ABSTRACT

Proposed dissertation: HEURISTICS FOR SOLVING THREE ROUTING PROBLEMS: CLOSE-ENOUGH TRAVELING SALESMAN PROBLEM, CLOSE-ENOUGH VEHICLE ROUTING PROBLEM, SEQUENCE-DEPENDENT TEAM ORIENTEERING PROBLEM

William K. Mennell, Doctor of Philosophy, 2009

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Dissertation co-advisor: Professor Edward Wasil

In this dissertation, we examine three important routing problems. In the second chapter we investigate the Close-Enough Traveling Salesman Problem (CETSP) in which a salesman must get within a specified radius of each node to visit it. The third chapter studies the multi-vehicle extension of the CETSP, the Close-Enough Vehicle Routing Problem (CEVRP). In the fourth chapter, we develop a post-processor to improve the accuracy of our heuristics for solving the CETSP and CEVRP. In the fifth chapter, we solve the Sequence-Dependent Team Orienteering Problem (SDTOP) in which the profit received for each node visited is dependent on the sequence in which all the nodes are visited. We summarize the dissertation in the final chapter.

The CETSP, CEVRP, and SDTOP have application in aerial reconnaissance route planning. We formulate each problem as a mathematical program and apply heuristic and combinatorial optimization techniques to solve them. We present the

results of extensive computational experiments that show that our methods produce high-quality solutions quickly.

HEURISTICS FOR SOLVING THREE ROUTING PROBLEMS: CLOSE-ENOUGH TRAVELING SALESMAN PROBLEM, CLOSE-ENOUGH VEHICLE ROUTING PROBLEM, AND SEQUENCE-DEPENDENT TEAM ORIENTEERING PROBLEM

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Professor Paul Schonfeld

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Dedication

Dedicated to my wife Amanda, my children Gracyn, Aedyn, any other children that come along down the road, my parents, and to the memories of Paul Ross and Leonard Opper.

Acknowledgments

Two pages is not enough to thank those who have made the completion of this arduous task possible.

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Soli Deo Gloria

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N.104 $dsj1000$, arbitrary radius, 3D, Euclidean, Length = 2074.8438211 1157
N.105 $team1_100$, Equal Radius, 2D, Manhattan, Length = 372.7430207 1171

N.106 $team2_200$, Equal Radius, 2D, Manhattan, Length = 278.4347435 1173
N.107 $team3_300$, Equal Radius, 2D, Manhattan, Length = 558.7495354 1176
N.108 $team4_400$, Equal Radius, 2D, Manhattan, Length = 829.1782830 1179
N.109 $team5_499$, Equal Radius, 2D, Manhattan, Length = 842.1865257 1183
N.110 $team6_500$, Equal Radius, 2D, Manhattan, Length = 260.7953578 1188
N.111 $bonus1000$, Equal Radius, 2D, Manhattan, Length = 459.6460772 1193
N.112 $kroD100$, $r = 0.7798$, Equal Radius, 2D, Manhattan, Length = 191.4224578 1201
N.113 $kroD100$, $r = 3.899$, Equal Radius, 2D, Manhattan, Length = 98.7090453 1203
N.114 $kroD100$, $r = 11.697$, Equal Radius, 2D, Manhattan, Length = 71.0158795577453 1205
N.115 $rat195$, $r = 0.578$, Equal Radius, 2D, Manhattan, Length = 189.1771060 1207
N.116 $rat195$, $r = 2.89$, Equal Radius, 2D, Manhattan, Length = 74.2568924 1210
N.117 $rat195$, $r = 8.67$, Equal Radius, 2D, Manhattan, Length = 55.8775337 1213
N.118 $lin318$, $r = 8.268$, Equal Radius, 2D, Manhattan, Length = 3339.8459111 1216
N.119 $lin318$, $r = 41.34$, Equal Radius, 2D, Manhattan, Length = 1529.0861960 1220
N.120 $lin318$, $r = 124.02$, Equal Radius, 2D, Manhattan, Length = 847.1658812 1224
N.121 $rd400$, $r = 1.9910618$, Equal Radius, 2D, Manhattan, Length = 1257.3570213 1228
N.122 $rd400$, $r = 9.955309$, Equal Radius, 2D, Manhattan, Length = 528.3877623 1232
N.123 $rd400$, $r = 29.865927$, Equal Radius, 2D, Manhattan, Length = 242.0228866 1236
N.124 $pcb442$, $r = 0.76$, Equal Radius, 2D, Manhattan, Length = 366.3747216 1240
N.125 $pcb442$, $r = 3.8$, Equal Radius, 2D, Manhattan, Length = 167.5629495 1244
N.126 $pcb442$, $r = 11.4$, Equal Radius, 2D, Manhattan, Length = 103.7559198 1248
N.127 $d493$, $r = 0.74904$, Equal Radius, 2D, Manhattan, Length = 256.2325549 1252
N.128 $d493$, $r = 3.7452$, Equal Radius, 2D, Manhattan, Length = 128.8478750 1257
N.129 $d493$, $r = 11.2356$, Equal Radius, 2D, Manhattan, Length = 92.4304507 1262
N.130 $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Manhattan, Length = 1158.9926373 1267

N.131 *dsj*1000, $r = 12.14609$, Equal Radius, 2D, Manhattan, Length = 436.5940805 1275
N.132 *dsj*1000, $r = 36.43827$, Equal Radius, 2D, Manhattan, Length = 239.7015872 1283
N.133 *concentricCircles*1, Equal Radius, 2D, Manhattan, Length = 67.1448769 1291
N.134 *concentricCircles*2, Equal Radius, 2D, Manhattan, Length = 178.9802725 1293
N.135 *concentricCircles*3, Equal Radius, 2D, Manhattan, Length = 329.6879183 1295
N.136 *concentricCircles*4, Equal Radius, 2D, Manhattan, Length = 556.5211162 1297
N.137 *concentricCircles*5, Equal Radius, 2D, Manhattan, Length = 786.4112373 1299
N.138 *bubbles*1, Equal Radius, 2D, Manhattan, Length = 367.8889005 1301
N.139 *bubbles*2, Equal Radius, 2D, Manhattan, Length = 447.8889308 1303
N.140 *bubbles*3, Equal Radius, 2D, Manhattan, Length = 579.2363902 1305
N.141 *bubbles*4, Equal Radius, 2D, Manhattan, Length = 888.9576556 1307
N.142 *bubbles*5, Equal Radius, 2D, Manhattan, Length = 1182.1279772 1310
N.143 *bubbles*6, Equal Radius, 2D, Manhattan, Length = 1451.2980253 1313
N.144 *bubbles*7, Equal Radius, 2D, Manhattan, Length = 1875.5920201 1317
N.145 *bubbles*8, Equal Radius, 2D, Manhattan, Length = 2225.7367958 1321
N.146 *bubbles*9, Equal Radius, 2D, Manhattan, Length = 2658.7776654 1326
N.147 *rotatingDiamonds*1, Equal Radius, 2D, Manhattan, Length = 35.5777872 1331
N.148 *rotatingDiamonds*2, Equal Radius, 2D, Manhattan, Length = 192.3430627 1333
N.149 *rotatingDiamonds*3, Equal Radius, 2D, Manhattan, Length = 432.3426801 1335
N.150 *rotatingDiamonds*4, Equal Radius, 2D, Manhattan, Length = 989.0239841 1338
N.151 *rotatingDiamonds*5, Equal Radius, 2D, Manhattan, Length = 1729.0214296 1342
N.152 *chaoSingleDep*, Equal Radius, 2D, Manhattan, Length = 1204.5642499 1348
N.153 *team*1_100, arbitrary radius, 2D, Manhattan, Length = 494.1144919 1351
N.154 *team*2_200, arbitrary radius, 2D, Manhattan, Length = 780.7125045 1353
N.155 *team*3_300, arbitrary radius, 2D, Manhattan, Length = 487.9948018 1356
N.156 *team*4_400, arbitrary radius, 2D, Manhattan, Length = 1231.65447143851 1359
N.157 *team*5_499, arbitrary radius, 2D, Manhattan, Length = 563.110301116539 1363

N.158 *team*6_500, arbitrary radius, 2D, Manhattan, Length = 781.134182103051 1368
N.159 *bonus*1000, arbitrary radius, 2D, Manhattan, Length = 1226.3949981 1376
N.160 *kroD*100, arbitrary radius, 2D, Manhattan, Length = 174.0126770 1390
N.161 *rat*195, arbitrary radius, 2D, Manhattan, Length = 82.1999999 1392
N.162 *lin*318, arbitrary radius, 2D, Manhattan, Length = 2505.4064740 1395
N.163 *rd*400, arbitrary radius, 2D, Manhattan, Length = 1544.5409324 1399
N.164 *pcb*442, arbitrary radius, 2D, Manhattan, Length = 281.2537974 1403
N.165 *d*493, arbitrary radius, 2D, Manhattan, Length = 179.5632101 . 1407
N.166 *dsj*1000, arbitrary radius, 2D, Manhattan, Length = 758.1192149 1412
N.167 *team*1_100, Equal Radius, 3D, Manhattan, Length = 1089.1559309 1420
N.168 *team*2_200, Equal Radius, 3D, Manhattan, Length = 359.4025228 1423
N.169 *team*3_300, Equal Radius, 3D, Manhattan, Length = 2001.1057597 1427
N.170 *team*4_400, Equal Radius, 3D, Manhattan, Length = 961.4325736 1432
N.171 *team*5_499, Equal Radius, 3D, Manhattan, Length = 2705.2350210 1439
N.172 *team*6_500, Equal Radius, 3D, Manhattan, Length = 289.8068752 1447
N.173 *bonus*1000, Equal Radius, 3D, Manhattan, Length = 1183.1870282 1455
N.174 *kroD*100, $r = 0.7798$, Equal Radius, 3D, Manhattan, Length = 276.9349054 1469
N.175 *kroD*100, $r = 3.899$, Equal Radius, 3D, Manhattan, Length = 109.7704722 1472
N.176 *kroD*100, $r = 11.697$, Equal Radius, 3D, Manhattan, Length = 71.3755246 1475
N.177 *rat*195, $r = 0.578$, Equal Radius, 3D, Manhattan, Length = 412.1314243 1478
N.178 *rat*195, $r = 2.89$, Equal Radius, 3D, Manhattan, Length = 149.6043831 1482
N.179 *rat*195, $r = 8.67$, Equal Radius, 3D, Manhattan, Length = 59.9565101 1486
N.180 *lin*318, $r = 8.268$, Equal Radius, 3D, Manhattan, Length = 3700.2413634 1490
N.181 *lin*318, $r = 41.34$, Equal Radius, 3D, Manhattan, Length = 1612.4919172 1496
N.182 *lin*318, $r = 124.02$, Equal Radius, 3D, Manhattan, Length = 851.4709259 1502
N.183 *rd*400, $r = 1.9910618$, Equal Radius, 3D, Manhattan, Length = 4560.3678377 1508
N.184 *rd*400, $r = 9.955309$, Equal Radius, 3D, Manhattan, Length = 2132.7786309 1515
N.185 *rd*400, $r = 29.865927$, Equal Radius, 3D, Manhattan, Length = 656.4960397 1522
N.186 *pcb*442, $r = 0.76$, Equal Radius, 3D, Manhattan, Length = 532.9168269 1529

N.187 *pcb*442, $r = 3.8$, Equal Radius, 3D, Manhattan, Length = 180.5786677 1536
N.188 *pcb*442, $r = 11.4$, Equal Radius, 3D, Manhattan, Length = 104.2560242 1543
N.189 *d*493, $r = 0.74904$, Equal Radius, 3D, Manhattan, Length = 1912.7275896 1550
N.190 *d*493, $r = 3.7452$, Equal Radius, 3D, Manhattan, Length = 938.4333440 1558
N.191 *d*493, $r = 11.2356$, Equal Radius, 3D, Manhattan, Length = 388.7310227 1566
N.192 *dsj*1000, $r = 2.429218$, Equal Radius, 3D, Manhattan, Length = 4412.9731379 1574
N.193 *dsj*1000, $r = 12.14609$, Equal Radius, 3D, Manhattan, Length = 1248.0843202 1588
N.194 *dsj*1000, $r = 36.43827$, Equal Radius, 3D, Manhattan, Length = 341.1658446 1602
N.195 *team*1_100, arbitrary radius, 3D, Manhattan, Length = 1264.3627211 1616
N.196 *team*2_200, arbitrary radius, 3D, Manhattan, Length = 1450.3564139 1619
N.197 *team*3_300, arbitrary radius, 3D, Manhattan, Length = 1382.5977637 1623
N.198 *team*4_400, arbitrary radius, 3D, Manhattan, Length = 1780.7982675 1628
N.199 *team*5_499, arbitrary radius, 3D, Manhattan, Length = 1156.8842941 1635
N.200 *team*6_500, arbitrary radius, 3D, Manhattan, Length = 1471.9799079 1643
N.201 *bonus*1000, arbitrary radius, 3D, Manhattan, Length = 3218.9380346 1651
N.202 *kroD*100, arbitrary radius, 3D, Manhattan, Length = 233.1348582 1665
N.203 *rat*195, arbitrary radius, 3D, Manhattan, Length = 112.7771027 1668
N.204 *lin*318, arbitrary radius, 3D, Manhattan, Length = 2736.7897884 1672
N.205 *rd*400, arbitrary radius, 3D, Manhattan, Length = 5163.8340072 1678
N.206 *pcb*442, arbitrary radius, 3D, Manhattan, Length = 337.1969964 1685
N.207 *d*493, arbitrary radius, 3D, Manhattan, Length = 1065.5848949 1692
N.208 *dsj*1000, arbitrary radius, 3D, Manhattan, Length = 2303.0686450 1700

O.1 *team*1_100, Equal Radius, 2D, Euclidean, Length = 1289.1592610 1718
O.2 *team*2_200, Equal Radius, 2D, Euclidean, Length = 525.3019014 1720
O.3 *team*3_300, Equal Radius, 2D, Euclidean, Length = 1009.3420570 1723
O.4 *team*4_400, Equal Radius, 2D, Euclidean, Length = 1332.0637099 1726
O.5 *team*5_499, Equal Radius, 2D, Euclidean, Length = 1070.6071323 1730
O.6 *team*6_500, Equal Radius, 2D, Euclidean, Length = 611.8037017 1735
O.7 *bonus*1000, Equal Radius, 2D, Euclidean, Length = 1358.4141657 1740
O.8 *kroD*100, $r = 0.7798$, Equal Radius, 2D, Euclidean, Length = 376.2838372 1748
O.9 *kroD*100, $r = 3.899$, Equal Radius, 2D, Euclidean, Length = 302.9671512 1750

O.10 $kroD100$, $r = 11.697$, Equal Radius, 2D, Euclidean, Length = 168.2115472 1752
O.11 $rat195$, $r = 0.578$, Equal Radius, 2D, Euclidean, Length = 294.3508149 1754
O.12 $rat195$, $r = 2.89$, Equal Radius, 2D, Euclidean, Length = 231.2867000 1757
O.13 $rat195$, $r = 8.67$, Equal Radius, 2D, Euclidean, Length = 133.3482658 1760
O.14 $lin318$, $r = 8.268$, Equal Radius, 2D, Euclidean, Length = 5029.0931705 1763
O.15 $lin318$, $r = 41.34$, Equal Radius, 2D, Euclidean, Length = 3923.4927869 1767
O.16 $lin318$, $r = 124.02$, Equal Radius, 2D, Euclidean, Length = 2406.1951812 1771
O.17 $rd400$, $r = 1.9910618$, Equal Radius, 2D, Euclidean, Length = 1199.4870122 1775
O.18 $rd400$, $r = 9.955309$, Equal Radius, 2D, Euclidean, Length = 792.9690826 1779
O.19 $rd400$, $r = 29.865927$, Equal Radius, 2D, Euclidean, Length = 469.1149557 1783
O.20 $pcb442$, $r = 0.76$, Equal Radius, 2D, Euclidean, Length = 524.2074655 1787
O.21 $pcb442$, $r = 3.8$, Equal Radius, 2D, Euclidean, Length = 406.1321582 1791
O.22 $pcb442$, $r = 11.4$, Equal Radius, 2D, Euclidean, Length = 270.1722565 1795
O.23 $d493$, $r = 0.74904$, Equal Radius, 2D, Euclidean, Length = 830.1387149 1799
O.24 $d493$, $r = 3.7452$, Equal Radius, 2D, Euclidean, Length = 732.9670615 1804
O.25 $d493$, $r = 11.2356$, Equal Radius, 2D, Euclidean, Length = 535.9189087 1809
O.26 $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Euclidean, Length = 1431.6074347 1814
O.27 $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Euclidean, Length = 973.0878722 1822
O.28 $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Euclidean, Length = 491.5866746 1830
O.29 $concentricCircles1$, Equal Radius, 2D, Euclidean, Length = 82.7198592 1838
O.30 $concentricCircles2$, Equal Radius, 2D, Euclidean, Length = 206.5896055 1840
O.31 $concentricCircles3$, Equal Radius, 2D, Euclidean, Length = 394.2431392 1842
O.32 $concentricCircles4$, Equal Radius, 2D, Euclidean, Length = 613.0437957 1844
O.33 $concentricCircles5$, Equal Radius, 2D, Euclidean, Length = 814.9371911 1846
O.34 $bubbles1$, Equal Radius, 2D, Euclidean, Length = 525.5619380 . 1849
O.35 $bubbles2$, Equal Radius, 2D, Euclidean, Length = 493.1269456 . 1851
O.36 $bubbles3$, Equal Radius, 2D, Euclidean, Length = 997.9625028 . 1853
O.37 $bubbles4$, Equal Radius, 2D, Euclidean, Length = 1517.6153350 1855
O.38 $bubbles5$, Equal Radius, 2D, Euclidean, Length = 1873.6646995 1858
O.39 $bubbles6$, Equal Radius, 2D, Euclidean, Length = 1840.3033167 1861

O.40 *bubbles*7, Equal Radius, 2D, Euclidean, Length = 1983.5504413 1865
O.41 *bubbles*8, Equal Radius, 2D, Euclidean, Length = 2935.0259367 1869
O.42 *bubbles*9, Equal Radius, 2D, Euclidean, Length = 3286.4711570 1874
O.43 *rotatingDiamonds*1, Equal Radius, 2D, Euclidean, Length = 43.5540318 1879
O.44 *rotatingDiamonds*2, Equal Radius, 2D, Euclidean, Length = 199.2152797 1881
O.45 *rotatingDiamonds*3, Equal Radius, 2D, Euclidean, Length = 632.5342941 1883
O.46 *rotatingDiamonds*4, Equal Radius, 2D, Euclidean, Length = 870.0369334 1886
O.47 *rotatingDiamonds*5, Equal Radius, 2D, Euclidean, Length = 1788.7227365 1890
O.48 *chaoSingleDep*, Equal Radius, 2D, Euclidean, Length = 1130.8193561 1896
O.49 *team*1_100, arbitrary radius, 2D, Euclidean, Length = 1419.2041059 1899
O.50 *team*2_200, arbitrary radius, 2D, Euclidean, Length = 911.1879857 1901
O.51 *team*3_300, arbitrary radius, 2D, Euclidean, Length = 864.1079332 1904
O.52 *team*4_400, arbitrary radius, 2D, Euclidean, Length = 1558.6012361 1907
O.53 *team*5_499, arbitrary radius, 2D, Euclidean, Length = 825.9850379 1911
O.54 *team*6_500, arbitrary radius, 2D, Euclidean, Length = 1068.2905716 1916
O.55 *bonus*1000, arbitrary radius, 2D, Euclidean, Length = 1768.6912579 1924
O.56 *kroD*100, arbitrary radius, 2D, Euclidean, Length = 362.6083673 1938
O.57 *rat*195, arbitrary radius, 2D, Euclidean, Length = 171.3521618 1940
O.58 *lin*318, arbitrary radius, 2D, Euclidean, Length = 4433.3799090 1943
O.59 *rd*400, arbitrary radius, 2D, Euclidean, Length = 1395.4245586 1947
O.60 *pcb*442, arbitrary radius, 2D, Euclidean, Length = 451.1431498 1951
O.61 *d*493, arbitrary radius, 2D, Euclidean, Length = 801.4571962 . 1955
O.62 *dsj*1000, arbitrary radius, 2D, Euclidean, Length = 1147.2716801 1960
O.63 *team*1_100, Equal Radius, 3D, Euclidean, Length = 2290.7803688 1968
O.64 *team*2_200, Equal Radius, 3D, Euclidean, Length = 642.6087972 1971
O.65 *team*3_300, Equal Radius, 3D, Euclidean, Length = 2164.8084510 1975
O.66 *team*4_400, Equal Radius, 3D, Euclidean, Length = 1401.1221480 1980
O.67 *team*5_499, Equal Radius, 3D, Euclidean, Length = 2227.2851840 1987
O.68 *team*6_500, Equal Radius, 3D, Euclidean, Length = 655.5062813 1995
O.69 *bonus*1000, Equal Radius, 3D, Euclidean, Length = 1776.6307639 2003
O.70 *kroD*100, $r = 0.7798$, Equal Radius, 3D, Euclidean, Length = 413.1622723 2017

O.71 *kroD*100, $r = 3.899$, Equal Radius, 3D, Euclidean, Length = 312.1328212 2020
O.72 *kroD*100, $r = 11.697$, Equal Radius, 3D, Euclidean, Length = 172.5595712 2023
O.73 *rat*195, $r = 0.578$, Equal Radius, 3D, Euclidean, Length = 405.3975662 2026
O.74 *rat*195, $r = 2.89$, Equal Radius, 3D, Euclidean, Length = 267.6733710 2030
O.75 *rat*195, $r = 8.67$, Equal Radius, 3D, Euclidean, Length = 144.6288277 2034
O.76 *lin*318, $r = 8.268$, Equal Radius, 3D, Euclidean, Length = 5152.4383252 2038
O.77 *lin*318, $r = 41.34$, Equal Radius, 3D, Euclidean, Length = 4009.1943364 2044
O.78 *lin*318, $r = 124.02$, Equal Radius, 3D, Euclidean, Length = 2367.9567361 2050
O.79 *rd*400, $r = 1.9910618$, Equal Radius, 3D, Euclidean, Length = 3434.9746874 2056
O.80 *rd*400, $r = 9.955309$, Equal Radius, 3D, Euclidean, Length = 1888.0184327 2063
O.81 *rd*400, $r = 29.865927$, Equal Radius, 3D, Euclidean, Length = 962.6975809 2070
O.82 *pcb*442, $r = 0.76$, Equal Radius, 3D, Euclidean, Length = 583.4034164 2077
O.83 *pcb*442, $r = 3.8$, Equal Radius, 3D, Euclidean, Length = 410.2656132 2084
O.84 *pcb*442, $r = 11.4$, Equal Radius, 3D, Euclidean, Length = 274.9591569 2091
O.85 *d*493, $r = 0.74904$, Equal Radius, 3D, Euclidean, Length = 2697.5562730 2098
O.86 *d*493, $r = 3.7452$, Equal Radius, 3D, Euclidean, Length = 2198.7001179 2106
O.87 *d*493, $r = 11.2356$, Equal Radius, 3D, Euclidean, Length = 1835.3061007 2114
O.88 *dsj*1000, $r = 2.429218$, Equal Radius, 3D, Euclidean, Length = 3580.9338122 2122
O.89 *dsj*1000, $r = 12.14609$, Equal Radius, 3D, Euclidean, Length = 1587.8133964 2136
O.90 *dsj*1000, $r = 36.43827$, Equal Radius, 3D, Euclidean, Length = 740.6639853 2150
O.91 *team*1_100, arbitrary radius, 3D, Euclidean, Length = 2371.7310651 2164
O.92 *team*2_200, arbitrary radius, 3D, Euclidean, Length = 1304.9378206 2167
O.93 *team*3_300, arbitrary radius, 3D, Euclidean, Length = 1745.4890697 2171
O.94 *team*4_400, arbitrary radius, 3D, Euclidean, Length = 1788.5826537 2176
O.95 *team*5_499, arbitrary radius, 3D, Euclidean, Length = 1309.0039164 2183
O.96 *team*6_500, arbitrary radius, 3D, Euclidean, Length = 1441.8847857 2191
O.97 *bonus*1000, arbitrary radius, 3D, Euclidean, Length = 2912.1509290 2199
O.98 *kroD*100, arbitrary radius, 3D, Euclidean, Length = 386.2939312 2213
O.99 *rat*195, arbitrary radius, 3D, Euclidean, Length = 194.9382562 2216
O.100 *lin*318, arbitrary radius, 3D, Euclidean, Length = 4501.2766338 2220

O.101 $rd400$, arbitrary radius, 3D, Euclidean, Length = 3802.0007403 2226
O.102 $pcb442$, arbitrary radius, 3D, Euclidean, Length = 463.4611888 2233
O.103 $d493$, arbitrary radius, 3D, Euclidean, Length = 2359.3451722 . 2240
O.104 $dsj1000$, arbitrary radius, 3D, Euclidean, Length = 2216.3550936 2248
O.105 $team1_100$, Equal Radius, 2D, Manhattan, Length = 1628.0615550 2262
O.106 $team2_200$, Equal Radius, 2D, Manhattan, Length = 640.1980808 2264
O.107 $team3_300$, Equal Radius, 2D, Manhattan, Length = 1223.2121977 2267
O.108 $team4_400$, Equal Radius, 2D, Manhattan, Length = 1674.5997332 2270
O.109 $team5_499$, Equal Radius, 2D, Manhattan, Length = 1300.8542954 2274
O.110 $team6_500$, Equal Radius, 2D, Manhattan, Length = 754.3073449 2279
O.111 $bonus1000$, Equal Radius, 2D, Manhattan, Length = 1752.0928165 2284
O.112 $kroD100$, $r = 0.7798$, Equal Radius, 2D, Manhattan, Length = 453.3184420 2292
O.113 $kroD100$, $r = 3.899$, Equal Radius, 2D, Manhattan, Length = 363.9952647 2294
O.114 $kroD100$, $r = 11.697$, Equal Radius, 2D, Manhattan, Length = 210.0868092 2296
O.115 $rat195$, $r = 0.578$, Equal Radius, 2D, Manhattan, Length = 353.6018368 2298
O.116 $rat195$, $r = 2.89$, Equal Radius, 2D, Manhattan, Length = 286.7876088 2301
O.117 $rat195$, $r = 8.67$, Equal Radius, 2D, Manhattan, Length = 175.8845855 2304
O.118 $lin318$, $r = 8.268$, Equal Radius, 2D, Manhattan, Length = 5906.1839702 2307
O.119 $lin318$, $r = 41.34$, Equal Radius, 2D, Manhattan, Length = 4783.5822620 2311
O.120 $lin318$, $r = 124.02$, Equal Radius, 2D, Manhattan, Length = 2800.8566057 2315
O.121 $rd400$, $r = 1.9910618$, Equal Radius, 2D, Manhattan, Length = 1490.8853253 2319
O.122 $rd400$, $r = 9.955309$, Equal Radius, 2D, Manhattan, Length = 944.8476090 2323
O.123 $rd400$, $r = 29.865927$, Equal Radius, 2D, Manhattan, Length = 566.4932202 2327
O.124 $pcb442$, $r = 0.76$, Equal Radius, 2D, Manhattan, Length = 647.7184586 2331
O.125 $pcb442$, $r = 3.8$, Equal Radius, 2D, Manhattan, Length = 516.0989123 2335
O.126 $pcb442$, $r = 11.4$, Equal Radius, 2D, Manhattan, Length = 360.8789007 2339
O.127 $d493$, $r = 0.74904$, Equal Radius, 2D, Manhattan, Length = 1101.6571312 2343
O.128 $d493$, $r = 3.7452$, Equal Radius, 2D, Manhattan, Length = 984.4375342 2348

O.129 $d493$, $r = 11.2356$, Equal Radius, 2D, Manhattan, Length = 714.5315086 2353
O.130 $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Manhattan, Length = 1803.0378859 2358
O.131 $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Manhattan, Length = 1248.2888837 2366
O.132 $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Manhattan, Length = 644.7273071 2374
O.133 $concentricCircles1$, Equal Radius, 2D, Manhattan, Length = 102.5368446 2382
O.134 $concentricCircles2$, Equal Radius, 2D, Manhattan, Length = 257.0534862 2384
O.135 $concentricCircles3$, Equal Radius, 2D, Manhattan, Length = 483.9745010 2386
O.136 $concentricCircles4$, Equal Radius, 2D, Manhattan, Length = 774.9603927 2388
O.137 $concentricCircles5$, Equal Radius, 2D, Manhattan, Length = 1023.2680182 2390
O.138 $bubbles1$, Equal Radius, 2D, Manhattan, Length = 606.8627792 2393
O.139 $bubbles2$, Equal Radius, 2D, Manhattan, Length = 530.5572421 2395
O.140 $bubbles3$, Equal Radius, 2D, Manhattan, Length = 1152.9396798 2397
O.141 $bubbles4$, Equal Radius, 2D, Manhattan, Length = 1778.8584587 2399
O.142 $bubbles5$, Equal Radius, 2D, Manhattan, Length = 2143.8837484 2402
O.143 $bubbles6$, Equal Radius, 2D, Manhattan, Length = 2066.6931725 2405
O.144 $bubbles7$, Equal Radius, 2D, Manhattan, Length = 2160.6461876 2409
O.145 $bubbles8$, Equal Radius, 2D, Manhattan, Length = 3461.2963461 2413
O.146 $bubbles9$, Equal Radius, 2D, Manhattan, Length = 3817.2175358 2418
O.147 $rotatingDiamonds1$, Equal Radius, 2D, Manhattan, Length = 56.2779117 2423
O.148 $rotatingDiamonds2$, Equal Radius, 2D, Manhattan, Length = 273.0716361 2425
O.149 $rotatingDiamonds3$, Equal Radius, 2D, Manhattan, Length = 727.4837613 2427
O.150 $rotatingDiamonds4$, Equal Radius, 2D, Manhattan, Length = 1119.9988904 2430
O.151 $rotatingDiamonds5$, Equal Radius, 2D, Manhattan, Length = 2029.8139163 2434
O.152 $chaoSingleDep$, Equal Radius, 2D, Manhattan, Length = 1332.7745235 2440
O.153 $team1_100$, arbitrary radius, 2D, Manhattan, Length = 1755.0629673 2443

O.154 *team*2_200, arbitrary radius, 2D, Manhattan, Length = 1121.1911403 2445
O.155 *team*3_300, arbitrary radius, 2D, Manhattan, Length = 1095.8086429 2448
O.156 *team*4_400, arbitrary radius, 2D, Manhattan, Length = 1942.8053448 2451
O.157 *team*5_499, arbitrary radius, 2D, Manhattan, Length = 1001.3131650 2455
O.158 *team*6_500, arbitrary radius, 2D, Manhattan, Length = 1311.1238318 2460
O.159 *bonus*1000, arbitrary radius, 2D, Manhattan, Length = 2230.8979714 2468
O.160 *kroD*100, arbitrary radius, 2D, Manhattan, Length = 433.1199688 2482
O.161 *rat*195, arbitrary radius, 2D, Manhattan, Length = 201.9965695 2484
O.162 *lin*318, arbitrary radius, 2D, Manhattan, Length = 5272.3096775 2487
O.163 *rd*400, arbitrary radius, 2D, Manhattan, Length = 1714.3281950 2491
O.164 *pcb*442, arbitrary radius, 2D, Manhattan, Length = 560.6561086 2495
O.165 *d*493, arbitrary radius, 2D, Manhattan, Length = 1072.8180884 2499
O.166 *dsj*1000, arbitrary radius, 2D, Manhattan, Length = 1429.9365464 2504
O.167 *team*1_100, Equal Radius, 3D, Manhattan, Length = 3271.6988366 2512
O.168 *team*2_200, Equal Radius, 3D, Manhattan, Length = 855.2410020 2515
O.169 *team*3_300, Equal Radius, 3D, Manhattan, Length = 2955.1944331 2519
O.170 *team*4_400, Equal Radius, 3D, Manhattan, Length = 1828.9714122 2524
O.171 *team*5_499, Equal Radius, 3D, Manhattan, Length = 3155.4176578 2531
O.172 *team*6_500, Equal Radius, 3D, Manhattan, Length = 913.6296009 2539
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O.176 *kroD*100, $r = 11.697$, Equal Radius, 3D, Manhattan, Length = 216.3612509 2567
O.177 *rat*195, $r = 0.578$, Equal Radius, 3D, Manhattan, Length = 549.4883869 2570
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O.179 *rat*195, $r = 8.67$, Equal Radius, 3D, Manhattan, Length = 208.3938064 2578
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O.184 $rd400$, $r = 9.955309$, Equal Radius, 3D, Manhattan, Length = 2611.1434156 2607
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Chapter 1

Introduction

In this dissertation, we model and solve three interesting problems in combinatorial optimization: the Close-Enough Traveling Salesman Problem (CETSP), the Close-Enough Vehicle Routing Problem (CEVRP), and the Sequence-Dependent Team Orienteering Problem (SDTOP). We combine exact techniques (linear, mixed integer, and nonlinear programming) and heuristic methods (greedy search, genetic algorithms, record-to-record travel) to develop efficient heuristic procedures that obtain high-quality solutions to each problem.

1.1 Outline

The Close-Enough Traveling Salesman Problem (CETSP) is a variant of the Traveling Salesman Problem (TSP). In the symmetric TSP, we are given a complete, undirected graph $G = (V, E)$, where V is the set of n nodes (cities), E is the set of edges, and each edge has a length (distance). We need to find the tour (Hamiltonian cycle) that minimizes the sum of the lengths of the edges. In the CETSP, the tour must pass within a specified distance of each node. That is, the salesman must get "close-enough" to each node to visit it.

The CETSP has practical application in unmanned aerial vehicle (UAV) operations, including aerial reconnaissance and delivering munitions to targets. For

instance, if a UAV is carrying a sensor that looks straight down, then the area visible to the sensor will be disk-shaped. As long as the UAV gets close-enough to a target so that the target lies within the sensor's visibility disk, the target can be considered visited. Similar applications exist in submarine reconnaissance of coastlines.

We formulate the CETSP as a nonconvex, mixed integer, nonlinear program (MINLP) and develop lower bounds. The CETSP is at least as difficult as the TSP, which is NP-hard, and, therefore, cannot easily be solved to optimality. A few heuristics for solving the CETSP have appeared recently in the operations research literature [43, 27, 73]. We develop a fast, three-phase solution procedure for the CETSP, called the Steiner-zone Heuristic (SZH). SZH is based on intersections of k disks called Steiner zones. There are no published benchmark problems so we generate 48 test problems with 17 to 1001 nodes. We apply two variants of our heuristic to the benchmark problems and compare the results to those produced by 13 methods. Our heuristic provides the best combination of accuracy and computational speed over all 48 problems.

The Close-Enough Vehicle Routing Problem (CEVRP) is a variant of the Vehicle Routing Problem (VRP). The CEVRP is a multi-vehicle extension of the CETSP. Given a complete, undirected graph $G = (V, E)$, where V is the set of n nodes (cities), E is the set of edges, and each edge has a length (distance), and k homogeneous vehicles, we need to find the set of k tours (Hamiltonian cycles) that minimizes the total sum of edge lengths. There is only one depot. Each node has a demand that must be serviced by exactly one vehicle. Each vehicle is subject to capacity (data storage or payload) and maximum tour length restrictions. A vehicle

must pass within a specified distance of a node to visit it. All n nodes must be visited.

The CEVRP has practical application in UAV operations. The military continues to rely more and more on UAVs to provide timely intelligence and to keep human pilots out of harm's way. Fleets of UAVs can visit many more targets in a given time period than a single aircraft. To use multiple aircraft efficiently, we must solve problems such as the CEVRP.

The CEVRP is a new problem in the operations research literature. We formulate the CEVRP as a nonconvex MINLP. The CEVRP is at least as difficult as the VRP, which is NP-hard, and, therefore, cannot easily be solved to optimality. We extend our Steiner-zone heuristic for the CETSP to solve the CEVRP, replacing the TSP solver with a VRP solver (additional minor changes are also made). We modify the 48 CETSP benchmark problems, adding node demands and vehicles, to create a set of 48 benchmark problems for the CEVRP. We apply four variants of the Steiner-zone heuristic to the benchmark problems and compare the results to the results produced by five heuristics. Two Steiner-zone variants produce the best combination of accuracy and computation speed over all 48 problems.

In the Generalized Traveling Salesman Problem (GTSP) variant of the TSP, n nodes are divided into k clusters. A salesman must visit exactly one node from each cluster. We approximate the boundary of each disk in the CETSP with k points, letting each set of k points form a cluster. We use a genetic algorithm (GA) to solve a GTSP on the k clusters and obtain a feasible solution to the CETSP. For problems where there is only a small or moderate amount of disk overlap (disk overlap creates

the Steiner zones), this GTSP solution procedure consistently produces tours that are shorter than tours produced by SZH. However, the GA is very slow, taking weeks and months to solve larger problems.

We find that the tours produced by the GA are different than the tours produced by SZH. Typically, the GA's tours have a simpler shape. For instance, a solution produced by the GA may have a square shape whereas the comparable SZH tour zigzags from point to point. We develop a post-processor for the Steiner-zone heuristic that tries to improve the quality of its solutions by encouraging a tour with a simpler shape. We show that our post-processor increases the accuracy of the Steiner-zone heuristic substantially with only a very modest increase in computing time.

The Sequence-Dependent Team Orienteering Problem (SDTOP) is a new variant of the Team Orienteering Problem (TOP). In the TOP, a reward, p_i, is given if node i is visited, and a team of k vehicles visits a subset of the n nodes in order to maximize the total reward. In the Sequence-Dependent Team Orienteering Problem (SDTOP), the rewards for visiting nodes are replaced by a matrix, P, whose components p_{ij} give the reward for visiting node i before j. The total profit associated with visiting node i is dependent upon the order in which the nodes are visited (not only for the other nodes in the same route as i but all visited nodes).

The SDTOP can be applied to route a fleet of UAVs on a set of predetermined targets. A real-world UAV routing problem must consider many variables such as wind speed, obstacles to be avoided, aircraft survivability, revisiting targets for re-imaging, requiring certain nodes to be visited before others, wide-area search over

a region, and cooperative control of multiple aircraft. Most papers in the literature consider very limited versions of this problem. For example, some formulations assign priority to each node (similar to p_i in the TOP) and the objective seeks to maximize the total sum of priorities [54, 56, 58, 59, 63, 64]. We suggest that assigning node i a priority (reward) without considering which nodes are visited before and which are visited after i does not fully capture the value relationship between targets. That is, visiting target i before target j may provide a different benefit than visiting j before i. Rather than ignoring the sequence in which nodes are visited or explicitly requiring a specified sequence, we let the objective function determine the order.

We formulate the SDTOP as a Mixed Integer Program (MIP). We develop a heuristic, based on the record-to-record travel procedure, that is capable of solving problems with heterogeneous fleets. Because the evaluation of any new route involves summing the rewards (an $O(n^2)$ operation), p_{ij}, we evaluate the objective function as efficiently as possible. We modify 130 TOP problems from the literature [6] to create benchmark problems for the SDTOP. We compare our solutions to the solutions that are generated when the SDTOP is solved as a VRP (minimizing distance without regard to reward). We create an additional 11 problems in which one of k available vehicles has arbitrarily large capacity and maximum tour length. In this case, the SDTOP reduces to the Linear Ordering Problem (LOP). Provably near-optimal solutions can be found for the LOP [18]. We compare our heuristic's performance on the 11 problems to the near-optimal solutions found by the LOP solver developed by Charon and Hudry [18]. These problems provide evidence that

our heuristic produces high-quality solutions.

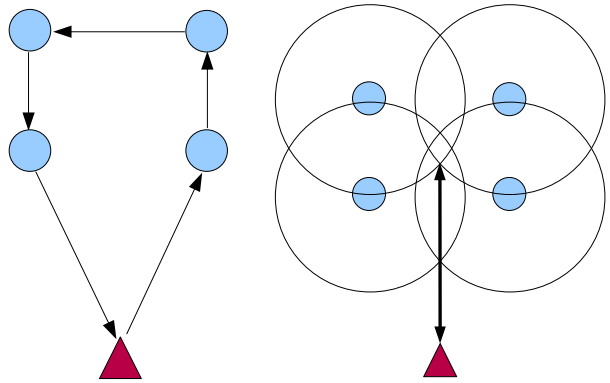
Chapter 2

The Close-Enough Traveling Salesman Problem

2.1 Introduction

The Traveling Salesman Problem (TSP) is one of the most studied problems in operations research. A salesman starts and ends at the same city and must find the cheapest way to visit n cities exactly once. Given a complete, undirected graph $G = (V, E)$, where V is the set of n nodes (cities), E is the set of edges, and each edge has a length (distance), we must find the tour (Hamiltonian cycle) that minimizes the sum of the lengths of the edges in the symmetric TSP. The book by Applegate et al. [13] provides a detailed history of the TSP including applications and computational aspects.

In this chapter, we examine the following variant of the TSP. If a salesman is within a specified distance of a node (in other words, a salesman is "close enough"), then the node is considered to have been visited. We illustrate the CETSP in Figure 2.1. In the standard TSP shown in Figure 2.1(a), the salesman leaves home (the start node is depicted by a triangle), visits four nodes, and returns home. In the CETSP shown in Figure 2.1(b), the salesman needs to get within distance r of each node i (this is depicted by the four disks), where r is the same for each node. If the salesman visits a location in the intersection of the four disks, then each node has been visited. Clearly, the out-and-back solution to the CETSP has a shorter total



(a) TSP tour (b) CETSP tour

Figure 2.1: The optimal TSP tour compared with the optimal CETSP tour. The CETSP tour is shorter.

length than the solution with five edges required by the TSP.

The CETSP has a number of practical applications. Consider the deployment of a drone aircraft (unmanned aerial vehicle) to monitor several geographic regions. To collect its reconnaissance information, the aircraft needs to fly within a certain distance of each region's center. The aircraft has a fixed flying time so that a flight path (tour) must be followed that gets close enough to the center of each region and minimizes flying time (distance traveled).

Utility companies use automated meter reading with radio frequency identification (RFID) to read utility meters from a distance. A meter reader can record the use of water, gas, or electricity within 500 to 1000 feet of a customer and does not need to traverse every street in a neighborhood. The radius of RFID coverage transforms the traditional meter reading problem from a TSP to a CETSP.

In remainder of this chapter, we review the literature on the CETSP (Section 5.2) and formulate this problem as a mathematical program (Section B.1). We develop a solution method based on Steiner zones (Section 5.5), generate a set of test

problems, and conduct extensive computational experiments in which we compare the results of our method to the results of other methods, including a genetic algorithm, a tour generation and modification heuristic, and a greedy heuristic (Section 3.5).

2.2 Literature Review

The CETSP is a specific case of three well-known combinatorial optimization problems: the Covering Tour Problem (CTP), the TSP with Neighborhoods (TSPN), and the Generalized TSP (GTSP).

In the CTP, there is a discrete set of nodes, V, that can be visited, a set of nodes, $T \subseteq V$, that must be visited, and a set of nodes, W, that must be covered. To be covered, node i must lie within a specified distance of a node in the tour. A continuous version of the CTP is the Geometric Covering Salesman Problem (GCSP) where V consists of entire regions in the plane [8]. For the CETSP, $T = \emptyset$, V is the set of all points on the boundaries of the disks, and W is the set of n nodes. Arkin and Hassin [8] and Current and Schilling [23, 24] present worst-case performance bounds for the CTP for various types of regions, including parallel line segments and disks. Gendreau et al. [37] present a branch-and-cut algorithm and a heuristic for the CTP. They suggest aerial forest-fire detection as a possible application for the CTP.

In the GTSP, each of the n nodes is assigned to one of k clusters. The clusters have arbitrary size and are not necessarily disjoint. A feasible solution tour visits

exactly one point (some definitions specify at least one point) in each cluster. In the CETSP, the boundary of each node's disk can be considered a cluster with an infinite number of points. Solving the GTSP over a discrete subset of these perimeter points for each disk produces a feasible solution to the CETSP. Fischetti and Toth [36] present polyhedral results along with a branch-and-cut algorithm for the exact solution to the GTSP. Recently, Silberholz and Golden [67] describe a genetic algorithm (GA) that found new best solutions for many of the standard test problems.

In the TSPN, each customer (node) is willing to travel a distance in a neighborhood to meet the salesman. The neighborhood may be a straight line, convex polygon, disk, or a general, non-convex region. De Berg et al. [25], Safra and Schwartz [61], Dumitrescu and Mitchell [31], Mitchell [52, 53], Gudmundsson and Levcopoulos [42], Arkin and Hassin [7], and Elbassioni [32, 34, 33], have studied approximation algorithms with provable worst-case bounds for different versions of the TSPN, including one where the regions are disjoint unit disks. Mitchell [53] presents the first known polynomial time approximation scheme (PTAS) for the TSPN where every region is only required to be fat. A c-fat region, P, contains a circle of diameter at least $c^{-1} * diameter(P))$ for some constant c. A circle is therefore 1-fat since it contains itself. In [53], regions are simply described as fat, implying that some constant, c, exists but need not be explicitly stated.). Elbassioni et al. [33] give the tightest known upper bounds for the TSPN for continuous, convex regions. Their bounds are dependent on the fatness of the regions. There are no known worst-case bounds for the TSPN where the regions are fat, convex, of varying

size, continuous, and possibly intersecting. Thus, there is no known algorithm with worst-case bounds for the CETSP. We note that none of the algorithms proposed in the literature is designed to produce high-quality solutions quickly. They only guarantee worst-case bounds on performance.

Klesh [49] studies time-optimal aerial exploration of a given region for autonomous aircraft. Objects of interest, such as radar sites, are visible to the aircraft only when the aircraft is within the object's *visibility disk*, a disk of a specified radius. Unlike the CETSP, flight paths are not straight-line edges between nodes and aircraft cannot turn instantaneously. Klesh develops necessary conditions for optimal flight path planning with multiple (possibly intersecting) disks and a single vehicle. He describes two methods, a rubberband heuristic and a GTSP-based heuristic, for solving this problem but does not report any test results.

The first description of the CETSP, specifically, is given by Gulczynski, Heath, and Price [43]. They consider utility companies that use RFID to read meters from a distance. The authors present six heuristics (three variants of tiling, radial adjacency, sweeping circle, Steiner zone) for solving problems with Euclidean distances and r is the same for all disks. The heuristics were developed by teams of graduate students as part of a class project. The six heuristics have three steps in common.

- Step 1. Find a feasible supernode set S such that each customer i is within r units of at least one point in S.
- Step 2. Solve a TSP on the points in S to produce a near-optimal solution T that is a feasible solution to the CETSP.

- Step 3. Reduce the distance traveled in T while maintaining feasibility.

Each heuristic has a different approach to finding S in the first step. Three heuristics use variations of hexagonal tiling in which the plane is tiled with regular hexagons. Feasibility is ensured since the center of each hexagon is no more than r units from any node inside the hexagon. The radial adjacency heuristic uses a binary matrix to build supernodes. A value in the matrix is 1 if two nodes are within distance r from each other and 0 otherwise. The sweeping circle heuristic covers the plane with supernodes that are circles instead of hexagons. The circles are merged into a set of supernodes that cover all original nodes. The Steiner-zone heuristic, an earlier implementation of the work presented here, constructs the supernodes (Steiner zones) by examining points that lie in the intersections of multiple circles (more about this in Section 5.5). The six heuristics were applied to seven test problems with 101 to 1001 customers. In this limited computational experiment, the tiling heuristic that merged supernodes and the Steiner-zone heuristic produced high-quality results.

Dong, Yang, and Chen [27] formulate the CETSP as a mixed integer, nonlinear program (MINLP), but they do not attempt to solve it. Instead, they develop two heuristics that use clustering (merged tiling) or convex hulls to generate the supernodes. The TSP tour over the supernodes is constructed with a convex hull insertion algorithm. The tour is improved with a simulated annealing algorithm. The authors test their two heuristics on 190 random Euclidean problems with 100 to 1000 customers and 10 different radii. Both heuristics produced good solutions

and were very fast with running times under one second.

Yuan, Orlowska, and Sadiq [73] consider the problem of routing a mobile robot to visit sensors that are distributed in the Euclidean plane. In order to communicate with a sensor and download data, a robot must be within a certain distance of it (the effective range is specified by a disk and the disks do not overlap). The authors develop an evolutionary approach for solving the robot routing problem and compare its performance to an approximation algorithm on five problems with 19 to 300 sensors. The evolutionary approach generated the shortest tour for each problem although the convergence speed was slow.

Shuttleworth et al. [65] extend the CETSP to street networks. They consider a real-world meter reading problem that uses actual data. The authors solve the problem using a two-stage process. In the first stage, a heuristic selects a subset of street segments to be traversed based on the radius r. In the second stage, street segments are added to the subset of street segments from the first stage to form a cycle. Shuttleworth et al. [65] consider four simple heuristics and two integer programs for selecting the street segments. For example, the weighted bang-for-buck heuristic first selects the street segment that covers the largest number of customers, then selects the street segment that covers the largest number of additional customers, and so on until each customer is covered by at least one street segment. The authors use a commercial vehicle routing system (RouteSmart's sequence solver) to produce a complete travel path that starts and ends at the depot. Computational results showed that the weighted bang-for-buck heuristic was simple and effective, and generated solutions that saved time and distance when compared

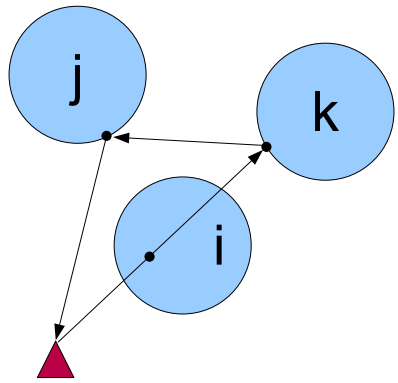


Figure 2.2: Three representative points are shown, one for each disk.

to the existing route used by the utility company.

2.3 Formulation

In this section, we formulate the CETSP as a MINLP. In the CETSP, a tour must cross a disk of radius r surrounding every node as shown in Figure 3.2. We refer to the disk surrounding node i as $disk(i)$. Any tour that touches or passes through $disk(i)$ successfully visits node i (with the exception of the depot (node 0) which has no disk). Node i is a fixed point in the plane at coordinate (a_i, b_i). We denote (a_i, b_i) as $orig(i)$, the origin of $disk(i)$, to emphasize that each node is surrounded by a disk. We assume that $orig(i) \neq orig(j)$ for all i and $j \geq 0$. The depot, however, may have the same coordinates as node i. Let ϵ be the smallest length of any edge. Requiring all edges to have non-zero length does not eliminate feasible solutions when the depot has the same coordinates as node i as long as ϵ is sufficiently close to zero.

Let (x_i, y_i) be the coordinate on the tour that is close enough to node i.

Coordinate (x_i, y_i) is known as node i's *representative point*. x_i and y_i are both unbounded continuous variables. In Figure 3.2, we illustrate the concept of representative points. Any of the points on the line through $disk(i)$ can be selected as node i's representative point. Distances in the CETSP are given by $\sqrt{(x_i - x_j)^2 + (y_i - y_j)^2}$. Let e_{ij} be a binary variable equal to 1 if node i immediately precedes node j on a tour and 0 otherwise. Our mixed-integer, nonlinear formulation of the CETSP is given below.

$$\text{Minimize} \quad \sum_{i=0}^{n} \sum_{j=0}^{n} e_{ij} \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2} \tag{2.1}$$

subject to

$$(x_i - a_i)^2 + (y_i - b_i)^2 \leq r^2 \qquad i = 1, \ldots, n \tag{2.2}$$

$$\sum_{i=0}^{n} e_{ij} = 1 \qquad i, j = 0, \ldots, n \tag{2.3}$$

$$\sum_{j=0}^{n} e_{ij} = 1 \qquad i, j = 0, \ldots, n \tag{2.4}$$

$$\sum_{i,j \in S} e_{ij} \leq |S| - 1 \quad \text{for } S \subseteq \{1, \ldots, n\},\ 2 \leq |S| \leq n \tag{2.5}$$

$$\sqrt{(x_i - x_j)^2 + (y_i - y_j)^2} \geq \epsilon \qquad i, j = 0, \ldots, n \tag{2.6}$$

$$e_{ij} \in \{0, 1\},\ (x_i, y_i) \in R \times R \qquad i, j = 0, \ldots, n \tag{2.7}$$

The objective function (2.1) minimizes the distance of the tour. However, the distance coefficients are not constants. The coefficients are functions of the representative points. In Figure 3.3, we show how different choices of representative points affect the edge distance between node i and node j.

Constraint (2.2) requires each representative point i to lie within a disk arround

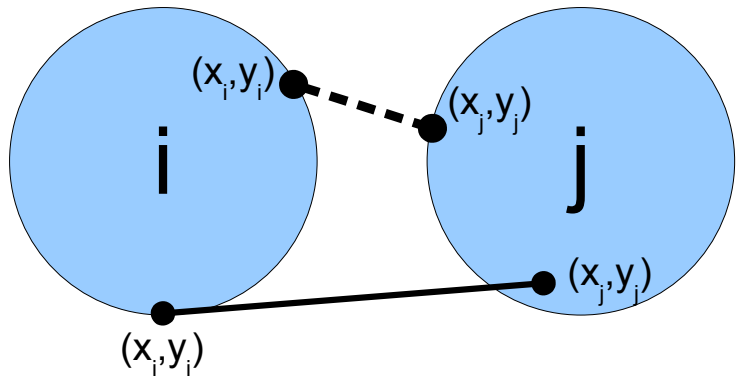


Figure 2.3: The two lines connect representative points for nodes i and j.

(a_i, b_i). Note that this constraint's index does not include the depot ($i = 0$) as there is no disk around the depot. Constraints (2.3) and (2.4) are assignment constraints that require each node to be visited exactly once. Constraint (2.5) prohibits subtours by forcing the number of edges in any subset of the non-depot nodes to be at most one less than the subset's cardinality. Constraint (2.6) requires the distance between any two representative points to be strictly positive. Without (2.6), edges in the tour can have length 0. If k disks have the same representative point, all $\binom{k}{2}$ edges between the k disks have length 0 and could be selected without increasing the objective function value. Assignment constraints ensure that exactly one edge enters and one edge exits each node. However, without (2.6), a node can have multiple predecessors and successors. In preliminary experiments, a solver was unable to find a feasible solution for very small problems where zero-length edges are possible. When constraint (2.6) is included, zero-length edges cannot occur and the assignment constraints ensure a single predecessor and successor for each node. Consider the problem in Figure 2.1(b) where each disk has the same representative point. If this problem is solved

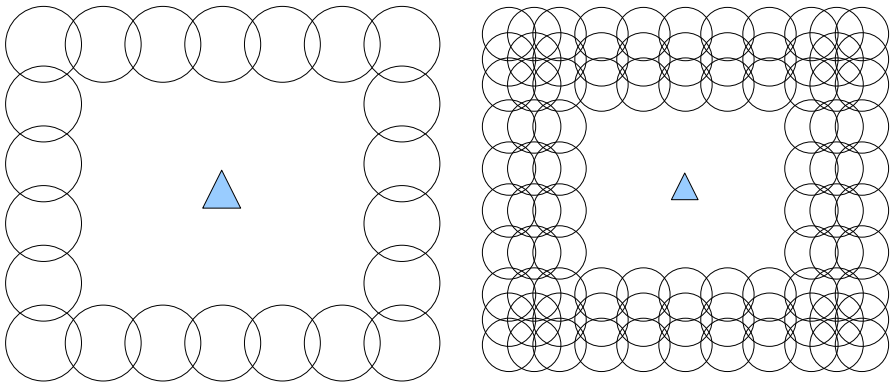
using the formulation including constraint (2.6), the single representative point is replaced by four points ϵ units apart. For values of ϵ sufficiently close to zero, our formulation produces the same optimal routes as if we could solve with $\epsilon = 0$. We point out that in (2.7), x_i and y_i are free variables. Their bounds (staying in $disk(i)$) are enforced by constraint (2.2). In addition, the CETSP reduces to the TSP when $r = 0$.

2.3.1 Lower Bounds

The CETSP is a non-convex MINLP. We cannot apply the standard 1-tree and 2-matching lower bounds techniques for TSPs without significant modifications. We construct a lower bound in the following way. Let $\bar{d}_{ij} = \min(0,\ d_{ij} - r)$ when either i or j is the depot. Otherwise, $\bar{d}_{ij} = \min(0,\ d_{ij} - 2r)$. If disks i and j overlap, then $\bar{d}_{ij} = 0$. We fix each edge in G to its minimum possible distance and solve a TSP to optimality using the set of all $\bar{d}_{ij}$. In Figure 2.4, we show two problems that differ in size and optimal CETSP solution but have the same lower bound using our method. Each layer of squares overlaps the next one so that $\bar{d}_{ij} = 0$ for all overlapping disks. The lengths of the optimal tour are the same for both problems.

Clearly, this lower bound is weak. When there is medium to high disk overlap, the lower bound is close to zero while the best tour is hundreds of units above zero. Unless there is no disk overlap and r is small, the lower bound provides no information about the optimality gap, as shown in Table 2.3.1.

Another lower bound technique is the longest out-and-back tour from the depot



(a) 22-node problem (b) 90-node problem

Figure 2.4: The lower bound for both problems is the same. The optimal objective function values are much different.

to any node. A CETSP cannot have an optimal solution shorter than the straight line out to the boundary of the disk furthest from the depot and back. This bound is also very weak.

2.4 Heuristic

Let $SZ(k)$ denote a Steiner zone of degree k. A $SZ(k)$ is the non-empty intersection of k convex regions. In this case, the regions are disks. Any point in $SZ(k)$ is close enough to all k member nodes, as shown in Figure 4.2. A Steiner zone of degree 1, $SZ(1)$, is called a *singleton*. We denote the origin of one of the k nodes whose disks form a $SZ(k)$, say node i, as the *base node* for the $SZ(k)$. For example, node i is the base node for the $SZ(k)$ in Figure 4.2. Since a point in a Steiner zone is not in general one of the original nodes to be visited and yet a visit to this point may reduce the total length, we envision these zones affecting the TSP as Steiner points affect the minimal spanning tree problem. The name Steiner zone comes from this observation.

Table 2.1: Best Known Solution vs. Lower Bound for 48 problems with fixed radius and 2D Euclidean and Manhattan norms

	Best Known (Euclidean)	Lower Bound	Best Known (Manhattan)	Lower Bound
Overlap ratio: 0.02				
kroD100	159.05	78.83	191.42	125.45
rat195	158.79	28.20	189.18	70.06
lin318	2863.37	977.43	3339.85	1423.67
rd400	1033.41	284.03	1257.36	563.33
pcb442	323.03	32.51	366.37	63.26
d493	202.79	57.46	256.23	93.16
dsj1000	935.74	100.19	1158.99	167.51
Overlap ratio: 0.1				
kroD100	89.67	0.00	98.71	0.00
rat195	68.08	0.00	74.26	0.00
lin318	1408.48	0.00	1529.09	0.00
rd400	466.10	0.00	528.39	0.00
pcb442	147.24	1.87	167.56	5.40
d493	101.73	31.73	128.85	47.59
dsj1000	376.10	10.17	436.59	18.61
Overlap ratio: 0.3				
kroD100	58.54	0.00	71.02	0.00
rat195	45.70	0.00	55.88	0.00
lin318	765.96	0.00	847.17	0.00
rd400	224.84	0.00	242.02	0.00
pcb442	83.54	0.00	103.76	0.00
d493	69.76	16.75	92.43	32.61
dsj1000	199.95	0.00	239.70	0.00
Varied overlap ratios				
team1_100	307.34	33.52	372.74	63.92
team2_200	246.68	0.00	278.43	0.00
team3_300	466.24	8.75	558.75	31.88
team4_400	680.21	20.59	829.18	49.47
team5_499	702.82	231.21	842.19	336.46
team6_500	225.22	0.00	260.80	0.00
bonus1000	402.47	0.00	459.65	0.00
rotatingDiamonds1	32.39	6.20	35.58	8.00
rotatingDiamonds2	140.48	13.87	192.34	22.00
rotatingDiamonds3	380.88	27.87	432.34	36.00
rotatingDiamonds4	770.66	35.57	989.02	50.00
rotatingDiamonds5	1510.75	69.57	1729.02	84.00
bubbles1	349.13	60.62	367.89	70.00
bubbles2	428.28	60.62	447.89	70.00
bubbles3	530.73	60.62	579.24	70.00
bubbles4	829.89	60.62	888.96	70.00
bubbles5	1062.34	60.62	1182.13	70.00
bubbles6	1383.14	60.62	1451.30	70.00
bubbles7	1720.21	60.62	1875.59	70.00
bubbles8	2101.37	60.62	2225.74	70.00
bubbles9	2426.27	60.62	2658.78	70.00
concentricCircles1	53.16	14.00	67.14	17.33
concentricCircles2	153.13	43.59	178.98	71.69
concentricCircles3	271.08	115.28	329.69	182.79
concentricCircles4	454.46	161.11	556.52	258.83
concentricCircles5	645.38	249.98	786.41	380.86
chaoSingleDep	1039.61	439.26	1204.56	596.00

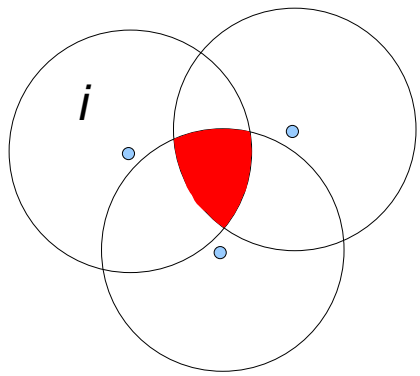


Figure 2.5: The shaded region is a Steiner Zone of degree 3 with base node i and is denoted $SZ(3)$. $SZ(3)$ is the intersection of the three disks.

A $SZ(k)$ with base node i is characterized by two polar angles, relative to $orig(i)$, with which the other $k-1$ disks intersect $disk(i)$, and the origins of the $k-1$ disks. The two angles are called upper and lower angles of intersection and are easily generated. For $k \geq 3$, the angles of intersection are obtained by comparing the angles of intersection for two Steiner zones with base node i, a $SZ(k-1)$ and a $SZ(2)$. If the angles overlap, then the upper and lower angles of that overlap become the upper and lower angles of intersection for the $SZ(k)$. For example, in Figure 4.8, the $SZ(2)$ formed by $disk(i)$ and $disk(j)$, with base node i, has lower and upper angles of intersection of 343° and 55°, respectively. The $SZ(2)$ formed by $disk(i)$ and $disk(k)$, with base node i, has lower and upper angles of intersection of 299° and 8°, respectively. The two sets of angles overlap such that the $SZ(3)$ formed by $disk(i)$, $disk(j)$, and $disk(k)$, with base node i, has a lower angle of intersection of 343° and an upper angle of intersection of 8°. When two or more disks intersect at exactly one point, the upper and lower angles of intersection are equal. As long as we know the base node and the upper and lower angles of intersection, we can

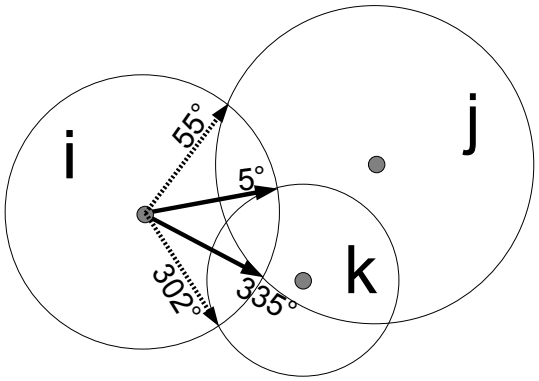
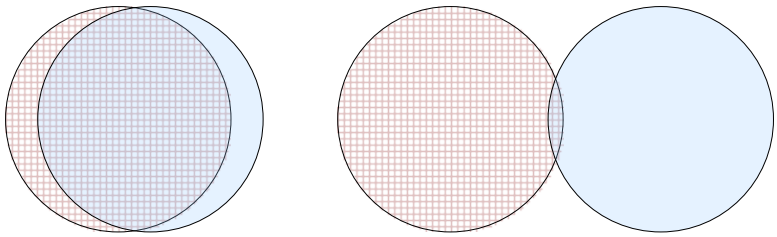


Figure 2.6: The base node is i. Only the lower (343°) and upper (8°) angles of intersection are required to specify the $SZ(3)$ formed by $disk(i)$, $disk(j)$, and $disk(k)$.

easily generate a point within r of each $disk(i)$ within a $SZ(k)$. In Figure 3.5, we show two Steiner zones of equal degree with different size overlaps.

In Figure 3.7, we see that the larger the radius, the larger the potential savings in tour length. For example, if r is very large, we can expect a much shorter optimal CETSP tour than the optimal TSP tour. If r is near zero, the optimal CETSP result will be only slightly shorter than the optimal TSP solution. We define a metric, *overlap ratio*, to indicate how much potential there is for improvement over the TSP solution. For a given CETSP, let $l_{contain}$ be the length of a side of the smallest square containing all n disks. The overlap ratio is the ratio of r to $l_{contain}$. In Figure 3.7, we show two different overlap ratios for the same set of nodes. We consider instances with an overlap ratio much larger than 0.3 uninteresting because almost any sequence of n nodes will produce a near-optimal solution to the CETSP. Overlap ratio is not appropriate for problems which lie in an elongated rectangle rather than a square, but it provides an indication of how much improvement is possible.



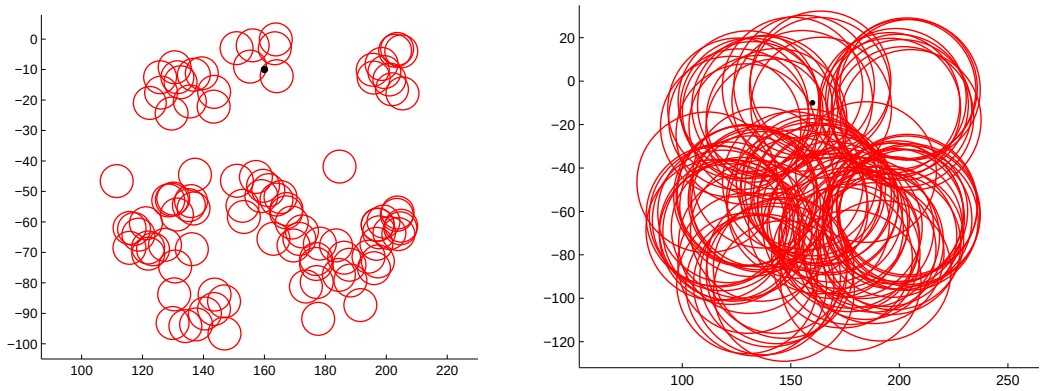
(a) large intersection (b) small intersection

Figure 2.7: The Steiner zones have degree 2 in both cases.

Our Steiner-zone heuristic, denoted by SZH, reduces a graph of n nodes to a graph of m Steiner zones, sequences the m zones, and locates the best representative point for each zone given the tour sequence. Node 0 is the depot and cannot be part of any Steiner zone. We now describe the three phases of SZH in detail.

2.4.1 Phase I - Graph Reduction

We describe two approaches to graph reduction. The first is a slow, naive heuristic. The second approach is a modification of the first heuristic and is faster. We begin by sorting the nodes and storing them in a list, denoted by $list$. We use four different sorts: closest to and furthest from the depot and closest to and furthest from the centroid of the graph. We select the first node in $list$, say i, and identify all Steiner zones that node i can form, storing them in a list called SZ_list_i. To do this, we consider all other nodes and calculate their angles of intersection with i, if possible. Let SZ_{ij} denote the $SZ(2)$ formed between nodes i and j. We compare SZ_{ij} with all previously identified Steiner zones already in SZ_list_i. Whenever SZ_{ij}'s angles of intersection overlap those of a Steiner zone in SZ_list_i, we form a new Steiner zone from their intersection. SZ_list_i is ordered from highest degree



(a) overlap ratio 0.05 (b) overlap ratio 0.2

Figure 2.8: The nodes are the same in (a) and (b), but the radius is larger in (b). The larger the overlap ratio, the greater the potential savings.

to lowest degree. That is, the Steiner zones capturing the intersection of a large number of disks are stored before those describing the intersections of fewer disks. Steiner zones of equal degree are ordered lexicographically. For example, a $SZ(3)$ consisting of nodes 1, 5, and 6 would be ordered prior to a $SZ(3)$ consisting of nodes 1, 6, and 9. With this ordering, we can easily locate a particular Steiner zone in SZ_list_i. To avoid a long search through SZ_list_i, we use bookmarks that store the location of the first Steiner zone in the list of each degree, k, for small values of k.

Consider the following example. We have selected node 1 from *list* and have compared it with nodes 2 through 5, such that SZ_list_1 is: {1,2,3}, {1,2}, {1,3}. Considering node 6 next, we find that nodes 1 and 6 form a $SZ(2)$. The lower and upper angles of intersection are 40° and 130°. We compare these angles against the angles of intersection for the three Steiner zones already in SZ_list_1 and find that {1,6} overlaps {1,2,3}. We have found a new Steiner zone, {1,2,3,6} and must add it to the list along with all sub-Steiner zones associated with it. SZ_list_1 now looks like: {1,2,3,6}, {1,2,3}, {1,2,6}, {1,3,6}, {1,2}, {1,3}, {1,6}. After constructing all

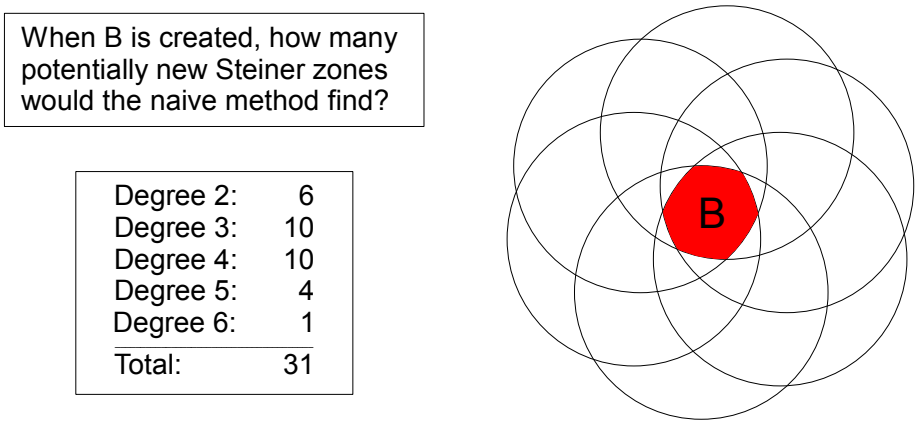


Figure 2.9: The number of sub-Steiner zones to look through for each new $SZ(k)$ grows roughly exponentially with k.

Steiner zones for node i, we set aside the highest degree Steiner zone for later use, and remove its nodes from $list$. This is repeated until $list = \emptyset$. When there are no nodes to consider, a set of Steiner zones remains such that any tour visiting each of these Steiner zones is a feasible solution to the CETSP.

In Figure 2.9, we illustrate the shortcoming of this naive approach to graph reduction. Assume $B = SZ(k)$ is found, where k is an integer larger than three. There is a set of unique sub-Steiner zones of degrees $k-1$, $k-2$, $\ldots$, 2, such that all members of the set contain B and may or may not have been identified yet. Therefore, we must identify all of them individually. As k grows, the number of possible sub-Steiner zones to identify grows exponentially. The vast majority of them, however, are contained in other larger Steiner zones and are thus redundant, creating giant lists of Steiner zones to store and search. Early experiments confirmed that this approach to graph reduction is computationally expensive. Because of the large number of sub-Steiner zones that must be identified, a large amount of

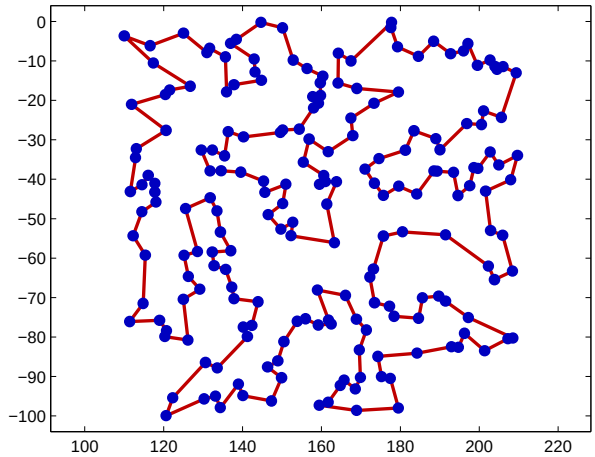


Figure 2.10: A 200-node CETSP instance (team2_200) with the optimal TSP solution shown (tour length is about 1074).

computation time (on the order of days) is needed to find Steiner zones of degree as small as 20.

Our second approach to Phase I differs from the naive heuristic only in its treatment of sub-Steiner zones. In addition to adding B to SZ_list_i, we add only those sub-Steiner zones of B that have degree no greater than three and have not previously been added. In computational experiments, our second approach is very fast (less than a second) and easily identifies Steiner zones with degrees in the thousands. The sub-Steiner zones of degree two and three seem to act as a suitable seedbed upon which to construct the Steiner zones of large degree. The choice of three as a cut-off value is arbitrary. In our experience, using a larger value slows the graph reduction without finding Steiner zones of much higher degree.

In Figure 2.10, we show an optimal TSP tour for a 200-node problem known as team2_200. In Figure 2.11, we show the Steiner zones that result from applying Phase I to team2_200. The Steiner zones happen to be disjoint. However, the Phase

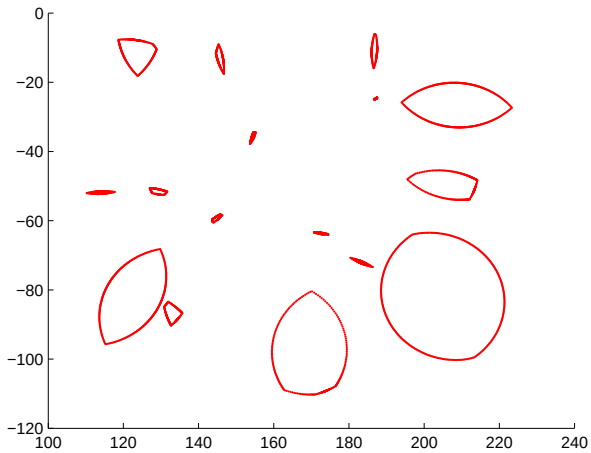


Figure 2.11: team2_200 after applying Phase I. The 200 nodes have been reduced to 16 Steiner zones.

I algorithm does not explicitly require or encourage disjoint Steiner zones.

We incorporate all four sorting criteria (closest-to-depot, furthest-from-depot, closest-to-centroid, furthest-from-centroid) into our heuristic, by solving Phases I - III for each criteria. That is, SZH is actually four different runs of the Phase I - Phase II - Phase III cycle, one run for each of the four orderings. In preliminary experiments, we found that a sorted *list* always produced shorter tours than a randomly ordered *list*.

2.4.2 Phase II - Tour Finding

The result of applying Phase I to graph G is graph G'. G' is a graph of Steiner zones rather than nodes. We designate a point in each Steiner zone as its representative point and solve a TSP on these points.

Given a $SZ(k)$ with base node i and $k \geq 2$, a chord may be drawn connecting the points on $disk(i)$ at the upper and lower angles of intersection. Because the

intersection of convex sets is convex and a $SZ(k)$ is the intersection of k convex sets (disks), any point along this chord (we select the midpoint of the chord) must lie within the $SZ(k)$. We show this in Figure 2.12.

For singletons, we choose the point on the disk's perimeter closest to the depot. A well-known method, such as the Concorde TSP Solver [1, 13], can be used to find the TSP tour on this set of points. The result is a feasible solution for the CETSP. Note that many TSP solvers require integer node coordinates. Our test problems do not have integer coordinates. This obstacle is easy to overcome by multiplying the coordinates by the appropriate power of 10. For example, if all coordinates have two decimal places, such as 123.45, the appropriate scaling factor would be 100, so that all coordinates are integer. If a coordinate has a large number of decimal places, for example 1.946382438, converting it to an integer accurate to all decimal places (1.946382438 becomes 1946382438) could produce numbers too large for the TSP solver to handle. Therefore, for each problem, we determined the smallest power-of-10 scaling factor such that the TSP solution for any feasible, larger power of 10 is the same. In this way, we achieve the most accurate solution possible given the TSP solver's numerical capabilities.

2.4.3 Phase III - Tour Improvement

The result of applying Phase II to G' is a feasible solution to the CETSP. The sequence in which the tour visits the Steiner zones is fixed, but the location of each Steiner zone's representative point can still be modified. In Figure 2.13, we show the

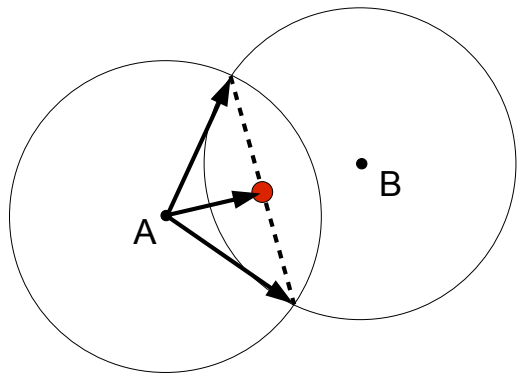


Figure 2.12: The base node for this Steiner zone is node i. The boundary of $disk(j)$ has at most two points of intersection with the boundary of $disk(i)$. The representative point is the midpoint of the chord that connects the two points of intersection.

results after applying Phase II to team2_200. We notice that: (1) the tour length is much less than the tour length of the optimal TSP solution, and (2) the tour could be shortened by changing the placement of representative points for each Steiner zone. To determine the optimal placement of the representative points, we solve the Touring Polygons Problem (TPP) described in Dror et al. [29] where we consider convex regions (Steiner zones) instead of polygons. We call this the Touring Steiner Zones Problem (TSZP). Given a tour on a set of disks, the TSZP minimizes the distance such that each Steiner zone (and thus each disk) remains feasibly covered and the sequence of Steiner zones visited remains unchanged.

We can formulate the TSZP as a second-order cone program (SOCP) and solve it optimally using CPLEX (see Appendix E). Our heuristic approach, denoted IP_{PhIII}, solves a succession of shortest path problems that converge to a near-optimal solution of the TSZP. Phase I, Phase II, and Phase III are equally important in SZH. IP_{PhIII} is complicated so we illustrate it by means of an example in Appendix D. In

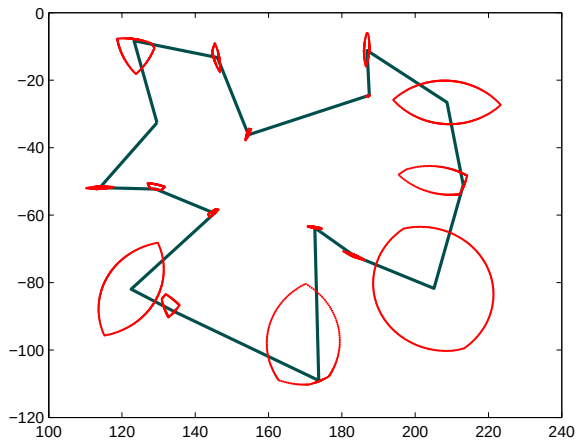


Figure 2.13: team2_200 after applying Phase II. The tour length is about 435.

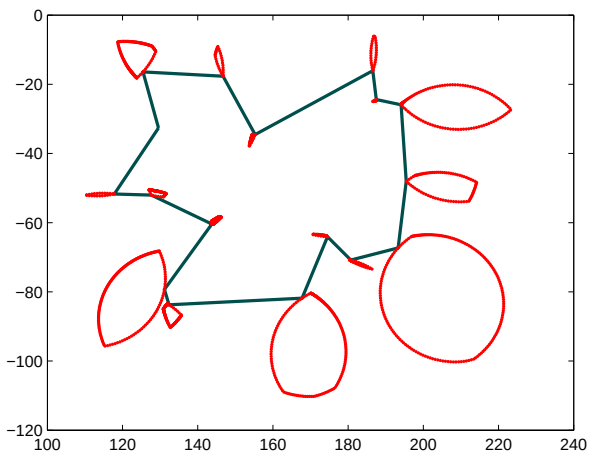


Figure 2.14: The solution to team2_200 after applying Phase III. The final tour length is about 304.

Figure 2.14, we show the solution to team2_200 after applying our heuristic solution to Phase III. In Appendix H, we provide the pseudocode for SZH where Phase III is solved with the IP_{PhIII} heuristic.

2.5 Computational Results

We selected seven TSPs from TSPLIB [4] that ranged in size from 100 to 1000 nodes including the depot. Two problems have clustered nodes, one has nodes arranged in rough lines, two have uniformly distributed nodes, and two are drill-press problems. In order to create CETSPs from the TSPs, we assigned three different radius patterns: (1) the overlap ratio is 0.02 (very low), (2) the overlap ratio is 0.1 (moderate), and (3) the overlap ratio is 0.3 (very high). We refer to these as $TSPLIB$ problems.

In addition to the $TSPLIB$ problems, we created 27 problems with 17 to 1001 nodes including the depot. 20 problems are geometric: nine *Bubbles* problems have concentric squares of overlapping nodes, five *ConcentricCircles* problems have nodes arranged in concentric circles, five *RotatingDiamonds* problems have non-overlapping concentric squares, and $ChaoCEVRP$ is based on a problem given in Chao [15]. The remaining problems are the seven $Team$ problems discussed in Gulczynski et al. [43]. Three of the $Team$ problems have uniformly generated points, and four are clustered [43]. Two of the $Team$ problems have high overlap ratios. The remaining 25 problems have low and medium overlap ratios. We refer to these 27 problems as $GEOMETRIC$ problems. In each of the total of 48 problems, all nodes have equal radius. All problem data are given in Appendix L.

We used the implementation of the Lin-Kernighan heuristic provided in the Concorde software package to solve Phase II. We tried Helsgaun's implementation of Lin-Kernighan [45] and the Concorde exact solver but found no advantage worth

the extra computation time.

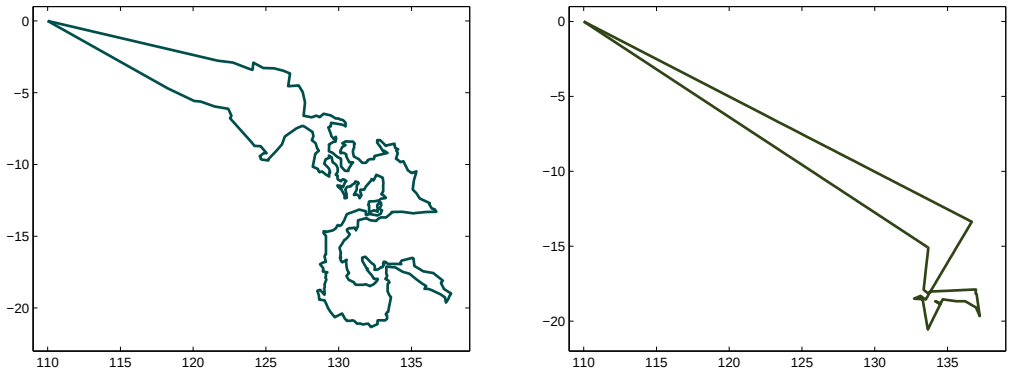
We coded 15 CETSP solution methods for comparison purposes. SZ1 is our Steiner-zone heuristic where we solve Phase III approximately using IP_{PhIII}. After Phase III, we re-run Phase II and stop. We apply IP_{PhIII} only until each Steiner zone is approximated by a 1536-sided polygon. This method emphasizes computational speed over tour length.

SZ2 is the same as SZ1 except that Phase III is solved to optimality using the SOCP formulation and the Phase II - Phase III cycle is repeated until no improvement is found. In computational experiments with problems up to 1001 nodes, this occurs after no more than three iterations of this cycle. This method emphasizes tour length over computational speed.

LK-SOCP does not use Steiner zones. It solves only Phase II and Phase III of our heuristic. That is, it finds a near-optimal TSP sequence on the original nodes (Phase II) and solves the Phase III SOCP formulation to optimality. The Phase II - Phase III cycle is run exactly once.

GTSP1 finds near-optimal solutions to a generalized TSP (GTSP) approximation of the CETSP using a genetic algorithm developed by Silberholz et al. [67].

By replacing each disk with k points, we create a GTSP where there are n clusters to be visited, each with k possible points to choose from. We used 3-, 6-, 12-, and 24-point approximations of each disk. Only the 24-point approximations were competitive, however, so we do not report on the 3-, 6-, and 12-point approximations. Silberholz et al.'s algorithm was an average of only 0.03% from optimality on the standard GTSP test problems of size up to 442 total nodes and found new



(a) GTSP1 (b) GTSP2

Figure 2.15: Solutions produced by the two GTSP-based heuristics for a 500-node CETSP.

best solutions for the larger problems with unknown optimal solutions. Our GTSP problem sizes range from 2,400 nodes to 24,000 nodes plus the depot.

GTSP2 applies the Phase III SOCP tour improvement to the GTSP1 solution. In Figure 2.15, we show the difference between a GTSP1 solution and a GTSP2 solution for the same problem.

HYBRID1 is Phase I of SZH followed by the GTSP genetic algorithm, with each Steiner zone approximated by 24 points. Phase III of the Steiner zone heuristic is applied to the resulting tour, using the IP_{PhIII} heuristic. GTSP and Phase III are applied once. HYBRID2 is the same as HYBRID1 except that, in Phase III, we solve the SOCP formulation using CPLEX.

CTD, circular trapezoidal decomposition, is a modification of the trapezoidal decomposition algorithm of Mulmuley [55]. CTD subdivides a graph of disks into non-overlapping regions such that each region is bordered on the left and right by vertical lines and on the top and bottom by arcs of a disk. Using this subdivision, we compute the degree of all distinct regions in the graph and greedily select the regions

with the highest degree. We then generate Steiner zones from these regions and finish by applying Phase II and the SOCP formulation of Phase III. In computational experiments, computing the subdivision for problems with large overlap ratios is computationally expensive. See Appendix F for more details.

TILE1 uses the shifted tiling method from Gulczynski et al. [43]. The authors provided their code to use in our experiments. Their code uses a genetic algorithm to solve Phase II. To ensure a fair comparison with our heuristics, TILE1 solves Phase II to optimality using the Concorde TSP solver [1]. The degree of the supernodes found by the shifted tiling heuristic depends on a parameter called step-size. TILE1 uses the default setting where step-size is equal to the disk radius.

TILE2 is the same heuristic as TILE1 except that Phase II is solved using the chained Lin-Kernighan code from Concorde [1].

TILE3 solves Phase II to optimality using Concorde and sets step-size to 50 for all problems. This ensures that problems with a small radius spend as much effort finding supernodes as problems with a large radius.

TILE4 is the same heuristic as TILE3 except that Phase II is solved using the chained Lin-Kernighan code from Concorde [1].

YUAN+ is an improved version of the heuristic given in Yuan et al. [73]. The heuristic specified by Yuan et al. does not apply a Phase I method. It finds the optimal TSP tour on the original nodes (Phase II) and applies an evolutionary algorithm to minimize tour distance (Phase III). We modified their algorithm to solve Phase III to optimality for a given tour using the SOCP formulation. This algorithm is the same as LK-SOCP except that Phase II is solved to optimality

rather than approximately.

MERGE is the merged tiling heuristic given in Dong et al. [27]. The authors provided their code (a version optimized for computational speed) to use in our experiments.

HULL is the convex-hull heuristic described in Dong et al. [27]. We used their code in our experiments.

We did not test our heuristic against the heuristic described in Shuttleworth et al. [65]. They solve the CETSP over a street network (the triangle inequality does not hold). None of the algorithms in our experiments were designed to work for the CETSP over a street network.

All experiments were performed on a 2.4 GHz Pentium machine with 3 GB RAM running Windows XP Professional. We note that different computers have different floating-point architectures. Very small numerical differences can add up over a computation and affect the outcome of SZH. Thus, for a small number of problems, we obtained a different solution for the same problem on different computers. All solutions are checked for feasibility. All methods use the same code to solve Phase III. Except for the genetic algorithm and the hybrid heuristics, all solution methods use the same code to solve Phase II. No special attention was given to the Steiner-zone methods to improve performance.

The tour-length results for the 15 heuristics on the 48 problems using the Euclidean norm are given in Table 2.2. The average deviations from the best solutions in Table 2.2 are given in Table 2.3. Columns in both tables are ordered by the overall average deviation from best (left) to worst (right). For Table 2.2, bold font

indicates the best value.

In Table 2.2, for the seven low overlap $TSPLIB$ problems, GTSP2 produces all the shortest tours. For the seven medium overlap $TSPLIB$ problems, GTSP2 produces the shortest tour five times. For the seven high overlap problems, LK-SOCP and YUAN+ each produce the shortest tours four times. GTSP2 produces the shortest tour for 15 $GEOMETRIC$ problems while $HYBRID2$ finds 8 shortest tours.

In Table 2.3, we see that, on average, GTSP2 and GTSP1 produce the smallest deviations (0.00% and 0.55%) for $TSPLIB$ problems with a low overlap ratio. For $TSPLIB$ problems with a medium overlap ratio, GTSP2 produces the smallest average (3.33%). For $TSPLIB$ problems with a high overlap ratio, HYBRID2 and SZ2 produce the smallest average deviations (0.86% and 1.04%). GTSP2 and GTSP1 produce the largest deviations (40.78% and 103.70%). $rd400$ and $pcb442$ are challenging problems for all heuristics except for GTSP1 and GTSP2. For the $GEOMETRIC$ problems two heuristics average less than 3% (HYBRID2, HYBRID1). SZ2 and SZ1 average less than 4%.

Over all 48 problems, the four methods that find Steiner zones using Phase I of SZH (HYBRID2, HYBRID1, SZ2, SZ1) have the lowest overall average deviations, ranging from 2.48% to 3.79%.

In Table 2.4, we give the computation times (in CPU seconds) for the 15 heuristics on the 48 problems. The columns are ordered from fastest (left) to slowest (right). All heuristics except for CTD, TILE1, TILE2, YUAN+, and LK-SOCP achieve faster times as the overlap ratio increases. CTD slows down because the

trapezoidal decomposition takes more time to compute as the overlap ratio increases. The running times for TILE1 and TILE2 are linked to the overlap ratio by the stepsize parameter (the radius, r, is the stepsize) so that higher overlap ratios lead to longer computation times. The running times for YUAN+ and LK-SOCP remain relatively constant over all overlap ratios. For methods that apply Phase I, the size of the TSP solved in Phase II decreases as the overlap ratio increases. YUAN+ and LK-SOCP do not apply Phase I, so their running times do not decrease as the overlap ratio increases.

MERGE, LK-SOCP, HULL, SZ1, and SZ2 are very fast, taking one-third to one and one-half seconds on average to solve a problem. The two methods based on the generalized TSP (GTSP1, GTSP2) are computationally expensive. They take an exorbitant amount of time to solve problems (on the order of several months for the largest problems!). The hybrid methods (HYBRID1, HYBRID2), though not as slow as the GTSP methods, are much slower than the other 11 methods.

We also used the Manhattan norm on the 48 test problems and found that HYBRID2, HYBRID1, SZ2, and SZ1 were the best methods based on overall accuracy. Computation times were comparable to the Euclidean results. The complete details are given in Appendix A.

Table 2.2: Tour lengths for 15 heuristics on 48 problems with equal radius and 2D Euclidean norm

	HYBRID2	HYBRID1	SZ2	SZ1	CTD	GTSP2	YUAN+	LK-SOCP	TILE3	TILE4	TILE2	TILE1	GTSP1	MERGE	HULL
Overlap ratio: 0.02															
kroD100	160.46	160.88	163.76	163.78	165.34	**159.05**	164.31	164.31	170.88	170.32	172.84	173.05	159.28	188.07	210.03
rat195	164.51	165.37	171.29	171.35	169.33	**158.79**	170.89	169.32	181.99	188.76	187.37	190.00	159.09	189.12	229.23
lin318	2903.26	2914.47	2941.00	2941.53	2968.92	**2867.46**	2949.71	3031.48	3191.60	3155.60	3217.70	3183.20	2875.34	3261.49	3824.50
rd400	1039.27	1042.62	1066.16	1066.44	1074.39	**1033.42**	1069.26	1091.84	1164.00	1166.60	1180.50	1177.90	1035.95	1243.61	1513.97
pcb442	327.26	328.72	333.24	333.27	332.93	**323.03**	340.59	348.15	359.93	366.64	371.53	359.47	324.21	401.09	450.22
d493	209.82	211.05	213.51	213.64	214.16	**204.71**	221.41	217.03	227.55	236.76	230.83	231.85	206.77	249.62	261.70
dsj1000	998.35	1015.30	1010.86	1012.72	1002.42	**935.74**	1005.80	1023.11	1156.20	1140.00	1156.60	1141.10	951.09	1266.38	1456.97
Overlap ratio: 0.1															
kroD100	96.68	97.58	96.68	97.09	96.20	**89.94**	95.64	95.64	116.63	114.81	102.49	115.81	91.53	121.88	107.85
rat195	73.89	74.41	74.16	74.22	76.67	**68.26**	77.66	82.36	82.34	84.45	87.74	84.12	72.25	90.81	85.83
lin318	1554.59	1563.48	1556.82	1557.47	1526.39	**1467.02**	1557.07	1532.05	1842.00	1679.50	1711.80	1646.80	1555.56	1828.95	1886.08
rd400	521.91	526.96	521.91	526.73	521.67	**473.70**	528.13	541.22	602.22	601.34	584.86	623.32	498.51	608.71	593.45
pcb442	161.77	162.61	162.26	162.73	163.07	**147.24**	214.50	211.66	179.91	186.02	185.63	180.30	159.06	197.41	177.65
d493	110.75	110.98	110.90	111.03	**108.22**	112.55	114.16	116.98	119.74	115.65	115.05	121.24	133.81	124.89	112.37
dsj1000	**404.60**	408.69	**404.60**	407.02	404.89	482.85	464.26	420.33	429.90	445.21	455.71	447.28	632.79	515.66	462.72
Overlap ratio: 0.3															
kroD100	**58.54**	58.69	**58.54**	**58.54**	58.70	62.15	**58.54**	**58.54**	61.45	61.45	61.45	61.45	71.32	78.45	64.55
rat195	45.79	45.91	45.79	45.91	45.82	48.19	**45.70**	45.74	52.79	52.97	52.11	51.82	75.04	58.15	52.92
lin318	**772.61**	780.56	782.40	782.96	803.37	946.67	776.58	776.58	809.06	809.06	809.06	809.06	1304.03	1116.14	814.65
rd400	233.29	237.59	233.29	233.75	239.81	348.99	228.95	**225.63**	300.32	300.32	294.05	298.04	445.58	255.27	239.87
pcb442	**85.12**	85.18	**85.12**	85.18	85.61	126.21	100.72	106.32	93.64	91.71	93.59	93.59	155.40	89.82	88.77
d493	70.75	70.84	70.75	70.84	75.38	82.83	**69.76**	**69.76**	80.09	82.89	80.71	78.94	148.97	76.95	73.19
dsj1000	201.92	203.08	201.92	201.95	207.16	459.22	204.16	**199.95**	214.38	214.38	214.87	214.87	754.84	277.26	219.71
Varied overlap ratios															
team1_100	317.09	320.10	326.73	327.28	325.89	**307.79**	316.32	316.32	352.34	352.34	350.27	350.27	311.90	391.71	436.15
team2_200	277.61	283.50	277.61	277.75	287.23	**249.92**	278.24	345.41	305.46	304.36	325.74	305.46	286.81	322.94	334.91
team3_300	504.30	508.47	505.65	508.75	503.87	**484.70**	497.66	497.66	576.73	572.13	557.06	558.30	501.02	586.83	610.66
team4_400	739.28	745.42	742.83	745.58	734.16	**680.21**	743.28	777.74	919.34	877.68	851.85	898.53	689.95	869.22	974.01
team5_499	727.13	730.07	727.57	727.84	729.52	**703.20**	740.67	758.48	787.30	803.12	814.46	808.53	707.47	892.65	944.55
team6_500	**232.94**	235.91	**232.94**	233.02	253.27	355.02	282.76	245.17	266.33	266.33	266.84	266.49	487.73	278.65	260.07
bonus1000	**435.98**	441.00	439.59	444.43	436.42	578.87	485.30	508.27	504.98	485.03	495.37	524.21	699.33	557.04	470.73
concentricCircles1	54.91	55.42	54.91	54.93	55.27	**53.16**	**53.16**	**53.16**	59.33	62.92	55.53	55.53	53.26	56.52	54.82
concentricCircles2	154.50	156.17	161.90	161.94	163.78	**153.13**	160.00	160.00	174.40	173.13	166.06	168.97	153.59	183.92	186.95
concentricCircles3	274.37	275.38	274.88	274.94	275.80	**271.08**	323.06	324.55	297.08	295.12	306.32	304.31	271.79	336.29	387.49
concentricCircles4	459.85	461.36	479.97	480.02	487.33	**454.46**	510.83	522.51	520.52	527.35	513.42	511.82	455.46	502.08	686.85

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	HYBRID2	HYBRID1	SZ2	SZ1	CTD	GTSP2	YUAN+	LK-SOCP	TILE3	TILE4	TILE2	TILE1	GTSP1	MERGE	HULL
concentricCircles5	645.50	649.26	666.73	671.65	664.79	**645.38**	687.54	694.01	711.91	695.38	727.25	727.61	646.71	725.58	954.90
bubbles1	360.87	360.89	351.58	351.58	361.97	**349.13**	**349.13**	**349.13**	367.33	367.33	367.33	368.96	349.55	382.64	376.81
bubbles2	**428.84**	428.87	429.29	428.96	430.28	432.38	514.14	514.14	470.38	467.02	455.90	467.68	442.32	501.75	459.18
bubbles3	590.39	591.31	595.56	595.96	565.97	**546.73**	712.74	712.74	609.26	614.91	682.58	725.77	565.82	814.60	933.82
bubbles4	**843.41**	844.11	863.49	863.56	915.86	877.47	1024.51	1024.51	984.69	992.59	1025.70	971.89	901.36	1157.24	1253.66
bubbles5	**1120.50**	1121.71	1141.87	1142.85	1174.62	1131.09	1327.46	1327.46	1278.80	1296.50	1291.70	1302.30	1169.65	1558.71	1479.07
bubbles6	**1444.69**	1447.05	1464.27	1464.47	1508.27	1446.26	1674.06	1674.06	1611.00	1659.70	1656.70	1579.00	1486.76	1962.85	1760.09
bubbles7	**1735.89**	1737.95	1839.94	1839.70	1841.19	1775.92	2154.57	2154.57	2150.60	2182.40	2224.40	2152.80	1878.28	2537.17	2356.86
bubbles8	**2136.39**	2138.06	2250.56	2251.56	2244.85	2236.40	2630.22	2630.22	2535.50	2476.00	2553.80	2538.40	2353.03	2894.47	2729.28
bubbles9	2547.50	**2537.80**	2626.10	2648.08	2684.92	2748.93	3176.34	3176.34	2904.20	2893.90	2850.20	2943.90	2988.66	3727.61	3368.31
rotatingDiamonds1	33.15	33.15	33.15	33.15	33.15	**32.39**	**32.39**	**32.39**	32.56	32.77	34.30	35.62	32.41	38.00	34.36
rotatingDiamonds2	141.80	141.81	142.25	142.25	142.01	**140.48**	144.71	144.71	147.09	145.39	145.51	145.51	140.53	155.24	150.76
rotatingDiamonds3	382.37	382.56	383.35	383.38	386.27	**382.17**	385.53	385.53	386.16	386.59	386.22	385.29	383.97	420.59	430.78
rotatingDiamonds4	772.83	773.24	774.80	774.87	778.29	773.21	**771.31**	**771.31**	779.85	776.42	777.12	773.91	783.49	814.39	882.19
rotatingDiamonds5	1512.98	1516.65	1515.44	1515.59	1520.82	1517.70	**1512.48**	1512.49	1515.00	1513.30	1516.30	1525.26	1554.60	1762.00	1822.56
chaoSingleDep	1022.98	1023.71	1022.98	1023.05	1022.98	1039.61	**1022.88**	**1022.88**	1083.60	1084.70	1073.80	1070.00	1042.12	1270.64	1386.75

Table 2.3: Percentage deviation from the best solution for 15 heuristics on 48 problems with equal radius and 2D Euclidean norm

	HYBRID2	HYBRID1	SZ2	SZ1	CTD	GTSP2	YUAN+	LK-SOCP	TILE3	TILE4	TILE2	TILE1	GTSP1	MERGE	HULL
Overlap ratio: 0.02															
kroD100	0.89	1.15	2.96	2.97	3.96	0.00	3.31	3.31	7.44	7.09	8.68	8.80	0.15	18.25	32.05
rat195	3.60	4.15	7.87	7.91	6.64	0.00	7.62	6.64	14.61	18.88	18.00	19.66	0.19	19.10	44.36
lin318	1.25	1.64	2.56	2.58	3.54	0.00	2.87	5.72	11.30	10.05	12.21	11.01	0.27	13.74	33.38
rd400	0.57	0.89	3.17	3.20	3.96	0.00	3.47	5.65	12.64	12.89	14.23	13.98	0.25	20.34	46.50
pcb442	1.31	1.76	3.16	3.17	3.06	0.00	5.44	7.78	11.42	13.50	15.01	11.28	0.37	24.16	39.37
d493	2.50	3.10	4.30	4.36	4.62	0.00	8.16	6.02	11.16	15.66	12.76	13.26	1.01	21.94	27.84
dsj1000	6.69	8.50	8.03	8.23	7.13	0.00	7.49	9.34	23.56	21.83	23.60	21.95	1.64	35.33	55.70
Average:	2.40	3.03	4.58	4.63	4.70	0.00	5.48	6.35	13.16	14.27	14.93	14.28	0.55	21.84	39.89
Overlap ratio: 0.1															
kroD100	7.49	8.50	7.49	7.95	6.96	0.00	6.34	6.34	29.68	27.65	13.95	28.76	1.77	35.52	19.91
rat195	8.25	9.01	8.64	8.73	12.32	0.00	13.77	20.66	20.62	23.72	28.54	23.23	5.84	33.03	25.73
lin318	5.97	6.57	6.12	6.16	4.05	0.00	6.14	4.43	25.56	14.48	16.69	12.25	6.03	24.67	28.57
rd400	10.18	11.24	10.18	11.20	10.13	0.00	11.49	14.25	27.13	26.95	23.47	31.59	5.24	28.50	25.28
pcb442	9.86	10.44	10.19	10.52	10.75	0.00	45.67	43.75	22.19	26.33	26.07	22.45	8.03	34.07	20.65
d493	2.33	2.55	2.47	2.59	0.00	3.99	5.48	8.09	10.64	6.86	6.31	12.03	23.64	15.40	3.83
dsj1000	0.00	1.01	0.00	0.60	0.07	19.34	14.75	3.89	6.25	10.04	12.63	10.55	56.40	27.45	14.37
Average:	6.30	7.05	6.44	6.82	6.32	3.33	14.81	14.49	20.30	19.43	18.24	20.12	15.28	28.38	19.76
Overlap ratio: 0.3															
kroD100	0.00	0.25	0.00	0.00	0.27	6.17	0.00	0.00	4.97	4.97	4.97	4.97	21.83	34.02	10.27
rat195	0.20	0.45	0.20	0.45	0.25	5.44	0.00	0.07	15.52	15.91	14.02	13.39	64.20	27.24	15.80
lin318	0.00	1.03	1.27	1.34	3.98	22.53	0.51	0.51	4.72	4.72	4.72	4.72	68.78	44.46	5.44
rd400	3.39	5.30	3.39	3.60	6.29	54.68	1.47	0.00	33.10	33.10	30.32	32.09	97.48	13.14	6.31
pcb442	0.00	0.06	0.00	0.06	0.58	48.27	18.32	24.90	10.00	7.74	9.95	9.95	82.57	5.52	4.28
d493	1.43	1.55	1.43	1.55	8.05	18.74	0.00	0.00	14.81	18.83	15.70	13.17	113.55	10.30	4.91
dsj1000	0.99	1.57	0.99	1.00	3.61	129.67	2.11	0.00	7.22	7.22	7.46	7.46	277.52	38.67	9.88
Average:	0.86	1.46	1.04	1.14	3.29	40.78	3.20	3.64	12.91	13.21	12.45	12.25	103.70	24.76	8.13
TSPLIB Average:	3.19	3.84	4.02	4.20	4.77	14.71	7.83	8.16	15.45	15.64	15.20	15.55	39.84	24.99	22.59
Varied overlap ratios															
team1_100	3.02	4.00	6.15	6.33	5.88	0.00	2.77	2.77	14.47	14.47	13.80	13.80	1.34	27.27	41.71
team2_200	11.08	13.44	11.08	11.14	14.93	0.00	11.33	38.21	22.22	21.78	30.34	22.22	14.76	29.22	34.01
team3_300	4.04	4.90	4.32	4.96	3.96	0.00	2.67	2.67	18.99	18.04	14.93	15.18	3.37	21.07	25.99
team4_400	8.68	9.59	9.20	9.61	7.93	0.00	9.27	14.34	35.15	29.03	25.23	32.09	1.43	27.79	43.19
team5_499	3.40	3.82	3.47	3.50	3.74	0.00	5.33	7.86	11.96	14.21	15.82	14.98	0.61	26.94	34.32
team6_500	0.00	1.27	0.00	0.03	8.73	52.41	21.39	5.25	14.34	14.34	14.55	14.41	109.38	19.62	11.65

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	HYBRID2	HYBRID1	SZ2	SZ1	CTD	GTSP2	YUAN+	LK-SOCP	TILE3	TILE4	TILE2	TILE1	GTSP1	MERGE	HULL
bonus1000	0.00	1.15	0.83	1.94	0.10	32.78	11.31	16.58	15.83	11.25	13.62	20.24	60.41	27.77	7.97
Average:	4.32	5.45	5.01	5.36	6.47	12.17	9.15	12.53	18.99	17.59	18.33	18.99	27.33	25.67	28.41
concentricCircles1	3.30	4.26	3.30	3.33	3.97	0.00	0.00	0.00	11.60	18.36	4.47	4.47	0.19	6.33	3.13
concentricCircles2	0.89	1.98	5.73	5.75	6.95	0.00	4.48	4.48	13.89	13.06	8.44	10.34	0.30	20.10	22.08
concentricCircles3	1.22	1.59	1.40	1.43	1.74	0.00	19.18	19.73	9.59	8.87	13.00	12.26	0.26	24.06	42.95
concentricCircles4	1.19	1.52	5.61	5.63	7.23	0.00	12.40	14.98	14.54	16.04	12.97	12.62	0.22	10.48	51.14
concentricCircles5	0.02	0.60	3.31	4.07	3.01	0.00	6.53	7.53	10.31	7.75	12.69	12.74	0.21	12.43	47.96
Average:	1.32	1.99	3.87	4.04	4.58	0.00	8.52	9.34	11.99	12.81	10.31	10.49	0.24	14.68	33.45
bubbles1	3.36	3.37	0.70	0.70	3.68	0.00	0.00	0.00	5.21	5.21	5.21	5.68	0.12	9.60	7.93
bubbles2	0.00	0.01	0.10	0.03	0.34	0.82	19.89	19.89	9.69	8.90	6.31	9.06	3.14	17.00	7.08
bubbles3	7.99	8.15	8.93	9.00	3.52	0.00	30.36	30.36	11.44	12.47	24.85	32.75	3.49	49.00	70.80
bubbles4	0.00	0.08	2.38	2.39	8.59	4.04	21.47	21.47	16.75	17.69	21.61	15.23	6.87	37.21	48.64
bubbles5	0.00	0.11	1.91	1.99	4.83	0.94	18.47	18.47	14.13	15.71	15.28	16.22	4.39	39.11	32.00
bubbles6	0.00	0.16	1.36	1.37	4.40	0.11	15.88	15.88	11.51	14.88	14.68	9.30	2.91	35.87	21.83
bubbles7	0.00	0.12	5.99	5.98	6.07	2.31	24.12	24.12	23.89	25.72	28.14	24.02	8.20	46.16	35.77
bubbles8	0.00	0.08	5.34	5.39	5.08	4.68	23.12	23.12	18.68	15.90	19.54	18.82	10.14	35.48	27.75
bubbles9	0.38	0.00	3.48	4.35	5.80	8.32	25.16	25.16	14.44	14.03	12.31	16.00	17.77	46.88	32.73
Average:	1.30	1.34	3.36	3.47	4.70	2.36	19.83	19.83	13.97	14.50	16.44	16.34	6.34	35.14	31.61
rotatingDiamonds1	2.35	2.36	2.35	2.35	2.35	0.00	0.00	0.00	0.54	1.17	5.89	9.96	0.07	17.33	6.09
rotatingDiamonds2	0.94	0.94	1.26	1.26	1.09	0.00	3.01	3.01	4.71	3.50	3.58	3.58	0.04	10.50	7.32
rotatingDiamonds3	0.05	0.10	0.31	0.32	1.07	0.00	0.88	0.88	1.04	1.16	1.06	0.82	0.47	10.05	12.72
rotatingDiamonds4	0.20	0.25	0.45	0.46	0.90	0.25	0.00	0.00	1.11	0.66	0.75	0.34	1.58	5.58	14.38
rotatingDiamonds5	0.03	0.28	0.20	0.21	0.55	0.35	0.00	0.00	0.17	0.05	0.25	0.84	2.78	16.50	20.50
Average:	0.72	0.79	0.91	0.92	1.19	0.12	0.78	0.78	1.51	1.31	2.31	3.11	0.99	11.99	12.20
chaoSingleDep	0.01	0.08	0.01	0.02	0.01	1.64	0.00	0.00	5.94	6.04	4.98	4.61	1.88	24.22	35.57
GEOMETRIC Average:	1.93	2.38	3.30	3.47	4.33	3.96	10.71	11.74	12.24	12.17	12.69	13.00	9.43	24.13	27.59
Overall Average:	2.48	3.02	3.62	3.79	4.52	8.66	9.45	10.17	13.65	13.69	13.79	14.11	22.74	24.51	25.41

Table 2.4: Computation time (CPU seconds) for 15 heuristics on 48 problems with equal radius and 2D Euclidean norm

	MERGE	LK-SOCP	HULL	SZ1	SZ2	TILE2	TILE1	TILE4	CTD	TILE3	YUAN+	HYBRID1	HYBRID2	GTSP1	GTSP2
Overlap ratio:0.02															
kroD100	0.570	0.102	0.235	0.235	0.297	0.279	0.427	3.158	0.425	3.275	0.938	78.296	78.906	665	666
rat195	1.453	0.141	0.532	0.484	0.539	0.447	1.651	6.645	1.223	8.885	25.265	347.578	344.313	7780	7781
lin318	0.297	0.375	0.508	1.547	1.477	0.909	13.923	10.686	1.332	26.076	6.313	357.015	349.063	48543	48545
rd400	0.649	0.469	1.219	1.250	1.820	0.659	5.031	15.217	2.695	17.232	61.328	1254.547	1225.765	76007	76010
pcb442	1.492	0.461	1.266	1.235	1.445	3.223	51.103	20.172	2.898	73.710	52.094	20289.579	24625.969	222043	222047
d493	1.211	0.789	0.477	1.422	2.523	0.825	1.962	16.344	3.859	18.677	86.796	348.875	322.609	309067	309071
dsj1000	1.040	1.875	1.117	3.969	9.195	2.270	10.558	57.731	10.115	75.471	509.515	1474.328	1876.625	12682539	12682545
Average:	0.959	0.602	0.765	1.449	2.471	1.230	12.093	18.564	3.221	31.904	106.036	3450.031	4117.607	1906663	1906666
Overlap ratio: 0.1															
kroD100	0.055	0.063	0.133	0.109	0.250	0.188	0.204	2.173	0.545	2.172	0.532	6.109	6.438	1482	1483
rat195	0.094	0.110	0.125	0.187	0.453	0.204	0.237	4.292	1.510	4.247	25.438	7.812	8.454	5949	5951
lin318	0.063	0.321	0.196	0.313	0.859	4.982	5.029	7.242	2.721	7.216	6.578	14.953	15.843	60249	60252
rd400	0.063	0.367	0.289	0.407	0.797	0.566	0.830	10.171	3.502	10.220	60.219	26.375	27.531	90999	91003
pcb442	0.063	0.391	0.180	0.437	1.594	0.224	0.287	11.664	3.847	11.662	51.891	17.407	20.281	250482	250485
d493	0.110	0.782	0.133	0.484	1.782	0.289	0.336	13.581	22.416	13.636	87.406	6.250	8.953	61711	61715
dsj1000	0.070	1.790	0.157	0.922	4.657	2.898	2.937	36.875	10.355	36.837	512.094	15.750	31.938	7807740	7807747
Average:	0.074	0.546	0.173	0.408	1.484	1.336	1.408	12.285	6.414	12.284	106.308	13.522	17.063	1182659	1182662
Overlap ratio: 0.3															
kroD100	0.039	0.071	0.079	0.078	0.133	0.184	0.231	1.611	1.289	1.693	0.625	0.391	0.500	865	865
rat195	0.047	0.102	0.078	0.156	0.336	0.234	0.297	3.233	2.812	3.358	25.187	1.016	1.250	6322	6323
lin318	0.039	0.266	0.070	0.265	0.594	35.652	35.722	6.255	9.265	6.326	8.109	1.937	3.703	40164	40166
rd400	0.040	0.352	0.078	0.375	0.867	2.807	2.877	7.860	14.212	7.782	60.516	4.250	5.547	61116	61120
pcb442	0.055	0.422	0.078	0.329	0.719	0.630	0.661	9.650	23.349	9.736	52.093	1.704	3.234	76133	76137
d493	0.047	0.688	0.086	0.375	0.680	0.743	0.821	12.086	44.881	12.154	126.485	0.625	1.250	59105	59109
dsj1000	0.032	1.727	0.188	1.063	2.602	10.990	11.036	20.177	323.244	20.231	512.032	3.797	12.265	2623492	2623498
Average:	0.042	0.518	0.094	0.377	0.847	7.320	7.378	8.696	59.865	8.754	112.150	1.960	3.964	409600	409603
TSPLIB Average:	0.358	0.555	0.344	0.745	1.601	3.295	6.960	13.182	23.166	17.647	108.164	1155.171	1379.545	1166307	1166310
Varied overlap ratios															
team1_100	0.055	0.469	0.133	0.141	0.313	0.233	0.247	2.468	1.143	2.415	1.344	7.469	9.329	913	913
team2_200	0.039	0.273	0.102	0.203	0.633	0.781	0.749	4.104	3.359	4.065	2.750	4.110	4.344	34768	34768
team3_300	0.086	0.422	0.219	0.375	1.110	0.561	0.719	7.226	1.826	7.352	9.046	33.766	37.016	69822	69823
team4_400	0.141	0.407	0.344	0.656	1.430	0.729	1.178	11.347	2.542	11.852	108.812	215.250	215.516	276261	276264
team5_499	0.360	0.750	0.649	1.390	2.617	0.894	15.510	16.252	3.486	20.914	129.188	721.218	732.969	396627	396631
team6_500	0.047	0.539	0.094	0.391	1.086	3.638	3.685	11.814	47.171	11.759	27.531	2.688	5.266	196027	196027
bonus1000	0.235	1.313	0.164	0.922	4.852	4.791	4.777	48.609	37.650	48.617	7419.375	21.438	37.641	2648670	2648762

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	MERGE	LK-SOCP	HULL	SZ1	SZ2	TILE2	TILE1	TILE4	CTD	TILE3	YUAN+	HYBRID1	HYBRID2	GTSP1	GTSP2
Average:	0.137	0.596	0.243	0.583	1.720	1.661	3.838	14.546	13.882	15.282	1099.721	143.706	148.869	517584	517598
concentricCircles1	0.024	0.008	0.063	0.047	0.055	0.151	0.221	0.705	0.008	0.768	0.078	2.391	2.969	123	123
concentricCircles2	0.055	0.016	0.117	0.070	0.117	0.251	0.247	1.300	0.031	1.310	0.125	7.359	7.719	169	169
concentricCircles3	0.063	0.040	0.149	0.141	0.125	0.223	0.265	2.062	0.054	2.651	0.281	26.656	27.766	372	372
concentricCircles4	0.094	0.070	0.203	0.219	0.274	0.247	0.221	3.263	0.081	4.767	0.531	126.797	139.281	4468	4468
concentricCircles5	0.141	0.110	0.297	0.422	0.719	0.244	7.117	4.846	0.165	6.230	1.610	259.422	285.437	22030	22031
Average:	0.075	0.049	0.166	0.180	0.258	0.223	1.614	2.435	0.068	3.145	0.525	84.525	92.634	5432	5433
bubbles1	0.055	0.016	0.188	0.078	0.086	0.261	0.331	1.224	0.287	1.171	0.109	46.390	40.922	95	95
bubbles2	0.047	0.047	0.157	0.102	2.657	0.303	0.272	2.217	0.066	2.245	0.906	114.641	99.453	64	64
bubbles3	0.031	0.102	0.227	0.203	1.071	0.094	0.282	3.306	0.132	3.343	0.375	398.281	302.141	471	471
bubbles4	0.047	0.180	0.243	0.297	0.774	0.581	0.374	5.300	0.347	5.135	0.906	771.875	655.625	23413	23414
bubbles5	0.118	0.305	0.367	0.657	4.125	0.583	0.646	6.935	0.351	7.311	2.828	2798.187	2100.828	6084	6085
bubbles6	0.195	0.383	0.438	0.727	1.360	2.082	2.317	9.508	1.512	10.056	1.485	6998.609	13256.422	24655	24657
bubbles7	0.235	0.523	0.867	0.922	2.235	1.133	1.168	12.592	0.967	14.981	3.063	10159.172	8624.468	34294	34295
bubbles8	0.399	0.742	0.657	1.000	2.938	0.917	2.650	16.733	1.990	17.585	6.938	10283.109	10277.734	100460	100462
bubbles9	0.656	1.000	0.969	1.422	5.727	2.042	1.963	20.043	2.902	21.185	4.235	50620.140	53482.297	304346	304348
Average:	0.198	0.366	0.457	0.601	2.330	0.888	1.111	8.651	0.950	9.223	2.316	9132.267	9871.099	54876	54877
rotatingDiamonds1	0.063	0.008	0.110	0.039	0.047	0.236	0.299	0.846	0.102	0.789	0.078	5.734	6.156	23	24
rotatingDiamonds2	0.047	0.039	0.235	0.110	0.141	0.213	0.278	1.966	0.251	2.034	0.125	91.781	80.922	367	368
rotatingDiamonds3	0.102	0.110	0.578	0.414	0.500	0.690	0.564	6.559	0.498	6.619	2.125	3028.062	2839.750	16406	16407
rotatingDiamonds4	0.531	0.227	1.836	0.879	1.008	1.701	2.065	12.163	0.729	14.128	4.594	12438.688	15499.562	49043	49045
rotatingDiamonds5	2.133	0.641	7.461	2.133	2.688	6.063	7.743	33.126	9.085	35.265	15.563	68829.250	58340.188	210895	210899
Average:	0.575	0.205	2.044	0.715	0.877	1.781	2.189	10.932	2.133	11.767	4.497	16878.703	15371.316	55347	55349
chaoSingleDep	0.086	0.250	0.235	0.227	0.415	0.409	0.558	5.584	0.707	5.841	1.859	29.156	32.125	43742	43743
GEOMETRIC Average:	0.225	0.333	0.633	0.525	1.448	1.113	2.090	9.337	4.350	10.014	286.884	6223.764	6193.846	165356	165360
Overall Average:	0.283	0.430	0.507	0.621	1.515	2.068	4.221	11.019	12.582	13.354	208.694	4006.255	4087.589	603272	603276

Based on the computational experiments with the 48 problems using the Euclidean norm, we observe the following. (1) As the overlap ratio increases from low to high, tour length decreases in almost all cases (except for GTSP1 on problems $rat195$, $d493$, and $dsj1000$), and computation times decrease for many heuristics, including the Steiner-zone methods (SZ1, SZ2, HYBRID1, HYBRID2), GTSP1, GTSP2, and the two methods from Dong et al. (HULL, MERGE). (2) For low and medium overlap ratios, the methods that use Steiner zones clearly outperform the methods that do not (LK-SOCP and YUAN+). This suggests that for these problems, Steiner zones improve the quality of the solution. (3) The two methods based on the generalized TSP (GTSP1, GTSP2) produce very good, short tour lengths for low and medium overlap problems if you are willing to wait months for results. These two methods produce poor tour lengths for high overlap problems with extremely long computation times. (4) The hybrid methods (HYBRID1, HYBRID2) produce results that fall between the Steiner zone methods and the GTSP methods. For low overlap problems, the hybrid methods find much better tours than the Steiner zone methods but not for the medium and high overlap problems. They are much slower than the Steiner zone methods and much faster than the GTSP methods. (5) The two methods that do not use Steiner zones (YUAN+ and LK-SOCP) perform better on most high overlap ratio problems than all Steiner-zone methods. Because LK-SOCP is so fast, it may be worthwhile to incorporate LK-SOCP into SZH as a hybrid heuristic. (6) Greedily choosing Steiner zones of the very highest degree, as in CTD, performs well, but is not as consistent as the SZH methods that build Steiner zones using an ordered list of nodes. CTD finds better tours than SZ1 and

SZ2 15 out of 48 times but has a poorer average deviation. (7) If we consider the order in which each heuristic appears in Tables 2.3 and 2.4 to be performance rankings, then SZ1 and SZ2 have the best mean ranking, 4, of all 15 heuristics tested. LK-SOCP is next with an average rank of 5. All other methods have average rank greater than 6.

2.6 Conclusions

In this chapter, we presented a new heuristic for solving the CETSP that is straightforward and easy to understand. The Steiner-zone heuristic reduces a graph of nodes to a set of Steiner zones, assigns a good tour sequence to them, and then minimizes the tour length with respect to the Steiner zones. We compared 15 different heuristics for solving the CETSP on 48 test problems. We found that the combination of low computation time and high solution quality made the Steiner-zone heuristics very competitive methods.

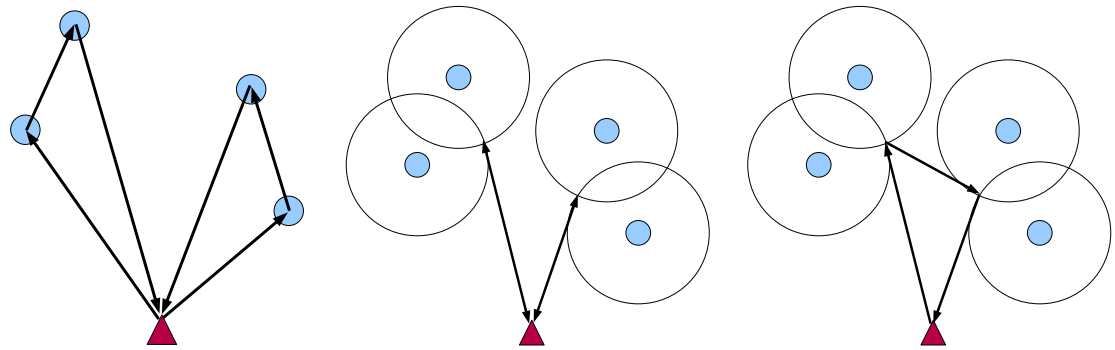
Chapter 3

The Close-Enough Vehicle Routing Problem

3.1 Introduction

In the Vehicle Routing Problem (VRP), k vehicles start at a single depot and visit n nodes such that each node is serviced by exactly one vehicle. Given a complete, undirected graph $G = (V, E)$, where V is the set of n nodes, E is the set of edges, and each edge has a symmetric distance, we must find the set of tours (Hamiltonian cycles) that minimizes the sum of the edge lengths. Each node has a demand that must be serviced in its entirety by a single vehicle. Each vehicle has a maximum tour length and a capacity restriction.

In this chapter, we model and solve a new variant of the VRP. If a vehicle is within a specified distance of a node, then the node is considered to have been serviced. We illustrate the CEVRP in Figure 3.1. In the standard VRP shown in Figure 4.1(a), two vehicles leave the depot, visit two nodes each, and return to the depot. In the CEVRP shown in Figure 4.1(b), the vehicles need to get within distance r of each node (this is depicted by the disks around each node). If each vehicle visits the intersection of two disks, all four nodes have been visited and the two routes are a feasible solution to this CEVRP. If maximum route length and capacity restrictions are not violated, then one vehicle can visit all four nodes as shown in Figure 3.1(c). The solutions in Figures 4.1(b) and 3.1(c) are clearly shorter



(a) VRP solution; the depot is depicted by a triangle.

(b) CEVRP solution with two vehicles

(c) A possible CEVRP solution that uses one vehicle and does not violate distance and capacity limits.

Figure 3.1: The optimal VRP solution compared to optimal CEVRP solutions. Both CEVRP solutions are shorter.

than the solution in Figure 4.1(a).

In the remainder of this chapter, we describe a single-depot, homogeneous fleet, capacitated CEVRP with route-length restrictions. There is no limit on the number of vehicles available, and nodes do not have service times.

The CEVRP can be applied to unmanned aerial vehicle (UAV) reconnaissance. To collect information on a set of intelligence targets, a user may deploy a fleet of UAVs. The aircraft need only get within a specified distance, r, of each target's center to collect the intelligence. Each aircraft has an upper bound on its flying time and has finite data storage capacity so that routes must be constructed that get close enough to all targets while minimizing distance traveled.

The chapter is organized as follows. In Section 5.2, we review the literature on the CETSP and VRP. In Section B.1, we formulate the CEVRP as a mathematical program. In Section 5.5, we develop a heuristic solution procedure based on intersections of disks called Steiner zones. In Section 3.5, we generate a set of test

problems and conduct extensive computational experiments in which we compare results produced by our heuristic to the results of several solution methods. We give our conclusions in Section 5.7.

3.2 Literature Review

The first description of the CETSP is given by Gulczynski, Heath, and Price [43]. They consider utility companies that use Radio Frequency Identification (RFID) to read meters from a distance. The authors present six heuristics for solving problems with Euclidean distances. The six heuristics have three steps in common.

- Step 1. Find a feasible supernode set S such that all customers are within r units of at least one point in S.
- Step 2. Solve a TSP on the points in S to produce a near-optimal solution T that is a feasible solution to the CETSP.
- Step 3. Reduce the distance traveled in T while maintaining feasibility.

Dong, Yang, and Chen [27] formulate the CETSP as a mixed integer, nonlinear program, but they do not attempt to solve it. Instead, they develop two heuristics that use clustering or convex hulls to generate the supernodes. Yuan, Orlowska, and Sadiq [73] consider the problem of routing a mobile robot to visit sensors that are distributed in the Euclidean plane. In order to communicate with a sensor and download data, a robot must be within a specified distance of the sensor (the effective range is specified by a disk of radius r and disks do not overlap). The

authors develop an evolutionary approach for solving the robot routing problem. The approach was effective but very slow. Shuttleworth et al. [65] extend the CETSP to street networks. They consider a real-world meter reading problem that uses actual data from a utility company. The authors solve the problem using a two-stage process. Their solutions save time and distance when compared to the existing route used by the utility company.

In Chapter 2, we described a Steiner-zone heuristic (SZH) for solving the CETSP in two dimensions using Euclidean and Manhattan norms, where r is the same for all nodes. We reduced a graph of nodes into a graph of disk intersections (the intersection of k disks is called a Steiner zone of degree k), solved a TSP on points from each region, and then minimized the distance of this tour. We generated a set of test problems and compared the results of the Steiner-zone heuristic to the results produced by 13 heuristics including two genetic algorithms, two hybrid methods combining Steiner zones and a genetic algorithm, and two simple methods. For problems where there was only small or medium overlap of disks, the genetic algorithms consistently found the shortest tours but were very slow. The Steiner-zone methods were extremely fast over all problems and produced the best solutions for problems where there was a large amount of disk overlap.

The book by Vigo and Toth [68] contains papers that discuss the standard VRP and its variants and describe successful solution approaches. The latest work on the VRP is given in the book by Golden, Wasil, and Raghavan [38] and the bibliography from Cordeau et al. [21]. Groër [39] combines integer programming, the record-to-record travel metaheuristic, and parallel computing to produce very

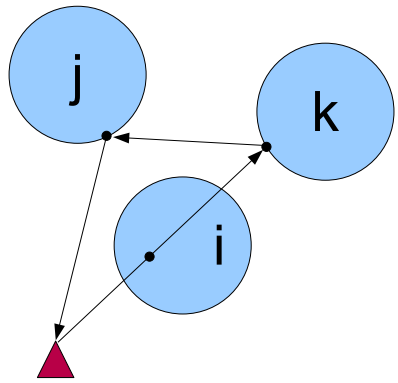


Figure 3.2: Three representative points are shown as small black circles, one for each disk.

high quality solutions to standard VRP test problems.

3.3 Formulation

In this section, we formulate the CEVRP as a mixed-integer nonlinear program. In the CEVRP, at least one route must cross a disk of radius r surrounding every node i as shown in Figure 3.2. The radius is the same for every node. We denote the disk surrounding node i as $disk(i)$. Any route that touches or passes through $disk(i)$ visits node i (with the exception of the depot (node 0) which has no disk). Node i is a fixed point in the plane at coordinate (a_i, b_i). We denote this as $orig(i)$, the origin of node i. We assume that $orig(i) \neq orig(j)$ for all i and $j \geq 0$. The depot, however, may have the same coordinates as node i. There is no service time requirement at any node. Let ϵ be the smallest non-zero length of any edge. Requiring all edges to have non-zero length does not eliminate feasible solutions when the depot has the same coordinates as node i as long as ϵ is sufficiently close to zero.

Let (x_i, y_i) be the coordinate on a vehicle's tour that is close enough to node i. Coordinate (x_i, y_i) is known as node i's *representative point*. x_i and y_i are unbounded continuous variables. In Figure 3.2, we illustrate the concept of representative points. Any of the points on the line through $disk(i)$ can be selected as node i's representative point. Distances in the CEVRP are given by $\sqrt{(x_i - x_j)^2 + (y_i - y_j)^2}$. Let e_{ijk} be a binary variable equal to 1 if node i immediately precedes node j on vehicle k's tour and 0 otherwise. w_{ik} is a binary variable equal to 1 if node i is visited by vehicle k. t_i is the continuous variable representing the arrival time at node i. K is the number of vehicles available. Q and T are constants representing the maximum capacity and tour length for all K vehicles, respectively. Our mixed-integer formulation of the CEVRP is given below.

$$\text{Minimize} \quad \sum_{i=0}^{n} \sum_{j=0}^{n} \sum_{k=1}^{K} e_{ijk} \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2} \tag{3.1}$$

subject to

$$x_0 = a_0; \; y_0 = b_0 \tag{3.2}$$

$$(x_i - a_i)^2 + (y_i - b_i)^2 \leq r^2 \qquad i = 1, \ldots, n \tag{3.3}$$

$$\sqrt{(x_i - x_j)^2 + (y_i - y_j)^2} \geq \epsilon \qquad \forall\, i, j \tag{3.4}$$

$$w_{0k} = 1 \qquad \forall\, k \tag{3.5}$$

$$t_0 = 0 \tag{3.6}$$

$$\sum_{k=1}^{K} w_{ik} = 1 \qquad i = 1, \ldots, n \tag{3.7}$$

$$\sum_{i=1}^{n} q_i w_{ik} \leq Q \qquad \forall\, k \tag{3.8}$$

$$\sum_{i=0}^{n} e_{ijk} = \sum_{i=0}^{n} e_{jik} = w_{jk} \qquad \forall\ j, k \tag{3.9}$$

$$t_i + e_{ijk} d_{ij} - (1 - e_{ijk})T \leq t_j \qquad \forall\ k;\ i \geq 0,\ j \geq 1 \tag{3.10}$$

$$t_i + e_{ijk} d_{ij} + (1 - e_{ijk})T \geq t_j \qquad \forall\ k;\ i \geq 0,\ j \geq 1 \tag{3.11}$$

$$0 \leq t_i + d_{i0} \leq T \qquad \forall\ i \geq 1 \tag{3.12}$$

$$\sum_{i,j \in S} e_{ijk} \leq |S| - 1 \qquad \text{for } S \subseteq \{1, \ldots, n\},$$

$$2 \leq |S| \leq n\ \forall\ k \tag{3.13}$$

$$e_{ijk} \in \{0, 1\},\ (x_i, y_i) \in R \times R \qquad \forall\ i, j, k \tag{3.14}$$

The objective function (3.1) minimizes the total distance of all tours. However, the distance coefficients are not constants. The coefficients are functions of the representative points. In Figure 3.3, we show how different choices of representative points affect the edge distance between node i and node j. Constraints (3.2) to (3.4) are the close-enough constraints while (3.5) to (3.13) are the VRP constraints.

Constraint (3.2) forces the representative point for the depot to lie at its origin, (a_0, b_0). Constraint (3.3) requires each representative point i to lie within a disk around $(a_i,\ b_i)$. The index does not include the depot ($i = 0$) as there is no disk around the depot. Constraint (3.4) requires the distance between any two representative points to be strictly positive. Without (3.4), edges in the tour can have length 0. If k disks have the same representative point, all $\binom{k}{2}$ edges between the k disks have length 0 and could be selected without increasing the objective function value. Assignment constraints (3.9) ensure that exactly one edge enters and one edge exits each node. However, without (3.4), a node can have multiple predecessors and

successors. In preliminary experiments, a solver was unable to find a feasible solution for very small problems where zero-length edges are possible. When constraint (3.4) is included, zero-length edges cannot occur and the assignment constraints ensure a single predecessor and successor for each node. Consider the problem in Figure 3.1(c) where there are only two unique points representing four disks. If this problem is solved using the formulation including constraint (3.4), each representative point is replaced by two points ϵ units apart. For values of ϵ sufficiently close to zero, our formulation produces the same optimal routes as if we could solve with $\epsilon = 0$.

Constraint (3.5) requires all vehicles to visit the depot and (3.6) sets the arrival time at the depot as 0. Without these two constraints, arrival times will not be computed correctly. Constraint (3.7) requires all nodes to be visited while (3.8) enforces the capacity constraints on each vehicle. In (3.9), each node is required to have exactly one predecessor and one successor. Together, (3.5) and (3.9) force the solution to use all K vehicles. Constraints (3.10) and (3.11) require the arrival time at node j to equal the arrival time at node i plus the distance between the two if and only if i immediately precedes j in route k. They may be rewritten as:

$$t_i + e_{ijk}(d_{ij} + T) - t_j \leq T \qquad \forall\ k;\ i \geq 0,\ j \geq 1 \tag{3.15}$$

$$t_i + e_{ijk}(d_{ij} - T) - t_j \geq -T \qquad \forall\ k;\ i \geq 0,\ j \geq 1 \tag{3.16}$$

Constraint (3.12) forces each route to return to the depot within the prescribed distance limit. Finally, constraint (3.13) prohibits subtours by forcing the number of edges in any subset of non-depot nodes to be at most one less than the subset's cardinality. Although (3.10) makes (3.13) redundant, we include it based on the

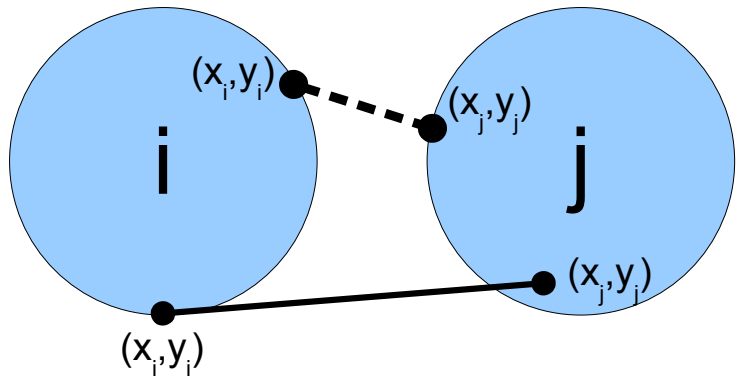


Figure 3.3: The two lines connect representative points for nodes i and j.

computational experience in [40]; including (3.13) should reduce computation time.

The CEVRP reduces to the VRP when $r = 0$ for all i. If $K = 1$, then the CEVRP reduces to the CETSP. When $r = 0$ for all i and $K = 1$, the CEVRP reduces to the TSP.

3.4 Heuristic

3.4.1 Definitions

Let $SZ(k)$ denote a Steiner zone of degree k. $SZ(k)$ is the non-empty intersection of k convex regions. In this case, the regions are disks. Any point in $SZ(k)$ is close enough to all k member nodes, as shown in Figure 4.2. A Steiner zone of degree 1, $SZ(1)$, is called a *singleton*. In Figure 3.5, we show two Steiner zones of equal degree that differ in the amount of overlap or intersection. A point in a Steiner zone is in general not one of the original nodes to be visited, but a visit to this point may reduce the total length of the tour. These zones affect the TSP the same way Steiner points affect the minimal spanning tree problem. The name

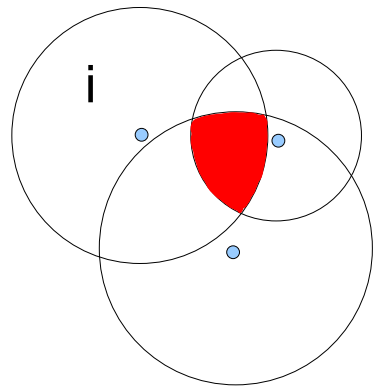
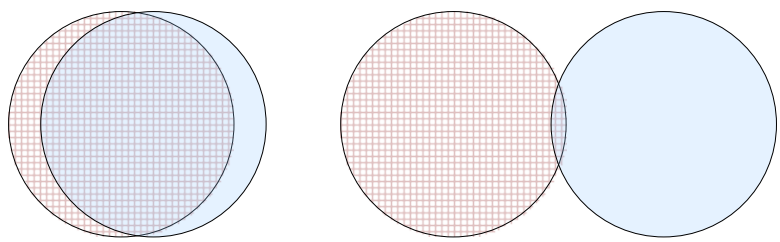


Figure 3.4: The shaded region is a Steiner zone of degree 3 with base node i and is denoted $SZ(3)$. $SZ(3)$ is the intersection of three disks.



(a) large intersection (b) small intersection

Figure 3.5: The Steiner zones have degree 2 in both cases.

Steiner zone comes from this observation.

Given $orig(i)$, $SZ(k)$ with base node i is characterized by the polar angles, relative to $orig(i)$, with which the $k-1$ other disks intersect node $disk(i)$. These angles are easily obtained for two disks knowing only the origins and radii of the two disks. We provide an example in Figure 4.8. To specify $SZ(k)$, we need only $orig(i)$ and the upper and lower angles of intersection. Note that the perimeter of each disk crosses $disk(i)$ at most twice. We refer to these as intersection points.

In Figure 3.1, the potential savings in tour length increases with r. In Figure 4.1(a), $r = 0$ (although we show disks around the nodes for illustration) and the optimal CEVRP result is the optimal VRP solution. If $r > 0$, as in Figures 4.1(b)

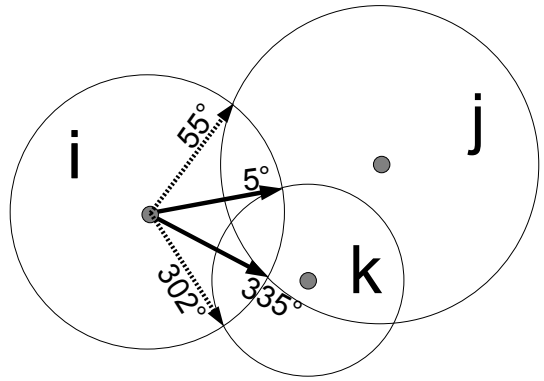
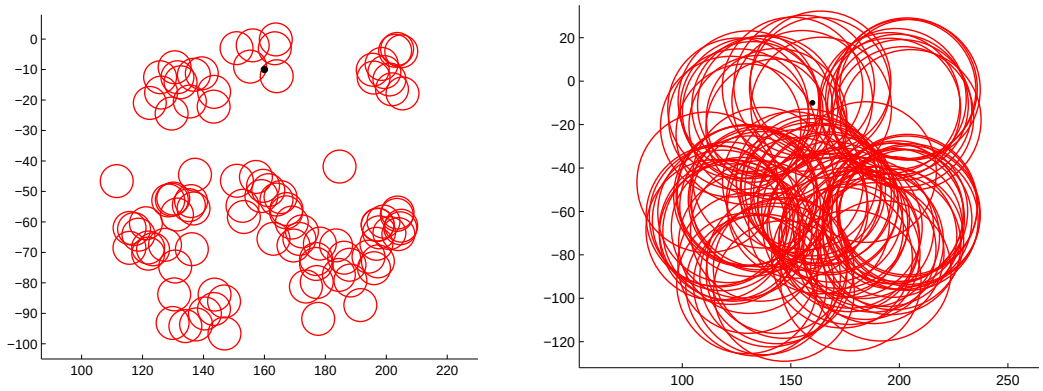


Figure 3.6: Node i is the base node. Only the lower (343°) and upper (8°) angles of intersection are required to specify the $SZ(3)$ formed by $disk(i)$, $disk(j)$, and $disk(k)$.

and 3.1(c), we expect the optimal CEVRP solution to be shorter than the optimal VRP solution. When r is large enough so that every node i is within r of the depot, then the optimal solution would have a total distance of zero.

We define a single metric, *overlap ratio*, to indicate how much potential there is for improvement of the CEVRP solution over the VRP solution. For a given CEVRP, let $l_{contain}$ be the length of a side of the smallest square containing all n disks. The *overlap ratio* is the ratio of r to $l_{contain}$. In Figure 3.7, we show two different overlap ratios for the same set of nodes. We consider instances with an overlap ratio much larger than 0.3 uninteresting because almost any sequence of n nodes will produce a near-optimal solution to the CEVRP. Overlap ratio is not appropriate for problems which lie in an elongated rectangle rather than a square, but it provides an indication of how much improvement is possible.

SZH reduces a graph of n nodes to a graph of m Steiner zones, finds a set of feasible tours through these zones, and locates the best representative point for



(a) overlap ratio 0.05 (b) overlap ratio 0.2

Figure 3.7: The nodes are the same in (a) and (b), but the radius is larger in (b). The larger the overlap ratio, the greater the potential savings.

each node in order to minimize the total distance of the routes. We now describe the three phases of our heuristic.

3.4.2 Phase I - Graph Reduction

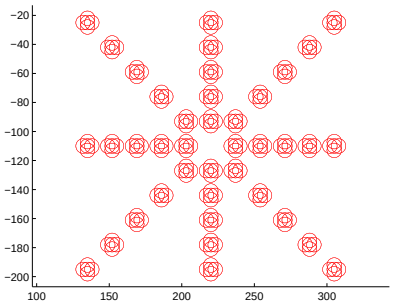
We sort all n nodes and place them in a list, denoted $list$. The first node is removed from the list, say node i, and we compute most of the Steiner zones that can be formed with i. Computing all possible Steiner zones would be computationally expensive. In addition, using only the Steiner zones of the very largest degree generally does not produce the best tours as shown in Chapter 2. The list of Steiner zones formed with i, denoted SZ_list_i, is stored from highest degree to lowest. Steiner zones of equal degree are stored lexicographically. For example, the four Steiner zones {1,2}, {1,6,4}, {1,2,3,4,5}, and {1,2,5} would be stored as {1,2,3,4,5}, {1,2,5}, {1,6,4}, and {1,2}.

We compute most of the Steiner zones associated with node i as follows. Given the current SZ_list_i and the next node to be considered from $list$, say node j,

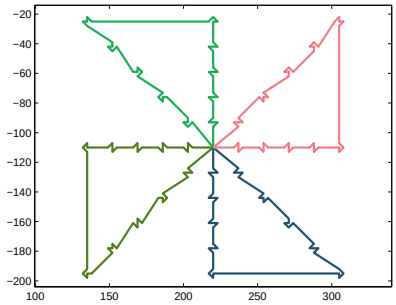
compute the angles of intersection for Steiner zone $\{i, j\}$, if it exists. If Steiner zone $\{i, j\}$ exists, we start at the beginning of SZ_list_i and move to the end, comparing each Steiner zone's angles of intersection to those of $\{i, j\}$. At the first (and therefore highest degree) Steiner zone in SZ_list_i whose angles of intersection have a non-empty overlap with those of Steiner zone $\{i, j\}$, we create the new Steiner zone along with new Steiner zones based on node i of degree two or three that we have found.

Consider $SZ_list_1 = \{1, 2, 3, 4, 5\}, \{1, 2, 5\}, \{1, 6, 4\}$, and $\{1, 2\}$, and let j be node 8. Let 1 and 8 have a non-empty intersection at angles 10° and 30°, that is, they form a $SZ(2)$. First, we compare those angles to the angles for Steiner zone {1,2,3,4,5}, then with {1,2,5}, and so on until we find a non-empty intersection. If none is found, add {1,8} to the end of SZ_list_1. Suppose that the angles of intersection for {1,2,3,4,5} are 0° and 12°. Since [0,12] and [10,30] overlap, a new Steiner zone of degree 6 has been found and Steiner zone {1,2,3,4,5,8} is added to the beginning of SZ_list_1. Node 8 must share an intersection with all smaller combinations of nodes 1, 2, 3, 4, and 5. Therefore, as described in Chapter 2, we add to SZ_list_1 any Steiner zones based on node 1 of degree two or three that had not already been added. This makes Phase I fast and effective. In practice, we find Steiner zones of degree 100 or more in a fraction of a CPU second.

After we have processed all the nodes remaining in *list*, we remove the Steiner zone of highest degree from SZ_list_1 and remove all its component nodes from *list*. The next remaining node in *list* is then chosen, and the process is repeated until $list = \emptyset$. Since each node in a VRP has a demand that must be satisfied in its



(a) 200-node CEVRP



(b) A near-optimal standard VRP solution with a total length of about 1535.

Figure 3.8: 200-node CEVRP and a near-optimal VRP solution.

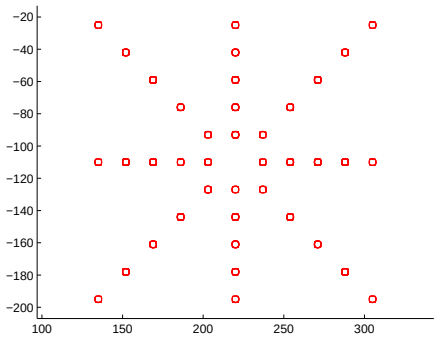


Figure 3.9: 200-node CEVRP after Phase I. There are 40 Steiner zones.

entirety by a single vehicle, care must be taken in Phase I to create Steiner zones whose cumulative demand is no larger than the maximum vehicle capacity.

In Figure 3.8, we show a 200-node CEVRP based on a problem from Chao et al. [15]. The test problems in Chao et al. [15] have visually estimated solutions that are high quality. To visually estimate a CEVRP solution, we replaced every node from the VRP problem with five intersecting nodes and used node demands given in Chao et al. [15]. For example, the node demand in the eight sets of five nodes closest to the depot is 12 units. The demand decreases the further away

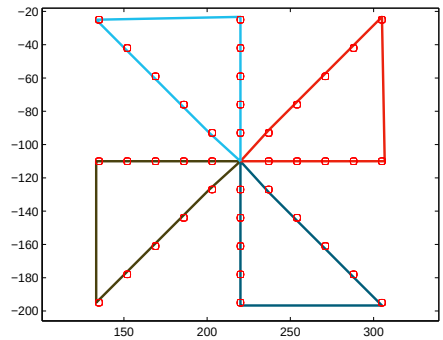


Figure 3.10: 200-node CEVRP after Phase II. The total length is about 1176.

from the depot each set of five nodes is, decreasing from 12, to 8, 4, 2, and finally 1. In Figure 3.8(b), we show a near-optimal solution to the VRP with a capacity of 270 per vehicle. In Figure 3.9, we show that applying Phase I to this problem has reduced the 200 nodes to 40 Steiner zones of degree 5. The Steiner zones are disjoint. The Phase I algorithm does not explicitly require or encourage disjoint Steiner zones.

3.4.3 Phase II - Routing

The result of applying Phase I to graph G is graph G'. G' is a graph of m Steiner zones rather than the original n nodes. In order to find a set of routes, we designate a single point in each Steiner zone as its representative point and apply a VRP solver to these points. The result is a feasible solution to the CEVRP.

3.4.4 Phase III - Tour Improvement

The result of applying Phase II to G' is a feasible solution to the CEVRP. The sequence in which each tour visits its Steiner zones is fixed, but the location of each Steiner zone's representative point can still be modified. In Figure 3.10, we show the results after applying Phase II to the 200-node CEVRP. We notice that the tour length is much less than the tour length of the near-optimal VRP solution. The tour could be further shortened by changing the representative points for the Steiner zones. To determine the optimal placement of the representative points, we solve the Touring Polygons Problem (TPP)[29] for each route in the Phase II solution where we consider convex regions (Steiner zones) instead of polygons. We call this the Touring Steiner Zones Problem (TSZP). Given a tour on a set of disks, the TSZP minimizes the distance such that each Steiner zone (and thus each disk) remains feasibly covered, and the sequence of Steiner zones visited remains unchanged.

In Chapter 2 we presented two solution procedures for the TSZP. The first, called $SOCP$, is an exact procedure using a Second Order Cone Program (SOCP) formulation and is solved using CPLEX [2]. It solves problems optimally in two and three dimensions for Euclidean and Manhattan norms and does not require the Steiner zones to be disjoint. Problems with 1001 nodes are solved in less than six CPU seconds. When the radii for the disks are different, numerical issues with CPLEX require solving the TSZP as a general nonlinear program.

The second procedure is a heuristic, called IP_{PhIII}, that solves an integer program at each iteration. In Chapter 2 we found that the heuristic frequently con-

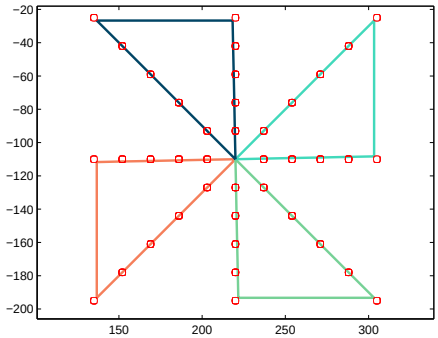


Figure 3.11: 200-node CEVRP after Phase III. The total length is about 1131.

verged to the optimal TSZP solution and was never more than 1% from optimality. At each iteration, a Steiner zone is approximated by three points. After 10 iterations, each Steiner zone has been approximated by a 1536-sided polygon, and the TPP has been solved to near optimality. IP_{PhIII} solves problems with 1001 nodes in less than one CPU second. It has none of the numerical issues associated with $SOCP$, but can only be used in 2D problems where the Steiner zones are mostly disjoint.

In Figure 3.11, we show the final result for a 200-node $CEVRP$ after applying Phase III. The total distance has been reduced considerably. This appears to be a very good solution.

3.5 Computational Experiments

3.5.1 VRP Solver

Recently, Groër [39] developed a record-to-record (RTR) travel procedure to solve several of the VRP variants, including the standard single-depot capacitated

vehicle routing problem (CVRP). He also developed a parallel algorithm combining RTR with integer programming that found nearly all the best-known solutions and generated new best-known solutions to the CVRP. The serial version of his code produced solutions that were competitive with those of the best codes currently available.

Record-to-record travel works in uphill and downhill phases. During the uphill phase, any move that is no worse than some percentage (deviation) from the current best solution (record) is accepted. During the downhill phase, only strictly improving moves are accepted. The uphill phase is run for a fixed number of iterations while the downhill phase ends only when no improving move has been found. After a series of uphill and downhill moves are finished, the solution may be perturbed and the entire process repeated.

The RTR algorithm in [39] starts with a solution produced by a modified Clarke-Wright savings procedure. Groër uses local optimization procedures including one-, two-, and three-point-movement, two-, three-, and or-opt, and a procedure called cross-exchange. These are all explained, with examples, in [39]. The k nearest neighbors for each node are stored.

We use Groër's code to solve Phase II. Our default settings run RTR three different times, using the modified Clarke-Wright procedure with $\lambda = 0.6$, 1, and 1.2. The size of the neighbor list is 25. Each uphill phase is run for 30 iterations. The uphill and downhill cycle phases are run five times after which we stop (the solution is not perturbed). We used the serial version of his code.

3.5.2 CEVRP Heuristics

We coded eight different CEVRP solution methods. SZVRP1 is the Steiner-zone heuristic where we solve Phase II using the modified Clarke-Wright savings procedure with $\lambda = 1$ and do not use the RTR heuristic. To solve Phase III, we apply IP_{PhIII} until each Steiner zone is approximated by a 1536-sided polygon. Each individual route is then post-processed using the chained Lin-Kernighan TSP heuristic implemented in the Concorde software package [1]. This method emphasizes computational speed over tour length.

SZVRP2 is the same as SZVRP1 except that we solve Phase II using Groër's RTR code with one-point and two-point-movement and two-opt, a neighbor list of size 10, and no perturbations. We initialize the RTR heuristic using the modified Clarke-Wright savings procedure with $\lambda = 1$. This method balances computation speed and tour length.

SZVRP3 is the Steiner-zone heuristic with the SOCP optimal Phase III solver in which the Phase II - Phase III cycle is repeated until no improvement is found. Phase II is solved using the RTR code with our default settings. This method emphasizes tour length over computational speed.

SZVRP4 is the same as SZVRP3 except that we use all local optimization routines specified by Groër except for cross-exchange. We use a neighbor list of size 75 and perform one perturbation. This method emphasizes tour length over computational speed.

GTSP-VRP finds near-optimal solutions to a generalized TSP (GTSP) ap-

proximation of the CETSP using a genetic algorithm developed by Silberholz and Golden [67]. By replacing each disk with k points, we create a GTSP where there are n clusters to be visited, each with k possible points from which to choose. Given the CETSP tour sequence found by solving the GTSP, we construct a set of Steiner zones. We solve Phase II using Groër's RTR solver with our default settings and apply the Phase III SOCP tour improvement algorithm to each route in the solution. We repeat the Phase II - Phase III cycle until no improvement is found. We used 24-point approximations of each disk. Our GTSP problem sizes range from 2,400 nodes to 24,000 nodes plus the depot.

CTD, circular trapezoidal decomposition, is a modification of Mulmuley's randomized trapezoidal decomposition algorithm [55]. It finds the highest degree Steiner zones possible in a graph. CTD subdivides a graph of disks into non-overlapping regions such that each region is bordered on the left and right by imaginary vertical lines and on the top and bottom by arcs of a disk. Using this subdivision, we compute the degree of all distinct regions in the graph and greedily select the regions with the highest degree. We break apart those zones whose total demand is larger than the maximum route capacity. Each region is assigned a feasible representative point. We solve Phase II using Groër's RTR code with default settings and then apply the Phase III SOCP formulation to each route. See Appendix F for more details.

CW-SOCP does not use Steiner zones. It uses only Phases II and III of our heuristic. It finds a high-quality feasible set of routes for the original nodes using the Clarke-Wright heuristic (Phase II) and applies the Chained Lin-Kernighan heuristic

to each route. CW-SOCP solves the Phase III SOCP for each route to optimality. The Phase II - Phase III cycle is run exactly once, and each individual route is not post-processed after Phase III using a TSP heuristic. Clarke-Wright is run only once with $\lambda = 1$.

TSP-VRP uses the route-first-cluster-second approach known as the Giant TSP. Phase I is applied and Concorde's Chained Lin-Kernighan code [1] is run on the representative points for all Steiner zones to obtain a near-optimal TSP tour. We start at the beginning of this tour and move to the end, filling one vehicle at a time. When adding the next Steiner zone exceeds the vehicle's capacity, we try to divide the Steiner zone into two zones to use as much of the vehicle's capacity as possible. To best divide the Steiner zone, we apply the first-fit-decreasing and first-fit-increasing bin-packing heuristics. Once splitting the TSP into VRP routes is finished, we apply the Phase III SOCP formulation to each route.

To the best of our knowledge, there are no published results against which to compare the Steiner-zone method. The CEVRP is a nonconvex mixed integer nonlinear program (MINLP), and as such, must be reformulated as a convex MINLP to produce valid lower bounds. In Chapter 2 we derived valid lower bounds for the CETSP that were too weak to be of any use. Any CEVRP bounds derived from the CETSP lower bounds will be too weak to provide any indication of how close to optimality our solutions are. Therefore, until tight bounds are derived and/or other heuristics published, we cannot definitively prove exactly how good or bad each heuristic is.

3.5.3 Problem Instances

We constructed CEVRP test problems by adding node demands and constraints on vehicle capacity and maximum tour distance to all 48 CETSP instances generated and described in Chapter 2. All problem data are given in Appendix L.

3.5.4 Computational Results

All experiments were performed on a 2.4 GHz Pentium machine with 3 GB RAM running Windows XP Professional. Solutions are checked for within-disk, distance, and capacity feasibility.

The results produced by eight methods (SZVRP1, SZVRP2, SZVRP3, SZVRP4, GTSP-VRP, CTD, CW-SOCP, TSP-VRP) on the 48 problems are given in Table 3.1. We report results to two decimal places. The bold font indicates the best value. In Table 3.2, we computed the percentage deviation from the best solution for the results given in Table 3.1. The columns in both tables are ordered from best (left) to worst (right) by overall average deviation.

In Table 3.1, for the low overlap ratio $TSPLIB$ problems, SZVRP4 produces three best solutions and SZVRP3 two best solutions. For the medium and high overlap ratios, CW-SOCP produces five best solutions. For the $GEOMETRIC$ problems, SZVRP3 finds 13 best solutions, and both SZVRP4 and CW-SOCP find six.

For the low overlap ratio $TSPLIB$ problems, three methods (SZVRP3, SZVRP4, CTD) have average percentage deviations that are less than 1%. SZVRP4 produces

the smallest average (0.20%). For the medium overlap ratio, CW-SOCP has the smallest average (2.06%) with the remaining seven methods having an average of 4% to 5%. For the high overlap ratio, CW-SOCP has the smallest average (1.42%) with the four Steiner zone methods averaging 5.89%.

Over all 21 $TSPLIB$ problems, SZVRP4 produces the smallest average (3.40%), closely followed by SZVRP3 (3.54%) and SZVRP2 and CW-SOCP (both at 3.82%). Three Steiner-zone methods perform well using all three overlap ratios. CW-SOCP does not perform well on problems with a low overlap ratio but is clearly the best method for problems with medium and high overlap ratios.

Looking at the $GEOMETRIC$ problems, we see that CW-SOCP produces the smallest average deviation for the seven $Team$ problems (2.97%) while the remaining methods averages under 6.00%. CTD and GTSP-VRP average less then 2.00% deviation (1.51%, 1.73%) for the $ConcentricCircles$ problems. SZVRP3 and SZVRP4 produce the smallest averages for the $Bubbles$ problems (0.54%, 1.50%). CW-SOCP performs very poorly on both sets of problems (13.73%, 30.37%). For the $RotatingDiamonds$ problems, six heuristics have an average of less than 3.00%. Over all $GEOMETRIC$ problems, SZVRP3 produces the smallest average (2.62%). Four methods (SZVRP2, SZVRP4, CTD, GTSP-VRP) produce an average less than 4.00%.

Over all 48 problems with 2D, Euclidean norm, three Steiner zone methods (SZVRP2, SZVRP3, SZVRP4) have the best average deviations, all under 4.00%. Five methods have an average deviation that is two to three times greater.

In Table 3.3, we give the computation times for the eight methods. As the

overlap ratio increases for the $TSPLIB$ problems, we see that the computation time decreases. Over all 21 problems, CW-SOCP is very fast with an average time of less than one second. Three methods (SZVRP1, SZVRP2, TSP-VRP) average less than six seconds. For the 27 $GEOMETRIC$ problems, CW-SOCP and SZVRP1 have an average less than one and one half CPU seconds and SZVRP2 averages less than four CPU seconds. Over all 48 problems, CW-SOCP is the fastest (1.140 seconds) with SZVRP1 close behind (1.982 seconds). SZVRP2 and TSP-VRP average less than seven seconds. CTD, SZVRP3, and SZVRP4 are moderately slow, averaging between 16 and 46 seconds, and GTSP-VRP is extraordinarily slow.

For the $TSPLIB$ problems that were solved using the Euclidean norm, we observe that the choice of Steiner zones matters for the low overlap ratio. The four Steiner-zone methods and CTD all place a large amount of effort into determining Steiner zones and are clearly better than CW-SOCP, which does not use Steiner zones. For the medium and high overlap ratios, the choice of Steiner zones does not appear to affect solution quality. For these problems, CW-SOCP clearly is the best.

Table 3.1: Tour lengths for 48 problems (2D Euclidean norm)

	SZVRP3	SZVRP4	SZVRP2	CTD	SZVRP1	GTSP-VRP	TSP-VRP	CW-SOCP
Overlap ratio: 0.02								
kroD100	**380.58**	381.03	381.48	380.95	380.76	384.99	393.60	380.94
rat195	300.23	**297.10**	304.03	301.98	322.26	306.09	316.88	327.25
lin318	5073.01	**5057.78**	5162.06	5065.76	5454.83	5088.97	5573.22	5569.46
rd400	1225.14	1217.42	1225.30	**1217.06**	1376.44	1246.12	1369.44	1367.05
pcb442	528.26	**527.67**	538.05	536.79	568.09	530.54	581.22	619.05
d493	**834.77**	837.41	835.87	840.94	855.98	841.77	866.22	846.39
dsj1000	1481.62	1476.38	1487.73	1485.28	1544.16	**1462.90**	1650.55	1528.59
Overlap ratio: 0.1								
kroD100	332.54	332.54	334.68	347.60	338.11	319.28	320.88	**302.97**
rat195	248.09	249.00	250.38	250.90	250.38	246.09	250.16	**244.52**
lin318	4231.94	4231.94	4196.50	4214.62	4250.36	4268.02	4356.80	**4021.75**
rd400	833.36	**824.72**	829.07	830.34	838.64	843.03	825.74	856.21
pcb442	430.34	429.85	429.48	434.72	438.50	442.03	**421.57**	466.19
d493	757.91	757.91	758.54	757.35	776.55	776.92	765.56	**742.76**
dsj1000	1064.47	1064.47	1065.30	1036.80	1065.30	1100.53	1130.12	**991.72**
Overlap ratio: 0.3								
kroD100	183.89	183.89	183.89	236.65	183.89	242.42	189.59	**180.38**
rat195	**140.59**	**140.59**	140.59	181.84	**140.59**	194.04	169.55	149.92
lin318	2966.33	2966.33	2966.33	3232.47	2966.33	3438.20	3359.74	**2410.10**
rd400	558.85	558.85	558.86	597.56	558.86	623.48	593.53	**523.46**
pcb442	**285.73**	**285.73**	**285.73**	348.92	**285.73**	369.28	287.89	295.12
d493	580.03	580.03	580.03	637.45	580.03	597.65	604.04	**568.40**
dsj1000	614.63	614.63	614.64	589.57	614.64	962.63	716.28	**568.80**
Varied overlap ratios								
team1_100	1447.69	1447.69	1447.74	1456.21	1478.25	1390.16	1392.82	**1362.62**
team2_200	672.20	672.20	679.48	651.36	679.48	647.48	647.04	**579.78**
team3_300	1064.96	1064.96	1067.62	1072.48	1091.67	**1048.18**	1134.97	1096.70
team4_400	**1375.55**	1378.82	1383.32	1390.18	1438.40	1402.56	1415.21	1478.98
team5_499	1085.04	**1082.63**	1088.53	1089.55	1141.56	1084.25	1134.01	1176.52
team6_500	704.53	704.53	704.69	748.93	704.69	832.51	755.12	**611.80**
bonus1000	1431.15	1442.40	1444.80	1449.46	1447.77	1512.99	1452.98	**1381.87**
concentricCircles1	90.96	90.96	91.75	84.01	91.68	**82.73**	83.21	100.28
concentricCircles2	211.92	210.50	212.44	**206.59**	215.04	210.78	225.35	212.80
concentricCircles3	403.49	396.66	402.81	401.86	424.70	**394.29**	402.11	428.21
concentricCircles4	**613.73**	623.05	637.63	633.59	726.14	643.38	654.16	721.23
concentricCircles5	**816.31**	837.88	823.18	823.36	928.68	830.79	828.33	965.82
bubbles1	534.37	534.37	534.37	549.00	534.37	531.93	534.45	**525.58**
bubbles2	**497.40**	**497.40**	500.67	**497.40**	500.67	497.85	499.94	702.28
bubbles3	**1070.12**	**1070.12**	1103.67	**1070.12**	1171.15	1073.81	1052.85	1292.59
bubbles4	1575.19	**1551.04**	1573.21	1568.62	1691.15	1570.18	1593.02	2014.43
bubbles5	**1955.41**	1963.82	1962.43	1958.91	2102.14	2003.23	1988.32	2556.32
bubbles6	**1932.52**	1959.32	1996.26	1974.71	2172.50	2012.56	2239.30	2418.42
bubbles7	**2027.34**	2127.53	2066.01	2167.71	2305.02	2075.12	2243.89	2873.33
bubbles8	**3074.93**	3091.01	3093.61	3136.04	3489.78	3251.37	3320.76	4177.58
bubbles9	**3361.37**	3458.36	3511.57	3531.33	4010.29	3520.08	3886.67	4908.86
rotatingDiamonds1	46.63	46.63	46.63	46.63	46.63	44.03	52.90	**43.55**
rotatingDiamonds2	202.78	204.78	204.48	204.53	204.49	**200.68**	224.71	202.78
rotatingDiamonds3	**634.80**	640.89	642.98	658.72	668.15	649.68	684.88	664.65
rotatingDiamonds4	**873.40**	874.33	882.43	881.38	950.95	883.47	997.21	951.08
rotatingDiamonds5	1795.65	**1791.62**	1795.39	1809.57	1799.95	1807.05	2089.61	1792.86
chaoSingleDep	**1143.51**	**1143.51**	1143.52	**1143.51**	1143.52	1145.27	1145.40	1240.35

Table 3.2: Percentage deviation from the best solution for 48 problems (2D Euclidean norm)

	SZVRP3	SZVRP4	SZVRP2	CTD	SZVRP1	GTSP-VRP	TSP-VRP	CW-SOCP
Overlap ratio: 0.02								
kroD100	0.00	0.12	0.24	0.10	0.05	1.16	3.42	0.09
rat195	1.05	0.00	2.33	1.64	8.47	3.02	6.66	10.15
lin318	0.30	0.00	2.06	0.16	7.85	0.62	10.19	10.12
rd400	0.66	0.03	0.68	0.00	13.10	2.39	12.52	12.32
pcb442	0.11	0.00	1.97	1.73	7.66	0.54	10.15	17.32
d493	0.00	0.32	0.13	0.74	2.54	0.84	3.77	1.39
dsj1000	1.28	0.92	1.70	1.53	5.55	0.00	12.83	4.49
Average:	0.49	0.20	1.30	0.84	6.46	1.22	8.50	7.98
Overlap ratio: 0.1								
kroD100	9.76	9.76	10.47	14.73	11.60	5.38	5.91	0.00
rat195	1.46	1.83	2.40	2.61	2.40	0.64	2.31	0.00
lin318	5.23	5.23	4.35	4.80	5.68	6.12	8.33	0.00
rd400	1.05	0.00	0.53	0.68	1.69	2.22	0.12	3.82
pcb442	2.08	1.96	1.87	3.12	4.01	4.85	0.00	10.58
d493	2.04	2.04	2.12	1.96	4.55	4.60	3.07	0.00
dsj1000	7.34	7.34	7.42	4.55	7.42	10.97	13.95	0.00
Average:	4.14	4.02	4.17	4.64	5.34	4.97	4.81	2.06
Overlap ratio: 0.3								
kroD100	1.95	1.95	1.95	31.19	1.95	34.39	5.11	0.00
rat195	0.00	0.00	0.00	29.34	0.00	38.02	20.60	6.64
lin318	23.08	23.08	23.08	34.12	23.08	42.66	39.40	0.00
rd400	6.76	6.76	6.76	14.16	6.76	19.11	13.39	0.00
pcb442	0.00	0.00	0.00	22.11	0.00	29.24	0.76	3.29
d493	2.05	2.05	2.05	12.15	2.05	5.15	6.27	0.00
dsj1000	8.06	8.06	8.06	3.65	8.06	69.24	25.93	0.00
Average:	5.98	5.98	5.98	20.96	5.98	33.97	15.92	1.42
TSPLIB **Average:**	3.54	3.40	3.82	8.81	5.93	13.39	9.75	3.82
Varied overlap ratios								
team1_100	6.24	6.24	6.25	6.87	8.49	2.02	2.22	0.00
team2_200	15.94	15.94	17.20	12.34	17.20	11.68	11.60	0.00
team3_300	1.60	1.60	1.86	2.32	4.15	0.00	8.28	4.63
team4_400	0.00	0.24	0.57	1.06	4.57	1.96	2.88	7.52
team5_499	0.22	0.00	0.55	0.64	5.44	0.15	4.75	8.67
team6_500	15.16	15.16	15.18	22.41	15.18	36.07	23.42	0.00
bonus1000	3.57	4.38	4.55	4.89	4.77	9.49	5.15	0.00
Average:	6.10	6.22	6.59	7.22	8.54	8.77	8.33	2.97
concentricCircles1	9.95	9.95	10.91	1.55	10.82	0.00	0.58	21.21
concentricCircles2	2.58	1.90	2.83	0.00	4.09	2.03	9.08	3.01
concentricCircles3	2.33	0.60	2.16	1.92	7.71	0.00	1.98	8.60
concentricCircles4	0.00	1.52	3.89	3.24	18.32	4.83	6.59	17.52
concentricCircles5	0.00	2.64	0.84	0.86	13.77	1.77	1.47	18.31
Average:	2.97	3.32	4.13	1.51	10.94	1.73	3.94	13.73
bubbles1	1.67	1.67	1.67	4.46	1.67	1.21	1.69	0.00
bubbles2	0.00	0.00	0.66	0.00	0.66	0.09	0.51	41.19
bubbles3	1.64	1.64	4.83	1.64	11.24	1.99	0.00	22.77
bubbles4	1.56	0.00	1.43	1.13	9.03	1.23	2.71	29.88
bubbles5	0.00	0.43	0.36	0.18	7.50	2.45	1.68	30.73
bubbles6	0.00	1.39	3.30	2.18	12.42	4.14	15.87	25.14
bubbles7	0.00	4.94	1.91	6.92	13.70	2.36	10.68	41.73
bubbles8	0.00	0.52	0.61	1.99	13.49	5.74	7.99	35.86
bubbles9	0.00	2.89	4.47	5.06	19.30	4.72	15.63	46.04
Average:	0.54	1.50	2.14	2.62	9.89	2.66	6.31	30.37
rotatingDiamonds1	7.07	7.07	7.07	7.07	7.07	1.09	21.46	0.00
rotatingDiamonds2	1.04	2.04	1.89	1.92	1.90	0.00	11.97	1.05
rotatingDiamonds3	0.00	0.96	1.29	3.77	5.25	2.34	7.89	4.70
rotatingDiamonds4	0.00	0.11	1.03	0.91	8.88	1.15	14.18	8.89
rotatingDiamonds5	0.23	0.00	0.21	1.00	0.47	0.86	16.63	0.07
Average:	1.67	2.04	2.30	2.93	4.71	1.09	14.43	2.94
chaoSingleDep	0.00	0.00	0.00	0.00	0.00	0.15	0.17	8.47
GEOMETRIC **Average:**	2.62	3.10	3.61	3.57	8.41	3.69	7.67	14.30
Overall Average:	3.02	3.23	3.70	5.86	7.32	7.93	8.58	9.71

Table 3.3: Computation time for 48 problems (2D Euclidean norm)

	CW-SOCP	SZVRP1	SZVRP2	TSP-VRP	CTD	SZVRP3	SZVRP4	GTSP-VRP
Overlap ratio: 0.02								
kroD100	0.188	0.812	3.938	1.140	4.440	45.859	22.141	687
rat195	0.297	1.438	9.000	1.875	12.334	100.125	80.359	7829
lin318	0.500	2.047	8.328	2.906	13.153	94.781	57.890	48578
rd400	1.594	2.938	14.235	6.125	18.397	128.531	143.453	76074
pcb442	0.641	3.063	12.766	4.688	23.768	183.937	204.328	222123
d493	1.157	18.453	21.640	13.750	12.087	144.422	107.297	309168
dsj1000	2.703	5.547	17.172	12.844	28.056	214.375	99.437	12682626
Average:	1.011	4.900	12.440	6.190	16.034	130.290	102.129	1906726
Overlap ratio: 0.1								
kroD100	0.156	0.547	0.907	0.359	0.953	3.782	2.266	1485
rat195	0.219	0.734	2.235	3.875	2.259	5.203	3.203	5960
lin318	0.453	1.000	1.578	1.032	3.315	9.422	6.000	60265
rd400	1.500	1.141	2.313	9.703	4.575	15.422	7.266	91030
pcb442	0.563	1.156	2.218	1.532	4.659	12.094	6.422	250523
d493	1.000	1.531	2.172	1.359	22.547	7.390	3.719	61783
dsj1000	2.500	2.516	3.484	2.671	10.410	13.609	8.266	7807814
Average:	0.913	1.232	2.130	2.933	6.960	9.560	5.306	1182694
Overlap ratio: 0.3								
kroD100	0.141	0.500	0.891	0.297	1.372	1.328	0.875	870
rat195	0.203	0.672	0.797	0.422	2.922	1.906	1.235	6331
lin318	0.453	0.953	1.922	9.125	9.407	2.766	1.969	40195
rd400	1.500	1.312	1.516	0.954	14.044	4.000	2.656	61179
pcb442	0.547	1.265	1.734	2.343	23.378	3.000	1.735	76182
d493	1.031	1.594	1.860	1.062	45.031	3.562	2.250	59122
dsj1000	2.437	5.875	3.140	1.922	322.986	5.515	3.438	2623690
Average:	0.902	1.739	1.694	2.304	59.877	3.154	2.023	409653
TSPLIB **Average:**	0.942	2.624	5.421	3.809	27.623	47.668	36.486	1166358
Varied overlap ratios								
team1_100	0.656	0.625	0.985	6.734	1.320	5.219	2.766	917
team2_200	0.235	0.735	0.922	0.500	3.319	3.562	2.188	34776
team3_300	0.656	1.109	2.265	1.125	2.922	15.563	7.312	69842
team4_400	0.718	1.609	3.890	7.250	7.215	52.187	32.187	276490
team5_499	8.859	3.203	8.343	6.235	13.402	79.110	61.469	396673
team6_500	0.796	1.438	1.703	1.078	47.214	3.438	2.109	196095
bonus1000	2.296	4.906	3.969	2.719	38.324	23.125	8.640	2648846
Average:	2.031	1.946	3.154	3.663	16.245	26.029	16.667	517663
concentricCircles1	0.063	0.344	0.562	0.203	0.157	1.344	1.000	13
concentricCircles2	0.046	0.547	1.390	2.468	0.487	4.125	2.563	171
concentricCircles3	0.078	0.703	1.750	8.125	1.238	13.781	6.875	375
concentricCircles4	0.125	0.766	3.296	27.031	2.711	30.812	17.828	4473
concentricCircles5	0.563	1.031	4.375	19.938	4.063	34.671	17.171	22040
Average:	0.175	0.678	2.275	11.553	1.731	16.947	9.087	5414
bubbles1	0.062	0.516	0.766	30.437	1.643	2.468	1.703	96
bubbles2	0.094	0.469	0.985	27.484	0.696	9.938	7.500	68
bubbles3	0.110	0.703	1.657	33.063	1.686	23.531	27.031	477
bubbles4	0.172	0.938	2.187	35.734	3.023	22.984	20.046	2347
bubbles5	0.938	1.250	3.532	0.157	6.818	46.375	26.344	6107
bubbles6	0.406	1.422	4.110	0.312	6.344	39.422	53.219	24678
bubbles7	0.532	1.813	5.297	0.890	8.769	80.079	51.656	34324
bubbles8	0.704	2.563	8.672	8.828	12.506	94.781	88.578	100501
bubbles9	14.672	3.641	10.266	4.750	15.821	124.719	83.297	304385
Average:	1.966	1.479	4.164	15.739	6.367	49.366	39.930	52554
rotatingDiamonds1	0.046	0.329	0.438	0.157	0.206	0.984	0.703	24
rotatingDiamonds2	0.079	0.563	1.109	0.234	1.059	6.469	3.985	371
rotatingDiamonds3	0.172	1.140	4.172	0.359	7.960	50.484	35.000	16427
rotatingDiamonds4	0.360	1.796	7.797	0.703	11.541	64.797	78.766	49095
rotatingDiamonds5	1.109	4.734	16.672	0.860	30.964	250.687	791.500	210955
Average:	0.353	1.712	6.038	0.463	10.346	74.684	181.991	55374
chaoSingleDep	0.375	1.141	1.875	0.563	2.237	9.953	5.781	43746
GEOMETRIC **Average:**	1.293	1.483	3.814	8.442	8.654	40.541	53.230	164604
Overall Average:	1.140	1.982	4.517	6.415	16.953	43.659	45.905	602871

Over all 48 test problems, we observe the following: (1) SZVRP2 has the best balance between speed and solution quality of the four Steiner zone methods; it produces some of the smallest average deviations overall and is fast; (2) spending too much time solving Phase II leads to diminishing returns for the Steiner zone methods as SZVRP4 demonstrates; SZVRP4 generally is as accurate as SZVRP3 but at a much higher computational cost; spending too little time, as with SZVRP1, almost never finds the best solutions; (3) CW-SOCP, conceptually the simplest algorithm, performs well on problems with medium and high overlap ratios but performs poorly on the problems with low overlap ratios (interestingly, the modified Clarke-Wright VRP solver produced only one best solution when applied to Steiner zones as in SZVRP1); CW-SOCP is the fastest algorithm; and (4) If we consider the order in which each heuristic appears in Tables 3.2 and 3.3 to be performance rankings, then SZVRP2 has the the best mean ranking, 3, of all eight heuristics tested. SZVRP1 and SZVRP3 are next with an average rank 3.5 while SZVRP4, CW-SOCP, and CTD all follow with an average rank of 4.5.

Our results indicate that underlying problem structure affects the performance of CW-SOCP. For most low overlap ratio problems, it performs poorly. For most medium and high overlap ratio problems, it performs well. Those results, along with the dominance of the methods explicitly using Steiner zones (SZVRP1, SZVRP2, SZVRP3, SZVRP4 and CTD) on low overlap ratio problems provide strong evidence that the choice of Steiner zones has a positive impact on the performance of SZH.

We also used the Manhattan norm on the 48 test problems and found similar results: SZVRP2, SZVRP3, and SZVRP4 were the best methods based on overall

accuracy. CW-SOCP and SZVRP1 were the fastest methods. SZVRP1 and SZVRP2 had the highest average performance ranking (3.5) based on average deviation and computation times. The complete details are given in Appendix A.

3.6 Conclusions

In this chapter, we presented a new routing problem, the CEVRP, and formulated it as a mathematical program. We described a heuristic for solving the CEVRP, SZH, that is straightforward and easy to understand. SZH reduces a set of nodes to a set of Steiner zones, assigns a set of routes to them, and then minimizes the sum of the route lengths with respect to the Steiner zones. We compared four versions of SZH against four different methods on 48 test problems. Over all problems, we found that SZH, combined with a fast but high-quality VRP solver, produced consistently good results in a short amount of time. The combination of computational speed and solution quality makes SZVRP1 and SZVRP2 highly competitive methods.

In future work, we will apply the Steiner-zone heuristic to problems where the radius for each disk is different and extend it to solve problems in three dimensions. We will develop a post-processor for the Steiner-zone heuristic in order to improve our results with relatively little increase in computational cost.

Chapter 4

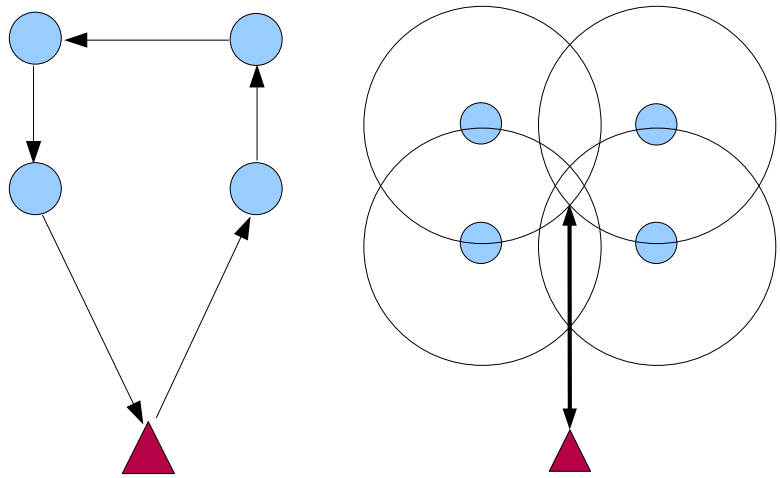
Improving the Steiner-zone Heuristic

4.1 Introduction

Until recently, algorithm design has been constrained by low computational power. In the past, simple heuristics were created that produced good solutions very quickly using limited resources. These methods were fast because they had relatively small search neighborhoods. The local minima in these neighborhoods generally are not globally optimal solutions (they can be over 20% away from optimality [47]). Examples include greedy Traveling Salesman Problem (TSP) heuristics such as the nearest-neighbor and nearest-insertion heuristics and local improvement methods for the TSP such as two-opt improvement [22, 60].

Processing power has increased dramatically, and more effective algorithms, called metaheuristics, have appeared. Metaheuristics use different mechanisms to escape local minima, allowing a much more thorough exploration of the entire search space. Examples include record-to-record travel, evolutionary computation, simulated annealing, and ant-colony optimization [28, 46, 48].

Metaheuristics are often designed with computational speed as only a secondary consideration to accuracy. In this chapter, we improve the Steiner-zone heuristic (SZH) in a way that combines the best aspect of simple, greedy heuristics such as SZH (speed) with the best aspect of metaheuristics (accuracy). We



(a) TSP tour (b) CETSP tour

Figure 4.1: The optimal TSP tour compared with the optimal CETSP tour. The CETSP tour is shorter.

develop a new variant of SZH called the minimum-angle heuristic (MAH) and a post-processing step for SZH called Phase IV. We test our modifications on the same CETSP and CEVRP problems given in Chapters 2 and 3 and compare the new solutions to best-known solutions.

In the CETSP, a salesman starts and ends at the same city and must find the cheapest way to visit all n cities exactly once. Each city is visited if the tour comes within r units of the ith city, for all i. Given a complete, nondirected (for the symmetric version) graph $G = (V, E)$, where V is the set of n nodes (cities) and E is the set of edges, we must find the tour (Hamiltonian cycle) that minimizes the sum of the lengths of the edges. The length of each edge e_{ij} is a function of the points at which the salesman visits nodes i and j. The CEVRP is a multi-vehicle extension of the CETSP. Each node must be visited by exactly one of K vehicles. A demand is associated with each node. Each vehicle has a maximum capacity and maximum tour length. All nodes must be visited.

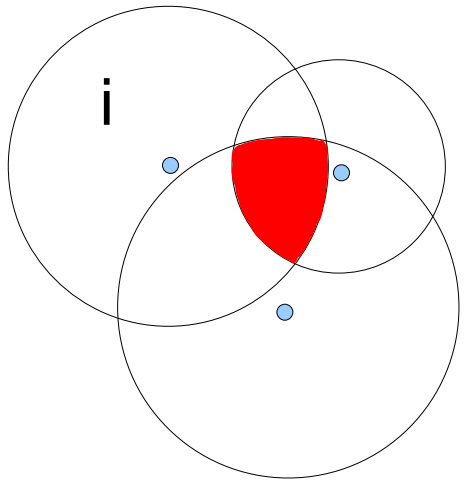
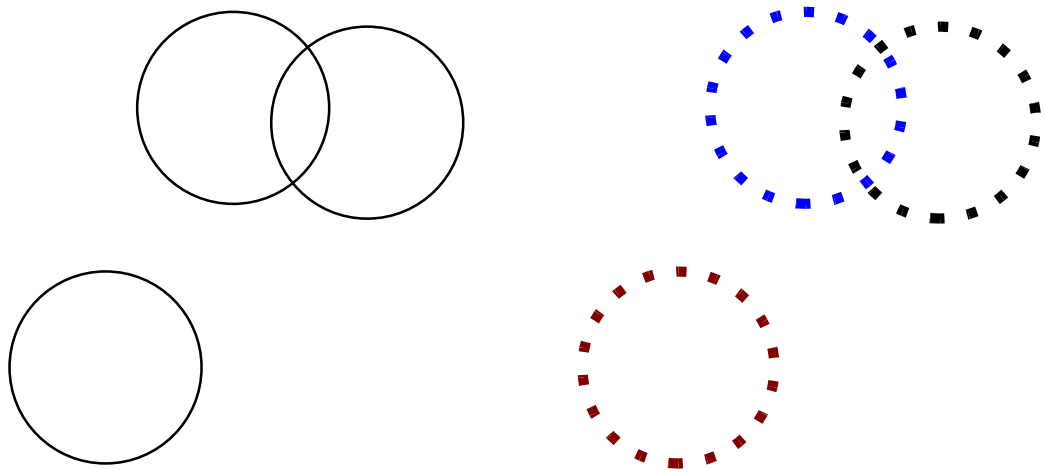


Figure 4.2: The shaded region is a Steiner Zone of degree 3 and is denoted $SZ(3)$. It is the intersection of three disks.

We illustrate the CETSP in Figure 4.1. In the standard TSP shown in Figure 4.1(a), the salesman leaves home (the start node is depicted by a rectangle), visits four nodes, and returns home. In the CETSP shown in Figure 4.1(b), the salesman needs to get within distance r_i of each node i (this is depicted by the four disks which, in this example, all have the same radius). If the salesman visits the location at the overlap of the four disks, then each node has been visited. Clearly, the out-and-back solution to the CETSP has a shorter total length than the optimal TSP solution.

A Steiner zone (SZ) of degree k, $SZ(k)$, is the non-empty intersection of k disks where each disk can have a different radius. Any point inside a Steiner zone simultaneously visits all k of its member nodes. We show this in Figure 4.2.

In Chapter 2, we developed a three phase Steiner-zone heuristic to solve the CETSP. We generated 48 test problems and compared our best heuristic (SZ2) to several methods, including a genetic algorithm (GA) from Silberholz and Golden



(a) Original CETSP

(b) Each disk is approximated by $k = 18$ evenly spaced points.

Figure 4.3: The GTSP tour must visit one of the $k = 18$ points in each cluster (circle).

[67]. The GA solves a generalized TSP (GTSP) approximation of the CETSP. In the most common definition of the GTSP, a salesman must visit exactly one node from each of the m clusters of nodes in the cheapest way. The GTSP can solve a discrete approximation of the CETSP. The perimeter of each disk in the CETSP is discretized by k points. Each disk's set of k points is designated a cluster. The depot is a one-node cluster. After the GTSP is solved, we take the solution found by the GA and further reduce the distance by adjusting the location of the visited point for each disk while maintaining the sequence of clusters found by the GA. In Chapters 2 and 3 we let $k = 24$ and called this method GTSP2 and GTSP-VRP. A GTSP approximation of three disks and a solution to a 100-node problem is illustrated in Figures 4.3 and 4.4. The solution in Figure 4.4 is an example of the GTSP1 heuristic described in Chapter 2. When Phase III is applied to the tour sequence found by GTSP1, the result is an example of GTSP2. In Figure 4.4, the GTSP1 tour length

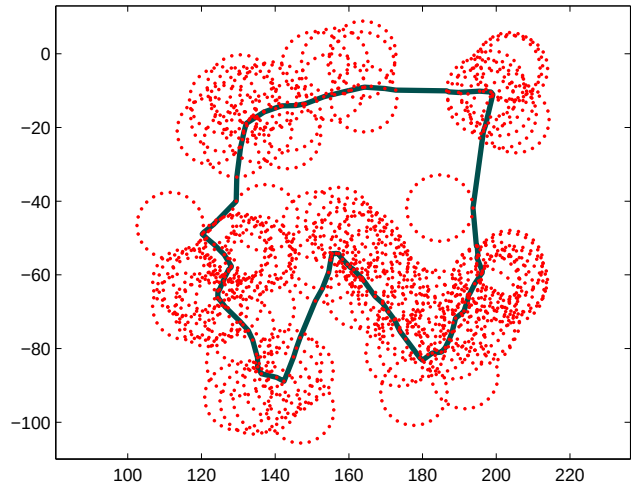


Figure 4.4: A $k = 24$ GTSP approximation of a 100-node CETSP and the solution found by the GA (about 311).

is approximately 311 and the GTSP2 tour length is almost 308.

In Chapter 2, we found that when there is a low or moderate overlap of disks, GTSP2 consistently produced tours up to 11% shorter than SZ2. GTSP2 was very slow, averaging about 1.1 million CPU seconds to solve each problem (the largest took months to solve). The smallest GTSP instances had 100 clusters (2,400 points), and the largest instances had 1,000 clusters (24,000 points), plus a depot. SZ2 solved the same CETSP problems in an average of 1.601 CPU seconds per problem. For the remainder of this chapter, SZH refers to all variants of our heuristic (SZ1, SZ2, SZVRP1, SZVRP2, SZVRP3, SZVRP4) that were discussed in Chapters 2 and 3.

The chapter is organized as follows. In Section 5.2, we review the literature on performance analysis of local search algorithms along with the literature on relevant problems. In Section 4.3, we study the tours found by Silberholz and Golden's GA to motivate the development of our new heuristics. In Section 4.4, we describe a variant of SZH called the minimum-angle heuristic, and in Section 4.5 we describe

the Phase IV post-processor for SZH. We summarize the results in Section 4.6 and give conclusions in Section 5.7.

4.2 Literature Review

Although local search heuristics are ubiquitous in modern algorithms, little rigorous comparison of their performance in actual implementations has been published. Johnson and McGeoch [47] compared many implementations of a large number of local search heuristics including two-opt, three-opt, and nearest-neighbor, for the symmetric TSP. They found that, implementation details aside, the performance of a simple heuristic such as two-opt varies greatly. For example, on large, structured problems (up to 100,000 nodes), two-opt generally produced solutions 5% to 20% from optimality. For random instances between 1,000 and 10,000 nodes, two-opt generally produced tours 60% to 120% from optimality.

Some authors have studied theoretical properties of greedy heuristics. Bang-Jensen et al. [11] and Gutin et al. [44] prove that, for certain types of problems, greedy methods not only perform poorly, they may actually produce the worst possible solution. Problems exhibiting this characteristic are called greedy-resistant. Bendall and Margot [12] give sufficient conditions for proving greedy resistance.

Lesh and Mitzenmacher [50] describe a general method for improving a solution generated by a greedy algorithm. Their Bubble Search methodology improves the solutions for a class of greedy algorithms known as priority algorithms. A *priority algorithm* organizes all elements of the problem according to a specified order func-

tion and places them according to a priority function. Using the nearest-neighbor (NN) heuristic for the TSP as an example, if node i was just inserted into the tour, NN orders all edges, e_{ij}, by length for all nodes j that have not yet been visited. The algorithm places the first edge in that order in the tour. For a *fixed priority* algorithm, the ordering function is applied exactly once and the highest-priority element remaining in the ordering is the next one placed. For an *adaptive priority* algorithm, the ordering may change after a certain number of placements. As with fixed priority algorithms, the highest-priority element in the ordering is always the one that is placed next.

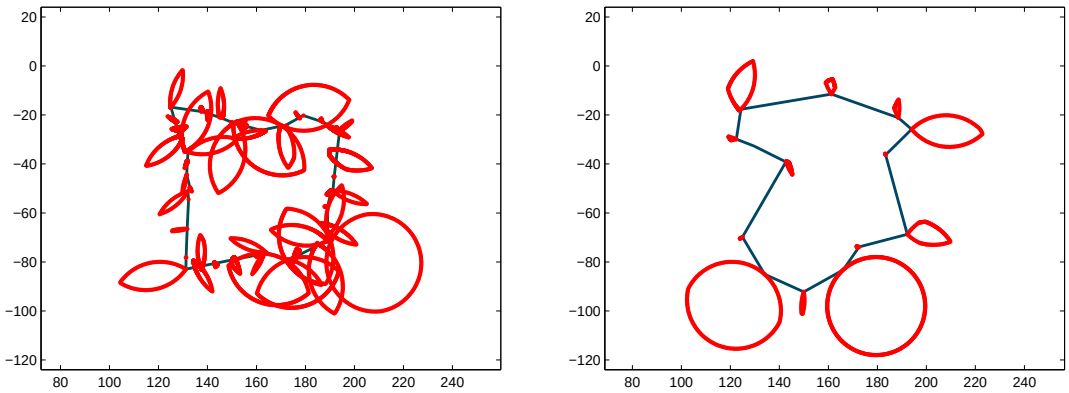
Lesh and Mitzenmacher extend the idea of prioritization to the *anytime priority* algorithm. The algorithm is run for for multiple orderings, returning the best solution found. For each new ordering, however, a different priority vector is used. Given an ordering, each element chooses the kth highest-priority remaining choice, where k is different for each element. For example, given a 5-node TSP (excluding the depot) solved by NN, and a priority vector $3, 4, 1, 2, 1$, do the following. The first node to be inserted in the tour chooses the third closest node as its neighbor, the second node inserted chooses the fourth closest remaining node, the third node chooses its closest remaining neighbor, and so on. The authors' Bubble Search formalizes the process of choosing different priority vectors to effectively search the solution space close to an incumbent solution.

Sarkar et al. [62] describe the Lookahead Search algorithm. A greedy algorithm deterministically explores only one complete solution whereas an exact algorithm such as branch-and-bound implicitly examines the entire solution space.

They point out that many combinatorial optimization problems can be modeled as a tree search where the leaves are all feasible solutions and the intermediate nodes at depth k are partial solutions with k of the n elements fixed.

Using the tree search paradigm, Sarkar et al. define a compromise between exact algorithms and greedy algorithms. In a greedy algorithm, starting at the root node of the tree, the next node is chosen using only local information available at that level. At a given node in the tree, Lookahead Search looks ahead k levels. It is guaranteed to produce results no worse than the strictly greedy method. Each lookahead subproblem is solved by the same greedy algorithm as the root node problem. If $k = n$, then the entire solution space is explored and optimality is assured. If $k = 0$, the algorithm is strictly greedy. The authors prove that even a $k = 1$ lookahead results in tighter bounds on solution values than the strictly greedy approach. For some problems, looking ahead only one level produces significantly better results. Solving the Euclidean TSP with the nearest neighbor (NN) heuristic, looking ahead one level at each node improved roughly 10% over the NN heuristic with no lookahead on a range of randomly generated TSPs up to 100 nodes.

Two problems that are highly relevant to our work in this chapter are the GTSP and the Angular-Metric TSP. Silberholz and Golden [67] define the current state of the art for the GTSP. The authors develop a genetic algorithm using a modified rotational ordered crossover operator (mrOX) along with local optimization routines such as two-opt improvement. The mrOX operator considers a large number of possible sequences before selecting one to be the new child. Their solutions averaged only 0.03% above optimal for the standard GTSP test problems with



(a) Steiner zones produced by the GA (b) Steiner zones produced by SZH

Figure 4.5: Two different solutions to the 2D, fixed-radius, Euclidean norm team2_200 problem. The GA's solution has many more Steiner zones than the SZH solution. Consequently, the average Steiner zone degree is much lower for the GA solution than the Steiner-zone solution.

$n \leq 442$ and known optimal solutions. For problems with $442 \leq n \leq 1084$ and unknown optima, their solutions equaled or bettered all best-known solutions.

The notion of a tour's *total angle cost* plays an important role in the improvements to SZH developed in this chapter. Aggarwal et al. [5] define the total angle cost of a tour to be the sum of the direction changes at the nodes in the tour. They describe the Angular-Metric TSP (AMTSP), in which the objective is to minimize the total angle cost. They present an approximation algorithm that runs in $O(\log n)$ time. Applications for the AMTSP include trajectory planning for high-speed aircraft as well as route planning for robots with high inertia. High-speed aircraft and high-inertia robots are both objects that cannot turn quickly, requiring a route that minimizes the total amount of turning.

4.3 Motivation

In Chapters 2 and 3, we described the three phases of SZH in detail. Phase I reduces a graph of n nodes to m Steiner zones. Phase II assigns a point to represent each Steiner zone and sequences these points as a TSP tour (CETSP) or as a set of VRP routes (CEVRP). Phase III minimizes the length of each tour by moving the point representing each Steiner zone.

Phase I of SZH is greedy. We order all n nodes in a list using one of four different ordering functions [50], closest-to-depot, furthest-from-depot, closest-to-centroid, and furthest-from-centroid (recall that SZH consists of four separate runs of the Phase I - Phase II - Phase III cycle, one for each of the four ordering functions). We choose the first remaining node, i, and construct all the Steiner zones that we find with the remaining nodes in the list. We set aside the Steiner zone of highest degree found and remove its member nodes from the list. This process is repeated until the list is empty. The result is a set of m Steiner zones where m is no larger than n and potentially much smaller. Some Steiner zones may have very high degree. A high-degree Steiner zone is the intersection of a large number of disks and is typically very small in area. This illustrates the trade-off inherent in SZH. SZH reduces problem size, sometimes quite dramatically. However, the feasible area for any member node in a high-degree (typically small area) Steiner zone is greatly restricted. For example, in Figure 4.5(b), 200 nodes were reduced to 13 Steiner zones, a substantial reduction in problem size. The high degree Steiner zones are very small, though, and force the solution tour to go out of the way to visit them.

Table 4.1: Highest Steiner zone degree for 48 problems with equal radius and 2D Euclidean norm

Overlap ratio	0.02			0.1			0.3		
	max	SZ2	GTSP2	max	SZ2	GTSP2	max	SZ2	GTSP2
kroD100	4	4	3	12	12	7	57	49	45
rat195	2	2	2	17	16	9	107	79	101
lin318	5	5	5	28	27	11	148	118	21
rd400	4	4	3	24	18	8	125	125	10
pcb442	4	4	4	31	26	9	189	136	24
d493	21	14	6	230	162	23	452	337	416
dsj1000	19	14	8	122	79	27	417	313	71
Different overlap ratios									
	max	SZ2	GTSP2			max	SZ2	GTSP2	
bubbles1	3	3	2		**concentricCircles1**	2	2	1	
bubbles2	4	4	4		**concentricCircles2**	2	2	2	
bubbles3	5	4	5		**concentricCircles3**	2	2	2	
bubbles4	5	4	5		**concentricCircles4**	3	3	2	
bubbles5	5	4	5		**concentricCircles5**	3	3	2	
bubbles6	5	4	5		**rotatingDiamonds1**	3	3	2	
bubbles7	5	4	5		**rotatingDiamonds2**	3	3	3	
bubbles8	5	4	5		**rotatingDiamonds3**	3	3	3	
bubbles9	5	4	5		**rotatingDiamonds4**	3	3	3	
chaoSingleDep	5	5	5		**rotatingDiamonds5**	3	3	3	
team1_100	13	11	5						
team2_200	37	30	8						
team3_300	36	22	14						
team4_400	20	18	8						
team5_499	15	12	8						
team6_500	166	138	22						
bonus1000	119	86	15						

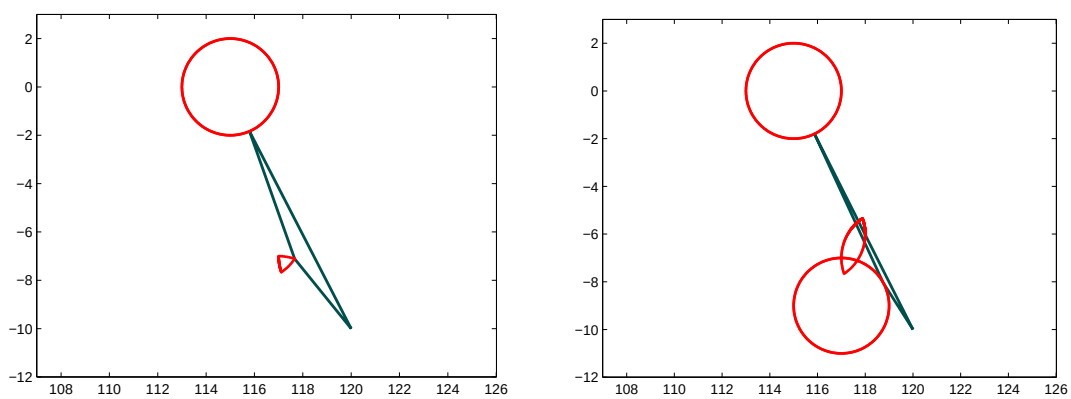
4.3.1 Steiner Zones and the Genetic Algorithm

Given a feasible CETSP tour sequence produced by any heuristic, we can create a set of Steiner zones (not unique) on which the tour is built. In Figure 4.5, we show the Steiner zones found by SZ2 and GTSP2 for a 200-node problem. The solution found by SZ2 contains many fewer Steiner zones than the solution found by GTSP2.

In Table 4.1, we show the highest-degree Steiner zone found by SZH (specifically, SZ2) and GTSP2 for the 48 fixed-radius, 2D, Euclidean test instances given in Chapter 2 along with the largest possible degree Steiner zone that exists for each problem. In Table 4.2, we show the number of Steiner zones found by each method for the same problems. The maximum-possible-degree SZs were found using Circu-

Table 4.2: Number of Steiner zones for 48 problems with equal radius and 2D Euclidean norm

Overlap ratio	0.02		0.1		0.3	
	SZ2	GTSP2	SZ2	GTSP2	SZ2	GTSP2
kroD100	68	87	17	34	5	25
rat195	125	175	22	65	8	40
lin318	138	215	28	99	10	83
rd400	229	316	41	134	11	115
pcb442	195	321	33	135	4	117
d493	124	232	16	95	4	4
dsj1000	220	457	29	217	5	193
Different overlap ratios						
	SZ2	GTSP2			SZ2	GTSP2
bubbles1	16	25		**concentricCircles1**	9	16
bubbles2	21	36		**concentricCircles2**	21	33
bubbles3	43	58		**concentricCircles3**	36	54
bubbles4	53	102		**concentricCircles4**	61	97
bubbles5	76	132		**concentricCircles5**	90	131
bubbles6	93	157		**rotatingDiamonds1**	8	12
bubbles7	119	200		**rotatingDiamonds2**	28	41
bubbles8	140	245		**rotatingDiamonds3**	88	123
bubbles9	171	326		**rotatingDiamonds4**	160	227
chaoSingleDep	40	66		**rotatingDiamonds5**	340	462
team1_100	20	45				
team2_200	13	60				
team3_300	42	91				
team4_400	80	188				
team5_499	146	251				
team6_500	9	131				
bonus1000	29	271				



(a) Result with a larger-degree SZ

(b) Result with a smaller-degree SZ and a singleton SZ

Figure 4.6: An illustration of better results using more Steiner zones. The depot is at the bottom right.

lar Trapezoidal Decomposition, denoted CTD, which is described in Appendix F. In 39 of the 48 problems, the highest-degree SZ found by GTSP2 is less than or equal to that found by SZ2 (often four to five times so). As a result, GTSP2 solutions tend to have a substantially larger number of Steiner zones than SZ2 solutions. In problems where lower-degree Steiner zones produce better solutions, the global search space explored by the GA enables it to find these solutions. SZH does not find those solutions because its search space is restricted to the m high-degree (very small in area) Steiner zones that it created from n nodes. The more the graph is reduced in Phase I, the smaller the solution space becomes. Compared to GTSP2, SZH is more likely to become stuck in a local minimum. Figure 4.6 demonstrates how a solution with more Steiner zones can be shorter than a solution with fewer Steiner zones. In Chapter 2, we found that GTSP2 consistently found better tours than SZH for problems with low or moderate levels of disk overlap. This suggests that any improvements to SZH should focus on finding solutions with more lower-degree Steiner zones.

In Figure 4.7, we employ a visual analogy to explain why GTSP2 performs better than SZH. We call this figure an *elevation map*. We create the map by overlaying graph G with a mesh grid (100 x 100), calculating the number of disks that contain each mesh point (the degree of the mesh point), and plotting the degree on the z-axis. Some regions contained by more than one disk might not contain any grid points. To ensure we sample every single intersection of disks, we include in the elevation map the centroid of every region found by CTD for G.

Now, assume Figure 4.7 represents a topographical map of an area to be visited

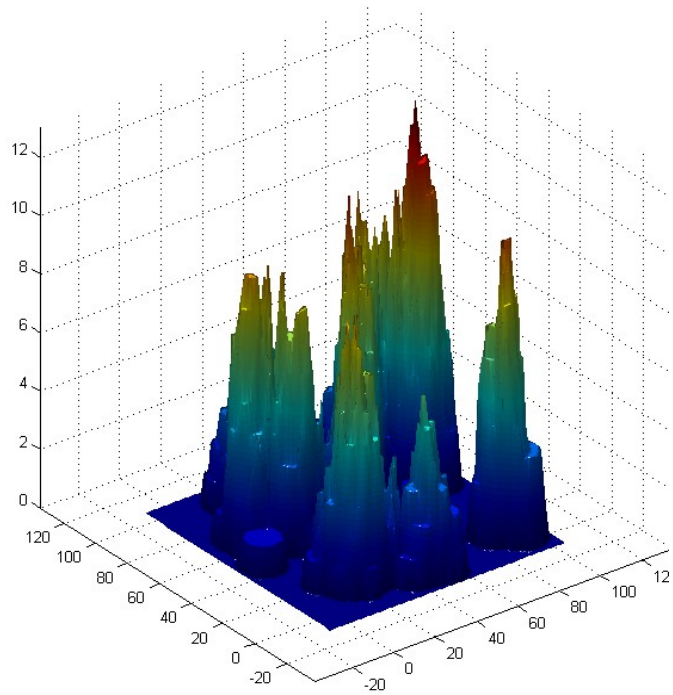


Figure 4.7: Elevation map for a 100-node CETSP. Overlap ratio is 0.08 (moderately low).

by a hiker. The hiker wants to visit (approach within r units) each of the n points of interest that have been identified. Using SZH to plan the route, the hiker would summit many of the steepest peaks (Steiner zones of large degree) since many points are visited simultaneously at the peaks. To visit the remaining nodes, the route produced by SZH might then lead the hiker to visit many of the deepest valleys (Steiner zones of small degree), resulting in a tour with substantial elevation change - an exhausting hike. If, on the other hand, the hiker used the GA to plan the route, the tour would tend to stay at the middle elevations, exhibiting a substantially lower total change in elevation. The route would not visit many peaks and could avoid most valleys. This hike would be much less arduous than the hike planned by SZH.

Our modifications to SZH attempt to create solutions with similar change-in-

elevation properties (low average Steiner zone degree) to the GA's solutions without the GA's extremely large computation times. We hope that the solution space of the CETSP is such that the local minimum initially found by Phases I through III of SZH is in roughly the same solution space as the improved solution we want to find. If this assumption holds, then by finding a good initial solution quickly using SZH, it should not be difficult to quickly move to the improved solution. This would accomplish our goal of combining the best aspect of simple, greedy algorithms (speed) and the best aspect of metaheuristics (accuracy).

4.4 Limiting Steiner Zone Degree

4.4.1 Maximum Degree

The naive way to minimize the degree of the Steiner zones found by SZH is to place an upper limit, u, on degree for all Steiner zones. We found that many of the same SZs found when $u = \infty$ may be constructed. For example, a $SZ(30)$ found when $u = 35$ may now exist as four different Steiner zones, for $u = 8$. Preliminary tests confirmed that placing an explicit upper limit on Steiner zone degree rarely found better solutions than the standard SZH heuristics. Choosing a good value for u was pure guesswork and the results did not exhibit any patterns that would help determine better values for u.

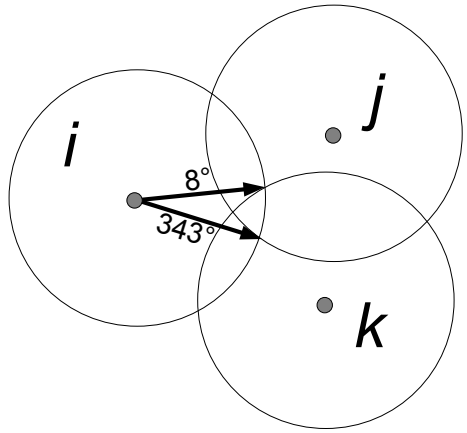


Figure 4.8: The base node is i. Only the lower (343°) and upper (8°) angles of intersection are required to specify the $SZ(3)$ formed by $disk(i)$, $disk(j)$, and $disk(k)$.

4.4.2 Minimum Angle of Intersection

A smarter method of limiting the degree requires a good conceptual understanding of Steiner zones. A Steiner zone of degree k is characterized by a node of origin (base node) and two polar angles of intersection relative to the base node. This is illustrated in Figure 4.8 for an SZ(3). We refer to the absolute value of the difference in the two angles as the total angle of intersection. A larger total angle of intersection between two disks implies a larger amount of overlap between the disks. A Steiner zone with a large total angle of intersection has a relatively large area. Steiner zones of large degree have a very small total angle of intersection and a relatively small area. The small area of intersection leaves little flexibility in choosing a point to represent such a Steiner zone in Phases II and III. The minimum angle of intersection heuristic (MAH) places a lower bound, denoted by ang_{LB}, on the minimum total angle of intersection for a Steiner zone. We illustrate this in Figure 4.9 where the minimum angle of intersection is 50°. Any potential Steiner

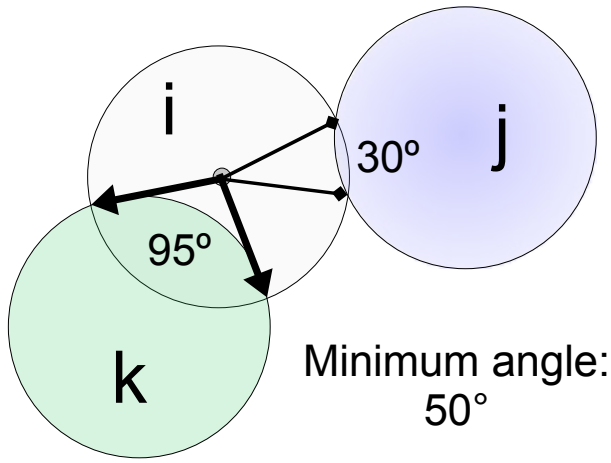


Figure 4.9: The total angle of intersection between node i and node k is 95°. SZ_{ik} is created. The total angle of intersection between node i and node j is $< 50°$. SZ_{ij} is not created.

zones whose total angle of intersection is less than ang_{LB} are not created. As ang_{LB} increases, MAH chooses Steiner zones that restrict the solution space less and less. MAH produces Steiner zones whose average degree is less than or equal to that of SZH. We hope to find a good value or range of values for ang_{LB} where the solution quality is similar to GTSP2. We note that when $ang_{LB} = 0°$, MAH is equivalent to SZH. When $ang_{LB} = (360 - \epsilon)°$, for ϵ near zero, all Steiner zones will have degree 1 (this is equivalent to the LK-SOCP and CW-SOCP heuristics described in Chapters 2 and 3, respectively).

4.5 Phase IV Post-Processor

Rather than searching for a good value or range of values for ang_{LB}, we use the solution found by Phases I through III of SZH as a starting solution which we modify to lower the average Steiner-zone degree. Let the current solution contain

the sequence of nodes i-j-k. We define the *turn angle* for edge e_{ij}, denoted by α_{ij}, as the deviation from a straight line between consecutive edges e_{ij} and e_{jk}. If nodes i, j, and k are collinear, then e_{ij} and e_{jk} form a straight line and $\alpha_{ij} = 0°$. If e_{ij} and e_{jk} are perpendicular, then $\alpha_{ij} = 90°$, the maximum possible turn angle. If the angle between e_{ij} and e_{jk} is greater than 90°, say 130°, then $\alpha_{ij} = ((0-130)\ modulo\ 90)° = 40°$. We let the turn angle for a tour be the sum of α_{ij} for all edges e_{ij} in the tour.

The definition of turn angle does not accurately characterize whether the shape of a tour is simple or complex. A route may have a simple overall structure, for example, a square, but consist of numerous short segments, each making large turns. The tour in Figure 4.10 contains many 90° turns, but as a whole, the tour is square in shape. Although a square has a very simple geometric shape, the tour in Figure 4.10 would have a very high turn angle. To address this, we normalize each edge's turn angle by dividing it by the proportion of total route length contributed by that edge. That is, we multiply each e_{ij}'s turn angle by $\frac{d_{ij}}{tour\ length}$ where d_{ij} is the length of edge e_{ij}. The tour in Figure 4.10 has a relatively small normalized turn angle consistent with that of a simple shape such as a square.

Phase IV is a post-processor that can be applied to any CETSP or CEVRP solution that contains Steiner zones with degree greater than one. At each iteration of the Phase IV post-processor, we calculate each Steiner zone's normalized turn angle and sort the Steiner zones in descending order. We choose the 10% highest-turn angle Steiner zones and remove them from the route. For each $SZ(k)$ removed, we replace it with unique duples and singletons ($SZ(2)$ and $SZ(1)$) created from its k member nodes. For member node i, we find the closest remaining member node,

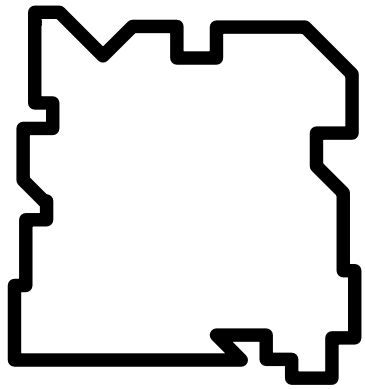
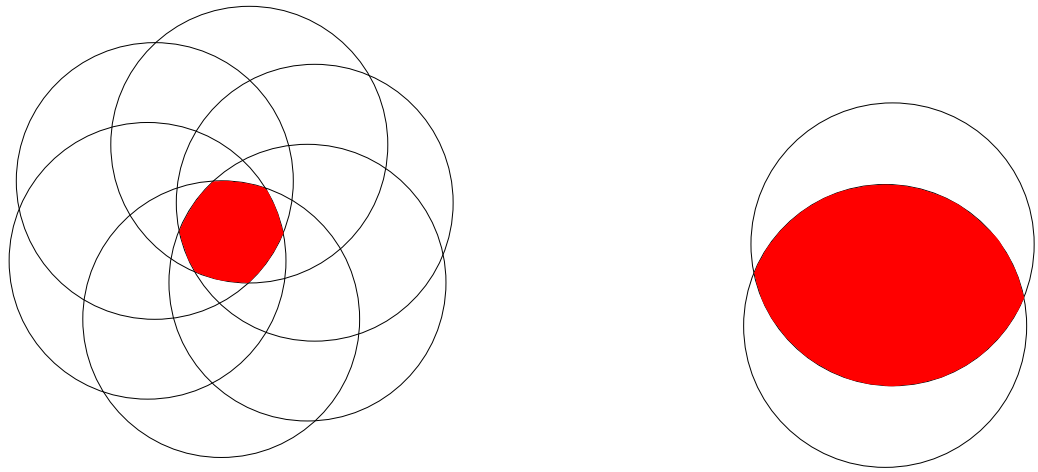


Figure 4.10: A nearly square route. It is a simple shape and should have a low turn angle. Without accounting for each edge's relative contribution to the tour length, however, the turn angle is very large.

and create a duple. We select the closest member node in order to create Steiner zones with the most overlap area and provide more flexibility in placing each zone's representative point. We force every third new Steiner zone created to be a singleton. We tested other numbers such as every second or every fifth, but found that every third produced the shortest tours. The entire process for replacing one Steiner zone with duples and singletons created from its member nodes is illustrated for a $SZ(6)$ in Figures 4.11 through 4.14.

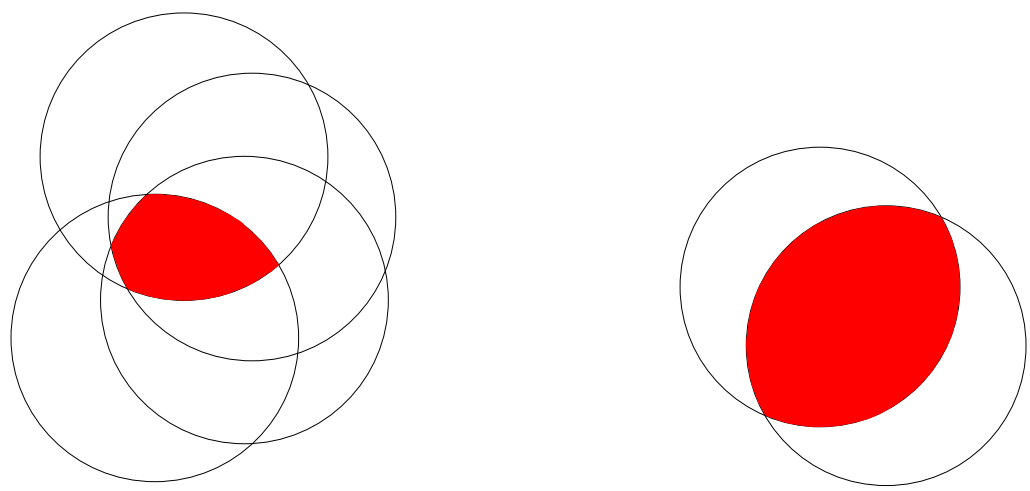
After replacing the top 10% highest-turn-angle Steiner zones with duple and singleton Steiner zones, unique feasible representative points for each of the new SZs are assigned using the method described in Chapter 2. Phase II and Phase III are reapplied to the route. Without assigning each new Steiner zone a representative point that is different from its previous one, the routing sequence could not change when Phase II is applied. The removal and replacement process is continued until four successive iterations produce no improvement in distance or the number of



(a) A $SZ(6)$ before applying Phase IV

(b) The first duple created

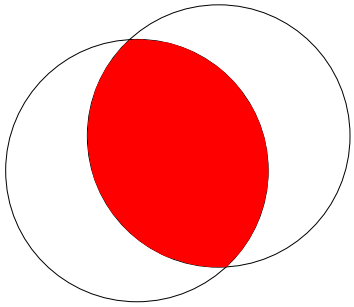
Figure 4.11: The Steiner zone in Figure 4.11(a) has degree 6. Remove one member node and create a duple with the closest of the other five member nodes. Set the duple aside.



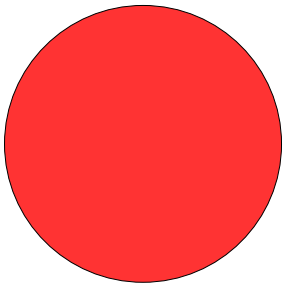
(a) The remaining $SZ(4)$

(b) The second duple created

Figure 4.12: A Steiner zone of degree 4 remains. Remove another node, create a duple in the same manner, and set it aside.

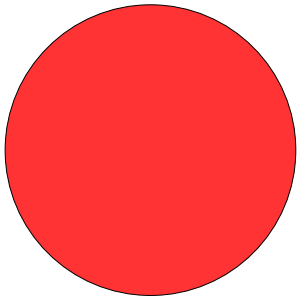


(a) The remaining $SZ(2)$

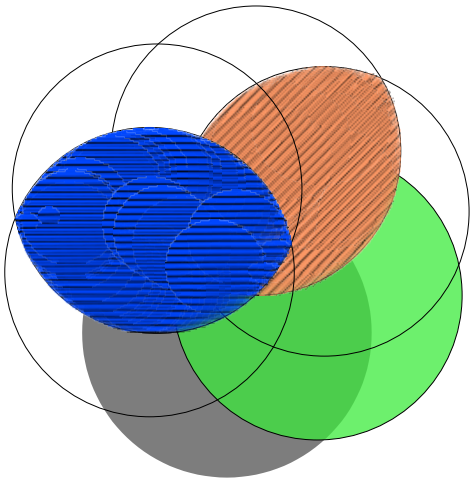


(b) Every third replacement must be a singleton

Figure 4.13: A duple is all that remains. Every third replacement, no matter the number of member nodes remaining, we automatically create a singleton. Set the singleton aside.



(a) A singleton remains



(b) Final result: four separate but overlapping Steiner zones

Figure 4.14: Only a singleton remains, so Phase IV for the original $SZ(6)$ is complete, having replaced one high-degree SZ with four low-degree ones. SZH now has more flexibility (a larger solution space) in which to find a good tour on these low-degree Steiner zones.

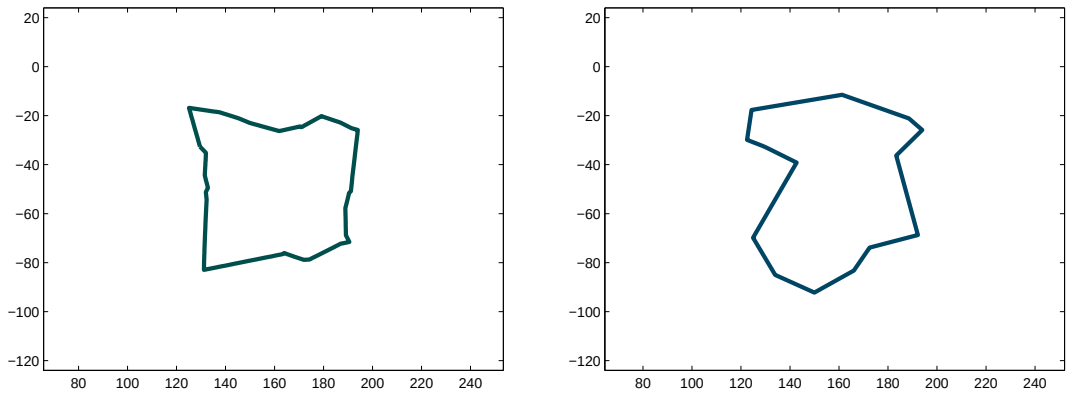
Steiner zones in the route is equal to the number of nodes in the problem, that is, no more Steiner zone replacements can occur.

We calculate the 10% number only at the beginning of Phase IV. For example, if Phase I reduced n nodes to $m = 10$ Steiner zones, then only one Steiner zone (10% of m) is removed from the solution at each iteration, even if n is relatively large compared to m. If we recalculated the 10% number at each iteration, then as the number of Steiner zones grows because of Phase IV replacements, the rate at which SZs are replaced grows faster. We found that recalculating can be twice as fast as not recalculating, but the results are usually slightly poorer.

After enough Steiner zones have been replaced by duples and singletons, there may be a large amount of Steiner-zone overlap. Because the IP_{PhIII} heuristic for Phase III works very poorly when there is substantial Steiner-zone overlap (see Appendix D), we solve Phase III to optimality using the second order cone program (SOCP) formulation described in Appendix E.

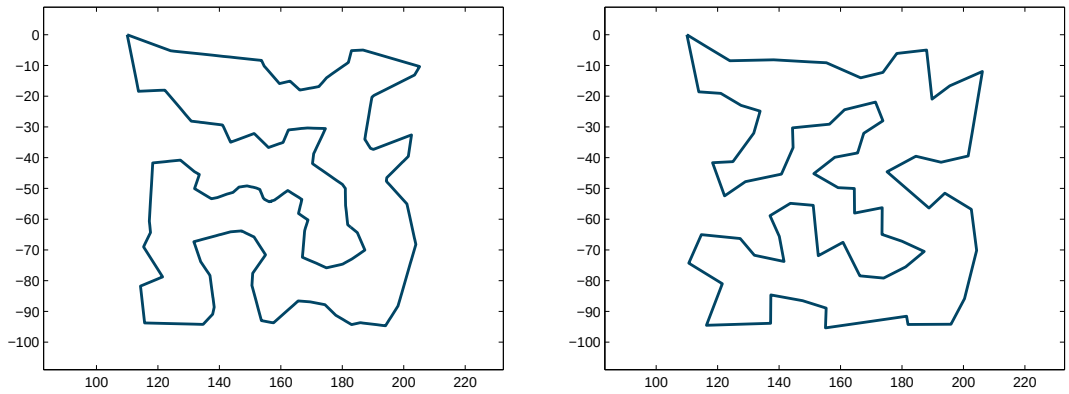
We expect that replacing a high-turn angle Steiner zone with many smaller ones will help the algorithm escape a local minimum and find routes with a simpler shape and a shorter distance. A route with a lower turn angle is not necessarily shorter than a route with a higher turn angle. However, in our experiments, we found that it typically is shorter.

In Figures 4.15 and 4.16, we show the tours found by SZH and the GA for two problem instances where the SZH solutions compare poorly with the GA solution (a 200-node moderate overlap problem and a 400-node low overlap problem). In both instances, the solution found by the GA has a much lower normalized turn angle



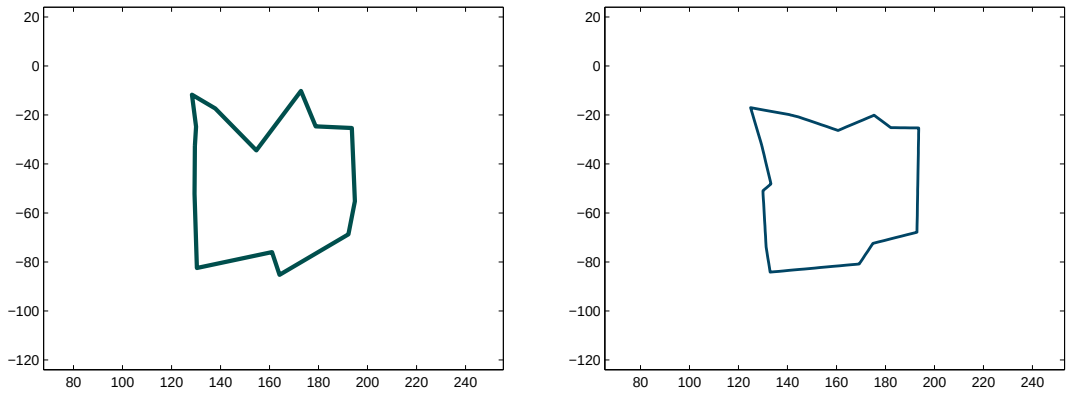
(a) GA solution (b) Steiner-zone solution

Figure 4.15: Solutions to a 200-node CETSP. The GA solution (249.9) is 11% shorter than the Steiner-zone solution (277.6) and has a simpler geometric shape. The SZ solution shape is not simple because the small, high-degree Steiner zones created in Phase I constrain the shape.



(a) GA solution (b) Steiner-zone solution

Figure 4.16: Solutions to a 400-node CETSP. The GA solution (680.0) is 9% shorter than the best Steiner-zone solution (742.8). It is difficult to visually judge which route has the simpler geometric shape, but the GA solution has a lower route turn angle.



(a) A Steiner-zone solution before post-processing

(b) After post-processing

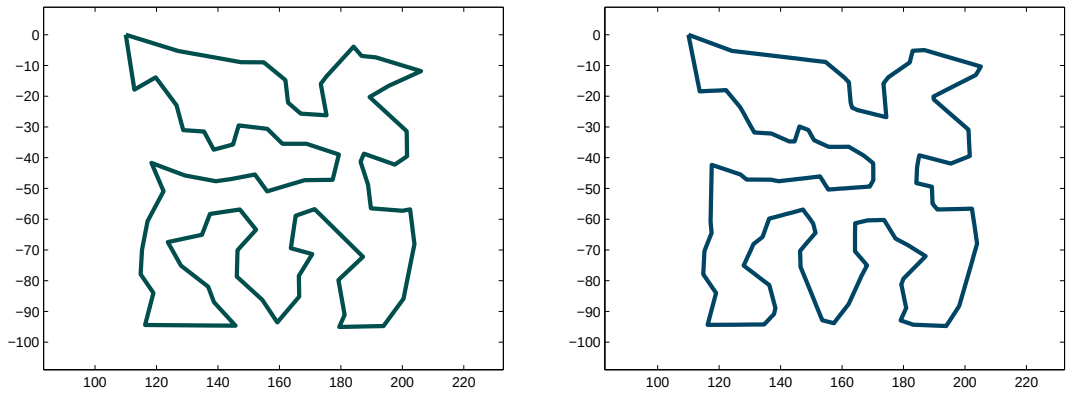
Figure 4.17: The route in (a) is about 284 and is not the best Phase III solution to this 200-node problem. After applying Phase IV, the shape is very similar to the GA solution in Figure 4.15(a). The tour length is about 250, only 0.11% longer than the GA solution.

than SZH.

In Figures 4.17 and 4.18, we show the SZH solutions to both problems before and after applying the Phase IV processor. Applying Phase IV usually produces smoother-looking tours which are shorter. GTSP2 solved the two problems in 34,768 CPU seconds and 276,264 CPU seconds, respectively. SZ2 solved them in 0.718 CPU seconds and 1.296 CPU seconds. When the Phase IV post-processor is applied to the SZ2 solutions, the times increase to 7.704 CPU seconds and 32.594 CPU seconds, respectively. In these examples, the post-processor adds a substantial amount of time to SZ2, but it is still several orders of magnitude faster than the GA.

4.5.1 Phase IV and MAH

The ideas behind MAH and the Phase IV post-processor can easily be combined. We can apply Phase IV to the results found by MAH for a range of values



(a) A Steiner-zone solution before post-processing

(b) After post-processing

Figure 4.18: The route in (a) is about 747 and is not the best Phase III solution to this 400-node problem. After applying Phase IV, many of the corners have been smoothed out and the distance is now about 688. This is only 1.27% longer than the GA solution.

for ang_{LB}.

4.5.2 Phase IV and the CEVRP

We developed two variants of the Phase IV heuristic for the CEVRP. In one method, VRP-based Phase IV, a maximum of one Steiner zone is replaced in each route per iteration of Phase IV. We expect that the VRP-based Phase IV will allow the solution to evolve gradually in each iteration. The limit on the number of Steiner zones per iteration means that Phase II is solved more often, allowing the VRP solver to potentially find a very good solution. A second method, which we call TSP-based Phase IV, treats each route as if it were a stand-alone CETSP. That is, for route k, we replace up to 10% of its Steiner zones per Phase IV iteration. With TSP-based Phase IV, our goal is to improve the initial set of VRP routes locally as much as possible without significantly altering the structure of the solution. We

expect that the underlying set of VRP routes to remain relatively similar after each iteration of TSP-based Phase IV.

4.6 Computational Results

In Chapter 2, we tested two variants of SZH (SZ1, SZ2) and 13 heuristics on 48 2D Euclidean CETSP problems. Across all problems, we found that SZ1 and SZ2 produced the best combination of speed and accuracy. For low and medium overlap ratio $TSPLIB$ problems, however, GTSP2 was substantially more accurate than SZ1 and SZ2, and for six of the seven high overlap $TSPLIB$ problems, LK-SOCP was much more accurate. In Chapter 3, we tested four variants of SZH (SZVRP1, SZVRP2, SZVRP3, SZVRP4) and four heuristics on the same 48 problems (converted to CEVRPs). We found that SZVRP2 produced the best combination of speed and accuracy with SZVRP3 and SZVRP1 performing nearly as well. However, for medium and high overlap problems, CW-SOCP typically produced the best solutions.

In this chapter, we compare results produced by MAH, the Phase IV post-processor, and the combined $\text{MAH}_{PhaseIV}$ to the results of the best methods from Chapters 2 and 3.

4.6.1 CETSP Heuristics

We coded 11 heuristics for comparison purposes including four heuristics described in Chapter 2: SZ1, SZ2, GTSP2, and LK-SOCP. GTSP2 and LK-SOCP are

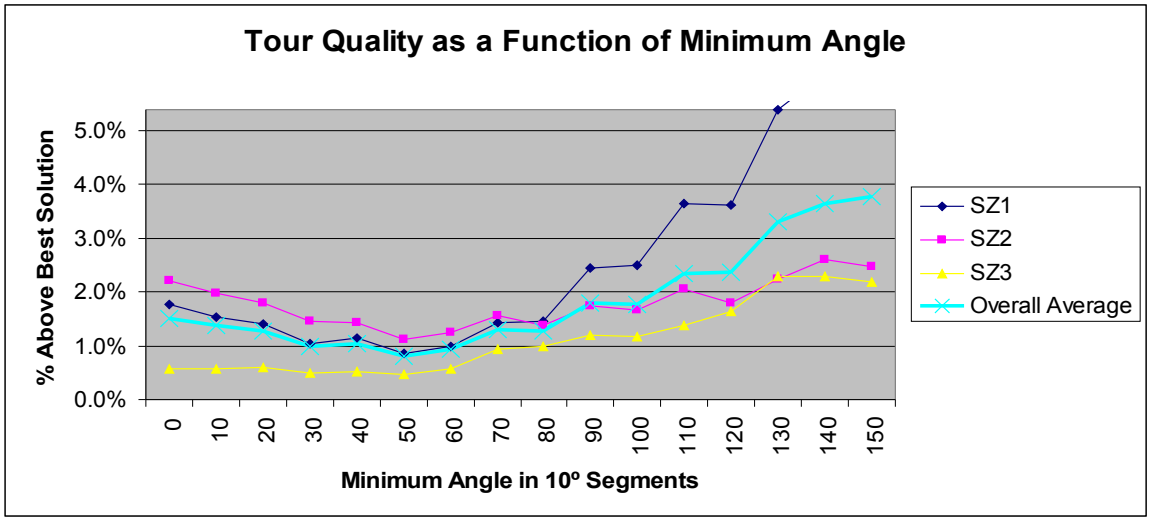


Figure 4.19: Letting ang_{LB} equal each of the integer values in [50°, 59°] produces the best set of solutions, on average, for $SZ1_{0-360}$, $SZ2_{0-360}$, and $SZ3_{0-360}$ across all Euclidean problems.

included because they performed better than any SZH method on specific classes of problems in Chapter 2. We coded four new heuristics using the methods described in this chapter: $SZ1_{0-359}$, $SZ2_{0-359}$, SZ3, and $SZ3_{0-359}$. SZ3 is the same as SZ2 except that the Phase IV post-processor is applied. $SZ1_{0-359}$ and $SZ2_{0-359}$ are two implementations of the MAH heuristic. $SZ3_{0-359}$ implements the $MAH_{PhaseIV}$ heuristic. They are the same as SZ1, SZ2, and SZ3 except that they are run 360 times, setting ang_{LB} equal to each of the integer values in [0°, 360°]. We include results for the best 10° ranges (over all problems) for $SZ1_{0-359}$, $SZ2_{0-359}$, and $SZ3_{0-359}$. For example, the best average deviation for $SZ1_{0-359}$ over a 10°range over all 48 problems is 50°-59°, as shown in Figure 4.19. We refer to this as $SZ1_{50-59}$. The best of the 10 solutions from this range is reported for each problem. The same idea applies to $SZ2_{50-59}$ and $SZ3_{50-59}$.

The tour-length results for the 11 heuristics on the 48 test problems are given

in Table 4.6.1. The average deviations from the best solutions in Table 4.6.1 are given in Table 4.6.1. Columns in both tables are ordered by the overall average deviation from best (left) to worst (right).

The results in Tables 4.6.1 and 4.6.1 are quite different from the results in Chapter 2. In Chapter 2, we saw that GTSP2 was clearly the most accurate method for low and medium overlap ratio $TSPLIB$ problems, finding best solutions for 12 of 14 problems. LK-SOCP was the best method for high overlap ratio $TSPLIB$ problems (if we removed the result for *pcb*442), averaging only 0.10% deviation from the best solution. In Table 4.6.1, the results are different. GTSP2 finds only six of 14 best solutions for low and medium overlap ratio $TSPLIB$ problems while $SZ3_{0-359}$ finds eight best solutions. $SZ3_{0-359}$ finds all seven best solutions for high overlap ratio $TSPLIB$ problems. Over all 48 problems, $SZ3_{0-359}$ finds 37 best solutions. SZ3 finds solutions as good as or better than GTSP2 26 times and finds solutions as good as or better than LK-SOCP 45 times. $SZ2_{0-360}$ equals or improves GTSP2 27 times and LK-SOCP 48 times.

The average deviation from the best solutions has also changed. In Chapter 2, we saw that the Steiner-zone methods averaged about 4.50% deviation from the best for low overlap ratio $TSPLIB$ problems and about 7.00% for medium overlap ratio $TSPLIB$ problems. For the same problems, $SZ3_{0-359}$ averages 0.99% and 0.16% and SZ3 averages 2.22% and 2.73%, respectively. For the high overlap ratio $TSPLIB$ problems, both $SZ3_{0-359}$ and SZ3 average 0.00% deviation. Over all 48 problems, $SZ3_{0-359}$ averages 0.41% deviation, and three methods ($SZ3_{50-59}$, SZ3, $SZ2_{0-359}$) average less than 2%.

In Table 4.6.1, we give the computation times for the 11 heuristics on the 48 problems. Columns are ordered from fastest (left) to slowest (right). In Chapter 2, we saw that LK-SOCP was the fastest method overall, with SZ1 a close second. GTSP2 was extremely slow. The current rankings remain the same. We see that three heuristics ($SZ2_{50-59}$, $SZ1_{50-59}$, SZ3) average between 20 and 28 seconds over all problems while $SZ3_{50-59}$ averages 169.225 seconds over all problems. Although much slower than LK-SOCP and SZ1, these four methods are still orders of magnitude faster than GTSP2.

Based on the computational experiments with the 48 problems using the 2D Euclidean norm, we observe the following. (1) SZ3 appears to be the best variant of SZH. If we consider the column orderings in Tables 4.6.1 and 4.6.1 to be algorithm rankings, then SZ3 and $SZ3_{50-59}$ have the best combination of speed and accuracy, having average ranks of 3.5 and 4.5, respectively. Obtaining a high-quality initial solution quickly and then escaping the local minimum (by relaxing the set of Steiner zones in search of a lower tour turn angle) improves accuracy with only a moderate increase in computation time. Combining that idea with the idea of encouraging moderate-degree Steiner zones with a minimum angle-of-intersection produces an accurate algorithm. (2) GTSP2 is the most accurate method for low overlap ratio problems; it is no longer the most accurate method for medium overlap ratio problems. Interestingly, GTSP2 finds the best solution for all five *concentrCircles* problems but does poorly on most of the other *GEOMETRIC* problems. (3) $SZ1_{0-360}$ and $SZ1_{50-59}$ are slower than their SZ2 counterparts which is different from the computation times reported in Chapter 2. This is because the IP_{PhIII}

solver used by the SZ1 variants does not perform well when there is a moderate or large amount of Steiner-zone overlap, as noted in Appendix D. As ang_{LB} increases, the Steiner zones found in Phase I have more overlap, causing IP_{PhIII} to slow down and produce poorer results. (4) The MAH, Phase IV, and $\mathrm{MAH}_{PhaseIV}$ algorithms improve the accuracy of SZH. Most increase computation time by only a small amount. For example, the best SZH method averages less than 1% deviation for low overlap ratio $TSPLIB$ problems (previously the best SZH method averaged 4.58%). The best SZH method averages 0.16% deviation for medium overlap ratio $TSPLIB$ problems (previously the best SZH method averaged 6.44%). The most inaccurate of the new methods, $\mathrm{SZ1}_{50-59}$, still improves on SZ2 by over 1%. (5) The MAH and $\mathrm{MAH}_{PhaseIV}$ variants can easily be parallelized, applying p different processors to p different values of ang_{LB} simultaneously. Quad-core and eight-core computers are available, and 16-core computers will become available soon. With such increased computing power at hand, $\mathrm{SZ3}_{50-59}$ could easily be as fast as SZ3.

Table 4.3: Tour lengths for 11 heuristics on 48 problems with equal radius and 2D Euclidean norm

	$SZ3_{0-360}$	$SZ3_{50-59}$	SZ3	$SZ2_{0-360}$	$SZ1_{0-360}$	$SZ2_{50-59}$	$SZ1_{50-59}$	SZ2	SZZ1	GTSP2	LK-SOCP
Overlap ratio: 0.02											
kroD100	160.81	160.81	160.96	162.17	162.22	162.36	162.38	163.76	163.78	**159.05**	164.31
rat195	164.47	164.47	167.57	166.41	166.43	166.41	166.43	171.29	171.35	**158.79**	169.32
lin318	**2863.37**	2873.10	2872.37	2905.53	2907.79	2911.93	2912.27	2941.00	2941.53	2867.46	3031.48
rd400	1039.73	1043.58	1051.70	1050.42	1050.60	1058.13	1058.52	1066.16	1066.44	**1033.42**	1091.84
pcb442	325.63	331.87	328.08	330.27	329.81	335.57	335.62	333.24	333.27	**323.03**	348.15
d493	**203.47**	205.66	207.44	207.82	207.99	210.49	210.70	213.51	213.64	204.71	217.03
dsj1000	943.44	943.44	965.52	977.73	977.06	986.06	986.95	1010.86	1012.72	**935.74**	1023.11
Overlap ratio: 0.1											
kroD100	**89.67**	89.90	90.88	90.97	91.33	92.29	92.43	96.68	97.09	89.94	95.64
rat195	**68.26**	68.85	69.48	69.77	70.03	73.44	73.47	74.16	74.22	**68.26**	82.36
lin318	**1414.44**	1425.05	1444.53	1441.99	1470.72	1484.65	1488.14	1556.82	1557.47	1467.02	1532.05
rd400	**469.75**	482.28	500.42	498.52	503.46	498.52	503.46	521.91	526.73	473.70	541.22
pcb442	148.88	151.26	152.98	153.55	155.08	157.09	157.31	162.26	162.73	**147.24**	211.66
d493	**101.73**	101.85	104.16	103.42	103.45	103.42	103.45	110.90	111.03	112.55	116.98
dsj1000	**377.10**	376.35	379.97	385.74	388.92	388.70	388.99	404.60	407.02	482.85	420.33
Overlap ratio: 0.3											
kroD100	**58.54**	**58.54**	**58.54**	**58.54**	**58.54**	**58.54**	58.79	**58.54**	**58.54**	62.15	**58.54**
rat195	**45.70**	**45.70**	**45.70**	**45.70**	**45.70**	**45.70**	**45.70**	45.79	45.91	48.19	45.74
lin318	**765.96**	**765.96**	**765.96**	**765.96**	766.08	766.06	766.46	782.40	782.96	946.67	776.58
rd400	**224.84**	**224.84**	**224.84**	**224.84**	226.66	225.04	229.50	233.29	233.75	348.99	225.63
pcb442	**83.54**	**83.54**	**83.54**	**83.54**	83.55	83.59	83.75	85.12	85.18	126.21	106.32
d493	**69.76**	**69.76**	**69.76**	**69.76**	69.78	**69.76**	69.85	70.75	70.84	82.83	**69.76**
dsj1000	**199.95**	**199.95**	**199.95**	**199.95**	200.28	200.62	200.79	201.92	201.95	459.22	**199.95**
Varied overlap ratios											
team1_100	**307.34**	**307.34**	308.73	309.18	309.83	312.12	312.46	326.73	327.28	307.79	316.32
team2_200	**246.74**	246.84	250.55	247.57	258.61	259.89	265.12	277.61	277.75	249.92	345.41
team3_300	**466.24**	478.28	468.65	483.26	483.72	487.06	488.13	505.65	508.75	484.70	497.66
team4_400	688.63	698.42	688.63	711.93	712.19	728.96	729.19	742.83	745.58	**680.21**	777.74
team5_499	**702.82**	704.48	710.02	715.99	716.61	716.69	716.85	727.57	727.84	703.20	758.48
team6_500	**225.22**	225.23	225.92	225.88	227.39	227.70	228.13	232.94	233.02	355.02	245.17
bonus1000	**404.01**	408.39	414.42	416.82	422.48	438.66	440.22	439.59	444.43	578.87	508.27
concentricCircles1	**53.16**	53.40	53.40	**53.16**	**53.16**	54.91	54.93	54.91	54.93	**53.16**	**53.16**
concentricCircles2	159.49	160.00	160.00	159.99	160.02	161.90	161.94	161.90	161.94	**153.13**	160.00
concentricCircles3	272.89	272.89	272.89	273.41	274.20	274.88	274.94	274.88	274.94	**271.08**	324.55
concentricCircles4	472.79	475.96	475.96	472.88	472.92	479.97	480.02	479.97	480.02	**454.46**	522.51
concentricCircles5	654.94	664.09	664.09	656.38	657.61	666.73	671.65	666.73	671.65	**645.38**	694.01
bubbles1	**349.13**	**349.13**	**349.13**	**349.13**	349.14	**349.13**	349.14	351.58	351.58	**349.13**	**349.13**
bubbles2	**428.28**	**428.28**	**428.28**	**428.28**	428.35	430.28	433.88	429.29	428.96	432.38	514.14
bubbles3	**536.62**	**536.62**	548.89	564.04	564.09	564.04	564.09	595.56	595.96	546.73	712.74
bubbles4	**836.54**	842.73	**836.54**	844.35	844.37	865.13	865.30	863.49	863.56	877.47	1024.51
bubbles5	**1073.71**	**1073.71**	1095.24	1106.41	1108.17	1106.41	1108.17	1141.87	1142.85	1131.09	1327.46
bubbles6	**1382.41**	**1383.14**	1404.16	1446.39	1446.94	1446.39	1446.94	1464.27	1464.47	1446.26	1674.06
bubbles7	**1720.21**	1736.75	**1720.21**	1806.89	1807.12	1806.89	1807.12	1839.94	1839.70	1775.92	2154.57
bubbles8	**2117.49**	2129.52	2158.78	2197.88	2200.19	2197.88	2200.19	2250.56	2251.56	2236.40	2630.22
bubbles9	**2481.23**	**2481.23**	2550.53	2586.72	2589.36	2586.72	2589.36	2626.10	2648.08	2748.93	3176.34
rotatingDiamonds1	**32.39**	**32.39**	33.15	**32.39**	**32.39**	**32.39**	**32.39**	33.15	33.15	**32.39**	**32.39**
rotatingDiamonds2	**140.48**	**140.48**	**140.48**	**140.48**	141.05	141.49	141.49	142.25	142.25	**140.48**	144.71
rotatingDiamonds3	**381.27**	381.48	381.48	382.05	382.10	382.05	382.10	383.35	383.38	382.17	385.53
rotatingDiamonds4	**770.76**	**770.76**	771.36	771.31	772.22	772.93	774.14	774.80	774.87	773.21	771.31
rotatingDiamonds5	**1511.44**	1511.50	1511.50	**1511.44**	1512.27	1515.44	1515.59	1515.44	1515.59	1517.70	1512.49
chaoSingleDep	**1022.88**	**1022.88**	**1022.88**	**1022.88**	1023.05	1022.94	1023.28	1022.98	1023.05	1039.61	**1022.88**

Table 4.4: Percentage deviation from the best solution for 11 heuristics on 48 problems with equal radius and 2D Euclidean norm

	$SZ3_{0-360}$	$SZ3_{50-59}$	SZ3	$SZ2_{0-360}$	$SZ1_{0-360}$	$SZ2_{50-59}$	$SZ1_{50-59}$	SZ2	SZZ1	GTSP2	LK-SOCP
Overlap ratio: 0.02											
kroD100	1.11	1.11	1.20	1.97	1.99	2.08	2.09	2.96	2.97	0.00	3.31
rat195	3.58	3.58	5.53	4.80	4.82	4.80	4.82	7.87	7.91	0.00	6.64
lin318	0.00	0.34	0.31	1.47	1.55	1.70	1.71	2.71	2.73	0.14	5.87
rd400	0.61	0.98	1.77	1.65	1.66	2.39	2.43	3.17	3.20	0.00	5.65
pcb442	0.80	2.74	1.56	2.24	2.10	3.88	3.90	3.16	3.17	0.00	7.78
d493	0.00	1.08	1.95	2.14	2.22	3.45	3.55	4.93	5.00	0.61	6.66
dsj1000	0.82	0.82	3.18	4.49	4.42	5.38	5.47	8.03	8.23	0.00	9.34
Average:	0.99	1.52	2.22	2.68	2.68	3.38	3.42	4.69	4.74	0.11	6.46
Overlap ratio: 0.1											
kroD100	0.00	0.26	1.36	1.45	1.86	2.93	3.08	7.82	8.27	0.30	6.66
rat195	0.00	0.87	1.79	2.22	2.59	7.59	7.63	8.64	8.73	0.00	20.66
lin318	0.00	0.75	2.13	1.95	3.98	4.96	5.21	10.07	10.11	3.72	8.31
rd400	0.00	2.67	6.53	6.12	7.18	6.12	7.18	11.10	12.13	0.84	15.21
pcb442	1.11	2.73	3.90	4.28	5.32	6.69	6.83	10.19	10.52	0.00	43.75
d493	0.00	0.12	2.38	1.65	1.68	1.65	1.68	9.01	9.13	10.63	14.98
dsj1000	0.00	0.07	1.03	2.56	3.41	3.35	3.43	7.58	8.22	28.38	11.76
Average:	0.16	1.07	2.73	2.89	3.72	4.76	5.01	9.20	9.59	6.27	17.33
Overlap ratio: 0.3											
kroD100	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	6.17	0.00
rat195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.45	5.44	0.07
lin318	0.00	0.00	0.00	0.00	0.02	0.01	0.06	2.15	2.22	23.59	1.39
rd400	0.00	0.00	0.00	0.00	0.81	0.09	2.07	3.76	3.96	55.22	0.35
pcb442	0.00	0.00	0.00	0.00	0.02	0.06	0.26	1.90	1.96	51.08	27.27
d493	0.00	0.00	0.00	0.00	0.03	0.00	0.13	1.43	1.55	18.74	0.00
dsj1000	0.00	0.00	0.00	0.00	0.16	0.34	0.42	0.99	1.00	129.67	0.00
Average:	0.00	0.00	0.00	0.00	0.15	0.07	0.48	1.49	1.59	41.42	4.15
Overall *TSPLIB*:	0.38	0.86	1.65	1.86	2.18	2.74	2.97	5.13	5.31	15.93	9.32
Varied overlap ratios											
team1_100	0.00	0.00	0.45	0.60	0.81	1.56	1.67	6.31	6.49	0.15	2.92
team2_200	0.00	0.04	1.55	0.34	4.81	5.33	7.45	12.51	12.57	1.29	39.99
team3_300	0.00	2.58	0.52	3.65	3.75	4.47	4.70	8.45	9.12	3.96	6.74
team4_400	1.27	2.71	1.27	4.69	4.73	7.20	7.23	9.24	9.64	0.00	14.37
team5_499	0.00	0.24	1.02	1.87	1.96	1.97	2.00	3.52	3.56	0.05	7.92
team6_500	0.00	0.00	0.31	0.29	0.96	1.10	1.29	3.43	3.46	57.63	8.86
bonus1000	0.00	1.08	2.58	3.17	4.57	8.58	8.96	8.81	10.01	43.28	25.81
Average:	0.18	0.95	1.10	2.08	3.08	4.31	4.75	7.46	7.83	15.20	15.23
concentricCircles1	0.00	0.46	0.46	0.00	0.00	3.30	3.33	3.30	3.33	0.00	0.00
concentricCircles2	4.15	4.48	4.48	4.48	4.50	5.73	5.75	5.73	5.75	0.00	4.48
concentricCircles3	0.67	0.67	0.67	0.86	1.15	1.40	1.43	1.40	1.43	0.00	19.73
concentricCircles4	4.03	4.73	4.73	4.05	4.06	5.61	5.63	5.61	5.63	0.00	14.98
concentricCircles5	1.48	2.90	2.90	1.70	1.90	3.31	4.07	3.31	4.07	0.00	7.53
Average:	2.07	2.65	2.65	2.22	2.32	3.87	4.04	3.87	4.04	0.00	9.34
bubbles1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.70	0.00	0.00
bubbles2	0.00	0.00	0.00	0.00	0.02	0.47	1.31	0.24	0.16	0.96	20.05
bubbles3	0.00	0.00	2.29	5.11	5.12	5.11	5.12	10.98	11.06	1.88	32.82
bubbles4	0.00	0.74	0.00	0.93	0.94	3.42	3.44	3.22	3.23	4.89	22.47
bubbles5	0.00	0.00	2.01	3.05	3.21	3.05	3.21	6.35	6.44	5.34	23.63
bubbles6	0.00	0.00	1.52	4.57	4.61	4.57	4.61	5.87	5.88	4.56	21.03
bubbles7	0.00	0.96	0.00	5.04	5.05	5.04	5.05	6.96	6.95	3.24	25.25
bubbles8	0.00	0.57	1.95	3.80	3.91	3.80	3.91	6.28	6.33	5.62	24.21
bubbles9	0.00	0.00	2.79	4.25	4.36	4.25	4.36	5.84	6.72	10.79	28.01
Average:	0.00	0.25	1.17	2.97	3.02	3.30	3.44	5.16	5.27	4.14	21.94
rotatingDiamonds1	0.00	0.00	2.35	0.00	0.00	0.00	0.00	2.35	2.35	0.00	0.00
rotatingDiamonds2	0.00	0.00	0.00	0.00	0.41	0.72	0.72	1.26	1.26	0.00	3.01
rotatingDiamonds3	0.00	0.06	0.06	0.21	0.22	0.21	0.22	0.55	0.56	0.24	1.12
rotatingDiamonds4	0.00	0.00	0.08	0.07	0.19	0.28	0.44	0.52	0.53	0.32	0.07
rotatingDiamonds5	0.00	0.00	0.00	0.00	0.05	0.26	0.27	0.26	0.27	0.41	0.07
Average:	0.00	0.01	0.50	0.06	0.17	0.29	0.33	0.99	1.00	0.19	0.85
chaoSingleDep	0.00	0.00	0.00	0.00	0.02	0.01	0.04	0.01	0.02	1.64	0.00
GEOMETRIC **Average:**	0.52	0.78	1.31	1.91	1.99	2.53	2.64	3.54	3.63	1.91	12.43
Overall Average:	0.41	0.84	1.43	1.91	2.23	2.88	3.09	4.81	4.98	9.98	11.48

Table 4.5: Computation time (CPU seconds) for 11 heuristics on 48 problems with equal radius and 2D Euclidean norm

	LK-SOCP	SZ1	SZ2	SZ3	$SZ2_{50-59}$	$SZ1_{50-59}$	$SZ3_{50-59}$	$SZ2_{0-360}$	$SZ1_{0-360}$	$SZ3_{0-360}$	GTSP2
Overlap ratio: 0.02											
kroD100	0.102	0.235	0.297	2.218	4.261	3.220	9.757	153.407	115.937	351.250	666
rat195	0.141	0.484	0.539	4.219	8.448	5.865	20.616	304.141	211.125	742.171	7781
lin318	0.375	1.547	1.477	18.016	19.658	17.165	104.027	707.703	617.937	3744.984	48545
rd400	0.469	1.250	1.820	15.250	25.751	18.980	74.161	927.031	683.265	2669.813	76010
pcb442	0.461	1.235	1.445	23.719	33.739	29.871	109.233	1214.609	1075.343	3932.375	222047
d493	0.789	1.422	2.523	35.734	42.605	52.082	279.496	1533.766	1874.969	10061.843	309071
dsj1000	1.875	3.969	9.195	71.266	110.762	144.592	740.746	3987.422	5205.312	26666.843	12682545
Average:	0.602	1.449	2.471	24.346	35.032	38.825	191.148	1261.154	1397.698	6881.326	1906666
Overlap ratio: 0.1											
kroD100	0.063	0.109	0.250	3.203	3.183	3.898	22.712	114.578	140.328	817.625	1483
rat195	0.110	0.187	0.453	6.813	6.122	8.857	54.655	220.390	318.843	1967.562	5951
lin318	0.321	0.313	0.859	17.062	13.170	17.758	108.212	474.125	639.282	3895.641	60252
rd400	0.367	0.407	0.797	20.265	17.390	29.755	137.181	626.047	1071.172	4938.531	91003
pcb442	0.391	0.437	1.594	17.829	20.745	32.163	163.980	746.812	1157.860	5903.296	250485
d493	0.782	0.484	1.782	22.875	27.562	45.822	228.256	992.234	1649.609	8217.204	61715
dsj1000	1.790	0.922	4.657	65.016	81.648	131.346	670.170	2939.344	4728.453	24126.109	7807747
Average:	0.546	0.408	1.484	21.866	24.260	38.514	197.881	873.361	1386.507	7123.710	1182662
Overlap ratio: 0.3											
kroD100	0.071	0.078	0.133	1.390	2.816	4.748	18.929	101.390	170.938	681.453	865
rat195	0.102	0.156	0.336	11.437	6.569	8.977	163.118	236.500	323.187	5872.265	6323
lin318	0.266	0.265	0.594	6.484	9.708	12.110	120.391	349.500	435.969	4334.062	40166
rd400	0.352	0.375	0.867	14.188	16.725	25.497	182.330	602.109	917.906	6563.875	61120
pcb442	0.422	0.329	0.719	37.625	17.546	26.958	240.606	631.640	970.485	8661.812	76137
d493	0.688	0.375	0.680	26.016	18.169	32.180	258.200	654.093	1158.485	9295.188	59109
dsj1000	1.727	1.063	2.602	35.282	56.745	103.612	710.437	2042.813	3730.047	25575.719	2623498
Average:	0.518	0.377	0.847	18.917	18.326	30.583	242.001	659.721	1101.002	8712.053	409603
Overall *TSPLIB*:	0.555	0.745	1.601	21.710	25.873	35.974	210.343	931.412	1295.069	7572.363	1166310
Varied overlap ratios											
team1_100	0.469	0.141	0.313	5.828	4.957	4.671	35.910	178.453	168.156	1292.766	913
team2_200	0.273	0.203	0.633	9.172	7.964	9.983	58.829	286.687	359.391	2117.860	34768
team3_300	0.422	0.375	1.110	14.953	15.374	24.316	94.165	553.453	875.359	3389.922	69823
team4_400	0.407	0.656	1.430	32.235	20.480	27.001	148.208	737.297	972.031	5335.484	276264
team5_499	0.750	1.390	2.617	42.688	39.633	38.312	209.362	1426.782	1379.235	7537.016	396631
team6_500	0.539	0.391	1.086	19.438	24.265	38.863	259.873	873.531	1399.079	9355.438	196027
bonus1000	1.313	0.922	4.852	82.578	80.163	131.711	807.425	2885.859	4741.609	29067.296	2648762
Average:	0.596	0.583	1.720	29.556	27.548	39.265	230.539	991.723	1413.551	8299.397	517598
concentricCircles1	0.008	0.047	0.055	0.359	0.675	0.406	3.613	24.290	14.625	130.078	123
concentricCircles2	0.016	0.070	0.117	0.649	1.437	0.910	6.532	51.719	32.774	235.156	169
concentricCircles3	0.040	0.141	0.125	2.156	1.984	1.852	12.546	71.438	66.657	451.656	372
concentricCircles4	0.070	0.219	0.274	2.047	3.397	3.331	20.915	122.297	119.907	752.922	4468
concentricCircles5	0.110	0.422	0.719	3.196	6.081	5.487	32.332	218.898	197.547	1163.937	22031
Average:	0.049	0.180	0.258	1.681	2.715	2.397	15.187	97.728	86.302	546.750	1166310
bubbles1	0.016	0.078	0.086	0.453	1.248	0.761	6.279	44.930	27.399	226.031	95
bubbles2	0.047	0.102	2.657	4.297	3.784	2.495	20.367	136.235	89.836	733.219	64
bubbles3	0.102	0.203	1.071	20.407	9.987	6.640	58.925	359.547	239.055	2121.297	471
bubbles4	0.180	0.297	0.774	28.164	12.839	10.619	80.148	462.211	382.282	2885.313	23414
bubbles5	0.305	0.657	4.125	21.243	13.521	18.128	123.218	486.766	652.609	4435.844	6085
bubbles6	0.383	0.727	1.360	24.961	17.160	24.248	151.103	617.766	872.930	5439.703	24657
bubbles7	0.523	0.922	2.235	36.610	40.342	36.890	244.849	1452.297	1328.032	8814.547	34295
bubbles8	0.742	1.000	2.938	55.406	55.832	50.410	337.529	2009.940	1814.774	12151.047	100462
bubbles9	1.000	1.422	5.727	69.102	77.464	71.502	475.316	2788.711	2574.071	17111.391	304348
Average:	0.366	0.601	2.330	28.960	25.798	24.633	166.415	928.711	886.776	5990.932	54877
rotatingDiamonds1	0.008	0.039	0.047	0.485	0.490	0.349	4.638	17.649	12.578	166.984	24
rotatingDiamonds2	0.039	0.110	0.141	2.313	2.097	1.202	14.137	75.508	43.281	508.922	368
rotatingDiamonds3	0.110	0.414	0.500	5.016	6.525	3.871	43.564	234.891	139.344	1568.312	16407
rotatingDiamonds4	0.227	0.879	1.008	9.219	15.837	7.537	85.125	570.125	271.344	3064.516	49045
rotatingDiamonds5	0.641	2.133	2.688	27.555	57.178	39.802	301.155	2058.391	1432.866	10841.579	210899
Average:	0.205	0.715	0.877	8.917	16.425	10.552	89.724	591.313	379.883	3230.063	55349
chaoSingleDep	0.250	0.227	0.415	5.422	8.058	7.792	69.537	290.079	280.516	2503.344	43743
GEOMETRIC **Average:**	0.241	0.505	1.353	15.953	16.797	14.712	104.591	604.684	529.621	3765.290	42077
Overall Average:	0.430	0.621	1.515	20.455	22.335	27.595	169.225	804.071	993.411	6092.108	603276

4.6.2 CEVRP Heuristics

We coded 15 SZH heuristics for comparison purposes including one heuristic described in Chapter 3, SZVRP3. SZVRP3 is included because it had one of the best average performance rankings of the eight heuristics tested in Chapter 3. We coded 14 new heuristics: eight Phase IV heuristics, four MAH heuristics, and two Phase IV + MAH heuristics. SZVRP1$_{50-59}$, SZVRP2$_{50-59}$, SZVRP3$_{50-59}$, SZVRP4$_{50-59}$ are MAH heuristics. They are the same as SZVRP1, SZVRP2, SZVRP3, and SZVRP4 except that they are run 10 times, for ang_{LB} equal to each integer value in [50°, 59°]. We chose this range because it performed best of all 10° ranges for the CETSP. SZVRPk_t and SZVRPk_v are Phase IV heuristics for SZVRP1, SZVRP2, SZVRP3, SZVRP4. t indicates that TSP-based Phase IV is applied. v indicates that VRP-based Phase IV is applied. SZVRP2$_{t\ 50-59}$ and SZVRP3$_{t\ 50-59}$ are two Phase IV + MAH heuristics. The variants of SZVRP1 and SZVRP2 that apply Phase IV solve Phase III to optimality. SZVRP1 and SZVRP2 without Phase IV apply the IP$_{PhIII}$ heuristic to solve Phase III, but as noted earlier, IP$_{PhIII}$ cannot be used to solve Phase IV.

In order to fit the CEVRP results into presentable tables, we use "SZV" for "SZVRP" in Tables 4.6 - 4.8.

Table 4.6: Tour lengths for 15 heuristics on 48 CEVRP problems with equal radius and 2D Euclidean norm

	$SZV3_{t\ 50-59}$	$SZV3_t$	$SZV4_t$	$SZV4_v$	$SZV3_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	SZV3	$SZV2_v$	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
Overlap ratio: 0.02															
kroD100	380.64	380.05	380.04	380.20	380.58	380.64	377.80	**377.74**	380.99	380.30	380.58	380.62	379.63	379.75	380.55
rat195	295.38	298.71	**294.35**	294.76	298.31	298.49	298.50	297.20	299.18	299.18	300.23	300.89	317.40	317.15	321.16
lin318	5035.00	**5029.09**	5052.41	5084.56	5062.40	5037.08	5029.41	5039.42	5052.39	**5029.09**	5073.01	5070.03	5295.05	5386.04	5436.14
rd400	1208.21	1211.20	**1199.49**	1209.26	1214.55	1208.21	1208.56	1215.08	1215.08	1211.20	1225.14	1223.37	1332.58	1355.36	1372.78
pcb442	**524.21**	527.04	524.52	529.67	528.82	**524.21**	524.51	528.35	527.91	527.37	528.26	529.66	569.65	558.56	567.90
d493	**830.14**	831.60	833.44	832.90	833.09	832.13	832.44	831.93	833.99	836.30	834.77	838.72	849.97	847.00	853.85
dsj1000	**1431.61**	1436.79	1442.47	1468.88	1470.03	1434.85	1451.03	1473.37	1460.85	1437.60	1481.62	1481.39	1513.93	1488.55	1538.87
Overlap ratio: 0.1															
kroD100	**305.50**	309.24	308.21	311.26	308.24	321.33	324.24	324.24	323.00	331.39	332.54	332.13	328.20	333.30	336.23
rat195	**231.29**	236.20	237.01	237.12	238.70	238.74	237.56	238.70	239.82	247.54	248.09	248.44	243.28	248.98	249.58
lin318	**3923.49**	4036.70	4035.26	4041.42	4030.86	4062.32	4049.43	4089.56	4101.97	4181.35	4231.94	4211.38	4173.92	4204.71	4228.97
rd400	**793.20**	799.01	809.85	795.70	805.34	**793.20**	805.66	818.34	819.89	810.23	833.36	833.23	833.30	801.12	829.14
pcb442	407.49	410.83	407.79	413.86	**406.13**	417.62	408.48	417.79	421.43	424.48	430.34	427.43	427.74	431.64	435.69
d493	737.05	**735.23**	741.87	739.18	740.69	744.63	747.04	747.04	748.24	755.19	757.91	755.32	750.49	772.21	774.40
dsj1000	988.69	999.87	987.94	**987.81**	990.06	998.46	1007.10	1011.34	1011.34	1037.68	1064.47	1042.24	1019.99	1038.63	1043.37
Overlap ratio: 0.3															
kroD100	**179.40**	182.88	182.88	182.88	182.88	191.64	193.42	193.42	193.42	182.88	183.89	182.88	193.43	182.88	182.88
rat195	147.55	**136.80**	137.14	138.95	138.95	164.24	164.24	164.24	164.24	138.95	140.59	138.95	164.24	138.95	138.95
lin318	**2611.83**	2763.65	2683.93	2646.35	2646.35	2773.19	2789.52	2789.52	2789.52	2872.46	2966.33	2872.46	2789.52	2872.46	2872.46
rd400	504.20	515.62	509.19	**488.24**	501.47	507.92	510.31	510.31	510.31	542.11	558.85	542.23	517.54	542.11	542.23
pcb442	291.29	283.17	283.22	284.78	**273.22**	320.44	322.33	322.33	322.33	285.47	285.73	285.47	322.79	285.47	285.47
d493	**557.38**	561.85	561.40	559.55	559.43	568.53	570.85	570.85	570.85	578.03	580.03	578.28	570.85	578.03	578.28
dsj1000	**561.46**	613.87	613.87	614.08	614.08	580.84	582.77	582.77	582.77	613.87	614.63	614.08	583.43	613.87	614.08
Varied overlap ratios															
team1_100	1314.45	**1304.33**	1309.23	1331.60	1337.72	1412.30	1420.39	1420.39	1420.39	1445.03	1447.69	1446.58	1439.54	1474.55	1475.91
team2_200	**541.80**	562.81	576.58	554.00	569.71	580.77	583.97	583.97	588.55	651.01	672.20	659.55	603.51	655.25	659.55
team3_300	**1009.83**	1033.82	1031.44	1034.28	1016.50	1010.80	1020.96	1020.96	1020.96	1040.54	1064.96	1057.90	1040.75	1057.36	1078.43
team4_400	1352.72	1351.03	**1332.06**	1360.33	1372.30	1357.50	1345.14	1354.11	1376.00	1351.03	1375.55	1372.30	1408.10	1401.01	1433.23
team5_499	**1070.61**	1074.53	1073.68	1078.35	1078.02	1067.16	1066.99	1076.91	1075.67	1076.03	1085.04	1083.38	1119.60	1122.74	1137.08
team6_500	**654.46**	663.36	677.43	660.74	671.03	682.42	693.80	693.80	693.80	700.91	704.53	703.50	704.07	700.91	703.50
bonus1000	1377.68	1407.34	1410.29	1401.99	**1358.41**	1386.04	1377.63	1391.97	1392.56	1431.52	1431.15	1439.61	1399.27	1435.18	1446.71
concentricCircles1	**82.72**	**82.72**	**82.72**	83.42	83.42	90.51	90.96	90.96	90.96	90.51	90.96	90.53	91.68	91.50	91.51
concentricCircles2	**208.69**	**208.69**	209.97	210.26	210.33	210.53	212.12	211.92	212.44	210.53	211.92	212.41	215.04	213.51	214.76
concentricCircles3	396.45	396.45	404.40	396.85	**394.26**	401.72	401.83	402.15	402.53	401.72	403.49	402.41	424.70	422.60	424.25
concentricCircles4	623.57	623.57	627.86	622.92	626.58	639.72	**613.04**	625.19	641.67	639.72	613.73	641.10	726.14	719.51	725.76
concentricCircles5	817.90	817.90	820.15	820.80	823.39	823.32	831.43	818.25	835.89	823.32	**816.31**	835.89	931.90	899.03	902.18
bubbles1	525.58	534.37	534.37	534.37	534.37	**525.56**	525.57	525.57	**525.56**	530.03	534.37	530.03	525.58	534.37	534.37
bubbles2	496.53	**495.13**	**495.13**	497.40	497.40	496.53	498.38	498.38	498.38	**495.13**	497.40	497.40	501.44	**495.13**	499.94
bubbles3	**997.96**	1054.35	1074.85	1063.67	1069.99	1001.29	1057.65	1058.29	1059.39	1064.48	1070.12	1070.03	1182.35	1169.74	1171.12

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	$SZV3_{t\ 50-59}$	$SZV3_t$	$SZV4_t$	$SZV4_v$	$SZV3_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	SZV3	$SZV2_v$	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
bubbles4	**1517.62**	1531.17	1535.84	1564.13	1545.25	1524.17	1530.59	1526.94	1535.21	1579.62	1575.19	1593.01	1685.53	1668.72	1690.67
bubbles5	**1873.66**	1911.14	1905.99	1933.27	1949.51	1919.45	1922.17	1912.03	1926.03	1949.93	1955.41	1958.87	2065.65	2075.60	2102.05
bubbles6	**1840.30**	1893.66	1927.99	1943.79	1937.51	1877.09	1862.32	1885.51	1908.71	1950.21	1932.52	1964.97	2079.07	2118.29	2164.17
bubbles7	**1983.55**	1995.30	1993.58	2037.05	2069.03	1994.37	2039.33	2023.36	2015.47	2073.05	2027.34	2167.71	2203.14	2243.75	2304.09
bubbles8	**2935.03**	3027.83	2990.21	3045.82	3062.86	2951.62	3036.85	3015.02	3022.67	3072.50	3074.93	3096.77	3359.35	3421.98	3480.06
bubbles9	**3286.47**	3366.56	3368.34	3362.11	3418.62	3313.50	3388.14	3380.25	3380.43	3468.57	3361.37	3479.25	3711.87	3921.55	4008.15
rotatingDiamonds1	**43.55**	46.63	46.63	46.63	46.63	45.25	45.25	45.25	45.25	46.63	46.63	46.63	45.25	46.63	46.63
rotatingDiamonds2	**201.18**	202.78	202.78	202.66	202.66	204.21	204.35	204.35	204.35	203.99	202.78	204.40	206.64	204.31	204.36
rotatingDiamonds3	641.10	642.27	634.64	633.82	641.79	641.19	**632.53**	638.19	641.99	642.27	634.80	642.39	667.53	667.27	668.15
rotatingDiamonds4	**870.04**	872.98	872.98	873.37	873.37	872.06	873.34	873.34	874.13	873.03	873.40	873.40	947.83	950.00	950.93
rotatingDiamonds5	**1788.72**	1793.10	1794.43	1795.22	1790.39	1791.64	1791.76	1793.51	1793.51	1795.87	1795.65	1796.56	1802.29	1798.30	1799.80
chaoSingleDep	1143.40	**1143.39**	**1143.39**	1143.40	1143.40	1143.40	1143.43	1143.43	1143.43	**1143.39**	1143.51	1143.50	1143.73	1143.40	1143.50

In Table 4.6, we present the results for the 15 heuristics on the 48 CEVRP problems with equal radius and 2D Euclidean norm. We see that $\text{SZV3}_{t\ 50-59}$ produces 28 best solutions, SZV3_t produces eight best solutions, and SZV4_t produces six best solutions.

In Table 4.7, we give the average deviation (as a percentage) from the best solution in Table 4.6 for each problem. $\text{SZV3}_{t\ 50-59}$ averages less than 1% deviation for every category of 48 problems and has an overall average deviation of 0.59%. In Chapter 3, we saw that SZV3 had the best overall average deviation of 3.02%. This represents a substantial improvement in accuracy. All heuristics except for variants of SZVRP1 average less than 5% deviation. SZVRP1 variants average over 7% deviation.

For each of the SZVRPk Phase IV variants, TSP-based Phase IV produced better average deviations than VRP-based Phase IV. For example, SZV2_t averages 4.09% deviation and SZV3_v averages 4.74%. The differences are not large but are consistent. As k grows from 1 to 4, the difference in average deviation between $\text{SZVRP}k_t$ and $\text{SZVRP}k_v$ shrinks suggesting that the quality of the Phase II VRP solver affects the performance of the VRP-based Phase IV methods more than it affects the quality of TSP-based Phase IV methods.

Table 4.7: Percentage deviation from the best solution for 15 heuristics on 48 CEVRP problems with equal radius and 2D Euclidean norm

	$SZV3_{t\ 50-59}$	$SZV3_t$	$SZV4_t$	$SZV4_v$	$SZV3_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	SZV3	$SZV2_v$	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
Overlap ratio: 0.02															
kroD100	0.77	0.61	0.61	0.65	0.75	0.77	0.02	0.00	0.86	0.68	0.75	0.76	0.50	0.53	0.74
rat195	0.35	1.48	0.00	0.14	1.35	1.41	1.41	0.97	1.64	1.64	2.00	2.22	7.83	7.75	9.11
lin318	0.12	0.00	0.46	1.10	0.66	0.16	0.01	0.21	0.46	0.00	0.87	0.81	5.29	7.10	8.09
rd400	0.73	0.98	0.00	0.81	1.26	0.73	0.76	1.30	1.30	0.98	2.14	1.99	11.10	13.00	14.45
pcb442	0.00	0.54	0.06	1.04	0.88	0.00	0.06	0.79	0.71	0.60	0.77	1.04	8.67	6.55	8.33
d493	0.00	0.18	0.40	0.33	0.36	0.24	0.28	0.22	0.46	0.74	0.56	1.03	2.39	2.03	2.86
dsj1000	0.00	0.36	0.76	2.60	2.68	0.23	1.36	2.92	2.04	0.42	3.49	3.48	5.75	3.98	7.49
Average:	0.28	0.59	0.33	0.96	1.13	0.50	0.55	0.91	1.07	0.72	1.51	1.62	5.93	5.85	7.30
Overlap ratio: 0.1															
kroD100	0.00	1.23	0.89	1.89	0.90	5.18	6.13	6.13	5.73	8.48	8.85	8.72	7.43	9.10	10.06
rat195	0.00	2.12	2.47	2.52	3.20	3.22	2.71	3.21	3.69	7.03	7.26	7.42	5.19	7.65	7.91
lin318	0.00	2.89	2.85	3.01	2.74	3.54	3.21	4.23	4.55	6.57	7.86	7.34	6.38	7.17	7.79
rd400	0.00	0.73	2.10	0.32	1.53	0.00	1.57	3.17	3.36	2.15	5.06	5.05	5.06	1.00	4.53
pcb442	0.33	1.16	0.41	1.90	0.00	2.83	0.58	2.87	3.77	4.52	5.96	5.24	5.32	6.28	7.28
d493	0.25	0.00	0.90	0.54	0.74	1.28	1.61	1.61	1.77	2.71	3.08	2.73	2.08	5.03	5.33
dsj1000	0.09	1.22	0.01	0.00	0.23	1.08	1.95	2.38	2.38	5.05	7.76	5.51	3.26	5.15	5.63
Average:	0.10	1.33	1.38	1.45	1.33	2.45	2.54	3.37	3.61	5.22	6.55	6.00	4.96	5.91	6.93
Overlap ratio: 0.3															
kroD100	0.00	1.94	1.94	1.94	1.94	6.82	7.81	7.81	7.81	1.94	2.50	1.94	7.82	1.94	1.94
rat195	7.85	0.00	0.25	1.57	1.57	20.06	20.06	20.06	20.06	1.57	2.76	1.57	20.06	1.57	1.57
lin318	0.00	5.81	2.76	1.32	1.32	6.18	6.80	6.80	6.80	9.98	13.57	9.98	6.80	9.98	9.98
rd400	3.27	5.61	4.29	0.00	2.71	4.03	4.52	4.52	4.52	11.03	14.46	11.06	6.00	11.03	11.06
pcb442	6.61	3.64	3.66	4.23	0.00	17.29	17.98	17.98	17.98	4.48	4.58	4.48	18.14	4.48	4.48
d493	0.00	0.80	0.72	0.39	0.37	2.00	2.42	2.42	2.42	3.71	4.06	3.75	2.42	3.71	3.75
dsj1000	0.00	9.33	9.33	9.37	9.37	3.45	3.79	3.79	3.79	9.33	9.47	9.37	3.91	9.33	9.37
Average:	2.53	3.88	3.28	2.69	2.47	8.55	9.05	9.05	9.05	6.01	7.35	6.02	9.31	6.01	6.02
TSPLIB **Average:**	0.97	1.93	1.66	1.70	1.65	3.83	4.05	4.45	4.58	3.98	5.14	4.55	6.73	5.92	6.75
Varied overlap ratios															
team1_100	0.78	0.00	0.38	2.09	2.56	8.28	8.90	8.90	8.90	10.79	10.99	10.91	10.37	13.05	13.15
team2_200	0.00	3.88	6.42	2.25	5.15	7.19	7.78	7.78	8.63	20.16	24.07	21.73	11.39	20.94	21.73
team3_300	0.00	2.38	2.14	2.42	0.66	0.10	1.10	1.10	1.10	3.04	5.46	4.76	3.06	4.71	6.79
team4_400	1.55	1.42	0.00	2.12	3.02	1.91	0.98	1.65	3.30	1.42	3.26	3.02	5.71	5.18	7.59
team5_499	0.00	0.81	0.73	1.17	1.14	0.12	0.10	1.03	0.92	0.95	1.80	1.64	5.04	5.33	6.68
team6_500	0.00	1.36	3.51	0.96	2.53	4.27	6.01	6.01	6.01	7.10	7.65	7.49	7.58	7.10	7.49
bonus1000	1.42	3.60	3.82	3.21	0.00	2.03	1.41	2.47	2.51	5.38	5.35	5.98	3.01	5.65	6.50
Average:	0.54	1.86	2.36	1.97	2.09	3.35	3.69	4.07	4.42	6.91	8.30	7.87	6.53	8.78	9.93
concentricCircles1	0.00	0.00	0.00	0.85	0.85	9.42	9.96	9.96	9.96	9.42	9.96	9.45	10.83	10.61	10.62
concentricCircles2	0.00	0.00	0.62	0.75	0.79	0.88	1.65	1.55	1.80	0.88	1.55	1.79	3.05	2.31	2.91

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	$SZV3_{t\ 50-59}$	$SZV3_t$	$SZV4_t$	$SZV4_v$	$SZV3_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	SZV3	$SZV2_v$	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
concentricCircles3	0.56	0.56	2.57	0.66	0.00	1.89	1.92	2.00	2.10	1.89	2.34	2.07	7.72	7.19	7.61
concentricCircles4	1.72	1.72	2.42	1.61	2.21	4.35	0.00	1.98	4.67	4.35	0.11	4.58	18.45	17.37	18.39
concentricCircles5	0.19	0.19	0.47	0.55	0.87	0.86	1.85	0.24	2.40	0.86	0.00	2.40	14.16	10.13	10.52
Average:	0.49	0.49	1.22	0.88	0.94	3.48	3.08	3.15	4.18	3.48	2.79	4.05	10.84	9.52	10.01
bubbles1	0.00	1.68	1.68	1.68	1.68	0.00	0.00	0.00	0.00	0.85	1.68	0.85	0.00	1.68	1.68
bubbles2	0.28	0.00	0.00	0.46	0.46	0.28	0.66	0.66	0.66	0.00	0.46	0.46	1.27	0.00	0.97
bubbles3	0.00	5.65	7.70	6.58	7.22	0.33	5.98	6.05	6.15	6.66	7.23	7.22	18.48	17.21	17.35
bubbles4	0.00	0.89	1.20	3.06	1.82	0.43	0.85	0.61	1.16	4.09	3.79	4.97	11.06	9.96	11.40
bubbles5	0.00	2.00	1.73	3.18	4.05	2.44	2.59	2.05	2.79	4.07	4.36	4.55	10.25	10.78	12.19
bubbles6	0.00	2.90	4.76	5.62	5.28	2.00	1.20	2.46	3.72	5.97	5.01	6.77	12.97	15.11	17.60
bubbles7	0.00	0.59	0.51	2.70	4.31	0.55	2.81	2.01	1.61	4.51	2.21	9.28	11.07	13.12	16.16
bubbles8	0.00	3.16	1.88	3.77	4.36	0.57	3.47	2.73	2.99	4.68	4.77	5.51	14.46	16.59	18.57
bubbles9	0.00	2.44	2.49	2.30	4.02	0.82	3.09	2.85	2.86	5.54	2.28	5.87	12.94	19.32	21.96
Average:	0.03	2.15	2.44	3.26	3.69	0.82	2.29	2.16	2.44	4.04	3.53	5.05	10.28	11.53	13.10
rotatingDiamonds1	0.00	7.07	7.07	7.07	7.07	3.90	3.90	3.90	3.90	7.07	7.07	7.07	3.90	7.07	7.07
rotatingDiamonds2	0.00	0.80	0.80	0.74	0.74	1.51	1.58	1.58	1.58	1.40	0.80	1.60	2.71	1.56	1.58
rotatingDiamonds3	1.35	1.54	0.33	0.20	1.46	1.37	0.00	0.89	1.49	1.54	0.36	1.56	5.53	5.49	5.63
rotatingDiamonds4	0.00	0.34	0.34	0.38	0.38	0.23	0.38	0.38	0.47	0.34	0.39	0.39	8.94	9.19	9.30
rotatingDiamonds5	0.00	0.24	0.32	0.36	0.09	0.16	0.17	0.27	0.27	0.40	0.39	0.44	0.76	0.54	0.62
Average:	0.27	2.00	1.77	1.75	1.95	1.43	1.21	1.40	1.54	2.15	1.80	2.21	4.37	4.77	4.84
chaoSingleDep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.00	0.01
GEOMETRIC **Average:**	0.29	1.66	1.98	2.09	2.31	2.05	2.52	2.62	3.02	4.18	4.18	4.88	8.25	9.11	10.04
Overall Average:	0.59	1.78	1.84	1.92	2.02	2.83	3.19	3.42	3.70	4.09	4.60	4.74	7.59	7.72	8.60

In Table 4.8, we give the computation times for the 15 heuristics. We see that eight methods need less than 100 CPU seconds on average to solve the test problems. $\text{SZV3}_{t\ 50-59}$ requires almost 1500 seconds to solve a problem. Variants of SZV1 and SZV2 are generally faster than variants of SZV3 and SZV4. This is consistent with the results in Chapter 3. For each k from 1 to 4, $\text{SZV}k_v$ is faster than $\text{SZV}k_t$. As k increases, the gap in computation time decreases. For example, SZV1_v is almost four times faster than SZV1_t, but SZV4_v is only twice as fast as SZV4_t. This decrease is not as substantial as the reduction for average deviations given in Table 4.7.

If we consider the column orderings in Tables 4.7 and 4.8 to be performance rankings, then SZV3_t is the best heuristic with an average rank of 5.5 followed by SZV3_v with an average rank of 6.5.

Table 4.8: Computation time (CPU seconds) for 15 heuristics on 48 CEVRP problems with equal radius and 2D Euclidean norm

	$SZV1_v$	$SZV1_{50-59}$	$SZV2_v$	$SZV1_t$	SZV3	$SZV2_t$	$SZV2_{50-59}$	$SZV3_v$	$SZV3_t$	$SZV2_{t\ 50-59}$	$SZV3_{50-59}$	$SZV4_v$	$SZV4_t$	$SZV4_{50-59}$	$SZV3_{t\ 50-59}$
Overlap ratio: 0.02															
kroD100	1.406	4.282	11.641	2.953	45.859	13.453	72.187	27.531	40.468	93.485	379.219	163.687	163.782	617.063	448.140
rat195	2.703	8.265	28.125	9.937	100.125	34.688	165.938	82.485	100.843	222.515	1175.797	635.797	591.875	1970.218	1020.046
lin318	3.922	11.860	29.265	28.094	94.781	57.703	201.140	76.140	119.594	311.125	769.813	506.922	623.640	1381.532	1463.985
rd400	6.188	27.688	38.344	26.031	128.531	52.390	250.422	187.516	111.657	355.454	887.453	1860.485	720.172	2229.562	1536.765
pcb442	6.719	21.688	48.453	43.781	183.937	94.750	315.234	169.297	239.203	544.469	1569.828	538.422	819.562	4540.515	2743.610
d493	35.860	125.266	45.407	82.750	144.422	87.594	233.984	380.140	602.406	500.547	1256.015	878.578	1774.859	2011.735	4127.829
dsj1000	13.407	40.313	53.797	118.515	214.375	154.297	342.546	190.860	434.188	931.015	1593.812	974.360	2666.532	4687.469	4533.000
Average:	10.029	34.195	36.433	44.580	130.290	70.696	225.922	159.138	235.480	422.659	1090.277	794.036	1051.489	2491.156	2267.625
Overlap ratio: 0.1															
kroD100	0.875	2.766	1.609	3.078	3.782	3.312	10.532	20.718	34.719	22.188	36.235	31.953	113.297	47.922	286.187
rat195	1.812	3.719	2.453	7.157	5.203	7.859	20.938	46.828	88.297	53.609	75.250	118.515	393.735	122.719	865.391
lin318	2.281	5.313	4.016	11.782	9.422	15.906	27.375	90.844	145.860	99.109	105.922	493.906	379.125	165.797	1184.516
rd400	4.047	6.703	5.625	18.469	15.422	18.578	41.329	91.156	139.484	111.219	142.391	182.172	465.359	238.859	949.609
pcb442	3.969	6.922	5.687	21.516	12.094	22.657	33.656	159.141	291.422	141.844	168.984	592.468	1493.562	267.515	2504.672
d493	11.594	9.047	5.422	21.594	7.390	24.046	27.500	112.125	374.109	130.641	71.516	725.906	1159.032	94.265	2362.297
dsj1000	10.219	13.078	10.907	52.610	13.609	60.078	50.172	396.187	931.390	429.484	132.031	1490.906	2666.250	182.750	5445.171
Average:	4.971	6.793	5.103	19.458	9.560	21.777	30.215	131.000	286.469	141.156	104.618	519.404	952.909	159.975	1942.549
Overlap ratio: 0.3															
kroD100	1.031	2.625	0.781	2.500	1.328	2.235	5.578	11.641	27.453	13.671	7.438	26.281	81.656	7.594	187.141
rat195	5.125	3.797	1.906	6.032	1.906	6.297	4.953	10.532	51.813	34.266	11.546	26.359	93.843	11.860	562.485
lin318	3.593	5.281	3.390	13.391	2.766	14.781	10.250	44.813	101.578	69.312	20.672	159.031	328.469	23.344	983.547
rd400	4.703	6.125	4.047	24.656	4.000	35.219	10.453	80.953	173.922	143.765	27.797	498.015	373.172	31.891	1424.094
pcb442	5.515	7.110	4.953	19.344	3.000	21.407	10.703	105.360	150.328	106.078	23.312	537.625	522.593	25.016	1769.469
d493	4.797	9.031	4.968	22.406	3.562	25.797	11.531	157.453	390.359	133.312	23.625	547.453	980.391	24.890	1772.859
dsj1000	14.140	15.625	15.093	64.937	5.515	75.313	22.078	129.969	412.234	508.391	41.781	610.016	1352.531	43.719	5482.469
Average:	5.558	7.085	5.020	21.895	3.154	25.864	10.792	77.246	186.812	144.114	22.310	343.540	533.236	24.045	1740.295
TSPLIB **Average:**	6.853	16.024	15.519	28.644	47.668	39.446	88.976	122.461	236.254	235.976	405.735	552.327	845.878	891.725	1983.490
Varied overlap ratios															
team1_100	1.203	2.922	2.141	2.422	5.219	3.078	14.125	25.313	34.797	23.422	52.484	59.297	117.813	60.359	253.125
team2_200	1.985	3.719	1.875	6.328	3.562	8.188	10.593	32.813	83.562	41.735	34.750	163.594	214.453	46.469	507.110
team3_300	2.578	5.922	5.797	13.890	15.563	19.172	36.000	60.844	127.078	106.531	139.172	301.797	389.485	229.156	906.219
team4_400	4.453	11.578	12.703	41.031	52.187	46.625	106.062	37.703	118.890	236.937	509.266	155.468	1301.547	1081.641	1687.844
team5_499	10.157	27.188	28.219	55.250	79.110	62.500	169.688	258.672	176.719	357.469	534.563	1101.296	715.344	1111.875	2038.609
team6_500	7.625	7.672	7.094	35.688	3.438	39.360	19.297	85.610	308.844	192.172	32.296	497.078	930.204	36.703	1829.157
bonus1000	11.188	14.000	12.953	46.735	23.125	80.890	62.547	415.594	579.562	402.688	214.078	2392.110	2714.156	305.922	5382.297
Average:	5.598	10.429	10.112	28.763	26.029	37.116	59.759	130.936	204.207	194.422	216.658	667.234	911.857	410.304	1800.623
concentricCircles1	0.532	1.703	0.687	0.640	1.344	0.657	3.953	3.594	3.828	3.969	8.266	2.797	4.047	9.375	29.781
concentricCircles2	0.656	2.125	1.750	1.094	4.125	1.969	8.500	9.344	7.640	12.219	28.984	9.578	7.781	43.500	82.407

...continued on next page

	$SZV1_v$	$SZV1_{50-59}$	$SZV2_v$	$SZV1_t$	SZV3	$SZV2_t$	$SZV2_{50-59}$	$SZV3_v$	$SZV3_t$	$SZV2_{t\ 50-59}$	$SZV3_{50-59}$	$SZV4_v$	$SZV4_t$	$SZV4_{50-59}$	$SZV3_{t\ 50-59}$
concentricCircles3	3.813	2.625	4.047	1.703	13.781	4.703	20.516	16.672	16.125	28.766	80.687	26.593	24.781	99.656	170.297
concentricCircles4	1.109	3.609	7.265	3.453	30.812	9.532	35.671	31.235	35.328	57.937	219.688	102.609	98.703	289.844	400.672
concentricCircles5	9.359	5.328	11.594	6.531	34.671	15.547	56.203	40.375	44.594	89.656	197.453	215.578	137.828	423.735	485.765
Average:	3.094	3.078	5.069	2.684	16.947	6.482	24.969	20.244	21.503	38.509	107.016	71.431	54.628	173.222	233.784
bubbles1	0.640	2.031	1.187	1.016	2.468	1.454	5.953	2.672	4.704	9.703	20.063	3.359	5.515	28.687	45.703
bubbles2	2.266	2.594	3.859	43.031	9.938	16.063	17.484	6.297	20.500	22.937	49.266	7.968	23.000	87.313	115.984
bubbles3	15.312	3.485	8.469	50.891	23.531	31.375	26.516	34.937	56.860	70.235	108.640	64.891	108.563	139.688	299.687
bubbles4	14.937	4.938	11.375	47.359	22.984	19.828	48.141	34.578	37.703	89.734	209.000	51.312	88.219	345.219	415.281
bubbles5	19.828	6.875	15.625	36.656	46.375	61.843	65.453	42.891	138.781	113.484	211.828	179.078	158.781	415.515	1041.984
bubbles6	16.813	8.687	17.391	64.985	39.422	29.188	67.438	43.297	58.859	179.797	307.781	146.438	215.063	735.000	1323.140
bubbles7	7.875	12.031	25.234	61.171	80.079	41.718	154.453	89.109	105.219	307.641	400.234	257.797	519.282	881.984	1489.531
bubbles8	30.047	16.062	38.000	81.110	94.781	75.032	186.141	141.000	128.594	317.781	523.328	226.187	342.171	1041.687	2148.828
bubbles9	23.047	18.734	58.047	121.187	124.719	61.140	180.734	194.484	129.140	407.797	731.625	532.000	520.297	1528.687	2163.375
Average:	14.529	8.382	19.910	56.378	49.366	37.516	83.590	65.474	75.596	168.790	284.641	163.226	220.099	578.198	1004.835
rotatingDiamonds1	0.531	1.719	0.516	0.734	0.984	0.656	8.141	1.797	2.609	4.203	7.859	1.781	2.656	8.766	21.031
rotatingDiamonds2	9.687	2.547	2.578	2.234	6.469	3.406	14.765	7.703	12.516	22.703	54.109	29.000	26.687	80.766	162.516
rotatingDiamonds3	5.000	5.437	11.547	7.703	50.484	15.734	57.750	35.063	38.578	88.109	247.047	180.093	176.453	940.000	409.969
rotatingDiamonds4	3.656	9.531	28.766	14.093	64.797	36.938	113.406	91.188	103.125	189.469	392.453	536.235	366.437	904.656	999.563
rotatingDiamonds5	14.984	25.359	57.547	25.422	250.687	69.390	362.578	204.453	264.157	508.656	1316.782	1172.860	2277.703	73.850	3250.047
Average:	6.772	8.919	20.191	10.037	74.684	25.225	111.328	68.041	84.197	162.628	403.650	383.994	569.987	401.608	968.625
chaoSingleDep	1.703	4.735	4.375	5.953	9.953	8.203	36.735	26.203	33.672	65.609	134.000	49.125	67.187	244.079	377.406
GEOMETRIC **Average:**	8.185	7.895	14.098	28.826	40.541	28.303	69.957	73.090	98.962	146.347	250.582	313.553	427.932	414.597	1038.420
Overall Average:	7.602	11.451	14.719	28.747	43.659	33.178	78.278	94.690	159.027	185.560	318.461	418.016	610.783	623.341	1451.888

4.7 Conclusions

We developed a post-processing phase of the Steiner-zone heuristic, called Phase IV, that systematically replaces Steiner-zones in an attempt to find a better solution with a lower total angle cost. We presented a variant of SZH, called the minimum angle heuristic (MAH), that enforces a lower limit on the total angle of intersection allowed in order for a Steiner zone to be created. Combining the Phase IV post-processor with MAH produced a third variant, $\text{MAH}_{PhaseIV}$. The three heuristics can be applied to both the CETSP and the CEVRP.

We tested all three methods on the same benchmark problems used in Chapters 2 and 3. We found that the Phase IV post-processor and $\text{MAH}_{PhaseIV}$ improved the accuracy of SZH. Applying MAH or $\text{MAH}_{PhaseIV}$ for a range of only 10° increased the computation time a reasonable amount, as did applying only Phase IV. Methods that previously found better tours than SZH for certain classes of problems (GTSP2, LK-SOCP, CW-SOCP) are now either not as good as or do not consistently outperform SZH.

We applied these our heuristics to the same problems using the Manhattan norm and found similar results (see Appendix A). In future work, we will develop cooperative parallel methods using SZH to solve the CETSP and CEVRP.

Chapter 5

The Sequence-Dependent Team Orienteering Problem

5.1 Introduction

The classical Vehicle Routing Problem (VRP) is one of the most well-studied problems in the operations research literature due to its very practical nature. Given a depot and a set of n nodes, k vehicles must visit all nodes in the cheapest (usually distance or time) manner such that each node is visited exactly once and the vehicles begin and end their routes at the depot. Additional constraints such as time limits and minimum delivery amounts can be imposed to make the VRP useful in practice. Orienteering problems are part of a group of VRP variants known as profit-maximizing VRPs (see Feillet et al. [35]). In the sport of orienteering, a person is given a set of locations to visit such that at every point visited, the participant receives a certain reward or profit. There is a time limit, so not all points can be visited. When the participant is part of a team, more points can be visited in the same amount of time and thus a larger profit obtained. Substituting vehicles for team members, we have the Orienteering Problem (OP) and the Team Orienteering Problem (TOP).

A related problem is called the Linear Ordering Problem (LOP). We are given a set of n nodes and a profit matrix P, such that p_{ij} is the profit received for ordering i before j. In the LOP, we order the set of n nodes such that the sum of p_{ij} over i

and j is maximized.

We present a new combinatorial optimization problem with practical application that is related to the VRP, TOP, and LOP. Given a profit matrix, P, where p_{ij} is the profit received for visiting i before j, the Sequence-Dependent Orienteering Problem (SDOP) and the Sequence-Dependent Team Orienteering Problem (SD-TOP) are orienteering problems in which the profit for visiting node i is dependent on the entire ordered sequence of visited nodes. For all visited nodes, h, preceding i, there is a profit p_{hi}, and for all visited nodes, j, following i, there is a profit of p_{ij}. There is an element of bin-packing in this problem since we want to visit as many nodes as possible in order to increase the total profit.

In order to evaluate the objective function, we combine all routes into one meta-route. The meta-route is the list of all visited nodes sequenced by arrival time, from first to last. Making small changes in the sequence of nodes, such as switching the order of two nodes, can cause large changes in the objective function. Similarly, switching a node from one vehicle to another can cause large changes to the ordered sequence, which in turn can cause large changes in the objective function. Unvisited nodes are not counted in the objective function. In the remainder of the paper, we refer to team members as vehicles and call both the single-vehicle and multiple-vehicle versions of the problem the SDTOP.

For example, consider the 10-node problem whose P is given in Table 5.1. There are two homogeneous vehicles, one depot, d, and the current routes are:

- Route 1: d-1-4-5-d

Table 5.1: Example profit matrix

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	0	4	9	3	1	10	7	6	1	5
2	2	0	3	1	8	5	1	5	3	7
3	0	6	0	7	1	5	6	3	1	2
4	1	10	7	0	5	1	3	1	2	3
5	10	9	1	2	0	0	6	10	3	8
6	7	6	9	8	3	0	2	8	2	2
7	4	10	9	6	8	7	0	4	1	9
8	7	3	7	10	0	4	6	0	8	4
9	4	7	8	4	2	4	9	7	0	2
10	5	5	3	3	9	6	8	8	8	0

- Route 2: d-9-2-6-7-d.

To evaluate the objective function, we combine the routes into one meta-route:

- Meta-route: d-1-9-2-6-7-4-5-d.

Summing all p_{ij} in the meta-route, for i preceding j, we obtain an objective function value of 101. Suppose that node 4 is moved from its current position in route 1 and placed after node 5 in the same route. This change results in the set of routes and meta-route:

- Route 1: d-1-5-4-d
- Route 2: d-9-2-6-7-d
- Meta-route: d-1-9-5-2-4-6-7-d.

Evaluating the meta-route, the objective function value is now 75, approximately 25% less than before, even though we have made only one, intra-route move. This kind of disproportionate change in objective function value for a small change in the routes is atypical in the classical VRP or OP but is commonplace in the SDTOP. The change in objective function value is amplified as the problem size grows.

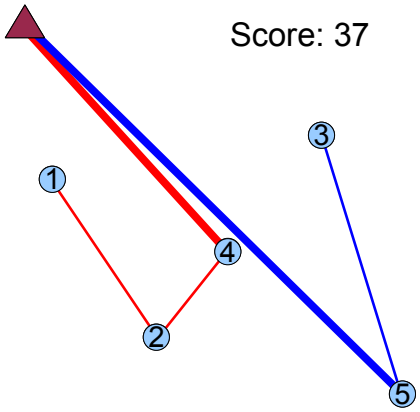
Table 5.2: Profit matrix for Figure 5.1

	1	**2**	**3**	**4**	**5**
1	0	-2	8	2	-9
2	2	0	3	-1	-6
3	-8	-3	0	13	-14
4	-2	1	-13	0	9
5	9	6	14	-9	0

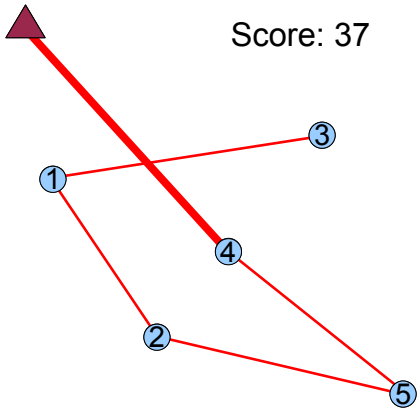
In Figure 5.1 and Table 5.2, we illustrate how the presence of additional vehicles does not guarantee a larger objective function. For two vehicles, the optimal ordering is $4-5-2-1-3$. Thus, we add $(p_{42}+p_{45}+p_{41}+p_{43})+(p_{52}+p_{51}+p_{53})+(p_{21}+p_{23})+(p_{13})=37$. For three vehicles, the optimal ordering is 4-2-5-1-3. Subtracting p_{52} from 37 and adding in p_{25}, we get 27. In general, if it is not true that $p_{ij}=-p_{ji}$ for all i and j and each row of P has at least some positive values, then if the optimal solution for k vehicles leaves at least one node unvisited, it is likely that the optimal solution for $k+1$ vehicles will have a better objective function value than that of the k-vehicle solution. If all nodes are visited in a k-vehicle solution, then the $k+1$-vehicle solution may or may not produce a better objective function value. This is true for any P.

When matrix P is replaced by a vector p whose i^{th} component, p_i, represents the profit for visiting node i, SDTOP becomes the TOP. When one vehicle has enough capacity and there is no maximum tour length, SDTOP reduces to the LOP.

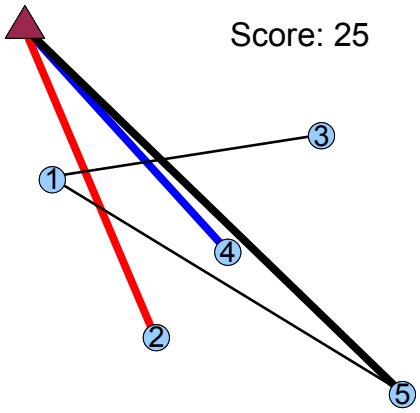
The SDTOP can be applied to problems in aerial reconnaissance. Given a set of potential targets to observe and limited resources such that all targets may not be visited, there may be a different benefit for visiting target i before target j than for



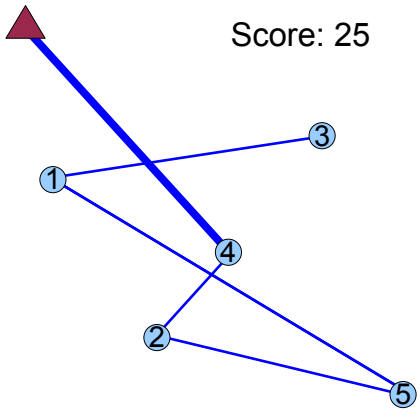
(a) Optimal solution with two vehicles required



(b) Meta-route for solution in (a)



(c) Optimal solution with three vehicles required



(d) Meta-route for (c)

Figure 5.1: More vehicles do not necessarily produce better objective function values. The triangle is the depot. Edges departing the depot are thicker than others. Edges returning to the depot are not shown.

visiting j before i. The intelligence available at target j may be much less valuable if j is observed after target i [56, 59].

In the rest of this chapter, we review the literature relevant to orienteering problems. We formulate the SDTOP as a mixed-integer program. We develop a record-to-record (RTR) travel algorithm to solve the SDTOP which can handle additional side constraints. We test our algorithm on many problem instances and find that our algorithm produces high-quality solutions.

5.2 Literature Review

Many authors discuss problems similar to the SDTOP. O'Rourke et al., Richards et al., Shetty et al., Moser, and Porto [56, 59, 64, 54, 58], described below, study variants of the unmanned aerial vehicle (UAV) routing problem in which target priorities are important. These articles collectively demonstrate that it is reasonable to model the UAV routing problem letting the objective function determine the order in which targets are visited based on pairwise priorities.

O'Rourke et al. [56] use a tabu search algorithm to dynamically route UAVs. They suggest a possible modification of their problem in which a priority scheme is added to the targets. They state that, in some cases, a subsequence of targets to visit may be fixed so that a consecutive image pass of these targets can be made.

Richards et al. [59] study a UAV routing problem that couples task allocation and trajectory planning. They allow for pairwise time dependencies, where target i must be visited after target j.

Shetty et al. [64] solve a static UAV routing problem with a heterogeneous fleet. That is, the targets are determined beforehand and do not change during the mission. They maximize the total weighted service (amount of bombs dropped) to the targets subject to service level bounds, capacities (a UAV's bomb payload), and distances. The service weights are based on predetermined priorities.

Moser [54] discusses the scheduling and routing of tactical aerial reconnaissance vehicles where each target is assigned a priority designation of highest, high, routine, etc. (using equivalent nonnegative integer values). He formulates the problem as an orienteering problem in which the total benefit to the route planners (the total sum of priorities) is maximized.

Porto [58] describes a UAV routing problem where targets must be re-imaged a certain number of times. Each target is given a priority level. A weighted combination of a target's priority level and the size of its area represents the target's value. The cumulative value is maximized using evolutionary programming. In his model, individual UAV routes cannot be evaluated independently. Routes are aggregated into a single solution for evaluation.

The problem in the literature most similar to the SDTOP is the Target Visitation Problem (TVP), a bi-objective problem introduced by Grundel and Jeffcoat [41]. The TVP can be thought of as an LOP with a second objective of minimizing tour length. That is, a single vehicle visits all n nodes, trying to minimize distance and simultaneously maximizing profit. Profit is defined as in the LOP and SDTOP; a profit p_{ij} is received if i is visited before j. The total profit is the sum of all pairwise profits.

Grundel and Jeffcoat's work was not meant to be a thorough computational study but rather an introduction to the problem. They consider a one-vehicle version of the problem and provide a simple Greedy Randomized Adaptive Search Procedure (GRASP) to solve the TVP. GRASP works by constructing a number of feasible solutions in two phases. In the constructive phase, solutions are built node by node, randomly selecting each node from an ordered candidate list. In the local optimization phase, heuristics such as 2-OPT are used to find a local optimum for each solution. The final solution is the best local optimum. Grundel and Jeffcoat use their heuristic to compare TVP objective function values with pure TSP and pure LOP versions for each test problem.

Arulsevan et al. [10] [9] present two random-keys genetic algorithms (GAs) to solve small instances of the TVP. Random-keys is a method of encoding TSP tours as chromosomes that ensures feasible solutions are always produced. Each allele of a chromosome is represented by a random number, typically between 0 and 1. The node in the tour corresponding to the ith allele is equal to the rank index of the ith allele in an ordered list of alleles. For example, consider a 5-node problem and a chromosome that looks like {0.63, 0.12, 0.29, 0.97, 0.06}. An ordered list of these five numbers, (0.06, 0.12, 0.29, 0.63, 0.97), implies that the corresponding tour is Depot-4-2-3-5-1-Depot since 0.63 has rank index 4 in the ordered list, 0.12 has rank index 2, etc.

Arulsevan et al.'s second genetic algorithm is the same as the first except that a 2-exchange local optimization is performed on every offspring produced by the crossover operator. They tested both methods on 25 problems ranging from 8 to

16 nodes and compared the average solution time and performance over 250 runs with that of the optimal solution found by solving a mixed-integer linear program (MILP) with CPLEX. On these small problems, both GAs performed extremely well, finding the optimal solution over 99% of the time with very fast solution times.

The literature on the VRP is vast and comprehensive. We refer the reader to books edited by Toth and Vigo [68] and by Golden et al.[38] and to the bibliography by Cordeau et al. [21]. The TOP was first introduced by Chao et al. [16] and continues to be studied today [6]. Similarly, the LOP has received substantial attention in the literature. Charon and Hudry [18] developed the noising method and used it within a branch-and-bound framework to solve the LOP for weighted tournaments. They solved thousands of LOPs with as many as 100 nodes to optimality. For all but six problems, the noising method found the optimal solution quickly. A second run of the noising method found the optimal solution to the remaining six problems.

5.3 Definitions

We say that matrix P is inverse symmetric if $p_{ij} = -p_{ji}$ for all i and j. Otherwise, P is generalized. If P is inverse symmetric, then $p_{ij} + p_{ji} = p_{ij} - p_{ij} = 0$. In order to evaluate the objective function, we order all visited nodes by arrival time, first to last. This sequence is called a meta-route, a route with infinite maximum route length and capacity.

If nodes i and j have arrival times less than ϵ units apart, we call these simultaneous arrivals. If i and j are visited simultaneously, what profit should we receive

(p_{ij}, p_{ji}, both, neither)? We decided that neither p_{ij} nor p_{ji} should be counted. However, p_{ik} and p_{jk} are counted for all k such that k is visited after i and j. If P is inverse symmetric, we can count both p_{ij} and p_{ji} (they cancel each other out), and the question of simultaneous arrivals becomes irrelevant. The formulation presented in Section B.1 does not consider simultaneous arrivals. It is much simpler than the alternative formulations given in Appendix K.

5.4 Formulating the SDTOP

In this section, we formulate the SDTOP as a MILP. We have a homogeneous fleet where k_{max} vehicles are used. To simplify the formulation, denoted by SDTOP$_{simp}$, we assume that there are no simultaneous arrivals (within ϵ). If this assumption does not hold, SDTOP$_{simp}$ could return an erroneous result. Even with randomly located points, there is no guarantee that simultaneous arrivals will not occur. In Appendix K, we present two alternative formulations for the SDTOP that are more complex than SDTOP$_{simp}$. SDTOP$_{general}$ identifies simultaneous arrivals, and SDTOP$_{noSimul}$ explicitly forbids them from happening. In both models: (1) each vehicle may have different beginning and ending depots, and one vehicle's depots may be different from the others', (2) each vehicle may have different capacity and route-length constraints, and (3) we may impose a minimum number and a maximum number of the available vehicles to use in a solution (we do not specify which vehicles to use).

All three models can include time window constraints. In some situations, it

may make sense that no two nodes can be visited within a certain period of each other. That is, we want no simultaneous arrivals for $\epsilon \gg 0$. Both formulations in Appendix K can model this situation, SDTOP$_{general}$ with a hard constraint and SDTOP$_{noSimul}$ awarding neither p_{ij} nor p_{ji} when the arrival times are less than ϵ units apart. Finally, we note that more than one solution with an optimal objective function value, opt^*, may exist. To find the minimum distance optimal solution, we add a constraint requiring that the objective function equal opt^*, change the objective function to minimize total distance, and solve the model again.

The meta-route sequence is not modeled explicitly in any of the formulations. It must be implied from the sequencing of arrival times (not vehicle-by-vehicle but across all vehicles in the solution). We use $4N(N-1)$ variables to accomplish this.

5.4.1 Variables and Constants

<u>Constants</u>: ($i \neq j$)

- N - number of possible nodes, excluding the depot (node 0)
- K - total number of vehicles available (indexed by k)
- P - profit matrix
- p_{ij} - profit received for visiting i before j
- q_i - demand at node i
- Q - vehicle capacity
- s_i - service time required at node i; $s_0 = 0$ by definition
- T - time or distance matrix (any distance norm is allowed)
- t_{ij} - travel time or distance between i and j

- T_{max} - maximum tour length
- ϵ - cutoff value for simultaneous arrivals; if two arrival times are less than ϵ units apart, they are considered simultaneous

<u>Variables</u>: $(i \neq j)$; $i > 0$ and $j > 0$ unless otherwise specified.

- $x_{ijk} = 1$ if vehicle k travels from node i to node j; 0 otherwise
- $y_{ik} = 1$ if node i, for $i \geq 0$, is visited by vehicle k; 0 otherwise
- $w_i = 1$ if node i is visited in general; 0 otherwise
- a_i is the time that node i, for $i \geq 0$, is visited; if node i not visited, a_i is forced to any number in $[0, N\epsilon]$
- $\delta_{ij} = a_j - a_i$; difference in arrival times
- $z_{ij} = 1$ if i's arrival time is before or simultaneous with j's time
- $\alpha_{ij} = 1$ if both i and j are visited; 0 otherwise
- $\beta_{ij} = 1$ if both i and j are visited and i's arrival time is before or simultaneous with j; 0 otherwise

5.4.2 SDTOP$_{simp}$

$$\text{Maximize} \quad \sum_{i=1}^{N}\sum_{j=1}^{N} p_{ij}\beta_{ij} \tag{5.1}$$

subject to

$$y_{0k} = 1 \qquad \forall\ k \tag{5.2}$$

$$a_0 = 0 \tag{5.3}$$

$$\sum_{k=1}^{K} y_{ik} = w_i \qquad \forall\ i \geq 1 \tag{5.4}$$

$$\sum_{i=1}^{N} q_i y_{ik} \leq Q \qquad \forall\ k \tag{5.5}$$

$$\sum_{i=0}^{N} x_{ijk} = y_{jk} \qquad \forall\ j,\ k \tag{5.6}$$

$$\sum_{j=0}^{N} x_{ijk} = y_{ik} \qquad \forall\ i,\ k \tag{5.7}$$

$$\delta_{ij} = a_j - a_i \qquad \forall\ i \geq 1,\ j \geq 1 \tag{5.8}$$

$$\delta_{ij} \leq T_{max} z_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{5.9}$$

$$-\delta_{ij} + T_{max} z_{ij} \leq T_{max} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{5.10}$$

$$-(w_i + w_j) \leq -2\alpha_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{5.11}$$

$$w_i + w_j \leq 1 + \alpha_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{5.12}$$

$$-(\alpha_{ij} + z_{ij}) \leq -2\beta_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{5.13}$$

$$\alpha_{ij} + z_{ij} \leq 1 + \beta_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{5.14}$$

$$a_i + x_{ijk}(T_{max} + (s_i + t_{ij})) \leq T_{max} + a_j \qquad \forall\ k;\ i \geq 0,\ j \geq 1 \tag{5.15}$$

$$-a_i + x_{ijk}(T_{max} - (s_i + t_{ij})) \leq T_{max} - a_j \qquad \forall\ k;\ i \geq 0,\ j \geq 1 \tag{5.16}$$

$$a_i + w_i(s_i + t_{i0} - T_{max}) \leq 0 \qquad \forall\ i \geq 1 \tag{5.17}$$

$$\sum_{i \in S, j \in S} x_{ijk} \leq |S| - 1 \text{ for } S \subseteq \{1, \ldots, N\},\ 2 \leq |S| \leq N \qquad \forall\ k \tag{5.18}$$

$$0 \leq a_i \leq T_{max} \qquad \forall\ i \geq 1$$

$$-T_{max} \leq \delta_{ij} \leq T_{max} \qquad \forall\ i \geq 1,\ j \geq 1$$

$$\alpha_{ij},\ \beta_{ij},\ w_i,\ x_{ijk},\ y_{ik},\ z_{ij} \in \{0, 1\} \qquad \forall\ i, j, k$$

The objective function (5.1) sums the pairwise profits, p_{ij}, for every pair of nodes that is visited such that i is visited strictly before j. Constraints (5.2) and (5.3) require that the depot be visited at time zero by all vehicles. Without (5.2), a_0 can be positive if it leads to an improved objective function value. This is invalid. Since w_i is binary, constraint (5.4) requires that every node is visited, if at all, by exactly one vehicle. w_i is a book-keeping variable and only included to help with readability. Constraint (5.5) guarantees that vehicle capacity is not violated. Constraints (5.6) and (5.7) are the flow-balance constraints requiring node i, if it is visited, to have exactly one predecessor and one successor. Constraints (5.15) and (5.16) fix the arrival times for all visited nodes. Groër et al. [40] pointed out both that (5.15) eliminates subtours and (5.16) could be dropped if we wanted to allow vehicles to wait at node i. They showed that adding some of the standard subtour elimination constraints in (5.18), with cardinality no larger than $N/2$, produces faster solution times. Constraint (5.17) ensures that the total time for a route is feasible. (5.17) forces the arrival times for unvisited nodes to zero.

Constraints (5.8) to (5.14) are specific to the SDTOP. Constraint (5.8) stores the difference in arrival times between nodes i and j and is included to make the formulation easier to read. Constraints (5.9) and (5.10) force z_{ij} to 1 if j's arrival time follows i, even if j was not visited. In constraints (5.11) and (5.12), α_{ij} is forced to 1 if and only if both i and j are visited. Constraints (5.13) and (5.14) tie all the binary variables together by requiring β_{ij} to be 1 if and only if i and j are both visited and i's arrival precedes j's. This allows the objective function to include only the correct p_{ij} values since β_{ij}, then α_{ij}, then w_i and w_j, and finally y_{ik} and y_{jk} will all be pushed towards one by the objective function.

5.5 Heuristic

We use a record-to-record travel (RTR) algorithm [30], based on the implementation described in Groër [39] to solve the SDTOP. RTR works in uphill and downhill phases. During the uphill phase, any move that is no worse than some percentage (deviation) from the current best solution (record) is accepted. During the downhill phase, only strictly improving moves are accepted. The uphill phase runs for a fixed number of iterations while the downhill phase ends only when no improving move has been found. After a series of uphill and downhill moves are made, the solution may be perturbed and the entire process repeated.

Candidate moves are generated by seven local optimization procedures -- one-point-movement, two-point-movement, three-point-movement, two-opt, three-opt, or-opt, and cross-exchange. These procedures are described in [39]. The RTR

algorithm in [39] is initialized with a solution produced by a modified Clarke-Wright savings procedure. The k nearest neighbors for each node are stored for use in the local optimization routines. Rather than consider every possible move for node i, we consider only the moves that can be made with the k nearest neighbors of node i. After each series of uphill and downhill moves are finished, the solution is perturbed using the procedure described in Mester and Bräysy [51]. Given nodes i, j, k, l, and m, and edges i-j-k, we search for an edge l-m such that the α-weighted change in total route distance for inserting node j between l and m is minimized. The insertion cost is: $(c_{ij} + c_{jk} - c_{lm}) - \alpha(c_{lj} + c_{jm} - c_{ik})$. This perturbation does not consider the resulting change in the value of the SDTOP objective function. By finding a new and potentially good VRP search neighborhood (which can mean fitting more nodes into our solution routes), we hope to find a better SDTOP neighborhood.

Our implementation considers a heterogeneous fleet where a minimum number and a maximum number of the K available vehicles may be specified. We ensure that the initial solution produced by the modified Clarke-Wright procedure is feasible. All nodes that are not in the current solution are placed in a route (which we call route 0) with infinite capacity and tour length. After any move is made such that we are no longer using the maximum allowable number of vehicles, we attempt to add one or two unrouted nodes to the empty route(s) even if the total profit decreases. Total profit can only decrease for a generalized matrix P such that at least one $p_{ij} < 0$ (P is easily transformed to ensure all $p_{ij} > 0$ by adding a large-enough constant) or if P is inverse symmetric. The optimal $k + 1$-vehicle solution is not necessarily better than the optimal solution with k vehicles. However, we found that

having more nodes routed generally provides a better chance of eventually finding a solution with higher total profit.

As noted earlier, small changes in the meta-route sequence can cause very large changes in the objective function value. Because of this, it is difficult to escape a poor solution neighborhood simply by switching the position of a few random nodes as in Mester and Bräysy [51] and Groër [39]. After a specified number of iterations, if any nodes are unrouted (route 0 is non-empty), we randomly choose a route, remove all nodes from this route, and set them aside. We try to place one or two nodes from route 0 into the now-empty route and apply one-point-movement to pack the route in the most profitable manner possible. The nodes that were set aside are then assigned to route 0. We refer to this procedure as Remove-Route-Shakeup.

5.5.1 Efficient Evaluation of the Objective Function

We found that over 99% of computation time was spent evaluating the objective function. In order to accurately calculate the value of the objective function, we must know the entire meta-route sequence. We call the potential solution being considered the candidate solution. We call the solution that is currently in place the current solution. For any candidate move, we must calculate all node arrival times that would change and create the candidate meta-route by sequencing the nodes by arrival time from first to last. Then we sum the relevant p_{ij}.

There is no shortcut around calculating new arrival times in any routes affected by a move. For example, suppose we have a single route with node sequence 1-2-3-4-

5. If we swap nodes 3 and 2, we obtain the sequence 1-3-2-4-5. a_1 does not change, a_2 and a_3 do change, and the arrival times for all nodes (4 and 5) that follow nodes 2 and 3 may or may not change. In order to create an accurate candidate meta-route, we must calculate new arrival times for node 2 and all nodes that follow it in its candidate solution route.

Similarly, suppose the current solution consists of two routes, 1-2-3-4-5 and 6-7-8-9-10. If we remove node 3 and place it after node 7, we obtain two new routes, 1-2-4-5 and 6-7-3-8-9-10. a_1, a_2, a_6, and a_7 do not change, a_3 does change, and the arrival times for all remaining nodes possibly change. In order to create an accurate candidate meta-route, we must calculate the new arrival times for node 3 and all nodes that follow 3 in its current route and its candidate route.

After the new arrival times have been calculated, we compute the new meta-route sequence. This can be done efficiently using a k-merge sort. Using a placeholder for each of the k routes, at each iteration, we append to the meta-route the node pointed to by the placeholder with the earliest arrival time and increment the placeholder one node forward in its route. When all k placeholders have reached the end of their respective routes, the meta-route has been ordered. Nodes not visited in the candidate solution are not included in the sort.

For example, let $k = 2$ with two candidate routes 4-1 and 3-5. Let the candidate arrival times in vector format be [10,-,5,2,7] (node 2 is not visited). The placeholder for each route is set at its first node. Node 4 is the first arrival, so node 4 is appended to the empty candidate meta-route. Route 1's placeholder is incremented and now points to node 1. Node 3 is the next arrival, so node 3 is ap-

pended to the candidate meta-route. Route 2's placeholder is incremented and now points to node 5. Node 5 is the third arrival, so node 5 is appended to the candidate meta-route. Route 2's placeholder is incremented past the end of route 2 so that route 2 is finished with the merge-sort. When only one route has nodes remaining to be merged, we add its remaining nodes in order. However, for illustration, we continue the example. The final arrival is node 1, so it is appended to the candidate meta-route which is 4-3-5-1. Route 1's placeholder is incremented past the end of route 1 so this route is finished. No visited nodes remain to be merged, and the sort is complete.

Once the candidate meta-route has been created, we evaluate the candidate objective function using Silberholz's HotnCold algorithm [66] (pseudocode for the algorithm is given in Appendix J). Any potential new objective function value is a function of the current value plus all new p_{ij}s minus all p_{ij}s that are no longer included. We must determine which p_{ij} should be added and which should be subtracted from the current objective function value. We define the set of hot nodes, HOT, to contain all nodes whose arrival times potentially change if the candidate move is accepted. Potentially is a key word since, for instance, in the example of route 1-2-3-4-5 becoming 1-3-2-4-5, it is possible that the arrival times for nodes 4, 5, or both, remain unchanged in the candidate solution. However, since node 4 and node 5 follow the nodes whose sequence changed, their arrival times potentially could change. They are considered hot nodes.

The set of cold nodes, $COLD$, contains all other nodes -- those whose arrival time remains unchanged if the candidate move is accepted. In the one-vehicle exam-

ple, if route 1-2-3-4-5 becomes 1-3-2-4-5, then HOT ={2, 3, 4, 5} and $COLD$ ={1}. In the two-vehicle example, if routes 1-2-3-4-5 and 6-7-8-9-10 become routes 1-2-4-5 and 6-7-3-8-9-10, then HOT ={3,4,5,8,9,10} and $COLD$ ={1,2,6,7}.

The HotnCold algorithm works as follows. Determine which nodes are in HOT and which are in $COLD$. Then, for each hot node, hot_i, in HOT, compare its arrival time against that of each cold node, $cold_j$, in $COLD$. If hot_i precedes $cold_j$ in the current meta-route but follows $cold_j$ in the candidate meta-route, subtract p_{ij} and add p_{ji}. Similarly, if hot_i follows $cold_j$ in the current meta-route but precedes $cold_j$ in the candidate meta-route, then subtract p_{ji} and add p_{ij}. Special attention must be paid to nodes that are visited in the candidate solution but are in the current solution's route 0. Similarly, special attention must be paid to nodes that are in the candidate solution's route 0 but are visited in the current solution.

After all comparisons between hot and cold nodes have been made, we do pairwise comparisons between all hot nodes. This can be done very efficiently when the move being considered is an intra-route move. This is because for any type of intra-route moves, we know which pairs of hot nodes i and j are currently ordered i before j but would have j before i in the candidate solution. For example, if we reverse a sequence of nodes in a route, all nodes currently sequenced before node j will now be sequenced after node j. For inter-route moves, we do not know this information, so every pairwise comparison must be made.

When the HotnCold algorithm finishes, we obtain the candidate objective function value. The HotnCold algorithm runs in $O(n^2)$ time but is fast in practice.

To illustrate the HotnCold algorithm, consider the profit matrix for the 10-

node SDTOP given in Table 5.1 along with the following routes and meta-route where node 5 is not visited and the objective function value is 179:

- Route 1: 6-10-2-1
- Route 2: 3-4
- Route 3: 9-7-8
- Meta-route: 6-3-9-10-7-8-2-4-1.

If we move node 1 to the second position in route 3, we obtain:

- Route 1: 6-10-2
- Route 2: 3-4
- Route 3: 9-1-7-8.

After calculating the new arrival times in Routes 1 and 2 (for nodes 1, 7, 8), we merge the three routes into the candidate meta-route. Given the current meta-route, we know that the arrival sequence and order of nodes 6-3-9 remains unchanged (although 10's new arrival time is unchanged, it is possible that node 1 would now precede node 10 whereas node 1 cannot precede nodes 6, 3, or 9). Therefore, we apply merge sort to the remaining nodes. The new meta-route is:

- Meta-route: 6-3-9-1-10-7-2-8-4.

Next, all nodes following node 1 in its current route (route 1) and its candidate route (route 3) could have new arrival times and belong in HOT. Therefore, $HOT = \{1, 7, 8\}$, and $COLD = \{6, 10, 2, 3, 4, 9\}$.

In the hot-to-cold comparisons, hot_1 now precedes $cold_{10}$, $cold_2$, and $cold_4$. hot_8 now follows $cold_2$. Therefore, add $p_{1,10}$, $p_{1,2}$, $p_{1,4}$, and $p_{8,2}$ and subtract $p_{10,1}$,

$p_{2,1}$, $p_{4,1}$, and $p_{2,8}$ to the current objective function value of 179. That is, $179 + 5 + 4 + 3 + 3 - 5 - 2 - 1 - 5 = 181$.

In the hot-to-hot comparisons, hot_1 now precedes hot_7 and hot_8. Therefore, add $p_{1,7}$ and $p_{1,8}$ and subtract $p_{7,1}$ and $p_{8,1}$. That is, $181 + 7 + 6 - 4 - 7 = 183$. Thus, the objective function value of the candidate solution is 183.

HOTnCOLD assumes that simultaneous arrivals do not occur. If they do occur, it is possible for the order in which two simultaneous-arrival cold nodes are stored to change when the data structure is sorted. If the order changes, the objective function of the potential move will be evaluated erroneously, perhaps allowing a move to be made that should not be made.

The nodes in many orienteering problems from the literature are geometrically arranged so that simultaneous arrivals occur frequently. In preliminary experiments, even after perturbing the coordinates, we encountered sporadic simultaneous arrivals. To evaluate a move in this situation, each time a potential move contains two nodes with simultaneous arrival times, i and j, we add a small, positive number to $t_{i-1,j}$, where node $i - 1$ is i's predecessor. When the RTR algorithm finishes, we restore the true edge distances and compute the true route distances.

5.6 Computational Experiments

There are no heuristics for solving the SDTOP in the literature. Obtaining exact solutions for even a 10-node problem has proven impractical. We solved one 10-node, 1-vehicle SDTOP in approximately 46,000 CPU seconds (we initialized

CPLEX with a very good solution). The root node LP relaxation for SDTOP$_{simp}$ is very weak and the default cuts that CPLEX applies tighten the lower bound very slowly.

5.6.1 Test Problems

Recently, Archetti et al. [6] published 130 new TOP problems based on 10 VRP problems from Christofides et al. [19]. Problems range from 51 to 200 nodes (including a depot) with various values for K (up to 20 vehicles) and Q for a total of 130 TOP problems. Some problem sets have randomly distributed nodes and some have highly clustered nodes. We created SDTOPS by generating an inverse symmetric P for each of the 10 data sets. The problems are divided into three sets.

For each of the 10 data sets, we created a single SDTOP which can be solved as an LOP using Charon and Hudry's code. In each problem, at least one vehicle can visit all N nodes in any order possible. Vehicles have different maximum tour length, maximum capacity, and starting and ending depots. We assigned each problem a unique generalized P matrix. We refer to these 10 problems as Set IV. We refer to the four sets of benchmark problems (140 total) collectively as the $SPERANZA$ problems. All problem data are given in Appendix M.

5.6.2 Parameters

In preliminary experiments, the RTR algorithm typically found its best solution for problems with fewer than 100 nodes in approximately 10 seconds, but the

larger problems sometimes found best solutions after hundreds of seconds of runtime. We chose 100 as a reasonable maximum computing time for each problem in our experiments. The local optimization parameter had three possible settings. In the first, we use all local optimization procedures (one-point movement, two-point movement, three-point movement, two-opt, three-opt, and or-opt) for the entire runtime. This is referred to as "All" in Table 5.3. In the second, we use all local optimization procedures only until we perform the first solution perturbation, after which we use only one-point movement and two-point movement. This is designated "All12" in Table 5.3. In the third, we use only one-point movement and two-point movement for the entire computation. This is designated "12Only".

The intensity parameter determines how many times the uphill phase of RTR is run before moving to the downhill phase. When applied to the VRP [15, 39], this is often set to 30. In preliminary testing, we found that large values of the intensity parameter consumed too much CPU time with little extra benefit. The initial deviation parameter sets the allowable deviation for all moves prior to the first perturbation. After the first perturbation, the deviation is set to 0.01 for the remaining RTR iterations. The neighbor list size parameter sets the size of the neighbor list used by the local optimization procedures. Helsgaun [45] found that the $k = 22^{nd}$ closest neighbor for one node appeared in the optimal solution of a 532-node TSP. Groër [39] used 25 as size of the neighbor list for his VRP algorithm. We tried three values for k, 10, 25, and 75.

The downhill cut-off parameter determines the number of perturbations that must be completed before we add the downhill phase to the RTR algorithm. For

example, if the parameter is set to three, then three cycles of the uphill phase and perturbation are completed before we include the downhill phase in the RTR algorithm. In our experiments, we used 0, 3, 4, and ∞ for this parameter.

The remove-route-shakeup parameter determines whether or not the Remove-Route-Shakeup procedure described in Section 5.5 is used. If yes, then we apply the procedure after 50 perturbations.

5.6.3 Creating SDTOP solutions from VRP solutions

We benchmark our solutions against a method (called VRP-SDTOP) that converts VRP solutions into SDTOP solutions. Given an SDTOP problem with a specified K, we solve the problem as a VRP using Groër's code [39], removing each node beforehand for which the maximum route length restriction is violated, even with an out-and-back route from the depot. When Groër's code is finished, it has stored up to the 200 best solutions found. For each of these 200 solutions, we do the following:

- Sort the routes by the number of nodes on each route. The number of routes may be larger than K so we want the K most-packed routes (routes that visit the most nodes). If matrix P is inverse symmetric, having more nodes in a solution is just as likely to worsen the solution as it is to improve it. For a generalized P, having more nodes cannot worsen the solution, as described earlier.
- Sort all routes having the same number of nodes by route length, from longest

to shortest. If the resulting SDTOP solution is used as a starting solution for local improvement procedures, then shorter routes are preferable to longer routes when the number of nodes is the same for each route.

- Choose the K most-packed feasible routes. If two routes visit the same number of nodes, choose the shorter route first.
- Create an SDTOP meta-route from the K routes, identifying all simultaneous arrivals to ensure the SDTOP objective function is evaluated correctly.
- Evaluate the SDTOP objective function for the meta-route.

The best of the 200 SDTOP objective functions is chosen as the result of VRP-SDTOP.

5.6.4 Finding an LOP solution to an SDTOP problem

As noted earlier, when at least one vehicle has large enough capacity and maximum tour length, the SDTOP reduces to the LOP. Charon and Hudry [18] have made their branch-and-bound code for solving the LOP on weighted tournaments available for public use. A weighted tournament is a directed acyclic digraph, but the profit matrix, P, for SDTOP is not. P is easily converted to such a graph by upper triangularization. Let P' be an upper triangular matrix whose elements, p'_{ij} for $j \geq i$, are equal to $p_{ij} - p_{ji}$. With P', we can use Charon and Hudry's code to find high-quality solutions to our problems in a fraction of a second, even for problems with hundreds of nodes. Given Charon and Hudry's reported results [18], it is reasonable to assume that their code produces excellent LOP solutions for our

Table 5.3: Parameter settings for nine variants of the RTR algorithm for solving the SDTOP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Maximum Time	100	100	100	100	100	100	100	100	100
Local Optimization	All12	All12	All12	All12	All12	All12	All12	All12	All
Intensity	5	5	3	5	3	5	3	5	5
Initial Deviation	0.5	0.5	0.5	0.5	0.5	0.01	0.01	0.5	0.5
Size of Neighbor List	75	75	75	25	25	75	75	75	75
Downhill Cut-off	4	4	4	4	4	4	4	3	3
Remove-Route-Shakeup	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

problems.

We use the following substitute to test the quality of our RTR algorithm. In some problems (designated as Set IV below), we let $kMax > 1$, where at least one of the $kMax$ vehicles has large enough capacity and maximum tour length to solve the problem as an LOP. We obtain a high-quality LOP solution using Charon and Hudry's code and compare it to the multiple-vehicle solutions produced by RTR. If RTR does not find a solution that meets or exceeds the LOP solution value, then we cannot expect that it will do well on more complex problems. Without heuristics to compare against or tight lower bounds, we cannot make any stronger statements about the performance of our heuristic.

5.6.5 Results

We tried 70 different combinations of parameters described in Section 5.6.2 on the 140 $SPERANZA$ problems. For each problem, we let RTR run a maximum of 100 CPU seconds. In Table 5.4, we give the results for the nine best parameter settings on Set IV of the $SPERANZA$ problems. Column 2 is the best LOP solution produced by Charon and Hudry's LOP code (their code produces solutions in less than two seconds for our problems). Columns 3 through 12 are the results

produced by the nine parameter settings described in Table 5.3. We see that the RTR algorithm can find high-quality solutions to SDTOP problems that can be solved as LOPs. In nine of 10 problems, at least one parameter setting produced a better solution than the solution produced by Charon and Hudry's LOP code. Four of the nine parameter settings produce a higher average profit than Charon and Hudry's solution. The smallest average profit (741426) is only 0.05% less than the largest average profit (744841).

Table 5.4: Total profit for nine RTR variants on the 10 *SPERANZA* Set IV problems for which near-optimal solutions are known

Name	Charon and Hudry	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Set IV										
p03$_{IV}$	270971	**271659**	**271659**	271620	270448	270576	271550	271579	271573	271573
p06$_{IV}$	34611	**34693**	**34693**	**34693**	34675	34678	**34693**	**34693**	34684	34684
p07$_{IV}$	115982	116119	116119	**116126**	115825	115847	116123	**116126**	**116126**	**116126**
p08$_{IV}$	271247	271621	271621	271714	270634	270418	271660	**271716**	271619	271619
p09$_{IV}$	904993	905380	905380	**905836**	901905	901996	905380	**905836**	905034	905034
p10$_{IV}$	**2102591**	2097318	2097318	2100172	2093424	2092013	2097318	2100172	2102454	2102012
p13$_{IV}$	466326	**467330**	**467330**	467230	465143	464894	467226	467295	466817	466816
p14$_{IV}$	271159	271764	271764	271778	270727	270792	271744	271646	**271806**	**271806**
p15$_{IV}$	904992	905328	905328	905720	901508	901231	905354	905720	**906003**	**906003**
p16$_{IV}$	2100618	2101029	2100953	**2103188**	2093154	2091814	2102029	**2103188**	2102290	2101757
Average:	744349	744224	744217	744808	741744	741426	744308	744797	744841	744743

Table 5.5: Total profit for nine RTR variants on the 130 *SPERANZA* Sets I, II, and III problems

Name	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	VRP-SDTOP	Best
Set I											
p03$_I$	44856	44856	40861	43028	49774	46151	49286	49014	49014	9788	**50152**
p06$_I$	8306	8306	8036	8268	8112	8132	8198	8220	8220	1814	**8764**
p07$_I$	24884	24884	25420	24592	25350	25834	25408	25554	25554	3627	**25834**
p08$_I$	50099	50099	51219	47982	48173	50890	49115	50769	50769	4787	**51219**
p09$_I$	80135	80135	79203	80023	75299	76798	84228	79116	79116	13248	**84228**
p10$_I$	252060	252060	248594	249569	247064	252315	255564	252601	252601	5670	**260699**
p13$_I$	90720	90720	92208	93040	91224	92620	92208	93482	93482	12452	**93994**
p14$_I$	51306	51306	51237	50386	49114	52106	52518	51279	51279	7131	**52518**
p15$_I$	111543	111543	109977	110714	113251	114146	112153	111729	111729	15580	**114146**
p16$_I$	256933	256933	246253	250532	245830	254738	253166	256712	256712	23096	**256933**
Average:	97084	97084	95301	95813	95319	97373	98184	97848	97848	9719	
Set II											
p03_2Q1$_{II}$	338	320	158	338	338	338	338	338	338	272	**338**
p03_2Q2$_{II}$	1087	729	896	1087	1087	1087	1087	1087	1087	428	**1087**
p03_2Q3$_{II}$	1852	1256	1812	1852	1852	1852	1852	1852	1852	302	**1852**
p03_3Q1$_{II}$	670	497	506	670	670	670	670	670	670	439	**670**
p03_3Q2$_{II}$	1845	1550	1268	1845	1845	1845	1845	1845	1845	878	**1845**
p03_3Q3$_{II}$	3326	3326	2667	3244	3326	3304	3280	3326	3326	622	**3327**
p03_4Q1$_{II}$	1041	814	814	1041	1041	1041	1041	1041	1041	790	**1041**
p03_4Q2$_{II}$	2727	2371	2116	2718	2739	2739	2718	2727	2727	1304	**2739**
p03_4Q3$_{II}$	4863	3345	4463	4712	4978	5001	4755	4863	4863	1086	**5001**
p06_2Q1$_{II}$	0	0	0	243	243	0	0	0	243	40	**243**
p06_2Q2$_{II}$	446	351	323	446	446	446	446	446	446	298	**446**
p06_2Q3$_{II}$	753	502	487	753	753	753	753	753	753	468	**753**
p06_3Q1$_{II}$	0	0	0	342	342	0	0	0	342	161	**342**
p06_3Q2$_{II}$	770	708	523	770	770	770	770	770	770	272	**770**
p06_3Q3$_{II}$	1382	942	812	1382	1382	1382	1382	1382	1382	515	**1382**
p06_4Q1$_{II}$	0	0	0	458	458	0	0	0	458	79	**458**
p06_4Q2$_{II}$	1101	932	914	1105	1105	1105	1105	1105	1105	400	**1105**
p06_4Q3$_{II}$	1880	1145	1622	1930	1938	1930	1930	1880	1880	913	**1938**
p07_2Q1$_{II}$	343	329	217	343	343	343	343	343	343	-12	**343**
p07_2Q2$_{II}$	795	423	437	795	795	795	795	795	795	162	**795**
p07_2Q3$_{II}$	1335	915	749	1335	1335	1335	1335	1335	1335	279	**1335**
p07_3Q1$_{II}$	668	668	668	668	668	668	668	668	668	62	**668**
p07_3Q2$_{II}$	1424	1247	880	1424	1424	1424	1424	1424	1424	637	**1424**
p07_3Q3$_{II}$	2407	1659	2074	2446	2407	2407	2446	2407	2407	399	**2465**
p07_4Q1$_{II}$	992	745	992	992	992	992	992	992	992	80	**992**
p07_4Q2$_{II}$	2133	1759	1737	2133	2041	2133	2133	2133	2133	720	**2133**
p07_4Q3$_{II}$	3687	3687	3282	3433	3449	3450	3450	3418	3309	474	**3687**
p08_2Q1$_{II}$	384	384	384	384	384	384	384	384	384	272	**394**
p08_2Q2$_{II}$	975	970	389	975	975	975	975	975	975	487	**975**
p08_2Q3$_{II}$	1914	1242	1351	1914	1914	1914	1914	1914	1914	315	**1914**
p08_3Q1$_{II}$	645	645	645	645	645	645	645	645	645	515	**645**
p08_3Q2$_{II}$	1738	1010	1156	1738	1637	1738	1738	1738	1738	661	**1738**
p08_3Q3$_{II}$	3119	2864	2554	3119	3027	3079	3079	3027	3027	-73	**3119**
p08_4Q1$_{II}$	925	772	772	925	925	925	947	925	925	518	**947**
p08_4Q2$_{II}$	2440	1581	1748	2496	2496	2496	2496	2440	2440	995	**2496**
p08_4Q3$_{II}$	4189	3699	3249	4365	4469	4441	4292	4121	4121	-273	**4469**
p09_2Q1$_{II}$	768	542	504	768	768	768	768	768	768	415	**768**
p09_2Q2$_{II}$	2147	1181	1332	2147	2147	2147	2147	2147	2147	966	**2147**
p09_2Q3$_{II}$	3425	2450	2774	3420	3425	3296	3475	3425	3425	1614	**3598**
p09_3Q1$_{II}$	1399	1146	1316	1399	1399	1399	1399	1399	1399	779	**1399**
p09_3Q2$_{II}$	3494	2484	2346	3494	3453	3453	3494	3494	3494	1595	**3494**
p09_3Q3$_{II}$	6129	5425	5084	5903	6201	5592	5927	5463	5463	2772	**6353**
p09_4Q1$_{II}$	2197	2197	1943	2197	2197	2197	2197	2197	2197	897	**2197**

Name	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	VRP-SDTOP	Best
p09_4Q2$_{II}$	5123	4655	3707	5282	5268	5057	5099	4874	4874	2133	**5408**
p09_4Q3$_{II}$	8669	8431	7421	8500	8917	9055	9068	8927	8927	3489	**9782**
p10_2Q1$_{II}$	1222	807	807	1222	1222	1222	1222	1222	1222	424	**1222**
p10_2Q2$_{II}$	2897	2429	1756	2897	2896	2896	2896	2897	2897	931	**2897**
p10_2Q3$_{II}$	4850	4850	4908	4974	4940	4986	4872	4720	4720	837	**4999**
p10_3Q1$_{II}$	2133	1839	2123	2123	2133	2133	2133	2133	2133	944	**2133**
p10_3Q2$_{II}$	5103	4549	4321	4127	5171	5103	5103	5103	5103	1464	**5171**
p10_3Q3$_{II}$	8727	8625	8669	8805	8193	8675	9341	8925	8925	1649	**9341**
p10_4Q1$_{II}$	3286	2861	3262	3286	3286	3286	3286	3286	3286	1200	**3286**
p10_4Q2$_{II}$	6789	7149	6705	7298	7792	7023	7768	6682	6682	2225	**7903**
p10_4Q3$_{II}$	13878	9452	12607	11792	13163	11825	12880	13878	13878	1809	**13878**
p13_2Q1$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p13_2Q2$_{II}$	0	0	0	120	118	0	0	0	120	-106	**120**
p13_2Q3$_{II}$	120	120	120	120	120	120	120	120	120	-106	**120**
p13_3Q1$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p13_3Q2$_{II}$	0	0	0	319	319	0	0	0	319	-9	**319**
p13_3Q3$_{II}$	337	309	309	350	337	350	350	337	337	-9	**350**
p13_4Q1$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p13_4Q2$_{II}$	0	0	0	533	554	0	0	0	533	29	**585**
p13_4Q3$_{II}$	585	585	585	566	566	585	585	585	585	29	**585**
p14_2Q1$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_2Q2$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_2Q3$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_3Q1$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_3Q2$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_3Q3$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_4Q1$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_4Q2$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p14_4Q3$_{II}$	0	0	0	0	0	0	0	0	0	0	**0**
p15_2Q1$_{II}$	725	606	593	725	725	725	725	725	725	956	**956**
p15_2Q2$_{II}$	2136	1533	1123	2136	2136	2136	2136	2136	2136	1695	**2136**
p15_2Q3$_{II}$	3500	2364	2582	3317	3366	3204	3500	3500	3500	1715	**3500**
p15_3Q1$_{II}$	1391	1192	1263	1391	1391	1391	1391	1391	1391	1239	**1391**
p15_3Q2$_{II}$	3800	2856	2884	3490	3800	3781	3800	3756	3756	2021	**3800**
p15_3Q3$_{II}$	6385	5317	5169	6052	6133	6018	6141	6018	6018	2477	**6385**
p15_4Q1$_{II}$	2123	1987	2117	2082	2123	2123	2123	2123	2123	1505	**2123**
p15_4Q2$_{II}$	4669	4046	4054	5291	5308	5049	5442	4669	4046	2349	**5442**
p15_4Q3$_{II}$	8479	8479	6988	8567	8859	8779	8855	8547	8547	2447	**9355**
p16_2Q1$_{II}$	1000	748	1000	1163	1163	1163	1163	1000	1000	-13	**1163**
p16_2Q2$_{II}$	3108	1295	1785	3108	3108	3108	3108	3108	3108	950	**3108**
p16_2Q3$_{II}$	4895	4775	4710	4834	5143	4984	5143	4878	4878	1806	**5143**
p16_3Q1$_{II}$	2184	1716	1791	2037	2037	2184	2037	2184	2184	431	**2184**
p16_3Q2$_{II}$	5188	4755	4323	5226	5226	5188	5359	5359	5359	1381	**5359**
p16_3Q3$_{II}$	8558	6745	7113	9018	8979	8207	9116	8985	8985	2913	**9116**
p16_4Q1$_{II}$	3212	2842	2913	3212	2842	3212	3212	3212	3212	1254	**3500**
p16_4Q2$_{II}$	7571	6943	7950	7386	7734	7156	7909	7571	7571	2155	**8249**
p16_4Q3$_{II}$	13666	13666	12475	13630	12842	13380	13371	13645	13645	3518	**14110**
Average:	2445	2082	2068	2437	2475	2415	2474	2435	2449	803	
Set III											
p03_2$_{III}$	5985	5985	5997	5975	5903	6201	5980	5985	5985	617	**6214**
p03_3$_{III}$	10289	10289	10610	10271	10083	10057	9958	10289	10289	840	**11060**
p03_4$_{III}$	15163	15163	15319	14321	14090	14220	14383	14734	14734	1369	**15805**
p06_2$_{III}$	1989	1875	1572	2084	2125	2018	2242	2088	2088	767	**2242**
p06_3$_{III}$	3540	3540	3574	3491	3453	3534	3476	3724	3724	1054	**3724**
p06_4$_{III}$	4896	4843	4731	4755	4981	4748	4984	4896	4896	1101	**5154**
p07_2$_{III}$	2648	2744	2783	2738	2893	2718	2812	2812	2812	751	**2914**
p07_3$_{III}$	5002	5225	4789	4719	4947	5106	4961	5002	5002	457	**5225**
p07_4$_{III}$	7205	7205	7112	6946	7030	7124	7250	7212	7212	696	**7562**
p08_2$_{III}$	6788	5850	6182	6172	6500	7088	7055	6114	6114	1739	**7088**
p08_3$_{III}$	9946	9022	10635	10806	10523	10929	10715	10268	10268	2591	**11178**

Name	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	VRP-SDTOP	Best
p08_4$_{III}$	15743	13905	14485	14884	15708	14624	14819	15393	15393	3162	**16095**
p09_2$_{III}$	10870	10870	10716	10673	10541	10696	10631	11123	11123	4880	**19045**
p09_3$_{III}$	20296	20296	17431	17866	18270	19061	17641	19766	19766	8635	**20296**
p09_4$_{III}$	27092	24764	24586	22821	25339	25570	25663	25770	25770	8079	**27092**
p10_2$_{III}$	16899	12893	14934	14208	14263	14159	16081	14649	14649	2470	**16899**
p10_3$_{III}$	28386	28386	28508	27848	26154	30661	27641	28816	28816	5094	**30661**
p10_4$_{III}$	43593	43593	45018	39561	39298	43489	42537	44365	44365	8053	**45018**
p13_2$_{III}$	11624	11540	11141	11539	11784	11664	11602	11540	11540	1157	**11904**
p13_3$_{III}$	19011	19011	19501	18132	19027	19018	19083	20202	20202	2612	**20202**
p13_4$_{III}$	26611	26678	27411	25885	26066	27353	27387	27214	27214	4173	**27411**
p14_2$_{III}$	8472	8472	8309	8472	7898	8450	8155	8362	8362	1801	**8472**
p14_3$_{III}$	14310	13616	14276	13568	13505	14179	14111	14696	14696	3026	**14696**
p14_4$_{III}$	19157	19157	19978	19259	19172	19798	19734	19438	19438	4322	**19978**
p15_2$_{III}$	10505	10505	10651	10101	10407	10440	10723	10536	10536	4528	**11710**
p15_3$_{III}$	17951	17951	19731	18762	18668	19284	19803	19491	19491	5298	**19886**
p15_4$_{III}$	28211	28211	24774	26941	25659	26979	26257	26361	26361	5297	**28530**
p16_2$_{III}$	15028	14938	16860	14977	13580	15907	14585	15283	15283	4847	**17188**
p16_3$_{III}$	25322	26952	24993	26864	27669	28506	27197	29466	29466	5849	**29683**
p16_4$_{III}$	40613	40613	38013	41193	41070	40268	39963	39899	39899	7950	**41953**
Average:	15772	15470	15487	15194	15220	15795	15581	15850	15850	3441	
Overall Average:	12800	12479	12336	12564	12558	12807	12861	12870	12880	2103	

In Table 5.5, we present the results for the nine best parameter settings on the 130 $SPERANZA$ problems from Sets I, II, and III and compare them against VRP-SDTOP. Columns 2 through 10 are the results for the nine RTR variants. Column 11 is the result for the VRP-SDTOP algorithm. Column 12 is the best result produced by any of the 70 parameter sets. We see that parameter sets seven, eight and nine produce the highest three average profits for Set I. For Set II, parameter sets five, seven, and nine produce the highest average profits. For Set III, parameter sets six, eight, and nine produce the highest average profits. Over all 130 problems, parameter set nine produces the largest average profit (12880) followed closely by parameter set eight (12870) and seven (12861). VRP-SDTOP does very poorly on each set of problems. It produces an overall average profit (2097) only 16% as large as parameter set nine. This indicates that minimizing distance alone, without accounting for the pairwise profits, is not a good strategy for solving the SDTOP.

There is very little difference in the results produced by any of the nine RTR

variants in Table 5.5. The smallest average profit (12336) is only 4% less than the largest average profit (12880). When we consider the entire collection of 70 parameter sets that we tried, the smallest average profit (9375) is 28% less than the largest. Of the nine best RTR variants, eight use the All12 local optimization setting. Parameter set nine, which produces the largest average profit, uses the All local optimization setting. The 12Only setting is not used in the best nine variants. Six of nine variants use an intensity setting of 5, and seven use an initial deviation of 0.5. Seven variants use a neighbor list size of 75 and none use 10. Seven of nine use a downhill cut-off value of 4. All but one method uses the Remove-Route-Shakeup procedure. Based on our results, for a fixed runtime, we recommend setting parameters to use the All12 local optimization setting, an intensity setting of 5, an initial deviation of 0.5, a neighbor list size of 75, a downhill cut-off of 4, and the Remove-Route-Shakeup procedure.

In Figure 5.2, we show the result of applying RTR to a 199-node SDTOP. In Figure 5.3, we show the meta-route for the solution in Figure 5.2. In each figure, the thickly drawn edges represent the first edge in the tour. The figures show that SDTOP solutions have little or no resemblance to typical "good" VRP or TOP solutions which tend to include routes that are good TSP tours, individually, and have minimal overlap with other routes. Given the poor performance of VRP-SDTOP on Sets I - III of the $SPERANZA$ problems, this is not a surprise.

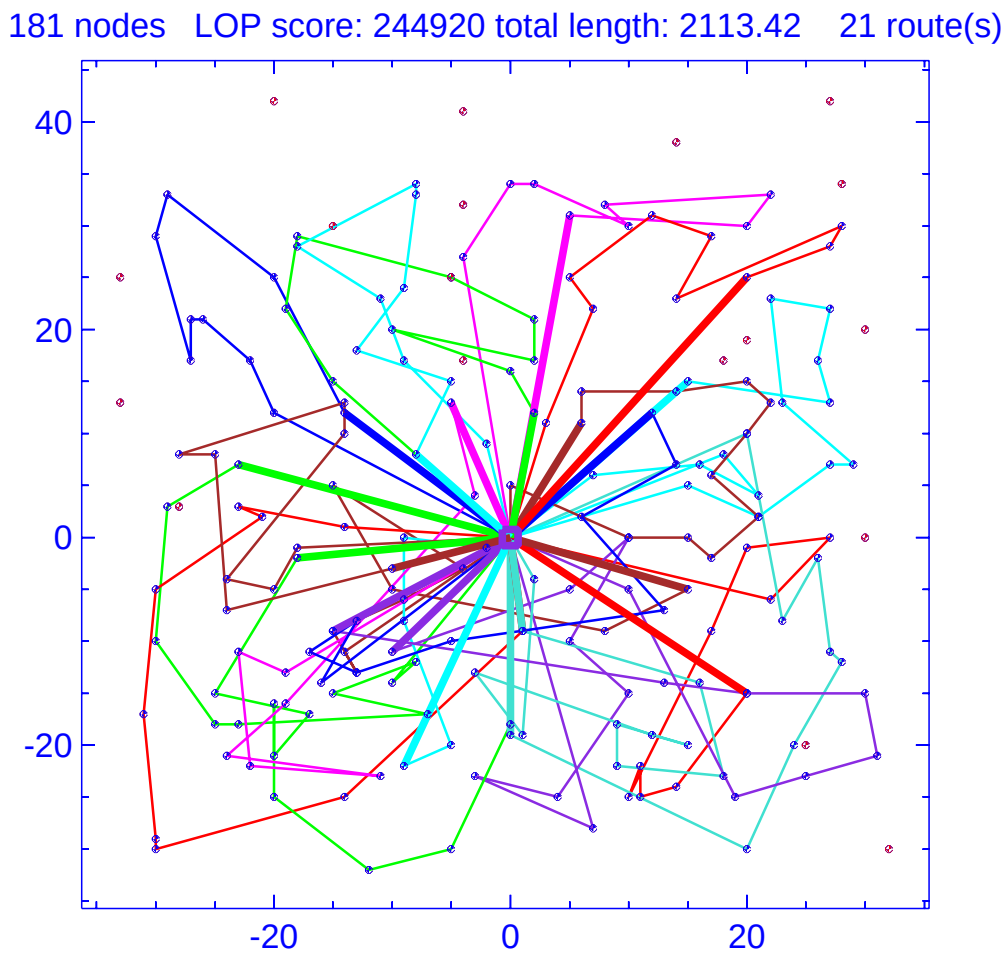


Figure 5.2: Solution to a 199-node SDTOP in which 181 nodes are visited by 20 vehicles (route 21 contains all unvisited nodes).

5.7 Conclusions

In this chapter, we described a new combinatorial optimization problem called the Sequence-Dependent Team Orienteering Problem that combines aspects of orienteering, routing, and ordering problems. We modeled the SDTOP with three different formulations. We developed a record-to-record travel algorithm that solves the SDTOP in reasonable time and showed that it produces solutions that appear

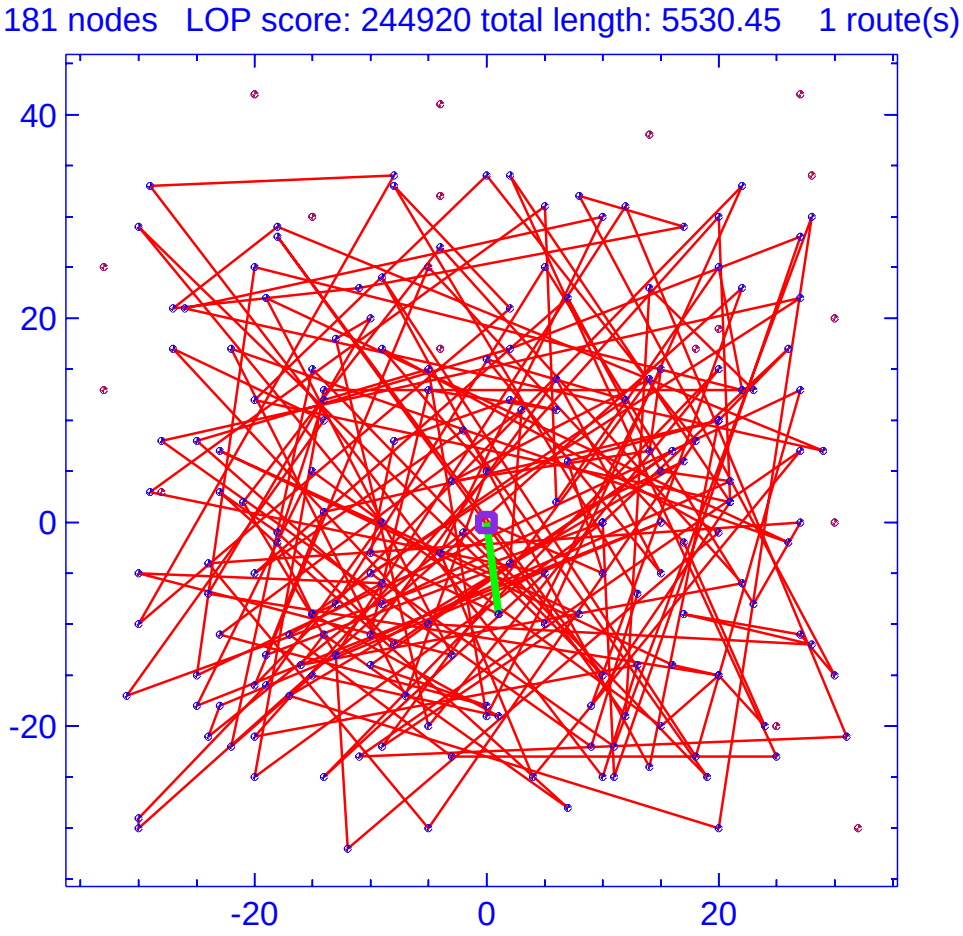


Figure 5.3: Meta-route for the solution in Figure 5.2.

to be of high quality in a reasonable amount of time.

In future work, we will allow each vehicle to leave the depot at any time, $t \geq 0$. Some meta-routes that were previously possible using only infeasible vehicle routes may now be feasible. We will also allow each vehicle to loiter at any target for an arbitrary amount of time. Again, some meta-routes that were previously possible only with infeasible vehicle routes will now be feasible. In both cases, some of the now-feasible meta-routes may produce better solutions than before. Both

modifications add considerable complexity to an already very difficult problem.

Chapter 6

Conclusions

In this dissertation, we studied three combinatorial optimization problems that have real-world applications. We developed a Steiner-zone heuristic and a record-to-record travel heuristic, created 516 benchmark problems, and studied the performance of our algorithms on all benchmark problems. We found that our algorithms are very effective, producing high-quality solutions quickly.

In the first problem, the Close-Enough Traveling Salesman Problem (CETSP), we minimize the distance of a Hamiltonian cycle that passes within a specified distance of each node. The problem has applications in aerial reconnaissance. General versions of this problem have been studied in the literature, but only a few papers have developed algorithms for solving the CETSP. We formulated the CETSP as a mixed-integer, nonlinear program (MINLP) and showed that the lower bounds derived from this formulation are very weak. We developed a three phase Steiner-zone heuristic (SZH) to solve the CETSP in which n nodes are reduced to m intersections of disks called Steiner-zones (Phase I), a tour sequence is assigned to the Steiner zones using any available TSP solver (Phase II), and the distance of the tour is minimized by moving the location of the points that visit the Steiner zones (Phase III). We developed an exact procedure and a heuristic procedure to solve Phase III. We generated a set of 48 benchmark problems with up to 1001 nodes using the 2D

Euclidean norm where the disks in a problem have the same radius. We conducted computational experiments to compare two variants of SZH to 13 heuristics. We found that SZH is very fast, needing less than one second to solve a problem on average and no more than four seconds to solve the most difficult problems. On average, SZH is the most accurate of the heuristics across a wide range of problem sizes and structures.

The second problem, the Close-Enough Vehicle Routing Problem (CEVRP), is a multiple-vehicle CETSP in which each node has a demand that must be satisfied. The CEVRP can be applied to unmanned aerial vehicle route planning where efficient routes are valuable not only to save fuel but also to maximize the amount of intelligence that can be gathered with the available resources. The CEVRP is new to the operations research literature. We formulated the CEVRP as a MINLP and showed that the lower bounds provide no useful information. We used SZH to solve the CEVRP by ensuring that the total demand for any Steiner zone does not exceed the maximum vehicle capacity in Phase I and by incorporating a state-of-the-art Vehicle Routing Problem (VRP) solver [39] into Phase II. We generated 48 benchmark problems with up to 1001 nodes using the 2D Euclidean norm where the disks in a problem have equal radii. We compared four variants of SZH with four baseline heuristics that we developed. We found that the variant that spent too little time on Phase II (SZVRP1) produced solutions very quickly but without much accuracy. The variant that spent too much time on Phase II (SZVRP4) produced the most accurate solutions but was very slow. The variants that spent a moderate amount of effort solving Phase II (SZVRP2, SZVRP3) produced good solutions fairly quickly.

One of the non-Steiner-zone heuristics was more accurate than any variant of SZH for problems in which there was a large amount of disk overlap (it was the least accurate method overall). Across all problems, we found that the best variant of SZH (SZVRP2) was the third most accurate (having an average deviation from the best solution of 3%) and the third fastest (solving problems in an average of 4.5 seconds) of the eight heuristics.

Chapter 4 was motivated by the results found in Chapters 2 and 3. In those chapters, our computational experiments revealed that although SZH produced better solutions faster than other methods when considering all problems, for specific types of CETSP and CEVRP problems, some methods were consistently more accurate than SZH. For example, for a set of seven CETSP problems in which there is a very small amount of disk overlap, the GTSP2 heuristic (described in Chapter 2) was almost 5% more accurate than any SZH variants (although GTSP2 took several hundred thousand seconds, on average, to solve a problem). We studied the structure of the CETSP results found by GTSP2 and used our findings to develop three new Steiner-zone heuristics, the minimum-angle heuristic (MAH), Phase IV post-processor, and MAH + Phase IV. We applied the new heuristics to the 48 benchmark problems from Chapter 2 and the 48 benchmark problems from Chapter 3 and found that the accuracy of SZH was improved substantially with only a reasonable increase in computation time.

We extended the Steiner-zone heuristic to solve several variants of the CETSP and the CEVRP. For instance, the disks surrounding each node in real-world CETSP and CEVRP applications are unlikely to have the same radius. Problems in three

dimensions could have practical application in undersea exploration and surveillance. It is possible that a vehicle may only be able to move forwards and backwards and side-to-side for which the Manhattan norm is more appropriate than the Euclidean norm. We extended SZH to solve CETSPs and CEVRPs for problems using the 2D Manhattan, 3D Euclidean, and 3D Manhattan norms. We generalized SZH to allow the radius of each disk or sphere to differ. For all variants, we compared the performance of SZH with several heuristics on benchmark problems that we generated.

SZH takes advantage of geometrical properties of disks and spheres to produce high-quality solutions to the CETSP and CEVRP quickly. SZH includes one Phase I heuristic for 2D, two unique Phase I heuristics for 3D, one heuristic for solving Phase III, and two heuristics for Phase IV. SZH uses three TSP solvers, one VRP solver, or one genetic algorithm to solve Phase II and uses optimization software to solve integer programs, second-order cone programs, and general nonlinear programs in Phase III. Our computational experiments on 208 benchmark CETSP and 208 benchmark CEVRP problems demonstrate that the Steiner-zone concept, as applied in SZH, works very well across a wide range of problem sizes and types. SZH can be extended to interesting variants of the CETSP and CEVRP such as letting each disk's radius be a function of time. It can also be applied to more general forms of the CETSP and CEVRP, such as the TSP with Neighborhoods (TSPN) and VRP with Neighborhoods (VRPN) where disks are replaced by general convex regions.

The third problem, the Sequence-Dependent Team Orienteering Problem (SD-TOP), is a multi-vehicle orienteering problem in which the profit received for visiting

any node is dependent on the entire sequence of nodes visited. This problem is new in the operations research literature. It is applicable in problems of aerial reconnaissance in which not all targets (nodes) may be visited given the limited resources available and the value of the intelligence gathered at a particular target is dependent upon where the target is located in the overall sequence of visited targets. Unlike similar problems in the literature, which allow sequences of nodes to be fixed, we let the objective function determine the best overall sequence. We formulated the SDTOP as a mixed-integer program (MIP) in three different ways. Each formulation answers the following question in a different manner, "What happens if multiple vehicles arrive at targets simultaneously?" and includes a large number of side-constraints. For example, we can specify a minimum and maximum number of the available vehicles that must be used in any solution. The formulations are too complex to solve to optimality for all but the smallest problems (about five nodes and three vehicles). We developed a record-to-record travel heuristic to solve the SDTOP and modified 130 Team Orienteering Problems with up to 200 nodes to create benchmark SDTOP problems. We generated 10 additional benchmark problems that can be solved as a Linear Ordering Problem (LOP), an optimization problem for which high-quality solvers exist. Our heuristic found solutions better than those found by the LOP solver for nine of the 10 problems. We tried 70 different sets of parameters for our algorithm on the 130 problems to determine the best settings for our heuristic and compared the results against a baseline method. We found that our heuristic produced high-quality results in a reasonable computation time.

This dissertation is designed to promote the further study of the CETSP,

CEVRP, and SDTOP. The author will provide an executable version of his software with a GUI interface along with data and results in file format to interested readers and can be reached at **wmennell@hotmail.com**.

Appendices

Appendix A

The Steiner-Zone Heuristic (SZH) and the Manhattan Norm

In Chapter 2, we applied the Steiner-zone heuristic (SZH) to 21 CETSP problems in 2D using the Euclidean norm. In Chapter 3, we applied the Steiner-zone heuristic to 48 CEVRP problems in 2D using the Euclidean norm. In this appendix, we apply the same heuristics to the 48 CETSP problems and 48 CEVRP problems using the Manhattan norm.

The CETSP and CEVRP formulations given in Chapters 2 and 3 can be modified to use the Manhattan norm. We replace the square root term in the objective function and the constraint requiring all edges to have non-zero length with $|x_i - x_j| + |y_i - y_j|$. We note that the constraint requiring the representative point for node i to lie within $disk(i)$ is not modified.

Due to the excessive computation time of the genetic algorithm used by the GTSP methods, we reused the tour sequences found with the Euclidean norm and applied Phase III using the Manhattan norm. For all Steiner zone methods, we used the Manhattan norm in Phase I to calculate the distance between disks (using the Euclidean norm in Phase I sometimes produced better results but solution quality was generally poorer). The CETSP methods (TILE1 - TILE4, MERGE, HULL) made available to us from Dong et al. [27] and Gulczyinski et al. [43] were implemented only for the Euclidean norm and are not included in this appendix. In each table in this appendix, columns are ordered from best to worst (left to right) by

overall average deviation or CPU time.

A.1 CETSP Results

In Table A-1, we give the results on the 21 $TSPLIB$ problems and the 27 $GEOMETRIC$ problems using equal radius and the 2D Manhattan norm. We note that although GTSP2 and GTSP1 reuse the tours found with the Euclidean norm, the GTSP genetic algorithm, as integrated into HYBRID1 and HYBRID2, is able to use the Manhattan norm in its computations.

We see that GTSP2 produces the shortest tours for four low overlap ratio $TSPLIB$ problems and five medium overlap ratio $TSPLIB$ problems. HYBRID2 produces the shortest tours for four of the remaining low and medium overlap ratio problems. LK-SOCP produces the shortest tours for five high overlap ratio problems. The two Steiner zone methods find shorter tours than both LK-SOCP and YUAN+ in 31 of 48 problems. These results are similar to the Euclidean norm results except that GTSP2 is no longer the most accurate method for the low overlap ratio problems. This may be due in part to not solving a GTSPs using the Manhattan norm.

In Table A-2, we give the percentage deviation from the best solution for each problem. On average, the two methods based on the generalized TSP and the exact Phase III (HYBRID2, GTSP2) produce the smallest deviations (0.74%, 1.14%) for problems with a low overlap ratio. After the four methods that use the generalized TSP, the two methods based on Steiner zones (SZ2, SZ1) are next best with averages of 4.33% and 4.42%, respectively.

For $TSPLIB$ problems with a medium overlap ratio, GTSP2 produces the smallest average (3.60%). Both Steiner zone methods and both hybrid methods are next best with an average deviation of about 8.50%.

For problems with a high overlap ratio, the two methods based on Steiner zones (SZ1, SZ2) and the two hybrid methods (HYBRID1, HYBRID2) produce the smallest average deviations (1.99%, 1.95%, 2.80%, and 1.76%, respectively). The two methods based on the generalized TSP (GTSP2, GTSP1) produce the largest deviations (43.98% and 112.68%, respectively).

Over all 48 problems, HYBRID2 and HYBRID1 are the most accurate methods, with an average deviation of 2.43% and 3.56%, respectively. SZ2 and SZ1 are next best with average deviations of 4.57% and 4.74%, respectively.

In Table A-3, we give the computation times for the six heuristics on the 48 problems. As in the Euclidean case, the two methods based on the generalized TSP (GTSP2, GTSP1) are computationally expensive and the hybrid methods are expensive for low and medium overlap problems while the remaining five methods take seconds to solve problems. Over all 48 problems, LK-SOCP and the two methods based on Steiner zones (SZ1, SZ2) are the fastest, with average times of 0.560, 0.590, and 1.818 seconds, respectively.

Table A-1: Tour lengths for nine heuristics on $TSPLIB$ problems with equal radius and 2D Manhattan norm

	HYBRID2	HYBRID1	SZ2	SZ1	CTD	LK-SOCP	GTSP2	YUAN+	GTSP1
Overlap ratio: 0.02									
kroD100	**191.42**	195.91	201.59	201.61	201.98	202.94	196.90	202.94	200.68
rat195	190.83	192.25	198.15	198.32	202.49	200.20	**189.44**	200.20	193.36
lin318	**3373.09**	3388.28	3433.31	3435.14	3557.13	3577.33	3427.01	3577.33	3500.15
rd400	**1257.36**	1262.70	1304.09	1304.56	1309.00	1291.62	1301.43	1296.50	1322.25
pcb442	373.30	375.19	381.67	382.71	384.02	402.67	**371.44**	385.42	378.65
d493	263.98	265.48	275.92	275.88	273.54	286.17	**259.10**	287.36	264.39
dsj1000	1201.91	1210.31	1244.13	1245.62	1237.07	1248.96	**1177.29**	1246.80	1210.96
Overlap ratio: 0.1									
kroD100	114.43	116.12	114.56	115.10	115.70	109.63	**102.63**	109.63	108.28
rat195	92.33	92.96	92.54	92.59	93.98	94.50	**76.70**	94.50	87.17
lin318	1840.90	1840.90	1869.35	1871.42	1920.09	1905.96	**1786.19**	1905.96	1945.53
rd400	615.06	620.42	617.85	618.09	637.52	613.00	**559.03**	636.74	616.24
pcb442	196.15	197.02	196.15	196.26	193.19	241.26	**175.08**	241.14	191.87
d493	137.23	137.25	137.23	137.23	**136.55**	143.67	145.37	143.48	174.17
dsj1000	**490.56**	498.99	**490.56**	490.74	514.83	586.49	582.39	577.32	803.48
Overlap ratio: 0.3									
kroD100	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	74.71	**71.02**	88.19
rat195	**55.88**	**55.88**	**55.88**	55.89	**55.88**	**55.88**	57.98	**55.88**	95.01
lin318	876.58	919.59	876.58	878.02	1075.16	**850.29**	1137.12	**850.29**	1616.93
rd400	**262.61**	266.21	266.13	266.14	301.77	289.55	427.82	326.40	565.31
pcb442	104.15	104.16	104.15	104.16	**104.09**	114.98	158.08	141.14	192.69
d493	97.30	97.33	97.30	97.33	100.92	**92.43**	106.50	**92.43**	187.83
dsj1000	248.90	250.75	248.90	248.95	258.51	**239.50**	563.17	310.46	959.96
Varied overlap ratios									
team1_100	392.31	398.46	403.68	404.40	397.51	398.38	**378.67**	398.38	388.97
team2_200	313.17	314.42	313.17	313.30	340.15	375.05	**293.10**	337.19	358.13
team3_300	**592.37**	597.91	605.53	606.09	610.20	603.46	594.15	603.46	631.42
team4_400	883.39	890.06	899.70	900.18	905.25	976.09	**831.32**	994.45	856.58
team5_499	**855.62**	859.15	893.05	889.71	889.63	891.86	872.63	896.37	888.31
team6_500	**269.23**	279.29	269.23	274.45	327.41	305.67	437.11	329.21	624.32
bonus1000	555.40	559.67	561.22	563.56	**527.28**	559.16	707.88	581.82	888.49
concentricCircles1	68.98	68.19	67.72	68.93	70.30	68.33	**67.14**	68.33	67.34
concentricCircles2	**178.98**	180.30	204.97	203.21	199.97	204.51	198.65	204.51	202.34
concentricCircles3	338.21	339.72	348.46	348.55	354.58	386.51	**329.69**	386.51	337.06
concentricCircles4	**556.52**	560.16	611.04	611.08	614.89	629.61	587.81	630.95	597.79
concentricCircles5	**786.41**	790.55	826.78	827.09	838.07	843.82	816.19	903.67	831.40
bubbles1	**367.89**	370.11	367.89	368.01	398.04	367.89	367.89	367.89	373.83
bubbles2	455.15	455.15	455.15	456.86	**447.89**	555.93	454.50	555.93	491.90
bubbles3	655.09	655.62	659.62	660.95	685.61	759.74	**591.54**	759.74	631.15
bubbles4	**902.86**	909.71	929.77	933.03	1023.90	1069.98	998.35	1069.98	1050.66
bubbles5	**1239.81**	1251.10	1316.39	1322.82	1370.58	1410.58	1300.62	1410.58	1351.99
bubbles6	**1542.56**	1550.29	1587.12	1600.17	1751.70	2034.24	1655.04	2034.24	1721.77
bubbles7	**1878.80**	1889.60	2027.42	2040.41	2198.78	2520.98	2024.58	2520.98	2171.95
bubbles8	**2311.56**	2344.13	2419.54	2454.69	2709.39	2948.70	2575.57	2948.70	2731.07
bubbles9	**2763.27**	2788.85	2901.34	2909.20	3227.97	3471.86	3253.49	3471.86	3566.35
rotatingDiamonds1	36.16	42.30	36.16	35.59	**35.58**	**35.58**	**35.58**	**35.58**	35.86
rotatingDiamonds2	**192.88**	**192.88**	**192.88**	**192.88**	193.07	193.06	**192.88**	193.06	**192.88**
rotatingDiamonds3	**432.88**	437.57	**432.88**	432.97	442.64	433.06	439.90	433.06	445.55
rotatingDiamonds4	990.29	993.08	**989.56**	989.67	993.33	990.45	992.19	990.45	1014.86
rotatingDiamonds5	1730.29	1755.88	**1729.56**	1729.97	1740.83	1729.74	1751.84	1729.74	1865.18
chaoSingleDep	**1184.56**	1184.62	1185.16	1185.16	1185.16	1185.16	1218.77	1185.16	1228.76

Table A-2: Percentage deviation from the best solution for nine heuristics on *TSPLIB* problems with equal radius and 2D Manhattan norm

	HYBRID2	HYBRID1	SZ2	SZ1	CTD	LK-SOCP	GTSP2	YUAN+	GTSP1
Overlap ratio: 0.02									
kroD100	0.00	2.35	5.31	5.32	5.52	6.02	2.86	6.02	4.83
rat195	0.73	1.48	4.59	4.68	6.88	5.68	0.00	5.68	2.07
lin318	0.00	0.45	1.79	1.84	5.46	6.06	1.60	6.06	3.77
rd400	0.00	0.42	3.72	3.75	4.11	2.73	3.51	3.11	5.16
pcb442	0.50	1.01	2.75	3.03	3.39	8.41	0.00	3.76	1.94
d493	1.88	2.46	6.49	6.48	5.57	10.45	0.00	10.90	2.04
dsj1000	2.09	2.80	5.68	5.80	5.08	6.09	0.00	5.90	2.86
Average:	0.74	1.57	4.33	4.42	5.14	6.49	1.14	5.92	2.93
Overlap ratio: 0.1									
kroD100	11.49	13.14	11.62	12.15	12.73	6.81	0.00	6.81	5.50
rat195	20.37	21.20	20.65	20.71	22.53	23.21	0.00	23.21	13.65
lin318	3.06	3.06	4.66	4.77	7.50	6.71	0.00	6.71	8.92
rd400	10.02	10.98	10.52	10.57	14.04	9.65	0.00	13.90	10.23
pcb442	12.03	12.53	12.03	12.10	10.34	37.80	0.00	37.73	9.59
d493	0.50	0.51	0.50	0.50	0.00	5.22	6.46	5.08	27.55
dsj1000	0.00	1.72	0.00	0.04	4.95	19.56	18.72	17.69	63.79
Average:	8.21	9.02	8.57	8.69	10.30	15.56	3.60	15.87	19.89
Overlap ratio: 0.3									
kroD100	0.00	0.00	0.00	0.00	0.01	0.00	5.21	0.00	24.18
rat195	0.00	0.00	0.00	0.02	0.01	0.00	3.76	0.00	70.03
lin318	3.09	8.15	3.09	3.26	26.45	0.00	33.73	0.00	90.16
rd400	0.00	1.37	1.34	1.34	14.91	10.26	62.91	24.29	115.27
pcb442	0.05	0.06	0.05	0.06	0.00	10.46	51.86	35.59	85.11
d493	5.27	5.30	5.27	5.30	9.18	0.00	15.22	0.00	103.22
dsj1000	3.92	4.70	3.92	3.94	7.94	0.00	135.15	29.63	300.82
Average:	1.76	2.80	1.95	1.99	8.36	2.96	43.98	12.79	112.68
TSPLIB Average:	3.57	4.46	4.95	5.03	7.93	8.34	16.24	11.53	45.27
Varied overlap ratios									
team1_100	3.60	5.23	6.60	6.79	4.97	5.21	0.00	5.21	2.72
team2_200	6.85	7.28	6.85	6.90	16.05	27.96	0.00	15.04	22.19
team3_300	0.00	0.94	2.22	2.32	3.01	1.87	0.30	1.87	6.59
team4_400	6.26	7.07	8.22	8.28	8.89	17.41	0.00	19.62	3.04
team5_499	0.00	0.41	4.38	3.98	3.98	4.24	1.99	4.76	3.82
team6_500	0.00	3.73	0.00	1.94	21.61	13.53	62.36	22.28	131.89
bonus1000	5.33	6.14	6.44	6.88	0.00	6.05	34.25	10.34	68.50
Average:	3.15	4.40	4.96	5.30	8.36	10.90	14.13	11.30	34.11
concentricCircles1	2.74	1.56	0.86	2.66	4.69	1.77	0.00	1.77	0.29
concentricCircles2	0.00	0.74	14.52	13.54	11.73	14.27	10.99	14.27	13.05
concentricCircles3	2.59	3.04	5.70	5.72	7.55	17.23	0.00	17.23	2.24
concentricCircles4	0.00	0.65	9.80	9.80	10.49	13.13	5.62	13.37	7.41
concentricCircles5	0.00	0.53	5.13	5.17	6.57	7.30	3.79	14.91	5.72
Average:	1.06	1.30	7.20	7.38	8.21	10.74	4.08	12.31	5.74
bubbles1	0.00	0.60	0.00	0.03	8.20	0.00	0.00	0.00	1.62
bubbles2	1.62	1.62	1.62	2.00	0.00	24.12	1.48	24.12	9.83
bubbles3	10.74	10.83	11.51	11.73	15.90	28.43	0.00	28.43	6.70
bubbles4	0.00	0.76	2.98	3.34	13.41	18.51	10.58	18.51	16.37
bubbles5	0.00	0.91	6.18	6.70	10.55	13.77	4.91	13.77	9.05
bubbles6	0.00	0.50	2.89	3.73	13.56	31.87	7.29	31.87	11.62
bubbles7	0.00	0.57	7.91	8.60	17.03	34.18	7.76	34.18	15.60
bubbles8	0.00	1.41	4.67	6.19	17.21	27.56	11.42	27.56	12.88
bubbles9	0.00	0.93	5.00	5.28	16.82	25.64	17.74	25.64	18.15
Average:	1.37	2.02	4.75	5.29	12.52	22.68	6.80	22.68	29.06
rotatingDiamonds1	1.64	18.90	1.64	0.03	0.00	0.00	0.00	0.00	0.79
rotatingDiamonds2	0.00	0.00	0.00	0.00	0.10	0.09	0.00	0.09	0.00
rotatingDiamonds3	0.00	1.08	0.00	0.02	2.25	0.04	1.62	0.04	2.93
rotatingDiamonds4	0.07	0.35	0.00	0.01	0.38	0.09	0.27	0.09	2.56
rotatingDiamonds5	0.04	1.52	0.00	0.02	0.65	0.01	1.29	0.01	7.84
Average:	0.35	4.37	0.33	0.02	0.68	0.05	0.64	0.05	2.82
chaoSingleDep	0.00	0.00	0.05	0.05	0.05	0.05	2.89	0.05	3.73
GEOMETRIC **Average:**	1.54	2.86	4.27	4.51	7.99	12.38	6.91	12.78	14.94
Overall Average:	2.43	3.56	4.57	4.74	7.96	10.61	10.99	12.23	28.21

Table A-3: Computation time (CPU seconds) for nine heuristics on *TSPLIB* problems with equal radius and 2D Manhattan norm

	LK-SOCP	SZ1	SZ2	CTD	YUAN+	HYBRID1	HYBRID2	GTSP1	GTSP2
Overlap ratio: 0.02									
kroD100	0.125	0.250	0.531	0.472	0.984	1363.781	1437.515	665	666
rat195	0.188	0.547	1.328	1.053	6.688	11549.532	12147.031	7780	7781
lin318	0.453	0.969	1.961	1.356	165.047	366.984	13425.766	48543	48545
rd400	0.547	1.328	2.719	2.881	18.500	45225.438	43109.610	76007	76010
pcb442	0.727	1.265	3.563	3.066	27.234	30599.078	29250.922	222043	222047
d493	1.000	1.609	3.899	3.635	78.672	6014.187	6132.609	309067	309071
dsj1000	2.828	3.469	6.289	9.587	369.765	37155.297	30123.484	12682539	12682545
Average:	0.838	1.348	2.898	3.150	95.270	18896.328	19375.277	1906663	1906666
Overlap ratio: 0.1									
kroD100	0.094	0.125	0.235	0.579	0.921	24.172	24.875	1482	1483
rat195	0.157	0.172	0.617	1.525	6.484	44.796	46.281	5949	5951
lin318	0.359	0.297	0.922	2.644	166.125	100.407	101.312	60249	60252
rd400	0.430	0.437	1.188	3.372	18.000	227.844	222.485	90999	91003
pcb442	0.633	0.422	1.594	3.847	27.640	133.516	125.547	250482	250485
d493	0.852	0.391	1.516	22.516	79.687	26.078	29.797	61711	61715
dsj1000	2.203	0.968	5.836	10.019	370.313	129.781	108.187	7807740	7807747
Average:	0.675	0.402	1.701	6.357	95.596	98.085	94.069	1182659	1182662
Overlap ratio: 0.3									
kroD100	0.070	0.078	0.149	1.263	0.891	0.140	0.250	865	865
rat195	0.118	0.125	0.344	2.844	6.781	0.656	1.000	6322	6323
lin318	0.313	0.250	0.742	9.282	143.328	3.406	4.984	40164	40166
rd400	0.422	0.359	0.985	14.043	17.735	5.000	7.234	61116	61120
pcb442	0.516	0.359	0.836	23.284	26.641	3.921	6.250	76133	76137
d493	0.930	0.359	0.695	44.781	117.844	0.891	2.110	59105	59109
dsj1000	2.414	0.938	2.352	323.220	367.906	9.078	12.672	2623492	2623498
Average:	0.683	0.353	0.872	59.817	97.304	3.299	4.929	409600	409603
TSPLIB Average:	0.732	0.701	1.824	23.108	96.056	6332.571	6491.425	1166307	1166310
Varied overlap ratios									
team1_100	0.149	0.141	0.407	1.043	1.578	72.500	60.578	913	913
team2_200	0.164	0.188	0.641	3.316	14.610	21.188	15.094	34768	34768
team3_300	0.586	0.391	1.727	1.764	12.500	324.437	313.047	69822	69822
team4_400	0.516	0.625	1.274	2.337	23.937	2140.344	2189.954	276261	276263
team5_499	1.000	1.313	3.524	3.127	42.140	14575.516	14988.484	396627	396630
team6_500	0.524	0.454	1.195	47.146	50.281	5.094	7.375	196027	196027
bonus1000	1.547	1.000	6.477	37.496	557.594	255.937	272.437	2648670	2648674
Average:	0.641	0.587	2.177	13.747	100.377	2485.002	2549.567	517584	517585
concentricCircles1	0.016	0.039	0.047	0.010	0.093	5.688	5.094	123	123
concentricCircles2	0.024	0.078	0.094	0.030	0.156	43.031	45.219	169	169
concentricCircles3	0.055	0.125	0.180	0.048	0.454	291.781	282.047	372	372
concentricCircles4	0.110	0.227	0.375	0.079	0.438	1055.828	1060.984	4468	4468
concentricCircles5	0.164	0.422	0.774	0.165	4.375	2497.609	2541.844	22030	22030
Average:	0.073	0.178	0.294	0.066	1.103	778.787	787.038	5432	5432
bubbles1	0.016	0.071	0.094	0.280	0.125	15.391	15.000	95	95
bubbles2	0.071	0.102	1.555	0.049	0.343	41.078	41.969	64	64
bubbles3	0.149	0.235	0.438	0.146	0.562	320.719	319.891	471	471
bubbles4	0.250	0.274	0.625	0.343	1.156	865.531	803.406	23413	23414
bubbles5	0.399	0.657	1.383	0.622	1.797	1929.047	2150.390	6084	6085
bubbles6	0.609	0.555	3.274	1.525	2.453	4839.156	4885.250	24655	24656
bubbles7	0.805	0.766	3.352	0.944	3.125	11743.172	5910.609	34294	34296
bubbles8	1.133	1.024	7.235	1.903	5.532	19708.328	17770.469	100460	100463
bubbles9	1.243	1.313	7.656	2.831	7.906	46269.110	46360.813	304346	304349
Average:	0.519	0.555	2.846	0.960	2.555	9525.726	8695.311	54876	54877
rotatingDiamonds1	0.016	0.039	0.047	0.108	0.094	4.000	4.250	23	23
rotatingDiamonds2	0.031	0.102	0.180	0.189	0.219	79.609	77.484	367	368
rotatingDiamonds3	0.156	0.391	0.657	0.497	0.531	4796.187	3911.344	16406	16407
rotatingDiamonds4	0.328	0.750	1.289	0.745	1.219	8450.469	15630.594	49043	49044
rotatingDiamonds5	1.070	2.055	3.961	8.796	4.484	9920.093	11978.797	210895	210900
Average:	0.320	0.667	1.227	2.067	1.309	4650.072	6320.494	55347	55348
chaoSingleDep	0.368	0.289	0.500	0.702	2.094	299.171	324.953	43742	43743
GEOMETRIC **Average:**	0.426	0.504	1.813	4.305	27.400	4835.926	4887.681	165356	165357
Overall Average:	0.560	0.590	1.818	12.531	57.437	5490.708	5589.319	603272	603274

A.2 CEVRP Results

The results for the 48 CEVRP test problems with equal radius and 2D Manhattan norm are given in Table A-4. We see that, for the low overlap ratio $TSPLIB$ problems, SZVRP4 produces four best solutions. For the medium overlap ratio $TSPLIB$ problems, CW-SOCP produces five best solutions, and for the high overlap ratio $TSPLIB$ problems, CW-SOCP produces seven best solutions.

CW-SOCP performs well on the $Team$ problems, finding three best solutions. The remaining $GEOMETRIC$ problems are dominated by SZVRP4 and SZVRP3. Each method finds eight best solutions for the remaining 20 problems. Taken together, SZVRP4 and SZVRP3 find 14 best solutions for the $ConcentricCircles$, $Bubbles$, and $RotatingCircles$ problems and $ChaoSingleDep$.

In Table A-5, we computed the percentage deviation from the best solution for the results given in Table A-4. For the low overlap ratio $TSPLIB$ problems, SZVRP3 and SZVRP4 have an average deviation of less than 0.2%. SZVRP2 and GTSP have an average deviation of less than 2%. For the medium overlap ratio $TSPLIB$ problems, CW-SOCP has the smallest average (1.06%) with the remaining seven methods having an average deviation between 2.5% and 6.5%. CW-SOCP dominates the other heuristics for the high overlap ratio $TSPLIB$ problems averaging 0.00%. Only two other methods (SZVRP3, SZVRP4) have an average deviation less than 10%.

Over all 21 $TSPLIB$ problems, CW-SOCP produces the smallest average deviation (2.85%), followed by SZVRP3 (4.19%) and SZVRP4 (4.45%). CW-SOCP

does not perform well on problems with a low overlap ratio but is clearly the best method for problems with medium and high overlap ratios. The Steiner-zone methods perform well across all three overlap ratios.

CW-SOCP performs well on the seven *Team* problems. CW-SOCP has the smallest average deviation (3.32%) with SZVRP2, SZVRP3, and SZVRP4 trailing by almost 2%. CW-SOCP produces very large average deviations on the *ConcentricCircles*, *Bubbles*, and *RotatingDiamonds* problems (16.84%, 19.61%, and 6.77%). SZVRP4 averages under 1% deviation for each group, and SZVRP3 is close behind. Over all *GEOMETRIC* problems, SZVRP4 is the most accurate (1.62%). SZVRP3 and SZVRP2 are both fairly close (2.08% and 3.06%) while CW-SOCP trails all other methods with an average deviation of 12.15%.

Over all 48 problems, we see that SZVRP4 (2.86%) and SZVRP3 (3.01%) are the most accurate methods with SZVRP2 not far behind. CW-SOCP performs well on high overlap ratio problems but has the second largest overall deviation (8.08%).

In Table A-6, we give the computation times for the eight methods. Over all *TSPLIB* problems, CW-SOCP is very fast with an average time of approximately one and one quarter seconds. In addition to CW-SOCP, three methods (SZVRP1, SZVRP2, and Giant TSP) have averages less than six seconds. GTSP is very slow. For the *GEOMETRIC* problems, CW-SOCP averages less than one second and four methods (including SZVRP1 and SZVRP2) average less than five seconds. Over all 48 problems, CW-SOCP is the fastest (1.097 seconds) and GTSP is the slowest (602857 seconds). SZVRP2 and Giant TSP are fast with an average of less than four seconds.

The results are very similar to what we found in Chapter 3 using the Euclidean norm. The results support the observation that the SZH methods (SZVRP1, SZVRP2, SZVRP3, SZVRP4) produce high-quality tours across a wide spectrum of problem types and sizes in reasonable time. The results suggest that CW-SOCP is the best method for non-geometric problems with medium and high overlap ratios. It is the fastest method across all problem types.

If we consider the column representations in Tables A-5 and A-6 to be rankings, SZVRP1, SZVRP2, and SZVRP4 have the best average rank of 3.5. CW-SOCP's average rank is 4 while SZVRP3 and CTD have an average rank of 4.5. CW-SOCP and SZVRP4 perform slightly better with the Manhattan norm than with the Euclidean norm while SZVRP3 does slightly worse. SZVRP2 ranks number one for both norms and SZVRP1 ranks second for the Euclidean norm and first for the Manhattan norm. The combination of speed and accuracy across all problems with either norm makes SZVRP2 a highly competitive method.

A.3 Phase IV with the Manhattan Norm

When using the Manhattan norm, the turn angle of each edge is either 0°or 90°. In order to apply Phase IV, we need meaningful turn angle values for each edge in the tour. Therefore, we calculate the turn angles as if the Euclidean norm were being used.

Table A-4: Tour lengths for eight heuristics on 48 problems with equal radius and 2D Manhattan norm

	SZVRP4	SZVRP3	SZVRP2	CTD	SZVRP1	GTSP	CW-SOCP	Giant TSP
Overlap ratio: 0.02								
kroD100	**456.00**	456.08	468.73	462.73	473.99	459.88	468.58	476.31
rat195	362.08	361.65	365.18	369.13	379.62	**360.73**	382.03	388.38
lin318	**6004.75**	6020.90	6109.61	6101.72	6414.61	6172.66	6750.32	6478.13
rd400	1523.29	1520.98	1531.65	**1518.23**	1676.42	1548.05	1683.95	1691.46
pcb442	646.23	**642.98**	675.44	668.13	691.72	653.38	712.75	689.76
d493	**1111.19**	1111.66	1113.08	1112.85	1121.78	1115.21	1139.10	1136.63
dsj1000	**1853.07**	1853.68	1862.06	1856.14	1937.79	1863.81	1985.57	2002.68
Overlap ratio: 0.1								
kroD100	403.37	403.37	404.78	424.72	429.21	391.08	**378.28**	410.62
rat195	307.94	**297.38**	310.27	310.05	324.77	300.38	310.84	300.87
lin318	5084.63	5084.63	5150.47	5255.15	5174.60	5316.87	**5077.09**	5177.39
rd400	1006.25	992.90	1007.23	997.61	1007.23	1009.38	**992.84**	1057.45
pcb442	549.57	**549.22**	553.65	564.39	567.39	555.21	565.26	556.58
d493	1020.97	1020.97	1023.55	1012.47	1023.55	1044.98	**987.32**	1019.96
dsj1000	1394.91	1394.50	1411.82	1319.49	1411.82	1433.59	**1284.63**	1485.06
Overlap ratio: 0.3								
kroD100	251.70	251.70	251.70	298.85	251.70	300.57	**234.26**	283.42
rat195	210.60	210.60	210.60	219.33	210.60	244.41	**196.65**	215.14
lin318	3425.75	3425.75	3425.75	3804.45	3425.75	3909.30	**2979.15**	3849.45
rd400	674.85	674.85	698.48	742.52	725.87	781.25	**599.52**	781.48
pcb442	393.56	393.56	393.56	459.35	393.56	492.21	**386.75**	441.82
d493	863.34	863.34	863.34	889.63	863.34	821.64	**738.40**	874.43
dsj1000	751.69	751.69	751.69	760.81	751.69	1152.42	**697.52**	856.43
Varied overlap ratios								
team1_100	1879.94	1879.94	1880.05	1807.58	1895.70	1736.56	**1684.19**	1797.16
team2_200	783.82	783.82	783.82	788.99	783.82	775.39	**724.39**	769.30
team3_300	1285.84	1285.84	1299.40	1316.75	1309.00	**1275.10**	1296.77	1373.91
team4_400	**1703.57**	1717.57	1740.61	1748.25	1890.41	1755.29	1953.68	1769.17
team5_499	1322.67	**1318.55**	1326.05	1340.07	1410.08	1325.29	1399.32	1408.18
team6_500	**916.69**	**916.69**	918.24	955.34	918.24	1021.70	834.62	996.52
bonus1000	1837.61	1848.40	1849.27	1866.56	1921.43	1964.43	**1768.90**	1886.33
concentricCircles1	102.78	102.78	102.79	115.95	116.72	106.26	118.59	**102.54**
concentricCircles2	262.18	262.40	259.50	**257.88**	284.80	277.76	321.94	268.14
concentricCircles3	491.22	**490.36**	496.17	522.10	514.99	498.10	603.33	518.24
concentricCircles4	783.89	779.25	796.88	816.47	822.94	**774.96**	824.17	822.95
concentricCircles5	1029.68	**1024.73**	1036.23	1051.11	1065.63	1036.45	1171.44	1070.14
bubbles1	610.51	610.51	610.53	648.79	610.53	610.51	**606.86**	610.51
bubbles2	538.79	581.47	538.79	601.47	538.79	**530.72**	668.79	**530.72**
bubbles3	**1262.94**	1289.26	1305.70	1335.02	1329.18	1285.79	1374.63	1310.76
bubbles4	**1785.41**	1816.37	1942.69	1917.33	2023.45	1967.30	1968.81	2048.58
bubbles5	**2214.41**	2280.15	2334.85	2283.48	2447.32	2408.06	2597.44	2364.33
bubbles6	2203.11	**2159.99**	2300.78	2273.61	2450.18	2311.50	2765.33	2364.85
bubbles7	**2291.37**	2294.80	2295.82	2419.72	2463.63	2382.33	2893.22	2428.59
bubbles8	3551.47	**3544.22**	3686.39	3649.06	3896.60	3809.18	4366.46	3767.44
bubbles9	3909.44	**3874.84**	4101.77	4126.33	4461.01	4291.03	5290.72	4387.99
rotatingDiamonds1	**57.37**	**57.37**	**57.37**	**57.37**	**57.37**	**57.37**	**57.37**	61.76
rotatingDiamonds2	277.07	277.07	277.07	277.07	**276.88**	279.07	284.00	287.61
rotatingDiamonds3	**739.27**	741.80	745.00	754.96	775.34	766.29	781.32	806.03
rotatingDiamonds4	**1124.54**	1128.00	1126.12	1135.33	1233.96	1128.00	1265.25	1299.02
rotatingDiamonds5	2043.81	**2042.97**	2046.90	2062.53	2044.74	2070.84	2310.50	2434.35
chaoSingleDep	**1365.97**	**1365.97**	**1365.97**	1471.16	1494.16	**1365.97**	1515.11	**1365.97**

Table A-5: Percentage deviation from the best solution for eight heuristics on 48 problems with equal radius and 2D Manhattan norm

	SZVRP4	SZVRP3	SZVRP2	CTD	SZVRP1	GTSP	CW-SOCP	Giant TSP
Overlap ratio: 0.02								
kroD100	0.00	0.02	2.79	1.48	3.95	0.85	2.76	4.46
rat195	0.37	0.25	1.23	2.33	5.24	0.00	5.90	7.66
lin318	0.00	0.27	1.75	1.61	6.83	2.80	12.42	7.88
rd400	0.33	0.18	0.88	0.00	10.42	1.96	10.92	11.41
pcb442	0.50	0.00	5.05	3.91	7.58	1.62	10.85	7.28
d493	0.00	0.04	0.17	0.15	0.95	0.36	2.51	2.29
dsj1000	0.00	0.03	0.49	0.17	4.57	0.58	7.15	8.07
Average:	0.17	0.11	1.77	1.38	5.65	1.17	7.50	7.01
Overlap ratio: 0.1								
kroD100	6.63	6.63	7.01	12.28	13.46	3.38	0.00	8.55
rat195	3.55	0.00	4.34	4.26	9.21	1.01	4.53	1.17
lin318	0.15	0.15	1.45	3.51	1.92	4.72	0.00	1.98
rd400	1.35	0.01	1.45	0.48	1.45	1.67	0.00	6.51
pcb442	0.06	0.00	0.81	2.76	3.31	1.09	2.92	1.34
d493	3.41	3.41	3.67	2.55	3.67	5.84	0.00	3.31
dsj1000	8.58	8.55	9.90	2.71	9.90	11.60	0.00	15.60
Average:	3.39	2.68	4.09	4.08	6.13	4.19	1.06	5.49
Overlap ratio: 0.1								
kroD100	7.44	7.44	7.44	27.57	7.44	28.31	0.00	20.98
rat195	7.09	7.09	7.09	11.53	7.09	24.28	0.00	9.40
lin318	14.99	14.99	14.99	27.70	14.99	31.22	0.00	29.21
rd400	12.56	12.56	16.51	23.85	21.07	30.31	0.00	30.35
pcb442	1.76	1.76	1.76	18.77	1.76	27.27	0.00	14.24
d493	16.92	16.92	16.92	20.48	16.92	11.27	0.00	18.42
dsj1000	7.77	7.77	7.77	9.07	7.77	65.22	0.00	22.78
Average:	9.79	9.79	10.35	19.85	11.01	31.13	0.00	20.77
TSPLIB **Average:**	4.45	4.19	5.40	8.44	7.60	12.16	2.85	11.09
Varied overlap ratios								
team1_100	11.62	11.62	11.63	7.33	12.56	3.11	0.00	6.71
team2_200	8.20	8.20	8.20	8.92	8.20	7.04	0.00	6.20
team3_300	0.84	0.84	1.91	3.27	2.66	0.00	1.70	7.75
team4_400	0.00	0.82	2.17	2.62	10.97	3.04	14.68	3.85
team5_499	0.31	0.00	0.57	1.63	6.94	0.51	6.13	6.80
team6_500	9.83	9.83	10.02	14.46	10.02	22.41	0.00	19.40
bonus1000	3.88	4.49	4.54	5.52	8.62	11.05	0.00	6.64
Average:	4.96	5.12	5.58	6.25	8.57	6.74	3.22	8.19
concentricCircles1	0.23	0.23	0.25	13.08	13.83	3.63	15.66	0.00
concentricCircles2	1.67	1.75	0.63	0.00	10.44	7.71	24.84	3.98
concentricCircles3	0.18	0.00	1.19	6.47	5.02	1.58	23.04	5.69
concentricCircles4	1.15	0.55	2.83	5.36	6.19	0.00	6.35	6.19
concentricCircles5	0.48	0.00	1.12	2.57	3.99	1.14	14.32	4.43
Average:	0.74	0.51	1.20	5.50	7.90	2.81	16.84	4.06
bubbles1	0.60	0.60	0.60	6.91	0.60	0.60	0.00	0.60
bubbles2	1.52	9.56	1.52	13.33	1.52	0.00	26.02	0.00
bubbles3	0.00	2.08	3.39	5.71	5.25	1.81	8.84	3.79
bubbles4	0.00	1.73	8.81	7.39	13.33	10.19	10.27	14.74
bubbles5	0.00	2.97	5.44	3.12	10.52	8.75	17.30	6.77
bubbles6	2.00	0.00	6.52	5.26	13.43	7.01	28.03	9.48
bubbles7	0.00	0.15	0.19	5.60	7.52	3.97	26.27	5.99
bubbles8	0.20	0.00	4.01	2.96	9.94	7.48	23.20	6.30
bubbles9	0.89	0.00	5.86	6.49	15.13	10.74	36.54	13.24
Average:	0.58	1.90	4.04	6.31	8.58	5.62	19.61	6.77
rotatingDiamonds1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.64
rotatingDiamonds2	0.07	0.07	0.07	0.07	0.00	0.79	2.57	3.87
rotatingDiamonds3	0.00	0.34	0.78	2.12	4.88	3.66	5.69	9.03
rotatingDiamonds4	0.00	0.31	0.14	0.96	9.73	0.31	12.51	15.52
rotatingDiamonds5	0.04	0.00	0.19	0.96	0.09	1.36	13.10	19.16
Average:	0.02	0.14	0.24	0.82	2.94	1.22	6.77	11.04
chaoSingleDep	0.00	0.00	0.00	7.70	9.38	0.00	10.92	0.00
GEOMETRIC **Average:**	1.62	2.08	3.06	5.18	7.44	4.37	12.15	7.18
Overall Average:	2.86	3.01	4.08	6.60	7.51	7.78	8.08	8.89

Table A-6: Computation time (CPU seconds) for eight heuristics on 48 problems with equal radius and 2D Manhattan norm

	CW-SOCP	SZVRP1	Giant TSP	SZVRP2	CTD	SZVRP4	SZVRP3	GTSP
Overlap ratio: 0.02								
kroD100	0.187	0.843	1.391	3.766	1.066	32.860	42.453	672
rat195	0.328	1.438	2.641	9.016	2.944	76.344	100.797	7811
lin318	0.718	1.937	3.547	8.547	2.966	47.844	84.437	48561
rd400	1.078	5.547	7.437	15.688	6.006	174.703	186.954	76052
pcb442	0.844	4.250	7.468	11.015	5.113	106.250	125.516	222126
d493	1.234	18.047	9.468	24.094	8.791	69.766	113.281	309104
dsj1000	3.234	5.234	17.422	20.281	7.728	130.047	189.500	12682597
Average:	1.089	5.328	7.053	13.201	4.945	91.116	120.420	1906703
Overlap ratio: 0.1								
kroD100	0.172	0.578	0.391	0.938	0.719	2.125	3.828	1485
rat195	5.000	0.735	0.984	1.531	1.713	3.734	6.219	5954
lin318	0.578	0.954	1.047	1.782	2.706	5.922	11.828	60260
rd400	0.937	1.125	1.687	2.125	3.497	9.750	16.562	91013
pcb442	0.688	1.125	1.797	1.969	3.893	8.422	13.844	250505
d493	1.125	1.578	2.594	2.047	22.109	3.594	6.047	61753
dsj1000	3.844	2.547	3.046	3.985	9.769	7.297	16.313	7807779
Average:	1.763	1.235	1.649	2.054	6.344	5.835	10.663	1182679
Overlap ratio: 0.3								
kroD100	0.172	0.547	0.328	0.766	1.357	0.922	1.313	869
rat195	0.265	0.688	0.532	0.859	2.953	1.094	1.609	6329
lin318	0.531	1.000	0.672	1.203	9.360	1.829	2.532	40174
rd400	0.875	1.172	21.860	1.454	14.044	1.906	3.063	61142
pcb442	0.594	1.250	2.984	1.625	23.425	1.938	3.188	76166
d493	1.015	1.735	1.188	1.875	45.031	2.391	3.906	59127
dsj1000	2.672	2.922	2.063	3.360	323.048	3.453	5.532	2623559
Average:	0.875	1.331	4.232	1.592	59.888	1.933	3.020	409624
TSPLIB **Average:**	1.242	2.631	4.312	5.616	23.726	32.961	44.701	1166335
Varied overlap ratios								
team1_100	0.719	0.641	0.484	1.141	0.680	4.593	7.110	919
team2_200	0.250	0.734	0.625	1.140	3.210	2.828	3.453	34778
team3_300	0.656	1.047	1.297	3.438	1.828	10.422	18.735	69835
team4_400	0.921	1.625	3.000	6.609	2.590	27.953	40.500	276483
team5_499	8.265	3.437	7.844	9.844	4.636	94.359	115.312	396659
team6_500	0.860	1.344	1.109	2.765	47.168	2.531	4.078	196048
bonus1000	2.344	6.562	3.188	6.921	37.714	16.766	21.782	2648717
Average:	2.002	2.199	2.507	4.551	13.975	22.779	30.139	517634
concentricCircles1	0.031	0.406	0.156	0.657	0.126	0.984	1.296	13
concentricCircles2	0.078	0.500	0.250	0.906	0.207	2.657	4.078	170
concentricCircles3	0.094	0.578	0.359	1.485	0.348	7.797	9.641	376
concentricCircles4	0.172	0.875	0.859	2.532	0.649	19.094	28.562	4474
concentricCircles5	3.844	1.063	1.265	4.485	1.000	28.766	44.422	22040
Average:	0.844	0.684	0.578	2.013	0.466	11.860	17.600	5415
bubbles1	0.062	0.453	0.235	0.735	1.082	1.735	12.062	96
bubbles2	0.156	0.468	5.297	0.922	0.244	5.875	2.453	68
bubbles3	0.172	0.766	1.125	1.562	0.764	13.016	4.406	477
bubbles4	0.281	0.938	1.297	2.141	0.695	17.391	13.484	2347
bubbles5	1.188	1.875	11.281	4.062	1.725	25.422	29.891	6107
bubbles6	0.609	5.203	4.125	3.953	1.578	28.469	46.891	24678
bubbles7	0.844	5.735	6.015	11.360	2.253	98.047	50.375	34324
bubbles8	1.016	2.500	13.468	9.078	2.928	79.672	69.047	100501
bubbles9	1.343	3.453	9.969	13.250	4.743	97.765	110.765	304385
Average:	0.630	2.377	5.868	5.229	1.779	40.821	37.708	52554
rotatingDiamonds1	0.047	0.328	5.203	0.438	0.159	0.812	136.000	23
rotatingDiamonds2	0.094	0.531	0.328	1.250	0.435	3.937	1.078	371
rotatingDiamonds3	0.203	1.125	1.078	3.781	2.772	26.890	7.250	16416
rotatingDiamonds4	0.468	11.500	1.969	6.797	2.040	86.250	31.453	49063
rotatingDiamonds5	1.375	4.454	7.031	26.953	6.761	521.016	70.610	210972
Average:	0.437	3.588	3.122	7.844	2.433	127.781	49.278	55369
chaoSingleDep	0.485	0.828	0.672	2.187	0.769	5.750	305.140	43748
GEOMETRIC **Average:**	0.984	2.184	3.316	4.829	4.782	45.585	44.069	164596
Overall Average:	1.097	2.380	3.752	5.173	13.070	40.062	44.346	602857

A.3.1 CETSP

In Tables A-7, A-8, and A-9, we present the results with the Manhattan norm. A 10° range is used for the MAH heuristics ([60°, 69°]). Our experiments showed that [60°, 69°] produced slightly better tours on average than the 10° range we used for the Euclidean norm ([50°, 59°]). For either norm, any 10°interval in the [30°, 69°] produced more accurate solutions than SZH without the minimum angle heuristic.

The tour-length results for the 11 heuristics on the 48 test problems are given in Table A-7. The average deviations from the best solutions in Table A-7 are given in Table A-8. Columns in both tables are ordered by the overall average deviation from best (left) to worst (right).

Over all 48 problems, $SZ3_{0-359}$ finds 40 best solutions. SZ3 finds solutions as good as or better than GTSP2 47 times and finds solutions as good as or better than LK-SOCP 34 times. $SZ2_{0-360}$ equals or is better than GTSP2 48 times and LK-SOCP 32 times. GTSP2 finds the best solution for the five *concentrCircles* problems.

In Table A-8, we give the average deviations from the best solution for the 11 heuristics. $SZ3_{0-359}$ has an average deviation of 0.30% and 0.00% for low and medium overlap ratio $TSPLIB$ problems, respectively, while SZ3 averages 2.28% and 3.43%, respectively. For the high overlap ratio $TSPLIB$ problems, $SZ3_{0-359}$, $SZ3_{60-69}$, and SZ3 have an average deviation of 0.00%. Over all 48 problems, $SZ3_{0-359}$ has an average deviation of 0.30% deviation, and three methods average less than 2% ($SZ3_{60-69}$, SZ3, $SZ2_{0-359}$).

In Table A-9, we give the computation times for the 11 heuristics on the 48 problems. Columns are ordered from fastest (left) to slowest (right). $\mathrm{SZ1}_{60-69}$ and $\mathrm{SZ2}_{60-69}$ are faster than $SZ3$. $\mathrm{SZ1}_{0-360}$ is faster than $\mathrm{SZ2}_{0-360}$.

If we consider the column representations in Tables A-8 and A-9 to be rankings, SZ3 and $\mathrm{SZ3}_{60-69}$ have the best average rank (4.5). The combination of speed and accuracy across all problems with either norm make these two methods highly competitive procedures for the CETSP.

The results for the 48 problems using the Manhattan norm do not provide any new insights on the Steiner-zone heuristic's performance. Instead, they reinforce the observations made in Chapter 4. The MAH, Phase IV, and Phase IV + MAH variants of SZH are more accurate than the standard Steiner-zone heuristic described in Chapters 2 and 3. Phase IV does not increase the computation time unreasonably. If MAH and Phase IV + MAH are applied with 10° ranges, they do not increase computation time unreasonably.

Table A-7: Tour lengths for 11 heuristics on 48 problems with equal radius and 2D Manhattan norm

	$SZ3_{0-360}$	$SZ3_{60-69}$	SZ3	$SZ2_{0-360}$	$SZ1_{0-360}$	$SZ2_{60-69}$	$SZ1_{60-69}$	SZ2	SZ1	GTSP2	LK-SOCP
Overlap ratio: 0.02											
kroD100	197.03	197.03	197.87	199.37	199.39	199.37	199.39	201.59	201.61	202.94	**196.90**
rat195	193.27	198.03	194.91	196.55	196.72	198.78	198.91	198.15	198.32	200.20	**189.44**
lin318	**3353.62**	3372.46	3399.26	3411.84	3419.53	3425.09	3431.29	3433.31	3435.14	3577.33	3427.01
rd400	**1272.65**	1285.56	1287.30	1286.06	1290.20	1301.48	1301.81	1304.09	1304.56	1291.62	1301.43
pcb442	**366.94**	370.30	370.98	372.09	374.23	373.94	374.49	381.67	382.71	402.67	371.44
d493	**256.36**	258.55	270.34	262.26	263.57	266.53	265.25	275.92	275.88	286.17	259.10
dsj1000	**1158.99**	**1158.99**	1199.82	1189.84	1190.59	1189.84	1190.59	1244.13	1245.62	1248.96	1177.29
Overlap ratio: 0.1											
kroD100	**98.71**	100.73	102.49	102.49	103.07	106.18	106.44	114.56	115.10	109.63	102.63
rat195	**75.70**	76.37	77.97	76.58	79.00	82.32	82.50	92.54	92.59	94.50	76.70
lin318	**1529.09**	1538.63	1605.13	1585.65	1630.08	1726.46	1734.08	1869.35	1871.42	1905.96	1786.19
rd400	**544.99**	566.26	550.90	588.25	596.84	602.56	610.57	617.85	618.09	613.00	559.03
pcb442	**167.56**	171.91	180.14	177.55	180.23	182.10	182.96	196.15	196.26	241.26	175.08
d493	**129.25**	129.45	132.38	134.71	135.42	134.91	135.61	137.23	137.23	143.67	145.37
dsj1000	**436.59**	441.34	441.84	451.47	464.07	458.44	466.73	490.56	490.74	586.49	582.39
Overlap ratio: 0.3											
kroD100	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	**71.02**	74.71
rat195	**55.88**	**55.88**	**55.88**	**55.88**	**55.88**	**55.88**	**55.88**	**55.88**	55.89	**55.88**	57.98
lin318	**847.17**	**847.17**	**847.17**	**847.17**	847.31	**847.17**	851.64	876.58	878.02	850.29	1137.12
rd400	**242.02**	**242.02**	**242.02**	242.53	247.71	246.01	247.71	266.13	266.14	289.55	427.82
pcb442	**103.76**	**103.76**	**103.76**	**103.76**	**103.76**	**103.76**	**103.76**	104.15	104.16	114.98	158.08
d493	**92.43**	**92.43**	**92.43**	**92.43**	92.44	**92.43**	92.51	97.30	97.33	**92.43**	106.50
dsj1000	**239.70**	**239.70**	**239.70**	**239.70**	240.75	239.70	242.15	248.90	248.95	**239.70**	563.17
Varied overlap ratios											
team1_100	**372.74**	373.39	383.28	379.40	376.76	383.23	385.84	403.68	404.40	398.38	378.67
team2_200	**278.43**	**278.43**	287.82	294.07	302.46	300.49	304.98	313.17	313.30	375.05	293.10
team3_300	**558.75**	566.84	578.92	575.64	578.94	593.98	595.97	605.53	606.09	603.46	594.15
team4_400	**830.60**	839.82	850.18	852.78	855.86	866.31	865.76	899.70	900.18	976.09	831.32
team5_499	**842.19**	851.24	857.53	857.62	862.35	872.34	872.84	893.05	889.71	891.86	872.63
team6_500	**260.80**	**260.80**	**260.80**	**260.80**	262.08	**260.80**	262.11	269.23	274.45	305.67	437.11
bonus1000	**464.03**	471.48	464.44	485.84	503.55	503.54	516.07	561.22	563.56	559.16	707.88
concentricCircles1	67.72	67.72	67.72	67.72	67.73	67.72	68.93	67.72	68.93	68.33	**67.14**
concentricCircles2	204.02	204.97	204.97	204.51	203.21	204.97	203.21	204.97	203.21	204.51	**198.65**
concentricCircles3	344.13	347.93	347.93	344.22	344.23	348.46	348.55	348.46	348.55	386.51	**329.69**
concentricCircles4	605.07	606.18	606.18	608.23	608.38	611.04	611.08	611.04	611.08	629.61	**587.81**
concentricCircles5	820.56	820.56	820.56	823.87	824.17	823.87	824.17	826.78	827.09	843.82	**816.19**
bubbles1	**367.89**	**367.89**	**367.89**	**367.89**	367.92	**367.89**	367.92	**367.89**	368.01	**367.89**	**367.89**
bubbles2	**447.89**	**447.89**	**447.89**	**447.89**	449.76	447.89	454.74	455.15	456.86	555.93	454.50
bubbles3	595.56	620.92	595.56	636.34	656.79	636.34	656.79	659.62	660.95	759.74	**591.54**
bubbles4	**888.96**	939.40	920.05	898.71	899.64	974.16	985.11	929.77	933.03	1069.98	998.35
bubbles5	**1182.13**	1205.30	1193.20	1241.45	1244.61	1241.45	1248.69	1316.39	1322.82	1410.58	1300.62
bubbles6	**1451.30**	**1451.30**	1542.37	1485.66	1493.72	1485.66	1493.72	1587.12	1600.17	2034.24	1655.04
bubbles7	**1875.59**	**1875.59**	1909.51	1882.62	1893.72	1882.62	1893.72	2027.42	2040.41	2520.98	2024.58
bubbles8	**2225.74**	**2225.74**	2357.26	**2225.74**	2247.87	**2225.74**	2247.87	2419.54	2454.69	2948.70	2575.57
bubbles9	**2658.78**	**2658.78**	2792.52	2690.85	2706.59	2690.85	2706.59	2901.34	2909.20	3471.86	3253.49
rotatingDiamonds1	**35.58**	**35.58**	**35.58**	**35.58**	**35.58**	**35.58**	35.59	36.16	35.59	**35.58**	**35.58**
rotatingDiamonds2	**192.34**	**192.34**	**192.34**	**192.34**	192.48	192.88	192.88	192.88	192.88	193.06	192.88
rotatingDiamonds3	**432.34**	**432.34**	**432.34**	**432.34**	432.97	432.88	432.97	432.88	432.97	433.06	439.90
rotatingDiamonds4	**989.03**	989.06	**989.03**	**989.03**	989.23	989.07	989.67	989.56	989.67	990.45	992.19
rotatingDiamonds5	**1729.03**	**1729.03**	**1729.03**	**1729.03**	1729.67	**1729.03**	1729.67	1729.56	1729.97	1729.74	1751.84
chaoSingleDep	**1184.56**	1198.77	**1184.56**	1184.57	1185.16	1198.77	1199.82	1185.16	1185.16	1185.16	1218.77

Table A-8: Percentage deviation from the best solution for 11 heuristics on 48 problems with equal radius and 2D Manhattan norm

	$SZ3_{0-360}$	$SZ3_{60-69}$	SZ3	$SZ2_{0-360}$	$SZ1_{0-360}$	$SZ2_{60-69}$	$SZ1_{60-69}$	SZ2	SZ1	GTSP2	LK-SOCP
Overlap ratio: 0.02											
kroD100	0.07	0.07	0.49	1.25	1.26	1.25	1.26	2.38	2.39	3.07	0.00
rat195	2.02	4.53	2.88	3.75	3.84	4.93	5.00	4.59	4.68	5.68	0.00
lin318	0.00	0.56	1.36	1.74	1.97	2.13	2.32	2.38	2.43	6.67	2.19
rd400	0.00	1.01	1.15	1.05	1.38	2.27	2.29	2.47	2.51	1.49	2.26
pcb442	0.00	0.92	1.10	1.40	1.99	1.91	2.06	4.01	4.30	9.74	1.23
d493	0.00	0.85	5.45	2.30	2.81	3.97	3.47	7.63	7.61	11.63	1.07
dsj1000	0.00	0.00	3.52	2.66	2.73	2.66	2.73	7.35	7.47	7.76	1.58
Average:	0.30	1.13	2.28	2.02	2.28	2.73	2.73	4.40	4.49	6.58	1.19
Overlap ratio: 0.1											
kroD100	0.00	2.05	3.83	3.83	4.42	7.57	7.83	16.05	16.61	11.06	3.98
rat195	0.00	0.87	3.00	1.15	4.36	8.74	8.98	22.23	22.30	24.83	1.32
lin318	0.00	0.62	4.97	3.70	6.61	12.91	13.41	22.25	22.39	24.65	16.81
rd400	0.00	3.90	1.08	7.94	9.51	10.56	12.03	13.37	13.41	12.48	2.58
pcb442	0.00	2.60	7.50	5.96	7.56	8.68	9.19	17.06	17.13	43.98	4.49
d493	0.00	0.15	2.42	4.22	4.77	4.37	4.92	6.17	6.17	11.15	12.47
dsj1000	0.00	1.09	1.20	3.41	6.29	5.00	6.90	12.36	12.40	34.33	33.39
Average:	0.00	1.61	3.43	4.31	6.22	8.26	9.04	15.64	15.77	23.21	10.72
Overlap ratio: 0.3											
kroD100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.21
rat195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	3.76
lin318	0.00	0.00	0.00	0.00	0.02	0.00	0.53	3.47	3.64	0.37	34.23
rd400	0.00	0.00	0.00	0.21	2.35	1.65	2.35	9.96	9.96	19.64	76.77
pcb442	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.39	10.82	52.36
d493	0.00	0.00	0.00	0.00	0.01	0.00	0.09	5.27	5.30	0.00	15.22
dsj1000	0.00	0.00	0.00	0.00	0.44	0.00	1.02	3.84	3.86	0.00	134.95
Average:	0.00	0.00	0.00	0.03	0.40	0.24	0.57	3.27	3.31	4.40	46.07
Overall *TSPLIB*:	0.10	0.92	1.90	2.12	2.97	3.74	4.11	7.77	7.86	11.40	19.33
Varied overlap ratios											
team1_100	0.00	0.17	2.83	1.78	1.08	2.81	3.51	8.30	8.49	6.88	1.59
team2_200	0.00	0.00	3.37	5.62	8.63	7.92	9.53	12.48	12.52	34.70	5.27
team3_300	0.00	1.45	3.61	3.02	3.61	6.31	6.66	8.37	8.47	8.00	6.34
team4_400	0.00	1.11	2.36	2.67	3.04	4.30	4.23	8.32	8.38	17.52	0.09
team5_499	0.00	1.08	1.82	1.83	2.39	3.58	3.64	6.04	5.64	5.90	3.61
team6_500	0.00	0.00	0.00	0.00	0.49	0.00	0.50	3.23	5.24	17.21	67.61
bonus1000	0.00	1.60	0.09	4.70	8.52	8.52	11.21	20.94	21.45	20.50	52.55
Average:	0.00	0.77	2.01	2.80	3.97	4.78	5.61	9.67	10.03	15.81	19.58
concentricCircles1	0.86	0.86	0.86	0.86	0.87	0.86	2.66	0.86	2.66	1.77	0.00
concentricCircles2	2.70	3.18	3.18	2.95	2.30	3.18	2.30	3.18	2.30	2.95	0.00
concentricCircles3	4.38	5.53	5.53	4.41	4.41	5.70	5.72	5.70	5.72	17.23	0.00
concentricCircles4	2.94	3.13	3.13	3.47	3.50	3.95	3.96	3.95	3.96	7.11	0.00
concentricCircles5	0.53	0.53	0.53	0.94	0.98	0.94	0.98	1.30	1.34	3.38	0.00
Average:	2.28	2.65	2.65	2.53	2.41	2.92	3.12	3.00	3.19	6.49	0.00
bubbles1	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.00
bubbles2	0.00	0.00	0.00	0.00	0.42	0.00	1.53	1.62	2.00	24.12	1.48
bubbles3	0.68	4.97	0.68	7.57	11.03	7.57	11.03	11.51	11.73	28.43	0.00
bubbles4	0.00	5.67	3.50	1.10	1.20	9.58	10.82	4.59	4.96	20.36	12.31
bubbles5	0.00	1.96	0.94	5.02	5.29	5.02	5.63	11.36	11.90	19.33	10.02
bubbles6	0.00	0.00	6.28	2.37	2.92	2.37	2.92	9.36	10.26	40.17	14.04
bubbles7	0.00	0.00	1.81	0.37	0.97	0.37	0.97	8.10	8.79	34.41	7.94
bubbles8	0.00	0.00	5.91	0.00	0.99	0.00	0.99	8.71	10.29	32.48	15.72
bubbles9	0.00	0.00	5.03	1.21	1.80	1.21	1.80	9.12	9.42	30.58	22.37
Average:	0.08	1.40	2.68	1.96	2.74	2.90	3.97	7.15	7.71	25.54	9.32
rotatingDiamonds1	0.00	0.00	0.00	0.00	0.02	0.00	0.03	1.64	0.03	0.00	0.00
rotatingDiamonds2	0.00	0.00	0.00	0.00	0.07	0.28	0.28	0.28	0.28	0.37	0.28
rotatingDiamonds3	0.00	0.00	0.00	0.00	0.14	0.12	0.14	0.12	0.14	0.16	1.75
rotatingDiamonds4	0.00	0.00	0.00	0.00	0.02	0.00	0.06	0.05	0.06	0.14	0.32
rotatingDiamonds5	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.03	0.05	0.04	1.32
Average:	0.00	0.00	0.00	0.00	0.06	0.08	0.11	0.43	0.11	0.14	0.73
chaoSingleDep	0.00	1.20	0.00	0.00	0.05	1.20	1.29	0.05	0.05	0.05	2.89
GEOMETRIC **Average:**	0.60	1.33	1.87	1.51	1.86	2.10	2.64	4.07	4.31	13.20	4.44
Overall Average:	0.30	1.07	1.90	1.97	2.65	3.21	3.72	6.51	6.70	12.79	13.16

Table A-9: Computation time (CPU seconds) for 11 heuristics on 48 problems with equal radius and 2D Manhattan norm

	LK-SOCP	SZ1	SZ2	$SZ1_{60-69}$	$SZ2_{60-69}$	SZ3	$SZ3_{60-69}$	$SZ1_{0-360}$	$SZ2_{0-360}$	$SZ3_{0-360}$	GTSP2
Overlap ratio: 0.02											
kroD100	0.125	0.250	0.531	3.236	6.845	3.594	16.646	116.485	246.407	599.250	666
rat195	0.188	0.547	1.328	7.655	17.763	9.968	39.316	275.562	639.453	1415.375	7781
lin318	0.453	0.969	1.961	18.713	26.243	30.032	152.297	673.672	944.750	5482.703	48545
rd400	0.547	1.328	2.719	22.095	53.436	24.500	140.957	795.437	1923.703	5074.438	76010
pcb442	0.727	1.265	3.563	41.680	59.864	48.313	207.286	1500.469	2155.093	7462.297	222047
d493	1.000	1.609	3.899	51.025	63.543	52.500	455.799	1836.891	2287.531	16408.766	309071
dsj1000	2.828	3.469	6.289	141.770	154.890	101.125	1014.734	5103.703	5576.032	36530.407	12682545
Average:	0.838	1.348	2.898	40.882	54.655	38.576	289.576	1471.746	1967.567	10424.748	1906666
Overlap ratio: 0.1											
kroD100	0.094	0.125	0.235	4.330	3.947	4.062	27.659	155.891	142.078	995.719	1483
rat195	0.157	0.172	0.617	9.418	8.834	10.015	75.120	339.062	318.016	2704.328	5951
lin318	0.359	0.297	0.922	21.002	16.569	26.172	171.405	756.063	596.484	6170.593	60252
rd400	0.430	0.437	1.188	32.102	22.955	29.750	207.674	1155.656	826.390	7476.265	91003
pcb442	0.633	0.422	1.594	35.132	31.856	27.297	235.372	1264.766	1146.828	8473.407	250485
d493	0.852	0.391	1.516	50.247	32.424	27.593	295.105	1808.891	1167.250	10623.766	61715
dsj1000	2.203	0.968	5.836	117.768	100.377	99.391	755.425	4239.656	3613.579	27195.312	7807747
Average:	0.675	0.402	1.701	38.571	30.995	32.040	252.537	1388.569	1115.804	9091.341	1182662
Overlap ratio: 0.3											
kroD100	0.070	0.078	0.149	3.533	2.865	1.375	18.562	127.187	103.156	668.235	865
rat195	0.118	0.125	0.344	9.877	5.997	6.422	120.099	355.578	215.891	4323.547	6323
lin318	0.313	0.250	0.742	13.212	11.900	13.360	175.103	475.641	428.406	6303.704	40166
rd400	0.422	0.359	0.985	24.021	19.695	18.031	261.692	864.766	709.031	9420.906	61120
pcb442	0.516	0.359	0.836	27.289	22.645	19.297	274.558	982.406	815.234	9884.078	76137
d493	0.930	0.359	0.695	26.956	19.113	15.954	340.193	970.406	688.063	12246.937	59109
dsj1000	2.414	0.938	2.352	104.091	63.794	47.890	805.024	3747.282	2296.594	28980.875	2623498
Average:	0.683	0.353	0.872	29.854	20.859	17.476	285.033	1074.752	750.911	10261.183	409603
Overall *TSPLIB*:	0.732	0.701	1.824	36.436	35.503	29.364	275.715	1311.689	1278.094	9925.758	1166310
Varied overlap ratios											
team1_100	0.149	0.141	0.407	5.290	5.489	7.218	43.482	190.453	197.609	1565.344	913
team2_200	0.164	0.188	0.641	10.951	9.080	9.375	73.530	394.250	326.875	2647.093	34768
team3_300	0.586	0.391	1.727	24.161	18.955	19.859	120.296	869.812	682.391	4330.672	69822
team4_400	0.516	0.625	1.274	29.719	26.939	49.797	227.768	1069.875	969.813	8199.656	276263
team5_499	1.000	1.313	3.524	45.122	58.347	66.406	341.010	1624.391	2100.500	12276.359	396630
team6_500	0.524	0.454	1.195	35.705	29.452	19.203	348.348	1285.391	1060.266	12540.531	196027
bonus1000	1.547	1.000	6.477	91.214	102.146	96.688	1099.944	3283.688	3677.250	39598.000	2648674
Average:	0.641	0.587	2.177	34.595	35.773	38.364	322.054	1245.409	1287.815	11593.951	517585
concentricCircles1	0.016	0.039	0.047	0.338	0.527	0.680	2.994	12.180	18.961	107.797	123
concentricCircles2	0.024	0.078	0.094	0.723	1.216	1.430	5.975	26.024	43.766	215.094	169
concentricCircles3	0.055	0.125	0.180	1.628	2.693	2.883	13.297	58.610	96.945	478.688	372
concentricCircles4	0.110	0.227	0.375	3.090	4.937	4.391	22.381	111.235	177.719	805.719	4468
concentricCircles5	0.164	0.422	0.774	5.254	7.952	7.914	36.156	189.149	286.274	1301.625	22030
Average:	0.073	0.178	0.294	2.207	3.465	3.459	16.161	79.440	124.733	581.785	5432
bubbles1	0.016	0.071	0.094	0.585	1.531	0.649	6.721	21.055	55.102	241.938	95
bubbles2	0.071	0.102	1.555	1.934	3.898	8.117	22.022	69.641	140.336	792.797	64
bubbles3	0.149	0.235	0.438	5.195	13.031	8.180	79.069	187.032	469.133	2846.500	471
bubbles4	0.250	0.274	0.625	8.624	16.169	14.891	110.669	310.461	582.094	3984.078	23414
bubbles5	0.399	0.657	1.383	14.412	25.522	36.274	202.961	518.836	918.789	7306.609	6085
bubbles6	0.609	0.555	3.274	28.729	40.280	47.375	202.990	1034.250	1450.070	7307.656	24656
bubbles7	0.805	0.766	3.352	41.497	56.061	59.805	292.836	1493.891	2018.196	10542.094	34296
bubbles8	1.133	1.024	7.235	55.504	60.093	150.391	440.757	1998.149	2163.336	15867.266	100463
bubbles9	1.243	1.313	7.656	62.798	96.142	154.781	567.914	2260.711	3461.110	20444.891	304349
Average:	0.519	0.555	2.846	24.364	34.747	53.385	213.993	877.114	1250.907	7703.759	54877
rotatingDiamonds1	0.016	0.039	0.047	0.359	0.555	0.672	5.040	12.938	19.977	181.453	23
rotatingDiamonds2	0.031	0.102	0.180	1.212	2.262	3.078	14.230	43.641	81.422	512.281	368
rotatingDiamonds3	0.156	0.391	0.657	4.521	8.229	8.508	61.410	162.750	296.227	2210.766	16407
rotatingDiamonds4	0.328	0.750	1.289	12.814	20.012	17.657	119.808	461.321	720.422	4313.078	49044
rotatingDiamonds5	1.070	2.055	3.961	34.453	60.317	60.430	436.563	1240.305	2171.407	15716.265	210900
Average:	0.320	0.667	1.227	10.672	18.275	18.069	127.410	384.191	657.891	4586.769	55348
chaoSingleDep	0.368	0.289	0.500	11.257	10.992	7.703	56.646	405.250	395.727	2039.250	43743
GEOMETRIC **Average:**	0.350	0.475	1.686	14.746	21.621	29.790	135.022	530.871	778.351	4860.792	42077
Overall Average:	0.560	0.590	1.818	27.130	29.758	30.854	223.851	976.682	1071.285	8058.634	603274

A.3.2 CEVRP

In Tables A-10, A-11, and A-12, we present the results for 15 heuristics using the Manhattan norm. In order for all the columns in each tables to appear on one page, we refer to the SZVRPk heuristic as SZVk.

The tour lengths for the 15 heuristics on the 48 test problems are given in Table A-10. The average deviations from the best solutions in Table A-10 are given in Table A-11. Columns in both tables are ordered by the overall average deviation from best (left) to worst (right).

Over all 48 problems, SZV3$_{t\ 50-59}$ produces 27 best solutions, SZV4$_t$ produces eight best solutions, and SZV3$_t$ produces eight best solutions.

In Table A-11, we give the average deviations from the best solution for the 15 heuristics. SZV3$_{t\ 50-59}$ has an average deviation of 0.54% over all 48 problems while the SZV1 variants have an average deviation over 6.40%. As with the Euclidean norm, for each of the four pairs of Phase IV methods (SZVk_t and SZVk_v, for $k = 1, \ldots, 4$), the TSP-based Phase IV method produces better average deviations than the associated VRP-based Phase IV method.

In Table A-12, we give the computation times for the 15 heuristics on the 48 problems. Columns are ordered from fastest (left) to slowest (right). As with the Euclidean norm, the SZV1 variants are fastest (SZV1 averages under six seconds per problem), and the VRP-based Phase IV methods (SZVk_v) are faster than the associated, more accurate TSP-based Phase IV methods (SZVk_t).

If we consider the column representations in Tables A-11 and A-12 to be

rankings, $SZV3_v$ has the best average rank (5.5) with $SZV3_t$ close behind (6). $SZV2_v$ is third with an average rank of 7. $SZV3_v$ deviates from the best solution an average of only 2.03% and solves each problem in an average of 82.094 seconds. $SZV2_v$ deviates an average of 5.40% from the best solution but solves each problem in 13.253 seconds. $SZV2_v$ and $SZV3_v$ combine accuracy and speed to produce high-quality solutions fairly quickly.

Table A-10: Tour lengths for 15 heuristics on 48 CEVRP problems with equal radius and 2D Manhattan norm

	$SZV3_{t\ 50-59}$	$SZV4_t$	$SZV3_t$	$SZV3_v$	$SZV4_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	$SZV2_v$	SZV4	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
Overlap ratio: 0.02															
kroD100	456.00	455.23	455.73	455.87	456.59	456.00	454.68	**453.32**	456.02	455.73	455.87	456.00	467.27	466.47	469.77
rat195	361.51	357.15	359.74	358.90	**353.60**	363.34	357.05	357.99	364.51	363.01	364.32	362.08	377.13	373.56	377.28
lin318	5970.65	6019.57	**5906.18**	6013.22	6022.67	5996.23	5980.97	5970.74	6002.65	5987.47	6034.52	6004.75	6400.19	6355.70	6402.74
rd400	1495.45	**1490.89**	1517.68	1513.69	1509.08	1495.45	1505.61	1502.04	1502.04	1517.68	1530.58	1523.29	1623.54	1647.63	1674.83
pcb442	654.83	656.19	648.85	674.72	647.81	649.83	**647.72**	648.84	657.02	655.27	652.28	649.23	675.42	679.81	691.64
d493	**1101.66**	1107.78	1108.37	1104.99	1105.89	1103.48	1106.85	1103.51	1105.31	1108.44	1111.67	1111.19	1119.07	1115.98	1120.40
dsj1000	**1804.55**	1808.00	1815.21	1856.10	1851.56	**1804.55**	1850.28	1832.74	1836.79	1821.49	1856.10	1853.07	1889.75	1874.86	1937.22
Overlap ratio: 0.1															
kroD100	366.93	370.33	374.77	**364.00**	372.02	367.35	387.91	387.91	391.15	409.37	414.88	403.37	396.29	422.07	428.26
rat195	288.18	290.10	294.07	291.80	294.96	298.21	**287.98**	**287.98**	289.87	308.80	310.72	307.94	295.12	317.66	320.67
lin318	**4783.58**	4965.35	4954.60	4916.22	4916.67	4791.15	4798.08	4861.81	4800.42	5030.98	5071.76	5084.63	4901.54	5060.84	5139.32
rd400	962.89	**949.98**	968.92	965.26	964.90	974.45	990.91	976.99	996.46	968.92	997.67	1006.25	992.46	975.13	1004.63
pcb442	**519.97**	525.80	530.58	521.23	528.97	532.60	522.15	537.21	534.53	544.16	550.28	549.57	544.28	555.07	565.97
d493	**984.44**	989.40	994.51	989.02	992.47	**984.44**	989.80	989.80	989.80	1014.61	1015.81	1020.97	1006.53	1016.15	1021.36
dsj1000	**1261.48**	1290.67	1299.97	1280.62	1320.94	1277.20	1286.75	1286.75	1288.21	1346.76	1375.60	1394.91	1312.73	1356.59	1376.20
Overlap ratio: 0.3															
kroD100	**210.36**	217.52	215.77	238.39	238.39	240.36	240.36	240.36	240.36	247.21	247.21	251.70	240.36	247.21	247.21
rat195	**176.24**	178.11	187.45	183.78	184.13	195.01	195.01	195.01	195.01	201.78	201.78	210.60	195.01	201.78	201.78
lin318	**3024.84**	3126.61	3086.01	3032.41	3079.60	3261.44	3286.25	3286.25	3286.25	3262.58	3262.58	3425.75	3288.11	3262.58	3262.58
rd400	**594.44**	613.73	613.73	615.19	616.45	642.10	643.75	643.75	644.54	654.33	667.08	674.85	653.32	697.90	697.90
pcb442	373.21	371.21	374.81	**370.20**	371.52	404.41	405.04	405.04	405.04	389.49	389.50	393.56	405.31	389.49	389.50
d493	**732.52**	771.95	773.50	775.98	767.46	746.96	753.33	753.33	753.99	830.52	836.11	863.34	754.81	830.52	836.11
dsj1000	**684.07**	733.69	733.69	733.69	733.69	718.22	735.17	735.17	735.17	733.69	733.69	751.69	766.62	733.69	733.69
Varied overlap ratios															
team1_100	**1628.06**	1653.13	1678.27	1683.72	1661.88	1733.19	1743.75	1743.75	1744.94	1857.38	1866.87	1879.94	1755.90	1879.21	1881.92
team2_200	**651.21**	683.92	698.22	666.86	685.58	707.89	707.96	707.96	707.96	755.88	759.94	783.82	726.10	755.88	759.94
team3_300	**1223.21**	1224.46	1224.22	1247.81	1254.04	1233.91	1246.86	1252.00	1252.00	1264.57	1279.67	1285.84	1274.82	1256.03	1279.97
team4_400	1685.95	1711.25	**1674.60**	1704.66	1708.10	1685.95	1683.92	1694.61	1701.36	1736.22	1754.57	1703.57	1796.18	1849.61	1862.82
team5_499	**1300.85**	1311.78	1312.34	1326.30	1313.71	**1300.85**	1316.00	1313.77	1318.16	1316.39	1328.93	1322.67	1389.95	1378.95	1407.86
team6_500	**793.95**	844.30	834.61	823.51	824.00	872.58	868.89	868.89	875.16	901.54	907.52	916.69	876.94	901.54	907.52
bonus1000	**1764.26**	1814.12	1787.33	1815.50	1777.31	1787.55	1790.40	1787.64	1800.12	1787.33	1815.50	1837.61	1799.94	1859.98	1899.27
concentricCircles1	**102.54**	**102.54**	**102.54**	102.66	102.66	**102.54**	102.78	102.78	102.78	**102.54**	102.66	102.78	116.72	115.54	115.66
concentricCircles2	262.43	**257.05**	262.43	263.33	**257.05**	262.43	257.19	262.40	263.47	262.43	263.34	262.18	284.80	283.48	284.11
concentricCircles3	500.39	502.42	500.39	**485.71**	501.27	500.39	490.36	486.87	501.93	500.39	501.93	491.22	516.70	515.40	516.00
concentricCircles4	794.68	807.90	794.68	786.26	793.78	806.39	**780.08**	790.93	811.32	806.39	806.39	783.89	812.23	806.52	809.24
concentricCircles5	1038.82	**1023.27**	1038.82	1029.91	1029.25	1040.50	1038.31	1029.68	1045.95	1040.50	1045.95	1029.68	1062.74	1057.18	1062.46
bubbles1	**606.86**	610.43	610.43	610.51	610.51	**606.86**	**606.86**	**606.86**	**606.86**	**606.86**	**606.86**	610.51	**606.86**	610.43	610.51
bubbles2	**530.56**	530.72	530.72	530.72	530.72	530.64	530.72	530.72	558.34	538.68	538.79	538.79	548.82	530.72	530.72
bubbles3	**1152.94**	1236.40	1233.86	1211.24	1236.48	1210.92	1254.62	1268.30	1275.66	1275.57	1280.30	1262.94	1434.46	1251.98	1299.83
bubbles4	1828.25	1790.93	1809.14	1803.14	1789.05	1863.04	1887.42	1879.80	1879.02	1914.66	1914.66	**1785.41**	1979.44	1990.23	2017.96
bubbles5	2276.21	2182.94	2153.37	2272.48	2200.77	2294.13	**2143.88**	2241.58	2324.85	2267.77	2283.48	2214.41	2419.95	2304.65	2338.25
bubbles6	**2066.69**	2186.22	2132.40	2168.84	2190.88	2075.48	2133.64	2184.39	2179.54	2162.26	2231.72	2203.11	2312.16	2381.65	2428.61

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	$SZV3_{t\ 50-59}$	$SZV4_t$	$SZV3_t$	$SZV3_v$	$SZV4_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	$SZV2_v$	SZV4	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
bubbles7	**2160.65**	2170.07	2193.39	2305.89	2261.58	2186.86	2238.26	2220.94	2244.37	2213.12	2306.11	2291.37	2461.99	2369.37	2454.95
bubbles8	3527.62	3518.73	**3461.30**	3535.00	3573.82	3577.85	3610.19	3596.97	3612.46	3604.79	3647.04	3551.47	3948.61	3756.31	3822.11
bubbles9	3893.04	**3867.90**	3910.09	3892.22	3934.77	3952.15	3890.23	3940.23	4047.90	3992.47	4080.33	3909.44	4409.87	4313.04	4431.43
rotatingDiamonds1	57.37	**56.28**	**56.28**	57.37	57.37	57.37	57.37	57.37	57.37	57.37	57.37	57.37	57.37	57.37	57.37
rotatingDiamonds2	277.07	**273.07**	277.06	277.07	277.07	277.07	277.07	277.07	277.07	277.06	277.07	277.07	282.13	276.88	276.88
rotatingDiamonds3	736.17	735.48	**735.27**	736.90	735.48	740.00	**735.27**	741.99	742.53	736.17	740.17	739.27	777.67	772.95	775.09
rotatingDiamonds4	**1120.00**	1128.00	1128.00	1132.00	1128.00	1124.00	1124.00	1124.00	1124.00	1128.00	1132.00	1124.54	1250.13	1230.98	1230.98
rotatingDiamonds5	**2042.03**	2045.11	**2042.03**	2046.09	2049.32	2047.47	2045.00	2047.47	2047.47	2050.05	2050.09	2043.81	2042.28	2043.58	2043.86
chaoSingleDep	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	**1365.97**	1482.64	1484.15	1484.15

Table A-11: Percentage deviation from the best solution for 15 heuristics on 48 CEVRP problems with equal radius and 2D Manhattan norm

	$SZV3_{t\ 50-59}$	$SZV4_t$	$SZV3_t$	$SZV3_v$	$SZV4_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	$SZV2_v$	SZV4	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
Overlap ratio: 0.02															
kroD100	0.59	0.42	0.53	0.56	0.72	0.59	0.30	0.00	0.60	0.53	0.56	0.59	3.08	2.90	3.63
rat195	2.24	1.00	1.74	1.50	0.00	2.75	0.97	1.24	3.09	2.66	3.03	2.40	6.65	5.64	6.70
lin318	1.09	1.92	0.00	1.81	1.97	1.52	1.27	1.09	1.63	1.38	2.17	1.67	8.36	7.61	8.41
rd400	0.31	0.00	1.80	1.53	1.22	0.31	0.99	0.75	0.75	1.80	2.66	2.17	8.90	10.51	12.34
pcb442	1.10	1.31	0.17	4.17	0.01	0.33	0.00	0.17	1.44	1.17	0.70	0.23	4.28	4.95	6.78
d493	0.00	0.56	0.61	0.30	0.38	0.17	0.47	0.17	0.33	0.62	0.91	0.87	1.58	1.30	1.70
dsj1000	0.00	0.19	0.59	2.86	2.61	0.00	2.53	1.56	1.79	0.94	2.86	2.69	4.72	3.90	7.35
Average:	0.76	0.77	0.78	1.82	0.99	0.81	0.93	0.71	1.37	1.30	1.84	1.52	5.37	5.26	6.70
Overlap ratio: 0.1															
kroD100	0.81	1.74	2.96	0.00	2.20	0.92	6.57	6.57	7.46	12.47	13.98	10.82	8.87	15.95	17.65
rat195	0.07	0.74	2.11	1.33	2.42	3.55	0.00	0.00	0.66	7.23	7.90	6.93	2.48	10.30	11.35
lin318	0.00	3.80	3.58	2.77	2.78	0.16	0.30	1.64	0.35	5.17	6.02	6.29	2.47	5.80	7.44
rd400	1.36	0.00	1.99	1.61	1.57	2.58	4.31	2.84	4.89	1.99	5.02	5.92	4.47	2.65	5.75
pcb442	0.00	1.12	2.04	0.24	1.73	2.43	0.42	3.31	2.80	4.65	5.83	5.69	4.67	6.75	8.85
d493	0.00	0.50	1.02	0.47	0.82	0.00	0.54	0.54	0.54	3.06	3.19	3.71	2.24	3.22	3.75
dsj1000	0.00	2.31	3.05	1.52	4.71	1.25	2.00	2.00	2.12	6.76	9.05	10.58	4.06	7.54	9.09
Average:	0.32	1.46	2.39	1.13	2.32	1.55	2.02	2.42	2.69	5.91	7.28	7.13	4.18	7.46	9.13
Overlap ratio: 0.3															
kroD100	0.00	3.40	2.57	13.33	13.33	14.27	14.27	14.27	14.27	17.52	17.52	19.65	14.27	17.52	17.52
rat195	0.00	1.06	6.36	4.27	4.47	10.65	10.65	10.65	10.65	14.49	14.49	19.49	10.65	14.49	14.49
lin318	0.00	3.36	2.02	0.25	1.81	7.82	8.64	8.64	8.64	7.86	7.86	13.25	8.70	7.86	7.86
rd400	0.00	3.25	3.25	3.49	3.70	8.02	8.30	8.30	8.43	10.07	12.22	13.53	9.90	17.40	17.40
pcb442	0.81	0.27	1.25	0.00	0.36	9.24	9.41	9.41	9.41	5.21	5.21	6.31	9.48	5.21	5.21
d493	0.00	5.38	5.59	5.93	4.77	1.97	2.84	2.84	2.93	13.38	14.14	17.86	3.04	13.38	14.14
dsj1000	0.00	7.25	7.25	7.25	7.25	4.99	7.47	7.47	7.47	7.25	7.25	9.89	12.07	7.25	7.25
Average:	0.12	3.43	4.04	4.93	5.10	8.14	8.80	8.80	8.83	10.83	11.24	14.28	9.73	11.87	11.98
TSPLIB **Average:**	0.40	1.89	2.40	2.63	2.80	3.50	3.92	3.97	4.30	6.01	6.79	7.65	6.43	8.20	9.27
Varied overlap ratios															
team1_100	0.00	1.54	3.08	3.42	2.08	6.46	7.11	7.11	7.18	14.09	14.67	15.47	7.85	15.43	15.59
team2_200	0.00	5.02	7.22	2.40	5.28	8.70	8.71	8.71	8.71	16.07	16.70	20.36	11.50	16.07	16.70
team3_300	0.00	0.10	0.08	2.01	2.52	0.87	1.93	2.35	2.35	3.38	4.62	5.12	4.22	2.68	4.64
team4_400	0.68	2.19	0.00	1.79	2.00	0.68	0.56	1.19	1.60	3.68	4.78	1.73	7.26	10.45	11.24
team5_499	0.00	0.84	0.88	1.96	0.99	0.00	1.16	0.99	1.33	1.19	2.16	1.68	6.85	6.00	8.23
team6_500	0.00	6.34	5.12	3.72	3.78	9.90	9.44	9.44	10.23	13.55	14.30	15.46	10.45	13.55	14.30
bonus1000	0.00	2.83	1.31	2.90	0.74	1.32	1.48	1.33	2.03	1.31	2.90	4.16	2.02	5.43	7.65
Average:	0.10	2.69	2.53	2.60	2.48	3.99	4.34	4.45	4.78	7.61	8.59	9.14	7.17	9.94	11.19
concentricCircles1	0.00	0.00	0.00	0.12	0.12	0.00	0.23	0.23	0.23	0.00	0.12	0.23	13.83	12.68	12.80
concentricCircles2	2.09	0.00	2.09	2.44	0.00	2.09	0.05	2.08	2.50	2.09	2.45	2.00	10.79	10.28	10.53
concentricCircles3	3.02	3.44	3.02	0.00	3.20	3.02	0.96	0.24	3.34	3.02	3.34	1.13	6.38	6.11	6.24
concentricCircles4	1.87	3.57	1.87	0.79	1.76	3.37	0.00	1.39	4.00	3.37	3.37	0.49	4.12	3.39	3.74
concentricCircles5	1.52	0.00	1.52	0.65	0.58	1.68	1.47	0.63	2.22	1.68	2.22	0.63	3.86	3.31	3.83

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	$SZV3_{t\ 50-59}$	$SZV4_t$	$SZV3_t$	$SZV3_v$	$SZV4_v$	$SZV2_{t\ 50-59}$	$SZV4_{50-59}$	$SZV3_{50-59}$	$SZV2_{50-59}$	$SZV2_t$	$SZV2_v$	SZV4	$SZV1_{50-59}$	$SZV1_t$	$SZV1_v$
Average:	1.70	1.40	1.70	0.80	1.13	2.03	0.54	0.91	2.46	2.03	2.30	0.90	7.80	7.16	7.43
bubbles1	0.00	0.59	0.59	0.60	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.59	0.60
bubbles2	0.00	0.03	0.03	0.03	0.03	0.02	0.03	0.03	5.24	1.53	1.55	1.55	3.44	0.03	0.03
bubbles3	0.00	7.24	7.02	5.06	7.25	5.03	8.82	10.01	10.64	10.64	11.05	9.54	24.42	8.59	12.74
bubbles4	2.19	0.11	1.12	0.79	0.00	4.14	5.50	5.07	5.03	7.02	7.02	0.00	10.64	11.24	12.79
bubbles5	6.17	1.82	0.44	6.00	2.65	7.01	0.00	4.56	8.44	5.78	6.51	3.29	12.88	7.50	9.07
bubbles6	0.00	5.78	3.18	4.94	6.01	0.43	3.24	5.69	5.46	4.62	7.98	6.60	11.88	15.24	17.51
bubbles7	0.00	0.44	1.52	6.72	4.67	1.21	3.59	2.79	3.87	2.43	6.73	6.05	13.95	9.66	13.62
bubbles8	1.92	1.66	0.00	2.13	3.25	3.37	4.30	3.92	4.37	4.15	5.37	2.61	14.08	8.52	10.42
bubbles9	0.65	0.00	1.09	0.63	1.73	2.18	0.58	1.87	4.65	3.22	5.49	1.07	14.01	11.51	14.57
Average:	1.21	1.96	1.67	2.99	2.91	2.60	2.90	3.77	5.30	4.38	5.75	3.48	11.70	8.10	10.15
rotatingDiamonds1	1.95	0.00	0.00	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
rotatingDiamonds2	1.46	0.00	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	3.32	1.39	1.39
rotatingDiamonds3	0.12	0.03	0.00	0.22	0.03	0.64	0.00	0.91	0.99	0.12	0.67	0.54	5.77	5.12	5.42
rotatingDiamonds4	0.00	0.71	0.71	1.07	0.71	0.36	0.36	0.36	0.36	0.71	1.07	0.41	11.62	9.91	9.91
rotatingDiamonds5	0.00	0.15	0.00	0.20	0.36	0.27	0.15	0.27	0.27	0.39	0.39	0.09	0.01	0.08	0.09
Average:	0.71	0.18	0.43	0.98	0.90	0.94	0.78	0.99	1.00	0.93	1.11	0.89	4.53	3.69	3.75
chaoSingleDep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.54	8.65	8.65
GEOMETRIC **Average:**	0.89	1.65	1.61	2.01	2.00	2.46	2.34	2.77	3.66	3.99	4.78	3.86	8.50	7.66	8.73
Overall Average:	0.54	1.61	2.02	2.03	2.36	2.97	2.98	3.13	3.65	5.05	5.40	5.99	6.47	8.57	8.58

Table A-12: Computation time (CPU seconds) for 15 heuristics on 48 CEVRP problems with equal radius and 2D Manhattan norm

	$SZV1_v$	$SZV1_{50-59}$	$SZV2_v$	$SZV1_t$	$SZV2_t$	$SZV2_{50-59}$	$SZV3_v$	SZV4	$SZV3_t$	$SZV2_{t\ 50-59}$	$SZV3_{50-59}$	$SZV4_v$	$SZV4_t$	$SZV4_{50-59}$	$SZV3_{t\ 50-59}$
Overlap ratio: 0.02															
kroD100	1.860	4.468	11.797	3.438	13.547	73.750	28.828	32.860	29.421	97.781	330.453	128.610	133.625	737.796	422.843
rat195	3.672	8.828	28.141	10.860	35.500	67.937	85.063	76.344	121.079	222.000	872.063	629.500	421.000	1779.281	1228.250
lin318	5.171	12.172	27.828	24.969	61.828	147.094	106.953	47.844	146.375	262.110	759.094	620.250	314.578	1533.281	1325.125
rd400	12.313	25.500	48.265	42.875	99.016	258.516	159.735	174.703	146.047	393.109	1054.125	826.718	576.782	3309.563	1617.218
pcb442	16.297	24.563	41.937	53.297	100.813	294.719	112.578	106.250	333.828	474.438	2189.156	689.781	757.672	5072.453	2493.750
d493	31.860	160.484	46.578	67.640	118.266	292.922	172.750	69.766	311.297	580.516	1556.454	794.594	521.907	2439.438	4066.891
dsj1000	17.437	40.672	67.421	119.218	229.359	367.609	128.343	130.047	429.766	890.609	1829.359	924.765	1868.000	4219.891	2591.641
Average:	12.659	39.527	38.852	46.042	94.047	214.650	113.464	91.116	216.830	417.223	1227.243	659.174	656.223	2727.386	1963.674
Overlap ratio: 0.1															
kroD100	1.015	2.907	1.531	2.844	3.328	10.531	29.188	2.125	44.750	22.500	38.625	36.297	113.375	48.609	365.656
rat195	1.610	3.750	2.422	5.468	6.782	17.656	32.094	3.734	85.187	43.765	85.140	80.594	306.953	119.015	834.563
lin318	2.703	5.375	4.422	11.203	18.625	36.407	62.563	5.922	91.125	73.375	133.829	267.672	500.250	213.563	932.797
rd400	5.312	6.859	6.625	20.312	29.172	40.109	54.812	9.750	88.031	117.141	166.640	72.391	327.250	254.844	1146.453
pcb442	5.609	6.859	5.594	20.031	29.734	35.000	99.000	8.422	89.578	97.344	172.390	222.453	324.000	270.953	1347.515
d493	4.875	9.047	5.640	19.406	35.141	23.078	211.781	3.594	432.406	151.734	73.532	1277.703	807.110	95.875	2697.218
dsj1000	10.047	12.922	11.328	47.547	75.235	43.609	271.250	7.297	842.110	294.344	152.219	770.985	2355.375	231.531	2313.016
Average:	4.453	6.817	5.366	18.116	28.288	29.484	108.670	5.835	239.027	114.315	117.482	389.728	676.330	176.341	1376.745
Overlap ratio: 0.3															
kroD100	0.985	2.922	0.906	2.687	2.437	3.625	9.297	0.922	26.860	13.687	8.938	26.531	64.844	9.078	246.391
rat195	1.984	3.828	1.734	5.781	6.469	4.843	57.094	1.094	96.734	39.891	10.750	329.109	369.375	11.266	762.484
lin318	3.734	5.438	3.453	13.078	24.547	11.016	61.953	1.829	109.062	89.406	19.250	213.562	312.594	21.016	1524.500
rd400	4.797	5.890	3.860	16.297	26.171	10.562	74.703	1.906	162.156	132.297	28.203	340.641	741.187	33.359	1682.391
pcb442	6.156	7.218	4.969	19.203	32.328	9.579	126.656	1.938	221.360	115.125	20.984	715.578	1048.735	22.562	2596.812
d493	5.204	9.109	5.344	20.032	34.250	11.203	209.250	2.391	578.391	165.688	22.625	1345.110	2383.609	24.453	2334.828
dsj1000	17.235	16.437	18.453	88.719	158.406	27.750	180.938	3.453	653.703	707.844	36.531	713.579	2083.110	38.562	4336.610
Average:	5.728	7.263	5.531	23.685	40.658	11.225	102.842	1.933	264.038	180.563	21.040	526.301	1000.493	22.899	1926.288
TSPLIB **Average:**	7.613	17.869	16.583	29.281	54.331	85.120	108.325	32.961	239.965	237.367	455.255	525.068	777.682	975.542	1755.569
Varied overlap ratios															
team1_100	1.297	3.297	2.438	2.437	3.484	14.844	31.625	4.593	49.828	25.953	60.140	117.875	108.938	71.000	479.094
team2_200	2.219	3.734	2.188	6.203	6.906	10.640	30.453	2.828	65.437	38.579	37.578	107.797	235.828	48.453	548.110
team3_300	2.453	6.000	5.765	10.484	14.766	38.532	41.937	10.422	151.812	88.985	151.828	260.297	468.406	235.953	1082.985
team4_400	4.968	11.391	12.297	28.703	30.875	106.844	55.765	27.953	124.672	192.062	489.844	230.469	569.562	1027.953	1103.875
team5_499	9.172	28.453	27.656	53.922	61.625	171.078	124.703	94.359	224.438	347.078	653.073	970.046	509.282	1402.688	1761.907
team6_500	9.062	7.985	5.156	21.047	23.937	12.078	110.641	2.531	351.312	154.422	31.438	735.250	1040.438	32.906	2091.844
bonus1000	10.563	13.953	13.532	46.562	59.578	75.047	103.610	16.766	526.922	315.641	306.625	1476.813	1926.047	495.297	4140.641
Average:	5.676	10.688	9.862	24.194	28.739	61.295	71.248	22.779	213.489	166.103	247.218	556.935	694.072	473.464	1601.208
concentricCircles1	0.609	1.797	0.610	0.562	0.938	2.921	2.328	0.984	2.156	3.734	7.828	2.672	1.734	16.734	11.297
concentricCircles2	0.687	2.110	1.750	0.984	3.078	8.594	4.985	2.657	5.375	12.953	29.484	5.421	5.796	45.484	32.235
concentricCircles3	0.906	2.625	3.594	1.890	6.640	17.890	21.859	7.797	13.312	27.188	87.265	35.688	17.609	103.141	86.063
concentricCircles4	1.516	4.125	7.672	3.766	14.469	37.344	23.516	19.094	43.843	56.459	232.437	93.375	69.109	402.578	287.375
concentricCircles5	2.297	5.218	12.672	6.750	25.516	63.109	39.531	28.766	40.203	103.218	211.375	130.891	173.110	370.437	274.578

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	$SZV1_v$	$SZV1_{50-59}$	$SZV2_v$	$SZV1_t$	$SZV2_t$	$SZV2_{50-59}$	$SZV3_v$	SZV4	$SZV3_t$	$SZV2_{t\ 50-59}$	$SZV3_{50-59}$	$SZV4_v$	$SZV4_t$	$SZV4_{50-59}$	$SZV3_{t\ 50-59}$
Average:	1.203	3.175	5.260	2.790	10.128	25.972	18.444	11.860	20.978	40.710	113.678	53.609	53.472	187.675	138.310
bubbles1	0.672	2.047	1.172	1.156	2.515	6.250	2.703	1.735	5.078	10.375	21.031	2.906	4.469	30.375	28.828
bubbles2	0.921	2.672	3.782	1.953	16.750	13.375	5.094	5.875	6.937	29.625	45.813	7.609	7.328	80.015	119.656
bubbles3	3.609	3.859	8.469	12.719	22.828	24.547	28.313	13.016	60.516	28.547	138.094	49.125	58.453	164.609	195.266
bubbles4	3.375	5.172	7.547	10.719	17.593	41.313	36.688	17.391	74.703	74.641	174.343	86.594	101.438	322.921	346.844
bubbles5	4.500	7.110	17.907	13.828	58.485	71.141	67.235	25.422	86.578	113.594	381.687	298.140	211.578	452.422	656.031
bubbles6	6.266	9.000	16.766	30.047	75.813	93.641	75.687	28.469	111.141	175.922	282.469	163.203	222.453	922.125	863.594
bubbles7	v8.594	11.797	25.969	67.047	126.829	114.407	68.297	98.047	215.703	368.024	402.375	275.812	606.719	993.547	1240.218
bubbles8	14.797	15.703	32.297	51.641	102.781	168.422	134.953	79.672	306.453	357.703	538.782	274.843	581.718	1613.906	1403.969
bubbles9	13.328	18.578	38.516	72.985	116.812	199.703	142.796	97.765	263.063	375.515	868.547	636.593	1423.078	2167.625	232.734
Average:	6.229	8.438	16.936	29.122	60.045	81.422	62.418	40.821	125.575	170.438	317.016	199.425	357.470	749.727	565.238
rotatingDiamonds1	0.531	1.719	0.578	0.719	1.062	3.531	2.375	0.812	3.422	4.406	8.187	2.515	3.156	9.547	13.688
rotatingDiamonds2	0.844	2.531	2.828	1.688	5.516	14.234	6.046	3.937	9.891	23.234	52.859	9.875	16.859	81.297	62.250
rotatingDiamonds3	2.046	5.812	11.360	5.703	21.453	60.593	32.843	26.890	41.515	95.531	243.469	122.265	121.844	413.390	289.891
rotatingDiamonds4	4.984	9.406	26.172	12.781	51.328	107.188	56.250	86.250	111.625	170.344	403.219	340.438	250.422	1604.125	433.156
rotatingDiamonds5	11.078	24.937	71.204	30.047	131.797	348.875	230.484	521.016	398.469	517.875	1719.578	1323.656	1658.047	7836.437	2689.000
Average:	3.897	8.881	22.428	10.188	42.231	106.884	65.600	127.781	112.984	162.278	485.462	359.750	410.066	1988.959	697.597
chaoSingleDep	2.125	5.781	4.500	4.953	10.375	50.000	13.953	5.750	18.969	76.828	191.484	26.594	32.672	292.484	264.078
GEOMETRIC **Average:**	4.571	8.030	13.496	18.567	37.546	69.487	55.358	45.585	122.718	140.312	287.809	288.399	386.152	786.572	768.119
Overall Average:	5.826	11.921	13.253	20.969	39.092	72.318	82.094	138.390	162.172	174.362	333.584	413.990	527.813	795.698	1234.720

A.4 Conclusions

In this appendix, we applied the Steiner-zone heuristic to 48 CETSP problems and 48 CEVRP problems with the Manhattan norm. We applied the MAH, Phase IV, and MAH + Phase IV variants of SZH to the 48 CETSP problems and 48 CEVRP problems. We found that several variants produce high-quality results in a very reasonable amount of time. This is the same as what we found in Chapters 2 - 4 for 48 CETSP problems and 48 CEVRP problems with the Euclidean norm.

Appendix B

The Steiner-Zone Heuristic (SZH) in 3D

The CETSP and CEVRP can be applied to problems in three dimensions. Unmanned Aquatic Vehicles (UAVs) are used to provide data collection for scientific and military purposes. For example, torpedo-shaped ocean gliders are being used to improve 3D models of the central California coastal region [17]. Monitoring specific underwater regions may require approaching only within a specified distance of each region. In this appendix, we extend SZH to solve the CETSP and the CEVRP in three dimensions, using either the Euclidean and Manhattan norms.

B.1 Formulation

In the 3D CETSP, a tour must cross a sphere of radius r_i surrounding every node i except the depot (node 0), which has no sphere. Any tour that touches or passes through node i's sphere (hereafter referred to as $sphere_i$) successfully visits node i. Node i is a fixed point in the plane at coordinate (a_i, b_i, c_i). We denote this coordinate as $orig(i)$, the origin of $sphere_i$. Let (x_i, y_i, z_i) be the coordinate on the tour that is close enough to node i. Coordinate (x_i, y_i, z_i) is known as node i's *representative point*. x_i, y_i, and z_i are unbounded continuous variables. Let e_{ij} be a binary variable equal to 1 if node i immediately precedes node j on a tour and 0 otherwise. Let ϵ be the smallest length of any edge.

Using either norm, constraint (2.2) is replaced by (B1). Node i's representative point must lie within the sphere of radius r_i surrounding $orig(i)$. That is, it must lie within $sphere_i$.

$$(x_i - a_i)^2 + (y_i - b_i)^2 + (z_i - c_i)^2 \leq r_i^2 \qquad i = 1, \ldots, n \tag{B1}$$

In 3D Euclidean space, the objective function (2.1) and constraint (2.6) are replaced by (B2) and (B3).

$$\text{Minimize} \quad \sum_{i=1}^{n} \sum_{j=1}^{n} e_{ij} \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2 + (z_i - z_j)^2} \tag{B2}$$

$$\sqrt{(x_i - x_j)^2 + (y_i - y_j)^2 + (z_i - z_j)^2} \geq \epsilon \qquad i, j = 1, \ldots, n \tag{B3}$$

In 3D Manhattan space, the objective function (2.1) and constraint (2.6) are replaced by (B4) and (B5).

$$\text{Minimize} \quad \sum_{i=1}^{n} \sum_{j=1}^{n} e_{ij} (|x_i - x_j| + |y_i - y_j| + |z_i - z_j|) \tag{B4}$$

$$|x_i - x_j| + |y_i - y_j| + |z_i - z_j| \geq \epsilon \qquad i, j = 1, \ldots, n \tag{B5}$$

For the remainder of this appendix we assume that $r_i = r_j$ for all nodes i and j.

B.2 SZH in 3 Dimensions

In two dimensions, a $SZ(k)$ is the non-empty intersection of k disks. $SZ(k)$ is characterized by its base node and the upper and lower angles of intersection

between the origin of the base node and the $k-1$ other disks. We do not need to know any information about the amount of overlap that exists between the k disks or where in the plane the boundaries of the Steiner zone are. The base node and upper and lower angles of intersection suffice to guarantee that a feasible point can be found. All disks lie in the X-Y plane. Phase I of SZH reduces a set of n disks to a set of m Steiner zones. $l_{contain}$ is the length of a side of the smallest square containing all n disks. The overlap ratio of a CETSP is the ratio of r to $l_{contain}$.

In three dimensions, a $SZ(k)$ is the non-empty intersection of k spheres. Since the intersection of convex sets is convex, and spheres are convex, a $SZ(k)$ is a three-dimensional convex region. In 3D, $l_{contain}$ is the length of a side of the smallest cube containing all n disks. An overlap ratio of 0.15 in 3D is likely to have fewer spheres overlapping than the number of disks that would overlap given the same overlap ratio in 2D. The Phase I heuristic was designed for two-dimensional space and must be modified for spheres rather than disks. We developed two possible Phase I heuristics for three-dimensional CETSPs and CEVRPs. The first, called $3D_{AN}$, applies the two-dimensional Phase I algorithm directly in three dimensions and then corrects for any infeasibilities found. The second, called $3D_{NUM}$, numerically approximates the boundary of the spherical polygon formed by the intersection of the base node's sphere and the $k-1$ other spheres.

B.2.1 $3D_{AN}$

$3D_{AN}$ applies the two-dimensional Phase I heuristic directly in three dimensions. We developed it with the goal of achieving similar speeds as in two dimensions. A trade-off exists, however, since $3D_{AN}$ finds infeasible representative points for some Steiner zones or determines that the intersection of k disks is non-empty when in fact it is empty.

Given $sphere_i$ and $sphere_j$ less than $r_i + r_j$ units apart, project $orig(i)$ and $orig(j)$ onto the X-Y plane, the X-Z plane, and the Y-Z plane. For each projection, calculate the two-dimensional angles of intersection for the two disks. A Steiner zone for nodes i and j, denoted SZ_{ij}, found by $3D_{AN}$ is characterized by the three sets of upper and lower angles of intersection and the base node i. In two dimensions (the X-Y plane), a chord connects the points on base node i's perimeter lying at the upper and lower angles of intersection (see Figure 2.12). Any point along this chord is feasible to the Steiner zone. We use the midpoint for simplicity. In three dimensions, we choose the midpoint of the chord for each of the three projections (X-Y, X-Z, Y-Z). This produces three sets of coordinates, (x_1, y_1), (x_2, z_1), and (y_2, z_2). The point chosen to represent SZ_{ij} is the midpoint of each dimension's two points, $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}, \frac{z_1+z_2}{2})$.

For example, let $orig(i) = (150, 2, 26)$, $orig(j) = (155, 9, 13)$, and $r_i = r_j = 9$. In Figure B.1, we show the projection of the spheres onto the X-Y, X-Z, and Y-Z planes. $sphere_i$ and $sphere_j$ intersect but $3D_{AN}$ finds an infeasible point. Calculating the intersection of two spheres based on three two-dimensional projections of

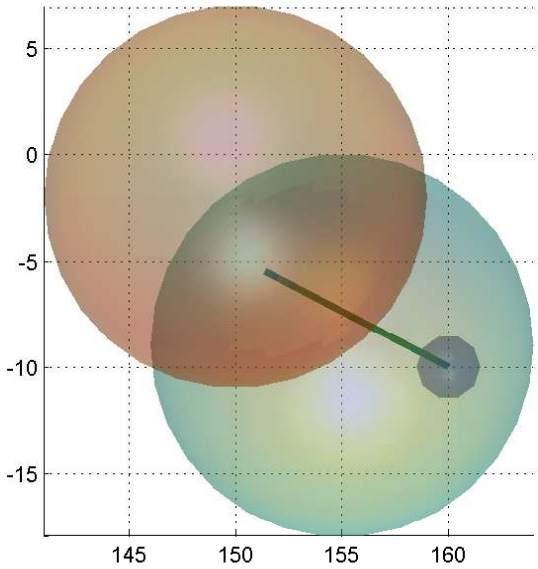
those spheres loses valuable information. $3D_{AN}$ sometimes finds $SZ(k)$'s that do not exist. For other (feasible) $SZ(k)$'s, $3D_{AN}$ may calculate infeasible representative points.

In two dimensions, given two feasible Steiner zones, SZ_{ij} and SZ_{ik}, both based on node i, if the angles of intersection for SZ_{ik} overlap those for SZ_{ij} then SZ_{ijk} must exist (see Figure 4.8). This is not true in three dimensions. That is, given a feasible Steiner zone SZ_{ij} based on node i, if Steiner zone SZ_{ik} exists and the angles of intersection for SZ_{ik} overlap those for SZ_{ij} in all three projections, then SZ_{ijk} does not necessarily exist. However, in order to compute Steiner zones proportionately as fast as SZH does in two dimensions, $3D_{AN}$ assumes that SZ_{ijk} exists if the angles of intersection for SZ_{ij} overlap the angles of intersection for SZ_{ik} in all three projections, even if this is not always the case.

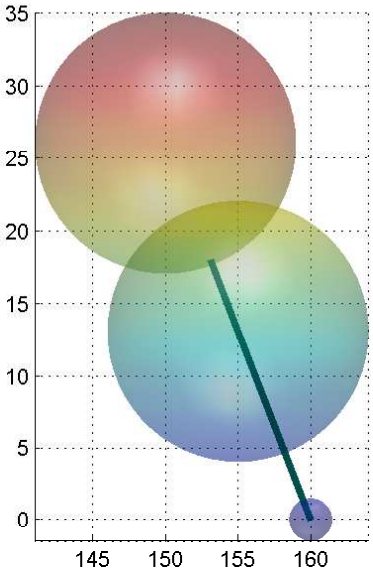
Due to the possible errors it introduces, when $3D_{AN}$ is complete, we check all Steiner zones for feasibility. Any member node, i, in a $SZ(k)$ for which $SZ(k)$'s representative point is infeasible is removed. Node i becomes a $SZ(1)$.

B.2.2 $3D_{NUM}$

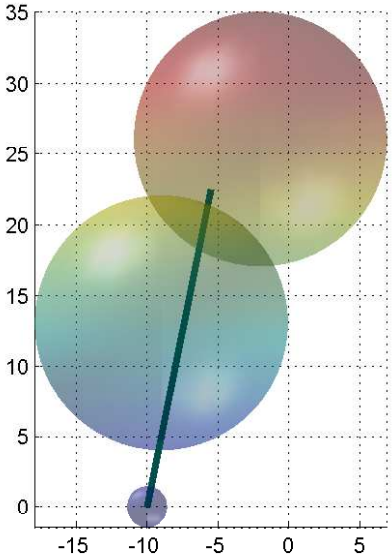
The two-dimensional Phase I algorithm is fast because it efficiently answers the question: do the $SZ(k)$ and the $SZ(2)$ being considered (both with base node i) have a non-empty intersection? If the answer is yes, then the angles at which the $k+1$ disks intersect relative to $orig(i)$ are returned. Nothing beyond the $orig(i)$ and the two angles of intersection are required.



(a) X-Y Projection



(b) X-Z Projection



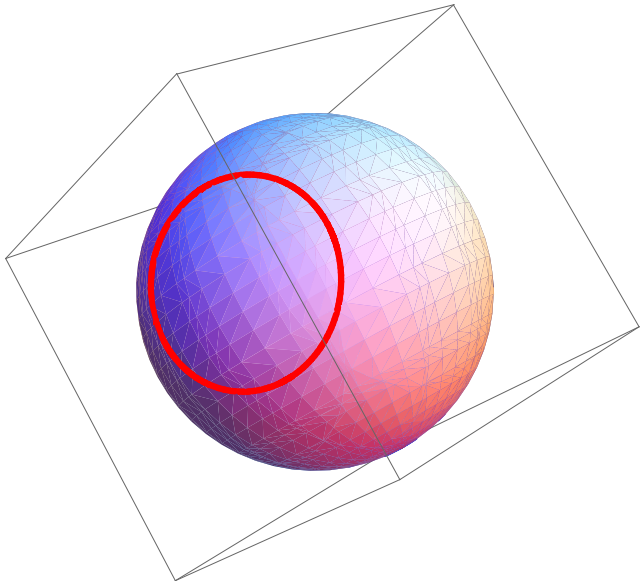
(c) Y-Z Projection

Figure B.1: The two large spheres form a $SZ(2)$ (the small sphere is the depot). $3D_{AN}$ chooses an infeasible representative point.

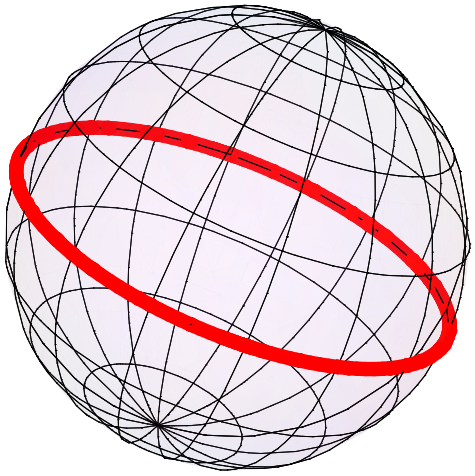
$3D_{AN}$ tries to answer this question in three dimensions using an analog of the two-dimensional method but has serious flaws. In the computational chemistry literature, much has been written about how to determine if k spheres intersect [57, 71]. However, these methods consider all k spheres simultaneously, whereas SZH does not. Finding a $SZ(k)$ in a graph of n nodes where n is large (say 100) using methods from computational chemistry would involve checking $\binom{n}{k}$ different possibilities. This is computationally inefficient.

Before describing $3D_{NUM}$, we define several geometric concepts. A *spheric section* [69] is the curve formed by the intersection of a plane and a sphere. The plane at which any sphere intersects $sphere_i$ forms a spheric section on the boundary of $sphere_i$. If the spheric section has a radius less than r_i, then it is called a *small circle* [20]. Otherwise, it is called a *great circle*. We show examples of both in Figure B.2. Given $orig(i)$ and $orig(j)$ (i is the base node) within $r_i + r_j$ units of each other, we can calculate a point-wise approximation of the spheric section that is formed. If $sphere_j$ intersects $sphere_i$ at exactly one point, then the spheric section describing their intersection is a single point on the boundary of $sphere_i$.

Given k spheres, if $k-1$ spheric sections overlap on the surface of sphere k, then the k spheres must have a non-empty intersection (a $SZ(k)$ exists for these k spheres). If the $k-1$ spheric sections do not overlap on sphere k's surface, then the k spheres either may or may not overlap. That is, for a $SZ(k)$ to exist in three dimensions, it is sufficient but not necessary for $k-1$ spheric sections to intersect on the surface of sphere k. We illustrate this in Figure B.3. In Figure B.3(a), the two (hidden) spheres ($sphere_j$ and $sphere_k$) whose intersection with $sphere_i$



(a) A small circle



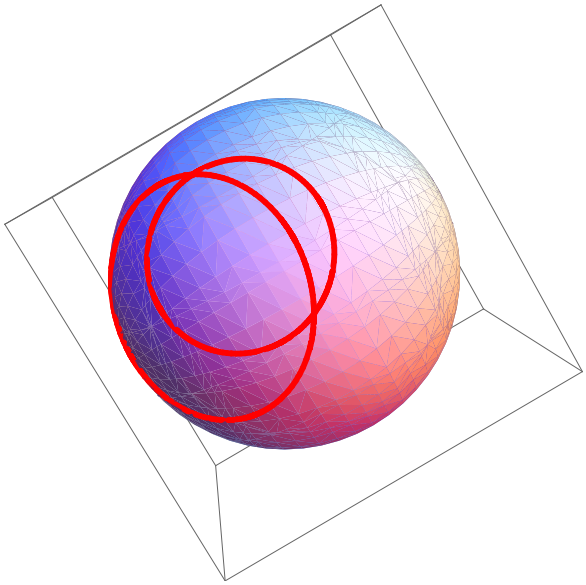
(b) A great circle

Figure B.2: Two spheric sections

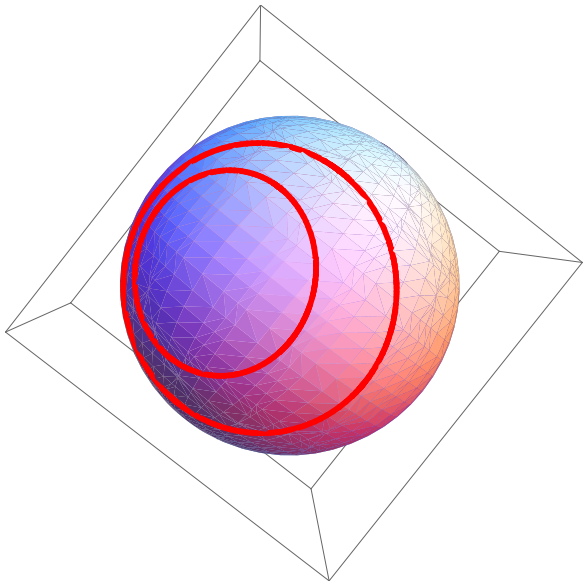
produces the small circles on $sphere_i$'s surface must also intersect each other. The same is true in Figure B.3(b), but the small circles do not overlap on $sphere_i$'s surface because $sphere_j$ and $sphere_k$ are almost collinear. A Phase I method that determines Steiner zones solely by the intersection of small circles on the surface of $sphere_i$ cannot recognize that any point in $sphere_j$'s (smaller) spheric section must be feasible for $sphere_k$. $3D_{NUM}$ is such a method.

The intersection of multiple spheres with base node i's sphere creates spherical polygons on the surface of $sphere_i$. A *spherical polygon* [70] is a closed geometric figure on the surface of a sphere formed by the arcs of great circles. An example is shown in Figure B.4. We also use *spherical polygon* to denote the closed geometric figure on the surface of a sphere formed by the arcs of both great and small circles. When more than two spheric sections intersect on the boundary of $sphere_i$, the result is called a *spherical polygon*. Any point in a spherical polygon, sp, is within r_i units of each node i whose sphere partially determines sp.

Using $3D_{NUM}$, a $SZ(k)$ with base node i is characterized by a numerical approximation of the perimeter of the spherical polygon on $sphere_i$'s surface formed by the intersection of $sphere_i$ and the other $k-1$ spheres. Given a $SZ(k)$ and a $SZ(2)$, both based on node i, if their spherical polygons intersect, then we have found a $SZ(k+1)$ based on node i. We create the numerical approximation of $SZ(k+1)$'s spherical polygon by piecing together the feasible portions of the $SZ(k)$'s and the $SZ(2)$'s spherical polygons. If $k = 1$, the approximation is a spheric section. If $k = 2$, it resembles a spherical lens shape. If $k = 3$, it resembles a spherical triangle. For $k \geq 4$, there is no term to describe the shape. Any point from the approximation



(a) Two intersecting small circles imply that a $SZ(3)$ exists



(b) One small circle contains the other - the spheres that produce non-intersecting small circles may or may not intersect, but in this case they do.

Figure B.3: A $SZ(3)$ exists in both figures.

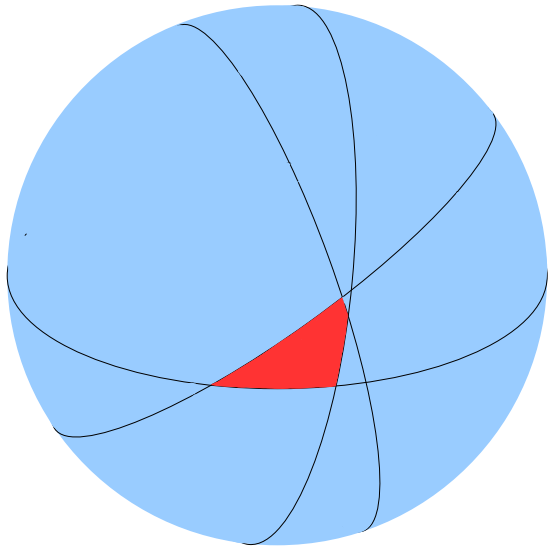


Figure B.4: A four-sided spherical polygon (the four great circles are produced by four (hidden) spheres intersecting the visible sphere).

of the polygon may be chosen to represent $SZ(k)$. As a result, all Steiner zones found by $3D_{NUM}$ are feasible and have feasible representative points.

In summary, $3D_{AN}$ should be initially faster than $3D_{NUM}$ at reducing a graph of n spheres into m Steiner zones because it uses 2D analytical methods rather than numerical methods. The 2D analytical methods do not guarantee feasible 3D Steiner zones; however, fixing the infeasibilities is easy. For problems where a large number of Steiner zones found by $3D_{AN}$ are infeasible, the number of Steiner zones after removing the infeasible member nodes and making singletons, m, is close to n, the number of nodes in the graph. The size of the TSPs solved in Phase II and the size of the QCPs solved in Phase III are not much smaller than if Phase I were not applied at all. Problems may take longer to solve than if we applied $3D_{NUM}$ to begin with, thereby guaranteeing feasible Steiner zones. One benefit of having m close to n is that the Steiner zones will have low degree. Feasible solutions will not

be forced to make inefficient visits to Steiner zones of high degree (and very small area) which may be in out-of-the-way locations.

B.3 Phase IV in 3D

The Phase IV post-processor (see Chapter 4) tries to minimize the total angle cost for a tour. In three dimensions, we can either calculate turn angle using the projection of the tour onto the XY axis, or we can factor in the change in elevation (the z-axis) for each edge into the definition of turn angle. Our default setting runs Phase IV for both methods.

B.4 Visualization

Visualizing a three-dimensional CETSP or CEVRP is non-trivial. We have developed three methods coded in MATLAB® [3], one fast, one slow, and one very slow. Each method is integrated into our C++ CETSP/CEVRP code. The first method, *BubblePlot*, uses code written by Bodin [14] to draw each sphere rather than Steiner zones. Figures B.5 and B.6 show the solution tour for a 101-node CETSP plotted amongst all 100 spheres (plut the depot). The spheres are drawn with 10% and 20% opacity, respectively. *BubblePlot* quickly produces a picture of how a tour visits all n spheres, especially when the overlap ratio is low. When the overlap ratio is medium to high, the overlapping spheres obscure the figure too much to obtain any useful information visually.

The second method, *NUMER*, calculates a NUMERICAL approximation of

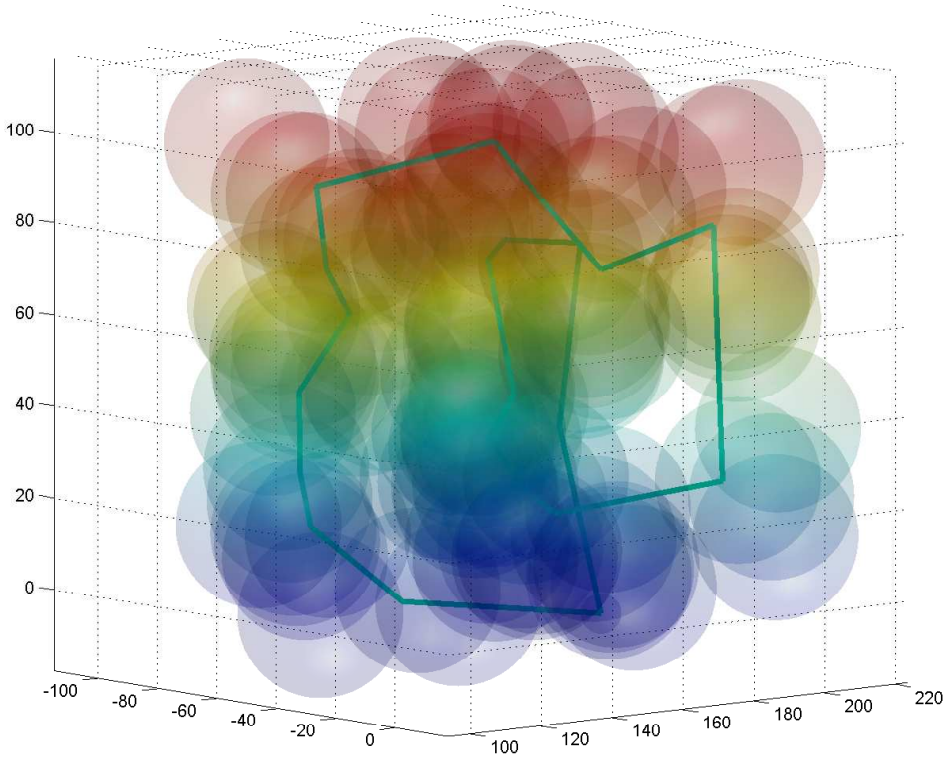


Figure B.5: All spheres are shown at 10% opacity.

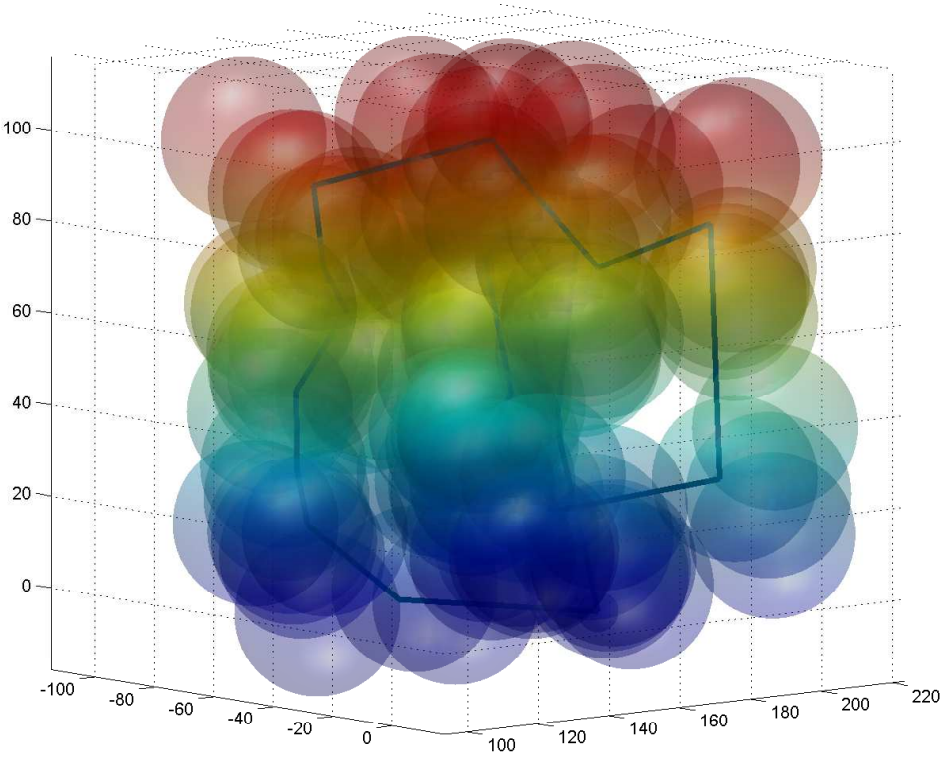


Figure B.6: All spheres are shown at 20% opacity.

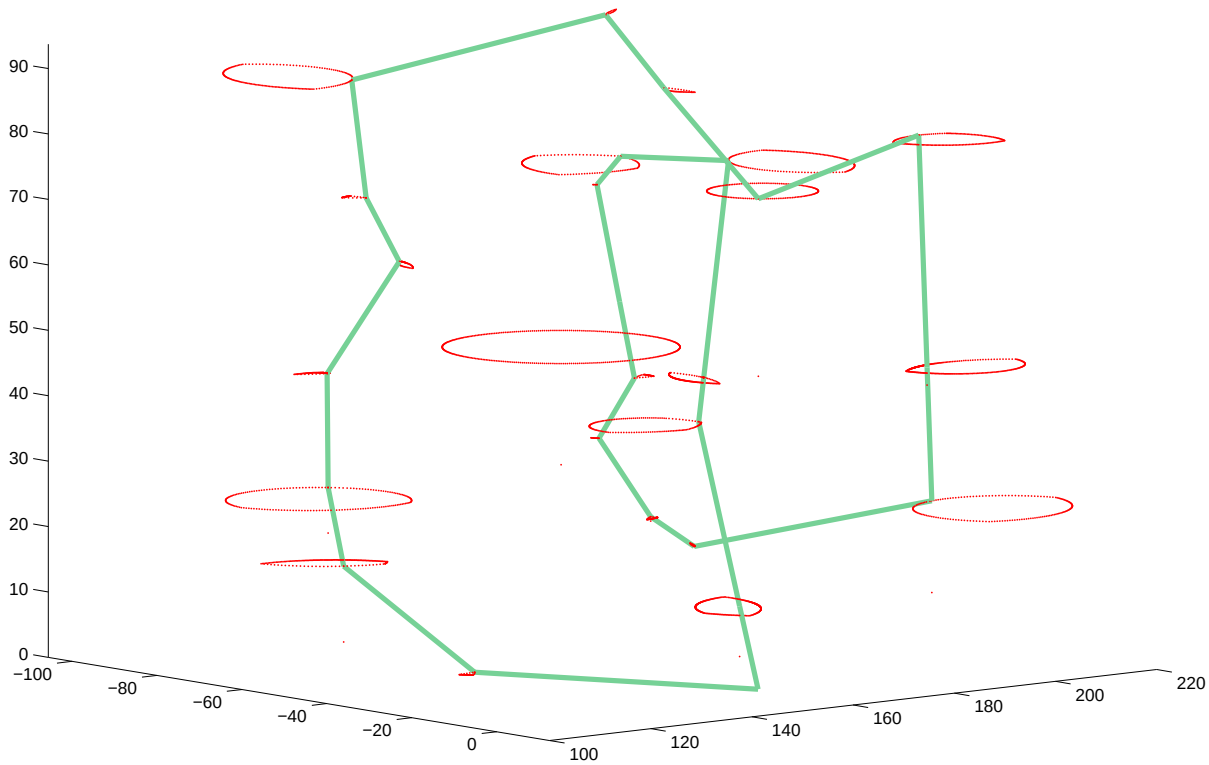


Figure B.7: 2D representation of the Steiner zones drawn in 3D.

the convex hull of each Steiner zone. For each Steiner zone, we calculate 360 point approximations for each of α meridians, where the meridians for SZ_i are connected to SZ_i's representative point. Figures B.7 through B.12 depict the same 101-node CETSP and solution as in Figures B.5 and B.6, plotted for different values of α. When $\alpha = 1$, the two-dimensional convex hulls are calculated but displayed in three dimensions. We show this in Figure B.7. As α increases, $NUMER$ becomes slower but produces more detailed images of each Steiner zone. When $\alpha = 180$, the convex hulls are highly detailed; the file conversion process altered the images to appear completely solid here.

The third method, $POLY$, calculates a polygonal approximation of each Steiner zone's convex hull. $POLY$ is based on code written by D'Errico [26] that tests the

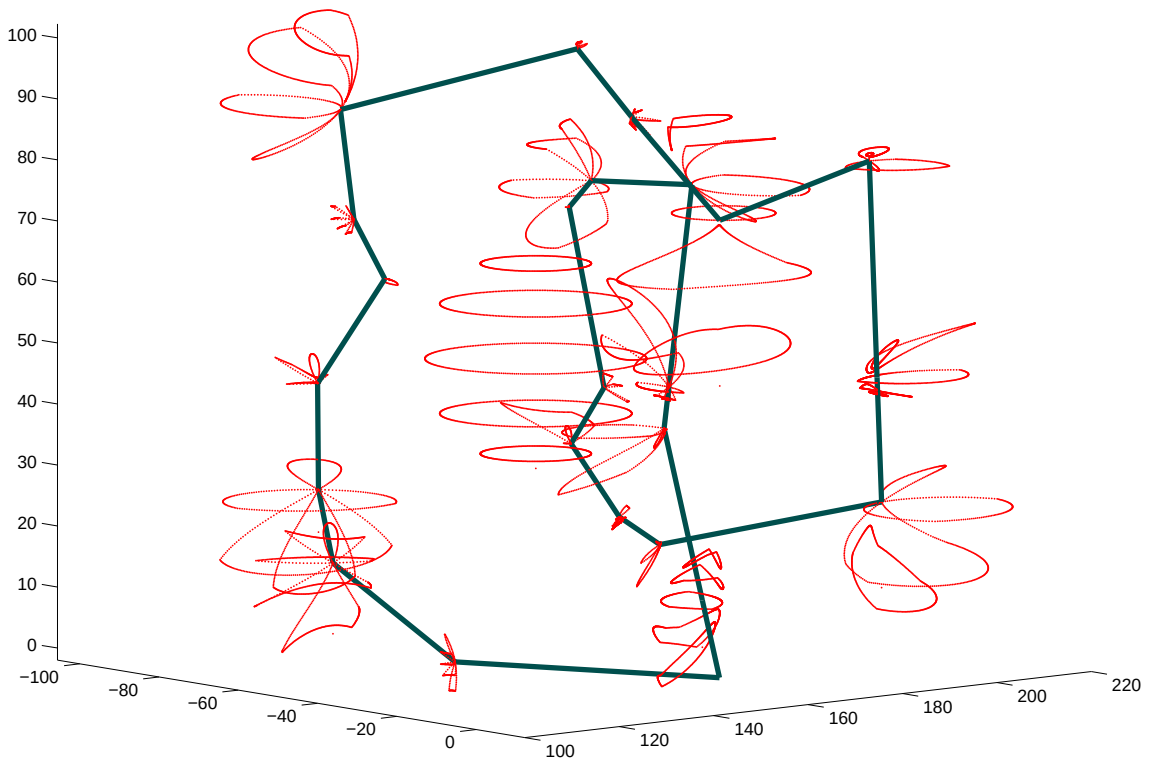


Figure B.8: Six longitudinal lines represent each SZ.

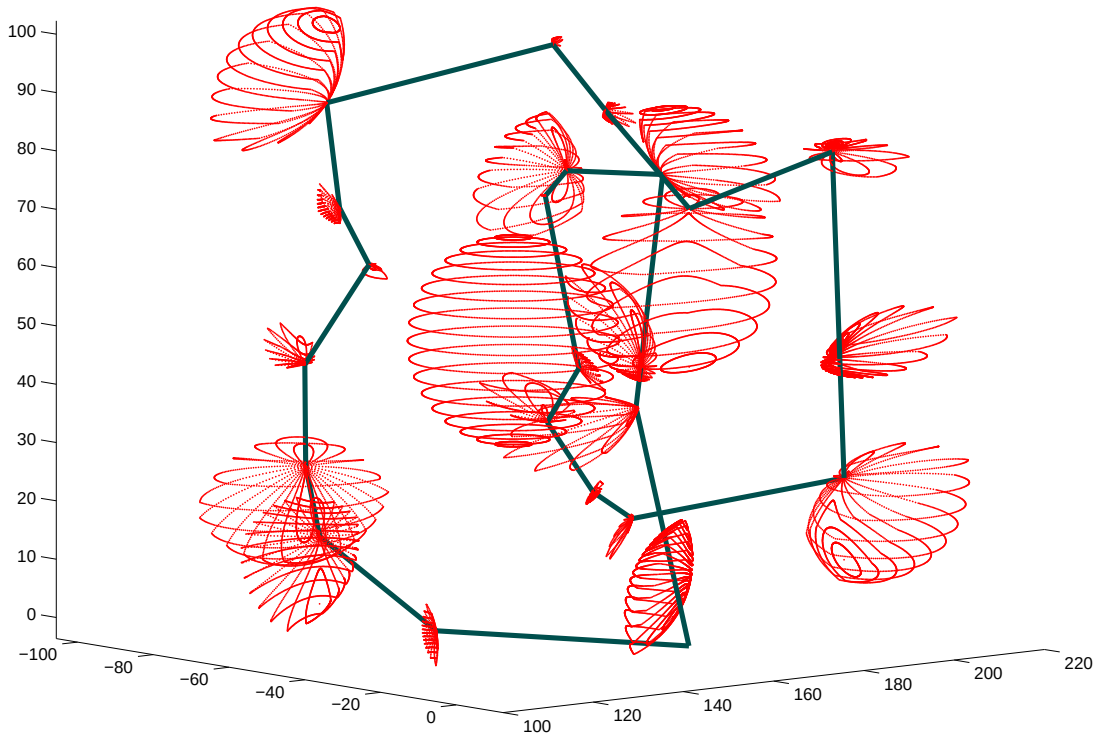


Figure B.9: 18 longitudinal lines represent each SZ.

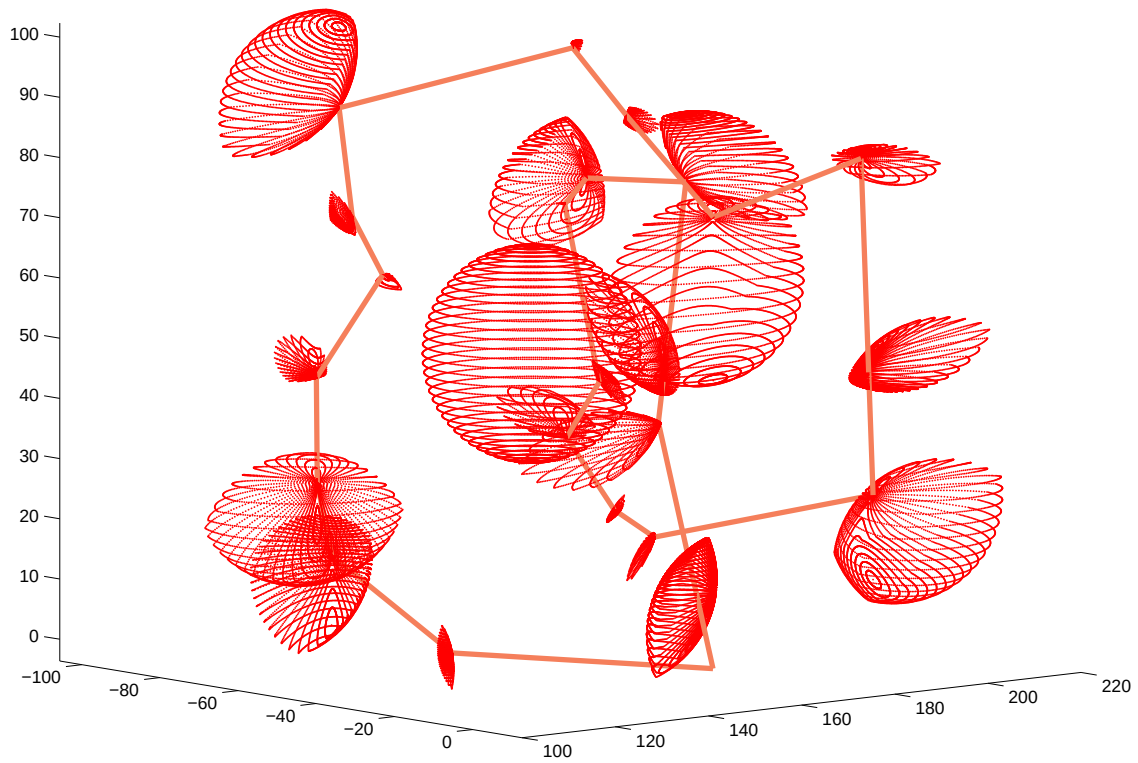


Figure B.10: 36 longitudinal lines represent each SZ.

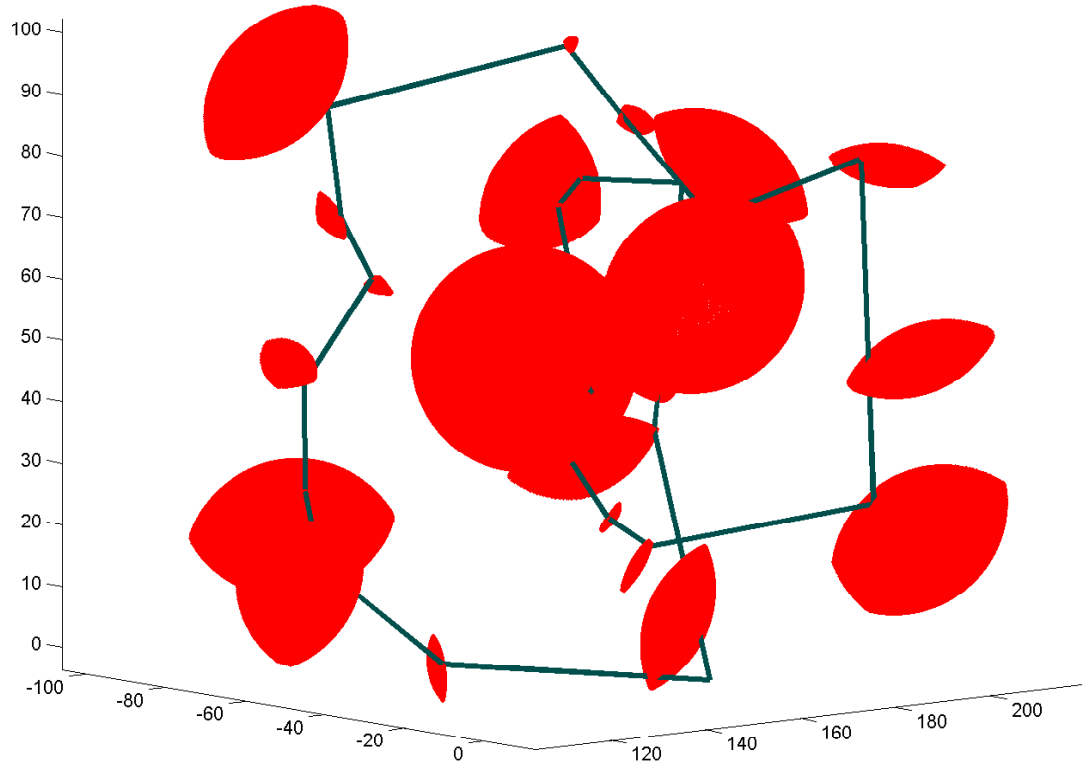


Figure B.11: 60 longitudinal lines represent each SZ.

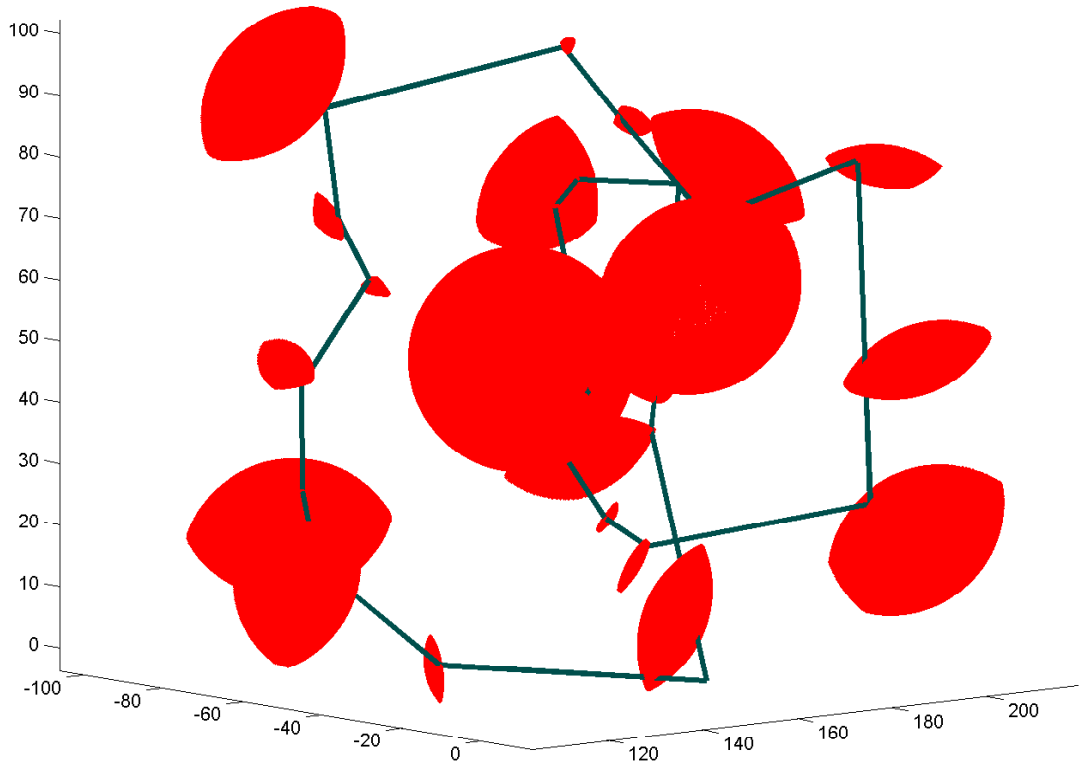


Figure B.12: 180 longitudinal lines represent each SZ.

members of an arbitrary set for inclusion in the convex hull of another set. For a given $SZ(k)$ with base node i, $POLY$ first computes the intersection of node i's sphere with one of the other $k-1$ spheres, where each sphere is approximated polygonally. Let the set of points in both spheres be called S_2. S_2 is intersected with one of the $k-2$ spheres to form the set S_3. This is repeated until the set S_k remains, containing the points that lie in all k spheres. The level of visual detail for $POLY$ depends on the number of points, β, used to approximate each sphere. As with $NUMER$, there is a tradeoff between speed and level of detail. For a small β (between three and five), $POLY$ is fast, but the spherical approximations are too coarse to be of much value. For β much larger than 20, $POLY$ is extremely slow. Due to its polygonal nature, $POLY$ does not approximate each Steiner zone

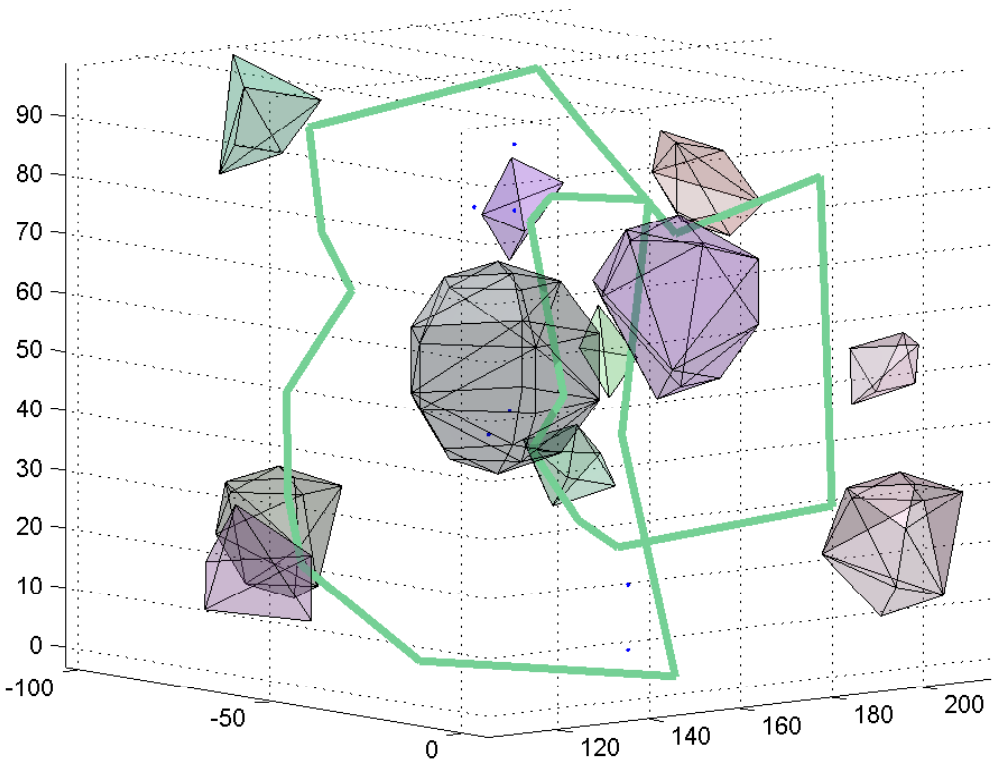


Figure B.13: $\alpha = 5$

as accurately as $NUMER$, even for a large β. Figures B.13 through B.16 depict the same 100-node CETSP and solution as Figures B.5 through B.12 for different values of β. Figure B.17 shows a closeup of two polygonally approximated Steiner zones for $\beta = 50$. Even for large values of β, as in Figure B.16, the tour sometimes appears not to touch some of the Steiner zones. The tour is feasible, but the polygonal approximation of the Steiner zones makes it appear that the solution is infeasible.

B.5 CETSP Results

We created 3D benchmark problems for the CETSP by adding z-dimensional coordinates to the 21 $TSPLIB$ and seven $Team$ problems described in Chapter 2.

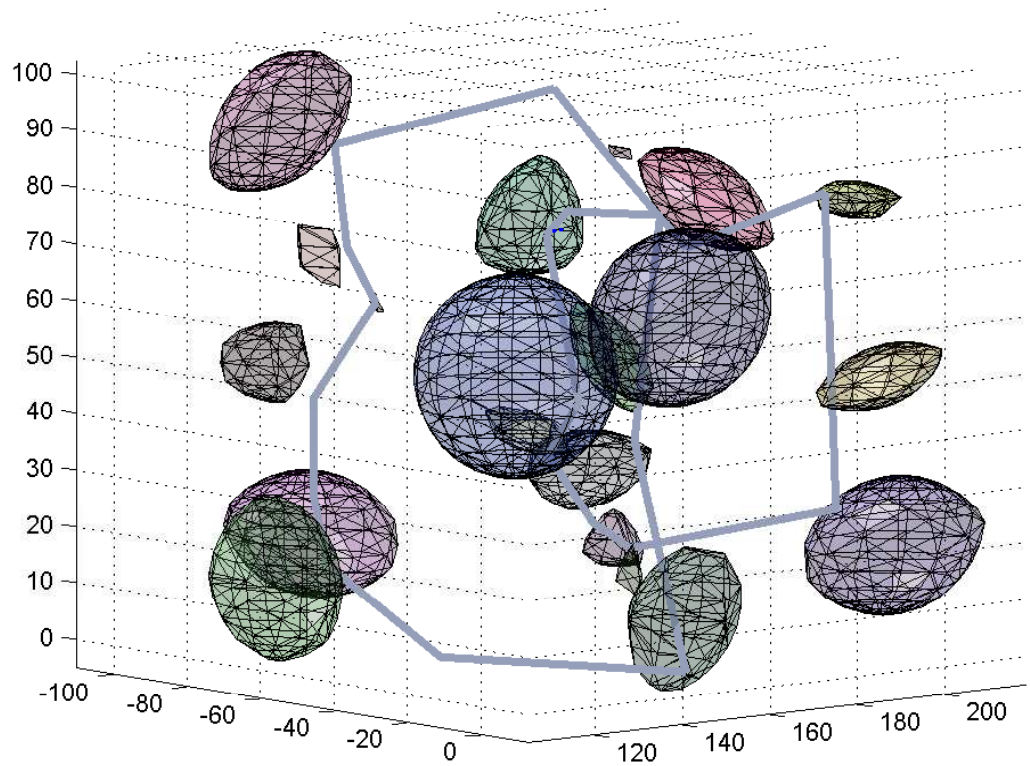


Figure B.14: $\alpha = 15$

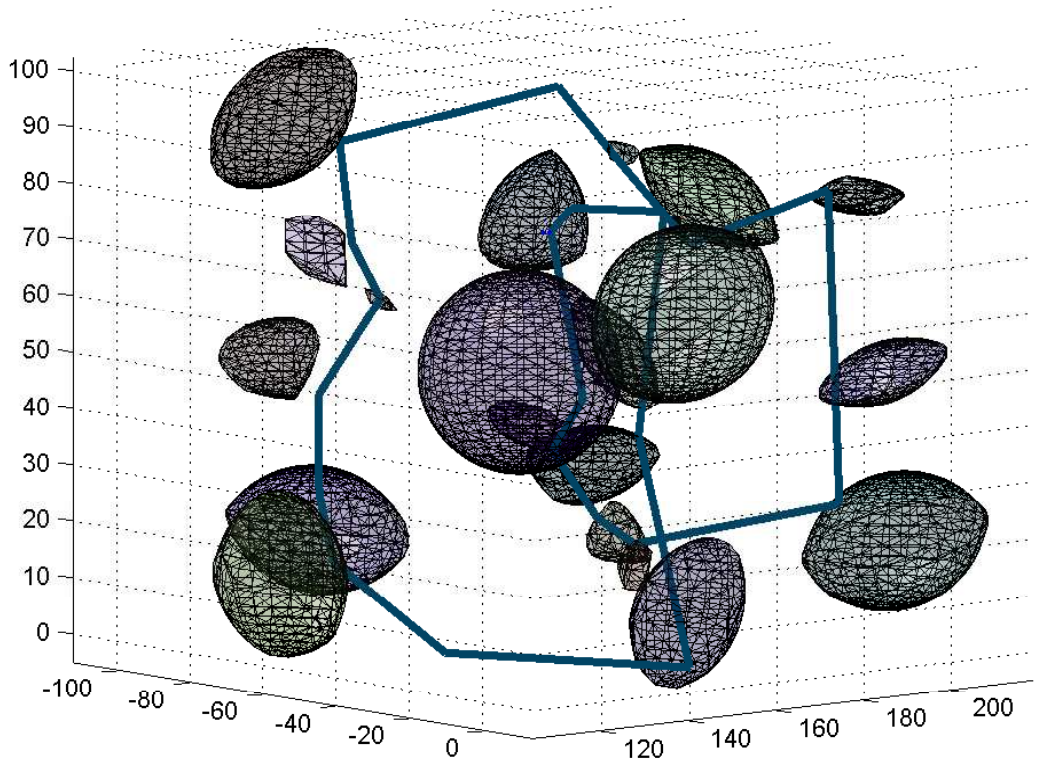


Figure B.15: $\alpha = 30$

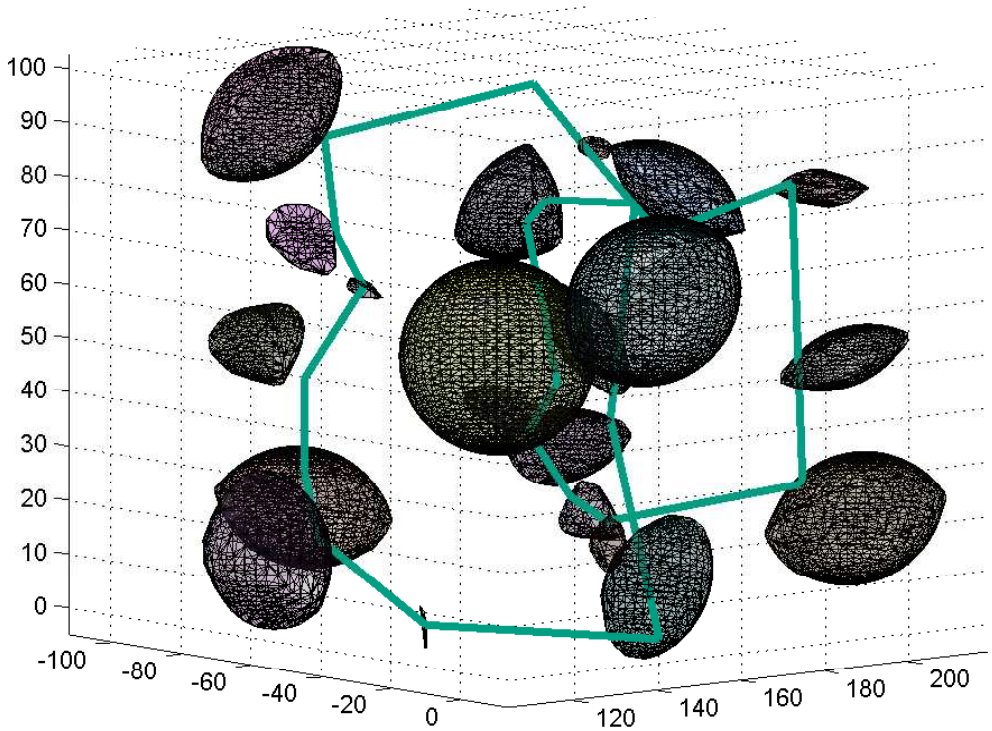


Figure B.16: $\alpha = 50$

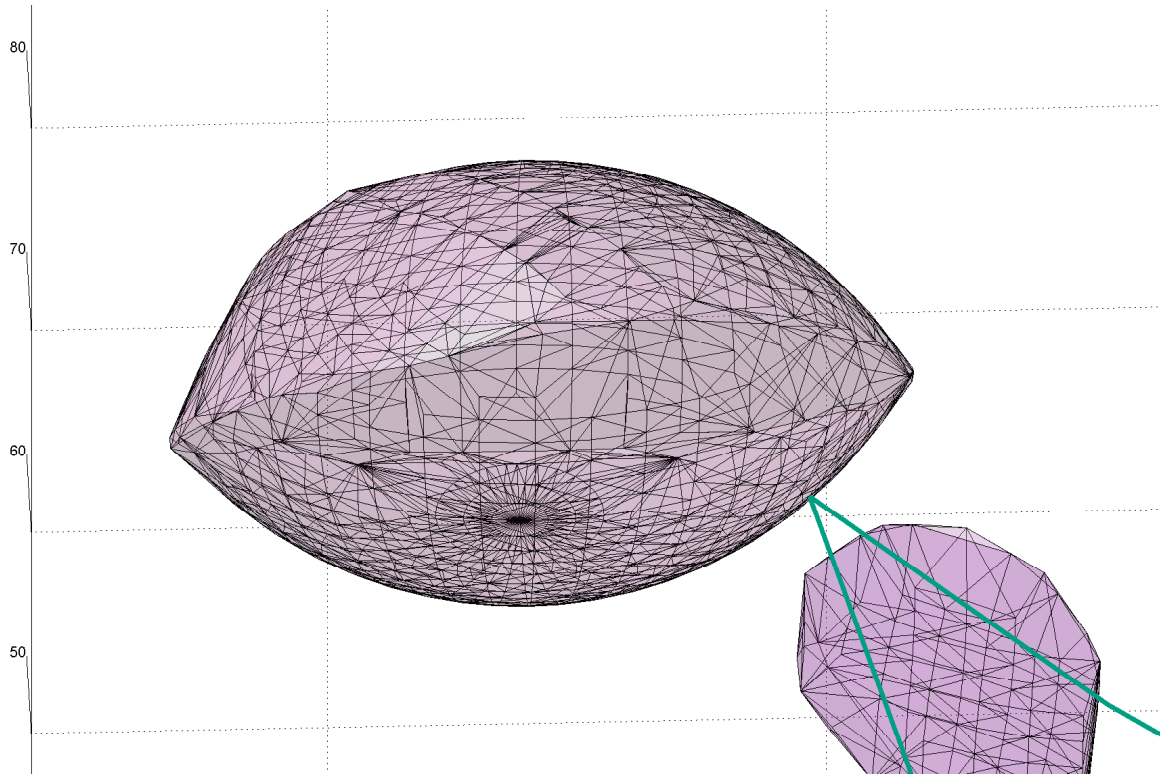


Figure B.17: A close-up of two Steiner zones when $\alpha = 50$

The remaining 20 $GEOMETRIC$ problems that were created specifically in two dimensions are not solved as 3D problems. All problems have almost the exact same overlap ratio in 3D as in 2D. Instead of thinking of 0.02, 0.1, and 0.3 as low, medium, and high overlap ratios (as we did in 2D), we treat them as very low, low, and medium-high overlap ratios in 3D.

We coded six CETSP solution methods for comparison purposes. SZ3$_{an}$ and SZ3$_{nu}$ are the same as the SZ3 method described in Chapter 4 except that SZ3$_{an}$ implements the $3D_{AN}$ Phase I solver and SZ3$_{nu}$ implements the $3D_{NUM}$ Phase I solver. SZ2$_{an}$ and SZ2$_{nu}$ are the same as the SZ2 method described in Chapter 2 except that SZ2$_{an}$ implements the $3D_{AN}$ Phase I solver and SZ2$_{nu}$ implements the $3D_{NUM}$ Phase I solver. YUAN+ and LK-SOCP are the same methods described in Chapter 2 except that they solve Phases II and III in 3D. We could not implement SZ1, CTD, HYBRID1, HYBRID2, GTSP1, and GTSP2 in 3D (SZ1 applies the Ip$_{PhIII}$ Phase III heuristic which does not easily extend to three dimensions. Creating a 3D spherical trapezoidal decomposition algorithm from the 2D circular trapezoidal decomposition heuristic used by CTD would take too long to implement. HYBRID1, HYBRID2, GTSP1, and GTSP2 rely on the code developed for only two-dimensional problems by Silberholz and Golden [67]). DAMON1, DAMON2, DAMON3, DAMON4, HULL, and MERGE were not provided to us with 3D implementations.

In Tables B-1, B-2, and B-3, we present the results for the 28 problems with fixed radius and 3D Euclidean norm. The columns in Table B-1 and B-2 are ordered from left (best average deviation) to right (worst average deviation). The columns

Table B-1: Tour lengths for 28 problems with equal radius and 3D Euclidean norm

	$SZ3_{nu}$	$SZ3_{an}$	$SZ2_{nu}$	$SZ2_{an}$	YUAN+	LK-SOCP
Overlap ratio: 0.02						
kroD100	**202.02**	202.43	202.25	202.69	202.43	202.43
rat195	292.86	**291.26**	293.38	291.59	296.37	296.37
lin318	**3044.27**	3058.83	3114.72	3078.35	3122.36	3172.96
rd400	**3226.84**	3227.49	3230.53	3228.07	3234.68	3237.62
pcb442	**404.49**	406.59	415.63	417.19	428.31	429.12
d493	1358.71	**1357.73**	1362.37	1358.42	1358.55	1366.28
dsj1000	3165.53	**3147.87**	3260.75	3172.35	3257.41	3213.25
Overlap ratio: 0.1						
kroD100	**91.67**	93.17	97.69	99.57	96.81	96.81
rat195	**112.40**	112.90	117.30	123.30	138.98	138.98
lin318	**1443.43**	1530.94	1545.70	1634.99	1610.92	1529.83
rd400	**1552.72**	1634.57	1713.22	1729.05	1767.71	1766.69
pcb442	**154.81**	162.13	162.92	182.02	222.20	217.66
d493	**665.06**	684.53	728.71	706.39	727.26	760.97
dsj1000	**1021.25**	1038.45	1022.98	1133.01	1212.84	1155.41
Overlap ratio: 0.3						
kroD100	**58.93**	**58.93**	59.06	**58.93**	**58.93**	**58.93**
rat195	**47.89**	**47.89**	48.11	**47.89**	47.92	47.92
lin318	**766.83**	766.83	783.33	767.02	768.56	768.56
rd400	**539.95**	581.78	575.51	585.99	739.91	762.64
pcb442	**83.72**	**83.72**	84.83	84.00	102.00	101.63
d493	**335.59**	344.30	348.29	347.68	359.06	373.62
dsj1000	**270.62**	300.69	302.43	322.55	314.75	316.17
Varied overlap ratios						
team1_100	**820.73**	823.59	838.39	828.41	833.08	833.08
team2_200	**283.24**	283.98	325.24	322.65	360.54	393.28
team3_300	1499.66	**1484.41**	1563.77	1533.96	1535.17	1544.50
team4_400	**753.81**	781.95	811.83	808.90	851.31	841.61
team5_499	1933.04	**1928.87**	1959.95	1937.18	1950.23	1937.80
team6_500	**236.96**	263.60	257.78	271.79	319.32	305.36
bonus1000	**941.35**	1074.15	**941.35**	1101.81	1135.68	1155.27

in Table B-3 are ordered left to right from fastest overall to slowest.

In Table B-1, we see that SZ3$_{nu}$ produces 23 best solutions and SZ3$_{an}$ produces eight best solutions (including problems where both methods find the same solution). Without the Phase IV post-processor, $3D_{NUM}$ (implemented by SZ2$_{nu}$) produces better solutions than $3D_{AN}$ (implemented by SZ2$_{an}$) slightly less than half of the time (12 out of 28 times). YUAN+ and LK-SOCP produce only one best solution (on a problem where three out of four Steiner-zone methods also produce the best solution).

In Table B-2, we give the average deviation from the best solutions in Table B-1. SZ3$_{nu}$ is the most accurate of the six methods, with an average deviation of 0.06%. SZ3$_{an}$ is very accurate for the low overlap ratio $TSPLIB$ problems but does poorly (an average deviation greater than 5%) on six of the remaining 20 problems. SZH methods that do not apply the post-processor (SZ2$_{an}$, SZ2$_{nu}$) are between 5% and 7% more accurate than either YUAN+ or LK-SOCP over all 28 problems.

In Table B-3, we compare computation times for the six heuristics. LK-SOCP is the fastest method with an average time of 1.025 seconds. SZ2$_{an}$ and SZ2$_{nu}$ are both fast, averaging between seven and 11 seconds. YUAN+ and both methods applying the Phase IV processor (SZ3$_{an}$, SZ3$_{nu}$) are slow, needing 29.587, 94.595, and 119.947 seconds, respectively.

Over all 28 problems we observe the following: (1) $3D_{NUM}$ is more accurate (approximately 2%) than $3D_{AN}$ for Euclidean 3D equal radius problems. 3D$_{NUM}$ is about 1.3 times slower than 3D$_{AN}$. (2) Methods that use Steiner zones (SZ3$_{an}$, SZ3$_{nu}$, SZ2$_{an}$, SZ2$_{nu}$) are more accurate than those that do not (YUAN+, LK-

Table B-2: Percentage deviation from the best solution for 28 problems with equal radius and 3D Euclidean norm

	$SZ3_{nu}$	$SZ3_{an}$	$SZ2_{nu}$	$SZ2_{an}$	YUAN+	LK-SOCP
Overlap ratio: 0.02						
kroD100	0.00	0.20	0.11	0.33	0.20	0.20
rat195	0.55	0.00	0.73	0.11	1.76	1.76
lin318	0.00	0.48	2.31	1.12	2.57	4.23
rd400	0.00	0.02	0.11	0.04	0.24	0.33
pcb442	0.00	0.52	2.75	3.14	5.89	6.09
d493	0.07	0.00	0.34	0.05	0.06	0.63
dsj1000	0.56	0.00	3.59	0.78	3.48	2.08
Average:	0.17	0.17	1.42	0.80	2.03	2.19
Overlap ratio: 0.1						
kroD100	0.00	1.64	6.56	8.62	5.61	5.61
rat195	0.00	0.44	4.35	9.69	23.65	23.65
lin318	0.00	6.06	7.09	13.27	11.60	5.99
rd400	0.00	5.27	10.34	11.36	13.85	13.78
pcb442	0.00	4.73	5.24	17.58	43.53	40.60
d493	0.00	2.93	9.57	6.21	9.35	14.42
dsj1000	0.00	1.68	0.17	10.94	18.76	13.14
Average:	0.00	3.25	6.19	11.10	18.05	16.74
Overlap ratio: 0.3						
kroD100	0.00	0.00	0.23	0.00	0.00	0.00
rat195	0.00	0.00	0.46	0.00	0.07	0.07
lin318	0.00	0.00	2.15	0.02	0.23	0.23
rd400	0.00	7.75	6.58	8.53	37.03	41.24
pcb442	0.00	0.00	1.32	0.34	21.83	21.39
d493	0.00	2.60	3.79	3.60	6.99	11.33
dsj1000	0.00	11.11	11.76	19.19	16.31	16.83
Average:	0.00	3.06	3.76	4.53	11.78	13.01
TSPLIB **average:**	0.06	2.16	3.79	5.47	10.62	10.65
Varied overlap ratios						
team1_100	0.00	0.35	2.15	0.94	1.50	1.50
team2_200	0.00	0.26	14.83	13.92	27.29	38.85
team3_300	1.03	0.00	5.35	3.34	3.42	4.05
team4_400	0.00	3.73	7.70	7.31	12.93	11.65
team5_499	0.22	0.00	1.61	0.43	1.11	0.46
team6_500	0.00	11.24	8.78	14.70	34.76	28.86
bonus1000	0.00	14.11	0.00	17.05	20.64	22.73
Average:	0.18	4.24	5.77	8.24	14.52	15.44
Overall average:	0.09	2.68	4.28	6.16	11.60	11.85

Table B-3: Computation time for 28 problems with equal radius and 3D Euclidean norm

	LK-SOCP	$SZ2_{an}$	$SZ2_{nu}$	YUAN+	$SZ3_{an}$	$SZ3_{nu}$
Overlap ratio: 0.02						
kroD100	0.133	0.781	0.890	1.242	7.453	12.937
rat195	0.266	2.891	2.891	6.399	36.172	45.328
lin318	0.664	3.547	3.907	2.149	35.125	60.828
rd400	0.680	4.531	8.188	4.852	61.984	117.156
pcb442	1.329	9.844	11.781	21.375	40.110	55.828
d493	0.891	6.281	12.281	25.156	173.765	94.922
dsj1000	2.406	26.890	32.563	346.750	388.219	520.532
Average:	0.910	7.824	10.357	58.275	106.118	129.647
Overlap ratio: 0.1						
kroD100	0.125	1.204	1.062	0.399	3.094	3.125
rat195	0.102	0.719	0.875	0.320	11.391	12.953
lin318	0.102	0.531	0.796	0.297	7.016	6.656
rd400	0.227	2.094	2.641	1.586	4.906	4.516
pcb442	0.219	1.813	2.609	1.555	22.047	31.281
d493	0.219	1.187	2.375	1.485	28.485	24.703
dsj1000	0.688	4.922	4.265	9.282	42.547	61.203
Average:	0.240	1.781	2.089	2.132	17.069	20.634
Overlap ratio: 0.3						
kroD100	0.641	3.438	4.984	9.258	48.625	58.187
rat195	0.571	3.453	3.859	8.477	55.843	36.719
lin318	0.672	5.844	6.281	6.227	12.640	11.125
rd400	0.641	5.953	6.641	6.344	47.843	105.891
pcb442	0.618	4.094	6.360	6.063	108.281	131.859
d493	0.820	8.500	8.875	16.469	41.891	58.829
dsj1000	0.696	5.688	9.234	16.688	99.937	84.453
Average:	0.665	5.281	6.605	9.932	59.294	69.580
TSPLIB **Average:**	0.605	4.962	6.350	23.446	60.827	73.287
Varied overlap ratios						
team1_100	0.695	4.578	5.765	16.532	134.578	52.922
team2_200	1.664	11.062	13.829	15.289	41.672	41.047
team3_300	1.633	9.625	12.891	14.438	100.984	205.812
team4_400	1.500	7.375	15.094	9.867	170.875	177.312
team5_499	3.571	30.078	43.531	87.664	148.953	198.500
team6_500	3.524	34.125	41.234	87.071	417.000	534.875
bonus1000	3.398	13.359	23.672	105.196	357.234	609.016
Average:	2.283	15.743	22.288	48.008	195.899	259.926
Overall average:	1.025	7.657	10.335	29.587	94.595	119.947

SOCP). (3) If we consider the order in which the columns appear in Tables B-2 and B-3, then $SZ2_{an}$ and $SZ2_{nu}$ have the best average rank (3). $SZ3_{an}$, $SZ3_{nu}$, and LK-SOCP follow with an average rank of 3.5. $SZ2_{nu}$ averages 10.335 seconds per problem with an average of 4.28% deviation. It seems to be the most competitive of the six methods.

In Tables B-4, B-5, and B-6, we present the results for the 28 problems with fixed radius and 3D Manhattan norm. $SZ3_{anEuc}$ and $SZ3_{nuEuc}$ are the same as

Table B-4: Tour lengths for 28 problems with equal radius and 3D Manhattan norm

	$SZ3_{nuEuc}$	$SZ3_{nu}$	$SZ3_{an}$	$SZ3_{anEuc}$	$SZ2_{nu}$	$SZ2_{an}$	YUAN+	LK-SOCP
Overlap ratio: 0.02								
kroD100	**276.93**	276.95	288.64	288.64	277.05	288.64	277.72	277.72
rat195	413.74	414.55	**413.36**	414.59	417.29	413.50	415.27	415.27
lin318	3783.24	3748.12	**3700.24**	3800.01	3904.44	3722.86	3873.60	3903.53
rd400	4600.25	4600.25	**4573.96**	4586.59	4602.34	**4573.96**	4590.66	4582.57
pcb442	**532.92**	539.54	566.21	570.43	563.70	566.21	575.36	575.36
d493	**1913.45**	1914.73	1925.40	1924.97	1921.38	1925.45	1926.40	1926.40
dsj1000	4473.88	**4412.97**	4477.33	4495.74	4582.50	4480.61	4553.75	4537.34
Overlap ratio: 0.1								
kroD100	**109.77**	112.57	120.32	118.99	123.81	120.32	121.49	121.49
rat195	**149.60**	151.82	164.44	164.26	169.30	171.87	176.76	176.76
lin318	1640.96	**1612.49**	1700.69	1695.50	1884.60	1728.39	1925.63	1805.28
rd400	2188.45	**2132.78**	2409.34	2425.72	2448.11	2437.88	2403.06	2504.25
pcb442	**180.58**	181.86	232.28	216.46	197.26	232.28	274.24	274.24
d493	**938.43**	950.83	1008.89	1009.71	1021.28	1019.33	1042.81	1042.81
dsj1000	**1248.08**	1315.99	1484.13	1454.45	1400.49	1484.13	1474.32	1507.62
Overlap ratio: 0.3								
kroD100	**71.38**	**71.38**	**71.38**	**71.38**	**71.38**	**71.38**	**71.38**	**71.38**
rat195	**59.96**	**59.96**	59.97	**59.96**	62.34	59.99	**59.96**	**59.96**
lin318	**851.47**	**851.47**	**851.47**	**851.47**	908.59	**851.47**	**851.47**	**851.47**
rd400	**656.50**	688.40	893.37	908.70	748.37	893.37	887.90	1108.54
pcb442	**104.26**	**104.26**	**104.26**	**104.26**	104.89	**104.26**	134.36	134.36
d493	**388.73**	391.92	406.04	434.34	458.68	445.18	478.42	481.59
dsj1000	361.11	**341.17**	363.74	361.17	423.63	363.74	390.39	442.47
Varied overlap ratios								
team1_100	1107.74	**1102.03**	1114.59	1107.18	1151.89	1114.59	1161.48	1161.48
team2_200	**359.40**	361.76	386.56	394.58	412.59	402.26	393.65	393.65
team3_300	2033.20	**2001.11**	2041.51	2108.60	2104.57	2074.14	2104.99	2112.78
team4_400	**961.43**	970.05	1058.02	1026.78	1082.03	1061.27	1084.18	1109.05
team5_499	2727.24	2710.33	**2705.24**	2709.08	2770.93	2705.39	2752.63	2746.39
team6_500	**289.81**	293.61	341.41	345.96	330.20	342.61	470.41	449.46
bonus1000	**1183.19**	1305.47	1545.06	1521.07	1305.47	1545.06	1730.52	1697.60

$SZ3_{an}$ and $SZ3_{nu}$ except that they compute distances when creating the ordered list in Phase I using the Euclidean norm. $SZ2_{an}$, $SZ2_{nu}$, $SZ3_{an}$, and $SZ3_{nu}$ compute the same distances using the Manhattan norm. For all methods, distances in Phase II and Phase III are calculated using the Manhattan norm.

In Table B-4, we see that $SZ3_{nuEuc}$ finds best solutions to 18 of 28 problems. $SZ3_{nu}$ finds the best solution 10 times. The two $3D_{NUM}$ methods that apply the post-processor ($SZ3_{nuEuc}$, $SZ3_{nu}$) produce better solutions than two $3D_{AN}$ methods that apply the post-processor ($SZ3_{anEuc}$, $SZ3_{an}$) 20 of 28 times. $SZ2_{nu}$ produces better solutions than $SZ2_{an}$ only 9 of 28 times.

Table B-5: Percentage deviation from the best solution for 28 problems with equal radius and 3D Manhattan norm

	$SZ3_{nuEuc}$	$SZ3_{nu}$	$SZ3_{an}$	$SZ3_{anEuc}$	$SZ2_{nu}$	$SZ2_{an}$	YUAN+	LK-SOCP
Overlap ratio: 0.02								
kroD100	0.00	0.01	4.23	4.23	0.04	4.23	0.28	0.28
rat195	0.09	0.29	0.00	0.30	0.95	0.03	0.46	0.46
lin318	2.24	1.29	0.00	2.70	5.52	0.61	4.69	5.49
rd400	0.57	0.57	0.00	0.28	0.62	0.00	0.37	0.19
pcb442	0.00	1.24	6.25	7.04	5.78	6.25	7.96	7.96
d493	0.00	0.07	0.62	0.60	0.41	0.63	0.68	0.68
dsj1000	1.38	0.00	1.46	1.88	3.84	1.53	3.19	2.82
Average:	0.61	0.50	1.79	2.43	2.45	1.90	2.52	2.56
Overlap ratio: 0.1								
kroD100	0.00	2.55	9.61	8.40	12.79	9.61	10.67	10.67
rat195	0.00	1.48	9.92	9.80	13.16	14.88	18.15	18.15
lin318	1.77	0.00	5.47	5.15	16.88	7.19	19.42	11.96
rd400	2.61	0.00	12.97	13.74	14.78	14.31	12.67	17.42
pcb442	0.00	0.71	28.63	19.87	9.24	28.63	51.87	51.87
d493	0.00	1.32	7.51	7.60	8.83	8.62	11.12	11.12
dsj1000	0.00	5.44	18.91	16.53	12.21	18.91	18.13	20.79
Average:	0.63	1.64	13.29	11.58	12.56	14.59	20.29	20.28
Overlap ratio: 0.3								
kroD100	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
rat195	0.00	0.00	0.03	0.00	3.97	0.06	0.00	0.00
lin318	0.00	0.00	0.00	0.00	6.71	0.00	0.00	0.00
rd400	0.00	4.86	36.08	38.42	14.00	36.08	35.25	68.86
pcb442	0.00	0.00	0.01	0.00	0.60	0.01	28.87	28.87
d493	0.00	0.82	4.45	11.73	17.99	14.52	23.07	23.89
dsj1000	5.85	0.00	6.62	5.86	24.17	6.62	14.43	29.69
Average:	0.84	0.81	6.74	8.00	9.64	8.18	14.52	21.62
TSPLIB **Average:**	0.69	0.98	7.27	7.34	8.21	8.22	12.44	14.82
Varied overlap ratios								
team1_100	0.52	0.00	1.14	0.47	4.52	1.14	5.39	5.39
team2_200	0.00	0.66	7.56	9.79	14.80	11.92	9.53	9.53
team3_300	1.60	0.00	2.02	5.37	5.17	3.65	5.19	5.58
team4_400	0.00	0.90	10.05	6.80	12.54	10.38	12.77	15.35
team5_499	0.81	0.19	0.00	0.14	2.43	0.01	1.75	1.52
team6_500	0.00	1.31	17.81	19.38	13.94	18.22	62.32	55.09
bonus1000	0.00	10.34	30.58	28.56	10.34	30.58	46.26	43.48
Average:	0.42	1.91	9.88	10.07	9.11	10.84	20.46	19.42
Overall average:	0.62	1.22	7.93	8.02	8.44	8.88	14.45	15.97

In Table B-5, we show the average deviations from the best solutions in Table B-4 for the 28 problems. $SZ3_{nuEuc}$ and $SZ3_{nu}$ have an average deviation close to 1% over all problems, while $SZ3_{an}$ and $SZ3_{anEuc}$ are close to 8%. $SZ2_{nu}$ is slightly more accurate than $SZ2_{an}$ (8.44% compared to 8.88%). Except for the low overlap ratio $TSPLIB$ problems and three of the high overlap ratio $TSPLIB$ problems ($kroD100, rat195, lin318$), YUAN+ and LK-SOCP produce large average deviations (about 15%).

In Table B-6, we see the average computation times for the eight heuristics over the 28 problems. LK-SOCP is the fastest method with an average of 1.360 CPU seconds. SZH methods that do not apply the Phase IV post-processor ($SZ2_{an}$, $SZ2_{nu}$) are fast with an average of 13 to 17 seconds. The $3D_{NUM}$ methods that apply Phase IV ($SZ3_{nu}$, $SZ3_{nuEuc}$) are slow with an average over 200 seconds.

Over all 28 problems we make the following observations. When applied with Phase IV, $3D_{NUM}$ produces better solutions than $3D_{AN}$. When Phase IV is not applied, $3D_{AN}$ finds more best solutions than $3D_{NUM}$ but has a slightly larger average deviation (8.88% compared to 8.44%). This is because $3D_{NUM}$ does not produce infeasible Steiner zones in Phase I (as described earlier), and therefore has more Steiner zones with degree greater than 1 than $3D_{AN}$ produces. After Phase I, the set of Steiner zones created by $3D_{AN}$ may have a large proportion of singletons (due to the infeasibilities in the Steiner zones that $3D_{AN}$ found). The Phase IV post-processor does not greatly improve a solution tour that already consists of mostly singletons (recall from Chapter 4 that the post-processor iteratively removes Steiner zones, replacing them with duples and singletons). If we consider the column order in Tables B-5 and B-6 to be rankings, then $SZ3_{an}$ and $SZ3_{anEuc}$ have the best average ranking (3.5) of the eight heuristics. The average deviations for these two methods, however, are much poorer than the average deviations for $SZ3_{nuEuc}$, which has an average rank of 4.5.

Over all 28 problems solved using both norms, $SZ2_{nu}$ has the best average rank for the Euclidean norm and the second best average rank for the Manhattan norm. $SZ3_{an}$ has the second best average rank for the Euclidean norm and the best

Table B-6: Computation time for 28 problems with equal radius and 3D Manhattan norm

	LK-SOCP	$SZ2_{an}$	$SZ2_{nu}$	$SZ3_{an}$	$SZ3_{anEuc}$	YUAN+	$SZ3_{nuEuc}$	$SZ3_{nu}$
Overlap ratio: 0.02								
kroD100	0.196	1.188	1.859	3.297	3.406	0.438	4.890	5.969
rat195	0.422	3.297	3.844	8.156	7.922	3.492	6.734	9.188
lin318	1.094	11.609	11.781	43.516	36.594	30.571	109.735	123.500
rd400	1.125	9.234	11.578	23.937	24.562	4.594	21.390	24.594
pcb442	1.555	19.906	15.297	40.750	43.609	4.766	161.953	152.485
d493	2.297	29.219	31.625	56.000	55.813	103.000	95.531	97.266
dsj1000	4.563	45.828	74.265	127.203	120.922	499.094	501.188	474.797
Average:	1.607	17.183	21.464	43.266	41.833	92.279	128.774	126.828
Overlap ratio: 0.1								
kroD100	0.164	1.359	1.125	5.406	5.718	0.391	18.937	21.735
rat195	0.297	3.125	3.282	11.406	13.891	3.000	60.688	64.172
lin318	0.813	7.500	7.907	25.438	27.656	29.750	85.281	116.813
rd400	0.899	8.281	12.640	29.156	27.375	3.789	265.703	226.781
pcb442	1.141	12.687	11.953	84.329	93.641	4.797	214.094	205.469
d493	2.055	19.141	20.750	65.406	61.094	93.484	443.203	426.781
dsj1000	3.961	36.641	78.703	186.485	253.532	472.930	969.594	1009.110
Average:	1.333	12.676	19.480	58.232	68.987	86.877	293.929	295.837
Overlap ratio: 0.3								
kroD100	0.110	1.375	0.875	10.859	9.562	0.633	7.156	9.343
rat195	0.367	3.016	1.954	29.313	28.282	3.078	50.312	35.859
lin318	0.688	7.438	4.516	69.844	54.843	21.695	49.875	54.562
rd400	0.961	7.437	9.453	54.906	51.313	3.719	246.109	251.859
pcb442	1.141	13.875	6.797	125.610	98.844	3.883	81.094	68.812
d493	1.781	17.609	19.187	110.859	104.796	49.305	357.421	370.312
dsj1000	4.219	26.390	20.672	259.016	263.922	448.735	730.766	469.203
Average:	1.324	11.020	9.065	94.344	87.366	75.864	217.533	179.993
TSPLIB **Average:**	1.421	13.626	16.670	65.281	66.062	85.007	213.412	200.886
Varied overlap ratios								
team1_100	0.149	1.406	1.766	4.828	4.172	2.102	16.797	30.188
team2_200	0.422	3.984	3.641	23.297	26.454	2.000	61.813	96.610
team3_300	0.852	7.860	7.047	22.953	22.328	9.961	99.282	121.359
team4_400	1.000	10.859	10.953	36.656	34.375	15.305	205.766	266.313
team5_499	1.805	16.375	25.609	53.703	53.140	57.711	91.797	123.906
team6_500	1.016	17.109	6.875	136.750	136.266	22.829	151.938	192.843
bonus1000	2.993	40.516	48.531	190.203	184.578	123.946	858.938	1055.359
Average:	1.176	14.016	14.917	66.913	65.902	33.407	212.333	269.511
Overall average:	1.360	13.724	16.232	65.689	66.022	72.107	213.142	218.042

rank for the Manhattan norm.

B.6 CEVRP Results

We created benchmark problems for the CEVRP in 3D by adding z-dimensional coordinates to the 21 $TSPLIB$ and seven $Team$ problems described in Chapter 3. That is, the CEVRP 3D benchmark problems have the same coordinates as the CETSP 3D benchmark problems in Section B.5 and use the same node demands,

vehicle capacities and maximum tour lengths as the 2D CEVRP problems described in Chapter 3.

We coded 14 CEVRP solution methods for comparison purposes. The 12 SZVRP methods are variants of the SZH. Subscripts t and v indicate methods that use either the TSP-based or VRP-based Phase IV methods described in Chapter 4. Subscripts a and n indicate which 3D Phase I method is used: $3D_{AN}$ or $3D_{NUM}$. For each SZVRPk method described in Chapter 3 (SZVRP1, SZVRP2, SZVRP3, SZVRP4), we implemented 6 different versions: SZVRPk_n, SZVRPk_{vn}, SSZVRPk_{tn}, SZVRPk_a, SZVRPk_{va}, and SZVRPk_{ta}. We do not include any methods subscripted with a in this section. We found that a SZVRPk method subscripted with n consistently produced shorter tours faster than the equivalent SZVRPk method subscripted with a. For example, SZVRP2_{vn} produces a lower average deviation and has a faster average computation time than SZVRP2_{va}.

In 2D, both SZVRP1 and SZVRP2 solved Phase III using the IP_{PhIII} heuristic procedure. Because IP_{PhIII} is not extended to work in three dimensions, all SZVRP methods described here solve Phase III to optimality using the SOCP formulation (see Appendix E).

CW-SOCP solves only Phases II and III of SZH. The Lin-Kernighan TSP heuristic is used to solve Phase II, computing a TSP tour (using a 3D norm) on the n nodes. Phase III is solved to optimality using the SOCP formulation. Giant TSP_{tn} is similar to the Giant TSP method described in Chapter 3 except that Phase I applies the $3D_{NUM}$ heuristic and the TSP-based Phase IV post-processor is applied.

Table B-7: Tour lengths for 28 problems with equal radius and 3D Euclidean norm

	SZVRP4$_{tn}$	SZVRP4$_{vn}$	SZVRP3$_{vn}$	SZVRP3$_{tn}$	SZVRP2$_{tn}$	SZVRP4$_{n}$	SZVRP2$_{vn}$	SZVRP3$_{n}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	Giant TSP$_{tn}$	SZVRP1$_{vn}$	SZVRP1$_{n}$	CW-SOCP
Overlap ratio: 0.02														
kroD100	413.97	**413.16**	416.36	417.32	416.46	415.76	416.51	416.60	416.82	421.33	435.09	421.46	421.58	419.79
rat195	407.77	409.20	**407.39**	409.65	409.26	407.46	409.50	408.24	409.73	440.50	441.55	440.72	441.21	408.17
lin318	5163.89	**5152.44**	5162.91	5233.04	5222.69	5228.63	5270.29	5227.88	5275.88	5530.01	5564.13	5601.65	5602.48	5433.32
rd400	3459.27	3457.71	**3438.66**	3450.75	3462.61	3452.73	3464.72	3445.66	3465.61	3811.39	3602.15	3813.64	3814.03	3476.01
pcb442	590.65	588.50	586.46	587.93	**583.40**	588.37	594.88	592.05	595.25	626.95	635.00	634.68	637.31	613.02
d493	2709.31	2714.50	2717.57	2727.63	2715.59	**2704.09**	2713.39	2723.53	2708.31	2968.03	2902.29	2979.31	2975.46	2731.11
dsj1000	3589.19	3603.81	3615.14	**3580.93**	3599.45	3630.09	3651.31	3627.19	3655.84	3733.58	3881.31	3822.13	3822.80	3606.31
Overlap ratio: 0.1														
kroD100	318.21	**315.77**	318.21	316.75	335.89	336.11	339.57	336.11	339.93	339.84	332.08	342.97	343.50	322.18
rat195	271.50	271.07	273.33	274.07	278.32	279.29	283.97	281.23	285.44	282.78	**267.67**	290.74	291.93	298.08
lin318	4125.42	4130.20	4125.42	**4093.42**	4154.33	4188.72	4171.82	4185.89	4198.65	4236.37	4185.99	4261.62	4280.80	4439.78
rd400	1900.72	**1888.02**	1946.68	1913.99	1918.64	2013.88	2005.02	1982.79	2016.32	2076.63	2019.42	2175.19	2180.14	2038.59
pcb442	414.65	413.36	414.12	**410.27**	427.34	433.71	431.74	427.70	434.78	430.29	434.90	439.25	440.99	474.34
d493	2225.87	2213.63	2208.71	2207.78	**2198.70**	2220.60	2221.62	2226.80	2230.79	2265.18	2262.58	2289.42	2297.18	2292.89
dsj1000	1590.88	**1587.81**	1620.85	1610.36	1617.59	1663.61	1661.79	1661.48	1696.24	1683.12	1748.87	1754.77	1781.43	1770.67
Overlap ratio: 0.3														
kroD100	190.10	**188.84**	190.10	190.10	192.66	195.84	192.66	195.84	195.84	192.66	195.19	192.66	195.84	205.03
rat195	**166.57**	167.18	169.45	167.18	169.45	169.49	169.45	169.49	169.49	169.45	183.22	169.45	169.49	207.48
lin318	2621.28	**2601.96**	2621.28	2610.67	2636.25	2702.94	2636.25	2702.94	2702.94	2636.25	3116.23	2636.25	2702.94	3096.84
rd400	969.02	966.88	969.02	966.88	985.36	1010.28	1010.18	1025.27	1025.27	**962.70**	1063.85	1014.63	1030.08	1181.86
pcb442	**277.40**	282.13	277.76	290.25	307.42	307.65	307.49	307.65	307.65	307.00	310.78	307.06	308.18	344.60
d493	1897.13	1894.00	**1874.81**	1884.47	1935.21	1942.78	1940.25	1942.78	1942.78	1934.40	1985.11	1940.25	1942.78	2022.02
dsj1000	**904.82**	**904.82**	905.23	**904.82**	911.44	932.10	941.78	954.71	954.71	955.39	991.60	971.09	992.58	965.51
Varied overlap ratios														
team1_100	2296.41	2305.55	2326.33	2312.81	2322.25	2337.83	2336.50	2377.20	2341.97	2424.78	2341.16	2430.66	2439.85	**2290.78**
team2_200	660.61	660.49	**652.25**	660.49	660.49	676.96	669.89	676.96	676.96	684.52	696.24	703.35	714.79	740.35
team3_300	2183.64	2167.40	2168.43	2186.40	**2164.81**	2194.08	2206.42	2195.70	2213.58	2313.89	2339.06	2359.48	2365.67	2222.21
team4_400	1410.15	**1401.12**	1427.69	1427.90	1429.49	1430.46	1459.41	1431.61	1461.46	1466.99	1446.47	1511.73	1513.88	1489.13
team5_499	2256.39	2247.34	2240.51	2241.77	**2236.93**	2252.22	2256.09	2263.26	2256.51	2404.04	2421.54	2427.17	2431.45	2271.16
team6_500	**712.15**	752.65	**712.15**	767.18	767.22	780.95	768.20	780.95	780.95	767.22	788.25	768.20	780.95	844.59
bonus1000	1782.05	1776.78	**1776.63**	1789.34	1795.90	1822.39	1833.06	1828.51	1844.46	1874.13	1887.76	1941.98	1952.39	2052.44

In Tables B-7 - B-9, we give our results on the 28 problems with equal radius and 3D Euclidean norm. Columns in Tables B-7 and B-8 are ordered left to right from lowest average deviation to highest. Columns in Tables B-9 are ordered from left to right, fastest average computation time to slowest.

In Table B-7, we present the tour lengths found by the 14 methods. The four variants of SZVRP3 and SZVRP4 that apply the Phase IV post-processor (SZVRP3$_{vn}$, SZVRP3$_{tn}$, SZVRP4$_{vn}$, SZVRP4$_{tn}$) collectively produce 20 out of 28 best solutions. CW-SOCP and Giant TSP$_{tn}$ each find one best solution.

Table B-8 gives the average deviation from the best solutions in Table B-7. For low overlap ratio $TSPLIB$ problems, seven of the 12 SZVRP methods average less than 1% deviation. For medium overlap ratio $TSPLIB$ problems, SZVRP4$_{tn}$ (0.88%) and SZVRP4$_{vn}$ (0.51%) average less than 1% deviation. For high overlap ratio $TSPLIB$ problems, four variants of SZVRP (SZVRP3$_{vn}$, SZVRP3$_{tn}$, SZVRP4$_{vn}$, SZVRP4$_{tn}$) average less than 1% deviation. For SZVRP1 and SZVRP2, the TSP-based Phase IV variants produces better tours on average than the VRP-based Phase IV variants.

Over all 28 problems, SZVRP4$_{tn}$ produces the lowest average deviation (0.59%). Nine SZVRP methods average less than 4% deviation. Giant TSP$_{tn}$ averages over 7% deviation across all problems. CW-SOCP, which does not use Steiner zones, performs poorly on the medium and high overlap ratio $TSPLIB$ problems and the $Team$ problems. CW-SOCP has the highest average deviation across the 28 problems (8.86%).

Table B-8: Percentage deviation from the best solution for 28 problems with equal radius and 3D Euclidean norm

	SZVRP4$_{tn}$	SZVRP4$_{vn}$	SZVRP3$_{vn}$	SZVRP3$_{tn}$	SZVRP2$_{tn}$	SZVRP4$_{n}$	SZVRP2$_{vn}$	SZVRP3$_{n}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	Giant TSP$_{tn}$	SZVRP1$_{vn}$	SZVRP1$_{n}$	CW-SOCP
Overlap ratio: 0.02														
kroD100	0.20	0.00	0.77	1.01	0.80	0.63	0.81	0.83	0.89	1.98	5.31	2.01	2.04	1.60
rat195	0.09	0.45	0.00	0.55	0.46	0.02	0.52	0.21	0.58	8.13	8.38	8.18	8.30	0.19
lin318	0.22	0.00	0.20	1.56	1.36	1.48	2.29	1.46	2.40	7.33	7.99	8.72	8.73	5.45
rd400	0.60	0.55	0.00	0.35	0.70	0.41	0.76	0.20	0.78	10.84	4.75	10.91	10.92	1.09
pcb442	1.24	0.87	0.52	0.78	0.00	0.85	1.97	1.48	2.03	7.46	8.84	8.79	9.24	5.08
d493	0.19	0.39	0.50	0.87	0.43	0.00	0.34	0.72	0.16	9.76	7.33	10.18	10.04	1.00
dsj1000	0.23	0.64	0.96	0.00	0.52	1.37	1.97	1.29	2.09	4.26	8.39	6.74	6.75	0.71
Average:	0.40	0.41	0.42	0.73	0.61	0.68	1.24	0.89	1.27	7.11	7.29	7.93	8.00	2.16
Overlap ratio: 0.1														
kroD100	0.77	0.00	0.77	0.31	6.37	6.44	7.54	6.44	7.65	7.62	5.17	8.61	8.78	2.03
rat195	1.43	1.27	2.11	2.39	3.98	4.34	6.09	5.07	6.64	5.65	0.00	8.62	9.06	11.36
lin318	0.78	0.90	0.78	0.00	1.49	2.33	1.92	2.26	2.57	3.49	2.26	4.11	4.58	8.46
rd400	0.67	0.00	3.11	1.38	1.62	6.67	6.20	5.02	6.80	9.99	6.96	15.21	15.47	7.98
pcb442	1.07	0.75	0.94	0.00	4.16	5.71	5.23	4.25	5.98	4.88	6.00	7.06	7.49	15.62
d493	1.24	0.68	0.46	0.41	0.00	1.00	1.04	1.28	1.46	3.02	2.91	4.13	4.48	4.28
dsj1000	0.19	0.00	2.08	1.42	1.88	4.77	4.66	4.64	6.83	6.00	10.14	10.51	12.19	11.52
Average:	0.88	0.51	1.46	0.84	2.79	4.47	4.67	4.14	5.42	5.81	4.78	8.32	8.86	8.75
Overlap ratio: 0.3														
kroD100	0.67	0.00	0.67	0.67	2.02	3.71	2.02	3.71	3.71	2.02	3.37	2.02	3.71	8.57
rat195	0.00	0.37	1.73	0.37	1.73	1.75	1.73	1.75	1.75	1.73	9.99	1.73	1.75	24.56
lin318	0.74	0.00	0.74	0.33	1.32	3.88	1.32	3.88	3.88	1.32	19.76	1.32	3.88	19.02
rd400	0.66	0.43	0.66	0.43	2.35	4.94	4.93	6.50	6.50	0.00	10.51	5.39	7.00	22.77
pcb442	0.00	1.71	0.13	4.63	10.82	10.91	10.85	10.91	10.91	10.67	12.03	10.69	11.10	24.23
d493	1.19	1.02	0.00	0.52	3.22	3.63	3.49	3.63	3.63	3.18	5.88	3.49	3.63	7.85
dsj1000	0.00	0.00	0.05	0.00	0.73	3.02	4.09	5.51	5.51	5.59	9.59	7.32	9.70	6.71
Average:	0.47	0.50	0.57	0.99	3.17	4.55	4.06	5.13	5.13	3.50	10.16	4.57	5.82	16.24
TSPLIB **Average:**	0.58	0.48	0.82	0.86	2.19	3.23	3.32	3.38	3.94	5.47	7.41	6.94	7.56	9.05
Varied overlap ratios														
team1_100	0.25	0.64	1.55	0.96	1.37	2.05	2.00	3.77	2.23	5.85	2.20	6.11	6.51	0.00
team2_200	1.28	1.26	0.00	1.26	1.26	3.79	2.70	3.79	3.79	4.95	6.74	7.83	9.59	13.51
team3_300	0.87	0.12	0.17	1.00	0.00	1.35	1.92	1.43	2.25	6.89	8.05	8.99	9.28	2.65
team4_400	0.64	0.00	1.90	1.91	2.02	2.09	4.16	2.18	4.31	4.70	3.24	7.89	8.05	6.28
team5_499	0.87	0.47	0.16	0.22	0.00	0.68	0.86	1.18	0.88	7.47	8.25	8.50	8.70	1.53
team6_500	0.00	5.69	0.00	7.73	7.73	9.66	7.87	9.66	9.66	7.73	10.69	7.87	9.66	18.60
bonus1000	0.31	0.01	0.00	0.72	1.08	2.58	3.18	2.92	3.82	5.49	6.25	9.31	9.89	15.52
Average:	0.60	1.17	0.54	1.97	1.93	3.17	3.24	3.56	3.85	6.15	6.49	8.07	8.81	8.30
Overall Average:	0.59	0.65	0.75	1.13	2.12	3.22	3.30	3.43	3.92	5.64	7.18	7.22	7.88	8.86

In Table B-9, we show the computation times for the 14 methods. SZVRP1$_n$ is the fastest overall, averaging about seven seconds per problem. SZVRP1$_{vn}$ and CW-SOCP are also fast, averaging less than 15 seconds per problem. The SZVRP3 and SZVRP4 variants are all slow, averaging between 370 and 1100 seconds per problem. For each k, of the two variants of SZVRPk that apply Phase IV (SZVRPk_{vn}, SZVRPk_{tn}), the VRP-based method is faster than the TSP-based method.

In Tables B-10 - B-12, we present the results for the 28 problems using the Manhattan norm. The 14 heuristics compared for the Euclidean norm are also used here. All SZH variants use the Manhattan norm to calculate distances in Phase I. As with the CETSP (see Section B.5), using the Euclidean norm to calculate distances in Phase I sometimes produces better tours and even better average deviations. However, for lack of room we present here only the results of methods that use the Manhattan norm in Phase I. In Appendix N and Appendix O, we give the best-known results from all our experiments for all problems. Many of the best-known results for the Manhattan norm indicate that the Euclidean norm was used in Phase I.

In Table B-10, we see that the four variants of SZVRP3 and SZVRP4 that apply the Phase IV post-processor (SZVRP3$_{vn}$, SZVRP3$_{tn}$, SZVRP4$_{vn}$, SZVRP4$_{tn}$) collectively produce 28 out of 28 best solutions. SZVRp4$_{tn}$, by itself, produces 15 best solutions.

Table B-9: Computation time for 28 problems with equal radius and 3D Euclidean norm

	SZVRP1$_n$	SZVRP1$_{vn}$	CW-SOCP	SZVRP2$_n$	SZVRP2$_{vn}$	Giant TSP$_{tn}$	SZVRP1$_{tn}$	SZVRP2$_{tn}$	SZVRP3$_n$	SZVRP3$_{vn}$	SZVRP3$_{tn}$	SZVRP4$_n$	SZVRP4$_{vn}$	SZVRP4$_{tn}$
Overlap ratio: 0.02														
kroD100	2.156	3.718	2.336	14.422	16.125	2.852	5.281	18.203	171.094	117.328	115.578	337.125	249.297	274.109
rat195	3.313	5.843	4.727	33.719	36.297	4.891	7.484	38.328	479.797	316.125	183.859	802.656	730.500	526.625
lin318	4.875	9.797	7.031	29.453	32.125	53.680	74.453	112.953	472.328	389.312	332.281	993.578	881.859	874.204
rd400	8.640	16.437	12.524	108.938	112.469	12.250	16.781	114.703	1038.703	671.719	437.578	2778.266	1403.062	1175.516
pcb442	8.500	16.656	20.469	68.078	72.484	103.594	94.062	135.922	1125.484	692.422	892.672	2832.406	1061.187	1478.453
d493	16.609	34.078	24.422	142.453	152.593	54.375	50.563	173.281	1195.734	957.391	1102.985	4370.390	1591.406	1752.265
dsj1000	26.843	46.625	34.258	228.562	233.734	141.672	179.734	346.766	3357.078	1616.953	1507.766	8998.157	5684.891	4732.547
Average:	10.134	19.022	15.109	89.375	93.690	53.331	61.194	134.308	1120.031	680.179	653.246	3016.083	1657.457	1544.817
Overlap ratio: 0.1														
kroD100	1.406	2.110	2.070	2.500	3.281	5.055	8.797	10.547	7.703	41.406	74.937	9.531	52.562	138.610
rat195	2.312	3.938	4.664	5.156	6.297	17.313	27.250	27.454	31.078	178.985	165.687	51.563	183.625	400.031
lin318	3.515	5.672	7.250	5.765	7.860	20.180	32.609	36.391	23.500	149.078	329.313	37.172	395.000	394.203
rd400	6.141	9.328	13.352	19.375	22.703	78.899	119.843	110.953	273.343	555.469	430.047	606.437	1494.047	679.016
pcb442	4.797	8.094	21.071	6.656	10.375	52.688	51.750	63.938	28.344	133.781	602.734	45.968	772.609	1201.422
d493	15.531	31.875	24.664	32.797	47.094	123.820	182.547	200.484	455.688	554.110	708.125	1208.265	848.516	1353.906
dsj1000	14.640	26.406	33.938	24.297	35.782	154.180	230.922	241.453	210.797	470.703	820.344	400.047	2731.532	3385.062
Average:	6.906	12.489	15.287	13.792	19.056	64.590	93.388	98.746	147.208	297.647	447.312	336.998	925.413	1078.893
Overlap ratio: 0.3														
kroD100	1.438	2.547	2.055	1.625	2.797	3.922	6.844	7.203	2.890	14.437	49.875	2.438	16.296	68.985
rat195	2.688	4.859	4.617	2.437	4.922	9.063	15.375	18.703	4.610	48.515	90.187	3.734	78.266	150.266
lin318	3.484	8.766	7.141	4.109	8.547	18.110	30.922	30.031	6.625	86.781	187.109	5.641	129.906	411.703
rd400	4.813	9.000	12.422	5.812	9.922	47.227	63.297	66.563	15.156	179.032	251.422	19.265	199.547	425.172
pcb442	4.656	12.657	20.430	4.672	12.781	45.031	43.985	44.218	9.234	295.282	435.875	8.625	445.984	747.921
d493	4.890	13.234	13.656	6.797	14.453	69.149	92.734	91.125	15.563	528.078	760.234	17.515	810.281	1217.860
dsj1000	12.547	34.344	34.430	13.219	35.172	186.422	213.468	201.890	23.156	1221.625	1353.047	20.984	1774.282	2117.141
Average:	4.931	12.201	13.536	5.524	12.656	54.132	66.661	65.676	11.033	339.107	446.821	11.172	493.509	734.150
TSPLIB **Average:**	7.324	14.571	14.644	36.231	41.801	57.351	73.748	99.577	426.091	438.978	515.793	1121.417	1025.460	1119.287
Varied overlap ratios														
team1_100	1.734	2.781	1.797	6.344	7.282	5.633	6.625	11.500	42.125	55.719	69.797	66.203	162.078	116.703
team2_200	2.234	4.000	3.711	3.063	4.562	17.868	22.906	23.234	7.015	64.375	91.125	8.063	186.312	179.875
team3_300	3.984	6.891	6.274	19.672	23.031	45.938	44.359	57.453	224.094	290.204	222.906	489.750	1514.906	478.968
team4_400	5.750	9.125	13.836	18.375	21.672	121.938	118.297	107.266	187.094	135.094	351.078	604.859	430.718	971.813
team5_499	11.656	21.250	11.336	86.156	90.406	51.282	64.672	122.922	895.406	1220.719	519.672	2057.937	2846.719	999.562
team6_500	5.687	14.203	13.055	6.453	14.656	35.172	61.218	64.609	10.766	280.219	360.562	13.297	521.391	725.781
bonus1000	13.484	25.969	46.922	25.625	36.297	138.477	245.265	219.375	160.047	752.719	1482.531	448.328	2180.938	2607.015
Average:	6.361	12.031	13.847	23.670	28.272	59.472	80.477	86.623	218.078	399.864	442.524	526.920	1120.437	868.531
Overall Average:	7.083	13.936	14.445	33.090	38.419	57.881	75.430	96.338	374.088	429.199	497.476	972.793	1049.204	1056.598

Table B-10: Tour lengths for 28 problems with equal radius and 3D Manhattan norm

	SZVRP4$_{tn}$	SZVRP3$_{tn}$	SZVRP3$_{vn}$	SZVRP4$_{vn}$	SZVRP2$_{tn}$	SZVRP4$_{n}$	SZVRP3$_{n}$	SZVRP2$_{vn}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	Giant TSP$_{tn}$	CW-SOCP	SZVRP1$_{vn}$	SZVRP1$_{n}$
Overlap ratio: 0.02														
kroD100	**549.33**	553.63	554.17	550.69	554.53	551.59	553.73	554.55	556.23	560.28	574.41	567.99	560.47	567.22
rat195	**552.30**	557.08	557.61	554.91	563.64	556.35	559.49	564.36	565.09	657.03	621.69	565.68	658.17	658.61
lin318	6396.83	**6358.54**	6435.20	6459.05	6455.44	6492.96	6477.36	6538.82	6586.34	6653.41	6966.68	6811.25	6772.41	6777.86
rd400	**4869.72**	4891.58	4896.95	4890.74	4905.52	4882.59	4893.94	4909.46	4912.17	5370.03	5084.21	4922.28	5374.80	5376.03
pcb442	**773.26**	774.50	791.49	792.31	779.74	786.89	789.87	802.14	805.42	865.35	827.67	816.01	889.35	889.97
d493	**3789.84**	3801.58	3804.33	3793.24	3821.76	3796.85	3801.50	3823.80	3824.20	4154.55	4070.97	3847.66	4158.79	4162.84
dsj1000	5069.25	**4976.37**	5104.73	5174.37	5054.95	5125.82	5105.68	5196.45	5201.65	5447.06	5362.72	5295.88	5579.63	5595.01
Overlap ratio: 0.1														
kroD100	411.61	410.94	405.63	**402.36**	417.02	428.78	428.78	422.93	428.78	417.02	420.86	438.64	422.93	428.78
rat195	373.37	**369.72**	375.51	377.65	381.74	387.02	381.65	388.45	393.03	408.24	385.15	399.93	420.72	429.74
lin318	**4977.35**	**4977.35**	4996.26	4984.15	5098.36	5157.79	5130.81	5165.66	5209.51	5054.44	5183.94	5373.09	5223.99	5228.17
rd400	**2662.02**	2677.68	2667.71	2722.33	2721.66	2811.36	2808.10	2893.94	2905.07	2803.60	2920.25	2986.73	3034.87	3042.05
pcb442	**540.73**	549.67	541.48	543.02	564.56	555.23	572.12	572.34	576.36	567.17	546.51	593.35	578.27	582.10
d493	**3054.15**	3103.84	3105.11	3097.78	3096.10	3114.72	3097.80	3145.48	3155.24	3213.89	3213.78	3199.11	3273.88	3279.98
dsj1000	**2252.50**	2262.76	2348.00	2255.11	2306.04	2349.19	2364.17	2401.88	2434.38	2353.82	2426.37	2691.40	2482.81	2518.35
Overlap ratio: 0.3														
kroD100	229.92	230.39	225.31	**222.21**	257.12	257.45	257.45	257.41	257.45	257.12	264.70	264.09	257.41	257.45
rat195	**224.63**	**224.63**	224.75	224.81	**224.63**	236.40	236.40	224.81	236.40	**224.63**	230.66	267.87	224.81	236.40
lin318	**3043.64**	**3043.64**	**3043.64**	**3043.64**	3319.48	3329.74	3329.74	3319.55	3329.74	3319.48	3770.12	3373.88	3319.55	3329.74
rd400	1350.68	1355.32	**1310.09**	1362.91	1360.88	1455.98	1455.98	1436.47	1455.98	1426.54	1418.87	1573.62	1456.94	1466.87
pcb442	370.11	365.61	**364.42**	369.28	431.46	425.96	425.96	431.85	445.28	426.60	406.52	444.79	426.93	427.34
d493	2635.35	2646.32	**2606.38**	2623.73	2721.10	2752.97	2771.09	2743.08	2772.58	2790.24	2707.64	2711.29	2828.25	2856.77
dsj1000	1477.34	1477.34	**1411.83**	1422.58	1477.38	1511.78	1511.78	1498.55	1513.46	1416.89	1510.25	1545.71	1499.21	1529.40
Varied overlap ratios														
team1_100	3324.16	**3287.42**	3357.42	3323.39	3319.73	3383.71	3403.20	3375.75	3381.43	3499.87	3341.23	3384.47	3517.76	3540.88
team2_200	932.59	924.13	**913.18**	935.88	932.59	973.43	973.43	942.45	973.43	946.00	944.79	992.99	981.82	1010.33
team3_300	2979.92	**2955.19**	2971.09	3003.19	2997.33	3073.93	3072.53	3028.23	3068.35	3203.47	3272.90	3121.97	3277.61	3287.34
team4_400	**1831.36**	1837.19	1906.72	1903.42	1893.75	1898.44	1916.18	1963.91	1970.58	1994.00	1937.54	1892.68	2091.65	2101.86
team5_499	**3173.91**	3191.12	3215.16	3174.24	3183.72	3218.79	3241.79	3217.68	3223.03	3444.06	3390.33	3214.73	3504.87	3507.49
team6_500	971.98	998.48	**962.27**	964.81	1032.61	1068.41	1068.41	1043.71	1068.41	1032.61	1072.04	1140.15	1043.71	1068.41
bonus1000	**2495.82**	2521.00	2574.52	2568.33	2511.75	2607.96	2609.31	2615.78	2623.62	2658.75	2660.34	2833.30	2798.29	2827.07

Table B-11: Percentage deviation from the best solution for 28 problems with equal radius and 3D Manhattan norm

	SZVRP4$_{tn}$	SZVRP3$_{tn}$	SZVRP3$_{vn}$	SZVRP4$_{vn}$	SZVRP2$_{tn}$	SZVRP4$_{n}$	SZVRP3$_{n}$	SZVRP2$_{vn}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	Giant TSP$_{tn}$	CW-SOCP	SZVRP1$_{vn}$	SZVRP1$_{n}$
Overlap ratio: 0.02														
kroD100	0.00	0.78	0.88	0.25	0.95	0.41	0.80	0.95	1.26	1.99	4.57	3.40	2.03	3.26
rat195	0.00	0.87	0.96	0.47	2.05	0.73	1.30	2.18	2.32	18.96	12.56	2.42	19.17	19.25
lin318	0.60	0.00	1.21	1.58	1.52	2.11	1.87	2.84	3.58	4.64	9.56	7.12	6.51	6.59
rd400	0.00	0.45	0.56	0.43	0.74	0.26	0.50	0.82	0.87	10.27	4.40	1.08	10.37	10.40
pcb442	0.00	0.16	2.36	2.46	0.84	1.76	2.15	3.73	4.16	11.91	7.04	5.53	15.01	15.09
d493	0.00	0.31	0.38	0.09	0.84	0.19	0.31	0.90	0.91	9.62	7.42	1.53	9.74	9.84
dsj1000	1.87	0.00	2.58	3.98	1.58	3.00	2.60	4.42	4.53	9.46	7.76	6.42	12.12	12.43
Average:	0.35	0.37	1.28	1.32	1.22	1.21	1.36	2.26	2.52	9.55	7.62	3.93	10.71	10.98
Overlap ratio: 0.1														
kroD100	2.30	2.13	0.81	0.00	3.64	6.57	6.57	5.11	6.57	3.64	4.60	9.02	5.11	6.57
rat195	0.99	0.00	1.57	2.15	3.25	4.68	3.23	5.07	6.31	10.42	4.18	8.17	13.79	16.23
lin318	0.00	0.00	0.38	0.14	2.43	3.63	3.08	3.78	4.66	1.55	4.15	7.95	4.96	5.04
rd400	0.00	0.59	0.21	2.27	2.24	5.61	5.49	8.71	9.13	5.32	9.70	12.20	14.01	14.28
pcb442	0.00	1.65	0.14	0.42	4.41	2.68	5.80	5.84	6.59	4.89	1.07	9.73	6.94	7.65
d493	0.00	1.63	1.67	1.43	1.37	1.98	1.43	2.99	3.31	5.23	5.23	4.75	7.19	7.39
dsj1000	0.00	0.46	4.24	0.12	2.38	4.29	4.96	6.63	8.07	4.50	7.72	19.49	10.22	11.80
Average:	0.47	0.92	1.29	0.93	2.82	4.21	4.37	5.45	6.38	5.08	5.23	10.19	8.89	9.85
Overlap ratio: 0.3														
kroD100	3.47	3.68	1.40	0.00	15.71	15.86	15.86	15.84	15.86	15.71	19.12	18.85	15.84	15.86
rat195	0.00	0.00	0.05	0.08	0.00	5.24	5.24	0.08	5.24	0.00	2.68	19.25	0.08	5.24
lin318	0.00	0.00	0.00	0.00	9.06	9.40	9.40	9.07	9.40	9.06	23.87	10.85	9.07	9.40
rd400	3.10	3.45	0.00	4.03	3.88	11.14	11.14	9.65	11.14	8.89	8.30	20.11	11.21	11.97
pcb442	1.56	0.33	0.00	1.34	18.40	16.89	16.89	18.51	22.19	17.06	11.56	22.06	17.15	17.27
d493	1.11	1.53	0.00	0.67	4.40	5.62	6.32	5.25	6.38	7.05	3.89	4.03	8.51	9.61
dsj1000	4.64	4.64	0.00	0.76	4.64	7.08	7.08	6.14	7.20	0.36	6.97	9.48	6.19	8.33
Average:	1.98	1.95	0.21	0.98	8.01	10.17	10.27	9.22	11.06	8.31	10.91	14.95	9.72	11.09
TSPLIB **Average:**	0.94	1.08	0.92	1.08	4.02	5.20	5.33	5.64	6.65	7.64	7.92	9.69	9.77	10.64
Varied overlap ratios														
team1_100	1.12	0.00	2.13	1.09	0.98	2.93	3.52	2.69	2.86	6.46	1.64	2.95	7.01	7.71
team2_200	2.13	1.20	0.00	2.49	2.13	6.60	6.60	3.21	6.60	3.59	3.46	8.74	7.52	10.64
team3_300	0.84	0.00	0.54	1.62	1.43	4.02	3.97	2.47	3.83	8.40	10.75	5.64	10.91	11.24
team4_400	0.00	0.32	4.11	3.93	3.41	3.66	4.63	7.24	7.60	8.88	5.80	3.35	14.21	14.77
team5_499	0.00	0.54	1.30	0.01	0.31	1.41	2.14	1.38	1.55	8.51	6.82	1.29	10.43	10.51
team6_500	1.01	3.76	0.00	0.26	7.31	11.03	11.03	8.46	11.03	7.31	11.41	18.49	8.46	11.03
bonus1000	0.00	1.01	3.15	2.91	0.64	4.49	4.55	4.81	5.12	6.53	6.59	13.52	12.12	13.27
Average:	0.73	0.98	1.61	1.76	2.31	4.88	5.21	4.32	5.51	7.10	6.64	7.71	10.09	11.31
Overall Average:	0.88	1.05	1.09	1.25	3.59	5.12	5.30	5.31	6.37	7.51	7.60	9.19	9.85	10.81

Table B-11 gives the average deviation from the best solutions in Table B-10. Results are similar to those for the Euclidean norm. One method averages less than 1% deviation across all 28 problems (SZVRP4$_{tn}$). Four methods average less than 2% deviation across all problems (SZVRP4$_{tn}$, SZVRP3$_{tn}$, SZVRP3$_{vn}$, SZVRP4$_{vn}$). For SZVRP1 and SZVRP2, the TSP-based Phase IV variant produces better tours on average than the VRP-based Phase IV variant, the same as with the Euclidean norm. Giant TSP$_{tn}$ and CW-SOCP are again among the least accurate methods.

Average computation times are given in Table B-12. They are very similar to those for the Euclidean norm given in Table B-9. SZVRP1$_n$ is the fastest method, averaging about 8.5 seconds. CW-SOCP and SZVRP1$_{tn}$ follow, averaging less than 18 seconds. The variants of SZVRP3 and SZVRP4 that apply Phase IV are all very slow, averaging in excess of 400 seconds per problems. For each k except 4, SZVRPk_{vn} is faster than the SZVRPk_{tn}. This is consistent with the results using the Euclidean norm.

Over all 28 CEVRP benchmark problems using either norm, we observe the following. (1) In Section B.5, we saw that for the CETSP, methods that use the 3D$_{AN}$ Phase I algorithm are somewhat faster than those that use the 3D$_{NUM}$ Phase I algorithm but are less accurate. For the CEVRP, methods that apply 3D$_{AN}$ are both slower and less accurate than those that apply 3D$_{NUM}$ and were not included in the results. (2) Steiner-zone methods are clearly more accurate than CW-SOCP, which does not use Steiner zones. (3) For variants of the SZVRP1 and SZVRP2 methods, TSP-based Phase IV produces more accurate results than VRP-based Phase IV but is slower. TSP-based Phase IV is more accurate than VRP-based Phase IV

for SZVRP3 and SZVRP4 using the Manhattan norm but only for SZVRP4 using the Euclidean norm. (4) If we consider the ordering of the columns in the tables presenting average deviation and average computation time to be performance rankings, for the Euclidean norm, SZVRP2$_{vn}$ has the best average rank of 6. SZVRP2$_{n}$, SZVRP2$_{tn}$, and SZVRP3$_{vn}$ follow with an average rank of 6.5. For the Manhattan norm, six methods have an average rank of 6.5 (SZVRP3$_{vn}$, SZVRP3$_{tn}$, SZVRP4$_{tn}$, and the three SZVRP2 variants) followed by CW-SOCP, with an average rank of 7. Considering the results for both norms, SZVRP2$_{vn}$ has the best average rank for each norm. All SZVRP2 methods perform very well for each norm.

Table B-12: Computation time for 28 problems with equal radius and 3D Manhattan norm

	SZVRP1$_n$	CW-SOCP	SZVRP1$_{vn}$	SZVRP2$_n$	SZVRP2$_{vn}$	Giant TSP$_{tn}$	SZVRP1$_{tn}$	SZVRP2$_{tn}$	SZVRP3$_n$	SZVRP3$_{vn}$	SZVRP3$_{tn}$	SZVRP4$_{tn}$	SZVRP4$_{vn}$	SZVRP4$_n$
Overlap ratio: 0.02														
kroD100	2.406	1.883	3.468	15.938	17.016	3.539	6.250	18.422	165.062	151.062	93.875	117.859	181.984	432.500
rat195	3.782	3.688	8.062	37.422	39.703	6.454	9.593	43.094	601.281	248.453	287.125	436.688	950.063	1131.328
lin318	6.047	8.734	11.890	29.391	33.766	67.610	91.079	100.609	532.672	363.750	453.172	705.375	1867.843	1047.516
rd400	10.235	11.266	19.968	101.344	108.828	21.836	24.828	112.312	1354.719	598.453	685.172	1143.281	1844.157	3907.875
pcb442	10.828	21.359	22.656	72.297	79.375	127.422	139.047	182.953	1055.172	619.421	563.187	963.500	956.532	3014.781
d493	18.234	13.071	39.047	114.922	129.250	65.891	64.656	151.672	1862.578	974.218	830.938	1214.782	2331.985	4330.156
dsj1000	35.922	34.977	66.922	263.562	285.610	234.891	266.422	452.109	2663.843	2545.141	1657.360	2857.734	3568.547	10888.719
Average:	12.493	13.568	24.573	90.697	99.078	75.377	85.982	151.596	1176.475	785.785	652.976	1062.746	1671.587	3536.125
Overlap ratio: 0.1														
kroD100	1.546	1.828	2.844	2.188	3.235	5.477	9.484	10.562	6.985	49.859	70.047	73.687	117.844	9.797
rat195	3.094	3.586	5.266	5.000	7.156	16.399	30.078	28.032	44.578	42.735	196.875	197.547	150.406	66.031
lin318	4.016	9.375	7.500	6.078	9.531	18.539	38.203	34.625	27.453	195.031	406.579	528.766	333.344	37.063
rd400	7.141	11.695	12.359	23.625	27.250	101.852	149.547	150.672	285.812	501.250	473.281	732.390	1491.328	858.406
pcb442	5.406	20.157	10.031	7.969	11.766	47.383	59.938	57.656	29.563	171.844	691.547	957.844	405.953	82.969
d493	15.641	13.391	30.437	31.343	47.000	167.188	163.796	168.718	654.234	423.000	646.485	960.156	993.359	1182.625
dsj1000	16.266	34.649	31.500	26.031	44.266	194.196	299.578	282.032	161.187	444.312	1113.531	2617.750	1454.218	569.625
Average:	7.587	13.526	14.277	14.605	21.458	78.719	107.232	104.614	172.830	261.147	514.049	866.877	706.636	400.931
Overlap ratio: 0.3														
kroD100	1.421	1.867	2.750	1.766	3.188	3.797	8.031	7.922	3.484	27.438	69.984	59.266	40.063	2.953
rat195	2.281	3.602	4.891	2.687	4.796	9.188	17.235	17.766	4.797	63.906	92.641	113.282	204.484	3.734
lin318	3.766	7.485	10.547	3.781	9.625	19.641	40.578	40.829	6.250	133.172	325.640	313.547	199.281	5.032
rd400	5.093	11.445	9.235	6.516	10.547	55.274	78.344	82.344	14.297	137.531	345.218	366.157	281.250	17.437
pcb442	4.859	19.454	14.297	4.875	14.641	41.383	55.891	53.265	8.735	365.890	684.234	792.344	889.156	7.500
d493	5.593	14.821	13.938	7.625	15.313	68.508	68.406	72.640	23.453	938.250	598.296	884.156	905.031	29.125
dsj1000	12.500	35.016	37.109	13.250	37.500	131.484	177.219	161.563	21.360	656.907	850.968	1142.766	1588.797	21.359
Average:	5.073	13.384	13.252	5.786	13.659	47.039	63.672	62.333	11.768	331.871	423.854	524.503	586.866	12.449
TSPLIB **Average:**	8.385	13.493	17.367	37.029	44.732	67.045	85.629	106.181	453.691	459.601	530.293	818.042	988.363	1316.501
Varied overlap ratios														
team1_100	1.922	2.289	3.469	6.766	8.313	6.117	8.594	13.531	71.516	66.000	141.891	117.031	229.093	82.563
team2_200	2.250	3.774	4.859	3.312	5.063	17.235	20.828	19.671	8.344	57.938	122.719	95.609	186.547	10.906
team3_300	4.359	6.867	8.344	19.891	23.547	56.360	57.609	67.250	215.813	509.515	298.765	345.234	717.031	474.281
team4_400	7.391	15.180	13.453	23.156	29.015	131.063	137.500	120.109	345.797	174.875	451.734	592.109	460.141	611.343
team5_499	23.297	13.992	38.875	104.235	109.438	59.774	91.235	161.719	1045.500	891.391	566.656	765.375	1766.079	3089.250
team6_500	5.500	10.609	17.235	5.657	17.157	36.383	104.766	96.531	9.078	287.609	382.813	580.625	488.469	8.078
bonus1000	15.625	45.266	31.531	27.344	41.625	150.367	276.828	242.797	242.546	631.157	991.687	1791.594	637.062	467.907
Average:	8.621	13.997	16.824	27.194	33.451	65.328	99.623	103.087	276.942	374.069	422.324	612.511	640.632	677.761
Overall Average:	8.444	13.619	17.232	34.570	41.911	66.616	89.127	105.407	409.504	438.218	503.301	766.659	901.430	1156.816

B.7 Conclusions

In this section, we extended the Steiner-zone heuristic to solve the CETSP and CEVRP in 3D. We developed two Phase I algorithms, one that tries to directly apply the 2D Phase I algorithm in 3D and the other that numerically approximates the boundary of the intersection of k spheres as it appears on the surface of one of them ($sphere_i$ where i is the base node). We applied numerous variants of the SZH to 28 benchmark CETSP problems and 28 benchmark CEVRP problems. We compared the results with those produced by two alternative heuristics for the CETSP and two alternative heuristics for the CEVRP. Our results indicate that Steiner-zone methods are more accurate than methods that do not use Steiner-zones. Some variants of SZH ($SZ2_{nu}$, $SZ3_{an}$, $SZVRP2_n$, $SZVRP2_{vn}$, $SZVRP2_{tn}$) balance accuracy and computational speed across all problems for both the Euclidean and Manhattan 3D norms.

Appendix C

The Steiner-Zone Heuristic (SZH) With Arbitrary Radius

In this appendix, we assume that the radius of each disk in a CETSP or CEVRP problem may be different ($r_i \neq r_j$). In Chapters 2 - 4, we described our benchmark problems as having equal radius. Here, we refer to problems with arbitrary radius.

To generalize the CETSP and CEVRP formulations given in Chapters 2 and 3, we replace r with r_i. Below, we generalize SZH to solve an arbitrary radius problem.

C.1 Phase I

If $r_i = r_j$ for all nodes i and j, then no node's disk will contain another node's disk unless two non-depot nodes have the same coordinates which we assume does not occur. This is not true when $r_i \neq r_j$ for at least one pair of nodes i and j. If $disk(i)$ contains $disk(j)$, any point inside $disk(j)$ visits i. Because the perimeter of $disk(j)$ does not intersect the perimeter of $disk(i)$, any Steiner zone based on node i cannot include node j. No upper and lower angles of intersection can be calculated. It is difficult to determine if $disk(j)$ intersects the $k-1$ other disks in the $SZ(k)$ based on node i. We show this in Figure C.1.

If $disk(j)$ contains $disk(i)$, then every point in any Steiner zone based on node

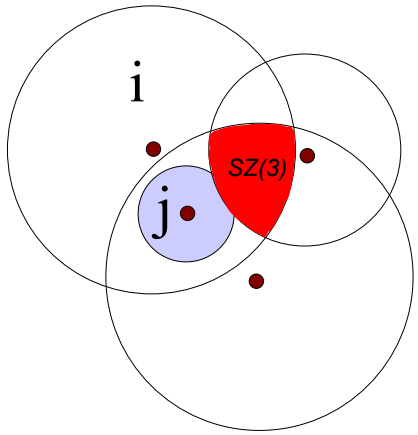


Figure C.1: $disk(i)$ contains $disk(j)$. $disk(j)$ intersects the $SZ(3)$ based on node i. The boundaries of $disk(i)$ and $disk(j)$ do not intersect, so we cannot calculate upper and lower angles of intersection with $disk(i)$. Without angles of intersection, there is no formula for obtaining a point that is feasible for all four disks although such a point exists. A feasible point would have to be calculated numerically.

i visits j. In Phase I, if node i is currently the first node in $list$, we set aside every node in $list$ whose disk contains $disk(i)$. After identifying the Steiner zone with largest degree that we can form with node i, we add to it all nodes whose disks contain $disk(i)$. If we are solving a CEVRP, we must ensure that adding disks that contain $disk(i)$ does not create a Steiner zone with a total demand exceeding the maximum vehicle capacity.

We apply the same modifications to SZH in 3D as in 2D, except that $sphere(i)$ replaces $disk(i)$.

C.2 Phase II

No changes to Phase II are required to apply SZH to a problem with arbitrary radius.

C.3 Phase III

Serious numerical issues can occur when we apply the Phase III SOCP exact solver to a problem with arbitrary radius. The constraint matrices are ill-conditioned meaning that a small change in a few coefficients leads to a very large change in the solution. In the presence of ill-conditioning, scaling the coefficients may alleviate the problem. For an equal-radius problem, we scale coefficients to lie within a unit square. Even with this scaling CPLEX often claims as optimal a solution that is not only suboptimal but highly infeasible. That is, the representative point returned as optimal for node i lies well beyond r_i units from node i.

In 2D, we have two options when we have an infeasible SOCP solution returned by CPLEX: (1) apply the IP_{PhIII} heuristic Phase III solver, which does not suffer from numerical issues but cannot be used when Phase IV is applied; (2) solve Phase III as a general NLP, which is computationally slow. In 3D, we have only the NLP option.

C.4 CETSP Results

We created benchmark problems for the CETSP and CEVRP with arbitrary radius by generating uniformly random radii for each node of the seven $TSPLIB$ problems (recall that there are only seven $TSPLIB$ TSP problems on which the 21 $TSPLIB$ CETSP and CEVRP problems given in previous chapters are based, and each is run with three different radius patterns) and the seven $Team$ problems. Radii are generated using a uniform distribution in the range $[0,\ b]$ where b is different

for each problem. The arbitrary radius problems are solved in 2D and 3D, using both the Euclidean and Manhattan norms. The results are ordered from left (best or fastest) to right (worst or slowest).

C.4.1 2D Euclidean CETSP

In Tables C-1, C-2, and C-3, we give the results for 10 heuristics on the 14 CETSP problems with arbitrary radius and 2D Euclidean norm. The 10 heuristics are described in detail in Chapters 2 and 4.

In Table C-1, we see that HYBRID2 produces four best solutions, SZ3 produces three best solutions, and GTSP2 produces three best solutions. SZ1 produces shorter tours than either YUAN+ or LK-SOCP for 12 of the 14 problems.

Table C-2 presents the average deviations (as percentages) from the best solutions in Table C-1. HYBRID2 and HYBRID1 are the most accurate heuristics over the 14 problems, averaging 1.24% and 1.89% deviation. YUAN+ and LK-SOCP both have large average deviations (13.71% and 14.09%, respectively).

Table C-3 gives computation times for the 10 heuristics across the 14 problems. SZ1 is very fast, averaging just over one second per problem. SZ2 is also quite fast (about 29 seconds per problem). LK-SOCP is much slower for problems with arbitrary radius than for problems with equal radius (compare with the results from Chapters 2 and 4), averaging over 200 seconds per problem. This is because the NLPs that must be solved for LK-SOCP are much larger than the NLPs that must be solved for Steiner-zone methods. The Steiner-zone methods reduce n nodes to m

Steiner zones. Steiner-zone methods solve Phase III for tours of $m \leq n$ points, but LK-SOCP and YUAN+ solve Phase III for tours of n points.

If we consider the column orderings in Tables C-2 and C-3 to be rankings, then SZ2 is the best heuristic, with an average rank of 2.5. HYBRID1 and HYBRID2 are next with an average rank of 3.5. SZ3, $SZ3_{50-59}$, LK-SOCP, and YUAN+ have an average rank of 6.

Table C-1: Tour lengths for 10 heuristics on 14 problems with arbitrary radius and 2D Euclidean norm

	HYBRID2	HYBRID1	SZ2	$SZ3_{50-59}$	SZ3	GTSP2	SZ1	YUAN+	LK-SOCP	GTSP1
kroD100	144.27	151.52	144.39	145.00	143.28	**141.83**	145.81	149.20	149.20	142.20
rat195	68.81	68.84	68.66	68.27	**68.22**	70.18	73.51	76.79	78.89	129.71
lin318	2160.85	2164.45	2175.72	2136.45	2187.68	**2081.66**	2310.38	2409.20	2365.44	2165.26
rd400	**1252.38**	1260.77	1276.08	1270.04	1273.15	1257.01	1279.46	1275.86	1288.05	1258.15
pcb442	**235.19**	237.32	243.48	237.83	246.08	251.22	255.97	292.72	298.99	267.03
d493	**140.12**	140.69	142.08	153.29	157.17	160.44	151.19	180.32	180.57	175.95
dsj1000	655.95	660.39	**653.37**	715.97	736.17	789.36	712.49	784.72	759.36	901.09
team1_100	390.34	390.78	390.95	389.10	**388.54**	388.55	410.52	413.87	413.87	392.55
team2_200	642.81	643.12	655.81	644.57	637.07	**622.74**	667.41	684.58	676.27	627.45
team3_300	399.39	400.02	396.61	**381.83**	398.29	441.65	423.98	435.23	418.53	496.78
team4_400	1026.32	1028.89	1025.83	**1011.77**	1020.85	1013.30	1037.44	1054.23	1063.87	1016.00
team5_499	456.39	457.88	455.61	476.19	**454.33**	528.60	496.59	517.65	557.32	631.27
team6_500	**666.15**	666.64	678.03	679.67	684.95	730.96	753.70	796.80	795.03	755.79
bonus1000	996.31	996.97	**992.61**	1015.52	1033.07	1049.79	1061.86	1141.71	1149.31	1087.47

Table C-2: Percentage deviation from the best solution for 10 heuristics on 14 problems with arbitrary radius and 2D Euclidean norm

	HYBRID2	HYBRID1	SZ2	$SZ3_{50-59}$	SZ3	GTSP2	SZ1	YUAN+	LK-SOCP	GTSP1
kroD100	1.71	6.83	1.80	2.23	1.02	0.00	2.80	5.19	5.19	0.26
rat195	0.86	0.90	0.64	0.06	0.00	2.86	7.75	12.55	15.63	90.12
lin318	3.86	4.03	4.57	2.69	5.15	0.05	11.05	15.80	13.69	4.07
rd400	0.00	0.67	1.89	1.41	1.66	0.37	2.16	1.88	2.85	0.46
pcb442	0.00	0.91	3.52	1.13	4.63	6.82	8.84	24.46	27.13	13.54
d493	0.00	0.41	1.40	9.40	12.17	14.50	7.90	28.69	28.87	25.57
dsj1000	0.39	1.07	0.00	9.58	12.67	20.81	9.05	20.10	16.22	37.91
Average:	0.98	2.12	1.98	3.79	5.33	6.49	7.08	15.52	15.65	24.56
team1_100	0.46	0.58	0.62	0.15	0.00	0.00	5.66	6.52	6.52	1.03
team2_200	3.22	3.27	5.31	3.51	2.30	0.00	7.17	9.93	8.60	0.76
team3_300	4.60	4.76	3.87	0.00	4.31	15.67	11.04	13.99	9.61	30.11
team4_400	1.44	1.69	1.39	0.00	0.90	0.15	2.54	4.20	5.15	0.42
team5_499	0.45	0.78	0.28	4.81	0.00	16.35	9.30	13.94	22.67	38.95
team6_500	0.00	0.07	1.78	2.03	2.82	9.73	13.14	19.61	19.35	13.46
bonus1000	0.37	0.44	0.00	2.31	4.08	5.76	6.98	15.02	15.79	9.56
Average:	1.51	1.66	1.89	1.83	2.06	6.81	7.98	11.89	12.53	13.47
Overall Average:	1.24	1.89	1.93	2.81	3.69	6.65	7.53	13.71	14.09	19.01

Table C-3: Computation time for 10 heuristics on 14 problems with arbitrary radius and 2D Euclidean norm

	SZ1	SZ2	LK-SOCP	YUAN+	HYBRID1	HYBRID2	SZ3	$SZ3_{50-59}$	GTSP1	GTSP2
kroD100	0.250	4.266	2.094	3.641	83.891	86.610	29.391	295.907	1006	1008
rat195	0.171	8.000	14.687	46.984	38.625	44.594	115.140	1655.234	9213	9223
lin318	0.516	8.812	74.594	81.313	191.406	204.718	753.937	9896.968	193723	193775
rd400	1.906	57.250	41.063	150.203	9499.781	12795.406	272.907	2573.500	350351	350369
pcb442	0.875	73.281	49.172	121.922	770.031	1160.750	806.906	13067.875	492575	492623
d493	0.938	7.422	93.265	221.421	20.875	46.218	1896.719	25737.782	484757	484810
dsj1000	2.391	24.578	938.625	1807.438	150.891	234.141	21482.985	196446.438	8819121	8820046
Average:	1.007	26.230	173.357	347.560	1536.500	2081.777	3622.569	35667.672	1478678	1478836
team1_100	0.250	9.297	3.859	6.297	43.359	51.000	46.516	403.594	413	418
team2_200	0.579	6.921	8.078	8.406	341.203	350.844	130.047	1300.391	7448	7455
team3_300	0.406	5.000	44.485	50.172	48.062	56.390	470.922	7949.719	27571	27598
team4_400	1.828	22.203	43.375	142.688	1514.843	1794.546	388.954	5175.187	574193	574226
team5_499	0.859	124.422	299.079	359.188	35.906	52.187	2763.407	38920.250	811557	811663
team6_500	0.984	11.468	68.063	111.297	212.844	244.797	1689.547	20166.171	535527	535623
bonus1000	2.984	41.203	1167.922	9470.250	1759.891	2080.281	12397.765	113452.344	10101278	10101935
Average:	1.127	31.502	233.552	1449.757	565.158	661.435	2555.308	26766.808	1722569	1722703
Overall Average:	1.067	28.866	203.454	898.659	1050.829	1371.606	3088.939	31217.240	1600624	1600769

C.4.2 2D Manhattan CETSP

In Tables C-4, C-5, and C-6, we give the results for 14 heuristics on the 14 CETSP problems with arbitrary radius and 2D Manhattan norm. The results are similar to the results for the Euclidean norm. Ten of the heuristics are the same as in Section . Four heuristics ($SZ1_E$, $SZ2_E$, $SZ3_E$, $SZ3_{E\ 50-59}$) are subscripted with an E because they use the Euclidean norm during Phase I to order the list of nodes from which Steiner zones are created. For example, $SZ3_E$ is the same as SZ3 except that $SZ3_E$ uses the Euclidean norm in Phase I and uses the Manhattan norm only in Phases II, III, and IV, whereas SZ3 uses the Manhattan norm in all phases.

In Table C-4, we see that $SZ3_{E\ 50-59}$ produces five best solutions, SZ3 produces four best solutions, and $SZ3_E$ produces three best solutions. Table C-5 presents the average deviations (as percentages) from the best solutions in Table C-6. HYBRID2 and SZ3 are the most accurate heuristics over the 14 problems, averaging 1.24% and 1.59%, respectively. YUAN+ and LK-SOCP both have large average deviations (14.22% and 15.76%, respectively).

Table C-6 gives computation times for the 14 heuristics across the 14 problems. SZ1 and $SZ1_E$ are very fast, averaging about 1.1 seconds per problem. LK-SOCP, SZ2, and $SZ2_E$ are also fast, requiring between nine and 16 seconds, on average, to solve a problem. Although still slower than SZ1 and $SZ1_E$, LK-SOCP's computation times are much closer to the times produced by LK-SOCP in Chapter 2 than to the results in Section C.4.1.

If we consider the column orderings in Tables C-5 and C-6 to be rankings, SZ3

produces the best average ranking (4.5), followed by $SZ3_E$ and $SZ2_E$ (5.5).

Over all 14 problems, using both the 2D Euclidean and Manhattan norms, we observe the following. (1) Methods that do not use Steiner zones (LK-SOCP and YUAN+) are not very accurate for CETSP problems with arbitrary radius. (2) HYBRID2 is consistently the most accurate method. It does not produce the largest number of best solutions, but is not more than 5.05% from the best solution for any problem (3) SZ2 and $SZ2_E$ produce the best combination of speed and accuracy across all problems, needing between 10 and 30 seconds per problem with an average deviation between 1.94% and 2.72% from the best solutions. (4) We did not use the Phase IV + MAH heuristic ($SZ3_{0-360}$) here, running experiments only for the 50°-59°range ($SZ3_{50-59}$, $SZ3_{E\ 50-59}$). Our results indicate that for very large average computation times (up to 32,000 seconds), these methods do not substantially increase the accuracy of Phase IV methods (SZ3 and $SZ3_E$). A different 10° range may produce better tours on average than [50°, 59°], but it could also be that the MAH heuristic is not as effective for problems with arbitrary radius as it is for problems with equal radius.

Table C-4: Tour lengths for 14 heuristics on 14 problems with arbitrary radius and 2D Manhattan norm

	HYBRID2	SZ3	$SZ3_{E\ 50-59}$	HYBRID1	$SZ3_E$	$SZ3_{50-59}$	$SZ2_E$	SZ2	$SZ1_E$	GTSP2	SZ1	YUAN+	LK-SOCP	GTSP1
kroD100	175.35	175.64	174.43	182.91	**174.01**	181.27	175.72	179.07	177.21	176.39	180.83	189.96	189.96	178.75
rat195	83.18	**82.20**	**82.20**	83.27	**82.20**	**82.20**	83.24	83.44	86.85	86.13	89.88	101.40	101.40	166.35
lin318	2631.57	2606.99	2573.55	2640.84	2573.40	2618.01	2645.63	2564.74	2812.19	**2512.26**	2920.99	3029.53	3029.53	2667.64
rd400	1548.27	**1544.54**	1745.85	1568.35	1552.18	1563.25	1576.60	1589.91	1583.05	1574.26	1585.18	1563.76	1562.38	1591.76
pcb442	284.63	**281.25**	283.37	285.87	289.57	288.88	295.70	291.20	312.09	308.24	306.28	335.51	353.05	327.60
d493	182.58	184.74	180.99	184.99	**179.56**	182.02	183.93	181.79	196.44	199.76	195.77	216.49	215.09	226.80
dsj1000	774.40	790.42	821.01	776.87	818.35	818.64	**772.37**	789.38	870.64	984.77	882.14	969.45	983.01	1150.02
team1_100	**494.11**	500.11	496.18	496.08	495.98	496.77	499.91	500.77	522.45	496.43	517.07	543.26	543.26	501.28
team2_200	787.66	**780.71**	785.78	787.63	792.57	791.47	805.82	817.18	816.23	786.83	830.51	861.18	868.04	798.65
team3_300	488.30	491.16	**487.99**	491.52	506.82	498.30	491.65	502.62	513.94	559.37	533.43	528.88	595.73	630.20
team4_400	1283.79	1244.83	**1233.94**	1284.98	1245.05	1247.34	1245.42	1260.90	1262.34	1259.14	1282.17	1321.60	1304.38	1274.78
team5_499	567.50	568.25	**563.11**	568.55	567.13	573.17	580.87	588.65	619.03	661.86	624.22	628.14	631.20	808.35
team6_500	810.26	847.47	**798.74**	812.87	832.71	811.03	840.11	838.60	934.41	904.28	916.36	917.77	921.93	953.34
bonus1000	**1226.39**	1257.90	1259.03	1228.63	1277.12	1264.11	1243.60	1233.12	1355.34	1324.18	1352.90	1436.53	1439.37	1397.21

Table C-5: Percentage deviation from the best solution for 14 heuristics on 14 problems with arbitrary radius and 2D Manhattan norm

	HYBRID2	SZ3	$SZ3_{E\ 50-59}$	HYBRID1	$SZ3_E$	$SZ3_{50-59}$	$SZ2_E$	SZ2	$SZ1_E$	GTSP2	SZ1	YUAN+	LK-SOCP	GTSP1
kroD100	0.77	0.94	0.24	5.11	0.00	4.17	0.98	2.91	1.83	1.37	3.92	9.16	9.16	2.72
rat195	1.19	0.00	0.00	1.30	0.00	0.00	1.26	1.51	5.66	4.78	9.34	23.36	23.36	102.38
lin318	4.75	3.77	2.44	5.12	2.43	4.21	5.31	2.09	11.94	0.00	16.27	20.59	20.59	6.19
rd400	0.24	0.00	13.03	1.54	0.49	1.21	2.08	2.94	2.49	1.92	2.63	1.24	1.16	3.06
pcb442	1.20	0.00	0.75	1.64	2.96	2.71	5.14	3.54	10.96	9.60	8.90	19.29	25.53	16.48
d493	1.68	2.89	0.80	3.02	0.00	1.37	2.43	1.24	9.40	11.25	9.03	20.56	19.78	26.31
dsj1000	0.26	2.34	6.30	0.58	5.95	5.99	0.00	2.20	12.72	27.50	14.21	25.52	27.27	48.90
Average:	1.44	1.42	3.37	2.62	1.69	2.81	2.46	2.35	7.86	8.06	9.18	17.10	18.12	29.43
team1_100	0.00	1.21	0.42	0.40	0.38	0.54	1.17	1.35	5.74	0.47	4.65	9.95	9.95	1.45
team2_200	0.89	0.00	0.65	0.89	1.52	1.38	3.22	4.67	4.55	0.78	6.38	10.31	11.19	2.30
team3_300	0.06	0.65	0.00	0.72	3.86	2.11	0.75	3.00	5.32	14.63	9.31	8.38	22.08	29.14
team4_400	4.04	0.88	0.00	4.14	0.90	1.09	0.93	2.19	2.30	2.04	3.91	7.10	5.71	3.31
team5_499	0.78	0.91	0.00	0.97	0.71	1.79	3.15	4.54	9.93	17.54	10.85	11.55	12.09	43.55
team6_500	1.44	6.10	0.00	1.77	4.25	1.54	5.18	4.99	16.99	13.21	14.73	14.90	15.42	19.36
bonus1000	0.00	2.57	2.66	0.18	4.14	3.08	1.40	0.55	10.51	7.97	10.31	17.13	17.37	13.93
Average:	1.03	1.76	0.53	1.29	2.25	1.64	2.26	3.04	7.91	8.09	8.59	11.33	13.40	16.15
Overall Average:	1.24	1.59	1.95	1.96	1.97	2.23	2.36	2.69	7.88	8.08	8.89	14.22	15.76	22.79

Table C-6: Computation time for 14 heuristics on 14 problems with arbitrary radius and 2D Manhattan norm

	$SZ1_E$	SZ1	LK-SOCP	$SZ2_E$	SZ2	YUAN+	SZ3	$SZ3_E$	$SZ3_{50-59}$	$SZ3_{E\ 50-59}$	HYBRID1	HYBRID2	GTSP1	GTSP2
kroD100	0.328	0.234	1.406	3.546	2.516	2.485	20.891	21.657	40.500	227.672	1124.109	1713.578	1006	1008
rat195	0.188	0.187	1.875	3.047	2.062	8.141	31.719	37.578	100.812	427.484	41.203	57.500	9213	9216
lin318	0.562	0.531	3.328	5.046	5.875	158.125	95.953	97.718	277.906	1009.328	4734.031	4784.204	193723	193726
rd400	2.985	2.453	29.797	19.765	15.438	64.484	614.079	455.516	832.969	5289.594	8887.813	9661.203	350351	350388
pcb442	0.906	0.890	3.328	10.719	22.219	33.797	168.813	157.969	330.125	1808.688	1774.438	1831.891	492575	492583
d493	1.047	0.985	9.797	12.079	8.907	128.344	177.922	223.188	426.750	2024.313	263.188	281.938	484757	484763
dsj1000	2.531	2.328	17.797	26.875	39.969	441.281	827.687	905.766	2322.281	8822.594	2156.407	2299.266	8819121	8819139
Average:	1.221	1.087	9.618	11.582	13.855	119.522	276.723	271.342	618.763	2801.382	2711.598	2947.083	1478678	1478689
team1_100	0.265	0.235	1.422	3.093	3.062	12.953	21.672	19.890	55.187	223.079	353.734	391.156	413	414
team2_200	0.562	0.625	2.328	5.532	4.047	24.312	60.766	63.234	678.141	668.422	8374.610	8484.641	7448	7452
team3_300	0.422	0.390	2.859	5.282	4.968	30.500	101.984	96.953	699.687	733.484	412.047	556.484	27571	27573
team4_400	1.922	1.937	12.641	18.594	15.015	40.906	393.437	416.359	4271.343	5022.875	54544.375	55703.672	574193	574217
team5_499	0.906	0.891	9.875	24.782	36.359	51.563	274.609	254.344	1856.328	1899.079	709.125	626.062	811557	811562
team6_500	1.015	1.031	5.766	8.031	11.406	60.500	297.750	245.625	2942.375	2741.282	4855.250	4138.984	535527	535534
bonus1000	3.063	3.031	25.531	34.157	46.766	601.125	2876.968	3573.000	3969.203	21683.469	32195.297	33728.844	10101278	10101324
Average:	1.165	1.163	8.632	14.210	17.375	117.408	575.312	667.058	2067.466	4710.241	14492.063	14804.263	1722569	1722582
Overall Average:	1.193	1.125	9.125	12.896	15.615	118.465	426.018	469.200	1343.115	3755.812	8601.831	8875.673	1600624	1600636

C.4.3 3D Euclidean CETSP

We created 14 3D CETSP problems with arbitrary radius by adding the z-coordinates to the 2D problems in Section C.4.1 and Section C.4.2.

In Tables C-7, C-8, and C-9, we give the results for the 14 CETSP problems with arbitrary radius and 3D Euclidean norm. We applied the same six heuristics to these problems as are described and used in Appendix B. The subscripts $_{nu}$ and $_{an}$ refer to which version of Phase I in 3D is applied. They are described in Appendix B.

In Table C-7, we see that SZ3$_{nu}$ produces 12 best solutions and SZ3$_{an}$ produces two best solutions. Of the two SZH methods that do not apply Phase IV, SZ2$_{nu}$ produces better solutions than SZ2$_{an}$ in eight problems. SZ2$_{an}$, SZ3$_{an}$, and SZ3$_{nu}$ produces solutions at least as good as those produced by YUAN+ and LK-SOCP for all problems. SZ2$_{nu}$ produces better solutions than YUAN+ and LK-SOCP 11 of 14 problems.

In Table C-8, we compare the average deviations from the best solutions given in Table C-9 for each of the six methods. The four SZH methods are more accurate than the methods that do not use Steiner zones (YUAN+, LK-SOCP), with an average deviation between 7.64% and 17.49% less than YUAN+ and LK-SOCP's average over all 14 problems. Specifically, SZ2$_{an}$ has the highest average deviation (9.44%) of the four SZH methods, and YUAN+ (17.18%) has the lower average of the methods that do not use Steiner zones. The difference is 7.64%. SZ3$_{nu}$ has the lowest average (0.03%) of the SZH methods, and LK-SOCP has the largest average

Table C-7: Tour lengths for six heuristics on 14 problems with arbitrary radius and 3D Euclidean norm

	$SZ3_{nu}$	$SZ2_{nu}$	$SZ3_{an}$	$SZ2_{an}$	YUAN+	LK-SOCP
kroD100	**171.57**	174.69	172.61	174.54	179.69	179.69
rat195	**84.47**	86.62	95.00	104.93	121.77	121.77
lin318	**2189.43**	2346.60	2277.78	2334.42	2349.45	2494.02
rd400	**3595.97**	3598.82	**3595.97**	**3595.97**	**3595.97**	3597.89
pcb442	**258.40**	269.99	276.65	287.63	325.94	332.47
d493	**761.07**	805.73	770.91	821.82	878.93	882.10
dsj1000	**2074.84**	**2074.84**	2573.45	2573.45	3177.01	3143.38
team1_100	908.96	949.43	**907.59**	914.86	927.88	927.88
team2_200	**1055.95**	1086.02	1064.00	1064.82	1086.19	1126.17
team3_300	**1053.38**	1091.66	1083.97	1197.96	1243.21	1243.21
team4_400	1280.40	1303.69	**1276.90**	1277.76	1300.84	1291.66
team5_499	**840.48**	900.01	875.84	940.09	1008.16	943.42
team6_500	**1076.35**	1128.66	1156.93	1178.88	1255.18	1276.44
bonus1000	**2689.41**	**2689.41**	3212.79	3212.79	3442.03	3428.78

(17.52%) of the methods that do not use Steiner zones. The different is 17.49%. Similarly, the SZH methods that use the $3D_{NUM}$ Phase I method ($SZ2_{nu}$, $SZ3_{nu}$) have an average deviation between 2.66% and 9.41% smaller than the SZH methods that use $3D_{AN}$ to solve Phase I. On the 14 problems in Table C-8, $SZ3_{nu}$ is the most accurate method with an average deviation of 0.03%.

In Table C-9, we give the computation times for the six methods on the 14 problems. None of the methods is very fast. $SZ2_{nu}$ is the fastest, averaging about 146 seconds for each problem, with YUAN+ and LK-SOCP following closely, averaging between 250 and 300 seconds per problem. $SZ3_{an}$ and $SZ3_{nu}$ are very slow, averaging between 17,000 and 22,000 seconds, although $SZ3_{nu}$ is faster than $SZ3_{an}$. It appears to be an anomaly that LK-SOCP is slower on average than YUAN+ (this does not occur elsewhere in the dissertation) since the methods are the same except that YUAN+ solves Phase II to optimality (slower) whereas LK-SOCP solves Phase II approximately (faster). The difference in time occurs during Phase III.

Table C-8: Percentage deviation from the best solution for six heuristics on 14 problems with arbitrary radius and 3D Euclidean norm

	$SZ3_{nu}$	$SZ2_{nu}$	$SZ3_{an}$	$SZ2_{an}$	YUAN+	LK-SOCP
kroD100	0.00	1.82	0.61	1.73	4.74	4.74
rat195	0.00	2.54	12.46	24.22	44.16	44.16
lin318	0.00	7.18	4.04	6.62	7.31	13.91
rd400	0.00	0.08	0.00	0.00	0.00	0.05
pcb442	0.00	4.48	7.06	11.31	26.14	28.66
d493	0.00	5.87	1.29	7.98	15.49	15.90
dsj1000	0.00	0.00	24.03	24.03	53.12	51.50
Average:	0.00	3.14	7.07	10.84	21.56	22.70
team1_100	0.15	4.61	0.00	0.80	2.24	2.24
team2_200	0.00	2.85	0.76	0.84	2.86	6.65
team3_300	0.00	3.63	2.90	13.72	18.02	18.02
team4_400	0.27	2.10	0.00	0.07	1.88	1.16
team5_499	0.00	7.08	4.21	11.85	19.95	12.25
team6_500	0.00	4.86	7.49	9.53	16.61	18.59
bonus1000	0.00	0.00	19.46	19.46	27.98	27.49
Average:	0.06	3.59	4.97	8.04	12.79	12.34
Overall average:	0.03	3.36	6.02	9.44	17.18	17.52

Table C-9: Computation time for six heuristics on 14 problems with arbitrary radius and 3D Euclidean norm

	$SZ2_{nu}$	YUAN+	LK-SOCP	$SZ2_{an}$	$SZ3_{nu}$	$SZ3_{an}$
kroD100	9.156	1.524	1.906	12.625	120.656	91.453
rat195	14.297	18.789	26.125	149.422	1945.266	2992.078
lin318	83.922	100.665	61.735	505.500	34639.890	23755.078
rd400	209.000	36.008	20.086	208.312	1664.297	1754.047
pcb442	58.953	194.250	124.602	550.141	7405.984	11188.000
d493	348.954	612.454	452.266	5917.359	25012.593	63275.063
dsj1000	63.782	222.586	68.266	388.797	46.859	386.172
Average:	112.581	169.468	107.855	1104.594	10119.364	14777.413
team1_100	13.531	5.141	11.164	12.141	154.625	126.829
team2_200	83.937	20.406	18.570	88.906	1262.969	1289.157
team3_300	44.890	251.915	342.313	267.266	15153.859	21207.407
team4_400	775.875	69.852	77.125	1076.781	4568.484	5451.781
team5_499	81.156	976.328	1879.430	3844.812	106692.375	121758.125
team6_500	124.953	546.492	1041.984	1563.282	46825.250	52610.579
bonus1000	134.469	514.008	82.539	465.375	90.234	468.906
Average:	179.830	340.591	493.303	1045.509	24963.971	28987.541
Overall average:	146.205	255.030	300.579	1075.051	17541.667	21882.477

C.4.4 3D Manhattan CETSP

In Tables C-10, C-11, and C-12, we give the results for the 14 CETSP problems with arbitrary radius and 3D Manhattan norm. We coded eight heuristics to solve these problems. These heuristics, along with $3D_{NUM}$ and $3D_{AN}$, are described in Appendix B.

In Table C-10, we see that $SZ3_{nuEuc}$ produces best solutions for 8 of 14 problems, and $SZ3_{nu}$ produces 5 best solutions. Of the SZH methods that apply Phase IV, methods that apply $3D_{NUM}$ in Phase I ($SZ3_{nuEuc}$, $SZ3_{nu}$) produce better solutions than both methods that apply $3D_{AN}$ ($SZ3_{anEuc}$, $SZ3_{an}$) on 12 of 14 problems. When Phase IV is not applied, $SZ2_{nu}$ (using $3D_{NUM}$) produces solutions that are no worse than solutions produced by $SZ2_{an}$ (using $3D_{AN}$) on all problems. YUAN+ and LK-SOCP produces poorer solutions than any SZH method on all 14 problems.

In Table C-11, we compare the average deviations from the best solutions given in Table C-10 for each of the eight methods. The six SZH methods are more accurate than the methods that do not use Steiner zones (YUAN+, LK-SOCP), with an average deviation between 9.18% and 16.22% less than that of YUAN+ and LK-SOCP. Of the SZH methods that apply Phase IV, those that use the $3D_{NUM}$ Phase I method ($SZ3_{nu}$, $SZ3_{nuEuc}$) are more accurate (by at least 1%) than those that use $3D_{AN}$ ($SZ3_{an}$, $SZ3_{anEuc}$). For SZH methods that do not apply Phase IV ($SZ2_{nu}$, $SZ2_{an}$), the results are different: $SZ2_{an}$ (using $3D_{AN}$) is more accurate than SZ_{nu} (using $3D_{NUM}$) by at least 1% (5.96% vs. 7.16%) over all problems.

In Table C-12, we give the computation times for the eight methods on the

Table C-10: Tour lengths for eight heuristics on 14 problems with arbitrary radius and 3D Manhattan norm

	$SZ3_{nuEuc}$	$SZ3_{nu}$	$SZ3_{an}$	$SZ3_{anEuc}$	$SZ2_{an}$	$SZ2_{nu}$	LK-SOCP	YUAN+
kroD100	235.26	234.38	235.68	**233.13**	239.11	241.12	243.21	243.21
rat195	**112.78**	142.01	116.38	118.38	122.67	125.10	157.94	157.94
lin318	**2736.79**	2741.18	2814.33	2885.17	2923.39	2993.03	3065.65	3054.78
rd400	**5166.18**	5166.22	5170.77	5173.23	5170.77	5166.95	5177.80	5187.15
pcb442	**337.20**	343.66	366.48	351.29	378.65	368.47	429.33	429.33
d493	1074.12	**1065.58**	1100.18	1122.51	1125.65	1139.99	1240.47	1238.35
dsj1000	**2303.07**	2321.20	2444.57	2355.47	2470.70	2517.57	2771.45	2845.67
team1_100	**1264.36**	1287.18	1296.75	1296.75	1300.04	1336.11	1336.93	1344.10
team2_200	1458.34	**1450.36**	1482.98	1486.33	1497.33	1514.10	1537.13	1537.13
team3_300	**1382.60**	1405.59	1466.38	1501.30	1547.96	1552.42	1720.39	1706.02
team4_400	1787.92	**1780.80**	1802.46	1809.39	1803.60	1808.51	1815.25	1833.59
team5_499	1188.54	**1156.88**	1225.55	1264.50	1239.52	1305.65	1495.87	1494.13
team6_500	**1471.98**	1474.08	1542.24	1510.25	1593.16	1597.44	1749.77	1796.33
bonus1000	3230.27	**3218.94**	3313.64	3310.91	3388.30	3399.58	3919.00	3845.39

Table C-11: Percentage deviation from the best solution for eight heuristics on 14 problems with arbitrary radius and 3D Manhattan norm

	$SZ3_{nuEuc}$	$SZ3_{nu}$	$SZ3_{an}$	$SZ3_{anEuc}$	$SZ2_{an}$	$SZ2_{nu}$	LK-SOCP	YUAN+
kroD100	0.91	0.54	1.09	0.00	2.56	3.43	4.32	4.32
rat195	0.00	25.92	3.20	4.96	8.77	10.93	40.05	40.05
lin318	0.00	0.16	2.83	5.42	6.82	9.36	12.02	11.62
rd400	0.00	0.00	0.09	0.14	0.09	0.01	0.22	0.41
pcb442	0.00	1.92	8.69	4.18	12.29	9.28	27.32	27.32
d493	0.80	0.00	3.25	5.34	5.64	6.98	16.41	16.21
dsj1000	0.00	0.79	6.14	2.28	7.28	9.31	20.34	23.56
Average:	0.24	4.19	3.61	3.19	6.21	7.04	17.24	17.64
team1_100	0.00	1.80	2.56	2.56	2.82	5.67	5.74	6.31
team2_200	0.55	0.00	2.25	2.48	3.24	4.39	5.98	5.98
team3_300	0.00	1.66	6.06	8.59	11.96	12.28	24.43	23.39
team4_400	0.40	0.00	1.22	1.61	1.28	1.56	1.93	2.96
team5_499	2.74	0.00	5.94	9.30	7.14	12.86	29.30	29.15
team6_500	0.00	0.14	4.77	2.60	8.23	8.52	18.87	22.03
bonus1000	0.35	0.00	2.94	2.86	5.26	5.61	21.75	19.46
Average:	0.58	0.52	3.68	4.28	5.71	7.27	15.43	15.61
Overall average:	0.41	2.35	3.64	3.74	5.96	7.16	16.34	16.63

14 problems. LK-SOCP is reasonably fast, averaging almost 37 seconds per problem. YUAN+ and $SZ2_{nu}$ have reasonable computation times (roughly 111 and 732 seconds). The remaining methods are all very slow, averaging in excess of 2,300 seconds per problem.

Over all 14 arbitrary radius problems, solved using the 3D Euclidean and Manhattan norms, we observe the following. (1) Methods that do not use Steiner zones are less accurate than SZH methods. (2) Solution times are substantially slower than solution times for the equal radius 3D problems (see Appendix B). This

Table C-12: Computation time for eight heuristics on 14 problems with arbitrary radius and 3D Manhattan norm

	LK-SOCP	YUAN+	$SZ2_{nu}$	$SZ2_{an}$	$SZ3_{an}$	$SZ3_{anEuc}$	$SZ3_{nu}$	$SZ3_{nuEuc}$
kroD100	0.922	1.617	22.734	21.328	59.266	58.141	160.656	157.594
rat195	5.289	10.641	5.844	81.250	163.703	114.844	429.047	326.266
lin318	17.860	52.227	57.484	173.843	444.265	372.750	1994.485	1952.828
rd400	38.750	219.000	1225.109	1105.375	1048.984	1440.250	1714.359	1480.875
pcb442	15.906	26.211	69.391	496.140	1191.016	1046.422	4239.406	4087.797
d493	16.875	77.032	408.203	1114.704	1747.765	1364.328	8775.031	5573.516
dsj1000	218.305	540.500	1208.125	3563.125	6023.718	8319.563	21451.672	23142.750
Average:	44.844	132.461	428.127	936.538	1525.531	1816.614	5537.808	5245.947
team1_100	4.477	6.875	21.703	30.359	69.766	116.672	228.766	264.375
team2_200	7.383	12.281	103.907	139.016	275.422	687.062	1240.422	991.109
team3_300	8.305	22.493	60.672	293.766	492.719	621.484	1836.062	1598.703
team4_400	21.071	55.422	716.235	1041.750	1163.203	2293.469	3687.860	3547.703
team5_499	16.774	62.430	58.687	543.531	1169.203	1635.235	2984.703	4370.968
team6_500	25.734	42.469	260.672	1115.953	1730.468	3770.593	7816.875	9666.297
bonus1000	117.196	420.774	6031.719	22484.141	24675.360	39171.250	100036.343	97143.313
Average:	28.705	88.963	1036.228	3664.074	4225.163	6899.395	16833.004	16797.495
Overall average:	36.775	110.712	732.178	2300.306	2875.347	4358.005	11185.406	11021.721

is because we are forced to use a general NLP solver in Phase III to guarantee feasible solutions (SOCP infeasibility due to ill-conditioned matrices was described in Section C.3). The NLP solver is much slower than the SOCP solver. (3) The $3D_{NUM}$ Phase I method is more accurate than $3D_{AN}$ (except for problem $rat195$ using the Manhattan norm). (4) When using the Manhattan norm, creating the ordered list of nodes in Phase I using the Euclidean norm produces better solutions on average than using the Manhattan norm. (5) When Phase IV is not applied, using $3D_{NUM}$ ($SZ2_{nu}$) is much faster than using $3D_{AN}$ ($SZ2_{an}$). This is because the problem size reduction achieved in Phase I using $3D_{NUM}$ is typically much greater than that achieved using $3D_{AN}$. When Phase IV is applied, $3D_{NUM}$ is two to four times faster for problems with the Manhattan norm but about 1.3 times slower for problems with the Euclidean norm. (6) If we consider the columns in the tables giving average deviations and computation times to be rankings, then $SZ2_{nu}$ is the most competitive heuristic, having the best average rank for both the Euclidean

norm (1.5) and the Manhattan norm (2.5). This ranking is consistent with the rankings for the equal radius CETSP problems solved using both 3D norms (see Appendix B) where $SZ2_{nu}$ has the highest average rank for the Euclidean norm and the second highest rank for the Manhattan norm).

C.5 CEVRP Results

C.5.1 2D Euclidean CEVRP

In Tables C-13 - C-15, we give results for 14 CEVRP arbitrary radius benchmark problems with 2D Euclidean norm. We coded the 15 heuristics described in Chapters 3 and 4.

In Table C-13, we give the tour lengths produced by each method. We see that $SZVRP3_{t50-59}$ produces six best solutions and $SZVRP4_t$ produces four. The average deviations from the best solutions in Table C-13 are given as percentages in Table C-14. $SZVRP3_{t\ 50-59}$, $SZVRP4_t$, and SZVRP4 have an average deviation less than 2%. Five SZH variants have averages less than 5% (SZVRP4, SZVRP3, $SZVRP4_v$, $SZVRP2_{t50-59}$, and $SZVRP3_v$). SZVRP1, GTSP-VRP, Giant TSP, and CW-SOCP have average deviations that exceed 9%.

In Table C-15, we give the computation times for the 15 heuristics. SZVRP1 is the fastest method, averaging about seven seconds per problem. CW-SOCP, SZVRP2, Giant TSP, and $SZVRP2_v$ are fast, averaging 10 to 40 seconds per problem. Nine methods take over 100 seconds per problem and seven methods take at least 1,000 seconds.

If we consider the column orderings to be performance rankings, SZVRP3 has the best average rank (5.5) followed by SZVRP4 (5.5) and SZVRP2 (6).

Table C-13: Tour lengths for 15 heuristics on 14 CEVRP problems with arbitrary radius and 2D Euclidean norm

	$SZVRP3_{t50-59}$	$SZVRP4_t$	SZVRP4	SZVRP3	SZVRP4+v	$SZVRP2_{t50-59}$	$SZVRP3_v$	$SZVRP3_t$	SZVRP2	$SZVRP2_t$	$SZVRP2_v$	SZVRP1	Giant TSP	GTSP-VRP	CW-SOCP
kroD100	366.17	364.44	366.61	366.90	**362.61**	368.33	362.74	365.55	373.27	368.49	369.28	387.75	383.93	369.86	366.37
rat195	**171.35**	177.92	176.66	176.66	184.70	196.61	185.18	189.96	183.06	210.89	211.08	183.38	205.75	212.00	231.83
lin318	4479.64	**4433.38**	4491.28	4533.58	4435.19	4509.59	4532.94	4550.28	4771.38	4612.14	4624.41	4857.34	4819.68	4770.23	4908.87
rd400	1406.52	**1395.42**	1397.32	1422.80	1396.63	1406.52	1424.47	1413.08	1428.77	1423.41	1424.35	1561.87	1551.95	1450.62	1565.28
pcb442	**451.14**	455.75	454.38	455.85	459.81	451.31	458.41	458.60	470.48	459.03	461.18	471.95	483.23	499.12	519.99
d493	837.00	836.04	802.10	**801.46**	836.04	837.00	839.93	839.93	815.15	839.93	839.93	825.95	817.32	855.58	860.79
dsj1000	1151.19	1160.72	1160.28	**1147.27**	1178.29	1169.90	1172.97	1177.69	1196.00	1175.03	1178.49	1229.96	1279.28	1404.26	1296.91
team1_100	1420.43	**1419.20**	1486.77	1486.77	1424.16	1485.47	1419.49	1425.75	1520.41	1508.61	1508.61	1588.94	1529.32	1477.45	1510.16
team2_200	**911.19**	919.66	931.57	931.14	914.14	916.81	920.66	916.09	937.50	916.09	926.68	1006.41	1001.83	935.08	1014.40
team3_300	917.64	**864.11**	919.21	918.27	961.61	945.88	995.22	1030.45	961.91	1085.67	1085.67	945.36	986.86	1015.98	1012.48
team4_400	**1558.60**	1572.37	1564.23	1583.95	1581.86	1558.60	1611.81	1586.22	1624.18	1597.16	1611.81	1664.80	1691.86	1654.71	1768.55
team5_499	**825.99**	867.44	857.79	857.79	861.99	856.01	861.99	849.10	918.76	868.23	870.50	924.16	937.22	974.82	948.65
team6_500	**1068.29**	1079.89	**1068.29**	1088.96	1086.57	1092.28	1087.83	1070.35	1144.43	1082.07	1100.49	1197.36	1116.79	1131.23	1211.03
bonus1000	1784.69	1774.10	1772.91	**1768.69**	1789.41	1784.27	1791.81	1777.24	1836.91	1777.24	1791.81	1994.70	1920.70	1868.12	2008.76

Table C-14: Percentage deviation from the best solution for 15 heuristics on 14 CEVRP problems with arbitrary radius and 2D Euclidean norm

	$SZVRP3_{t\ 50-59}$	$SZVRP4_t$	SZVRP4	SZVRP3	$SZVRP4_v$	$SZVRP2_{t\ 50-59}$	$SZVRP3_v$	$SZVRP3_t$	SZVRP2	$SZVRP2_t$	$SZVRP2_v$	SZVRP1	Giant TSP	GTSP-VRP	CW-SOCP
kroD100	0.98	0.50	1.10	1.18	0.00	1.58	0.04	0.81	2.94	1.62	1.84	6.93	5.88	2.00	1.04
rat195	0.00	3.83	3.10	3.10	7.79	14.74	8.07	10.86	6.83	23.08	23.18	7.02	20.08	23.72	35.29
lin318	1.04	0.00	1.31	2.26	0.04	1.72	2.25	2.64	7.62	4.03	4.31	9.56	8.71	7.60	10.73
rd400	0.80	0.00	0.14	1.96	0.09	0.80	2.08	1.26	2.39	2.01	2.07	11.93	11.22	3.96	12.17
pcb442	0.00	1.02	0.72	1.04	1.92	0.04	1.61	1.65	4.29	1.75	2.22	4.61	7.11	10.63	15.26
d493	4.43	4.32	0.08	0.00	4.32	4.43	4.80	4.80	1.71	4.80	4.80	3.06	1.98	6.75	7.40
dsj1000	0.34	1.17	1.13	0.00	2.70	1.97	2.24	2.65	4.25	2.42	2.72	7.19	11.51	22.40	13.04
Average:	1.09	1.55	1.08	1.36	2.41	3.61	3.01	3.53	4.29	5.67	5.88	7.19	9.50	11.01	13.56
team1_100	0.09	0.00	4.76	4.76	0.35	4.67	0.02	0.46	7.13	6.30	6.30	11.96	7.76	4.10	6.41
team2_200	0.00	0.93	2.24	2.19	0.32	0.62	1.04	0.54	2.89	0.54	1.70	10.45	9.95	2.62	11.33
team3_300	6.19	0.00	6.38	6.27	11.28	9.46	15.17	19.25	11.32	25.64	25.64	9.40	14.21	17.58	17.17
team4_400	0.00	0.88	0.36	1.63	1.49	0.00	3.41	1.77	4.21	2.47	3.41	6.81	8.55	6.17	13.47
team5_499	0.00	5.02	3.85	3.85	4.36	3.64	4.36	2.80	11.23	5.11	5.39	11.89	13.47	18.02	14.85
team6_500	0.00	1.09	0.00	1.93	1.71	2.25	1.83	0.19	7.13	1.29	3.01	12.08	4.54	5.89	13.36
bonus1000	0.90	0.31	0.24	0.00	1.17	0.88	1.31	0.48	3.86	0.48	1.31	12.78	8.59	5.62	13.57
Average:	1.03	1.17	2.55	2.95	2.96	3.07	3.88	3.64	6.82	5.98	6.68	10.77	9.58	8.57	12.88
Overall average:	1.06	1.36	1.81	2.16	2.68	3.34	3.44	3.58	5.56	5.82	6.28	8.98	9.54	9.79	13.22

Table C-15: Computation time for 15 heuristics on 14 CEVRP problems with arbitrary radius and 2D Euclidean norm

	SZVRP1	CW-SOCP	SZVRP2	Giant TSP	$SZVRP2_v$	SZVRP3	$SZVRP2_t$	SZVRP4	$SZVRP4_v$	$SZVRP2_{t\ 50-59}$	$SZVRP4_t$	$SZVRP3_v$	$SZVRP3_t$	$SZVRP3_{t\ 50-59}$	GTSP-VRP
kroD100	1.938	1.852	3.797	14.446	19.579	71.891	67.782	174.265	294.234	385.734	387.078	176.000	261.687	753.281	1009
rat195	10.453	2.508	4.492	8.289	14.204	48.609	63.961	52.235	103.781	439.734	286.016	78.422	337.265	1531.750	9216
lin318	1.875	4.118	6.586	20.000	26.594	84.906	149.821	335.922	1329.062	886.265	860.937	454.969	609.985	2461.563	193730
rd400	11.765	5.102	36.407	40.469	66.485	339.438	115.469	2140.922	1404.422	782.579	959.437	287.312	348.578	1662.750	350364
pcb442	2.703	4.313	10.993	19.836	30.657	197.172	147.321	700.234	431.297	1419.390	780.922	321.469	730.359	4116.765	492593
d493	20.375	41.789	13.016	21.422	40.422	183.313	131.899	379.078	120.953	1235.641	255.687	99.109	300.375	1388.156	484771
dsj1000	5.984	26.555	12.344	23.953	93.117	225.343	455.477	720.797	5563.250	5184.406	14028.593	28660.094	30341.468	193547.703	8819142
Average:	7.870	12.319	12.519	21.202	41.579	164.382	161.675	643.350	1321.000	1476.250	2508.381	4296.768	4704.245	29351.710	1478689
team1_100	14.656	4.938	7.750	16.657	27.984	107.172	64.000	135.172	329.734	437.625	410.562	247.125	395.469	1185.203	417
team2_200	2.063	3.211	8.000	14.180	22.469	87.125	92.860	290.015	578.250	551.469	431.532	162.546	244.360	1070.812	7453
team3_300	5.813	4.414	5.399	12.313	17.891	68.359	74.500	101.453	580.312	773.656	902.593	232.359	350.843	2148.219	27576
team4_400	9.391	4.469	34.703	35.820	54.375	359.547	165.969	1855.328	932.984	1160.500	1139.141	247.328	527.297	2874.547	574209
team5_499	4.797	15.000	5.727	31.125	28.540	140.187	192.734	414.172	1380.562	1577.907	976.765	529.234	873.062	4185.657	811566
team6_500	3.468	6.649	9.407	19.547	33.836	127.171	273.055	602.781	1822.531	1724.656	1482.344	705.453	865.562	4385.016	535537
bonus1000	6.719	15.625	27.664	42.711	77.235	411.797	485.922	2153.922	1953.078	3797.000	4047.016	581.391	1450.329	9406.172	10101300
Average:	6.701	7.758	14.093	24.622	37.476	185.908	192.720	793.263	1082.493	1431.830	1341.422	386.491	672.417	3607.947	1722580
Overall Average:	7.286	10.039	13.306	22.912	39.527	175.145	177.198	718.307	1201.746	1454.040	1924.902	2341.629	2688.331	16479.828	1600635

C.5.2 2D Manhattan CEVRP

In Tables C-16 - C-18, we give results for 14 CEVRP arbitrary radius benchmark problems with 2D Manhattan norm. We coded the same 15 heuristics given in Section C.5.1 except that the Manhattan norm is used in every phase.

In Table C-16, we give the tour lengths produced by each method. We see that SZVRP4$_t$ produces four best solutions and SZVRP3$_{t50-59}$ produces three. SZVRP4$_v$, SZVRP4, and SZVRP3 produce two each. The average deviations from the best solutions in Table C-16 are given as percentages in Table C-17. Both variants of SZVRP4 that apply Phase IV (SZVRP4$_v$, SZVRP4$_t$) have an average deviation less than 2% across the 14 problems. Seven variants of SZH produce average deviations less than 5%. CW-SOCP, which does not use Steiner zones, has the highest average deviation (15.57%).

In Table C-18, we give the computation times for each method. CW-SOCP and SZVRP1 are both fast, averaging five to five and a half seconds per problem. SZVRP2, Giant TSP, SZVRP2$_v$, and SZVRP2$_t$ have an average less than 100 seconds per problem. Nine methods have an average over 190 seconds per problem.

If we consider the column orderings to be performance rankings, then SZVRP3 and SZVRP3$_t$ have the best average rank (6) followed by SZVRP4$_v$ (6.5). SZVRP2, SZVRP2$_v$, SZVRP2$_t$, and SZVRP3$_v$ each have an average rank of 7.

Table C-16: Tour lengths for 15 heuristics on 14 CEVRP problems with arbitrary radius and 2D Manhattan norm

	SZVRP4$_v$	SZVRP4$_t$	SZVRP3$_t$	SZVRP4	SZVRP3	SZVRP3$_v$	SZVRP3$_{t50-59}$	SZVRP2$_t$	SZVRP2$_v$	SZVRP2$_{t50-59}$	SZVRP2	SZVRP1	GTSP-VRP	Giant TSP	CW-SOCP
kroD100	435.84	**433.12**	439.73	439.44	436.85	439.70	439.85	443.50	448.08	442.92	449.47	459.12	442.38	468.82	455.16
rat195	**202.00**	215.68	208.43	219.28	222.44	218.17	250.99	217.24	218.25	256.50	228.95	228.95	260.00	267.44	302.10
lin318	5361.55	5446.02	5441.10	5392.50	5374.84	5416.67	**5272.31**	5539.12	5502.67	5304.68	5601.32	5991.66	5689.44	6253.13	5920.65
rd400	1735.83	**1714.33**	1761.69	1740.74	1746.01	1752.61	1724.95	1764.57	1771.01	1728.24	1777.95	1942.42	1788.54	1873.38	1980.68
pcb442	566.38	580.26	571.72	**560.66**	567.68	574.73	568.60	569.91	575.00	567.20	580.70	597.86	632.39	603.45	660.71
d493	1112.55	1112.55	1111.11	1081.04	**1079.46**	1111.11	1107.29	1111.11	1111.11	1107.29	1087.23	1085.80	1143.47	1084.40	1159.81
dsj1000	1452.85	1456.37	1468.57	**1429.94**	1444.83	1483.59	1457.31	1504.94	1488.79	1536.56	1490.62	1523.64	1711.71	1610.07	1655.78
team1_100	1772.05	**1755.06**	1777.87	1905.60	1905.60	1790.04	1769.82	1894.65	1894.65	1905.97	1913.19	2002.47	1849.23	1896.82	1873.89
team2_200	**1121.19**	1125.91	1145.76	1143.64	1147.05	1145.99	1128.09	1147.89	1157.62	1144.72	1197.08	1258.88	1140.85	1269.39	1196.92
team3_300	1147.58	1140.96	1155.10	1152.62	1127.70	1135.29	**1106.26**	1243.98	1261.25	1187.99	1174.98	1228.74	1312.55	1214.06	1241.51
team4_400	1966.38	1955.40	1976.60	1954.57	1986.91	1980.39	**1954.12**	1976.60	1980.39	**1954.12**	1997.16	2206.91	2048.75	2098.39	2290.65
team5_499	1012.04	**1001.31**	1007.63	1029.83	1020.36	1023.59	1111.38	1033.67	1054.60	1150.76	1100.14	1139.44	1201.81	1207.96	1217.14
team6_500	1323.29	1314.85	**1311.12**	1335.84	1329.16	1339.40	1344.58	1362.86	1385.74	1365.52	1398.68	1478.62	1460.01	1396.76	1516.71
bonus1000	2279.66	2247.71	2237.53	2239.46	**2230.90**	2269.21	2264.09	2252.96	2275.43	2259.11	2326.30	2512.09	2397.74	2386.95	2547.42

Table C-17: Percentage deviation from the best solution for 15 heuristics on 14 CEVRP problems with arbitrary radius and 2D Manhattan norm

	SZVRP4$_v$	SZVRP4$_t$	SZVRP3$_t$	SZVRP4	SZVRP3	SZVRP3$_v$	SZVRP3$_{t\ 50-59}$	SZVRP2$_t$	SZVRP2$_v$	SZVRP2$_{t\ 50-59}$	SZVRP2	SZVRP1	GTSP-VRP	Giant TSP	CW-SOCP
kroD100	0.63	0.00	1.53	1.46	0.86	1.52	1.55	2.40	3.45	2.26	3.78	6.00	2.14	8.24	5.09
rat195	0.00	6.77	3.18	8.56	10.12	8.01	24.26	7.54	8.05	26.98	13.34	13.34	28.72	32.40	49.56
lin318	1.69	3.29	3.20	2.28	1.94	2.74	0.00	5.06	4.37	0.61	6.24	13.64	7.91	18.60	12.30
rd400	1.25	0.00	2.76	1.54	1.85	2.23	0.62	2.93	3.31	0.81	3.71	13.30	4.33	9.28	15.54
pcb442	1.02	3.50	1.97	0.00	1.25	2.51	1.42	1.65	2.56	1.17	3.58	6.64	12.80	7.63	17.85
d493	3.07	3.07	2.93	0.15	0.00	2.93	2.58	2.93	2.93	2.58	0.72	0.59	5.93	0.46	7.44
dsj1000	1.60	1.85	2.70	0.00	1.04	3.75	1.91	5.24	4.12	7.46	4.24	6.55	19.71	12.60	15.79
Average:	1.32	2.64	2.61	2.00	2.44	3.38	4.62	3.97	4.11	5.98	5.09	8.58	11.65	12.74	17.65
team1_100	0.97	0.00	1.30	8.58	8.58	1.99	0.84	7.95	7.95	8.60	9.01	14.10	5.37	8.08	6.77
team2_200	0.00	0.42	2.19	2.00	2.31	2.21	0.62	2.38	3.25	2.10	6.77	12.28	1.75	13.22	6.75
team3_300	3.73	3.14	4.42	4.19	1.94	2.62	0.00	12.45	14.01	7.39	6.21	11.07	18.65	9.74	12.23
team4_400	0.63	0.07	1.15	0.02	1.68	1.34	0.00	1.15	1.34	0.00	2.20	12.94	4.84	7.38	17.22
team5_499	1.07	0.00	0.63	2.85	1.90	2.22	10.99	3.23	5.32	14.93	9.87	13.79	20.02	20.64	21.55
team6_500	0.93	0.28	0.00	1.88	1.38	2.16	2.55	3.95	5.69	4.15	6.68	12.78	11.36	6.53	15.68
bonus1000	2.19	0.75	0.30	0.38	0.00	1.72	1.49	0.99	2.00	1.26	4.28	12.60	7.48	6.99	14.19
Average:	1.36	0.67	1.43	2.84	2.54	2.04	2.36	4.59	5.65	5.49	6.43	12.79	9.92	10.37	13.48
Overall average:	1.34	1.65	2.02	2.42	2.49	2.71	3.49	4.28	4.88	5.74	5.76	10.69	10.79	11.56	15.57

Table C-18: Computation time for 15 heuristics on 14 CEVRP problems with arbitrary radius and 2D Manhattan norm

	CW-SOCP	SZVRP1	SZVRP2	Giant TSP	SZVRP2$_v$	SZVRP2$_t$	SZVRP3	SZVRP3$_v$	SZVRP3$_t$	SZVRP2$_{t\ 50-59}$	SZVRP4	SZVRP4$_v$	SZVRP4$_t$	SZVRP3$_{t\ 50-59}$	GTSP-VRP
kroD100	1.375	1.531	4.063	8.664	14.414	35.485	71.516	109.203	163.437	310.297	186.437	273.063	358.735	658.125	1009
rat195	1.492	6.203	2.875	5.696	13.125	60.922	33.312	97.015	446.515	296.766	43.375	276.062	274.890	571.203	9216
lin318	2.422	1.984	6.625	9.852	18.828	58.938	118.781	151.750	235.469	528.282	364.375	657.828	947.594	1321.546	193728
rd400	6.867	5.375	32.696	75.672	77.563	92.360	533.094	438.375	468.641	1044.438	3608.375	1708.297	2578.547	2333.015	350369
pcb442	2.805	2.531	13.367	17.977	29.196	98.383	154.391	182.172	368.781	936.078	729.891	796.047	677.125	2116.687	492616
d493	22.164	15.375	12.289	16.891	31.211	81.336	175.203	75.172	190.843	819.922	391.922	104.515	214.781	906.953	484782
dsj1000	5.649	4.969	13.579	21.852	49.516	149.367	206.328	719.687	700.797	1536.562	504.750	2189.984	2950.078	5918.125	8819146
Average:	6.110	5.424	12.213	22.372	33.407	82.398	184.661	253.339	367.783	781.764	832.732	857.971	1143.107	1975.093	1478695
team1_100	3.531	9.250	6.484	11.438	21.461	40.188	78.609	158.718	297.781	331.156	112.907	326.719	565.110	996.297	416
team2_200	1.609	1.625	7.266	11.258	18.727	47.914	120.125	155.344	207.234	448.000	296.078	418.578	391.219	1036.359	7452
team3_300	2.305	4.484	3.665	9.695	16.164	62.274	69.265	240.203	445.031	466.422	106.546	641.578	814.687	1305.281	27576
team4_400	2.868	4.282	37.485	35.758	55.985	121.516	410.531	284.906	566.281	1107.781	2167.688	1143.906	1512.172	2584.125	574224
team5_499	8.141	4.329	5.539	16.485	19.250	69.204	125.641	246.062	450.907	688.406	446.563	1575.609	1073.187	1944.000	811600
team6_500	2.610	3.172	9.735	15.782	25.743	82.852	103.781	207.391	494.516	812.734	501.734	1096.312	2023.735	2282.875	535534
bonus1000	5.961	11.797	34.102	35.094	63.164	186.305	471.438	395.734	819.859	1603.766	2139.547	2483.484	2850.891	4342.937	10101299
Average:	3.860	5.563	14.896	19.358	31.499	87.179	197.056	241.194	468.801	779.752	824.438	1098.027	1318.714	2070.268	1722586
Overall Average:	4.985	5.493	13.555	20.865	32.453	84.789	190.858	247.267	418.292	780.758	828.585	977.999	1230.911	2022.681	1600641

Over all 14 CEVRP problems, using both the 2D Euclidean and Manhattan norms, we observe the following. (1) The method that does not use Steiner zones (CW-SOCP) does not produce good results for arbitrary radius problems. (2) Based on the results using the 50°-t9° range, MAH heuristics do not add substantial accuracy to SZH methods for arbitrary radius CEVRP problems. (3) Variants of SZVRP2 and SZVRP3 combine accuracy and computational speed better than SZVRP1, SZVRP4, and the non-SZH methods.

C.5.3 3D Euclidean CEVRP

We created 14 3D CEVRP problems with arbitrary radius by adding the z-coordinates to the 2D problems in Section C.5.1 and Section C.5.2. In Tables C-19, C-20, and C-21, we give the results for the 14 CEVRP problems with arbitrary radius and 3D Euclidean norm. We use the same 14 heuristics given in Appendix B.

In Table C-19, we see that SZVRP4$_{tn}$ and SZVRP3$_{vn}$ together produce 10 best solutions. CW-SOCP produces only one best solution. The average deviation from the best solutions in Table C-19 is given as a percentage in Table C-20. We see that SZVRP4$_{tn}$ is the most accurate method with an average deviation less than 1%. All variants of SZVRP3 and SZVRP4, along with SZVRP2$_{tn}$ have an average deviation less than 3%. Giant TSP$_{tn}$, CW-SOCP, and the variants of SZVRP1 produce average deviations between 6% and 10.50%.

Computation times are given in Table C-21. CW-SOCP has an average of 25

seconds per problem. SZVRP1$_n$ and SZVRP2$_n$ average less than 100 seconds per problem. Seven SZVRP methods along with Giant TSP$_{tn}$ are very slow, averaging more than 1,000 seconds per problem. Though not as slow as the CETSP heuristics given in Section C.5, the computation times are still much slower than those for equal radius problems. This is because of the numerical difficulties encountered by CPLEX when solving the SOCP formulation for arbitrary radius. When CPLEX returns an infeasible solution, we resolve Phase III as a general NLP which can be very slow. The times given in Table C-21 are faster than the times for the equivalent CETSP problems because each route in the CEVRP generally has fewer nodes than the single route in the CETSP problems. The Phase III NLP is solved more quickly for k small routes with a total of n nodes than for one large route with n nodes.

If column order in Tables C-20 and C-21 is considered a ranking, then SZVRP4$_{vn}$ has the best average rank (5.5) followed by SZVRP2$_n$ (6) and SZVRP2$_{vn}$ and SZVRP3$_n$ (6.5).

Table C-19: Tour lengths for 14 heuristics on 14 CEVRP problems with arbitrary radius and 3D Euclidean norm

	SZVRP4$_{tn}$	SZVRP4$_{vn}$	SZVRP3$_{vn}$	SZVRP3$_{tn}$	SZVRP4$_{n}$	SZVRP2$_{tn}$	SZVRP3$_{n}$	SZVRP2$_{vn}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	SZVRP1$_{vn}$	Giant TSP$_{tn}$	SZVRP1$_{n}$	CW-SOCP
kroD100	394.10	394.75	**386.48**	389.63	394.10	388.68	396.49	392.46	392.84	401.91	403.14	407.95	405.55	395.68
rat195	**194.94**	207.81	208.00	203.89	201.27	223.86	202.96	224.54	230.07	228.60	229.40	236.28	231.20	282.33
lin318	4683.83	4567.18	**4501.28**	4588.37	4672.71	4732.14	4657.35	4764.44	4777.76	4656.39	4680.74	4822.61	4728.59	5075.34
rd400	3814.37	3814.37	**3806.23**	**3806.23**	3810.69	3819.43	3814.97	3819.43	3820.42	4074.20	4074.20	3941.84	4074.77	3833.53
pcb442	**463.46**	465.70	468.56	468.99	469.40	464.70	470.30	469.64	474.68	484.63	494.96	501.55	496.61	523.30
d493	2376.77	**2359.35**	2382.73	2404.51	2394.85	2408.19	2394.38	2421.97	2425.72	2439.38	2457.06	2467.61	2465.16	2527.50
dsj1000	**2216.36**	2238.05	2266.80	2255.23	2266.48	2255.85	2307.31	2293.68	2301.22	2279.62	2393.37	2326.80	2414.04	2484.37
team1_100	2404.23	2404.29	2416.76	2410.20	2408.93	2428.69	2403.78	2430.04	2432.78	2478.34	2483.41	2472.03	2502.12	**2396.69**
team2_200	**1304.94**	1310.03	1321.46	1324.72	1339.86	1324.54	1329.72	1342.28	1345.38	1403.49	1428.13	1394.79	1434.49	1374.15
team3_300	**1745.49**	1775.69	1772.38	1810.02	1801.21	1774.31	1800.54	1817.82	1820.89	1829.78	1852.23	1968.53	1856.37	1919.52
team4_400	1818.36	1809.18	1812.07	1801.99	**1797.84**	1812.88	1811.69	1821.93	1823.35	1913.96	1926.08	1927.38	1929.85	1840.77
team5_499	1335.63	1326.09	**1309.00**	1331.93	1360.16	1339.30	1363.06	1368.76	1378.96	1329.40	1364.15	1418.74	1400.04	1445.87
team6_500	1459.40	1458.28	1471.91	1445.13	1469.30	**1441.88**	1484.56	1494.58	1500.04	1581.86	1609.12	1597.87	1622.64	1662.45
bonus1000	**2912.15**	2940.34	2949.42	2930.66	2974.92	2912.65	2995.34	2996.03	3005.18	3230.42	3339.73	3245.68	3346.86	3146.00

Table C-20: Percentage deviation from the best solution for 14 heuristics on 14 CEVRP problems with arbitrary radius and 3D Euclidean norm

	SZVRP4$_{tn}$	SZVRP4$_{vn}$	SZVRP3$_{vn}$	SZVRP3$_{tn}$	SZVRP4$_{n}$	SZVRP2$_{tn}$	SZVRP3$_{n}$	SZVRP2$_{vn}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	SZVRP1$_{vn}$	Giant TSP$_{tn}$	SZVRP1$_{n}$	CW-SOCP
kroD100	1.97	2.14	0.00	0.81	1.97	0.57	2.59	1.55	1.64	3.99	4.31	5.56	4.93	2.38
rat195	0.00	6.60	6.70	4.59	3.25	14.84	4.12	15.19	18.02	17.27	17.68	21.21	18.60	44.83
lin318	4.06	1.46	0.00	1.93	3.81	5.13	3.47	5.85	6.14	3.45	3.99	7.14	5.05	12.75
rd400	0.21	0.21	0.00	0.00	0.12	0.35	0.23	0.35	0.37	7.04	7.04	3.56	7.06	0.72
pcb442	0.00	0.48	1.10	1.19	1.28	0.27	1.47	1.33	2.42	4.57	6.80	8.22	7.15	12.91
d493	0.74	0.00	0.99	1.91	1.51	2.07	1.48	2.65	2.81	3.39	4.14	4.59	4.48	7.13
dsj1000	0.00	0.98	2.28	1.75	2.26	1.78	4.10	3.49	3.83	2.85	7.99	4.98	8.92	12.09
Average:	1.00	1.70	1.58	1.74	2.03	3.57	2.50	4.34	5.04	6.08	7.42	7.89	8.03	13.26
team1_100	0.31	0.32	0.84	0.56	0.51	1.33	0.30	1.39	1.51	3.41	3.62	3.14	4.40	0.00
team2_200	0.00	0.39	1.27	1.52	2.68	1.50	1.90	2.86	3.10	7.55	9.44	6.89	9.93	5.30
team3_300	0.00	1.73	1.54	3.70	3.19	1.65	3.15	4.14	4.32	4.83	6.12	12.78	6.35	9.97
team4_400	1.14	0.63	0.79	0.23	0.00	0.84	0.77	1.34	1.42	6.46	7.13	7.21	7.34	2.39
team5_499	2.03	1.31	0.00	1.75	3.91	2.31	4.13	4.56	5.34	1.56	4.21	8.38	6.95	10.46
team6_500	1.22	1.14	2.08	0.23	1.90	0.00	2.96	3.65	4.03	9.71	11.60	10.82	12.54	15.30
bonus1000	0.00	0.97	1.28	0.64	2.16	0.02	2.86	2.88	3.19	10.93	14.68	11.45	14.93	8.03
Average:	0.67	0.93	1.11	1.23	2.05	1.09	2.30	2.98	3.27	6.35	8.11	8.67	8.92	7.35
Overall Average:	0.83	1.31	1.35	1.49	2.04	2.33	2.40	3.66	4.15	6.21	7.77	8.28	8.47	10.30

Table C-21: Computation time for 14 heuristics on 14 CEVRP problems with arbitrary radius and 3D Euclidean norm

	CW-SOCP	SZVRP1$_n$	SZVRP2$_n$	SZVRP1$_{vn}$	SZVRP2$_{vn}$	SZVRP3$_n$	SZVRP3$_{vn}$	Giant TSP$_{tn}$	SZVRP4$_{vn}$	SZVRP2$_{tn}$	SZVRP1$_{tn}$	SZVRP4$_n$	SZVRP4$_{tn}$	SZVRP3$_{tn}$
kroD100	3.735	22.546	30.765	60.125	68.906	137.672	255.500	111.266	321.453	192.766	186.078	209.312	225.703	329.328
rat195	7.149	17.985	23.562	66.125	72.125	79.734	406.578	210.656	467.813	436.515	443.703	77.016	659.266	1233.344
lin318	11.688	31.422	45.297	83.437	97.937	326.922	1062.579	382.039	1694.719	773.625	699.531	651.171	1471.094	2137.562
rd400	13.844	43.078	131.094	151.890	205.641	1660.047	1164.360	199.570	1810.203	205.765	152.641	3698.906	1069.156	1244.641
pcb442	22.602	33.375	49.734	84.688	104.546	471.468	444.547	391.664	1905.141	1010.515	945.563	882.828	1204.688	1780.703
d493	20.539	60.906	98.656	167.703	208.734	1405.719	1165.797	1096.344	1868.218	1310.172	1445.828	2093.812	2144.203	2239.109
dsj1000	104.383	62.844	106.219	170.625	201.641	1089.219	1500.094	5017.133	2109.344	9692.875	10025.406	1948.656	11376.922	16796.344
Average:	26.277	38.879	69.332	112.085	137.076	738.683	857.065	1058.382	1453.842	1946.033	1985.536	1365.957	2593.005	3680.147
team1_100	5.079	36.532	42.485	105.328	104.969	207.578	345.219	68.438	268.734	189.031	187.641	226.250	179.078	378.672
team2_200	6.313	22.687	39.578	63.094	79.453	261.328	815.891	136.547	1327.953	323.141	328.281	565.671	328.235	520.297
team3_300	14.196	27.141	40.594	87.437	85.328	163.891	893.437	325.071	589.906	662.906	846.547	285.485	989.250	1606.829
team4_400	16.617	39.640	129.578	124.344	224.453	1136.968	896.859	352.891	2002.828	557.640	496.438	3556.828	1280.188	1075.875
team5_499	30.047	32.531	42.000	103.859	120.016	259.344	1736.563	1495.742	1975.125	1611.828	1626.172	438.125	2878.266	5099.609
team6_500	27.258	33.922	60.625	95.281	116.375	542.922	697.453	1455.867	1542.469	2469.750	2315.078	1228.516	2834.593	3014.594
bonus1000	75.500	82.578	221.172	220.235	345.109	3016.218	2664.031	4187.125	4570.859	6171.234	7386.688	11328.359	8424.657	8280.203
Average:	25.001	39.290	82.290	114.225	153.672	798.321	1149.922	1145.954	1753.982	1712.219	1883.835	2518.462	2416.324	2853.726
Overall Average:	25.639	39.085	75.811	113.155	145.374	768.502	1003.493	1102.168	1603.912	1829.126	1934.685	1942.210	2504.664	3266.936

C.5.4 3D Manhattan CEVRP

In Tables C-22 - C-24, we provide results for the same 14 CEVRP problems given in Section C.5.3 where we use the Manhattan norm instead of the Euclidean norm.

In Table C-22, we see that SZVRP4$_{tn}$ and SZVRP3$_{tn}$ together produce 11 best solutions. CW-SOCP does not produce any best solutions. The average deviations from the best solutions in Table C-22 are given as a percentage in Table C-23. We see that SZVRP4$_{tn}$ is the most accurate method with an average deviation of less than 1%. All variants of SZVRP3 and SZVRP4, along with SZVRP2$_{tn}$ have an average deviation less than 4%. Giant TSP$_{tn}$, CW-SOCP, and the variants of SZVRP1 produce average deviations between 7.5% and 12.50%.

Computation times are given in Table C-24. They are similar to those for the Euclidean norm. CW-SOCP is the fastest with an average of 22 seconds per problem. SZVRP1$_n$ and SZVRP2$_n$ have an average between 50 and 90 seconds per problem. Eight SZVRP methods along with Giant TSP$_{tn}$ are very slow, averaging more than 700 seconds per problem. SZVRP4$_n$ is the slowest method, averaging almost 2,300 seconds per problem. SZVRP4$_n$, which does not apply Phase IV, is slower than the two variants of SZVRP4 that apply Phase IV. The slower times of SZVRP4$_{tn}$ and SZVRP4$_{vn}$ can be attributed to the high variability in computation time when solving Phase III as a general NLP.

If the column orderings in Tables C-23 and C-24 are considered to be rankings, then SZVRP2 and SZVRP4$_{tn}$ have the best overall average rank (6) followed by

SZVRP2$_{tn}$, SZVRP2$_{vn}$, SZVRP3$_{vn}$ (6.5).

Table C-22: Tour lengths for 14 heuristics on 14 CEVRP problems with arbitrary radius and 3D Manhattan norm

	SZVRP4$_{tn}$	SZVRP3$_{tn}$	SZVRP4$_{vn}$	SZVRP3$_{vn}$	SZVRP2$_{tn}$	SZVRP4$_{n}$	SZVRP3$_{n}$	SZVRP2$_{vn}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	Giant TSP$_{tn}$	SZVRP1$_{vn}$	SZVRP1$_{n}$	CW-SOCP
kroD100	**515.13**	522.41	516.86	517.05	522.71	522.09	526.42	525.06	526.16	539.35	546.11	540.62	545.45	546.62
rat195	277.30	**265.09**	293.13	288.87	300.60	299.82	286.58	303.07	305.05	307.67	330.90	312.12	314.15	400.66
lin318	**5668.26**	5678.98	5671.10	5718.76	5821.80	5712.95	5751.02	5855.62	5880.62	5823.55	5895.62	5923.54	5949.20	6245.61
rd400	**5448.01**	5473.01	**5448.01**	5473.01	5465.41	5466.14	5462.47	5465.41	5466.20	5853.57	5698.40	5853.57	5857.88	5511.70
pcb442	**630.11**	**630.31**	635.51	635.98	643.54	643.95	640.73	656.89	659.54	657.09	663.39	673.83	680.02	705.47
d493	**3323.09**	3347.54	3340.85	3341.68	3357.64	3327.08	3354.21	3389.17	3402.70	3473.02	3468.84	3510.54	3531.58	3500.84
dsj1000	**3105.72**	3192.18	3178.34	3232.97	3242.12	3230.84	3235.10	3315.76	3327.26	3324.93	3397.84	3432.97	3475.63	3737.12
team1_100	**3469.67**	3505.35	3503.28	3504.63	3525.58	3539.73	3531.85	3539.99	3543.35	3586.99	3605.68	3589.76	3625.13	3588.54
team2_200	1848.22	1856.49	**1802.99**	1805.52	1853.29	1845.29	1886.61	1877.62	1879.03	1952.54	1956.46	1998.10	2007.50	1965.21
team3_300	**2459.09**	2509.77	2503.55	2547.04	2495.33	2588.14	2605.41	2539.02	2548.55	2643.44	2796.60	2665.61	2692.92	2833.83
team4_400	2508.93	2498.64	2503.32	2507.29	**2480.84**	2490.67	2503.21	2514.25	2519.34	2798.94	2615.56	2826.27	2856.65	2516.69
team5_499	1834.65	**1822.66**	1870.00	1886.45	1870.51	1929.15	1929.65	1950.31	1960.38	1918.02	1971.50	2003.54	2014.53	2031.32
team6_500	**2004.42**	2081.33	2082.31	2078.82	2063.48	2114.74	2109.92	2133.93	2148.46	2147.24	2143.93	2237.01	2252.44	2335.81
bonus1000	4155.63	4169.16	**4132.39**	4140.84	4172.69	4195.42	4218.47	4316.89	4331.08	4748.51	4620.01	4929.18	4943.24	4636.49

Table C-23: Percentage deviation from the best solution for 14 heuristics on 14 CEVRP problems with arbitrary radius and 3D Manhattan norm

	SZVRP4$_{tn}$	SZVRP3$_{tn}$	SZVRP4$_{vn}$	SZVRP3$_{vn}$	SZVRP2$_{tn}$	SZVRP4$_{n}$	SZVRP3$_{n}$	SZVRP2$_{vn}$	SZVRP2$_{n}$	SZVRP1$_{tn}$	Giant TSP$_{tn}$	SZVRP1$_{vn}$	SZVRP1$_{n}$	CW-SOCP
kroD100	0.00	1.41	0.33	0.37	1.47	1.35	2.19	1.93	2.14	4.70	6.01	4.95	5.89	6.11
rat195	4.61	0.00	10.58	8.97	13.39	13.10	8.11	14.33	15.07	16.06	24.82	17.74	18.51	51.14
lin318	0.00	0.19	0.05	0.89	2.71	0.79	1.46	3.31	3.75	2.74	4.01	4.50	4.96	10.19
rd400	0.00	0.46	0.00	0.46	0.32	0.33	0.27	0.32	0.33	7.44	4.60	7.44	7.52	1.17
pcb442	0.00	0.03	0.86	0.93	2.13	2.20	1.69	4.25	4.67	4.28	5.28	6.94	7.92	11.96
d493	0.00	0.74	0.53	0.56	1.04	0.12	0.94	1.99	2.40	4.51	4.39	5.64	6.27	5.35
dsj1000	0.00	2.78	2.34	4.10	4.39	4.03	4.17	6.76	7.13	7.06	9.41	10.54	11.91	20.33
Average:	0.66	0.80	2.10	2.33	3.64	3.13	2.69	4.70	5.07	6.69	8.36	8.25	9.00	15.18
team1_100	0.00	1.03	0.97	1.01	1.61	2.02	1.79	2.03	2.12	3.38	3.92	3.46	4.48	3.43
team2_200	2.51	2.97	0.00	0.14	2.79	2.35	4.64	4.14	4.22	8.29	8.51	10.82	11.34	9.00
team3_300	0.00	2.06	1.81	3.58	1.47	5.25	5.95	3.25	3.64	7.50	13.72	8.40	9.51	15.24
team4_400	1.13	0.72	0.91	1.07	0.00	0.40	0.90	1.35	1.55	12.82	5.43	13.92	15.15	1.45
team5_499	0.66	0.00	2.60	3.50	2.63	5.84	5.87	7.00	7.56	5.23	8.17	9.92	10.53	11.45
team6_500	0.00	3.84	3.89	3.71	2.95	5.50	5.26	6.46	7.19	7.12	6.96	11.60	12.37	16.53
bonus1000	0.56	0.89	0.00	0.20	0.98	1.53	2.08	4.46	4.81	14.91	11.80	19.28	19.62	12.20
Average:	0.69	1.64	1.45	1.89	1.77	3.27	3.79	4.10	4.44	8.47	8.36	11.06	11.86	9.90
Overall Average:	0.68	1.22	1.78	2.11	2.71	3.20	3.24	4.40	4.76	7.58	8.36	9.65	10.43	12.54

Table C-24: Computation time for 14 heuristics on 14 CEVRP problems with arbitrary radius and 3D Manhattan norm

	CW-SOCP	SZVRP1$_n$	SZVRP2$_n$	SZVRP1$_{vn}$	SZVRP2$_{vn}$	Giant TSP$_{tn}$	SZVRP1$_{tn}$	SZVRP2$_{tn}$	SZVRP3$_{vn}$	SZVRP3$_n$	SZVRP4$_{tn}$	SZVRP4$_{vn}$	SZVRP3$_{tn}$	SZVRP4$_n$
kroD100	4.180	15.813	22.297	44.047	49.640	70.953	124.344	131.578	214.422	174.266	197.641	285.437	266.484	256.172
rat195	5.204	14.015	15.937	42.984	42.157	112.430	226.547	211.546	316.203	80.421	471.062	486.015	1183.469	66.407
lin318	12.977	21.187	36.094	57.391	74.844	333.938	467.531	470.328	549.907	440.562	769.969	688.640	1014.531	896.797
rd400	30.750	164.766	255.563	374.906	443.203	440.492	381.500	431.906	1080.890	2199.234	2601.641	4338.875	1088.250	5853.296
pcb442	14.774	23.703	39.000	64.938	71.781	496.016	737.969	647.860	569.937	661.312	1206.265	589.313	1312.734	1516.360
d493	23.915	56.687	81.453	141.828	165.531	784.266	1098.359	988.266	939.344	1313.140	1797.797	1789.360	1826.688	3626.453
dsj1000	55.196	64.469	128.531	150.937	228.797	2049.063	2651.797	2297.657	1059.625	1188.547	3425.859	3235.016	4833.938	2674.390
Average:	20.999	51.520	82.696	125.290	153.708	612.451	812.578	739.877	675.761	865.355	1495.748	1630.379	1646.585	2127.125
team1_100	5.508	26.297	32.328	70.860	76.000	63.781	124.281	132.406	309.609	224.406	187.390	406.969	359.859	331.563
team2_200	6.422	20.921	39.797	57.547	79.516	185.782	288.109	342.562	482.969	485.859	324.844	863.015	510.000	866.297
team3_300	10.047	21.469	32.031	63.547	68.703	238.086	415.297	384.672	405.375	206.891	697.250	553.844	926.515	460.344
team4_400	28.789	82.969	192.094	210.188	335.890	482.352	665.281	763.000	1280.110	1714.468	1939.172	2935.547	1518.594	3127.735
team5_499	20.313	26.453	35.422	72.969	77.797	630.180	805.250	762.469	785.000	308.532	1486.422	883.547	2047.719	587.219
team6_500	24.836	35.625	52.953	94.250	120.359	939.719	1400.281	1311.672	689.484	809.047	1802.016	1164.297	2169.265	1900.188
bonus1000	73.024	134.406	264.891	333.860	457.657	2995.196	3005.265	3838.109	4453.594	4545.812	5376.234	5856.563	6412.563	9599.344
Average:	24.134	49.734	92.788	129.032	173.703	790.728	957.681	1076.413	1200.877	1185.002	1687.618	1809.112	1992.074	2410.384
Overall Average:	22.567	50.627	87.742	127.161	163.705	701.589	885.129	908.145	938.319	1025.178	1591.683	1719.746	1819.329	2268.755

Over all 14 CEVRP benchmark problems using both the 3D Euclidean and 3D Manhattan norms, we see the following. (1) Methods that use Steiner zones are consistently more accurate than CW-SOCP, which does not use Steiner zones. (2) In 7 out of 8 cases (the only exception being SZVRP3 with the Euclidean norm), TSP-based Phase IV produces more accurate tours, on average, than VRP-based Phase IV. VRP-based Phase IV is substantially faster than TSP-based Phase IV. For equal radius 3D CEVRP problems, the difference was much closer. The large disparity in computation times for arbitrary radius 3D CEVRP problems is due to the fact that TSP-based Phase IV replaces more Steiner zones with duple and singleton Steiner zones at each iteration. This creates larger routes to which Phase III must be applied. We recall that Phase IV is finished when there is no improvement after 4 iterations or only singletons and duples remain. VRP-based Phase IV replaces fewer Steiner zones per iteration meaning that more iterations would be required to have only singletons and duples. Therefore, VRP-based Phase IV must reach a local minimum from which is cannot escape faster than TSP-based Phase IV.

C.6 Conclusions

In this appendix, we extended the Steiner-zone heuristic to solve CETSP and CEVRP problems where each disk can have a different radius. We created and solved benchmark problems in 2D and 3D, using the Euclidean and Manhattan norms. We found that the numerical difficulties associated with solving Phase III to optimality led to very large increases in computation time for Steiner-zone methods as well as

moderate increases in computation time for methods that do not use Steiner zones (LK-SOCP, YUAN+, CW-SOCP). As opposed to equal radius problems, where LK-SOCP, YUAN+, and CW-SOCP produced excellent results quickly for certain types of problems (high-overlap ratio problems), methods that do not apply Phase I have large average deviations for the majority of problems. Over all problems, variants variants of SZ2, SZVRP2, and SZVRP3 exhibit the best balance of accuracy and computation speed for the methods studied in this appendix.

Appendix D

The IP_{PhIII} Heuristic

The shortest path problem solved at each iteration is formulated as a minimum-cost network flow problem. Each Steiner zone is approximated by k points (we use $k = 3$). The source (depot) is given an artificial supply of 1 unit and the sink (a dummy copy of the depot) is given a demand of 1 unit. The k points approximating each Steiner zone are transhipment nodes. Arc costs are distances between points. We show the structure of the network in Figure D.1. The constraint matrix of a network flow problem with this structure is totally unimodular [72], and the righthand-side values are integer. We can solve each network flow problem as a linear program and produce integer solutions.

The first two iterations of the IP_{PhIII} integer program establish a bounded region on each Steiner zone's perimeter that is likely to contain the optimal TSZP location for each Steiner zone's representative point. In subsequent iterations, the solution converges to a near-optimal TZSP tour. The bounded region defined by

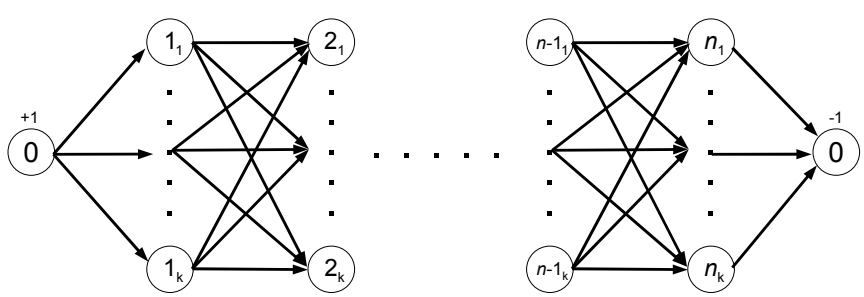
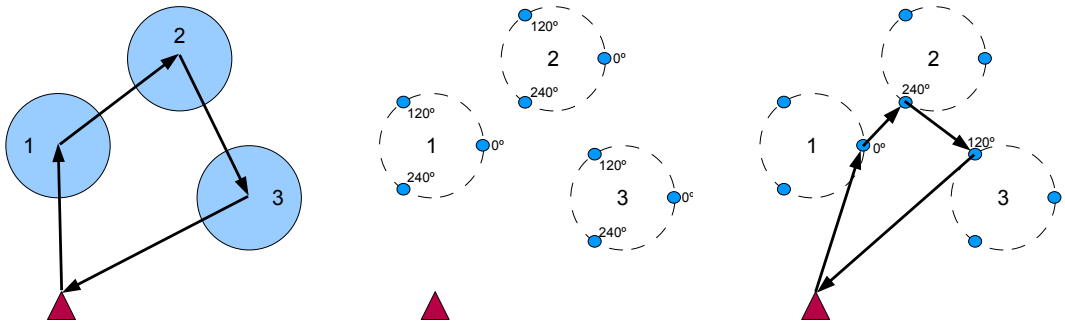


Figure D.1: Network-flow structure of the IP_{PhIII} model.

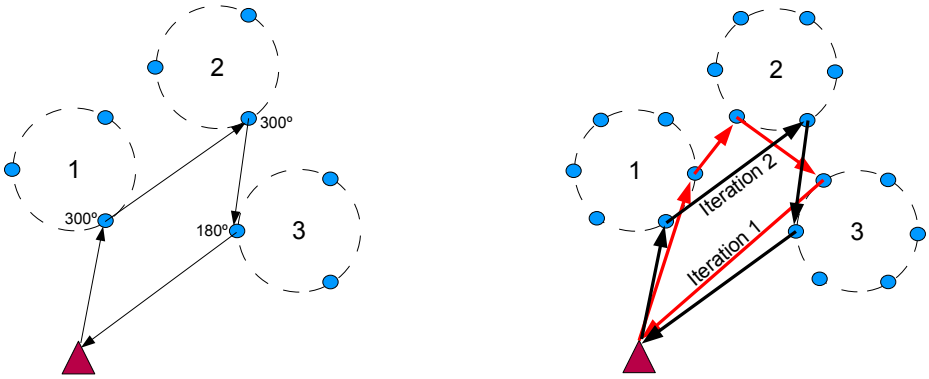


(a) A small problem before the first iteration of IP_{PhIII}

(b) Approximate each Steiner zone by three points

(c) Solution to iteration 1

Figure D.2: The first iteration of the Phase III iterative approximation.



(a) Solution to iteration 2

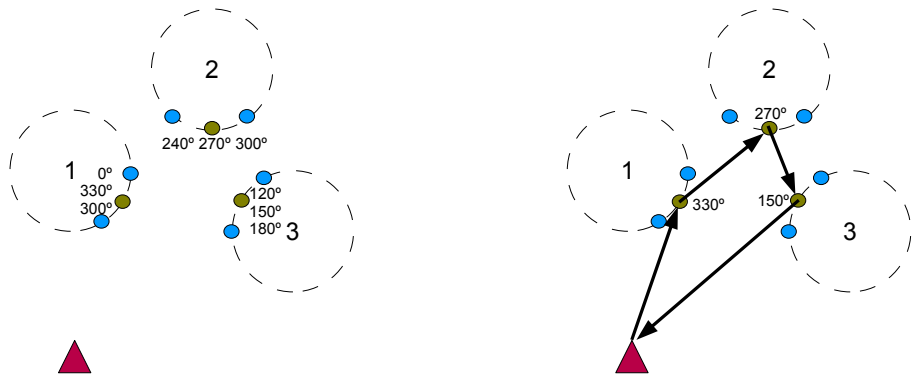
(b) Solutions for the first two iterations of IP_{PhIII}

Figure D.3: Solution after the first two iterations of IP_{PhIII}.

iterations 1 and 2 and refined in iterations 3 and 4 sometimes does not contain the optimal representative point for some Steiner zones. Iteration 5 is the first iteration where this can be recognized. We shift these bounded regions so that the heuristic converges good representative points. We discuss iteration 5 in greater detail. Using the example problem in Figure D.2(a), we now show how IP_{PhIII} converges.

In Figure D.2(a), we show the results of applying Phase II to a problem with one depot and three Steiner zones of degree 1 (typically, Steiner zones have degree greater than 1 and are not disks; we use disks here for simplicity.). Each Steiner zone is approximated by k points on its perimeter. In our example, $k = 3$. The location of these points is 0°, 120°, and 240°, where the degree refers to the polar angle relative to the SZ's representative point. We show this in Figure D.2(b). The angle size between two neighboring points is denoted θ. Initially, $\theta = 120°$ but decreases as the number of iterations increases. In this example, each Steiner zone's representative point is the origin of the disk. Typically, each representative point fixed in Phase II will not be the center of its Steiner zone. The tour order is depot-1-2-3-depot. An iteration of IP_{PhIII} minimizes the tour distance such that one of the k points in each SZ is visited. The Steiner zones are visited in the order determined by Phase II. The solution to this example is shown in Figure D.2(c) where the points at 0°, 240°, and 120° were chosen for Steiner zones 1, 2, and 3. This represents the first iteration of IP_{PhIII}. Computational experiments suggested that values of k larger than three do not converge to better solutions and only slow the algorithm. We set $k = 3$ in the remainder of this chapter.

A single iteration of IP_{PhIII} does not lead to a good approximation of the



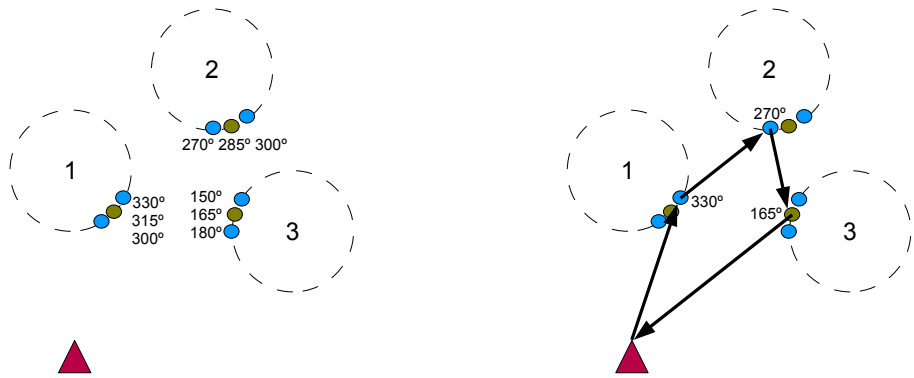
(a) Possible solution points for iteration 3

(b) Solution to iteration 3

Figure D.4: Iteration 3

TSZP. Therefore, we use an iterative strategy by which a succession of IPs converge to a near-optimal value for the TSZP. As discussed previously, in iteration 1, we approximate each Steiner zone by three points, located at 0°, 120°, and 240°. We set aside the solution of iteration 1 for use in iteration 3. In iteration 2, we approximate each Steiner zone by three points located at 60°, 180°, and 300°. For this example, the solution to iteration 2 is shown in Figure D.3(a) where the points at 300°, 300°, and 180° were chosen for Steiner zones 1, 2, and 3. The two solution points in each Steiner zone are spaced 60° apart relative to the representative point. Thus, $\theta = 60°$ after iteration 2.

After the first two iterations, we now have two possible solution points for each Steiner zone that act as upper and lower bounds on the final value for each SZ's representative point. In iteration 3, we begin an iterative process that converges to a near-optimal solution. For any SZ_i, two of the three possible points for the current iteration are the solution points from the prior two iterations. In general, the third point for SZ_i is the point at the polar angle bisecting the other two. In Figure



(a) Possible solution points for iteration 4

(b) Solution to iteration 4

Figure D.5: Iteration 4

D.4(a), we show the three points for each Steiner zone that are used in iteration 3. The bisecting angles are 330°, 270°, and 150° for Steiner zones 1, 2, and 3. The solution to iteration 3 is shown in Figure D.4(b) where the points at 330°, 270°, and 150° were chosen for Steiner zones 1, 2, and 3.

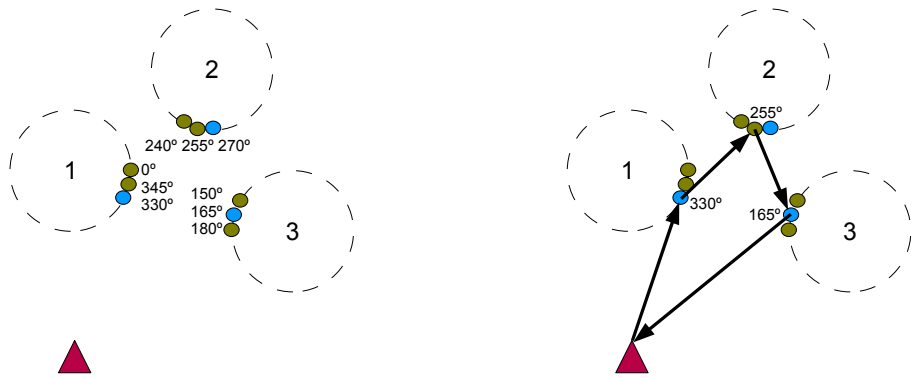
It is possible for the same point to be chosen for a particular Steiner zone in iterations 2 and 3 or any other pair of consecutive iterations except for 1 and 2. We call these situations ties and, except in iteration 5, we handle them by choosing two new points for that Steiner zone. The two new points are equally spaced $\pm(\frac{\theta}{\alpha})^\circ$ around the tie point. In early iterations, $\alpha = 1$ to ensure that a large enough section of the Steiner zone is being checked. In later iterations, or when the Steiner zone is extremely small and its Phase II representative point is on or nearly on the Steiner zone's perimeter, a larger $\frac{\theta}{\alpha}$ is needed to ensure that points are far enough apart to avoid missing a solution point.

We show the possible points for iteration 4 in Figure D.5(a). In SZ_1, the prior two iterations had solution points at 330° and 300°. Therefore, the third point for

this Steiner zone is at the polar angle of 315°($\theta = 15°$). Similarly, the third points for SZ_2 and SZ_3 are at the angles 285° and 165°. It appears that we ignore the results of iteration 1; however, we consider these results in iteration 5. The solution to iteration 4, given in Figure D.5(b), shows that points at 330°, 270°, and 165° were selected for Steiner zones 1, 2, and 3.

In iteration 5, we choose points differently than in previous iterations to avoid convergence to incorrect representative points. For SZ_1 and SZ_2, ties occur. In each case, the point that is selected is the point closest to solution point found in iteration 1. This indicates that we incorrectly ignored the result of iteration 1 for these two Steiner zones. Therefore, in iteration 5, for SZ_1 and SZ_2, instead of using the procedure for handling ties described above, we use the point selected in the previous iteration and the point from iteration 1 along with the point at the bisecting angle. For SZ_3, unlike the other two SZs, the solution points for the prior two iterations are different, 150°and 165°, indicating that we could ignore the result of iteration 1 for this Steiner zone. However, because we are in iteration 5, instead of choosing the point at the bisecting angle, 157.5°, as we do in other iterations, we choose the point at 180° as the third point. This ensures that we account for the case when the globally optimal point lies between 165° and 180°. The possible points for iteration 5 are shown in Figure D.6(a). The solution is shown in Figure D.6(b) where points at 330°, 255°, and 165° were chosen for Steiner zones 1, 2, and 3.

For all subsequent iterations, the rule for choosing the third point to represent each Steiner zone remains the same as before iteration 5: when the solution points



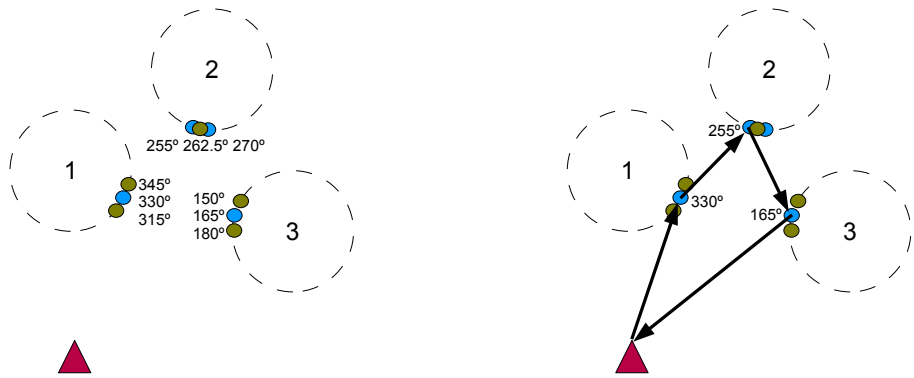
(a) Possible solution points for iteration 5

(b) Solution to iteration 5

Figure D.6: Iteration 5

for the prior two iterations are different for a particular Steiner zone, the third point is at the bisecting angle. If the points selected in the prior two iterations are the same for a given Steiner zone (a tie), then we select two new points for that Steiner zone in the next iteration. The two new points are equally spaced $\pm(\frac{\theta}{\alpha})^\circ$ around the tie point where $\alpha = 1$, 2, or 4, depending on the iteration. For example, we show the possible points for iteration 6 in Figure D.7(a). SZ_1 and SZ_3 both chose the same points in iterations 4 and 5. For SZ_1, this is the point at 330°, and thus, the two other points used in iteration 6 for SZ_1 are at 315°and 345°($\theta = 15°$). SZ_2 selected different points in iterations 4 and 5 (255° and 270°) and, therefore, for iteration 6, the third point will be the point at the bisecting angle, 265°. We show the solution to iteration 6 in Figure D.7(b).

In iterations 7 and 8, shown in Figures D.8 and D.9, it is clear that the heuristic is converging to a near-optimal solution of the TSZP. Note that the point selected for SZ_3 has not changed in several iterations. At each iteration, the two points selected around a tie point get progressively closer to the tie point, that is, θ is



(a) Possible solution points for iteration 6

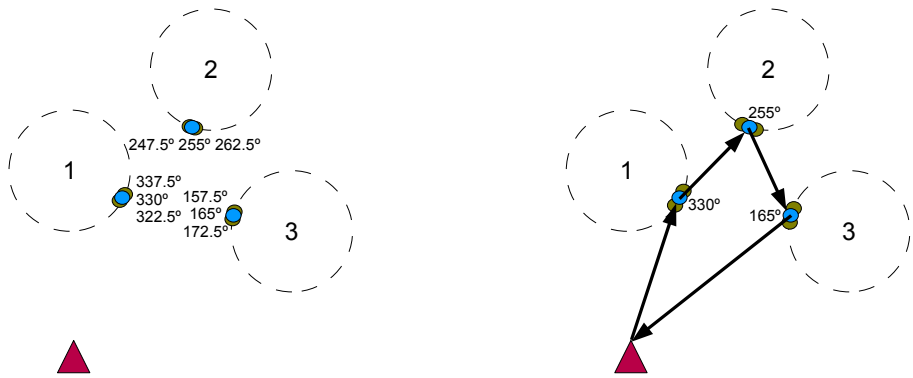
(b) Solution to iteration 6

Figure D.7: Iteration 6

halved at each iteration. Eventually, either the tie is broken, or the tied point is the best representative point for that Steiner zone.

The solution to iteration 3 should be close to, if not exactly the same as, the solution of one iteration of IP_{PhIII} with $k = 12$ and $\theta = 30°$. Similarly, the solution to the fourth iteration should be very close to that of one iteration of IP_{PhIII} with $k = 24$ and $\theta = 15°$, the fifth, $k = 48$ and $\theta = 7.5°$, and so on. After 10 iterations, the solution should closely approximate the solution of one iteration of IP_{PhIII} for $k = 1536$. That is, the solution to the tenth iteration is equivalent to approximating each Steiner zone with a 1536-sided polygon and finding a near-optimal solution to the resulting TPP. Because each Steiner zone is always approximated by $k = 3$ points, the size of the IP remains constant for all iterations.

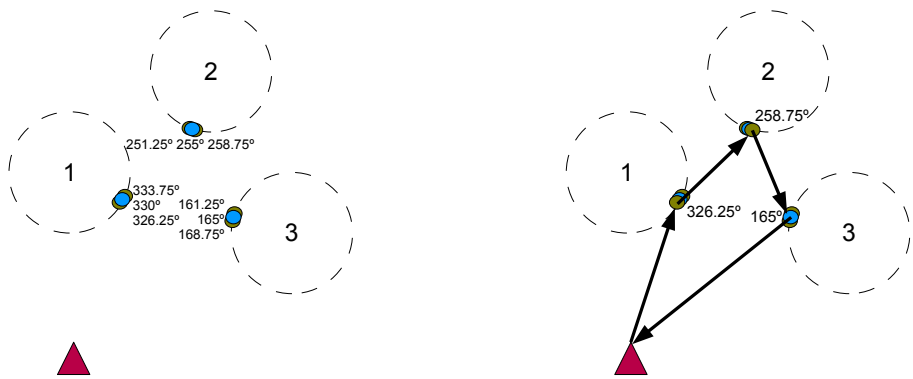
In Figure D.10, we show the solution to iteration 30. In our experiments, the heuristic converges to three or four decimal places after 10 iterations but may be run as many times as needed to achieve the desired numerical precision. IP_{PhIII} solves problems with up to 1001 nodes in under 1 CPU second. IP_{PhIII} solves most



(a) Possible solution points for iteration 7

(b) Solution to iteration 7

Figure D.8: Iteration 7



(a) Possible solution points for iteration 8

(b) Solution to iteration 8

Figure D.9: Iteration 8

problems to optimality and is never more than 1% from optimality when it fails.

The IP_{PhIII} was designed for 2D problems (equal radius or arbitrary radius, Euclidean and Manhattan norm) where there the Steiner zones found in Phase I are disjoint or nearly disjoint. When there is too much overlap of Steiner zones, IP_{PhIII} produces very poor results and slows down substantially. We have not extended IP_{PhIII} to work in 3D.

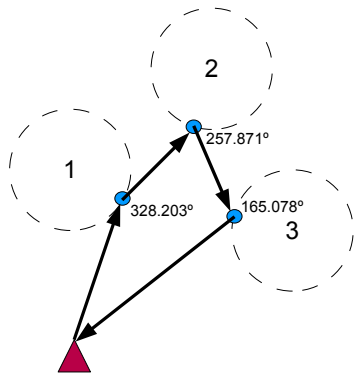


Figure D.10: The final result (iteration 30).

Appendix E

Formulation of the Touring Steiner Zones Problem as a Second-Order Cone Program

In this appendix, we formulate the Touring Steiner Zones Problem (TSZP) used to solve Phase III of the Steiner-zone heuristic to optimality as a second-order cone program (SOCP). The TSZP is the same problem as the Touring Polygons Problem (TPP) studied by Dror et al.[29] except that we consider convex regions whose boundaries are arcs of disks (Steiner zones) rather than polygons.

Let (a_i, b_i) be the origin of node i, $orig(i)$. We define r_i as the radius of the disk around node i, $disk(i)$. The binary variable e_{ij} represents the edge between nodes i and j. The sequence of Steiner zones in the tour is fixed in Phase III so that $j = i + 1$ for $i = 0, \ldots, (n-1)$ and $j = 0$ for $i = n$. Steiner zone m is denoted SZ_m. We now present the formulation.

$$\text{Minimize} \sum_{i,j} d_{ij} \tag{E1}$$

subject to

$$dX_{ij} - (x_i - x_j) = 0 \qquad i = 0, \ldots, n \tag{E2}$$

$$dY_{ij} - (y_i - y_j) = 0 \qquad i = 0, \ldots, n \tag{E3}$$

$$d_{ij}^2 - (dX_{ij}^2 + dY_{ij}^2) \leq 0 \qquad i = 0, \ldots, n \tag{E4}$$

$$(x_m - a_i)^2 + (y_m - b_i)^2 \leq r_i^2 \qquad \forall\ \mathrm{SZ}_m,\ i \in\ \mathrm{SZ}_m \tag{E5}$$

$$d \geq 0;\ dX,\ dY,\ x,\ y \text{ free};\ e \in \{0, 1\} \tag{E6}$$

The objective function (E1) minimizes the total distance of the tour found in Phase II. We include d_{ij} in the sum only when e_{ij} is an edge in the tour, that is, $e_{ij} = 1$. Similarly, all variables subscripted with ij appear only when the associated edge is in the tour produced by Phase II. The objective function is linear. Constraints (E2), (E3), and (E4) define the edge length variables, d_{ij}, such that the objective function can be written linearly. Second-order cone constraints may contain quadratic terms but cannot have mixed terms such as $x_i x_j$. Therefore, we use the dX, dY, and d variables. In (E2) and (E3), dX_{ij} and dY_{ij} define the difference variables for x_i and x_j and for y_i and y_j, respectively. Constraint (E4) expresses the distance squared, d_{ij}^2, as less than or equal to the sum of the squared x and y differences. SOCP formulations require constraints with quadratic terms to be expressed as inequalities rather than equalities. The minimization pushes this constraint towards equality so that the squared distance variable will approximate the squared Euclidean norm within a specified tolerance. Constraint (E12) requires node i's representative point to lie within the Steiner zone m of which it is a member.

The SOCP formulation can be extended to solve problems using the Manhattan norm. Constraint (E4) is dropped and constraints (E2) and (E3) are modified

to calculate the absolute value of the differences in x and y values, that is,

$$-dX_{ij} + (x_i - x_j) \leq 0 \qquad i = 0, \ldots, n \tag{E7}$$

$$-dX_{ij} + (x_j - x_i) \leq 0 \qquad i = 0, \ldots, n \tag{E8}$$

$$-dY_{ij} + (y_i - y_j) = 0 \qquad i = 0, \ldots, n \tag{E9}$$

$$-dY_{ij} + (y_j - y_i) = 0 \qquad i = 0, \ldots, n \tag{E10}$$

The SOCP formulation can be extended to solve problems using either norm in 3D. Node i's origin, $orig(i)$, is now represented by a triple, (a_i, b_i, c_i). We define r_i as the radius of the sphere surrounding node i, $sphere(i)$. The difference in z-coordinates for edge e_{ij} is represented by the continuous variable, dZ_{ij}, in constraint (E11):

$$dY_{ij} - (y_i - y_j) = 0 i = 0, \ldots, n \tag{E11}$$

Each representative point must lie within a three-dimensional Steiner-zone so that constraint (E12) is rewritten as:

$$(x_m - a_i)^2 + (y_m - b_i)^2 + (z_m - c_i)^2 \leq r_i^2 \qquad \forall \text{ SZ}_m,\ i \in \text{ SZ}_m \tag{E12}$$

Using the Manhattan norm in 3D, we add

$$-dZ_{ij} + (z_i - z_j) \leq 0 \qquad i = 0, \ldots, n \tag{E13}$$

$$-dZ_{ij} + (z_j - z_i) \leq 0 \qquad i = 0, \ldots, n \tag{E14}$$

to constraints (E7)-(E10).

The SOCP formulation solves Phase III of SZH to optimality and can handle arbitrary amounts of disk overlap. In computational experiments, CPLEX solved

100-node TSZPs in less than 1 second and 1000-node TSZPs in roughly 6 seconds. However, solution times grow rapidly as n grows. A 13,509-node TSZP is solved in roughly 300 seconds. In addition to longer solution times, the interior-point solver used by CPLEX to solve SOCPs is prone to numerical difficulties. For problems with a large variance among the values of r_i, CPLEX returns an infeasible solution due to ill-conditioning in the constraint matrix. Even when $r_i = r_j$ for all nodes i and j, the TSZP coefficients must be scaled to avoid ill-conditioning.

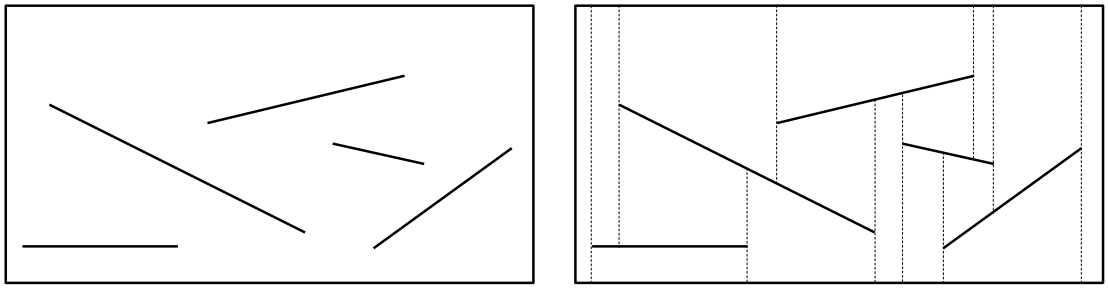
We note that our SOCP formulation can solve the general TPP to optimality with convex, possibly intersecting polygons presented in Dror et al. [29] by replacing constraint (E12) with the appropriate linear constraints describing each polygon.

Appendix F

Circular Trapezoidal Decomposition

Given a bounded rectangle containing a set, S, of non-intersecting lines, each non-vertical with unique endpoints, the rectangle can be decomposed into a set of contiguous trapezoids. A vertical line (bullet path) is extended from each endpoint and stops only when it hits a line from S or the rectangle. We show a rectangle and a set S in Figure F.1(a) and the resulting decomposition in Figure F.1(b). This decomposition is constructed efficiently with the randomized incremental algorithm introduced by Mulmuley [55] and is stored using a data structure called a history directed acyclical graph or history DAG. With this structure, one can answer point-location queries in $O(\log n)$ time. The algorithm is used frequently in the computational geometry field.

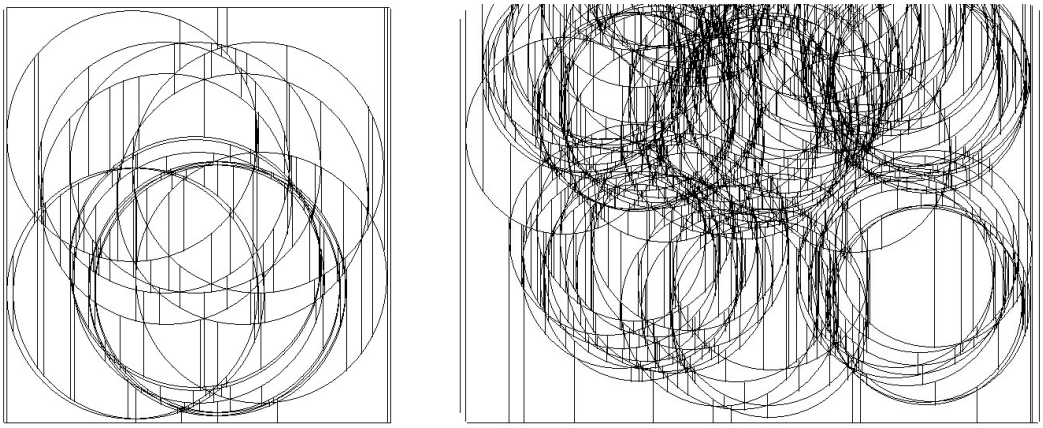
Trapezoidal decomposition can be extended to the case where the lines intersect and have non-unique endpoints. The lines in S can be replaced by a set, C of upper and lower hemisphere perimeters such that the union of each pair of perimeters is a disk. We call this circular trapezoidal decomposition (CTD) and show two examples in Figure F.1. The resulting trapezoids are replaced by regions whose bottom and top boundaries are either arcs from a disk or the bounding rectangle. The left and right boundaries remain vertical bullet paths. Each disk in a CETSP or CEVRP problem can be divided into an upper and lower hemisphere perimeters.



(a) A bounding rectangle containing five non-intersecting, non-vertical lines with unique endpoints.

(b) The region decomposed into 16 trapezoids.

Figure F.1: An example of trapezoidal decomposition. The dashed vertical lines are called bullet paths.



(a) An example with 18 disks

(b) Detail from problem pcb442 from TSPLIB with $r = 25$ for all disks.

Figure F.2: Two examples of the circular trapezoidal decomposition of a graph of disks.

We can apply circular trapezoidal decomposition to the C producing contiguous, non-overlapping regions. The number of disks overlapping in each region (degree) can be computed. We can order the entire list of regions by degree and greedily choose the regions with the highest degree to serve in Phase II and Phase III of SZH.

Some regions found by CTD may be contained entirely in the interior of one or more disks. We know of no closed form expression to obtain a feasible point for

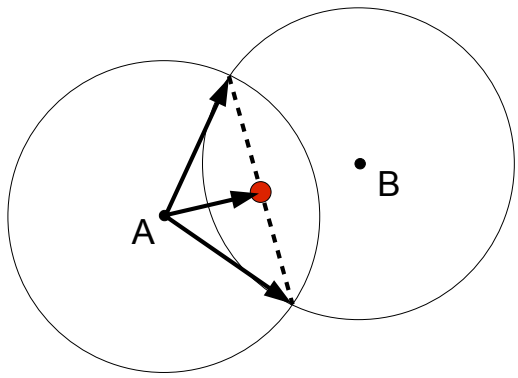


Figure F.3: The base node for this SZ is A. The perimeter of $disk(B)$ has at most two points of intersection with the perimeter of $disk(A)$. The representative point is the midpoint of the chord that connects the two points of intersection.

such regions using the method described in Phase II of SZH. Figure F.3 depicts how a feasible point is found when a node of origin is known for a particular Steiner zone. The convex hull of a $SZ(k)$ found by our Phase I heuristic has one side from each of its k component nodes. In Figure F.4 we show what a possible region found by circular trapezoidal decomposition looks like. The lens-shaped region is the intersection of $disk(A)$, $disk(B)$, and $disk(C)$. If we designated node C the origin of this $SZ(3)$, we would find an infeasible point using the method shown in Figure F.3. The angles of intersection between C and A do not overlap those of C and B. This is because $disk(C)$ contains the $SZ(3)$ in its interior. $disk(C)$ does not share any of the Steiner zone's convex hull. If, however, we knew *a priori* that either node A or node B was the origin, then we could correctly calculate a feasible point using the Phase II method shown in Figure F.3. CTD does not know which of the intersecting disks should be the node of origin for each region it creates. Therefore, the centroid of every region created by the CTD algorithm is saved as a feasible

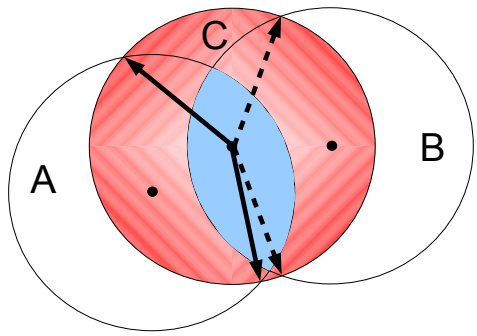


Figure F.4: The lens-shaped region is the intersection of $disk(A), disk(B)$, and $disk(C)$. The intersection of $disk(A)$ and $disk(B)$ lies in the interior of $disk(C)$. Without *a priori* knowledge that either node A or node B is the origin of this zone, we cannot compute a feasible representative point using standard Phase II methods.

point for use by the Steiner-zone heuristic.

Appendix G

LK-SOCP and CW-SOCP

In Chapters 2 - 4, we compared the performance of the Steiner-zone heuristic (SZH) to several heuristics, including YUAN+, LK-SOCP, and CW-SOCP. YUAN+, LK-SOCP, and CW-SOCP do not use Steiner zones. That is, they do not apply Phase I of SZH. Each method solves a TSP for the CETSP or a VRP for the CEVRP in Phase II. YUAN+ solves a TSP on the original n nodes to optimality using Concorde's exact TSP solver [1, 13]. LK-SOCP solves a TSP on the original n nodes using Concorde's implementation of the Lin-Kernighan TSP heuristic [1, 13]. CW-SOCP solves a VRP on the original nodes using Groër's implementation of the modified Clarke-Wright VRP heuristic [39]. All three methods solve Phase III to optimality for all routes found in Phase II. Concorde's implementation of the Lin-Kernighan heuristic (LK) is initialized by a random integer in [0, 32767]. The modified Clarke-Wright (mCW) heuristic uses a parameter λ which has values in (0, 2]. We think of YUAN+ as an optimal form of LK-SOCP since it is identical to LK-SOCP in every way except that Phase II is solved to optimality rather than approximately. We do not study YUAN+ specifically in this appendix because it achieves a similar accuracy to LK-SOCP but is much slower (see Chapter 2).

In Chapters 2 and 3, we found that for problems with high overlap ratios, LK-SOCP and CW-SOCP are generally faster than any SZH method and are more

accurate than any SZH method except those that apply Phase IV. For problems with low overlap ratio, LK-SOCP and CW-SOCP consistently produce poor results. In this appendix, we try to determine whether or not a problem's overlap ratio affects the performance of LK-SOCP and CW-SOCP. If LK-SOCP and CW-SOCP produce better tours than SZH for high overlap ratio problems, then we can consider a hybrid heuristic that applies LK-SOCP or CW-SOCP to high overlap ratio problems and a variant of SZH to problems with low and medium overlap ratios.

We computed two sets of 1001 solutions using the LK-SOCP heuristic for each CETSP problem using each norm (2D and 3D Euclidean, 2D and 3D Manhattan), with equal radius and arbitrary radius. For the first 1001 LK-SOCP runs, we used i to initialize the ith run of LK. The second 1001 tours were generated initializing LK with random integers in [0, 32767]. We also computed two sets of 1000 solutions using the CW-SOCP heuristic for each CEVRP problem, using each norm with equal radius and arbitrary radius. For the first 1000 CW-SOCP runs, we used $\lambda = \frac{i}{500}$ to initialize mCW for the ith run. The second 1000 solutions initialized mCW with a random value in (0, 2]. We report only the results produced by the first 1000 tours for each method since the results of the second 1000 were almost exactly the same as those of the first. We refer to the 1001 LK-SOCP tours as the LK1001 heuristic and the 1000 CW-SOCP solutions as the CW1000 heuristic.

G.1 CETSP

In Table G-1, we give the results for 48 CETSP problems with equal radius and 2D Euclidean norm. For the remainder of this section, all tables are formatted in the same manner. Column two displays the average length of the Phase II TSP tours found by LK1001 (LK found the optimal TSP tour at least once for all problems except $dsj1000$). All tour lengths are given to two decimal places. Column three shows the percentage difference between the worst and the best TSP tour lengths produced by LK. Column four gives the average length of the 1001 CETSP tours produced by LK1001. Column five shows the percentage difference between the longest and the shortest CETSP tours produced by LK1001. Columns six through eight display the results found by one run of LK-SOCP, SZ2, and SZ3. Recall that SZ2 is the standard variant of SZH, and SZ3 applies the Phase IV post-processor to the solution produced by Phase III for each of the four Phase I - Phase II - Phase III cycles in SZ2 (see Chapter 2).

When LK-SOCP is modified so that Phase II is solved to optimality, we call this method YUAN+ (see Chapter 2 and [73]). In columns nine and 10, we present the amount (as a percentage) that the solution produced by YUAN+ is better than the solutions produced by SZ2 and SZ3, respectively. In columns 11 and 12, we present the amount (as a percentage) by which the average CETSP tour produced by LK1001 is better than SZ2 and SZ3, respectively. In columns nine though 12, a negative percentage indicates that the SZH solution (either SZ2 or SZ3) is longer (poorer) than the YUAN+ or LK1001 solution. For example, the average LK1001

tour for low-overlap $kroD100$ is 0.34% longer than the tour produced by SZ2. The average LK1001 tour for low-overlap $rat195$ is 0.25% shorter than the SZ2 tour. Columns 13 and 14 indicate how many of the 1001 solutions are shorter than SZ2 and SZ3, respectively.

In Table G-1, we see that LK produces TSP tours that vary no more than 2% in length (column 3). However, the CETSP solutions produced from these TSP tours vary up to 47% (column 5 for $rd400$ is 47.29%). Comparing tour lengths of the four heuristics (columns 4, 6, 7, and 8), we see in columns 9 and 11 that for two low overlap ratio $TSPLIB$ problems, one medium overlap ratio $TSPLIB$ problem, and four high overlap ratio $TSPLIB$ problems, YUAN+ is 0.20% to 1.86% shorter than SZ2 on average. For two medium overlap ratio $TSPLIB$ problems and two high overlap ratio $TSPLIB$ problems, YUAN+ is 10% to 39% worse than SZ2 on average. Similarly, the average LK1001 solution is up to 1.76% shorter than SZ2's solution for two low overlap ratio problems, two medium overlap ratio problems, and four high overlap ratio problems. The average LK1001 solution is 10% to 31% longer than SZ2 for five of the $TSPLIB$ problems.

In columns 10 and 12, we see that YUAN+ and the average LK1001 tour are both longer than the SZ3 solution for 45 problems. In column 13, we see that, for nine of 27 $TSPLIB$ problems, only zero to 59 of the 1001 LK1001 solutions are shorter than the SZ2 solution. For five high overlap ratio problems and one medium overlap ratio problem, however, 959 to 1001 of the 1001 LK1001 solutions are shorter than the SZ2 solution. For 18 of the 48 problems, LK1001 produces better tours than SZ2 over 50% of the time (at least 561 tours). For 25 problems,

LK1001 produces zero to 86 tours better than SZ2's solution.

The results are different when we compare LK1001 to SZ3 in column 14. We see that in 39 problems, LK1001 produces zero solutions better than SZ3 and in two problems, it produces one solution that is better than the SZ3 solution. Recall that SZ3 applies Phase IV to each solution found in Phase III and is much slower but more accurate, in general, than LK-SOCP or SZ2. Only for the *rotatingDiamonds* problems, *concentricCircles*1, and *concentricCircles*2 are at least 5% of the 1001 LK1001 tours better than the SZ3 solution. SZ3 is more accurate than SZ2 and LK1001 (LK-SOCP) but slower. For the remainder of the appendix, we compare LK-1001 mostly with SZ2 and not SZ3.

The results given in Table G-1 indicate that LK-SOCP's performance is highly problem dependent. For many problems (10 of 14 low and medium overlap ratio $TSPLIB$ problems, 32 of 48 overall), the average length of the 1001 LK1001 solutions is longer than the SZ2 solutions, often well over 10% longer. For some problems (five of seven low overlap ratio $TSPLIB$ problems, 15 of 48 overall), 69% to 100% of the LK-SOCP solutions are shorter than the SZ2 solutions. It appears that the overlap ratio has a strong affect on the LK-SOCP heuristic's performance compared to SZ2.

The results in Tables G-2, G-3, and G-4 are very similar to those in Table G-1. For most problems, LK-SOCP either produces a slightly better solution than SZ2 on average or a substantially poorer solution. Over all four problem sets, over 50% of the LK1001 tours are better than the SZ2 solutions in 49 of 152 problems (32.24%). Over 50% of the tours are better than the SZ3 solutions in only four of 152 problems

(2.63%). LK1001 finds no solutions that are better than the SZ2 solutions for 43 of 152 problems (28.29%) and no solutions better than the SZ3 solutions for 128 of the 152 problems (84.21%).

Table G-1: LK1001, 2D Euclidean Norm, Equal Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	212.94	0.07	164.31	0.25	164.31	163.76	160.96	0.34	2.08	0.34	2.08	0	0
rat195	233.77	0.78	170.86	4.80	172.51	171.29	167.57	-0.23	1.98	-0.25	1.96	705	0
lin318	4221.74	1.23	2990.81	5.81	3003.94	2941.00	2872.37	0.30	2.69	1.69	4.12	1	0
rd400	1531.13	0.86	1075.40	5.86	1066.15	1066.16	1051.70	0.29	1.67	0.87	2.25	164	0
pcb442	509.97	1.26	350.20	11.43	351.61	333.24	328.08	2.86	4.47	5.09	6.74	0	0
d493	351.01	1.00	219.83	7.40	217.82	213.51	207.44	3.70	6.73	2.96	5.97	3	0
dsj1000	1877.08	0.99	1006.64	6.41	1010.43	1010.86	965.52	-0.50	4.17	-0.42	4.26	691	0
Overlap ratio: 0.1													
kroD100	212.94	0.07	95.64	0.51	95.64	96.68	90.88	-1.07	5.24	-1.07	5.23	1001	0
rat195	233.77	0.78	82.75	25.10	88.44	74.16	69.48	4.72	11.77	11.59	19.10	0	0
lin318	4221.74	1.23	1529.39	15.87	1471.93	1556.82	1444.53	0.02	7.79	-1.76	5.87	586	0
rd400	1531.13	0.86	578.76	23.85	542.43	521.91	500.42	1.19	5.54	10.89	15.65	11	0
pcb442	509.97	1.26	211.96	24.72	209.68	162.26	152.98	32.76	40.81	30.63	38.55	0	0
d493	351.01	1.00	115.62	18.30	122.04	110.90	104.16	2.94	9.60	4.26	11.01	59	0
dsj1000	1877.08	0.99	411.90	26.73	398.78	404.60	379.97	14.75	22.18	1.81	8.40	321	1
Overlap ratio: 0.3													
kroD100	212.94	0.07	58.54	0.00	58.54	58.54	58.54	0.00	0.00	0.00	0.00	1001	0
rat195	233.77	0.78	45.73	0.07	45.74	45.79	45.70	-0.20	0.00	-0.14	0.06	1001	0
lin318	4221.74	1.23	769.80	2.62	765.96	782.40	765.96	-0.74	1.39	-1.61	0.50	992	0
rd400	1531.13	0.86	269.28	47.29	229.11	233.29	224.84	-1.86	1.83	15.43	19.77	183	0
pcb442	509.97	1.26	102.50	40.96	106.32	85.12	83.54	21.80	24.10	20.42	22.70	19	0
d493	351.01	1.00	69.84	2.98	69.76	70.75	69.76	-1.41	0.00	-1.30	0.11	959	0
dsj1000	1877.08	0.99	200.15	19.22	199.95	201.92	199.95	1.11	2.11	-0.88	0.10	976	0
Varied overlap ratios													
team1_100	627.11	0.74	316.97	6.97	316.32	326.73	308.73	-3.19	2.46	-2.99	2.67	968	0
team2_200	1075.52	0.62	347.92	29.04	345.41	277.61	250.55	0.23	11.05	25.33	38.86	0	0
team3_300	1049.66	1.60	497.45	10.73	497.66	505.65	468.65	-1.58	6.19	-1.62	6.15	861	0
team4_400	1419.12	0.92	763.32	8.93	777.74	742.83	688.63	0.06	7.94	2.76	10.85	27	0
team5_499	1135.58	0.48	741.65	6.50	758.48	727.57	710.02	1.80	4.32	1.93	4.45	38	0
team6_500	1514.00	0.75	258.26	37.79	245.17	232.94	225.92	21.39	25.16	10.87	14.32	5	1
bonus1000	2083.53	0.66	512.53	33.35	508.27	439.59	414.42	10.40	17.10	16.59	23.67	0	0
concentricCircles1	77.98	0.00	53.16	0.00	53.16	54.91	53.40	-3.19	-0.46	-3.19	-0.46	1001	1001

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
concentricCircles2	209.65	0.00	161.71	2.64	160.00	161.90	160.00	1.43	2.64	-0.12	1.07	692	201
concentricCircles3	396.18	0.17	323.24	2.79	324.55	274.88	272.89	16.56	17.41	17.59	18.45	0	0
concentricCircles4	639.30	0.13	524.02	2.27	522.51	479.97	475.96	9.74	10.67	9.18	10.10	0	0
concentricCircles5	931.44	0.35	695.00	7.34	694.01	666.73	664.09	4.96	5.37	4.24	4.65	0	0
bubbles1	430.62	0.00	349.13	0.00	349.13	351.58	349.13	-0.70	0.00	-0.70	0.00	1001	0
bubbles2	830.62	0.00	530.21	56.84	514.14	429.29	428.28	24.88	25.17	23.51	23.80	74	0
bubbles3	1330.62	0.00	659.10	50.82	712.74	595.56	548.89	4.32	13.19	10.67	20.08	86	0
bubbles4	1910.62	0.00	1006.29	35.42	1024.51	863.49	836.54	19.84	23.71	16.54	20.29	0	0
bubbles5	2570.62	0.00	1320.69	27.12	1327.46	1141.87	1095.24	14.81	19.70	15.66	20.58	0	0
bubbles6	3310.65	0.20	1692.13	23.58	1674.06	1464.27	1404.16	18.97	24.06	15.56	20.51	0	0
bubbles7	4130.68	0.10	2107.62	20.63	2154.57	1839.94	1720.21	12.93	20.79	14.55	22.52	0	0
bubbles8	5030.89	0.16	2559.61	18.02	2630.22	2250.56	2158.78	15.88	20.80	13.73	18.57	0	0
bubbles9	6010.94	0.14	3054.66	17.95	3176.34	2626.10	2550.53	16.51	19.97	16.32	19.77	0	0
rotatingDiamonds1	48.20	0.00	32.39	0.00	32.39	33.15	33.15	-2.30	-2.30	-2.30	-2.30	1001	1001
rotatingDiamonds2	172.65	0.51	142.91	3.01	144.71	142.25	140.48	-1.25	0.00	0.46	1.73	352	163
rotatingDiamonds3	430.10	0.29	384.04	1.99	385.53	383.35	381.48	-0.64	-0.16	0.18	0.67	343	137
rotatingDiamonds4	836.96	0.15	773.87	0.95	771.31	774.80	771.36	0.10	0.54	-0.12	0.33	561	151
rotatingDiamonds5	1594.54	0.13	1514.65	0.59	1512.49	1515.44	1511.50	-0.03	0.23	-0.05	0.21	585	54
chaoSingleDep	1439.88	3.40	1023.90	6.29	1022.88	1022.98	1022.88	-0.01	0.00	0.09	0.10	981	0

Table G-2: LK1001, 3D Euclidean Norm, Equal Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	277.90	0.00	202.56	0.13	202.43	202.25	202.02	0.09	0.20	0.15	0.27	0	0
rat195	406.80	0.37	295.00	3.48	296.37	293.38	292.86	1.02	1.20	0.55	0.73	56	41
lin318	4989.73	0.47	3126.14	4.12	3172.96	3114.72	3044.27	0.55	2.88	0.37	2.69	304	0
rd400	4017.86	0.41	3234.97	1.20	3237.62	3230.53	3226.84	0.13	0.24	0.14	0.25	125	5
pcb442	682.52	0.28	425.10	4.56	429.12	415.63	404.49	3.23	6.08	2.28	5.09	0	0
d493	1717.52	0.33	1362.59	2.87	1366.28	1362.37	1358.71	0.17	0.44	0.02	0.29	536	232
dsj1000	5195.19	0.52	3234.08	2.84	3213.25	3260.75	3165.53	-0.10	2.90	-0.82	2.17	963	0
Overlap ratio: 0.1													
kroD100	277.90	0.00	96.81	0.00	96.81	97.69	91.67	-0.89	5.61	-0.89	5.61	1001	0
rat195	406.80	0.37	132.60	23.43	138.98	117.30	112.40	9.75	14.53	13.05	17.97	0	0
lin318	4989.73	0.47	1575.95	12.51	1529.83	1545.70	1443.43	4.22	11.60	1.96	9.18	211	0
rd400	4017.86	0.41	1763.97	7.06	1766.69	1713.22	1552.72	3.18	13.85	2.96	13.61	2	0
pcb442	682.52	0.28	218.68	19.20	217.66	162.92	154.81	36.39	43.53	34.23	41.26	0	0
d493	1717.52	0.33	731.25	8.24	760.97	728.71	665.06	-0.20	9.35	0.35	9.95	446	0
dsj1000	5195.19	0.52	1162.36	21.03	1155.41	1022.98	1021.25	18.56	18.76	13.63	13.82	0	0
Overlap ratio: 0.3													
kroD100	277.90	0.00	58.93	0.00	58.93	59.06	58.93	-0.23	0.00	-0.23	0.00	1001	0
rat195	406.80	0.37	47.92	19.77	47.92	48.11	47.89	-0.34	0.12	-0.39	0.07	997	0
lin318	4989.95	0.43	770.30	4.30	768.56	783.33	766.83	-1.88	0.23	-1.66	0.45	955	0
rd400	4017.86	0.41	753.90	37.21	762.64	575.51	539.95	28.57	37.03	31.00	39.62	0	0
pcb442	682.52	0.28	102.00	40.11	101.63	84.83	83.72	20.25	21.83	20.25	21.83	0	0
d493	1717.31	0.35	362.36	11.97	373.62	348.29	335.59	3.09	6.99	4.04	7.98	1	0
dsj1000	5195.19	0.52	301.92	46.90	316.17	302.43	270.62	4.07	16.31	-0.17	11.57	537	0
Varied overlap ratios													
team1_100	1446.15	0.71	841.99	7.88	833.08	838.39	820.73	-0.63	2.46	0.43	2.59	550	0
team2_200	1797.62	0.55	394.76	52.19	393.28	325.24	283.24	10.85	11.05	21.37	39.37	3	0
team3_300	2856.77	0.53	1547.64	5.17	1544.50	1563.77	1499.66	-1.83	6.19	-1.03	3.20	905	0
team4_400	1907.26	0.31	856.93	7.06	841.61	811.83	753.81	4.86	7.94	5.55	13.68	0	0
team5_499	2814.04	0.23	1943.79	2.05	1937.80	1959.95	1933.04	-0.50	4.32	-0.82	0.56	995	69
team6_500	2795.18	0.34	315.36	59.17	305.36	257.78	236.96	23.88	25.16	22.34	33.08	8	0
bonus1000	5011.11	0.25	1150.93	21.94	1155.27	941.35	941.35	20.64	17.10	22.26	22.26	0	0

Table G-3: LK1001, 2D Manhattan Norm, Equal Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	264.40	0.05	202.93	1.07	202.94	201.59	197.87	0.67	2.56	0.67	2.56	3	0
rat195	286.63	0.91	202.53	7.04	200.20	198.15	194.91	2.26	1.98	2.21	3.91	8	0
lin318	4930.77	1.01	3562.80	6.23	3577.33	3433.31	3399.26	3.04	4.07	3.77	4.81	0	0
rd400	1920.64	1.10	1314.70	5.51	1291.62	1304.09	1287.30	-0.58	0.71	0.81	2.13	240	4
pcb442	562.11	1.61	396.09	12.44	402.67	381.67	370.98	-0.19	2.68	3.78	6.77	23	0
d493	434.34	0.93	282.50	6.45	286.17	275.92	270.34	4.14	6.30	2.38	4.50	33	0
dsj1000	2340.12	1.15	1240.57	7.35	1248.96	1244.13	1199.82	0.21	3.92	-0.29	3.40	578	3
Overlap ratio: 0.1													
kroD100	0.00	0.05	109.63	1.63	109.63	114.56	102.49	-4.30	6.96	-4.30	6.97	1001	0
rat195	0.00	0.91	97.86	31.15	94.50	92.54	77.97	1.08	19.96	5.75	25.51	34	0
lin318	4930.77	1.01	1906.15	25.22	1905.96	1869.35	1605.13	2.04	18.84	1.97	18.75	111	0
rd400	1920.64	1.10	652.07	28.45	613.00	617.85	550.90	3.06	15.58	5.54	18.36	109	0
pcb442	562.11	1.61	237.63	28.18	241.26	196.15	180.14	22.94	33.87	21.15	31.92	0	0
d493	434.34	0.93	147.34	24.73	143.67	137.23	132.38	4.56	8.39	7.37	11.30	16	0
dsj1000	2340.12	1.15	507.22	37.63	586.49	490.56	441.84	17.69	30.66	3.40	14.80	326	29
Overlap ratio: 0.3													
kroD100	264.40	0.05	71.02	0.00	71.02	71.02	71.02	0.00	0.00	0.00	0.00	0	0
rat195	286.63	0.91	55.88	0.00	55.88	55.88	55.88	0.00	0.00	0.00	0.00	0	0
lin318	4932.30	1.04	853.11	4.09	850.29	876.58	847.17	-3.00	0.37	-2.68	0.70	1000	0
rd400	1920.64	1.10	305.25	56.35	289.55	266.13	242.02	22.65	34.87	14.70	26.12	152	0
pcb442	562.11	1.61	126.16	36.65	114.98	104.15	103.76	35.52	36.03	21.13	21.59	30	0
d493	434.11	0.89	92.51	3.52	92.43	97.30	92.43	-5.00	0.00	-4.92	0.08	1001	0
dsj1000	2340.12	1.15	240.85	29.63	239.50	248.90	239.50	24.74	29.63	-3.23	0.56	966	0
Varied overlap ratios													
team1_100	788.24	0.90	392.69	6.76	398.38	403.68	383.28	-1.31	3.94	-2.72	2.67	997	310
team2_200	1333.17	0.74	359.19	42.73	375.05	313.17	287.82	7.67	17.15	14.69	24.79	133	0
team3_300	1312.70	0.95	603.82	9.43	603.46	605.53	578.92	-0.34	4.24	-0.28	4.30	481	6
team4_400	1773.60	0.77	961.85	14.48	976.09	899.70	850.18	10.53	16.97	6.91	13.13	1	0
team5_499	1404.07	3.70	888.27	11.39	891.86	893.05	857.53	0.37	4.53	-0.54	3.58	731	0
team6_500	1899.89	0.61	316.03	51.29	305.67	269.23	260.80	22.28	26.23	17.38	21.18	4	0
bonus1000	2604.75	0.68	584.65	34.52	559.16	561.22	464.44	3.67	25.27	4.17	25.88	186	0
concentricCircles1	98.33	0.00	68.33	0.00	53.16	54.91	53.40	0.90	0.90	0.90	0.90	0	0

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
concentricCircles2	265.80	0.00	204.51	0.00	160.00	161.90	160.00	-0.22	-0.22	-0.22	-0.22	1001	1001
concentricCircles3	502.87	0.11	387.12	1.36	324.55	274.88	272.89	10.92	11.09	11.09	11.26	0	0
concentricCircles4	810.79	0.35	631.09	7.79	522.51	479.97	475.96	3.26	4.09	3.28	4.11	0	0
concentricCircles5	1170.46	0.44	874.28	8.00	694.01	666.73	664.09	5.01	5.81	5.74	6.55	0	0
bubbles1	440.00	0.00	367.89	0.00	349.13	351.58	349.13	0.00	0.00	0.00	0.00	0	0
bubbles2	840.01	1.19	556.32	0.00	514.14	429.29	428.28	0.00	0.00	22.23	24.21	18	0
bubbles3	1340.00	0.00	739.51	0.00	712.74	595.56	548.89	0.00	0.00	12.11	24.17	61	0
bubbles4	1920.00	0.00	1113.52	0.00	1024.51	863.49	836.54	0.00	0.00	19.76	21.03	0	0
bubbles5	2580.00	0.00	1487.17	0.00	1327.46	1141.87	1095.24	0.00	0.00	12.97	24.64	1	0
bubbles6	3320.14	0.30	1918.16	0.00	1674.06	1464.27	1404.16	0.00	0.00	20.86	24.36	0	0
bubbles7	4140.10	0.48	2407.52	0.00	2154.57	1839.94	1720.21	0.00	0.00	18.75	26.08	0	0
bubbles8	5040.43	0.40	2930.47	0.00	2630.22	2250.56	2158.78	0.00	0.00	21.12	24.32	0	0
bubbles9	6020.36	0.33	3503.69	0.00	3176.34	2626.10	2550.53	0.00	0.00	20.76	25.47	0	0
rotatingDiamonds1	50.00	0.00	35.58	0.00	32.39	33.15	33.15	-1.61	0.00	-1.61	0.00	1001	0
rotatingDiamonds2	226.00	0.00	192.75	0.38	144.71	142.25	140.48	-0.28	0.00	-0.07	0.21	420	0
rotatingDiamonds3	482.00	0.00	432.88	0.87	385.53	383.35	381.48	-0.12	0.00	0.00	0.13	414	0
rotatingDiamonds4	1058.00	0.00	990.15	0.57	771.31	774.80	771.36	0.09	0.14	0.06	0.11	189	20
rotatingDiamonds5	1814.00	0.00	1730.07	0.27	1512.49	1515.44	1511.50	0.05	0.08	0.03	0.06	191	12
chaoSingleDep	1718.05	2.79	1195.02	8.56	1022.88	1022.98	1022.88	-0.05	0.00	0.83	0.88	0	0

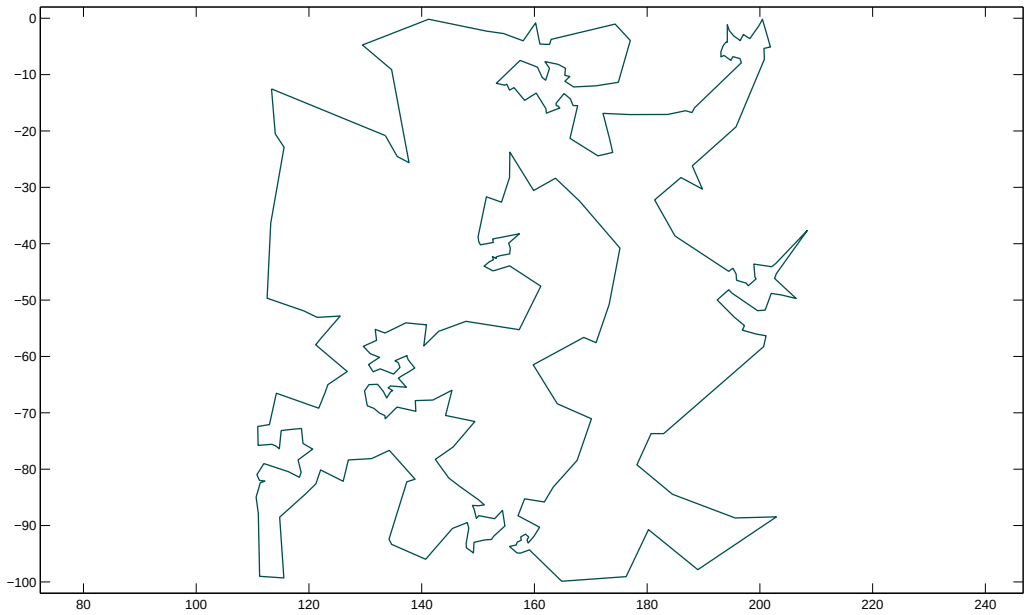
Table G-4: LK1001, 3D Manhattan Norm, Equal Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

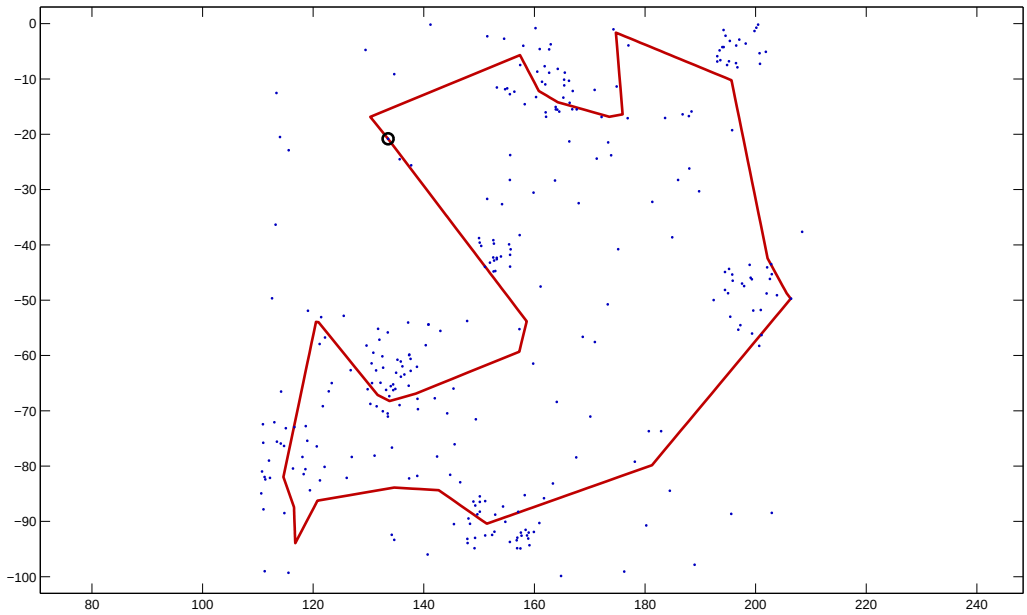
Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	399.06	0.13	277.72	0.38	277.72	277.05	276.95	0.24	0.28	0.24	0.28	0	0
rat195	591.49	0.27	416.49	2.75	415.27	417.29	414.55	0.18	0.84	-0.19	0.47	659	90
lin318	6708.76	0.62	3868.97	4.77	3903.53	3904.44	3748.12	-0.02	4.15	-0.91	3.22	797	0
rd400	5874.96	0.32	4596.40	2.14	4582.57	4602.34	4600.25	-0.43	-0.38	-0.13	-0.08	718	611
pcb442	901.00	0.49	575.93	5.38	575.36	563.70	539.54	1.31	5.85	2.17	6.75	4	0
d493	2486.45	0.16	1925.20	1.90	1926.40	1921.38	1914.73	0.27	0.62	0.20	0.55	249	0
dsj1000	7556.78	0.45	4555.97	3.15	4537.34	4582.50	4412.97	-0.99	2.82	-0.58	3.24	880	0
Overlap ratio: 0.1													
kroD100	399.06	0.13	121.49	2.85	121.49	123.81	112.57	-1.88	7.92	-1.88	7.93	999	0
rat195	591.49	0.27	178.71	18.23	176.76	169.30	151.82	10.78	23.53	5.56	17.71	27	0
lin318	6708.76	0.62	1899.65	26.33	1805.28	1884.60	1612.49	-4.21	11.96	0.80	17.81	616	0
rd400	5874.96	0.32	2513.09	9.37	2504.25	2448.11	2132.78	2.29	17.42	2.65	17.83	33	0
pcb442	901.00	0.49	274.62	24.55	274.24	197.26	181.86	40.33	52.21	39.22	51.01	0	0
d493	2486.45	0.16	1034.24	9.22	1042.81	1021.28	950.83	2.11	9.67	1.27	8.77	248	0
dsj1000	7556.78	0.45	1553.64	22.96	1507.62	1400.49	1315.99	7.65	14.56	10.94	18.06	2	0
Overlap ratio: 0.3													
kroD100	399.06	0.13	71.38	0.00	71.38	71.38	71.38	-0.01	0.00	-0.01	0.00	1001	0
rat195	591.49	0.27	60.14	11.47	59.96	62.34	59.96	-3.53	0.31	-3.52	0.31	999	0
lin318	6708.04	0.63	852.35	11.02	851.47	908.59	851.47	-6.29	0.00	-6.19	0.10	1000	0
rd400	5874.96	0.32	1070.52	43.73	1108.54	748.37	688.40	48.13	61.03	43.05	55.51	0	0
pcb442	901.00	0.49	121.44	51.48	134.36	104.89	104.26	18.62	19.33	15.78	16.48	76	0
d493	2486.48	0.19	475.07	11.48	481.59	458.68	391.92	5.00	22.88	3.57	21.22	251	0
dsj1000	7556.78	0.45	434.43	64.08	442.47	423.63	341.17	4.45	29.69	2.55	27.34	394	0
Varied overlap ratios													
team1_100	2058.56	0.22	1142.10	7.26	1161.48	1151.89	1102.03	0.83	3.94	-0.85	3.64	384	81
team2_200	2590.83	0.53	403.27	39.77	393.65	412.59	361.76	-4.59	17.15	-2.26	11.47	776	0
team3_300	4154.28	0.46	2118.39	6.32	2112.78	2104.57	2001.11	0.39	4.24	0.66	5.86	249	0
team4_400	2762.26	0.37	1099.41	8.62	1109.05	1082.03	970.05	2.50	16.97	1.61	13.34	111	0
team5_499	4086.33	0.23	2755.48	3.16	2746.39	2770.93	2710.33	-0.89	4.53	-0.56	1.67	822	0
team6_500	4096.20	0.31	427.15	74.38	449.46	330.20	293.61	36.12	26.23	29.36	45.48	13	0
bonus1000	7319.90	0.20	1658.92	19.58	1697.60	1305.47	1305.47	30.04	25.27	27.07	27.07	0	0

In Tables G-5 - G-8, we give the results for the same experiments as in Tables G-1 - G-4, except that we use arbitrary radius instead of equal radius. We have 14 arbitrary radius problems using each norm (2D Euclidean, 2D Manhattan, 3D Euclidean, 3D Manhattan).

The results for arbitrary radius problems show that LK1001 typically performs very poorly for these problems. For example, in column 13, we see that in 33 of the 47 problems for which we present results in Tables G-5 - G-8, none of the LK1001 tours are better than the SZ2 solution. In 41 of the 47 solutions, none of the LK1001 tours are better than the SZ3 solution. In only 11 of the 47 problems are more than 100 of the LK1001 tours better than the SZ2 solution. This suggests that LK-SOCP is not nearly as effective for solving arbitrary radius problems as it can be for problems with equal radius. We think that because the disk radii can vary so much for arbitrary radius problems, the best CETSP tour sequence may look nothing like the optimal TSP solution, as shown in Figure G.1. Applying Phase III to high-quality TSP tours for an arbitrary radius problem may not produce good CETSP solutions. Although this can also happen with equal radius problems, it seems much less likely to do so than for arbitrary radius problems.



(a) Optimal 300-node TSP tour



(b) Best known CETSP tour

Figure G.1: The optimal TSP solution and the best known solution for a 300-node CETSP with arbitrary radius.

Table G-5: LK1001, 2D Euclidean Norm, Arbitrary Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	212.94	0.07	149.20	0.32	149.20	144.39	143.28	3.33	4.13	3.32	4.12	0	0
rat195	233.77	0.78	77.09	34.51	78.89	68.66	68.22	11.84	12.55	12.29	13.00	0	0
lin318	4221.74	1.23	2367.80	17.11	2365.44	2175.72	2187.68	10.73	10.13	8.83	8.23	0	0
rd400	1531.13	0.86	1279.66	3.13	1288.05	1276.08	1273.15	-0.02	0.21	0.28	0.51	277	102
pcb442	509.97	1.26	293.78	14.15	298.99	243.48	246.08	22.58	21.28	20.66	19.38	0	0
d493	351.30	0.97	173.04	16.10	180.57	142.08	157.17	26.92	14.73	21.79	10.10	0	0
dsj1000	-	-	-	-	-	-	-	-	-	-	-	-	-
team1_100	627.12	0.74	414.40	8.52	413.87	390.95	388.54	5.86	6.52	6.00	6.66	0	0
team2_200	1075.52	0.62	680.16	9.27	676.27	655.81	637.07	4.39	7.46	3.71	6.76	0	0
team3_300	1049.74	1.38	436.97	16.36	418.53	396.61	398.29	9.74	9.27	10.18	9.71	0	0
team4_400	1419.12	0.92	1055.32	3.96	1063.87	1025.83	1020.85	2.77	3.27	2.87	3.38	0	0
team5_499	1135.58	0.48	518.96	19.44	557.32	455.61	454.33	13.62	13.94	13.90	14.23	0	0
team6_500	1514.00	0.75	773.37	17.68	795.03	678.03	684.95	17.52	16.33	14.06	12.91	0	0
bonus1000	2083.79	0.62	1143.50	7.28	1149.31	992.61	1033.07	15.02	10.52	15.20	10.69	471	471

Table G-6: LK1001, 3D Euclidean Norm, Arbitrary Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	277.90	0.00	179.38	0.34	179.69	174.69	171.57	2.51	4.38	2.69	4.55	0	0
rat195	406.80	0.37	117.48	26.19	121.77	86.62	84.47	33.51	36.90	35.64	39.08	0	0
lin318	4989.73	0.47	2388.08	14.88	2494.02	2346.60	2189.43	0.12	7.31	1.77	9.07	166	0
rd400	4017.86	0.41	3600.45	0.69	3597.89	3598.82	3595.97	355.29	355.65	0.05	0.12	499	52
pcb442	682.52	0.28	327.43	9.79	332.47	269.99	258.40	19.12	24.46	21.28	26.71	0	0
d493	-	-	-	-	-	-	-	-	-	-	-	-	-
dsj1000	-	-	-	-	-	-	-	-	-	-	-	-	-
team1_100	1446.45	0.71	942.27	3.94	927.88	949.43	908.96	-2.27	2.08	-0.75	3.66	528	0
team2_200	1797.62	0.55	1101.98	6.64	1126.17	1086.02	1055.95	0.02	2.86	1.47	4.36	86	0
team3_300	2857.33	0.70	1239.03	39.61	1243.21	1091.66	1053.38	13.88	18.02	13.50	17.62	0	0
team4_400	1907.26	0.31	1302.11	2.28	1291.66	1303.69	1280.40	-0.22	1.60	-0.12	1.70	498	0
team5_499	2814.05	0.23	1098.83	95.62	943.42	900.01	840.48	12.02	19.95	22.09	30.74	320	315
team6_500	-	-	-	-	-	-	-	-	-	-	-	-	-
bonus1000	-	-	-	-	-	-	-	-	-	-	-	-	-

Table G-7: LK1001, 2D Manhattan Norm, Arbitrary Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	264.40	0.05	189.95	1.46	189.96	179.07	175.64	6.08	8.15	6.08	8.15	0	0
rat195	286.63	0.91	105.22	42.10	101.40	83.44	82.20	21.53	23.36	26.11	28.00	0	0
lin318	4930.77	1.01	2975.87	14.58	3029.53	2564.74	2606.99	14.52	12.66	16.03	14.15	0	0
rd400	1920.64	1.10	1586.52	5.68	1562.38	1589.91	1544.54	-1.64	1.24	-0.21	2.72	636	0
pcb442	562.11	1.61	351.17	16.87	353.05	291.20	281.25	19.25	23.47	20.59	24.86	0	0
d493	434.11	0.89	219.32	13.66	215.09	181.79	184.74	19.84	17.93	20.65	18.72	0	0
dsj1000	-	-	-	-	-	-	-	-	-	-	-	-	-
team1_100	788.05	0.39	537.36	6.81	543.26	500.77	500.11	8.48	8.62	7.31	7.45	0	0
team2_200	1333.17	0.74	859.21	9.66	868.04	817.18	780.71	5.39	10.31	5.14	10.06	0	0
team3_300	1313.31	1.00	549.29	18.16	595.73	502.62	491.16	5.22	7.68	9.29	11.84	0	0
team4_400	1773.60	0.77	1314.21	6.50	1304.38	1260.90	1244.83	4.81	6.17	4.23	5.57	0	0
team5_499	1404.07	3.70	645.46	17.65	631.20	588.65	568.25	6.71	10.54	9.65	13.59	0	0
team6_500	1899.89	0.61	912.13	13.02	921.93	838.60	847.47	9.44	8.30	8.77	7.63	0	0
bonus1000	-	-	-	-	-	-	-	-	-	-	-	-	-

Table G-8: LK1001, 3D Manhattan Norm, Arbitrary Radius

(2): Average length of LK1001 TSP tours
(3): % difference between the best and worst of the TSP tours
(4): Average length of LK1001 CETSP tours
(5): % difference between the best and worst of the CETSP tours
(9): % that tour produced by YUAN+ is longer than the tour produced by SZ2
(10): % that tour produced by YUAN+ is longer than the tour produced by SZ3
(11): % that the average CETSP tour (column 4) is longer than the tour produced by SZ2
(12): % that the average CETSP tour (column 4) is longer than SZ3
(13): Number of LK1001 solutions that are longer than SZ2
(14): Number of LK1001 solutions that are longer than SZ3

Name	(2)	(3)	(4)	(5)	LK-SOCP	SZ2	SZ3	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	399.06	0.13	243.22	1.90	243.21	241.12	234.38	0.87	3.77	0.87	3.77	0	0
rat195	591.49	0.27	156.60	22.15	157.94	125.10	142.01	19.78	5.52	25.17	10.27	0	0
lin318	6708.76	0.62	3070.91	10.99	3065.65	2993.03	2741.18	2.06	11.44	2.60	12.03	126	0
rd400	5874.96	0.32	5194.20	1.20	5177.80	5166.95	5166.22	0.38	0.39	0.53	0.54	8	8
pcb442	901.00	0.49	437.22	14.22	429.33	368.47	343.66	22.79	31.65	18.66	27.22	0	0
d493	2486.48	0.19	1231.37	6.40	1240.47	1139.99	1065.58	8.63	16.21	8.02	15.56	0	0
dsj1000	-	-	-	-	-	-	-	-	-	-	-	-	-
team1_100	2058.64	0.22	1334.33	6.34	1336.93	1336.11	1287.18	0.60	4.42	-0.13	3.66	382	0
team2_200	2590.83	0.53	1538.87	4.60	1537.13	1514.10	1450.36	1.52	5.98	1.64	6.10	2	0
team3_300	4153.74	0.41	1732.48	17.56	1720.39	1552.42	1405.59	9.89	21.37	11.60	23.26	0	0
team4_400	2762.26	0.37	1827.28	4.04	1815.25	1808.51	1780.80	1.39	2.96	1.04	2.61	100	0
team5_499	4086.33	0.23	1471.73	22.07	1495.87	1305.65	1156.88	14.44	29.15	12.72	27.21	0	0
team6_500	4096.20	0.31	1792.04	9.99	1749.77	1597.44	1474.08	12.45	21.86	12.18	21.57	0	0
bonus1000	-	-	-	-	-	-	-	-	-	-	-	-	-

G.2 CEVRP

We conducted the same experiments for the CEVRP as we did for the CETSP. We compare between the CW-SOCP, SZVRP2, and SZVRP4$_t$ heuristics (SZVRP2 and SZVRP4$_t$ are described in detail in Chapters 3 and 4). We use the modified Clarke-Wright (mCW) VRP heuristic. We do not have a CEVRP method analogous to YUAN+ for the CETSP (which solves Phase II to optimality) since currently, there is no exact VRP solver available that can solve VRPs much larger than 50 nodes. For the results in this section, we replace columns (9) and (10) from Section G.1 with columns that compare the CEVRP solution produced from the best mCW-produced VRP solution with the solution produced by SZVRP2. We included the *concentricCircles*, *bubbles*, *rotatingDiamonds*, and *chaoSingleDep* problems in experiments with 3D norms even though these problems are two-dimensional (the z-coordinate for every node in these problems is 0) to determine if the results were consistent with what we found in two dimensions. The optimal Phase III solution to these problems using 3D norms must leave every z-coordinate at 0 so that the solution remains unchanged when projected into two dimensions. This makes intuitive sense since the shortest path between coplanar points lies in the same plane.

In Tables G-9 to G-12, we give results for the CEVRP problems with equal radius using the 2D Euclidean, 3D Euclidean, 2D Manhattan, and 3D Manhattan norms. Column 3 in each table shows that the variation in the lengths of the VRP solutions found by mCW for a problem ranges from 0% (all 1000 VRP tours have the same length) to 139%, a much larger variation than produced by the LK heuristic

for CETSP problems. The difference is likely due to the Lin-Kernighan heuristic's accuracy and mCW's inaccuracy. Solutions produced by mCW are typically used as initial solutions for tour-improvement procedures rather than final, near-optimal solutions. The length of the CEVRP solutions that result from the VRP solutions (column 5) varies between 0% and 124%. This is also a much larger variation than the variation produced by LK1001.

In column 9 of the four tables, we see that the CEVRP solution produced by the best VRP solution is better than the SZVRP2 solution in 91 of 192 problems (up to 28%). For 101 of the 192 problems, the CEVRP solution produced by the best VRP solution is worse than the SZVRP2 solution (up to 26%). In column 10, we see that the CEVRP solution produced from the best VRP solution is better than the SZVRP4$_t$ solution in only 30 of 192 problems. Columns 11 and 12 reveal that the average length of the 1000 CW1000 solutions is better than SZVRP2 in 65 of 192 problems and better than SZVRP4$_t$ in only 16 of 192 problems.

Columns 13 and 14 of the four tables show that CW-SOCP performs very well on medium and high overlap ratio problems. For 38 of 56 medium and high overlap ratio $TSPLIB$ problems, more than 50% of the CW1000 solutions are better than SZVRP2's solutions. For 26 of the 28 high overlap ratio $TSPLIB$ problems, at least one of the 1000 CW1000 solutions is better than SZVRP4$_t$'s solution, and in 15 of the 28 problems, more than 40% of the CW1000 solutions are better than SZVRP4$_t$'s solution. For low overlap ratio $TSPLIB$ problems, CW-SOCP performs very poorly. We see that for 25 of 28 low overlap ratio $TSPLIB$ problems, none of the CW1000 solutions are better than SZVRP2's solution.

Over all 192 problems in the four tables, more than 50% of the 1000 CW1000 solutions are better SZVRP2's solution in 75 of the problems (39.06%) and are better than SZVRP4$_t$'s solution in 21 of the problems (10.94%). CW1000 produces no solutions better than SZVRP2's solution in 65 of the 192 problems (33.85%) and no solutions better than SZVRP4$_t$'s solution in 122 of the 192 problems (63.54%). The percentage of problems on which CW1000 finds no solutions better than SZVRP2 (33.85%) is larger than the percentage of problems for which LK1001 finds no solutions better than SZ2 (28.29%). However, the percentage of problems on which over 50% of the CW1000 tours are better than SZVRP2 (39.06%)) is larger than the percentage of problems on which over 50% of the LK1001 tours are better than SZ2 (32.24%). CW-SOCP seems to be effective on medium overlap ratio problems and highly effective for high overlap ratio problems, and completely ineffective for low overlap ratio problems. It is interesting that CW-SOCP does so well for so many problems even though using mCW with SZH as a Phase II VRP solver does so poorly (see the results for SZVRP1 and its variants in Chapters 3 and 4).

Table G-9: CW1000, 2D Euclidean Norm, Equal Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1001 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	448.84	17.40	399.72	18.44	468.58	468.73	380.04	-0.14	0.24	4.78	5.18	168	0
rat195	398.16	9.15	334.39	9.22	382.03	365.18	294.35	5.70	9.18	9.99	13.60	0	0
lin318	6915.03	17.78	5704.78	18.13	6750.32	6109.61	5052.41	4.62	6.89	10.51	12.91	0	0
rd400	1851.26	14.46	1398.52	18.92	1683.95	1531.65	1199.49	8.56	10.89	14.14	16.59	0	0
pcb442	755.00	16.79	604.20	18.04	712.75	675.44	524.52	5.55	8.27	12.29	15.19	0	0
d493	1009.92	16.54	878.52	18.39	1139.10	1113.08	833.44	1.26	1.55	5.10	5.41	0	0
dsj1000	2461.45	23.54	1613.13	31.26	1985.57	1862.06	1442.47	2.74	5.97	8.43	11.83	0	0
Overlap ratio: 0.1													
kroD100	448.84	17.40	314.97	12.15	378.28	404.78	308.21	-6.83	1.17	-5.89	2.19	965	200
rat195	398.16	9.15	249.11	13.26	310.84	310.27	237.01	-2.38	3.12	-0.51	5.10	718	0
lin318	6915.16	17.83	4204.80	16.62	5077.09	5150.47	4035.26	-2.81	1.07	0.20	4.20	709	8
rd400	1851.25	14.43	878.41	25.41	992.84	1007.23	809.85	3.15	5.60	5.95	8.47	98	43
pcb442	755.00	16.79	452.00	17.25	565.26	553.65	407.79	2.43	7.88	5.24	10.84	10	0
d493	1009.92	16.54	752.25	17.00	987.32	1023.55	741.87	-2.08	0.12	-0.83	1.40	797	211
dsj1000	2461.40	23.92	1027.03	30.86	1284.63	1411.82	987.94	-6.44	0.89	-3.59	3.96	925	27
Overlap ratio: 0.3													
kroD100	448.84	17.40	183.68	19.83	234.26	251.70	182.88	8.93	9.53	-0.11	0.44	593	593
rat195	398.16	9.15	148.80	24.56	196.65	210.60	137.14	9.49	12.23	5.84	8.50	266	175
lin318	6915.17	17.83	2486.74	9.12	2979.15	3425.75	2683.93	-14.53	-5.54	-16.17	-7.35	1000	1000
rd400	1851.29	14.43	511.92	23.29	599.52	698.48	509.19	-7.01	2.06	-8.40	0.54	980	444
pcb442	755.00	16.88	294.32	16.15	386.75	393.56	283.22	5.45	6.38	3.01	3.92	167	98
d493	1009.92	16.54	555.60	12.34	738.40	863.34	561.40	-2.01	1.25	-4.21	-1.03	976	833
dsj1000	2461.27	23.48	557.09	29.31	697.52	751.69	613.87	-6.21	-6.09	-9.36	-9.25	962	962
Varied overlap ratios													
team1_100	1797.07	37.23	1385.00	37.98	1684.19	1880.05	1309.23	-8.67	0.99	-4.33	5.79	927	0
team2_200	1435.94	20.01	586.17	18.79	724.39	783.82	576.58	-17.14	-2.35	-13.73	1.66	1000	307
team3_300	1630.51	40.55	1107.96	46.82	1296.77	1299.40	1031.44	-4.57	-1.22	3.78	7.42	208	37
team4_400	2128.53	17.79	1472.99	24.61	1953.68	1740.61	1332.06	0.03	3.88	6.48	10.58	2	0
team5_499	1580.29	44.03	1185.64	54.56	1399.32	1326.05	1073.68	3.75	5.18	8.92	10.43	0	0
team6_500	2018.86	19.98	681.18	23.15	834.62	918.24	677.43	0.51	4.56	-3.34	0.55	781	422
bonus1000	3047.52	23.04	1463.35	30.93	1768.90	1849.27	1410.29	-3.60	-1.24	1.28	3.76	534	508
concentricCircles1	156.17	0.00	100.28	0.00	118.59	102.79	82.72	-2.45	21.23	-2.45	21.23	1000	0

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
concentricCircles2	287.40	12.77	221.46	10.36	321.94	259.50	209.97	-18.00	1.35	-14.66	5.47	1000	0
concentricCircles3	533.55	7.54	431.30	11.33	603.33	496.17	404.40	-15.55	3.62	-13.07	6.65	1000	0
concentricCircles4	852.42	4.69	724.24	6.67	824.17	796.88	627.86	-10.65	13.41	-9.12	15.35	1000	0
concentricCircles5	1164.60	11.69	938.79	23.10	1171.44	1036.23	820.15	-20.32	0.67	-9.40	14.47	1000	0
bubbles1	703.05	90.39	542.01	97.41	606.86	610.53	534.37	-13.91	-1.65	-11.22	1.43	952	951
bubbles2	914.36	18.09	669.31	52.01	668.79	538.79	495.13	-8.48	-0.40	24.23	35.18	194	115
bubbles3	1806.10	42.44	1373.42	57.51	1374.63	1305.70	1074.85	8.49	31.80	5.19	27.78	314	0
bubbles4	2688.14	55.74	2089.57	67.99	1968.81	1942.69	1535.84	8.28	36.96	7.56	36.05	25	0
bubbles5	3449.93	38.30	2593.93	62.98	2597.44	2334.85	1905.99	16.97	43.29	11.10	36.09	117	0
bubbles6	3952.79	16.75	2757.37	37.47	2765.33	2300.78	1927.99	5.99	26.48	19.85	43.02	0	0
bubbles7	4523.53	10.09	2825.36	47.37	2893.22	2295.82	1993.58	25.88	44.97	23.07	41.72	2	0
bubbles8	6164.36	30.20	4210.51	58.82	4366.46	3686.39	2990.21	10.36	36.06	14.22	40.81	23	0
bubbles9	7252.74	33.84	4944.37	60.55	5290.72	4101.77	3368.34	-1.77	19.62	20.54	46.79	21	0
rotatingDiamonds1	76.62	66.80	46.24	78.23	57.37	57.37	46.63	-24.09	-6.60	-19.40	-0.84	923	909
rotatingDiamonds2	264.43	81.32	212.59	88.37	284.00	277.07	202.78	-28.10	-1.76	-23.27	4.84	960	155
rotatingDiamonds3	774.19	83.71	683.46	88.96	781.32	745.00	634.64	-10.83	4.68	-8.26	7.69	986	0
rotatingDiamonds4	1076.14	42.47	982.62	42.55	1265.25	1126.12	872.98	-15.68	8.77	-12.74	12.56	987	0
rotatingDiamonds5	2094.97	58.82	1964.47	61.16	2310.50	2046.90	1794.43	-11.55	0.90	-4.03	9.48	634	190
chaoSingleDep	1640.80	29.12	1242.04	33.80	1515.11	1365.97	1143.39	-16.26	0.04	-9.07	8.63	846	0

Table G-10: CW1000, 3D Euclidean Norm, Equal Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1001 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	514.40	14.44	441.36	15.36	419.79	416.82	413.16	2.02	2.92	5.89	6.82	0	0
rat195	569.60	15.52	460.62	18.17	408.17	409.73	409.20	5.57	5.70	12.42	12.57	0	0
lin318	7642.21	16.97	5838.52	19.15	5433.32	5275.88	5152.44	5.10	7.61	10.66	13.32	0	0
rd400	4572.88	15.44	3788.64	18.17	3476.01	3465.61	3457.71	3.77	4.01	9.32	9.57	0	0
pcb442	925.07	13.39	667.04	16.46	613.02	595.25	588.50	6.08	7.30	12.06	13.35	0	0
d493	3348.14	7.95	3008.03	9.45	2731.11	2708.31	2714.50	6.66	6.41	11.07	10.81	0	0
dsj1000	5973.60	18.34	4010.54	25.33	3606.31	3655.84	3603.81	3.87	5.37	9.70	11.29	0	0
Overlap ratio: 0.1													
kroD100	514.40	14.44	322.03	10.50	322.18	339.93	315.77	-7.60	-0.53	-5.27	1.98	899	374
rat195	569.63	15.56	289.59	14.60	298.08	285.44	271.07	-0.12	5.17	1.46	6.83	359	0
lin318	7641.95	16.96	4260.20	16.99	4439.78	4198.65	4130.20	-0.04	1.61	1.47	3.15	511	116
rd400	4572.90	15.38	2273.55	26.93	2038.59	2016.32	1888.02	3.76	10.81	12.76	20.42	0	0
pcb442	925.07	13.39	450.13	13.43	474.34	434.78	413.36	-0.49	4.67	3.53	8.90	66	0
d493	3328.53	9.29	2352.46	7.83	2292.89	2230.79	2213.63	3.35	4.15	5.45	6.27	0	0
dsj1000	5973.60	18.28	1900.58	45.00	1770.67	1696.24	1587.81	2.46	9.46	12.05	19.70	0	0
Overlap ratio: 0.3													
kroD100	514.40	14.44	188.57	17.16	205.03	195.84	188.84	-1.10	2.57	-3.71	-0.14	730	459
rat195	569.64	15.57	164.18	23.29	207.48	169.49	167.18	5.14	6.60	-3.13	-1.79	814	559
lin318	7641.94	16.96	2551.10	18.79	3096.84	2702.94	2601.96	2.41	6.39	-5.62	-1.95	983	772
rd400	4572.86	15.32	1161.10	25.96	1181.86	1025.27	966.88	11.78	18.53	13.25	20.09	0	0
pcb442	925.08	13.43	292.60	20.27	344.60	307.65	282.13	-2.17	6.68	-4.89	3.71	957	42
d493	3328.50	9.29	1892.12	8.32	2022.02	1942.78	1894.00	-2.67	-0.16	-2.61	-0.10	945	577
dsj1000	5973.56	18.29	858.52	41.75	965.51	954.71	904.82	-10.32	-5.38	-10.08	-5.12	957	860
Varied overlap ratios													
team1_100	3109.96	46.81	2465.24	45.29	2290.78	2341.97	2305.55	-0.13	1.45	5.26	6.93	19	0
team2_200	2213.90	18.78	733.13	29.80	740.35	676.96	660.49	10.14	12.89	8.30	11.00	43	10
team3_300	3808.18	33.05	2483.53	44.96	2222.21	2213.58	2167.40	3.97	6.19	12.19	14.59	0	0
team4_400	2605.85	15.80	1537.94	23.56	1489.13	1461.46	1401.12	-2.72	1.47	5.23	9.77	37	0
team5_499	3368.47	28.08	2503.99	36.62	2271.16	2256.51	2247.34	4.02	4.44	10.97	11.42	0	0
team6_500	3352.25	15.75	739.23	25.69	844.59	780.95	752.65	-3.58	0.04	-5.34	-1.78	902	675
bonus1000	6139.69	21.97	2181.99	40.06	2052.44	1844.46	1776.78	10.37	14.57	18.30	22.81	0	0
concentricCircles1	156.17	0.00	100.28	0.00	118.59	102.79	82.72	-2.45	21.23	-2.45	21.23	1000	909

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
concentricCircles2	287.40	12.77	221.46	10.36	321.94	259.50	209.97	-18.00	1.35	-14.66	5.47	1000	155
concentricCircles3	533.55	7.54	431.30	11.33	603.33	496.17	404.40	-15.55	3.62	-13.07	6.65	1000	0
concentricCircles4	852.42	4.69	724.24	6.67	824.17	796.88	627.86	-10.65	13.41	-9.12	15.35	1000	0
concentricCircles5	1164.82	11.56	936.66	23.38	1171.44	1036.23	820.15	-20.22	0.80	-9.61	14.21	1000	198
bubbles1	703.05	90.39	542.01	97.41	606.86	610.53	534.37	-13.91	-1.65	-11.22	1.43	952	951
bubbles2	914.29	18.09	666.16	52.01	668.79	538.79	495.13	-8.48	-0.40	23.64	34.54	222	132
bubbles3	1806.09	42.44	1372.08	57.51	1374.63	1305.70	1074.85	8.49	31.80	5.08	27.65	333	0
bubbles4	2688.12	55.74	2089.05	67.57	1968.81	1942.69	1535.84	8.28	36.96	7.53	36.02	25	0
bubbles5	3448.53	38.30	2600.44	62.67	2597.44	2334.85	1905.99	16.97	43.29	11.37	36.43	94	0
bubbles6	3945.11	16.46	2725.30	39.25	2765.33	2300.78	1927.99	7.58	28.38	18.45	41.35	1	0
bubbles7	4507.55	8.81	2846.10	60.40	2893.22	2295.82	1993.58	17.68	35.52	23.97	42.76	3	0
bubbles8	6155.44	30.17	4155.00	62.55	4366.46	3686.39	2990.21	7.85	32.96	12.71	38.95	43	0
bubbles9	7238.85	33.71	4890.49	59.24	5290.72	4101.77	3368.34	-1.67	19.74	19.23	45.19	15	0
rotatingDiamonds1	76.62	66.80	46.24	78.23	57.37	57.37	46.63	-24.09	-6.60	-19.40	-0.84	923	0
rotatingDiamonds2	264.43	81.32	212.58	88.37	284.00	277.07	202.78	-28.10	-1.76	-23.27	4.83	960	0
rotatingDiamonds3	774.19	83.71	683.47	88.96	781.32	745.00	634.64	-10.80	4.71	-8.26	7.69	986	0
rotatingDiamonds4	1076.65	42.66	983.17	42.41	1265.25	1126.12	872.98	-15.70	8.75	-12.69	12.62	987	0
rotatingDiamonds5	2095.82	56.52	1965.32	59.10	2310.50	2046.90	1794.43	-12.30	0.03	-3.99	9.52	634	0
chaoSingleDep	1644.03	29.09	1241.89	32.95	1515.11	1365.97	1143.39	-16.26	0.04	-9.08	8.61	846	0

Table G-11: CW1000, 2D Manhattan Norm, Equal Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1001 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	546.00	19.02	489.37	18.25	468.58	468.73	455.23	-1.19	1.74	4.40	7.50	104	0
rat195	487.60	14.45	405.21	19.39	382.03	365.18	357.15	3.68	6.01	10.96	13.46	0	0
lin318	8124.81	25.46	6766.76	26.95	6750.32	6109.61	6019.57	5.04	6.61	10.76	12.41	0	0
rd400	2333.71	17.54	1738.32	23.50	1683.95	1531.65	1490.89	8.53	11.50	13.49	16.60	0	0
pcb442	881.15	21.94	723.65	27.35	712.75	675.44	646.19	-0.43	4.08	7.14	11.99	18	0
d493	1310.06	16.77	1158.60	19.50	1139.10	1113.08	1107.78	0.83	1.31	4.09	4.59	0	0
dsj1000	3134.76	25.51	2056.41	34.28	1985.57	1862.06	1808.00	3.83	6.93	10.44	13.74	0	0
Overlap ratio: 0.1													
kroD100	546.00	19.02	390.95	17.21	378.28	404.78	370.33	-8.02	0.54	-3.42	5.57	815	0
rat195	487.59	0.15	311.56	16.57	310.84	310.27	290.10	-4.66	1.97	0.41	7.40	503	0
lin318	8124.79	25.46	5142.01	28.60	5077.09	5150.47	4965.35	-3.39	0.21	-0.16	3.56	610	256
rd400	2333.69	17.54	1072.40	35.54	992.84	1007.23	949.98	0.01	6.03	6.47	12.89	112	0
pcb442	881.14	21.94	563.01	28.40	565.26	553.65	525.80	-1.97	3.22	1.69	7.08	417	28
d493	1310.06	16.78	1005.98	19.92	987.32	1023.55	989.40	-3.67	-0.34	-1.72	1.68	896	238
dsj1000	3134.78	25.46	1342.45	40.22	1284.63	1411.82	1290.67	-7.85	0.80	-4.91	4.01	934	144
Overlap ratio: 0.3													
kroD100	546.00	19.02	229.55	15.28	234.26	251.70	217.52	-10.49	3.58	-8.80	5.53	1000	99
rat195	487.60	14.55	189.65	20.05	196.65	210.60	178.11	-11.04	5.19	-9.95	6.48	952	18
lin318	8125.00	25.46	3123.25	22.26	2979.15	3425.75	3126.61	-4.26	4.90	-8.83	-0.11	1000	564
rd400	2333.70	17.54	628.06	26.19	599.52	698.48	613.73	-5.22	7.87	-10.08	2.33	985	390
pcb442	881.16	21.94	395.33	26.37	386.75	393.56	371.21	2.14	8.30	0.45	6.50	506	44
d493	1310.06	16.77	740.48	18.40	738.40	863.34	771.95	-14.34	-4.20	-14.23	-4.08	1000	961
dsj1000	3134.83	25.44	708.85	30.40	697.52	751.69	733.69	-5.95	-3.65	-5.70	-3.39	928	880
Varied overlap ratios													
team1_100	2264.81	48.63	1737.34	50.38	1684.19	1880.05	1653.13	-11.17	1.03	-7.59	5.09	912	0
team2_200	1757.14	24.75	715.44	34.03	724.39	783.82	683.92	-25.58	-22.32	-26.50	-23.28	1000	1000
team3_300	2014.67	44.40	1358.39	50.60	1296.77	1299.40	1224.46	1.00	7.18	4.54	10.94	344	0
team4_400	2752.42	18.74	1939.46	28.41	1953.68	1740.61	1711.25	1.32	3.06	11.42	13.34	0	0
team5_499	1984.93	44.25	1487.51	58.16	1399.32	1326.05	1311.78	4.97	6.11	12.18	13.40	0	0
team6_500	2514.82	23.80	857.11	27.86	834.62	918.24	844.30	-1.65	6.96	-6.66	1.52	920	433
bonus1000	3867.52	19.69	1882.47	30.77	1768.90	1849.27	1814.12	-2.09	-0.20	1.80	3.77	546	285
concentricCircles1	174.60	74.57	119.22	70.14	118.59	102.79	102.54	3.38	3.63	15.99	16.27	0	0

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
concentricCircles2	393.02	46.44	303.57	47.47	321.94	259.50	257.05	6.34	7.35	16.98	18.10	0	0
concentricCircles3	719.35	37.03	582.58	42.01	603.33	496.17	502.42	1.79	0.52	17.42	15.96	0	0
concentricCircles4	1106.34	41.64	914.57	50.25	824.17	796.88	807.90	-0.14	-1.50	14.77	13.20	62	384
concentricCircles5	1508.18	40.21	1173.29	53.22	1171.44	1036.23	1023.27	4.09	5.41	13.23	14.66	0	0
bubbles1	804.56	138.89	665.31	123.56	606.86	610.53	610.43	-0.60	-0.58	8.97	8.99	876	876
bubbles2	1015.43	34.78	686.88	62.68	668.79	538.79	530.72	12.63	14.35	27.49	29.42	47	26
bubbles3	2045.90	54.10	1426.51	77.67	1374.63	1305.70	1236.40	-1.35	4.18	9.25	15.38	141	0
bubbles4	3137.54	66.43	2255.02	92.89	1968.81	1942.69	1790.93	4.12	12.94	16.08	25.91	3	0
bubbles5	3881.52	58.45	2717.21	82.34	2597.44	2334.85	2182.94	2.22	9.34	16.38	24.47	0	0
bubbles6	4315.47	37.08	2861.11	69.18	2765.33	2300.78	2186.22	5.89	11.43	24.35	30.87	0	0
bubbles7	4827.43	24.83	3033.32	57.62	2893.22	2295.82	2170.07	15.80	22.51	32.12	39.78	0	0
bubbles8	6768.89	52.14	4605.17	85.71	4366.46	3686.39	3518.73	9.62	14.84	24.92	30.88	0	0
bubbles9	7799.12	43.12	5238.62	86.15	5290.72	4101.77	3867.90	10.07	16.73	27.72	35.44	0	0
rotatingDiamonds1	91.23	80.00	62.69	56.98	57.37	57.37	56.28	0.00	1.95	9.26	11.39	0	0
rotatingDiamonds2	361.06	14.88	291.49	15.04	284.00	277.07	273.07	-1.44	0.00	5.20	6.75	62	0
rotatingDiamonds3	900.98	92.76	813.78	95.92	781.32	745.00	735.48	3.21	4.55	9.23	10.64	0	0
rotatingDiamonds4	1434.69	30.98	1329.14	30.51	1265.25	1126.12	1128.00	6.62	6.44	18.03	17.83	0	0
rotatingDiamonds5	2472.28	71.77	2342.97	74.26	2310.50	2046.90	2045.11	-0.28	-0.20	14.46	14.56	29	23
chaoSingleDep	1989.47	34.59	1517.28	45.67	1515.11	1365.97	1365.97	0.00	0.00	11.08	11.08	154	4

Table G-12: CW1000, 3D Manhattan Norm, Equal Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1000 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
Overlap ratio: 0.02													
kroD100	718.44	20.09	604.05	21.75	567.99	556.23	549.33	2.61	3.90	8.60	9.96	0	0
rat195	822.57	20.63	654.10	25.79	565.68	565.09	552.30	4.24	6.66	15.75	18.43	0	0
lin318	9923.50	21.31	7219.47	26.09	6811.25	6586.34	6396.83	3.62	6.69	9.61	12.86	0	0
rd400	6717.44	17.13	5435.14	21.51	4922.28	4912.17	4869.72	3.45	4.36	10.65	11.61	0	0
pcb442	1244.14	17.20	912.67	20.88	816.01	805.42	773.26	4.14	8.47	13.32	18.03	0	0
d493	4813.08	11.59	4264.97	12.51	3847.66	3824.20	3789.84	6.92	7.89	11.53	12.54	0	0
dsj1000	8773.03	21.76	5771.05	31.85	5295.88	5201.65	5069.25	5.39	8.15	10.95	13.84	0	0
Overlap ratio: 0.1													
kroD100	718.44	20.09	430.30	19.46	438.64	428.78	411.61	-0.89	3.24	0.35	4.54	595	193
rat195	822.57	0.21	418.28	22.79	399.93	393.03	373.37	-1.37	3.82	6.42	12.03	17	0
lin318	9923.48	21.31	5132.90	30.32	5373.09	5209.51	4977.35	-6.04	-1.65	-1.47	3.13	731	340
rd400	6717.39	17.20	3233.78	32.83	2986.73	2905.07	2662.02	1.15	10.38	11.31	21.48	21	0
pcb442	1244.14	17.20	589.70	24.37	593.35	576.36	540.73	-4.25	2.06	2.31	9.05	336	0
d493	4813.08	11.59	3374.54	13.71	3199.11	3155.24	3054.15	3.03	6.44	6.95	10.49	0	0
dsj1000	8772.89	21.78	2714.07	54.64	2691.40	2434.38	2252.50	4.80	13.26	11.49	20.49	0	0
Overlap ratio: 0.3													
kroD100	718.44	20.09	244.98	23.55	264.09	257.45	229.92	-1.78	9.98	-4.84	6.55	732	247
rat195	822.57	20.66	230.98	22.54	267.87	236.40	224.63	2.23	7.58	-2.29	2.82	706	267
lin318	9923.36	21.31	3091.23	25.62	3373.88	3329.74	3043.64	-8.76	-0.19	-7.16	1.56	866	444
rd400	6717.28	17.25	1640.51	38.10	1573.62	1455.98	1350.68	7.85	16.25	12.67	21.46	16	0
pcb442	1244.14	17.20	399.62	27.50	444.79	445.28	370.11	-10.60	7.56	-10.25	7.97	987	15
d493	4813.07	11.54	2692.23	11.94	2711.29	2772.58	2635.35	-3.72	1.30	-2.90	2.16	955	102
dsj1000	8772.87	21.78	1339.81	36.70	1545.71	1513.46	1477.34	-12.96	-10.83	-11.47	-9.31	964	948
Varied overlap ratios													
team1_100	4652.44	42.87	3615.28	43.90	3384.47	3381.43	3324.16	2.36	1.03	6.82	8.76	0	0
team2_200	3178.32	22.81	953.33	44.05	992.99	973.43	932.59	-6.70	-0.66	-3.99	2.22	787	482
team3_300	5569.53	36.95	3538.74	53.70	3121.97	3068.35	2979.92	7.39	12.51	13.35	18.75	0	0
team4_400	3827.70	14.87	2162.63	25.45	1892.68	1970.58	1831.36	8.19	11.81	14.26	18.09	0	0
team5_499	4966.63	28.37	3616.41	39.81	3214.73	3223.03	3173.91	4.26	5.60	12.50	13.94	0	0
team6_500	4928.45	17.54	1041.58	40.52	1140.15	1068.41	971.98	-10.04	5.53	-8.65	7.16	951	74
bonus1000	9087.04	22.58	3186.42	42.04	2833.30	2623.62	2495.82	3.32	17.29	12.46	27.67	0	0
concentricCircles1	174.60	74.57	119.22	70.14	118.59	102.79	102.54	3.38	3.63	15.99	16.27	0	0

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
concentricCircles2	393.02	46.44	303.57	47.47	321.94	259.50	257.05	6.34	7.35	16.98	18.10	0	0
concentricCircles3	719.35	37.03	582.65	42.01	603.33	496.17	502.42	1.79	0.52	17.43	15.97	0	0
concentricCircles4	1106.36	41.64	914.76	50.25	824.17	796.88	807.90	-0.14	-1.50	14.79	13.23	62	384
concentricCircles5	1508.66	40.24	1175.48	55.43	1171.44	1036.23	1023.27	4.28	5.60	13.44	14.88	0	0
bubbles1	804.56	138.89	665.31	123.56	606.86	610.53	610.43	-0.60	-0.58	8.97	8.99	876	876
bubbles2	1015.41	33.70	686.19	66.46	668.79	538.79	530.72	12.63	14.35	27.36	29.29	43	24
bubbles3	2045.83	54.10	1427.86	78.08	1374.63	1305.70	1236.40	1.94	7.65	9.36	15.49	106	0
bubbles4	3137.37	67.03	2249.50	94.35	1968.81	1942.69	1790.93	4.12	12.94	15.79	25.61	4	0
bubbles5	3880.90	58.45	2716.79	83.05	2597.44	2334.85	2182.94	2.69	9.84	16.36	24.46	0	0
bubbles6	4312.94	37.08	2861.18	71.18	2765.33	2300.78	2186.22	4.14	9.60	24.36	30.87	0	0
bubbles7	4817.81	24.83	3035.25	51.28	2893.22	2295.82	2170.07	18.50	25.37	32.21	39.87	0	0
bubbles8	6764.92	52.14	4603.40	90.04	4366.46	3686.39	3518.73	9.14	14.34	24.88	30.83	0	0
bubbles9	7789.23	43.53	5237.31	83.40	5290.72	4101.77	3867.90	11.55	18.30	27.68	35.40	0	0
rotatingDiamonds1	91.23	80.00	62.69	56.98	57.37	57.37	56.28	0.00	1.95	9.26	11.39	0	0
rotatingDiamonds2	361.06	14.88	291.49	15.04	284.00	277.07	273.07	-1.44	0.00	5.20	6.75	62	0
rotatingDiamonds3	900.95	92.76	813.77	95.92	781.32	745.00	735.48	3.21	4.55	9.23	10.64	0	0
rotatingDiamonds4	1434.67	30.98	1329.03	30.55	1265.25	1126.12	1128.00	6.62	6.44	18.02	17.82	0	0
rotatingDiamonds5	2472.25	71.77	2342.92	74.99	2310.50	2046.90	2045.11	-0.28	-0.20	14.46	14.56	28	24
chaoSingleDep	1989.48	34.59	1517.33	45.91	1515.11	1365.97	1365.97	0.00	0.00	11.08	11.08	152	13

In Tables G-13 - G-16, we give the results using arbitrary radius. We have 14 arbitrary radius CEVRP problems using each norm.

The values in columns 3 and 5 are similar to those for equal radius problems. There is a large variation in the VRP routes produced by mCW and in the CEVRP solutions produced from the VRP routes. Columns 9 through 14 show that CW1000 does not perform nearly as well on arbitrary radius CEVRP problems as it does on equal radius problems. In column 9 of the four tables, we see that the CEVRP solutions produced from the best VRP tour is shorter than SZVRP2's solutions in four of the 56 problems. Column 10 of the four tables shows that the CEVRP solution produced from the best VRP tour is longer than the SZVRP4$_t$ solution in every problem. In columns 11 and 12, we see that the average of the 1000 CEVRP solutions produced by CW1000 is longer (up to 38%) than both the SZVRP2 and SZVRP4$_t$ solutions in all 56 problems. Columns 13 and 14 show that in only seven of the 56 problems are any of the CW1000 solutions better than SZVRP2's solutions, and in none of the problems are any CW1000 solutions better than the SZVRP4$_t$ solutions.

These results are similar to the results on arbitrary radius problems for LK1001. CW1000 does not perform nearly as well for arbitrary radius problems as it does for medium and high overlap ratio equal radius problems.

Table G-13: CW1000, 2D Euclidean Norm, Arbitrary Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1000 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	448.84	17.40	380.94	13.79	366.37	373.27	364.44	-1.25	1.14	2.05	4.53	319	0
rat195	398.16	9.15	232.64	16.34	231.83	183.06	177.92	24.54	28.13	27.09	30.76	0	0
lin318	6915.02	17.78	5011.72	18.08	4908.87	4771.38	4433.38	0.89	8.58	5.04	13.05	0	0
rd400	1851.26	14.48	1598.02	16.73	1565.28	1428.77	1395.42	6.58	9.12	11.85	14.52	0	0
pcb442	735.83	18.54	520.56	18.31	519.99	470.48	455.75	5.65	9.07	10.64	14.22	0	0
d493	1065.84	16.64	876.36	14.97	860.79	815.15	836.04	5.53	2.89	7.51	4.82	0	0
dsj1000	2461.41	23.39	1374.52	28.82	1296.91	1196.00	1160.72	10.45	13.81	14.93	18.42	0	0
team1_100	1797.07	37.23	1535.94	35.60	1510.16	1520.41	1419.20	-2.62	4.32	1.02	8.23	707	0
team2_200	1435.98	20.01	1043.98	20.31	1014.40	937.50	919.66	7.65	9.74	11.36	13.52	0	0
team3_300	1630.51	40.55	1027.37	40.98	1012.48	961.91	864.11	1.74	13.26	6.81	18.89	0	0
team4_400	2128.51	17.74	1757.79	19.86	1768.55	1624.18	1572.37	2.56	5.93	8.23	11.79	0	0
team5_499	1580.31	44.03	957.69	53.00	948.65	918.76	867.44	2.55	8.62	4.24	10.40	28	0
team6_500	2018.87	20.22	1257.87	28.37	1211.03	1144.43	1079.89	2.77	8.92	9.91	16.48	0	0
bonus1000	3047.54	23.05	2075.37	28.11	2008.76	1836.91	1774.10	4.50	8.20	12.98	16.98	0	0

Table G-14: CW1000, 3D Euclidean Norm, Arbitrary Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1000 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	514.40	14.44	411.38	12.46	395.68	392.84	394.10	1.40	1.07	4.72	4.38	0	0
rat195	569.63	15.51	257.66	13.90	282.33	230.07	194.94	15.76	36.62	11.99	32.17	0	0
lin318	7641.99	16.96	5076.02	21.05	5075.34	4777.76	4683.83	3.37	5.44	6.24	8.37	56	0
rd400	4572.90	15.33	4160.92	16.85	3833.53	3820.42	3814.37	3.64	3.81	8.91	9.09	0	0
pcb442	913.81	13.06	545.79	19.25	523.30	474.68	463.46	7.42	10.02	14.98	17.76	0	0
d493	3403.94	9.07	2553.15	7.99	2527.50	2425.72	2376.77	3.37	5.50	5.25	7.42	0	0
dsj1000	5973.56	18.32	2717.42	37.12	2484.37	2301.22	2216.36	12.39	16.69	18.09	22.61	0	0
team1_100	3109.96	46.81	2576.42	46.17	2396.69	2432.78	2404.23	0.50	1.69	5.99	7.25	0	0
team2_200	2213.88	18.78	1511.87	27.88	1374.15	1345.38	1304.94	5.01	8.26	12.38	15.86	0	0
team3_300	3808.19	33.05	2081.61	40.33	1919.52	1820.89	1745.49	5.13	9.67	14.32	19.26	0	0
team4_400	2605.87	15.80	2005.21	19.50	1840.77	1823.35	1818.36	3.04	3.33	9.97	10.28	0	0
team5_499	3367.64	28.12	1542.10	42.60	1445.87	1378.96	1335.63	5.70	9.13	11.83	15.46	0	0
team6_500	3352.26	15.75	1749.37	24.41	1662.45	1500.04	1459.40	9.65	12.70	16.62	19.87	0	0
bonus1000	6139.59	22.01	3618.81	30.95	3146.00	3005.18	2912.15	12.53	16.13	20.42	24.27	0	0

Table G-15: CW1000, 2D Manhattan Norm, Arbitrary Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1000 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	546.00	19.02	470.25	16.97	455.16	449.47	433.12	0.05	3.83	4.62	8.57	36	0
rat195	487.60	14.55	296.52	19.11	302.10	228.95	215.68	30.75	38.80	29.52	37.48	0	0
lin318	8124.83	25.46	6022.10	27.66	5920.65	5601.32	5446.02	2.04	4.95	7.51	10.58	0	0
rd400	2333.71	17.54	2000.83	21.53	1980.68	1777.95	1714.33	6.86	10.83	12.54	16.71	0	0
pcb442	869.65	18.91	648.17	22.22	660.71	580.70	580.26	5.99	6.07	11.62	11.70	0	0
d493	1390.14	17.04	1178.06	17.47	1159.81	1087.23	1112.55	7.88	5.42	8.35	5.89	0	0
dsj1000	3134.64	25.48	1756.31	37.35	1655.78	1490.62	1456.37	13.45	16.12	17.82	20.59	0	0
team1_100	2264.80	48.63	1921.60	49.34	1873.89	1913.19	1755.06	-4.47	4.13	0.44	9.49	826	0
team2_200	1757.14	24.75	1280.15	31.31	1196.92	1197.08	1125.91	-0.01	6.31	6.94	13.70	19	0
team3_300	2014.66	44.40	1282.17	46.14	1241.51	1174.98	1140.96	7.57	10.78	9.12	12.38	0	0
team4_400	2752.43	18.73	2281.47	23.62	2290.65	1997.16	1955.40	5.53	7.78	14.24	16.68	0	0
team5_499	1984.95	44.30	1229.24	52.58	1217.14	1100.14	1001.31	9.75	20.58	11.73	22.76	0	0
team6_500	2514.80	23.80	1553.38	32.96	1516.71	1398.68	1314.85	6.72	13.52	11.06	18.14	0	0
bonus1000	3867.71	19.71	2665.70	26.92	2547.42	2326.30	2247.71	7.32	11.07	14.59	18.60	0	0

Table G-16: CW1000, 3D Manhattan Norm, Arbitrary Radius

(2): Average length of CW1000 VRP solutions
(3): % difference between the best and worst of the VRP solutions
(4): Average length of 1000 CEVRP solutions
(5): % difference between the best and worst of the CEVRP solutions
(9): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP2 solution
(10): % that CEVRP solution produced by the best mCW solution is longer than the SZVRP4$_t$ solution
(11): % that the average CEVRP solution (column 4) is longer than the SZVRP2 solution
(12): % that the average CEVRP solution (column 4) is longer than the SZVRP4$_t$ solution
(13): Number of CW1000 solutions that are longer than the SZVRP2 solution
(14): Number of CW1000 solutions that are longer than the SZVRP4$_t$ solution

Name	(2)	(3)	(4)	(5)	CW-SOCP	SZVRP2	SZVRP4$_t$	(9)	(10)	(11)	(12)	(13)	(14)
kroD100	718.44	20.09	567.36	19.41	546.62	526.16	515.13	4.53	6.77	7.83	10.14	0	0
rat195	822.58	20.61	377.51	18.20	400.66	305.05	277.30	22.02	34.23	23.75	36.14	0	0
lin318	9923.47	21.31	6384.77	28.94	6245.61	5880.62	5668.26	3.72	7.60	8.57	12.64	0	0
rd400	6717.30	17.42	6035.33	19.92	5511.70	5466.20	5448.01	3.60	3.95	10.41	10.78	0	0
pcb442	1227.09	17.27	741.46	23.85	705.47	659.54	630.11	8.53	13.60	12.42	17.67	0	0
d493	4953.81	12.52	3726.49	10.67	3500.84	3402.70	3323.09	6.55	9.10	9.52	12.14	0	0
dsj1000	8772.95	21.77	3992.93	39.98	3737.12	3327.26	3105.72	11.34	19.28	20.01	28.57	0	0
team1_100	4652.40	42.87	3819.76	42.80	3588.54	3543.35	3469.67	2.83	5.01	7.80	10.09	0	0
team2_200	3178.29	22.81	2124.90	36.23	1965.21	1879.03	1848.22	7.04	8.82	13.09	14.97	0	0
team3_300	5569.67	36.95	3001.47	44.20	2833.83	2548.55	2459.09	13.78	17.92	17.77	22.06	0	0
team4_400	3827.65	14.87	2893.51	18.65	2516.69	2519.34	2508.93	8.78	9.23	14.85	15.33	0	0
team5_499	4966.76	28.37	2245.40	55.31	2031.32	1960.38	1834.65	4.12	11.25	14.54	22.39	0	0
team6_500	4928.38	17.54	2571.44	28.30	2335.81	2148.46	2004.42	12.52	20.60	19.69	28.29	0	0
bonus1000	9087.05	22.62	5410.59	31.92	4636.49	4331.08	4155.63	15.44	20.32	24.92	30.20	0	0

G.3 Conclusions

In Chapters 2 - 4, we saw that methods that do not use Steiner zones (LK-SOCP, YUAN+, CW-SOCP) were extremely fast and consistently outperformed SZH (without Phase IV) on certain types of problems. When averaged over all problem types, LK-SOCP, YUAN+, and CW-SOCP did not perform nearly as well as SZH. In this appendix, we tested the performance of the three methods to learn more about their performance. We observed the following. (1) Overlap ratio strongly affects the performance of methods that do not use Steiner zones. LK-SOCP, YUAN+, and CW-SOCP almost never do well on problems with low overlap ratio. For high overlap ratio problems, for many problems (especially for CW-SOCP) they find better solutions on average than SZH. (2) On a large percentage of problems, LK-SOCP, YUAN+, and CW-SOCP either never produce better solutions than SZH or almost always produce better than SZH. This happens across all overlap ratios, indicating that something else other than overlap ratio, probably the layout of the nodes, affects their performance. (3) LK-SOCP, YUAN+, and CW-SOCP do not perform well on problems with arbitrary radius. We think it is intuitive that the optimal CETSP or CEVRP node sequence is often substantially different from the optimal TSP or VRP node sequence - much more so than when the radius is equal for all disks.

The computational speed of LK-SOCP and CW-SOCP, along with their accuracy on equal radius problems with medium and high overlap ratio, suggest that a hybrid SZH+LK-SOCP or SZH+CW-SOCP heuristic would be very competitive.

For problems with medium or high overlap ratio and equal radius, LK-SOCP or CW-SOCP could be applied in addition to SZH, improving the accuracy of the solution with only a small increase in computation time.

Appendix H

Pseudocode: CETSP Steiner-zone Heuristic

```
for i = 1, ..., 4 do
    Phase I
    Sort n nodes in fashion i and store in list.
    while list ≠ ∅ do
        Pick first node from list and identify Steiner zones it creates.
        Set aside the Steiner zone of highest degree, and remove its component nodes from l.
    end while
    Phase II
    Select a representative point for each Steiner zone, and solve TSP on these representative points.
    Phase III
    Choose k = 3 points, SZ_{j,k}, for each SZ_j along its convex hull at 0°, 120°, and 240°.
        Iteration (m = 1).  Solve the IP_PhIII integer program and obtain solution point sol_{j,m} ∀ j SZ.
        Iteration (m = 2).  Repeat for points at 60°, 180°, and 300°.
    θ ⇐ 30°
    for Iterations (m = 3, ..., 12) do
        for all j Steiner zones do
            Choose the k = 3 points to use in the next iteration of IP_PhIII
            if m ≠ 5 then
                if sol_{j,m-1} ≠ sol_{j,m-2} then
                    SZ_{j,1} = sol_{j,m-1}
                    SZ_{j,2} = sol_{j,m-2}
                    SZ_{j,3} = the point on the convex hull midway between SZ_{j,1} and SZ_{j,2}
                else
                    SZ_{j,1} = sol_{j,m-1}
                    if θ < 30° then
                        if SZ_j has degree < 25 then
                            SZ_{j,2} = the point on the convex hull 2θ above SZ_{j,1}
                            SZ_{j,3} = the point on the convex hull 2θ below SZ_{j,1}
                        else
                            SZ_{j,2} = the point on the convex hull 4θ above SZ_{j,1}
                            SZ_{j,3} = the point on the convex hull 4θ below SZ_{j,1}
                        end if
                    else
                        SZ_{j,2} = the point on the convex hull θ above SZ_{j,1}
                        SZ_{j,3} = the point on the convex hull θ below SZ_{j,1}
                    end if
                end if
            else
                if sol_{j,m-1} ≠ sol_{j,m-2} then
                    SZ_{j,1} = sol_{j,m-1}
                    SZ_{j,2} = sol_{j,m-2}
                    SZ_{j,3} = the point on the convex hull on the opposite side of SZ_{j,m-1} from SZ_{j,m-2}
                else
                    SZ_{j,1} = sol_{j,m-1}
                    SZ_{j,2} = sol_{j,1}
                    SZ_{j,3} = the point on the convex hull midway between SZ_{j,m-1} and SZ_{j,1}
                end if
            end if
        end for
        Solve the IP_PhIII shortest path problem
        θ ⇐ θ/2
    end for
end for
```

Algorithm 1: Phases I-III of the Steiner-zone heuristic using IP_{PhIII} for Phase III.

Appendix I

Pseudocode: CETSP Steiner-zone Heuristic with Phase IV

```
for i = 1, ..., 4 do
  Do Phase I.
  Do Phase II.
  Do Phase III.
  Phase IV:
  Sort Steiner zones in descending order by normalized turn angle.
  while no improvement in four successive iterations or all Steiner zones are now
  singletons do
    Remove the 10% highest-turn angle Steiner zones.
    for each Steiner zone do
      Divide the Steiner zone into duples and singletons by utilizing the clos-
      est neighbor nodes to maximize freedom of movement (every third one is
      always made a singleton).
    end for
    Do Phases II and III.
  end while
end for
```

Algorithm 2: The Steiner-zone heuristic including Phase IV.

Appendix J

Pseudocode: SDTOP HotnCold Algorithm

```
M: set of nodes moved in the candidate solution
META_current: current meta-route
currScore: current objective function value
newVal = currScore
Obtain arrival times for all visited nodes in the potential move.
Merge-sort all nodes that are visited in the candidate solution into a new meta-route,
META_potential.
for all visited nodes do //Determine the sets of hot nodes and cold nodes
  if node i ∈ M or i is in a route containing a node from M and i succeeds that node
  then
    Put i in HOT
  else
    Put i in COLD
  end if
end for
for all nodes i in HOT do //hot/cold comparisons
  for all nodes j in COLD do
    if i before j in META_current but j before i in META_potential then
      newVal = newVal + p_ji − p_ij
    else if i after j in META_current but i before j in META_potential then
      newVal = newVal + p_ij − p_ji
    end if
  end for
end for
for all nodes i in HOT do //hot/hot comparisons
  for all nodes j after i in HOT do
    if i before j in META_current but j before i in META_potential then
      newVal = newVal + p_ji − p_ij
    else if i after j in META_current but i before j in META_potential then
      newVal = newVal + p_ij − p_ji
    end if
  end for
end for
return newVal
```

Algorithm 3: Objective function calculation for a candidate move using the HotnCold algorithm.

Appendix K

Alternative SDTOP Formulations

In this appendix we present two alternative formulations for the SDTOP. The first recognizes a simultaneous arrival between nodes i and j and counts neither p_{ij} nor p_{ji} in the objective function value. The other explicitly forbids simultaneous arrivals from occurring. Both models include an additional $4 * N(N-1)$ variables to the formulation given in Section 5.4.2. We consider heterogeneous fleets in both models.

<u>Constants</u>:

- N -number of possible nodes, excluding the depot (node 0)
- K -total number of vehicles available for use
- k_{min} - minimum number of vehicles to be used in the solution
- k_{max} - maximum number of vehicles to be used in the solution
- P - profit matrix
- p_{ij} - profit received for visiting i before j
- q_i - demand at node i
- 0_k - starting depot for the kth vehicle, which may be different for each vehicle. It is only really necessary for the constants related to the depot, but we use it for consistency everywhere.
- $\bar{0}_k$ - destination depot for the kth vehicle, which may be different than the

starting depot, and may be different for each vehicle. It is only really necessary for the constants related to the depot, but we use it for consistency everywhere.

- Q_k - maximum capacity for vehicle k -loses the subscript in the simple model formulation when vehicle fleet is homogeneous
- s_i - service time required at node i; $s_0 = 0$ by definition
- T - time/distance matrix (any distance norm is allowed)
- t_{ij} - travel time/distance between i and j
- $\bar{t}_{i\bar{0}_{mDiff}}$ -for node i, the absolute value of $\max_k(t_{i\bar{0}_k})$ - $\min_k(t_{i\bar{0}_k})$
- T_k - maximum travel time/distance for vehicle k -loses the subscript in the simple model formulation when vehicle fleet is homogeneous
- T_{max} - largest travel time/distance of all k vehicles, i.e. $\max_k(T_k)$
- Q_{max} - $\max(Q_k)$, largest capacity of all k vehicles; not used in the formulations
- ϵ - cutoff value for simultaneous arrivals; if two arrival times are less than ϵ units apart, they are considered simultaneous
- LB_{a_i} - lower time window for arriving at node i if node i is actually visited.
- UB_{a_i} - upper time window for arriving at node i if node i is actually visited.

<u>Variables</u>: $(i \neq j)$; $i > 0$ and $j > 0$ unless otherwise specified.

- $x_{ijk} = 1$ if vehicle k travels from node i to node j; 0 o.w.
- $y_{ik} = 1$ if node i, for $i \geq 0$, is visited by vehicle k; 0 o.w.
- $u_k = 1$ if vehicle k is used in the solution; 0 o.w.
- $w_i = 1$ if node i is visited in general; 0 o.w.
- a_i is the time that node i, for $i \geq 0$, is visited; if node i not visited, a_i is forced

to any number in [0, $N\epsilon$]

- $\delta_{ij} = a_j - a_i$; difference in arrival times
- $\Delta_{ij} = |\delta_{ij}|$ is the magnitude of the difference in arrival times for i and j
- v_{ij} is an indicator variable used to calculate Δ_{ij}
- $z_{ij} = 1$ if i's arrival time is before or simultaneous with j's time
- $\alpha_{ij} = 1$ if both i and j are visited; 0 o.w.
- $\beta_{ij} = 1$ if both i and j are visited and i's arrival time is before or simultaneous with j; 0 o.w.
- $\gamma_{ij} = 1$ if $\Delta_{ij} \leq \epsilon$, 0 o.w., for the generalized P case where simultaneous arrivals are allowed. If they are explicitly forbidden and P is generalized then it is 1 if both i and j are visited and i's arrival time strictly precedes that of j; 0 otherwise.

We do not assume the absence of simultaneous arrivals. SDTOP$_{general}$ adds p_{ij} to the objective function if i is visited before or simultaneous to j. For those pairs of arrivals, i and j, that are simultaneous, it subtracts both p_{ij} and p_{ji} from the objective function. Although SDTOP$_{general}$ is valid for an inverse symmetric P, SDTOP$_{simp}$ is preferable because of its relative simplicity. For a heterogeneous fleet and an inverse symmetric P, SDTOP$_{simp}$ may be modified by replacing the relevant constraints in SDTOP$_{simp}$ with the heterogeneous-fleet constraints in SDTOP$_{general}$.

K.1 Recognizing Simultaneous Arrivals

SDTOP$_{general}$

$$\text{Maximize} \quad \sum_{i=1}^{N}\sum_{j=1}^{N} p_{ij}(\beta_{ij} - \gamma_{ij}) \tag{K1}$$

subject to

$$y_{0_k k} = 1 \qquad \forall\ k \tag{K2}$$

$$a_0 = 0 \tag{K3}$$

$$\sum_{k=1}^{K} y_{ik} = w_i \qquad \forall\ i \geq 1 \tag{K4}$$

$$\sum_{i=1}^{N} q_i y_{ik} \leq Q_k \qquad \forall\ k \tag{K5}$$

$$-(1 - u_k) + \sum_{i=1}^{N} x_{i\bar{0}_k k} = y_{0_k k} \qquad \forall\ k \tag{K6}$$

$$\sum_{i=1}^{N} x_{ijk} + x_{0_k jk} = y_{jk} \qquad \forall\ j \geq 1,\ k \tag{K7}$$

$$-(1 - u_k) + \sum_{j=1}^{N} xx_{0_k jk} = y_{0_k k} \qquad \forall\ k \tag{K8}$$

$$\sum_{j=1}^{N} x_{ijk} + x_{i\bar{0}_k k} = y_{ik} \qquad \forall\ i \geq 1,\ k \tag{K9}$$

$$\delta_{ij} = a_j - a_i \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K10}$$

$$\Delta_{ij} - \delta_{ij} + 2T_{max} v_{ij} \leq 2T_{max} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K11}$$

$$\Delta_{ij} + \delta_{ij} \leq 2T_{max} v_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K12}$$

$$-\Delta_{ij} \leq \delta_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K13}$$

$$\delta_{ij} \leq \Delta_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K14}$$

$$\delta_{ij} \leq T_{max} z_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K15}$$

$$-\delta_{ij} + T_{max} z_{ij} \leq T_{max} \qquad \forall\ i \geq 1,\ j \geq 1 \quad \text{(K16)}$$

$$-\Delta_{ij} + \epsilon(1 - z_{ij}) \leq 0 \qquad \forall\ i \geq 1,\ j \geq 1 \quad \text{(K17)}$$

$$-(w_i + w_j) \leq -2\alpha_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \quad \text{(K18)}$$

$$w_i + w_j \leq 1 + \alpha_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \quad \text{(K19)}$$

$$-(\alpha_{ij} + z_{ij}) \leq -2\beta_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \quad \text{(K20)}$$

$$\alpha_{ij} + z_{ij} \leq 1 + \beta_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \quad \text{(K21)}$$

$$\Delta_{ij} - T_{max}(1 - \gamma_{ij}) \leq \epsilon \qquad \forall\ i \geq 1, j \geq 1 \quad \text{(K22)}$$

$$\epsilon(1 - \gamma_{ij}) \leq \Delta_{ij} \qquad \forall\ i \geq 1, j \geq 1 \quad \text{(K23)}$$

$$\gamma_{ij} \leq w_i \qquad \forall\ i \geq 1, j \geq 1 \quad \text{(K24)}$$

$$\gamma_{ij} \leq w_j \qquad \forall\ i \geq 1, j \geq 1 \quad \text{(K25)}$$

$$u_k \leq \sum_{i=1}^{N} y_{ik} \qquad \forall\ k \quad \text{(K26)}$$

$$\frac{1}{N}(\sum_{i=1}^{N} y_{ik}) \leq u_k \qquad \forall\ k \quad \text{(K27)}$$

$$\sum_{k=1}^{K} u_k \geq k_{min} \quad \text{(K28)}$$

$$\sum_{k=1}^{K} u_k \leq k_{max} \quad \text{(K29)}$$

$$a_i + x_{ijk}(T_k + (s_i + t_{ij})) + y_{jk}(T_{max} - T_k) \leq\ T_{max} + a_j \quad \text{(K30)}$$

$$-a_i + x_{ijk}(T_k - (s_i + t_{ij})) + y_{jk}(T_{max} - T_k) \leq\ T_{max} - a_j \quad \text{(K31)}$$

$$\forall\ k;\ i \geq 0,\ j \geq 1 \text{ for (K30) and (K31)}$$

$$a_i + w_i(s_i + t_{i\bar{0}_k} - T_{max}) + y_{ik}(\bar{t}_{i\bar{0}_{mDiff}} + T_{max} - T_k) \leq \bar{t}_{i\bar{0}_{mDiff}}\ \forall\ i \geq 1, k \quad \text{(K32)}$$

$$a_i - T_{max} w_i \leq N\epsilon \qquad \forall\ i \geq 1 \tag{K33}$$

$$\sum_{i \in S, j \in S} x_{ijk} \leq |S| - 1 \text{ for } S \subseteq \{1, 2, \ldots, N\},\ 2 \leq |S| \leq N \qquad \forall\ k \tag{K34}$$

$$0 \leq a_i \leq T_{max} \qquad \forall\ i \geq 1$$

$$-T_{max} \leq \delta_{ij} \leq T_{max} \qquad \forall\ i \geq 1,\ j \geq 1$$

$$0 \leq \Delta_{ij} \leq T_{max} \qquad \forall\ i \geq 1,\ j \geq 1$$

$$\alpha_{ij},\ \beta_{ij},\ w_i,\ x_{ijk},\ y_{ik},\ z_{ij} \in \{0, 1\} \qquad \forall\ i, j, k$$

The objective function (K1) sums the pairwise profits, p_{ij}, for every pair of nodes that is visited such that i is visited before or simultaneous to j and subtracts out p_{ij} and p_{ji} erroneously added when i and j are visited simultaneously. Constraints (K2) and (K3) require that the depot be visited at time 0 by all vehicles, whether or not they actually visit any nodes. Since w_i is binary, constraint (K4) requires that every node is visited, if at all, by exactly one vehicle. w_i is a bookkeeping variable and only included to help with readability. (K5) guarantees that capacity feasibility is maintained.

Constraints (K6) to (K9) are the flow balance constraints requiring node i, if it is visited, to have exactly one predecessor and one successor. Without (K2) and (K3), a_0 can be greater than 0 (maximizing the objective function might cause a_0 to be assigned a value that allows the objective function for a particular meta-routes to be given a larger value than is correct). The arrival time equations discussed below (constraints (K30) and (K31)) then compute incorrect arrival times. With constraints (K2) and (K3) included, every vehicle is forced to visit its depot at

time 0, whether or not it visits other nodes, and the arrival time equations behave correctly. Because every vehicle is forced to visit its depot, we must modify the flow constraints in and out of the depot by adding the $-(1 - u_k)$ term to constraints (K6) and (K8). If vehicle k is not used in a non-trivial route, these two constraints are automatically satisfied. If vehicle k is used ($u_k = 1$) then vehicle k's initial depot must have exactly one successor and its ending depot must have exactly one predecessor.

Constraints (K10) to (K25) are specific to the SDTOP. (K10) is a book-keeping constraint storing the difference in arrival times between nodes i and j and is included only for easier reading. Constraints (K11) to (K14) compute the magnitude of the pairwise difference in arrival times using a disjunctive approach. In a linear programming minimization, the usual method of computing the absolute value, $AbsX$, of variable x requires that $AbsX$ appear in the objective function so that the objective function forces $AbsX \geq x$ and $AbsX \geq -x$ to hold at equality. This is not the case with the SDTOP, so instead, we use these four constraints.

Consider an example. Let i and j both be visited, i after j. Without loss of generality, let $a_i = 21$ and $a_j = 10$. Then $\delta_{ij} < 0$ and in fact equals -11. If $\Delta_{ij} < |\delta_{ij}|$, then constraint (K13) is violated. If $\Delta_{ij} > |\delta_{ij}|$, constraints (K13) and (K14) hold, but (K11) and (K12) are violated (constraint (K12) forces v_{ij} to 1, and constraint (K11) falsely implies that a positive minus a negative is a negative). If $\Delta_{ij} = |\delta_{ij}|$, then v_{ij} is forced to 1 and constraint (K11) holds at equality.

If i and j are both visited, i before j, similar analysis shows that these constraints again correctly calculate the absolute value of δ_{ij}. If i and j are visited at

precisely the same time, Δ_{ij} is forced to 0, but v_{ij} is not forced to any value. This does not affect the model's correctness because v_{ij} is not linked to the objective function and Δ_{ij} is correctly computed.

Constraints (K15) and (K16) force z_{ij} to 1 if j's arrival time follow's i, even if j actually was not visited. For example, if δ_{ij} is positive then constraint (K15) forces z_{ij} to 1, and constraint(K16) forces z_{ji} to 0 (since δ_{ji} is negative). If $\delta_{ij} = 0$, then both constraints hold without forcing z_{ij} to either 0 or 1. Since z_{ij} is indirectly linked to the objective function variables, this can allow the erroneous case where both p_{ij} and p_{ji} are counted. There are two possible cases where δ_{ij} can equal 0. One is that i and j are both visited simultaneously (within ϵ of each other where ϵ can take meaningful values anywhere from near zero to much larger time frames). The second way that δ_{ij} can equal 0 is if both i and j are not visited and we omit constraint (K33). We discuss this in detail below.

If $\Delta_{ij} < \epsilon$, i and j are considered to be simultaneous arrivals. Constraint (K17) forces both z_{ij} and z_{ji} to 1 in this situation. If arrival times are simultaneous within ϵ, z_{ij} and z_{ji} are forced to 1. Because i and j are both visited (α_{ij} and α_{ji} will equal 1) and z_{ij} and z_{ji} are both 1, β_{ij} and β_{ji} will both equal 1 and p_{ij} and p_{ji} will both be counted in the objective function. If P has the inverse property, this is okay since p_{ij} and p_{ji} cancel each other out. However, if P is generalized, $p_{ij} + p_{ji}$ may equal anything, so we modify the objective function (K1) and add additional constraints, (K22) through (K25), described below.

In (K18) and (K19), if neither i nor j is visited, then constraint (K18) forces α_{ij} to 0 so that $-(0 + 0) \leq 0$. If exactly one of i and j is visited then (K18) again

forces α_{ij} to 0 so that $-(1+0) \leq 0$ or $-(0+1) \leq 0$. If both i and j are visited, then (K19) forces α_{ij} to 1 so that $2 \leq 1 + \alpha_{ij}$ holds. Thus, α_{ij} is forced to 1 if and only if both i and j are visited, 0 otherwise.

(K20) and (K21) tie all the additional binary variables together. If both α_{ij} and $z_{ij} = 0$, then constraint (K20) forces β_{ij} to 0 so that $-(0+0) \leq 0$. If either $\alpha_{ij} = 1$ or $z_{ij} = 1$, but not both, then (K20) again forces β_{ij} to 0 so that $-(1+0) \leq 0$ or $-(0+1) \leq 0$. If $\alpha_{ij} = z_{ij} = 1$, then (K21) forces β_{ij} to 1 so that $2 \leq 1 + \beta_{ij}$ holds. Thus, β_{ij} is 1 if and only if i and j are both visited and i's arrival precedes or is simultaneous to j's. Otherwise, $\beta_{ij} = 0$.

We desire γ_{ij} to be 1 if and only if $|a_i - a_j| < \epsilon$. This is accomplished with constraints (K22) and (K23) which force γ_{ij} to 1 when Δ_{ij} is less than ϵ (effectively 0), 0 otherwise.

Now, assume that we do not include the $N\epsilon$ term in constraint (K33), and we do not include constraints (K24), and (K25) in the model. Let i and j be two unvisited nodes. a_i and a_j are forced to 0 by constraint (K33) so that $\Delta_{ij} = \Delta_{ji} = 0$; this is a simultaneous arrival. β_{ij} and β_{ji} both equal 0 since i and j are not visited, but γ_{ij} and γ_{ji} are forced to 1 which invalidates the model.

Next, add the $N\epsilon$ term back to constraint (K33). Now, every unvisited node can be given an arrival time between 0 and $N\epsilon$ at least ϵ units apart. We note that if two nodes are less than $N\epsilon$ units apart, any route that visits the two nodes consecutively automatically contains a simultaneous arrival.

However, there is no mechanism to force the arrival times to be at least ϵ units apart. Let P be inverse symmetric. An inverse symmetric P should automatically

imply that the model in Section B.1 is solved (since $p_{ij} + p_{ji} = 0$, simultaneous arrivals are not a concern) but is certainly not required. Let i and j again be unvisited nodes. Their arrival times are both forced to less than $N\epsilon$, say 2ϵ and 3ϵ where $N >= 3$. Δ_{ij} and Δ_{ij} are therefore ϵ. If $p_{ij} < 0$ ($p_{ji} < 0$), constraints (K22) and (K23) do not force γ_{ij} and γ_{ji} to 0. The objective function will then drive γ_{ij} but not γ_{ji} (γ_{ji} but not γ_{ij}) to 1 and increase in value. This is erroneous.

Now, add constraints (K24) and (K25) back to the model. Continuing our example, i and j are both unvisited (so that $w_i = w_j = 0$) and $\Delta_{ij} = \Delta_{ji} = \epsilon$. Here, if the objective function pushes either γ_{ij} or γ_{ji} to 1, (K24) and (K25) both evaluate to $1 \leq 0$ which is infeasible. Thus, the final loophole is closed and simultaneous arrivals are correctly handled. The objective function will count only the proper profits since y_{ik} and w_i, then z_{ij} and α_{ij}, and finally β_{ij}, will all be pushed towards 1 while γ_{ij} is pushed to 0.

u_k is a binary variable equal to 1 if and only if vehicle k visits any node other than the depot, 0 otherwise. That is, if vehicle k visits no other node than the depot, constraint (K26) forces u_k to 0. If vehicle k visits any node other than the depot, constraint (K27) forces u_i to 1. In general, an optimal $k+1$-vehicle solution is not necessarily better than an optimal k-vehicle solution, as previously illustrated in Figure 5.1. Constraints (K28) and (K29) dictate how many vehicles are used in the solution with $k_{min} = 1$ and $k_{max} = K$ being a typical choice. These two constraints do not specify which of the K vehicles must be chosen.

Constraints (K30) and (K31) fix the arrival times for all nodes, whether or not they are visited. To understand this constraint, consider an example with a

homogeneous fleet. Since $T_{max} = T$, the $y_{jk}(T_{max} - T)$ term drops out and we are left with:

$$a_i + x_{ijk}(s_i + t_{ij} + T) \leq T + a_j \quad \forall\ k;\ i \geq 0,\ j \geq 1$$

$$-a_i + x_{ijk}(T - (s_i + t_{ij})) \leq T - a_j \quad \forall\ k;\ i \geq 0,\ j \geq 1$$

$$\forall\ k;\ i \geq 0,\ j \geq 1 \text{ for both constraints}$$

If edge ij is not included in vehicle k's tour, then we do not want its associated arrival time constraints to restrict i and j's arrival times in any way. This holds since $a_i \leq T + a_j$ and $a_i \geq a_j - T$. If edge ij is included in vehicle k's tour, then the T's cancel out and we have that $a_i + (s_i + t_{ij}) \leq a_j$ and $a_i + (s_i + t_{ij}) \geq a_j$. That is, $a_j = a_i + (s_i + t_{ij})$.

When the fleet is heterogeneous, the logic remains the same, but the details are messier. Without loss of generality, assume we have a two-vehicle fleet ($K = 2$) where $T_1 = 100$ and $T_2 = 12$ (any $T_1 > T_2$ will do). T_{max} must be 100, $T_{max} - T_1 = 0$ and $T_{max} - T_2 = 88$. $t_{i\bar{0}_1} = 3$, $t_{i\bar{0}_2} = 5$, and $\bar{t}_{i\bar{0}_{mDiff}} = 2$. Assume we model these constraints as:

$$a_i + x_{ijk}(T_k + (s_i + t_{ij})) \leq\ T_k + a_j$$

$$-a_i + x_{ijk}(T_k - (s_i + t_{ij})) \leq\ T_k - a_j$$

$$\forall\ k;\ i \geq 0,\ j \geq 1 \text{ for both constraints}$$

If edge ij is not included in vehicle 1's tour, we must satisfy $a_i \leq 100 + a_j$ and $a_i \geq a_j - 100$. This means that $a_i - 100 \leq a_j \leq a_i + 100$ which is valid since neither i nor j's arrival time is restricted more than their bounds. If edge ij is not

included in vehicle 2's tour, we must satisfy $a_i \leq 12 + a_j$ and $a_i \geq a_j - 12$. That is, $a_i - 12 \leq a_j \leq a_i + 12$. This is a problem since the constraint should not restrict either a_i or a_j. Therefore, the T in the righthand-side of each constraint must be replaced by T_{max}. We now have:

$$a_i + x_{ijk}(T_k + (s_i + t_{ij})) \leq \ T_{max} + a_j$$

$$-a_i + x_{ijk}(T_k - (s_i + t_{ij})) \leq \ T_{max} - a_j$$

$$\forall\ k;\ i \geq 0,\ j \geq 1 \text{ for both constraints}$$

Continuing our two-vehicle example, without loss of generality let $s_i + t_{ij} = 4$ (any number $< T_2$ will do) and let i be the depot ($a_i = 0$). The constraints would be:

$$0 + 104x_{ij1} \leq \ 100 + a_j$$

$$-0 + 96x_{ij1} \leq \ 100 - a_j$$

$$0 + 16x_{ij2} \leq \ 100 + a_j$$

$$-0 + 8x_{ij2} \leq \ 100 - a_j$$

Although $T_2 = 12$, edge ij could be included in vehicle 2's route for any $a_j \leq 92$ and is not forced to any particular value. Even in tandem with constraint (K32), a_j can take any value such that $0 + s_j + t_{0_2 j} + t_{j\bar{0}_2} \leq 12$. The constraints are incorrect since a_j should be forced to exactly one value if included in vehicle 2's route.

Next, assume that we change the T_k term on the lefthand-side to T_{max}. We

have:

$$a_i + x_{ijk}(T_{max} + (s_i + t_{ij})) \leq \ T_{max} + a_j$$

$$-a_i + x_{ijk}(T_{max} - (s_i + t_{ij})) \leq \ T_{max} - a_j$$

$$\forall\ k;\ i \geq 0,\ j \geq 1 \text{ for both constraints}$$

Continuing our example, for vehicle 2, these constraints would look like:

$$a_i + 104x_{ij2} \leq \ 100 + a_j$$

$$-a_i + 96x_{ij2} \leq \ 100 - a_j$$

Again, let i be the depot ($a_i = 0$) and $s_0 + t_{0_2 j} = 4$ ($s_0 = 0$ by definition). We now have:

$$104x_{ij2} \leq \ 100 + a_j$$

$$96x_{ij2} \leq \ 100 - a_j$$

Therefore, $a_j \leq 4$. In tandem with constraint (K32), a_j can take any value such that $0 + 4 + t_{j\bar{0}_2} \leq 12$. The constraints are still incorrect because if j is visited in route k, the arrival time constraints pertaining to i, j, and route k should force a_j to exactly one value rather than an interval.

Now, replace the T_{max} on the lefthand-side with T_k, as we had it, and add in the $y_{jk}(T_{max} - T_k)$ term. We now have constraints (K30) and (K31) as they appear

in SDTOP$_{general}$. For our two-vehicle example, the constraints are:

$$a_i + 104x_{ij1} + 0y_{j1} \leq \ 100 + a_j$$

$$-a_i + 96x_{ij1} + 0y_{j1} \leq \ 100 - a_j$$

$$a_i + 16x_{ij2} + 88y_{j2} \leq \ 100 + a_j$$

$$-a_i + 8x_{ij2} + 88y_{j2} \leq \ 100 - a_j$$

If edge ij is not included in either tour, these constraints do not restrict the values of either a_i or a_j. If edge ij is included in vehicle 1's tour ($x_{ij1} = y_{j1} = 1$ and $x_{ij2} = y_{j2} = 0$), a_j is forced to equal exactly $a_i + 4$, and vehicle 2's constraints do not restrict a_j. If edge ij is included in vehicle 2's tour ($x_{ij2} = y_{j2} = 1$ and $x_{ij1} = y_{j1} = 0$), a_j is also forced to equal exactly $a_i + 4$, and vehicle 1's constraints do not restrict a_j.

Constraint (K32) requires that the arrival time for any node is early enough so that its vehicle can feasibly reach its depot. Note that when $i = 0$, t_{ij} is actually $t_{0_k j}$. Consider an example, letting the righthand side of (K32) equal T_k . Once again using our two-vehicle example from above, let $y_{i1} = 0$, $y_{i2} = 1$, and $a_i = 7$. Vehicle 2 visits node i at time 7. The constraints are:

$$7 + (3 - 100) \leq 100$$

$$7 + (5 - 100) \leq 12$$

Both constraints are valid which is as it should be. However, if vehicle 1 infeasibly visits node i at time 103, the constraints do not work. $y_{i1} = 1$, $y_{i2} = 0$, and $a_i = 103$.

The constraints are:

$$103 + (3 - 100) \leq 100$$

$$103 + (5 - 100) \leq 12$$

which incorrectly is feasible for both constraints. Now, let the righthand side = 0 and remove the y_{ik} term. It is easily verified that the above situations are handled correctly. Assume, vehicle 2 visits node i at time 7. $y_{i1} = 0$, $y_{i2} = 1$, and $a_i = 7$. The constraints are:

$$7 + (3 - 100) \leq 0$$

$$7 + (5 - 100) \leq 0$$

which correctly says this is feasible. However, if vehicle 1 visits node i at time 96, the constraints do not work. $y_{i1} = 1$, $y_{i2} = 0$, and $a_i = 96$. The constraints are:

$$96 + (3 - 100) \leq 0$$

$$96 + (5 - 100) \leq 0$$

which is infeasible. These constraints are invalid because vehicle 1 would return to its depot at time 99 which is feasible.

Now, add to $-y_{ik}(T_{max} - T_k)$ the righthand side and recall that $(T_{max} - T_1 = 0$ and $T_{max} - T_1 = 88$. It is easily verified that the first three scenarios we have described are handled correctly. However, if vehicle 1 visits node i at time 96, the constraints still do not work. $y_{i1} = 1$, $y_{i2} = 0$, and $a_i = 96$. The constraints are:

$$96 + (3 - 100) \leq -1 \cdot 0$$

$$96 + (5 - 100) \leq 0 \cdot 88$$

which is infeasible although vehicle 1 can feasibly visit node i at time 96.

Next, let the righthand side be $(1 - y_{ik})\bar{t}_{i\bar{0}_{mDiff}}$. Recall that $t_{i\bar{0}_1} = 3$, and $t_{i\bar{0}_2} = 5$. Therefore, $t_{i\bar{0}_{max}} = 5$, $t_{i\bar{0}_{min}} = 3$, and $\bar{t}_{i\bar{0}_{mDiff}} = 2$. If vehicle 1 visits node i at time 96, the constraints are:

$$96 + (3 - 100) \leq (1 - 1) \cdot 2$$

$$96 + (5 - 100) \leq (1 - 0) \cdot 2$$

which correctly allows the values given. If $a_i = 97$, which is the latest that vehicle 1 can feasibly visit node i, the constraints still work. For $a_i > 97$, the constraints correctly forbid this infeasibility. It is easily verified that this form of the constraint works for the other scenarios described above.

There is one remaining scenario to consider for a visited node i. Let vehicle 2 visit i at time 10, which should be recognized as infeasible $(10 + 5 > 12)$. $y_{i1} = 0$, $y_{i2} = 1$, and $a_i = 10$. The constraints are:

$$10 + (3 - 100) \leq (1 - 0) \cdot 2$$

$$10 + (5 - 100) \leq (1 - 1) \cdot 2$$

which incorrectly allows i to be visited at an infeasible time.

Finally, let the righthand side be $(1 - y_{ik})\bar{t}_{i\bar{0}_{mDiff}} - y_{ik}(T_{max} - T_k)$. Combining terms and moving the y_{ik} terms to the lefthand side, we obtain constraint (K32) as it appears in SDTOP$_{general}$. For the scenario given above the constraints are:

$$10 + (3 - 100) \leq (1 - 0) \cdot 2 - (0 \cdot 100)$$

$$10 + (5 - 100) \leq (1 - 1) \cdot 2 - (1 \cdot 88)$$

which correctly identifies $-85 < -88$ as infeasible. It can easily be verified that all the scenarios above are handled correctly by constraint (K32).

However, constraint (K32), alone, does not suffice when i is unvisited. In this case every constraint Constraint(K33), in conjunction with (K24) and (K25)), forces the arrival time of unvisited nodes into the interval $[0, N\epsilon]$. Without (K33), (K32) could unnecessarily restrict a_i as shown previously.

Groër et al., [40], have pointed out both that (K30) eliminates subtours and that (K31) could be dropped if we wanted to allow vehicles to wait at node i. However, although redundant, adding some of the standard subtour elimination constraints in (K34), with cardinality no larger than $n/2$, helps achieve faster solution times since they are tighter than (K31).

K.2 Explicitly Excluding Simultaneous Arrivals

The third model explicitly forbids simultaneous arrivals. Note that in the second model, $\beta_{ij} + \beta_{ji} = 2$ if and only if $a_i = a_j$ and i and j are visited. This is due to the maximization pushing z_{ij} and z_{ji} both to 1. To forbid simultaneous arrivals, we modify $\text{SDTOP}_{general}$ to include a new objective (K35) and additional constraints (K36) through (K39), and we remove constraints (K22) through (K25). In this formulation, called $\text{SDTOP}_{noSimul}$ γ_{ij} are the objective function variables. The first two constraints force γ_{ij} to 0 if neither i nor j is visited or if both are visited such that $a_{ij} = a_{ji}$. The last two constraints force the correct γ (γ_{ij} or γ_{ji}) to 1. Without these two constraints, if $\beta_{ij} = 1$ and $p_{ij} < 0$, γ_{ij} could still equal 0 to avoid lowering the objective function. When an optimal solution to the first model

has simultaneous arrivals, that solution will not be optimal to this version.

$$\text{Maximize} \qquad \sum_{i=1}^{N}\sum_{j=1}^{N} p_{ij}\gamma_{ij} \tag{K35}$$

$$-(\beta_{ij} + \beta_{ji}) \leq -\gamma_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K36}$$

$$\beta_{ij} + \beta_{ji} \leq 2 - \gamma_{ij} \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K37}$$

$$\frac{1}{2}\gamma_{ij} - \beta_{ij} \leq 0 \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K38}$$

$$\beta_{ij} - \gamma_{ij} \leq 0 \qquad \forall\ i \geq 1,\ j \geq 1 \tag{K39}$$

K.3 Using the Minimum Number of Variables

Both δ_{ij} and w_i are book-keeping variables included to make the formulations easier to read. They are unnecessary for model correctness. If we leave δ_{ij} out, constraint K10 is removed and all occurrences of δ_{ij} are replaced by $(a_j - a_i)$. To remove w_i, replace constraint (K4) with (K40), and replace all other occurrences of w_i with $\sum_{k=1}^{K} y_{ik}$. In preliminary experiments, we found that the lower bound increases somewhat faster when we include δ_{ij} and w_i in any of the formulations.

$$\sum_{k=1}^{K} y_{ik} \leq 1 \qquad \forall\ i \geq 1 \tag{K40}$$

K.4 Extensions

We can add in constraints to force a_i to be visited within some time window, if it is actually visited, otherwise 0. This is done using constraints (K41) and (K42).

$$a_i - (1 - w_i)T_{Max} \leq UB_{a_i} \qquad \forall\ i \geq 1 \tag{K41}$$

$$a_i + (1 - w_i)T_{Max} \geq LB_{a_i} \qquad \forall\ i \geq 1 \tag{K42}$$

$0 \leq a_i \leq N\epsilon$ when node i is not visited, so the w_i term can be dropped and constraint (K41) becomes (K43). This assumes that $UB_{a_i} > N\epsilon$.

$$a_i \leq UB_{a_i} \qquad \forall\ i \geq 1 \tag{K43}$$

In some situations, it may make sense that no two nodes can be visited within a certain period ($\gg 0$) of each other. That is, we want no simultaneous arrivals and the ϵ used to indicate one is $\gg 0$. In this situation, both SDTOP$_{general}$ and SDTOP$_{noSimul}$ can be used. SDTOP$_{general}$ would count neither p_{ij} nor p_{ji} when these simultaneous arrivals (simultaneous only in the sense that they are within a large ϵ of each other) occur. SDTOP$_{noSimul}$ would explicitly forbid such arrivals. For large enough ϵ, it is unlikely that no two nodes will be within $N\epsilon$ units of each. For large enough ϵ, constraint (K22) can unnecessarily become infeasible. Thus, for very large ϵ it is preferable to use SDTOP$_{noSimul}$.

It is possible that the optimal solution value, $sdtop^*$, corresponds to more than one unique solution. In this situation, the minimum-distance route is preferable. This can be achieved by solving a second SDTOP in which a constraint is added requiring that the total profit equal $sdtop^*$ and the objective function minimizes the total distance of the routes.

K.5 Number of variables and constraints

The three formulations for the SDTOP that we have presented are more complex than the standard VRP and TOP formulations. We added variables and constraints to model requirements such as explicitly forbidding simultaneous arrivals.

Table K-1: Numbers of variables and constraint for three SDTOP formulations.

$V_1 = (N+1)(K+NK+1)+N+K$ $V_2 = (N+1)(K+NK+1)+K$ $C = 2K((N+1)+N^2+1.5)+NK+2(N+1)$			
	SDTOP$_{simp}$	SDTOP$_{general}$	SDTOP$_{noSimul}$
Total number of variables	$V_1+4N(N-1)$	$V_1+7N(N-1)$	$V_1+7N(N-1)$
Number of binary variables	V_1+3N^2-4N-1	V_1+5N^2-6N-1	V_1+5N^2-6N-1
Number of continuous variables	N^2+1	$2N^2-N+1$	$2N^2-N+1$
Number of constraints	$C+7N(N-1)$	$C+16N(N-1)$	$C+16N(N-1)$
Minimum variable formulations			
Total number of variables	$V_2+3N(N-1)$	$V_2+6N(N-1)$	$V_2+6N(N-1)$
Number of binary variables	V_2+3N^2-4N-1	V_2+5N^2-6N-1	V_2+5N^2-6N-1
Number of continuous variables	$N+1$	N^2+1	N^2+1
Number of constraints	$C+6N(N-1)$	$C+15N(N-1)$	$C+15N(N-1)$

The formulations produce linear relaxations that are too weak to use in the branch-and-bound process. Because of this, we have been unsuccessful in trying to solve problems with more than 10 nodes and one vehicle although problems with up to five nodes and three vehicles solve in seconds.

In Table K.5, we show the number of variables and constraints in the three formulations where we allow different depots, maximum tour lengths, and maximum capacities for each vehicle. Giving every vehicle the same starting and ending depot, maximum tour length, and maximum capacity reduces complexity only marginally. The majority of the binary variables are used to determine the meta-route sequence in order to evaluate the objective function. Each formulation has $O(N^2K)$ complexity for both variables and constraints.

Appendix L

CETSP/CEVRP Problem Data

In this appendix, we present the problem data for all CETSP and CEVRP instances. The six problems whose names begin with *team* along with the *bonus*1000 problem are collectively denoted the *Team* problems. The problems whose names begin with *rotatingDiamonds*, *bubbles*, or *concentricCircles*, along with *chaoSingleDep*, are collectively denoted the *Geometric* problems. The seven problems created from TSPLIB instances are referred to as the *TSPLIB* problems.

The data for each problem are presented in the following tables. Each table has six columns. Node ID numbers each node in the problem, where node 0 represents the depot. Counting the depot, the *Team* problems have one more node than their names imply. That is, including the depot, *team*1_100 has 101 nodes. Including the depot, the *TSPLIB* problems have exactly the number of nodes as their names imply. The second, third, and fourth columns give the coordinates for each node where the z-coordinates are only relevant for the 3D versions of problems. The fifth column gives the radius of each node for the arbitrary radius versions of the problem. The sixth column gives each node's demand. Node demands are only relevant to CEVRP problems. Each table lists the maximum vehicle capacity and tour length for CEVRP problems.

The *Team* problems each have one fixed-radius scenario. For example, as shown in Table L-1, for the fixed-radius version of *team*1_100, $r_i = 9$ for all i.

The $TSPLIB$ problems have three fixed-radius scenarios, low overlap ratio (0.02), medium overlap ratio (0.1), and high overlap ratio (0.3). For example, consider $kroD100$, as shown in Table L-8. For low overlap ratio, $r_i = 0.7798$ for all i, for medium overlap ratio, $r_i = 3.899$ for all i, and for high overlap ratio, $r_i = 11.697$ for all i.

The *Geometric* problems were created solely for 2D, fixed-radius experiments. Therefore, all z-coordinates are 0 and the radii for all nodes in problem are equal. Data for the five *rotatingDiamonds* and the five *concentricCircles* problems are given in Tables L-15 and L-16. The nodes used and the vehicle capacities for both sets of problems are given in Table L-17. Data for *bubbles*2 to *bubbles*9 are given in Table L-20. The nodes used and the vehicle capacities are given in Table L-19.

The nodes for each problem are shown in 2D and also 3D, if relevant. x-coordinates have been shifted right 110 units and y-coordinates are graphed with the sign flipped. In the 2D (3D) figures, the depot is shown as disk (sphere) slightly larger than the nodes.

The author can be reached at `wmennell@hotmail.com` for copies of the data files.

Table L-1: team1_100

n:	101
r:	9
Description:	clustered
Total Demand:	543
Max Vehicle Capacity:	46
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	50	10	0	-	-
1	78.214	79.218	18.292	2.902	8
2	74.447	77.382	91.404	0.86	2
3	76.154	71.763	97.979	8.051	1
4	77.919	74.057	76.926	8.389	10
5	54.032	12.197	7.44	11.442	6
6	53.754	0.148	93.309	8.742	10
7	46.154	2.083	10.72	3.275	3
8	53.405	3.041	5.972	0.28	1
9	40.868	2.981	76.025	5.001	7
10	45.293	9.057	63.281	13.174	9
11	27.219	44.51	3.327	4.337	8
12	19.881	93.181	96.862	12.244	1
13	1.527	46.599	0.05	0.521	10
14	74.679	41.865	10.639	6.615	4
15	36.924	96.636	7.226	0.737	4
16	30.503	90.056	84.685	13.109	7
17	24.053	94.189	12.551	1.867	8
18	33.443	88.578	84.328	7.057	2
19	36.762	86.092	10.176	0.194	6
20	20.393	83.793	60.447	0.615	7
21	33.626	83.869	72.958	3.982	5
22	27.59	93.644	36.826	3.286	1
23	19.569	24.449	84.923	0.997	3
24	25.542	20.506	48.088	2.023	10
25	15.772	12.549	91.264	9.192	2
26	29.447	11.243	26.345	5.69	2
27	21.459	12.53	50.646	6.577	10
28	33.5	17.352	15.52	4.16	1
29	33.341	22.178	45.103	10.381	1
30	26.839	11.732	76.118	5.19	2
31	12.414	20.962	80.147	4.565	7
32	22.494	14.202	49.345	13.068	9
33	20.541	9.26	39.729	2.556	4
34	16.123	17.568	4.443	8.298	7
35	49.571	48.14	55.073	8.233	7
36	47.232	45.27	89.834	13.543	7
37	52.975	65.56	80.551	9.534	1
38	51.29	49.58	11.489	10.97	2
39	55.281	51.871	55.993	9.377	4
40	59.007	60.213	31.626	2.987	6
41	49.02	51.541	23.534	12.697	3
42	57.243	55.792	50.963	0.38	6
43	40.978	46.49	25.743	6.437	4
44	59.534	67.732	45.235	9.572	5
45	43.243	58.404	75.054	12.71	4
46	42.804	54.74	25.734	7.11	1
47	57.142	56.857	57.493	5.652	9
48	53.958	52.681	59.332	10.486	5
49	89.359	10.839	25.32	9.385	5
50	85.841	12.653	93.498	10.749	8
51	91.857	16.502	66.492	2.743	1
52	94.926	4.006	36.794	11.26	8
53	91.007	13.249	70.645	2.373	1
54	92.889	3.855	22.202	5.733	5
55	85.554	10.061	65.642	2.745	8
56	88.457	8.185	95.157	13.747	6
57	95.317	17.864	59.209	7.295	5
58	93.574	3.255	13.429	10.497	8
59	20.735	74.659	7.978	9.97	4
60	26.213	68.977	77.227	4.574	1
61	26.732	55.612	72.392	5.676	4
62	21.299	57.593	80.779	4.473	8
63	11.844	68.394	54.009	13.519	9
64	13.454	69.007	48.213	9.443	10
65	5.777	62.003	23.29	14.244	3
66	17.374	67.529	56.063	2.247	1
67	8.641	64.188	15.551	14.025	6
68	25.923	53.185	46.671	1.603	4
69	19.619	52.734	79.19	6.234	8
70	11.123	60.442	50.101	0.24	8
71	20.103	52.347	63.856	8.385	10
72	7.235	62.367	51.584	12.76	10
73	11.878	70.444	28.798	14.354	8
74	25.201	54.507	48.664	0.116	4
75	18.45	52.954	46.14	14.862	5
76	5.739	68.535	65.134	13.479	10
77	93.694	56.925	1.612	3.099	1
78	87.173	60.998	48.592	11.762	6
79	87.18	60.86	47.333	5.182	8
80	89.091	59.886	77.014	4.603	6
81	93.456	57.69	77.108	14.427	5
82	87.633	63.432	97.407	11.884	8
83	91.043	63.691	55.511	7.01	4
84	93.946	64.003	91.762	8.979	8
85	94.894	61.262	13.169	7.46	10
86	94.619	62.103	50.624	0.816	6
87	63.631	81.224	94.784	14.134	9
88	73.523	67.727	97.567	6.866	2
89	81.476	87.316	28.362	12.684	6

Node ID	x	y	z	r_i	demand
90	86.785	67.217	67.68	10.959	2
91	68.193	67.124	4.172	11.572	2
92	67.643	91.829	97.188	6.325	3
93	85.968	75.194	1.985	10.133	1
94	66.971	72.201	17.644	7.244	3
95	84.146	71.427	3.869	10.315	4
96	87.252	72.952	19.479	10.77	8
97	66.957	73.797	28.023	11.351	2
98	67.179	79.746	30.609	10.928	9
99	61.493	65.592	32.325	2.691	10
100	62.352	63.144	84.329	5.122	10

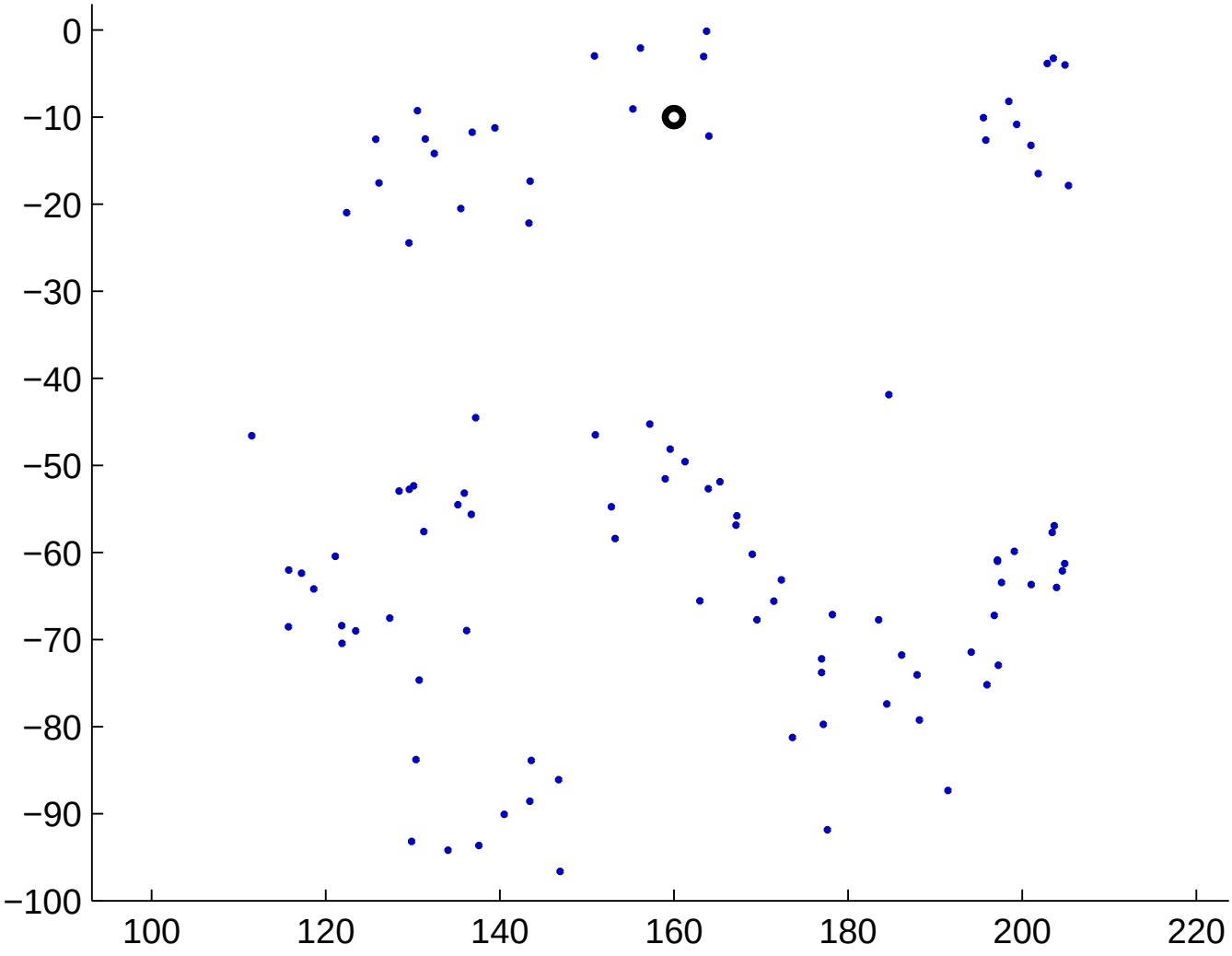


Figure L.1: team1_100

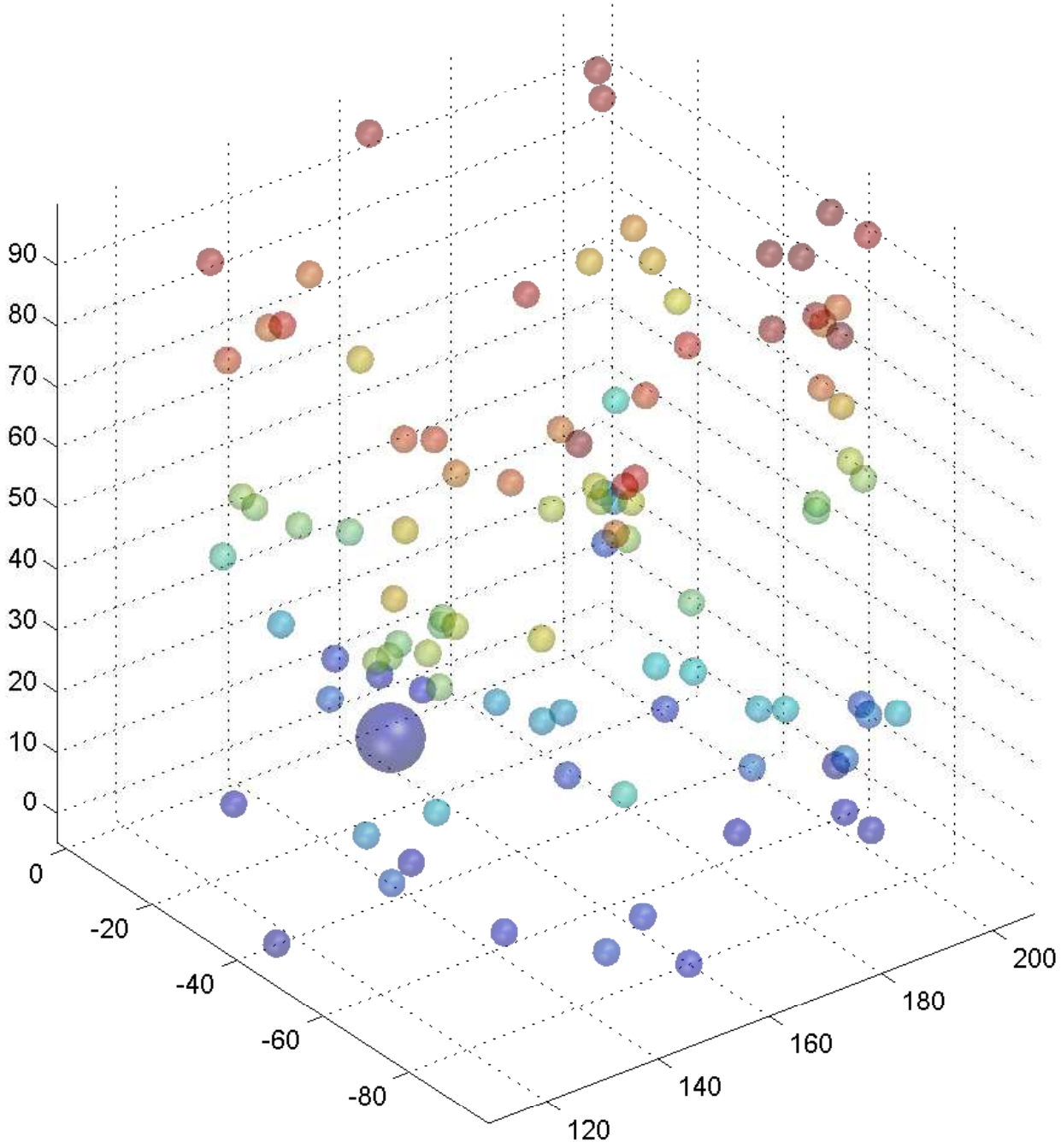


Figure L.2: team1_100_3D

Table L-2: team2_200

n:	201
r:	20
Description:	random
Total Demand:	617
Max Vehicle Capacity:	120
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	19.5535	32.6157	0	-	-
1	70.55475	53.342402	18.770686	6.30295	4
2	57.95186	28.956245	5.320699	2.906543	2
3	30.1948	77.47401	0.923346	8.506801	5
4	1.401765	76.07236	14.516115	7.401092	3
5	81.449	70.90379	9.10693	4.00725	5
6	4.535275	41.40327	15.496926	1.201293	2
7	86.26193	79.048	11.651774	6.603528	4
8	37.353615	96.195315	18.415189	1.909791	1
9	87.144585	5.62369	21.911356	7.10022	4
10	94.955665	36.40187	7.771411	7.002314	2
11	52.486843	76.711165	9.36826	6.306844	5
12	5.35045	59.245825	2.02242	9.802178	4
13	46.870011	29.816545	8.525673	7.806658	2
14	62.26967	64.78212	6.975531	9.008592	3
15	26.379295	27.934205	23.031473	5.600223	1
16	82.980165	82.460215	28.432538	3.407507	4
17	58.9163	98.60932	2.300231	7.507171	3
18	91.09643	22.6866	6.913126	1.205359	4
19	69.51155	98.000325	10.150379	1.707329	3
20	24.393135	53.387308	3.209069	8.804674	4
21	10.636965	99.941455	22.606097	9.901623	3
22	67.61759	1.570395	20.822479	5.100981	2
23	57.51838	10.00522	23.910843	10.000856	3
24	10.302265	79.88844	24.724981	1.80828	4
25	28.448025	4.56492	10.374303	4.604428	5
26	29.577285	38.20107	12.365171	0.303974	4
27	30.09705	94.85711	4.685105	8.906507	5
28	97.982935	40.137435	28.75306	10.003975	5
29	27.827995	16.04415	0.143676	1.001454	5
30	16.28216	64.658715	7.376906	2.608407	2
31	41.00732	41.27668	4.938398	0.107583	1
32	71.273045	32.62062	26.349189	3.608079	5
33	63.31789	20.756115	1.726904	3.203825	4
34	18.601355	58.3359	16.263038	9.106551	2
35	8.071465	45.7971455	5.631658	0.90257	1
36	90.572985	26.136825	24.857885	8.602133	1
37	78.52122	37.890255	25.630233	6.801958	1
38	28.966505	91.93771	20.861988	1.002586	5
39	63.17424	62.764205	21.920947	7.706659	1
40	42.845635	9.79738	11.955362	5.407265	3
41	56.10401	69.44853	29.951816	7.107666	5
42	91.37176	83.481715	13.123111	1.3041	5
43	2.26292	54.336059	8.412226	5.709688	3
44	91.6164	43.026115	2.808093	8.109517	1
45	67.794775	0.2453923	14.617193	4.606064	1
46	51.37375	46.298003	11.79476	8.802177	3
47	35.347265	40.483415	12.676508	6.900943	4
48	26.97316	5.55935	2.320922	8.204253	3
49	24.384515	97.907795	0.111537	6.707286	1
50	6.091625	39.029145	21.745986	2.102568	4
51	36.49954	48.989475	3.669737	8.009904	2
52	15.566305	47.445917	16.822861	8.70734	4
53	25.726765	62.875185	13.655865	6.002164	4
54	54.207021	15.63022	20.585643	7.700153	3
55	93.854515	65.44994	7.938496	0.901393	3
56	50.608737	39.047145	0.30438	7.509385	1
57	10.737535	78.399525	25.651463	6.808137	3
58	45.96408	75.36881	19.356846	5.908922	1
59	59.609455	83.27302	29.920795	1.405546	1
60	1.875835	21.036865	8.472142	9.501742	3
61	7.39533	10.545265	21.25087	8.903739	5
62	33.169445	12.82499	1.129185	2.709158	4
63	0.024125	3.6794065	26.062187	4.00481	5
64	65.705495	54.4013975	3.082521	1.503619	1
65	82.741185	8.18936	9.780027	0.708018	1
66	19.19225	67.891335	25.986874	4.001137	3
67	45.420784	35.70231	13.427579	1.409626	5
68	14.99811	70.439575	28.594361	3.802058	2
69	92.878595	53.021252	1.55944	10.006179	4
70	8.96414	75.77293	21.604208	2.204212	1
71	40.184205	46.1874365	21.269314	1.907077	1
72	49.216563	20.76273	2.277188	1.803198	4
73	32.973595	9.54291	20.606347	2.603527	5
74	58.979255	16.987345	1.276103	4.304944	4
75	92.761655	9.792985	28.945088	7.707934	4
76	44.38625	27.294685	26.050788	2.501465	2
77	87.254685	75.06877	11.123991	5.900928	3
78	27.294235	67.36467	25.05905	8.501742	5
79	25.662895	8.989655	21.265898	0.207105	3
80	3.09506	32.271765	28.722779	2.008496	4
81	79.01289	29.7258	2.755744	7.100822	5
82	23.528225	48.047471	10.497692	7.005381	2
83	25.46019	34.06066	24.177315	5.200669	2
84	4.493385	48.2428075	1.749018	7.3014	2
85	20.60172	86.45345	23.44328	9.802386	2
86	58.86286	75.490835	22.793064	6.800719	1
87	92.788305	33.10169	27.022649	4.109114	3
88	54.294115	8.069135	15.776464	6.606257	3
89	63.437195	41.00367	26.99622	9.004095	5
90	96.04228	11.46233	26.220597	0.702338	3
91	92.344515	62.02096	28.826016	3.309346	2
92	34.77264	14.924575	26.641448	1.100481	4
93	47.997827	21.94091	22.00424	8.509285	5
94	99.37313	13.042045	19.983146	2.501137	2
95	2.888575	34.539165	0.815621	1.003767	3
96	54.766852	92.295455	6.553331	9.502154	2
97	53.824634	40.64213	16.603226	9.902994	5
98	84.72455	82.62255	16.621981	0.208434	1
99	67.24276	72.18951	20.816233	5.208708	5
100	99.67714	33.98061	22.565216	5.405501	1
101	49.52113	41.29678	9.327678	2.009713	1
102	69.52818	17.90893	23.466902	5.206535	3
103	42.291825	54.317701	14.78098	4.104253	4
104	81.466395	54.091358	0.343064	6.706774	2
105	42.753335	50.906813	15.568394	6.308285	5
106	22.77816	61.91876	23.535116	9.100277	5
107	48.983044	68.08194	24.712405	6.601797	5
108	88.660005	37.051535	6.873362	7.30023	1
109	30.249755	29.28668	9.627144	0.408718	2
110	15.031135	2.9821155	24.523433	9.903269	5
111	22.32618	58.45293	10.978007	1.401145	2
112	36.34587	87.597465	1.344209	6.900084	2
113	47.801417	19.06334	7.814097	4.70736	2
114	68.40623	74.741575	8.582781	3.705743	4
115	61.393495	78.21387	27.829379	9.209541	5
116	16.17437	80.77798	18.674423	4.001447	3
117	20.26183	95.676245	17.846167	5.307169	4
118	6.5851	6.152225	13.546134	0.405995	1
119	79.319755	37.96047	22.926601	9.501655	1
120	46.358401	11.954405	18.491997	1.303234	4
121	11.54701	17.37734	26.244082	9.803906	4
122	4.81189	71.48163	19.467897	9.90886	2
123	53.302235	56.10093	10.554691	4.70213	4
124	21.673354	6.8005655	13.961641	8.80316	1
125	74.635475	75.231085	23.616275	3.002518	1
126	39.89323	90.309885	11.775799	2.808165	4
127	74.60069	8.85595	6.459838	4.00271	3
128	63.457115	71.302795	28.410692	5.306378	3
129	1.56824	43.114435	27.74491	3.00535	4
130	40.19826	27.52955	29.10549	2.101085	3
131	98.53739	80.25874	11.354076	5.208919	3
132	69.610075	41.75992	4.719164	4.204327	3
133	73.44882	27.71684	3.250298	0.105102	2
134	35.65863	43.345715	7.513468	0.305492	2
135	94.4971	12.154995	26.111766	9.50306	5
136	64.595135	34.78327	9.989898	0.604254	5
137	10.44323	18.54025	17.132759	2.209906	5
138	7.76847	43.27595	27.165517	8.308131	3
139	95.92709	54.202926	8.883113	6.608684	5
140	49.437672	97.29667	7.39626	8.8097	3
141	21.779985	37.899125	15.006029	3.504901	2
142	39.58443	28.150345	20.548662	1.800561	2
143	50.337118	13.87323	4.749218	8.600173	3
144	51.725585	96.536445	28.40681	3.603979	2
145	55.7501	90.920415	19.617278	1.606912	1
146	65.72564	44.111465	7.622314	4.10252	1
147	69.299455	6.449115	15.081267	5.10428	4
148	75.60926	70.05143	9.458663	2.801868	1
149	49.707097	15.54357	19.872896	9.000518	2
150	22.373755	32.6144	28.047693	4.900414	1
151	78.44886	5.02628	2.732259	8.808511	3

Node ID	x	y	z	r_i	demand
152	51.801592	75.702955	19.859805	5.507245	3
153	80.066985	32.520545	19.480329	5.404485	5
154	97.272905	80.426715	12.650593	7.307128	2
155	67.48261	90.51293	17.817861	1.203441	3
156	87.57797	41.66484	5.551613	6.902275	4
157	12.30828	95.415795	18.734286	4.20063	5
158	79.72973	69.6285	5.76607	6.503827	1
159	40.16046	1.62977	24.917947	1.008583	3
160	16.776285	16.423415	15.502152	7.709348	5
161	50.972003	40.60627	2.976184	8.001002	3
162	10.613375	27.61233	15.443404	4.807428	4
163	64.30468	84.91	26.009678	1.203546	5
164	49.796921	18.777515	27.389734	4.003148	5
165	89.661665	37.28143	20.914346	7.609892	2
166	32.35548	77.08328	26.131092	8.907943	5
167	21.800035	44.699325	19.798588	9.804285	5
168	23.602775	87.83846	18.275699	8.306271	4
169	61.04328	37.44322	1.978623	7.908259	5
170	38.950185	86.058925	28.399966	3.201927	1
171	58.59379	93.155945	12.405414	9.907152	1
172	51.719243	33.03008	9.909651	0.507925	3
173	86.845365	25.906095	9.026374	8.100197	1
174	25.954135	17.869355	4.361083	7.603419	3
175	34.695715	0.250565	26.535311	8.309293	2
176	74.234205	84.088705	29.630347	0.803281	5
177	27.85894	70.297015	5.978866	7.608202	5
178	40.48646	81.157135	14.786912	0.906206	4
179	74.17807	43.76639	28.605582	8.300269	3
180	7.79806	41.063165	21.758433	5.901659	3
181	33.93752	71.055425	5.905417	5.201316	1
182	31.22881	79.877355	13.445056	7.509507	4
183	15.17562	59.299125	20.231796	5.903506	3
184	95.62369	24.314785	12.804988	0.900802	5
185	93.997115	11.43328	4.127594	7.703152	3
186	98.425325	63.29758	13.439936	4.501834	5
187	59.88564	90.256965	29.954013	6.102678	2
188	57.48649	24.517395	4.703245	9.301244	4
189	86.016245	7.495035	26.90563	0.503562	2
190	43.88264	75.9979	6.534575	8.106066	2
191	24.567885	37.86062	12.401465	3.403033	2
192	39.724355	52.657318	1.123019	4.803105	3
193	27.03592	58.11764	25.51317	0.607949	5
194	20.9699	7.87089	11.180156	1.008062	4
195	89.544625	11.14329	6.653118	1.801549	4
196	65.23767	90.033385	6.608827	0.507723	1
197	23.159665	94.99055	21.634541	6.103619	2
198	84.61874	44.121625	19.170305	3.6006	5
199	49.200624	76.95068	27.905495	0.307107	5
200	83.48933	38.25693	16.203282	8.302552	1

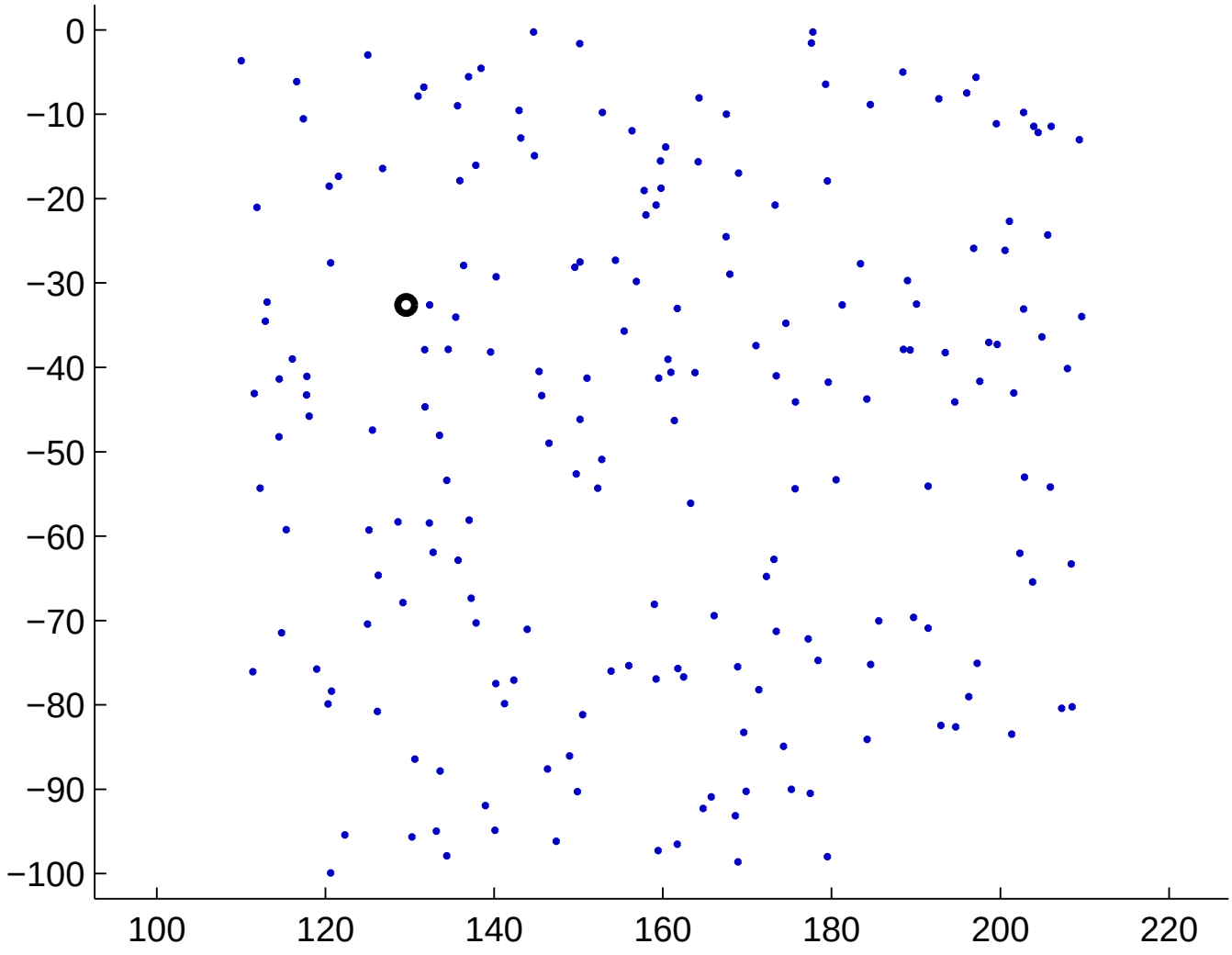


Figure L.3: team2_200

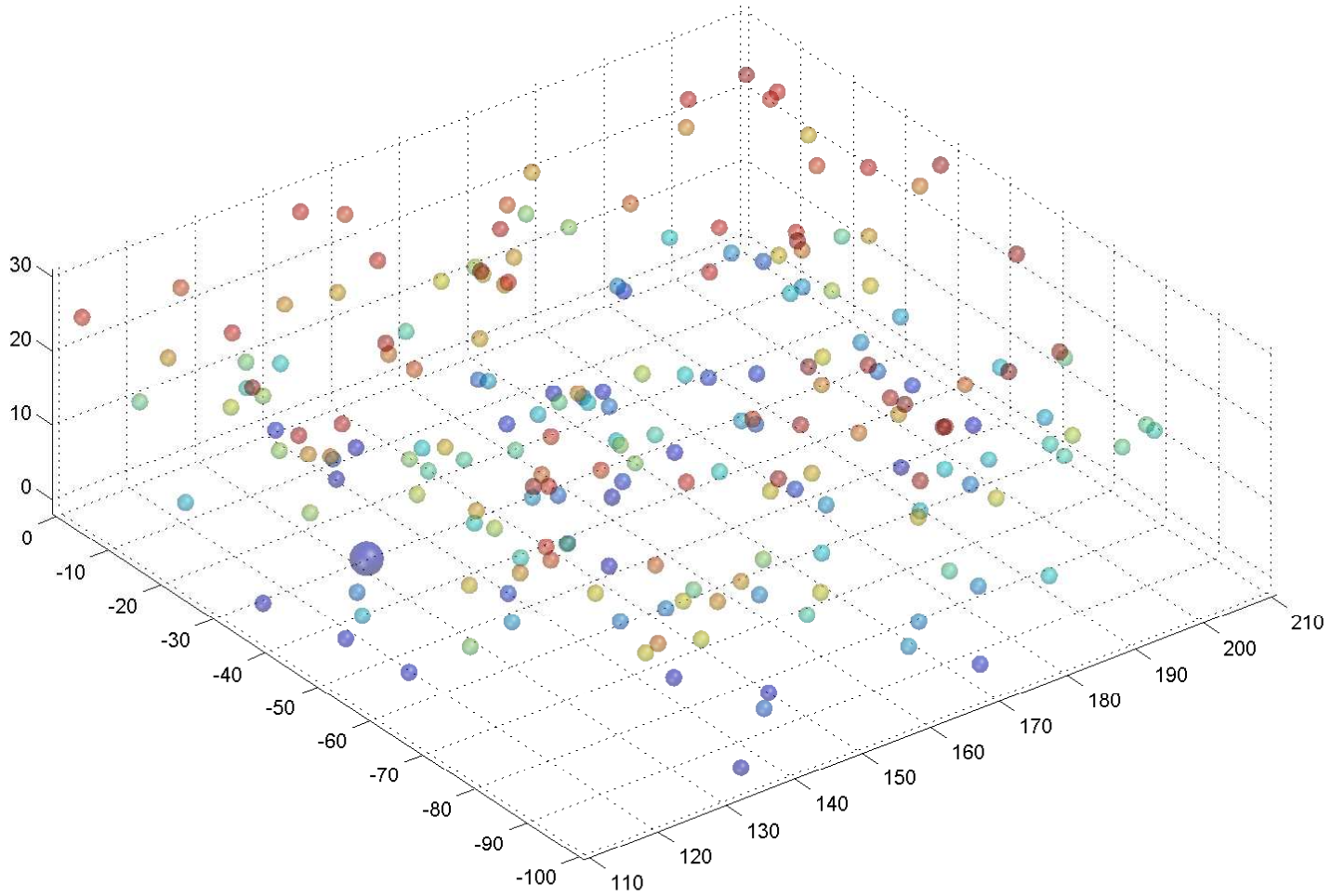


Figure L.4: team2_200_3D

Table L-3: team3_300

n:	301
r:	7
Description:	clustered
Total Demand:	9490
Max Vehicle Capacity:	1300
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	23.55	20.83	0	-	-
1	44.75	90.08	82.93	11.27	22
2	82.42	49.99	99.02	11.64	6
3	2.01	79.01	40.57	42.13	46
4	25.84	61.09	65.42	17.04	50
5	88.21	3.61	89.96	26.68	29
6	24.47	65.24	5.9	32.36	24
7	5.07	73.15	76.92	4.26	49
8	85.76	19.27	96.66	9.99	37
9	64.87	11.36	51.75	35.55	18
10	43.21	42.61	80.16	13.5	18
11	49.78	61.48	16.59	3.32	57
12	51.38	10.51	60.31	13.35	13
13	23.55	20.83	14.19	11.78	30
14	27.74	25.63	13.28	7.06	24
15	40.14	85.47	20.22	26.51	6
16	39.28	92.99	62.54	15.28	18
17	46.8	93.43	44.07	39.27	10
18	48.98	92.03	89.79	41.59	15
19	37.93	93.92	46.64	38.41	36
20	39.31	87.14	57.08	5.32	16
21	42.37	92.45	91.48	18.71	37
22	40.14	88.25	82.87	7.74	33
23	47.67	92.59	55.65	35.3	43
24	47.56	92.03	4.61	9.48	50
25	37.88	93.16	68.12	38.09	51
26	49.11	94.31	36.24	17.31	27
27	49.91	91.9	29.51	43.61	20
28	48.89	93.1	33.02	36.74	3
29	39.7	88.73	54.48	41.5	55
30	41.11	92.55	72.93	2.15	1
31	47.08	88.26	42.71	25.21	56
32	45.57	93.71	36.64	20.17	38
33	46.89	94.85	27.74	49.64	25
34	47.48	94.9	89.56	26.29	47
35	46.92	92.94	79.18	12.72	23
36	42.93	88.78	59.49	12.51	42
37	39.18	94.86	64.79	14.97	16
38	38.99	86.42	22.62	12.82	37
39	41.11	86.33	11.14	3.31	60
40	38.36	90.43	43.39	47.27	38
41	48.42	91.53	51.1	30.91	25
42	48.25	85.26	10.69	49.96	51
43	48.68	92.55	68.87	20.63	1
44	42.78	91.87	12.41	35.26	34
45	38.08	89.48	68.3	35.64	29
46	40.13	86.48	38.33	6.39	58
47	50.91	90.3	36.65	4.38	60
48	44.33	87.3	2.27	27.93	44
49	51.75	85.81	80.64	36.53	42
50	85.78	45.37	88.36	33.83	56
51	86.88	55.34	28.08	10.88	47
52	92.82	43.5	36.14	36.84	37
53	90.93	51.78	26.41	5.57	60
54	89.33	46.23	11.31	10.42	27
55	84.47	44.91	39.53	21.75	38
56	85.43	53	49.96	9.41	16
57	91.08	56.32	19.58	17.84	47
58	89.59	51.88	82.73	4.09	3
59	85.21	44.35	20.93	35.25	25
60	92.92	45.3	3.79	44.4	53
61	92.59	46.16	69.75	30.13	11
62	87.26	54.53	99.96	10.31	1
63	92	48.8	50.4	13.39	52
64	93.86	49.11	54.34	7.68	10
65	92.09	44.08	96.66	37.36	55
66	85.02	48.75	32.58	30.39	51
67	89.36	56.03	81.08	3.45	17
68	84.47	48.16	64.66	27.36	40
69	89.11	45.94	22.79	8.83	46
70	88.92	43.62	77.06	3.46	31
71	87.56	46.99	46.13	41.58	9
72	87.92	47.46	7.48	19.28	55
73	85.85	46.49	60.83	8.76	48
74	8.95	75.43	49.37	30.95	49
75	3.44	75.58	64.88	32.57	37
76	0.76	80.97	91.36	8.89	2
77	2.99	72.09	73.38	6.04	55
78	6.62	72.96	75.87	3.81	44
79	6.36	80.44	74.53	34.29	51
80	1.21	81.97	77.86	14.68	21
81	4.15	75.92	20.91	36	7
82	1.36	82.41	81.26	36.76	39
83	0.97	75.78	96.61	17.69	45
84	10.66	76.44	91.14	43.81	52
85	8.29	81.45	86.91	44.4	54
86	2.19	82.13	61.84	2.44	3
87	4.75	76.37	88.59	18.12	41
88	8.06	78.36	80.59	4.56	19
89	8.6	80.56	11.38	41.43	51
90	0.91	72.43	63.78	18.26	37
91	11.23	82.6	85.27	5.9	52
92	21.75	55.19	94.83	18.06	1
93	30.85	54.39	47.15	33.55	32
94	23.78	67.37	54.34	23.49	23
95	23.5	55.84	45.92	18.38	12
96	23.19	66.22	32.78	5.11	30
97	30.36	58.14	54.2	13.13	58
98	19.65	58.2	51.17	41.68	39
99	86.46	7.15	36.07	18.46	60
100	90.71	5.35	36.18	17.99	44
101	90.14	0.74	66.47	21.22	30
102	86.71	7.9	46.76	17.03	41
103	84.21	1.15	74	11.63	57
104	84.57	2.19	72.59	42.77	18
105	90.45	0.18	67.28	30.09	24
106	84.22	4.25	20.41	43.87	38
107	84.85	7.49	23.97	13.74	19
108	85.18	6.81	41.52	43.66	19
109	91.86	5.09	13.18	8.07	43
110	83.5	4.83	59.12	37.8	2
111	89.81	1.33	12.56	26.05	9
112	83.98	4.24	58.09	15.73	15
113	86.49	3.97	82.84	35.89	31

Node ID	x	y	z	r_i	demand
114	87.06	2.89	85.23	20.41	44
115	90.79	7.27	2.84	30.18	55
116	83.08	5.9	51.4	14.32	46
117	83.63	6.61	58.86	7.21	11
118	85.34	3.13	7.91	40.46	34
119	83.08	6.85	43.86	42.38	9
120	24.03	65.56	79.56	12.46	28
121	20.64	65	8.49	4.42	10
122	28.77	62.05	46.68	31.17	32
123	23.52	71.05	74.38	2.83	24
124	26.5	63.44	75.23	28.82	51
125	20.88	59.51	94.7	36.31	42
126	25.86	63.85	60.16	38.15	7
127	25.24	60.77	36.77	37.65	44
128	27.64	62.78	13.86	15.95	41
129	27.4	59.84	3.43	47.68	7
130	25.01	63.12	37.19	28.84	59
131	27.62	60.61	68.71	40.48	42
132	22.17	64.94	33.7	3.52	31
133	22.51	60.15	43.07	23.44	17
134	27.28	65.47	69.94	12.73	38
135	28.86	67.84	42.89	0.99	27
136	27.36	59.94	13.4	22.06	50
137	24.49	66.27	29.11	27.9	48
138	26.15	61.96	69.66	39.04	49
139	21.39	62.71	50.33	35.55	44
140	20.56	61.44	16.14	30.47	16
141	25.62	68.98	3.75	43.08	10
142	24.86	66.05	97.16	20.4	26
143	22.65	62.2	11.71	11.7	48
144	20.35	68.75	46.32	2.07	52
145	8.67	72.77	42.39	28.82	22
146	21.49	69.2	86.43	28.99	55
147	19.86	66.11	18.19	2.9	52
148	4.8	88.51	50.28	18.34	40
149	28.95	69.72	73.23	21.24	20
150	1.01	87.83	68.27	21.8	41
151	21.99	57.15	79.17	10.23	26
152	24.25	76.66	84.45	7.23	25
153	4.21	66.53	21.42	21.01	45
154	28.82	81.78	35.71	43.64	45
155	35.58	76.06	26.53	8.78	19
156	30.83	54.42	86.59	13.2	11
157	37.85	53.76	4.29	19.4	11
158	12.82	66.49	92.89	17.6	53
159	27.18	54.04	89.82	49.76	20
160	39.42	71.54	17.38	47.2	18
161	36.6	82.94	12.12	44.77	40
162	23.47	70.49	67.86	29.96	29
163	16.79	62.67	10.23	4.76	44
164	35.46	90.5	93.34	36.39	9
165	21.1	78.12	20.54	28.48	1
166	13.36	65	72.75	29.08	5
167	24.2	92.42	34.13	40.35	60
168	35.37	65.99	46.58	42.77	18
169	11.74	69.17	44.25	18.09	33
170	16.99	78.36	62.01	10.94	10
171	12.14	56.76	74.37	5.34	26
172	12.07	80.14	22.08	6.18	5
173	34.79	81.57	97.09	35.28	38
174	31.99	67.74	24.97	46.93	27

Node ID	x	y	z	r_i	demand
175	27.35	82.24	75.13	4.58	5
176	11.18	57.92	34.05	14	46
177	58.75	56.63	68.13	26.43	18
178	92.92	88.46	92.3	39.57	38
179	2.57	49.67	48.06	15.72	9
180	70.7	73.7	97.99	18.06	6
181	72.93	73.7	97.12	16.22	38
182	24.67	93.34	35.07	18.16	15
183	33.01	55.55	89.21	36.48	22
184	31.22	0.18	51	17.31	47
185	90.65	58.26	13.09	31.68	51
186	60.94	57.56	60.13	37.6	1
187	68.17	79.21	59.57	25.07	38
188	51.12	47.54	2.22	20.96	47
189	19.48	4.75	3.34	45.94	23
190	53.73	28.37	56.21	48.55	5
191	16.07	82.14	77.28	24.27	42
192	5.54	99.29	6.96	5.49	22
193	48.26	14.58	6.53	3.5	33
194	9.41	84.38	51.54	2.32	31
195	74.49	84.46	5.13	5.64	5
196	47.3	55.25	23.22	13.14	45
197	98.41	37.64	42.84	22.32	31
198	54.05	68.39	12.29	14.97	9
199	63.26	50.77	40.6	14.97	2
200	57.57	78.44	87.74	7.54	54
201	65.16	40.78	60.78	37.77	43
202	3.21	36.35	38.54	37.4	25
203	32.42	78.27	77.18	49.72	30
204	1.24	99.01	69.5	41.19	58
205	60.12	71.05	6.63	24.74	2
206	53.35	83.14	97.2	7.08	17
207	3.36	12.54	56.95	17.51	8
208	78.98	97.83	29.61	29.46	50
209	22.6	70.1	92.91	3.11	29
210	54.83	99.88	42.57	28.66	38
211	5.58	22.9	91.06	47.89	55
212	24.66	9.13	90.15	37.86	47
213	15.54	52.83	23.01	26.09	56
214	4.01	20.5	95.59	30.01	50
215	96.43	49.73	81.64	0.08	34
216	60.89	11.99	66.92	21.62	9
217	61.27	24.41	67.08	39.95	12
218	78.01	26.19	31.01	23.38	4
219	44.53	2.72	56.05	49.48	38
220	54.22	8.18	8.6	10.41	19
221	71.33	32.23	64.13	42.89	37
222	50.21	0.82	0.76	29.59	38
223	63.35	21.49	87.32	4.65	19
224	55.5	8.86	22.02	30.33	60
225	73.63	17.07	53.58	49.78	46
226	47.34	38.25	97.3	14.49	22
227	45.57	28.26	77.82	48.56	11
228	58.02	32.46	71.61	35.22	36
229	79.79	30.32	50.96	35.55	50
230	56.31	21.31	38.26	24.49	56
231	62.16	16.88	79.65	21	12
232	43.23	11.54	68.02	40.96	43
233	75.98	28.26	8.37	25	9
234	45.63	23.76	45.59	13.71	33
235	74.93	38.63	8.7	25.85	13

Node ID	x	y	z	r_i	demand
236	50.3	13.28	95.6	17.44	41
237	77.94	16.73	64.38	14.1	57
238	40	38.77	99.41	18.88	25
239	66.87	17.1	39.83	1.15	36
240	41.47	31.69	75.83	27.11	25
241	67	3.94	64.95	32.81	49
242	63.88	23.81	11.61	9.81	14
243	76.81	16.4	5.21	34.4	15
244	41.49	2.29	43.49	8.71	20
245	78.41	15.88	16.4	33.29	45
246	49.85	30.56	58.41	44.85	22
247	44.15	32.64	73.77	10.23	18
248	42.72	42.84	54.45	48.6	7
249	42.95	44.74	22.67	47.83	26
250	42.69	39.78	60.49	10.22	40
251	45.6	43.93	17.79	19.94	37
252	43.21	42.35	12.25	16.43	56
253	42.62	44.81	79.79	3.21	41
254	42.59	39.16	5.9	36.88	29
255	41.07	43.98	42.76	16.59	29
256	41.97	43.22	75.7	4.65	18
257	40.11	39.6	39.05	36.03	2
258	45.42	39.91	67.31	7.33	58
259	40.4	40.19	35.32	32.32	39
260	45.6	41.81	1.51	23.25	43
261	42.56	42.28	42.23	38.94	41
262	43.96	42.1	91.03	13.34	36
263	45.71	40.8	10.89	34.61	13
264	64.3	1.03	20.6	0.73	3
265	30.69	95.98	98.88	13.17	18
266	11.46	53.07	0.5	1.04	41
267	0.62	84.95	30.66	36.73	15
268	34.24	70.46	67.21	46.56	32
269	85.6	88.65	32.39	40.1	26
270	66.26	99.07	96.4	34.13	16
271	25.65	24.53	24.47	2.83	10
272	70.23	90.73	4.71	37.84	33
273	9.07	51.92	93.4	2.47	46
274	53.87	15.51	67.82	48.76	11
275	57.66	15.51	81.33	35.11	58
276	52.12	16.84	52.03	26.81	46
277	47.45	7.49	9.86	16.55	40
278	48	4	84.7	1.79	3
279	50.97	4.59	83.57	36.43	56
280	55.4	11.17	38.22	24.33	47
281	54.5	15.91	93.18	18.5	49
282	52.67	8.88	54.93	8.37	56
283	52.96	3.75	74.52	34.45	22
284	44.72	11.87	38.22	20.59	51
285	55.38	10.13	64.28	5.89	54
286	45.57	12.76	80.46	29.32	30
287	56.94	12.18	54.17	13.04	29
288	53.85	15.08	32.9	0.95	57
289	56.38	14.32	39.64	21.79	4
290	54.15	15.54	5.27	39.45	12
291	56.26	10.34	5.55	24.93	31
292	46.38	12.31	81.64	40.75	22
293	50.52	8.68	79.3	38.38	8
294	56.85	15.49	62.45	20.36	6
295	55.24	13.37	88.36	7.67	44
296	51.98	10.99	46.43	14.06	59

Node ID	x	y	z	r_i	demand
297	45.09	11.7	92.12	48.9	45
298	52.67	4.65	71.84	26.24	39
299	51.86	7.7	30.42	17.94	44
300	52.03	16.04	55.64	40.73	54

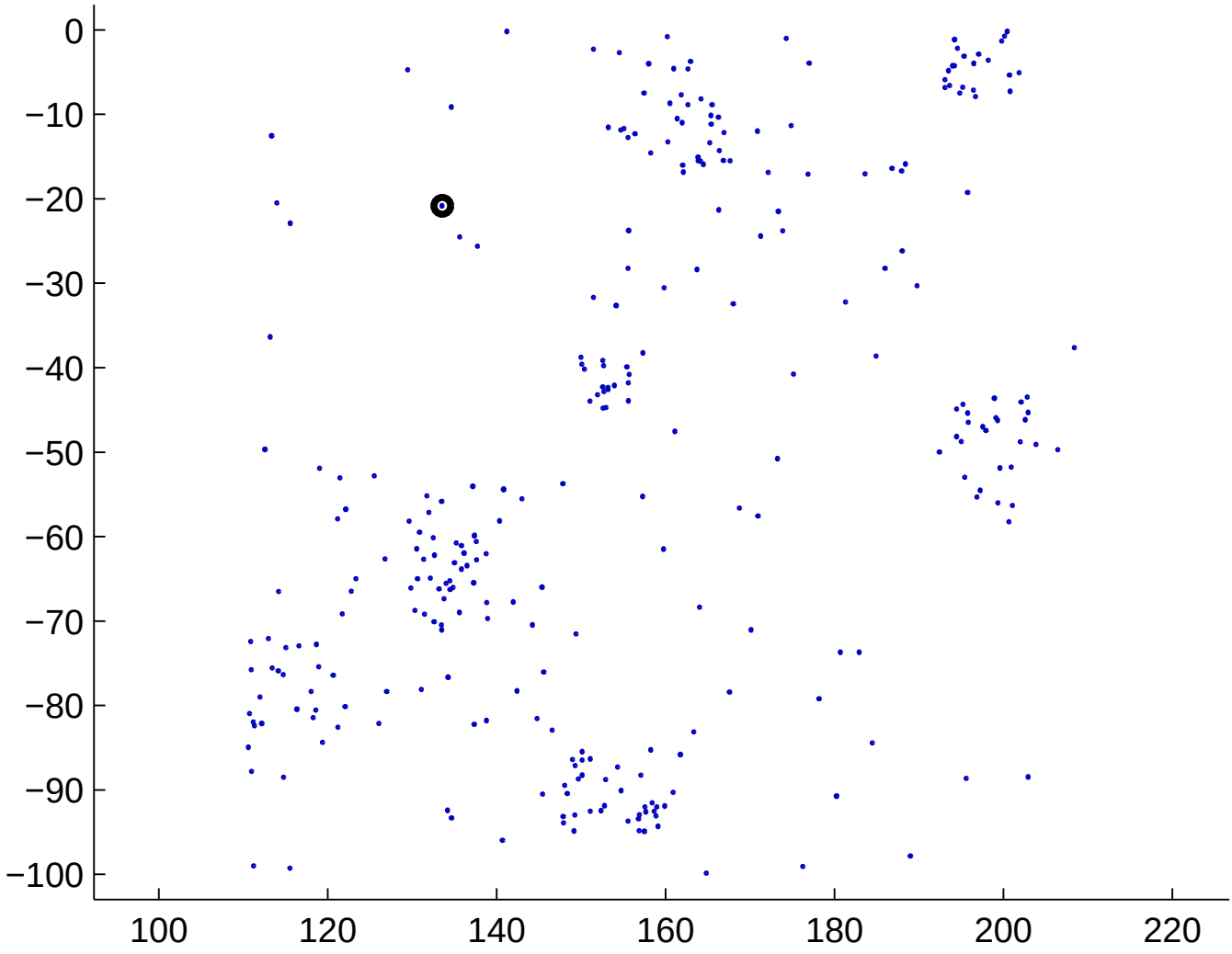


Figure L.5: team3_300: in 2D, the depot has the same coordinates as one node but not 3D

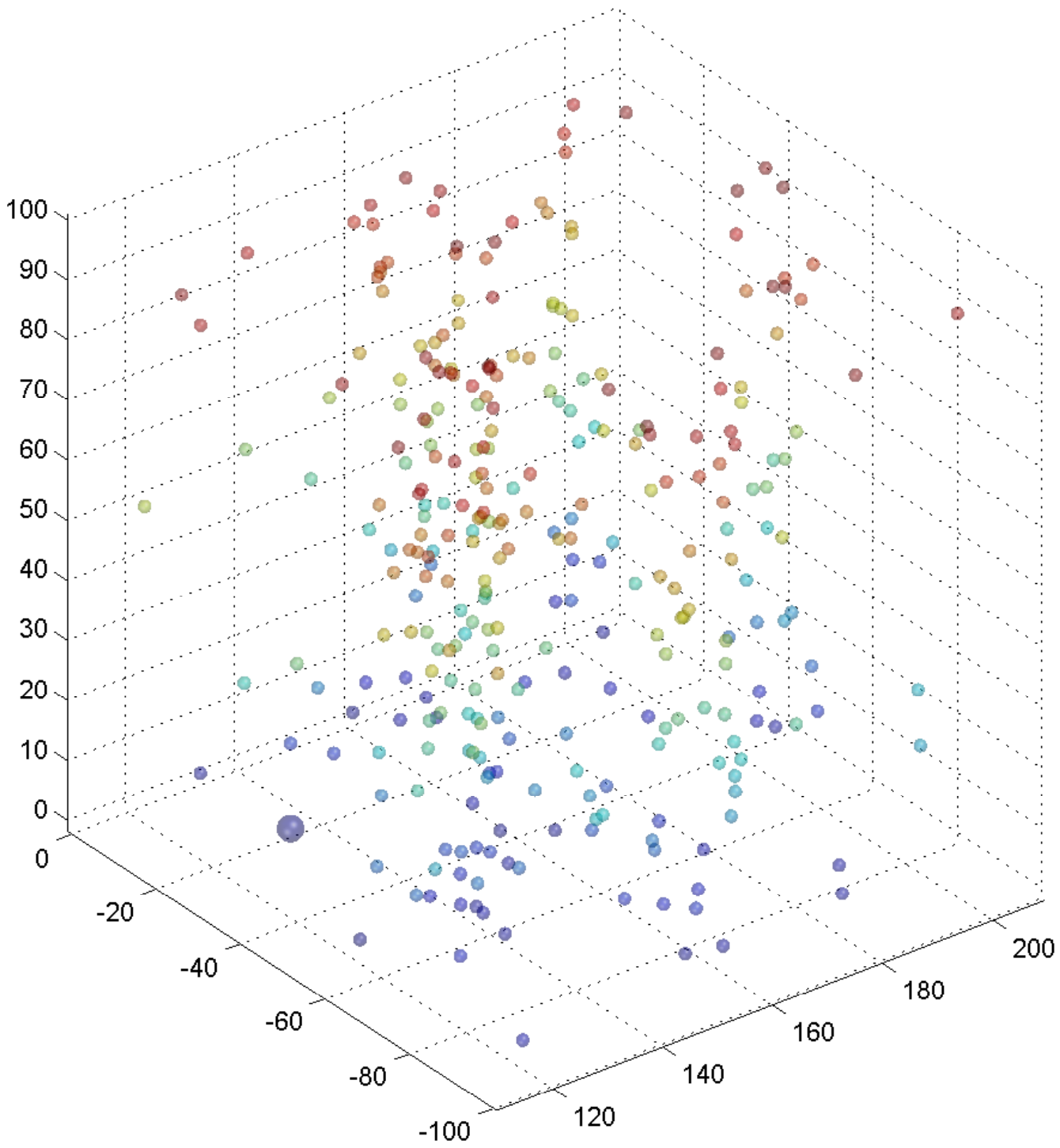


Figure L.6: team3_300_3D

Table L-4: team4_400

n:	401
r:	5
Description:	random
Total Demand:	2245
Max Vehicle Capacity:	375
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	0	0	0	-	-
1	68.792375	27.90175	4.368368	3.9463741	3
2	17.272875	64.973225	8.378801	1.6542893	2
3	77.750225	18.79385	0.265085	3.8375488	7
4	0.00155	79.256375	5.511897	1.9485664	5
5	54.870925	48.098925	4.394617	1.102256	7
6	91.08095	71.69145	1.548548	3.6485541	9
7	36.110325	75.95995	0.32151	2.3419359	4
8	22.27635	97.920025	9.573749	3.7249339	7
9	76.1173	11.832075	5.793623	0.047676	5
10	92.480625	84.1266	1.286063	1.2780059	2
11	33.324025	88.862275	2.512368	2.0476207	8
12	92.049975	40.056175	5.962344	1.6551621	2
13	2.125025	13.8908	8.215003	0.1492663	4
14	2.404275	62.37445	1.602613	3.9363141	1
15	91.03755	80.9252	1.385966	0.7625888	2
16	16.4015	79.860725	3.65876	0.6462605	7
17	83.1155	24.690275	4.773978	2.6366931	9
18	80.003925	44.278875	7.256115	3.7953033	9
19	14.358825	25.883825	4.414924	2.1162985	10
20	55.5813	65.9389	1.049446	1.399502	3
21	74.44305	98.0205	8.628544	3.9109049	10
22	34.098725	26.483975	3.010898	0.1187202	8
23	72.88955	91.55335	2.086078	1.8128248	3
24	33.240325	8.160175	9.454403	1.9941137	7
25	40.4237	12.94705	3.760655	3.5125829	3
26	39.658325	53.39295	5.48876	0.8383044	10
27	94.404	75.185075	7.131673	0.0991926	8
28	40.290225	96.689525	2.280132	1.7024114	5
29	28.20205	68.6988	5.301267	3.0947027	10
30	87.3023	11.937375	5.783418	0.026883	2
31	14.24105	46.110125	0.966331	1.6004334	3
32	18.476575	32.50015	2.42942	1.0381531	5
33	2.34935	1.70725	1.418964	1.5141472	5
34	90.725625	70.444425	7.760216	2.1020018	2
35	64.46975	94.91155	5.12346	1.6813097	5
36	56.428075	90.20545	9.562383	1.4950934	9
37	27.65685	28.081275	4.203862	0.8146082	7
38	98.6909	7.723575	8.237085	2.0288551	2
39	76.27055	23.463675	8.429053	3.2776576	3
40	31.8731	36.0461	3.846108	1.8377332	3
41	27.4824	83.15295	4.645899	2.409453	8
42	12.5519	14.734025	9.438961	2.0899186	7
43	75.8385	89.39705	2.129044	0.982971	10
44	76.538875	22.08605	1.37194	0.7706109	4
45	43.054225	52.07985	5.94327	3.6716308	8
46	75.589675	88.707575	0.958209	3.3878078	8
47	74.919425	66.332825	2.561604	3.2122786	7
48	56.7601	13.3255	9.545614	3.6207209	6
49	10.7326	2.49095	9.542224	1.8617797	6
50	20.9401	75.2051	6.209147	3.2102784	10
51	71.829525	5.85575	2.05089	0.986674	7
52	99.82775	8.49955	3.828547	1.0178851	5
53	67.679475	96.828325	2.179153	2.2617553	5
54	95.486225	52.746525	3.57388	2.9208705	8
55	77.335225	0.00945	1.073545	2.6715027	7
56	23.831575	88.204275	5.345531	3.750467	7
57	82.150425	71.4598	0.532397	2.6881218	3
58	96.9141	16.74635	0.695888	0.7260841	8
59	84.9479	97.513325	6.355392	1.6436369	2
60	62.944875	12.9098	8.420704	2.4896628	6
61	20.686175	21.9667	1.804567	1.6301674	9
62	72.106325	71.513625	4.730422	3.4765924	6
63	54.0981	10.209075	9.589747	1.9657569	2
64	39.243575	59.34405	2.988695	2.5403868	4
65	59.360575	77.3659	4.085186	3.7611478	6
66	70.163125	48.595475	2.681471	3.4643229	3
67	40.913925	82.729825	6.876661	3.0771461	9
68	86.192975	99.203225	7.750239	0.6341733	2
69	44.89855	41.381	7.163397	2.1076985	3
70	61.491825	51.7088	3.765748	3.6794322	8
71	57.24125	42.40615	5.476964	2.5354041	5
72	37.32375	47.164775	1.301487	3.8061293	4
73	28.87265	55.2137	3.915468	1.0577671	5
74	84.25115	92.664475	5.874601	1.1430606	9
75	12.1212	83.525275	6.555356	1.4206244	1
76	32.733925	86.47665	2.244896	0.6742613	1
77	61.33205	47.81805	9.220678	0.6721027	7
78	76.5757	39.19325	8.28894	0.3224087	6
79	42.31835	87.347525	7.738111	3.5183382	3
80	60.2356	81.956375	8.121308	0.9615343	6
81	69.349625	77.516575	1.446757	2.180516	7
82	8.347775	79.0334	0.64524	2.1293776	3
83	98.93765	68.322275	8.948906	1.6195826	2
84	91.825175	77.123475	9.251483	3.5229343	10
85	80.128375	42.2928	0.877447	2.9296913	5
86	44.6523	7.1683	9.495828	2.2507146	7
87	49.100125	97.070175	0.603113	2.680503	10
88	13.3837	46.032275	5.26473	2.1621199	3
89	30.732825	57.781	6.904491	3.9919808	8
90	59.82755	37.21565	1.143092	1.095882	6
91	9.352575	52.2461	8.408063	0.7596151	1
92	2.307925	97.449675	7.701639	3.6521191	5
93	43.312375	33.022625	9.818329	3.1742295	7
94	51.0767	59.931625	7.815468	0.8096439	10
95	95.9689	41.808	7.756384	1.4448559	7
96	47.99765	20.639375	7.512605	1.2618593	5
97	61.732525	60.28975	3.358698	0.5327791	5
98	45.110025	59.219325	7.835164	0.3457469	4
99	53.08505	32.116125	1.177184	1.1328164	2
100	89.0595	90.291	3.16566	1.201812	2
101	34.822	51.041775	1.965488	1.4877525	3
102	58.980725	40.369175	5.096252	1.2293142	8
103	95.640625	28.68455	2.397586	2.2964659	2
104	19.028925	48.6519	8.742576	3.3340627	1
105	30.46345	78.65395	2.876347	2.8521408	3
106	19.9845	27.40155	0.660019	0.687027	1
107	87.858275	88.334025	4.100051	3.4946441	3
108	72.419975	34.998125	8.679512	1.302263	1
109	77.464	15.628175	3.533669	3.5672263	1
110	90.195175	89.03695	6.180904	3.7016857	8
111	1.692025	67.9044	4.763979	0.5973869	8
112	37.4986	37.94785	9.024015	3.3389816	7
113	24.1584	82.49565	6.916419	0.0600879	7
114	54.01775	81.8894	8.14471	3.9555254	1
115	67.97015	74.943825	1.28227	0.4775226	10
116	67.662425	58.9604	5.24713	0.4817437	6
117	38.122975	58.912025	4.096565	1.3466157	5
118	18.77905	36.01655	4.45503	2.0153111	7
119	69.817575	1.306825	4.894499	1.5726355	10
120	46.59205	4.24755	0.914106	2.7958463	8
121	5.2982	16.16745	9.485319	3.2389206	6
122	94.807975	43.25145	7.382414	1.5111964	4
123	59.92645	35.207	4.720771	1.4324328	6
124	26.6212	98.85125	4.844028	2.5342758	5
125	81.52085	13.687775	5.204149	3.1351213	4
126	74.4851	34.7013	1.961771	1.668137	3
127	82.33615	2.420325	8.700274	2.4460605	7
128	40.4153	76.30845	7.455735	1.7018987	6
129	64.181275	8.885925	4.857898	1.4590044	5
130	28.471925	7.124375	1.494169	0.46477	9
131	94.377175	57.5521	6.223661	0.7082996	5
132	58.66755	14.455925	4.659081	1.8727735	6
133	66.508125	91.303225	8.984758	3.030605	1
134	91.5733	68.725	1.37953	2.6135119	9
135	94.81355	7.137025	0.426722	2.3027404	5
136	71.306475	97.9771	2.882666	1.5158171	8
137	42.344525	27.231625	2.735005	0.6721026	8
138	73.97555	66.71955	2.504	2.6718873	3
139	48.99045	98.5583	3.927321	0.8268489	4
140	40.718225	8.45085	2.325605	2.0651849	10
141	59.25755	30.092125	1.789844	2.9531507	2
142	77.472675	18.057475	0.141489	1.59513	2
143	92.685275	90.310575	1.584168	1.653919	2
144	32.22375	93.28635	0.1273	2.7707895	6
145	83.835575	49.221375	2.182226	3.0061312	4
146	84.77555	95.283075	3.666391	0.7763126	1
147	68.784175	11.8632	9.776368	2.318307	7
148	84.710775	44.260425	5.70064	3.5456061	8
149	53.686425	15.19815	7.953267	3.2492576	3
150	17.13825	10.254625	1.09375	2.541304	3
151	0.331025	69.303175	3.842333	2.7183647	1

Node ID	x	y	z	r_i	demand
152	34.7277	67.482525	7.589491	2.9420086	2
153	13.011825	10.0758	8.49229	0.8489863	6
154	0.610975	22.331075	4.829551	1.7663891	2
155	15.45105	94.471525	3.135131	0.9496062	9
156	68.033375	62.578975	2.177441	2.4747025	6
157	39.217825	28.48755	6.718496	2.7558001	9
158	21.668825	63.73225	4.392072	1.824597	7
159	75.12385	56.355025	6.655597	2.2591934	8
160	67.8084	64.88	6.618444	1.7006027	3
161	59.205025	55.76	1.820366	2.6513752	2
162	43.9034	88.387225	9.898098	3.5077797	8
163	29.46595	31.229925	1.232208	2.0362226	10
164	2.206275	60.72485	3.544594	2.6045019	9
165	40.205375	70.4585	3.559151	2.1049867	5
166	56.13655	83.451075	6.561985	2.1163693	7
167	71.96685	79.285825	7.324255	0.9050284	9
168	59.666825	17.15215	3.601254	2.7658857	6
169	94.09005	9.358875	9.999877	1.3658877	5
170	32.636425	9.71905	0.854223	1.0447423	10
171	15.2685	27.387025	1.441223	1.686213	4
172	21.1268	22.989225	6.335554	2.3000479	2
173	12.34295	3.720825	3.558355	1.2923936	7
174	60.77085	76.3761	8.633151	1.6799218	10
175	79.6523	4.144625	8.31435	0.8742129	7
176	35.77655	45.5234	7.314779	1.4365385	5
177	49.821325	32.088775	0.505787	2.6868713	1
178	72.222075	99.2555	9.348041	3.494791	10
179	84.730325	97.611875	9.216212	2.4041303	6
180	77.882675	4.11235	4.515775	3.3455297	5
181	53.249925	71.4317	1.507319	2.1097265	10
182	16.533825	6.314025	5.413684	0.10641	1
183	13.11545	76.27845	9.886291	3.3850773	9
184	72.374675	95.981125	5.386278	3.0465832	5
185	75.3053	17.780525	0.662947	0.815641	1
186	8.8531	66.09375	2.882202	0.2828521	4
187	75.94035	77.0935	8.244154	1.3321727	9
188	31.583525	68.6781	7.867205	2.5702207	6
189	4.729125	38.22055	5.844342	1.829267	6
190	15.806625	40.87695	9.361797	0.7429492	8
191	74.018375	45.692475	4.261669	0.6860415	5
192	22.609375	83.218325	5.878629	2.9452111	5
193	60.81405	45.86495	6.053591	3.5607331	2
194	48.825175	33.4678	4.421401	2.052047	4
195	44.549375	51.8385	4.639375	3.4753711	9
196	47.81055	52.508825	5.320082	1.4515793	7
197	25.090375	4.2535	0.574579	2.6027734	2
198	90.314475	71.662575	4.957094	1.5699234	1
199	85.82305	42.253575	5.699647	2.2900333	10
200	45.884675	65.715725	8.319043	2.1094453	8
201	36.3513	83.686975	3.385766	3.004223	7
202	30.804475	50.3614	3.667235	3.2757758	4
203	49.4347	86.0537	7.963635	2.0059997	9
204	41.323875	57.06515	2.903463	1.1453823	2
205	63.106325	74.44845	6.994666	0.6512855	1
206	56.680125	15.845675	6.62366	3.207153	7
207	36.34605	45.558575	2.970524	3.6813731	3
208	86.306375	44.08645	5.63357	1.9276333	1
209	57.8987	27.066925	9.346556	3.9092312	9
210	61.692525	66.479075	4.622593	0.4217361	9
211	41.3638	51.811825	0.610596	1.0822466	3
212	59.6161	30.5374	8.744708	3.7763801	10
213	35.05695	38.887125	3.774047	2.3714259	6
214	12.54795	14.295525	6.980367	1.0755618	6
215	66.095725	55.876775	6.205798	1.2540995	4
216	55.894525	37.29925	9.136585	0.9531114	4
217	90.921925	35.308625	2.502062	1.329223	4
218	70.38585	48.289775	4.820236	2.9015796	7
219	74.186175	37.664625	1.593253	3.0650817	4
220	8.7059	46.626875	9.397095	1.0497725	7
221	62.138225	61.218175	0.933898	1.1077798	4
222	27.251975	44.47235	3.840979	3.7272714	4
223	76.3481	68.05155	4.299693	1.7646676	4
224	11.134375	51.580675	9.341968	0.9823989	10
225	65.757275	28.49595	9.473031	0.1519096	9
226	92.124775	61.791725	6.696503	2.9459173	1
227	38.0514	44.25295	8.429467	1.3154571	7
228	46.718325	46.79505	7.837302	2.1962207	5
229	82.455325	37.974875	2.274181	2.6754574	10
230	53.1029	58.71345	6.825055	3.7092457	2
231	30.1798	54.1346	0.93414	1.5141057	7

Node ID	x	y	z	r_i	demand
232	40.703325	55.537825	6.299364	0.2543153	5
233	56.707375	20.9848	8.081779	0.3923879	6
234	27.27955	90.9405	3.131217	3.6132742	7
235	61.751375	53.5726	3.689653	2.857714	2
236	31.7652	39.5927	8.134315	0.7012804	3
237	69.4258	42.661825	9.2188	0.367001	5
238	63.06625	46.073225	9.963062	3.8790845	8
239	41.683175	67.299925	9.367966	2.7312469	7
240	30.2641	36.115	4.866777	1.0777196	9
241	75.41995	23.365625	8.701179	0.3064542	4
242	22.793175	31.8095	6.267813	0.8390697	6
243	24.44465	63.1281	8.275156	0.6252843	6
244	57.767975	55.4125	2.368927	0.1892578	8
245	56.708375	61.084725	7.280884	3.5527238	2
246	19.322625	41.061025	7.646061	2.6823985	10
247	74.97575	51.8098	4.043794	1.2273588	9
248	46.228875	65.56925	6.129679	2.8726006	9
249	35.60905	81.995775	1.580638	1.4026949	2
250	75.70595	48.354275	5.510084	2.7185379	9
251	78.897475	61.3791	6.581026	1.7125137	1
252	44.541975	62.0002	4.336081	1.1492733	4
253	32.800625	59.186225	6.71386	2.9956219	5
254	83.247325	46.458225	8.799584	0.4748225	5
255	45.015525	41.584025	2.803346	2.3336041	3
256	62.8697	20.929125	3.670375	3.2881032	1
257	52.0729	45.66175	8.843258	2.0135272	1
258	55.9361	51.897075	1.720125	2.2731123	5
259	28.216025	27.287675	5.4487	2.41843	7
260	40.468775	56.35765	3.688499	2.0428185	3
261	62.1796	60.091575	6.795975	3.7726122	3
262	63.9561	69.944325	5.325084	2.046353	9
263	87.349525	37.1432	9.692858	3.6954146	4
264	67.096325	78.407125	5.545343	2.3790582	10
265	63.564825	58.6141	2.885043	0.5925861	5
266	52.726325	74.9715	6.042198	1.1497459	7
267	66.273425	16.5814	2.463993	0.4764014	10
268	50.5204	51.7746	0.922891	0.2497815	5
269	39.7753	66.19835	5.821872	0.5459462	6
270	53.51985	31.610925	8.734185	3.9899375	1
271	33.276075	49.648225	0.482877	3.6486347	8
272	31.916925	49.63125	4.365548	3.3038515	6
273	40.529725	53.231175	6.058478	3.1574837	5
274	38.966475	52.166125	2.317575	3.6894736	6
275	29.5312	77.759375	2.944562	0.9421706	4
276	64.2971	80.8087	0.617407	1.6296583	10
277	60.964225	55.767775	5.605242	0.3858666	4
278	43.5222	45.0811	1.214529	3.7775081	5
279	65.024675	48.473875	9.912197	1.4488497	2
280	58.59885	48.807625	9.719414	3.714657	10
281	79.556325	49.1563	6.397826	0.8288938	1
282	32.5307	9.603625	5.102178	0.3776832	10
283	64.04505	44.910675	0.523975	3.3686945	8
284	61.5062	10.2838	8.047741	0.7604293	9
285	26.5978	58.30075	8.947543	0.0580748	8
286	17.095675	43.177	5.934841	3.0748926	6
287	58.5251	25.335175	8.213376	2.8927993	9
288	94.997925	34.851	5.629957	2.8244109	6
289	85.3769	55.416	3.88436	1.1913741	10
290	49.5023	72.1454	0.362105	1.6675468	3
291	76.046775	40.829925	8.304908	1.3388025	1
292	32.29465	34.1886	4.533526	3.1017705	9
293	53.429725	29.230175	5.838259	2.9604889	1
294	37.615325	65.262725	9.608735	3.9137176	8
295	26.51415	33.575825	9.461971	0.0227537	10
296	19.292975	43.870425	8.142944	2.0965358	4
297	46.119125	55.3112	3.945632	0.6405949	2
298	44.898775	67.784675	2.145396	3.8144474	10
299	67.6691	30.587025	1.957775	2.7503569	10
300	56.46315	20.9863	9.377425	3.1469731	10
301	47.35915	48.071	7.780887	0.1249376	9
302	45.616825	55.349625	8.112205	0.8547389	1
303	44.4217	64.703925	2.042243	0.8623628	10
304	49.014675	34.9475	8.94848	2.6167984	5
305	47.802925	54.5327	5.178486	0.3289734	9
306	64.48255	39.62755	9.929967	1.7702677	8
307	22.467675	76.02705	4.2329	1.6009174	2
308	18.3822	65.772725	3.391578	2.0122239	8
309	30.688625	60.637275	0.70091	3.9031621	7
310	21.4066	50.274675	5.660638	1.3469706	1
311	28.231575	43.86655	5.176578	3.8908642	6

Node ID	x	y	z	r_i	demand
312	51.332325	47.3944	1.206534	2.0193416	1
313	39.430175	70.428325	1.436461	0.2158504	4
314	51.8225	53.851	9.626807	0.0190516	8
315	58.962525	15.549225	6.884037	2.3682429	9
316	54.099275	51.121125	0.198175	2.2154275	1
317	68.048425	58.486425	8.31929	1.6060654	2
318	26.549225	47.5983	5.827804	1.9405088	10
319	42.114525	60.87195	6.966651	0.0091942	2
320	43.10885	48.272275	1.575949	0.6882847	10
321	37.074525	51.14655	9.462196	3.5957201	6
322	53.6353	62.58645	0.328338	1.9291342	3
323	49.0937	40.0849	6.606023	2.5088011	8
324	66.686275	83.4025	9.789982	3.6281274	4
325	56.7604	48.090675	9.498427	3.4617573	6
326	75.0516	36.4713	6.125794	3.1806421	6
327	34.241775	45.041325	3.482667	2.3579528	9
328	10.71515	57.182775	5.281599	3.2469865	5
329	54.7913	22.79115	2.590985	3.9863921	1
330	42.88515	65.09985	8.113938	2.6385081	6
331	43.7645	63.186425	9.005722	3.8299193	2
332	36.8297	55.690525	7.310631	0.0597683	3
333	51.464375	46.273425	9.764247	1.9665818	9
334	56.4549	49.1402	6.740043	1.0924331	9
335	22.891175	56.122525	6.014662	3.1174634	8
336	52.703075	49.56845	2.111726	0.9899267	4
337	52.902425	64.80215	1.303032	2.0317535	2
338	19.41455	76.0326	9.16761	2.3028676	3
339	60.313175	36.907775	7.157937	0.9152904	2
340	85.726975	46.8848	0.120938	1.2191665	4
341	43.47965	52.4779	9.729662	0.5165632	5
342	29.2116	52.625	7.111098	2.2691686	9
343	77.267275	35.3236	0.141297	1.527158	10
344	20.9892	20.7572	9.683969	2.581261	4
345	41.89655	53.797625	8.251962	3.5360134	7
346	21.0091	68.35155	4.610936	2.1296062	6
347	13.92855	83.165725	6.067072	0.6244747	4
348	50.075475	49.526025	6.785114	1.2581756	2
349	56.145325	18.970525	8.712859	3.3151033	2
350	56.18475	25.5187	0.990177	1.3818024	4
351	74.7548	56.66355	6.610021	2.6437784	5
352	50.9611	51.5263	9.096967	0.5699678	2
353	20.995625	24.282225	3.380339	3.5058599	10
354	70.20275	51.264575	0.287703	1.88246	9
355	64.881075	21.1972	7.607995	1.4515751	2
356	48.801425	47.111675	0.180447	3.261649	6
357	25.49855	33.45475	4.180424	0.8372327	3
358	53.3194	62.871025	8.033264	3.2245451	9
359	12.50315	65.202575	6.796126	2.0894727	10
360	43.242475	40.8624	6.853519	1.9934273	6
361	55.460475	43.213925	0.442759	3.4716194	10
362	56.281125	43.406775	0.357518	1.8663211	5
363	44.413025	51.821425	3.225875	1.9013123	9
364	51.731775	54.063975	3.386729	1.2006342	1
365	39.47365	37.672175	3.042346	0.4907813	10
366	59.0369	52.162425	0.980631	3.0447964	5
367	62.481725	64.778425	2.883198	1.7172899	1
368	33.989075	25.3104	7.891632	3.7659631	7
369	82.166	45.384	5.835084	0.895923	1
370	11.458875	55.406825	8.437123	3.5619902	5
371	52.727475	27.05645	3.021539	2.9182147	1
372	17.219275	51.795125	6.528901	2.288647	7
373	31.60195	76.5275	2.478681	2.2545249	8
374	42.80595	50.969325	5.199786	2.8313705	6
375	64.627025	39.598675	9.161247	0.591454	5
376	41.765825	57.606275	4.678763	1.8921573	7
377	8.9679	51.422725	2.23495	3.3986294	7
378	50.03295	71.692275	1.548117	4.0015227	2
379	40.7628	47.39015	6.093812	2.9963842	9
380	43.2503	8.7931	9.432262	1.4609189	8
381	54.125425	38.6935	6.380106	0.1464412	3
382	65.789175	19.559925	1.053267	2.251298	8
383	50.342	58.1772	6.133715	0.970213	8
384	27.2689	42.18555	1.296271	2.7742388	9
385	74.758025	68.76505	2.771423	2.7316723	10
386	31.24645	46.9846	0.258005	2.8458636	6
387	42.3891	68.379025	5.906332	3.3982575	8
388	63.23165	61.378	8.16167	3.0992482	3
389	65.721375	76.70655	7.829144	0.0690749	4
390	75.320425	66.338125	2.101527	0.0963723	2
391	83.98185	43.958725	1.112514	0.6740969	6
392	55.289875	75.9977	8.05121	1.1076205	9
393	36.0198	39.389875	2.90819	1.9831699	5
394	37.4906	38.735475	3.373994	0.2840973	4
395	49.48335	26.949275	8.082485	3.4612295	2
396	29.23795	80.022375	0.178216	1.1674686	8
397	55.262125	52.9866	2.328913	3.5612885	10
398	77.736325	41.257125	4.306668	2.4159837	9
399	14.259	13.428825	7.786985	2.5476741	1
400	30.896	84.86835	8.084952	3.8695341	10

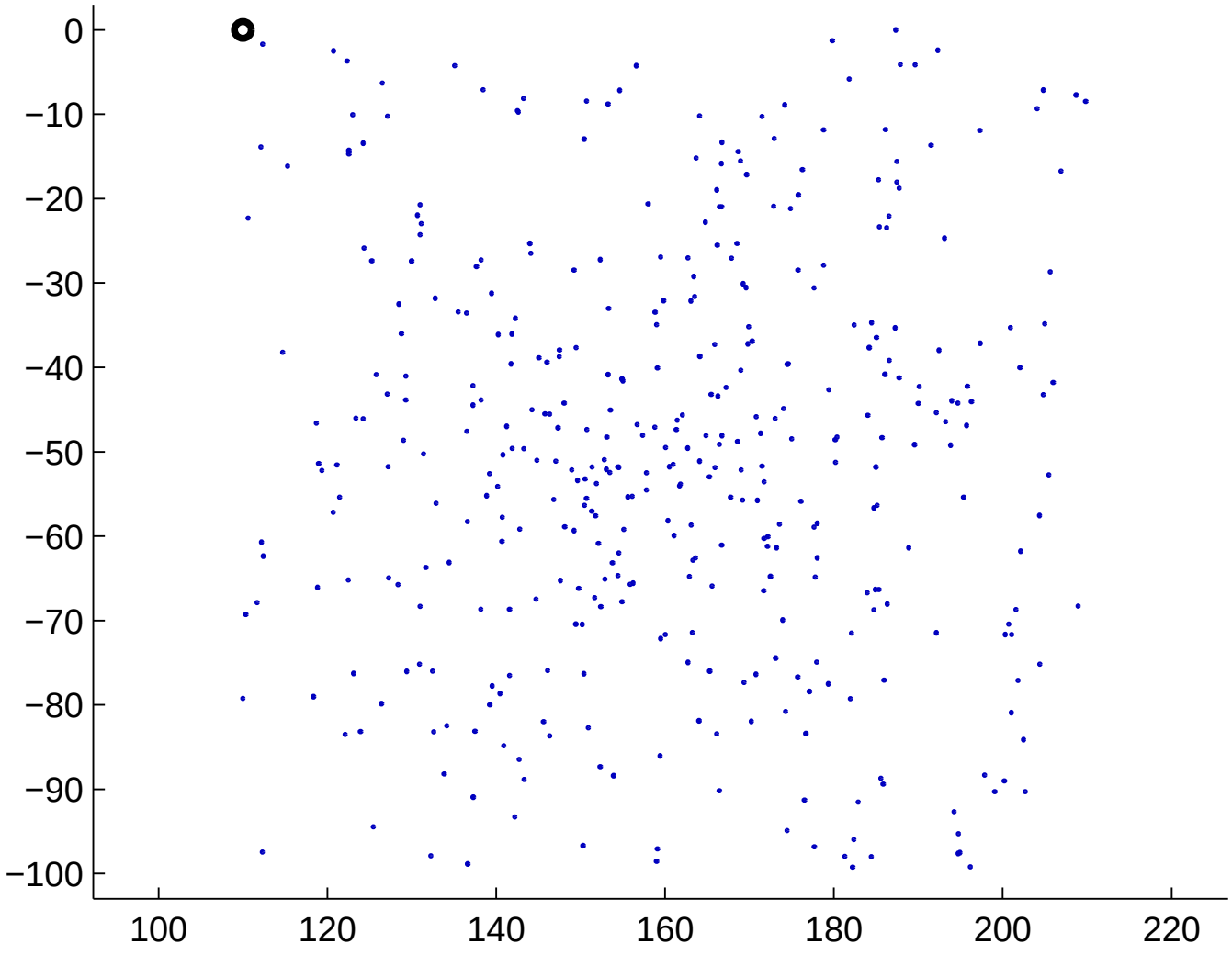


Figure L.7: team4_400

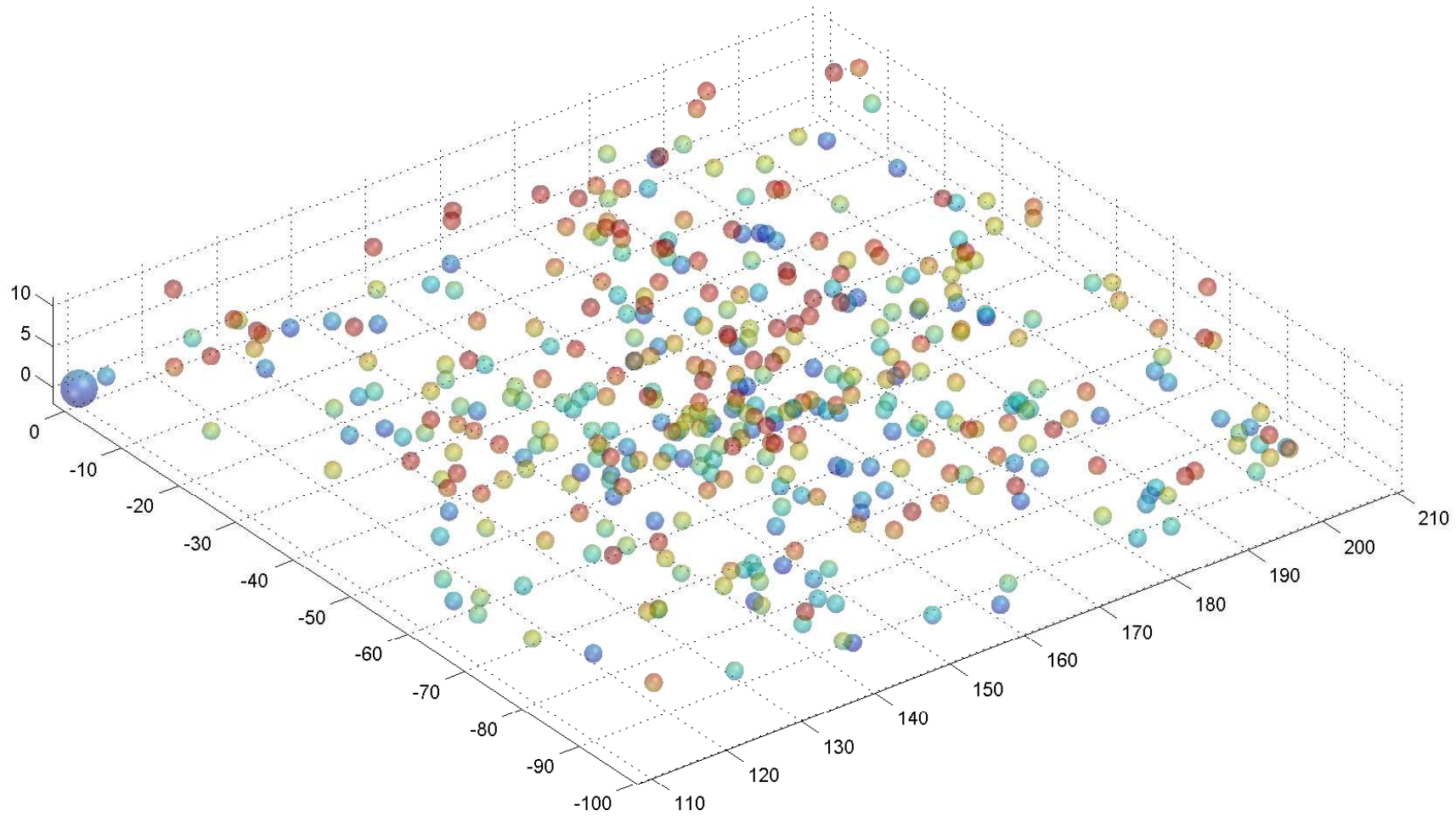


Figure L.8: team4_400_3D

Table L-5: team5_499

n:	500
r:	2
Description:	clustered
Total Demand:	9744
Max Vehicle Capacity:	1624
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	70	40	0	-	-
1	10.526	3.779	24.6321	20.82	35
2	8.4009	11.7989	4.4087	5.5639	28
3	11.3126	12.1774	8.305	11.447	33
4	9.2095	19.5087	23.9042	29.1422	24
5	9.7281	5.4172	24.1163	13.7083	5
6	11.169	1.5527	6.9406	37.2188	8
7	19.7672	14.9362	24.0245	14.1421	6
8	2.2625	16.1551	5.423	18.392	2
9	11.8636	12.6991	19.7066	36.7112	9
10	13.2666	12.9678	48.999	29.5528	27
11	5.0355	11.9367	30.2057	6.6489	23
12	8.6382	10.3371	11.0732	27.1817	10
13	14.5843	15.7568	10.6354	0.244	5
14	3.5607	15.7968	11.1608	5.1124	13
15	15.42	17.0914	20.8872	16.8786	34
16	17.8934	15.1905	44.1135	13.0517	23
17	1.2192	5.9144	48.7598	28.8322	21
18	15.5961	8.5134	30.9972	9.1422	28
19	2.4773	0.052	34.3258	34.0937	32
20	16.5052	19.9903	24.3242	2.3082	12
21	4.024	17.3232	48.8138	37.3677	1
22	13.8628	4.3052	10.5937	36.3913	11
23	1.729	2.5191	1.116	7.1357	4
24	4.8686	17.5054	20.7421	8.1304	8
25	18.8587	8.5087	18.9878	16.8623	11
26	9.9074	11.0867	39.8487	12.9373	5
27	8.0267	2.1019	15.008	25.3395	2
28	8.65	19.7295	4.359	27.9816	9
29	13.9396	19.5452	20.1112	16.1224	13
30	4.0211	5.0495	22.5141	26.717	34
31	5.3173	19.9696	21.9865	36.3373	27
32	4.1301	7.1548	40.2018	37.1524	8
33	9.4253	3.1222	32.8197	2.062	27
34	18.047	6.7045	32.7171	18.9999	37
35	19.0819	14.2893	25.2658	6.4132	8
36	19.3111	17.5672	45.5963	32.0992	20
37	14.7151	17.4542	12.2868	14.2143	34
38	16.6256	12.3206	29.6782	7.479	31
39	18.6523	3.9117	30.6336	19.4015	3
40	16.2452	9.322	13.5564	31.0488	31
41	15.7685	10.3669	47.703	18.5804	16
42	4.243	12.8676	1.4876	6.736	2
43	15.4595	7.4752	20.3496	3.0314	32
44	18.2952	1.0836	13.7585	19.3439	2
45	2.6723	10.4123	33.2768	24.6134	22
46	1.5116	19.0597	21.7588	16.8413	5
47	1.2522	5.4022	3.551	7.2247	27
48	0.7828	19.7397	35.1787	1.8473	4
49	14.7479	11.7757	0.3405	30.4615	18
50	19.5822	17.4941	4.8723	10.5093	27
51	13.7484	0.7577	11.0651	20.4003	17
52	9.9632	1.8111	30.9688	39.4027	39
53	13.2084	1.5682	5.3875	22.8241	34
54	2.785	16.9995	21.2146	3.817	15
55	10.31	1.5005	9.6337	14.7461	20
56	3.6086	13.0876	23.3357	29.6311	8
57	15.3812	8.8682	40.3179	15.4856	14
58	0.4211	5.2548	22.7354	12.1971	29
59	16.1355	6.6685	45.2938	36.4875	38
60	18.0288	10.2093	41.4498	31.7011	27
61	5.4781	9.3534	39.1694	25.1036	20
62	11.5459	0.8736	43.2005	30.4629	28
63	10.6256	1.7583	32.3574	24.4015	24
64	12.9432	8.6486	42.1679	15.3773	11
65	12.295	19.9912	41.8654	28.6871	3
66	2.3396	12.8751	20.4499	24.3453	4
67	12.5256	4.7007	49.4275	23.5883	27
68	12.3192	17.7013	37.8038	29.1964	32
69	2.8757	1.3778	31.3806	25.9254	10
70	3.7626	17.1174	49.9096	21.877	8
71	5.2006	6.8919	22.4547	22.5304	19
72	3.9756	4.3104	38.409	39.2995	12
73	2.7247	6.6491	25.454	8.9474	14
74	8.8668	5.4121	44.5737	1.245	10
75	6.693	16.2603	19.0942	35.4947	15
76	3.8933	3.6617	34.8265	1.7453	5
77	2.4532	11.1564	41.7483	29.4831	9
78	3.9473	4.1638	20.7291	2.4396	19
79	8.098	10.1576	40.7441	7.8091	30
80	15.3264	12.7877	8.2093	21.1927	3
81	17.3372	11.1211	33.7282	21.5037	19
82	15.9493	16.7531	4.9236	36.5644	15
83	11.5168	3.287	14.9558	27.8697	12
84	5.4981	6.1028	41.7036	36.5373	19
85	1.4037	6.1535	31.8542	1.4597	3
86	9.0075	17.4052	0.9316	24.0927	5
87	8.9599	2.5066	9.8186	22.9145	37
88	5.6082	3.0104	39.1925	11.8319	34
89	12.8565	9.4609	19.9198	9.659	18
90	4.753	19.8404	42.7266	29.0972	1
91	5.6246	7.277	28.7239	11.7089	14
92	14.8098	1.8409	8.2695	1.2782	2
93	10.2894	7.4847	25.4008	1.9001	28
94	12.6858	19.6571	22.2672	29.725	20
95	12.1595	5.1953	46.5778	17.8764	4
96	2.5621	10.2967	1.629	12.6169	29
97	19.0824	1.094	9.1576	39.3681	12
98	1.2646	1.8964	47.5137	2.7408	6
99	2.4914	14.471	42.2927	5.3662	32
100	45.5527	26.8832	17.5652	29.6166	18
101	49.5874	32.9921	18.1971	32.9977	6
102	20.821	23.0825	24.0822	38.9893	23
103	32.0319	48.7602	21.6234	2.1023	10
104	31.0932	49.2942	23.7876	14.8063	36
105	28.4876	46.0461	28.1502	21.3519	27
106	44.3864	36.3116	23.5359	25.6737	34
107	38.8284	23.4703	6.171	29.4494	12
108	25.1657	24.0751	15.8892	31.1219	22
109	40.4113	32.0356	8.7762	16.7439	30
110	20.1897	48.2132	1.8547	9.8947	26
111	32.1965	21.571	25.1134	23.9954	30
112	43.5486	39.6053	49.4906	27.6035	9
113	27.0476	34.4285	7.3345	22.5144	3

Node ID	x	y	z	r_i	demand
114	24.2607	34.0424	42.9391	1.9949	27
115	47.2249	31.4694	15.6819	0.8229	6
116	24.5672	24.4137	22.4773	9.9276	28
117	47.2998	37.9687	10.4015	27.2808	15
118	30.1704	30.5441	13.3093	13.1238	33
119	27.0718	22.4926	21.0532	16.8129	17
120	32.0569	46.2162	23.8838	8.3019	2
121	20.1974	25.6106	23.6453	21.4356	30
122	23.8984	35.8981	31.4349	7.2024	17
123	24.5323	49.8988	32.6923	23.3971	39
124	29.0027	23.8765	31.3376	31.6897	36
125	35.1494	28.8106	26.783	32.8637	24
126	37.8149	25.869	45.9364	3.1941	16
127	22.5985	27.2784	2.308	18.0514	35
128	32.7117	42.3778	27.3609	10.9453	24
129	30.9136	43.9894	21.9238	22.4068	26
130	41.7938	26.8087	24.3703	25.8964	12
131	23.4201	21.9457	1.1934	16.8924	19
132	37.7223	44.0563	30.8827	29.1657	4
133	33.6715	23.2449	9.8871	5.013	36
134	33.7228	34.609	11.6821	1.4413	10
135	44.5785	34.1629	40.8334	2.9998	17
136	25.9644	23.203	35.3119	29.8543	35
137	27.7157	24.2487	8.5851	7.9151	7
138	45.8348	38.3992	25.1619	22.4696	30
139	44.6412	21.1681	25.9788	2.8359	8
140	45.8095	43.1051	48.3862	19.6777	18
141	36.302	43.7274	11.7602	22.8064	32
142	44.7377	48.2657	7.7582	29.7234	7
143	20.5677	31.0115	4.2467	1.6881	25
144	20.4824	37.2243	17.8497	26.8839	10
145	42.0622	41.0674	12.3472	34.7982	21
146	47.312	20.115	22.1433	1.1739	12
147	36.9556	37.1182	29.5204	17.3813	30
148	24.4655	29.9184	30.3851	29.8304	25
149	30.3241	25.8121	22.3846	12.6672	30
150	29.6006	20.2054	49.7928	12.7079	11
151	23.4789	26.9268	25.8998	12.6384	37
152	48.0614	30.3792	22.0976	10.3406	16
153	49.2796	22.4102	31.3443	3.4493	10
154	22.8416	32.9746	42.6888	3.8923	36
155	47.7847	28.4345	6.8217	34.5556	11
156	22.4944	48.7727	6.2361	18.9786	7
157	48.8851	33.6728	5.7706	37.4425	17
158	33.916	28.6484	33.3227	11.305	16
159	48.2875	25.5427	23.29	34.7388	1
160	31.0534	27.3935	41.3669	17.9341	6
161	35.5448	24.2684	24.4525	19.4434	38
162	26.5855	26.5008	8.649	2.5361	8
163	43.0635	31.4686	2.6925	35.4855	12
164	30.4469	21.4825	3.8833	31.6307	14
165	33.3877	38.8388	47.9844	13.1359	13
166	20.8616	31.8567	15.5881	16.439	37
167	20.9805	20.9752	1.6334	15.7265	36
168	30.555	31.3009	2.2328	18.8032	1
169	41.9344	32.8635	38.9519	35.1115	30
170	32.6566	40.0511	6.9534	38.6421	6
171	38.1953	36.049	49.7462	32.0805	22
172	37.4163	24.6203	17.7469	31.2894	17
173	29.5705	36.67	2.9094	21.5656	33
174	23.5397	47.0618	33.8948	4.6924	3

Node ID	x	y	z	r_i	demand
175	44.7486	39.7162	41.5468	12.5268	26
176	42.5333	36.3249	41.241	34.2929	13
177	28.8128	30.4765	38.3516	39.1387	21
178	25.2216	48.8368	12.0716	29.4028	11
179	32.6554	40.5505	15.9859	13.7264	7
180	45.8434	28.1097	8.3609	15.1991	17
181	21.333	28.4534	22.585	38.4741	17
182	23.8226	36.8408	17.9115	22.7865	10
183	41.315	20.08	19.8292	34.9881	15
184	21.8127	22.4456	3.4445	26.3083	29
185	37.6461	42.0792	39.3984	22.0605	11
186	47.084	47.7144	42.2332	24.8395	27
187	22.2385	33.2025	32.4261	37.3358	11
188	36.1356	35.5262	17.2008	3.41	27
189	49.7446	26.3767	39.5089	17.8751	37
190	35.3466	47.2689	27.5268	39.4146	22
191	28.392	21.3903	1.2616	19.1959	31
192	37.9243	23.9119	1.2026	11.4323	19
193	41.4412	38.9568	21.684	5.527	27
194	26.8183	32.6012	18.9499	9.1398	6
195	22.5313	48.1754	17.677	10.3014	40
196	47.3754	37.9401	16.076	18.8601	8
197	22.0871	33.226	43.1435	33.6947	12
198	23.1185	40.5549	22.8959	4.3029	29
199	29.0396	36.1372	21.3542	26.8002	21
200	73.1002	79.4037	30.5501	12.7865	34
201	84.7887	79.7551	43.3502	24.4915	13
202	81.7913	86.2239	2.8298	19.3521	30
203	73.6863	74.2382	1.6716	25.5224	27
204	75.4182	80.175	27.0139	23.5169	9
205	74.9451	88.4605	13.7746	8.2599	33
206	78.0272	82.0721	40.7931	8.7342	28
207	89.7033	80.1502	39.6028	26.8819	34
208	81.6179	74.1421	49.6219	15.9576	4
209	74.3211	82.1244	47.3456	8.5161	17
210	89.2994	73.1482	41.8171	4.9668	28
211	78.4966	80.8407	46.208	27.0644	28
212	77.1908	76.3248	19.088	8.3165	24
213	70.0787	86.0551	23.7512	4.8813	23
214	87.8356	87.4643	21.4217	27.6715	12
215	89.6546	85.279	42.7332	10.469	24
216	87.2864	89.2526	43.6381	24.3141	2
217	76.9521	88.589	30.1519	36.7425	16
218	75.5773	80.7384	32.0605	16.9072	17
219	85.3838	89.3565	26.2565	14.2439	12
220	82.4808	71.6064	25.4475	18.1512	9
221	70.5598	83.7819	30.4468	31.7327	34
222	87.485	79.3312	28.225	14.9303	37
223	85.22	71.0885	8.0711	39.2361	35
224	70.8021	79.2974	26.7913	26.617	28
225	72.5273	88.3137	27.5858	14.2003	17
226	79.7775	80.296	30.6811	29.6152	35
227	77.364	70.7565	29.611	18.9213	6
228	70.8501	86.3243	19.985	34.4665	32
229	79.415	85.235	33.6242	23.8334	36
230	84.4928	76.9707	34.1362	35.8799	23
231	83.5177	79.6473	12.5117	24.9276	37
232	88.5666	89.9178	38.0498	22.668	31
233	85.7193	87.9646	47.7548	30.5682	18
234	73.5126	71.3248	10.3828	18.5601	5
235	88.3919	89.421	29.806	7.2563	5

Node ID	x	y	z	r_i	demand
236	82.7904	89.3622	35.5781	32.2308	21
237	85.5265	86.4226	22.7788	27.3567	7
238	72.3356	86.155	20.9164	38.7669	25
239	80.7173	88.9602	30.7691	17.7309	1
240	84.8025	72.2361	43.599	24.0623	29
241	78.8402	71.1237	45.9036	4.6244	9
242	81.0772	83.8409	29.4446	24.7807	19
243	77.9819	77.7483	36.1545	19.944	8
244	73.6161	81.1388	33.9424	38.2238	22
245	89.4354	80.1567	8.4369	4.0019	10
246	83.3441	85.5151	19.0157	31.408	26
247	75.6074	70.2776	13.8577	26.094	25
248	77.1151	89.3423	7.0894	37.2077	14
249	78.4301	80.0876	35.2889	24.8331	5
250	80.2922	75.8098	32.7263	14.5911	5
251	87.5661	81.6563	15.3738	27.3837	5
252	79.6279	80.9538	46.8845	23.4026	19
253	77.4087	74.0915	13.1093	5.5705	30
254	75.9291	73.9471	7.416	36.4707	7
255	71.0504	85.2637	43.1302	27.4246	15
256	76.8895	78.6378	42.7161	24.9962	15
257	79.7296	78.3022	25.4406	15.676	38
258	79.3747	83.7664	12.9303	2.2827	19
259	76.1087	74.9228	48.9063	26.6713	24
260	79.3483	75.3688	19.5443	27.2443	38
261	85.8335	84.6274	4.9143	15.0275	39
262	76.3867	80.9989	23.608	33.1367	19
263	72.6803	81.9225	14.2859	4.2531	22
264	76.1847	74.2911	12.7823	17.8739	3
265	87.8874	83.7559	45.2883	28.0801	40
266	85.5459	86.1581	36.8243	23.0206	10
267	89.4099	75.3847	11.7139	13.3372	30
268	77.4302	82.5606	3.0237	33.5083	14
269	82.7718	81.5009	6.6283	13.2622	33
270	87.314	87.2617	7.5328	16.5203	1
271	85.4655	89.4614	40.2893	13.9477	15
272	82.0065	75.6791	41.5159	28.4662	5
273	82.7574	74.2926	38.276	14.8137	23
274	84.1657	89.6201	18.7606	13.6552	39
275	70.0314	77.1275	8.8524	35.8588	24
276	83.0689	84.7397	49.7222	17.7189	3
277	84.0326	80.947	31.8699	25.7062	20
278	78.9268	79.6337	5.1041	28.7763	7
279	80.5183	71.0301	37.6084	20.9716	36
280	71.008	83.9726	12.5028	10.613	23
281	75.2812	79.5319	0.6498	38.4796	5
282	73.5352	77.8165	42.524	36.1475	15
283	87.0156	79.966	38.2934	12.6359	21
284	73.8575	87.669	40.179	25.5244	11
285	79.9937	73.4457	8.9779	4.0141	29
286	80.026	88.4312	32.9439	31.2606	28
287	76.4126	75.548	2.1999	18.6216	28
288	85.8774	87.324	15.9329	11.0712	22
289	89.0638	74.5581	37.2181	18.603	2
290	84.6626	79.7388	29.6454	28.8542	28
291	71.4242	75.4202	7.9198	25.4968	9
292	79.4655	74.4467	41.2824	12.4177	6
293	76.7822	82.9894	44.8431	3.1025	31
294	85.6153	86.7737	15.008	37.7006	36
295	86.8222	80.0693	3.9589	26.0963	5
296	80.1131	82.5047	41.0389	19.9521	18

Node ID	x	y	z	r_i	demand
297	89.379	76.0987	3.6739	38.3025	14
298	81.9035	87.9149	41.5399	16.8426	40
299	88.9513	72.6403	24.2874	19.8606	16
300	92.5909	80.0433	37.2966	19.5797	32
301	86.7862	83.711	0.7854	21.1375	22
302	83.1514	91.319	24.221	39.4372	38
303	87.6085	88.0524	34.9791	0.9405	21
304	92.7639	86.5161	40.1878	5.447	40
305	94.6937	81.204	45.1011	23.1601	22
306	99.1691	80.9928	48.8748	24.2662	17
307	94.4375	89.8165	9.7901	6.7853	15
308	83.6163	95.496	9.4544	6.5288	11
309	83.3685	88.3604	12.0152	8.2767	14
310	92.0809	99.3222	11.7562	13.6093	33
311	95.3031	91.4204	17.8619	25.4609	34
312	99.0472	85.7396	32.4859	19.7408	3
313	95.4796	96.129	4.4906	2.5755	27
314	87.1273	84.0324	13.0404	22.6844	1
315	81.0134	86.425	30.4534	31.9429	7
316	97.0785	86.7219	43.0832	0.1222	6
317	90.256	83.0105	30.9795	8.936	17
318	98.1513	96.345	10.1326	8.7509	35
319	86.8895	84.3247	23.0154	31.0852	9
320	82.0258	98.9707	44.6731	16.4132	24
321	89	83.7031	44.7227	2.6411	34
322	80.4141	88.4668	31.9981	26.3631	10
323	88.3602	93.5594	13.9637	0.2833	15
324	95.9324	92.1458	48.2362	31.1565	39
325	80.5965	92.0964	38.2365	36.4049	31
326	91.4519	94.5103	31.5983	21.3367	2
327	94.4683	90.0421	37.16	36.408	20
328	92.8113	98.2407	8.6156	11.443	36
329	88.7272	81.0174	24.4065	30.12	6
330	89.931	94.5372	6.4495	17.4038	38
331	89.3359	93.6392	1.2449	11.0562	8
332	85.1326	93.3031	36.2953	30.9423	25
333	84.3334	97.0716	17.1577	13.2701	25
334	83.3686	96.8014	16.23	13.9298	15
335	96.0605	94.495	5.5816	12.9494	34
336	93.3103	99.0843	27.6346	24.3725	29
337	99.7949	88.8243	9.6989	10.9809	20
338	84.0572	98.2927	13.228	11.5023	16
339	86.994	98.105	22.6387	12.5626	20
340	91.162	99.965	45.0985	25.8943	27
341	88.1669	82.2879	22.5207	36.2685	25
342	85.9222	83.4369	36.366	1.3228	2
343	90.7381	99.8897	10.9244	39.8736	12
344	89.983	98.6224	48.7896	7.2459	16
345	94.509	92.4532	22.8398	10.0411	19
346	83.9295	97.9734	19.8967	22.5699	14
347	84.3608	92.148	16.0712	27.0972	1
348	87.8518	83.2273	45.632	10.2812	36
349	99.292	98.0492	12.4987	20.4892	33
350	96.671	90.7145	10.1968	32.754	26
351	87.7484	83.7546	3.1863	5.1562	37
352	86.0867	81.533	3.6186	7.8826	19
353	82.5335	87.3296	48.5022	23.2737	7
354	80.7551	80.6861	0.4798	19.901	24
355	96.5452	93.172	22.7505	16.1374	30
356	88.3323	91.5035	43.0727	13.825	27
357	89.0976	96.4455	27.3307	23.7594	3

Node ID	x	y	z	r_i	demand
358	82.1226	91.9552	25.5944	29.2899	10
359	88.176	88.8141	22.7557	24.7619	12
360	89.697	88.1654	44.368	35.3374	38
361	89.5983	91.5249	48.4013	17.2739	9
362	80.3025	81.1115	9.6723	15.7523	27
363	92.093	98.3621	2.0725	32.0505	23
364	97.9735	93.9042	14.8216	16.4454	15
365	94.7529	81.9671	23.1963	38.2984	17
366	84.7929	84.8117	21.5385	17.1593	4
367	87.3294	86.7915	39.9582	10.1629	27
368	81.9044	86.793	39.6738	18.7468	39
369	83.1803	86.2205	46.5816	0.461	11
370	89.9071	81.4441	38.6007	15.7904	32
371	90.3741	83.7882	8.516	6.0655	27
372	84.4799	87.8799	46.3607	17.7516	7
373	93.0738	84.8753	19.4127	27.0049	5
374	96.6476	96.9796	12.6166	23.7398	35
375	90.1019	83.486	18.038	37.2389	39
376	90.6972	96.9626	11.6096	12.1171	10
377	96.6676	92.6743	28.4611	10.3882	1
378	88.0059	90.774	26.7084	31.4291	13
379	94.2258	98.7848	13.3192	33.585	18
380	97.4362	85.8361	18.6294	6.7092	30
381	81.2522	99.2612	19.5952	19.7395	22
382	92.1839	88.8237	5.0595	30.3052	27
383	94.7976	88.4491	0.0367	36.0251	15
384	93.4254	97.8126	20.9017	10.7468	2
385	80.2014	81.5949	36.2605	32.3848	4
386	97.0965	81.0307	25.4066	20.0164	14
387	88.2817	96.351	29.2562	29.8948	23
388	98.6006	82.3388	36.0882	4.9458	26
389	99.7041	87.1751	32.3993	20.8453	35
390	84.2824	83.9445	3.7257	9.6857	9
391	96.809	92.5136	0.2967	11.7087	40
392	93.255	98.1789	24.6576	39.9406	3
393	96.8293	85.3988	23.0282	25.2212	3
394	84.785	93.3953	20.8615	25.851	4
395	84.5701	92.5098	41.6265	11.4862	25
396	96.1791	97.5552	24.4974	14.7422	11
397	86.675	81.8002	49.155	31.4898	23
398	94.8083	91.5304	12.0006	29.5468	17
399	85.8291	89.3215	18.2752	27.9965	28
400	1.5647	88.8122	41.3941	1.9171	3
401	1.8225	87.776	42.1327	36.7171	7
402	16.072	81.5553	45.6344	6.7432	27
403	19.5543	89.8549	35.5989	33.619	16
404	2.0599	86.005	27.783	20.2991	24
405	9.9966	85.8576	17.8499	5.4423	40
406	13.6279	83.3943	14.3913	17.0874	27
407	13.8296	81.5783	47.5142	24.0124	5
408	0.7751	88.6342	47.6629	34.6112	25
409	4.4842	86.5445	8.1765	5.1195	23
410	13.617	84.1913	11.8486	7.3733	39
411	16.4864	81.6235	25.3496	21.8233	31
412	17.8246	84.0918	18.5648	15.5287	12
413	11.8372	87.4011	35.0448	35.7247	32
414	1.1933	81.8445	35.7922	20.336	27
415	16.2773	81.3093	25.7994	7.8184	16
416	6.7503	86.812	36.4409	32.5272	16
417	1.983	86.3665	46.2259	17.6822	30
418	5.091	83.7862	45.0917	25.4049	26

Node ID	x	y	z	r_i	demand
419	2.625	81.2761	5.8521	30.3022	18
420	19.4915	88.9148	34.46	6.4477	10
421	15.9151	82.9337	42.2853	11.014	1
422	2.696	85.7661	44.4643	16.7328	33
423	0.029	82.9455	44.9095	21.0457	11
424	17.8311	84.5721	16.3475	18.6031	26
425	17.0206	82.7787	9.6966	29.1615	1
426	14.2245	83.0966	40.7659	3.3966	3
427	0.2473	82.0871	22.6092	6.3206	31
428	11.6247	87.7046	5.4339	3.2321	28
429	5.1015	81.8103	26.7596	31.1473	4
430	10.6041	85.0219	16.3433	25.6845	20
431	8.8756	85.3213	18.2881	16.0341	33
432	15.4215	81.5375	18.2132	38.9838	35
433	9.522	88.7288	32.8263	27.8783	38
434	18.7876	82.3448	48.1119	1.5043	28
435	13.2856	89.4879	17.2258	21.8166	15
436	19.7188	83.0222	34.7895	29.297	10
437	14.2132	82.4414	28.7174	14.4019	22
438	7.6764	88.6806	43.7076	9.6476	27
439	17.1642	87.7833	12.5892	37.7116	2
440	17.0519	88.8308	49.5668	13.9972	7
441	12.6448	83.0865	6.5696	35.3802	37
442	6.0677	84.3942	30.725	37.1993	11
443	3.3964	83.4982	10.9781	22.6969	33
444	16.887	83.4344	26.4901	34.5743	9
445	9.2565	85.6186	20.1316	2.8621	35
446	5.1953	87.1361	22.5444	37.283	29
447	2.5389	82.9669	19.2333	4.4555	23
448	5.387	87.7604	0.9494	6.3922	39
449	7.4797	86.7529	34.8532	25.8983	6
450	94.4757	9.4701	4.1216	35.9228	26
451	29.7505	96.621	38.9958	6.5556	13
452	17.7167	97.5636	38.0165	31.3797	14
453	1.0919	90.7016	20.5918	28.434	26
454	25.0595	61.5431	43.0509	18.8768	39
455	97.0848	81.6578	13.6354	37.2835	23
456	78.1743	38.6355	23.4376	9.4129	38
457	22.1476	14.8515	41.0167	12.414	28
458	28.6149	8.2266	35.9223	6.0195	36
459	73.6361	68.0431	3.2936	6.0588	22
460	84.5964	57.5663	6.5683	31.6899	23
461	73.1545	60.0435	17.8914	34.4744	6
462	84.9979	3.9891	22.3271	21.6131	28
463	27.0169	46.6583	34.9486	30.8141	27
464	26.3736	85.6358	40.2837	33.6814	31
465	91.1956	46.5873	37.0515	33.1213	6
466	59.4827	70.1321	42.8614	13.0297	38
467	28.4031	32.2444	2.4033	13.356	6
468	52.9148	12.3625	13.3985	18.1234	25
469	97.6128	23.6668	47.1593	38.6763	30
470	7.7403	89.8119	11.7653	8.6997	22
471	39.3354	89.658	8.0536	8.4792	13
472	92.0943	24.688	5.2999	2.3066	22
473	93.093	71.3467	11.2543	21.4346	6
474	30.7692	16.7931	38.6765	37.8932	31
475	64.954	37.309	2.2557	38.0588	18
476	47.0351	69.5204	13.3405	24.0774	12
477	84.8772	45.0654	27.1944	32.4975	8
478	4.1027	5.9391	36.7092	6.8207	30
479	44.1821	62.8241	31.2839	34.6478	8

Node ID	x	y	z	r_i	demand
480	73.9225	9.6395	49.6476	4.3559	14
481	44.9743	74.4953	49.2176	27.6089	23
482	43.1416	9.2079	26.5197	35.1675	6
483	25.8602	58.6207	10.547	28.7536	16
484	72.5026	72.4828	42.5897	37.2859	11
485	49.5234	55.0957	34.2852	33.4236	24
486	54.1532	48.4548	25.954	21.9974	14
487	99.2739	52.0431	4.3408	5.158	11
488	57.0413	9.9678	41.9779	25.5663	14
489	92.9329	22.8145	25.5988	15.1532	9
490	84.7658	77.8153	16.2748	28.1634	28
491	63.7544	71.2264	45.6612	1.3435	19
492	19.3715	86.9483	48.882	2.6697	40
493	80.252	96.9762	30.8948	27.7656	24
494	88.2673	94.5543	28.7709	14.161	16
495	27.2789	43.4795	19.1307	3.5918	6
496	77.6803	63.0066	43.1391	3.3991	28
497	23.9463	67.9458	29.6197	30.7026	9
498	49.2766	27.3707	5.7576	19.0778	16
499	10.8331	85.8288	6.1261	11.4013	20

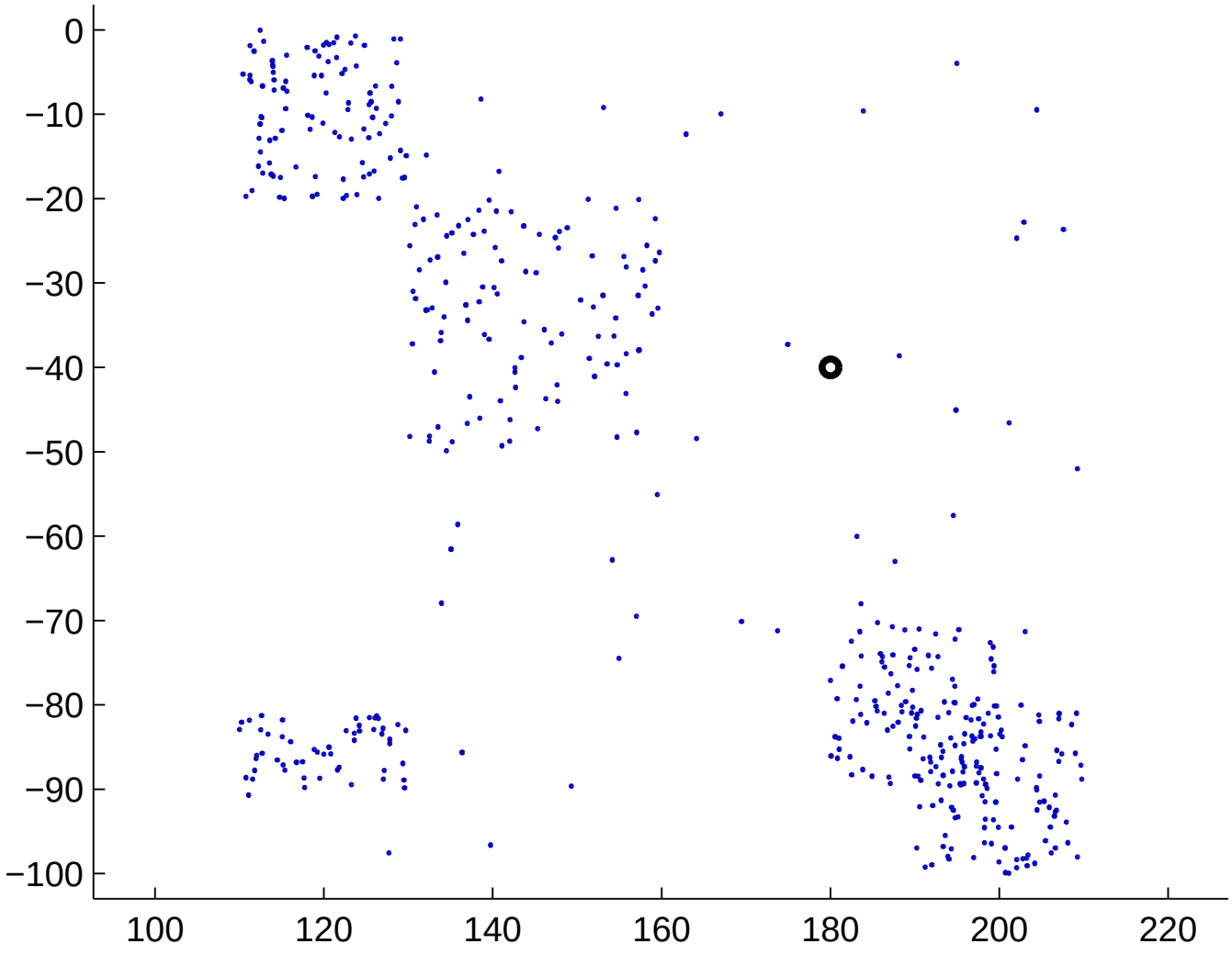


Figure L.9: team5_499

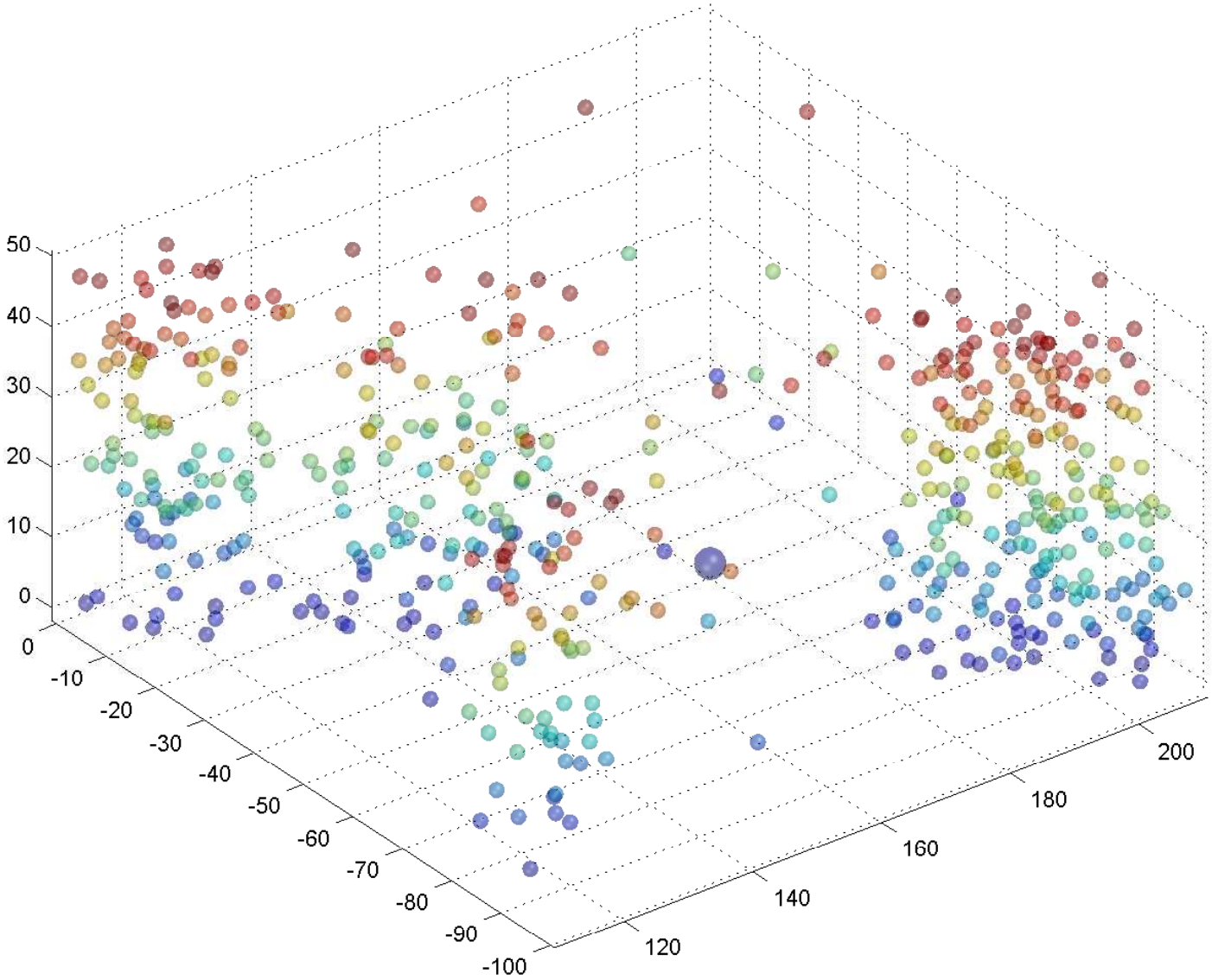


Figure L.10: team5_499_3D

Table L-6: team6_500

n:	501
r:	27
Description:	random
Total Demand:	25539
Max Vehicle Capacity:	5000
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	95	50	0	-	-
1	9.8269964	6.8843491	16.4620329	6.8651251	17
2	2.4253981	44.8523436	2.2881323	11.7215543	48
3	53.0250996	68.7918887	2.0307378	1.5438111	62
4	0.2763329	64.7359652	24.1588067	5.9629374	16
5	4.944301	50.787374	18.9241415	6.1768296	61
6	20.5127244	86.7993916	9.2772764	6.7971193	32
7	58.429274	38.9397266	17.4146787	18.6397178	52
8	53.3341085	54.2742297	9.8426206	4.845343	77
9	57.0336699	24.3925592	19.6603049	10.3178167	17
10	41.2499501	12.693222	14.1376671	15.4469364	38
11	30.2787157	8.2280249	1.312123	8.4927039	51
12	46.3729602	74.0499355	16.6434815	10.9997053	72
13	21.4283979	90.119601	10.9146393	12.23519	16
14	55.0653569	81.234009	22.9552522	5.9096312	35
15	25.6408756	32.9849766	23.8146293	2.7008855	100
16	47.9098314	77.7959758	13.7573709	9.5350991	24
17	37.4597811	44.2188485	16.422469	8.3563058	4
18	23.2467308	53.1536864	15.3512789	11.4161743	35
19	3.9184302	46.6238898	20.1933306	2.4013658	83
20	56.0822206	62.8731122	23.9833277	7.9532835	13
21	57.43771	71.1535593	20.5447257	13.3451357	99
22	15.5276897	59.9411898	0.034091	6.7609848	85
23	26.8042407	95.3391438	15.0909578	3.8148041	23
24	7.3492035	35.5012058	13.5793477	9.3339917	23
25	3.4980922	86.0326352	18.0570339	13.3409157	88
26	79.80288	56.0883078	18.4129389	5.2865846	28
27	72.24704	39.7077335	13.756154	3.7506664	92
28	9.2263989	90.0124515	4.4717238	19.4614621	56
29	9.4077401	50.7341371	22.0830838	15.2153276	17
30	2.4095765	76.567725	8.2487866	13.9285738	100
31	29.6716712	65.8677857	16.615982	16.7115843	4
32	16.1987878	59.3187745	15.8426137	8.6880066	76
33	1.4410502	27.5670412	20.5926225	9.0702473	72
34	43.8195847	68.1613988	20.4285954	3.0343172	38
35	72.0757838	18.033427	9.5185824	4.1897587	68
36	20.1950128	67.681815	12.2807597	11.7719782	30
37	40.565033	30.2350611	14.624538	16.7047972	42
38	64.1033853	11.196525	7.8712992	1.9674937	6
39	46.8228713	71.844353	9.3127449	6.908088	91
40	74.2228108	38.6099587	15.750928	8.4402478	100
41	75.8801773	29.7113355	20.1473913	15.8480612	55
42	2.7334234	77.6753662	22.8134911	7.9974461	3
43	37.6481264	47.8813096	6.5793036	7.0802754	45
44	50.8238583	67.1806384	20.6239323	19.5280512	72
45	74.4567732	73.8913977	2.9219836	9.1604579	49
46	38.4714341	30.1541626	2.0837059	8.9883187	88
47	16.5565287	18.5575743	19.3585299	18.4350632	88
48	75.0689318	72.4744486	0.4051745	14.9698309	69
49	48.3601763	34.0464698	9.5017871	2.951746	45
50	33.7088519	9.9711832	22.3346661	13.226048	15
51	46.0567355	72.019762	4.0391076	17.1499692	91
52	45.8972803	89.1189208	23.3584238	14.0274616	75
53	33.8269693	93.4852631	8.3635932	7.8640695	5
54	36.9545772	32.1019086	19.1323386	17.1509479	21
55	51.6262531	32.9510025	3.9807244	3.6157759	93
56	77.3466754	92.4222135	24.9773835	14.6923437	52
57	51.5218465	39.5765057	8.1668107	17.6859637	4
58	4.5207011	34.7763494	11.5308277	18.0479256	5
59	31.6461166	7.3585956	24.5416178	12.8469017	61
60	54.2235528	56.265496	3.5115961	13.6774223	81
61	55.5353048	38.1752447	17.6684542	10.1702798	82
62	23.3330747	67.4297538	2.1722534	6.4618896	78
63	23.1076735	77.6165558	13.9842376	6.3711973	54
64	76.8303918	30.6898889	19.4810071	15.6982902	37
65	34.617789	91.6565199	3.2534463	17.1587159	63
66	77.1265753	88.6843079	7.3792466	19.9105474	66
67	23.260163	19.1726271	1.8635456	5.5937891	41
68	69.2934493	49.5142976	7.1641629	0.775327	51
69	39.4220046	48.156385	14.5273965	18.6805968	84
70	70.9135058	14.8761766	3.8438809	6.3074316	55
71	57.0800315	64.0172849	6.0370203	9.5428133	94
72	28.9097869	26.1468646	19.859402	4.1835746	53
73	75.0360354	91.1497098	19.4705099	11.023678	46
74	38.2308224	97.9753907	0.1604725	7.7014595	52
75	77.6409989	49.4044045	6.2831565	0.1967239	26
76	6.820668	39.0713932	12.1631417	16.2462105	73
77	15.6671545	41.9038059	9.4975475	18.2677056	71
78	48.6878693	60.2173135	5.6974781	11.2892676	54
79	61.4066356	99.633296	10.2157007	16.0904388	79
80	64.136723	44.5156078	8.6797357	8.3082067	12
81	63.6802314	81.8267454	23.9676687	19.0132656	13
82	44.272376	24.1529526	16.7575015	13.4087757	13
83	57.9600279	34.4089577	5.7051211	11.7355261	30
84	78.4065879	56.8222853	10.2773712	18.7893207	54
85	63.772212	68.1836695	14.3458559	14.1434905	83
86	1.1893308	3.3623299	20.9336159	7.3969025	44
87	70.2766166	21.7580017	19.3250026	9.1846004	60
88	71.3343578	25.5495623	21.1336705	6.1682291	21
89	31.6418617	23.7354033	9.0609597	2.3258089	82
90	41.5241877	2.2495139	17.9679654	5.9346817	3
91	11.0262565	80.6460603	18.6716382	8.6895387	69
92	33.1471098	60.1558513	4.4414558	4.0709462	8
93	50.7478618	74.0551131	24.8207298	4.9191824	99
94	36.1244237	41.0242921	19.6707957	15.4858909	6
95	14.9649191	8.2569823	17.1672819	11.1052011	48
96	39.6568849	80.0063838	5.1586736	8.4281529	79
97	70.4834315	96.1070737	18.6164445	17.0458905	37
98	62.5782193	94.8345715	12.3846974	11.8936571	58
99	2.7731053	90.8551563	10.3958831	11.768651	91
100	4.0094679	79.3774545	3.2513282	4.1542009	5
101	10.0346396	20.0550826	11.5771729	2.640927	65
102	24.284459	53.5118781	4.6981631	0.6991082	95
103	13.6477983	21.6503409	20.9429038	10.1300266	71
104	5.6520223	82.6769432	10.5413091	11.1746738	72
105	58.3586123	20.3359236	6.4801103	10.6167883	99
106	4.4183327	14.4467589	21.446539	11.646626	35
107	13.5198617	39.2703319	6.7423337	5.6665967	80
108	9.1420339	20.9818632	21.7425538	15.7590069	2
109	0.9335658	72.1659561	13.9038289	13.4077909	27
110	2.2885744	93.0945686	4.7870646	2.1740904	38
111	78.3681704	28.4149174	19.0447715	15.9637623	35
112	5.9392628	95.2323551	18.983803	4.2724995	28
113	70.748982	60.565778	20.2126548	4.327335	44
114	11.1949114	32.5347928	13.765914	2.918689	6
115	22.9057445	97.6296948	0.3244356	8.6251096	8
116	44.6441662	33.1239716	16.5654644	11.3823841	21
117	6.1457761	57.4553139	19.7085867	10.5969023	8
118	20.6501388	50.1791373	13.3126618	16.3804834	50
119	40.3910959	90.932739	23.935083	16.8734606	61
120	68.9038468	16.8104734	21.7337542	18.4978064	94
121	57.8811625	36.8910334	2.4827855	11.1609103	33
122	78.4106856	73.5257917	13.7197973	15.5467792	62
123	39.0651937	2.4238303	22.4127866	9.0370307	68
124	64.3381393	93.722702	21.2607142	16.872102	38
125	62.3573907	96.159986	6.7572642	5.0891887	24
126	38.9701661	21.3778805	18.3750053	5.0370217	45
127	38.9617732	51.3997809	16.210445	12.7914782	17
128	73.6483802	37.1698351	8.0638871	9.29445	57
129	45.1705924	33.2150554	0.7183829	5.0012449	71
130	49.7030604	90.8227548	10.5216088	1.4005809	2
131	39.7157151	22.5518047	13.0027284	19.2813071	38
132	43.0002757	59.9692573	5.0791111	5.8261393	96
133	32.0336769	81.0046037	12.2328895	2.6979108	26
134	55.2537104	1.3428502	19.4907476	0.3825811	22
135	40.9379615	91.8870672	23.915222	1.5042087	36
136	25.1363027	82.596723	1.6788626	16.9876139	8
137	44.7688336	34.8472485	18.3927145	19.5683767	92
138	76.9820609	94.8106777	15.132467	5.1618551	69
139	79.9522127	98.0359405	21.2412381	18.7966063	34
140	57.8283627	65.6998258	15.4827548	5.6799674	16
141	20.1050057	16.8211128	11.4177964	7.104643	7
142	17.0586402	58.0717087	14.4615884	18.9407433	92
143	38.9767874	28.6595996	7.54261	1.2675438	20
144	30.51178	74.0433946	6.2558417	12.6878142	62
145	2.1729785	46.8604253	18.9044886	11.1913394	26
146	56.98499	36.3050676	16.2652139	14.2729457	51
147	39.5709227	52.0192185	20.9490324	18.7792196	24
148	64.9776601	99.8572829	20.7305349	14.8646935	28
149	52.3761166	17.3066951	24.8659343	10.3802999	63
150	64.0121883	92.7907393	13.624016	9.0477095	11
151	73.9903157	3.2090585	6.7443046	1.7193821	95

Node ID	x	y	z	r_i	demand
152	45.3945603	79.9114427	16.0984045	10.2225307	44
153	7.7653349	6.167634	7.7136991	19.726704	70
154	47.2237184	11.5265695	11.522225	0.1165005	48
155	56.5514993	98.5201232	15.0548231	8.4190197	34
156	62.0390375	27.7696953	8.7011853	7.3539199	66
157	64.4754864	95.6952093	9.6236824	6.985863	86
158	13.0553452	35.1491327	19.4677587	12.3752896	99
159	26.7897314	74.395765	23.1412606	1.8631854	35
160	65.884583	36.2103636	0.6036001	2.551361	61
161	17.9198509	62.5969087	8.2401641	1.1752301	78
162	31.9710737	13.1659452	6.9350237	6.1525799	91
163	69.6306367	57.4599551	14.1507992	8.6491765	84
164	6.0949397	74.0865476	5.2825592	7.6811646	87
165	4.9451086	53.7479899	10.2966488	0.9055154	67
166	45.3795945	10.2393952	3.6711995	17.2768189	16
167	11.2137447	2.0282324	10.133715	19.8233424	28
168	58.9987357	45.7674431	3.4982849	9.2369593	15
169	66.3729212	97.9005203	11.9390694	0.2667237	13
170	3.796854	1.0310825	8.8837938	3.6866637	27
171	72.4289329	91.88372	3.0217722	10.9387068	10
172	3.9504558	53.4738105	7.1081084	13.2039761	7
173	33.7699504	15.2531662	14.0155756	0.4500872	70
174	65.5339196	33.299582	2.2513726	4.4914809	73
175	79.9570853	14.106802	16.0131314	15.0949781	55
176	62.1996928	26.9322785	20.2466983	11.912547	91
177	51.8847181	57.7017397	23.1071854	17.2459771	27
178	12.2844966	12.8434228	15.9512599	16.9324181	67
179	64.4880133	60.4854675	12.6069191	17.3914578	22
180	68.3855742	35.3493495	17.8360025	5.6398572	48
181	25.7941467	5.022901	22.6635913	13.154074	61
182	78.2121151	82.5216358	9.4131561	10.3605913	79
183	9.6122245	63.4753738	1.8891309	15.5818673	81
184	10.2956976	4.6843351	8.4372721	13.6376992	63
185	33.6742877	16.0147514	17.7329183	19.9827348	85
186	61.6781701	59.473286	10.2741841	14.5751959	24
187	15.820225	13.1438067	8.0447276	7.149623	60
188	0.0137858	97.6201473	12.5524591	0.6638812	5
189	2.27936	46.9159446	7.984275	4.2205505	21
190	16.0956015	47.1989931	18.8482809	14.2319044	96
191	31.00496	87.5127119	14.2496673	15.7467648	51
192	65.7364961	88.9695394	1.2659879	13.1578882	51
193	67.7945884	81.6777909	13.5506647	7.7525837	49
194	33.8398153	32.0377234	11.3609992	2.359689	28
195	6.7702019	28.6398243	6.655852	18.6590849	66
196	51.7496653	79.9144917	22.4057667	15.0357032	15
197	29.1113171	69.2428114	2.3178943	9.8595935	64
198	8.4509457	92.4898096	19.3229772	15.3075709	44
199	24.4888337	25.329984	1.2423959	19.8782132	9
200	68.523768	98.3881808	6.8534875	8.1618794	65
201	15.7168362	72.1075902	13.3837018	1.9558061	69
202	3.2029124	51.042154	21.6188315	12.1504864	92
203	67.4654721	12.1137109	23.8276929	14.0781794	53
204	41.3355343	82.7796974	17.0555529	5.9611972	72
205	63.3053921	48.8331121	7.8682203	9.0739339	96
206	17.2034005	24.1027648	4.0750954	19.2446407	34
207	9.5621792	88.5032381	1.7950294	5.8071138	51
208	22.4746551	48.1041051	9.2672876	15.816336	27
209	16.954408	52.9270638	19.3144339	16.3581023	56
210	20.3908302	60.0437447	17.3381089	17.1200275	83
211	45.412979	71.2677197	7.8505587	19.9703759	2
212	53.5581269	47.7413894	5.6200486	13.1857928	26
213	37.7594155	72.4638416	24.7804303	1.8761545	75
214	67.7686962	50.942416	23.8888342	9.9071922	51
215	2.2118306	78.338365	17.5236695	2.7310978	13
216	37.6570142	81.9317057	5.2409906	6.23332	41
217	5.3360715	49.6056788	2.051856	1.5688834	38
218	72.320279	3.8462993	6.5608426	12.1872623	93
219	27.0999394	87.1794445	14.318048	15.3093219	39
220	73.9542296	35.1681427	22.8323041	17.0431609	68
221	58.1838222	68.9986011	16.3418061	5.0984315	38
222	23.0786229	38.1227731	23.1605385	15.8911359	73
223	20.3277951	46.570702	14.9318681	10.9961913	23
224	61.0866811	94.7582572	1.1597592	17.8354325	84
225	51.358437	31.183912	20.2786449	5.9744983	4
226	45.3765455	76.9954785	11.855076	19.7202249	48
227	25.3533813	42.3962835	8.9845466	16.55549	48
228	70.8086056	11.5809577	17.5154997	15.5821047	51
229	32.3710377	53.6854	0.0060466	15.9945905	7
230	70.2907843	10.4186099	14.6666305	7.1185577	33
231	71.2868972	13.7571779	21.261272	15.5198317	62

Node ID	x	y	z	r_i	demand
232	51.2078647	35.5791539	12.2358489	4.4951633	83
233	12.7057803	46.3942459	23.5548248	11.1678278	63
234	72.4566884	79.8068651	12.2176684	3.4026054	79
235	77.5184606	26.3492827	20.0048231	1.1896541	40
236	37.130172	34.1670861	22.6509329	7.7958056	99
237	20.4274735	84.2677658	10.0950289	6.7799767	67
238	75.4923392	99.8090463	23.5616918	10.3077719	73
239	68.4102584	6.9403941	4.658299	16.8109375	62
240	2.2999767	55.3764405	4.437231	4.3558776	88
241	30.6527015	22.708305	8.3283902	3.2179614	44
242	13.1891897	88.2938542	23.4034575	7.7896989	8
243	72.9487249	9.0752285	0.6396625	6.7256814	51
244	0.7950307	63.4582891	12.408302	17.1080484	69
245	3.1062568	26.7803784	17.2167375	2.2743131	63
246	21.2205961	30.6755865	15.8621351	0.1855493	40
247	43.3709663	79.9295648	12.3122786	6.4309473	80
248	59.1397084	81.6064397	24.1713239	2.5044765	65
249	60.5482992	13.7850738	16.8556106	0.6493638	9
250	40.8799687	90.9919823	19.2349904	1.5621823	47
251	38.0621359	81.3957333	12.1235509	6.4246672	37
252	74.3685871	61.179785	20.6768635	0.787426	43
253	3.2443278	74.1558976	22.7592184	17.4562068	78
254	79.155929	54.6404138	23.5670664	1.6003827	68
255	2.8109458	93.7321232	7.4419786	1.5519124	25
256	49.4509792	19.23293	17.9552005	5.5356339	7
257	45.092729	13.545129	18.3076608	9.6124868	47
258	34.7673517	23.4200763	4.8203284	8.3957645	92
259	5.5712407	90.2337915	20.7281907	18.9787731	8
260	53.1446811	48.4277704	1.8438372	14.7395753	38
261	2.4227502	13.8762399	13.6085461	1.5263186	99
262	14.6392528	26.7492086	4.8139494	14.0759419	87
263	66.5761879	96.7049476	8.0800553	4.0776062	79
264	41.3950957	34.602479	9.5059407	10.330203	70
265	65.5436157	56.992435	13.1266946	17.084027	80
266	54.8328865	43.6672378	22.5503676	6.4152555	36
267	19.7736057	66.4248411	22.4431961	8.3807699	51
268	13.4475731	91.4293541	19.9118277	11.6363893	66
269	55.1300701	40.0588307	9.3430467	5.0900091	50
270	69.1126526	61.5737532	13.3447692	13.1055803	97
271	24.4057133	14.819481	14.2616378	14.1480218	55
272	66.8428254	74.9418962	18.8280244	11.9134957	83
273	16.5956207	19.4929376	15.3111277	6.6403358	70
274	54.100404	16.0525172	0.8678853	18.9251989	36
275	6.9413921	77.9428724	3.7844258	8.4884288	90
276	16.6661596	74.8364156	22.1285239	8.962299	2
277	43.0965371	49.287121	4.5164689	2.8888775	20
278	31.5095969	51.0684653	11.523883	15.7915136	54
279	75.4040099	79.0607348	6.3376777	12.6702712	36
280	6.5131248	96.1438685	22.6159881	18.9754882	88
281	49.7681271	46.8278362	16.9025729	2.4284766	44
282	27.922577	21.764341	5.4511195	14.2606988	76
283	48.2549784	40.2375649	15.7273532	18.4484604	23
284	71.8742878	17.8343061	13.6189325	6.5081686	84
285	28.2512087	43.1796715	6.8189779	0.9121146	94
286	44.8729194	51.9811136	24.4648411	2.0479424	49
287	47.6524078	52.2249928	24.4877735	17.0127082	58
288	78.2442809	33.2914556	24.7068001	5.9254971	32
289	63.2522018	99.6147456	0.7669575	18.4401179	8
290	73.6393721	37.6930766	12.5724621	4.535198	20
291	2.2068367	85.97283	4.4333903	4.2948267	75
292	15.1928212	63.8863652	20.6093336	3.6655736	79
293	49.3212736	48.3119567	9.5488066	3.8293124	2
294	54.9748886	31.6899499	9.1125802	11.8489378	30
295	14.7546051	14.610274	24.9337615	12.5838102	67
296	66.7264937	28.6241638	4.754423	9.8453178	50
297	4.0389978	87.3302987	23.4710958	15.0585227	68
298	4.8021518	64.3437535	14.9149548	13.9826688	12
299	37.489488	92.2138591	10.0537289	7.9102312	100
300	6.4321646	5.6038094	17.9548593	10.5758755	27
301	18.0420031	31.0087706	14.9562459	9.8590332	29
302	2.5746679	43.4683609	15.573931	9.7340669	46
303	48.3895216	84.8378656	6.8593636	2.445755	79
304	34.237799	1.769458	21.0926833	3.8958604	29
305	63.7965883	99.8649883	6.5257645	5.4396338	87
306	30.1525293	91.7059859	19.8161573	6.8413479	89
307	19.6070156	87.5155962	19.7643343	13.0351264	77
308	20.7475398	95.759314	10.8106372	2.1619272	78
309	18.5593029	70.8497614	1.5511613	16.4543343	56
310	68.0410206	93.0677269	14.2384361	2.2249974	81
311	26.1534967	60.2417469	15.9637624	15.8350837	37

Node ID	x	y	z	r_i	demand
312	28.9980611	9.3107142	10.3932004	0.5567948	44
313	42.9598051	72.0704928	1.9046969	12.5037762	85
314	44.2906965	51.8898251	11.3116798	3.7343282	11
315	19.95828	6.5164086	22.2907726	19.0088103	72
316	16.4819632	98.2716229	22.9610856	9.7324435	65
317	77.1618533	52.0527053	6.1051205	6.548551	77
318	66.0988248	58.3515559	13.6719306	17.5072809	54
319	68.5426632	70.6500378	2.313903	3.2232857	49
320	8.7488745	58.9072962	5.1240813	0.0497795	26
321	43.6827488	74.1878852	3.8851851	13.0248043	100
322	56.9481598	35.7189477	11.6860928	0.7997132	87
323	17.6447354	95.7025091	24.4008135	18.1912178	74
324	67.3900644	74.174693	20.6721334	0.1104763	29
325	6.2196931	67.2192158	1.3051514	9.1371587	15
326	20.4303529	56.6155569	23.1754411	0.1377486	45
327	36.6688954	15.3802855	11.2906359	16.9765386	14
328	55.3536754	50.0230289	15.6187386	10.7398558	61
329	26.2175773	40.5220972	21.9150058	0.2851225	93
330	54.3749565	73.471727	7.5546522	4.4215583	96
331	46.3458684	54.8708712	24.5219613	8.2955698	62
332	40.9923031	81.1407106	10.4646561	14.9699296	56
333	50.0180258	68.4527432	3.6702061	3.7667027	10
334	13.6466825	56.641223	0.3772494	16.9874359	4
335	78.8734057	30.5074156	10.2492504	17.7741551	16
336	31.5115819	30.4349931	13.1711147	4.1547529	33
337	23.9069485	59.9121563	8.8002389	8.0586758	67
338	42.5831476	37.1399223	7.4293369	8.4151487	2
339	25.3620642	2.9418291	18.8013171	9.3612642	47
340	1.9077799	84.1438746	3.0185488	1.1337425	52
341	28.8394854	85.6978668	0.4508897	18.7042447	13
342	42.0438698	1.2746098	8.4709115	18.5219549	78
343	38.5584867	8.9239146	23.1054293	8.3130054	98
344	22.4809106	75.2843669	23.7038192	6.1954617	6
345	57.9145816	37.4787407	0.4915272	9.8427718	65
346	21.5799527	71.4486566	7.5717836	10.0338577	97
347	14.3875276	98.8261078	17.7695633	6.6290931	39
348	7.2093662	55.909681	20.1638147	8.5307974	58
349	72.8917692	2.6849909	9.1068195	5.1292918	80
350	46.2315326	17.3070005	18.3576471	18.9782971	21
351	15.2275578	8.2482088	20.735321	10.0059049	5
352	9.4518233	0.0818322	21.8708164	12.2091392	95
353	57.1362338	5.5136309	23.5708492	10.1201436	2
354	64.943613	1.686391	19.5930668	14.0946653	91
355	61.0701287	98.8683739	3.7920781	7.9054547	84
356	65.5247054	34.4819771	22.2818751	3.6959394	74
357	11.5512784	26.7283657	10.5788887	1.9160125	83
358	21.6218153	70.9164832	0.5487705	1.4089143	24
359	57.7424662	53.0431767	19.7584506	1.1375089	76
360	67.1669184	49.4371849	3.0262948	15.5982026	9
361	38.128444	50.990683	1.5244057	14.1351688	71
362	17.3929381	9.8303298	1.4719335	5.6745961	56
363	7.5281123	85.6801168	11.1420674	14.3445898	89
364	41.0252369	15.6288565	6.5265879	2.3078897	74
365	39.7052051	20.7340789	2.9027737	9.9402181	97
366	23.9936704	92.6751712	13.4234383	7.0508341	96
367	21.5004558	1.4444458	11.8706015	10.4654737	21
368	14.7299938	38.6202015	11.4606651	5.5606508	3
369	9.8142501	65.891213	10.4751695	15.3270767	71
370	23.2409835	69.6045703	6.9223743	11.4000663	20
371	4.2645198	75.4568775	14.9212902	4.1743619	84
372	9.7861225	28.4044715	22.2738758	0.6023624	89
373	33.6893922	8.5224136	7.0176775	19.9918892	47
374	21.4467307	69.0185063	0.8942161	4.517097	23
375	21.0216738	51.8703093	12.3795264	6.5542883	6
376	15.3634563	8.946465	9.6121679	13.8278483	37
377	34.4981613	43.6098189	6.3838863	7.4849006	86
378	77.8566059	47.3210428	1.4302369	13.3824609	99
379	19.7989907	26.8559855	1.6393695	13.3335104	45
380	11.9839899	90.8471274	5.5312557	12.6071325	75
381	10.2638739	16.7343669	2.745395	18.8298176	98
382	75.6464183	86.4517504	17.8073467	11.7494177	46
383	18.1200543	57.6122523	16.2352309	15.16683	11
384	45.5118999	65.9532613	1.4856264	17.6961201	9
385	52.4413086	6.2567644	20.6204114	17.7872557	29
386	56.7397866	71.0931061	18.3430984	12.7871715	21
387	59.7400431	37.5401839	2.8523374	7.0381524	44
388	62.9728444	48.2610974	18.088966	5.9042331	44
389	54.6678163	5.1970784	7.0182008	9.6677205	77
390	67.3268965	96.007007	6.0328841	10.9024154	29
391	34.0986738	23.3047286	4.238405	16.797077	6

Node ID	x	y	z	r_i	demand
392	67.0620012	97.8077872	5.6584534	8.2792999	95
393	13.919931	46.2670929	1.9535236	15.1163989	47
394	77.5651358	71.0148631	15.8380209	2.331233	65
395	1.295681	73.7881021	0.4861457	19.2219951	19
396	37.7928549	6.0601138	4.720283	3.405887	66
397	21.5694811	0.9567502	13.1824134	13.3401903	24
398	6.1363219	48.8674613	19.7646406	18.2256529	48
399	43.6411268	3.9331303	13.8180098	18.3321607	30
400	40.4352515	45.1450838	11.9573703	4.3768484	9
401	32.8302989	42.2309887	13.616708	9.1323516	69
402	24.3319298	37.4283803	9.9719727	13.053577	31
403	76.1612584	37.0439506	15.0269683	3.365582	91
404	44.3710695	67.9205927	10.1383529	17.6190773	67
405	2.9296139	91.7761922	24.0474062	1.1614786	54
406	61.0630253	98.699805	24.8594975	11.0127062	42
407	77.2293497	82.6694496	0.4080071	19.9727905	78
408	73.3690079	50.7128517	12.3210863	17.0196572	90
409	32.3078962	45.114069	10.6720814	14.2581658	1
410	1.8947773	99.155621	15.7943163	13.566985	24
411	73.7932186	65.1929118	21.2635249	5.5307734	41
412	6.5220454	46.8393292	9.3610404	1.8896117	63
413	0.6045586	98.8714353	15.0611354	2.1193873	87
414	32.5068688	76.0167984	20.6942387	18.6744309	74
415	65.8501112	46.5185477	18.4012114	5.7590293	75
416	30.8819888	13.4626957	23.5805357	3.5848945	9
417	50.0446513	86.3510967	14.724494	11.408718	70
418	30.0937988	44.3308943	14.5383671	9.1718387	25
419	12.1928408	37.3702852	11.5867049	0.8140869	50
420	5.3401207	99.7769332	23.3119522	19.3172668	88
421	26.3324067	9.9110212	1.9657306	19.0585155	89
422	67.7860652	18.0440513	10.7235759	17.8951575	52
423	60.774398	89.648206	21.5223541	12.5083419	45
424	18.0605132	3.6100683	1.3230623	8.5868999	84
425	21.8832831	32.2702186	24.0783885	16.0376904	96
426	49.4827685	84.8462228	4.1362821	10.3517087	28
427	34.482979	80.365325	2.7097027	8.2940253	86
428	32.7632095	61.4478694	17.2734289	19.7763438	69
429	25.824676	62.4300357	22.6279041	7.6620297	43
430	19.6994488	87.7215703	8.9292535	12.92719	38
431	57.0032853	47.929495	24.4820709	2.0977627	82
432	28.018456	49.9258106	18.7011667	6.3626175	71
433	63.3830619	45.6708392	19.4411223	11.4259131	34
434	75.1791401	28.4357222	11.5456464	18.0653964	80
435	56.1389342	85.561632	20.0765614	4.4417673	47
436	64.4543682	70.2655389	2.1929672	6.7382235	9
437	62.4719528	86.6470186	17.4140053	0.2482165	64
438	61.3811866	10.1841347	3.2294003	1.9011369	25
439	35.4564008	78.9241199	21.2236154	15.1810796	24
440	9.4153722	53.1681384	17.4096726	17.5248196	50
441	75.4422908	46.5496079	10.6773392	15.4085245	5
442	63.9530194	87.4245185	17.4311618	11.3124411	80
443	33.5301093	3.5426558	21.7233363	3.7368294	4
444	61.1689993	94.8861498	0.1686343	3.5486281	11
445	10.881307	21.222109	11.4410052	15.2562401	23
446	8.8711802	13.2955279	17.3948906	15.7653907	44
447	11.8541821	36.7134083	15.5034658	16.0938551	36
448	70.5957341	27.6007009	14.8208364	1.8901283	16
449	28.3264783	80.6515072	10.7169993	7.0901709	86
450	75.2339764	1.1053279	6.9329867	16.7841753	87
451	49.7783583	78.4397036	19.1457188	1.598943	17
452	47.2434466	72.8348775	10.3871125	7.3999265	19
453	73.2290706	73.9762718	17.115174	18.8679238	40
454	1.0903939	26.3844516	18.4073439	6.0462866	79
455	13.5790401	86.3111074	8.8070912	4.776713	29
456	1.1696301	7.0254341	24.7260216	16.3262783	20
457	15.0419936	3.4632806	14.5409941	4.5348945	14
458	35.1926471	70.9963316	12.3857242	1.4121083	9
459	44.680977	94.9895485	20.4805113	12.4233676	54
460	73.292725	7.8305571	19.3842603	14.0833606	49
461	71.5874534	94.5399994	3.1033191	16.9233519	37
462	71.4909917	88.8238404	7.979611	8.4049975	71
463	4.4919615	30.1971308	23.0431363	9.6799472	81
464	67.7343836	45.7338412	11.9249335	10.9613064	49
465	35.0133629	33.6653342	20.0549291	15.142596	2
466	56.2067364	40.2417677	14.7422616	19.6165059	70
467	67.6344777	29.9025036	14.033884	17.8609779	18
468	12.9149435	73.6813943	7.0579	16.8344008	86
469	25.8175111	47.2716024	20.9185995	14.9058581	10
470	19.3270801	51.9549025	21.8491926	14.5767542	4
471	14.8230271	72.6203252	11.2037362	2.4779351	76

Node ID	x	y	z	r_i	demand
472	6.6502494	63.3598676	12.1766222	19.9843888	68
473	69.765468	86.0199863	16.8900143	10.8561261	61
474	74.8496365	95.8479299	7.1137605	2.1681576	68
475	18.6253841	45.1799856	19.5247549	17.6321283	29
476	1.389212	56.8496436	7.9005554	9.3148689	35
477	18.474215	58.4012448	21.6380189	5.4896057	9
478	35.4889656	25.3753347	12.2670294	17.6050983	23
479	37.3849664	18.6565566	4.7787046	3.8521791	15
480	45.6990417	60.3070344	11.94067	16.3509992	42
481	22.9209187	53.7233909	24.603033	7.2787759	53
482	61.6425082	72.8564323	6.6704147	8.9988257	70
483	25.434095	30.36432	15.4263508	1.6710488	98
484	56.0727891	23.8686819	7.47443	15.5553362	62
485	61.8021468	40.7857588	11.6604123	13.1222565	87
486	52.878421	80.2956919	22.1921533	17.8391178	68
487	61.0935569	52.6920317	4.4207174	2.1590612	79
488	39.21475	31.0795566	21.1487172	8.3251067	37
489	64.6626599	65.39963	6.8345581	5.0684212	28
490	37.415218	67.1119326	2.4786359	1.1509522	2
491	56.5346421	68.6367247	22.9662555	7.6638079	59
492	69.6772126	28.9703915	6.8785128	10.4491408	50
493	29.8399494	3.731908	9.1569031	5.1894117	86
494	25.8819635	79.9487476	10.2285525	9.3875474	71
495	62.1748486	23.5386262	9.8971034	19.2663276	98
496	6.6484375	67.6725429	4.7357573	18.7895827	54
497	58.3317264	48.8464518	15.1551224	16.6689028	80
498	62.6982725	97.3778678	18.7400798	9.4559017	53
499	18.3784185	57.1026507	1.60641	10.6506348	82
500	34.2887402	41.9043439	6.835982	4.1016802	3

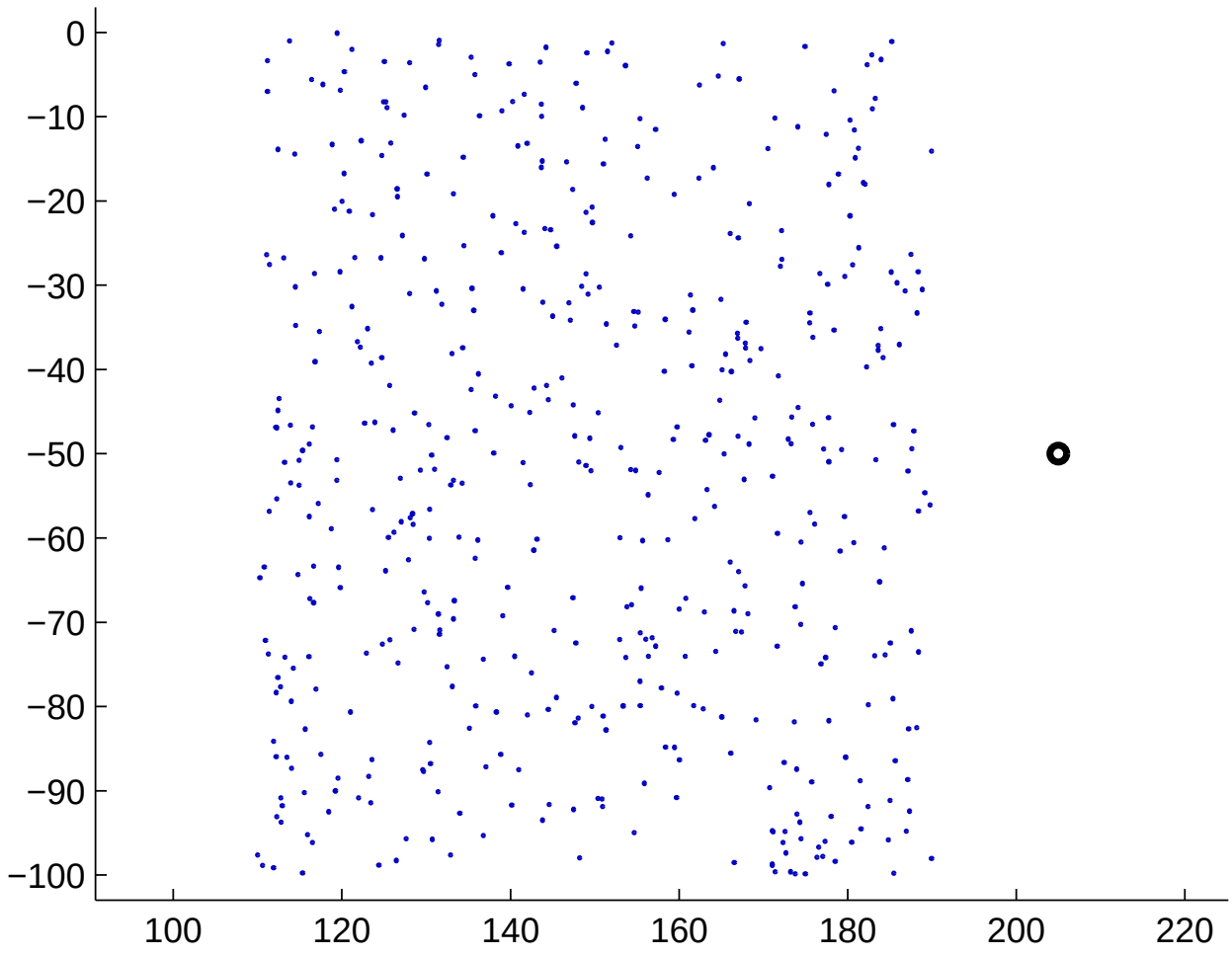


Figure L.11: team6_500

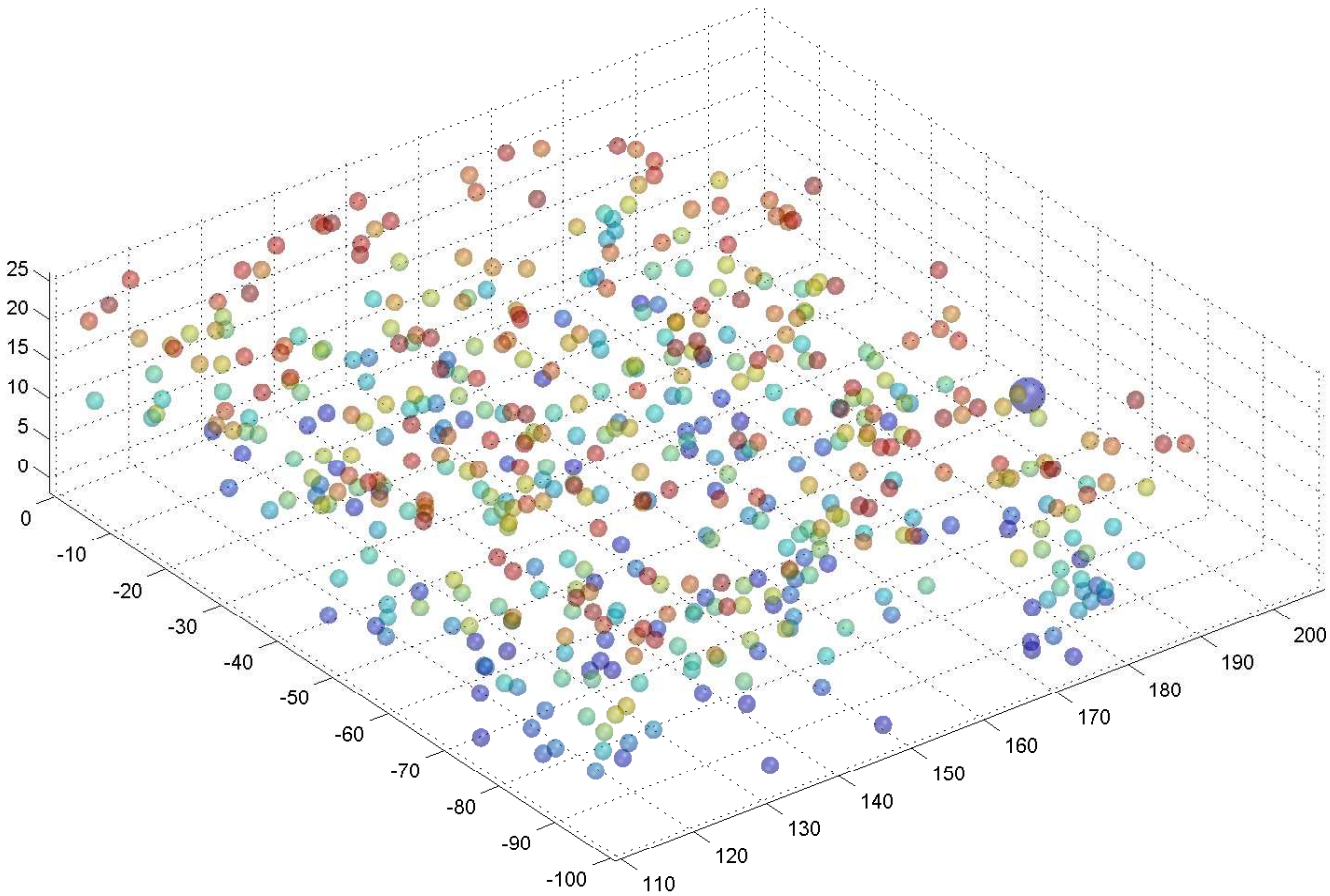


Figure L.12: team6_500_3D

Table L-7: bonus1000

n:	1001
r:	12
Description:	clustered
Total Demand:	25289
Max Vehicle Capacity:	3000
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	80	20	0	-	-
1	8.842438164	89.89183088	2.824200169	9.248878075	26
2	32.77989789	83.25231939	22.10896744	4.247864371	41
3	10.36857839	64.9958121	20.62230905	11.82219863	46
4	3.430192849	27.39779729	20.1502757	6.526989384	16
5	45.34071838	99.2752365	24.31073394	6.545950484	12
6	59.11600598	27.89604561	4.171146498	6.714910247	30
7	35.17250587	39.36136713	13.28284014	1.66175135	21
8	20.19850768	8.627828216	19.22611956	7.471216408	7
9	56.76810138	74.93595817	28.17323894	10.01955077	4
10	12.65054039	38.20990532	17.83269917	8.455350331	44
11	27.06311365	42.64274924	23.39166283	7.281813729	5
12	55.99099974	83.60147673	17.9737132	11.10984141	3
13	17.25875189	95.69940805	8.290437664	3.398739413	38
14	3.972668798	68.43095677	28.84137669	4.819982765	47
15	18.10270516	98.29192556	19.61359774	0.6619415	20
16	27.46499326	78.56518576	33.59652638	6.680683032	39
17	16.85080568	91.45389056	39.93862668	0.616270698	39
18	63.68037897	79.29990004	5.705664659	1.33873582	40
19	50.32982697	35.43640834	3.785700884	1.581696088	30
20	28.69202489	99.34571575	27.8214658	3.476487599	28
21	33.85806756	68.2147305	3.068667124	8.272925857	15
22	36.86677729	93.06343809	25.83290646	3.595056547	26
23	53.69991452	99.81161169	33.42740223	0.858562362	48
24	66.17419814	21.15751135	18.97034229	7.122166774	38
25	94.75890926	85.83537613	36.18471901	2.888102094	21
26	39.07927218	20.57348801	18.57850652	5.646872091	32
27	55.9549233	32.80200534	27.96563646	9.08801586	5
28	27.32463884	98.08040747	18.9687539	2.022977234	12
29	74.55729645	43.48740037	20.58508364	11.94062462	46
30	36.65639834	59.2724504	14.55953297	2.438593171	17
31	10.08146406	81.46406963	37.62633094	5.184740001	38
32	19.77510428	38.58926296	16.64922472	11.91376449	2
33	86.50661976	33.33916758	0.489048022	4.865256989	29
34	22.84438078	60.01413405	11.39370551	9.832099483	31
35	56.73611746	58.87824868	26.03485933	10.42122905	1
36	25.58817455	94.62259734	16.80660453	11.27075496	14
37	24.77779172	44.04083387	26.11612996	11.013687	41
38	30.33187934	43.75504148	14.96541955	8.637269115	17
39	3.212591442	94.51392157	23.83849287	10.08518593	49
40	53.87450626	88.16447802	6.291517338	7.742268204	39
41	25.47356848	81.94258519	37.44485814	6.220239291	41
42	64.96530116	93.98228963	34.40488013	1.618288248	48
43	59.28037529	42.02965748	18.78086606	8.171091803	9
44	23.10855555	93.46528062	15.33870171	6.046811031	38
45	63.76560063	37.45231942	9.842542758	11.55334525	8
46	6.302525489	40.0085763	32.06550398	3.025946417	43
47	5.283007933	51.8957834	3.767703534	3.483971696	18
48	12.63857375	82.42671014	11.06948651	6.575237335	31
49	35.40868681	49.33377596	1.880059691	6.467074744	22
50	20.75129811	88.7330358	32.51930493	0.972274996	32
51	67.69295238	75.24403656	20.54681948	11.35995088	31
52	66.67195124	95.92017704	38.76714707	9.763847817	49
53	39.84944538	96.227912	20.60442108	4.047622309	22
54	38.87334077	61.97418169	4.472466865	1.279905437	21
55	55.07321291	28.85442279	12.55016086	3.578504928	4
56	38.05290287	66.43336709	23.58284008	5.771110944	35
57	7.342191074	50.36568708	15.52547031	3.656790591	18
58	20.47481611	85.68176763	4.096992025	4.269604774	22
59	25.6524776	56.5792119	5.011755882	0.126699333	41
60	29.7776223	79.3796747	28.90759999	3.220365403	32
61	2.197761157	16.16441336	29.99258788	10.88783855	23
62	51.98537923	93.03310405	5.658677856	10.9895755	23
63	51.65508094	43.85648581	22.32830057	1.762166358	28
64	28.82263126	20.36706254	14.69297653	2.386009522	44
65	19.64225061	34.99214308	28.17560222	6.554722745	14
66	51.33580352	40.30660727	1.042528676	4.986289138	9
67	65.55566867	66.58332744	7.127202217	6.556838353	15
68	65.33791464	63.72798066	4.706052333	0.84567857	42
69	48.35826716	45.69665672	26.59304148	9.422444764	32
70	64.66140077	51.58253517	18.71344865	4.820243123	42
71	70.61748839	78.65460339	33.23222305	7.660924967	37
72	36.31961338	94.1541845	22.11569666	11.14531248	34
73	29.03165996	90.53300961	6.710005169	3.624031953	9
74	3.815111582	26.65111472	27.4138472	5.810017463	45
75	1.837820965	81.06813079	39.8464095	5.360711684	16
76	26.49994117	86.49656314	20.04082186	11.41565502	20
77	2.766374061	66.09545945	29.36453565	9.314186257	16
78	19.40209516	41.66020767	37.5577128	11.97444555	3
79	24.68488711	59.85199485	22.75052505	7.587909595	25
80	39.75179858	71.51477588	1.359571846	9.864345808	38
81	15.77830732	66.19409337	0.808180704	0.843394073	23
82	44.66930475	80.79724102	25.59577081	1.096402137	34
83	70.83372488	78.21085961	24.5182183	5.320597925	5
84	54.15102156	63.89433124	1.875052021	0.495436049	10
85	56.36080227	54.43871329	23.33898219	4.01664825	25
86	1.354188569	31.31594018	20.59719751	7.295671947	1
87	11.00474377	35.14184161	13.52979102	10.56540176	28
88	17.20155001	81.69531761	4.530646889	7.066943728	38
89	32.83493269	54.50530143	23.93617923	5.131563652	37
90	0.848777488	80.80421078	5.669295757	10.36784038	10
91	51.17754367	73.39508539	6.606709632	0.21557261	46
92	32.87814817	90.10176773	12.94837243	9.598818493	7
93	15.06397637	86.4956065	14.41870487	2.769631739	17
94	52.24575767	74.98560476	14.55357765	1.544515511	40
95	11.28159713	86.83718755	19.13922705	7.508047868	44
96	30.51609732	92.20951413	14.80192542	7.873323153	2
97	11.73654707	68.82383733	18.16264782	7.948897757	36
98	94.17807015	30.5898166	23.81736257	2.95308255	5
99	22.68191696	72.90808337	38.77088424	0.442938698	38
100	8.078510661	52.12465727	17.30721805	11.74516273	7
101	48.01348394	55.67625048	22.64155069	3.794373864	29
102	68.52022941	55.69012612	11.12241046	6.004927032	20
103	63.24920239	4.015695007	1.646238652	2.810594924	25
104	36.99117209	62.09652931	16.1628835	3.164960791	26
105	47.31578899	98.13704672	24.13193979	11.87713881	8
106	4.440109707	94.87692744	8.233710837	8.411496493	43
107	91.19333201	55.09349477	31.72721103	2.162271031	30
108	6.359309777	87.06467249	1.39262333	5.433004527	34
109	53.60239056	70.80290226	5.406808424	0.11567415	11
110	72.84290598	65.67053988	28.7186167	5.910036243	49
111	35.85991513	20.90404301	13.98769394	8.748151694	26
112	55.72002047	71.91921816	21.5952445	0.163996439	16
113	16.80968797	72.84815948	15.34934359	5.35823493	6
114	14.06057656	63.93249207	34.35643485	5.381459732	13
115	17.22630202	94.08640458	22.99978352	10.84424377	7
116	0.073554416	50.20291794	9.32702938	11.48330524	35
117	63.59211348	50.34808715	9.20862338	9.725987624	38
118	56.30399813	89.72916428	6.343295144	0.18367023	32
119	11.54525803	68.93314303	25.95468917	9.632544021	27
120	30.18341718	92.15484297	29.45540328	6.43104448	49
121	22.33900559	31.60235215	9.968662506	6.287046338	44
122	0.102323447	55.05645207	30.68754948	3.635297833	23
123	9.755265232	43.18329059	30.87649008	1.339232837	34
124	31.34183617	77.86791685	6.462154326	1.166905359	25
125	18.69463352	36.26547074	33.27071747	6.160741982	23
126	49.55654528	80.81624315	0.169379697	5.359214828	22
127	40.32660467	53.626561	31.93108458	11.22803277	32
128	1.775610616	46.38397362	3.634697851	1.950063647	2
129	40.16683897	89.097423	24.82067356	10.1742901	25
130	16.73656026	65.26611785	12.28815231	7.348251841	4
131	11.71156616	63.23151575	10.39694521	10.95254356	27
132	19.92687299	66.4828608	36.85195291	7.674542398	30
133	8.026602483	29.17059173	11.48261049	9.758103666	3
134	43.59103477	70.75648589	19.17067552	1.830314492	30
135	78.18108034	99.79242924	3.657350909	11.42083614	43
136	85.71414415	51.67250379	7.296357424	10.80797757	39
137	31.78300706	62.74548174	25.97934086	0.072923073	46
138	10.35439985	93.61856888	31.55963283	1.829714932	45
139	36.49499514	99.8776323	35.60714208	1.525555131	40
140	51.91564321	83.24154723	26.19545671	4.641150631	30
141	31.92346769	85.96439053	34.03343791	5.672562244	2
142	20.72246404	50.29048837	10.84675569	3.507005939	14
143	66.65703205	47.7722791	14.44067044	4.863538053	11
144	42.58773685	73.94634336	30.2774743	0.801427016	8
145	67.89989075	88.12316705	3.528198384	7.944934507	27
146	36.26720319	91.81523904	18.88940672	3.763004237	8
147	33.45977848	51.47641849	1.316430254	7.198818879	31
148	17.93093151	43.30092715	17.11460176	5.511425972	20
149	69.38304877	98.18671586	10.95698255	10.74668541	26
150	30.46512782	92.10545477	16.97866967	8.699579279	39
151	30.41452332	39.55317391	35.96788826	2.75931255	36

Node ID	x	y	z	r_i	demand
152	72.70378804	66.70645397	9.083647724	3.620764964	43
153	5.793118726	87.72031575	18.95737877	2.544917974	24
154	10.71615729	46.62293177	28.86994808	5.678630364	48
155	43.11381093	45.00092033	20.21315796	0.098012743	13
156	76.68650337	13.86956158	1.8774276	1.962359022	31
157	47.96746082	95.14523251	6.669541987	8.805162658	11
158	1.250751092	48.74029716	30.02493246	5.852672895	36
159	71.17046416	92.96230041	3.31475723	4.264714687	37
160	77.11333094	85.3156461	2.683835286	3.063152598	37
161	36.77121212	29.70512597	6.399428168	4.799880351	40
162	52.59359138	61.87082203	17.23711721	8.855134315	1
163	13.34199807	71.15108407	14.18117491	2.435319437	50
164	39.83687168	68.05987049	1.771904532	8.931405029	31
165	50.20668952	26.40233109	10.32749181	3.704996422	13
166	45.01212749	95.47966426	34.75016178	8.619068903	43
167	3.200690229	54.90401263	9.791910202	3.339909369	26
168	28.34961296	82.66841267	14.80317352	2.008122438	3
169	18.46683587	77.29301103	30.42019724	4.716670657	27
170	4.377655918	84.98459142	5.210127271	1.270737521	48
171	90.50689197	55.43830225	17.11301088	10.39640446	26
172	90.81819821	18.2159484	35.33294835	2.233445753	21
173	39.12047899	68.75765335	13.33882614	3.957947734	50
174	36.90788531	88.78292268	9.064555312	8.871911482	42
175	63.48323083	69.36201841	31.45080353	5.452872617	9
176	16.47526591	49.4455512	6.794569926	9.818184126	5
177	38.18944723	65.54612606	17.9243242	4.457511574	3
178	65.51501196	11.68636529	3.24100338	7.30737771	27
179	62.03675317	91.42777069	38.34727303	2.470705606	13
180	3.380314451	80.99890539	17.02151813	11.39696855	23
181	51.49657531	83.11057243	16.78262105	7.887384084	15
182	39.67150404	49.44131071	30.57444188	0.288303678	29
183	39.47053756	98.01039691	0.046804559	1.338634383	47
184	14.81228179	50.29125842	28.12065032	4.356482226	32
185	20.03955091	90.83830295	21.35984013	2.258156755	39
186	18.15807888	79.40011164	23.44302335	9.804701845	49
187	61.09603132	95.38804721	2.385400865	8.526033691	3
188	52.57887869	54.16196226	35.47497689	4.016092555	40
189	0.867278095	18.04823486	8.201101929	3.160190534	50
190	55.16481024	55.42346911	31.47512835	2.604442543	41
191	36.17809574	80.13104248	5.688631409	8.234427368	33
192	65.98277732	56.02257659	36.50214422	2.034393571	3
193	37.51752459	33.09106605	16.01141602	9.30247437	36
194	12.00297966	63.9466553	16.56981835	5.950994709	27
195	45.13867401	81.86371268	20.6390675	0.563248674	3
196	42.25980634	46.86827481	24.73500352	6.991437475	32
197	77.77449926	46.72256252	10.92269156	0.900649502	39
198	13.17908278	60.05355856	0.206865651	7.781969298	9
199	48.20619517	39.24794213	0.08063613	0.03569097	37
200	84.14082278	54.46253046	0.380513445	9.425227564	12
201	7.178182114	91.76838261	25.47562666	1.609117439	44
202	8.376403562	96.83801393	4.582503625	9.194583524	33
203	76.04244622	64.45001766	13.22117777	10.41499903	25
204	57.53422575	91.73216299	13.63995038	2.263638208	38
205	5.724809855	81.80721271	6.405774196	6.479054365	8
206	86.75397464	75.23932777	39.5614605	8.469131771	2
207	23.06731773	35.0375678	21.55663613	8.814338039	34
208	42.53215273	92.92397176	36.17653823	1.03008857	24
209	0.155166122	73.1143838	18.2350269	9.943054863	15
210	56.84900895	69.27095699	14.65228976	9.651018813	34
211	48.88810081	29.6929228	28.59078684	11.17097838	3
212	41.84687745	52.15158968	38.57062516	3.267858024	44
213	12.63680518	12.91935497	10.56277797	10.77386908	48
214	8.013859219	41.41457221	25.49555223	9.523443187	6
215	0.846436708	97.15575264	0.271481864	11.19775474	6
216	3.684518627	54.75346427	34.67646632	10.66155854	16
217	40.58416037	81.54961967	6.0287924	7.064640642	40
218	50.37372436	63.54183807	17.2232387	3.991959404	1
219	57.48443808	43.25173204	37.88033317	5.068521277	21
220	5.351054934	54.87903352	31.2051026	3.370669882	23
221	8.880939202	67.16779099	33.76570468	7.575125342	34
222	20.16006997	73.55306832	21.43875646	7.784192094	22
223	26.37919279	28.3108891	38.48025156	11.05276225	17
224	10.20301226	47.6234059	3.00365475	9.015245558	43
225	31.54519137	79.16359507	27.34637643	3.505835342	36
226	1.009741561	74.32200243	17.21598932	6.745106086	8
227	41.30767537	70.05965636	6.684179381	2.389077221	41
228	75.00767938	29.50135545	13.77877729	5.124594895	14
229	36.44207057	76.13900165	9.824805701	11.50367704	50
230	18.56973911	98.93410982	17.86986814	1.127429706	1
231	13.48749824	42.29987548	28.42807605	9.005353542	6
232	57.82109764	79.24611201	0.587934441	11.76834886	2
233	36.43143728	90.48214242	22.55722277	6.954373264	25
234	33.91919319	90.52236574	22.93790886	7.193036058	32
235	70.24663893	43.40548551	1.656037041	10.39433718	12
236	22.06521443	57.50548607	32.39286042	6.030659205	5
237	3.164572856	61.67055704	18.73530868	3.732266773	38
238	47.89205446	67.3947139	7.919602812	3.735189713	5
239	11.04946885	95.30278919	26.87229799	11.15137795	50
240	37.58124673	53.7047325	1.291628295	6.278048118	15
241	61.64088805	64.72462094	13.53456764	1.377778269	27
242	45.33430047	93.58613905	11.44191552	5.098588574	45
243	4.961462551	81.51420623	19.50536364	9.226598726	29
244	38.25086273	84.70191635	10.62939488	0.879303979	17
245	83.91646182	55.69492785	39.74024442	10.80258547	22
246	93.53556787	11.2495411	17.39352488	9.93311926	15
247	17.38954679	82.23173111	30.2609052	4.9464631	39
248	52.05342714	85.82620662	0.803032132	2.610320997	6
249	77.03036191	15.51069798	15.03164451	4.834719524	48
250	27.39065822	19.10906735	34.23380192	2.166651987	41
251	10.77763243	89.00986935	18.62168793	11.5413795	45
252	46.11608956	79.13405595	12.05021293	3.077288175	42
253	20.16675465	86.45561332	33.59426088	5.662375247	47
254	47.52772375	30.54529654	17.6892221	5.345510096	32
255	69.92952441	96.42807986	14.30332435	9.02685985	39
256	35.03662295	76.31902131	1.401481412	4.632798788	24
257	28.95022635	86.79829568	12.40202554	0.208105648	39
258	21.65865806	17.99154884	8.745957007	8.718780186	3
259	3.705228073	66.5975084	22.49684982	9.299418871	26
260	34.03327785	85.06694553	30.01520061	9.82794583	15
261	41.09480481	34.92509896	27.7383049	6.686212606	42
262	4.281409798	24.72152663	26.34546352	3.095213609	8
263	55.11001594	85.68607737	27.25029831	1.677066237	5
264	83.75499038	5.857780347	33.63275215	7.422722871	39
265	39.25918273	24.78783876	35.71196052	9.890531084	37
266	53.22205568	50.84724902	15.61737169	8.874987766	17
267	3.115821998	88.00026043	26.66042774	11.67905671	5
268	43.40294282	59.60424206	0.51389979	9.536160415	31
269	37.87107476	99.67477247	15.46291348	5.142647072	41
270	24.37529212	73.10827156	29.72637521	9.946110191	41
271	29.89833465	58.88393924	31.18403904	9.428399067	3
272	14.14878683	27.98719075	26.90047422	10.13344558	2
273	31.52001616	50.89228775	38.01036066	10.98721573	2
274	35.96077646	77.38727187	28.20511129	5.108866084	48
275	33.84742868	94.52834747	10.85109907	8.71001742	19
276	13.50520564	67.72241024	17.09707449	9.360297306	39
277	63.88368354	92.98872817	38.82161587	4.684052733	40
278	79.30599483	40.28434635	35.54252376	6.78710395	43
279	21.52581462	69.05739134	31.57893426	1.947101759	20
280	47.65008175	45.51867646	25.16647853	10.88958897	27
281	6.334374787	68.85467086	8.438723386	1.608457989	19
282	31.17947294	31.40633137	5.155453447	3.870118229	30
283	16.54761864	53.09785344	0.161381972	6.228334506	10
284	53.61605765	80.93460352	33.38542247	4.795394132	30
285	45.47068469	56.96814934	6.687113785	4.238980951	5
286	53.04622082	62.56220406	2.597564218	11.46013038	30
287	9.832177112	38.08691559	39.13126485	4.043657799	42
288	25.83818458	22.03803134	36.60516078	1.439459118	39
289	69.82339194	93.15949799	27.73705762	3.201208435	50
290	55.40337389	57.61168804	14.09596446	1.863254992	16
291	38.07401644	11.09458783	4.920078282	6.973490769	24
292	21.4032788	88.65695382	8.541884	2.971051139	49
293	46.26887105	26.53209753	18.29584073	8.81744986	29
294	68.36889636	72.61479797	11.90493723	6.100291297	4
295	37.36735143	64.72519961	6.841621681	8.210035462	36
296	38.00030199	82.20200968	0.019607641	9.151482372	29
297	59.77266019	58.01872841	1.019723189	6.553588622	42
298	43.12816365	79.63219046	23.15451647	0.795070626	28
299	64.88897514	21.58345165	8.959362969	5.371825022	8
300	29.49613778	81.77737157	38.35679407	0.723751207	7
301	64.88497046	82.96772641	30.52764719	9.339812785	37
302	2.544714587	74.45838234	20.47608884	3.751572119	44
303	6.719406227	25.73868862	24.12156356	2.345987396	22
304	0.539457489	84.81338557	26.32883597	5.520424731	43
305	6.579193932	89.24907689	23.95110219	0.979496385	28
306	30.18073163	48.32029982	32.22769732	9.58620967	10
307	7.880864255	53.63419396	36.66849242	2.73437995	29
308	10.40564453	91.96900158	9.717112894	4.396700555	20
309	46.25821854	91.17761288	0.218810451	1.63636571	22
310	25.64004891	98.33585155	37.39052093	1.834844509	50
311	28.59013959	24.83311171	20.75915805	10.05513054	16

Node ID	x	y	z	r_i	demand
312	34.32584869	66.311045	4.144300462	8.8122254	3
313	39.86881125	93.47781189	29.627917	5.895861926	17
314	38.46066343	17.33665094	24.22591115	2.23318621	32
315	91.90328388	76.16243153	11.12653143	10.02897755	1
316	5.668356774	43.14782971	2.118277692	8.305775856	28
317	54.10050901	92.28618361	12.05829408	9.480891031	2
318	63.54041364	40.47906672	32.95919177	10.09103037	46
319	57.06276587	74.98770524	20.67544591	9.477514768	49
320	9.921883095	86.8721598	22.00737941	5.099750684	22
321	61.30013954	82.69641043	22.92622968	3.087682485	9
322	70.07355989	96.61021246	6.954740599	7.658895206	15
323	46.03038143	83.79986665	30.96050312	6.928032766	47
324	48.45592928	88.4082341	31.5542414	6.862006444	40
325	9.018582074	78.03824041	22.65782791	0.473501375	21
326	86.10921689	91.46882481	10.98097302	0.199217703	39
327	69.67922342	40.74675918	12.58912096	1.020269779	19
328	24.61643689	54.01115924	6.209992422	7.411713322	37
329	10.82142722	82.89323555	36.78865334	9.472743412	26
330	18.31523717	76.27495825	29.81755027	7.153261702	21
331	24.34494447	68.89894191	6.614252607	0.165384594	2
332	0.094225631	39.91558536	7.02793547	5.346313369	35
333	19.29354577	63.34226321	29.80733532	9.732805781	26
334	2.885836634	40.60849192	26.29324057	7.864786769	48
335	6.772905892	23.04434695	34.36872103	2.6690689	28
336	81.47694776	70.94126153	23.66230135	6.403879885	13
337	24.84752889	78.21896812	35.91459865	11.0945574	24
338	75.75634139	60.02200009	5.726434896	0.947433566	39
339	55.73082902	81.05870461	7.770192012	0.265267923	5
340	15.36448886	54.97389236	39.50883453	0.473484508	4
341	38.38951699	19.65672727	24.71703453	4.440566438	49
342	9.964092428	69.02740379	34.44916177	10.49120227	26
343	18.79013692	77.54174683	13.67079469	11.83768723	19
344	63.47892732	68.70647259	29.32775126	6.807486056	45
345	9.265122262	48.10149258	36.29819804	9.899762573	17
346	45.78512338	48.76667443	13.05604142	10.70444172	2
347	45.13861135	90.47060332	31.83589749	6.162353189	10
348	54.29998953	99.89190946	28.80232628	1.044878103	14
349	94.15587216	20.2227246	36.0994515	8.426061551	22
350	10.28504553	75.43578797	21.16629174	2.70670664	16
351	1.282619347	62.39268391	2.604217434	6.209124989	1
352	12.36712067	15.90584574	24.47249551	8.460729812	28
353	25.20403775	63.98638021	32.83153178	4.126692706	14
354	41.95376322	74.60739468	6.926728294	10.5272795	3
355	32.11403346	10.63014558	35.85165647	3.943215754	13
356	12.24975114	50.92735248	27.57127396	3.387131358	25
357	71.22771139	93.77569631	25.9346523	4.877275027	15
358	24.87958822	27.09583401	32.67332021	0.141251684	22
359	56.1557774	36.1071959	13.13084437	6.201998603	44
360	41.57443341	43.13832473	6.475589725	5.186489261	48
361	63.41360315	44.69674786	5.219771375	7.070238855	26
362	61.01859213	37.82208646	31.82775528	0.850005209	29
363	32.14669335	66.5741861	28.83764483	2.169371802	17
364	82.01891737	31.58538586	22.96295297	7.858683337	5
365	18.16441332	83.32201509	7.61422766	4.389263708	42
366	17.24413003	73.14298035	27.78293034	6.329084859	36
367	5.722550995	17.38650207	24.6119319	10.68361364	28
368	34.15723352	12.84614068	2.236297964	4.597761329	48
369	6.291693293	89.27097954	11.1353809	4.843225065	49
370	36.88863481	65.11756178	9.028914476	1.700574542	27
371	14.9958336	14.5728326	1.422152891	8.817791313	44
372	54.43632749	91.92787857	15.4166252	10.0796961	17
373	21.61123904	90.19731465	15.12916055	9.443600344	29
374	56.64479831	82.24679775	31.938846	3.64219376	42
375	39.86159624	55.58185516	39.85963663	2.315133001	32
376	2.559418382	66.60707534	29.94444397	5.994415632	49
377	97.99058573	82.84537681	12.83735391	9.301137649	33
378	8.915897502	48.83105962	4.105846181	5.482065711	41
379	9.360499311	76.63383999	11.96842635	9.675555003	2
380	44.56970667	97.22856143	30.36827838	0.038895351	30
381	8.933612257	64.19415642	15.31500377	8.119454693	38
382	58.14893689	37.55022655	17.10511358	9.288752836	18
383	62.20174968	80.96664236	37.77358899	8.789809443	3
384	36.2315122	27.60710766	22.87055815	7.544747892	4
385	6.625140742	98.72893978	20.20468371	8.11126017	47
386	1.096851862	69.20060768	38.65184391	4.924336954	21
387	25.84588775	61.17671521	8.212138725	1.034434548	1
388	78.29263567	66.45988674	19.86750284	6.639910385	44
389	7.871697725	40.35198819	7.19843067	6.3641027	26
390	78.83068399	69.67274441	24.24069079	11.30182844	21
391	12.48771043	90.90107319	36.2773466	3.496358466	35
392	79.86750899	54.35421653	8.27403967	0.202710806	31
393	28.08331623	42.02257662	27.79667825	9.317039589	31
394	43.04035221	95.37042711	39.63020675	9.4350131	41
395	29.47881008	65.01108227	16.71360152	0.038865631	48
396	22.00300591	49.77440842	32.73357505	6.521574248	48
397	35.55901251	90.85604615	4.893665446	4.28990011	44
398	63.53725064	67.03413314	29.14142524	7.164195385	17
399	38.21932161	86.88940242	6.390388464	0.372090901	7
400	62.03157877	81.16617953	8.458189727	8.754951123	37
401	58.50503897	53.8647284	36.33438611	0.206189664	41
402	25.73174612	44.02606181	8.459085063	0.711901016	36
403	16.29427026	68.63097998	5.127480774	1.605088602	50
404	12.45480817	85.29988604	5.441763796	8.467366828	30
405	13.78543979	72.75062985	12.01531817	9.733830208	12
406	3.319354366	86.8534104	10.89284525	1.444683466	8
407	14.86812736	22.17705421	27.08627601	8.397529002	21
408	22.68802089	46.28526246	22.76975049	10.38254064	24
409	71.29498477	19.86081824	30.17263192	1.460834206	33
410	37.43465738	70.14594443	13.87115315	3.15595335	30
411	5.231683223	94.88567828	37.04813984	5.753061171	5
412	49.77274656	84.13753559	18.23448828	4.242971999	14
413	35.62470684	10.73896033	9.362523366	6.976212454	19
414	49.19512952	89.44346883	37.79505672	4.342724929	13
415	25.35918107	97.93925835	33.70510702	0.894739291	15
416	42.95157888	64.84132436	26.30910849	9.17378456	1
417	18.97844246	66.0992932	30.20753751	9.320379407	31
418	5.677247541	18.04924585	36.67897415	6.000363709	7
419	30.55507662	47.73107042	32.65818922	10.01719534	39
420	29.65914735	42.12761495	24.52937867	5.483604448	10
421	52.83415121	85.50123146	31.48102764	6.270496768	5
422	40.55838899	87.88304878	23.6255072	7.94496914	49
423	75.20998283	80.5662569	34.55930276	0.905134017	4
424	24.79158589	85.73273425	15.36547182	9.89839469	7
425	50.59311922	22.75724468	32.75181399	8.529458236	5
426	69.70404765	60.5822767	24.01827102	3.495543351	16
427	44.21687698	34.39769027	11.89272829	3.557457265	43
428	20.16713628	56.2637712	6.937664837	7.589009856	41
429	14.44281578	41.35822358	23.25943932	11.77700274	37
430	22.46431132	85.87828698	39.40664672	5.64815455	6
431	76.57028534	49.55513485	21.13053287	6.459051132	4
432	3.437419026	82.39656928	11.4164042	1.58437925	22
433	6.041792217	70.01715429	8.958731963	11.62482668	2
434	28.94608169	87.05476962	32.15968695	8.550013673	24
435	15.83973733	72.60736968	8.73861151	9.12349234	3
436	25.34553204	99.20543489	30.35671629	0.063480344	41
437	20.11668251	80.56671914	21.763779	7.222669816	13
438	55.90538334	73.56581582	30.52666899	5.910476566	10
439	5.042739397	78.40053531	10.86923314	10.26257011	7
440	52.71570498	99.46690315	35.19170787	5.481309266	36
441	7.810086676	100	26.21604958	1.559511127	20
442	7.992357197	82.08091397	36.27596397	4.51998708	32
443	39.57638463	86.69599702	34.69521123	10.21132869	9
444	25.71821347	44.02373583	30.1225615	0.02530284	46
445	24.09498187	20.3828805	2.129534364	10.45340098	16
446	59.0134746	66.34233581	2.610073656	8.63026105	39
447	22.06521104	97.80973943	1.986453498	10.44097889	45
448	14.30638295	91.72702037	37.41288443	2.704929464	28
449	21.04749508	76.84597788	0.391094884	0.462481096	37
450	5.902742913	84.57417463	9.395938461	10.96205759	18
451	2.885089549	70.78781924	5.964704064	11.83875801	33
452	9.577914639	89.11916471	27.81169318	4.320583214	11
453	6.256438132	90.66257931	27.09179537	10.99795307	38
454	37.83606476	96.13365876	36.97541326	0.51935799	48
455	41.14116704	94.61634345	23.98672915	11.9580341	46
456	91.59995025	72.67875795	22.12004218	6.385143329	14
457	21.56136042	60.00845368	9.387366518	11.66584778	22
458	43.74535734	43.87626012	1.779657186	7.961235625	29
459	50.86986196	67.11854893	6.466301231	4.50428609	28
460	29.81370195	76.77877617	33.99746475	0.987897175	12
461	5.584406208	23.81184943	17.55438576	9.409363681	34
462	21.95406549	97.08230078	10.07565883	5.310921574	20
463	8.595205897	76.73972439	1.498449057	10.65699304	10
464	54.69460289	37.32086801	4.721267047	6.733868048	1
465	40.91327599	65.05437313	16.01674823	3.322312195	12
466	60.79681015	75.33369853	28.93747546	8.472276725	8
467	40.92420024	52.54921675	3.399585878	7.535927257	11
468	16.10416337	94.62212285	35.78598723	7.114799892	18
469	8.736047039	47.86465463	22.63362148	7.075947311	45
470	64.64609008	95.09261932	13.24961232	9.659748021	22
471	69.09548968	84.07624055	12.89569188	0.956524245	32

Node ID	x	y	z	r_i	demand
472	73.13866372	41.71405139	17.04301109	6.333819835	35
473	40.05041388	28.81118981	27.86495236	7.168813073	35
474	54.03625818	65.02303827	30.15017844	5.354401863	26
475	19.16596982	83.58117432	33.35557023	11.91490763	18
476	34.28587406	93.01320732	33.5082721	5.515074689	21
477	42.10911161	58.06602885	13.19335194	5.369736734	11
478	47.22851165	47.89903616	20.36250944	11.51868038	6
479	87.63411723	89.72076827	28.65831969	4.425243646	44
480	18.39694528	22.72524013	21.81072027	8.568057279	6
481	23.73647568	45.21539639	11.53681715	5.188751838	39
482	17.47416259	43.6041515	31.53434731	0.973016574	16
483	63.32241418	89.29380754	27.27800065	7.42798409	49
484	65.84999623	61.37790202	25.6974767	9.405960407	1
485	18.49430275	75.1491321	23.37172362	9.770365975	24
486	38.90241804	39.45548462	22.15074575	0.84645279	31
487	68.96890483	80.55619731	30.92710539	4.842060922	42
488	14.11476256	66.58488992	23.55512122	0.845524181	14
489	94.43184685	8.796264511	23.29859307	5.035188817	32
490	45.59084573	70.21452412	23.93560611	0.113582292	13
491	62.81703196	55.94894639	0.04067048	5.494902887	13
492	25.40396983	32.32053998	7.877867709	11.43146897	12
493	18.15532249	77.80652015	16.99185344	5.054973135	13
494	18.20950886	6.619599382	5.445678785	6.369371766	2
495	6.810990128	49.52757429	10.46442277	9.894324521	2
496	24.93956922	85.18138774	19.5490822	10.96633056	48
497	22.00240146	99.12603644	39.9893956	7.885601786	40
498	50.26037041	48.95030273	24.30726963	0.987355419	43
499	32.47933058	60.09950546	10.14811096	0.095780428	29
500	76.48394754	93.81500316	33.05082675	3.73579719	1
501	15.25088212	86.85170355	0.622562014	8.312417494	18
502	17.80089583	46.64512233	2.63462135	2.679415185	49
503	95.77662579	57.68215173	3.069360741	0.911744354	13
504	48.65047008	56.26343732	32.64491993	11.1175127	44
505	0.224660494	41.43611847	14.21171956	9.809410917	34
506	14.67447984	73.22055772	21.75092301	0.560824618	20
507	28.77703399	67.75671878	24.26797752	2.359780417	14
508	14.51945543	70.49107423	24.26034768	7.364687094	50
509	11.56644578	72.10851879	29.32762892	2.482161061	18
510	67.26622281	20.02005982	35.0966755	10.98398776	11
511	10.84189087	50.74783931	12.90312929	3.28397178	8
512	87.34079917	59.37931572	10.08579475	11.8500657	38
513	24.58618772	59.92581691	21.04332426	6.813403422	26
514	30.62796082	46.77730777	34.94066727	8.83821808	29
515	61.63608438	74.03409399	0.746346368	7.121975094	13
516	27.13020332	56.00735022	18.32075531	9.113612959	18
517	50.67630959	98.08417141	16.59101162	8.634086059	15
518	43.66555329	47.77139353	28.778171	2.714393217	28
519	47.34853229	74.63427391	38.87043339	8.300992216	6
520	2.518275748	30.45426362	34.97941135	5.70976178	22
521	59.10597324	64.72617137	21.25191915	7.277653794	14
522	49.59427698	92.51123595	3.551090207	5.147122326	39
523	2.781332517	68.35625636	3.710000307	5.523577876	36
524	42.34346606	5.769949569	4.366098536	0.652527155	49
525	54.43373891	52.12894009	7.9067999	7.548403707	18
526	87.56748283	36.27406643	21.13489416	0.073017187	1
527	23.23282295	99.37897746	14.24859303	9.140009252	15
528	39.96945525	49.46230999	23.88525166	2.614076519	41
529	42.13585343	68.94604524	25.50967647	4.750703238	8
530	16.63383213	64.77854357	18.98571058	0.351715097	3
531	27.37111129	46.43616017	27.11673494	2.003178979	43
532	23.39691794	71.43920824	1.906907845	2.45996491	6
533	3.857750749	53.93522034	16.19502855	9.829595519	50
534	83.77232341	73.14211564	19.82850896	8.533805631	26
535	31.80606468	35.45021175	24.23960074	0.619311075	1
536	46.93472918	83.75304242	25.57195373	7.122281837	50
537	3.390983182	60.32064994	30.61068338	8.156128877	42
538	48.82360524	98.37839062	35.9745595	7.220914682	17
539	39.00311055	58.98114927	34.60197054	3.475306118	32
540	12.77181014	48.33401693	34.40572033	2.429592834	46
541	26.12441872	44.96485891	27.03242338	2.839436564	4
542	49.03663551	90.65504513	13.8830876	8.507710049	48
543	25.63863856	75.55318582	34.2564448	1.789599458	1
544	61.56325619	58.635877	0.997422198	7.786489382	50
545	42.23200248	88.95299773	4.136491045	4.651433464	23
546	41.14789047	74.75727523	32.931636	7.341258219	37
547	48.39934621	99.02729511	30.05026749	0.989182834	23
548	11.99216143	50.52822644	12.13005328	8.464820885	30
549	26.567735	46.7768569	17.70634543	5.167125033	11
550	68.09186985	95.85522589	22.47153407	2.454162297	4
551	26.97467166	54.66512134	21.38913798	11.66012717	25
552	5.779054124	82.01317499	31.17715184	10.01915756	22
553	2.643010323	87.48230483	39.26134045	1.581592217	40
554	36.79414467	92.2553405	34.07762876	5.623371076	30
555	25.99458773	34.37910238	4.84512326	11.0175516	29
556	22.96398221	79.24584246	32.40861489	5.253467184	7
557	14.09860615	77.68853822	13.45994873	11.70742841	47
558	21.2618816	68.31108552	38.60957073	3.123606085	39
559	71.99750065	50.82091856	33.04720741	11.82057255	17
560	0.773453591	79.81662315	5.077053724	6.785233233	28
561	51.99282443	27.99909333	30.19770488	9.260790549	13
562	5.863440787	76.06172049	20.11271942	5.891195528	5
563	13.01348985	89.5505908	15.47048063	6.625491116	38
564	45.68320409	63.6499192	24.04332627	2.984457028	36
565	44.53236455	98.59505273	17.96036731	8.99567986	3
566	14.92906226	79.42060964	37.22040132	9.914113666	1
567	41.14833132	82.10595877	30.01446557	1.515527703	4
568	44.56064253	79.77318093	20.51948675	0.271783078	27
569	47.14165764	77.84331314	10.33249494	3.855818645	30
570	44.47086767	80.17305261	3.885836986	4.558123438	30
571	13.89109091	56.92730438	11.2581209	9.141496171	27
572	39.58652985	43.55288071	14.45846769	5.227108341	14
573	62.35255518	88.46202983	5.064300638	4.962229956	39
574	8.980893435	92.30918249	24.9496481	10.59560796	23
575	39.44288188	96.38027853	38.94704805	1.997947716	15
576	3.795442881	81.20966501	27.41200193	11.97973034	4
577	30.01509861	69.93828769	21.72402497	10.72586107	31
578	9.320660383	27.08555662	0.10230943	10.8588123	31
579	36.57027062	15.62107689	13.23399254	9.745800746	37
580	28.17365085	71.94302821	19.49378883	4.360337135	26
581	58.40265516	82.89286098	16.95320583	3.789211097	29
582	41.10546356	60.73573959	25.88754111	2.160394708	27
583	53.70737401	57.8077763	9.994366281	11.42963583	10
584	23.53960858	80.471438	3.12432842	0.285654541	7
585	73.75840634	73.11670598	12.48249331	1.876459737	9
586	74.57969734	99.83821951	39.01985633	6.450291742	18
587	62.61153544	17.95816147	22.4620849	4.324411312	46
588	53.90080059	74.55382457	8.588853077	11.74270355	15
589	72.73426073	54.95021428	39.57914747	0.075751006	15
590	57.84005051	97.24933499	35.2604133	10.98084378	10
591	1.725004249	93.73701725	20.97210735	6.881927737	10
592	40.57036155	31.31828969	15.51939441	1.240512039	48
593	26.03259253	67.05188068	24.42560707	2.852941681	36
594	10.89890727	16.02503912	12.34011368	4.675459945	39
595	10.83705181	59.65376627	0.709551762	8.510330825	35
596	88.13068149	33.9074779	16.96093724	7.167241247	18
597	31.96159565	70.60936436	21.8177247	0.492493397	21
598	77.14427045	45.25079579	0.327384457	1.425858377	8
599	21.53298817	97.76613815	23.69582939	6.447332374	44
600	57.56166222	41.97700689	5.193477838	1.823459763	28
601	65.09617026	64.32634731	13.59892336	6.924546531	36
602	36.53251416	65.89826385	3.47943245	7.253690252	48
603	46.15723029	56.4070148	19.959172	5.286178878	35
604	66.92261807	21.4897109	27.4812889	4.897969721	28
605	26.46280572	62.61127777	22.19141047	3.79783788	2
606	22.14002238	72.37729838	30.29531679	10.56803504	38
607	21.61039636	65.83676525	18.75923326	4.44331993	43
608	23.31975826	27.34182644	2.882941415	8.782240679	46
609	31.12121771	52.61678334	1.82071962	1.950915934	25
610	28.44331265	74.98671685	9.740464776	1.065596119	31
611	58.20433528	69.50520456	29.55764241	8.582697416	16
612	64.47235297	44.07915445	14.05919317	7.777532307	32
613	2.881941531	70.78732912	3.789169139	7.680996283	37
614	21.51917751	80.74471553	21.88319617	9.9567065	40
615	74.78372311	42.05088328	3.322634156	8.48875153	50
616	26.20322759	94.45704722	0.043122659	10.10698797	32
617	27.50072899	99.76767751	31.96071673	2.315046026	23
618	23.91492832	35.50451908	14.65205958	5.452232026	36
619	35.84999591	97.26233792	26.33021041	1.02094072	38
620	38.20769452	77.89743741	37.44950686	10.9290231	13
621	4.297539438	80.73294711	0.059971047	11.22405457	38
622	12.31993183	42.07287161	37.42873621	11.95610617	26
623	52.68458788	66.68600654	36.07142386	11.1378938	21
624	53.29556121	92.47449182	25.90682802	6.766260463	28
625	31.80593192	45.60640645	39.41102857	10.76621751	40
626	66.92699784	97.50570073	24.16462464	6.78636185	18
627	44.98764045	56.96391467	9.231659535	10.72794423	8
628	66.59307852	88.41880362	32.58136924	2.156539854	39
629	55.80484172	50.30189669	30.08035465	7.040116877	33
630	52.60387814	98.51053443	27.61605738	2.070061212	29
631	56.12304172	60.76926662	25.75259057	8.549372537	27

Node ID	x	y	z	r_i	demand
632	30.90434674	20.96780911	4.645040707	1.948898626	38
633	95.99475962	18.1472698	27.39786086	6.014618976	27
634	6.810206318	85.20186256	2.844617135	3.122176307	28
635	8.465864182	8.874062551	25.43796737	11.71772619	28
636	14.52745655	66.82146945	34.730647	9.209129847	49
637	27.03699297	98.99807723	18.13725322	9.045435578	39
638	51.91696279	73.69595809	14.416915	5.533020939	10
639	23.68432498	51.4412716	36.97532542	4.840858032	2
640	58.48548965	38.49282405	23.12403661	11.79894595	4
641	22.95220857	73.2582761	29.61659281	8.329429805	44
642	49.21219028	82.18677234	33.0110742	11.80432558	43
643	7.085383584	88.77850283	10.21283209	1.129697938	25
644	32.21271953	85.45061531	28.67707968	9.951664756	23
645	3.252339284	73.9521337	6.052632886	4.320781181	50
646	28.38294287	59.7022254	11.36065683	6.876187581	1
647	18.71921477	25.10440199	21.46380598	9.380442313	49
648	48.20934555	82.30314786	4.491594241	7.596162818	2
649	24.23492671	17.98856994	0.400117348	1.250251176	48
650	63.21772914	46.4808445	18.00555738	2.251010045	15
651	32.28903103	63.37386507	1.032108002	5.529867185	26
652	3.177857831	14.97802426	24.78576733	5.317837399	1
653	62.01287875	62.70691628	29.4740589	7.75530817	28
654	81.4352048	82.89764497	33.18556014	3.652744946	10
655	38.24583972	80.95791524	3.839199962	10.77332683	25
656	67.87575086	63.89107621	33.2359079	2.566981804	25
657	22.62104276	94.03699994	18.3046068	3.483508579	8
658	9.196765131	46.15569372	17.99642834	11.9809647	18
659	44.45005227	17.91363181	31.37577496	0.722516784	50
660	67.45457311	72.85375456	29.93900874	11.61655168	35
661	22.79879511	41.59634367	39.45795983	7.012240784	37
662	70.94365949	58.14560753	5.076539278	0.08194644	29
663	6.979895184	73.91637244	25.14533012	7.031194882	3
664	22.95922483	75.83051285	0.740171728	9.548150341	6
665	45.3176187	83.7901857	37.67961833	4.538711056	2
666	93.29522257	74.82458329	19.9847248	10.91349472	45
667	17.16840861	23.65521269	38.43535721	10.62185038	42
668	34.30971303	75.90183293	2.096267325	10.30780315	45
669	17.44262234	43.68368222	35.8944745	10.91295355	27
670	28.54401437	40.13690379	8.087159098	5.278992328	36
671	5.020361565	69.58798476	32.44258164	2.661868193	9
672	72.91384846	91.54886288	27.04740893	4.973733961	49
673	1.825477279	70.78130479	1.056192161	2.330446868	34
674	60.59756518	67.42291916	21.31629348	6.033901052	49
675	29.15811552	9.518746656	35.77137383	4.849447835	39
676	71.61626861	44.97765672	39.11549021	11.56039904	43
677	58.21523833	76.77458472	1.682398914	1.432175303	9
678	31.03913924	88.81924735	11.29281098	5.700862296	36
679	10.62327399	24.29073933	35.14972626	10.64782213	9
680	8.679954371	15.22687294	13.91463376	10.6053774	24
681	63.12520069	41.24941139	24.07122315	6.279661735	35
682	44.96838238	64.05706864	11.93558957	9.942108139	38
683	11.86612062	56.83051802	27.8782456	3.1512409	5
684	3.298576907	92.26869515	0.703140302	0.379092562	37
685	30.83636789	38.35208021	33.99399048	5.711258926	27
686	14.01917911	69.22007201	23.43359605	9.959122763	7
687	53.48089128	34.57431179	29.79987824	2.509863553	25
688	7.319977879	15.37807435	33.05725748	6.081166637	44
689	41.95981534	64.94436816	23.77879253	2.929752986	16
690	85.16088414	60.47696067	19.97453885	4.793291165	25
691	93.12739448	86.70709298	18.39915073	11.17874385	40
692	4.203561784	71.28689241	26.51244139	5.184520227	32
693	32.06711817	41.12824267	27.14001544	9.236365321	12
694	28.94274384	52.01860718	30.54475385	4.898024634	37
695	32.43971284	75.52883521	28.48064207	2.656140818	36
696	56.15571936	89.41500769	36.83882342	1.432185748	37
697	17.45311026	57.02027397	2.53786626	4.698442012	4
698	38.78467609	39.06908374	12.83761672	2.608214338	35
699	7.009024866	89.80852716	6.686928303	9.591229282	23
700	1.834626902	71.15202574	0.775939504	0.401994686	8
701	18.85500198	86.61471751	28.9549492	1.746017703	30
702	24.92385591	92.07997464	15.00916266	3.317074037	14
703	24.57644237	79.57543571	13.43961074	7.621327433	16
704	18.10483235	51.48322234	38.87016683	8.264928029	41
705	12.03430063	87.78817585	32.36153594	9.339380238	39
706	14.50630809	38.16565664	31.09752118	6.420525444	36
707	19.17901123	72.48982593	17.20855307	10.20159412	39
708	23.64941173	19.80991504	13.65279264	0.188087651	3
709	10.63863267	61.64507704	12.52958841	8.169031835	34
710	35.53984032	15.99196501	21.54085765	8.611862088	41
711	87.03899122	21.09553754	1.216015821	10.64878101	17
712	23.29263587	57.34435722	30.94445508	5.760491154	16
713	34.06373355	42.77086753	33.9464291	11.54083384	13
714	35.60188133	93.1465045	36.33325574	7.692381008	21
715	3.166581108	54.38581172	37.35766501	2.806090341	30
716	29.56587444	24.57869021	18.08116751	7.997446269	24
717	9.442374955	27.32019574	23.59921997	10.87002293	37
718	8.327911253	95.97957355	16.39239366	8.978439052	13
719	18.21730526	92.48725442	38.15120003	1.5701409	5
720	46.20732106	94.82215894	11.38854737	0.332990442	47
721	22.19955839	99.83998701	15.37683497	6.495340695	39
722	39.73860453	66.92518954	24.34934694	1.039178085	49
723	49.90577559	41.072269	23.3893886	2.801182703	2
724	3.702577787	67.55965669	35.63856131	9.862533299	3
725	6.663988874	86.9326968	14.76370285	2.017737523	20
726	4.724328509	85.88211036	2.778795893	10.66842937	29
727	26.36495426	64.10386589	19.00754119	5.012038977	18
728	72.1570689	9.179080442	1.515121588	9.589007965	27
729	3.082410661	9.043855976	8.462200359	9.949435792	26
730	23.40792676	43.64379836	35.72280889	8.702120093	15
731	38.19879917	73.45302115	2.159211899	11.60064907	45
732	82.53992082	88.87907996	14.07314191	1.738688046	43
733	19.47269695	75.25893863	20.7798111	3.538510883	37
734	66.81087893	72.19337817	6.977880898	0.774597684	20
735	3.765987951	77.28123402	18.22137656	9.204063574	49
736	25.08011935	60.4806985	0.592321921	8.52356797	42
737	29.09610379	74.18683092	25.64666307	3.584248474	34
738	9.020444459	42.86210706	4.331128313	2.418478506	45
739	41.72170476	60.36141703	24.46424235	0.360615737	50
740	25.66105506	62.27941228	31.77717439	9.39136023	21
741	3.336609071	66.34370608	12.08281041	10.13002568	3
742	24.05460087	58.82740751	33.73414623	0.345409995	46
743	5.333729823	86.89695613	31.50319232	7.779774892	38
744	58.00620671	94.64720593	1.304858734	11.42342539	26
745	37.35558564	97.30806318	23.47070651	0.287005759	34
746	14.35540419	64.70998039	34.26175056	9.721773775	8
747	82.09017124	81.333147	13.10533341	9.364452955	25
748	10.79914705	20.42039499	35.93251466	9.255684285	49
749	76.68533256	86.49303137	21.67959601	0.250577812	17
750	50.29671492	64.07582579	3.765527546	2.617903286	42
751	68.84275879	76.03221479	29.69910657	10.79538264	31
752	75.19376171	39.75388964	3.378695446	11.99616742	11
753	48.69087386	94.64188777	30.6210566	2.380405111	40
754	8.011277516	61.69215045	17.84993877	10.57580758	19
755	30.28185343	43.77834378	32.70178342	7.043480934	3
756	6.962926975	47.87740863	12.6680673	8.307462013	10
757	11.51332542	99.95442641	21.54207323	9.875636287	8
758	54.00076983	32.50218762	13.15428984	8.205190824	8
759	35.92075185	99.04269187	36.73360907	5.09129157	16
760	19.55892343	94.48515334	9.227774263	8.137719702	48
761	54.48965648	89.30641789	34.42411824	9.13140765	25
762	45.32225765	79.26748614	7.718311017	4.954739166	47
763	28.17203359	56.51587977	9.985576368	4.557563307	25
764	24.67927032	81.21698222	36.79859251	7.738446369	2
765	18.13426387	49.15791018	7.430088572	1.2520007	3
766	3.059490558	82.05603574	19.35294441	7.23908529	44
767	8.077114598	60.52651503	33.72017469	4.01884632	16
768	25.24294214	93.18181598	14.28875041	0.174920924	47
769	57.97334153	65.39941546	18.27090119	9.414607276	25
770	43.91518159	93.39792889	6.973666169	1.222268104	36
771	16.07158763	60.00636388	16.82852088	7.250262131	23
772	38.55825219	62.0328479	1.356643655	8.230604564	30
773	41.23951851	98.4925435	12.0504117	2.263631388	1
774	66.67873973	56.13517049	35.54640769	1.600074425	33
775	23.65267964	99.40598609	29.7230242	5.864138835	13
776	53.92763119	74.12654413	38.27376011	8.444710151	48
777	9.954481978	42.50823893	15.05115407	10.6166074	5
778	18.21138052	45.58660191	25.83715904	4.414503197	27
779	17.25601024	61.69443137	35.1920429	6.772109512	37
780	30.96168192	84.99460949	29.50639116	5.800733164	25
781	51.95218378	92.57992082	30.72068519	2.064617824	11
782	72.09010058	81.417498	36.30236671	6.705862814	24
783	17.81960057	98.01765152	13.9964983	0.543902723	40
784	60.71671796	14.8721563	28.06290831	10.90485749	49
785	34.17044541	50.63731129	14.2756352	11.2605766	26
786	70.71952594	19.54937922	9.466423791	6.168002999	32
787	44.42598809	67.45202223	18.20113405	3.872665591	40
788	12.87616068	80.54131267	1.790579055	11.25097601	40
789	59.48412304	31.97998889	33.72997467	5.267581898	13
790	52.40986372	76.90026657	30.53428803	0.582033584	33
791	34.31056081	43.95356429	5.695822859	3.881034988	7

Node ID	x	y	z	r_i	demand
792	8.689838933	62.80875147	27.12937634	6.672826006	22
793	51.19858704	31.0981292	6.058142298	0.816420237	33
794	30.08845088	94.04600611	25.46859145	2.38535719	15
795	30.34406593	27.74432368	15.48974465	1.723178802	36
796	28.86030824	61.83789689	13.23528428	5.323228343	19
797	25.39416892	74.01493111	32.17996221	4.846769394	23
798	40.81010844	38.77304558	7.861958026	5.734432078	15
799	52.64945222	62.68533593	20.742851	7.539647236	11
800	3.105512661	84.71082736	3.992777578	5.063715926	28
801	53.50308144	57.04941766	21.52167719	6.080321585	6
802	2.694391803	27.62826968	12.84474665	5.298497076	2
803	32.33676606	89.56266763	36.70990188	6.977995049	41
804	15.50686687	76.44859369	16.39940441	0.73258615	25
805	19.18169919	47.05766373	27.00382561	3.954790614	15
806	49.52719402	60.88674536	13.02441036	0.419829482	24
807	2.82031094	66.9400554	1.18723785	6.180554629	34
808	55.58088554	76.52999392	28.31600672	3.50422197	38
809	60.70093329	80.64454551	19.95511414	3.209176581	41
810	49.13669956	77.10708156	27.62901252	1.314416719	16
811	5.838459994	89.46110654	32.98505569	0.185805925	30
812	41.72708173	62.5487287	34.68501321	8.265204335	35
813	9.891024822	52.16610985	9.967821485	9.993987041	27
814	32.56942546	80.98884638	22.4278796	0.362936649	15
815	40.77647626	81.23711291	32.65865455	8.680043042	43
816	31.89808649	95.62749105	29.09944527	8.151929048	50
817	37.67648628	59.01822185	34.10509713	8.663388767	15
818	57.09480153	60.45993374	34.61199265	2.677287543	14
819	29.90863496	38.4851443	12.83287597	2.311172422	35
820	5.801300438	5.23076571	0.128009607	10.356567	41
821	72.48804708	89.57044348	25.63543235	0.737731979	36
822	46.02083433	88.3362158	14.03418258	9.025977842	26
823	9.940095688	86.998178	38.16021851	0.917600499	34
824	59.01602486	86.99268685	19.95901958	4.144714535	13
825	65.26732099	95.86741863	25.98441419	6.903660169	16
826	74.46580568	79.0435318	1.384862598	7.178734541	7
827	62.17589976	23.53474989	9.188656209	5.377142852	25
828	79.39161289	97.26593015	10.2457076	9.87516425	5
829	62.83458953	32.37480154	31.54745986	11.26631142	24
830	34.82834577	24.45085722	36.05632865	2.058629996	26
831	68.01446808	90.26524455	37.65674979	9.658401998	31
832	27.26619514	25.90196542	35.39277783	1.092233728	19
833	16.93400358	77.9224885	0.924123088	2.955652193	28
834	47.92908542	80.11129273	4.265931676	4.896396861	32
835	5.819691822	97.53170939	24.16806715	10.47278678	3
836	58.09138733	33.97784367	3.040604697	4.941158085	16
837	22.07359754	33.01769228	30.23180819	8.049766298	32
838	1.696022601	79.3379408	35.04130759	6.739019376	11
839	59.97712424	27.07719444	29.13491814	8.051501149	34
840	58.81674593	76.2826012	22.48412381	7.335997979	17
841	21.63379999	90.72848541	25.0330528	0.991362215	38
842	37.07046765	30.04479215	18.0646406	0.347521723	8
843	84.85983095	39.85329756	21.28837281	7.318048431	24
844	16.76117492	28.31246812	1.562447455	0.289848796	29
845	70.77169737	73.88064127	33.24954023	8.726232409	5
846	83.19197135	53.48639501	32.18766969	0.813698186	30
847	33.50828257	58.48410354	3.557102036	11.3670918	13
848	38.78697828	81.20736169	22.75217398	1.751750667	10
849	10.30388261	47.84277995	17.55376223	0.981509885	39
850	64.75792457	49.92103542	3.951957012	4.153788299	23
851	49.48945411	49.44119699	20.62289914	4.953096168	19
852	49.81718199	39.89953162	25.94554765	11.40867509	14
853	68.11557125	90.29313921	19.6765572	9.036263761	12
854	22.58317288	64.23875961	11.9213097	0.246610864	19
855	61.14896118	72.70410502	7.635652533	3.400508534	23
856	45.94832838	45.50704308	38.19660802	7.19052718	46
857	0.715064701	54.34039001	17.34040242	5.620649576	1
858	72.13050555	55.03070373	28.54528132	5.622701454	17
859	53.27314218	89.6748569	31.66096453	11.35118685	10
860	74.85083054	64.74645556	30.78568814	10.29426937	43
861	39.35568633	35.06788426	34.69629234	9.948736286	8
862	73.04972269	93.68364053	0.740152131	1.367275869	47
863	49.39322363	67.57061768	37.48715692	11.53351655	4
864	57.43254842	97.94119843	9.821238574	10.09429194	3
865	51.90516717	74.10528304	22.83711571	4.497348507	7
866	18.80954314	50.67936902	11.76647286	11.57690137	21
867	24.68088332	89.71453351	6.983081462	5.772547732	15
868	8.675234817	76.17385221	29.29611493	4.360484441	14
869	51.18829335	82.80979047	5.597845952	7.761910446	28
870	40.57741767	42.47262	24.8981708	3.80870253	2
871	7.974625907	40.8370263	13.38849506	8.509762243	38
872	75.38279951	84.8495864	16.86303573	9.738201242	41
873	49.49892788	30.73465222	20.32700892	9.148611436	8
874	44.01236363	95.54242778	0.007676566	10.44212715	40
875	69.12634406	69.4594231	3.844630021	0.727966519	8
876	2.510162792	94.82470236	6.564520873	1.092397933	34
877	27.42853428	33.27622768	38.61257115	0.943306484	10
878	52.03099226	42.50134863	22.51431543	7.192186477	38
879	20.42707279	96.69258649	1.544902576	2.602601065	50
880	31.67974116	78.20082263	20.94127433	10.5302733	12
881	51.08696185	26.42044109	32.70824117	3.4213392	18
882	43.63164404	99.67485887	36.08960829	11.34349589	9
883	53.79810347	45.16180718	4.496135918	1.985311525	41
884	34.68773061	48.27076221	5.003934468	4.719701242	38
885	37.64776281	91.60925844	32.09349115	7.287109974	1
886	33.57300136	70.51852673	38.6296637	11.82127081	11
887	9.897889543	67.94003152	30.38024953	3.836811672	43
888	53.08761619	83.0335557	12.88369987	11.99564131	8
889	8.988027099	7.925934732	19.26951737	1.314505506	25
890	52.2623599	99.83573023	14.38314162	3.745784047	50
891	35.94447387	20.12395641	25.28688733	2.090335546	20
892	88.60564442	53.67349247	30.97358927	11.4446079	34
893	23.92476676	88.85275247	0.073261016	4.755388035	18
894	19.29153506	80.52426775	7.949521468	5.162100755	29
895	55.75342338	84.56592915	0.703415223	5.992730061	16
896	23.86908483	73.83689183	36.6939804	0.501137023	39
897	91.04765146	90.60180149	20.03455373	7.6089096	10
898	3.100034102	78.61964126	7.805263196	6.829391359	8
899	33.45872958	53.85918585	23.94292918	6.545746658	28
900	7.936374341	83.63932008	31.96057141	7.056138248	36
901	79.19703593	96.06011661	13.22486099	11.2419465	44
902	44.13660931	71.38940487	9.812814914	5.060740493	16
903	49.62844822	78.65994225	20.1083463	3.895592856	20
904	54.09260921	96.04789718	12.52208915	7.918650854	25
905	21.30645349	61.8915326	27.89064267	1.625246019	21
906	0.438114408	29.42535326	2.454773911	10.7393682	34
907	20.73212412	24.23741148	36.78766314	6.929326091	41
908	73.05372772	69.26625594	20.0928079	1.566755571	22
909	26.36749261	61.24478927	19.91950535	10.05967123	11
910	21.70527032	21.60018691	37.91508039	8.932392927	31
911	27.36103425	64.84526011	12.45761345	5.82414556	3
912	65.34735437	72.80394877	34.67473005	7.821760947	27
913	5.912402555	83.10767778	28.97692543	4.777473299	15
914	51.12261026	42.05252276	30.83772297	1.177483398	44
915	61.59665848	60.86573745	25.73038778	4.870665397	29
916	22.81585575	48.67591425	26.59144604	0.788075572	37
917	8.811692105	48.50504439	3.044600386	1.445405816	27
918	38.57181853	69.29967661	29.47346952	10.842735	16
919	57.58318464	98.55697919	27.3972425	7.09566511	48
920	35.39691212	60.01558524	36.77171252	7.016255469	27
921	28.72359173	49.06807614	23.44175989	3.019170961	40
922	5.209294544	90.50333801	29.97691556	7.245222646	45
923	24.70443529	26.12365999	11.74081492	8.158816457	18
924	16.23739593	85.87006787	34.99641701	9.998633909	12
925	39.91233765	41.2977364	28.26450372	9.100834641	23
926	30.78074407	88.67743671	34.14412331	9.308222123	3
927	33.71990859	84.56649705	17.88810749	11.87467854	9
928	78.92131522	50.41345477	7.556720976	0.375112442	27
929	50.78444002	76.12504454	23.00978791	8.918500215	46
930	36.93641703	55.80482127	27.58013236	9.247821291	19
931	48.91348948	54.77748717	32.9330217	1.998111236	44
932	20.75020952	68.82081849	3.659175109	6.986664743	8
933	4.692804385	58.08052349	25.21182896	11.75765381	25
934	67.10787364	49.80646667	13.82525922	8.845260172	28
935	24.00842436	69.26671548	26.32388978	3.536360214	6
936	86.37403118	99.02923308	15.37465632	11.96387757	28
937	34.15128455	57.37934974	2.952751483	3.806785854	40
938	55.55130491	39.21526309	7.425393497	11.86807905	3
939	61.67834468	82.51967341	13.24261796	0.399541158	2
940	78.85550393	52.04144231	24.20403351	8.272925398	38
941	18.65944439	93.90622028	36.26618878	1.153549238	50
942	42.45831495	25.01806118	18.69304905	11.16727795	9
943	44.94410764	36.28576006	32.88778098	3.530989553	29
944	10.16802995	51.02082052	39.350114	0.802611588	17
945	69.80433177	81.60817435	25.92271927	4.561618689	27
946	20.37447933	52.92580791	35.47903396	2.126357542	38
947	0.793870075	65.00803843	8.045595465	9.318627115	31
948	50.20394782	81.95454381	24.2461412	5.63710621	29
949	71.85259834	57.85616299	9.805797889	6.145303146	42
950	67.27809665	56.79217526	31.19414535	1.980408171	43
951	18.74305811	29.30240259	6.154559295	6.990859055	7

Node ID	x	y	z	r_i	demand
952	1.451959255	80.87244268	12.37991353	0.071990607	14
953	47.38308024	49.71863955	31.58389373	4.361961303	8
954	21.16552744	75.92926841	33.87335876	0.348170438	2
955	51.44475874	86.59474587	38.70943792	4.908082369	22
956	9.088863996	70.57778186	13.84286783	9.588159879	9
957	18.21468575	45.65080463	39.25800482	4.897381571	19
958	21.60880813	73.64895737	1.318444959	8.789616797	24
959	86.51848331	50.71555717	36.90102142	3.154772102	25
960	53.26472651	92.17526811	13.38443287	6.470026475	15
961	2.887848626	89.80188387	16.96831616	3.077223153	8
962	29.05539546	78.84402949	14.28609887	4.430792212	16
963	9.701793671	81.23141394	32.23008983	8.243525166	18
964	20.53092136	55.63617906	20.16527215	5.894866268	36
965	28.66025221	61.13181458	11.59083816	8.682831908	22
966	6.668915236	38.80565327	2.074648475	8.512380576	5
967	63.04507341	24.29862677	23.57575014	4.664845393	8
968	31.65500689	99.46882276	25.89517482	7.475813284	13
969	48.86252985	99.44183304	4.964951227	10.4064769	37
970	70.36283848	70.39401036	9.239076068	6.760808749	31
971	4.953508892	23.81507206	25.41914679	11.32693583	23
972	56.20333441	63.09635143	9.893720293	7.090992634	3
973	26.6523776	66.91672378	14.68008016	7.970867369	19
974	0.299902086	68.51958527	21.52036301	1.726641853	25
975	77.87000631	52.21112855	39.93820594	1.783848909	46
976	52.45383187	66.17944394	1.57361944	1.363350544	39
977	3.553988961	91.38716753	22.96960314	0.836905203	42
978	11.17807544	66.07771318	32.92555185	3.944211846	15
979	24.66562586	67.58605744	10.297776	8.251747258	30
980	13.21771043	55.16074821	22.9111302	0.169027539	4
981	14.02380259	94.55773265	18.6627295	2.149671288	40
982	37.35140359	99.57591236	15.11952707	4.551929256	3
983	74.07680751	69.16329968	17.32839223	10.96743145	7
984	40.76978451	74.94346594	30.5932008	8.186468819	4
985	83.55927983	59.64747077	24.27812457	10.99948591	45
986	57.35658457	43.71456461	3.914439364	10.0633535	33
987	85.22979418	8.715884504	12.16207554	3.406980154	2
988	54.90972966	93.30800556	12.19693664	7.380299806	46
989	20.97945435	58.66863495	34.56781671	2.745603401	40
990	9.984816242	87.60870523	18.9809529	5.654212003	24
991	80.84419352	99.98848979	20.3915349	4.64228932	16
992	61.4906739	91.40517217	33.71736683	5.140621126	11
993	10.78091353	34.08373955	26.71276523	6.747292093	17
994	49.38151416	71.84627519	34.52041136	5.560857427	9
995	59.09181099	73.44789922	33.41304482	8.247004523	46
996	1.662890125	98.21483308	37.96621421	0.253633777	6
997	38.72818734	43.64397508	34.64285831	6.801536894	4
998	12.97854061	40.66549102	35.96453487	4.434042673	47
999	5.065657714	76.41830653	16.15003851	1.058298093	31
1000	62.61309781	94.29391595	17.98130243	5.245785935	42

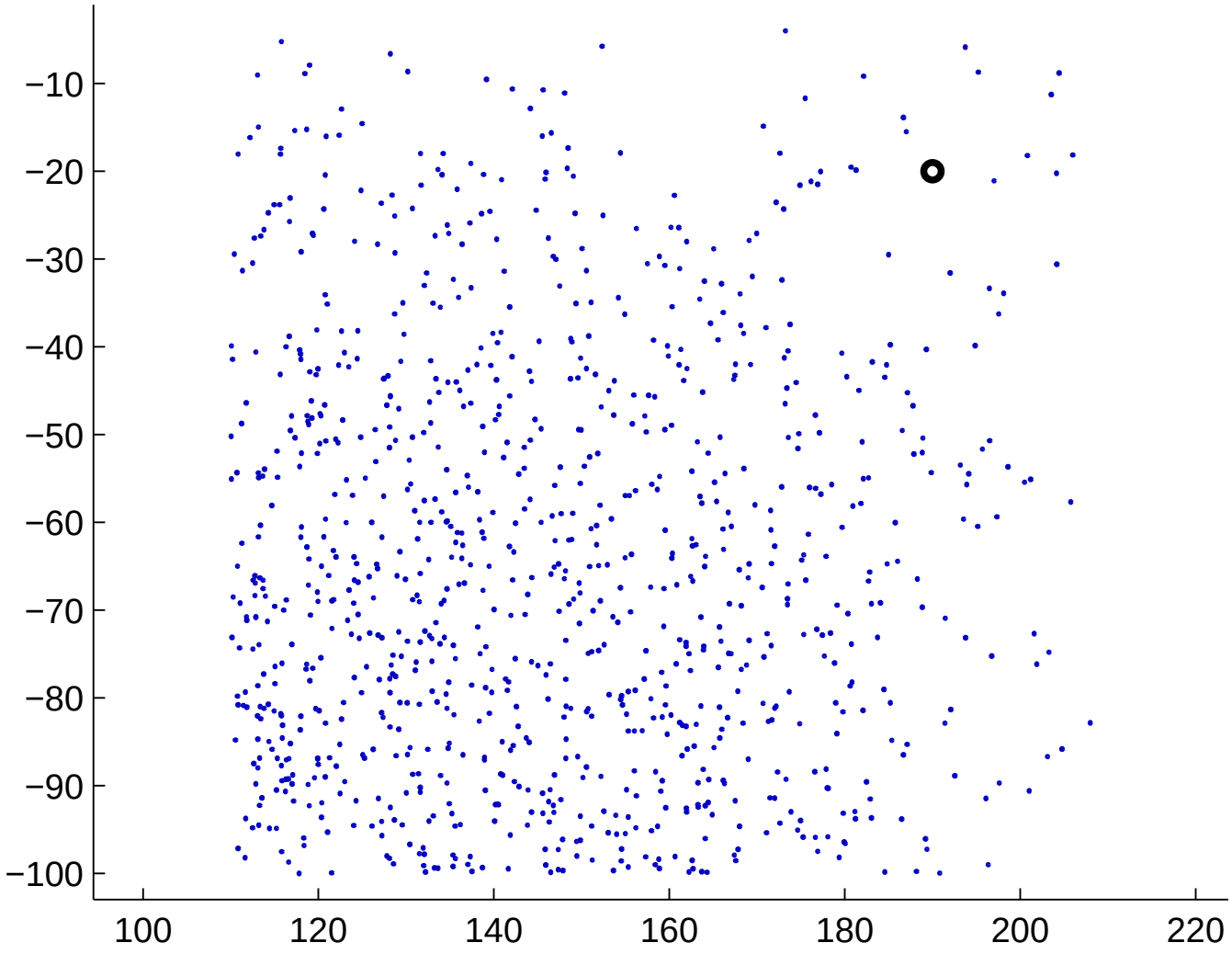


Figure L.13: bonus1000

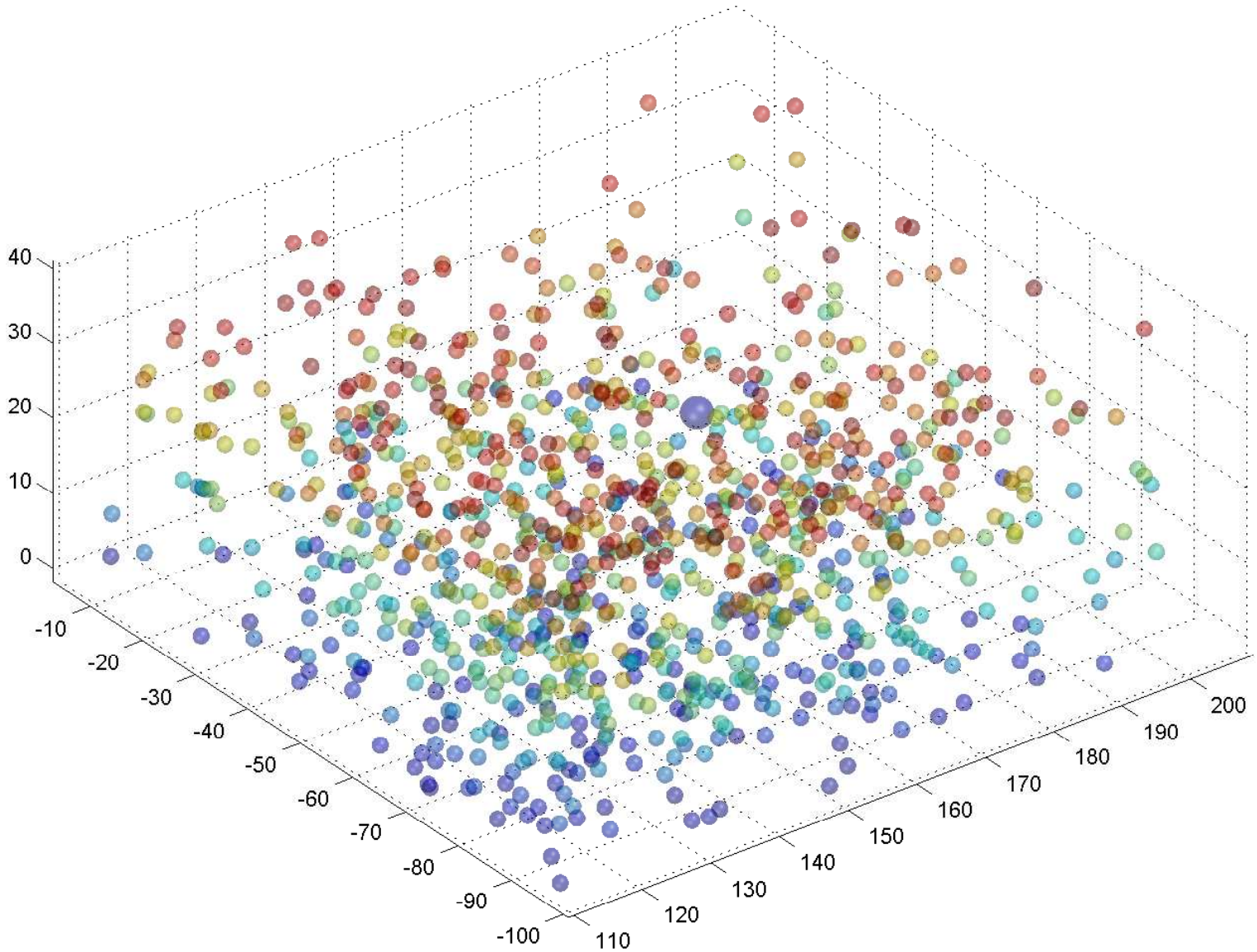


Figure L.14: bonus1000_3D

Table L-8: kroD100

n:	100
Overlap Ratio: 0.02	r: 0.7798
Overlap Ratio: 0.10	r: 3.899
Overlap Ratio: 0.30	r: 11.697
Description:	random
Total Demand:	2719
Max Vehicle Capacity:	400
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	2.78	1.65	0	-	-
1	29.95	2.64	1.7	1.44	31
2	2.02	2.33	2.08	2.61	6
3	9.81	8.48	4.05	0.57	30
4	13.46	4.08	0.87	0.73	36
5	7.81	6.7	2.36	1.89	56
6	10.09	10.01	2.31	1.34	57
7	29.27	17.77	0.77	0.26	42
8	29.82	9.49	1.92	2.12	35
9	5.55	11.21	0.58	1.68	31
10	4.64	13.02	0.19	2.05	12
11	34.52	6.37	0.69	1.63	28
12	5.71	19.82	2.08	1.86	13
13	26.56	1.28	3.27	1.2	41
14	16.23	17.23	0.85	1.46	10
15	20.67	6.94	0.95	1.01	50
16	17.25	9.27	1.67	1.01	46
17	36	4.59	3.96	2	27
18	11.09	11.96	0.79	2.22	16
19	3.66	3.39	1.25	2.53	49
20	7.78	12.82	1.55	1.85	11
21	3.86	16.16	2.13	0.58	28
22	39.18	12.17	3.68	2.52	18
23	33.32	10.49	1.92	0.71	13
24	25.97	3.49	4.95	0.85	48
25	8.11	12.95	0.83	2.74	40
26	2.41	10.69	4.97	1.25	44
27	26.58	3.6	2.5	1.33	52
28	3.94	19.44	3.99	0.96	20
29	37.86	18.62	1.72	0.69	17
30	2.64	0.36	4.24	1.63	22
31	20.5	18.33	0.82	2.94	5
32	35.38	1.25	1.14	1.59	51
33	16.46	18.17	1.97	2.5	13
34	29.93	6.24	0.47	0.53	14
35	5.47	0.25	2.56	1.09	9
36	33.73	19.02	3.72	2.71	3
37	4.6	2.67	2.69	0.47	12
38	30.6	7.81	2.03	1.39	38
39	18.28	4.56	3.27	1.76	51
40	10.21	9.62	0.29	2.98	13
41	23.47	3.88	3.22	2.49	50
42	35.35	11.12	3.97	2.82	3
43	15.29	5.81	0.79	1.78	26
44	12.03	3.85	2.73	2.95	18
45	17.87	19.02	3.83	2.94	3
46	27.4	11.01	2.19	0.81	4
47	5.55	17.53	4.5	0.33	8
48	0.47	3.63	2.67	2.62	8
49	39.35	5.4	2.53	1.63	22
50	30.62	3.29	3.3	1.51	36
51	3.87	1.99	4.81	2	45
52	29.01	9.2	2.88	1.16	8
53	9.31	5.12	4.87	2.65	14
54	17.66	6.92	4.8	1.93	12
55	4.01	9.8	2.35	2.63	55
56	1.49	16.29	2.83	2.86	7
57	22.14	19.77	0.32	0.9	18
58	38.05	16.19	4.44	0.21	51
59	11.79	9.69	0.13	2.24	32
60	10.17	3.33	3.55	2.62	17
61	28.34	15.12	3.98	2.04	51
62	6.34	2.94	3.58	1.98	24
63	18.19	8.14	4.91	1.15	1
64	13.93	8.59	1.72	0.69	48
65	17.68	15.78	3.21	2.13	24
66	30.23	8.71	2.76	2.25	22
67	32.48	19.06	0.64	2.69	21
68	16.32	17.42	0.34	1.83	39
69	22.23	9.9	1.41	0.27	55
70	38.68	6.97	0.22	0.47	14
71	15.41	3.54	2.28	1.67	33
72	23.74	19.44	4.67	0.79	6
73	19.62	3.89	2.49	0.93	57
74	30.07	15.24	3.68	1.99	37
75	32.2	19.45	3.11	2.25	31
76	23.56	15.68	4.13	0.56	51
77	16.04	7.06	4.67	2.63	11
78	20.28	17.36	4.94	2.77	32
79	25.81	1.21	4.92	0.04	38
80	22.21	15.78	0.34	2.02	57
81	29.44	6.32	4.14	0.62	35
82	10.82	15.61	2.72	1.75	56
83	9.97	9.42	1.03	0.09	14
84	23.34	5.23	2.71	1.43	52
85	12.64	10.9	3.18	0.41	38
86	16.99	12.94	3.45	1.36	4
87	2.35	10.59	1.97	1.67	43

Node ID	x	y	z	r_i	demand
88	25.92	2.48	4.76	1.24	9
89	36.42	6.99	3.53	1.73	48
90	35.99	5.14	4.02	0.4	42
91	17.66	6.78	2.14	0.36	33
92	2.4	6.19	3.07	0.88	20
93	12.72	2.46	3.03	1.2	4
94	35.03	3.01	2.97	2.47	17
95	0.8	15.33	0.47	0.47	7
96	16.77	12.38	3.99	1.54	26
97	37.66	1.54	0.37	1.75	25
98	39.46	4.59	0.2	2.26	17
99	19.94	18.52	1.49	1.09	2

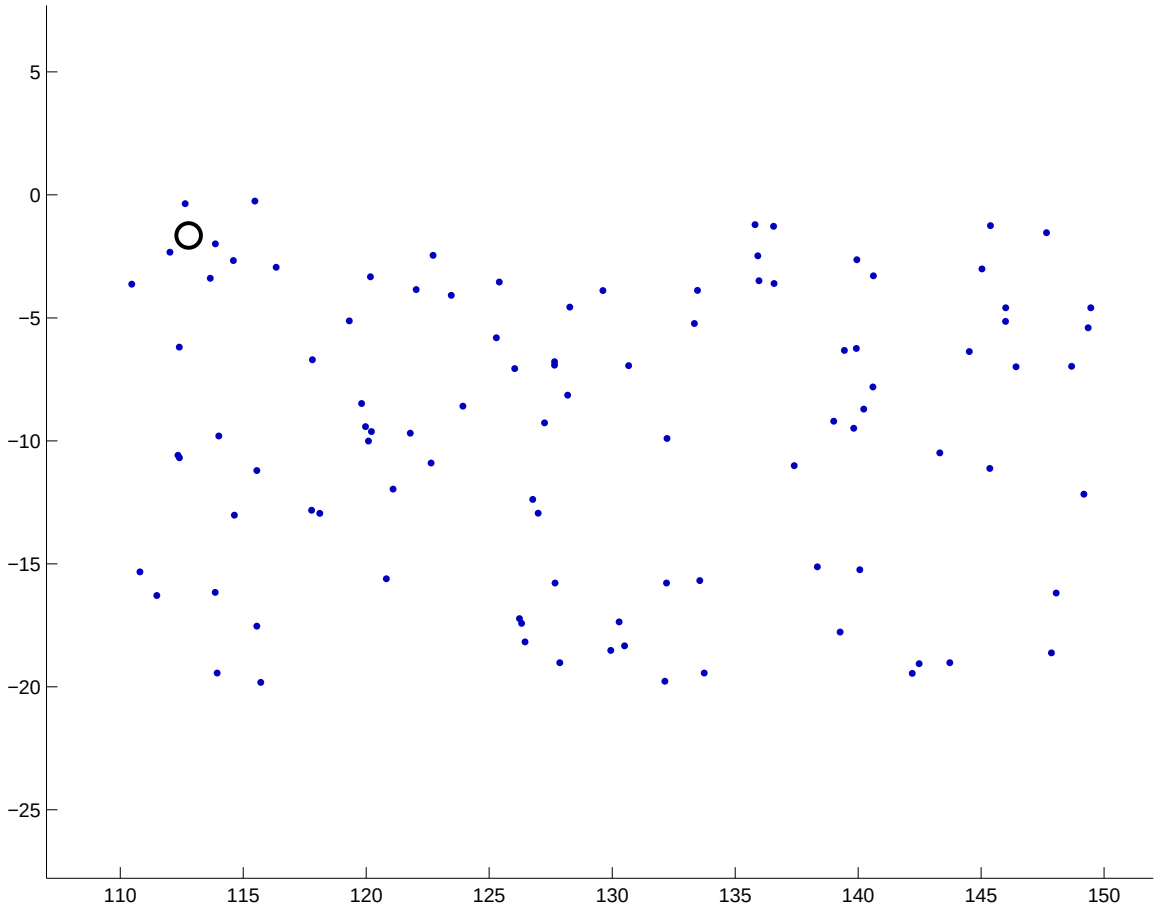


Figure L.15: kroD100

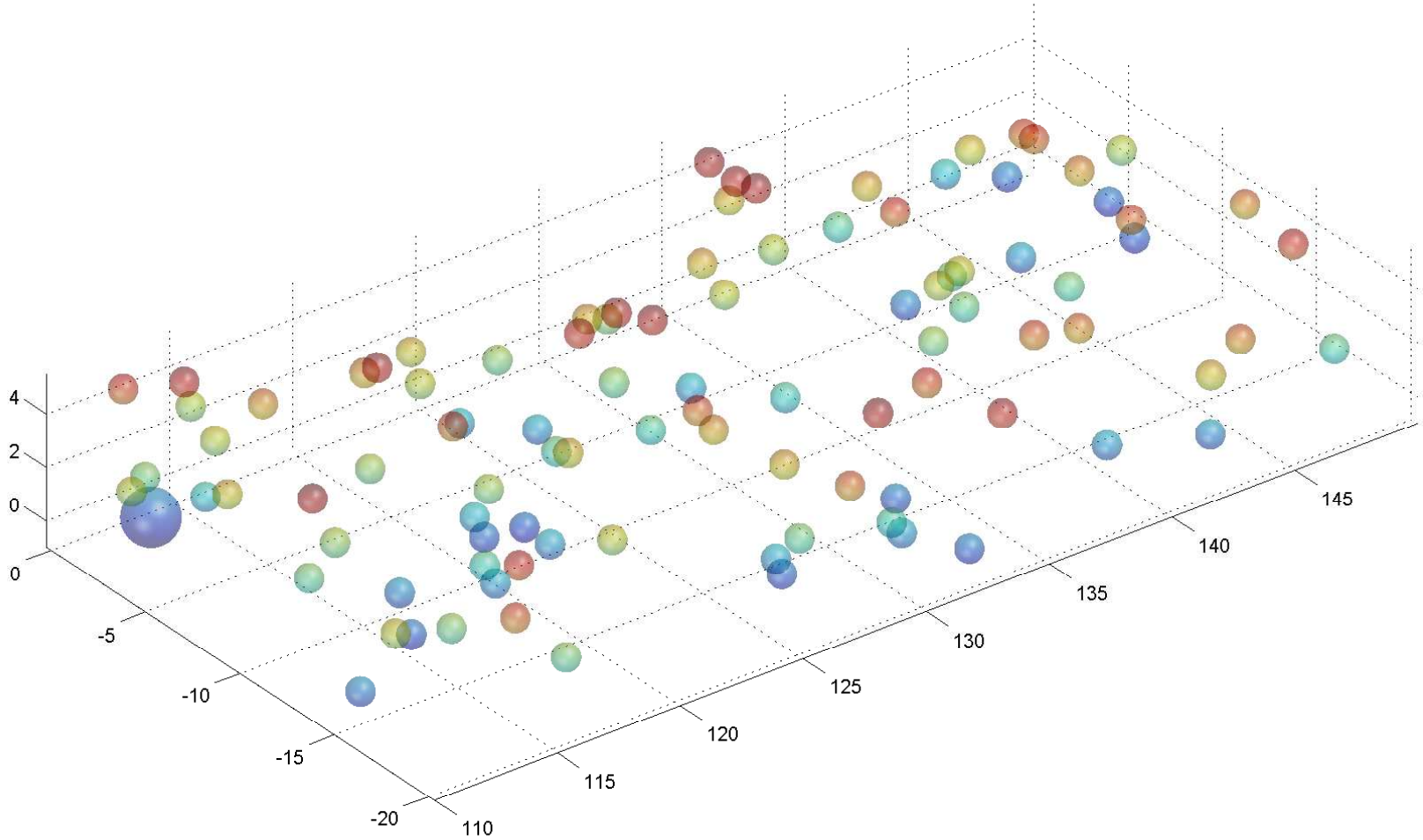


Figure L.16: kroD100_3D

Table L-9: rat195

n:	195
Overlap Ratio: 0.02	r: 0.578
Overlap Ratio: 0.10	r: 2.89
Overlap Ratio: 0.30	r: 8.67
Description:	Perturbed grid
Total Demand:	11712
Max Vehicle Capacity:	2000
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	12.7	29	0	-	-
1	0.3	1.2	2.6	18.1	102
2	1.7	1.2	4.1	10	45
3	2.3	0.9	5.1	8	39
4	3.4	1.1	2	18.1	108
5	4.7	1.1	0.2	20.1	66
6	5.4	1.2	0.3	23	4
7	6.6	1.6	1.4	18	123
8	7.5	0.7	4.6	14.1	101
9	8.6	0.6	7.6	2	117
10	9.4	0.8	7.9	3	97
11	10.7	0.9	0.9	23.1	38
12	11.5	1.4	6.7	3.1	94
13	12.3	1.5	6	5	69
14	0.3	3.2	6.5	4.1	109
15	1.5	3.2	3.6	14.1	111
16	2.6	3.4	1.3	4.1	119
17	3.3	3.4	4	20.1	53
18	4.2	3.4	5.8	10.1	59
19	5.3	2.5	6.5	9.1	93
20	6.4	3.2	0.3	5.1	91
21	7.4	3.2	3.2	9	103
22	8.5	3.4	4.2	3.1	24
23	9.5	2.8	2.3	19	106
24	10.4	2.5	2.2	19	111
25	11.3	3.1	6.2	7	115
26	12.5	3.4	2.8	10.1	65
27	0.3	4.8	1	20	38
28	1.5	4.6	5.8	22	57
29	2.6	5	2.8	9.1	42
30	3.6	5.4	1.9	18.1	32
31	4.8	5	7.8	21.1	122
32	5.4	4.6	2.8	24	79
33	6.4	5.4	1.3	8	71
34	7.5	4.4	2.9	14.1	50
35	8.8	4.9	6.7	12	111
36	9.8	5	1.1	13	46
37	10.3	5.4	1.9	2	32
38	11.5	4.7	3.2	2	90
39	12.7	4.9	6.8	23	85
40	0.6	7.5	5.5	17.1	28
41	1.5	7.5	4.4	4	120
42	2.7	7.3	2.8	3	70
43	3.6	7.3	0	22	46
44	4.7	6.8	4	3	73
45	5.4	7.2	1.4	3.1	81
46	6.6	6.8	6.1	7.1	17
47	7.4	6.7	6.3	8	27
48	8.5	6.5	2.8	24.1	13
49	9.4	7.4	2	19	47
50	10.7	6.5	4.1	12	20
51	11.7	6.5	2.6	20.1	82
52	12.5	6.8	4.3	14.1	75
53	0.6	8.4	0.5	8.1	68
54	1.3	9.5	6.3	7	11
55	2.5	9.4	1.9	11.1	34
56	3.7	8.4	7.5	3.1	25
57	4.7	8.7	1.2	4.1	6
58	5.3	9.5	2	19.1	84
59	6.3	8.6	0.9	20	18
60	7.7	9.3	3.2	10.1	111
61	8.3	8.9	1.9	9	86
62	9.4	9.5	1	13	108
63	10.3	9.2	3.3	4	12
64	11.5	9.5	4.3	21	4
65	12.3	9.3	7.2	13.1	48
66	0.7	11.4	6.7	12.1	35
67	1.5	11.1	3.9	2	16
68	2.4	11.2	0.3	8	45
69	3.6	10.8	4.8	22	21
70	4.3	11.2	3.3	10	120
71	5.6	10.5	0.4	25	41
72	6.4	11.2	5.2	12	39
73	7.3	11.2	0.4	18.1	22
74	8.6	10.7	4.5	14	100
75	9.8	10.8	3.4	8.1	31
76	10.4	11.3	7	24	52
77	11.7	11.5	2.9	9.1	115
78	12.6	10.9	4	9	102
79	0.6	12.7	5.3	1.1	123
80	1.7	12.5	1	18.1	75
81	2.7	13.4	6.1	5.1	110
82	3.5	12.6	3.2	1.1	108
83	4.4	13.1	0.1	16	115
84	5.4	13.2	5.7	3.1	42
85	6.3	12.4	6.5	4	82
86	7.7	12.7	4.4	23	38
87	8.2	13.4	6.9	18	2

Node ID	x	y	z	r_i	demand
88	9.6	12.8	7.5	5	7
89	10.3	12.6	5.4	10	38
90	11.6	13	7.6	12	15
91	12.6	13.4	7.7	4	29
92	0.7	15.2	6.3	7.1	65
93	1.6	14.7	5.3	11	49
94	2.4	15.3	3.6	3.1	108
95	3.5	15.1	6.8	0.1	61
96	4.5	15.4	4.9	20.1	112
97	5.5	14.6	7.4	9.1	80
98	6.3	15.5	7.6	11	22
99	7.5	15.1	1.1	23.1	94
100	8.7	15.4	1.1	17	68
101	9.3	15.6	1.2	5.1	28
102	10.4	15.1	4.9	18	62
103	11.7	15.3	3.7	18	66
104	12.7	14.8	0.7	9	89
105	0.3	16.4	1.1	19	92
106	1.6	17.2	3.9	21.1	17
107	2.5	16.5	6.9	10	50
108	3.5	17.5	6.6	0	82
109	4.4	16.9	6.4	1	47
110	5.3	17.4	7.6	8	1
111	6.4	16.8	1.7	6	6
112	7.6	17.1	1.9	19.1	105
113	8.7	17.3	3.1	13.1	64
114	9.5	17.4	3.2	17	115
115	10.6	16.8	0	19.1	104
116	11.4	16.9	4.3	15	41
117	12.5	16.9	0.1	2	3
118	0.3	19	1.4	19.1	6
119	1.6	18.8	1.3	10	25
120	2.5	19.5	4.2	6	10
121	3.7	18.6	2.9	17	37
122	4.4	18.9	6.5	24	80
123	5.4	19.4	0.4	1.1	66
124	6.6	19.2	7.9	8.1	45
125	7.7	19.2	6.3	23	11
126	8.5	18.8	1.3	23	102
127	9.3	18.5	2.6	9.1	118
128	10.6	19.2	0.8	11	118
129	11.3	19.3	1.9	6.1	97
130	12.5	19.5	0.7	5.1	124
131	0.5	20.7	6.8	19	76
132	1.5	21.3	4.6	6	58
133	2.4	20.9	6.2	0	100
134	3.3	21.4	7.2	7	6
135	4.3	20.6	6.3	21.1	61
136	5.3	21.1	5.7	15.1	41

Node ID	x	y	z	r_i	demand
137	6.4	21.3	7.2	20	59
138	7.4	21.2	2.2	20.1	8
139	8.4	21.2	7.3	24	96
140	9.4	20.9	2.9	9.1	32
141	10.4	21.5	7.4	16	81
142	11.5	20.6	7	14	104
143	12.7	20.9	2.2	21	80
144	0.6	22.9	2.8	14	36
145	1.3	22.7	4.8	22.1	16
146	2.6	23.5	7.4	8	76
147	3.4	22.5	7.6	5	10
148	4.3	22.7	1.3	8	87
149	5.5	22.5	1.9	14.1	21
150	6.7	22.9	2.9	22	116
151	7.5	23.4	5.3	15.1	87
152	8.7	23	0.9	11	105
153	9.5	23.5	3.6	3.1	42
154	10.5	22.8	0.7	15.1	14
155	11.7	22.5	7.9	14.1	61
156	12.7	23	4.7	4.1	4
157	0.6	24.9	2.3	4.1	68
158	1.5	24.6	3.5	5	45
159	2.6	25.5	6.5	11	123
160	3.3	24.6	6.9	9.1	32
161	4.7	24.8	2.4	24	51
162	5.8	25.2	5.8	22.1	90
163	6.5	24.8	0.7	19.1	29
164	7.3	24.7	2.7	8	23
165	8.7	24.9	3.7	12.1	54
166	9.4	24.5	2.9	16.1	20
167	10.4	25.6	3.6	8.1	5
168	11.3	24.6	0.1	14.1	110
169	12.5	25.3	2.9	5	28
170	0.5	26.6	5.8	0.1	13
171	1.6	27.4	1.8	19.1	42
172	2.4	26.7	1.4	11	123
173	3.7	26.6	6.4	21.1	6
174	4.5	26.7	5.4	21.1	19
175	5.4	26.6	0.3	19.1	3
176	6.7	26.7	7.9	1	103
177	7.4	26.5	3.3	18	21
178	8.7	26.4	4.3	9.1	63
179	9.5	27.1	1	21	76
180	10.6	26.4	2.7	17	34
181	11.6	27.1	4.6	0.1	39
182	12.7	27.3	0.2	3.1	67
183	0.7	28.7	7.3	22.1	68
184	1.7	29.4	1	22	15
185	2.3	28.7	7.3	13	17

Node ID	x	y	z	r_i	demand
186	3.3	28.4	2.5	7.1	28
187	4.3	28.8	2.1	4	100
188	5.3	29.5	4.1	24	10
189	6.7	28.8	0.2	14.1	50
190	7.3	28.6	0.6	1.1	26
191	8.7	29.3	1.9	21	106
192	9.4	28.4	4.3	5.1	123
193	10.4	29.1	7.1	17.1	1
194	11.4	29.4	4.3	25.1	80

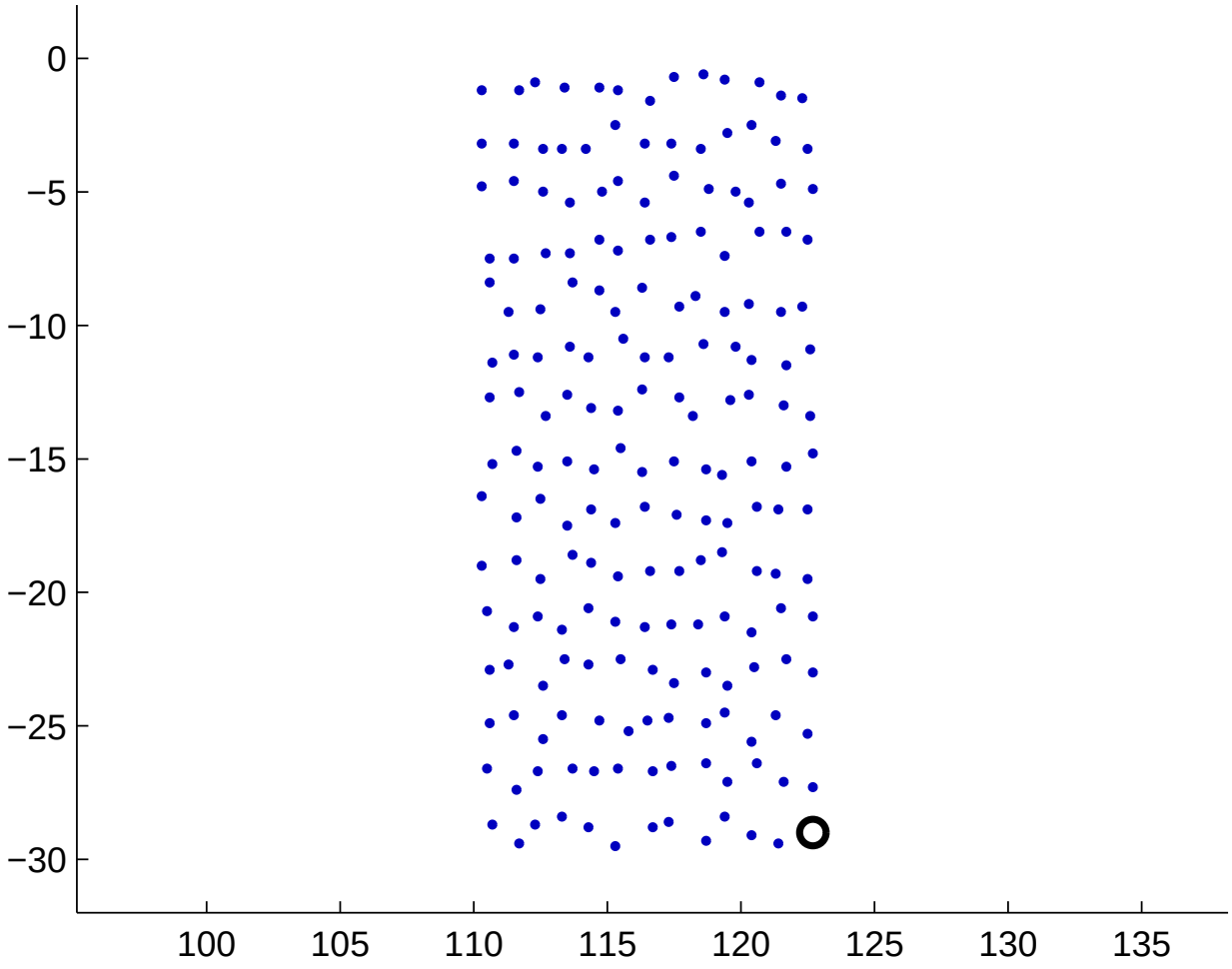


Figure L.17: rat195

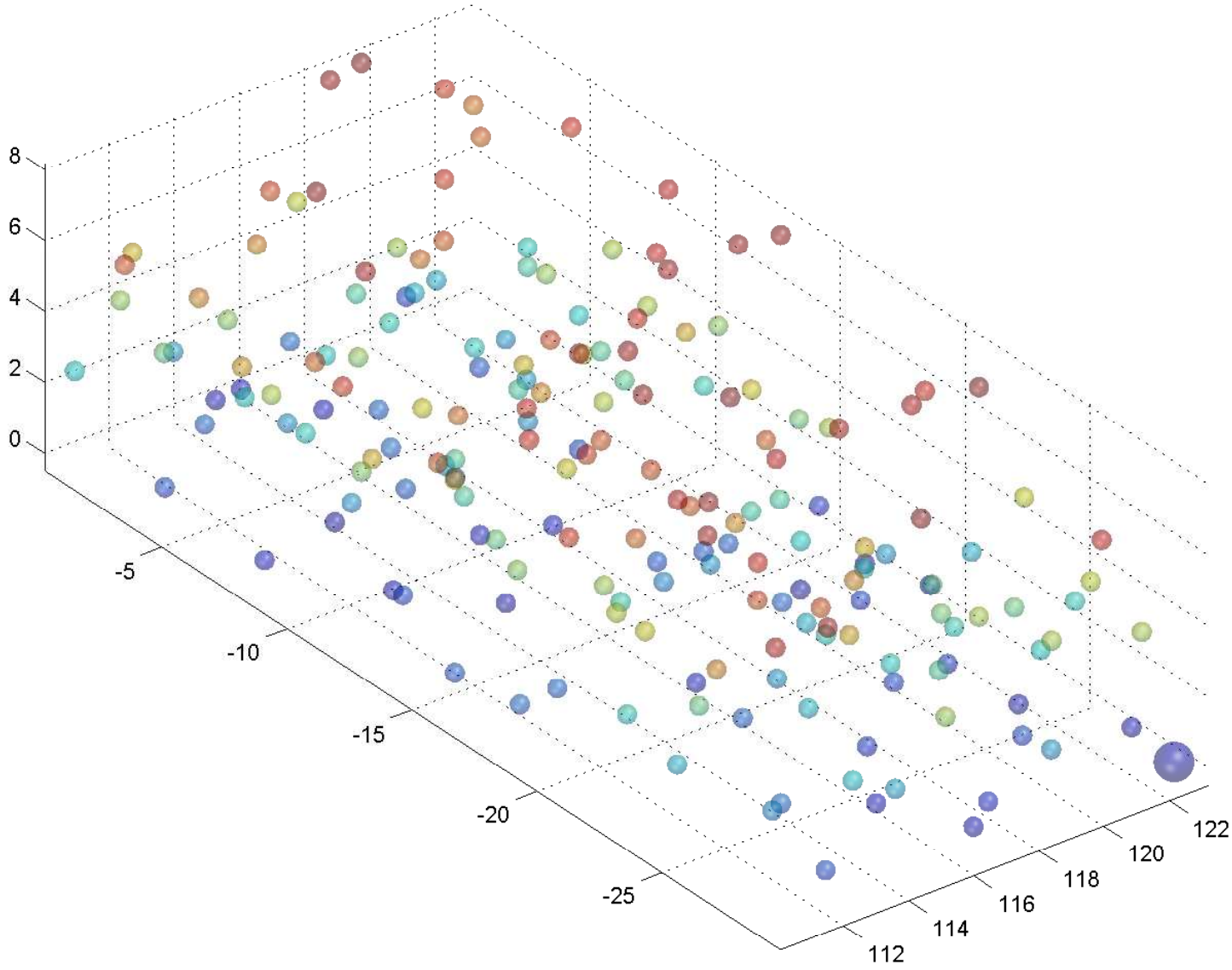


Figure L.18: rat195_3D

Table L-10: lin318

n:	318
Overlap Ratio: 0.02	r: 8.268
Overlap Ratio: 0.10	r: 41.34
Overlap Ratio: 0.30	r: 124.02
Description:	drill-press
Total Demand:	6261
Max Vehicle Capacity:	950
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	169.3	405.5	0	-	-
1	6.3	7.1	12	39.2	29
2	9.4	7.1	2.4	11.9	30
3	14.2	37	6.3	44.6	14
4	17.3	127.6	16.4	73.4	9
5	20.5	121.3	8.4	76.9	20
6	21.3	6.9	14.1	41	3
7	24.4	6.9	1.6	74.1	29
8	27.6	63	3.4	76.3	17
9	28.3	73.2	9.3	20.4	24
10	36.2	6.9	0.3	19.4	37
11	39.4	6.9	14.8	37.7	10
12	44.9	37	12.5	1	20
13	48	127.6	5.5	40.8	3
14	51.2	121.3	6.2	8.2	4
15	52.8	15.7	13.8	64.3	17
16	58.3	63	8.5	68.9	19
17	59.1	73.2	9.3	29.3	15
18	63.8	65.4	13.7	57.7	28
19	63.8	49.6	2.8	33.5	13
20	63.8	31.4	12.4	27.9	35
21	63.8	14.2	14.4	23.68	5
22	66.9	14.2	11.4	52	15
23	67.7	31.5	4.3	48.5	21
24	67.7	49.6	9.5	74	5
25	67.7	65.4	8.4	19.9	38
26	70.9	65.4	6.9	71.5	12
27	70.9	49.6	14.9	1.2	27
28	70.9	31.5	11.6	68.2	34
29	70.1	14.2	16.8	18.4	12
30	76.4	22	1.9	28.1	6
31	81.1	18.9	10.9	25.4	30
32	84.3	17.3	5.6	27.4	30
33	85.8	37	14	59.3	3
34	89	127.6	0.1	17.7	22
35	92.1	121.3	6.9	64.6	6
36	99.2	63	0.7	11.4	21
37	100	73.2	14.4	54.1	15
38	119.7	127.6	15.5	64	15
39	122.8	121.3	7.8	4.4	6
40	127.6	20.5	16.5	20.4	17
41	129.9	63	9.4	16	36
42	130.7	73.2	7.2	24.6	15
43	136.2	65.4	3.7	54.2	31
44	136.2	49.6	6.3	8.7	13
45	136.2	29.1	0.8	21.8	8
46	142.5	65.4	2.7	66.7	21
47	142.5	49.6	0.1	28.5	27
48	142.5	29.1	2.7	81.1	29
49	141.7	17.3	2	52.8	38
50	148.8	29.1	19.2	68.3	15
51	148.8	49.6	18.9	66.7	32
52	148.8	65.4	6.2	68.2	13
53	155.1	65.4	8.7	62	17
54	155.1	49.6	5.1	57	33
55	155.1	29.1	1.4	2.3	4
56	161.4	29.1	11.5	80.6	4
57	161.4	49.6	13.6	79.4	32
58	161.4	65.4	7.2	60	29
59	173.2	18.9	8.3	3.9	30
60	181.1	127.6	7.7	13.2	31
61	184.3	121.3	14.5	57.9	36
62	191.3	63	18.3	18.3	27
63	192.1	73.2	7.8	2.6	3
64	208.7	37	3.4	62.2	23
65	211.8	127.6	10.4	53.8	9
66	215	121.3	10.5	69.7	16
67	218.9	20.5	18.5	7.4	38
68	222	18.9	3.1	14.4	15
69	222	63	7.9	20.4	7
70	222.8	73.2	10.5	62.4	25
71	224.4	14.2	0.3	14.2	10
72	227.6	31.5	14.9	39.6	12
73	227.6	49.6	17.6	30.7	20
74	227.6	65.4	13.5	8.3	8
75	231.5	65.4	1.8	1.4	15
76	231.5	49.6	10.4	41.1	36
77	231.5	31.5	11.2	56.7	35
78	233.1	14.2	19.1	77.3	30
79	234.6	31.5	11.8	69.7	27
80	234.6	49.6	6	0.4	26
81	234.6	65.4	4.6	24.2	27
82	236.2	14.2	3.3	10.1	30
83	240.2	15.7	7.9	16	22
84	240.2	22	17.8	3.2	29
85	248	14.2	2	37.6	15
86	249.6	37	15.8	20.7	25
87	252.8	127.6	3.3	21.2	6

Node ID	x	y	z	r_i	demand
88	255.9	121.3	14.5	72.9	36
89	263	63	0.7	43	10
90	263.8	73.2	0.8	55.8	22
91	275.6	6.9	6.7	4.4	3
92	278.7	6.9	10.2	32.7	11
93	280.3	37	9.6	73	31
94	283.5	127.6	15	48.7	26
95	286.6	121.3	15.1	53.2	4
96	290.6	6.9	18.4	35.4	28
97	293.7	6.9	18.6	10.2	28
98	293.7	63	15.4	37	27
99	294.5	73.2	1.3	59.4	26
100	301.6	127.6	0.4	10.7	16
101	305.5	6.9	5.7	29.6	10
102	308.7	6.9	18.2	32.2	33
103	60.6	22	16.9	36.4	14
104	116.5	37	12.1	49.6	2
105	178	37	4.3	22.7	3
106	6.3	140.2	17.5	53.1	33
107	9.4	140.2	11.5	80.8	1
108	14.2	170.1	13.5	15.9	34
109	17.3	260.7	14.5	36.9	5
110	20.5	254.4	9	56.1	15
111	21.3	140	9.6	51.1	23
112	24.4	140	15.5	73	18
113	27.6	196.1	18.7	35.6	36
114	28.3	206.3	15.8	25.7	26
115	36.2	140	1.4	2.1	4
116	39.4	140	3.5	4.5	4
117	44.9	170.1	19.9	42	38
118	48	260.7	17.4	54.8	22
119	51.2	254.4	2.7	9.5	30
120	52.8	148.8	15.5	54.4	20
121	58.3	196.1	1.6	20.4	22
122	59.1	206.3	14.9	26	25
123	63.8	198.5	2.5	60.1	12
124	63.8	182.7	4.6	81.7	1
125	63.8	164.5	8.3	10.7	2
126	63.8	147.3	12.9	52	30
127	66.9	147.3	5	43.6	23
128	67.7	164.6	2.1	53.4	10
129	67.7	182.7	12.4	29.6	29
130	67.7	198.5	11.8	13.7	30
131	70.9	198.5	18.8	76.6	13
132	70.9	182.7	16.9	40.4	4
133	70.9	164.6	8.4	21.9	9
134	70.1	147.3	17.8	74.2	28
135	76.4	155.1	3.4	19.1	16
136	81.1	152	7.1	42.7	8

Node ID	x	y	z	r_i	demand
137	84.3	150.4	4.3	61.5	23
138	85.8	170.1	5	56	1
139	89	260.7	3.7	48.3	5
140	92.1	254.4	16.6	70.4	17
141	99.2	196.1	13.9	46.1	12
142	100	206.3	18	53.6	35
143	119.7	260.7	11.7	67.1	13
144	122.8	254.4	9.9	25.8	15
145	127.6	153.6	18.6	25.7	19
146	129.9	196.1	10	31.1	12
147	130.7	206.3	18.1	42	36
148	136.2	198.5	8.4	5	15
149	136.2	182.7	6.2	73.4	29
150	136.2	162.2	1.7	53.2	1
151	142.5	198.5	1.1	69.8	15
152	142.5	182.7	2.1	52.7	28
153	142.5	162.2	2.7	56.6	24
154	141.7	150.4	15.8	56	14
155	148.8	162.2	5.3	66	29
156	148.8	182.7	9.2	49.8	29
157	148.8	198.5	8.3	59.7	20
158	155.1	198.5	17.6	57.2	29
159	155.1	182.7	16.5	57.9	17
160	155.1	162.2	15.7	51.3	6
161	161.4	162.2	17.4	60.1	33
162	161.4	182.7	0.7	56.9	1
163	161.4	198.5	1.4	1.3	11
164	173.2	152	19.2	43.5	8
165	181.1	260.7	13.4	21.4	14
166	184.3	254.4	16.9	21.5	36
167	191.3	196.1	16.7	65.9	21
168	192.1	206.3	17	10.4	35
169	208.7	170.1	15.4	55.8	5
170	211.8	260.7	3.2	12.9	26
171	215	254.4	19.4	15.5	14
172	218.9	153.6	11.5	44.9	12
173	222	152	14.6	6.3	25
174	222	196.1	3.2	5.1	7
175	222.8	206.3	17	36.2	22
176	224.4	147.3	2.3	27.7	17
177	227.6	164.6	1.4	68.2	27
178	227.6	182.7	0.3	69	8
179	227.6	198.5	10.4	71.7	5
180	231.5	198.5	1.6	54.9	16
181	231.5	182.7	19.2	62.1	33
182	231.5	164.6	6.5	80.6	30
183	233.1	147.3	11.4	53.4	24
184	234.6	164.6	0.1	25.4	23
185	234.6	182.7	13.3	1.6	3

Node ID	x	y	z	r_i	demand
186	234.6	198.5	10.6	64.9	21
187	236.2	147.3	7.3	14.3	33
188	240.2	148.8	5.8	12	33
189	240.2	155.1	5.1	52.7	31
190	248	147.3	4.5	33	21
191	249.6	170.1	0.7	30.4	14
192	252.8	260.7	8.8	64.9	20
193	255.9	254.4	18.1	74.1	35
194	263	196.1	17.9	74.1	5
195	263.8	206.3	6.2	78	32
196	275.6	140	4.2	63.7	16
197	278.7	140	19.3	31.7	36
198	280.3	170.1	14.3	29.1	5
199	283.5	260.7	2.6	62.8	18
200	286.6	254.4	15.7	68.8	27
201	290.6	140	0.4	58.6	31
202	293.7	140	9.3	60.8	31
203	293.7	196.1	5.6	3.7	27
204	294.5	206.3	5.6	67.1	7
205	301.6	260.7	2.7	17.7	19
206	305.5	140	11.2	43.2	37
207	308.7	140	16.6	57.3	29
208	60.6	155.1	13.8	3.4	18
209	116.5	170.1	13.6	39	23
210	178	170.1	11.6	4	9
211	6.3	273.3	11.2	71.7	3
212	9.4	273.3	14	39.2	26
213	14.2	303.2	5.3	25.2	25
214	17.3	393.8	14.6	28.4	5
215	20.5	387.5	17.4	30.2	9
216	21.3	273.1	15.8	71.9	4
217	24.4	273.1	19.3	45.5	7
218	27.6	329.2	2.8	13.2	26
219	28.3	339.4	12.9	44.9	2
220	36.2	273.1	6.7	28.7	26
221	39.4	273.1	0.8	61.9	36
222	44.9	303.2	8.5	67.2	37
223	48	393.8	19.4	61.4	34
224	51.2	387.5	1.4	18.6	16
225	52.8	281.9	9	48.7	4
226	58.3	329.2	7.6	56.8	25
227	59.1	339.4	4.8	8.5	37
228	63.8	331.6	18.4	16.8	13
229	63.8	315.8	14.7	50.8	38
230	63.8	297.6	5.2	81.2	17
231	63.8	280.4	12.2	22	32
232	66.9	280.4	18.4	41.3	30
233	67.7	297.7	2.9	81	3
234	67.7	315.8	13.4	26.1	11

Node ID	x	y	z	r_i	demand
235	67.7	331.6	4.4	72.5	31
236	70.9	331.6	19.3	81.8	6
237	70.9	315.8	15.2	68	1
238	70.9	297.7	11.7	30.8	10
239	70.1	280.4	12.5	10	27
240	76.4	288.2	6.4	37.9	19
241	81.1	285.1	18.2	6.1	37
242	84.3	283.5	16.3	54.6	10
243	85.8	303.2	13.4	50.8	11
244	89	393.8	11	1.5	37
245	92.1	387.5	18.7	46.4	26
246	99.2	329.2	7.7	46.6	37
247	100	339.4	3.8	61.5	14
248	119.7	393.8	17.8	72	17
249	122.8	387.5	3.6	61.9	34
250	127.6	286.7	5.8	75.6	33
251	129.9	329.2	5.1	48.2	32
252	130.7	339.4	10.6	25.3	27
253	136.2	331.6	10.8	42.4	31
254	136.2	315.8	9.7	6.4	17
255	136.2	295.3	3.1	62.2	16
256	142.5	331.6	14.7	70.4	27
257	142.5	315.8	4.2	63.6	1
258	142.5	295.3	13.4	23	6
259	141.7	283.5	17.7	8.5	25
260	148.8	295.3	14.4	39.6	10
261	148.8	315.8	8.4	45	12
262	148.8	331.6	0.2	79	3
263	155.1	331.6	14.3	4.2	8
264	155.1	315.8	5.4	37.1	29
265	155.1	295.3	0.7	1.2	1
266	161.4	295.3	10.8	52.8	7
267	161.4	315.8	7.1	25.4	21
268	161.4	331.6	4.6	0.3	34
269	173.2	285.1	12.1	7.8	25
270	181.1	393.8	14.3	9	37
271	184.3	387.5	3.8	61.5	4
272	191.3	329.2	9.3	60.6	12
273	192.1	339.4	1.6	44.1	38
274	208.7	303.2	16.2	47.1	8
275	211.8	393.8	13.7	37.7	25
276	215	387.5	7.3	42	32
277	218.9	286.7	3.7	9.4	4
278	222	285.1	1.9	76.7	6
279	222	329.2	14.2	53.4	33
280	222.8	339.4	15.5	9.8	13
281	224.4	280.4	17.9	71.8	20
282	227.6	297.7	4.1	31.3	13
283	227.6	315.8	6.5	32.6	14

Node ID	x	y	z	r_i	demand
284	227.6	331.6	9.8	65.9	12
285	231.5	331.6	8.7	33.6	28
286	231.5	315.8	7.2	80.7	26
287	231.5	297.7	7.4	23.7	3
288	233.1	280.4	17.3	78.4	30
289	234.6	297.7	7.7	68.2	4
290	234.6	315.8	11.2	30.3	14
291	234.6	331.6	5.2	0.7	12
292	236.2	280.4	11.1	68.9	38
293	240.2	281.9	12.5	1.3	15
294	240.2	288.2	11.3	74.7	3
295	248	280.4	9.5	61.5	15
296	249.6	303.2	7.3	11.1	33
297	252.8	393.8	15.4	64.1	19
298	255.9	387.5	4.9	12.9	6
299	263	329.2	0.8	67.9	32
300	263.8	339.4	8.3	73.1	9
301	275.6	273.1	17.9	24	24
302	278.7	273.1	18.4	72.9	9
303	280.3	303.2	11.5	54.2	15
304	283.5	393.8	11.4	11.9	23
305	286.6	387.5	8.3	29.3	21
306	290.6	273.1	10.7	54.5	7
307	293.7	273.1	6.2	71.8	38
308	293.7	329.2	1.4	38.2	33
309	294.5	339.4	13.8	16.6	23
310	301.6	393.8	0.9	56.6	28
311	305.5	273.1	0.7	77.3	29
312	308.7	273.1	9.4	11.8	32
313	60.6	288.2	12.5	62.7	27
314	116.5	303.2	9.1	28.2	31
315	178	303.2	1.5	29.3	37
316	141.7	-7.9	4.6	7.3	29
317	149.6	-7.9	5.2	8.2	24

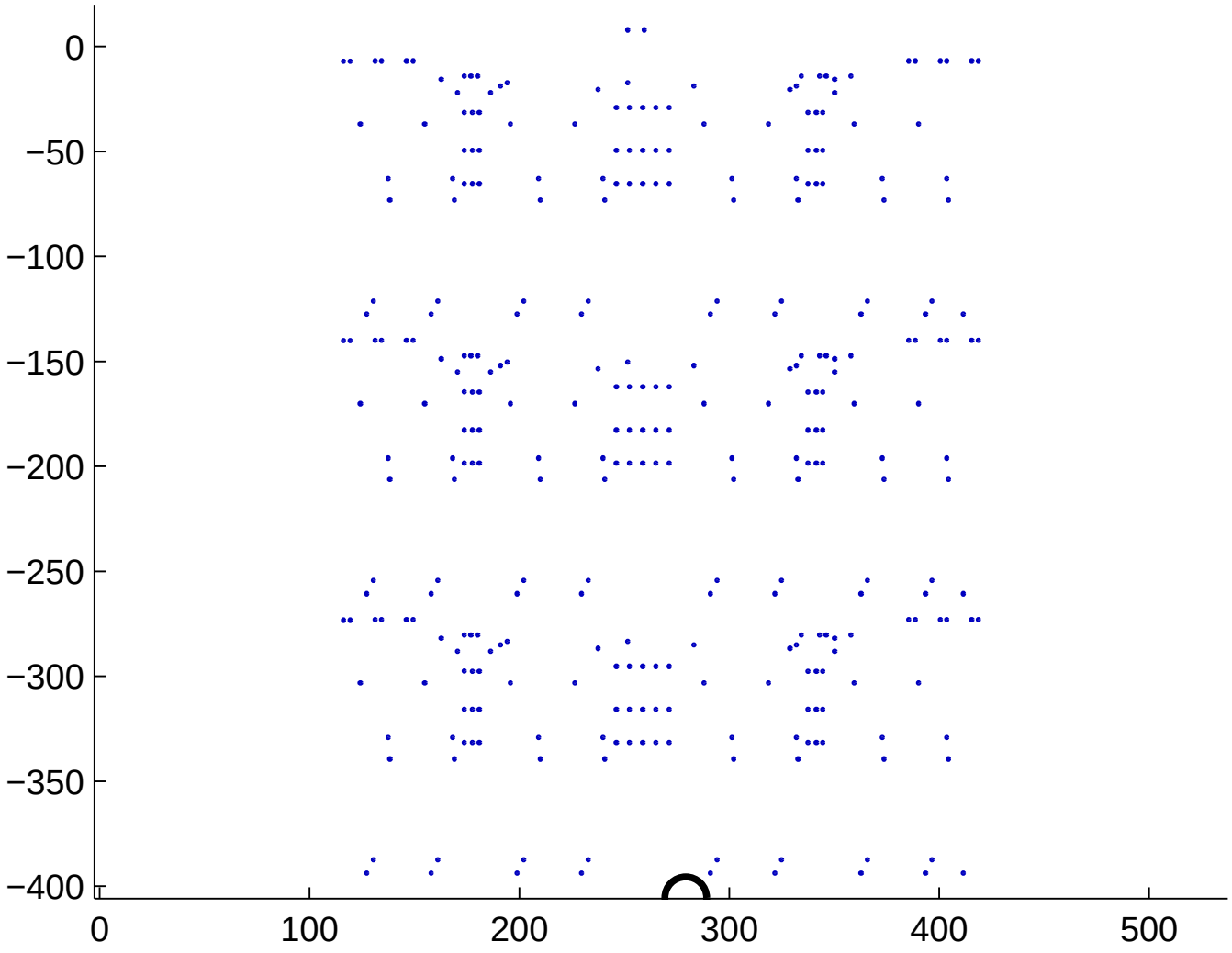


Figure L.19: lin318

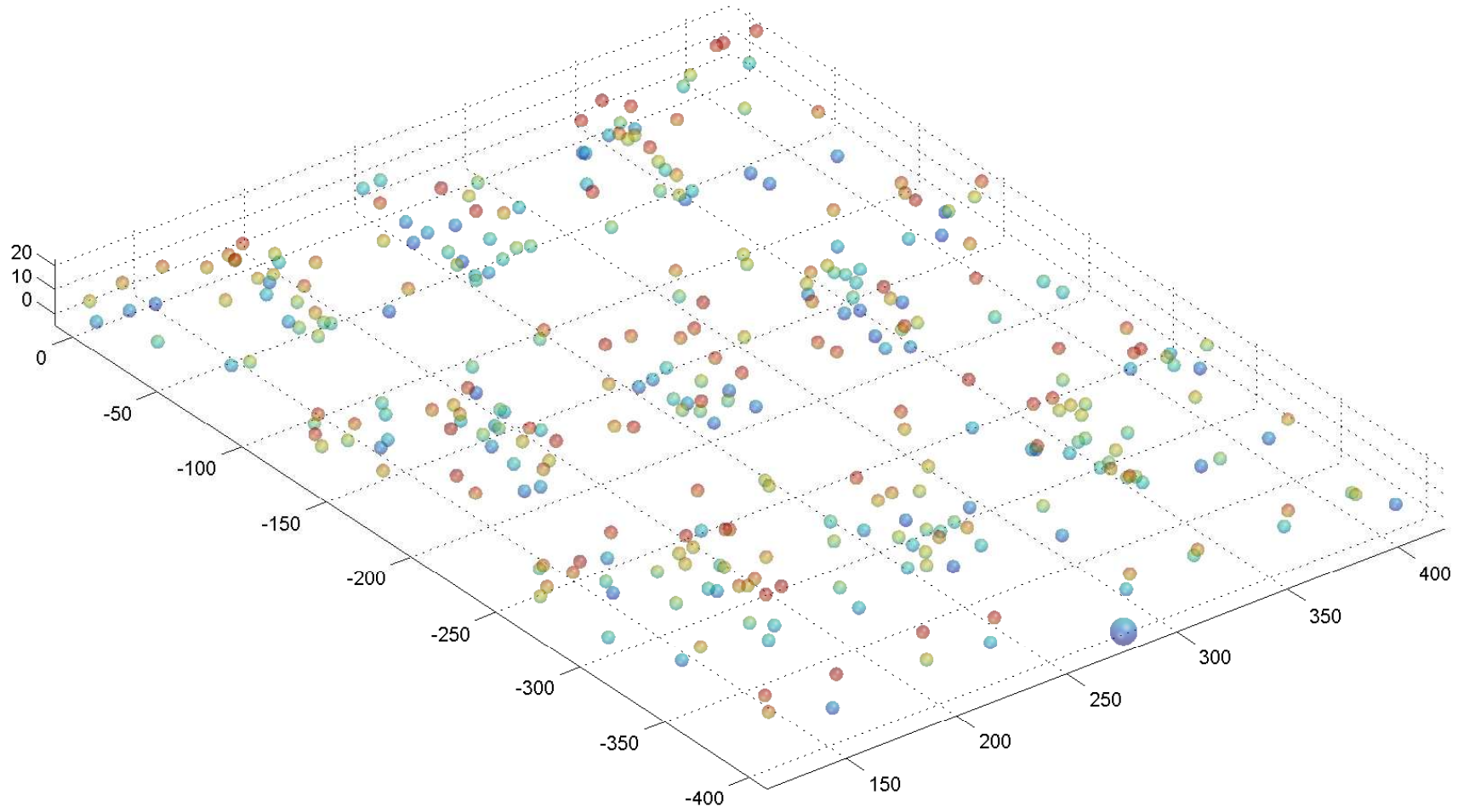


Figure L.20: lin318_3D

Table L-11: rd400

n:	400
Overlap Ratio: 0.02	r: 1.9910618
Overlap Ratio: 0.10	r: 9.955309
Overlap Ratio: 0.30	r: 29.865927
Description:	random
Total Demand:	3297
Max Vehicle Capacity:	800
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	2.28315	35.5085	0	-	-
1	43.5841	58.7522	99.5019	0.0954	11
2	60.2539	80.1704	27.9583	0.0946	1
3	86.1563	95.4019	99.9835	1.7864	3
4	44.4217	55.3301	59.2126	0.4519	5
5	79.6042	79.6519	48.0916	0.547	13
6	8.89064	83.8954	29.0611	0.9118	12
7	23.3569	85.0798	30.5318	0.8816	1
8	47.6864	20.3976	74.364	0.9045	7
9	40.6271	60.1839	50.1596	1.0856	5
10	95.4573	78.5053	38.9919	1.8568	14
11	59.3326	96.8644	60.2925	1.5824	10
12	94.61	43.2995	53.8065	1.6034	9
13	8.30742	60.1487	54.798	1.8807	12
14	86.1254	75.412	92.2501	0.5633	5
15	24.7619	69.8637	9.1655	0.6444	13
16	96.3227	96.5824	35.4748	1.0031	12
17	12.5872	53.6987	19.2898	0.0087	15
18	56.3237	2.07366	66.7228	1.5607	15
19	5.5259	61.9092	6.1438	0.3328	4
20	69.1414	57.6653	59.1832	0.8958	14
21	23.7167	70.7298	59.5174	1.8661	13
22	58.3448	60.9201	41.5011	0.9763	9
23	40.4171	94.2218	3.0792	0.4984	7
24	1.5771	61.4642	62.0285	1.5502	6
25	2.00806	6.28968	2.6575	1.1788	15
26	19.6656	61.3862	20.5906	1.0677	6
27	91.3249	42.8902	41.6597	0.2858	13
28	82.834	58.4111	60.6469	1.5249	1
29	4.96047	4.06059	34.5353	0.8823	1
30	27.1361	73.6904	92.6772	1.7551	1
31	97.9153	71.697	3.8476	1.103	6
32	48.9418	95.7946	8.5835	0.9184	14
33	81.7106	28.112	19.2367	1.8663	6
34	33.2771	46.652	45.1216	1.5816	8
35	27.8353	94.5623	59.9313	1.2194	2
36	16.854	97.4806	6.0907	0.2455	6
37	80.6139	53.7748	37.9975	1.125	12
38	44.5404	30.686	94.969	0.5937	5
39	30.6696	55.2626	12.0174	1.0672	5
40	55.5492	35.9315	44.2535	0.9688	1
41	15.6444	17.8995	34.8069	1.1341	1
42	14.0141	70.4084	60.1608	0.2376	4
43	96.3235	44.2629	60.2644	1.97	5
44	46.0829	25.5503	78.1024	1.8965	9
45	38.5534	48.7846	64.7262	0.38	5
46	93.1464	19.8146	96.7782	0.2092	14
47	27.9893	89.6021	79.9213	0.7899	6
48	33.1283	92.3481	27.8161	1.7117	15
49	3.35356	88.986	2.7967	1.2038	3
50	51.1528	6.04103	87.327	0.6171	12
51	23.2874	32.7742	59.4617	0.5102	13
52	87.0562	74.7862	94.9506	1.4318	6
53	12.6307	2.70835	31.4638	1.996	12
54	2.57158	38.4711	27.3546	0.6534	10
55	55.099	31.771	70.6981	1.0947	3
56	42.1545	66.9856	47.2528	1.6215	12
57	69.9395	64.1832	90.6048	0.7187	2
58	3.06059	88.1315	51.3598	1.011	5
59	48.6626	98.7924	25.383	1.3028	8
60	54.7886	87.0165	7.4948	1.406	14
61	76.419	22.7841	27.7958	0.7107	8
62	48.934	88.5471	3.512	0.3461	10
63	90.8764	48.3318	12.9357	1.4138	15
64	19.5225	82.1483	62.667	1.7523	14
65	17.1854	11.1942	73.5432	1.4044	13
66	59.9164	58.75	88.5608	1.5215	5
67	13.2524	50.7626	76.4367	1.3367	14
68	32.7208	86.88	6.0296	0.598	12
69	26.7929	78.8352	37.5421	1.2073	15
70	79.2919	13.6517	22.466	1.5872	12
71	15.6993	18.7479	59.9926	1.8907	3
72	18.6101	90.3489	8.9268	1.0216	6
73	74.5996	81.8744	91.5993	1.5343	13
74	67.267	14.1516	17.4107	0.9605	8
75	79.5061	49.6701	11.7965	1.8387	15
76	29.8827	79.684	74.8634	0.0979	9
77	9.16001	37.8018	54.1714	1.821	6
78	91.7898	10.5225	38.6828	0.1297	7
79	37.0272	27.4581	25.0096	1.9712	9
80	78.9206	73.8168	40.4273	1.3456	15
81	80.035	15.8589	58.0701	1.8794	9
82	74.8357	53.7031	27.6754	1.8745	4
83	48.6979	8.85907	21.303	1.8519	14
84	14.8737	9.51072	37.7455	1.7498	14
85	23.1984	1.0131	19.9686	1.5757	1
86	97.2905	22.0419	32.8941	1.4574	4
87	4.056	25.9589	74.3875	1.9713	13
88	19.247	29.2712	80.817	0.0965	13
89	2.40393	50.9808	25.185	0.2182	11
90	31.6686	31.1822	62.9487	1.4884	12
91	49.4944	16.327	40.7382	0.0746	7
92	52.5118	68.1256	10.9937	1.1594	12
93	83.5669	88.2708	89.9554	0.4412	9
94	77.5205	18.1054	72.6356	1.5949	8
95	10.9477	2.73525	75.6448	1.5193	2
96	65.3011	67.1869	28.6409	1.457	7
97	62.8285	19.7058	3.0557	1.1531	3
98	0.194865	71.2335	31.0366	0.9184	2
99	73.064	44.6995	31.3834	1.7939	5
100	58.0371	93.3465	37.2538	0.6162	12
101	37.7453	86.3505	90.2585	0.2766	13
102	25.8125	25.1372	50.1121	1.0046	8
103	65.9297	69.3415	71.7927	0.4476	14
104	70.0979	43.9308	97.3335	0.1558	6
105	80.1207	32.7664	32.9471	0.1817	1
106	75.5117	58.1702	94.9268	0.4238	9
107	16.8354	77.4785	96.9485	0.7723	6
108	60.771	67.3196	52.7577	1.3646	14
109	56.9788	35.9946	54.4126	0.0528	7
110	50.5772	79.5094	6.7911	0.9566	10
111	69.2786	47.5055	16.1011	1.1881	4

Node ID	x	y	z	r_i	demand
112	61.5258	41.6034	50.3406	0.3112	14
113	43.3068	85.4106	16.2891	0.4921	4
114	22.6997	14.9199	96.5597	1.8126	11
115	32.641	61.5676	34.0062	0.0686	4
116	75.6359	99.7073	96.3469	0.0761	6
117	17.5187	55.1629	44.2721	1.8177	9
118	20.7262	75.308	17.3361	0.3141	11
119	12.7313	98.6134	79.0339	1.4759	1
120	24.5176	59.5849	13.4915	0.7579	3
121	36.8488	32.2474	21.2512	0.163	4
122	61.8453	80.8454	29.5157	1.0427	13
123	28.4623	90.5817	94.8789	0.4301	15
124	34.7487	93.2543	26.9859	0.5908	3
125	94.2046	73.3577	49.4797	0.9912	8
126	92.3029	41.017	61.4442	0.5727	11
127	15.3759	23.0999	65.044	0.4688	6
128	47.6331	25.3181	18.59	0.3149	4
129	23.2085	58.8069	93.3912	1.5314	1
130	43.9629	81.9344	16.1851	0.2289	11
131	95.9404	38.2332	74.7444	0.1935	15
132	65.9332	98.9174	85.8003	1.264	8
133	47.522	42.292	65.6102	1.7871	8
134	73.4709	7.6166	79.1313	1.9485	14
135	84.4594	85.6238	69.4005	0.9728	5
136	1.02508	82.9527	3.7072	0.66	7
137	35.9094	68.8825	29.2317	1.885	3
138	90.11	20.7153	5.7932	0.661	3
139	60.7208	77.8844	16.4053	0.3957	14
140	68.2389	8.47105	37.5341	0.1429	5
141	84.0931	75.7357	43.6346	0.2514	7
142	44.9959	88.3516	56.7624	1.7636	14
143	72.565	40.2263	84.1996	1.0559	14
144	88.2698	14.9994	45.4757	0.9013	8
145	42.987	22.9253	37.986	1.8509	11
146	98.0879	82.1977	81.4504	0.1197	8
147	57.8122	54.5104	45.2899	0.4734	15
148	54.169	81.8375	12.9059	1.7916	7
149	50.9211	16.4053	69.6798	1.3211	3
150	87.5589	25.1226	45.9834	1.4356	4
151	10.1219	82.045	24.5182	1.7637	12
152	48.5894	0.54797	14.4264	1.6697	2
153	13.4	22.8874	2.3331	0.3087	5
154	16.7243	94.3593	34.7835	0.252	7
155	15.6372	44.5891	30.235	1.712	8
156	26.7979	6.90196	59.464	1.8284	13
157	47.6475	71.1843	17.3202	1.1821	15
158	45.6946	80.9262	23.2292	1.6109	14
159	21.7245	2.01127	55.495	1.4575	11
160	16.5471	81.1813	37.3426	0.9026	15
161	38.1612	45.7549	62.3997	0.3855	12
162	31.0765	22.0815	48.5077	0.8334	8
163	0.219756	2.58493	14.7832	1.6167	5
164	13.5318	57.9262	6.7229	0.2263	5
165	25.7714	33.2927	46.3113	0.6969	2
166	67.8108	54.6502	44.2592	1.0734	5
167	17.6011	61.1721	91.0121	0.1092	9
168	56.0389	33.1015	51.1098	0.7741	7
169	41.6783	52.1535	70.8377	0.5487	3
170	85.2354	42.0312	17.7315	1.3087	8
171	85.0689	32.1301	62.1612	1.2391	3
172	74.5771	5.70821	6.0306	1.6887	1

Node ID	x	y	z	r_i	demand
173	10.4725	58.878	47.8708	1.3585	4
174	6.43447	8.70233	59.8478	1.9239	7
175	41.7205	19.4188	86.0496	0.9813	14
176	88.4474	55.9131	14.5629	0.0043	6
177	86.8707	18.0065	43.4379	0.4648	8
178	26.2003	42.5604	24.4871	1.3196	6
179	66.9764	66.2314	9.0944	0.0408	13
180	42.0178	3.44287	36.938	1.5448	1
181	42.4972	23.9973	88.7768	0.2028	8
182	61.5069	0.482106	98.5604	0.3755	3
183	96.7473	23.5618	82.348	0.5737	3
184	18.064	96.3276	61.2807	0.8708	4
185	15.3897	25.3897	58.7078	0.6196	11
186	13.8308	54.4775	90.8096	1.5454	15
187	2.38826	24.0295	62.08	0.0211	1
188	70.1018	4.34543	9.0382	1.3082	14
189	95.1537	79.2325	85.4918	0.3032	12
190	19.0116	0.977048	36.1157	1.9383	10
191	34.7579	99.7518	13.4448	0.104	5
192	33.1085	0.882753	62.284	1.5792	15
193	54.7387	20.4852	11.8363	0.0458	10
194	77.6794	29.1288	65.8649	0.229	2
195	75.6586	91.7899	79.8395	1.4188	2
196	17.2306	77.2747	24.7644	0.6584	6
197	8.57052	3.36732	32.2638	0.0917	9
198	90.4883	12.6216	83.5226	1.3602	8
199	8.75416	38.928	96.5496	1.075	1
200	2.19732	10.251	34.6682	1.6516	13
201	41.7302	58.1199	97.2119	0.6619	13
202	20.5641	47.7219	38.8826	0.5609	6
203	48.6743	62.5481	86.8455	0.7783	3
204	37.2177	7.79249	31.0238	1.6549	5
205	11.7937	48.0467	6.2423	1.685	2
206	29.5533	92.3189	26.5937	0.8869	4
207	87.9339	96.7331	97.5762	1.0374	2
208	88.9914	10.7701	17.3091	0.3849	6
209	63.6977	85.2552	13.695	0.3532	7
210	38.2491	9.61738	19.3363	0.9895	8
211	13.4598	41.6191	22.5554	0.6615	15
212	75.9957	81.402	37.5418	0.8074	6
213	4.45069	94.0863	19.178	1.713	11
214	24.4594	47.3987	68.2546	1.6009	8
215	64.2573	58.953	49.3124	1.3119	1
216	22.8193	53.7552	17.9075	1.0267	11
217	64.5769	3.66176	91.1441	1.772	3
218	88.1955	43.6361	47.6404	1.3319	3
219	68.0574	15.6194	97.6814	1.1416	10
220	81.1997	46.621	50.135	1.799	5
221	96.3481	58.4969	97.3507	0.5165	14
222	31.2678	61.1344	2.0752	1.3636	2
223	85.3959	62.1638	1.7086	0.5093	13
224	51.8363	98.9629	1.5963	0.4592	11
225	27.2482	20.2425	98.6789	1.7718	13
226	76.2214	75.1456	46.9071	1.339	14
227	64.8783	60.379	95.6551	0.7048	13
228	78.3667	74.2083	50.3369	0.3033	3
229	39.9475	19.2268	79.8118	0.9798	12
230	3.24988	93.8751	52.5027	0.5654	4
231	81.4209	43.6493	50.298	0.987	2
232	29.1053	29.2049	97.3043	1.728	3
233	60.7013	1.36116	46.4176	0.6779	10

Node ID	x	y	z	r_i	demand
234	9.27453	43.3967	88.7547	0.2856	10
235	76.9072	18.2917	80.6948	1.0706	6
236	17.5856	40.8861	25.0628	0.9883	14
237	34.4656	38.8185	62.9703	0.1595	8
238	22.7183	34.3604	52.0641	1.087	12
239	49.1148	32.8614	42.5439	0.0147	15
240	2.55217	66.9796	45.1209	0.4532	8
241	78.906	18.0381	53.555	1.0293	10
242	98.0725	73.509	85.0617	1.2703	15
243	5.81823	20.7452	12.0688	1.9707	15
244	19.5262	30.4483	48.5255	1.1203	12
245	54.3707	99.6057	90.3024	1.2802	7
246	55.717	37.8511	81.0117	1.2977	11
247	25.6513	60.6643	37.4717	1.2002	8
248	80.5435	37.2793	30.7227	1.6755	9
249	46.2037	41.7062	48.7254	1.1092	7
250	81.8209	62.9891	53.3907	0.048	3
251	41.546	82.3742	71.0491	1.3555	10
252	20.3288	28.022	94.6827	0.8967	15
253	32.5896	90.759	99.4978	0.8044	2
254	51.2472	90.6526	88.5593	0.5448	1
255	82.6909	80.2719	62.172	0.4975	14
256	37.4105	49.4356	12.3771	0.1422	15
257	59.9164	61.9972	76.3491	1.3282	10
258	32.7353	38.4372	45.6112	0.5909	14
259	36.0033	17.5038	68.4307	0.1295	9
260	80.9911	75.8316	78.9882	1.9298	14
261	26.0672	21.3383	63.983	1.195	9
262	93.4248	68.5015	98.1606	0.4609	9
263	17.6023	36.5196	56.7286	0.4927	12
264	60.6972	35.5066	52.4287	1.483	9
265	66.7645	81.0279	23.2022	0.4871	13
266	85.2864	82.465	90.0038	0.4328	13
267	74.632	5.60444	48.5009	0.8055	10
268	9.35555	53.1101	48.6717	1.2462	7
269	81.8774	60.6902	25.477	1.3427	2
270	74.6616	49.1772	30.6996	1.123	9
271	23.1083	96.0553	21.9675	1.1723	5
272	68.3546	93.0491	63.4728	1.5264	7
273	43.1006	68.5786	87.3861	0.9291	15
274	70.983	56.1077	39.9244	1.4882	5
275	45.2184	66.3382	18.5431	0.3817	8
276	38.4806	81.2568	32.7466	1.0976	10
277	88.6343	0.494442	25.7719	1.6845	8
278	5.25835	27.1001	26.8402	1.8723	12
279	15.2733	95.1553	18.4059	0.3997	11
280	80.8889	76.3527	85.0129	1.4712	8
281	77.5352	78.0347	33.1993	1.5107	2
282	17.8085	51.9553	71.4677	1.3165	12
283	98.8743	25.646	5.6301	1.374	2
284	11.4258	37.7412	14.2255	0.0901	4
285	23.6126	49.4214	29.6987	1.1428	7
286	31.4339	43.8079	91.7683	0.3271	12
287	27.3595	17.3028	77.1892	0.534	15
288	4.99968	74.2733	96.2118	0.7686	5
289	0.642906	35.395	17.4189	0.4629	12
290	54.0007	52.8659	92.5002	0.7817	12
291	78.6058	43.2582	65.7281	1.5156	9
292	99.5164	7.77478	36.5945	1.3086	12
293	50.9984	83.4341	15.7476	0.351	11
294	89.036	30.7257	77.9388	1.2917	2

Node ID	x	y	z	r_i	demand
295	30.4468	53.5688	58.3124	0.6731	6
296	47.3917	2.23053	7.041	0.7543	10
297	86.8559	48.4797	70.9689	0.2277	15
298	9.17265	66.1356	6.7326	0.4854	5
299	61.6789	74.8507	42.3385	1.3431	1
300	41.4131	74.8199	27.7293	1.287	3
301	23.6206	68.344	50.228	0.4172	12
302	97.4766	17.1802	10.0021	0.0871	3
303	73.2088	32.0501	51.6558	1.9183	1
304	33.4192	59.483	33.0004	1.6934	12
305	56.1254	1.40532	17.903	0.8975	9
306	3.30116	54.5758	46.8676	1.2586	12
307	45.1636	79.7971	7.5816	1.3964	12
308	19.7287	0.198716	79.5663	0.1412	4
309	23.6339	40.0124	41.5074	1.3495	11
310	74.7866	36.0265	64.8468	1.4465	13
311	43.0779	81.6476	81.3569	0.4575	2
312	2.1823	25.6845	27.6693	1.6403	14
313	34.4638	23.0393	61.4662	1.9126	5
314	75.4786	92.9344	80.494	1.7328	2
315	25.7178	17.895	52.7372	0.4178	5
316	23.3293	78.9181	52.7226	1.7443	11
317	10.9638	55.5178	10.1729	1.4157	2
318	81.8496	38.8539	28.9342	1.8548	5
319	43.8962	13.6901	83.4665	0.3615	11
320	34.4937	83.7515	46.1073	0.8917	12
321	92.0634	46.0336	40.4672	1.8841	6
322	95.0473	3.39817	49.8314	1.9254	3
323	12.3803	91.1149	15.3598	1.6319	15
324	82.6839	23.4883	70.1916	1.0259	10
325	96.7716	16.6523	73.2113	1.5563	11
326	76.3859	55.8636	29.5918	0.8017	6
327	47.7087	83.4773	42.5429	1.9514	9
328	18.9042	62.1271	34.907	1.3155	10
329	50.0418	88.5256	42.3177	1.6597	10
330	80.7777	87.9354	23.575	0.5804	10
331	0.613562	12.2624	51.4967	0.352	6
332	68.0526	97.9535	69.9593	1.5961	10
333	75.2455	17.3084	91.8789	0.1612	14
334	74.0572	35.987	63.4666	1.8168	10
335	49.4045	19.961	26.5255	1.3777	13
336	22.5447	55.6169	28.4034	0.7794	6
337	78.2186	68.7569	71.4148	0.8201	9
338	55.9929	17.1432	85.8884	0.9443	10
339	46.3399	71.17	31.2162	0.8683	7
340	9.96077	19.2347	95.1963	1.6989	11
341	25.7615	81.4539	44.2448	1.1541	10
342	4.28894	92.6489	49.3954	1.1451	7
343	17.2907	17.3232	33.1257	0.3201	8
344	48.3206	81.4332	48.7053	0.4983	12
345	53.7144	89.3849	55.8234	0.1253	11
346	0.299018	97.3272	63.0477	0.7113	6
347	28.6889	43.6077	12.417	1.8201	1
348	3.44571	28.2052	68.896	0.0619	3
349	38.2173	22.874	49.077	0.3887	15
350	40.7053	85.7824	6.0265	0.3234	4
351	95.7659	2.55349	7.5519	0.1129	10
352	53.4254	44.9898	88.3964	1.2721	12
353	89.1084	77.1611	62.2997	0.0145	9
354	60.9907	71.4945	66.9566	1.0514	2
355	80.0506	36.8529	1.8328	0.167	7

Node ID	x	y	z	r_i	demand
356	0.65945	19.6999	21.228	0.4456	10
357	12.2621	43.6923	1.4336	0.6746	12
358	51.793	64.9464	0.9013	0.0547	10
359	23.5387	4.13129	73.048	1.8604	3
360	60.356	72.3736	25.6911	1.0968	9
361	91.0373	94.8618	33.7328	0.4152	2
362	49.8328	92.6571	10.5815	1.7491	12
363	54.8665	95.2849	41.9419	0.2416	7
364	77.911	9.90186	32.1435	0.9185	11
365	58.2097	7.56071	2.229	1.435	9
366	21.4744	8.21886	12.0685	1.7788	13
367	56.0439	62.2937	45.4781	0.3947	14
368	69.3672	55.5594	61.2856	0.4087	6
369	9.0496	1.67955	6.7742	1.784	9
370	76.05	41.1841	50.3284	0.878	7
371	62.6521	52.6724	96.4246	1.4735	2
372	99.5853	23.4577	6.8435	1.3777	15
373	91.8947	87.6684	31.3605	1.0085	10
374	98.9579	4.73211	12.8251	1.1529	6
375	37.7688	31.4408	76.6336	0.766	5
376	96.1419	41.3034	39.8142	1.4714	3
377	82.5413	70.9361	35.9747	0.7022	12
378	82.7455	58.0479	28.4959	0.4014	14
379	3.57801	99.0366	79.8401	0.4571	14
380	62.0154	28.1819	31.0401	1.3609	4
381	10.9524	12.0779	65.6188	1.7347	9
382	73.8931	82.0767	63.5442	0.5368	9
383	27.4222	25.8428	88.2494	0.1631	9
384	8.25408	64.3565	18.8288	0.3367	3
385	59.2712	76.4167	39.0582	1.3428	2
386	72.4782	47.1166	11.4083	0.1063	2
387	77.8131	90.2453	61.6399	0.627	6
388	88.5712	66.6382	86.5414	0.2169	11
389	2.68873	16.3883	43.9305	0.5531	1
390	74.1314	97.2935	62.187	0.8261	11
391	16.576	71.2313	59.4946	1.5967	11
392	25.6231	12.6549	17.499	1.4785	7
393	92.7385	89.9534	78.6648	0.9411	2
394	52.4925	5.37248	88.2454	0.635	5
395	7.21925	42.3799	79.403	0.4529	10
396	36.723	86.3354	38.0239	1.9971	3
397	34.9224	79.9328	54.0968	0.3592	7
398	12.7116	4.29147	5.5693	0.06	14
399	58.7637	13.9566	16.9818	1.7747	6

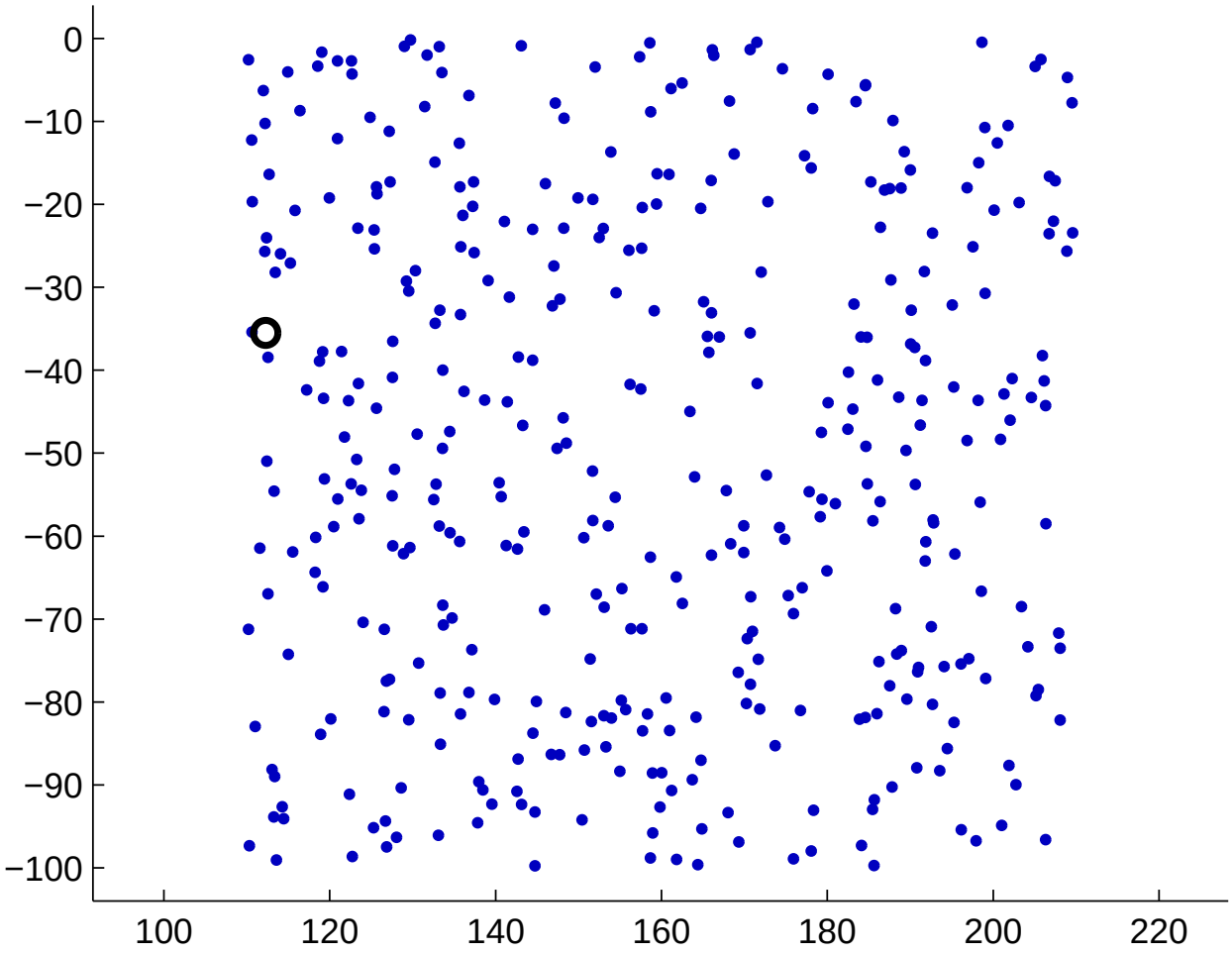


Figure L.21: rd400

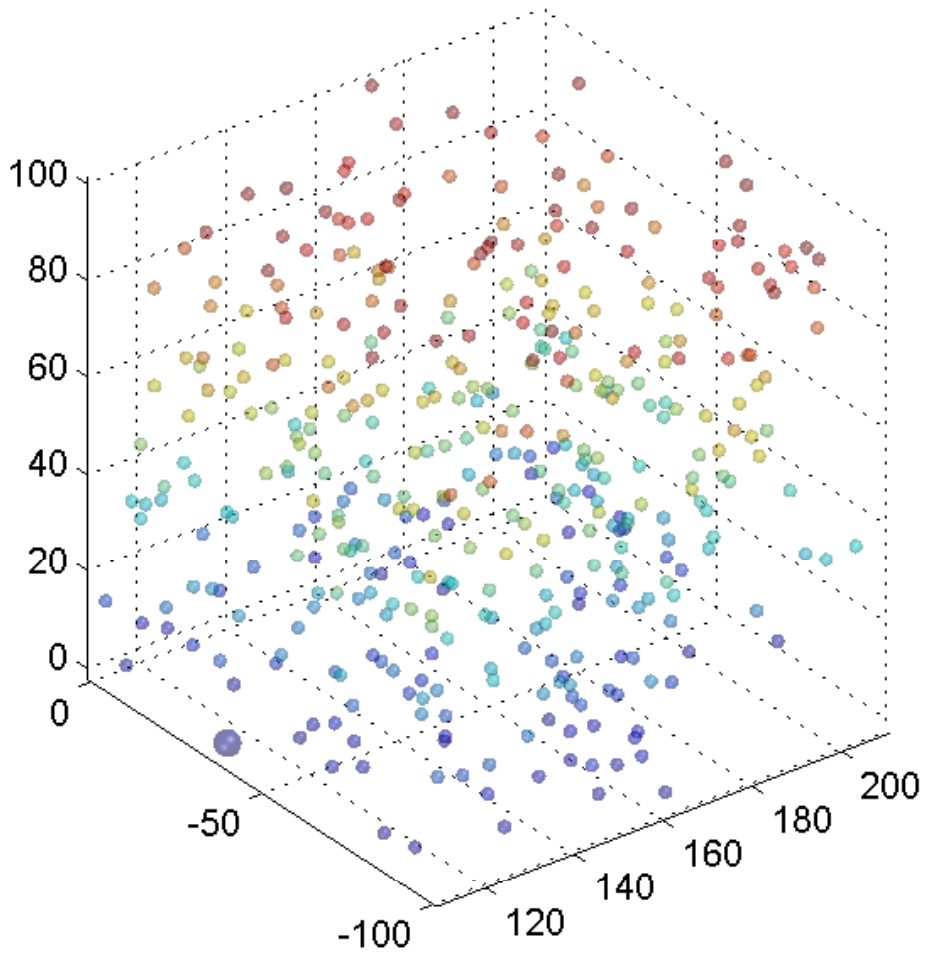


Figure L.22: rd400

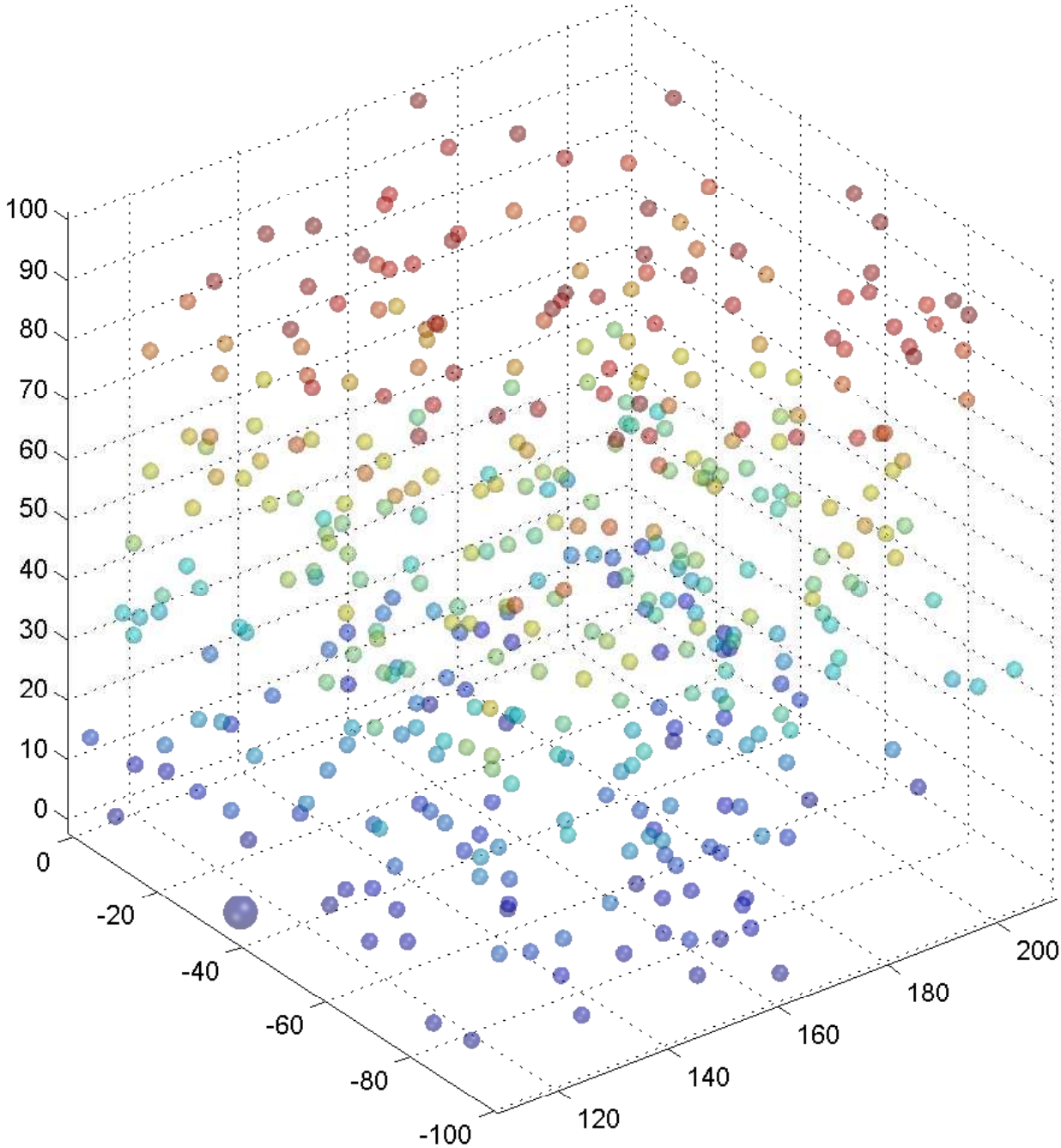


Figure L.23: rd400_3D

Table L-12: pcb442

n:	442
Overlap Ratio: 0.02	r: 0.76
Overlap Ratio: 0.10	r: 3.8
Overlap Ratio: 0.30	r: 11.4
Description:	drill-press
Total Demand:	1100
Max Vehicle Capacity:	184
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	0	0	0	-	-
1	2	4	3	6	4
2	2	5	2	3	2
3	2	6	1	0	3
4	2	7	3	1	2
5	2	8	1	4	3
6	2	9	2	0	1
7	2	10	1	3	2
8	2	11	1	7	3
9	2	12	1	1	1
10	2	13	0	4	2
11	2	14	3	7	4
12	2	15	1	1	1
13	2	16	1	7	2
14	2	17	2	5	2
15	2	18	1	5	4
16	2	19	1	5	2
17	2	20	1	4	3
18	2	21	1	3	3
19	2	22	1	0	1
20	2	23	1	3	4
21	2	24	0	5	4
22	2	25	2	3	4
23	2	26	0	2	4
24	2	27	1	6	2
25	2	28	2	4	4
26	2	29	1	1	4
27	2	30	3	3	2
28	2	31	3	3	3
29	2	32	1	3	2
30	2	33	3	4	1
31	2	34	1	0	2
32	2	35	3	0	2
33	2	36	2	1	1
34	3	4	0	7	3
35	3	5	1	3	3
36	3	6	1	3	3
37	3	7	1	3	4
38	3	8	0	5	4
39	3	9	1	2	2
40	3	10	2	6	3
41	3	11	1	2	2
42	3	12	2	4	2
43	3	13	1	6	3
44	3	14	0	6	4
45	3	15	1	4	1
46	3	16	2	4	4
47	3	17	3	1	4
48	3	18	2	2	3
49	3	19	2	2	1
50	3	20	3	4	4
51	3	21	2	3	3
52	3	22	0	5	3
53	3	23	1	5	4
54	3	24	1	3	4
55	3	25	0	6	3
56	3	26	3	2	4
57	3	27	0	6	3
58	3	28	0	1	2
59	3	29	2	2	1
60	3	30	2	2	1
61	3	31	2	3	2
62	3	32	2	1	4
63	3	33	1	1	1
64	3	34	1	5	4
65	3	35	2	3	1
66	4	4	1	4	2
67	4	5	1	4	3
68	4	6	3	1	1
69	4	7	2	7	4
70	4	8	3	7	3
71	4	9	0	1	4
72	4	10	0	0	4
73	4	11	3	5	3
74	4	12	2	0	4
75	4	13	3	2	4
76	4	14	1	4	4
77	4	15	1	6	4
78	4	16	3	5	3
79	4	17	3	1	1
80	4	18	1	3	2
81	4	19	1	1	3
82	4	20	2	1	2
83	4	21	3	2	3
84	4	22	1	2	3
85	4	23	2	1	1
86	4	24	1	4	2
87	4	25	2	4	1

Node ID	x	y	z	r_i	demand
88	4	26	0	3	1
89	4	27	0	1	1
90	4	28	2	6	1
91	4	29	2	3	3
92	4	30	0	5	2
93	4	31	2	0	4
94	4	32	1	4	1
95	4	33	1	4	1
96	4	34	3	5	3
97	4	35	3	5	1
98	4	36	2	1	4
99	5	15	2	0	4
100	5	18.3	1	4	1
101	5	31	1	1	2
102	6	4	1	3	3
103	7	3	0	1	1
104	7	6	2	5	1
105	7	15	3	0	4
106	7	16	2	5	2
107	7	18	0	7	4
108	7	21	1	3	1
109	7	24	2	6	1
110	7	27	1	2	4
111	7	30	2	5	2
112	7	33	1	3	1
113	7	36	1	6	3
114	8	3	2	2	2
115	8	6	2	4	4
116	8	10.3	1	5	4
117	8	15	1	3	1
118	8	18	1	5	1
119	8	21	2	6	2
120	8	24	1	6	3
121	8	26	0	2	3
122	8	27	1	3	3
123	8	30	0	5	3
124	8	33	2	4	1
125	8	36	0	2	4
126	9	3	1	6	4
127	9	6	2	1	1
128	9	15	1	5	4
129	9	18	1	6	1
130	9	21	1	1	3
131	9	24	1	5	2
132	9	27	3	6	3
133	9	30	2	2	1
134	9	33	2	1	2
135	9	36	0	5	1
136	10	3	3	4	3

Node ID	x	y	z	r_i	demand
137	10	6	2	7	4
138	10	11	1	1	1
139	10	15	2	2	3
140	10	16.3	0	5	4
141	10	18	0	3	1
142	10	21	2	4	1
143	10	24	2	4	2
144	10	26	2	4	1
145	10	27	1	5	1
146	10	30	3	1	1
147	10	33	0	0	2
148	10	36	2	1	1
149	11	3	3	1	2
150	11	6	2	1	4
151	11	7	1	2	3
152	11	9	1	5	1
153	11	15	1	1	1
154	11	18	0	1	2
155	11	21	3	2	3
156	11	24	1	5	2
157	11	27	2	5	2
158	11	30	2	7	4
159	11	33	1	4	1
160	11	36	1	6	4
161	12	3	3	2	3
162	12	6	2	3	2
163	12	15	3	6	3
164	12	17	1	6	1
165	12	18	0	6	4
166	12	21	2	4	4
167	12	24	2	5	4
168	12	27	0	3	2
169	12	30	2	1	1
170	12	33	1	4	1
171	12	36	1	4	2
172	13	3	2	6	4
173	13	6	0	5	2
174	13	7	0	3	2
175	13	11.3	2	4	2
176	13	15	2	1	1
177	13	18	1	5	3
178	13	21	2	4	2
179	13	22	1	1	1
180	13	24	1	5	3
181	13	27	2	7	3
182	13	30	2	5	1
183	13	33	2	6	2
184	13	36	2	6	2
185	14	3	1	3	4

Node ID	x	y	z	r_i	demand
186	14	6	2	1	3
187	14	9.3	1	7	3
188	14	15	2	1	1
189	14	18	3	2	4
190	14	20	2	5	4
191	14	21	2	7	2
192	14	24	1	5	1
193	14	25	0	3	3
194	14	27	0	1	4
195	14	28.2	1	3	1
196	14	29	1	1	2
197	14	30	1	0	3
198	14	33	1	4	1
199	14	36	0	7	4
200	15	15	0	7	2
201	15	18	3	7	3
202	15	19	0	3	3
203	15	21	2	6	1
204	15	24	1	4	2
205	15	27	3	6	1
206	15	28	2	3	1
207	15	28.6	2	6	1
208	15	30	2	7	1
209	15	33	2	6	1
210	15	36	1	3	2
211	16	11	2	5	3
212	16	13	1	6	3
213	16	15	1	5	2
214	16	18	3	4	3
215	16	21	3	3	4
216	16	24	2	0	3
217	16	27	0	7	1
218	16	30	2	7	2
219	16	33	2	2	1
220	16	36	1	4	1
221	17	12	2	3	4
222	17	15	2	6	1
223	17	18	3	2	4
224	17	21	1	1	4
225	17	24	2	2	4
226	17	36	1	5	3
227	18	3	1	5	3
228	18	6	1	5	4
229	18	12.3	2	3	2
230	18	15	3	6	1
231	18	18	2	3	3
232	18	21	1	1	4
233	18	24	2	6	2
234	19	3	1	5	4

Node ID	x	y	z	r_i	demand
235	19	6	2	1	1
236	19	30	3	4	1
237	19	35.2	1	6	1
238	20	3	2	5	3
239	20	3.7	2	1	4
240	20	6	1	5	1
241	20	8	1	6	3
242	20	9	1	6	4
243	20	10	1	1	2
244	20	11	1	1	2
245	20	12	1	5	4
246	20	13	2	1	2
247	20	14	2	6	2
248	20	15	1	2	4
249	20	16	3	7	1
250	20	17	0	3	3
251	20	18	0	1	1
252	20	19	2	2	2
253	20	20	3	1	4
254	20	21	1	2	2
255	20	22	2	2	3
256	20	23	2	7	1
257	20	24	0	4	1
258	20	25	3	5	4
259	20	26	1	4	2
260	20	27	2	3	3
261	20	28	2	2	3
262	20	29	1	7	3
263	20	30	3	3	1
264	20	31	0	6	2
265	20	35	2	2	3
266	21	3	2	4	3
267	21	6	3	5	4
268	21	32	1	6	3
269	22	3	1	4	1
270	22	4.7	1	1	1
271	22	6	1	3	1
272	22	32	2	7	2
273	23	3	0	6	4
274	23	6	0	2	2
275	23	34	3	0	4
276	24	3	2	5	3
277	24	6	2	5	1
278	24	21	2	1	3
279	25	3	2	3	2
280	25	8	2	7	2
281	26	4	1	2	2
282	26	5	1	6	3
283	26	8	2	2	4

Node ID	x	y	z	r_i	demand
284	26	9	0	5	3
285	26	10	1	1	3
286	26	11	3	6	4
287	26	12	1	5	3
288	26	13	1	5	4
289	26	14	2	1	1
290	26	15	1	5	1
291	26	16	1	3	2
292	26	17	2	1	1
293	26	18	2	5	2
294	26	19	0	5	4
295	26	20	1	2	3
296	26	21	2	4	1
297	26	22	0	3	1
298	26	23	3	6	2
299	26	24	0	3	1
300	26	25	1	1	4
301	26	26	1	7	1
302	26	27	2	6	1
303	26	28	1	3	3
304	26	29	0	5	1
305	26	30	2	7	2
306	26	31	1	1	2
307	26	34	2	7	4
308	27	7	2	6	1
309	27	8	3	4	1
310	27	9	2	6	2
311	27	10	1	6	4
312	27	11	1	6	3
313	27	12	1	4	1
314	27	13	2	0	4
315	27	14	1	2	3
316	27	15	1	7	4
317	27	16	2	0	3
318	27	17	2	1	3
319	27	18	1	3	1
320	27	19	3	5	3
321	27	20	1	2	4
322	27	21	1	4	2
323	27	22	0	2	2
324	27	23	2	3	3
325	27	25	1	2	1
326	27	26	3	3	4
327	27	27	1	7	4
328	27	28	0	1	1
329	27	29	1	3	2
330	27	30	3	6	3
331	27	31	3	3	3
332	27	32	2	7	1

Node ID	x	y	z	r_i	demand
333	27	33	2	0	2
334	27	34	2	2	1
335	27	35	2	3	4
336	27	36	0	1	4
337	27	37	0	6	3
338	27	38	1	4	1
339	28	9	1	4	2
340	28	11.3	2	1	2
341	29	4	3	2	4
342	29	5	2	1	3
343	29	14	2	5	2
344	29	24	2	1	3
345	29	30	0	7	2
346	30	7	3	5	3
347	30	8	3	4	1
348	30	9	1	2	2
349	30	10	3	6	1
350	30	11	3	1	3
351	30	12	0	0	3
352	30	13	2	1	4
353	30	15	1	4	3
354	30	16	1	0	3
355	30	17	1	2	3
356	30	18	1	6	2
357	30	19	0	5	1
358	30	20	2	1	3
359	30	21	0	6	2
360	30	22	3	4	1
361	30	23	1	5	3
362	30	25	1	4	4
363	30	26	1	1	4
364	30	27	1	0	3
365	30	28	3	6	2
366	30	29	2	1	2
367	30	30	0	7	4
368	30	31	1	4	3
369	30	32	3	1	1
370	30	33	2	5	1
371	30	34	3	3	1
372	30	35	2	2	2
373	30	36	2	3	4
374	30	37	0	1	1
375	30	38	2	7	4
376	1.5	35	1	1	1
377	1.5	35.5	2	1	3
378	4.7	25.5	2	1	4
379	4.7	33.5	3	6	4
380	4.7	34.5	1	0	2
381	5.4	23.3	2	6	2

Node ID	x	y	z	r_i	demand
382	5.4	24.3	3	5	3
383	6.2	36.5	2	3	3
384	6.2	37.1	3	3	2
385	7.5	25.5	1	3	1
386	8.5	5.2	1	4	1
387	8.5	7	0	1	4
388	8.5	22.8	2	7	4
389	9.4	7.4	2	0	1
390	9.5	22.2	2	7	2
391	9.1	26	1	5	1
392	10.5	10.5	2	7	2
393	11.5	13.5	2	2	1
394	11.7	22.8	2	3	1
395	12.2	22.1	3	5	2
396	13.5	7.5	3	1	2
397	13.5	17	3	0	1
398	13.5	21.4	1	3	1
399	14.5	7.7	3	4	2
400	15.5	3	1	1	1
401	15.5	5	3	4	1
402	15.5	18.5	2	5	1
403	16.5	10.5	0	6	3
404	16.9	26.8	2	1	4
405	17.1	3.1	2	6	4
406	17.1	5.1	1	2	1
407	17.5	7.5	1	6	1
408	17.9	25.8	2	5	3
409	17.2	26.1	2	6	3
410	17.9	33.3	2	0	1
411	17.2	34.1	2	1	2
412	18.3	27	1	5	1
413	18.3	28	0	7	1
414	18.3	34.5	2	1	3
415	20.6	16.5	1	2	4
416	20.5	31.5	3	4	3
417	21.7	19	3	0	1
418	21.1	20	2	4	2
419	21.2	27.5	0	0	3
420	21.5	32.5	2	7	2
421	22.9	14	1	1	1
422	22.2	28.2	1	3	3
423	22.8	32.5	1	7	3
424	23.9	13	0	1	3
425	23.2	15	1	6	3
426	24.5	7.1	0	2	4
427	26.2	36.5	2	3	3
428	27.5	5.2	2	6	3
429	27.6	23.6	1	7	2
430	28.5	22	1	6	1

Node ID	x	y	z	r_i	demand
431	28.5	27	1	2	3
432	28.5	33.5	2	5	1
433	29.3	9.5	1	1	4
434	29.5	17.5	1	5	3
435	29.5	20.5	1	0	3
436	5.2	32	2	3	1
437	23	35	1	6	4
438	23.2	31.5	2	2	1
439	5.3	21	2	5	1
440	25.5	7.1	2	7	3
441	7.5	4.9	0	0	2

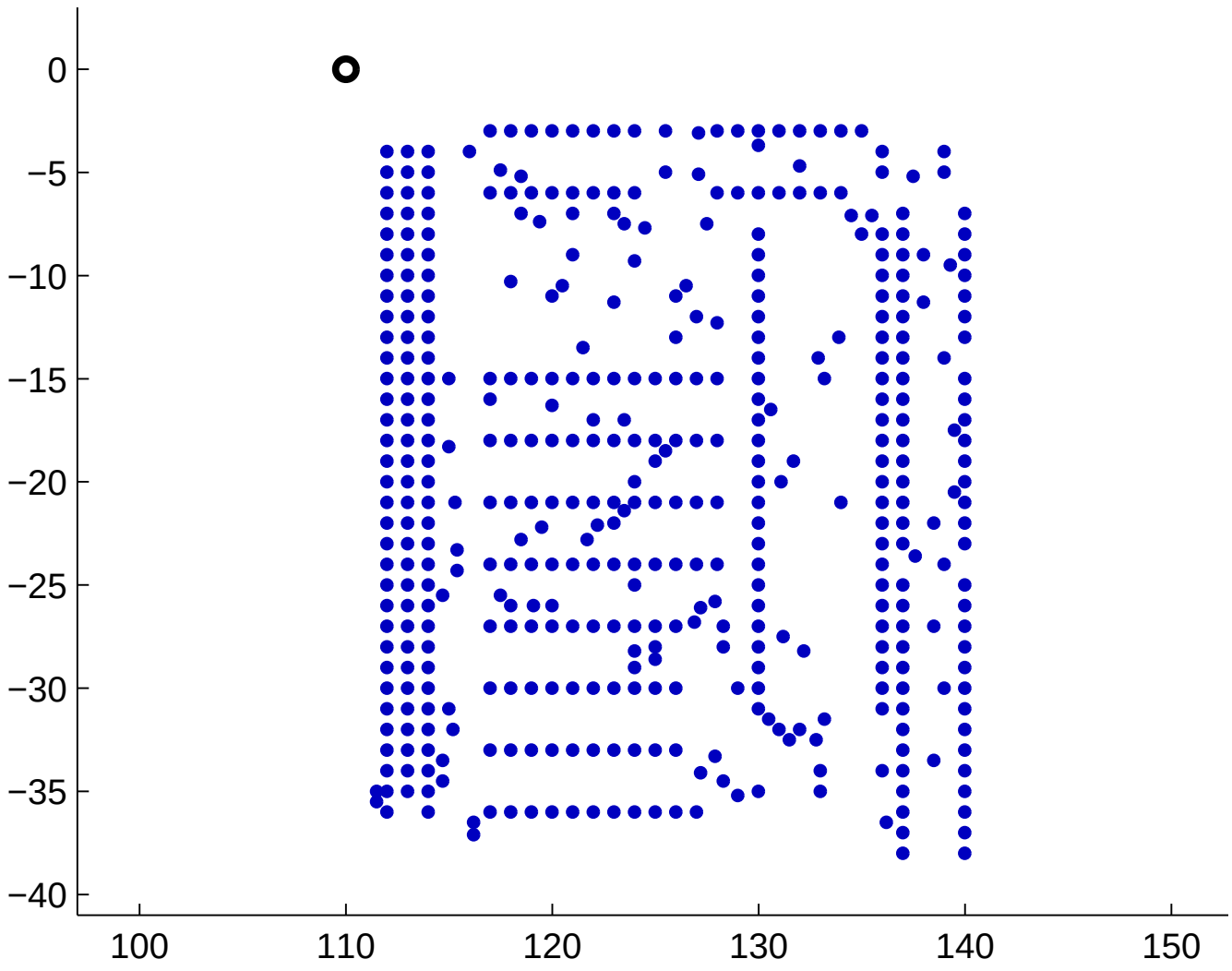


Figure L.24: pcb442

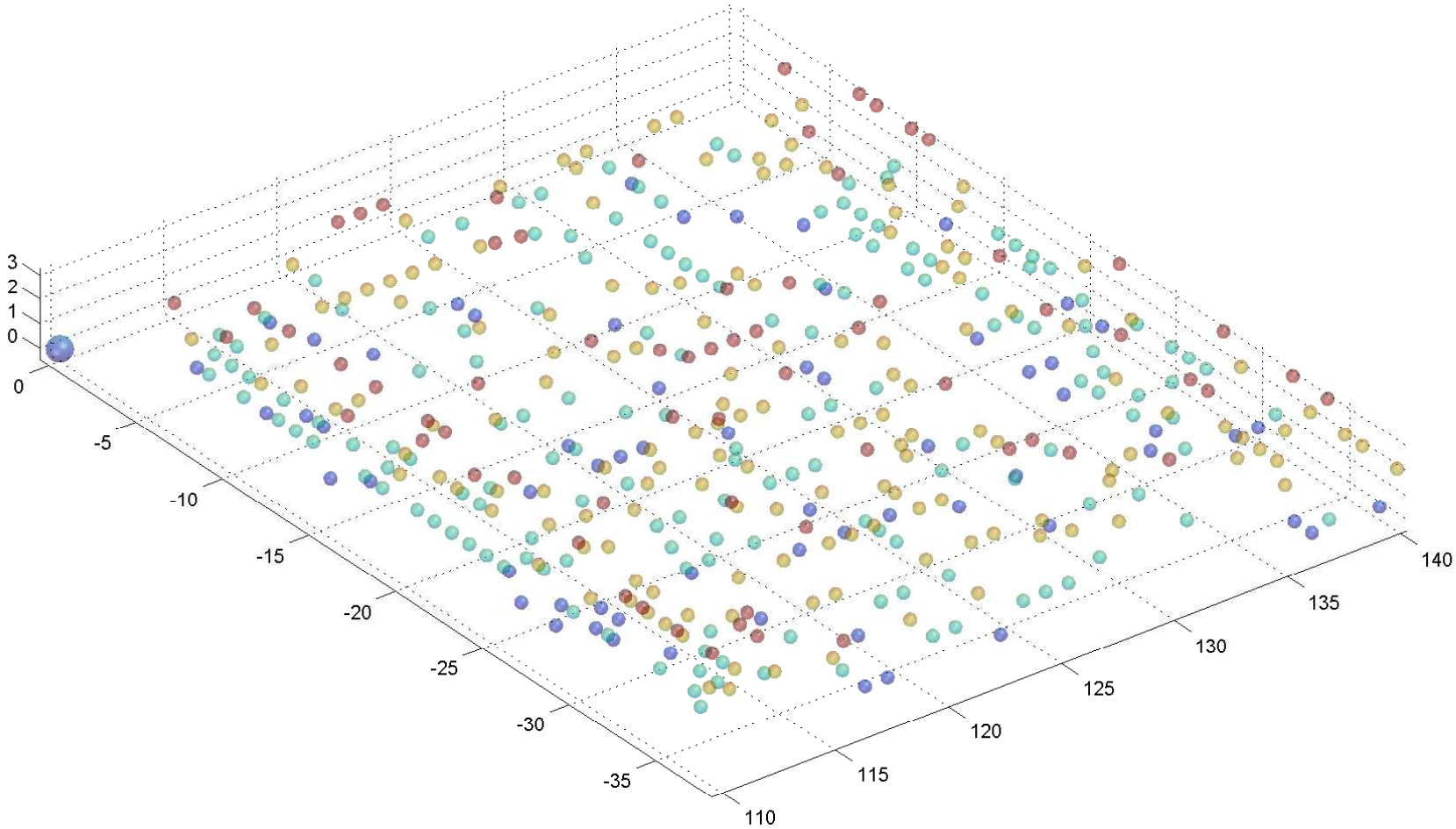


Figure L.25: pcb442_3D

Table L-13: d493

n:	493
Overlap Ratio: 0.02	r: 0.74904
Overlap Ratio: 0.10	r: 3.7452
Overlap Ratio: 0.30	r: 11.2356
Description:	random
Total Demand:	10514
Max Vehicle Capacity:	1000
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	0	0	0	-	-
1	11.163	15.552	141.832	0.651	35
2	13.576	14.79	138.325	1.637	41
3	11.481	17.711	124.498	3.058	2
4	11.862	17.965	73.909	2.45	5
5	12.052	18.854	46.124	6.347	14
6	12.37	19.934	15.842	0.061	26
7	13.005	20.061	68.646	3.941	38
8	11.608	20.251	101.424	6.345	36
9	11.735	20.378	116.222	7.485	37
10	12.243	20.505	94.648	2.717	42
11	13.513	22.41	17.465	8.854	22
12	17.323	21.331	107.01	8.168	28
13	17.45	21.902	76.475	6.347	43
14	17.64	22.918	47.209	3.23	14
15	17.64	23.426	22.454	9.913	12
16	17.323	23.934	50.146	5.56	19
17	17.45	24.188	63.322	1.702	3
18	16.497	24.315	17.876	2.342	19
19	17.577	25.204	95.05	4.26	29
20	22.974	17.711	70.862	5.019	42
21	22.149	14.282	119.226	1.97	35
22	22.276	13.393	54.239	3.052	13
23	21.831	13.203	64.85	7.88	22
24	26.149	11.107	19.141	6.643	27
25	25.07	11.615	69.179	8.154	22
26	23.482	9.52	92.151	3.464	4
27	22.212	10.091	100.44	4.948	24
28	22.085	10.853	55.182	1.409	11
29	22.022	11.361	19.929	6.97	33
30	22.149	11.742	1.36	9.67	2
31	20.244	11.234	37.646	6.925	32
32	20.434	13.012	7.24	7.723	37
33	19.482	13.076	31.528	9.717	40
34	19.418	13.901	64.222	6.882	3
35	18.466	14.155	8.671	2.196	12
36	17.577	13.647	137.156	6.049	1
37	18.021	13.52	41.784	4.982	38
38	18.339	12.631	142.199	6.166	15
39	17.323	12.504	65.716	3.533	11
40	20.434	15.806	127.618	8.615	13
41	20.498	17.457	115.048	7.365	38
42	19.99	18.029	118.966	0.012	18
43	19.609	18.156	48.051	3.821	41
44	20.561	18.219	35.874	9.121	14
45	20.117	18.283	2.485	0.424	26
46	20.434	18.537	132.408	8.447	4
47	18.466	17.838	58.207	4.44	11
48	18.212	18.283	36.255	7.954	9
49	18.466	18.664	140.644	8.295	26
50	18.148	16.505	99.59	6.09	20
51	16.688	18.092	103.09	8.156	6
52	18.593	21.648	126.239	9.517	13
53	19.863	21.331	75.529	9.178	28
54	20.117	21.775	51.546	2.22	27
55	19.482	21.966	17.833	0.074	4
56	18.91	22.474	122.979	4.101	2
57	20.117	22.728	3.645	7.823	12
58	20.371	23.045	124.747	6.483	16
59	20.561	23.553	119.319	7.372	24
60	18.974	24.125	61.119	8.219	10
61	18.974	24.569	127.812	2.27	32
62	19.164	24.696	74.306	8.537	19
63	20.561	24.696	36.269	0.361	18
64	21.577	21.394	126.294	2.115	10
65	16.37	26.982	10.968	2.311	9
66	17.069	27.046	52.438	1.002	12
67	17.64	27.49	72.733	0.99	42
68	17.069	27.744	45.218	2.549	30
69	17.64	27.998	119.961	1.574	8
70	18.72	30.665	66.986	3.298	33
71	18.529	30.03	146.971	2.079	4
72	18.72	29.967	135.012	7.58	37
73	18.974	29.967	133.455	3.376	7
74	22.149	29.713	141.818	6.925	11
75	21.958	29.395	74.461	1.302	35
76	22.466	28.887	64.369	7.763	41
77	18.91	28.697	98.028	3.011	25
78	22.022	28.443	62.892	5.071	15
79	19.037	28.189	146.557	3.611	23
80	18.72	28.189	115.769	7.716	31
81	20.117	27.617	1.782	1.231	28
82	19.037	26.982	129.54	6.169	39
83	19.545	25.839	93.739	4.367	40
84	20.561	25.776	90.646	5.596	13
85	20.942	25.649	17.701	8.469	16
86	21.958	24.76	23.638	6.761	27
87	25.895	29.903	127.854	9.341	38
88	26.086	29.903	39.661	5.939	39
89	25.07	30.03	143.44	3.224	11
90	28.943	30.475	107.548	3.204	1
91	28.943	30.03	106.391	6.569	1
92	29.07	29.713	2.284	9.61	28
93	30.277	30.475	112.299	7.266	2
94	27.927	28.125	119.109	6.761	21
95	22.276	28.125	102.29	2.538	35
96	25.832	27.998	69.522	0.738	30
97	25.959	27.744	8.296	5.865	31
98	25.07	27.744	59.542	6.389	9
99	27.229	27.554	96.447	5.774	29
100	26.149	27.49	136.669	8.339	18
101	28.88	27.3	58.991	4.959	2
102	32.118	27.3	81.725	5.473	32
103	31.42	27.173	7.305	0.84	25
104	27.546	26.982	70.094	8.192	35
105	24.562	26.982	72.259	7.031	37
106	25.705	26.22	32.496	0.211	17
107	27.229	26.22	125.044	2.987	5
108	33.642	26.22	42.336	5.615	37
109	29.007	26.157	18.195	0.76	31
110	31.356	26.03	76.034	3.642	24
111	27.102	25.966	59.543	2.428	16

Node ID	x	y	z	r_i	demand
112	27.165	25.458	104.784	2.59	31
113	28.88	25.331	116.966	8.431	25
114	28.499	25.141	57.61	1.031	36
115	22.974	25.141	19.537	2.625	31
116	26.086	24.95	59.469	5.746	36
117	32.245	24.887	125.449	2.188	11
118	26.911	24.76	115.286	7.931	16
119	28.753	24.379	51.035	0.74	5
120	25.006	24.188	94.535	1.627	33
121	24.308	23.998	113.458	2.157	31
122	28.753	23.998	106.929	1.239	23
123	31.293	23.68	29.18	6.085	39
124	25.832	23.68	109.484	9.355	27
125	24.943	23.68	69.938	9.291	35
126	27.8	23.617	42.03	6.658	3
127	23.355	23.553	9.247	6.4	37
128	26.149	23.172	91.657	0.891	29
129	29.261	23.045	43.901	3.259	43
130	28.054	22.918	87.821	3.972	28
131	25.832	22.918	24.535	6.514	12
132	28.245	22.855	90.204	6.887	22
133	28.626	22.791	23.223	9.57	10
134	27.991	22.601	101.939	0.551	36
135	26.911	22.601	75.564	7.439	30
136	27.546	22.537	91.326	5.492	31
137	29.134	22.537	96.334	0.024	17
138	23.482	22.41	74.725	8.804	19
139	29.07	22.347	101.831	8.48	8
140	31.356	22.347	59.353	9.352	42
141	29.261	22.283	32.908	1.411	42
142	34.341	22.029	122.727	7.918	4
143	28.816	21.902	78.963	4.368	34
144	26.022	21.902	22.93	6.288	42
145	27.102	21.648	79.965	0.659	32
146	27.927	21.458	117.97	1.027	10
147	28.245	21.331	19.247	3.596	18
148	24.244	21.077	52.586	4.835	4
149	28.689	21.013	29.015	0.24	39
150	34.341	21.013	142.761	9.585	11
151	26.149	20.886	38.979	5.887	8
152	30.785	20.823	44.268	6.267	1
153	25.895	20.759	90.426	0.152	26
154	24.879	20.632	106.077	4.555	36
155	27.356	20.632	65.916	8.262	13
156	34.468	20.442	147.277	9.777	36
157	33.515	20.315	142.968	2.143	17
158	26.276	20.188	119.025	3.614	21
159	26.975	20.061	22.417	0.272	31
160	24.879	19.934	139.42	4.656	35
161	26.848	19.743	76.594	9.863	40
162	24.625	19.68	11.726	9.202	33
163	31.356	19.68	141.631	4.172	21
164	33.96	19.68	39.41	7.146	13
165	27.483	19.616	74.587	4.477	42
166	27.229	19.616	102.004	0.171	32
167	32.309	19.553	108.506	9.666	26
168	29.705	19.426	70.279	2.488	11
169	24.752	19.362	96.308	9.904	1
170	25.133	19.235	120.496	5.738	12
171	29.261	19.172	68.315	3.212	1
172	24.943	19.108	0.303	0.6	1

Node ID	x	y	z	r_i	demand
173	26.149	19.045	2.783	0.291	4
174	25.197	18.918	59.354	4.006	2
175	25.895	18.918	46.48	7.438	15
176	34.087	18.918	64.082	9.955	34
177	36.436	18.918	131.64	5.753	25
178	27.864	18.854	16.375	5.87	42
179	26.594	18.854	52.883	6.988	30
180	24.943	18.791	91.664	4.875	26
181	29.578	18.791	116.421	1.065	40
182	34.595	18.791	106.414	4.79	15
183	30.531	18.664	72.004	6.676	6
184	27.737	18.664	80.683	7.927	22
185	27.102	18.664	121.623	5.391	37
186	32.372	18.537	39.944	3.113	38
187	33.261	18.537	71.995	7.388	7
188	27.356	18.473	143.695	1.404	8
189	24.943	18.346	64.008	3.687	39
190	32.69	18.346	2.359	1.033	3
191	33.071	18.346	97.156	7.578	2
192	33.642	18.346	49.307	5.973	33
193	26.721	18.283	80.536	8.04	10
194	33.515	18.219	27.24	4.061	20
195	34.722	18.219	109.051	0.084	34
196	28.689	18.156	16.722	4.491	43
197	28.118	18.092	12.931	9.723	37
198	33.515	18.029	124.645	3.593	27
199	32.944	17.965	22.768	2.152	2
200	25.451	17.965	131.595	5.492	40
201	31.102	17.775	23.735	2.111	1
202	31.61	17.775	32.188	4.415	37
203	32.817	17.775	101.585	7.615	36
204	33.388	17.584	48.735	0.393	39
205	29.959	17.584	8.664	6.004	29
206	31.991	17.203	67.188	2.464	35
207	30.023	17.203	33.037	0.175	39
208	26.34	17.203	39.025	3.101	29
209	25.07	17.076	49.249	5.925	34
210	29.642	17.076	106.306	3.024	22
211	30.594	17.076	65.103	5.185	20
212	30.975	17.076	111.068	3.584	4
213	36.436	17.076	35.413	2.007	18
214	28.054	17.013	121.063	8.339	31
215	25.832	16.949	91.413	3.416	13
216	30.785	16.949	44.302	7.677	25
217	28.943	16.886	125.854	0.628	19
218	31.483	16.822	46.955	9.589	28
219	32.182	16.632	75.383	9.605	43
220	31.991	16.632	118.575	2.73	13
221	27.292	16.632	106.393	9.708	12
222	29.515	16.505	21.691	0.121	13
223	24.308	16.441	56.035	3.717	7
224	25.07	16.314	3.298	2.3	28
225	35.992	16.314	18.057	6.3	39
226	31.356	16.251	69.04	5.882	18
227	30.785	16.251	71.611	3.205	10
228	30.594	16.251	121.669	2.691	39
229	27.737	16.251	47.666	9.503	41
230	29.134	16.187	10.819	3.747	34
231	33.071	16.187	80.531	6.12	35
232	31.356	16.06	129.885	3.559	26
233	30.15	16.06	32.059	8.901	36

Node ID	x	y	z	r_i	demand
234	24.244	15.997	28.696	8.356	5
235	28.308	15.933	3.524	3.661	40
236	32.944	15.933	144.54	2.412	34
237	31.293	15.806	105.367	3.238	14
238	33.769	15.679	145.826	3.318	32
239	26.149	15.679	137.044	9.977	12
240	29.324	15.489	136.921	9.524	39
241	30.462	15.473	131.052	6.788	42
242	30.722	15.473	90.573	0.772	24
243	30.982	15.473	49.591	9.722	39
244	31.242	15.473	19.727	0.426	10
245	31.502	15.473	118.128	5.299	4
246	31.762	15.473	67.554	7.919	43
247	32.022	15.473	29.854	6.4	32
248	32.282	15.473	127.6	0.309	8
249	32.542	15.473	89.387	5.858	38
250	32.802	15.473	97.861	3.005	7
251	33.062	15.473	78.089	7.07	35
252	33.322	15.473	140.664	2.231	42
253	33.582	15.473	147.748	0.316	21
254	27.229	15.362	116.263	4.245	32
255	30.657	15.246	48.98	4.816	7
256	31.112	15.246	13.662	8.972	6
257	31.372	15.246	104.804	6.866	37
258	31.632	15.246	15.179	4.737	7
259	31.892	15.246	4.139	6.832	34
260	32.152	15.246	27.742	4.552	13
261	32.412	15.246	88.024	8.256	8
262	32.672	15.246	60.724	2.909	19
263	32.932	15.246	4.376	6.384	42
264	33.452	15.246	111.765	2.23	32
265	24.371	15.235	126.557	7.737	29
266	29.642	15.108	43.621	5.237	18
267	27.419	15.044	35.984	7.778	24
268	24.308	15.044	33.546	9.423	28
269	34.135	14.986	84.727	7.609	38
270	29.975	14.921	90.476	2.292	38
271	28.245	14.854	144.187	5.84	8
272	30.202	14.791	95.605	5.659	29
273	33.907	14.791	115.865	0.855	28
274	34.135	14.726	38.301	3.323	6
275	28.372	14.663	135.085	8.657	41
276	26.086	14.663	104.115	1.968	2
277	29.975	14.661	145.197	0.642	37
278	31.047	14.661	110.232	2.465	5
279	31.307	14.661	68.868	1.899	6
280	31.567	14.661	34.796	2.638	2
281	31.827	14.661	58.532	8.515	5
282	32.087	14.661	75.705	1.421	24
283	32.347	14.661	129.857	7.755	31
284	32.607	14.661	52.963	4.485	33
285	32.867	14.661	131.697	8.465	31
286	33.127	14.661	132.624	2.812	42
287	34.135	14.466	84.176	7.813	18
288	30.787	14.466	78.121	9.289	12
289	31.177	14.433	6.693	9.897	1
290	31.437	14.433	67.041	8.72	12
291	31.697	14.433	93.007	8.117	24
292	31.957	14.433	102.967	4.494	19
293	32.217	14.433	117.304	0.628	20
294	32.477	14.433	75.823	7.82	25

Node ID	x	y	z	r_i	demand
295	32.737	14.433	86.615	4.264	29
296	29.007	14.409	30.293	6.619	33
297	26.911	14.409	89.199	5.204	2
298	29.975	14.401	55.717	4.095	31
299	33.322	14.401	29.372	5.546	33
300	24.371	14.346	43.342	7.57	35
301	33.907	14.336	141.111	1.948	14
302	33.095	14.271	36.737	9.731	31
303	30.202	14.271	77.775	0.592	39
304	25.832	14.219	61.701	0.235	25
305	30.787	14.206	147.62	3.808	19
306	34.135	14.206	54.088	1.632	5
307	32.835	14.173	77.958	0.155	20
308	31.275	14.173	56.999	1.24	34
309	29.975	14.141	17.903	0.982	2
310	33.322	14.141	54.817	3.297	18
311	32.372	14.092	41.845	6.932	6
312	31.991	14.092	145.487	3.28	24
313	31.015	14.076	113.16	6.371	31
314	33.907	14.076	24.403	0.382	25
315	34.404	14.028	139.514	9.888	32
316	29.515	14.028	97.711	5.055	43
317	30.202	14.011	102.151	8.617	32
318	33.095	14.011	61.011	2.901	24
319	34.135	13.946	120.705	7.157	29
320	30.787	13.946	28.148	7.399	32
321	31.61	13.901	20.326	7.404	3
322	29.975	13.881	149.391	2.974	9
323	33.322	13.881	49.4	0.777	40
324	29.388	13.838	84.576	7.053	25
325	28.753	13.838	102.669	1.257	39
326	31.015	13.816	44.684	1.481	21
327	33.907	13.816	122.673	8.76	17
328	31.399	13.754	2.704	6.233	15
329	30.202	13.751	40.213	8.941	27
330	33.095	13.751	14.049	7.425	33
331	34.135	13.686	10.417	4.602	27
332	30.787	13.686	41.698	6.343	14
333	27.991	13.647	44.302	2.618	19
334	35.992	13.647	125.389	9.144	20
335	33.322	13.621	122.895	7.179	6
336	29.975	13.621	83.535	8.631	41
337	31.015	13.556	83.741	2.877	38
338	33.907	13.556	148.567	0.805	21
339	32.69	13.52	54.423	0.287	22
340	29.197	13.52	74.598	8.532	26
341	28.372	13.52	60.757	4.868	12
342	30.202	13.491	28.883	9.735	36
343	33.095	13.491	38.538	0.844	15
344	28.753	13.457	65.491	9.22	30
345	30.787	13.426	19.207	9.125	9
346	34.135	13.426	109.486	8.117	3
347	34.849	13.393	93.121	6.061	29
348	29.705	13.393	23.437	8.359	16
349	29.975	13.361	103.951	8.8	33
350	33.322	13.361	37.986	9.946	30
351	29.134	13.33	42.125	6.084	27
352	31.015	13.296	40.037	5.495	23
353	33.907	13.296	83.348	9.748	6
354	33.095	13.231	40.765	6.668	23
355	32.436	13.231	35.38	5.906	10

Node ID	x	y	z	r_i	demand
356	30.202	13.231	95.497	0.532	20
357	29.578	13.203	105.988	0.362	12
358	31.547	13.203	92.722	3.992	9
359	30.787	13.166	3.014	1.867	40
360	34.135	13.166	82.509	1.621	40
361	36.119	13.139	51.404	3.085	33
362	33.322	13.101	119.477	6.817	31
363	29.975	13.101	114.777	5.333	35
364	31.015	13.036	5.79	5.03	39
365	33.907	13.036	49.61	3.305	6
366	33.095	12.971	48.557	2.042	3
367	30.202	12.971	61.507	8.778	13
368	28.499	12.949	46.85	0.524	38
369	28.753	12.949	99.196	9.829	30
370	29.007	12.949	137.787	8.697	26
371	35.42	12.949	84.367	1.498	41
372	34.135	12.906	3.426	0.387	40
373	30.787	12.906	76.252	6.569	32
374	31.737	12.885	98.954	5.959	24
375	33.322	12.841	4.069	4.98	15
376	29.975	12.841	90.667	8.339	11
377	31.015	12.776	72.117	4.762	8
378	33.907	12.776	139.011	9.552	23
379	33.095	12.711	107.498	5.532	43
380	30.202	12.711	66.602	9.036	36
381	27.673	12.695	125.598	3.999	36
382	30.787	12.646	75.914	0.184	29
383	34.135	12.646	86.486	4.083	15
384	26.022	12.631	109.182	1.625	13
385	31.275	12.613	107.178	5.931	38
386	32.835	12.613	75.794	0.955	6
387	33.322	12.581	100.045	6.265	25
388	29.975	12.581	76.539	3.034	24
389	28.816	12.568	71.763	3.752	29
390	27.927	12.568	120.417	0.363	32
391	25.578	12.568	43.273	5.855	39
392	31.015	12.516	61.408	8.72	25
393	33.907	12.516	116.73	2.372	26
394	34.785	12.504	141.232	9.071	10
395	30.202	12.451	21.726	0.019	21
396	29.197	12.441	103.553	7.211	31
397	28.181	12.441	28.249	9.321	31
398	25.197	12.441	114.729	9.295	10
399	30.787	12.386	130.829	7.465	11
400	34.135	12.386	7.828	5.584	22
401	32.932	12.353	108.278	3.826	9
402	32.672	12.353	81.337	8.34	19
403	32.412	12.353	94.929	7.931	20
404	32.152	12.353	82.503	7.264	31
405	31.892	12.353	146.679	3.015	1
406	31.632	12.353	111.341	8.922	28
407	31.372	12.353	15.396	3.954	31
408	29.975	12.321	39.763	7.85	37
409	33.322	12.321	95.076	0.752	2
410	28.816	12.25	22.231	9.823	18
411	30.982	12.126	111.418	5.546	8
412	31.242	12.126	17.355	5.83	15
413	31.502	12.126	74.715	9.301	16
414	31.762	12.126	11.712	6.006	29
415	32.022	12.126	9.107	7.596	18
416	32.282	12.126	74.654	3.133	22

Node ID	x	y	z	r_i	demand
417	32.542	12.126	4.969	1.441	20
418	32.802	12.126	77.71	6.243	14
419	33.062	12.126	22.872	4.87	39
420	34.135	12.126	105.614	8.535	41
421	25.895	12.123	19.556	4.686	8
422	25.705	12.123	93.472	8.029	9
423	29.975	12.061	16.621	7.414	37
424	30.202	11.996	64.142	1.233	21
425	33.907	11.996	124.886	7.29	13
426	34.595	11.996	135.081	4.778	8
427	34.849	11.996	64.173	7.912	5
428	26.594	11.933	126.917	0.605	19
429	34.135	11.866	136.659	1.771	30
430	29.388	11.804	105.494	6.15	19
431	29.975	11.801	40.794	8.467	5
432	30.657	11.541	18.351	6.88	15
433	31.177	11.541	103.36	1.55	28
434	31.437	11.541	78.241	2.677	41
435	31.697	11.541	138.673	4.577	6
436	31.957	11.541	90.999	8.595	11
437	32.217	11.541	36.145	0.2	25
438	32.477	11.541	107.287	3.772	30
439	32.737	11.541	92.508	5.142	40
440	32.997	11.541	6.26	0.865	29
441	33.452	11.541	6.941	4.46	15
442	29.261	11.425	96.137	8.741	35
443	30.527	11.313	94.769	2.614	24
444	30.787	11.313	10.711	9.249	11
445	31.047	11.313	78.28	6.138	13
446	31.307	11.313	71.461	7.443	36
447	31.567	11.313	0.396	7.667	4
448	31.827	11.313	19.849	3.091	5
449	32.087	11.313	118.866	9.723	21
450	32.347	11.313	110.138	0.438	7
451	32.607	11.313	43.742	7.65	32
452	32.867	11.313	21.273	1.814	2
453	33.127	11.313	0.11	2.902	39
454	33.387	11.313	58.128	9.319	19
455	33.647	11.313	7.765	0.027	24
456	27.419	11.298	96.166	1.537	8
457	28.626	11.234	75.345	4.284	9
458	30.658	10.98	44.543	9.268	8
459	30.34	10.917	88.584	4.723	4
460	28.753	10.79	11.577	0.508	19
461	27.927	10.409	29.559	7.95	39
462	29.007	10.282	76.107	4.077	8
463	28.372	10.218	25.305	4.687	20
464	29.451	10.155	5.592	0.94	35
465	28.626	10.091	52.872	7.98	15
466	29.388	8.313	137.407	3.288	20
467	30.721	9.329	106.333	3.502	18
468	30.594	9.52	26.782	7.585	39
469	30.34	9.647	108.046	1.289	13
470	30.658	9.71	56.048	8.685	42
471	30.912	9.901	131.507	0.974	33
472	32.055	9.837	66.681	5.02	23
473	34.087	8.758	8.639	5.137	18
474	34.595	9.202	128.931	3.337	12
475	35.103	10.155	111.634	3.418	24
476	33.642	10.155	35.22	3.353	1
477	33.833	10.282	23.21	9.452	9

Node ID	x	y	z	r_i	demand
478	34.976	10.282	131.121	4.446	25
479	33.96	10.536	22.989	7.536	23
480	32.944	10.536	54.126	3.833	25
481	35.166	10.726	7.803	5.004	28
482	32.182	10.98	18.901	7.118	28
483	35.674	11.044	107.474	6.002	15
484	35.547	11.234	131.369	6.26	14
485	33.96	11.234	59.829	9.284	22
486	35.484	11.425	66.484	2.932	22
487	35.293	11.552	21.184	5.688	9
488	34.087	11.615	26.904	4.861	32
489	34.722	11.742	108.413	0.519	25
490	36.944	13.012	57.936	3.218	43
491	37.452	12.758	72.01	1.986	33
492	37.452	10.218	146.804	4.761	24

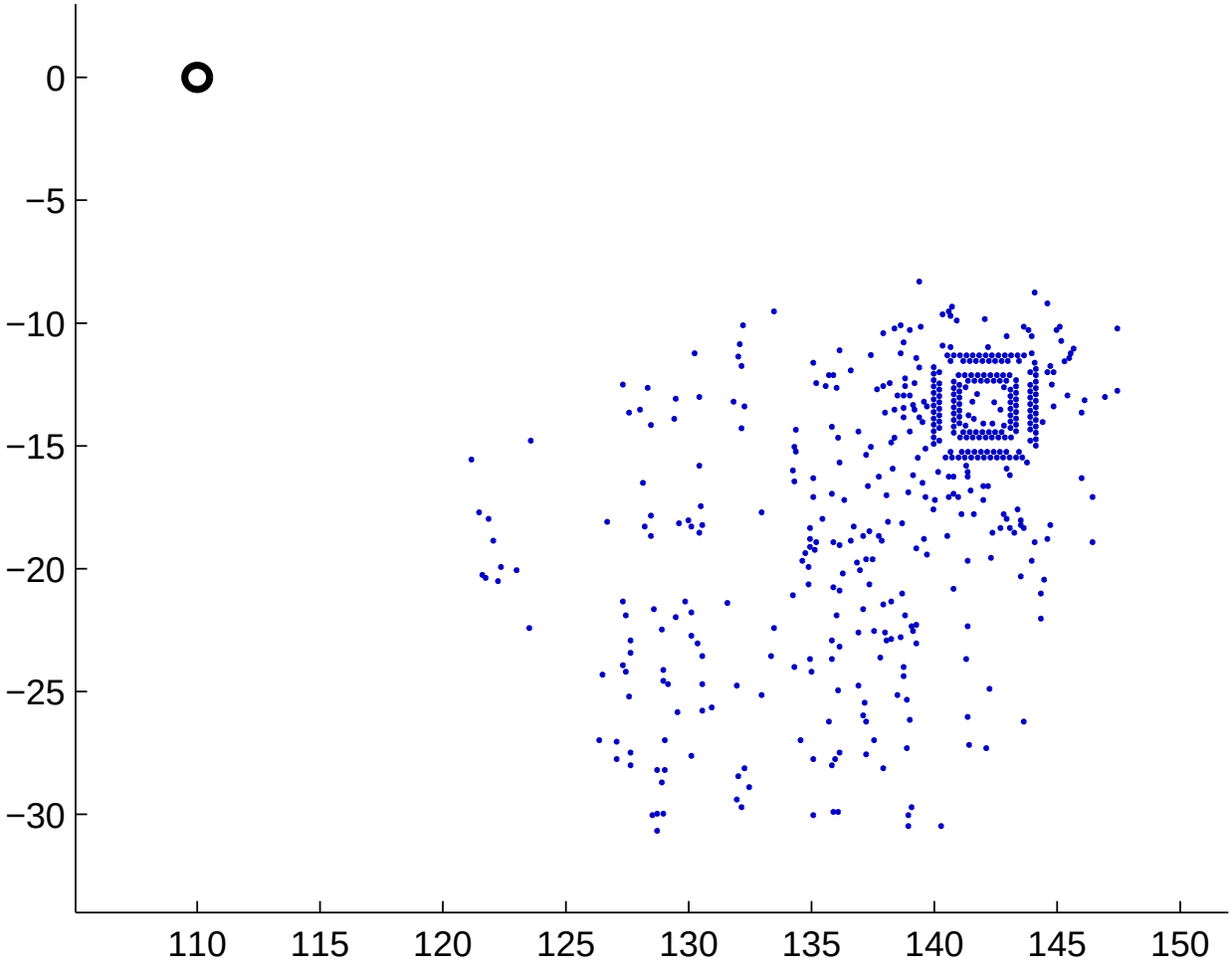


Figure L.26: d493

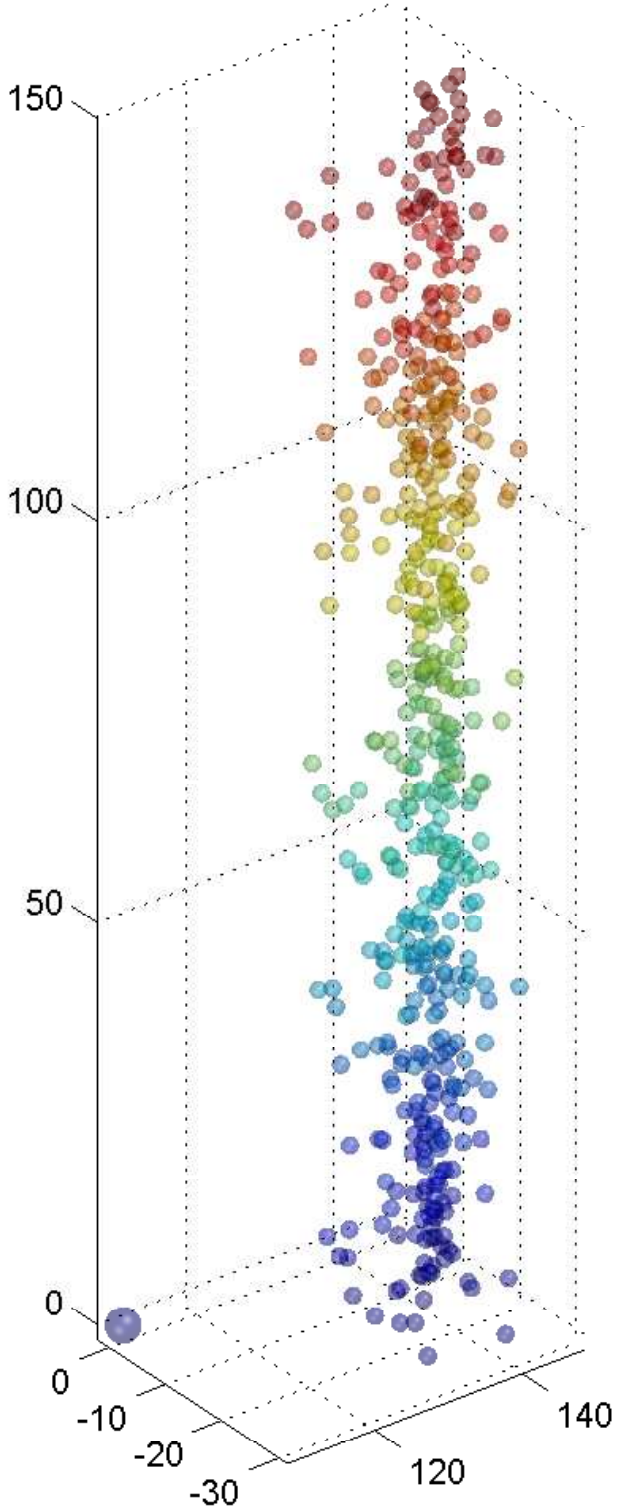


Figure L.27: d493_3D

Table L-14: dsj1000

n:	1000
Overlap Ratio: 0.02	r: 2.429218
Overlap Ratio: 0.10	r: 12.14609
Overlap Ratio: 0.30	r: 36.43827
Description:	clustered
Total Demand:	76422
Max Vehicle Capacity:	10000
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	47.1287	11.9659	0	-	-
1	98.1036	50.8139	41.2796	1.1045	3
2	53.412	-4.2453	38.3008	16.6165	145
3	57.7878	-4.3732	24.6962	27.1183	24
4	53.289	-9.6645	34.2743	25.3042	138
5	20.5322	21.5891	20.6595	28.8292	83
6	22.5923	19.795	49.1879	27.7634	57
7	6.9842	66.7632	27.251	0.6443	64
8	39.1965	105.4524	44.823	4.0584	13
9	31.0065	-1.0714	59.1851	23.9753	96
10	24.7401	75.4523	49.5075	27.8452	65
11	21.7951	21.835	45.5134	24.0928	31
12	44.3097	5.4051	59.4302	11.9467	10
13	4.7342	63.0935	56.3188	4.7706	66
14	31.7515	71.3679	39.9054	28.4179	138
15	30.1816	102.1772	4.0412	8.5674	53
16	95.0864	33.2234	41.4865	27.2565	120
17	27.6433	72.5657	51.9251	2.8004	45
18	92.1801	41.0349	29.4683	29.4376	44
19	55.5508	6.709	40.6861	3.2447	64
20	40.9959	37.9409	51.1587	12.8365	104
21	96.8097	54.0588	2.5941	13.9289	31
22	4.0089	72.186	49.5614	2.2824	134
23	70.2011	52.705	34.7749	12.1835	127
24	72.6191	32.6684	16.6889	20.9501	6
25	99.0428	19.6959	54.528	17.7192	119
26	38.189	100.3805	31.8594	26.8425	47
27	40.9527	105.6227	4.1926	16.0561	90
28	67.5609	49.631	28.0783	13.5732	50
29	97.1071	18.8552	9.2302	18.2973	96
30	93.2494	81.8793	2.8544	4.3234	116
31	93.6083	38.4774	26.0941	16.8124	49
32	83.5076	51.7826	22.7284	1.0852	85
33	12.0444	66.3239	28.7604	13.9456	148
34	64.8516	39.5774	48.8657	16.3435	125
35	40.2323	12.6508	42.5989	15.4062	34
36	30.7839	5.7178	56.2846	20.1469	141
37	39.7333	98.7582	4.2197	18.7088	68
38	31.4281	94.9219	54.3744	25.0918	33
39	10.5042	66.7806	23.1982	12.8873	117
40	100.6036	46.802	22.0951	2.256	66
41	47.3356	31.1656	48.6863	22.3253	8
42	97.0499	25.7334	20.6225	22.9168	21
43	91.9732	45.8332	46.1527	12.7139	150
44	103.3956	43.6231	38.3961	9.5596	9
45	93.4265	31.4744	1.0443	21.1215	127
46	23.9142	5.5856	8.3806	20.6816	137
47	72.0304	52.5053	58.0692	20.8079	119
48	48.0764	105.8084	10.3389	0.9653	131
49	97.0063	39.6578	31.3742	6.2182	7
50	54.3132	33.4794	38.814	25.0485	74
51	75.5587	49.1352	25.3998	7.8556	82
52	97.5653	74.5618	43.9951	26.0912	96
53	27.2842	5.8331	28.3822	18.4271	150
54	53.7123	16.59	54.3027	19.1512	102
55	51.9742	12.9315	39.5168	19.8738	118
56	3.5924	94.7451	26.9481	6.9732	114
57	106.4442	49.0895	9.9061	0.5602	128
58	48.9393	11.7496	40.9103	17.8826	103
59	63.132	27.7543	33.1939	11.7407	128
60	26.1674	96.1159	30.3905	22.0166	11
61	53.4617	5.8056	38.0578	21.7012	91
62	69.1689	51.2673	37.9561	13.4858	23
63	18.2654	71.5277	59.9496	0.7001	46
64	94.5838	45.9916	57.9488	12.3529	97
65	62.7821	-0.0838	27.7653	4.3251	69
66	102.211	28.3893	55.4005	3.0468	82
67	45.8725	14.3747	21.2711	19.0119	41
68	27.3755	-1.0984	56.1861	2.359	39
69	29.376	80.5861	55.9809	14.4218	104
70	46.6598	16.011	21.0885	13.039	65
71	90.6179	26.4649	2.7134	21.9514	36
72	71.2619	53.5794	21.4252	11.3066	79
73	24.0847	21.2619	9.4135	18.4856	120
74	99.3782	93.0601	2.9898	23.8531	118
75	32.2034	92.5655	35.5696	28.0393	54
76	95.46	44.379	21.4845	10.525	17
77	99.5817	52.1789	51.8005	22.5087	33
78	26.7943	-2.6353	5.1743	24.1177	18
79	67.4673	33.2544	9.192	16.5328	82
80	97.816	74.8015	47.4482	15.0437	113
81	35.3466	107.7036	41.395	0.412	73
82	37.1788	95.0118	52.8478	2.6206	150
83	77.9223	44.6051	30.7678	3.0325	25
84	52.5136	31.162	22.8965	28.7958	36
85	102.6402	60.9181	59.3218	29.8857	145
86	61.9524	-0.333	11.9086	23.4378	147
87	64.4232	44.0581	27.3148	28.7966	87
88	19.8821	27.2321	11.7559	8.0149	36
89	28.099	29.8348	27.0633	0.9117	94
90	47.5893	27.8934	1.3329	19.7112	110
91	29.1897	96.4145	23.036	0.5229	52
92	47.6091	10.2274	48.878	11.8474	147
93	3.4538	93.5151	43.6356	19.9908	116
94	98.5493	33.1624	37.7737	15.8362	12
95	2.5533	99.1767	7.9857	13.4676	141
96	102.9016	24.8202	19.8795	1.7694	59
97	104.1034	98.3317	9.2012	13.8815	73
98	92.288	83.6157	17.9977	16.0638	88
99	75.4748	37.8532	8.3059	28.9661	103
100	19.3676	20.9011	45.1036	22.1053	56
101	26.9511	99.1097	54.9389	22.0884	34
102	60.8351	33.4935	47.8851	6.3537	126
103	22.1344	71.2137	11.8857	6.3651	141
104	94.0795	80.8773	41.7611	27.9293	102
105	3.5503	90.3653	48.0124	9.6646	91
106	19.4163	-0.8394	2.2943	2.1538	59
107	45.9581	33.5048	45.1742	9.009	125
108	33.1638	109.6815	28.6324	13.4189	33
109	53.8796	31.7093	51.2249	3.1598	85
110	50.5069	12.3029	52.6774	19.1593	57
111	70.6191	48.182	36.9413	10.2546	36

Node ID	x	y	z	r_i	demand
112	97.4314	81.946	52.8698	7.1176	25
113	33.517	80.8699	6.7304	7.8126	133
114	77.4079	49.147	51.5989	24.2468	109
115	72.7757	56.7077	5.4576	24.2193	131
116	46.9054	30.8841	31.5685	23.9447	127
117	98.2345	80.86	27.262	27.4352	144
118	63.5739	32.9982	33.2424	17.0906	100
119	55.9782	19.9329	26.5423	2.6736	30
120	86.5983	36.2039	44.7429	13.6175	126
121	56.6229	3.2945	52.4352	3.6572	52
122	94.5355	44.3621	59.1041	13.4241	145
123	34.3074	104.3145	33.9426	24.0514	106
124	45.6407	35.658	2.8521	25.0567	85
125	93.0994	86.3608	2.8092	27.9466	47
126	46.503	16.5426	2.0548	0.2542	40
127	58.5931	27.1316	32.5338	12.8934	111
128	7.8142	89.6258	27.2865	2.0055	14
129	22.8762	75.7017	33.805	22.7687	135
130	64.1748	30.2745	31.4674	28.016	70
131	26.55	96.735	54.3574	21.6617	92
132	-1.8619	98.5581	36.524	15.9681	21
133	43.7681	7.8375	35.3656	19.4193	70
134	65.7303	47.3671	58.4265	12.9967	78
135	20.7311	19.0512	39.2565	27.1888	91
136	103.9916	60.6173	50.4601	27.4308	144
137	50.1654	34.298	41.7388	3.7703	103
138	80.8872	43.1227	9.5119	14.1296	70
139	97.9141	29.0493	9.3885	23.1555	41
140	96.2582	32.5713	56.693	16.7348	141
141	85.8477	60.7859	54.7762	18.5843	38
142	68.2062	28.5319	10.0866	2.9167	118
143	101.8123	94.891	12.8509	1.3025	128
144	55.5686	2.3786	41.1094	17.8085	124
145	89.5287	45.4109	8.5583	3.6829	42
146	37.3296	94.7968	3.7833	26.3816	99
147	-0.3116	97.6012	28.6474	20.2615	18
148	61.7542	11.527	18.9198	4.9252	107
149	73.5268	49.2611	4.4383	16.8647	144
150	95.4724	61.7777	41.2303	4.4248	37
151	56.514	2.6652	55.8183	22.7885	54
152	89.2688	56.3248	44.4917	12.5008	143
153	91.1677	84.1211	45.979	16.3324	56
154	107.981	80.0957	12.6444	26.4329	146
155	77.8264	55.5164	53.7679	14.0686	90
156	41.9974	13.5778	7.3366	24.1613	29
157	51.1106	98.2963	5.5983	24.3822	128
158	68.2826	55.0673	33.7791	4.1147	81
159	53.4554	15.0784	17.1477	7.1719	82
160	25.4767	75.481	0.001	1.9623	115
161	34.0163	93.2553	22.3961	18.0121	123
162	50.8592	31.2824	4.4654	23.4486	72
163	57.9508	29.6187	7.6435	14.7612	11
164	96.156	30.1327	19.1399	15.6026	76
165	49.3862	17.5735	5.4967	29.4535	145
166	50.1386	26.6573	56.0437	9.4164	1
167	46.3909	8.819	37.7186	24.8054	41
168	33.839	67.1668	7.1332	20.2124	41
169	96.5235	92.1962	47.4754	1.8611	26
170	71.0505	50.768	8.8572	14.6692	133
171	36.7928	9.6586	58.8057	12.2244	133
172	106.1692	29.0085	43.7624	2.1859	72

Node ID	x	y	z	r_i	demand
173	57.7618	2.6586	23.6599	24.3155	21
174	56.8778	27.618	56.4108	8.9898	100
175	12.0097	66.7734	42.888	5.0159	5
176	43.984	9.2005	15.6271	7.1984	68
177	40.065	98.6098	6.7408	21.6771	71
178	94.4072	76.9857	34.4342	17.5737	49
179	60.463	30.4795	30.5011	7.3122	86
180	93.3823	48.5086	44.2946	29.5211	8
181	33.6792	4.7017	30.2163	13.2435	81
182	98.4258	65.8894	6.8362	20.8311	131
183	66.5887	34.1226	10.8677	18.4197	11
184	68.3701	31.308	4.6701	5.8267	81
185	28.6989	1.5656	37.4478	19.8786	85
186	72.7013	43.6681	47.6828	23.6645	95
187	19.6457	23.2311	5.559	5.0904	48
188	48.9533	90.4759	7.3728	19.0092	72
189	0.4838	63.8626	0.7436	5.7993	99
190	96.4356	62.0951	55.4366	20.9554	60
191	1.4019	97.5847	15.4849	8.9245	127
192	101.161	45.7653	49.9947	23.4902	85
193	108.656	34.8419	30.8419	3.7915	116
194	33.1881	90.5996	30.8927	12.9818	44
195	44.6028	29.9319	49.9927	0.2814	99
196	98.9521	56.5952	10.596	9.6017	128
197	63.8645	34.3723	36.4179	14.5693	89
198	8.0472	76.1743	13.1381	21.0495	114
199	91.8795	37.1845	41.8015	3.6728	48
200	96.2133	40.5576	25.5914	17.1844	84
201	9.0002	73.0359	5.8372	24.3533	96
202	106.6231	51.946	40.2003	20.5204	46
203	31.4455	71.7336	19.6874	27.0146	45
204	69.8977	54.8286	42.1718	26.5823	102
205	99.0152	86.155	1.7016	11.2918	108
206	42.0156	103.5929	44.0945	23.2765	43
207	98.9198	48.0008	44.9228	5.0724	135
208	102.4997	24.4075	19.7902	22.2451	39
209	67.5765	27.7962	32.158	15.1317	122
210	101.7295	28.4449	56.1482	24.6989	54
211	27.9452	7.0873	43.7392	24.5101	61
212	6.6701	63.5082	34.9077	29.6501	28
213	79.9479	46.2913	1.0177	20.0233	31
214	35.9551	95.9225	47.402	5.5858	15
215	-2.1508	94.1499	7.6254	24.1365	72
216	17.9606	81.6588	21.6946	21.1617	17
217	68.022	53.7678	15.3935	25.621	121
218	10.9416	69.7746	52.0032	20.3266	49
219	102.0461	86.7072	16.2393	14.3206	11
220	26.4488	5.1021	19.0029	9.3497	42
221	51.32	11.9016	40.4537	29.8963	26
222	32.4952	97.9758	48.1403	7.8091	25
223	-2.3037	90.7079	58.2529	19.8948	26
224	42.5793	100.4271	14.8388	3.5498	48
225	24.5076	73.115	4.3052	8.9241	47
226	73.2401	49.0047	54.3428	19.489	95
227	49.5432	29.0024	13.3417	8.1871	59
228	86.3374	85.7586	1.5055	11.3801	67
229	100.0845	45.3198	38.3951	20.4175	35
230	0.5802	93.7511	50.7296	6.2472	127
231	32.2488	71.8762	47.8257	10.0488	90
232	29.7064	94.0211	29.3487	26.0785	71
233	7.8039	17.6061	5.7787	13.3149	121

Node ID	x	y	z	r_i	demand
234	31.0707	1.7474	5.3999	2.3995	1
235	43.1057	91.7939	5.1823	21.808	135
236	101.2985	78.2917	28.1682	13.0659	44
237	91.0332	34.8187	52.6374	16.4532	76
238	103.6911	80.62	5.0557	12.7759	143
239	60.4167	1.4088	44.4464	18.4179	56
240	103.4615	37.3033	20.8908	18.992	89
241	59.5552	26.5288	41.5263	17.0515	116
242	48.0446	14.6778	22.9405	8.8581	15
243	96.8706	83.0827	11.4782	1.8883	71
244	52.0827	15.9727	59.9151	11.4211	45
245	92.7178	89.1801	18.823	2.5518	80
246	5.8502	91.8647	13.1882	18.0105	47
247	67.8857	28.9512	53.8343	7.9175	92
248	92.1982	53.9806	59.5699	4.0431	42
249	106.6895	31.0233	49.137	23.9388	63
250	98.2152	53.7701	7.2972	29.4627	141
251	55.3647	9.0137	38.8085	9.4748	5
252	54.6523	25.2022	31.3259	28.2307	73
253	97.0347	92.0258	44.3343	0.4301	128
254	54.2786	24.4277	59.9569	0.8349	8
255	103.8062	50.1176	9.3383	16.2282	128
256	93.9444	64.9	44.2206	23.8239	76
257	75.5201	48.6107	22.753	10.8007	148
258	24.5208	1.7631	30.0851	29.7307	131
259	85.9154	51.5363	38.6114	1.4882	76
260	92.8209	56.9207	15.4027	12.3836	24
261	22.8581	29.0039	22.5241	5.9592	86
262	89.835	77.746	1.5427	1.1998	130
263	48.6326	32.1618	43.4727	29.9479	15
264	35.4152	92.5489	58.019	4.9112	65
265	30.7482	95.8761	57.2879	28.9897	61
266	92.0851	66.8651	17.5763	14.1856	82
267	9.6606	65.5604	9.552	2.866	62
268	92.6699	80.64	42.9825	12.8577	114
269	74.8417	48.5823	43.578	11.9548	147
270	63.3607	23.5913	11.9128	24.1094	102
271	52.0306	12.0787	8.641	25.2448	81
272	25.9081	14.4892	36.1934	15.0463	27
273	45.985	27.4123	27.7797	25.7471	18
274	14.5018	68.1646	16.8217	28.3495	2
275	95.9481	74.251	38.8025	27.2231	99
276	-3.1358	95.2162	31.8855	4.3309	2
277	33.1686	108.6172	19.7963	0.5617	144
278	10.7344	66.9849	31.9545	3.0771	20
279	103.8959	45.4099	37.4639	16.5891	94
280	88.0225	60.7529	26.1198	27.571	24
281	66.949	50.6855	34.7495	0.8443	54
282	54.8257	29.6059	7.5612	17.9639	114
283	32.697	74.6737	51.2201	0.2814	121
284	42.9285	106.2179	5.6354	10.4101	78
285	97.5519	44.8528	38.2336	3.8542	10
286	61.1622	34.1592	24.5106	28.1161	9
287	98.9119	80.0767	11.0692	14.6996	19
288	55.8132	15.4408	3.6174	11.5975	51
289	56.047	-0.6998	19.4659	25.6513	139
290	93.4941	85.8189	27.3685	18.0194	77
291	85.065	35.2948	58.2863	4.702	101
292	95.4289	57.3916	42.7453	14.9929	120
293	47.4903	33.2139	54.5514	11.8665	62
294	47.2412	18.0641	21.8927	26.9311	18

Node ID	x	y	z	r_i	demand
295	27.1736	83.2653	40.5956	16.1862	131
296	91.86	79.7087	2.2114	0.6809	131
297	54.5895	27.7676	11.1642	3.8179	46
298	6.0914	73.9114	36.5077	1.8676	47
299	91.1842	48.1207	54.4953	17.5671	94
300	99.5987	51.3246	10.6347	2.5606	90
301	33.6244	92.4492	56.3457	13.8672	55
302	66.9624	36.7077	4.2616	25.6742	74
303	21.3113	31.7798	46.1078	2.2081	69
304	38.2186	96.6747	17.5328	1.6837	76
305	85.1876	33.113	2.1197	12.2337	49
306	37.9917	90.5379	9.9912	3.3721	29
307	47.9603	31.0225	36.0363	3.9403	18
308	26.4587	69.6793	44.9112	4.4461	65
309	50.5738	30.8854	25.5173	21.7078	45
310	100.5275	34.9543	58.1047	18.18	64
311	1.1743	92.9818	59.2535	22.3694	46
312	96.6284	43.246	1.131	6.0243	34
313	6.6564	74.2265	20.3804	11.3789	28
314	98.5933	78.8152	8.2256	8.4088	93
315	17.7323	26.9057	35.8248	28.6742	144
316	58.2741	0.1622	8.0145	6.0785	67
317	104.1728	96.9352	2.733	2.9606	73
318	44.7075	13.3055	33.9605	12.6011	42
319	35.7224	107.36	58.7833	11.5177	132
320	93.9524	73.145	3.1932	21.3513	3
321	98.0763	43.3554	53.563	27.4576	138
322	46.684	28.1154	34.4272	27.5206	83
323	20.8129	26.0745	22.3222	16.1762	141
324	99.0651	51.1078	59.3413	22.694	130
325	87.5583	39.2312	23.679	14.1099	102
326	56.6752	3.9284	4.2715	9.6519	64
327	64.9829	35.6055	23.509	27.8112	139
328	58.3955	-2.2935	14.9348	20.2689	107
329	105.5782	30.6326	47.1426	17.6401	133
330	22.0744	6.6433	40.1203	29.8611	40
331	106.8535	30.7643	14.4546	22.1596	104
332	95.7576	96.9635	11.4638	15.3189	59
333	42.4155	0.0668	38.5675	2.9443	138
334	58.2864	0.0731	4.559	2.2981	57
335	45.0704	101.2748	27.009	15.9718	1
336	73.6428	45.1426	7.6389	25.8084	57
337	70.0624	50.1219	34.6274	0.7325	45
338	59.4358	8.0877	8.3998	0.0349	126
339	103.8313	82.5056	7.2236	18.7916	8
340	103.0838	43.6629	35.7673	28.7382	74
341	46.213	15.3079	43.6977	3.873	21
342	41.599	92.4813	48.0171	2.9467	22
343	23.1689	25.59	48.8728	25.7524	15
344	36.4279	-4.3699	52.432	20.2708	118
345	98.9301	33.2654	27.8083	6.2044	26
346	42.0978	97.503	57.9578	9.3352	22
347	22.4229	-2.1641	56.3911	7.0873	106
348	99.9754	58.6633	29.714	10.7282	96
349	66.2863	51.2705	54.2569	7.8797	83
350	80.8076	41.6004	10.0065	22.8911	35
351	49.1677	19.2175	6.1526	29.9217	53
352	0.6138	95.4238	16.9249	17.1272	126
353	1.6453	95.7178	31.8751	2.5699	88
354	24.4797	75.354	37.647	15.2855	22
355	101.583	94.8217	23.7006	5.6707	134

Node ID	x	y	z	r_i	demand
356	95.8908	32.6754	36.0409	17.855	139
357	58.0726	3.0503	30.5544	10.1594	86
358	29.9497	8.0977	27.1858	1.6035	120
359	12.0877	66.3858	4.5331	4.791	111
360	102.0152	42.2262	11.91	18.485	21
361	9.4578	72.6847	40.961	17.4171	28
362	61.1452	36.2851	50.8184	29.605	148
363	9.17	97.1621	20.3835	26.9226	86
364	92.2396	41.0703	39.2658	23.428	19
365	40.715	18.8306	21.9165	23.0792	125
366	98.8373	99.4165	35.0062	17.0801	100
367	25.2224	21.1268	9.0297	20.0558	48
368	102.9211	31.879	13.8489	24.191	77
369	22.8228	67.5784	3.2098	16.2582	143
370	18.1963	16.0602	36.4885	17.912	86
371	19.4151	20.4264	46.5071	0.2712	134
372	99.0429	61.6589	39.3422	0.2669	7
373	96.2485	47.1277	52.4491	17.9146	107
374	48.7027	4.8736	15.3944	25.6148	70
375	42.8212	36.4305	1.5446	19.4237	102
376	73.6395	46.5004	2.2066	26.6417	81
377	43.7231	10.6871	23.6231	24.1762	65
378	95.9325	86.7596	55.1395	20.5114	68
379	62.9268	27.0211	37.7555	28.5574	118
380	47.0712	4.3382	9.7807	28.9099	110
381	40.2693	101.3043	8.6864	10.0221	51
382	40.5226	102.8002	1.3549	3.2203	43
383	19.4476	21.0876	59.2618	13.323	67
384	100.7126	88.5952	23.1233	21.6123	67
385	100.6388	53.8259	6.8403	11.1764	80
386	90.2672	64.2791	51.3539	29.5547	123
387	99.4285	63.8276	59.6975	13.2796	73
388	52.1655	19.1446	41.5432	15.5087	36
389	71.5231	31.8286	8.0149	7.639	113
390	72.9198	44.5581	6.5665	29.4271	9
391	73.911	51.0144	2.5794	19.7234	72
392	104.3693	90.8389	25.0156	29.9766	72
393	44.0393	95.7757	50.8289	16.7138	5
394	64.6914	7.7788	3.6297	22.2178	72
395	70.1037	27.3839	19.7642	17.3373	38
396	97.8831	81.9659	16.6355	26.0286	36
397	85.9182	41.843	9.5066	3.5933	121
398	97.1852	78.7831	16.5303	16.1734	27
399	26.9783	71.0141	56.5271	24.9531	15
400	73.7963	57.8273	45.2128	0.5433	148
401	48.493	25.186	47.2334	2.0582	64
402	50.0191	-2.6033	31.7826	29.6269	110
403	36.2059	6.8965	29.7476	2.2375	83
404	61.2083	54.3519	23.523	20.9342	11
405	55.4854	26.8201	32.387	10.8698	85
406	87.8413	47.1867	25.6907	18.3729	117
407	53.9006	102.5381	21.0284	26.8445	91
408	24.5354	72.6275	12.2334	5.9717	79
409	94.549	73.3405	36.7472	4.2829	43
410	15.1112	64.361	7.2726	9.0815	95
411	81.9079	40.1742	36.8216	6.2209	79
412	23.9369	61.5866	18.0383	22.0202	54
413	9.3844	71.5303	46.4336	26.9324	33
414	65.4552	32.6167	36.7679	29.012	86
415	55.9275	34.3566	30.6301	23.3784	34
416	100.6204	94.7646	50.8195	15.4911	9

Node ID	x	y	z	r_i	demand
417	98.853	91.6792	31.3431	14.5242	15
418	46.4115	30.3033	33.5708	28.1751	25
419	52.3173	10.0275	11.1526	24.0147	71
420	92.1151	81.2598	42.8198	24.5532	95
421	67.6588	29.7348	5.9837	2.8615	12
422	93.3932	53.1876	39.0419	28.8804	67
423	40.8939	84.3555	43.1765	20.2802	11
424	42.9721	90.3177	28.7365	7.6955	54
425	46.8369	6.4403	54.1626	14.1993	103
426	29.8552	101.3038	43.5974	17.7782	12
427	70.694	53.8562	23.1583	5.7549	98
428	78.0993	54.3894	50.2798	5.6239	26
429	21.1184	76.9048	10.6601	8.7289	82
430	-1.9602	93.9224	5.6614	23.076	111
431	101.1976	33.4905	53.5496	15.926	84
432	-2.5612	92.1356	23.79	25.3912	41
433	92.4623	94.734	14.7003	13.3072	9
434	67.242	26.9141	23.9429	16.4624	115
435	102.4507	89.6037	15.6617	13.3753	42
436	26.6904	96.1713	46.6576	25.5008	49
437	13.2613	67.7948	17.1077	9.5466	130
438	87.5129	47.9594	27.6836	13.3149	110
439	104.9423	23.521	33.0938	1.8836	66
440	58.8992	5.3006	6.9433	25.2792	29
441	107.8221	37.3636	42.4217	23.6325	106
442	55.089	27.0379	56.5554	20.8338	107
443	95.6122	103.8055	23.229	14.657	90
444	23.1228	16.7524	24.3445	13.0518	142
445	46.7163	23.0055	0.3229	28.4765	137
446	45.465	105.2608	3.7217	13.9094	48
447	99.6903	41.4772	23.4888	20.1453	37
448	94.0924	96.5838	56.3482	3.4463	11
449	105.6149	29.5786	27.9356	12.2754	69
450	-3.2639	94.8889	48.3647	23.5193	148
451	31.105	77.2121	42.4385	19.85	139
452	96.5473	37.5774	41.1201	13.5522	77
453	58.2987	1.8222	52.9601	22.9315	51
454	29.7849	97.5299	53.9895	6.777	77
455	88.6062	92.2681	23.9863	22.8388	45
456	12.5389	66.9051	22.2814	25.9958	99
457	13.7649	76.0563	18.1156	11.1171	126
458	49.9475	19.2284	25.6639	17.8419	27
459	103.2876	94.1817	57.6589	1.3947	17
460	28.0443	7.2557	0.5495	23.7219	16
461	46.7677	27.4481	8.8301	29.3514	82
462	58.4334	33.3219	33.0094	26.7455	125
463	21.6596	11.213	17.563	23.4533	147
464	35.5392	31.6783	58.7469	0.9079	132
465	4.7737	93.7785	6.1602	12.9549	124
466	96.8865	41.9997	31.9305	5.9999	117
467	96.8345	90.0197	42.1774	11.1201	2
468	33.7832	8.5886	57.2507	17.2676	55
469	48.302	2.6164	11.9932	1.3426	30
470	63.0749	1.8033	17.7213	22.3131	48
471	50.8742	24.2729	53.2264	23.767	73
472	73.8072	55.2741	29.1095	22.0263	40
473	-4.2807	74.2616	57.1387	26.6495	63
474	21.4132	25.3225	51.4824	11.064	9
475	42.7704	10.2739	1.2183	5.5443	114
476	19.6468	14.5775	38.07	7.1553	97
477	32.8593	93.0881	38.0081	18.3654	81

Node ID	x	y	z	r_i	demand
478	67.6648	48.1141	30.5928	12.6345	113
479	98.5859	34.5756	44.3792	9.3554	100
480	58.6228	31.6703	20.587	25.6598	35
481	24.1578	73.3792	57.4094	11.3579	53
482	14.2239	63.9607	10.3191	12.6801	73
483	26.246	7.8923	16.6585	7.1855	54
484	104.5599	87.8351	55.8078	14.6615	100
485	31.4906	71.3219	1.4719	26.6563	7
486	70.5527	57.3223	8.5137	18.2025	118
487	57.3839	0.9502	46.0215	3.1655	131
488	102.0076	93.075	9.5996	14.2567	137
489	40.2335	17.1357	30.0024	11.2782	113
490	23.4089	84.0628	5.796	9.7975	132
491	60.4719	1.0667	55.1539	17.5347	76
492	47.126	99.3914	58.8698	14.4896	61
493	69.9782	57.1009	12.9468	18.2604	130
494	80.3964	49.7264	23.6683	1.7131	114
495	98.1138	89.594	19.2781	0.7463	8
496	26.4833	65.6457	42.68	15.8608	91
497	20.5046	21.2685	13.3595	15.1676	93
498	54.7376	29.7596	56.3053	17.0277	98
499	93.9129	43.6355	26.629	15.3805	112
500	27.6562	5.4902	56.4427	8.29	37
501	42.4716	105.6496	56.7244	1.9926	99
502	37.4272	33.8061	3.3013	15.7441	20
503	60.9493	37.7343	34.646	9.1697	73
504	45.4903	38.3462	11.2293	2.3358	85
505	98.0879	44.5657	15.6818	26.354	66
506	58.6741	1.1796	4.0744	18.8015	37
507	-6.686	94.6391	7.4364	5.5087	59
508	22.6294	-1.9579	25.7184	16.8768	34
509	63.3795	20.1125	53.5518	3.6505	63
510	96.2085	41.8253	45.162	7.8844	124
511	93.6941	39.0671	28.969	9.1173	142
512	95.1558	61.2395	57.4763	27.409	108
513	73.7989	28.6287	7.3132	0.1893	100
514	93.5538	62.1822	15.7085	5.8892	29
515	42.9226	100.4615	26.2167	4.0129	147
516	19.0397	19.3917	26.8913	27.4702	76
517	52.7074	28.2489	52.4902	1.3637	144
518	39.6285	91.4521	58.9959	19.1143	81
519	55.1607	27.7715	51.8295	18.2237	54
520	35.4006	103.6799	50.1937	1.122	10
521	98.8606	57.9963	4.7298	15.8873	23
522	29.2451	9.0499	23.6495	5.6713	59
523	29.3468	93.7461	14.2413	24.255	134
524	102.1595	55.9791	16.6639	15.0641	9
525	14.0233	68.3418	48.6515	20.9704	38
526	47.5448	13.9665	39.1563	6.8471	141
527	70.4096	46.4113	26.9931	21.9243	11
528	93.9312	28.9768	31.8553	14.5805	57
529	56.2795	36.0371	23.7369	11.477	147
530	26.4747	67.9787	32.7219	12.3016	114
531	73.2283	44.0709	14.6285	10.2788	49
532	90.4865	46.0315	39.3528	3.9724	58
533	88.0687	81.4777	36.1559	18.8265	144
534	102.8738	56.4102	20.1678	11.5644	86
535	70.1344	58.5671	20.707	0.7142	4
536	46.0729	100.678	36.5278	0.8085	57
537	1.7661	66.5446	12.6159	26.4568	9
538	92.412	50.9961	13.3675	8.4715	109

Node ID	x	y	z	r_i	demand
539	89.3668	41.343	14.5671	15.2017	29
540	72.4429	44.8985	35.9587	21.9495	79
541	101.1477	85.2681	2.6541	21.9848	48
542	94.4828	106.1237	38.6118	9.4889	88
543	28.1717	107.4546	19.2451	16.9459	13
544	94.5987	62.0376	18.5629	22.0196	138
545	21.1889	21.267	39.0474	20.9082	124
546	33.8351	99.3235	37.4512	26.1581	134
547	96.9541	82.6989	20.5312	14.592	88
548	39.196	99.7694	49.3378	4.3434	42
549	62.0243	36.102	59.234	3.1072	110
550	98.9319	91.3958	49.6094	11.9055	35
551	98.3241	22.4412	26.657	19.863	78
552	3.1448	100.72	31.1491	20.6463	117
553	47.2642	16.1804	48.1934	3.1622	34
554	0.3096	68.1954	39.7657	12.3905	48
555	84.6532	51.7406	11.3965	13.6619	113
556	72.0385	47.603	37.589	19.8624	23
557	90.1236	40.724	54.2833	15.0486	149
558	23.1615	20.5337	28.672	18.9562	16
559	32.3564	-1.4633	20.5286	25.6089	116
560	100.6297	27.3107	24.1251	20.9684	2
561	95.9041	59.3009	4.8034	16.7412	58
562	92.749	64.7326	27.0986	21.2415	124
563	66.7168	38.698	48.2341	29.069	64
564	6.3198	96.0864	20.0555	13.0595	108
565	44.7902	101.1589	57.6534	13.5802	51
566	70.6462	49.6735	6.8503	27.2687	42
567	98.4033	39.6451	29.8224	2.523	141
568	53.589	37.6567	38.7584	4.7875	141
569	53.8048	-5.0553	19.1679	14.1877	91
570	72.4926	42.7909	40.5929	23.9047	39
571	101.602	92.3175	35.5214	24.3611	84
572	24.8641	0.1355	28.7608	6.251	144
573	15.3124	65.205	52.7286	17.4654	149
574	16.9397	16.157	0.3423	23.6795	62
575	94.1971	38.0204	14.8005	3.1512	27
576	98.567	80.2017	48.301	23.8946	126
577	67.7055	32.9993	17.0949	14.8259	40
578	28.2891	98.27	21.6276	21.2566	130
579	73.2561	47.9132	17.0605	27.6156	143
580	1.2023	90.7259	43.7677	19.1166	111
581	61.5106	34.0654	15.2705	10.912	63
582	70.5497	45.0925	44.08	13.3393	12
583	29.5221	90.7635	22.4343	1.898	132
584	43.7884	36.8808	19.8614	16.446	111
585	88.6759	82.3658	11.13	2.7213	66
586	-0.1009	90.0487	0.1507	2.3121	4
587	67.4955	46.0347	52.8305	3.4091	52
588	63.453	34.6286	41.047	7.4277	115
589	14.2076	63.0144	54.8035	24.0324	2
590	12.73	75.2001	37.6748	18.6111	10
591	96.1169	76.0362	57.1147	25.7488	21
592	73.3859	52.8201	55.9097	15.2561	30
593	68.5789	56.8701	42.2821	16.6688	139
594	91.1655	36.0648	5.0962	0.3187	94
595	66.0257	55.1875	22.0287	16.5761	138
596	-0.0468	93.7668	57.0052	20.328	21
597	37.0706	93.0168	1.0492	27.7874	137
598	43.0828	99.6317	56.4863	26.6664	88
599	46.5714	10.174	4.4604	27.098	49

Node ID	x	y	z	r_i	demand
600	94.3087	39.6383	18.4042	5.7437	148
601	92.9131	56.6287	40.2251	15.0729	126
602	62.5649	23.4331	22.9907	17.3284	62
603	92.5654	91.5305	24.0262	28.4592	51
604	99.1261	78.6323	53.6332	23.8719	64
605	68.7356	47.889	4.3235	2.3048	30
606	25.8989	0.7413	53.4706	22.2466	91
607	21.5395	100.4343	27.1149	29.9057	25
608	98.7715	55.3698	27.9452	10.7015	136
609	28.1449	5.3771	22.529	15.5333	113
610	94.6583	60.3511	50.0221	8.4724	112
611	31.0449	71.9995	0.0029	23.5272	26
612	77.9078	47.2474	41.2613	6.5423	33
613	47.7278	5.7114	59.7593	28.1097	135
614	105.6501	47.8555	48.2801	11.3295	80
615	100.6854	61.817	51.0639	3.0255	6
616	11.6475	70.8021	30.9107	20.1612	133
617	53.965	12.2967	46.7771	9.8572	107
618	54.7597	1.1902	50.9644	4.007	14
619	71.8327	48.0379	13.6369	28.84	58
620	94.6877	57.1733	21.1304	13.9646	89
621	92.4351	33.0022	54.3205	23.0347	76
622	18.9682	67.082	33.9115	0.0743	101
623	96.9343	84.943	57.6208	15.8069	125
624	97.9579	54.2407	46.7851	26.2321	74
625	103.5291	67.906	8.9335	21.3267	100
626	49.0558	10.279	28.6803	25.3924	102
627	32.8361	107.2479	41.504	24.978	107
628	49.5265	1.5006	43.2383	5.684	89
629	97.7943	87.7833	36.2243	29.1465	68
630	7.0214	70.8048	31.3366	24.0693	146
631	53.5826	-3.7128	29.3577	20.6553	84
632	99.7789	45.6905	34.3678	1.6891	71
633	99.7259	57.0659	38.9488	5.4613	35
634	101.7941	49.0832	29.2585	1.419	23
635	98.3613	42.0392	20.5386	22.2209	135
636	92.634	40.1716	1.8791	17.8594	136
637	54.6465	1.327	47.163	23.7327	95
638	30.8807	93.5109	0.3364	15.6566	147
639	27.2709	73.9256	16.4296	19.9916	137
640	101.778	67.1686	27.7348	23.9527	16
641	77.9705	58.8491	56.0075	15.3336	25
642	93.2846	41.9379	42.3812	28.0563	121
643	41.1669	5.3004	18.6447	27.2131	4
644	107.2392	85.9448	2.4326	25.7344	78
645	42.2565	98.7398	22.9258	24.1013	116
646	70.1179	52.2878	46.5219	5.6226	37
647	2.5704	90.3092	4.6781	25.529	99
648	101.0606	82.9382	56.7378	16.7992	1
649	102.2936	85.0217	15.0829	21.6835	76
650	87.5726	32.8781	1.3636	19.8465	76
651	87.1149	58.1702	24.9275	8.6573	138
652	90.6435	28.0536	25.8632	9.6928	68
653	31.7997	5.4917	35.1341	9.7028	147
654	44.2621	15.3855	4.7212	17.5289	51
655	94.6788	63.8911	59.4837	17.5158	5
656	79.533	47.2684	42.1428	8.9398	67
657	98.2007	80.5294	17.4055	24.0186	95
658	99.272	31.5703	11.7517	3.1541	42
659	95.0304	53.2116	46.2852	22.3786	107
660	50.3723	32.2399	19.4829	6.6627	31

Node ID	x	y	z	r_i	demand
661	66.7818	30.0369	13.8618	10.9633	117
662	94.5726	47.3613	8.9492	6.423	134
663	31.4187	76.5703	2.7936	26.413	57
664	97.4429	30.1528	28.42	27.9419	84
665	47.4524	12.1509	5.76	13.8821	65
666	95.7654	46.8722	1.8076	22.8599	33
667	34.0458	95.0903	5.2592	23.4922	94
668	2.7376	84.0979	3.4333	22.8219	108
669	48.4975	2.4432	11.2037	10.4173	37
670	10.0835	69.723	3.7551	14.2892	134
671	104.0844	32.9988	51.1923	0.3135	85
672	93.6487	25.1273	31.9089	25.1293	142
673	35.0473	98.5367	9.9491	21.3919	124
674	44.7872	36.1398	42.3342	5.7289	64
675	3.5998	89.8159	36.4775	20.0402	94
676	43.0131	-4.6452	57.9101	20.9992	27
677	75.9022	40.5634	8.2476	19.0711	134
678	69.1853	30.9522	12.1629	13.139	24
679	94.6798	69.1984	4.5089	14.7127	122
680	71.8965	50.0142	14.8598	19.3441	133
681	81.1686	57.7423	31.0101	24.938	86
682	96.3928	32.1668	2.4627	2.1401	55
683	39.9467	-2.3317	18.5214	24.6235	87
684	60.137	35.2014	51.7925	3.3879	63
685	32.1756	91.0244	47.2823	9.1133	89
686	96.6051	36.0943	31.9245	18.2734	110
687	80.0004	48.0282	43.1849	9.8035	18
688	86.2321	62.729	51.1705	16.3953	11
689	45.9074	18.6439	58.1761	15.0199	51
690	94.4684	44.7163	40.2539	7.0613	72
691	51.545	-0.7619	6.4521	25.0267	122
692	49.9971	19.9155	18.5508	3.9588	89
693	48.2378	10.888	40.0435	5.8133	87
694	101.5683	27.6266	39.8262	8.8382	39
695	77.6289	48.4559	5.3003	16.6228	107
696	64.2784	38.8059	47.0778	29.0239	24
697	35.7306	102.2767	4.1846	20.2694	5
698	35.5571	102.295	9.2843	22.4132	47
699	70.5469	25.0661	53.9959	16.1699	28
700	9.9143	75.8382	26.191	21.3192	97
701	53.9046	16.3668	14.1276	12.2702	8
702	91.0116	75.887	40.3125	1.8515	65
703	97.0865	83.6094	41.2641	9.8674	40
704	98.7317	39.6579	27.3708	13.6077	36
705	18.7531	32.536	21.0115	27.0946	12
706	-5.5457	98.4014	26.4862	2.1156	50
707	34.0464	97.1856	33.2284	23.2445	59
708	105.6506	92.4297	8.9472	20.7058	19
709	49.2438	-0.5725	42.7886	17.8927	84
710	49.309	3.6922	59.7251	20.878	20
711	76.5498	52.218	12.9878	29.3359	7
712	33.2241	90.2072	6.3544	24.6184	49
713	40.9431	96.0349	18.7884	13.182	126
714	97.3283	27.0933	33.194	16.7318	136
715	31.1128	-2.8096	30.5667	18.9309	14
716	36.4235	4.5159	28.6582	16.6099	10
717	58.5415	3.6684	5.0311	22.039	90
718	102.9023	68.4164	43.143	1.0646	29
719	23.527	73.6169	0.5641	21.6834	140
720	70.8564	51.5507	32.2844	19.1375	92
721	8.8648	72.0358	37.3381	5.5515	126

Node ID	x	y	z	r_i	demand
722	39.7266	17.3977	50.5452	17.8866	91
723	61.565	4.5717	36.954	20.8967	33
724	31.1391	0.2266	57.7289	2.8236	46
725	58.8785	37.4935	28.0133	17.2077	92
726	48.325	36.101	31.2943	13.1633	38
727	95.479	61.1306	33.7151	12.7416	30
728	97.7133	51.9341	48.5236	11.5332	76
729	104.3617	84.8664	42.6246	23.8168	47
730	46.0937	-5.8176	9.1179	0.9163	91
731	62.5325	1.766	39.3982	5.6387	137
732	44.1303	30.8739	2.5661	4.2334	54
733	25.7737	68.9159	14.4865	2.2837	75
734	99.0228	31.9463	24.4512	24.3368	22
735	18.4916	22.031	28.1174	8.3539	4
736	52.4859	17.4578	33.7507	0.3541	141
737	24.3218	77.9732	38.2426	3.9436	132
738	94.9909	83.4209	53.4521	6.6825	62
739	-0.339	97.1979	25.6607	24.9263	116
740	74.5598	39.2546	26.0148	7.8873	150
741	88.7937	67.447	23.6857	7.6628	68
742	3.811	100.5395	9.9764	22.995	42
743	77.8794	45.0468	10.8339	0.405	146
744	87.2346	40.5435	32.6709	24.2659	83
745	103.8628	98.4843	53.5771	1.4511	74
746	58.6318	9.4344	53.4701	7.474	48
747	89.3464	46.1786	22.3858	28.4968	115
748	91.9372	36.8319	23.3371	3.8859	73
749	100.8882	91.1406	6.6906	9.708	57
750	92.5592	25.4331	20.672	8.84	126
751	51.2901	7.6487	52.6277	4.2708	73
752	14.7433	68.1941	29.0053	9.3958	47
753	15.4332	72.9689	53.8868	2.4401	70
754	19.5225	24.6717	34.6116	0.4277	146
755	93.1133	78.1389	33.5399	7.0122	137
756	72.1444	51.2772	8.2689	22.7706	60
757	100.5945	52.9653	41.549	16.0066	11
758	57.2331	12.7874	5.1838	7.0243	11
759	98.2349	98.4363	43.0129	21.6189	133
760	88.2545	36.066	42.1212	15.726	108
761	5.2812	65.5492	44.5709	11.3895	24
762	65.211	38.9167	43.4098	22.6036	117
763	90.014	39.915	40.6629	25.9424	87
764	41.6896	94.8028	3.024	26.2925	144
765	3.0162	107.1796	11.3112	15.3823	139
766	42.6808	88.2098	40.1619	26.1251	47
767	108.1531	76.0691	2.761	21.0274	115
768	34.7819	91.1147	8.0437	26.8877	123
769	100.8862	48.4618	50.2894	10.9264	16
770	68.3676	27.331	45.292	4.5622	121
771	42.8352	101.6931	44.9574	21.2677	46
772	22.0389	18.6688	59.3708	16.6692	22
773	95.0373	98.5247	13.5608	4.6173	20
774	98.656	92.6213	53.0887	22.9191	123
775	47.4152	28.2569	57.2588	4.917	2
776	89.95	80.2132	31.6802	25.9539	101
777	90.4784	41.2284	44.1276	19.2596	70
778	28.241	67.9653	9.5896	4.4101	13
779	36.1694	94.3523	52.0418	28.0801	140
780	100.5649	91.4192	35.2273	20.5542	71
781	93.1284	88.6615	20.1351	29.2956	116
782	18.7218	26.0511	59.401	18.3773	66

Node ID	x	y	z	r_i	demand
783	35.2297	94.8683	9.4168	10.0169	144
784	36.8108	99.4487	34.5912	12.3219	9
785	7.5677	74.3816	13.1566	29.6105	117
786	100.384	25.6874	43.9589	21.4485	124
787	96.2545	87.1498	32.8659	21.7369	1
788	74.3979	53.0985	48.6112	4.2274	142
789	68.0366	38.8903	2.9918	3.4888	141
790	8.4928	63.9998	55.0759	9.7983	23
791	44.5228	11.8645	13.3212	25.0082	148
792	35.4073	87.2216	40.4202	1.8355	73
793	53.2794	21.4994	19.0176	2.9791	125
794	33.9629	96.8355	4.449	13.8521	49
795	-0.7351	89.6931	26.6301	28.3044	48
796	76.2244	51.9684	6.7104	3.4858	138
797	94.4551	58.0456	35.6169	10.0481	74
798	82.0477	53.0979	5.7932	18.2605	29
799	46.0043	6.8606	27.4465	2.7263	108
800	90.0385	42.8005	44.3862	21.625	20
801	8.3117	72.2049	29.6247	15.4861	101
802	34.9317	80.2335	16.9208	24.9565	133
803	44.2937	4.7268	51.9613	3.889	46
804	17.2669	18.1061	25.0094	10.6475	78
805	16.9754	26.2994	50.4148	25.4942	4
806	92.8093	39.7693	16.6418	4.7222	123
807	31.6341	101.1443	12.133	2.7843	88
808	15.0509	21.8739	10.7741	20.7664	116
809	33.4349	0.0139	45.2628	13.2105	14
810	35.2228	101.4244	59.0123	27.011	17
811	88.4465	41.4478	32.5802	21.203	128
812	-0.171	97.1566	2.8672	11.053	61
813	44.0031	6.0986	31.1209	17.8329	134
814	58.0725	5.2013	11.1785	2.9904	89
815	45.5397	7.2979	57.1732	4.7628	32
816	29.4417	11.4808	30.7206	11.6626	95
817	97.7455	51.8526	39.6885	5.024	45
818	59.6709	-1.5476	33.1451	26.9171	2
819	76.0043	50.5809	30.4596	29.1787	2
820	-1.2335	86.0108	56.7294	9.9154	24
821	74.4488	50.3129	52.3971	5.5377	47
822	94.6945	78.572	44.5388	1.7622	114
823	60.5785	6.8128	27.9807	2.6428	49
824	91.14	83.5499	11.0268	11.1932	44
825	89.6611	52.1615	6.6683	14.4321	59
826	97.7624	79.6432	41.8331	23.8114	141
827	29.6205	6.6839	35.8272	7.8815	84
828	69.5886	28.6002	31.4169	10.8714	27
829	94.3452	48.7818	37.6589	4.4406	132
830	93.0102	50.1223	20.798	27.268	56
831	45.9242	19.9	29.6168	25.1738	105
832	95.1298	37.6897	58.9361	8.2516	44
833	26.6151	77.1467	3.8306	15.3985	122
834	37.1983	106.347	12.5162	4.5493	64
835	98.3827	22.3334	54.4737	15.4136	31
836	92.942	26.4511	38.6789	3.2602	117
837	12.0587	67.8257	18.5408	15.0634	76
838	54.0368	23.8586	2.2143	14.1498	139
839	47.9812	30.2306	39.2099	11.8841	139
840	70.7664	48.6137	12.8047	19.7705	111
841	62.6603	37.129	7.3175	12.7997	26
842	97.9014	66.9835	57.8832	12.1626	34
843	-4.1255	85.596	43.5867	25.3799	82

Node ID	x	y	z	r_i	demand
844	67.4683	58.2291	37.5546	22.4924	117
845	31.9656	14.6164	16.7619	14.4873	77
846	38.0686	7.3443	51.7798	25.6467	85
847	61.643	23.6955	42.1255	3.0344	119
848	22.0857	71.4539	26.9077	17.4147	66
849	26.2205	72.9044	33.175	6.2191	27
850	51.6732	17.1776	23.9169	3.9198	68
851	21.2889	20.2133	0.1771	12.2867	147
852	95.2026	90.5293	12.2607	13.6073	2
853	35.7481	97.1257	4.802	23.4808	69
854	97.0806	39.3994	12.7921	0.8811	11
855	73.6611	50.4924	3.9757	19.7557	90
856	35.1535	70.6086	57.9365	16.7445	131
857	80.7698	50.729	27.0276	24.0359	101
858	97.3108	57.82	10.7791	22.7988	128
859	63.8119	26.0212	34.0563	22.8759	131
860	51.6292	37.4529	39.3047	0.2611	55
861	2.1469	96.6722	44.5395	20.9499	78
862	103.1106	83.2736	35.5168	15.1682	133
863	49.1449	22.3659	43.2644	23.3416	117
864	102.9297	48.0592	51.9744	14.2478	18
865	92.7124	33.4453	33.5856	14.4155	127
866	0.6193	91.0377	37.0534	11.2677	12
867	16.7224	69.1113	14.1768	26.0784	41
868	78.2967	50.1808	43.2865	11.8299	51
869	15.0856	70.6386	28.9208	28.271	42
870	22.9431	70.0987	4.2047	5.5998	96
871	96.0562	52.3857	26.7058	12.0834	51
872	18.7356	77.2891	30.4652	27.8207	146
873	4.4426	63.6871	51.0243	23.1902	96
874	88.3633	87.3681	2.2205	27.6489	4
875	29.2732	5.6917	40.0529	15.7976	28
876	104.1102	44.8822	12.643	24.3902	149
877	63.4243	4.3429	39.6925	22.7299	91
878	97.3132	81.5365	12.7479	6.4549	89
879	58.9981	26.6128	49.6223	10.0374	35
880	51.539	18.7116	33.0294	3.3237	86
881	10.4334	62.822	33.9682	8.2889	14
882	93.0933	68.7697	14.1811	21.8016	113
883	45.0418	3.8658	25.2247	10.1722	12
884	93.2379	56.4517	4.9219	7.5848	84
885	72.0955	52.6394	50.8408	7.0709	93
886	100.0565	80.1054	0.0522	29.4827	66
887	43.4311	0.4843	45.1031	25.8563	130
888	52.2056	3.4977	49.7426	20.8953	95
889	44.8479	-0.9391	15.0769	19.1888	34
890	62.4332	-0.684	2.8792	29.6949	148
891	3.1184	98.924	29.022	10.2515	142
892	90.3356	51.1932	37.7625	6.8103	113
893	101.377	48.1816	18.5975	20.458	120
894	64.2717	31.7627	18.8904	14.3523	135
895	-12.8049	93.8535	15.5008	19.948	114
896	95.0864	47.4256	26.3676	15.4813	9
897	45.4526	36.121	9.3446	8.6374	25
898	46.5537	103.4177	45.8992	24.5733	95
899	53.915	28.4629	8.3577	20.5718	132
900	102.543	45.6081	13.7083	21.8293	57
901	27.0312	22.0371	1.4535	12.0381	37
902	72.2401	34.2889	7.5435	2.9732	32
903	54.4331	-6.2551	57.3764	16.56	114
904	76.4125	46.981	46.4216	12.1404	51

Node ID	x	y	z	r_i	demand
905	69.1565	53.343	39.551	16.8114	22
906	67.8488	53.6384	2.957	21.5605	107
907	93.9684	87.8762	13.7783	12.1102	65
908	73.2116	57.797	29.252	20.4365	122
909	50.3352	41.2014	16.9793	12.9522	26
910	60.2628	6.0605	25.9406	10.0471	71
911	9.1569	61.6426	15.1483	9.3858	114
912	50.9668	1.717	44.4164	23.9816	149
913	8.0611	104.093	26.141	29.9646	7
914	98.2004	50.3921	3.9008	18.7026	150
915	55.7669	1.6852	42.4618	24.4965	48
916	99.3434	90.9979	30.2293	16.5588	24
917	96.0238	29.4057	14.5945	0.7719	145
918	8.1477	101.1634	5.5645	26.7278	14
919	58.126	35.24	1.1949	0.3044	114
920	52.0607	4.6851	47.5572	25.9984	22
921	67.7991	50.1342	31.512	7.0884	122
922	22.4003	2.9895	12.1851	21.9707	37
923	51.7623	34.8081	42.2217	20.8873	55
924	44.5689	9.75	12.1988	0.5947	93
925	69.2681	55.3133	57.276	27.1365	26
926	22.6268	64.3936	19.9605	24.3192	44
927	7.6803	61.1857	24.6436	15.0459	111
928	11.4442	66.9869	57.5373	21.9247	32
929	52.3291	3.6705	6.1162	19.2214	3
930	91.9756	47.4725	20.0446	19.7423	3
931	85.525	32.0217	10.845	5.5598	84
932	9.1707	70.0865	21.5855	9.3679	78
933	47.7428	26.438	23.4687	28.0445	89
934	52.8937	1.339	38.4463	0.8894	47
935	72.0723	49.2863	13.9841	10.8405	145
936	47.1015	12.1757	10.5923	0.8443	11
937	96.2521	73.5638	59.9232	18.6663	103
938	60.1802	30.671	38.4138	27.7411	47
939	25.3366	76.538	54.326	21.2393	66
940	76.379	48.6237	27.9163	7.5959	96
941	17.3215	22.815	38.4524	26.1071	128
942	91.1291	78.4897	13.7054	23.993	13
943	65.3289	43.5846	33.8262	21.6754	149
944	75.73	42.7229	0.0066	0.4404	6
945	32.6009	89.9531	17.4409	11.1863	144
946	4.9579	99.4405	59.5277	7.1688	148
947	51.8363	2.0767	53.9783	1.2126	62
948	62.464	33.4003	33.7046	5.2338	92
949	47.7789	92.5461	5.4276	17.3786	17
950	43.7175	13.3612	37.2361	11.2776	8
951	63.2951	31.2899	8.2512	4.0204	128
952	94.8477	58.3247	47.7413	10.8435	113
953	89.352	47.1855	40.3099	0.6817	133
954	24.5729	19.8583	16.0395	11.2071	49
955	51.0819	30.8837	36.7669	1.7131	53
956	51.7765	0.7553	20.0441	1.0658	95
957	35.7859	98.3251	5.4495	3.261	98
958	66.7482	27.6121	12.1372	22.4893	149
959	98.3726	88.4744	52.1576	13.4661	64
960	31.3011	106.2109	32.3658	16.9428	93
961	-7.5489	96.9207	56.8305	21.6	2
962	44.3034	16.6265	25.3299	9.4533	37
963	31.6916	96.8159	17.5787	27.5118	66
964	98.4228	65.0226	33.0945	19.713	147
965	77.5882	39.4219	14.211	18.0454	103

Node ID	x	y	z	r_i	demand
966	53.1154	7.9184	18.71	19.9574	75
967	99.3413	60.508	43.9191	18.4113	128
968	42.4139	3.5597	1.814	13.287	105
969	21.3934	72.6127	7.7423	27.5896	98
970	97.5011	28.0267	29.587	4.1233	65
971	100.3439	52.2486	6.1962	1.0866	38
972	31.7064	96.988	25.1942	27.9597	144
973	33.0573	97.9271	5.3628	8.5196	110
974	75.2757	50.6388	0.889	7.5436	26
975	11.4886	67.7219	43.0579	21.8599	60
976	44.3651	39.5082	4.2576	12.4052	110
977	86.512	33.4131	7.017	8.2137	126
978	51.473	33.7115	46.7085	2.7502	133
979	97.1838	29.5842	37.1942	15.6415	4
980	105.0575	26.2706	17.0665	21.5332	146
981	39.3246	101.8921	42.5744	13.7336	58
982	69.4154	51.8752	55.6067	4.1739	108
983	54.5841	1.3	6.274	17.8466	66
984	23.796	77.2181	9.3562	18.2059	108
985	50.2911	5.2466	39.9878	6.9728	8
986	89.5631	83.3752	32.5568	25.9016	23
987	89.1249	38.0318	13.3915	15.9201	39
988	95.504	96.351	10.2996	27.717	26
989	70.916	53.3608	4.8842	25.4746	74
990	72.9378	43.4347	40.5471	22.409	12
991	79.7169	32.9378	5.3155	5.5373	97
992	89.0134	41.3658	15.8043	27.9234	34
993	23.3217	16.9506	6.2856	12.0877	131
994	95.8598	39.2349	3.852	9.5298	19
995	75.9853	41.4015	43.6031	28.8962	123
996	90.72	30.049	19.1921	25.9851	125
997	95.1396	47.3596	38.3213	26.132	30
998	46.003	37.4534	46.4333	29.0578	145
999	54.3108	6.5803	34.1725	23.4136	111

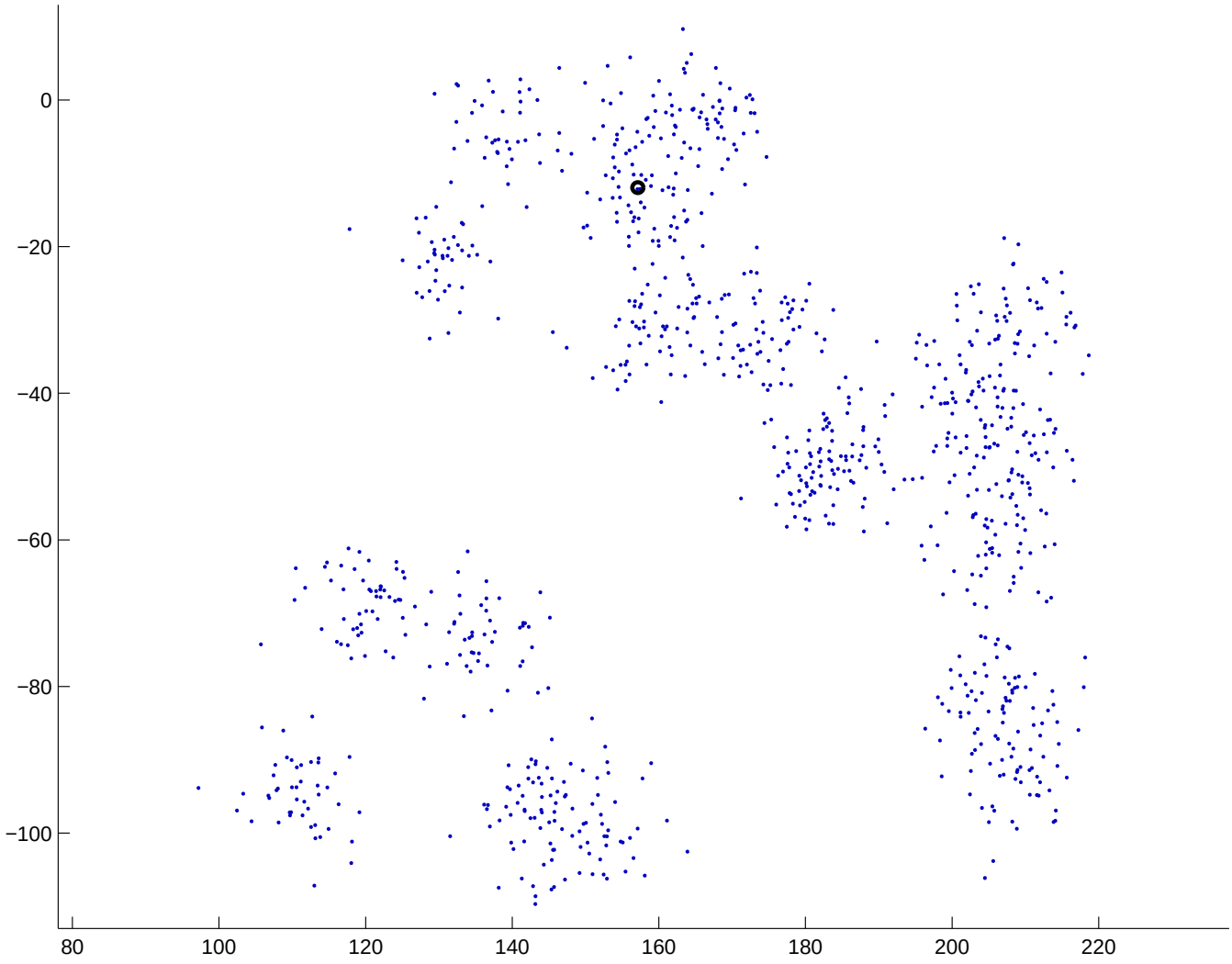


Figure L.28: dsj1000: Depot has same coordinates as one node in 2D but not 3D

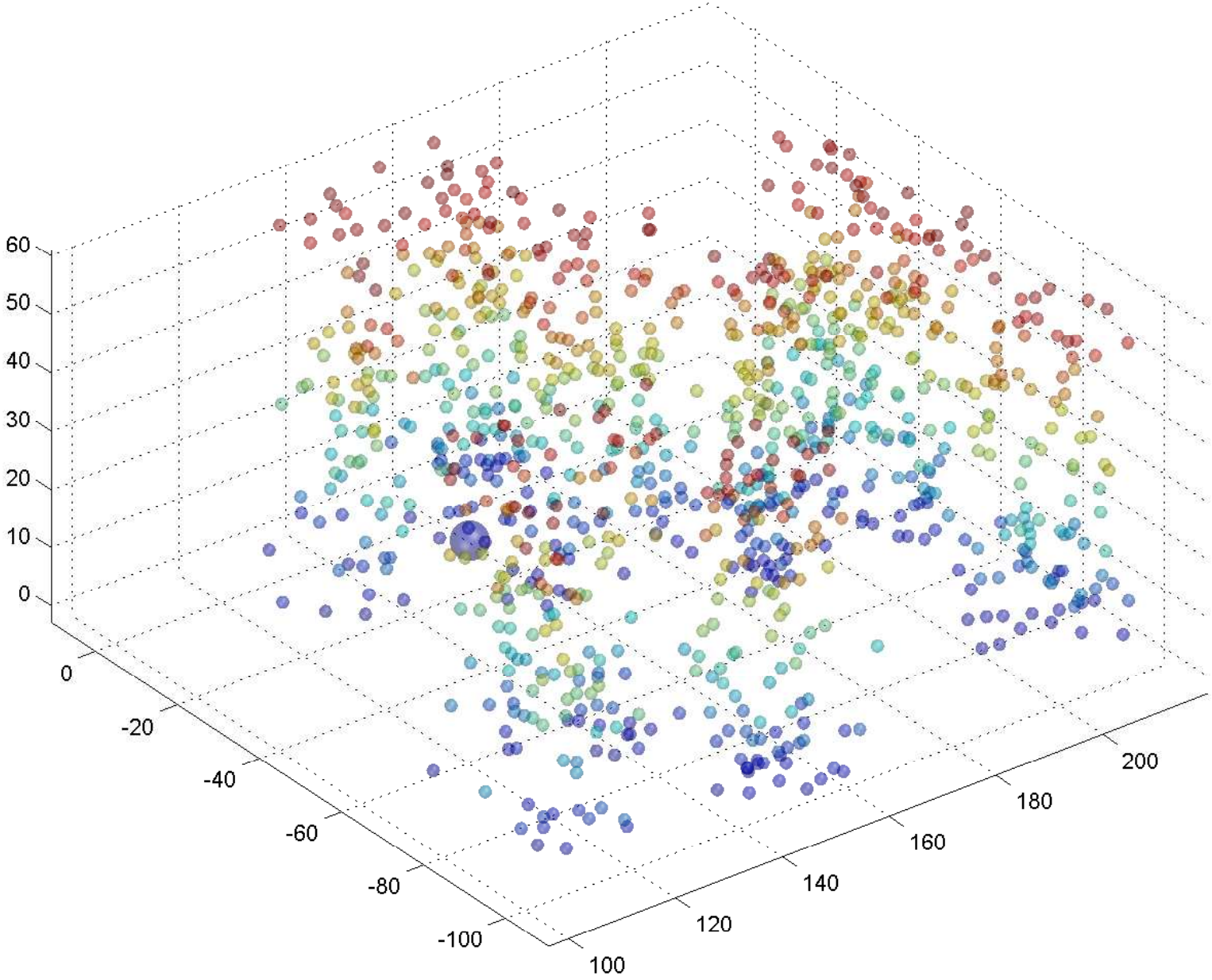


Figure L.29: dsj1000_3D

Table L-15: rotatingDiamonds

			r:	2	
	Description:		geometric pattern		
Node ID	x	y	z	r_i	demand
0	100	100	0	-	-
1	101	95	0	2	1
2	103	95	0	2	1
3	105	95	0	2	1
4	105	97	0	2	1
5	105	99	0	2	1
6	105	101	0	2	1
7	105	103	0	2	1
8	105	105	0	2	1
9	103	105	0	2	1
10	101	105	0	2	1
11	99	105	0	2	1
12	97	105	0	2	1
13	95	105	0	2	1
14	95	103	0	2	1
15	95	101	0	2	1
16	95	99	0	2	1
17	95	97	0	2	1
18	95	95	0	2	1
19	97	95	0	2	1
20	99	95	0	2	1
21	100	80	0	2	1
22	102	82	0	2	1
23	104	84	0	2	1
24	106	86	0	2	1
25	108	88	0	2	1
26	110	90	0	2	1
27	112	92	0	2	1
28	114	94	0	2	1
29	116	96	0	2	1
30	118	98	0	2	1
31	120	100	0	2	1
32	118	102	0	2	1
33	116	104	0	2	1
34	114	106	0	2	1
35	112	108	0	2	1
36	110	110	0	2	1
37	108	112	0	2	1
38	106	114	0	2	1
39	104	116	0	2	1
40	102	118	0	2	1
41	100	120	0	2	1
42	98	118	0	2	1
43	96	116	0	2	1
44	94	114	0	2	1
45	92	112	0	2	1
46	86	106	0	2	1
47	90	110	0	2	1
48	88	108	0	2	1
49	84	104	0	2	1
50	82	102	0	2	1
51	80	100	0	2	1
52	82	98	0	2	1
53	84	96	0	2	1
54	86	94	0	2	1
55	88	92	0	2	1
56	90	90	0	2	1
57	92	88	0	2	1
58	94	86	0	2	1
59	96	84	0	2	1
60	98	82	0	2	1
61	100	70	0	2	1
62	102	70	0	2	1
63	104	70	0	2	1
64	106	70	0	2	1
65	108	70	0	2	1
66	110	70	0	2	1
67	112	70	0	2	1
68	114	70	0	2	1
69	116	70	0	2	1
70	118	70	0	2	1
71	120	70	0	2	1
72	122	70	0	2	1
73	124	70	0	2	1
74	126	70	0	2	1
75	128	70	0	2	1
76	130	70	0	2	1
77	130	72	0	2	1
78	130	74	0	2	1
79	130	76	0	2	1
80	130	78	0	2	1
81	130	80	0	2	1
82	130	82	0	2	1
83	130	84	0	2	1
84	130	86	0	2	1
85	130	88	0	2	1
86	130	90	0	2	1
87	130	92	0	2	1
88	130	94	0	2	1
89	130	96	0	2	1
90	130	98	0	2	1
91	130	100	0	2	1
92	130	102	0	2	1
93	130	104	0	2	1
94	130	106	0	2	1
95	130	108	0	2	1
96	130	110	0	2	1
97	130	112	0	2	1
98	130	114	0	2	1
99	130	116	0	2	1
100	130	118	0	2	1
101	130	120	0	2	1
102	130	122	0	2	1
103	130	124	0	2	1
104	130	126	0	2	1
105	130	128	0	2	1
106	130	130	0	2	1
107	128	130	0	2	1
108	126	130	0	2	1
109	124	130	0	2	1
110	122	130	0	2	1
111	120	130	0	2	1
112	118	130	0	2	1
113	116	130	0	2	1
114	114	130	0	2	1
115	112	130	0	2	1
116	110	130	0	2	1
117	108	130	0	2	1

Node ID	x	y	z	r_i	demand
118	106	130	0	2	1
119	104	130	0	2	1
120	102	130	0	2	1
121	100	130	0	2	1
122	98	130	0	2	1
123	96	130	0	2	1
124	94	130	0	2	1
125	92	130	0	2	1
126	90	130	0	2	1
127	88	130	0	2	1
128	86	130	0	2	1
129	84	130	0	2	1
130	82	130	0	2	1
131	80	130	0	2	1
132	78	130	0	2	1
133	76	130	0	2	1
134	74	130	0	2	1
135	72	130	0	2	1
136	70	130	0	2	1
137	70	128	0	2	1
138	70	126	0	2	1
139	70	124	0	2	1
140	70	122	0	2	1
141	70	120	0	2	1
142	70	118	0	2	1
143	70	116	0	2	1
144	70	114	0	2	1
145	70	112	0	2	1
146	70	110	0	2	1
147	70	108	0	2	1
148	70	106	0	2	1
149	70	104	0	2	1
150	70	102	0	2	1
151	70	100	0	2	1
152	70	98	0	2	1
153	70	96	0	2	1
154	70	94	0	2	1
155	70	92	0	2	1
156	70	90	0	2	1
157	70	88	0	2	1
158	70	86	0	2	1
159	70	84	0	2	1
160	70	82	0	2	1
161	70	80	0	2	1
162	70	78	0	2	1
163	70	76	0	2	1
164	70	74	0	2	1
165	70	72	0	2	1
166	70	70	0	2	1
167	72	70	0	2	1
168	74	70	0	2	1
169	76	70	0	2	1
170	78	70	0	2	1
171	80	70	0	2	1
172	82	70	0	2	1
173	84	70	0	2	1
174	86	70	0	2	1
175	88	70	0	2	1
176	90	70	0	2	1
177	92	70	0	2	1
178	94	70	0	2	1

Node ID	x	y	z	r_i	demand
179	96	70	0	2	1
180	98	70	0	2	1
181	100	30	0	2	1
182	102	32	0	2	1
183	104	34	0	2	1
184	106	36	0	2	1
185	108	38	0	2	1
186	110	40	0	2	1
187	112	42	0	2	1
188	114	44	0	2	1
189	116	46	0	2	1
190	118	48	0	2	1
191	120	50	0	2	1
192	122	52	0	2	1
193	124	54	0	2	1
194	126	56	0	2	1
195	128	58	0	2	1
196	130	60	0	2	1
197	132	62	0	2	1
198	134	64	0	2	1
199	136	66	0	2	1
200	138	68	0	2	1
201	140	70	0	2	1
202	142	72	0	2	1
203	144	74	0	2	1
204	146	76	0	2	1
205	148	78	0	2	1
206	150	80	0	2	1
207	152	82	0	2	1
208	154	84	0	2	1
209	156	86	0	2	1
210	158	88	0	2	1
211	160	90	0	2	1
212	162	92	0	2	1
213	164	94	0	2	1
214	166	96	0	2	1
215	168	98	0	2	1
216	170	100	0	2	1
217	168	102	0	2	1
218	166	104	0	2	1
219	164	106	0	2	1
220	162	108	0	2	1
221	160	110	0	2	1
222	158	112	0	2	1
223	156	114	0	2	1
224	154	116	0	2	1
225	152	118	0	2	1
226	150	120	0	2	1
227	148	122	0	2	1
228	146	124	0	2	1
229	144	126	0	2	1
230	142	128	0	2	1
231	140	130	0	2	1
232	138	132	0	2	1
233	136	134	0	2	1
234	134	136	0	2	1
235	132	138	0	2	1
236	130	140	0	2	1
237	128	142	0	2	1
238	126	144	0	2	1
239	124	146	0	2	1

Node ID	x	y	z	r_i	demand
240	122	148	0	2	1
241	120	150	0	2	1
242	118	152	0	2	1
243	116	154	0	2	1
244	114	156	0	2	1
245	112	158	0	2	1
246	110	160	0	2	1
247	108	162	0	2	1
248	106	164	0	2	1
249	104	166	0	2	1
250	102	168	0	2	1
251	100	170	0	2	1
252	98	168	0	2	1
253	96	166	0	2	1
254	94	164	0	2	1
255	92	162	0	2	1
256	90	160	0	2	1
257	88	158	0	2	1
258	86	156	0	2	1
259	84	154	0	2	1
260	82	152	0	2	1
261	80	150	0	2	1
262	78	148	0	2	1
263	76	146	0	2	1
264	74	144	0	2	1
265	72	142	0	2	1
266	70	140	0	2	1
267	68	138	0	2	1
268	66	136	0	2	1
269	64	134	0	2	1
270	62	132	0	2	1
271	60	130	0	2	1
272	58	128	0	2	1
273	56	126	0	2	1
274	54	124	0	2	1
275	52	122	0	2	1
276	50	120	0	2	1
277	48	118	0	2	1
278	46	116	0	2	1
279	44	114	0	2	1
280	42	112	0	2	1
281	40	110	0	2	1
282	38	108	0	2	1
283	36	106	0	2	1
284	34	104	0	2	1
285	32	102	0	2	1
286	30	100	0	2	1
287	32	98	0	2	1
288	34	96	0	2	1
289	36	94	0	2	1
290	38	92	0	2	1
291	40	90	0	2	1
292	42	88	0	2	1
293	44	86	0	2	1
294	46	84	0	2	1
295	48	82	0	2	1
296	50	80	0	2	1
297	52	78	0	2	1
298	54	76	0	2	1
299	56	74	0	2	1
300	58	72	0	2	1

Node ID	x	y	z	r_i	demand
301	60	70	0	2	1
302	62	68	0	2	1
303	64	66	0	2	1
304	66	64	0	2	1
305	68	62	0	2	1
306	70	60	0	2	1
307	72	58	0	2	1
308	74	56	0	2	1
309	76	54	0	2	1
310	78	52	0	2	1
311	80	50	0	2	1
312	82	48	0	2	1
313	84	46	0	2	1
314	86	44	0	2	1
315	88	42	0	2	1
316	90	40	0	2	1
317	92	38	0	2	1
318	94	36	0	2	1
319	96	34	0	2	1
320	98	32	0	2	1
321	100	10	0	2	1
322	102	10	0	2	1
323	104	10	0	2	1
324	106	10	0	2	1
325	108	10	0	2	1
326	110	10	0	2	1
327	112	10	0	2	1
328	114	10	0	2	1
329	116	10	0	2	1
330	118	10	0	2	1
331	120	10	0	2	1
332	122	10	0	2	1
333	124	10	0	2	1
334	126	10	0	2	1
335	128	10	0	2	1
336	130	10	0	2	1
337	132	10	0	2	1
338	134	10	0	2	1
339	136	10	0	2	1
340	138	10	0	2	1
341	140	10	0	2	1
342	142	10	0	2	1
343	144	10	0	2	1
344	146	10	0	2	1
345	148	10	0	2	1
346	150	10	0	2	1
347	152	10	0	2	1
348	154	10	0	2	1
349	156	10	0	2	1
350	158	10	0	2	1
351	160	10	0	2	1
352	162	10	0	2	1
353	164	10	0	2	1
354	166	10	0	2	1
355	168	10	0	2	1
356	170	10	0	2	1
357	172	10	0	2	1
358	174	10	0	2	1
359	176	10	0	2	1
360	178	10	0	2	1
361	180	10	0	2	1

Node ID	x	y	z	r_i	demand
362	182	10	0	2	1
363	184	10	0	2	1
364	186	10	0	2	1
365	188	10	0	2	1
366	190	10	0	2	1
367	190	12	0	2	1
368	190	14	0	2	1
369	190	16	0	2	1
370	190	18	0	2	1
371	190	20	0	2	1
372	190	22	0	2	1
373	190	24	0	2	1
374	190	26	0	2	1
375	190	28	0	2	1
376	190	30	0	2	1
377	190	32	0	2	1
378	190	34	0	2	1
379	190	36	0	2	1
380	190	38	0	2	1
381	190	40	0	2	1
382	190	42	0	2	1
383	190	44	0	2	1
384	190	46	0	2	1
385	190	48	0	2	1
386	190	50	0	2	1
387	190	52	0	2	1
388	190	54	0	2	1
389	190	56	0	2	1
390	190	58	0	2	1
391	190	60	0	2	1
392	190	62	0	2	1
393	190	64	0	2	1
394	190	66	0	2	1
395	190	68	0	2	1
396	190	70	0	2	1
397	190	72	0	2	1
398	190	74	0	2	1
399	190	76	0	2	1
400	190	78	0	2	1
401	190	80	0	2	1
402	190	82	0	2	1
403	190	84	0	2	1
404	190	86	0	2	1
405	190	88	0	2	1
406	190	90	0	2	1
407	190	92	0	2	1
408	190	94	0	2	1
409	190	96	0	2	1
410	190	98	0	2	1
411	190	100	0	2	1
412	190	102	0	2	1
413	190	104	0	2	1
414	190	106	0	2	1
415	190	108	0	2	1
416	190	110	0	2	1
417	190	112	0	2	1
418	190	114	0	2	1
419	190	116	0	2	1
420	190	118	0	2	1
421	190	120	0	2	1
422	190	122	0	2	1

Node ID	x	y	z	r_i	demand
423	190	124	0	2	1
424	190	126	0	2	1
425	190	128	0	2	1
426	190	130	0	2	1
427	190	132	0	2	1
428	190	134	0	2	1
429	190	136	0	2	1
430	190	138	0	2	1
431	190	140	0	2	1
432	190	142	0	2	1
433	190	144	0	2	1
434	190	146	0	2	1
435	190	148	0	2	1
436	190	150	0	2	1
437	190	152	0	2	1
438	190	154	0	2	1
439	190	156	0	2	1
440	190	158	0	2	1
441	190	160	0	2	1
442	190	162	0	2	1
443	190	164	0	2	1
444	190	166	0	2	1
445	190	168	0	2	1
446	190	170	0	2	1
447	190	172	0	2	1
448	190	174	0	2	1
449	190	176	0	2	1
450	190	178	0	2	1
451	190	180	0	2	1
452	190	182	0	2	1
453	190	184	0	2	1
454	190	186	0	2	1
455	190	188	0	2	1
456	190	190	0	2	1
457	188	190	0	2	1
458	186	190	0	2	1
459	184	190	0	2	1
460	182	190	0	2	1
461	180	190	0	2	1
462	178	190	0	2	1
463	176	190	0	2	1
464	174	190	0	2	1
465	172	190	0	2	1
466	170	190	0	2	1
467	168	190	0	2	1
468	166	190	0	2	1
469	164	190	0	2	1
470	162	190	0	2	1
471	160	190	0	2	1
472	158	190	0	2	1
473	156	190	0	2	1
474	154	190	0	2	1
475	152	190	0	2	1
476	150	190	0	2	1
477	148	190	0	2	1
478	146	190	0	2	1
479	144	190	0	2	1
480	142	190	0	2	1
481	140	190	0	2	1
482	138	190	0	2	1
483	136	190	0	2	1

Node ID	x	y	z	r_i	demand
484	134	190	0	2	1
485	132	190	0	2	1
486	130	190	0	2	1
487	128	190	0	2	1
488	126	190	0	2	1
489	124	190	0	2	1
490	122	190	0	2	1
491	120	190	0	2	1
492	118	190	0	2	1
493	116	190	0	2	1
494	114	190	0	2	1
495	112	190	0	2	1
496	110	190	0	2	1
497	108	190	0	2	1
498	106	190	0	2	1
499	104	190	0	2	1
500	102	190	0	2	1
501	100	190	0	2	1
502	98	190	0	2	1
503	96	190	0	2	1
504	94	190	0	2	1
505	92	190	0	2	1
506	90	190	0	2	1
507	88	190	0	2	1
508	86	190	0	2	1
509	84	190	0	2	1
510	82	190	0	2	1
511	80	190	0	2	1
512	78	190	0	2	1
513	76	190	0	2	1
514	74	190	0	2	1
515	72	190	0	2	1
516	70	190	0	2	1
517	68	190	0	2	1
518	66	190	0	2	1
519	64	190	0	2	1
520	62	190	0	2	1
521	60	190	0	2	1
522	58	190	0	2	1
523	56	190	0	2	1
524	54	190	0	2	1
525	52	190	0	2	1
526	50	190	0	2	1
527	48	190	0	2	1
528	46	190	0	2	1
529	44	190	0	2	1
530	42	190	0	2	1
531	40	190	0	2	1
532	38	190	0	2	1
533	36	190	0	2	1
534	34	190	0	2	1
535	32	190	0	2	1
536	30	190	0	2	1
537	28	190	0	2	1
538	26	190	0	2	1
539	24	190	0	2	1
540	22	190	0	2	1
541	20	190	0	2	1
542	18	190	0	2	1
543	16	190	0	2	1
544	14	190	0	2	1

Node ID	x	y	z	r_i	demand
545	12	190	0	2	1
546	10	190	0	2	1
547	10	188	0	2	1
548	10	186	0	2	1
549	10	184	0	2	1
550	10	182	0	2	1
551	10	180	0	2	1
552	10	178	0	2	1
553	10	176	0	2	1
554	10	174	0	2	1
555	10	172	0	2	1
556	10	170	0	2	1
557	10	168	0	2	1
558	10	166	0	2	1
559	10	164	0	2	1
560	10	162	0	2	1
561	10	160	0	2	1
562	10	158	0	2	1
563	10	156	0	2	1
564	10	154	0	2	1
565	10	152	0	2	1
566	10	150	0	2	1
567	10	148	0	2	1
568	10	146	0	2	1
569	10	144	0	2	1
570	10	142	0	2	1
571	10	140	0	2	1
572	10	138	0	2	1
573	10	136	0	2	1
574	10	134	0	2	1
575	10	132	0	2	1
576	10	130	0	2	1
577	10	128	0	2	1
578	10	126	0	2	1
579	10	124	0	2	1
580	10	122	0	2	1
581	10	120	0	2	1
582	10	118	0	2	1
583	10	116	0	2	1
584	10	114	0	2	1
585	10	112	0	2	1
586	10	110	0	2	1
587	10	108	0	2	1
588	10	106	0	2	1
589	10	104	0	2	1
590	10	102	0	2	1
591	10	100	0	2	1
592	10	98	0	2	1
593	10	96	0	2	1
594	10	94	0	2	1
595	10	92	0	2	1
596	10	90	0	2	1
597	10	88	0	2	1
598	10	86	0	2	1
599	10	84	0	2	1
600	10	82	0	2	1
601	10	80	0	2	1
602	10	78	0	2	1
603	10	76	0	2	1
604	10	74	0	2	1
605	10	72	0	2	1

Node ID	x	y	z	r_i	demand
606	10	70	0	2	1
607	10	68	0	2	1
608	10	66	0	2	1
609	10	64	0	2	1
610	10	62	0	2	1
611	10	60	0	2	1
612	10	58	0	2	1
613	10	56	0	2	1
614	10	54	0	2	1
615	10	52	0	2	1
616	10	50	0	2	1
617	10	48	0	2	1
618	10	46	0	2	1
619	10	44	0	2	1
620	10	42	0	2	1
621	10	40	0	2	1
622	10	38	0	2	1
623	10	36	0	2	1
624	10	34	0	2	1
625	10	32	0	2	1
626	10	30	0	2	1
627	10	28	0	2	1
628	10	26	0	2	1
629	10	24	0	2	1
630	10	22	0	2	1
631	10	20	0	2	1
632	10	18	0	2	1
633	10	16	0	2	1
634	10	14	0	2	1
635	10	12	0	2	1
636	10	10	0	2	1
637	12	10	0	2	1
638	14	10	0	2	1
639	16	10	0	2	1
640	18	10	0	2	1
641	20	10	0	2	1
642	22	10	0	2	1
643	24	10	0	2	1
644	26	10	0	2	1
645	28	10	0	2	1
646	30	10	0	2	1
647	32	10	0	2	1
648	34	10	0	2	1
649	36	10	0	2	1
650	38	10	0	2	1
651	40	10	0	2	1
652	42	10	0	2	1
653	44	10	0	2	1
654	46	10	0	2	1
655	48	10	0	2	1
656	50	10	0	2	1
657	52	10	0	2	1
658	54	10	0	2	1
659	56	10	0	2	1
660	58	10	0	2	1
661	60	10	0	2	1
662	62	10	0	2	1
663	64	10	0	2	1
664	66	10	0	2	1
665	68	10	0	2	1
666	70	10	0	2	1

Node ID	x	y	z	r_i	demand
667	72	10	0	2	1
668	74	10	0	2	1
669	76	10	0	2	1
670	78	10	0	2	1
671	80	10	0	2	1
672	82	10	0	2	1
673	84	10	0	2	1
674	86	10	0	2	1
675	88	10	0	2	1
676	90	10	0	2	1
677	92	10	0	2	1
678	94	10	0	2	1
679	96	10	0	2	1
680	98	10	0	2	1

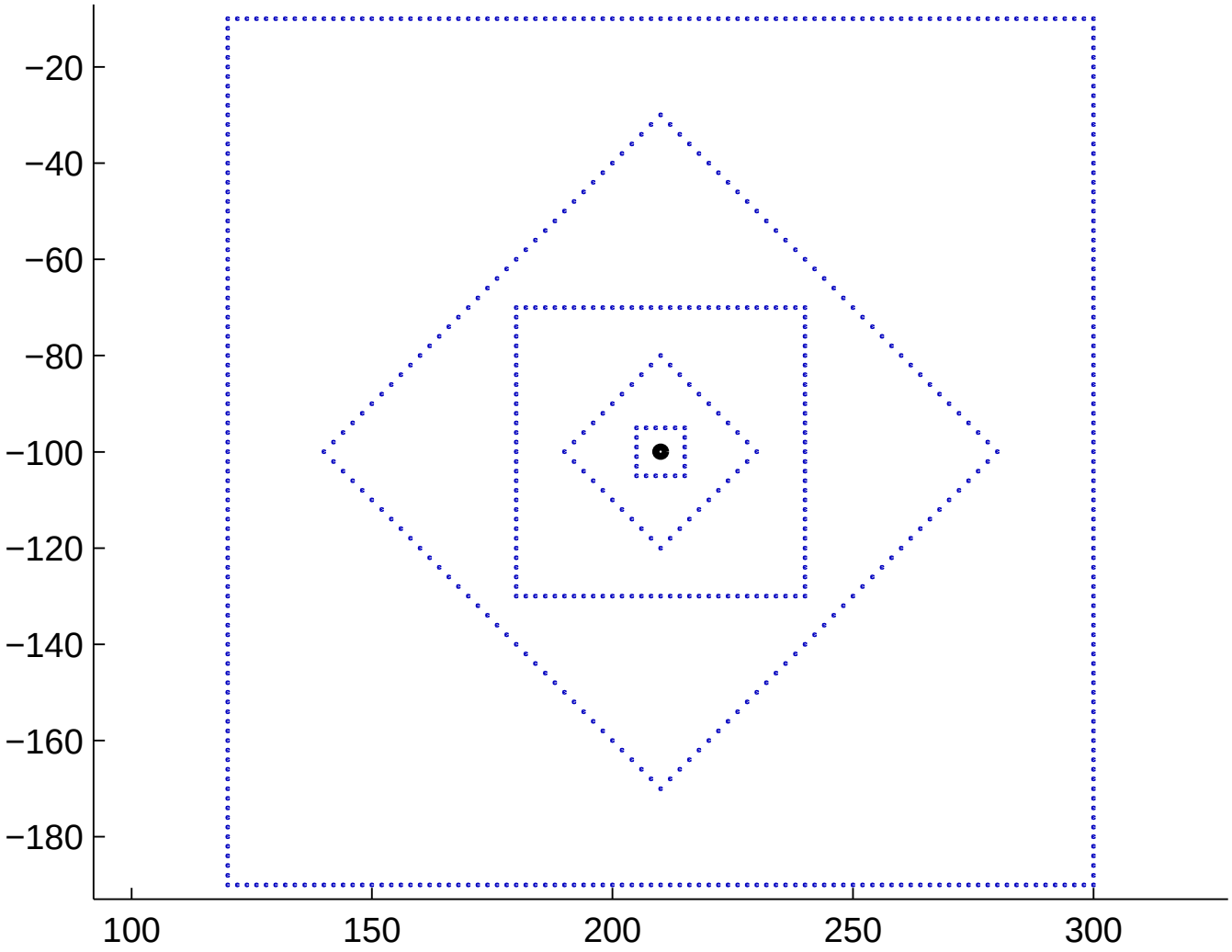


Figure L.30: rotatingDiamonds: The innermost square by itself is *rotatingDiamonds*1. Add the innermost diamond to get *rotatingDiamonds*2, etc.

Table L-16: concentricCircles

		r:	3		
		Description:	geometric pattern		
Node ID	x	y	z	r_i	demand
0	100	100	0	-	-
1	100	90	0	3	12
2	104	90.83484861	0	3	12
3	107	92.85857157	0	3	12
4	109.4	96.58825558	0	3	12
5	110	100	0	3	12
6	109.4	103.4117444	0	3	12
7	107	107.1414284	0	3	12
8	104	109.1651514	0	3	12
9	100	110	0	3	12
10	96	109.1651514	0	3	12
11	93	107.1414284	0	3	12
12	90.6	103.4117444	0	3	12
13	90	100	0	3	12
14	90.6	96.58825558	0	3	12
15	93	92.85857157	0	3	12
16	96	90.83484861	0	3	12
17	100	80	0	3	8
18	107	81.265006	0	3	8
19	110	82.67949192	0	3	8
20	115.5	87.36077534	0	3	8
21	117.5	90.31754163	0	3	8
22	120	100	0	3	8
23	117.5	109.6824584	0	3	8
24	115.5	112.6392247	0	3	8
25	110	117.3205081	0	3	8
26	107	118.734994	0	3	8
27	100	120	0	3	8
28	93	118.734994	0	3	8
29	90	117.3205081	0	3	8
30	84.5	112.6392247	0	3	8
31	82.5	109.6824584	0	3	8
32	80	100	0	3	8
33	82.5	90.31754163	0	3	8
34	84.5	87.36077534	0	3	8
35	90	82.67949192	0	3	8
36	93	81.265006	0	3	8
37	100	70	0	3	4
38	112	72.50454583	0	3	4
39	115	74.01923789	0	3	4
40	124.5	82.68671031	0	3	4
41	126	85.03337045	0	3	4
42	129.7	95.76797921	0	3	4
43	130	100	0	3	4
44	129.7	104.2320208	0	3	4
45	126	114.9666295	0	3	4
46	124.5	117.3132897	0	3	4
47	115	125.9807621	0	3	4
48	112	127.4954542	0	3	4
49	100	130	0	3	4
50	88	127.4954542	0	3	4
51	85	125.9807621	0	3	4
52	76.5	117.3132897	0	3	4
53	74	114.9666295	0	3	4
54	70.3	104.2320208	0	3	4
55	70	100	0	3	4
56	70.3	95.76797921	0	3	4
57	74	85.03337045	0	3	4
58	76.5	82.68671031	0	3	4
59	85	74.01923789	0	3	4
60	88	72.50454583	0	3	4
61	100	60	0	3	2
62	104	60.20050252	0	3	2
63	115.5	63.12521187	0	3	2
64	119	64.80056819	0	3	2
65	122.5	66.92810861	0	3	2
66	129	72.45004537	0	3	2
67	131.5	75.34741393	0	3	2
68	134	78.92869249	0	3	2
69	137.7	86.63175404	0	3	2
70	138.5	89.14873279	0	3	2
71	139.1	91.56258333	0	3	2
72	140	100	0	3	2
73	139.1	108.4374167	0	3	2
74	138.5	110.8512672	0	3	2
75	137.7	113.368246	0	3	2
76	134	121.0713075	0	3	2
77	131.5	124.6525861	0	3	2
78	129	127.5499546	0	3	2
79	122.5	133.0718914	0	3	2
80	119	135.1994318	0	3	2
81	115.5	136.8747881	0	3	2
82	104	139.7994975	0	3	2
83	100	140	0	3	2
84	96	139.7994975	0	3	2
85	84.5	136.8747881	0	3	2
86	81	135.1994318	0	3	2
87	77.5	133.0718914	0	3	2
88	71	127.5499546	0	3	2
89	68.5	124.6525861	0	3	2
90	66	121.0713075	0	3	2
91	62.3	113.368246	0	3	2
92	61.5	110.8512672	0	3	2
93	60.9	108.4374167	0	3	2
94	60	100	0	3	2
95	60.9	91.56258333	0	3	2
96	61.5	89.14873279	0	3	2
97	62.3	86.63175404	0	3	2
98	66	78.92869249	0	3	2
99	68.5	75.34741393	0	3	2
100	71	72.45004537	0	3	2
101	77.5	66.92810861	0	3	2
102	81	64.80056819	0	3	2
103	84.5	63.12521187	0	3	2
104	96	60.20050252	0	3	2
105	100	50	0	3	1
106	104	50.16025682	0	3	1
107	108	50.64414928	0	3	1
108	124	56.1365756	0	3	1
109	127.5	58.24176728	0	3	1
110	130.5	60.37992933	0	3	1
111	139.6200707	69.5	0	3	1
112	141.7582327	72.5	0	3	1
113	143.8634244	76	0	3	1
114	149.3558507	92	0	3	1
115	149.8397432	96	0	3	1
116	150	100	0	3	1
117	149.8397432	104	0	3	1

Node ID	x	y	z	r_i	demand
118	149.3558507	108	0	3	1
119	143.8634244	124	0	3	1
120	141.7582327	127.5	0	3	1
121	139.6200707	130.5	0	3	1
122	130.5	139.6200707	0	3	1
123	127.5	141.7582327	0	3	1
124	124	143.8634244	0	3	1
125	108	149.3558507	0	3	1
126	104	149.8397432	0	3	1
127	100	150	0	3	1
128	96	149.8397432	0	3	1
129	92	149.3558507	0	3	1
130	76	143.8634244	0	3	1
131	72.5	141.7582327	0	3	1
132	69.5	139.6200707	0	3	1
133	60.37992933	130.5	0	3	1
134	56.1365756	124	0	3	1
135	58.24176728	127.5	0	3	1
136	50.64414928	108	0	3	1
137	50.16025682	104	0	3	1
138	50	100	0	3	1
139	50.16025682	96	0	3	1
140	50.64414928	92	0	3	1
141	56.1365756	76	0	3	1
142	58.24176728	72.5	0	3	1
143	60.37992933	69.5	0	3	1
144	69.5	60.37992933	0	3	1
145	72.5	58.24176728	0	3	1
146	76	56.1365756	0	3	1
147	92	50.64414928	0	3	1
148	96	50.16025682	0	3	1

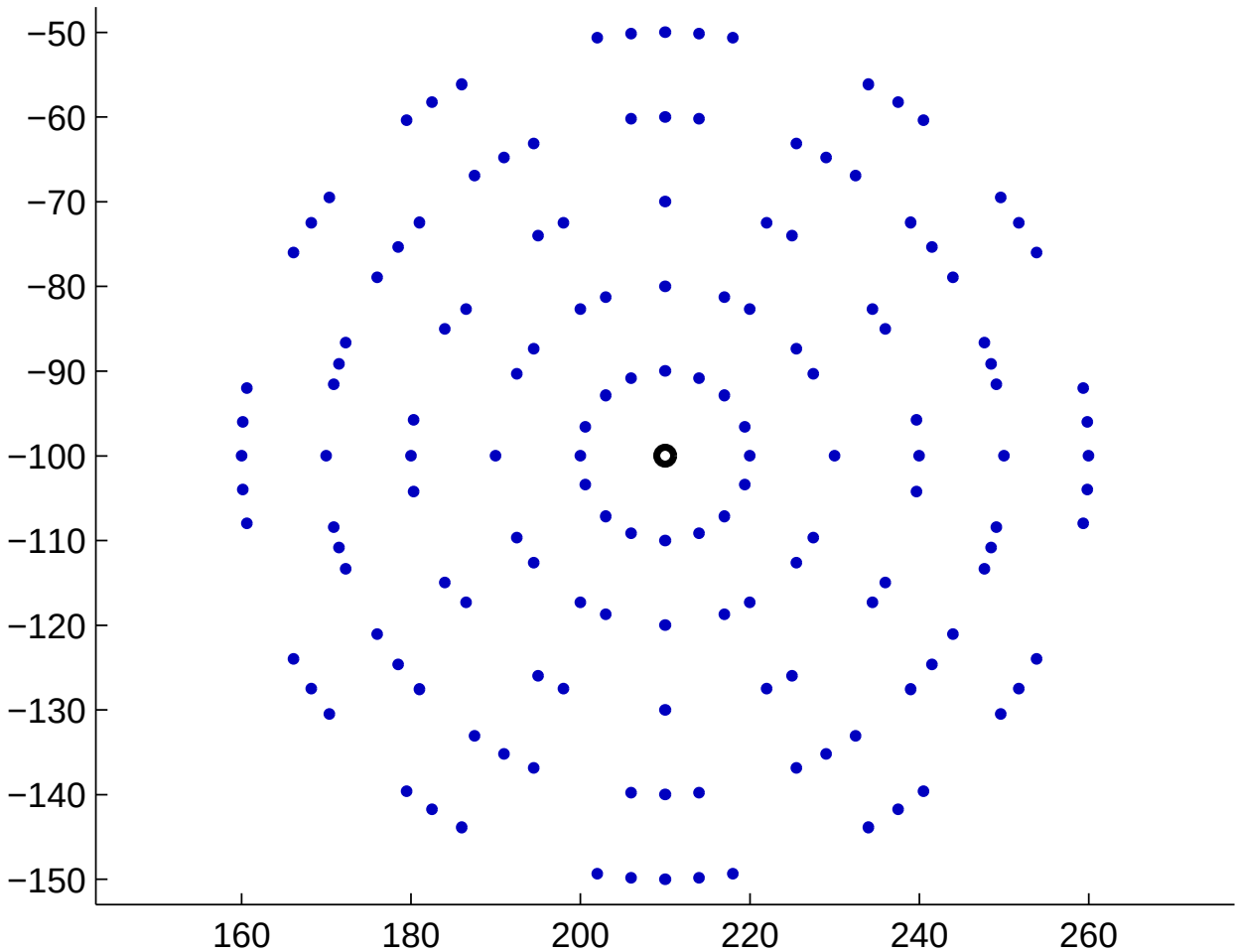


Figure L.31: concentricCircles: The innermost circle of 16 nodes is *concentricCircles*1. Add the second inner circle to get *concentricCircles*2 and so on.

Table L-17: Details of rotatingDiamonds and concentricCircles

Name	Nodes	n	Total Demand	Max Vehicle Capacity	Max Vehicle Distance
rotatingDiamonds1	[0,. . . ,20]	21	20	6	∞
rotatingDiamonds2	[0,. . . ,60]	61	60	13	∞
rotatingDiamonds3	[0,. . . ,180]	181	180	27	∞
rotatingDiamonds4	[0,. . . ,320]	321	320	85	∞
rotatingDiamonds5	[0,. . . ,680]	681	680	160	∞
concentricCircles1	[0,. . . ,16]	17	192	50	∞
concentricCircles2	[0,. . . ,36]	37	352	95	∞
concentricCircles3	[0,. . . ,60]	61	448	88	∞
concentricCircles4	[0,. . . ,104]	105	536	90	∞
concentricCircles5	[0,. . . ,148]	149	580	90	∞

Table L-18: bubbles1

n:	37
r:	10
Description:	geometric pattern
Total Demand:	432
Max Vehicle Capacity:	120
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	100	100	0	-	-
1	100	55	0	10	12
2	110	55	0	10	12
3	120	55	0	10	12
4	130	55	0	10	12
5	140	55	0	10	12
6	140	65	0	10	12
7	140	75	0	10	12
8	140	85	0	10	12
9	140	95	0	10	12
10	140	105	0	10	12
11	140	115	0	10	12
12	140	125	0	10	12
13	140	135	0	10	12
14	140	145	0	10	12
15	130	145	0	10	12
16	120	145	0	10	12
17	110	145	0	10	12
18	100	145	0	10	12
19	90	145	0	10	12
20	80	145	0	10	12
21	70	145	0	10	12
22	60	145	0	10	12
23	50	145	0	10	12
24	50	135	0	10	12
25	50	125	0	10	12
26	50	115	0	10	12
27	50	105	0	10	12
28	50	95	0	10	12
29	50	85	0	10	12
30	50	75	0	10	12
31	50	65	0	10	12
32	50	55	0	10	12
33	60	55	0	10	12
34	70	55	0	10	12
35	80	55	0	10	12
36	90	55	0	10	12

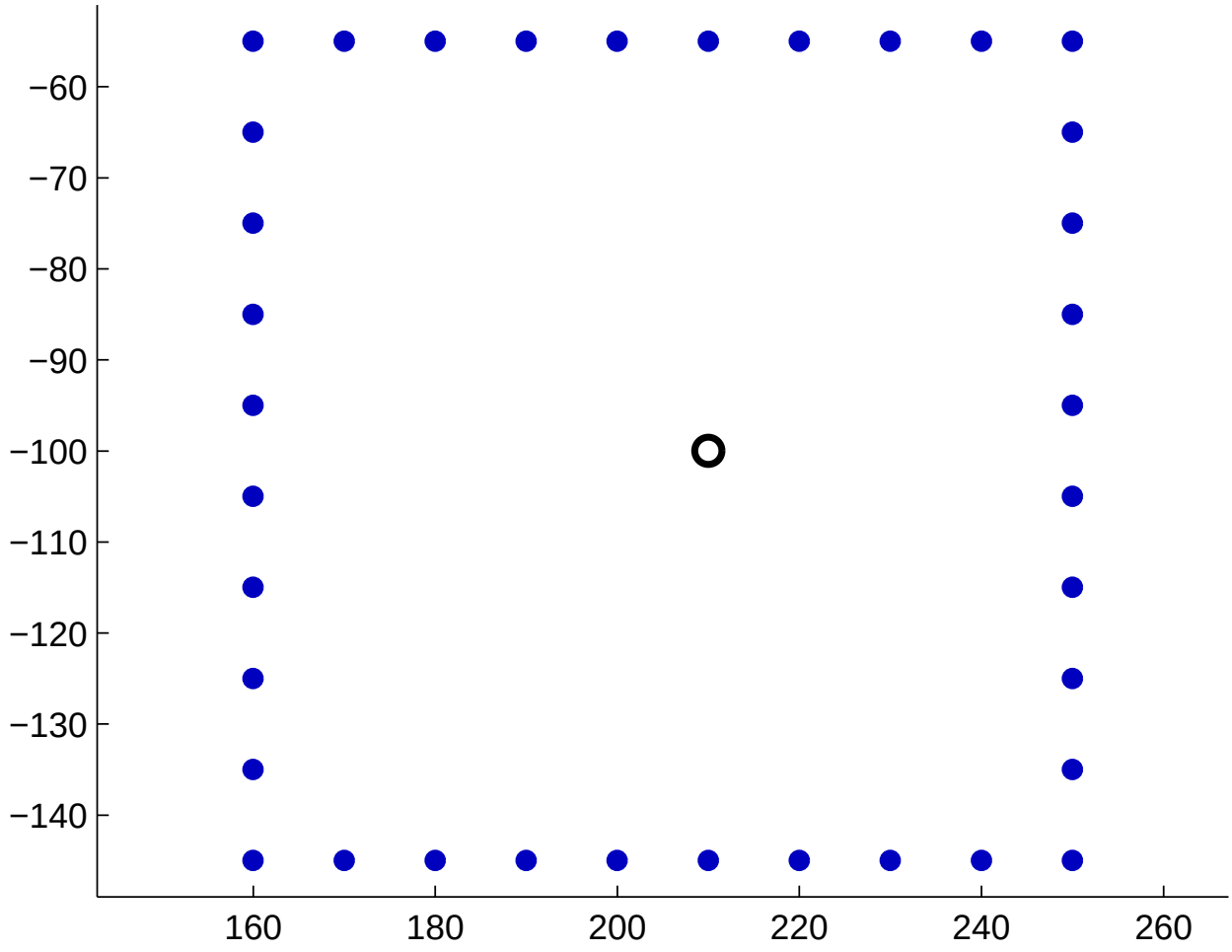


Figure L.32: bubbles1

Table L-19: Details of bubbles

Name	Nodes	n	Total Demand	Max Vehicle Capacity	Max Vehicle Distance
bubbles2	[0,. . . ,76]	77	752	400	∞
bubbles3	[0,. . . ,126]	127	1052	212	∞
bubbles4	[0,. . . ,184]	185	1284	170	∞
bubbles5	[0,. . . ,250]	251	1416	178	∞
bubbles6	[0,. . . ,324]	325	1490	257	∞
bubbles7	[0,. . . ,406]	407	1818	500	∞
bubbles8	[0,. . . ,496]	497	2538	300	∞
bubbles9	[0,. . . ,594]	595	3714	470	∞

Table L-20: bubbles

r: 10

Description: geometric pattern

Node ID	x	y	z	r_i	demand
0	100	100	0	-	-
1	60	55	0	10	12
2	60	65	0	10	12
3	60	75	0	10	12
4	60	85	0	10	12
5	60	95	0	10	12
6	60	105	0	10	12
7	60	115	0	10	12
8	60	125	0	10	12
9	60	135	0	10	12
10	60	145	0	10	12
11	150	55	0	10	12
12	150	65	0	10	12
13	150	75	0	10	12
14	150	85	0	10	12
15	150	95	0	10	12
16	150	105	0	10	12
17	150	115	0	10	12
18	150	125	0	10	12
19	150	135	0	10	12
20	150	145	0	10	12
21	70	145	0	10	12
22	80	145	0	10	12
23	90	145	0	10	12
24	100	145	0	10	12
25	110	145	0	10	12
26	120	145	0	10	12
27	130	145	0	10	12
28	140	145	0	10	12
29	70	55	0	10	12
30	80	55	0	10	12
31	90	55	0	10	12
32	100	55	0	10	12
33	110	55	0	10	12
34	120	55	0	10	12
35	130	55	0	10	12
36	140	55	0	10	12
37	50	45	0	10	8
38	50	55	0	10	8
39	50	65	0	10	8
40	50	75	0	10	8
41	50	85	0	10	8
42	50	95	0	10	8
43	50	105	0	10	8
44	50	115	0	10	8
45	50	125	0	10	8
46	50	135	0	10	8
47	50	145	0	10	8
48	50	155	0	10	8
49	60	45	0	10	8
50	70	45	0	10	8
51	80	45	0	10	8
52	90	45	0	10	8
53	100	45	0	10	8
54	110	45	0	10	8
55	120	45	0	10	8
56	130	45	0	10	8
57	140	45	0	10	8
58	150	45	0	10	8
59	140	65	0	10	8
60	140	75	0	10	8
61	140	85	0	10	8
62	140	95	0	10	8
63	140	105	0	10	8
64	140	115	0	10	8
65	140	125	0	10	8
66	140	135	0	10	8
67	150	155	0	10	8
68	140	155	0	10	8
69	130	155	0	10	8
70	120	155	0	10	8
71	110	155	0	10	8
72	100	155	0	10	8
73	90	155	0	10	8
74	80	155	0	10	8
75	70	155	0	10	8
76	60	155	0	10	8
77	40	35	0	10	6
78	50	35	0	10	6
79	60	35	0	10	6
80	70	35	0	10	6
81	80	35	0	10	6
82	90	35	0	10	6
83	100	35	0	10	6
84	110	35	0	10	6
85	120	35	0	10	6
86	130	35	0	10	6
87	140	35	0	10	6
88	150	35	0	10	6
89	160	35	0	10	6
90	40	165	0	10	6
91	50	165	0	10	6
92	60	165	0	10	6
93	70	165	0	10	6

Node ID	x	y	z	r_i	demand
94	80	165	0	10	6
95	90	165	0	10	6
96	100	165	0	10	6
97	110	165	0	10	6
98	120	165	0	10	6
99	130	165	0	10	6
100	140	165	0	10	6
101	150	165	0	10	6
102	160	165	0	10	6
103	40	45	0	10	6
104	40	55	0	10	6
105	40	65	0	10	6
106	40	75	0	10	6
107	40	85	0	10	6
108	40	95	0	10	6
109	40	105	0	10	6
110	40	115	0	10	6
111	40	125	0	10	6
112	40	135	0	10	6
113	40	145	0	10	6
114	40	155	0	10	6
115	160	45	0	10	6
116	160	55	0	10	6
117	160	65	0	10	6
118	160	75	0	10	6
119	160	85	0	10	6
120	160	95	0	10	6
121	160	105	0	10	6
122	160	115	0	10	6
123	160	125	0	10	6
124	160	135	0	10	6
125	160	145	0	10	6
126	160	155	0	10	6
127	30	35	0	10	4
128	30	45	0	10	4
129	30	55	0	10	4
130	30	65	0	10	4
131	30	75	0	10	4
132	30	85	0	10	4
133	30	95	0	10	4
134	30	105	0	10	4
135	30	115	0	10	4
136	30	125	0	10	4
137	30	135	0	10	4
138	30	145	0	10	4
139	30	155	0	10	4
140	30	165	0	10	4
141	30	175	0	10	4
142	170	35	0	10	4

Node ID	x	y	z	r_i	demand
143	170	45	0	10	4
144	170	55	0	10	4
145	170	65	0	10	4
146	170	75	0	10	4
147	170	85	0	10	4
148	170	95	0	10	4
149	170	105	0	10	4
150	170	115	0	10	4
151	170	125	0	10	4
152	170	135	0	10	4
153	170	145	0	10	4
154	170	155	0	10	4
155	170	165	0	10	4
156	170	175	0	10	4
157	30	25	0	10	4
158	40	25	0	10	4
159	50	25	0	10	4
160	60	25	0	10	4
161	70	25	0	10	4
162	80	25	0	10	4
163	90	25	0	10	4
164	100	25	0	10	4
165	110	25	0	10	4
166	120	25	0	10	4
167	130	25	0	10	4
168	140	25	0	10	4
169	150	25	0	10	4
170	160	25	0	10	4
171	170	25	0	10	4
172	40	175	0	10	4
173	50	175	0	10	4
174	60	175	0	10	4
175	70	175	0	10	4
176	80	175	0	10	4
177	90	175	0	10	4
178	100	175	0	10	4
179	110	175	0	10	4
180	120	175	0	10	4
181	130	175	0	10	4
182	140	175	0	10	4
183	150	175	0	10	4
184	160	175	0	10	4
185	20	15	0	10	2
186	20	25	0	10	2
187	20	35	0	10	2
188	20	45	0	10	2
189	20	55	0	10	2
190	20	65	0	10	2
191	20	75	0	10	2

Node ID	x	y	z	r_i	demand
192	20	85	0	10	2
193	20	95	0	10	2
194	20	105	0	10	2
195	20	115	0	10	2
196	20	125	0	10	2
197	20	135	0	10	2
198	20	145	0	10	2
199	20	155	0	10	2
200	20	165	0	10	2
201	20	175	0	10	2
202	20	185	0	10	2
203	180	15	0	10	2
204	180	25	0	10	2
205	180	35	0	10	2
206	180	45	0	10	2
207	180	55	0	10	2
208	180	65	0	10	2
209	180	75	0	10	2
210	180	85	0	10	2
211	180	95	0	10	2
212	180	105	0	10	2
213	180	115	0	10	2
214	180	125	0	10	2
215	180	135	0	10	2
216	180	145	0	10	2
217	180	155	0	10	2
218	180	165	0	10	2
219	180	175	0	10	2
220	180	185	0	10	2
221	30	15	0	10	2
222	40	15	0	10	2
223	50	15	0	10	2
224	60	15	0	10	2
225	70	15	0	10	2
226	80	15	0	10	2
227	90	15	0	10	2
228	100	15	0	10	2
229	110	15	0	10	2
230	120	15	0	10	2
231	130	15	0	10	2
232	140	15	0	10	2
233	150	15	0	10	2
234	160	15	0	10	2
235	170	15	0	10	2
236	30	185	0	10	2
237	40	185	0	10	2
238	50	185	0	10	2
239	60	185	0	10	2
240	70	185	0	10	2

Node ID	x	y	z	r_i	demand
241	80	185	0	10	2
242	90	185	0	10	2
243	100	185	0	10	2
244	110	185	0	10	2
245	120	185	0	10	2
246	130	185	0	10	2
247	140	185	0	10	2
248	150	185	0	10	2
249	160	185	0	10	2
250	170	185	0	10	2
251	10	5	0	10	1
252	10	15	0	10	1
253	10	25	0	10	1
254	10	35	0	10	1
255	10	45	0	10	1
256	10	55	0	10	1
257	10	65	0	10	1
258	10	75	0	10	1
259	10	85	0	10	1
260	10	95	0	10	1
261	10	105	0	10	1
262	10	115	0	10	1
263	10	125	0	10	1
264	10	135	0	10	1
265	10	145	0	10	1
266	10	155	0	10	1
267	10	165	0	10	1
268	10	175	0	10	1
269	10	185	0	10	1
270	10	195	0	10	1
271	190	15	0	10	1
272	190	25	0	10	1
273	190	35	0	10	1
274	190	45	0	10	1
275	190	55	0	10	1
276	190	65	0	10	1
277	190	75	0	10	1
278	190	85	0	10	1
279	190	95	0	10	1
280	190	105	0	10	1
281	190	115	0	10	1
282	190	125	0	10	1
283	190	135	0	10	1
284	190	145	0	10	1
285	190	155	0	10	1
286	190	165	0	10	1
287	190	175	0	10	1
288	190	185	0	10	1
289	20	5	0	10	1

Node ID	x	y	z	r_i	demand
290	30	5	0	10	1
291	40	5	0	10	1
292	50	5	0	10	1
293	60	5	0	10	1
294	70	5	0	10	1
295	80	5	0	10	1
296	90	5	0	10	1
297	100	5	0	10	1
298	110	5	0	10	1
299	120	5	0	10	1
300	130	5	0	10	1
301	140	5	0	10	1
302	150	5	0	10	1
303	160	5	0	10	1
304	170	5	0	10	1
305	180	5	0	10	1
306	190	5	0	10	1
307	20	195	0	10	1
308	30	195	0	10	1
309	40	195	0	10	1
310	50	195	0	10	1
311	60	195	0	10	1
312	70	195	0	10	1
313	80	195	0	10	1
314	90	195	0	10	1
315	100	195	0	10	1
316	110	195	0	10	1
317	120	195	0	10	1
318	130	195	0	10	1
319	140	195	0	10	1
320	150	195	0	10	1
321	160	195	0	10	1
322	170	195	0	10	1
323	180	195	0	10	1
324	190	195	0	10	1
325	0	-5	0	10	4
326	0	5	0	10	4
327	0	15	0	10	4
328	0	25	0	10	4
329	0	35	0	10	4
330	0	45	0	10	4
331	0	55	0	10	4
332	0	65	0	10	4
333	0	75	0	10	4
334	0	85	0	10	4
335	0	95	0	10	4
336	0	105	0	10	4
337	0	115	0	10	4
338	0	125	0	10	4

Node ID	x	y	z	r_i	demand
339	0	135	0	10	4
340	0	145	0	10	4
341	0	155	0	10	4
342	0	165	0	10	4
343	0	175	0	10	4
344	0	185	0	10	4
345	0	195	0	10	4
346	0	205	0	10	4
347	200	-5	0	10	4
348	200	5	0	10	4
349	200	15	0	10	4
350	200	25	0	10	4
351	200	35	0	10	4
352	200	45	0	10	4
353	200	55	0	10	4
354	200	65	0	10	4
355	200	75	0	10	4
356	200	85	0	10	4
357	200	95	0	10	4
358	200	105	0	10	4
359	200	115	0	10	4
360	200	125	0	10	4
361	200	135	0	10	4
362	200	145	0	10	4
363	200	155	0	10	4
364	200	165	0	10	4
365	200	175	0	10	4
366	200	185	0	10	4
367	200	195	0	10	4
368	200	205	0	10	4
369	10	-5	0	10	4
370	20	-5	0	10	4
371	30	-5	0	10	4
372	40	-5	0	10	4
373	50	-5	0	10	4
374	60	-5	0	10	4
375	70	-5	0	10	4
376	80	-5	0	10	4
377	90	-5	0	10	4
378	100	-5	0	10	4
379	110	-5	0	10	4
380	120	-5	0	10	4
381	130	-5	0	10	4
382	140	-5	0	10	4
383	150	-5	0	10	4
384	160	-5	0	10	4
385	170	-5	0	10	4
386	180	-5	0	10	4
387	190	-5	0	10	4

Node ID	x	y	z	r_i	demand
388	10	205	0	10	4
389	20	205	0	10	4
390	30	205	0	10	4
391	40	205	0	10	4
392	50	205	0	10	4
393	60	205	0	10	4
394	70	205	0	10	4
395	80	205	0	10	4
396	90	205	0	10	4
397	100	205	0	10	4
398	110	205	0	10	4
399	120	205	0	10	4
400	130	205	0	10	4
401	140	205	0	10	4
402	150	205	0	10	4
403	160	205	0	10	4
404	170	205	0	10	4
405	180	205	0	10	4
406	190	205	0	10	4
407	-10	-15	0	10	8
408	-10	-5	0	10	8
409	-10	5	0	10	8
410	-10	15	0	10	8
411	-10	25	0	10	8
412	-10	35	0	10	8
413	-10	45	0	10	8
414	-10	55	0	10	8
415	-10	65	0	10	8
416	-10	75	0	10	8
417	-10	85	0	10	8
418	-10	95	0	10	8
419	-10	105	0	10	8
420	-10	115	0	10	8
421	-10	125	0	10	8
422	-10	135	0	10	8
423	-10	145	0	10	8
424	-10	155	0	10	8
425	-10	165	0	10	8
426	-10	175	0	10	8
427	-10	185	0	10	8
428	-10	195	0	10	8
429	-10	205	0	10	8
430	-10	215	0	10	8
431	210	-15	0	10	8
432	210	-5	0	10	8
433	210	5	0	10	8
434	210	15	0	10	8
435	210	25	0	10	8
436	210	35	0	10	8

Node ID	x	y	z	r_i	demand
437	210	45	0	10	8
438	210	55	0	10	8
439	210	65	0	10	8
440	210	75	0	10	8
441	210	85	0	10	8
442	210	95	0	10	8
443	210	105	0	10	8
444	210	115	0	10	8
445	210	125	0	10	8
446	210	135	0	10	8
447	210	145	0	10	8
448	210	155	0	10	8
449	210	165	0	10	8
450	210	175	0	10	8
451	210	185	0	10	8
452	210	195	0	10	8
453	210	205	0	10	8
454	210	215	0	10	8
455	0	-15	0	10	8
456	10	-15	0	10	8
457	20	-15	0	10	8
458	30	-15	0	10	8
459	40	-15	0	10	8
460	50	-15	0	10	8
461	60	-15	0	10	8
462	70	-15	0	10	8
463	80	-15	0	10	8
464	90	-15	0	10	8
465	100	-15	0	10	8
466	110	-15	0	10	8
467	120	-15	0	10	8
468	130	-15	0	10	8
469	140	-15	0	10	8
470	150	-15	0	10	8
471	160	-15	0	10	8
472	170	-15	0	10	8
473	180	-15	0	10	8
474	190	-15	0	10	8
475	200	-15	0	10	8
476	0	215	0	10	8
477	10	215	0	10	8
478	20	215	0	10	8
479	30	215	0	10	8
480	40	215	0	10	8
481	50	215	0	10	8
482	60	215	0	10	8
483	70	215	0	10	8
484	80	215	0	10	8
485	90	215	0	10	8

Node ID	x	y	z	r_i	demand
486	100	215	0	10	8
487	110	215	0	10	8
488	120	215	0	10	8
489	130	215	0	10	8
490	140	215	0	10	8
491	150	215	0	10	8
492	160	215	0	10	8
493	170	215	0	10	8
494	180	215	0	10	8
495	190	215	0	10	8
496	200	215	0	10	8
497	-20	-25	0	10	12
498	-20	-15	0	10	12
499	-20	-5	0	10	12
500	-20	5	0	10	12
501	-20	15	0	10	12
502	-20	25	0	10	12
503	-20	35	0	10	12
504	-20	45	0	10	12
505	-20	55	0	10	12
506	-20	65	0	10	12
507	-20	75	0	10	12
508	-20	85	0	10	12
509	-20	95	0	10	12
510	-20	105	0	10	12
511	-20	115	0	10	12
512	-20	125	0	10	12
513	-20	135	0	10	12
514	-20	145	0	10	12
515	-20	155	0	10	12
516	-20	165	0	10	12
517	-20	175	0	10	12
518	-20	185	0	10	12
519	-20	195	0	10	12
520	-20	205	0	10	12
521	-20	215	0	10	12
522	-20	225	0	10	12
523	220	-25	0	10	12
524	220	-15	0	10	12
525	220	-5	0	10	12
526	220	5	0	10	12
527	220	15	0	10	12
528	220	25	0	10	12
529	220	35	0	10	12
530	220	45	0	10	12
531	220	55	0	10	12
532	220	65	0	10	12
533	220	75	0	10	12
534	220	85	0	10	12

Node ID	x	y	z	r_i	demand
535	220	95	0	10	12
536	220	105	0	10	12
537	220	115	0	10	12
538	220	125	0	10	12
539	220	135	0	10	12
540	220	145	0	10	12
541	220	155	0	10	12
542	220	165	0	10	12
543	220	175	0	10	12
544	220	185	0	10	12
545	220	195	0	10	12
546	220	205	0	10	12
547	220	215	0	10	12
548	220	225	0	10	12
549	-10	-25	0	10	12
550	0	-25	0	10	12
551	10	-25	0	10	12
552	20	-25	0	10	12
553	30	-25	0	10	12
554	40	-25	0	10	12
555	50	-25	0	10	12
556	60	-25	0	10	12
557	70	-25	0	10	12
558	80	-25	0	10	12
559	90	-25	0	10	12
560	100	-25	0	10	12
561	110	-25	0	10	12
562	120	-25	0	10	12
563	130	-25	0	10	12
564	140	-25	0	10	12
565	150	-25	0	10	12
566	160	-25	0	10	12
567	170	-25	0	10	12
568	180	-25	0	10	12
569	190	-25	0	10	12
570	200	-25	0	10	12
571	210	-25	0	10	12
572	-10	225	0	10	12
573	0	225	0	10	12
574	10	225	0	10	12
575	20	225	0	10	12
576	30	225	0	10	12
577	40	225	0	10	12
578	50	225	0	10	12
579	60	225	0	10	12
580	70	225	0	10	12
581	80	225	0	10	12
582	90	225	0	10	12
583	100	225	0	10	12

Node ID	x	y	z	r_i	demand
584	110	225	0	10	12
585	120	225	0	10	12
586	130	225	0	10	12
587	140	225	0	10	12
588	150	225	0	10	12
589	160	225	0	10	12
590	170	225	0	10	12
591	180	225	0	10	12
592	190	225	0	10	12
593	200	225	0	10	12
594	210	225	0	10	12

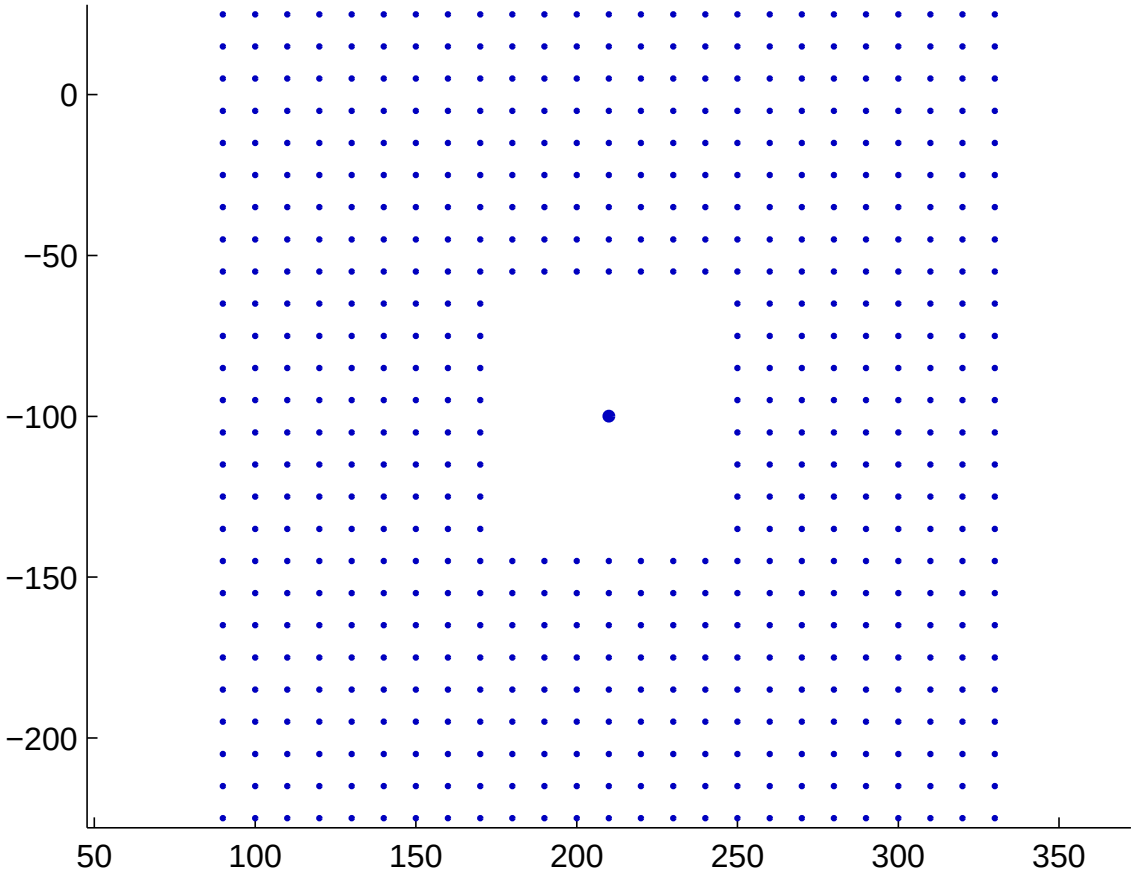


Figure L.33: bubbles: The innermost two squares comprise *bubbles*2. The innermost three squares comprise *bubbles*3, etc.

Table L-21: chaoSingleDep

n:	201
r:	5
Description:	geometric pattern
Total Demand:	1080
Max Vehicle Capacity:	280
Max Vehicle Distance:	∞

Node ID	x	y	z	r_i	demand
0	110	110	0	-	-
1	107	93	0	5	12
2	110	96	0	5	12
3	110	93	0	5	12
4	110	90	0	5	12
5	113	93	0	5	12
6	124	93	0	5	12
7	127	96	0	5	12
8	127	93	0	5	12
9	127	90	0	5	12
10	130	93	0	5	12
11	124	110	0	5	12
12	127	113	0	5	12
13	127	110	0	5	12
14	127	107	0	5	12
15	130	110	0	5	12
16	124	127	0	5	12
17	127	130	0	5	12
18	127	127	0	5	12
19	127	124	0	5	12
20	130	127	0	5	12
21	107	127	0	5	12
22	110	130	0	5	12
23	110	127	0	5	12
24	110	124	0	5	12
25	113	127	0	5	12
26	90	127	0	5	12
27	93	130	0	5	12
28	93	127	0	5	12
29	93	124	0	5	12
30	96	127	0	5	12
31	90	110	0	5	12
32	93	113	0	5	12
33	93	110	0	5	12
34	93	107	0	5	12
35	96	110	0	5	12
36	90	93	0	5	12
37	93	96	0	5	12
38	93	93	0	5	12
39	93	90	0	5	12
40	96	93	0	5	12
41	107	76	0	5	8
42	110	79	0	5	8
43	110	76	0	5	8
44	110	73	0	5	8
45	113	76	0	5	8
46	141	76	0	5	8
47	144	79	0	5	8
48	144	76	0	5	8
49	144	73	0	5	8
50	147	76	0	5	8
51	141	110	0	5	8
52	144	113	0	5	8
53	144	110	0	5	8
54	144	107	0	5	8
55	147	110	0	5	8
56	141	144	0	5	8
57	144	147	0	5	8
58	144	144	0	5	8
59	144	141	0	5	8
60	147	144	0	5	8
61	107	144	0	5	8
62	110	147	0	5	8
63	110	144	0	5	8
64	110	141	0	5	8
65	113	144	0	5	8
66	73	144	0	5	8
67	76	147	0	5	8
68	76	144	0	5	8
69	76	141	0	5	8
70	79	144	0	5	8
71	73	110	0	5	8
72	76	113	0	5	8
73	76	110	0	5	8
74	76	107	0	5	8
75	79	110	0	5	8
76	73	76	0	5	8
77	76	79	0	5	8
78	76	76	0	5	8
79	76	73	0	5	8
80	79	76	0	5	8
81	107	59	0	5	4
82	110	62	0	5	4
83	110	59	0	5	4
84	110	56	0	5	4
85	113	59	0	5	4
86	158	59	0	5	4
87	161	62	0	5	4
88	161	59	0	5	4
89	161	56	0	5	4

Node ID	x	y	z	r_i	demand
90	164	59	0	5	4
91	158	110	0	5	4
92	161	113	0	5	4
93	161	110	0	5	4
94	161	107	0	5	4
95	164	110	0	5	4
96	158	161	0	5	4
97	161	164	0	5	4
98	161	161	0	5	4
99	161	158	0	5	4
100	164	161	0	5	4
101	107	161	0	5	4
102	110	164	0	5	4
103	110	161	0	5	4
104	110	158	0	5	4
105	113	161	0	5	4
106	56	161	0	5	4
107	59	164	0	5	4
108	59	161	0	5	4
109	59	158	0	5	4
110	62	161	0	5	4
111	56	110	0	5	4
112	59	113	0	5	4
113	59	110	0	5	4
114	59	107	0	5	4
115	62	110	0	5	4
116	56	59	0	5	4
117	59	62	0	5	4
118	59	59	0	5	4
119	59	56	0	5	4
120	62	59	0	5	4
121	107	42	0	5	2
122	110	45	0	5	2
123	110	42	0	5	2
124	110	39	0	5	2
125	113	42	0	5	2
126	175	42	0	5	2
127	178	45	0	5	2
128	178	42	0	5	2
129	178	39	0	5	2
130	181	42	0	5	2
131	175	110	0	5	2
132	178	113	0	5	2
133	178	110	0	5	2
134	178	107	0	5	2
135	181	110	0	5	2
136	175	178	0	5	2
137	178	181	0	5	2
138	178	178	0	5	2

Node ID	x	y	z	r_i	demand
139	178	175	0	5	2
140	181	178	0	5	2
141	107	178	0	5	2
142	110	181	0	5	2
143	110	178	0	5	2
144	110	175	0	5	2
145	113	178	0	5	2
146	39	178	0	5	2
147	42	181	0	5	2
148	42	178	0	5	2
149	42	175	0	5	2
150	45	178	0	5	2
151	39	110	0	5	2
152	42	107	0	5	2
153	42	110	0	5	2
154	42	113	0	5	2
155	45	110	0	5	2
156	39	42	0	5	2
157	42	45	0	5	2
158	42	42	0	5	2
159	42	39	0	5	2
160	45	42	0	5	2
161	107	25	0	5	1
162	110	28	0	5	1
163	110	25	0	5	1
164	110	22	0	5	1
165	113	25	0	5	1
166	192	25	0	5	1
167	195	28	0	5	1
168	195	25	0	5	1
169	195	22	0	5	1
170	198	25	0	5	1
171	192	110	0	5	1
172	195	107	0	5	1
173	195	110	0	5	1
174	195	113	0	5	1
175	198	110	0	5	1
176	192	195	0	5	1
177	195	198	0	5	1
178	195	195	0	5	1
179	195	192	0	5	1
180	198	195	0	5	1
181	107	195	0	5	1
182	110	198	0	5	1
183	110	195	0	5	1
184	110	192	0	5	1
185	113	195	0	5	1
186	22	195	0	5	1
187	25	198	0	5	1

Node ID	x	y	z	r_i	demand
188	25	195	0	5	1
189	25	192	0	5	1
190	28	195	0	5	1
191	22	110	0	5	1
192	25	113	0	5	1
193	25	110	0	5	1
194	25	107	0	5	1
195	28	110	0	5	1
196	22	25	0	5	1
197	25	28	0	5	1
198	25	25	0	5	1
199	25	22	0	5	1
200	28	25	0	5	1

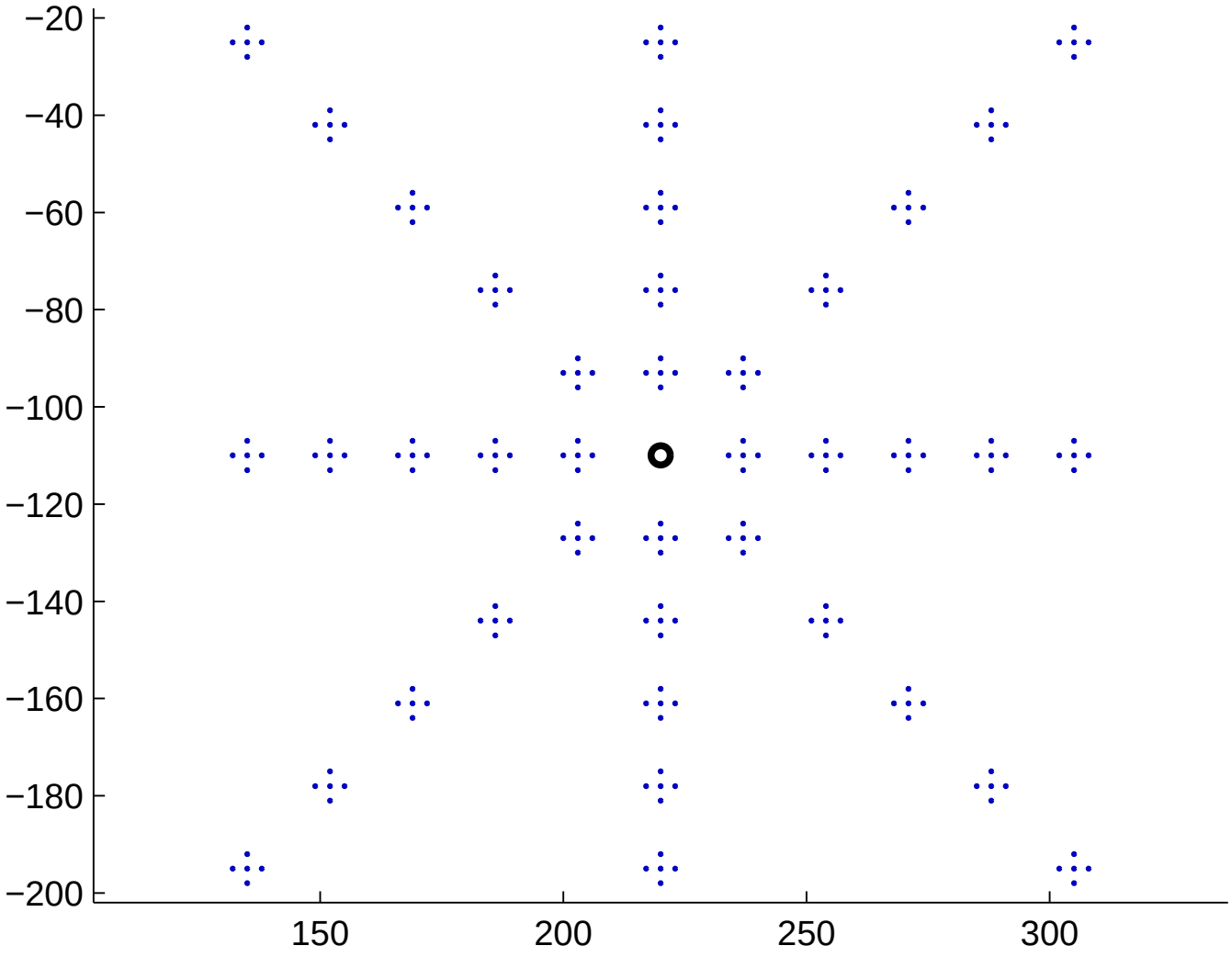


Figure L.34: chaoSingleDep

Appendix M

SDTOP Problem Data

In this appendix, we present the problem data for all SDTOP instances. The problems are created from the 130 TOP problems given in Archetti et al. [6]. Each of the 10 unique node sets are given different combinations of maximum vehicle capacity, maximum tour length, and number of vehicles available to create the 130 problems and are divided into Set I, Set II, and Set III. To make SDTOP problems we added an inverse symmetric reward matrix P for each of the 10 node sets.

We created 10 additional, heterogeneous-fleet problems, called Set IV, based on the 10 Archetti et al. node sets. All Set IV problems can achieve the LOP solutions found by Charon and Hudry's code. The reward matrix, P, is generalized. The number of vehicles available for use, K, is not necessarily equal to the maximum number that can be used in any solution, k_{max}. The minimum number of vehicles that must be used, k_{min}, is not necessarily equal to one.

For all problems, the p_{ij} values for any matrix P are uniformly distributed on the interval [0, n] for a generalized P and [-n, n] for an inverse symmetric P. All problems use the 2D, Euclidean norm although our method can solve problems using the Euclidean 3D, Manhattan 2D, and Manhattan 3D norms.

The data for each of the 10 unique node sets problem are presented in Tables M-1 through M-10. Following each table, the inverse symmetric P and the generalized P associated with that problem are given. Tables M-11 through M-14 present the maximum

capacities, tour lengths, number of vehicles that can be used, and which P matrix is associated with each problem.

The author can be reached at `wmennell@hotmail.com` for copies of the data files include P matrices.

Table M-1: p_03cri Node Data

non-depot nodes: 100

Node ID	x	y	demand	service time
0	35	35	-	-
1	41	49	10	10
2	35	17	7	10
3	55	45	13	10
4	55	20	19	10
5	15	30	26	10
6	25	30	3	10
7	20	50	5	10
8	10	43	9	10
9	55	60	16	10
10	30	60	16	10
11	20	65	12	10
12	50	35	19	10
13	30	25	23	10
14	15	10	20	10
15	30	5	8	10
16	10	20	19	10
17	5	30	2	10
18	20	40	12	10
19	15	60	17	10
20	45	65	9	10
21	45	20	11	10
22	45	10	18	10
23	55	5	29	10
24	65	35	3	10
25	65	20	6	10
26	45	30	17	10
27	35	40	16	10
28	41	37	16	10
29	64	42	9	10
30	40	60	21	10
31	31	52	27	10
32	35	69	23	10
33	53	52	11	10
34	65	55	14	10
35	63	65	8	10
36	2	60	5	10
37	20	20	8	10
38	5	5	16	10
39	60	12	31	10
40	40	25	9	10
41	42	7	5	10
42	24	12	5	10
43	23	3	7	10
44	11	14	18	10
45	6	38	16	10
46	2	48	1	10
47	8	56	27	10
48	13	52	36	10
49	6	68	30	10
50	47	47	13	10
51	49	58	10	10
52	27	43	9	10
53	37	31	14	10
54	57	29	18	10
55	63	23	2	10
56	53	12	6	10
57	32	12	7	10
58	36	26	18	10
59	21	24	28	10
60	17	34	3	10
61	12	24	13	10
62	24	58	19	10
63	27	69	10	10
64	15	77	9	10
65	62	77	20	10
66	49	73	25	10
67	67	5	25	10
68	56	39	36	10
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p03 Inverse P matrix

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80 90 20 23 35 64 74 0 39 52 21 85 17 39 82 4 50 20 84 92 22 51 41 50 37 94 28 30 43 66 79: 100 14 71 62 88 36 28 73 65 13 43 96 52 22
64 59 13 35 88 58 83 10 49 81 57 78 93 28 85 5 21 56 28 4 15 40 5 14 87 68 66 31 30 52 11 31 76 42 37 77 53 67 37 40 82 35 16 27 3 5
94 80 89 85 30 86 41 82 20 69 95 93 44 65 7 97 48 79 0 53 84 86 10 32 56 29 90 91 90 4 34 82 17 94 86 46 87 63 37 27 80: 72 34 39 62
92 47 15 88 90 46 98 9 80 43 30 6 80 0 70 23 69 38 54 11 7 13 87 32 73 64 36 99 85 35 88 72 97 42 93 68 93 41 32 69 55 88 54 32 54 22
60 76 95 82 50 94 83 1 56 32 71 86 50 74 42 35 91 1 75 48 31 1 5 86 77 21 70 13 100 0 31 29 23 46 5 82 0 14 13 95 15 16 27 59 40 43 79
87 60 91 81: 41 73 65 47 79 75 59 36 14 41 73 85 48 67 70 95 54 49 28 60 89 13 45 53 73 86 75 51 12 75 56 3 42 60 0 14 13 35 59 10 42
14 46 47 56 84 100 89 23 23 97 82 79 22 66 26 40 32 27 49 5 21 90 5 59 78 53 4 97 14 26 11 21 68 17 25 74 11 73 60 0 85 21 64 97 66 48
84 25 34 89 80 28 26 18 4 57 69 42 45 82: 5 63 55 49 95 16 42 1 52 65 1 89 33 71 6 94 44 48 92 98 82 49 63 88 17 90 52 65 61 71 90 86
47 61 69 0 63 90 46 6 14 49 63 52 82 42 50 86 5 98 32 93 76 27 42 55 61 45 9 82 96 37 29 67 81 54 74 16 56 3 39 87 0 13 21 26 80 42 12
78 91 0 82 39 91 33 33 89 49 18 16 53 48 61 29 87 4 28 30 20 83: 44 73 35 39 84 77 93 42 44 63 59 12 43 65 46 69 41 62 2 25 72 39 58
74 50 13 99 27 34 65 2 66 41 70 30 31 73 74 43 80 75 26 9 47 76 68 100 4 99 5 82 67 55 50 4 79 15 57 16 10 17 84 36 95 38 90 95 6 13
98 46 87 12 46 2 96 9 58 3 95 93 44 0 44 47 28 10 89 88 2 13 69 27 31 42 46 19 8 72 38 84: 74 18 30 82 19 33 2 69 89 54 45 70 96 79 29
0 3 48 9 44 65 98 16 13 56 73 38 93 51 60 47 91 71 21 14 87 98 89 72 58 70 31 32 100 85 97 28 70 18 13 6 96 48 67 97 7 22 71 89 92 71
100 12 7 8 54 10 94 33 4 7 41 94 32 56 20 9 67 79 4 31 54 74 0 35 50 39 100 35 32 30 34 98 55 32 47 29 51 98 90 85: 26 70 63 36 49 2
68 10 77 89 18 30 76 49 60 54 46 20 8 6 10 47 50 37 77 29 97 47 85 75 26 37 37 68 12 9 32 90 7 89 94 82 73 49 97 69 9 36 49 9 56 5 25
25 1 33 87 28 6 83 33 66 46 28 71 41 24 57 49 97 21 82 60 74 76 43 55 69 96 5 37 83 52 87 0 14 29 29 35 24 12 47 91 34 50 12 15 66 22
21 86: 99 1 76 70 54 20 27 85 85 66 15 85 91 47 78 69 69 8 18 1 10 49 1 96 19 45 20 91 85 48 97 76 41 87 78 24 76 7 73 91 83 72 74 75
4 71 49 46 42 79 52 25 90 46 20 100 23 31 71 97 86 72 78 33 53 23 0 4 57 37 19 6 67 58 16 51 43 71 49 90 94 29 12 21 58 0 73 1 35 69
74 67 34 90 25 26 12 78 26 14 87: 33 32 30 31 93 64 76 13 77 12 44 46 94 22 48 56 36 97 48 46 31 13 100 13 36 44 20 12 25 98 83 94 60
62 38 31 14 63 72 39 77 85 90 95 90 44 42 25 47 71 95 32 57 52 13 98 15 92 31 83 17 85 51 77 56 89 64 79 13 13 96 6 53 85 14 8 86 5 78
87 87 42 67 26 24 17 0 87 3 44 52 12 8 56 78 29 26 84 29 70 88: 23 36 8 41 50 77 74 30 19 58 40 8 40 38 95 41 69 28 52 26 41 78 42 69
35 71 20 71 1 61 35 19 45 31 77 97 92 16 3 35 65 24 99 4 80 17 95 65 32 6 34 5 5 82 32 63 76 84 80 61 60 58 26 80 54 93 8 84 78 32 5 28
48 91 8 57 26 35 90 59 66 77 63 49 18 76 58 0 38 42 40 41 90 43 72 37 55 46 72 73 89: 69 47 82 5 65 92 99 38 91 44 96 40 32 1 84 49 7
21 53 6 13 47 79 46 39 99 10 93 68 24 93 11 69 92 36 18 83 40 43 91 79 27 37 96 8 96 23 38 16 87 70 15 44 58 68 4 52 14 85 62 20 39 81
76 67 11 22 77 74 48 52 50 32 79 100 3 64 15 95 7 97 17 46 17 57 21 79 4 0 38 77 83 81 31 86 24 15 56 96 68 90: 95 59 90 17 70 41 47
57 49 77 62 66 90 68 62 100 6 16 26 79 49 100 66 68 68 39 7 68 72 99 36 72 45 6 41 84 80 44 44 64 30 95 79 80 61 96 88 24 19 37 70 27
37 39 18 90 42 53 41 29 84 28 84 93 24 84 8 2 85 77 11 38 35 94 33 84 45 49 94 86 30 9 79 53 54 92 28 33 71 0 38 64 83 53 42 11 19 74
45 40 91: 32 76 15 29 3 30 55 16 19 88 59 40 81 86 61 52 47 96 67 85 35 19 1 55 14 28 30 40 11 2 63 61 15 78 75 16 41 56 8 26 70 73 59
37 21 86 37 72 58 82 20 38 59 12 81 87 14 61 12 38 8 64 63 22 8 64 59 52 14 62 57 2 0 28 13 77 68 29 38 77 92 31 19 80 18 63 63 79 95
90 0 98 94 75 33 4 41 11 58 92 92: 53 45 28 7 69 89 26 16 68 36 80 75 63 13 79 84 0 3 2 29 29 6 1 37 68 85 64 69 31 4 83 31 79 40 53 69
39 64 47 8 43 70 67 5 26 62 75 4 33 55 39 98 19 11 23 92 37 69 59 59 18 53 8 86 76 88 52 88 30 30 63 13 35 98 10 53 92 82 12 16 8 66
10 72 66 12 76 6 55 9 68 0 43 100 52 1 7 79 50 75 93: 31 94 25 43 76 15 79 20 57 64 49 37 36 34 22 42 59 10 1 68 73 63 41 1 71 89 55

32 31 13 84 28 22 5 77 50 69 47 34 10 33 100 54 55 24 56 31 90 93 14 7 87 2 46 58 1 96 42 9 51 57 31 23 94 20 92 39 59 22 4 9 17 77 58
100 60 13 35 52 2 79 58 58 36 28 13 52 6 69 74 39 45 0 70 1 92 11 17 41 43 94: 60 15 42 15 26 61 24 23 26 35 96 91 25 49 11 92 68 15
41 54 89 41 5 76 64 38 38 2 15 63 38 45 54 38 75 19 98 72 32 13 11 90 30 49 23 92 42 10 56 96 22 61 7 68 26 85 22 9 51 65 96 18 1 48
10 86 28 88 70 11 35 29 75 49 100 67 47 99 92 36 75 91 98 58 39 37 73 22 37 64 4 14 72 0 86 67 77 9 47 69 95: 18 94 90 96 19 15 19 19
27 5 27 90 85 90 65 19 64 25 31 86 66 18 50 25 75 61 85 68 70 29 68 12 81 74 56 66 94 33 94 3 44 34 9 12 76 98 93 25 16 2 14 55 33 14
54 34 63 16 9 1 77 13 77 35 53 59 65 65 14 71 52 56 23 75 59 58 63 53 85 16 58 57 48 90 99 37 47 100 39 54 96 21 3 76 0 74 28 88 69 75
96: 79 78 82 83 25 39 77 60 79 8 37 15 56 11 86 96 24 90 4 4 94 84 59 98 33 14 58 32 49 100 85 36 65 70 44 27 10 91 92 24 0 6 42 37 31
19 89 20 19 94 43 94 95 16 64 67 32 32 59 26 91 63 15 4 94 13 49 39 2 77 78 81 36 21 9 70 90 48 58 51 90 2 70 21 50 37 50 85 29 45 14
3 23 43 8 0 82 86 94 40 97: 55 36 84 47 39 3 61 99 68 46 65 15 90 89 75 97 28 80 63 64 26 21 7 35 78 18 4 82 83 15 59 74 71 7 6 96 88
77 92 5 34 73 95 20 50 53 16 17 3 10 43 86 42 79 58 67 5 48 51 95 92 82 20 1 72 17 13 89 27 84 84 53 5 98 38 66 12 95 63 16 87 45 60
23 63 11 20 67 54 84 64 0 14 68 38 17 0 8 64 54 98: 1 14 33 26 39 61 78 0 83 15 14 90 21 10 49 90 56 26 20 31 32 37 40 68 26 35 51 85
38 92 9 50 82 44 92 36 99 92 26 47 39 32 18 77 39 62 80 0 36 68 52 99 61 79 90 66 33 85 49 32 91 54 64 44 83 88 41 70 9 7 43 91 69 14
17 35 36 12 72 1 3 71 7 11 58 12 44 52 69 38 39 54 87 21 16 75 23 0 8 22 99: 24 89 8 41 39 3 64 48 59 24 27 66 66 31 70 18 91 87 33 7
89 51 45 11 17 48 3 53 19 17 51 38 84 21 73 47 22 90 51 97 82 20 95 91 41 99 82 67 29 94 100 60 63 20 7 28 68 46 21 41 98 100 4 81 67
74 73 73 4 80 69 40 35 29 6 85 85 15 99 12 55 69 37 65 64 18 4 79 10 56 45 36 50 83 24 44 75 64 0 77 100: 80 72 62 79 99 90 11 30 68
75 13 98 1 3 87 49 37 15 20 5 40 27 10 58 90 74 60 69 77 45 75 63 96 69 65 43 26 77 37 52 58 55 76 10 56 78 27 36 88 29 92 96 6 37 92
48 40 26 47 11 26 93 14 9 45 40 14 45 13 82 50 19 90 43 56 41 57 6 71 7 73 12 38 34 47 28 97 74 65 39 36 32 21 77 42 100 25 47 55 0

Table M-2: p_06cri Node Data

non-depot nodes: 50

Node ID	x	y	demand	service time
0	30	40	-	-
1	37	52	7	10
2	49	49	30	10
3	52	64	16	10
4	20	26	9	10
5	40	30	21	10
6	21	47	15	10
7	17	63	19	10
8	31	62	23	10
9	52	33	11	10
10	51	21	5	10
11	42	41	19	10
12	31	32	29	10
13	5	25	23	10
14	12	42	21	10
15	36	16	10	10
16	52	41	15	10
17	27	23	3	10
18	17	33	41	10
19	13	13	9	10
20	57	58	28	10
21	62	42	8	10
22	42	57	8	10
23	16	57	16	10
24	8	52	10	10
25	7	38	28	10
26	27	68	7	10
27	30	48	15	10
28	43	67	14	10
29	58	48	6	10
30	58	27	19	10
31	37	69	11	10
32	38	46	12	10
33	46	10	23	10
34	61	33	26	10
35	62	63	17	10
36	63	69	6	10
37	32	22	9	10
38	45	35	15	10
39	59	15	14	10
40	5	6	7	10
41	10	17	27	10
42	21	10	13	10
43	5	64	11	10
44	30	15	16	10
45	39	10	10	10
46	32	39	5	10
47	25	32	25	10
48	25	55	17	10
49	48	28	18	10
50	56	37	10	10

p06 Inverse P matrix

1: 0 -39 -25 15 -35 17 43 31 -25 -14 22 -15 -34 -4 -19 49 33 -43 -8 -28 -42 -16 -12 -38 0 17 9 43 34 12 14 -3 44 -15 48 34 -36 48 5 -23 21 -14 -16 -5 -32 14 34 39 -20 -18 2: 39 0 -5 -7 17 -31 22 35 17 -38 -11 27 18 -23 25 49 15 49 43 44 -40 0 -18 28 37 11 30 -25 -16 12 30 -7 16 42 49 -29 -28 11 44 13 -27 6 -18 33 12 28 4 -12 -27 -28 3: 25 5 0 -12 33 39 21 48 -19 33 24 -34 -22 -8 48 47 -11 -39 25 19 9 -32 -21 -35 11 37 12 -13 -19 6 -21 -43 9 4 38 28 34 -7 -23 -42 -24 13 50 -18 -1 -15 -22 -23 42 -37 4: -15 7 12 0 -18 6 25 50 -35 2 -35 -29 22 42 -47 -3 -50 -8 -5 36 1 -36 36 12 -6 -12 -36 -37 -45 12 -33 37 -8 -29 22 -3 25 47 30 5 -9 -34 -40 42 -29 -4 -33 44 -18 -18 5: 35 -17 -33 18 0 28 -26 4 7 -39 -47 -46 4 27 31 -45 7 47 -11 10 41 20 41 12 30 5 -46 -23 -18 -20 -48 4 8 24 -16 39 50 18 0 38 -39 -18 26 -24 32 50 19 -39 39 50 6: -17 31 -39 -6 -28 0 31 -45 -35 -8 -44 27 -3 -35 -23 -22 -1 -14 26 45 -9 33 -31 40 27 33 -41 5 8 45 -49 -14 35 -16 0 13 -33 -30 8 -49 38 -11 13 -18 -23 31 -47 -9 -36 -33 7: -43 -22 -21 -25 26 -31 0 -21 -36 34 -31 -4 15 11 -31 13 32 -20 -35 44 -4 -2 -12 -13 -8 0 5 0 -10 42 -25 -43 -50 1 34 -19 38 17 -28 -37 -9 11 -25 -6 0 15 0 40 -7 14 8: -31 -35 -48 -50 -4 45 21 0 22 -23 -46 -14 -39 20 -5 -28 1 -46 -34 -23 -8 -43 -27 40 -1 42 40 -16 -1 34 48 12 28 32 40 44 -33 -39 -43 24 -50 -26 -3 28 -6 16 -16 24 -16 1 9: 25 -17 19 35 -7 35 36 -22 0 -26 -13 48 -35 45 -11 -11 -4 -32 25 -35 -13 22 18 18 37 5 -16 -32 -30 -16 3 33 42 9 -42 -19 11 -41 -13 43 14 13 14 -3 35 -37 1 -50 30 -2 10: 14 38 -33 -2 39 8 -34 23 26 0 -24 -3 14 13 22 -14 -29 27 -33 -29 31 24 -30 -35 -31 48 40 32 -43 -26 -30 -40 10 -30 48 -32 -39 -34 -7 24 -25 37 -26 15 21 19 44 -36 33 8 11: -22 11 -24 35 47 44 31 46 13 24 0 -39 -9 50 1 -22 -26 -20 31 -1 -48 -12 -42 -30 37 -25 19 47 49 23 -46 22 -24 -35 30 5 16 -36 30 32 9 -8 -35 10 -18 20 -4 24 -29 39 12: 15 -27 34 29 46 -27 4 14 -48 3 39 0 44 2 -27 24 -25 -23 23 -9 33 -19 -28 -25 47 30 -26 -2 1 11 42 -34 -28 -46 -47 46 3 9 -21 42 36 46 -17 19 15 -30 -5 -5 -28 46 13: 34 -18 22 -22 -4 3 -15 39 35 -14 9 -44 0 -32 -21 -43 8 -28 -44 6 -8 -41 -12 -11 26 -38 -36 -46 4 -1 17 21 40 -50 39 49 -42 -11 -28 9 -27 -29 24 -1 -26 -26 26 -8 18 18 14: 4 23 8 -42 -27 35 -11 -20 -45 -13 -50 -2 32 0 -14 39 14 11 -9 29 41 11 44 -40 17 0 -34 22 -6 -18 -10 -35 -35 50 45 -35 -10 39 -7 -1 -29 2 -44 -36 -37 7 21 -6 -27 -15 15: 19 -25 -48 47 -31 23 31 5 11 -22 -1 27 21 14 0 35 47 27 0 -44 -19 -50 -6 34 -31 -13 5 4 44 35 18 32 -37 18 14 -37 39 -17 -36 29 -40 -9 22 -14 41 2 41 -6 -10 22 16: -49 -49 -47 3 45 22 -13 28 11 14 22 -24 43 -39 -35 0 -32 -17 -35 -33 -25 7 -36 24 -11 -8 50 20 -15 -23 -27 30 2 -38 -35 -40 -25 -8 -1 5 21 -41 -29 41 12 47 -19 -43 11 -11 17: -33 -15 11 50 -7 1 -32 -1 4 29 26 25 -8 -14 -47 32 0 11 47 -25 0 -30 21 5 6 -39 20 22 23 -39 28 0 43 -25 -39 -34 27 45 -50 28 14 -29 -14 -3 11 47 -6 -16 -22 -38 18: 43 -49 39 8 -47 14 20 46 32 -27 20 23 28 -11 -27 17 -11 0 -32 2 40 35 -34 5 45 43 37 1 50 0 5 -29 -13 23 -34 -18 0 -17 -20 35 49 -26 1 2 25 -12 -29 49 12 -5 19: 8 -43 -25 5 11 -26 35 34 -25 33 -31 -23 44 9 0 35 -47 32 0 2 11 22 -36 16 1 -12 -12 -9 -37 -16 14 -23 -39 -39 -8 47 2 22 -29 0 40 26 -17 5 45 26 0 -35 -32 9 20: 28 -44 -19 -36 -10 -45 -44 23 35 29 1 9 -6 -29 44 33 25 -2 -2 0 -35 46 49 16 44 43 -47 -37 13 50 34 24 -24 35 -12 -17 -16 46 0 -1 10 8 19 49 -42 -18 -43 -31 -26 1 21: 42 40 -9 -1 -41 9 4 8 13 -31 48 -33 8 -41 19 25 0 -40 -11 35 0 -27 42 -31 16 17 47 13 -33 -34 43 25 -28 -43 -47 38 28 -45 -35 -38 12 -26 -19 19 -2 23 21 37 32 41 22: 16 0 32 36 -20 -33 2 43 -22 -24 12 19 41 -11 50 -7 30 -35 -22 -46 27 0 12 -24 17 18 -45 23 3 40 -5 33 8 -35 41 4 -25 -11 -34 21 20 -33 -3 8 26 -5 -23 -37 -19 -24 23: 12 18 21 -36 -41 31 12 27 -18 30 42 28 12 -44 6 36 -21 34 36 -49 -42 -12 0 42 -3 -20 39 -12 -21 1 -31 48 -6 34 23 19 -45 -40 -27 27 -44 -48 -40 -12 -4 -14 44 46 -10 -18 24: 38 -28 35 -12 -12 -40 13 -40 -18 35 30 25 11 40 -34 -24 -5 -5 -16 -16 31 24 -42 0 8 14 -15 -40 21 -36 -19 44 0 21 13 -11 -13 -10 -45 0 27 11 -7 0 12 -50 29 -5 -40 -23 25: 0 -37 -11 6 -30 -27 8 1 -37 31 -37 -47 -26 -17 31 11 -6 -45 -1 -44 -16 -17 3 -8 0 -23 47 34 -23 40 -50 48 6 17 32 -9 -45 -48 48 -27 38 -5 20 -13 2 7 -2 -17 -9 7 26: -17 -11 -37 12 -5 -33 0 -42 -5 -48 25 -30 38 0 13 8 39 -43 12 -43 -17 -18 20 -14 23 0 2 -24 -24 -20 -19 50 -31 26 -10 -34 13 17 45 4 37 -45 -27 -48 21 3 -10 23 47 -24 27: -9 -30 -12 36 46 41 -5 -40 16 -40 -19 26 36 34 -5 -50 -20 -37 12 47 -47 45 -39 15 -47 -2 0 -33 -30 -2 -18 28 35 -23 -9 -12 -32 -33 38 -36 -9 45 42 -23 -23 47 32 14 50 28 28: -43 25 13 37 23 -5 0 16 32 -32 -47 2 46 -22 -4 -20 -22 -1 9 37 -13 -23 12 40 -34 24 33 0 2 -32 -13 -22 -2 0 -33 -39 25 25 -25 -15 -6 38 17 7 -27 -6 -23 14 16 0 29: -34 16 19 45 18 -8 10 1 30 43 -49 -1 -4 6 -44 15 -23 -50 37 -13 33 -3 21 -21 23 24 30 -2 0 -17 13 -38 -28 14 -44 23 -19 43 32 31 1 -22 -27 -18 11 -24 -4 -16 11 36 30: -12 -12 -6 -12 20 -45 -42 -34 16 26 -23 -11 1 18 -35 23 39 0 16 -50 34 -40 -1 36 -40 20 2 32 17 0 -27 -19 50 9 7 4 -20 -37 45 21 -46 -27 -33 36 9 -15 -2 -36 -27 6 31: -14 -30 21 33 48 49 25 -48 -3 30 46 -42 -17 10 -18 27 -28 -5 -14 -34 -43 5 31 19 50 19 18 13 -13 27 0 5 -25 -34 -20 41 -11 7 -42 -24 3 -34 0 -9 -39 -17 -37 -39 26 39 32: 3 7 43 -37 -4 14 43 -12 -33 40 -22 34 -21 35 -32 -30 0 29 23 -24 -25 -33 -48 -44 -48 -50 -28 22 38 19 -5 0 0 -10 46 -33 41 33 50 -17 -38 -37 35 -24 42 -33 47 26 15 42 33: -44 -16 -9 8 -8 -35 50 -28 -42 -10 24 28 -40 35 37 -2 -43 13 39 24 28 -8 6 0 -6 31 -35 2 28 -50 25 0 0 16 -3 -6 -23 -29 26 -42 -39 -14 44 8 5 -25 -10 9 -23 23 34: 15 -42 -4 29 -24 16 -1 -32 -9 30 35 46 50 -50 -18 38 25 -23 39 -35 43 35 -34 -21 -17 -26 23 0 -14 -9 34 10 -16 0 35 -44 21 48 -29 40 -17 -26 -30 -34 -2 -12 36 -50 -22 -38 35: -48 -49 -38 -22 16 0 -34 -40 42 -48 -30 47 -39 -45 -14 35 39 34 8 12 47 -41 -23 -13 -32 10 9 33 44 -7 20 -46 3 -35 0 40 1 -20 -42 -48 -1 42 24 50 0 -1 38 -9 -17 -11 36: -34 29 -28 3 -39 -13 19 -44 19 32 -5 -46 -49 35 37 40 34 18 -47 17 -38 -4 -19 11 9 34 12 39 -23 -4 -41 33 6 44 -40 0 -48 4 31 44 -14 -17 42 -3 20 7 -1 -9 -28 36 37: 36 28 -34 -25 -50 33 -38 33 -11 39 -16 -3 42 10 -39 25 -27 0 -2 16 -28 25 45 13 45 -13 32 -25 19 20 11 -41 23 -21 -1 48 0 -15 -34 -13 -27 -4 -8 50 -42 8 -16 -17 7 48 38: -48 -11 7 -47 -18 30 -17 39 41 34 36 -9 11 -39 17 8 -45 17 -22 -46 45 11 40 10 48 -17 33 -25 -43 37 -7 -33 29 -48 20 -4 15 0 5 -32 33 44 -39 20 -19 6 43 -3 41 -45 39: -5 -44 23 -30 0 -8 28 43 13 7 -30 21 28 7 36 1 50 20 29 0 35 34 27 45 -48 -45 -38 25 -32 -45 42 -50 -26 29 42 -31 34 -5 0 -6 -40 -8 -15 -20 -6 38 2 -6 16 38 40: 23 -13 42 -5 -38 49 37 -24 -43 -24 -32 -42 -9 1 -29 -5 -28 -35 0 1 38 -21 -27 0 27 -4 36 15 -31 -21 24 17 42 -40 48 -44 13 32 6 0 1 30 -23 1 11 -6 4 -35 -27 25 41: -21 27 24 9 39 -38 9 50 -14 25 -9 -36 27 29 40 -21 -14 -49 -40 -10 -12 -20 44 -27 -38 -37 9 6 -1 46 -3 38 39 17 1 14 27 -33 40 -1 0 -18 5 9 46 -17 0 39 -35 -36 42: 14 -6 -13 34 18 11 -11 26 -13 -37 8 -46 29 -2 9 41 29 26 -26 -8 26 33 48 -11 5 45 -45 -38 22 27 34 37 14 26 -42 17 4 -44 8 -30 18 0 -35 -29 -8 44 -47 -27 -36 -9 43: 16 18 -50 40 -26 -13 25 3 -14 26 35 17 -24 44 -22 29 14 -1 17 -19 19 3 40 7 -20 27 -42 -17 27 33 0 -35 -44 30 -24 -42 8 39 15 23 -5 35 0 -5 1 -26 -21 -5 -1 15 44: 5 -33 18 -42 24 18 6 -28 3 -15 -10 -19 1 36 14 -41 3 -2 -5 -49 -19 -8 12 0 13 48 23 -7 18 -36 9 24 -8 34 -50 3 -50 -20 20 -1 -9 29 5 0 -18 4 15 -42 35 0 45: 32 -12 1 29 -32 23 0 6 -35 -21 18 -15 26 37 -41 -12 -11 -25 -45 42 2 -26 4 -12 -2 -21 23 27 -11 -9 39 -42 -5 2 0 -20 42 19 6 -11 -46 8 -1 18 0 8 -47 28 -41 39 46: -14 -28 15 4 -50 -31 -15 -16 37 -19 -20 30 26 -7 -2 -47 -47 12 -26 18 -23 5 14 50 -7 -3 -47 6 24 15 17 33 25 12 1 -7 -8 -6 -38 6 17 -44 26 -4 -8 0 29 -25 50 -44 47: -34 -4 22 33 -19 47 0 16 -1 -44 4 5 -26 -21 -41 19 6 29 0 43 -21 23 -44 -29 2 10 -32 23 4 2 37 -47 10 -36 -38 1 16 -43 -2 -4 0 47 21 -15 47 -29 0 -42 1 -38 48: -39 12 23 -44 39 9 -40 -24 50 36 -24 5 8 6 6 43 16 -49 35 31 -37 37 -46 5 17 -23 -14 -14 16 36 39 -26 -9 50 9 9 17 3 6 35 -39 27 5 42 -28 25 42 0 -4 33 49: 20 27 -42 18 -39 36 7 16 -30 -33 29 28 -18 27 10 -11 22 -12 32 26 -32 19 10 40 9 -47 -50 -16 -11 27 -26 -15 23 22 17 28 -7 -41 -16 27 35 36 1 -35 41 -50 -1 4 0 20 50: 18 28 37 18 -50 33 -14 -1 2 -8 -39 -46 -18 15 -22 11 38 5 -9 -1 -41 24 18 23 -7 24 -28 0 -36 -6 -39 -42 -23 38 11 -36 -48 45 -38 -25 36 9 -15 0 -39 44 38 -33 -20 0

p06 Generalized P matrix

1: 0 5 12 33 7 34 47 41 12 18 36 17 8 23 15 50 42 3 21 11 4 17 19 6 25 34 30 47 42 31 32 23 47 17 49 42 7 49 28 13 36 18 17 22 9 32 42 45 15 16 2: 22 0 21 34 9 36 43 34 6 19 39 34 13 38 50 33 50 47 47 5 25 16 39 44 31 40 12 17 31 40 21 33 46 50 10 11 31 47 32 11 28 16 42 31 39 27 19 11 11 19 3: 42 45 0 36 49 15 42 37 8 14 21 49 49 19 5 38 35 30 9 14 7 31 44 31 18 15 28 14 3 30 27 44 39 42 21 13 4 13 32 50 16 24 17 14 13 46 6 16 28 38 4: 50 7 26 0 7 10 36 46 1 23 0 21 22 43 26 7 43 31 22 19 7 6 2 31 8 44 21 10 36 23 38 49 40 28 20 8 5 46 10 23 8 47 16 16 39 12 27 29 5 1 5: 2 27 39 41 0 2 29 49 19 30 46 35 46 31 40 28 2 13 16 15 1 27 29 37 17 45 50 34 25 44 5 16 38 13 41 50 35 5 45 50 41 2 7 21 3 39 23 7 13 14 6: 24 18 38 48 20 0 42 9 45 39 42 4 28 29 48 0 18 43 17 25 32 8 10 29 0 44 19 32 16 13 41 1 20 7 8 14 7 42 9 23 33 31 9 32 41 15 7 47 23 24 7: 19 18 21 25 28 25 0 20 46 12 3 0 26 42 15 44 34 11 6 20 31 12 22 25 33 25 45 21 32 36 13 2 18 5 35 22 11 26 2 8 13 21 3 11 45 24 46 45 17 24 8: 42 49 31 39 41 45 47 0 8 5 3 37 0 12 23 39 22 33 17 37 17 26 12 18 49 7 48 19 19 23 9 38 7 18 36 34 34 44 28 17 9 10 17 27 42 46 30 4 15 31 9: 4 18 47 32 32 32 23 43 0 6 26 0 40 24 13 23 32 32 36 18 10 39 8 10 41 37 10 7 9 49 45 41 3 12 10 5 30 10 49 9 5 8 21 37 12 44 12 33 36 35 10: 47 7 42 29 5 20 50 26 14 0 12 15 41 24 1 19 4 10 44 12 35 49 50 37 2 36 13 7 40 28 33 7 40 41 30 21 7 30 16 35 23 37 10 45 47 26 11 37 12 13 11: 37 20 42 15 11 12 49 40 12 24 0 26 31 46 8 11 2 1 48 27 30 14 46 43 48 16 35 33 10 22 22 11 48 9 14 3 29 11 3 28 21 4 19 19 38 6 7 2 27 24 12: 34 36 45 0 45 50 4 19 11 30 11 0 10 37 24 12 12 38 21 34 34 18 45 32 31 20 40 46 31 47 5 34 25 8 36 22 16 20 7 7 50 48 7 20 45 21 24 10 26 3 13: 7 6 29 36 22 11 17 43 49 39 25 3 0 15 0 22 42 9 18 28 27 47 43 34 41 6 34 32 6 45 16 7 40 5 20 36 18 46 26 46 22 20 36 9 16 7 8 12 29 7 14: 37 19 21 50 35 17 13 11 40 26 6 7 5 0 12 21 24 28 36 4 10 46 31 49 15 3 31 19 31 49 12 25 10 36 28 28 5 35 36 37 5 39 25 47 12 5 8 39 48 0 15: 39 32 10 18 23 31 49 22 17 14 6 9 26 45 0 43 8 28 48 47 44 26 50 25 28 10 18 37 8 16 25 16 15 43 50 12 26 26 38 19 10 50 31 22 26 31 36 7 33 26 16: 19 19 20 6 17 32 13 5 5 21 49 26 36 10 25 0 45 38 16 28 48 38 25 7 9 30 7 48 50 33 47 47 1 6 32 50 42 37 13 43 19 16 17 48 25 24 30 29 35 50 17: 4 16 3 9 12 26 11 46 9 33 34 49 32 8 8 47 0 38 11 3 1 44 39 2 7 6 31 12 15 35 24 37 36 44 41 46 31 13 34 34 2 37 27 45 22 42 29 7 46 27 18: 12 19 8 36 35 8 23 29 38 22 13 6 15 13 46 23 15 0 45 19 14 26 9 49 22 42 37 35 2 5 11 39 3 1 5 19 23 18 47 48 20 16 29 32 17 5 36 7 15 47 19: 25 36 32 19 18 20 2 25 39 31 21 25 31 0 40 22 5 13 0 13 49 42 13 45 0 49 28 34 41 20 2 1 49 11 44 22 35 18 26 29 24 16 20 29 26 13 13 15 15 50 20: 9 38 20 8 32 34 48 27 44 2 11 1 36 27 20 37 49 13 8 0 10 24 16 39 43 13 20 19 9 8 44 7 20 48 46 13 13 49 41 32 50 39 26 9 18 14 24 25 8 5 21: 38 38 12 17 22 44 34 29 11 22 13 32 33 25 16 32 6 11 32 3 0 37 15 47 41 41 26 14 11 16 31 13 23 17 31 43 11 15 50 30 29 27 15 6 48 36 2 11 8 43 22: 30 17 24 7 11 28 28 12 8 15 46 19 29 4 13 27 8 25 20 5 16 0 6 5 38 45 25 20 48 8 46 42 50 16 6 6 43 13 46 8 49 38 33 46 33 23 22 13 10 38 23: 4 5 18 47 29 28 12 20 30 13 37 43 3 36 49 10 45 16 12 10 8 24 0 19 43 0 14 6 45 26 15 4 1 24 46 37 50 25 24 44 20 16 19 1 27 41 47 18 16 46 24: 23 35 29 24 20 11 43 17 8 18 11 23 21 50 4 29 17 16 29 49 28 9 42 0 47 5 35 15 28 47 23 46 2 22 5 21 17 15 22 44 26 22 33 44 26 40 13 26 31 22 25: 27 7 11 38 16 28 30 48 16 25 45 7 7 7 10 21 47 1 11 7 20 22 26 12 0 14 22 24 33 16 27 33 4 43 25 29 1 39 4 45 40 12 50 3 4 26 6 23 42 35 26: 31 36 40 17 39 31 33 15 39 44 2 19 1 36 37 0 43 4 9 12 12 25 20 49 46 0 44 23 48 1 28 18 10 43 0 23 32 1 28 25 15 1 24 35 7 46 2 38 50 47 27: 17 22 22 14 13 24 26 38 12 50 22 6 10 25 14 31 3 15 47 9 1 4 5 45 49 21 0 49 45 3 37 15 43 18 49 50 46 10 6 24 11 38 33 4 22 27 11 29 3 40 28: 9 15 18 26 40 7 15 7 26 37 35 38 30 33 30 10 21 12 15 42 6 0 18 38 16 5 9 0 37 36 35 9 0 30 20 41 41 50 42 46 42 10 12 43 32 14 26 14 26 44 29: 19 17 19 13 28 13 13 49 41 25 50 23 29 43 39 13 42 40 32 49 24 3 30 20 49 37 15 44 0 34 28 13 11 6 27 43 7 5 28 16 31 14 33 9 17 20 17 33 47 30 30: 17 41 40 35 33 5 38 32 13 0 15 43 30 7 26 24 10 20 32 10 30 23 36 37 18 9 41 32 49 0 7 0 43 37 8 15 41 9 43 43 38 50 25 15 8 23 27 42 16 23 31: 20 42 2 41 33 36 45 7 3 23 39 46 49 16 8 30 22 24 22 40 46 12 9 34 9 9 48 27 6 10 0 48 32 16 21 20 41 26 20 0 37 21 26 14 50 28 49 14 21 25 32: 50 41 9 46 34 35 42 2 0 30 1 11 27 9 12 36 36 14 19 29 23 26 45 30 14 30 34 7 46 45 8 0 3 15 40 18 41 3 35 6 27 21 48 3 16 40 3 12 36 24 33: 29 7 42 30 2 1 6 45 8 44 32 11 13 24 5 16 42 8 12 9 1 0 7 38 39 13 46 1 28 27 4 1 0 34 42 19 13 45 3 50 40 42 21 35 20 46 31 29 47 40 34: 40 47 24 39 33 6 38 21 11 37 16 33 10 49 29 8 45 24 6 47 22 35 46 48 8 48 40 25 0 39 37 1 9 0 6 38 48 19 13 22 19 14 38 50 31 12 25 1 8 26 35: 6 37 47 3 32 48 43 20 29 46 3 24 39 50 22 2 30 30 5 33 16 39 25 20 30 42 10 18 1 27 19 27 11 6 0 10 37 42 50 37 9 17 36 38 45 43 35 34 49 46 36: 15 47 39 44 4 22 1 45 5 7 32 13 33 23 37 45 6 32 29 25 10 1 10 10 20 17 30 41 37 49 35 42 12 34 11 0 36 7 23 21 24 20 22 13 41 16 11 11 30 40 37: 18 50 20 39 36 35 16 33 23 30 40 23 1 47 15 14 15 24 26 9 12 3 8 26 28 23 38 30 24 5 24 33 34 47 29 44 0 12 17 11 20 36 30 14 23 46 2 39 10 26 38: 21 22 0 16 33 30 12 12 44 26 40 48 5 31 40 41 36 41 39 25 17 45 50 42 10 7 28 35 34 14 32 45 50 0 32 32 7 0 11 31 39 35 9 35 7 25 20 1 14 40 39: 44 29 25 38 16 35 34 33 8 41 21 50 28 46 13 23 43 28 30 2 0 13 45 7 17 29 16 16 1 50 29 38 17 12 5 30 44 32 0 22 2 11 27 9 9 3 25 11 31 47 40: 45 49 22 14 11 25 8 13 43 39 22 43 17 5 20 4 14 44 48 14 29 23 33 6 50 36 45 19 37 6 25 38 10 48 41 27 8 18 31 0 38 10 14 8 5 35 49 31 23 41 41: 38 34 46 10 44 41 45 33 27 46 29 29 16 36 13 28 40 38 32 42 11 29 7 38 6 33 4 1 46 49 50 28 21 13 20 27 13 15 38 39 0 45 31 23 29 46 13 47 49 30 42: 14 44 19 16 5 24 23 43 49 46 36 3 4 41 36 38 39 4 15 28 6 7 23 9 32 16 2 5 7 16 18 30 32 23 48 47 5 22 30 32 25 0 13 18 10 31 4 5 10 24 43: 48 5 0 31 8 26 48 50 29 2 23 37 36 46 8 14 12 26 27 24 34 39 47 39 11 10 35 1 44 20 22 11 4 22 8 26 25 31 5 39 15 19 0 23 6 9 32 43 3 14 44: 5 36 41 8 34 27 38 12 40 29 6 45 34 18 49 46 15 5 10 27 17 24 3 15 41 30 30 46 6 48 32 45 36 35 38 49 21 27 20 44 17 23 18 0 14 44 17 48 40 24 45: 33 36 44 22 19 46 0 30 35 0 12 44 14 43 15 13 18 27 10 50 33 26 7 47 31 3 47 19 7 42 2 26 2 31 14 45 30 22 44 47 39 32 43 9 0 19 20 41 32 13 46: 6 25 37 24 5 0 10 14 43 36 25 0 45 45 31 27 21 12 34 0 49 21 44 29 45 24 36 32 1 43 28 34 36 12 5 38 49 15 21 28 6 22 41 48 38 0 16 4 25 49 47: 4 46 2 10 16 5 33 18 41 25 9 31 48 11 15 31 47 39 21 15 4 24 27 44 30 21 40 2 24 4 35 38 37 29 37 48 21 42 8 45 40 48 6 30 38 26 0 44 15 17 48: 42 29 7 25 6 43 45 34 10 31 49 2 10 46 0 3 8 24 28 2 29 3 24 43 48 31 23 37 29 7 28 23 36 50 26 28 35 4 36 3 27 30 26 39 20 12 32 0 38 46 49: 46 21 30 33 40 45 35 24 29 10 23 43 37 10 32 49 15 30 14 23 33 44 50 26 27 36 33 22 16 13 21 1 43 5 16 0 33 23 24 47 9 4 49 43 17 5 31 50 0 1 50: 31 2 44 43 26 30 7 26 0 24 9 13 14 43 4 45 34 47 38 32 27 30 11 28 48 11 33 17 22 48 22 29 11 46 45 6 1 40 2 16 10 15 43 4 24 32 31 37 34 0

Table M-3: p_07cri Node Data

non-depot nodes: 75

Node ID	x	y	demand	service time
0	40	40	-	-
1	22	22	18	10
2	36	26	26	10
3	21	45	11	10
4	45	35	30	10
5	55	20	21	10
6	33	34	19	10
7	50	50	15	10
8	55	45	16	10
9	26	59	29	10
10	40	66	26	10
11	55	65	37	10
12	35	51	16	10
13	62	35	12	10
14	62	57	31	10
15	62	24	8	10
16	21	36	19	10
17	33	44	20	10
18	9	56	13	10
19	62	48	15	10
20	66	14	22	10
21	44	13	28	10
22	26	13	12	10
23	11	28	6	10
24	7	43	27	10
25	17	64	14	10
26	41	46	18	10
27	55	34	17	10
28	35	16	29	10
29	52	26	13	10
30	43	26	22	10
31	31	76	25	10
32	22	53	28	10
33	26	29	27	10
34	50	40	19	10
35	55	50	10	10
36	54	10	12	10
37	60	15	14	10
38	47	66	24	10
39	30	60	16	10
40	30	50	33	10
41	12	17	15	10
42	15	14	11	10
43	16	19	18	10
44	21	48	17	10
45	50	30	21	10
46	51	42	27	10
47	50	15	19	10
48	48	21	20	10
49	12	38	5	10
50	15	56	22	10
51	29	39	12	10
52	54	38	19	10
53	55	57	22	10
54	67	41	16	10
55	10	70	7	10
56	6	25	26	10
57	65	27	14	10
58	40	60	21	10
59	70	64	24	10
60	64	4	13	10
61	36	6	15	10
62	30	20	18	10
63	20	30	11	10
64	15	5	28	10
65	50	70	9	10
66	57	72	37	10
67	45	42	30	10
68	38	33	10	10
69	50	4	8	10
70	66	8	11	10
71	59	5	3	10
72	35	60	1	10
73	27	24	6	10
74	40	20	10	10
75	40	37	20	10

p07 Inverse P matrix

1: 0 -59 -37 23 -53 25 65 46 -38 -21 33 -23 -50 -6 -29 74 50 -65 -13 -42 -63 -24 -19 -57 0 25 14 64 52 19 21 -5 65 -22 72 51 -54 72 7 -34 31 -21 -24 -8 -48 21 51 59 -29 -27 -7 -11 26 -47 33 52 26 -58 -16 40 28 -35 37 74 23 73 64 66 -60 1 -27 42 56 17 45 2: 59 0 -37 -24 18 46 -11 24 62 74 -44 -42 16 66 20 -41 9 -27 50 19 42 6 -19 -40 -42 -18 50 58 31 73 -29 49 36 -51 -33 -12 72 71 -17 -58 38 29 13 -48 -32 -53 16 56 19 -20 -29 8 -32 -64 14 6 56 42 51 -11 -34 -63 -37 19 74 -27 -2 -22 -34 -35 63 -55 -27 9 37 3: 37 37 0 74 -53 4 -52 -43 33 62 -71 -4 -75 -12 -8 54 1 -53 53 18 -10 -18 -53 -56 -67 18 -49 56 -12 -43 33 -5 37 71 44 7 -13 -51 -59 63 -43 -6 -50 66 -27 -27 42 -39 5 11 -58 -70 -68 6 40 46 -67 11 70 -17 15 62 30 62 18 44 7 -69 -34 -27 -31 -72 6 12 36 4: -23 24 -74 0 -23 58 75 27 0 56 -59 -28 39 -35 47 74 29 -59 59 75 46 -68 -52 -13 -65 41 -4 -52 -35 -32 -2 -21 39 67 -14 49 -47 60 40 49 -61 8 12 67 -74 -21 52 -24 0 19 -50 -45 12 -73 57 -17 20 -27 -35 46 -71 -14 -55 -49 -31 -54 51 -47 -6 23 17 -46 20 48 -31 5: 53 -18 53 23 0 -53 66 -6 -3 -18 -19 -12 -1 8 0 -16 63 -37 -64 -75 2 51 -28 57 26 -42 -56 -14 17 -38 -10 0 22 1 60 -11 22 32 -34 -69 -22 -58 30 -7 -41 2 -69 -50 -34 -13 -65 -41 60 -1 62 60 -24 -1 50 72 19 42 48 60 66 -50 -58 -64 36 -75 -39 -4 42 -9 24 6: -25 -46 -4 -58 53 0 -24 36 -24 1 -39 -19 72 -53 68 -17 -17 -6 -47 37 -53 -20 33 28 26 55 8 -23 -48 -45 -24 4 50 63 14 -63 -28 17 -61 -20 65 21 20 21 -5 52 -55 1 -74 45 -4 -36 -4 21 20 33 -20 -44 40 -49 -44 46 37 -45 -53 -47 71 60 49 -64 -39 -45 -60 15 -45 7: -65 11 52 -75 -66 24 0 71 -47 -58 -52 -11 37 -37 56 -40 23 31 28 66 -54 50 12 -58 -13 74 2 -33 -39 -30 47 -1 -72 -18 -63 -45 55 -38 29 71 73 34 -68 34 -36 -52 45 7 24 -54 45 48 14 -12 -53 14 -28 30 -6 36 -44 58 65 4 -40 35 -37 -34 34 -14 49 -29 -42 -38 71 8: -46 -24 43 -27 6 -36 -71 0 45 -39 -3 2 17 63 -51 -41 -69 -70 69 4 14 -32 63 54 69 -26 29 22 -45 -7 -7 -42 68 -48 -32 -65 12 -42 -65 9 -12 -61 -18 -16 39 -57 -55 -68 7 -2 25 31 60 -75 58 73 -63 -17 -42 14 -40 -44 36 -2 -39 -38 40 -12 27 27 -21 59 21 17 -13 9: 38 -62 -33 0 3 24 47 -45 0 44 62 16 67 -59 25 1 -51 33 -9 -27 -16 -53 -52 75 68 -52 -15 59 -10 -1 -44 4 -66 -54 -55 11 32 -9 -40 -22 52 70 41 0 -66 -28 -75 -9 50 -47 -20 7 6 65 52 26 48 -55 27 21 -56 58 -26 -53 44 -59 -13 33 -21 61 4 61 -9 -15 33 10: 21 -74 -62 -56 18 -1 58 39 -44 0 -47 -25 -52 -49 -37 11 -53 36 -17 -12 75 31 -22 -35 -41 45 4 -56 -52 -59 -37 -12 -2 8 31 -61 -44 62 18 71 -29 -64 17 -17 17 71 -37 0 -45 32 8 10 -58 29 33 35 -59 42 1 65 -37 -59 -51 41 67 -75 42 21 -44 -22 -4 16 71 -9 -23 11: -33 44 71 59 19 39 52 3 -62 47 0 -33 -57 -47 3 60 53 -51 7 67 64 55 2 74 0 7 -44 -20 34 -52 -27 0 -26 -30 53 74 -39 2 3 37 -18 -43 73 17 -8 4 17 33 -54 24 2 -18 -19 -13 -55 -23 21 -35 -58 -59 -13 70 3 34 -44 1 60 39 -25 7 68 39 0 -53 -48 12: 23 42 4 28 12 19 11 -2 -16 25 33 0 13 -52 69 74 24 66 64 -70 -55 19 74 51 36 -36 52 -18 -26 -24 68 0 -2 15 12 29 74 -63 -27 -65 -46 -39 2 -40 63 -46 25 26 70 20 -49 -50 65 38 -42 -65 -71 57 42 -68 -53 -57 19 -39 -28 29 -4 35 32 55 47 61 19 -36 25 13: 50 -16 75 -39 1 -72 -37 -17 -67 52 57 -13 0 28 -68 35 5 60 -7 50 12 -53 61 6 -37 -17 -50 32 30 -50 -5 11 38 -7 -35 -55 -28 -36 63 -4 -30 59 -18 -32 1 -47 71 -10 52 35 28 -68 -60 -41 40 -66 -72 -60 -18 -6 -21 66 69 -14 -27 13 20 -22 -60 31 -54 -28 66 0 31 14: 6 -66 12 35 -8 53 37 -63 59 49 47 52 -28 0 19 -16 -20 -15 -68 0 41 17 -11 0 18 -75 43 -8 -60 -35 -35 70 51 -35 60 -74 72 9 25 47 -13 -67 -72 72 -40 57 -7 30 -19 3 10 -3 -26 -14 11 4 -36 -37 -30 -28 74 -46 38 -15 -51 20 26 68 6 55 -68 -41 -72 31 5 15: 29 -20 8 -47 0 -68 -56 51 -25 37 -3 -69 68 -19 0 -15 35 70 -36 -49 -45 -3 -28 43 52 -35 -14 -18 -47 -49 57 -54 -14 68 63 -34 -35 71 47 21 75 42 3 -48 -20 -33 -3 0 -49 -59 38 37 -37 -23 -9 57 25 10 -41 -10 -34 21 25 0 -26 20 -57 -41 21 -66 35 -29 65 48 46 16: -74 41 -54 -74 16 17 40 41 -1 -11 -60 -74 -35 16 15 0 2 -34 -40 -27 17 -36 -6 -24 16 54 -40 -28 75 13 10 7 -30 -55 67 31 -69 -41 -49 54 14 -23 -4 -54 -41 9 8 -38 -51 -30 61 -16 10 -63 -36 5 -52 1 -14 -59 -25 -55 -59 39 59 1 -15 69 -50 62 49 75 -25 -57 -56 17: -50 -9 -1 -29 -63 17 -23 69 51 53 -53 -24 -5 20 -35 -2 0 53 -36 63 -49 71 38 23 63 24 -5 -9 -34 -44 39 -63 -59 -22 66 12 7 -37 -16 14 -34 35 52 -66 31 72 -44 60 -25 -39 -45 -51 -3 -18 54 -75 -33 -57 60 1 -30 -63 -71 -2 63 36 75 1 -1 58 -14 -26 -16 -72 7 18: 65 27 53 59 37 6 -31 70 -33 -36 51 -66 -60 15 -70 34 -53 0 46 66 -22 -26 62 -4 30 11 -2 -13 -43 54 -22 -51 -20 -41 -6 -13 75 -63 12 -24 -26 10 72 8 -48 49 66 -58 30 -28 8 64 -5 61 -68 -9 -59 -13 -23 -31 -9 57 4 -10 23 57 1 45 -35 1 17 -9 6 -53 -41 19: 13 -50 -53 -59 64 47 -28 -69 9 17 -7 -64 7 68 36 40 36 -46 0 37 -27 8 14 69 -25 0 59 -52 -54 -53 -44 -13 65 -70 -40 -54 -14 -8 2 -38 -31 -8 -2 22 -27 6 23 -62 52 0 12 -71 41 -62 59 44 -37 75 -66 -63 2 -58 -6 50 30 17 31 43 -22 40 17 24 -29 42 57 20: 42 -19 -18 -75 75 -37 -66 -4 27 12 -67 70 -50 0 49 27 -63 -66 -37 0 -68 -19 -70 33 36 -75 53 -61 -47 -39 -40 0 -15 71 63 56 -4 70 -72 9 -21 -43 53 -73 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-73 -2 18 72 -3 4 -52 -72 2 -53 57 39 14 -50 12 -34 -11 37 -32 7 -27 -9 69 -53 -61 -18 19 -4 -6 24 64 -32 0 49 69 37 -26 -61 0 71 -63 63
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22 34 20 20 49 19 24 21 59 31 20 14 2 6 48 9 3 28 66 0 54 11 70 51 33 55 62 12 20 75 41 17 48 49 23 70 35 21 18 6 56: 5 13 34 27 34 20
58 22 40 43 27 44 31 59 12 14 32 70 39 7 5 42 65 31 18 46 37 48 72 22 74 45 55 27 70 15 33 30 55 0 5 44 31 6 59 36 45 27 60 21 6 1 52
28 71 0 9 48 24 45 42 51 17 7 65 33 13 31 21 48 73 24 69 32 24 57: 31 9 51 25 14 4 8 30 48 53 36 35 35 43 74 41 23 45 3 73 34 30 30 22
50 45 2 7 19 62 69 58 70 50 37 6 41 72 11 59 4 32 15 68 55 47 29 52 39 49 28 55 35 27 55 46 0 67 18 24 75 27 20 70 1 11 61 43 16 3 55
63 29 33 9 58: 17 69 5 63 58 50 53 46 31 52 16 55 6 72 43 73 16 16 37 6 38 74 41 27 72 3 37 17 56 14 30 6 53 68 63 11 38 40 52 39 3 65
56 53 66 37 36 46 59 70 61 48 1 47 13 28 1 0 6 72 45 29 62 69 19 48 2 37 63 22 40 13 72 37 75 59: 37 38 37 68 17 36 49 3 72 12 50 26
69 59 30 3 11 32 69 60 54 25 50 8 8 63 19 40 22 50 69 52 30 40 68 12 11 0 72 31 12 58 7 43 39 72 74 72 69 6 47 41 33 44 28 44 74 4 0 30
7 24 18 13 54 44 72 20 9 51 71 51 4 20 11 60: 50 59 14 1 53 55 34 45 18 53 2 4 45 41 6 36 41 41 37 66 48 75 53 59 13 45 22 28 12 73 74
55 65 27 29 39 63 19 47 24 2 23 12 70 58 56 50 33 48 61 64 44 33 17 50 40 13 3 30 0 64 18 74 32 7 4 62 67 41 39 75 74 0 34 24 61: 12 1
52 72 47 10 35 43 69 39 72 47 11 3 20 9 50 63 5 57 20 75 17 11 62 18 48 37 50 68 16 32 53 75 67 5 25 43 26 10 16 69 63 35 48 4 16 51
53 49 8 40 30 14 43 1 40 71 46 58 0 54 6 50 4 53 39 73 67 8 26 58 51 29 27 62: 47 21 8 16 55 5 16 51 40 34 36 62 44 58 60 20 68 62 39
52 12 49 33 38 36 42 52 23 70 17 8 39 53 66 44 59 48 21 64 46 14 66 44 51 14 11 15 13 4 49 26 47 8 2 12 3 22 63 22 45 23 0 71 75 69 67
47 45 70 74 22 58 4 37 62 63: 61 61 18 75 6 15 7 43 50 28 14 35 6 12 13 72 57 3 47 31 74 51 20 5 62 70 37 19 50 74 74 28 56 11 1 48 30
51 20 37 36 40 0 25 29 70 61 19 28 36 41 75 30 47 52 19 5 7 5 20 34 57 0 50 51 50 64 53 58 0 34 15 56 7 70 64: 28 69 9 30 67 53 24 15
43 3 20 3 21 12 22 6 34 5 26 31 5 66 3 41 61 68 28 28 49 28 9 15 75 43 72 15 68 54 68 3 45 23 50 62 3 18 45 62 54 23 67 67 54 18 60 44
67 40 46 26 39 39 23 0 51 45 12 16 27 36 75 11 65 20 26 65: 50 32 8 41 29 68 6 52 45 5 64 2 20 2 73 0 29 46 21 23 66 4 67 73 64 69 35
15 1 8 40 18 8 22 72 49 5 58 45 4 19 20 63 40 63 55 46 1 21 74 71 74 35 2 3 70 64 7 8 38 71 29 30 9 0 6 67 35 39 9 46 9 7 26 24 66: 65 3
58 70 66 36 4 19 13 5 37 63 40 22 5 67 36 67 2 6 38 18 70 42 25 59 32 54 49 11 31 64 55 31 50 46 34 59 31 9 18 12 3 64 13 55 41 11 9 51
72 10 5 46 45 51 42 50 64 9 43 31 37 31 61 0 43 0 41 60 58 61 68 5 54 67: 67 33 27 51 11 73 39 1 2 50 45 22 27 58 38 2 16 44 50 47 63
47 65 0 70 62 38 41 52 68 54 29 67 47 42 63 24 64 57 10 14 30 27 24 23 69 27 73 1 74 58 57 63 20 60 56 62 3 29 70 10 45 3 71 42 14 0
35 3 20 13 20 10 65 38 68: 57 47 1 50 59 14 24 60 0 10 14 15 65 1 0 47 69 38 58 38 69 16 51 52 22 15 11 62 18 71 17 69 32 21 49 63 71
44 58 14 56 13 57 53 2 29 7 33 1 0 14 73 34 13 44 41 68 22 21 3 2 39 62 65 3 44 60 0 15 55 29 9 42 9 21 69: 15 73 26 25 8 67 44 74 72
75 18 39 74 63 25 45 51 68 43 44 63 59 10 41 36 27 33 23 74 29 61 16 65 8 61 72 0 19 4 18 68 67 19 54 2 25 66 45 13 19 68 15 67 50 55
54 31 18 16 1 27 42 13 63 67 58 61 75 0 13 13 53 4 72 46 70: 55 20 5 27 32 61 75 69 27 63 27 68 13 64 70 38 64 64 18 45 55 19 26 22 18
40 15 49 30 30 23 18 55 1 29 37 54 60 21 15 51 73 67 75 37 17 46 52 58 35 23 39 30 30 42 26 15 46 1 24 33 72 8 56 28 58 29 13 60 0 16
42 42 71 70 71: 42 24 66 18 72 13 63 22 26 39 26 12 11 14 60 36 58 44 28 32 66 43 18 33 55 4 72 74 34 33 43 16 57 54 23 28 53 11 53 71
68 17 53 37 64 27 27 16 28 16 5 3 18 55 60 29 33 0 23 2 15 63 6 32 44 3 30 37 72 26 0 17 19 22 74 72: 33 51 2 58 49 54 62 69 20 68 10
23 45 60 4 2 31 9 15 48 45 71 50 61 42 46 53 32 61 24 61 54 22 59 60 70 13 15 4 20 2 62 8 73 1 51 5 61 1 55 66 4 29 34 32 6 48 1 60 25
8 36 69 16 33 28 40 50 16 21 29 0 30 17 53 73: 60 5 23 39 58 35 22 19 58 12 73 38 24 27 29 53 12 69 21 64 5 58 39 35 11 11 61 15 52 69
69 74 0 21 6 11 4 67 59 26 25 67 28 73 63 32 25 65 20 46 54 74 42 4 18 50 58 46 8 20 48 14 3 39 33 62 54 54 67 55 1 17 0 17 70 74: 59
36 16 53 55 19 47 5 56 58 61 47 10 39 45 13 21 71 67 9 41 14 65 14 42 64 40 15 46 27 15 61 18 35 19 22 67 9 54 49 0 53 56 8 66 4 23 4
69 49 39 49 36 64 48 22 20 20 63 42 24 40 14 19 14 56 8 45 30 11 38 1 40 0 9 75: 43 63 63 54 7 8 59 75 35 43 26 54 49 63 47 1 61 2 73
58 5 2 19 62 5 20 58 43 66 18 34 11 29 61 75 68 52 7 21 28 74 47 6 71 15 71 71 33 9 38 14 24 52 21 14 16 64 7 29 72 27 36 30 52 32 33
47 24 22 52 0 9 39 51 0

Table M-4: p_08cri Node Data

non-depot nodes: 100

Node ID	x	y	demand	service time
0	35	35	-	-
1	41	49	10	10
2	35	17	7	10
3	55	45	13	10
4	55	20	19	10
5	15	30	26	10
6	25	30	3	10
7	20	50	5	10
8	10	43	9	10
9	55	60	16	10
10	30	60	16	10
11	20	65	12	10
12	50	35	19	10
13	30	25	23	10
14	15	10	20	10
15	30	5	8	10
16	10	20	19	10
17	5	30	2	10
18	20	40	12	10
19	15	60	17	10
20	45	65	9	10
21	45	20	11	10
22	45	10	18	10
23	55	5	29	10
24	65	35	3	10
25	65	20	6	10
26	45	30	17	10
27	35	40	16	10
28	41	37	16	10
29	64	42	9	10
30	40	60	21	10
31	31	52	27	10
32	35	69	23	10
33	53	52	11	10
34	65	55	14	10
35	63	65	8	10
36	2	60	5	10
37	20	20	8	10
38	5	5	16	10
39	60	12	31	10
40	40	25	9	10
41	42	7	5	10
42	24	12	5	10
43	23	3	7	10
44	11	14	18	10
45	6	38	16	10
46	2	48	1	10
47	8	56	27	10
48	13	52	36	10
49	6	68	30	10
50	47	47	13	10
51	49	58	10	10
52	27	43	9	10
53	37	31	14	10
54	57	29	18	10
55	63	23	2	10
56	53	12	6	10
57	32	12	7	10
58	36	26	18	10
59	21	24	28	10
60	17	34	3	10
61	12	24	13	10
62	24	58	19	10
63	27	69	10	10
64	15	77	9	10
65	62	77	20	10
66	49	73	25	10
67	67	5	25	10
68	56	39	36	10
69	37	47	6	10
70	37	56	5	10
71	57	68	15	10
72	47	16	25	10
73	44	17	9	10
74	46	13	8	10
75	49	11	18	10
76	49	42	13	10
77	53	43	14	10
78	61	52	3	10
79	57	48	23	10
80	56	37	6	10
81	55	54	26	10
82	15	47	16	10

Node ID	x	y	demand	service time
83	14	37	11	10
84	11	31	7	10
85	16	22	41	10
86	4	18	35	10
87	28	18	26	10
88	26	52	9	10
89	26	35	15	10
90	31	67	3	10
91	15	19	1	10
92	22	22	2	10
93	18	24	22	10
94	26	27	27	10
95	25	24	20	10
96	22	27	11	10
97	25	21	12	10
98	19	21	10	10
99	20	26	9	10
100	18	18	17	10

p08 Inverse P matrix

1: 0 -78 -49 30 -70 33 86 61 -51 -28 44 -31 -67 -9 -38 98 66 -86 -17 -56 -83 -32 -25 -76 0 33 19 86 69 25 29 -7 87 -29 95 69 -72 96 10 -45 42 -29 -32 -10 -64 28 68 78 -39 -36 -10 -15 35 -63 44 69 35 -77 -21 53 37 -46 49 98 30 97 86 88 -80 1 -36 56 74 23 59 -50 -32 23 61 -15 31 83 98 -59 -56 21 88 26 -54 12 -36 66 25 57 8 -25 -53 -55 -24 66 2: 78 0 77 42 97 -39 65 48 -68 -44 -16 95 94 -23 -78 50 38 18 -64 -43 -70 22 74 25 -27 -39 11 -42 -86 18 7 75 57 68 -14 -46 -84 -49 25 99 -35 -3 -29 -45 -46 84 -73 -37 12 50 99 -71 5 -69 -58 44 83 -94 -6 -100 -16 -11 72 2 -71 71 24 -13 -24 -71 -75 -89 24 -66 74 -16 -57 44 -7 49 95 59 10 -17 -68 -79 85 -57 -8 -67 88 -36 -36 56 -52 7 14 -78 -93 -91 3: 49 -77 0 8 54 61 -89 15 94 -23 20 83 41 82 24 59 10 -92 -46 -36 -41 -95 8 16 48 -31 77 100 36 0 75 -78 -37 52 -47 63 99 39 -78 79 99 62 -90 -69 -17 -87 55 -6 -70 -46 -43 -2 -28 53 89 -19 66 -63 80 53 65 -81 11 16 90 -98 -28 69 -33 0 26 -66 -60 16 -97 76 -23 27 -37 -46 62 -94 -19 -73 -66 -42 -72 68 -63 -8 31 23 -61 27 64 -41 -71 88 -9 -5 4: -30 -42 -8 0 -24 -26 -17 -1 11 0 -21 83 -49 -86 -100 3 68 -38 75 35 -56 -75 -18 23 -50 -13 0 30 1 80 -14 29 43 -46 -92 -29 -77 40 -10 -55 3 -92 -67 -46 -17 -86 -55 80 -2 83 80 -33 -2 67 96 25 56 64 80 87 -66 -77 -85 48 -100 -52 -6 55 -12 31 -32 48 -32 2 -52 -26 96 -70 90 -23 -22 -8 -63 50 -70 -26 43 37 35 73 10 -31 -65 -60 -32 6 66 84 18 -83 5: 70 -97 -54 24 0 -37 22 -81 -27 86 29 26 28 -6 69 -74 2 -99 61 -5 -48 -6 28 27 44 -27 -59 53 -66 -58 62 49 -60 -70 -62 95 80 65 -86 -52 -61 -80 20 -59 95 -63 -78 -69 -15 49 -50 74 -53 30 42 38 88 -72 67 16 -77 -17 99 2 -43 -52 -41 63 -2 -95 -25 -84 -60 73 -51 38 94 98 45 -91 45 -48 -70 60 9 32 -72 60 64 19 -15 -70 19 -37 40 -8 47 -59 77 87 6: -33 39 -61 26 37 0 5 -53 47 -50 -45 46 -19 65 -39 -56 -50 94 61 -52 -4 3 23 84 -68 -55 -92 -93 93 6 18 -43 84 71 92 -35 38 29 -60 -9 -10 -57 91 -65 -43 -87 15 -56 -87 12 -16 -81 -24 -21 52 -76 -73 -91 9 -3 34 42 80 -100 78 98 -83 -23 -56 19 -54 -58 48 -2 -53 -51 53 -16 37 37 -28 78 28 22 -18 59 83 21 89 -79 33 1 -67 44 -11 -36 -21 -70 -70 100 7: -86 -65 89 17 -22 -5 0 90 -69 -20 78 -14 -2 -59 5 -88 -72 -73 15 43 -13 -54 -29 69 93 55 0 -88 -38 -100 -12 67 -63 -26 10 8 87 70 35 64 -73 36 28 -75 77 -34 -71 58 -79 -18 44 -28 81 5 82 -12 -20 45 -63 -34 -70 -66 -50 14 -71 48 -23 -17 100 41 -29 -47 -55 60 5 -75 -69 -79 -49 -17 -3 10 42 -81 -58 82 24 94 -39 -85 23 -23 23 94 -50 -1 -60 43 11 13 8: -61 -48 -15 1 81 53 -90 0 -77 39 44 46 -78 55 1 87 -49 -79 -68 55 89 -99 56 28 -58 -29 -6 21 94 -12 -31 -45 -76 -63 4 80 70 -68 10 89 86 73 3 99 0 10 -59 -27 45 -69 -36 0 -35 -41 71 99 -53 3 4 49 -24 -57 97 23 -11 5 23 44 -73 33 3 -25 -25 -18 -74 -31 28 -47 -77 -78 -17 93 4 45 -59 1 80 51 -33 10 90 52 0 -70 -63 17 -69 91 98 32 9: 51 68 -94 -11 27 -47 69 77 0 87 86 -93 -74 26 99 68 48 -49 70 -24 -34 -32 91 0 -3 20 17 39 98 -84 -36 -86 -61 -52 2 -54 84 -62 33 34 93 27 -65 -67 86 51 -56 -86 -94 76 56 -90 -71 -76 25 -52 -38 39 -5 46 42 74 63 81 25 -48 33 37 -90 46 7 80 -10 66 16 -70 81 7 -49 -23 -67 42 40 -66 -7 15 51 -10 -46 -73 -37 -48 83 -5 -40 78 -24 -42 2 -62 10: 28 44 23 0 -86 50 20 -39 -87 0 95 -13 69 47 37 -91 -80 -54 53 -88 -96 -81 -24 -8 -28 88 92 -19 -36 17 27 -30 -80 42 -71 -38 87 0 42 26 -22 -27 -20 -90 0 55 22 -15 1 24 -100 57 -11 -80 -47 -47 93 68 -46 80 -99 95 12 33 63 -18 -89 -96 95 -53 75 -10 40 -25 4 14 -4 -34 -18 14 5 -48 -49 -40 -37 99 -61 51 -20 -68 27 35 90 9 74 -90 -54 -95 41 7 11: -44 16 -20 21 -29 45 -78 -44 -86 -95 0 -20 46 93 -48 -65 -59 -4 -37 57 70 -46 -19 -24 -63 -66 77 -72 -19 90 84 -46 -46 94 63 28 100 56 5 -63 -27 -44 -4 0 -66 -79 50 50 -50 -30 -12 76 33 14 -54 -13 -45 29 33 -1 -35 26 -76 -55 28 -88 46 -39 87 64 62 3 -45 -54 -36 23 -48 -8 -32 22 72 -53 -38 99 18 14 9 -40 -74 89 42 -92 -54 -65 71 18 -30 -5 -72 -55 12: 31 -95 -83 -83 -26 -46 14 -46 93 13 20 0 13 10 -51 -68 -41 82 -22 14 -84 -48 7 -69 1 -18 -79 -34 -73 -79 52 78 1 -20 92 -66 82 65 100 -34 -76 -74 70 -47 84 -65 94 51 30 84 33 -6 -12 -45 -59 52 -84 -79 -29 88 17 10 -50 -21 18 -46 47 69 -88 41 95 -58 80 -34 -52 -60 -67 -4 -24 72 -99 -45 -76 80 2 -39 -84 -95 -2 84 48 100 1 -2 77 -19 -35 -22 -96 9 13: 67 -94 -41 49 -28 19 2 78 74 -69 -46 -13 0 62 88 -29 -35 83 -6 39 15 -3 -17 -57 73 -30 -69 -27 -55 -8 -17 100 -84 16 -32 -35 14 96 10 -64 66 87 -78 40 -38 11 85 -7 82 -90 -12 -79 -17 -30 -41 -12 76 5 -13 31 76 2 60 -46 1 22 -11 9 -70 -55 49 -35 11 18 92 -34 0 78 -69 -72 -70 -58 -17 87 -94 -53 -72 -19 -11 3 -51 -41 -11 -2 30 -37 8 30 -83 69 14: 9 23 -82 86 6 -65 59 -55 -26 -47 -93 -10 -62 0 0 17 -94 55 -82 78 59 -50 100 -89 -84 3 -77 -8 67 40 22 42 57 -30 54 22 33 -39 57 76 -90 -25 -94 43 48 -99 71 -81 -63 -53 -53 0 -20 95 83 75 -6 93 -96 12 -28 -57 70 -98 -7 28 -96 11 0 -40 -96 -5 40 -71 82 -91 50 99 88 -29 -12 -11 -43 -48 -5 3 52 -49 99 -10 -74 -59 0 -41 25 -89 -40 87 -65 -96 15: 38 78 -24 100 -69 39 -5 -1 -99 -37 48 51 -88 0 0 -84 -79 78 94 -16 94 77 -87 46 -41 69 -26 96 99 84 -60 -76 -2 -55 50 30 -81 -11 9 -54 16 -87 61 -63 -38 -26 5 58 -69 -39 -72 2 48 40 50 21 33 18 -58 -14 -52 -38 68 -76 -97 -28 51 -37 -77 -62 47 45 38 -64 -98 18 -21 63 63 100 68 81 69 -59 -52 72 28 -42 3 -44 3 75 -22 -32 -22 -49 10 -48 -49 95 16: -98 -50 -59 -3 74 56 88 -87 -68 91 65 68 29 -17 84 0 63 0 98 -6 15 70 56 -49 67 58 27 94 -4 -86 18 -21 95 46 -39 75 36 11 -46 -54 -75 7 69 -69 -78 12 -35 24 -43 33 -62 -31 -19 -30 32 88 21 -31 63 59 38 30 -78 49 29 -47 -99 -39 73 19 -69 3 -5 -60 -18 28 -59 21 -8 41 46 -28 -62 61 29 94 -72 -99 71 49 -67 -37 61 -64 71 69 50 100 -1 -41 17: -66 -38 -10 -68 -2 50 72 49 -48 80 59 41 35 94 79 -63 0 -68 -6 8 66 -36 -7 -19 69 -89 63 33 45 78 -73 -85 -8 54 81 94 -33 -66 20 -12 -3 -11 59 82 -51 -65 33 -65 -62 92 7 -75 -61 92 29 -35 -15 -19 64 5 -20 -99 48 -13 4 -41 99 12 94 -44 -16 -1 98 63 -62 83 34 39 67 -89 -97 21 -96 -54 6 -64 -52 44 41 -44 -25 14 -7 2 79 20 -44 20 34 -71 18: 86 -18 92 38 99 -94 73 79 49 54 4 -82 -83 -55 -78 0 68 0 83 79 -65 -85 -39 58 -28 63 -87 38 -76 7 -15 91 -86 -34 61 -85 -52 45 -4 16 -69 66 19 -90 -96 -74 78 -65 75 29 -53 -47 -5 -79 -34 65 -65 -50 -62 -93 -98 -73 52 54 -49 82 -95 11 8 -84 -95 36 69 -25 -48 80 -87 100 59 69 -15 39 -18 84 22 14 86 59 58 88 -4 55 29 -76 52 -16 -54 49 -35 30 19: 17 64 46 -75 -61 -61 -15 68 -70 -53 37 22 6 82 -94 -98 6 -83 0 -59 96 15 -66 80 -4 -74 87 -13 38 84 92 -67 90 58 0 -98 54 46 -95 -63 -74 50 91 -21 -46 -13 -24 -42 52 100 23 -49 1 -95 -68 4 -73 46 86 -87 25 89 73 -18 17 82 -88 -3 53 97 -10 -91 19 21 -79 30 -36 55 0 -21 20 65 -58 -29 -95 6 -22 6 -54 -75 -59 47 66 100 45 -64 -31 42 51 80 20: 56 43 36 -35 5 52 -43 -55 24 88 -57 -14 -39 -78 16 6 -8 -79 59 0 70 39 37 94 83 -38 88 55 74 -82 -11 -96 80 -80 -72 26 -45 32 -7 46 78 -75 29 17 0 -59 -94 -59 -59 -18 -31 19 63 46 95 41 65 -52 37 -55 45 -72 -9 -16 -5 -21 -11 -48 62 -36 -54 -56 20 57 -26 98 -21 54 43 37 -35 31 -9 18 58 -9 -94 87 -39 -45 -38 -3 5 -63 -51 -85 -67 5 11 -8 21: 83 70 41 56 48 4 13 -89 34 96 -70 84 -15 -59 -94 -15 -66 65 -96 -70 0 50 20 -4 -80 -5 31 36 88 14 76 -52 -29 -56 -21 42 18 -45 -8 81 -89 56 -59 3 -14 -12 -98 -36 32 18 -50 -50 76 3 57 92 -80 24 59 61 42 64 55 0 -30 79 100 67 -57 -69 12 40 37 -44 25 78 98 -97 26 29 -73 -54 22 56 41 -62 39 -71 0 -19 -95 -42 61 77 16 0 50 -36 40 34 22: 32 -22 95 75 6 -3 54 99 32 81 46 48 3 50 -77 -70 36 85 -15 -39 -50 0 30 -66 63 -15 100 11 83 -45 -6 71 11 19 -92 -99 -46 78 -69 -30 17 -36 -34 -93 99 15 50 -32 -51 -80 18 76 25 -13 -91 -57 9 -65 -63 -85 1 -54 24 85 80 93 -11 -45 -56 -1 -67 -46 71 54 -12 70 -30 -77 -19 -82 -45 75 90 -43 16 -6 30 -73 99 44 78 -23 48 -76 1 50 -60 90 62 8 23: 25 -74 -8 18 -28 -23 29 -56 -91 24 19 -7 17 -100 87 -56 7 39 66 -37 -20 -30 0 -67 -27 23 53 -58 -43 -68 -81 41 96 24 -8 64 51 34 81 -58 74 64 79 30 9 84 16 14 -36 41 -46 10 58 49 27 65 -56 16 -71 53 -75 29 -82 -94 83 94 100 11 -14 -47 -18 7 -47 -39 52 54 79 24 -8 14 82 -47 87 94 18 -42 75 -21 -36 -80 -3 -7 69 94 82 42 -88 -81 64 44 24: 76 -25 -16 -23 -27 -84 -69 -28 0 8 24 69 57 89 -46 49 19 -58 -80 -94 4 66 67 0 51 54 -81 -40 10 -74 -71 -9 -62 29 -35 -90 -79 -72 -34 -26 20 26 -8 90 85 -78 -10 21 26 0 -46 -29 -58 24 -81 -79 -60 -5 90 -77 -97 22 -69 3 89 98 14 -89 -6 46 42 82 -66 -43 -51 3 6 -4 36 56 88 56 -56 -60 39 -94 75 -17 -13 -53 -82 -12 -67 4 -1 25 -80 56 -40 -23 25: 0 27 -48 50 -44 68 -93 58 3 28 63 -1 -73 84 41 -67 -69 28 4 -83 80 -63 27 -51 0 -7 -74 -62 26 72 -86 -44 -77 43 63 -65 35 9 49 -49 57 15 -77 78 35 -29 96 84 -39 -79 -58 7 -30 -5 -86 -40 64 19 18 85 -75 92 28 79 41 40 51 94 -17 8 -20 74 -32 -6 -26 -43 75 -30 89 59 -4 32 43 75 -11 -25 81 -97 19 41 -97 -50 73 -43 71 -38 -46 -29 6 -59 26: -33 39 31 13 27 55 -55 29 -20 -88 66 18 30 -3 -69 -58 89 -63 74 38 5 15 -23 -54 7 0 98 30 3 -70 85 23 -85 85 -25 -72 67 -90 5 -89 23 -45 78 17 -12 76 86 55 26 72 -63 -23 -18 61 28 -46 -76 0 48 -3 -80 -97 -59 -41 70 43 -1 -98 78 80 23 7 -15 -51 35 -99 94 -17 75 13 81 -2 45 26 -96 71 11 33 44 -53 -79 52 96 -41 -14 12 -75 -11 65 92 27: -19 -11 -77 0 59 92 0 6 -17 -92 -77 79 69 77 26 -27 -63 87 -87 -88 -31 -100 -53 81 74 -98 0 49 -34 -81 0 95 -83 83 -92 -59 -36 -78 30 -25 64 -1 -64

25 92 -55 -38 24 85 56 -16 -38 -81 -5 7 76 21 -16 58 -92 -4 -84 40 50 47 16 45 89 -14 65 -66 80 60 91 -76 19 52 2 76 -41 -32 68 16 -71
0 -77 70 78 36 -60 23 95 -91 -59 81 -99 -87 -68 -5 13 28: -86 42 -100 -30 -53 93 88 -21 -39 19 72 34 27 8 -96 -94 -33 -38 13 -55 -36 -11
58 40 62 -30 -49 0 -91 14 -88 -2 69 91 25 -6 46 16 -73 10 -6 44 99 3 13 38 -81 45 -87 6 19 2 55 -19 -51 27 51 83 84 -15 20 32 58 78 40
-3 14 -57 -6 70 47 -57 28 94 -39 20 -44 -9 32 73 100 3 7 43 30 -10 -34 -45 -14 -94 72 -78 -35 -100 32 -7 -3 89 -61 -83 29: -69 86 -36 -1
66 -93 38 -94 -98 36 19 73 55 -67 -99 4 -45 76 -38 -74 -88 -83 43 -10 -26 -3 34 91 0 93 69 -32 -77 24 97 -94 22 -91 76 72 2 19 -70 2
-99 -2 -63 -48 -41 70 -82 78 35 88 52 27 8 19 -54 11 89 -55 31 -30 -11 91 -13 14 -54 84 78 -73 -95 60 -90 -34 -58 -39 70 -85 -3 29 24
48 34 -91 -94 33 -14 17 -19 39 15 47 -69 -94 -1 64 93 -89 30: -25 -18 0 -80 58 -6 100 12 84 -17 -90 79 8 -40 -84 86 -78 -7 -84 82 -14 45
68 74 -72 70 81 -14 -93 0 -70 39 -50 65 -84 92 45 -99 23 58 -34 -57 46 53 60 -29 8 -93 45 71 65 75 46 -5 22 -32 21 -3 -68 91 63 -94 60
-73 75 -2 42 -83 32 -69 81 17 -83 3 73 43 96 -30 42 52 -48 -58 -60 77 -98 -3 -74 -48 93 -4 32 79 100 -46 -75 31 -57 -36 -82 -19 31: -29
-7 -75 14 -62 -18 12 31 36 -27 -84 -52 17 -22 60 -18 73 15 -92 11 -76 6 81 71 86 -85 0 88 -69 70 0 27 74 34 62 -15 82 97 -99 37 -50 -33
-82 46 -66 49 -93 -47 61 55 -12 4 33 6 0 -48 60 85 56 13 14 68 -3 -71 -52 -37 -74 42 7 -53 58 -6 24 -24 17 99 59 44 -68 16 -44 -88 -17
-10 -56 17 -23 -54 78 15 92 -61 34 -66 39 -89 -46 -70 -18 51 32: 7 -75 78 -29 -49 43 -67 45 86 30 46 -78 -100 -42 76 21 85 -91 67 96 52
-71 -41 9 44 -23 -95 2 32 -39 -27 0 -26 28 -7 44 27 10 -23 65 -9 -76 -65 59 -66 -14 42 49 18 33 -69 -66 -78 -44 -4 44 16 -12 -76 10 2 77
16 99 -31 -79 -47 -87 54 11 28 -24 -3 92 64 92 -80 33 -56 75 92 56 -92 -100 -6 28 -13 49 64 72 95 77 -62 -21 -31 -47 -1 62 -4 23 33:
-87 -57 37 -43 60 -84 63 76 61 80 46 -1 84 -57 2 -95 8 86 -90 -80 29 -11 -96 62 77 85 83 -69 77 50 -74 26 0 -32 -28 -74 -63 7 3 -31 78
40 -72 17 92 -19 53 -72 97 66 -48 -70 11 -18 10 -10 -42 -43 22 -45 -82 -73 96 80 67 84 13 -44 -84 10 -11 80 62 9 49 -25 -73 37 63 64
100 91 14 -66 -52 -95 97 62 -82 -48 2 83 17 -81 57 14 34 34 81 0 34: 29 -68 -52 46 70 -71 26 63 52 -42 -94 20 -16 30 55 -46 -54 34 -58
80 56 -19 -24 -29 -43 -85 -83 -91 -24 -65 -34 -28 32 0 -51 -12 -69 -18 -96 64 -91 72 -52 -100 42 43 -98 75 -89 -86 -13 -28 44 17 -33 41
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p08 Generalized P matrix

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28 85 7 77 52 47 14 15 81 21 69 92 91 99 0 28 8 14 6 89 78 35 34 89 37 97 83 42 33 86 27 62 72 98 56 5 24 66 77 61 10 26 64 19 4 52 44
83 72 72 89 74 2 23 0 22 94 79 49 21 71 74 26 62 7 74 77 81 63 14 52 60 17 28 94 89 12 55 19 86 19 56 86 53 21 61 36 20 81 24 47 25 29
89 12 71 66 0 70 75 56: 11 88 6 31 6 92 66 52 66 48 85 63 30 26 27 83 55 32 54 19 25 19 74 11 61 40 15 50 1 53 12 57 83 83 72 9 10 79
100 46 57 34 71 66 84 62 2 81 3 98 77 7 3 26 82 0 7 26 78 57 87 24 45 15 38 82 100 90 69 9 28 37 99 63 8 94 20 94 95 44 12 51 19 32 69
28 18 21 85 9 39 96 36 48 40 69 42 44 63 33 57: 29 70 1 12 52 68 81 26 87 46 100 81 19 18 35 10 51 83 62 41 72 38 71 56 10 28 60 47 87
82 38 60 62 91 31 25 28 20 78 0 7 54 36 12 73 65 58 60 71 36 92 30 24 86 70 38 0 24 27 74 20 15 97 3 42 18 90 0 21 22 20 94 14 99 87
44 25 92 44 4 28 2 23 60 30 98 64 93 33 46 57 24 78 56 62 40 98 93 69 61 58: 44 99 61 18 61 69 66 93 10 94 26 17 45 75 97 81 14 45 2 5
67 26 68 5 3 44 98 78 40 39 46 47 46 10 54 20 28 65 55 5 97 81 64 32 78 60 4 24 91 87 49 48 86 18 11 96 96 0 66 78 73 97 33 18 55 82
99 47 12 47 37 73 58 60 7 91 69 26 21 92 38 57 75 34 59 3 36 41 32 40 9 9 12 4 91 10 19 97 36 39 59: 6 78 100 0 5 34 65 88 97 47 18 48
75 73 85 58 88 70 66 25 91 64 36 25 17 79 16 12 89 12 45 62 51 56 2 37 22 22 20 52 74 99 9 67 49 76 84 3 30 39 23 45 10 14 34 14 8 89
0 1 18 47 42 50 26 68 2 86 99 61 95 23 29 84 97 53 11 52 56 21 12 16 97 10 12 59 70 12 65 49 100 71 17 74 25 36 4 96 15 35 60: 96 61
62 87 78 98 42 48 82 19 63 0 71 87 60 93 94 98 4 67 18 85 48 78 47 2 20 89 42 12 53 45 83 18 93 31 41 89 66 26 52 86 24 100 78 98 9 56
38 5 84 31 13 96 48 88 4 96 79 0 39 16 1 63 11 97 97 82 11 42 23 6 20 6 79 55 32 51 37 69 98 58 66 100 72 38 81 24 71 43 99 4 18 3 60
55 34 23 0 67 61: 9 16 53 34 25 39 60 33 61 3 45 83 1 28 40 89 24 100 47 95 68 9 94 54 12 87 35 10 5 10 0 86 74 95 98 10 23 1 97 98 10
97 80 24 94 34 31 11 30 31 83 89 30 21 31 1 88 56 95 10 0 66 41 61 96 28 86 77 0 7 66 58 83 7 50 23 3 69 14 44 12 45 12 55 40 31 55 84
36 48 47 96 78 20 96 54 83 79 44 94 62: 40 47 50 40 12 68 94 20 45 3 65 82 89 94 35 23 0 42 93 60 97 63 27 79 58 28 48 18 87 58 46 7

29 29 65 13 63 51 82 67 30 32 86 14 3 81 12 58 40 33 29 85 65 12 92 14 73 69 75 6 50 0 27 65 62 91 44 34 13 85 46 19 77 69 63 6 100 82
34 100 47 46 79 69 45 98 74 60 25 75 58 5 11 25 30 81 22 23 73 11 63: 72 44 14 96 55 65 35 99 25 89 13 87 27 20 32 78 6 78 28 55 51 8
48 36 39 56 27 25 98 6 7 70 82 60 97 1 75 99 90 53 14 89 67 35 17 38 89 59 100 50 47 100 29 45 23 14 71 55 41 85 88 82 0 44 60 13 84
42 97 29 45 21 50 38 78 47 45 4 70 25 86 20 80 14 28 14 43 70 19 46 4 44 62 58 15 18 66 74 60 3 64: 41 35 59 75 94 58 42 70 78 46 12
41 1 38 71 54 67 35 74 20 33 80 28 42 25 88 52 42 12 16 68 10 26 1 20 38 69 48 85 83 69 19 21 58 96 47 20 77 72 63 35 22 24 57 79 35 0
4 14 89 17 35 87 0 29 17 56 44 43 18 35 20 38 69 60 72 6 88 44 14 9 96 85 79 58 16 7 44 99 18 27 87 60 63 24 40 56 94 39 13 65: 40 31
73 1 56 94 55 84 44 68 71 47 67 66 100 60 77 83 9 72 62 39 49 80 45 45 70 40 49 27 6 13 47 57 80 68 47 63 36 35 45 12 81 1 94 52 44 32
36 45 6 79 68 29 9 92 64 4 79 43 47 4 64 67 0 64 36 55 94 84 73 81 69 18 90 92 29 4 1 79 61 92 60 97 56 66 0 85 12 62 0 4 50 4 100 43
67 68 68 64 66: 23 84 4 92 76 87 18 60 86 4 81 72 61 52 60 10 69 70 80 51 18 79 10 17 72 32 55 52 40 92 32 24 86 28 15 11 70 48 61 34
19 14 19 32 62 19 14 61 24 78 50 19 92 99 77 1 32 3 30 11 96 65 20 37 62 0 11 87 55 34 50 75 65 24 36 10 70 78 5 45 54 93 36 61 100 38
58 95 56 30 85 61 18 79 80 84 8 15 48 43 67: 2 33 82 18 15 99 25 66 0 43 71 42 22 54 12 71 94 3 50 52 98 56 26 96 31 11 69 85 74 14 88
78 94 61 27 70 92 95 18 49 16 28 0 12 49 71 78 85 66 8 37 18 6 12 87 98 33 68 73 32 44 96 25 29 52 38 0 72 75 13 46 76 36 38 31 49 4
16 6 65 82 77 3 73 58 94 31 62 66 40 21 43 5 67 94 95 86 44 44 50 68: 33 16 4 94 60 51 45 19 24 94 47 33 20 52 18 62 29 11 37 98 37 50
38 51 99 7 63 81 64 27 92 99 96 79 36 30 35 15 22 73 25 93 3 16 81 11 38 18 12 32 66 11 43 79 43 30 78 59 39 66 83 38 35 0 47 100 91 0
19 0 48 88 14 22 28 73 85 21 53 92 66 85 65 88 23 79 69 23 78 25 63 100 14 70 40 45 7 16 54 67 69: 17 99 24 74 12 5 98 75 66 46 48 92
90 88 84 64 15 41 91 50 1 30 50 34 19 22 52 44 0 51 8 49 89 50 1 63 93 23 48 84 84 9 64 12 97 19 12 79 89 5 9 47 10 36 86 8 67 60 20 61
63 21 95 10 15 90 43 3 0 80 77 61 8 55 41 39 95 38 98 85 85 36 0 94 3 42 96 93 61 73 68 84 39 90 38 85 1 24 78 98 70: 6 90 28 8 7 96 98
13 87 13 44 5 33 59 64 45 95 82 80 45 86 91 15 95 19 24 64 5 66 30 87 92 74 75 85 92 39 24 5 38 62 8 43 6 15 28 33 54 81 80 30 83 17
47 95 26 62 22 91 51 43 75 82 79 15 9 72 62 31 0 64 29 54 53 83 56 96 11 29 53 41 93 37 93 90 47 23 100 77 12 37 61 87 22 5 52 72 28
46 42 71: 74 22 30 41 69 63 37 9 9 31 34 92 4 7 0 47 17 11 69 100 21 77 82 18 78 75 48 20 37 28 81 100 97 81 35 39 49 74 61 81 6 40 9
33 74 83 60 51 66 33 97 82 39 28 28 60 14 64 89 29 77 78 89 58 55 49 51 55 3 95 0 71 38 90 87 94 49 22 35 62 28 59 53 49 25 24 65 25
37 13 91 1 67 30 50 24 83 75 33 93 72: 19 72 7 38 49 61 11 95 54 65 62 81 12 99 89 1 56 49 69 37 74 48 90 14 51 69 47 87 49 59 20 83
54 97 11 89 58 39 83 34 96 75 78 43 38 60 52 14 26 39 54 30 83 15 5 8 63 15 51 68 62 0 77 13 58 66 50 93 63 69 0 0 50 88 3 65 52 74 47
97 57 4 68 81 17 3 52 59 20 43 71 68 18 39 72 40 12 71 48 0 73: 84 77 99 38 31 98 53 25 7 88 89 31 51 33 38 85 51 96 45 55 71 62 14 76
18 77 36 31 44 8 63 83 39 56 36 98 89 23 41 15 25 32 72 0 84 97 52 74 92 52 2 64 65 68 24 28 27 27 9 40 36 29 7 46 76 15 40 92 51 57
64 5 0 9 33 3 4 85 36 7 64 66 26 29 99 90 47 70 1 86 14 62 39 11 98 22 2 15 98 68 74: 61 43 5 39 41 47 81 46 41 69 44 67 43 49 34 2 32
89 19 71 88 84 9 18 56 14 96 75 30 100 13 10 49 3 19 94 30 44 11 69 43 1 50 16 25 3 53 93 14 98 15 44 62 33 100 3 0 28 41 5 91 79 53
77 10 56 8 69 97 66 31 39 43 0 99 21 53 42 100 36 77 30 50 51 14 61 88 60 71 72 38 71 71 58 53 100 57 32 68 54 75: 56 78 83 55 3 54 28
79 20 47 48 16 37 36 62 24 77 79 0 67 49 29 77 49 78 71 78 68 40 21 6 99 20 48 75 17 76 80 1 23 94 5 92 21 61 48 51 32 47 37 86 11 60
29 6 60 29 95 3 56 71 84 77 64 66 98 80 66 73 7 42 78 27 10 0 90 24 51 70 59 59 68 80 78 19 71 37 22 71 47 13 3 43 30 81 9 95 3 15 54
76: 68 97 93 54 31 29 83 23 51 12 31 7 65 66 27 14 80 65 9 53 38 49 96 52 29 27 89 49 9 27 87 73 88 99 84 66 32 25 23 57 83 82 79 73
24 100 90 81 51 56 91 44 37 25 21 42 37 81 90 0 27 22 54 31 58 99 55 10 89 90 77 32 42 17 54 0 96 29 51 66 97 78 3 11 92 33 61 91 3 28
22 64 11 52 63 57 16 70 94 7 77: 16 21 82 12 18 1 97 40 30 100 35 81 34 39 53 36 12 91 68 6 95 40 24 50 99 73 91 82 75 50 62 87 20 11
71 27 53 33 38 60 32 36 94 90 6 3 76 19 45 27 77 67 37 50 31 28 97 47 79 58 24 79 57 27 22 58 81 39 99 84 58 50 13 65 64 0 0 14 93 37
46 21 6 78 81 4 73 97 82 90 72 4 50 11 69 20 33 68 43 38 78: 88 18 88 1 38 100 86 16 85 89 15 99 57 34 86 81 91 11 42 5 55 32 70 40 90
90 26 51 77 99 96 85 68 49 1 92 44 63 59 79 53 55 64 23 19 14 77 73 23 23 51 38 52 33 43 50 77 45 94 68 53 3 19 51 17 99 78 89 45 98
80 90 20 23 35 64 74 0 39 52 21 85 17 39 82 4 50 20 84 92 22 51 41 50 37 94 28 30 43 66 79: 100 14 71 62 88 36 28 73 65 13 43 96 52 22
64 59 13 35 88 58 83 10 49 81 57 78 93 28 85 5 21 56 28 4 15 40 5 14 87 68 66 31 30 52 11 31 76 42 37 77 53 67 37 40 82 35 16 27 3 5
94 80 89 85 30 86 41 82 20 69 95 93 44 65 7 97 48 79 0 53 84 86 10 32 56 29 90 91 90 4 34 82 17 94 86 46 87 63 37 27 80: 72 34 39 62
92 47 15 88 90 46 98 9 80 43 30 6 80 0 70 23 69 38 54 11 7 13 87 32 73 64 36 99 85 35 88 72 97 42 93 68 93 41 32 69 55 88 54 32 54 22
60 76 95 82 50 94 83 1 56 32 71 86 50 74 42 35 91 1 75 48 31 1 5 86 77 21 70 13 100 0 31 29 23 46 5 82 0 14 13 95 15 16 27 59 40 43 79
87 60 91 81: 41 73 65 47 79 75 59 36 14 41 73 85 48 67 70 95 54 49 28 60 89 13 45 53 73 86 75 51 12 75 56 3 42 60 0 14 13 35 59 10 42
14 46 47 56 84 100 89 23 23 97 82 79 22 66 26 40 32 27 49 5 21 90 5 59 78 53 4 97 14 26 11 21 68 17 25 74 11 73 60 0 85 21 64 97 66 48
84 25 34 89 80 28 26 18 4 57 69 42 45 82: 5 63 55 49 95 16 42 1 52 65 1 89 33 71 6 94 44 48 92 98 82 49 63 88 17 90 52 65 61 71 90 86
47 61 69 0 63 90 46 6 14 49 63 52 82 42 50 86 5 98 32 93 76 27 42 55 61 45 9 82 96 37 29 67 81 54 74 16 56 3 39 87 0 13 21 26 80 42 12
78 91 0 82 39 91 33 33 89 49 18 16 53 48 61 29 87 4 28 30 20 83: 44 73 35 39 84 77 93 42 44 63 59 12 43 65 46 69 41 62 2 25 72 39 58
74 50 13 99 27 34 65 2 66 41 70 30 31 73 74 43 80 75 26 9 47 76 68 100 4 99 5 82 67 55 50 4 79 15 57 16 10 17 84 36 95 38 90 95 6 13
98 46 87 12 46 2 96 9 58 3 95 93 44 0 44 47 28 10 89 88 2 13 69 27 31 42 46 19 8 72 38 84: 74 18 30 82 19 33 2 69 89 54 45 70 96 79 29
0 3 48 9 44 65 98 16 13 56 73 38 93 51 60 47 91 71 21 14 87 98 89 72 58 70 31 32 100 85 97 28 70 18 13 6 96 48 67 97 7 22 71 89 92 71
100 12 7 8 54 10 94 33 4 7 41 94 32 56 20 9 67 79 4 31 54 74 0 35 50 39 100 35 32 30 34 98 55 32 47 29 51 98 90 85: 26 70 63 36 49 2
68 10 77 89 18 30 76 49 60 54 46 20 8 6 10 47 50 37 77 29 97 47 85 75 26 37 37 68 12 9 32 90 7 89 94 82 73 49 97 69 9 36 49 9 56 5 25
25 1 33 87 28 6 83 33 66 46 28 71 41 24 57 49 97 21 82 60 74 76 43 55 69 96 5 37 83 52 87 0 14 29 29 35 24 12 47 91 34 50 12 15 66 22
21 86: 99 1 76 70 54 20 27 85 85 66 15 85 91 47 78 69 69 8 18 1 10 49 1 96 19 45 20 91 85 48 97 76 41 87 78 24 76 7 73 91 83 72 74 75
4 71 49 46 42 79 52 25 90 46 20 100 23 31 71 97 86 72 78 33 53 23 0 4 57 37 19 6 67 58 16 51 43 71 49 90 94 29 12 21 58 0 73 1 35 69
74 67 34 90 25 26 12 78 26 14 87: 33 32 30 31 93 64 76 13 77 12 44 46 94 22 48 56 36 97 48 46 31 13 100 13 36 44 20 12 25 98 83 94 60
62 38 31 14 63 72 39 77 85 90 95 90 44 42 25 47 71 95 32 57 52 13 98 15 92 31 83 17 85 51 77 56 89 64 79 13 13 96 6 53 85 14 8 86 5 78
87 87 42 67 26 24 17 0 87 3 44 52 12 8 56 78 29 26 84 29 70 88: 23 36 8 41 50 77 74 30 19 58 40 8 40 38 95 41 69 28 52 26 41 78 42 69
35 71 20 71 1 61 35 19 45 31 77 97 92 16 3 35 65 24 99 4 80 17 95 65 32 6 34 5 5 82 32 63 76 84 80 61 60 58 26 80 54 93 8 84 78 32 5 28
48 91 8 57 26 35 90 59 66 77 63 49 18 76 58 0 38 42 40 41 90 43 72 37 55 46 72 73 89: 69 47 82 5 65 92 99 38 91 44 96 40 32 1 84 49 7
21 53 6 13 47 79 46 39 99 10 93 68 24 93 11 69 92 36 18 83 40 43 91 79 27 37 96 8 96 23 38 16 87 70 15 44 58 68 4 52 14 85 62 20 39 81
76 67 11 22 77 74 48 52 50 32 79 100 3 64 15 95 7 97 17 46 17 57 21 79 4 0 38 77 83 81 31 86 24 15 56 96 68 90: 95 59 90 17 70 41 47
57 49 77 62 66 90 68 62 100 6 16 26 79 49 100 66 68 68 39 7 68 72 99 36 72 45 6 41 84 80 44 44 64 30 95 79 80 61 96 88 24 19 37 70 27
37 39 18 90 42 53 41 29 84 28 84 93 24 84 8 2 85 77 11 38 35 94 33 84 45 49 94 86 30 9 79 53 54 92 28 33 71 0 38 64 83 53 42 11 19 74
45 40 91: 32 76 15 29 3 30 55 16 19 88 59 40 81 86 61 52 47 96 67 85 35 19 1 55 14 28 30 40 11 2 63 61 15 78 75 16 41 56 8 26 70 73 59
37 21 86 37 72 58 82 20 38 59 12 81 87 14 61 12 38 8 64 63 22 8 64 59 52 14 62 57 2 0 28 13 77 68 29 38 77 92 31 19 80 18 63 63 79 95
90 0 98 94 75 33 4 41 11 58 92 92: 53 45 28 7 69 89 26 16 68 36 80 75 63 13 79 84 0 3 2 29 29 6 1 37 68 85 64 69 31 4 83 31 79 40 53 69
39 64 47 8 43 70 67 5 26 62 75 4 33 55 39 98 19 11 23 92 37 69 59 59 18 53 8 86 76 88 52 88 30 30 63 13 35 98 10 53 92 82 12 16 8 66
10 72 66 12 76 6 55 9 68 0 43 100 52 1 7 79 50 75 93: 31 94 25 43 76 15 79 20 57 64 49 37 36 34 22 42 59 10 1 68 73 63 41 1 71 89 55

32 31 13 84 28 22 5 77 50 69 47 34 10 33 100 54 55 24 56 31 90 93 14 7 87 2 46 58 1 96 42 9 51 57 31 23 94 20 92 39 59 22 4 9 17 77 58 100 60 13 35 52 2 79 58 58 36 28 13 52 6 69 74 39 45 0 70 1 92 11 17 41 43 94: 60 15 42 15 26 61 24 23 26 35 96 91 25 49 11 92 68 15 41 54 89 41 5 76 64 38 38 2 15 63 38 45 54 38 75 19 98 72 32 13 11 90 30 49 23 92 42 10 56 96 22 61 7 68 26 85 22 9 51 65 96 18 1 48 10 86 28 88 70 11 35 29 75 49 100 67 47 99 92 36 75 91 98 58 39 37 73 22 37 64 4 14 72 0 86 67 77 9 47 69 95: 18 94 90 96 19 15 19 19 27 5 27 90 85 90 65 19 64 25 31 86 66 18 50 25 75 61 85 68 70 29 68 12 81 74 56 66 94 33 94 3 44 34 9 12 76 98 93 25 16 2 14 55 33 14 54 34 63 16 9 1 77 13 77 35 53 59 65 65 14 71 52 56 23 75 59 58 63 53 85 16 58 57 48 90 99 37 47 100 39 54 96 21 3 76 0 74 28 88 69 75 96: 79 78 82 83 25 39 77 60 79 8 37 15 56 11 86 96 24 90 4 4 94 84 59 98 33 14 58 32 49 100 85 36 65 70 44 27 10 91 92 24 0 6 42 37 31 19 89 20 19 94 43 94 95 16 64 67 32 32 59 26 91 63 15 4 94 13 49 39 2 77 78 81 36 21 9 70 90 48 58 51 90 2 70 21 50 37 50 85 29 45 14 3 23 43 8 0 82 86 94 40 97: 55 36 84 47 39 3 61 99 68 46 65 15 90 89 75 97 28 80 63 64 26 21 7 35 78 18 4 82 83 15 59 74 71 7 6 96 88 77 92 5 34 73 95 20 50 53 16 17 3 10 43 86 42 79 58 67 5 48 51 95 92 82 20 1 72 17 13 89 27 84 84 53 5 98 38 66 12 95 63 16 87 45 60 23 63 11 20 67 54 84 64 0 14 68 38 17 0 8 64 54 98: 1 14 33 26 39 61 78 0 83 15 14 90 21 10 49 90 56 26 20 31 32 37 40 68 26 35 51 85 38 92 9 50 82 44 92 36 99 92 26 47 39 32 18 77 39 62 80 0 36 68 52 99 61 79 90 66 33 85 49 32 91 54 64 44 83 88 41 70 9 7 43 91 69 14 17 35 36 12 72 1 3 71 7 11 58 12 44 52 69 38 39 54 87 21 16 75 23 0 8 22 99: 24 89 8 41 39 3 64 48 59 24 27 66 66 31 70 18 91 87 33 7 89 51 45 11 17 48 3 53 19 17 51 38 84 21 73 47 22 90 51 97 82 20 95 91 41 99 82 67 29 94 100 60 63 20 7 28 68 46 21 41 98 100 4 81 67 74 73 73 4 80 69 40 35 29 6 85 85 15 99 12 55 69 37 65 64 18 4 79 10 56 45 36 50 83 24 44 75 64 0 77 100: 80 72 62 79 99 90 11 30 68 75 13 98 1 3 87 49 37 15 20 5 40 27 10 58 90 74 60 69 77 45 75 63 96 69 65 43 26 77 37 52 58 55 76 10 56 78 27 36 88 29 92 96 6 37 92 48 40 26 47 11 26 93 14 9 45 40 14 45 13 82 50 19 90 43 56 41 57 6 71 7 73 12 38 34 47 28 97 74 65 39 36 32 21 77 42 100 25 47 55 0

Table M-5: p_09cri Node Data

non-depot nodes: 150

Node ID	x	y	demand	service time
0	35	35	-	-
1	37	52	7	10
2	49	49	30	10
3	52	64	16	10
4	20	26	9	10
5	40	30	21	10
6	21	47	15	10
7	17	63	19	10
8	31	62	23	10
9	52	33	11	10
10	51	21	5	10
11	42	41	19	10
12	31	32	29	10
13	5	25	23	10
14	12	42	21	10
15	36	16	10	10
16	52	41	15	10
17	27	23	3	10
18	17	33	41	10
19	13	13	9	10
20	57	58	28	10
21	62	42	8	10
22	42	57	8	10
23	16	57	16	10
24	8	52	10	10
25	7	38	28	10
26	27	68	7	10
27	30	48	15	10
28	43	67	14	10
29	58	48	6	10
30	58	27	19	10
31	37	69	11	10
32	38	46	12	10
33	46	10	23	10
34	61	33	26	10
35	62	63	17	10
36	63	69	6	10
37	32	22	9	10
38	45	35	15	10
39	59	15	14	10
40	5	6	7	10
41	10	17	27	10
42	21	10	13	10
43	5	64	11	10
44	30	15	16	10
45	39	10	10	10
46	32	39	5	10
47	25	32	25	10
48	25	55	17	10
49	48	28	18	10
50	56	37	10	10
51	41	49	10	10
52	35	17	7	10
53	55	45	13	10
54	55	20	19	10
55	15	30	26	10
56	25	30	3	10
57	20	50	5	10
58	10	43	9	10
59	55	60	16	10
60	30	60	16	10
61	20	65	12	10
62	50	35	19	10
63	30	25	23	10
64	15	10	20	10
65	30	5	8	10
66	10	20	19	10
67	5	30	2	10
68	20	40	12	10
69	15	60	17	10
70	45	65	9	10
71	45	20	11	10
72	45	10	18	10
73	55	5	29	10
74	65	35	3	10
75	65	20	6	10
76	45	30	17	10
77	35	40	16	10
78	41	37	16	10
79	64	42	9	10
80	40	60	21	10
81	31	52	27	10
82	35	69	23	10

Node ID	x	y	demand	service time
83	53	52	11	10
84	65	55	14	10
85	63	65	8	10
86	2	60	5	10
87	20	20	8	10
88	5	5	16	10
89	60	12	31	10
90	40	25	9	10
91	42	7	5	10
92	24	12	5	10
93	23	3	7	10
94	11	14	18	10
95	6	38	16	10
96	2	48	1	10
97	8	56	27	10
98	13	52	36	10
99	6	68	30	10
100	47	47	13	10
101	49	58	10	10
102	27	43	9	10
103	37	31	14	10
104	57	29	18	10
105	63	23	2	10
106	53	12	6	10
107	32	12	7	10
108	36	26	18	10
109	21	24	28	10
110	17	34	3	10
111	12	24	13	10
112	24	58	19	10
113	27	69	10	10
114	15	77	9	10
115	62	77	20	10
116	49	73	25	10
117	67	5	25	10
118	56	39	36	10
119	37	47	6	10
120	37	56	5	10
121	57	68	15	10
122	47	16	25	10
123	44	17	9	10
124	46	13	8	10
125	49	11	18	10

Node ID	x	y	demand	service time
126	49	42	13	10
127	53	43	14	10
128	61	52	3	10
129	57	48	23	10
130	56	37	6	10
131	55	54	26	10
132	15	47	16	10
133	14	37	11	10
134	11	31	7	10
135	16	22	41	10
136	4	18	35	10
137	28	18	26	10
138	26	52	9	10
139	26	35	15	10
140	31	67	3	10
141	15	19	1	10
142	22	22	2	10
143	18	24	22	10
144	26	27	27	10
145	25	24	20	10
146	22	27	11	10
147	25	21	12	10
148	19	21	10	10
149	20	26	9	10
150	18	18	17	10

p09 Inverse P matrix

1: 0 -117 -74 46 -106 50 129 92 -76 -42 66 -47 -101 -13 -58 147 100 -129 -26 -84 -125 -48 -38 -113 0 50 29 128 103 37 43 -11 130 -44 143
103 -108 144 15 -68 63 -43 -48 -16 -96 42 103 117 -59 -54 -15 -23 52 -94 67 104 53 -115 -32 79 55 -69 74 147 45 145 128 132 -120 2 -54 84
111 35 89 -75 -48 35 91 -22 47 125 147 -88 -84 32 132 39 -81 18 -53 100 38 85 12 -37 -80 -83 -36 100 116 63 145 -59 98 71 -102 -66 -25 143
141 -34 -116 76 58 26 -96 -64 -105 33 111 38 -41 -58 17 -63 -128 28 11 112 85 102 -22 -69 -126 -73 38 148 -53 -5 -44 -67 -69 125 -109 -55
18 75 148 -106 2: 117 0 8 -104 -87 66 124 -141 -9 -150 -24 -16 108 3 -106 107 37 -20 -36 -107 -112 -133 37 -98 112 -24 -86 66 -11 74 142 89
15 -26 -101 -118 127 -86 -12 -100 132 -55 -54 84 -78 11 22 -116 -139 -136 12 81 92 -134 22 140 -35 31 124 61 123 36 88 15 -137 -69 -53 -62
-143 12 24 72 -47 115 150 54 0 112 -117 -55 79 -71 94 148 58 -117 118 149 93 -135 -103 -26 -130 82 -9 -105 -69 -65 -4 -41 79 134 -28 98
-94 120 80 98 -121 16 24 134 -147 -43 103 -49 0 39 -99 -90 24 -146 113 -35 41 -55 -69 93 -141 -29 -109 -98 -62 -108 102 -94 -12 46 34 -92
41 96 -61 -106 131 -13 -7 -36 -39 -25 3: 74 -8 0 -2 17 0 -32 125 -74 -129 -150 5 102 -57 113 52 -84 -112 -28 35 -76 -20 0 45 2 119 -22 43 65
-68 -138 -44 -115 60 -15 -83 4 -137 -100 -68 -26 -129 -82 119 -3 124 120 -49 -3 100 144 38 85 96 119 131 -99 -115 -127 72 -149 -78 -9 83
-18 47 -49 73 -47 3 -77 -39 144 -106 135 -35 -33 -11 -95 75 -105 -39 65 55 53 110 16 -47 -97 -91 -48 9 100 126 28 -125 -56 34 -122 -40 129
43 39 42 -10 104 -111 3 -148 91 -8 -72 -9 41 41 66 -41 -88 80 -99 -87 93 73 -89 -106 -93 142 120 97 -128 -78 -91 -120 30 -89 142 -95 -116
-103 -23 73 -75 111 -79 46 63 56 131 -107 100 4: -46 104 2 0 25 -115 -26 148 4 -65 -78 -61 94 -3 -143 -37 -126 -90 110 -76 58 142 146 68
-136 67 -72 -104 90 14 48 -108 90 95 28 -23 -105 29 -55 60 -11 71 -88 115 131 8 -80 71 -75 -68 69 -29 97 -59 -84 -76 141 91 -78 -7 4 35 126
-102 -83 -138 -139 139 9 27 -64 126 107 138 -52 58 44 -90 -14 -15 -85 136 -97 -64 -130 23 -83 -130 19 -25 -121 -37 -32 78 -114 -109 -137
13 -5 51 63 120 -150 116 146 -125 -35 -84 28 -81 -88 73 -4 -79 -77 79 -25 55 55 -42 117 43 33 -27 88 124 32 133 -118 50 2 -101 66 -17 -55
-32 -105 -104 150 135 -104 -30 117 -21 -3 -88 8 -132 -108 -110 5: 106 87 -17 -25 0 23 64 -19 -81 -44 103 139 82 0 -132 -57 -150 -19 100 -94
-40 15 12 130 104 53 96 -110 54 43 -112 116 -51 -106 87 -118 -27 65 -42 122 8 122 -19 -30 67 -95 -51 -104 -98 -75 22 -107 71 -35 -25 150
61 -44 -70 -82 91 8 -113 -103 -119 -74 -25 -5 15 62 -122 -87 123 36 141 -58 -128 34 -34 35 141 -74 -1 -90 64 16 20 -116 59 66 70 -117 83 2
130 -74 -118 -102 82 133 -149 85 42 -87 -43 -9 32 141 -17 -47 -67 -114 -95 7 120 105 -102 15 134 128 109 5 148 0 15 -88 -41 68 -103 -54 0
-52 -61 106 148 -79 4 6 74 -36 -86 145 35 -16 8 34 66 -109 49 4 6: -50 -66 0 115 -23 0 -37 -38 -27 -110 -47 43 -70 -116 -117 -26 140 6 67
-88 2 120 77 -50 15 135 79 0 -105 -95 26 -103 137 147 48 131 128 -139 -111 39 148 102 72 -73 104 -36 -51 -47 136 0 -5 30 25 58 147 -126
-54 -129 -91 -79 4 -81 127 -92 49 51 139 41 -98 -101 129 76 -84 -129 -141 115 84 -135 -106 -113 38 -78 -57 59 -8 69 63 111 95 122 38 -72
50 55 -135 69 10 120 -15 99 24 -106 122 11 -74 -34 -101 64 61 -99 -11 23 77 -15 -69 -110 -56 -72 125 -8 -60 117 -36 -64 3 -93 142 -20 103
70 56 -136 -120 -82 80 -132 -144 -121 -36 -12 -43 132 138 -29 -55 26 41 -45 -119 63 7: -129 -124 32 26 -64 37 0 -107 -56 131 -1 62 39 -33
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114 45 1 133 84 79 71 24 16 60 114 24 116 109 31 98 34 72 149 37 108 92 110 146 16 79 99 64 118 47 68 121 36 127 88 50 22 37 86 121
150 131 83 95 8 67 0 24 146 77 92 14 42 145: 113 74 98 100 59 97 15 139 132 62 17 60 70 56 90 14 54 97 84 149 28 15 120 6 44 25 147
79 62 79 64 94 120 63 48 4 85 51 135 57 26 128 98 109 126 97 78 30 2 39 148 43 34 136 44 139 70 146 86 92 124 48 80 69 140 145 24 43
35 78 83 48 68 60 80 86 60 40 96 0 41 10 40 149 125 96 118 105 144 54 136 59 65 115 3 96 103 117 4 105 133 36 99 115 19 89 41 125 48
114 75 38 107 150 100 20 122 60 137 13 70 3 44 111 94 107 47 70 125 88 30 62 143 116 70 60 84 73 125 13 113 71 138 29 0 40 145 147

127 53 146: 56 13 61 111 109 135 134 76 121 14 65 111 45 67 73 27 60 146 80 112 37 62 74 34 133 148 99 115 104 84 125 135 55 79 78 33 99 83 3 17 0 106 2 83 51 102 85 66 3 34 124 140 124 11 27 123 21 131 131 9 137 128 140 16 101 142 131 99 89 122 138 108 13 76 16 20 20 119 27 19 93 1 89 40 117 1 134 68 51 62 7 144 88 29 65 92 144 34 75 142 121 127 115 60 17 137 146 14 142 20 74 92 137 134 113 92 129 137 131 13 19 10 140 27 70 148 25 16 66 139 50 12 47 18 5 55 46 122 53 110 3 6 3 87 60 0 15 100 57 44 147: 52 143 71 144 105 112 110 43 33 142 20 105 70 138 2 139 44 95 55 26 140 3 59 62 99 10 36 31 45 113 88 99 90 150 107 135 70 67 39 14 137 8 141 65 75 43 70 59 147 124 42 3 53 74 119 3 52 104 42 133 84 46 86 12 114 68 37 142 15 71 47 106 61 134 91 43 37 119 88 17 32 22 41 81 9 135 64 142 50 147 78 60 26 94 25 130 87 42 29 135 19 35 136 16 104 11 123 64 110 86 108 45 95 53 124 46 66 99 12 116 89 60 19 58 7 36 126 23 44 94 92 17 112 23 12 14 124 1 13 27 66 50 104 80 118 32 0 124 56 101 148: 137 64 55 71 127 15 86 93 24 94 120 41 36 105 146 110 40 144 74 81 121 111 147 29 139 110 106 148 31 36 41 131 41 66 70 132 39 149 142 64 94 54 149 18 103 82 149 107 107 4 107 123 15 22 16 65 78 46 24 79 141 20 38 3 31 103 83 95 37 104 15 123 67 143 58 17 36 28 121 66 130 111 124 88 139 145 46 0 39 2 132 38 48 105 124 76 127 85 24 102 98 105 142 50 62 91 142 55 46 26 142 122 97 30 28 43 25 136 133 120 28 9 80 72 145 2 116 49 20 140 122 80 28 30 28 92 90 146 101 128 37 118 90 104 13 102 30 0 137 104 149: 35 83 136 46 74 83 16 110 1 62 129 65 110 131 82 85 39 78 145 17 144 133 15 131 107 38 118 83 44 104 105 136 63 110 54 118 110 126 89 128 40 143 70 69 104 34 118 46 150 29 25 76 35 77 99 113 120 96 20 65 120 89 53 82 81 33 114 135 98 143 91 114 89 107 80 87 35 135 4 71 29 137 1 142 6 49 4 107 84 103 88 143 54 93 30 81 51 70 84 19 43 145 48 107 2 84 36 61 112 142 46 147 37 3 114 48 48 133 89 127 149 3 75 59 42 5 142 101 12 54 18 52 47 57 74 51 140 41 142 91 64 5 10 23 73 34 116 10 0 108 150: 96 90 99 32 90 132 10 71 2 93 22 89 71 21 39 90 88 41 103 115 40 8 142 143 150 92 13 28 43 102 79 4 11 30 135 72 85 17 124 65 126 11 30 147 102 141 34 9 35 33 98 110 54 57 140 33 42 72 139 148 116 30 91 43 0 62 110 4 121 51 135 74 55 20 46 95 8 85 55 35 116 119 91 67 103 141 0 121 119 54 75 26 86 133 53 21 111 13 134 94 66 107 39 85 15 14 62 111 141 11 46 93 14 67 69 13 12 100 1 105 71 53 142 80 146 70 5 37 150 21 140 8 58 50 14 135 91 121 50 63 28 113 113 122 48 113 55 72 140 0

Table M-6: p_10cri Node Data

non-depot nodes: 199

Node ID	x	y	demand	service time
0	35	35	-	-
1	22	22	18	10
2	36	26	26	10
3	21	45	11	10
4	45	35	30	10
5	55	20	21	10
6	33	34	19	10
7	50	50	15	10
8	55	45	16	10
9	26	59	29	10
10	40	66	26	10
11	55	65	37	10
12	35	51	16	10
13	62	35	12	10
14	62	57	31	10
15	62	24	8	10
16	21	36	19	10
17	33	44	20	10
18	9	56	13	10
19	62	48	15	10
20	66	14	22	10
21	44	13	28	10
22	26	13	12	10
23	11	28	6	10
24	7	43	27	10
25	17	64	14	10
26	41	46	18	10
27	55	34	17	10
28	35	16	29	10
29	52	26	13	10
30	43	26	22	10
31	31	76	25	10
32	22	53	28	10
33	26	29	27	10
34	50	40	19	10
35	55	50	10	10
36	54	10	12	10
37	60	15	14	10
38	47	66	24	10
39	30	60	16	10
40	30	50	33	10
41	12	17	15	10
42	15	14	11	10
43	16	19	18	10
44	21	48	17	10
45	50	30	21	10
46	51	42	27	10
47	50	15	19	10
48	48	21	20	10
49	12	38	5	10
50	37	52	7	10
51	49	49	30	10
52	52	64	16	10
53	20	26	9	10
54	40	30	21	10
55	21	47	15	10
56	17	63	19	10
57	31	62	23	10
58	52	33	11	10
59	51	21	5	10
60	42	41	19	10
61	31	32	29	10
62	5	25	23	10
63	12	42	21	10
64	36	16	10	10
65	52	41	15	10
66	27	23	3	10
67	17	33	41	10
68	13	13	9	10
69	57	58	28	10
70	62	42	8	10
71	42	57	8	10
72	16	57	16	10
73	8	52	10	10
74	7	38	28	10
75	27	68	7	10
76	30	48	15	10
77	43	67	14	10
78	58	48	6	10
79	58	27	19	10
80	37	69	11	10
81	38	46	12	10
82	46	10	23	10

Node ID	x	y	demand	service time
83	61	33	26	10
84	62	63	17	10
85	63	69	6	10
86	32	22	9	10
87	45	35	15	10
88	59	15	14	10
89	5	6	7	10
90	10	17	27	10
91	21	10	13	10
92	5	64	11	10
93	30	15	16	10
94	39	10	10	10
95	32	39	5	10
96	25	32	25	10
97	25	55	17	10
98	48	28	18	10
99	56	37	10	10
100	41	49	10	10
101	35	17	7	10
102	55	45	13	10
103	55	20	19	10
104	15	30	26	10
105	25	30	3	10
106	20	50	5	10
107	10	43	9	10
108	55	60	16	10
109	30	60	16	10
110	20	65	12	10
111	50	35	19	10
112	30	25	23	10
113	15	10	20	10
114	30	5	8	10
115	10	20	19	10
116	5	30	2	10
117	20	40	12	10
118	15	60	17	10
119	45	65	9	10
120	45	20	11	10
121	45	10	18	10
122	55	5	29	10
123	65	35	3	10
124	65	20	6	10
125	45	30	17	10

Node ID	x	y	demand	service time
126	35	40	16	10
127	41	37	16	10
128	64	42	9	10
129	40	60	21	10
130	31	52	27	10
131	35	69	23	10
132	53	52	11	10
133	65	55	14	10
134	63	65	8	10
135	2	60	5	10
136	20	20	8	10
137	5	5	16	10
138	60	12	31	10
139	40	25	9	10
140	42	7	5	10
141	24	12	5	10
142	23	3	7	10
143	11	14	18	10
144	6	38	16	10
145	2	48	1	10
146	8	56	27	10
147	13	52	36	10
148	6	68	30	10
149	47	47	13	10
150	49	58	10	10
151	27	43	9	10
152	37	31	14	10
153	57	29	18	10
154	63	23	2	10
155	53	12	6	10
156	32	12	7	10
157	36	26	18	10
158	21	24	28	10
159	17	34	3	10
160	12	24	13	10
161	24	58	19	10
162	27	69	10	10
163	15	77	9	10
164	62	77	20	10
165	49	73	25	10
166	67	5	25	10
167	56	39	36	10
168	37	47	6	10

Node ID	x	y	demand	service time
169	37	56	5	10
170	57	68	15	10
171	47	16	25	10
172	44	17	9	10
173	46	13	8	10
174	49	11	18	10
175	49	42	13	10
176	53	43	14	10
177	61	52	3	10
178	57	48	23	10
179	56	37	6	10
180	55	54	26	10
181	15	47	16	10
182	14	37	11	10
183	11	31	7	10
184	16	22	41	10
185	4	18	35	10
186	28	18	26	10
187	26	52	9	10
188	26	35	15	10
189	31	67	3	10
190	15	19	1	10
191	22	22	2	10
192	18	24	22	10
193	26	27	27	10
194	25	24	20	10
195	22	27	11	10
196	25	21	12	10
197	19	21	10	10
198	20	26	9	10
199	18	18	17	10

p10 Inverse P matrix

1: 0 -155 -98 61 -140 66 172 122 -101 -55 87 -62 -133 -17 -76 195 132 -171 -35 -111 -166 -63 -50 -150 0 66 39 170 137 50 57 -14 172 -59 189 136 -143 192 20 -90 83 -57 -64 -21 -127 56 136 155 -78 -72 -20 -30 69 -124 88 138 70 -152 -43 105 74 -92 98 195 60 192 170 174 -159 3 -71 112 148 46 118 -99 -64 47 121 -30 63 165 194 -117 -112 43 175 52 -107 24 -71 132 50 113 16 -50 -106 -110 -48 132 154 84 192 -78 130 95 -135 -87 -33 189 187 -46 -154 100 76 35 -127 -85 -140 43 148 50 -54 -77 23 -84 -170 37 15 149 113 135 -29 -92 -168 -97 51 197 -71 -6 -59 -89 -92 166 -145 -73 24 99 197 -140 11 -137 -115 88 164 -187 -12 -199 -32 -22 143 3 -141 142 49 -26 -47 -141 -148 -177 49 -130 148 -32 -114 87 -15 98 188 117 21 -35 -135 -157 168 -114 -17 -132 175 -73 -72 111 -104 15 29 -154 -184 -180 17 2: 155 0 107 122 -177 30 186 -46 41 164 81 163 48 117 20 -182 -91 -71 -82 -189 17 32 96 -62 153 199 71 0 149 -156 -73 104 -94 125 196 77 -156 156 197 123 -179 -137 -35 -172 109 -13 -139 -92 -86 -5 -55 105 177 -37 130 -125 159 106 130 -161 22 32 178 -195 -57 137 -65 0 52 -131 -120 32 -193 150 -46 54 -73 -92 123 -187 -38 -144 -131 -83 -144 135 -125 -16 61 46 -122 54 127 -81 -140 174 -18 -9 -48 -51 -33 -2 22 1 -42 165 -98 -170 -199 7 135 -75 150 69 -112 -148 -37 46 -100 -26 -1 59 2 158 -29 58 86 -91 -183 -58 -153 80 -20 -110 6 -182 -133 -91 -34 -171 -109 158 -4 165 159 -65 -4 133 191 50 112 128 158 173 -131 -153 -169 95 -198 -103 -12 110 -24 63 -65 97 -63 4 -103 -51 191 -140 179 -46 -44 -15 -126 99 -140 -52 86 74 71 146 21 -62 -128 -120 -63 12 132 168 37 -166 -74 45 -162 -54 171 3: 98 -107 0 57 52 56 -13 138 -147 4 -196 120 -11 -96 -13 55 54 88 -55 -116 106 -131 -115 123 97 -118 -140 -123 189 159 129 -170 -104 -120 -159 40 -118 188 -126 -154 -136 -30 97 -99 147 -105 61 83 75 174 -142 132 33 -153 -35 197 5 -86 -104 -81 124 -4 -189 -49 -168 -119 145 -101 77 188 194 90 -180 89 -96 -138 119 19 63 -143 120 126 37 -31 -139 39 -73 80 -15 94 -117 153 173 11 -106 94 -99 -90 91 -38 129 -78 -112 -100 188 121 -103 -9 6 46 167 -135 -110 -183 -185 184 12 37 -85 167 142 182 -69 77 59 -120 -19 -20 -113 181 -128 -85 -172 31 -111 -172 25 -33 -160 -49 -43 103 -151 -144 -181 18 -7 68 84 159 -198 154 194 -166 -46 -111 37 -107 -116 96 -5 -105 -102 105 -33 73 73 -55 155 57 44 -36 117 164 43 176 -157 66 3 -134 88 -23 -72 -42 -139 -139 198 179 -137 -39 156 -28 -4 -117 11 -175 -143 -146 30 4: -61 -122 -57 0 85 -26 -107 -59 137 184 109 1 -175 -75 -199 -25 133 -124 -53 20 16 172 138 70 128 -146 72 57 -148 154 -68 -141 116 -157 -36 87 -55 162 11 162 -25 -40 89 -125 -68 -138 -130 -99 29 -141 95 -46 -33 199 81 -59 -93 -109 120 11 -149 -137 -157 -98 -34 -7 21 83 -161 -116 163 48 187 -77 -170 45 -45 46 186 -99 -2 -120 85 22 27 -154 78 87 92 -155 110 3 172 -98 -156 -135 108 177 -197 112 55 -116 -58 -12 43 187 -23 -62 -89 -151 -126 9 159 140 -135 20 177 170 145 7 196 1 20 -117 -54 90 -137 -71 0 -69 -81 140 196 -105 6 8 98 -48 -114 192 47 -21 11 46 88 -144 65 6 -49 -50 -36 -146 -62 57 -93 -153 -155 -34 185 8 89 -117 3 159 102 -67 20 179 104 0 -139 -126 35 -137 182 195 64 174 170 -184 -147 52 196 135 95 -97 138 -48 -68 -63 181 0 -7 39 33 77 194 -167 -72 5: 140 177 -52 -85 0 -171 -121 -104 5 -107 168 -122 66 68 185 54 -130 -133 171 101 -112 -171 -187 152 111 -179 -140 -150 50 -103 -75 78 -10 92 84 147 125 161 50 -95 66 73 -179 92 13 159 -20 132 32 -140 162 15 -98 -46 -134 85 81 -132 -14 31 102 -20 -92 -146 -74 -95 165 -11 -80 0 155 -48 -84 4 -124 188 -27 136 93 74 -180 -159 -108 106 -175 -191 -160 -48 -16 -57 175 183 -39 -72 35 54 -60 -158 84 -142 -75 173 -1 83 51 -44 -53 -40 -179 -1 108 45 -29 2 47 -198 114 -22 -158 -93 -93 185 135 -92 160 -196 190 24 66 125 -35 -176 -191 189 -106 150 -20 80 -51 8 28 -9 -69 -37 29 11 -95 -97 -79 -75 196 -121 101 -39 -134 53 69 179 18 147 -179 -108 -189 82 14 -41 92 185 -96 -129 -118 -9 -74 113 139 -92 -38 -49 -126 -130 152 -142 -38 178 167 -91 -92 187 126 55 199 112 10 -126 -54 -88 -8 0 -130 -156 6: -66 -30 -56 26 171 0 100 99 -99 -61 -23 151 66 28 -108 -27 -90 57 66 -2 -69 53 -152 -109 55 -174 92 -77 172 127 123 7 -89 -107 -72 46 -95 -17 -64 44 143 -106 -75 197 36 28 18 -79 -146 177 83 -182 -108 -129 142 37 -61 -10 -143 -108 25 21 -101 -135 -81 162 -44 27 -166 -95 14 -137 3 -36 -156 -67 -145 -156 103 156 2 -40 182 -132 163 130 198 -67 -151 -148 139 -94 166 -129 188 102 61 167 65 -13 -24 -90 -117 104 -167 -156 -58 175 34 20 -99 -42 37 -91 93 137 -174 82 190 -116 160 -67 -103 -119 -134 -8 -48 143 -197 -89 -152 159 4 -79 -168 -188 -5 166 95 198 3 -4 152 -39 -70 -44 -191 18 123 176 -58 -69 165 -13 79 29 -7 -35 -113 144 -60 -136 -53 -109 -16 -34 199 -167 33 -64 -70 28 191 21 -128 130 174 -154 79 -76 23 170 -14 162 -179 -23 -157 -34 -60 -82 -25 150 11 -26 62 150 5 120 -92 7: -172 -186 13 107 121 -100 0 3 45 -23 18 -139 -108 98 -71 22 37 182 -68 0 155 -138 -144 -139 -116 -34 173 -186 -106 -143 -38 -22 7 -102 -82 -21 -5 59 -73 16 61 -165 137 1 34 -187 110 -163 156 117 -99 199 -176 -167 6 -152 -17 133 80 45 83 114 -60 107 44 65 -78 112 150 -179 -50 -186 87 96 -197 142 -161 -125 -105 -105 1 -39 188 166 148 -13 184 -191 24 -56 -114 140 -194 -14 56 -191 23 0 -80 -191 -11 80 -141 162 -181 99 197 174 -58 -25 -22 -86 -95 -11 6 103 -98 196 -21 -147 -117 1 -82 50 -176 -80 173 -128 -191 -167 -157 156 187 -32 186 153 -172 92 -82 137 -53 190 197 166 -119 -152 -4 -110 99 60 -161 -22 19 -107 32 -174 121 -126 -75 -52 9 116 -138 -78 -143 4 95 81 100 42 65 37 -116 -28 -103 -75 135 -151 -193 -56 101 -73 -154 -123 93 89 76 -128 -194 36 -42 125 124 198 135 160 136 -117 -104 8: -122 46 -138 59 104 -99 -3 0 142 56 -83 7 -88 6 149 -44 -63 -44 -97 20 -95 -97 189 125 -1 194 -11 30 140 111 -97 134 116 55 186 -9 -172 35 -42 189 91 -77 148 73 22 -92 -108 -148 14 138 -137 -155 24 -70 47 -87 65 -124 -61 -38 -59 63 176 42 -62 124 118 76 59 -154 98 57 -94 -197 -77 144 38 -138 7 -11 -120 -36 56 -117 41 -17 82 91 -56 -123 122 57 187 -144 -196 140 97 -134 -74 122 -127 141 138 100 199 -2 -82 -136 -12 17 132 -72 -14 -39 137 -177 126 66 89 155 -144 -168 -16 108 161 186 -66 -132 40 -25 -5 -21 117 162 -102 -128 66 -128 -123 183 14 -149 -121 183 58 -69 -30 -38 126 10 -40 -196 95 -27 8 -82 197 24 186 -88 -31 -2 194 125 -123 164 68 77 134 -177 -193 41 -191 -107 13 -127 -104 88 82 -88 -50 28 -15 5 156 39 -87 41 68 -140 164 157 -129 -168 -77 116 -57 126 -172 9: 101 -41 147 -137 -5 99 -45 -142 0 76 -151 15 -30 180 -172 -68 121 -169 -102 90 -9 33 -137 132 38 -178 -191 -147 154 -129 149 57 -106 -94 -11 -157 -68 130 -129 -100 -123 -186 -195 -144 104 108 -97 162 -189 22 17 -167 -188 73 136 -50 -96 159 -173 199 117 136 -31 78 -37 166 44 29 170 118 116 175 -9 109 59 -150 103 -32 -108 97 -70 59 -118 191 31 -131 159 -8 -147 173 -26 77 166 182 -133 178 116 -1 -195 108 92 -189 -126 -146 100 181 -43 -91 -27 -48 -84 104 198 47 -98 2 -188 -135 8 -146 92 170 -173 51 177 144 -37 34 162 -174 -6 106 192 -21 -182 39 42 -158 61 -71 108 0 -41 40 129 -116 -57 -188 12 -44 13 -107 -149 -118 93 130 198 90 -127 -62 84 101 158 138 77 74 186 164 -76 175 109 147 -164 -22 -191 160 -158 -143 52 -90 65 -14 92 154 -149 57 35 0 -118 -188 -117 -117 -36 -61 38 126 91 188 81 10: 55 -164 -4 -184 107 61 23 -56 -76 0 130 -104 73 -109 89 -144 -18 -33 -10 -41 -23 -96 124 -73 -108 -112 40 114 -52 195 -42 108 85 74 -70 62 -19 35 115 -18 -188 173 -78 -89 -75 -6 10 -126 -101 -170 -132 10 23 -17 99 40 -9 -160 -10 62 72 175 29 151 -104 -59 -111 -42 83 36 -90 -16 162 -176 112 -118 7 -29 -24 -194 -71 63 37 -99 -100 151 7 114 184 -158 49 118 122 83 128 109 0 -60 156 198 134 -114 -137 24 79 74 -87 51 155 195 -194 53 57 -144 -107 45 112 81 -124 78 -140 0 -38 -188 -84 121 152 32 0 100 -71 81 68 61 -132 124 -31 198 23 166 -90 -11 141 23 39 -182 -196 -91 155 -137 -60 34 -73 -67 -184 196 31 100 -64 -102 -159 37 150 51 -27 -181 -113 18 -129 -126 -169 3 -107 49 169 158 184 -22 -89 -111 -2 -132 -92 142 107 -25 139 -60 -154 -38 -162 -89 149 178 -85 32 -12 60 -146 11: -87 -81 196 -109 -168 23 -18 83 151 -130 0 196 87 155 -45 95 -151 2 99 -120 179 123 16 -132 -53 47 105 -116 -85 -136 -160 82 191 48 -17 127 101 68 161 -116 147 127 157 60 19 166 31 28 -71 83 -91 20 114 98 54 130 -111 32 -140 105 -149 59 -163 -186 165 187 199 22 -27 -94 -37 14 -94 -78 104 108 158 49 -17 28 163 -94 173 186 37 -83 148 -43 -72 -158 -7 -14 137 186 163 83 -176 -161 127 87 102 107 -160 -80 21 -147 -142 -19 -123 57 -70 -178 -157 -143 -68 -51 41 51 -16 179 169 -156 -21 42 52 1 -92 -58 -116 49 -160 -156 -120 -11 178 -153 -193 44 -137 7 177 194 27 -176 -12 92 84 164 -132 -85 -102 6 12 -8 72 111 175 112 -111 -120 77 -186 148 -35 -25 -106 -163 -24 -134 9 -3 50 -159 111 -80 -47 -14 -147 -123 53 143 -171 -87 -154 85 125 -130 70 18 98 -98 113 31 -152 155 69 -57 190 167 12: 62 -163 -120 -1 122 -151 139 -7 -15 104 -196 0 -77 -158 -115 14 -59 -11 -170 -79 128 39 37 168 -150 183 56 156 83 79 101 188 -35 16 -40 147 -64 -13 -52 -85 149 -60 177 118 -9 63 86 149 -21 -50 161 -192 39 81 -192 -100 146 -86 141 -75 -91 -58 13 -117 195 61 7 -140 168 46 -170 170 -49 -144 133 -179 10 -178 47 -90 155 35 -23 150 170 110 53 144 -125 -46 -36 121 56 -92 -150 1 96 -6 -160 -193 -118 -82 138 85 -3 -194 155 158 46 15 -30 -102 69 -196 186 -34 148 27 160 -5 89 52 -190 142 23 67 87 -105 -156 103 191 -82 -29

25 -149 -23 129 183 98 -68 -161 1 188 -166 165 -183 -118 -72 -154 60 -51 126 -3 -128 50 183 -110 -76 49 169 112 -32 -76 -162 -10 15 151
41 -32 116 -182 -8 -166 79 100 94 32 90 176 -29 129 -130 159 120 181 -150 39 104 5 150 -81 -64 136 32 -141 0 -152 140 154 13: 133 -48
11 175 -66 -66 108 88 30 -73 -87 77 0 71 -119 45 189 -181 -117 161 -196 -173 -135 -10 26 -181 28 -174 -5 138 180 49 -13 92 33 -144 21 -12
88 197 6 25 76 -161 89 -173 12 38 4 110 -38 -101 54 102 165 168 -29 40 64 115 155 80 -6 27 -114 -12 139 94 -114 56 187 -78 41 -88 -18
63 145 198 6 14 86 61 -21 -68 -90 -27 -186 143 -155 -69 -198 64 -15 -6 176 -122 -164 185 137 -64 -153 47 193 -186 44 -181 150 143 4 38
-140 4 -196 -5 -124 -95 -82 140 -162 155 70 175 103 54 17 38 -107 22 177 -109 62 -60 -22 180 -25 29 -107 168 156 -145 -189 120 -179 -67
-116 -77 140 -168 -6 58 48 96 69 -181 -186 65 -28 35 -39 77 30 94 -137 -188 -2 127 185 -176 -139 77 -100 128 -167 183 90 -196 46 116 -69
-114 91 105 118 -59 16 -185 89 141 129 149 91 -10 43 -64 43 -6 -135 181 126 14: 17 -117 96 75 -68 -28 -98 -6 -180 109 -155 158 -71 0 -187
120 -145 150 -4 83 -164 64 -138 160 33 -166 6 144 85 191 -60 84 104 -96 -116 -118 153 -195 -7 -146 -95 185 -9 63 157 199 -92 -149 63 -113
-73 -163 -38 54 148 67 123 -29 162 192 -197 73 -100 -66 -164 92 -131 97 -185 -95 122 110 -25 8 66 12 -1 -96 120 170 111 27 29 134 -6 -141
-103 -74 -146 83 15 -105 114 -12 49 -47 33 197 117 88 -135 32 -88 -175 -34 -20 -111 34 -47 -107 155 30 182 -122 67 -131 79 -176 -92 -139
-36 102 -51 55 -15 88 55 20 -46 129 -19 -152 -130 118 -131 -28 84 98 36 65 -136 -132 -154 -87 -8 87 33 -24 -151 21 5 154 32 196 -62 -157
-93 -173 108 22 55 -49 -6 182 126 182 -158 67 -111 149 183 111 -182 -198 -13 56 -26 98 127 144 188 152 -123 -42 -62 -95 -2 123 -9 46 -63
-56 -147 -125 15 7 -62 155 81 15: 76 -20 13 199 -185 108 71 -149 172 -89 45 115 119 187 0 -143 35 182 -39 105 -144 193 132 -96 -140 23
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p10 Generalized P matrix

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176 121 4 84 160 128 141 48 117 135 56 150 44 123 180 197 147 163 14 138 18 138 167 101 159 120 164 37 145 82 148 107 12 154 94 64
31 33 95 143 58 1 100 192 38 160 71 156 37 74 112 129 132 115 124 190 53 57 148 30 36 145 75 111 165 186 9 126 26 43 48 122 183 99
170 103 66 117 97 190 97 184 37 114 180 156 104 16 148 59 132 101 164 39 133 185 186 12 63 84 36 13 44 197 164 120 22 99 10 192 90
128 132 39 196 74 28 101 52 133 190 91 100 149 191 188 75 162 184 170 132 170 144 134 52 21 72 43 33 79 35 153 139 174 187 51 47
111 24 147 182 90 166 75 77 117 65 1 107 66 108 196 180 171 107 9 93 115 136 110 5 22 153 72 135 74 54 178 144 155 78 106 97 163 54
160 123 0 171 37 135 26 130 194 139 157 47 191: 117 44 196 32 59 130 32 77 20 10 20 121 146 54 69 55 108 11 131 97 74 22 126 186 62
21 135 143 148 38 198 13 173 163 32 14 52 2 97 40 55 160 23 40 137 60 51 10 117 24 75 75 69 158 15 61 24 19 78 99 53 106 174 106 144
65 4 124 125 97 143 169 139 112 44 119 141 109 91 8 176 33 163 141 139 198 111 150 138 13 54 119 30 174 154 28 15 6 166 191 155 198
140 73 101 116 183 153 110 94 57 14 197 118 72 51 103 152 162 84 56 76 63 44 47 168 58 64 94 78 115 51 195 104 182 79 167 30 121
154 172 57 24 20 192 7 90 155 184 121 54 77 24 100 163 105 159 185 133 111 10 182 54 169 68 174 39 81 103 11 80 56 94 184 1 42 185
101 134 36 106 166 61 138 114 5 55 176 174 181 0 69 129 38 11 71 67 2 41 192: 168 184 161 99 184 157 148 48 43 17 106 149 81 60 59
64 110 71 156 181 47 154 134 97 107 8 71 40 92 58 45 91 134 149 140 7 97 12 13 143 70 72 195 64 150 78 75 27 196 5 177 135 9 162 131
99 98 6 149 68 14 39 53 194 38 38 148 159 24 92 148 117 161 123 120 118 26 166 84 163 127 76 193 13 43 98 56 190 115 123 9 190 196
26 45 144 130 166 51 25 132 70 51 54 27 59 3 119 176 63 56 167 25 167 15 7 154 189 160 168 76 78 42 37 119 7 156 98 82 173 196 187
39 187 153 29 2 147 48 67 69 132 73 112 75 106 11 108 144 13 0 13 111 156 88 135 183 141 163 168 133 2 184 114 108 173 32 118 74
186 91 32 54 5 8 152 166 20 33 158 79 77 25 54 123 8 110 182 116 50 16 0 174 22 175 22 102 72 113 193: 34 25 15 193 109 160 138 162
100 66 27 172 31 143 80 104 102 18 61 40 20 190 15 113 13 92 6 193 28 9 134 135 134 80 27 25 90 91 125 115 10 99 67 188 141 27 78 79
146 155 128 158 129 180 187 117 23 35 89 127 126 0 114 14 148 57 133 106 133 194 57 104 144 48 77 73 30 94 176 163 115 68 62 23 44
85 37 89 55 66 73 186 130 0 81 167 116 12 125 139 181 179 58 108 1 183 127 154 171 98 117 84 104 21 51 40 10 139 73 139 119 117 25
54 199 129 74 139 121 86 90 71 194 119 122 124 46 173 8 61 73 5 111 41 116 22 185 108 92 45 190 179 52 76 185 34 161 4 185 196 181
135 149 94 37 43 77 83 188 154 148 121 33 12 60 116 59 100 0 172 1 0 174 113 63 101 85 41 185 150 162 155 0 105 149 3 178 2 106 194:
152 61 164 198 186 128 178 32 116 182 61 45 107 122 145 43 6 1 126 121 95 197 160 154 156 107 102 12 26 129 199 25 12 149 35 138
157 77 128 168 156 171 63 153 115 115 44 84 21 80 53 126 92 60 96 88 53 132 113 128 49 65 163 152 70 18 143 173 85 134 26 123 176

29 180 123 12 118 17 185 131 32 129 82 153 142 89 104 85 35 188 116 140 129 130 84 154 198 8 163 25 34 66 88 133 173 188 122 81 191
149 20 74 118 185 121 144 194 100 116 183 163 105 23 179 109 64 123 151 26 55 14 175 185 155 21 168 32 177 6 45 132 33 153 176 67
174 121 73 155 105 119 42 191 2 129 69 102 132 191 78 66 144 175 167 18 160 75 110 41 37 31 136 169 65 131 0 28 155 37 150 97 192
137 81 87 36 176 22 39 58 91 24 0 62 67 126 111 62 195: 15 102 84 94 59 158 181 43 196 181 138 160 148 121 180 33 19 162 58 84 167
8 142 145 137 112 153 107 11 38 143 127 175 124 23 137 12 151 104 110 117 168 7 100 56 72 29 125 16 85 20 123 138 37 11 194 126 175
10 142 74 191 59 105 46 189 149 132 83 134 60 162 91 19 113 197 183 95 138 62 93 33 123 142 186 97 92 156 108 89 189 7 136 50 100
123 42 25 129 140 196 12 88 158 128 106 76 23 199 104 2 110 49 28 178 162 96 198 103 175 168 120 22 182 24 119 29 181 43 2 20 84 13
199 110 21 40 115 146 174 30 40 93 54 111 137 34 180 184 4 50 153 10 180 16 190 101 133 199 56 71 125 125 60 187 129 57 28 12 157
85 84 151 112 170 100 192 115 185 13 125 23 176 51 34 61 169 96 36 184 142 45 4 186 0 44 41 121 57 196: 166 100 162 16 101 30 169 5
145 106 153 3 140 190 37 10 23 61 31 186 21 77 64 1 35 199 152 15 14 153 26 3 37 130 61 93 68 178 7 182 47 103 34 169 111 40 72 3
142 116 175 132 77 2 137 141 40 86 159 50 180 121 86 106 64 39 147 35 148 20 197 104 30 138 194 158 60 174 67 105 118 76 8 80 186
124 194 104 77 75 90 121 140 123 105 130 100 139 29 7 100 19 150 33 186 9 187 89 149 76 93 148 184 75 175 106 88 169 170 185 142 2
175 140 179 115 84 110 140 39 74 153 127 160 68 21 155 195 127 47 80 133 11 79 147 76 105 13 185 62 179 129 32 76 71 177 110 97 116
3 155 143 63 122 190 15 73 111 94 152 36 129 49 85 4 126 19 42 16 194 51 145 73 138 46 143 113 193 50 156 8 49 151 136 126 0 21 138
170 197: 57 36 24 77 115 112 91 107 177 104 162 100 26 52 105 12 41 12 64 133 17 94 104 158 141 90 175 124 19 37 106 140 179 165 69
36 64 90 62 174 29 10 15 58 33 157 164 109 10 130 7 166 171 7 138 14 41 175 70 49 165 145 69 5 195 105 9 70 34 34 114 79 25 119 13
155 102 7 52 31 56 175 189 159 190 181 88 172 3 33 96 84 114 98 199 185 167 138 172 152 29 76 110 21 49 85 139 66 36 38 80 46 135
33 78 96 104 145 18 27 62 162 48 4 80 5 199 95 39 87 20 187 196 49 126 29 91 106 133 157 43 195 91 179 45 78 17 126 60 115 111 0 82
26 54 21 18 23 89 148 74 144 53 116 163 72 61 101 185 57 184 113 160 75 29 82 39 23 61 145 167 39 102 176 38 167 30 72 35 31 160 33
126 185 101 62 0 104 80 198: 105 183 106 159 46 101 169 0 158 168 146 30 166 141 188 48 146 47 15 112 104 166 2 45 133 141 25 93
114 3 53 77 8 167 68 183 103 73 89 177 178 149 96 144 16 77 123 27 195 111 68 43 61 3 132 160 195 179 44 47 9 136 23 108 26 20 102
161 195 25 150 91 124 182 63 122 63 110 188 198 193 53 61 87 63 10 56 21 163 76 146 179 143 176 108 68 30 197 187 18 99 69 41 182 8
196 50 45 150 138 15 141 158 188 168 93 170 112 68 49 17 129 171 36 187 59 0 190 177 11 14 2 148 101 106 110 17 108 136 189 78 197
197 40 128 35 142 173 11 139 63 103 1 127 188 22 105 61 121 138 131 88 138 173 18 78 151 136 146 197 16 8 16 21 109 62 127 90 24
181 37 77 25 111 67 21 56 159 115 182 59 118 117 190 25 49 101 0 14 199: 47 117 42 155 43 154 153 1 176 192 194 84 62 27 79 123 85
49 135 121 193 74 42 168 9 58 19 80 131 4 133 172 95 131 87 75 23 79 136 13 85 64 32 192 74 71 38 82 106 99 165 12 156 198 21 40 38
4 96 155 120 55 60 131 158 115 34 78 127 95 53 89 167 2 187 93 184 107 193 86 139 123 16 82 28 94 88 185 149 23 35 196 49 147 178
31 43 108 124 11 142 73 77 86 164 142 27 18 118 48 49 37 76 123 94 91 115 187 21 44 95 192 46 180 73 0 96 89 129 165 139 197 84 178
155 141 11 51 126 101 40 32 85 5 130 14 9 89 38 7 181 74 47 163 130 45 108 27 96 114 188 23 199 191 7 120 161 170 21 71 135 7 136
133 175 25 119 88 26 96 138 186 56 145 141 80 70 133 107 94 66 112 5 116 102 33 142 3 0

Table M-7: p_13cri Node Data

non-depot nodes: 120

Node ID	x	y	demand	service time
0	10	45	-	-
1	25	1	25	50
2	25	3	7	50
3	31	5	13	50
4	32	5	6	50
5	31	7	14	50
6	32	9	5	50
7	34	9	11	50
8	46	9	19	50
9	35	7	5	50
10	34	6	15	50
11	35	5	15	50
12	47	6	17	50
13	40	5	13	50
14	39	3	12	50
15	36	3	18	50
16	73	6	13	50
17	73	8	18	50
18	24	36	12	50
19	76	6	17	50
20	76	10	4	50
21	76	13	7	50
22	78	3	12	50
23	78	9	13	50
24	79	3	8	50
25	79	5	16	50
26	79	11	15	50
27	82	3	6	50
28	82	7	5	50
29	90	15	9	50
30	84	3	11	50
31	84	5	10	50
32	84	9	3	50
33	85	1	7	50
34	87	5	2	50
35	85	8	4	50
36	87	7	4	50
37	86	41	18	50
38	86	44	14	50
39	86	46	12	50
40	85	55	17	50
41	89	43	20	50
42	89	46	14	50
43	89	52	16	50
44	92	42	10	50
45	92	52	9	50
46	94	42	11	50
47	94	44	7	50
48	94	48	13	50
49	96	42	5	50
50	99	46	4	50
51	99	50	21	50
52	83	80	13	50
53	83	83	11	50
54	85	81	12	50
55	85	85	14	50
56	85	89	10	50
57	87	80	8	50
58	87	86	16	50
59	90	77	19	50
60	90	88	5	50
61	93	82	17	50
62	93	84	7	50
63	93	89	16	50
64	94	86	14	50
65	95	80	17	50
66	99	89	13	50
67	37	83	17	50
68	50	80	13	50
69	35	85	14	50
70	35	87	16	50
71	44	86	7	50
72	46	89	13	50
73	46	83	9	50
74	46	87	11	50
75	46	89	35	50
76	48	83	5	50
77	50	85	28	50
78	50	88	7	50
79	54	86	3	50
80	54	90	10	50
81	10	35	7	50
82	10	40	12	50

Node ID	x	y	demand	service time
83	18	30	11	50
84	17	35	10	50
85	16	38	8	50
86	14	40	11	50
87	15	42	21	50
88	11	42	4	50
89	18	40	15	50
90	21	39	16	50
91	20	40	4	50
92	18	41	16	50
93	20	44	7	50
94	22	44	10	50
95	16	45	9	50
96	20	45	11	50
97	25	45	17	50
98	30	55	12	50
99	20	50	11	50
100	22	51	7	50
101	18	49	9	50
102	16	48	11	50
103	20	55	12	50
104	18	53	7	50
105	14	50	8	50
106	15	51	6	50
107	16	54	5	50
108	28	33	12	50
109	33	38	13	50
110	30	50	7	50
111	13	40	7	50
112	15	36	8	50
113	18	31	11	50
114	25	37	13	50
115	30	46	11	50
116	25	52	10	50
117	16	33	7	50
118	25	35	4	50
119	5	40	20	50
120	5	50	13	50

p13 Inverse P matrix

1: 0 -94 -59 37 -85 40 104 74 -61 -33 53 -37 -80 -10 -46 118 80 -103 -21 -67 -100 -38 -30 -91 0 40 23 103 83 30 34 -8 104 -35 114 82 -87 116 12 -54 50 -34 -38 -12 -77 34 82 94 -47 -43 -12 -18 42 -75 53 83 42 -92 -26 64 44 -56 59 118 36 116 103 105 -96 2 -43 67 89 28 71 -60 -39 28 73 -18 38 100 117 -71 -67 26 106 31 -65 14 -43 80 30 68 10 -30 -64 -67 -29 80 93 50 116 -47 78 57 -82 -52 -20 114 113 -27 -93 60 46 21 -77 -51 -84 26 2: 94 0 89 30 -33 -47 14 -51 -103 22 9 90 68 82 -17 -55 -101 -59 30 119 -43 -4 -35 -54 -56 100 -87 -44 15 60 119 -85 6 -83 -69 53 99 -113 -7 -120 -19 -13 86 2 -85 85 29 -16 -28 -85 -89 -107 29 -79 89 -19 -69 52 -9 59 113 71 12 -21 -81 -95 101 -69 -10 -80 106 -44 -43 67 -63 9 17 -93 -111 -109 10 65 74 -107 18 112 -28 25 99 49 99 29 71 12 -110 -55 -43 -49 -114 10 19 58 -38 92 120 43 0 90 -94 -44 63 -57 76 119 46 -94 94 119 74 -108 3: 59 -89 0 -83 -21 -104 66 -7 -84 -55 -52 -3 -33 63 107 -22 79 -75 96 64 78 -97 13 19 108 -118 -34 83 -39 0 31 -79 -72 19 -117 91 -28 33 -44 -55 74 -113 -23 -87 -79 -50 -87 81 -75 -10 37 28 -74 33 77 -49 -85 105 -10 -6 -29 -31 -20 -1 13 0 -25 100 -59 -103 -120 4 81 -45 90 42 -68 -89 -22 28 -60 -16 0 36 1 96 -17 35 52 -55 -110 -35 -92 48 -12 -66 3 -110 -80 -55 -20 -103 -66 95 -2 99 96 -39 -2 80 115 30 68 77 95 105 -79 -92 -102 58 4: -37 -30 83 0 -120 -62 -7 66 -14 38 -39 58 -38 2 -62 -31 115 -85 108 -28 -27 -9 -76 60 -84 -31 52 44 42 88 12 -37 -77 -73 -38 7 80 101 22 -100 -45 27 -98 -32 103 34 31 33 -8 83 -89 2 -118 73 -6 -58 -7 33 33 53 -33 -70 64 -79 -70 74 59 -71 -84 -74 114 96 78 -103 -63 -73 -96 24 -71 114 -76 -93 -82 -18 59 -60 89 -64 37 50 45 105 -86 80 20 -92 -21 119 3 -52 -63 -49 75 -2 -114 -30 -101 -72 88 -61 46 113 117 54 -109 54 -58 -84 72 11 5: 85 33 21 120 0 38 -86 72 76 22 -19 -84 23 -44 48 -9 57 -71 92 105 6 -64 57 -60 -54 55 -23 78 -47 -67 -61 113 73 -62 -5 3 28 101 -82 -66 -111 -111 111 7 22 -51 101 85 110 -41 46 35 -72 -11 -12 -68 109 -77 -51 -104 19 -67 -104 15 -20 -97 -29 -26 62 -91 -87 -109 11 -4 41 50 96 -120 93 117 -100 -28 -67 22 -65 -70 58 -3 -63 -62 64 -20 44 44 -33 94 34 27 -22 71 99 26 106 -95 40 1 -81 53 -14 -44 -25 -84 -84 120 108 -83 -24 94 -17 -2 6: -40 47 104 62 -38 0 -71 7 -106 -86 -88 18 51 -15 -65 -35 83 111 66 0 -106 -45 -120 -15 80 -75 -32 12 9 104 83 42 77 -88 43 34 -89 93 -41 -85 70 -95 -21 52 -33 98 6 98 -15 -24 53 -76 -41 -83 -79 -60 17 -85 57 -28 -20 120 49 -35 -56 -66 73 7 -90 -83 -95 -59 -20 -4 12 50 -97 -70 98 29 113 -47 -102 27 -27 28 113 -59 -1 -72 51 13 16 -93 47 52 56 -93 66 2 104 -59 -94 -81 65 107 -119 68 33 -70 -35 -7 26 113 -14 -38 -54 -91 -76 5 7: -104 -14 -66 7 86 71 0 96 84 -82 12 107 103 87 4 119 0 12 -71 -32 54 -82 -43 0 -42 -49 85 118 -63 3 4 59 -29 -69 116 28 -13 7 27 53 -87 39 3 -30 -30 -22 -88 -38 34 -56 -93 -94 -21 112 5 54 -71 2 96 62 -40 12 108 63 0 -84 -76 21 -83 110 118 39 105 103 -111 -89 31 119 81 57 -58 84 -29 -41 -38 109 0 -4 24 20 46 117 -101 -44 -103 -73 -63 3 -64 101 -74 39 41 112 33 -78 -80 103 61 -67 -103 -113 92 67 -108 -85 -91 30 -62 -45 8: -74 51 7 -66 -72 -7 -96 0 47 -6 55 51 88 76 97 30 -58 40 44 -108 56 8 96 -12 79 19 -85 98 9 -59 -27 -81 51 49 -80 -8 19 61 -12 -55 -88 -45 -57 100 -7 -48 94 -29 -51 2 -75 114 -16 82 56 45 -109 -96 -65 64 -106 -116 -97 -29 -10 -34 106 110 -23 -44 21 33 -36 -96 50 -86 -45 105 0 50 31 -26 -32 -24 -108 0 65 27 -18 1 28 -119 69 -13 -96 -56 -56 112 81 -55 97 -118 114 14 40 76 -21 -106 -116 114 -64 90 -12 48 -31 5 17 -5 -41 -22 9: 61 103 84 14 -76 106 -84 -47 0 17 6 -57 -58 -48 -45 118 -73 61 -24 -81 32 42 108 10 89 -108 -65 -114 49 8 -25 55 111 -58 -78 -71 -5 -44 68 84 -56 -23 -29 -76 -79 92 -86 -23 108 101 -55 -56 113 76 33 120 67 6 -76 -32 -53 -5 0 -79 -94 60 60 -60 -37 -14 91 40 17 -65 -16 -54 34 39 -1 -42 32 -92 -66 33 -105 55 -47 104 77 74 4 -54 -64 -44 28 -57 -10 -38 26 86 -64 -45 119 21 17 11 -48 -88 107 50 -110 -65 -78 86 22 -36 -6 -86 -65 15 10: 33 -22 55 -38 -22 86 82 6 -17 0 12 -61 -81 -49 98 -26 16 -101 -57 9 -83 2 -22 -94 -40 -88 -94 62 94 1 -24 110 -79 98 78 120 -41 -91 -89 84 -57 100 -78 113 61 36 101 39 -8 -14 -54 -70 63 -101 -94 -35 105 20 12 -60 -25 22 -55 56 83 -105 49 114 -70 96 -40 -62 -71 -81 -5 -29 87 -119 -53 -91 96 2 -47 -101 -113 -3 100 57 119 2 -2 92 -23 -42 -27 -115 11 74 106 -35 -42 100 -7 47 18 -4 -21 -68 87 -36 -82 -32 -66 -9 -20 120 -101 19 -38 -42 11: -53 -9 52 39 19 88 -12 -55 -6 -12 0 17 115 13 -77 79 105 -93 48 -46 14 102 -8 98 -108 -14 -95 -20 -36 -49 -15 91 6 -16 37 91 3 72 -55 2 27 -14 10 -84 -65 59 -42 13 22 110 -41 0 94 -83 -87 -84 -70 -21 105 -112 -64 -86 -23 -13 4 -61 -50 -13 -3 35 -44 9 37 -99 83 1 20 -113 66 -99 94 71 -60 120 -106 -101 3 -92 -10 80 48 27 50 69 -36 64 27 39 -47 68 91 -108 -30 -113 52 58 -119 85 -97 -76 -63 -63 0 -23 114 100 89 -7 111 -115 12: 37 -90 3 -58 84 -18 -107 -51 57 61 -17 0 14 -34 -69 85 -117 -8 33 -115 14 0 -48 -116 -7 48 -85 98 -109 60 119 105 -35 -15 -13 -52 -57 -7 3 62 -59 119 -12 -89 -71 0 -50 30 -106 -48 104 -77 -116 -101 -95 94 113 -19 113 92 -104 55 -49 83 -32 115 119 100 -72 -92 -2 -66 59 36 -97 -13 11 -64 19 -105 73 -76 -45 -32 6 70 -83 -47 -86 2 57 49 60 25 39 22 -70 -17 -62 -45 81 -91 -116 -34 61 -44 -93 -74 56 54 46 -77 -117 22 -25 76 75 120 82 97 13: 80 -68 33 38 -23 -51 -103 -88 58 81 -115 -14 0 82 -71 -62 86 34 -50 4 -53 3 90 -27 -38 -26 -58 12 -58 -58 114 76 0 117 -7 18 84 67 -58 81 70 33 112 -5 -104 21 -25 114 55 -46 89 44 13 -55 -65 -89 9 83 -83 -93 14 -42 28 -52 39 -75 -37 -23 -36 38 106 25 -37 75 71 46 36 -93 59 34 -57 -119 -46 87 23 -83 4 -6 -73 -22 33 -70 25 -10 49 55 -34 -74 73 34 113 -87 -119 85 59 -81 -45 74 -77 85 83 60 120 -1 -49 -82 -7 10 80 -44 14: 10 -82 -63 -2 44 15 -87 -76 48 49 -13 34 -82 0 -8 -23 82 -107 76 39 54 94 -87 -102 -9 65 97 113 -40 -80 24 -15 -3 -13 71 98 -61 -77 40 -77 -74 110 8 -90 -73 111 35 -41 -18 -23 76 6 -24 -119 57 -16 5 -49 119 14 113 -53 -19 -1 117 76 -74 99 41 46 81 -107 -117 25 -115 -64 8 -77 -63 53 50 -53 -30 17 -9 3 94 23 -53 24 41 -85 99 95 -78 -102 -46 70 -34 76 -104 46 -91 9 -18 109 -104 -41 73 -102 -62 54 -5 20 -83 80 23 -108 -115 -89 15: 46 17 -107 62 -48 65 -4 -97 45 -98 77 69 71 8 0 93 -78 90 34 -64 -57 -6 -95 -41 78 -78 -60 -74 -112 -118 -87 63 65 -59 98 -114 13 10 -101 -114 44 82 -30 -58 96 -104 120 71 82 -18 47 -22 100 26 17 103 71 70 106 -5 65 35 -91 62 -19 -65 59 -42 35 -71 115 18 -79 96 -5 -89 104 -16 46 100 110 -80 108 70 0 -118 65 56 -114 -76 -88 60 109 -26 -55 -16 -29 -50 63 120 28 -59 1 -113 -81 5 -88 56 103 -104 31 107 87 -22 21 98 -105 -3 64 116 16: -118 55 22 31 9 35 -119 -30 -118 26 -79 -85 62 23 -93 0 -13 -110 23 25 -95 37 -43 65 0 -25 24 78 -70 -35 -114 7 -27 7 -65 -90 -71 56 79 120 54 -77 -37 51 61 96 84 47 44 112 99 -46 106 66 89 -99 -13 -115 96 -96 -86 31 -54 39 -8 55 93 -90 35 21 0 -71 -113 -70 -70 -21 -37 23 76 55 113 49 79 -63 44 -66 54 -87 -11 -20 -6 -25 -14 -58 75 -44 -65 -68 24 69 -31 118 -25 65 51 45 -42 37 -11 21 70 -11 -113 105 -47 -54 -45 -3 6 -76 17: -80 101 -79 -115 -57 -83 0 58 73 -16 -105 117 -86 -82 78 13 0 -61 -102 -80 6 14 -10 59 24 -5 -96 -6 38 44 106 17 91 -63 -35 -67 -25 50 22 -54 -9 98 -106 68 -71 4 -17 -14 -117 -43 38 22 -60 -60 91 4 69 111 -95 29 71 74 50 77 66 0 -36 94 120 81 -69 -83 14 48 44 -53 31 94 118 -117 32 34 -87 -64 27 68 49 -75 47 -85 0 -23 -114 -51 73 92 19 0 61 -43 49 41 37 -80 75 -19 120 14 100 -55 -7 85 14 23 -110 -119 -55 94 -83 -36 18: 103 59 75 85 71 -111 -12 -40 -61 101 93 8 -34 107 -90 110 61 0 20 -44 -40 -111 118 19 60 -39 -61 -96 22 91 30 -16 -109 -68 11 -78 -76 -102 2 -65 29 102 95 111 -13 -54 -67 -1 -80 -55 86 64 -15 84 -36 -93 -23 -98 -53 90 108 -51 19 -7 36 -88 118 52 93 -27 57 -91 1 60 -72 108 74 9 -80 -32 28 63 -70 -51 -82 -97 49 116 29 -10 77 61 41 97 -70 89 77 95 36 11 100 19 17 -43 50 -55 12 69 59 33 78 -67 19 -85 63 -90 35 -98 -113 99 19: 21 -30 -96 -108 -92 -66 71 -44 24 57 -48 -33 50 -76 -34 -23 102 -20 0 113 120 13 -16 -57 -22 8 -57 -47 63 65 95 29 -10 17 99 -57 104 113 22 -50 90 -26 -43 -96 -4 -9 83 113 98 50 -106 -97 76 53 61 64 -97 -48 12 -89 -86 -11 -74 35 -42 -107 -95 -86 -41 -31 25 31 -10 108 102 -94 -12 25 31 0 -56 -35 -70 29 -97 -94 -72 -6 108 -92 -116 26 -82 4 107 117 16 -107 -7 55 51 99 -79 -51 -61 4 7 -5 43 67 106 68 -67 -72 46 -113 89 -21 -15 -64 20: 67 -119 -64 28 -105 0 32 108 81 -9 46 115 -4 -39 64 -25 80 44 -113 0 -99 -14 -81 5 -2 30 -96 67 -48 -28 -9 -89 -74 32 87 -103 -52 -93 51 75 -79 42 10 59 -59 68 18 -92 94 42 -34 115 101 -46 -95 -69 8 -36 -6 -103 -48 77 23 22 101 -91 111 33 94 50 48 61 113 -21 9 -24 89 -39 -8 -31 -51 90 -36 107 71 -5 38 52 90 -13 -30 97 -116 23 49 -116 -61 88 -52 85 -45 -55 -35 7 -70 117 36 4 -84 102 28 -102 102 -30 -87 80 -108 6 -107 28 21: 100 43 -78 27 -6 106 -54 -56 -32 83 -14 -14 53 -54 57 95 -6 40 -120 99 0 -54 94 21 -14 91 103 66 32 87 -76 -27 -21 73 34 -56 -91 1 58 -3 -96 -117 -71 -49 84 51 -2 -117 93 96 28 9 -18 -62 42 -119 112 -20 90 16 97 -3 54 31 -115 86 14 40 53 -63 -94 62 115 -49 -17 15 -90 -14 78 111 59 -41 -97 0 114 -100 100 -110 -71 -43 -93 36 -31 76 -2 -77 30 111 -66 -46 29 102 68

-19 -46 -98 -6 9 91 25 -19 70 -110 -5 -100 47 60 57 19 54 22: 38 4 97 9 64 45 82 -8 -42 -2 -102 0 -3 -94 6 -37 -14 111 -13 14 54 0 107
-17 78 -79 96 72 109 -91 23 63 3 91 -49 -39 82 19 -85 0 -92 85 93 43 -72 27 114 -110 -70 97 -119 -104 -82 -6 16 -109 17 -105 -3 83 109
30 -7 55 20 -87 13 -7 53 119 3 15 46 -97 54 -104 7 23 2 66 -23 -61 32 62 99 101 -18 24 38 70 94 48 -3 16 -69 -7 84 57 -69 33 113 -47
24 -53 -11 38 88 120 3 8 52 37 -13 -41 -54 -16 -112 86 -94 -42 23: 30 35 -13 76 -57 120 43 -96 -108 22 8 48 -90 87 95 43 10 -118 16 81
-94 -107 0 -120 39 -9 -3 106 -73 -99 111 83 -38 -92 28 117 -112 26 -109 91 86 2 23 -84 2 -118 -3 -75 -57 -49 84 -98 93 42 105 62 32 10
23 -65 13 107 -66 37 -36 -13 109 -15 17 -65 101 94 -87 -114 72 -108 -40 -70 -46 84 -101 -3 35 29 58 41 -109 -112 39 -17 21 -23 46 18
56 -82 -113 -1 77 112 -106 -84 46 -60 77 -101 111 54 -118 27 70 -41 -69 55 63 71 -35 10 -112 54 24: 91 54 -19 -60 60 15 0 12 -10 94
-98 116 27 102 41 -65 -59 -19 57 -5 -21 17 120 0 85 78 90 55 -6 26 -39 26 -3 -82 109 76 -113 73 -87 91 -2 50 -99 38 -83 97 20 -100 3
87 51 115 -36 50 63 -58 -70 -71 92 -118 -4 -88 -57 112 -5 38 95 120 -55 -90 38 -68 -44 -98 -23 32 89 40 74 -18 98 116 -119 44 -60 -39
-99 56 -79 59 -112 -57 73 66 -15 5 39 7 -1 -58 72 102 67 16 17 81 -3 -85 -62 -45 -88 50 9 -63 69 -7 29 -28 20 119 25: 0 56 -108 84 54
-80 42 -79 -89 40 108 7 38 9 -78 0 -24 -60 22 2 14 -78 -39 -85 0 71 53 -82 19 -53 -106 -21 -12 -67 21 -28 -65 94 18 110 -74 41 -79 47
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49 84 43 57 13 5 78 13 17 9 84 21 118 66 30 49 8 55 103 109 52 111 86 106 69 54 72 46 118 51 45 19 9 112 51 72 45 24 77 87 0 47 30
120 24 56 108 115: 33 38 109 29 28 82 82 64 20 25 38 39 74 37 70 92 54 42 44 99 98 19 7 28 48 34 55 46 70 102 115 52 7 100 11 99 93
18 75 86 35 117 67 89 5 39 99 97 31 47 63 4 80 74 46 60 54 71 25 73 18 65 92 4 108 53 93 59 59 114 55 59 65 6 16 111 97 30 112 111 8
31 108 79 73 110 93 41 48 44 72 84 101 44 111 107 71 52 24 98 12 111 2 7 4 120 100 35 55 14 69 111 18 87 0 1 15 66 88 23 116: 90 1 56
107 107 6 0 55 82 101 90 92 4 15 32 56 40 99 19 118 95 12 34 56 53 94 49 39 58 17 108 117 18 32 109 40 84 59 61 82 20 101 72 29 20 94
28 16 36 61 31 106 85 33 7 13 107 8 59 83 5 120 12 39 44 44 88 93 59 33 96 21 31 100 56 83 107 58 112 85 8 24 44 44 54 113 66 36 87
113 80 12 90 101 28 79 90 14 56 45 115 64 68 2 116 4 32 106 32 27 110 70 81 59 9 0 9 68 98 111 117: 74 18 93 113 54 80 31 46 4 9 40
67 78 72 43 115 83 85 16 15 61 56 96 109 84 64 101 63 55 63 100 120 41 81 31 110 68 52 89 57 16 100 108 92 106 92 116 55 102 100 7
13 14 66 8 8 99 39 68 50 49 38 12 55 39 17 4 49 0 52 39 109 59 30 97 91 77 46 76 75 42 33 33 81 97 79 103 106 46 64 100 110 90 68 6
37 9 112 99 70 65 46 109 86 0 115 116 84 1 38 115 39 56 110 71 29 0 35 78 57 118: 33 23 30 39 114 34 31 51 115 70 115 11 0 39 97 102
101 71 100 91 3 5 72 115 66 34 71 80 45 83 27 54 16 0 69 20 7 32 65 72 59 6 3 41 107 48 119 47 22 112 19 32 59 60 93 46 15 12 67 35
79 19 54 106 118 25 106 15 77 28 60 3 14 27 49 51 80 21 55 61 94 65 36 44 24 59 67 85 80 52 26 10 46 34 36 118 57 2 63 27 116 62 102
46 10 5 61 52 70 101 5 62 109 110 108 40 118 0 117 28 119: 52 106 69 18 107 13 23 67 95 7 29 75 57 117 107 104 28 3 93 25 96 30 103
32 25 24 44 97 33 94 90 120 96 76 53 15 89 49 107 57 26 79 43 102 59 54 22 2 24 18 30 15 8 88 100 26 80 66 28 38 32 15 120 83 81 84
104 22 2 62 17 76 23 61 83 87 51 42 15 56 38 114 11 75 22 69 80 8 3 53 55 7 83 75 54 95 34 86 64 9 69 1 34 43 70 11 72 64 109 29 73 63
59 17 61 113 80 9 0 55 120: 51 46 114 43 57 12 46 34 114 93 120 87 37 3 23 42 33 120 97 65 75 106 98 0 37 26 61 14 56 111 64 119 7 72
102 64 95 53 0 45 58 71 119 79 13 53 11 99 96 14 54 87 4 1 30 119 23 96 47 1 7 85 69 82 62 15 90 25 97 42 112 98 37 90 109 75 30 92
113 45 112 44 4 120 115 84 39 30 101 85 27 21 103 93 116 67 92 109 19 96 7 51 38 106 9 76 7 34 21 94 58 75 70 29 107 109 77 91 77 0

Table M-8: p_14cri Node Data

non-depot nodes: 100

Node ID	x	y	demand	service time
0	40	50	-	-
1	45	68	10	90
2	45	70	30	90
3	42	66	10	90
4	42	68	10	90
5	42	65	10	90
6	40	69	20	90
7	40	66	20	90
8	38	68	20	90
9	38	70	10	90
10	35	66	10	90
11	35	69	10	90
12	25	85	20	90
13	22	75	30	90
14	22	85	10	90
15	20	80	40	90
16	20	85	40	90
17	18	75	20	90
18	15	75	20	90
19	15	80	10	90
20	30	50	10	90
21	30	52	20	90
22	28	52	20	90
23	28	55	10	90
24	25	50	10	90
25	25	52	40	90
26	25	55	10	90
27	23	52	10	90
28	23	55	20	90
29	20	50	10	90
30	20	55	10	90
31	10	35	20	90
32	10	40	30	90
33	8	40	40	90
34	8	45	20	90
35	5	35	10	90
36	5	45	10	90
37	2	40	20	90
38	0	40	30	90
39	0	45	20	90
40	35	30	10	90
41	35	32	10	90
42	33	32	20	90
43	33	35	10	90
44	32	30	10	90
45	30	30	10	90
46	30	32	30	90
47	30	35	10	90
48	28	30	10	90
49	28	35	10	90
50	26	32	10	90
51	25	30	10	90
52	25	35	10	90
53	44	5	20	90
54	42	10	40	90
55	42	15	10	90
56	40	5	30	90
57	40	15	40	90
58	38	5	30	90
59	38	15	10	90
60	35	5	20	90
61	50	30	10	90
62	50	35	20	90
63	50	40	50	90
64	48	30	10	90
65	48	40	10	90
66	47	35	10	90
67	47	40	10	90
68	45	30	10	90
69	45	35	10	90
70	95	30	30	90
71	95	35	20	90
72	53	30	10	90
73	92	30	10	90
74	53	35	50	90
75	45	65	20	90
76	90	35	10	90
77	88	30	10	90
78	88	35	20	90
79	87	30	10	90
80	85	25	10	90
81	85	35	30	90
82	75	55	20	90

Node ID	x	y	demand	service time
83	72	55	10	90
84	70	58	20	90
85	68	60	30	90
86	66	55	10	90
87	65	55	20	90
88	65	60	30	90
89	63	58	10	90
90	60	55	10	90
91	60	60	10	90
92	67	85	20	90
93	65	85	40	90
94	65	82	10	90
95	62	80	30	90
96	60	80	10	90
97	60	85	30	90
98	58	75	20	90
99	55	80	10	90
100	55	85	20	90

p14 Inverse P matrix

1: 0 -78 -49 30 -70 33 86 61 -51 -28 44 -31 -67 -9 -38 98 66 -86 -17 -56 -83 -32 -25 -76 0 33 19 86 69 25 29 -7 87 -29 95 69 -72 96 10 -45 42 -29 -32 -10 -64 28 68 78 -39 -36 -10 -15 35 -63 44 69 35 -77 -21 53 37 -46 49 98 30 97 86 88 -80 1 -36 56 74 23 59 -50 -32 23 61 -15 31 83 98 -59 -56 21 88 26 -54 12 -36 66 25 57 8 -25 -53 -55 -24 66 2: 78 0 77 42 97 -39 65 48 -68 -44 -16 95 94 -23 -78 50 38 18 -64 -43 -70 22 74 25 -27 -39 11 -42 -86 18 7 75 57 68 -14 -46 -84 -49 25 99 -35 -3 -29 -45 -46 84 -73 -37 12 50 99 -71 5 -69 -58 44 83 -94 -6 -100 -16 -11 72 2 -71 71 24 -13 -24 -71 -75 -89 24 -66 74 -16 -57 44 -7 49 95 59 10 -17 -68 -79 85 -57 -8 -67 88 -36 -36 56 -52 7 14 -78 -93 -91 3: 49 -77 0 8 54 61 -89 15 94 -23 20 83 41 82 24 59 10 -92 -46 -36 -41 -95 8 16 48 -31 77 100 36 0 75 -78 -37 52 -47 63 99 39 -78 79 99 62 -90 -69 -17 -87 55 -6 -70 -46 -43 -2 -28 53 89 -19 66 -63 80 53 65 -81 11 16 90 -98 -28 69 -33 0 26 -66 -60 16 -97 76 -23 27 -37 -46 62 -94 -19 -73 -66 -42 -72 68 -63 -8 31 23 -61 27 64 -41 -71 88 -9 -5 4: -30 -42 -8 0 -24 -26 -17 -1 11 0 -21 83 -49 -86 -100 3 68 -38 75 35 -56 -75 -18 23 -50 -13 0 30 1 80 -14 29 43 -46 -92 -29 -77 40 -10 -55 3 -92 -67 -46 -17 -86 -55 80 -2 83 80 -33 -2 67 96 25 56 64 80 87 -66 -77 -85 48 -100 -52 -6 55 -12 31 -32 48 -32 2 -52 -26 96 -70 90 -23 -22 -8 -63 50 -70 -26 43 37 35 73 10 -31 -65 -60 -32 6 66 84 18 -83 5: 70 -97 -54 24 0 -37 22 -81 -27 86 29 26 28 -6 69 -74 2 -99 61 -5 -48 -6 28 27 44 -27 -59 53 -66 -58 62 49 -60 -70 -62 95 80 65 -86 -52 -61 -80 20 -59 95 -63 -78 -69 -15 49 -50 74 -53 30 42 38 88 -72 67 16 -77 -17 99 2 -43 -52 -41 63 -2 -95 -25 -84 -60 73 -51 38 94 98 45 -91 45 -48 -70 60 9 32 -72 60 64 19 -15 -70 19 -37 40 -8 47 -59 77 87 6: -33 39 -61 26 37 0 5 -53 47 -50 -45 46 -19 65 -39 -56 -50 94 61 -52 -4 3 23 84 -68 -55 -92 -93 93 6 18 -43 84 71 92 -35 38 29 -60 -9 -10 -57 91 -65 -43 -87 15 -56 -87 12 -16 -81 -24 -21 52 -76 -73 -91 9 -3 34 42 80 -100 78 98 -83 -23 -56 19 -54 -58 48 -2 -53 -51 53 -16 37 37 -28 78 28 22 -18 59 83 21 89 -79 33 1 -67 44 -11 -36 -21 -70 -70 100 7: -86 -65 89 17 -22 -5 0 90 -69 -20 78 -14 -2 -59 5 -88 -72 -73 15 43 -13 -54 -29 69 93 55 0 -88 -38 -100 -12 67 -63 -26 10 8 87 70 35 64 -73 36 28 -75 77 -34 -71 58 -79 -18 44 -28 81 5 82 -12 -20 45 -63 -34 -70 -66 -50 14 -71 48 -23 -17 100 41 -29 -47 -55 60 5 -75 -69 -79 -49 -17 -3 10 42 -81 -58 82 24 94 -39 -85 23 -23 23 94 -50 -1 -60 43 11 13 8: -61 -48 -15 1 81 53 -90 0 -77 39 44 46 -78 55 1 87 -49 -79 -68 55 89 -99 56 28 -58 -29 -6 21 94 -12 -31 -45 -76 -63 4 80 70 -68 10 89 86 73 3 99 0 10 -59 -27 45 -69 -36 0 -35 -41 71 99 -53 3 4 49 -24 -57 97 23 -11 5 23 44 -73 33 3 -25 -25 -18 -74 -31 28 -47 -77 -78 -17 93 4 45 -59 1 80 51 -33 10 90 52 0 -70 -63 17 -69 91 98 32 9: 51 68 -94 -11 27 -47 69 77 0 87 86 -93 -74 26 99 68 48 -49 70 -24 -34 -32 91 0 -3 20 17 39 98 -84 -36 -86 -61 -52 2 -54 84 -62 33 34 93 27 -65 -67 86 51 -56 -86 -94 76 56 -90 -71 -76 25 -52 -38 39 -5 46 42 74 63 81 25 -48 33 37 -90 46 7 80 -10 66 16 -70 81 7 -49 -23 -67 42 40 -66 -7 15 51 -10 -46 -73 -37 -48 83 -5 -40 78 -24 -42 2 -62 10: 28 44 23 0 -86 50 20 -39 -87 0 95 -13 69 47 37 -91 -80 -54 53 -88 -96 -81 -24 -8 -28 88 92 -19 -36 17 27 -30 -80 42 -71 -38 87 0 42 26 -22 -27 -20 -90 0 55 22 -15 1 24 -100 57 -11 -80 -47 -47 93 68 -46 80 -99 95 12 33 63 -18 -89 -96 95 -53 75 -10 40 -25 4 14 -4 -34 -18 14 5 -48 -49 -40 -37 99 -61 51 -20 -68 27 35 90 9 74 -90 -54 -95 41 7 11: -44 16 -20 21 -29 45 -78 -44 -86 -95 0 -20 46 93 -48 -65 -59 -4 -37 57 70 -46 -19 -24 -63 -66 77 -72 -19 90 84 -46 -46 94 63 28 100 56 5 -63 -27 -44 -4 0 -66 -79 50 50 -50 -30 -12 76 33 14 -54 -13 -45 29 33 -1 -35 26 -76 -55 28 -88 46 -39 87 64 62 3 -45 -54 -36 23 -48 -8 -32 22 72 -53 -38 99 18 14 9 -40 -74 89 42 -92 -54 -65 71 18 -30 -5 -72 -55 12: 31 -95 -83 -83 -26 -46 14 -46 93 13 20 0 13 10 -51 -68 -41 82 -22 14 -84 -48 7 -69 1 -18 -79 -34 -73 -79 52 78 1 -20 92 -66 82 65 100 -34 -76 -74 70 -47 84 -65 94 51 30 84 33 -6 -12 -45 -59 52 -84 -79 -29 88 17 10 -50 -21 18 -46 47 69 -88 41 95 -58 80 -34 -52 -60 -67 -4 -24 72 -99 -45 -76 80 2 -39 -84 -95 -2 84 48 100 1 -2 77 -19 -35 -22 -96 9 13: 67 -94 -41 49 -28 19 2 78 74 -69 -46 -13 0 62 88 -29 -35 83 -6 39 15 -3 -17 -57 73 -30 -69 -27 -55 -8 -17 100 -84 16 -32 -35 14 96 10 -64 66 87 -78 40 -38 11 85 -7 82 -90 -12 -79 -17 -30 -41 -12 76 5 -13 31 76 2 60 -46 1 22 -11 9 -70 -55 49 -35 11 18 92 -34 0 78 -69 -72 -70 -58 -17 87 -94 -53 -72 -19 -11 3 -51 -41 -11 -2 30 -37 8 30 -83 69 14: 9 23 -82 86 6 -65 59 -55 -26 -47 -93 -10 -62 0 0 17 -94 55 -82 78 59 -50 100 -89 -84 3 -77 -8 67 40 22 42 57 -30 54 22 33 -39 57 76 -90 -25 -94 43 48 -99 71 -81 -63 -53 -53 0 -20 95 83 75 -6 93 -96 12 -28 -57 70 -98 -7 28 -96 11 0 -40 -96 -5 40 -71 82 -91 50 99 88 -29 -12 -11 -43 -48 -5 3 52 -49 99 -10 -74 -59 0 -41 25 -89 -40 87 -65 -96 15: 38 78 -24 100 -69 39 -5 -1 -99 -37 48 51 -88 0 0 -84 -79 78 94 -16 94 77 -87 46 -41 69 -26 96 99 84 -60 -76 -2 -55 50 30 -81 -11 9 -54 16 -87 61 -63 -38 -26 5 58 -69 -39 -72 2 48 40 50 21 33 18 -58 -14 -52 -38 68 -76 -97 -28 51 -37 -77 -62 47 45 38 -64 -98 18 -21 63 63 100 68 81 69 -59 -52 72 28 -42 3 -44 3 75 -22 -32 -22 -49 10 -48 -49 95 16: -98 -50 -59 -3 74 56 88 -87 -68 91 65 68 29 -17 84 0 63 0 98 -6 15 70 56 -49 67 58 27 94 -4 -86 18 -21 95 46 -39 75 36 11 -46 -54 -75 7 69 -69 -78 12 -35 24 -43 33 -62 -31 -19 -30 32 88 21 -31 63 59 38 30 -78 49 29 -47 -99 -39 73 19 -69 3 -5 -60 -18 28 -59 21 -8 41 46 -28 -62 61 29 94 -72 -99 71 49 -67 -37 61 -64 71 69 50 100 -1 -41 17: -66 -38 -10 -68 -2 50 72 49 -48 80 59 41 35 94 79 -63 0 -68 -6 8 66 -36 -7 -19 69 -89 63 33 45 78 -73 -85 -8 54 81 94 -33 -66 20 -12 -3 -11 59 82 -51 -65 33 -65 -62 92 7 -75 -61 92 29 -35 -15 -19 64 5 -20 -99 48 -13 4 -41 99 12 94 -44 -16 -1 98 63 -62 83 34 39 67 -89 -97 21 -96 -54 6 -64 -52 44 41 -44 -25 14 -7 2 79 20 -44 20 34 -71 18: 86 -18 92 38 99 -94 73 79 49 54 4 -82 -83 -55 -78 0 68 0 83 79 -65 -85 -39 58 -28 63 -87 38 -76 7 -15 91 -86 -34 61 -85 -52 45 -4 16 -69 66 19 -90 -96 -74 78 -65 75 29 -53 -47 -5 -79 -34 65 -65 -50 -62 -93 -98 -73 52 54 -49 82 -95 11 8 -84 -95 36 69 -25 -48 80 -87 100 59 69 -15 39 -18 84 22 14 86 59 58 88 -4 55 29 -76 52 -16 -54 49 -35 30 19: 17 64 46 -75 -61 -61 -15 68 -70 -53 37 22 6 82 -94 -98 6 -83 0 -59 96 15 -66 80 -4 -74 87 -13 38 84 92 -67 90 58 0 -98 54 46 -95 -63 -74 50 91 -21 -46 -13 -24 -42 52 100 23 -49 1 -95 -68 4 -73 46 86 -87 25 89 73 -18 17 82 -88 -3 53 97 -10 -91 19 21 -79 30 -36 55 0 -21 20 65 -58 -29 -95 6 -22 6 -54 -75 -59 47 66 100 45 -64 -31 42 51 80 20: 56 43 36 -35 5 52 -43 -55 24 88 -57 -14 -39 -78 16 6 -8 -79 59 0 70 39 37 94 83 -38 88 55 74 -82 -11 -96 80 -80 -72 26 -45 32 -7 46 78 -75 29 17 0 -59 -94 -59 -59 -18 -31 19 63 46 95 41 65 -52 37 -55 45 -72 -9 -16 -5 -21 -11 -48 62 -36 -54 -56 20 57 -26 98 -21 54 43 37 -35 31 -9 18 58 -9 -94 87 -39 -45 -38 -3 5 -63 -51 -85 -67 5 11 -8 21: 83 70 41 56 48 4 13 -89 34 96 -70 84 -15 -59 -94 -15 -66 65 -96 -70 0 50 20 -4 -80 -5 31 36 88 14 76 -52 -29 -56 -21 42 18 -45 -8 81 -89 56 -59 3 -14 -12 -98 -36 32 18 -50 -50 76 3 57 92 -80 24 59 61 42 64 55 0 -30 79 100 67 -57 -69 12 40 37 -44 25 78 98 -97 26 29 -73 -54 22 56 41 -62 39 -71 0 -19 -95 -42 61 77 16 0 50 -36 40 34 22: 32 -22 95 75 6 -3 54 99 32 81 46 48 3 50 -77 -70 36 85 -15 -39 -50 0 30 -66 63 -15 100 11 83 -45 -6 71 11 19 -92 -99 -46 78 -69 -30 17 -36 -34 -93 99 15 50 -32 -51 -80 18 76 25 -13 -91 -57 9 -65 -63 -85 1 -54 24 85 80 93 -11 -45 -56 -1 -67 -46 71 54 -12 70 -30 -77 -19 -82 -45 75 90 -43 16 -6 30 -73 99 44 78 -23 48 -76 1 50 -60 90 62 8 23: 25 -74 -8 18 -28 -23 29 -56 -91 24 19 -7 17 -100 87 -56 7 39 66 -37 -20 -30 0 -67 -27 23 53 -58 -43 -68 -81 41 96 24 -8 64 51 34 81 -58 74 64 79 30 9 84 16 14 -36 41 -46 10 58 49 27 65 -56 16 -71 53 -75 29 -82 -94 83 94 100 11 -14 -47 -18 7 -47 -39 52 54 79 24 -8 14 82 -47 87 94 18 -42 75 -21 -36 -80 -3 -7 69 94 82 42 -88 -81 64 44 24: 76 -25 -16 -23 -27 -84 -69 -28 0 8 24 69 57 89 -46 49 19 -58 -80 -94 4 66 67 0 51 54 -81 -40 10 -74 -71 -9 -62 29 -35 -90 -79 -72 -34 -26 20 26 -8 90 85 -78 -10 21 26 0 -46 -29 -58 24 -81 -79 -60 -5 90 -77 -97 22 -69 3 89 98 14 -89 -6 46 42 82 -66 -43 -51 3 6 -4 36 56 88 56 -56 -60 39 -94 75 -17 -13 -53 -82 -12 -67 4 -1 25 -80 56 -40 -23 25: 0 27 -48 50 -44 68 -93 58 3 28 63 -1 -73 84 41 -67 -69 28 4 -83 80 -63 27 -51 0 -7 -74 -62 26 72 -86 -44 -77 43 63 -65 35 9 49 -49 57 15 -77 78 35 -29 96 84 -39 -79 -58 7 -30 -5 -86 -40 64 19 18 85 -75 92 28 79 41 40 51 94 -17 8 -20 74 -32 -6 -26 -43 75 -30 89 59 -4 32 43 75 -11 -25 81 -97 19 41 -97 -50 73 -43 71 -38 -46 -29 6 -59 26: -33 39 31 13 27 55 -55 29 -20 -88 66 18 30 -3 -69 -58 89 -63 74 38 5 15 -23 -54 7 0 98 30 3 -70 85 23 -85 85 -25 -72 67 -90 5 -89 23 -45 78 17 -12 76 86 55 26 72 -63 -23 -18 61 28 -46 -76 0 48 -3 -80 -97 -59 -41 70 43 -1 -98 78 80 23 7 -15 -51 35 -99 94 -17 75 13 81 -2 45 26 -96 71 11 33 44 -53 -79 52 96 -41 -14 12 -75 -11 65 92 27: -19 -11 -77 0 59 92 0 6 -17 -92 -77 79 69 77 26 -27 -63 87 -87 -88 -31 -100 -53 81 74 -98 0 49 -34 -81 0 95 -83 83 -92 -59 -36 -78 30 -25 64 -1 -64

25 92 -55 -38 24 85 56 -16 -38 -81 -5 7 76 21 -16 58 -92 -4 -84 40 50 47 16 45 89 -14 65 -66 80 60 91 -76 19 52 2 76 -41 -32 68 16 -71
0 -77 70 78 36 -60 23 95 -91 -59 81 -99 -87 -68 -5 13 28: -86 42 -100 -30 -53 93 88 -21 -39 19 72 34 27 8 -96 -94 -33 -38 13 -55 -36 -11
58 40 62 -30 -49 0 -91 14 -88 -2 69 91 25 -6 46 16 -73 10 -6 44 99 3 13 38 -81 45 -87 6 19 2 55 -19 -51 27 51 83 84 -15 20 32 58 78 40
-3 14 -57 -6 70 47 -57 28 94 -39 20 -44 -9 32 73 100 3 7 43 30 -10 -34 -45 -14 -94 72 -78 -35 -100 32 -7 -3 89 -61 -83 29: -69 86 -36 -1
66 -93 38 -94 -98 36 19 73 55 -67 -99 4 -45 76 -38 -74 -88 -83 43 -10 -26 -3 34 91 0 93 69 -32 -77 24 97 -94 22 -91 76 72 2 19 -70 2
-99 -2 -63 -48 -41 70 -82 78 35 88 52 27 8 19 -54 11 89 -55 31 -30 -11 91 -13 14 -54 84 78 -73 -95 60 -90 -34 -58 -39 70 -85 -3 29 24
48 34 -91 -94 33 -14 17 -19 39 15 47 -69 -94 -1 64 93 -89 30: -25 -18 0 -80 58 -6 100 12 84 -17 -90 79 8 -40 -84 86 -78 -7 -84 82 -14 45
68 74 -72 70 81 -14 -93 0 -70 39 -50 65 -84 92 45 -99 23 58 -34 -57 46 53 60 -29 8 -93 45 71 65 75 46 -5 22 -32 21 -3 -68 91 63 -94 60
-73 75 -2 42 -83 32 -69 81 17 -83 3 73 43 96 -30 42 52 -48 -58 -60 77 -98 -3 -74 -48 93 -4 32 79 100 -46 -75 31 -57 -36 -82 -19 31: -29
-7 -75 14 -62 -18 12 31 36 -27 -84 -52 17 -22 60 -18 73 15 -92 11 -76 6 81 71 86 -85 0 88 -69 70 0 27 74 34 62 -15 82 97 -99 37 -50 -33
-82 46 -66 49 -93 -47 61 55 -12 4 33 6 0 -48 60 85 56 13 14 68 -3 -71 -52 -37 -74 42 7 -53 58 -6 24 -24 17 99 59 44 -68 16 -44 -88 -17
-10 -56 17 -23 -54 78 15 92 -61 34 -66 39 -89 -46 -70 -18 51 32: 7 -75 78 -29 -49 43 -67 45 86 30 46 -78 -100 -42 76 21 85 -91 67 96 52
-71 -41 9 44 -23 -95 2 32 -39 -27 0 -26 28 -7 44 27 10 -23 65 -9 -76 -65 59 -66 -14 42 49 18 33 -69 -66 -78 -44 -4 44 16 -12 -76 10 2 77
16 99 -31 -79 -47 -87 54 11 28 -24 -3 92 64 92 -80 33 -56 75 92 56 -92 -100 -6 28 -13 49 64 72 95 77 -62 -21 -31 -47 -1 62 -4 23 33:
-87 -57 37 -43 60 -84 63 76 61 80 46 -1 84 -57 2 -95 8 86 -90 -80 29 -11 -96 62 77 85 83 -69 77 50 -74 26 0 -32 -28 -74 -63 7 3 -31 78
40 -72 17 92 -19 53 -72 97 66 -48 -70 11 -18 10 -10 -42 -43 22 -45 -82 -73 96 80 67 84 13 -44 -84 10 -11 80 62 9 49 -25 -73 37 63 64
100 91 14 -66 -52 -95 97 62 -82 -48 2 83 17 -81 57 14 34 34 81 0 34: 29 -68 -52 46 70 -71 26 63 52 -42 -94 20 -16 30 55 -46 -54 34 -58
80 56 -19 -24 -29 -43 -85 -83 -91 -24 -65 -34 -28 32 0 -51 -12 -69 -18 -96 64 -91 72 -52 -100 42 43 -98 75 -89 -86 -13 -28 44 17 -33 41
77 -84 -75 27 75 48 -11 96 69 93 63 -64 55 67 2 -1 77 10 -76 -79 -32 -56 -19 -21 67 -98 74 -98 97 37 23 -40 59 -33 -19 -51 -20 47 -34
82 75 22 -25 28 35: -95 14 47 92 62 -92 -10 -4 -2 71 -63 -92 32 -54 -50 39 -81 -61 0 72 21 92 8 35 -63 25 92 -25 -97 84 -62 7 28 51 0
-30 58 78 39 -57 -69 49 -82 -78 74 -48 -58 68 47 -88 -50 -94 -11 91 50 74 62 28 -52 51 -1 1 51 -45 -47 16 -84 0 -78 67 16 -86 98 86 -47
-35 94 59 39 48 18 -7 -5 0 -9 -87 -63 71 -46 -29 8 86 -17 -64 19 -15 -72 47 93 -2 36: -69 46 -63 29 -95 35 -8 -80 54 38 -28 66 35 -22
-30 -75 -94 85 98 -26 -42 99 -64 90 65 72 59 6 94 -92 15 -44 74 12 30 0 90 36 90 73 51 -94 73 71 30 -19 71 18 58 70 -1 79 -82 7 7 -50
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63 69 -58 -90 0 86 -16 -35 41 -1 52 -22 -6 90 -84 33 -8 44 55 55 30 30 -71 20 -63 -32 -29 52 3 -86 83 25 22 63 -1 8 31 77 88 -22 31 -5
-49 33 -46 19 -40 -13 -5 -83 -14 -41 -77 0 100 52 84 63 26 80 -80 -66 -39 60 7 43 82 -50 38: -96 49 -39 -40 -65 -29 -70 68 62 0 -56 -65
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-1 70 62 -38 15 -22 -32 -78 -15 39: -10 -25 78 10 86 60 -35 -10 -33 -42 -5 -100 -10 -57 -9 46 -20 4 95 7 8 69 -81 34 -49 -5 -30 73 -76
-23 99 23 -3 96 -39 -90 16 -60 0 14 52 86 82 -10 51 -76 -69 49 75 88 -65 6 46 -73 68 -81 -26 -25 17 -64 -21 -35 96 36 27 -22 -4 7 23 25
91 68 55 84 15 -26 -37 0 69 -44 -93 -49 -65 26 -10 -72 47 77 -97 -8 -94 -54 -78 -9 -17 48 -45 -70 46 88 40: 45 -99 -79 55 52 9 -64 -89
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p14 Generalized P matrix

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48 36 39 56 27 25 98 6 7 70 82 60 97 1 75 99 90 53 14 89 67 35 17 38 89 59 100 50 47 100 29 45 23 14 71 55 41 85 88 82 0 44 60 13 84
42 97 29 45 21 50 38 78 47 45 4 70 25 86 20 80 14 28 14 43 70 19 46 4 44 62 58 15 18 66 74 60 3 64: 41 35 59 75 94 58 42 70 78 46 12
41 1 38 71 54 67 35 74 20 33 80 28 42 25 88 52 42 12 16 68 10 26 1 20 38 69 48 85 83 69 19 21 58 96 47 20 77 72 63 35 22 24 57 79 35 0
4 14 89 17 35 87 0 29 17 56 44 43 18 35 20 38 69 60 72 6 88 44 14 9 96 85 79 58 16 7 44 99 18 27 87 60 63 24 40 56 94 39 13 65: 40 31
73 1 56 94 55 84 44 68 71 47 67 66 100 60 77 83 9 72 62 39 49 80 45 45 70 40 49 27 6 13 47 57 80 68 47 63 36 35 45 12 81 1 94 52 44 32
36 45 6 79 68 29 9 92 64 4 79 43 47 4 64 67 0 64 36 55 94 84 73 81 69 18 90 92 29 4 1 79 61 92 60 97 56 66 0 85 12 62 0 4 50 4 100 43
67 68 68 64 66: 23 84 4 92 76 87 18 60 86 4 81 72 61 52 60 10 69 70 80 51 18 79 10 17 72 32 55 52 40 92 32 24 86 28 15 11 70 48 61 34
19 14 19 32 62 19 14 61 24 78 50 19 92 99 77 1 32 3 30 11 96 65 20 37 62 0 11 87 55 34 50 75 65 24 36 10 70 78 5 45 54 93 36 61 100 38
58 95 56 30 85 61 18 79 80 84 8 15 48 43 67: 2 33 82 18 15 99 25 66 0 43 71 42 22 54 12 71 94 3 50 52 98 56 26 96 31 11 69 85 74 14 88
78 94 61 27 70 92 95 18 49 16 28 0 12 49 71 78 85 66 8 37 18 6 12 87 98 33 68 73 32 44 96 25 29 52 38 0 72 75 13 46 76 36 38 31 49 4
16 6 65 82 77 3 73 58 94 31 62 66 40 21 43 5 67 94 95 86 44 44 50 68: 33 16 4 94 60 51 45 19 24 94 47 33 20 52 18 62 29 11 37 98 37 50
38 51 99 7 63 81 64 27 92 99 96 79 36 30 35 15 22 73 25 93 3 16 81 11 38 18 12 32 66 11 43 79 43 30 78 59 39 66 83 38 35 0 47 100 91 0
19 0 48 88 14 22 28 73 85 21 53 92 66 85 65 88 23 79 69 23 78 25 63 100 14 70 40 45 7 16 54 67 69: 17 99 24 74 12 5 98 75 66 46 48 92
90 88 84 64 15 41 91 50 1 30 50 34 19 22 52 44 0 51 8 49 89 50 1 63 93 23 48 84 84 9 64 12 97 19 12 79 89 5 9 47 10 36 86 8 67 60 20 61
63 21 95 10 15 90 43 3 0 80 77 61 8 55 41 39 95 38 98 85 85 36 0 94 3 42 96 93 61 73 68 84 39 90 38 85 1 24 78 98 70: 6 90 28 8 7 96 98
13 87 13 44 5 33 59 64 45 95 82 80 45 86 91 15 95 19 24 64 5 66 30 87 92 74 75 85 92 39 24 5 38 62 8 43 6 15 28 33 54 81 80 30 83 17
47 95 26 62 22 91 51 43 75 82 79 15 9 72 62 31 0 64 29 54 53 83 56 96 11 29 53 41 93 37 93 90 47 23 100 77 12 37 61 87 22 5 52 72 28
46 42 71: 74 22 30 41 69 63 37 9 9 31 34 92 4 7 0 47 17 11 69 100 21 77 82 18 78 75 48 20 37 28 81 100 97 81 35 39 49 74 61 81 6 40 9
33 74 83 60 51 66 33 97 82 39 28 28 60 14 64 89 29 77 78 89 58 55 49 51 55 3 95 0 71 38 90 87 94 49 22 35 62 28 59 53 49 25 24 65 25
37 13 91 1 67 30 50 24 83 75 33 93 72: 19 72 7 38 49 61 11 95 54 65 62 81 12 99 89 1 56 49 69 37 74 48 90 14 51 69 47 87 49 59 20 83
54 97 11 89 58 39 83 34 96 75 78 43 38 60 52 14 26 39 54 30 83 15 5 8 63 15 51 68 62 0 77 13 58 66 50 93 63 69 0 0 50 88 3 65 52 74 47
97 57 4 68 81 17 3 52 59 20 43 71 68 18 39 72 40 12 71 48 0 73: 84 77 99 38 31 98 53 25 7 88 89 31 51 33 38 85 51 96 45 55 71 62 14 76
18 77 36 31 44 8 63 83 39 56 36 98 89 23 41 15 25 32 72 0 84 97 52 74 92 52 2 64 65 68 24 28 27 27 9 40 36 29 7 46 76 15 40 92 51 57
64 5 0 9 33 3 4 85 36 7 64 66 26 29 99 90 47 70 1 86 14 62 39 11 98 22 2 15 98 68 74: 61 43 5 39 41 47 81 46 41 69 44 67 43 49 34 2 32
89 19 71 88 84 9 18 56 14 96 75 30 100 13 10 49 3 19 94 30 44 11 69 43 1 50 16 25 3 53 93 14 98 15 44 62 33 100 3 0 28 41 5 91 79 53
77 10 56 8 69 97 66 31 39 43 0 99 21 53 42 100 36 77 30 50 51 14 61 88 60 71 72 38 71 71 58 53 100 57 32 68 54 75: 56 78 83 55 3 54 28
79 20 47 48 16 37 36 62 24 77 79 0 67 49 29 77 49 78 71 78 68 40 21 6 99 20 48 75 17 76 80 1 23 94 5 92 21 61 48 51 32 47 37 86 11 60
29 6 60 29 95 3 56 71 84 77 64 66 98 80 66 73 7 42 78 27 10 0 90 24 51 70 59 59 68 80 78 19 71 37 22 71 47 13 3 43 30 81 9 95 3 15 54
76: 68 97 93 54 31 29 83 23 51 12 31 7 65 66 27 14 80 65 9 53 38 49 96 52 29 27 89 49 9 27 87 73 88 99 84 66 32 25 23 57 83 82 79 73
24 100 90 81 51 56 91 44 37 25 21 42 37 81 90 0 27 22 54 31 58 99 55 10 89 90 77 32 42 17 54 0 96 29 51 66 97 78 3 11 92 33 61 91 3 28
22 64 11 52 63 57 16 70 94 7 77: 16 21 82 12 18 1 97 40 30 100 35 81 34 39 53 36 12 91 68 6 95 40 24 50 99 73 91 82 75 50 62 87 20 11
71 27 53 33 38 60 32 36 94 90 6 3 76 19 45 27 77 67 37 50 31 28 97 47 79 58 24 79 57 27 22 58 81 39 99 84 58 50 13 65 64 0 0 14 93 37
46 21 6 78 81 4 73 97 82 90 72 4 50 11 69 20 33 68 43 38 78: 88 18 88 1 38 100 86 16 85 89 15 99 57 34 86 81 91 11 42 5 55 32 70 40 90
90 26 51 77 99 96 85 68 49 1 92 44 63 59 79 53 55 64 23 19 14 77 73 23 23 51 38 52 33 43 50 77 45 94 68 53 3 19 51 17 99 78 89 45 98
80 90 20 23 35 64 74 0 39 52 21 85 17 39 82 4 50 20 84 92 22 51 41 50 37 94 28 30 43 66 79: 100 14 71 62 88 36 28 73 65 13 43 96 52 22
64 59 13 35 88 58 83 10 49 81 57 78 93 28 85 5 21 56 28 4 15 40 5 14 87 68 66 31 30 52 11 31 76 42 37 77 53 67 37 40 82 35 16 27 3 5
94 80 89 85 30 86 41 82 20 69 95 93 44 65 7 97 48 79 0 53 84 86 10 32 56 29 90 91 90 4 34 82 17 94 86 46 87 63 37 27 80: 72 34 39 62
92 47 15 88 90 46 98 9 80 43 30 6 80 0 70 23 69 38 54 11 7 13 87 32 73 64 36 99 85 35 88 72 97 42 93 68 93 41 32 69 55 88 54 32 54 22
60 76 95 82 50 94 83 1 56 32 71 86 50 74 42 35 91 1 75 48 31 1 5 86 77 21 70 13 100 0 31 29 23 46 5 82 0 14 13 95 15 16 27 59 40 43 79
87 60 91 81: 41 73 65 47 79 75 59 36 14 41 73 85 48 67 70 95 54 49 28 60 89 13 45 53 73 86 75 51 12 75 56 3 42 60 0 14 13 35 59 10 42
14 46 47 56 84 100 89 23 23 97 82 79 22 66 26 40 32 27 49 5 21 90 5 59 78 53 4 97 14 26 11 21 68 17 25 74 11 73 60 0 85 21 64 97 66 48
84 25 34 89 80 28 26 18 4 57 69 42 45 82: 5 63 55 49 95 16 42 1 52 65 1 89 33 71 6 94 44 48 92 98 82 49 63 88 17 90 52 65 61 71 90 86
47 61 69 0 63 90 46 6 14 49 63 52 82 42 50 86 5 98 32 93 76 27 42 55 61 45 9 82 96 37 29 67 81 54 74 16 56 3 39 87 0 13 21 26 80 42 12
78 91 0 82 39 91 33 33 89 49 18 16 53 48 61 29 87 4 28 30 20 83: 44 73 35 39 84 77 93 42 44 63 59 12 43 65 46 69 41 62 2 25 72 39 58
74 50 13 99 27 34 65 2 66 41 70 30 31 73 74 43 80 75 26 9 47 76 68 100 4 99 5 82 67 55 50 4 79 15 57 16 10 17 84 36 95 38 90 95 6 13
98 46 87 12 46 2 96 9 58 3 95 93 44 0 44 47 28 10 89 88 2 13 69 27 31 42 46 19 8 72 38 84: 74 18 30 82 19 33 2 69 89 54 45 70 96 79 29
0 3 48 9 44 65 98 16 13 56 73 38 93 51 60 47 91 71 21 14 87 98 89 72 58 70 31 32 100 85 97 28 70 18 13 6 96 48 67 97 7 22 71 89 92 71
100 12 7 8 54 10 94 33 4 7 41 94 32 56 20 9 67 79 4 31 54 74 0 35 50 39 100 35 32 30 34 98 55 32 47 29 51 98 90 85: 26 70 63 36 49 2
68 10 77 89 18 30 76 49 60 54 46 20 8 6 10 47 50 37 77 29 97 47 85 75 26 37 37 68 12 9 32 90 7 89 94 82 73 49 97 69 9 36 49 9 56 5 25
25 1 33 87 28 6 83 33 66 46 28 71 41 24 57 49 97 21 82 60 74 76 43 55 69 96 5 37 83 52 87 0 14 29 29 35 24 12 47 91 34 50 12 15 66 22
21 86: 99 1 76 70 54 20 27 85 85 66 15 85 91 47 78 69 69 8 18 1 10 49 1 96 19 45 20 91 85 48 97 76 41 87 78 24 76 7 73 91 83 72 74 75
4 71 49 46 42 79 52 25 90 46 20 100 23 31 71 97 86 72 78 33 53 23 0 4 57 37 19 6 67 58 16 51 43 71 49 90 94 29 12 21 58 0 73 1 35 69
74 67 34 90 25 26 12 78 26 14 87: 33 32 30 31 93 64 76 13 77 12 44 46 94 22 48 56 36 97 48 46 31 13 100 13 36 44 20 12 25 98 83 94 60
62 38 31 14 63 72 39 77 85 90 95 90 44 42 25 47 71 95 32 57 52 13 98 15 92 31 83 17 85 51 77 56 89 64 79 13 13 96 6 53 85 14 8 86 5 78
87 87 42 67 26 24 17 0 87 3 44 52 12 8 56 78 29 26 84 29 70 88: 23 36 8 41 50 77 74 30 19 58 40 8 40 38 95 41 69 28 52 26 41 78 42 69
35 71 20 71 1 61 35 19 45 31 77 97 92 16 3 35 65 24 99 4 80 17 95 65 32 6 34 5 5 82 32 63 76 84 80 61 60 58 26 80 54 93 8 84 78 32 5 28
48 91 8 57 26 35 90 59 66 77 63 49 18 76 58 0 38 42 40 41 90 43 72 37 55 46 72 73 89: 69 47 82 5 65 92 99 38 91 44 96 40 32 1 84 49 7
21 53 6 13 47 79 46 39 99 10 93 68 24 93 11 69 92 36 18 83 40 43 91 79 27 37 96 8 96 23 38 16 87 70 15 44 58 68 4 52 14 85 62 20 39 81
76 67 11 22 77 74 48 52 50 32 79 100 3 64 15 95 7 97 17 46 17 57 21 79 4 0 38 77 83 81 31 86 24 15 56 96 68 90: 95 59 90 17 70 41 47
57 49 77 62 66 90 68 62 100 6 16 26 79 49 100 66 68 68 39 7 68 72 99 36 72 45 6 41 84 80 44 44 64 30 95 79 80 61 96 88 24 19 37 70 27
37 39 18 90 42 53 41 29 84 28 84 93 24 84 8 2 85 77 11 38 35 94 33 84 45 49 94 86 30 9 79 53 54 92 28 33 71 0 38 64 83 53 42 11 19 74
45 40 91: 32 76 15 29 3 30 55 16 19 88 59 40 81 86 61 52 47 96 67 85 35 19 1 55 14 28 30 40 11 2 63 61 15 78 75 16 41 56 8 26 70 73 59
37 21 86 37 72 58 82 20 38 59 12 81 87 14 61 12 38 8 64 63 22 8 64 59 52 14 62 57 2 0 28 13 77 68 29 38 77 92 31 19 80 18 63 63 79 95
90 0 98 94 75 33 4 41 11 58 92 92: 53 45 28 7 69 89 26 16 68 36 80 75 63 13 79 84 0 3 2 29 29 6 1 37 68 85 64 69 31 4 83 31 79 40 53 69
39 64 47 8 43 70 67 5 26 62 75 4 33 55 39 98 19 11 23 92 37 69 59 59 18 53 8 86 76 88 52 88 30 30 63 13 35 98 10 53 92 82 12 16 8 66
10 72 66 12 76 6 55 9 68 0 43 100 52 1 7 79 50 75 93: 31 94 25 43 76 15 79 20 57 64 49 37 36 34 22 42 59 10 1 68 73 63 41 1 71 89 55

32 31 13 84 28 22 5 77 50 69 47 34 10 33 100 54 55 24 56 31 90 93 14 7 87 2 46 58 1 96 42 9 51 57 31 23 94 20 92 39 59 22 4 9 17 77 58 100 60 13 35 52 2 79 58 58 36 28 13 52 6 69 74 39 45 0 70 1 92 11 17 41 43 94: 60 15 42 15 26 61 24 23 26 35 96 91 25 49 11 92 68 15 41 54 89 41 5 76 64 38 38 2 15 63 38 45 54 38 75 19 98 72 32 13 11 90 30 49 23 92 42 10 56 96 22 61 7 68 26 85 22 9 51 65 96 18 1 48 10 86 28 88 70 11 35 29 75 49 100 67 47 99 92 36 75 91 98 58 39 37 73 22 37 64 4 14 72 0 86 67 77 9 47 69 95: 18 94 90 96 19 15 19 19 27 5 27 90 85 90 65 19 64 25 31 86 66 18 50 25 75 61 85 68 70 29 68 12 81 74 56 66 94 33 94 3 44 34 9 12 76 98 93 25 16 2 14 55 33 14 54 34 63 16 9 1 77 13 77 35 53 59 65 65 14 71 52 56 23 75 59 58 63 53 85 16 58 57 48 90 99 37 47 100 39 54 96 21 3 76 0 74 28 88 69 75 96: 79 78 82 83 25 39 77 60 79 8 37 15 56 11 86 96 24 90 4 4 94 84 59 98 33 14 58 32 49 100 85 36 65 70 44 27 10 91 92 24 0 6 42 37 31 19 89 20 19 94 43 94 95 16 64 67 32 32 59 26 91 63 15 4 94 13 49 39 2 77 78 81 36 21 9 70 90 48 58 51 90 2 70 21 50 37 50 85 29 45 14 3 23 43 8 0 82 86 94 40 97: 55 36 84 47 39 3 61 99 68 46 65 15 90 89 75 97 28 80 63 64 26 21 7 35 78 18 4 82 83 15 59 74 71 7 6 96 88 77 92 5 34 73 95 20 50 53 16 17 3 10 43 86 42 79 58 67 5 48 51 95 92 82 20 1 72 17 13 89 27 84 84 53 5 98 38 66 12 95 63 16 87 45 60 23 63 11 20 67 54 84 64 0 14 68 38 17 0 8 64 54 98: 1 14 33 26 39 61 78 0 83 15 14 90 21 10 49 90 56 26 20 31 32 37 40 68 26 35 51 85 38 92 9 50 82 44 92 36 99 92 26 47 39 32 18 77 39 62 80 0 36 68 52 99 61 79 90 66 33 85 49 32 91 54 64 44 83 88 41 70 9 7 43 91 69 14 17 35 36 12 72 1 3 71 7 11 58 12 44 52 69 38 39 54 87 21 16 75 23 0 8 22 99: 24 89 8 41 39 3 64 48 59 24 27 66 66 31 70 18 91 87 33 7 89 51 45 11 17 48 3 53 19 17 51 38 84 21 73 47 22 90 51 97 82 20 95 91 41 99 82 67 29 94 100 60 63 20 7 28 68 46 21 41 98 100 4 81 67 74 73 73 4 80 69 40 35 29 6 85 85 15 99 12 55 69 37 65 64 18 4 79 10 56 45 36 50 83 24 44 75 64 0 77 100: 80 72 62 79 99 90 11 30 68 75 13 98 1 3 87 49 37 15 20 5 40 27 10 58 90 74 60 69 77 45 75 63 96 69 65 43 26 77 37 52 58 55 76 10 56 78 27 36 88 29 92 96 6 37 92 48 40 26 47 11 26 93 14 9 45 40 14 45 13 82 50 19 90 43 56 41 57 6 71 7 73 12 38 34 47 28 97 74 65 39 36 32 21 77 42 100 25 47 55 0

Table M-9: p_15cri Node Data

non-depot nodes: 150

Node ID	x	y	demand	service time
0	35	35	-	-
1	41	49	10	10
2	35	17	7	10
3	55	45	13	10
4	55	20	19	10
5	15	30	26	10
6	25	30	3	10
7	20	50	5	10
8	10	43	9	10
9	55	60	16	10
10	30	60	16	10
11	20	65	12	10
12	50	35	19	10
13	30	25	23	10
14	15	10	20	10
15	30	5	8	10
16	10	20	19	10
17	5	30	2	10
18	20	40	12	10
19	15	60	17	10
20	45	65	9	10
21	45	20	11	10
22	45	10	18	10
23	55	5	29	10
24	65	35	3	10
25	65	20	6	10
26	45	30	17	10
27	35	40	16	10
28	41	37	16	10
29	64	42	9	10
30	40	60	21	10
31	31	52	27	10
32	35	69	23	10
33	53	52	11	10
34	65	55	14	10
35	63	65	8	10
36	2	60	5	10
37	20	20	8	10
38	5	5	16	10
39	60	12	31	10
40	40	25	9	10
41	42	7	5	10
42	24	12	5	10
43	23	3	7	10
44	11	14	18	10
45	6	38	16	10
46	2	48	1	10
47	8	56	27	10
48	13	52	36	10
49	6	68	30	10
50	47	47	13	10
51	49	58	10	10
52	27	43	9	10
53	37	31	14	10
54	57	29	18	10
55	63	23	2	10
56	53	12	6	10
57	32	12	7	10
58	36	26	18	10
59	21	24	28	10
60	17	34	3	10
61	12	24	13	10
62	24	58	19	10
63	27	69	10	10
64	15	77	9	10
65	62	77	20	10
66	49	73	25	10
67	67	5	25	10
68	56	39	36	10
69	37	47	6	10
70	37	56	5	10
71	57	68	15	10
72	47	16	25	10
73	44	17	9	10
74	46	13	8	10
75	49	11	18	10
76	49	42	13	10
77	53	43	14	10
78	61	52	3	10
79	57	48	23	10
80	56	37	6	10
81	55	54	26	10
82	15	47	16	10

Node ID	x	y	demand	service time
83	14	37	11	10
84	11	31	7	10
85	16	22	41	10
86	4	18	35	10
87	28	18	26	10
88	26	52	9	10
89	26	35	15	10
90	31	67	3	10
91	15	19	1	10
92	22	22	2	10
93	18	24	22	10
94	26	27	27	10
95	25	24	20	10
96	22	27	11	10
97	25	21	12	10
98	19	21	10	10
99	20	26	9	10
100	18	18	17	10
101	37	52	7	10
102	49	49	30	10
103	52	64	16	10
104	20	26	9	10
105	40	30	21	10
106	21	47	15	10
107	17	63	19	10
108	31	62	23	10
109	52	33	11	10
110	51	21	5	10
111	42	41	19	10
112	31	32	29	10
113	5	25	23	10
114	12	42	21	10
115	36	16	10	10
116	52	41	15	10
117	27	23	3	10
118	17	33	41	10
119	13	13	9	10
120	57	58	28	10
121	62	42	8	10
122	42	57	8	10
123	16	57	16	10
124	8	52	10	10
125	7	38	28	10

Node ID	x	y	demand	service time
126	27	68	7	10
127	30	48	15	10
128	43	67	14	10
129	58	48	6	10
130	58	27	19	10
131	37	69	11	10
132	38	46	12	10
133	46	10	23	10
134	61	33	26	10
135	62	63	17	10
136	63	69	6	10
137	32	22	9	10
138	45	35	15	10
139	59	15	14	10
140	5	6	7	10
141	10	17	27	10
142	21	10	13	10
143	5	64	11	10
144	30	15	16	10
145	39	10	10	10
146	32	39	5	10
147	25	32	25	10
148	25	55	17	10
149	48	28	18	10
150	56	37	10	10

p15 Inverse P matrix

1: 0 -117 -74 46 -106 50 129 92 -76 -42 66 -47 -101 -13 -58 147 100 -129 -26 -84 -125 -48 -38 -113 0 50 29 128 103 37 43 -11 130 -44 143 103 -108 144 15 -68 63 -43 -48 -16 -96 42 103 117 -59 -54 -15 -23 52 -94 67 104 53 -115 -32 79 55 -69 74 147 45 145 128 132 -120 2 -54 84 111 35 89 -75 -48 35 91 -22 47 125 147 -88 -84 32 132 39 -81 18 -53 100 38 85 12 -37 -80 -83 -36 100 116 63 145 -59 98 71 -102 -66 -25 143 141 -34 -116 76 58 26 -96 -64 -105 33 111 38 -41 -58 17 -63 -128 28 11 112 85 102 -22 -69 -126 -73 38 148 -53 -5 -44 -67 -69 125 -109 -55 18 75 148 -106 2: 117 0 8 -104 -87 66 124 -141 -9 -150 -24 -16 108 3 -106 107 37 -20 -36 -107 -112 -133 37 -98 112 -24 -86 66 -11 74 142 89 15 -26 -101 -118 127 -86 -12 -100 132 -55 -54 84 -78 11 22 -116 -139 -136 12 81 92 -134 22 140 -35 31 124 61 123 36 88 15 -137 -69 -53 -62 -143 12 24 72 -47 115 150 54 0 112 -117 -55 79 -71 94 148 58 -117 118 149 93 -135 -103 -26 -130 82 -9 -105 -69 -65 -4 -41 79 134 -28 98 -94 120 80 98 -121 16 24 134 -147 -43 103 -49 0 39 -99 -90 24 -146 113 -35 41 -55 -69 93 -141 -29 -109 -98 -62 -108 102 -94 -12 46 34 -92 41 96 -61 -106 131 -13 -7 -36 -39 -25 3: 74 -8 0 -2 17 0 -32 125 -74 -129 -150 5 102 -57 113 52 -84 -112 -28 35 -76 -20 0 45 2 119 -22 43 65 -68 -138 -44 -115 60 -15 -83 4 -137 -100 -68 -26 -129 -82 119 -3 124 120 -49 -3 100 144 38 85 96 119 131 -99 -115 -127 72 -149 -78 -9 83 -18 47 -49 73 -47 3 -77 -39 144 -106 135 -35 -33 -11 -95 75 -105 -39 65 55 53 110 16 -47 -97 -91 -48 9 100 126 28 -125 -56 34 -122 -40 129 43 39 42 -10 104 -111 3 -148 91 -8 -72 -9 41 41 66 -41 -88 80 -99 -87 93 73 -89 -106 -93 142 120 97 -128 -78 -91 -120 30 -89 142 -95 -116 -103 -23 73 -75 111 -79 46 63 56 131 -107 100 4: -46 104 2 0 25 -115 -26 148 4 -65 -78 -61 94 -3 -143 -37 -126 -90 110 -76 58 142 146 68 -136 67 -72 -104 90 14 48 -108 90 95 28 -23 -105 29 -55 60 -11 71 -88 115 131 8 -80 71 -75 -68 69 -29 97 -59 -84 -76 141 91 -78 -7 4 35 126 -102 -83 -138 -139 139 9 27 -64 126 107 138 -52 58 44 -90 -14 -15 -85 136 -97 -64 -130 23 -83 -130 19 -25 -121 -37 -32 78 -114 -109 -137 13 -5 51 63 120 -150 116 146 -125 -35 -84 28 -81 -88 73 -4 -79 -77 79 -25 55 55 -42 117 43 33 -27 88 124 32 133 -118 50 2 -101 66 -17 -55 -32 -105 -104 150 135 -104 -30 117 -21 -3 -88 8 -132 -108 -110 5: 106 87 -17 -25 0 23 64 -19 -81 -44 103 139 82 0 -132 -57 -150 -19 100 -94 -40 15 12 130 104 53 96 -110 54 43 -112 116 -51 -106 87 -118 -27 65 -42 122 8 122 -19 -30 67 -95 -51 -104 -98 -75 22 -107 71 -35 -25 150 61 -44 -70 -82 91 8 -113 -103 -119 -74 -25 -5 15 62 -122 -87 123 36 141 -58 -128 34 -34 35 141 -74 -1 -90 64 16 20 -116 59 66 70 -117 83 2 130 -74 -118 -102 82 133 -149 85 42 -87 -43 -9 32 141 -17 -47 -67 -114 -95 7 120 105 -102 15 134 128 109 5 148 0 15 -88 -41 68 -103 -54 0 -52 -61 106 148 -79 4 6 74 -36 -86 145 35 -16 8 34 66 -109 49 4 6: -50 -66 0 115 -23 0 -37 -38 -27 -110 -47 43 -70 -116 -117 -26 140 6 67 -88 2 120 77 -50 15 135 79 0 -105 -95 26 -103 137 147 48 131 128 -139 -111 39 148 102 72 -73 104 -36 -51 -47 136 0 -5 30 25 58 147 -126 -54 -129 -91 -79 4 -81 127 -92 49 51 139 41 -98 -101 129 76 -84 -129 -141 115 84 -135 -106 -113 38 -78 -57 59 -8 69 63 111 95 122 38 -72 50 55 -135 69 10 120 -15 99 24 -106 122 11 -74 -34 -101 64 61 -99 -11 23 77 -15 -69 -110 -56 -72 125 -8 -60 117 -36 -64 3 -93 142 -20 103 70 56 -136 -120 -82 80 -132 -144 -121 -36 -12 -43 132 138 -29 -55 26 41 -45 -119 63 7: -129 -124 32 26 -64 37 0 -107 -56 131 -1 62 39 -33 -40 -30 -135 -1 82 34 -22 1 36 -149 86 -16 -120 -70 -70 139 101 -69 121 -148 143 18 50 94 -27 -133 -144 143 -80 113 -15 61 -38 6 21 -6 -52 -28 21 8 -72 -73 -60 -56 148 -91 76 -30 -101 40 52 135 13 111 -135 -82 -143 62 10 -31 69 139 -73 -98 -89 -7 -55 85 105 -70 -29 -37 -95 -98 115 -107 -29 135 126 -69 -69 141 95 42 150 84 7 -95 -41 -67 -6 0 -98 -118 75 75 -75 -46 -18 114 50 21 -82 -20 -68 43 49 -1 -52 40 -114 -82 41 -131 69 -58 130 96 93 5 -67 -80 -55 35 -71 -13 -48 33 108 -80 -57 149 27 21 14 -60 8: -92 141 -125 -148 19 38 107 0 -110 134 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127 53 146: 56 13 61 111 109 135 134 76 121 14 65 111 45 67 73 27 60 146 80 112 37 62 74 34 133 148 99 115 104 84 125 135 55 79 78 33 99 83 3 17 0 106 2 83 51 102 85 66 3 34 124 140 124 11 27 123 21 131 131 9 137 128 140 16 101 142 131 99 89 122 138 108 13 76 16 20 20 119 27 19 93 1 89 40 117 1 134 68 51 62 7 144 88 29 65 92 144 34 75 142 121 127 115 60 17 137 146 14 142 20 74 92 137 134 113 92 129 137 131 13 19 10 140 27 70 148 25 16 66 139 50 12 47 18 5 55 46 122 53 110 3 6 3 87 60 0 15 100 57 44 147: 52 143 71 144 105 112 110 43 33 142 20 105 70 138 2 139 44 95 55 26 140 3 59 62 99 10 36 31 45 113 88 99 90 150 107 135 70 67 39 14 137 8 141 65 75 43 70 59 147 124 42 3 53 74 119 3 52 104 42 133 84 46 86 12 114 68 37 142 15 71 47 106 61 134 91 43 37 119 88 17 32 22 41 81 9 135 64 142 50 147 78 60 26 94 25 130 87 42 29 135 19 35 136 16 104 11 123 64 110 86 108 45 95 53 124 46 66 99 12 116 89 60 19 58 7 36 126 23 44 94 92 17 112 23 12 14 124 1 13 27 66 50 104 80 118 32 0 124 56 101 148: 137 64 55 71 127 15 86 93 24 94 120 41 36 105 146 110 40 144 74 81 121 111 147 29 139 110 106 148 31 36 41 131 41 66 70 132 39 149 142 64 94 54 149 18 103 82 149 107 107 4 107 123 15 22 16 65 78 46 24 79 141 20 38 3 31 103 83 95 37 104 15 123 67 143 58 17 36 28 121 66 130 111 124 88 139 145 46 0 39 2 132 38 48 105 124 76 127 85 24 102 98 105 142 50 62 91 142 55 46 26 142 122 97 30 28 43 25 136 133 120 28 9 80 72 145 2 116 49 20 140 122 80 28 30 28 92 90 146 101 128 37 118 90 104 13 102 30 0 137 104 149: 35 83 136 46 74 83 16 110 1 62 129 65 110 131 82 85 39 78 145 17 144 133 15 131 107 38 118 83 44 104 105 136 63 110 54 118 110 126 89 128 40 143 70 69 104 34 118 46 150 29 25 76 35 77 99 113 120 96 20 65 120 89 53 82 81 33 114 135 98 143 91 114 89 107 80 87 35 135 4 71 29 137 1 142 6 49 4 107 84 103 88 143 54 93 30 81 51 70 84 19 43 145 48 107 2 84 36 61 112 142 46 147 37 3 114 48 48 133 89 127 149 3 75 59 42 5 142 101 12 54 18 52 47 57 74 51 140 41 142 91 64 5 10 23 73 34 116 10 0 108 150: 96 90 99 32 90 132 10 71 2 93 22 89 71 21 39 90 88 41 103 115 40 8 142 143 150 92 13 28 43 102 79 4 11 30 135 72 85 17 124 65 126 11 30 147 102 141 34 9 35 33 98 110 54 57 140 33 42 72 139 148 116 30 91 43 0 62 110 4 121 51 135 74 55 20 46 95 8 85 55 35 116 119 91 67 103 141 0 121 119 54 75 26 86 133 53 21 111 13 134 94 66 107 39 85 15 14 62 111 141 11 46 93 14 67 69 13 12 100 1 105 71 53 142 80 146 70 5 37 150 21 140 8 58 50 14 135 91 121 50 63 28 113 113 122 48 113 55 72 140 0

Table M-10: p_16cri Node Data

non-depot nodes: 199

Node ID	x	y	demand	service time
0	35	35	-	-
1	41	49	10	10
2	35	17	7	10
3	55	45	13	10
4	55	20	19	10
5	15	30	26	10
6	25	30	3	10
7	20	50	5	10
8	10	43	9	10
9	55	60	16	10
10	30	60	16	10
11	20	65	12	10
12	50	35	19	10
13	30	25	23	10
14	15	10	20	10
15	30	5	8	10
16	10	20	19	10
17	5	30	2	10
18	20	40	12	10
19	15	60	17	10
20	45	65	9	10
21	45	20	11	10
22	45	10	18	10
23	55	5	29	10
24	65	35	3	10
25	65	20	6	10
26	45	30	17	10
27	35	40	16	10
28	41	37	16	10
29	64	42	9	10
30	40	60	21	10
31	31	52	27	10
32	35	69	23	10
33	53	52	11	10
34	65	55	14	10
35	63	65	8	10
36	2	60	5	10
37	20	20	8	10
38	5	5	16	10
39	60	12	31	10
40	40	25	9	10
41	42	7	5	10
42	24	12	5	10
43	23	3	7	10
44	11	14	18	10
45	6	38	16	10
46	2	48	1	10
47	8	56	27	10
48	13	52	36	10
49	6	68	30	10
50	47	47	13	10
51	49	58	10	10
52	27	43	9	10
53	37	31	14	10
54	57	29	18	10
55	63	23	2	10
56	53	12	6	10
57	32	12	7	10
58	36	26	18	10
59	21	24	28	10
60	17	34	3	10
61	12	24	13	10
62	24	58	19	10
63	27	69	10	10
64	15	77	9	10
65	62	77	20	10
66	49	73	25	10
67	67	5	25	10
68	56	39	36	10
69	37	47	6	10
70	37	56	5	10
71	57	68	15	10
72	47	16	25	10
73	44	17	9	10
74	46	13	8	10
75	49	11	18	10
76	49	42	13	10
77	53	43	14	10
78	61	52	3	10
79	57	48	23	10
80	56	37	6	10
81	55	54	26	10
82	15	47	16	10

Node ID	x	y	demand	service time
83	14	37	11	10
84	11	31	7	10
85	16	22	41	10
86	4	18	35	10
87	28	18	26	10
88	26	52	9	10
89	26	35	15	10
90	31	67	3	10
91	15	19	1	10
92	22	22	2	10
93	18	24	22	10
94	26	27	27	10
95	25	24	20	10
96	22	27	11	10
97	25	21	12	10
98	19	21	10	10
99	20	26	9	10
100	18	18	17	10
101	37	52	7	10
102	49	49	30	10
103	52	64	16	10
104	20	26	9	10
105	40	30	21	10
106	21	47	15	10
107	17	63	19	10
108	31	62	23	10
109	52	33	11	10
110	51	21	5	10
111	42	41	19	10
112	31	32	29	10
113	5	25	23	10
114	12	42	21	10
115	36	16	10	10
116	52	41	15	10
117	27	23	3	10
118	17	33	41	10
119	13	13	9	10
120	57	58	28	10
121	62	42	8	10
122	42	57	8	10
123	16	57	16	10
124	8	52	10	10
125	7	38	28	10

Node ID	x	y	demand	service time
126	27	68	7	10
127	30	48	15	10
128	43	67	14	10
129	58	48	6	10
130	58	27	19	10
131	37	69	11	10
132	38	46	12	10
133	46	10	23	10
134	61	33	26	10
135	62	63	17	10
136	63	69	6	10
137	32	22	9	10
138	45	35	15	10
139	59	15	14	10
140	5	6	7	10
141	10	17	27	10
142	21	10	13	10
143	5	64	11	10
144	30	15	16	10
145	39	10	10	10
146	32	39	5	10
147	25	32	25	10
148	25	55	17	10
149	48	28	18	10
150	56	37	10	10
151	22	22	18	10
152	36	26	26	10
153	21	45	11	10
154	45	35	30	10
155	55	20	21	10
156	33	34	19	10
157	50	50	15	10
158	55	45	16	10
159	26	59	29	10
160	40	66	26	10
161	55	65	37	10
162	35	51	16	10
163	62	35	12	10
164	62	57	31	10
165	62	24	8	10
166	21	36	19	10
167	33	44	20	10
168	9	56	13	10

Node ID	x	y	demand	service time
169	62	48	15	10
170	66	14	22	10
171	44	13	28	10
172	26	13	12	10
173	11	28	6	10
174	7	43	27	10
175	17	64	14	10
176	41	46	18	10
177	55	34	17	10
178	35	16	29	10
179	52	26	13	10
180	43	26	22	10
181	31	76	25	10
182	22	53	28	10
183	26	29	27	10
184	50	40	19	10
185	55	50	10	10
186	54	10	12	10
187	60	15	14	10
188	47	66	24	10
189	30	60	16	10
190	30	50	33	10
191	12	17	15	10
192	15	14	11	10
193	16	19	18	10
194	21	48	17	10
195	50	30	21	10
196	51	42	27	10
197	50	15	19	10
198	48	21	20	10
199	12	38	5	10

p16 Inverse P matrix

1: 0 -155 -98 61 -140 66 172 122 -101 -55 87 -62 -133 -17 -76 195 132 -171 -35 -111 -166 -63 -50 -150 0 66 39 170 137 50 57 -14 172 -59 189 136 -143 192 20 -90 83 -57 -64 -21 -127 56 136 155 -78 -72 -20 -30 69 -124 88 138 70 -152 -43 105 74 -92 98 195 60 192 170 174 -159 3 -71 112 148 46 118 -99 -64 47 121 -30 63 165 194 -117 -112 43 175 52 -107 24 -71 132 50 113 16 -50 -106 -110 -48 132 154 84 192 -78 130 95 -135 -87 -33 189 187 -46 -154 100 76 35 -127 -85 -140 43 148 50 -54 -77 23 -84 -170 37 15 149 113 135 -29 -92 -168 -97 51 197 -71 -6 -59 -89 -92 166 -145 -73 24 99 197 -140 11 -137 -115 88 164 -187 -12 -199 -32 -22 143 3 -141 142 49 -26 -47 -141 -148 -177 49 -130 148 -32 -114 87 -15 98 188 117 21 -35 -135 -157 168 -114 -17 -132 175 -73 -72 111 -104 15 29 -154 -184 -180 17 2: 155 0 107 122 -177 30 186 -46 41 164 81 163 48 117 20 -182 -91 -71 -82 -189 17 32 96 -62 153 199 71 0 149 -156 -73 104 -94 125 196 77 -156 156 197 123 -179 -137 -35 -172 109 -13 -139 -92 -86 -5 -55 105 177 -37 130 -125 159 106 130 -161 22 32 178 -195 -57 137 -65 0 52 -131 -120 32 -193 150 -46 54 -73 -92 123 -187 -38 -144 -131 -83 -144 135 -125 -16 61 46 -122 54 127 -81 -140 174 -18 -9 -48 -51 -33 -2 22 1 -42 165 -98 -170 -199 7 135 -75 150 69 -112 -148 -37 46 -100 -26 -1 59 2 158 -29 58 86 -91 -183 -58 -153 80 -20 -110 6 -182 -133 -91 -34 -171 -109 158 -4 165 159 -65 -4 133 191 50 112 128 158 173 -131 -153 -169 95 -198 -103 -12 110 -24 63 -65 97 -63 4 -103 -51 191 -140 179 -46 -44 -15 -126 99 -140 -52 86 74 71 146 21 -62 -128 -120 -63 12 132 168 37 -166 -74 45 -162 -54 171 3: 98 -107 0 57 52 56 -13 138 -147 4 -196 120 -11 -96 -13 55 54 88 -55 -116 106 -131 -115 123 97 -118 -140 -123 189 159 129 -170 -104 -120 -159 40 -118 188 -126 -154 -136 -30 97 -99 147 -105 61 83 75 174 -142 132 33 -153 -35 197 5 -86 -104 -81 124 -4 -189 -49 -168 -119 145 -101 77 188 194 90 -180 89 -96 -138 119 19 63 -143 120 126 37 -31 -139 39 -73 80 -15 94 -117 153 173 11 -106 94 -99 -90 91 -38 129 -78 -112 -100 188 121 -103 -9 6 46 167 -135 -110 -183 -185 184 12 37 -85 167 142 182 -69 77 59 -120 -19 -20 -113 181 -128 -85 -172 31 -111 -172 25 -33 -160 -49 -43 103 -151 -144 -181 18 -7 68 84 159 -198 154 194 -166 -46 -111 37 -107 -116 96 -5 -105 -102 105 -33 73 73 -55 155 57 44 -36 117 164 43 176 -157 66 3 -134 88 -23 -72 -42 -139 -139 198 179 -137 -39 156 -28 -4 -117 11 -175 -143 -146 30 4: -61 -122 -57 0 85 -26 -107 -59 137 184 109 1 -175 -75 -199 -25 133 -124 -53 20 16 172 138 70 128 -146 72 57 -148 154 -68 -141 116 -157 -36 87 -55 162 11 162 -25 -40 89 -125 -68 -138 -130 -99 29 -141 95 -46 -33 199 81 -59 -93 -109 120 11 -149 -137 -157 -98 -34 -7 21 83 -161 -116 163 48 187 -77 -170 45 -45 46 186 -99 -2 -120 85 22 27 -154 78 87 92 -155 110 3 172 -98 -156 -135 108 177 -197 112 55 -116 -58 -12 43 187 -23 -62 -89 -151 -126 9 159 140 -135 20 177 170 145 7 196 1 20 -117 -54 90 -137 -71 0 -69 -81 140 196 -105 6 8 98 -48 -114 192 47 -21 11 46 88 -144 65 6 -49 -50 -36 -146 -62 57 -93 -153 -155 -34 185 8 89 -117 3 159 102 -67 20 179 104 0 -139 -126 35 -137 182 195 64 174 170 -184 -147 52 196 135 95 -97 138 -48 -68 -63 181 0 -7 39 33 77 194 -167 -72 5: 140 177 -52 -85 0 -171 -121 -104 5 -107 168 -122 66 68 185 54 -130 -133 171 101 -112 -171 -187 152 111 -179 -140 -150 50 -103 -75 78 -10 92 84 147 125 161 50 -95 66 73 -179 92 13 159 -20 132 32 -140 162 15 -98 -46 -134 85 81 -132 -14 31 102 -20 -92 -146 -74 -95 165 -11 -80 0 155 -48 -84 4 -124 188 -27 136 93 74 -180 -159 -108 106 -175 -191 -160 -48 -16 -57 175 183 -39 -72 35 54 -60 -158 84 -142 -75 173 -1 83 51 -44 -53 -40 -179 -1 108 45 -29 2 47 -198 114 -22 -158 -93 -93 185 135 -92 160 -196 190 24 66 125 -35 -176 -191 189 -106 150 -20 80 -51 8 28 -9 -69 -37 29 11 -95 -97 -79 -75 196 -121 101 -39 -134 53 69 179 18 147 -179 -108 -189 82 14 -41 92 185 -96 -129 -118 -9 -74 113 139 -92 -38 -49 -126 -130 152 -142 -38 178 167 -91 -92 187 126 55 199 112 10 -126 -54 -88 -8 0 -130 -156 6: -66 -30 -56 26 171 0 100 99 -99 -61 -23 151 66 28 -108 -27 -90 57 66 -2 -69 53 -152 -109 55 -174 92 -77 172 127 123 7 -89 -107 -72 46 -95 -17 -64 44 143 -106 -75 197 36 28 18 -79 -146 177 83 -182 -108 -129 142 37 -61 -10 -143 -108 25 21 -101 -135 -81 162 -44 27 -166 -95 14 -137 3 -36 -156 -67 -145 -156 103 156 2 -40 182 -132 163 130 198 -67 -151 -148 139 -94 166 -129 188 102 61 167 65 -13 -24 -90 -117 104 -167 -156 -58 175 34 20 -99 -42 37 -91 93 137 -174 82 190 -116 160 -67 -103 -119 -134 -8 -48 143 -197 -89 -152 159 4 -79 -168 -188 -5 166 95 198 3 -4 152 -39 -70 -44 -191 18 123 176 -58 -69 165 -13 79 29 -7 -35 -113 144 -60 -136 -53 -109 -16 -34 199 -167 33 -64 -70 28 191 21 -128 130 174 -154 79 -76 23 170 -14 162 -179 -23 -157 -34 -60 -82 -25 150 11 -26 62 150 5 120 -92 7: -172 -186 13 107 121 -100 0 3 45 -23 18 -139 -108 98 -71 22 37 182 -68 0 155 -138 -144 -139 -116 -34 173 -186 -106 -143 -38 -22 7 -102 -82 -21 -5 59 -73 16 61 -165 137 1 34 -187 110 -163 156 117 -99 199 -176 -167 6 -152 -17 133 80 45 83 114 -60 107 44 65 -78 112 150 -179 -50 -186 87 96 -197 142 -161 -125 -105 -105 1 -39 188 166 148 -13 184 -191 24 -56 -114 140 -194 -14 56 -191 23 0 -80 -191 -11 80 -141 162 -181 99 197 174 -58 -25 -22 -86 -95 -11 6 103 -98 196 -21 -147 -117 1 -82 50 -176 -80 173 -128 -191 -167 -157 156 187 -32 186 153 -172 92 -82 137 -53 190 197 166 -119 -152 -4 -110 99 60 -161 -22 19 -107 32 -174 121 -126 -75 -52 9 116 -138 -78 -143 4 95 81 100 42 65 37 -116 -28 -103 -75 135 -151 -193 -56 101 -73 -154 -123 93 89 76 -128 -194 36 -42 125 124 198 135 160 136 -117 -104 8: -122 46 -138 59 104 -99 -3 0 142 56 -83 7 -88 6 149 -44 -63 -44 -97 20 -95 -97 189 125 -1 194 -11 30 140 111 -97 134 116 55 186 -9 -172 35 -42 189 91 -77 148 73 22 -92 -108 -148 14 138 -137 -155 24 -70 47 -87 65 -124 -61 -38 -59 63 176 42 -62 124 118 76 59 -154 98 57 -94 -197 -77 144 38 -138 7 -11 -120 -36 56 -117 41 -17 82 91 -56 -123 122 57 187 -144 -196 140 97 -134 -74 122 -127 141 138 100 199 -2 -82 -136 -12 17 132 -72 -14 -39 137 -177 126 66 89 155 -144 -168 -16 108 161 186 -66 -132 40 -25 -5 -21 117 162 -102 -128 66 -128 -123 183 14 -149 -121 183 58 -69 -30 -38 126 10 -40 -196 95 -27 8 -82 197 24 186 -88 -31 -2 194 125 -123 164 68 77 134 -177 -193 41 -191 -107 13 -127 -104 88 82 -88 -50 28 -15 5 156 39 -87 41 68 -140 164 157 -129 -168 -77 116 -57 126 -172 9: 101 -41 147 -137 -5 99 -45 -142 0 76 -151 15 -30 180 -172 -68 121 -169 -102 90 -9 33 -137 132 38 -178 -191 -147 154 -129 149 57 -106 -94 -11 -157 -68 130 -129 -100 -123 -186 -195 -144 104 108 -97 162 -189 22 17 -167 -188 73 136 -50 -96 159 -173 199 117 136 -31 78 -37 166 44 29 170 118 116 175 -9 109 59 -150 103 -32 -108 97 -70 59 -118 191 31 -131 159 -8 -147 173 -26 77 166 182 -133 178 116 -1 -195 108 92 -189 -126 -146 100 181 -43 -91 -27 -48 -84 104 198 47 -98 2 -188 -135 8 -146 92 170 -173 51 177 144 -37 34 162 -174 -6 106 192 -21 -182 39 42 -158 61 -71 108 0 -41 40 129 -116 -57 -188 12 -44 13 -107 -149 -118 93 130 198 90 -127 -62 84 101 158 138 77 74 186 164 -76 175 109 147 -164 -22 -191 160 -158 -143 52 -90 65 -14 92 154 -149 57 35 0 -118 -188 -117 -117 -36 -61 38 126 91 188 81 10: 55 -164 -4 -184 107 61 23 -56 -76 0 130 -104 73 -109 89 -144 -18 -33 -10 -41 -23 -96 124 -73 -108 -112 40 114 -52 195 -42 108 85 74 -70 62 -19 35 115 -18 -188 173 -78 -89 -75 -6 10 -126 -101 -170 -132 10 23 -17 99 40 -9 -160 -10 62 72 175 29 151 -104 -59 -111 -42 83 36 -90 -16 162 -176 112 -118 7 -29 -24 -194 -71 63 37 -99 -100 151 7 114 184 -158 49 118 122 83 128 109 0 -60 156 198 134 -114 -137 24 79 74 -87 51 155 195 -194 53 57 -144 -107 45 112 81 -124 78 -140 0 -38 -188 -84 121 152 32 0 100 -71 81 68 61 -132 124 -31 198 23 166 -90 -11 141 23 39 -182 -196 -91 155 -137 -60 34 -73 -67 -184 196 31 100 -64 -102 -159 37 150 51 -27 -181 -113 18 -129 -126 -169 3 -107 49 169 158 184 -22 -89 -111 -2 -132 -92 142 107 -25 139 -60 -154 -38 -162 -89 149 178 -85 32 -12 60 -146 11: -87 -81 196 -109 -168 23 -18 83 151 -130 0 196 87 155 -45 95 -151 2 99 -120 179 123 16 -132 -53 47 105 -116 -85 -136 -160 82 191 48 -17 127 101 68 161 -116 147 127 157 60 19 166 31 28 -71 83 -91 20 114 98 54 130 -111 32 -140 105 -149 59 -163 -186 165 187 199 22 -27 -94 -37 14 -94 -78 104 108 158 49 -17 28 163 -94 173 186 37 -83 148 -43 -72 -158 -7 -14 137 186 163 83 -176 -161 127 87 102 107 -160 -80 21 -147 -142 -19 -123 57 -70 -178 -157 -143 -68 -51 41 51 -16 179 169 -156 -21 42 52 1 -92 -58 -116 49 -160 -156 -120 -11 178 -153 -193 44 -137 7 177 194 27 -176 -12 92 84 164 -132 -85 -102 6 12 -8 72 111 175 112 -111 -120 77 -186 148 -35 -25 -106 -163 -24 -134 9 -3 50 -159 111 -80 -47 -14 -147 -123 53 143 -171 -87 -154 85 125 -130 70 18 98 -98 113 31 -152 155 69 -57 190 167 12: 62 -163 -120 -1 122 -151 139 -7 -15 104 -196 0 -77 -158 -115 14 -59 -11 -170 -79 128 39 37 168 -150 183 56 156 83 79 101 188 -35 16 -40 147 -64 -13 -52 -85 149 -60 177 118 -9 63 86 149 -21 -50 161 -192 39 81 -192 -100 146 -86 141 -75 -91 -58 13 -117 195 61 7 -140 168 46 -170 170 -49 -144 133 -179 10 -178 47 -90 155 35 -23 150 170 110 53 144 -125 -46 -36 121 56 -92 -150 1 96 -6 -160 -193 -118 -82 138 85 -3 -194 155 158 46 15 -30 -102 69 -196 186 -34 148 27 160 -5 89 52 -190 142 23 67 87 -105 -156 103 191 -82 -29

25 -149 -23 129 183 98 -68 -161 1 188 -166 165 -183 -118 -72 -154 60 -51 126 -3 -128 50 183 -110 -76 49 169 112 -32 -76 -162 -10 15 151
41 -32 116 -182 -8 -166 79 100 94 32 90 176 -29 129 -130 159 120 181 -150 39 104 5 150 -81 -64 136 32 -141 0 -152 140 154 13: 133 -48
11 175 -66 -66 108 88 30 -73 -87 77 0 71 -119 45 189 -181 -117 161 -196 -173 -135 -10 26 -181 28 -174 -5 138 180 49 -13 92 33 -144 21 -12
88 197 6 25 76 -161 89 -173 12 38 4 110 -38 -101 54 102 165 168 -29 40 64 115 155 80 -6 27 -114 -12 139 94 -114 56 187 -78 41 -88 -18
63 145 198 6 14 86 61 -21 -68 -90 -27 -186 143 -155 -69 -198 64 -15 -6 176 -122 -164 185 137 -64 -153 47 193 -186 44 -181 150 143 4 38
-140 4 -196 -5 -124 -95 -82 140 -162 155 70 175 103 54 17 38 -107 22 177 -109 62 -60 -22 180 -25 29 -107 168 156 -145 -189 120 -179 -67
-116 -77 140 -168 -6 58 48 96 69 -181 -186 65 -28 35 -39 77 30 94 -137 -188 -2 127 185 -176 -139 77 -100 128 -167 183 90 -196 46 116 -69
-114 91 105 118 -59 16 -185 89 141 129 149 91 -10 43 -64 43 -6 -135 181 126 14: 17 -117 96 75 -68 -28 -98 -6 -180 109 -155 158 -71 0 -187
120 -145 150 -4 83 -164 64 -138 160 33 -166 6 144 85 191 -60 84 104 -96 -116 -118 153 -195 -7 -146 -95 185 -9 63 157 199 -92 -149 63 -113
-73 -163 -38 54 148 67 123 -29 162 192 -197 73 -100 -66 -164 92 -131 97 -185 -95 122 110 -25 8 66 12 -1 -96 120 170 111 27 29 134 -6 -141
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-93 -173 108 22 55 -49 -6 182 126 182 -158 67 -111 149 183 111 -182 -198 -13 56 -26 98 127 144 188 152 -123 -42 -62 -95 -2 123 -9 46 -63
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140 -2 157 -163 14 15 -99 143 -28 -79 71 161 -103 55 -176 162 187 130 179 90 -13 -73 153 161 -55 169 -7 100 118 -85 1 163 57 -105 -124
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-158 -131 -78 119 14 86 164 -100 120 -35 -172 -144 -102 -28 83 123 92 -54 195 -125 -101 -22 -68 176 -177 -8 93 192 199 -6 51 171 82 -47
10 173 -70 -75 -172 -130 -137 41 32 11 29 -157 19 132 -120 -158 -108 -79 -135 -104 -114 125 101 -99 16 17: -132 91 -54 -133 130 90 -37 63
-121 18 151 59 -189 145 -35 30 0 175 -191 -3 139 123 -76 30 -43 -64 -155 -31 28 104 170 163 -21 101 -151 -138 97 149 175 -129 11 91 -146
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21 135 143 148 38 198 13 173 163 32 14 52 2 97 40 55 160 23 40 137 60 51 10 117 24 75 75 69 158 15 61 24 19 78 99 53 106 174 106 144
65 4 124 125 97 143 169 139 112 44 119 141 109 91 8 176 33 163 141 139 198 111 150 138 13 54 119 30 174 154 28 15 6 166 191 155 198
140 73 101 116 183 153 110 94 57 14 197 118 72 51 103 152 162 84 56 76 63 44 47 168 58 64 94 78 115 51 195 104 182 79 167 30 121
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101 134 36 106 166 61 138 114 5 55 176 174 181 0 69 129 38 11 71 67 2 41 192: 168 184 161 99 184 157 148 48 43 17 106 149 81 60 59
64 110 71 156 181 47 154 134 97 107 8 71 40 92 58 45 91 134 149 140 7 97 12 13 143 70 72 195 64 150 78 75 27 196 5 177 135 9 162 131
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26 45 144 130 166 51 25 132 70 51 54 27 59 3 119 176 63 56 167 25 167 15 7 154 189 160 168 76 78 42 37 119 7 156 98 82 173 196 187
39 187 153 29 2 147 48 67 69 132 73 112 75 106 11 108 144 13 0 13 111 156 88 135 183 141 163 168 133 2 184 114 108 173 32 118 74
186 91 32 54 5 8 152 166 20 33 158 79 77 25 54 123 8 110 182 116 50 16 0 174 22 175 22 102 72 113 193: 34 25 15 193 109 160 138 162
100 66 27 172 31 143 80 104 102 18 61 40 20 190 15 113 13 92 6 193 28 9 134 135 134 80 27 25 90 91 125 115 10 99 67 188 141 27 78 79
146 155 128 158 129 180 187 117 23 35 89 127 126 0 114 14 148 57 133 106 133 194 57 104 144 48 77 73 30 94 176 163 115 68 62 23 44
85 37 89 55 66 73 186 130 0 81 167 116 12 125 139 181 179 58 108 1 183 127 154 171 98 117 84 104 21 51 40 10 139 73 139 119 117 25
54 199 129 74 139 121 86 90 71 194 119 122 124 46 173 8 61 73 5 111 41 116 22 185 108 92 45 190 179 52 76 185 34 161 4 185 196 181
135 149 94 37 43 77 83 188 154 148 121 33 12 60 116 59 100 0 172 1 0 174 113 63 101 85 41 185 150 162 155 0 105 149 3 178 2 106 194:
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157 77 128 168 156 171 63 153 115 115 44 84 21 80 53 126 92 60 96 88 53 132 113 128 49 65 163 152 70 18 143 173 85 134 26 123 176

29 180 123 12 118 17 185 131 32 129 82 153 142 89 104 85 35 188 116 140 129 130 84 154 198 8 163 25 34 66 88 133 173 188 122 81 191
149 20 74 118 185 121 144 194 100 116 183 163 105 23 179 109 64 123 151 26 55 14 175 185 155 21 168 32 177 6 45 132 33 153 176 67
174 121 73 155 105 119 42 191 2 129 69 102 132 191 78 66 144 175 167 18 160 75 110 41 37 31 136 169 65 131 0 28 155 37 150 97 192
137 81 87 36 176 22 39 58 91 24 0 62 67 126 111 62 195: 15 102 84 94 59 158 181 43 196 181 138 160 148 121 180 33 19 162 58 84 167
8 142 145 137 112 153 107 11 38 143 127 175 124 23 137 12 151 104 110 117 168 7 100 56 72 29 125 16 85 20 123 138 37 11 194 126 175
10 142 74 191 59 105 46 189 149 132 83 134 60 162 91 19 113 197 183 95 138 62 93 33 123 142 186 97 92 156 108 89 189 7 136 50 100
123 42 25 129 140 196 12 88 158 128 106 76 23 199 104 2 110 49 28 178 162 96 198 103 175 168 120 22 182 24 119 29 181 43 2 20 84 13
199 110 21 40 115 146 174 30 40 93 54 111 137 34 180 184 4 50 153 10 180 16 190 101 133 199 56 71 125 125 60 187 129 57 28 12 157
85 84 151 112 170 100 192 115 185 13 125 23 176 51 34 61 169 96 36 184 142 45 4 186 0 44 41 121 57 196: 166 100 162 16 101 30 169 5
145 106 153 3 140 190 37 10 23 61 31 186 21 77 64 1 35 199 152 15 14 153 26 3 37 130 61 93 68 178 7 182 47 103 34 169 111 40 72 3
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124 194 104 77 75 90 121 140 123 105 130 100 139 29 7 100 19 150 33 186 9 187 89 149 76 93 148 184 75 175 106 88 169 170 185 142 2
175 140 179 115 84 110 140 39 74 153 127 160 68 21 155 195 127 47 80 133 11 79 147 76 105 13 185 62 179 129 32 76 71 177 110 97 116
3 155 143 63 122 190 15 73 111 94 152 36 129 49 85 4 126 19 42 16 194 51 145 73 138 46 143 113 193 50 156 8 49 151 136 126 0 21 138
170 197: 57 36 24 77 115 112 91 107 177 104 162 100 26 52 105 12 41 12 64 133 17 94 104 158 141 90 175 124 19 37 106 140 179 165 69
36 64 90 62 174 29 10 15 58 33 157 164 109 10 130 7 166 171 7 138 14 41 175 70 49 165 145 69 5 195 105 9 70 34 34 114 79 25 119 13
155 102 7 52 31 56 175 189 159 190 181 88 172 3 33 96 84 114 98 199 185 167 138 172 152 29 76 110 21 49 85 139 66 36 38 80 46 135
33 78 96 104 145 18 27 62 162 48 4 80 5 199 95 39 87 20 187 196 49 126 29 91 106 133 157 43 195 91 179 45 78 17 126 60 115 111 0 82
26 54 21 18 23 89 148 74 144 53 116 163 72 61 101 185 57 184 113 160 75 29 82 39 23 61 145 167 39 102 176 38 167 30 72 35 31 160 33
126 185 101 62 0 104 80 198: 105 183 106 159 46 101 169 0 158 168 146 30 166 141 188 48 146 47 15 112 104 166 2 45 133 141 25 93
114 3 53 77 8 167 68 183 103 73 89 177 178 149 96 144 16 77 123 27 195 111 68 43 61 3 132 160 195 179 44 47 9 136 23 108 26 20 102
161 195 25 150 91 124 182 63 122 63 110 188 198 193 53 61 87 63 10 56 21 163 76 146 179 143 176 108 68 30 197 187 18 99 69 41 182 8
196 50 45 150 138 15 141 158 188 168 93 170 112 68 49 17 129 171 36 187 59 0 190 177 11 14 2 148 101 106 110 17 108 136 189 78 197
197 40 128 35 142 173 11 139 63 103 1 127 188 22 105 61 121 138 131 88 138 173 18 78 151 136 146 197 16 8 16 21 109 62 127 90 24
181 37 77 25 111 67 21 56 159 115 182 59 118 117 190 25 49 101 0 14 199: 47 117 42 155 43 154 153 1 176 192 194 84 62 27 79 123 85
49 135 121 193 74 42 168 9 58 19 80 131 4 133 172 95 131 87 75 23 79 136 13 85 64 32 192 74 71 38 82 106 99 165 12 156 198 21 40 38
4 96 155 120 55 60 131 158 115 34 78 127 95 53 89 167 2 187 93 184 107 193 86 139 123 16 82 28 94 88 185 149 23 35 196 49 147 178
31 43 108 124 11 142 73 77 86 164 142 27 18 118 48 49 37 76 123 94 91 115 187 21 44 95 192 46 180 73 0 96 89 129 165 139 197 84 178
155 141 11 51 126 101 40 32 85 5 130 14 9 89 38 7 181 74 47 163 130 45 108 27 96 114 188 23 199 191 7 120 161 170 21 71 135 7 136
133 175 25 119 88 26 96 138 186 56 145 141 80 70 133 107 94 66 112 5 116 102 33 142 3 0

Table M-11: Set I Vehicle Data

Instance	P	n	k_{min}	k_{max}	Q	T_{max}
p_03	inverse symmetric	101	1	15	200	200
p_06	inverse symmetric	51	1	10	160	200
p_07	inverse symmetric	76	1	20	140	160
p_08	inverse symmetric	101	1	15	200	230
p_09	inverse symmetric	151	1	10	200	200
p_10	inverse symmetric	200	1	20	200	200
p_13	inverse symmetric	121	1	15	200	720
p_14	inverse symmetric	101	1	10	200	1040
p_15	inverse symmetric	151	1	15	200	200
p_16	inverse symmetric	200	1	15	200	200

Table M-12: Set II Vehicle Data

Instance	P	n	k_{min}	k_{max}	Q	T_{max}
p_03	inverse symmetric	101	1	2,3,4	50,75,100	50,75,100
p_06	inverse symmetric	51	1	2,3,4	50,75,100	50,75,100
p_07	inverse symmetric	76	1	2,3,4	50,75,100	50,75,100
p_08	inverse symmetric	101	1	2,3,4	50,75,100	50,75,100
p_09	inverse symmetric	151	1	2,3,4	50,75,100	50,75,100
p_10	inverse symmetric	200	1	2,3,4	50,75,100	50,75,100
p_13	inverse symmetric	121	1	2,3,4	50,75,100	50,75,100
p_14	inverse symmetric	101	1	2,3,4	50,75,100	50,75,100
p_15	inverse symmetric	151	1	2,3,4	50,75,100	50,75,100
p_16	inverse symmetric	200	1	2,3,4	50,75,100	50,75,100

Table M-11 presents the problem data for the 10 test problems in Set I.

Table M-12 presents the problem data for the 90 test problems in Set II. Each row represents nine different problems. For example, in row 1, instance 3 has three problems for $Q = 2$, three for $Q = 3$, and three for $Q = 4$. For a given Q, one problem sets $k_{max} = 2$, one sets $k_{max} = 3$, and one sets $k_{max} = 4$.

Table M-13 presents the problem data for the 90 test problems in Set III. Each row represents three different problems. For example, in row 1, instance 3 has three problems: one for $k_{max} = 2$, one for $k_{max} = 3$, and one for $k_{max} = 4$.

Table M-14 presents the problem data for the 10 test problems in Set IV. Each problem in this test set has one or a combination of vehicles that can feasibly visit all n nodes in any order.

Table M-13: Set III Vehicle Data

Instance	P	n	k_{min}	k_{max}	Q	T_{max}
p_03	inverse symmetric	101	1	2,3,4	200	200
p_06	inverse symmetric	51	1	2,3,4	160	200
p_07	inverse symmetric	76	1	2,3,4	140	160
p_08	inverse symmetric	101	1	2,3,4	200	230
p_09	inverse symmetric	151	1	2,3,4	200	200
p_10	inverse symmetric	200	1	2,3,4	200	200
p_13	inverse symmetric	121	1	2,3,4	200	720
p_14	inverse symmetric	101	1	2,3,4	200	1040
p_15	inverse symmetric	151	1	2,3,4	200	200
p_16	inverse symmetric	200	1	2,3,4	200	200

Note that the number of vehicles available for use, K, is larger than the maximum number allowed in a solution, k_{max}, in some of the problems.

Table M-14: Set IV Vehicle Data

Instance	P	n	k_{min}	k_{max}	-	-	-
p_03	generalized	101	1	5	-	-	
	Vehicle	**startX**	**startY**	**endX**	**endY**	Q	T_{max}
	1	65.02	56.53	10.00	56.53	900	250
	2	11.00	6.53	45.95	71.37	1500	18000000
	3	50.00	0.00	0.24	23.63	900	250
	4	96.41	88.88	110.55	0.06	900	250
	5	0.09	65.70	43.34	16.76	900	250
p_06	generalized	51	1	2	-	-	-
	1	0.00	0.00	170.00	240.00	850	4500000
	2	60.00	40.00	170.00	240.00	90	52
p_07	generalized	76	1	1	-	-	-
	1	0.00	0.00	0.00	50.00	1400	4500000
p_08	generalized	101	2	3	-	-	-
	1	50.00	50.00	60.00	50.60	1001	4500000
	2	31.00	40.00	31.00	77.71	90	52
	3	50.00	0.00	0.24	23.63	1001	27
	4	96.41	88.88	110.55	0.06	99	250
p_09	generalized	151	3	3	-	-	-
	1	0.00	0.00	0.00	100.00	2250	4500000
	2	0.00	100.00	100.00	100.00	2250	4500000
	3	100.00	100.00	100.00	0.60	2250	4500000
p_10	generalized	200	2	3	-	-	-
	1	65.02	56.53	10.11	56.53	900	220
	2	11.00	6.53	45.95	71.37	75	18000000
	3	50.00	0.00	0.24	23.63	900	27
	4	96.41	88.88	110.55	0.06	99	250
	5	0.09	65.70	43.34	16.76	125	99.963
	6	65.02	56.53	10.05	56.53	150	184
	7	11.00	6.53	45.95	71.37	3200	18000000
	8	50.00	0.00	0.24	23.63	133	133
	9	96.41	88.88	110.55	0.06	15	2500
	10	0.09	65.70	43.34	16.76	49	300
p_13	generalized	121	1	1	-	-	-
	1	0.09	65.70	43.34	16.76	2000	10000000
p_14	generalized	101	1	6	-		-
	1	96.41	88.88	110.55	0.06	99	250
	2	0.09	65.70	110.55	0.06	125	99.963
	3	65.02	56.53	110.55	0.06	150	184
	4	11.00	6.53	110.55	0.06	1900	18000000
	5	50.00	0.00	110.55	0.06	133	133
	6	96.41	88.88	110.55	0.06	15	2500
p_15	generalized	151	1	2	-	-	-
	1	50.00	50.00	50.00	75.00	2250	1000000
	2	50.00	50.00	50.00	25.00	120	333
p_16	generalized	200	1	1	-	-	-
	1	0.00	23.45	56.78	90.12	3200	4500000

Appendix N

CETSP Best Known Solutions

In this appendix, we present the best known solution for each benchmark CETSP problem generated in this dissertation. Solution distances are given in Tables N, N, and N. Some of the solutions do not appear anywhere else in the dissertation. This is because they were found by methods that were still in development and do not, in their current form, produce these results. The solutions are still valuable since they provide a measuring stick for new heuristics for the CETSP.

For each problem, we show two figures and give the values of each node and its representative point. Solution correctness and feasibility may thus be verified by any interested reader. The x, y, and z values for the representative points are referred to in the tables as Solution x, Solution y, and Solution z. The x, y, and z values for $orig(i)$ are referred to as Original x, Original y, and Original z.

One figure overlays the solution tour on the graph of disks or spheres surrounding the original nodes. The other figure overlays the solution tour on the original nodes. The perspective is the same for the two figures except for a few problems where the tour cannot be seen without changing the perspective. Feasibility for each solution is guaranteed to at least 1e-5. That is, the representative point for node i, (x_i, y_i) or (x_i, y_i, z_i), is no more than 1e-5 units outside the disk or sphere surrounding (a_i, b_i) or (a_i, b_i, c_i). For many problems, representative points are feasible to 1e-10.

We note three things regarding solutions and figures. (1) Coordinate values are shown as

they are represented internally by the computer. For example, the number 21.6 may be represented as 21.59999999999999. Similarly, the number 4.01 may be represented as 4.01000000000001. (2) In the solution figures, the x values have been shifted to the right by 110. That is, an x-coordinate of x_k is graphed at $x_k + 110$. (3) In the solution figures, the y values are multiplied by -1. That is, a y-coordinate equal to 10 in the solution is set to -10 in the figure.

Table N-1: Best Known Solutions for 2D, Equal Radius Problems

Name	Euclidean Equal	Manhattan Equal
Overlap ratio: 0.02		
kroD100	159.046169545290	191.422457825805
rat195	158.785192949264	189.177106028661
lin318	2863.36598004197	3339.84591105749
rd400	1033.41434463551	1257.35702126831
pcb442	323.033670745928	366.374721614667
d493	202.793434098298	256.232554880384
dsj1000	935.742954369289	1158.99263736746
Overlap ratio: 0.1		
kroD100	89.6679139369754	98.7090453059581
rat195	68.0830160865114	74.2568924324595
lin318	1408.48207402009	1529.08619604337
rd400	466.101655568714	528.387762291707
pcb442	147.244407358007	167.562949490060
d493	101.734596601034	128.847874969484
dsj1000	376.098819820130	436.594080531301
Overlap ratio: 0.3		
kroD100	58.5412125780523	71.0158795577453
rat195	45.7016510452518	55.8775337121406
lin318	765.964067977045	847.165881190547
rd400	224.838646549811	242.022886637549
pcb442	83.5373318570905	103.755919819867
d493	69.7577297892617	92.4304507350420
dsj1000	199.947838874135	239.701587151810
Varied overlap ratios		
team1_100	307.336816927230	372.743020674967
team2_200	246.682976849579	278.434743491941
team3_300	466.240809631002	558.749535387546
team4_400	680.211272598623	829.178282978774
team5_499	702.822999382501	842.186525659700
team6_500	225.216003044219	260.795357755211
bonus1000	402.469520380874	459.646077232407
rotatingDiamonds1	32.3890198325262	35.5777871569768
rotatingDiamonds2	140.477408784276	192.343062701765
rotatingDiamonds3	380.882333288815	432.342680128384
rotatingDiamonds4	770.660153881788	989.023984102151
rotatingDiamonds5	1510.75230190769	1729.02142956083
bubbles1	349.134774047349	367.888900469635
bubbles2	428.279184936044	447.888930814337
bubbles3	530.733391043906	579.236390195789
bubbles4	829.887763099065	888.957655638539
bubbles5	1062.33508611364	1182.12797722753
bubbles6	1383.13907805680	1451.29802531349
bubbles7	1720.21447115693	1875.59202011935
bubbles8	2101.37331214818	2225.73679576763
bubbles9	2426.27405864549	2658.77766539585
concentricCircles1	53.1579881919424	67.1448768795923
concentricCircles2	153.132174922169	178.980272472889
concentricCircles3	271.075857929619	329.687918259930
concentricCircles4	454.456539837418	556.521116172519
concentricCircles5	645.380504453232	786.411237311941
chaoSingleDep	1039.60998887526	1204.56424992228

Table N-2: Best Known Solutions for 2D, Equal Radius Problems

Name	Euclidean Equal	Manhattan Equal
Overlap ratio: 0.02		
kroD100	202.021168980618	276.934905445295
rat195	291.258370618718	412.131424309341
lin318	3044.26999271690	3700.24136337711
rd400	3218.19754303697	4560.36783774256
pcb442	404.489787351544	532.916826948658
d493	1353.13721382300	1912.72758958798
dsj1000	3147.86523193103	4412.97313791776
Overlap ratio: 0.1		
kroD100	91.6690992015274	109.770472159589
rat195	112.404740757691	149.604383138837
lin318	1443.42667557130	1612.49191724847
rd400	1552.72264650564	2132.77863089705
pcb442	154.809892103611	180.578667734680
d493	665.055515089365	938.433343957503
dsj1000	1021.25154821172	1248.08432019708
Overlap ratio: 0.3		
kroD100	58.9262217579219	71.3755246326367
rat195	47.8893373681168	59.9565101071076
lin318	766.830975029988	851.470925912844
rd400	539.954146564889	656.496039666644
pcb442	83.7221517026943	104.256024181597
d493	335.591924884086	388.731022718210
dsj1000	270.398545673663	341.165844609089
Varied overlap ratios		
team1_100	820.727144233490	1089.15593085414
team2_200	283.237713959944	359.402522787148
team3_300	1484.41053620068	2001.10575971971
team4_400	753.812910893862	961.432573580038
team5_499	1924.52650293003	2705.23502097583
team6_500	236.963611477309	289.806875223691
bonus1000	941.348433677378	1183.18702816547

Table N-3: Best Known Solutions for Arbitrary Radius Problems

Name	2D Euclidean Arbitrary	2D Manhattan Arbitrary	3D Euclidean Arbitrary	3D Manhattan Arbitrary
team1_100	388.536875650000	494.114491902807	907.592849301374	1264.36272114116
team2_200	622.738390069713	780.712504456912	1055.94784213946	1450.35641387472
team3_300	381.828272673962	487.994801797785	1053.38028160140	1382.59776365685
team4_400	1011.77210810529	1231.65447143851	1276.89555880446	1780.79826746153
team5_499	454.327366133730	563.110301116539	840.476647444070	1156.88429407185
team6_500	666.149091405399	781.134182103051	1076.35161980633	1471.97990792047
bonus1000	987.113907029313	1226.39499807866	2689.41319283233	3218.93803460693
kroD100	141.834665853582	174.012676966135	171.567505229782	233.134858225544
rat195	68.2240033373067	82.1999998866636	84.4702017102714	112.777102692755
lin318	2080.57414412218	2505.40647403602	2189.42623422614	2736.78978842239
rd400	1252.37993725512	1544.54093240802	3592.60131589890	5163.83400723664
pcb442	235.187704475920	281.253797370160	258.404209260926	337.196996375827
d493	140.119875334979	179.563210066766	761.065411297479	1065.58489487762
dsj1000	653.128494795868	758.119214942377	2074.84382108725	2303.06864501282

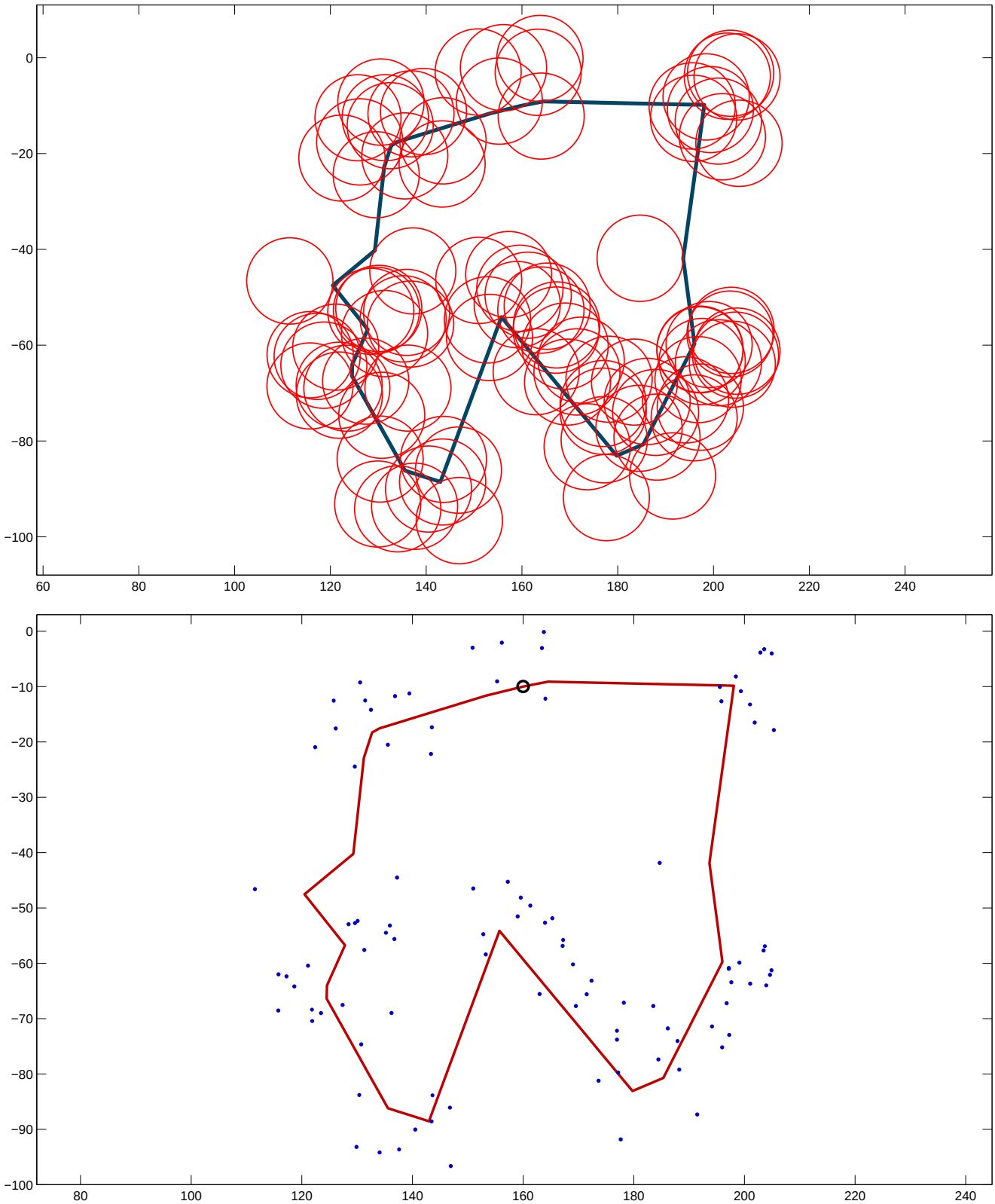


Figure N.1: *team*1_100, Equal Radius, 2D, Euclidean, Length = 307.3368231

Table N-4: Solution for *team*1_100, Equal Radius, 2D, Euclidean

Total distance: 307.336823104563			
Depot: x 50 y 10			
Solution x	Solution y	Original x	Original y
48.7091276842366	10.3174197770801	54.032	12.197
48.7091276842366	10.3174197770801	45.293	9.057
47.1862888357965	10.6918550615339	46.154	2.083
43.2626161599494	11.656586491422	40.868	2.981
33.4877196473926	14.6539501706718	29.447	11.243
28.5337804245935	16.1730185659893	33.341	22.178
28.5337804245935	16.1730185659893	33.5	17.352
28.5337804245935	16.1730185659893	25.542	20.506
28.5337804245935	16.1730185659893	26.839	11.732
28.5337804245935	16.1730185659893	22.494	14.202
24.0488455423924	17.5482482776837	20.541	9.26
23.377558779918	17.9178526977944	21.459	12.53
22.7044133644184	18.2884855253526	15.772	12.549
21.9064559108574	20.7322864995956	19.569	24.449
21.9064559108574	20.7322864995956	16.123	17.568
21.2113230976213	22.8612425289942	12.414	20.962
19.2979391889175	40.2371981594153	27.219	44.51
10.4784614756648	47.5324802077368	1.527	46.599
14.9080551958426	53.1009098692148	19.619	52.734
14.9080551958426	53.1009098692148	18.45	52.954
17.1413137062662	55.9083337199594	25.201	54.507
17.8029757091135	56.7400860814163	26.732	55.612
17.7772720479954	56.7974577612647	25.923	53.185
17.7772720479954	56.7974577612647	20.103	52.347
16.7006836589223	59.2039122954905	21.299	57.593
15.2240207031548	62.5047032853144	11.123	60.442
15.2240207031548	62.5047032853144	7.235	62.367
14.5501422798165	64.0109886998128	5.777	62.003
14.4802557770306	66.3924568560413	5.739	68.535
15.1861696549815	67.6540123220379	11.844	68.394
15.1861696549815	67.6540123220379	8.64100000000001	64.188
18.3127157054183	73.240952125176	26.213	68.977
18.3127157054183	73.240952125176	17.374	67.529
18.3127157054183	73.240952125176	20.735	74.659
18.3127157054183	73.240952125176	13.454	69.007
18.3127157054183	73.240952125176	11.878	70.444
22.4435044877856	80.6234969543563	20.393	83.793
25.5660266758625	86.203856404504	19.881	93.181
27.6881016051742	86.8761409266447	27.59	93.644
27.6881016051742	86.8761409266447	24.053	94.189
30.7045564540813	87.8318303761087	33.443	88.578
30.7045564540813	87.8318303761087	30.503	90.056
32.9718215802139	88.5501883325645	36.924	96.636
35.1713846692825	82.6116044937712	33.626	83.869
35.1713846692825	82.6116044937712	36.762	86.092
42.4713295325741	62.9032399038709	43.243	58.404
44.3489545784922	57.8339525867416	42.804	54.74
45.716614773719	54.1415090299536	47.232	45.27
45.716614773719	54.1415090299536	49.02	51.541
45.7166148704264	54.1415090334369	40.978	46.49
46.5752441340823	55.1744930768958	49.571	48.14
46.5752441340823	55.1744930768958	51.29	49.58
48.5059142061369	57.4970955707492	53.958	52.681
48.5059142061369	57.4970955707492	55.281	51.871
50.928472126675	60.4115798134702	57.243	55.792
52.9885471463721	62.8900067141281	57.142	56.857
52.9885471463721	62.8900067141281	59.007	60.213
55.6042684023103	66.036912154244	52.975	65.56
55.6042684023103	66.036912154244	59.534	67.732
57.7925632799235	68.6695856398708	62.352	63.144
57.7925632799235	68.6695856398708	61.493	65.592
61.2758426056149	72.8602101254456	68.193	67.124
63.3864903613878	75.4000248720371	66.971	72.201
65.6416065209052	78.1136813532016	63.631	81.224
65.6416065209052	78.1136813532016	67.179	79.746
67.3966778879565	80.2255451022289	66.957	73.797
67.3966778879565	80.2255451022289	74.447	77.382
69.7725441958222	83.0845667454594	67.643	91.829
75.3412643613916	80.7307818974927	81.476	87.316
78.1517263956269	75.2080409850572	85.968	75.194
78.9163439222792	73.7054004918176	84.146	71.427
78.9163439222792	73.7054004918176	78.214	79.218
79.816907799083	71.9356541512852	77.919	74.057
80.8148233679944	69.9745983817016	73.523	67.727
80.8148233679944	69.9745983817016	76.154	71.763
83.0926784404863	65.4983931513828	87.18	60.86
83.0926784404863	65.4983931513828	87.173	60.998
83.0926784404863	65.4983931513828	87.633	63.432
83.0926784404863	65.4983931513828	86.785	67.217
83.0926784404863	65.4983931513828	91.043	63.691
83.0926784404863	65.4983931513828	87.252	72.952
85.8732649530719	60.0341322352107	93.946	64.003
85.9656436749887	59.8522891627563	94.619	62.103
85.9943700730581	59.795706442986	89.091	59.886
85.9943700730581	59.795706442986	93.456	57.69
86.0241142110596	59.7371427389541	94.894	61.262
85.5707844944101	56.2875418946468	93.694	56.925
83.6789649086483	41.8909597542871	74.679	41.865
86.9791357122337	17.8567560756539	95.317	17.864
87.5151512929336	13.9526576519876	91.857	16.502
87.5151512929336	13.9526576519876	91.007	13.249
88.0602603934562	9.98259265339237	85.554	10.061
88.0602603934562	9.98259265339237	92.889	3.855
88.0602603934562	9.98259265339237	93.574	3.255
88.0788732636607	9.84697204864346	94.926	4.006
85.8849229063548	9.79908668798687	88.457	8.185
83.1598652277085	9.73962399455034	85.841	12.653
83.1598652277085	9.73962399455034	89.359	10.839
54.5240852116374	9.11499766997367	53.754	0.148
52.6151011857848	9.48840381626802	53.405	3.041

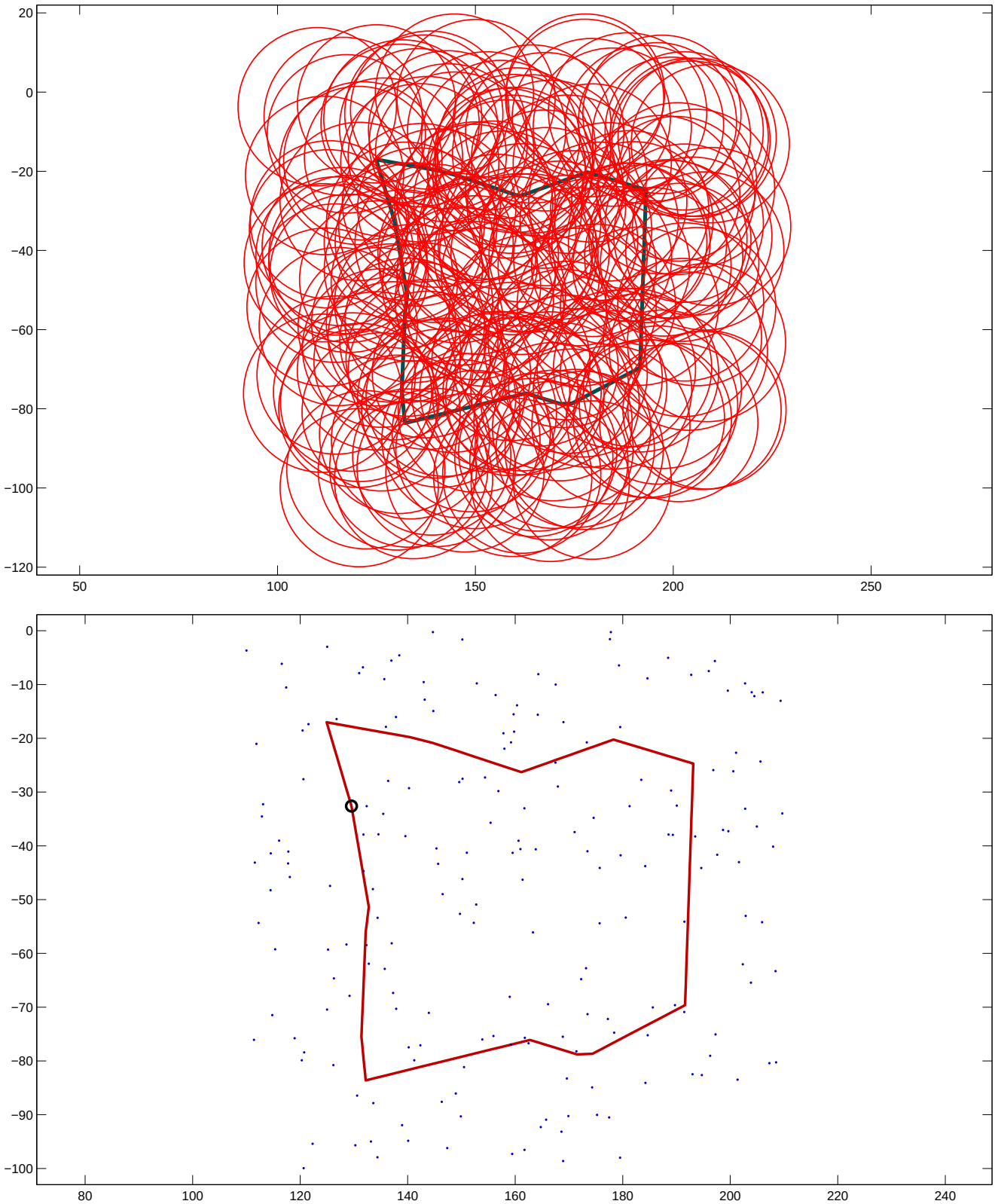


Figure N.2: *team*2_200, Equal Radius, 2D, Euclidean, Length = 246.6829785

Table N-5: Solution for *team*2_200, Equal Radius, 2D, Euclidean

Total distance: 246.68297850082 Depot: x 19.5535 y 32.6157			
Solution x	Solution y	Original x	Original y
19.3987936547306	32.0938138696346	35.347265	40.483415
19.3987936547306	32.0938138696346	7.76846999999999	43.27595
19.3987936547306	32.0938138696346	7.79806000000001	41.063165
19.3987936547306	32.0938138696346	29.577285	38.20107
19.3987936547306	32.0938138696346	21.779985	37.899125
19.3987936547306	32.0938138696346	22.373755	32.6144
19.0898007171109	31.0515095099042	8.071465	45.7971455
18.4981276414313	29.0557263242831	6.09162499999999	39.029145
17.7470283637348	26.5222424558703	2.888575	34.539165
17.7470283637348	26.5222424558703	3.09506	32.271765
16.7785893413504	23.2557026097447	10.613375	27.61233
15.7838467194468	19.9004100338563	1.87583499999999	21.036865
14.9286278240719	17.0156661084657	0.024125	3.6794065
15.8780152378973	17.1857419281788	6.5851	6.152225
17.0197661080679	17.3902723469188	7.39533	10.545265
17.0197661080679	17.3902723469188	11.54701	17.37734
18.4607624453214	17.6484018706345	10.44323	18.54025
18.4607624453214	17.6484018706345	16.776285	16.423415
20.1123959301661	17.9442570107864	27.827995	16.04415
21.5579397655856	18.203198801482	15.031135	2.9821155
21.5579397655856	18.203198801482	21.673354	6.8005655
23.6804957522199	18.5834012236458	26.97316	5.55935
23.6804957522199	18.5834012236458	25.662895	8.989655
25.8253004518536	18.9675850056364	32.973595	9.54291
25.8253004518536	18.9675850056364	20.9699	7.87089
28.0856441084996	19.3724638591133	28.448025	4.56492
30.4838660224923	19.8020440646652	34.695715	0.250565
34.5802343081711	20.8355266697204	40.16046	1.62977
39.1430286853463	22.3395122374705	41.00732	41.27668
39.1430286853463	22.3395122374705	25.954135	17.869355
41.4097158345317	23.0866631197862	40.19826	27.52955
41.4097158345317	23.0866631197862	39.58443	28.150345
43.6342628505523	23.8199230224087	45.420784	35.70231
45.6875596618153	24.4967374082831	57.51838	10.00522
45.6875596618153	24.4967374082831	54.294115	8.069135
45.6875596618153	24.4967374082831	54.207021	15.63022
45.6875596618153	24.4967374082831	50.337118	13.87323
45.6875596618153	24.4967374082831	49.707097	15.54357
45.6875596618153	24.4967374082831	46.358401	11.954405
45.6875596618153	24.4967374082831	42.845635	9.79738
45.6875596618153	24.4967374082831	47.801417	19.06334
45.6875596618153	24.4967374082831	33.169445	12.82499
45.6875596618153	24.4967374082831	34.77264	14.924575
48.7602427242896	25.5095428082302	49.52113	41.29678
51.1558924139687	26.2991893771387	51.37375	46.298003
52.0625003354728	25.9782922378743	51.719243	33.03008
53.0410143208315	25.6319433377115	46.870011	29.816545
53.0410143208315	25.6319433377115	44.38625	27.294685
54.1992759654385	25.2219777460154	50.972003	40.60627
54.1992759654385	25.2219777460154	50.608737	39.047145
55.7573731470968	24.6705013583618	49.216563	20.76273
55.7573731470968	24.6705013583618	47.997827	21.94091
57.561649554832	24.0319098888149	53.824634	40.64213
60.1328619817355	23.1219015419747	64.595135	34.78327
60.1328619817355	23.1219015419747	61.04328	37.44322
63.2023375761143	22.0355242600231	79.01289	29.7258
63.2023375761143	22.0355242600231	73.44882	27.71684
63.2023375761143	22.0355242600231	69.52818	17.90893
63.2023375761143	22.0355242600231	71.273045	32.62062
63.2023375761143	22.0355242600231	63.31789	20.756115
63.2023375761143	22.0355242600231	58.979255	16.987345
63.2023375761143	22.0355242600231	57.48649	24.517395
63.2023375761143	22.0355242600231	57.95186	28.956245
63.2023375761143	22.0355242600231	49.796921	18.777515
65.3716844553634	21.26770713015	69.299455	6.449115
67.0963431446212	20.6573027007081	67.61759	1.570395
68.2765370687301	20.2395901224054	67.794775	0.2453923
71.3146675704628	21.1528436657666	74.60069	8.85595
74.7826303869279	22.1953190125792	82.741185	8.18936
74.7826303869279	22.1953190125792	78.44886	5.02628
78.5880540741914	23.3392535420047	87.144585	5.62369
78.5880540741914	23.3392535420047	86.016245	7.495035
79.9557018568493	23.7503525475361	89.544625	11.14329
81.0996426082285	24.0942350122574	93.997115	11.43328
81.0996426082285	24.0942350122574	92.761655	9.792985
81.8314236026755	24.314193346022	96.04228	11.46233
81.8314236026755	24.314193346022	94.4971	12.154995
82.2816077861032	24.4494956710648	90.572985	26.136825
82.7024362602434	24.5759758400799	91.09643	22.6866
83.1241770999178	24.7027293145716	99.37313	13.042045
83.0267787292918	27.5710394381259	95.62369	24.314785
82.9172785673215	30.7957428685245	99.67714	33.98061
82.9172785673215	30.7957428685245	94.955665	36.40187
82.8380493121076	33.1294505690777	97.982935	40.137435
82.7732014978857	35.0396192891235	91.6164	43.026115
82.7732014978857	35.0396192891235	88.660005	37.051535
82.7194930933359	36.6216767035555	92.788305	33.10169
82.7194930933359	36.6216767035555	89.661665	37.28143
82.6626763943631	38.2953033052816	80.066985	32.520545
82.6626763943631	38.2953033052816	79.319755	37.96047
82.603551865278	40.0368772397162	74.17807	43.76639
82.5414426234194	41.8662877315595	95.92709	54.202926
82.5414426234194	41.8662877315595	92.878595	53.021252
82.5414426234194	41.8662877315595	87.57797	41.66484
82.5414426234194	41.8662877315595	86.845365	25.906095
82.5414426234194	41.8662877315595	84.61874	44.121625
82.5414426234194	41.8662877315595	83.48933	38.25693
82.4877383142865	43.4481207854066	78.52122	37.890255
82.4877383142865	43.4481207854066	69.610075	41.75992
82.4242313186487	45.3184256762935	63.437195	41.00367
82.2614929832396	50.1114812723758	65.705495	54.4013975
82.2614929832396	50.1114812723758	65.72564	44.111465
82.0654939473328	55.8841740846621	70.55475	53.342402
81.8588961333803	61.9697289049226	98.425325	63.29758
81.8588961333803	61.9697289049226	93.854515	65.44994
81.8588961333803	61.9697289049226	92.344515	62.02096
81.8588961333803	61.9697289049226	79.72973	69.6285
81.8588961333803	61.9697289049226	75.60926	70.05143
81.7227603219523	65.9793079178235	81.449	70.90379
81.5990073597763	69.6243044166508	98.53739	80.25874
81.0000426172085	69.9388199850613	97.272905	80.426715
77.9194428646935	71.5564670579637	64.30468	84.91
77.9194428646935	71.5564670579637	81.466395	54.091358
77.1358861067428	71.9679168086937	86.26193	79.048
76.3032363121641	72.4051482479879	82.980165	82.460215
76.3032363121641	72.4051482479879	87.254685	75.06877
75.4450781941346	72.8557712181335	91.37176	83.481715
75.4450781941346	72.8557712181335	84.72455	82.62255
72.6290775135691	74.3344994809363	74.234205	84.088705
72.6290775135691	74.3344994809363	74.635475	75.231085
70.2111733441432	75.6041779154237	62.26967	64.78212
70.2111733441432	75.6041779154237	63.17424	62.764205
67.9041126597758	76.8156501975363	65.23767	90.033385
66.030994614577	77.799251857204	67.48261	90.51293
64.3659632811313	78.6735829595326	69.51155	98.000325
61.51304648433	78.7786132275143	58.9163	98.60932
60.0990478960342	78.3455865063534	58.59379	93.155945
58.7115785426493	77.9207000207572	61.393495	78.21387
57.3925406654531	77.5167775639781	59.88564	90.256965
57.3925406654531	77.5167775639781	55.7501	90.920415
55.9303813579462	77.0690229994171	54.766852	92.295455
55.9303813579462	77.0690229994171	59.609455	83.27302
54.2509391933133	76.5546753472023	68.40623	74.741575
54.2509391933133	76.5546753472023	67.24276	72.18951
54.2509391933133	76.5546753472023	63.457115	71.302795
54.2509391933133	76.5546753472023	58.86286	75.490835
54.2509391933133	76.5546753472023	52.486843	76.711165
54.2509391933133	76.5546753472023	51.801592	75.702955
54.2509391933133	76.5546753472023	49.200624	76.95068
54.2509391933133	76.5546753472023	56.10401	69.44853
54.2509391933133	76.5546753472023	45.96408	75.36881
54.2509391933133	76.5546753472023	48.983044	68.08194
52.7436886850783	76.0931296742658	53.302235	56.10093
49.3570136033797	76.9268813231021	33.93752	71.055425
47.4101717751272	77.4061588514417	40.48646	81.157135
47.4101717751272	77.4061588514417	43.88264	75.9979
45.7483314396754	77.8152686455757	36.34587	87.597465
45.7483314396754	77.8152686455757	38.950185	86.058925
44.5309847136153	78.1149528750157	51.725585	96.536445
44.5309847136153	78.1149528750157	49.437672	97.29667
37.1942772697765	79.9211406624846	37.353615	96.195315
37.1942772697765	79.9211406624846	39.89323	90.309885
31.9075887494079	81.2226370111091	30.09705	94.85711
31.9075887494079	81.2226370111091	28.966505	91.93771

Solution x	Solution y	Original x	Original y
28.2999063381729	82.1108085201346	24.384515	97.907795
25.761562233899	82.735730263116	20.26183	95.676245
25.761562233899	82.735730263116	23.159665	94.99055
23.9325762379365	83.1860216570075	23.602775	87.83846
22.1892160845964	83.6152332719856	10.636965	99.941455
22.0622588098709	82.3209469669405	12.30828	95.415795
21.9005764936454	80.6726550105146	31.22881	79.877355
21.9005764936454	80.6726550105146	16.17437	80.77798
21.7382448847678	79.0177237389616	20.60172	86.45345
21.5660838060627	77.2625756579452	10.302265	79.88844
21.5660838060627	77.2625756579452	10.737535	78.399525
21.3937270007902	75.5053820450291	1.401765	76.07236
21.5381466264676	71.9903038797887	8.96414	75.77293
21.5381466264676	71.9903038797887	4.81189000000001	71.48163
21.6844859363807	68.4285485303831	14.99811	70.439575
21.8304611987288	64.8756416965251	32.35548	77.08328
21.8304611987288	64.8756416965251	30.1948	77.47401
21.8304611987288	64.8756416965251	27.85894	70.297015
21.8304611987288	64.8756416965251	27.294235	67.36467
21.8304611987288	64.8756416965251	19.19225	67.891335
21.8304611987288	64.8756416965251	16.28216	64.658715
21.8304611987288	64.8756416965251	25.726765	62.875185
21.8304611987288	64.8756416965251	22.77816	61.91876
21.8304611987288	64.8756416965251	15.17562	59.299125
21.8304611987288	64.8756416965251	18.601355	58.3359
22.1964506278264	55.9652783350415	2.26291999999999	54.336059
22.4210892585751	54.1331658315914	4.493385	48.2428075
22.5724187806163	52.8992934638684	5.35044999999999	59.245825
22.5724187806163	52.8992934638684	39.724355	52.657318
22.5724187806163	52.8992934638684	27.03592	58.11764
22.5724187806163	52.8992934638684	22.32618	58.45293
22.5724187806163	52.8992934638684	40.184205	46.1874365
22.5724187806163	52.8992934638684	36.49954	48.989475
22.5724187806163	52.8992934638684	24.393135	53.387308
22.5724187806163	52.8992934638684	35.65863	43.345715
22.5724187806163	52.8992934638684	23.528225	48.047471
22.5724187806163	52.8992934638684	15.566305	47.445917
22.5724187806163	52.8992934638684	21.800035	44.699325
22.6668781557833	52.1290984706448	42.291825	54.317701
22.7589060763948	51.3788578874366	42.753335	50.906813
21.7871217899861	45.6902489978266	24.567885	37.86062
21.0530092644276	41.3929544091352	1.56824	43.114435
20.6407928943904	38.9800289588369	4.535275	41.40327
20.2471691445825	36.6759583605944	25.46019	34.06066
19.8693173724074	34.464246389298	30.249755	29.28668
19.8693173724074	34.464246389298	26.379295	27.934205

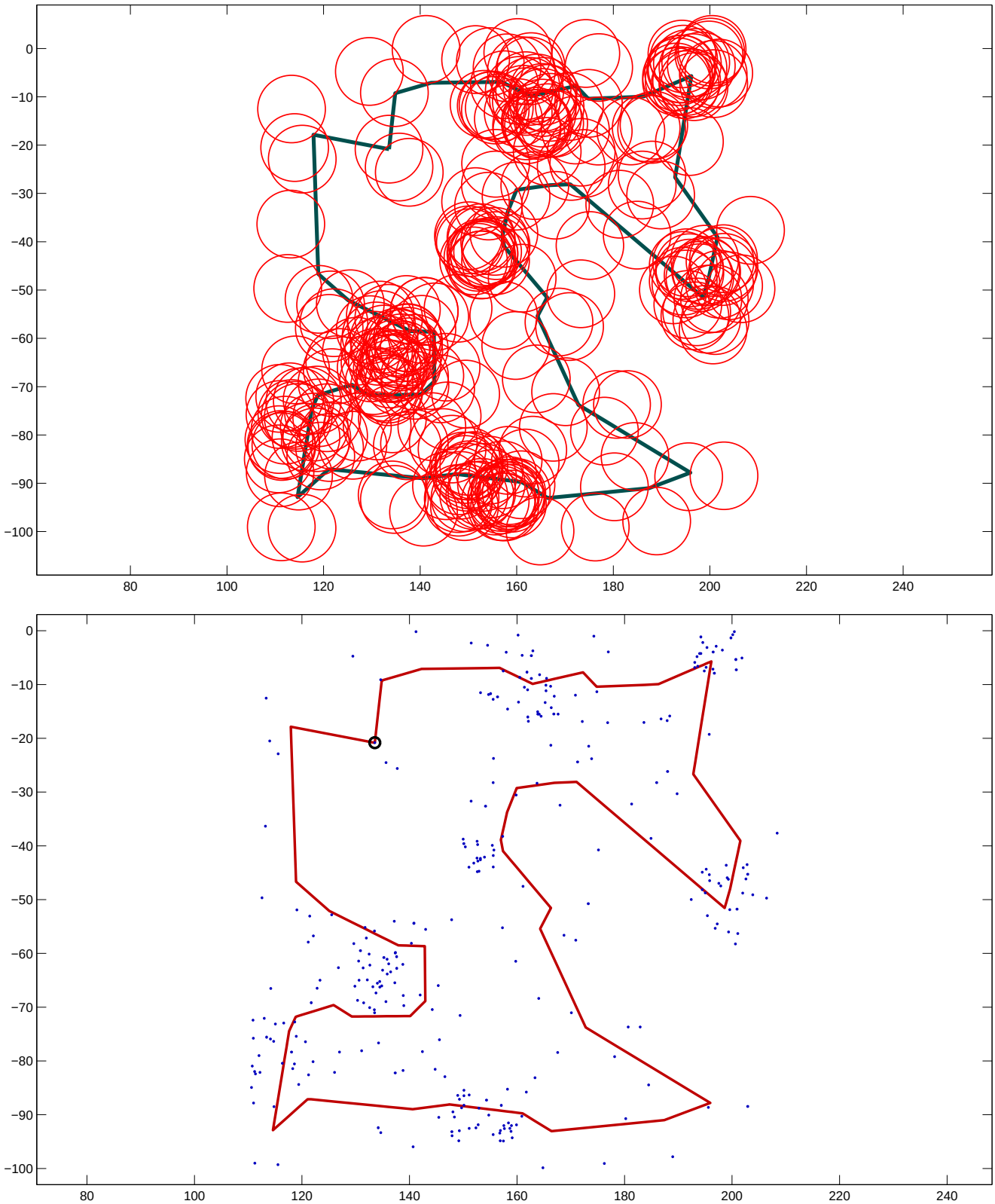


Figure N.3: *team*3_300, Equal Radius, 2D, Euclidean, Length = 466.2408096

Table N-6: Solution for *team*3_300, Equal Radius, 2D, Euclidean

Total distance: 466.240809631002 Depot: x 23.55 y 20.83			
Solution x	Solution y	Original x	Original y
7.91457357578726	17.855625870349	3.36	12.54
8.02205096712271	21.0082035941672	4.01000000000001	20.5
8.1578630576993	24.9918909889142	5.58	22.9
8.53202599240784	35.9667153643173	3.20999999999999	36.35
8.89712447867194	46.6754198698739	2.56999999999999	49.67
10.8184714539825	48.363173153373	9.06999999999999	51.92
12.4809762368762	49.8235546009954	11.46	53.07
13.9091936134568	51.0781331118774	15.54	52.83
15.0823474802645	52.1086581932449	11.18	57.92
15.0823474802645	52.1086581932449	12.14	56.76
19.3435878696116	54.2301363246605	19.65	58.2
21.9767906128397	55.5410830920082	20.56	61.44
21.9767906128397	55.5410830920082	20.88	59.51
23.3419495587566	56.2207327960976	22.51	60.15
24.585464242868	56.8398219111838	21.39	62.71
24.585464242868	56.8398219111838	22.65	62.2
25.9375386494554	57.5129676817435	25.01	63.12
26.9593658931959	58.0216972846457	26.15	61.96
27.918414443313	58.4991721178378	27.28	65.47
27.918414443313	58.4991721178378	25.86	63.85
27.9184159818468	58.499172112504	26.5	63.44
27.9184159818468	58.499172112504	27.64	62.78
27.918417526436	58.4991719300546	30.36	58.14
27.918417526436	58.4991719300546	21.99	57.15
27.918417526436	58.4991719300546	23.5	55.84
27.918417526436	58.4991719300546	21.75	55.19
27.918417526436	58.4991719300546	30.83	54.42
27.918417526436	58.4991719300546	30.85	54.39
27.918417526436	58.4991719300546	27.18	54.04
28.5675317089294	58.5197370802268	25.84	61.09
28.5675317089294	58.5197370802268	25.24	60.77
29.4016040710401	58.5461637695101	27.36	59.94
29.4016040710401	58.5461637695101	27.4	59.84
30.3898045380961	58.5774762534439	28.77	62.05
30.3898045380961	58.5774762534439	27.62	60.61
31.6655744981063	58.6179060729257	33.01	55.55
32.8464228565279	58.6553281053856	37.85	53.76
32.906968940417	64.8285354004378	35.37	65.99
32.9466681467122	68.8761691647422	39.42	71.54
31.6581763169063	70.1513767809306	34.24	70.46
30.1433827252486	71.6505564199317	32.42	78.27
30.1433827252486	71.6505564199317	35.58	76.06
29.0605694078312	71.6596118811573	31.99	67.74
27.5874189080129	71.6719323799735	28.95	69.72
27.5874189080129	71.6719323799735	28.86	67.84
25.7544337583499	71.6872626005801	24.49	66.27
25.7544337583499	71.6872626005801	24.86	66.05
24.5147583776023	71.6976273049368	24.47	65.24
23.2616569354617	71.7081022184324	23.19	66.22
23.2616569354617	71.7081022184324	24.03	65.56
21.6671533379709	71.7214307882309	20.64	65
21.6671533379709	71.7214307882309	22.17	64.94
20.441316802341	71.7316700836141	19.86	66.11
19.2692435328909	71.7414602006924	16.99	78.36
19.2692435328909	71.7414602006924	21.1	78.12
19.2692435328909	71.7414602006924	24.25	76.66
19.2692435328909	71.7414602006924	23.52	71.05
19.2692435328909	71.7414602006924	23.47	70.49
19.2692435328909	71.7414602006924	22.6	70.1
19.2692435328909	71.7414602006924	21.49	69.2
19.2692435328909	71.7414602006924	25.62	68.98
19.2692435328909	71.7414602006924	20.35	68.75
19.2692435328909	71.7414602006924	23.78	67.37
15.8779165707382	69.6103259094147	16.79	62.67
14.4780960122247	70.042918767761	13.36	65
12.9353962456118	70.5196673068996	11.74	69.17
12.9353962456118	70.5196673068996	12.82	66.49
11.2513853666041	71.0400870887603	8.67	72.77
9.93988931146092	71.4453856428275	5.06999999999999	73.15
9.17716708741551	71.681092720524	2.98999999999999	72.09
9.17716708741551	71.681092720524	6.62000000000001	72.96
8.83084699921093	71.7881168749429	4.20999999999999	66.53
7.60741714789188	74.465833627139	0.969999999999999	75.78
7.60741714789188	74.465833627139	0.909999999999997	72.43
7.44170954010016	75.4820466314849	3.44	75.58
7.28493637456572	76.4434666579475	4.15000000000001	75.92
7.28493637456572	76.4434666579475	8.95	75.43
7.11778880169544	77.4685065158227	10.66	76.44
6.9305579287266	78.6167084486626	6.36	80.44
6.9305579287266	78.6167084486626	8.06	78.36
6.75589210397499	79.6878538632868	8.28999999999999	81.45
6.75589210397499	79.6878538632868	4.75	76.37
6.5508690288535	80.9451648449599	2.01000000000001	79.01
6.30866286151442	82.4304975202078	2.19	82.13
6.30866286151442	82.4304975202078	0.760000000000005	80.97
6.03366945151912	84.1168844179989	1.36	82.41
6.03366945151912	84.1168844179989	1.20999999999999	81.97
5.51300306218866	87.3098283916957	1.01000000000001	87.83
5.51300306218866	87.3098283916957	0.620000000000005	84.95
4.60593128511468	92.87236768762	1.24	99.01
4.81848403970267	92.6824542739574	5.54000000000001	99.29
7.08324666919096	90.6589462561418	4.8	88.51
9.46217612121293	88.5334366374065	9.41	84.38
11.0451915777231	87.1190442446162	11.23	82.6
11.0451915777231	87.1190442446162	8.59999999999999	80.56
11.6742119144152	87.1288020717441	12.07	80.14
16.2364215309648	87.5755724180529	16.07	82.14
23.4552306301248	88.2824739086069	24.67	93.34
23.4552306301248	88.2824739086069	24.2	92.42
26.2023643179328	88.5515094479226	27.35	82.24
28.1388289926795	88.7411563285324	28.82	81.78
30.5871592636338	88.9807543580105	30.69	95.98
30.5871592636338	88.9807543580105	35.46	90.5
37.2566761412033	88.1294094255044	39.18	94.86
37.2566761412033	88.1294094255044	37.93	93.92
37.2852033556636	88.1163157179861	39.28	92.99
37.3135776925142	88.1032914416872	37.88	93.16
37.3135776925142	88.1032914416872	38.36	90.43
37.3432862085903	88.0896552744886	38.08	89.48
37.3731400610538	88.0759518668313	42.37	92.45
37.3731400610538	88.0759518668313	41.11	92.55
37.3731400610538	88.0759518668313	42.78	91.87
37.3731400610538	88.0759518668313	42.93	88.78
37.3731400610538	88.0759518668313	39.7	88.73
37.3731400610538	88.0759518668313	44.33	87.3
37.3731400610538	88.0759518668313	40.14	88.25
37.3731400610538	88.0759518668313	39.31	87.14
37.3731400610538	88.0759518668313	41.11	86.33
37.3731400610538	88.0759518668313	40.13	86.48
37.3731400610538	88.0759518668313	38.99	86.42
37.3731400610538	88.0759518668313	40.14	85.47
37.3731400610538	88.0759518668313	36.6	82.94
37.3731400610538	88.0759518668313	34.79	81.57
43.692908978971	88.8485045373687	48.25	85.26
44.8505066636246	88.9900111086124	44.75	90.08
44.8505066636246	88.9900111086124	47.08	88.26
45.8962246030819	89.1178413490031	47.56	92.03
45.8962246030819	89.1178413490031	48.42	91.53
46.7034624725378	89.2165198494834	46.8	93.43
46.7034624725378	89.2165198494834	46.92	92.94
47.4648358525845	89.3095922237122	45.57	93.71
47.4648358525845	89.3095922237122	47.67	92.59
48.2912441980012	89.4106150801156	49.11	94.31
49.0424741382442	89.5024482993722	47.48	94.9
49.0424741382442	89.5024482993722	46.89	94.85
50.0762539791837	89.6288230291735	51.75	85.81
51.0345903503201	89.7459748743816	53.35	83.14
51.7028988154548	90.1581070544266	50.91	90.3
52.3902670812501	90.5819918665962	49.91	91.9
52.3902670812501	90.5819918665962	48.98	92.03
53.1960847657954	91.0789148472282	48.68	92.55
54.2577903825442	91.7336285569882	48.89	93.1
56.4096335325508	93.0605583617371	54.83	99.88
65.5802059203227	92.1650232583075	66.26	99.07
74.606150229848	91.2836014889386	70.23	90.73
74.606150229848	91.2836014889386	74.49	84.46
77.398922941749	91.0108929767157	78.98	97.83
85.9503852379779	87.808461853939	92.92	88.46
83.042585669298	86.0465983232368	85.6	88.65
71.814932801524	79.2436159968584	68.17	79.21
68.8082363032985	77.421827456188	72.93	73.7
68.8082363032985	77.421827456188	70.7	73.7
62.7883746905222	73.7743180474064	57.57	78.44
60.6968207375864	69.2501231963094	60.12	71.05

Solution x	Solution y	Original x	Original y
57.741160486834	62.8568034929326	54.05	68.39
57.741160486834	62.8568034929326	60.94	57.56
57.741160486834	62.8568034929326	58.75	56.63
55.8596635373365	58.7869677035855	49.78	61.48
54.2981868898294	55.4093773442541	47.3	55.25
56.3030274264622	51.5449547227827	63.26	50.77
52.6548754065055	47.2176549522645	51.12	47.54
49.6188270624349	43.6164153386723	45.6	43.93
49.6188270624349	43.6164153386723	45.6	41.81
48.666430181854	42.4867284957882	43.96	42.1
48.666430181854	42.4867284957882	43.21	42.35
48.2025487718673	41.9364969043562	43.21	42.61
48.2025487718673	41.9364969043562	42.72	42.84
47.8741321129955	41.5469476458627	41.97	43.22
47.8741321129955	41.5469476458627	42.56	42.28
47.6366152984298	41.2652201059445	42.95	44.74
47.6366152984298	41.2652201059445	42.62	44.81
47.3924995413428	40.975667470732	41.07	43.98
47.0376961777351	39.0978246254801	40.4	40.19
47.0376961777351	39.0978246254801	40.11	39.6
46.9989257302972	38.8926896738905	40	38.77
47.1486445217188	38.2288705737082	42.59	39.16
47.3161804946016	37.4860525120308	45.42	39.91
47.3161804946016	37.4860525120308	42.69	39.78
47.5855959837765	36.2915161924892	45.71	40.8
48.1555138134829	33.7645874651324	47.34	38.25
48.1555138134829	33.7645874651324	49.85	30.56
48.1555138134829	33.7645874651324	44.15	32.64
48.1555138134829	33.7645874651324	45.57	28.26
48.1555138134829	33.7645874651324	41.47	31.69
49.9517468111966	29.2665892819579	45.63	23.76
56.9455464814248	28.2810891717665	58.02	32.46
56.9455464814248	28.2810891717665	56.31	21.31
56.9455464814248	28.2810891717665	53.73	28.37
59.3835769641627	28.1790428786314	61.27	24.41
61.0704636517655	28.1084392160027	63.88	23.81
61.0704636517655	28.1084392160027	63.35	21.49
67.0260073859508	33.1784072144743	71.33	32.23
69.6979077397637	35.4530289002161	65.16	40.78
75.2243634020534	40.1551261613767	74.93	38.63
83.8722070492126	47.5130038947012	87.92	47.46
83.8722070492126	47.5130038947012	87.56	46.99
83.8722070492126	47.5130038947012	85.02	48.75
83.8722070492126	47.5130038947012	85.85	46.49
83.8722070492126	47.5130038947012	85.78	45.37
83.8722070492126	47.5130038947012	84.47	48.16
83.8722070492126	47.5130038947012	85.21	44.35
83.8722070492126	47.5130038947012	82.42	49.99
83.8722070492126	47.5130038947012	84.47	44.91
85.7691000122229	49.1269628337405	85.43	53
87.1516652388827	50.3033133680647	86.88	55.34
88.0429503910968	51.0616739317152	89.36	56.03
88.6270612774455	51.5586759315333	90.65	58.26
88.6270612774455	51.5586759315333	91.08	56.32
88.8948960271231	50.6253657366115	92	48.8
88.8948960271231	50.6253657366115	87.26	54.53
89.2243468990722	49.4773627187226	90.93	51.78
89.2243468990722	49.4773627187226	89.59	51.88
89.6385920055277	48.033892349445	96.43	49.73
89.6385920055277	48.033892349445	93.86	49.11
89.9376727744924	46.6307638379164	89.33	46.23
89.9376727744924	46.6307638379164	89.11	45.94
90.2224998436546	45.2945055560353	88.92	43.62
90.4808162082864	44.0826222432694	92.09	44.08
90.7330682643294	42.8991906253944	92.92	45.3
90.7330682643294	42.8991906253944	92.59	46.16
91.1062752601887	41.1483005916657	92.82	43.5
91.5535047504135	39.0501413593544	98.41	37.64
82.7978245273361	26.6734032803788	79.79	30.32
82.7978245273361	26.6734032803788	75.98	28.26
83.1652017170258	24.3736109276506	78.01	26.19
84.1908269867058	17.9531259312697	85.76	19.27
85.6138512149933	9.04481909699113	90.79	7.27
85.9991122630439	6.63308654724792	91.86	5.09
85.9991122630439	6.63308654724792	90.71	5.35
86.1478617533486	5.70192441628398	90.45	0.18
86.1478617533486	5.70192441628398	90.14	0.74
85.8742288936449	5.81938230310077	89.81	1.33
85.5114396911908	5.97511100426681	88.21	3.61
85.5114396911908	5.97511100426681	87.06	2.89

Solution x	Solution y	Original x	Original y
85.1033828852643	6.1502709677855	86.49	3.97
85.1033828852643	6.1502709677855	85.34	3.13
84.6694946679553	6.33651944426201	84.57	2.19
84.6694946679553	6.33651944426201	84.21	1.15
84.1901391124287	6.54228433080013	84.22	4.25
83.7103341485295	6.74824272065232	83.98	4.24
83.7103341485295	6.74824272065232	83.5	4.83
83.2109991752375	6.96258391204461	83.08	5.9
82.7188628114502	7.17383521725933	83.08	6.85
82.2244803090286	7.3860509668533	84.85	7.49
82.2244803090286	7.3860509668533	83.63	6.61
81.6779050651947	7.62067001051568	86.46	7.15
81.6779050651947	7.62067001051568	85.18	6.81
80.8281325900673	7.98543569659828	86.71	7.9
76.3223685110856	9.91947291710972	78.41	15.88
76.3223685110856	9.91947291710972	77.94	16.73
73.8163667100939	10.0724888197097	76.81	16.4
73.8163667100939	10.0724888197097	73.63	17.07
66.9537456427251	10.3219364336012	66.87	17.1
64.8074950268837	10.39997006369	64.87	11.36
64.8074950268837	10.39997006369	62.16	16.88
63.3089943375529	8.81953560070136	67	3.94
62.2773116894244	7.73140046632172	64.3	1.03
59.0331001368913	8.47661829738398	60.89	11.99
59.0331001368913	8.47661829738398	56.94	12.18
56.8530742760661	8.97739218403743	57.66	15.51
56.8530742760661	8.97739218403743	56.85	15.49
56.0211178503972	9.16851008134418	55.5	8.86
55.2010139719474	9.35690510506684	56.38	14.32
55.2010139719474	9.35690510506684	55.24	13.37
54.3956946066494	9.54190380604202	54.5	15.91
54.3956946066494	9.54190380604202	54.15	15.54
53.831446923544	9.6715246462175	53.85	15.08
53.2908219324902	9.7957186334877	53.87	15.51
53.2908219324902	9.7957186334877	52.03	16.04
52.9055735845497	9.88421942434602	52.12	16.84
52.9055735845497	9.88421942434602	50.3	13.28
52.345772475034	9.61330357295836	48.26	14.58
51.9579721439316	9.42562618083414	51.98	10.99
51.9579721439316	9.42562618083414	51.38	10.51
51.5709601221668	9.2383299764575	55.38	10.13
51.5709601221668	9.2383299764575	55.4	11.17
51.066659225183	8.99427257775169	56.26	10.34
50.3246251562066	8.63516739130175	54.22	8.18
49.4251001419396	8.19984774541746	52.67	8.88
49.4251001419396	8.19984774541746	51.86	7.7
48.2128126915603	7.61317690732305	50.52	8.68
46.7521102521439	6.90629709029024	52.96	3.75
46.7521102521439	6.90629709029024	50.21	0.82
46.7521102521439	6.90629709029024	52.67	4.65
46.7521102521439	6.90629709029024	50.97	4.59
46.7521102521439	6.90629709029024	48	4
46.7521102521439	6.90629709029024	44.53	2.72
46.7521102521439	6.90629709029024	47.45	7.49
46.7521102521439	6.90629709029024	41.49	2.29
44.4385063694082	6.93774467766102	46.38	12.31
44.4385063694082	6.93774467766102	45.57	12.76
44.4385063694082	6.93774467766102	45.09	11.7
44.4385063694082	6.93774467766102	44.72	11.87
44.4385063694082	6.93774467766102	43.23	11.54
32.2527702112404	7.10339604363582	31.22	0.18
24.8363254581332	9.25663938394222	19.48	4.75
24.4895241925938	12.376884466188	24.66	9.13
23.5898968618721	20.471040113646	27.74	25.63
23.5898968618721	20.471040113646	25.65	24.53
23.5898968618721	20.471040113646	23.55	20.83

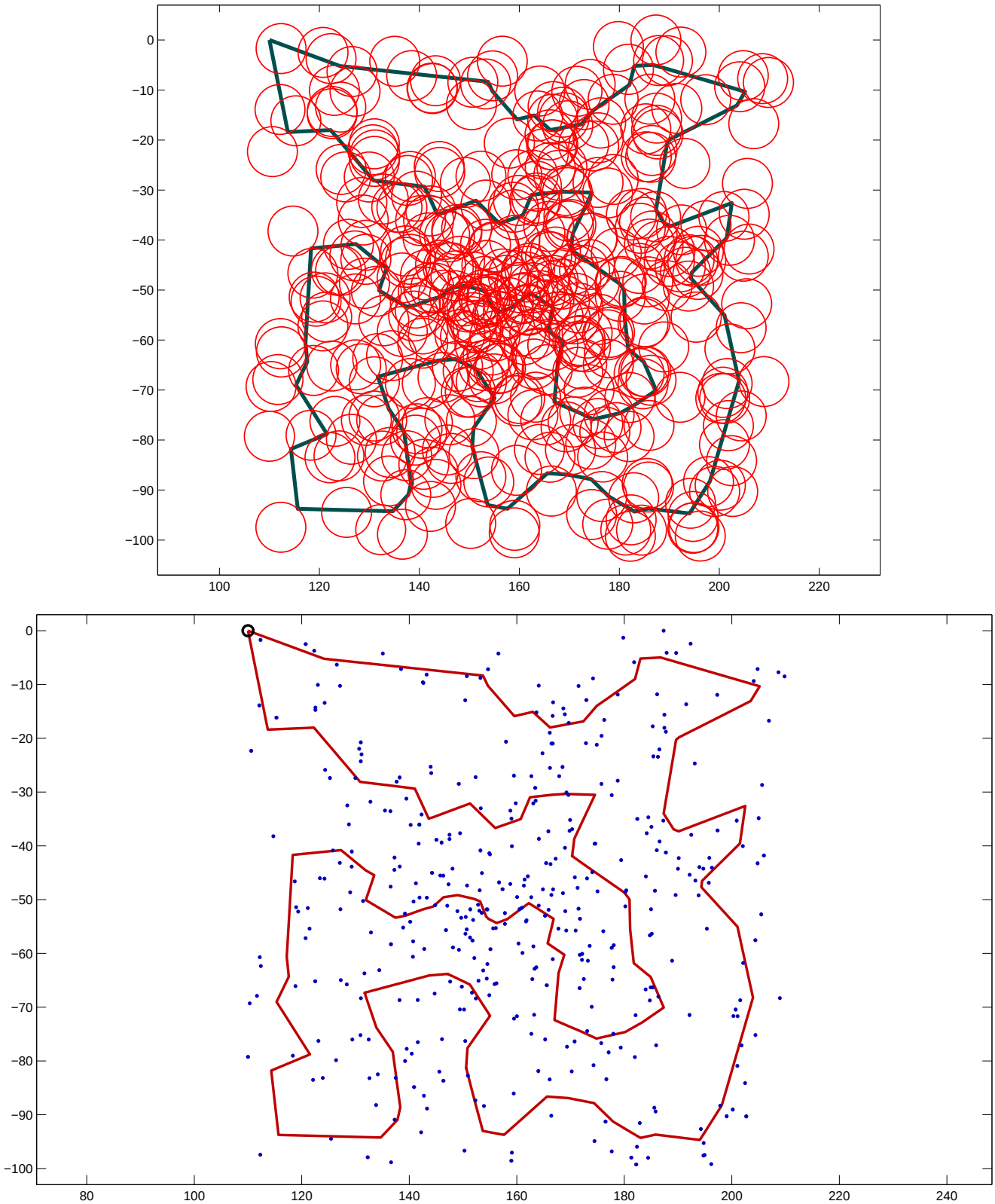


Figure N.4: *team*4_400, Equal Radius, 2D, Euclidean, Length = 680.2112726

Table N-7: Solution for *team*4_400, Equal Radius, 2D, Euclidean

Total distance: 680.211272598623			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
0.733196788914924	3.65196242508027	2.34935	1.70725
2.99730775324578	14.9292213775851	5.29819999999999	16.16745
3.69289274687266	18.3938442941515	0.610974999999996	22.331075
3.69289274687266	18.3938442941515	2.12502499999999	13.8908
10.6364381441395	18.0854670177117	12.5519	14.734025
12.263171452195	18.0132194605697	14.259	13.428825
12.263171452195	18.0132194605697	12.54795	14.295525
17.057476181083	23.6454911186509	20.686175	21.9667
17.057476181083	23.6454911186509	21.1268	22.989225
17.057476181083	23.6454911186509	20.9892	20.7572
17.057476181083	23.6454911186509	14.358825	25.883825
17.057476181083	23.6454911186509	15.2685	27.387025
20.6212899612605	27.832207209631	22.793175	31.8095
20.8476081310692	28.0980817758336	18.476575	32.50015
23.4852538766085	28.4229418950682	28.216025	27.287675
23.4852538766085	28.4229418950682	20.995625	24.282225
24.652749334438	28.566731890837	25.49855	33.45475
24.652749334438	28.566731890837	19.9845	27.40155
26.7683906387965	28.8272924794532	29.46595	31.229925
26.7683906387965	28.8272924794532	26.51415	33.575825
31.0423696370529	29.3498216793966	33.989075	25.3104
31.0397919811655	29.3533551982901	34.098725	26.483975
31.0397919811655	29.3533551982901	32.29465	34.1886
31.0397919811655	29.3533551982901	27.65685	28.081275
33.6208044070141	34.9497771829945	31.7652	39.5927
33.6367468286672	34.9098875206441	30.2641	36.115
33.6367468286672	34.9098875206441	35.05695	38.887125
33.6367468286672	34.9098875206441	37.4986	37.94785
34.3584389856025	34.7085189097849	36.0198	39.389875
35.3212382063033	34.3504645593987	37.4906	38.735475
35.3212382063033	34.3504645593987	31.8731	36.0461
38.1239492501044	33.3081697029038	39.47365	37.672175
41.3097987725835	32.1233881209863	42.344525	27.231625
41.3097987725835	32.1233881209863	39.217825	28.48755
45.9789857720418	36.6777248487919	49.014675	34.9475
45.9789857720418	36.6777248487919	43.242475	40.8624
45.9789857720418	36.6777248487919	44.89855	41.381
45.9789857720418	36.6777248487919	45.015525	41.584025
45.9789857720418	36.6777248487919	43.312375	33.022625
49.6561664898017	35.4025475676371	53.08505	32.116125
49.6561664898017	35.4025475676371	49.0937	40.0849
50.718035541374	35.0343059605927	54.125425	38.6935
51.9482728557086	32.1650307441565	53.429725	29.230175
52.4630380431869	30.9644292914461	49.48335	26.949275
52.4630380431869	30.9644292914461	48.825175	33.4678
52.4630380431869	30.9644292914461	49.821325	32.088775
52.4630380431869	30.9644292914461	52.727475	27.05645
56.6653115101974	30.4955516545172	56.18475	25.5187
56.6653115101974	30.4955516545172	53.51985	31.610925
58.6601186830169	30.3700169531383	59.92645	35.207
58.6505847448297	30.3336003402324	58.5251	25.335175
58.6505847448297	30.3336003402324	57.8987	27.066925
63.8064896531948	30.4944994682197	67.6691	30.587025
64.5309304420386	30.5171076851946	68.792375	27.90175
64.5309304420386	30.5171076851946	65.757275	28.49595
63.7395924741848	32.2037109262215	59.25755	30.092125
63.7395924741848	32.2037109262215	59.6161	30.5374
61.697275692375	36.5565772631565	64.48255	39.62755
61.697275692375	36.5565772631565	58.980725	40.369175
60.6986952530958	38.68487330729	55.894525	37.29925
60.3417477834861	41.5745269600275	57.24125	42.40615
60.3417477834861	41.5745269600275	60.81405	45.86495
60.2877871103036	41.9112132937056	55.460475	43.213925
60.3005854836254	41.9077594895249	63.06625	46.073225
60.3005854836254	41.9077594895249	60.313175	36.907775
60.3005854836254	41.9077594895249	59.82755	37.21565
60.3005854836254	41.9077594895249	56.281125	43.406775
62.5917169624356	43.5263888245109	61.33205	47.81805
62.5917169624356	43.5263888245109	64.627025	39.598675
67.886000709657	47.2098171715304	69.4258	42.661825
67.886000709657	47.2098171715304	70.163125	48.595475
67.886000709657	47.2098171715304	70.20275	51.264575
67.886000709657	47.2098171715304	64.04505	44.910675
70.0198096382829	48.6943877670259	74.018375	45.692475
70.0198096382829	48.6943877670259	65.024675	48.473875
70.8212841696073	49.7683793208243	74.97575	51.8098
70.9762830855555	49.9760815479195	75.70595	48.354275
70.9762830855555	49.9760815479195	70.38585	48.289775
71.085586910363	55.5585309249738	66.095725	55.876775
71.085586910363	55.5585309249738	68.048425	58.486425
71.085586910363	55.5585309249738	75.12385	56.355025
71.085586910363	55.5585309249738	74.7548	56.66355
71.7633640486428	61.820871862018	67.8084	64.88
71.7633640486428	61.820871862018	67.662425	58.9604
72.4996024635082	62.4226626491206	74.919425	66.332825
72.4996024635082	62.4226626491206	68.033375	62.578975
74.9044343736143	64.3883578163482	78.897475	61.3791
77.3474722896737	70.069961115756	82.150425	71.4598
77.3474722896737	70.069961115756	75.320425	66.338125
77.3474722896737	70.069961115756	73.97555	66.71955
77.3474722896737	70.069961115756	76.3481	68.05155
73.2924312496182	72.8522114683086	75.94035	77.0935
73.2924312496182	72.8522114683086	74.758025	68.76505
70.9359160547735	74.1854315410562	69.349625	77.516575
70.1639326891619	74.6221896681695	71.96685	79.285825
70.1639326891619	74.6221896681695	72.106325	71.513625
64.8124030808643	75.8353240190871	64.2971	80.8087
63.7432564982917	75.3457535407508	59.360575	77.3659
63.7432564982917	75.3457535407508	67.096325	78.407125
63.7432564982917	75.3457535407508	67.97015	74.943825
61.9276159852931	74.5143625590894	63.9561	69.944325
61.9276159852931	74.5143625590894	65.721375	76.70655
59.154357759637	73.3219732895538	55.289875	75.9977
59.154357759637	73.3219732895538	63.106325	74.44845
59.154357759637	73.3219732895538	60.77085	76.3761
57.0158850805612	72.4025157457657	52.726325	74.9715
57.2295202945815	69.910672164598	55.5813	65.9389
57.2295202945815	69.910672164598	53.249925	71.4317
57.670944014324	64.7619256267078	61.692525	66.479075
57.670944014324	64.7619256267078	53.6353	62.58645
57.670944014324	64.7619256267078	62.481725	64.778425
57.7666961058521	63.6450537235584	62.138225	61.218175
57.7666961058521	63.6450537235584	52.902425	64.80215
58.1029222902986	62.5810708484322	62.1796	60.091575
58.1029222902986	62.5810708484322	53.3194	62.871025
58.605904160867	60.9893821868563	63.23165	61.378
58.8397756285867	60.2493107767949	63.564825	58.6141
58.8397756285867	60.2493107767949	60.964225	55.767775
58.8397756285867	60.2493107767949	61.732525	60.28975
55.7442857925038	58.1389599354467	51.0767	59.931625
56.2130903760699	56.2151835976855	55.262125	52.9866
56.2130903760699	56.2151835976855	59.0369	52.162425
56.2130903760699	56.2151835976855	56.708375	61.084725
56.4073613371943	55.4179758395895	54.099275	51.121125
56.4073613371943	55.4179758395895	51.731775	54.063975
56.4073613371943	55.4179758395895	53.1029	58.71345
56.7925675454337	53.8372414396977	56.4549	49.1402
56.7925675454337	53.8372414396977	61.751375	53.5726
56.8552215623951	53.5801401925653	61.491825	51.7088
56.8552215623951	53.5801401925653	59.205025	55.76
55.9197319524332	52.9876887833282	58.59885	48.807625
55.9197319524332	52.9876887833282	57.767975	55.4125
53.4458905627218	51.4209708506374	51.332325	47.3944
53.4458905627218	51.4209708506374	56.7604	48.090675
52.3618178657511	50.7344113509759	47.81055	52.508825
52.2425417117447	50.6588718790727	52.0729	45.66175
51.4814481128691	51.2165831532646	47.802925	54.5327
51.4814481128691	51.2165831532646	51.464375	46.273425
51.4814481128691	51.2165831532646	48.801425	47.111675
51.4814481128691	51.2165831532646	54.870925	48.098925
51.4814481128691	51.2165831532646	55.9361	51.897075
49.4831321253258	52.6809811417846	45.616825	55.349625
49.4831321253258	52.6809811417846	52.703075	49.56845
48.1873695890182	53.6652638532807	50.342	58.1772
48.1750851615322	53.6395394635509	43.47965	52.4779
48.1750851615322	53.6395394635509	50.075475	49.526025
46.8654713207503	54.134109661283	41.89655	53.797625
46.8654713207503	54.134109661283	51.8225	53.851
46.8654713207503	54.134109661283	50.9611	51.5263
46.2329142362274	54.3470437836207	45.110025	59.219325
46.2329142362274	54.3470437836207	50.5204	51.7746
45.2518850159054	53.8455208814906	41.3638	51.811825
45.2518850159054	53.8455208814906	40.703325	55.537825
44.7258358950329	53.5765927699893	41.765825	57.606275

Solution x	Solution y	Original x	Original y
44.7258358950329	53.5765927699893	41.323875	57.06515
44.2884176225597	53.1311449907452	43.10885	48.272275
44.2884176225597	53.1311449907452	40.468775	56.35765
43.5292909380428	51.2222176260459	38.966475	52.166125
43.5292909380428	51.2222176260459	47.35915	48.071
43.5292909380428	51.2222176260459	46.119125	55.3112
43.1693427495136	50.3170848946831	46.718325	46.79505
42.0226160601536	49.8509271195001	43.5222	45.0811
41.2961074640408	49.6860959343562	37.074525	51.14655
41.2961074640408	49.6860959343562	37.32375	47.164775
41.2961074640408	49.6860959343562	44.549375	51.8385
41.2961074640408	49.6860959343562	44.413025	51.821425
38.9928164104599	49.1635242430756	38.0514	44.25295
38.9928164104599	49.1635242430756	35.77655	45.5234
38.9928164104599	49.1635242430756	43.054225	52.07985
38.1989609605461	49.2846303310778	33.276075	49.648225
38.1989609605461	49.2846303310778	42.80595	50.969325
38.1989609605461	49.2846303310778	40.529725	53.231175
38.1989609605461	49.2846303310778	40.7628	47.39015
38.1989609605461	49.2846303310778	39.658325	53.39295
36.3766708271164	49.5626327804514	34.241775	45.041325
36.3766708271164	49.5626327804514	36.34605	45.558575
34.4410533496614	51.2979892125301	36.8297	55.690525
32.5394594965117	51.8145199768491	29.2116	52.625
32.5394594965117	51.8145199768491	28.87265	55.2137
32.5394594965117	51.8145199768491	31.24645	46.9846
32.5394594965117	51.8145199768491	34.822	51.041775
32.5394594965117	51.8145199768491	31.916925	49.63125
29.367467882224	52.9710310337513	30.732825	57.781
27.4311716290024	53.3706895989465	26.5978	58.30075
27.4311716290024	53.3706895989465	30.804475	50.3614
25.7706183636542	52.3787728451477	21.4066	50.274675
25.7706183636542	52.3787728451477	30.1798	54.1346
25.7706183636542	52.3787728451477	26.549225	47.5983
25.7706183636542	52.3787728451477	22.891175	56.122525
21.914127464028	50.0751353603154	17.219275	51.795125
23.1189907681366	46.5573299956645	19.292975	43.870425
23.1189907681366	46.5573299956645	27.251975	44.47235
23.4935483348942	45.4637687234639	28.231575	43.86655
23.4935483348942	45.4637687234639	27.2689	42.18555
21.882204352928	44.5459534667199	19.028925	48.6519
21.8831646665205	44.5445715493615	17.095675	43.177
18.631148038031	41.8744234309902	15.806625	40.87695
17.3253432206321	40.800558853474	18.77905	36.01655
17.3253432206321	40.800558853474	19.322625	41.061025
13.7846234582397	41.149529673811	14.24105	46.110125
13.7846234582397	41.149529673811	13.3837	46.032275
8.62089998701113	41.6584541990156	8.7059	46.626875
8.33253625471653	41.6868782335184	4.729125	38.22055
7.60255767582871	53.9485573156965	8.9679	51.422725
7.60255767582871	53.9485573156965	11.134375	51.580675
7.60255767582871	53.9485573156965	11.458875	55.406825
7.60255767582871	53.9485573156965	9.352575	52.2461
7.20522934219529	60.6225873954612	2.20627500000001	60.72485
7.20522934219529	60.6225873954612	10.71515	57.182775
7.34105896947133	61.9713024494314	2.404275	62.37445
7.57906259931454	64.3346076940126	12.50315	65.202575
5.85305400138088	67.9139159849077	1.692025	67.9044
5.32264682239857	69.0138375330983	0.331024999999997	69.303175
5.32264682239857	69.0138375330983	8.8531	66.09375
9.88900488923605	76.2149317507843	8.347775	79.0334
11.5186274487691	78.7848249292767	16.4015	79.860725
11.5186274487691	78.7848249292767	13.92855	83.165725
11.5186274487691	78.7848249292767	13.11545	76.27845
11.5186274487691	78.7848249292767	12.1212	83.525275
4.31310990342014	81.7882629490759	0.00155	79.256375
5.68283087045816	93.7604994522284	2.307925	97.449675
14.9325488997154	93.9917367279189	15.45105	94.471525
24.1985535349116	94.2233819154734	22.27635	97.920025
24.1985535349116	94.2233819154734	27.27955	90.9405
24.69810943442	94.2358704186334	26.6212	98.85125
26.9806791004424	91.8160318921534	23.831575	88.204275
27.8103641748369	90.9364497440858	32.22375	93.28635
28.328837902713	88.6429327994858	33.324025	88.862275
27.9170349379383	85.600978916494	24.1584	82.49565
27.9170349379383	85.600978916494	32.733925	86.47665
27.6032207754073	83.4663257488833	22.609375	83.218325
27.6282220461734	83.4675673438688	29.23795	80.022375
27.6282220461734	83.4675673438688	30.896	84.86835
26.9297761502444	78.3081730155234	31.60195	76.5275

Solution x	Solution y	Original x	Original y
26.9297761502444	78.3081730155234	27.4824	83.15295
26.9297761502444	78.3081730155234	30.46345	78.65395
26.9297761502444	78.3081730155234	29.5312	77.759375
23.8925164823557	73.8082305100495	19.41455	76.0326
23.8925164823557	73.8082305100495	22.467675	76.02705
23.8925164823557	73.8082305100495	20.9401	75.2051
21.9584384533241	68.131082665424	18.3822	65.772725
21.9584384533241	68.131082665424	21.668825	63.73225
21.6979118988006	67.3060695790443	24.44465	63.1281
21.6843846133346	67.3266454712778	17.272875	64.973225
21.6843846133346	67.3266454712778	21.0091	68.35155
30.0356250437259	65.0842770946792	31.583525	68.6781
30.0356250437259	65.0842770946792	30.688625	60.637275
30.0356250437259	65.0842770946792	28.20205	68.6988
33.2324000654864	64.2259195820781	37.615325	65.262725
33.6524808381653	64.1131251240382	32.800625	59.186225
37.158436913371	63.8181096180475	38.122975	58.912025
37.1557230183449	63.8319137371659	39.7753	66.19835
37.1557230183449	63.8319137371659	39.243575	59.34405
38.2419870811051	64.3243446990653	42.88515	65.09985
38.2419870811051	64.3243446990653	41.683175	67.299925
38.2419870811051	64.3243446990653	34.7277	67.482525
41.2660291818918	65.7775589487069	43.7645	63.186425
41.2660291818918	65.7775589487069	44.4217	64.703925
41.2660291818918	65.7775589487069	44.898775	67.784675
41.2660291818918	65.7775589487069	39.430175	70.428325
41.2660291818918	65.7775589487069	42.114525	60.87195
41.2660291818918	65.7775589487069	45.884675	65.715725
41.2660291818918	65.7775589487069	44.541975	62.0002
41.2660291818918	65.7775589487069	46.228875	65.56925
45.0337687526234	71.6017623029859	50.03295	71.692275
45.0337687526234	71.6017623029859	49.5023	72.1454
44.0555243176809	73.0002074276921	40.4153	76.30845
44.0555243176809	73.0002074276921	42.3891	68.379025
44.0555243176809	73.0002074276921	40.205375	70.4585
40.8295210387997	77.6119772039195	36.110325	75.95995
40.5661846649293	81.3424635017416	35.60905	81.995775
40.5942044883974	81.3387707086084	40.913925	82.729825
40.5942044883974	81.3387707086084	36.3513	83.686975
41.9876407605346	86.717925978594	43.9034	88.387225
41.9876407605346	86.717925978594	42.31835	87.347525
43.680438536581	93.0144115901792	40.290225	96.689525
46.9059605172132	93.608138798588	49.100125	97.070175
47.6418714536051	93.743599337799	48.99045	98.5583
52.1355414560856	89.7364574280109	49.4347	86.0537
52.1355414560856	89.7364574280109	56.428075	90.20545
55.626377682002	86.6235655685414	54.01775	81.8894
55.626377682002	86.6235655685414	56.13655	83.451075
59.5798057185725	86.9131822065723	60.2356	81.956375
64.3716601299049	87.8344933324342	66.686275	83.4025
67.8975048889303	91.2714260225995	72.88955	91.55335
67.8975048889303	91.2714260225995	64.46975	94.91155
70.8828888262492	93.0479264581878	72.374675	95.981125
70.8828888262492	93.0479264581878	71.306475	97.9771
70.8828888262492	93.0479264581878	66.508125	91.303225
70.8828888262492	93.0479264581878	67.679475	96.828325
73.0198812658859	94.3195590748579	72.222075	99.2555
75.83210358334	93.7016950226092	75.589675	88.707575
75.83210358334	93.7016950226092	75.8385	89.39705
75.83210358334	93.7016950226092	74.44305	98.0205
81.3834623580871	94.3668907759545	84.25115	92.664475
81.3834623580871	94.3668907759545	84.730325	97.611875
84.0488613431775	94.6862808016593	86.192975	99.203225
85.1511829717972	92.9480404210006	89.0595	90.291
85.1511829717972	92.9480404210006	84.9479	97.513325
85.1511829717972	92.9480404210006	84.77555	95.283075
88.1274501754541	88.2547929134385	92.685275	90.310575
89.0745166359201	84.9893970440386	92.480625	84.1266
89.0745166359201	84.9893970440386	91.03755	80.9252
89.0745166359201	84.9893970440386	90.195175	89.03695
89.0745166359201	84.9893970440386	87.858275	88.334025
92.5281398182066	73.0816537782697	94.404	75.185075
92.5281398182066	73.0816537782697	91.08095	71.69145
92.5281398182066	73.0816537782697	91.5733	68.725
92.5281398182066	73.0816537782697	91.825175	77.123475
93.9387353229479	68.2180659816958	98.93765	68.322275
93.9387353229479	68.2180659816958	90.314475	71.662575
93.556019021505	66.475623085295	92.124775	61.791725
93.556019021505	66.475623085295	90.725625	70.444425
91.9070778880226	58.9682614409761	94.377175	57.5521

Solution x	Solution y	Original x	Original y
91.0449966753899	55.0433701816848	95.486225	52.746525
88.7250954408825	52.4942409058371	85.3769	55.416
85.0060905096306	48.4077663767135	83.835575	49.221375
85.0060905096306	48.4077663767135	83.247325	46.458225
85.0060905096306	48.4077663767135	84.710775	44.260425
85.0060905096306	48.4077663767135	82.166	45.384
85.0060905096306	48.4077663767135	83.98185	43.958725
84.3280343729103	47.6627152138918	79.556325	49.1563
84.4534790364257	46.7154468082448	85.82305	42.253575
84.4814680340951	46.5040972935944	80.003925	44.278875
84.4814680340951	46.5040972935944	85.726975	46.8848
89.5956197525481	41.4446626453793	87.349525	37.1432
89.5956197525481	41.4446626453793	86.306375	44.08645
91.1697839673623	39.8873492702797	94.807975	43.25145
91.5048069866319	39.5559166112572	95.9689	41.808
91.5048069866319	39.5559166112572	92.049975	40.056175
92.5131912299362	32.5857248562025	95.640625	28.68455
92.5131912299362	32.5857248562025	94.997925	34.851
92.5131912299362	32.5857248562025	90.921925	35.308625
81.0523640909018	36.9383606696075	77.267275	35.3236
80.1190789019662	37.2928081496476	80.128375	42.2928
79.1956372387307	36.9460260058358	76.046775	40.829925
79.1956372387307	36.9460260058358	77.736325	41.257125
79.1956372387307	36.9460260058358	82.455325	37.974875
79.1956372387307	36.9460260058358	76.5757	39.19325
77.9647011103274	35.0150347925012	74.186175	37.664625
77.3201261945559	34.0038799251719	72.419975	34.998125
77.3201261945559	34.0038799251719	75.0516	36.4713
77.3201261945559	34.0038799251719	74.4851	34.7013
79.351185655824	21.9659971692446	76.27055	23.463675
79.351185655824	21.9659971692446	83.1155	24.690275
79.351185655824	21.9659971692446	77.472675	18.057475
79.351185655824	21.9659971692446	75.41995	23.365625
79.6356167475278	20.2801974671083	75.3053	17.780525
80.2020301348767	19.8118570799795	77.464	15.628175
80.2020301348767	19.8118570799795	76.538875	22.08605
80.2020301348767	19.8118570799795	77.750225	18.79385
83.814790083685	17.9853302384956	81.52085	13.687775
88.9230179654942	15.40272892119	87.3023	11.937375
93.5110293883818	13.0831389635816	96.9141	16.74635
95.0299877960721	10.5588521151379	98.6909	7.723575
95.1720271022429	10.3228030008296	99.82775	8.49955
95.1720271022429	10.3228030008296	94.81355	7.137025
95.1720271022429	10.3228030008296	94.09005	9.358875
81.9513211992428	6.48409085115301	79.6523	4.144625
81.9513211992428	6.48409085115301	82.33615	2.420325
76.7570889822962	4.97591431302297	77.335225	0.00945
72.9952281844581	5.16720427177761	69.817575	1.306825
72.9952281844581	5.16720427177761	77.882675	4.11235
72.0085623416935	8.98281569146998	76.1173	11.832075
72.0085623416935	8.98281569146998	68.784175	11.8632
72.0085623416935	8.98281569146998	71.829525	5.85575
67.0584483149025	12.4512462510261	62.944875	12.9098
67.0584483149025	12.4512462510261	66.273425	16.5814
67.0584483149025	12.4512462510261	64.181275	8.885925
64.8625898895596	13.9898289870797	61.5062	10.2838
63.4555589710645	15.6264242183926	65.789175	19.559925
63.4555589710645	15.6264242183926	58.962525	15.549225
63.4555589710645	15.6264242183926	58.66755	14.455925
62.3966355125287	16.8581259204179	64.881075	21.1972
59.7540740894869	17.3300123487737	56.7601	13.3255
59.7587963497749	17.3363284854776	56.680125	15.845675
59.7587963497749	17.3363284854776	56.707375	20.9848
59.7587963497749	17.3363284854776	56.46315	20.9863
59.7587963497749	17.3363284854776	62.8697	20.929125
56.1741435613473	17.9861789297904	54.7913	22.79115
56.1741435613473	17.9861789297904	59.666825	17.15215
52.9968711578926	15.0862976433597	54.0981	10.209075
52.9968711578926	15.0862976433597	56.145325	18.970525
49.5424575591779	15.8840019752323	47.99765	20.639375
49.5424575591779	15.8840019752323	53.686425	15.19815
44.8194123851663	10.4513498050844	43.2503	8.7931
44.8194123851663	10.4513498050844	40.718225	8.45085
44.6032349832502	10.202694146155	40.4237	12.94705
43.7077743235241	8.33178304713267	46.59205	4.24755
43.7077743235241	8.33178304713267	44.6523	7.1683
33.3569808351802	7.23740008599469	33.240325	8.160175
33.3569808351802	7.23740008599469	32.636425	9.71905
33.3569808351802	7.23740008599469	32.5307	9.603625
33.3569808351802	7.23740008599469	28.471925	7.124375

Solution x	Solution y	Original x	Original y
23.9682142439616	6.24473087702003	25.090375	4.2535
17.900508334268	5.60319552320679	17.13825	10.254625
15.289461155344	5.32713100455192	12.34295	3.720825
14.1467838386525	5.20631658214135	13.011825	10.0758
14.1467838386525	5.20631658214135	16.533825	6.314025
14.1467838386525	5.20631658214135	10.7326	2.49095

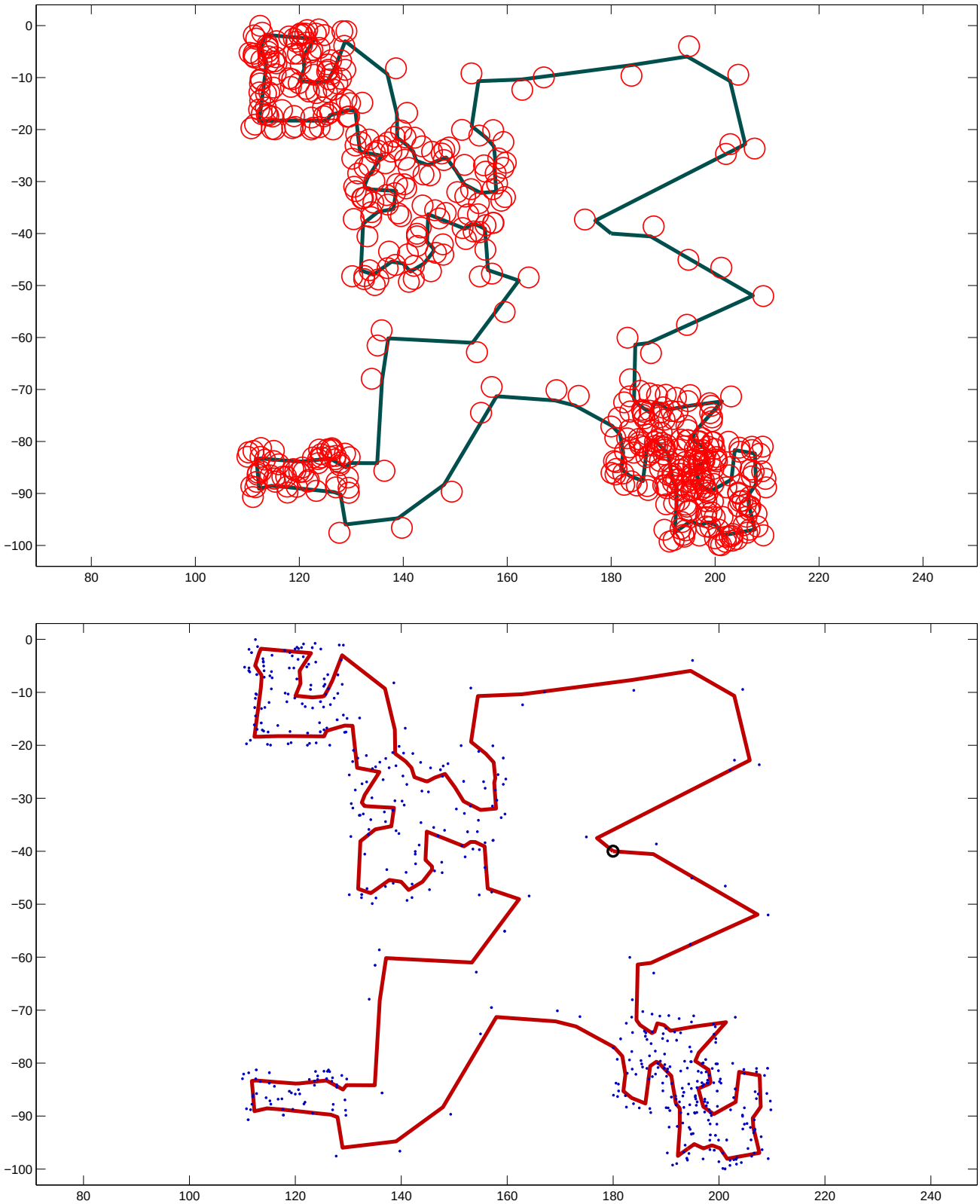


Figure N.5: *team*5_499, Equal Radius, 2D, Euclidean, Length = 702.8228546

Table N-8: Solution for *team5_499*, Equal Radius, 2D, Euclidean

Total distance: 702.822854598051			
Depot: x 70 y 40			
Solution x	Solution y	Original x	Original y
77.5864017185849	40.5471440620937	78.1743	38.6355
84.9376069136094	44.8022990174522	84.8772	45.0654
90.4050829589059	47.9670825775169	91.1956	46.5873
97.2762433814494	51.9443874014649	99.2739	52.0431
84.7239062123086	57.6398595254693	84.5964	57.5663
77.1400372883966	61.0809519586956	77.6803	63.0066
74.6373302233705	61.3855971982667	73.1545	60.0435
74.501134845412	67.7061226344602	73.6361	68.0431
74.455014615083	69.8463493698408	75.6074	70.2776
74.4296397953288	71.0238440391558	73.5126	71.3248
74.4110873658962	71.8847316660682	72.5026	72.4828
75.0787027007082	72.8025046170311	73.6863	74.2382
75.8824430051129	73.3503418240655	75.9291	73.9471
76.5181659087383	73.7836598658622	76.1847	74.2911
76.5181659087383	73.7836598658622	76.1087	74.9228
77.0050220135351	74.1155101927361	77.4087	74.0915
77.0050220135351	74.1155101927361	76.4126	75.548
77.3180027844287	74.3288462388294	77.1908	76.3248
77.8283226604018	74.0689230922694	79.3483	75.3688
77.9948397935128	73.5584970817504	79.4655	74.4467
78.3394147007153	72.5025178597905	77.364	70.7565
78.8336492012457	72.6217209199755	78.8402	71.1237
79.5990299651729	72.8063182892757	80.5183	71.0301
80.2012529375306	73.3329164998819	79.9937	73.4457
80.831269723595	73.8838155580505	80.2922	75.8098
81.6485537091659	73.7412560502076	82.0065	75.6791
82.2132237089501	73.6427660036393	81.6179	74.1421
82.2132237089501	73.6427660036393	82.7574	74.2926
82.8674452023057	73.5286549255266	82.4808	71.6064
84.4760062917969	73.2480776162948	84.8025	72.2361
85.5253174626032	73.0650496148761	85.22	71.0885
88.2854901104435	72.693422027037	88.9513	72.6403
89.5795149808466	72.5191901977749	89.2994	73.1482
91.3261497557153	72.2840167022132	93.093	71.3467
89.7071044973054	74.0963471645346	89.0638	74.5581
88.9344480323672	74.961235004217	89.4099	75.3847
88.1568601695326	75.8316429275211	89.379	76.0987
86.1803101947577	78.0441604187042	84.4928	76.9707
85.9136152835857	78.6679899736073	84.7658	77.8153
85.517035259683	79.5956104663607	83.5177	79.6473
85.5210294022071	79.6037625472129	84.6626	79.7388
85.5250217656525	79.6119104209224	84.7887	79.7551
85.5290220855919	79.6200740428919	84.0326	80.947
86.2485713880955	80.086925772472	86.0867	81.533
86.7185354940499	80.3918298157502	86.8222	80.0693
86.7185354940499	80.3918298157502	86.675	81.8002
87.0564728719482	80.6110737155106	87.485	79.3312
87.0564728719482	80.6110737155106	87.0156	79.966
87.5131373215796	80.9073502451143	87.5661	81.6563
87.9091414288451	81.1642682437001	89.4354	80.1567
88.02660043175	81.2404720505126	89.7033	80.1502
88.0763257535979	81.5529370636506	88.7272	81.0174
88.1318675515929	81.901951260301	89.9071	81.4441
88.2289571554553	82.5120596428792	88.1669	82.2879
88.3346784614154	83.1764159922932	90.256	83.0105
88.3663744734653	83.3755435796369	90.1019	83.486
88.3908905671347	83.5295627315852	90.3741	83.7882
88.318859081345	83.6920436861154	89	83.7031
88.2437820845537	83.8613940948082	89.6546	85.279
87.8972973422857	84.013050862003	87.8518	83.2273
87.8972973422857	84.013050862003	87.8874	83.7559
87.5177452743706	84.1791849682066	87.7484	83.7546
87.5177452743706	84.1791849682066	87.1273	84.0324
87.1281935399738	84.3496973551983	86.7862	83.711
86.7417425149671	84.5188525699078	85.8335	84.6274
86.7417425149671	84.5188525699078	86.8895	84.3247
86.4198095736467	84.6597615990921	85.9222	83.4369
86.0877799092078	84.8050916444976	84.2824	83.9445
86.1868495565173	85.1649701163991	84.7929	84.8117
86.396894602334	85.9279106153455	85.5459	86.1581
86.396894602334	85.9279106153455	85.5265	86.4226
86.5745333801347	86.5731597376642	85.6153	86.7737
86.5745333801347	86.5731597376642	85.8774	87.324
86.7092540245519	87.0625310996946	87.3294	86.7915
86.7092540245519	87.0625310996946	87.314	87.2617
86.8339799305555	87.5155975400287	87.8356	87.4643
86.8339799305555	87.5155975400287	87.6085	88.0524
86.9261810202601	87.8505251366009	85.7193	87.9646
87.0268220761537	88.2161077664701	85.3838	89.3565
87.0289578038084	88.2176490978306	85.4655	89.4614
87.225656367998	88.3600429835514	85.8291	89.3215
87.6738080932704	88.6844493965602	87.2864	89.2526
88.1270887748694	89.0125671549849	88.176	88.8141
88.1270887748694	89.0125671549849	88.3919	89.421
88.5214758370343	89.2980568241871	89.697	88.1654
88.5214758370343	89.2980568241871	88.0059	90.774
88.7299854303497	89.4490010391215	88.5666	89.9178
88.9326849806166	89.5957393105245	88.3323	91.5035
89.0798604304163	89.5932602904371	89.5983	91.5249
91.56913917367	88.2087934340045	92.1839	88.8237
93.1345155456327	87.3381702412222	94.7976	88.4491
93.3204828168742	85.7230936646485	93.0738	84.8753
93.3204828168742	85.7230936646485	92.7639	86.5161
93.7901826737904	81.6439531381741	92.5909	80.0433
94.5858249227678	81.7806438887962	94.6937	81.204
95.4056017588829	81.9214810362002	94.7529	81.9671
96.7973624854582	82.1605880004815	97.0965	81.0307
96.7973624854582	82.1605880004815	97.0848	81.6578
97.6635876165325	82.3094043531246	99.1691	80.9928
97.6893867421814	83.0167180924546	98.6006	82.3388
97.7693446332649	85.2086013205721	96.8293	85.3988
97.7693446332649	85.2086013205721	97.4362	85.8361
97.8048396935597	86.1817195127431	97.0785	86.7219
97.8048396935597	86.1817195127431	99.0472	85.7396
97.8435458303609	87.2428649705904	99.7041	87.1751
97.8801571179724	88.2465674694529	99.7949	88.8243
96.8704850627864	89.6533577803498	96.671	90.7145
96.3615520638806	90.3624292173488	94.4375	89.8165
96.3663420760284	90.4311576397485	94.4683	90.0421
96.4171310396106	91.1599643463492	94.8083	91.5304
96.4515271232577	91.6535343278914	95.3031	91.4204
96.4515271232577	91.6535343278914	95.9324	92.1458
96.4863263859158	92.1528951626693	94.509	92.4532
96.6085417162681	92.6705265218326	96.809	92.5136
96.7361148789242	93.2108510763695	96.5452	93.172
96.8682875102847	93.770657518852	96.6676	92.6743
96.8682875102847	93.770657518852	97.9735	93.9042
97.0910448327192	94.7141658490851	96.0605	94.495
97.4103292349106	96.0665831396537	98.1513	96.345
97.6194693109568	96.9524054008258	99.292	98.0492
96.6462493029913	97.127578165459	96.6476	96.9796
95.633005706249	97.3099550429448	95.4796	96.129
95.633005706249	97.3099550429448	96.1791	97.5552
93.7804015160842	97.6434161323914	93.3103	99.0843
93.7804015160842	97.6434161323914	94.2258	98.7848
93.2218594793506	97.7439518797287	93.4254	97.8126
93.2218594793506	97.7439518797287	93.255	98.1789
92.6403116570243	97.848628322884	92.8113	98.2407
92.0406695840613	97.9565617023673	92.093	98.3621
92.0406695840613	97.9565617023673	92.0809	99.3222
91.552139720408	98.044496307344	91.162	99.965
91.5223287537995	98.0498624851411	90.7381	99.8897
91.1595009453142	97.5042236443404	89.983	98.6224
90.6960569829925	96.8072776887097	90.6972	96.9626
90.2123509696788	96.0798647085301	91.4519	94.5103
89.5020647681493	95.8182698078473	89.931	94.5372
88.8596293560752	95.5816661016124	89.3359	93.6392
88.7207723539188	95.5638195260847	88.2817	96.351
88.5864879711799	95.5465603836695	88.3602	93.5594
88.2298086663351	95.6785655263868	88.2673	94.5543
87.8283885633331	95.8271288392426	89.0976	96.4455
87.0732717146352	96.1065681151374	86.994	98.105
85.3200516746971	95.2943001766522	85.1326	93.3031
85.3069493768404	95.3036804440947	84.785	93.3953
84.1105806646953	96.1600844318348	84.3334	97.0716
83.1494165659921	96.8481266759665	84.0572	98.2927
82.3814345365748	97.3978832930101	82.0258	98.9707
82.2219791639253	97.51204470333	81.2522	99.2612
82.2473981471453	97.1090116085787	80.252	96.9762
82.25351603742	97.0204873581434	83.9295	97.9734
82.3065770998947	96.2532640563681	83.3686	96.8014
82.394489046342	94.9822956464905	83.6163	95.496
82.5729871025054	92.4018594120269	80.5965	92.0964
82.5730367952066	92.4012066788003	82.1226	91.9552

Solution x	Solution y	Original x	Original y
82.5730367952066	92.4012066788003	84.3608	92.148
82.5730846231627	92.4005796228635	84.5701	92.5098
82.5785271808452	91.2373870793856	83.1514	91.319
82.584510961397	89.9576332816248	84.1657	89.6201
82.5877693372365	89.2616794355937	82.7904	89.3622
82.5911583189294	88.5376753518593	84.4799	87.8799
82.3998867373683	88.2985940535087	83.3685	88.3604
82.1792931279221	88.0228532678658	80.7173	88.9602
81.9919073633891	87.7886195748747	80.4141	88.4668
81.8504391699485	87.6117902953534	80.026	88.4312
81.795776734204	87.2921508061954	81.9044	86.793
81.795776734204	87.2921508061954	81.9035	87.9149
81.7393211139099	86.9620300188662	82.5335	87.3296
81.6747862362576	86.584676300257	81.0134	86.425
81.6148310450922	86.2340973732829	83.1803	86.2205
81.5430541519356	85.8144118576815	83.3441	85.5151
81.4657303928815	85.3623065895087	83.0689	84.7397
81.4657303928815	85.3623065895087	81.7913	86.2239
81.3880454074484	84.9080948460573	79.415	85.235
81.1991423177573	83.7309012429245	79.3747	83.7664
81.1075527170052	83.160178934368	81.0772	83.8409
80.9856940537082	82.4008100037415	82.7718	81.5009
80.5656376816035	81.9713241076492	80.1131	82.5047
80.1316470595643	81.527591204161	80.3025	81.1115
80.1316470595643	81.527591204161	80.2014	81.5949
79.7209713192047	81.1076962539071	80.7551	80.6861
79.1762177137887	80.5507132775406	79.7775	80.296
78.5726721458022	79.933618296761	79.7296	78.3022
78.4708632219997	79.8860425102222	78.4966	80.8407
78.4708632219997	79.8860425102222	79.6279	80.9538
78.3193740740294	79.8152515127363	78.9268	79.6337
78.1592480134339	79.7404245291748	77.9819	77.7483
77.7970819918941	79.9961006526059	76.8895	78.6378
77.3591974885722	80.305228601777	78.4301	80.0876
77.3591974885722	80.305228601777	76.3867	80.9989
76.9955583370688	80.5619427404084	75.2812	79.5319
76.9610874433767	80.834102784212	75.4182	80.175
76.8998933192453	81.3172603892898	75.5773	80.7384
76.8079305613899	82.0433666884524	78.0272	82.0721
76.7040114649104	82.8638691187134	77.4302	82.5606
76.5673263543187	83.9430679684642	76.7822	82.9894
76.1411551178891	87.3070310608436	76.9521	88.589
76.1017658855231	87.6180125638346	77.1151	89.3423
74.876122284599	87.1253649349256	73.8575	87.669
74.876122284599	87.1253649349256	74.9451	88.4605
73.5360146748992	86.5867078424364	72.5273	88.3137
72.7844736149742	85.9850321757062	72.3356	86.155
72.156875195063	85.4825838231269	71.0504	85.2637
72.156875195063	85.4825838231269	70.8501	86.3243
71.9315849363953	85.3022189130644	70.0787	86.0551
72.1033546482314	83.9213839870695	70.5598	83.7819
72.1033546482314	83.9213839870695	71.008	83.9726
72.3215587600502	82.1672995591963	74.3211	82.1244
72.1738792821954	81.2895233080068	73.6161	81.1388
72.1738792821954	81.2895233080068	72.6803	81.9225
71.8937118865711	79.6242774542484	70.8021	79.2974
71.8937118865711	79.6242774542484	73.1002	79.4037
71.7367870617416	78.6915552681854	73.5352	77.8165
70.721400495831	77.5772859184061	70.0314	77.1275
70.1894617200642	76.9935493652887	71.4242	75.4202
63.0237060503777	73.0881439508253	63.7544	71.2264
59.1626156036162	72.1063204702028	59.4827	70.1321
47.9609008339045	71.293223119092	47.0351	69.5204
45.6615641585834	75.1658207871492	44.9743	74.4953
37.8559639104907	88.3121635129823	39.3354	89.658
29.0189793837408	94.7595796930654	29.7505	96.621
18.9162778068898	95.9632802341146	17.7167	97.5636
18.0288388951108	90.6578519815427	19.5543	89.8549
17.9505363062283	90.1897279413058	19.4915	88.9148
17.2270230518906	89.9222358085831	17.0519	88.8308
16.7096876458366	89.7309706791079	17.1642	87.7833
13.6176747077776	89.406906238145	13.2856	89.4879
11.6101537182451	89.1965156141973	11.8372	87.4011
11.6101537182451	89.1965156141973	11.6247	87.7046
9.72000784644406	88.998431768994	9.52200000000001	88.7288
8.23107313864548	88.8423938003511	7.6764	88.6806
7.29842192809014	88.7446528991569	7.47969999999999	86.7529
6.97325373461838	88.7195375560305	7.74030000000001	89.8119
6.50321512111121	88.6832348434061	6.7503	86.812
5.7839442874169	88.6276883336243	5.387	87.7604

Solution x	Solution y	Original x	Original y
5.1993996767832	88.5825433848566	5.1953	87.1361
4.6340372323409	88.5388798313143	4.4842	86.5445
2.26974542857324	89.085218245311	1.0919	90.7016
2.22892035634888	88.6016633710198	1.5647	88.8122
2.18509066576976	88.0825216042541	0.775099999999995	88.6342
2.09306494694553	86.9925088553829	1.983	86.3665
2.09306494694553	86.9925088553829	1.82250000000001	87.776
1.98135022181975	85.669288673646	2.696	85.7661
1.98135022181975	85.669288673646	2.0599	86.005
1.79850766486243	83.5035666821401	0.0289999999999964	82.9455
1.78671457284521	83.3638977421974	0.247299999999996	82.0871
1.97577304905786	83.344599042463	1.19329999999999	81.8445
2.32119000371847	83.3093376169016	2.5389	82.9669
2.64809611138789	83.2759661252992	2.625	81.2761
3.6966914463636	83.3585555906506	3.3964	83.4982
5.02763363014448	83.4633813432122	5.1015	81.8103
5.02763363014448	83.4633813432122	5.09099999999999	83.7862
6.46263350761944	83.5764054928077	6.0677	84.3942
8.57363259810859	83.7426702988875	8.87560000000001	85.3213
9.35545862692887	83.8042498448897	9.2565	85.6186
10.0383357845189	83.8580373572368	9.9966	85.8576
10.3726234811107	83.8457050438616	10.6041	85.0219
10.6881303447792	83.8340654347794	10.8331	85.8288
12.1336500083682	83.6770773027416	12.6448	83.0865
13.0667154247766	83.5757412817756	13.6279	83.3943
13.0667154247766	83.5757412817756	13.617	84.1913
13.6211784595918	83.5155225183086	14.2245	83.0966
14.0639221188432	83.4674369334164	13.8296	81.5783
14.5896371462724	83.41033756254	14.2132	82.4414
15.1914547962427	83.3449738045905	15.4215	81.5375
15.4621860755269	83.3155663927625	15.9151	82.9337
15.7119915542448	83.2884317813585	16.072	81.5553
15.8823781255898	83.2699234420124	16.2773	81.3093
16.1069471711361	83.3942835411022	16.4864	81.6235
16.7523994438868	83.7517005754912	17.0206	82.7787
16.7523994438868	83.7517005754912	16.887	83.4344
17.5043168940429	84.16807221281	17.8246	84.0918
18.1833597085693	84.5440937646262	17.8311	84.5721
18.9823331033847	84.9865257674767	19.3715	86.9483
19.6503863256762	84.1491309312001	18.7876	82.3448
20.4939940467422	84.1536141515969	19.7188	83.0222
25.0048702621091	84.1775173426936	26.3736	85.6358
25.9356916267459	68.1514891240858	23.9463	67.9458
26.8693761929351	61.8904919143286	25.0595	61.5431
27.1260773135013	60.1691064182239	25.8602	58.6207
43.3315810943552	61.0139549606112	44.1821	62.8241
48.3560930558958	54.2685351160591	49.5234	55.0957
52.2436504893569	49.0494670200536	54.1532	48.4548
47.8187367975061	47.549681844241	47.084	47.7144
46.3192213766136	47.0414461056887	44.7377	48.2657
46.0283208599417	43.0898252494126	45.8095	43.1051
45.7332621053487	39.0817611933029	47.3754	37.9401
45.6938509086754	39.0637222157335	47.2998	37.9687
45.0390103578606	38.7640012235351	45.8348	38.3992
45.0390103578606	38.7640012235351	44.7486	39.7162
43.9407027040408	38.2613071063481	44.3864	36.3116
43.0956465572299	38.2442154544942	42.5333	36.3249
42.5506915833569	38.6092398929714	43.5486	39.6053
41.8497800074776	39.0787110564776	42.0622	41.0674
40.7498136762296	38.6426239318464	41.4412	38.9568
37.9894519655382	37.5482716261717	38.1953	36.049
36.8973414762675	37.1152990323245	36.9556	37.1182
35.7828310593528	36.6734455296813	36.1356	35.5262
34.8099328654394	36.2877344417904	33.7228	34.609
34.7051819483585	38.6658518361319	33.3877	38.8388
34.6409910419932	40.1236422992882	32.6566	40.0511
34.6167405073671	40.6744751325389	32.6554	40.5505
34.5739130500258	41.6483012176793	32.7117	42.3778
35.8092018404907	42.8702819321125	37.6461	42.0792
35.8218502155274	43.433165865212	37.7223	44.0563
35.3349559699171	44.0655450673434	36.302	43.7274
34.0229745390661	45.7695606214619	35.3466	47.2689
32.6885321910432	46.5546936883754	32.0569	46.2162
31.7294963998116	47.1189509371057	32.0319	48.7602
31.3931820213816	47.3168235694618	31.0932	49.2942
29.9722408754269	45.7540100441174	30.9136	43.9894
28.7781392142261	45.576969537068	28.4876	46.0461
27.7466415808332	45.4240369183872	27.2789	43.4795
25.4159481733622	47.0854518673974	27.0169	46.6583
25.4159481733622	47.0854518673974	25.2216	48.8368

Solution x	Solution y	Original x	Original y
24.2460777637272	47.9193852946905	24.5323	49.8988
23.5950978051392	47.6948816838854	23.5397	47.0618
23.0066899314189	47.4919571387314	22.4944	48.7727
22.4688987011506	47.3064891919079	22.5313	48.1754
21.8455462372932	47.0915141104452	20.1897	48.2132
22.1481751823036	40.778406725957	23.1185	40.5549
22.2761262746428	38.108966802591	23.8226	36.8408
22.276128395543	38.1089155723197	20.4824	37.2243
24.0164044311933	36.7204708112876	23.8984	35.8981
25.0945464280533	35.8602842732099	24.2607	34.0424
26.7593798193466	35.5458000532963	27.0476	34.4285
27.7712690109017	35.3546689491499	29.0396	36.1372
28.1249088051114	35.2878740435381	29.5705	36.67
28.4588601850355	32.9492680364261	28.4031	32.2444
28.621508040445	31.810121049021	30.555	31.3009
28.6215979284433	31.8094935174917	30.1704	30.5441
28.0553049552398	31.7752469555058	28.8128	30.4765
26.4480421620263	31.6780040896961	26.8183	32.6012
23.6195350299275	31.506823763712	22.8416	32.9746
23.1155076714786	31.4763438879147	22.2385	33.2025
23.0486316516381	31.4723006453012	22.0871	33.226
22.5559682561905	30.7941277606546	20.8616	31.8567
22.55583166403	30.793925500727	20.5677	31.0115
23.11538196931	29.3606544298372	21.333	28.4534
23.5888397962073	28.6210408376064	22.5985	27.2784
23.8108308358672	28.2742529764155	24.4655	29.9184
23.8108308358672	28.2742529764155	23.4789	26.9268
25.5498330173122	25.5576509686005	26.5855	26.5008
25.5498330173122	25.5576509686005	25.1657	24.0751
25.8798239700977	25.042151821279	27.7157	24.2487
25.392029221645	24.9506113255232	25.9644	23.203
23.9970393336404	24.688832766801	24.5672	24.4137
21.6642524093364	24.2510598264485	20.1974	25.6106
21.5743859116009	23.4345109319692	20.821	23.0825
21.5010860281735	22.7685599784923	21.8127	22.4456
21.434186173969	22.1607875702623	23.4201	21.9457
21.25352469735	20.5233268479714	20.9805	20.9752
20.9621730338001	17.8829702721088	19.3111	17.5672
20.8820068871039	17.1562540111468	19.5822	17.4941
20.7897431909271	16.3199111016623	22.1476	14.8515
19.9758818696937	16.2941233383753	19.7672	14.9362
19.3312303872167	16.2736979663814	19.0819	14.2893
18.1795383076596	16.6069133364558	17.8934	15.1905
16.7346194775432	17.0249676156936	15.9493	16.7531
15.8942378760694	17.2681131914118	14.5843	15.7568
15.6683154094909	17.7682792161281	15.42	17.0914
15.6683154094909	17.7682792161281	14.7151	17.4542
15.4249027961402	18.3071593630931	16.5052	19.9903
14.0700483927632	18.2998415765328	13.9396	19.5452
12.9475876314928	18.2937783709755	12.3192	17.7013
12.1898810469546	18.2896854699017	12.6858	19.6571
12.1898810469546	18.2896854699017	12.295	19.9912
9.69511096235364	18.2762048961544	9.20950000000001	19.5087
8.59884983683342	18.2702848642832	8.65000000000001	19.7295
8.59884983683342	18.2702848642832	9.00749999999999	17.4052
6.71860400091833	18.2601261067464	6.693	16.2603
5.17309677575082	18.3080639340628	5.3173	19.9696
5.17309677575082	18.3080639340628	4.753	19.8404
4.37508059880298	18.3328156645134	4.8686	17.5054
4.37508059880298	18.3328156645134	4.024	17.3232
4.48344529050698	18.3604714236069	3.76260000000001	17.1174
2.26619426786013	18.3982283239021	0.782799999999995	19.7397
2.3588487123059	17.6971805867468	1.5116	19.0597
2.3588487123059	17.6971805867468	2.2625	16.1551
2.50649466149011	16.5800534966852	2.785	16.9995
2.70475891557074	15.0799458616506	3.5607	15.7968
2.70475891557074	15.0799458616506	2.4914	14.471
2.94136715791151	13.2897230680986	4.24299999999999	12.8676
2.94136715791151	13.2897230680986	3.6086	13.0876
3.03564732398422	12.576369084881	2.3396	12.8751
3.15092762216888	11.7041232393844	5.0355	11.9367
3.25812507173579	10.8930432181606	2.4532	11.1564
3.25812507173579	10.8930432181606	2.67230000000001	10.4123
3.3630127872805	10.0994384707446	2.5621	10.2967
3.48840967827753	9.15064779594376	5.4781	9.3534
3.57579554571041	7.93388921298643	4.1301	7.1548
3.62475675380401	7.25218859412693	5.6246	7.277
3.61265503647985	6.99450360567413	5.20059999999999	6.8919
3.60043804697442	6.73437084201713	5.49809999999999	6.1028
3.22925886530304	6.18671583744711	4.1027	5.9391

Solution x	Solution y	Original x	Original y
2.81271852385349	5.57212808265053	2.7247	6.6491
2.81271852385349	5.57212808265053	3.9473	4.1638
2.60167678773172	5.26075437906512	1.4037	6.1535
2.60167678773172	5.26075437906512	1.2192	5.9144
2.39965339536433	4.96268672802749	0.421099999999996	5.2548
2.52849053814469	4.54985674123681	3.8933	3.6617
2.52849053814469	4.54985674123681	1.2522	5.4022
2.64087325074115	4.18975170681663	4.0211	5.0495
2.79748312858392	3.68792872512514	3.9756	4.3104
2.98204242651076	3.09654414576076	1.729	2.5191
3.13828823810913	2.59588616307935	1.2646	1.8964
3.33491159868717	2.14608891584664	2.87569999999999	1.3778
3.49863061958226	1.77156054922612	2.4773	0.052
6.7040266666187	2.0504591977158	8.02670000000001	2.1019
6.7040266666187	2.0504591977158	5.6082	3.0104
8.98847164430534	2.24922809030265	9.42529999999999	3.1222
8.98847164430534	2.24922809030265	8.95990000000001	2.5066
10.210285207468	2.35554006165269	10.526	3.779
10.9434461723709	2.41933390135858	11.169	1.5527
10.9434461723709	2.41933390135858	11.5459	0.8736
10.9434461723709	2.41933390135858	10.6256	1.7583
10.9434461723709	2.41933390135858	10.31	1.5005
10.9434461723709	2.41933390135858	9.9632	1.8111
12.3588411345255	2.54248880574365	13.2084	1.5682
12.9572317136206	2.59455533733473	14.8098	1.8409
12.9572304427511	2.5945572387319	13.7484	0.7577
12.3993947148981	3.45408784163978	13.8628	4.3052
12.3993947148981	3.45408784163978	11.5168	3.287
11.8852738527052	4.24625280055469	12.5256	4.7007
11.3860964718847	5.01539145020553	12.1595	5.1953
10.8027391571667	5.91423840201318	8.8668	5.4121
10.8329602912227	6.35726156951692	9.7281	5.4172
10.9020217348182	7.36976399725475	10.2894	7.4847
10.9678838408139	8.33534798823564	12.9432	8.6486
10.0368568485556	10.6483410768952	8.098	10.1576
10.0368460211133	10.6483847677979	8.40090000000001	11.7989
10.2412864540649	10.6685466286261	9.9074	11.0867
10.2412864540649	10.6685466286261	8.6382	10.3371
11.2442063410147	10.7674614799805	11.3126	12.1774
12.0073370744895	10.8427235425778	11.8636	12.6991
12.6577891789624	10.9068748117943	12.8565	9.4609
13.2757621090377	10.9678223843434	13.2666	12.9678
15.0108179457928	10.8127574303717	15.3264	12.7877
15.4333956760096	10.7147818031308	16.6256	12.3206
15.558249514469	10.4973861554602	16.2452	9.322
15.558249514469	10.4973861554602	14.7479	11.7757
15.7152956326882	10.223938719444	15.7685	10.3669
15.8750920919846	9.94570242203491	17.3372	11.1211
16.2621504700023	9.27178913329582	18.0288	10.2093
16.4555223019211	8.87595960310457	15.5961	8.5134
16.4555223019211	8.87595960310457	15.3812	8.8682
16.6947661362606	8.38622954673637	15.4595	7.4752
16.8930507344201	7.9803433951078	16.1355	6.6685
17.0250037483414	7.71023810523672	18.8587	8.5087
17.5791329199314	6.26856676098982	18.047	6.7045
18.3392952252652	4.29086261767943	18.6523	3.9117
18.8314756822979	3.0103625365822	18.2952	1.0836
18.8646777469114	3.03617809358184	19.0824	1.094
26.9337419973677	9.30998018190605	28.6149	8.2266
28.784733501635	17.0418772266686	30.7692	16.7931
28.8339463566001	20.4471144707588	29.6006	20.2054
28.8339463566001	20.4471144707588	28.392	21.3903
28.8502836797037	21.5777226606869	27.0718	22.4926
29.8199303002399	22.2922307927734	29.0027	23.8765
30.2585991892712	22.6154686437746	30.4469	21.4825
30.8584363000033	23.0574662661484	32.1965	21.571
31.933957352126	24.2353280232435	33.6715	23.2449
32.2309825499435	25.2090251944909	30.3241	25.8121
32.4911935301834	26.0032645065264	31.0534	27.3935
34.4801256579957	26.7296104680862	33.916	28.6484
34.9056072003193	26.8255133323671	35.1494	28.8106
36.3448889590507	26.1013885348499	35.5448	24.2684
37.8349998785974	25.5456523914796	37.9243	23.9119
38.2589720175297	25.3875268964254	38.8284	23.4703
38.4755134659434	25.6805690502866	37.8149	25.869
38.4755134659434	25.6805690502866	37.4163	24.6203
40.137598850521	27.9298525735717	41.7938	26.8087
41.7672306365859	30.5654110434827	40.4113	32.0356
42.8235400779773	31.1060202703806	41.9344	32.8635
43.6633333893514	31.5358175502305	43.0635	31.4686

Solution x	Solution y	Original x	Original y
44.9606128816501	32.1997408288251	44.5785	34.1629
46.7706655848995	32.0390091147302	47.2249	31.4694
47.8865421031309	31.9399171436768	49.5874	32.9921
47.8865423535242	31.9399163041873	48.8851	33.6728
47.7650676092932	30.2021757187598	48.0614	30.3792
47.6169977639351	28.0839425151765	49.2766	27.3707
47.6169977639351	28.0839425151765	47.7847	28.4345
47.5904944679077	27.7048128941209	45.8434	28.1097
47.5451741949632	27.0565392460092	45.5527	26.8832
47.74984958777	26.2318798527532	49.7446	26.3767
47.6385632851682	25.1045415363485	48.2875	25.5427
47.4529990782267	23.2247763478667	49.2796	22.4102
45.9436552998335	21.5736389704508	47.312	20.115
44.7453722366882	20.6111267833786	44.6412	21.1681
43.1777873054693	19.3519691473896	41.315	20.08
44.4764255716866	10.6972783515582	43.1416	9.2079
52.7464117430109	10.369605375678	52.9148	12.3625
57.293470109636	9.77981812190583	57.0413	9.9678
73.6406998796818	7.65946825500523	73.9225	9.6395
84.6340976163559	5.95573642969126	84.9979	3.9891
92.875673244922	10.6700682534915	94.4757	9.4701
95.7965879518964	22.8293134684747	97.6128	23.6668
93.5589302575874	23.9685526112043	92.9329	22.8145
91.5417581003021	24.99553934995	92.0943	24.688
66.9429080651175	37.5193642234944	64.954	37.309

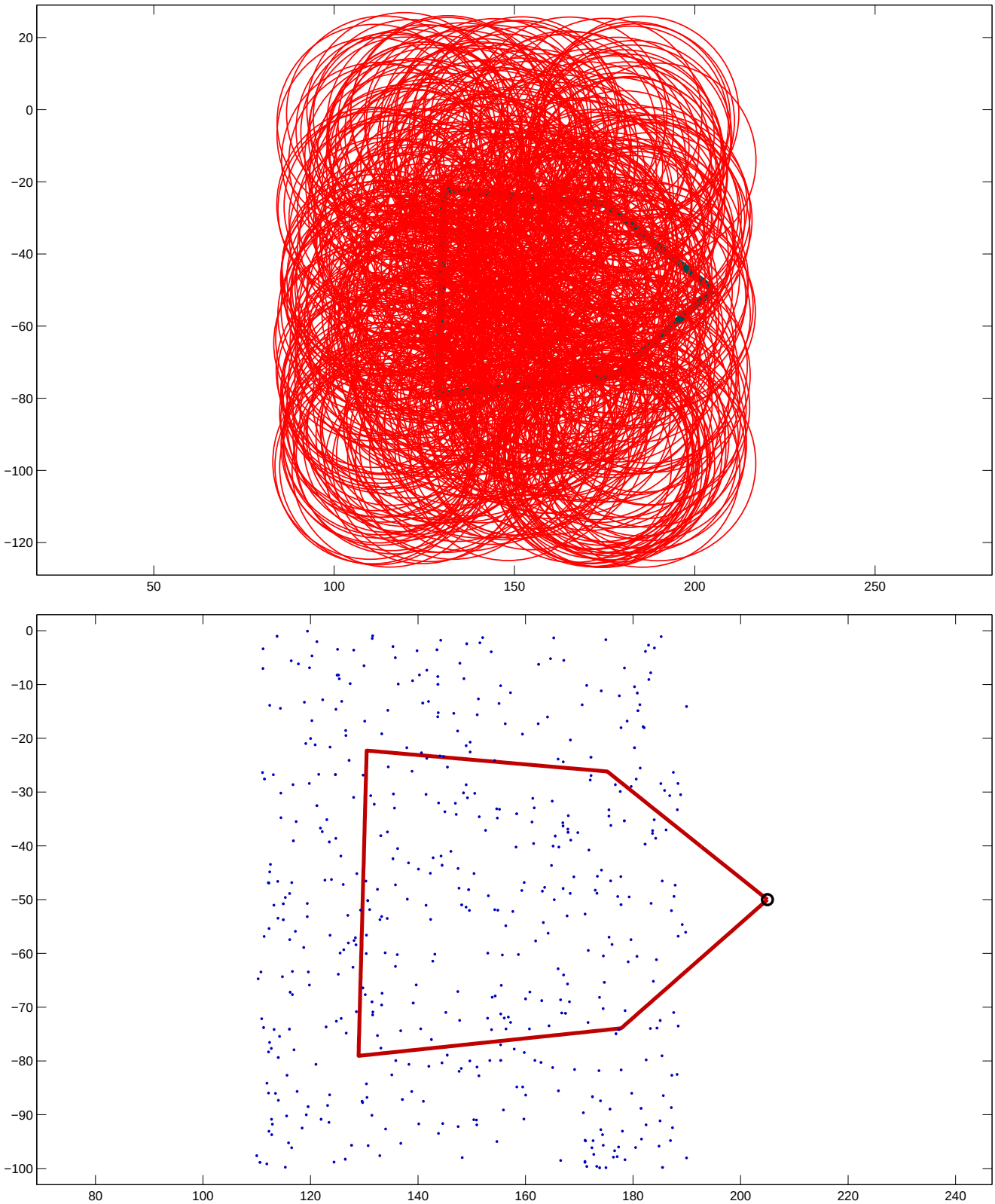


Figure N.6: *team*6_500, Equal Radius, 2D, Euclidean, Length = 225.2160041

Table N-9: Solution for *team6_500*, Equal Radius, 2D, Euclidean

Total distance: 225.216004148543			
Depot: x 95 y 50			
Solution x	Solution y	Original x	Original y
89.0622001494853	45.2517344311625	72.24704	39.7077335
85.571232462695	42.4601091321824	74.2228108	38.6099587
82.7029343441934	40.1664171114797	73.9542296	35.1681427
82.7029343441934	40.1664171114797	68.3855742	35.3493495
80.765424976543	38.6170654394386	76.1612584	37.0439506
79.0049678096847	37.2092802347336	76.8303918	30.6898889
77.427615497358	35.9479089223817	73.6393721	37.6930766
75.9546640097335	34.7700240520434	73.6483802	37.1698351
74.5382431461513	33.6373500714293	77.5184606	26.3492827
74.5382431461513	33.6373500714293	75.1791401	28.4357222
73.2323645661158	32.5930796643711	75.8801773	29.7113355
73.2323645661158	32.5930796643711	70.5957341	27.6007009
72.019461587277	31.6231618753963	71.3343578	25.5495623
72.019461587277	31.6231618753963	69.6772126	28.9703915
70.9049130078182	30.731896592316	67.7860652	18.0440513
70.9049130078182	30.731896592316	70.2766166	21.7580017
69.9364988320042	29.9574919400298	72.0757838	18.033427
69.9364988320042	29.9574919400298	71.8742878	17.8343061
69.0381469474624	29.2391130074666	68.9038468	16.8104734
68.200909549111	28.569606034161	70.9135058	14.8761766
67.3970740762014	27.9268096087852	70.8086056	11.5809577
67.3970740762014	27.9268096087852	71.2868972	13.7571779
66.6489707177879	27.3285790891369	79.9570853	14.106802
66.6489707177879	27.3285790891369	72.9487249	9.0752285
65.9085781789092	26.736512061649	73.292725	7.8305571
65.9085781789092	26.736512061649	70.2907843	10.4186099
65.2043610794703	26.1733717258384	75.2339764	1.1053279
64.2861792284641	26.0936529474044	73.9903157	3.2090585
63.216280012203	26.0007461543145	72.8917692	2.6849909
63.216280012203	26.0007461543145	72.320279	3.8462993
61.8680529911597	25.8834794815495	64.943613	1.686391
60.444537623607	25.759722079769	68.4102584	6.9403941
59.0677036333939	25.6399991901162	67.4654721	12.1137109
59.0677036333939	25.6399991901162	64.1033853	11.196525
57.9957492499644	25.5467572108978	61.3811866	10.1841347
57.9957492499644	25.5467572108978	60.5482992	13.7850738
56.8840456499818	25.4500685664834	57.1362338	5.5136309
56.8840456499818	25.4500685664834	52.4413086	6.2567644
55.6988450189779	25.3470325544111	55.2537104	1.3428502
55.6988450189779	25.3470325544111	54.6678163	5.1970784
54.5828866210529	25.2500565634737	43.6411268	3.9331303
53.699151059535	25.1732775161755	42.0438698	1.2746098
53.4337591701508	25.1502262396906	41.5241877	2.2495139
53.4337591701508	25.1502262396906	39.0651937	2.4238303
53.3771171530393	25.1453053667132	37.7928549	6.0601138
53.3771171530393	25.1453053667132	38.5584867	8.9239146
53.323115744033	25.1406114063008	33.7088519	9.9711832
53.2713266556103	25.1361086236323	33.7699504	15.2531662
53.2205731161349	25.1316947447309	36.6688954	15.3802855
53.2205731161349	25.1316947447309	33.6742877	16.0147514
53.1717224628171	25.1274446153105	41.0252369	15.6288565
53.1717224628171	25.1274446153105	37.3849664	18.6565566
53.1243051912098	25.1233187106266	41.2499501	12.693222
53.0785532481478	25.1193383408178	45.3795945	10.2393952
53.0785532481478	25.1193383408178	47.2237184	11.5265695
53.0374772189772	25.1157659178857	45.092729	13.545129
53.0374772189772	25.1157659178857	46.2315326	17.3070005
52.9986528076649	25.1123895691061	49.4509792	19.23293
52.9614645250964	25.1091556066865	54.100404	16.0525172
52.9614645250964	25.1091556066865	52.3761166	17.3066951
52.9244526243097	25.1059369899556	58.3586123	20.3359236
52.887761121181	25.1027462555933	56.0727891	23.8686819
52.8493533781661	25.0994062179415	62.0390375	27.7696953
52.8493533781661	25.0994062179415	57.0336699	24.3925592
52.8078147460685	25.0957936883931	62.1748486	23.5386262
52.8078147460685	25.0957936883931	62.1996928	26.9322785
52.7635353121941	25.091942706187	78.3681704	28.4149174
52.7635353121941	25.091942706187	78.8734057	30.5074156
52.7031201959202	25.0866878396217	67.6344777	29.9025036
52.7031201959202	25.0866878396217	66.7264937	28.6241638
52.6373762801178	25.0809696641183	78.2442809	33.2914556
52.302871899125	25.0518821717684	65.5339196	33.299582
52.302871899125	25.0518821717684	65.5247054	34.4819771
51.9537633303725	25.0215260119537	65.884583	36.2103636
51.9537633303725	25.0215260119537	61.8021468	40.7857588
51.5860458310269	24.9895526179153	59.7400431	37.5401839
51.5860458310269	24.9895526179153	57.9145816	37.4787407
51.2170342149835	24.9574660133044	58.429274	38.9397266
51.2170342149835	24.9574660133044	56.2067364	40.2417677
50.8425066548795	24.9248983230985	55.5353048	38.1752447
50.4724672218297	24.8927205244795	57.8811625	36.8910334
50.4724672218297	24.8927205244795	56.98499	36.3050676
50.1048268628582	24.8607512841987	57.9600279	34.4089577
50.1048268628582	24.8607512841987	56.9481598	35.7189477
49.740944577794	24.8291095736781	54.9748886	31.6899499
49.3856201102123	24.7982125558211	51.358437	31.183912
49.0368657693862	24.7678869380179	51.6262531	32.9510025
49.0368657693862	24.7678869380179	51.2078647	35.5791539
48.6986131586202	24.7384744186186	51.5218465	39.5765057
48.6986131586202	24.7384744186186	48.2549784	40.2375649
48.3633347100116	24.7093202526546	55.1300701	40.0588307
48.3633347100116	24.7093202526546	54.8328865	43.6672378
48.0157929700265	24.6791007981413	58.3317264	48.8464518
48.0157929700265	24.6791007981413	55.3536754	50.0230289
47.3891625373895	24.6246224931834	53.5581269	47.7413894
46.7087574886884	24.5654708132508	53.1446811	48.4277704
46.7087574886884	24.5654708132508	49.7681271	46.8278362
45.9235404613839	24.4972103405758	49.3212736	48.3119567
45.9235404613839	24.4972103405758	40.4352515	45.1450838
45.1396392635349	24.4290633592234	37.4597811	44.2188485
44.4093953436928	24.3655795472949	42.5831476	37.1399223
43.7019232648784	24.304074983366	44.7688336	34.8472485
42.9933035883451	24.2424713436804	48.3601763	34.0464698
42.9933035883451	24.2424713436804	45.1705924	33.2150554
42.2631957745379	24.1790014104329	44.6441662	33.1239716
41.522775269958	24.1146364545915	35.0133629	33.6653342
41.522775269958	24.1146364545915	41.3950957	34.602479
40.8177174312449	24.0533448924524	36.9545772	32.1019086
40.8177174312449	24.0533448924524	37.130172	34.1670861
40.1489376112549	23.9952061725322	33.8398153	32.0377234
39.5022497376108	23.9389876915076	38.9767874	28.6595996
39.5022497376108	23.9389876915076	38.4714341	30.1541626
38.8746505405659	23.8844292221654	40.565033	30.2350611
38.8746505405659	23.8844292221654	39.21475	31.0795566
38.2489822485647	23.830039939029	44.272376	24.1529526
37.614181865875	23.774858188989	36.1244237	41.0242921
36.9823821587067	23.7199369737706	34.2887402	41.9043439
36.9823821587067	23.7199369737706	34.4981613	43.6098189
36.3731802947726	23.6669776612956	32.8302989	42.2309887
35.7794062838609	23.6153590308778	39.7157151	22.5518047
35.1707670301055	23.5624497984461	39.7052051	20.7340789
35.1707670301055	23.5624497984461	38.9701661	21.3778805
34.5421234769414	23.5078050010824	30.0937988	44.3308943
34.5421234769414	23.5078050010824	32.3078962	45.114069
33.9312151446928	23.4547008557845	25.8175111	47.2716024
33.9312151446928	23.4547008557845	28.2512087	43.1796715
33.3951866559522	23.4081043499975	34.7673517	23.4200763
33.3951866559522	23.4081043499975	35.4889656	25.3753347
32.8414475667974	23.359970198639	25.3533813	42.3962835
32.3076437411871	23.313568306432	23.0786229	38.1227731
32.3076437411871	23.313568306432	26.2175773	40.5220972
31.8183412429318	23.2710327232781	25.6408756	32.9849766
31.8183412429318	23.2710327232781	24.3319298	37.4283803
31.3514602633107	23.2304455396871	31.6418617	23.7354033
31.3514602633107	23.2304455396871	34.0986738	23.3047286
30.866412706731	23.1882808069747	18.0420031	31.0087706
30.866412706731	23.1882808069747	21.8832831	32.2702186
30.4117986056663	23.1487608340172	19.7989907	26.8559855
30.4117986056663	23.1487608340172	21.2205961	30.6755865
29.9796442485809	23.1111924317912	25.434095	30.36432
29.5555288503254	23.0743225177825	31.5115819	30.4349931
29.1263503200005	23.0370122946263	24.4888337	25.329984
29.1263503200005	23.0370122946263	28.9097869	26.1468646
28.6961006006201	22.9996086184074	27.922577	21.764341
28.6961006006201	22.9996086184074	30.6527015	22.708305
28.2449039393545	22.9603843846441	24.4057133	14.819481
27.7837409279427	22.9202946444596	20.1050057	16.8211128
27.7837409279427	22.9202946444596	23.260163	19.1726271
27.3321487885721	22.8810369923319	16.5956207	19.4929376
27.3321487885721	22.8810369923319	17.2034005	24.1027648
26.9153456595478	22.844802171934	16.5565287	18.5575743
26.5107111754975	22.809624996304	12.2844966	12.8434228
26.5107111754975	22.809624996304	14.7546051	14.610274
26.151001873906	22.7783529839196	15.3634563	8.946465

Solution x	Solution y	Original x	Original y
26.151001873906	22.7783529839196	15.820225	13.1438067
25.8227353312338	22.7498146223987	14.9649191	8.2569823
25.8227353312338	22.7498146223987	15.2275578	8.2482088
25.5190131438502	22.7234104335451	19.95828	6.5164086
25.5190131438502	22.7234104335451	17.3929381	9.8303298
25.2248093897587	22.6978340858614	26.3324067	9.9110212
24.9303801894827	22.6722383057396	28.9980611	9.3107142
24.9303801894827	22.6722383057396	30.8819888	13.4626957
24.6216138767516	22.6453962639719	31.9710737	13.1659452
24.3008481779228	22.617511376194	33.6893922	8.5224136
23.960531350603	22.58792749393	31.6461166	7.3585956
23.960531350603	22.58792749393	30.2787157	8.2280249
23.6003463510242	22.5566173731559	29.8399494	3.731908
23.2241354688138	22.5239154857831	25.3620642	2.9418291
23.2241354688138	22.5239154857831	25.7941467	5.022901
22.8473773344126	22.4911674427938	21.5694811	0.9567502
22.8473773344126	22.4911674427938	21.5004558	1.4444458
22.4838781796601	22.4595724452231	18.0605132	3.6100683
22.1295211796202	22.4287719433986	15.0419936	3.4632806
21.78686354467	22.3989876634683	9.4518233	0.0818322
21.78686354467	22.3989876634683	11.2137447	2.0282324
21.510673552631	22.3749777674574	10.2956976	4.6843351
21.510673552631	22.3749777674574	9.8269964	6.8843491
21.2499273377598	22.352308653737	6.432164599999999	5.6038094
21.2499273377598	22.352308653737	7.7653349	6.167634
21.0047697701684	22.330993380682	33.5301093	3.5426558
20.7406478762315	22.3080311840975	34.237799	1.769458
20.4510469120842	22.2828557955882	3.796854	1.0310825
20.4510468842202	22.2828558284021	1.18933079999999	3.3623299
20.4326433051929	22.9741533989638	1.16963010000001	7.0254341
20.4112538867238	23.7775960766962	2.4227502	13.8762399
20.4112538867238	23.7775960766962	4.41833269999999	14.4467589
20.3870434296712	24.6870988680835	8.8711802	13.2955279
20.3615458463021	25.6449434708273	10.2638739	16.7343669
20.3350994292612	26.6383915348709	10.0346396	20.0550826
20.3350994292612	26.6383915348709	9.1420339	20.9818632
20.3075610547099	27.6728005842526	10.881307	21.222109
20.3075610547099	27.6728005842526	13.6477983	21.6503409
20.2787798625408	28.7537974216886	11.5512784	26.7283657
20.2787798625408	28.7537974216886	14.6392528	26.7492086
20.2501322719104	29.8297798333547	6.7702019	28.6398243
20.2501322719104	29.8297798333547	9.78612250000001	28.4044715
20.2215333251834	30.9039729290408	3.1062568	26.7803784
20.2215333251834	30.9039729290408	4.4919615	30.1971308
20.1920589955493	32.0110361295579	1.0903939	26.3844516
20.1920589955493	32.0110361295579	1.44105020000001	27.5670412
20.1599531609573	33.2169193285634	4.5207011	34.7763494
20.1599531609573	33.2169193285634	7.3492035	35.5012058
20.1291866480651	34.3725682066201	2.57466789999999	43.4683609
20.1291866480651	34.3725682066201	6.820668	39.0713932
20.1023558825081	35.3804686608038	11.1949114	32.5347928
20.1023558825081	35.3804686608038	13.0553452	35.1491327
20.0747945438788	36.4157444308882	11.8541821	36.7134083
20.0468455130361	37.4655349097331	12.1928408	37.3702852
20.0183383194099	38.5362440017192	13.5198617	39.2703319
19.9892353446173	39.6292716326368	14.7299938	38.6202015
19.9892353446173	39.6292716326368	15.6671545	41.9038059
19.9593305239665	40.7523222367271	12.7057803	46.3942459
19.9593305239665	40.7523222367271	13.919931	46.2670929
19.9309543441165	41.8180009610868	4.944301	50.787374
19.9309543441165	41.8180009610868	5.3360715	49.6056788
19.9061488279114	42.7497295457286	16.954408	52.9270638
19.9061488279114	42.7497295457286	19.3270801	51.9549025
19.8842494782715	43.5723496910193	3.2029124	51.042154
19.8631337276466	44.3655636553207	20.6501388	50.1791373
19.8631337276466	44.3655636553207	21.0216738	51.8703093
19.842805885877	45.1291640401717	23.2467308	53.1536864
19.842805885877	45.1291640401717	24.284459	53.5118781
19.8229933873895	45.8733658499945	37.6481264	47.8813096
19.8026946474206	46.6357525643535	39.4220046	48.156385
19.7817011922307	47.4241394791489	20.4303529	56.6155569
19.7817011922307	47.4241394791489	22.9209187	53.7233909
19.7615637227722	48.1804063918571	16.0956015	47.1989931
19.7615637227722	48.1804063918571	18.6253841	45.1798856
19.7408593731423	48.9579445670142	43.0965371	49.287121
19.7192434493653	49.7695843610971	44.2906965	51.8898251
19.6975616343475	50.5836428940225	18.1200543	57.6122523
19.6975616343475	50.5836428940225	18.3784185	57.1026507
19.6766425502175	51.3691174059668	20.3277951	46.570702
19.6766425502175	51.3691174059668	22.4746551	48.1041051

Solution x	Solution y	Original x	Original y
19.6540395071296	52.2177376608268	18.474215	58.4012448
19.6315371392315	53.0626224987062	20.3908302	60.0437447
19.609369566112	53.8950025008058	23.9069485	59.9121563
19.5873319515269	54.72251552451	25.824676	62.4300357
19.5873319515269	54.72251552451	26.1534967	60.2417469
19.5658594812307	55.5288146826993	33.1471098	60.1558513
19.5444954284312	56.3309568287939	32.7632095	61.4478694
19.5233059125461	57.1264707924889	29.1113171	69.2428114
19.5233059125461	57.1264707924889	29.6716712	65.8677857
19.5043326776325	57.8388161561256	23.2409835	69.6045703
19.4863648953652	58.5134480079285	21.5799527	71.4486566
19.4694917482329	59.1470196788061	21.6218153	70.9164832
19.4694917482329	59.1470196788061	21.4467307	69.0185063
19.4541990576172	59.7212755806002	19.7736057	66.4248411
19.4541990576172	59.7212755806002	23.3330747	67.4297538
19.4397870566599	60.2624365445166	20.1950128	67.681815
19.4257261184756	60.7904051145276	15.1928212	63.8863652
19.4257261184756	60.7904051145276	17.9198509	62.5969087
19.411729626972	61.3159689818597	28.8394854	85.6978668
19.411729626972	61.3159689818597	2.1729785	46.8604253
19.411729626972	61.3159689818597	2.4253981	44.8523436
19.411729626972	61.3159689818597	2.27936	46.9159446
19.411729626972	61.3159689818597	3.9184302	46.6238898
19.411729626972	61.3159689818597	6.1363219	48.8674613
19.411729626972	61.3159689818597	23.1076735	77.6165558
19.411729626972	61.3159689818597	6.5220454	46.8393292
19.411729626972	61.3159689818597	22.4809106	75.2843669
19.411729626972	61.3159689818597	26.7897314	74.395765
19.411729626972	61.3159689818597	30.51178	74.0433946
19.411729626972	61.3159689818597	28.018456	49.9258106
19.411729626972	61.3159689818597	32.3710377	53.6854
19.411729626972	61.3159689818597	31.5095969	51.0684653
19.400568365139	61.7351712283546	15.5276897	59.9411898
19.400568365139	61.7351712283546	17.0586402	58.0717087
19.3889016281874	62.1733684063198	13.6466825	56.641223
19.3889016281874	62.1733684063198	16.1987878	59.3187745
19.3762237144967	62.6495437159241	9.41537220000001	53.1681384
19.3762237144967	62.6495437159241	9.4077401	50.7341371
19.3617566238725	63.1928730267876	4.9451086	53.7479899
19.3617566238725	63.1928730267876	7.20936620000001	55.909681
19.3451597749477	63.8161232097327	3.9504558	53.4738105
19.3272285361487	64.4894400793756	1.389212	56.8496436
19.3272285361487	64.4894400793756	2.2999767	55.3764405
19.3068129689994	65.2559898546084	6.1457761	57.4553139
19.3068129689994	65.2559898546084	8.7488745	58.9072962
19.2849874287126	66.0754298517505	6.6502494	63.3598676
19.2849874287126	66.0754298517505	9.6122245	63.4753738
19.2630632058017	66.89856491258	6.6484375	67.6725429
19.2630632058017	66.89856491258	9.8142501	65.891213
19.241403276272	67.7118042477034	6.2196931	67.2192158
19.2195668830526	68.5316634200733	0.7950307	63.4582891
19.2195668830526	68.5316634200733	4.8021518	64.3437535
19.1960296347856	69.4153148089115	0.2763329	64.7359652
19.1713360545949	70.3423313074315	1.295681	73.7881021
19.1713360545949	70.3423313074315	0.9335658	72.1659561
19.1469827120204	71.2565670562837	3.2443278	74.1558976
19.1226690591824	72.1692953373623	4.2645198	75.4568775
19.1226690591824	72.1692953373623	6.0949397	74.0865476
19.098255382694	73.0857451560559	2.7334234	77.6753662
19.098255382694	73.0857451560559	2.4095765	76.567725
19.0742154333386	73.9881440022102	2.2118306	78.338365
19.0503020632567	74.8857747411516	5.6520223	82.6769432
19.0503020632567	74.8857747411516	4.0094679	79.3774545
19.0270812227524	75.757407021084	4.0389978	87.3302987
19.0050464664955	76.5845251313726	2.7731053	90.8551563
19.0050464664955	76.5845251313726	5.5712407	90.2337915
18.9862058608826	77.2917812267654	2.2885744	93.0945686
18.9862058608826	77.2917812267654	2.9296139	91.7761922
18.9706958109537	77.8740266920108	11.0262565	80.6460603
18.9706958109537	77.8740266920108	16.6661596	74.8364156
18.9544079095852	78.4854101342651	2.8109458	93.7321232
18.9393311140994	79.0513413878719	0.6045586	98.8714353
18.9666700061246	79.0484730413786	1.8947773	99.155621
18.9940248154975	79.0456036901328	5.3401207	99.7769332
18.9940248154975	79.0456036901328	6.5131248	96.1438685
19.0216206839496	79.0427091853777	5.9392628	95.2323551
19.0216206839496	79.0427091853777	8.4509457	92.4898096
19.0493760685966	79.0397979669289	14.3875276	98.8261078
19.0768236938908	79.0369188387757	16.4819632	98.2716229
19.0768236938908	79.0369188387757	17.6447354	95.7025091

Solution x	Solution y	Original x	Original y
19.1034074368482	79.0341299107177	20.7475398	95.759314
19.1034074368482	79.0341299107177	26.8042407	95.3391438
19.1281765206094	79.0315311727221	11.9839899	90.8471274
19.1528214883888	79.0289454475266	9.2263989	90.0124515
19.1528214883888	79.0289454475266	9.5621792	88.5032381
19.178226767901	79.0262796498545	13.4475731	91.4293541
19.178226767901	79.0262796498545	7.5281123	85.6801168
19.2053899991967	79.0234289536293	6.9413921	77.9428724
19.2053899991967	79.0234289536293	12.9149435	73.6813943
19.2330810916739	79.020523127023	14.8230271	72.6203252
19.260683074481	79.0176269625176	15.7168362	72.1075902
19.260683074481	79.0176269625176	18.5593029	70.8497614
19.2879928322572	79.0147619701637	3.4980922	86.0326352
19.2879928322572	79.0147619701637	1.9077799	84.1438746
19.317321232426	79.011685102858	0.0137858	97.6201473
19.317321232426	79.011685102858	2.2068367	85.97283
20.1475845754018	78.9246844529817	13.1891897	88.2938542
21.0088989248173	78.8344315392975	19.6994488	87.7215703
21.0088989248173	78.8344315392975	20.5127244	86.7993916
21.8780334197168	78.7433554912126	27.0999394	87.1794445
21.8780334197168	78.7433554912126	31.00496	87.5127119
22.6794051494725	78.6593707717269	20.4274735	84.2677658
23.493745941469	78.5740256298494	13.5790401	86.3111074
23.493745941469	78.5740256298494	19.6070156	87.5155962
24.3828331235302	78.4808511270436	21.4283979	90.119601
25.2982835459922	78.3849153640246	22.9057445	97.6296948
25.2982835459922	78.3849153640246	23.9936704	92.6751712
26.2784567814543	78.282202026582	30.1525293	91.7059859
26.2784567814543	78.282202026582	25.1363027	82.596723
27.2647267891205	78.1788548872165	25.8819635	79.9487476
27.2647267891205	78.1788548872165	28.3264783	80.6515072
28.2792951248155	78.0725465263956	34.617789	91.6565199
29.2840012977998	77.9672713457314	33.8269693	93.4852631
30.3033046973127	77.8604669696221	38.2308224	97.9753907
30.3033046973127	77.8604669696221	37.489488	92.2138591
31.2762524987403	77.7585177797077	40.8799687	90.9919823
31.2762524987403	77.7585177797077	40.3910959	90.932739
32.1985621358332	77.6618725280219	44.680977	94.9895485
32.1985621358332	77.6618725280219	40.9379615	91.8870672
33.0365129522921	77.5740625718829	49.7030604	90.8227548
33.0365129522921	77.5740625718829	45.8972803	89.1189208
33.7601488772982	77.4982272162856	48.3895216	84.8378656
34.4477961357173	77.4261627053906	50.0446513	86.3510967
34.4477961357173	77.4261627053906	49.4827685	84.8462228
35.0562178649643	77.3623975776593	56.1389342	85.561632
35.5885488568898	77.3066055254217	55.0653569	81.234009
35.5885488568898	77.3066055254217	52.878421	80.2956919
36.05300563632	77.257925545393	51.7496653	79.9144917
36.05300563632	77.257925545393	49.7783583	78.4397036
36.4840540002693	77.2127467851131	47.9098314	77.7959758
36.9025288231945	77.1688861611334	45.3945603	79.9114427
37.3129870480727	77.1258659190168	43.3709663	79.9295648
37.3129870480727	77.1258659190168	45.3765455	76.9954785
37.7246003117134	77.0827248259537	41.3355343	82.7796974
38.1390105564461	77.0392908253154	40.9923031	81.1407106
38.1390105564461	77.0392908253154	39.6568849	80.0063838
38.5709156201284	76.9940232044549	37.6570142	81.9317057
38.5709156201284	76.9940232044549	38.0621359	81.3957333
39.0281155785126	76.94610481506	32.0336769	81.0046037
39.0281155785126	76.94610481506	34.482979	80.365325
39.5245896190473	76.8940716248138	35.4564008	78.9241199
39.5245896190473	76.8940716248138	32.5068688	76.0167984
40.0643720640049	76.8375019036532	37.7594155	72.4638416
40.0643720640049	76.8375019036532	35.1926471	70.9963316
40.6378710621611	76.7774015797319	43.6827488	74.1878852
40.6378710621611	76.7774015797319	42.9598051	72.0704928
41.2067543009323	76.7177848283446	46.3729602	74.0499355
41.7605397913131	76.6597499797334	50.7478618	74.0551131
41.7605397913131	76.6597499797334	47.2434466	72.8348775
42.2727168293167	76.6060732408325	46.8228713	71.844353
42.2727168293167	76.6060732408325	46.0567355	72.019762
42.7588878413314	76.5551206033985	45.412979	71.2677197
43.234718091659	76.5052513938004	43.8195847	68.1613988
43.7055631653597	76.4559044408684	44.3710695	67.9205927
43.7055631653597	76.4559044408684	37.415218	67.1119326
44.1859813686623	76.4055540574199	43.0002757	59.9692573
44.6709731656486	76.3547246461287	54.2235528	56.265496
44.6709731656486	76.3547246461287	45.6990417	60.3070344
45.1676781910253	76.3026673962559	39.5709227	52.0192185
45.6754104978364	76.2494544066042	38.9617732	51.3997809

Solution x	Solution y	Original x	Original y
45.6754104978364	76.2494544066042	38.128444	50.990683
46.4248013884647	76.1709128205769	47.6524078	52.2249928
46.4248013884647	76.1709128205769	44.8729194	51.9811136
47.1488757117964	76.0950224974363	46.3458684	54.8708712
47.8628120339299	76.020194644753	51.8847181	57.7017397
47.8628120339299	76.020194644753	48.6878693	60.2173135
48.5426174688483	75.9489396673739	56.0822206	62.8731122
48.5426174688483	75.9489396673739	45.5118999	65.9532613
49.2515225726473	75.8746393391134	50.0180258	68.4527432
49.2515225726473	75.8746393391134	50.8238583	67.1806384
49.967225234731	75.799623547102	53.0250996	68.7918887
50.6998270227977	75.7228356266446	54.3749565	73.471727
50.6998270227977	75.7228356266446	56.7397866	71.0931061
51.4709143342798	75.6420099017462	57.43771	71.1535593
52.2488040861596	75.5604701583348	58.1838222	68.9986011
52.2488040861596	75.5604701583348	56.5346421	68.6367247
53.0195242127084	75.4796810866424	57.8283627	65.6998258
53.0195242127084	75.4796810866424	57.0800315	64.0172849
53.7661833741141	75.4014134017165	63.772212	68.1836695
53.7661833741141	75.4014134017165	64.6626599	65.39963
54.4399806793974	75.3307800538002	68.5426632	70.6500378
54.4399806793974	75.3307800538002	64.4543682	70.2655389
55.0401742122037	75.2678592291261	66.8428254	74.9418962
55.0401742122037	75.2678592291261	67.3900644	74.174693
55.5892536067878	75.2102947724246	61.6425082	72.8564323
56.1442960167347	75.1521051291517	63.6802314	81.8267454
56.1442960167347	75.1521051291517	59.1397084	81.6064397
56.6865164890772	75.0952601739758	63.9530194	87.4245185
56.6865164890772	75.0952601739758	62.4719528	86.6470186
57.2262688653014	75.0386751189549	60.774398	89.648206
57.7701524645955	74.98165801604	64.0121883	92.7907393
57.7701524645955	74.98165801604	65.7364961	88.9695394
58.3157018316428	74.9244676338773	68.0410206	93.0677269
58.3157018316428	74.9244676338773	64.3381393	93.722702
58.8541187281358	74.8680256381538	64.4754864	95.6952093
59.3915163502081	74.81169146445	62.6982725	97.3778678
59.3915163502081	74.81169146445	62.3573907	96.159986
59.9314450963848	74.755093371225	62.5782193	94.8345715
59.9314450963848	74.755093371225	61.0866811	94.7582572
60.4833387424805	74.6972430350325	56.5514993	98.5201232
60.4833387424805	74.6972430350325	61.1689993	94.8861498
61.0870831394446	74.6339617513507	61.0701287	98.8683739
61.0870831394446	74.6339617513507	61.0630253	98.699805
61.7379798144926	74.5657428496651	63.2522018	99.6147456
61.7379798144926	74.5657428496651	61.4066356	99.633296
62.4487066337314	74.4912599494823	64.9776601	99.8572829
62.4487066337314	74.4912599494823	63.7965883	99.8649883
63.1993170944281	74.412605054822	68.523768	98.3881808
63.1993170944281	74.412605054822	67.0620012	97.8077872
63.9319699935517	74.335834821905	66.3729212	97.9005203
63.9319699935517	74.335834821905	66.5761879	96.7049476
64.6923223314145	74.25616581724	67.3268965	96.007007
65.4708089019942	74.1745983645329	70.4834315	96.1070737
66.2497333089379	74.0929850275239	71.5874534	94.5399994
67.0319224901368	74.0110298661913	76.9820609	94.8106777
67.7868133155362	73.9319353330673	79.9522127	98.0359405
67.7868135606695	73.9319351732602	75.4923392	99.8090463
68.1589742473698	73.604688475431	74.8496365	95.8479299
68.552998104986	73.2582155405842	77.3466754	92.4222135
68.9590563068611	72.9011609576317	75.0360354	91.1497098
68.9590563068611	72.9011609576317	72.4289329	91.88372
69.3966482438635	72.5163741706085	71.4909917	88.8238404
69.3966482438635	72.5163741706085	69.765468	86.0199863
69.8633674932576	72.1059715562574	77.1265753	88.6843079
69.8633674932576	72.1059715562574	75.6464183	86.4517504
70.3539720554134	71.6745649153588	78.2121151	82.5216358
70.8391514843194	71.2479296038048	77.2293497	82.6694496
71.3130383359136	70.8312249771445	75.4040099	79.0607348
71.7787524200284	70.4217072753352	72.4566884	79.8068651
71.7787524200284	70.4217072753352	67.7945884	81.6777909
72.2480492771228	70.009035466069	74.4567732	73.8913977
72.2480492771228	70.009035466069	73.2290706	73.9762718
72.7043773214771	69.6077673863735	78.4106856	73.5257917
72.7043773214771	69.6077673863735	75.0689318	72.4744486
73.1429645234418	69.2220996705837	77.5651358	71.0148631
73.1429645234418	69.2220996705837	73.7932186	65.1929118
73.5626100884904	68.8530864063373	74.3685871	61.179785
73.5626100884904	68.8530864063373	70.748982	60.565778
73.9644723239424	68.4997120115504	69.1126526	61.5737532
73.9644723239424	68.4997120115504	69.6306367	57.4599551

Solution x	Solution y	Original x	Original y
74.3661459459848	68.1465069057227	66.0988248	58.3515559
74.3661459459848	68.1465069057227	65.5436157	56.992435
74.7757543604907	67.7863284704077	64.4880133	60.4854675
75.2087582389073	67.4055786294297	61.6781701	59.473286
75.2087582389073	67.4055786294297	61.0935569	52.6920317
75.6752964075483	66.9953385830762	57.7424662	53.0431767
75.6752964075483	66.9953385830762	53.3341085	54.2742297
76.2836163729721	66.4603850741843	57.0032853	47.929495
77.081836411568	65.7584116445807	62.9728444	48.2610974
77.081836411568	65.7584116445807	58.9987357	45.7674431
78.3841391740645	64.6130485399533	63.3053921	48.8331121
79.6685857605786	63.4833912445982	64.136723	44.5156078
79.6685857605786	63.4833912445982	63.3830619	45.6708392
80.9243235548219	62.3789853013394	67.7343836	45.7338412
82.1475148867787	61.3032038065804	78.4065879	56.8222853
83.3685312092704	60.2293401925211	79.80288	56.0883078
84.5273060226409	59.2102260044712	67.1669184	49.4371849
84.5273060226409	59.2102260044712	65.8501112	46.5185477
85.7895728281956	58.100104857572	69.2934493	49.5142976
85.7895728281956	58.100104857572	67.7686962	50.942416
87.175399122563	56.8812976534142	75.4422908	46.5496079
87.175399122563	56.8812976534142	73.3690079	50.7128517
88.959180321667	55.3125168286372	77.8566059	47.3210428
88.959180321667	55.3125168286372	77.6409989	49.4044045
91.4731290996686	53.1016403365948	79.155929	54.6404138
91.4731290996686	53.1016403365948	77.1618533	52.0527053

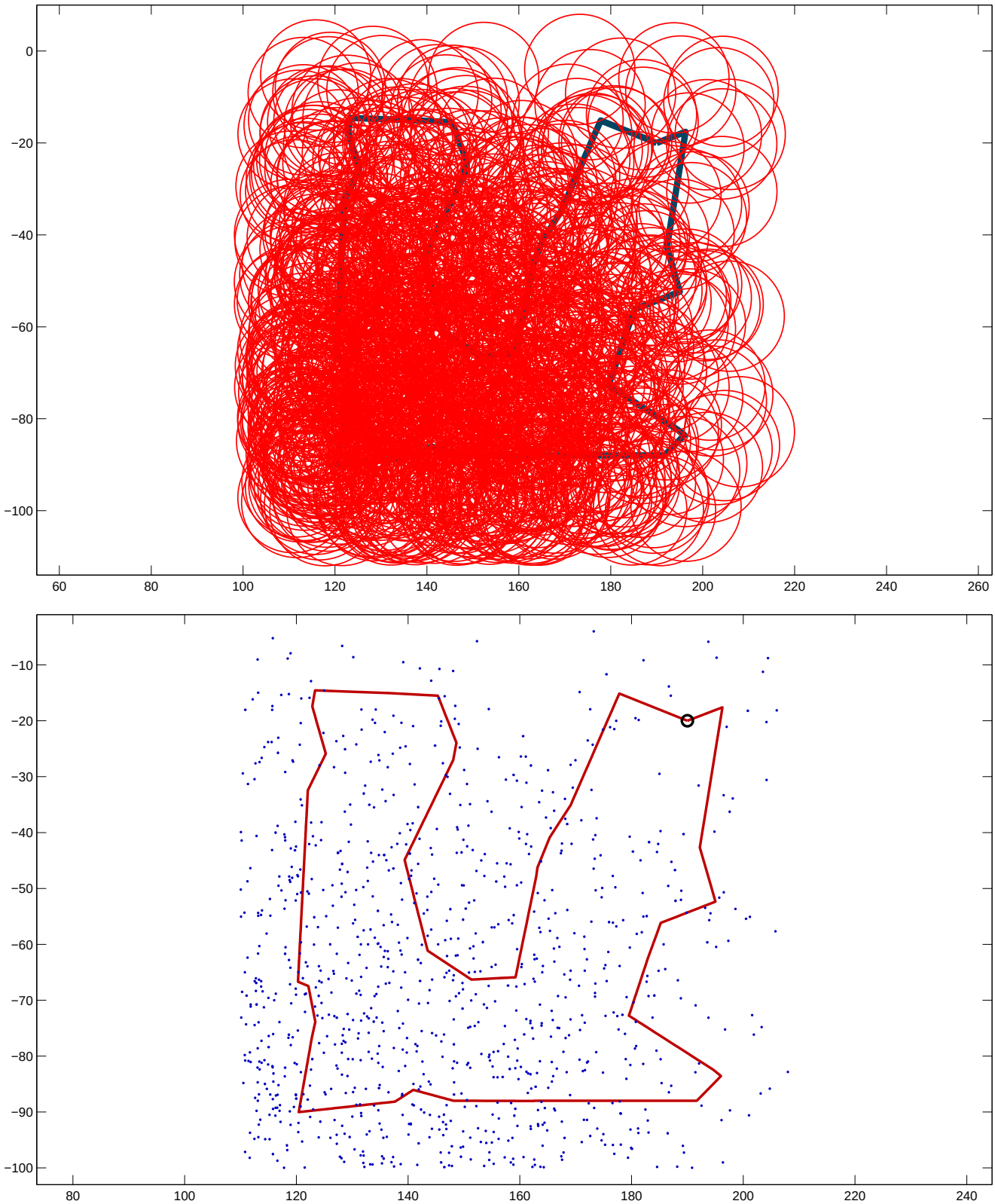


Figure N.7: *bonus*1000, Equal Radius, 2D, Euclidean, Length = 402.4695204

Table N-10: Solution for *bonus*1000, Equal Radius, 2D, Euclidean

Total distance: 402.469520380874 Depot: x 80 y 20			
Solution x	Solution y	Original x	Original y
81.5565969841455	19.4019386491769	77.03036191	15.51069798
84.1016015407306	18.4241197639523	85.22979418	8.715884504
84.1016015407306	18.4241197639523	76.68650337	13.86956158
86.2683961030985	17.591612260038	83.75499038	5.857780347
86.2683983595967	17.591611685503	94.43184685	8.796264511
86.1208118871649	18.5071633730889	93.53556787	11.2495411
85.8162808340881	20.3963191749141	95.99475962	18.1472698
85.8162808340881	20.3963191749141	94.15587216	20.2227246
85.2515892248658	23.899388754036	90.81819821	18.2159484
85.2515892248658	23.899388754036	87.03899122	21.09553754
83.3620647029373	35.6214496039141	94.17807015	30.5898166
83.3620647029373	35.6214496039141	88.13068149	33.9074779
83.3620647029373	35.6214496039141	86.50661976	33.33916758
83.3620647029373	35.6214496039141	87.56748283	36.27406643
83.3620647029373	35.6214496039141	82.01891737	31.58538586
83.3620647029373	35.6214496039141	75.00767938	29.50135545
83.3620647029373	35.6214496039141	77.14427045	45.25079579
83.3620647029373	35.6214496039141	75.19376171	39.75388964
83.3620647029373	35.6214496039141	74.78372311	42.05088328
83.3620647029373	35.6214496039141	74.55729645	43.48740037
83.3620647029373	35.6214496039141	73.13866372	41.71405139
82.7586807525338	39.3645420254043	79.30599483	40.28434635
82.2245643201128	42.6779454625034	70.24663893	43.40548551
82.8711844059353	44.9169404521644	84.85983095	39.85329756
82.8711844059353	44.9169404521644	77.77449926	46.72256252
83.6475395501648	47.6051461734979	86.51848331	50.71555717
83.6475395501648	47.6051461734979	85.71414415	51.67250379
84.2599847729404	49.7257912199621	90.50689197	55.43830225
84.2599847729404	49.7257912199621	88.60564442	53.67349247
84.6680760390212	51.1388336994014	91.19333201	55.09349477
85.0209943769638	52.3608353121166	95.77662579	57.68215173
83.9864679171578	52.7630120404839	87.34079917	59.37931572
82.9348665069668	53.1718272823141	85.16088414	60.47696067
81.9115344975291	53.5696524564949	83.55927983	59.64747077
81.9115344975291	53.5696524564949	83.91646182	55.69492785
80.9240416329604	53.9535441554808	84.14082278	54.46253046
80.9240416329604	53.9535441554808	83.19197135	53.48639501
79.8811912954324	54.3589562051246	79.86750899	54.35421653
78.8505176542601	54.7596347627924	78.92131522	50.41345477
78.8505176542601	54.7596347627924	78.85550393	52.04144231
77.7933096873747	55.1706296468465	77.87000631	52.21112855
77.7933096873747	55.1706296468465	76.57028534	49.55513485
76.691080276535	55.5991279204598	71.61626861	44.97765672
75.8444206209131	55.9282697897089	71.99750065	50.82091856
75.8444206209131	55.9282697897089	67.10787364	49.80646667
75.2328971347412	56.166000134099	66.65703205	47.7722791
74.4985488201216	58.1819237826574	64.66140077	51.58253517
74.4985488201216	58.1819237826574	62.81703196	55.94894639
72.8980455632522	62.5757409276384	61.56325619	58.635877
72.8028843435352	62.8632474834856	66.67873973	56.13517049
72.8028843435352	62.8632474834856	65.98277732	56.02257659
72.6982087998638	63.1795015358082	68.52022941	55.69012612
72.6982087998638	63.1795015358082	67.27809665	56.79217526
72.5826869690213	63.5285242937406	72.73426073	54.95021428
72.5826869690213	63.5285242937406	72.13050555	55.03070373
72.4420099535154	63.953537479383	71.85259834	57.85616299
72.4420099535154	63.953537479383	70.94365949	58.14560753
72.2850783502656	64.4276531637105	76.04244622	64.45001766
72.2850783502656	64.4276531637105	74.85083054	64.74645556
72.124802763815	64.9118698944535	69.70404765	60.5822767
71.9588147236287	65.4133431946206	72.70378804	66.70645397
71.7939294760274	65.9114852060386	78.29263567	66.45988674
71.7939294760274	65.9114852060386	75.75634139	60.02200009
71.6128123192904	66.4586650438138	72.84290598	65.67053988
71.6128123192904	66.4586650438138	67.87575086	63.89107621
71.4267760375885	67.0207054556241	65.33791464	63.72798066
71.4267760375885	67.0207054556241	65.84999623	61.37790202
71.2253467325734	67.6292437890672	65.09617026	64.32634731
71.017968154817	68.2557490911969	65.55566867	66.58332744
71.017968154817	68.2557490911969	63.53725064	67.03413314
70.813043007503	68.8748420423673	63.48323083	69.36201841
70.813043007503	68.8748420423673	63.47892732	68.70647259
70.6196639409411	69.4590549274162	61.64088805	64.72462094
70.4023850938101	70.1154511174772	59.0134746	66.34233581
70.4023850938101	70.1154511174772	62.01287875	62.70691628
69.9133056015611	71.5936814262423	58.20433528	69.50520456
69.9133056015611	71.5936814262423	60.59756518	67.42291916
69.7966533472456	71.9461649038681	61.14896118	72.70410502
69.6831155038118	72.2892405839768	60.79681015	75.33369853
69.6831155038118	72.2892405839768	61.63608438	74.03409399
69.5829188322868	72.5919987409886	58.81674593	76.2826012
69.5829188322868	72.5919987409886	59.09181099	73.44789922
69.5256077266167	72.7651509648188	58.21523833	76.77458472
70.0428116004667	73.0965852833849	63.68037897	79.29990004
70.5815475653346	73.4418161907789	64.88497046	82.96772641
71.0696027493861	73.7545681298051	69.09548968	84.07624055
71.0696027493861	73.7545681298051	69.80433177	81.60817435
71.4577274861575	74.003281025067	68.96890483	80.55619731
71.4577274861575	74.003281025067	70.61748839	78.65460339
71.8295236264107	74.2415294216674	70.83372488	78.21085961
71.8295236264107	74.2415294216674	68.84275879	76.03221479
72.1984555808592	74.4779416901093	67.69295238	75.24403656
72.5816714043341	74.7235071980684	66.81087893	72.19337817
72.5816714043341	74.7235071980684	65.34735437	72.80394877
73.0345887063644	75.0137386512774	68.36889636	72.61479797
73.0345887063644	75.0137386512774	67.45457311	72.85375456
73.5675676155331	75.3552758706216	70.36283848	70.39401036
73.5675676155331	75.3552758706216	69.12634406	69.4594231
74.239484078267	75.7858488657765	73.75840634	73.11670598
74.239484078267	75.7858488657765	70.77169737	73.88064127
74.9903387884818	76.2670092129368	74.07680751	69.16329968
74.9903387884818	76.2670092129368	73.05372772	69.26625594
75.9585438081614	76.8874540090669	78.83068399	69.67274441
76.9956720111857	77.55206871596	83.77232341	73.14211564
76.9956720111857	77.55206871596	81.47694776	70.94126153
77.954043082963	78.1662138019374	75.20998283	80.5662569
77.954043082963	78.1662138019374	74.46580568	79.0435318
79.013322913115	78.8450227049459	72.09010058	81.417498
80.2632050953151	79.645975675476	76.68533256	86.49303137
80.2632050953151	79.645975675476	75.38279951	84.8495864
81.5923662265765	80.4977329829526	82.09017124	81.333147
81.5923662265765	80.4977329829526	77.11333094	85.3156461
83.0448272843681	81.4285000235519	81.4352048	82.89764497
84.5937772930988	82.4211165020127	91.59995025	72.67875795
84.5937772930988	82.4211165020127	86.75397464	75.23932777
84.9584626113909	82.7142328963882	93.29522257	74.82458329
85.28449582275	82.9762820249067	93.12739448	86.70709298
85.28449582275	82.9762820249067	91.90328388	76.16243153
85.562715024666	83.1999006980585	91.04765146	90.60180149
85.562715024666	83.1999006980585	87.63411723	89.72076827
85.7969654138369	83.388179540443	86.10921689	91.46882481
85.7969654138369	83.388179540443	82.53992082	88.87907996
86.011940031097	83.5609654972576	97.99058573	82.84537681
84.8528768373608	84.7457279421124	94.75890926	85.83537613
81.6858437616384	87.9829252686739	86.37403118	99.02923308
80.8070848850332	87.9885550961327	80.84419352	99.98848979
78.5479587196569	87.9880729858134	78.18108034	99.79242924
76.9871033508049	87.987736701897	68.01446808	90.26524455
76.9871033508049	87.987736701897	67.89989075	88.12316705
76.1919851069989	87.9875643230005	79.39161289	97.26593015
76.1919851069989	87.9875643230005	79.19703593	96.06011661
75.2510343678833	87.987359837947	66.59307852	88.41880362
74.5077778044851	87.9871983396954	69.82339194	93.15949799
74.5077778044851	87.9871983396954	68.11557125	90.29313921
73.8946241320718	87.9870651982169	70.07355989	96.61021246
73.8946241320718	87.9870651982169	69.92952441	96.42807986
73.3937792228584	87.9869567207041	74.57969734	99.83821951
73.3937792228584	87.9869567207041	69.38304877	98.18671586
72.3238032330078	87.9867342372184	76.48394754	93.81500316
71.1636540306033	87.9864927238298	73.04972269	93.68364053
71.1636540306033	87.9864927238298	71.22771139	93.77569631
69.9905222281922	87.9862483181423	71.17046416	92.96230041
69.9905222281922	87.9862483181423	72.91384846	91.54886288
68.7544962093329	87.9859905946167	72.48804708	89.57044348
67.4476998365807	87.9857176402838	66.92699784	97.50570073
66.1918485545689	87.9854554632334	68.09186985	95.85522589
66.1918485545689	87.9854554632334	66.67195124	95.92017704
64.9019482163436	87.9851868092043	65.26732099	95.86741863
63.6294994693248	87.9849217438331	64.64609008	95.09261932
62.3504399486488	87.9846551244123	64.96530116	93.98228963
62.3504399486488	87.9846551244123	63.88368354	92.98872817
61.0036628861779	87.9843748265611	61.09603132	95.38804721
61.0036628861779	87.9843748265611	62.61309781	94.29391595
59.6599080220567	87.984095788961	62.03675317	91.42777069

Solution x	Solution y	Original x	Original y
58.2810802791567	87.983809072757	61.4906739	91.40517217
58.2810802791567	87.983809072757	63.32241418	89.29380754
56.6403698474574	87.9834667864787	62.35255518	88.46202983
56.6403698474574	87.9834667864787	59.01602486	86.99268685
54.6216947800224	87.9830428581786	53.87450626	88.16447802
52.6277699234158	87.9826221333399	44.01236363	95.54242778
52.6277699234158	87.9826221333399	49.59427698	92.51123595
52.6277699234158	87.9826221333399	49.03663551	90.65504513
52.6277699234158	87.9826221333399	61.30013954	82.69641043
52.6277699234158	87.9826221333399	61.67834468	82.51967341
52.6277699234158	87.9826221333399	58.40265516	82.89286098
52.6277699234158	87.9826221333399	62.03157877	81.16617953
52.6277699234158	87.9826221333399	62.20174968	80.96664236
52.6277699234158	87.9826221333399	56.64479831	82.24679775
52.6277699234158	87.9826221333399	60.70093329	80.64454551
52.6277699234158	87.9826221333399	57.82109764	79.24611201
52.6277699234158	87.9826221333399	55.58088554	76.52999392
52.6277699234158	87.9826221333399	52.40986372	76.90026657
52.6277699234158	87.9826221333399	50.78444002	76.12504454
52.5975057426141	87.9922758484281	56.15571936	89.41500769
52.5975057426141	87.9922758484281	54.48965648	89.30641789
52.567231645387	88.0019325221179	57.53422575	91.73216299
52.567231645387	88.0019325221179	56.30399813	89.72916428
52.5368370305453	88.0116275854421	57.84005051	97.24933499
52.5368370305453	88.0116275854421	58.00620671	94.64720593
52.5061002631416	88.0214316998065	57.58318464	98.55697919
52.5061002631416	88.0214316998065	57.43254842	97.94119843
52.4741272231655	88.031629710932	54.29998953	99.89190946
52.4741272231655	88.031629710932	53.69991452	99.81161169
51.9734713643721	88.0299972851922	52.2623599	99.83573023
51.4570286576205	88.0283152505305	52.71570498	99.46690315
51.4570286576205	88.0283152505305	52.60387814	98.51053443
50.8668287614556	88.026393879112	54.09260921	96.04789718
50.246920091483	88.0243759932626	54.90972966	93.30800556
50.246920091483	88.0243759932626	54.10050901	92.28618361
49.5670639740888	88.022163166392	54.43632749	91.92787857
48.846697011461	88.0198189743661	53.29556121	92.47449182
48.846697011461	88.0198189743661	53.26472651	92.17526811
48.0423381644093	88.0172022502069	51.98537923	93.03310405
48.0423381644093	88.0172022502069	51.95218378	92.57992082
47.1294623787796	88.0142336959688	43.04035221	95.37042711
47.1294623787796	88.0142336959688	53.27314218	89.6748569
46.2447987793456	88.011355975399	43.63164404	99.67485887
46.2447987793456	88.011355975399	48.86252985	99.44183304
46.2447987793456	88.011355975399	45.34071838	99.2752365
46.2447987793456	88.011355975399	48.39934621	99.02729511
46.2447987793456	88.011355975399	44.53236455	98.59505273
46.2447987793456	88.011355975399	48.82360524	98.37839062
46.2447987793456	88.011355975399	50.67630959	98.08417141
46.2447987793456	88.011355975399	47.31578899	98.13704672
46.2447987793456	88.011355975399	44.56970667	97.22856143
46.2447987793456	88.011355975399	45.01212749	95.47966426
46.2447987793456	88.011355975399	47.96746082	95.14523251
46.2447987793456	88.011355975399	46.20732106	94.82215894
46.2447987793456	88.011355975399	48.69087386	94.64188777
46.2447987793456	88.011355975399	45.33430047	93.58613905
46.2447987793456	88.011355975399	43.91518159	93.39792889
46.2447987793456	88.011355975399	42.53215273	92.92397176
46.2447987793456	88.011355975399	46.25821854	91.17761288
46.2447987793456	88.011355975399	45.13861135	90.47060332
46.2447987793456	88.011355975399	40.16683897	89.097423
46.2447987793456	88.011355975399	49.19512952	89.44346883
46.2447987793456	88.011355975399	42.23200248	88.95299773
46.2447987793456	88.011355975399	40.55838899	87.88304878
46.2447987793456	88.011355975399	48.45592928	88.4082341
46.2447987793456	88.011355975399	46.02083433	88.3362158
46.2447987793456	88.011355975399	38.21932161	86.88940242
46.2447987793456	88.011355975399	39.57638463	86.69599702
46.2447987793456	88.011355975399	51.44475874	86.59474587
46.2447987793456	88.011355975399	55.11001594	85.68607737
46.2447987793456	88.011355975399	38.25086273	84.70191635
46.2447987793456	88.011355975399	52.05342714	85.82620662
46.2447987793456	88.011355975399	52.83415121	85.50123146
46.2447987793456	88.011355975399	55.75342338	84.56592915
46.2447987793456	88.011355975399	55.99099974	83.60147673
46.2447987793456	88.011355975399	49.77274656	84.13753559
46.2447987793456	88.011355975399	45.3176187	83.7901857
46.2447987793456	88.011355975399	46.03038143	83.79986665
46.2447987793456	88.011355975399	38.00030199	82.20200968
46.2447987793456	88.011355975399	46.93472918	83.75304242

Solution x	Solution y	Original x	Original y
46.2447987793456	88.011355975399	51.91564321	83.24154723
46.2447987793456	88.011355975399	53.08761619	83.0335557
46.2447987793456	88.011355975399	51.49657531	83.11057243
46.2447987793456	88.011355975399	51.18829335	82.80979047
46.2447987793456	88.011355975399	41.14833132	82.10595877
46.2447987793456	88.011355975399	38.78697828	81.20736169
46.2447987793456	88.011355975399	40.58416037	81.54961967
46.2447987793456	88.011355975399	48.20934555	82.30314786
46.2447987793456	88.011355975399	49.21219028	82.18677234
46.2447987793456	88.011355975399	40.77647626	81.23711291
46.2447987793456	88.011355975399	55.73082902	81.05870461
46.2447987793456	88.011355975399	50.20394782	81.95454381
46.2447987793456	88.011355975399	45.13867401	81.86371268
46.2447987793456	88.011355975399	53.61605765	80.93460352
46.2447987793456	88.011355975399	44.66930475	80.79724102
46.2447987793456	88.011355975399	49.55654528	80.81624315
46.2447987793456	88.011355975399	44.47086767	80.17305261
46.2447987793456	88.011355975399	47.92908542	80.11129273
46.2447987793456	88.011355975399	43.12816365	79.63219046
46.2447987793456	88.011355975399	44.56064253	79.77318093
46.2447987793456	88.011355975399	45.32225765	79.26748614
46.2447987793456	88.011355975399	46.11608956	79.13405595
46.2447987793456	88.011355975399	49.62844822	78.65994225
46.2447987793456	88.011355975399	47.14165764	77.84331314
46.2447987793456	88.011355975399	49.13669956	77.10708156
43.6657917440179	88.0029973429709	41.14116704	94.61634345
43.6657917440179	88.0029973429709	39.86881125	93.47781189
41.8224933967953	87.997024479275	39.44288188	96.38027853
41.8224933967953	87.997024479275	39.84944538	96.227912
40.344659522226	87.9922366040672	41.23951851	98.4925435
40.344659522226	87.9922366040672	39.47053756	98.01039691
38.8282900491829	87.9873251247502	37.35140359	99.57591236
38.8282900491829	87.9873251247502	37.87107476	99.67477247
38.0963330873629	87.984956959202	36.49499514	99.8776323
37.8034027490353	87.9056343122039	35.92075185	99.04269187
37.8034027490353	87.9056343122039	35.84999591	97.26233792
37.5074240034744	87.8254853247706	37.35558564	97.30806318
37.5074240034744	87.8254853247706	37.83606476	96.13365876
37.2021212622165	87.7428110401123	36.31961338	94.1541845
36.8971318579124	87.6602217305224	33.84742868	94.52834747
36.5966441990625	87.5788514617423	34.28587406	93.01320732
36.5966441990625	87.5788514617423	35.60188133	93.1465045
36.3007624593202	87.4987280397125	36.86677729	93.06343809
36.3007624593202	87.4987280397125	36.79414467	92.2553405
36.0001351907122	87.4173197444847	36.26720319	91.81523904
36.0001351907122	87.4173197444847	35.55901251	90.85604615
35.6974311526223	87.3353492838842	37.64776281	91.60925844
35.6974311526223	87.3353492838842	36.43143728	90.48214242
35.3859618229275	87.2510057492646	34.03327785	85.06694553
35.3859618229275	87.2510057492646	33.71990859	84.56649705
35.0820812960542	87.1687171653347	36.90788531	88.78292268
34.7725833762144	87.084907974289	31.92346769	85.96439053
34.7725833762144	87.084907974289	32.21271953	85.45061531
34.4744157527643	87.0041664263242	33.91919319	90.52236574
34.1741569665666	86.9228589902513	30.96168192	84.99460949
34.1741569665666	86.9228589902513	32.77989789	83.25231939
33.8848087485018	86.8445057844144	32.87814817	90.10176773
33.8848087485018	86.8445057844144	32.33676606	89.56266763
33.5970712045021	86.7665889067004	31.03913924	88.81924735
33.5970712045021	86.7665889067004	30.78074407	88.67743671
33.3174508787016	86.6908697899703	28.94608169	87.05476962
33.3174508787016	86.6908697899703	28.95022635	86.79829568
33.0530876675632	86.6192813892684	28.34961296	82.66841267
32.797376984287	86.5500358494422	29.49613778	81.77737157
32.797376984287	86.5500358494422	29.7776223	79.3796747
32.5581602980592	86.4852562335423	27.46499326	78.56518576
32.5581602980592	86.4852562335423	29.05539546	78.84402949
32.343890156025	86.4272313680283	31.67974116	78.20082263
32.343890156025	86.4272313680283	31.34183617	77.86791685
32.1377452641223	86.3714066912997	32.56942546	80.98884638
32.1377452641223	86.3714066912997	31.54519137	79.16359507
31.9322218763284	86.3157504053787	38.24583972	80.95791524
31.7159736276193	86.2571906088153	36.17809574	80.13104248
31.7159736276193	86.2571906088153	35.96077646	77.38727187
31.483443579433	86.1942228936919	34.30971303	75.90183293
31.483443579433	86.1942228936919	36.44207057	76.13900165
31.2146409241088	86.1214346360319	35.03662295	76.31902131
30.9335544173236	86.0453210400849	29.09610379	74.18683092
30.9335544173236	86.0453210400849	32.43971284	75.52883521
30.753517241515	86.1611871345826	29.81370195	76.77877617

Solution x	Solution y	Original x	Original y
30.753517241515	86.1611871345826	28.44331265	74.98671685
30.5397904389021	86.2987337812473	25.63863856	75.55318582
30.2909947433631	86.4588507569708	24.84752889	78.21896812
30.045735731529	86.6166924844576	23.53960858	80.471438
30.045735731529	86.6166924844576	22.96398221	79.24584246
29.8186197229144	86.762861387652	24.67927032	81.21698222
29.8186197229144	86.762861387652	24.57644237	79.57543571
29.5992472166236	86.9040486216852	25.47356848	81.94258519
29.3817923424566	87.0440019275931	26.49994117	86.49656314
29.1668292284303	87.1823515634512	24.68088332	89.71453351
29.1668292284303	87.1823515634512	23.92476676	88.85275247
28.96596323293	87.311629980605	24.93956922	85.18138774
28.7665555365666	87.4399700632777	22.46431132	85.87828698
28.7665555365666	87.4399700632777	24.79158589	85.73273425
28.5757322090908	87.5627867858226	24.92385591	92.07997464
28.3895755093095	87.6826003193905	25.24294214	93.18181598
28.2076434485411	87.7996950999918	29.03165996	90.53300961
28.0246822588852	87.9174517539509	30.18341718	92.15484297
28.0246822588852	87.9174517539509	30.46512782	92.10545477
27.8405212538063	88.0359797083766	30.08845088	94.04600611
27.8405212538063	88.0359797083766	30.51609732	92.20951413
27.6559167554837	88.1547920617343	31.65500689	99.46882276
27.6559167554837	88.1547920617343	31.89808649	95.62749105
27.0176989590825	88.2237787993599	28.69202489	99.34571575
26.3584503569258	88.295040427721	27.50072899	99.76767751
26.3584503569258	88.295040427721	27.03699297	98.99807723
25.7443427537696	88.3614253053802	20.03955091	90.83830295
25.1794065273943	88.4224947877926	21.63379999	90.72848541
25.1794065273943	88.4224947877926	21.61123904	90.19731465
24.6590921041526	88.4787407571929	21.4032788	88.65695382
24.6590921041526	88.4787407571929	20.16675465	86.45561332
24.1749595125202	88.5310755855858	20.47481611	85.68176763
23.7049982863016	88.5818785476184	19.16596982	83.58117432
23.7049982863016	88.5818785476184	21.51917751	80.74471553
23.2704192480791	88.6288567982157	16.23739593	85.87006787
23.2704192480791	88.6288567982157	18.85500198	86.61471751
22.8918694769659	88.6697783047262	15.25088212	86.85170355
22.8918694769659	88.6697783047262	20.75129811	88.7330358
22.555541227139	88.706135632237	16.85080568	91.45389056
22.555541227139	88.706135632237	18.21730526	92.48725442
22.2487436534481	88.7393006579917	27.32463884	98.08040747
22.2487436534481	88.7393006579917	26.20322759	94.45704722
21.9027084454295	88.7767074699364	18.65944439	93.90622028
21.9027084454295	88.7767074699364	19.55892343	94.48515334
21.5722068998586	88.8124350835384	21.95406549	97.08230078
21.5722068998586	88.8124350835384	22.62104276	94.03699994
21.2416378482962	88.8481700403638	25.35918107	97.93925835
21.2416378482962	88.8481700403638	23.10855555	93.46528062
20.8883519450934	88.8863608322587	25.34553204	99.20543489
20.8883519450934	88.8863608322587	25.64004891	98.33585155
20.4014323015342	88.9389985080742	23.23282295	99.37897746
20.4014323015342	88.9389985080742	23.65267964	99.40598609
19.8049305604674	89.0034833445757	22.19955839	99.83998701
19.8049305604674	89.0034833445757	22.00240146	99.12603644
19.1143111366822	89.0781439005736	21.53298817	97.76613815
19.1143111366822	89.0781439005736	22.06521104	97.80973943
18.3676673917907	89.1588612654622	20.42707279	96.69258649
17.6079544378035	89.2409915010108	18.56973911	98.93410982
17.6079544378035	89.2409915010108	18.10270516	98.29192556
16.8707713213751	89.3206862273331	17.25875189	95.69940805
16.1360945607895	89.4001099617964	17.81960057	98.01765152
16.1360945607895	89.4001099617964	25.58817455	94.62259734
14.4805113617125	89.5790906798191	16.10416337	94.62212285
14.4805113617125	89.5790906798191	17.22630202	94.08640458
12.5530802679368	89.7874601223942	14.02380259	94.55773265
10.4265297102239	90.0173557957667	1.662890125	98.21483308
10.4276947629497	90.0107478170809	2.510162792	94.82470236
10.4289040749185	90.0038879428755	5.819691822	97.53170939
10.4301377928415	89.9968897469813	7.810086676	100
10.4301377928415	89.9968897469813	6.625140742	98.72893978
10.4314125219105	89.9896590309229	11.51332542	99.95442641
10.4326793540879	89.9824726876739	8.376403562	96.83801393
10.4326793540879	89.9824726876739	8.327911253	95.97957355
10.4339434700349	89.9753014770919	11.04946885	95.30278919
10.4339434700349	89.9753014770919	10.35439985	93.61856888
10.4351835453322	89.968266236529	0.846436708	97.15575264
10.4351835453322	89.968266236529	1.725004249	93.73701725
10.4749652202527	89.7424827959264	3.212591442	94.51392157
10.4749652202527	89.7424827959264	4.440109707	94.87692744
10.5174176849895	89.5015415249349	5.231683223	94.88567828

Solution x	Solution y	Original x	Original y
10.5174176849895	89.5015415249349	3.298576907	92.26869515
10.5618079125669	89.2496027809534	7.178182114	91.76838261
10.6061680492253	88.9978350152774	5.209294544	90.50333801
10.6061680492253	88.9978350152774	6.256438132	90.66257931
10.6505811428738	88.7457676207052	5.838459994	89.46110654
10.6505811428738	88.7457676207052	6.291693293	89.27097954
10.6945117126286	88.4964399541472	7.009024866	89.80852716
10.6945117126286	88.4964399541472	6.579193932	89.24907689
10.7381287044235	88.2488928591528	7.085383584	88.77850283
10.7814096270705	88.003253550823	9.940095688	86.998178
10.7814096270705	88.003253550823	9.921883095	86.8721598
10.8230958612585	87.7666659294632	10.77763243	89.00986935
10.8230958612585	87.7666659294632	9.984816242	87.60870523
10.8639111049536	87.5350220741876	8.842438164	89.89183088
10.8639111049536	87.5350220741876	9.577914639	89.11916471
10.9048273759886	87.3028048394207	8.980893435	92.30918249
10.9464982424221	87.0663044042968	10.40564453	91.96900158
10.9464982424221	87.0663044042968	12.48771043	90.90107319
10.9893060564219	86.8233502887324	3.553988961	91.38716753
10.9893060564219	86.8233502887324	2.887848626	89.80188387
11.0356900508186	86.5600986275822	14.30638295	91.72702037
11.0827104358888	86.293234331552	13.01348985	89.5505908
11.1297695077455	86.0261502300897	2.643010323	87.48230483
11.1297695077455	86.0261502300897	3.115821998	88.00026043
11.1787900103342	85.7479338095564	12.03430063	87.78817585
11.2274328362771	85.4718609643361	11.28159713	86.83718755
11.2274328362771	85.4718609643361	15.06397637	86.4956065
11.2749488535231	85.2021841284574	0.539457489	84.81338557
11.3232887196963	84.9278311342457	3.105512661	84.71082736
11.3716343242809	84.6534459013959	4.377655918	84.98459142
11.3716343242809	84.6534459013959	5.902742913	84.57417463
11.4200131633362	84.3788728695237	3.319354366	86.8534104
11.4200131633362	84.3788728695237	4.724328509	85.88211036
11.4702851617781	84.0935550055373	5.333729823	86.89695613
11.5215486143287	83.8026097807818	5.793118726	87.72031575
11.5215486143287	83.8026097807818	6.359309777	87.06467249
11.5756362551821	83.495634553759	6.663988874	86.9326968
11.5756362551821	83.495634553759	6.810206318	85.20186256
11.6316481672847	83.1777371974671	7.936374341	83.63932008
11.687597245858	82.8601964246692	10.82142722	82.89323555
11.7429831522402	82.5458519283127	12.45480817	85.29988604
11.7429831522402	82.5458519283127	12.63857375	82.42671014
11.7978546560592	82.2344265854072	12.87616068	80.54131267
11.8511439666856	81.9319817867172	9.701793671	81.23141394
11.8511439666856	81.9319817867172	10.08146406	81.46406963
11.9029304732677	81.6380670295309	7.992357197	82.08091397
11.9543709656138	81.3461162161816	5.912402555	83.10767778
11.9543709656138	81.3461162161816	5.779054124	82.01317499
12.0067806212229	81.0486643490605	4.961462551	81.51420623
12.0067806212229	81.0486643490605	5.724809855	81.80721271
12.0600407440019	80.7463853187388	3.795442881	81.20966501
12.0600407440019	80.7463853187388	4.297539438	80.73294711
12.1144463644171	80.4376045072302	3.380314451	80.99890539
12.1697734831081	80.1235932150724	3.059490558	82.05603574
12.1697734831081	80.1235932150724	3.437419026	82.39656928
12.2302082281891	79.7805909558907	1.837820965	81.06813079
12.2948130564095	79.4139191627284	0.848777488	80.80421078
12.2948130564095	79.4139191627284	1.451959255	80.87244268
12.3926633830385	78.8585435062961	0.773453591	79.81662315
12.3926633830385	78.8585435062961	1.696022601	79.3379408
12.5789775038972	77.8010284445057	3.100034102	78.61964126
12.7818281385764	76.6496479540286	1.009741561	74.32200243
12.7818281385764	76.6496479540286	2.544714587	74.45838234
12.8067716720978	76.5362570459528	3.765987951	77.28123402
12.8067716720978	76.5362570459528	5.065657714	76.41830653
12.8320066783978	76.4215409267276	10.28504553	75.43578797
12.8571818050135	76.3070966907467	5.042739397	78.40053531
12.8571818050135	76.3070966907467	5.863440787	76.06172049
12.8828617740016	76.1903581325912	3.252339284	73.9521337
12.8828617740016	76.1903581325912	8.675234817	76.17385221
12.9084541602941	76.0740178431274	9.018582074	78.03824041
12.9084541602941	76.0740178431274	8.595205897	76.73972439
12.9344101174967	75.9560257375943	9.360499311	76.63383999
12.9605869806461	75.8370296318091	11.56644578	72.10851879
12.9605869806461	75.8370296318091	13.34199807	71.15108407
12.9859490408222	75.7217365121997	13.78543979	72.75062985
13.0111409091131	75.6072165895443	14.67447984	73.22055772
13.0111409091131	75.6072165895443	16.80968797	72.84815948
13.0358625482616	75.494833551749	17.24413003	73.14298035
13.0358625482616	75.494833551749	19.17901123	72.48982593

Solution x	Solution y	Original x	Original y
13.0599712841508	75.385235815764	20.16006997	73.55306832
13.0599712841508	75.385235815764	21.60880813	73.64895737
13.0833955461913	75.2787487641536	19.47269695	75.25893863
13.1066881859025	75.1728596219267	18.31523717	76.27495825
13.1066881859025	75.1728596219267	18.49430275	75.1491321
13.1297321802197	75.0681004406486	15.50686687	76.44859369
13.1297321802197	75.0681004406486	16.93400358	77.9224885
13.1528179325279	74.9631516871166	14.92906226	79.42060964
13.1528179325279	74.9631516871166	14.09860615	77.68853822
13.1763616770145	74.8561219091251	17.20155001	81.69531761
13.2005127456917	74.7463319645838	18.16441332	83.32201509
13.2005127456917	74.7463319645838	17.38954679	82.23173111
13.2268586510519	74.6265666200314	19.29153506	80.52426775
13.253778718582	74.5041916151484	20.11668251	80.56671914
13.253778718582	74.5041916151484	18.79013692	77.54174683
13.2814750040594	74.3782887609838	18.15807888	79.40011164
13.2814750040594	74.3782887609838	18.15532249	77.80652015
13.3097878264483	74.2495841276879	18.46683587	77.29301103
13.3382395674132	74.1202480656521	21.04749508	76.84597788
13.3382395674132	74.1202480656521	21.16552744	75.92926841
13.3668386560656	73.9902422753998	22.95922483	75.83051285
13.3668386560656	73.9902422753998	23.86908483	73.83689183
13.3951488350982	73.8615492447775	25.39416892	74.01493111
13.3139601133442	73.4415762682012	24.37529212	73.10827156
13.2283900240733	72.9989414696328	22.95220857	73.2582761
13.1404354411752	72.5439729481371	22.14002238	72.37729838
13.1404354411752	72.5439729481371	22.68191696	72.90808337
13.0487946206548	72.0699371369886	23.39691794	71.43920824
12.954479277982	71.582067758489	24.00842436	69.26671548
12.8611595677324	71.0993475415877	21.52581462	69.05739134
12.7688996759172	70.6221096596076	20.75020952	68.82081849
12.7688996759172	70.6221096596076	21.2618816	68.31108552
12.6781817087819	70.1528473177439	19.92687299	66.4828608
12.6781817087819	70.1528473177439	21.61039636	65.83676525
12.5952196559036	69.7237002660596	21.30645349	61.8915326
12.5952196559036	69.7237002660596	22.58317288	64.23875961
12.5553512635651	69.5174577640026	17.25601024	61.69443137
12.5553512635651	69.5174577640026	19.29354577	63.34226321
12.5190934127727	69.3298903981316	16.63383213	64.77854357
12.5190934127727	69.3298903981316	18.97844246	66.0992932
12.4838267175464	69.1474495293439	16.73656026	65.26611785
12.4490422862506	68.9675032072499	15.77830732	66.19409337
12.4144340854266	68.788468570769	16.29427026	68.63097998
12.379561157706	68.6080650564096	15.83973733	72.60736968
12.379561157706	68.6080650564096	14.01917911	69.22007201
12.3428889577928	68.4183558653828	14.51945543	70.49107423
12.3055738615208	68.2253220473089	11.73654707	68.82383733
12.3055738615208	68.2253220473089	13.50520564	67.72241024
12.2675274241923	68.0285059480446	14.11476256	66.58488992
12.2675274241923	68.0285059480446	14.52745655	66.82146945
12.2296657292043	67.8326460071926	14.06057656	63.93249207
12.2296657292043	67.8326460071926	14.35540419	64.70998039
12.1931745454242	67.6438750674717	11.71156616	63.23151575
12.1931745454242	67.6438750674717	12.00297966	63.9466553
12.1583902510918	67.4639324783832	1.282619347	62.39268391
12.1583902510918	67.4639324783832	21.56136042	60.00845368
11.9737874646227	67.3878763465375	8.933612257	64.19415642
11.9737874646227	67.3878763465375	8.689838933	62.80875147
11.7954311449034	67.3143943866013	10.36857839	64.9958121
11.7954311449034	67.3143943866013	11.17807544	66.07771318
11.6191737387678	67.2417772745112	8.880939202	67.16779099
11.4445985471999	67.1698531802431	9.897889543	67.94003152
11.4445985471999	67.1698531802431	11.54525803	68.93314303
11.2692705459056	67.0976184902279	9.088863996	70.57778186
11.2692705459056	67.0976184902279	9.964092428	69.02740379
11.093199826063	67.0250773259958	6.041792217	70.01715429
11.093199826063	67.0250773259958	6.334374787	68.85467086
10.9207486940089	66.9540274392066	4.203561784	71.28689241
10.9207486940089	66.9540274392066	5.020361565	69.58798476
10.7537603395159	66.8852283258308	1.096851862	69.20060768
10.7537603395159	66.8852283258308	6.979895184	73.91637244
10.5956271435809	66.8200776624456	2.885089549	70.78781924
10.4409640088491	66.7563567469919	1.825477279	70.78130479
10.4409640088491	66.7563567469919	2.881941531	70.78732912
10.2943965956594	66.6959715560368	0.155166122	73.1143838
10.2943965956594	66.6959715560368	1.834626902	71.15202574
10.3277480701588	66.0465032664662	0.299902086	68.51958527
10.3277480701588	66.0465032664662	2.781332517	68.35625636
10.3644454631461	65.3318726660127	3.972668798	68.43095677
10.3644454631461	65.3318726660127	3.702577787	67.55965669

Solution x	Solution y	Original x	Original y
10.4029705291072	64.5816469708332	3.336609071	66.34370608
10.4029705291072	64.5816469708332	3.705228073	66.5975084
10.4425912146492	63.810083824823	2.559418382	66.60707534
10.4425912146492	63.810083824823	2.82031094	66.9400554
10.4865233093158	62.9545496370936	2.766374061	66.09545945
10.5335149760583	62.0394272736914	3.164572856	61.67055704
10.5795903856245	61.1421547182818	8.011277516	61.69215045
10.6256380931935	60.2454181615015	8.077114598	60.52651503
10.6256380931935	60.2454181615015	10.63863267	61.64507704
10.6723152722382	59.3364130288082	10.83705181	59.65376627
10.7193022068192	58.4213695585007	0.793870075	65.00803843
10.7193022068192	58.4213695585007	0.102323447	55.05645207
10.7193022068192	58.4213695585007	0.715064701	54.34039001
10.7193022068192	58.4213695585007	3.390983182	60.32064994
10.7193022068192	58.4213695585007	3.166581108	54.38581172
10.7193022068192	58.4213695585007	3.200690229	54.90401263
10.7193022068192	58.4213695585007	3.684518627	54.75346427
10.7193022068192	58.4213695585007	3.857750749	53.93522034
10.7193022068192	58.4213695585007	4.692804385	58.08052349
10.7193022068192	58.4213695585007	5.351054934	54.87903352
10.7193022068192	58.4213695585007	7.880864255	53.63419396
10.7193022068192	58.4213695585007	8.078510661	52.12465727
10.7193022068192	58.4213695585007	9.891024822	52.16610985
10.7193022068192	58.4213695585007	11.99216143	50.52822644
10.7193022068192	58.4213695585007	12.24975114	50.92735248
10.7193022068192	58.4213695585007	13.21771043	55.16074821
10.7193022068192	58.4213695585007	14.81228179	50.29125842
10.7193022068192	58.4213695585007	15.36448886	54.97389236
10.7193022068192	58.4213695585007	16.47526591	49.4455512
10.7193022068192	58.4213695585007	16.54761864	53.09785344
10.7193022068192	58.4213695585007	17.45311026	57.02027397
10.7193022068192	58.4213695585007	18.13426387	49.15791018
10.7193022068192	58.4213695585007	18.10483235	51.48322234
10.7193022068192	58.4213695585007	18.80954314	50.67936902
10.7193022068192	58.4213695585007	20.16713628	56.2637712
10.7193022068192	58.4213695585007	20.97945435	58.66863495
10.7193022068192	58.4213695585007	20.53092136	55.63617906
10.7193022068192	58.4213695585007	20.37447933	52.92580791
10.7813303084581	57.2132769826277	13.17908278	60.05355856
10.7813303084581	57.2132769826277	16.07158763	60.00636388
10.8511664195438	55.8530754243775	11.86612062	56.83051802
10.8511664195438	55.8530754243775	13.89109091	56.92730438
10.9234220373434	54.4457276694605	10.16802995	51.02082052
10.9234220373434	54.4457276694605	10.84189087	50.74783931
10.9844266375991	53.2575344394471	8.811692105	48.50504439
10.9844266375991	53.2575344394471	8.915897502	48.83105962
11.0344707111641	52.2828381598464	9.265122262	48.10149258
11.0344707111641	52.2828381598464	10.20301226	47.6234059
11.0768682348587	51.4570853002584	10.30388261	47.84277995
11.1165215632819	50.6847841687945	9.196765131	46.15569372
11.1165215632819	50.6847841687945	10.71615729	46.62293177
11.1510072830699	50.0131369436108	8.736047039	47.86465463
11.184298526241	49.3647543402311	6.962926975	47.87740863
11.2168993019555	48.729818500318	6.810990128	49.52757429
11.2168993019555	48.729818500318	7.342191074	50.36568708
11.2509694347918	48.0662568677788	5.283007933	51.8957834
11.2878104181044	47.34872066203	0.073554416	50.20291794
11.2878104181044	47.34872066203	1.250751092	48.74029716
11.3778311161273	45.5952457780029	1.775610616	46.38397362
11.475680263972	43.6892632938929	0.224660494	41.43611847
11.475680263972	43.6892632938929	2.885836634	40.60849192
11.53353771605	42.5622862660951	0.094225631	39.91558536
11.5654075919423	41.9414940998602	6.302525489	40.0085763
11.5654075919423	41.9414940998602	6.668915236	38.80565327
11.5947453256904	41.3700301532062	7.871697725	40.35198819
11.5947453256904	41.3700301532062	7.974625907	40.8370263
11.6232657677382	40.8144878202226	5.668356774	43.14782971
11.6232657677382	40.8144878202226	8.013859219	41.41457221
11.6529535192052	40.2362054651396	9.020444459	42.86210706
11.6529535192052	40.2362054651396	9.755265232	43.18329059
11.6848533342758	39.6148287720895	9.954481978	42.50823893
11.7181462012146	38.9663127353664	12.77181014	48.33401693
11.7181462012146	38.9663127353664	14.44281578	41.35822358
11.7642614028319	38.0680065226089	12.31993183	42.07287161
11.7642614028319	38.0680065226089	13.48749824	42.29987548
11.817276817582	37.0352743810948	12.97854061	40.66549102
11.8732614405886	35.9446979254342	12.65054039	38.20990532
11.8732614405886	35.9446979254342	14.50630809	38.16565664
11.9323106202695	34.7944181423193	11.00474377	35.14184161
11.9323106202695	34.7944181423193	9.832177112	38.08691559

Solution x	Solution y	Original x	Original y
11.9952404918149	33.5685343076949	2.518275748	30.45426362
11.9952404918149	33.5685343076949	10.78091353	34.08373955
12.0531478418295	32.4404832708076	0.438114408	29.42535326
12.0531478418295	32.4404832708076	1.354188569	31.31594018
12.1679781498983	32.2067363426926	2.694391803	27.62826968
12.1679781498983	32.2067363426926	3.430192849	27.39779729
12.2810026889036	31.9766730072274	3.815111582	26.65111472
12.3915236024609	31.7517043065876	4.281409798	24.72152663
12.4948005100029	31.541475552809	4.953508892	23.81507206
12.4948005100029	31.541475552809	5.584406208	23.81184943
12.5832469635296	31.3614248088803	6.772905892	23.04434695
12.5832469635296	31.3614248088803	6.719406227	25.73868862
12.6631103421564	31.198839201766	10.62327399	24.29073933
12.739859271503	31.0425902597444	9.320660383	27.08555662
12.739859271503	31.0425902597444	9.442374955	27.32019574
12.8138003405024	30.8920552427913	8.026602483	29.17059173
12.8138003405024	30.8920552427913	14.14878683	27.98719075
12.8864871711116	30.7440734420636	16.76117492	28.31246812
12.8864871711116	30.7440734420636	18.74305811	29.30240259
12.9577692337691	30.5989516925695	18.69463352	36.26547074
13.0311537967777	30.4495542801654	19.64225061	34.99214308
13.0311537967777	30.4495542801654	22.07359754	33.01769228
13.1069259433403	30.2953035983145	22.33900559	31.60235215
13.1069259433403	30.2953035983145	23.06731773	35.0375678
13.1829024428048	30.1406420661096	23.91492832	35.50451908
15.2661951232165	25.8998296075448	27.26619514	25.90196542
15.2661951232165	25.8998296075448	25.40396983	32.32053998
15.1681373917274	25.5556147513866	24.87958822	27.09583401
15.1681373917274	25.5556147513866	26.37919279	28.3108891
14.9763186207446	24.8822503622787	24.70443529	26.12365999
14.7652873280407	24.1414413888189	20.73212412	24.23741148
14.7652873280407	24.1414413888189	23.31975826	27.34182644
14.5241749474836	23.2950306244063	18.71921477	25.10440199
14.277146161245	22.4278494837288	17.16840861	23.65521269
14.277146161245	22.4278494837288	18.39694528	22.72524013
14.0227685733164	21.5348695644868	14.86812736	22.17705421
13.7663104943367	20.6345870977619	12.36712067	15.90584574
13.7663104943367	20.6345870977619	10.79914705	20.42039499
13.5316845742713	19.8109508721761	8.679954371	15.22687294
13.5316845742713	19.8109508721761	10.89890727	16.02503912
13.3285954305861	19.0980317856338	7.319977879	15.37807435
13.139579544201	18.4345185224912	3.177857831	14.97802426
13.139579544201	18.4345185224912	5.722550995	17.38650207
12.9936416710473	17.9222271848387	5.677247541	18.04924585
12.8508786335921	17.4210790469742	0.867278095	18.04823486
13.0558319679697	16.247825136451	2.197761157	16.16441336
13.3089733135257	14.7987011518676	3.082410661	9.043855976
13.3089733135257	14.7987011518676	8.465864182	8.874062551
13.3509733702237	14.5582763555944	5.801300438	5.23076571
15.3266097674673	14.6313206775908	8.988027099	7.925934732
18.8144739004904	14.7602737150578	12.63680518	12.91935497
18.8144739004904	14.7602737150578	14.9958336	14.5728326
26.7458652065158	15.0534939570678	18.20950886	6.619599382
26.7458652065158	15.0534939570678	20.19850768	8.627828216
26.7458652065158	15.0534939570678	29.15811552	9.518746656
26.7458652065158	15.0534939570678	32.11403346	10.63014558
26.7458652065158	15.0534939570678	35.62470684	10.73896033
26.7458652065158	15.0534939570678	21.65865806	17.99154884
26.7458652065158	15.0534939570678	38.07401644	11.09458783
26.7458652065158	15.0534939570678	34.15723352	12.84614068
26.7458652065158	15.0534939570678	24.23492671	17.98856994
26.7458652065158	15.0534939570678	23.64941173	19.80991504
26.7458652065158	15.0534939570678	21.70527032	21.60018691
26.7458652065158	15.0534939570678	24.09498187	20.3828805
26.7458652065158	15.0534939570678	27.39065822	19.10906735
26.7458652065158	15.0534939570678	36.57027062	15.62107689
26.7458652065158	15.0534939570678	35.53984032	15.99196501
26.7458652065158	15.0534939570678	25.83818458	22.03803134
26.7458652065158	15.0534939570678	28.82263126	20.36706254
26.7458652065158	15.0534939570678	38.46066343	17.33665094
26.7458652065158	15.0534939570678	30.90434674	20.96780911
26.7458652065158	15.0534939570678	35.94447387	20.12395641
26.7458652065158	15.0534939570678	28.59013959	24.83311171
26.7458652065158	15.0534939570678	35.85991513	20.90404301
26.7458652065158	15.0534939570678	29.56587444	24.57869021
35.3309948935269	15.5077760826615	42.34346606	5.769949569
36.050188864189	17.3327358890738	44.45005227	17.91363181
36.6888424921504	18.9533281347994	38.38951699	19.65672727
36.6888424921504	18.9533281347994	39.07927218	20.57348801
37.2902435281005	20.4793848557592	34.82834577	24.45085722

Solution x	Solution y	Original x	Original y
37.8564595182759	21.9161542323472	30.34406593	27.74432368
37.8564595182759	21.9161542323472	31.17947294	31.40633137
38.0137660349558	22.3153103713028	36.2315122	27.60710766
38.1654321187435	22.7001534860301	36.77121212	29.70512597
38.3087536177054	23.0638219363845	37.07046765	30.04479215
38.3087536177054	23.0638219363845	37.51752459	33.09106605
38.4242853117581	23.3569739464521	40.05041388	28.81118981
38.5367404017298	23.6423193974344	39.25918273	24.78783876
38.5367404017298	23.6423193974344	42.45831495	25.01806118
38.6507114290262	23.9315127676099	50.59311922	22.75724468
38.6507114290262	23.9315127676099	46.26887105	26.53209753
38.3196471793609	25.7574121499097	48.88810081	29.6929228
38.0936865606846	27.0036368684466	47.52772375	30.54529654
38.0936865606846	27.0036368684466	49.49892788	30.73465222
37.0397084834773	29.1692914193641	44.21687698	34.39769027
37.0397084834773	29.1692914193641	44.94410764	36.28576006
36.3944081134661	30.4952045228459	40.81010844	38.77304558
35.9032209389545	31.5044546622852	39.35568633	35.06788426
35.4277422762148	32.4814283770839	40.57036155	31.31828969
35.4277422762148	32.4814283770839	41.09480481	34.92509896
34.9137938044615	33.5374482176436	38.78467609	39.06908374
34.4380763367924	34.514913644579	38.90241804	39.45548462
34.4380763367924	34.514913644579	39.91233765	41.2977364
34.0431985273353	35.3262740281062	40.57741767	42.47262
33.7000934905837	36.0312553522745	38.72818734	43.64397508
33.7000934905837	36.0312553522745	39.58652985	43.55288071
33.436946467294	36.5719443060426	35.17250587	39.36136713
33.436946467294	36.5719443060426	34.06373355	42.77086753
33.1950680023462	37.0689320538682	30.41452332	39.55317391
33.1950680023462	37.0689320538682	32.06711817	41.12824267
32.9667756616747	37.5380042402868	27.42853428	33.27622768
32.7309259373256	38.0226053006849	25.99458773	34.37910238
32.4903480504343	38.51692195253	31.80606468	35.45021175
32.2384393134073	39.0345209754039	29.90863496	38.4851443
32.2384393134073	39.0345209754039	30.83636789	38.35208021
31.9823140548607	39.5607844449458	28.54401437	40.13690379
31.7286377330598	40.0820163145666	27.06311365	42.64274924
31.7286377330598	40.0820163145666	28.08331623	42.02257662
31.4944311972165	40.5632428667512	29.65914735	42.12761495
31.2622904598075	41.0402249529309	30.28185343	43.77834378
31.2622904598075	41.0402249529309	30.33187934	43.75504148
31.0394919026958	41.4980113576997	30.55507662	47.73107042
31.0394919026958	41.4980113576997	31.80593192	45.60640645
30.8351635948371	41.9178461303089	30.62796082	46.77730777
30.6379338893531	42.3230951136884	28.72359173	49.06807614
30.6379338893531	42.3230951136884	30.18073163	48.32029982
30.4654133190137	42.6775731835575	27.37711129	46.43616017
30.2989663463111	43.0195716681709	26.12441872	44.96485891
30.2989663463111	43.0195716681709	26.567735	46.7768569
30.1425627592983	43.3409337588626	25.71821347	44.02373583
30.1425627592983	43.3409337588626	25.73174612	44.02606181
29.9896454574625	43.6551326018174	24.77779172	44.04083387
29.8383118810428	43.9660773964681	22.68802089	46.28526246
29.8383118810428	43.9660773964681	23.73647568	45.21539639
29.6958413593769	44.2588110272899	22.79879511	41.59634367
29.6958413593769	44.2588110272899	23.40792676	43.64379836
29.5513192790415	44.5557601482517	19.77510428	38.58926296
29.5513192790415	44.5557601482517	19.40209516	41.66020767
29.3873593581548	44.8926474819074	17.47416259	43.6041515
29.3873593581548	44.8926474819074	17.93093151	43.30092715
29.3800341478387	44.907695176025	17.44262234	43.68368222
29.475179229837	45.2825125448924	17.80089583	46.64512233
29.475179229837	45.2825125448924	18.21468575	45.65080463
29.6232583677637	45.8658739469173	18.21138052	45.58660191
29.6232583677637	45.8658739469173	19.18169919	47.05766373
29.864881326084	46.8177623505595	20.72246404	50.29048837
30.0934688332023	47.7182975109188	22.00300591	49.77440842
30.0934688332023	47.7182975109188	22.81585575	48.67591425
30.325178598832	48.6311335741199	23.68432498	51.4412716
30.325178598832	48.6311335741199	24.61643689	54.01115924
30.5299190898637	49.4377223542545	25.6524776	56.5792119
30.7074872527573	50.1372638871334	27.13020332	56.00735022
30.7074872527573	50.1372638871334	28.17203359	56.51587977
30.8562130304782	50.7231786162018	26.97467166	54.66512134
30.8562130304782	50.7231786162018	28.94274384	52.01860718
30.9982979826884	51.282931291999	31.12121771	52.61678334
31.1399046712753	51.8407998861023	32.83493269	54.50530143
31.1399046712753	51.8407998861023	33.45872958	53.85918585
31.2750255134378	52.3731169676636	31.52001616	50.89228775
31.2750255134378	52.3731169676636	33.45977848	51.47641849

Solution x	Solution y	Original x	Original y
31.4153190612807	52.9258123562561	34.17044541	50.63731129
31.4153190612807	52.9258123562561	35.40868681	49.33377596
31.5672310316233	53.5242795978124	34.31056081	43.95356429
31.5672310316233	53.5242795978124	34.68773061	48.27076221
31.8058122307303	54.464187360876	39.67150404	49.44131071
31.8058122307303	54.464187360876	39.96945525	49.46230999
32.1254116254859	55.7232725627431	36.93641703	55.80482127
32.1254116254859	55.7232725627431	37.58124673	53.7047325
32.4444852044391	56.980286358735	35.39691212	60.01558524
32.4444852044391	56.980286358735	41.84687745	52.15158968
32.8143665857662	58.4374587949481	36.65639834	59.2724504
32.8143665857662	58.4374587949481	37.67648628	59.01822185
33.1459386385664	59.7437074468975	34.15128455	57.37934974
33.5009026020477	61.1421099830761	24.34494447	68.89894191
33.5009026020477	61.1421099830761	24.66562586	67.58605744
33.5009026020477	61.1421099830761	22.06521443	57.50548607
33.5009026020477	61.1421099830761	22.84438078	60.01413405
33.5009026020477	61.1421099830761	25.20403775	63.98638021
33.5009026020477	61.1421099830761	23.29263587	57.34435722
33.5009026020477	61.1421099830761	26.36495426	64.10386589
33.5009026020477	61.1421099830761	25.66105506	62.27941228
33.5009026020477	61.1421099830761	27.36103425	64.84526011
33.5009026020477	61.1421099830761	25.84588775	61.17671521
33.5009026020477	61.1421099830761	26.36749261	61.24478927
33.5009026020477	61.1421099830761	28.86030824	61.83789689
33.5009026020477	61.1421099830761	29.89833465	58.88393924
33.5009026020477	61.1421099830761	32.47933058	60.09950546
33.5009026020477	61.1421099830761	33.50828257	58.48410354
33.5009026020477	61.1421099830761	36.99117209	62.09652931
33.5009026020477	61.1421099830761	41.72708173	62.5487287
33.5009026020477	61.1421099830761	39.86159624	55.58185516
33.5009026020477	61.1421099830761	42.10911161	58.06602885
33.5009026020477	61.1421099830761	40.32660467	53.626561
33.5009026020477	61.1421099830761	40.92420024	52.54921675
33.6479995925469	61.2390866338881	28.38294287	59.7022254
33.7958125839303	61.3365353140166	24.05460087	58.82740751
33.7958125839303	61.3365353140166	24.68488711	59.85199485
33.9700394039613	61.4513979736223	24.58618772	59.92581691
34.1584449854863	61.5756084220742	25.08011935	60.4806985
34.3608968233984	61.7090793347793	26.46280572	62.61127777
34.3608968233984	61.7090793347793	28.66025221	61.13181458
34.5800557906347	61.8535650673172	26.6523776	66.91672378
34.5800557906347	61.8535650673172	29.47881008	65.01108227
34.8125669836302	62.0068537539296	26.03259253	67.05188068
35.0615942373917	62.1710311462566	28.17365085	71.94302821
35.0615942373917	62.1710311462566	28.77703399	67.75671878
35.4496330367257	62.4268717186143	30.01509861	69.93828769
35.4496330367257	62.4268717186143	31.96159565	70.60936436
35.8261860340235	62.6751396746902	33.57300136	70.51852673
36.188136474981	62.9137800280022	33.85806756	68.2147305
36.188136474981	62.9137800280022	34.32584869	66.311045
36.5439069262852	63.1483458438294	32.14669335	66.5741861
36.5439069262852	63.1483458438294	32.28903103	63.37386507
36.9183473136528	63.3952210472754	36.53251416	65.89826385
36.9183473136528	63.3952210472754	36.88863481	65.11756178
37.2912658284715	63.6410928749827	31.78300706	62.74548174
37.2912658284715	63.6410928749827	37.36735143	64.72519961
37.689871880727	63.9039009102061	38.55825219	62.0328479
37.689871880727	63.9039009102061	38.87334077	61.97418169
38.1014815685978	64.1752824495942	39.00311055	58.98114927
38.1014815685978	64.1752824495942	41.10546356	60.73573959
38.5328717009005	64.459705591259	41.72170476	60.36141703
38.9664631977929	64.7455802545669	45.68320409	63.6499192
38.9664631977929	64.7455802545669	43.40294282	59.60424206
39.3742881982544	65.0144667891938	44.96838238	64.05706864
39.763532532874	65.2711028558802	42.95157888	64.84132436
40.1447100894453	65.5224203898979	41.95376322	74.60739468
40.1447100894453	65.5224203898979	42.58773685	73.94634336
40.4562840824581	65.7278470497597	40.91327599	65.05437313
40.4562840824581	65.7278470497597	41.95981534	64.94436816
40.7720615908125	65.9360451827194	40.76978451	74.94346594
40.7720615908125	65.9360451827194	41.14789047	74.75727523
41.0535240531036	66.1216188217646	39.73860453	66.92518954
41.0535240531036	66.1216188217646	38.18944723	65.54612606
41.3476075346969	66.3155137202422	38.20769452	77.89743741
41.7620310598564	66.2933554008449	38.05290287	66.43336709
42.1895010469975	66.2704995117077	39.12047899	68.75765335
42.1895010469975	66.2704995117077	39.83687168	68.05987049
42.6450467730221	66.2461424767971	37.43465738	70.14594443
42.6450467730221	66.2461424767971	38.57181853	69.29967661

Solution x	Solution y	Original x	Original y
43.156644762943	66.2187884334487	38.19879917	73.45302115
43.156644762943	66.2187884334487	39.75179858	71.51477588
43.7581749842766	66.1866258987458	41.30767537	70.05965636
44.3801517636367	66.1533701455122	44.13660931	71.38940487
45.0094032924205	66.119725471406	43.59103477	70.75648589
45.0094032924205	66.119725471406	45.59084573	70.21452412
45.6573800803431	66.0850796320798	42.13585343	68.94604524
45.6573800803431	66.0850796320798	44.42598809	67.45202223
46.3592017993348	66.0475548710514	47.34853229	74.63427391
47.0600427405035	66.0100826334349	51.17754367	73.39508539
47.7189588141023	65.9748521145158	51.90516717	74.10528304
47.7189588141023	65.9748521145158	51.91696279	73.69595809
48.2958095627537	65.9440095550321	53.90080059	74.55382457
48.2958095627537	65.9440095550321	53.92763119	74.12654413
48.7373928046392	65.9203996221781	52.24575767	74.98560476
49.1570130463411	65.8979640739858	56.76810138	74.93595817
49.2331684965484	65.8938931902828	57.06276587	74.98770524
49.3096410103723	65.5215109536496	55.90538334	73.56581582
49.3998671723065	65.0821563267555	55.72002047	71.91921816
49.3998671723065	65.0821563267555	53.60239056	70.80290226
49.5023765275326	64.5829906797344	56.84900895	69.27095699
49.6074180178959	64.0714940881547	57.97334153	65.39941546
49.6074180178959	64.0714940881547	56.20333441	63.09635143
49.7055340007868	63.5937188271444	56.12304172	60.76926662
49.7055340007868	63.5937188271444	53.04622082	62.56220406
49.7953431273251	63.1563915076526	52.64945222	62.68533593
49.8827358246541	62.7308302148339	54.15102156	63.89433124
49.9691463572828	62.310050951794	52.45383187	66.17944394
49.9691463572828	62.310050951794	54.03625818	65.02303827
50.0587357335825	61.8737926487152	52.68458788	66.68600654
50.150876711628	61.4251095069675	49.38151416	71.84627519
50.150876711628	61.4251095069675	49.39322363	67.57061768
50.3053294440202	60.6730072409273	47.89205446	67.3947139
50.3053294440202	60.6730072409273	50.86986196	67.11854893
50.5041568190161	59.7048344898522	50.29671492	64.07582579
50.5041568190161	59.7048344898522	50.37372436	63.54183807
50.7299532988056	58.6053455538508	52.59359138	61.87082203
50.7299532988056	58.6053455538508	49.52719402	60.88674536
50.9735966589906	57.418956750535	48.65047008	56.26343732
50.9735966589906	57.418956750535	48.91348948	54.77748717
51.1973075620539	56.3296186507904	59.10597324	64.72617137
51.1973075620539	56.3296186507904	61.59665848	60.86573745
51.1973075620539	56.3296186507904	59.77266019	58.01872841
51.1973075620539	56.3296186507904	57.09480153	60.45993374
51.1973075620539	56.3296186507904	56.73611746	58.87824868
51.1973075620539	56.3296186507904	58.50503897	53.8647284
51.1973075620539	56.3296186507904	55.40337389	57.61168804
51.1973075620539	56.3296186507904	56.36080227	54.43871329
51.1973075620539	56.3296186507904	53.70737401	57.8077763
51.1973075620539	56.3296186507904	55.16481024	55.42346911
51.1973075620539	56.3296186507904	53.50308144	57.04941766
51.1973075620539	56.3296186507904	43.66555329	47.77139353
51.1973075620539	56.3296186507904	52.57887869	54.16196226
51.1973075620539	56.3296186507904	45.78512338	48.76667443
51.1973075620539	56.3296186507904	48.01348394	55.67625048
51.5409485878207	54.6563183307576	46.15723029	56.4070148
51.8975231540073	52.9200348065176	44.98764045	56.96391467
51.8975231540073	52.9200348065176	45.47068469	56.96814934
52.5277483708477	49.8513342144052	63.59211348	50.34808715
52.9337179646054	47.8745417805512	64.75792457	49.92103542
53.0070182546827	47.3550924751915	42.25980634	46.86827481
53.0847401253231	46.8043143538498	43.11381093	45.00092033
53.1618403812999	46.2579413728985	41.57443341	43.13832473
54.0197628042446	44.1455295792205	49.81718199	39.89953162
54.7857638854935	42.2594543591168	50.32982697	35.43640834
54.7857638854935	42.2594543591168	48.20619517	39.24794213
55.357768848959	40.851048669078	55.07321291	28.85442279
55.357768848959	40.851048669078	55.9549233	32.80200534
55.357768848959	40.851048669078	54.00076983	32.50218762
55.357768848959	40.851048669078	53.48089128	34.57431179
55.357768848959	40.851048669078	56.1557774	36.1071959
55.357768848959	40.851048669078	63.41360315	44.69674786
55.357768848959	40.851048669078	63.21772914	46.4808445
55.357768848959	40.851048669078	54.69460289	37.32086801
55.357768848959	40.851048669078	59.28037529	42.02965748
55.357768848959	40.851048669078	55.55130491	39.21526309
55.357768848959	40.851048669078	57.56166222	41.97700689
55.357768848959	40.851048669078	57.48443808	43.25173204
55.357768848959	40.851048669078	57.35658457	43.71456461
55.357768848959	40.851048669078	51.33580352	40.30660727

Solution x	Solution y	Original x	Original y
55.357768848959	40.851048669078	49.90577559	41.072269
55.357768848959	40.851048669078	51.12261026	42.05252276
55.357768848959	40.851048669078	52.03099226	42.50134863
55.357768848959	40.851048669078	43.74535734	43.87626012
55.357768848959	40.851048669078	53.79810347	45.16180718
55.357768848959	40.851048669078	51.65508094	43.85648581
55.357768848959	40.851048669078	55.80484172	50.30189669
55.357768848959	40.851048669078	45.94832838	45.50704308
55.357768848959	40.851048669078	47.65008175	45.51867646
55.357768848959	40.851048669078	54.43373891	52.12894009
55.357768848959	40.851048669078	48.35826716	45.69665672
55.357768848959	40.851048669078	53.22205568	50.84724902
55.357768848959	40.851048669078	47.22851165	47.89903616
55.357768848959	40.851048669078	50.26037041	48.95030273
55.357768848959	40.851048669078	49.48945411	49.44119699
55.357768848959	40.851048669078	47.38308024	49.71863955
56.3350727902346	39.3438683026878	58.14893689	37.55022655
57.2069573720458	37.9992667302067	61.01859213	37.82208646
57.2069573720458	37.9992667302067	58.48548965	38.49282405
58.0434595098092	36.7092338119508	63.12520069	41.24941139
58.0434595098092	36.7092338119508	64.47235297	44.07915445
59.1092386765568	35.0656124107597	69.67922342	40.74675918
59.1092386765568	35.0656124107597	63.54041364	40.47906672
59.5229664853051	34.116524888815	63.76560063	37.45231942
59.9420334695412	33.1551892016604	51.19858704	31.0981292
60.3863242508089	32.1359902663754	51.99282443	27.99909333
60.8204644909207	31.140076216883	50.20668952	26.40233109
61.2424794441783	30.1719727126501	51.08696185	26.42044109
61.690484242218	29.1442473540079	62.83458953	32.37480154
62.1602301891265	28.0666479207237	59.48412304	31.97998889
62.1602301891265	28.0666479207237	58.09138733	33.97784367
62.8265420902555	26.5381283711112	59.97712424	27.07719444
62.8265420902555	26.5381283711112	59.11600598	27.89604561
63.5860759560094	24.795759804591	62.17589976	23.53474989
64.3244575580864	23.1019142010628	64.88897514	21.58345165
64.3244575580864	23.1019142010628	63.04507341	24.29862677
65.0680102319598	21.3962059632762	66.17419814	21.15751135
65.7914711316211	19.7365873409111	67.26622281	20.02005982
65.7914711316211	19.7365873409111	66.92261807	21.4897109
66.5022979636385	18.1059517549095	60.71671796	14.8721563
66.5022979636385	18.1059517549095	62.61153544	17.95816147
67.1980656117014	16.5098598132522	65.51501196	11.68636529
67.8051543315434	15.1171960674763	63.24920239	4.015695007
70.9338537206457	16.3699239541806	72.1570689	9.179080442
70.9338537206457	16.3699239541806	70.71952594	19.54937922
74.8625006823416	17.9429510107602	71.29498477	19.86081824

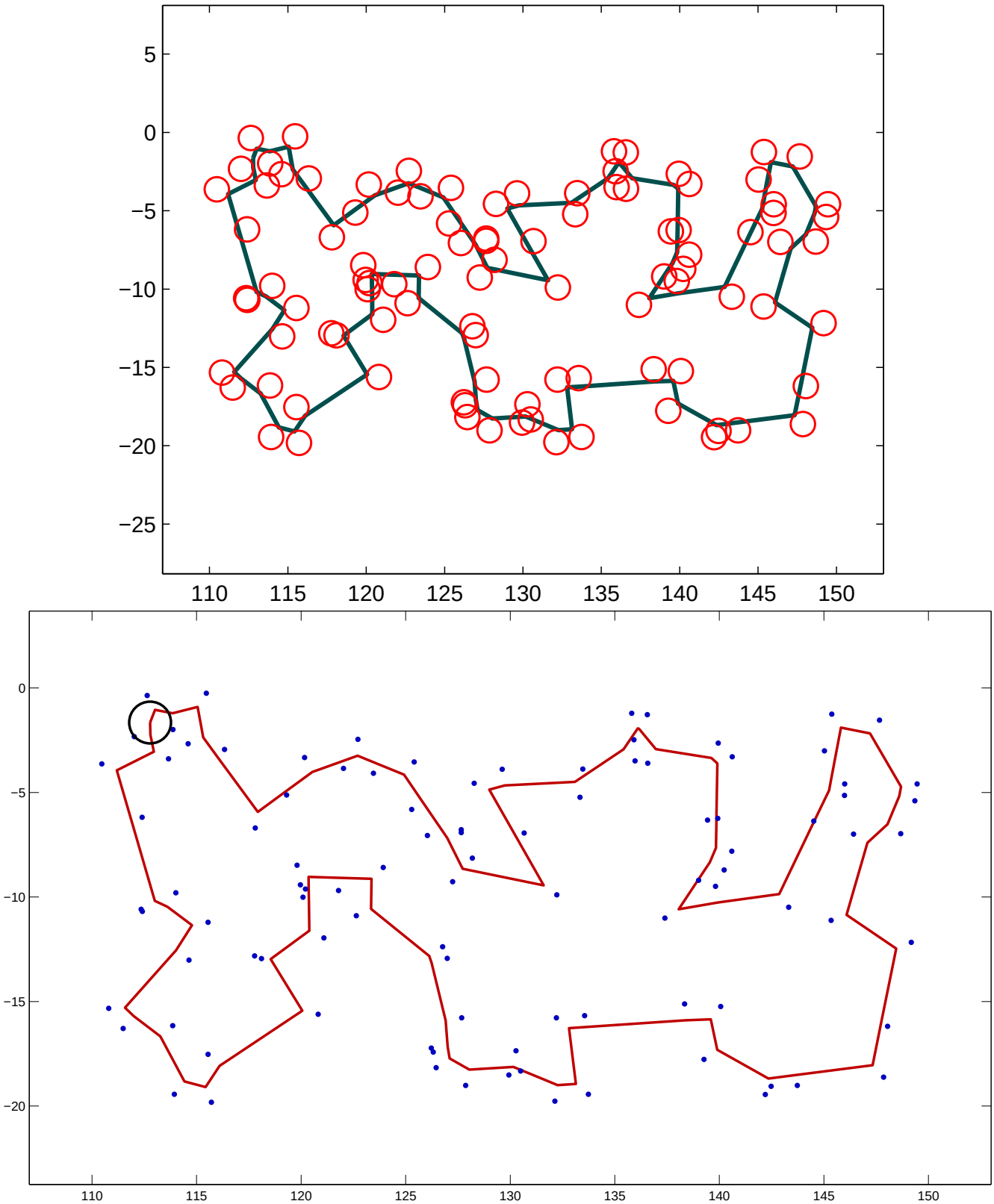


Figure N.8: $kroD100$, $r = 0.7798$, Equal Radius, 2D, Euclidean, Length = 159.0461695

Table N-11: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 2D, Euclidean

Total distance: 159.04616954529 Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
3.01511775551812	1.04364880496182	2.64	0.36
3.85003672778664	1.21045523847624	3.87	1.99
5.0489429653031	0.90635357513475	5.47	0.25
5.31614998601337	2.36142616706108	4.59999999999999	2.67
5.99496536205025	3.28837960654066	6.34	2.94
7.92893813925798	5.92932315649258	7.81	6.7
9.214117062751	4.98741262023416	9.31	5.12
10.5361414096116	4.01849754027542	10.17	3.33
11.8457052516174	3.54780270703982	12.03	3.85
12.7031355651614	3.23961821929007	12.72	2.46
13.6709100660974	3.63551334232441	13.46	4.08
14.9196662494191	4.14635119418076	15.41	3.54
15.8107279702388	5.4513524735981	15.29	5.81
16.620949427366	6.63794780064808	16.04	7.06
16.9876102968615	7.1749428155639	17.66	6.78
17.0700167848506	7.34000334543365	17.66	6.92
17.7247226474068	8.65135015529173	17.25	9.27
18.2042511112637	8.74919299129387	18.19	8.14
21.5989759638916	9.44185362871691	22.23	9.9
20.3003531978183	7.15304908778296	20.67	6.94
18.9995752353976	4.8605008545592	18.28	4.56
19.7420366007851	4.66019176374765	19.62	3.89
23.0948680528572	4.48973011461607	23.34	5.23
23.7480051059062	4.0535866330244	23.47	3.88
25.4203739818451	2.9368270774953	25.97	3.49
26.0993541963671	1.93412956718395	25.81	1.21
26.1547865912182	1.94625178548707	26.56	1.28
26.404153006373	2.24634579109836	25.92	2.48
26.9659355602487	2.92239894963464	26.58	3.6
29.6157854785646	3.34454953909954	29.95	2.64
29.9057531385862	3.60295527859098	30.62	3.29
29.8657123780756	5.96534488136665	29.93	6.24
29.8568413880062	6.48886636900603	29.44	6.32
29.8371964069767	7.64807403538201	30.6	7.81
29.5433470439637	8.34041064647017	30.23	8.71
28.9416499185174	9.24661869495286	29.01	9.2
28.0534099252909	10.5843885432225	27.4	11.01
29.9390034009859	10.2606631040157	29.82	9.49
32.86099038574	9.85960329659521	33.32	10.49
34.5037003073262	6.4457648826664	34.52	6.37
35.2492012884914	4.89647072472713	35.99	5.14
35.3388537095418	4.4219609491246	36	4.59
35.5855194808652	3.11644606198739	35.03	3.01
35.8160237101863	1.89650851589038	35.38	1.25
37.2068095524482	2.17459291513012	37.66	1.54
38.691232855966	4.72071770128975	39.46	4.59
38.6034384325581	5.17475574907449	39.35	5.4
38.041719088257	6.52201865201302	38.68	6.97
37.0826402938554	7.40109326259654	36.42	6.99
36.0834081801699	10.855042240903	35.35	11.12
38.4580707776499	12.4648026757386	39.18	12.17
37.7236914064927	16.0967888737828	38.05	16.19
37.328958933781	18.048960969125	37.86	18.62
33.7051380812833	18.5115030835174	33.73	19.02
32.3490976982703	18.6845852308791	32.2	19.45
32.1926328385908	18.5967085336291	32.48	19.06
29.8982834547838	17.3081020086243	29.27	17.77
29.590177919704	15.8547037153791	30.07	15.24
28.3806559649039	15.8987353524846	28.34	15.12
23.6526555997532	16.2194859130224	23.56	15.68
22.8112656702557	16.2765573217501	22.21	15.78
23.1391943998358	18.9428860046402	23.74	19.44
22.2661823381466	19.0004758788854	22.14	19.77
20.4032071418021	18.2326728642834	19.94	18.52
20.1523364423471	18.1292796658991	20.28	17.36
19.9785224978835	18.1400763421318	20.5	18.33
18.0453267533183	18.2601646103611	17.87	19.02
17.0999089644891	17.7243477749813	16.46	18.17
17.004278217583	17.1373690835867	16.23	17.23
17.0013288085789	17.0987854616182	16.32	17.42
16.9098705788192	15.9024286267999	17.68	15.78
16.2408733833137	13.1565543882526	16.99	12.94
16.1294376972596	12.8247122781114	16.77	12.38
13.3462274116271	10.5693461158027	12.64	10.9
13.3663765470305	9.12890425402155	13.93	8.59
11.8154234504735	9.08108844799294	11.79	9.69
10.473229083867	9.0397049411965	9.97	9.42
10.3566527165589	9.03611144432788	9.81	8.48
10.3644820737488	9.60966915242165	10.21	9.62
10.372334941881	10.1849653813537	10.09	10.01
10.3918190062753	11.6126781785266	11.09	11.96
8.66548888376128	12.8817562443957	8.11	12.95
8.54520219504538	12.9701825909015	7.78	12.82
10.0584352395879	15.4423444370468	10.82	15.61
6.10212551427831	18.0806779034324	5.55	17.53
5.43183117579056	19.0915006080359	5.70999999999999	19.82
4.42282907340605	18.8276559594722	3.94	19.44
3.26620352712669	16.665464640357	3.86	16.16
1.99665981388908	15.6972242474842	1.48999999999999	16.29
1.57914512399452	15.298030425675	0.799999999999997	15.33
4.01761712366945	12.5501836832986	4.64	13.02
4.78278307991323	11.3495253830381	5.55	11.21
3.60792003001376	10.4681465408495	4.01000000000001	9.8
3.0028221882868	10.1833928351767	2.41	10.69
2.9991220246645	10.1706865967619	2.34999999999999	10.59
1.88927183781038	6.35974557738571	2.40000000000001	6.19
1.1849550354985	3.9413330974481	0.469999999999999	3.63
2.95860356605455	3.04921845110638	3.66	3.39
2.79485688555401	2.24233784535905	2.02	2.33

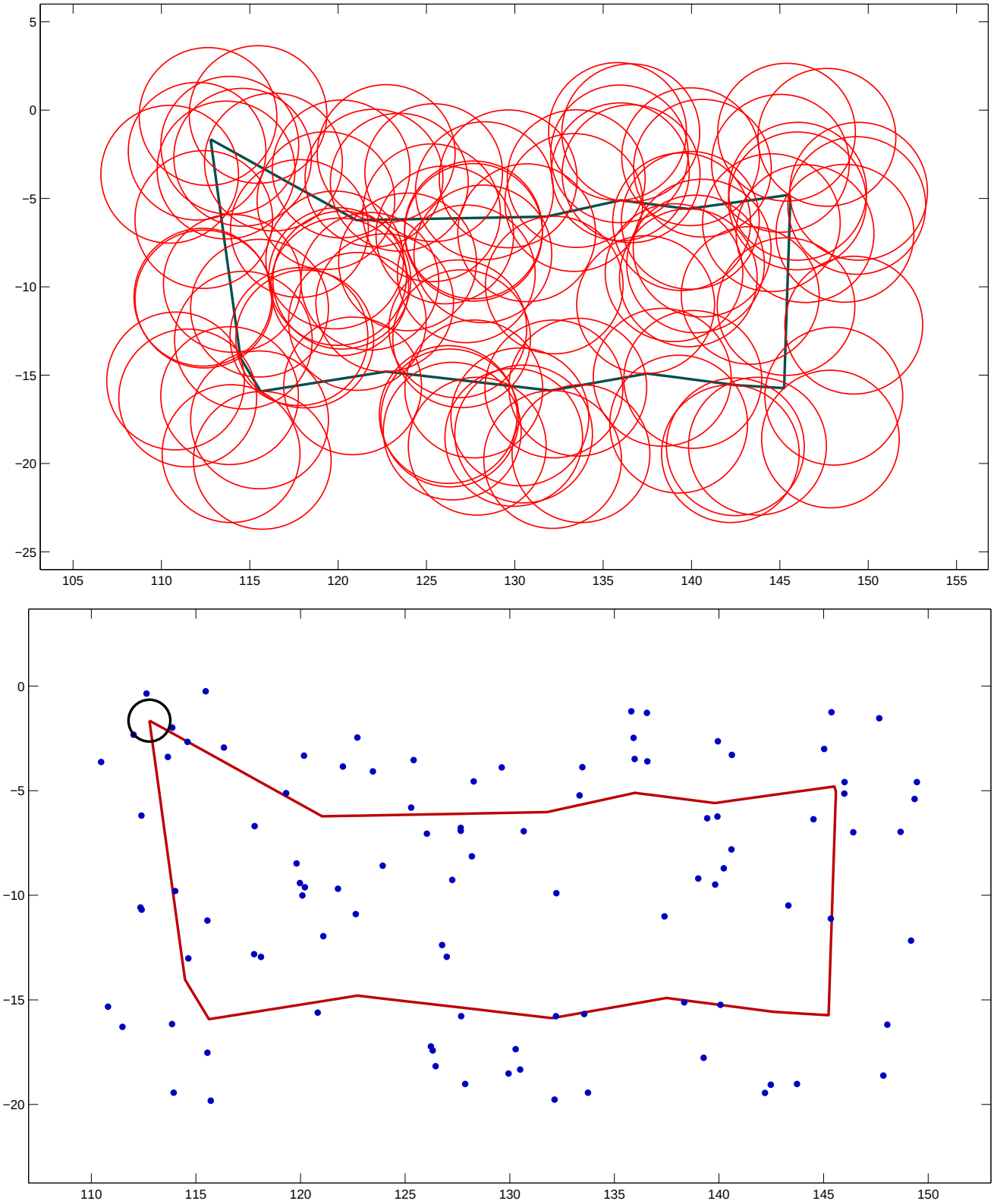


Figure N.9: $kroD100$, $r = 3.899$, Equal Radius, 2D, Euclidean, Length = 89.6679139

Table N-12: Solution for $kroD100$, $r = 3.899$, Equal Radius, 2D, Euclidean

Total distance: 89.6679139369754			
Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
4.14234864312074	2.40556073245384	2.02	2.33
4.14234864312074	2.40556073245384	3.87	1.99
4.14234864312074	2.40556073245384	2.64	0.36
4.14234864312074	2.40556073245384	3.66	3.39
4.14234864312074	2.40556073245384	4.59999999999999	2.67
4.14234864312074	2.40556073245384	5.47	0.25
4.14234864312074	2.40556073245384	6.34	2.94
7.25513373930616	4.13192131432904	7.81	6.7
8.63813194167111	4.89893608555511	9.31	5.12
9.87163397549	5.58304025561814	9.81	8.48
10.6937397980116	6.03898259126405	9.97	9.42
10.6937397980116	6.03898259126405	10.21	9.62
11.0317441081566	6.22644064748244	10.09	10.01
11.9803581517612	6.20889419970166	11.79	9.69
11.9803581517612	6.20889419970166	13.93	8.59
12.6553913375829	6.19640859873847	12.72	2.46
12.6553913375829	6.19640859873847	15.41	3.54
12.6553913375829	6.19640859873847	16.04	7.06
12.728633881367	6.19505449524396	10.17	3.33
12.728633881367	6.19505449524396	12.03	3.85
14.3928240728758	6.16426852071405	13.46	4.08
14.3928240728758	6.16426852071405	15.29	5.81
16.327416404026	6.12848152839927	17.66	6.78
16.327416404026	6.12848152839927	17.66	6.92
17.5219026782273	6.10638485319411	17.25	9.27
18.9687721898993	6.07961869486129	18.19	8.14
20.8829728542252	6.04420690503982	18.28	4.56
20.8829728542252	6.04420690503982	19.62	3.89
20.8829728542252	6.04420690503982	20.67	6.94
20.8829728542252	6.04420690503982	23.47	3.88
20.8829728542252	6.04420690503982	23.34	5.23
21.7743383743917	6.02771702234279	22.23	9.9
25.9835925479941	5.10513527438131	25.81	1.21
26.2471226387215	5.13870310214699	26.56	1.28
26.9240985565546	5.22493447845831	25.92	2.48
26.9240985565546	5.22493447845831	25.97	3.49
28.0474730248837	5.36802719048508	26.58	3.6
29.7984246670512	5.59105925692369	29.82	9.49
29.9431263268901	5.57099929072493	29.44	6.32
29.9431263268901	5.57099929072493	29.93	6.24
30.089482039965	5.55070964863778	29.01	9.2
30.5890264298382	5.48145923259437	30.23	8.71
31.1841564992014	5.3989581507305	30.6	7.81
31.8531270046233	5.30622130226698	29.95	2.64
31.8531270046233	5.30622130226698	30.62	3.29
33.6781472436162	5.05322769493499	35.03	3.01
34.8041132939118	4.89713930207748	35.38	1.25
35.169889017281	4.84643184118218	36	4.59
35.5183169867989	4.79812979265558	37.66	1.54
35.5883796561657	5.0512650401717	39.46	4.59
35.5762612194548	5.4198883270021	34.52	6.37
35.5762612194548	5.4198883270021	35.99	5.14
35.5637213793055	5.80131884303914	39.35	5.4
35.5261057836993	6.94561979756314	36.42	6.99
35.4907258122398	8.02190925717985	38.68	6.97
35.3659665758557	11.8174923231793	39.18	12.17
35.342749317547	12.5238204383227	33.32	10.49
35.342749317547	12.5238204383227	35.35	11.12
35.2670886291918	14.8256596983221	38.05	16.19
35.2371979708383	15.7350183088712	37.86	18.62
34.1182213924042	15.6652374569311	33.73	19.02
33.2094329478799	15.6085648678042	32.48	19.06
32.5728444470257	15.5688678668554	32.2	19.45
30.443977574651	15.2921455551882	29.27	17.77
28.9948806708562	15.1037836589647	28.34	15.12
28.9948806708562	15.1037836589647	30.07	15.24
27.4886359455463	14.9079934819838	27.4	11.01
23.24664508043	15.6568353806157	23.74	19.44
22.0235926993313	15.8727375493785	22.14	19.77
21.3365510361912	15.7933670530826	20.28	17.36
21.3365510361912	15.7933670530826	20.5	18.33
20.7771018965753	15.7287365411965	22.21	15.78
20.7771018965753	15.7287365411965	23.56	15.68
19.6881423724103	15.6029339548628	19.94	18.52
18.430648154338	15.4576617287042	17.87	19.02
17.4034680271459	15.3389962914183	16.32	17.42
17.4034680271459	15.3389962914183	16.46	18.17
16.6693621271571	15.2541879860219	17.68	15.78
16.6693621271571	15.2541879860219	16.23	17.23
15.9211466473117	15.1677499627054	16.99	12.94
15.047044428634	15.0667687150881	16.77	12.38
13.493626285052	14.8873097174218	10.82	15.61
12.7217872847321	14.7981428415742	12.64	10.9
10.9552101281538	15.0777501173402	11.09	11.96
8.28834311162022	15.4998549630002	7.78	12.82
8.28834311162022	15.4998549630002	8.11	12.95
5.62110843935996	15.9220163052393	5.70999999999999	19.82
5.62107868290295	15.9220204155798	3.94	19.44
5.27089517071063	15.3433530802981	5.55	17.53
4.8025115481188	14.5693715069531	1.48999999999999	16.29
4.47559520660337	14.0291522838534	0.799999999999997	15.33
4.3492047673849	13.1064035390856	5.55	11.21
4.3492047673849	13.1064035390856	4.64	13.02
4.3492047673849	13.1064035390856	3.86	16.16
3.93909789829182	10.1123462466486	4.01000000000001	9.8
3.93909789829182	10.1123462466486	2.34999999999999	10.59
3.93909789829182	10.1123462466486	2.41	10.69
3.45969501178612	6.61237701712701	2.40000000000001	6.19
3.07090851940217	3.77393330483144	0.469999999999999	3.63

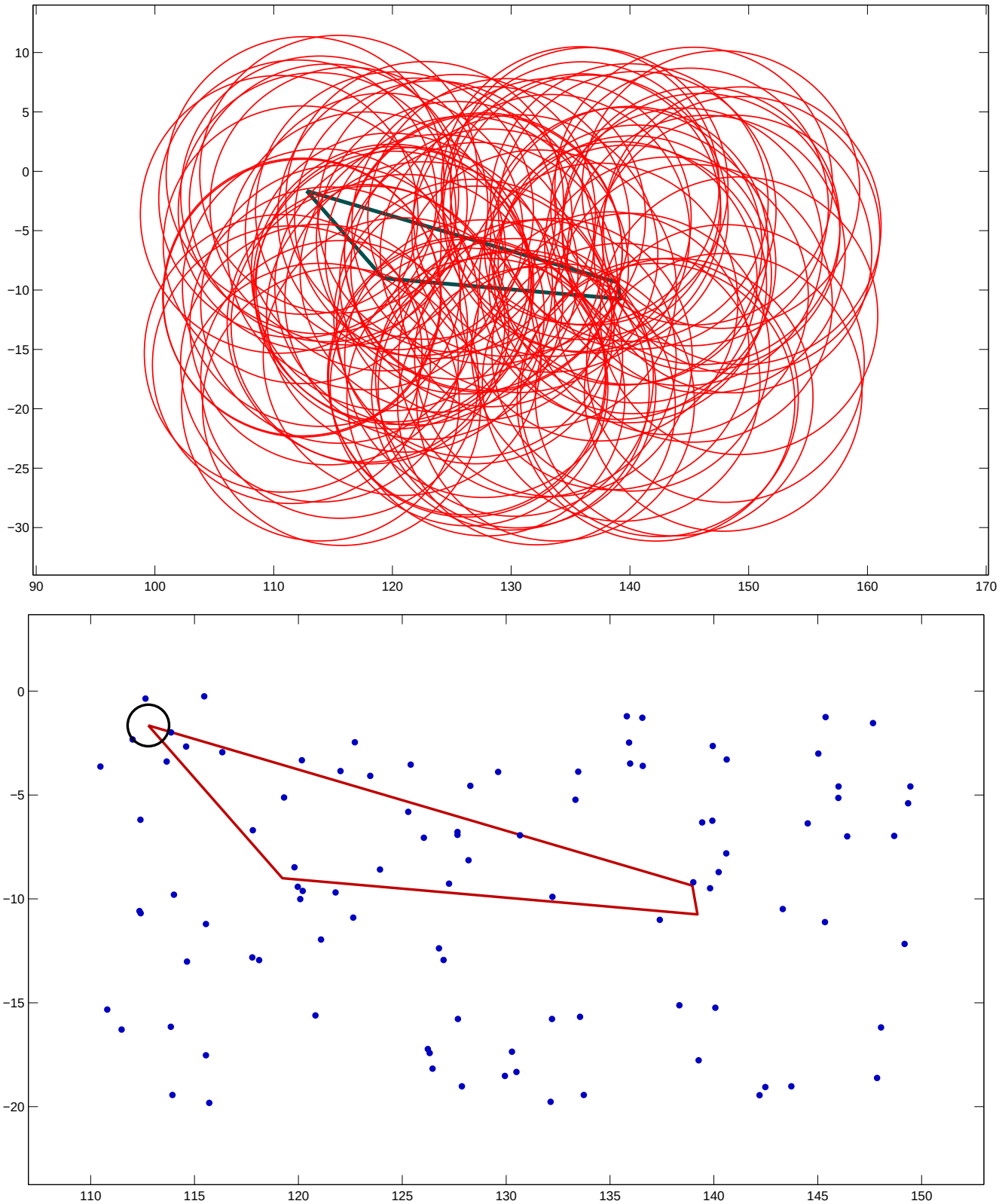


Figure N.10: $kroD100$, $r = 11.697$, Equal Radius, 2D, Euclidean, Length = 58.5412126

Table N-13: Solution for $kroD100$, $r = 11.697$, Equal Radius, 2D, Euclidean

Total distance: 58.5412125780523			
Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
8.09225142003812	3.21452262312107	2.64	0.36
28.9603357646996	9.35893040559276	25.97	3.49
28.9603357646996	9.35893040559276	26.58	3.6
28.9603357646996	9.35893040559276	26.56	1.28
28.9603357646996	9.35893040559276	30.62	3.29
28.9603357646996	9.35893040559276	35.03	3.01
28.9603357646996	9.35893040559276	35.99	5.14
28.9603357646996	9.35893040559276	36	4.59
28.9603357646996	9.35893040559276	35.38	1.25
28.9603357646996	9.35893040559276	37.66	1.54
28.9603357646996	9.35893040559276	39.35	5.4
28.9603357646996	9.35893040559276	39.46	4.59
29.2122895903742	10.7436424114011	20.67	6.94
29.2122895903742	10.7436424114011	22.23	9.9
29.2122895903742	10.7436424114011	23.34	5.23
29.2122895903742	10.7436424114011	23.47	3.88
29.2122895903742	10.7436424114011	22.21	15.78
29.2122895903742	10.7436424114011	23.56	15.68
29.2122895903742	10.7436424114011	27.4	11.01
29.2122895903742	10.7436424114011	29.01	9.2
29.2122895903742	10.7436424114011	25.81	1.21
29.2122895903742	10.7436424114011	29.82	9.49
29.2122895903742	10.7436424114011	28.34	15.12
29.2122895903742	10.7436424114011	30.23	8.71
29.2122895903742	10.7436424114011	30.6	7.81
29.2122895903742	10.7436424114011	30.07	15.24
29.2122895903742	10.7436424114011	29.27	17.77
29.2122895903742	10.7436424114011	33.32	10.49
29.2122895903742	10.7436424114011	35.35	11.12
29.2122895903742	10.7436424114011	32.48	19.06
29.2122895903742	10.7436424114011	32.2	19.45
29.2122895903742	10.7436424114011	36.42	6.99
29.2122895903742	10.7436424114011	33.73	19.02
29.2122895903742	10.7436424114011	38.68	6.97
29.2122895903742	10.7436424114011	38.05	16.19
29.2122895903742	10.7436424114011	39.18	12.17
29.2122895903742	10.7436424114011	37.86	18.62
24.0394908597959	10.2943080629612	18.28	4.56
24.0394908597959	10.2943080629612	19.62	3.89
24.0394908597959	10.2943080629612	17.68	15.78
24.0394908597959	10.2943080629612	20.28	17.36
24.0394908597959	10.2943080629612	20.5	18.33
24.0394908597959	10.2943080629612	25.92	2.48
24.0394908597959	10.2943080629612	16.46	18.17
24.0394908597959	10.2943080629612	19.94	18.52
24.0394908597959	10.2943080629612	17.87	19.02
24.0394908597959	10.2943080629612	29.44	6.32
24.0394908597959	10.2943080629612	22.14	19.77
24.0394908597959	10.2943080629612	29.93	6.24
24.0394908597959	10.2943080629612	23.74	19.44
24.0394908597959	10.2943080629612	29.95	2.64
24.0394908597959	10.2943080629612	34.52	6.37
9.2264813650223	9.00577907368725	18.19	8.14
9.2264813650223	9.00577907368725	17.25	9.27
9.2264813650223	9.00577907368725	17.66	6.92
9.2264813650223	9.00577907368725	17.66	6.78
9.2264813650223	9.00577907368725	16.04	7.06
9.2264813650223	9.00577907368725	16.77	12.38
9.2264813650223	9.00577907368725	16.99	12.94
9.2264813650223	9.00577907368725	15.29	5.81
9.2264813650223	9.00577907368725	13.93	8.59
9.2264813650223	9.00577907368725	15.41	3.54
9.2264813650223	9.00577907368725	12.64	10.9
9.2264813650223	9.00577907368725	11.79	9.69
9.2264813650223	9.00577907368725	13.46	4.08
9.2264813650223	9.00577907368725	11.09	11.96
9.2264813650223	9.00577907368725	12.03	3.85
9.2264813650223	9.00577907368725	16.23	17.23
9.2264813650223	9.00577907368725	10.21	9.62
9.2264813650223	9.00577907368725	16.32	17.42
9.2264813650223	9.00577907368725	10.09	10.01
9.2264813650223	9.00577907368725	9.97	9.42
9.2264813650223	9.00577907368725	12.72	2.46
9.2264813650223	9.00577907368725	9.81	8.48
9.2264813650223	9.00577907368725	9.31	5.12
9.2264813650223	9.00577907368725	10.17	3.33
9.2264813650223	9.00577907368725	10.82	15.61
9.2264813650223	9.00577907368725	7.81	6.7
9.2264813650223	9.00577907368725	8.11	12.95
9.2264813650223	9.00577907368725	7.78	12.82
9.2264813650223	9.00577907368725	5.55	11.21
9.2264813650223	9.00577907368725	6.34	2.94
9.2264813650223	9.00577907368725	4.64	13.02
9.2264813650223	9.00577907368725	4.01000000000001	9.8
9.2264813650223	9.00577907368725	4.59999999999999	2.67
9.2264813650223	9.00577907368725	5.55	17.53
9.2264813650223	9.00577907368725	5.47	0.25
9.2264813650223	9.00577907368725	3.66	3.39
9.2264813650223	9.00577907368725	3.87	1.99
9.2264813650223	9.00577907368725	2.41	10.69
9.2264813650223	9.00577907368725	2.34999999999999	10.59
9.2264813650223	9.00577907368725	3.86	16.16
9.2264813650223	9.00577907368725	2.40000000000001	6.19
9.2264813650223	9.00577907368725	5.70999999999999	19.82
9.2264813650223	9.00577907368725	2.02	2.33
9.2264813650223	9.00577907368725	3.94	19.44
9.2264813650223	9.00577907368725	1.48999999999999	16.29
9.2264813650223	9.00577907368725	0.799999999999997	15.33
9.2264813650223	9.00577907368725	0.469999999999999	3.63

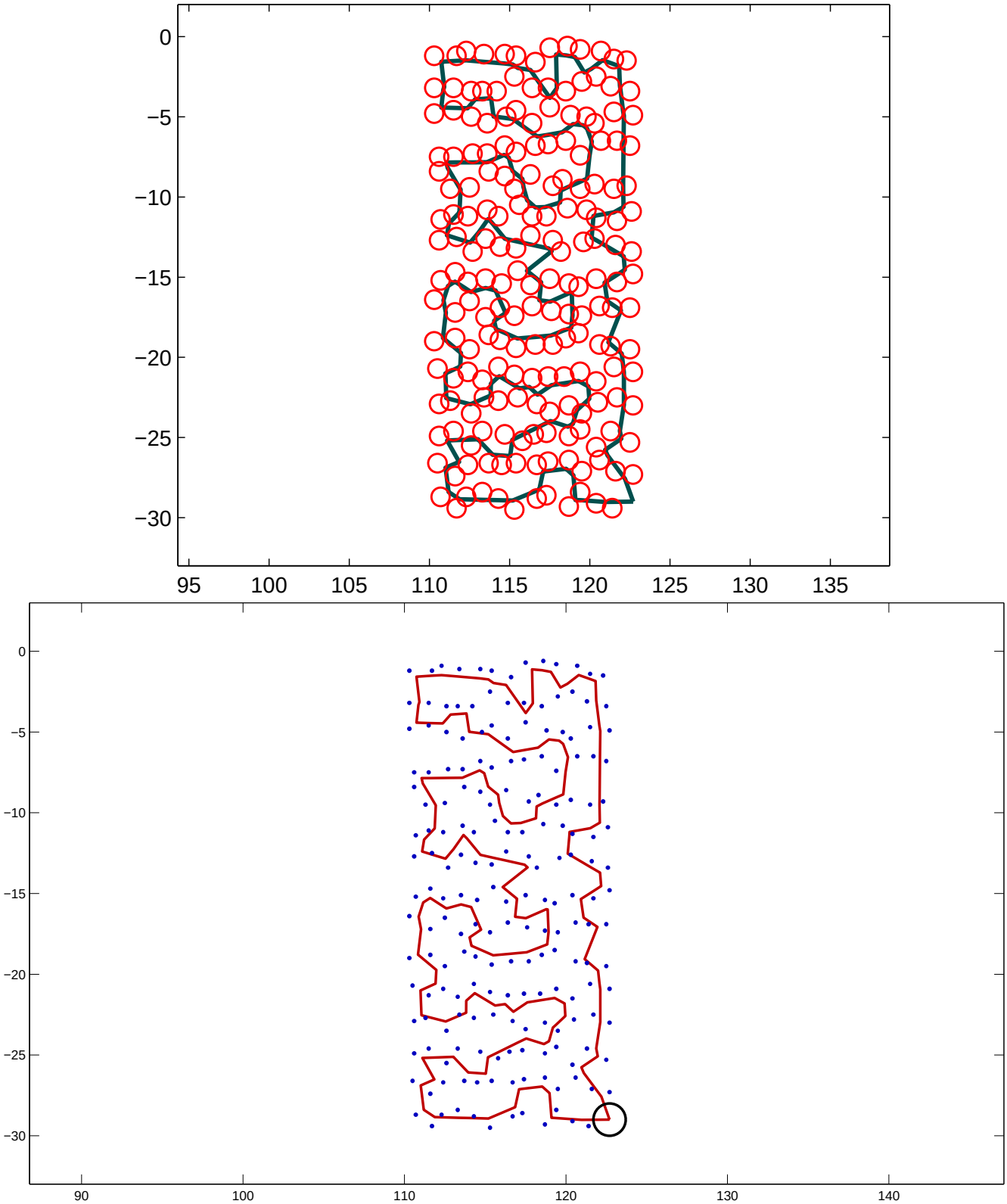


Figure N.11: $rat195$, $r = 0.578$, Equal Radius, 2D, Euclidean, Length = 158.7851929

Table N-14: Solution for $rat195$, $r = 0.578$, Equal Radius, 2D, Euclidean

Total distance: 158.785192949264 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
10.9713082388737	29.0123087265603	10.4	29.1
10.9713053773864	29.0123086608198	11.4	29.4
9.41968866795669	28.9092745622187	9.4	28.4
9.10583266198321	28.8884341643845	8.7	29.3
8.98257328255517	27.3575965240311	9.5	27.1
8.52594988945151	26.9511740174632	8.7	26.4
7.47158496543426	27.0735264215985	7.4	26.5
7.09245385375956	27.1243422844176	6.7	26.7
6.85482386346141	28.2313474655625	7.3	28.6
6.48413449625959	28.3876086218155	6.7	28.8
5.19258073955262	28.9320676251921	5.3	29.5
4.29024656088062	28.9094215680214	4.3	28.8
3.29321111724509	28.8843980006826	3.3	28.4
2.38819251060283	28.8616884025061	2.3	28.7
1.87390849667618	28.8487814008977	1.7	29.4
1.19134974141285	28.3955962755986	0.7	28.7
1.07563850659893	27.4719145836534	1.6	27.4
1.00225031852888	26.8860609092075	0.5	26.6
1.85214544993083	26.5157672552694	2.4	26.7
1.1039696416406	25.1830207266801	0.6	24.9
1.52237766776203	25.1679624586402	1.5	24.6
3.03487510287265	25.1136096862458	3.3	24.6
3.05237818629313	25.1402242562088	2.6	25.5
3.94759533547197	26.0777139721699	3.7	26.6
4.53990552455062	26.1234068887526	4.5	26.7
5.03285284801026	26.1535817005741	5.4	26.6
5.16894648689176	25.137898374707	4.7	24.8
5.97950894631232	24.7412174626949	6.5	24.8
6.01965712820689	24.7215687357056	5.8	25.2
7.05045716686014	24.2170988307641	7.3	24.7
7.54217073251463	23.9764612938554	7.5	23.4
8.63591617725072	24.3255616717006	8.7	24.9
8.9443882693196	24.1443260317467	9.4	24.5
9.19159848878685	23.3040010603588	8.7	23
9.38432959642243	23.1247388589103	9.5	23.5
9.9628018036622	22.5866830883047	10.5	22.8
9.91171941411011	21.8093024047675	10.4	21.5
9.2995616910287	21.4692081720103	9.4	20.9
8.45750929744037	21.6031932518549	8.4	21.2
7.61194637624955	21.7377398473094	7.4	21.2
6.74280607163391	22.3235854533043	6.7	22.9
6.22718815572458	21.8515632139798	6.4	21.3
5.61658689688215	21.9338787244638	5.5	22.5
5.01184857793048	21.571080274912	5.3	21.1
4.35261305503305	21.175602049343	4.3	20.6
3.82569198641305	21.6402784551633	3.3	21.4
3.81870218699348	22.37994003527	4.3	22.7
3.34197442618017	22.5851221534392	3.4	22.5
2.55522334947158	22.9237354404877	2.6	23.5
1.04999302079786	22.5372436909008	0.6	22.9
1.04438109189299	22.3875709191602	1.3	22.7
1.00600194318324	21.3640110689278	1.5	21.3
0.992453925930334	21.0026134330895	0.5	20.7
1.9222696555649	20.5746394380391	2.4	20.9
1.96986792296208	19.7303164385763	2.5	19.5
1.3118029047838	19.1818360225789	1.6	18.8
0.836958810219784	18.7860820109452	0.3	19
1.02231284233814	17.2190316610676	1.6	17.2
0.876889308607772	16.4358313965174	0.3	16.4
1.15723485784061	15.5535839137232	0.7	15.2
1.59492366425347	15.2779789583225	1.6	14.7
2.1545914887098	15.6442592503353	2.4	15.3
2.58965380465428	15.9289941096365	2.5	16.5
3.50367681473202	15.677989301505	3.5	15.1
4.12553838118743	15.8402998697615	4.5	15.4
4.74469594668038	17.2396156630582	5.3	17.4
4.56287432780351	17.3618590532154	4.4	16.9
4.0360920264585	17.7160810308981	3.5	17.5
4.14812198215154	18.2349351856807	3.7	18.6
4.61774252145372	18.4425470250275	4.4	18.9
5.49317164302478	18.8295576682009	5.4	19.4
6.55293657665015	18.7313157273896	6.59999999999999	19.2
7.56844895243619	18.6371685081494	7.7	19.2
8.31154846393272	18.3516998869249	8.5	18.8
8.84144168151438	18.1481335168469	9.3	18.5
8.90163913292811	17.5768847104205	8.7	17.3
8.92232785807751	17.3805335834017	9.5	17.4
8.86994114501604	15.9861801023855	9.3	15.6
8.77783186244051	15.9727368062557	8.7	15.4
7.51785954010866	16.5278651214575	7.59999999999999	17.1
6.85305712683635	16.4410781091608	6.40000000000001	16.8
6.96643288548292	15.3222425862414	7.5	15.1
6.6439761597275	15.0612801715864	6.3	15.5
6.07799241094281	14.6032223088168	5.5	14.6
7.62228524729171	13.3817996665543	8.2	13.4
7.43555633847542	13.2139598027399	7.7	12.7
6.18648792055338	12.9369266063181	6.3	12.4
5.47814758987036	12.7798356232836	5.40000000000001	13.2
4.70336148071266	12.608007018417	4.40000000000001	13.1
3.87345509014357	11.5900545074955	4.3	11.2
3.65362628219295	11.3755081660591	3.59999999999999	10.8
3.04205032209052	12.2473462165108	3.5	12.6
2.537650705752	12.845267521962	2.7	13.4
1.72281150782801	12.5926385876767	1.7	12.5
1.09231587319503	12.3971626506194	0.599999999999994	12.7
1.21701286682499	11.6584235694958	0.700000000000003	11.4
1.86863017541076	10.9725549575167	2.40000000000001	11.2
1.87550051311686	10.8325251354632	1.5	11.1
1.93895562486576	9.53897570659807	2.5	9.4
1.74004495655547	9.20311602505785	1.3	9.5
1.13534448103083	8.18207632251014	0.599999999999994	8.4
1.05590874240846	7.85529210783345	0.599999999999994	7.5
1.58753049412022	7.85084712223179	1.5	7.5
2.69992483529323	7.8415400695917	2.7	7.3
3.4864909642135	7.83496852597056	3.59999999999999	7.3
3.58203222936015	7.83416589911352	3.7	8.4
4.65712935455387	7.37640896193835	4.7	6.8
4.9403752804002	7.55047140706473	5.40000000000001	7.2
5.18211270861342	8.38117034635827	4.7	8.7
5.79615449089162	8.88323996639498	6.3	8.6
5.86590525693973	9.38237890217658	5.3	9.5
6.09227571436374	10.1970979079481	5.59999999999999	10.5
6.59689449789309	10.6565684719649	6.40000000000001	11.2
7.20248605253239	10.6302846293543	7.3	11.2
8.145342045653	10.3431084339883	8.59999999999999	10.7
8.18623166049005	9.61251269375183	7.7	9.3
8.55053850374627	9.42087548297812	8.3	8.9
9.22285491793693	9.12662640676939	9.40000000000001	9.5
9.83282235451237	8.85966126703244	10.3	9.2
9.9729853782392	7.47595328901668	9.40000000000001	7.4
10.1244318826176	6.5529754517395	10.7	6.5
9.82979087823251	5.73613754090211	10.3	5.4
9.5763301442131	5.53296984550463	9.8	5
8.95027271408927	5.4581247810673	8.8	4.9
8.27057033303531	5.96948429578287	8.5	6.5
7.30271739181497	6.13706209622208	7.40000000000001	6.7
6.72846195036558	6.23645521687644	6.59999999999999	6.8
6.10218754993528	5.78959741971444	6.40000000000001	5.4
5.18925844806088	5.13821257945484	5.40000000000001	4.6
4.70596713252465	5.07666476958001	4.8	5
4.00474067175132	4.98736186328238	3.59999999999999	5.4
3.83753812318909	3.85022952185973	4.2	3.4
3.34221826958176	3.88454597510656	3.3	3.4
2.85596782582542	3.91823303317038	2.59999999999999	3.4
2.36984622258801	4.46979784459541	2.59999999999999	5
1.51994327559531	4.4448723276375	1.5	4.6
0.737192521605493	4.4219155039641	0.299999999999997	4.8
0.864412216822544	3.32459088389881	0.299999999999997	3.2
0.924994644192466	3.14123429362252	1.5	3.2
0.742966834127003	1.57130246964451	0.299999999999997	1.2
1.67376453377535	1.51525534205708	1.7	1.2
2.29317900462863	1.47795938201536	2.3	0.9
3.36766869776517	1.56812971405669	3.40000000000001	1.1
4.64193422895438	1.67506927791525	4.7	1.1
5.19495950178623	1.74041019531192	5.40000000000001	1.2
5.51658273745048	1.96411141722999	5.3	2.5
6.29303985685678	2.08975561892552	6.59999999999999	1.6
6.85139377567246	2.88623097204599	6.40000000000001	3.2
7.50746911032407	3.82204712138662	7.5	4.4
7.75559233856083	3.48687381003202	7.40000000000001	3.2
7.94888479165884	3.22576718108605	8.5	3.4
7.89656982912321	1.12049692170488	7.5	0.7
8.5228523827188	1.17282717934269	8.59999999999999	0.6
9.07067584436328	1.27500606830279	9.40000000000001	0.8

Solution x	Solution y	Original x	Original y
9.65451001768115	2.24303317142962	9.5	2.8
10.087060157395	2.01404475010737	10.4	2.5
10.7908779390878	1.47081213250778	10.7	0.9
11.3662902775241	1.67536589505489	11.5	1.4
11.8336860028773	1.84152104217817	12.3	1.5
11.8761645215645	3.05399733622915	11.3	3.1
11.9288014978935	3.47313157726817	12.5	3.4
12.0722696184894	4.61887657788324	11.5	4.7
12.1235620962925	4.94246367617501	12.7	4.9
12.1073465682304	6.56326927437212	12.5	6.8
12.1057163425355	6.72638408876058	11.7	6.5
12.081942790267	9.10240218273435	12.3	9.3
12.077988442025	9.49788435415453	11.5	9.5
12.0972589315171	10.6148036013094	12.6	10.9
11.5014182530241	10.9571831161583	11.7	11.5
10.2276778512728	11.1888150675457	9.8	10.8
10.2018877283489	11.4924056518637	10.4	11.3
10.1133725363877	12.5344172764263	9.59999999999999	12.8
10.4403469734388	12.7265331720223	10.3	12.6
11.40488368722	13.2932567867753	11.6	13
12.1109800409177	13.7081316486724	12.6	13.4
12.1820894168063	14.543378928645	12.7	14.8
11.4984363168752	14.9775653762999	11.7	15.3
10.9250306932969	15.3417198324814	10.4	15.1
11.0897096647774	16.4929655434263	10.6	16.8
11.9479045184578	17.0711038275842	12.5	16.9
11.9232189135974	17.1335504973726	11.4	16.9
11.2195075752809	18.9130521587889	11.3	19.3
11.1610243615948	19.0609401881925	10.6	19.2
11.9891144352595	19.7703365587066	12.5	19.5
12.0740803507417	20.5331013428747	11.5	20.6
12.1230626904314	20.9350285241486	12.7	20.9
12.1234633403666	22.4367849246047	11.7	22.5
12.1236032313446	22.9569733829284	12.7	23
11.8779275561689	24.5907785551346	11.3	24.6
11.9668826485806	25.0766788547174	12.5	25.3
10.9542754371693	25.7639058305966	10.4	25.6
11.1015524874274	26.1127188214464	10.6	26.4
11.7342784349195	26.9611757297531	11.6	27.1
12.1905130656658	27.5729630366525	12.7	27.3

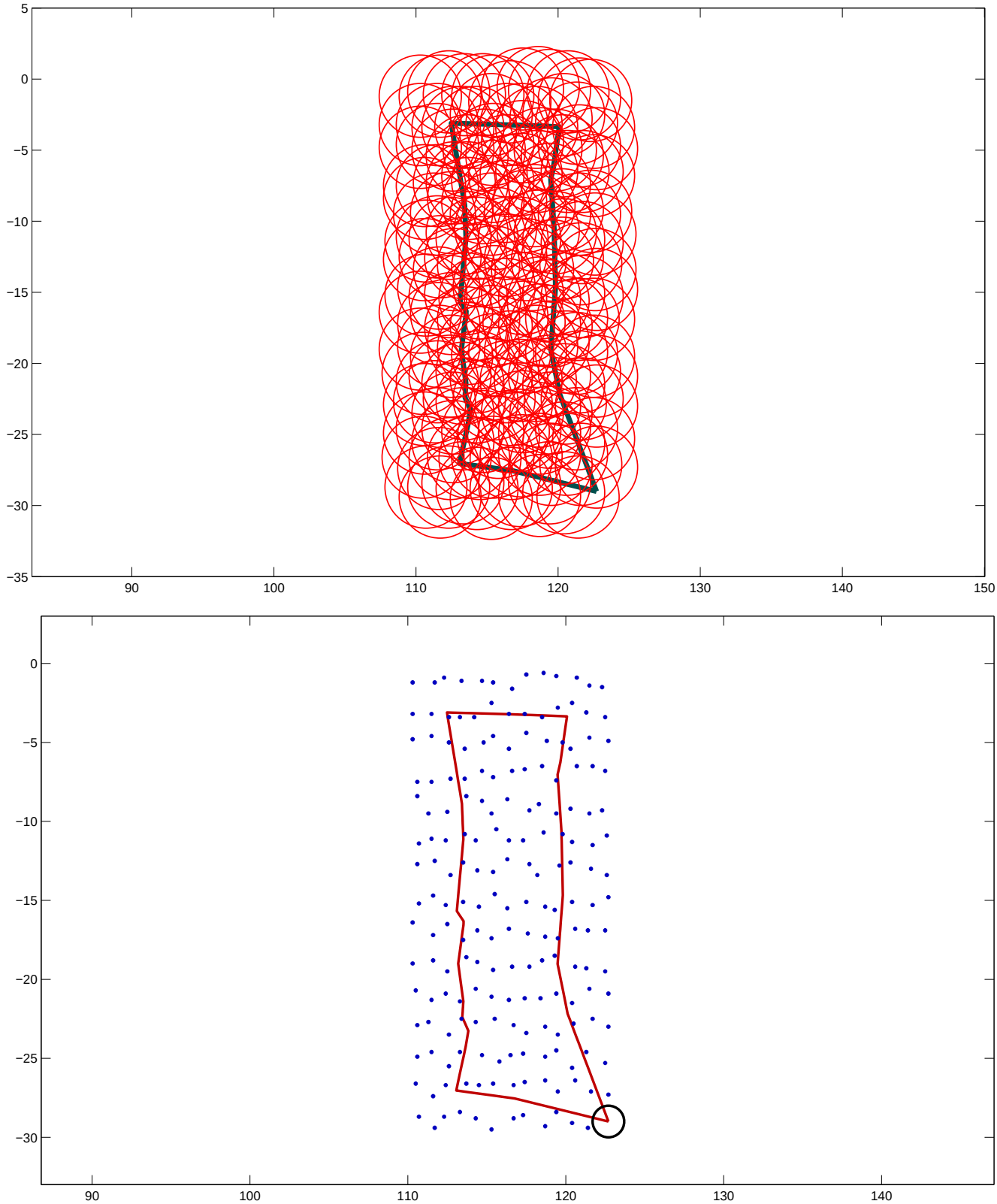


Figure N.12: $rat195$, $r = 2.89$, Equal Radius, 2D, Euclidean, Length = 68.0830161

Table N-15: Solution for $rat195$, $r = 2.89$, Equal Radius, 2D, Euclidean

Total distance: 68.0830160865114 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
12.0833221846794	27.3700415208884	12.7	27.3
12.0833221846794	27.3700415208884	9.40000000000001	28.4
11.4466643573302	25.6872600527242	11.6	27.1
11.4466643573302	25.6872600527242	9.5	27.1
11.4466643573302	25.6872600527242	10.6	26.4
11.4466643573302	25.6872600527242	8.7	26.4
11.193089680555	25.01701811161	8.7	24.9
11.0353323037425	24.6000423933588	12.5	25.3
11.0353323037425	24.6000423933588	10.4	25.6
10.8454814625184	24.0982318894994	11.3	24.6
10.8454814625184	24.0982318894994	9.40000000000001	24.5
10.6614233103369	23.6117307490931	12.7	23
10.4649198319845	23.0923399614886	11.7	22.5
10.4649198319845	23.0923399614886	9.5	23.5
10.4649198319845	23.0923399614886	10.5	22.8
10.2842352884399	22.6147607352443	8.7	23
10.1192468913329	22.1786703424083	8.40000000000001	21.2
10.1192468913329	22.1786703424083	7.40000000000001	21.2
10.1192467362467	22.1786698454429	7.5	23.4
10.1192467362467	22.1786698454429	10.4	21.5
10.1192467362467	22.1786698454429	9.40000000000001	20.9
9.97558691967666	21.4642492150259	12.7	20.9
9.8380062878185	20.7800621010034	11.5	20.6
9.69963571770201	20.0919469601481	12.5	19.5
9.58348077157007	19.5143118074035	7.7	19.2
9.4845264210547	19.0222133325761	6.59999999999999	19.2
9.55158921485508	18.1336023062184	9.3	18.5
9.55158921485508	18.1336023062184	8.5	18.8
9.63132979443302	17.0770075075365	11.3	19.3
9.63132979443302	17.0770075075365	12.5	16.9
9.64887514044818	16.8445208175562	10.6	19.2
9.64887514044818	16.8445208175562	11.4	16.9
9.64887514044818	16.8445208175562	10.6	16.8
9.67961677484946	16.4371738915742	9.5	17.4
9.67961677484946	16.4371738915742	10.4	15.1
9.70689766897996	16.0756866865383	9.3	15.6
9.70689766897996	16.0756866865383	7.59999999999999	17.1
9.74394448467164	15.5847822537201	7.5	15.1
9.77702212295345	15.1464811137543	8.7	17.3
9.77702212295345	15.1464811137543	9.59999999999999	12.8
9.81284475995145	14.6717936592807	8.7	15.4
9.81284475995145	14.6717936592807	8.2	13.4
9.81284475995145	14.6717936592807	7.7	12.7
9.81284515084481	14.6717887221542	12.7	14.8
9.79126307178865	13.679917136992	12.6	13.4
9.79126307178865	13.679917136992	11.7	15.3
9.75105837422825	11.8323754489433	8.59999999999999	10.7
9.75105837422825	11.8323754489433	7.3	11.2
9.73687090775616	11.1803496684035	10.3	12.6
9.73687090775616	11.1803496684035	7.7	9.3
9.73382791458543	11.040500158353	8.3	8.9
9.73382791458543	11.040500158353	10.4	11.3
9.73382791458543	11.040500158353	9.8	10.8
9.73163091856135	10.939530033523	11.6	13
9.73163091856135	10.939530033523	9.40000000000001	9.5
9.72448315359192	10.6110333092963	12.3	9.3
9.72448315359192	10.6110333092963	12.6	10.9
9.72448315359192	10.6110333092963	11.7	11.5
9.62099435197192	9.09273003879993	11.5	9.5
9.48059653656969	7.03294698994894	6.59999999999999	6.8
9.51402621883119	6.88981229374439	7.40000000000001	6.7
9.54812613088595	6.74380820319068	8.5	6.5
9.54812613088595	6.74380820319068	9.40000000000001	7.4
9.54812613088595	6.74380820319068	10.3	9.2
9.60519930430594	6.49943939068483	10.7	6.5
9.6599436677913	6.26504166352401	12.5	6.8
9.6599436677913	6.26504166352401	11.7	6.5
9.89035963311666	4.66365198374911	12.7	4.9
9.89035963311666	4.66365198374911	11.5	4.7
9.89035963311666	4.66365198374911	9.8	5
9.89035963311666	4.66365198374911	10.3	5.4
10.0118451290182	3.8193240978476	12.5	3.4
10.0118451290182	3.8193240978476	10.4	2.5
10.0118451290182	3.8193240978476	11.3	3.1
10.0118451290182	3.8193240978476	9.5	2.8
10.05666410156	3.50783433762124	11.5	1.4
10.0794265406016	3.34963645314134	12.3	1.5
9.59985831333755	3.33098978908166	10.7	0.9
9.59985831333755	3.33098978908166	9.40000000000001	0.8
8.40267714170946	3.28443581222524	6.40000000000001	3.2
8.40267714170946	3.28443581222524	7.5	4.4
8.40267714170946	3.28443581222524	8.8	4.9
7.85861273001827	3.26328008971451	6.59999999999999	1.6
7.85861273001827	3.26328008971451	8.5	3.4
7.85861273001827	3.26328008971451	7.40000000000001	3.2
7.44006199457773	3.24700492320244	8.59999999999999	0.6
7.44006199457773	3.24700492320244	7.5	0.7
7.44006199457773	3.24700492320244	5.40000000000001	1.2
6.4978514542466	3.21961525903349	6.40000000000001	5.4
5.54694005834151	3.19197308020384	5.40000000000001	4.6
5.54694005834151	3.19197308020384	4.8	5
4.82542492680714	3.17099802385079	5.3	2.5
4.82542492680714	3.17099802385079	4.2	3.4
4.13788733408332	3.15101027664724	4.7	1.1
3.30650821123864	3.1268412856468	2.3	0.9
3.30650821123864	3.1268412856468	3.40000000000001	1.1
2.82822697954258	3.11293621068069	1.7	1.2
2.47529964466955	3.10267516151313	0.299999999999997	1.2
2.54172597326961	3.5076468073216	1.5	3.2
2.54172597326961	3.5076468073216	2.59999999999999	3.4
2.61602705812635	3.96062703341374	0.299999999999997	3.2
2.61602705812635	3.96062703341374	0.299999999999997	4.8
2.71428481105737	4.55965972088237	1.5	4.6
2.71428481105737	4.55965972088237	2.59999999999999	5
2.80999450442692	5.14315751773221	3.3	3.4
2.96280403374304	6.07476593564754	3.59999999999999	5.4
2.96280403374304	6.07476593564754	4.7	6.8
3.09048664782567	6.85318956957011	3.59999999999999	7.3
3.09048664782567	6.85318956957011	5.40000000000001	7.2
3.17756503090175	7.38406847254499	0.599999999999994	7.5
3.17756503090175	7.38406847254499	1.5	7.5
3.29322530868423	8.08919556730752	2.7	7.3
3.29322530868423	8.08919556730752	3.7	8.4
3.42459913923221	8.8901210315575	0.599999999999994	8.4
3.42459913923221	8.8901210315575	1.3	9.5
3.42459913923221	8.8901210315575	6.3	8.6
3.42459913923221	8.8901210315575	3.59999999999999	10.8
3.43931790101948	9.27197584659476	4.7	8.7
3.45558585668205	9.69402568268579	2.5	9.4
3.45558585668205	9.69402568268579	5.3	9.5
3.47298751105556	10.1454867138659	5.59999999999999	10.5
3.48874955986903	10.5544119375276	4.3	11.2
3.50340294662004	10.9345736972792	0.700000000000003	11.4
3.50340294662004	10.9345736972792	1.5	11.1
3.51088184207174	11.1286090693338	6.40000000000001	11.2
3.42156478151851	12.1417730268972	6.3	12.4
3.35524728796399	12.8684727862403	2.40000000000001	11.2
3.35524728796399	12.8684727862403	5.5	14.6
3.33603991908819	13.0789553952279	4.40000000000001	13.1
3.33603991908819	13.0789553952279	5.40000000000001	13.2
3.31687162452962	13.2890102935363	2.7	13.4
3.31687162452962	13.2890102935363	3.5	12.6
3.29689015127192	13.5079757852034	0.599999999999994	12.7
3.29689015127192	13.5079757852034	1.7	12.5
3.19581965603807	14.6154950874164	1.59999999999999	14.7
3.09872740982003	15.679426733941	0.299999999999997	16.4
3.09872740982003	15.679426733941	0.700000000000003	15.2
3.28405193376054	15.9532333876282	2.5	16.5
3.28405193376054	15.9532333876282	2.40000000000001	15.3
3.52606691517477	16.3107996557463	6.3	15.5
3.52289549426141	16.4316948858266	3.5	15.1
3.52289549426141	16.4316948858266	4.5	15.4
3.51931668429641	16.5681292609214	6.40000000000001	16.8
3.42727089003745	17.2487903478999	5.3	17.4
3.42727089003745	17.2487903478999	4.40000000000001	16.9
3.31831044802109	18.054532165511	5.40000000000001	19.4
3.31831044802109	18.054532165511	4.40000000000001	18.9
3.31831044802109	18.054532165511	3.7	18.6
3.31831044802109	18.054532165511	3.5	17.5
3.25730792706173	18.5056321446097	2.5	19.5
3.25730792706173	18.5056321446097	1.59999999999999	18.8
3.25730792706173	18.5056321446097	1.59999999999999	17.2
3.18999817260253	19.0033739090638	0.299999999999997	19
3.36422782289786	20.3149447698019	0.5	20.7

Solution x	Solution y	Original x	Original y
3.43676952970938	20.8481020218568	4.3	20.6
3.51168617258891	21.3987126921966	6.40000000000001	21.3
3.50055723710302	21.5648096119789	5.5	22.5
3.50055723710302	21.5648096119789	5.3	21.1
3.48971894803459	21.7265641115312	4.3	22.7
3.47930181918559	21.8820308730674	3.3	21.4
3.46860969858864	22.0416026303522	1.5	21.3
3.46860969858864	22.0416026303522	2.40000000000001	20.9
3.45654226052392	22.2217065744411	1.3	22.7
3.44509663928152	22.3925295750579	0.599999999999994	22.9
3.64130733201023	22.8320024052435	2.59999999999999	23.5
3.64130733201023	22.8320024052435	3.40000000000001	22.5
3.83255436634983	23.2603563488708	6.7	22.9
3.66235775154171	24.2523811050109	5.8	25.2
3.66235775154171	24.2523811050109	6.5	24.8
3.55037796746305	24.7743502631313	4.7	24.8
3.43246307439094	25.3239831314663	2.59999999999999	25.5
3.43246307439094	25.3239831314663	3.3	24.6
3.30599985773212	25.9134581343669	0.5	26.6
3.30599985773212	25.9134581343669	0.599999999999994	24.9
3.30599985773212	25.9134581343669	1.5	24.6
3.21728944707891	26.3271022234299	2.40000000000001	26.7
3.21728944707891	26.3271022234299	3.7	26.6
3.13604058761902	26.7059519816593	1.59999999999999	27.4
3.06470151747369	27.0385885099925	0.700000000000003	28.7
3.19476312272631	27.0562040865239	1.7	29.4
3.19476312272631	27.0562040865239	2.3	28.7
3.91268357914518	27.153444722275	3.3	28.4
4.73012246306193	27.2641660303559	5.3	29.5
4.73012246306193	27.2641660303559	4.3	28.8
5.37927134610236	27.3520932289056	5.40000000000001	26.6
6.01500608648502	27.4382038608793	7.3	28.6
6.01500608648502	27.4382038608793	4.5	26.7
6.76018901882674	27.5391380470338	7.3	24.7
7.42855714175208	27.7035194820497	6.7	28.8
8.16501960431297	27.8846480279252	6.7	26.7
8.16501960431297	27.8846480279252	7.40000000000001	26.5
10.2316187553798	28.3929167447835	11.4	29.4
10.2316187553798	28.3929167447835	10.4	29.1
10.2316187553798	28.3929167447835	8.7	29.3

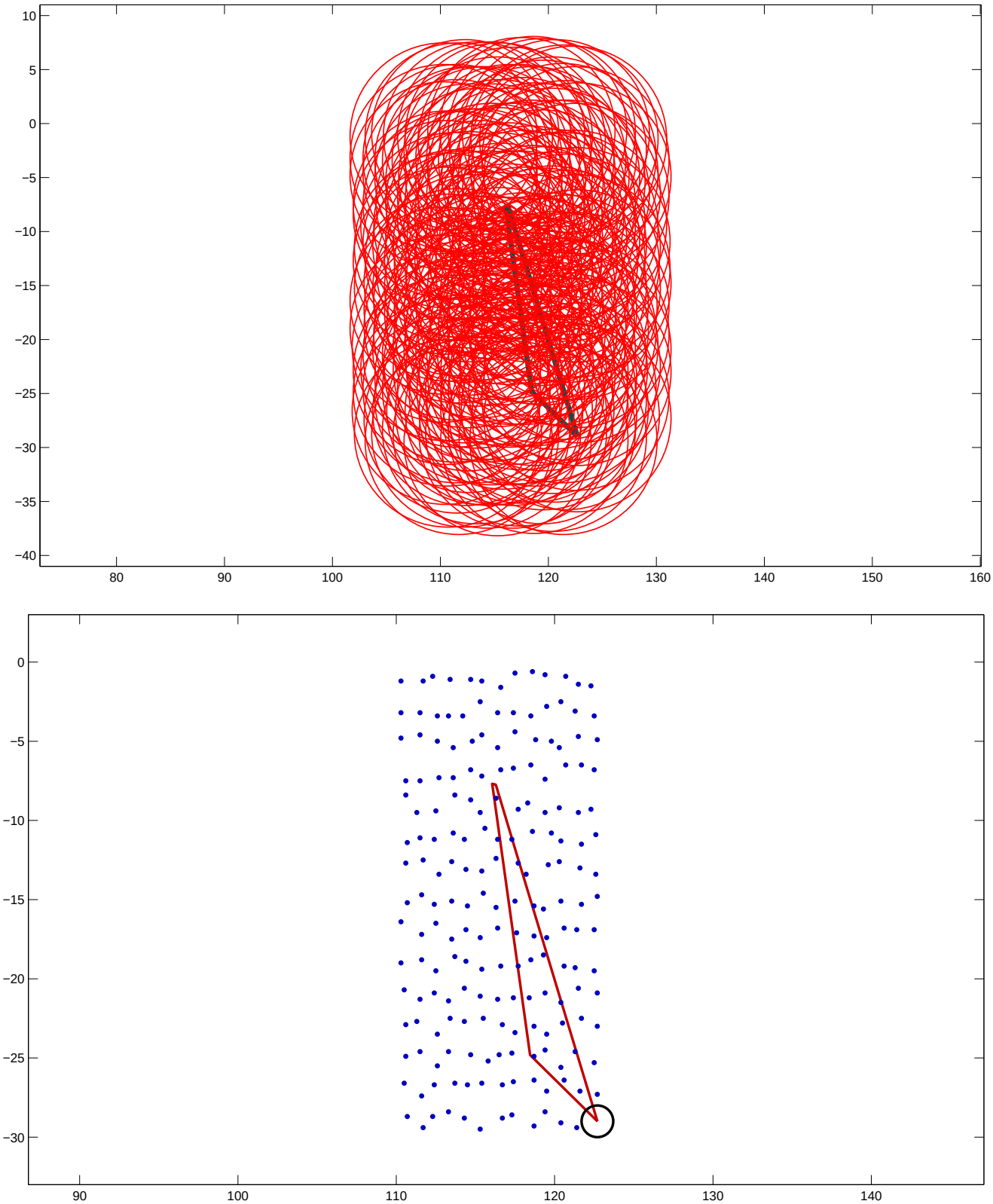


Figure N.13: $rat195$, $r = 8.67$, Equal Radius, 2D, Euclidean, Length = 45.7016510

Table N-16: Solution for $rat195$, $r = 8.67$, Equal Radius, 2D, Euclidean

Total distance: 45.7016510452518 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
10.7427692394524	22.5178229126617	11.4	29.4
10.7427692394524	22.5178229126617	12.7	27.3
10.7427692394524	22.5178229126617	11.6	27.1
10.7427692394524	22.5178229126617	10.6	26.4
10.7427692394524	22.5178229126617	10.4	25.6
10.7427692394524	22.5178229126617	11.3	24.6
10.7427692394524	22.5178229126617	9.40000000000001	24.5
10.7427692394524	22.5178229126617	12.7	23
10.7427692394524	22.5178229126617	9.5	23.5
10.7427692394524	22.5178229126617	11.7	22.5
10.7427692394524	22.5178229126617	10.5	22.8
10.7427692394524	22.5178229126617	8.7	23
10.7427692394524	22.5178229126617	10.4	21.5
10.7427692394524	22.5178229126617	12.7	20.9
10.7427692394524	22.5178229126617	11.5	20.6
10.7427692394524	22.5178229126617	9.40000000000001	20.9
10.7427692394524	22.5178229126617	12.5	19.5
10.7427692394524	22.5178229126617	11.3	19.3
10.7427692394524	22.5178229126617	10.6	19.2
9.1262699897343	17.163568894851	4.3	22.7
9.1262699897343	17.163568894851	7.7	19.2
9.1262699897343	17.163568894851	8.5	18.8
9.1262699897343	17.163568894851	9.3	18.5
9.1262699897343	17.163568894851	9.5	17.4
9.1262699897343	17.163568894851	11.4	16.9
9.1262699897343	17.163568894851	8.7	17.3
9.1262699897343	17.163568894851	10.6	16.8
9.1262699897343	17.163568894851	7.59999999999999	17.1
9.1262699897343	17.163568894851	11.7	15.3
9.1262699897343	17.163568894851	9.3	15.6
9.1262699897343	17.163568894851	10.4	15.1
9.1262699897343	17.163568894851	8.7	15.4
8.25576378431883	14.2805355142859	8.40000000000001	21.2
8.25576378431883	14.2805355142859	12.5	16.9
8.25576378431883	14.2805355142859	12.7	14.8
8.25576378431883	14.2805355142859	12.6	13.4
8.25576378431883	14.2805355142859	11.6	13
8.25576378431883	14.2805355142859	9.59999999999999	12.8
8.25576378431883	14.2805355142859	10.3	12.6
8.25576378431883	14.2805355142859	11.7	11.5
8.25576378431883	14.2805355142859	10.4	11.3
8.25576378431883	14.2805355142859	12.6	10.9
7.04350717755281	10.2657366160294	6.40000000000001	16.8
7.04350717755281	10.2657366160294	7.5	15.1
7.04350717755281	10.2657366160294	6.3	15.5
7.04350717755281	10.2657366160294	5.5	14.6
7.04350717755281	10.2657366160294	8.2	13.4
7.04350717755281	10.2657366160294	5.40000000000001	13.2
7.04350717755281	10.2657366160294	6.3	12.4
7.04350717755281	10.2657366160294	4.40000000000001	13.1
7.04350717755281	10.2657366160294	7.3	11.2
7.04350717755281	10.2657366160294	8.59999999999999	10.7
7.04350717755281	10.2657366160294	6.40000000000001	11.2
7.04350717755281	10.2657366160294	4.3	11.2
7.04350717755281	10.2657366160294	5.59999999999999	10.5
7.04350717755281	10.2657366160294	7.7	9.3
7.04350717755281	10.2657366160294	8.3	8.9
7.04350717755281	10.2657366160294	5.3	9.5
7.04350717755281	10.2657366160294	6.3	8.6
7.04350717755281	10.2657366160294	4.7	8.7
7.04350717755281	10.2657366160294	7.40000000000001	6.7
7.04350717755281	10.2657366160294	5.40000000000001	7.2
7.04350717755281	10.2657366160294	6.59999999999999	6.8
7.04350717755281	10.2657366160294	4.7	6.8
7.04350717755281	10.2657366160294	6.40000000000001	5.4
6.51933874741847	8.52968221285206	7.7	12.7
6.51933874741847	8.52968221285206	9.8	10.8
6.51933874741847	8.52968221285206	11.5	9.5
6.51933874741847	8.52968221285206	12.3	9.3
6.51933874741847	8.52968221285206	9.40000000000001	9.5
6.51933874741847	8.52968221285206	10.3	9.2
6.51933874741847	8.52968221285206	12.5	6.8
6.51933874741847	8.52968221285206	11.7	6.5
6.51933874741847	8.52968221285206	10.7	6.5
6.51933874741847	8.52968221285206	8.5	6.5
6.51933874741847	8.52968221285206	10.3	5.4
6.51933874741847	8.52968221285206	9.8	5
6.51933874741847	8.52968221285206	11.5	4.7
6.51933874741847	8.52968221285206	12.5	3.4
6.31616338286166	7.85670752363913	12.7	4.9
6.31616338286166	7.85670752363913	8.8	4.9
6.31616338286166	7.85670752363913	7.5	4.4
6.31616338286166	7.85670752363913	11.3	3.1
6.31616338286166	7.85670752363913	8.5	3.4
6.31616338286166	7.85670752363913	7.40000000000001	3.2
6.31616338286166	7.85670752363913	9.5	2.8
6.31616338286166	7.85670752363913	6.40000000000001	3.2
6.31616338286166	7.85670752363913	10.4	2.5
6.31616338286166	7.85670752363913	4.2	3.4
6.31616338286166	7.85670752363913	5.3	2.5
6.31616338286166	7.85670752363913	6.59999999999999	1.6
6.31616338286166	7.85670752363913	8.59999999999999	0.6
6.31616338286166	7.85670752363913	5.40000000000001	1.2
6.31616338286166	7.85670752363913	7.5	0.7
6.31616338286166	7.85670752363913	4.7	1.1
6.31616338286166	7.85670752363913	3.40000000000001	1.1
6.31616338286166	7.85670752363913	2.3	0.9
6.28100135678648	7.74023883767625	12.3	1.5
6.28100135678648	7.74023883767625	11.5	1.4
6.28100135678648	7.74023883767625	1.5	3.2
6.28100135678648	7.74023883767625	10.7	0.9
6.28100135678648	7.74023883767625	9.40000000000001	0.8
6.28100135678648	7.74023883767625	1.7	1.2
6.05799538706334	7.68185225013727	0.299999999999997	3.2
6.05799538706334	7.68185225013727	0.299999999999997	1.2
6.12410877187696	8.15544783616681	9.40000000000001	7.4
6.12410877187696	8.15544783616681	3.7	8.4
6.12410877187696	8.15544783616681	3.59999999999999	7.3
6.12410877187696	8.15544783616681	2.7	7.3
6.12410877187696	8.15544783616681	4.8	5
6.12410877187696	8.15544783616681	3.59999999999999	5.4
6.12410877187696	8.15544783616681	5.40000000000001	4.6
6.12410877187696	8.15544783616681	2.59999999999999	5
6.12410877187696	8.15544783616681	1.5	4.6
6.12410877187696	8.15544783616681	0.299999999999997	4.8
6.12410877187696	8.15544783616681	3.3	3.4
6.12410877187696	8.15544783616681	2.59999999999999	3.4
6.44023335917728	10.4206139722101	4.5	15.4
6.44023335917728	10.4206139722101	3.5	15.1
6.44023335917728	10.4206139722101	2.7	13.4
6.44023335917728	10.4206139722101	3.5	12.6
6.44023335917728	10.4206139722101	1.7	12.5
6.44023335917728	10.4206139722101	0.599999999999994	12.7
6.44023335917728	10.4206139722101	3.59999999999999	10.8
6.44023335917728	10.4206139722101	2.40000000000001	11.2
6.44023335917728	10.4206139722101	1.5	11.1
6.44023335917728	10.4206139722101	0.700000000000003	11.4
6.44023335917728	10.4206139722101	2.5	9.4
6.44023335917728	10.4206139722101	1.3	9.5
6.44023335917728	10.4206139722101	0.599999999999994	8.4
6.44023335917728	10.4206139722101	1.5	7.5
6.44023335917728	10.4206139722101	0.599999999999994	7.5
7.42148091096043	17.4556759628824	7.5	23.4
7.42148091096043	17.4556759628824	6.7	22.9
7.42148091096043	17.4556759628824	7.40000000000001	21.2
7.42148091096043	17.4556759628824	5.5	22.5
7.42148091096043	17.4556759628824	6.40000000000001	21.3
7.42148091096043	17.4556759628824	5.3	21.1
7.42148091096043	17.4556759628824	6.59999999999999	19.2
7.42148091096043	17.4556759628824	4.3	20.6
7.42148091096043	17.4556759628824	5.40000000000001	19.4
7.42148091096043	17.4556759628824	3.3	21.4
7.42148091096043	17.4556759628824	4.40000000000001	18.9
7.42148091096043	17.4556759628824	2.40000000000001	20.9
7.42148091096043	17.4556759628824	3.7	18.6
7.42148091096043	17.4556759628824	5.3	17.4
7.42148091096043	17.4556759628824	2.5	19.5
7.42148091096043	17.4556759628824	4.40000000000001	16.9
7.42148091096043	17.4556759628824	3.5	17.5
7.42148091096043	17.4556759628824	1.59999999999999	18.8
7.42148091096043	17.4556759628824	2.5	16.5
7.42148091096043	17.4556759628824	1.59999999999999	17.2
7.42148091096043	17.4556759628824	2.40000000000001	15.3
7.42148091096043	17.4556759628824	0.299999999999997	16.4

Solution x	Solution y	Original x	Original y
7.42148091096043	17.4556759628824	1.59999999999999	14.7
7.42148091096043	17.4556759628824	0.700000000000003	15.2
8.04801085854183	21.9476872074285	1.59999999999999	27.4
8.04801085854183	21.9476872074285	3.40000000000001	22.5
8.04801085854183	21.9476872074285	1.3	22.7
8.04801085854183	21.9476872074285	0.599999999999994	22.9
8.04801085854183	21.9476872074285	1.5	21.3
8.04801085854183	21.9476872074285	0.5	20.7
8.04801085854183	21.9476872074285	0.299999999999997	19
8.44711405719833	24.8075535656148	0.700000000000003	28.7
8.44711405719833	24.8075535656148	0.5	26.6
8.56993024991931	24.9286596231795	10.4	29.1
8.56993024991931	24.9286596231795	9.40000000000001	28.4
8.56993024991931	24.9286596231795	9.5	27.1
8.56993024991931	24.9286596231795	8.7	29.3
8.56993024991931	24.9286596231795	8.7	26.4
8.56993024991931	24.9286596231795	7.3	28.6
8.56993024991931	24.9286596231795	7.40000000000001	26.5
8.56993024991931	24.9286596231795	6.7	28.8
8.56993024991931	24.9286596231795	6.7	26.7
8.56993024991931	24.9286596231795	7.3	24.7
8.56993024991931	24.9286596231795	6.5	24.8
8.56993024991931	24.9286596231795	5.40000000000001	26.6
8.56993024991931	24.9286596231795	5.8	25.2
8.56993024991931	24.9286596231795	4.5	26.7
8.56993024991931	24.9286596231795	4.7	24.8
8.56993024991931	24.9286596231795	3.7	26.6
8.56993024991931	24.9286596231795	3.3	24.6
8.56993024991931	24.9286596231795	2.40000000000001	26.7
8.56993024991931	24.9286596231795	2.59999999999999	25.5
8.56993024991931	24.9286596231795	2.59999999999999	23.5
8.56993024991931	24.9286596231795	1.5	24.6
8.56993024991931	24.9286596231795	0.599999999999994	24.9
9.18775271493398	25.5375725227136	12.5	25.3
9.18775271493398	25.5375725227136	8.7	24.9
9.18775271493398	25.5375725227136	5.3	29.5
9.18775271493398	25.5375725227136	4.3	28.8
9.18775271493398	25.5375725227136	3.3	28.4
9.18775271493398	25.5375725227136	2.3	28.7
9.18775271493398	25.5375725227136	1.7	29.4

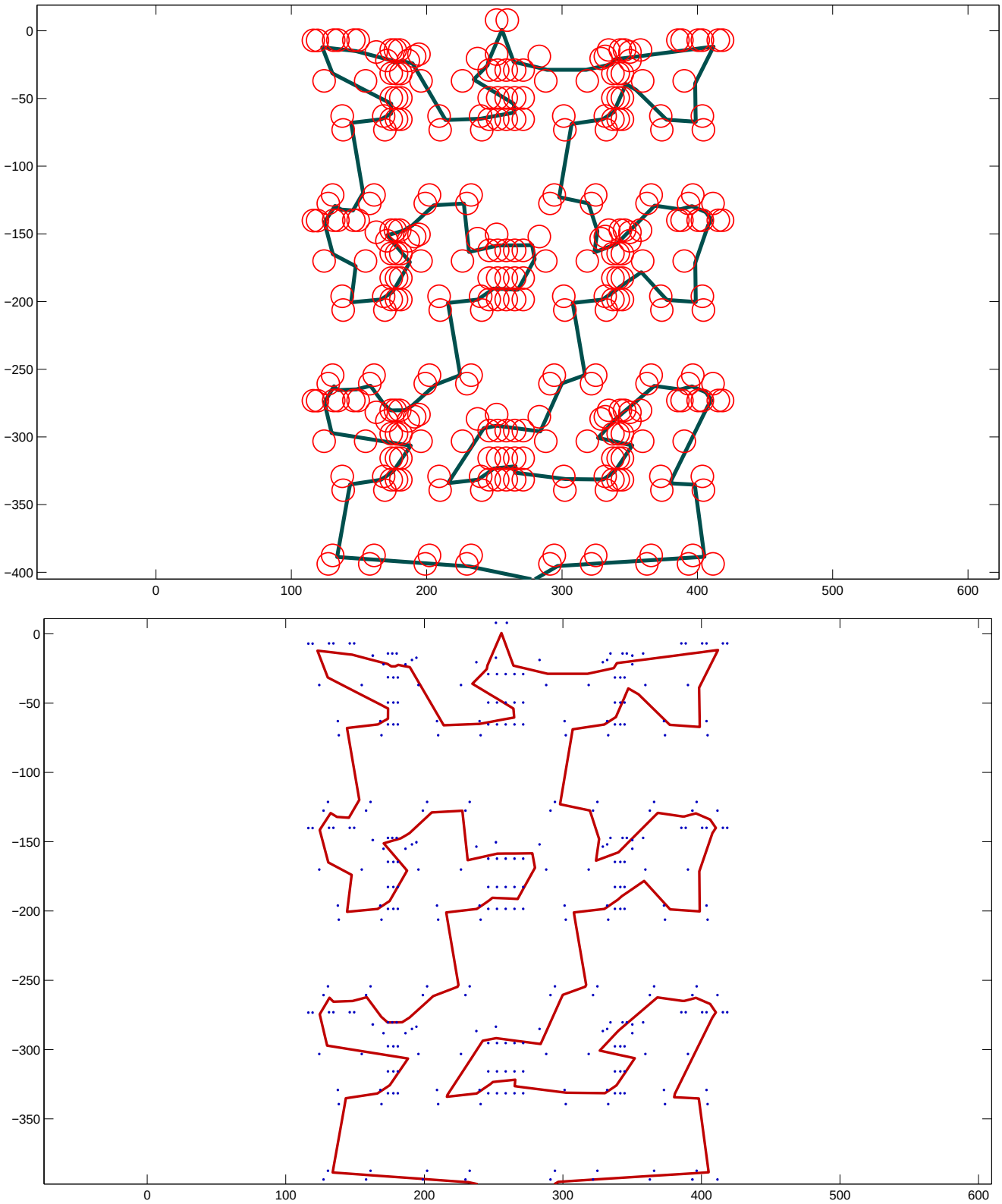


Figure N.14: $lin318$, $r = 8.268$, Equal Radius, 2D, Euclidean, Length = 2863.3659800

Table N-17: Solution for $lin318$, $r = 8.268$, Equal Radius, 2D, Euclidean

Total distance: 2863.36598004197 Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
121.669831159203	395.690403622991	122.8	387.5
116.400863436283	395.315032564983	119.7	393.8
92.8670204190855	393.638410112951	92.1	387.5
86.168633771033	393.161198149723	89	393.8
53.3455732290962	390.822821262862	51.2	387.5
46.2326141446697	390.316071836147	48	393.8
23.8230014364842	388.719585021218	17.3	393.8
24.4695007571064	385.089681535587	20.5	387.5
32.1700700298119	341.853161960328	28.3	339.4
33.3687328620249	335.122993815063	27.6	329.2
56.1215015564995	331.687113046655	59.1	339.4
58.6527636723491	330.002587395053	58.3	329.2
61.1005203693078	328.373633141264	63.8	331.6
63.3606048463166	326.869574628117	67.7	331.6
65.0862711651495	325.72117015678	70.9	331.6
68.7413764055968	320.359225934112	63.8	315.8
70.872038321652	317.233604412292	67.7	315.8
73.2332556981738	313.769764191528	70.9	315.8
78.2073703800522	306.472932330193	85.8	303.2
70.1930343457151	305.19181674201	70.9	297.7
66.2788613298354	304.566191433253	67.7	297.7
61.5313390170829	303.80735657525	63.8	297.6
44.68716416917	301.115051986858	44.9	303.2
19.8260425980357	297.141308681536	14.2	303.2
14.4742828332822	274.541438741699	6.3	273.3
15.4759807727514	272.847264334493	9.40000000000001	273.3
19.9845736625202	265.221613977898	17.3	260.7
21.5326769531507	262.603271818136	20.5	254.4
24.3328049361764	265.408305348416	21.3	273.1
25.4327751123265	265.36957889253	24.4	273.1
35.7864322282511	265.005637803795	36.2	273.1
38.1892489950874	264.921121024055	39.4	273.1
45.1769905663305	263.071126763837	48	260.7
48.461784121513	262.201427411024	51.2	254.4
58.9189345917406	276.33955279428	52.8	281.9
63.4966491621951	280.456001993129	60.6	288.2
65.6129625479491	280.421009353211	63.8	280.4
68.1021256090326	280.379851354905	66.9	280.4
70.9188666868743	280.333276769601	70.1	280.4
74.0197898802807	280.282003280259	76.4	288.2
76.8125412438675	278.501926735357	81.1	285.1
79.2895384553959	276.923129510678	84.3	283.5
91.7154642751442	265.700006384116	89	260.7
96.4240086898814	261.447196350421	92.1	254.4
114.003750857852	254.707269522604	119.7	260.7
114.596621960854	253.368181656651	122.8	254.4
106.683085038142	206.288204983544	100	206.3
105.806235753596	201.071691660643	99.2	196.1
127.812093647444	198.552741872893	130.7	206.3
130.779122404594	196.524416756115	129.9	196.1
133.928246304855	194.371605536528	136.2	198.5
137.344652743727	192.036075233625	142.5	198.5
139.043332500649	190.463731734185	136.2	182.7
142.370573866262	190.612643624427	142.5	182.7
148.316454603068	190.878811486252	148.8	182.7
150.230985987041	190.964586823322	148.8	198.5
154.73811208371	191.166626760656	155.1	198.5
157.36352425282	191.284258256223	161.4	198.5
160.377624955445	185.844003958334	155.1	182.7
163.139325335291	180.859315291758	161.4	182.7
169.840677667615	168.763772101195	178	170.1
167.936706772481	158.376348046224	173.2	152
161.451528087205	158.437229576752	161.4	162.2
155.069249558602	158.497143588831	155.1	162.2
148.788219444628	158.556106793334	148.8	162.2
142.645454031779	158.613772317931	141.7	150.4
139.24811170762	159.372832416969	142.5	162.2
133.435875689779	160.671447583638	136.2	162.2
121.315880523719	163.379335151584	116.5	170.1
120.301725382882	153.975901466116	127.6	153.6
117.876925552836	131.495087186603	119.7	127.6
117.457961365594	127.610520714493	122.8	121.3
95.3476829790995	128.903458467212	92.1	121.3
91.4074432433107	132.566369206504	89	127.6
79.3363498805437	143.787732614963	84.3	150.4
76.8990858728531	145.24514443071	81.1	152
73.0867484991695	147.524890357689	76.4	155.1
70.1563030084237	148.385617433365	70.1	147.3
67.1526650939836	149.267843760723	66.9	147.3
64.0476810082984	150.179839350589	63.8	147.3
60.725325674444	151.155685702418	52.8	148.8
63.671113869455	154.601866048128	60.6	155.1
67.890943729685	159.538558791517	63.8	164.5
70.5211941268199	162.615580320093	67.7	164.6
73.275418907706	165.837631067467	70.9	164.6
77.566801150253	170.857946373804	85.8	170.1
72.3863320504456	179.829090985778	70.9	182.7
70.2686947188012	183.496270990104	67.7	182.7
68.3282693727793	186.856566289412	63.8	182.7
64.8732099886439	192.839804976782	70.9	198.5
63.2536286469207	193.915759106655	67.7	198.5
61.0808306951844	195.359246542356	63.8	198.5
58.7238295544858	196.925111662177	58.3	196.1
56.3481754312819	198.503368085818	59.1	206.3
34.2391913683183	200.547952669823	28.3	206.3
34.7894935192135	196.140567541851	27.6	196.1
37.5644887375936	173.914488609211	44.9	170.1
20.6752495423771	164.958875801077	14.2	170.1
14.464549528107	141.503896768576	6.3	140.2
15.4111253783208	140.045124136919	9.40000000000001	140.2
17.7104360240953	136.501612202152	21.3	140
20.6668923948536	131.945348426961	17.3	127.6
22.3447440667389	129.359588055104	20.5	121.3
26.8906408914009	132.11605019556	24.4	140
34.4466212460044	132.621618802889	36.2	140
35.5291558357684	132.69407231164	39.4	140
40.9292308195473	123.46828447001	48	127.6
43.0660363232211	119.817219362719	51.2	121.3
35.1037025324835	73.1430444945452	28.3	73.2
34.2186587767317	67.9551370073756	27.6	63
56.5218446211562	65.3442356853348	59.1	73.2
58.6592376976501	64.1269769804947	58.3	63
60.7876950541467	62.9148063354101	63.8	65.4
62.6129782639316	61.8752967491616	67.7	65.4
63.7678603383629	61.2175872661862	70.9	65.4
63.8240044840452	53.876717219252	70.9	49.6
62.3913311226339	53.1383755095617	67.7	49.6
59.1035522345797	51.4439834780084	63.8	49.6
41.8627639509061	42.5586682702797	44.9	37
20.3464064312759	31.4699325510716	14.2	37
12.8449706369957	12.1520704903576	6.3	7.1
13.8497807532305	12.2674579072461	9.40000000000001	7.1
20.0358540342987	12.9778041890392	21.3	6.9
24.7352330801149	13.5174407868699	24.4	6.9
34.8194032667743	14.6754116333531	36.2	6.9
37.8763699535846	15.0264073058314	39.4	6.9
50.6003313460496	18.3615751013252	52.8	15.7
57.7033287578882	20.2233818379549	60.6	22
61.205279454225	21.1412959327441	63.8	14.2
63.5331666512076	21.7514532761748	66.9	14.2
66.1450597252746	23.4715307693017	63.8	31.4
67.5723064523905	23.4610930590338	67.7	31.5
69.011279074907	23.4506118558526	70.9	31.5
71.1700448662065	22.3984790285332	70.1	14.2
74.7307530288474	23.0984947963588	76.4	22
77.6883641831173	23.6799466831193	81.1	18.9
79.5079270863107	24.037661895149	84.3	17.3
87.1782871732092	37.174982719863	85.8	37
100.376202035022	59.7794656945217	99.2	63
103.980964031331	65.9534894400625	100	73.2
125.899284765663	65.1285489464475	129.9	63
129.791690855866	64.9820434321967	130.7	73.2
135.817611654666	63.8697410404673	136.2	65.4
141.798725535067	62.7657090779549	142.5	65.4
147.507117828981	61.7120182244071	148.8	65.4
152.267046280718	60.8334041076057	155.1	65.4
154.848044381838	60.3569958707884	161.4	65.4
154.356768448897	53.9304658339745	161.4	49.6
151.583894538914	52.2510531136022	155.1	49.6
147.65992336809	49.8744732881376	148.8	49.6
143.145934064721	47.1405430936526	142.5	49.6
137.884567206212	43.9539526517261	136.2	49.6
124.703689960472	35.9706867647713	116.5	37
131.919903492347	28.6260755590433	136.2	29.1

Solution x	Solution y	Original x	Original y
135.123379837289	25.3656395586662	142.5	29.1
135.536944489766	22.8162205441049	127.6	20.5
139.00345044056	14.7772138905703	141.7	17.3
145.649994044308	-0.63656012857636	141.7	-7.9
145.650004747977	-0.636560373375406	149.6	-7.9
154.288459350534	22.9164090876764	148.8	29.1
157.674615818016	23.7184593643679	155.1	29.1
163.294949026644	25.0496272363232	161.4	29.1
171.281708444092	26.9412284829436	173.2	18.9
178.970921200264	28.7892019598406	178	37
207.833155485608	28.7775631493686	208.7	37
218.925719561682	26.4170783314173	218.9	20.5
224.495495466652	25.2318367926482	227.6	31.5
226.710535018581	24.7604875857758	231.5	31.5
227.809854546103	22.9467625274459	222	18.9
228.912057253759	21.1283084840399	224.4	14.2
233.306133741595	20.5604014192314	233.1	14.2
236.70025758051	20.1217413028652	240.2	22
238.998909001131	19.824669969161	236.2	14.2
242.943611850127	19.3148486835317	240.2	15.7
250.386030264967	18.352943391266	248	14.2
276.465118740024	14.9820593287452	275.6	6.9
280.228565407403	14.4956552483236	278.7	6.9
290.124411480257	13.2168004782185	290.6	6.9
295.009633476571	12.5854324523416	293.7	6.9
300.895701690523	11.8247872189513	305.5	6.9
301.958970243366	11.6873469572352	308.7	6.9
288.361205682677	38.8376699689374	280.3	37
288.720763921174	61.2469173787651	293.7	63
288.816239195959	67.1954236541344	294.5	73.2
267.189659050381	65.6587630548414	263.8	73.2
261.841767206567	60.4322947709343	263	63
244.612184138031	43.5940654994597	249.6	37
237.21202894897	39.3445790846923	234.6	31.5
234.273604470731	46.1669111994224	234.6	49.6
232.692597711518	49.8377189380908	231.5	49.6
231.150599933225	53.417956180584	227.6	49.6
228.292008186886	60.0549778897763	234.6	65.4
226.805339525302	61.0111878606357	231.5	65.4
224.686266756027	62.3741585358999	227.6	65.4
222.316290900782	63.8985102686167	222	63
219.882753022519	65.4637446059305	222.8	73.2
197.092682924359	68.8995667871095	191.3	63
195.933785719446	75.7365314211726	192.1	73.2
188.609065033768	118.948758413254	184.3	121.3
187.931957307679	122.94334831656	181.1	127.6
209.47803871069	127.453700434274	215	121.3
210.782777384529	131.465347426434	211.8	127.6
216.162106542931	148.005091684884	224.4	147.3
215.656914432639	151.497123847262	222	152
215.060593280871	155.619113187069	218.9	153.6
213.896149799662	163.668818080109	208.7	170.1
224.042083434503	159.903936774742	227.6	164.6
227.979075559102	158.443041306381	231.5	164.6
230.128432017362	157.645496668726	234.6	164.6
234.756349461457	152.997889468405	240.2	155.1
236.851707117929	150.893604678366	233.1	147.3
238.997164100958	148.739005269871	236.2	147.3
241.450140609779	146.275576536299	240.2	148.8
245.38194195257	142.327033036923	248	147.3
255.135452671003	132.532105501755	252.8	127.6
258.50692192247	129.14627727857	255.9	121.3
276.294581034232	131.76123059772	275.6	140
277.703161798179	131.792300798852	278.7	140
282.466203441136	130.505988713543	283.5	127.6
286.015768671281	129.547350571771	286.6	121.3
296.333487100532	133.973691713362	301.6	127.6
300.432037295045	140.030443757175	308.7	140
299.833220159779	140.929593527416	305.5	140
298.895971866244	142.336998378338	293.7	140
298.010590019154	143.666498484649	290.6	140
288.462973031005	171.413746514682	280.3	170.1
288.745942457671	194.527780334252	293.7	196.1
288.816578884342	200.295097451652	294.5	206.3
267.389976426454	198.852035171453	263.8	206.3
262.273127936732	193.245261312529	263	196.1
248.645229364139	178.312706018229	249.6	170.1
239.064965536027	184.860965446223	234.6	182.7
235.490767694004	187.303998684441	231.5	182.7
232.659485090133	189.239230353258	227.6	182.7

Solution x	Solution y	Original x	Original y
229.538119012308	191.962627398462	234.6	198.5
227.423866279204	193.409964891591	231.5	198.5
224.989228275859	195.076632060322	227.6	198.5
222.459007374095	196.808734236956	222	196.1
219.910573171869	198.55330607839	222.8	206.3
197.910654853179	201.065817113861	191.3	196.1
198.781234330407	206.181283416438	192.1	206.3
206.803047307918	253.318302624363	215	254.4
206.20992640502	254.608105077972	211.8	260.7
189.917713800059	260.466417057335	184.3	254.4
188.272549387786	264.130374090813	181.1	260.7
178.298967556907	286.341643680399	173.2	285.1
173.97104357526	295.980052078066	178	303.2
162.966682432895	294.532909420299	161.4	295.3
155.643168540805	293.569786300185	155.1	295.3
148.896861005713	292.682567065053	148.8	295.3
141.920387510202	291.765076098091	141.7	283.5
139.393252610738	292.235648514469	142.5	295.3
135.773073393455	292.90975869075	136.2	295.3
132.18991475538	293.576976241927	127.6	286.7
123.097834270519	307.519571458118	116.5	303.2
106.721600496204	332.63301549368	99.2	329.2
106.313257503292	334.061188602923	100	339.4
127.816573599687	331.651066578459	130.7	339.4
130.831035186082	329.585041730062	129.9	329.2
134.039997151731	327.385713442789	136.2	331.6
137.511519909871	325.006439520419	142.5	331.6
139.419742485872	323.415339574282	136.2	315.8
143.554085498542	322.980018920956	142.5	315.8
149.123536506268	322.39355524674	148.8	315.8
153.531846019909	321.92935464541	155.1	315.8
155.617657308201	321.709710226023	161.4	315.8
155.227022661867	326.398697702869	148.8	331.6
158.060604037361	326.758389794068	155.1	331.6
163.953162149245	327.50637284377	161.4	331.6
187.654918642865	330.514970855789	191.3	329.2
192.671593694818	331.151774615306	192.1	339.4
220.400232324437	331.487903366081	222.8	339.4
222.653434437831	329.942770344754	222	329.2
224.940821144887	328.374194341319	227.6	331.6
227.095833621604	326.896396831401	231.5	331.6
228.734897823804	325.772418000433	234.6	331.6
232.447084321781	320.283944648868	227.6	315.8
234.581547179262	317.128134385027	231.5	315.8
236.927496352602	313.65964122073	234.6	315.8
241.924016461699	306.272370398529	249.6	303.2
234.812546491681	304.721547057829	234.6	297.7
229.825781186659	303.634116081707	231.5	297.7
224.236679185174	302.415662985929	227.6	297.7
216.596929480958	300.750782360951	208.7	303.2
224.520321527243	292.324031790851	218.9	286.7
227.120534730697	289.558664706976	222	285.1
230.107407246967	286.382093739291	224.4	280.4
233.012360684829	283.897303735033	233.1	280.4
235.089582767135	282.120497141386	240.2	288.2
237.318184971387	280.214227734335	236.2	280.4
239.859639470661	278.04035586877	240.2	281.9
243.949978831281	274.541630592855	248	280.4
254.541568369657	265.481907808621	252.8	260.7
258.219406181645	262.336026071452	255.9	254.4
276.268834871618	264.859099133725	275.6	273.1
277.706174154897	264.891930709116	278.7	273.1
282.454619065324	263.609452762047	283.5	260.7
286.016461761022	262.647402921538	286.6	254.4
296.32889947726	267.069902230276	301.6	260.7
300.432154565885	273.154150491927	308.7	273.1
299.817177470417	274.092286769795	305.5	273.1
298.774036521044	275.683619962423	293.7	273.1
297.778538907903	277.202261687218	290.6	273.1
284.046674285028	305.052550721719	280.3	303.2
270.827108612536	331.863925241552	263	329.2
270.332170571108	334.331373508196	263.8	339.4
288.091280465993	335.274738964787	293.7	329.2
288.934943809236	341.589294734951	294.5	339.4
295.209786487624	388.553531221067	301.6	393.8
287.568934554537	389.036498962314	286.6	387.5
281.415777749614	389.425435615452	283.5	393.8
257.925149300887	390.910257485858	255.9	387.5
250.292913790931	391.392694386542	252.8	393.8
216.499359783449	393.528800177787	215	387.5

Solution x	Solution y	Original x	Original y
209.300877816253	393.983810517254	211.8	393.8
186.698143843062	395.412591822252	184.3	387.5
181.682530305323	398.320646375774	181.1	393.8

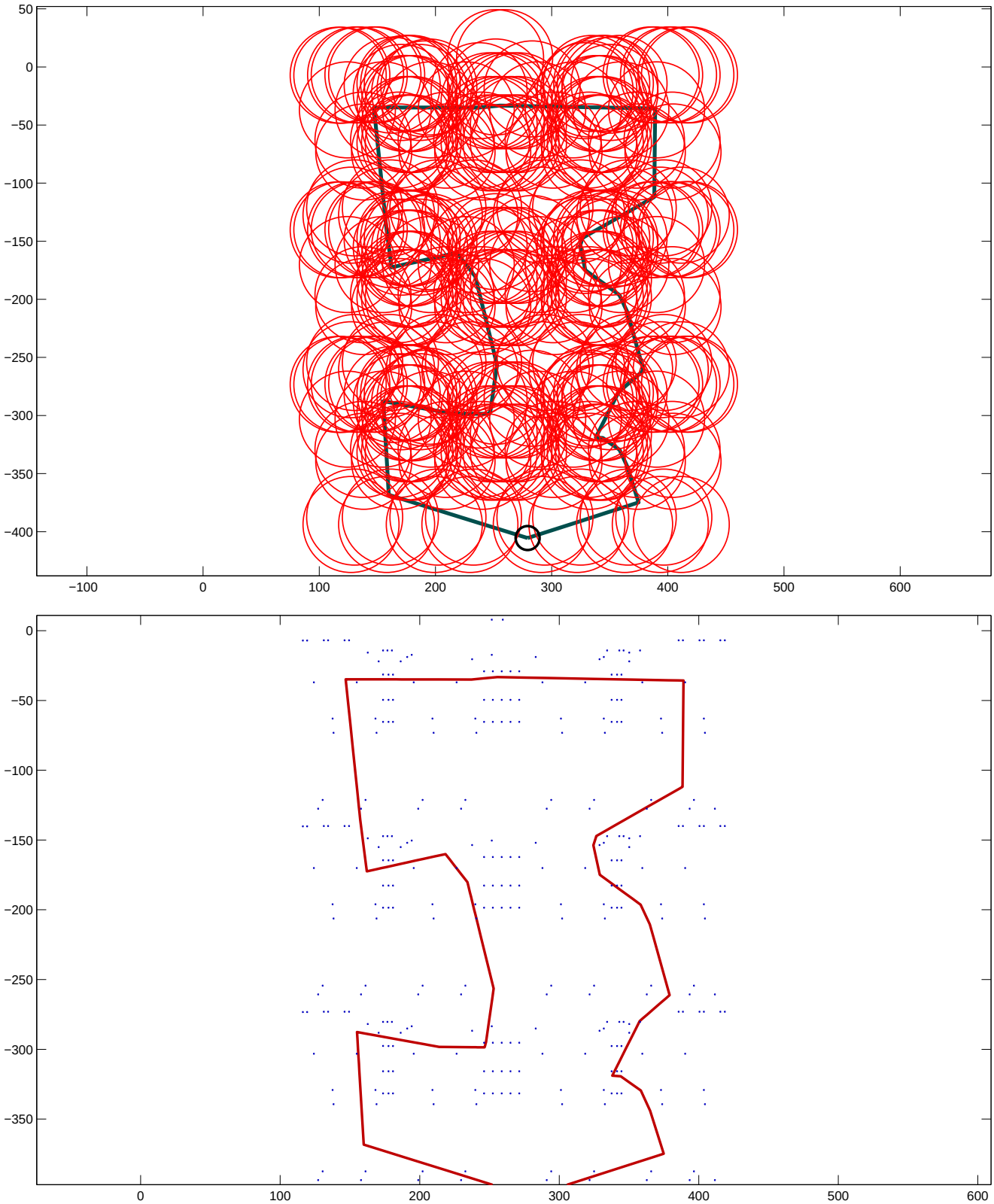


Figure N.15: $lin318$, $r = 41.34$, Equal Radius, 2D, Euclidean, Length = 1408.4820740

Table N-18: Solution for $lin318$, $r = 41.34$, Equal Radius, 2D, Euclidean

Total distance: 1408.48207402009			
Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
210.813732376675	392.176942965081	211.8	393.8
210.813732376675	392.176942965081	215	387.5
238.647748939204	383.244100891042	252.8	393.8
238.647748939204	383.244100891042	255.9	387.5
253.775256237298	378.389198494326	283.5	393.8
260.185035464853	376.33209143968	286.6	387.5
264.870218567196	374.828463580898	301.6	393.8
255.13835698122	344.099514749046	294.5	339.4
255.13835698122	344.099514749046	293.7	329.2
248.457222916178	329.563487488598	280.3	303.2
244.58536983594	326.806932598136	263.8	339.4
244.58536983594	326.806932598136	263	329.2
239.339164985938	323.071909639064	249.6	303.2
234.075206135477	319.324234435977	227.6	315.8
234.075206135477	319.324234435977	234.6	297.7
234.075206135477	319.324234435977	231.5	297.7
234.075206135477	319.324234435977	240.2	288.2
234.075206135477	319.324234435977	248	280.4
234.075206135477	319.324234435977	240.2	281.9
231.049914699331	319.11648600594	222.8	339.4
231.049914699331	319.11648600594	234.6	331.6
231.049914699331	319.11648600594	231.5	331.6
231.049914699331	319.11648600594	227.6	331.6
231.049914699331	319.11648600594	234.6	315.8
231.049914699331	319.11648600594	231.5	315.8
228.003274048095	318.907296951293	222	329.2
228.003274048095	318.907296951293	192.1	339.4
228.003274048095	318.907296951293	191.3	329.2
232.75997198849	309.42505253125	208.7	303.2
237.992479696299	298.994323667271	218.9	286.7
242.867042786947	289.277137268828	224.4	280.4
247.629696463012	279.783040808093	211.8	260.7
247.629696463012	279.783040808093	215	254.4
249.957431448003	277.768121290993	222	285.1
252.758911408686	275.343109965892	227.6	297.7
252.758911408686	275.343109965892	236.2	280.4
252.758911408686	275.343109965892	252.8	260.7
252.758911408686	275.343109965892	233.1	280.4
258.371808792405	270.484331545521	255.9	254.4
263.613168591754	265.947190577246	301.6	260.7
263.613168591754	265.947190577246	283.5	260.7
263.613168591754	265.947190577246	286.6	254.4
265.052166086833	264.701586270564	275.6	273.1
266.473921097279	263.470905932253	278.7	273.1
267.872060034838	262.260666352884	293.7	273.1
267.872060034838	262.260666352884	290.6	273.1
269.114129175608	261.185521473789	308.7	273.1
269.114129175608	261.185521473789	305.5	273.1
257.729162456284	220.463692861204	294.5	206.3
254.926794867005	210.439956680748	293.7	196.1
248.365597518992	196.352424666655	280.3	170.1
242.64198166887	192.174278344015	263.8	206.3
242.64198166887	192.174278344015	263	196.1
242.64198166887	192.174278344015	249.6	170.1
233.339244163972	185.383402092039	231.5	164.6
233.339244163972	185.383402092039	234.6	182.7
233.339244163972	185.383402092039	234.6	198.5
233.339244163972	185.383402092039	231.5	182.7
233.339244163972	185.383402092039	231.5	198.5
233.339244163972	185.383402092039	227.6	182.7
233.339244163972	185.383402092039	227.6	198.5
225.864958861533	179.927327220229	227.6	164.6
219.053878214875	174.95539481747	191.3	196.1
219.053878214875	174.95539481747	178	170.1
219.053877496151	174.955394079429	222.8	206.3
219.053877496151	174.955394079429	208.7	170.1
219.053876774621	174.955393330062	222	196.1
219.053876051173	174.955392584384	192.1	206.3
214.500553233718	153.805579727184	173.2	152
216.271282266224	148.069899267878	181.1	127.6
216.551645075684	147.161694141654	184.3	121.3
223.273394578355	143.326841584641	215	121.3
223.273394578355	143.326841584641	211.8	127.6
229.80668540464	139.599504927952	248	147.3
229.80668540464	139.599504927952	240.2	148.8
229.80668540464	139.599504927952	240.2	155.1
229.80668540464	139.599504927952	236.2	147.3
229.80668540464	139.599504927952	233.1	147.3
229.80668540464	139.599504927952	222	152
229.80668540464	139.599504927952	218.9	153.6
237.575385529211	135.167348915137	234.6	164.6
237.575385529211	135.167348915137	224.4	147.3
257.32317696584	123.900930089138	278.7	140
257.32317696584	123.900930089138	275.6	140
257.32317696584	123.900930089138	255.9	121.3
257.32317696584	123.900930089138	252.8	127.6
270.370797352795	116.457062709624	286.6	121.3
270.370797352795	116.457062709624	293.7	140
270.370797352795	116.457062709624	290.6	140
270.370797352795	116.457062709624	283.5	127.6
276.582285012165	112.91331828768	301.6	127.6
276.582285012165	112.91331828768	305.5	140
278.401304421636	111.87554481024	308.7	140
278.401304421636	111.87554481024	263.8	73.2
278.85533907003	60.2630363126207	280.3	37
278.85533907003	60.2630363126207	293.7	63
278.85533907003	60.2630363126207	294.5	73.2
279.071049417498	35.7291723502045	308.7	6.9
278.170159591548	35.7124324065185	305.5	6.9
274.942096305745	35.6524562216582	293.7	6.9
274.942096305745	35.6524562216582	290.6	6.9
268.475398008398	35.5323303040348	278.7	6.9
260.547673406439	35.3850750702379	275.6	6.9
247.792507083832	35.1482042223305	263	63
247.792507083832	35.1482042223305	234.6	49.6
247.792507083832	35.1482042223305	231.5	49.6
247.792507083832	35.1482042223305	227.6	49.6
239.889338229292	35.0014055222454	240.2	22
239.889338229292	35.0014055222454	249.6	37
231.282098436353	34.8415378189604	248	14.2
231.282098436353	34.8415378189604	240.2	15.7
231.282098436353	34.8415378189604	236.2	14.2
231.282098436353	34.8415378189604	233.1	14.2
231.282098436353	34.8415378189604	224.4	14.2
231.282098436353	34.8415378189604	222	18.9
231.282098436353	34.8415378189604	218.9	20.5
222.918571488286	34.6861908755212	234.6	31.5
222.918571488286	34.6861908755212	231.5	31.5
222.918571488286	34.6861908755212	227.6	31.5
222.918571488286	34.6861908755212	208.7	37
214.249536019145	34.5251711651787	178	37
214.249536019145	34.5251711651787	234.6	65.4
214.249536019145	34.5251711651787	231.5	65.4
214.249536019145	34.5251711651787	227.6	65.4
214.249536019145	34.5251711651787	222	63
214.249536019145	34.5251711651787	222.8	73.2
214.249536019145	34.5251711651787	191.3	63
183.811992351237	33.9598803073294	161.4	65.4
183.811992351237	33.9598803073294	192.1	73.2
166.085825264369	33.630565020441	173.2	18.9
145.650018703069	33.2508561396556	141.7	-7.9
145.650018703069	33.2508561396556	149.6	-7.9
134.755661159052	34.2742558054588	141.7	17.3
134.755661159052	34.2742558054588	127.6	20.5
134.755661159052	34.2742558054588	116.5	37
127.091313809424	34.9942583274537	85.8	37
127.091313809424	34.9942583274537	136.2	29.1
127.091313809424	34.9942583274537	142.5	29.1
127.091313809424	34.9942583274537	148.8	29.1
127.091313809424	34.9942583274537	161.4	29.1
127.091313809424	34.9942583274537	155.1	29.1
127.091313809424	34.9942583274537	136.2	49.6
127.091313809424	34.9942583274537	142.5	49.6
127.091313809424	34.9942583274537	148.8	49.6
127.091313809424	34.9942583274537	161.4	49.6
127.091313809424	34.9942583274537	155.1	49.6
127.091313809424	34.9942583274537	99.2	63
127.091313809424	34.9942583274537	129.9	63
127.091313809424	34.9942583274537	136.2	65.4
127.091313809424	34.9942583274537	142.5	65.4
127.091313809424	34.9942583274537	148.8	65.4
127.091313809424	34.9942583274537	155.1	65.4
127.091313809424	34.9942583274537	130.7	73.2
103.095873314651	34.9476178896257	100	73.2

Solution x	Solution y	Original x	Original y
87.3817877694464	34.9170108746707	67.7	65.4
81.3626270589615	34.9052887803663	70.9	49.6
81.3626270589615	34.9052887803663	70.9	65.4
76.8712461247007	34.8965463573948	63.8	49.6
76.8712461247007	34.8965463573948	67.7	49.6
73.10860261265	34.8892260341111	44.9	37
73.10860261265	34.8892260341111	67.7	31.5
70.2651853798879	34.8836958581961	60.6	22
70.2651853798879	34.8836958581961	63.8	31.4
67.6488471731463	34.8786079642096	70.9	31.5
65.004945226259	34.8734663775298	81.1	18.9
65.004945226259	34.8734663775298	76.4	22
61.9390621776298	34.8675028652839	84.3	17.3
58.2117287698583	34.860251363681	70.1	14.2
54.1049912392249	34.8522607769115	63.8	14.2
54.1049912392249	34.8522607769115	66.9	14.2
49.0576892521549	34.8424380557916	39.4	6.9
49.0576892521549	34.8424380557916	52.8	15.7
44.4865456435852	34.8335412757737	36.2	6.9
40.3773480115968	34.8255433732346	21.3	6.9
40.3773480115968	34.8255433732346	24.4	6.9
37.8399212388134	34.8206042444215	9.40000000000001	7.1
36.9701455608859	34.8189099507862	6.3	7.1
38.7274644699175	51.8289618723892	14.2	37
38.7274644699175	51.8289618723892	27.6	63
38.7274644699175	51.8289618723892	28.3	73.2
40.2886389240508	66.9402590033486	58.3	63
40.2886389240508	66.9402590033486	63.8	65.4
41.9374541919602	82.9002280729654	59.1	73.2
43.9079678085702	101.974334617642	51.2	121.3
45.1922595444546	114.405801970195	39.4	140
45.1922595444546	114.405801970195	48	127.6
45.8998219282465	121.254649680138	24.4	140
45.8998219282465	121.254649680138	36.2	140
46.3875291746895	125.975392548938	21.3	140
46.8228690340446	130.189247687006	17.3	127.6
46.8228690340446	130.189247687006	20.5	121.3
47.367800918965	135.463890059703	6.3	140.2
47.367800918965	135.463890059703	9.40000000000001	140.2
51.5026443905129	167.893550979299	14.2	170.1
51.5026443905129	167.893550979299	27.6	196.1
52.0886674637044	172.490309955647	28.3	206.3
55.6716175522461	171.697653442788	67.7	198.5
59.1034916541087	170.938422496223	59.1	206.3
59.1034916541087	170.938422496223	58.3	196.1
59.1034916541087	170.938422496223	63.8	182.7
59.1034916541087	170.938422496223	63.8	198.5
59.1034916541087	170.938422496223	67.7	182.7
59.1034916541087	170.938422496223	70.9	182.7
62.7972372374811	170.121269846948	70.9	198.5
62.7972372374811	170.121269846948	85.8	170.1
65.8269649968694	169.451025925476	44.9	170.1
65.8269649968694	169.451025925476	63.8	164.5
69.2481623071324	168.694175410928	67.7	164.6
69.2481623071324	168.694175410928	70.9	164.6
72.6208423705744	167.948059079471	52.8	148.8
72.6208423705744	167.948059079471	60.6	155.1
76.7787159327148	167.028227447214	63.8	147.3
81.2889696767556	166.030434337417	66.9	147.3
81.2889696767556	166.030434337417	70.1	147.3
86.6847830389494	164.836717071761	76.4	155.1
92.5109754515729	163.547781222596	81.1	152
92.5109754515729	163.547781222596	84.3	150.4
99.393755403107	162.025076595206	89	127.6
99.393755403107	162.025076595206	119.7	127.6
100.775074453211	161.719487271317	92.1	121.3
108.539573319192	160.102526621385	122.8	121.3
111.536120146445	163.954646037974	127.6	153.6
114.512705749258	167.781105526848	141.7	150.4
117.344951842138	171.422012136378	148.8	162.2
119.689258216226	174.435661949881	136.2	162.2
119.689258216226	174.435661949881	142.5	162.2
121.961167645998	177.356243163129	116.5	170.1
121.961167645998	177.356243163129	136.2	182.7
124.202864153943	180.237984248222	161.4	162.2
124.202864153943	180.237984248222	155.1	162.2
125.120035583381	183.954920203193	99.2	196.1
126.000889111737	187.524674362675	100	206.3
126.780469643539	190.684015574071	142.5	182.7
126.780469643539	190.684015574071	148.8	182.7

Solution x	Solution y	Original x	Original y
127.599963008751	194.005102600983	148.8	198.5
128.37759254033	197.156531513542	142.5	198.5
129.1436135736	200.260912419428	129.9	196.1
129.1436135736	200.260912419428	136.2	198.5
129.940993663498	203.492364250459	161.4	182.7
129.940993663498	203.492364250459	155.1	182.7
131.767783915882	210.895449989916	130.7	206.3
133.741568468746	218.894214925616	161.4	198.5
133.741568468746	218.894214925616	155.1	198.5
143.011337383492	256.459651652466	119.7	260.7
143.011337383492	256.459651652466	122.8	254.4
143.011337383492	256.459651652466	184.3	254.4
142.037354156126	263.260969872216	141.7	283.5
142.037354156126	263.260969872216	181.1	260.7
139.524445631163	280.809071424647	155.1	295.3
139.524445631163	280.809071424647	173.2	285.1
137.51757431606	294.823310301927	178	303.2
137.164630867505	296.119447413949	161.4	315.8
137.164630867505	296.119447413949	161.4	295.3
136.816451983972	297.398085706159	148.8	315.8
136.816451983972	297.398085706159	155.1	315.8
136.486290862224	298.610561750221	161.4	331.6
136.486290862224	298.610561750221	155.1	331.6
135.302196192547	298.597208366635	148.8	295.3
134.103856512031	298.583694243391	148.8	331.6
134.103856512031	298.583694243391	142.5	315.8
132.769858776069	298.56864946276	136.2	295.3
132.769858776069	298.56864946276	142.5	295.3
131.431932144372	298.553561135837	136.2	315.8
130.089006895797	298.538416415555	136.2	331.6
130.089006895797	298.538416415555	142.5	331.6
128.621717851296	298.521867453142	129.9	329.2
127.164822646521	298.505434167914	130.7	339.4
103.909979108902	298.245318482721	100	339.4
100.539599420682	297.63817119265	99.2	329.2
97.0667705677471	297.012569756057	85.8	303.2
97.0667705677471	297.012569756057	116.5	303.2
93.4024480074443	296.352471324658	127.6	286.7
84.7991495155002	294.802601233759	92.1	254.4
75.0141086789084	293.039701803722	89	260.7
58.1806691547623	290.007200047457	51.2	254.4
51.2596442993734	288.760264987307	48	260.7
45.0712223956132	287.645314051359	20.5	254.4
45.0712217947049	287.645316804904	17.3	260.7
45.0712212327022	287.645319559409	6.3	273.3
45.0712212327022	287.645319559409	9.40000000000001	273.3
45.1338019462166	288.701256772895	21.3	273.1
45.1338019462166	288.701256772895	24.4	273.1
45.2018116600815	289.84879673853	36.2	273.1
45.2018116600815	289.84879673853	39.4	273.1
45.2740832161483	291.068241547464	52.8	281.9
45.2740832161483	291.068241547464	60.6	288.2
45.3469629894183	292.297948253591	63.8	280.4
45.3469629894183	292.297948253591	66.9	280.4
45.4240685989511	293.598954971647	70.1	280.4
45.4240685989511	293.598954971647	81.1	285.1
45.5089332011547	295.030857854847	84.3	283.5
45.7654883534685	299.358725392567	70.9	297.7
45.7654883534685	299.358725392567	76.4	288.2
46.0734099843499	304.553052936495	63.8	297.6
46.4033091812255	310.11811510792	44.9	303.2
46.7597291894001	316.130551198713	59.1	339.4
46.7597291894001	316.130551198713	58.3	329.2
46.7597291894001	316.130551198713	63.8	331.6
46.7597291894001	316.130551198713	63.8	315.8
46.7597291894001	316.130551198713	67.7	315.8
46.7597291894001	316.130551198713	70.9	315.8
46.7597291894001	316.130551198713	67.7	297.7
47.0529933314752	321.077627425795	28.3	339.4
47.0529933314752	321.077627425795	27.6	329.2
47.0529933314752	321.077627425795	14.2	303.2
48.04138970608	337.750589463272	67.7	331.6
48.04138970608	337.750589463272	70.9	331.6
49.5574071962013	363.32426582051	20.5	387.5
49.8535209446483	368.319336241583	17.3	393.8
62.6894472465315	372.314855161007	48	393.8
62.6894472465315	372.314855161007	51.2	387.5
86.9995535043909	379.881985785606	89	393.8
109.447874062002	386.869556616374	92.1	387.5
150.92646062699	399.780762983425	119.7	393.8

Solution x	Solution y	Original x	Original y
150.92646062699	399.780762983425	181.1	393.8
150.92646062699	399.780762983425	122.8	387.5
150.92646062699	399.780762983425	184.3	387.5

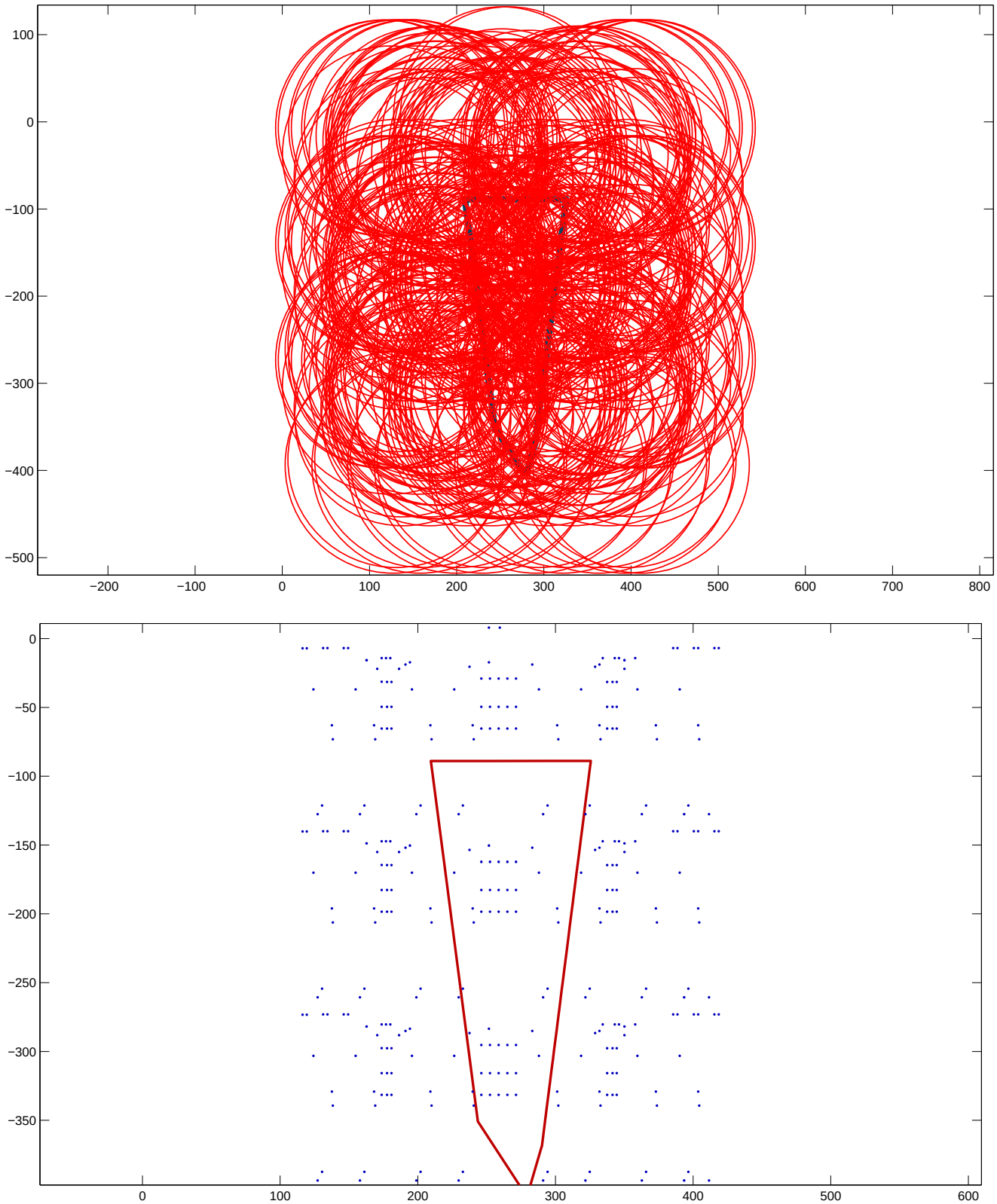


Figure N.16: $lin318$, $r = 124.02$, Equal Radius, 2D, Euclidean, Length = 765.9640680

Table N-19: Solution for $lin318$, $r = 124.02$, Equal Radius, 2D, Euclidean

Total distance: 765.964067977045			
Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
179.464411305992	370.938078475135	141.7	283.5
179.464411305992	370.938078475135	173.2	285.1
179.464411305992	370.938078475135	155.1	295.3
179.464411305992	370.938078475135	161.4	295.3
179.464411305992	370.938078475135	148.8	295.3
179.464411305992	370.938078475135	142.5	295.3
179.464411305992	370.938078475135	178	303.2
179.464411305992	370.938078475135	208.7	303.2
179.464411305992	370.938078475135	155.1	315.8
179.464411305992	370.938078475135	161.4	315.8
179.464411305992	370.938078475135	148.8	315.8
179.464411305992	370.938078475135	142.5	315.8
179.464411305992	370.938078475135	155.1	331.6
179.464411305992	370.938078475135	161.4	331.6
179.464411305992	370.938078475135	148.8	331.6
179.464411305992	370.938078475135	191.3	329.2
179.464411305992	370.938078475135	227.6	315.8
179.464411305992	370.938078475135	231.5	315.8
179.464411305992	370.938078475135	234.6	315.8
179.464411305992	370.938078475135	192.1	339.4
179.464411305992	370.938078475135	222	329.2
179.464411305992	370.938078475135	227.6	331.6
179.464411305992	370.938078475135	231.5	331.6
179.464411305992	370.938078475135	234.6	331.6
179.464411305992	370.938078475135	222.8	339.4
179.464411305992	370.938078475135	184.3	387.5
179.464411305992	370.938078475135	181.1	393.8
179.464411305992	370.938078475135	215	387.5
179.464411305992	370.938078475135	211.8	393.8
179.464411305992	370.938078475135	255.9	387.5
179.464411305992	370.938078475135	252.8	393.8
180.203995933597	368.423416843858	263	329.2
180.203995933597	368.423416843858	263.8	339.4
180.203995933597	368.423416843858	293.7	329.2
180.203995933597	368.423416843858	294.5	339.4
180.203995933597	368.423416843858	286.6	387.5
180.203995933597	368.423416843858	283.5	393.8
180.203995933597	368.423416843858	301.6	393.8
182.777510226946	348.131625662485	181.1	260.7
184.539952389882	334.235527718173	184.3	254.4
185.958500729873	323.050897048699	215	254.4
187.149052551662	313.663949935815	211.8	260.7
187.149052551662	313.663949935815	224.4	280.4
188.152115295239	305.755430875258	218.9	286.7
188.152115295239	305.755430875258	222	285.1
189.063352650779	298.571035381677	227.6	297.7
189.063352650779	298.571035381677	231.5	297.7
189.925194118182	291.776127384082	234.6	297.7
189.925194118182	291.776127384082	249.6	303.2
190.756887953583	285.218898694612	248	280.4
190.756887953583	285.218898694612	240.2	288.2
191.537422603231	279.06504502363	236.2	280.4
191.537422603231	279.06504502363	240.2	281.9
192.307675592346	272.992237351305	233.1	280.4
193.055284416719	267.097996828759	255.9	254.4
193.055284416719	267.097996828759	252.8	260.7
193.790304032363	261.303006610496	275.6	273.1
194.500454808491	255.704125456269	283.5	260.7
194.500454808491	255.704125456269	278.7	273.1
195.220970265196	250.023505072885	290.6	273.1
195.913627966889	244.562647250006	280.3	303.2
195.913627966889	244.562647250006	308.7	273.1
196.850468454056	237.176454050517	293.7	273.1
196.850468454056	237.176454050517	305.5	273.1
197.966406321802	228.378313418674	301.6	260.7
199.199558981789	218.656294060775	294.5	206.3
199.199558981789	218.656294060775	286.6	254.4
200.400018697458	209.191779028166	293.7	196.1
201.475762483994	200.710860731338	263	196.1
201.475762483994	200.710860731338	263.8	206.3
202.490602645106	192.710141853902	234.6	198.5
202.490602645106	192.710141853902	234.6	182.7
203.454901057745	185.107908284097	227.6	198.5
203.454901057745	185.107908284097	231.5	198.5

Solution x	Solution y	Original x	Original y
204.422088977945	177.482897502778	192.1	206.3
204.422088977945	177.482897502778	222.8	206.3
205.453768352702	169.349405123321	227.6	182.7
205.453768352702	169.349405123321	231.5	182.7
206.481798796962	161.244721340121	231.5	164.6
206.481798796962	161.244721340121	234.6	164.6
207.470034904685	153.453823169967	240.2	155.1
207.470034904685	153.453823169967	248	147.3
208.421710888979	145.951190654017	249.6	170.1
209.374793464653	138.43745146543	280.3	170.1
210.368569367202	130.602813929314	275.6	140
211.3387952111	122.953872902147	278.7	140
211.3387952111	122.953872902147	290.6	140
212.327346134897	115.160330628477	293.7	140
212.327346134897	115.160330628477	305.5	140
213.362331658519	107.000594830071	301.6	127.6
213.362331658519	107.000594830071	308.7	140
214.471390399847	98.2567522002538	283.5	127.6
214.471390399847	98.2567522002538	286.6	121.3
215.658022911703	88.9009294872664	308.7	6.9
214.535724011114	88.9011445453266	293.7	6.9
214.535724011114	88.9011445453266	305.5	6.9
212.522582885715	88.9015182999353	275.6	6.9
212.522582885715	88.9015182999353	290.6	6.9
210.100434265425	88.9019736499401	280.3	37
210.100434265425	88.9019736499401	278.7	6.9
207.295497543189	88.9025100028209	248	14.2
204.536889401132	88.9030317313306	236.2	14.2
204.536889401132	88.9030317313306	240.2	15.7
201.742451068495	88.9035653819561	233.1	14.2
199.019697950309	88.9040791887633	222	18.9
199.019697950309	88.9040791887633	224.4	14.2
196.365794604983	88.9045801830597	208.7	37
196.365794604983	88.9045801830597	218.9	20.5
193.815664492487	88.9050619643168	227.6	31.5
193.815664492487	88.9050619643168	231.5	31.5
191.221400947395	88.9055566888555	234.6	31.5
188.729169602796	88.9060244302132	249.6	37
188.729169602796	88.9060244302132	240.2	22
186.134163941715	88.9065138568911	155.1	162.2
186.134163941715	88.9065138568911	161.4	162.2
186.134163941715	88.9065138568911	191.3	196.1
186.134163941715	88.9065138568911	173.2	152
186.134163941715	88.9065138568911	208.7	170.1
186.134163941715	88.9065138568911	222	196.1
186.134163941715	88.9065138568911	181.1	127.6
186.134163941715	88.9065138568911	218.9	153.6
186.134163941715	88.9065138568911	227.6	164.6
186.134163941715	88.9065138568911	184.3	121.3
186.134163941715	88.9065138568911	222	152
186.134163941715	88.9065138568911	224.4	147.3
186.134163941715	88.9065138568911	211.8	127.6
186.134163941715	88.9065138568911	233.1	147.3
186.134163941715	88.9065138568911	236.2	147.3
186.134163941715	88.9065138568911	215	121.3
186.134163941715	88.9065138568911	240.2	148.8
186.134163941715	88.9065138568911	252.8	127.6
186.134163941715	88.9065138568911	255.9	121.3
186.134163941715	88.9065138568911	222.8	73.2
186.134163941715	88.9065138568911	222	63
186.134163941715	88.9065138568911	227.6	65.4
186.134163941715	88.9065138568911	231.5	65.4
186.134163941715	88.9065138568911	234.6	65.4
186.134163941715	88.9065138568911	227.6	49.6
186.134163941715	88.9065138568911	263.8	73.2
186.134163941715	88.9065138568911	231.5	49.6
186.134163941715	88.9065138568911	234.6	49.6
186.134163941715	88.9065138568911	263	63
186.134163941715	88.9065138568911	294.5	73.2
186.134163941715	88.9065138568911	293.7	63
143.837906779163	88.9155429650155	148.8	198.5
143.837906779163	88.9155429650155	155.1	182.7
143.837906779163	88.9155429650155	161.4	182.7
143.837906779163	88.9155429650155	148.8	182.7
143.837906779163	88.9155429650155	142.5	182.7
143.837906779163	88.9155429650155	136.2	182.7
143.837906779163	88.9155429650155	178	170.1
143.837906779163	88.9155429650155	148.8	162.2
143.837906779163	88.9155429650155	142.5	162.2
143.837906779163	88.9155429650155	136.2	162.2

Solution x	Solution y	Original x	Original y
143.837906779163	88.9155429650155	141.7	150.4
143.837906779163	88.9155429650155	127.6	153.6
143.837906779163	88.9155429650155	119.7	127.6
143.837906779163	88.9155429650155	122.8	121.3
143.837906779163	88.9155429650155	130.7	73.2
143.837906779163	88.9155429650155	192.1	73.2
143.837906779163	88.9155429650155	155.1	65.4
143.837906779163	88.9155429650155	161.4	65.4
143.837906779163	88.9155429650155	148.8	65.4
143.837906779163	88.9155429650155	142.5	65.4
143.837906779163	88.9155429650155	136.2	65.4
143.837906779163	88.9155429650155	129.9	63
143.837906779163	88.9155429650155	191.3	63
143.837906779163	88.9155429650155	155.1	49.6
143.837906779163	88.9155429650155	161.4	49.6
143.837906779163	88.9155429650155	148.8	49.6
143.837906779163	88.9155429650155	142.5	49.6
143.837906779163	88.9155429650155	136.2	49.6
143.837906779163	88.9155429650155	178	37
143.837906779163	88.9155429650155	155.1	29.1
143.837906779163	88.9155429650155	161.4	29.1
143.837906779163	88.9155429650155	148.8	29.1
143.837906779163	88.9155429650155	142.5	29.1
143.837906779163	88.9155429650155	136.2	29.1
143.837906779163	88.9155429650155	173.2	18.9
116.187537428356	88.9212889842928	89	127.6
116.187537428356	88.9212889842928	92.1	121.3
116.187537428356	88.9212889842928	100	73.2
116.187537428356	88.9212889842928	99.2	63
116.187537428356	88.9212889842928	70.9	65.4
116.187537428356	88.9212889842928	59.1	73.2
116.187537428356	88.9212889842928	67.7	65.4
116.187537428356	88.9212889842928	63.8	65.4
116.187537428356	88.9212889842928	116.5	37
116.187537428356	88.9212889842928	58.3	63
116.187537428356	88.9212889842928	70.9	49.6
116.187537428356	88.9212889842928	67.7	49.6
116.187537428356	88.9212889842928	63.8	49.6
116.187537428356	88.9212889842928	85.8	37
116.187537428356	88.9212889842928	127.6	20.5
116.187537428356	88.9212889842928	141.7	17.3
116.187537428356	88.9212889842928	70.9	31.5
116.187537428356	88.9212889842928	67.7	31.5
116.187537428356	88.9212889842928	63.8	31.4
116.187537428356	88.9212889842928	76.4	22
116.187537428356	88.9212889842928	81.1	18.9
116.187537428356	88.9212889842928	84.3	17.3
116.187537428356	88.9212889842928	60.6	22
116.187537428356	88.9212889842928	70.1	14.2
116.187537428356	88.9212889842928	66.9	14.2
116.187537428356	88.9212889842928	141.7	-7.9
116.187537428356	88.9212889842928	63.8	14.2
116.187537428356	88.9212889842928	52.8	15.7
110.882833069532	88.922302017829	44.9	37
110.882833069532	88.922302017829	149.6	-7.9
105.526380758781	88.9233539144627	39.4	6.9
105.526380758781	88.9233539144627	36.2	6.9
102.098462033084	88.9240280746118	24.4	6.9
99.4971459457882	88.9245293894225	21.3	6.9
99.4971459457882	88.9245293894225	6.3	7.1
99.7006645790213	90.4862602400264	14.2	37
99.7006645790213	90.4862602400264	9.40000000000001	7.1
107.116641744814	147.395430084362	51.2	254.4
107.116641744814	147.395430084362	51.2	121.3
107.116641744814	147.395430084362	20.5	121.3
107.116641744814	147.395430084362	28.3	73.2
107.116641744814	147.395430084362	27.6	63
108.931176748484	161.318293874107	142.5	198.5
108.931176748484	161.318293874107	136.2	198.5
108.931176748484	161.318293874107	129.9	196.1
108.931176748484	161.318293874107	130.7	206.3
108.931176748484	161.318293874107	116.5	170.1
108.931176748484	161.318293874107	99.2	196.1
108.931176748484	161.318293874107	100	206.3
108.931176748484	161.318293874107	85.8	170.1
108.931176748484	161.318293874107	84.3	150.4
108.931176748484	161.318293874107	81.1	152
108.931176748484	161.318293874107	70.9	198.5
108.931176748484	161.318293874107	70.9	182.7
108.931176748484	161.318293874107	76.4	155.1

Solution x	Solution y	Original x	Original y
108.931176748484	161.318293874107	67.7	198.5
108.931176748484	161.318293874107	67.7	182.7
108.931176748484	161.318293874107	70.9	164.6
108.931176748484	161.318293874107	63.8	198.5
108.931176748484	161.318293874107	67.7	164.6
108.931176748484	161.318293874107	63.8	182.7
108.931176748484	161.318293874107	63.8	164.5
108.931176748484	161.318293874107	70.1	147.3
108.931176748484	161.318293874107	58.3	196.1
108.931176748484	161.318293874107	59.1	206.3
108.931176748484	161.318293874107	66.9	147.3
108.931176748484	161.318293874107	60.6	155.1
108.931176748484	161.318293874107	63.8	147.3
108.931176748484	161.318293874107	52.8	148.8
108.931176748484	161.318293874107	44.9	170.1
108.931176748484	161.318293874107	48	127.6
108.931176748484	161.318293874107	39.4	140
108.931176748484	161.318293874107	28.3	206.3
108.931176748484	161.318293874107	27.6	196.1
108.931176748484	161.318293874107	36.2	140
108.931176748484	161.318293874107	24.4	140
108.931176748484	161.318293874107	14.2	170.1
108.931176748484	161.318293874107	21.3	140
108.931176748484	161.318293874107	17.3	127.6
108.931176748484	161.318293874107	9.40000000000001	140.2
108.931176748484	161.318293874107	6.3	140.2
115.392563651207	210.906402085912	155.1	198.5
115.392563651207	210.906402085912	161.4	198.5
120.997324924581	253.917351258665	48	260.7
120.997324924581	253.917351258665	20.5	254.4
120.997324924581	253.917351258665	24.4	273.1
120.997324924581	253.917351258665	17.3	260.7
120.997324924581	253.917351258665	21.3	273.1
120.997324924581	253.917351258665	9.40000000000001	273.3
120.997324924581	253.917351258665	6.3	273.3
131.487974705449	334.379512563492	122.8	254.4
131.487974705449	334.379512563492	119.7	260.7
131.487974705449	334.379512563492	92.1	254.4
131.487974705449	334.379512563492	89	260.7
131.487974705449	334.379512563492	84.3	283.5
131.487974705449	334.379512563492	116.5	303.2
131.487974705449	334.379512563492	81.1	285.1
131.487974705449	334.379512563492	70.1	280.4
131.487974705449	334.379512563492	76.4	288.2
131.487974705449	334.379512563492	66.9	280.4
131.487974705449	334.379512563492	63.8	280.4
131.487974705449	334.379512563492	85.8	303.2
131.487974705449	334.379512563492	60.6	288.2
131.487974705449	334.379512563492	70.9	297.7
131.487974705449	334.379512563492	52.8	281.9
131.487974705449	334.379512563492	67.7	297.7
131.487974705449	334.379512563492	63.8	297.6
131.487974705449	334.379512563492	39.4	273.1
131.487974705449	334.379512563492	36.2	273.1
131.487974705449	334.379512563492	99.2	329.2
131.487974705449	334.379512563492	70.9	315.8
131.487974705449	334.379512563492	67.7	315.8
131.487974705449	334.379512563492	63.8	315.8
131.487974705449	334.379512563492	44.9	303.2
131.487974705449	334.379512563492	70.9	331.6
131.487974705449	334.379512563492	67.7	331.6
131.487974705449	334.379512563492	63.8	331.6
131.487974705449	334.379512563492	58.3	329.2
131.487974705449	334.379512563492	59.1	339.4
131.487974705449	334.379512563492	14.2	303.2
131.487974705449	334.379512563492	27.6	329.2
131.487974705449	334.379512563492	28.3	339.4
131.487974705449	334.379512563492	20.5	387.5
133.63938681693	350.833645094752	51.2	387.5
133.63938681693	350.833645094752	48	393.8
133.63938681693	350.833645094752	17.3	393.8
139.234158172498	359.410067306487	127.6	286.7
139.234158172498	359.410067306487	136.2	295.3
139.234158172498	359.410067306487	136.2	315.8
139.234158172498	359.410067306487	129.9	329.2
139.234158172498	359.410067306487	142.5	331.6
139.234158172498	359.410067306487	136.2	331.6
139.234158172498	359.410067306487	130.7	339.4
139.234158172498	359.410067306487	100	339.4
139.234158172498	359.410067306487	122.8	387.5

Solution x	Solution y	Original x	Original y
139.234158172498	359.410067306487	119.7	393.8
139.234158172498	359.410067306487	92.1	387.5
139.234158172498	359.410067306487	89	393.8

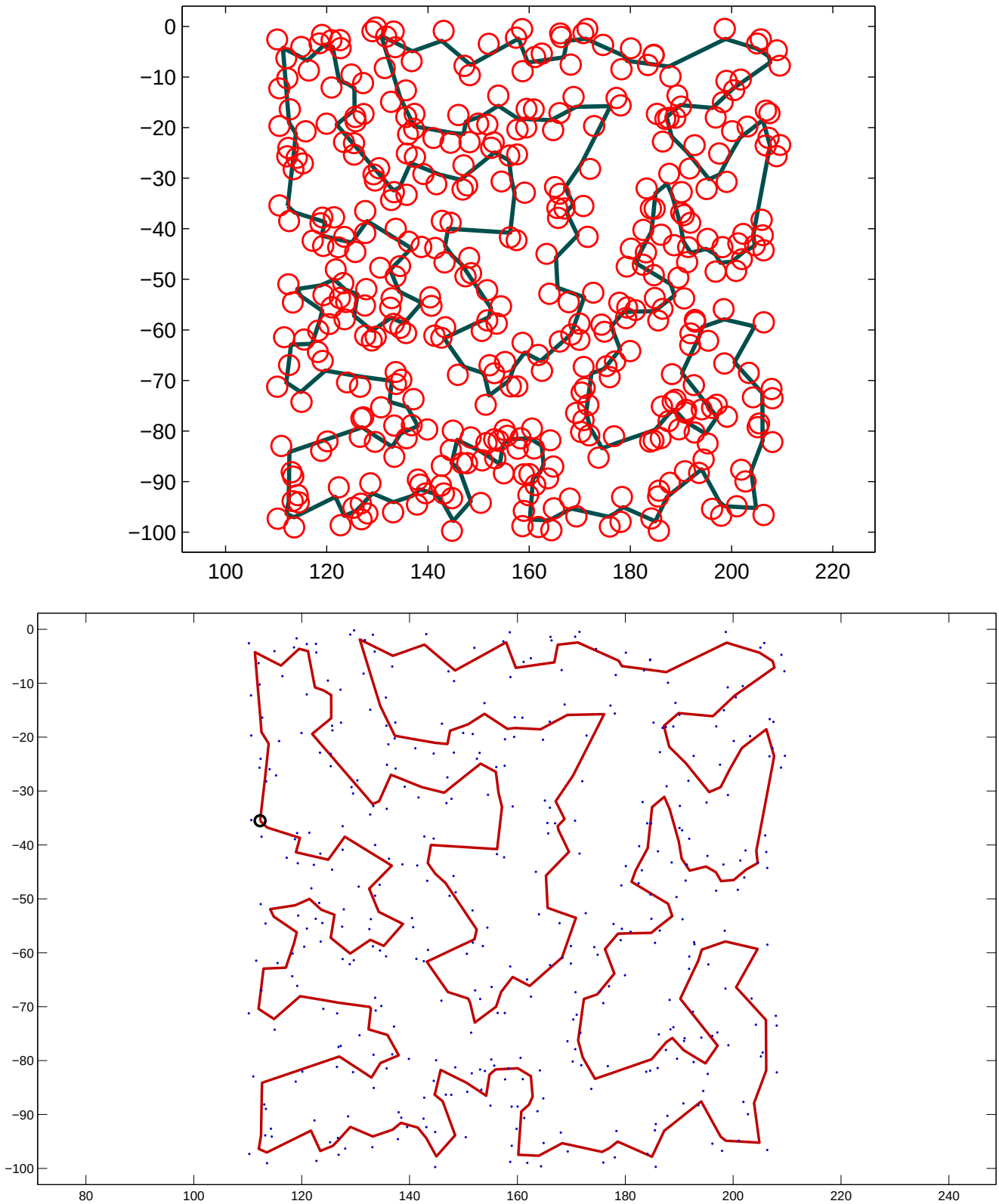


Figure N.17: $rd400$, $r = 1.9910618$, Equal Radius, 2D, Euclidean, Length = 1033.4143446

Table N-20: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 2D, Euclidean

Total distance: 1033.41434463551 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
3.58773376340754	36.7588577404564	2.57158	38.4711
8.36113192602568	38.2721895256612	9.16001	37.8018
9.67457453155036	38.6885972889779	11.4258	37.7412
9.4103194109007	39.636201898201	8.75416	38.928
8.92953190629325	41.3604447982171	7.21925	42.3799
9.74148601632008	41.5452652309886	9.27453	43.3967
12.5717506719926	42.1894945194122	12.2621	43.6923
14.9326044120894	42.7268707188875	15.6372	44.5891
15.1661136439964	42.4022156662575	13.4598	41.6191
16.6621274918069	40.322213685291	17.5856	40.8861
17.9928658015846	38.4719858584002	17.6023	36.5196
22.7158796566399	41.3833063695757	23.6339	40.0124
25.4362574281975	43.0602022062376	26.2003	42.5604
26.7122317024597	43.8467344080358	28.6889	43.6077
24.066439559822	46.5335551193491	24.4594	47.3987
22.7885061404713	47.8312833103646	23.6126	49.4214
22.5177141837221	48.1062772127315	20.5641	47.7219
24.2788003780337	52.4008694390867	22.8193	53.7552
28.7750097784015	54.6502218081926	30.4468	53.5688
28.7750152499179	54.6503061800266	30.6696	55.2626
25.2238190601856	58.719661765549	25.6513	60.6643
24.4183052947783	58.3594540243417	24.5176	59.5849
22.7203452190727	57.6002064215699	22.5447	55.6169
21.9836122935153	58.1012080976051	23.2085	58.8069
19.435777281769	59.8338096929868	19.6656	61.3862
18.9887154645134	60.1378250646991	18.9042	62.1271
18.4304705704554	59.6844395814703	17.6011	61.1721
15.3922372722772	57.2168842298024	13.5318	57.9262
15.7029450837788	55.293620642716	17.5187	55.1629
15.7870655102968	54.7730791137367	13.8308	54.4775
16.0822610275219	52.9474968324566	17.8085	51.9553
13.6375904710285	52.0072446049628	12.5872	53.6987
11.4703418260168	50.0113356492061	11.7937	48.0467
11.4421444393469	50.0238563046265	13.2524	50.7626
8.79502480446975	51.1995640353679	9.35554999999999	53.1101
4.1634739543948	51.9126579927235	2.40393	50.9808
4.81497524788141	53.2824669765927	3.30116	54.5758
9.10008698158508	56.2184633690697	10.9638	55.5178
8.56360048537577	58.3119684741058	10.4725	58.878
7.92000189312409	60.2179827652817	8.30742000000001	60.1487
7.06073597023386	62.7626719590548	8.25408	64.3565
5.3449514664795	62.8317196343605	5.52590000000001	61.9092
2.92557790862075	62.9291110687972	1.5771	61.4642
2.43522266672622	66.8978716432904	2.55217	66.9796
2.00263919000568	70.3990477125018	0.194864999999993	71.2335
4.86537221458559	72.2867648184386	4.99968	74.2733
9.7137611593196	68.0517304072881	9.17265	66.1356
14.2019138247008	68.8107429510008	14.0141	70.4084
16.8784284377201	69.263370518898	16.576	71.2313
22.6025525872296	70.0551216977885	23.6206	68.344
22.8372876031345	70.373821684521	24.7619	69.8637
22.7263340634924	71.3207753860305	23.7167	70.7298
22.3877291149124	74.2108744864785	20.7262	75.308
25.8923725043237	75.2452316695011	27.1361	73.6904
28.0018669015475	79.0306762178843	29.8827	79.684
26.0978226954542	79.8217778051278	25.7615	81.4539
25.791162341419	79.9491867808568	26.7929	78.8352
24.6162987085056	80.4373077863511	23.3293	78.9181
22.9289310913381	83.1352667256832	23.3569	85.0798
20.1200781116937	81.3004373525908	19.5225	82.1483
17.7077859327	79.7246325172698	16.5471	81.1813
17.0597983217756	79.3013472984709	16.8354	77.4785
16.9813539272375	79.2501083332546	17.2306	77.2747
8.78842228907816	82.0344173619497	8.89064000000001	83.8954
8.50421438354812	82.1310025608161	10.1219	82.045
2.63382298708785	84.1258621798654	1.02508	82.9527
2.56578753635553	88.1368209386081	3.35356	88.986
2.55080053705105	89.0202777374407	3.06059000000001	88.1315
2.49140547200933	92.5210227836259	4.28894	92.6489
2.46793038900438	93.9046423567988	4.45068999999999	94.0863
2.35267228469958	94.5935484980136	3.24988	93.8751
2.05298784705738	96.3848841766654	0.299018000000004	97.3272
3.53722257110411	97.0459456007222	3.57801000000001	99.0366
11.7183341356483	92.9927099235216	12.3803	91.1149
13.4599387829097	96.7604408981813	12.7313	98.6134
15.7522919081123	95.8221061223683	16.854	97.4806
16.6231786157726	94.953447663731	18.064	96.3276
16.8103182165569	94.7471420317758	15.2733	95.1553
17.4817873180329	94.0068835285139	16.7243	94.3593
19.0354837408364	92.2940010093576	18.6101	90.3489
23.1858445353692	94.0657383080544	23.1083	96.0553
26.8651905909689	92.8235510200815	27.8353	94.5623
28.0682338152677	91.826223171037	29.5533	92.3189
28.40132241208	91.5500749616055	27.9893	89.6021
28.9876139687647	91.7157159723911	28.4623	90.5817
31.3672961787987	92.3880309717419	33.1283	92.3481
31.5001282608518	92.4255586257682	32.5896	90.759
33.1012532910594	94.372451600962	34.7487	93.2543
34.9783081300398	97.7729632515807	34.7579	99.7518
38.4607035460782	93.851820010499	40.4171	94.2218
36.1302605179337	87.514977970357	37.7453	86.3505
34.6307599184317	86.3174864294251	32.7208	86.88
34.808617718129	85.7881644110806	36.723	86.3354
35.2579386826452	83.8926322618923	34.4937	83.7515
35.7694617704896	81.7347026450665	34.9224	79.9328
37.7941135361505	82.7357243425339	38.4806	81.2568
40.5508680393299	84.0987414702289	41.546	82.3742
41.9217997137929	85.0118344965871	43.3068	85.4106
42.2301650547392	85.217212781934	40.7053	85.7824
44.197582162593	86.5275768424926	44.9959	88.3516
44.7395636125017	83.1292724656386	43.9629	81.9344
44.8229632705198	82.6063073945514	43.0779	81.6476
45.9137571958103	81.6414507926449	45.1636	79.7971
46.7763068401544	81.5996735246564	48.3206	81.4332
47.0195027830109	81.5878913477695	45.6946	80.9262
47.6996963412592	81.5549423727415	47.7087	83.4773
50.0872290295262	81.4392428754346	50.5772	79.5094
52.4802296433187	82.8922152751912	54.169	81.8375
52.5581482624219	83.7421323304323	50.9984	83.4341
52.8270235437811	86.6750525530378	54.7886	87.0165
52.119628896489	88.1928138803864	53.7144	89.3849
51.0736755837011	89.1161447823945	51.2472	90.6526
50.7190139568831	89.4291974047777	48.934	88.5471
50.6894959329544	89.8485824969745	50.0418	88.5256
50.3639556228329	94.4721527012049	48.9418	95.7946
50.361478736776	94.5073706961373	49.8328	92.6571
50.1528566882099	97.4719787436532	48.6626	98.7924
51.9325829037896	97.5618386408777	51.8363	98.9629
53.9348010817758	97.6629272841472	54.3707	99.6057
55.7311311756101	96.7004750443076	54.8665	95.2849
58.3099911074057	95.318784506802	58.0371	93.3465
59.9633854925569	95.6831787439296	59.3326	96.8644
65.6783755349828	96.9426989589755	65.9332	98.9174
66.9841279892478	96.2734016705633	68.0526	97.9535
68.5945677782551	95.0256620409359	68.3546	93.0491
74.9423072848378	97.8409361215385	75.6359	99.7073
75.3248023135971	97.0320905614754	74.1314	97.2935
76.8075927202567	93.8966064022162	75.4786	92.9344
77.218975304244	93.0266716907524	75.6586	91.7899
78.955816785147	91.6446749558972	77.8131	90.2453
82.135176997427	89.1148723254545	83.5669	88.2708
82.3019950387286	88.9821436815058	80.7777	87.9354
84.0689687374022	87.5762207275577	84.4594	85.6238
87.6735354958791	94.1125688858475	86.1563	95.4019
88.6385879199448	94.8708967940752	87.9339	96.7331
91.1679045438906	95.0165480595633	91.0373	94.8618
94.8620561829254	95.2292880691727	96.3227	96.5824
94.1487602441125	89.9342642623808	92.7385	89.9534
93.873385645932	87.890176187868	91.8947	87.6684
96.1275146910864	81.8494677211769	98.0879	82.1977
96.114458911046	79.4901908284349	95.1537	79.2325
96.1059956628519	77.9624709682843	95.4573	78.5053
96.0815183319446	73.5277556500285	98.0725	73.509
96.0668758148141	72.4370746772639	97.9153	71.697
95.668545175831	72.0083391954952	94.2046	73.3577
92.9332209977851	69.0167004625198	93.4248	68.5015
90.5490553888724	66.4091475083277	88.5712	66.6382
94.526290154297	59.3002600163239	96.3481	58.4969
88.5535002322242	57.9013431765093	88.4474	55.9131
84.3274094807426	59.3805883018506	82.834	58.4111
84.1748968924871	59.4339720908874	82.7455	58.0479
83.5420337220176	61.4374979225301	85.3959	62.1638
83.3765025166954	61.788293433566	81.8774	60.6902
82.4817800793563	63.6843599504342	81.8209	62.9891

Solution x	Solution y	Original x	Original y
80.1964134049715	68.5274919466498	78.2186	68.7569
82.3672213310248	71.2570935289433	82.5413	70.9361
85.4162845665272	75.0910651300356	87.0562	74.7862
85.6611551620751	75.3989714987478	84.0931	75.7357
86.2069541635779	76.0852646128131	86.1254	75.412
87.1185710401416	77.2315396797071	89.1084	77.1611
84.8640738101354	80.5192296535642	85.2864	82.465
83.0710973942037	79.4389834685256	82.6909	80.2719
81.0074498054202	78.1956510739761	80.8889	76.3527
80.860070824835	78.1068591971292	79.6042	79.6519
79.8004045460005	76.965088211775	80.9911	75.8316
78.7873166390179	75.8735379138527	78.3667	74.2083
78.7166544946771	75.7974016609282	78.9206	73.8168
77.8162191484377	76.4367883636544	77.5352	78.0347
77.5640706090026	76.6158348336819	76.2214	75.1456
74.8745801798767	79.7565630839592	75.9957	81.402
73.9893168011762	80.0634252862558	74.5996	81.8744
73.1858148664314	80.3419100267135	73.8931	82.0767
67.3514720736609	82.3640192258338	66.7645	81.0279
64.3929172068549	83.3894433682536	63.6977	85.2552
62.093328113851	79.408257712233	60.2539	80.1704
62.033819201262	79.1861420504368	61.8453	80.8454
61.2583297653339	76.2914889454722	59.2712	76.4167
61.2747672258183	76.1713386322921	60.7208	77.8844
61.4879164731892	74.6133912334974	61.6789	74.8507
61.755652870367	72.6564435901008	60.356	72.3736
61.9467726935193	71.2595264207867	60.9907	71.4945
62.3135867295201	68.578486015044	60.771	67.3196
64.2761753404558	67.8889447698529	65.3011	67.1869
64.7912979801349	67.7079746679224	65.9297	69.3415
66.417572375537	65.7429315670708	66.9764	66.2314
67.9745736156831	63.8615889083937	69.9395	64.1832
66.5204768531814	60.0771243823272	64.8783	60.379
66.2191442402052	59.2929019267952	64.2573	58.953
68.4391479667082	56.7099609720231	69.3672	55.5594
68.6627590555569	56.4497917999788	67.8108	54.6502
69.7316820302411	56.4246568630554	70.983	56.1077
70.1447466232358	56.4149383818424	69.1414	57.6653
74.814881695783	56.3050429940628	75.5117	58.1702
76.0845620233919	55.2537578908664	74.8357	53.7031
76.6780765295105	54.7888779908822	76.3859	55.8636
78.7078969281037	53.1990204207501	80.6139	53.7748
77.9518362041974	50.9145398487159	79.5061	49.6701
74.8881939312248	49.0776051724282	74.6616	49.1772
72.5422996535489	47.6710370003864	72.4782	47.1166
71.1548580556019	46.8391506517871	69.2786	47.5055
71.9151658267231	44.7443599829601	70.0979	43.9308
72.458286056842	43.7350736628889	73.064	44.6995
74.1481548858771	40.5947450842916	76.05	41.1841
74.2202401087496	39.9255531822513	72.565	40.2263
74.5656385446762	36.7190787577545	74.7866	36.0265
74.6946445597067	35.5214394354343	74.0572	35.987
74.9681568877459	32.9823146441354	73.2088	32.0501
77.2251420936968	31.0673599128056	77.6794	29.1288
78.2447369060293	33.4335520702695	80.1207	32.7664
79.1236990684843	36.5308860875437	80.0506	36.8529
79.4699381401188	37.7509743300715	80.5435	37.2793
79.9076687229889	39.2934757647944	81.8496	38.8539
80.4190147337652	42.2956009947906	81.4209	43.6493
80.4589524367233	42.5300613187562	78.6058	43.2582
81.9242104301782	44.7664235738391	81.1997	46.621
84.9637622366671	44.0036552751322	85.2354	42.0312
86.794825335481	45.0511888033946	88.1955	43.6361
87.7659534219402	46.708775046194	86.8559	48.4797
90.11116661744	46.4936523723887	90.8764	48.3318
91.383708015107	45.4272942902847	92.0634	46.0336
92.455710735545	44.5289802215	91.3249	42.8902
93.8938323746452	43.7235372784114	94.61	43.2995
94.5513102994106	43.3553107870849	96.3235	44.2629
94.2926604273844	41.0891561241369	92.3029	41.017
94.3716691003894	40.6697602647606	96.1419	41.3034
94.9192882156218	37.763009526076	95.9404	38.2332
97.3088219007744	25.0791114365452	96.7473	23.5618
97.3676136445301	24.7670381523547	98.8743	25.646
97.596474888498	23.5522540485737	99.5853	23.4577
97.075453249412	21.7487461651847	97.2905	22.0419
96.1625040707121	18.5885535429657	97.4766	17.1802
96.1495491131697	18.5437081829626	96.7716	16.6523
93.6760040794093	20.4402083824798	93.1464	19.8146
91.6110252354679	22.0234600325664	90.11	20.7153

Solution x	Solution y	Original x	Original y
89.3112759276273	26.0678210325952	87.5589	25.1226
87.6733464273594	29.2739625276488	89.036	30.7257
85.5446837570718	30.1967100343026	85.0689	32.1301
83.0347718250488	27.0877341455767	81.7106	28.112
81.2065843341804	24.8231635190073	82.6839	23.4883
78.1456421333092	21.7926037125939	76.419	22.7841
77.4741693532993	19.1859864883184	77.5205	18.1054
77.3013937727094	18.515287326233	78.906	18.0381
77.1445891234376	17.9065823949309	75.2455	17.3084
77.6617701532312	17.4635022225993	76.9072	18.2917
79.8968954333056	15.5486297069427	79.2919	13.6517
80.9769261322651	15.6470920311966	80.035	15.8589
86.219314757433	16.1249945339788	86.8707	18.0065
87.9575881488948	14.4811576426867	88.2698	14.9994
90.2530220810034	12.3104386624709	88.9914	10.7701
90.9293208971946	11.8327007127366	90.4883	12.6216
92.4920064609	10.7288192706234	91.7898	10.5225
97.6480543571846	7.08655387799745	99.5164	7.77478
97.3451090171947	5.89970254201638	98.9579	4.73211
95.3935524341206	4.6557829667507	95.0473	3.39817
94.9315726215673	4.36132069363459	95.7659	2.55349
88.789664581177	2.47944234130226	88.6343	0.494442
77.5951170581548	7.93600749324009	77.911	9.90186
74.5380244395895	7.52099371302539	74.632	5.60444
74.0463917088842	7.45425992655089	74.5771	5.70821
72.8302437669987	7.28918361380653	73.4709	7.6166
69.3462295836655	6.81630591743941	68.2389	8.47105
68.7709736011712	5.82639371762502	70.1018	4.34543
64.5852092952834	3.95901644677345	64.5769	3.66176
61.5472899086431	2.60372822441031	60.7013	1.36116
61.2020073934678	2.44969129244886	61.5069	0.482106
57.4748216019246	2.86936136668139	56.1254	1.40532
57.4074596453571	3.21295250618347	56.3237	2.07366
56.8379743564984	6.11754517376914	58.2097	7.56071
52.9540001689577	6.67606717090253	52.4925	5.37248
51.2952597453456	6.91459741585122	51.1528	6.04103
49.7074566113546	7.14292632228467	48.6979	8.85907
47.9045376271533	2.41754697356773	48.5894	0.54797
46.9050055818252	2.96886582626384	47.3917	2.23053
42.9566399374089	5.14663341981179	42.0178	3.44287
38.4439310453995	7.63586738833185	38.2491	9.61738
37.3811281209055	6.7405570955275	37.2177	7.79249
32.7530465047662	2.84183499777333	33.1085	0.882753
26.9145553626048	4.914313612321	26.7979	6.90196
24.1210156819924	3.53600633488213	23.5387	4.13129
22.3871987845368	2.68055608013363	23.1984	1.0131
20.781803473749	1.88848570180232	19.7287	0.198716
20.7818026530945	1.88848893951075	19.0116	0.977048
21.1013940835968	2.93124127954821	21.7245	2.01127
22.6282541703726	7.91305231658256	21.4744	8.21886
24.5518079991768	14.1891313466801	22.6997	14.9199
24.5912541658232	14.2699427934275	25.6231	12.6549
25.9419837299325	17.0370263410549	25.7178	17.895
26.4499557483922	18.0776488955147	27.3595	17.3028
27.2653720792909	19.748101134071	26.0672	21.3383
28.1709578184605	19.9080003505905	27.2482	20.2425
31.3705566699709	20.4729708108016	31.0765	22.0815
34.7293935276201	21.0660390735422	34.4638	23.0393
37.0247019090162	21.2796152138492	38.2173	22.874
37.509664228541	18.8058051796509	36.0033	17.5038
39.3899827586501	18.1431134921064	39.9475	19.2268
40.8467410799995	17.6297004640482	41.7205	19.4188
43.8882710907506	15.6811524206049	43.8962	13.6901
48.1541216378648	18.4622482144311	47.6864	20.3976
49.5502062313031	18.3172801372482	49.4944	16.327
49.9525087683941	18.3363964367384	49.4045	19.961
50.8428189507878	18.3786656420726	50.9211	16.4053
54.3001446952054	18.5430312215106	54.7387	20.4852
56.3655894322377	17.436990991411	55.9929	17.1432
59.2680692423279	15.8827260433493	58.7637	13.9566
66.0701549745784	15.7428006479013	67.267	14.1516
66.070159282615	15.7428110034235	68.0574	15.6194
63.7679523386211	20.3024716781976	62.8285	19.7058
60.2996114834228	27.1717543312715	62.0154	28.1819
57.0856350061355	31.9038106855745	55.099	31.771
57.5171698179719	32.7680417298493	56.0389	33.1015
58.7302554284045	35.1975847276054	60.6972	35.5066
57.4585047981695	36.4962237935687	55.5492	35.9315
57.6044755983064	37.2172413023426	55.717	37.8511
57.7161151377602	37.4493967833626	56.9788	35.9946

Solution x	Solution y	Original x	Original y
59.5604264023099	41.2845456995349	61.5258	41.6034
55.2892926508151	45.6899869977052	53.4254	44.9898
55.5961738933836	51.674755719509	54.0007	52.8659
58.4430887675318	52.6800206985061	57.8122	54.5104
60.8560959378085	53.5318963582473	62.6521	52.6724
58.7827756231624	59.4173504195103	58.3448	60.9201
58.6839995241142	59.6977436834233	59.9164	58.75
58.2666632864846	60.8824226111759	59.9164	61.9972
56.1703032956472	62.7247472982312	56.0439	62.2937
53.0229935037456	65.4906704353596	51.793	64.9464
52.2741591499903	66.1487610038881	52.5118	68.1256
49.1049342147872	64.4920439670892	48.6743	62.5481
46.9739292565002	67.2775974039092	45.2184	66.3382
46.1530030471796	69.6771064795728	46.3399	71.17
46.0386948041015	70.01122438803	47.6475	71.1843
42.095497700391	72.9494190331925	41.4131	74.8199
41.2262715875368	69.2503397109815	43.1006	68.5786
40.853156877865	68.4925396100086	42.1545	66.9856
37.0951763733386	67.283033775155	35.9094	68.8825
33.5830896911884	62.2178395761636	32.641	61.5676
33.1905090140473	61.6516522811762	31.2678	61.1344
34.2848069205262	61.1378962915708	33.4192	59.483
40.0529410849536	58.4299380950905	41.7302	58.1199
40.2436683323602	58.3403918758104	40.6271	60.1839
42.0376108280665	57.4981145194694	43.5841	58.7522
42.4630683468948	55.6880383741665	44.4217	55.3301
40.5642954831625	52.8666005951334	41.6783	52.1535
38.4260514335187	49.6893536343552	38.5534	48.7846
37.7562888347992	48.6941374582918	37.4105	49.4356
36.6531063605586	47.054896570513	38.1612	45.7549
34.7690528258296	45.333511112761	33.2771	46.652
33.3762672322943	43.3702223832502	31.4339	43.8079
33.918789484626	40.2793983850237	34.4656	38.8185
33.9676454811349	40.0010665090703	32.7353	38.4372
45.4166049553107	40.7147177285969	46.2037	41.7062
46.2428028063193	40.7662175387835	47.522	42.292
47.1272845201995	32.98025955648	49.1148	32.8614
46.4988411644297	30.3270865393443	44.5404	30.686
46.0520155090403	26.9075267908384	46.0829	25.5503
45.9915675604056	26.4449203408788	47.6331	25.3181
43.474812668235	25.077856390371	42.4972	23.9973
43.1631385050773	24.908561933849	42.987	22.9253
38.2408619175602	28.8463432202957	37.0272	27.4581
36.8672104986558	29.9452797331632	37.7688	31.4408
36.4199884208331	30.3030562659333	36.8488	32.2474
32.27919009449	29.2870741144702	31.6686	31.1822
29.5911992025311	28.2048243786163	29.1053	29.2049
27.3221593379189	27.2912509381442	27.4222	25.8428
26.5578151738924	26.9835089819307	25.8125	25.1372
24.36626997505	31.8820414270763	25.7714	33.2927
23.1556744746251	32.4179646869738	22.7183	34.3604
22.6948818751297	31.8830494826516	23.2874	32.7742
20.8173699835642	29.7035433112212	19.5262	30.4483
20.0043780952209	28.7597735769569	20.3288	28.022
19.3999309615917	28.0580951063874	19.247	29.2712
16.5326394965709	24.7295698247155	15.3897	25.3897
15.2758939918938	23.2706599884187	15.3759	23.0999
14.11646957545	21.924726663243	13.4	22.8874
11.9446653550217	19.4035447396497	9.96077	19.2347
14.1863146079052	17.5538923914613	15.6444	17.8995
14.6008112876822	17.2118724889282	15.6993	18.7479
15.4865086719745	16.4810357236499	17.2907	17.3232
15.4542127982294	12.1777335605361	17.1854	11.1942
14.0291740909264	11.3138021233555	14.8737	9.51072
12.4564208261504	10.7731898709777	10.9524	12.0779
11.3668875861369	5.08881370777628	12.7116	4.29147
11.2130276561544	4.28608922751813	10.9477	2.73525
11.169945970348	4.06132623324648	12.6307	2.70835
9.89523866079742	3.7140826693179	8.57052	3.36732
9.52461599804487	3.61312326380358	9.0496	1.67955
6.16394299723541	6.72972696167626	6.43447000000001	8.70233
4.16392823530281	5.7007323529978	4.96047	4.06059
2.70705022578507	4.9511952310296	2.00806	6.28968
1.32577183086195	4.24054984106433	0.219756000000004	2.58493
1.79392207405083	9.9175697541872	2.19732	10.251
1.98858733847341	12.2781712516927	0.613562000000002	12.2624
2.31562744011592	16.243903459139	2.68873000000001	16.3883
2.54882549613662	19.0717274836583	0.659450000000007	19.6999
3.8784023711966	21.1939905077948	5.81823	20.7452
3.59181620421631	23.9153311410935	2.38826	24.0295

Solution x	Solution y	Original x	Original y
3.4127733151273	25.6154197127982	2.1823	25.6845
3.27940942217886	26.8817216769617	5.25835000000001	27.1001
3.23716160746201	27.2475982113315	4.056	25.9589
3.05288090184412	28.8434099511011	3.44571000000001	28.2052
2.34021424142347	35.014311422071	0.642905999999996	35.395

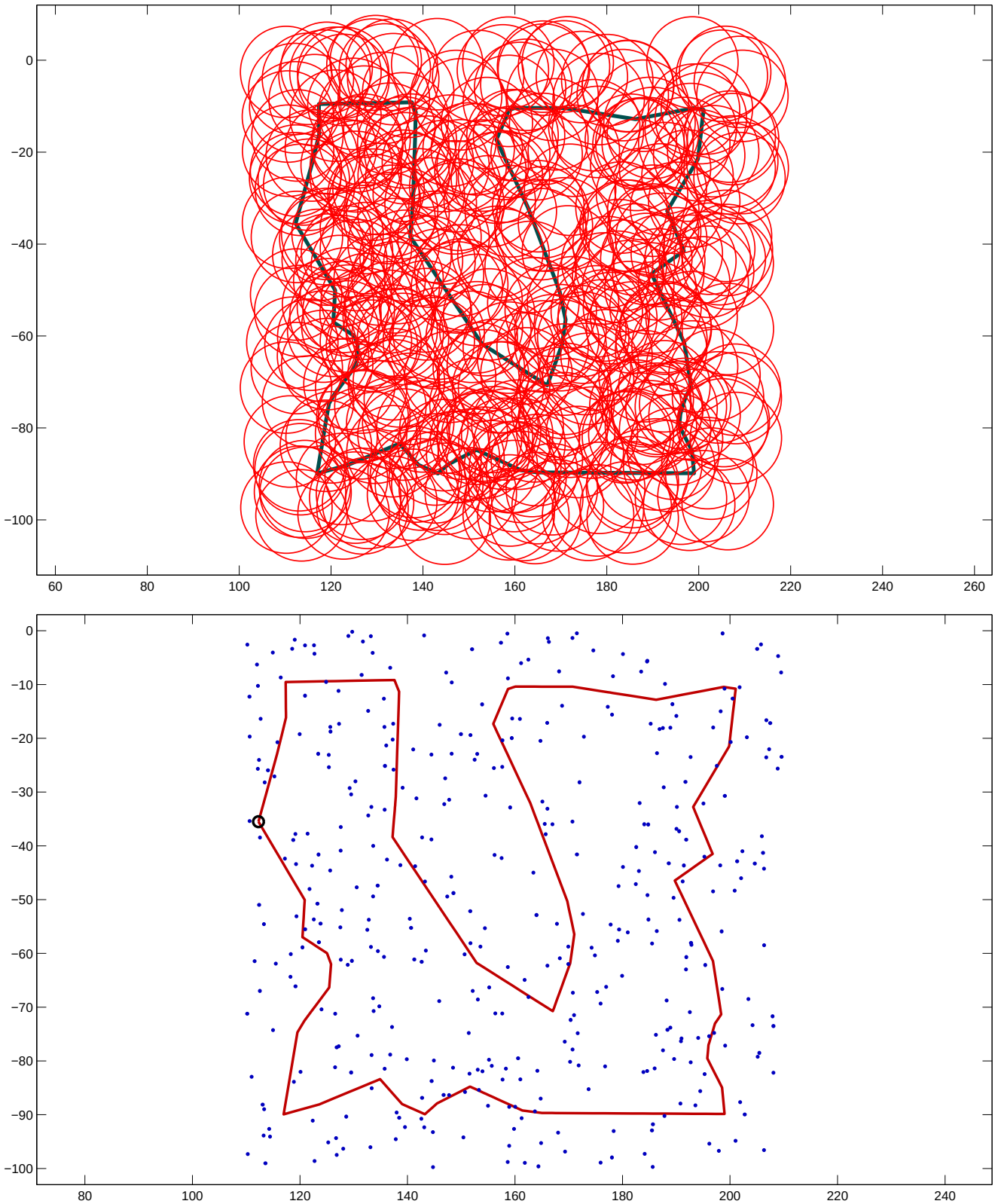


Figure N.18: $rd400$, $r = 9.955309$, Equal Radius, 2D, Euclidean, Length = 466.1016556

Table N-21: Solution for $rd400$, $r = 9.955309$, Equal Radius, 2D, Euclidean

Total distance: 466.101655568714 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
3.31765286468689	37.257912735912	0.642906	35.395
3.31765286468689	37.257912735912	2.57158	38.4711
4.49549176720646	39.2497202682727	9.16001	37.8018
4.49549176720646	39.2497202682727	8.75416	38.928
5.53491764971346	41.0074618904823	11.4258	37.7412
6.58387045523378	42.7813154931438	7.21925	42.3799
7.64835929549216	44.5814404949504	9.27453	43.3967
7.64835929549216	44.5814404949504	12.2621	43.6923
8.65743609848025	46.2878557474071	11.7937	48.0467
8.65743609848025	46.2878557474071	13.2524	50.7626
9.29369104960236	47.3637944665602	13.4598	41.6191
10.0642213327791	48.6668012875784	15.6372	44.5891
10.8866679710834	50.0576010459172	20.5641	47.7219
10.8136011705476	51.2668727475758	9.35554999999999	53.1101
10.8136011705476	51.2668727475758	10.9638	55.5178
10.7513530323818	52.2969361100418	2.40393	50.9808
10.6822578483757	53.4405288646493	12.5872	53.6987
10.6129959119938	54.5868676869097	13.8308	54.4775
10.5429901142736	55.745507601957	3.30116	54.5758
10.468082175358	56.985514144088	1.5771	61.4642
11.2723224513248	57.5092281126094	8.30742000000001	60.1487
11.2723224513248	57.5092281126094	5.52590000000001	61.9092
12.1891371131544	58.1062543418665	10.4725	58.878
12.1891371131544	58.1062543418665	13.5318	57.9262
13.1193510407647	58.7120083665732	17.8085	51.9553
14.0727451140755	59.3328857348903	17.5187	55.1629
15.0324697882529	59.9578983697904	22.8193	53.7552
15.1982977386598	60.4099257661793	22.5447	55.6169
15.3845240654226	60.9175472514283	23.2085	58.8069
15.3845240654226	60.9175472514283	24.5176	59.5849
15.5206914233365	61.2887201199646	19.6656	61.3862
15.6550517303245	61.6549683705303	17.6011	61.1721
15.6550517303245	61.6549683705303	18.9042	62.1271
15.7885904956661	62.0189772526434	25.6513	60.6643
15.5680755203913	64.8197264570461	23.6206	68.344
15.4476748216783	66.348959519834	24.7619	69.8637
14.967690105523	66.9894965626638	16.576	71.2313
14.967690105523	66.9894965626638	23.7167	70.7298
13.9915781123324	68.2921688985792	14.0141	70.4084
13.0551268381231	69.5419118537519	8.25408	64.3565
12.0081465340581	70.9391812203775	9.17265	66.1356
10.8206714224813	72.5239725288536	2.55217	66.9796
9.53673624330813	74.6740859430984	0.194864999999993	71.2335
8.85698724765152	78.6968706823512	4.99968	74.2733
8.85698724765152	78.6968706823512	10.1219	82.045
7.93387793637265	84.1599986510318	1.02508	82.9527
7.93387793637265	84.1599986510318	3.06059000000001	88.1315
7.47493232270838	86.8759153345651	8.89064000000001	83.8954
7.47493232270838	86.8759153345651	3.35356	88.986
6.95921124548258	89.927874256893	0.299018	97.3272
7.02592955315095	89.9092243736998	4.28894	92.6489
7.02592955315095	89.9092243736998	4.45068999999999	94.0863
7.09776785214882	89.8891428248557	3.24988	93.8751
7.09776785214882	89.8891428248557	3.57801000000001	99.0366
9.06655049830083	89.3389417227211	15.2733	95.1553
10.2361905899338	89.0120499254797	12.7313	98.6134
13.6025189415846	88.0712398752703	16.854	97.4806
14.3985243744916	87.7413074755672	12.3803	91.1149
15.2559106115085	87.3859340022852	16.7243	94.3593
16.1498881017669	87.0153941715708	18.064	96.3276
17.6514768733441	86.3930322889316	18.6101	90.3489
19.1826799576311	85.7583957100054	16.5471	81.1813
19.1826799576311	85.7583957100054	19.5225	82.1483
20.6954428602724	85.1314027131674	16.8354	77.4785
22.3244736986111	84.4562171036031	20.7262	75.308
22.3244736986111	84.4562171036031	17.2306	77.2747
23.2343047624223	84.079097407034	23.3569	85.0798
24.1160439366755	83.7136212715835	23.3293	78.9181
24.8958833967863	83.3903807559799	27.1361	73.6904
25.9515612852094	84.5844035391103	26.7929	78.8352
27.2671951637741	86.0724282683325	25.7615	81.4539
28.9958400190116	88.0275317505061	23.1083	96.0553
29.714288775422	88.3472623374011	32.7208	86.88
29.714288775422	88.3472623374011	27.9893	89.6021
30.4217996894418	88.6621233204075	28.4623	90.5817
31.1402949811278	88.9818723195736	27.8353	94.5623
31.8638230045031	89.3038610551529	29.5533	92.3189
32.5748167068523	89.6202741783952	33.1283	92.3481
33.2343017610966	89.9137694506648	34.7579	99.7518
33.6825115042801	89.5158349662594	34.7487	93.2543
34.1475513851774	89.1029609994133	32.5896	90.759
34.6283425409023	88.6761076790284	36.723	86.3354
34.6283425409023	88.6761076790284	37.7453	86.3505
35.0701715323928	88.2838415832158	34.4937	83.7515
35.4955814475005	87.9061503738449	29.8827	79.684
38.3345343557733	86.4568340604695	34.9224	79.9328
41.6335019892848	84.7727699934202	41.4131	74.8199
42.0836078770955	84.9779602042132	45.1636	79.7971
42.5343981869306	85.183462675925	38.4806	81.2568
42.5343981869306	85.183462675925	41.546	82.3742
43.0488239784187	85.4179705199333	43.0779	81.6476
43.5761639869554	85.6583660365037	43.9629	81.9344
43.5761639869554	85.6583660365037	45.6946	80.9262
44.1144289010857	85.9037420529105	48.3206	81.4332
44.6272693333976	86.1375312655178	47.7087	83.4773
45.1261944174644	86.3649795451449	40.7053	85.7824
45.1261944174644	86.3649795451449	43.3068	85.4106
45.6784075287112	86.6167189570944	50.5772	79.5094
45.6784075287112	86.6167189570944	44.9959	88.3516
46.1926248050709	86.8511344325643	48.934	88.5471
46.1926248050709	86.8511344325643	50.0418	88.5256
46.6586856715668	87.0635991621365	51.2472	90.6526
47.0876141239627	87.2591385890026	40.4171	94.2218
49.4180222015335	88.3212232917807	48.9418	95.7946
51.3782274497165	89.2146361591996	48.6626	98.7924
52.2019846589263	89.3180000129009	49.8328	92.6571
53.0748015634858	89.4275221898674	54.8665	95.2849
53.8835194225176	89.5289990625524	51.8363	98.9629
55.0191969793668	89.671534849947	54.3707	99.6057
55.7210086083824	89.6753756993963	59.3326	96.8644
56.3073976137668	89.6785832175254	58.0371	93.3465
56.8871480984415	89.6817544591363	54.7886	87.0165
56.8871480984415	89.6817544591363	53.7144	89.3849
57.5450361798714	89.6853578147353	50.9984	83.4341
57.5450361798714	89.6853578147353	54.169	81.8375
61.2313924352305	89.7057277792876	61.8453	80.8454
64.4837454800754	89.723678276381	66.7645	81.0279
64.4837454800754	89.723678276381	63.6977	85.2552
66.5695997279076	89.7351727312812	65.9332	98.9174
68.9076760264722	89.7480566755446	68.3546	93.0491
68.9076760264722	89.7480566755446	68.0526	97.9535
71.7803130071705	89.7638946652722	75.6586	91.7899
71.7803130071705	89.7638946652722	75.4786	92.9344
73.7164949697387	89.7745505285092	74.1314	97.2935
75.6094734846698	89.7849583365035	75.6359	99.7073
76.7663916865351	89.7913783105502	73.8931	82.0767
78.263504871983	89.7996827491485	74.5996	81.8744
81.1108028103378	89.8153976751697	77.8131	90.2453
81.1108028103378	89.8153976751697	86.1563	95.4019
83.1501962140414	89.8266738203276	80.7777	87.9354
83.1501962140414	89.8266738203276	83.5669	88.2708
85.4877631517443	89.8395783627522	87.9339	96.7331
87.3996746491801	89.850155054748	91.0373	94.8618
88.9808306561081	89.8589219057791	96.3227	96.5824
88.8342740865038	88.2905129695473	92.7385	89.9534
88.6778309845484	86.6162877313978	84.4594	85.6238
88.6778309845484	86.6162877313978	91.8947	87.6684
88.5228627297963	84.9578198593098	98.0879	82.1977
87.8156205121311	83.5607563340597	95.1537	79.2325
87.146911480119	82.2398145838302	95.4573	78.5053
86.4348415539851	80.8332264186243	82.6909	80.2719
86.4348415539851	80.8332264186243	85.2864	82.465
85.7723999340015	79.5246777370157	75.9957	81.402
85.8848515703197	78.2674365229567	77.5352	78.0347
85.9944948726287	77.0415989052289	76.2214	75.1456
86.1428292381519	76.5518238465847	78.3667	74.2083
86.2878077875648	76.073134331731	79.6042	79.6519
86.4570260095418	75.5144026472473	80.9911	75.8316
86.4570260095418	75.5144026472473	80.8889	76.3527
86.6381703140907	74.9162940392192	84.0931	75.7357
86.6381703140907	74.9162940392192	86.1254	75.412
86.8182362446925	74.3217483001924	78.9206	73.8168
87.0110320016585	73.6851727426681	87.0562	74.7862
87.2081664436213	73.0342696270934	78.2186	68.7569

Solution x	Solution y	Original x	Original y
87.6944418983842	72.3142490378585	89.1084	77.1611
88.3584201276042	71.3307314178063	98.0725	73.509
88.2868174734687	70.8660002287016	97.9153	71.697
88.0362202843468	69.2393736086593	82.5413	70.9361
88.0362202843468	69.2393736086593	94.2046	73.3577
87.5463443831111	66.0593570996617	88.5712	66.6382
87.5463443831111	66.0593570996617	93.4248	68.5015
86.8317988553017	61.4206321364863	96.3481	58.4969
86.21257415708	60.1165512377286	88.4474	55.9131
85.6510598031389	58.9340078017445	81.8209	62.9891
85.0491600607697	57.6664123205741	82.7455	58.0479
85.0491600607697	57.6664123205741	85.3959	62.1638
84.3787800151022	56.2545966025612	81.8774	60.6902
84.3787800151022	56.2545966025612	82.834	58.4111
83.6033504611051	54.6215473908087	75.5117	58.1702
83.6033504611051	54.6215473908087	76.3859	55.8636
82.9427625109236	53.2303682661669	80.6139	53.7748
82.3033159977337	51.883713252911	74.8357	53.7031
81.7268544589812	50.6697048527335	86.8559	48.4797
81.1473081879228	49.4492068639059	74.6616	49.1772
81.1473081879228	49.4492068639059	79.5061	49.6701
80.6572658429006	48.4172047518208	72.4782	47.1166
80.3220040562744	47.7111656837661	81.1997	46.621
79.9979511611828	47.0287314614908	73.064	44.6995
79.7270417588408	46.4582145224371	70.0979	43.9308
80.0957569416664	46.1981386687031	72.565	40.2263
80.0957569416664	46.1981386687031	76.05	41.1841
81.2618109414724	45.3755577060818	78.6058	43.2582
82.4454494857496	44.5405789891052	81.4209	43.6493
83.6414766961584	43.6968627854997	85.2354	42.0312
84.7794171412505	42.894135106984	91.3249	42.8902
84.7794171412505	42.894135106984	90.8764	48.3318
84.7794171412505	42.894135106984	92.0634	46.0336
85.5330789909036	42.3625017918228	88.1955	43.6361
86.2677454765312	41.8442694091282	92.3029	41.017
86.2677454765312	41.8442694091282	94.61	43.2995
86.760148647171	41.4969452387901	96.3235	44.2629
86.6369751394794	41.1999841327949	96.1419	41.3034
86.4329480521311	40.7080400072861	95.9404	38.2332
85.5265981119405	38.5220105828083	81.8496	38.8539
84.6588532586773	36.4291137764882	80.0506	36.8529
84.6588532586773	36.4291137764882	80.5435	37.2793
83.8976326480522	34.593119288652	74.7866	36.0265
83.4819181049765	33.5905902300689	74.0572	35.987
83.2958380982575	33.1419232641845	80.1207	32.7664
83.2958380982575	33.1419232641845	81.7106	28.112
83.1385697811546	32.7627482298317	73.2088	32.0501
84.0311393739797	31.2614420853796	85.0689	32.1301
84.9266540361442	29.7551809582975	77.6794	29.1288
86.0619105820375	27.8456597855236	89.036	30.7257
87.2585163045191	25.8329446046007	82.6839	23.4883
88.476420358246	23.7844057629853	87.5589	25.1226
89.787748574558	21.5787186036418	98.8743	25.646
89.8076700407855	21.5155496196099	96.7473	23.5618
89.8076700407855	21.5155496196099	97.2905	22.0419
89.8272858429443	21.4533454400767	90.11	20.7153
89.8272858429443	21.4533454400767	93.1464	19.8146
89.8467277202037	21.3916895935211	99.5853	23.4577
90.1159384956254	19.0280148605709	97.4766	17.1802
90.3270064124972	17.1749366799592	86.8707	18.0065
90.3270064124972	17.1749366799592	88.2698	14.9994
90.5382350854119	15.3203971847174	96.7716	16.6523
90.7574351816441	13.3958482297346	90.4883	12.6216
90.9707750754973	11.5227380681716	99.5164	7.77478
91.0216020984889	11.0766154455591	91.7898	10.5225
91.0216020984889	11.0766154455591	95.0473	3.39817
91.0547255302607	10.7858724561476	98.9579	4.73211
90.8217170343372	10.7506543047963	95.7659	2.55349
89.826267454102	10.6001415202323	88.9914	10.7701
88.8201973762789	10.4480168352274	88.6343	0.494442
84.2324446596907	11.3178506457053	79.2919	13.6517
81.3582452649362	11.8628247620384	78.906	18.0381
81.3582452649362	11.8628247620384	80.035	15.8589
79.502709188266	12.2146571500372	77.911	9.90186
77.7311114650004	12.5505803854852	76.9072	18.2917
77.7311114650004	12.5505803854852	77.5205	18.1054
76.2569425228487	12.8301097790662	76.419	22.7841
71.6111604485538	12.1051524941299	68.0574	15.6194
68.2016270481214	11.5730647584082	62.8285	19.7058
67.9797911975818	11.5384492098437	67.267	14.1516

Solution x	Solution y	Original x	Original y
67.9797911975818	11.5384492098437	75.2455	17.3084
67.6741791456273	11.4907622558727	73.4709	7.6166
67.3477156937847	11.4398214447182	74.5771	5.70821
67.3477156937847	11.4398214447182	74.632	5.60444
65.7860362897185	11.1961181046424	68.2389	8.47105
65.7860362897185	11.1961181046424	70.1018	4.34543
63.2778602733326	10.8046952837099	64.5769	3.66176
60.7297687540848	10.4070375118845	61.5069	0.482106
59.4902003403441	10.405216258655	60.7013	1.36116
57.9034112927694	10.4028800318763	58.7637	13.9566
57.9034112927694	10.4028800318763	58.2097	7.56071
56.4000122204909	10.400668651964	56.3237	2.07366
54.9240106708557	10.3984938292006	52.4925	5.37248
53.6160048036502	10.3965666650648	56.1254	1.40532
50.0779960187045	10.3913578138211	48.5894	0.54797
49.6192682960865	10.5341302116017	48.6979	8.85907
49.6192682960865	10.5341302116017	51.1528	6.04103
49.1650489591468	10.675501074233	47.3917	2.23053
48.703508147321	10.8191499436019	42.0178	3.44287
47.2141202800093	14.3431509214954	43.8962	13.6901
47.2141202800093	14.3431509214954	49.4944	16.327
45.9568736906631	17.3178940448658	36.0033	17.5038
46.3517548419065	18.1627618714591	41.7205	19.4188
46.7622493831019	19.0410333157037	38.2173	22.874
46.7622493831019	19.0410333157037	39.9475	19.2268
47.2419642960585	20.0674286351725	50.9211	16.4053
47.7518720742738	21.1584257525661	54.7387	20.4852
47.7518720742738	21.1584257525661	55.9929	17.1432
48.2289700091329	22.1792101362045	47.6864	20.3976
48.2289700091329	22.1792101362045	49.4045	19.961
48.7582232810868	23.3115872033721	42.987	22.9253
49.3630081119449	24.6055732347833	42.4972	23.9973
50.1411950814734	26.2705764318591	46.0829	25.5503
50.1411950814734	26.2705764318591	47.6331	25.3181
51.1340713102648	28.3949410492072	44.5404	30.686
51.1340713102648	28.3949410492072	49.1148	32.8614
52.0288919138681	30.3094968543049	55.099	31.771
52.8415916374316	32.0483475787573	62.0154	28.1819
53.66203504624	34.2244586170441	60.6972	35.5066
54.2917749279721	35.8947190716244	55.717	37.8511
54.2917749279721	35.8947190716244	56.0389	33.1015
54.9338223002756	37.5976397950114	55.5492	35.9315
54.9338223002756	37.5976397950114	56.9788	35.9946
55.6689291833965	39.5474262732917	46.2037	41.7062
55.6689291833965	39.5474262732917	47.522	42.292
55.6689291833965	39.5474262732917	53.4254	44.9898
55.6689291833965	39.5474262732917	61.5258	41.6034
59.725357152484	50.3061671059683	69.2786	47.5055
60.0197624460059	51.6890479990342	54.0007	52.8659
60.3236231254967	53.1163216558121	57.8122	54.5104
60.6221540716684	54.5185313685427	69.3672	55.5594
60.829178032852	55.4908860294394	67.8108	54.6502
61.0336138601143	56.4510772592595	70.983	56.1077
60.7255440444222	58.6252428530582	69.1414	57.6653
60.2784996850739	61.7804382721087	69.9395	64.1832
60.2228866261264	61.9342331088125	66.9764	66.2314
60.1689444535661	62.0834074297876	62.6521	52.6724
60.1689444535661	62.0834074297876	64.2573	58.953
60.1689444535661	62.0834074297876	64.8783	60.379
59.7062859674072	63.3628801923434	59.9164	58.75
59.1537904680762	64.8907934000084	58.3448	60.9201
58.5097907894838	66.6717568976753	65.3011	67.1869
58.5097907894838	66.6717568976753	65.9297	69.3415
57.7512222260729	68.7695696227404	61.6789	74.8507
57.2562750060696	70.138348546369	60.7208	77.8844
57.0351861936499	70.7497802181031	60.2539	80.1704
56.4012667712752	70.3475915235187	59.2712	76.4167
55.6098590782566	69.8454842520126	60.356	72.3736
55.6098590782566	69.8454842520126	60.9907	71.4945
54.4413812928625	69.1041410658498	59.9164	61.9972
54.4413812928625	69.1041410658498	60.771	67.3196
52.7140608856432	68.0082227607642	56.0439	62.2937
51.081914735202	66.9726893409516	51.793	64.9464
51.081914735202	66.9726893409516	52.5118	68.1256
49.4368461877044	65.9289569282361	46.3399	71.17
49.4368461877044	65.9289569282361	47.6475	71.1843
47.6306160957902	64.7829721867615	45.2184	66.3382
47.6306160957902	64.7829721867615	48.6743	62.5481
46.0296716740272	63.7672386189843	43.1006	68.5786
44.4447269736594	62.7616561967515	42.1545	66.9856

Solution x	Solution y	Original x	Original y
42.8627458698805	61.7579529453417	35.9094	68.8825
40.5279787047303	58.2687771814863	32.641	61.5676
39.1013829995437	56.1367596119475	31.2678	61.1344
37.8451189444976	54.2592956890269	30.4468	53.5688
37.8451189444976	54.2592956890269	30.6696	55.2626
37.8451189444976	54.2592956890269	37.4105	49.4356
37.8451189444976	54.2592956890269	38.5534	48.7846
37.8451189444976	54.2592956890269	33.4192	59.483
37.8451189444976	54.2592956890269	41.6783	52.1535
37.8451189444976	54.2592956890269	41.7302	58.1199
37.8451189444976	54.2592956890269	40.6271	60.1839
37.8451189444976	54.2592956890269	44.4217	55.3301
37.8451189444976	54.2592956890269	43.5841	58.7522
35.0724770263976	50.1156063677419	38.1612	45.7549
32.9060858383932	46.8779893208553	28.6889	43.6077
32.9060858383932	46.8779893208553	33.2771	46.652
31.557819520663	44.8630376971121	23.6126	49.4214
30.4747446331953	43.2444101099772	24.4594	47.3987
29.3977310964504	41.6348383607254	31.4339	43.8079
29.3977310964504	41.6348383607254	32.7353	38.4372
28.2525180981779	39.9233541419789	23.6339	40.0124
28.2525180981779	39.9233541419789	26.2003	42.5604
27.2206323872106	38.3812368350453	17.5856	40.8861
27.332166146483	37.0071752294769	17.6023	36.5196
27.4749740046785	35.2472443075112	22.7183	34.3604
27.4749740046785	35.2472443075112	23.2874	32.7742
27.59878990692	33.7214056763444	19.5262	30.4483
27.59878990692	33.7214056763444	19.247	29.2712
27.6379356444789	33.2389785166852	20.3288	28.022
27.667825246021	32.8706238237526	25.7714	33.2927
27.667825246021	32.8706238237526	29.1053	29.2049
27.6965423626232	32.516720785745	31.6686	31.1822
27.72501579958	32.1658165806633	34.4656	38.8185
27.72501579958	32.1658165806633	36.8488	32.2474
27.8291959048569	30.8818394978233	37.7688	31.4408
27.9257501266007	27.8004749958509	37.0272	27.4581
28.007479403503	25.1923534488948	25.8125	25.1372
28.007479403503	25.1923534488948	27.4222	25.8428
28.0919922474579	22.495257317707	27.2482	20.2425
28.0919922474579	22.495257317707	31.0765	22.0815
28.1649462522738	20.1670392254724	34.4638	23.0393
28.2579694991336	17.1982119097391	26.0672	21.3383
28.2579694991336	17.1982119097391	22.6997	14.9199
28.2579694991336	17.1982119097391	25.7178	17.895
28.3725907153714	13.539890117491	27.3595	17.3028
28.3725907153714	13.539890117491	25.6231	12.6549
28.3725907153714	13.539890117491	26.7979	6.90196
28.4418997173029	11.3282308001403	38.2491	9.61738
28.0906902492338	10.4405756436315	37.2177	7.79249
27.586497038752	9.16621152399626	33.1085	0.882753
24.6343710690924	9.21962508130519	21.4744	8.21886
24.6343710690924	9.21962508130519	23.5387	4.13129
22.5111467379465	9.25804726054172	21.7245	2.01127
22.5111467379465	9.25804726054172	23.1984	1.0131
20.3289336824198	9.29753377676895	19.7287	0.198716
18.4704245875885	9.33115559702003	17.1854	11.1942
16.7140751150121	9.36292983104023	19.0116	0.977048
13.7700556723852	9.41618680412963	9.0496	1.67955
12.8296556092888	9.43319289288401	14.8737	9.51072
12.8296556092888	9.43319289288401	12.7116	4.29147
11.8506334788046	9.4508970769877	12.6307	2.70835
10.8250224180684	9.46944274296103	10.9524	12.0779
9.78581537067893	9.48823459734183	8.57052	3.36732
9.78581537067893	9.48823459734183	10.9477	2.73525
8.73202323345929	9.50728915562832	6.43447000000001	8.70233
8.73202323345929	9.50728915562832	4.96047	4.06059
7.87939880111958	9.52270578002416	0.613562000000002	12.2624
7.87939880111958	9.52270578002416	2.19732	10.251
7.35015487067679	9.53227543859868	0.219756000000004	2.58493
7.36427669659213	11.3151793342195	2.00806	6.28968
7.38918309342037	14.4675079790248	15.6993	18.7479
7.39658804271181	15.4001849767024	5.81823	20.7452
7.39658804271181	15.4001849767024	9.96077	19.2347
7.40268588357851	16.1676222846007	17.2907	17.3232
7.06145314702314	17.5584081579806	15.6444	17.8995
6.63779780049524	19.2851941523637	0.659450000000007	19.6999
6.63779780049524	19.2851941523637	2.68873000000001	16.3883
6.20687421621743	21.0416296780382	13.4	22.8874
6.20687421621743	21.0416296780382	15.3759	23.0999
5.75489571784946	22.8839703679165	15.3897	25.3897

Solution x	Solution y	Original x	Original y
5.0521801123045	25.4393563456827	3.44571000000001	28.2052
5.0521801123045	25.4393563456827	4.056	25.9589
4.45706058770335	27.6034645961167	5.25835000000001	27.1001
3.83186908856415	29.8769088920008	2.1823	25.6845
3.83186908856415	29.8769088920008	2.38826	24.0295

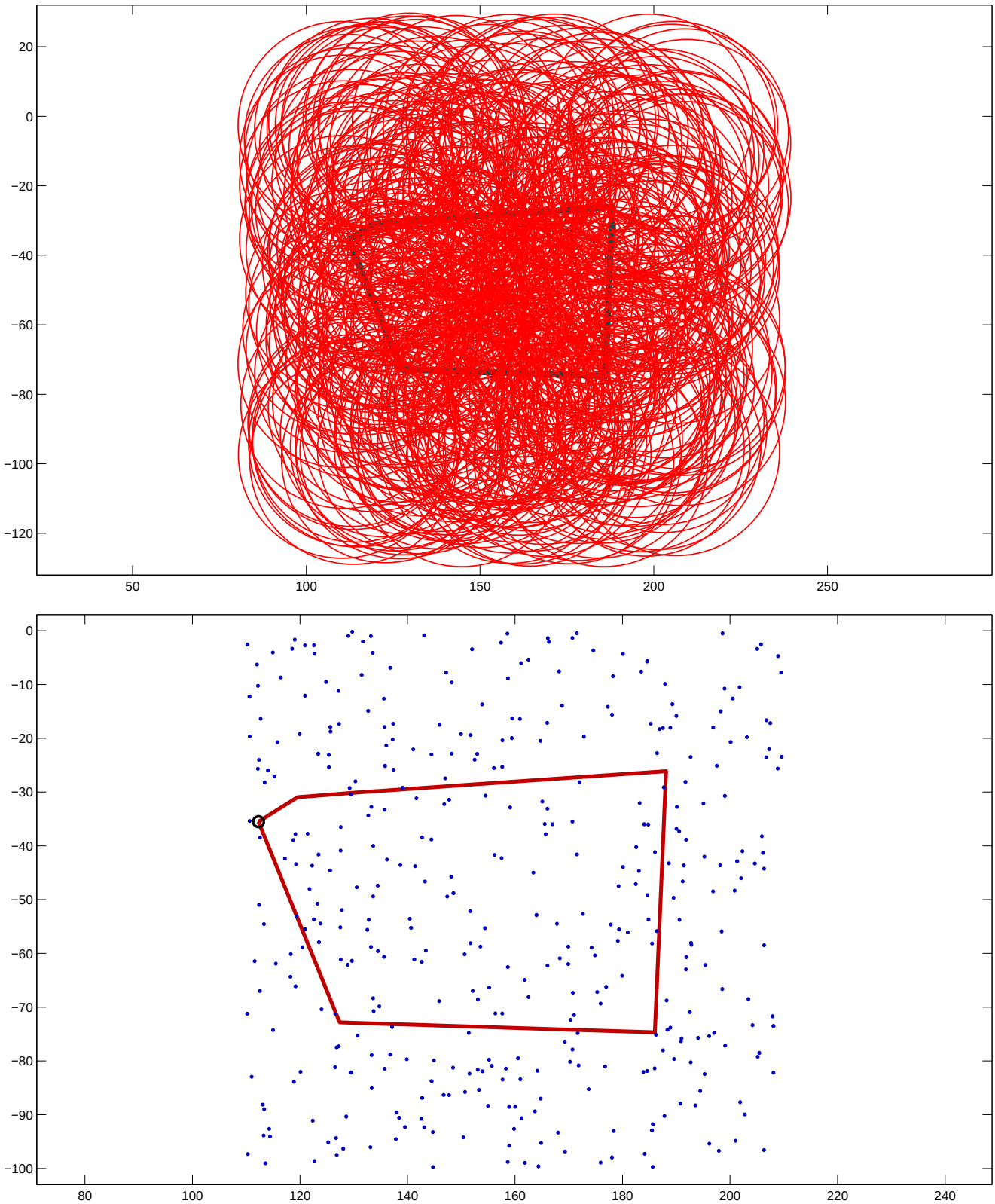


Figure N.19: $rd400$, $r = 29.865927$, Equal Radius, 2D, Euclidean, Length = 224.8386465

Table N-22: Solution for $rd400$, $r = 29.865927$, Equal Radius, 2D, Euclidean

Total distance: 224.838646549811 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
4.2457738818797	34.2807224063639	5.81823	20.7452
4.2457738818797	34.2807224063639	2.38826	24.0295
4.2457738818797	34.2807224063639	0.659450000000007	19.6999
4.2457738818797	34.2807224063639	2.68873000000001	16.3883
5.83285220094605	33.2878825546466	9.96077	19.2347
5.83285220094605	33.2878825546466	10.9524	12.0779
7.20244657385118	32.4310897455864	6.43447000000001	8.70233
7.20244657385118	32.4310897455864	2.19732	10.251
8.42047878898009	31.6691066164374	0.613562000000002	12.2624
8.42047878898009	31.6691066164374	2.00806	6.28968
9.57176057111462	30.9488802590798	0.219756000000004	2.58493
11.4636201841777	30.8010847741048	4.96047	4.06059
13.4058148003112	30.6493473288453	8.57052	3.36732
13.4058148003112	30.6493473288453	9.0496	1.67955
15.9263402456855	30.4524359292226	10.9477	2.73525
18.6666293487139	30.2383964933315	14.8737	9.51072
18.6666293487139	30.2383964933315	12.7116	4.29147
21.9177899256487	29.9842938398444	19.7287	0.198716
21.9177899256487	29.9842938398444	12.6307	2.70835
22.4839847951311	29.9453152037946	19.0116	0.977048
23.0497076190739	29.9063672960147	21.7245	2.01127
23.0497076190739	29.9063672960147	23.1984	1.0131
23.5358543951163	29.8728965779016	21.4744	8.21886
23.5358543951163	29.8728965779016	23.5387	4.13129
24.0201073655483	29.8395562199877	17.1854	11.1942
24.5099054509508	29.8058335737409	46.2037	41.7062
24.5099054509508	29.8058335737409	38.1612	45.7549
24.5099054509508	29.8058335737409	33.2771	46.652
24.5099054509508	29.8058335737409	31.4339	43.8079
24.5099054509508	29.8058335737409	30.4468	53.5688
24.5099054509508	29.8058335737409	32.7353	38.4372
24.5099054509508	29.8058335737409	36.8488	32.2474
24.5099054509508	29.8058335737409	37.7688	31.4408
24.5099054509508	29.8058335737409	28.6889	43.6077
24.5099054509508	29.8058335737409	26.2003	42.5604
24.5099054509508	29.8058335737409	24.4594	47.3987
24.5099054509508	29.8058335737409	37.0272	27.4581
24.5099054509508	29.8058335737409	31.6686	31.1822
24.5099054509508	29.8058335737409	23.6126	49.4214
24.5099054509508	29.8058335737409	22.8193	53.7552
24.5099054509508	29.8058335737409	23.6339	40.0124
24.5099054509508	29.8058335737409	25.7714	33.2927
24.5099054509508	29.8058335737409	29.1053	29.2049
24.5099054509508	29.8058335737409	20.5641	47.7219
24.5099054509508	29.8058335737409	22.7183	34.3604
24.5099054509508	29.8058335737409	23.2874	32.7742
24.5099054509508	29.8058335737409	17.8085	51.9553
24.5099054509508	29.8058335737409	27.4222	25.8428
24.5099054509508	29.8058335737409	17.5187	55.1629
24.5099054509508	29.8058335737409	17.5856	40.8861
24.5099054509508	29.8058335737409	25.8125	25.1372
24.5099054509508	29.8058335737409	15.6372	44.5891
24.5099054509508	29.8058335737409	17.6023	36.5196
24.5099054509508	29.8058335737409	19.5262	30.4483
24.5099054509508	29.8058335737409	20.3288	28.022
24.5099054509508	29.8058335737409	13.8308	54.4775
24.5099054509508	29.8058335737409	19.247	29.2712
24.5099054509508	29.8058335737409	13.2524	50.7626
24.5099054509508	29.8058335737409	13.4598	41.6191
24.5099054509508	29.8058335737409	12.5872	53.6987
24.5099054509508	29.8058335737409	12.2621	43.6923
24.5099054509508	29.8058335737409	11.7937	48.0467
24.5099054509508	29.8058335737409	11.4258	37.7412
24.5099054509508	29.8058335737409	9.27453	43.3967
24.5099054509508	29.8058335737409	15.3897	25.3897
24.5099054509508	29.8058335737409	9.16001	37.8018
24.5099054509508	29.8058335737409	8.75416	38.928
24.5099054509508	29.8058335737409	7.21925	42.3799
24.5099054509508	29.8058335737409	15.3759	23.0999
24.5099054509508	29.8058335737409	13.4	22.8874
24.5099054509508	29.8058335737409	2.57158	38.4711
24.5099054509508	29.8058335737409	5.25835000000001	27.1001
24.5099054509508	29.8058335737409	3.44571000000001	28.2052
24.5099054509508	29.8058335737409	0.642905999999996	35.395
24.5099054509508	29.8058335737409	4.056	25.9589
24.5099054509508	29.8058335737409	2.1823	25.6845
37.3848586485335	28.919391075054	61.5258	41.6034
37.3848586485335	28.919391075054	49.1148	32.8614
37.3848586485335	28.919391075054	56.0389	33.1015
37.3848586485335	28.919391075054	34.4656	38.8185
37.3848586485335	28.919391075054	60.6972	35.5066
37.3848586485335	28.919391075054	55.099	31.771
37.3848586485335	28.919391075054	44.5404	30.686
37.3848586485335	28.919391075054	26.0672	21.3383
37.3848586485335	28.919391075054	22.6997	14.9199
37.3848586485335	28.919391075054	17.2907	17.3232
37.3848586485335	28.919391075054	15.6993	18.7479
37.3848586485335	28.919391075054	15.6444	17.8995
42.5115852614246	28.5664152409018	55.717	37.8511
42.5115852614246	28.5664152409018	56.9788	35.9946
42.5115852614246	28.5664152409018	46.0829	25.5503
42.5115852614246	28.5664152409018	47.6331	25.3181
42.5115852614246	28.5664152409018	42.4972	23.9973
42.5115852614246	28.5664152409018	42.987	22.9253
42.5115852614246	28.5664152409018	38.2173	22.874
42.5115852614246	28.5664152409018	47.6864	20.3976
42.5115852614246	28.5664152409018	49.4045	19.961
42.5115852614246	28.5664152409018	54.7387	20.4852
42.5115852614246	28.5664152409018	34.4638	23.0393
42.5115852614246	28.5664152409018	41.7205	19.4188
42.5115852614246	28.5664152409018	39.9475	19.2268
42.5115852614246	28.5664152409018	31.0765	22.0815
42.5115852614246	28.5664152409018	55.9929	17.1432
42.5115852614246	28.5664152409018	50.9211	16.4053
42.5115852614246	28.5664152409018	49.4944	16.327
42.5115852614246	28.5664152409018	36.0033	17.5038
42.5115852614246	28.5664152409018	43.8962	13.6901
42.5115852614246	28.5664152409018	27.2482	20.2425
42.5115852614246	28.5664152409018	58.7637	13.9566
42.5115852614246	28.5664152409018	27.3595	17.3028
42.5115852614246	28.5664152409018	25.7178	17.895
42.5115852614246	28.5664152409018	48.6979	8.85907
42.5115852614246	28.5664152409018	38.2491	9.61738
42.5115852614246	28.5664152409018	58.2097	7.56071
42.5115852614246	28.5664152409018	37.2177	7.79249
42.5115852614246	28.5664152409018	51.1528	6.04103
42.5115852614246	28.5664152409018	25.6231	12.6549
42.5115852614246	28.5664152409018	52.4925	5.37248
42.5115852614246	28.5664152409018	42.0178	3.44287
42.5115852614246	28.5664152409018	47.3917	2.23053
42.5115852614246	28.5664152409018	26.7979	6.90196
42.5115852614246	28.5664152409018	48.5894	0.54797
42.5115852614246	28.5664152409018	33.1085	0.882753
60.4468044030963	27.3315505688886	67.267	14.1516
60.4468044030963	27.3315505688886	68.2389	8.47105
60.4468044030963	27.3315505688886	56.3237	2.07366
60.4468044030963	27.3315505688886	64.5769	3.66176
60.4468044030963	27.3315505688886	73.4709	7.6166
60.4468044030963	27.3315505688886	56.1254	1.40532
60.4468044030963	27.3315505688886	60.7013	1.36116
60.4468044030963	27.3315505688886	61.5069	0.482106
66.7774516408714	26.8956933301081	70.1018	4.34543
66.7774516408714	26.8956933301081	74.5771	5.70821
66.7774516408714	26.8956933301081	74.632	5.60444
71.42238093536	26.5758891672376	77.911	9.90186
71.42238093536	26.5758891672376	88.9914	10.7701
74.7830691236268	26.3444987350614	90.4883	12.6216
74.7830691236268	26.3444987350614	91.7898	10.5225
77.2133086391822	26.1771685336258	88.6343	0.494442
77.2133086391822	26.1771685336258	95.0473	3.39817
77.8911560120073	26.1304957801043	95.7659	2.55349
78.1079278784566	26.1155697758552	98.9579	4.73211
78.0706155306075	26.9733155467426	97.4766	17.1802
78.0706155306075	26.9733155467426	99.5164	7.77478
77.8282021103505	32.544723465281	96.7716	16.6523
77.3832527691999	42.8001744339055	47.522	42.292
77.3832527691999	42.8001744339055	55.5492	35.9315
77.3832527691999	42.8001744339055	70.0979	43.9308
77.3832527691999	42.8001744339055	69.1414	57.6653
77.3832527691999	42.8001744339055	70.983	56.1077
77.3832527691999	42.8001744339055	72.4782	47.1166
77.3832527691999	42.8001744339055	65.3011	67.1869
77.3832527691999	42.8001744339055	73.064	44.6995
77.3832527691999	42.8001744339055	62.0154	28.1819

Solution x	Solution y	Original x	Original y
77.3832527691999	42.8001744339055	66.9764	66.2314
77.3832527691999	42.8001744339055	72.565	40.2263
77.3832527691999	42.8001744339055	74.6616	49.1772
77.3832527691999	42.8001744339055	69.9395	64.1832
77.3832527691999	42.8001744339055	74.8357	53.7031
77.3832527691999	42.8001744339055	65.9297	69.3415
77.3832527691999	42.8001744339055	75.5117	58.1702
77.3832527691999	42.8001744339055	76.05	41.1841
77.3832527691999	42.8001744339055	76.3859	55.8636
77.3832527691999	42.8001744339055	74.0572	35.987
77.3832527691999	42.8001744339055	74.7866	36.0265
77.3832527691999	42.8001744339055	73.2088	32.0501
77.3832527691999	42.8001744339055	78.6058	43.2582
77.3832527691999	42.8001744339055	79.5061	49.6701
77.3832527691999	42.8001744339055	80.6139	53.7748
77.3832527691999	42.8001744339055	81.1997	46.621
77.3832527691999	42.8001744339055	62.8285	19.7058
77.3832527691999	42.8001744339055	81.4209	43.6493
77.3832527691999	42.8001744339055	80.0506	36.8529
77.3832527691999	42.8001744339055	80.5435	37.2793
77.3832527691999	42.8001744339055	81.8496	38.8539
77.3832527691999	42.8001744339055	77.6794	29.1288
77.3832527691999	42.8001744339055	81.8774	60.6902
77.3832527691999	42.8001744339055	82.7455	58.0479
77.3832527691999	42.8001744339055	80.1207	32.7664
77.3832527691999	42.8001744339055	82.834	58.4111
77.3832527691999	42.8001744339055	78.2186	68.7569
77.3832527691999	42.8001744339055	81.8209	62.9891
77.3832527691999	42.8001744339055	85.2354	42.0312
77.3832527691999	42.8001744339055	86.8559	48.4797
77.3832527691999	42.8001744339055	76.419	22.7841
77.3832527691999	42.8001744339055	68.0574	15.6194
77.3832527691999	42.8001744339055	85.3959	62.1638
77.3832527691999	42.8001744339055	81.7106	28.112
77.3832527691999	42.8001744339055	88.1955	43.6361
77.3832527691999	42.8001744339055	85.0689	32.1301
77.3832527691999	42.8001744339055	88.4474	55.9131
77.3832527691999	42.8001744339055	82.5413	70.9361
77.3832527691999	42.8001744339055	75.2455	17.3084
77.3832527691999	42.8001744339055	76.9072	18.2917
77.3832527691999	42.8001744339055	90.8764	48.3318
77.3832527691999	42.8001744339055	77.5205	18.1054
77.3832527691999	42.8001744339055	82.6839	23.4883
77.3832527691999	42.8001744339055	91.3249	42.8902
77.3832527691999	42.8001744339055	78.906	18.0381
77.3832527691999	42.8001744339055	92.0634	46.0336
77.3832527691999	42.8001744339055	88.5712	66.6382
77.3832527691999	42.8001744339055	89.036	30.7257
77.3832527691999	42.8001744339055	92.3029	41.017
77.3832527691999	42.8001744339055	87.5589	25.1226
77.3832527691999	42.8001744339055	80.035	15.8589
77.3832527691999	42.8001744339055	94.61	43.2995
77.3832527691999	42.8001744339055	79.2919	13.6517
77.3832527691999	42.8001744339055	96.3235	44.2629
77.3832527691999	42.8001744339055	96.1419	41.3034
77.3832527691999	42.8001744339055	95.9404	38.2332
77.3832527691999	42.8001744339055	96.3481	58.4969
77.3832527691999	42.8001744339055	86.8707	18.0065
77.3832527691999	42.8001744339055	90.11	20.7153
77.3832527691999	42.8001744339055	88.2698	14.9994
77.3832527691999	42.8001744339055	93.1464	19.8146
77.3832527691999	42.8001744339055	96.7473	23.5618
77.3832527691999	42.8001744339055	98.8743	25.646
77.3832527691999	42.8001744339055	97.2905	22.0419
77.3832527691999	42.8001744339055	99.5853	23.4577
76.092892372702	72.7339754750132	69.2786	47.5055
76.092892372702	72.7339754750132	86.1254	75.412
76.092892372702	72.7339754750132	87.0562	74.7862
76.092892372702	72.7339754750132	93.4248	68.5015
76.092892372702	72.7339754750132	89.1084	77.1611
76.092892372702	72.7339754750132	94.2046	73.3577
76.092892372702	72.7339754750132	97.9153	71.697
76.092892372702	72.7339754750132	98.0725	73.509
76.092892372702	72.7339754750132	95.4573	78.5053
76.092892372702	72.7339754750132	95.1537	79.2325
76.092892372702	72.7339754750132	91.8947	87.6684
76.092892372702	72.7339754750132	98.0879	82.1977
76.092892372702	72.7339754750132	86.1563	95.4019
76.092892372702	72.7339754750132	92.7385	89.9534
76.092892372702	72.7339754750132	87.9339	96.7331

Solution x	Solution y	Original x	Original y
76.092892372702	72.7339754750132	91.0373	94.8618
76.0085812109809	74.6892451577429	96.3227	96.5824
68.1370871105024	74.4396996492472	62.6521	52.6724
68.1370871105024	74.4396996492472	67.8108	54.6502
68.1370871105024	74.4396996492472	69.3672	55.5594
68.1370871105024	74.4396996492472	60.771	67.3196
68.1370871105024	74.4396996492472	60.9907	71.4945
68.1370871105024	74.4396996492472	60.356	72.3736
68.1370871105024	74.4396996492472	61.6789	74.8507
68.1370871105024	74.4396996492472	59.2712	76.4167
68.1370871105024	74.4396996492472	60.7208	77.8844
68.1370871105024	74.4396996492472	60.2539	80.1704
68.1370871105024	74.4396996492472	61.8453	80.8454
68.1370871105024	74.4396996492472	66.7645	81.0279
68.1370871105024	74.4396996492472	76.2214	75.1456
68.1370871105024	74.4396996492472	54.7886	87.0165
68.1370871105024	74.4396996492472	78.3667	74.2083
68.1370871105024	74.4396996492472	78.9206	73.8168
68.1370871105024	74.4396996492472	63.6977	85.2552
68.1370871105024	74.4396996492472	53.7144	89.3849
68.1370871105024	74.4396996492472	77.5352	78.0347
68.1370871105024	74.4396996492472	73.8931	82.0767
68.1370871105024	74.4396996492472	74.5996	81.8744
68.1370871105024	74.4396996492472	80.9911	75.8316
68.1370871105024	74.4396996492472	80.8889	76.3527
68.1370871105024	74.4396996492472	75.9957	81.402
68.1370871105024	74.4396996492472	79.6042	79.6519
68.1370871105024	74.4396996492472	84.0931	75.7357
68.1370871105024	74.4396996492472	58.0371	93.3465
68.1370871105024	74.4396996492472	82.6909	80.2719
68.1370871105024	74.4396996492472	68.3546	93.0491
68.1370871105024	74.4396996492472	59.3326	96.8644
68.1370871105024	74.4396996492472	85.2864	82.465
68.1370871105024	74.4396996492472	80.7777	87.9354
68.1370871105024	74.4396996492472	77.8131	90.2453
68.1370871105024	74.4396996492472	75.6586	91.7899
68.1370871105024	74.4396996492472	84.4594	85.6238
68.1370871105024	74.4396996492472	75.4786	92.9344
68.1370871105024	74.4396996492472	83.5669	88.2708
68.1370871105024	74.4396996492472	68.0526	97.9535
68.1370871105024	74.4396996492472	65.9332	98.9174
68.1370871105024	74.4396996492472	74.1314	97.2935
68.1370871105024	74.4396996492472	75.6359	99.7073
48.0663628009119	73.8033861419361	64.2573	58.953
48.0663628009119	73.8033861419361	64.8783	60.379
48.0663628009119	73.8033861419361	50.0418	88.5256
48.0663628009119	73.8033861419361	48.934	88.5471
48.0663628009119	73.8033861419361	51.2472	90.6526
48.0663628009119	73.8033861419361	49.8328	92.6571
48.0663628009119	73.8033861419361	40.4171	94.2218
48.0663628009119	73.8033861419361	54.8665	95.2849
48.0663628009119	73.8033861419361	48.9418	95.7946
48.0663628009119	73.8033861419361	48.6626	98.7924
48.0663628009119	73.8033861419361	51.8363	98.9629
48.0663628009119	73.8033861419361	54.3707	99.6057
48.0663628009119	73.8033861419361	34.7579	99.7518
45.8195836764342	73.7321675838513	53.4254	44.9898
45.8195836764342	73.7321675838513	54.0007	52.8659
45.8195836764342	73.7321675838513	44.4217	55.3301
45.8195836764342	73.7321675838513	41.6783	52.1535
45.8195836764342	73.7321675838513	57.8122	54.5104
45.8195836764342	73.7321675838513	38.5534	48.7846
45.8195836764342	73.7321675838513	43.5841	58.7522
45.8195836764342	73.7321675838513	37.4105	49.4356
45.8195836764342	73.7321675838513	41.7302	58.1199
45.8195836764342	73.7321675838513	48.6743	62.5481
45.8195836764342	73.7321675838513	40.6271	60.1839
45.8195836764342	73.7321675838513	59.9164	58.75
45.8195836764342	73.7321675838513	56.0439	62.2937
45.8195836764342	73.7321675838513	58.3448	60.9201
45.8195836764342	73.7321675838513	51.793	64.9464
45.8195836764342	73.7321675838513	59.9164	61.9972
45.8195836764342	73.7321675838513	45.2184	66.3382
45.8195836764342	73.7321675838513	33.4192	59.483
45.8195836764342	73.7321675838513	42.1545	66.9856
45.8195836764342	73.7321675838513	30.6696	55.2626
45.8195836764342	73.7321675838513	52.5118	68.1256
45.8195836764342	73.7321675838513	43.1006	68.5786
45.8195836764342	73.7321675838513	32.641	61.5676
45.8195836764342	73.7321675838513	31.2678	61.1344

Solution x	Solution y	Original x	Original y
45.8195836764342	73.7321675838513	47.6475	71.1843
45.8195836764342	73.7321675838513	46.3399	71.17
45.8195836764342	73.7321675838513	35.9094	68.8825
45.8195836764342	73.7321675838513	41.4131	74.8199
45.8195836764342	73.7321675838513	50.5772	79.5094
45.8195836764342	73.7321675838513	45.1636	79.7971
45.8195836764342	73.7321675838513	24.7619	69.8637
45.8195836764342	73.7321675838513	45.6946	80.9262
45.8195836764342	73.7321675838513	48.3206	81.4332
45.8195836764342	73.7321675838513	27.1361	73.6904
45.8195836764342	73.7321675838513	43.0779	81.6476
45.8195836764342	73.7321675838513	54.169	81.8375
45.8195836764342	73.7321675838513	43.9629	81.9344
45.8195836764342	73.7321675838513	23.7167	70.7298
45.8195836764342	73.7321675838513	38.4806	81.2568
45.8195836764342	73.7321675838513	34.9224	79.9328
45.8195836764342	73.7321675838513	41.546	82.3742
45.8195836764342	73.7321675838513	50.9984	83.4341
45.8195836764342	73.7321675838513	47.7087	83.4773
45.8195836764342	73.7321675838513	29.8827	79.684
45.8195836764342	73.7321675838513	43.3068	85.4106
45.8195836764342	73.7321675838513	26.7929	78.8352
45.8195836764342	73.7321675838513	34.4937	83.7515
45.8195836764342	73.7321675838513	40.7053	85.7824
45.8195836764342	73.7321675838513	37.7453	86.3505
45.8195836764342	73.7321675838513	36.723	86.3354
45.8195836764342	73.7321675838513	23.3293	78.9181
45.8195836764342	73.7321675838513	44.9959	88.3516
45.8195836764342	73.7321675838513	25.7615	81.4539
45.8195836764342	73.7321675838513	32.7208	86.88
45.8195836764342	73.7321675838513	32.5896	90.759
45.8195836764342	73.7321675838513	27.9893	89.6021
45.8195836764342	73.7321675838513	33.1283	92.3481
45.8195836764342	73.7321675838513	28.4623	90.5817
45.8195836764342	73.7321675838513	34.7487	93.2543
45.8195836764342	73.7321675838513	29.5533	92.3189
36.6627470511311	73.4418850423819	23.3569	85.0798
30.7113524308674	73.2532072193228	27.8353	94.5623
30.7113524308674	73.2532072193228	23.1083	96.0553
26.5531273019195	73.121378665339	18.6101	90.3489
26.5531273019195	73.121378665339	16.7243	94.3593
23.5318724421207	73.0255934924089	18.064	96.3276
23.5318724421207	73.0255934924089	16.854	97.4806
21.1065799484658	72.9487015600343	15.2733	95.1553
21.1065799484658	72.9487015600343	12.7313	98.6134
19.2772822991368	72.8907049825324	12.3803	91.1149
17.545486966112	72.8357992992864	3.57801000000001	99.0366
17.3839314701421	72.8306825719404	0.299018	97.3272
17.0160377223109	71.9214155383004	4.45068999999999	94.0863
17.0160377223109	71.9214155383004	3.24988	93.8751
16.5458913242267	70.7594279818388	3.35356	88.986
16.5458913242267	70.7594279818388	4.28894	92.6489
15.9804544676543	69.3619267990528	1.02508	82.9527
15.4168558254077	67.9689692912566	8.89064000000001	83.8954
15.4168558254077	67.9689692912566	3.06059000000001	88.1315
14.7484405113172	66.3169531869266	10.1219	82.045
14.0496368313868	64.5898309374092	19.5225	82.1483
14.0496368313868	64.5898309374092	16.5471	81.1813
13.1495588668853	62.3652495571568	17.2306	77.2747
13.1495588668853	62.3652495571568	16.8354	77.4785
12.0184426092116	59.569645833468	23.6206	68.344
12.0184426092116	59.569645833468	20.7262	75.308
10.450118425336	55.6934635946818	25.6513	60.6643
10.450118425336	55.6934635946818	24.5176	59.5849
10.450118425336	55.6934635946818	22.5447	55.6169
10.450118425336	55.6934635946818	23.2085	58.8069
10.450118425336	55.6934635946818	19.6656	61.3862
10.450118425336	55.6934635946818	18.9042	62.1271
10.450118425336	55.6934635946818	17.6011	61.1721
10.450118425336	55.6934635946818	13.5318	57.9262
10.450118425336	55.6934635946818	10.9638	55.5178
10.450118425336	55.6934635946818	16.576	71.2313
10.450118425336	55.6934635946818	10.4725	58.878
10.450118425336	55.6934635946818	9.35554999999999	53.1101
10.450118425336	55.6934635946818	14.0141	70.4084
10.450118425336	55.6934635946818	8.30742000000001	60.1487
10.450118425336	55.6934635946818	9.17265	66.1356
10.450118425336	55.6934635946818	8.25408	64.3565
10.450118425336	55.6934635946818	5.52590000000001	61.9092
10.450118425336	55.6934635946818	3.30116	54.5758

Solution x	Solution y	Original x	Original y
10.450118425336	55.6934635946818	2.40393	50.9808
10.450118425336	55.6934635946818	1.5771	61.4642
10.450118425336	55.6934635946818	2.55217	66.9796
10.450118425336	55.6934635946818	4.99968	74.2733
10.450118425336	55.6934635946818	0.194864999999993	71.2335

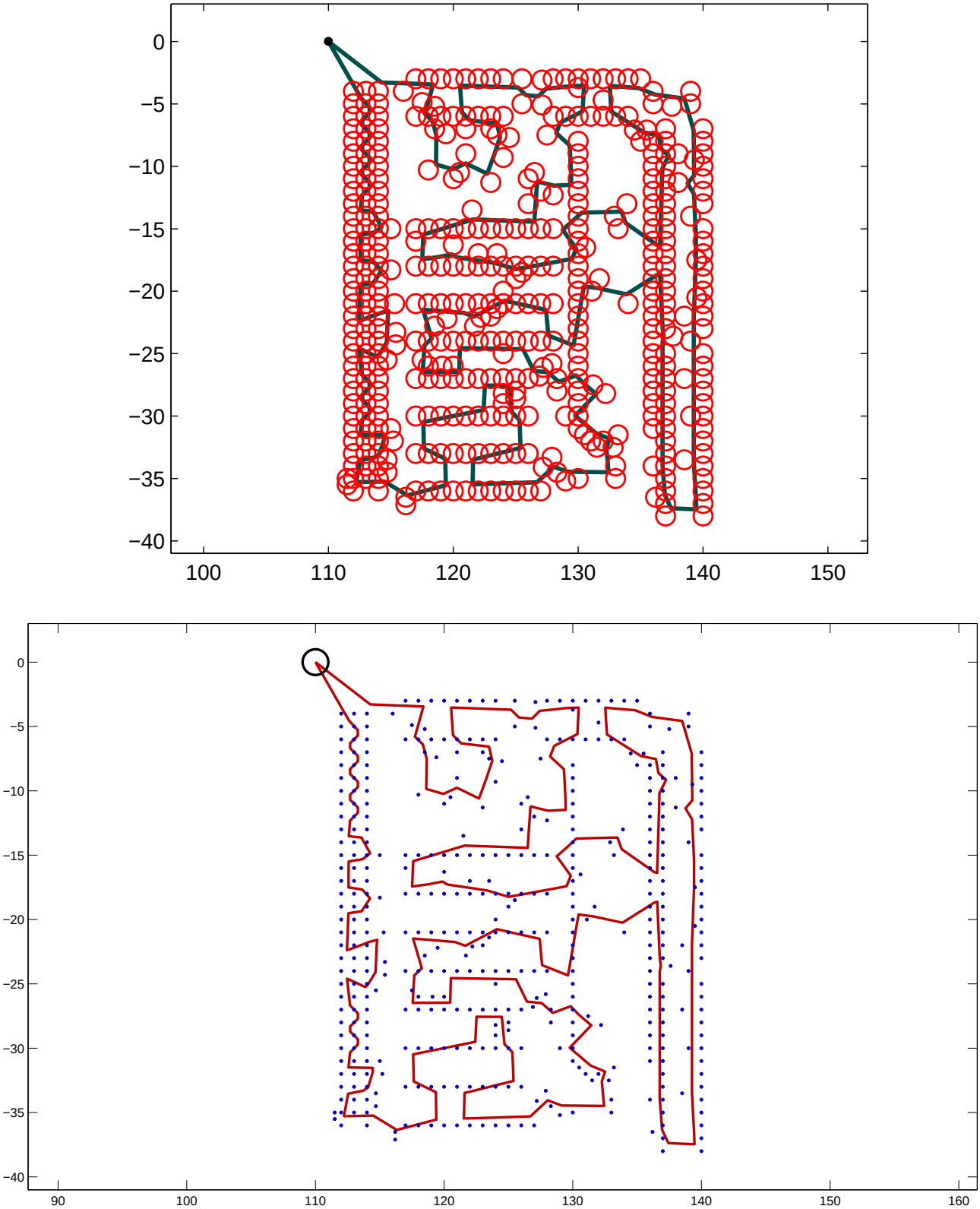


Figure N.20: $pcb442$, $r = 0.76$, Equal Radius, 2D, Euclidean, Length = 323.0336707

Table N-23: Solution for *pcb*442, $r = 0.76$, Equal Radius, 2D, Euclidean

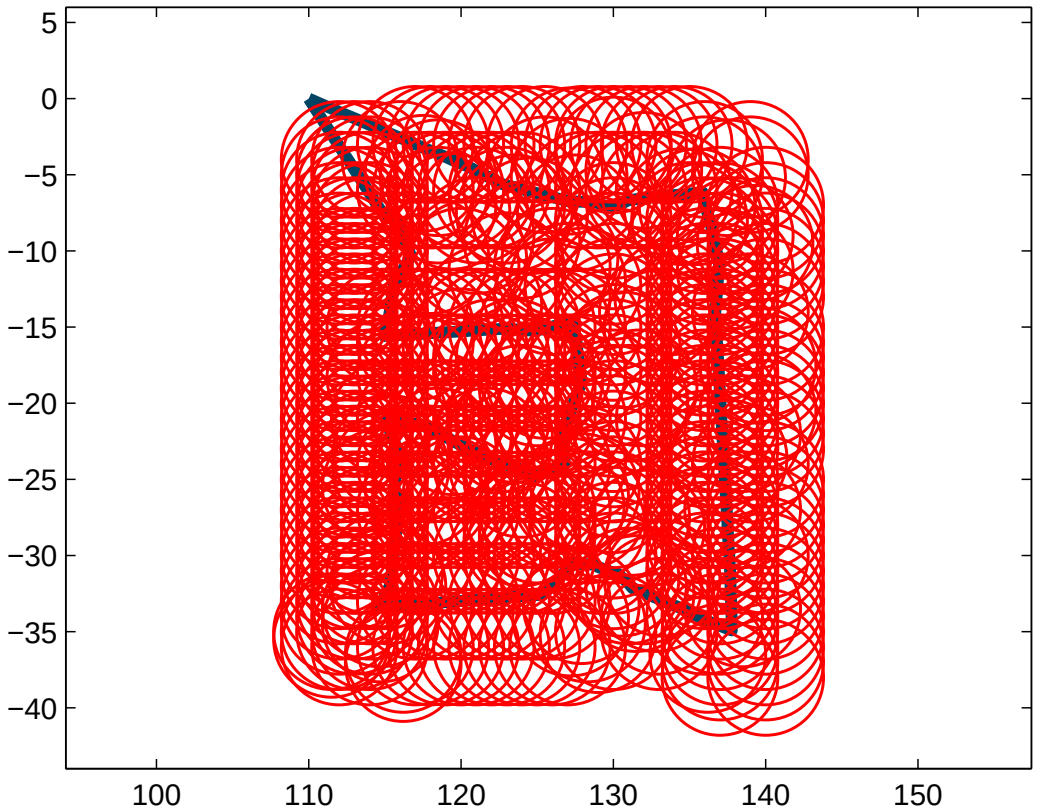
Total distance: 323.033670745928			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
2.09664571982611	3.65182070540676	2	4
2.42359552595629	4.22128401430314	3	4
2.61185619959684	4.54918656290067	2	5
3.29528442658696	5.2845660523415	4	5
3.30302747094177	5.69696319752568	4	6
3.30301563742641	5.69697455852075	3	5
2.69698671945076	6.30302849892952	3	7
2.69696829325139	6.30304650706158	2	6
2.69696639961271	6.69694911301264	2	7
2.69698795826484	6.69696999261037	3	6
3.29858219104015	7.29260037938284	4	7
3.29858219747517	7.70739956730236	4	8
2.69698802607616	8.30302994560215	3	9
2.69696643266931	8.3030508612757	2	8
2.69696649472132	8.69694924329094	2	9
2.69698802818348	8.69697009849461	3	8
3.2985822075533	9.29260051302803	4	9
3.29858219053254	9.70739947844761	4	10
2.69698806325674	10.3030298789563	3	11
2.69696653155725	10.3030507313106	2	10
2.69696649551288	10.6969491414425	2	11
2.69698814643489	10.6969701006253	3	10
3.29840482818108	11.292175066688	4	11
3.29781100706926	11.7092549437682	4	12
2.69988343135657	12.3092423997651	3	13
2.68951047683488	12.3196519818073	2	12
2.6615648544589	12.649648720173	2	13
2.66059980601356	12.6610488165642	3	12
2.58799713700385	13.5184797521973	2	14
3.47900369691887	13.6204896709854	4	14
3.57754539232387	13.6317708076647	4	13
3.6673632071289	13.7938724249115	3	14
4.10063405086858	14.5758359038036	4	15
4.25431234228084	14.8531927279348	5	15
3.68932098877806	15.3064003017167	4	16
3.00226617196607	15.4216768740888	3	16
2.57861713186598	15.4927521099829	2	15
2.57825553698282	15.5508505267151	3	15
2.57230028521658	16.4999797689093	2	17
2.57230022348276	16.5000204162369	2	16
2.57587235017694	17.5040427143228	2	18
3.00386097062236	17.5697810570905	3	17
3.63530195151323	17.6667815048088	4	17
3.6731652457908	17.7097661927389	3	18
4.20553780156236	18.3141627952736	4	19
4.24203454992795	18.3555968132411	5	18.3
4.12668263784795	18.5333292695909	4	18
3.66768444955456	19.2405509545786	3	19
3.59018791694349	19.3599557885418	4	20
2.99664618609233	19.4460059837273	3	20
2.56472026600122	19.5086193916718	2	19
2.52709225507182	20.4602605121599	3	21
2.52562707502022	20.4973178628541	2	20
2.48674372710805	21.4807401760368	2	22
2.48505947635292	21.5233403286468	2	21
2.4508743319096	22.3881869017164	2	23
2.73917919392598	22.2861663294654	3	23
3.15777398365303	22.1284085052474	3	22
4.22879688948095	21.7247426233755	4	21
4.8051750309149	21.576845817745	5.3	21
4.75811492901936	22.05347175279	4	22
4.71836511812324	22.9899663979182	4	23
4.70461824567354	23.3138531749365	5.40000000000001	23.3
4.67999698587583	23.8939830673379	4	24
4.6720302397537	24.0816822807317	5.40000000000001	24.3
4.10456823827266	25.0277044342241	4.7	25.5
3.87491065076766	25.2503629010992	4	26
3.53257510277665	25.089512039941	3	25
3.40069770050191	25.0275485245322	4	25
2.69895239978899	24.697830961837	3	24
2.46110606651042	24.6041392512605	2	24
2.55800289739609	25.4953187064119	2	26
2.55878053402425	25.5024717149246	2	25
2.66888972545661	26.5147741634158	3	27
2.68610809116078	26.6731076092679	2	27
2.70015360781859	26.6872798160992	3	26
3.29749675621613	27.2899865471487	4	27
3.29833270213094	27.7079964459635	4	28
2.69698936132841	28.3030270221398	3	29
2.69696910191857	28.303046532056	2	28
2.69697104849524	28.696957800552	2	29
2.69698793548577	28.6969741415201	3	28
3.30301334391798	29.3030238215111	3	30
3.30302633005626	29.3030362468591	4	29
3.29871449122005	29.7070803994898	4	30
2.68731353164885	30.3243506092273	2	30
2.61583453444328	31.0281914059464	2	31
2.5734351803717	31.4457008737937	3	32
2.56838088039112	31.4954736408411	2	32
3.48504014781683	31.5116670067198	4	31
3.51627674766353	31.5122203264506	3	31
4.45416842495936	31.5288397935914	5	31
4.44925268680953	31.8817576279492	5.2	32
4.32487403299345	32.2859903137026	4	32
4.09139212073482	33.044807621166	4.7	33.5
3.70953531422927	33.2976942224084	4	34
3.5360213899273	33.3327539516018	4	33
2.56937530569191	33.5280841522948	2	34
2.55681143347746	33.5306235054558	3	33
2.54095381912057	33.5338284161261	2	33
2.44968610860832	34.0186387911036	3	34
2.24122310200418	35.1259511362555	1.5	35
2.2178163424164	35.2503129226206	1.5	35.5
2.25782929069374	35.285067935741	2	36
2.44469049467273	35.2807789816691	2	35
3.44422932642269	35.2578577346551	4	35
3.55195679884439	35.2553849674617	3	35
3.9842435538298	35.2454647565266	4	36
4.50135303807301	35.2335823166776	4.7	34.5
6.00196805690825	36.1574565403305	6.2	36.5
6.31191797447661	36.3482829917437	6.2	37.1
7.08878458211645	36.1447203383727	7	36
8.04541968755974	35.8940530446588	8	36
9.39462108018989	35.5405214838768	10	36
9.39335606441833	35.4618052511261	9	36
9.36221000544377	33.5237043970937	9	33
9.3603905863888	33.410491987766	10	33
7.63849742648925	32.5877806379914	7	33
7.63607416454431	32.4749590493142	8	33
7.5946152218404	30.5447453455746	8	30
7.59312140626039	30.4751952332463	7	30
8.97667489608391	30.1970198714637	9	30
9.98733425280817	29.9938188566097	10	30
10.9481454234007	29.8006402504565	11	30
11.8494597115308	29.6194239046997	12	30
12.4242933473254	29.5038492130225	13	30
12.5224532626479	27.5519475403352	12	27
13.4957262099474	27.5564537161398	14	27
13.5035342412953	27.5564899069297	13	27
14.00271648261	27.5588214275028	14	28.2
14.487370628439	27.5610834969038	15	27
14.5828000874304	28.5643466404884	14	29
14.5856637757009	28.5944519550402	15	28
14.6139281916809	28.8916108793636	15	28.6
14.6746397156544	29.5298845363153	15	30
14.6888067537592	29.6788321156411	14	30
15.3026643814671	30.3022032141487	16	30
15.3893131684951	32.4607464630738	15	33
15.3926215697876	32.5431678695972	16	33
14.0468231747222	32.8738630130145	14	33
13.0589868647081	33.1165961408082	13	33
12.173005451018	33.3343010521334	12	33
11.591523218809	33.4771836582474	11	33
11.5363881327585	35.4615838003143	11	36
12.4990026423615	35.4312517739437	13	36
12.5009395586987	35.4311905031284	12	36
13.9617691243853	35.3848188719848	14	36
14.9809932967128	35.3524702562104	15	36
15.9697678404695	35.3210862990146	16	36
16.7097644010924	35.2975986016371	17	36
17.4780152773564	34.5791204926421	17.2	34.1
17.8371158438876	34.2432812129585	18.3	34.5
18.0488203080839	34.0452898288264	17.9	33.3
19.1390148297656	34.4528195406473	19	35.2

Solution x	Solution y	Original x	Original y
20.0749451237586	34.4623266099943	20	35
22.4398490310433	34.4863506528068	23	35
22.390760223322	33.9803037834896	23	34
22.2802895814868	32.84144010929	22.8	32.5
22.2599956074985	32.6322314465672	22	32
22.2553305790014	32.5841379052759	21.5	32.5
22.5087017617912	31.8157709382203	23.2	31.5
21.3969089628285	31.3518746460941	21	32
20.7222380339799	30.7795358098294	20	31
20.7180294493912	30.7759636692786	20.5	31.5
19.7590665767083	29.9622896707913	19	30
20.1204292075348	29.5880255157921	20	29
20.2299986416037	29.4745439345197	20	30
21.4402800135267	28.221014110826	21.2	27.5
21.4402876370498	28.2210066133614	22.2	28.2
20.51745862525	27.4433698219573	20	28
19.8323829138668	26.7412882863897	20	26
19.5514284480005	26.8447748906232	20	27
18.4420503343743	27.2533906210903	18.3	28
17.718469961666	26.6072010541205	17.2	26.1
17.7020374793753	26.5925260551063	18.3	27
17.5951322629387	26.4970516191897	16.9	26.8
17.5931968350347	26.4953238499808	17.9	25.8
16.43537964006	26.377064881318	16	27
15.5911090058238	26.6406337007684	16	24
14.9739763905833	24.6295683684122	15	24
14.2302247033873	24.6162295389308	14	25
13.8703024932204	24.6097787902352	14	24
12.9547330651265	24.5933595771562	13	24
11.5013011424492	24.5672904901806	11	24
11.4984468173157	24.5672395329523	12	24
10.5245901932064	24.5499166692317	10	24
10.4685949518025	26.456665765691	11	27
9.62873545473447	26.4626854850671	9.09999999999999	26
9.58441936119272	26.4630030055794	10	27
9.50667726941171	26.4635598067972	10	26
8.5112818457899	26.4706986009686	8	27
8.4896403697621	26.470853652179	9	27
7.55195686910099	26.4775568257886	7	27
7.58515054349158	25.9437069014326	8	26
7.62189373913972	25.3527680635291	7.5	25.5
7.68561610676824	24.327922748934	7	24
8.2680506977387	23.7954194053654	9	24
8.14911890608151	23.3895925406091	8.5	22.8
8.13118428356381	23.3283925717662	8	24
7.58942921655302	21.4797666825816	7	21
8.49347979134095	21.5528181484155	9	21
8.50408815331727	21.5536752213135	8	21
9.74575171033528	21.6540507664255	10	21
9.88663683505501	21.6654374867801	9.5	22.2
10.8366169404649	21.7422316507602	11	21
11.6500229942145	22.0416430348695	11.7	22.8
12.3515726992969	21.6725351751753	12	21
12.5034345828139	21.5926896209695	13	22
12.5860968021779	21.5492268343065	13	21
12.6197337383902	21.5315409853431	12.2	22.1
13.2757228019423	21.1866616431664	13.5	21.4
13.7639653444291	20.9299673620466	14	21
14.0997418195442	20.7534284475588	14	20
15.0152440248962	20.9589346638954	15	21
15.9532111086204	21.1694836259598	16	21
16.8445140815514	21.3695578357975	17	21
17.4281266299451	21.5005638210778	18	21
17.6085269196541	23.5446996552718	17	24
18.2239130853063	23.786308500643	18	24
19.471556800344	24.2761505403976	20	24
19.6276767119657	24.3374450573177	20	25
19.8557312949704	23.03033853837	20	23
20.0327607424245	22.0156791806981	20	22
20.2009138791926	21.051895012033	20	21
20.3565495166699	20.1598572471207	20	20
20.4523591273351	19.6107164438662	20	19
21.5719591597047	19.7491366683909	21.7	19
21.6920465816852	19.7754337143617	21.1	20
23.8670058726082	20.2517245434441	24	21
25.7575032878382	19.0469683612496	26	19
26.3152338339322	18.6915419329607	26	18
26.5593509120942	18.6192189876298	27	18
26.5983260514056	19.4694487639235	27	20
26.6015805244175	19.5404413103748	27	19

Solution x	Solution y	Original x	Original y
26.6244464209338	20.039286360515	26	20
26.6654238001453	20.9332804863653	26	21
26.6893274084454	21.4547381433966	27	22
26.6936849507956	21.5497966665617	27	21
26.7140485710081	21.994034859057	26	22
26.7571592429011	22.9343413564574	26	23
26.8401769417606	23.5834976897278	27.6	23.6
26.8291302211427	23.6475962749441	27	23
26.7572304126163	24.0648416609754	26	24
26.7576976577451	25.004010008839	26	25
26.7576125687609	25.4447509598637	27	26
26.7575958853947	25.5547425757927	27	25
26.7575094526125	26.0016989160035	26	26
26.7573971885902	26.9991015717504	26	27
26.7573950881142	27.4466879345856	27	28
26.7573959773603	27.5516510027901	27	27
26.757393318115	28.0012687082542	26	28
26.757489480097	28.9989352797834	26	29
26.7575814189223	29.4475464816468	27	30
26.7576009159174	29.5524544259812	27	29
26.7576928381457	30.0008585614666	26	30
26.7580311668302	30.9984402827629	26	31
26.7581959212231	31.3524162644938	27	31
26.7587202042509	32.4369586300203	27	33
26.7587748885782	32.5643338839009	27	32
26.7594566037604	33.9712463932838	26	34
26.7956626945133	34.4515472426566	27	35
26.804773145518	34.5724026452577	27	34
26.8954382262417	35.7751023472083	27	36
26.9357145311111	36.3093989152397	26.2	36.5
27.4240606181212	37.3693036325711	27	38
27.5190647480679	37.3735654864055	27	37
29.4643779867401	37.4608202750556	30	38
29.4276673182839	36.5000132651686	30	36
29.4276662823582	36.4999906467671	30	37
29.347070084993	35.0503296486668	30	35
29.2919552625706	34.058956348508	30	34
29.2597045747963	33.4788449912407	28.5	33.5
29.2596545453974	32.9883650765694	30	33
29.2595445803582	32.0001209081168	30	32
29.259424612696	30.9996244215089	30	31
29.2592961147942	30.022937196565	30	30
29.2592549871198	29.7028021929958	29	30
29.2591561070746	28.9950416019251	30	29
29.2590071923312	27.9998916479145	30	28
29.2588485256723	27.0004690193422	28.5	27
29.2588673001091	26.9173349847802	30	27
29.2590679934256	25.9999190384068	30	26
29.2592795388024	24.9998716346321	30	25
29.2594791216193	23.998815041077	29	24
29.2596789520003	22.999393845433	30	23
29.2598657551401	22.014092275393	28.5	22
29.2640863547928	21.9005649432846	30	22
29.2967161308262	21.022820215788	29.5	20.5
29.3030969983057	20.8511189224817	30	21
29.3358443263797	19.9700886465095	30	20
29.3736075932575	18.954048812794	30	19
29.4276478173721	17.5000050576574	30	17
29.4276480153223	17.4999941793914	30	18
29.4276480534628	17.1323438644347	29.5	17.5
29.4276451052373	15.5000046724402	30	15
29.4276448823581	15.4999960494231	30	16
29.3586960724254	14.0414846132674	29	14
29.3112490144721	13.0377613611342	30	13
29.2726024899715	12.2202182543008	30	12
28.7574501959908	11.3622320619538	28	11.3
29.2853517896773	10.741385619123	30	11
29.2778623469533	10.0075555569626	30	10
29.2683087162531	9.07152365069663	30	9
29.2668347399876	8.92724729491363	29.3	9.5
29.2574270736191	8.00647591784066	30	8
29.2482771562151	7.11187225560079	30	7
28.6967974446976	5.2314632938602	29	5
28.5046909652409	4.57643068624603	29	4
27.5991107177502	4.45419839287709	27.5	5.2
26.4199386342149	4.2950024652248	26	4
26.1886153456521	4.26377583562614	26	5
24.8294378148144	3.74061505192667	25	3
23.9449930569019	3.66501239740146	24	3
23.0200257145339	3.58594904172769	23	3

Solution x	Solution y	Original x	Original y
22.5306054620119	3.544114602848	22	3
22.5973238923421	4.65227672015063	22	4.7
22.6482818112574	5.49862704436726	23	6
22.6552906361365	5.61503633154935	22	6
24.1413189939132	6.56464736690921	24.5	7.1
24.2233871284822	6.61709147204365	24	6
25.2848640323085	7.29540444167298	25	8
25.7969601541952	7.39910174754686	26	8
25.9426783082835	7.42860870542343	25.5	7.1
26.4582381403235	7.53300789776571	27	7
26.559358972272	8.0778418645653	27	8
26.6608461208123	8.62465294433084	26	9
27.2542264051175	9.14637356483533	28	9
27.0927181080467	9.4707507309234	27	10
27.0331797930398	9.59032897197289	27	9
26.7371895795095	10.1848086003511	26	10
26.7132799770818	11.0002477263723	26	11
26.7001380149497	11.4485502697621	27	12
26.6972173754071	11.5481833413929	27	11
26.6824540892073	12.0517754668341	26	12
26.6556002550052	12.9678473062752	26	13
26.641323363378	13.4548790209581	27	14
26.6388290586062	13.5399610982887	27	13
26.6233862226888	14.0667553193327	26	14
26.5976063795395	14.9462708223524	26	15
26.5824470934547	15.463423568142	27	16
26.5805125184607	15.5294102948774	27	15
26.5554703412112	16.38356096081	27	17
26.3322552462692	16.3164729618665	26	17
25.7808888405515	15.9286895194448	26	16
23.8033471572492	14.5378580231166	23.2	15
23.471723916311	13.6278398316423	23.9	13
22.7341088881483	13.6456079588874	22.9	14
20.4732426811035	13.7000698304057	20	14
20.2848331242521	13.7046083234006	20	13
19.4912413209275	14.4354171664657	20	15
18.7553107830399	15.0843125881078	18	15
19.4989629476356	16.1132649030419	20	16
19.7717729552452	16.4907331981612	20	17
19.8457146908041	16.5930420717525	20.6	16.5
19.5181730302012	17.4122535249672	20	18
18.0091514039241	17.6914394445089	18	18
17.008396654813	17.8765896859168	17	18
16.1258151852831	18.0398765334783	16	18
15.5158950615564	18.1527182101677	15.5	18.5
15.0387846682147	18.2409886152599	15	19
14.5472145157256	18.0969442845353	14	18
14.4150355308207	18.0582121937646	15	18
13.5222441926447	17.7965999946529	13	18
13.3369559365111	17.7423053409788	13.5	17
12.2540840996428	17.5815409283065	12	18
11.8180201886322	17.5168028594591	12	17
11.0782829076875	17.4069813746945	11	18
10.2583292060838	17.2852496305667	10	18
9.86911160275477	17.0486458879572	10	16.3
8.8725004359447	17.2507725317417	9	18
7.98088441106046	17.3737127248695	8	18
7.51202127382143	17.4383623375822	7	18
7.57196709471381	16.0972410191887	7	16
7.59710512881861	15.5348621743904	8	15
7.60017176274239	15.4662577774358	7	15
9.41694854069237	14.9151713259833	10	15
9.56166533395643	14.8712739061839	9	15
10.7968787847611	14.4965924922541	11	15
11.5975910618611	14.2537093458323	11.5	13.5
12.0488065252437	14.2704144533139	12	15
13.0261895966636	14.30659866649	13	15
14.0237804390236	14.3435272179741	14	15
15.0178756699097	14.380324241962	15	15
15.9586324395087	14.4151453421648	16	15
16.4918219349034	14.4348823344388	17	15
16.5894481023941	13.0220916652342	16	13
16.7105501597041	11.2696679338684	16	11
16.7508017531829	11.2174267633395	16.5	10.5
17.2015525345419	11.3285367360461	17	12
18.0741622009529	11.5436258661444	18	12.3
19.4455506988822	11.4802029777422	20	12
19.4276506807895	10.5000063448248	20	10
19.4276502823807	10.4999950267085	20	11
19.3515082408617	9.06807992682364	20	9

Solution x	Solution y	Original x	Original y
19.3118707645224	8.32261555511114	20	8
18.2409077475322	7.33071223245507	17.5	7.5
18.5634218451908	6.51005714141536	18	6
19.4310921898184	6.06515500004773	20	6
19.5717156762317	5.99304987884012	19	6
20.3612116223829	5.58823283796365	21	6
20.440062645402	3.95164670607689	20	3.7
20.4601400492222	3.53493364991567	21	3
19.5000039597323	3.57235656803114	19	3
19.4999976158938	3.57235703292002	20	3
18.0841187141443	3.7178687205471	18	3
17.4287430156252	3.78522283935285	17.1	3.1
16.8341688669437	4.38800543891696	17.1	5.1
15.8160510020912	4.30883140908349	15.5	5
15.1983236939664	3.69756265671518	15.5	3
13.986514105573	3.653631704373	14	3
12.9559680169954	3.61627388460378	13	3
11.5024285189444	3.56357866405818	11	3
11.4971537411185	3.56338766907022	12	3
10.5457126095497	3.52896124545125	10	3
10.6911099895684	5.68382113275632	10	6
11.3289897456587	6.31489574489994	11	7
11.4846541930332	6.33292785197518	11	6
12.4605691740669	6.44596576112704	13	6
12.5223971509172	6.45312816203306	12	6
13.49222610312	6.56548039973901	14	6
13.5869129849105	6.98351480553164	13.5	7.5
13.6222126787115	7.13935940657424	13	7
13.7408857226584	7.66328961750853	14.5	7.7
13.2823777933851	9.04977661265314	14	9.3
12.7153672810972	10.5953108861493	13	11.3
10.9923663092301	9.7599631528144	11	9
10.3922756877767	10.0361443385455	10.5	10.5
9.9450117472901	10.2419904487997	10	11
8.61189295772235	9.84923475566867	8	10.3
8.64423980437105	7.61129336739751	8.5	7
8.64592424532597	7.49471534215249	9.40000000000001	7.4
8.34626583720828	6.38759958906197	9	6
7.73296137951925	5.79907776365249	7	6
7.79373117387483	5.58029230564403	8	6
7.92146677567391	5.12041824896304	8.5	5.2
8.01523321204513	4.78283834529695	7.5	4.9
8.38602198305858	3.44792101106018	9	3
7.53042337588509	3.41426511007054	7	3
7.4555951980681	3.41132145374739	8	3
6.01151681807207	3.35452427473633	6	4
4.25930471219851	3.28560315622129	4	4



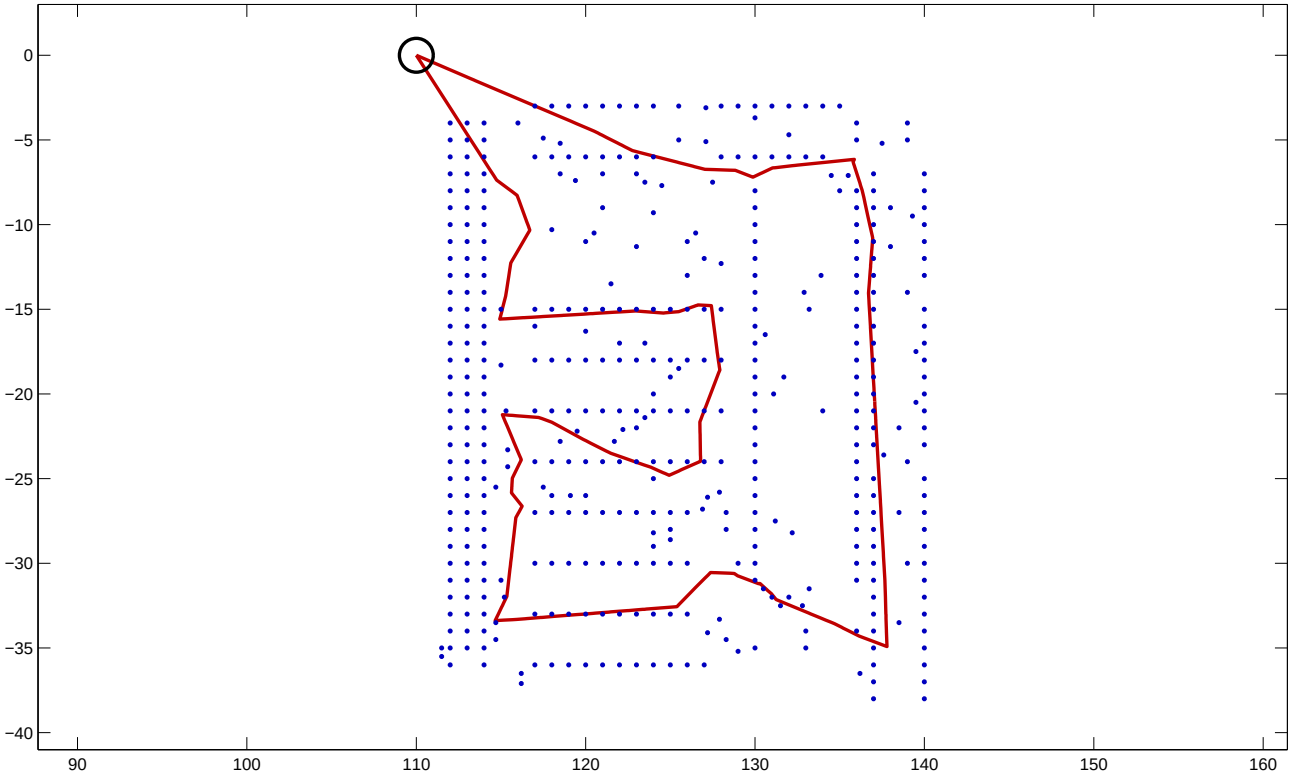


Figure N.21: $pcb442$, $r = 3.8$, Equal Radius, 2D, Euclidean, Length = 147.2444074

Table N-24: Solution for $pcb442$, $r = 3.8$, Equal Radius, 2D, Euclidean

Total distance: 147.244407358007			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
1.7884528668943	0.770871792174435	2	4
2.65720359492519	1.14532753421049	4	4
3.13674364140931	1.35202277441574	3	5
3.38820641231418	1.46040986801206	6	4
3.49441075018693	1.50618652902119	2	5
6.47531168609288	2.77149433773164	9	3
7.70437352152841	3.29319681548938	10	3
8.52298920742791	3.64067676738249	11	3
9.0913823170655	3.88194431891953	12	3
9.44897191639528	4.0337315286554	7	6
9.93494669186229	4.24001482342637	13	3
10.2066066887955	4.35532720807643	8.5	7
10.4999999706082	4.47986479546498	14	3
10.5000000047956	4.479864813224	7	3
10.7329976158987	4.59865937503606	14	6
10.8388527441937	4.65262995193843	8	3
10.9796728476676	4.72442753021802	7.5	4.9
11.2444477752162	4.85942386329713	8	6
11.8874264082776	5.18724850313916	15.5	5
12.0248337202741	5.25730605972354	14.5	7.7
12.1161476034405	5.30386273860685	8.5	5.2
12.3306130561948	5.41320864280248	9.40000000000001	7.4
12.7584717196498	5.63135376967544	15.5	3
12.7584718128844	5.63135382658299	11	9
13.1641280505713	5.73625594836048	10	6
14.3233858984688	6.03603842047423	18	6
14.4209796072852	6.06127601059755	11	7
14.5794143976656	6.102247019574	11	6
15.3898541438881	6.31182560907019	19	6
15.5272914376781	6.34736669429511	12	6
15.8627017928878	6.43410333284672	14	9.3
16.3455966341814	6.55897927479524	20	6
16.4224942552883	6.57886488438839	13	7
16.5225176969867	6.6047307965812	13	6
16.7199379458117	6.65578337881742	13.5	7.5
17.0401141673709	6.73858047406646	16.5	10.5
17.612355095108	6.75700251903319	18	3
17.8160847405293	6.76356099768609	17.1	3.1
18.5122204753352	6.78597150589675	20	10
18.8304771713932	6.79621682332837	22	4.7
18.8304772219513	6.79621682690744	19	3
19.6451424048752	7.11371281251414	23	6
19.8720739166208	7.20215387701067	20	11
20.3627239297785	6.97178853657152	24	6
20.3890631884126	6.95942198438693	17.1	5.1
21.0340100109264	6.65661366303067	20	3
21.1119755660458	6.64782854224872	22	3
21.1542523367716	6.64306481619796	17.5	7.5
21.9892203351667	6.54897293451891	23	3
22.2012441077395	6.52508126180421	25	8
22.3682277137112	6.50626506223941	25.5	7.1
22.4999988987335	6.49141683736268	24	3
22.5000001969198	6.49141669727837	20	3.7
22.5000014970294	6.49141655716998	20	9
22.5000027849834	6.49141641811103	21	3
22.91061595263	6.44960892853443	20	8
24.2205713755157	6.31623586568764	27.5	5.2
24.4624450986351	6.29160872153939	21	6
25.6784347967829	6.16780283918417	29	5
25.8658345195629	6.1487221926246	29	4
25.7879922032925	6.301853147601	22	6
25.8331685939545	6.44227296039458	26	10
25.8619739853331	6.53180749355016	27	10
25.8801310340389	6.58824426528406	25	3
26.1365783479717	7.38534730431609	26	11
26.1843917669893	7.53396357126138	27	11
26.2126942355816	7.62193487558179	29.3	9.5
26.2327103851559	7.68415019942762	26	4
26.3132827767635	7.93458940672433	28	11.3
26.3229883246932	7.96475668858263	30	8
26.331837652957	7.99226262750091	30	7
26.4241231766938	8.41063902236269	30	9
26.4760570964473	8.64608091439971	30	10
26.4826129552671	8.67580170505301	27	12
26.4887191916933	8.70348413989366	26	12
26.494499350163	8.72968830494926	26	5
26.6705977853289	9.52803047012896	27	13
26.71952602071	9.74984492361613	26	13
26.7532395307736	9.9026838772142	24.5	7.1
26.8819459201405	10.4861729499474	27	14
26.923483800184	10.6744834658899	26	14
26.9511010850152	10.7996853999459	29	14
26.9511010844552	10.7996854044482	27	7
26.9080770475952	11.3542456520838	27	15
26.8993362346102	11.4669090138023	26	15
26.8944229097733	11.5302384225653	26	8
26.8856850958931	11.6428630833861	27	8
26.8337402694756	12.31240859764	27	16
26.8275325680347	12.3924217730053	26	16
26.8243160085844	12.4338810278718	26	9
26.8204557131162	12.4836376593906	28	9
26.8133191039165	12.5756239738256	27	9
26.7998250272929	12.7495544659192	30	11
26.7555287644086	13.3205176146588	30	15
26.7388651220119	13.5353027275569	30	12
26.6998018001176	14.0388129209965	22.9	14
26.7239881355297	14.4626816112269	30	16
26.7352888461253	14.6607271971184	30	13
26.7654718003877	15.1896892407979	30	17
26.772441553294	15.3118341745235	23.9	13
26.8124852912793	16.0136092546707	30	18
26.8160469676991	16.076027566388	23.2	15
26.9164962336941	17.836441149163	30	19
26.9604063550114	18.6059749434218	29.5	20.5
26.9854189612422	19.044324375648	30	20
27.005672104049	19.3992630382152	24	21
27.0205309702591	19.6596663084376	28.5	22
27.0329147208983	19.8766927732459	30	21
27.0437989165794	20.0674392724494	27.6	23.6
27.0494037936053	20.1656651875734	30	22
27.0541105618406	20.2481516402406	29.5	17.5
27.065569922275	20.4489771352082	26	24
27.0689412753017	20.5080603299921	26	17
27.0756098433125	20.6249274112674	27	17
27.1037588756196	21.1182426070058	30	23
27.1185699813088	21.3778079701496	27	25
27.1242293142433	21.4769881222545	26	25
27.1270303709868	21.5260769055883	26	18
27.1335470114698	21.6402816121483	27	18
27.1744182336678	22.3565551343146	27	26
27.1811013405723	22.473677211253	26	26
27.1837571679628	22.5202209296318	26	19
27.1904377340854	22.6372987418544	27	19
27.2316934690415	23.3603125105896	27	27
27.2383663182098	23.4772551195965	26	27
27.2406963919493	23.5180900607552	26	20
27.247369493264	23.635037426546	27	20
27.2889760337715	24.3642004076255	27	28
27.2956535701066	24.4812255467533	26	28
27.2975922205874	24.5152008319332	26	21
27.3042625629522	24.6321003694978	27	21
27.3463256100732	25.369265864048	27	29
27.3529851152559	25.4859755181291	26	29
27.3544409516997	25.5114894635906	26	22
27.3610385811668	25.6271154257076	27	22
27.399763953905	26.3057847960353	27	30
27.4036175654321	26.373320745735	26	23
27.4109541259549	26.5018967964184	27	23
27.4254558294174	26.7560447038688	29	24
27.4471661937377	27.1365268434242	30	25
27.4886523820489	27.8635835976955	30	26
27.5745229515048	29.3684615122334	30	32
27.5879499582946	29.6037745729725	30	27
27.6258205886132	30.2674634302221	30	33
27.635168169088	30.4312830616836	28.5	27
27.6585221929058	30.8405682733177	26	34
27.6676194182721	30.9999999375945	30	34
27.6676194244321	31.0000000765589	30	28
27.69805958892	31.9936525942924	30	35
27.6984842182064	32.007514809965	30	29
27.7287664320146	32.9960381203824	30	36
27.7298553029045	33.0315821923014	26.2	36.5
27.7300560026729	33.0381341058694	30	30
27.7369783890004	33.2640958713526	29	30

Solution x	Solution y	Original x	Original y
27.7588890182977	33.9793477549596	30	37
27.7601834035103	34.0215985543654	30	31
27.7874154204686	34.910587437278	30	38
26.8527610585497	34.5604743558708	27	31
26.4254855134575	34.4004207177223	26	31
26.1484434301154	34.2966431943095	22.8	32.5
26.1484434010474	34.2966431841138	27	38
25.4677783480856	33.9554657412588	23.2	31.5
25.1972904595102	33.8198859199888	22	32
25.1302255449974	33.7862701852583	27	37
24.7006632965339	33.5709556453422	26	30
24.7006628835902	33.5709554729843	28.5	33.5
24.5825842614099	33.521924982108	27	36
24.4013851457116	33.4466845852483	27	35
24.1689825792195	33.3501826695429	27	34
23.8620197601562	33.2227206290787	27	32
23.2328717914849	32.9614753751018	20	31
23.218449059152	32.9554865361794	27	33
21.8192417563321	32.3744842605187	20	30
21.2512027730764	32.1386136381887	19	35.2
21.0668642404807	31.9180868631097	17.9	33.3
20.9620540292813	31.7926995474235	22.2	28.2
20.962054005682	31.792699527615	23	35
20.8009923077856	31.6486095615905	20	28
20.7551651488395	31.6076109742773	23	34
20.701804561098	31.559872751233	18.3	34.5
20.2868662535207	31.1886565477646	21.2	27.5
20.2166196864009	31.2061791971211	20	35
19.0289455149055	30.7610912066545	16	33
18.9804426210376	30.7429143046082	17.2	34.1
18.7746364161459	30.597010485404	20	27
18.5393435428835	30.5876036270109	21.5	32.5
17.6634350858333	30.5525849311038	14	30
17.5958720977259	30.5498838227252	21	32
17.3783972294754	30.5411892645207	16	27
17.366373216529	30.5531404944907	16.9	26.8
17.2273824803937	30.6912895711909	20.5	31.5
17.0519790892823	30.8656305977257	20	29
16.5443925143607	31.3701388875052	13	30
16.5443922015857	31.3701392058677	18.3	28
16.4734040628287	31.44302289887	15	28
16.2111126690407	31.712318952218	19	30
15.5384293376544	32.4029684175143	12	33
15.3854120068341	32.5600718033217	17	36
14.549227359557	32.6263628525892	13	36
14.4232304771892	32.6363516719246	12	30
14.3327284991606	32.643526514184	16	36
13.691778928972	32.6943397092173	12	36
13.5798743590531	32.7032113656468	11	30
13.5303775138226	32.7071354052761	16	30
13.4602851460858	32.7126922281183	15	36
13.3742255506666	32.7195149133845	14	29
12.7075370321861	32.7723689231807	11	36
12.5263234919871	32.7867351954732	10	30
12.4843550572482	32.7900623568644	15	30
12.2637832021945	32.8075487454069	14	36
11.7122701038119	32.8512716880902	10	36
11.4918219629747	32.8687483066828	8	33
11.3660209299649	32.8787215134254	15	33
10.5823905798641	32.9408464459082	7	33
10.4226833843364	32.9535076612265	14	33
9.80967768250443	33.0021056390764	8	36
9.53740332908491	33.023690954409	13	33
8.15067944596352	33.1336293424704	5.2	32
7.68965326794715	33.17017859307	6.2	36.5
7.51009145960225	33.184413858932	4	33
7.40291809476574	33.1929103220304	4	32
7.3342167958273	33.19835680354	4	34
7.27669900125679	33.2029166810474	4	35
7.24738568287422	33.205240574518	11	33
6.64632136221178	33.2528918045233	3	33
6.53587771355235	33.2616475324988	3	34
6.46744509102109	33.2670727192707	10	33
6.37234417881321	33.2746121119245	3	35
6.3628163892148	33.2753674661303	9	36
5.9383763012153	33.3090169437427	6.2	37.1
5.68221405856266	33.324083857566	7	30
5.16541582946964	33.3544800734098	2	33
4.88930249612872	33.3707203922614	2	35
4.70951094513734	33.3812953542933	2	36

Solution x	Solution y	Original x	Original y
4.69091916089582	33.3823888978469	1.5	35
4.67383300364565	33.3833938829768	4	30
4.65662212922699	33.3844062072843	1.5	35.5
4.77852807987458	33.1311669246739	3	30
4.84131026540577	33.0007475657279	7	36
5.04679828963796	32.5738790029512	4	29
5.08091990298726	32.5029971036019	4	36
5.15944616351189	32.3398720572586	2	34
5.34916906853962	31.9457543882009	9	33
5.38378079970278	31.6423740350311	2	32
5.42406353166463	31.2892857655738	4.7	34.5
5.53350732717671	30.3299754927487	4	27
5.54645496651553	30.2164862550275	2	31
5.56306109177993	30.0709293449712	2	29
5.57529585558689	29.9636883901561	4.7	33.5
5.61787392529696	29.590479306601	3	27
5.63148959474356	29.4711342139468	3	32
5.67017990799602	29.1320021598231	4.7	25.5
5.67422358665431	29.0965582187102	2	30
5.7195527592404	28.6992340418761	2	28
5.73821190058473	28.5356770827032	3	26
5.74513209749328	28.4750179297647	3	31
5.76905224573576	28.2653462860511	9	30
5.8205058927205	27.8143415183008	9.09999999999999	26
5.82758527657865	27.7522873516722	4	31
5.8788401746389	27.3030228345602	4	24
5.87884017852394	27.3030228293096	5	31
6.01729409084066	27.0517490837673	8	24
6.06461165517939	26.9658747830955	3	29
6.25190972480409	26.6259549418791	10	26
6.25190970625242	26.62595491918	3	25
6.25190968795771	26.6259548968573	8	30
5.76069680922036	26.0183271302633	4	23
5.61998366363876	25.8442671008761	2	27
5.62921464641408	25.6950428647146	2	25
5.63658799746612	25.5758473186202	9	24
5.64086219734698	25.5067515618702	3	23
5.64400139520433	25.4560038237078	3	28
5.64866305331417	25.3806444206247	9	27
5.65650568735025	25.2538631718416	2	26
5.67405118518812	24.9702309561362	2	24
5.73930094278286	24.8367203893728	4	28
6.11882937356327	24.0601443054937	8	21
6.18396633547751	23.9268645126714	9.5	22.2
6.20156790734447	23.8908491346471	10	24
6.17202568205282	23.8204122660252	8	27
6.08548543504286	23.6140760400225	7	27
5.74646930212677	22.8057642858223	2	23
5.70272577797304	22.7014676458847	4	26
5.4536285011165	22.1075476981089	4	19
5.37080415989431	21.9100714070535	4	25
5.24561238860844	21.6115789325944	3	24
5.08237601588387	21.2223767337507	2	19
5.15127003067394	21.2276013426483	2	20
5.23595041562723	21.2340231371049	2	22
5.3401126986913	21.2419223694938	2	21
5.47933793833586	21.2524806597207	3	19
5.6718528493131	21.2670802734311	3	20
5.91626970621746	21.2856159842785	3	22
6.25650583636177	21.311418387884	3	21
7.21949757828747	21.3844497848175	11	21
7.21949758860531	21.3844497861349	5.40000000000001	24.3
7.21949759892524	21.3844497873591	4	22
7.21949760934831	21.3844497885727	4	20
7.21949761996362	21.3844497898551	5	18.3
7.41951808582037	21.4565960519915	4	21
8.00100031091257	21.6663332633066	11	24
8.00100040454211	21.6663332962099	5.40000000000001	23.3
8.0010004983835	21.6663333291144	8	18
8.00100059305394	21.6663333626372	9	18
8.39661401834276	21.8834985165144	5.3	21
9.76999262570969	22.6373930031444	8	26
9.87567610959057	22.6906828607723	7.5	25.5
10.0153820789334	22.7611282348403	7	21
10.3024164951312	22.90586252199	7	24
11.233531337516	23.3753674882691	12	27
11.3384451293808	23.4282692458272	9	21
11.4850947683131	23.5022158945175	10	27
12.1228367191582	23.7249425163818	14	27
12.1467319315364	23.7332877380183	8.5	22.8

Solution x	Solution y	Original x	Original y
12.2878228374345	23.7825626833696	10	21
12.7543224269779	23.9454841627206	11	27
13.466054263325	24.1940511626357	15	27
13.8401848393208	24.3247134849658	17.2	26.1
13.8401848630419	24.3247134926395	12	21
14.3717394047714	24.557110485098	14	28.2
14.58098077652	24.6485911789554	17.9	25.8
14.6895037188777	24.6960375849124	12.2	22.1
14.928819023694	24.8006666898511	15	28.6
14.9314808542834	24.7993821145454	15	21
14.9314811542836	24.799381976913	11.7	22.8
15.4344970920181	24.5747605515979	18.3	27
15.492814143379	24.5487188487162	13	27
15.5684226465858	24.5149555803841	12	24
15.6973963988666	24.4573618676727	13.5	21.4
16.7872212374065	23.9707013612879	20	26
16.7814103364707	23.7297232518233	20	22
16.7781070620325	23.5926991526679	14	21
16.7781069120729	23.5926924754744	20	25
16.7781067607931	23.5926857244774	13	24
16.7583522813809	22.5177467327861	13	22
16.7576465829856	22.4793753646065	20	21
16.7570215200207	22.4453876902413	14	20
16.7565157419949	22.4178855143651	14	25
16.7532797419735	22.2418826656887	20	24
16.742552032975	21.6582587128008	13	21
16.7702212552939	21.5861938288232	20	20
16.7908093467114	21.5325718507641	14	24
16.8701994495734	21.3257990378064	20	23
16.9608223379378	21.0897702412851	20	19
16.9893514668722	21.0154657068449	15	24
17.0356285715803	20.8949362916689	16	24
17.0967564578276	20.7357277677335	18	24
17.187898763367	20.4983461679481	17	24
17.6951444724762	19.1772111732851	20	17
17.8633833438046	18.7390301474979	20.6	16.5
17.9228118547467	18.5842476775043	21.7	19
17.8943811928631	18.3926872524937	18	15
17.8753671579545	18.2645734694321	17	15
17.8610587443297	18.1681649740563	16	15
17.8533348690631	18.116121917694	21.1	20
17.7833299830925	17.6444534774008	14	18
17.7833295346541	17.6444499960004	16	21
17.7704234860267	17.543532702698	17	21
17.7503734957065	17.3867541045345	18	21
17.5783294402409	16.0414627488709	16	13
17.5464020613504	15.791810530728	18	12.3
17.5306460892308	15.6686086663892	20	18
17.5088499323237	15.4981762241939	15.5	18.5
17.4180403089562	14.7880969188519	20	12
16.6259557524241	14.7480901295452	16	11
16.6259554835663	14.7480902229224	15	18
16.6259552152593	14.7480903160497	20	13
16.5757969360567	14.7654679747502	20	14
16.5126939833187	14.7873303948848	20	16
16.3774294430133	14.8341936124863	20	15
15.5000000017263	15.1381823807035	13	18
15.4999999761802	15.1381823875335	18	18
15.2901725887909	15.1575413480973	17	12
14.7228738116023	15.2098810560614	11.5	13.5
14.5927029540219	15.2218907936357	12	18
14.5927028028155	15.2218908055326	17	18
14.5927026448639	15.2218908175656	15	19
13.500860999671	15.1397497956949	11	18
13.5000923317322	15.139691982805	10	16.3
13.4993533859847	15.1396364032838	16	18
12.971183088061	15.0998907445183	13	11.3
12.0100865166011	15.1575578628051	10	18
11.6829515912193	15.1771864096859	15	15
10.5948488731201	15.2424741428314	7	16
10.494081299577	15.2485203390802	7	15
10.4203278355233	15.252945651963	14	15
10.2997922773031	15.2601779563738	13.5	17
9.86974857800355	15.2859812100982	13	15
8.72770471096143	15.354505477774	5	15
8.68234997827378	15.3572268273483	12	15
8.63171159636076	15.360265204201	12	17
7.58639099139147	15.4229857609078	4	16
7.44939190797611	15.4312059195782	4	15
7.35393440648116	15.4369335216285	11	15

Solution x	Solution y	Original x	Original y
6.82569143359348	15.4686288692981	4	14
6.50979285783049	15.4875832859417	3	16
6.37237653310345	15.495828490721	3	17
6.31329801570416	15.499373300499	10	15
5.67321685837757	15.5377792052192	3	14
5.28850437772751	15.5608625959606	2	16
5.07463082763964	15.5736953726505	2	17
4.93165516040813	15.5822741552845	2	18
4.96040626108481	15.470370414841	3	13
4.98614719269938	15.370182692159	3	18
5.01786464273025	15.2467334896933	2	15
5.05002059658375	15.1215775575536	4	18
5.08881556201727	14.9705816191076	7	18
5.17131304346584	14.6494892832926	4	17
5.2777712471653	14.2351384824444	9	15
5.34081073799399	13.8286015265408	2	14
5.41659206677315	13.3398935865406	2	12
5.45607668460585	13.0852598155012	3	15
5.50939590093405	12.741407792344	2	13
5.5832750581913	12.2649664089163	2	11
5.66698158969734	12.1204125909738	8	15
5.88948190395561	11.7361741659982	3	12
6.18406602129805	11.2274533121173	3	10
6.54955462459431	10.5962866253906	4	8
6.70380884543765	10.3299031609446	10.5	10.5
6.70380879546289	10.3299030404611	4	13
6.6094761060433	10.0711152414523	3	11
6.53995360154605	9.88039066204323	3	9
6.50116501946295	9.77398003461347	4	7
6.48793009617461	9.73767202071887	4	12
6.47405391090012	9.69960479623529	10	11
6.06534976573482	8.5783847124058	3	7
5.95333318812581	8.2710837774069	9	6
5.63801472269007	8.03670489081772	4	5
5.48023348869431	7.91942508425809	2	9
5.39124265260793	7.85327773439211	2	7
5.32541597023585	7.80434846171694	8	10.3
5.10342827970456	7.63934349448999	4	11
4.74716002588244	7.37452614538662	3	4
4.74715940161676	7.37452568358331	2	10
4.56883718420845	7.09750913948291	4	10
4.32031205050367	6.71143519131023	4	9
4.01118784238025	6.23122305366778	3	8
3.66404751049062	5.69195437262823	2	8
3.23798689841375	5.03008587833658	4	6
2.73088715807259	4.2423263225757	3	6
2.05235319953491	3.1882505821152	2	6

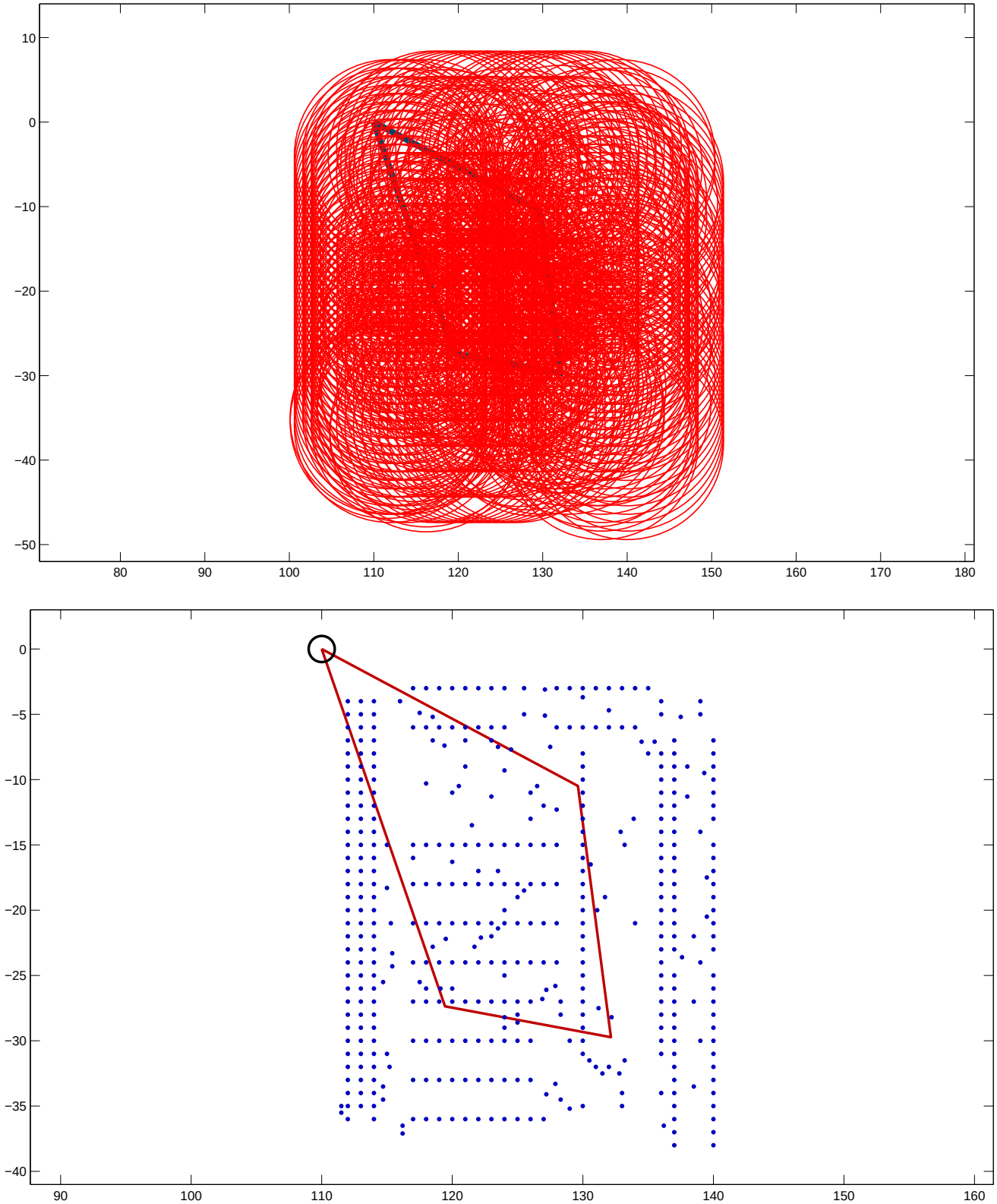


Figure N.22: $pcb442$, $r = 11.4$, Equal Radius, 2D, Euclidean, Length = 83.5373319

Table N-25: Solution for *pcb*442, $r = 11.4$, Equal Radius, 2D, Euclidean

Total distance: 83.5373318570905			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
2.70662099234775	7.84894008573791	2	4
2.70662099234775	7.84894008573791	3	4
2.70662099234775	7.84894008573791	2	5
2.70662099234775	7.84894008573791	4	4
2.70662099234775	7.84894008573791	3	5
2.70662099234775	7.84894008573791	2	6
2.70662099234775	7.84894008573791	7	3
2.70662099234775	7.84894008573791	4	5
2.70662099234775	7.84894008573791	3	6
2.70662099234775	7.84894008573791	8	3
2.70662099234775	7.84894008573791	2	7
2.70662099234775	7.84894008573791	9	3
2.70662099234775	7.84894008573791	4	6
2.70662099234775	7.84894008573791	10	3
2.70662099234775	7.84894008573791	3	7
2.70662099234775	7.84894008573791	2	8
2.70662099234775	7.84894008573791	11	3
2.70662099234775	7.84894008573791	12	3
2.70662099234775	7.84894008573791	13	3
2.70662099234775	7.84894008573791	4	7
2.70662099234775	7.84894008573791	2	9
2.70662099234775	7.84894008573791	3	8
2.70662099234775	7.84894008573791	7.5	4.9
2.70662099234775	7.84894008573791	2	10
2.70662099234775	7.84894008573791	4	8
2.70662099234775	7.84894008573791	3	9
2.70662099234775	7.84894008573791	8.5	5.2
2.70662099234775	7.84894008573791	7	6
2.70662099234775	7.84894008573791	2	11
2.70662099234775	7.84894008573791	8	6
2.70662099234775	7.84894008573791	3	10
2.70662099234775	7.84894008573791	4	9
2.70662099234775	7.84894008573791	2	12
2.70662099234775	7.84894008573791	9	6
2.70662099234775	7.84894008573791	3	11
2.70662099234775	7.84894008573791	10	6
2.70662099234775	7.84894008573791	4	10
2.70662099234775	7.84894008573791	2	13
2.70662099234775	7.84894008573791	11	6
2.70662099234775	7.84894008573791	8.5	7
2.70662099234775	7.84894008573791	3	12
2.70662099234775	7.84894008573791	2	14
2.70662099234775	7.84894008573791	4	11
2.70662099234775	7.84894008573791	2	15
2.70662099234775	7.84894008573791	3	13
2.70662099234775	7.84894008573791	9.40000000000001	7.4
2.70662099234775	7.84894008573791	4	12
2.70662099234775	7.84894008573791	2	16
2.70662099234775	7.84894008573791	3	14
2.70662099234775	7.84894008573791	2	17
2.70662099234775	7.84894008573791	2	18
2.70662099234775	7.84894008573791	4	13
2.70662099234775	7.84894008573791	3	15
2.70662099234775	7.84894008573791	3	16
2.70662099234775	7.84894008573791	4	14
2.70662099234775	7.84894008573791	3	17
2.70662099234775	7.84894008573791	3	18
2.70662099234775	7.84894008573791	4	15
2.70662099234775	7.84894008573791	8	10.3
2.70662099234775	7.84894008573791	4	16
2.70662099234775	7.84894008573791	4	17
2.70662099234775	7.84894008573791	5	15
2.70662099234775	7.84894008573791	7	15
2.70662099234775	7.84894008573791	7	16
2.70662099234775	7.84894008573791	8	15
2.70662099234775	7.84894008573791	9	15
9.28255193990529	26.9044607818292	6.2	37.1
9.28255193990529	26.9044607818292	3	35
9.28255193990529	26.9044607818292	6.2	36.5
9.28255193990529	26.9044607818292	4	35
9.28255193990529	26.9044607818292	3	34
9.28255193990529	26.9044607818292	4	34
9.28255193990529	26.9044607818292	4.7	34.5
9.28255193990529	26.9044607818292	3	33
9.28255193990529	26.9044607818292	4	33
9.28255193990529	26.9044607818292	4.7	33.5
9.28255193990529	26.9044607818292	3	32
9.28255193990529	26.9044607818292	4	32
9.28255193990529	26.9044607818292	4	31
9.28255193990529	26.9044607818292	5.2	32
9.28255193990529	26.9044607818292	7	33
9.28255193990529	26.9044607818292	5	31
9.28255193990529	26.9044607818292	4	30
9.28255193990529	26.9044607818292	8	33
9.28255193990529	26.9044607818292	9	33
9.28255193990529	26.9044607818292	10	33
9.28255193990529	26.9044607818292	11	33
9.28255193990529	26.9044607818292	12	33
9.28255193990529	26.9044607818292	2	19
9.28255193990529	26.9044607818292	7	30
9.28255193990529	26.9044607818292	8	30
9.28255193990529	26.9044607818292	7	27
9.28255193990529	26.9044607818292	8	27
9.28255193990529	26.9044607818292	9	27
9.28255193990529	26.9044607818292	8	26
9.28255193990529	26.9044607818292	10	27
9.28255193990529	26.9044607818292	9.09999999999999	26
9.28255193990529	26.9044607818292	11	27
9.28255193990529	26.9044607818292	10	26
9.44088932640793	27.3632652623439	2	36
9.44088932640793	27.3632652623439	1.5	35.5
9.44088932640793	27.3632652623439	1.5	35
9.44088932640793	27.3632652623439	2	35
9.44088932640793	27.3632652623439	4	36
9.44088932640793	27.3632652623439	2	34
9.44088932640793	27.3632652623439	2	33
9.44088932640793	27.3632652623439	7	36
9.44088932640793	27.3632652623439	2	32
9.44088932640793	27.3632652623439	8	36
9.44088932640793	27.3632652623439	9	36
9.44088932640793	27.3632652623439	2	31
9.44088932640793	27.3632652623439	10	36
9.44088932640793	27.3632652623439	11	36
9.44088932640793	27.3632652623439	2	30
9.44088932640793	27.3632652623439	12	36
9.44088932640793	27.3632652623439	3	31
9.44088932640793	27.3632652623439	2	29
9.44088932640793	27.3632652623439	3	30
9.44088932640793	27.3632652623439	2	28
9.44088932640793	27.3632652623439	3	29
9.44088932640793	27.3632652623439	2	27
9.44088932640793	27.3632652623439	3	28
9.44088932640793	27.3632652623439	2	26
9.44088932640793	27.3632652623439	4	29
9.44088932640793	27.3632652623439	2	25
9.44088932640793	27.3632652623439	3	27
9.44088932640793	27.3632652623439	4	28
9.44088932640793	27.3632652623439	2	24
9.44088932640793	27.3632652623439	3	26
9.44088932640793	27.3632652623439	2	23
9.44088932640793	27.3632652623439	2	22
9.44088932640793	27.3632652623439	4	27
9.44088932640793	27.3632652623439	2	21
9.44088932640793	27.3632652623439	3	25
9.44088932640793	27.3632652623439	2	20
9.44088932640793	27.3632652623439	3	24
9.44088932640793	27.3632652623439	4	26
9.44088932640793	27.3632652623439	3	23
9.44088932640793	27.3632652623439	3	22
9.44088932640793	27.3632652623439	4	25
9.44088932640793	27.3632652623439	3	21
9.44088932640793	27.3632652623439	3	19
9.44088932640793	27.3632652623439	3	20
9.44088932640793	27.3632652623439	4	24
9.44088932640793	27.3632652623439	4.7	25.5
9.44088932640793	27.3632652623439	4	23
9.44088932640793	27.3632652623439	4	22
9.44088932640793	27.3632652623439	4	18
9.44088932640793	27.3632652623439	4	21
9.44088932640793	27.3632652623439	4	19
9.44088932640793	27.3632652623439	4	20
9.44088932640793	27.3632652623439	5.40000000000001	24.3
9.44088932640793	27.3632652623439	5.40000000000001	23.3
9.44088932640793	27.3632652623439	5	18.3

Solution x	Solution y	Original x	Original y
9.44088932640793	27.3632652623439	5.3	21
9.44088932640793	27.3632652623439	7.5	25.5
9.44088932640793	27.3632652623439	7	24
9.44088932640793	27.3632652623439	7	18
9.44088932640793	27.3632652623439	8	24
9.44088932640793	27.3632652623439	7	21
9.44088932640793	27.3632652623439	8	18
9.44088932640793	27.3632652623439	9	24
9.44088932640793	27.3632652623439	8.5	22.8
9.44088932640793	27.3632652623439	8	21
9.44088932640793	27.3632652623439	10	24
9.44088932640793	27.3632652623439	9	18
9.44088932640793	27.3632652623439	10	16.3
9.44088932640793	27.3632652623439	9	21
9.44088932640793	27.3632652623439	9.5	22.2
9.44088932640793	27.3632652623439	11	24
9.44088932640793	27.3632652623439	10	18
9.44088932640793	27.3632652623439	10	21
9.44088932640793	27.3632652623439	12	24
9.44088932640793	27.3632652623439	11	18
9.44088932640793	27.3632652623439	11.7	22.8
9.44088932640793	27.3632652623439	11	21
9.44088932640793	27.3632652623439	12.2	22.1
9.44088932640793	27.3632652623439	12	21
9.44088932640793	27.3632652623439	13	22
9.44088932640793	27.3632652623439	13	21
9.44088932640793	27.3632652623439	13.5	21.4
9.44088932640793	27.3632652623439	16	21
9.44088932640793	27.3632652623439	14	21
9.44088932640793	27.3632652623439	15	21
9.44088932640793	27.3632652623439	14	20
12.9945258991523	28.0242102800343	13	36
12.9945258991523	28.0242102800343	9	30
12.9945258991523	28.0242102800343	10	30
12.9945258991523	28.0242102800343	11	30
22.1555658721451	29.7280663965691	30	38
22.1555658721451	29.7280663965691	30	37
22.1555658721451	29.7280663965691	30	36
22.1555658721451	29.7280663965691	27	38
22.1555658721451	29.7280663965691	30	35
22.1555658721451	29.7280663965691	27	37
22.1555658721451	29.7280663965691	30	34
22.1555658721451	29.7280663965691	27	36
22.1555658721451	29.7280663965691	26.2	36.5
22.1555658721451	29.7280663965691	30	33
22.1555658721451	29.7280663965691	30	32
22.1555658721451	29.7280663965691	27	35
22.1555658721451	29.7280663965691	28.5	33.5
22.1555658721451	29.7280663965691	30	31
22.1555658721451	29.7280663965691	27	34
22.1555658721451	29.7280663965691	30	30
22.1555658721451	29.7280663965691	26	34
22.1555658721451	29.7280663965691	27	33
22.1555658721451	29.7280663965691	30	29
22.1555658721451	29.7280663965691	29	30
22.1555658721451	29.7280663965691	23	35
22.1555658721451	29.7280663965691	30	28
22.1555658721451	29.7280663965691	27	32
22.1555658721451	29.7280663965691	30	27
22.1555658721451	29.7280663965691	27	31
22.1555658721451	29.7280663965691	30	26
22.1555658721451	29.7280663965691	23	34
22.1555658721451	29.7280663965691	17	36
22.1555658721451	29.7280663965691	16	36
22.1555658721451	29.7280663965691	14	36
22.1555658721451	29.7280663965691	15	36
22.1555658721451	29.7280663965691	30	25
22.1555658721451	29.7280663965691	20	35
22.1555658721451	29.7280663965691	19	35.2
22.1555658721451	29.7280663965691	27	30
22.1555658721451	29.7280663965691	26	31
22.1555658721451	29.7280663965691	28.5	27
22.1555658721451	29.7280663965691	27	29
22.1555658721451	29.7280663965691	18.3	34.5
22.1555658721451	29.7280663965691	26	30
22.1555658721451	29.7280663965691	22.8	32.5
22.1555658721451	29.7280663965691	29	24
22.1555658721451	29.7280663965691	27	28
22.1555658721451	29.7280663965691	17.2	34.1
22.1555658721451	29.7280663965691	26	29

Solution x	Solution y	Original x	Original y
22.1555658721451	29.7280663965691	23.2	31.5
22.1555658721451	29.7280663965691	21.5	32.5
22.1555658721451	29.7280663965691	27	27
22.1555658721451	29.7280663965691	22	32
22.1555658721451	29.7280663965691	17.9	33.3
22.1555658721451	29.7280663965691	26	28
22.1555658721451	29.7280663965691	27	26
22.1555658721451	29.7280663965691	21	32
22.1555658721451	29.7280663965691	13	33
22.1555658721451	29.7280663965691	27.6	23.6
22.1555658721451	29.7280663965691	26	27
22.1555658721451	29.7280663965691	16	33
22.1555658721451	29.7280663965691	14	33
22.1555658721451	29.7280663965691	27	25
22.1555658721451	29.7280663965691	15	33
22.1555658721451	29.7280663965691	20.5	31.5
22.1555658721451	29.7280663965691	26	26
22.1555658721451	29.7280663965691	27	23
22.1555658721451	29.7280663965691	27	22
22.1555658721451	29.7280663965691	26	25
22.1555658721451	29.7280663965691	20	31
22.1555658721451	29.7280663965691	26	24
22.1555658721451	29.7280663965691	26	23
22.1555658721451	29.7280663965691	26	22
22.1555658721451	29.7280663965691	20	30
22.1555658721451	29.7280663965691	22.2	28.2
22.1555658721451	29.7280663965691	19	30
22.1555658721451	29.7280663965691	12	30
22.1555658721451	29.7280663965691	20	29
22.1555658721451	29.7280663965691	13	30
22.1555658721451	29.7280663965691	16	30
22.1555658721451	29.7280663965691	14	30
22.1555658721451	29.7280663965691	15	30
22.1555658721451	29.7280663965691	21.2	27.5
22.1555658721451	29.7280663965691	20	28
22.1555658721451	29.7280663965691	24	21
22.1555658721451	29.7280663965691	14	29
22.1555658721451	29.7280663965691	18.3	28
22.1555658721451	29.7280663965691	20	27
22.1555658721451	29.7280663965691	15	28.6
22.1555658721451	29.7280663965691	14	28.2
22.1555658721451	29.7280663965691	15	28
22.1555658721451	29.7280663965691	20	26
22.1555658721451	29.7280663965691	18.3	27
22.1555658721451	29.7280663965691	12	27
22.1555658721451	29.7280663965691	13	27
22.1555658721451	29.7280663965691	20	25
22.1555658721451	29.7280663965691	16	27
22.1555658721451	29.7280663965691	14	27
22.1555658721451	29.7280663965691	16.9	26.8
22.1555658721451	29.7280663965691	15	27
22.1555658721451	29.7280663965691	17.9	25.8
22.1555658721451	29.7280663965691	17.2	26.1
22.1555658721451	29.7280663965691	20	24
22.1555658721451	29.7280663965691	20	23
22.1555658721451	29.7280663965691	20	22
22.1555658721451	29.7280663965691	20	21
22.1555658721451	29.7280663965691	14	25
22.1555658721451	29.7280663965691	18	24
22.1555658721451	29.7280663965691	17	24
22.1555658721451	29.7280663965691	13	24
22.1555658721451	29.7280663965691	16	24
22.1555658721451	29.7280663965691	14	24
22.1555658721451	29.7280663965691	15	24
22.1555658721451	29.7280663965691	18	21
22.1555658721451	29.7280663965691	17	21
20.7132070042248	18.7580211001321	30	13
20.7132070042248	18.7580211001321	30	15
20.7132070042248	18.7580211001321	30	16
20.7132070042248	18.7580211001321	30	23
20.7132070042248	18.7580211001321	30	17
20.7132070042248	18.7580211001321	30	22
20.7132070042248	18.7580211001321	30	18
20.7132070042248	18.7580211001321	30	21
20.7132070042248	18.7580211001321	30	19
20.7132070042248	18.7580211001321	30	20
20.7132070042248	18.7580211001321	29.5	17.5
20.7132070042248	18.7580211001321	29.5	20.5
20.7132070042248	18.7580211001321	28.5	22
20.7132070042248	18.7580211001321	27	18

Solution x	Solution y	Original x	Original y
20.7132070042248	18.7580211001321	27	21
20.7132070042248	18.7580211001321	27	19
20.7132070042248	18.7580211001321	27	20
20.7132070042248	18.7580211001321	26	21
20.7132070042248	18.7580211001321	26	19
20.7132070042248	18.7580211001321	26	20
19.6258974233642	10.4873893698033	29	4
19.6258974233642	10.4873893698033	29	5
19.6258974233642	10.4873893698033	30	7
19.6258974233642	10.4873893698033	25	3
19.6258974233642	10.4873893698033	26	4
19.6258974233642	10.4873893698033	27.5	5.2
19.6258974233642	10.4873893698033	24	3
19.6258974233642	10.4873893698033	30	8
19.6258974233642	10.4873893698033	23	3
19.6258974233642	10.4873893698033	30	9
19.6258974233642	10.4873893698033	26	5
19.6258974233642	10.4873893698033	22	3
19.6258974233642	10.4873893698033	30	10
19.6258974233642	10.4873893698033	21	3
19.6258974233642	10.4873893698033	29.3	9.5
19.6258974233642	10.4873893698033	20	3
19.6258974233642	10.4873893698033	27	7
19.6258974233642	10.4873893698033	30	11
19.6258974233642	10.4873893698033	19	3
19.6258974233642	10.4873893698033	18	3
19.6258974233642	10.4873893698033	20	3.7
19.6258974233642	10.4873893698033	17.1	3.1
19.6258974233642	10.4873893698033	28	9
19.6258974233642	10.4873893698033	14	3
19.6258974233642	10.4873893698033	15.5	3
19.6258974233642	10.4873893698033	30	12
19.6258974233642	10.4873893698033	27	8
19.6258974233642	10.4873893698033	22	4.7
19.6258974233642	10.4873893698033	24	6
19.6258974233642	10.4873893698033	25.5	7.1
19.6258974233642	10.4873893698033	27	9
19.6258974233642	10.4873893698033	26	8
19.6258974233642	10.4873893698033	23	6
19.6258974233642	10.4873893698033	24.5	7.1
19.6258974233642	10.4873893698033	22	6
19.6258974233642	10.4873893698033	28	11.3
19.6258974233642	10.4873893698033	27	10
19.6258974233642	10.4873893698033	25	8
19.6258974233642	10.4873893698033	26	9
19.6258974233642	10.4873893698033	29	14
19.6258974233642	10.4873893698033	21	6
19.6258974233642	10.4873893698033	17.1	5.1
19.6258974233642	10.4873893698033	15.5	5
19.6258974233642	10.4873893698033	27	11
19.6258974233642	10.4873893698033	26	10
19.6258974233642	10.4873893698033	20	6
19.6258974233642	10.4873893698033	19	6
19.6258974233642	10.4873893698033	27	12
19.6258974233642	10.4873893698033	18	6
19.6258974233642	10.4873893698033	12	6
19.6258974233642	10.4873893698033	26	11
19.6258974233642	10.4873893698033	13	6
19.6258974233642	10.4873893698033	14	6
19.6258974233642	10.4873893698033	27	13
19.6258974233642	10.4873893698033	26	12
19.6258974233642	10.4873893698033	11	7
19.6258974233642	10.4873893698033	27	14
19.6258974233642	10.4873893698033	13	7
19.6258974233642	10.4873893698033	26	13
19.6258974233642	10.4873893698033	27	15
19.6258974233642	10.4873893698033	20	8
19.6258974233642	10.4873893698033	17.5	7.5
19.6258974233642	10.4873893698033	27	16
19.6258974233642	10.4873893698033	13.5	7.5
19.6258974233642	10.4873893698033	26	14
19.6258974233642	10.4873893698033	27	17
19.6258974233642	10.4873893698033	14.5	7.7
19.6258974233642	10.4873893698033	26	15
19.6258974233642	10.4873893698033	20	9
19.6258974233642	10.4873893698033	26	16
19.6258974233642	10.4873893698033	11	9
19.6258974233642	10.4873893698033	26	17
19.6258974233642	10.4873893698033	23.9	13
19.6258974233642	10.4873893698033	26	18

Solution x	Solution y	Original x	Original y
19.6258974233642	10.4873893698033	20	10
19.6258974233642	10.4873893698033	14	9.3
19.6258974233642	10.4873893698033	10.5	10.5
19.6258974233642	10.4873893698033	20	11
19.6258974233642	10.4873893698033	10	11
19.6258974233642	10.4873893698033	22.9	14
19.6258974233642	10.4873893698033	16.5	10.5
19.6258974233642	10.4873893698033	23.2	15
19.6258974233642	10.4873893698033	20	12
19.6258974233642	10.4873893698033	16	11
19.6258974233642	10.4873893698033	13	11.3
19.6258974233642	10.4873893698033	20	13
19.6258974233642	10.4873893698033	18	12.3
19.6258974233642	10.4873893698033	17	12
19.6258974233642	10.4873893698033	20	14
19.6258974233642	10.4873893698033	11.5	13.5
19.6258974233642	10.4873893698033	20	15
19.6258974233642	10.4873893698033	16	13
19.6258974233642	10.4873893698033	10	15
19.6258974233642	10.4873893698033	21.7	19
19.6258974233642	10.4873893698033	20.6	16.5
19.6258974233642	10.4873893698033	20	16
19.6258974233642	10.4873893698033	11	15
19.6258974233642	10.4873893698033	21.1	20
19.6258974233642	10.4873893698033	20	17
19.6258974233642	10.4873893698033	18	15
19.6258974233642	10.4873893698033	12	15
19.6258974233642	10.4873893698033	20	18
19.6258974233642	10.4873893698033	17	15
19.6258974233642	10.4873893698033	13	15
19.6258974233642	10.4873893698033	20	19
19.6258974233642	10.4873893698033	16	15
19.6258974233642	10.4873893698033	14	15
19.6258974233642	10.4873893698033	20	20
19.6258974233642	10.4873893698033	15	15
19.6258974233642	10.4873893698033	12	17
19.6258974233642	10.4873893698033	18	18
19.6258974233642	10.4873893698033	12	18
19.6258974233642	10.4873893698033	13.5	17
19.6258974233642	10.4873893698033	17	18
19.6258974233642	10.4873893698033	13	18
19.6258974233642	10.4873893698033	16	18
19.6258974233642	10.4873893698033	14	18
19.6258974233642	10.4873893698033	15	18
19.6258974233642	10.4873893698033	15.5	18.5
19.6258974233642	10.4873893698033	15	19
7.09001151392849	3.78863852305285	6	4

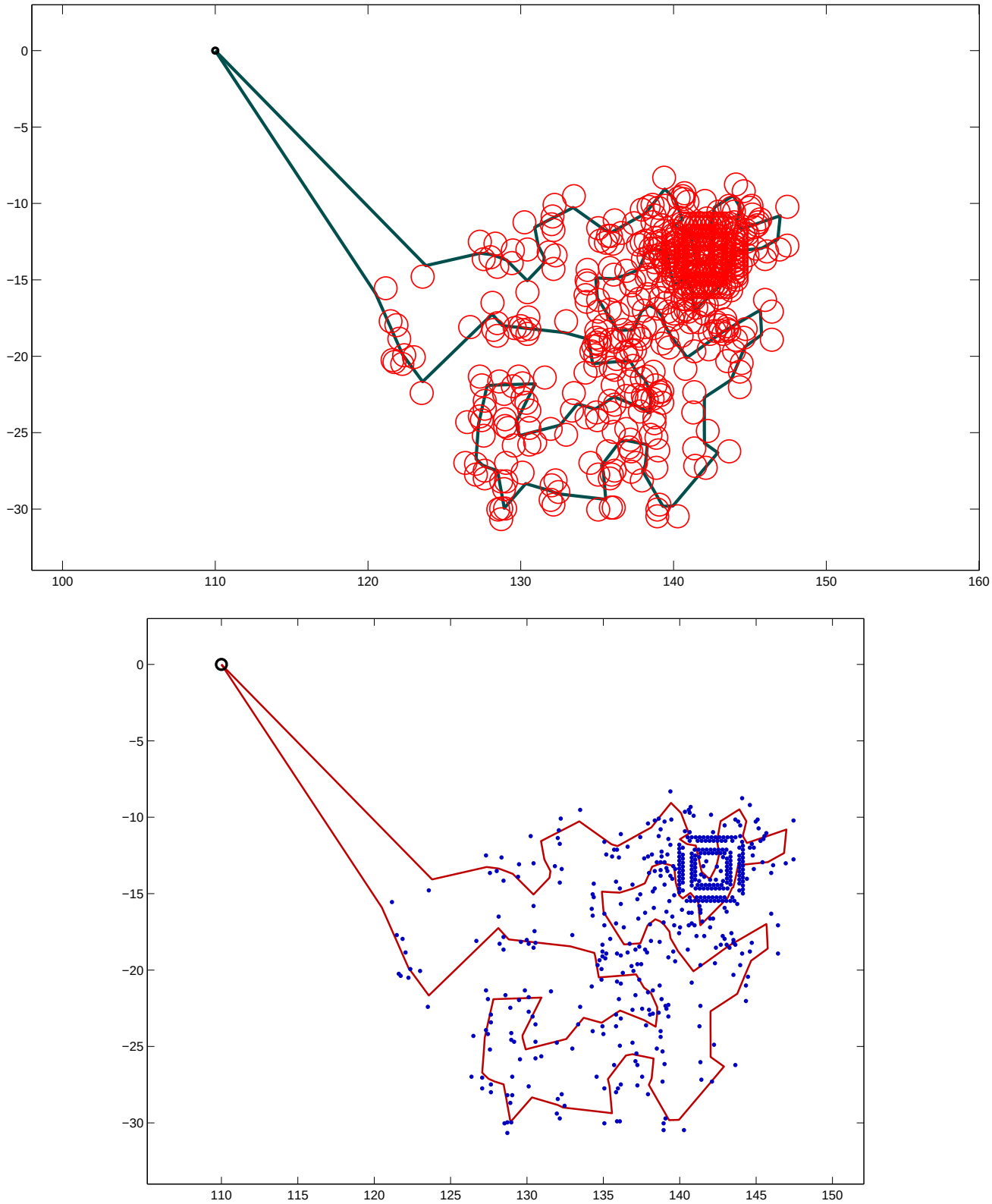


Figure N.23: $d493$, $r = 0.74904$, Equal Radius, 2D, Euclidean, Length = 202.7934341

Table N-26: Solution for $d493$, $r = 0.74904$, Equal Radius, 2D, Euclidean

Total distance: 202.793434098298			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
10.5055403579461	15.9108983370854	11.163	15.552
11.5889438271979	18.3645851808365	12.052	18.854
11.5889438271979	18.3645851808365	11.862	17.965
11.5889438271979	18.3645851808365	11.481	17.711
12.2559193824434	19.8751518348196	11.608	20.251
12.3768878163097	20.0391611192841	13.005	20.061
12.3768878163097	20.0391611192841	12.37	19.934
12.3768878163097	20.0391611192841	12.243	20.505
12.3768878163097	20.0391611192841	11.735	20.378
13.5749574141301	21.6635263326187	13.513	22.41
16.9145785302716	18.4272608016338	16.688	18.092
18.1256115815347	17.2537058219253	18.148	16.505
18.5977391573126	17.7693786824823	18.466	17.838
18.5977391573126	17.7693786824823	18.212	18.283
18.8055160074464	17.9963245407665	18.466	18.664
20.0529483847667	18.1358284281249	20.434	18.537
20.0529483847667	18.1358284281249	20.117	18.283
20.0529483847667	18.1358284281249	19.609	18.156
20.4162914595862	18.1764632188337	20.561	18.219
20.4162914595862	18.1764632188337	20.498	17.457
20.4162914595862	18.1764632188337	19.99	18.029
22.8341113679525	18.4468617599023	22.974	17.711
24.4115602514032	18.8738575296981	24.943	18.346
24.4375564053028	18.9725397127474	24.943	18.791
24.4648227689141	19.0760429299844	25.197	18.918
24.5019223906931	19.2952938968208	25.133	19.235
24.534443797557	19.4874885158661	24.752	19.362
24.534443797557	19.4874885158661	24.943	19.108
24.644272896773	20.1365179450652	24.625	19.68
24.644272896773	20.1365179450652	24.879	19.934
24.644272896773	20.1365179450652	24.879	20.632
24.7032903340213	20.4852955074462	24.244	21.077
25.9390135953365	20.3824550736867	25.895	20.759
25.9390135953365	20.3824550736867	26.149	20.886
26.6194129112931	20.325825618584	26.276	20.188
26.6194129112931	20.325825618584	26.975	20.061
27.0630100043901	20.2889050978774	26.848	19.743
27.0630100043901	20.2889050978774	27.229	19.616
27.1410123667163	20.282413017567	27.483	19.616
27.3854999060986	20.6907448925778	27.356	20.632
27.6583865552345	21.1465065013185	27.102	21.648
27.8959967343355	21.3246009518964	27.927	21.458
28.1034098223633	21.4800609911013	28.689	21.013
28.1971183547214	21.6905105099141	28.245	21.331
28.3710128944803	22.081040739527	28.816	21.902
28.5266307128855	22.4305248676619	29.261	22.283
28.524243970923	22.5369294630475	29.07	22.347
28.520849390871	22.6882765150482	28.626	22.791
28.520849390871	22.6882765150482	29.134	22.537
28.5141273597764	22.9880557221126	29.261	23.045
28.4201781749092	23.7079623088654	28.753	24.379
28.3092773689369	23.6444390641857	27.8	23.617
28.3092773689369	23.6444390641857	28.753	23.998
28.0194774604367	23.478445875623	28.245	22.855
27.8397079199652	23.3754756287203	28.054	22.918
27.6647004050266	23.2752329345039	27.991	22.601
27.1399081696322	23.064835980974	26.911	22.601
27.1399081696322	23.064835980974	27.546	22.537
26.0980919476883	22.647165668282	26.022	21.902
25.5266617552371	23.0254854283998	26.149	23.172
25.5266617552371	23.0254854283998	25.832	23.68
25.2781923998135	23.1899872908307	25.832	22.918
25.2781923998135	23.1899872908307	24.943	23.68
24.8880089842294	23.4483108852508	25.006	24.188
24.4558204973618	23.3294224011197	24.308	23.998
23.7087143193964	23.1239064680037	23.482	22.41
23.2588030566255	23.6719839632589	23.355	23.553
22.5714226405286	24.5093408517769	22.974	25.141
21.2563046441041	24.847104781103	21.958	24.76
21.2563046441041	24.847104781103	20.561	24.696
20.5302105638666	25.0335879345617	20.942	25.649
20.5302105638666	25.0335879345617	20.561	25.776
19.9196560784666	25.190390235151	19.545	25.839
19.7138023509988	24.4517224356002	18.974	24.569
19.706534259643	24.2813817855596	18.974	24.125
19.7184162981324	24.2575979501318	19.164	24.696
20.2916721248963	23.1101409730793	20.117	22.728
20.2916721248963	23.1101409730793	20.371	23.045
20.2916721248963	23.1101409730793	20.561	23.553
20.9467854377902	21.7988349740222	21.577	21.394
19.831777566762	21.8373425314858	19.863	21.331
19.831777566762	21.8373425314858	20.117	21.775
19.831777566762	21.8373425314858	19.482	21.966
18.8041664362322	21.8728307142249	18.593	21.648
18.8041664362322	21.8728307142249	18.91	22.474
17.8012787709756	21.907464311094	17.323	21.331
17.7401425129317	22.1806477731424	17.45	21.902
17.5917572452095	22.8436954451707	17.64	22.918
17.4664625728928	23.4035648453593	17.64	23.426
17.334532678087	23.9930830818508	17.323	23.934
17.334532678087	23.9930830818508	17.45	24.188
17.2380099736844	24.4243873247016	16.497	24.315
17.1773917718102	25.2537815100919	17.577	25.204
17.0704739986613	26.7166738878044	16.37	26.982
17.2666225557144	26.9082768483495	17.069	27.046
17.4834084810009	27.1200390297325	17.069	27.744
17.6942047853102	27.20887932262	17.64	27.49
17.8984830969082	27.2949725210149	17.64	27.998
18.4747599374123	27.4769221586373	19.037	26.982
18.571244159666	28.011375113612	18.72	28.189
18.6369927114003	28.3755765603988	19.037	28.189
18.7297488113694	28.8893801272615	18.91	28.697
18.8758004568484	29.6983942221538	18.529	30.03
18.9199856644274	29.943149847021	18.72	30.665
19.0263537123521	29.8216630276389	18.974	29.967
19.0263537123521	29.8216630276389	18.72	29.967
20.3271803503548	28.3359479063161	20.117	27.617
22.0075471755759	28.8242815265442	22.276	28.125
22.1103486247523	28.8739745128673	22.022	28.443
22.2347319694258	28.9340991997972	22.466	28.887
22.2347319694258	28.9340991997972	21.958	29.395
22.3581202389408	28.993743084073	22.149	29.713
25.1352299134215	29.3162015281281	25.07	30.03
25.5119539240317	29.3599453000088	25.895	29.903
25.5638314822657	29.3659692173391	26.086	29.903
25.4707932205444	28.3058480599265	25.832	27.998
25.43514330462	27.8996575188904	25.959	27.744
25.40982226528	27.6111519942172	26.149	27.49
25.3611339619682	27.4098964363348	25.07	27.744
25.2949622174333	27.1363641824018	24.562	26.982
25.8822451212176	26.3678590469694	25.705	26.22
26.4779862517341	25.5882857116178	26.086	24.95
26.9057843729928	25.5090224227364	26.911	24.76
27.1335832628607	25.5545186246262	27.102	25.966
27.346424979862	25.5970275548611	27.229	26.22
27.5536239593354	25.6384096210077	27.165	25.458
28.2035656471156	25.7682184791824	28.499	25.141
28.2836233898248	25.7842073744531	28.88	25.331
28.2608876690691	26.0908493328627	29.007	26.157
28.1559784934307	27.1080243423585	28.88	27.3
28.074216905463	27.2933156823351	27.546	26.982
27.976957584269	27.5137330956171	27.229	27.554
28.299142623344	28.0723370335406	27.927	28.125
29.1826069018464	29.6040765406847	29.07	29.713
29.1826069018464	29.6040765406847	28.943	30.03
29.3075106503843	29.8206346287969	28.943	30.475
29.9511024589137	29.8005722280067	30.277	30.475
31.9159684504839	27.4757925193485	31.42	27.173
31.9159684504839	27.4757925193485	32.118	27.3
32.8987533689913	26.3129867933137	33.642	26.22
32.0216670476057	25.6865623333795	31.356	26.03
32.0199577668078	24.8285801434253	32.245	24.887
32.0176692422921	23.6804986245873	31.293	23.68
32.0157210487319	22.7017253974286	31.356	22.347
33.7646788748979	21.5505483654015	34.341	22.029
34.1125999058813	20.7209922639675	34.468	20.442
34.1125999058813	20.7209922639675	34.341	21.013
34.262023083034	20.3647291571154	33.515	20.315
34.262023083034	20.3647291571154	33.96	19.68
34.6740672775839	19.3832031408496	34.087	18.918
35.0307714208727	19.1241553527625	34.595	18.791
35.7605945070014	18.5941335572402	36.436	18.918
35.6905449173147	17.1491997117278	36.436	17.076
35.6667304232958	16.9887308112667	35.992	16.314

Solution x	Solution y	Original x	Original y
34.4731755624758	17.6801576383265	34.722	18.219
33.8256359048822	18.0552774135279	33.515	18.219
33.8256359048822	18.0552774135279	33.642	18.346
33.6586978419482	18.1519849446255	33.388	17.584
33.4624988952639	18.2656431247957	33.515	18.029
33.2241832742749	18.4036995114835	32.817	17.775
33.2241832742749	18.4036995114835	32.944	17.965
33.025143341977	18.5471291961672	33.071	18.346
32.7863436173928	18.7192110012856	32.372	18.537
32.7863436173928	18.7192110012856	32.69	18.346
32.5891217298263	18.8613302814166	32.309	19.553
32.5891217298263	18.8613302814166	33.261	18.537
31.5109062125414	19.6382880050229	31.356	19.68
30.8950353222073	20.0820855966853	30.785	20.823
30.1499824530214	19.1050673263107	29.705	19.426
30.1499824530214	19.1050673263107	30.531	18.664
29.8846532826497	18.757128892444	29.261	19.172
29.705870221785	18.4466859383307	29.578	18.791
29.3960275804641	17.9086667583974	28.689	18.156
29.3639315995421	17.6970666767347	29.959	17.584
29.3333159676055	17.4952288388293	30.023	17.203
29.1770334309798	17.2900951246238	29.642	17.076
28.9719452066488	17.0209002758092	29.515	16.505
28.8561841859916	16.9229370716204	28.943	16.886
28.7374611090608	16.8224672175851	29.134	16.187
28.4034735931758	16.6759310920682	28.308	15.933
28.2011508839994	16.8359181410366	27.737	16.251
28.2011508839994	16.8359181410366	28.054	17.013
27.8920132676606	17.0803813211412	27.292	16.632
27.4981489856651	18.0613746129357	27.356	18.473
27.4981489856651	18.0613746129357	27.737	18.664
27.4708191842618	18.1294458627504	28.118	18.092
27.4230068131518	18.2485358354594	27.864	18.854
26.9896652837083	18.2789108460024	26.721	18.283
26.7227359429216	18.29762135958	26.594	18.854
26.7227359429216	18.29762135958	27.102	18.664
26.3509074941992	18.323685188004	25.895	18.918
26.3509073808193	18.3236851281205	26.149	19.045
25.8243519373806	17.4849534460949	25.451	17.965
25.8243519373806	17.4849534460949	25.832	16.949
25.8243519373806	17.4849534460949	26.34	17.203
25.4598913040886	16.9044175536717	25.07	17.076
25.1922197469246	16.4780537922734	25.07	16.314
25.0166809512465	16.1984448992414	24.308	16.441
24.9900875986936	15.9305819434837	24.244	15.997
24.9420535074172	15.3213416084604	24.371	15.235
24.9212776049088	15.0578541767461	24.308	15.044
24.9064485034152	14.8697906317962	24.371	14.346
25.6992910489788	14.9147683910876	25.832	14.219
25.895170534875	14.9258818521195	26.086	14.663
26.0601825945785	14.9352439351169	26.149	15.679
26.9665193971518	14.6604551184284	27.229	15.362
27.2285149945945	14.5429286911779	26.911	14.409
27.2285149945945	14.5429286911779	27.419	15.044
27.7149939989921	14.3247029051923	28.245	14.854
27.731636799579	14.2874722933801	28.372	14.663
27.731636799579	14.2874722933801	27.991	13.647
28.0653386479703	13.5410461875968	28.753	13.838
28.0653386479703	13.5410461875968	28.753	13.457
28.1288262518341	13.3886945040016	28.372	13.52
28.1933944758802	13.2337498257558	27.673	12.695
28.3828832523618	13.1623188996875	27.927	12.568
28.3828832523618	13.1623188996875	28.181	12.441
28.6257612785641	13.0768269243279	28.499	12.949
28.6257612785641	13.0768269243279	28.753	12.949
28.8487864500738	12.9983226512652	28.816	12.25
28.9768809336751	13.0311544139281	29.197	12.441
29.0800759168299	13.05760398781	29.007	12.949
29.0800759168299	13.05760398781	28.816	12.568
29.3197279958458	13.119028127114	29.134	13.33
29.6003504833894	13.1909530947765	29.975	12.581
29.6343050421992	13.1996555742953	30.202	12.711
29.6381122111015	13.2370257740944	29.975	13.101
29.6419750825209	13.2749427278999	29.975	12.841
29.6466020423109	13.3203596640141	29.705	13.393
29.6466020423109	13.3203596640141	29.578	13.203
29.6512708317974	13.3661871616204	30.202	13.231
29.6512708317974	13.3661871616204	30.202	12.971
29.6633361497847	13.4846108809043	29.975	13.361
29.6761153342594	13.610040898099	29.975	13.621

Solution x	Solution y	Original x	Original y
29.6885393999506	13.7319858396886	30.202	13.751
29.6885393999506	13.7319858396886	30.202	13.491
29.7029841868746	13.8737635491862	29.515	14.028
29.7029841868746	13.8737635491862	29.197	13.52
29.7437638311722	14.2739425877282	29.007	14.409
29.7437638311722	14.2739425877282	29.388	13.838
29.7624633641121	14.3439270467586	29.975	14.141
29.7624633641121	14.3439270467586	29.975	13.881
29.787277521471	14.4367953322321	30.202	14.271
29.787277521471	14.4367953322321	30.202	14.011
29.823369846505	14.5718712015935	29.975	14.401
29.8621726733908	14.7170907564458	30.202	14.791
29.8960261260216	14.8437878024476	29.975	14.921
29.8960261260216	14.8437878024476	29.975	14.661
29.9310002644833	14.9746787700017	29.642	15.108
29.9647823723174	15.1011086003705	29.324	15.489
30.1945749275224	15.312286858554	30.15	16.06
30.3696959265856	15.1861767985384	30.462	15.473
30.5071497280459	15.0871958651376	30.722	15.473
30.5071497280459	15.0871958651376	30.657	15.246
30.6980310351618	14.9497381207877	30.787	14.206
30.7180123127047	14.9730534657547	30.787	14.466
30.7399594416388	14.9986626756836	31.047	14.661
30.7621161361989	15.0245164186185	31.177	14.433
30.7621161361989	15.0245164186185	31.307	14.661
31.2022685253253	15.5381169869921	31.892	15.246
31.2063492513234	15.5820291692238	31.762	15.473
31.21044876258	15.6261432939211	30.982	15.473
31.21044876258	15.6261432939211	31.112	15.246
31.2151885540602	15.6771475008121	31.372	15.246
31.2151885540602	15.6771475008121	31.632	15.246
31.2237035233651	15.7687764001791	31.502	15.473
31.2337614429392	15.877008932856	31.293	15.806
31.2337614429392	15.877008932856	31.242	15.473
31.2481457119124	16.0317968249477	31.356	16.06
31.2621668304191	16.1826768512882	31.356	16.251
31.2755359936581	16.3265412521008	30.594	16.251
31.2755359936581	16.3265412521008	30.785	16.251
31.3131644905137	16.731394510921	30.785	16.949
31.3350488859505	16.9668772883579	30.594	17.076
31.3560007585568	17.0703401282254	31.102	17.775
31.3560012501493	17.0703397513377	31.61	17.775
31.453051755351	16.9722696019122	30.975	17.076
31.453051755351	16.9722696019122	31.483	16.822
31.6552186784771	16.7679782887677	31.991	17.203
31.9859003119419	16.4338202689213	32.182	16.632
32.3271672732091	16.0889656523595	31.991	16.632
32.3271672732091	16.0889656523595	32.022	15.473
32.3271672732091	16.0889656523595	32.282	15.473
32.5173975470656	15.8967366479617	33.071	16.187
32.6128915938269	15.8002394602316	32.542	15.473
32.6128915938269	15.8002394602316	32.802	15.473
32.6790151517814	15.733421278391	32.672	15.246
32.7320747151594	15.6798043013326	32.152	15.246
32.7320747151594	15.6798043013326	32.412	15.246
32.8449261742243	15.5657667832189	32.932	15.246
32.9360650863114	15.4736698906814	32.944	15.933
32.9360650863114	15.4736698906814	33.062	15.473
33.0672736736299	15.3410826383699	33.322	15.473
33.0672736736299	15.3410826383699	33.582	15.473
33.1494124773261	15.2580806269134	33.769	15.679
33.2106543880611	15.1184424262979	33.127	14.661
33.2106543880611	15.1184424262979	33.452	15.246
33.254790764298	15.0178066419745	32.867	14.661
33.2932716469933	14.9300659331355	32.607	14.661
33.3665204410746	14.7630503738913	32.737	14.433
33.4202992127254	14.6404254317058	32.835	14.173
33.4773761791832	14.5982140550176	33.322	14.141
33.4773761791832	14.5982140550176	33.322	13.881
33.4929531411051	14.5867038687256	33.095	14.271
33.4929531411051	14.5867038687256	33.322	14.401
33.5087849323905	14.5750053777771	34.135	14.986
33.5324552415798	14.472614093067	33.907	14.791
33.5609871708373	14.3491944814945	34.135	14.726
33.5609871708373	14.3491944814945	34.135	14.466
33.6723893398419	13.8673599762992	34.404	14.028
33.6790825634604	13.8351803645295	34.135	14.206
33.6790825634604	13.8351803645295	34.135	13.946
33.686325455311	13.8003583316136	33.907	14.336
33.686325455311	13.8003583316136	33.907	14.076

Solution x	Solution y	Original x	Original y
33.6955734107968	13.7558966836159	33.095	14.011
33.7092149366101	13.6903121492997	33.095	13.751
33.7259550142788	13.6098308164053	33.907	13.816
33.74370756789	13.5244819444148	33.907	13.556
33.74370756789	13.5244819444148	34.135	13.686
33.7617599906162	13.4376914907024	33.322	13.621
33.7617599906162	13.4376914907024	33.322	13.361
33.7842426597766	13.3296023635899	33.095	13.231
33.7842426597766	13.3296023635899	33.322	13.101
33.8088991648732	13.2110628025035	33.322	12.841
33.8243923139845	13.1365752719058	33.322	12.581
33.9452798997886	13.1238816455013	33.907	12.776
33.9452798997886	13.1238816455013	33.907	12.516
34.0557720813524	13.1122794480622	34.135	12.646
34.1543056105377	13.1019329076634	34.135	12.906
34.2528316455237	13.0915871354394	33.907	13.296
34.2528316455237	13.0915871354394	33.907	13.036
34.4298225456445	13.0730021150544	34.135	13.426
34.4298225456445	13.0730021150544	34.135	13.166
35.0113186293163	13.0119377063464	34.849	13.393
35.0113186293163	13.0119377063464	34.785	12.504
35.0113186293163	13.0119377063464	35.42	12.949
35.766861809444	12.9325948909206	35.992	13.647
36.0887507002877	12.7542477711327	36.119	13.139
36.5848739874277	12.4793633940182	36.944	13.012
36.8269471014455	12.3452399560051	37.452	12.758
36.9853469485046	10.8039154230793	37.452	10.218
35.5020856998666	11.3087415812899	35.166	10.726
35.5020856998666	11.3087415812899	35.674	11.044
34.980721488051	11.4861936283994	34.595	11.996
34.980721488051	11.4861936283994	34.849	11.996
34.980721488051	11.4861936283994	34.722	11.742
34.980721488051	11.4861936283994	35.293	11.552
34.980721488051	11.4861936283994	35.484	11.425
34.980721488051	11.4861936283994	35.547	11.234
34.3978288931695	11.6845850726408	34.135	12.386
34.3600520278709	11.6194673155982	33.907	11.996
34.3600520278709	11.6194673155982	34.135	12.126
34.2960344516399	11.5091178669576	34.135	11.866
34.2179014029783	11.3744374316149	34.087	11.615
34.1307671990219	11.2242416134343	33.452	11.541
34.1307620905203	11.2242315639849	33.387	11.313
34.1651638387563	11.0813232391445	33.647	11.313
34.2286597122024	10.8175423526509	33.96	11.234
34.2286597122024	10.8175423526509	33.96	10.536
34.3293954711847	10.3990428939557	34.976	10.282
34.3619215759478	10.2639250649004	35.103	10.155
33.9664827919892	9.58608695714604	34.595	9.202
33.9076595845434	9.48525435471913	34.087	8.758
33.4632537143865	9.76334109944808	33.642	10.155
33.4632537143865	9.76334109944808	33.833	10.282
32.9380006103615	10.0920172837025	32.944	10.536
32.6758460272206	10.256060893924	32.055	9.837
32.557413139656	10.9226815616804	32.182	10.98
32.4811598797147	11.351896361298	31.827	11.313
32.4459880030467	11.5498696315282	31.697	11.541
32.4490465466927	11.5698131359561	32.087	11.313
32.4490465466927	11.5698131359561	32.347	11.313
32.4523099030922	11.5910920600216	32.607	11.313
32.4523099030922	11.5910920600216	32.867	11.313
32.4558276050502	11.6140294015929	33.127	11.313
32.4666293435599	11.684462800429	32.737	11.541
32.4666293435599	11.684462800429	32.997	11.541
32.4786037969063	11.762543776844	32.217	11.541
32.4786037969063	11.762543776844	32.477	11.541
32.4931365321001	11.8573083206442	31.957	11.541
32.5216064066993	12.0429745689674	31.892	12.353
32.5216064066993	12.0429745689674	32.152	12.353
32.5310991275344	12.1048720381609	32.022	12.126
32.5407405918236	12.1677394740542	32.282	12.126
32.5407405918236	12.1677394740542	32.542	12.126
32.5507032348131	12.2327012671245	32.412	12.353
32.5507032348131	12.2327012671245	32.672	12.353
32.5600417711484	12.29359337723	32.932	12.353
32.5600417711484	12.29359337723	32.802	12.126
32.569530511687	12.3554649092439	33.062	12.126
32.5804499834547	12.426666081931	33.095	12.971
32.5804499834547	12.426666081931	33.322	12.321
32.5220956393849	12.6761252234559	32.835	12.613
32.5220956393849	12.6761252234559	33.095	12.711

Solution x	Solution y	Original x	Original y
32.391886299303	13.232750542482	33.095	13.491
32.319059471566	13.3746362294915	32.436	13.231
32.2353446063916	13.5377344732743	32.69	13.52
32.1151766831478	13.7718517211658	32.372	14.092
32.0294651930089	13.9388400275698	32.477	14.433
31.9993427229778	13.9975270783745	32.347	14.661
31.9576449690999	13.9920217894295	31.827	14.661
31.9198824767541	13.9870362501896	31.61	13.901
31.9198824767541	13.9870362501896	31.991	14.092
31.8838629205026	13.9822808221603	31.567	14.661
31.877131078222	13.9761052607952	31.957	14.433
31.877131078222	13.9761052607952	32.217	14.433
31.8698369976811	13.9694139227508	32.087	14.661
31.7925067375109	13.8984743577266	31.437	14.433
31.7925067375109	13.8984743577266	31.697	14.433
31.5566152206305	13.6820805893236	31.015	14.076
31.5566152206305	13.6820805893236	31.275	14.173
31.4352800822273	13.5707737411527	30.787	13.946
31.4208617639791	13.506569590424	30.787	13.686
31.4065216640219	13.4427138553245	31.015	13.816
31.3890726329936	13.3650146188087	31.399	13.754
31.3675335759953	13.2691034601039	31.015	13.556
31.3675335759953	13.2691034601039	31.547	13.203
31.3427734578312	13.1588498149773	31.015	13.296
31.3427734578312	13.1588498149773	31.015	13.036
31.3201431066684	13.0580792518414	30.787	13.426
31.3201431066684	13.0580792518414	30.787	13.166
31.2778609748893	12.8698063968942	30.787	12.906
31.2778609748893	12.8698063968942	31.015	12.776
31.2443602299399	12.7206332954498	30.787	12.646
31.2443602299399	12.7206332954498	30.787	12.386
31.2268569477143	12.6426931269603	31.015	12.516
31.2104671278224	12.569711041309	31.737	12.885
31.2104671278224	12.569711041309	31.632	12.353
31.1815340277868	12.4408760342528	31.275	12.613
31.1815340277868	12.4408760342528	31.372	12.353
31.1497223165918	12.2992232289434	31.762	12.126
31.1193239150239	12.1638633574054	31.502	12.126
31.0871372068542	12.020540774986	30.982	12.126
31.0871372068542	12.020540774986	31.242	12.126
31.0499522251149	11.8549625922714	31.567	11.313
30.9070766400685	11.8298626670524	31.437	11.541
30.4771549529223	11.7543283028224	30.202	12.451
30.3900802043488	11.6974888636429	29.975	12.321
30.3900802043488	11.6974888636429	29.975	12.061
30.0223733679546	11.4479723325536	29.388	11.804
30.0223733679546	11.4479723325536	29.975	11.801
30.0099000825435	11.4395083425305	29.261	11.425
30.1594719662201	11.3462584045067	30.202	11.996
30.1594719662201	11.3462584045067	30.657	11.541
30.381960016779	11.2075452202985	30.527	11.313
30.5944146763923	11.0750880671992	31.177	11.541
30.5973654011587	11.0732488897966	31.307	11.313
30.5679081612911	10.995380531333	30.787	11.313
30.5679081612911	10.995380531333	31.047	11.313
30.470452948607	10.7377622572558	30.34	10.917
30.470452948607	10.7377622572558	30.658	10.98
30.2370595854291	10.1207880827428	30.658	9.71
30.2370595854291	10.1207880827428	30.912	9.901
30.0905261261275	9.73343095354801	30.721	9.329
30.0038104714808	9.64561050266099	30.34	9.647
30.0038104714808	9.64561050266099	30.594	9.52
29.4266008210821	9.06104527917432	29.388	8.313
28.9034964241868	9.7133007492746	29.451	10.155
28.4383191198334	10.2933228224444	27.927	10.409
28.4383191198334	10.2933228224444	28.753	10.79
28.4383191198334	10.2933228224444	28.372	10.218
28.4383191198334	10.2933228224444	28.626	10.091
28.4383191198334	10.2933228224444	29.007	10.282
28.1431688159382	10.6613432992753	28.626	11.234
27.3463806704654	11.1030124531584	27.419	11.298
26.6527915190153	11.4874772781419	26.594	11.933
26.3997672730025	11.6277323448895	26.149	11.107
26.1196598625941	11.7829998087854	25.705	12.123
26.0186472772864	11.8389925942445	25.895	12.123
25.9311598141149	11.8874882137065	26.022	12.631
25.7852934797986	11.8482162609017	25.578	12.568
25.5290384627522	11.769574651065	25.197	12.441
24.955653160623	11.3595384315239	25.07	11.615
23.4279862291817	10.2670904631883	23.482	9.52

Solution x	Solution y	Original x	Original y
22.5429678774452	10.7238524653647	22.212	10.091
21.8330154834043	11.0902611490793	22.149	11.742
21.8330154834043	11.0902611490793	22.022	11.361
21.8330154834043	11.0902611490793	22.085	10.853
20.9168795747077	11.563081592043	20.244	11.234
21.1415757741828	12.766239997824	20.434	13.012
21.3792529249644	13.2184101871826	21.831	13.203
21.5378160401068	13.5200671288014	22.276	13.393
21.4752100179953	13.9547864826576	22.149	14.282
20.4252080242833	15.0570111091744	20.434	15.806
19.5002515408062	14.1306146971999	19.418	13.901
19.0753390147014	13.7050376394267	19.482	13.076
18.665685229556	13.5500870455928	18.466	14.155
18.1563308357092	13.3574250420998	18.339	12.631
17.9130917498004	13.3253544941321	18.021	13.52
17.6300795903587	13.2880399629992	17.577	13.647
17.3583100221046	13.2522076160748	17.323	12.504
13.7866711756608	14.0711959991762	13.576	14.79

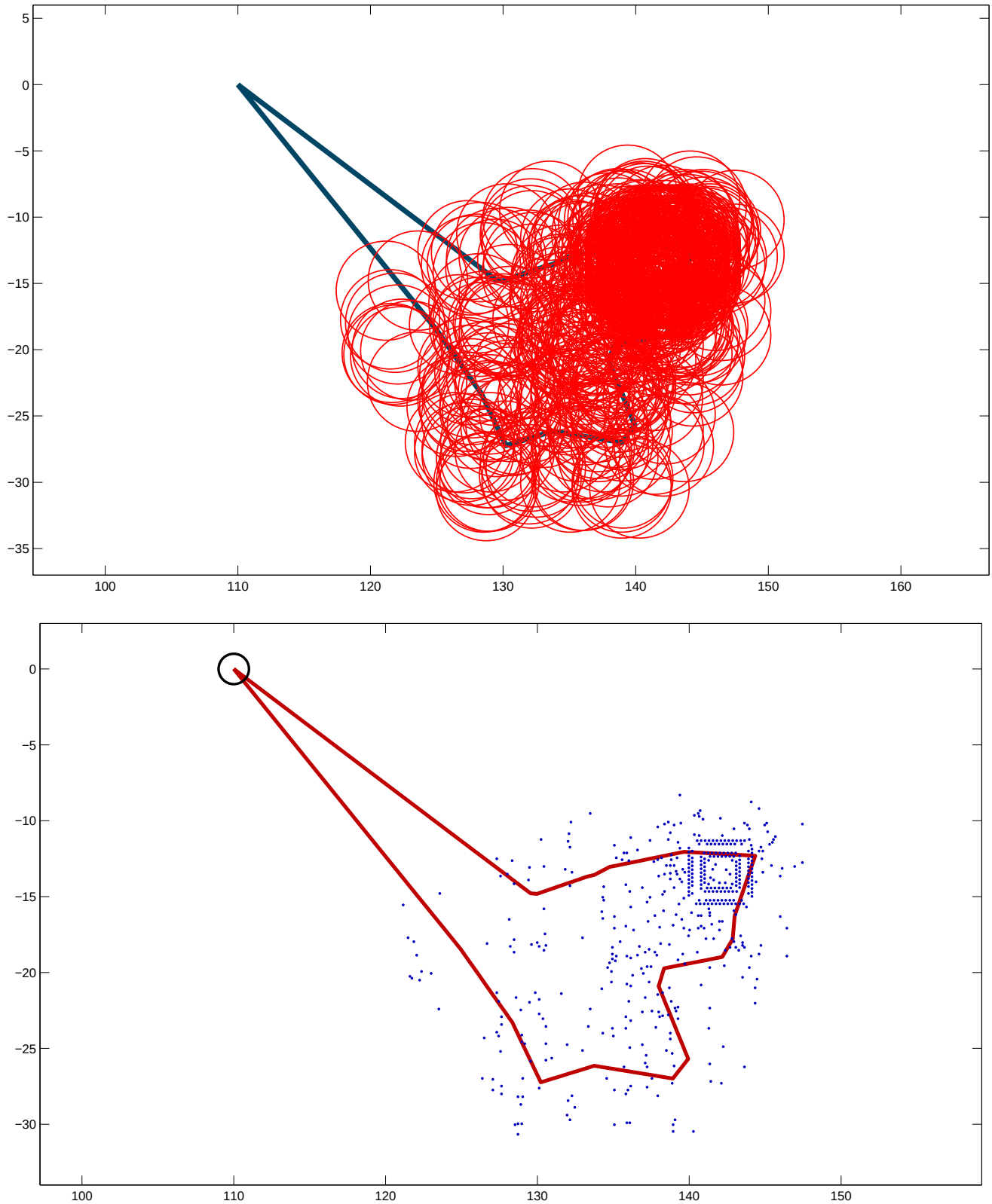


Figure N.24: $d493$, $r = 3.7452$, Equal Radius, 2D, Euclidean, Length = 101.7345966

Table N-27: Solution for $d493$, $r = 3.7452$, Equal Radius, 2D, Euclidean

Total distance: 101.734596601034			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
10.9962912378072	13.5791402585706	11.163	15.552
12.3025497427538	15.1922152676316	13.576	14.79
13.5035509545857	16.6753139434521	12.052	18.854
14.4580568327612	17.8540161385886	11.608	20.251
14.9688719933652	18.4848153980848	18.148	16.505
14.9720426011244	18.4916683554028	16.688	18.092
14.9752287306103	18.4985556445366	11.862	17.965
14.9752287306103	18.4985556445366	11.481	17.711
14.9782195377859	18.5050210844884	11.735	20.378
15.2905487374535	18.9485216932742	13.005	20.061
15.2905487374535	18.9485216932742	12.37	19.934
15.7099156671368	19.5440148156352	13.513	22.41
15.7099156671368	19.5440148156352	12.243	20.505
16.1966795626958	20.2352191037084	17.45	21.902
16.5736614763799	20.7705340707061	17.323	21.331
16.5736614763799	20.7705340707061	18.466	18.664
16.9856022817152	21.355489405899	19.863	21.331
16.9856022817152	21.355489405899	18.593	21.648
17.2604653152828	21.7457955045193	17.64	22.918
17.5192128844344	22.1132177163598	18.91	22.474
17.5192128844344	22.1132177163598	19.482	21.966
17.7449200199886	22.4337225934729	16.497	24.315
17.7449200199886	22.4337225934729	17.64	23.426
17.9524200391918	22.7283733555866	17.45	24.188
17.9524200391918	22.7283733555866	17.323	23.934
18.1466407276396	23.004167451503	20.117	21.775
18.3434958700349	23.2837023042328	21.577	21.394
18.5241029671279	23.663197807294	18.974	24.569
18.5241029671279	23.663197807294	18.974	24.125
18.6910715446874	24.0140369953258	20.371	23.045
18.8622623322754	24.3737474411961	20.561	23.553
19.0353133352253	24.7373664987864	20.117	22.728
19.2341269060075	25.1551166363858	17.577	25.204
19.4507042001872	25.6101898269963	17.069	27.046
19.4507042001872	25.6101898269963	16.37	26.982
19.6858850542042	26.1043496117356	17.64	27.49
19.6858850542042	26.1043496117356	17.069	27.744
19.9113263896112	26.5780442141668	18.72	28.189
19.9113263896112	26.5780442141668	17.64	27.998
20.1229792602179	27.0227679108002	18.529	30.03
20.2240102565152	27.2350616231817	18.72	30.665
20.364425014247	27.1916061715698	18.974	29.967
20.364425014247	27.1916061715698	18.72	29.967
20.589229990073	27.1220342931027	18.91	28.697
20.842001494569	27.0438076212662	20.117	27.617
20.842001494569	27.0438076212662	19.037	28.189
21.1401639121875	26.9515337961646	19.037	26.982
21.4853082624267	26.8447207410579	19.545	25.839
21.4853082624267	26.8447207410579	19.164	24.696
22.0808421640598	26.6604227436864	20.561	24.696
22.7686531321359	26.4475695765415	22.149	29.713
22.7686531321359	26.4475695765415	21.958	29.395
22.7686531321359	26.4475695765415	22.466	28.887
22.7686531321359	26.4475695765415	22.022	28.443
22.7686531321359	26.4475695765415	22.276	28.125
22.7686531321359	26.4475695765415	25.006	24.188
22.7686531321359	26.4475695765415	24.308	23.998
22.7686531321359	26.4475695765415	22.974	25.141
22.7686531321359	26.4475695765415	23.355	23.553
22.7686531321359	26.4475695765415	20.942	25.649
22.7686531321359	26.4475695765415	21.958	24.76
22.7686531321359	26.4475695765415	20.561	25.776
23.7428290525944	26.1461065972777	23.482	22.41
24.4057546869971	26.2535821076788	24.943	23.68
25.0622470806652	26.3600156614598	27.229	26.22
25.5789716220254	26.4437908871328	27.546	26.982
26.015171265907	26.5145114381527	27.927	28.125
26.015171265907	26.5145114381527	27.229	27.554
26.3458998728456	26.568133103007	25.07	30.03
26.3458998728456	26.568133103007	28.88	25.331
26.3458998728456	26.568133103007	28.499	25.141
26.3458998728456	26.568133103007	28.753	24.379
26.3458998728456	26.568133103007	27.102	25.966
26.3458998728456	26.568133103007	28.753	23.998
26.3458998728456	26.568133103007	25.07	27.744
26.3458998728456	26.568133103007	27.165	25.458
26.3458998728456	26.568133103007	25.705	26.22
26.3458998728456	26.568133103007	26.911	24.76
26.3458998728456	26.568133103007	24.562	26.982
26.3458998728456	26.568133103007	26.086	24.95
26.6635966954771	26.61964565619	25.959	27.744
26.6635966954771	26.61964565619	26.149	27.49
26.9982984633854	26.6739150900704	25.895	29.903
26.9982984633854	26.6739150900704	25.832	27.998
27.469094955508	26.7502482268044	26.086	29.903
28.303181090955	26.8854619796208	28.943	30.475
28.4752089088112	26.9133582802707	28.943	30.03
28.6424707852598	26.9404818130346	32.118	27.3
28.6424707852598	26.9404818130346	29.07	29.713
28.7340319488574	26.9553299403114	29.007	26.157
28.8258650857938	26.9702220962052	28.88	27.3
28.9178227180786	26.9851344703633	30.277	30.475
29.4457770838021	26.3149948345011	31.42	27.173
29.9336825766973	25.6956849441118	33.642	26.22
29.7493419699287	25.2424932575701	32.245	24.887
29.556309386511	24.7679376506541	31.356	26.03
29.556309386511	24.7679376506541	31.293	23.68
29.3369846332984	24.2287347621318	27.8	23.617
29.3369846332984	24.2287347621318	28.054	22.918
29.1719860525982	23.8231011893609	28.245	22.855
29.1719860525982	23.8231011893609	27.991	22.601
29.0359841751971	23.4887569686405	28.626	22.791
28.9088412597808	23.1761937544938	29.261	23.045
28.9088412597808	23.1761937544938	29.134	22.537
28.7856867603665	22.8734352521224	29.261	22.283
28.7856867603665	22.8734352521224	29.07	22.347
28.6670171530983	22.5817022671147	28.816	21.902
28.5536891443577	22.303102415517	28.689	21.013
28.5536891443577	22.303102415517	28.245	21.331
28.4510881021135	22.0508739522123	27.927	21.458
28.353130310984	21.8100614679884	27.546	22.537
28.353130310984	21.8100614679884	26.911	22.601
28.2523712152663	21.5623612200295	25.832	23.68
28.2523712152663	21.5623612200295	26.149	23.172
28.1237084532092	21.2460592696945	25.832	22.918
27.9852831232527	20.9057558247742	24.244	21.077
28.0184892214816	20.796433447775	24.879	20.632
28.0184892214816	20.796433447775	24.879	19.934
28.0510355728784	20.6892845326544	24.625	19.68
28.08042936403	20.5925155419522	24.752	19.362
28.08042936403	20.5925155419522	24.943	18.791
28.0993130994088	20.5303420594239	25.133	19.235
28.0993130994088	20.5303420594239	24.943	19.108
28.1170439012286	20.4719632917252	25.895	18.918
28.1170439012286	20.4719632917252	25.197	18.918
28.1339411941711	20.4163282039624	26.276	20.188
28.1339411941711	20.4163282039624	26.149	19.045
28.1507138309191	20.3611033728731	27.229	19.616
28.1507138309191	20.3611033728731	26.594	18.854
28.1673003135942	20.3064912114024	27.483	19.616
28.1836445205234	20.2526766180245	26.975	20.061
28.1836445205234	20.2526766180245	26.848	19.743
28.2002156458591	20.1981147999873	25.895	20.759
28.2170117408373	20.142812303528	26.022	21.902
28.2170117408373	20.142812303528	26.149	20.886
28.2352171033961	20.0828699371758	27.102	21.648
28.2352171033961	20.0828699371758	27.356	20.632
28.2544168409617	20.0196536573418	27.864	18.854
28.2731270221684	19.9580491330129	28.118	18.092
28.2731270221684	19.9580491330129	27.737	18.664
28.2912887294871	19.8982501648131	27.356	18.473
28.3090914394916	19.8396331297844	27.102	18.664
28.3090914394916	19.8396331297844	26.721	18.283
28.3267595601919	19.7814591520779	26.34	17.203
28.3431022718246	19.7276488943582	25.832	16.949
28.3603341870161	19.7242680851819	24.943	18.346
28.4641578281721	19.7038945471552	25.451	17.965
28.664347238757	19.6646037309777	27.292	16.632
28.8818221025145	19.6219180057538	28.054	17.013
28.8818221025145	19.6219180057538	27.737	16.251
29.1262381861603	19.5739436633271	28.308	15.933
29.522755324159	19.4960957220901	28.943	16.886
29.522755324159	19.4960957220901	29.134	16.187
29.8811640170018	19.4257306636768	29.578	18.791

Solution x	Solution y	Original x	Original y
29.8811640170018	19.4257306636768	28.689	18.156
30.2657494251031	19.350226155977	29.705	19.426
30.2657494251031	19.350226155977	29.261	19.172
30.6959438878319	19.2657666080297	30.531	18.664
31.1336800626044	19.1798260888237	32.309	19.553
31.1336800626044	19.1798260888237	31.356	19.68
31.5470796786699	19.0986636968181	31.356	22.347
31.5470796786699	19.0986636968181	30.785	20.823
32.1716942288095	18.9760282268441	34.341	22.029
32.2739401170239	18.801168354177	34.341	21.013
32.3845122976758	18.6120686513627	34.468	20.442
32.4990688640527	18.4161547117027	33.515	20.315
32.6196466457406	18.2099431712183	33.96	19.68
32.6196466457406	18.2099431712183	34.087	18.918
32.7435561928232	17.9980333693108	34.595	18.791
32.8641279541724	17.791832023454	36.436	18.918
32.873958638196	17.6717468120023	34.722	18.219
32.873958638196	17.6717468120023	33.642	18.346
32.8838723371033	17.550647686943	33.515	18.219
32.8838723371033	17.550647686943	33.515	18.029
32.8939830776079	17.4271418335785	33.261	18.537
32.9042346909417	17.3019134050296	33.071	18.346
32.9042346909417	17.3019134050296	32.69	18.346
32.9148524068038	17.1722174584244	32.372	18.537
32.9148524068038	17.1722174584244	31.61	17.775
32.9259471152538	17.0367005547865	32.944	17.965
32.9259471152538	17.0367005547865	32.817	17.775
32.9372351830676	16.8988252665387	33.388	17.584
32.9490970477535	16.7539330088167	36.436	17.076
32.9490970477535	16.7539330088167	35.992	16.314
32.9490970477535	16.7539330088167	31.102	17.775
32.9490970477535	16.7539330088167	30.975	17.076
32.9490970477535	16.7539330088167	30.785	16.949
32.9490970477535	16.7539330088167	31.632	15.246
32.9490970477535	16.7539330088167	31.502	15.473
32.9490970477535	16.7539330088167	31.293	15.806
32.9490970477535	16.7539330088167	31.827	14.661
32.9490970477535	16.7539330088167	30.594	17.076
32.9490970477535	16.7539330088167	31.372	15.246
32.9490970477535	16.7539330088167	31.242	15.473
32.9490970477535	16.7539330088167	31.697	14.433
32.9490970477535	16.7539330088167	30.785	16.251
32.9490970477535	16.7539330088167	31.567	14.661
32.9490970477535	16.7539330088167	29.959	17.584
32.9490970477535	16.7539330088167	31.112	15.246
32.9490970477535	16.7539330088167	30.594	16.251
32.9490970477535	16.7539330088167	30.982	15.473
32.9490970477535	16.7539330088167	30.023	17.203
32.9490970477535	16.7539330088167	31.437	14.433
32.9490970477535	16.7539330088167	31.307	14.661
32.9490970477535	16.7539330088167	30.722	15.473
32.9490970477535	16.7539330088167	31.177	14.433
32.9490970477535	16.7539330088167	31.047	14.661
32.9490970477535	16.7539330088167	30.657	15.246
32.9490970477535	16.7539330088167	29.642	17.076
32.9490970477535	16.7539330088167	30.462	15.473
32.9490970477535	16.7539330088167	30.15	16.06
32.9490970477535	16.7539330088167	29.515	16.505
32.9560872077796	16.6685499257825	33.071	16.187
32.9560872077796	16.6685499257825	32.944	15.933
32.9627197517306	16.5875288944567	32.182	16.632
32.9627197517306	16.5875288944567	31.991	16.632
32.9694775514508	16.5049793829278	31.991	17.203
32.9763321003354	16.4212481934861	31.483	16.822
32.9763321003354	16.4212481934861	31.356	16.251
32.9832398154415	16.3368702029109	31.356	16.06
32.9832398154415	16.3368702029109	30.787	14.466
32.9898862169707	16.2556824884348	29.324	15.489
33.0326244360535	16.1311876801244	29.642	15.108
33.075089722184	16.0074904411901	29.975	14.921
33.075089722184	16.0074904411901	29.975	14.661
33.1155546844684	15.8896219623755	30.202	14.791
33.1555930346178	15.7729962869625	29.975	14.401
33.1555930346178	15.7729962869625	29.975	14.141
33.1900230759106	15.6727070598777	30.202	14.271
33.1900230759106	15.6727070598777	30.202	14.011
33.2217493671113	15.5802932361558	30.202	13.751
33.2217493671113	15.5802932361558	30.202	13.491
33.2426434445096	15.519429429472	30.787	13.686
33.2426434445096	15.519429429472	30.787	13.426

Solution x	Solution y	Original x	Original y
33.2621997837598	15.4624617766716	31.015	13.556
33.2621997837598	15.4624617766716	31.015	13.296
33.2808260372382	15.4082029718505	31.015	13.816
33.2990771138377	15.3550367481335	30.787	14.206
33.2990771138377	15.3550367481335	30.787	13.946
33.3171486393587	15.3023935992849	31.275	14.173
33.3171486393587	15.3023935992849	31.015	14.076
33.3350409953605	15.2502722591493	31.61	13.901
33.3350409953605	15.2502722591493	31.399	13.754
33.3525365402785	15.1993064683333	31.957	14.433
33.3525365402785	15.1993064683333	31.991	14.092
33.3701281556503	15.1480607533414	32.217	14.433
33.3874534448135	15.0975906820529	32.347	14.661
33.4048536333652	15.0469023085337	31.892	15.246
33.4048536333652	15.0469023085337	32.087	14.661
33.4223385464106	14.9959673017663	32.022	15.473
33.4223385464106	14.9959673017663	31.762	15.473
33.440182189756	14.9439876380544	32.412	15.246
33.440182189756	14.9439876380544	32.152	15.246
33.4582216742352	14.8914376291722	32.542	15.473
33.4582216742352	14.8914376291722	32.282	15.473
33.47684327192	14.8371923183022	32.802	15.473
33.4953140104267	14.7833862900468	32.932	15.246
33.4953140104267	14.7833862900468	32.672	15.246
33.5140270216982	14.728874788699	33.452	15.246
33.5140270216982	14.728874788699	33.062	15.473
33.5329562282953	14.6737336660687	33.582	15.473
33.5329562282953	14.6737336660687	33.322	15.473
33.5524573331968	14.6169269712895	33.769	15.679
33.5718729095133	14.5603694188733	34.135	14.986
33.5718729095133	14.5603694188733	34.135	14.726
33.5915583015336	14.5030259914171	33.907	14.791
33.6110989662969	14.4461040928181	34.135	14.466
33.6110989662969	14.4461040928181	34.135	14.206
33.6308017222797	14.3887098839554	33.907	14.336
33.6502639635591	14.3320163289014	33.907	14.076
33.6697971021299	14.2751163313016	34.404	14.028
33.6697971021299	14.2751163313016	34.135	13.946
33.6890781161027	14.2189506514613	35.992	13.647
33.6890781161027	14.2189506514613	34.849	13.393
33.7078119535846	14.1643783672864	34.135	13.686
33.7078119535846	14.1643783672864	34.135	13.426
33.7264376472417	14.1101211066351	33.907	13.816
33.7264376472417	14.1101211066351	33.907	13.556
33.745101572965	14.0557525651504	32.217	11.541
33.745101572965	14.0557525651504	32.087	11.313
33.7621751735645	14.0060162052153	32.737	11.541
33.7621751735645	14.0060162052153	32.477	11.541
33.7783239611646	13.9589734902287	32.932	12.353
33.7783239611646	13.9589734902287	32.542	12.126
33.7941140567053	13.9129755889009	33.062	12.126
33.7941140567053	13.9129755889009	32.802	12.126
33.8095060012324	13.8681373235471	33.322	12.581
33.8095060012324	13.8681373235471	33.322	12.321
33.8248436242443	13.8234571829018	33.907	12.516
33.8398446362472	13.7797574598992	33.322	14.401
33.8398446362472	13.7797574598992	33.322	14.141
33.8552218219506	13.7349624796958	34.135	12.386
33.8552218219506	13.7349624796958	34.135	12.126
33.8703445835696	13.690908084131	34.135	12.646
33.885214210535	13.6475909594734	33.907	13.036
33.885214210535	13.6475909594734	33.907	12.776
33.8997886515972	13.6051334035063	34.135	13.166
33.8997886515972	13.6051334035063	34.135	12.906
33.9141517295232	13.5632912021449	33.127	14.661
33.9141517295232	13.5632912021449	32.867	14.661
33.9290623408341	13.5198544971545	32.607	14.661
33.9441803218338	13.4758140137208	32.737	14.433
33.9441803218338	13.4758140137208	32.477	14.433
33.9596625863766	13.430712832982	32.835	14.173
33.9596625863766	13.430712832982	32.372	14.092
33.9754866488508	13.3846163210434	33.095	14.271
33.9754866488508	13.3846163210434	33.095	14.011
33.9917928160246	13.3371155899257	33.322	13.881
34.0079515741613	13.2900442947122	33.322	13.621
34.0242543216146	13.2425535475136	33.095	13.751
34.0242543216146	13.2425535475136	33.095	13.491
34.0406174918822	13.1948868003626	32.69	13.52
34.0406174918822	13.1948868003626	32.436	13.231
34.0573390852982	13.1461761256711	33.095	13.231

Solution x	Solution y	Original x	Original y
34.0739424184715	13.0978099587187	33.095	12.971
34.0739424184715	13.0978099587187	32.835	12.613
34.0905144245125	13.0495350119875	33.322	12.841
34.0905144245125	13.0495350119875	33.095	12.711
34.1072786769836	13.0006999989991	33.322	13.101
34.1239501242152	12.9521354101907	33.907	13.296
34.1239501242152	12.9521354101907	33.322	13.361
34.1410233051046	12.9024007408557	32.347	11.313
34.1578193656386	12.8534733178435	32.867	11.313
34.1578193656386	12.8534733178435	32.607	11.313
34.1743161480371	12.805417417457	32.997	11.541
34.1904938088477	12.7582910217464	33.387	11.313
34.1904938088477	12.7582910217464	33.127	11.313
34.2065930905465	12.7113926721487	33.647	11.313
34.2222932644369	12.6656568540937	33.96	11.234
34.237870356957	12.6202794673503	33.907	11.996
34.237870356957	12.6202794673503	33.452	11.541
34.2532595826706	12.5754493522315	34.135	11.866
34.2532595826706	12.5754493522315	34.087	11.615
34.2687712005319	12.5302626913328	34.722	11.742
34.2837574893896	12.4866062387997	34.849	11.996
34.2837574893896	12.4866062387997	34.595	11.996
34.298777357238	12.4428520651262	35.42	12.949
34.298777357238	12.4428520651262	34.785	12.504
34.3144618881961	12.3971618669615	36.119	13.139
34.3297457208827	12.3526391568596	37.452	12.758
34.3297457208827	12.3526391568596	36.944	13.012
34.3447756028308	12.3088565106249	37.452	10.218
34.2275297225299	12.3023409636432	35.674	11.044
34.1080568604971	12.2957020179085	35.547	11.234
34.1080568604971	12.2957020179085	35.484	11.425
33.9774530142004	12.2884429588321	35.293	11.552
33.847724525139	12.2812332834884	35.166	10.726
33.847724525139	12.2812332834884	34.976	10.282
33.7113712370096	12.2736549349682	35.103	10.155
33.7113712370096	12.2736549349682	34.595	9.202
33.5593014125229	12.2652023342284	34.087	8.758
33.3999906823103	12.2563467439033	32.672	12.353
33.2445117960592	12.2477046124874	33.96	10.536
33.2445117960592	12.2477046124874	33.833	10.282
33.0855736291002	12.2388697552274	32.412	12.353
33.0855736291002	12.2388697552274	32.152	12.353
32.9306016048676	12.2302552296428	32.282	12.126
32.7814489230296	12.2219644510378	32.022	12.126
32.6359239324701	12.2138756321722	33.642	10.155
32.6359239324701	12.2138756321722	32.944	10.536
32.4855655101482	12.2055176676381	31.892	12.353
32.4855655101482	12.2055176676381	31.632	12.353
32.3403479907761	12.1974455031941	31.762	12.126
32.3403479907761	12.1974455031941	31.372	12.353
32.1988949772422	12.1895825038185	31.502	12.126
32.0623802185482	12.1819944514687	32.182	10.98
32.0623802185482	12.1819944514687	32.055	9.837
31.9269663618735	12.174467398546	31.242	12.126
31.9269663618735	12.174467398546	30.982	12.126
31.7937605838927	12.1670629176612	31.015	12.516
31.6648557190994	12.1598976992432	31.275	12.613
31.537043769068	12.152793352533	31.437	11.541
31.537043769068	12.152793352533	31.177	11.541
31.4107395386369	12.1457726567118	31.957	11.541
31.4107395386369	12.1457726567118	31.697	11.541
31.2822851243342	12.1386322634492	31.827	11.313
31.2822851243342	12.1386322634492	31.567	11.313
31.1503768823531	12.1312995650937	31.307	11.313
31.0206365468149	12.1240876933368	31.047	11.313
31.0206365468149	12.1240876933368	30.787	11.313
30.891520830543	12.1169103133057	30.657	11.541
30.891520830543	12.1169103133057	30.527	11.313
30.7639421988031	12.1098183240449	30.658	10.98
30.7639421988031	12.1098183240449	30.34	10.917
30.6380432933492	12.1028196805415	30.912	9.901
30.6380432933492	12.1028196805415	30.658	9.71
30.5113045628618	12.0957741699347	30.721	9.329
30.5113045628618	12.0957741699347	30.594	9.52
30.383210880927	12.088653137409	30.34	9.647
30.383210880927	12.088653137409	29.451	10.155
30.2585493931167	12.0817229218753	29.007	10.282
30.2585493931167	12.0817229218753	28.626	10.091
30.1442856681513	12.0753709915875	28.372	10.218
30.1442856681513	12.0753709915875	27.927	10.409

Solution x	Solution y	Original x	Original y
30.0432134147834	12.0697526997168	28.753	10.79
29.9458530182269	12.0643409634597	29.261	11.425
29.9458530182269	12.0643409634597	28.626	11.234
29.8504594383215	12.0590385092946	29.975	13.361
29.7546337085123	12.053711893715	29.197	12.441
29.6588961943772	12.0483901547681	29.388	8.313
29.5786164864795	12.0646905385608	28.753	13.457
29.5786164864795	12.0646905385608	28.372	13.52
29.5018813610969	12.0802712161302	29.388	13.838
29.5018813610969	12.0802712161302	29.197	13.52
29.426848416479	12.0955062677317	29.975	11.801
29.426848416479	12.0955062677317	29.388	11.804
29.3521890168417	12.1106654830582	30.787	12.646
29.3521890168417	12.1106654830582	30.202	13.231
29.2757761568942	12.12618072932	30.787	13.166
29.2757761568942	12.12618072932	30.787	12.906
29.1963877405213	12.1423001512346	30.202	11.996
29.1963877405213	12.1423001512346	29.975	12.061
29.1159365642936	12.1586353733623	31.015	13.036
29.1159365642936	12.1586353733623	31.015	12.776
29.0309928371496	12.1758827988413	31.737	12.885
29.0309928371496	12.1758827988413	31.547	13.203
28.9338917206512	12.1955987544181	30.787	12.386
28.9338917206512	12.1955987544181	30.202	12.451
28.8313891664642	12.2164114517125	29.975	12.321
28.7290298394935	12.2371950938455	29.975	12.581
28.6253052323498	12.2582559706837	30.202	12.711
28.6253052323498	12.2582559706837	29.975	12.841
28.5174459816643	12.2801563718269	30.202	12.971
28.4078001687372	12.3024195499809	29.975	13.101
28.2955091550185	12.3252198320351	29.975	13.621
28.1799031510212	12.3486932186287	29.975	13.881
28.0599669987272	12.3730458532889	29.705	13.393
28.0599669987272	12.3730458532889	29.578	13.203
27.9339058245819	12.3986421580922	29.134	13.33
27.8068236792966	12.4244458072269	29.007	12.949
27.8068236792966	12.4244458072269	28.753	12.949
27.6764623270146	12.4509153000706	28.499	12.949
27.5459337432692	12.4774187876384	28.816	12.568
27.5459337432692	12.4774187876384	28.816	12.25
27.4090190463161	12.5052189749514	29.515	14.028
27.2636253143355	12.5347408712153	29.007	14.409
27.2636253143355	12.5347408712153	28.753	13.838
27.1064565874969	12.5666537060415	28.181	12.441
27.1064565874969	12.5666537060415	27.927	12.568
26.9443221359627	12.5995748637955	28.372	14.663
26.9443221359627	12.5995748637955	28.245	14.854
26.7709179894339	12.6347844028129	27.991	13.647
26.7709179894339	12.6347844028129	26.911	14.409
26.5973857993882	12.6700199623923	27.419	15.044
26.5973857993882	12.6700199623923	27.229	15.362
26.4239277894039	12.7052405521207	27.673	12.695
26.4239277894039	12.7052405521207	26.594	11.933
26.2436182636917	12.7418523715624	27.419	11.298
26.054899693976	12.7801716823422	26.149	11.107
25.8642284790166	12.8188875205328	25.895	12.123
25.8642284790166	12.8188875205328	25.705	12.123
25.6765825818843	12.8569890973742	25.832	14.219
25.6765825818843	12.8569890973742	26.022	12.631
25.4904314744655	12.8947871613054	26.149	15.679
25.4904314744655	12.8947871613054	26.086	14.663
25.3042844977861	12.9325844067305	25.578	12.568
25.1179968053941	12.9704102376528	25.07	11.615
24.9314104482706	13.0082967238744	25.197	12.441
24.7428373084323	13.0465866484817	23.482	9.52
24.2132985463108	13.3265593758709	25.07	16.314
23.7525327709679	13.5701757682226	25.07	17.076
23.255355507275	13.6879338456008	22.212	10.091
23.0207696536473	13.7688170203943	22.085	10.853
22.7834804312698	13.8506321199743	22.149	11.742
22.7834804312698	13.8506321199743	22.022	11.361
22.5485257035963	13.9316421778106	20.244	11.234
22.3987123415627	13.9832953953358	21.831	13.203
22.3987123415627	13.9832953953358	20.434	13.012
22.2618297329979	14.0304902645196	22.149	14.282
22.1267380194656	14.0770676729891	24.371	14.346
22.1267380194656	14.0770676729891	22.276	13.393
21.9805777058908	14.1274613949102	24.244	15.997
21.9805777058908	14.1274613949102	24.371	15.235
21.8015163230269	14.189199043919	24.308	16.441

Solution x	Solution y	Original x	Original y
21.5594540422462	14.2726589315483	22.974	17.711
21.5594540422462	14.2726589315483	24.308	15.044
20.3711274149132	14.682386347253	20.561	18.219
19.9702354118757	14.8206246216346	20.434	18.537
19.8887430752678	14.8137771677927	20.498	17.457
19.8887430752678	14.8137771677927	19.99	18.029
19.8066587929313	14.8068797893524	20.434	15.806
19.7243529880039	14.7999637720678	20.117	18.283
19.6353878814123	14.7924883827797	19.609	18.156
19.6353878814123	14.7924883827797	18.466	17.838
19.5511818056332	14.7854128793469	18.212	18.283
18.8776095335881	14.276028179942	18.466	14.155
18.2446082664841	13.7973249500567	19.418	13.901
18.2446082664841	13.7973249500567	19.482	13.076
17.4671415351439	13.2093709368455	18.339	12.631
16.6585368752615	12.5978697195409	17.323	12.504
15.7889066533098	11.9402186739175	18.021	13.52
15.7889066533098	11.9402186739175	17.577	13.647

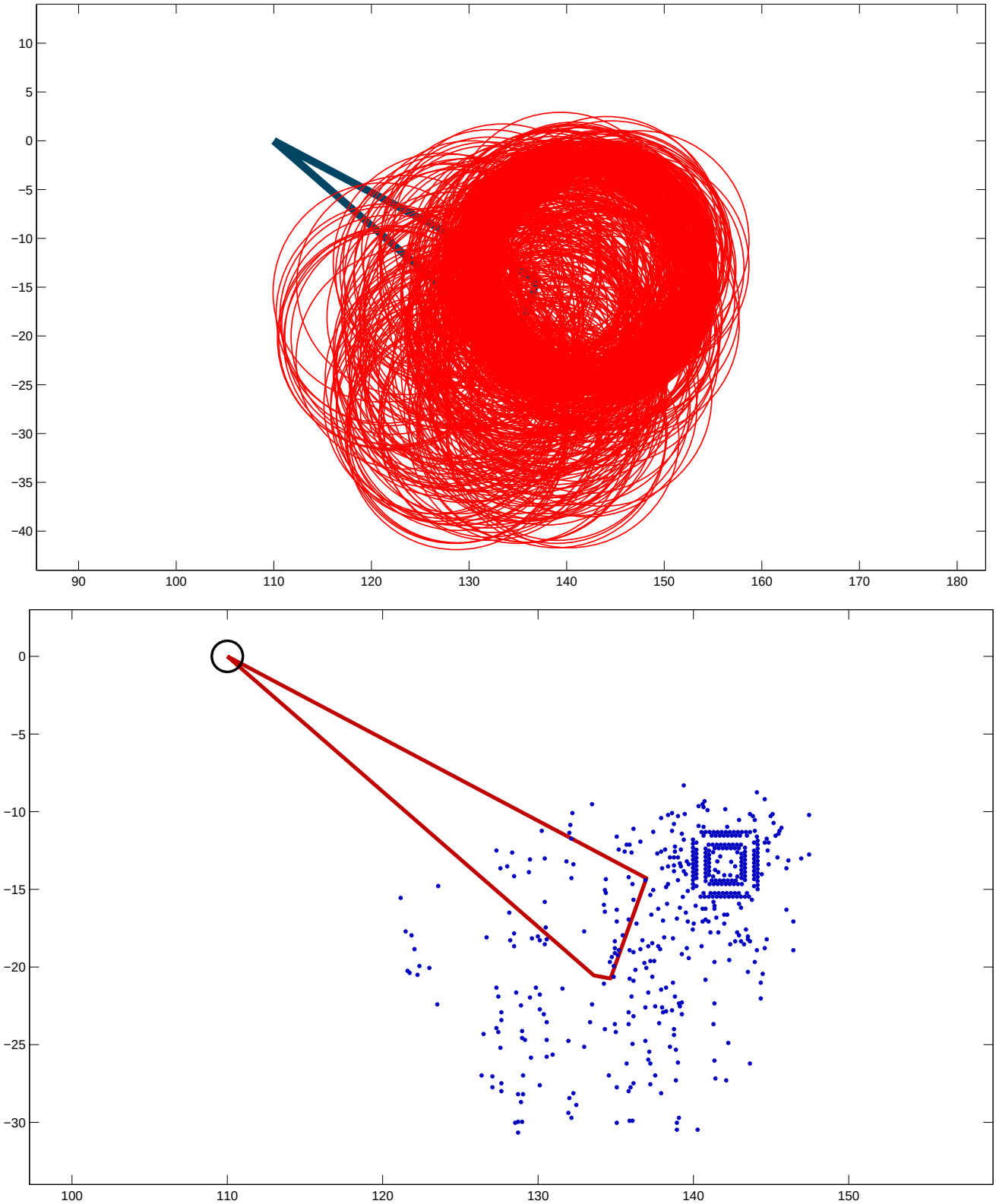


Figure N.25: $d493$, $r = 11.2356$, Equal Radius, 2D, Euclidean, Length = 69.7577298

Table N-28: Solution for $d493$, $r = 11.2356$, Equal Radius, 2D, Euclidean

Total distance: 69.7577297892617			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
17.0056006303107	14.8025961299802	24.371	15.235
17.0056006303107	14.8025961299802	20.434	15.806
17.0056006303107	14.8025961299802	24.308	15.044
17.0056006303107	14.8025961299802	19.482	21.966
17.0056006303107	14.8025961299802	18.148	16.505
17.0056006303107	14.8025961299802	22.149	11.742
17.0056006303107	14.8025961299802	17.577	13.647
17.0056006303107	14.8025961299802	13.576	14.79
17.0056006303107	14.8025961299802	11.163	15.552
20.8125060791501	18.11773686719	20.434	18.537
20.8125060791501	18.11773686719	20.117	18.283
20.8125060791501	18.11773686719	19.863	21.331
20.8125060791501	18.11773686719	20.117	21.775
20.8125060791501	18.11773686719	20.117	22.728
20.8125060791501	18.11773686719	20.371	23.045
20.8125060791501	18.11773686719	18.593	21.648
20.8125060791501	18.11773686719	20.561	23.553
20.8125060791501	18.11773686719	18.91	22.474
20.8125060791501	18.11773686719	17.323	21.331
20.8125060791501	18.11773686719	20.561	24.696
20.8125060791501	18.11773686719	17.45	21.902
20.8125060791501	18.11773686719	16.688	18.092
20.8125060791501	18.11773686719	18.974	24.125
20.8125060791501	18.11773686719	17.64	22.918
20.8125060791501	18.11773686719	19.164	24.696
20.8125060791501	18.11773686719	18.974	24.569
20.8125060791501	18.11773686719	17.64	23.426
20.8125060791501	18.11773686719	17.323	23.934
20.8125060791501	18.11773686719	17.45	24.188
20.8125060791501	18.11773686719	19.545	25.839
20.8125060791501	18.11773686719	17.577	25.204
20.8125060791501	18.11773686719	16.497	24.315
20.8125060791501	18.11773686719	19.037	26.982
20.8125060791501	18.11773686719	17.069	27.046
20.8125060791501	18.11773686719	19.037	28.189
20.8125060791501	18.11773686719	17.64	27.49
20.8125060791501	18.11773686719	13.005	20.061
20.8125060791501	18.11773686719	13.513	22.41
20.8125060791501	18.11773686719	18.72	28.189
20.8125060791501	18.11773686719	16.37	26.982
20.8125060791501	18.11773686719	17.64	27.998
20.8125060791501	18.11773686719	17.069	27.744
20.8125060791501	18.11773686719	12.37	19.934
20.8125060791501	18.11773686719	12.243	20.505
20.8125060791501	18.11773686719	12.052	18.854
20.8125060791501	18.11773686719	11.862	17.965
20.8125060791501	18.11773686719	11.735	20.378
20.8125060791501	18.11773686719	11.608	20.251
20.8125060791501	18.11773686719	11.481	17.711
23.5975812842074	20.543341998152	19.99	18.029
23.5975812842074	20.543341998152	19.609	18.156
23.5975812842074	20.543341998152	18.466	18.664
23.5975812842074	20.543341998152	18.466	17.838
23.5975812842074	20.543341998152	18.212	18.283
23.5975812842074	20.543341998152	20.942	25.649
23.5975812842074	20.543341998152	20.561	25.776
23.5975812842074	20.543341998152	20.117	27.617
23.5975812842074	20.543341998152	22.022	28.443
23.5975812842074	20.543341998152	22.466	28.887
23.5975812842074	20.543341998152	21.958	29.395
23.5975812842074	20.543341998152	18.91	28.697
23.5975812842074	20.543341998152	22.149	29.713
23.5975812842074	20.543341998152	18.974	29.967
23.5975812842074	20.543341998152	18.72	29.967
23.5975812842074	20.543341998152	18.529	30.03
23.5975812842074	20.543341998152	18.72	30.665
24.6672577020965	20.7400349182124	22.974	17.711
24.6672577020965	20.7400349182124	24.625	19.68
24.6672577020965	20.7400349182124	24.752	19.362
24.6672577020965	20.7400349182124	24.943	19.108
24.6672577020965	20.7400349182124	24.943	18.791
24.6672577020965	20.7400349182124	24.943	18.346
24.6672577020965	20.7400349182124	24.879	19.934
24.6672577020965	20.7400349182124	25.133	19.235
24.6672577020965	20.7400349182124	25.197	18.918
24.6672577020965	20.7400349182124	24.244	21.077
24.6672577020965	20.7400349182124	24.879	20.632
24.6672577020965	20.7400349182124	25.451	17.965
24.6672577020965	20.7400349182124	21.577	21.394
24.6672577020965	20.7400349182124	25.07	17.076
24.6672577020965	20.7400349182124	25.895	18.918
24.6672577020965	20.7400349182124	26.149	19.045
24.6672577020965	20.7400349182124	25.895	20.759
24.6672577020965	20.7400349182124	23.482	22.41
24.6672577020965	20.7400349182124	26.276	20.188
24.6672577020965	20.7400349182124	25.832	16.949
24.6672577020965	20.7400349182124	26.594	18.854
24.6672577020965	20.7400349182124	26.149	20.886
24.6672577020965	20.7400349182124	26.721	18.283
24.6672577020965	20.7400349182124	26.848	19.743
24.6672577020965	20.7400349182124	26.975	20.061
24.6672577020965	20.7400349182124	27.102	18.664
24.6672577020965	20.7400349182124	26.022	21.902
24.6672577020965	20.7400349182124	27.229	19.616
24.6672577020965	20.7400349182124	27.356	18.473
24.6672577020965	20.7400349182124	27.483	19.616
24.6672577020965	20.7400349182124	23.355	23.553
24.6672577020965	20.7400349182124	27.356	20.632
24.6672577020965	20.7400349182124	27.737	18.664
24.6672577020965	20.7400349182124	25.832	22.918
24.6672577020965	20.7400349182124	27.864	18.854
24.6672577020965	20.7400349182124	27.102	21.648
24.6672577020965	20.7400349182124	27.292	16.632
24.6672577020965	20.7400349182124	24.943	23.68
24.6672577020965	20.7400349182124	24.308	23.998
24.6672577020965	20.7400349182124	28.118	18.092
24.6672577020965	20.7400349182124	26.149	23.172
24.6672577020965	20.7400349182124	26.911	22.601
24.6672577020965	20.7400349182124	25.832	23.68
24.6672577020965	20.7400349182124	27.927	21.458
24.6672577020965	20.7400349182124	25.006	24.188
24.6672577020965	20.7400349182124	28.245	21.331
24.6672577020965	20.7400349182124	28.689	18.156
24.6672577020965	20.7400349182124	27.546	22.537
24.6672577020965	20.7400349182124	21.958	24.76
24.6672577020965	20.7400349182124	28.689	21.013
24.6672577020965	20.7400349182124	22.974	25.141
24.6672577020965	20.7400349182124	27.991	22.601
24.6672577020965	20.7400349182124	29.261	19.172
24.6672577020965	20.7400349182124	28.054	22.918
24.6672577020965	20.7400349182124	28.816	21.902
24.6672577020965	20.7400349182124	28.245	22.855
24.6672577020965	20.7400349182124	29.578	18.791
24.6672577020965	20.7400349182124	27.8	23.617
24.6672577020965	20.7400349182124	26.086	24.95
24.6672577020965	20.7400349182124	29.705	19.426
24.6672577020965	20.7400349182124	28.626	22.791
24.6672577020965	20.7400349182124	29.07	22.347
24.6672577020965	20.7400349182124	26.911	24.76
24.6672577020965	20.7400349182124	29.261	22.283
24.6672577020965	20.7400349182124	29.134	22.537
24.6672577020965	20.7400349182124	29.261	23.045
24.6672577020965	20.7400349182124	30.531	18.664
24.6672577020965	20.7400349182124	28.753	23.998
24.6672577020965	20.7400349182124	27.165	25.458
24.6672577020965	20.7400349182124	25.705	26.22
24.6672577020965	20.7400349182124	28.753	24.379
24.6672577020965	20.7400349182124	30.785	20.823
24.6672577020965	20.7400349182124	30.785	16.949
24.6672577020965	20.7400349182124	27.102	25.966
24.6672577020965	20.7400349182124	24.562	26.982
24.6672577020965	20.7400349182124	31.102	17.775
24.6672577020965	20.7400349182124	28.499	25.141
24.6672577020965	20.7400349182124	27.229	26.22
24.6672577020965	20.7400349182124	31.356	19.68
24.6672577020965	20.7400349182124	28.88	25.331
24.6672577020965	20.7400349182124	31.61	17.775
24.6672577020965	20.7400349182124	25.07	27.744
24.6672577020965	20.7400349182124	31.356	22.347
24.6672577020965	20.7400349182124	26.149	27.49
24.6672577020965	20.7400349182124	22.276	28.125
24.6672577020965	20.7400349182124	27.546	26.982
24.6672577020965	20.7400349182124	25.959	27.744
24.6672577020965	20.7400349182124	32.309	19.553

Solution x	Solution y	Original x	Original y
24.6672577020965	20.7400349182124	29.007	26.157
24.6672577020965	20.7400349182124	32.372	18.537
24.6672577020965	20.7400349182124	25.832	27.998
24.6672577020965	20.7400349182124	31.293	23.68
24.6672577020965	20.7400349182124	27.229	27.554
24.6672577020965	20.7400349182124	32.69	18.346
24.6672577020965	20.7400349182124	32.817	17.775
24.6672577020965	20.7400349182124	32.944	17.965
24.6672577020965	20.7400349182124	33.071	18.346
24.6672577020965	20.7400349182124	28.88	27.3
24.6672577020965	20.7400349182124	33.261	18.537
24.6672577020965	20.7400349182124	27.927	28.125
24.6672577020965	20.7400349182124	33.515	18.219
24.6672577020965	20.7400349182124	33.515	18.029
24.6672577020965	20.7400349182124	33.515	20.315
24.6672577020965	20.7400349182124	33.642	18.346
24.6672577020965	20.7400349182124	31.356	26.03
24.6672577020965	20.7400349182124	32.245	24.887
24.6672577020965	20.7400349182124	33.96	19.68
24.6672577020965	20.7400349182124	34.087	18.918
24.6672577020965	20.7400349182124	25.07	30.03
24.6672577020965	20.7400349182124	25.895	29.903
24.6672577020965	20.7400349182124	26.086	29.903
24.6672577020965	20.7400349182124	34.341	21.013
24.6672577020965	20.7400349182124	34.468	20.442
24.6672577020965	20.7400349182124	34.595	18.791
24.6672577020965	20.7400349182124	31.42	27.173
24.6672577020965	20.7400349182124	34.341	22.029
24.6672577020965	20.7400349182124	29.07	29.713
24.6672577020965	20.7400349182124	32.118	27.3
24.6672577020965	20.7400349182124	28.943	30.03
24.6672577020965	20.7400349182124	33.642	26.22
24.6672577020965	20.7400349182124	28.943	30.475
24.6672577020965	20.7400349182124	30.277	30.475
26.0711153559751	16.8159930319374	25.07	16.314
26.0711153559751	16.8159930319374	26.34	17.203
26.0711153559751	16.8159930319374	26.149	15.679
26.0711153559751	16.8159930319374	28.054	17.013
26.0711153559751	16.8159930319374	27.737	16.251
26.0711153559751	16.8159930319374	29.642	17.076
26.0711153559751	16.8159930319374	30.975	17.076
26.9774358313756	14.2827574379458	20.561	18.219
26.9774358313756	14.2827574379458	24.308	16.441
26.9774358313756	14.2827574379458	22.149	14.282
26.9774358313756	14.2827574379458	22.276	13.393
26.9774358313756	14.2827574379458	21.831	13.203
26.9774358313756	14.2827574379458	28.943	16.886
26.9774358313756	14.2827574379458	28.245	14.854
26.9774358313756	14.2827574379458	29.134	16.187
26.9774358313756	14.2827574379458	28.372	14.663
26.9774358313756	14.2827574379458	25.197	12.441
26.9774358313756	14.2827574379458	25.578	12.568
26.9774358313756	14.2827574379458	29.515	16.505
26.9774358313756	14.2827574379458	26.022	12.631
26.9774358313756	14.2827574379458	29.959	17.584
26.9774358313756	14.2827574379458	29.324	15.489
26.9774358313756	14.2827574379458	30.023	17.203
26.9774358313756	14.2827574379458	27.991	13.647
26.9774358313756	14.2827574379458	25.705	12.123
26.9774358313756	14.2827574379458	25.895	12.123
26.9774358313756	14.2827574379458	29.007	14.409
26.9774358313756	14.2827574379458	25.07	11.615
26.9774358313756	14.2827574379458	28.372	13.52
26.9774358313756	14.2827574379458	29.642	15.108
26.9774358313756	14.2827574379458	28.753	13.838
26.9774358313756	14.2827574379458	30.15	16.06
26.9774358313756	14.2827574379458	30.594	17.076
26.9774358313756	14.2827574379458	27.673	12.695
26.9774358313756	14.2827574379458	26.594	11.933
26.9774358313756	14.2827574379458	28.753	13.457
26.9774358313756	14.2827574379458	30.594	16.251
26.9774358313756	14.2827574379458	29.975	14.921
26.9774358313756	14.2827574379458	27.927	12.568
26.9774358313756	14.2827574379458	28.499	12.949
26.9774358313756	14.2827574379458	29.515	14.028
26.9774358313756	14.2827574379458	29.388	13.838
26.9774358313756	14.2827574379458	29.975	14.661
26.9774358313756	14.2827574379458	30.462	15.473
26.9774358313756	14.2827574379458	30.785	16.251
26.9774358313756	14.2827574379458	29.197	13.52

Solution x	Solution y	Original x	Original y
26.9774358313756	14.2827574379458	30.202	14.791
26.9774358313756	14.2827574379458	28.753	12.949
26.9774358313756	14.2827574379458	29.134	13.33
26.9774358313756	14.2827574379458	29.975	14.401
26.9774358313756	14.2827574379458	28.181	12.441
26.9774358313756	14.2827574379458	30.722	15.473
26.9774358313756	14.2827574379458	26.149	11.107
26.9774358313756	14.2827574379458	29.975	14.141
26.9774358313756	14.2827574379458	29.007	12.949
26.9774358313756	14.2827574379458	30.657	15.246
26.9774358313756	14.2827574379458	30.202	14.271
26.9774358313756	14.2827574379458	29.975	13.881
26.9774358313756	14.2827574379458	28.816	12.568
26.9774358313756	14.2827574379458	30.982	15.473
26.9774358313756	14.2827574379458	29.705	13.393
26.9774358313756	14.2827574379458	31.483	16.822
26.9774358313756	14.2827574379458	30.202	14.011
26.9774358313756	14.2827574379458	29.578	13.203
26.9774358313756	14.2827574379458	31.356	16.251
26.9774358313756	14.2827574379458	29.975	13.621
26.9774358313756	14.2827574379458	31.356	16.06
26.9774358313756	14.2827574379458	27.419	11.298
26.9774358313756	14.2827574379458	31.293	15.806
26.9774358313756	14.2827574379458	28.816	12.25
26.9774358313756	14.2827574379458	30.202	13.751
26.9774358313756	14.2827574379458	31.112	15.246
26.9774358313756	14.2827574379458	31.242	15.473
26.9774358313756	14.2827574379458	29.975	13.361
26.9774358313756	14.2827574379458	30.787	14.466
26.9774358313756	14.2827574379458	29.197	12.441
26.9774358313756	14.2827574379458	30.202	13.491
26.9774358313756	14.2827574379458	29.975	13.101
26.9774358313756	14.2827574379458	31.047	14.661
26.9774358313756	14.2827574379458	30.787	14.206
26.9774358313756	14.2827574379458	31.991	17.203
26.9774358313756	14.2827574379458	31.372	15.246
26.9774358313756	14.2827574379458	31.502	15.473
26.9774358313756	14.2827574379458	30.202	13.231
26.9774358313756	14.2827574379458	30.787	13.946
26.9774358313756	14.2827574379458	31.991	16.632
26.9774358313756	14.2827574379458	29.975	12.841
26.9774358313756	14.2827574379458	31.177	14.433
26.9774358313756	14.2827574379458	31.307	14.661
26.9774358313756	14.2827574379458	30.202	12.971
26.9774358313756	14.2827574379458	31.015	14.076
26.9774358313756	14.2827574379458	31.632	15.246
26.9774358313756	14.2827574379458	30.787	13.686
26.9774358313756	14.2827574379458	31.762	15.473
26.9774358313756	14.2827574379458	29.975	12.581
26.9774358313756	14.2827574379458	32.182	16.632
26.9774358313756	14.2827574379458	31.015	13.816
26.9774358313756	14.2827574379458	30.202	12.711
26.9774358313756	14.2827574379458	30.787	13.426
26.9774358313756	14.2827574379458	31.275	14.173
26.9774358313756	14.2827574379458	28.626	11.234
26.9774358313756	14.2827574379458	31.437	14.433
26.9774358313756	14.2827574379458	31.567	14.661
26.9774358313756	14.2827574379458	29.388	11.804
26.9774358313756	14.2827574379458	31.892	15.246
26.9774358313756	14.2827574379458	29.975	12.321
26.9774358313756	14.2827574379458	32.022	15.473
26.9774358313756	14.2827574379458	31.015	13.556
26.9774358313756	14.2827574379458	30.787	13.166
26.9774358313756	14.2827574379458	30.202	12.451
26.9774358313756	14.2827574379458	31.697	14.433
26.9774358313756	14.2827574379458	29.261	11.425
26.9774358313756	14.2827574379458	31.827	14.661
26.9774358313756	14.2827574379458	31.015	13.296
26.9774358313756	14.2827574379458	29.975	12.061
26.9774358313756	14.2827574379458	30.787	12.906
26.9774358313756	14.2827574379458	32.152	15.246
26.9774358313756	14.2827574379458	31.399	13.754
26.9774358313756	14.2827574379458	27.927	10.409
26.9774358313756	14.2827574379458	32.282	15.473
26.9774358313756	14.2827574379458	31.015	13.036
26.9774358313756	14.2827574379458	31.61	13.901
26.9774358313756	14.2827574379458	29.975	11.801
26.9774358313756	14.2827574379458	28.753	10.79
26.9774358313756	14.2827574379458	30.202	11.996
26.9774358313756	14.2827574379458	30.787	12.646

Solution x	Solution y	Original x	Original y
26.9774358313756	14.2827574379458	31.957	14.433
26.9774358313756	14.2827574379458	32.087	14.661
26.9774358313756	14.2827574379458	32.412	15.246
26.9774358313756	14.2827574379458	31.015	12.776
26.9774358313756	14.2827574379458	32.542	15.473
26.9774358313756	14.2827574379458	30.787	12.386
26.9774358313756	14.2827574379458	31.991	14.092
26.9774358313756	14.2827574379458	32.217	14.433
26.9774358313756	14.2827574379458	28.372	10.218
26.9774358313756	14.2827574379458	32.347	14.661
26.9774358313756	14.2827574379458	31.015	12.516
26.9774358313756	14.2827574379458	31.547	13.203
26.9774358313756	14.2827574379458	32.672	15.246
26.9774358313756	14.2827574379458	32.944	15.933
26.9774358313756	14.2827574379458	32.802	15.473
26.9774358313756	14.2827574379458	31.275	12.613
26.9774358313756	14.2827574379458	33.071	16.187
26.9774358313756	14.2827574379458	33.388	17.584
26.9774358313756	14.2827574379458	32.477	14.433
26.9774358313756	14.2827574379458	30.982	12.126
26.9774358313756	14.2827574379458	28.626	10.091
26.9774358313756	14.2827574379458	32.607	14.661
26.9774358313756	14.2827574379458	32.372	14.092
26.9774358313756	14.2827574379458	29.007	10.282
26.9774358313756	14.2827574379458	32.932	15.246
26.9774358313756	14.2827574379458	33.062	15.473
26.9774358313756	14.2827574379458	31.737	12.885
26.9774358313756	14.2827574379458	30.657	11.541
26.9774358313756	14.2827574379458	31.372	12.353
26.9774358313756	14.2827574379458	31.242	12.126
26.9774358313756	14.2827574379458	32.737	14.433
26.9774358313756	14.2827574379458	30.527	11.313
26.9774358313756	14.2827574379458	32.867	14.661
26.9774358313756	14.2827574379458	31.632	12.353
26.9774358313756	14.2827574379458	33.322	15.473
26.9774358313756	14.2827574379458	30.34	10.917
26.9774358313756	14.2827574379458	31.502	12.126
26.9774358313756	14.2827574379458	30.787	11.313
26.9774358313756	14.2827574379458	29.451	10.155
26.9774358313756	14.2827574379458	32.835	14.173
26.9774358313756	14.2827574379458	33.127	14.661
26.9774358313756	14.2827574379458	32.436	13.231
26.9774358313756	14.2827574379458	31.177	11.541
26.9774358313756	14.2827574379458	30.658	10.98
26.9774358313756	14.2827574379458	31.892	12.353
26.9774358313756	14.2827574379458	33.452	15.246
26.9774358313756	14.2827574379458	31.047	11.313
26.9774358313756	14.2827574379458	32.69	13.52
26.9774358313756	14.2827574379458	31.762	12.126
26.9774358313756	14.2827574379458	33.095	14.271
26.9774358313756	14.2827574379458	33.582	15.473
26.9774358313756	14.2827574379458	33.095	14.011
26.9774358313756	14.2827574379458	31.437	11.541
26.9774358313756	14.2827574379458	33.769	15.679
26.9774358313756	14.2827574379458	33.322	14.401
26.9774358313756	14.2827574379458	32.152	12.353
26.9774358313756	14.2827574379458	31.307	11.313
26.9774358313756	14.2827574379458	32.022	12.126
26.9774358313756	14.2827574379458	33.095	13.751
26.9774358313756	14.2827574379458	33.322	14.141
26.9774358313756	14.2827574379458	31.697	11.541
26.9774358313756	14.2827574379458	33.095	13.491
26.9774358313756	14.2827574379458	31.567	11.313
26.9774358313756	14.2827574379458	33.322	13.881
26.9774358313756	14.2827574379458	32.412	12.353
26.9774358313756	14.2827574379458	32.282	12.126
26.9774358313756	14.2827574379458	33.095	13.231
26.9774358313756	14.2827574379458	33.322	13.621
26.9774358313756	14.2827574379458	31.957	11.541
26.9774358313756	14.2827574379458	33.907	14.791
26.9774358313756	14.2827574379458	31.827	11.313
26.9774358313756	14.2827574379458	32.835	12.613
26.9774358313756	14.2827574379458	32.672	12.353
26.9774358313756	14.2827574379458	34.722	18.219
26.9774358313756	14.2827574379458	33.095	12.971
26.9774358313756	14.2827574379458	32.542	12.126
26.9774358313756	14.2827574379458	33.322	13.361
26.9774358313756	14.2827574379458	34.135	14.986
26.9774358313756	14.2827574379458	32.217	11.541
26.9774358313756	14.2827574379458	33.907	14.336

Solution x	Solution y	Original x	Original y
26.9774358313756	14.2827574379458	33.322	13.101
26.9774358313756	14.2827574379458	30.34	9.647
26.9774358313756	14.2827574379458	33.095	12.711
26.9774358313756	14.2827574379458	32.087	11.313
26.9774358313756	14.2827574379458	34.135	14.726
26.9774358313756	14.2827574379458	32.932	12.353
26.9774358313756	14.2827574379458	33.907	14.076
26.9774358313756	14.2827574379458	32.802	12.126
26.9774358313756	14.2827574379458	33.322	12.841
26.9774358313756	14.2827574379458	34.135	14.466
26.9774358313756	14.2827574379458	30.658	9.71
26.9774358313756	14.2827574379458	30.912	9.901
26.9774358313756	14.2827574379458	32.477	11.541
26.9774358313756	14.2827574379458	33.907	13.816
26.9774358313756	14.2827574379458	32.347	11.313
26.9774358313756	14.2827574379458	34.135	14.206
26.9774358313756	14.2827574379458	30.594	9.52
26.9774358313756	14.2827574379458	33.322	12.581
26.9774358313756	14.2827574379458	33.062	12.126
26.9774358313756	14.2827574379458	33.907	13.556
26.9774358313756	14.2827574379458	32.182	10.98
26.9774358313756	14.2827574379458	34.135	13.946
26.9774358313756	14.2827574379458	32.737	11.541
26.9774358313756	14.2827574379458	33.322	12.321
26.9774358313756	14.2827574379458	32.607	11.313
26.9774358313756	14.2827574379458	33.907	13.296
26.9774358313756	14.2827574379458	34.135	13.686
26.9774358313756	14.2827574379458	30.721	9.329
26.9774358313756	14.2827574379458	33.907	13.036
26.9774358313756	14.2827574379458	34.404	14.028
26.9774358313756	14.2827574379458	29.388	8.313
26.9774358313756	14.2827574379458	34.135	13.426
26.9774358313756	14.2827574379458	32.997	11.541
26.9774358313756	14.2827574379458	32.867	11.313
26.9774358313756	14.2827574379458	33.907	12.776
26.9774358313756	14.2827574379458	34.135	13.166
26.9774358313756	14.2827574379458	33.907	12.516
26.9774358313756	14.2827574379458	34.135	12.906
26.9774358313756	14.2827574379458	33.127	11.313
26.9774358313756	14.2827574379458	34.135	12.646
26.9774358313756	14.2827574379458	33.452	11.541
26.9774358313756	14.2827574379458	32.055	9.837
26.9774358313756	14.2827574379458	33.387	11.313
26.9774358313756	14.2827574379458	34.135	12.386
26.9774358313756	14.2827574379458	33.907	11.996
26.9774358313756	14.2827574379458	32.944	10.536
26.9774358313756	14.2827574379458	34.135	12.126
26.9774358313756	14.2827574379458	34.849	13.393
26.9774358313756	14.2827574379458	33.647	11.313
26.9774358313756	14.2827574379458	34.135	11.866
26.9774358313756	14.2827574379458	35.992	16.314
26.9774358313756	14.2827574379458	34.087	11.615
26.9774358313756	14.2827574379458	33.96	11.234
26.9774358313756	14.2827574379458	36.436	18.918
26.9774358313756	14.2827574379458	34.785	12.504
26.9774358313756	14.2827574379458	34.595	11.996
26.9774358313756	14.2827574379458	36.436	17.076
26.9774358313756	14.2827574379458	34.849	11.996
26.9774358313756	14.2827574379458	34.722	11.742
26.9774358313756	14.2827574379458	35.42	12.949
26.9774358313756	14.2827574379458	33.642	10.155
26.9774358313756	14.2827574379458	33.96	10.536
26.9774358313756	14.2827574379458	33.833	10.282
26.9774358313756	14.2827574379458	35.992	13.647
26.9774358313756	14.2827574379458	36.119	13.139
26.9774358313756	14.2827574379458	35.293	11.552
26.9774358313756	14.2827574379458	35.484	11.425
26.9774358313756	14.2827574379458	35.166	10.726
26.9774358313756	14.2827574379458	35.547	11.234
26.9774358313756	14.2827574379458	34.976	10.282
26.9774358313756	14.2827574379458	35.674	11.044
26.9774358313756	14.2827574379458	35.103	10.155
26.9774358313756	14.2827574379458	34.087	8.758
26.9774358313756	14.2827574379458	36.944	13.012
26.9774358313756	14.2827574379458	34.595	9.202
26.9774358313756	14.2827574379458	37.452	12.758
26.9774358313756	14.2827574379458	37.452	10.218
21.8920413975474	11.5902924879716	20.498	17.457
21.8920413975474	11.5902924879716	24.244	15.997
21.8920413975474	11.5902924879716	24.371	14.346

Solution x	Solution y	Original x	Original y
21.8920413975474	11.5902924879716	26.086	14.663
21.8920413975474	11.5902924879716	25.832	14.219
21.8920413975474	11.5902924879716	27.229	15.362
21.8920413975474	11.5902924879716	27.419	15.044
21.8920413975474	11.5902924879716	26.911	14.409
21.8920413975474	11.5902924879716	28.308	15.933
21.8920413975474	11.5902924879716	19.418	13.901
21.8920413975474	11.5902924879716	20.434	13.012
21.8920413975474	11.5902924879716	18.466	14.155
21.8920413975474	11.5902924879716	19.482	13.076
21.8920413975474	11.5902924879716	18.021	13.52
21.8920413975474	11.5902924879716	22.022	11.361
21.8920413975474	11.5902924879716	18.339	12.631
21.8920413975474	11.5902924879716	22.085	10.853
21.8920413975474	11.5902924879716	20.244	11.234
21.8920413975474	11.5902924879716	17.323	12.504
21.8920413975474	11.5902924879716	22.212	10.091
21.8920413975474	11.5902924879716	23.482	9.52

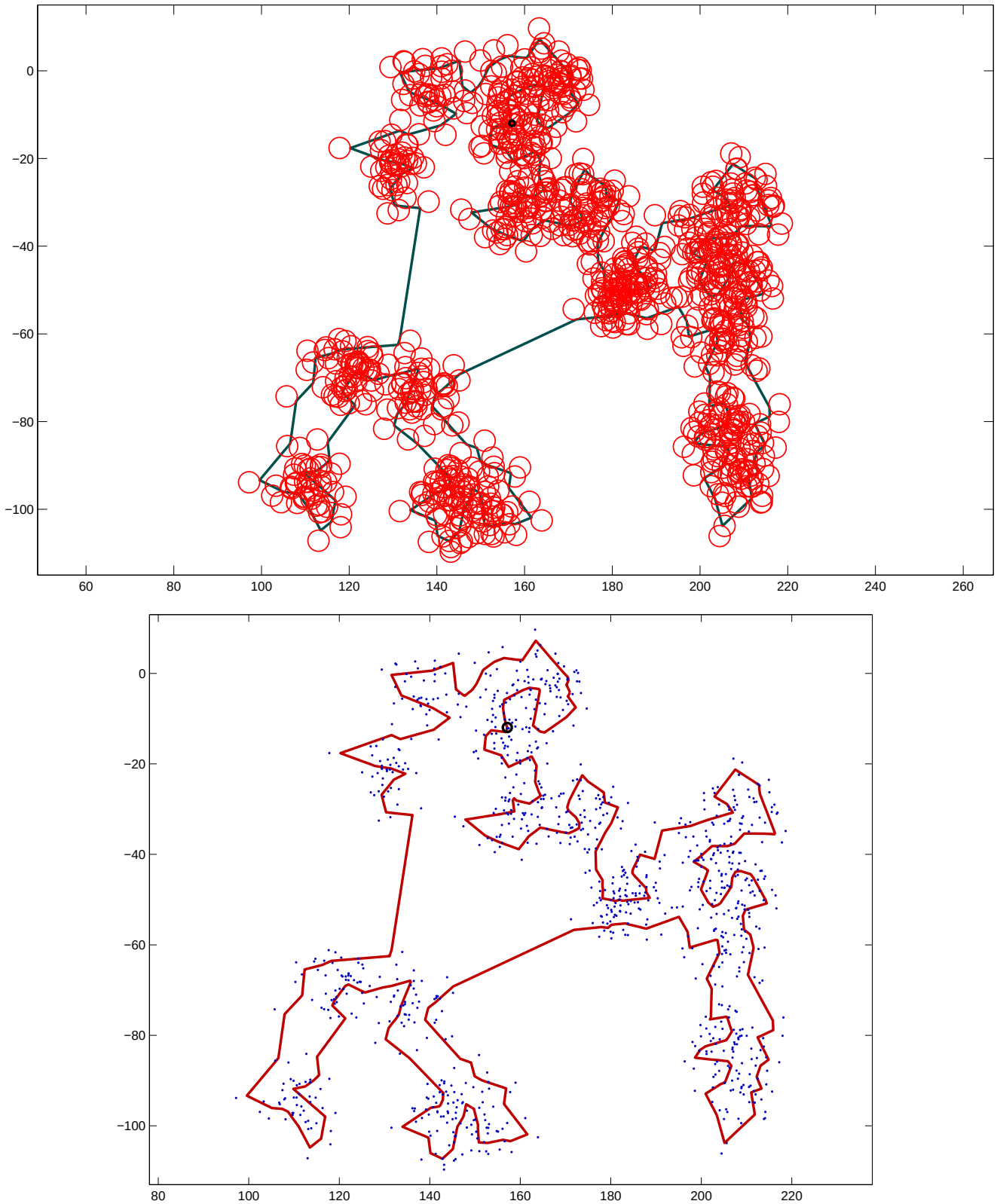


Figure N.26: $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Euclidean, Length = 935.7429544

Table N-29: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Euclidean

Total distance: 935.742954369289			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
46.8548435269056	11.1983903069195	49.0558	10.279
46.7322886568546	10.8549160191844	44.5689	9.75
46.7322872920768	10.854911912723	44.5228	11.8645
46.4117137273649	9.28597798033782	43.984	9.2005
46.4117131012569	9.28597266094927	48.2378	10.888
46.3252576341799	8.63990652300611	46.0043	6.8606
46.2833272970132	8.32657424415196	46.5714	10.174
46.1844002578222	7.58730319542718	47.7278	5.7114
46.1843997761428	7.58730027681264	43.7681	7.8375
46.3150001528346	6.72760787135792	44.0031	6.0986
46.337433959544	6.57993726936455	44.3097	5.4051
46.3492359483864	6.50225018141171	46.3909	8.819
46.4486080646168	5.84817269400354	44.2937	4.7268
46.4567959272385	5.84036095911533	45.0418	3.8658
46.7324097006837	5.69627246855274	45.5397	7.2979
47.8926572052463	5.08970570185053	49.309	3.6922
48.1760448945378	4.94155307063451	50.2911	5.2466
48.3200811199941	4.86625216510653	48.302	2.6164
48.415695578411	4.81626573262006	46.8369	6.4403
48.8447663067358	4.59195129218195	47.0712	4.3382
50.1260613317445	3.92210397722137	52.2056	3.4977
50.3292828466692	3.81586149925388	51.8363	2.0767
50.3941708485818	3.78193861366857	48.4975	2.4432
50.504614788911	3.72419934919373	49.5265	1.5006
50.6237589166938	3.68110057192698	48.7027	4.8736
52.0345388521767	3.17077536946142	51.7765	0.7553
52.3674979591992	3.21574450637917	50.9668	1.717
53.7109039336763	3.39719160261972	53.4617	5.8056
53.8745010437439	3.41928753179262	54.5841	1.3
53.9928365041451	3.43527074968911	54.6465	1.327
54.0968777445328	3.4493233776879	55.7669	1.6852
54.0968781014299	3.44932365262229	52.8937	1.339
54.1311996623836	3.48024319057299	54.7597	1.1902
54.2765356882031	3.61117017675692	56.514	2.6652
54.2731747824339	3.70076046933664	56.6229	3.2945
54.2562666821723	4.15169613108951	54.3108	6.5803
54.2562665711541	4.15169896237545	55.5686	2.3786
54.2562664555027	4.15170185222497	56.6752	3.9284
54.1000732079012	4.9776323864906	55.5508	6.709
54.0683513420207	5.14537501642845	52.3291	3.6705
53.9663384691736	5.68480862914241	52.0607	4.6851
53.6842116036912	7.17667272204083	53.1154	7.9184
53.4911535856852	8.19754580610346	51.2901	7.6487
53.1486406688389	10.0087661605653	53.965	12.2967
53.1486396838058	10.0087711898744	55.3647	9.0137
52.8785896918033	11.2134485958737	51.9742	12.9315
52.8085326450247	11.5259873058308	50.5069	12.3029
52.9926045094067	11.6807826007218	52.3173	10.0275
53.268506464788	11.9128025751069	51.32	11.9016
54.3446496091364	12.8177937010785	53.4554	15.0784
54.3446516551506	12.8177941725587	52.0306	12.0787
55.3547678078822	13.0552295855212	55.8132	15.4408
57.0378147356641	11.8774784074289	57.2331	12.7874
59.6210588407894	10.0697933999194	59.4358	8.0877
60.1685205217811	9.68669425375528	61.7542	11.527
60.7409994356275	9.08309786351567	60.5785	6.8128
60.8453887363244	8.97303432612457	58.6318	9.4344
61.952121183083	7.80615001338199	60.2628	6.0605
62.2761796210999	7.51838235551125	64.6914	7.7788
61.2556537563413	6.11821826962923	61.565	4.5717
60.7504913797499	5.42513507114207	58.8992	5.3006
60.4986706641333	5.07963544607154	58.0725	5.2013
60.9978558670372	4.22681670237083	63.4243	4.3429
60.6132929868418	3.39715230522335	60.4167	1.4088
60.4866543357525	3.12393395641273	58.5415	3.6684
60.3719416574327	2.87644524741807	62.5325	1.766
60.2890962116259	2.73022442653513	58.0726	3.0503
60.2304529991346	2.6267204577185	58.6741	1.1796
60.1887261070484	2.55307363381841	57.7618	2.6586
60.6627821044485	1.51556176345569	63.0749	1.8033
60.5290550635177	0.824436906929556	62.7821	-0.0838
60.5290043241653	0.824357895440459	62.4332	-0.684
59.8523659421734	0.13708864617279	59.6709	-1.5476
59.5272124837737	-0.193177939890241	57.3839	0.9502
59.5272101390335	-0.193180824116343	61.9524	-0.333
59.4748131601897	-0.253675726626863	58.2987	1.8222
59.2515977086051	-0.511387888618174	60.4719	1.0667
58.163916820132	-1.76714568789781	56.047	-0.6998
58.0643218474341	-1.88213225571731	58.2741	0.1622
57.9160853106098	-2.05327756359096	58.2864	0.0731
57.3558945078111	-2.70004225893268	58.3955	-2.2935
56.4124211216388	-3.78932479951831	57.7878	-4.3732
54.7646495384134	-5.6917559723027	53.8048	-5.0553
53.4244656239429	-7.23906079199674	53.289	-9.6645
52.6934933847506	-6.17563823199234	53.412	-4.2453
52.4687558165266	-5.84868977725404	54.4331	-6.2551
51.7179768153263	-4.75645506576735	53.5826	-3.7128
50.4693863156639	-2.94000954319894	51.545	-0.7619
49.4688999087313	-2.99126628129876	49.2438	-0.5725
48.6750135710589	-3.09861254961822	50.0191	-2.6033
46.3941066135405	-3.40702724301183	46.0937	-5.8176
44.9003447814852	-2.80630413472925	44.8479	-0.9391
44.1934461133871	-2.52202144533769	43.0131	-4.6452
42.851222657761	-1.53842209423298	42.4155	0.0668
42.3197359235135	-1.14894154905851	43.4311	0.4843
41.8149194913497	-0.779005328411976	39.9467	-2.3317
40.3192751880088	2.32939526516472	42.4139	3.5597
39.402996949471	3.6301454517137	41.1669	5.3004
37.7482884151956	4.93629126115073	38.0686	7.3443
37.4429616488192	4.80585834619019	36.2059	6.8965
35.8007582838792	3.51844361743377	33.6792	4.7017
35.7271895669506	2.86195295605911	36.4235	4.5159
35.1481520453301	-2.30511168670173	36.4279	-4.3699
33.5558583001381	-1.72478518580328	32.3564	-1.4633
32.7719366402661	-1.43907701539769	33.4349	0.0139
31.9089673978128	-1.12455926704848	31.1128	-2.8096
31.1685690829474	-0.854713618819925	31.1391	0.2266
30.521801029388	-0.618992437558227	31.0707	1.7474
29.4376876827485	-0.503267977435534	28.6989	1.5656
29.1404904090374	-0.471542147524314	27.3755	-1.0984
28.9364692491803	-0.449762826780416	31.0065	-1.0714
27.4281960018849	-0.28876154987797	25.8989	0.7413
26.9500773944498	-0.237722480595563	26.7943	-2.6353
23.4081386838693	0.140385187726389	22.6294	-1.9579
22.8619197795954	0.198693383005986	22.4229	-2.1641
22.6738178043211	0.218772440779778	24.8641	0.1355
21.5401142714781	0.339802329638349	19.4163	-0.8394
22.3481019295812	2.0092007630526	22.4003	2.9895
22.8066027968707	2.95651916011673	24.5208	1.7631
23.7311145110394	4.86667344137826	22.0744	6.6433
25.0779257797447	5.40607979999654	26.4488	5.1021
25.7829896699895	5.68846157452527	27.6562	5.4902
26.0985014387246	5.81482562104583	27.9452	7.0873
26.2016489785607	5.85613677778434	28.0443	7.2557
26.2508977368531	5.87586121089111	23.9142	5.5856
26.9722769839126	6.16477696977942	26.246	7.8923
27.713984110286	6.46183403941326	27.2842	5.8331
28.6454953316756	6.8349081713453	28.1449	5.3771
30.6999379920212	7.65771604674202	31.7997	5.4917
30.6999666271866	7.65773275617037	29.2732	5.6917
30.8241842509117	7.73038259810809	30.7839	5.7178
30.9755543866711	7.8189128419731	29.6205	6.6839
31.1756361500655	7.93593252819155	29.2451	9.0499
31.7107043285017	8.24887182394217	29.9497	8.0977
34.3678723300766	9.80293130095131	36.7928	9.6586
33.7134377868665	10.298488245806	33.7832	8.5886
31.3375233015872	12.0975995629511	29.4417	11.4808
30.8830887967156	12.4417105948479	31.9656	14.6164
26.1556219870702	13.7787541202909	25.9081	14.4892
23.6473488865384	14.4881549013067	23.1228	16.7524
23.5053015566169	14.5283293114695	23.3217	16.9506
21.5521693916282	13.6398423014885	21.6596	11.213
18.9632957297885	14.5511197397812	18.1963	16.0602
18.216603775692	14.8139533367508	19.6468	14.5775
16.0713890556201	15.5690634880975	16.9397	16.157
10.2330520497299	17.6241425479989	7.8039	17.6061
15.6813789930374	19.6333885331196	17.2669	18.1061
16.0840957222284	19.7819031165729	15.0509	21.8739
17.2638197544921	20.2169633441852	19.0397	19.3917
17.6775381195727	20.3695353364995	19.3676	20.9011
17.9354163844512	20.4646362844077	17.3215	22.815
19.331430658959	20.6866026841095	20.7311	19.0512
19.6837533370098	20.7426215021507	21.2889	20.2133
19.9370892034465	20.7829015511077	18.4916	22.031

Solution x	Solution y	Original x	Original y
20.3110429416915	20.8423596799968	19.4151	20.4264
20.7604463431975	20.9138142274259	19.4476	21.0876
21.4280500522924	21.0199625230622	22.0389	18.6688
22.8466286601259	21.5388875978188	24.5729	19.8583
22.8752717430015	21.5493655928106	20.5046	21.2685
23.2728518560914	21.6948057596426	22.5923	19.795
24.6063438625635	22.1826281378703	27.0312	22.0371
23.9402334960984	22.5214713490581	21.7951	21.835
23.8005143072587	22.5925449445846	25.2224	21.1268
23.5678620026802	22.7108925431488	23.1615	20.5337
23.1970445692746	22.899523314561	24.0847	21.2619
22.3976486138476	23.3061707120121	21.1889	21.267
22.0593456107484	23.4782613434333	20.5322	21.5891
21.5478438229189	24.108579045358	23.1689	25.59
21.1277084344951	24.6263066208457	19.6457	23.2311
20.6469003994439	25.2188005972094	21.4132	25.3225
20.1023284831945	25.8898701119123	19.5225	24.6717
19.3484193096984	26.8189042035531	16.9754	26.2994
19.4092050685034	27.0562940190364	20.8129	26.0745
19.4774100904408	27.322658656621	18.7218	26.0511
19.5663493552245	27.6699977958712	17.7323	26.9057
19.7907651642863	28.546420553283	19.8821	27.2321
20.3417653103905	30.6982709452727	18.7531	32.536
21.6426644728494	30.8360889302996	21.3113	31.7798
22.9201337020146	30.9714253056249	22.8581	29.0039
26.1736970884145	31.316121874547	28.099	29.8348
21.5712655560115	61.0344427632662	23.9369	61.5866
21.1115522308002	62.4948817397985	22.6268	64.3936
16.1469005852399	62.8991401101638	15.1112	64.361
15.2786207744724	62.9698403822514	14.2239	63.9607
14.7217656302174	63.0151827690916	15.3124	65.205
12.4664539779351	63.1988189948254	10.4334	62.822
12.1713517996042	63.2228480665464	14.2076	63.0144
10.1363086179604	63.3885499225379	9.1569	61.6426
9.52342494214605	63.4384544798723	8.4928	63.9998
9.05764656220796	63.4763809188952	9.6606	65.5604
8.28017603139492	63.5396868084425	7.6803	61.1857
6.61538150153018	64.2787408784425	4.7342	63.0935
6.3594644052352	64.3923509934925	4.4426	63.6871
6.19107986324217	64.4671025113473	6.9842	66.7632
5.55526880997535	64.6276832083742	6.6701	63.5082
3.42436757881704	65.1658684948915	1.7661	66.5446
3.19959539493102	65.2226372317852	5.2812	65.5492
2.32907317056475	65.4424966544879	0.4838	63.8626
2.05843583422669	68.3523463686568	0.3096	68.1954
1.79484236182842	71.1864724828265	4.0089	72.186
-2.09056349255323	75.312508473496	-4.2807	74.2616
-3.45318915942242	85.0238414971557	-1.2335	86.0108
-4.62121937039831	86.4180030069492	-4.1255	85.596
-10.4285176963054	93.3495998575164	-12.8049	93.8535
-7.3322964077788	94.8664044639214	-6.686	94.6391
-5.4783192331941	95.77464827942	-3.2639	94.8889
-5.44076927138467	95.7930436815371	-7.5489	96.9207
-4.89243695147125	96.0616661573772	-5.5457	98.4014
-2.59775546722173	96.2664626231756	-1.9602	93.9224
-2.34666727027437	96.3853176082562	-0.3389	97.1979
-2.23541167823818	96.4379815651375	-0.171	97.1566
-2.16443890427415	96.4715772685238	-0.3116	97.6012
-2.11067688604074	96.497026094233	-1.8619	98.5581
-2.06112206126872	96.5204833982001	-2.1508	94.1499
-1.34620316754666	96.8588941524278	0.6138	95.4238
-1.34620273706807	96.8588947718537	-3.1358	95.2162
-0.12129995474352	98.5663881967581	1.4019	97.5847
0.964647489242083	100.080181918855	3.1448	100.72
1.05568464937224	100.20708607315	3.1184	98.924
1.30718214491935	100.677852280028	2.5533	99.1767
1.86808640074625	101.727779456751	3.8110	100.5395
3.50994681147216	104.8010871764	3.0162	107.1796
5.97875992631862	102.842012992621	8.0611	104.093
6.32530282905529	100.958391352371	8.1477	101.1634
6.58085905311853	99.5693223391599	4.9579	99.4405
6.87646036751747	97.9625901079902	9.17	97.1621
4.79899488579373	96.1506128467823	3.5924	94.7451
4.43465617444375	95.8328312715305	6.3198	96.0864
2.8256193687568	94.4294211011618	0.5802	93.7511
2.77426099590639	94.3846253104443	2.1469	96.6722
2.61894113414814	94.2491532784815	4.7737	93.7785
2.10312936733391	93.7992553861879	1.6453	95.7178
0.127736055039222	92.0762591419228	-0.1009	90.0487
-0.150868876805902	91.8332563875682	-2.5612	92.1356

Solution x	Solution y	Original x	Original y
-0.150868894581635	91.8332560612383	-2.3037	90.7079
0.1005376705901	91.7812483248337	-0.7351	89.6931
0.49679790906454	91.6992755133533	-0.0468	93.7668
2.05081329721551	91.377785304572	3.5503	90.3653
2.48263252311673	91.2884566355751	3.4538	93.5151
2.56176890510443	91.2321295453402	1.1743	92.9818
2.73268406255899	91.1104767492516	0.6193	91.0377
3.11418916022596	90.8389311454054	1.2023	90.7259
4.29588125545273	89.9978313808521	5.8502	91.8647
4.53173440107251	89.7691276229094	2.5704	90.3092
5.52884176373666	88.8022433151013	7.8142	89.6258
5.50072930011474	88.5454407616554	3.5998	89.8159
5.0830717848736	84.7302522590572	2.7376	84.0979
10.5101915605447	77.3756681946301	9.9143	75.8382
11.3431661846198	76.2468589007487	13.7649	76.0563
10.9355245671034	75.8451887055893	12.73	75.2001
9.67664096404917	74.6047350261967	9.0002	73.0359
9.29490927972533	74.228595346007	8.8648	72.0358
9.18897226103715	74.1242098071762	8.0472	76.1743
8.66787889936201	73.6107459238006	6.6564	74.2265
8.46939564577467	73.4151704305333	6.0914	73.9114
8.8971110795126	72.3484364023216	7.0214	70.8048
8.89711221207837	72.3484348929787	7.5677	74.3816
9.51247679307357	71.5272731053556	10.0835	69.723
9.71813978772632	71.252829758315	10.9416	69.7746
9.83980473153147	71.0904761071082	8.3117	72.2049
10.0398151951608	70.8235756817337	9.4578	72.6847
10.749303147452	69.8768127894073	11.4886	67.7219
10.8159115807578	69.787928340907	9.3844	71.5303
11.2473664990121	69.2121814454836	10.7344	66.9849
11.317675428976	69.118358920017	11.4442	66.9869
11.3681587766783	69.0509923144779	10.5042	66.7806
11.3681592782548	69.0509920838454	9.1707	70.0865
12.0131871325679	68.7529188075035	12.0444	66.3239
12.0473264320282	68.7697722602845	12.0877	66.3858
12.2003613850307	68.8453210647897	14.0233	68.3418
12.3234445357342	68.9060835243775	12.0097	66.7734
12.5238651194186	69.005025213681	12.5389	66.9051
12.8409841444773	69.161577430773	14.7433	68.1941
13.0062877334954	69.2431827962766	12.0587	67.8257
13.2165138314767	69.3469650533358	13.2613	67.7948
13.4486789761853	69.4615779477921	11.6475	70.8021
14.7652006131964	70.1114958100983	16.7224	69.1113
15.0128436036571	70.2337495431984	14.5018	68.1646
15.6526763772904	70.5496156104374	15.4332	72.9689
16.6641077827949	70.261371302004	18.2654	71.5277
17.0052886492332	70.1641394132466	15.0856	70.6386
19.5155622131847	69.4487481114862	18.9682	67.082
21.2954532618413	69.1305100935953	22.8228	67.5784
21.5396451156951	69.086849908599	22.0857	71.4539
21.9886478608785	68.9594282871611	22.1344	71.2137
24.3743517230452	68.2824012162369	25.7737	68.9159
25.2117062587646	68.0447701214598	26.4587	69.6793
25.6390505000699	67.9234949546147	26.4833	65.6457
25.8233523929592	68.2021271383809	28.241	67.9653
25.3072542169248	69.4609475445093	26.9783	71.0141
25.2176821773248	69.679419740423	26.4747	67.9787
24.6789592998877	70.9934054969942	24.5354	72.6275
24.4723235319918	71.497403904233	24.1578	73.3792
24.3713092955479	71.7437843505963	22.9431	70.0987
24.1241870470179	72.3465323010374	26.2205	72.9044
23.7210471979701	73.3298187872329	24.7401	75.4523
23.6873691833524	73.4119620857778	22.8762	75.7017
23.6873535173031	73.412000318329 3	21.3934	72.6127
23.4242045570599	74.4220630427523	25.4767	75.481
23.3495442024443	74.7086314160104	24.5076	73.115
23.1470469109141	75.4858766889017	25.3366	76.538
23.0359985341437	75.634714136641	23.527	73.6169
22.8107658882678	75.9365936911982	24.4797	75.354
22.395507683876	76.4931703623027	24.3218	77.9732
21.9679856020881	77.0336253263617	23.796	77.2181
20.9114910961598	78.3691946752116	18.7356	77.2891
20.806261906853	78.777455734363	21.1184	76.9048
20.2631459822956	80.8845973828564	17.9606	81.6588
23.4674135257815	83.422219966816	23.4089	84.0628
25.5434992186499	85.0663762044687	27.1736	83.2653
29.7638505416975	89.4240513801384	29.5221	90.7635
30.9314360241674	90.6296285851443	32.1756	91.0244
31.4854080050765	91.2016262301649	33.2241	90.2072
31.8403395781339	91.5681068865694	32.2034	92.5655

Solution x	Solution y	Original x	Original y
32.1284453567797	91.8655873090472	33.6244	92.4492
32.3289361622999	92.0726018827121	34.0163	93.2553
32.4359355705474	92.1830829871477	32.6009	89.9531
32.995219583414	92.76056742841	35.4152	92.5489
32.9952196662126	92.760567807231	34.7819	91.1147
32.9873847724897	92.8600992248848	33.1881	90.5996
32.9126778255792	93.8091467881323	31.4281	94.9219
32.8768851752744	94.2638413398932	35.2297	94.8683
32.5424344760593	95.0040355575586	30.7482	95.8761
32.4101171427649	95.2968763399202	33.9629	96.8355
32.336257604488	95.4603402061463	34.0464	97.1856
32.336256477792	95.4603411027113	32.8593	93.0881
32.0317751725839	95.7249629947821	33.0573	97.9271
31.9200263410486	95.7425627135027	34.0458	95.0903
31.4782319207287	95.8121527596082	29.1897	96.4145
31.4319854870184	95.8194363161725	29.7849	97.5299
31.4071544565795	95.8233471893662	32.4952	97.9758
31.0947163451428	95.8725563162175	30.8807	93.5109
30.2313862625356	96.0085355654609	29.3468	93.7461
30.089682858587	96.1032531043051	29.7064	94.0211
29.9003991083225	96.2297743023124	31.6916	96.8159
29.6393282956868	96.4042794380483	31.7064	96.988
28.2030105871452	97.3643352917333	26.55	96.735
27.6118625614896	97.7594705628452	26.1674	96.1159
27.2126339089204	98.0263232358726	26.6904	96.1713
26.6074426399181	98.430845690725	28.2891	98.27
23.9575937249372	100.202067496413	21.5395	100.4343
26.1599005357716	101.127281487203	26.9511	99.1097
28.8324578221971	102.250059335066	30.1816	102.1772
29.7004533758945	102.61471490251	31.6341	101.1443
29.761811116291	103.094392255213	29.8552	101.3038
30.1368981683151	106.026627400742	28.1717	107.4546
32.3327574188084	107.063787712767	33.1686	108.6172
32.792320233043	107.280851596844	33.1638	109.6815
33.2089702235274	106.894012143069	31.3011	106.2109
34.4221021076026	105.767678458972	35.4006	103.6799
34.4788169772029	105.715021496147	32.8361	107.2479
34.5897174502465	105.61205579512	35.3466	107.7036
34.7761650078253	105.438948328218	35.7224	107.36
35.0812532285863	105.155688788637	37.1983	106.347
35.464845694451	103.288671592585	35.2228	101.4244
35.556872228041	102.840754669006	34.3074	104.3145
35.9500402045752	100.927137967602	36.8108	99.4487
36.0604428644079	100.389778659448	35.7859	98.3251
36.0980351094954	100.206807556592	33.8351	99.3235
36.1357149748778	100.144186675576	35.5571	102.295
36.197119094222	100.042138118635	35.7306	102.2767
37.040585683164	98.64039631278	38.2186	96.6747
37.0959139818482	98.5484454467999	39.196	99.7694
37.2098979416159	98.3454202132829	35.0473	98.5367
37.4623060985984	97.8958228744662	39.7333	98.7582
37.6817065482201	96.8874551565069	37.1788	95.0118
37.7534985895643	96.5574887568175	37.3296	94.7968
37.8002262701431	96.3427213538969	35.7481	97.1257
37.9363711944168	95.7169953631721	36.1694	94.3523
37.9801533415615	95.5157657097308	35.9551	95.9225
38.0391560063758	95.2445810323685	37.0706	93.0168
39.2798048601782	95.9821201628868	40.9431	96.0349
39.7162484713175	96.2415751167946	40.065	98.6098
39.7449583293372	96.2586426381663	41.6896	94.8028
40.2473362241532	98.2192032986654	42.2565	98.7398
40.3670074912648	98.686238988995	42.0978	97.503
40.6624694546811	99.8393247870471	43.0828	99.6317
40.6181792741153	100.39441590505	38.189	100.3805
40.6385510017812	100.692493077698	39.3246	101.8921
40.6544983392101	100.925835341467	40.5226	102.8002
40.6657456631885	101.090408146055	42.9226	100.4615
40.6871018348529	101.402889856248	42.8352	101.6931
40.7045383042729	101.658018819209	42.5793	100.4271
40.8417106552313	103.665113822485	39.1965	105.4524
40.8417155982172	103.665113855939	40.2693	101.3043
41.4488665751634	103.705887487149	40.9527	105.6227
42.7643759115364	103.794230963443	42.9285	106.2179
43.1256468123358	103.720138240178	42.4716	105.6496
44.0543675815075	103.52966814869	45.465	105.2608
44.2740313578647	103.48461757662	45.0704	101.2748
44.3423002151616	103.470616386796	42.0156	103.5929
45.2176554948384	103.291091496932	44.7902	101.1589
46.1160795618146	103.10683586425	46.0729	100.678
47.8169303316001	103.39307702823	48.0764	105.8084

Solution x	Solution y	Original x	Original y
48.3335331622217	103.186276332183	46.5537	103.4177
51.5579063587596	101.895529551552	53.9006	102.5381
49.2345326780087	98.8683953423592	47.126	99.3914
48.9731628025634	98.5278551220809	51.1106	98.2963
46.3896733675606	95.1618155283081	44.0393	95.7757
46.8835433657999	91.7475983903139	48.9533	90.4759
46.3168271661263	91.5565022908492	47.7789	92.5461
42.4102467739977	90.2392145341015	41.599	92.4813
41.5322263247853	89.9431493232829	39.6285	91.4521
41.5322252996293	89.9431487654306	43.1057	91.7939
41.3143955207993	89.8227979924187	42.6808	88.2098
41.0549590431423	89.67945958826	42.9721	90.3177
39.909117255969	89.0463841419778	37.9917	90.5379
39.1132680863538	86.0079098984183	40.8939	84.3555
36.7469379931338	85.1951554071815	35.4073	87.2216
33.9601101366954	82.1022749249447	33.517	80.8699
33.2028577440295	81.2618571478816	34.9317	80.2335
31.3554198857134	79.2115341115509	31.105	77.2121
31.0808805736607	78.9068431158855	29.376	80.5861
28.9747106922699	76.5693396660037	26.6151	77.1467
29.1472888666903	75.903096763319	31.4187	76.5703
29.4847409510773	74.6003520241709	27.2709	73.9256
29.6616022879345	73.917573881261	27.6433	72.5657
30.8113936906075	73.0544919331367	31.4906	71.3219
31.1560885443097	72.7957508062021	32.697	74.6737
31.6117741008772	72.3876559320874	31.0449	71.9995
32.0879638554401	71.9611982990562	31.4455	71.7336
32.6099833786074	71.4936972889587	31.7515	71.3679
33.241976237801	70.9277083642786	32.2488	71.8762
35.178919203565	69.1930582473717	33.839	67.1668
35.8486751430656	68.8792504519076	35.1535	70.6086
61.8590738142311	56.6923273154891	61.2083	54.3519
65.3881675071297	56.3230915604038	66.0257	55.1875
66.8353083419768	56.1716819466909	68.2826	55.0673
67.3123495755268	56.1217703950642	68.5789	56.8701
67.6699505301696	56.0843555289227	68.022	53.7678
67.8215655904135	56.0684923364063	69.8977	54.8286
67.8305644237612	56.067550732289	67.8488	53.6384
68.5518324538177	56.1539635127173	70.5527	57.3223
68.6320876805924	56.163577935379	67.4683	58.2291
69.3908427530993	56.2544757759499	70.1344	58.5671
70.0991730004066	55.6059030237689	71.2619	53.5794
70.1491325384736	55.5601577339298	69.1565	53.343
71.4586190107024	55.4281175437058	73.8072	55.2741
71.5081400253873	55.4231241344555	69.9782	57.1009
71.574803434527	55.4164022011061	69.2681	55.3133
71.7833315412839	55.3953755180174	70.916	53.3608
72.1168628228341	55.3617442236364	70.694	53.8562
73.2627810160358	55.2461977841976	74.3979	53.0985
73.2627835731278	55.2461976795077	73.3859	52.8201
73.8975398916289	55.4666373850117	73.2116	57.797
74.2741810508791	55.558116619233	73.7963	57.8273
74.5936871161937	55.6357188464971	72.7757	56.7077
76.4756189694437	56.0928074308239	77.8264	55.5164
77.2737939868308	56.286670249351	78.0993	54.3894
77.8372968029776	56.4235350506108	77.9705	58.8491
80.3466234850392	55.513291415655	81.1686	57.7423
82.5220294834769	54.7241576998965	82.0477	53.0979
84.32018505665	54.0718744217871	83.5076	51.7826
84.8050226814881	53.903556201402	84.6532	51.7406
85.0670703635296	53.8125790037546	85.9154	51.5363
86.971602740582	57.1147323842423	89.2688	56.3248
87.2908548820232	59.3924112002238	88.0225	60.7529
87.3900424772108	60.1000879393366	85.8477	60.7859
87.4651544853455	60.6359910614488	86.2321	62.729
87.8975689569239	60.4698809146281	87.1149	58.1702
92.5898719467307	59.0731067651884	92.8209	56.9207
92.9731415490925	58.9590184203688	92.9131	56.6287
93.0929549936306	58.9233534746479	94.8477	58.3247
93.1877336798668	58.8951405967046	94.6877	57.1733
93.2355109682518	58.8809187297143	93.2379	56.4517
93.5997259501851	58.9901094230218	95.4289	57.3916
93.7475033514688	59.9242272195446	95.479	61.1306
93.7869224634782	60.1734102385173	95.4724	61.7777
93.7968445387498	60.236130978812	94.4551	58.0456
93.8181917141212	60.3710738320061	95.9041	59.3009
94.0335744347701	61.7326319616807	96.4356	62.0951
93.884882903484	62.0354507650767	94.6788	63.8911
93.7979637722658	62.2124671190625	94.6583	60.3511
93.5765711160772	62.6633448283445	92.749	64.7326

Solution x	Solution y	Original x	Original y
93.5253333919918	62.7676941490427	95.1558	61.2395
93.344881585923	63.1351946116705	93.9444	64.9
93.231266990468	63.3665779767979	94.5987	62.0376
93.0041342976167	63.8291468835363	93.5538	62.1822
92.2629429060727	65.3386219952032	90.2672	64.2791
91.3366166069758	67.2251481048993	93.0933	68.7697
91.2229005229714	67.4567398882138	88.7937	67.447
91.5905282072864	68.2208923927404	92.0851	66.8651
92.3035780141661	69.7030570266688	94.6798	69.1984
92.2188863962919	72.5385233739678	93.9524	73.145
92.1814198895883	73.7927371636339	91.0116	75.887
92.1806561674723	73.8183014303936	94.549	73.3405
92.1095823507758	76.1969899835631	94.4072	76.9857
91.9056857301009	76.4758143490974	89.835	77.746
92.0359919773726	76.4546358738349	91.1291	78.4897
93.9107338476276	76.1499283206171	96.1169	76.0362
94.1409911390598	76.1125043379772	93.1133	78.1389
95.5374506023468	75.8855207093153	96.2521	73.5638
95.7615874891916	76.0978409203793	97.816	74.8015
95.7734920502039	76.1345830556297	97.5653	74.5618
95.906691428914	76.5456923641326	94.6945	78.572
95.9239551380729	76.5989750395981	95.9481	74.251
96.4038760471616	78.0802020773214	97.1852	78.7831
96.6773612203255	78.9242872066514	98.2007	80.5294
96.7180438988843	79.0498500613368	98.567	80.2017
96.7435120403619	79.1284548052041	98.2345	80.86
96.7575201526311	79.1716893902653	97.3132	81.5365
96.7575202436938	79.1716896668625	99.1261	78.6323
96.7152730183471	79.2401180768628	98.5933	78.8152
96.6653747618065	79.320938995819	98.9119	80.0767
95.9069351277559	80.5494066881243	96.9541	82.6989
95.8883508315181	80.5795081487782	97.8831	81.9659
95.8075794900359	80.6832400500494	97.7624	79.6432
95.501942829234	81.075739958455	96.8706	83.0827
95.3635019258017	81.11671994403	97.4314	81.946
94.3720889664539	81.4101879360096	92.6699	80.64
93.9075432217914	81.5476976771866	92.1151	81.2598
93.624418113401	81.6315054046765	94.9909	83.4209
92.508999834399	81.9616738423548	91.14	83.5499
92.2482617318192	82.0388546882953	91.1677	84.1211
92.1849172930994	82.0576055418516	94.0795	80.8773
92.0780527347724	82.0892388952287	91.86	79.7087
91.2481783721077	82.3348959572781	89.5631	83.3752
90.9739525086875	82.4160687665405	89.95	80.2132
90.9478411705418	82.4332698428843	88.6759	82.3658
90.927021675923	82.4469848457954	93.2494	81.8793
89.7776464371654	83.2041448997834	88.0687	81.4777
88.6189794156833	84.9246297222409	86.3374	85.7586
88.8239402152635	84.9829547016981	88.3633	87.3681
91.7840454948494	85.2929071110212	92.288	83.6157
94.0232115439959	85.5273827354552	93.9684	87.8762
94.6160144649135	85.5894539552092	95.9325	86.7596
94.9846637254014	85.6280548752542	96.9343	84.943
95.1535366960819	85.6457376911691	93.0994	86.3608
95.8885433225705	85.7226939116199	97.0865	83.6094
95.9008584979083	85.7391070374601	93.4941	85.8189
96.468711175124	86.495937141461	97.7943	87.7833
96.6602988255184	86.7512829614502	98.3726	88.4744
96.6602992417341	86.7512835400005	99.0152	86.155
95.9288322758815	88.6488079570805	98.1138	89.594
95.7882496632916	89.0134887002072	96.2545	87.1498
95.2709413978131	90.3553906158355	97.0347	92.0258
95.1276369747413	90.4197826092383	96.5235	92.1962
94.8994203384462	90.5223301585034	96.8345	90.0197
94.276883866289	90.8020821497052	93.1284	88.6615
93.8764619910536	91.0545772520679	92.7178	89.1801
93.4561594673397	91.319608814171	95.2026	90.5293
90.9521877055598	92.8985389781501	88.6062	92.2681
91.1213812894528	93.221052099844	92.5654	91.5305
92.4526051492555	95.7586096452793	94.0924	96.5838
92.719300660217	96.2669777692669	92.4623	94.734
93.3058588971701	97.3850602966346	95.504	96.351
93.4623820299574	97.7591643098913	95.7576	96.9635
93.9307261940758	99.4440289680679	95.0373	98.5247
95.137204685851	103.784283966647	94.4828	106.1237
96.0416284812433	102.934683558805	95.6122	103.8055
99.0116209012347	100.144710922444	98.2349	98.4363
99.9491400070464	99.2640215411254	98.8373	99.4165
101.733667108564	97.5876687837906	103.8628	98.4843
101.81789579214	97.5085453771333	104.1034	98.3317

Solution x	Solution y	Original x	Original y
101.743641406276	96.9185183675357	100.6204	94.7646
101.743639672089	96.9185040916027	104.1728	96.9352
101.25304183335	93.9356694153871	101.602	92.3175
101.13664313133	93.2279554558114	99.3782	93.0601
101.049179453216	92.6961700357196	98.656	92.6213
101.039974396092	92.6402056406416	98.853	91.6792
101.037261234081	92.6237096580065	99.3434	90.9979
101.035205238806	92.6112092107498	98.9319	91.3958
101.148937402581	92.5684283562758	101.8123	94.891
101.402472333252	92.4730606820686	101.583	94.8217
102.877548458471	91.9182004561888	102.4507	89.6037
103.317632323987	91.7526661501971	105.6506	92.4297
103.317632104932	91.7526656451911	103.2876	94.1817
103.238686212143	91.5690871576305	102.0076	93.075
102.611371383464	90.1103665803751	100.7126	88.5952
102.611367783031	90.1103578928122	100.5649	91.4192
102.491500345252	89.785847439828	104.3693	90.8389
102.24851087226	89.1279731002574	102.0461	86.7072
102.248510833376	89.1279730485765	100.8882	91.1406
103.073735630103	86.7950278301489	104.3617	84.8664
103.104839761697	86.7070978695452	101.1477	85.2681
103.722608166039	86.2443967753274	104.5599	87.8351
104.876532797087	85.3800732376438	107.2392	85.9448
104.200031590536	84.0102427684504	102.2936	85.0217
103.409122548675	82.4087461923555	103.6911	80.62
103.173760855484	81.9321668777156	101.0606	82.9382
102.961320692972	81.5020016168465	103.1106	83.2736
102.456649069336	80.480094698651	100.0565	80.1054
102.572997513225	80.3597345855625	101.2985	78.2917
102.946560886479	80.24322374359	103.8313	82.5056
105.901068815544	78.840710599555	107.981	80.0957
105.812368473731	76.7187822427583	108.1531	76.0691
102.136898610887	69.9861146959962	102.9023	68.4164
101.57783386245	68.9620304294799	101.778	67.1686
101.346169584225	68.5376714658077	103.5291	67.906
100.30477231416	66.6300711582586	97.9014	66.9835
100.503609075062	65.6864326612338	99.4285	63.8276
100.552622936059	65.4538246656668	98.4258	65.8894
100.654666164044	64.9695528988199	98.4228	65.0226
101.240554862416	62.1890025966353	102.6402	60.9181
101.347007501299	61.6838045943793	99.3413	60.508
101.385390886435	61.501645132504	99.0429	61.6589
101.562754104243	60.6599344439802	103.9916	60.6173
101.430941905082	60.1277026238575	100.6854	61.817
100.87246661185	57.8726605997898	102.1595	55.9791
100.838833938162	57.7368585888725	102.8738	56.4102
99.4445831890879	56.6589318759406	97.3108	57.82
99.4326104068966	56.5166800263215	99.9754	58.6633
99.3729016235976	55.8072210600381	100.6388	53.8259
99.3671624341257	55.7390328281021	98.2152	53.7701
99.3634880821826	55.695377040558	98.8606	57.9963
99.2965032467718	54.8994350703646	100.5945	52.9653
99.2893669780157	54.8146467380272	99.7259	57.0659
99.2567014957725	54.4265234348337	99.5817	52.1789
99.2488043578033	54.332694454889	98.9521	56.5952
99.1931780862794	53.671738618596	97.7133	51.9341
99.1860153246232	53.5866348016191	97.7455	51.8526
99.1816041793865	53.5342241403162	99.0651	51.1078
99.1816041464393	53.5342237304064	96.8097	54.0588
99.2527661673868	53.3817591024058	98.7715	55.3698
99.3935878224447	53.0800485544085	97.9579	54.2407
99.7913402011674	52.2278611969892	98.2004	50.3921
99.8954446238897	52.1963356654322	98.1036	50.8139
100.508130926689	52.0107930989862	99.5987	51.3246
101.28265064537	51.7762396274932	100.3439	52.2486
102.492379327863	51.4098799987865	101.7941	49.0832
104.469644006399	50.8218389849157	106.6231	51.946
104.225188049612	50.0828849272815	102.9297	48.0592
104.218718990479	50.0633287656232	106.4442	49.0895
103.527100424347	48.8136728553104	101.377	48.1816
103.441103712327	48.6582921629156	105.6501	47.8555
103.262934599525	48.3363719350773	103.8062	50.1176
102.706045583015	47.3301706424877	100.8862	48.4618
102.001993972331	46.058066284208	104.1102	44.8822
101.605673870909	45.3419998102986	103.0838	43.6629
101.483829220833	45.1218459520777	103.3956	43.6231
101.483824978458	45.1218403453942	103.8959	45.4099
100.91718725919	44.3931052071462	102.0152	42.2262
100.917180910218	44.3931048676862	100.6036	46.802
100.768139396326	44.3457126062537	102.543	45.6081

Solution x	Solution y	Original x	Original y
99.735414347262	44.0173311935027	97.5519	44.8528
99.6542255229099	43.9915146621202	98.3613	42.0392
99.6160079537136	43.9793622023231	101.161	45.7653
99.285869407637	43.8743843556604	99.7789	45.6905
98.773135584285	43.7113444203288	96.6284	43.246
98.6486822582177	43.6717707312952	96.8865	41.9997
98.6486817146935	43.6717706093218	99.6903	41.4772
98.4850104132046	43.6961662848152	100.0845	45.3198
97.6671805736669	43.8180679268959	95.46	44.379
97.5786070548591	43.8312701115681	96.2085	41.8253
96.9433787268563	44.939929399565	95.7654	46.8722
96.8855781184665	45.0408113878064	96.2485	47.1277
96.8477395991746	45.1068527560064	94.5355	44.3621
96.8433111201141	45.1497221514636	94.4684	44.7163
96.8331812888737	45.2477577269393	98.0763	43.3554
96.7747182191342	45.8135231424979	98.0879	44.5657
96.6335023219107	47.1798542810119	98.9198	48.0008
96.4232086296207	47.4963102351151	94.5838	45.9916
95.487902583411	48.9037714943188	93.3823	48.5086
95.196365150722	49.3424840569127	93.0102	50.1223
95.1481252318667	49.4150766169482	94.5726	47.3613
95.0877465412069	49.5059358751409	95.1396	47.3596
94.9932209841426	49.6481801330653	95.0864	47.4256
94.4382191039932	50.483367285366	92.412	50.9961
94.2632522840651	50.7466615362018	96.0562	52.3857
93.8060803884072	51.1134698955008	95.0304	53.2116
93.7831239030073	51.1226455773306	94.3452	48.7818
92.6187007880062	51.5880514214216	92.1982	53.9806
92.4345929158248	51.4238881718448	93.3932	53.1876
91.553156791828	50.6379418703088	89.6611	52.1615
90.804227913081	49.3092015458464	91.9756	47.4725
90.6317256629841	49.0031491738193	89.352	47.1855
90.5794785328518	48.910452595669	90.3356	51.1932
89.9344065814035	47.7659705998513	87.5129	47.9594
90.0332897805886	47.498265804004	87.8413	47.1867
90.2174015582706	46.9998230099606	91.1842	48.1207
90.4610048778284	46.3403182004006	89.3464	46.1786
90.7213381334745	45.6355204649198	89.5287	45.4109
90.997303859172	44.8884010464178	90.4865	46.0315
91.4845857638007	43.5691747942418	93.2846	41.9379
91.4845857494819	43.5691746052455	93.9129	43.6355
91.4410292319199	43.5349408929815	91.9732	45.8332
90.8273264696088	43.052599063463	92.1801	41.0349
89.9143130507578	42.5357319235657	90.1236	40.724
89.3309065561598	42.2054623840184	89.0134	41.3658
88.8377759362775	41.9262989415616	90.014	39.915
88.3392625452535	41.6440900783754	85.9182	41.843
88.9410739686869	41.1583467634517	87.5583	39.2312
89.1999997021218	40.9493587838812	87.2346	40.5435
89.9121420322729	40.3745752302046	92.2396	41.0703
89.9121456569499	40.3745721288262	90.0385	42.8005
90.0642203595025	40.2384452653634	88.4465	41.4478
90.4039269929099	39.9343623210747	89.1249	38.0318
90.596644985658	39.7618540817692	89.3668	41.343
91.1575819537751	39.2597394402305	91.8795	37.1845
91.2796301465375	39.1504901054536	90.4784	41.2284
92.3702399519133	38.1742368702346	94.3087	39.6383
92.3702430219581	38.174232047487	91.1655	36.0648
93.0481231125992	38.1717680021298	95.1298	37.6897
93.2216696943592	38.1711389109045	92.634	40.1716
93.4270396784177	38.1703944630378	91.9372	36.8319
93.7785978348851	38.1691196261482	92.8093	39.7693
94.2939074049036	38.1672496227927	93.6941	39.0671
94.8924630134221	38.1650766526652	93.6083	38.4774
95.8121481185692	38.161731734554	96.2133	40.5576
96.1465956905789	38.0478532046729	94.1971	38.0204
97.1952974642841	37.6907633224762	98.4033	39.6451
97.4167139263711	37.6153720642935	98.7317	39.6579
97.4534988183108	37.5762758943817	95.8598	39.2349
97.5251149970057	37.500159596069	97.0063	39.6578
97.6719174354411	37.3441321312595	97.0806	39.3994
98.2490201806569	36.7307641892811	98.5859	34.5756
98.3772609716229	36.5944648697816	96.5473	37.5774
98.6500495521279	36.3045339741432	96.6051	36.0943
99.5052166610173	35.3956336610843	98.5493	33.1624
99.7027923741052	35.3970097051612	98.9301	33.2654
100.920232107803	35.4054909212637	101.1976	33.4905
101.811814862529	35.4117023524359	100.5275	34.9543
104.016132097942	35.4270582755408	104.0844	32.9988
104.495305851323	35.4506771457975	103.4615	37.3033

Solution x	Solution y	Original x	Original y
106.22203505562	35.5357864360573	107.8221	37.3636
106.251282073369	35.1860525487035	108.656	34.8419
105.130024407271	32.2760225089986	106.6895	31.0233
104.78041244497	31.3686157244024	105.6149	29.5786
104.645995061165	31.0197282188779	106.8535	30.7643
104.338072690877	30.2205419200483	106.1692	29.0085
104.178663725995	29.8067926617537	102.211	28.3893
104.177539756852	29.8038752995112	102.9211	31.879
104.025109658115	29.4082215419059	105.5782	30.6326
103.265422552899	27.436255537896	105.0575	26.2706
102.979044247409	26.6928908378127	100.6297	27.3107
102.956784609655	26.5420358214781	101.7295	28.4449
102.808619504894	25.537979322186	100.384	25.6874
102.808619379108	25.5379365018784	101.5683	27.6266
102.808081162394	24.6812669881163	104.9423	23.521
102.209858979718	24.2931849645625	102.9016	24.8202
101.362900282997	23.7437417127619	102.4997	24.4075
98.1704575407143	21.6727243078321	99.0428	19.6959
97.5179479983318	21.2494249278525	97.1071	18.8552
97.1007505138733	21.7920871593331	98.3827	22.3334
96.6067165811216	22.4346933272433	98.3241	22.4412
95.1781235167373	24.2929246897048	97.0499	25.7334
93.796396357539	26.090163458944	92.942	26.4511
93.1124527357932	26.9797888035838	93.9312	28.9768
92.926040198538	27.2222616800046	90.6179	26.4649
92.9260398048512	27.2222632090714	90.6435	28.0536
93.078263884976	27.3135648147917	93.6487	25.1273
93.3060111441977	27.4501636121123	92.5592	25.4331
94.7465726227802	28.3141974994428	96.0238	29.4057
95.3287680549352	28.6633873254564	96.156	30.1327
95.6688180056493	28.8673427414347	97.3283	27.0933
96.0521392996915	29.4193351704227	97.9141	29.0493
96.2835945082546	29.7526385967244	97.5011	28.0267
96.8706202167101	30.5979706246109	95.8908	32.6754
96.9718576396798	30.7437567953409	99.0228	31.9463
96.9823228246423	30.7588272690643	99.272	31.5703
95.7225478873553	31.1246907619352	93.4265	31.4744
95.65600591823	31.1440157750488	97.4429	30.1528
95.5745254906707	31.1676791864934	95.0864	33.2234
95.504045007059	31.1881480111617	97.1838	29.5842
95.1488332027343	31.2913079049554	96.2582	32.5713
94.6964644891716	31.4226839667171	96.3928	32.1668
93.0767312682212	31.893087211816	92.7124	33.4453
92.2580035607539	32.1308608456017	92.4351	33.0022
91.464828823725	32.3612133527584	90.72	30.049
90.2005910683044	32.8093050646425	91.0332	34.8187
88.2117861317849	33.5142067258818	86.512	33.4131
87.6513070233219	33.7128608588278	88.2545	36.066
86.8771246527173	33.8387879660898	85.1876	33.113
86.5129078184575	33.8980306550193	85.525	32.0217
86.2547963593862	33.9400145153934	87.5726	32.8781
85.8786315874115	34.0012006992325	86.5983	36.2039
84.3104928706698	34.2562718133325	85.065	35.2948
81.347762166704	34.7381879502254	79.7169	32.9378
80.2138899765162	39.0007519407666	81.9079	40.1742
80.0132074140981	39.7551966422925	80.8076	41.6004
79.9378703296868	40.0384179955607	77.5882	39.4219
79.6861989178802	41.011135424856	80.8872	43.1227
77.4073103136261	40.3476542202327	75.9022	40.5634
76.4624730835982	40.072571541955	75.4748	37.8532
76.1455512074433	40.7285277537136	75.73	42.7229
76.0403432292651	40.9462839614424	74.5598	39.2546
75.0347695168503	43.0275978926788	73.2283	44.0709
74.913091662642	43.279443057416	72.7013	43.6681
74.8598357623998	43.3896704496543	72.9198	44.5581
74.8307081372925	43.449957903584	72.4926	42.7909
74.8273262040499	43.4838706465996	75.9853	41.4015
74.7592384958425	44.1665956694351	72.4429	44.8985
75.0935389088669	44.5544142534057	73.6395	46.5004
75.0935484671076	44.5544247692407	72.9378	43.4347
75.5846678750196	45.0901724159433	76.4125	46.981
75.7419391750048	45.261738286203	77.8794	45.0468
75.8429494552551	45.3719297183067	77.9223	44.6051
75.9204459153122	45.4564701295203	73.6428	45.1426
76.8598266306793	46.4812000639263	76.379	48.6237
77.081336490135	46.7228429430433	77.6289	48.4559
77.2318483029149	46.8870351230503	75.5201	48.6107
77.4968595442916	47.1266141169912	79.533	47.2684
77.6493500288884	47.2644691800389	77.4079	49.147
77.7756020187615	47.3786038036262	79.9479	46.2913

Solution x	Solution y	Original x	Original y
77.8194067802511	47.8512927141678	80.0004	48.0282
77.8511545483712	48.1939148068694	78.2967	50.1808
77.8687322480272	48.3836295775228	75.5587	49.1352
78.4382972568603	49.3408549025429	80.3964	49.7264
78.6065992787427	49.623707488891	80.7698	50.729
78.1407197251208	49.6654201304228	77.9078	47.2474
77.2786088461371	49.7543338852121	76.0043	50.5809
76.7525016344836	49.8085891173819	75.2757	50.6388
76.4204720851884	49.8428279963877	76.2244	51.9684
76.156922129375	49.8700046559086	74.4488	50.3129
75.9637240616769	49.8899264147061	73.911	51.0144
75.9044912694208	49.8960340044396	73.6611	50.4924
75.8676069368027	49.8998371789031	76.5498	52.218
74.8457185267745	50.0052034273399	73.5268	49.2611
74.2284622894815	50.0688524026525	73.2401	49.0047
73.7536222778852	50.1178169404011	71.8965	50.0142
73.4897368593039	50.1450287719707	74.8417	48.5823
72.8219296262313	50.2138893715344	71.0505	50.768
72.5109060559641	50.2459620242606	72.0955	52.6394
72.3233069451818	50.1561894627991	73.2561	47.9132
71.9724602748585	50.0313216158069	72.0385	47.603
71.4480254489352	50.1863365659257	72.0304	52.5053
71.0914762854836	50.2917316857921	70.1179	52.2878
70.9419861847789	50.3359213159683	69.4154	51.8752
70.8483592394887	50.3635979244233	70.2011	52.705
70.6718577525937	50.1718055765052	71.8327	48.0379
70.1594605084661	50.0840858776078	67.7991	50.1342
70.1152608358519	50.076519599697	72.1444	51.2772
69.8246905445413	50.0267780679486	68.7356	47.889
69.7979223649129	50.0221956254437	72.0723	49.2863
69.2016175252514	49.9201164162285	67.6648	48.1141
69.1583861083579	49.9127156155506	70.8564	51.5507
69.0094397611561	49.8872179725932	70.7664	48.6137
68.7378478027038	49.8407254209717	70.6462	49.6735
68.1764935989614	49.7446309833805	66.2863	51.2705
68.1833158039348	49.5859035807532	69.1689	51.2673
68.1930942451262	49.3583976591495	70.0624	50.1219
68.2052855039828	49.074755565351	66.949	50.6855
68.2702927550588	47.5621560009956	70.4096	46.4113
68.2702926064997	47.5621547600991	70.6191	48.182
68.2417583474883	47.4565361097001	67.5609	49.631
68.144333504349	47.0959023519464	65.7303	47.3671
68.2000464556226	45.7091324348342	70.5497	45.0925
67.3215207666035	44.2872782274722	65.3289	43.5846
67.1742036027176	44.048852470035	67.4955	46.0347
66.7512356803719	43.3643011624052	64.4232	44.0581
66.6742196596582	40.3818128676973	64.8516	39.5774
66.65841743922	39.7698723908941	65.211	38.9167
66.6474049567961	39.3434149225194	64.2784	38.8059
67.1546789800091	38.3498409242031	66.9624	36.7077
67.3895705995926	37.8897678431766	66.7168	38.698
67.7072724150274	37.2674980748868	68.0366	38.8903
68.6894273751134	35.3437961531266	67.4673	33.2544
68.6953324031337	35.3322289848868	66.5887	34.1226
69.9745718708821	33.3387380208711	71.5231	31.8286
70.0884853600512	33.1612211829147	72.2401	34.2889
70.1068806815647	33.1170906358223	67.7055	32.9993
70.4515347342891	32.2902522470656	72.6191	32.6684
70.6242245574222	31.8759635542457	68.3701	31.308
71.5726290137689	29.6007212171149	73.7989	28.6287
70.7579400366431	29.3009921223055	69.5886	28.6002
70.2488912006368	29.113711456334	70.1037	27.3839
69.8674332799807	28.9733722274549	69.1853	30.9522
69.4565172556588	28.8221951108072	68.2062	28.5319
69.1408295160118	28.706052937133	68.3676	27.331
68.8930113995523	28.6148802140464	67.5765	27.7962
68.6972503069107	28.5428593826004	66.7818	30.0369
68.6619322995271	28.2127488216732	67.6588	29.7348
68.5925807564055	27.5645430806408	67.8857	28.9512
68.4579134169296	26.3059557294929	70.5469	25.0661
67.8062677213669	25.8542881342641	66.7482	27.6121
67.0454191629689	25.3269300529204	67.242	26.9141
64.9532511807886	23.8768073180803	62.5649	23.4331
64.9532495736605	23.8768061322824	63.8119	26.0212
63.7613434980234	22.5836407083036	61.643	23.6955
63.7027878162244	22.5201112811558	63.3795	20.1125
62.9088550793209	24.0536135998087	63.3607	23.5913
61.4773367602649	26.8186239112792	59.5552	26.5288
61.0904399941361	27.5659259434101	58.9981	26.6128
60.8497784135328	28.0307702605954	58.5931	27.1316

Solution x	Solution y	Original x	Original y
60.8309191721864	28.0962036167732	62.9268	27.0211
60.7681503594894	28.3140147457046	60.1802	30.671
60.7681482206396	28.3140221429993	63.132	27.7543
60.3795582149374	29.5713707421816	57.9508	29.6187
60.6445248330575	30.3235502689085	58.6228	31.6703
61.5147915553864	31.1090145212447	63.2951	31.2899
61.9217439432405	31.4763065307583	62.464	33.4003
62.1086251105735	31.64497431238	64.2717	31.7627
62.2046724255335	31.7316609722737	60.8351	33.4935
62.2950969025183	31.81327283095	64.1748	30.2745
62.3307526275975	31.8733816402288	61.5106	34.0654
62.3531978114462	31.9112201072521	60.463	30.4795
63.0835686015101	33.1425054842054	65.4552	32.6167
62.9746408654145	34.2387511162245	64.9829	35.6055
62.6899348384841	34.3850654040125	62.0243	36.102
62.492028692151	34.4867718845701	63.5739	32.9982
62.1893183116241	34.6423388709304	63.8645	34.3723
61.6439088850326	34.9226339892108	62.6603	37.129
61.4246427081614	35.0124175107099	63.453	34.6286
60.6707834321676	35.321099812956	60.9493	37.7343
59.5760182088716	35.1457420729891	58.4334	33.3219
59.319672007657	35.1046792400444	58.8785	37.4935
59.2413358934926	35.0882758524	61.1452	36.2851
59.0962430139822	35.0578936569773	61.1622	34.1592
58.4906748722822	34.9310877654306	60.137	35.2014
56.289928080561	34.4702512865801	54.3132	33.4794
56.1242046242892	34.4355490492758	58.126	35.24
55.5691558188928	34.3193219381471	56.2795	36.0371
54.4176222590182	34.0781897461946	53.8796	31.7093
53.6502367281701	34.665289037604	51.473	33.7115
53.6002217068932	34.7035537889529	55.9275	34.3566
52.3956527265644	35.6251298981962	53.589	37.6567
52.0956950663072	35.8546177515778	51.6292	37.4529
51.8764654444997	36.0223432506644	50.1654	34.298
51.494808780957	36.5132820818059	51.7623	34.8081
49.6655576241603	38.8663012986495	50.3352	41.2014
47.6520772705861	38.1280559969823	46.003	37.4534
47.1792469084398	37.9546920911619	48.325	36.101
46.2183138434037	37.6023647394453	45.4526	36.121
45.7144494353311	37.4176220475402	43.7884	36.8808
45.4953003456019	37.3372706932228	45.6407	35.658
45.2911431254013	37.2624161339388	44.3651	39.5082
44.7725929671184	37.0241114906231	45.4903	38.3462
43.7986908084924	36.5765451560317	44.7872	36.1398
42.2787671133361	35.8780484152838	40.9959	37.9409
41.6582178698307	35.3742332109914	42.8212	36.4305
37.8846961988912	32.3105608270677	35.5392	31.6783
38.4716732459684	32.2186417832158	37.4272	33.8061
43.9276057393467	31.3642645989368	44.6028	29.9319
45.2612223474322	31.155423669041	47.3356	31.1656
45.5387070834508	31.1119701986585	47.9603	31.0225
45.5439002189497	31.1111569127793	45.9581	33.5048
46.5499593172534	30.9199674022675	48.6326	32.1618
46.5536393677586	30.9192678993352	44.1303	30.8739
47.0219987392	30.8302557110632	47.4903	33.2139
48.2953295125731	30.5718837335771	49.5432	29.0024
48.6843118698549	30.4929590693294	50.3723	32.2399
48.6843125882834	30.4929567792373	51.0819	30.8837
48.6741249618931	30.4212144594554	50.8592	31.2824
48.5855423367335	29.7974474441698	47.5893	27.8934
48.5582971360947	29.6055875777853	46.4115	30.3033
48.5222405269851	29.3516794401536	46.9054	30.8841
48.3533043213844	28.1619535028196	50.1386	26.6573
48.3344984902954	28.0295218995066	45.985	27.4123
48.6568888396579	27.6096845800415	48.493	25.186
48.7464723519961	27.6984640197692	46.7677	27.4481
48.8696768966844	27.8205614612075	46.684	28.1154
49.156137747187	28.1044234273086	47.9812	30.2306
49.2556645973224	28.1275964676951	47.7428	26.438
49.5132374041461	28.1875671808385	47.4152	28.2569
51.0998148505197	28.556976031042	50.5738	30.8854
52.0481964892745	28.7777797878059	52.5136	31.162
53.0832380303348	28.0477146552174	54.8257	29.6059
53.2614209839306	27.9220312535746	54.5895	27.7676
53.4177438145651	27.8117671248623	55.1607	27.7715
53.5458112099041	27.7214332636608	55.089	27.0379
53.653754135513	27.6452944093313	55.4854	26.8201
53.7360639478227	27.5872361434839	54.7376	29.7596
54.5197066105123	27.0344741772434	56.8778	27.618
54.1381216989208	26.2857043938046	54.0368	23.8586

Solution x	Solution y	Original x	Original y
54.1381212224354	26.2857035191757	52.7074	28.2489
54.0992688210133	26.1798238699892	53.915	28.4629
53.2823370100807	23.9535547908279	50.8742	24.2729
53.3151213254391	23.5820202449845	53.2794	21.4994
53.3300116096979	23.4132727450356	54.6523	25.2022
53.381051316893	22.8348602972138	54.2786	24.4277
53.5954105533509	20.4055736451861	55.9782	19.9329
52.6245130700866	18.5391646861333	53.7123	16.59
52.5398553779992	18.3764214683629	53.9046	16.3668
52.4759385273159	18.3698794041445	52.0827	15.9727
52.1551617319322	18.5158979159247	52.4859	17.4578
51.7846032438594	18.6845771392241	51.6732	17.1776
51.3548446948494	18.8802043247428	52.1655	19.1446
50.8584727877906	19.1061539665443	51.539	18.7116
50.25259627709	19.3819501116772	49.3862	17.5735
49.6818360984478	19.6417615410927	49.9475	19.2284
49.0520006348388	19.9284641244456	49.9971	19.9155
48.2147738468621	20.3095713044599	49.1449	22.3659
47.4079663778178	20.676830010357	46.7163	23.0055
47.0755784871348	20.153861069663	47.2412	18.0641
46.9425086224314	19.9444947525001	49.1677	19.2175
45.8392598535177	18.2086811396316	46.6598	16.011
45.797767271007	18.1433989265934	44.3034	16.6265
45.764961690085	18.0917843184187	47.2642	16.1804
45.5091218622592	18.005390728199	45.9242	19.9
45.1419365161073	17.8813972975506	46.503	16.5426
44.5543281240867	17.6829699875454	45.9074	18.6439
42.3524998720915	16.9394308004484	40.2335	17.1357
42.1513188432381	16.8714946918516	40.715	18.8306
42.0710971481062	16.7617450292398	39.7266	17.3977
42.2512620288213	14.9916439690666	41.9974	13.5778
42.3221115029701	14.2955514370796	43.7175	13.3612
42.3672645214589	13.851926775622	44.7075	13.3055
42.3725625031142	13.7998787875946	40.2323	12.6508
42.6045526501954	13.6096513920889	44.2621	15.3855
43.4102613156085	12.7545823554976	43.7231	10.6871
43.5944910968144	12.5590650949381	42.7704	10.2739
45.4895110962027	12.7931218127519	47.1015	12.1757
46.1238018904953	12.871469112152	47.5448	13.9665
46.447521897252	12.9114546801268	47.4524	12.1509
46.7272039840054	12.9460007150534	48.0446	14.6778
46.8325418270733	12.9590121135696	46.213	15.3079
46.8325419073196	12.9590116935622	48.9393	11.7496
46.9834417751783	12.4530021193931	47.6091	10.2274
47.008689737268	12.3683361481901	45.8725	14.3747

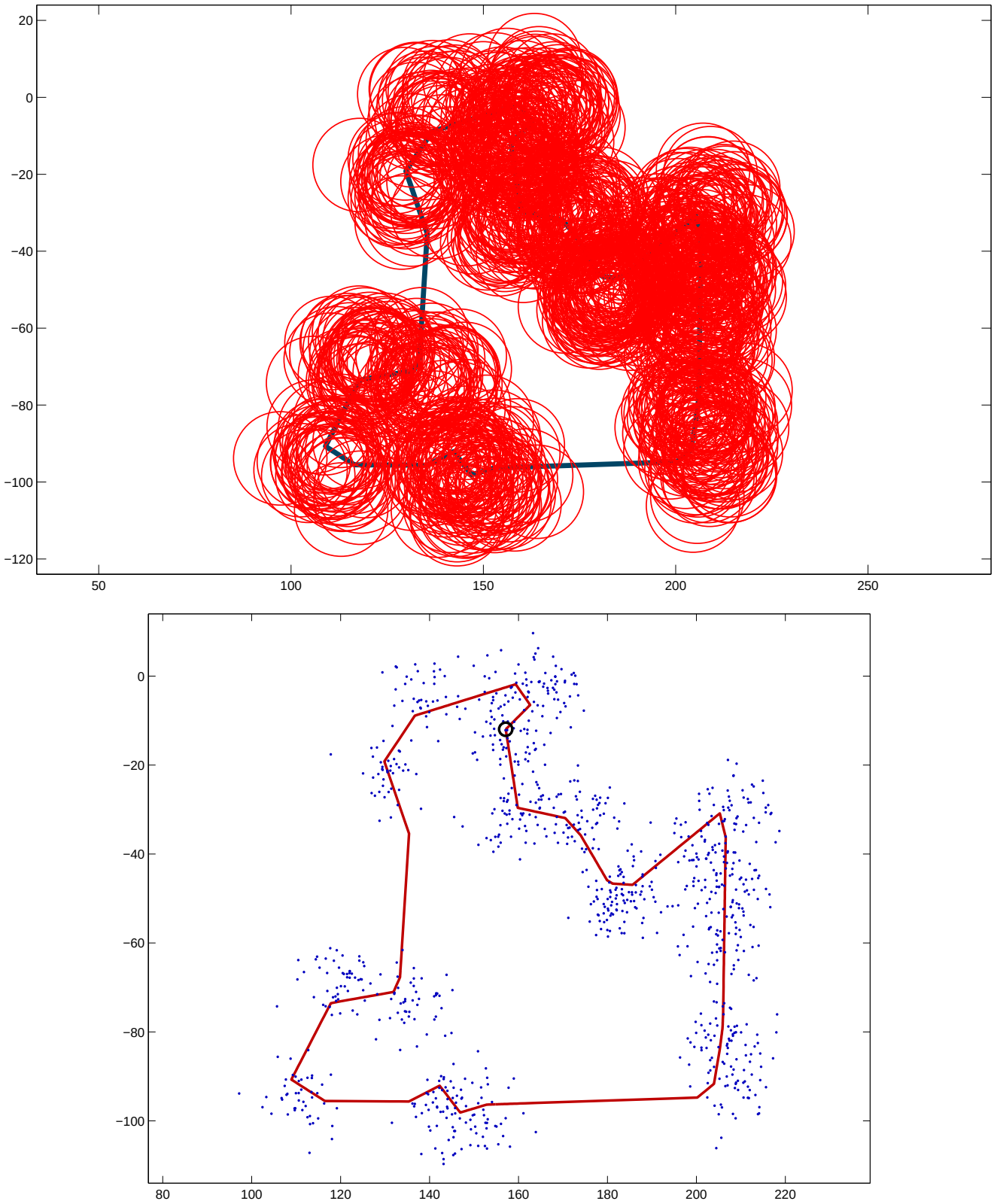


Figure N.27: $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Euclidean, Length = 376.0988198

Table N-30: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Euclidean

Total distance: 376.09881982013 Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
47.5189108700503	11.5766062399191	48.9393	11.7496
47.5189108700503	11.5766062399191	48.2378	10.888
47.8938011291787	11.202597547362	47.6091	10.2274
48.2664004414815	10.8308745025675	49.0558	10.279
48.6378840019715	10.4602646557861	50.5069	12.3029
48.6378840019715	10.4602646557861	51.32	11.9016
49.0127578131867	10.0862722901294	51.9742	12.9315
49.3878448644296	9.71206712275033	52.0306	12.0787
49.7652375386167	9.33556168915391	53.965	12.2967
49.7652375386167	9.33556168915391	52.3173	10.0275
50.1413951023764	8.96028826593673	55.3647	9.0137
50.1413951023764	8.96028826593673	58.6318	9.4344
50.4843035985368	8.61818605643311	59.4358	8.0877
50.796097814311	8.30712532182837	60.2628	6.0605
51.0702112152411	8.03365716927317	53.1154	7.9184
51.0702112152411	8.03365716927317	51.2901	7.6487
51.3485956158538	7.75592782282773	55.8132	15.4408
51.636430096753	7.46877038533356	57.2331	12.7874
51.9269768969268	7.17890689088223	58.0725	5.2013
51.9269768969268	7.17890689088223	58.8992	5.3006
52.1950659781066	6.91144839050985	61.565	4.5717
52.1950659781066	6.91144839050985	63.4243	4.3429
52.3417236886667	6.76513639270195	60.4167	1.4088
52.3417236886667	6.76513639270195	60.4719	1.0667
52.469649946695	6.63751181320331	61.9524	-0.333
52.5450168300274	6.56232282747817	58.3955	-2.2935
52.5450168300274	6.56232282747817	57.7878	-4.3732
52.5513267345738	6.55602774953849	58.2864	0.0731
52.5513267345738	6.55602774953849	56.047	-0.6998
52.5575887793819	6.54978043435598	57.3839	0.9502
52.5575887793819	6.54978043435598	58.2741	0.1622
52.5638146559971	6.54356920621651	58.5415	3.6684
52.5638146559971	6.54356920621651	58.0726	3.0503
52.5700197089158	6.53737875265831	57.7618	2.6586
52.5700197089158	6.53737875265831	58.2987	1.8222
52.5762151085305	6.5311979293231	58.6741	1.1796
52.5823771476867	6.5250503832801	56.6752	3.9284
52.5823771476867	6.5250503832801	56.6229	3.2945
52.5885440374095	6.5188980018842	55.7669	1.6852
52.5885440374095	6.5188980018842	54.7597	1.1902
52.5947435385086	6.51271308920026	52.8937	1.339
52.6009482750599	6.50652295476348	52.3291	3.6705
52.6071855237769	6.50030038718383	53.4617	5.8056
52.613447844467	6.49405280517351	64.6914	7.7788
52.58960767104	6.45723072706767	52.0607	4.6851
52.5658038235464	6.42046472357731	52.2056	3.4977
52.5658038235464	6.42046472357731	51.8363	2.0767
52.5424098169366	6.38433159457507	54.6465	1.327
52.5424098169366	6.38433159457507	54.5841	1.3
52.5193482651145	6.34871183189502	56.514	2.6652
52.5193482651145	6.34871183189502	55.5686	2.3786
52.496417435671	6.31329393284337	61.7542	11.527
52.4722386306076	6.27594880495889	54.3108	6.5803
52.4722386306076	6.27594880495889	55.5508	6.709
52.447949621024	6.23843354177201	62.7821	-0.0838
52.4205907656282	6.19617610764503	62.5325	1.766
52.4205907656282	6.19617610764503	63.0749	1.8033
52.3905925339362	6.14984251371928	60.5785	6.8128
52.3603909417822	6.10319500335619	62.4332	-0.684
51.9261721303392	5.48368919370365	59.6709	-1.5476
51.5089985333551	4.88850133382942	53.5826	-3.7128
51.1317748725562	4.35030878660815	50.2911	5.2466
51.1317748725562	4.35030878660815	49.309	3.6922
50.7585770774536	3.81786016255699	50.9668	1.717
50.392376576109	3.29539442791274	51.7765	0.7553
50.0304186186648	2.77898134688285	51.545	-0.7619
50.0304186186648	2.77898134688285	50.0191	-2.6033
49.6927106275794	2.2971649368993	49.5265	1.5006
49.6927106275794	2.2971649368993	49.2438	-0.5725
49.3656065239889	1.83047667082588	53.289	-9.6645
49.0004065662461	1.94410229684145	53.8048	-5.0553
49.0004065662461	1.94410229684145	54.4331	-6.2551
48.5542340022867	2.08292120304969	48.4975	2.4432
48.1073697142659	2.22195535737004	47.0712	4.3382
48.1073697142659	2.22195535737004	48.302	2.6164
47.6716835127104	2.35751162272737	47.7278	5.7114
47.6716835127104	2.35751162272737	48.7027	4.8736
47.2409193790619	2.49153646696271	46.8369	6.4403
46.8134219967135	2.62454493135546	45.5397	7.2979
46.8134219967135	2.62454493135546	46.0043	6.8606
46.4044426444291	2.75179180777721	46.5714	10.174
46.4044426444291	2.75179180777721	46.3909	8.819
46.0096032283156	2.87463928284043	44.5228	11.8645
46.0096032283156	2.87463928284043	43.7231	10.6871
45.6534004573665	2.98546559855653	40.2323	12.6508
45.6534004573665	2.98546559855653	42.7704	10.2739
45.3809919244129	3.07022073123635	44.5689	9.75
45.3809919244129	3.07022073123635	43.984	9.2005
45.1200856698428	3.15139710074321	43.7681	7.8375
44.861924744195	3.23171930817748	44.0031	6.0986
44.861924744195	3.23171930817748	44.3097	5.4051
44.6080367738525	3.31071204974074	44.2937	4.7268
44.6080367738525	3.31071204974074	45.0418	3.8658
44.3487284693719	3.39139124985276	33.4349	0.0139
44.3487284693719	3.39139124985276	53.412	-4.2453
43.1645875377353	3.75981658329701	43.4311	0.4843
43.1645875377353	3.75981658329701	44.8479	-0.9391
41.8415471088202	4.17145814254153	42.4139	3.5597
41.8415471088202	4.17145814254153	42.4155	0.0668
40.412992219077	4.61592866199467	36.2059	6.8965
40.412992219077	4.61592866199467	36.4235	4.5159
40.412992219077	4.61592866199467	39.9467	-2.3317
40.412992219077	4.61592866199467	32.3564	-1.4633
40.412992219077	4.61592866199467	43.0131	-4.6452
40.412992219077	4.61592866199467	31.1128	-2.8096
40.412992219077	4.61592866199467	36.4279	-4.3699
40.412992219077	4.61592866199467	46.0937	-5.8176
39.2631579761515	4.9736786547861	41.1669	5.3004
38.0696013564599	5.34503225514385	33.6792	4.7017
36.972307808129	5.68643523827065	33.7832	8.5886
35.9444043667333	6.00624872708333	36.7928	9.6586
35.9444043667333	6.00624872708333	38.0686	7.3443
34.8929462375854	6.33339088723882	31.9656	14.6164
34.8929462375854	6.33339088723882	29.4417	11.4808
34.1094394285798	6.57716461142303	29.2451	9.0499
34.1094394285798	6.57716461142303	29.9497	8.0977
33.4319442576383	6.78795464259726	28.0443	7.2557
32.7964058966432	6.98569056612029	26.246	7.8923
32.7964058966432	6.98569056612029	27.9452	7.0873
32.2486068745464	7.15612794516421	27.2842	5.8331
32.2486068745464	7.15612794516421	27.6562	5.4902
31.7464389467931	7.31236802834444	28.1449	5.3771
31.7464389467931	7.31236802834444	26.4488	5.1021
31.2791916197361	7.4577431974066	29.6205	6.6839
31.2791916197361	7.4577431974066	29.2732	5.6917
30.8215103984514	7.60014205510784	31.7997	5.4917
30.8215103984514	7.60014205510784	30.7839	5.7178
30.3532859240792	7.74582128077493	31.0707	1.7474
30.3532859240792	7.74582128077493	31.1391	0.2266
29.8495406024181	7.90255221838602	31.0065	-1.0714
29.8495406024181	7.90255221838602	27.3755	-1.0984
29.3031787079587	8.07254254991647	28.6989	1.5656
28.7460086807161	8.24589566780539	25.8989	0.7413
28.1901562569776	8.41883883779942	24.5208	1.7631
28.1901562569776	8.41883883779942	24.8641	0.1355
27.6531301887873	8.5859244870686	26.7943	-2.6353
27.6531301887873	8.5859244870686	22.6294	-1.9579
27.1279651476787	8.74931946390711	22.4229	-2.1641
26.6953504966394	8.88391876489323	19.4163	-0.8394
25.7450503675038	10.311851654124	23.9142	5.5856
25.7450503675038	10.311851654124	22.4003	2.9895
24.5016513745352	12.180198495409	22.0744	6.6433
23.0788062899503	14.3181832008145	25.9081	14.4892
23.0788062899503	14.3181832008145	21.6596	11.213
21.4811773261305	16.7188002609381	19.6468	14.5775
19.8486452969242	19.1718631170841	7.8039	17.6061
21.1708816211284	23.049083136847	28.099	29.8348
21.1708816211284	23.049083136847	21.3113	31.7798
21.1708816211284	23.049083136847	22.8581	29.0039
21.1708816211284	23.049083136847	18.7531	32.536
21.1708816211284	23.049083136847	23.1689	25.59
21.1708816211284	23.049083136847	27.0312	22.0371
21.1708816211284	23.049083136847	19.8821	27.2321
21.1708816211284	23.049083136847	20.8129	26.0745

Solution x	Solution y	Original x	Original y
21.1708816211284	23.049083136847	21.4132	25.3225
21.1708816211284	23.049083136847	25.2224	21.1268
21.1708816211284	23.049083136847	24.0847	21.2619
21.1708816211284	23.049083136847	18.7218	26.0511
21.1708816211284	23.049083136847	17.7323	26.9057
21.1708816211284	23.049083136847	19.5225	24.6717
21.1708816211284	23.049083136847	24.5729	19.8583
21.1708816211284	23.049083136847	21.7951	21.835
21.1708816211284	23.049083136847	23.1615	20.5337
21.1708816211284	23.049083136847	16.9754	26.2994
21.1708816211284	23.049083136847	19.6457	23.2311
21.1708816211284	23.049083136847	21.1889	21.267
21.1708816211284	23.049083136847	20.5322	21.5891
21.1708816211284	23.049083136847	22.5923	19.795
21.1708816211284	23.049083136847	20.5046	21.2685
21.1708816211284	23.049083136847	21.2889	20.2133
21.1708816211284	23.049083136847	18.4916	22.031
21.1708816211284	23.049083136847	19.4476	21.0876
21.1708816211284	23.049083136847	22.0389	18.6688
21.1708816211284	23.049083136847	19.3676	20.9011
21.1708816211284	23.049083136847	17.3215	22.815
21.1708816211284	23.049083136847	19.4151	20.4264
21.1708816211284	23.049083136847	20.7311	19.0512
21.1708816211284	23.049083136847	23.3217	16.9506
21.1708816211284	23.049083136847	23.1228	16.7524
21.1708816211284	23.049083136847	19.0397	19.3917
21.1708816211284	23.049083136847	15.0509	21.8739
21.1708816211284	23.049083136847	17.2669	18.1061
21.1708816211284	23.049083136847	18.1963	16.0602
21.1708816211284	23.049083136847	16.9397	16.157
24.4811510030888	32.7558563348964	35.5392	31.6783
25.3882379744289	35.4157262711154	37.4272	33.8061
23.9483521210717	58.3022606236355	23.9369	61.5866
23.9483521210717	58.3022606236355	18.9682	67.082
23.7819224761632	60.9476079081469	26.4833	65.6457
23.7819224761632	60.9476079081469	22.6268	64.3936
23.6519641234426	63.0132466982012	22.8228	67.5784
23.6519641234426	63.0132466982012	22.9431	70.0987
23.5595343639284	64.4823779713991	22.1344	71.2137
23.5595343639284	64.4823779713991	22.0857	71.4539
23.4928217416973	65.5427439628055	21.3934	72.6127
23.4928217416973	65.5427439628055	22.8762	75.7017
23.4522053608372	66.1883208484167	24.3218	77.9732
23.4522053608372	66.1883208484167	21.1184	76.9048
23.4411274876711	66.3643976402135	25.3366	76.538
23.4411274876711	66.3643976402135	23.796	77.2181
23.4321245664136	66.5074941615171	26.6151	77.1467
23.4241451240207	66.6343230383192	25.4767	75.481
23.4241451240207	66.6343230383192	24.7401	75.4523
23.4167027442202	66.7526155732921	23.527	73.6169
23.4167027442202	66.7526155732921	24.4797	75.354
23.4095883220029	66.8656953989419	24.1578	73.3792
23.4025586016662	66.9774289339735	24.5354	72.6275
23.4025586016662	66.9774289339735	24.5076	73.115
23.3956900100287	67.0866014141525	26.2205	72.9044
23.3956900100287	67.0866014141525	27.2709	73.9256
23.389015972548	67.1926815256482	27.6433	72.5657
23.3823958348528	67.2979049093024	26.4587	69.6793
23.3823958348528	67.2979049093024	26.9783	71.0141
23.3758204888739	67.4024163533716	25.7737	68.9159
23.3692214265869	67.5073047665219	28.241	67.9653
23.3692214265869	67.5073047665219	26.4747	67.9787
23.3625735044619	67.612969792686	33.839	67.1668
23.3558207036085	67.7203017721992	35.1535	70.6086
23.1226899506373	68.2460782409271	31.7515	71.3679
22.884342342796	68.7836201592158	31.4906	71.3219
22.884342342796	68.7836201592158	31.4455	71.7336
22.6341693646565	69.347831580167	32.2488	71.8762
22.6341693646565	69.347831580167	31.0449	71.9995
22.3633705047594	69.9585601119835	32.697	74.6737
22.3633705047594	69.9585601119835	31.4187	76.5703
22.115950752058	70.5165629134556	31.105	77.2121
21.8933587810306	71.018572414514	29.376	80.5861
20.2762549957915	71.3028214589229	17.9606	81.6588
19.2455005813789	71.484004693676	18.7356	77.2891
18.2629207949445	71.6567200202911	13.7649	76.0563
18.2629207949445	71.6567200202911	12.73	75.2001
17.4825597252824	71.793890103903	18.2654	71.5277
17.4825597252824	71.793890103903	15.4332	72.9689
16.7266189635775	71.9267676880092	16.7224	69.1113

Solution x	Solution y	Original x	Original y
15.9681330543591	72.0600926297138	15.0856	70.6386
15.9681330543591	72.0600926297138	13.2613	67.7948
15.2406201859726	72.187973218469	14.0233	68.3418
14.5180726903669	72.3149809893833	14.7433	68.1941
14.5180726903669	72.3149809893833	14.5018	68.1646
13.7814230153268	72.4444675687599	15.3124	65.205
13.7814230153268	72.4444675687599	14.2239	63.9607
12.9675074661261	72.5875355887624	15.1112	64.361
12.074919676736	72.7444322554593	14.2076	63.0144
12.074919676736	72.7444322554593	10.4334	62.822
11.0215222427647	72.9295952200008	9.1569	61.6426
9.94263606765193	73.1192382125829	7.6803	61.1857
9.19754106698326	73.2708388618405	6.6701	63.5082
8.4574765144641	73.4214165575248	4.7342	63.0935
8.4574765144641	73.4214165575248	4.4426	63.6871
7.80509099883343	73.5541531181025	0.4838	63.8626
7.73020467623289	73.6988531549706	0.3096	68.1954
7.65594438766125	73.842343552411	1.7661	66.5446
7.58083434061618	73.9874759172267	6.9842	66.7632
7.58083434061618	73.9874759172267	5.2812	65.5492
7.50220387686234	74.1394106611191	9.6606	65.5604
7.50220387686234	74.1394106611191	8.4928	63.9998
7.41288357306402	74.3120009864208	10.7344	66.9849
7.41288357306402	74.3120009864208	10.5042	66.7806
7.31598769244778	74.4992293145429	12.0444	66.3239
7.31598769244778	74.4992293145429	11.4442	66.9869
7.20577605375996	74.7121871815807	12.0877	66.3858
7.08462686825314	74.9462792591524	12.5389	66.9051
7.08462686825314	74.9462792591524	12.0097	66.7734
6.93504844013306	75.235304092448	12.0587	67.8257
6.93504844013306	75.235304092448	11.4886	67.7219
6.75417039157654	75.5848079971892	11.6475	70.8021
6.75417039157654	75.5848079971892	10.9416	69.7746
6.55125499747703	75.9768938230817	10.0835	69.723
6.55125499747703	75.9768938230817	9.1707	70.0865
6.32036128779838	76.4230410853838	8.3117	72.2049
6.32036128779838	76.4230410853838	7.0214	70.8048
6.06860264276312	76.9095048767983	9.3844	71.5303
6.06860264276312	76.9095048767983	8.8648	72.0358
5.78254514158233	77.4622430416746	9.4578	72.6847
5.47490177957806	78.0566907317579	9.0002	73.0359
5.47490177957806	78.0566907317579	7.5677	74.3816
5.12475146404107	78.7332729750486	9.9143	75.8382
4.74924962716167	79.4588409681735	8.0472	76.1743
4.74924962716167	79.4588409681735	6.6564	74.2265
4.30970527383329	80.3081557980412	6.0914	73.9114
4.30970527383329	80.3081557980412	4.0089	72.186
3.68450413281074	81.5162077553927	-4.2807	74.2616
2.85639470111859	83.116330794156	-4.1255	85.596
2.16625685422554	84.4498571469666	2.7376	84.0979
2.16625685422554	84.4498571469666	-1.2335	86.0108
1.49938894161187	85.7384199712166	-0.1009	90.0487
1.49938894161187	85.7384199712166	-0.7351	89.6931
0.937379799385795	86.8243684624677	-2.3037	90.7079
0.422644197901477	87.8189721976771	-2.5612	92.1356
-0.049526201862875	88.7313288969053	-1.9602	93.9224
-0.049526201862875	88.7313288969053	-2.1508	94.1499
-0.446421848571674	89.4982351834179	-3.2639	94.8889
-0.810218346167076	90.2011852919169	-6.6860	94.6391
-0.810218346167076	90.2011852919169	-7.5489	96.9207
-1.07294885846582	90.7088495716022	-12.8049	93.8535
-0.633605463935567	90.9901175215902	-5.5457	98.4014
-0.18990775420923	91.2741732046845	-3.1358	95.2162
-0.18990775420923	91.2741732046845	-1.8619	98.5581
0.247534709267995	91.5542242836567	-0.339	97.1979
0.247534709267995	91.5542242836567	-0.3116	97.6012
0.666252664032328	91.8222878198301	0.6138	95.4238
0.666252664032328	91.8222878198301	-0.171	97.1566
1.07346595227635	92.0829859829016	2.1469	96.6722
1.07346595227635	92.0829859829016	1.4019	97.5847
1.45972260944382	92.3302675818342	3.5924	94.7451
1.45972260944382	92.3302675818342	1.6453	95.7178
1.83389652250294	92.5698137492322	0.5802	93.7511
1.83389652250294	92.5698137492322	-0.0468	93.7668
2.21583327718983	92.814329731828	0.6193	91.0377
2.21583327718983	92.814329731828	1.1743	92.9818
2.61249149007176	93.0682704942315	1.2023	90.7259
3.01992536497652	93.3291099087342	3.5503	90.3653
3.01992536497652	93.3291099087342	2.5704	90.3092
3.4453008461054	93.6014356954952	3.5998	89.8159

Solution x	Solution y	Original x	Original y
3.88086605152502	93.8802850248405	7.8142	89.6258
3.88086605152502	93.8802850248405	5.8502	91.8647
4.31589575426119	94.158791576497	4.7737	93.7785
4.31589575426119	94.158791576497	3.4538	93.5151
4.7604283377141	94.4433819339167	9.17	97.1621
4.7604283377141	94.4433819339167	6.3198	96.0864
5.18267321580076	94.7137035753757	4.9579	99.4405
5.60052043084281	94.9812097958194	3.1184	98.924
5.60052043084281	94.9812097958194	2.5533	99.1767
6.02962965586694	95.2559259847041	3.8110	100.5395
6.02962965586694	95.2559259847041	3.1448	100.72
6.46145366073375	95.5323801200451	3.0162	107.1796
10.7922178785702	95.5572693965692	8.1477	101.1634
10.7922178785702	95.5572693965692	8.0611	104.093
21.1372494534657	95.6167206683014	23.4089	84.0628
23.1683604520829	95.6283921062522	21.5395	100.4343
25.3495357180044	95.6409260354224	28.1717	107.4546
29.1328497180035	93.6965460329168	27.1736	83.2653
31.6777210910711	92.3886444459003	33.517	80.8699
32.2698518277131	92.0843256427123	34.9317	80.2335
32.8479338822888	92.8382052288148	26.6904	96.1713
32.8479338822888	92.8382052288148	26.1674	96.1159
33.4791716276862	93.661404436986	26.55	96.735
33.4791716276862	93.661404436986	28.2891	98.27
34.1574782065668	94.5459851199088	26.9511	99.1097
34.8724961260879	95.4784401598541	29.8552	101.3038
34.8724961260879	95.4784401598541	30.1816	102.1772
35.5432208325188	96.3531326286491	29.1897	96.4145
36.2904735176537	97.327623286768	31.3011	106.2109
36.9018519214256	98.1249230042791	33.1638	109.6815
37.0328057813361	98.0857092007965	32.8361	107.2479
37.1685234099431	98.0450688798453	35.3466	107.7036
37.1685234099431	98.0450688798453	33.1686	108.6172
37.3218141543493	97.9991663117785	37.1983	106.347
37.3218141543493	97.9991663117785	35.7224	107.36
37.4775761015793	97.952523780482	35.4006	103.6799
37.4775761015793	97.952523780482	34.3074	104.3145
37.6358176868773	97.9051387689478	29.7849	97.5299
37.6358176868773	97.9051387689478	31.6341	101.1443
37.8015825043777	97.8555009469519	31.7064	96.988
37.8015825043777	97.8555009469519	32.4952	97.9758
37.9724577242023	97.8043328316722	31.6916	96.8159
38.1461504091167	97.7523210367399	31.4281	94.9219
38.1461504091167	97.7523210367399	30.7482	95.8761
38.3285806795376	97.6976927786292	30.8807	93.5109
38.5163171211557	97.6414755926428	29.7064	94.0211
38.7143276535654	97.582181838477	29.5221	90.7635
38.7143276535654	97.582181838477	29.3468	93.7461
39.008504033058	97.4940910018933	32.1756	91.0244
39.008504033058	97.4940910018933	32.2034	92.5655
39.3369270973136	97.3957448850876	33.6244	92.4492
39.3369270973136	97.3957448850876	32.8593	93.0881
39.6942433627137	97.2887466020057	35.4152	92.5489
39.6942433627137	97.2887466020057	34.0163	93.2553
40.0747318685432	97.1748093133967	34.7819	91.1147
40.4715988162422	97.0559674341966	33.2241	90.2072
40.4715988162422	97.0559674341966	33.1881	90.5996
40.9982953655862	96.8982469039614	32.6009	89.9531
41.766984162845	96.6680580722622	35.4073	87.2216
42.8551012810648	96.342209023371	40.8939	84.3555
42.9445224098907	96.3392204779194	42.6808	88.2098
43.0335317163095	96.3362456942346	37.9917	90.5379
43.0335317163095	96.3362456942346	39.6285	91.4521
43.1237585398354	96.3332302181048	37.0706	93.0168
43.2148205122973	96.3301868298488	37.3296	94.7968
43.2148205122973	96.3301868298488	37.1788	95.0118
43.30801699074	96.3270721011868	36.1694	94.3523
43.4025830850202	96.3239115980763	35.2297	94.8683
43.4025830850202	96.3239115980763	34.0458	95.0903
43.5028126266634	96.3205618161056	35.9551	95.9225
43.5028126266634	96.3205618161056	35.7481	97.1257
43.6073778560361	96.3170671296163	33.9629	96.8355
43.7162797419979	96.3134275077863	34.0464	97.1856
43.7162797419979	96.3134275077863	33.0573	97.9271
43.8398406840738	96.3092979657726	35.7859	98.3251
43.8398406840738	96.3092979657726	35.0473	98.5367
43.9724006424004	96.3048676673556	33.8351	99.3235
44.1158847721828	96.3000722731882	35.2228	101.4244
44.1158847721828	96.3000722731882	35.5571	102.295
44.2817396547493	96.2945292279024	35.7306	102.2767

Solution x	Solution y	Original x	Original y
44.4610968643074	96.288534924404	36.8108	99.4487
44.4610968643074	96.288534924404	38.189	100.3805
44.6534407911244	96.2821065945326	38.2186	96.6747
44.6534407911244	96.2821065945326	39.7333	98.7582
44.8546238495182	96.2753828566395	40.065	98.6098
44.8546238495182	96.2753828566395	39.196	99.7694
45.0649540540851	96.268353416703	40.2693	101.3043
45.0649540540851	96.268353416703	39.3246	101.8921
45.2881813248025	96.2608929494887	40.5226	102.8002
45.2881813248025	96.2608929494887	42.0156	103.5929
45.524343292058	96.2530001952694	39.1965	105.4524
45.7970996353185	96.2438844502137	42.4716	105.6496
45.7970996353185	96.2438844502137	40.9527	105.6227
46.1085118967414	96.2334768174066	45.465	105.2608
46.1085118967414	96.2334768174066	42.9285	106.2179
46.4430330973765	96.2222968821435	46.5537	103.4177
46.77701940167	96.2111348245881	47.126	99.3914
46.77701940167	96.2111348245881	46.0729	100.678
47.1117199402982	96.1999488979235	44.7902	101.1589
47.1117199402982	96.1999488979235	45.0704	101.2748
47.4571753734606	96.1884035349458	42.8352	101.6931
47.8154361974549	96.1764302075186	42.5793	100.4271
48.1893675688984	96.1639331588762	43.0828	99.6317
48.1893675688984	96.1639331588762	42.9226	100.4615
48.6005108896893	96.150192456946	44.0393	95.7757
48.6005108896893	96.150192456946	42.2565	98.7398
49.0589076610237	96.1348725170063	40.9431	96.0349
49.0589076610237	96.1348725170063	42.0978	97.503
49.618021329054	96.11618659108	41.599	92.4813
49.618021329054	96.11618659108	41.6896	94.8028
50.3643194647924	96.0912449799581	42.9721	90.3177
50.3643194647924	96.0912449799581	43.1057	91.7939
51.4627521207216	96.054535209407	48.9533	90.4759
51.4627521207216	96.054535209407	47.7789	92.5461
52.6987491352638	96.0132282110847	51.1106	98.2963
53.9619252092761	95.9710128464833	53.9006	102.5381
53.9619252092761	95.9710128464833	48.0764	105.8084
83.3167075450555	94.9899514711807	86.3374	85.7586
83.3167075450555	94.9899514711807	88.6062	92.2681
90.1936388035519	94.7601353905378	94.4828	106.1237
90.6944169350389	94.3481499446149	98.8373	99.4165
90.6944169350389	94.3481499446149	95.6122	103.8055
91.2748315958401	93.8706436380015	92.4623	94.734
91.2748315958401	93.8706436380015	94.0924	96.5838
91.8441430705301	93.4022724444698	95.504	96.351
91.8441430705301	93.4022724444698	95.7576	96.9635
92.4020655418574	92.9432710931805	95.0373	98.5247
92.4020655418574	92.9432710931805	98.2349	98.4363
92.9551174883384	92.4882767396643	104.1728	96.9352
93.0118959859527	92.4415660259567	92.5654	91.5305
93.0118959859527	92.4415660259567	95.2026	90.5293
93.0677909193841	92.3955822035326	93.1284	88.6615
93.0677909193841	92.3955822035326	92.7178	89.1801
93.1233243467152	92.3498957900519	88.3633	87.3681
93.1788491657113	92.3042164524608	89.5631	83.3752
93.2340500782354	92.258803590979	88.0687	81.4777
93.2340500782354	92.258803590979	88.6759	82.3658
93.2831836929663	92.2183821750004	92.1151	81.2598
93.2831836929663	92.2183821750004	92.6699	80.64
93.3281522382873	92.1813873104461	93.4941	85.8189
93.37285305329	92.1446127164117	93.2494	81.8793
93.37285305329	92.1446127164117	92.288	83.6157
93.4163856194108	92.1087992347448	91.14	83.5499
93.4163856194108	92.1087992347448	91.1677	84.1211
93.4595230120942	92.0733108742129	95.9325	86.7596
93.4595230120942	92.0733108742129	96.2545	87.1498
93.5022740224294	92.0381403901087	96.8345	90.0197
93.5448303677876	92.0031300607802	97.7943	87.7833
93.5448303677876	92.0031300607802	98.3726	88.4744
93.5867994169535	91.968602888069	98.1138	89.594
93.5867994169535	91.968602888069	99.3434	90.9979
93.6283132510658	91.9344502132698	100.5649	91.4192
93.6283132510658	91.9344502132698	100.8882	91.1406
93.6692335121882	91.9007858571992	100.7126	88.5952
93.7098489454219	91.8673722844998	101.8123	94.891
93.7098489454219	91.8673722844998	103.2876	94.1817
93.7493125234053	91.8349063076213	102.4507	89.6037
93.788511028465	91.8026584085254	98.9319	91.3958
93.788511028465	91.8026584085254	98.853	91.6792
93.8272474436335	91.7707906553955	97.0347	92.0258

Solution x	Solution y	Original x	Original y
93.8272474436335	91.7707906553955	98.656	92.6213
93.8659910430409	91.7389169833603	96.5235	92.1962
93.9050413882509	91.7067909579139	93.0994	86.3608
93.9050413882509	91.7067909579139	93.9684	87.8762
93.9441080008749	91.6746515423504	89.95	80.2132
93.9441080008749	91.6746515423504	91.86	79.7087
93.9441081181688	91.6746514556706	103.8628	98.4843
93.9441082371201	91.6746513680227	101.602	92.3175
93.9441082371201	91.6746513680227	102.0076	93.075
93.9441083556231	91.674651280029	104.1034	98.3317
94.1053100674617	90.7287362235008	99.3782	93.0601
94.1053100674617	90.7287362235008	100.6204	94.7646
94.2846439821986	89.6764252389092	101.583	94.8217
94.4823823550205	88.5161205463583	105.6506	92.4297
94.8203979006464	86.5327103531803	104.3693	90.8389
95.2263362222379	84.1507526667938	107.2392	85.9448
95.2674002246056	83.8309119853411	102.0461	86.7072
95.2674002246056	83.8309119853411	104.5599	87.8351
95.3108222748946	83.492704410231	104.3617	84.8664
95.3531808082712	83.1627814903448	103.1106	83.2736
95.3531808082712	83.1627814903448	102.2936	85.0217
95.3949073303645	82.8377812963295	103.6911	80.62
95.3949073303645	82.8377812963295	103.8313	82.5056
95.4342723726856	82.5311748401726	101.0606	82.9382
95.4730675424771	82.2290076044207	99.0152	86.155
95.4730675424771	82.2290076044207	101.1477	85.2681
95.5131993069801	81.9164293212827	96.9343	84.943
95.5535460624345	81.602176862654	94.0795	80.8773
95.5535460624345	81.602176862654	97.7624	79.6432
95.5934270748899	81.2915517069829	98.2007	80.5294
95.6325202116537	80.9870637154992	94.9909	83.4209
95.6325202116537	80.9870637154992	96.8706	83.0827
95.6728517572867	80.6729293748969	96.9541	82.6989
95.7129124034317	80.3609054412448	97.8831	81.9659
95.7129124034317	80.3609054412448	97.0865	83.6094
95.7538632453288	80.0419475109786	97.3132	81.5365
95.7538632453288	80.0419475109786	97.4314	81.946
95.7951717090668	79.7202041201887	98.567	80.2017
95.7951717090668	79.7202041201887	98.9119	80.0767
95.8361683582728	79.4008895523984	98.2345	80.86
95.8361683582728	79.4008895523984	100.0565	80.1054
95.8776145164835	79.0780736332917	107.981	80.0957
95.8925866599786	78.704595529542	98.5933	78.8152
95.9075832320521	78.3305097290824	99.1261	78.6323
95.9225245455147	77.9578012022467	97.816	74.8015
95.9225245455147	77.9578012022467	97.1852	78.7831
95.937226315742	77.5910691725631	101.2985	78.2917
95.9517822018717	77.2279716333213	93.1133	78.1389
95.9517822018717	77.2279716333213	94.6945	78.572
95.9664694242991	76.861600641598	89.835	77.746
95.9664694242991	76.861600641598	91.1291	78.4897
95.9816114701849	76.4838885286488	91.0116	75.887
95.9964489540054	76.1137706987027	94.4072	76.9857
95.9964489540054	76.1137706987027	96.1169	76.0362
96.0115461701229	75.7371798045193	108.1531	76.0691
96.0324755630538	74.3031485441037	95.9481	74.251
96.0324755630538	74.3031485441037	97.5653	74.5618
96.0536706864285	72.8509499128325	96.2521	73.5638
96.07481118942	71.4024708175471	93.9524	73.145
96.07481118942	71.4024708175471	94.549	73.3405
96.097439122259	69.8521324371701	93.0933	68.7697
96.1192727674257	68.3561974065832	92.0851	66.8651
96.1403154174409	66.9144541129001	88.7937	67.447
96.1614984964175	65.4630861729734	85.8477	60.7859
96.1614984964175	65.4630861729734	86.2321	62.729
96.1725517095274	64.7056484725197	88.0225	60.7529
96.1725517095274	64.7056484725197	90.2672	64.2791
96.1824375852393	64.0281883757526	92.749	64.7326
96.1824375852393	64.0281883757526	93.9444	64.9
96.1923173086646	63.3511487104319	94.6798	69.1984
96.1923173086646	63.3511487104319	97.9014	66.9835
96.2036004204805	62.577956461452	98.4258	65.8894
96.2150280112251	61.794857350486	96.4356	62.0951
96.2150280112251	61.794857350486	98.4228	65.0226
96.2270505865478	60.9710012275371	94.6788	63.8911
96.2270505865478	60.9710012275371	95.4724	61.7777
96.2396487612147	60.1077112571501	93.5538	62.1822
96.2396487612147	60.1077112571501	94.5987	62.0376
96.2529021845894	59.1995329287572	95.1558	61.2395
96.2529021845894	59.1995329287572	95.479	61.1306

Solution x	Solution y	Original x	Original y
96.2665061104272	58.2673188383902	92.8209	56.9207
96.2665061104272	58.2673188383902	94.4551	58.0456
96.2665061104272	58.2673188383902	95.0304	53.2116
96.2665061104272	58.2673188383902	94.6877	57.1733
96.2665061104272	58.2673188383902	94.8477	58.3247
96.2665061104272	58.2673188383902	94.6583	60.3511
96.2665061104272	58.2673188383902	95.4289	57.3916
96.2665061104272	58.2673188383902	96.0562	52.3857
96.2665061104272	58.2673188383902	95.9041	59.3009
96.2665061104272	58.2673188383902	96.8097	54.0588
96.2665061104272	58.2673188383902	97.7133	51.9341
96.2665061104272	58.2673188383902	97.7455	51.8526
96.2665061104272	58.2673188383902	97.3108	57.82
96.2665061104272	58.2673188383902	97.9579	54.2407
96.2665061104272	58.2673188383902	98.2152	53.7701
96.2665061104272	58.2673188383902	98.7715	55.3698
96.2665061104272	58.2673188383902	98.9521	56.5952
96.2665061104272	58.2673188383902	98.8606	57.9963
96.2665061104272	58.2673188383902	99.5817	52.1789
96.2665061104272	58.2673188383902	99.7259	57.0659
96.2665061104272	58.2673188383902	99.0429	61.6589
96.2665061104272	58.2673188383902	99.3413	60.508
96.2665061104272	58.2673188383902	100.3439	52.2486
96.2665061104272	58.2673188383902	100.5945	52.9653
96.2665061104272	58.2673188383902	99.9754	58.6633
96.2665061104272	58.2673188383902	100.6388	53.8259
96.2665061104272	58.2673188383902	99.4285	63.8276
96.2665061104272	58.2673188383902	100.6854	61.817
96.2665061104272	58.2673188383902	102.1595	55.9791
96.2665061104272	58.2673188383902	102.8738	56.4102
96.2665061104272	58.2673188383902	102.6402	60.9181
96.2665061104272	58.2673188383902	101.778	67.1686
96.2665061104272	58.2673188383902	103.9916	60.6173
96.2665061104272	58.2673188383902	102.9023	68.4164
96.2665061104272	58.2673188383902	103.5291	67.906
96.2665061104272	58.2673188383902	106.6231	51.946
96.2790144657935	57.4106275005198	92.9131	56.6287
96.2790144657935	57.4106275005198	93.2379	56.4517
96.2908311919193	56.6013482820633	92.1982	53.9806
96.2908311919193	56.6013482820633	93.3932	53.1876
96.3017312674956	55.8548570361976	87.1149	58.1702
96.3017312674956	55.8548570361976	89.2688	56.3248
96.3134411123602	55.0528700881816	85.9154	51.5363
96.3134411123602	55.0528700881816	89.6611	52.1615
96.3225223629717	54.4309631614398	90.3356	51.1932
96.3225223629717	54.4309631614398	92.412	50.9961
96.3309346907246	53.8548773158963	99.0651	51.1078
96.3309346907246	53.8548773158963	99.5987	51.3246
96.3390357158297	53.3001088589794	93.0102	50.1223
96.3467870017682	52.7693076237834	98.1036	50.8139
96.3467870017682	52.7693076237834	98.2004	50.3921
96.3543573218132	52.2508888689935	93.3823	48.5086
96.3616282867014	51.7529845208592	91.9756	47.4725
96.3616282867014	51.7529845208592	91.9732	45.8332
96.368270951396	51.2981066146652	91.1842	48.1207
96.3746755171427	50.8595388784394	98.9198	48.0008
96.3809282057881	50.4313779784371	87.5129	47.9594
96.3809282057881	50.4313779784371	87.8413	47.1867
96.386816884934	50.028140513266	96.2485	47.1277
96.392505155846	49.6386359882302	95.1396	47.3596
96.392505155846	49.6386359882302	95.7654	46.8722
96.3981257769206	49.2537580132792	95.0864	47.4256
96.4036048046047	48.8785834529467	94.3452	48.7818
96.4036048046047	48.8785834529467	94.5726	47.3613
96.409154711343	48.4985437323778	94.5838	45.9916
96.4145522833307	48.1289439428487	94.4684	44.7163
96.4145522833307	48.1289439428487	94.5355	44.3621
96.4197551636486	47.7726735429882	93.2846	41.9379
96.4197551636486	47.7726735429882	93.9129	43.6355
96.4246340693946	47.4385927535764	95.46	44.379
96.4246340693946	47.4385927535764	96.6284	43.246
96.429332398799	47.1168791206504	96.2085	41.8253
96.429332398799	47.1168791206504	96.8865	41.9997
96.433828667048	46.8090019679973	96.2133	40.5576
96.438098133939	46.5166640601316	94.3087	39.6383
96.438098133939	46.5166640601316	95.8598	39.2349
96.4420164629418	46.2483716971483	94.1971	38.0204
96.4420164629418	46.2483716971483	95.1298	37.6897
96.4455338265642	46.0075394379531	96.5473	37.5774
96.4488061057212	45.7834944165942	97.0063	39.6578

Solution x	Solution y	Original x	Original y
96.4488061057212	45.7834944165942	97.0806	39.3994
96.4519701961372	45.5668554038823	98.4033	39.6451
96.4550052072268	45.3590590588763	98.7317	39.6579
96.4550052072268	45.3590590588763	102.0152	42.2262
96.4579373381225	45.1583063102655	98.3613	42.0392
96.4579373381225	45.1583063102655	99.6903	41.4772
96.4607908930577	44.9629346815266	90.0385	42.8005
96.4607908930577	44.9629346815266	90.4865	46.0315
96.4636692661588	44.7658622361814	98.0763	43.3554
96.4665120542285	44.5712269579527	89.5287	45.4109
96.4693684293854	44.3756630030418	97.5519	44.8528
96.4693684293854	44.3756630030418	98.0879	44.5657
96.4722150229703	44.180766912273	89.352	47.1855
96.4722150229703	44.180766912273	89.3464	46.1786
96.4751764443742	43.9780077758667	99.7789	45.6905
96.4780685401498	43.7799984570512	100.0845	45.3198
96.4780685401498	43.7799984570512	101.161	45.7653
96.4810012626504	43.579204621982	100.6036	46.802
96.4810012626504	43.579204621982	101.377	48.1816
96.4840979846682	43.3671771775839	100.8862	48.4618
96.4872205635134	43.1533787423721	101.7941	49.0832
96.4904414351487	42.9328506771841	102.9297	48.0592
96.4904414351487	42.9328506771841	103.8062	50.1176
96.4940792881931	42.6837622384218	105.6501	47.8555
96.4940792881931	42.6837622384218	106.4442	49.0895
96.5051584974831	41.9249028629799	102.543	45.6081
96.5051584974831	41.9249028629799	103.8959	45.4099
96.5175740452159	41.0744710639537	103.3956	43.6231
96.5175740452159	41.0744710639537	104.1102	44.8822
96.5320074659866	40.0857083108939	103.0838	43.6629
96.5471906968375	39.0455559773853	103.4615	37.3033
96.5619062601748	38.037428472725	107.8221	37.3636
96.5759943608136	37.0723237701643	106.6895	31.0233
96.5759943608136	37.0723237701643	106.8535	30.7643
96.5771468120794	36.9934362147931	104.0844	32.9988
96.5771468120794	36.9934362147931	105.5782	30.6326
96.5782383556024	36.9187185862303	101.1976	33.4905
96.5782383556024	36.9187185862303	102.9211	31.879
96.5793153675098	36.844995318178	100.5275	34.9543
96.5803926743288	36.7712539064385	96.6051	36.0943
96.5803926743288	36.7712539064385	98.5859	34.5756
96.5814636402647	36.6979450525234	98.5493	33.1624
96.5814636402647	36.6979450525234	98.9301	33.2654
96.5825308948159	36.6248907891471	99.0228	31.9463
96.5825308948159	36.6248907891471	99.272	31.5703
96.5835876186356	36.5525582104601	97.1838	29.5842
96.5835876186356	36.5525582104601	97.4429	30.1528
96.5846256202409	36.4815083355247	97.9141	29.0493
96.5846256202409	36.4815083355247	97.5011	28.0267
96.5856355392212	36.4123816593346	100.6297	27.3107
96.5856355392212	36.4123816593346	101.5683	27.6266
96.5866014529691	36.3462672401619	101.7295	28.4449
96.5875424166679	36.2818619127789	102.211	28.3893
96.5875424166679	36.2818619127789	105.6149	29.5786
96.5884345041301	36.2208006407538	108.656	34.8419
96.0420594711872	34.0084003833583	106.1692	29.0085
95.6204642592604	32.3012596194101	100.384	25.6874
95.2647156948315	30.8607456642817	104.9423	23.521
95.264715669746	30.8607456326153	98.3241	22.4412
95.264715669746	30.8607456326153	98.3827	22.3334
95.2647156445673	30.8607455989194	97.3283	27.0933
95.2647156445673	30.8607455989194	97.0499	25.7334
95.2647156193794	30.8607455710202	97.1071	18.8552
95.2164644202119	30.900245581258	93.6487	25.1273
95.1679697546373	30.9399449114816	93.9312	28.9768
95.1679697546373	30.9399449114816	96.0238	29.4057
95.1191858106647	30.9798810481248	99.0428	19.6959
94.9451769412061	31.1223301811872	102.4997	24.4075
94.9451769412061	31.1223301811872	102.9016	24.8202
94.7259548579352	31.3017922384078	105.0575	26.2706
94.3086381253277	31.6434207456773	92.942	26.4511
94.3086381253277	31.6434207456773	92.5592	25.4331
93.8783225113376	31.9956905094434	96.3928	32.1668
93.8783225113376	31.9956905094434	96.156	30.1327
93.4366748238808	32.3572370585119	95.8908	32.6754
93.4366748238808	32.3572370585119	96.2582	32.5713
92.9888644573699	32.7238285764049	93.4265	31.4744
92.9888644573699	32.7238285764049	95.0864	33.2234
92.5341964033642	33.0960339950473	90.6179	26.4649
92.0727902449087	33.4737554426578	92.4351	33.0022

Solution x	Solution y	Original x	Original y
91.607200246308	33.8549019184897	90.72	30.049
91.607200246308	33.8549019184897	90.6435	28.0536
91.1283861605434	34.2468740254713	91.0332	34.8187
91.1283861605434	34.2468740254713	92.7124	33.4453
90.6496920635022	34.638747914581	87.5726	32.8781
90.1819638431028	35.0216448267867	85.1876	33.113
90.1819638431028	35.0216448267867	86.512	33.4131
89.7383940664391	35.3847648857399	91.1655	36.0648
89.2977109274474	35.7455218735882	91.8795	37.1845
89.2977109274474	35.7455218735882	91.9372	36.8319
88.8540124187794	36.1087473313736	93.6941	39.0671
88.8540124187794	36.1087473313736	93.6083	38.4774
88.3877901235643	36.4904114341382	85.525	32.0217
87.9263376556916	36.8681708223217	92.8093	39.7693
87.4514452665061	37.2569325411795	92.2396	41.0703
87.4514452665061	37.2569325411795	92.634	40.1716
86.9623392789401	37.6573299301119	90.4784	41.2284
86.9623392789401	37.6573299301119	92.1801	41.0349
86.4648513112461	38.0645890711276	89.3668	41.343
86.4648513112461	38.0645890711276	90.1236	40.724
85.9649502528132	38.4738236432996	90.014	39.915
85.4537097083952	38.892341083119	87.5583	39.2312
85.4537097083952	38.892341083119	89.1249	38.0318
84.9222271516284	39.3274292335571	85.065	35.2948
84.3756329918889	39.7748882173714	86.5983	36.2039
84.3756329918889	39.7748882173714	88.2545	36.066
83.7678198327846	40.2724629179364	87.2346	40.5435
83.1413724959102	40.7852921428905	88.4465	41.4478
83.1413724959102	40.7852921428905	89.0134	41.3658
82.4478703153792	41.353014480053	79.7169	32.9378
81.6960474432066	41.9684798707858	75.4748	37.8532
80.9804505869069	42.5542895339716	85.9182	41.843
80.2106736641046	43.1844526153003	80.8076	41.6004
80.2106736641046	43.1844526153003	81.9079	40.1742
79.4035425309585	43.8451949990023	80.0004	48.0282
79.4035425309585	43.8451949990023	79.9479	46.2913
78.6440650356829	44.4669266964485	79.533	47.2684
77.9016782154239	45.0746674795389	80.3964	49.7264
77.9016782154239	45.0746674795389	80.7698	50.729
77.1943206860076	45.6537322109104	83.5076	51.7826
77.1943206860076	45.6537322109104	84.6532	51.7406
76.4155716390207	46.2912401431527	82.0477	53.0979
75.6359243949821	46.9294833430533	81.1686	57.7423
75.6359242102009	46.929483416158	77.9705	58.8491
75.5247057420346	46.9227387324415	77.8264	55.5164
75.5247057420346	46.9227387324415	78.0993	54.3894
75.4121435150113	46.9159125470224	76.5498	52.218
75.300112622176	46.9091185769393	76.2244	51.9684
75.1882215871148	46.902333081023	75.2757	50.6388
75.1882215871148	46.902333081023	76.0043	50.5809
75.0772262880226	46.8956018912489	73.911	51.0144
75.0772262880226	46.8956018912489	74.4488	50.3129
74.967550642029	46.8889507096146	73.6611	50.4924
74.8589696050267	46.8823658993535	73.2401	49.0047
74.8589696050267	46.8823658993535	73.5268	49.2611
74.7516671455375	46.8758586126284	73.2561	47.9132
74.6454190023816	46.8694152563793	73.6395	46.5004
74.6454190023816	46.8694152563793	74.8417	48.5823
74.5401896620077	46.8630336761983	75.5201	48.6107
74.5401896620077	46.8630336761983	75.5587	49.1352
74.43508923251	46.8566599099214	76.379	48.6237
74.43508923251	46.8566599099214	77.4079	49.147
74.3293041622929	46.8502446265449	77.6289	48.4559
74.3293041622929	46.8502446265449	78.2967	50.1808
74.2218969605152	46.8437309786756	76.4125	46.981
74.2218969605152	46.8437309786756	77.9078	47.2474
74.1132323547065	46.8371410885399	75.9853	41.4015
74.1132323547065	46.8371410885399	80.8872	43.1227
74.0018037393642	46.8303836015526	77.8794	45.0468
73.8898433257762	46.8235938705178	75.73	42.7229
73.8898433257762	46.8235938705178	77.9223	44.6051
73.7769154950628	46.8167454873001	72.4926	42.7909
73.7769154950628	46.8167454873001	72.9378	43.4347
73.6651129917765	46.8099653436819	72.7013	43.6681
73.5542412198671	46.8032416384131	72.9198	44.5581
73.5542412198671	46.8032416384131	73.2283	44.0709
73.4439408136642	46.7965525831312	73.6428	45.1426
73.3341046153858	46.789891675911	72.0385	47.603
73.3341046153858	46.789891675911	72.4429	44.8985
73.2253556343503	46.7832966986575	70.4096	46.4113

Solution x	Solution y	Original x	Original y
73.2253556343503	46.7832966986575	70.5497	45.0925
73.1181326566675	46.7767942522778	70.6191	48.182
73.0118585446894	46.7703493434562	70.7664	48.6137
73.0118585446894	46.7703493434562	71.8327	48.0379
72.9060930952012	46.7639352826707	72.0723	49.2863
72.8007323631543	46.7575457630942	71.0505	50.768
72.8007323631543	46.7575457630942	71.8965	50.0142
72.6961059549577	46.7512007763601	70.0624	50.1219
72.6961059549577	46.7512007763601	70.6462	49.6735
72.5923424046886	46.744908111261	69.1689	51.2673
72.4895216592647	46.7386726185936	69.4154	51.8752
72.3871952247906	46.732467098526	70.1179	52.2878
72.3871952247906	46.732467098526	70.8564	51.5507
72.2860914612159	46.7263357209712	69.1565	53.343
72.2860914612159	46.7263357209712	70.2011	52.705
72.1861120774511	46.7202725221729	70.694	53.8562
72.0865729378097	46.7142360219489	70.916	53.3608
71.9869623829284	46.7081951902777	71.2619	53.5794
71.9869623829284	46.7081951902777	72.0955	52.6394
71.8874158109831	46.7021582432336	72.0304	52.5053
71.8874158109831	46.7021582432336	72.1444	51.2772
71.7876610713954	46.6961086766213	73.3859	52.8201
71.7876610713954	46.6961086766213	74.3979	53.0985
71.6859962397181	46.6899432902387	73.8072	55.2741
71.5834821265395	46.6837264049826	72.7757	56.7077
71.5834821265395	46.6837264049826	73.7963	57.8273
71.4758412922273	46.6771986384685	70.1344	58.5671
71.4758412922273	46.6771986384685	73.2116	57.797
71.370166383819	46.6707903062034	69.9782	57.1009
71.370166383819	46.6707903062034	70.5527	57.3223
71.265134967176	46.6644209916297	68.5789	56.8701
71.1615965374142	46.6581422060277	67.4683	58.2291
70.8664070917528	46.4741593996434	69.2681	55.3133
70.8664070917528	46.4741593996434	69.8977	54.8286
70.5540678350352	46.2794876644896	68.2826	55.0673
70.234550846163	46.0803422653387	66.0257	55.1875
69.9102844976357	45.8782367314585	61.2083	54.3519
69.7176034369128	45.5499733452494	67.8488	53.6384
69.7176034369128	45.5499733452494	68.022	53.7678
69.5033723695284	45.1849961234068	66.2863	51.2705
69.5033723695284	45.1849961234068	66.949	50.6855
69.2789921857606	44.8027282509655	67.7991	50.1342
69.0507628705362	44.4139027728446	67.5609	49.631
68.8169686795446	44.0155966598987	65.7303	47.3671
68.8169686795446	44.0155966598987	67.6648	48.1141
68.5777435583867	43.6080381554907	67.4955	46.0347
68.5777435583867	43.6080381554907	68.7356	47.889
68.3307954563215	43.1873223716878	64.4232	44.0581
68.3307954563215	43.1873223716878	65.3289	43.5846
68.0913447884002	42.7793795575444	64.2784	38.8059
68.0913447884002	42.7793795575444	65.211	38.9167
67.8732120097813	42.4077550196233	64.8516	39.5774
67.8732120097813	42.4077550196233	66.7168	38.698
67.6677120262514	42.0576524153904	68.0366	38.8903
67.6677120262514	42.0576524153904	66.9624	36.7077
67.4716612379183	41.7236480754743	74.5598	39.2546
67.2734657152428	41.3859899427762	64.9829	35.6055
67.0842404258806	41.0636139825245	63.453	34.6286
67.0842404258806	41.0636139825245	63.8645	34.3723
66.9168307386506	40.7784043314461	62.6603	37.129
66.9168307386506	40.7784043314461	62.0243	36.102
66.7609451345968	40.5128277508615	60.9493	37.7343
66.6106606629485	40.2567935682795	61.1452	36.2851
66.4658507021891	40.0100860561612	60.137	35.2014
66.4658507021891	40.0100860561612	61.1622	34.1592
66.3353437111407	39.7877458869369	60.8351	33.4935
66.3353437111407	39.7877458869369	61.5106	34.0654
66.217231448123	39.5865220683437	62.464	33.4003
66.217231448123	39.5865220683437	63.5739	32.9982
66.1071999790972	39.3990651523285	63.2951	31.2899
66.0031952274741	39.2218756919463	64.1748	30.2745
66.0031952274741	39.2218756919463	66.7818	30.0369
65.9097289257423	39.0626401829562	64.2717	31.7627
65.9097289257423	39.0626401829562	65.4552	32.6167
65.8204305374306	38.9105053840362	66.5887	34.1226
65.7324557893852	38.7606256178523	67.4673	33.2544
65.7324557893852	38.7606256178523	67.7055	32.9993
65.6459292833677	38.6132132003494	75.9022	40.5634
65.6459292833677	38.6132132003494	77.5882	39.4219
65.0020483249249	37.516266320103	68.3701	31.308

Solution x	Solution y	Original x	Original y
65.0020483249249	37.516266320103	72.2401	34.2889
64.451415726077	36.5781785084604	72.6191	32.6684
63.9897781139838	35.7917043471118	73.7989	28.6287
60.5169342387679	31.9164493931777	63.3795	20.1125
60.516934219845	31.9164493826819	63.3607	23.5913
60.516934201034	31.9164493714456	57.9508	29.6187
60.516934201034	31.9164493714456	56.8778	27.618
60.5169341825395	31.9164493630531	55.1607	27.7715
60.5169341825395	31.9164493630531	60.463	30.4795
60.5169341642869	31.9164493547653	58.5931	27.1316
60.5169341642869	31.9164493547653	58.9981	26.6128
60.5169341461945	31.9164493464257	59.5552	26.5288
60.5169341281615	31.9164493358884	58.4334	33.3219
60.5169341281615	31.9164493358884	58.6228	31.6703
60.51693411023	31.9164493304498	61.643	23.6955
60.51693411023	31.9164493304498	62.5649	23.4331
60.5169340923521	31.9164493196762	60.1802	30.671
60.5169340744991	31.916449312852	70.1037	27.3839
60.5169340565631	31.9164493044752	63.8119	26.0212
60.516934038625	31.9164492954833	63.132	27.7543
60.516934038625	31.9164492954833	62.9268	27.0211
60.5169340206964	31.9164492872204	68.2062	28.5319
60.5169340206964	31.9164492872204	68.3676	27.331
60.5169340026725	31.9164492790959	67.5765	27.7962
60.5169339846106	31.9164492708151	66.7482	27.6121
60.5169339846106	31.9164492708151	67.242	26.9141
60.5169339664646	31.916449263697	70.5469	25.0661
60.3113401567148	31.8721190518047	67.6588	29.7348
60.3113401567148	31.8721190518047	67.8857	28.9512
60.0907711579419	31.8245598656168	69.1853	30.9522
60.0907711579419	31.8245598656168	69.5886	28.6002
59.8321091489032	31.7687870211605	71.5231	31.8286
58.6567502905554	31.5153518922671	58.8785	37.4935
57.4529237277461	31.2557780649029	58.126	35.24
56.2238795379604	30.9907664478293	53.589	37.6567
56.2238795379604	30.9907664478293	56.2795	36.0371
55.0248197882715	30.7322200220569	55.9275	34.3566
55.0248197882715	30.7322200220569	54.3132	33.4794
53.8141525640459	30.4711706628195	51.7623	34.8081
53.8141525640459	30.4711706628195	51.473	33.7115
52.6853081147693	30.2277644824678	50.1654	34.298
51.6051347494534	29.9948530596836	48.325	36.101
50.5765359946826	29.7730624481834	43.7884	36.8808
50.5765359946826	29.7730624481834	44.7872	36.1398
49.8383165760395	29.6138853809661	40.9959	37.9409
49.8383165760395	29.6138853809661	42.8212	36.4305
49.8256240988214	29.5312181162841	44.1303	30.8739
49.8130017888315	29.4490078204155	47.3356	31.1656
49.8130017888315	29.4490078204155	46.9054	30.8841
49.8004179329074	29.3670479410245	54.7376	29.7596
49.8004179329074	29.3670479410245	54.8257	29.6059
49.7878700470538	29.2853223697704	50.3352	41.2014
49.7642885791086	29.1317339751214	44.3651	39.5082
49.7642885791086	29.1317339751214	45.4903	38.3462
49.7237492441849	28.8676974436403	51.6292	37.4529
49.6802275222962	28.5842363443138	51.0819	30.8837
49.6802275222962	28.5842363443138	49.5432	29.0024
49.6361297539534	28.2970233500044	50.5738	30.8854
49.5916261497203	28.0071671147447	53.915	28.4629
49.5916261497203	28.0071671147447	54.5895	27.7676
49.5466246201659	27.7140678753361	52.7074	28.2489
49.5015859392335	27.4207266970033	53.9046	16.3668
49.4814159397581	27.2893573392704	49.9971	19.9155
49.4814159397581	27.2893573392704	49.9475	19.2284
49.462393323973	27.1654610077966	49.1677	19.2175
49.462393323973	27.1654610077966	49.3862	17.5735
49.4447657963527	27.0506510221663	51.539	18.7116
49.4447657963527	27.0506510221663	51.6732	17.1776
49.428540114828	26.9449714211654	52.4859	17.4578
49.428540114828	26.9449714211654	53.7123	16.59
49.4143558775017	26.8525879573968	54.2786	24.4277
49.4143558775017	26.8525879573968	54.0368	23.8586
49.4002494928488	26.7607115758222	55.4854	26.8201
49.4002494928488	26.7607115758222	54.6523	25.2022
49.3860152860958	26.6680026985013	55.9782	19.9329
49.3721037759491	26.5773955917854	55.089	27.0379
49.3581437254141	26.4864723579462	53.2794	21.4994
49.3581437254141	26.4864723579462	52.1655	19.1446
49.3446345249417	26.398485569955	45.9074	18.6439
49.3314913683908	26.3128828538416	45.9242	19.9

Solution x	Solution y	Original x	Original y
49.3185947861372	26.2288860936497	46.7163	23.0055
49.3185947861372	26.2288860936497	49.1449	22.3659
49.305933263711	26.1464202967936	53.8796	31.7093
49.305933263711	26.1464202967936	52.5136	31.162
49.2929972600653	26.0621667956863	50.3723	32.2399
49.2929972600653	26.0621667956863	50.8592	31.2824
49.2797178268145	25.9756765055335	46.003	37.4534
49.2797178268145	25.9756765055335	45.4526	36.121
49.2363846883589	25.6934435408537	45.6407	35.658
49.1842232625434	25.3537110956389	45.9581	33.5048
49.1842232625434	25.3537110956389	47.4903	33.2139
49.1230062064138	24.9549984757126	48.6326	32.1618
49.0581051706979	24.5322917796583	47.9603	31.0225
49.0581051706979	24.5322917796583	47.9812	30.2306
48.9864457065024	24.0655668320556	46.4115	30.3033
48.9111686734025	23.5752803512039	44.6028	29.9319
48.9111686734025	23.5752803512039	46.684	28.1154
48.8282008928713	23.0349033659254	47.4152	28.2569
48.8282008928713	23.0349033659254	47.5893	27.8934
48.7374416917814	22.4437801959271	46.7677	27.4481
48.6430015330058	21.8286826751801	45.985	27.4123
48.6430015330058	21.8286826751801	47.7428	26.438
48.5380594325927	21.1451852369698	50.1386	26.6573
48.5380594325927	21.1451852369698	48.493	25.186
48.4201089379637	20.3769632888099	50.8742	24.2729
48.2968371502538	19.5740834241731	40.715	18.8306
48.2968371502538	19.5740834241731	39.7266	17.3977
48.1887900107034	18.8703627622936	40.2335	17.1357
48.1887900107034	18.8703627622936	41.9974	13.5778
48.098121247232	18.2798288100561	43.7175	13.3612
48.0143813070476	17.7344228992063	47.2412	18.0641
47.9311144516442	17.1920982582308	44.7075	13.3055
47.8516423796937	16.6744893791214	52.0827	15.9727
47.7723822752102	16.1582611075123	46.503	16.5426
47.6932913846406	15.6431349511693	53.4554	15.0784
47.6140653655887	15.1271287239632	44.2621	15.3855
47.6140653655887	15.1271287239632	45.8725	14.3747
47.5359756170388	14.6185230897457	44.3034	16.6265
47.4573517125526	14.1064384555167	46.213	15.3079
47.3782392939276	13.5911720787233	47.2642	16.1804
47.3782392939276	13.5911720787233	46.6598	16.011
47.2960697266737	13.0559942172517	48.0446	14.6778
47.2960697266737	13.0559942172517	47.5448	13.9665
47.2124574468077	12.5114198497632	47.1015	12.1757
47.2124574468077	12.5114198497632	47.4524	12.1509

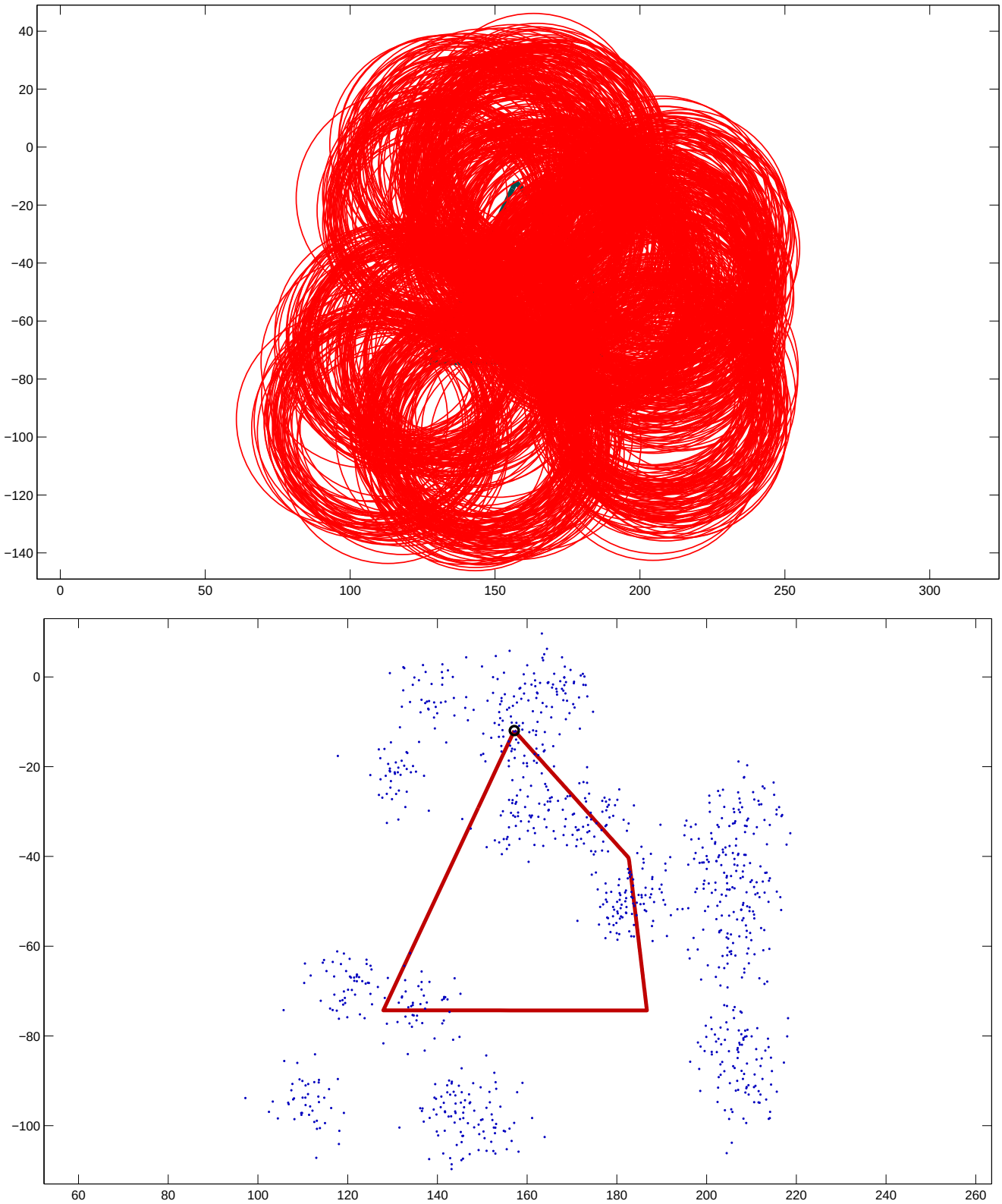


Figure N.28: $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Euclidean, Length = 199.9478389

Table N-31: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Euclidean

Total distance: 199.947838874135			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
46.563900958694	13.1723579044169	47.1015	12.1757
46.563900958694	13.1723579044169	47.4524	12.1509
45.9949322638535	14.3877225741394	47.5448	13.9665
45.9949322638535	14.3877225741394	48.0446	14.6778
45.4082321574273	15.6409634384628	43.7681	7.8375
45.4082321574273	15.6409634384628	44.0031	6.0986
45.4082321574273	15.6409634384628	47.0712	4.3382
45.4082321574273	15.6409634384628	48.302	2.6164
45.4082321574273	15.6409634384628	49.2438	-0.5725
45.4082321574273	15.6409634384628	50.0191	-2.6033
45.4082321574273	15.6409634384628	53.289	-9.6645
44.7034698165511	17.1463896097502	45.5397	7.2979
44.7034698165511	17.1463896097502	46.0043	6.8606
44.7034698165511	17.1463896097502	46.8369	6.4403
44.7034698165511	17.1463896097502	44.3097	5.4051
44.7034698165511	17.1463896097502	44.2937	4.7268
44.7034698165511	17.1463896097502	45.0418	3.8658
44.7034698165511	17.1463896097502	42.4139	3.5597
44.7034698165511	17.1463896097502	43.4311	0.4843
44.7034698165511	17.1463896097502	42.4155	0.0668
44.7034698165511	17.1463896097502	44.8479	-0.9391
44.7034698165511	17.1463896097502	39.9467	-2.3317
44.7034698165511	17.1463896097502	43.0131	-4.6452
44.7034698165511	17.1463896097502	46.0937	-5.8176
44.7034698165511	17.1463896097502	36.4279	-4.3699
43.4746195904171	19.7712877702423	41.1669	5.3004
43.4746195904171	19.7712877702423	38.0686	7.3443
43.4746195904171	19.7712877702423	36.2059	6.8965
43.4746195904171	19.7712877702423	36.4235	4.5159
43.4746195904171	19.7712877702423	33.7832	8.5886
43.4746195904171	19.7712877702423	33.6792	4.7017
43.4746195904171	19.7712877702423	31.7997	5.4917
43.4746195904171	19.7712877702423	30.7839	5.7178
43.4746195904171	19.7712877702423	29.9497	8.0977
43.4746195904171	19.7712877702423	29.2451	9.0499
43.4746195904171	19.7712877702423	33.4349	0.0139
43.4746195904171	19.7712877702423	29.6205	6.6839
43.4746195904171	19.7712877702423	29.2732	5.6917
43.4746195904171	19.7712877702423	31.0707	1.7474
43.4746195904171	19.7712877702423	28.0443	7.2557
43.4746195904171	19.7712877702423	27.9452	7.0873
43.4746195904171	19.7712877702423	31.1391	0.2266
43.4746195904171	19.7712877702423	32.3564	-1.4633
43.4746195904171	19.7712877702423	28.1449	5.3771
43.4746195904171	19.7712877702423	27.6562	5.4902
43.4746195904171	19.7712877702423	31.0065	-1.0714
43.4746195904171	19.7712877702423	27.2842	5.8331
43.4746195904171	19.7712877702423	28.6989	1.5656
43.4746195904171	19.7712877702423	26.246	7.8923
43.4746195904171	19.7712877702423	26.4488	5.1021
43.4746195904171	19.7712877702423	31.1128	-2.8096
43.4746195904171	19.7712877702423	27.3755	-1.0984
43.4746195904171	19.7712877702423	25.8989	0.7413
43.4746195904171	19.7712877702423	23.9142	5.5856
43.4746195904171	19.7712877702423	24.5208	1.7631
43.4746195904171	19.7712877702423	26.7943	-2.6353
43.4746195904171	19.7712877702423	24.8641	0.1355
43.4746195904171	19.7712877702423	21.6596	11.213
43.4746195904171	19.7712877702423	22.0744	6.6433
43.4746195904171	19.7712877702423	22.4003	2.9895
43.4746195904171	19.7712877702423	22.6294	-1.9579
43.4746195904171	19.7712877702423	22.4229	-2.1641
43.4746195904171	19.7712877702423	19.4163	-0.8394
43.4746195904171	19.7712877702423	7.8039	17.6061
40.6682782658402	25.7657836451207	46.5714	10.174
40.6682782658402	25.7657836451207	44.5228	11.8645
40.6682782658402	25.7657836451207	45.8725	14.3747
40.6682782658402	25.7657836451207	44.7075	13.3055
40.6682782658402	25.7657836451207	44.5689	9.75
40.6682782658402	25.7657836451207	46.213	15.3079
40.6682782658402	25.7657836451207	43.7231	10.6871
40.6682782658402	25.7657836451207	43.7175	13.3612
40.6682782658402	25.7657836451207	44.2621	15.3855
40.6682782658402	25.7657836451207	46.503	16.5426

Solution x	Solution y	Original x	Original y
40.6682782658402	25.7657836451207	42.7704	10.2739
40.6682782658402	25.7657836451207	41.9974	13.5778
40.6682782658402	25.7657836451207	44.3034	16.6265
40.6682782658402	25.7657836451207	45.9074	18.6439
40.6682782658402	25.7657836451207	40.2323	12.6508
40.6682782658402	25.7657836451207	45.9242	19.9
40.6682782658402	25.7657836451207	40.2335	17.1357
40.6682782658402	25.7657836451207	39.7266	17.3977
40.6682782658402	25.7657836451207	40.715	18.8306
40.6682782658402	25.7657836451207	36.7928	9.6586
40.6682782658402	25.7657836451207	31.9656	14.6164
40.6682782658402	25.7657836451207	29.4417	11.4808
40.6682782658402	25.7657836451207	25.9081	14.4892
40.6682782658402	25.7657836451207	27.0312	22.0371
40.6682782658402	25.7657836451207	35.5392	31.6783
40.6682782658402	25.7657836451207	25.2224	21.1268
40.6682782658402	25.7657836451207	24.5729	19.8583
40.6682782658402	25.7657836451207	37.4272	33.8061
40.6682782658402	25.7657836451207	23.3217	16.9506
40.6682782658402	25.7657836451207	23.1228	16.7524
40.6682782658402	25.7657836451207	24.0847	21.2619
40.6682782658402	25.7657836451207	23.1615	20.5337
40.6682782658402	25.7657836451207	22.5923	19.795
40.6682782658402	25.7657836451207	22.0389	18.6688
40.6682782658402	25.7657836451207	28.099	29.8348
40.6682782658402	25.7657836451207	21.2889	20.2133
40.6682782658402	25.7657836451207	21.7951	21.835
40.6682782658402	25.7657836451207	20.7311	19.0512
40.6682782658402	25.7657836451207	21.1889	21.267
40.6682782658402	25.7657836451207	23.1689	25.59
40.6682782658402	25.7657836451207	19.6468	14.5775
40.6682782658402	25.7657836451207	20.5046	21.2685
40.6682782658402	25.7657836451207	20.5322	21.5891
40.6682782658402	25.7657836451207	19.4151	20.4264
40.6682782658402	25.7657836451207	21.4132	25.3225
40.6682782658402	25.7657836451207	19.0397	19.3917
40.6682782658402	25.7657836451207	19.4476	21.0876
40.6682782658402	25.7657836451207	19.3676	20.9011
40.6682782658402	25.7657836451207	18.1963	16.0602
40.6682782658402	25.7657836451207	22.8581	29.0039
40.6682782658402	25.7657836451207	19.6457	23.2311
40.6682782658402	25.7657836451207	20.8129	26.0745
40.6682782658402	25.7657836451207	18.4916	22.031
40.6682782658402	25.7657836451207	19.5225	24.6717
40.6682782658402	25.7657836451207	16.9397	16.157
40.6682782658402	25.7657836451207	17.2669	18.1061
40.6682782658402	25.7657836451207	19.8821	27.2321
40.6682782658402	25.7657836451207	18.7218	26.0511
40.6682782658402	25.7657836451207	17.3215	22.815
40.6682782658402	25.7657836451207	21.3113	31.7798
40.6682782658402	25.7657836451207	17.7323	26.9057
40.6682782658402	25.7657836451207	16.9754	26.2994
40.6682782658402	25.7657836451207	15.0509	21.8739
40.6682782658402	25.7657836451207	18.7531	32.536
39.0795244912015	29.1594113150598	46.3909	8.819
39.0795244912015	29.1594113150598	46.6598	16.011
39.0795244912015	29.1594113150598	43.984	9.2005
39.0795244912015	29.1594113150598	47.2642	16.1804
39.0795244912015	29.1594113150598	47.2412	18.0641
39.0795244912015	29.1594113150598	46.7163	23.0055
39.0795244912015	29.1594113150598	48.493	25.186
39.0795244912015	29.1594113150598	47.7428	26.438
39.0795244912015	29.1594113150598	46.7677	27.4481
39.0795244912015	29.1594113150598	45.985	27.4123
39.0795244912015	29.1594113150598	47.5893	27.8934
39.0795244912015	29.1594113150598	46.684	28.1154
39.0795244912015	29.1594113150598	47.4152	28.2569
39.0795244912015	29.1594113150598	49.5432	29.0024
39.0795244912015	29.1594113150598	44.6028	29.9319
39.0795244912015	29.1594113150598	47.9812	30.2306
39.0795244912015	29.1594113150598	46.4115	30.3033
39.0795244912015	29.1594113150598	46.9054	30.8841
39.0795244912015	29.1594113150598	47.9603	31.0225
39.0795244912015	29.1594113150598	44.1303	30.8739
39.0795244912015	29.1594113150598	47.3356	31.1656
39.0795244912015	29.1594113150598	48.6326	32.1618
39.0795244912015	29.1594113150598	47.4903	33.2139
39.0795244912015	29.1594113150598	45.9581	33.5048
39.0795244912015	29.1594113150598	45.6407	35.658
39.0795244912015	29.1594113150598	45.4526	36.121

Solution x	Solution y	Original x	Original y
39.0795244912015	29.1594113150598	44.7872	36.1398
39.0795244912015	29.1594113150598	42.8212	36.4305
39.0795244912015	29.1594113150598	43.7884	36.8808
39.0795244912015	29.1594113150598	46.003	37.4534
39.0795244912015	29.1594113150598	45.4903	38.3462
39.0795244912015	29.1594113150598	40.9959	37.9409
39.0795244912015	29.1594113150598	44.3651	39.5082
23.6908575838395	62.0302294725668	48.325	36.101
23.6908575838395	62.0302294725668	23.9369	61.5866
23.6908575838395	62.0302294725668	33.839	67.1668
23.6908575838395	62.0302294725668	26.4833	65.6457
23.6908575838395	62.0302294725668	22.6268	64.3936
23.6908575838395	62.0302294725668	28.241	67.9653
23.6908575838395	62.0302294725668	26.4747	67.9787
23.6908575838395	62.0302294725668	35.1535	70.6086
23.6908575838395	62.0302294725668	22.8228	67.5784
23.6908575838395	62.0302294725668	14.2076	63.0144
23.6908575838395	62.0302294725668	25.7737	68.9159
23.6908575838395	62.0302294725668	26.4587	69.6793
23.6908575838395	62.0302294725668	31.7515	71.3679
23.6908575838395	62.0302294725668	31.4906	71.3219
23.6908575838395	62.0302294725668	15.1112	64.361
23.6908575838395	62.0302294725668	14.2239	63.9607
23.6908575838395	62.0302294725668	32.2488	71.8762
23.6908575838395	62.0302294725668	31.4455	71.7336
23.6908575838395	62.0302294725668	18.9682	67.082
23.6908575838395	62.0302294725668	15.3124	65.205
23.6908575838395	62.0302294725668	31.0449	71.9995
23.6908575838395	62.0302294725668	26.9783	71.0141
23.6908575838395	62.0302294725668	9.1569	61.6426
23.6908575838395	62.0302294725668	10.4334	62.822
23.6908575838395	62.0302294725668	22.9431	70.0987
23.6908575838395	62.0302294725668	7.6803	61.1857
23.6908575838395	62.0302294725668	27.6433	72.5657
23.6908575838395	62.0302294725668	22.1344	71.2137
23.6908575838395	62.0302294725668	26.2205	72.9044
23.6908575838395	62.0302294725668	22.0857	71.4539
23.6908575838395	62.0302294725668	12.0444	66.3239
23.6908575838395	62.0302294725668	12.0877	66.3858
23.6908575838395	62.0302294725668	16.7224	69.1113
23.6908575838395	62.0302294725668	24.5354	72.6275
23.6908575838395	62.0302294725668	8.4928	63.9998
23.6908575838395	62.0302294725668	14.7433	68.1941
23.6908575838395	62.0302294725668	12.5389	66.9051
23.6908575838395	62.0302294725668	14.5018	68.1646
23.6908575838395	62.0302294725668	27.2709	73.9256
23.6908575838395	62.0302294725668	12.0097	66.7734
23.6908575838395	62.0302294725668	24.5076	73.115
23.6908575838395	62.0302294725668	13.2613	67.7948
23.6908575838395	62.0302294725668	14.0233	68.3418
23.6908575838395	62.0302294725668	9.6606	65.5604
23.6908575838395	62.0302294725668	24.1578	73.3792
23.6908575838395	62.0302294725668	11.4442	66.9869
23.6908575838395	62.0302294725668	21.3934	72.6127
23.6908575838395	62.0302294725668	10.5042	66.7806
23.6908575838395	62.0302294725668	12.0587	67.8257
23.6908575838395	62.0302294725668	10.7344	66.9849
23.6908575838395	62.0302294725668	23.527	73.6169
23.6908575838395	62.0302294725668	11.4886	67.7219
23.6908575838395	62.0302294725668	18.2654	71.5277
23.6908575838395	62.0302294725668	15.0856	70.6386
23.6908575838395	62.0302294725668	25.4767	75.481
23.6908575838395	62.0302294725668	24.4797	75.354
23.6908575838395	62.0302294725668	24.7401	75.4523
23.6908575838395	62.0302294725668	6.9842	66.7632
23.6908575838395	62.0302294725668	22.8762	75.7017
23.6908575838395	62.0302294725668	10.9416	69.7746
23.6908575838395	62.0302294725668	10.0835	69.723
23.6908575838395	62.0302294725668	11.6475	70.8021
23.6908575838395	62.0302294725668	15.4332	72.9689
23.6908575838395	62.0302294725668	9.1707	70.0865
23.6908575838395	62.0302294725668	21.1184	76.9048
23.6908575838395	62.0302294725668	9.3844	71.5303
23.6908575838395	62.0302294725668	7.0214	70.8048
23.6908575838395	62.0302294725668	8.8648	72.0358
23.6908575838395	62.0302294725668	18.7356	77.2891
23.6908575838395	62.0302294725668	9.4578	72.6847
23.6908575838395	62.0302294725668	8.3117	72.2049
23.6908575838395	62.0302294725668	12.73	75.2001
23.6908575838395	62.0302294725668	9.0002	73.0359

Solution x	Solution y	Original x	Original y
23.6908575838395	62.0302294725668	13.7649	76.0563
23.6908575838395	62.0302294725668	7.5677	74.3816
23.6908575838395	62.0302294725668	9.9143	75.8382
23.6908575838395	62.0302294725668	6.6564	74.2265
23.6908575838395	62.0302294725668	6.0914	73.9114
23.6908575838395	62.0302294725668	8.0472	76.1743
18.3408572147701	73.4579534244528	32.697	74.6737
18.3408572147701	73.4579534244528	6.6701	63.5082
18.3408572147701	73.4579534244528	4.7342	63.0935
18.3408572147701	73.4579534244528	31.4187	76.5703
18.3408572147701	73.4579534244528	4.4426	63.6871
18.3408572147701	73.4579534244528	31.105	77.2121
18.3408572147701	73.4579534244528	5.2812	65.5492
18.3408572147701	73.4579534244528	25.3366	76.538
18.3408572147701	73.4579534244528	26.6151	77.1467
18.3408572147701	73.4579534244528	23.796	77.2181
18.3408572147701	73.4579534244528	0.4838	63.8626
18.3408572147701	73.4579534244528	24.3218	77.9732
18.3408572147701	73.4579534244528	1.7661	66.5446
18.3408572147701	73.4579534244528	0.3096	68.1954
18.3408572147701	73.4579534244528	4.0089	72.186
18.3408572147701	73.4579534244528	17.9606	81.6588
18.3408572147701	73.4579534244528	23.4089	84.0628
18.3408572147701	73.4579534244528	-4.2807	74.2616
18.3408572147701	73.4579534244528	2.7376	84.0979
18.3408572147701	73.4579534244528	7.8142	89.6258
18.3408572147701	73.4579534244528	-1.2335	86.0108
18.3408572147701	73.4579534244528	3.5998	89.8159
18.3408572147701	73.4579534244528	3.5503	90.3653
18.3408572147701	73.4579534244528	-4.1255	85.596
18.3408572147701	73.4579534244528	5.8502	91.8647
18.3408572147701	73.4579534244528	2.5704	90.3092
18.3408572147701	73.4579534244528	1.2023	90.7259
18.3408572147701	73.4579534244528	-0.1009	90.0487
18.3408572147701	73.4579534244528	-0.7351	89.6931
18.3408572147701	73.4579534244528	0.6193	91.0377
18.3408572147701	73.4579534244528	3.4538	93.5151
18.3408572147701	73.4579534244528	-2.3037	90.7079
18.3408572147701	73.4579534244528	1.1743	92.9818
18.3408572147701	73.4579534244528	0.5802	93.7511
18.3408572147701	73.4579534244528	-2.5612	92.1356
18.3408572147701	73.4579534244528	-0.0468	93.7668
17.9449270832766	74.3036755541432	4.7737	93.7785
17.9449270832766	74.3036755541432	3.5924	94.7451
17.9449270832766	74.3036755541432	1.6453	95.7178
17.9449270832766	74.3036755541432	-1.9602	93.9224
17.9449270832766	74.3036755541432	0.6138	95.4238
17.9449270832766	74.3036755541432	-2.1508	94.1499
17.9449270832766	74.3036755541432	2.1469	96.6722
17.9449270832766	74.3036755541432	-3.2639	94.8889
17.9449270832766	74.3036755541432	1.4019	97.5847
17.9449270832766	74.3036755541432	-3.1358	95.2162
17.9449270832766	74.3036755541432	-0.171	97.1566
17.9449270832766	74.3036755541432	-0.339	97.1979
17.9449270832766	74.3036755541432	-0.3116	97.6012
17.9449270832766	74.3036755541432	-6.686	94.6391
17.9449270832766	74.3036755541432	-1.8619	98.5581
17.9449270832766	74.3036755541432	-7.5489	96.9207
17.9449270832766	74.3036755541432	-5.5457	98.4014
17.9449270832766	74.3036755541432	-12.8049	93.8535
18.670812500103	74.3038756425609	34.9317	80.2335
18.670812500103	74.3038756425609	33.517	80.8699
18.670812500103	74.3038756425609	29.376	80.5861
18.670812500103	74.3038756425609	27.1736	83.2653
18.670812500103	74.3038756425609	35.4073	87.2216
18.670812500103	74.3038756425609	32.6009	89.9531
18.670812500103	74.3038756425609	33.2241	90.2072
18.670812500103	74.3038756425609	33.1881	90.5996
18.670812500103	74.3038756425609	34.7819	91.1147
18.670812500103	74.3038756425609	32.1756	91.0244
18.670812500103	74.3038756425609	29.5221	90.7635
18.670812500103	74.3038756425609	35.4152	92.5489
18.670812500103	74.3038756425609	33.6244	92.4492
18.670812500103	74.3038756425609	32.2034	92.5655
18.670812500103	74.3038756425609	34.0163	93.2553
18.670812500103	74.3038756425609	32.8593	93.0881
18.670812500103	74.3038756425609	36.1694	94.3523
18.670812500103	74.3038756425609	30.8807	93.5109
18.670812500103	74.3038756425609	29.3468	93.7461
18.670812500103	74.3038756425609	35.2297	94.8683

Solution x	Solution y	Original x	Original y
18.670812500103	74.3038756425609	29.7064	94.0211
18.670812500103	74.3038756425609	34.0458	95.0903
18.670812500103	74.3038756425609	31.4281	94.9219
18.670812500103	74.3038756425609	35.9551	95.9225
18.670812500103	74.3038756425609	30.7482	95.8761
18.670812500103	74.3038756425609	33.9629	96.8355
18.670812500103	74.3038756425609	35.7481	97.1257
18.670812500103	74.3038756425609	34.0464	97.1856
18.670812500103	74.3038756425609	31.6916	96.8159
18.670812500103	74.3038756425609	29.1897	96.4145
18.670812500103	74.3038756425609	31.7064	96.988
18.670812500103	74.3038756425609	26.6904	96.1713
18.670812500103	74.3038756425609	26.1674	96.1159
18.670812500103	74.3038756425609	35.7859	98.3251
18.670812500103	74.3038756425609	33.0573	97.9271
18.670812500103	74.3038756425609	26.55	96.735
18.670812500103	74.3038756425609	32.4952	97.9758
18.670812500103	74.3038756425609	29.7849	97.5299
18.670812500103	74.3038756425609	35.0473	98.5367
18.670812500103	74.3038756425609	28.2891	98.27
18.670812500103	74.3038756425609	33.8351	99.3235
18.670812500103	74.3038756425609	26.9511	99.1097
18.670812500103	74.3038756425609	35.2228	101.4244
18.670812500103	74.3038756425609	31.6341	101.1443
18.670812500103	74.3038756425609	29.8552	101.3038
18.670812500103	74.3038756425609	30.1816	102.1772
18.670812500103	74.3038756425609	21.5395	100.4343
18.670812500103	74.3038756425609	34.3074	104.3145
18.670812500103	74.3038756425609	9.17	97.1621
18.670812500103	74.3038756425609	6.3198	96.0864
18.670812500103	74.3038756425609	31.3011	106.2109
18.670812500103	74.3038756425609	32.8361	107.2479
18.670812500103	74.3038756425609	4.9579	99.4405
18.670812500103	74.3038756425609	8.1477	101.1634
18.670812500103	74.3038756425609	28.1717	107.4546
18.670812500103	74.3038756425609	3.1184	98.924
18.670812500103	74.3038756425609	2.5533	99.1767
18.670812500103	74.3038756425609	3.811	100.5395
18.670812500103	74.3038756425609	3.1448	100.72
18.670812500103	74.3038756425609	8.0611	104.093
18.670812500103	74.3038756425609	3.0162	107.1796
36.3817940390097	74.309913507532	37.9917	90.5379
36.3817940390097	74.309913507532	39.6285	91.4521
36.3817940390097	74.309913507532	41.599	92.4813
36.3817940390097	74.309913507532	37.0706	93.0168
36.3817940390097	74.309913507532	41.6896	94.8028
36.3817940390097	74.309913507532	37.3296	94.7968
36.3817940390097	74.309913507532	37.1788	95.0118
36.3817940390097	74.309913507532	40.9431	96.0349
36.3817940390097	74.309913507532	38.2186	96.6747
36.3817940390097	74.309913507532	42.0978	97.503
36.3817940390097	74.309913507532	42.2565	98.7398
36.3817940390097	74.309913507532	40.065	98.6098
36.3817940390097	74.309913507532	39.7333	98.7582
36.3817940390097	74.309913507532	43.0828	99.6317
36.3817940390097	74.309913507532	36.8108	99.4487
36.3817940390097	74.309913507532	39.196	99.7694
36.3817940390097	74.309913507532	42.5793	100.4271
36.3817940390097	74.309913507532	42.9226	100.4615
36.3817940390097	74.309913507532	38.189	100.3805
36.3817940390097	74.309913507532	44.7902	101.1589
36.3817940390097	74.309913507532	40.2693	101.3043
36.3817940390097	74.309913507532	42.8352	101.6931
36.3817940390097	74.309913507532	39.3246	101.8921
36.3817940390097	74.309913507532	35.7306	102.2767
36.3817940390097	74.309913507532	35.5571	102.295
36.3817940390097	74.309913507532	40.5226	102.8002
36.3817940390097	74.309913507532	42.0156	103.5929
36.3817940390097	74.309913507532	35.4006	103.6799
36.3817940390097	74.309913507532	45.465	105.2608
36.3817940390097	74.309913507532	42.4716	105.6496
36.3817940390097	74.309913507532	39.1965	105.4524
36.3817940390097	74.309913507532	40.9527	105.6227
36.3817940390097	74.309913507532	42.9285	106.2179
36.3817940390097	74.309913507532	37.1983	106.347
36.3817940390097	74.309913507532	35.7224	107.36
36.3817940390097	74.309913507532	35.3466	107.7036
36.3817940390097	74.309913507532	33.1686	108.6172
36.3817940390097	74.309913507532	33.1638	109.6815
38.9110387722896	74.3107824355923	40.8939	84.3555

Solution x	Solution y	Original x	Original y
38.9110387722896	74.3107824355923	42.6808	88.2098
41.3460614191833	74.3116197071449	42.9721	90.3177
43.7673231837308	74.3124523970526	43.1057	91.7939
46.2150135113655	74.3132941828255	48.9533	90.4759
46.2150135113655	74.3132941828255	47.7789	92.5461
48.6176271052857	74.3141209999622	44.0393	95.7757
48.6176271052857	74.3141209999622	47.126	99.3914
51.1303893763135	74.3149848269671	46.0729	100.678
51.1303893763135	74.3149848269671	45.0704	101.2748
53.9356336134326	74.3159467532994	46.5537	103.4177
57.0618561925614	74.3170157331417	53.9006	102.5381
57.0618561925614	74.3170157331417	48.0764	105.8084
61.179473484305	74.3184189996754	51.1106	98.2963
65.8722426054778	74.3200071336439	86.3374	85.7586
65.8722426054778	74.3200071336439	88.3633	87.3681
68.9702669463287	74.3210662250208	88.6062	92.2681
71.5975194293622	74.3219636870556	92.4623	94.734
71.5975194293622	74.3219636870556	94.0924	96.5838
73.2860427743355	74.3225454301675	95.504	96.351
74.7077077048475	74.3230354783952	95.7576	96.9635
74.7077077048475	74.3230354783952	95.0373	98.5247
75.7817952250648	74.3234073408846	98.2349	98.4363
76.692113756953	74.3237226694866	94.4828	106.1237
76.6921218758377	74.3237226306908	104.1034	98.3317
76.6921218758377	74.3237226306908	95.6122	103.8055
76.6883854568519	74.2922195145166	98.8373	99.4165
76.6883854568519	74.2922195145166	103.8628	98.4843
76.6756488118492	74.1848069150551	103.2876	94.1817
76.6756488118492	74.1848069150551	104.1728	96.9352
76.6620543286026	74.0701488819343	104.3693	90.8389
76.6620543286026	74.0701488819343	105.6506	92.4297
76.6479719686061	73.9513680439509	104.5599	87.8351
76.6342649872436	73.8357543523029	104.3617	84.8664
76.6342649872436	73.8357543523029	102.0461	86.7072
76.6202281266957	73.7173539104732	101.1477	85.2681
76.6065477283179	73.6019617014494	103.1106	83.2736
76.6065477283179	73.6019617014494	102.2936	85.0217
76.5926754876876	73.4849495848581	103.6911	80.62
76.5926754876876	73.4849495848581	103.8313	82.5056
76.5787310184562	73.3673296933885	107.981	80.0957
76.5787310184562	73.3673296933885	107.2392	85.9448
76.5643383749272	73.2459291066133	108.1531	76.0691
76.5500517854535	73.1254242628543	101.2985	78.2917
76.5356266193707	73.0037493468459	100.0565	80.1054
76.5211641862249	72.8817602503953	99.1261	78.6323
76.5211641862249	72.8817602503953	98.9119	80.0767
76.5063555636837	72.756852173572	98.5933	78.8152
76.4917978823426	72.6340626845521	97.1852	78.7831
76.4917978823426	72.6340626845521	97.7624	79.6432
76.4770227932983	72.5094403515806	98.567	80.2017
76.4770227932983	72.5094403515806	98.2007	80.5294
76.4621043276205	72.3836103515584	98.2345	80.86
76.4621043276205	72.3836103515584	97.3132	81.5365
76.4470457289304	72.2565996549374	97.4314	81.946
76.4470457289304	72.2565996549374	97.8831	81.9659
76.4318481173846	72.1284175883483	97.0865	83.6094
76.4318481173846	72.1284175883483	101.0606	82.9382
76.4165004975213	71.9989714913395	96.9541	82.6989
76.4165004975213	71.9989714913395	96.8706	83.0827
76.4011032066351	71.8691078593802	94.9909	83.4209
76.4011032066351	71.8691078593802	96.9343	84.943
76.3854347244233	71.7369572940867	95.9325	86.7596
76.3700055671154	71.6068251847086	96.2545	87.1498
76.3700055671154	71.6068251847086	97.7943	87.7833
76.3543637514872	71.4748989236398	99.0152	86.155
76.3543637514872	71.4748989236398	98.3726	88.4744
76.3383635110055	71.3399498514458	100.7126	88.5952
76.3226031183878	71.2070241036011	102.4507	89.6037
76.3226031183878	71.2070241036011	100.8882	91.1406
76.3062805529091	71.0693562182797	100.5649	91.4192
76.3062805529091	71.0693562182797	101.602	92.3175
76.2891256289451	70.9246672974827	102.0076	93.075
76.2717422310394	70.7780516160299	101.583	94.8217
76.2717422310394	70.7780516160299	101.8123	94.891
76.2511734984035	70.6045671613824	99.3782	93.0601
76.2511734984035	70.6045671613824	100.6204	94.7646
76.2286921438384	70.4149490130303	98.656	92.6213
76.2060158828585	70.2236875744217	98.9319	91.3958
76.2060158828585	70.2236875744217	98.853	91.6792
76.1820717742634	70.0217277621358	99.3434	90.9979

Solution x	Solution y	Original x	Original y
76.1579036421992	69.8178794456205	96.8345	90.0197
76.1579036421992	69.8178794456205	98.1138	89.594
76.1329111608425	69.6070748067741	96.5235	92.1962
76.1329111608425	69.6070748067741	97.0347	92.0258
76.1067606717646	69.3864999679943	92.5654	91.5305
76.1067606717646	69.3864999679943	95.2026	90.5293
76.0797490051677	69.1586577239703	93.1284	88.6615
76.0797490051677	69.1586577239703	92.7178	89.1801
76.0520579914001	68.9250825100607	93.0994	86.3608
76.0520579914001	68.9250825100607	93.9684	87.8762
76.0237311483437	68.6861426235947	92.288	83.6157
76.0237311483437	68.6861426235947	93.4941	85.8189
75.994705369943	68.441304885688	91.1677	84.1211
75.9657657504935	68.1971957212061	89.5631	83.3752
75.9657657504935	68.1971957212061	91.14	83.5499
75.9360603824066	67.9466219049577	88.6759	82.3658
75.906515719865	67.6974056141103	89.95	80.2132
75.906515719865	67.6974056141103	88.0687	81.4777
75.8765530331558	67.4446608544713	92.1151	81.2598
75.8765530331558	67.4446608544713	93.2494	81.8793
75.84578613794	67.1851288335069	94.0795	80.8773
75.8151809603095	66.926963043969	93.1133	78.1389
75.8151809603095	66.926963043969	92.6699	80.64
75.7839567738565	66.6635716224573	91.1291	78.4897
75.7839567738565	66.6635716224573	91.86	79.7087
75.7523004106862	66.3965334272289	91.0116	75.887
75.7523004106862	66.3965334272289	89.835	77.746
75.7200037513367	66.1240916474932	94.4072	76.9857
75.6879758463921	65.8539200772209	96.1169	76.0362
75.6879758463921	65.8539200772209	94.6945	78.572
75.6551117387485	65.5766894006088	93.9524	73.145
75.6551117387485	65.5766894006088	94.549	73.3405
75.6213804776349	65.2921411495773	96.2521	73.5638
75.5880666771201	65.0111184816973	95.9481	74.251
75.5880666771201	65.0111184816973	97.5653	74.5618
75.5541470317022	64.7249871065277	103.5291	67.906
75.5541470317022	64.7249871065277	97.816	74.8015
75.5186253821773	64.4253258815984	97.9014	66.9835
75.5186253821773	64.4253258815984	102.9023	68.4164
75.4835912762845	64.1297872376095	102.6402	60.9181
75.4835912762845	64.1297872376095	101.778	67.1686
75.4485093714803	63.8338500019867	99.0429	61.6589
75.4485093714803	63.8338500019867	100.6854	61.817
75.4131464743404	63.5355441510322	99.3413	60.508
75.378137372329	63.2402247501111	99.4285	63.8276
75.3430891908322	62.944576747505	98.4228	65.0226
75.3430891908322	62.944576747505	98.4258	65.8894
75.3074596766839	62.6440206528172	94.6798	69.1984
75.2719465405335	62.3444478880329	93.9444	64.9
75.2719465405335	62.3444478880329	93.0933	68.7697
75.2356852079211	62.0385563597958	94.6788	63.8911
75.1997302754342	61.7352545880204	93.5538	62.1822
75.1997302754342	61.7352545880204	94.5987	62.0376
75.1635092735268	61.4297068383028	95.4724	61.7777
75.1635092735268	61.4297068383028	96.4356	62.0951
75.1267426928277	61.1195550136665	95.479	61.1306
75.0903903112501	60.8129023937917	94.6583	60.3511
75.0903903112501	60.8129023937917	95.1558	61.2395
75.0536443292662	60.5029251855408	94.8477	58.3247
75.0536443292662	60.5029251855408	95.9041	59.3009
75.0164438090111	60.1891118778124	94.4551	58.0456
74.979685314843	59.8790323196034	94.6877	57.1733
74.979685314843	59.8790323196034	95.4289	57.3916
74.9427652196935	59.5675867263339	92.9131	56.6287
74.9427652196935	59.5675867263339	92.8209	56.9207
74.9056513021179	59.2545044778011	93.2379	56.4517
74.8690410815486	58.9456751323192	92.1982	53.9806
74.8690410815486	58.9456751323192	93.3932	53.1876
74.8322114175003	58.6349919310293	95.0304	53.2116
74.7957561214527	58.3274673646985	96.8097	54.0588
74.7594801179334	58.0214569981327	98.2152	53.7701
74.7594801179334	58.0214569981327	97.9579	54.2407
74.7231114859962	57.7146638334696	98.7715	55.3698
74.7231114859962	57.7146638334696	98.9521	56.5952
74.686615145727	57.4067937465914	97.3108	57.82
74.686615145727	57.4067937465914	98.8606	57.9963
74.6496888312296	57.0952943263333	99.7259	57.0659
74.6496888312296	57.0952943263333	99.9754	58.6633
74.6122946949455	56.779846735525	102.1595	55.9791
74.6122946949455	56.779846735525	102.8738	56.4102

Solution x	Solution y	Original x	Original y
74.5748189477933	56.4637194085969	106.6231	51.946
74.5748189477933	56.4637194085969	103.9916	60.6173
74.5348430282658	56.1264862809842	100.6388	53.8259
74.4962918470874	55.8012764444252	100.5945	52.9653
74.457647880341	55.475286549333	99.5817	52.1789
74.457647880341	55.475286549333	100.3439	52.2486
74.4187472591581	55.1471260203339	99.0651	51.1078
74.4187472591581	55.1471260203339	99.5987	51.3246
74.3798418889209	54.8189270376705	98.2004	50.3921
74.3798418889209	54.8189270376705	98.1036	50.8139
74.3409928622914	54.4912052840292	97.7455	51.8526
74.3409928622914	54.4912052840292	97.7133	51.9341
74.301950928153	54.1618555027164	94.3452	48.7818
74.301950928153	54.1618555027164	96.0562	52.3857
74.2625719146934	53.8296594741978	93.0102	50.1223
74.2234661087634	53.4997721043897	90.3356	51.1932
74.2234661087634	53.4997721043897	92.412	50.9961
74.18412604475	53.1679033539049	91.1842	48.1207
74.18412604475	53.1679033539049	93.3823	48.5086
74.1445256887538	52.8338379038017	91.9756	47.4725
74.1052291376251	52.5023353988996	91.9732	45.8332
74.0660703125791	52.1719970281135	89.352	47.1855
74.0660703125791	52.1719970281135	90.4865	46.0315
74.0269252315533	51.8417712676708	87.8413	47.1867
74.0269252315533	51.8417712676708	87.5129	47.9594
73.9874620701349	51.5088579876703	89.3464	46.1786
73.9484131976233	51.1794426137257	90.0385	42.8005
73.9484131976233	51.1794426137257	89.5287	45.4109
73.9093911752102	50.8502495212776	90.1236	40.724
73.9093911752102	50.8502495212776	90.4784	41.2284
73.8707491014254	50.5242634952576	89.0134	41.3658
73.8707491014254	50.5242634952576	89.3668	41.343
73.8324020175692	50.2007666700098	85.9182	41.843
73.8324020175692	50.2007666700098	88.4465	41.4478
73.7942845787155	49.8792067266738	87.5583	39.2312
73.7942845787155	49.8792067266738	87.2346	40.5435
73.7565251147855	49.5606677345947	89.1249	38.0318
73.7565251147855	49.5606677345947	90.014	39.915
73.718785499179	49.242295432681	91.1655	36.0648
73.6816412512068	48.9289480622546	91.9372	36.8319
73.6447817840439	48.6180056656004	91.8795	37.1845
73.6447817840439	48.6180056656004	93.6083	38.4774
73.6077992727392	48.3060210214009	94.1971	38.0204
73.5714479250753	47.9993662864105	93.6941	39.0671
73.5714479250753	47.9993662864105	94.3087	39.6383
73.5352032006205	47.6936089613213	92.8093	39.7693
73.5352032006205	47.6936089613213	92.634	40.1716
73.4991416250514	47.3893971731951	92.1801	41.0349
73.4991416250514	47.3893971731951	92.2396	41.0703
73.4628634035753	47.0833558707127	93.2846	41.9379
73.4270451171618	46.781199420585	93.9129	43.6355
73.4270451171618	46.781199420585	94.5355	44.3621
73.3904454676479	46.4724437332546	94.4684	44.7163
73.3539213532723	46.1643247432097	95.46	44.379
73.3173237981889	45.8555876728003	94.5838	45.9916
73.3173237981889	45.8555876728003	97.5519	44.8528
73.2801119207288	45.5416602376979	96.8865	41.9997
73.2801119207288	45.5416602376979	96.6284	43.246
73.2427096547743	45.2261253433924	96.2133	40.5576
73.2427096547743	45.2261253433924	96.2085	41.8253
73.205214420593	44.9098057121505	98.3613	42.0392
73.205214420593	44.9098057121505	98.0763	43.3554
73.1673432422073	44.5903107142073	98.0879	44.5657
73.1673432422073	44.5903107142073	102.0152	42.2262
73.1288740404508	44.265764382707	98.7317	39.6579
73.1288740404508	44.265764382707	99.6903	41.4772
73.090097320613	43.9386203669833	97.0806	39.3994
73.090097320613	43.9386203669833	98.4033	39.6451
73.0510732016828	43.6093862300264	95.8598	39.2349
73.0510732016828	43.6093862300264	97.0063	39.6578
73.0117429550926	43.2775657639824	95.1298	37.6897
73.0117429550926	43.2775657639824	96.5473	37.5774
72.9722802408794	42.9446256362516	96.6051	36.0943
72.9722802408794	42.9446256362516	98.5859	34.5756
72.9329533965779	42.6128314961393	95.0864	33.2234
72.9329533965779	42.6128314961393	95.8908	32.6754
72.8939972916704	42.2841669622449	96.3928	32.1668
72.8939972916704	42.2841669622449	96.2582	32.5713
72.8554531514361	41.9589797638226	99.0228	31.9463
72.8554531514361	41.9589797638226	98.5493	33.1624

Solution x	Solution y	Original x	Original y
72.8173396284785	41.6374263716075	98.9301	33.2654
72.8173396284785	41.6374263716075	101.1976	33.4905
72.7795465337254	41.3185760347303	100.5275	34.9543
72.7795465337254	41.3185760347303	103.4615	37.3033
72.7416172540366	40.9985726753398	108.656	34.8419
72.7416172540366	40.9985726753398	107.8221	37.3636
72.7097526079863	40.8574660987704	104.0844	32.9988
72.6799155626309	40.7253621937251	102.9211	31.879
72.6517169693709	40.6005315873855	105.5782	30.6326
72.6517169693709	40.6005315873855	106.6895	31.0233
72.6333911713833	40.519557511435	106.8535	30.7643
72.6151248919135	40.4388309884589	105.6149	29.5786
72.6151248919135	40.4388309884589	106.1692	29.0085
72.5949609251639	40.3496299381178	102.211	28.3893
72.5949609251639	40.3496299381178	105.0575	26.2706
72.5734255532118	40.2543044547314	102.9016	24.8202
72.5734255532118	40.2543044547314	104.9423	23.521
72.5427457029479	40.2201989089501	102.4997	24.4075
72.5123995221969	40.1864640754634	97.1071	18.8552
72.5123995221969	40.1864640754634	99.0428	19.6959
72.4813072231865	40.1518995079448	98.3241	22.4412
72.4506661716499	40.1178365304665	98.3827	22.3334
72.4506661716499	40.1178365304665	100.384	25.6874
72.4193306417648	40.0830014732506	100.6297	27.3107
72.3884504705023	40.0486725911727	101.5683	27.6266
72.3884504705023	40.0486725911727	101.7295	28.4449
72.3571045814328	40.013825928604	97.9141	29.0493
72.3571045814328	40.013825928604	99.272	31.5703
72.3252001811102	39.9783583590812	97.4429	30.1528
72.2937075085881	39.9433484739877	96.156	30.1327
72.2937075085881	39.9433484739877	97.1838	29.5842
72.2619400238308	39.9080330509854	93.9312	28.9768
72.2619400238308	39.9080330509854	96.0238	29.4057
72.2296774878736	39.8721672962166	97.5011	28.0267
72.1977018130754	39.836620405733	97.3283	27.0933
72.1657727653991	39.8011253594735	93.6487	25.1273
72.1657727653991	39.8011253594735	97.0499	25.7334
72.1337979492467	39.7655794702367	92.5592	25.4331
72.1337979492467	39.7655794702367	92.942	26.4511
72.1019179311183	39.7301390196944	90.6179	26.4649
72.1019179311183	39.7301390196944	90.6435	28.0536
72.0701498011603	39.6948229820591	90.72	30.049
72.0701498011603	39.6948229820591	93.4265	31.4744
72.0383493265431	39.6594709928397	92.4351	33.0022
72.0383493265431	39.6594709928397	92.7124	33.4453
72.0062808115941	39.6238210074711	91.0332	34.8187
71.9744113833447	39.5883923333103	87.5726	32.8781
71.9744113833447	39.5883923333103	88.2545	36.066
71.942450469492	39.5528619062293	85.065	35.2948
71.942450469492	39.5528619062293	86.5983	36.2039
71.9102622918845	39.5170787904902	86.512	33.4131
71.8782900088683	39.4815357097746	85.525	32.0217
71.8782900088683	39.4815357097746	85.1876	33.113
71.8462033677045	39.4458655232621	79.7169	32.9378
71.8143887217147	39.4104977422489	75.4748	37.8532
71.8143887217147	39.4104977422489	74.5598	39.2546
71.7826279621159	39.375189805558	75.9022	40.5634
71.7826279621159	39.375189805558	75.9853	41.4015
71.7509076433325	39.3399267798545	77.5882	39.4219
71.7509076433325	39.3399267798545	75.73	42.7229
71.7193751424468	39.3048725161926	81.9079	40.1742
71.7193751424468	39.3048725161926	80.8076	41.6004
71.6881494791935	39.2701593443699	80.8872	43.1227
71.6881494791935	39.2701593443699	79.9479	46.2913
71.6573615141663	39.2359326885186	77.9223	44.6051
71.6573615141663	39.2359326885186	77.8794	45.0468
71.6271388738274	39.2023344293758	79.533	47.2684
71.5971777407433	39.1690268560607	80.0004	48.0282
71.5667361430202	39.1351851489045	77.9078	47.2474
71.535710285207	39.1006939200238	76.4125	46.981
71.5047801672859	39.0663092016832	94.5726	47.3613
71.5047801672859	39.0663092016832	95.0864	47.4256
71.5047801672859	39.0663092016832	95.1396	47.3596
71.5047801672859	39.0663092016832	95.7654	46.8722
71.5047801672859	39.0663092016832	96.2485	47.1277
71.5047801672859	39.0663092016832	99.7789	45.6905
71.5047801672859	39.0663092016832	100.0845	45.3198
71.5047801672859	39.0663092016832	98.9198	48.0008
71.5047801672859	39.0663092016832	101.161	45.7653
71.5047801672859	39.0663092016832	100.6036	46.802

Solution x	Solution y	Original x	Original y
71.5047801672859	39.0663092016832	103.0838	43.6629
71.5047801672859	39.0663092016832	103.3956	43.6231
71.5047801672859	39.0663092016832	102.543	45.6081
71.5047801672859	39.0663092016832	100.8862	48.4618
71.5047801672859	39.0663092016832	101.377	48.1816
71.5047801672859	39.0663092016832	104.1102	44.8822
71.5047801672859	39.0663092016832	103.8959	45.4099
71.5047801672859	39.0663092016832	101.7941	49.0832
71.5047801672859	39.0663092016832	102.9297	48.0592
71.5047801672859	39.0663092016832	103.8062	50.1176
71.5047801672859	39.0663092016832	105.6501	47.8555
71.5047801672859	39.0663092016832	106.4442	49.0895
71.4084018840896	38.9591639268685	73.6395	46.5004
71.3038488638219	38.8429292683279	50.5738	30.8854
71.3038488638219	38.8429292683279	51.0819	30.8837
71.3038488638219	38.8429292683279	50.8592	31.2824
71.3038488638219	38.8429292683279	50.3723	32.2399
71.3038488638219	38.8429292683279	51.473	33.7115
71.3038488638219	38.8429292683279	50.1654	34.298
71.3038488638219	38.8429292683279	51.7623	34.8081
71.3038488638219	38.8429292683279	51.6292	37.4529
71.3038488638219	38.8429292683279	53.589	37.6567
71.3038488638219	38.8429292683279	50.3352	41.2014
71.3038488638219	38.8429292683279	64.4232	44.0581
71.3038488638219	38.8429292683279	67.4955	46.0347
71.3038488638219	38.8429292683279	65.7303	47.3671
71.3038488638219	38.8429292683279	67.6648	48.1141
71.3038488638219	38.8429292683279	70.4096	46.4113
71.3038488638219	38.8429292683279	68.7356	47.889
71.3038488638219	38.8429292683279	67.5609	49.631
71.3038488638219	38.8429292683279	70.6191	48.182
71.3038488638219	38.8429292683279	67.7991	50.1342
71.3038488638219	38.8429292683279	72.0385	47.603
71.3038488638219	38.8429292683279	66.949	50.6855
71.3038488638219	38.8429292683279	70.7664	48.6137
71.3038488638219	38.8429292683279	71.8327	48.0379
71.3038488638219	38.8429292683279	66.2863	51.2705
71.3038488638219	38.8429292683279	73.2561	47.9132
71.3038488638219	38.8429292683279	70.6462	49.6735
71.3038488638219	38.8429292683279	70.0624	50.1219
71.3038488638219	38.8429292683279	61.2083	54.3519
71.3038488638219	38.8429292683279	72.0723	49.2863
71.3038488638219	38.8429292683279	69.1689	51.2673
71.3038488638219	38.8429292683279	73.2401	49.0047
71.3038488638219	38.8429292683279	71.8965	50.0142
71.3038488638219	38.8429292683279	71.0505	50.768
71.3038488638219	38.8429292683279	73.5268	49.2611
71.3038488638219	38.8429292683279	69.4154	51.8752
71.3038488638219	38.8429292683279	74.8417	48.5823
71.3038488638219	38.8429292683279	70.8564	51.5507
71.3038488638219	38.8429292683279	75.5201	48.6107
71.3038488638219	38.8429292683279	70.1179	52.2878
71.3038488638219	38.8429292683279	67.8488	53.6384
71.3038488638219	38.8429292683279	72.1444	51.2772
71.3038488638219	38.8429292683279	68.022	53.7678
71.3038488638219	38.8429292683279	73.6611	50.4924
71.3038488638219	38.8429292683279	75.5587	49.1352
71.3038488638219	38.8429292683279	70.2011	52.705
71.3038488638219	38.8429292683279	69.1565	53.343
71.3038488638219	38.8429292683279	76.379	48.6237
71.3038488638219	38.8429292683279	74.4488	50.3129
71.3038488638219	38.8429292683279	66.0257	55.1875
71.3038488638219	38.8429292683279	73.911	51.0144
71.3038488638219	38.8429292683279	77.6289	48.4559
71.3038488638219	38.8429292683279	72.0304	52.5053
71.3038488638219	38.8429292683279	72.0955	52.6394
71.3038488638219	38.8429292683279	70.916	53.3608
71.3038488638219	38.8429292683279	75.2757	50.6388
71.3038488638219	38.8429292683279	77.4079	49.147
71.3038488638219	38.8429292683279	68.2826	55.0673
71.3038488638219	38.8429292683279	70.694	53.8562
71.3038488638219	38.8429292683279	71.2619	53.5794
71.3038488638219	38.8429292683279	76.0043	50.5809
71.3038488638219	38.8429292683279	69.8977	54.8286
71.3038488638219	38.8429292683279	73.3859	52.8201
71.3038488638219	38.8429292683279	69.2681	55.3133
71.3038488638219	38.8429292683279	78.2967	50.1808
71.3038488638219	38.8429292683279	74.3979	53.0985
71.3038488638219	38.8429292683279	76.2244	51.9684
71.3038488638219	38.8429292683279	68.5789	56.8701

Solution x	Solution y	Original x	Original y
71.3038488638219	38.8429292683279	76.5498	52.218
71.3038488638219	38.8429292683279	80.3964	49.7264
71.3038488638219	38.8429292683279	67.4683	58.2291
71.3038488638219	38.8429292683279	69.9782	57.1009
71.3038488638219	38.8429292683279	73.8072	55.2741
71.3038488638219	38.8429292683279	70.5527	57.3223
71.3038488638219	38.8429292683279	80.7698	50.729
71.3038488638219	38.8429292683279	72.7757	56.7077
71.3038488638219	38.8429292683279	70.1344	58.5671
71.3038488638219	38.8429292683279	78.0993	54.3894
71.3038488638219	38.8429292683279	73.2116	57.797
71.3038488638219	38.8429292683279	73.7963	57.8273
71.3038488638219	38.8429292683279	77.8264	55.5164
71.3038488638219	38.8429292683279	83.5076	51.7826
71.3038488638219	38.8429292683279	82.0477	53.0979
71.3038488638219	38.8429292683279	84.6532	51.7406
71.3038488638219	38.8429292683279	85.9154	51.5363
71.3038488638219	38.8429292683279	77.9705	58.8491
71.3038488638219	38.8429292683279	81.1686	57.7423
71.3038488638219	38.8429292683279	89.6611	52.1615
71.3038488638219	38.8429292683279	87.1149	58.1702
71.3038488638219	38.8429292683279	89.2688	56.3248
71.3038488638219	38.8429292683279	85.8477	60.7859
71.3038488638219	38.8429292683279	88.0225	60.7529
71.3038488638219	38.8429292683279	86.2321	62.729
71.3038488638219	38.8429292683279	90.2672	64.2791
71.3038488638219	38.8429292683279	88.7937	67.447
71.3038488638219	38.8429292683279	92.749	64.7326
71.3038488638219	38.8429292683279	92.0851	66.8651
71.0709183134793	38.5839668311749	72.9198	44.5581
71.0709183134793	38.5839668311749	73.6428	45.1426
70.8402596157116	38.3275312745274	72.7013	43.6681
70.8402596157116	38.3275312745274	73.2283	44.0709
70.6077424499245	38.0690297656951	72.4926	42.7909
70.6077424499245	38.0690297656951	72.9378	43.4347
70.3713505065118	37.8062201503423	72.4429	44.8985
70.1347227104804	37.543148414922	70.5497	45.0925
69.8966163641331	37.2784329255456	68.0366	38.8903
69.8966163641331	37.2784329255456	65.3289	43.5846
69.6561470360095	37.0110896874423	66.7168	38.698
69.4171360842005	36.7453684596327	65.211	38.9167
69.4171360842005	36.7453684596327	64.8516	39.5774
69.1765983869417	36.4779493155311	64.2784	38.8059
68.9374089422229	36.2120295914362	62.0243	36.102
68.9374089422229	36.2120295914362	62.6603	37.129
68.6974056971814	35.9452047230093	60.9493	37.7343
68.4589107194251	35.6800568986712	61.1452	36.2851
68.2214250057887	35.41603148418	61.5106	34.0654
68.2214250057887	35.41603148418	60.137	35.2014
67.9846796803912	35.152828992125	60.8351	33.4935
67.9846796803912	35.152828992125	61.1622	34.1592
67.7490112666011	34.8908238784848	58.4334	33.3219
67.7490112666011	34.8908238784848	58.126	35.24
67.5147691245522	34.6304045831468	56.2795	36.0371
67.5147691245522	34.6304045831468	58.8785	37.4935
67.2798496141022	34.3692319330059	55.9275	34.3566
67.047074844089	34.1104442465562	53.8796	31.7093
67.047074844089	34.1104442465562	54.3132	33.4794
66.8153802572922	33.8528573364726	52.5136	31.162
66.5867783045851	33.5987093225071	54.8257	29.6059
66.5867783045851	33.5987093225071	54.7376	29.7596
66.3603122767477	33.3469360115663	52.7074	28.2489
66.3603122767477	33.3469360115663	53.915	28.4629
66.13710613134	33.0987872555442	54.5895	27.7676
66.13710613134	33.0987872555442	55.1607	27.7715
65.9164807796928	32.8535079658375	55.4854	26.8201
65.9164807796928	32.8535079658375	55.089	27.0379
65.6969357646687	32.6094298726647	56.8778	27.618
65.4797783144671	32.3680064977655	58.9981	26.6128
65.2639641438794	32.1280769302075	58.5931	27.1316
65.2639641438794	32.1280769302075	59.5552	26.5288
65.0489677045345	31.8890564826011	57.9508	29.6187
65.0489677045345	31.8890564826011	58.6228	31.6703
64.8343763100421	31.650486384732	60.1802	30.671
64.8343763100421	31.650486384732	60.463	30.4795
64.6187770974601	31.4107958303314	63.2951	31.2899
64.4049761065631	31.1731048565405	64.2717	31.7627
64.4049761065631	31.1731048565405	63.5739	32.9982
64.1874170787417	30.9312353715374	62.464	33.4003
63.9707362334602	30.6903423325146	63.453	34.6286

Solution x	Solution y	Original x	Original y
63.7541677918957	30.4495744252712	63.8645	34.3723
63.7541677918957	30.4495744252712	64.9829	35.6055
63.5352805355475	30.2062279373312	67.4673	33.2544
63.5352805355475	30.2062279373312	66.9624	36.7077
63.3139245779821	29.9601362692218	65.4552	32.6167
63.3139245779821	29.9601362692218	66.5887	34.1226
63.0911125891673	29.7124254777556	68.3701	31.308
63.0911125891673	29.7124254777556	67.7055	32.9993
62.866290718356	29.4624797436768	72.6191	32.6684
62.866290718356	29.4624797436768	72.2401	34.2889
62.6367206283027	29.2072541973128	73.7989	28.6287
62.6367206283027	29.2072541973128	71.5231	31.8286
62.4034754701795	28.947942211844	69.5886	28.6002
62.4034754701795	28.947942211844	69.1853	30.9522
62.1678805428795	28.6860174537482	70.5469	25.0661
62.1678805428795	28.6860174537482	70.1037	27.3839
61.9307177970399	28.4223494939244	68.3676	27.331
61.9307177970399	28.4223494939244	68.2062	28.5319
61.6904271346247	28.1552036413574	67.5765	27.7962
61.4513591446	27.8894174927273	67.242	26.9141
61.4513591446	27.8894174927273	66.7482	27.6121
61.2082794847187	27.6191706556551	67.8857	28.9512
60.9654574910256	27.3492105222258	66.7818	30.0369
60.9654574910256	27.3492105222258	67.6588	29.7348
60.7173018573758	27.0733196371169	63.132	27.7543
60.7173018573758	27.0733196371169	64.1748	30.2745
60.4643665275731	26.7921140601477	62.9268	27.0211
60.2125175960665	26.512116645894	61.643	23.6955
60.2125175960665	26.512116645894	63.3607	23.5913
59.9594214070268	26.2307320656116	63.3795	20.1125
59.9594214070268	26.2307320656116	62.5649	23.4331
59.7046428597383	25.9474766926764	55.9782	19.9329
59.4532170360754	25.6679494404034	53.2794	21.4994
59.4532170360754	25.6679494404034	54.0368	23.8586
59.2026929031239	25.3894244979771	54.2786	24.4277
59.2026929031239	25.3894244979771	54.6523	25.2022
58.9501987600066	25.1087088688023	50.8742	24.2729
58.9501987600066	25.1087088688023	50.1386	26.6573
58.6961065622501	24.8262160442948	49.1449	22.3659
58.4445990619253	24.5465972507757	49.9475	19.2284
58.4445990619253	24.5465972507757	49.9971	19.9155
58.1946241417238	24.2686822534736	49.3862	17.5735
58.1946241417238	24.2686822534736	49.1677	19.2175
57.9455154063904	23.9917302453634	51.539	18.7116
57.6988109190035	23.717451425788	52.1655	19.1446
57.4529265271012	23.4440845120417	51.6732	17.1776
57.4529265271012	23.4440845120417	52.4859	17.4578
57.2061566482835	23.1697327759901	52.0827	15.9727
56.9619374834155	22.8982172420999	53.7123	16.59
56.9619374834155	22.8982172420999	53.9046	16.3668
56.7165880843291	22.6254448570397	55.8132	15.4408
56.4733075271917	22.3549728992995	53.965	12.2967
56.4733075271917	22.3549728992995	53.4554	15.0784
56.2308113578013	22.0853730600553	57.2331	12.7874
56.2308113578013	22.0853730600553	58.6318	9.4344
55.9882264208723	21.8156746155795	61.7542	11.527
55.7448713596645	21.5451202131916	62.7821	-0.0838
55.7448713596645	21.5451202131916	63.8119	26.0212
55.4948954410216	21.2672036233097	64.6914	7.7788
55.2482024572579	20.9929369812008	61.565	4.5717
55.2482024572579	20.9929369812008	63.4243	4.3429
55.0030179351125	20.7203473073064	62.5325	1.766
55.0030179351125	20.7203473073064	63.0749	1.8033
54.7590366835418	20.4490952716943	61.9524	-0.333
54.5190566914076	20.1822920515309	60.4719	1.0667
54.2818193454697	19.9185381986572	60.4167	1.4088
54.046586801206	19.657013421406	58.2987	1.8222
54.046586801206	19.657013421406	58.6741	1.1796
53.8140197144103	19.3984517508061	57.3839	0.9502
53.8140197144103	19.3984517508061	58.2741	0.1622
53.5841551122194	19.1428945467162	58.2864	0.0731
53.5841551122194	19.1428945467162	59.6709	-1.5476
53.3566608086995	18.889972456411	54.4331	-6.2551
53.3566608086995	18.889972456411	62.4332	-0.684
53.133313851928	18.641661331015	58.3955	-2.2935
53.133313851928	18.641661331015	57.7878	-4.3732
52.9133077511781	18.3970645445721	53.412	-4.2453
52.9133077511781	18.3970645445721	53.8048	-5.0553
52.699202029403	18.1590280224169	51.545	-0.7619
52.699202029403	18.1590280224169	53.5826	-3.7128

Solution x	Solution y	Original x	Original y
52.4887674522519	17.9250731829075	56.047	-0.6998
52.2809222132286	17.6939973864857	54.5841	1.3
52.2809222132286	17.6939973864857	54.6465	1.327
52.0743497680202	17.4643365014744	54.7597	1.1902
52.0743497680202	17.4643365014744	55.7669	1.6852
51.8676681798669	17.2345541163912	55.5686	2.3786
51.6632175053723	17.0072521912719	56.514	2.6652
51.4597633225004	16.7810583264041	56.6752	3.9284
51.4597633225004	16.7810583264041	56.6229	3.2945
51.2558913120473	16.5543996779633	57.7618	2.6586
51.0541706053511	16.330133090196	58.5415	3.6684
51.0541706053511	16.330133090196	58.0726	3.0503
50.8534354993508	16.1069621721905	58.0725	5.2013
50.8534354993508	16.1069621721905	58.8992	5.3006
50.652697793005	15.8837881274759	60.2628	6.0605
50.652697793005	15.8837881274759	60.5785	6.8128
50.4506390842211	15.6591449300033	59.4358	8.0877
50.2495921551171	15.4356266332133	55.3647	9.0137
50.2495921551171	15.4356266332133	55.5508	6.709
50.0486380029004	15.212210997764	53.4617	5.8056
50.0486380029004	15.212210997764	54.3108	6.5803
49.8483962780317	14.9895871894102	52.0607	4.6851
49.8483962780317	14.9895871894102	52.3291	3.6705
49.6496488473861	14.7686246797107	52.2056	3.4977
49.6496488473861	14.7686246797107	51.8363	2.0767
49.4522756683603	14.5491900733214	52.8937	1.339
49.4522756683603	14.5491900733214	51.7765	0.7553
49.2565090420607	14.3315417304228	49.5265	1.5006
49.2565090420607	14.3315417304228	50.9668	1.717
49.0624651937491	14.1158089013326	49.309	3.6922
49.0624651937491	14.1158089013326	48.4975	2.4432
48.869840440886	13.9016539013416	47.7278	5.7114
48.869840440886	13.9016539013416	48.7027	4.8736
48.6769986639279	13.687257563622	50.2911	5.2466
48.4857926284318	13.4746799729166	51.2901	7.6487
48.2948860970529	13.2624354878435	52.3173	10.0275
48.2948860970529	13.2624354878435	53.1154	7.9184
48.1024868215607	13.0485310959792	52.0306	12.0787
48.1024868215607	13.0485310959792	51.9742	12.9315
47.9068574316555	12.8310350832217	51.32	11.9016
47.711974770775	12.6143694179511	49.0558	10.279
47.711974770775	12.6143694179511	50.5069	12.3029
47.5164019789051	12.3969364146544	48.9393	11.7496
47.3226634843652	12.181543125226	48.2378	10.888
47.3226634843652	12.181543125226	47.6091	10.2274

Table N-32: Solution for *concentricCircles*1, Equal Radius, 2D, Euclidean

Total distance: 53.1579881919424 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
104.204656469442	106.05236217586	107	107.1414284285
103.334488808516	106.247790365839	104	109.1651513899
99.9827509509519	107.000048403291	100	110
97.1691716311145	106.402355199377	96	109.1651513899
95.1423637985732	105.041361390031	93	107.1414284285
93.3968012283053	102.326430799408	90.6	103.4117444218
93.0000001797641	100.000002851749	90	100
93.3967949181323	97.6735847665254	90.6	96.5882555782
95.1424671990395	94.958532363819	93	92.8585715715
97.1677288037547	93.598254191197	96	90.8348486101
99.9999927522002	93.0000003348359	100	90
102.832402550409	93.5983100257386	104	90.8348486101
104.856592149174	94.9575729803566	107	92.8585715715
106.609715818548	97.6902172519415	109.4	96.5882555782
107.111216883039	100.417667543385	110	100
107.272768271695	101.296349787728	109.4	103.4117444218

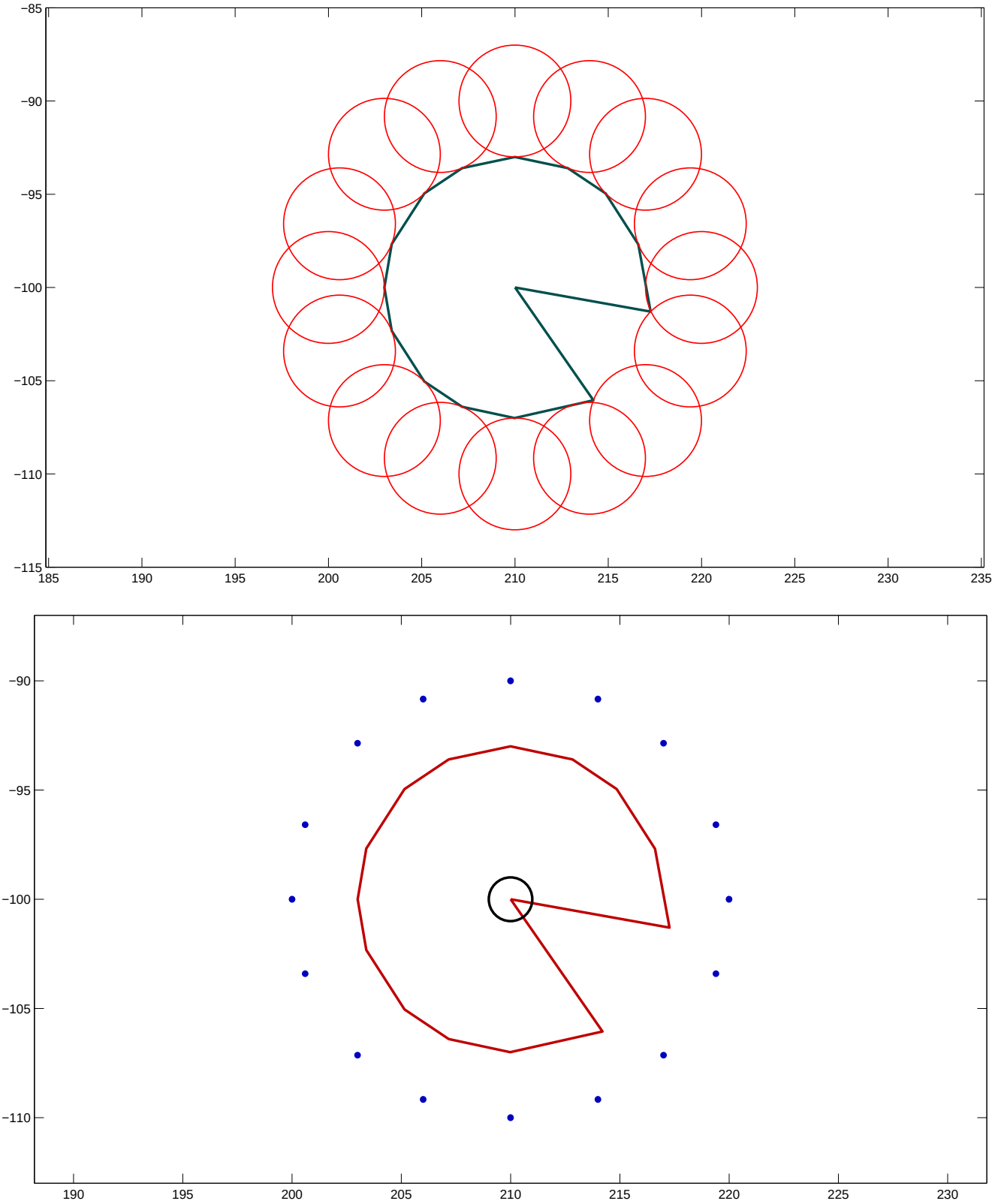


Figure N.29: *concentricCircles*1, Equal Radius, 2D, Euclidean, Length = 53.1579882

Table N-33: Solution for *concentricCircles*2, Equal Radius, 2D, Euclidean

Total distance: 153.132174922169 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
92.7371401054052	95.8470361879783	93	92.8585715715
90.8506436870497	96.5228531925326	90.6	96.5882555782
89.260522884012	97.0925684095619	90	100
82.3716256618482	98.162770362811	80	100
85.134875834311	91.7519109845779	82.5	90.3175416345
86.7358185060606	89.3610539279832	84.5	87.3607753402
91.8863783982856	85.0121175430738	90	82.6794919243
92.8564872717088	84.2615743778814	93	81.2650060048
96.7656437143782	87.9341926837572	96	90.8348486101
98.2283064558163	87.5790257467326	100	90
101.146446036186	82.7723061112372	100	80
106.18919908132	84.0117086206641	107	81.2650060048
107.496864259681	84.3330752515861	110	82.6794919243
106.660093090773	89.4477934257655	104	90.8348486101
107.680689275892	89.9368123631284	107	92.8585715715
114.090999498906	90.0093119495323	115.5	87.3607753402
114.515768764299	90.6247776743663	117.5	90.3175416345
112.310087579348	95.8592692041521	109.4	96.5882555782
117.017664657281	99.6748621895708	120	100
112.113448008045	102.129169686397	110	100
110.97904257128	104.355037758675	109.4	103.4117444218
109.916737999013	106.43952562245	107	107.1414284285
114.501228430099	109.768544862146	117.5	109.6824583655
113.516010196579	110.573642422259	115.5	112.6392246598
108.132751244186	114.972517304504	110	117.3205080757
107.143057810662	115.738399608533	107	118.7349939952
103.233105660518	112.065479461657	104	109.1651513899
101.774939055691	112.418598188947	100	110
98.8789263930315	117.217333669176	100	120
94.0279896880936	115.916619410538	93	118.7349939952
91.5866818116961	114.774441933444	90	117.3205080757
86.3370128575833	110.556392501309	84.5	112.6392246598
85.493576436578	109.87873312427	82.5	109.6824583655
90.6834842087489	106.724325024918	93	107.1414284285
91.357961812652	106.314417534675	90.6	103.4117444218
94.7599757649605	106.433418352858	96	109.1651513899

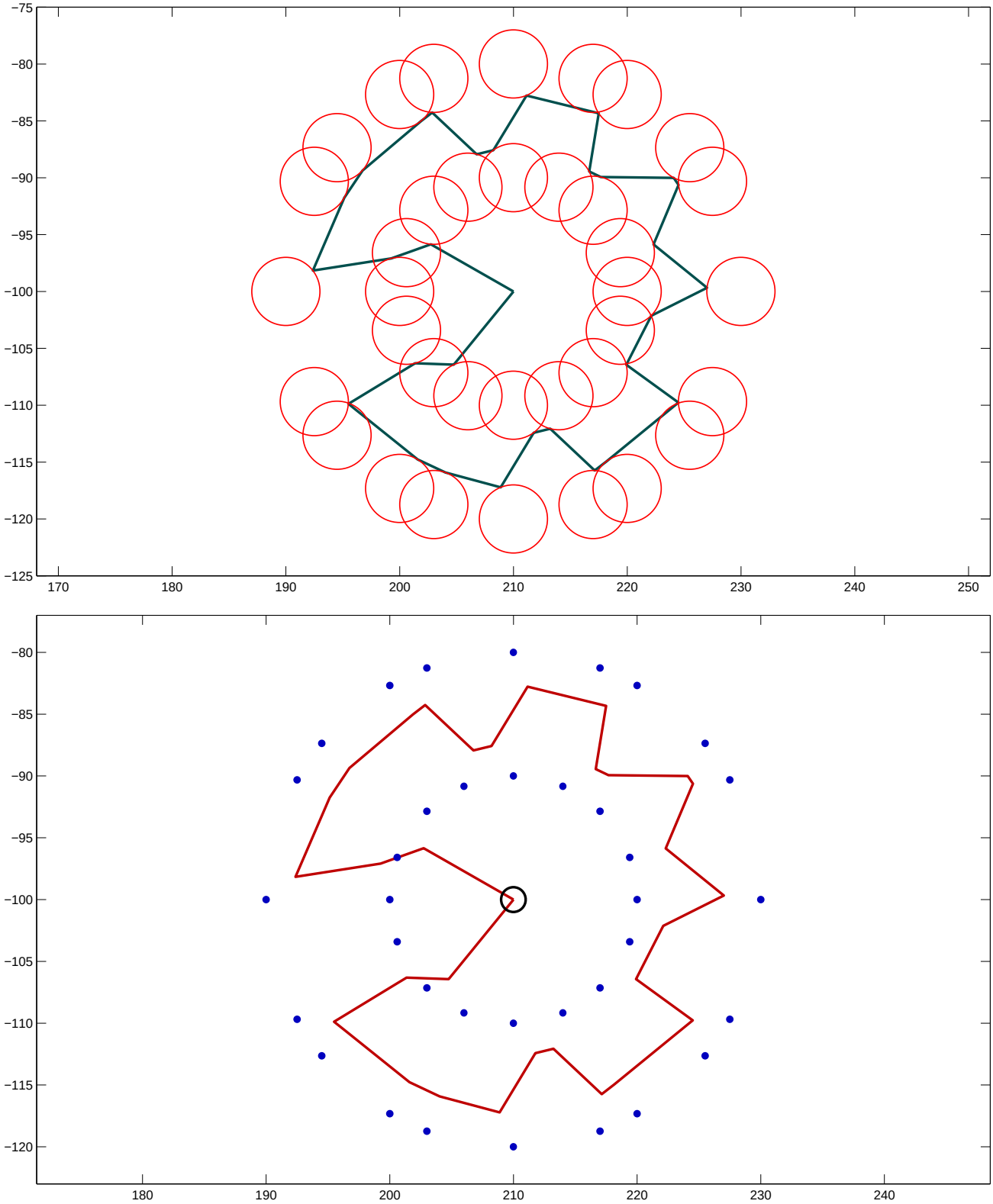


Figure N.30: *concentricCircles*2, Equal Radius, 2D, Euclidean, Length = 153.1321749

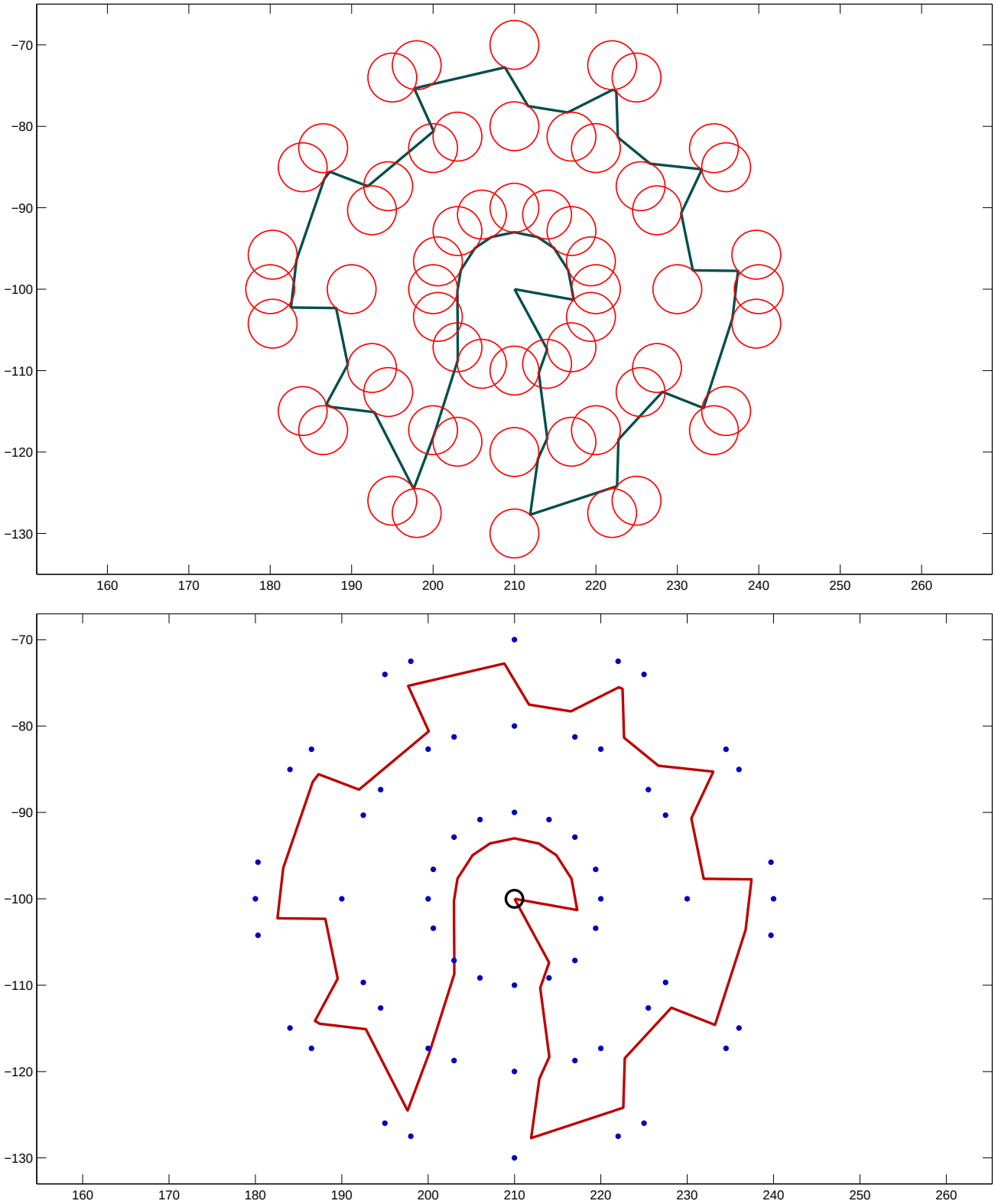


Figure N.31: *concentricCircles*3, Equal Radius, 2D, Euclidean, Length = 271.0758579

Table N-34: Solution for *concentricCircles*3, Equal Radius, 2D, Euclidean

Total distance: 271.075857929619 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
107.27280705977	101.296311116363	109.4	103.4117444218
107.114229418207	100.43393738498	110	100
106.609719724712	97.6902268513232	109.4	96.5882555782
104.856583910435	94.957564624116	107	92.8585715715
102.832405761421	93.5983115242123	104	90.8348486101
99.9999786178465	93.0000005827357	100	90
97.167830550146	93.5982115438906	96	90.8348486101
95.1416824290938	94.9593331985198	93	92.8585715715
93.4019671006711	97.6601620780018	90.6	96.5882555782
92.9911763054196	100.229916993367	90	100
93.0071854220522	103.386968333283	90.6	103.4117444218
93.0231921571952	106.543114181202	93	107.1414284285
93.0341987282344	108.713458843811	96	109.1651513899
90.1647431002871	117.754535240325	93	118.7349939952
89.7100981688165	118.967211057855	90	117.3205080757
87.6288708777954	124.518497217003	88	127.4954541697
87.5724353890924	124.437200458333	85	125.9807621135
82.7867702374141	115.101916395569	84.5	112.6392246598
77.4428704185399	114.465307951918	76.5	117.3132896932
76.8854320430647	114.145478431849	74	114.9666295471
79.5316380248342	109.247909579568	82.5	109.6824583655
78.0927140103356	102.315656661583	80	100
72.5518589334531	102.249815631736	70.3	104.2320207939
72.7869979783537	100.219875672631	70	100
73.2259473722738	96.430422286529	70.3	95.7679792061
76.6438233855011	86.4511852323174	74	85.0333704529
77.317627523477	85.5731422809018	76.5	82.6867103068
81.7731116505852	87.2714839176792	84.5	87.3607753402
82.0027956574739	87.3590297833117	82.5	90.3175416345
88.3137771389715	82.0740472044854	90	82.6794919243
90.074786678605	80.5993249691918	93	81.2650060048
87.6903794457137	75.3465898249752	85	74.0192378865
89.001313634707	75.0423775355246	88	72.5045458303
98.8286756944589	72.7618842591667	100	70
101.681975219429	77.5158574481489	100	80
106.540346079928	78.3004279488926	107	81.2650060048
112.077331212051	75.5035499933046	112	72.5045458303
112.512181127266	75.695771224599	115	74.0192378865
112.690015436021	81.351401911729	110	82.6794919243
116.658526740881	84.5934983781305	115.5	87.3607753402
122.991633226556	85.2799396216128	124.5	82.6867103068
123.012698724627	85.3091238947992	126	85.0333704529
120.478483804731	90.6762075115059	117.5	90.3175416345
121.910374288304	97.6868896982288	120	100
127.448212516061	97.7502666511561	129.7	95.7679792061
127.213090285624	99.7717126944655	130	100
126.768376440331	103.59516293266	129.7	104.2320207939
123.516070699828	113.678303297605	126	114.9666295471
123.218534487891	114.600752561919	124.5	117.3132896932
118.169010197543	112.606912959945	117.5	109.6824583655
116.627299420865	114.279209848401	115.5	112.6392246598
112.776940962531	118.455676569457	110	117.3205080757
112.597421965141	124.184201451432	115	125.9807621135
111.040896653092	124.696488972604	112	127.4954541697
101.923004751977	127.697379068685	100	130
102.881437815377	120.835057830358	100	120
104.032539331184	118.294329696923	107	118.7349939952
103.096533232248	111.165944194617	104	109.1651513899
102.984027162471	110.309171507333	100	110
104.009659398287	107.381991242891	107	107.1414284285

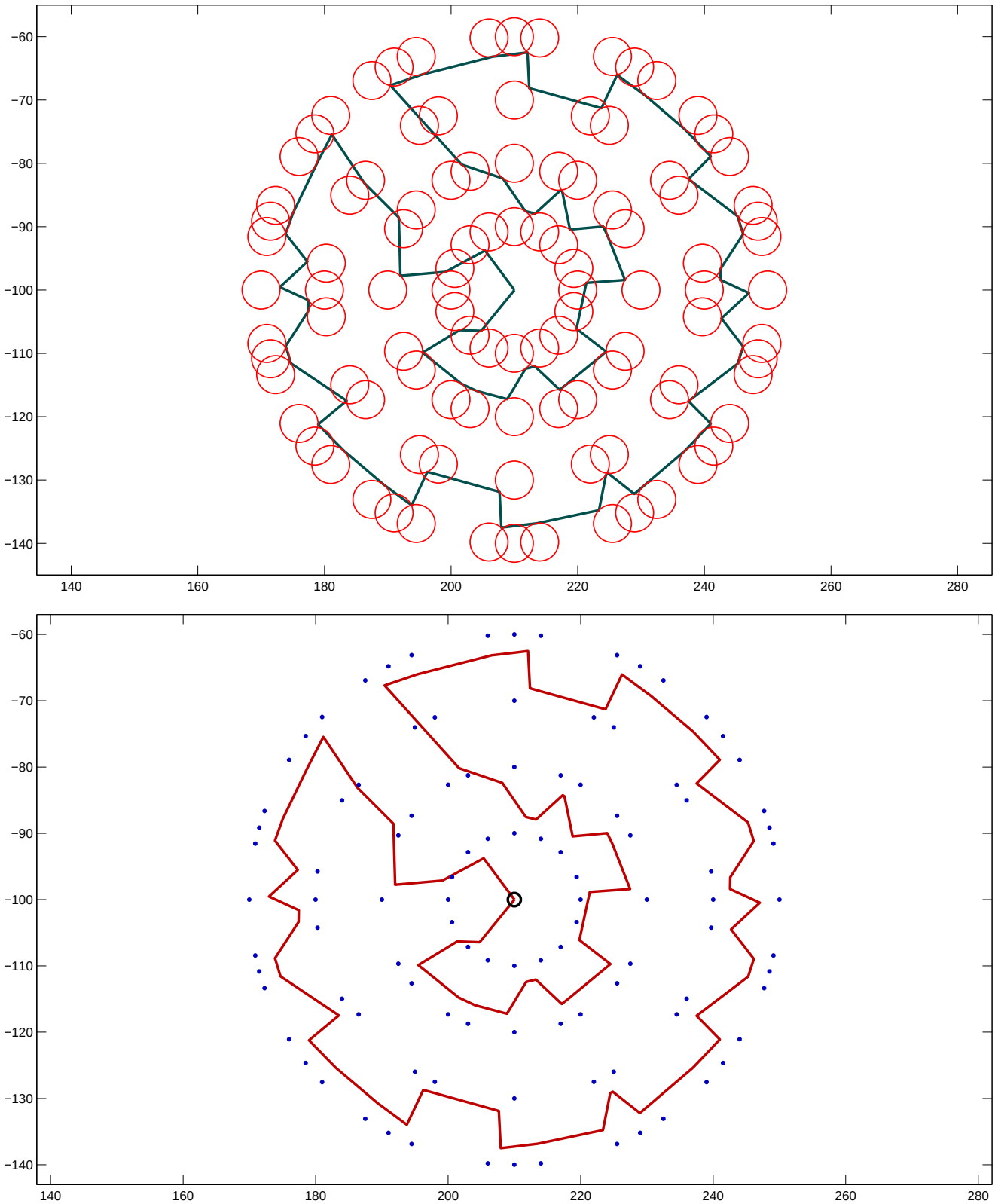


Figure N.32: *concentricCircles*4, Equal Radius, 2D, Euclidean, Length = 454.4565398

Table N-35: Solution for *concentricCircles4*, Equal Radius, 2D, Euclidean

Total distance: 454.456539837418 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
94.7599731238313	106.433419424512	96	109.1651513899
91.3582284374627	106.314348348693	90.6	103.4117444218
90.7572092439177	106.679612421256	93	107.1414284285
85.4935928429227	109.878491437033	82.5	109.6824583655
86.4503546200744	110.647282534622	84.5	112.6392246598
91.5865643681472	114.774369499942	90	117.3205080757
94.0280799286199	115.916652019183	93	118.7349939952
98.8789667580635	117.217318233619	100	120
101.774212597282	112.419131220801	100	110
103.233657500498	112.065625144455	104	109.1651513899
107.143300178557	115.738412548387	107	118.7349939952
108.12766298731	114.97653461159	110	117.3205080757
113.578380368551	110.488196351758	115.5	112.6392246598
114.500355104158	109.729009530185	117.5	109.6824583655
109.817037811192	106.10976567459	107	107.1414284285
110.42636995092	103.262380265113	109.4	103.4117444218
111.370536287506	98.8503377825515	109.4	96.5882555782
111.937964377611	98.8086775081386	110	100
117.460283752675	98.4031668860408	120	100
114.747460443419	91.5106356382586	117.5	90.3175416345
114.014924441226	89.9674167147291	115.5	87.3607753402
108.78730755775	90.4490987790619	107	92.8585715715
107.547177056217	84.4068259193175	110	82.6794919243
107.290594006536	84.2509028962447	107	81.2650060048
103.265598497279	87.9261241351853	104	90.8348486101
101.713244748378	87.5373159895346	100	90
98.1878698897313	82.3908578542118	100	80
91.649797180092	80.1738617984758	90	82.6794919243
91.2544943235719	79.7348887342435	93	81.2650060048
86.4356171455123	74.3836339818885	88	72.5045458303
84.9667043459448	72.7524317795683	85	74.0192378865
80.4030566975669	67.6846010876397	77.5	66.9281086117
82.1171324291196	67.1017422687054	81	64.8005681864
85.3537598033604	66.0011539298813	84.5	63.125211865
96.5489529102514	63.1498462055575	96	60.2005025157
100.175612614603	62.7175087927558	100	60
102.064187121075	62.4923689312676	104	60.2005025157
102.342613640888	68.1259181745564	100	70
111.641122138722	70.7062102241761	112	72.5045458303
113.750874781469	71.2916541652969	115	74.0192378865
116.234018527402	66.0340336967305	115.5	63.125211865
117.591704552557	67.0348211896196	119	64.8005681864
120.638031318785	69.2803453773494	122.5	66.9281086117
126.938964297843	74.6299783311486	129	72.4500453721
129.444853487399	77.2666634462845	131.5	75.3474139288
131.000103219533	78.9030935028167	134	78.9286924943
127.49220529854	82.4705151481089	124.5	82.6867103068
127.829027438625	82.7262507070779	126	85.0333704529
135.246399219912	88.3579857234599	137.7	86.6317540418
135.758402758019	89.9852282431294	138.5	89.1487327929
136.12740534125	91.1579617384443	139.1	91.5625833337
132.569310453309	96.6438141115247	129.7	95.7679792061
132.539326033389	98.4025457685697	130	100
137.036983239574	100.469655379016	140	100
132.689576871439	104.481959344347	129.7	104.2320207939
136.143180560775	108.944626557969	139.1	108.4374166663
135.795710998857	109.997079219686	138.5	110.8512672071
135.258094645236	111.625507381123	137.7	113.3682459582
127.825744981691	117.275397853641	126	114.9666295471
127.492248425721	117.528909040684	124.5	117.3132896932
131.000099330714	121.096662716418	134	121.0713075057
129.445002774929	122.732906678417	131.5	124.6525860712
126.936043683254	125.372783916402	129	127.5499546279
120.56230993836	130.814231864376	122.5	133.0718913883
118.938885825473	132.20004662301	119	135.1994318136
114.833039367033	128.976119210143	115	125.9807621135
114.466560338425	129.203118388446	112	127.4954541697
113.365884394397	134.76632997434	115.5	136.874788135
103.512322393445	136.839404846491	104	139.7994974843
99.7721992272774	137.287316858302	100	140
97.9354102766625	137.507286879848	96	139.7994974843
97.6572547006581	131.873921557152	100	130
88.2535082283433	129.264479449954	88	127.4954541697
86.2491984533693	128.708313519116	85	125.9807621135
83.7659454280765	133.965973501583	84.5	136.874788135
82.4143605541961	132.969676725936	81	135.1994318136
79.3621332032076	130.719783753733	77.5	133.0718913883
73.0444681914328	125.354478346591	71	127.5499546279
70.5048123476979	122.76270955704	68.5	124.6525860712
68.9961624618716	121.223097539875	66	121.0713075057
73.5040651513572	117.469506812743	76.5	117.3132896932
72.2363765619261	116.620532466229	74	114.9666295471
64.7077845488544	111.578666759129	62.3	113.3682459582
64.2371882799291	110.044614238204	61.5	110.8512672071
63.8712520834813	108.851762069319	60.9	108.4374166663
67.430438540349	103.357016742763	70.3	104.2320207939
67.4605852781405	101.597308233131	70	100
62.963058124126	99.5306287385241	60	100
67.310105168191	95.5219103327049	70.3	95.7679792061
63.8634747989377	91.0958558230853	60.9	91.5625833337
64.2414480288348	90.0576400989577	61.5	89.1487327929
65.0647201037591	87.7963482759269	62.3	86.6317540418
68.6853181553894	80.2661880076002	66	78.9286924943
71.1710858906955	75.4451660556559	71	72.4500453721
71.2945396600275	75.6294684491544	68.5	75.3474139288
76.3172741017704	83.1280536759963	74	85.0333704529
77.2809635265298	84.090316195289	76.5	82.6867103068
81.7446652470842	88.5474289547728	84.5	87.3607753402
81.8144427897439	91.1122032621916	82.5	90.3175416345
81.9953172774977	97.7597470511938	80	100
89.1361396121996	97.1270645242771	90	100
91.1355345334298	96.0456386440637	90.6	96.5882555782
95.3533782196045	93.7643373672668	96	90.8348486101
95.4957638473082	93.9553841531309	93	92.8585715715

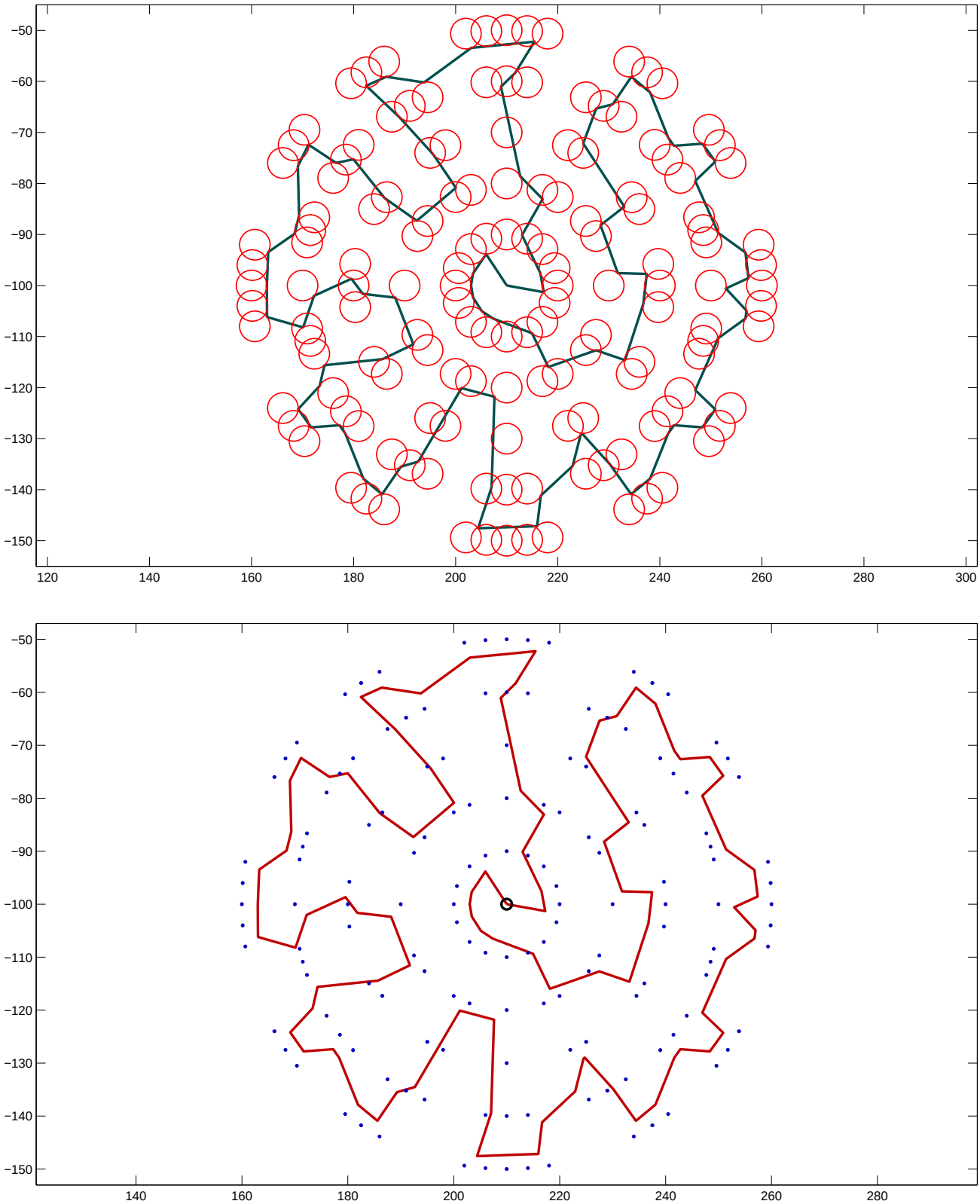


Figure N.33: *concentricCircles*5, Equal Radius, 2D, Euclidean, Length = 645.3805045

Table N-36: Solution for *concentricCircles*5, Equal Radius, 2D, Euclidean

Total distance: 645.380504453232 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
107.26758161101	101.301568051134	109.4	103.4117444218
107.114370513645	100.495319429748	110	100
106.549682737157	97.5240497008979	109.4	96.5882555782
104.87040065476	94.0178984050023	107	92.8585715715
103.738357567448	91.6543284724439	104	90.8348486101
102.998040090575	90.1086143404989	100	90
107.024366155301	83.0611318679422	110	82.6794919243
105.616041897673	81.6208605468658	107	81.2650060048
102.642685466896	78.5800550676897	100	80
100.75936388332	69.8261332921541	100	70
98.8737789430133	61.0615657137711	96	60.2005025157
100.154771211943	59.8027348379937	100	60
101.658549855515	58.3249712609769	104	60.2005025157
105.452137262813	52.2279535040259	108	50.644149283
103.687017774492	52.4017440924585	104	50.1602568225
100.242315908549	52.7408907497762	100	50
96.2862302950435	53.1304027051376	96	50.1602568225
93.0679364882625	53.447635510782	92	50.644149283
83.7850221981899	60.2116513770114	84.5	63.125211865
76.4079766217328	59.1087088224042	76	56.1365756011
72.4583132723829	60.878340090233	69.5	60.3799293287
72.6095106331602	61.0206410672311	72.5	58.2417672788
77.4304893729291	65.5577334867925	77.5	66.9281086117
78.86073260479	66.9037710610026	81	64.8005681864
84.3780313875872	72.9694767262127	85	74.0192378865
85.6412326667531	74.3582437815079	88	72.5045458303
90.0283794192133	80.8532922259536	93	81.2650060048
88.4750744516481	82.1653009504579	90	82.6794919243
82.371969724261	87.3202686532225	82.5	90.3175416345
82.0305370134617	87.0785620452784	84.5	87.3607753402
76.0571675178914	82.8497795794057	74	85.0333704529
75.2002965068683	81.780620227961	76.5	82.6867103068
69.9849329402493	75.2731056562983	71	72.4500453721
66.5677918109013	75.9829093163368	66	78.9286924943
66.097672633328	75.6710638319775	68.5	75.3474139288
61.1612030955592	72.3964878521755	60.3799293287	69.5
60.4585141668892	73.821305723787	58.2417672788	72.5
59.0668028374437	76.6432616659629	56.1365756011	76
59.3179085704458	86.3044385464209	62.3	86.6317540418
58.7885750308518	88.4248884068498	61.5	89.1487327929
58.4305502846997	89.8591028831384	60.9	91.5625833337
53.2724120522135	93.4464669429264	50.644149283	92
53.1567415610321	96.1241199815639	50.1602568225	96
52.9995229592456	100.051958126574	50	100
53.0206126575068	103.945072130752	50.1602568225	104
53.0327686255942	106.184913985985	50.644149283	108
60.108513003582	108.193484888397	61.5	110.8512672071
60.5461696732605	106.914169417544	60.9	108.4374166663
62.2220901174009	102.015527056988	60	100
69.5618711208974	98.6757624225913	70.3	95.7679792061
70.5634411431228	100.002551348169	70	100
71.7910802822194	101.628808270449	70.3	104.2320207939
78.1635499000729	102.372232858303	80	100
80.9161965445475	109.482435875878	82.5	109.6824583655
81.7107130675131	111.534722747053	84.5	112.6392246598
75.6833965192675	114.426564478454	76.5	117.3132896932
73.1112885317165	114.695038681594	74	114.9666295471
64.2866765285339	115.616169395211	62.3	113.3682459582
63.350510453454	119.664098231192	66	121.0713075057
59.1297798804676	124.201927561474	56.1365756011	124
60.3818568195207	125.97632802309	58.2417672788	127.5
61.6590911775484	127.786368639408	60.3799293287	130.5
67.221942679499	127.366737716374	68.5	124.6525860712
68.3649928994945	128.984091256717	71	127.5499546279
71.924721193368	137.853499892116	69.5	139.6200706713
74.1162834196845	139.674071205016	72.5	141.7582327212
75.5830462276349	140.892530367016	76	143.8634243989
79.2629510631229	135.499245306288	77.5	133.0718913883
80.9611042457965	135.00307399881	81	135.1994318136
82.6571577788264	134.507514107533	84.5	136.874788135
86.7276860505156	127.593159225667	85	125.9807621135
87.648258617618	126.029458464684	88	127.4954541697
91.1422365928298	120.094556671556	90	117.3205080757
93.0944563888081	120.608711959192	93	118.7349939952
97.5956495564156	121.794199847952	100	120
97.3422873499524	129.938285510069	100	130
97.0452791754007	139.480710087938	100	140
96.5126610054376	141.105072245787	96	139.7994974843
94.3982923967416	147.553556816587	92	149.355850717
96.2417266733104	147.489068537945	96	149.8397431775
99.9285506833557	147.360106983806	100	150
103.858355489527	147.222609685361	104	149.8397431775
105.968007027846	147.148798528303	108	149.355850717
106.675598272817	141.15641913495	104	139.7994974843
112.920389430889	135.343230844469	115.5	136.874788135
114.505734064314	129.145105977862	112	127.4954541697
114.734244787725	128.968978792141	115	125.9807621135
119.10662959801	133.788553343577	119	135.1994318136
120.163289034352	134.953319481124	122.5	133.0718913883
124.392187305465	140.889156780113	124	143.8634243989
125.853853248636	139.68377708232	127.5	141.7582327212
128.078329605759	137.849314195904	130.5	139.6200706713
131.634955026804	128.984193757841	129	127.5499546279
132.778973408546	127.366310230148	131.5	124.6525860712
138.351818415085	127.781247572828	139.6200706713	130.5
139.654373779084	125.970204767775	141.7582327212	127.5
140.875765427303	124.271979948977	143.8634243989	124
136.943326447249	120.490875116933	134	121.0713075057
139.597023660081	114.480418955317	137.7	113.3682459582
140.703790523752	111.973697300069	138.5	110.8512672071
141.431679289524	110.325095394131	139.1	108.4374166663
146.779476460486	106.463000725797	149.355850717	108
146.98258627341	104.914725114623	149.8397431775	104
142.94337326258	100.580191217841	140	100
147.380671721936	98.5374030642287	150	100
147.111904397126	96.3219379954405	149.8397431775	96
146.772619785689	93.5254455990702	149.355850717	92
141.430977801753	89.6740404194998	139.1	91.5625833337
140.696816697736	88.0111337538748	138.5	89.1487327929
139.585695570072	85.49440147714	137.7	86.6317540418
136.943298995304	79.5092512028287	134	78.9286924943
140.875768299229	75.7280183369098	143.8634243989	76
139.645271779806	74.0171317411771	141.7582327212	72.5
138.351850369437	72.2187634715363	139.6200706713	69.5
132.779010907093	72.6337106453942	131.5	75.3474139288
131.634828832039	71.0155799486967	129	72.4500453721
128.075034765039	62.1461636459256	130.5	60.3799293287
125.925201929713	60.3592537597837	127.5	58.2417672788
124.418845031476	59.1072008721374	124	56.1365756011
120.764519410902	64.4810394569471	122.5	66.9281086117
117.517618948616	65.3454043340716	115.5	63.125211865
117.233276629933	66.1108618679004	119	64.8005681864
114.981580237524	72.1725491748819	112	72.5045458303
116.302439114273	74.1999484538576	115	74.0192378865
122.316754071661	83.4313481048729	124.5	82.6867103068
123.040472942187	84.5421936141606	126	85.0333704529
118.382861598463	88.1909312574035	115.5	87.3607753402
119.151189753882	90.3249147621442	117.5	90.3175416345
121.759937520367	97.5704577018544	120	100
127.433902247886	97.7339043061619	129.7	95.7679792061
127.212152916472	99.6873917092968	130	100
126.768703405543	103.593644166247	129.7	104.2320207939
123.415743047934	113.854820813809	126	114.9666295471
123.163241261593	114.627560762564	124.5	117.3132896932
117.50872383701	112.682454314674	117.5	109.6824583655
115.077127708748	113.534851865662	115.5	112.6392246598
109.91516838646	115.344375866299	110	117.3205080757
108.148700187171	115.963614316757	107	118.7349939952
104.974084260185	109.354054323233	107	107.1414284285
103.348295213687	108.742712951589	104	109.1651513899
100.727838238976	107.757350790455	100	110
97.3585835615795	106.490406056555	96	109.1651513899
95.1316594117308	105.030490495063	93	107.1414284285
93.3973112435665	102.327734315637	90.6	103.4117444218
93.0000027374066	99.997672045788	90	100
93.3893769187852	97.692521527611	90.6	96.5882555782
95.4868425956166	94.5362586099657	93	92.8585715715
95.9676083059888	93.8346809484616	96	90.8348486101

Table N-37: Solution for *bubbles*1, Equal Radius, 2D, Euclidean

Total distance: 349.134774047349 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
131.956793698774	89.0580209378104	140	95
132.245489658151	79.9940425582415	140	75
132.245489658151	79.9940425582415	140	85
132.821631395182	61.9621313449818	140	55
132.821631395182	61.9621313449818	140	65
132.821631395182	61.9621313449818	130	55
114.975721637326	61.9862547711191	120	55
114.975721637326	61.9862547711191	110	55
100.533560821126	62.0059057462734	100	55
89.356100848559	62.0213071462114	90	55
74.9506647176778	62.0412614189865	70	55
74.9506647176778	62.0412614189865	80	55
57.0760163660968	62.0661360558123	50	55
57.0760163660968	62.0661360558123	60	55
57.0760163660968	62.0661360558123	50	65
57.0758505218898	80.0090209390878	50	75
57.0758505218898	80.0090209390878	50	85
57.0753312736772	99.9904681834266	50	95
57.0753312736772	99.9904681834266	50	105
57.0758345446595	119.966161832446	50	125
57.0758345446595	119.966161832446	50	115
57.0759445330327	137.933794336053	50	145
57.0759445330327	137.933794336053	50	135
57.0759445330327	137.933794336053	60	145
74.9741262273564	137.958569594329	70	145
74.9741262273564	137.958569594329	80	145
94.9611113596662	137.986409971566	90	145
94.9611113596662	137.986409971566	100	145
114.93872920609	138.012989988786	120	145
114.93872920609	138.012989988786	110	145
132.822517870666	138.036949517081	140	145
132.822517870666	138.036949517081	130	145
132.822517870666	138.036949517081	140	135
132.243537557484	119.895427007365	140	125
132.243537557484	119.895427007365	140	115
131.958429129132	110.944198462891	140	105

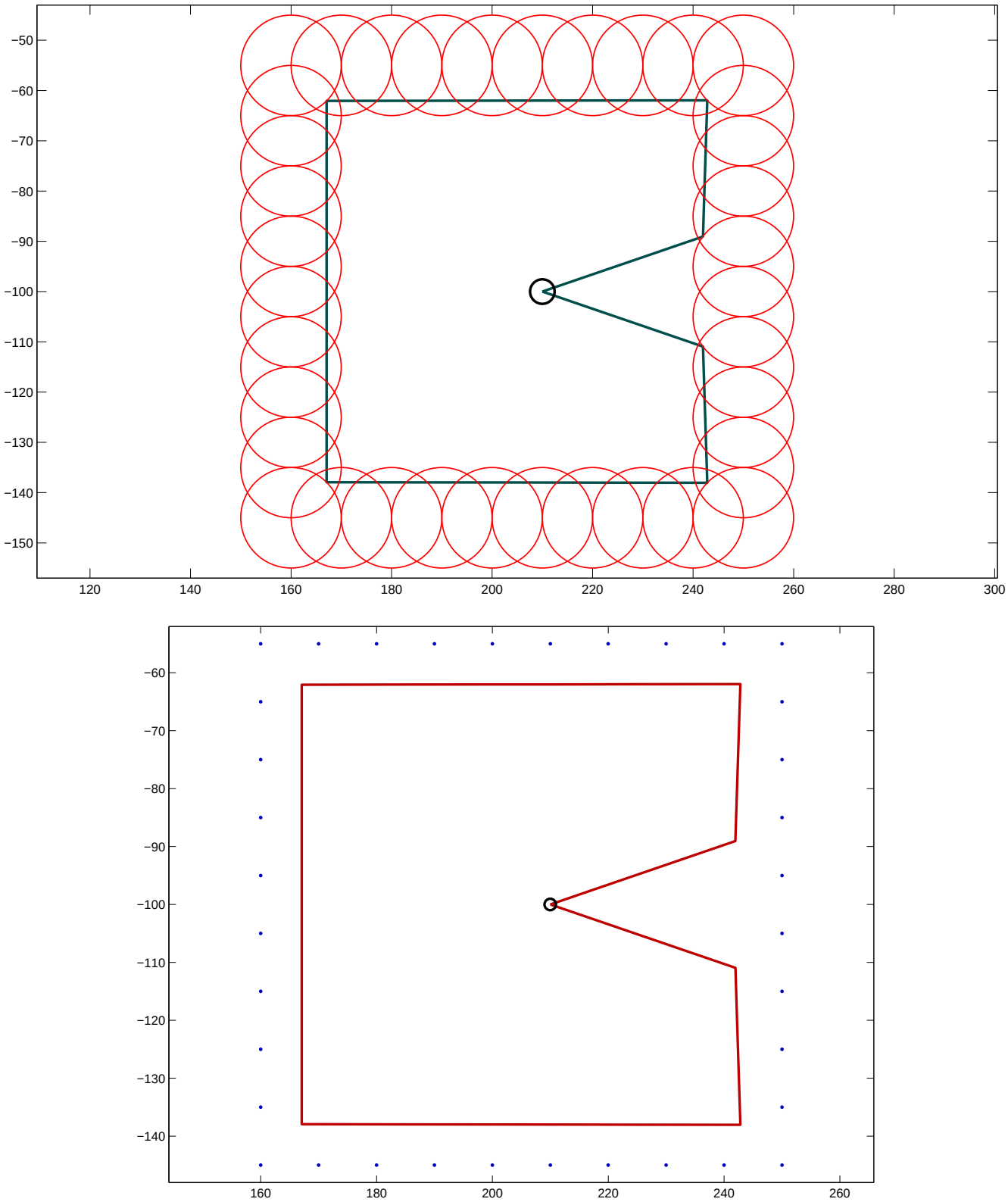


Figure N.34: *bubbles*1, Equal Radius, 2D, Euclidean, Length = 349.1347740

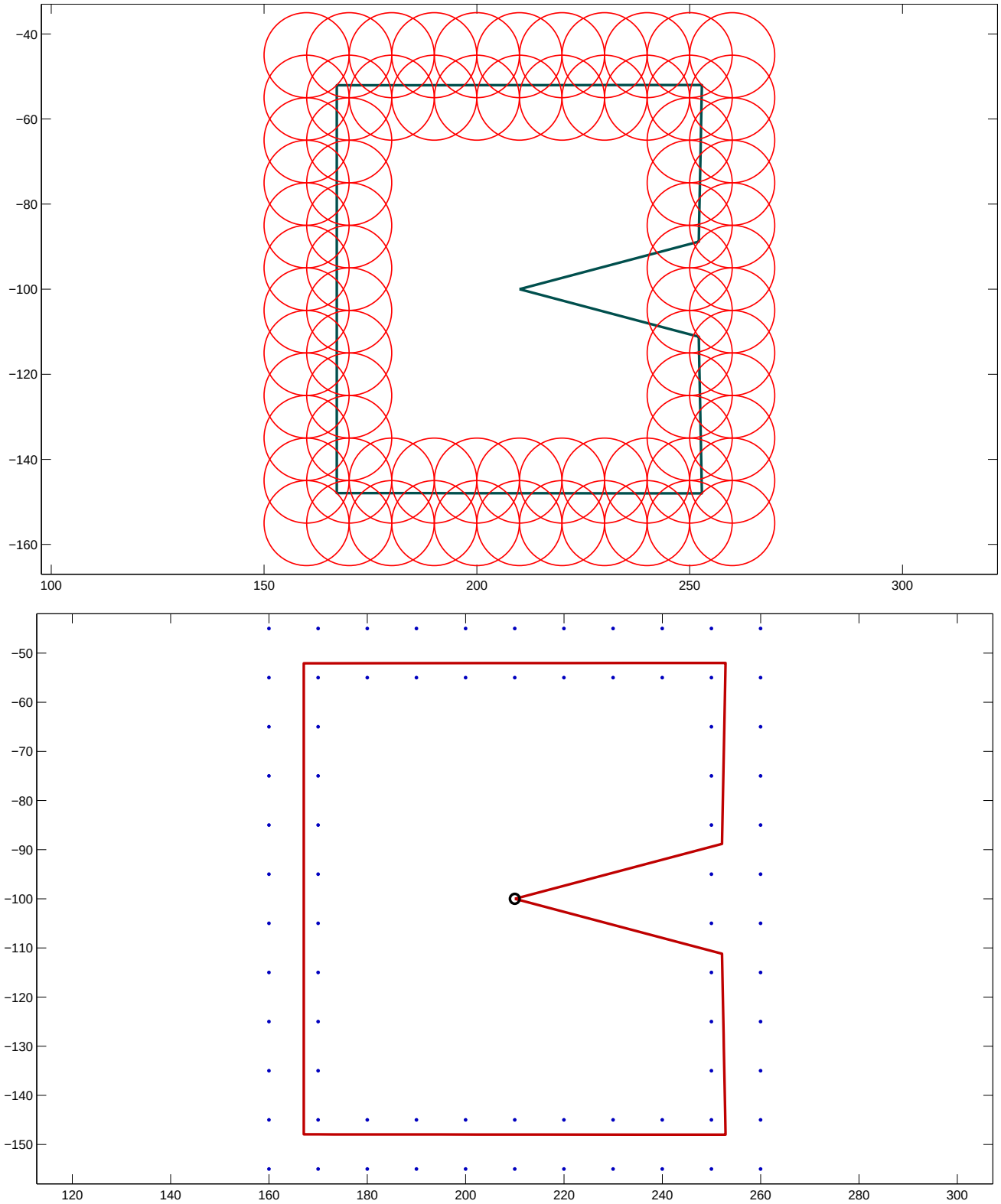


Figure N.35: *bubbles*2, Equal Radius, 2D, Euclidean, Length = 428.2791849

Table N-38: Solution for *bubbles*2, Equal Radius, 2D, Euclidean

Total distance: 428.279184936044			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
136.122935416729	109.581314883645	140	115
136.122935416729	109.581314883645	140	105
142.134902517435	111.175793158462	150	105
142.246822152326	116.830472381459	150	115
142.459113049006	127.545344709766	140	135
142.459113049006	127.545344709766	140	125
142.516090732002	130.415786699344	150	135
142.516090732002	130.415786699344	150	125
142.76732285843	143.168235777232	150	145
142.76732285843	143.168235777232	140	145
142.862747625232	147.99572802024	150	155
137.457612064424	147.991799243411	140	155
124.878507342141	147.982857844366	130	155
124.878507342141	147.982857844366	120	155
124.878507342141	147.982857844366	130	145
124.878507342141	147.982857844366	120	145
105.010184285454	147.969307396061	110	155
105.010184285454	147.969307396061	100	155
105.010184285454	147.969307396061	110	145
105.010184285454	147.969307396061	100	145
92.4131763060369	147.959959299808	90	145
84.9301394908105	147.954650733679	80	155
84.9301394908105	147.954650733679	90	155
78.2305375556408	147.949218740414	80	145
69.9478769967871	147.94260523386	70	155
69.9478769967871	147.94260523386	70	145
63.188286296502	147.937390226047	60	155
60.048428550082	147.935068338291	60	145
57.0750575622583	147.93291401381	50	155
57.0749875626425	143.668055524231	50	145
57.0747164134676	137.67138373123	60	135
57.0745545433234	133.216237130658	50	135
57.0742466479559	126.597225755742	50	125
57.0741315842412	121.759515981413	60	125
57.0737643156902	114.844911928781	50	115
57.0737643156902	114.844911928781	60	115
57.0734805926132	107.627296559756	60	105
57.0731730545115	102.456882643747	50	105
57.0730264522183	92.5414712131283	60	85
57.0730264522183	92.5414712131283	60	95
57.0728703730722	90.1975588581444	50	95
57.0729146718321	82.8562558028515	50	85
57.0735483624678	69.9162265980224	50	65
57.0735483624678	69.9162265980224	50	75
57.0735483624678	69.9162265980224	60	65
57.0735483624678	69.9162265980224	60	75
57.0738653842175	56.6295515025713	50	55
57.0738653842175	56.6295515025713	60	55
57.0737782032144	52.0683673067123	50	45
62.2043158692076	52.0644684756035	60	45
74.9938916443133	52.0543983919701	70	45
74.9938916443133	52.0543983919701	80	45
74.9938916443133	52.0543983919701	70	55
74.9938916443133	52.0543983919701	80	55
94.3111355376408	52.0382646955879	90	45
94.3111355376408	52.0382646955879	100	45
97.2437635854599	52.0363841761157	90	55
97.2437635854599	52.0363841761157	100	55
110.109970599737	52.0274869286718	110	45
110.109970599737	52.0274869286718	110	55
124.437745132557	52.0176045481062	130	45
124.437745132557	52.0176045481062	120	45
127.046863428233	52.015745890388	130	55
127.046863428233	52.015745890388	120	55
137.922334330415	52.0078297035422	140	45
142.862488664604	52.0040116435365	150	45
142.770925403975	56.6420367827211	150	55
142.770925403975	56.6420367827211	140	55
142.507866032713	69.9817493909706	150	65
142.507866032713	69.9817493909706	150	75
142.507866032713	69.9817493909706	140	65
142.507866032713	69.9817493909706	140	75
142.247643526097	83.1271401563118	150	85
142.135053570125	88.8240176627495	150	95
136.157713502916	90.4095414538005	140	85
136.157713502916	90.4095414538005	140	95

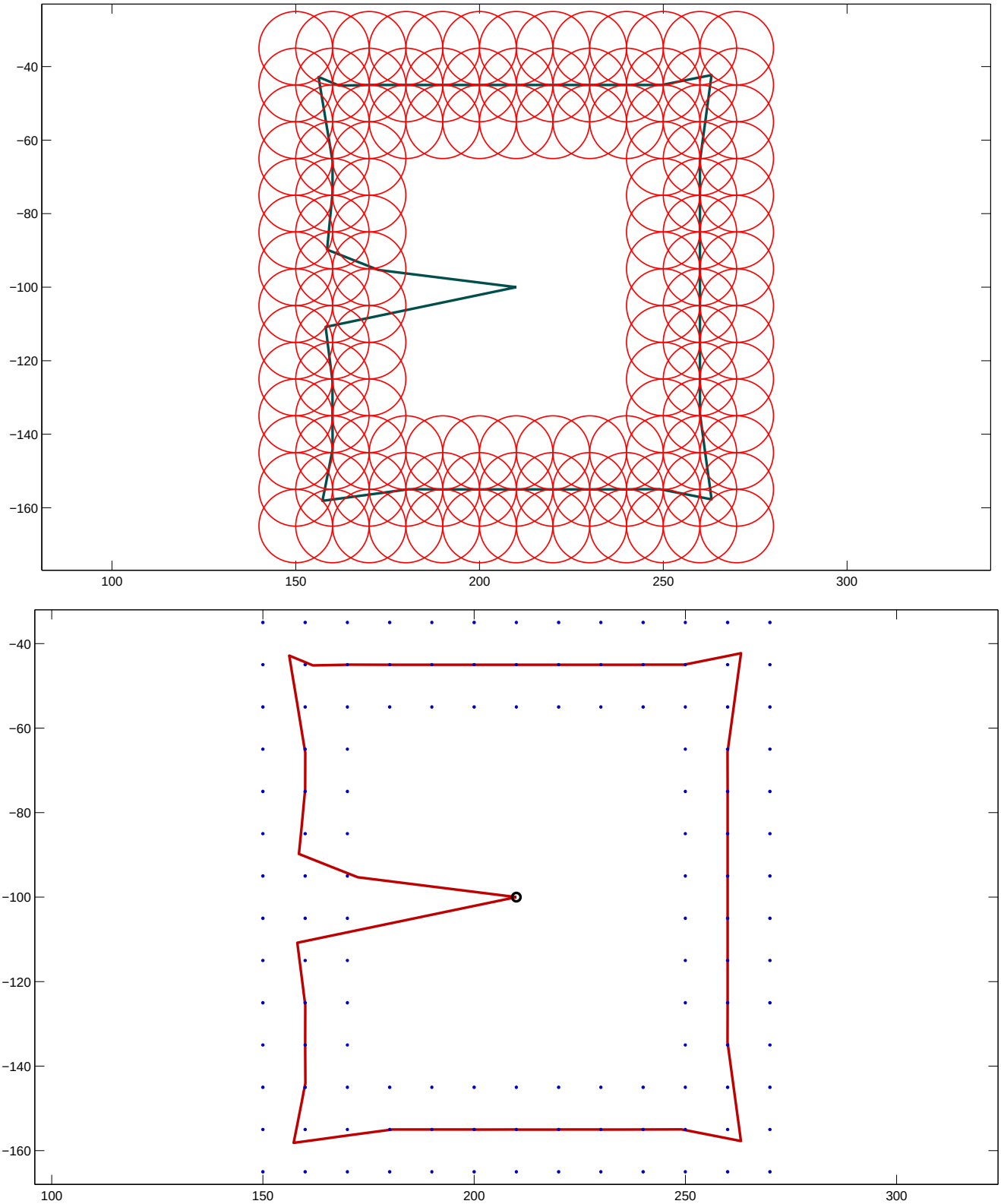


Figure N.36: *bubbles*3, Equal Radius, 2D, Euclidean, Length = 530.7333910

Table N-39: Solution for *bubbles*3, Equal Radius, 2D, Euclidean

Total distance: 530.733391043906 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
62.4814838737272	95.3127771549323	60	105
58.8340409046112	93.8675135643527	60	95
54.8258948522589	92.2793166167731	60	85
54.8258948522589	92.2793166167731	50	95
48.5330125367041	89.7858112843594	40	95
49.1768216306302	83.1355328808286	50	75
49.1768216306302	83.1355328808286	40	85
49.8137730946356	76.5558047836891	40	75
49.8137730946356	76.5558047836891	50	85
50.0122180407166	74.5058237192056	60	75
50.0328620042743	65.8100509183272	60	65
49.7596076303094	64.1647547899328	50	65
49.480812986366	62.4860881515063	40	65
48.0524998950274	53.8859494673805	40	55
46.8371458432842	46.5680765987035	40	45
46.2167697893238	42.8327408396977	40	35
48.4559961355359	43.7626636077351	50	45
50.5528335413576	44.6334522554501	60	45
50.5528335413576	44.6334522554501	50	35
51.8520886111297	45.1730061382833	50	55
59.7316864152995	45.0074967963257	60	55
60.1045022554183	44.9994372136397	60	35
70.0000022202046	44.9999999562716	70	55
70.0000022202046	44.9999999562716	70	35
79.9999999259417	44.9999999519164	90	45
79.9999999259417	44.9999999519164	80	55
79.9999999259417	44.9999999519164	80	35
79.9999999259417	44.9999999519164	70	45
79.9999999259417	44.9999999519164	80	45
90.0065725192328	44.9999999923275	90	55
90.0065725192328	44.9999999923275	90	35
90.0065725192328	44.9999999923275	100	45
100.006755723039	44.9999999628861	110	45
100.006755723039	44.9999999628861	100	55
100.006755723039	44.9999999628861	100	35
109.999997187973	44.999999909311	110	35
109.999997187973	44.999999909311	110	55
119.963065780991	44.9998293823969	120	35
120.000635315239	45.0000061311389	120	45
120.039238839193	45.0001863124955	120	55
129.967755294369	45.0001201782885	130	55
130.012283876712	44.999871828816	130	45
130.057864570187	44.9996186216601	130	35
139.406032442227	44.9823443225096	140	35
139.510273348013	44.9949853798511	140	45
139.613266861112	45.0074772060066	140	55
149.443805494157	43.0348425860475	150	35
149.443805494157	43.0348425860475	150	45
153.154957826827	42.2900957644126	160	35
152.370022645476	48.0648475947871	160	45
152.370022645476	48.0648475947871	150	55
151.521302391284	54.3089491227785	160	55
150.306858029822	63.2437267333784	160	65
150.306858029822	63.2437267333784	150	65
149.977991698915	65.6631147080916	140	65
149.999531616699	74.9334010231943	140	75
149.999810599261	74.9823115962371	150	75
150.00008843996	75.0308008074474	160	75
149.999999778336	84.9999873925748	140	85
149.999999778336	84.9999873925748	160	85
149.999999706087	94.9999998691766	160	95
149.999999706087	94.9999998691766	150	105
149.999999706087	94.9999998691766	140	95
149.999999706087	94.9999998691766	150	85
149.999999706087	94.9999998691766	150	95
149.999999673901	105.008822645307	160	105
149.999999673901	105.008822645307	140	105
149.999999673901	105.008822645307	150	115
149.999999626874	115.008990659514	150	125
149.999999626874	115.008990659514	160	115
149.999999626874	115.008990659514	140	115
150.00009680199	124.979040485261	160	125
149.999721479458	125.037320099956	140	125
149.978187032669	134.339813232038	140	135
150.309660506167	136.789522898181	160	135
150.309660506167	136.789522898181	150	135
151.475099937504	145.402869711915	160	145
152.243953949466	151.084952533254	150	145
152.243953949466	151.084952533254	160	155
152.696333344718	154.428099484995	150	155
153.142054485889	157.722037795938	160	165
147.15418021602	156.545908732874	150	165
147.15418021602	156.545908732874	140	155
139.744958729551	155.090605334439	140	165
139.744958729551	155.090605334439	130	155
139.056456360873	154.955391199698	140	145
130.056533684021	154.999418566788	130	145
129.974994951762	155.00008024758	130	165
120.044047750902	155.000191497837	120	165
119.999265197117	154.999991955234	120	155
119.954577543343	154.99979284214	120	145
110.045289238646	154.999792068663	110	145
110.000614753111	154.99999176019	110	155
109.955915463017	155.000191408086	110	165
100.044560219437	155.00018867429	100	165
100.000011835376	154.999988828989	100	155
99.9550903397464	154.99978783114	100	145
90.0434151353514	155.000194136272	90	165
89.9991690823702	154.999993728609	90	155
89.9550097958877	154.999793915352	90	145
80.0557832129028	154.99970652189	80	145
80.0156989218678	154.999877485356	80	155
79.9755410095401	155.000048922507	80	165
70.6601525833291	154.978188477757	70	145
69.3108204360645	155.160764039294	70	155
67.9388503732804	155.346402908703	70	165
59.3647825744874	156.50665390083	60	165
53.130140125062	157.350326242385	60	155
53.130140125062	157.350326242385	50	165
47.2781177068571	158.142222585747	40	165
47.976270777283	154.587585483773	40	155
49.2525005205309	148.089397178907	40	145
49.2525005205309	148.089397178907	50	155
49.6585143985481	146.022186962726	50	145
50.0446226894939	144.056326756551	60	145
50.0009230504668	135.095363803953	60	135
50.0004456165722	135.034393348884	50	135
49.9999679782019	134.973471017791	40	135
50.0192262575937	125.619824506754	60	125
49.7461896408234	123.46637260394	40	125
49.3549264420498	120.38061898336	50	125
48.7768807139171	115.821828306513	40	115
48.470759887002	113.407541424162	50	115
48.1410458575032	110.807188803811	40	105
53.9953539278918	109.587180220955	50	105
62.2017621437911	107.877046459905	60	115

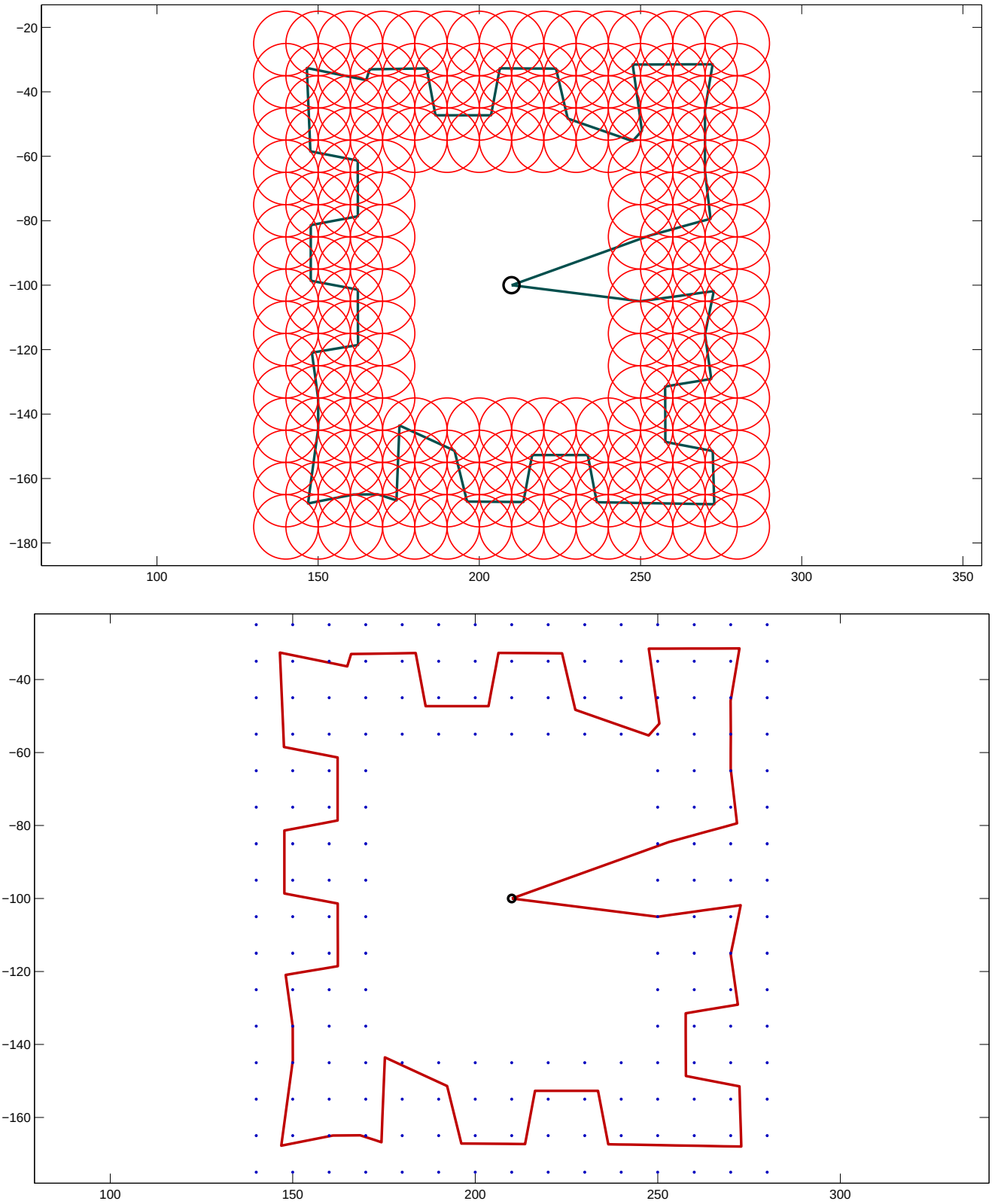


Figure N.37: *bubbles*4, Equal Radius, 2D, Euclidean, Length = 829.8877631

Table N-40: Solution for *bubbles*4, Equal Radius, 2D, Euclidean

Total distance: 829.887763099065 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
139.935456716976	105.000206645538	140	115
143.443252885686	104.514881727632	140	105
148.166267688252	103.861428280824	150	105
152.292155439215	103.290597462911	150	95
158.956196526831	102.368598663265	160	95
162.71341041749	101.848771996142	170	95
162.025058144603	105.254735692884	170	105
160.678710480214	111.916528883261	170	115
160.459373094215	113.001862809494	160	105
160.459373094215	113.001862809494	160	115
159.995600070287	115.296687147043	150	115
160.859439293714	121.42485781385	160	125
161.44754530099	125.596865116634	170	125
161.938879298542	129.082364746173	170	135
157.462105088211	129.824476587303	160	135
151.427859348847	130.824833670017	150	125
151.427859348847	130.824833670017	150	135
147.639451888365	131.452816275449	140	125
147.656990519359	136.112211430584	140	135
147.686487675739	143.94951491959	140	145
147.686487675739	143.94951491959	150	145
147.704082272655	148.624485343566	140	155
152.351468125515	149.5278252423	150	155
157.82414287709	150.591580735927	160	145
162.381361369147	151.47737766374	170	145
162.477161958284	154.63170468524	160	155
162.570853111995	157.716617409794	170	155
162.75913417564	163.916280738784	160	165
162.75913417564	163.916280738784	170	165
162.882426999216	167.97573883392	170	175
158.340766745349	167.897375132413	160	175
151.234425293928	167.774772550231	150	165
144.948835321707	167.666322487748	140	175
144.948835321707	167.666322487748	150	175
139.097380918434	167.565338178686	140	165
132.565094407201	167.452607315573	130	175
129.532041169403	167.40026734956	130	165
126.436566649004	167.346851481454	120	175
125.615722576257	163.068110459504	120	165
124.268156897727	156.04512320792	120	155
124.268156897727	156.04512320792	130	155
123.627722854015	152.706760003575	130	145
118.79539065951	152.704242984522	120	145
111.138853747035	152.700252827102	110	145
106.383128080853	152.697774648803	100	145
105.681448506942	156.433192765541	100	155
105.681448506942	156.433192765541	110	155
104.347325860757	163.534501532978	100	165
104.347325860757	163.534501532978	110	165
103.643751025566	167.28001497889	110	175
98.8164360299664	167.243848277317	100	175
90.9062189960693	167.184582141631	90	165
90.9062189960693	167.184582141631	90	175
86.1940472673482	167.149277544658	80	175
84.9900472196412	162.278622596873	80	165
83.4963763641682	156.236180202574	90	155
83.4963763641682	156.236180202574	80	155
82.2943994843857	151.373678198049	90	145
76.871078095609	148.880081910592	80	145
70.5237810178525	145.96164858382	70	145
65.2260033340682	143.525780980081	60	135
65.026740002266	148.498330987792	60	145
64.5777461430498	159.701298299848	70	155
64.5777461430498	159.701298299848	70	165
64.2937427658759	166.787893520652	70	175
62.4779165128371	166.193743978798	60	175
60.454609718904	165.531708082015	60	165
58.4695917475221	164.882200595295	60	155
51.0107009977834	164.948794197128	50	155
49.1579396257461	165.312000289069	50	165
47.233642920327	165.689229592913	50	175
40.4014067444115	167.028577528922	40	175
36.8589835746337	167.723022204216	30	175
37.8803970973628	160.172353436319	40	155
37.8803970973628	160.172353436319	30	155
37.8803970973628	160.172353436319	30	165
39.6628543551933	146.995999725423	30	145
39.8448004898902	145.650933072637	40	145
40.0214931757258	144.344705858219	50	145
39.992337931694	135.391273284732	30	135
39.9978444363931	135.325523665219	40	135
40.0033676129518	135.259582948006	50	135
39.0951985738596	128.597811296625	40	125
38.5178752814007	124.362932616219	30	125
38.0502093638227	120.932467560645	30	115
42.5469383778196	120.183089690475	40	115
48.387960687159	119.209676899356	50	115
48.387960687159	119.209676899356	50	125
52.3600877178371	118.547730205855	60	125
52.3454556834226	113.712127095109	60	115
52.3228009131658	106.226546056656	60	105
52.3081594438797	101.390276025583	60	95
48.2750089996962	100.625667780304	50	105
48.2750089996962	100.625667780304	50	95
41.6767499104917	99.3747372281876	40	105
41.6767499104917	99.3747372281876	40	95
37.7012423137567	98.6210576614809	30	105
37.7008347280656	93.7430748525234	30	95
37.7002126310491	86.2397509883825	30	85
37.6998160154093	81.3806635224375	30	75
41.6664500358214	80.6311768471376	40	85
41.6664500358214	80.6311768471376	40	75
48.3284721955967	79.3723850399269	50	85
48.3284721955967	79.3723850399269	50	75
52.2976277533067	78.6224222420361	60	85
52.2932981046869	73.7129343564771	60	75
52.2867110863597	66.2529414223472	60	65
52.2823822649451	61.3591201500588	60	55
48.2617911669494	60.5721106341041	50	65
48.2617911669494	60.5721106341041	50	55
41.5880644254725	59.265757156979	40	65
41.5880644254725	59.265757156979	40	55
37.5838767002459	58.4819599711784	30	65
37.3420085459503	52.784674234602	30	55
36.7981221768845	39.9733264889874	40	45
36.7981221768845	39.9733264889874	40	35
36.7981221768845	39.9733264889874	30	45
36.7981221768845	39.9733264889874	30	35
36.4856109688884	32.6116280269592	30	25
40.2069039123804	33.3730918335202	40	25
51.2623896869065	35.6353164209651	50	45
54.9233734647539	36.3844387985154	60	45
55.4288349170032	34.7734610715476	60	35
55.4288349170032	34.7734610715476	50	35
55.9807879638822	33.014374923825	50	25
61.1369384430753	32.934839250847	60	25
68.8549015358091	32.8157894919424	70	25
73.6700053010799	32.7415244113307	80	25
74.402922779141	36.6680891078899	80	35
74.402922779141	36.6680891078899	70	35
75.6331437879457	43.2588530018709	80	45
75.6331437879457	43.2588530018709	70	45
76.3887335029701	47.3068785243723	70	55
81.2460288313487	47.3059183473533	80	55
88.7185391165981	47.30443194755	90	55
93.6153922145503	47.3034539200277	100	55
94.3645153638572	43.3225137795144	100	45
94.3645153638572	43.3225137795144	90	45
95.6139942269854	36.682749771582	100	35
95.6139942269854	36.682749771582	90	35
96.360330139575	32.7166207504451	90	25
100.751195113104	32.7434132560231	100	25
106.327891967054	32.7774450333722	110	35
110.042763004616	32.8001159008124	110	25
113.770811845001	32.8228674728437	120	25
115.436144114252	39.8726943862591	120	45
115.436144114252	39.8726943862591	120	35
116.398425513565	43.9464169042436	110	45
117.427952421247	48.3048105424786	110	55
123.020091201995	50.2555406235574	120	55
130.458256844897	52.8502195334939	130	55
137.518034563988	55.3129004983134	140	65
138.954987050562	53.7185480228834	140	55

Solution x	Solution y	Original x	Original y
140.437891879979	52.0732038317021	150	55
139.085145128246	42.4360839987605	130	45
139.085145128246	42.4360839987605	140	45
139.085145128246	42.4360839987605	140	35
138.106666043255	35.4653862132176	130	35
137.55694266336	31.5492490500134	130	25
141.992233384979	31.5352443725043	140	25
148.981355093578	31.513185132919	150	35
155.124273861263	31.4937960609277	150	25
155.124273861263	31.4937960609277	160	25
161.690858178838	31.4730856029658	160	35
161.690858178838	31.4730856029658	170	35
162.375881154491	31.4709249171393	170	25
160.5078316925	42.5925757373958	170	45
160.233835569844	44.223832341757	160	45
159.966886916227	45.813130264182	150	45
160.00005039321	55.0094294064983	170	55
159.991710235768	59.8934306705861	160	65
159.991710235768	59.8934306705861	160	55
159.983965484831	64.4339319411022	150	65
160.221321024335	66.4891159263398	170	65
161.218900080991	75.1267184566361	160	75
161.218900080991	75.1267184566361	170	75
161.712830103602	79.4033154950632	170	85
157.690841823774	80.5070788892527	160	85
152.811882503846	81.8460127048955	150	85
149.327946831113	82.8021103749439	150	75
143.017068358456	84.5340062832764	140	75
139.365600328671	85.8468642406299	140	85
135.469540170134	87.247655825441	140	95

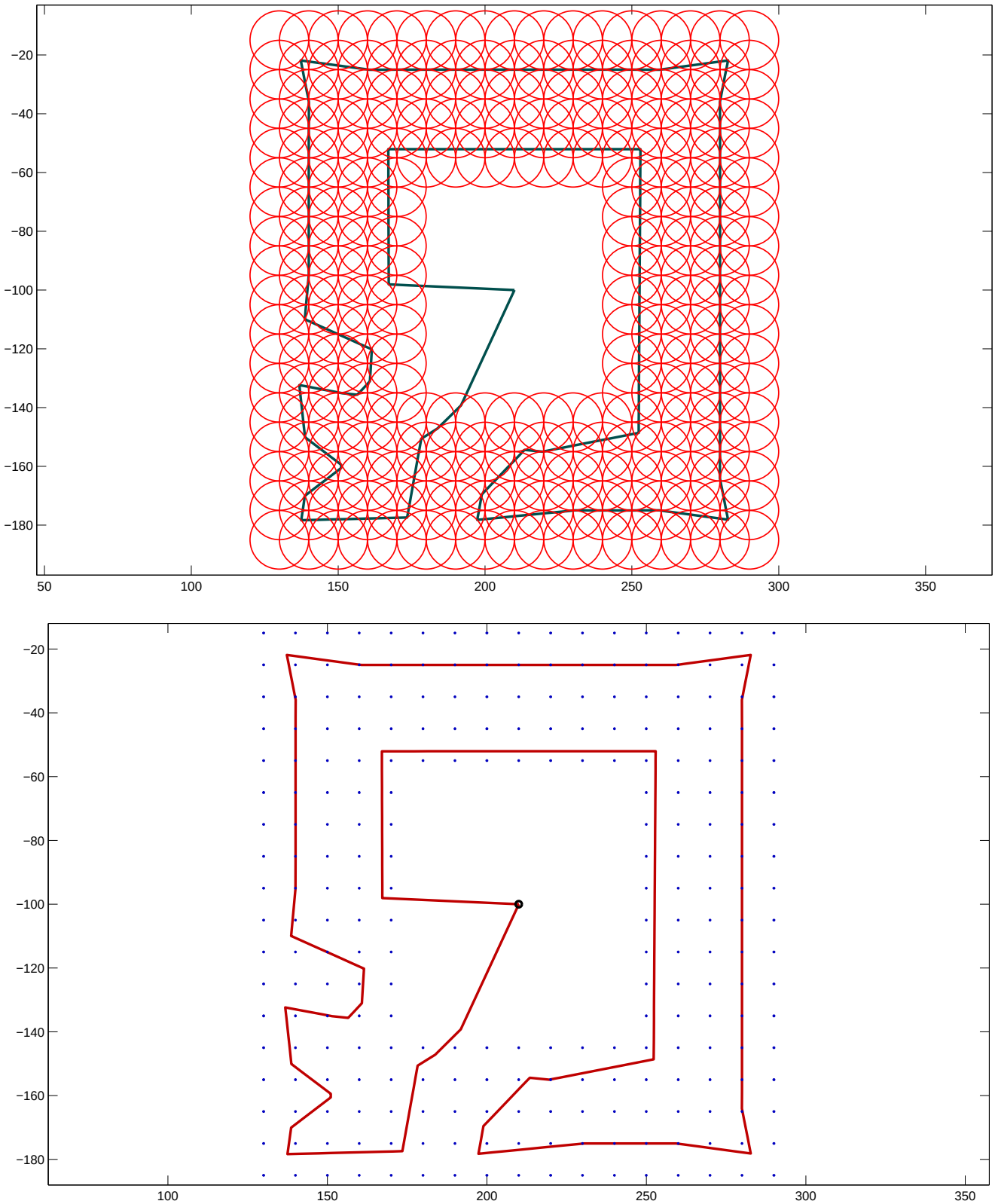


Figure N.38: *bubbles*5, Equal Radius, 2D, Euclidean, Length = 1062.3350861

Table N-41: Solution for *bubbles*5, Equal Radius, 2D, Euclidean

Total distance: 1062.33508611364 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
81.8214630078357	139.245731116231	90	145
77.8513832457759	143.159969050853	80	145
73.8019434898487	147.15244221173	80	155
71.2097700214445	148.772854179213	70	145
68.2834902582209	150.602132449359	60	145
67.6602621629237	154.083573393914	70	155
67.019036466871	157.665562636895	60	155
66.1052227906262	162.77028783213	70	165
65.3029492192771	167.251945085616	60	165
64.3066658092846	172.817395594233	70	175
63.4837089110537	177.414615335831	70	185
60.4750360288283	177.492251471624	60	175
57.5351340123473	177.568112586961	60	185
52.2106419892382	177.705507114185	50	175
48.0783222427923	177.812138027024	50	185
41.4356842553734	177.983544860837	40	185
37.2598543304558	178.091300537745	40	175
31.3147757425567	178.244708084155	30	185
27.463181810851	178.344098734034	20	185
27.7893454680302	176.0301674543	30	175
28.0928172264505	173.877234661796	20	175
28.632632160147	170.047550490276	20	165
32.7026205362563	166.935841918785	30	165
37.1584340341391	163.529159229168	40	165
41.0383308486913	160.562818307222	50	165
41.0398961930497	159.440341941236	50	155
37.1106765868896	156.458051330452	40	155
32.5565257989668	153.001429703729	30	155
28.7048039805742	150.077960172537	20	155
28.1462052834404	144.910104737295	20	145
27.764185210523	141.375865100813	30	145
27.1633764105976	135.817604135732	20	135
26.7878416341004	132.343384498064	20	125
29.6184011286287	132.876725137547	30	125
33.138009206469	133.539887247012	30	135
37.6326627455918	134.386758803118	40	135
41.4421385706021	135.10453378027	40	145
46.5087330844186	135.629240247164	50	145
48.6323496324036	133.369272143879	50	135
50.814444063522	131.047071163294	60	135
51.0404134942078	127.187726822183	50	125
51.2287664936828	123.970797933975	60	125
51.4503246755825	120.186823617588	60	115
47.7087875796499	118.508352246276	50	115
43.7670000989814	116.740047504949	40	125
39.9191032618079	115.013859031288	40	115
36.1173158694943	113.308356805127	40	105
32.2324847115998	111.565604063581	30	115
28.6312381622448	109.950069205535	20	115
29.0202063428371	105.656511679632	20	105
29.4118366391064	101.333563646146	30	105
30.0015451392459	94.8240936126448	40	95
29.998932710548	94.7763809708879	30	95
29.9963187721377	94.7286384473642	20	95
29.9998133556807	85.0438576079178	20	85
29.999985683979	85.0029563151077	30	85
30.0001579509131	84.9620615853775	40	85
30.0001287768201	78.9271890114156	30	75
30.0001122131081	75.0244633881392	40	75
29.9998890959719	74.9751975387868	20	75
29.9998394625763	65.0388538152444	20	65
30.000000076552	64.9997406258215	30	65
30.0001606196204	64.9606384214588	40	65
30.0001588929177	55.0401780624314	40	55
29.9999967207182	55.0016073723052	30	55
29.9998348253874	54.9631002648294	20	55
30.0001448671234	45.0320894165553	40	45
29.9999702091292	44.995839595768	20	45
30.0182199608656	41.2949364066985	30	45
30.0446183758297	35.9436147139	40	35
29.6895301635372	34.1356827913318	30	35
29.3210095034379	32.2593600898036	20	35
28.2275679908891	26.6920975605005	20	25
27.762173047859	24.3225886298944	30	25
27.2780694159482	21.8578286551988	20	15
31.1959023175168	22.3879814540593	30	15
37.9820299693292	23.3062495239014	40	15
42.4814497770627	23.9150961338752	40	25
48.3123079111071	24.7041092919474	50	15
50.660389833052	25.0218299871722	50	35
54.2653189236086	25.0134815937567	50	25
59.942587858121	25.0003469549483	60	35
59.9893912381129	25.000111517141	60	25
60.0363062446477	24.9998766405527	60	15
69.9731004503103	24.9998899692307	70	15
70.0241596200889	25.0001297549799	70	35
73.0639993585498	25.0000543196699	70	25
76.9027131122666	24.9999502098159	80	25
79.9751462088958	24.9998749747306	80	15
80.0257722621612	25.0001252727263	80	35
89.961080345755	24.9998367207695	90	15
89.9999839912065	25.0000019963623	90	25
90.0388737233559	25.0001684883461	90	35
99.9742566268873	24.9998748943748	100	15
100.026683962142	25.0001241131147	100	35
103.05133601315	25.0001255380016	100	25
106.898171732397	25.0001264177746	110	25
109.973707215001	25.0001262965544	110	35
110.027466805304	24.9998809981467	110	15
119.959091904565	24.9998359445936	120	15
120.00002809334	25.0000025011155	120	25
120.040846578361	25.0001699200831	120	35
129.958461786431	25.0001698566552	130	35
129.999915243883	25.0000007107734	130	25
130.041197072031	24.9998336181883	130	15
139.96249659099	24.999879659383	140	15
140.011978582422	25.0001284733424	140	25
140.061089957278	25.0003767690886	140	35
149.339723552306	25.0218216457631	150	35
150.679274850816	24.8405660083086	150	25
152.041321586034	24.6562680522935	150	15
159.479480838626	23.6497736270829	160	15
163.435974768085	23.1143872356839	160	25
168.978424529279	22.3644026135266	170	15
172.721933210837	21.8578363959725	180	15
172.214092497782	24.4434639104752	170	25
171.733209266439	26.8918347541521	180	25
170.69398152242	32.1831216907269	180	35
170.318571977804	34.0944971144715	170	35
169.955377117361	35.9436797032779	160	35
169.999995531202	45.0044130483967	180	45
169.99986697989	45.0324374644388	170	45
169.999738826034	45.0603782439626	160	45
170.000142238215	54.9712422327193	180	55
169.999866138227	55.0304151995345	160	55
169.999849944321	58.9978418194038	170	55
169.999824577376	64.9574556922438	160	65
169.999998152154	65.0003185498256	170	65
170.000171777997	65.0431877899131	180	65
170.000128594487	74.9690941144211	180	75
169.99984949486	75.0280603600749	160	75
169.999938106588	78.0882126476331	170	75
170.000052118024	81.8954185609535	170	85
170.000139576275	84.9707977121041	180	85
169.999858586254	85.0292158570395	160	85
170.000179281606	94.9580234039719	180	95
170.000005124439	95.000761883831	170	95
169.999831022996	95.0434347747815	160	95
169.999822658535	104.956623417764	160	105
169.9999983375	105.000176226805	170	105
170.000174155517	105.043746253319	180	105
170.000169238164	114.956274695002	180	115
169.999994499253	114.999452117994	170	115
169.99981955731	115.042687542442	160	115
169.999843994805	120.991605689134	170	125
169.999857504704	124.970055703878	160	125
170.000136834267	125.030770208921	180	125
170.000177441347	134.955818479173	180	135
170.000001275666	134.999819991408	170	135
169.999824878589	135.043825012843	160	135
169.999833761526	144.95602312001	160	145
170.000009194228	144.999711409717	170	145
170.00018496789	145.043356881872	180	145
169.999802902007	154.959090760472	160	155

Solution x	Solution y	Original x	Original y
170.000016469414	155.005710111635	180	155
169.981861846126	158.687171422397	170	155
169.955384956371	164.056386108312	160	165
170.311741023284	165.870740919617	170	165
170.685084356696	167.771583411575	180	165
171.755458493592	173.221525990911	180	175
172.22596389874	175.617042030874	170	175
172.721926474459	178.142172554285	180	185
168.733668573621	177.602489692059	170	185
161.908367003034	176.6789344927	160	185
157.311766882037	176.056934157669	160	175
151.647722548352	175.290495452569	150	185
149.339708324448	174.978181387911	150	165
145.633444894433	174.986742742828	150	175
140.06460522033	174.999590997107	140	165
140.014080740969	174.999850247196	140	175
139.963552311793	175.000109175258	140	185
130.029486204566	175.000119255036	130	185
129.963742817534	174.999787868923	130	165
126.094314647311	174.995170212001	130	175
120.479724577408	174.988489812975	120	165
119.496227060024	175.084402191863	120	175
118.511411502539	175.180443224167	120	185
110.485972173114	175.963142279141	110	185
106.82066005433	176.320616809651	110	175
101.913296501233	176.799223616324	100	175
97.8691361514892	177.193646141706	100	185
91.544508359854	177.810466665943	90	185
87.3501965812878	178.219533898129	80	185
87.7749980286159	175.855734323523	90	175
88.168728418185	173.664830302259	80	175
88.9100137526241	169.540017956023	80	165
91.8387981424349	166.487346367861	90	165
94.7853684223509	163.416136822716	100	165
97.0099066960148	161.097508473979	90	155
100.474879321923	157.485959324581	100	155
103.448451414664	154.3866019476	100	145
109.546244339619	155.010296158027	110	165
111.08411678085	154.710177780847	110	155
112.69884545881	154.395060147498	110	145
117.769332732497	153.405519966208	120	155
122.164223001957	152.547827574484	120	145
127.596571045022	151.487668310684	130	155
132.189084032204	150.591408405113	130	145
137.731605556233	149.509748077844	140	155
142.301342211553	148.617932357115	150	155
142.320714474224	145.529360924097	140	145
142.339677751764	142.506061773644	150	145
142.377350944301	136.501492702817	150	135
142.402636399257	132.471089663485	140	135
142.435308596504	127.263540092557	140	125
142.461125514625	123.14857772359	150	125
142.501644118202	116.690728506782	150	115
142.527679680752	112.541028535828	140	115
142.560849969452	107.254220384814	140	105
142.586934438157	103.096820349589	150	105
142.62692580487	96.7227763518659	150	95
142.653121743345	92.5476602424289	140	95
142.686421985012	87.2401576241131	140	85
142.712564932962	83.0735440046686	150	85
142.752142032568	76.7654273718372	150	75
142.77817710247	72.61617934263	140	75
142.810965782013	67.3903539443871	140	65
142.836262669733	63.3587407761954	150	65
142.871031509183	57.8171528822038	150	55
142.889293175602	54.9071587865658	140	55
142.907227554929	52.0493041093856	150	45
138.625686476772	52.0498501908882	140	45
132.66693453689	52.0506044870196	130	55
128.292729153054	52.0511598027562	130	45
121.854716056642	52.0519720197222	120	45
117.635785797834	52.0525064577606	120	55
112.265928828433	52.0531855703197	110	55
108.07106159842	52.0537164340924	110	45
101.815351735838	52.0545084151297	100	45
97.6221878923996	52.0550406267631	100	55
92.3275246757372	52.0557122456537	90	55
88.2266259369626	52.0562318621477	90	45
82.446912682342	52.056965773986	80	55
78.1219828530399	52.0575141269647	80	45

Solution x	Solution y	Original x	Original y
71.6367709696866	52.0583396212641	70	45
67.2786830578178	52.058891828943	70	55
61.3211263868974	52.0596492245398	60	45
57.0819398762199	52.0601844859886	50	45
57.0903733983384	54.9175352762054	60	55
57.0989221048424	57.8139407459753	50	55
57.1155617311724	63.4537267696135	50	65
57.1274285160024	67.4751454134548	60	65
57.1430098269303	72.7556040919457	60	75
57.1552008208858	76.8865623446483	50	75
57.1747503740466	83.5111110997373	50	85
57.1876082905426	87.8675866932805	60	85
57.2056762049667	93.9889328115476	50	95
57.2177445541229	98.07871163577	50	105
60.4150836628527	98.2223064743131	60	95
64.0068088627878	98.383613760619	60	105

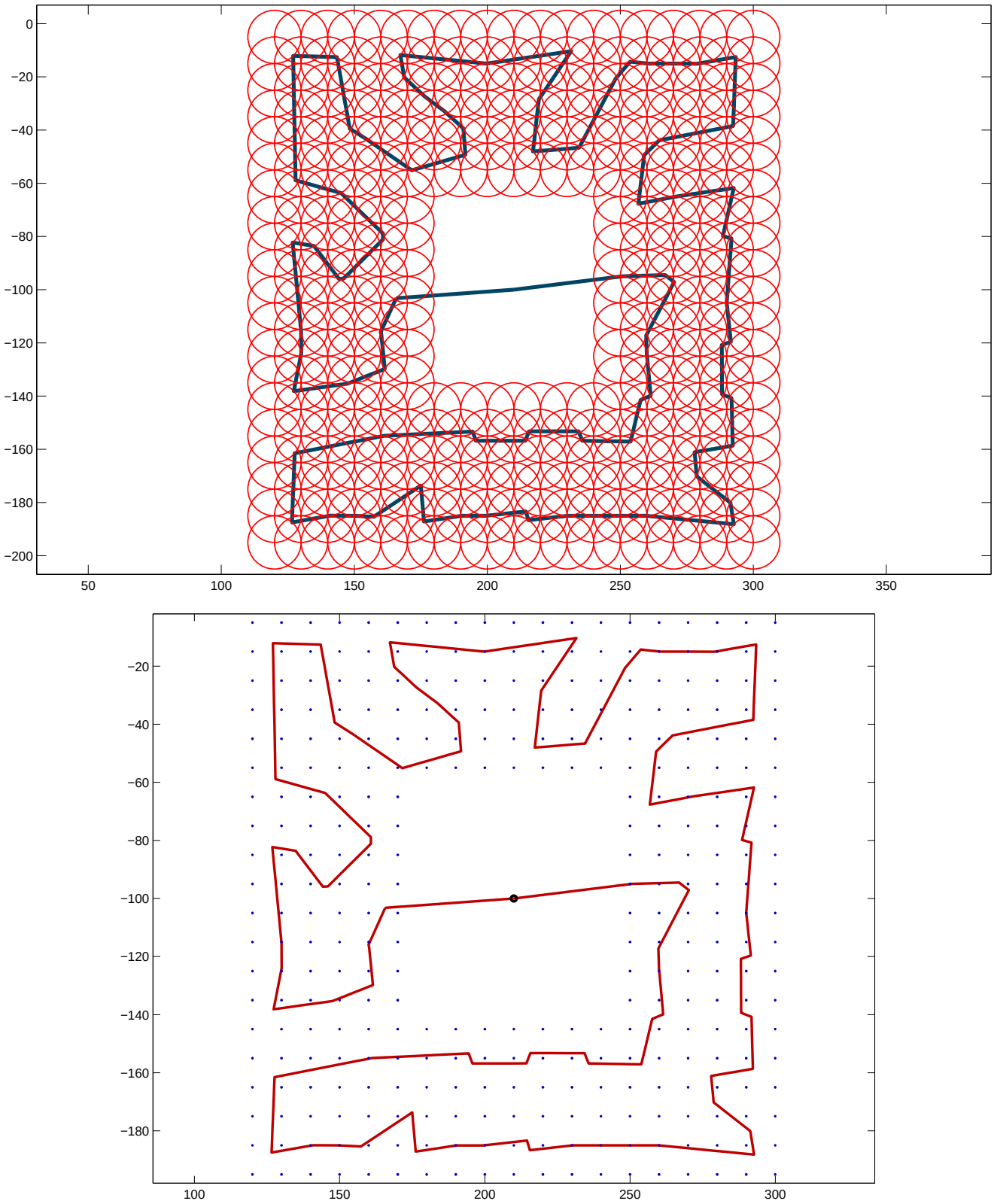


Figure N.39: *bubbles*6, Equal Radius, 2D, Euclidean, Length = 1383.1390781

Table N-42: Solution for *bubbles*6, Equal Radius, 2D, Euclidean

Total distance: 1383.1390780568 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
63.5564137161454	102.636083312953	60	95
59.6362748153	102.919641831	60	105
55.7193941229995	103.202964383823	50	95
52.5326552142919	110.239213440627	50	105
52.5326552142919	110.239213440627	50	115
49.9570241116954	115.92615113698	40	115
50.144004453937	116.690970466639	60	115
50.9825559275725	125.039983882774	60	125
51.4603054263977	129.796759446461	60	135
48.8044201938273	130.845968195204	50	125
45.0472032739096	132.330257012761	50	135
45.0472032739096	132.330257012761	40	135
42.0512887567215	133.513793821553	40	125
37.4571808199442	135.328695500116	40	145
30.2128195007355	136.334670918873	30	145
26.4761575546953	136.853554373773	30	135
20.8294679339452	137.637669353939	20	135
20.8294679339452	137.637669353939	20	145
17.2686046094013	138.13214125887	10	145
18.0020479381535	134.412057743204	10	135
19.3088049135965	127.784027336052	10	125
19.6841244584901	125.880335117761	20	125
20.0454541233575	124.04760233089	30	125
20.0122622631581	115.49505526751	30	115
19.8526640867914	113.822869206034	10	115
19.5239014037032	110.378840559832	20	115
18.9629931184294	104.50291554233	10	105
18.5043221079333	99.6979999160835	20	105
18.5043221079333	99.6979999160835	20	95
17.9587352600078	93.9825599599732	10	95
17.3654865533644	87.7677969819302	10	85
17.1046263187783	85.0351141907144	20	85
16.8427902169506	82.2922088297232	10	75
20.0981194822068	82.813345599029	20	75
24.8548943070498	83.5748451115496	30	75
27.9260926456323	87.6260143428211	30	85
31.3399778416779	92.1292155388576	30	95
34.2268308371307	95.9372204234781	30	105
35.9619049441171	95.8515652261833	40	105
43.3849679664775	88.4784196283254	50	85
43.3849679664775	88.4784196283254	40	95
43.3849679664775	88.4784196283254	40	85
49.2081496428391	82.6943966770696	50	75
50.7763893494682	81.1367009110761	60	85
50.7865683631022	78.8875131402895	60	75
45.875228497441	74.1467921829782	40	75
43.1280530813934	71.4950582012395	50	65
38.8667238406544	67.3817753139782	40	65
35.0278692150266	63.6762888931539	40	55
30.3853139565583	62.3761902407535	30	55
27.3397475073222	61.5233131021626	30	65
23.156448549516	60.3518256405118	20	55
20.6179195121185	59.640938880706	20	65
17.9107728092882	58.8828326320303	10	65
17.8204223131088	54.0533503229169	10	55
17.7063257578792	47.9546010217944	20	45
17.625503807792	43.6344377817058	10	45
17.5155642818686	37.7578475634505	20	35
17.4355818845095	33.4825527521135	10	35
17.324905299586	27.5665346150749	20	25
17.2431515721513	23.1965525306994	10	25
17.1196685372578	16.5959574859556	10	15
17.0356752489521	12.1062931977311	10	5
20.6476282412995	12.2099623199536	20	15
24.4528487523909	12.3191832925484	30	5
25.4536255389301	12.3479067497835	20	5
29.5637901822242	12.465875544589	30	15
33.4752903822405	12.5781462941403	40	5
34.3016473937536	17.1765125834036	40	15
35.2987753483746	22.7251545175992	40	25
35.9714574116801	26.4683833942138	30	25
36.9546236986413	31.9393332514053	30	35
37.6209593515945	35.6472449698036	40	35
38.299143163265	39.4210864355282	30	45
41.473296900759	41.4329158724664	40	45
44.4865587923659	43.3427703687098	50	35
51.1184408905403	47.9096557548375	50	55
51.1184408905403	47.9096557548375	50	45
55.1794484806707	50.7061659939363	60	45
58.6820847312181	53.118166873755	60	55
61.6024947675026	55.1292315381787	60	65
67.6767012129589	53.3749202186716	70	55
72.59476224377	51.9545186028686	70	45
78.2572172911447	50.3191259808678	80	55
78.2572172911447	50.3191259808678	80	45
81.7829645198814	49.3008421121154	90	55
81.4566037742575	45.0612342642514	90	45
81.020955276237	39.4019134154511	90	35
77.5316882549409	36.2413862581634	80	35
73.6465651084924	32.7222974392804	80	25
70.5342998727292	30.4007040079347	70	35
66.4054098343482	27.3207619916378	60	35
64.4524893343057	25.5032512630323	70	25
61.648274239409	22.89346908402	60	25
58.7917495176511	20.2350039955146	50	25
57.9076685271092	15.1470237375401	50	15
57.3270451062368	11.8054789709415	50	5
60.022081124176	12.0711522180325	60	15
62.7055782190268	12.3356924936259	60	5
68.104214316257	12.8678746092663	70	5
72.0824113482514	13.2600372375841	70	15
76.8999513782807	13.7349416745365	80	15
80.4929584335076	14.0891387224691	80	5
88.7429574831655	14.9023931193298	90	5
89.2544817664117	14.9528060617822	90	15
89.7620512323975	15.0028308638273	90	25
97.0115805975372	13.9380754392436	100	15
102.001283909738	13.2052305361429	100	5
109.032342752823	12.1725638567642	110	5
113.420009958331	11.5281361419863	110	15
121.542132267293	10.3352249710735	130	5
120.383721942616	12.0612027008234	120	5
117.833337012698	15.8611581977421	120	15
114.590466920527	20.6928897580581	120	25
111.827515024637	24.8095628932729	110	25
109.388250579412	28.4439558382569	100	25
108.872306957549	33.0279670936679	110	35
108.439101092164	36.8768810339348	100	35
107.773106750958	42.7940212317117	100	45
107.48326220557	45.3691921055141	110	45
107.182421209786	48.0420619864754	100	55
111.170343397856	47.721002609274	110	55
117.405960666016	47.2189842317537	120	55
120.858248965029	46.9410484802516	120	45
124.500847906435	46.6477904532599	130	55
126.462051920477	42.9406425421476	130	45
128.463957938457	39.1565586065886	120	35
131.079433104852	34.2126865927989	130	35
134.139421301546	28.4285813482167	140	35
134.139421301546	28.4285813482167	130	25
134.139421301546	28.4285813482167	140	25
138.267104087079	20.6262844705534	130	15
141.10953591149	17.3094136360365	140	15
143.695112125543	14.2922733495065	140	5
146.503165125231	14.5890554578033	150	15
148.81433796015	14.8333299869923	150	5
150.519043002115	15.0134814005725	150	25
159.958932466094	14.9998681378269	160	5
160.027073406936	15.0003232943687	160	15
160.0950892661	15.00077945613	160	25
169.151961233063	15.036022968711	170	25
170.840913455491	14.739593715879	170	15
172.57268295211	14.4356518081033	170	5
179.47297173519	13.2245320323879	180	5
183.421489112293	12.5314948865298	190	5
183.186280272491	18.5792419328415	180	25
183.186280272491	18.5792419328415	180	15
183.186280272491	18.5792419328415	190	15
182.934452631051	25.0542091972543	190	25
182.669619401166	31.8636461843324	190	35
182.541384699995	35.1608308277977	180	35
182.41203354786	38.4867156904985	190	45
177.692024501331	39.3993888293373	180	45
172.030281476831	40.494159729381	170	45

Solution x	Solution y	Original x	Original y
168.088948709495	41.2562662064676	170	35
161.028265515063	42.6215435682272	160	45
161.028265515063	42.6215435682272	160	35
154.644702450784	43.8558941277298	150	35
151.782089989144	46.6599745934592	150	45
148.975462454297	49.409215285178	140	45
147.724807305488	60.001566359085	140	65
147.724807305488	60.001566359085	140	55
147.724807305488	60.001566359085	150	55
147.253194917526	63.9958904422791	150	65
146.817699698301	67.6843272005044	140	75
150.433543310013	66.9965609600842	150	75
157.346896827625	65.6815803082944	160	75
159.522115254667	65.2678397196121	160	65
161.657599138535	64.8616573451845	160	55
169.581278222591	63.7039917296077	170	55
173.376827581119	63.1494532984803	170	65
178.972770759172	62.3318779527346	180	55
182.661353880842	61.7929684814801	190	55
182.021120389623	64.6258418523715	190	65
181.212899140375	68.2020148547486	180	65
180.161421565828	72.8545313130836	180	75
179.279757097073	76.7556719591566	170	75
178.578102251214	79.860323076804	170	85
181.821798478529	80.7547510277838	190	75
181.588614582628	83.8369666989475	180	85
181.371856916385	86.7020653329351	190	85
180.839848010399	93.7339583558757	190	95
180.497843515895	98.2544735521435	180	95
179.99887183452	104.849582818001	170	105
180.093054591395	105.736540271737	180	105
180.188360548323	106.634076788833	190	105
180.964133991048	113.932371334911	190	115
181.248473397414	116.609382552762	180	115
181.568741662664	119.622824925553	190	125
178.151374646679	120.792681622349	170	115
178.167931325083	124.022849402835	180	125
178.183657205483	127.089777109864	170	125
178.213154423253	132.860684452372	170	135
178.229175882685	135.981641320775	180	135
178.246426393195	139.343446878403	170	145
181.812486524098	140.741496606801	190	135
181.913133936701	144.630900882235	190	145
182.004113700452	148.146565295072	180	145
182.128897535145	152.968541937818	190	155
182.200554848874	155.737456101509	180	155
182.275896883436	158.648748809709	190	165
177.693648328648	159.428662653487	180	165
172.346858720751	160.338696568495	170	155
167.931568964087	161.090186267494	160	155
168.203997438244	164.02460356689	160	165
168.474084481061	166.933857349496	170	165
168.778248052732	170.2101666431	160	175
174.45950681145	174.659252140369	170	175
181.358865302049	180.062290742168	180	175
181.358865302049	180.062290742168	180	185
181.358865302049	180.062290742168	190	185
181.390671362352	180.087203473262	190	175
182.702496763546	188.162849584342	190	195
178.704313657066	187.77815515605	180	195
172.428932331941	187.174362606898	170	185
167.886662014664	186.737319865688	160	185
166.466732122568	186.600697617585	170	195
160.227079072873	186.000339209769	160	195
149.812246180902	184.998242180962	150	175
149.760934106721	185.001231011791	150	185
149.709699231835	185.004215489925	150	195
140.059797557564	185.000328483357	140	195
140.001688742803	185.000026049316	140	185
139.943483980594	184.999723183032	140	175
130.056059214141	184.999724825918	130	175
129.997319498244	185.000033367054	130	185
129.9385622158	185.000341929755	130	195
120.33723877732	185.00568823722	120	195
120.277844974419	185.001655291866	120	185
120.218404403753	184.997619204751	120	175
111.850363186301	185.935331026797	110	185
105.498193419994	186.647155646473	100	195
105.435949121397	186.442239365199	110	195
104.496220527749	183.349164921957	110	175

Solution x	Solution y	Original x	Original y
101.549902584838	183.675420240802	100	185
98.89281193109	183.969648280901	100	175
91.6733109610483	184.769084136589	90	175
90.554081496854	184.892993715001	90	185
89.4516261097053	185.015045851493	90	195
80.4596186906669	185.01056531506	80	195
80.2965152605581	184.995607806818	80	175
76.9646204756188	185.501954688761	80	185
72.6737115250056	186.154039961338	70	185
69.2455326992102	186.675019626672	70	195
66.1828547469564	187.140455701146	60	195
65.8082246739972	182.838253981503	60	185
65.3262366657695	177.303227788467	70	175
65.0094953683127	173.665736772262	70	165
64.9010056746462	173.716662785476	60	165
59.5811405235607	177.244308433458	60	175
52.7486099909265	181.775010630767	50	175
52.7486099909265	181.775010630767	50	185
47.3432012180811	185.359381051147	50	195
40.7335284992366	185.043933690989	40	195
40.2378087648221	185.020280793365	40	185
39.7438262837742	184.996711691469	40	175
30.8493183579504	184.963870662715	30	175
29.1915325703752	185.254898517523	30	185
27.4854354839473	185.554407597749	30	195
20.4115461778412	186.796285654581	20	195
16.579179321189	187.469095443707	10	195
16.717636860396	183.929096663633	10	185
16.8885756389481	179.558619339927	20	175
16.8885756389481	179.558619339927	20	185
17.0943030509254	174.298677671922	10	175
17.3484551573318	167.800628421297	10	165
17.4716253039143	164.651482075326	20	165
17.5946733135518	161.505463090705	10	155
22.6575634053889	160.514521374929	20	155
29.7973279725288	159.117080706515	30	155
29.7973279725288	159.117080706515	30	165
37.0935156822759	157.689023479071	40	165
41.7702936100252	156.773653403281	40	155
47.2755373548058	155.696130329331	50	165
49.2659234442832	155.306568111057	50	155
51.2038238595821	154.927278512057	50	145
56.8593498888736	154.655158497221	60	155
60.9801013886541	154.456890410234	60	145
69.3746037097273	154.052988275898	70	145
73.4823058885589	153.855345022475	70	155
79.7297757650592	153.55474944234	80	145
84.4627755032034	153.32702015935	90	145
85.0533060002067	154.949149782248	80	155
85.7282739302561	156.803233082141	80	165
89.7483180562491	156.795858133789	90	165
93.5895850690313	156.788812056458	90	155
99.434677939273	156.778089161814	100	165
104.320841741692	156.769126329021	110	165
104.968329703749	155.073521605775	100	155
105.669378854705	153.237612862356	100	145
109.010356465708	153.239426358806	110	155
112.175608579561	153.241144573968	110	145
119.191164718298	153.244945840706	120	145
124.345363493332	153.247740225983	130	145
125.720069957761	156.797505195486	120	165
127.710491305187	156.830242948387	120	155
127.710491305187	156.830242948387	130	165
131.780542591548	156.89717415008	130	155
136.670189005203	156.977580546647	140	155
140.235178124061	157.036207000843	140	165
143.874016038054	157.096047871947	150	165
144.981063157507	152.485705789883	150	155
146.330388062902	146.866380679629	140	145
147.626686875785	141.467903197829	140	135
149.43070400417	140.705635417002	150	145
151.366111092341	139.887850583252	150	135
151.366111092341	139.887850583252	160	135
151.418729367714	139.865612990047	160	145
150.172673988992	126.446197338338	160	125
150.075995161122	125.404732575575	150	125
149.98053656329	124.376426537727	140	125
149.749979389444	117.222163491824	140	115
152.473662673101	111.995532148778	150	105
152.473662673101	111.995532148778	150	115

Solution x	Solution y	Original x	Original y
153.947375482604	109.167543006472	160	115
157.028764490372	103.254485761436	160	105
160.226781248302	97.1176223910834	170	95
156.880533991608	94.501003098233	160	85
154.422361950809	94.5726966399593	160	95
150.300201811099	94.6929112597669	150	85
146.410410113987	94.8063498301783	150	95
140.758797811171	94.9711708732942	140	85
139.425775348409	95.1356232020387	140	95
138.082194887212	95.301379601685	140	105

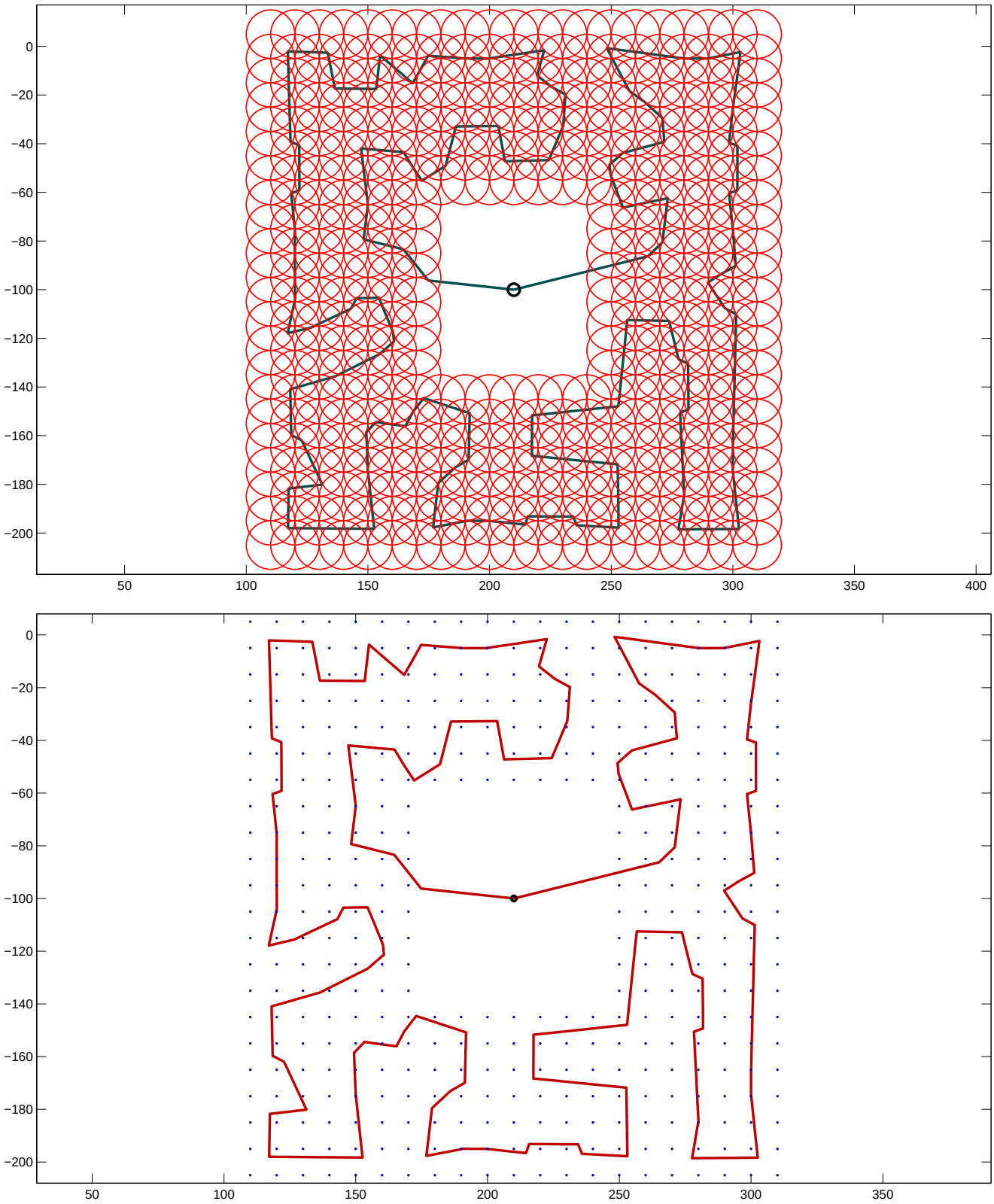


Figure N.40: *bubbles*7, Equal Radius, 2D, Euclidean, Length = 1720.214471

Table N-43: Solution for *bubbles*7, Equal Radius, 2D, Euclidean

Total distance: 1720.21447115693 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
138.315844067689	90.4509117345563	140	95
138.315844067689	90.4509117345563	140	85
146.585261786954	88.3899923121771	150	95
150.835130306696	87.3308150049398	150	85
155.148080822839	86.255918750938	160	95
158.121470829251	83.3789394465479	160	85
161.044215059158	80.5509553457137	170	85
161.809639019809	74.2171396499129	160	75
161.809639019809	74.2171396499129	170	75
162.635715126431	67.3812925413821	170	65
162.937874149771	64.8809388943811	160	65
163.241287736363	62.3702029905627	170	55
159.873592396659	63.0766195639026	160	55
152.064922415378	64.7144710124907	150	55
148.124164116458	65.5411162126892	150	75
144.8146665287	66.2353514961687	140	75
143.785306955301	63.4953734731435	150	65
142.112223156554	59.0419012248202	140	65
142.112223156554	59.0419012248202	140	55
139.735620137077	52.7157610801002	130	55
139.319019159337	48.6271132977172	130	45
141.943867484498	46.2926894569498	140	45
144.741939244582	43.8042075445441	140	35
150.673125974399	42.2187602366422	150	35
154.997220934438	41.0629091158415	150	45
154.997220934438	41.0629091158415	160	45
161.827534317114	39.2371113118567	170	45
161.49187620248	35.1146052390314	160	35
161.49187620248	35.1146052390314	170	35
161.027892832383	29.4160353304675	170	25
157.556866550839	26.2640136621497	160	25
153.742807151518	22.8004843507713	160	15
151.237763016817	21.0315594744254	150	15
149.570609714781	19.8543109696196	150	25
147.515211091818	18.402905220738	140	25
143.894597154568	11.5307764224548	140	15
139.001314578586	2.24305061476623	130	5
139.001314578586	2.24305061476623	140	5
138.200455302385	0.722988907502497	130	-5
142.08753028601	1.2419461840888	140	-5
149.581801756596	2.24248870168304	150	5
149.581801756596	2.24248870168304	150	-5
158.335500072609	3.4111713435233	160	-5
164.769021729337	4.27009914756254	160	5
164.769021729337	4.27009914756254	170	5
170.261747626372	5.00342396279836	170	15
170.407722317988	4.99168536810057	170	-5
179.403743562055	4.98220962401004	180	-5
179.612824506891	5.00749467729075	180	15
182.886180189215	4.35129087035225	180	5
187.162495673962	3.49402951028035	190	5
190.523160351338	2.82032091082873	190	-5
193.157265639786	2.29226137514915	200	-5
192.656127942046	6.0023395930396	200	5
191.714419747474	12.9741557994372	200	15
191.113169018417	17.4254191886622	190	15
190.340982786211	23.1421773257062	200	25
190.132479556862	24.6858276412574	190	25
189.925546001519	26.2178553857247	180	25
189.051054392963	34.1384173165628	180	35
188.763821907339	36.7397949097047	190	35
188.443386234471	39.6418922470321	180	45
191.863113752184	40.8130178025415	200	35
191.862252612811	43.8705201248331	190	45
191.861446793238	46.73132280418	200	45
191.860051818765	51.6984232128822	190	55
191.859049027511	55.266632823914	200	55
191.857945635929	59.1942229251273	200	65
188.431589154886	60.376652746747	180	55
188.733682675955	63.2915626868063	190	65
189.006167479706	65.9207828557361	180	65
189.821153144096	73.784561936953	180	75
190.042140563375	75.916875729801	200	75
190.274059569139	78.795962772017	190	75
190.592604271245	82.7504926275312	190	85
190.861726258287	86.0914544071998	200	85
191.197149860626	90.25553670257	200	95
188.071779853745	91.9700603703003	190	95
185.130477029362	93.5836007947059	180	85
182.065377266462	95.5730588355954	180	95
179.787270303955	97.0516905910423	170	95
183.2506788989	102.317141265503	180	105
186.724745219425	107.598791648198	180	115
189.325915749397	108.97339234977	190	105
189.325915749397	108.97339234977	190	115
191.371307852122	110.054283045701	200	105
191.238605036141	115.381141097883	200	115
191.020665706456	124.130751059025	200	125
190.878102076062	129.854199303515	190	125
190.878102076062	129.854199303515	190	135
190.74367320818	135.251231023663	200	135
190.51582921585	144.397845969025	200	145
190.379171638272	149.882638215868	190	145
190.379171638272	149.882638215868	190	155
190.251187991217	155.019539171604	200	155
190.010792223077	164.66695569772	200	165
190.000579217133	165.074741179139	190	165
190.000579217133	165.074741179139	190	175
189.999093631761	165.133999122069	180	165
189.986193876907	174.47466722865	180	175
190.191447796146	176.393925257343	200	175
191.07895067894	184.693408747547	200	185
191.504839512015	188.676004118741	190	185
192.131669814139	194.537845714624	200	195
192.538497490999	198.342214048426	200	205
186.717283590533	198.384071680557	180	195
186.717283590533	198.384071680557	190	195
184.415455639227	198.400617698356	180	205
184.415455639227	198.400617698356	190	205
172.197548664632	198.488459437991	170	205
167.617591787792	198.521387883021	160	205
168.280209176322	194.624795326266	160	195
168.280209176322	194.624795326266	170	195
169.514571692441	187.365850774237	160	185
169.769529620108	185.866509347273	170	185
170.017530089512	184.408076793781	180	185
169.718964612436	178.438844440445	170	175
169.511523696038	174.291279573969	160	175
169.204519621043	168.15284026841	170	165
168.988509618753	163.833825600028	160	165
168.624782853888	156.560782904882	160	155
168.480555781694	153.677039836099	170	155
168.323767604255	150.542110986582	160	145
171.78873773092	149.292524024281	180	155
171.756523638042	146.045321921558	170	145
171.726752677138	143.044349986136	180	145
171.653102300629	135.621267339028	180	135
171.601583982423	130.428324890115	180	125
169.753584517947	129.573809516299	170	125
169.753584517947	129.573809516299	170	135
167.706276651882	128.627136214266	160	135
166.31313171937	123.035967672068	160	125
164.888681660728	117.319147378689	170	115
163.767746588601	112.820428941438	170	105
159.065325666513	112.730528345403	160	105
159.065325666513	112.730528345403	160	115
150.731281501444	112.571192258765	150	105
150.731281501444	112.571192258765	150	115
146.62271417129	112.492645761648	140	105
146.078267505275	117.709120730723	140	115
144.801342016912	129.943527818763	140	125
144.801342016912	129.943527818763	140	135
144.801342016912	129.943527818763	150	125
144.801342016912	129.943527818763	150	135
143.464869820567	142.748471983972	140	145
143.464869820567	142.748471983972	150	145
142.923626169429	147.934235097693	150	155
136.926429120862	148.569210623893	140	155
124.950146896889	149.837243253877	120	145
124.950146896889	149.837243253877	130	145
124.950146896889	149.837243253877	120	155
124.950146896889	149.837243253877	130	155
112.651218944597	151.139434399496	110	145
107.430670248685	151.692176257363	100	145

Solution x	Solution y	Original x	Original y
107.426481266687	155.908839507713	100	155
107.426481266687	155.908839507713	110	155
107.418556551269	163.89360617939	100	165
107.418556551269	163.89360617939	110	165
107.414190161692	168.289569431609	100	175
112.494806587284	168.792016220021	110	175
124.969197920761	170.025711345796	120	165
124.969197920761	170.025711345796	130	165
124.969197920761	170.025711345796	120	175
124.969197920761	170.025711345796	130	175
137.451560882507	171.26020042237	140	165
142.643530554064	171.773659394749	150	165
142.719333524813	176.473134650707	140	175
142.719333524813	176.473134650707	150	175
142.937257217816	189.982606193234	140	185
142.937257217816	189.982606193234	150	185
142.937257217816	189.982606193234	140	195
142.937257217816	189.982606193234	150	195
143.063302941021	197.797059776187	150	205
138.858395026855	197.570691188312	140	205
131.194179501654	197.158109008209	130	205
125.821056464274	196.868861521211	120	205
125.090540749117	195.050373003987	120	195
125.090540749117	195.050373003987	130	195
124.374354798955	193.267540258392	130	185
119.244405617077	193.236226624403	120	185
112.055951852254	193.192337877208	110	185
109.027808947716	193.173856504941	110	195
105.78886414981	193.154087765524	100	185
104.618182467679	196.571705552879	110	205
100.750902195973	196.166978036972	100	205
96.7847718952232	195.751904728183	100	195
91.3042517743625	195.178345849797	90	205
89.6893413013718	195.009335228534	90	195
89.6893413013718	195.009335228534	80	195
89.4615381263874	194.985494626156	90	185
80.9310644385484	194.956564064286	80	185
77.7310480489135	195.571629804335	80	205
70.2614587564252	197.00731785743	70	205
66.8042540432788	197.671819853142	60	205
67.2149629805124	194.140372376549	70	195
67.2149629805124	194.140372376549	60	195
68.1640685173202	185.979524062946	70	185
68.1640685173202	185.979524062946	60	185
68.9138641067809	179.532450766383	60	175
72.2687294488089	176.433466180497	70	175
75.9269004919491	173.054309670835	70	165
77.8901406408417	171.922317559365	80	175
79.8270748381678	170.805492349655	80	165
81.3986427479608	169.899338781378	90	175
81.5280309395891	164.212811434906	90	165
81.7291836195141	155.372213716656	90	155
81.7291836195141	155.372213716656	80	155
81.8338586602374	150.771846859748	90	145
77.6733443253202	149.404670947788	80	145
72.706565437213	147.772551368547	70	155
68.1645700460859	146.280019723398	70	145
62.931927227485	144.560537426716	60	135
60.8361802987818	147.271046150149	60	145
58.4154808610581	150.40182496621	50	145
56.6126734711864	153.838331852892	60	155
56.6126734711864	153.838331852892	50	155
55.4209613029347	156.109978162972	60	165
51.0185416653031	155.505820770784	50	165
43.2860374369392	154.444682642602	40	145
40.5813567612066	157.263381527016	40	155
40.5813567612066	157.263381527016	40	165
39.3498990181596	158.546753750758	30	155
39.5928863960666	164.678234446881	30	165
39.9727152514514	174.261816660042	30	175
40.0967770905705	175.403848980861	40	175
40.2226615496325	176.562658172047	50	175
41.2140455634589	185.688500802706	50	185
41.2140455634589	185.688500802706	40	185
42.156348105109	194.362667321445	50	195
42.156348105109	194.362667321445	40	195
42.5832566997225	198.292391255828	50	205
37.9806476066681	198.256104619198	40	205
25.5162074334824	198.157855251065	30	205
25.5162074334824	198.157855251065	20	205

Solution x	Solution y	Original x	Original y
23.0338460915993	198.138286724953	30	195
23.0338460915993	198.138286724953	20	195
11.9009937369635	198.050499359264	10	205
7.15423050667623	198.013078087326	0	205
7.21952850366421	193.875208214585	10	195
7.21952850366421	193.875208214585	0	195
7.33884648298337	186.313177488	0	185
7.41141914403217	181.713490173662	0	175
11.5972756617778	181.231924188073	10	175
11.5972756617778	181.231924188073	10	185
17.062476944287	180.603150071952	20	185
21.2722166438601	180.118823134636	30	185
18.6333114285007	174.460762188765	20	175
15.522706550708	167.791334457222	20	165
12.7874605754345	161.926712138626	20	155
10.4731382295358	160.731069762667	10	155
10.4731382295358	160.731069762667	10	165
8.48122650607364	159.70199332087	0	165
8.35334620620685	154.08842868202	0	155
8.16033707729872	145.615676699001	0	145
8.05355249477454	140.927930672311	0	135
11.8036681201251	139.853715373506	10	135
11.8036681201251	139.853715373506	10	145
18.9685616879843	137.801336647146	20	135
18.9685616879843	137.801336647146	20	145
26.3788909929927	135.678648152419	30	145
30.0360541092395	133.857190598531	30	135
33.8236454604167	131.970773384682	30	125
37.899648771356	129.940715905943	40	125
40.4894797668756	128.650847014374	40	135
44.4690363937786	126.668824541341	50	135
49.1395236617749	122.653877736732	50	115
49.1395236617749	122.653877736732	50	125
50.7071945688959	121.306243691809	60	125
50.3042602540119	117.447994114172	60	115
46.6649514122378	108.608477039794	50	105
44.5009157708246	103.35225324604	50	95
40.0969162205053	103.421532104412	40	105
40.0969162205053	103.421532104412	40	95
35.2719752187037	103.497431129081	30	95
34.1176888968448	105.736713341976	30	105
33.0480545943164	107.811779874984	40	115
27.4394329380218	110.469408581548	30	115
21.3396630764643	113.35976652875	20	115
16.6843451235122	115.565676249091	20	125
10.1327077849616	117.1233323396	10	115
10.1327077849616	117.1233323396	10	125
7.00785135988011	117.866271250133	0	125
7.75426133196289	114.458313282738	0	115
9.28001097538451	107.49195941875	0	105
10.0548231119637	103.954301737606	20	105
10.0013136765151	95.1391247851657	20	95
10.0009613568442	95.0915976001877	10	105
10.0009613568442	95.0915976001877	10	95
9.99989836516728	94.9697996363715	0	95
9.9998675923764	85.022312863262	0	85
10.0002235166684	84.9523295351298	10	85
10.0002235166684	84.9523295351298	10	75
10.0003428540954	84.926561578513	20	85
10.0132327798718	75.5142609254688	20	75
9.81873437390435	73.6562950920698	0	75
8.91384627138704	65.0116960439458	0	65
8.42907130593298	60.3805955747726	0	55
10.0644749295247	59.8199880124708	10	65
10.0644749295247	59.8199880124708	10	55
11.8476268641959	59.2087251152766	20	65
11.8204597622642	54.0361814018108	20	55
11.7779525893607	45.9439689562242	20	45
11.7501437909496	40.6515413684689	20	35
9.94423931562417	39.9410517828771	10	45
9.94423931562417	39.9410517828771	10	35
8.17916715084434	39.2466295708227	0	45
8.00092734395845	33.3163196997275	0	35
7.60623929442221	20.1849072913374	0	25
7.60623929442221	20.1849072913374	0	15
7.53159231418888	17.7010047367848	10	25
7.53159231418888	17.7010047367848	10	15
7.19645138149642	6.54794745285443	10	5
7.19645138149642	6.54794745285443	0	5
7.0621742874161	2.07995354867621	0	-5

Solution x	Solution y	Original x	Original y
11.3446579519563	2.21944301782078	10	-5
18.5916426464965	2.45549577605737	20	-5
23.5195339506371	2.61600997714139	30	-5
24.313888038756	6.67357378738183	30	5
24.313888038756	6.67357378738183	20	5
25.6038167214969	13.2624564265733	30	15
25.6038167214969	13.2624564265733	20	15
26.3969338362038	17.31369487763	20	25
31.2161802806995	17.3653831497848	30	25
38.735182330659	17.4460252885807	40	25
43.3902114294361	17.4959513119189	50	25
43.8512997141323	13.5329552589647	40	15
44.6397569551701	6.75646619535747	50	5
44.6397569551701	6.75646619535747	40	5
44.9999958867617	3.66025936434834	40	-5
45.0000326550212	3.6602747868345	50	-5
52.648748823208	10.2388866790175	50	15
58.3447060335174	15.1379486575792	60	25
59.7373321642219	12.7495458032485	60	15
61.299855088204	10.0697705499922	70	15
63.4243202289324	6.21064464007199	70	5
63.4243202289324	6.21064464007199	60	5
64.7521089512711	3.79872214584782	60	-5
69.8378671064182	4.19179536591348	70	-5
78.983599701322	4.89864787038684	80	-5
80.2189460330039	4.99414164098948	90	5
80.2189460330039	4.99414164098948	80	5
80.3966194818922	5.00786936303735	80	15
89.2758848498196	5.02625131230292	90	15
91.8416881616322	4.64621450256436	90	-5
100.762258642663	3.32496445964047	100	5
100.762258642663	3.32496445964047	100	-5
108.66376886486	2.15465558408899	110	-5
112.478281381356	1.58967477551553	120	-5
111.536110272817	4.87920042944481	110	5
111.536110272817	4.87920042944481	120	5
109.516877181139	11.9293144843656	100	15
112.351380455189	14.1639708189417	110	15
115.516217202498	16.6590545569476	110	25
118.344429848915	18.2078021787151	120	15
121.216792659536	19.7807253443269	130	15
120.85839095683	24.6897988635627	120	25
120.85839095683	24.6897988635627	130	25
120.275991372738	32.6668252720232	130	35
118.078952550232	37.8909734752752	120	45
118.078952550232	37.8909734752752	120	35
117.158921854	40.0786314444681	110	35
115.511837062669	43.9950868154708	110	45
114.355091959236	46.7456024181745	120	55
109.070636957208	46.8879979718574	110	55
100.961726484913	47.1065014517239	100	55
96.2976973062696	47.2321771877174	90	55
95.5687752874149	43.2568563133574	100	45
95.5687752874149	43.2568563133574	90	45
94.3689047775384	36.7132977920365	100	35
94.3689047775384	36.7132977920365	90	35
93.6354255031488	32.7131220848846	100	25
88.8927375006291	32.7589331908627	90	25
81.0871197552266	32.8343300237272	80	25
76.1542214588752	32.8819802894817	70	25
75.1290531833779	36.8209286735668	80	35
75.1290531833779	36.8209286735668	70	35
73.353569758314	43.642715323976	80	45
73.353569758314	43.642715323976	70	45
71.9372291206812	49.0846150331093	80	55
67.2485336596577	52.0207887598548	70	55
62.1260431480171	55.2286132538907	60	65
60.4135798993153	52.6310025683181	60	55
58.4521142909447	49.6556945101616	50	55
56.2225605825811	45.9765630184605	60	45
56.2225605825811	45.9765630184605	50	45
54.7154740605116	43.4896311414081	60	35
48.7454431325409	42.9653946792626	50	35
41.0321901632663	42.2880867072045	40	45
41.0321901632663	42.2880867072045	40	35
37.1894676136663	41.950655195217	30	35
37.6823096038839	45.9917713003544	30	45
38.673447722547	54.1189268570458	30	55
39.7816600944223	63.2059902116236	30	65
39.8551715764294	63.8087731390493	40	65

Solution x	Solution y	Original x	Original y
39.8551715764294	63.8087731390493	40	55
39.9999995050675	64.9962501599766	50	65
38.7647809009257	75.0655281275463	30	75
38.2409738228627	79.3355133580074	30	85
41.8651670645231	80.239159117291	40	85
41.8651670645231	80.239159117291	40	75
48.7609674834589	81.9585350839201	50	85
48.7609674834589	81.9585350839201	50	75
54.594339882264	83.4130191136729	60	75
57.8392969763905	87.4842965209925	60	85
61.5844502837045	92.1831487216474	60	95
64.8138472754215	96.2349024927882	60	105

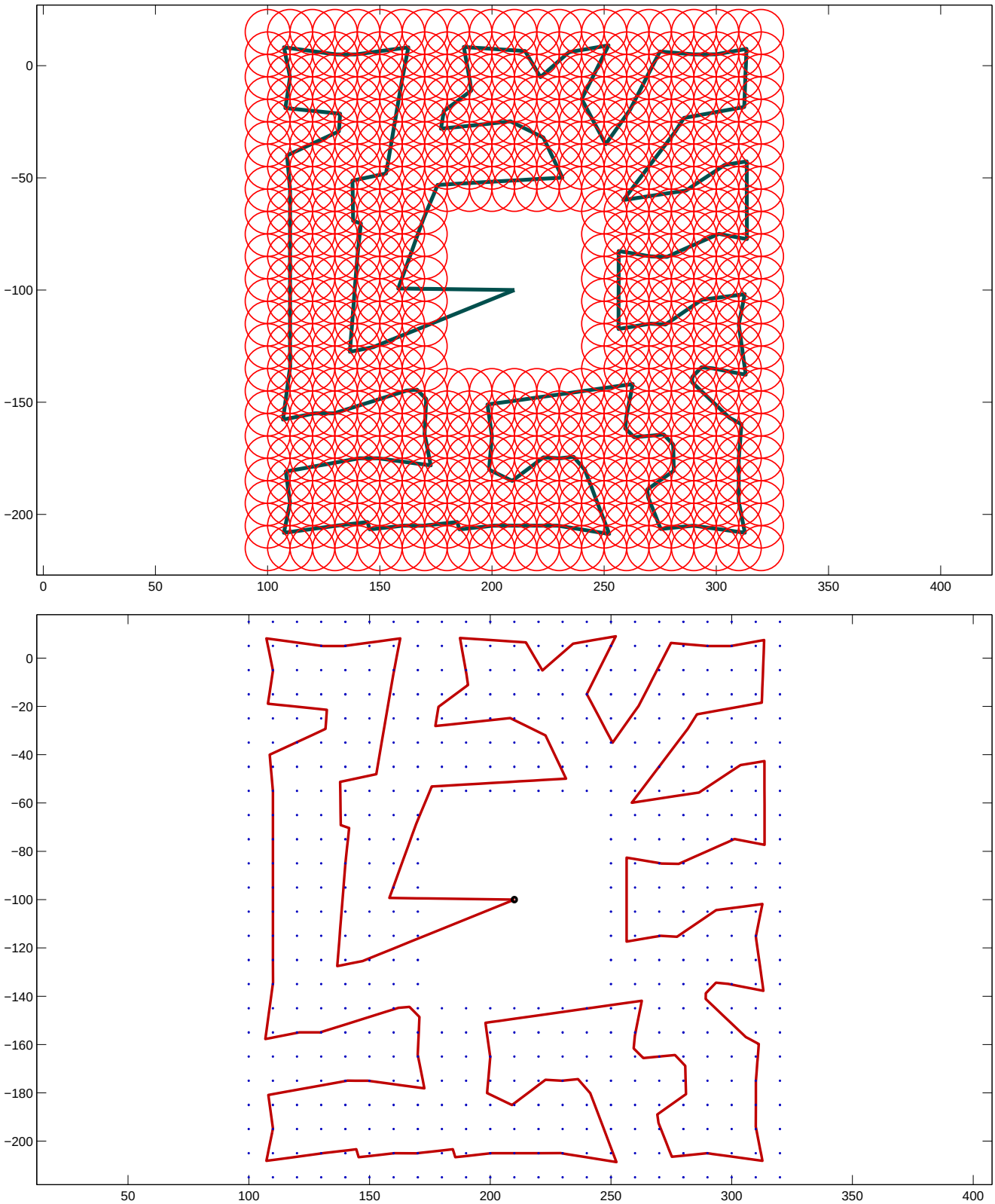


Figure N.41: *bubbles*8, Equal Radius, 2D, Euclidean, Length = 2101.3733121

Table N-44: Solution for *bubbles*8, Equal Radius, 2D, Euclidean

Total distance: 2101.37331214818			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
64.3686898804989	114.407171493824	60	115
56.9989257799595	117.387056444484	60	125
50.0706103431793	120.188435320374	50	125
50.0706103431793	120.188435320374	50	115
43.3558938311245	122.903446415413	40	115
37.131208958508	125.420330379702	40	135
32.1668331733097	126.414754076005	30	135
32.1668331733097	126.414754076005	30	125
32.1668331733097	126.414754076005	40	125
27.8480091116351	127.27986473932	20	125
26.6392383669738	127.521993924237	20	135
27.4502776362129	117.277394520303	20	115
27.8449023334296	112.292719010849	30	115
28.4089228649845	105.168346941766	20	105
28.4089228649845	105.168346941766	30	105
29.10378042877	96.3914061442755	20	95
29.4697855221694	91.7682090454922	30	95
30.0002299482455	85.0680206152085	40	85
30.0000155909922	85.0657024964196	30	85
29.9998006719205	85.0633789259717	20	85
30.6813871906423	78.6040347098825	30	75
31.1318201661103	74.3353183713126	40	75
31.5522262211405	70.3511844219451	40	65
29.7323139893203	69.7147342642637	30	65
28.1079490411514	69.1466923481552	20	75
28.0233882838918	63.9117179182803	20	65
27.8954624259646	55.9922353918465	20	55
27.8186081772105	51.2345345729556	20	45
31.412692778621	50.4746992978367	30	45
31.412692778621	50.4746992978367	30	55
36.3893439686949	49.422562454921	40	55
39.7237122455927	48.7176363545851	40	45
42.7915207346306	48.0690641403766	50	55
43.6928101150153	42.7895689990291	50	45
44.9073098527827	35.6753397558109	50	35
45.8283470402432	30.2801542583704	40	25
45.8283470402432	30.2801542583704	40	35
46.9787964121009	23.5411286220919	50	25
48.3082420917481	15.7535725790536	40	15
48.3082420917481	15.7535725790536	50	15
49.8380398933407	6.79242248967874	40	5
50.5515722564397	3.10888669913439	60	5
51.2487522892262	-0.490213456178083	50	-5
51.2487522892262	-0.490213456178083	50	5
52.1285279646753	-5.03192255867716	60	-5
52.7294664751354	-8.13418674795674	60	-15
49.0537640273811	-7.63831787662172	50	-15
43.3724927619217	-6.87189279551012	40	-5
39.5373620658588	-6.35451916354037	40	-15
31.9801406727602	-5.33502536495233	30	-15
30.6422671576831	-5.15455112535398	30	-5
29.3299358582577	-4.97752463205411	30	5
20.675544464227	-4.97715507254044	20	5
19.3509673110298	-5.1574295238657	20	-5
18.0027608230333	-5.34092214752627	20	-15
10.456299922859	-6.36805602320218	10	-15
6.61658643419858	-6.89067412937188	10	-5
0.956927916969192	-7.66100189910253	0	-15
-2.70563560790197	-8.15951077331594	-10	-15
-2.21667840053044	-5.74089989879864	0	-5
-1.74800324357005	-3.42261535855295	-10	-5
-0.597176441969466	2.26998730382575	-10	5
-0.291524159073674	3.7819344332008	0	5
0.00283117305311009	5.23800105721913	10	5
-1.44372737985086	14.6908284246695	-10	15
-2.08590179017004	18.8871374768612	-10	25
1.72223167169352	19.2829521593853	0	25
6.24098886405999	19.7526287790719	0	15
6.24098886405999	19.7526287790719	10	15
6.24098886405999	19.7526287790719	10	25
16.9312233109856	20.8637841376938	20	15
22.3377584000992	21.4257381871607	30	15
22.1514553760417	24.0259955353979	30	25
21.9694768059696	26.5659193898052	20	25
21.7724363615282	29.3160544908343	30	35
16.0662479394008	31.9552781816763	20	35
7.12870948449454	36.0890789833768	10	45
4.15895930329503	37.4626482491505	0	35
4.15895930329503	37.4626482491505	10	35
-1.3443980673123	40.0080542050962	-10	35
-0.969549318855272	44.2317263483037	-10	45
-0.587621615678259	48.5351888622048	0	45
0.00150114589951045	55.1732957421943	10	55
-0.00359235573019134	55.2679323910713	-10	55
-0.000205625837153889	64.9551450323958	-10	65
-5.79652743226689E-6	65.0000003444312	0	55
-5.79652743226689E-6	65.0000003444312	0	75
0.000128989756916553	65.0312171854631	0	65
0.000263616605195693	65.0623838946577	10	65
0.000149228886670016	74.9671932229284	10	75
-0.000150454626762553	75.0326070440559	-10	75
-0.000191358466850033	84.9561712548878	-10	85
-5.5695565492897E-8	85.0000343375852	0	85
0.000191464058843849	85.0439456973685	10	85
0.000191848065924205	94.9559284965459	10	95
-2.27091831561665E-7	95.0000202898556	0	95
-0.000192377912441088	95.0441308270959	-10	95
-0.000192598226220753	104.955823457071	-10	105
-1.09636317802142E-7	105.000021796179	0	105
0.000192320120049771	105.04420820294	10	105
0.000192523617357665	114.9557356871	10	115
-2.06807584390845E-7	115.000008098035	0	115
-0.000192758035211682	115.044240768449	-10	115
-0.000148675313994318	124.959921193633	-10	125
0.000123939162165243	125.011692923086	0	125
0.000396110242192549	125.063384812924	10	125
0.0218150259699001	134.339814044156	10	135
-0.151935375895491	135.624075409146	0	135
-0.329489814504228	136.936452082135	-10	135
-1.08672898314907	142.533188481494	0	145
-1.68565468700203	146.959823718558	-10	145
-2.62654224593246	153.914005494245	-10	155
-3.14180542926221	157.722278129516	-10	165
-0.780520301895024	157.258788249739	0	155
1.47161124334018	156.816723331571	0	165
7.33789043145622	155.66527624196	10	165
9.18330184880092	155.303053577665	10	155
10.9650509137943	154.95332696159	10	145
19.0774100370603	154.957352098027	20	145
19.4022838134069	155.017876274156	20	165
23.5445722325297	153.718659365783	20	155
30.5403494633672	151.524464037585	30	155
30.5403494633672	151.524464037585	30	145
36.8205631891489	149.554700507015	40	155
41.4626676033496	148.098718529409	40	145
46.3891647295131	146.553538381606	50	155
49.2652751518679	145.651455857153	50	145
51.9619618508393	144.805649020002	50	135
56.5518463873847	144.386709110476	60	135
58.5895232780884	146.464363172198	60	145
60.6617084274616	148.577202953345	70	145
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60.3914368521104	154.712604648164	70	155
59.9714908199921	164.245402458017	50	165
60.6546774535538	167.702669561559	60	175
60.6546774535538	167.702669561559	60	165
60.6546774535538	167.702669561559	70	165
62.0254926044657	174.639733472509	70	175
62.7183645553088	178.145959897824	70	185
59.1355936393501	177.660714514271	60	185
53.3580990326706	176.878230530447	50	175
49.5282762721895	176.359525612716	50	185
41.9486554135384	175.332967188525	40	185
40.6164796167812	175.152550709976	40	175
39.3183040913164	174.976739241969	40	165
34.1419103329251	174.96713845392	30	175
30.8813216673998	174.961090250091	30	165
27.820939173388	175.512791404551	30	185
20.20385141976	176.885955880137	20	185
15.9781635595989	177.647739501981	20	175
5.82395671837877	179.478276015273	0	185
5.82395671837877	179.478276015273	10	185
5.82395671837877	179.478276015273	10	175
1.68446693029686	180.224520247847	0	175

Solution x	Solution y	Original x	Original y
-1.90533681099704	180.871669734318	-10	175
-1.33547720766161	184.995325939374	-10	185
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-0.288937554866692	196.15267445974	0	195
-0.597472350690879	197.685718404969	-10	195
-1.76657573967177	203.494756366991	-10	205
-2.22426815786932	205.768872636546	0	205
-2.70545061992479	208.159705118463	-10	215
1.09804903750774	207.645573532133	0	215
8.08906706238071	206.700574002147	10	215
12.5708997090996	206.094751928099	10	205
18.4481767805301	205.300299350091	20	215
21.2536571429872	204.921087694392	20	195
24.0033856507875	204.597802390565	20	205
27.7793213459143	204.153888648465	30	205
31.0071627677519	203.774399348527	30	195
34.5156393964705	203.361929972172	40	195
35.5052732746245	206.651823642196	30	215
39.4149298761041	206.212303723432	40	215
43.6950161329528	205.731143117403	40	205
50.2205500829254	204.997570894544	50	195
50.2816057596665	205.001718465178	50	205
50.3428942340652	205.005881751697	50	215
59.4543272337729	205.014897252132	60	215
61.2552864564916	204.815622714034	60	195
64.6223721997367	204.443029724341	60	205
70.2546939179443	203.819800576315	70	205
70.2546939179443	203.819800576315	70	195
74.4979124598327	203.35027708987	80	195
75.5019639778023	206.649641736624	70	215
79.0032034074077	206.262214395936	80	215
82.2056740156485	205.907831644429	80	205
86.0006436991154	205.487890222287	90	205
88.7911861369764	205.179087672404	90	215
90.5429349064172	204.985252475971	90	195
96.1297472358294	204.994133996504	100	205
100.007961710408	205.000272351473	100	215
109.958729925783	205.000127702601	110	215
110.015284061349	204.999802435948	110	205
110.071753519367	204.999477609429	110	195
119.218502720221	204.969419516027	120	195
120.727495771397	205.212604072248	120	205
122.291587756712	205.464668736177	120	215
129.398026319175	206.609938529427	130	215
133.197018977223	207.222190726546	130	205
138.741037766611	208.115662826798	140	215
142.24942650024	208.681082702134	150	215
141.452134469822	206.579510250805	150	205
139.65996910503	201.855557754796	140	205
136.789763069046	194.290027725439	140	195
136.789763069046	194.290027725439	130	195
134.550087855549	188.386491663022	140	185
132.940872646838	184.144772987685	130	185
131.420609560953	180.137523093175	140	175
128.752563561283	177.073983937392	130	175
126.343120971055	174.307380335538	130	165
121.431487920271	174.827642240679	120	165
120.600621641982	174.915646897956	120	175
119.781765170409	175.002379108847	120	185
112.883551692742	174.5752397636	110	165
109.688318091386	176.988574702174	110	175
106.165401057145	179.649403028883	110	185
102.656433126817	182.29968887509	100	185
102.656433126817	182.29968887509	100	175
99.0171438659838	185.048413208229	100	195
93.0227788852473	182.152830037149	90	185
88.6962772069697	180.062911292161	80	185
88.9640746720175	177.030858882103	90	175
89.2015284680073	174.342401462279	80	175
89.9334118128173	166.055055097596	80	165
89.9686730566363	165.655655434874	90	165
90.0034291984398	165.261967798234	100	165
88.5555737960585	155.015254315622	80	155
87.9900701426449	151.013223435597	80	145
90.7026390303598	150.630660355834	90	145
93.5009760045233	150.236000450459	90	155
98.375773896376	149.548498174186	100	155
102.77824483396	148.927606685193	100	145
109.483572028223	147.98194806745	110	155
109.483572028223	147.98194806745	110	145

Solution x	Solution y	Original x	Original y
116.348586939802	147.013769230083	120	145
120.371377483701	146.446424699073	120	155
128.484620421393	145.302205047709	130	155
133.544368988154	144.588622924128	130	145
142.857142862484	143.27519836565	150	145
142.857142862484	143.27519836565	140	145
142.857142862484	143.27519836565	140	135
149.278315433663	142.369596170289	150	135
152.743709591953	141.880867865477	160	135
152.050571523741	145.423742465866	160	145
150.788662586784	151.873960523641	150	155
149.897001743382	156.431567630498	140	155
149.408253008586	161.611067361084	140	165
151.392005621814	163.594079641563	150	165
153.391260497615	165.592585758316	150	175
158.966037756944	165.071579158738	160	175
160.117227851125	164.963902216731	160	165
161.268510178901	164.856216058463	160	155
166.499156600453	164.367187222923	170	155
168.607451927356	166.575612894828	170	165
170.764732594693	168.835353599383	180	165
170.902152654923	174.321467201134	180	175
170.973598820908	177.17392061479	170	175
171.057515741605	180.524279021456	180	185
167.572021702671	183.000259047406	170	185
162.239390822695	186.788648841511	160	185
159.182403015447	188.960249590521	150	185
159.670252382946	192.453178206432	150	195
162.773719930072	200.308421147194	170	205
162.773719930072	200.308421147194	170	195
162.773719930072	200.308421147194	160	195
163.996458300549	203.403317439341	160	205
165.204529182221	206.461090025242	160	215
169.88254355724	205.992825946978	170	215
179.818147786666	204.998350698592	180	195
180.862474830901	205.141442620048	180	205
181.943938586184	205.289623791936	180	215
189.538124180424	206.330225382935	190	215
193.39754144496	206.859075236882	190	205
199.142534984754	207.646286897507	200	215
202.726442360392	208.137385166231	210	215
202.245763454612	205.694730701242	200	205
201.789507215742	203.376188924062	210	205
200.670726513864	197.690663934685	210	195
200.305137930937	195.83284442195	200	195
199.955220380701	194.054659406249	190	195
200.000009928636	185.014884301716	210	185
199.999878649318	184.981155383922	200	185
199.999748007468	184.947475855412	190	185
200.002864611105	175.23933900048	210	175
199.998802529314	175.154968256014	190	175
200.262173474365	171.835312049962	200	175
200.603721115595	167.530191811018	200	165
200.878026384177	164.072697161933	210	165
201.21830510616	159.783507878634	210	155
199.058463269031	158.620093215014	200	155
197.0199160737	157.522022027709	190	155
195.861949526384	156.898294823723	190	165
189.556697040115	150.921821324274	190	145
186.448792102671	147.975943411134	180	155
182.500592872392	144.233541268126	180	145
179.217112194378	141.121220382189	170	145
179.253231235695	138.79180726081	170	135
181.345572600536	136.600563479306	180	135
183.46566373972	134.380259713504	180	125
188.538050242385	134.892559942913	190	125
192.449894288291	135.656162423459	190	135
199.548448618875	137.041750900809	200	145
203.123462420856	137.739605196089	210	145
202.779689799654	135.273116206733	200	135
202.443380017032	132.860171454112	210	135
201.764748284167	127.991039997375	200	125
201.256457375181	124.344138364554	210	125
200.204360184745	116.79538395136	210	115
200.098556838631	116.036147076351	200	115
199.995585420229	115.297229948428	190	115
201.921855226714	105.688986917851	210	105
202.695590348018	101.829765777799	210	95
199.522903425153	102.246921247046	200	95
194.865860384218	102.859244347903	200	105

Solution x	Solution y	Original x	Original y
194.865860384218	102.859244347903	190	105
190.378852062001	103.449210041553	190	95
183.556343235609	104.346256310189	180	95
180.245887828266	106.593852808609	180	105
176.790443852779	108.939886213485	180	115
173.597307820773	111.107829241949	170	105
170.309792499639	113.33985035645	170	115
167.329794821396	115.363087529255	170	125
160.556267061358	114.984519365583	160	105
159.121843496056	115.226573894384	160	115
157.647212158909	115.475413603004	160	125
150.103334151382	116.74842237648	150	125
146.456669664999	117.363803783351	140	125
146.457145715775	114.67343278943	150	115
146.457639335228	111.884399070721	140	115
146.458826991591	105.135379830999	140	105
146.460004811024	98.4485984269129	150	105
146.460004811024	98.4485984269129	150	95
146.460004811024	98.4485984269129	140	95
146.461775438004	88.4030262726186	140	85
146.462297434742	85.4394081637063	150	85
146.462792296091	82.6310152915149	140	75
150.27579855324	83.2667886447508	150	75
157.642685429969	84.495095314518	160	75
159.305505157823	84.7723443212389	160	85
160.931839322055	85.0435093450414	160	95
168.031205190752	85.1957197667981	170	95
173.975872624277	82.5567595985945	180	85
173.975872624277	82.5567595985945	170	75
173.975872624277	82.5567595985945	170	85
180.404597080502	79.7029227886052	180	75
185.377018088098	77.495566859648	190	85
188.43237474029	76.1392313919775	190	75
191.147446128245	74.9339547095468	190	65
199.446947140836	76.5110130169301	200	85
203.615713229265	77.3031845237325	210	85
203.609914617745	74.2595943417897	200	75
203.603885552192	71.0949681245831	210	75
203.58369776663	60.4926184824042	210	55
203.58369776663	60.4926184824042	210	65
203.58369776663	60.4926184824042	200	65
203.571256497813	53.9606092253391	200	55
203.558105558311	47.0547140421376	210	45
203.549702977498	42.64158141892	210	35
201.223481332165	43.0331616207836	200	45
199.057679735499	43.3977377952466	200	35
193.659126550112	44.3064963960895	190	35
189.344533674466	47.1484458323591	190	45
183.523455995813	50.9826867567083	190	55
183.523455995813	50.9826867567083	180	45
183.523455995813	50.9826867567083	180	55
176.415707211601	55.6644279835325	180	65
169.835854843831	56.6636386525134	170	65
166.24095051605	57.2095637208368	170	55
159.359072883898	58.2546433791922	160	55
159.359072883898	58.2546433791922	160	65
152.146456011587	59.3499493067834	150	65
148.595350040651	59.8892247333066	140	65
148.764641366886	59.6659094763569	140	55
152.223654589327	55.1028684056799	150	55
156.617701604094	49.3063581375085	150	45
162.99170116027	40.8979677201953	170	45
162.99170116027	40.8979677201953	160	35
162.99170116027	40.8979677201953	160	45
167.798137034936	34.5574530173139	170	35
171.783500565763	29.3000753380219	180	35
173.615145474506	26.4066666313948	170	25
175.584871149204	23.2951372947208	170	15
179.30209854543	22.6237761841412	180	25
182.935221648487	21.9676066855982	180	15
188.008488022453	21.0513324133892	190	25
192.437474037164	20.2514234410337	190	15
197.754099301883	19.2911973096284	200	25
202.449658103687	18.4431402377669	210	25
202.564552154953	15.4261493978917	200	15
202.677590153958	12.4578950751149	210	15
202.868262797871	7.45109059855262	200	5
203.021034295056	3.4395094805848	210	5
203.225312914595	-1.92455682812507	210	-5
203.330335509754	-4.6822818116263	200	-5

Solution x	Solution y	Original x	Original y
203.435963101682	-7.45589613538501	210	-15
199.271679855737	-6.71199164879169	200	-15
189.654351494904	-4.99402617554677	190	5
189.561630095254	-5.00404822373384	190	-5
189.468196419344	-5.01414880388278	190	-15
180.254796731823	-5.00324782382921	180	-15
180.208510117427	-5.00095645879151	180	-5
180.162476773957	-4.99868002480013	180	5
169.934192157188	-5.83983201302257	170	-15
164.854858252421	-6.25755068598324	160	-15
163.397573533921	-3.42312653645037	160	-5
161.909963061185	-0.52972051634757	170	-5
161.909963061185	-0.52972051634757	170	5
161.909963061185	-0.52972051634757	160	5
157.200286472121	8.63065339059129	160	15
155.578821636093	11.7844422989525	150	5
155.578821636093	11.7844422989525	150	15
151.454553270448	19.8062190072216	160	25
147.997602070587	24.6756669074558	150	25
144.042941056617	30.2461865733264	150	35
140.652936210882	35.0213362613143	140	45
139.465799720324	32.7777575889515	140	35
138.065756716413	30.1318057716141	130	35
135.102213704527	24.5309869508095	140	25
135.102213704527	24.5309869508095	130	25
131.834671091214	18.3556352481643	130	15
129.999365496853	14.887090910322	120	15
132.162019599848	10.5666563595533	140	15
135.132202769497	4.63296414131435	140	5
135.132202769497	4.63296414131435	130	5
138.803453282725	-2.70130486748015	140	-5
141.139640311466	-7.36842197236938	150	-5
141.97386895398	-9.03499482315953	150	-15
138.634196338917	-8.45630600952912	140	-15
132.59504157534	-7.40985795016083	130	-15
128.660050170878	-6.72801566538218	130	-5
124.302688823216	-5.97298942798421	120	-15
120.499545705898	-2.65075978031428	120	-5
116.204954805158	1.10076814850962	120	5
111.594767893019	5.12798114358676	110	15
110.158200499969	2.69003017722037	110	5
108.531243698678	-0.0710132546942539	100	5
106.658265090477	-3.24965141600453	110	-5
104.749262364475	-6.48942955202262	110	-15
99.2904973005961	-6.85733316822463	100	-15
99.2904973005961	-6.85733316822463	100	-5
92.7990628142404	-7.29484045531202	90	-5
88.2351897906539	-7.60243445617429	90	-15
81.3978429089372	-8.06325665200811	80	-15
77.4499838429036	-8.32933348483134	70	-15
77.8958118639067	-5.84495320332972	80	-5
78.3230882169497	-3.46395354826642	70	-5
79.4095890060208	2.59060343484296	70	5
79.7715040141901	4.60742678417834	80	5
80.1267560483491	6.587120540189	90	5
80.7742504745583	11.1418149782755	90	15
77.0473524602483	13.9014641510469	80	15
72.6234348095584	17.1772386362554	70	15
68.5420420151521	20.1993819928453	60	15
67.7629185814985	25.0231991416048	60	25
67.261916114979	28.1250732003568	60	35
69.9222463117671	27.8436437169026	70	25
72.5782662442473	27.5626699392487	70	35
79.6836498249767	26.8110320148157	80	25
79.6836498249767	26.8110320148157	80	35
88.2832721126155	25.9013269967286	90	35
92.540597970657	25.4509629931536	90	25
98.2545907731865	24.8465026088108	100	15
100.943531450475	26.1662766595957	100	25
103.944555095644	27.639226209057	100	35
107.196442579256	29.2353056335867	110	25
110.239561314842	30.7289174133122	110	35
112.885913636131	32.0277906599729	120	25
115.580268223132	37.6909538671991	120	35
118.54182207385	43.9157297968139	120	45
120.909074261864	48.8913802277252	130	45
121.393098325498	49.9087030795187	130	55
117.490766445887	50.1367223053315	120	55
111.941652235169	50.4609669199015	110	55
107.899246344228	50.6971720830927	110	45

Solution x	Solution y	Original x	Original y
101.892589660461	51.0481527103468	100	45
97.3163300685782	51.3155521029999	100	55
90.7856229903551	51.6971555104923	90	55
85.1166941722598	52.0284025175932	80	45
85.1166941722598	52.0284025175932	90	45
79.4713162171608	52.3582735072708	80	55
73.6251502959161	52.6998780329011	70	55
69.9524760539217	52.9144772771656	70	45
65.783215705781	53.1580926939355	60	45
63.7984993974305	57.9076225425848	60	55
61.3486990743532	63.770112183406	60	65
59.3181985792342	68.6292045863652	50	65
57.5781699102529	73.4411056709438	60	75
55.9543558102543	77.9316257949991	50	75
54.0810343945001	83.1121390609884	60	85
52.120971032158	88.532532632236	50	85
49.101307966166	96.8831763448455	40	95
48.2236159235737	99.3103428899801	40	105
50.8843729934797	99.3457847712835	50	95
53.8118127503302	99.3847790078281	50	105
59.4306803279347	99.4596217051228	60	105
64.60935470198	99.5286008939146	60	95

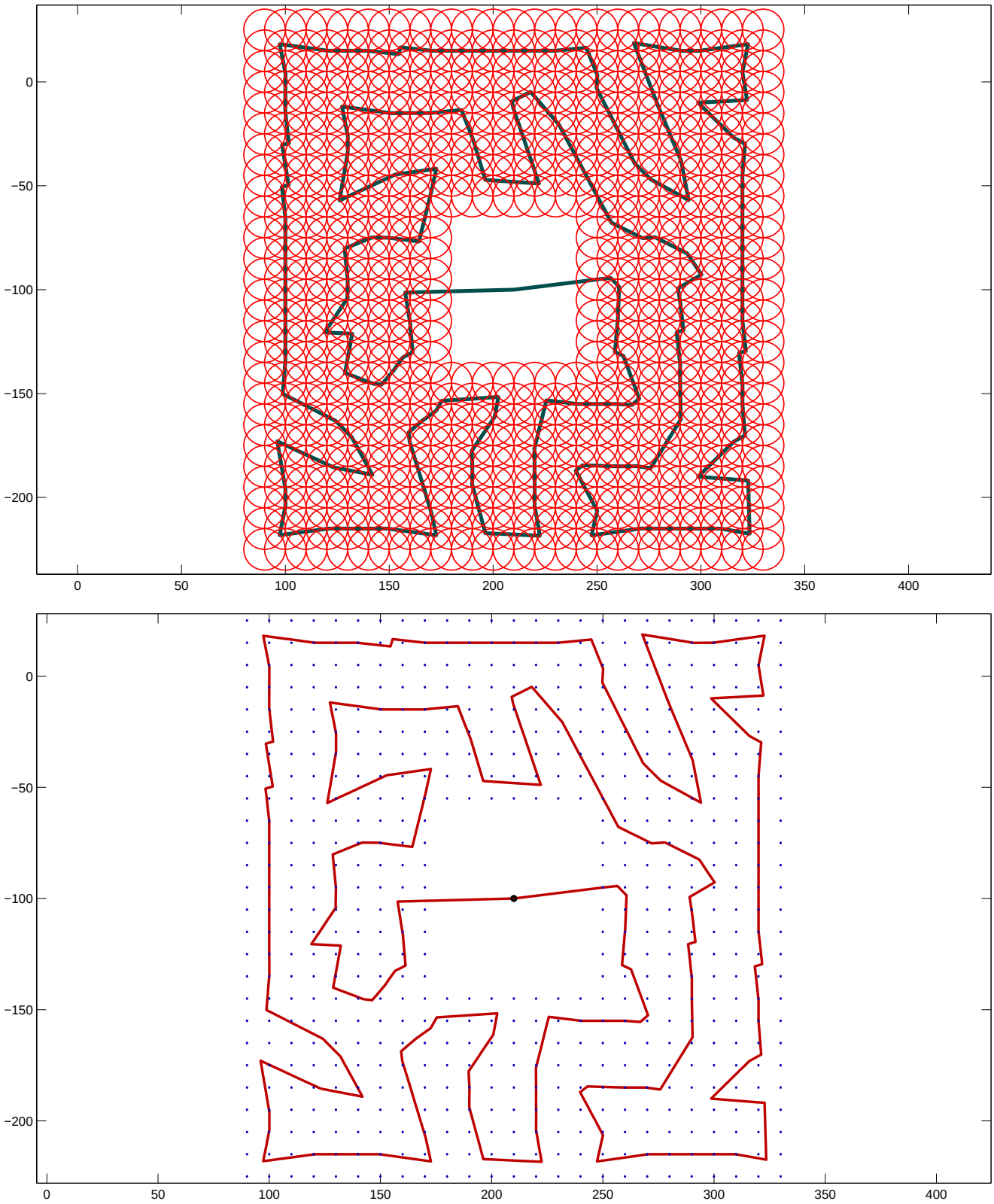

Figure N.42: *bubbles*9, Equal Radius, 2D, Euclidean, Length = 2426.2740586

Table N-45: Solution for *bubbles*9, Equal Radius, 2D, Euclidean

Total distance: 2426.27405864549 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
64.5972025993641	100.937909674985	60	105
59.3517422959217	101.076874889484	60	95
53.3784992559541	101.235117946116	50	95
50.4512712789572	101.312667236388	50	105
47.6956701042056	101.385669561283	40	95
48.3277618832617	105.326647642509	40	105
49.5159474743118	112.735019298434	40	115
49.7969566849728	114.487139980239	50	115
50.0741201997358	116.215280895921	60	115
50.5456937134527	121.772882151048	50	125
50.8847767674133	125.769016787308	60	125
51.2562915044393	130.147404873424	60	135
48.8500203216869	131.378365882001	50	135
46.5537328801519	132.553057855453	40	125
44.1344465240124	135.983373548998	40	135
42.0929557422364	138.878016804935	50	145
38.9965335628422	142.528756906785	40	145
36.2978874145646	145.71051784304	40	155
32.3412309750284	145.277925991338	30	155
29.3796772530961	144.150559210835	30	145
26.2265166572503	142.95025361193	30	135
22.2597213510394	141.440220350894	20	145
18.7112895672545	140.089445175901	10	145
19.3522246535519	136.576178435129	10	135
20.0596491863141	132.698532841715	20	135
20.9286112422458	127.935413970255	20	125
21.6019688607914	124.244512471496	30	125
22.1567611644614	121.20352516889	30	115
13.8231580723612	120.770078930788	10	125
8.93838900580299	120.516105456722	0	125
12.1228318104151	115.748785632094	10	115
15.5207601818181	110.661857630244	20	115
20.0653974082153	103.858169962047	30	105
19.9667266270386	103.596142235622	20	105
19.8537945106816	103.29623407775	10	105
19.9933414455469	95.3647350824458	10	95
20.0021208463685	95.2060547056268	30	95
19.6125013804061	91.1783333741816	20	95
18.9902441069617	84.7455580822865	10	85
18.5493188570251	80.1874125410197	10	75
21.1149461610476	79.1519500612631	20	85
24.809058710066	77.661045394698	20	75
24.809058710066	77.661045394698	30	75
27.6758927738733	76.5040193947863	30	85
31.8132107291689	74.8342440447887	30	65
39.3101920087272	74.9761811162421	40	65
41.3074516644745	75.2152952870335	40	85
44.0324589765821	75.54155671052	40	75
47.7930759682464	75.9918013388468	50	75
50.9897403487294	76.3745296024121	50	85
54.3156317971903	76.7727249750195	60	85
55.3637693111415	72.5341349946322	60	75
56.6254349217722	67.4320723381347	50	65
57.7099927219205	63.0462039495946	60	65
58.9526630845603	58.0209553771387	50	55
59.6168586901145	55.3349526851249	60	55
60.2619245557503	52.7263097117887	70	55
61.3037464689896	47.9856759925473	60	45
62.0914713897546	44.4012997293517	70	45
62.6640604750766	41.7958885599902	70	35
59.2682365901638	42.2742193520376	60	35
53.4183862225622	43.0982129062151	50	45
49.9550206197858	43.586056372137	50	35
42.8399663989691	44.5882569058482	40	35
39.5850834239464	46.1046500407743	40	45
36.0762568179949	47.7393506145884	40	55
31.7873782412661	49.7374641221705	30	45
27.3450511414105	51.8070651368024	30	55
21.8879760050285	54.3494115204699	20	55
17.8114178803524	56.248605156569	20	65
16.0756332808277	57.0572823256811	10	65
16.6465101057522	53.7547159819986	10	55
17.6087027381782	48.1882902395019	20	45
18.241556501145	44.5271764257062	10	45
19.470264529104	37.4188910584795	10	35
19.7578919032784	35.7548535495092	20	35
20.0370761170606	34.1396622456884	30	35
20.0463722973661	25.9619447656467	30	25
19.6953649973659	24.1738203825649	20	25
19.3314587717438	22.3199867110117	10	25
17.9710908656198	15.3899641921244	10	15
17.2777756695768	11.8581401390792	10	5
19.9558968233069	12.220502606598	20	5
23.1150823131952	12.6479527752731	20	15
27.3352359290434	13.2189532880625	30	15
30.6416195859013	13.6663209549746	30	5
38.030722075717	14.6660748467247	40	5
39.3555451683958	14.8453099874314	40	15
40.6602077445489	15.0218174552525	40	25
49.9331366931582	15.0005117488975	50	25
49.9875241998869	15.0001668711007	50	15
50.0419800673597	14.9998212367545	60	15
50.0701970510028	14.9996878266945	50	5
59.7031137880696	14.9955920087799	60	5
59.8075915254289	15.0018505707015	60	25
66.4088247603536	14.3514680727234	70	15
70.6989366062823	13.9287790899862	70	5
74.7760932171109	13.5270698762051	80	5
76.2439668373863	17.2751050516744	80	15
77.8371497459708	21.3431000332837	70	25
79.2100220931198	24.8485653852003	80	25
80.5480377907178	28.2650289116965	90	25
82.3681750730775	34.32170065004	90	35
83.3180302784289	37.4824539928015	80	35
84.6448401995772	41.8975563268977	90	45
85.4029920037021	44.420395393416	80	45
86.2321390364379	47.1794799183918	80	55
91.1474928414968	47.5084329576758	90	55
97.3398614135346	47.9228524474991	100	45
101.860285605359	48.2253770400346	100	55
108.329709634555	48.6583391304874	110	55
112.069355282061	48.9086142967719	120	55
111.297992114726	46.6394041124129	120	45
109.914839501618	42.5704017835925	110	45
107.98561554928	36.8949435687212	110	35
106.45833964429	32.4019628581221	100	35
104.669420221887	27.1392693045133	110	25
103.153374661724	22.6793311068683	100	25
101.076517033716	16.5695599565657	100	15
99.6437538553522	12.3546209931689	90	15
99.0085172855507	9.3412819487415	90	5
102.991877277454	7.34344649939911	100	5
108.047895118865	4.80762109230924	110	-5
110.287138705182	7.39721106082106	110	5
113.037171674328	10.5775053614115	120	5
115.360050422684	13.2638070764137	110	15
118.471795682907	16.862398880408	120	15
121.757159284524	20.6617722829341	130	15
123.808460921528	24.5006336911986	130	25
125.144335066781	27.0006299330598	120	25
127.305813985988	31.0456793430332	120	35
129.515389461864	35.180741009256	130	35
131.729367183884	39.3240411168781	140	35
133.755946681	43.1166306564071	130	45
135.840062037067	47.0168948485789	140	45
137.887119536002	50.8478072660229	130	55
140.08651424735	54.9638150216801	140	55
142.309291371494	59.1235805625407	150	55
144.51190981205	63.2456167034206	140	65
146.951741731744	67.8115790048463	140	75
149.652107267789	69.1403178417901	150	65
152.733687110391	70.6566361563795	150	75
156.029930892705	72.2785825780759	160	65
159.112635675037	73.7954525799623	160	75
161.95123602315	75.1922081275579	160	85
168.013985714016	74.80081030986	170	65
172.990728076135	77.2936852624296	180	75
172.990728076135	77.2936852624296	170	75
175.511877200411	78.5565360487226	170	85
179.85609116535	80.7325740834743	180	85
183.386991337094	82.5012176954733	190	75
186.722390890528	87.4820009460546	190	85
190.254796824141	92.7569728506625	200	95
186.82422419603	94.7590732117384	190	95

Solution x	Solution y	Original x	Original y
182.701787179855	97.1649743880758	180	95
179.02243878701	99.3122792556546	170	95
179.592621475369	103.064687253948	170	105
179.841935110845	104.705497479132	180	105
180.089421679833	106.334285070806	190	105
180.724252283806	111.739673914224	180	115
181.188083685941	115.688991722696	190	115
181.637597177512	119.51635356954	190	125
178.34509341593	120.509953027534	170	115
178.662433720246	123.367113004322	180	125
178.951685386105	125.971367965993	170	125
179.802639272945	133.63385107051	170	135
180.014831026209	135.544516439148	190	135
179.999541071469	144.903269635535	170	145
180.000883325898	144.965606469818	190	145
180.001190919287	144.980819412453	180	135
180.06475094313	148.115713488834	180	145
180.147305428972	152.187487055583	180	155
180.212591343219	155.40751985703	190	155
180.353565643166	162.364383528276	190	165
178.418514788989	165.49436247155	180	165
176.261154664179	168.983930151272	170	165
174.072876565766	172.523505122923	180	175
171.318729829752	176.978385794944	170	175
168.219930198019	181.990748257146	170	185
165.782904897339	185.932680242544	170	195
161.704003563187	185.331290263295	160	195
159.282504365106	184.97423319854	160	175
150.105875102576	184.999420999239	150	175
150.059521684538	185.000179388415	150	195
150.032789632351	184.999404389028	160	185
145.950688677262	184.880685836739	150	185
139.637139387871	184.697074299299	140	175
133.100923560257	184.50707289638	130	175
131.394019886791	185.830868126389	130	185
129.780882994938	187.081944330141	120	185
131.193164750436	189.718812755129	140	185
133.125910205978	193.328078133602	130	195
135.091761951169	196.999162932154	140	195
137.022587866665	200.604827884436	130	205
138.641137182984	203.6272919346	140	205
140.088952644211	206.330911616928	150	205
138.868611415108	211.67056593986	140	215
137.99092725137	215.510674206267	130	215
137.367489092945	218.238322254362	130	225
140.658324178635	217.777933060111	140	225
146.413044358164	216.972871137577	150	215
150.274742195641	216.432620886715	150	225
157.979423403402	215.354771548597	160	225
159.34451991716	215.163807704419	160	215
160.681791774031	214.97673680721	160	205
169.931477937607	214.99948729747	170	205
169.986482731775	214.999825737291	170	215
170.041536934803	215.00016475099	170	225
179.951848825632	215.000228339567	180	225
180.000074806412	214.99998452106	180	215
180.048330433691	214.999740366023	180	205
189.955545924469	214.999767358571	190	205
190.008438235964	215.000061714824	190	215
190.06134840883	215.000357058521	190	225
199.476198378653	215.013722837496	200	225
199.567582852384	215.003961862372	200	215
199.659023564375	214.994194747862	200	205
209.531946371407	216.735692758603	210	225
213.466144934354	217.429732035732	220	225
213.394271711147	214.85590737427	210	215
213.322184912192	212.274440651532	220	215
213.161393313438	206.516262200129	220	205
213.050058101009	202.529109770319	210	205
212.906954913106	197.40431609081	220	195
212.830128060508	194.652897029887	210	195
212.752998571666	191.890659283892	220	185
208.566196043689	191.562114140029	210	185
202.512217890544	191.087017210129	200	195
197.601914313946	190.701597021695	200	185
192.460575197158	190.298205099192	190	195
188.660265428929	190.000000609656	180	195
188.66027002662	189.99998964618	180	185
192.396151879717	186.333486078652	190	185
196.838951430775	181.973167233217	190	175

Solution x	Solution y	Original x	Original y
201.524674775204	177.374619105202	200	175
205.926795640024	173.054393531911	200	165
208.554042033075	171.643622382194	210	175
211.221014276982	170.2115125367	220	175
210.855165496051	165.611164734363	220	165
210.511614068067	161.291355777262	210	165
209.998765044143	154.842467249524	200	155
210.000896878625	154.798124363786	210	155
210.003032112426	154.753702696084	220	155
210.014845013107	145.544800122641	220	145
209.898497416633	144.494093941199	210	145
209.781100803827	143.433912840107	200	145
208.956789041221	135.991278750458	200	135
208.667260170249	133.377141848082	210	135
208.349041624511	130.503969733678	200	125
211.647393852821	129.501441191177	220	135
211.202584517421	125.532700932776	220	125
210.720391143127	121.23030367414	210	125
209.997615823347	114.781342800081	200	115
210.001631854072	114.72251387723	210	115
210.005657915481	114.663532858717	220	115
210.000275180094	105.053359665137	220	105
210.000014954078	105.004295011993	210	105
209.999755267548	104.955299190509	200	105
210.001196543999	99.0079038604162	210	95
210.00212517756	94.9970881243622	220	95
209.999795998978	85.0329786633033	200	85
210.000194662727	84.965288441262	220	85
210.000075537561	81.910444229826	210	85
209.99991426052	78.0745776319357	210	75
209.9997940151	75.0337004242946	200	75
210.000195886063	74.9649109636325	220	75
210.000237079792	65.0482001252311	220	65
209.999990712917	64.9998737757394	210	65
209.9997443189	64.9515262949125	200	65
209.999777123722	58.95949853866	210	55
209.999795672292	55.0335175346605	200	55
210.000209527232	54.9628301941883	220	55
210.002926045045	45.2419305122961	220	45
210.000852535224	45.1990713906424	210	45
209.998782682625	45.1562910862437	200	45
210.511650659055	38.7074531662738	210	35
210.856445926883	34.3721323191431	220	35
211.220987784336	29.7884356528384	220	25
208.548040648495	28.3531418034452	210	25
205.926818617295	26.9456278788782	200	35
202.415532119855	23.4996282506453	200	25
199.094160902922	20.240006273329	200	15
196.680077225052	17.8707899844952	190	25
192.428264273519	13.6979827974791	190	15
188.660260767029	10.000003935234	180	5
188.660261867709	10.000003696	180	15
193.178172293327	9.75656392281612	190	5
200.409157951416	9.36691981922171	200	5
207.524519759909	8.98351312218365	210	15
212.208918834607	8.73109365152146	220	15
211.772407310174	6.05765669035827	210	5
211.36746646597	3.57758269333527	220	5
209.998190932131	-4.8095166920482	200	-5
210.292555162135	-6.26194830929889	210	-5
210.600484918699	-7.78131224586627	220	-5
211.720996716877	-13.3101526636816	220	-15
212.197412474506	-15.6607888612359	210	-15
212.704156660688	-18.1610802431507	220	-25
208.751609828617	-17.6228642457369	210	-25
201.994953425682	-16.7028424979783	200	-25
197.487292523881	-16.0890355011711	200	-15
191.66727423661	-15.2965431046375	190	-25
189.318951616396	-14.9767821371658	190	-5
185.910048635641	-14.9733723009777	190	-15
180.796120859883	-14.9682600228492	180	-5
179.250962782523	-15.2182694550088	180	-15
177.67129579813	-15.473867374582	180	-25
170.53330453889	-16.6288524992579	170	-25
166.76457149019	-17.2386715284277	170	-15
161.224694469181	-18.1350794307753	160	-25
157.762187413213	-18.6953537140716	150	-25
158.579567567199	-16.5685327327746	150	-15
160.121096531759	-12.557445506215	160	-15
162.216082656285	-7.10623911852399	160	-5

Solution x	Solution y	Original x	Original y
163.973447380296	-2.53354170587568	170	-5
165.819284561838	2.26935960225009	160	5
167.47730872674	6.58356768540169	170	5
169.280141149447	11.2745708402611	160	15
171.278869954898	16.0473583698584	170	15
173.7443208901	21.9346368802193	170	25
175.682430619511	26.5626734258379	180	25
177.579388127886	31.0924388834224	170	35
179.047214447957	34.5974875775869	180	35
180.428435121807	37.895729296516	190	35
181.767080495339	44.8196875066936	190	45
182.427864472526	48.2374955529382	180	45
183.471996154285	53.6381109014368	190	55
184.106708816072	56.9210613384138	190	65
182.565724006108	56.0765702774824	180	65
178.506612583026	53.8520913743843	180	55
173.556593979063	51.1393703455113	170	55
169.467416924385	48.8984149008013	170	45
165.991073970318	46.9933076821585	160	55
162.016254238451	43.0339352502976	160	45
158.092714544823	39.1256437685176	150	45
156.35605789177	35.6934649154807	160	35
154.4195791078	31.8663779307131	150	35
152.26502243784	27.6083069284832	160	25
148.927699448289	21.0127809569966	140	25
148.002261247575	19.1838567803201	150	25
146.37170403441	15.9614063568059	150	15
144.627854141259	12.5150531255333	140	15
142.856981759663	9.01529727110814	150	5
141.249269270179	5.83799271535788	140	5
139.7873961331	2.94891204862651	130	5
140.136166231481	-3.35534651256197	150	-5
139.03520018472	-6.06662532735686	140	-5
137.831967915225	-9.02974712294646	130	-5
136.277989323277	-12.8566168638886	140	-15
134.820495093147	-16.4458874087729	140	-25
130.707563678133	-16.0491907172134	130	-25
126.394012245355	-15.6331420810264	130	-15
119.810841674758	-14.9982108322257	120	-5
119.759025110483	-15.0012452538586	120	-15
119.707093731274	-15.0042905999612	120	-25
110.011057734002	-15.0034112637867	110	-25
106.904122784462	-15.0022971481759	110	-15
103.072001225256	-15.0008965647637	100	-15
100.02949955425	-14.9998133669706	100	-5
99.9670744836557	-15.0001898570568	100	-25
93.9297506884488	-14.9999354185648	90	-15
90.0320444585021	-14.9998046824454	90	-5
89.9670973716665	-15.0001874441455	90	-25
80.046751575035	-15.0002496433112	80	-25
80.000160178771	-14.9999995594641	80	-15
79.9535752491823	-14.9997536166789	80	-5
70.044955409881	-14.9997659118255	70	-5
69.9963924976274	-15.0000300829287	70	-15
69.9478201529318	-15.0002983640493	70	-25
60.3371574498693	-15.0056857998153	60	-25
60.2778419945871	-15.0016399691088	60	-15
60.2186820621762	-14.9976086214603	60	-5
53.6393077285907	-15.7348943380967	50	-15
49.3564470044954	-16.2148352583244	50	-25
45.4982412141112	-16.6471905493846	40	-25
44.4963584285441	-13.3492502642489	50	-5
41.5727570138643	-13.673030648055	40	-15
38.9323286692737	-13.965452866814	40	-5
31.6215905778558	-14.775058260981	30	-5
30.5306407882823	-14.8958546233862	30	-15
29.4567309228473	-15.0147677422219	30	-25
20.0528828279239	-15.0003179068824	20	-25
19.994585111854	-14.9999354128758	20	-15
19.936364820961	-14.9995573852426	20	-5
10.6602672396663	-14.978177437131	10	-5
9.35123755859354	-15.1552946766238	10	-15
8.02241685577388	-15.3350936921248	10	-25
0.389742558348459	-16.3679222601729	0	-25
-3.42991361436771	-16.8847912559123	0	-15
-9.16002747562257	-17.6601777975841	-10	-25
-12.7219317583309	-18.1421721048544	-20	-25
-12.2515720471153	-15.7473895911339	-10	-15
-11.8018041446248	-13.4574540161673	-20	-15
-10.6676391922202	-7.68283443457662	-20	-5

Solution x	Solution y	Original x	Original y
-10.3056167992502	-5.83958027670079	-10	-5
-9.9553739409853	-4.05630065990406	0	-5
-9.99912497908933	4.90564361788522	0	5
-9.99968010270572	4.97697051698913	-10	5
-10.0002358248717	5.04836884901467	-20	5
-10.0155570794448	14.4424145106178	-20	15
-9.88939199410304	15.551768337224	-10	15
-9.76109704568499	16.6798466703996	0	15
-8.93954197775764	23.9025408156137	0	25
-8.64041932891708	26.5322105723355	-10	25
-8.30997564073678	29.437232944489	0	35
-11.5605761232251	30.3643467720659	-20	25
-10.9966600865592	33.8450161830053	-20	35
-10.3872593738764	37.6064933273526	-10	35
-9.61323867549679	42.3841420062955	-10	45
-9.00149415874779	46.1600910872491	0	45
-8.4386151975785	49.6343832872978	0	55
-11.6868012404515	50.557950091346	-20	45
-11.2455313025529	54.3889119712962	-20	55
-10.7521145784628	58.672650392304	-10	55
-9.99747801339535	65.2246860341961	0	65
-10.001733706964	65.2854165494529	-10	65
-10.0059965540762	65.3462497447938	-20	65
-10.0003073829327	74.9474418188763	-20	75
-10.0000403831998	74.9959087545557	-10	75
-9.99977333740915	75.0443849703763	0	75
-9.99975566950512	84.9536965361004	0	85
-10.0000030430859	85.000192756001	-10	85
-10.0002504176494	85.0466943311155	-20	85
-10.0002493571687	94.9533927488858	-20	95
-10.0000014187964	94.9999488111938	-10	95
-9.99975351560374	95.0464974858311	0	95
-9.99975173951813	104.953332314902	0	105
-9.99999989077895	105.000021253482	-10	105
-10.0002478819956	105.046679343975	-20	105
-10.0002363631465	114.953871302356	-20	115
-9.99998794807964	114.999902039948	-10	115
-9.99973976820736	115.045888352659	0	115
-10.0008377226374	124.99603172519	-20	125
-9.99183854042585	134.596067511027	0	135
-10.0134778096631	134.860357885537	-20	135
-10.0184866443566	134.921461688292	-10	125
-10.285821687521	138.182267827208	-10	135
-10.639506889098	142.496417670052	-10	145
-10.9241488449833	145.968342123047	-20	145
-11.2654131857931	150.13100518617	-20	155
-7.87860124252406	151.859536318685	-10	155
-4.36183460685118	153.654392821405	0	145
-0.405702526581791	155.6734901316	0	155
3.55910540611598	157.697015324823	0	165
7.22967290431384	159.570365643664	10	155
10.8186277962415	161.402062996161	10	165
14.1124943935354	163.083154155822	20	155
18.0142516852173	166.998362872139	20	165
21.9934914440782	170.991320875911	30	165
23.8880594590991	174.449804315985	20	175
26.1454714544442	178.57064787979	30	175
28.9576895494403	183.704266466968	30	185
31.2381624562535	187.867204556085	40	185
31.9188403527185	189.109753835997	40	195
28.8758844570256	188.524332539493	30	195
23.2673129153882	187.445324965098	20	185
19.9278584730283	186.80286189208	20	195
13.0746360570622	185.484396683984	10	195
9.69309291758407	183.913074694462	10	185
6.10503559517039	182.245790845022	10	175
1.75620979820022	180.225000084974	0	185
-2.73990157448677	178.135770056234	0	175
-8.15265502120414	175.620610692204	-10	175
-12.184196309011	173.747256669078	-10	165
-13.9210459073023	172.940179672623	-20	165
-13.3528334147451	176.230386560461	-20	175
-12.4052924739356	181.717183583691	-10	185
-11.7592624357678	185.458012240083	-20	185
-10.5310239318252	192.570235978605	-20	195
-10.242996228086	194.238130414967	-10	195
-9.96299306499029	195.859559762272	0	195
-9.95363356119239	204.038092269518	0	205
-10.3003701534082	205.804437186995	-10	205
-10.6615840451177	207.6445284979	-20	205

Solution x	Solution y	Original x	Original y
-11.814722385908	213.519025111432	-20	215
-12.2570174001123	215.772097503817	-10	215
-12.72221860179	218.14186240145	-20	225
-9.06559942903628	217.647104190713	-10	225
-1.95909601276283	216.685602414259	0	225
2.49308482627964	216.083204732279	0	215
8.37983499462214	215.286710590297	10	225
10.6601319182162	214.978191463156	10	205
13.4252218337979	214.984684092794	10	215
17.0861731199605	214.993284213153	20	215
19.9816351420378	215.000082984824	20	225
20.0372574707841	214.999761687578	20	205
29.9590468282683	215.00018000832	30	225
30.014368487434	214.999835975516	30	215
30.0696587857026	214.999491933773	30	205
39.3248571058938	214.977187400645	40	205
40.6329465380685	215.158322676821	40	215
41.977090515421	215.344451102556	40	225
49.6130418034162	216.401881878577	50	225
53.4133212399553	216.928162201931	50	215
59.2167256186248	217.731822677236	60	225
62.6598591748949	218.208645432426	70	225
62.097513265767	215.636483443119	70	215
61.3270328072437	212.112286686824	60	215
60.3247069824709	207.527597742783	70	205
59.429970480209	204.591837155129	60	205
58.5090125686456	201.570039807083	50	205
57.036555395318	196.738691609742	60	195
55.7192272417849	192.416351510622	50	195
54.2051688434295	187.448500701689	60	185
52.8973840341701	183.157474471173	50	185
51.4685056455902	178.469117903955	60	175
50.6026962241813	175.628271256596	50	175
49.7902102926218	172.962386814168	40	175
49.2976210478224	168.68162704155	40	165
52.4974556393542	165.97456221322	50	165
56.1384477124272	162.894270030945	50	155
59.0621735030557	160.808433047962	60	165
62.5730245298233	158.303721952453	70	165
63.9033941140107	155.960326206286	60	155
65.3178769137886	153.46878501559	60	145
69.8355426004467	153.165970780488	70	145
73.1813703363824	152.941701998291	70	155
77.9103478538153	152.624720960185	80	155
81.8320643808982	152.361851126194	80	145
87.5219341238097	151.980460023688	90	145
90.0190818255982	151.813073976195	90	155
92.5270733987179	151.644961351055	100	145
91.9353071057035	154.823129908063	100	155
90.7461431944956	161.209716028769	100	165
88.3238024561249	164.801089327939	90	165
85.7114704837884	168.674147516078	90	175
84.1835825135292	170.939386122035	80	165
81.7840501203489	174.496940535881	80	175
79.6321477964398	177.68735316027	70	175
79.9581922750793	184.307710450561	70	185
79.9800467946483	184.752043609105	80	185
80.0019466599043	185.197289332649	90	185
79.9193714382414	193.732643173202	70	195
80.5232685192846	195.968099457207	80	195
81.1796973900022	198.398010012903	90	195
82.6782996768497	203.945336342072	90	205
83.5217908068166	207.067659710819	80	205
84.7196449077993	211.501720236671	80	215
85.5419538070727	214.54564132857	90	215
86.2593601064282	217.201245225656	80	225
90.8548081699886	217.411480007596	90	225
97.1573417821363	217.699817866511	100	215
101.655599232645	217.905609338309	100	225
108.629961682768	218.224682892045	110	225
112.486353900364	218.401113737789	120	225
112.049137046103	215.930716636618	110	215
111.633664517738	213.58319201002	120	215
110.549573248174	207.457340471273	120	205
110.250937904918	205.769934739929	110	205
109.963413020053	204.145302910456	100	205
110.000037979515	195.013528727812	120	195
109.999405934198	194.92712794189	100	195
109.987690653329	191.88870135713	110	195
109.972617036801	187.982161649526	110	185

Solution x	Solution y	Original x	Original y
109.960798134298	184.916738400325	100	185
109.92733886503	176.203353082056	100	175
110.466112775425	174.049845489607	110	175
111.031972280759	171.788077352813	120	175
112.266847164399	166.852278013787	110	165
113.349503110383	162.524899148671	120	165
114.602728109398	157.515754966486	110	155
115.673832390747	153.234547610645	110	145
118.522292155967	153.575083113538	120	155
121.155348604901	153.889869954287	120	145
128.255768076039	154.738662814625	130	145
129.426167850988	154.878573897905	130	155
130.585336065287	155.017142106594	130	165
139.937392294323	155.000406355397	140	165
139.992912036485	155.000077300497	140	155
140.048518376284	154.999747140187	140	145
149.645328720897	154.993710556623	150	145
150.327691784493	155.042660777995	150	155
151.019639492387	155.092299061608	150	165
156.846139396487	155.51035742792	160	165
158.603710901535	153.989295248314	160	155
160.315511143938	152.507845041032	170	155
157.700412829764	145.424425681902	160	145
154.908664795142	137.862516408169	160	135
152.672178815948	131.804644487785	160	125
150.704428167628	130.907453861976	150	135
148.640876443395	129.966572068555	140	135
149.013522580638	125.751030624307	140	125
149.367296819984	121.748968632611	150	125
149.853082643872	116.253455973945	140	115
149.937134741597	115.302353125125	150	115
150.020742066651	114.356279869358	160	115
150.39226429865	105.236712352956	160	105
150.515436379545	102.213774464004	150	105
150.66342062568	98.581679242382	160	95
148.602516050651	96.4704730454153	150	95
146.577598323747	94.3961327261407	150	85
141.104072720529	94.938850593396	140	85
139.65882556503	95.1167858430489	140	95
138.212731997118	95.2948278141521	140	105

Table N-46: Solution for *rotatingDiamonds*1, Equal Radius, 2D, Euclidean

Total distance: 32.3890198325262 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
97.9259357576294	103.312875135826	97	105
97.9259357576294	103.312875135826	99	105
96.3329148254251	103.508912527181	95	105
96.3434628992311	102.497986856607	95	103
96.3618222195238	100.737963213506	95	101
96.3901546187234	98.0217780068296	95	97
96.3901546187234	98.0217780068296	95	99
96.4068428052542	96.4215478564244	95	95
97.4003867785525	96.4215439778258	97	95
99.1878614239413	96.4215389846514	99	95
101.964649710679	96.4215396170369	103	95
101.964649710679	96.4215396170369	101	95
103.593146757638	96.4215384300115	105	95
103.604038183653	97.4682070047741	105	97
103.622346849984	99.2272064092495	105	99
103.650654858673	101.947083916452	105	103
103.650654858673	101.947083916452	105	101
103.666908675996	103.509069867052	105	105
103.666908675996	103.509069867052	103	105
102.074262503376	103.31300104959	101	105

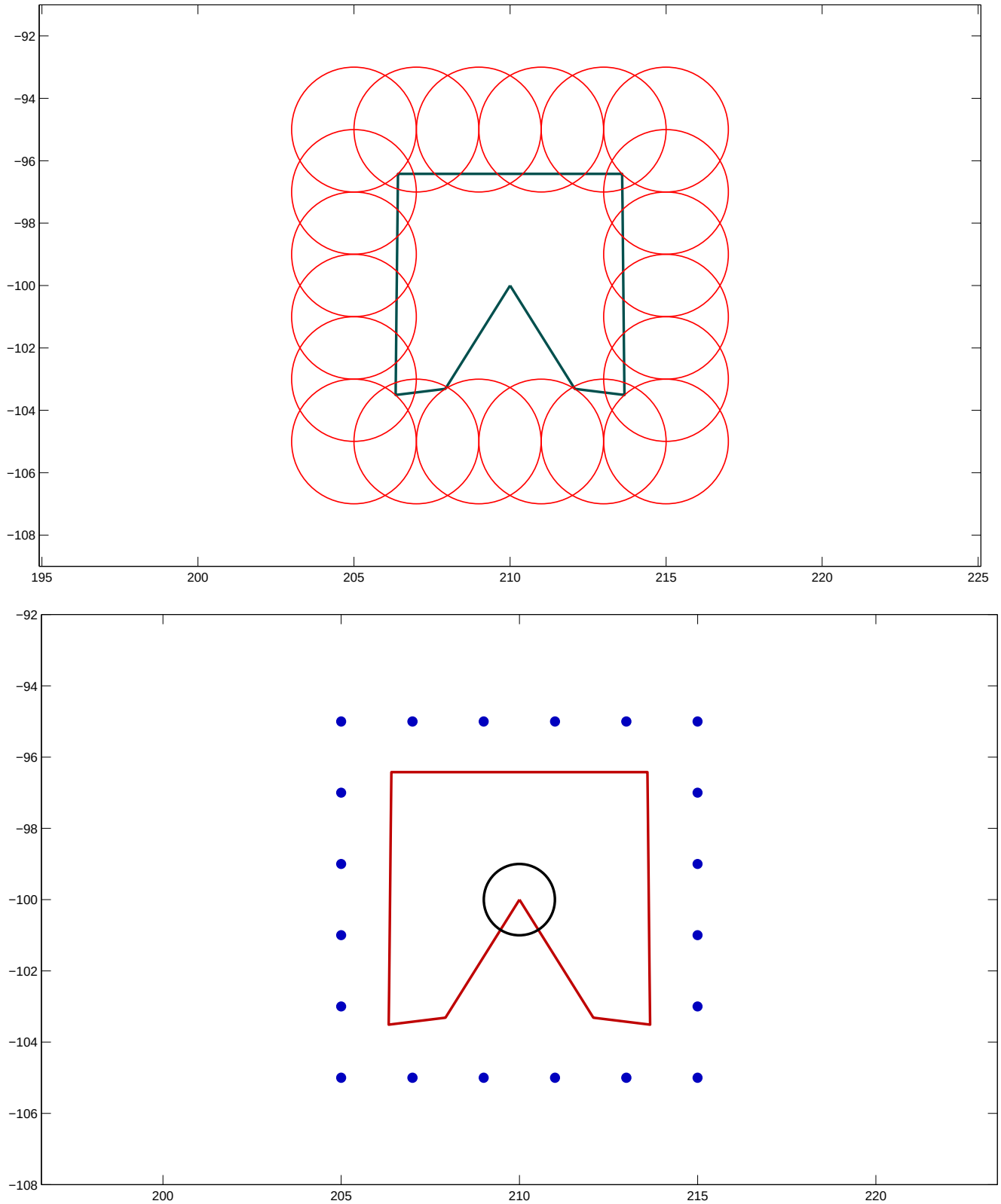

Figure N.43: $rotatingDiamonds1$, Equal Radius, 2D, Euclidean, Length = 32.3890198

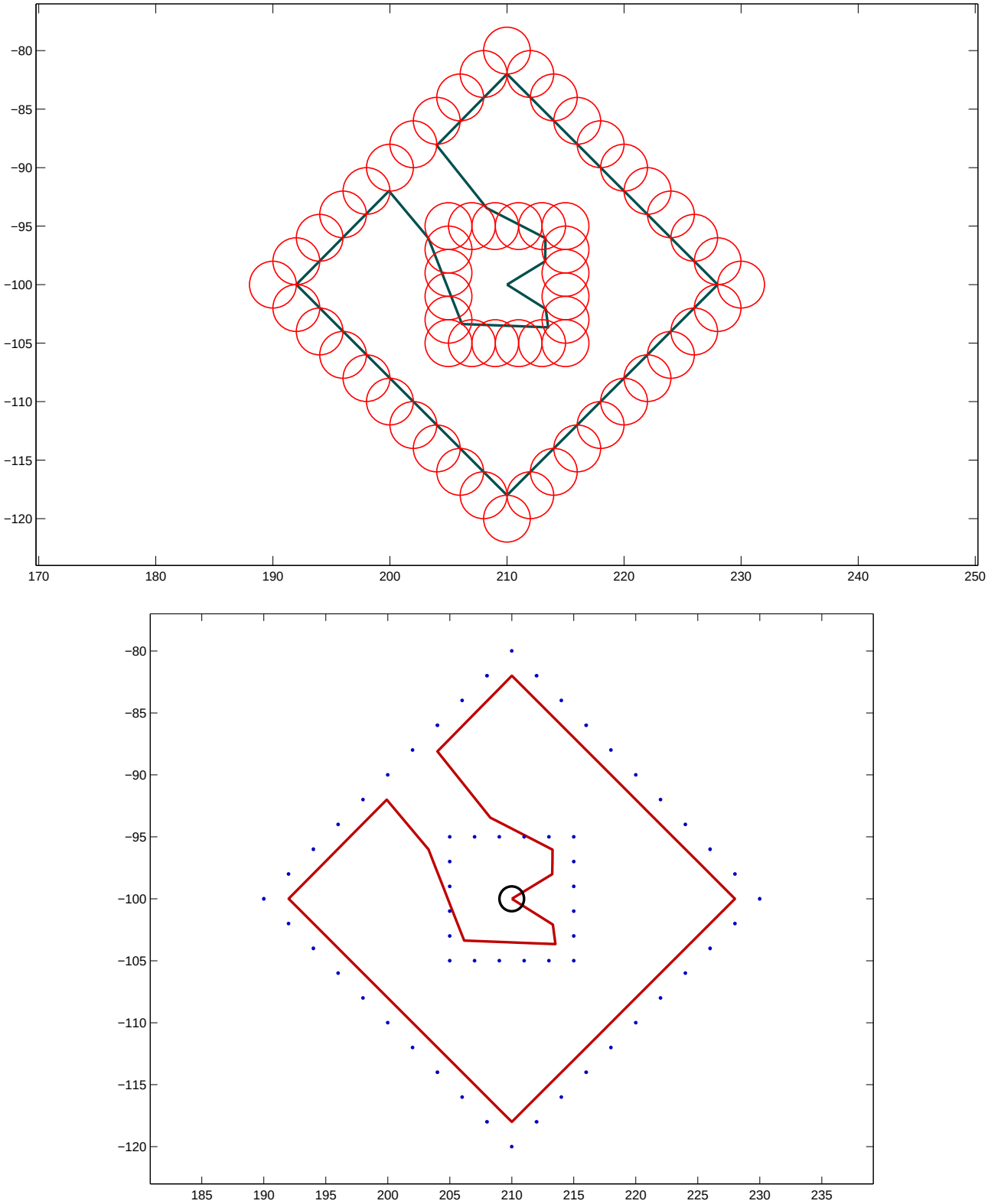

Figure N.44: $rotatingDiamonds2$, Equal Radius, 2D, Euclidean, Length = 140.4774088

Table N-47: Solution for *rotatingDiamonds*2, Equal Radius, 2D, Euclidean

Total distance: 140.477408784276 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
103.262066354466	98.010259236435	105	99
103.274010418702	97.0442041207093	105	97
103.286532770541	96.031518400203	105	95
102.280806357919	95.5147635344817	103	95
100.912672515447	94.8117976665582	101	95
99.4832376545908	94.0773364023529	99	95
98.266695909964	93.4522656658297	97	95
93.9972978421786	88.1039299617469	92	88
95.078659071596	87.0057096022483	94	86
97.0251336721248	85.0288832580928	96	84
98.9664262083378	83.0573227024133	98	82
100.007528624091	81.99998588395	100	80
101.080421616606	83.0733209461023	102	82
102.969412887585	84.9630788395152	104	84
104.963285074623	86.9577523399974	106	86
106.97698544396	88.9722566144329	108	88
109.004588719489	91.0006790431135	110	90
111.030184874579	93.0271155654619	112	92
113.041126628176	95.0388994575948	114	94
115.032468870466	97.0310701274624	116	96
116.902369113748	98.9017403881344	118	98
117.999999954845	99.9998166945028	120	100
116.90509333971	101.094740817079	118	102
115.03400498597	102.96587075806	116	104
113.033807298553	104.966121647157	114	106
111.017303771158	106.982681461997	112	108
108.994742052558	109.005287705432	110	110
106.971609276149	111.028443982907	108	112
104.951108244259	113.048956838203	106	114
102.936195236325	115.063884768875	104	116
101.031846200588	116.968257821255	102	118
100.00012528408	117.999999953665	100	120
98.9449058275194	116.944493484479	98	118
97.0274783590272	115.026558168478	96	116
95.0257578051209	113.024318793243	94	114
93.0145472927771	111.012596505874	92	112
90.9862159467153	108.983740096824	90	110
88.9588639863235	106.955833517532	88	108
86.9459080335779	104.942317548274	86	106
84.9451605453909	102.941021000002	84	104
83.0536863035349	101.049035957119	82	102
81.9999939426351	99.995065626869	80	100
83.056912190305	98.9273854155018	82	98
84.9691451499279	96.9956738912364	84	96
86.9726655893171	94.9717496613828	86	94
88.8624981184496	93.0626729283029	88	92
89.9161958547591	91.9982434768011	90	90
93.2793902401859	96.0195597856807	95	95
93.8379024720472	97.4453593451011	95	97
94.4808934902953	99.0868134224397	95	99
95.1354243868504	100.757723165294	95	101
95.7387488661161	102.297909903196	95	103
96.1586274482574	103.369790635659	95	105
97.2486555208522	103.41158832278	97	105
99.0702163044959	103.481437526053	99	105
100.996147878604	103.555285879063	101	105
102.62384091443	103.61769766183	103	105
103.522396481951	103.652154309668	105	105
103.428815086396	102.937099932864	105	103
103.31663999494	102.079953359354	105	101

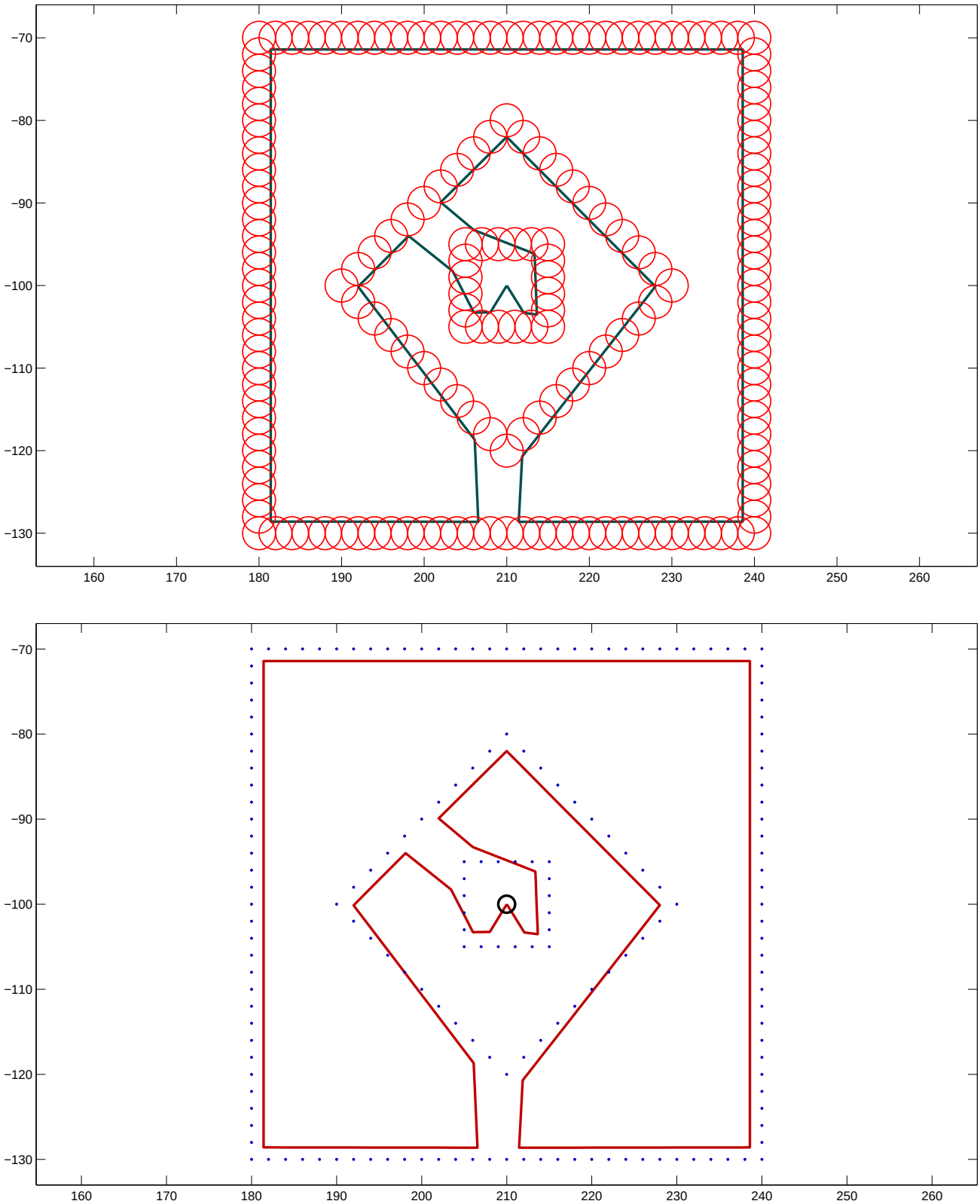

Figure N.45: $rotatingDiamonds3$, Equal Radius, 2D, Euclidean, Length = 380.8823333

Table N-48: Solution for *rotatingDiamonds*3, Equal Radius, 2D, Euclidean

Total distance: 380.882333288815			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
98.01023428	103.2620758	99 105	
96.97897675	103.27481	97	105
96.03150684	103.2865211	95	105
95.52789331	102.3064315	95	103
94.83619599	100.960331	95	101
94.10540026	99.53813933	95	99
93.45175903	98.26608183	95	97
88.11243815	93.9968402	88	92
87.00331093	95.10946939	86	94
85.06281406	97.05606791	84	96
83.13124143	98.99371131	82	98
81.99558089	100.132931	80	100
82.99031986	101.4392458	82	102
84.59412888	103.5454146	84	104
86.28316769	105.7635131	86	106
87.98343095	107.9963551	88	108
89.68777821	110.2345651	90	110
91.39364336	112.4747762	92	112
93.09422739	114.7080587	94	114
94.7651036	116.9023227	96	116
96.11947623	118.6809182	98	118
96.55667877	128.6154986	98	130
95.70354825	128.6145049	96	130
93.97105951	128.612519	94	130
91.99812434	128.6102488	92	130
90.00127148	128.6079456	90	130
88.00224502	128.6056394	88	130
86.00203379	128.6033326	86	130
84.00117433	128.6010257	84	130
82.00003575	128.5987188	82	130
79.99886389	128.5964124	80	130
77.99802943	128.5941071	78	130
76.00040966	128.5918059	76	130
74.03662566	128.5895428	74	130
72.31708814	128.5875608	72	130
71.41496445	128.5865304	70	130
71.41496181	127.6668139	70	128
71.41492262	125.9623463	70	126
71.41488324	124.0037501	70	124
71.41484919	122.0054651	70	122
71.41481821	120.003661	70	120
71.41478877	118.0019863	70	118
71.41476033	116.0006083	70	116
71.41473277	113.9995008	70	114
71.41470601	111.9986308	70	112
71.41467998	109.9979618	70	110
71.41465452	107.9974615	70	108
71.41462949	105.9971046	70	106
71.41460472	103.9968708	70	104
71.41458006	101.9967426	70	102
71.41455541	99.99670503	70	100
71.41453068	97.99674364	70	98
71.41450581	95.99684434	70	96
71.4144808	93.99699183	70	94
71.41445568	91.99716842	70	92
71.41443053	89.99735278	70	90
71.41440545	87.99751898	70	88
71.41438059	85.99763425	70	86
71.41435609	83.99765164	70	84
71.41433211	81.99749486	70	82
71.41430889	79.9970854	70	80
71.41428689	77.99687338	70	78
71.41426732	76.00209945	70	76
71.41425289	74.05110547	70	74
71.41424522	72.34958906	70	72
71.41422414	71.41420679	70	70
72.34954373	71.41421583	72	70
74.05114313	71.41420183	74	70
76.00215656	71.41419132	76	70
77.99692728	71.41418534	78	70
79.99713743	71.41418169	80	70
81.99754797	71.41417923	82	70
83.99770716	71.41417752	84	70
85.99769248	71.41417631	86	70
87.99757968	71.41417546	88	70
89.99741525	71.4141748	90	70
91.99723135	71.4141742	92	70
93.99705301	71.41417355	94	70
95.99690024	71.41417278	96	70
97.99678902	71.41417184	98	70
99.99673244	71.41417075	100	70
101.9967421	71.41416954	102	70
103.9968295	71.41416831	104	70
105.9970077	71.41416717	106	70
107.9972929	71.41416626	108	70
109.9977066	71.41416573	110	70
111.9982782	71.41416574	112	70
113.9990449	71.41416643	114	70
116.0000443	71.41416789	116	70
118.0012968	71.4141702	118	70
120.0027818	71.41417348	120	70
122.0042082	71.4141783	122	70
124.0016291	71.41418631	124	70
125.9584795	71.41420038	126	70
127.6619569	71.4142182	128	70
128.5857746	71.41420911	130	70
128.5857503	72.33190946	130	72
128.5857411	74.03718021	130	74
128.5857243	75.99609559	130	76
128.5856997	77.99437509	130	78
128.5856712	79.99571121	130	80
128.5856411	81.99657627	130	82
128.5856104	83.99706497	130	84
128.5855796	85.99737606	130	86
128.5855488	87.99760524	130	88
128.5855182	89.99779133	130	90
128.5854876	91.99794732	130	92
128.5854571	93.99807526	130	94
128.5854267	95.99817227	130	96
128.5853963	97.99823176	130	98
128.5853658	99.99824223	130	100
128.5853352	101.9981848	130	102
128.5853042	103.9980294	130	104
128.5852728	105.9977293	130	106
128.5852405	107.9972112	130	108
128.5852072	109.9963579	130	110
128.5851728	111.9949788	130	112
128.5851369	113.9927624	130	114
128.5850997	115.9892149	130	116
128.5850612	117.9836122	130	118
128.5850219	119.9750129	130	120
128.584982	121.9621214	130	122
128.5849408	123.9405207	130	124
128.5848966	125.8813094	130	126
128.5848518	127.6173453	130	128
128.584842	128.5867205	130	130
127.6221813	128.5879963	128	130
125.8781591	128.590329	126	130
123.9376086	128.592922	124	130
121.9601445	128.5955629	122	130
119.972636	128.5982165	120	130
117.9803175	128.600875	118	130
115.9853541	128.6035351	116	130
113.9892313	128.6061949	114	130
111.9930637	128.608854	112	130
109.9976817	128.6115122	110	130
108.003648	128.6141698	108	130
106.0125658	128.6168246	106	130
104.0492058	128.6194418	104	130
102.3281575	128.621737	102	130
101.4504033	128.6229189	100	130
101.8725214	120.7026265	100	120
103.2504026	118.9443121	102	118
104.9526583	116.7720388	104	116
106.6843713	114.5621687	106	114
108.4211606	112.3458218	108	112
110.1581016	110.1292848	110	110
111.8940418	107.9140272	112	108
113.6279845	105.7013194	114	106
115.3516067	103.5017811	116	104
116.9855072	101.4167365	118	102
118.0034621	100.1177154	120	100
116.8569353	98.96442596	118	98
114.9520164	97.04823412	116	96

Solution x	Solution y	Original x	Original y
112.96164	95.04607543	114	94
110.9635728	93.03618008	112	92
108.9631975	91.02397583	110	90
106.963709	89.0126832	108	88
104.9676078	87.00481033	106	86
102.9794633	85.00494201	104	84
101.0816313	83.095917	102	82
99.9921506	81.99998797	100	80
98.90367914	83.0778729	98	82
96.97252884	84.99022453	96	84
94.96402205	86.97917626	94	86
93.04116926	88.8833016	92	88
91.99824106	89.91606124	90	90
96.01956196	93.27938808	95	95
97.50375918	93.8607777	97	95
99.15678659	94.50830616	99	95
100.805783	95.15425696	101	95
102.3181023	95.74666749	103	95
103.369787	96.15862926	105	95
103.4111438	97.23738192	105	97
103.481297	99.06685916	105	99
103.5558916	101.0121761	105	101
103.6203711	102.693685	105	103
103.6521547	103.5223902	105	105
103.0296839	103.440924	103	105
102.0799374	103.3166248	101	105

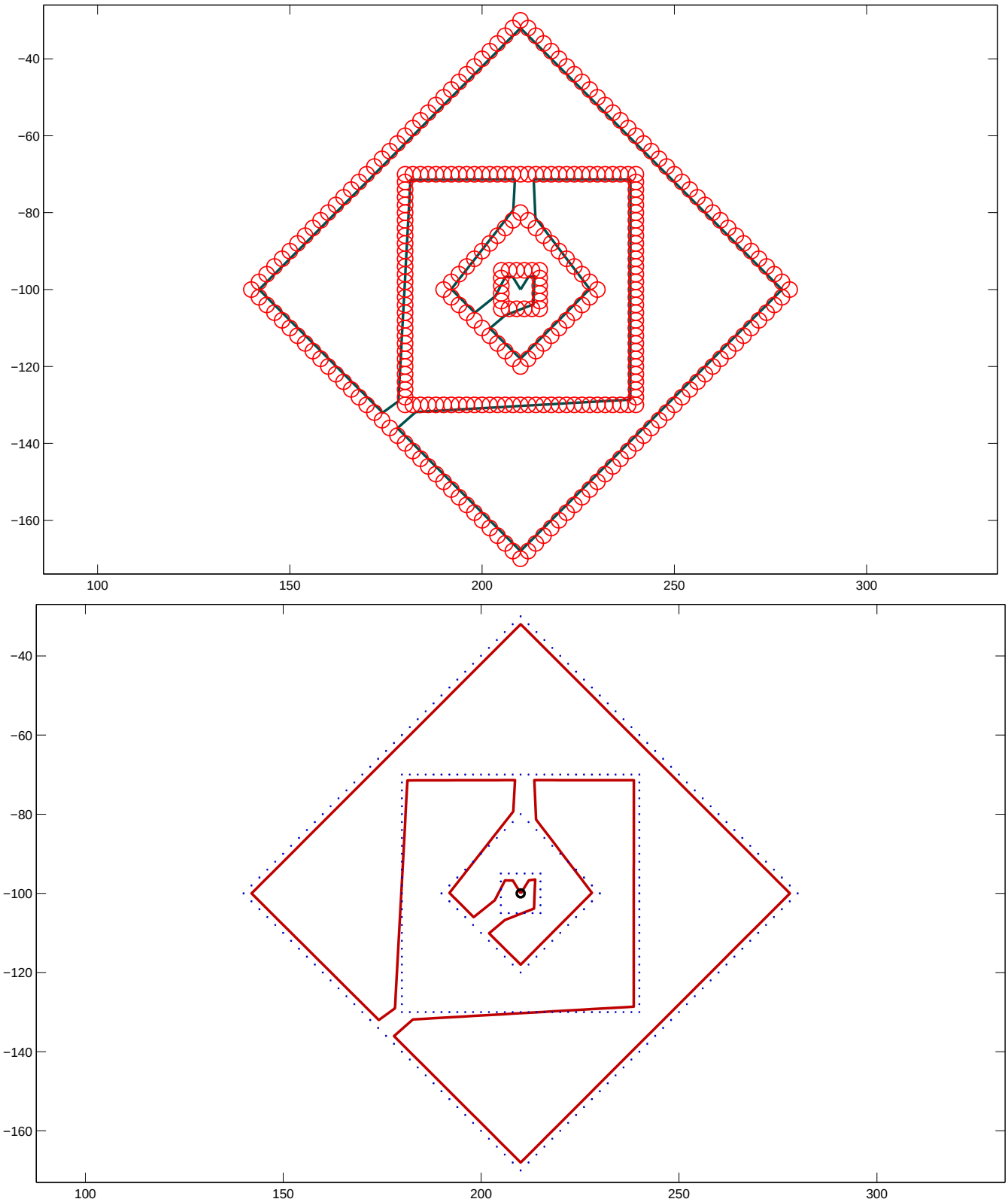

Figure N.46: $rotatingDiamonds4$, Equal Radius, 2D, Euclidean, Length = 770.6601538

Table N-49: Solution for *rotatingDiamonds*4, Equal Radius, 2D, Euclidean

Total distance: 770.660153881788			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
98.01047601	96.73806069	99	95
96.97644464	96.72525955	97	95
96.03144943	96.71351149	95	95
95.53762574	97.67457876	95	97
94.85232937	99.00825597	95	99
94.11751046	100.4383117	95	101
93.45181286	101.7338545	95	103
88.11163973	106.0031158	88	108
86.99825072	104.8882814	86	106
85.05790209	102.9454584	84	104
83.12099603	101.0060642	82	102
81.99640149	99.88004066	80	100
83.01480247	98.58060422	82	98
84.66086674	96.48026847	84	96
86.3837509	94.28191966	86	94
88.11315433	92.07525591	88	92
89.84309371	89.86790987	90	90
91.5732422	87.66029753	92	88
93.30359557	85.45242331	94	86
95.03350577	83.24511237	96	84
96.74618864	81.05977739	98	82
98.12753451	79.29723311	100	80
98.55043271	71.37795617	100	70
97.70006437	71.38024123	98	70
95.9746428	71.3848302	96	70
94.00314852	71.3900693	94	70
92.00349913	71.39538979	92	70
90.0023299	71.40071763	90	70
88.00226884	71.40604344	88	70
86.00293924	71.4113668	86	70
84.00383484	71.41668837	84	70
82.00469114	71.42200872	82	70
80.00531113	71.42732878	80	70
78.0055949	71.43264986	78	70
76.00752223	71.43796876	76	70
74.03394284	71.44322766	74	70
72.27401792	71.4479168	72	70
71.37719988	71.45028563	70	70
71.32770054	72.36036835	70	72
71.23248151	74.11059055	70	74
71.12574376	76.07251998	70	76
71.01750602	78.062041	70	78
70.9090887	80.05485714	70	80
70.80065227	82.04800874	70	82
70.69220907	84.04126682	70	84
70.58375605	86.03468754	70	86
70.47529215	88.0282923	70	88
70.36681828	90.02206651	70	90
70.25833616	92.0159813	70	92
70.14984777	94.01000309	70	94
70.04135518	96.00409656	70	96
69.93286051	97.99822585	70	98
69.82436584	99.99235529	70	100
69.71587321	101.9864503	70	102
69.60738453	103.9804784	70	104
69.49890152	105.9744109	70	106
69.39042553	107.9682254	70	108
69.28195741	109.9619085	70	110
69.17349728	111.9554598	70	112
69.06504434	113.9488952	70	114
68.95659656	115.9422508	70	116
68.84814997	117.9355967	70	118
68.73969594	119.9290843	70	120
68.63121323	121.9230889	70	122
68.52266425	123.9182724	70	124
68.41425976	125.9107128	70	126
68.31003532	127.8262685	70	128
68.24385334	129.0429425	70	130
64.15579467	132.0060359	64	134
63.00076604	130.8562962	62	132
61.06610708	128.9305576	60	130
59.06164384	126.9353187	58	128
57.05626325	124.9391532	56	126
55.05174422	122.9438382	54	124
53.04736626	120.9486588	52	122
51.0429264	118.9534137	50	120
49.03842352	116.9581025	48	118
47.03387978	114.9627476	46	116
45.0293149	112.967369	44	114
43.02474387	110.9719821	42	112
41.02014226	108.9765626	40	110
39.01531537	106.9809163	38	108
37.00993101	104.9847107	36	106
35.00920199	102.99313	34	104
33.10356307	101.0961922	32	102
32.00000077	99.99770584	30	100
33.10714492	98.89060304	32	98
35.00209065	96.99566318	34	96
36.99755283	95.00022348	36	94
38.99855104	92.99925943	38	92
40.9988288	90.99902222	40	90
42.99875317	88.99914242	42	88
44.99864004	86.99930323	44	86
46.99857952	84.9994142	46	84
48.99857886	82.99946786	48	82
50.99862317	80.99947888	50	80
52.99869523	78.99946427	52	78
54.99878145	76.9994374	54	76
56.99887288	74.99940697	56	74
58.99896452	72.9993778	58	72
60.99905414	70.99935196	60	70
62.99914129	68.99932979	62	68
64.99922652	66.99931066	64	66
66.99931089	64.99929344	66	64
68.99939563	62.99927694	68	62
70.9994818	60.99926011	70	60
72.99957	58.99924245	72	58
74.99965987	56.99922444	74	56
76.99974947	54.99920817	76	54
78.99983439	52.99919826	78	52
80.99990677	50.99920278	80	50
82.99995464	48.99923393	82	48
84.9999628	46.99930714	84	46
86.99991787	44.99943598	86	44
88.9998258	42.99961467	88	42
90.99976735	40.99976276	90	40
93.00002813	38.99959552	92	38
95.0009002	36.99882323	94	36
96.99605369	35.00378063	96	34
98.89108245	33.10887266	98	32
99.99998631	32.00000209	100	30
101.1081188	33.10813644	102	32
103.0035823	35.00353604	104	34
104.9990194	36.99892196	106	36
107.0001058	38.99996835	108	38
109.0005516	41.00038007	110	40
111.0006409	43.00043878	112	42
113.0006594	45.00042922	114	44
115.000695	47.00043904	116	46
117.0007629	49.0004832	118	48
119.0008585	51.00055706	120	50
121.0009741	53.00065283	122	52
123.0011036	55.00076432	124	54
125.0012435	57.00088787	126	56
127.0013923	59.00102208	128	58
129.0015502	61.00116719	130	60
131.0017185	63.00132458	132	62
133.0018992	65.00149637	134	64
135.0020945	67.00168523	136	66
137.0023073	69.00189422	138	68
139.0025405	71.00212677	140	70
141.0027971	73.00238647	142	72
143.0030797	75.00267657	144	74
145.0033891	77.00299839	146	76
147.0037201	79.00334762	148	78
149.0040539	81.00370603	150	80
151.0043421	83.00402555	152	82
153.0044796	85.00420074	154	84
155.0042616	87.00402583	156	86
157.0033195	89.00312998	158	88
159.001049	91.00090553	160	90
160.9966804	92.99658032	162	92
162.9893987	94.98933956	164	94
164.9727933	96.97277739	166	96

Solution x	Solution y	Original x	Original y
166.8558055	98.85583628	168	98
167.9999652	99.9999954	170	100
166.8532655	101.1466811	168	102
164.9683653	103.0316046	166	104
162.9822156	105.0177652	164	106
160.9871869	107.0127922	162	108
158.9908714	109.0090995	160	110
156.9938369	111.0061241	158	112
154.9961208	113.0038304	156	114
152.9977773	115.0021649	154	116
150.9989112	117.0010225	152	118
148.999642	119.0002831	150	120
147.0000768	120.9998389	148	122
145.0003008	122.9996041	146	124
143.0003777	124.9995144	144	126
141.0003543	126.9995227	142	128
139.0002642	128.9995951	140	130
137.0001319	130.9997069	138	132
134.9999759	132.9998396	136	134
132.9998112	134.9999782	134	136
130.9996518	137.0001086	132	138
128.999513	139.0002155	130	140
126.999414	141.0002799	128	142
124.9993805	143.0002762	126	144
122.9994477	145.0001693	124	146
120.9996645	146.9999109	122	148
119.0000972	148.999435	120	150
117.0008338	150.9986541	118	152
115.0019849	152.9974585	116	154
113.0036734	154.9957256	114	156
111.0060072	156.9933478	112	158
109.0090403	158.9902706	110	160
107.0127946	160.9864696	108	162
105.0176773	162.9815325	106	164
103.0296169	164.9695222	104	166
101.1318178	166.8672325	102	168
99.99907797	167.9999572	100	170
98.87566086	166.8786475	98	168
96.96949102	164.9761144	96	166
94.98229574	162.9927019	94	164
92.98832306	161.0025207	92	162
90.99081865	159.0088136	90	160
88.99082155	157.012615	88	158
86.98953117	155.0151181	86	156
84.98774957	153.0171217	84	154
82.98590326	151.0190514	82	152
80.98421848	149.0211343	80	150
78.98282725	147.0235042	78	148
76.98178368	145.0262169	76	146
74.98100275	143.0291888	74	144
72.98058265	141.032517	72	142
70.98999616	139.0456546	70	140
69.1512542	137.2103614	68	138
67.99909087	136.0603765	66	136
72.76195756	131.8491703	72	130
74.14726771	131.7691507	74	130
76.09836284	131.6564414	76	130
78.09352982	131.5411887	78	130
80.08821019	131.4259657	80	130
82.08128466	131.3108354	82	130
84.07384393	131.1957338	84	130
86.06639255	131.0806315	86	130
88.05909803	130.965519	88	130
90.05199454	130.8503943	90	130
92.04506533	130.7352586	92	130
94.03827448	130.6201142	94	130
96.03157978	130.5049636	96	130
98.02493798	130.3898095	98	130
100.0183067	130.2746546	100	130
102.0116447	130.1595014	102	130
104.0049104	130.0443523	104	130
105.9980607	129.9292101	106	130
107.9910467	129.8140777	108	130
109.98381	129.6989585	110	130
111.9762753	129.583857	112	130
113.968341	129.4687791	114	130
115.9598646	129.3537331	116	130
117.950647	129.2387306	118	130
119.9404452	129.1237854	120	130
121.9290714	129.0089083	122	130

Solution x	Solution y	Original x	Original y
123.9155616	128.894154	124	130
125.8808458	128.780622	126	130
127.6415891	128.6789077	128	130
128.5459853	128.6266768	130	130
128.5465723	127.7275729	130	128
128.5477815	125.9631188	130	126
128.5491328	123.9908147	130	124
128.5504911	121.9944831	130	122
128.551843	119.9961671	130	120
128.5531897	117.9974385	130	118
128.554533	115.9983761	130	116
128.5558739	113.9990495	130	114
128.5572135	111.9995328	130	112
128.5585523	109.9998861	130	110
128.559891	108.0001536	130	108
128.5612302	106.0003658	130	106
128.5625704	104.0005437	130	104
128.5639118	102.0007013	130	102
128.5652547	100.0008485	130	100
128.5665994	98.00099227	130	98
128.5679457	96.00113767	130	96
128.5692938	94.00128758	130	94
128.5706433	92.00144245	130	92
128.571994	90.00159933	130	90
128.5733453	88.00174926	130	88
128.5746967	86.00186978	130	86
128.5760475	84.0019058	130	84
128.5773965	82.00173288	130	82
128.5787424	80.00112936	130	80
128.5800832	77.99999562	130	78
128.5814143	76.00081009	130	76
128.5827157	74.03102912	130	74
128.5838644	72.29287136	130	72
128.5844749	71.41294252	130	70
127.7141114	71.41194888	128	70
125.968418	71.40991295	126	70
123.9948002	71.40760806	124	70
121.9969566	71.40528158	122	70
119.9976905	71.4029569	120	70
117.9985912	71.40063353	118	70
115.999615	71.39831028	116	70
114.0004482	71.39598637	114	70
112.0004009	71.3936612	112	70
109.9986781	71.39133467	110	70
107.9966087	71.38901008	108	70
106.0155136	71.3867151	106	70
104.2813765	71.38470078	104	70
103.4440775	71.38370833	102	70
103.8805672	81.31920963	102	82
105.235953	83.09931114	104	84
106.9154946	85.30516235	106	86
108.6119633	87.5332396	108	88
110.3083077	89.76115144	110	90
112.0036287	91.98771868	112	92
113.6971899	94.21197557	114	94
115.3837376	96.42702403	116	96
116.9987353	98.54810919	118	98
118.0042777	99.86873894	120	100
116.8670167	101.0134819	118	102
114.9381463	102.9551055	116	104
112.9484325	104.9579619	114	106
110.956578	106.9629677	112	108
108.9640681	108.9686302	110	110
106.9711772	110.9746721	108	112
104.9778721	112.9811234	106	114
102.9871938	114.9849167	104	116
101.0789046	116.9057603	102	118
99.99184152	118.0000139	100	120
98.90956883	116.9282144	98	118
96.97969679	115.0170672	96	116
94.9608103	113.0177369	94	114
93.02565137	111.1012963	92	112
91.99829315	110.0839047	90	110
96.01957305	106.7206036	95	105
97.51681192	106.1341017	97	105
99.17679895	105.4838418	99	105
100.8243546	104.8384487	101	105
102.3295677	104.2488207	103	105
103.3697982	103.8413572	105	105
103.4100626	102.7909025	105	103

Solution x	Solution y	Original x	Original y
103.4806498	100.9503514	105	101
103.5565704	98.97037737	105	99
103.6221705	97.25929737	105	97
103.6521497	96.4776232	105	95
103.0180605	96.56060128	103	95
102.0799332	96.68337558	101	95

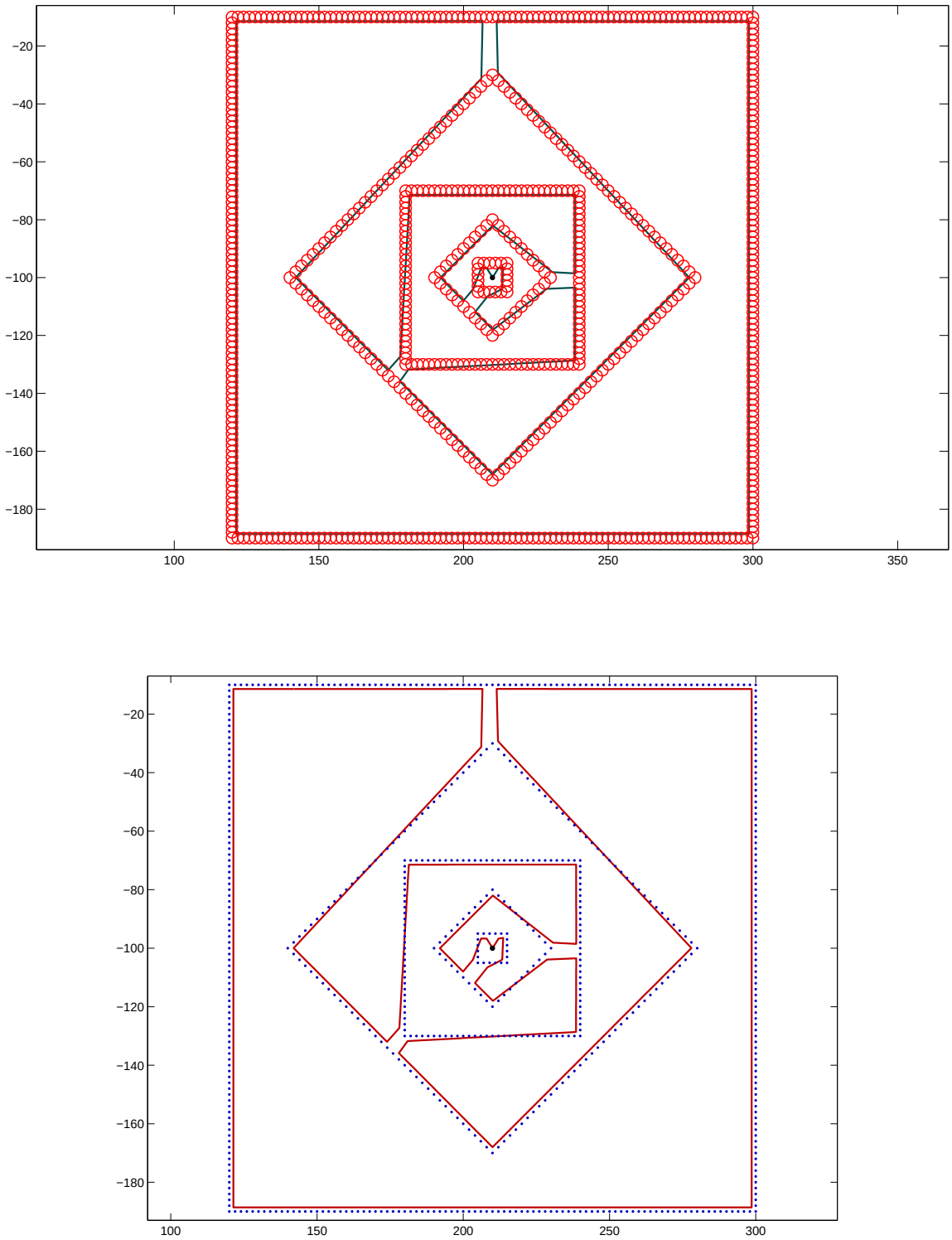

Figure N.47: *rotatingDiamonds*5, Equal Radius, 2D, Euclidean, Length = 1510.7523019

Table N-50: Solution for *rotatingDiamonds*5, Equal Radius, 2D, Euclidean

Total distance: 1510.75230190769			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
97.99462341	96.72894158	99	95
96.95662069	96.69526762	97	95
96.10415324	96.66759311	95	95
95.72601301	97.64630579	95	97
95.13946198	99.1643511	95	99
94.50225499	100.8134914	95	101
93.85966321	102.4765783	95	103
93.27711194	103.9842846	95	105
89.91630319	108.0017466	90	110
88.91233855	106.9879232	88	108
86.98413936	105.0408467	86	106
84.98744727	103.0245924	84	104
83.01964934	101.037497	82	102
81.99998973	100.0078415	80	100
83.06052353	98.95354961	82	98
85.03221427	96.99342092	84	96
87.03160498	95.00578002	86	94
89.02879007	93.02033581	88	92
91.02772132	91.03315191	90	90
93.02793472	89.04468784	92	88
95.02909199	87.05528142	94	86
97.03365562	85.06249085	96	84
98.99751124	83.11018382	98	82
100.1177213	81.99653755	100	80
101.3645538	82.97359965	102	82
103.5127532	84.65697913	104	84
105.7215524	86.38785485	106	86
107.9240893	88.11382815	108	88
110.1253665	89.83881627	110	90
112.327951	91.56482946	112	92
114.5328621	93.29266566	114	94
116.7419055	95.02373879	116	96
118.9433405	96.74884637	118	98
120.7026064	98.12747031	120	100
128.6229341	98.54958149	130	100
128.6219099	97.78109044	130	98
128.6195649	95.99549786	130	96
128.6169162	93.9793954	130	94
128.6142709	91.9732032	130	92
128.611639	89.97982768	130	90
128.6090087	87.98769575	130	88
128.6063787	85.99448918	130	86
128.6037498	84.00063037	130	84
128.601123	82.00662694	130	82
128.598498	80.01282554	130	80
128.5958728	78.01864333	130	78
128.593239	76.01981555	130	76
128.5905965	74.02015315	130	74
128.5881942	72.20482548	130	72
128.5871668	71.41560056	130	70
127.7735578	71.41616158	128	70
125.9786918	71.41735018	126	70
123.9863035	71.41867315	124	70
121.9841584	71.42001197	122	70
119.9855069	71.42135483	120	70
117.9877526	71.42270077	118	70
115.9898357	71.42404874	116	70
113.9916019	71.4253977	114	70
111.9930801	71.42674682	112	70
109.9943191	71.42809548	110	70
107.9953678	71.42944326	108	70
105.9962716	71.43078983	106	70
103.9970712	71.43213496	104	70
101.9978014	71.43347851	102	70
99.99849276	71.43482037	100	70
97.99917313	71.43616049	98	70
95.99986975	71.43749886	96	70
94.00061133	71.43883553	94	70
92.00143007	71.44017056	92	70
90.00236339	71.44150412	90	70
88.00345439	71.4428364	88	70
86.0047498	71.44416772	86	70
84.00629286	71.44549856	84	70
82.00809943	71.4468296	82	70
80.01004482	71.44816192	80	70
78.01142446	71.44949753	78	70
76.01084382	71.45083976	76	70
74.02201043	71.45218244	74	70
72.22075604	71.45340286	72	70
71.37332839	71.45395569	70	70
71.32539948	72.28376378	70	72
71.22031801	74.10277624	70	74
71.10545342	76.09116142	70	76
70.99049814	78.08114253	70	78
70.87571328	80.0681729	70	80
70.76089893	82.05570451	70	82
70.6460085	84.04454182	70	84
70.53104958	86.0345545	70	86
70.41603756	88.02547768	70	88
70.30098598	90.01707866	70	90
70.18590568	92.00917144	70	92
70.07080528	94.00160868	70	94
69.95569167	95.99427276	70	96
69.84057046	97.9870681	70	98
69.72544638	99.97991481	70	100
69.61032349	101.9727439	70	102
69.49520546	103.9654939	70	104
69.38009559	105.9581092	70	106
69.26499684	107.9505405	70	108
69.1499117	109.9427468	70	110
69.03484172	111.9347031	70	112
68.91978667	113.9264155	70	114
68.80474227	115.9179597	70	116
68.68969432	117.9095821	70	118
68.57460223	119.9019831	70	120
68.45935978	121.8969922	70	122
68.34378969	123.8976509	70	124
68.22923729	125.8806199	70	126
68.15081864	127.2380614	70	128
63.9400862	132.000892	64	134
62.90288639	130.9606463	62	132
60.96364463	129.0157681	60	130
58.96119002	127.007467	58	128
56.9676269	125.0080673	56	126
54.97443479	123.009034	54	124
52.98018997	121.0089439	52	122
50.98518827	119.0080957	50	120
48.98974317	117.0068049	48	118
46.99408575	115.0053035	46	116
44.99840747	113.0037838	44	114
43.00290884	111.0024465	42	112
41.00783357	109.0015355	40	110
39.01342911	107.0012973	38	108
37.01937927	105.0014121	36	106
35.02367421	102.9998573	34	104
33.08505735	101.0555394	32	102
31.99973318	99.9670508	30	100
33.0480101	98.8440572	32	98
34.92982453	96.82808657	34	96
36.85651505	94.76405088	36	94
38.78022642	92.70320913	38	92
40.7049007	90.64133534	40	90
42.63092879	88.57801008	42	88
44.5579313	86.51363975	44	86
46.48558008	84.44857604	46	84
48.41365481	82.38305512	48	82
50.34201291	80.31722992	50	80
52.27056146	78.25120012	52	78
54.19923858	76.18503215	54	76
56.12800215	74.11877122	56	74
58.05682301	72.05244868	58	72
59.98568063	69.98608662	60	70
61.91456019	67.919701	62	68
63.84345039	65.85330402	64	66
65.77234192	63.78690575	66	64
67.70122621	61.72051545	68	62
69.63009448	59.65414263	70	60
71.55893705	57.58779776	72	58
73.48774279	55.5214929	74	56
75.41649885	53.45524193	76	54
77.34519088	51.38906037	78	52
79.27380381	49.3229645	80	50
81.20232391	47.25696919	82	48
83.13074244	45.19108397	84	46

Solution x	Solution y	Original x	Original y
85.05906119	43.12530705	86	44
86.98730016	41.0596171	88	42
88.91551954	38.99394959	90	40
90.84394727	36.92805992	92	38
92.77327537	34.86120528	94	36
94.69273625	32.80491653	96	34
96.14729866	31.24666357	98	32
96.5709407	11.39921663	98	10
95.69836397	11.39938344	96	10
93.95613115	11.39967729	94	10
91.98209639	11.40001285	92	10
89.98353287	11.40036089	90	10
87.98576506	11.40071469	88	10
85.98845026	11.40107207	86	10
83.99078321	11.40143171	84	10
81.99263511	11.40179271	82	10
79.9940669	11.40215441	80	10
77.99516614	11.40251632	78	10
75.99601299	11.40287808	76	10
73.99667273	11.40323941	74	10
71.9971952	11.40360011	72	10
69.9976171	11.40396002	70	10
67.99796511	11.404319	68	10
65.99825876	11.40467697	66	10
63.9985125	11.40503385	64	10
61.99873728	11.40538959	62	10
59.99894163	11.40574413	60	10
57.99913243	11.40609746	58	10
55.99931541	11.40644956	56	10
53.99949562	11.40680041	54	10
51.99967763	11.40715001	52	10
49.99986581	11.40749838	50	10
48.00006447	11.40784552	48	10
46.00027803	11.40819146	46	10
44.00051118	11.40853623	44	10
42.000769	11.40887989	42	10
40.00105726	11.40922249	40	10
38.00138268	11.40956412	38	10
36.00175352	11.40990487	36	10
34.00218044	11.4102449	34	10
32.00267784	11.41058436	32	10
30.00326568	11.41092348	30	10
28.003971	11.41126256	28	10
26.00482702	11.41160196	26	10
24.00586338	11.41194218	24	10
22.00707257	11.41228386	22	10
20.00831923	11.41262788	20	10
18.00924229	11.4129755	18	10
16.01091226	11.41332825	16	10
14.03679841	11.41368404	14	10
12.27510555	11.41400605	12	10
11.41429021	11.41414207	10	10
11.41430134	12.29572869	10	12
11.41427806	14.03489327	10	14
11.41425967	16.00484787	10	16
11.41424073	18.00370443	10	18
11.41422194	20.00373495	10	20
11.41420475	22.00332159	10	22
11.41419005	24.00279954	10	24
11.41417819	26.00233052	10	26
11.41416922	28.00194152	10	28
11.41416304	30.00161763	10	30
11.41415944	32.00133891	10	32
11.41415816	34.00109058	10	34
11.41415894	36.00086387	10	36
11.41416152	38.00065425	10	38
11.41416564	40.00045962	10	40
11.41417108	42.00027904	10	42
11.41417761	44.00011204	10	44
11.41418503	45.99995822	10	46
11.41419319	47.9998171	10	48
11.41420191	49.99968809	10	50
11.41421105	51.99957048	10	52
11.41422049	53.99946348	10	54
11.41423011	55.99936625	10	56
11.41423981	57.99927788	10	58
11.4142495	59.99919749	10	60
11.41425909	61.9991242	10	62
11.41426852	63.99905717	10	64
11.41427771	65.99899559	10	66

Solution x	Solution y	Original x	Original y
11.41428661	67.99893872	10	68
11.41429517	69.99888585	10	70
11.41430333	71.99883634	10	72
11.41431105	73.99878958	10	74
11.4143183	75.99874505	10	76
11.41432504	77.99870225	10	78
11.41433124	79.99866074	10	80
11.41433688	81.99862012	10	82
11.41434192	83.99858001	10	84
11.41434636	85.99854009	10	86
11.41435016	87.99850006	10	88
11.41435332	89.99845964	10	90
11.41435581	91.99841859	10	92
11.41435763	93.99837666	10	94
11.41435877	95.99833365	10	96
11.41435922	97.99828936	10	98
11.41435898	99.99824361	10	100
11.41435803	101.9981962	10	102
11.41435639	103.998147	10	104
11.41435405	105.9980959	10	106
11.41435101	107.9980427	10	108
11.41434728	109.9979872	10	110
11.41434286	111.9979294	10	112
11.41433777	113.9978691	10	114
11.41433202	115.9978062	10	116
11.41432562	117.9977406	10	118
11.41431859	119.9976721	10	120
11.41431094	121.9976008	10	122
11.41430272	123.9975263	10	124
11.41429394	125.9974488	10	126
11.41428463	127.9973679	10	128
11.41427484	129.9972837	10	130
11.41426461	131.997196	10	132
11.41425399	133.9971045	10	134
11.41424303	135.9970092	10	136
11.41423181	137.9969098	10	138
11.41422039	139.9968061	10	140
11.41420887	141.9966976	10	142
11.41419734	143.996584	10	144
11.41418591	145.9964647	10	146
11.4141747	147.996339	10	148
11.41416387	149.9962058	10	150
11.41415357	151.996064	10	152
11.41414398	153.9959117	10	154
11.41413531	155.9957466	10	156
11.41412779	157.9955655	10	158
11.41412167	159.9953641	10	160
11.41411722	161.9951363	10	162
11.41411472	163.9948743	10	164
11.41411447	165.9945677	10	166
11.41411676	167.9942039	10	168
11.41412186	169.9937671	10	170
11.41412995	171.9932385	10	172
11.41414111	173.9925941	10	174
11.41415518	175.9918054	10	176
11.4141716	177.9908717	10	178
11.41418914	179.9900048	10	180
11.41420534	181.9901966	10	182
11.41421562	183.9934643	10	184
11.41421603	185.9864959	10	186
11.4142293	187.7596367	10	188
11.41422144	188.5857841	10	190
12.23827561	188.5857762	12	190
14.0064157	188.585782	14	190
16.005468	188.5857609	16	190
18.00702116	188.5857651	18	190
20.00592537	188.5857823	20	190
22.00456484	188.5858035	22	190
24.00348634	188.5858247	24	190
26.00268375	188.5858439	26	190
28.00206817	188.5858599	28	190
30.00157647	188.5858726	30	190
32.00117278	188.5858818	32	190
34.00083575	188.5858878	34	190
36.00055085	188.5858906	36	190
38.00030729	188.5858908	38	190
40.00009678	188.5858885	40	190
41.99991296	188.5858841	42	190
43.99975097	188.5858779	44	190
45.99960711	188.5858703	46	190

Solution x	Solution y	Original x	Original y
47.99947855	188.5858614	48	190
49.99936307	188.5858515	50	190
51.99925895	188.5858408	52	190
53.99916484	188.5858295	54	190
55.99907965	188.5858178	56	190
57.9990025	188.5858058	58	190
59.99893267	188.5857937	60	190
61.99886956	188.5857815	62	190
63.99881267	188.5857695	64	190
65.99876158	188.5857576	66	190
67.99871592	188.585746	68	190
69.99867534	188.5857347	70	190
71.99863954	188.5857238	72	190
73.99860825	188.5857133	74	190
75.99858117	188.5857034	76	190
77.99855806	188.585694	78	190
79.99853866	188.5856852	80	190
81.99852271	188.585677	82	190
83.99850996	188.5856694	84	190
85.99850016	188.5856625	86	190
87.99849304	188.5856564	88	190
89.99848837	188.5856509	90	190
91.99848588	188.5856461	92	190
93.99848533	188.5856421	94	190
95.99848645	188.5856388	96	190
97.99848898	188.5856363	98	190
99.99849269	188.5856345	100	190
101.9984973	188.5856335	102	190
103.9985026	188.5856332	104	190
105.9985082	188.5856337	106	190
107.998514	188.5856349	108	190
109.9985196	188.5856369	110	190
111.9985248	188.5856396	112	190
113.9985293	188.5856429	114	190
115.9985328	188.585647	116	190
117.9985348	188.5856517	118	190
119.9985351	188.585657	120	190
121.9985332	188.585663	122	190
123.9985286	188.5856695	124	190
125.9985208	188.5856765	126	190
127.9985092	188.585684	128	190
129.998493	188.5856919	130	190
131.9984713	188.5857002	132	190
133.9984431	188.5857087	134	190
135.9984072	188.5857174	136	190
137.9983619	188.5857262	138	190
139.9983054	188.5857349	140	190
141.9982354	188.5857436	142	190
143.9981489	188.5857519	144	190
145.9980424	188.5857598	146	190
147.9979112	188.5857671	148	190
149.9977494	188.5857735	150	190
151.9975496	188.585779	152	190
153.9973023	188.5857832	154	190
155.9969954	188.5857859	156	190
157.9966136	188.5857869	158	190
159.9961378	188.5857858	160	190
161.9955446	188.5857825	162	190
163.9948065	188.5857767	164	190
165.9938923	188.5857681	166	190
167.992769	188.5857566	168	190
169.9914056	188.5857421	170	190
171.9897769	188.5857247	172	190
173.9878678	188.5857045	174	190
175.9856749	188.5856823	176	190
177.9832126	188.5856593	178	190
179.9805636	188.5856381	180	190
181.9781089	188.5856251	182	190
183.9779759	188.5856385	184	190
186.0005634	188.585743	186	190
187.8051055	188.5857764	188	190
188.5857789	188.5857801	190	190
188.5857748	187.8051703	190	188
188.5857389	186.0007588	190	186
188.5856283	183.9776548	190	184
188.5856131	181.9779807	190	182
188.5856249	179.9805194	190	180
188.585645	177.9832014	190	178
188.5856671	175.9856765	190	176
188.5856883	173.9878748	190	174

Solution x	Solution y	Original x	Original y
188.5857076	171.9897859	190	172
188.5857241	169.9914151	190	170
188.5857376	167.9927784	190	168
188.5857482	165.993901	190	166
188.5857558	163.9948145	190	164
188.5857607	161.9955518	190	162
188.585763	159.9961441	190	160
188.585763	157.9966191	190	158
188.5857611	155.9970001	190	156
188.5857573	153.9973063	190	154
188.5857521	151.9975529	190	152
188.5857456	149.9977521	190	150
188.585738	147.9979134	190	148
188.5857297	145.9980442	190	146
188.5857207	143.9981503	190	144
188.5857112	141.9982365	190	142
188.5857015	139.9983062	190	140
188.5856916	137.9983624	190	138
188.5856817	135.9984075	190	136
188.5856718	133.9984433	190	134
188.5856621	131.9984713	190	132
188.5856527	129.9984929	190	130
188.5856437	127.998509	190	128
188.585635	125.9985206	190	126
188.5856268	123.9985283	190	124
188.5856191	121.9985328	190	122
188.5856119	119.9985347	190	120
188.5856054	117.9985345	190	118
188.5855995	115.9985324	190	116
188.5855942	113.998529	190	114
188.5855896	111.9985246	190	112
188.5855857	109.9985194	190	110
188.5855826	107.9985138	190	108
188.5855801	105.9985081	190	106
188.5855784	103.9985025	190	104
188.5855774	101.9984972	190	102
188.5855772	99.99849268	190	100
188.5855778	97.99848903	190	98
188.5855791	95.99848654	190	96
188.5855811	93.99848548	190	94
188.5855839	91.99848608	190	92
188.5855875	89.99848862	190	90
188.5855917	87.99849333	190	88
188.5855967	85.99850048	190	86
188.5856023	83.99851032	190	84
188.5856086	81.9985231	190	82
188.5856156	79.99853907	190	80
188.5856232	77.99855849	190	78
188.5856314	75.99858161	190	76
188.5856401	73.9986087	190	74
188.5856493	71.99864001	190	72
188.585659	69.99867582	190	70
188.5856691	67.99871641	190	68
188.5856796	65.99876211	190	66
188.5856903	63.99881324	190	64
188.5857011	61.99887019	190	62
188.5857121	59.99893339	190	60
188.5857231	57.99900337	190	58
188.5857339	55.99908072	190	56
188.5857445	53.99916619	190	54
188.5857547	51.99926067	190	52
188.5857643	49.99936528	190	50
188.5857731	47.99948142	190	48
188.585781	45.99961085	190	46
188.5857876	43.99975581	190	44
188.5857928	41.99991921	190	42
188.5857961	40.00010483	190	40
188.5857975	38.00031759	190	38
188.5857964	36.00056394	190	36
188.5857927	34.00085226	190	34
188.5857859	32.00119343	190	32
188.5857759	30.00160201	190	30
188.5857624	28.0020992	190	28
188.5857456	26.00272031	190	26
188.5857257	24.00352666	190	24
188.5857037	22.00460172	190	22
188.5856815	20.00593472	190	20
188.5856632	18.00693339	190	18
188.5856573	16.00522571	190	16
188.585675	14.00688587	190	14

Solution x	Solution y	Original x	Original y
188.5856679	12.23790912	190	12
188.5856757	11.41411299	190	10
187.7767766	11.41397454	188	10
185.9830901	11.413618	186	10
183.9907749	11.41322537	184	10
181.9865327	11.4128371	182	10
179.9859787	11.41245582	180	10
177.9869808	11.41207968	178	10
175.988228	11.41170718	176	10
173.9893892	11.41133727	174	10
171.9904138	11.41096913	172	10
169.9913019	11.4106021	170	10
167.9920619	11.41023566	168	10
165.9927069	11.40986936	166	10
163.9932525	11.40950287	164	10
161.9937149	11.40913591	162	10
159.9941091	11.40876825	160	10
157.9944479	11.40839973	158	10
155.9947425	11.4080302	156	10
153.9950019	11.40765957	154	10
151.9952339	11.40728774	152	10
149.9954451	11.40691467	150	10
147.9956413	11.40654031	148	10
145.9958276	11.40616462	146	10
143.9960091	11.40578761	144	10
141.9961905	11.40540925	142	10
139.9963769	11.40502957	140	10
137.9965735	11.40464857	138	10
135.9967866	11.40426629	136	10
133.9970235	11.40388277	134	10
131.9972932	11.40349807	132	10
129.9976072	11.40311225	130	10
127.9979802	11.40272542	128	10
125.998432	11.40233769	126	10
123.998989	11.40194922	124	10
121.9996872	11.40156021	122	10
120.0005753	11.40117089	120	10
118.0017184	11.40078159	118	10
116.0031999	11.40039272	116	10
114.0051167	11.40000482	114	10
112.0075444	11.39961861	112	10
110.010356	11.39923503	110	10
108.0126903	11.39885542	108	10
106.0139813	11.39848194	106	10
104.0385307	11.39812136	104	10
102.2911852	11.39780506	102	10
101.4306135	11.39762755	100	10
101.8514874	29.24368485	100	30
103.3067367	30.79957756	102	32
105.2292879	32.85508012	104	34
107.1604981	34.91983383	106	36
109.0906646	36.98347048	108	38
111.0206484	39.04691252	110	40
112.9506901	41.1104178	112	42
114.8808392	43.1740395	114	44
116.8111061	45.23778842	116	46
118.7414876	47.30166129	118	48
120.6719741	49.36564756	120	50
122.6025528	51.42973332	122	52
124.5332098	53.49390375	124	54
126.463932	55.55814462	126	56
128.3947073	57.62244285	128	58
130.3255248	59.68678669	130	60
132.2563746	61.75116538	132	62
134.1872473	63.81556879	134	64
136.1181334	65.87998669	136	66
138.0490226	67.94440795	138	68
139.9799028	70.00881958	140	70
141.910759	72.07320539	142	72
143.8415716	74.13754431	144	74
145.7723141	76.20180797	146	76
147.7029499	78.2659572	148	78
149.6334281	80.32993723	150	80
151.5636767	82.39367125	152	82
153.4935967	84.45705306	154	84
155.4230536	86.51993887	156	86
157.3518629	88.58213116	158	88
159.2797521	90.64333875	160	90
161.2064506	92.70327277	162	92
163.1333187	94.76338917	164	94

Solution x	Solution y	Original x	Original y
165.0686096	96.83251762	166	96
166.9676351	98.86288987	168	98
168.0002663	99.96691646	170	100
166.9179118	101.0498215	168	102
164.9801525	102.9886097	166	104
162.9775607	104.9922537	164	106
160.9782953	106.9925571	162	108
158.9800941	108.9917869	160	110
156.9817882	110.9911156	158	112
154.9832623	112.9906607	156	114
152.9845366	114.9904035	154	116
150.985643	116.9903132	152	118
148.9866162	118.990356	150	120
146.9874878	120.9905008	148	122
144.9882841	122.9907218	146	124
142.9890256	124.9909987	144	126
140.9897281	126.9913159	142	128
138.9904039	128.9916613	140	130
136.9910629	130.9920252	138	132
134.9917131	132.9923995	136	134
132.9923619	134.9927769	134	136
130.9930164	136.9931503	132	138
128.9936839	138.9935123	130	140
126.9943732	140.9938542	128	142
124.9950945	142.9941656	126	144
122.9958607	144.9944332	124	146
120.9966884	146.9946404	122	148
118.9975985	148.9947659	120	150
116.9986173	150.994783	118	152
114.9997766	152.9946591	116	154
113.0011119	154.9943581	114	156
111.0026584	156.9938433	112	158
109.0044444	158.9930851	110	160
107.0063633	160.9921879	108	162
105.0072328	162.9923315	106	164
103.0050174	164.9955489	104	166
101.0719549	166.9295678	102	168
100.0020834	167.9999937	100	170
98.94107529	166.9340787	98	168
96.99947925	164.9835652	96	166
95.0012219	162.9761097	94	164
93.0078399	160.9735369	92	162
91.01499636	158.9714984	90	160
89.02168469	156.9689874	88	158
87.02799595	154.966098	86	156
85.03407877	152.9629809	84	154
83.04007795	150.9597822	82	152
81.04614516	148.9566546	80	150
79.0524518	146.95377	78	148
77.05918346	144.9513137	76	146
75.06645168	142.9493955	74	144
73.0734111	140.9471614	72	142
71.07491256	138.9394285	70	140
69.1212379	136.9767025	68	138
67.99392769	135.8441948	66	136
70.95705501	131.7561516	70	130
72.14341828	131.6916147	72	130
74.09553309	131.5854004	74	130
76.0953448	131.4765982	76	130
78.09014017	131.3680732	78	130
80.08193627	131.2597127	80	130
82.07300627	131.1513916	82	130
84.06417136	131.043065	84	130
86.05567058	130.9347195	86	130
88.04755043	130.8263526	88	130
90.03979091	130.7179654	90	130
92.03234633	130.6095605	92	130
94.02516026	130.5011412	94	130
96.01817158	130.3927106	96	130
98.01131654	130.2842726	98	130
100.0045287	130.1758306	100	130
101.997738	130.0673888	102	130
103.990868	129.9589512	104	130
105.9838334	129.8505227	106	130
107.9765359	129.7421086	108	130
109.9688589	129.6337155	110	130
111.9606594	129.5253512	112	130
113.9517525	129.4170258	114	130
115.9418911	129.3087528	116	130
117.9307979	129.2005475	118	130

Solution x	Solution y	Original x	Original y
119.9185472	129.0924055	120	130
121.9071718	128.9842159	122	130
123.9038378	128.8755877	124	130
125.9099216	128.7664429	126	130
127.7491132	128.6663767	128	130
128.5496778	128.6228316	130	130
128.551751	127.8223524	130	128
128.5565608	125.9822011	130	126
128.5618	123.9764935	130	124
128.5670169	121.9760076	130	122
128.5722146	119.981693	130	120
128.5774097	117.9883962	130	118
128.5826059	115.9952785	130	116
128.587802	114.0029181	130	114
128.5929959	112.0119988	130	112
128.5981935	110.0196773	130	110
128.6034293	108.0112174	130	108
128.6086901	105.9892363	130	106
128.6133433	104.2004375	130	104
128.6153274	103.4431585	130	102
118.6809167	103.8805254	118	102
116.9034317	105.2340573	116	104
114.6874918	106.9214478	114	106
112.4621431	108.6160044	112	108
110.2412647	110.3071577	110	110
108.0228877	111.9964052	108	112
105.8026485	113.687068	106	114
103.5725441	115.385236	104	116
101.3989158	117.0403886	102	118
100.1329315	118.0044167	100	120
99.03095912	116.9058999	98	118
97.05537282	114.9365269	96	116
95.06861324	112.9559869	94	114
93.99684443	111.8875965	92	112
98.26956431	106.5453893	97	105
99.58343948	105.8625881	99	105
100.9890852	105.1320995	101	105
102.308066	104.4466476	103	105
103.3142691	103.9237414	105	105
103.3588162	102.9312212	105	103
103.4463935	100.9804541	105	101
103.5370355	98.96133881	105	99
103.6180261	97.15717106	105	97
103.6486808	96.47443487	105	95
103.2190232	96.53145733	103	95
102.0813085	96.68249628	101	95

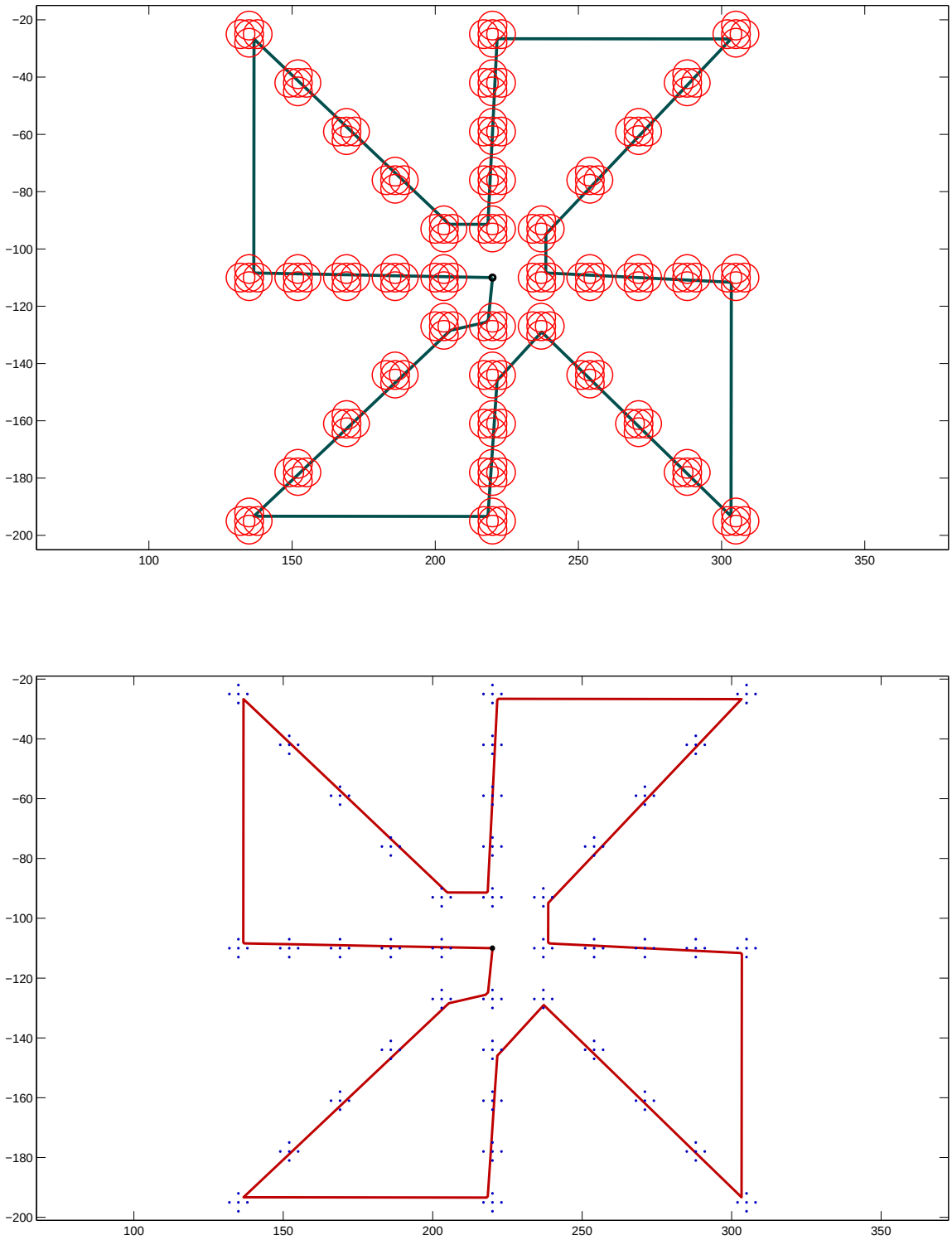

Figure N.48: *chaoSingleDep*, Equal Radius, 2D, Euclidean, Length = 1039.6099889

Table N-51: Solution for *chaoSingleDep*, Equal Radius, 2D, Euclidean

Total distance: 1039.60998887526			
Depot: x 110 y 110			
Solution x	Solution y	Original x	Original y
108.63042375292	123.677897247307	110	124
108.63042375292	123.677897247307	110	127
108.520196409224	124.779245885089	113	127
107.657268436841	125.582765857421	110	130
107.657268436841	125.582765857421	107	127
98.3026785101666	127.732047851575	96	127
95.3604506206107	128.407794011217	93	124
93.2654072626802	130.387703458182	90	127
93.2654072626802	130.387703458182	93	127
93.2654072626802	130.387703458182	93	130
77.3714211336992	145.412069422986	79	144
77.3714211336992	145.412069422986	76	147
77.3714211336992	145.412069422986	73	144
77.3714211336992	145.412069422986	76	141
77.3714211336992	145.412069422986	76	144
59.8843674740951	161.937988086056	59	161
59.8843674740951	161.937988086056	56	161
59.8843674740951	161.937988086056	59	158
59.8843674740951	161.937988086056	62	161
59.8843674740951	161.937988086056	59	164
42.4437885362689	178.420884539163	45	178
42.4437885362689	178.420884539163	42	175
42.4437885362689	178.420884539163	42	181
42.4437885362689	178.420884539163	42	178
42.4437885362689	178.420884539163	39	178
27.9615327757634	192.107854995148	25	192
26.7016157783089	193.29844038399	22	195
26.7016157783089	193.29844038399	25	198
26.7016157783089	193.29844038399	25	195
26.7016157783089	193.29844038399	28	195
106.825840574622	193.4030332183	107	195
106.825840574622	193.4030332183	110	195
108.029624920762	193.404551239047	110	198
108.420605814652	192.992594670574	113	195
108.420605814652	192.992594670574	110	192
109.438255483767	177.925178996674	110	181
109.438255483767	177.925178996674	110	178
109.438255483767	177.925178996674	113	178
109.438255483767	177.925178996674	107	178
109.438255483767	177.925178996674	110	175
110.579446989694	161.024396297605	110	164
110.579446989694	161.024396297605	113	161
110.579446989694	161.024396297605	107	161
110.579446989694	161.024396297605	110	161
110.579446989694	161.024396297605	110	158
111.513660315779	147.191540503033	110	147
111.513660315779	147.191540503033	110	144
111.596247242741	145.968489172318	107	144
113.491709141655	143.899840837326	110	141
113.491709141655	143.899840837326	113	144
126.236827242925	129.987582497684	124	127
126.236827242925	129.987582497684	127	127
127.143565121078	128.99798516922	127	124
127.143565121078	128.99798516922	130	127
127.143565121078	128.99798516922	127	130
143.292797062504	144.693269579158	144	141
143.292797062504	144.693269579158	144	144
143.292797062504	144.693269579158	141	144
143.292797062504	144.693269579158	144	147
143.292797062504	144.693269579158	147	144
160.530467824465	161.447430527024	161	161
160.530467824465	161.447430527024	161	164
160.530467824465	161.447430527024	158	161
160.530467824465	161.447430527024	161	158
160.530467824465	161.447430527024	164	161
177.740494420277	178.175321597972	178	175
177.740494420277	178.175321597972	178	181
177.740494420277	178.175321597972	175	178
177.740494420277	178.175321597972	178	178
177.740494420277	178.175321597972	181	178
191.75960749745	191.802811619863	192	195
193.298393892811	193.298385221624	195	198
193.298393892811	193.298385221624	198	195
193.298393892811	193.298385221624	195	195
193.298393892811	193.298385221624	195	192
193.397015039225	113.08913302715	195	113
193.397015039225	113.08913302715	195	110
193.398321007445	111.955788942759	198	110
193.018540537866	111.590683643549	195	107
193.018540537866	111.590683643549	192	110
177.920313526315	110.840350036604	178	113
177.920313526315	110.840350036604	178	107
177.920313526315	110.840350036604	181	110
177.920313526315	110.840350036604	178	110
177.920313526315	110.840350036604	175	110
160.980219219776	109.998630024752	164	110
160.980219219776	109.998630024752	161	113
160.980219219776	109.998630024752	161	107
160.980219219776	109.998630024752	161	110
160.980219219776	109.998630024752	158	110
144.045559841469	109.157438742918	147	110
144.045559841469	109.157438742918	144	107
144.045559841469	109.157438742918	144	113
144.045559841469	109.157438742918	144	110
144.045559841469	109.157438742918	141	110
131.914619017113	108.55447936161	130	110
128.980065490859	108.408737290873	127	113
128.602625126639	108.04648924873	124	110
128.602625126639	108.04648924873	127	110
128.602625126639	108.04648924873	127	107
128.63775043308	96.0775817128746	127	96
128.63775043308	96.0775817128746	127	93
128.641364659232	94.8596009944074	124	93
130.515114880644	92.8844719066307	127	90
130.515114880644	92.8844719066307	130	93
145.317412691814	77.2803467740821	144	76
145.317412691814	77.2803467740821	144	73
145.317412691814	77.2803467740821	141	76
145.317412691814	77.2803467740821	144	79
145.317412691814	77.2803467740821	147	76
161.869369198509	59.8313187860124	161	62
161.869369198509	59.8313187860124	164	59
161.869369198509	59.8313187860124	158	59
161.869369198509	59.8313187860124	161	59
161.869369198509	59.8313187860124	161	56
178.395073092729	42.4111887227564	178	45
178.395073092729	42.4111887227564	181	42
178.395073092729	42.4111887227564	175	42
178.395073092729	42.4111887227564	178	42
178.395073092729	42.4111887227564	178	39
191.639293200643	28.45063479253	195	28
193.298385932621	26.7015715735679	198	25
193.298385932621	26.7015715735679	195	22
193.298385932621	26.7015715735679	195	25
193.298385932621	26.7015715735679	192	25
114.187683620814	26.604325436546	113	25
111.955910402475	26.6015976184653	110	22
111.590594540726	26.9815960095125	107	25
111.590594540726	26.9815960095125	110	25
111.590594540726	26.9815960095125	110	28
110.842369066681	42.0362833356097	110	39
110.842369066681	42.0362833356097	110	42
110.842369066681	42.0362833356097	107	42
110.842369066681	42.0362833356097	110	45
110.842369066681	42.0362833356097	113	42
110.000042056557	58.9915966004804	110	56
110.000042056557	58.9915966004804	110	59
110.000042056557	58.9915966004804	110	62
110.000042056557	58.9915966004804	113	59
110.000042056557	58.9915966004804	107	59
109.159120223975	75.9214291990606	107	76
109.159120223975	75.9214291990606	110	73
109.159120223975	75.9214291990606	113	76
109.159120223975	75.9214291990606	110	76
109.159120223975	75.9214291990606	110	79
108.557387290287	88.0267504539562	110	90
108.408710550598	91.0200065689391	113	93
108.046563071937	91.3973497118232	110	96
108.046563071937	91.3973497118232	110	93
108.046563071937	91.3973497118232	107	93
96.1012835094345	91.3624055333262	96	93
96.1012835094345	91.3624055333262	93	93
94.8597855736282	91.3587184659066	93	96
92.859050006843	89.4607327331902	90	93

Solution x	Solution y	Original x	Original y
92.859050006843	89.4607327331902	93	90
77.2780150743135	74.680411902328	79	76
77.2780150743135	74.680411902328	76	73
77.2780150743135	74.680411902328	73	76
77.2780150743135	74.680411902328	76	79
77.2780150743135	74.680411902328	76	76
59.8264750280232	58.1258589260619	59	62
59.8264750280232	58.1258589260619	59	59
59.8264750280232	58.1258589260619	56	59
59.8264750280232	58.1258589260619	62	59
59.8264750280232	58.1258589260619	59	56
42.3942976770345	41.5881061038242	42	45
42.3942976770345	41.5881061038242	42	42
42.3942976770345	41.5881061038242	39	42
42.3942976770345	41.5881061038242	45	42
42.3942976770345	41.5881061038242	42	39
28.1480829553819	28.0736131482027	28	25
26.7015570684201	26.7015896034655	25	22
26.7015570684201	26.7015896034655	22	25
26.7015570684201	26.7015896034655	25	25
26.7015570684201	26.7015896034655	25	28
26.6141601169456	106.806033910754	25	107
26.6141601169456	106.806033910754	25	110
26.6128156553406	108.070696846603	22	110
26.9383982555008	108.391000330297	25	113
26.9383982555008	108.391000330297	28	110
42.0260854195067	108.684061757322	42	107
42.0260854195067	108.684061757322	42	113
42.0260854195067	108.684061757322	39	110
42.0260854195067	108.684061757322	42	110
42.0260854195067	108.684061757322	45	110
59.0099895327015	109.014048377427	56	110
59.0099895327015	109.014048377427	59	107
59.0099895327015	109.014048377427	59	113
59.0099895327015	109.014048377427	59	110
59.0099895327015	109.014048377427	62	110
76.0081394321545	109.343271790356	73	110
76.0081394321545	109.343271790356	76	113
76.0081394321545	109.343271790356	76	107
76.0081394321545	109.343271790356	76	110
76.0081394321545	109.343271790356	79	110
92.9995871192958	109.671636754813	90	110
92.9995871192958	109.671636754813	93	110
92.9995871192958	109.671636754813	96	110
92.9995871192958	109.671636754813	93	107
92.9995871192958	109.671636754813	93	113

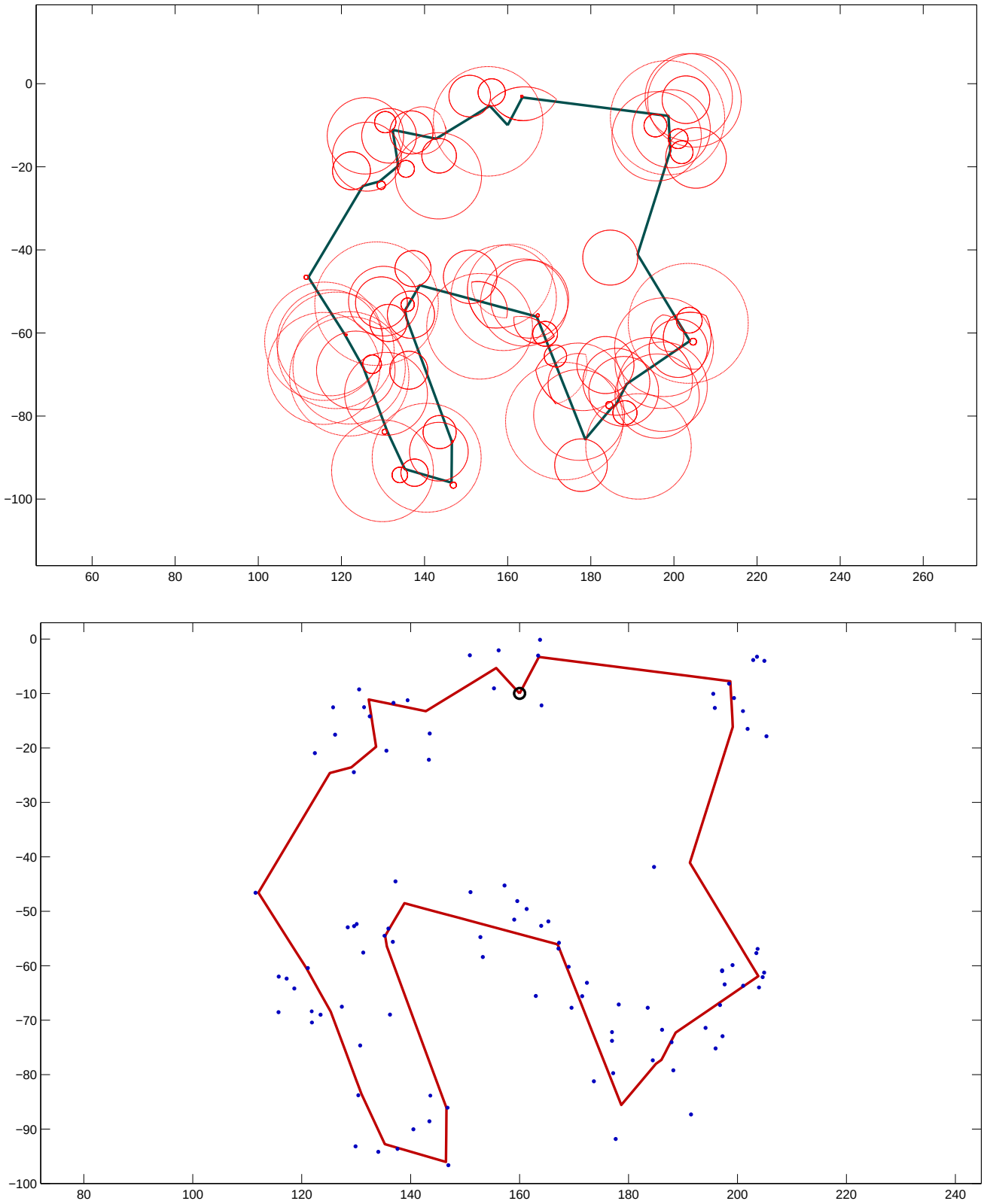

Figure N.49: $team1_100$, arbitrary radius, 2D, Euclidean, Length = 388.5368757

Table N-52: Solution for *team*1_100, arbitrary radius, 2D, Euclidean

Total distance: 388.53687565 Depot: x 50 y 10				
Solution x	Solution y	Original x	Original y	Radius
47.5883441127421	7.37773977240252	45.293	9.057	13.174
45.7019926117128	5.32665755296917	46.154	2.083	3.275
41.4244761510816	7.95094318813378	40.868	2.981	5.001
35.1069742087533	11.8267738913718	29.447	11.243	5.69
35.1069742087533	11.8267738913718	22.494	14.202	13.068
32.7791022021428	13.2549393017622	33.5	17.352	4.16
29.4180080402756	12.5667932555824	33.341	22.178	10.381
25.8346173124592	11.833134508218	26.839	11.732	5.19
22.3043335962637	11.1103487855774	20.541	9.26	2.556
22.6605200609048	13.4079908629215	15.772	12.549	9.192
23.0406664462727	15.8601908142901	16.123	17.568	8.298
23.4183940001186	18.2967869542548	21.459	12.53	6.577
23.6498957861044	19.7901294504183	25.542	20.506	2.023
19.1120765852693	23.5628679595733	19.569	24.449	0.997
15.1612477975627	24.6077995746869	12.414	20.962	4.565
2.04794997411938	46.5917802724947	1.527	46.599	0.521
7.71534722582355	55.5208656780765	11.844	68.394	13.519
9.02581673127112	57.585533723558	11.878	70.444	14.354
10.5682913901299	60.0157300775185	13.454	69.007	9.443
10.9168444226269	60.5648815605286	11.123	60.442	0.24
12.0904726072946	62.6655851729635	5.739	68.535	13.479
13.1548814604531	64.5707946424783	8.64100000000001	64.188	14.025
14.2193449822655	66.4761019302655	7.235	62.367	12.76
15.2799184896846	68.3744464165219	5.777	62.003	14.244
15.3345998890396	68.4723218896087	17.374	67.529	2.247
17.9384039321727	75.4534656928456	20.735	74.659	9.97
19.9837954505444	80.9374315211884	19.881	93.181	12.244
20.5314797039538	82.4058456037237	30.503	90.056	13.109
20.9601389162066	83.5551377505278	20.393	83.793	0.615
25.2681728294389	92.7715925093349	24.053	94.189	1.867
30.5098651418078	94.3011005838471	27.59	93.644	3.286
36.4844093017085	96.0444520154918	36.924	96.636	0.737
36.5280163327328	91.0419221671165	33.443	88.578	7.057
36.570874655494	86.125273152653	36.762	86.092	0.194
34.2899249099456	79.9427387104328	33.626	83.869	3.982
30.5104670614821	69.6984850641221	26.213	68.977	4.574
25.6256231002946	56.4580720075711	21.299	57.593	4.473
25.6254641564296	56.4570847199495	26.732	55.612	5.676
25.3149819707837	54.5285432201922	25.201	54.507	0.116
25.7677405738996	53.7614946982256	19.619	52.734	6.234
26.8710099675014	51.8923724041635	25.923	53.185	1.603
28.0289287748631	49.93066488223	20.103	52.347	8.385
28.858547119589	48.5251530783579	27.219	44.51	4.337
32.557743511509	49.518011571175	18.45	52.954	14.862
35.869964204379	50.4070064220897	40.978	46.49	6.437
38.8144487977229	51.1973014220955	43.243	58.404	12.71
42.3834944586138	52.1552276514191	49.571	48.14	8.233
42.3834944586138	52.1552276514191	42.804	54.74	7.11
44.9613126040928	52.8471099720543	47.232	45.27	13.543
44.9613126040928	52.8471099720543	51.29	49.58	10.97
47.9874703946669	53.6593259835503	49.02	51.541	12.697
51.0075888481215	54.4699210575854	55.281	51.871	9.377
54.027707317267	55.280516071299	53.958	52.681	10.486
56.9900924014783	56.0756154907796	57.243	55.792	0.38
58.3817819841775	59.5950164720757	57.142	56.857	5.652
58.3817819841775	59.5950164720757	52.975	65.56	9.534
59.7683054639668	63.1013529892543	59.007	60.213	2.987
61.448047803668	67.3492021443443	62.352	63.144	5.122
61.448047803668	67.3492021443443	61.493	65.592	2.691
63.1347395956106	71.6146259600996	68.193	67.124	11.572
63.1347395956106	71.6146259600996	66.957	73.797	11.351
64.7684198079685	75.7459898473823	59.534	67.732	9.572
64.7684198079685	75.7459898473823	66.971	72.201	7.244
68.659581494163	85.5862292156667	67.643	91.829	6.325
75.0290786866167	78.0150753530082	74.447	77.382	0.86
75.2254643826541	77.8761956491209	81.476	87.316	12.684
76.0295406937489	77.3075703259913	78.214	79.218	2.902
76.7421602707342	75.945038704904	63.631	81.224	14.134
77.1236730331605	75.2155847581563	67.179	79.746	10.928
78.1877903564292	73.180988049873	76.154	71.763	8.051
78.6543426805692	72.2889379976681	73.523	67.727	6.866
81.2581982928777	70.5104620156911	77.919	74.057	8.389
83.071831323614	69.271720990224	85.968	75.194	10.133
84.8832658084779	68.0344816120103	87.252	72.952	10.77
86.6946958769793	66.7972452435738	86.785	67.217	10.959
86.6946958769793	66.7972452435738	84.146	71.427	10.315
88.5061303543516	65.5600058570996	87.633	63.432	11.884
90.3180497399522	64.3224352734694	87.18	60.86	5.182
90.3180497399522	64.3224352734694	89.091	59.886	4.603
92.1286837350297	63.0857426372826	91.043	63.691	7.01
93.8216804897482	61.9293981608048	94.619	62.103	0.816
92.4589036655237	59.6702507481439	87.173	60.998	11.762
92.4589036655237	59.6702507481439	94.894	61.262	7.46
92.4589036655237	59.6702507481439	93.946	64.003	8.979
91.176173121051	57.5438004271001	93.456	57.69	14.427
90.6113167051035	56.6074079607957	93.694	56.925	3.099
81.2478670267066	41.0851211725865	74.679	41.865	6.615
89.1359725349018	16.1555053619729	91.857	16.502	2.743
89.1359194282455	16.1545067731271	95.317	17.864	7.295
89.0422728577148	14.3936277244607	91.007	13.249	2.373
88.9290074296096	12.2638474636432	93.574	3.255	10.497
88.8087772907148	10.0031059371011	94.926	4.006	11.26
88.6893574476591	7.75760059864803	92.889	3.855	5.733
86.020598103317	7.41840097705555	85.554	10.061	2.745
83.3313588170796	7.0765984275091	85.841	12.653	10.749
80.9029514413008	6.7679475841103	89.359	10.839	9.385
74.8842784626188	6.00297363244436	88.457	8.185	13.747
53.5342512573411	3.28938299554473	53.405	3.041	0.28
51.8216576815728	6.54114942133913	54.032	12.197	11.442
51.8216576815728	6.54114942133913	53.754	0.148	8.742

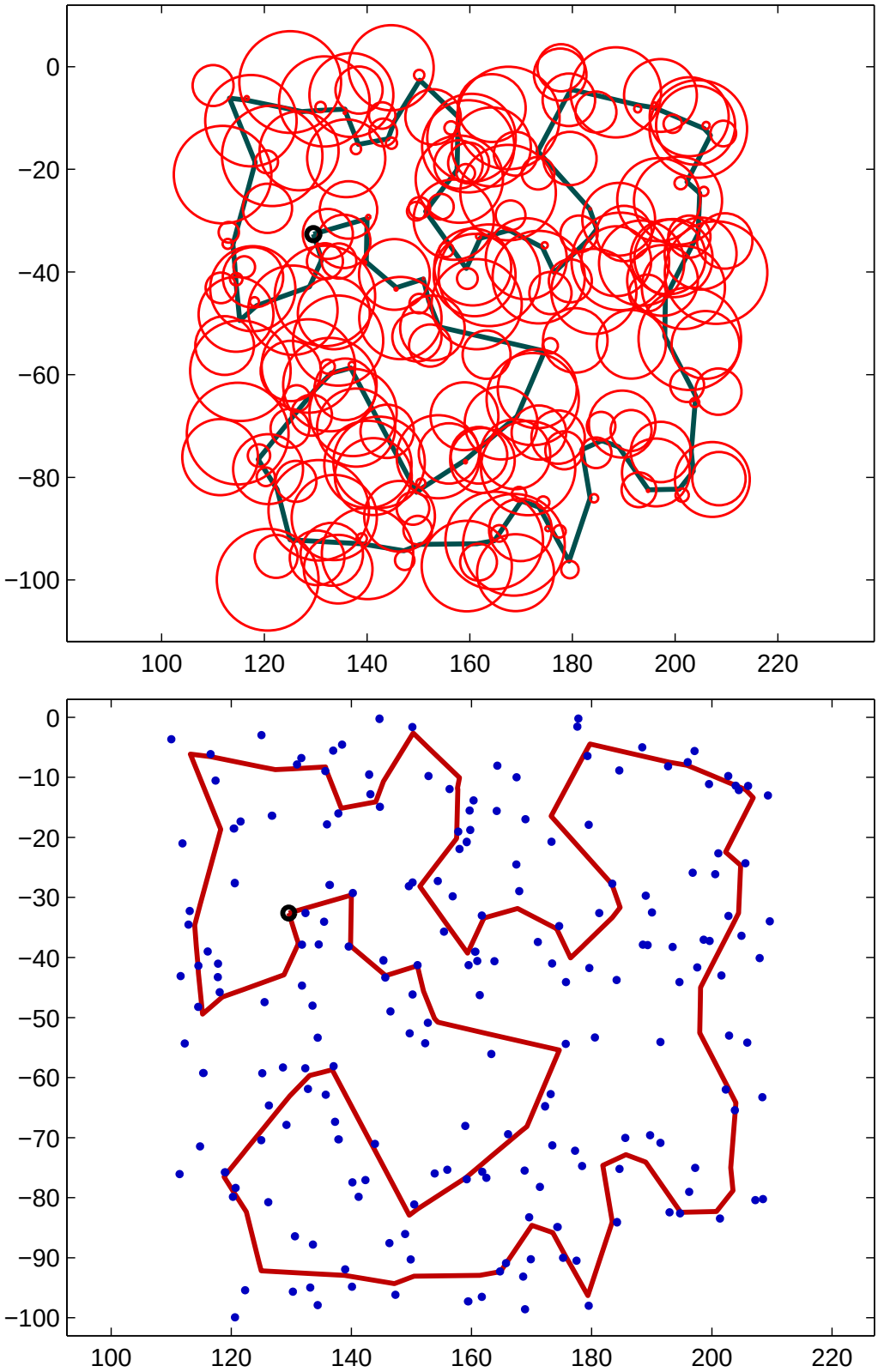

Figure N.50: *team*2_200, arbitrary radius, 2D, Euclidean, Length = 622.7383901

Table N-53: Solution for *team*2_200, arbitrary radius, 2D, Euclidean

Total distance: 622.738390069713 Depot: x 19.5535 y 32.6157				
Solution x	Solution y	Original x	Original y	Radius
24.7834007791207	31.111617440841	26.379295	27.934205	5.600223
30.0010866729471	29.6110477953262	30.249755	29.28668	0.408718
29.9274073743729	33.8568293355315	25.46019	34.06066	5.200669
29.854195316435	38.0756871091101	29.577285	38.20107	0.303974
33.8232984345386	41.439886059368	36.49954	48.989475	8.009904
34.661941701227	42.1507173768772	35.347265	40.483415	6.900943
35.7183368915854	43.0461145174215	35.65863	43.345715	0.305492
40.9548415640851	41.3705954707873	41.00732	41.27668	0.107583
41.9996297886051	45.6033341794713	40.184205	46.1874365	1.907077
43.8140592249085	50.138560966503	39.724355	52.657318	4.803105
44.388651862936	50.7891429146184	42.753335	50.906813	6.308285
44.3893138408621	50.7898924379508	42.291825	54.317701	4.104253
52.1269227712469	52.5647139095585	51.37375	46.298003	8.802177
57.3866210874386	53.7711624524455	53.302235	56.10093	4.70213
64.6060668370369	55.4271303168898	65.705495	54.4013975	1.503619
64.6067913422917	55.4278195861666	70.55475	53.342402	6.30295
62.8791324412972	59.4865602576558	63.17424	62.764205	7.706659
61.5469262194145	62.6162755044786	62.26967	64.78212	9.008592
59.1948121093481	68.1420321890278	63.457115	71.302795	5.306378
59.1940453835697	68.1426741637786	56.10401	69.44853	7.107666
57.8455552349774	69.2717563752688	58.86286	75.490835	6.800719
55.7746568193822	71.0057064923744	61.393495	78.21387	9.209541
53.2355164718093	73.1317124324099	48.983044	68.08194	6.601797
52.4131807311154	73.8281853112874	51.801592	75.702955	5.507245
50.6507697010818	75.3208503345806	52.486843	76.711165	6.306844
49.0174626242818	76.7041711362764	49.200624	76.95068	0.307107
46.3895144488371	78.4083857891563	43.88264	75.9979	8.106066
43.9504718694731	79.9900960906198	45.96408	75.36881	5.908922
41.006891958748	81.8989974473242	40.48646	81.157135	0.906206
39.6420401496165	82.9326375907431	38.950185	86.058925	3.201927
37.9210216795071	79.6829103348203	30.1948	77.47401	8.506801
36.30330256941	76.6282391317573	31.22881	79.877355	7.509507
34.6828644211231	73.5684338378742	32.35548	77.08328	8.907943
33.0577123038479	70.4997271201804	33.93752	71.055425	5.201316
31.4372742013661	67.4399218020483	27.85894	70.297015	7.608202
29.8168365289183	64.3801162566298	25.726765	62.875185	6.002164
28.1997227402482	61.3265884473749	24.393135	53.387308	8.804674
26.7961700943185	58.6763187711438	27.03592	58.11764	0.607949
25.1211349044485	59.1453480687648	27.294235	67.36467	8.501742
23.0259765962744	59.6668048019742	22.32618	58.45293	1.401145
21.3370933845035	61.4126766432101	22.77816	61.91876	9.100277
19.7690191792522	63.033663001353	18.601355	58.3359	9.106551
19.5918990533539	63.2167597985677	15.17562	59.299125	5.903506
16.8233659631027	66.6231572396042	16.28216	64.658715	2.608407
15.3659027049264	68.416417213558	19.19225	67.891335	4.001137
13.6561567084129	70.5200856157786	14.99811	70.439575	3.802058
12.0207299265217	72.5323116320391	4.81189000000001	71.48163	9.90886
10.3846804654362	74.5453037693412	8.96414	75.77293	2.204212
8.79006494308642	76.5073160247348	1.401765	76.07236	7.401092
10.2557540392289	78.8200842791604	10.737535	78.399525	6.808137
11.6771606405213	81.0629775839348	10.302265	79.88844	1.80828
12.4985297846474	82.3590482480543	16.17437	80.77798	4.001447
13.908282314122	87.9371178933924	20.60172	86.45345	9.802386
14.9789320820869	92.1734332291075	12.30828	95.415795	4.20063
16.908523004849	92.2792295905029	10.636965	99.941455	9.901623
21.4996742856283	92.5309548532005	20.26183	95.676245	5.307169
21.4996742856283	92.5309548532005	30.09705	94.85711	8.906507
24.1612894086424	92.6768871013729	23.602775	87.83846	8.306271
24.1612894086424	92.6768871013729	23.159665	94.99055	6.103619
26.9280177900039	92.8285823354597	24.384515	97.907795	6.707286
28.8578769118643	92.9343938143885	28.966505	91.93771	1.002586
33.3572107450109	93.6713295557446	36.34587	87.597465	6.900084
37.1644714691093	94.294913361292	37.353615	96.195315	1.909791
40.4121948499884	93.0696795850554	39.89323	90.309885	2.808165
44.8590088140759	93.0207693577456	49.437672	97.29667	8.8097
51.3803297903171	92.949041555637	51.725585	96.536445	3.603979
51.497736183149	92.9275689014484	54.766852	92.295455	9.502154
54.8162979927623	92.3206317453727	58.9163	98.60932	7.507171
55.8574824000462	90.7861869148902	55.7501	90.920415	1.606912
57.2974294244934	88.6640658744003	58.59379	93.155945	9.907152
58.7350151976444	86.5454247695791	59.88564	90.256965	6.102678
60.0497604269347	84.6078198685676	59.609455	83.27302	1.405546
63.5249752971079	85.8268334365652	64.30468	84.91	1.203546
65.6810429069159	89.7859923765407	65.23767	90.033385	0.507723
66.435396533922	91.1059006543744	67.48261	90.51293	1.203441
69.3495682109995	96.3006973306932	69.51155	98.000325	1.707329
73.4333042628157	84.0269120057464	74.234205	84.088705	0.803281
72.0111256566721	75.6002125757884	68.40623	74.741575	3.705743
71.8466501600617	74.6256615600124	67.24276	72.18951	5.208708
73.5081684973756	73.8632303981352	74.635475	75.231085	3.002518
75.7132579217899	72.8513672710272	75.60926	70.05143	2.801868
78.2443512018999	73.7924189544317	79.72973	69.6285	6.503827
78.9944118380114	74.0712889372572	81.449	70.90379	4.00725
82.5348246196209	79.156054529848	82.980165	82.460215	3.407507
83.6967626943041	80.8248381533763	86.26193	79.048	6.603528
84.8191513994859	82.4368208758129	84.72455	82.62255	0.208434
90.788738118154	82.3151978354075	91.37176	83.481715	1.3041
92.4452858194477	80.1991540311029	97.272905	80.426715	7.307128
93.5347007470031	78.8075551783763	98.53739	80.25874	5.208919
93.1553037519954	75.0083580410516	87.254685	75.06877	5.900928
93.8411367033275	66.3512337155152	93.854515	65.44994	0.901393
94.0124882447224	64.1882994478774	98.425325	63.29758	4.501834
91.9830831807152	60.2652967573444	92.344515	62.02096	3.309346
90.3601257473174	57.1279897758343	95.92709	54.202926	6.608684
88.7371684443692	53.9906827268642	92.878595	53.021252	10.006179
87.9951186216864	52.5562406238003	81.466395	54.091358	6.706774
88.1125440304361	44.9920580858309	84.61874	44.121625	3.6006
88.1129994186051	44.9911677928364	91.6164	43.026115	8.109517
89.1269513439869	43.0088740168914	87.57797	41.66484	6.902275
90.1573827676766	40.9943627068818	83.48933	38.25693	8.302552
91.186845937751	38.9871444483607	88.660005	37.051535	7.30023
92.2163091513986	36.9691262116882	97.982935	40.137435	10.003975
93.2457724001239	34.956507992957	94.955665	36.40187	7.002314
94.2752356337185	32.9438897668031	92.788305	33.10169	4.109114
94.2752356337185	32.9438897668031	89.661665	37.28143	7.609892
94.450692263624	32.6008690388295	99.67714	33.98061	5.405501
94.6720389118122	27.5038197809195	86.845365	25.906095	8.100197
94.7951735247525	24.6683450280681	95.62369	24.314785	0.900802
93.4131527257113	23.4544762231167	90.572985	26.136825	8.602133
92.2801725254087	22.4593469418905	91.09643	22.6866	1.205359
96.8961529159616	13.3888458332142	99.37313	13.042045	2.501137
95.6411123377362	12.0388221274382	96.04228	11.46233	0.702338
94.2216568990929	11.448593004899	94.4971	12.154995	9.50306
92.5194849970027	10.7408065713722	93.997115	11.43328	7.703152
90.8126229790021	10.0310699462414	92.761655	9.792985	7.707934
89.22400504358	9.37050077311873	89.544625	11.14329	1.801549
87.326703114914	8.58157656654312	87.144585	5.62369	7.10022
85.8784809766418	7.97938586632746	86.016245	7.495035	0.503562
82.877637660997	7.49461532774195	82.741185	8.18936	0.708018
78.392383120968	6.45522487765373	78.44886	5.02628	8.808511
74.3790403327297	5.5251931040703	74.60069	8.85595	4.00271
69.6971659707725	4.4402384433549	67.794775	0.2453923	4.606064
69.0104350776165	5.7229405838062	69.299455	6.449115	5.10428
68.5485282841905	6.58570765958464	67.61759	1.570395	5.100981
63.2536778416575	16.4756300267453	58.979255	16.987345	4.304944
64.6459022207036	18.0318156705094	69.52818	17.90893	5.206535
66.4400192571164	20.037224512872	63.31789	20.756115	3.203825
73.35833021289	27.7703005352834	73.44882	27.71684	0.105102
74.0057756682697	29.615875708397	79.01289	29.7258	7.100822
74.7287684172995	31.6768022480864	80.066985	32.520545	5.404485
73.656098682438	33.0851500218921	79.319755	37.96047	9.501655
73.4428810371093	33.3650913552518	78.52122	37.890255	6.801958
70.8277122001326	35.8806797238524	71.273045	32.62062	3.608079
68.9477160061113	37.6890895515366	61.04328	37.44322	7.908259
68.3010013946317	38.3111784110719	74.17807	43.76639	8.300269
67.2228329322281	39.348292142407	69.610075	41.75992	4.204327
66.4660033509541	40.076302988511	65.72564	44.111465	4.10252
65.1471958952188	37.288629230757	63.437195	41.00367	9.004095
64.1605770641394	35.2031298538757	64.595135	34.78327	0.604254
57.6566540732321	31.8477576960901	57.95186	28.956245	2.906543
55.5913466654048	32.4255868158396	57.48649	24.517395	9.301244
52.0485573178928	33.4167838733399	51.719243	33.03008	0.507925
51.4285934320807	34.7587839807206	53.824634	40.64213	9.902994
50.6884789877781	36.3608663155467	50.972003	40.60627	8.001002
49.9505071660017	37.9583108449695	50.608737	39.047145	7.509385
49.3325659824763	39.295932691067	49.52113	41.29678	2.009713
46.717690538084	35.6385356303619	45.420784	35.70231	1.409626
44.1985570410237	32.1150528242344	46.870011	29.816545	7.806658
41.3847562210395	28.1794209790737	39.58443	28.150345	1.800561
42.1502602531904	27.1786760959334	40.19826	27.52955	2.101085
43.8401056910727	24.9695372224112	44.38625	27.294685	2.501465
45.4362488981747	22.8828958950803	47.997827	21.94091	8.509285
47.5153633309839	20.1648648702731	49.216563	20.76273	1.803198
47.534201942785	19.3430209549258	54.207021	15.63022	7.700153

Solution x	Solution y	Original x	Original y	Radius
47.534201942785	19.3430209549258	49.796921	18.777515	4.003148
47.5735943599227	17.624503539136	47.801417	19.06334	4.70736
47.6129141365855	15.9091576611682	49.707097	15.54357	9.000518
47.6522340520398	14.1938117858804	50.337118	13.87323	8.600173
47.7041648692289	11.9283170073503	57.51838	10.00522	10.000856
47.6539021013216	11.8126455021504	46.358401	11.954405	1.303234
47.9946743496351	10.059029228993	54.294115	8.069135	6.606257
43.6055106322431	5.82904130484192	42.845635	9.79738	5.407265
40.2865453804306	2.63044084734734	40.16046	1.62977	1.008583
38.2158991635295	5.98374913511065	34.695715	0.250565	8.309293
35.3145366393343	10.682359463978	32.973595	9.54291	2.603527
34.9077578897492	11.787132157014	33.169445	12.82499	2.709158
34.0619055136965	14.0843875677326	34.77264	14.924575	1.100481
28.3125649028627	15.1677356440269	27.827995	16.04415	1.001454
27.1632906467318	12.2430138046983	25.954135	17.869355	7.603419
25.8604489539651	8.92748654901584	25.662895	8.989655	0.207105
25.7002996728186	8.2596138619526	28.448025	4.56492	4.604428
23.523562851016	8.382823177079	26.97316	5.55935	8.204253
21.7838736976057	8.48129441958182	21.673354	6.8005655	8.80316
20.2422640220605	8.56855387282999	20.9699	7.87089	1.008062
17.3254693836701	8.73365277364756	16.776285	16.423415	7.709348
11.3087984312212	7.51942666215283	15.031135	2.9821155	9.903269
6.51916320898276	6.55282989215111	6.5851	6.152225	0.405995
3.19336512594893	6.12775699781996	0.024124999999998	3.6794065	4.00481
4.86578743929881	10.2861904303098	7.39533	10.545265	8.903739
6.52687450741162	14.4164393206386	11.54701	17.37734	9.803906
8.23706505494388	18.6687831242972	10.44323	18.54025	2.209906
7.13851581324899	22.7009505639764	1.87583499999999	21.036865	9.501742
6.02560175074285	26.7858433455485	10.613375	27.61233	4.807428
4.81401757585684	31.2328997371192	3.09506	32.271765	2.008496
3.8880884489421	34.6314745643639	2.888575	34.539165	1.003767
4.18526042921682	38.256111333733	6.09162499999999	39.029145	2.102568
4.25909447537632	39.1566725440414	7.79806000000001	41.063165	5.901659
4.40546239872252	40.9419368960114	4.493385	48.2428075	7.3014
4.53450460336752	42.515877751729	4.535275	41.40327	1.201293
4.56149117273006	42.845035594658	1.56824	43.114435	3.00535
5.20845590342564	49.444806062462	2.26291999999999	54.336059	5.709688
5.2094453597028	49.4446612305745	5.35044999999999	59.245825	9.802178
8.52684962727635	46.5764127494983	8.071465	45.7971455	0.90257
11.7741903088149	45.41017631244	7.76846999999999	43.27595	8.308131
15.0089313135297	44.2484648712702	15.566305	47.445917	8.70734
18.7846823145309	42.8924573485831	23.528225	48.047471	7.005381
19.7993940604723	40.6674939195805	21.800035	44.699325	9.804285
21.1707389489584	37.6605392488472	24.567885	37.86062	3.403033
20.4027947311927	35.2650026257584	22.373755	32.6144	4.900414
20.4027947311927	35.2650026257584	21.779985	37.899125	3.504901

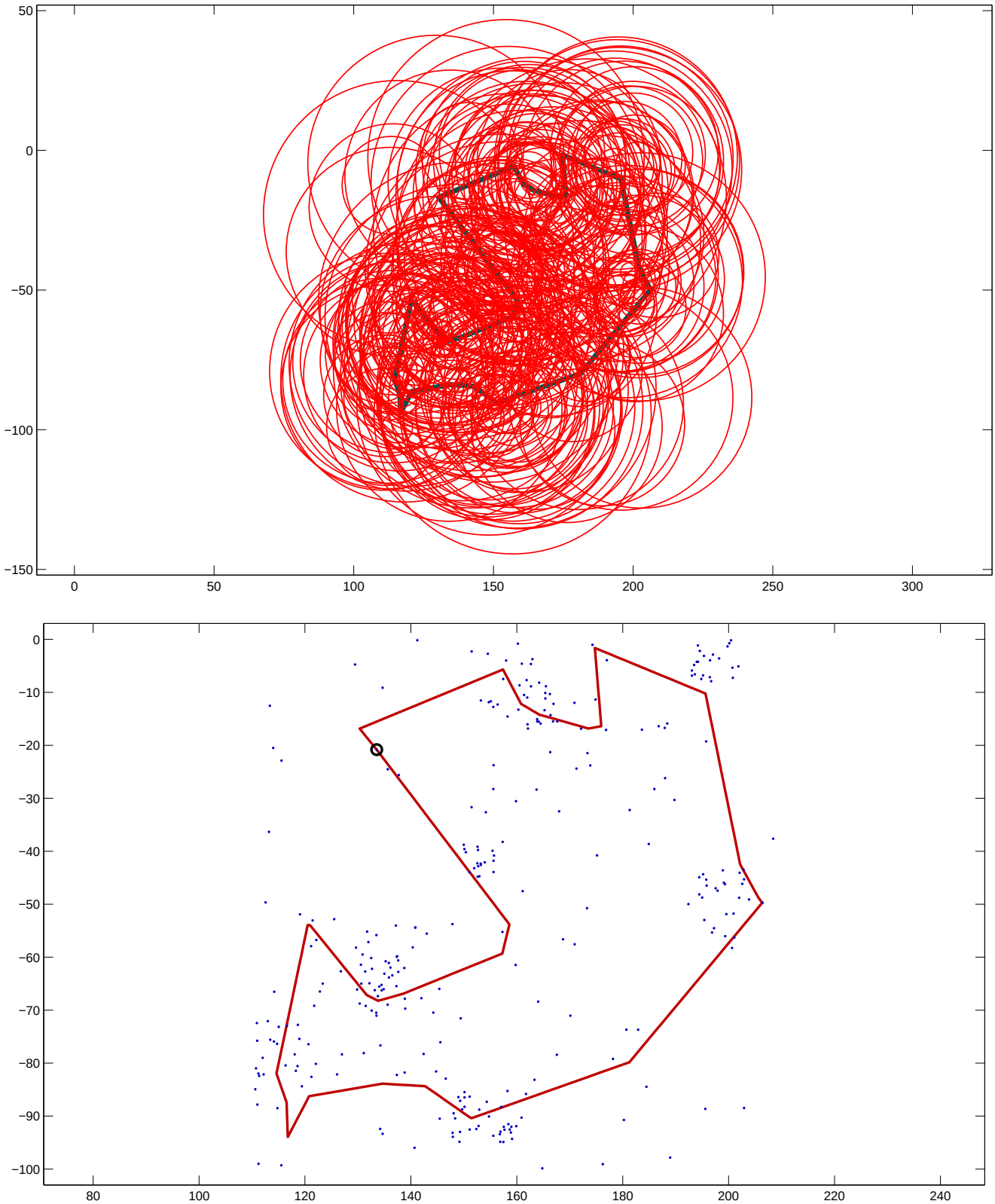

Figure N.51: *team*3_300, arbitrary radius, 2D, Euclidean, Length = 381.8282727

Table N-54: Solution for *team*3_300, arbitrary radius, 2D, Euclidean

Total distance: 381.828272673962 Depot: x 23.55 y 20.83				
Solution x	Solution y	Original x	Original y	Radius
22.2743187703305	19.2559032728933	23.55	20.83	11.78
20.9589856293786	17.6328790059972	5.58	22.9	47.89
20.329659327355	16.8563366774977	3.36	12.54	17.51
24.3571210491066	15.1933634853011	4.01000000000001	20.5	30.01
27.5548285869358	13.8730028511677	19.48	4.75	45.94
30.7944455156435	12.5353374727225	24.66	9.13	37.86
34.0204135634293	11.2033078338964	31.22	0.18	17.31
37.2206662429302	9.88189628951452	41.49	2.29	8.71
40.4072876954754	8.56611319383311	43.23	11.54	40.96
43.8621222394206	7.13958263331725	54.22	8.18	10.41
45.3642196047079	6.5193538585386	47.45	7.49	16.55
47.3900479644791	5.6828721027945	48	4	1.79
47.4734680475155	5.84164236563346	50.21	0.82	29.59
47.7298420822385	6.32958928931662	50.97	4.59	36.43
47.9975049044971	6.83902173188701	52.96	3.75	34.45
48.2866019895264	7.38924918975038	50.52	8.68	38.38
48.560793508919	7.91110745302123	51.38	10.51	13.35
48.8358890747823	8.43468635357267	51.86	7.7	17.94
49.1120544435267	8.96030136915044	52.67	4.65	26.24
49.3839783512998	9.47784377368479	56.26	10.34	24.93
49.6601436249023	10.0034586078891	55.4	11.17	24.33
49.9363088381615	10.5290733273734	46.38	12.31	40.75
50.2124739036679	11.0546877658119	45.57	12.76	29.32
50.4886390773433	11.5803024102883	50.3	13.28	17.44
50.7989510024569	12.1709072647316	48.26	14.58	3.5
51.2463934379445	12.4368406006035	55.38	10.13	5.89
51.7524290283484	12.737598244421	51.98	10.99	14.06
52.2681883338602	13.044135089816	52.67	8.88	8.37
52.7742240346622	13.3448927991754	86.49	3.97	35.89
53.3339491115673	13.6775603002925	44.72	11.87	20.59
53.8058509950235	13.9580308861684	45.63	23.76	13.71
54.2241234209232	14.2066272923875	52.12	16.84	26.81
54.2249830525911	14.2071382066618	53.85	15.08	0.95
55.5974241077379	14.5947795338674	52.03	16.04	40.73
56.3788239078474	14.8154832600942	54.15	15.54	39.45
57.0852738387004	15.0150176492049	54.5	15.91	18.5
57.898226554378	15.2446333888367	55.5	8.86	30.33
58.7000411499847	15.4711032044605	56.94	12.18	13.04
59.4752692086809	15.690063743342	55.24	13.37	7.67
60.2934961752035	15.9211691786355	56.85	15.49	20.36
61.0687239950729	16.1401296508606	56.38	14.32	21.79
61.8439518428667	16.3590901308195	57.66	15.51	35.11
62.6191796706656	16.578050604655	62.16	16.88	21
63.3944074472968	16.7970110637369	61.27	24.41	39.95
63.4425596352589	16.8106114850283	56.31	21.31	24.49
63.5640634894598	16.8449298366461	63.35	21.49	4.65
65.956219923682	16.4017837210976	66.87	17.1	1.15
65.7724136304517	14.1842599946144	63.88	23.81	9.81
65.5645771455673	11.676825044392	64.87	11.36	35.55
65.3581579995673	9.18648948997045	60.89	11.99	21.62
65.1512978390803	6.6908332956864	67	3.94	32.81
64.9447922963526	4.19945540122661	90.79	7.27	30.18
64.7309232769581	1.6192411470491	64.3	1.03	0.73
65.5293776712559	1.94802853149205	42.72	42.84	48.6
66.4307228571444	2.3191842646536	45.57	28.26	48.56
67.3352296979575	2.69164190338186	53.73	28.37	48.55
68.2492949154137	3.06803548830621	45.09	11.7	48.9
69.1781581258643	3.45052258775267	53.87	15.51	48.76
70.0808529792604	3.82223408647314	44.53	2.72	49.48
70.9565807779701	4.18284109708993	83.08	6.85	42.38
71.8592757532708	4.55455264612623	83.5	4.83	37.8
72.7513878638911	4.9219063854819	87.06	2.89	20.41
73.629412742307	5.28345928754799	85.18	6.81	43.66
74.5321077486597	5.65517084966309	89.81	1.33	26.05
75.4628683123245	6.03843924068118	84.22	4.25	43.87
76.3581121355344	6.40708255536034	85.34	3.13	40.46
77.2599122077181	6.77842560093104	90.45	0.18	30.09
78.1579653650747	7.14822574316729	88.21	3.61	26.68
79.0768938165986	7.5266219099066	86.46	7.15	18.46
79.9795882119586	7.89833322048841	86.71	7.9	17.03
80.8507579595339	8.25706331812206	84.85	7.49	13.74
81.7534529779248	8.62877488493425	83.08	5.9	14.32
82.6689603919428	9.00576233714448	84.57	2.19	42.77
83.5716557580661	9.37747404672064	84.21	1.15	11.63
84.4919437277466	9.75643003507767	90.14	0.74	21.22
85.3857179561567	10.1244682009933	90.71	5.35	17.99
85.6369108217177	10.2279043470218	91.86	5.09	8.07
86.0153789889175	12.0934056031013	83.98	4.24	15.73
86.2609356390872	13.3037748762747	83.63	6.61	7.21
86.656837690539	15.255209214932	77.94	16.73	14.1
87.041057232309	17.1490594813156	85.76	19.27	9.99
87.4295443683956	19.063945074867	78.41	15.88	33.29
87.8168752654781	20.9731314703628	76.81	16.4	34.4
88.2026610201174	22.8747017316698	78.01	26.19	23.38
88.5899918947674	24.7838880206198	75.98	28.26	25
88.9773227907269	26.693074413534	73.63	17.07	49.78
89.3637331781228	28.5977235392636	79.79	30.32	35.55
89.7500728660236	30.5020241804761	71.33	32.23	42.89
90.1359670888273	32.404129090115	65.16	40.78	37.77
90.5207556729804	34.3007842176344	74.93	38.63	25.85
90.9045353530915	36.19246637195	98.41	37.64	22.32
91.6643929257886	39.9378679115467	85.85	46.49	8.76
92.1713251263416	42.4365791438293	88.92	43.62	3.46
92.171802787026	42.4374576882337	84.47	44.91	21.75
92.1722804476977	42.4383362326451	92.82	43.5	36.84
92.1727581083012	42.4392147770936	92.09	44.08	37.36
92.5258958456269	43.0887285389822	85.21	44.35	35.25
92.9800262448943	43.9239945343196	84.47	48.16	27.36
93.4223531190142	44.7375507231686	85.78	45.37	33.83
93.8830273931512	45.5848526361742	87.92	47.46	19.28
94.3584743185997	46.4593253649895	92	48.8	13.39
94.819149078144	47.30662817112	85.02	48.75	30.39
95.2798237827807	48.1539308762846	92.59	46.16	30.13
95.6046715587475	48.7514119101738	90.93	51.78	5.57
96.3500184172133	49.7282834875681	96.43	49.73	0.08
94.743562432413	51.6562534399878	85.43	53	9.41
94.452171603889	52.0059628421687	89.11	45.94	8.83
93.6827586823698	52.9293650441385	82.42	49.99	11.64
93.1883986756078	53.5226656076306	89.59	51.88	4.09
92.4226382717996	54.4416842832395	89.36	56.03	3.45
91.9518217480445	55.0067294008837	89.33	46.23	10.42
91.346104039619	55.7336746466502	91.08	56.32	17.84
90.9448528785792	56.2152316823924	93.86	49.11	7.68
89.3237870750731	58.1607354467562	90.65	58.26	31.68
87.8957103362625	59.8746255713674	87.26	54.53	10.31
86.4758762294392	61.5786233918435	86.88	55.34	10.88
85.011136817614	63.3365138077378	87.56	46.99	41.58
83.5890093844555	65.0432639409804	92.92	45.3	44.4
82.0823804495318	66.8514275906188	48.98	92.03	41.59
80.7278743073592	68.4770227938058	60.94	57.56	37.6
79.2969975436498	70.1942733369839	60.12	71.05	24.74
77.862407740723	71.9159800394616	72.93	73.7	16.22
76.4278175970363	73.6376871502224	70.7	73.7	18.06
74.9932278515886	75.3593937823863	68.17	79.21	25.07
73.5594705818108	77.0801013286329	85.6	88.65	40.1
72.1248806635729	78.8018081684144	70.23	90.73	37.84
71.2665248074453	79.8319542263516	74.49	84.46	5.64
68.028378645202	80.9797504304451	92.92	88.46	39.57
65.5513941913348	81.8577445724922	78.98	97.83	29.46
63.1243659382759	82.7180311932556	57.57	78.44	7.54
60.4093461689047	83.6803995443845	53.35	83.14	7.08
59.7130645195504	83.9272041646194	66.26	99.07	34.13
58.7121761714982	84.2819799500195	54.83	99.88	28.66
57.7164959406737	84.6349096617196	49.11	94.31	17.31
56.8196527328628	84.9528055132779	46.92	92.94	12.72
55.741769336633	85.3348730331775	47.67	92.59	35.3
54.800632837931	85.6684691242654	48.89	93.1	36.74
53.8503894413403	86.0052932543041	48.42	91.53	30.91
52.834426953435	86.365412232407	50.91	90.3	4.38
52.0559408226483	86.6413551270884	51.75	85.81	36.53
51.3192003589823	86.9025008151799	46.8	93.43	39.27
50.4292300586358	87.2179604895516	42.78	91.87	35.26
49.6440193833976	87.4962869729292	48.68	92.55	20.63
48.8214562209822	87.787853452674	47.08	88.26	25.21
47.9988932410169	88.0794198674211	45.57	93.71	20.17
47.1763301527807	88.3709863202678	42.37	92.45	18.71
46.317565579871	88.6753847840596	44.75	90.08	11.27
45.4950025364314	88.9669512212386	47.56	92.03	9.48
44.6724394958677	89.2585176575621	44.33	87.3	27.93
43.849876485409	89.5500840833763	42.93	88.78	12.51
43.027313474862	89.8416505089647	47.48	94.9	26.29
42.2047504580097	90.1332169365545	39.18	94.86	14.97
41.3975951529188	90.4193219323376	41.11	92.55	2.15
40.6357939942925	89.8880427300117	39.28	92.99	15.28

Solution x	Solution y	Original x	Original y	Radius
39.8599638397123	89.3469797225712	30.69	95.98	13.17
39.076381657801	88.8005104605311	37.88	93.16	38.09
38.5608811050886	88.441001001022	40.14	88.25	7.74
38.5600608720534	88.4404289715048	41.11	86.33	3.31
36.6348346994578	87.0977785747659	38.99	86.42	12.82
35.7670729083664	86.4926025551967	40.14	85.47	26.51
34.7449657943954	85.7797862952173	39.31	87.14	5.32
33.8750685591142	85.1731210194443	40.13	86.48	6.39
32.7858736677658	84.4135178239898	34.79	81.57	35.28
32.7016707112764	84.3547947838193	35.58	76.06	8.78
30.4362666083581	84.2209146510958	23.78	67.37	23.49
29.1752222431585	84.1463898514802	26.5	63.44	28.82
27.9053387443565	84.071342679778	28.77	62.05	31.17
26.6133108378558	83.9949868246497	33.01	55.55	36.48
25.3501213827979	83.9203352551104	28.95	69.72	21.24
24.6517066086013	83.8790605604088	30.85	54.39	33.55
24.6507083503083	83.8790015656596	27.35	82.24	4.58
24.6497100920143	83.878942570927	24.25	76.66	7.23
18.8036468405827	84.8803847977378	24.67	93.34	18.16
16.5296247277895	85.2699292952179	16.99	78.36	10.94
14.2724322837102	85.6565908372834	12.07	80.14	6.18
10.7754285750272	86.2556345077065	9.41	84.38	2.32
10.7749650838006	86.2565206092147	11.74	69.17	18.09
10.593309281083	86.6038096538231	25.01	63.12	28.84
10.1059953492658	87.5354550368081	11.23	82.6	5.9
9.61009073223039	88.4835240675509	24.49	66.27	27.9
9.60962724074636	88.4844101689244	0.909999999999997	72.43	18.26
8.60629828797855	90.4025715984297	0.969999999999999	75.78	17.69
7.99702272310552	91.5673828840324	1.01000000000001	87.83	21.8
7.38541147522491	92.7366595221839	4.75	76.37	18.12
6.75768527771173	93.9367446759524	5.54000000000001	99.29	5.49
6.74620498723789	93.6051720355273	1.24	99.01	20.96
6.7461703842223	93.6041726343909	0.620000000000005	84.95	36.73
6.73339869030602	93.2353018076863	1.36	82.41	36.76
6.724590674729	92.9809095561772	2.01000000000001	79.01	42.13
6.71620163055732	92.7386179974886	8.28999999999999	81.45	44.4
6.70830409719532	92.5105222055169	8.59999999999999	80.56	41.43
6.69654762528103	92.1709729248906	10.66	76.44	43.81
6.69015562181912	91.9863596959802	6.36	80.44	34.29
6.68080720375183	91.7163595882073	4.15000000000001	75.92	36
6.67380693349395	91.5141784607047	3.44	75.58	32.57
6.66504936809943	91.2612433018398	4.8	88.51	18.34
6.65023239252362	90.8333008369396	8.95	75.43	30.95
6.6501977895003	90.8323014358036	25.62	68.98	43.08
6.6326506577787	90.3255068671157	31.99	67.74	46.93
6.63261605476079	90.3245074659795	34.24	70.46	46.56
6.61523926661177	89.8226327516954	8.67	72.77	28.82
6.61520466358782	89.8216333505594	36.6	82.94	44.77
6.59714601536088	89.3000652224066	28.82	81.78	43.64
6.59711141229759	89.2990658212719	32.42	78.27	49.72
6.58835384648088	89.0461306531849	24.2	92.42	40.35
6.57547933209601	88.6742901708404	38.36	90.43	47.27
6.56672176728217	88.4213550293748	27.4	59.84	47.68
6.55398673604675	88.0535430893825	27.18	54.04	49.76
6.55395213302796	88.0525436882463	46.89	94.85	49.64
6.54049866195859	87.663981871727	19.65	58.2	41.68
6.53244266022672	87.4313092009407	39.7	88.73	41.5
6.53240805718542	87.4303097998053	37.93	93.92	38.41
6.5323734541702	87.4293103986689	13.36	65	29.08
6.53233885113505	87.4283109975332	20.88	59.51	36.31
6.53230424811581	87.4273115963971	21.39	62.71	35.55
6.53226964510165	87.4263121952607	25.86	63.85	38.15
6.53223504209083	87.4253127941241	26.15	61.96	39.04
6.53220043908122	87.4243133929876	27.62	60.61	40.48
6.53216583609998	87.4233139918501	25.24	60.77	37.65
6.53213123311537	87.4223145907127	21.49	69.2	28.99
6.53209663014185	87.4213151895749	23.47	70.49	29.96
6.53206202723113	87.4203157884349	35.37	65.99	42.77
6.53202742436444	87.4193163872934	39.42	71.54	47.2
6.53199282151729	87.4183169861512	21.1	78.12	28.48
6.53195821867793	87.4173175850088	16.07	82.14	24.27
6.53192361592292	87.4163181838634	48.25	85.26	49.96
6.53188901309787	87.4153187827205	35.46	90.5	36.39
6.53185441021252	87.4143193815797	24.47	65.24	32.36
6.53181980722529	87.4133199804424	20.56	61.44	30.47
6.5317852043614	87.4123205793007	38.08	89.48	35.64
6.53175060118696	87.4113211781699	4.20999999999999	66.53	21.01
6.5317233235567	87.4103215502737	49.91	91.9	43.61
4.81787992630721	82.5217696280631	1.20999999999999	81.97	14.68
4.62481956735938	81.9710859527797	2.19	82.13	2.44

Solution x	Solution y	Original x	Original y	Radius
5.2033990221387	79.2139204455683	0.760000000000005	80.97	8.89
5.57896301447498	77.4242058752371	8.06	78.36	4.56
5.94858061947856	75.6628282491216	6.62000000000001	72.96	3.81
6.32955579365861	73.8473272076392	5.06999999999999	73.15	4.26
6.7051198237982	72.0576124601573	2.98999999999999	72.09	6.04
7.08068385487508	70.2678977072253	15.54	52.83	26.09
7.45807811703466	68.4694611629919	22.51	60.15	23.44
7.84165988435977	66.6415386504237	12.82	66.49	17.6
8.21722390879184	64.8518239271719	21.75	55.19	18.06
8.58524190190143	63.098069098677	23.5	55.84	18.38
8.96080592442158	61.3083543871706	27.36	59.94	22.06
9.32608898310623	59.5676326355776	12.14	56.76	5.34
9.71942720768482	57.6932166498496	2.56999999999999	49.67	15.72
10.0865716701604	55.943624548734	3.20999999999999	36.35	37.4
10.5097538566601	53.9269899930574	9.06999999999999	51.92	2.47
10.95784520359	53.980736273815	11.46	53.07	1.04
12.808488514843	56.2581628495338	11.18	57.92	14
14.330050633055	58.1306176786044	21.99	57.15	10.23
15.8812826090784	60.0395846336376	22.65	62.2	11.7
17.4370352483293	61.9541147757089	16.79	62.67	4.76
17.4370352483293	61.9541147757089	20.64	65	4.42
18.869376425532	63.7167731119427	22.17	64.94	3.52
19.6463364707971	64.6729106049946	19.86	66.11	2.9
20.6042899856949	65.851781098556	23.19	66.22	5.11
21.6511459572922	67.1400561507238	20.35	68.75	2.07
22.7915195600779	67.7207855595185	22.6	70.1	3.11
23.7988698205316	68.233773513512	23.52	71.05	2.83
25.3932290435257	67.7863109593758	24.03	65.56	12.46
26.7860534048844	67.3954098761608	27.28	65.47	12.73
28.1022889710549	67.0260037078155	24.86	66.05	20.4
28.5397542676465	66.9032275244707	28.86	67.84	0.99
32.2582398605479	65.3955651709272	27.64	62.78	15.95
35.0959996296786	64.2449936643426	30.36	58.14	13.13
38.0088655985639	63.0639703012296	25.84	61.09	17.04
40.8560759453304	61.9095670523774	30.83	54.42	13.2
43.7248886176931	60.746405127038	58.75	56.63	26.43
47.2671737488352	59.3101833645543	49.78	61.48	3.32
47.6199241094649	57.8621669960248	47.3	55.25	13.14
48.1736880825518	55.5890033466397	54.05	68.39	14.97
48.6042908902373	53.8214079520802	63.26	50.77	14.97
46.8638120170956	51.5295510834121	51.12	47.54	20.96
45.435564776119	49.6488398054257	37.85	53.76	19.4
43.9718698703114	47.7214511594296	42.62	44.81	3.21
43.5923911121928	47.2217547793159	45.71	40.8	34.61
43.1825632339442	46.6820947740779	41.07	43.98	16.59
42.7749264305448	46.1453199716071	45.6	41.81	23.25
42.3618043779186	45.60132220838	42.95	44.74	47.83
41.9493923513572	45.0582594067874	43.21	42.61	13.5
41.536980418584	44.5151967284514	43.21	42.35	16.43
41.1222043578652	43.9690209734132	43.96	42.1	13.34
40.7097924889505	43.4259583802934	45.6	43.93	19.94
40.297380563731	42.8828957123417	45.42	39.91	7.33
39.890936185673	42.3476910911596	42.69	39.78	10.22
39.4785242984832	41.804628472692	40.4	40.19	32.32
39.0661125655327	41.2615660575532	40.11	39.6	36.03
38.6581953326131	40.7244219861034	40	38.77	18.88
38.3432931813217	40.3097598636277	41.97	43.22	4.65
37.0136113659168	38.5588392141769	42.56	42.28	38.94
35.7780935242186	36.9319133766816	47.34	38.25	14.49
34.5540126607985	35.3200477131738	58.02	32.46	35.22
34.1479008775598	34.7852810422916	49.85	30.56	44.85
34.1472960877893	34.7844846571251	44.15	32.64	10.23
30.4883538278526	29.9664015220872	42.59	39.16	36.88
28.7636270750595	27.6952869989778	41.47	31.69	27.11
27.0205972284306	25.4000710248494	27.74	25.63	7.06
25.2800548488176	23.1081305387389	25.65	24.53	2.83

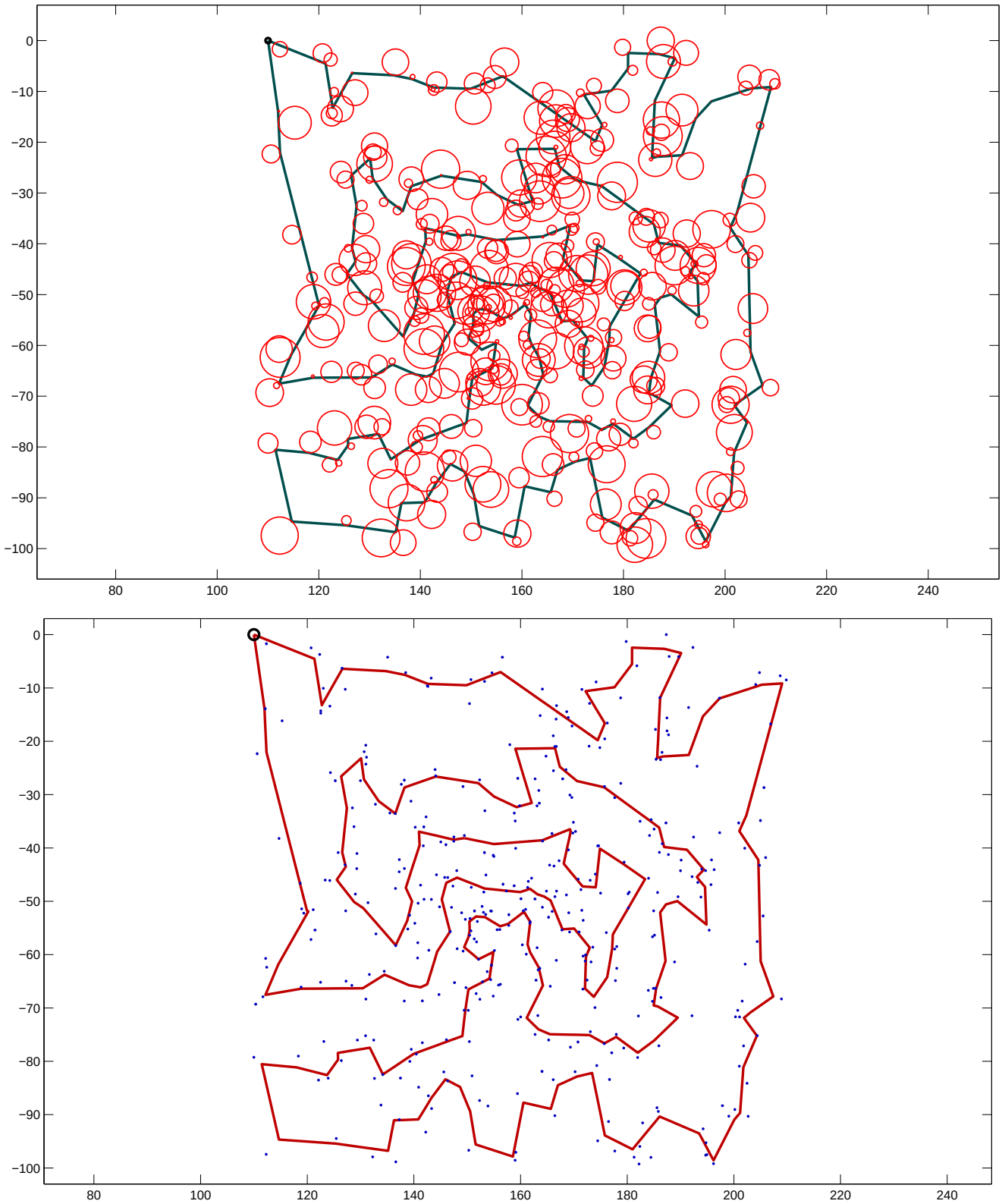

Figure N.52: *team*4_400, arbitrary radius, 2D, Euclidean, Length = 1011.7721081

Table N-55: Solution for *team*4_400, arbitrary radius, 2D, Euclidean

Total distance: 1011.77210810529				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
1.97641688253391	13.9048019905372	2.125025	13.8908	0.1492663
2.10841117717418	16.7294588245874	5.2982	16.16745	3.2389206
2.35797403221396	22.0700676551898	0.610975	22.331075	1.7663891
6.2043699347401	37.1389446469187	4.729125	38.22055	1.829267
8.37214923006394	45.6315696572415	8.7059	46.626875	1.0497725
9.11219212647717	48.530807245308	8.9679	51.422725	3.3986294
9.93653207439138	51.7602921826314	9.352575	52.2461	0.7596151
10.1992310131306	51.8816954686451	11.134375	51.580675	0.9823989
8.54273965440989	54.8083357059537	11.458875	55.406825	3.5619902
7.51729548343607	56.6200603102376	10.71515	57.182775	3.2469865
4.54365160783931	61.8738063700291	2.206275	60.72485	2.6045019
3.60553666717614	64.1007580439257	2.404275	62.37445	3.9363141
2.23238962854121	67.3604142860833	0.331025	69.303175	2.7183647
2.15977050986879	67.5328017676452	1.692025	67.9044	0.5973869
8.87803793159613	66.3755006167555	8.8531	66.09375	0.2828521
12.230359748195	66.3554709980047	12.50315	65.202575	2.0894727
16.3278091470588	66.330989199594	17.272875	64.973225	1.6542893
18.13145171041	66.3202128951161	18.3822	65.772725	2.0122239
20.414723723796	66.3065709269128	21.0091	68.35155	2.1296062
22.5616264570499	64.9613421081011	21.668825	63.73225	1.824597
24.492362634492	63.7515612741272	24.44465	63.1281	0.6252843
29.0965559811946	65.7361923899722	28.20205	68.6988	3.0947027
31.2587871570456	66.1284765415141	31.583525	68.6781	2.5702207
32.5085468490684	65.5510038649397	34.7277	67.482525	2.9420086
33.3099261155878	62.9086870033065	30.688625	60.637275	3.9031621
34.0454468884234	60.4835195218466	32.800625	59.186225	2.9956219
34.3583856837837	59.4516945967981	30.732825	57.781	3.9919808
36.7706836814621	55.681073871436	36.8297	55.690525	0.0597683
36.3031193717111	53.8617279535439	37.074525	51.14655	3.5957201
35.8371791886207	52.0487019395748	34.822	51.041775	1.4877525
35.2207232810166	49.6500023972887	31.916925	49.63125	3.3038515
35.4807525902187	48.6838290808919	37.32375	47.164775	3.8061293
36.0555749305515	46.5480005519883	34.241775	45.041325	2.3579528
36.2696427067151	46.4452884299038	36.34605	45.558575	3.6813731
37.0591147818516	46.0664903943426	35.77655	45.5234	1.4365385
38.0989899733722	45.5675459745773	38.0514	44.25295	1.3154571
39.9494773348851	46.2959386671043	40.7628	47.39015	2.9963842
41.5421261407447	46.922840322743	43.5222	45.0811	3.7775081
43.2709997792983	47.6033629898464	43.10885	48.272275	0.6882847
44.7414861376509	47.7518642324479	46.718325	46.79505	2.1962207
46.0887463792245	47.8879212489456	48.801425	47.111675	3.261649
47.4764787748126	48.0280656024292	47.35915	48.071	0.1249376
49.9320592471244	48.2760498953429	50.075475	49.526025	1.2581756
50.6097404819234	48.0445951828462	51.464375	46.273425	1.9665818
51.2605345283459	47.8222335158057	51.332325	47.3944	2.0193416
51.7618460711806	47.6511059858672	52.0729	45.66175	2.0135272
53.1584848465734	48.6894979290558	52.703075	49.56845	0.9899267
54.4067830088609	49.0986952244004	54.870925	48.098925	1.102256
54.9375144367064	49.4259275024018	56.7604	48.090675	3.4617573
55.6235630301924	49.8489234443749	56.4549	49.1402	1.0924331
56.1223636663406	51.0500176238806	54.099275	51.121125	2.2154275
56.5561135734495	52.094471993217	55.262125	52.9866	3.5612885
56.9898634900383	53.1389263654784	55.9361	51.897075	2.2731123
57.4236134012037	54.1833807383342	59.0369	52.162425	3.0447964
57.8670981111505	55.2512761689554	57.767975	55.4125	0.1892578
58.8611810772325	55.1768856552534	59.205025	55.76	2.6513752
60.0379776728844	55.0888220803769	61.491825	51.7088	3.6794322
60.4313274258153	55.5715910112246	61.751375	53.5726	2.857714
60.9013706742654	56.1484879715836	60.964225	55.767775	0.3858666
62.6777238805419	58.328654945831	63.23165	61.378	3.0992482
62.9781130426595	58.6973307937423	63.564825	58.6141	0.5925861
62.543671507047	59.7196087455052	62.1796	60.091575	3.7726122
62.2530024968747	60.4035776971739	61.732525	60.28975	0.5327791
62.1977290179283	62.3243555264687	62.138225	61.218175	1.1077798
62.1395015751877	64.347784993789	62.481725	64.778425	1.7172899
62.0827717197585	66.3191724179039	61.692525	66.479075	0.4217361
63.7415188395283	67.9092536188982	63.9561	69.944325	2.046353
66.2331898649782	64.2390923828098	67.8084	64.88	1.7006027
66.6121985425135	62.1129435832642	68.033375	62.578975	2.4747025
67.1835807798977	58.9076249550802	67.662425	58.9604	0.4817437
67.2494979786919	57.3803307675197	68.048425	58.486425	1.6060654
67.299161667806	56.2296287125785	66.095725	55.876775	1.2540995
69.2571082923465	52.8670908913728	70.20275	51.264575	1.88246
70.6493068624135	50.476157019291	70.163125	48.595475	3.4643229
72.0406682043584	48.0866606710487	70.38585	48.289775	2.9015796
73.3485137495087	45.840592672182	74.018375	45.692475	0.6860415
69.2206261851905	42.9661167016904	69.4258	42.661825	0.367001
64.8799756345209	40.1333092774378	64.627025	39.598675	0.591454
64.7440495221286	41.3783971462666	64.48255	39.62755	1.7702677
64.4197278659476	44.3491947206548	64.04505	44.910675	3.3686945
64.090322648125	47.3665579109348	65.024675	48.473875	1.4488497
61.6355512190418	47.2183758806756	61.33205	47.81805	0.6721027
61.0442579346562	46.5078161626172	58.59885	48.807625	3.714657
60.2468178896243	45.5495289742311	60.81405	45.86495	3.5607331
59.4708560749779	44.6170522485538	63.06625	46.073225	3.8790845
58.0937024218306	42.9621205969234	56.281125	43.406775	1.8663211
58.3057473132721	41.9812755535395	55.460475	43.213925	3.4716194
58.5845314267276	40.6917182829367	57.24125	42.40615	2.5354041
58.8633155237158	39.402161008209	58.980725	40.369175	1.2293142
59.149830527339	38.0768431689813	59.82755	37.21565	1.095882
59.3981161332445	36.9283610803549	60.313175	36.907775	0.9152904
59.2814321306776	36.4859900995594	59.92645	35.207	1.4324328
56.5674379476341	37.565931388811	55.894525	37.29925	0.9531114
54.0921399459572	38.5508916894609	54.125425	38.6935	0.1464412
50.3360229786045	38.8515911737774	49.0937	40.0849	2.5088011
45.2303554570464	39.2603305342274	45.015525	41.584025	2.3336041
45.0226523003791	39.2769582737163	44.89855	41.381	2.1076985
43.0383869052137	38.8794475421857	43.242475	40.8624	1.9934273
39.4610513822	38.1627945667309	39.47365	37.672175	0.4907813
38.6359148695741	38.2844378888957	37.4986	37.94785	3.3389816
37.5019757103667	38.4516055421834	37.4906	38.735475	0.2840973
36.0269003950138	38.1117107416168	36.0198	39.389875	1.9831699
34.6199822736166	37.787521146079	35.05695	38.887125	2.3714259
32.446340717575	37.2866590957682	32.29465	34.1886	3.1017705
32.0582067674925	37.1972231860423	31.8731	36.0461	1.8377332
30.9541635812946	36.9428235258769	30.2641	36.115	1.0777196
31.0703737609424	39.4977753091063	31.7652	39.5927	0.7012804
29.9079497878269	43.0410131131149	27.2689	42.18555	2.7742388
29.7994948354823	43.3796596902644	28.231575	43.86655	3.8908642
29.2155461932321	45.2030130069385	27.251975	44.47235	3.7272714
28.4861551586624	47.480503721018	26.549225	47.5983	1.9405088
28.9367991954936	48.4594359822385	31.24645	46.9846	2.8458636
29.6440282606782	49.9957471682525	33.276075	49.648225	3.6486347
29.3057200628889	51.3743887264681	30.804475	50.3614	3.2757758
28.9398253419149	52.865448403614	29.2116	52.625	2.2691686
28.7521164637935	53.6303820003036	30.1798	54.1346	1.5141057
27.862617203234	55.5278734987223	28.87265	55.2137	1.0577671
26.5897168716749	58.2432404752973	26.5978	58.30075	0.0580748
23.8387306606814	55.0916620234987	22.891175	56.122525	3.1174634
20.516443075274	51.2855906476318	21.4066	50.274675	1.3469706
18.7793587543387	50.120597075462	17.219275	51.795125	2.288647
17.4919878586634	48.4669520980245	19.028925	48.6519	3.3340627
15.8266166355653	46.3277611918847	14.24105	46.110125	1.6004334
15.5447965238051	45.9657597628467	13.3837	46.032275	2.1621199
16.4577010081007	44.6312541556435	17.095675	43.177	3.0748926
17.2286664163286	43.504238664834	19.292975	43.870425	2.0965358
16.7910460185176	41.7819991530093	19.322625	41.061025	2.6823985
16.5477106672146	40.8243615256942	15.806625	40.87695	0.7429492
17.0207358314431	36.4265695986736	18.77905	36.01655	2.0153111
17.439081288494	32.5371453730244	18.476575	32.50015	1.0381531
16.677342429745	28.3135654953477	15.2685	27.387025	1.686213
16.3621619418243	26.5659983200766	14.358825	25.883825	2.1162985
20.1001394492672	23.1805199721151	20.9892	20.7572	2.581261
20.1429082321255	23.5036798212554	20.686175	21.9667	1.6301674
20.3233529470104	24.8671105926255	21.1268	22.989225	2.3000479
20.5154448884284	26.3185476914759	20.995625	24.282225	3.5058599
20.6263477372414	27.1565243259834	19.9845	27.40155	0.687027
23.3995104152328	31.2295040295894	22.793175	31.8095	0.8390697
25.2904686834084	32.6437871404097	25.49855	33.45475	0.8372327
26.5075351944305	33.5540540282492	26.51415	33.575825	0.0227537
27.4725455569979	30.8145442067813	29.46595	31.229925	2.0362226
28.232228247592	28.6579260137902	27.65685	28.081275	0.8146082
30.1572165529994	27.9846139801166	28.216025	27.287675	2.41843
32.1562918359476	27.2853880645247	33.989075	25.3104	3.7659631
34.1094998407785	26.6022052359561	34.098725	26.483975	0.1187202
38.1073538367545	27.2256851786257	39.217825	28.48755	2.7558001
42.0651704344652	27.8429211079883	42.344525	27.231625	0.6721026
45.0296936434429	30.3530651869308	43.312375	33.022625	3.1742295
49.2441509541995	32.3407827823704	49.014675	34.9475	2.6167984
49.2451160224987	32.3405207839391	49.821325	32.088775	2.6868713
50.0596532454005	32.1193878269214	48.825175	33.4678	2.052047
51.2202688105374	31.8043005149566	53.51985	31.610925	3.9899375
52.0942009754634	31.5670428506964	53.08505	32.116125	1.1328164
51.3935766189417	29.2501063249383	53.429725	29.230175	2.9604889

Solution x	Solution y	Original x	Original y	Radius
50.7577711889327	27.1475234577451	49.48335	26.949275	3.4612295
50.2593821424279	25.499371106142	52.727475	27.05645	2.9182147
49.0153516158048	21.3854127431369	47.99765	20.639375	1.2618593
53.8144215699222	21.327811382543	56.145325	18.970525	3.3151033
54.7375660004692	21.3167312218709	56.46315	20.9863	3.1469731
56.4683160972764	21.2959576852578	56.707375	20.9848	0.3923879
56.7872766838078	22.5525106335536	54.7913	22.79115	3.9863921
57.1269539871222	23.8906778360982	57.8987	27.066925	3.9092312
57.3528126211498	24.7804537093094	56.18475	25.5187	1.3818024
59.0364902411581	26.1760406952286	58.5251	25.335175	2.8927993
60.4007377979202	27.306854555307	59.6161	30.5374	3.7763801
60.5684646365619	27.4458820269232	59.25755	30.092125	2.9531507
64.8837408294725	28.4462198872627	68.792375	27.90175	3.9463741
65.6939749131389	28.6340428150758	65.757275	28.49595	0.1519096
68.9335336035056	31.0051205336385	67.6691	30.587025	2.7503569
72.6340474657285	33.7135776475891	72.419975	34.998125	1.302263
73.3806702071532	34.2600411607178	74.4851	34.7013	1.668137
74.6737722706154	35.2064803418071	75.0516	36.4713	3.1806421
76.0018303637222	36.1785043393736	77.267275	35.3236	1.527158
76.3412434814728	37.5115360697692	74.186175	37.664625	3.0650817
76.6929691599918	38.8929246531668	76.5757	39.19325	0.3224087
76.9299794712482	39.8237729260203	76.046775	40.829925	1.3388025
78.494078365797	40.0113483559007	80.128375	42.2928	2.9296913
79.8988177988889	40.1798125414165	77.736325	41.257125	2.4159837
81.1958981021355	40.3353656668213	82.455325	37.974875	2.6754574
82.2537866030518	41.5663711415073	80.003925	44.278875	3.7953033
83.8652423945259	43.4415320257625	85.82305	42.253575	2.2900333
83.8658941587736	43.4422904473902	83.98185	43.958725	0.6740969
84.3793081747477	44.0397210980137	86.306375	44.08645	1.9276333
83.7010878429422	44.7555930150559	84.710775	44.260425	3.5456061
83.0606589260206	45.4315754981122	82.166	45.384	0.895923
83.6181854015075	46.1617136695251	83.247325	46.458225	0.4748225
84.5887511973984	47.3216220803868	85.726975	46.8848	1.2191665
84.7257736420416	51.1129080462194	83.835575	49.221375	3.0061312
84.8428041355056	54.3510521826489	85.3769	55.416	1.1913741
79.392465033852	49.9688360565369	79.556325	49.1563	0.8288938
77.2712200719044	50.5769710916277	75.70595	48.354275	2.7185379
76.1634721137092	52.1191958702757	74.97575	51.8098	1.2273588
76.5473190626931	55.4948179385712	75.12385	56.355025	2.2591934
76.8618033948366	58.2604535420005	74.7548	56.66355	2.6437784
77.1951836494316	61.19226496456	78.897475	61.3791	1.7125137
75.4141162754933	66.3606985487663	75.320425	66.338125	0.0963723
75.3098649862631	67.0951728004073	74.919425	66.332825	3.2122786
75.1838662594441	67.9828625633468	73.97555	66.71955	2.6718873
75.057867488993	68.8705522774154	74.758025	68.76505	2.7316723
74.9637928662527	69.5333290349808	72.106325	71.513625	3.4765924
75.7199009757597	69.7006157125881	76.3481	68.05155	1.7646676
79.4848972436321	71.8075938925104	82.150425	71.4598	2.6881218
75.0787516844983	76.0774623799534	75.94035	77.0935	1.3321727
71.9654871949641	78.3807976260665	71.96685	79.285825	0.9050284
70.0549942525833	76.976211052457	69.349625	77.516575	2.180516
67.9386859011437	75.4203098832796	67.97015	74.943825	0.4775226
65.7216666043302	76.6374757155163	65.721375	76.70655	0.0690749
65.5914147105352	76.5645282075219	67.096325	78.407125	2.3790582
62.9349756262239	75.0767908267945	63.106325	74.44845	0.6512855
60.6317887430287	75.026274162238	60.77085	76.3761	1.6799218
58.2008163427948	74.9729548790131	59.360575	77.3659	3.7611478
55.5195075634971	74.9141447140076	55.289875	75.9977	1.1076205
53.3591840410221	74.0116015320548	52.726325	74.9715	1.1497459
52.3391942781628	73.0224964561137	50.03295	71.692275	4.0015227
51.1462113905807	71.8656364031735	49.5023	72.1454	1.6675468
52.306716781803	69.5445582030148	53.249925	71.4317	2.1097265
54.1914244869277	65.7750344875635	55.5813	65.9389	1.399502
54.1202306456797	65.4694883050937	52.902425	64.80215	2.0317535
53.8213261804519	64.1866643034996	53.3194	62.871025	3.2245451
53.5252526827698	62.91599008743	53.6353	62.58645	1.9291342
53.4006247799536	62.3811180271602	56.708375	61.084725	3.5527238
52.3004509767126	60.4512760771763	53.1029	58.71345	3.7092457
51.8159024080857	59.601317499801	51.0767	59.931625	0.8096439
51.3071103595071	58.0778256605499	50.342	58.1772	0.970213
51.8038976189085	53.8551127703915	51.8225	53.851	0.0190516
51.2538584398378	52.9625585284815	51.731775	54.063975	1.2006342
50.6711639317893	52.017014142233	50.9611	51.5263	0.5699678
50.5941318600234	52.0132513232516	50.5204	51.7746	0.2497815
49.1242625736134	53.1262727614492	47.81055	52.508825	1.4515793
47.654899071631	54.2389112622338	47.802925	54.5327	0.3289734
46.1749585265973	54.673042932176	46.119125	55.3112	0.6405949
46.0274702046511	54.599992354586	45.616825	55.349625	0.8547389
45.3037150442318	54.1637680107737	44.549375	51.8385	3.4753711
44.5622540596069	53.7168719525418	44.413025	51.821425	1.9013123

Solution x	Solution y	Original x	Original y	Radius
44.1438212273169	53.4646725684537	42.80595	50.969325	2.8313705
43.6900472866937	53.191172253109	43.054225	52.07985	3.6716308
43.3236798506077	52.9703539085974	43.47965	52.4779	0.5165632
42.4914474817973	52.9111405972882	41.89655	53.797625	3.5360134
41.6621470173712	52.8521358960486	41.3638	51.811825	1.0822466
41.2822346924386	53.1289095335583	40.529725	53.231175	3.1574837
40.7779751814294	53.4962725488849	38.966475	52.166125	3.6894736
40.4097933198086	53.7645003080115	39.658325	53.39295	0.8383044
40.4328274383168	54.7738134737862	40.468775	56.35765	2.0428185
40.4498048060972	55.5177306451292	40.703325	55.537825	0.2543153
40.2666765314679	56.518362027724	41.765825	57.606275	1.8921573
40.2269089158967	56.7356564135971	41.323875	57.06515	1.1453823
39.4329638141546	58.6000904711699	38.122975	58.912025	1.3466157
40.4027195604836	59.4180385108624	39.243575	59.34405	2.5403868
41.3478497412483	60.2152159243226	43.7645	63.186425	3.8299193
42.1156525735922	60.8628252045811	42.114525	60.87195	0.0091942
44.9059755063022	59.4984391755291	45.110025	59.219325	0.3457469
44.6527605717603	61.2141519973533	44.541975	62.0002	1.1492733
44.327848492685	63.4156640542791	46.228875	65.56925	2.8726006
44.2628130276973	63.8563257262529	44.4217	64.703925	0.8623628
44.1696566438155	64.4875265178146	45.884675	65.715725	2.1094453
43.0430758069342	65.0659956731926	44.898775	67.784675	3.8144474
42.06897443431	65.5661707736151	42.88515	65.09985	2.6385081
41.1008684127723	66.0632674757765	37.615325	65.262725	3.9137176
40.2194148740073	66.515870443405	39.7753	66.19835	0.5459462
40.0089255250218	67.9578193666765	41.683175	67.299925	2.7312469
39.8127780701617	69.3015196761111	42.3891	68.379025	3.3982575
39.6441742527281	70.4565334209427	39.430175	70.428325	0.2158504
39.4143158177549	72.4091907436503	40.205375	70.4585	2.1049867
39.0794413056128	75.2539639954974	40.4153	76.30845	1.7018987
36.542056420474	76.1845618750127	36.110325	75.95995	2.3419359
33.751295086067	77.2080866775948	31.60195	76.5275	2.2545249
32.0379878732756	77.8364498861171	30.46345	78.65395	2.8521408
29.958260859433	78.5991990660071	29.5312	77.759375	0.9421706
28.4254985488414	79.6240194140974	29.23795	80.022375	1.1674686
26.1532978302404	81.1432357960462	27.4824	83.15295	2.409453
25.1795780689554	81.7801578998704	22.609375	83.218325	2.9452111
24.1743201818448	82.4377094827737	24.1584	82.49565	0.0600879
21.7322240233828	77.4490374762513	22.467675	76.02705	1.6009174
20.1878624355829	77.6997504602873	20.9401	75.2051	3.2102784
18.2433843153373	78.0154187315533	19.41455	76.0326	2.3028676
15.7348217122006	78.4226608479109	13.11545	76.27845	3.3850773
15.7823329267051	79.6755635320653	16.4015	79.860725	0.6462605
13.7132206346128	82.5795493306465	13.92855	83.165725	0.6244747
11.9020987572734	82.1216481509724	12.1212	83.525275	1.4206244
7.98931880566202	81.1323897856165	8.347775	79.0334	2.1293776
1.46791913762057	80.5396024028569	0.00155	79.256375	1.9485664
4.68351035239645	94.6757665382687	2.307925	97.449675	3.6521191
15.3522779646562	95.415980409277	15.45105	94.471525	0.9496062
19.7677333915852	96.034313364425	22.27635	97.920025	3.7249339
25.149638007713	96.787985806223	26.6212	98.85125	2.5342758
26.2672975358441	91.0561618221706	23.831575	88.204275	3.750467
27.9218389530956	90.9974205399558	27.27955	90.9405	3.6132742
30.8253397149449	90.8943376405081	32.22375	93.28635	2.7707895
31.9133720328591	89.1126083729889	33.324025	88.862275	2.0476207
33.2917925545254	86.855347890522	32.733925	86.47665	0.6742613
34.5135301368513	85.2298508604232	30.896	84.86835	3.8695341
35.915475820298	83.3645906191178	35.60905	81.995775	1.4026949
37.7930060689235	84.3559471772943	36.3513	83.686975	3.004223
38.6402813362887	84.8033178529443	40.913925	82.729825	3.0771461
40.2420761922052	88.6585391155126	42.31835	87.347525	3.5183382
40.5324755513078	89.3574758876274	43.9034	88.387225	3.5077797
41.579191991656	95.5774239842324	40.290225	96.689525	1.7024114
48.5704318488683	97.8460754173359	48.99045	98.5583	0.8268489
49.2393210859321	94.3932886029577	49.100125	97.070175	2.680503
50.5292380560102	87.7347774046264	49.4347	86.0537	2.0059997
55.6756301233434	88.9135014784571	56.428075	90.20545	1.4950934
57.0007109261353	84.4871154007311	54.01775	81.8894	3.9555254
58.0846347560198	83.9916907401964	56.13655	83.451075	2.1163693
60.5482228265818	82.8656687800167	60.2356	81.956375	0.9615343
63.4202389913064	82.1823451310989	64.2971	80.8087	1.6296583
64.2086082652592	86.0528728006055	66.686275	83.4025	3.6281274
64.9772772223245	89.8266843701396	66.508125	91.303225	3.030605
65.8048351722632	93.8896156135949	64.46975	94.9155	1.6813097
68.1064954918708	95.0446466585628	67.679475	96.828325	2.2617553
70.994240087352	96.4937892301422	71.306475	97.9771	1.5158171
71.5104887717911	95.8692432086963	72.222075	99.2555	3.494791
72.3383172124174	94.8677549296719	72.374675	95.981125	3.0465832
72.5702561570807	94.5871604655567	74.44305	98.0205	3.9109049
74.2384902671805	92.5689674570706	72.88955	91.55335	1.8128248

Solution x	Solution y	Original x	Original y	Radius
75.354810739266	91.2184676680744	75.589675	88.707575	3.3878078
76.0709057612914	90.3521518526626	75.8385	89.39705	0.982971
83.4794176706554	93.5076930898895	84.25115	92.664475	1.1430606
84.1694977051844	94.7979339918594	84.77555	95.283075	0.7763126
84.8235759790844	96.0208622763519	84.9479	97.513325	1.6436369
85.515991562817	97.315469532669	84.730325	97.611875	2.4041303
86.1864828611063	98.5690849314303	86.192975	99.203225	0.6341733
90.0581470507912	90.9596225776104	89.0595	90.291	1.201812
90.2190217786521	90.7721923196049	87.858275	88.334025	3.4946441
91.1300130230154	89.7108235805593	90.195175	89.03695	3.7016857
91.1561064716276	89.6804228989984	92.685275	90.310575	1.653919
91.4997905387678	84.9459063164008	92.480625	84.1266	1.2780059
91.7785920214375	81.1051955564715	91.03755	80.9252	0.7625888
93.0136604253043	78.2170402265566	91.825175	77.123475	3.5229343
94.3054408032343	75.1962668107541	94.404	75.185075	0.0991926
91.871901082068	71.8602704242312	90.314475	71.662575	1.5699234
92.4887279321962	71.3532159270057	91.08095	71.69145	3.6485541
92.6926157056028	71.1856126491656	90.725625	70.444425	2.1020018
93.1545180812075	70.8059117787893	91.5733	68.725	2.6135119
97.39360675242	67.8334209851599	98.93765	68.322275	1.6195826
95.0207797360779	61.2517386047515	92.124775	61.791725	2.9459173
94.9267698379727	57.1052959742414	94.377175	57.5521	0.7082996
94.7845279861773	50.8315148019601	95.486225	52.746525	2.9208705
94.6467361979805	44.7540200010637	94.807975	43.25145	1.5111964
94.5897058492767	42.2386182373932	95.9689	41.808	1.4448559
92.8538156977692	39.6040501822647	92.049975	40.056175	1.6551621
91.0324614851361	36.8397730527022	87.349525	37.1432	3.6954146
91.9219240114129	34.8383308486645	90.921925	35.308625	1.329223
92.3364294389044	33.9056226624741	94.997925	34.851	2.8244109
94.2435259879065	26.8619502139058	95.640625	28.68455	2.2964659
96.866736214402	17.1733834514026	96.9141	16.74635	0.7260841
99.0405031357268	9.14478829047432	99.82775	8.49955	1.0178851
97.4096134424083	9.25387848289484	98.6909	7.723575	2.0288551
95.2475382486828	9.39849964053822	94.81355	7.137025	2.3027404
92.9663062162522	10.1353085885956	94.09005	9.358875	1.3658877
87.3167523762796	11.9600426974799	87.3023	11.937375	0.026883
84.1948005012385	15.3245322460937	81.52085	13.687775	3.1351213
81.5446977462157	22.572556703556	83.1155	24.690275	2.6366931
76.6607456505135	22.8469630723954	76.538875	22.08605	0.7706109
75.6127712041669	23.1274356637121	75.41995	23.365625	0.3064542
75.6998466804329	21.4465476038018	76.27055	23.463675	3.2776576
75.7853561451264	19.7958921312961	77.750225	18.79385	3.8375488
75.879409192166	17.9803159647751	75.3053	17.780525	0.815641
75.8794609241189	17.979317303769	77.472675	18.057475	1.59513
76.048917441931	14.3196203965398	77.464	15.628175	3.5672263
76.1635662365717	11.8435830984309	76.1173	11.832075	0.047676
79.4043873525095	4.98294922948459	79.6523	4.144625	0.8742129
80.1229157714815	3.46186531096953	82.33615	2.420325	2.4460605
77.5134563442751	2.79614511336243	77.882675	4.11235	3.3455297
76.9557494842756	2.65386392544228	77.335225	0.00945	2.6715027
70.9075316287045	2.4404814573994	69.817575	1.306825	1.5726355
70.8950298028703	5.53913618346999	71.829525	5.85575	0.986674
67.6132819284047	9.86231100729224	68.784175	11.8632	2.318307
64.6264057613596	10.275368213849	64.181275	8.885925	1.4590044
62.1921563551958	10.6120020704764	61.5062	10.2838	0.7604293
63.9403707077978	13.5228942536851	62.944875	12.9098	2.4896628
65.7983183917133	16.6164999242768	66.273425	16.5814	0.4764014
65.1855506359275	18.0931102245976	65.789175	19.559925	2.251298
64.4758357017645	19.8033379615953	64.881075	21.1972	1.4515751
62.9147798610601	18.7086176629588	62.8697	20.929125	3.2881032
61.3576313083441	17.6166372613603	59.666825	17.15215	2.7658857
59.8191124817795	16.537721226063	58.962525	15.549225	2.3682429
58.2619639613128	15.4457407789103	58.66755	14.455925	1.8727735
56.7048154211409	14.353760359664	56.680125	15.845675	3.207153
55.1476668182446	13.2617800296019	56.7601	13.3255	3.6207209
53.8498043423858	12.3516290175031	53.686425	15.19815	3.2492576
52.586398377997	11.4656411128405	54.0981	10.209075	1.9657569
46.2504727441313	7.02245207241569	46.59205	4.24755	2.7958463
45.2050142739965	7.4238858311621	44.6523	7.1683	2.2507146
42.7293112207375	8.37450309941275	43.2503	8.7931	1.4609189
40.2536081214321	9.32512024778265	40.718225	8.45085	2.0651849
39.8429288440979	9.48281220593221	40.4237	12.94705	3.5125829
33.5783761986471	9.26714911177699	32.636425	9.71905	1.0447423
32.6068797137518	9.23370439936364	32.5307	9.603625	0.3776832
31.3312568319582	8.73632444094171	33.240325	8.160175	1.9941137
28.340309598895	7.57011992604191	28.471925	7.124375	0.46477
24.7597493005635	6.83518859830565	25.090375	4.2535	2.6027734
16.5850917869757	6.40727093638997	16.533825	6.314025	0.10641
15.3282692198514	8.63783322050697	17.13825	10.254625	2.541304
14.0343322207394	10.9342648425496	14.259	13.428825	2.5476741

Solution x	Solution y	Original x	Original y	Radius
12.7370072286373	13.2367093645283	12.54795	14.295525	1.0755618
12.6418504228782	12.6460430374222	12.5519	14.734025	2.0899186
12.1921522594041	9.85463414388267	13.011825	10.0758	0.8489863
11.3341307150367	4.52863987211305	12.34295	3.720825	1.2923936
9.34727832156267	3.73477776081889	10.7326	2.49095	1.8617797
3.85423040755667	1.53998762461348	2.34935	1.70725	1.5141472

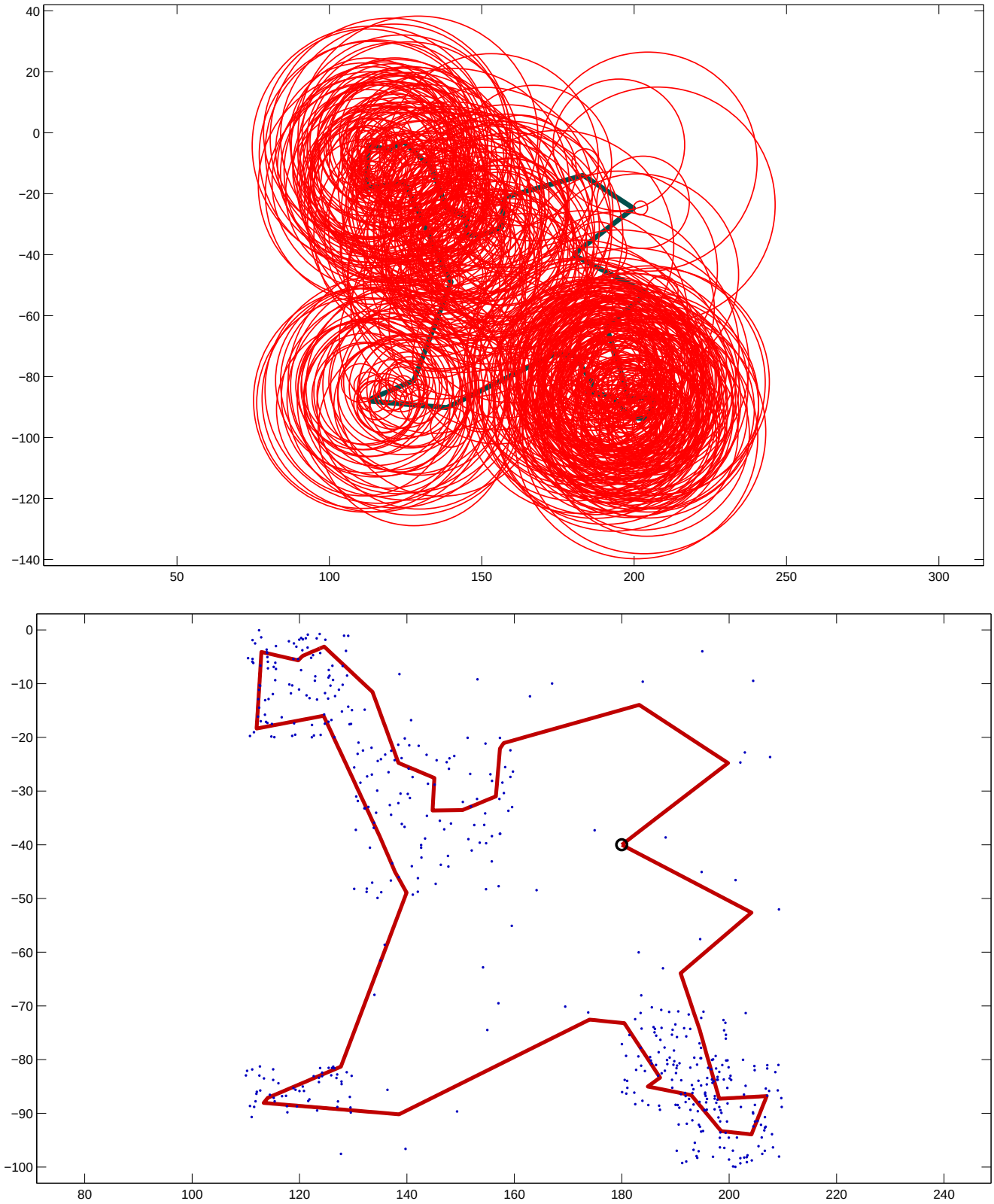

Figure N.53: *team*5_499, arbitrary radius, 2D, Euclidean, Length = 454.3273661

Table N-56: Solution for *team*5_499, arbitrary radius, 2D, Euclidean

Total distance: 454.32736613373				
Depot: x 70 y 40				
Solution x	Solution y	Original x	Original y	Radius
76.3788434777157	35.0925143452912	64.954	37.309	38.0588
82.5834116351572	30.3191052884245	78.1743	38.6355	9.4129
89.7893527344486	24.7753021364398	92.0943	24.688	2.3066
86.2570691875777	22.460823496789	97.6128	23.6668	38.6763
82.4885473657075	19.9915530815147	94.4757	9.4701	35.9228
78.7311697800432	17.5295847689327	84.9979	3.9891	21.6131
78.7311697800432	17.5295847689327	92.9329	22.8145	15.1532
73.2600919689667	13.9447387170078	73.9225	9.6395	4.3559
62.2518347837437	17.0473710372436	57.0413	9.9678	25.5663
51.7532899690259	20.006343010256	49.2796	22.4102	3.4493
50.746125126137	20.2902083071039	45.8348	38.3992	22.4696
49.2520991356866	20.7112934295269	52.9148	12.3625	18.1234
48.0044115478973	21.0629490800347	47.312	20.115	1.1739
47.3199310529511	22.0990826829514	44.6412	21.1681	2.8359
47.052960174994	25.2258352721242	41.7938	26.8087	25.8964
46.8410005690059	27.7082979757702	54.1532	48.4548	21.9974
46.7501309524436	28.7725594136967	49.2766	27.3707	19.0778
46.644947987496	30.0044582300536	48.0614	30.3792	10.3406
46.644947987496	30.0044582300536	47.3754	37.9401	18.8601
46.5614314819264	30.9826003127309	47.2249	31.4694	0.8229
44.7882835430452	31.7114053624626	44.5785	34.1629	2.9998
43.1699307110997	32.3765860221565	44.7486	39.7162	12.5268
40.3358560393478	33.541456637973	41.4412	38.9568	5.527
39.9335012001357	33.5465757622473	25.8602	58.6207	28.7536
39.9335012001357	33.5465757622473	32.6554	40.5505	13.7264
38.8626917069195	33.5601995741727	45.8434	28.1097	15.1991
37.4686980845343	33.5779352290965	45.8095	43.1051	19.6777
37.4686980845343	33.5779352290965	47.084	47.7144	24.8395
36.0835053710729	33.5955589110155	36.1356	35.5262	3.41
34.7639671522364	33.6123472765783	33.7228	34.609	1.4413
34.8493236626087	32.1006346995816	49.7446	26.3767	17.8751
34.9309204260055	30.6555093930189	29.5705	36.67	21.5656
34.9309204260055	30.6555093930189	35.5448	24.2684	19.4434
35.0142293809483	29.1800601944301	33.916	28.6484	11.305
35.1056569088834	27.5608264341348	37.8149	25.869	3.1941
34.0303937594446	27.1087904213133	37.9243	23.9119	11.4323
32.8368503198699	26.6070298818286	32.1965	21.571	23.9954
31.6258593271756	26.097934465586	31.0534	27.3935	17.9341
31.6258593271756	26.097934465586	30.555	31.3009	18.8032
30.4148683344611	25.588839049241	30.3241	25.8121	12.6672
29.2038773420302	25.0797436328165	33.6715	23.2449	5.013
28.4208325275464	24.7505549533479	26.5855	26.5008	2.5361
27.7439077621771	22.8990563812054	27.7157	24.2487	7.9151
27.1915895727331	21.3883769215983	28.392	21.3903	19.1959
26.6528990310642	19.9149712786581	29.6006	20.2054	12.7079
26.0875426555059	18.3686302729127	27.0718	22.4926	16.8129
25.5436704159367	16.8810518494028	23.4789	26.9268	12.6384
25.5436704159367	16.8810518494028	24.5672	24.4137	9.9276
25.0015795800474	15.3983458518581	22.1476	14.8515	12.414
24.4577073397715	13.9107674257702	19.7672	14.9362	14.1421
23.9138351006337	12.4231890013109	19.0819	14.2893	6.4132
23.5928504082801	11.5452440225348	28.6149	8.2266	6.0195
21.8182398258335	9.88062352095746	47.7847	28.4345	34.5556
20.4506325415392	8.59778031807396	18.8587	8.5087	16.8623
18.3772390454748	6.65289541986463	15.4595	7.4752	3.0314
18.3765096975944	6.65221127684648	18.047	6.7045	18.9999
18.0454899714596	6.34170810049515	15.7685	10.3669	18.5804
17.4705048227798	5.80236043948064	12.8565	9.4609	9.659
16.8756316780426	5.2443574380531	18.6523	3.9117	19.4015
16.3035164276095	4.70770179930271	12.9432	8.6486	15.3773
16.3035164276095	4.70770179930271	15.3812	8.8682	15.4856
15.7060644138828	4.1472797671398	12.5256	4.7007	23.5883
15.1177867602945	3.59546346870654	41.315	20.08	34.9881
14.5895687993794	3.09998437297633	14.8098	1.8409	1.2782
13.7719602318796	3.45253106586715	13.7484	0.7577	20.4003
13.7719602318796	3.45253106586715	13.2084	1.5682	22.8241
13.0400954207914	3.76810569256997	10.6256	1.7583	24.4015
12.3082306105	4.08368031899262	2.8757	1.3778	25.9254
12.3082306105	4.08368031899262	8.0267	2.1019	25.3395
11.6278641612434	4.37704923757671	8.96	2.5066	22.9145
10.5868040408108	4.82594656659382	9.4253	3.1222	2.062
10.2787952425012	5.13656742292301	10.526	3.779	20.82
10.2787952425012	5.13656742292301	12.1595	5.1953	17.8764
9.75989244376986	5.65987075925028	10.2894	7.4847	1.9001
8.96810718880012	5.47882126649481	8.8668	5.4121	1.245
8.19175677712465	5.30130110243756	43.1416	9.2079	35.1675
7.44726164394864	5.13106496155335	15.5961	8.5134	9.1422
6.68930324292995	4.95775031191218	5.2006	6.8919	22.5304
6.28393921112084	4.86505983561912	3.9473	4.1638	2.4396
5.19275573143285	4.61554999153549	5.6082	3.0104	11.8319
4.43479733330631	4.44223534248466	3.8933	3.6617	1.7453
3.66861873207853	4.26704106313385	1.729	2.5191	7.1357
3.66861873207853	4.26704106313385	4.1027	5.9391	6.8207
2.90465351211259	4.09235289507931	1.2646	1.8964	2.7408
2.86635348270752	4.69916226000525	1.2522	5.4022	7.2247
2.80117349760529	5.73184621608374	1.4037	6.1535	1.4597
2.80117349760529	5.73184621608374	2.7247	6.6491	8.9474
2.80111050588616	5.7328442301334	18.2952	1.0836	19.3439
2.7683234320745	6.2523086802391	10.31	1.5005	14.7461
2.7407303961221	6.68948100251971	0.4211	5.2548	12.1971
2.7407303961221	6.68948100251971	5.6246	7.277	11.7089
2.70893311088034	7.19326366341716	9.7281	5.4172	13.7083
2.67872343734804	7.67189288079272	30.7692	16.7931	37.8932
2.65000020143678	8.12697161576028	9.9074	11.0867	12.9373
2.6199180653514	8.60358018501813	28.8128	30.4765	39.1387
2.58715427340015	9.12267576831682	22.2385	33.2025	37.3358
2.55707213711298	9.59928433773474	2.5621	10.2967	12.6169
2.52838885170608	10.0537301110838	21.333	28.4534	38.4741
2.49825444288291	10.5311668675905	20.821	23.0825	38.9893
2.46812003408532	11.00860362398	5.3173	19.9696	36.3373
2.4379856253024	11.4860403795596	4.024	17.3232	37.3677
2.40790348926859	11.9626489481338	6.693	16.2603	35.4947
2.3790746246233	12.419401212499	15.9493	16.7531	36.5644
2.34899248866058	12.8960097811115	11.8636	12.6991	36.7112
2.31891035260587	13.3726183497312	4.1301	7.1548	37.1524
2.28641701582876	13.8874289598822	5.4981	6.1028	36.5373
2.25602963914021	14.3688736284306	16.1355	6.6685	36.4875
2.22675145537499	14.8327447185465	13.8628	4.3052	36.3913
2.19930997582571	15.2675158500256	19.0824	1.094	39.3681
2.17077108847585	15.7196738425763	11.5168	3.287	27.8697
2.13774983591222	16.2428485217208	11.5459	0.8736	30.4629
2.10508402331533	16.7603917590661	4.0211	5.0495	26.717
2.07555187361125	17.2282865767992	11.169	1.5527	37.2188
2.04694938242596	17.6814522793665	9.9632	1.8111	39.4027
2.01691258926569	18.1573424582932	3.9756	4.3104	39.2995
2.00449586117306	18.3540678291867	0.7828	19.7397	1.8473
3.09895578474455	18.1451489053112	2.785	16.9995	3.817
4.12541485396503	17.9492105067329	3.5607	15.7968	5.1124
5.03116055509763	17.7763148037327	2.4914	14.471	5.3662
5.03116055509763	17.7763148037327	4.243	12.8676	6.736
6.00270329985031	17.5908592556935	4.8686	17.5054	8.1304
6.00270329985031	17.5908592556935	11.3126	12.1774	11.447
6.95935042100419	17.4082470983884	5.0355	11.9367	6.6489
7.95163298104382	17.2188325747012	8.4009	11.7989	5.5639
8.8339141902396	17.050415954138	8.098	10.1576	7.8091
9.77343349293731	16.8710732867374	32.6566	40.0511	38.6421
10.6803170843555	16.6979603745059	38.8284	23.4703	29.4494
11.6543172956697	16.5120357260966	43.0635	31.4686	35.4855
12.6067229770153	16.3302332077977	41.9344	32.8635	35.1115
13.5221497299644	16.1554895114809	15.3264	12.7877	21.1927
13.5221497299644	16.1554895114809	17.3372	11.1211	21.5037
14.4730672372878	15.9739710673626	14.5843	15.7568	0.244
14.7855493759165	16.645594876791	15.42	17.0914	16.8786
14.7855493759165	16.645594876791	17.8934	15.1905	13.0517
15.1028527387162	17.3275810349748	42.5333	36.3249	34.2929
15.4201561018737	18.0095671935713	14.7151	17.4542	14.2143
15.7365817958841	18.6896669623938	48.2875	25.5427	34.7388
16.0533059598738	19.3704082381905	20.9805	20.9752	15.7265
16.0533059598738	19.3704082381905	23.4201	21.9457	16.8924
16.2485688629933	19.7900905128615	16.6256	12.3206	7.479
16.7602082586303	20.8897668072334	19.5822	17.4941	10.5093
17.1445371594541	21.7158122324382	16.5052	19.9903	2.3082
17.5314437945139	22.5473980285657	2.4773	0.052	34.0937
17.5314437945139	22.5473980285657	1.2192	5.9144	28.8322
17.5314437945139	22.5473980285657	2.6723	10.4123	24.6134
17.5314437945139	22.5473980285657	2.4532	11.1564	29.4831
17.5314437945139	22.5473980285657	2.3396	12.8751	24.3453
17.5314437945139	22.5473980285657	2.2625	16.1551	18.392
17.5314437945139	22.5473980285657	3.6086	13.0876	29.6311
17.5314437945139	22.5473980285657	1.5116	19.0597	16.8413
17.5314437945139	22.5473980285657	5.4781	9.3534	25.1036
17.5314437945139	22.5473980285657	3.7626	17.1174	21.877
17.5314437945139	22.5473980285657	4.753	19.8404	29.0972
17.5314437945139	22.5473980285657	8.6382	10.3371	27.1817

Solution x	Solution y	Original x	Original y	Radius
17.5314437945139	22.5473980285657	9.0075	17.4052	24.0927
17.5314437945139	22.5473980285657	8.65	19.7295	27.9816
17.5314437945139	22.5473980285657	9.2095	19.5087	29.1422
17.5314437945139	22.5473980285657	13.2666	12.9678	29.5528
17.5314437945139	22.5473980285657	14.7479	11.7757	30.4615
17.5314437945139	22.5473980285657	16.2452	9.322	31.0488
17.5314437945139	22.5473980285657	12.3192	17.7013	29.1964
17.5314437945139	22.5473980285657	12.295	19.9912	28.6871
17.5314437945139	22.5473980285657	12.6858	19.6571	29.725
17.5314437945139	22.5473980285657	18.0288	10.2093	31.7011
17.5314437945139	22.5473980285657	13.9396	19.5452	16.1224
17.5314437945139	22.5473980285657	19.3111	17.5672	32.0992
17.5314437945139	22.5473980285657	20.1974	25.6106	21.4356
17.5314437945139	22.5473980285657	21.8127	22.4456	26.3083
17.5314437945139	22.5473980285657	20.8616	31.8567	16.439
17.5314437945139	22.5473980285657	20.4824	37.2243	26.8839
17.5314437945139	22.5473980285657	22.5985	27.2784	18.0514
17.5314437945139	22.5473980285657	22.0871	33.226	33.6947
17.5314437945139	22.5473980285657	25.1657	24.0751	31.1219
17.5314437945139	22.5473980285657	25.9644	23.203	29.8543
17.5314437945139	22.5473980285657	24.4655	29.9184	29.8304
17.5314437945139	22.5473980285657	23.8226	36.8408	22.7865
17.5314437945139	22.5473980285657	29.0027	23.8765	31.6897
17.5314437945139	22.5473980285657	30.4469	21.4825	31.6307
17.5314437945139	22.5473980285657	27.0476	34.4285	22.5144
17.5314437945139	22.5473980285657	29.0396	36.1372	26.8002
17.5314437945139	22.5473980285657	35.1494	28.8106	32.8637
17.5314437945139	22.5473980285657	37.4163	24.6203	31.2894
17.5314437945139	22.5473980285657	38.1953	36.049	32.0805
17.9292811401995	23.4024774108655	42.0622	41.0674	34.7982
18.3073351870804	24.2150361720612	48.8851	33.6728	37.4425
18.7014084904405	25.0620254265411	28.4031	32.2444	13.356
19.1073981700382	25.9346267758799	30.9136	43.9894	22.4068
19.4615459387362	26.6958033176971	28.4876	46.0461	21.3519
19.9763931878553	27.8023743116297	36.302	43.7274	22.8064
20.1977515516218	28.2781440567037	43.5486	39.6053	27.6035
20.5228242370907	28.9768289687598	49.5874	32.9921	32.9977
20.8454934571288	29.6703480669034	45.5527	26.8832	29.6166
21.1681626765284	30.3638671631721	30.1704	30.5441	13.1238
21.4851651770725	31.0452066734739	37.6461	42.0792	22.0605
21.7744028454605	31.666870686976	20.5677	31.0115	1.6881
22.1506613473838	32.4755702647822	44.3864	36.3116	25.6737
22.5114563212679	33.2510337715074	36.9556	37.1182	17.3813
22.8604307598619	34.0010911766824	47.2998	37.9687	27.2808
23.2076770717591	34.7474342862497	33.3877	38.8388	13.1359
23.550935930249	35.4852070855012	22.8416	32.9746	3.8923
23.7805151044995	35.9786459751109	24.2607	34.0424	1.9949
24.39452013925	37.2983386868723	23.8984	35.8981	7.2024
24.39452013925	37.2983386868723	26.8183	32.6012	9.1398
24.9101974199742	38.4066936829032	23.1185	40.5549	4.3029
25.1246398656337	38.8675989129373	40.4113	32.0356	16.7439
25.8453892534007	40.5483153378991	31.0932	49.2942	14.8063
26.3318060662456	41.6825913297087	27.2789	43.4795	3.5918
26.8030366873873	42.7814546218138	20.1897	48.2132	9.8947
27.7513699994879	44.9928742943708	23.5397	47.0618	4.6924
27.7518565266171	44.9937479598402	32.7117	42.3778	10.9453
28.243343085421	45.876319143122	44.7377	48.2657	29.7234
28.243343085421	45.876319143122	49.5234	55.0957	33.4236
28.7945865133218	46.8661968032598	27.0169	46.6583	30.8141
28.7945865133218	46.8661968032598	37.7223	44.0563	29.1657
29.3835438007187	47.9237979142639	32.0569	46.2162	8.3019
29.9347872302088	48.9136755768062	35.3466	47.2689	39.4146
29.9352737573403	48.9145492422744	32.0319	48.7602	2.1023
28.4434043792004	52.8643818556949	25.2216	48.8368	29.4028
27.2079331444404	56.135381749395	22.4944	48.7727	18.9786
26.6477163600442	57.6185964032715	22.5313	48.1754	10.3014
23.4416554268689	66.1068757460683	25.0595	61.5431	18.8768
20.8372308075917	73.002279220094	24.5323	49.8988	23.3971
17.7017331050948	81.3037372850067	18.7876	82.3448	1.5043
17.7008133199685	81.3041297073828	16.4864	81.6235	21.8233
16.7607530183407	81.7052023920584	17.8246	84.0918	15.5287
15.6772710723072	82.1674653044056	16.887	83.4344	34.5743
14.5902688925654	82.6312301097006	14.2245	83.0966	3.3966
13.5132249880453	83.0907462595989	13.8296	81.5783	24.0124
13.5132249880453	83.0907462595989	17.0206	82.7787	29.1615
12.4361810859189	83.5502624082377	16.072	81.5553	6.7432
12.4361810859189	83.5502624082377	16.2773	81.3093	7.8184
11.3591371889707	84.0097785545199	0.7751	88.6342	34.6112
11.3591371889707	84.0097785545199	6.7503	86.812	32.5272
10.2757380657782	84.472006130685	9.2565	85.6186	2.8621

Solution x	Solution y	Original x	Original y	Radius
9.19869416742776	84.9315222775454	10.8331	85.8288	11.4013
8.12165027504244	85.3910384216806	19.7188	83.0222	29.297
8.12165027504244	85.3910384216806	26.3736	85.6358	33.6814
7.06015690454517	85.8439200028042	5.091	83.7862	25.4049
4.78638298371607	86.8140158661921	2.5389	82.9669	4.4555
4.07307417500893	87.1183460009261	0.2473	82.0871	6.3206
4.07245020839082	87.1191274519222	1.8225	87.776	36.7171
3.32566628730433	88.0543938605568	1.5647	88.8122	1.9171
3.79258805126852	88.0938139249028	1.0919	90.7016	28.434
4.4081579213529	88.1457836676775	14.2132	82.4414	14.4019
4.96211801998781	88.1925519795629	7.7403	89.8119	8.6997
5.48767833437388	88.2369226281636	23.9463	67.9458	30.7026
6.01659165897199	88.2815763558321	7.6764	88.6806	9.6476
6.58697759791002	88.3297314262946	5.387	87.7604	6.3922
7.14549329414416	88.3768843466262	13.6279	83.3943	17.0874
7.57185181976611	88.4128798427857	13.617	84.1913	7.3733
8.26893881548541	88.4717317022666	15.9151	82.9337	11.014
8.82745451221268	88.5188846225796	4.4842	86.5445	5.1195
8.82745451221268	88.5188846225796	9.9966	85.8576	5.4423
9.39807286279658	88.5670593145571	11.6247	87.7046	3.2321
9.95658856204294	88.6142122349845	9.522	88.7288	27.8783
10.5151042618027	88.6613651555431	8.8756	85.3213	16.0341
11.0736199611842	88.7085180761311	13.2856	89.4879	21.8166
11.6321356584836	88.7556709965573	17.1642	87.7833	37.7116
12.190651353795	88.8028239167475	11.8372	87.4011	35.7247
12.7395502138391	88.8491649315418	7.4797	86.7529	25.8983
13.3000091728171	88.8964819126314	12.6448	83.0865	35.3802
13.8585248687063	88.9436348327002	15.4215	81.5375	38.9838
14.4170405647605	88.9907877529042	5.1953	87.1361	37.283
14.987204277294	89.0389240616689	6.0677	84.3942	37.1993
15.541797562236	89.0857458308322	2.625	81.2761	30.3022
16.1141707162466	89.1340686726958	3.3964	83.4982	22.6969
16.6611554320271	89.1802480852414	2.696	85.7661	16.7328
17.2043764637567	89.2261097473208	17.0519	88.8308	13.9972
17.2043764637567	89.2261097473208	17.8311	84.5721	18.6031
17.7570270337784	89.2727675023033	1.1933	81.8445	20.336
18.3490946716721	89.3227530596888	0.029	82.9455	21.0457
18.8969457149801	89.3690056123141	2.0599	86.005	20.2991
19.4010305161203	89.4115631815287	1.983	86.3665	17.6822
20.2172998680794	89.4804770619681	19.3715	86.9483	2.6697
22.6465753391275	89.6855696543038	17.7167	97.5636	31.3797
22.6465753391275	89.6855696543038	19.5543	89.8549	33.619
24.2462072135366	89.8206192409223	5.1015	81.8103	31.1473
24.2462072135366	89.8206192409223	10.6041	85.0219	25.6845
25.8545105155219	89.9564009165501	19.4915	88.9148	6.4477
28.5217548579218	90.1815841308532	29.7505	96.621	6.5556
39.0926893008032	84.9267722311409	39.3354	89.658	8.4792
47.1307194931397	80.931067130526	44.9743	74.4953	27.6089
55.1407086966732	76.9493012058982	44.1821	62.8241	34.6478
63.99389731817	72.5483808185407	63.7544	71.2264	1.3435
64.1603111923624	72.5655624227781	77.1151	89.3423	37.2077
64.1603111923624	72.5655624227781	76.9521	88.589	36.7425
65.0932456660391	72.6618843750755	73.5352	77.8165	36.1475
65.0932456660391	72.6618843750755	70.0314	77.1275	35.8588
66.2853552955186	72.784965180627	85.22	71.0885	39.2361
66.2853552955186	72.784965180627	75.9291	73.9471	36.4707
67.4331081152127	72.9034663129125	72.5026	72.4828	37.2859
70.48610596463	73.2186767811069	73.6361	68.0431	6.0588
70.4866541566863	73.2195131335862	47.0351	69.5204	24.0774
70.4866541566863	73.2195131335862	59.4827	70.1321	13.0297
70.4872023487437	73.2203494860645	77.364	70.7565	18.9213
70.4872023487437	73.2203494860645	75.6074	70.2776	26.094
70.4877505408127	73.2211858385356	79.4655	74.4467	12.4177
70.4877505408127	73.2211858385356	76.1847	74.2911	17.8739
70.4882987328605	73.2220221910201	80.2922	75.8098	14.5911
70.8430563270703	73.7632602282771	71.4242	75.4202	25.4968
71.182448006364	74.2810551652883	79.3483	75.3688	27.2443
71.5218396813114	74.7988500963382	77.1908	76.3248	8.3165
71.5218396813114	74.7988500963382	76.4126	75.548	18.6216
71.8612605762001	75.3166896061972	73.6863	74.2382	25.5224
72.2006522549922	75.8344845423767	81.0772	83.8409	24.7807
72.2006522549922	75.8344845423767	79.6279	80.9538	23.4026
72.536238575584	76.346473811071	76.1087	74.9228	26.6713
72.8756302549831	76.8642687477336	79.7296	78.3022	15.676
73.2134850762478	77.3797189675007	78.4966	80.8407	27.0644
73.2134850762478	77.3797189675007	78.9268	79.6337	28.7763
73.557935014667	77.9052310690379	70.8021	79.2974	26.617
73.8857177518524	78.4053147545558	80.2014	81.5949	32.3848
73.8857177518524	78.4053147545558	79.7775	80.296	29.6152
73.8862659439169	78.4061511070294	73.5126	71.3248	18.5601

Solution x	Solution y	Original x	Original y	Radius
73.8868141359707	78.4069874595104	84.5964	57.5663	31.6899
73.8873623280272	78.4078238119893	77.4087	74.0915	5.5705
75.2545305245037	80.4936521166102	75.4182	80.175	23.5169
75.2545305245037	80.4936521166102	73.1002	79.4037	12.7865
75.6350390350115	81.0741771934698	80.1131	82.5047	19.9521
75.6350390350115	81.0741771934698	80.3025	81.1115	15.7523
76.026545972078	81.6714820841358	76.3867	80.9989	33.1367
76.4044826561841	82.248083438312	77.4302	82.5606	33.5083
77.1295180858602	83.3542380628693	79.3747	83.7664	2.2827
77.1270101466943	83.3560569987256	76.7822	82.9894	3.1025
77.1262006405494	83.3566441101306	93.255	98.1789	39.9406
77.1262006405494	83.3566441101306	70.8501	86.3243	34.4665
76.9013755005322	83.5197032922148	75.5773	80.7384	16.9072
76.6397563411572	83.7094481127438	72.3356	86.155	38.7669
76.4052178522344	83.8795521046384	73.6161	81.1388	38.2238
76.4052178522344	83.8795521046384	75.2812	79.5319	38.4796
76.0933387697219	84.1057489960435	72.6803	81.9225	4.2531
75.8523911998246	84.2805013091083	72.5273	88.3137	14.2003
75.5817315036032	84.4768029700208	80.026	88.4312	31.2606
75.2948703210709	84.6848551011065	70.5598	83.7819	31.7327
75.2948703210709	84.6848551011065	74.3211	82.1244	8.5161
74.8475839565046	85.0092589837076	71.008	83.9726	10.613
74.8467744503812	85.0098460951417	70.0787	86.0551	4.8813
75.5890482292951	85.1571272698202	74.9451	88.4605	8.2599
76.2174563404678	85.28181533974	94.2258	98.7848	33.585
76.2174563404678	85.28181533974	92.093	98.3621	32.0505
76.8792895032963	85.4131355726513	80.252	96.9762	27.7656
76.8792895032963	85.4131355726513	82.1226	91.9552	29.2899
77.5197185668074	85.5402088270689	79.415	85.235	23.8334
78.1631852841678	85.6678848093215	73.8575	87.669	25.5244
78.1631852841678	85.6678848093215	71.0504	85.2637	27.4246
78.7940583843165	85.7930619795939	84.3608	92.148	27.0972
79.4747444717189	85.9281229898042	81.0134	86.425	31.9429
80.1220370446757	86.0565580943343	81.7913	86.2239	19.3521
80.7731905730608	86.1857592858468	80.4141	88.4668	26.3631
81.4231740170786	86.314728310171	81.9044	86.793	18.7468
82.0898380244832	86.4470070742719	82.5335	87.3296	23.2737
82.9443934870988	86.6165670614565	83.1803	86.2205	0.461
82.9450317825166	86.6173368529606	83.0689	84.7397	17.7189
83.2600634335789	86.9972685931821	83.3441	85.5151	31.408
83.26070172899	86.9980383846913	78.0272	82.0721	8.7342
83.6825236768102	87.506760432722	85.5265	86.4226	27.3567
83.8899267868559	87.7568909329545	85.7193	87.9646	30.5682
83.8905650822764	87.7576607244562	84.4799	87.8799	17.7516
84.0979681925928	88.0077912249111	85.8774	87.324	11.0712
84.4051801630123	88.3782923418323	85.6153	86.7737	37.7006
84.6125832735103	88.6284228424989	82.7904	89.3622	32.2308
84.809597657693	88.8660244212562	84.1657	89.6201	13.6552
85.0170007715533	89.1161549259686	83.1514	91.319	39.4372
85.2244038796152	89.3662854236946	96.6476	96.9796	23.7398
85.2244038796152	89.3662854236946	91.4519	94.5103	21.3367
85.4318069900204	89.6164159243123	85.3838	89.3565	14.2439
85.6602731493353	89.89194869987	84.5701	92.5098	11.4862
85.8676762593774	90.1420791999943	83.6163	95.496	6.5288
86.0750793694308	90.3922097001337	89.0976	96.4455	23.7594
86.2824824795324	90.6423402003898	92.0809	99.3222	13.6093
86.461385323334	90.8580990563106	88.3919	89.421	7.2563
86.461385323334	90.8580990563106	87.3294	86.7915	10.1629
86.761860103051	91.2204750443259	88.3323	91.5035	13.825
86.761860103051	91.2204750443259	85.4655	89.4614	13.9477
86.9692632131768	91.470605544541	88.5666	89.9178	22.668
87.1766663231577	91.7207360446692	88.1669	82.2879	36.2685
87.1766663231577	91.7207360446692	89.379	76.0987	38.3025
87.3840694332596	91.9708665448275	88.0059	90.774	31.4291
87.3840694332596	91.9708665448275	85.8291	89.3215	27.9965
87.5914725431685	92.2209970448959	89.5983	91.5249	17.2739
87.7988756529118	92.4711275446958	80.5965	92.0964	36.4049
88.0062787629586	92.7212580448707	81.2522	99.2612	19.7395
88.006917058376	92.7220278363752	82.0258	98.9707	16.4132
88.3363257514621	93.1192984518077	88.2673	94.5543	14.161
88.4943464573463	93.3098732118959	88.3602	93.5594	0.2833
89.257397184196	93.39263344158	89.983	98.6224	7.2459
89.2583913538346	93.3927412688941	89.3359	93.6392	11.0562
89.8868314973739	93.4609016792804	83.3685	88.3604	8.2767
90.4057356867771	93.51718185655	83.3686	96.8014	13.9298
90.9137990562813	93.5722862420007	84.0572	98.2927	11.5023
90.9137990562813	93.5722862420007	84.3334	97.0716	13.2701
91.3613040994469	93.6208224911821	86.994	98.105	12.5626
91.8489035675327	93.6737073684152	90.6972	96.9626	12.1171
91.8489035675327	93.6737073684152	89.931	94.5372	17.4038

Solution x	Solution y	Original x	Original y	Radius
92.3757777872533	93.7308519721255	97.9735	93.9042	16.4454
92.8544320755134	93.7827666574537	95.3031	91.4204	25.4609
93.3675658023571	93.8384209720543	92.8113	98.2407	11.443
93.7870452156654	93.8839175709837	93.4254	97.8126	10.7468
94.1499429743323	93.9232773419824	95.4796	96.129	2.5755
94.4162804584276	93.2521249323129	96.1791	97.5552	14.7422
94.6142253240028	92.753317286417	96.0605	94.495	12.9494
94.8278877901484	92.2149023521154	88.2817	96.351	29.8948
94.8278877901484	92.2149023521154	85.1326	93.3031	30.9423
95.0332278624115	91.6974592867639	94.8083	91.5304	29.5468
95.0332278624115	91.6974592867639	92.1839	88.8237	30.3052
95.2409246437653	91.174077474116	95.9324	92.1458	31.1565
95.4550655270523	90.6344569611498	94.509	92.4532	10.0411
95.6627623084194	90.1110751482136	96.5452	93.172	16.1374
95.8704590895941	89.5876933358446	96.6676	92.6743	10.3882
95.8704590895941	89.5876933358446	96.809	92.5136	11.7087
96.0781558712844	89.0643115224725	98.1513	96.345	8.7509
96.0781558712844	89.0643115224725	94.4375	89.8165	6.7853
96.2858526515701	88.5409297121734	96.671	90.7145	32.754
96.2858526515701	88.5409297121734	94.7976	88.4491	36.0251
96.5013507519701	87.9978891038092	83.9295	97.9734	22.5699
96.6936488128858	87.5133110225247	99.7949	88.8243	10.9809
96.6936488128858	87.5133110225247	97.4362	85.8361	6.7092
96.9035649674442	86.9843365393331	98.6006	82.3388	4.9458
96.9793587734625	86.7933412849892	97.0785	86.7219	0.1222
96.5014268205202	86.8200458928329	96.8293	85.3988	25.2212
95.9791625556553	86.8492275832644	97.0848	81.6578	37.2835
95.4617572284869	86.8781377792185	94.7529	81.9671	38.2984
94.9094995116978	86.9089953633457	93.0738	84.8753	27.0049
94.3994551162814	86.9374942640996	92.7639	86.5161	5.447
93.89680915841	86.9655797749186	94.6937	81.204	23.1601
93.89680915841	86.9655797749186	92.5909	80.0433	19.5797
93.3867647631924	86.9940786757231	84.7887	79.7551	24.4915
93.3867647631924	86.9940786757231	83.5177	79.6473	24.9276
92.9067239222555	87.0209011182965	88.7272	81.0174	30.12
92.9067239222555	87.0209011182965	89.7033	80.1502	26.8819
92.3966795267971	87.0494000192035	86.8222	80.0693	26.0963
92.3966795267971	87.0494000192035	84.6626	79.7388	28.8542
91.868532853563	87.0789103908753	89.9071	81.4441	15.7904
91.868532853563	87.0789103908753	87.485	79.3312	14.9303
91.3584884576135	87.1074092919438	90.7381	99.8897	39.8736
91.3584884576135	87.1074092919438	94.4683	90.0421	36.408
90.8484440618703	87.1359081930562	89.4099	75.3847	13.3372
90.3623893222032	87.1630666637622	99.7041	87.1751	20.8453
90.3623893222032	87.1630666637622	99.0472	85.7396	19.7408
89.835443998311	87.1925099098596	93.093	71.3467	21.4346
89.835443998311	87.1925099098596	84.8025	72.2361	24.0623
89.3465333807249	87.2198279540743	99.1691	80.9928	24.2662
89.3465333807249	87.2198279540743	97.0965	81.0307	20.0164
88.7831111723692	87.251309358653	91.162	99.965	25.8943
88.7831111723692	87.251309358653	93.3103	99.0843	24.3725
88.1542614477654	87.2864465470191	87.6085	88.0524	0.9405
88.0915696546882	87.0657838553326	99.292	98.0492	20.4892
88.0264675921222	86.8366374942589	87.8356	87.4643	27.6715
87.9235619497636	86.4744300214818	87.314	87.2617	16.5203
87.8195129631219	86.1081982046281	89.697	88.1654	35.3374
87.7291711364833	85.7902128752921	89.6546	85.279	10.469
87.7291711364833	85.7902128752921	90.3741	83.7882	6.0655
87.627392822149	85.4319733755378	89	83.7031	2.6411
87.4915487559501	84.9538291774257	90.1019	83.486	37.2389
87.4886986350252	84.9437973175485	87.8874	83.7559	28.0801
87.3499475082093	84.455420843006	84.785	93.3953	25.851
87.3499475082093	84.455420843006	87.2864	89.2526	24.3141
87.2484604988354	84.0982066810331	90.256	83.0105	8.936
87.1644825427556	83.8026209140521	87.8518	83.2273	10.2812
87.0392966240749	83.3619912850286	89.4354	80.1567	4.0019
87.0390233327537	83.3610293537141	87.7484	83.7546	5.1562
86.9244070569746	82.9576027741812	87.1273	84.0324	22.6844
86.9244070569746	82.9576027741812	86.7862	83.711	21.1375
86.8415713841263	82.6660376178066	86.8895	84.3247	31.0852
86.7732978916068	82.4257284521218	80.7173	88.9602	17.7309
86.7732978916068	82.4257284521218	81.9035	87.9149	16.8426
86.773024600283	82.424766520808	86.0867	81.533	7.8826
86.773024600283	82.424766520808	87.0156	79.966	12.6359
86.7727513089768	82.4238045894893	85.9222	83.4369	1.3228
86.4431088061818	81.2635282895072	87.5661	81.6563	27.3837
86.2504944156584	80.5855637953649	86.675	81.8002	31.4898
86.0562234911055	79.9017686306625	85.8335	84.6274	15.0275
86.0562234911055	79.9017686306625	84.7929	84.8117	17.1593
85.8777514643878	79.2735824536157	84.2824	83.9445	9.6857

Solution x	Solution y	Original x	Original y	Radius
85.6804865651384	78.5792490914974	84.0326	80.947	25.7062
85.4872284486445	77.8990188102157	82.7718	81.5009	13.2622
85.3027461229103	77.2496775724806	84.7658	77.8153	28.1634
85.1100489740286	76.5714217855132	80.7551	80.6861	19.901
84.9173518248462	75.8931659976851	77.9819	77.7483	19.944
84.7246546754913	75.2149102084515	82.0065	75.6791	28.4662
84.5551934656978	74.6184403204527	89.2994	73.1482	4.9668
84.2897981016157	73.828759904592	82.7574	74.2926	14.8137
84.05408502226	73.1273987340587	81.6179	74.1421	15.9576
83.8200553574336	72.4310465472145	88.176	88.8141	24.7619
83.8200553574336	72.4310465472145	85.5459	86.1581	23.0206
83.5864289683732	71.7358943005984	78.4301	80.0876	24.8331
83.5864289683732	71.7358943005984	76.8895	78.6378	24.9962
83.5118884306697	71.5140999049911	89.0638	74.5581	18.603
83.5115698610026	71.5131520055412	88.9513	72.6403	19.8606
83.5112512914543	71.5122041060513	84.4928	76.9707	35.8799
83.5109327219037	71.5112562065622	79.9937	73.4457	4.0141
82.381646542655	68.1510800183126	80.5183	71.0301	20.9716
82.3813279731073	68.1501321188225	82.4808	71.6064	18.1512
82.3810094033639	68.1491842193982	78.8402	71.1237	4.6244
80.9567700752406	63.911378788463	77.6803	63.0066	3.3991
87.9546081678383	57.9242650131169	73.1545	60.0435	34.4744
94.148797534703	52.6247259280724	99.2739	52.0431	5.158
86.0495879111839	48.3905481567129	91.1956	46.5873	33.1213
78.0396111998063	44.2030203706567	84.8772	45.0654	32.4975

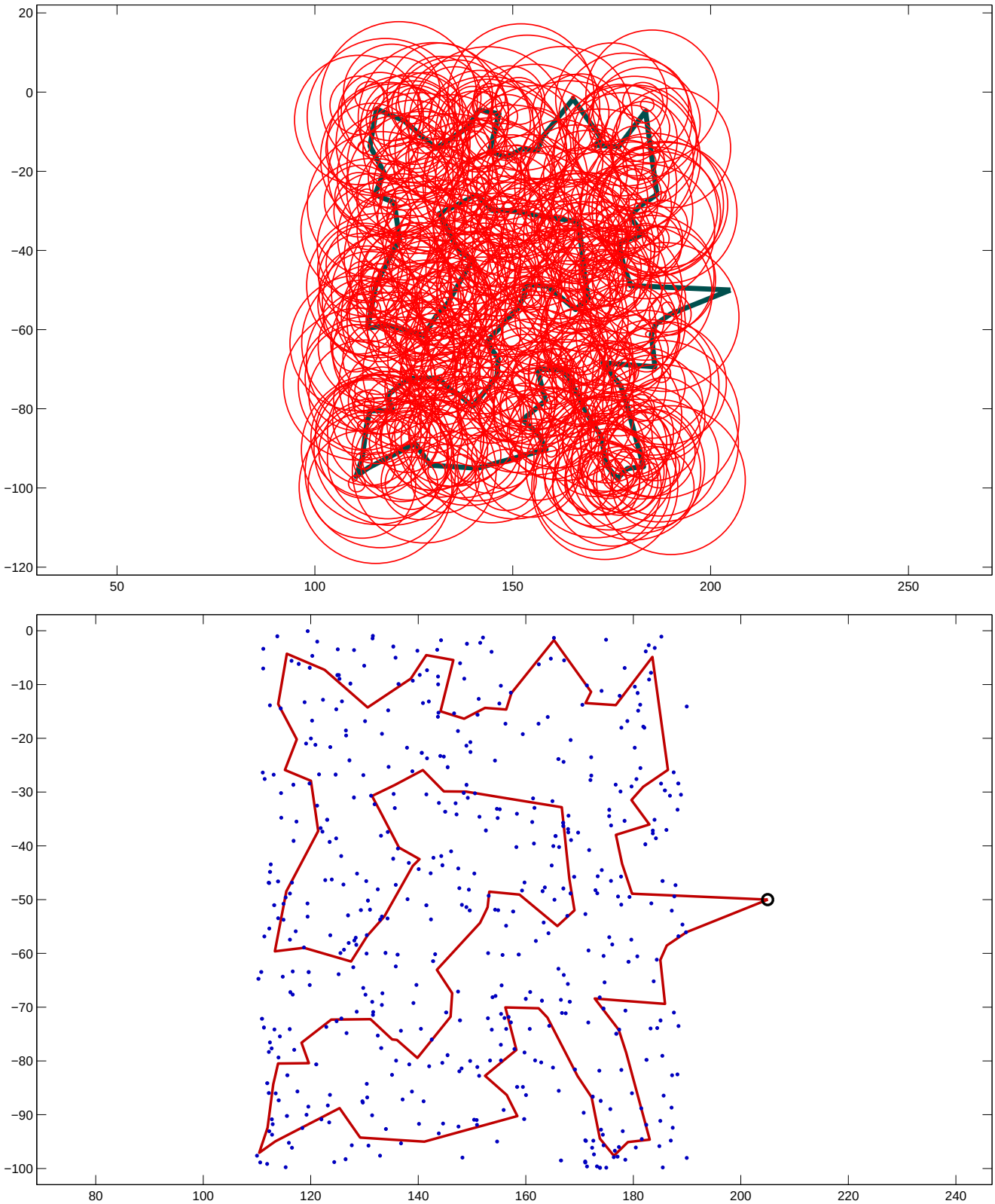

Figure N.54: *team*6_500, arbitrary radius, 2D, Euclidean, Length = 666.1490914

Table N-57: Solution for *team*6_500, arbitrary radius, 2D, Euclidean

Total distance: 666.149091405399 Depot: x 95 y 50				
Solution x	Solution y	Original x	Original y	Radius
79.9048856463479	56.0547294395765	79.155929	54.6404138	1.6003827
79.9048856463479	56.0547294395765	73.3690079	50.7128517	17.0196572
79.9048856463479	56.0547294395765	66.0988248	58.3515559	17.5072809
79.9048856463479	56.0547294395765	67.1669184	49.4371849	15.5982026
79.9048856463479	56.0547294395765	64.4880133	60.4854675	17.3914578
79.9048856463479	56.0547294395765	65.5436157	56.992435	17.084027
76.223043734484	58.53361239695	78.4106856	73.5257917	15.5467792
76.223043734484	58.53361239695	75.0689318	72.4744486	14.9698309
76.223043734484	58.53361239695	79.80288	56.0883078	5.2865846
76.223043734484	58.53361239695	77.8566059	47.3210428	13.3824609
76.223043734484	58.53361239695	77.1618533	52.0527053	6.548551
76.223043734484	58.53361239695	75.4422908	46.5496079	15.4085245
76.223043734484	58.53361239695	69.1126526	61.5737532	13.1055803
76.223043734484	58.53361239695	69.6306367	57.4599551	8.6491765
76.223043734484	58.53361239695	61.6781701	59.473286	14.5751959
75.023948725941	61.2369618007005	70.748982	60.565778	4.327335
75.0582953900065	61.5597089136622	74.3685871	61.179785	0.787426
75.8917785081126	69.3917418248095	77.5651358	71.0148631	2.331233
75.8917785081126	69.3917418248095	78.4065879	56.8222853	18.7893207
71.0778587152171	69.0273832834551	75.4040099	79.0607348	12.6702712
71.0778587152171	69.0273832834551	73.7932186	65.1929118	5.5307734
71.0778587152171	69.0273832834551	66.8428254	74.9418962	11.9134957
71.0778587152171	69.0273832834551	68.5426632	70.6500378	3.2232857
71.0778587152171	69.0273832834551	64.4543682	70.2655389	6.7382235
66.8816761357254	68.709780346974	64.6626599	65.39963	5.0684212
62.8240308359221	68.4026631130463	57.8283627	65.6998258	5.6799674
62.8240308359221	68.4026631130463	57.0800315	64.0172849	9.5428133
62.8240308359221	68.4026631130463	51.8847181	57.7017397	17.2459771
67.2923321665936	74.2262043911201	67.3900644	74.174693	0.1104763
67.2923321665936	74.2262043911201	63.772212	68.1836695	14.1434905
67.2923321665936	74.2262043911201	57.43771	71.1535593	13.3451357
67.2923321665936	74.2262043911201	56.7397866	71.0931061	12.7871715
67.2923321665936	74.2262043911201	50.8238583	67.1806384	19.5280512
68.6775444726226	78.467771589498	78.2121151	82.5216358	10.3605913
68.6775444726226	78.467771589498	67.7945884	81.6777909	7.7525837
68.6775444726226	78.467771589498	74.4567732	73.8913977	9.1604579
68.6775444726226	78.467771589498	61.6425082	72.8564323	8.9988257
69.494108815487	81.480437839244	72.4566884	79.8068651	3.4026054
69.494108815487	81.480437839244	73.2290706	73.9762718	18.8679238
72.4416453948256	92.3551991084077	76.9820609	94.8106777	5.1618551
72.4416453948256	92.3551991084077	77.3466754	92.4222135	14.6923437
72.4416453948256	92.3551991084077	70.4834315	96.1070737	17.0458905
72.4416453948256	92.3551991084077	75.0360354	91.1497098	11.023678
72.4416453948256	92.3551991084077	77.1265753	88.6843079	19.9105474
72.4416453948256	92.3551991084077	72.4289329	91.88372	10.9387068
72.4416453948256	92.3551991084077	77.2293497	82.6694496	19.9727905
73.0575508647739	94.6275461675395	74.8496365	95.8479299	2.1681576
73.0575508647739	94.6275461675395	75.6464183	86.4517504	11.7494177
68.9947355426961	95.0779610251917	75.4923392	99.8090463	10.3077719
68.9947355426961	95.0779610251917	66.5761879	96.7049476	4.0776062
68.9947355426961	95.0779610251917	68.0410206	93.0677269	2.2249974
68.9947355426961	95.0779610251917	71.4909917	88.8238404	8.4049975
66.3876624761666	97.6342042717202	66.3729212	97.9005203	0.2667237
66.3876624761666	97.6342042717202	63.6802314	81.8267454	19.0132656
63.7680788190999	94.4254292105515	79.9522127	98.0359405	18.7966063
63.7680788190999	94.4254292105515	68.523768	98.3881808	8.1618794
63.7680788190999	94.4254292105515	64.9776601	99.8572829	14.8646935
63.7680788190999	94.4254292105515	63.7965883	99.8649883	5.4396338
63.7680788190999	94.4254292105515	67.0620012	97.8077872	8.2792999
63.7680788190999	94.4254292105515	63.2522018	99.6147456	18.4401179
63.7680788190999	94.4254292105515	71.5874534	94.5399994	16.9233519
63.7680788190999	94.4254292105515	61.4066356	99.633296	16.0904388
63.7680788190999	94.4254292105515	67.3268965	96.007007	10.9024154
63.7680788190999	94.4254292105515	61.0701287	98.8683739	7.9054547
63.7680788190999	94.4254292105515	61.0630253	98.699805	11.0127062
63.7680788190999	94.4254292105515	62.6982725	97.3778678	9.4559017
63.7680788190999	94.4254292105515	64.4754864	95.6952093	6.985863
63.7680788190999	94.4254292105515	62.3573907	96.159986	5.0891887
63.7680788190999	94.4254292105515	56.5514993	98.5201232	8.4190197
63.7680788190999	94.4254292105515	62.5782193	94.8345715	11.8936571
63.7680788190999	94.4254292105515	64.3381393	93.722702	16.872102
63.7680788190999	94.4254292105515	61.1689993	94.8861498	3.5486281
63.7680788190999	94.4254292105515	61.0866811	94.7582572	17.8354325
63.7680788190999	94.4254292105515	64.0121883	92.7907393	9.0477095
63.7680788190999	94.4254292105515	65.7364961	88.9695394	13.1578882
63.7680788190999	94.4254292105515	60.774398	89.648206	12.5083419

Solution x	Solution y	Original x	Original y	Radius
63.7680788190999	94.4254292105515	63.9530194	87.4245185	11.3124411
63.7680788190999	94.4254292105515	52.878421	80.2956919	17.8391178
62.2425164886636	86.741730847955	62.4719528	86.6470186	0.2482165
62.2425164886636	86.741730847955	51.7496653	79.9144917	15.0357032
59.6344501480609	82.8210727497372	69.765468	86.0199863	10.8561261
59.6344501480609	82.8210727497372	56.1389342	85.561632	4.4417673
59.6344501480609	82.8210727497372	59.1397084	81.6064397	2.5044765
59.6344501480609	82.8210727497372	49.4827685	84.8462228	10.3517087
59.6344501480609	82.8210727497372	55.0653569	81.234009	5.9096312
54.0172474411486	71.9369098889286	58.1838222	68.9986011	5.0984315
54.0172474411486	71.9369098889286	50.7478618	74.0551131	4.9191824
52.3930277010123	70.2003764802073	54.3749565	73.471727	4.4215583
52.3930277010123	70.2003764802073	53.0250996	68.7918887	1.5438111
52.3930277010123	70.2003764802073	50.0180258	68.4527432	3.7667027
49.2896319504124	70.1232775582275	56.5346421	68.6367247	7.6638079
49.2896319504124	70.1232775582275	47.2434466	72.8348775	7.3999265
49.2896319504124	70.1232775582275	46.8228713	71.844353	6.908088
46.1973246534582	70.0464541264942	43.8195847	68.1613988	3.0343172
46.1973246534582	70.0464541264942	45.6990417	60.3070344	16.3509992
48.2568592020817	77.9481151417519	49.7783583	78.4397036	1.598943
48.2568592020817	77.9481151417519	43.6827488	74.1878852	13.0248043
48.2568592020817	77.9481151417519	42.9598051	72.0704928	12.5037762
48.2568592020817	77.9481151417519	44.3710695	67.9205927	17.6190773
48.2568592020817	77.9481151417519	45.5118999	65.9532613	17.6961201
45.5298633855689	80.2025100345843	41.3355343	82.7796974	5.9611972
45.5298633855689	80.2025100345843	32.5068688	76.0167984	18.6744309
42.4196327792422	82.773723319523	44.680977	94.9895485	12.4233676
42.4196327792422	82.773723319523	50.0446513	86.3510967	11.408718
42.4196327792422	82.773723319523	37.6570142	81.9317057	6.23332
42.4196327792422	82.773723319523	38.0621359	81.3957333	6.4246672
42.4196327792422	82.773723319523	34.482979	80.365325	8.2940253
42.4196327792422	82.773723319523	45.3945603	79.9114427	10.2225307
42.4196327792422	82.773723319523	43.3709663	79.9295648	6.4309473
42.4196327792422	82.773723319523	39.6568849	80.0063838	8.4281529
42.4196327792422	82.773723319523	47.9098314	77.7959758	9.5350991
42.4196327792422	82.773723319523	46.3729602	74.0499355	10.9997053
46.4525683813499	86.3311605302754	48.3895216	84.8378656	2.445755
46.4525683813499	86.3311605302754	46.0567355	72.019762	17.1499692
46.4525683813499	86.3311605302754	45.412979	71.2677197	19.9703759
48.4233273367505	90.2536237568554	49.7030604	90.8227548	1.4005809
48.4233273367505	90.2536237568554	40.3910959	90.932739	16.8734606
48.4233273367505	90.2536237568554	45.8972803	89.1189208	14.0274616
48.4233273367505	90.2536237568554	40.9923031	81.1407106	14.9699296
48.4233273367505	90.2536237568554	45.3765455	76.9954785	19.7202249
42.0741670768641	91.9991087941052	40.8799687	90.9919823	1.5621823
42.0741670768641	91.9991087941052	35.4564008	78.9241199	15.1810796
39.6507451447572	92.6653459854947	40.9379615	91.8870672	1.5042087
31.1232887887726	95.0096792515591	22.9057445	97.6296948	8.6251096
31.1232887887726	95.0096792515591	38.2308224	97.9753907	7.7014595
31.1232887887726	95.0096792515591	33.8269693	93.4852631	7.8640695
31.1232887887726	95.0096792515591	30.1525293	91.7059859	6.8413479
31.1232887887726	95.0096792515591	37.489488	92.2138591	7.9102312
25.3564768713979	94.6465031972026	26.8042407	95.3391438	3.8148041
25.3564768713979	94.6465031972026	21.4283979	90.119601	12.23519
25.3564768713979	94.6465031972026	34.617789	91.6565199	17.1587159
25.3564768713979	94.6465031972026	27.0999394	87.1794445	15.3093219
25.3564768713979	94.6465031972026	31.00496	87.5127119	15.7467648
25.3564768713979	94.6465031972026	28.8394854	85.6978668	18.7042447
25.3564768713979	94.6465031972026	25.1363027	82.596723	16.9876139
19.1916569096457	94.2582618191606	14.3875276	98.8261078	6.6290931
19.1916569096457	94.2582618191606	20.7475398	95.759314	2.1619272
17.382359286611	91.6672761331669	23.9936704	92.6751712	7.0508341
15.3629141006931	88.7753507568739	16.4819632	98.2716229	9.7324435
15.3629141006931	88.7753507568739	9.5621792	88.5032381	5.8071138
15.3629141006931	88.7753507568739	13.1891897	88.2938542	7.7896989
15.3629141006931	88.7753507568739	13.5790401	86.3111074	4.776713
15.3629141006931	88.7753507568739	20.5127244	86.7993916	6.7971193
15.3629141006931	88.7753507568739	20.4274735	84.2677658	6.7799767
3.41965730769783	94.951264731112	2.2885744	93.0945686	2.1740904
3.41965730769783	94.951264731112	17.6447354	95.7025091	18.1912178
3.41965730769783	94.951264731112	11.9839899	90.8471274	12.6071325
3.41965730769783	94.951264731112	7.5281123	85.6801168	14.3445898
2.83436899693248	95.3665178436137	5.9392628	95.2323551	4.2724995
0.409385532109027	97.0870065121506	0.0137858	97.6201473	0.6638812
0.409385532109027	97.0870065121506	3.4980922	86.0326352	13.3409157
0.520955931942026	96.753697563335	0.6045586	98.8714353	2.1193873
0.520955931942026	96.753697563335	1.8947773	99.155621	13.566985
0.520955931942026	96.753697563335	5.3401207	99.7769332	19.3172668
0.520955931942026	96.753697563335	6.5131248	96.1438685	18.9754882
0.520955931942026	96.753697563335	2.7731053	90.8551563	11.768651

Solution x	Solution y	Original x	Original y	Radius
0.520955931942026	96.753697563335	8.4509457	92.4898096	15.3075709
0.520955931942026	96.753697563335	5.5712407	90.2337915	18.9787731
0.520955931942026	96.753697563335	4.0389978	87.3302987	15.0585227
0.520955931942026	96.753697563335	9.2263989	90.0124515	19.4614621
1.96870661704268	92.4286412262216	2.8109458	93.7321232	1.5519124
1.96870661704268	92.4286412262216	2.9296139	91.7761922	1.1614786
3.02350933840985	84.3451700956575	1.9077799	84.1438746	1.1337425
3.02350933840985	84.3451700956575	5.6520223	82.6769432	11.1746738
3.02350933840985	84.3451700956575	2.7334234	77.6753662	7.9974461
3.02350933840985	84.3451700956575	2.4095765	76.567725	13.9285738
3.02350933840985	84.3451700956575	1.295681	73.7881021	19.2219951
3.02350933840985	84.3451700956575	0.9335658	72.1659561	13.4077909
3.02350933840985	84.3451700956575	3.2443278	74.1558976	17.4562068
3.02350933840985	84.3451700956575	6.6484375	67.6725429	18.7895827
3.02350933840985	84.3451700956575	12.9149435	73.6813943	16.8344008
3.4158727973667	82.6483151000812	2.2068367	85.97283	4.2948267
3.4158727973667	82.6483151000812	4.0094679	79.3774545	4.1542009
3.91965249509022	80.4696180510982	2.2118306	78.338365	2.7310978
3.91965249509022	80.4696180510982	6.6502494	63.3598676	19.9843888
9.66078459050098	80.4263641097528	13.4475731	91.4293541	11.6363893
9.66078459050098	80.4263641097528	6.9413921	77.9428724	8.4884288
9.66078459050098	80.4263641097528	11.0262565	80.6460603	8.6895387
9.66078459050098	80.4263641097528	6.0949397	74.0865476	7.6811646
9.66078459050098	80.4263641097528	16.6661596	74.8364156	8.962299
8.2755804604632	76.6130304527947	4.2645198	75.4568775	4.1743619
8.2755804604632	76.6130304527947	0.7950307	63.4582891	17.1080484
8.2755804604632	76.6130304527947	9.8142501	65.891213	15.3270767
13.8071090495139	72.3102656247462	6.2196931	67.2192158	9.1371587
13.8071090495139	72.3102656247462	14.8230271	72.6203252	2.4779351
13.8071090495139	72.3102656247462	15.7168362	72.1075902	1.9558061
13.8071090495139	72.3102656247462	19.7736057	66.4248411	8.3807699
21.1117745863618	72.2298369128953	21.6218153	70.9164832	1.4089143
21.1117745863618	72.2298369128953	21.4467307	69.0185063	4.517097
21.1117745863618	72.2298369128953	23.3330747	67.4297538	6.4618896
21.1117745863618	72.2298369128953	26.1534967	60.2417469	15.8350837
25.1367841056627	75.9935002938185	19.6994488	87.7215703	12.92719
25.1367841056627	75.9935002938185	25.8819635	79.9487476	9.3875474
25.1367841056627	75.9935002938185	28.3264783	80.6515072	7.0901709
25.1367841056627	75.9935002938185	23.1076735	77.6165558	6.3711973
25.1367841056627	75.9935002938185	22.4809106	75.2843669	6.1954617
25.1367841056627	75.9935002938185	21.5799527	71.4486566	10.0338577
25.1367841056627	75.9935002938185	20.1950128	67.681815	11.7719782
25.1367841056627	75.9935002938185	30.51178	74.0433946	12.6878142
25.1367841056627	75.9935002938185	23.2409835	69.6045703	11.4000663
25.1367841056627	75.9935002938185	29.1113171	69.2428114	9.8595935
26.0327643038229	76.0982516078998	26.7897314	74.395765	1.8631854
26.0327643038229	76.0982516078998	29.6716712	65.8677857	16.7115843
26.0327643038229	76.0982516078998	32.7632095	61.4478694	19.7763438
29.8374428485353	79.4376708118572	19.6070156	87.5155962	13.0351264
29.8374428485353	79.4376708118572	32.0336769	81.0046037	2.6979108
36.0118647339206	71.7811835392948	37.7594155	72.4638416	1.8761545
36.0118647339206	71.7811835392948	35.1926471	70.9963316	1.4121083
36.3019231706757	67.4039353220504	37.415218	67.1119326	1.1509522
36.3019231706757	67.4039353220504	39.5709227	52.0192185	18.7792196
33.4607865088294	63.0597304043033	25.824676	62.4300357	7.6620297
33.4607865088294	63.0597304043033	33.1471098	60.1558513	4.0709462
41.4774859445587	54.3456454265038	43.0002757	59.9692573	5.8261393
41.4774859445587	54.3456454265038	44.2906965	51.8898251	3.7343282
42.4348116622182	52.3806208030658	37.6481264	47.8813096	7.0802754
42.9041063150173	51.417337837734	44.8729194	51.9811136	2.0479424
42.9041063150173	51.417337837734	38.9617732	51.3997809	12.7914782
43.2064558857521	48.5328896044952	40.4352515	45.1450838	4.3768484
43.2064558857521	48.5328896044952	43.0965371	49.287121	2.8888775
48.8351037556539	49.0699258582547	48.6878693	60.2173135	11.2892676
48.8351037556539	49.0699258582547	49.7681271	46.8278362	2.4284766
48.8351037556539	49.0699258582547	49.3212736	48.3119567	3.8293124
48.8351037556539	49.0699258582547	46.3458684	54.8708712	8.2955698
55.8750555196746	54.9225272491385	56.0822206	62.8731122	7.9532835
55.8750555196746	54.9225272491385	53.3341085	54.2742297	4.845343
57.1462227530955	53.7485691320192	57.7424662	53.0431767	1.1375089
57.1462227530955	53.7485691320192	54.2235528	56.265496	13.6774223
57.1462227530955	53.7485691320192	53.5581269	47.7413894	13.1857928
57.1462227530955	53.7485691320192	47.6524078	52.2249928	17.0127082
59.0524751577455	51.9880923654118	62.9728444	48.2610974	5.9042331
59.0524751577455	51.9880923654118	61.0935569	52.6920317	2.1590612
58.1038293234897	46.1436027306084	57.9600279	34.4089577	11.7355261
58.1038293234897	46.1436027306084	57.8811625	36.8910334	11.1609103
58.1038293234897	46.1436027306084	57.0032853	47.929495	2.0977627
58.1038293234897	46.1436027306084	54.8328865	43.6672378	6.4152555
58.1038293234897	46.1436027306084	55.3536754	50.0230289	10.7398558

Solution x	Solution y	Original x	Original y	Radius
57.5928871437738	41.3099989189531	55.1300701	40.0588307	5.0900091
57.0820086781338	36.4769941271538	56.9481598	35.7189477	0.7997132
57.0820086781338	36.4769941271538	56.98499	36.3050676	14.2729457
57.0820086781338	36.4769941271538	51.5218465	39.5765057	17.6859637
57.0820086781338	36.4769941271538	44.7688336	34.8472485	19.5683767
57.0820086781338	36.4769941271538	53.1446811	48.4277704	14.7395753
57.0820086781338	36.4769941271538	48.2549784	40.2375649	18.4484604
56.6956830982619	32.8222888551004	62.0390375	27.7696953	7.3539199
56.6956830982619	32.8222888551004	51.358437	31.183912	5.9744983
49.9308497489392	31.7219896686255	57.0336699	24.3925592	10.3178167
49.9308497489392	31.7219896686255	57.9145816	37.4787407	9.8427718
49.9308497489392	31.7219896686255	51.6262531	32.9510025	3.6157759
49.9308497489392	31.7219896686255	55.5353048	38.1752447	10.1702798
49.9308497489392	31.7219896686255	51.2078647	35.5791539	4.4951633
49.9308497489392	31.7219896686255	48.3601763	34.0464698	2.951746
49.9308497489392	31.7219896686255	45.1705924	33.2150554	5.0012449
44.6768399182831	30.8674257152986	54.9748886	31.6899499	11.8489378
44.6768399182831	30.8674257152986	38.4714341	30.1541626	8.9883187
44.6768399182831	30.8674257152986	44.6441662	33.1239716	11.3823841
44.6768399182831	30.8674257152986	41.3950957	34.602479	10.330203
44.6768399182831	30.8674257152986	42.5831476	37.1399223	8.4151487
38.865988460935	29.9222915180943	38.9767874	28.6595996	1.2675438
38.865988460935	29.9222915180943	36.1244237	41.0242921	15.4858909
34.761796595036	29.8656086082993	34.7673517	23.4200763	8.3957645
34.761796595036	29.8656086082993	31.5115819	30.4349931	4.1547529
34.761796595036	29.8656086082993	39.21475	31.0795566	8.3251067
34.761796595036	29.8656086082993	33.8398153	32.0377234	2.359689
34.761796595036	29.8656086082993	37.130172	34.1670861	7.7958056
30.8451709913761	25.9205053466128	30.6527015	22.708305	3.2179614
30.8451709913761	25.9205053466128	31.6418617	23.7354033	2.3258089
25.5965179434237	28.7011835415484	28.9097869	26.1468646	4.1835746
25.5965179434237	28.7011835415484	25.434095	30.36432	1.6710488
21.3968974946707	30.7334342395207	21.2205961	30.6755865	0.1855493
21.3968974946707	30.7334342395207	35.0133629	33.6653342	15.142596
23.2494345116062	34.2402821424287	25.6408756	32.9849766	2.7008855
26.4224789437552	40.3238293095269	26.2175773	40.5220972	0.2851225
26.4224789437552	40.3238293095269	30.0937988	44.3308943	9.1718387
26.4224789437552	40.3238293095269	32.8302989	42.2309887	9.1323516
30.2262283608448	42.4698330862769	34.2887402	41.9043439	4.1016802
30.2262283608448	42.4698330862769	37.4597811	44.2188485	8.3563058
28.9795106573959	43.7287883385566	28.2512087	43.1796715	0.9121146
28.9795106573959	43.7287883385566	34.4981613	43.6098189	7.4849006
28.9795106573959	43.7287883385566	38.128444	50.990683	14.1351688
23.7145288840902	53.1069930073054	24.284459	53.5118781	0.6991082
23.7145288840902	53.1069930073054	28.018456	49.9258106	6.3626175
23.7145288840902	53.1069930073054	32.3078962	45.114069	14.2581658
23.7145288840902	53.1069930073054	39.4220046	48.156385	18.6805968
21.0817423015237	56.0858798039895	15.5276897	59.9411898	6.7609848
21.0817423015237	56.0858798039895	18.474215	58.4012448	5.4896057
21.0817423015237	56.0858798039895	21.0216738	51.8703093	6.5542883
20.540512176825	56.6982588378937	20.4303529	56.6155569	0.1377486
20.540512176825	56.6982588378937	20.3277951	46.570702	10.9961913
20.540512176825	56.6982588378937	23.9069485	59.9121563	8.0586758
20.540512176825	56.6982588378937	22.9209187	53.7233909	7.2787759
20.540512176825	56.6982588378937	23.2467308	53.1536864	11.4161743
20.540512176825	56.6982588378937	25.8175111	47.2716024	14.9058581
20.540512176825	56.6982588378937	32.3710377	53.6854	15.9945905
20.540512176825	56.6982588378937	31.5095969	51.0684653	15.7915136
17.5034966065234	61.4979023805233	15.1928212	63.8863652	3.6655736
17.5034966065234	61.4979023805233	17.9198509	62.5969087	1.1752301
8.74483670836479	58.9569116699574	8.7488745	58.9072962	0.0497795
8.74483670836479	58.9569116699574	18.5593029	70.8497614	16.4543343
8.74483670836479	58.9569116699574	16.1987878	59.3187745	8.6880066
8.74483670836479	58.9569116699574	18.3784185	57.1026507	10.6506348
8.74483670836479	58.9569116699574	20.3908302	60.0437447	17.1200275
8.74483670836479	58.9569116699574	19.3270801	51.9549025	14.5767542
8.74483670836479	58.9569116699574	20.6501388	50.1791373	16.3804834
3.32344877169506	59.6103718391507	0.2763329	64.7359652	5.9629374
3.32344877169506	59.6103718391507	2.2999767	55.3764405	4.3558776
4.31985026231807	54.4029785646321	4.9451086	53.7479899	0.9055154
4.31985026231807	54.4029785646321	6.1363219	48.8674613	18.2256529
4.31985026231807	54.4029785646321	9.6122245	63.4753738	15.5818673
4.31985026231807	54.4029785646321	9.4153722	53.1681384	17.5248196
4.31985026231807	54.4029785646321	9.4077401	50.7341371	15.2153276
4.31985026231807	54.4029785646321	13.6466825	56.641223	16.9874359
4.31985026231807	54.4029785646321	13.919931	46.2670929	15.1163989
4.31985026231807	54.4029785646321	17.0586402	58.0717087	18.9407433
4.31985026231807	54.4029785646321	16.0956015	47.1989931	14.2319044
4.31985026231807	54.4029785646321	18.1200543	57.6122523	15.16683
4.31985026231807	54.4029785646321	16.954408	52.9270638	16.3581023

Solution x	Solution y	Original x	Original y	Radius
4.31985026231807	54.4029785646321	18.6253841	45.1799856	17.6321283
4.87376173301024	51.50812637295	4.8021518	64.3437535	13.9826688
4.87376173301024	51.50812637295	2.1729785	46.8604253	11.1913394
4.87376173301024	51.50812637295	2.5746679	43.4683609	9.7340669
4.87376173301024	51.50812637295	2.4253981	44.8523436	11.7215543
4.87376173301024	51.50812637295	3.2029124	51.042154	12.1504864
4.87376173301024	51.50812637295	3.9504558	53.4738105	13.2039761
4.87376173301024	51.50812637295	6.1457761	57.4553139	10.5969023
4.87376173301024	51.50812637295	7.2093662	55.909681	8.5307974
4.87376173301024	51.50812637295	12.7057803	46.3942459	11.1678278
5.45526551736937	48.4690713392248	1.389212	56.8496436	9.3148689
5.45526551736937	48.4690713392248	2.27936	46.9159446	4.2205505
5.45526551736937	48.4690713392248	3.9184302	46.6238898	2.4013658
5.45526551736937	48.4690713392248	4.944301	50.787374	6.1768296
5.45526551736937	48.4690713392248	5.3360715	49.6056788	1.5688834
7.23941279259127	45.0911826384029	6.5220454	46.8393292	1.8896117
11.3906217702914	37.231785708574	12.1928408	37.3702852	0.8140869
11.3906217702914	37.231785708574	13.5198617	39.2703319	5.6665967
11.3906217702914	37.231785708574	14.7299938	38.6202015	5.5606508
11.3906217702914	37.231785708574	23.0786229	38.1227731	15.8911359
11.3906217702914	37.231785708574	24.3319298	37.4283803	13.053577
11.3906217702914	37.231785708574	22.4746551	48.1041051	15.816336
11.3906217702914	37.231785708574	25.3533813	42.3962835	16.55549
10.8314312733931	33.3759244379133	11.1949114	32.5347928	2.918689
10.1769293097633	28.8628496172533	9.7861225	28.4044715	0.6023624
10.1769293097633	28.8628496172533	7.3492035	35.5012058	9.3339917
10.1769293097633	28.8628496172533	13.0553452	35.1491327	12.3752896
10.1769293097633	28.8628496172533	19.7989907	26.8559855	13.3335104
10.1769293097633	28.8628496172533	18.0420031	31.0087706	9.8590332
10.1769293097633	28.8628496172533	15.6671545	41.9038059	18.2677056
10.1769293097633	28.8628496172533	21.8832831	32.2702186	16.0376904
10.0377669105191	27.9032643642965	11.5512784	26.7283657	1.9160125
6.96807224987381	26.6248935064611	1.0903939	26.3844516	6.0462866
6.96807224987381	26.6248935064611	1.4410502	27.5670412	9.0702473
6.96807224987381	26.6248935064611	4.5207011	34.7763494	18.0479256
5.1980938201194	25.88778781183	3.1062568	26.7803784	2.2743131
5.1980938201194	25.88778781183	4.4919615	30.1971308	9.6799472
5.1980938201194	25.88778781183	6.820668	39.0713932	16.2462105
5.1980938201194	25.88778781183	17.2034005	24.1027648	19.2446407
5.1980938201194	25.88778781183	14.6392528	26.7492086	14.0759419
5.1980938201194	25.88778781183	11.8541821	36.7134083	16.0938551
7.39815796619584	20.2082492215019	10.0346396	20.0550826	2.640927
7.39815796619584	20.2082492215019	24.4888337	25.329984	19.8782132
3.9303117809896	13.637688965753	2.4227502	13.8762399	1.5263186
3.9303117809896	13.637688965753	4.4183327	14.4467589	11.646626
3.9303117809896	13.637688965753	8.8711802	13.2955279	15.7653907
3.9303117809896	13.637688965753	9.1420339	20.9818632	15.7590069
3.9303117809896	13.637688965753	10.881307	21.222109	15.2562401
3.9303117809896	13.637688965753	6.7702019	28.6398243	18.6590849
3.9303117809896	13.637688965753	16.5565287	18.5575743	18.4350632
5.55503814943278	4.2714957041425	3.796854	1.0310825	3.6866637
5.55503814943278	4.2714957041425	1.1893308	3.3623299	7.3969025
5.55503814943278	4.2714957041425	9.4518233	0.0818322	12.2091392
5.55503814943278	4.2714957041425	1.1696301	7.0254341	16.3262783
5.55503814943278	4.2714957041425	11.2137447	2.0282324	19.8233424
5.55503814943278	4.2714957041425	6.4321646	5.6038094	10.5758755
5.55503814943278	4.2714957041425	7.7653349	6.167634	19.726704
5.55503814943278	4.2714957041425	10.2956976	4.6843351	13.6376992
12.3694600575891	7.19106678628708	9.8269964	6.8843491	6.8651251
12.3694600575891	7.19106678628708	17.3929381	9.8303298	5.6745961
12.6257945556156	7.30089057290741	15.0419936	3.4632806	4.5348945
12.6257945556156	7.30089057290741	21.5694811	0.9567502	13.3401903
12.6257945556156	7.30089057290741	18.0605132	3.6100683	8.5868999
12.6257945556156	7.30089057290741	14.9649191	8.2569823	11.1052011
12.6257945556156	7.30089057290741	15.2275578	8.2482088	10.0059049
12.6257945556156	7.30089057290741	19.95828	6.5164086	19.0088103
12.6257945556156	7.30089057290741	15.3634563	8.946465	13.8278483
12.6257945556156	7.30089057290741	12.2844966	12.8434228	16.9324181
12.6257945556156	7.30089057290741	10.2638739	16.7343669	18.8298176
12.6257945556156	7.30089057290741	26.3324067	9.9110212	19.0585155
20.5793184411812	14.2630905692539	25.7941467	5.022901	13.154074
20.5793184411812	14.2630905692539	15.820225	13.1438067	7.149623
20.5793184411812	14.2630905692539	14.7546051	14.610274	12.5838102
20.5793184411812	14.2630905692539	20.1050057	16.8211128	7.104643
20.5793184411812	14.2630905692539	13.6477983	21.6503409	10.1300266
20.5793184411812	14.2630905692539	16.5956207	19.4929376	6.6403358
20.5793184411812	14.2630905692539	23.260163	19.1726271	5.5937891
28.6036450725496	8.9177047260718	28.9980611	9.3107142	0.5567948
28.6036450725496	8.9177047260718	33.6893922	8.5224136	19.9918892
28.6036450725496	8.9177047260718	33.7088519	9.9711832	13.226048

Solution x	Solution y	Original x	Original y	Radius
28.6036450725496	8.9177047260718	24.4057133	14.819481	14.1480218
28.6036450725496	8.9177047260718	31.9710737	13.1659452	6.1525799
28.6036450725496	8.9177047260718	41.2499501	12.693222	15.4469364
28.6036450725496	8.9177047260718	36.6688954	15.3802855	16.9765386
28.6036450725496	8.9177047260718	33.6742877	16.0147514	19.9827348
28.6036450725496	8.9177047260718	27.922577	21.764341	14.2606988
28.6036450725496	8.9177047260718	39.7157151	22.5518047	19.2813071
28.6036450725496	8.9177047260718	34.0986738	23.3047286	16.797077
31.4979240175664	4.53908132040342	21.5004558	1.4444458	10.4654737
31.4979240175664	4.53908132040342	25.3620642	2.9418291	9.3612642
31.4979240175664	4.53908132040342	34.237799	1.769458	3.8958604
31.4979240175664	4.53908132040342	39.0651937	2.4238303	9.0370307
31.4979240175664	4.53908132040342	29.8399494	3.731908	5.1894117
31.4979240175664	4.53908132040342	33.5301093	3.5426558	3.7368294
31.4979240175664	4.53908132040342	30.2787157	8.2280249	8.4927039
31.4979240175664	4.53908132040342	38.5584867	8.9239146	8.3130054
36.5323132875888	5.45913019031094	41.5241877	2.2495139	5.9346817
36.5323132875888	5.45913019031094	37.7928549	6.0601138	3.405887
34.1290792757282	14.9818638995636	30.8819888	13.4626957	3.5848945
34.1290792757282	14.9818638995636	33.7699504	15.2531662	0.4500872
38.5322463815227	16.3599313246456	38.9701661	21.3778805	5.0370217
38.5322463815227	16.3599313246456	36.9545772	32.1019086	17.1509479
39.836540185442	15.6851815322897	37.3849664	18.6565566	3.8521791
39.836540185442	15.6851815322897	35.4889656	25.3753347	17.6050983
39.836540185442	15.6851815322897	40.565033	30.2350611	16.7047972
42.427331244508	14.3448889003496	31.6461166	7.3585956	12.8469017
42.427331244508	14.3448889003496	45.092729	13.545129	9.6124868
42.427331244508	14.3448889003496	52.3761166	17.3066951	10.3802999
42.427331244508	14.3448889003496	41.0252369	15.6288565	2.3078897
42.427331244508	14.3448889003496	39.7052051	20.7340789	9.9402181
46.3543198746229	14.6444723400249	49.4509792	19.23293	5.5356339
47.3264002120468	11.5816041434077	47.2237184	11.5265695	0.1165005
47.3264002120468	11.5816041434077	44.272376	24.1529526	13.4087757
55.2431565315716	1.72528570297848	55.2537104	1.3428502	0.3825811
55.2431565315716	1.72528570297848	42.0438698	1.2746098	18.5219549
55.2431565315716	1.72528570297848	57.1362338	5.5136309	10.1201436
55.2431565315716	1.72528570297848	54.6678163	5.1970784	9.6677205
55.2431565315716	1.72528570297848	43.6411268	3.9331303	18.3321607
55.2431565315716	1.72528570297848	52.4413086	6.2567644	17.7872557
55.2431565315716	1.72528570297848	45.3795945	10.2393952	17.2768189
55.2431565315716	1.72528570297848	54.100404	16.0525172	18.9251989
55.2431565315716	1.72528570297848	46.2315326	17.3070005	18.9782971
62.1425760061921	11.3585693545947	64.1033853	11.196525	1.9674937
62.1425760061921	11.3585693545947	61.3811866	10.1841347	1.9011369
61.1103515529659	13.4598500350689	60.5482992	13.7850738	0.6493638
66.7461316121166	13.82702864034	75.2339764	1.1053279	16.7841753
66.7461316121166	13.82702864034	64.943613	1.686391	14.0946653
66.7461316121166	13.82702864034	79.9570853	14.106802	15.0949781
66.7461316121166	13.82702864034	73.292725	7.8305571	14.0833606
66.7461316121166	13.82702864034	70.2907843	10.4186099	7.1185577
66.7461316121166	13.82702864034	70.8086056	11.5809577	15.5821047
66.7461316121166	13.82702864034	71.2868972	13.7571779	15.5198317
66.7461316121166	13.82702864034	70.9135058	14.8761766	6.3074316
66.7461316121166	13.82702864034	67.4654721	12.1137109	14.0781794
66.7461316121166	13.82702864034	71.8742878	17.8343061	6.5081686
66.7461316121166	13.82702864034	70.2766166	21.7580017	9.1846004
66.7461316121166	13.82702864034	58.3586123	20.3359236	10.6167883
66.7461316121166	13.82702864034	56.0727891	23.8686819	15.5553362
73.5534468708407	4.87201383070177	73.9903157	3.2090585	1.7193821
73.5534468708407	4.87201383070177	72.8917692	2.6849909	5.1292918
73.5534468708407	4.87201383070177	72.320279	3.8462993	12.1872623
73.5534468708407	4.87201383070177	68.4102584	6.9403941	16.8109375
73.5534468708407	4.87201383070177	68.9038468	16.8104734	18.4978064
73.5534468708407	4.87201383070177	67.7860652	18.0440513	17.8951575
74.9689161085647	15.2022264842777	72.9487249	9.0752285	6.7256814
74.9689161085647	15.2022264842777	72.0757838	18.033427	4.1897587
76.4303982665058	25.8682450340339	77.5184606	26.3492827	1.1896541
76.4303982665058	25.8682450340339	78.3681704	28.4149174	15.9637623
76.4303982665058	25.8682450340339	78.8734057	30.5074156	17.7741551
76.4303982665058	25.8682450340339	76.8303918	30.6898889	15.6982902
76.4303982665058	25.8682450340339	75.8801773	29.7113355	15.8480612
76.4303982665058	25.8682450340339	75.1791401	28.4357222	18.0653964
76.4303982665058	25.8682450340339	73.9542296	35.1681427	17.0431609
76.4303982665058	25.8682450340339	69.6772126	28.9703915	10.4491408
76.4303982665058	25.8682450340339	62.1748486	23.5386262	19.2663276
76.4303982665058	25.8682450340339	67.6344777	29.9025036	17.8609779
71.8439030983365	29.0200877894888	70.5957341	27.6007009	1.8901283
71.8439030983365	29.0200877894888	66.7264937	28.6241638	9.8453178
71.8439030983365	29.0200877894888	62.1996928	26.9322785	11.912547
71.8439030983365	29.0200877894888	58.429274	38.9397266	18.6397178

Solution x	Solution y	Original x	Original y	Radius
69.6406273287177	31.4806943437785	71.3343578	25.5495623	6.1682291
69.6406273287177	31.4806943437785	65.5339196	33.299582	4.4914809
72.990339016831	36.0314575289027	78.2442809	33.2914556	5.9254971
72.990339016831	36.0314575289027	76.1612584	37.0439506	3.365582
72.990339016831	36.0314575289027	73.6393721	37.6930766	4.535198
72.990339016831	36.0314575289027	72.24704	39.7077335	3.7506664
72.990339016831	36.0314575289027	68.3855742	35.3493495	5.6398572
66.7654579301382	37.9634281203977	74.2228108	38.6099587	8.4402478
66.7654579301382	37.9634281203977	65.5247054	34.4819771	3.6959394
66.7654579301382	37.9634281203977	65.884583	36.2103636	2.551361
66.7654579301382	37.9634281203977	64.136723	44.5156078	8.3082067
66.7654579301382	37.9634281203977	59.7400431	37.5401839	7.0381524
67.9116216442345	43.3421840921983	73.6483802	37.1698351	9.29445
67.9116216442345	43.3421840921983	65.8501112	46.5185477	5.7590293
67.9116216442345	43.3421840921983	63.3053921	48.8331121	9.0739339
67.9116216442345	43.3421840921983	58.9987357	45.7674431	9.2369593
69.7605443388071	48.8954646809897	69.2934493	49.5142976	0.775327
69.7605443388071	48.8954646809897	67.7686962	50.942416	9.9071922
69.7605443388071	48.8954646809897	63.3830619	45.6708392	11.4259131
69.7605443388071	48.8954646809897	61.8021468	40.7857588	13.1222565
69.7605443388071	48.8954646809897	58.3317264	48.8464518	16.6689028
69.7605443388071	48.8954646809897	56.2067364	40.2417677	19.6165059
77.7568348449304	49.2454003280632	77.6409989	49.4044045	0.1967239
77.7568348449304	49.2454003280632	67.7343836	45.7338412	10.9613064

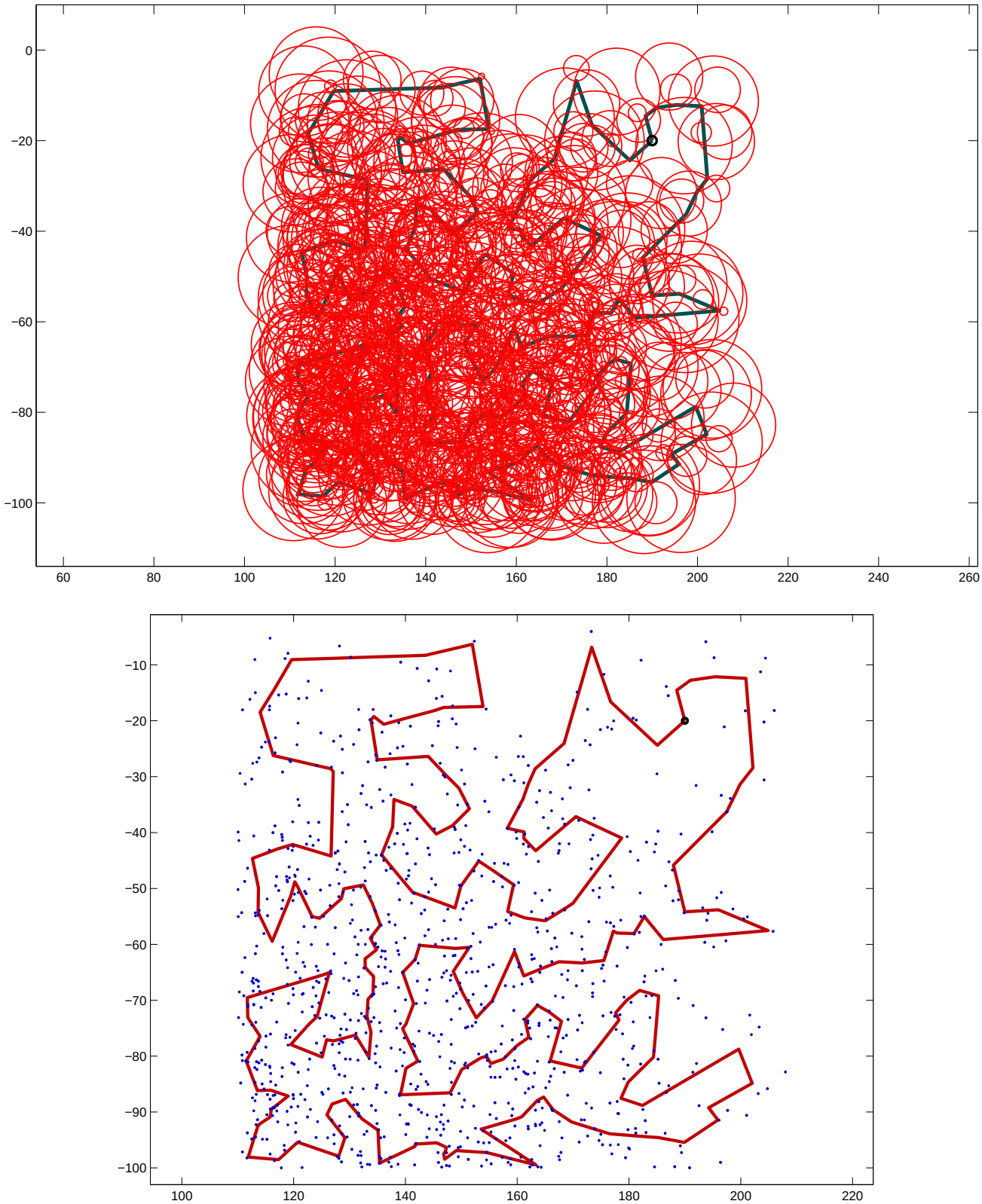

Figure N.55: *bonus*1000, arbitrary radius, 2D, Euclidean, Length = 987.1139070

Table N-58: Solution for *bonus*1000, arbitrary radius, 2D, Euclidean

Total distance: 987.113907029313 Depot: x 80 y 20				
Solution x	Solution y	Original x	Original y	Radius
78.5351292670073	14.5279195556779	76.68650337	13.86956158	1.962359022
80.9994234761048	12.7500706671928	83.75499038	5.857780347	7.422722871
80.9994234761048	12.7500706671928	77.03036191	15.51069798	4.834719524
85.3853242367801	12.1193128007606	85.22979418	8.715884504	3.406980154
90.9200270928799	12.4046226440499	94.43184685	8.796264511	5.035188817
90.9200270928799	12.4046226440499	93.53556787	11.2495411	9.93311926
91.5359553436184	20.2228454801358	95.99475962	18.1472698	6.014618976
91.5359553436184	20.2228454801358	90.81819821	18.2159484	2.233445753
92.1812773230297	28.4141523443588	94.15587216	20.2227246	8.426061551
92.1812773230297	28.4141523443588	94.17807015	30.5898166	2.95308255
92.1812773230297	28.4141523443588	88.13068149	33.9074779	7.167241247
89.8743652321792	31.3599026548035	87.03899122	21.09553754	10.64878101
89.8743652321792	31.3599026548035	86.50661976	33.33916758	4.865256989
89.8743652321792	31.3599026548035	82.01891737	31.58538586	7.858683337
87.5079551793071	36.2317820546306	87.56748283	36.27406643	0.073017187
87.5079551793071	36.2317820546306	84.85983095	39.85329756	7.318048431
77.9456971208988	45.8383335802584	79.30599483	40.28434635	6.78710395
77.9456971208988	45.8383335802584	77.77449926	46.72256252	0.900649502
77.9456971208988	45.8383335802584	77.14427045	45.25079579	1.425858377
77.9456971208988	45.8383335802584	76.57028534	49.55513485	6.459051132
77.9456971208988	45.8383335802584	73.13866372	41.71405139	6.333819835
78.9734091049988	50.041977218472	78.92131522	50.41345477	0.375112442
78.9734091049988	50.041977218472	75.19376171	39.75388964	11.99616742
78.9734091049988	50.041977218472	74.55729645	43.48740037	11.94062462
78.9734091049988	50.041977218472	71.61626861	44.97765672	11.56039904
79.4838138649954	52.1296804519119	77.87000631	52.21112855	1.783848909
79.9877776956674	54.1910383779504	79.86750899	54.35421653	0.202710806
79.9877776956674	54.1910383779504	71.99750065	50.82091856	11.82057255
83.5478565117155	53.9746427200738	83.19197135	53.48639501	0.813698186
83.5478565117155	53.9746427200738	78.85550393	52.04144231	8.272925398
85.9919531652913	53.8260801199722	86.51848331	50.71555717	3.154772102
90.8890085788334	55.8739321855581	91.19333201	55.09349477	2.162271031
90.8890085788334	55.8739321855581	85.71414415	51.67250379	10.80797757
90.8890085788334	55.8739321855581	84.14082278	54.46253046	9.425227564
90.8890085788334	55.8739321855581	83.91646182	55.69492785	10.80258547
94.8758502629085	57.5411509610518	95.77662579	57.68215173	0.911744354
94.8758502629085	57.5411509610518	90.50689197	55.43830225	10.39640446
94.8758502629085	57.5411509610518	88.60564442	53.67349247	11.4446079
94.8758502629085	57.5411509610518	87.34079917	59.37931572	11.8500657
85.6419273160019	58.3329053995318	85.16088414	60.47696067	4.793291165
85.6419273160019	58.3329053995318	83.55927983	59.64747077	10.99948591
76.1243832064377	59.1489734103752	75.75634139	60.02200009	0.947433566
72.7397601091238	55.0257654000401	72.73426073	54.95021428	0.075751006
70.9043932118675	58.0736813287219	70.94365949	58.14560753	0.08194644
67.8771125636393	57.984761974785	76.04244622	64.45001766	10.41499903
67.8771125636393	57.984761974785	74.85083054	64.74645556	10.29426937
67.8771125636393	57.984761974785	71.85259834	57.85616299	6.145303146
67.8771125636393	57.984761974785	72.13050555	55.03070373	5.622701454
67.8771125636393	57.984761974785	69.70404765	60.5822767	3.495543351
67.8771125636393	57.984761974785	65.09617026	64.32634731	6.924546531
67.8771125636393	57.984761974785	68.52022941	55.69012612	6.004927032
67.8771125636393	57.984761974785	65.84999623	61.37790202	9.405960407
67.8771125636393	57.984761974785	67.27809665	56.79217526	1.980408171
67.8771125636393	57.984761974785	67.10787364	49.80646667	8.845260172
67.8771125636393	57.984761974785	62.01287875	62.70691628	7.75530817
67.8771125636393	57.984761974785	63.59211348	50.34808715	9.725987624
67.8771125636393	57.984761974785	62.81703196	55.94894639	5.494902887
67.8771125636393	57.984761974785	61.56325619	58.635877	7.786489382
67.2105451611472	57.6442831925314	66.67873973	56.13517049	1.600074425
67.210006517295	57.645125726092	65.98277732	56.02257659	2.034393571
65.5079821052978	62.899579005605	67.87575086	63.89107621	2.566981804
65.5079821052978	62.899579005605	65.33791464	63.72798066	0.84567857
61.6031429917813	63.3473597922415	61.64088805	64.72462094	1.377778269
61.6031429917813	63.3473597922415	59.10597324	64.72617137	7.277653794
61.6031429917813	63.3473597922415	56.20333441	63.09635143	7.090992634
61.6031429917813	63.3473597922415	56.12304172	60.76926662	8.549372537
61.6031429917813	63.3473597922415	56.73611746	58.87824868	10.42122905
57.5138754320585	63.1042192110719	60.59756518	67.42291916	6.033901052
57.5138754320585	63.1042192110719	61.59665848	60.86573745	4.870665397
57.5138754320585	63.1042192110719	54.03625818	65.02303827	5.354401863
57.5138754320585	63.1042192110719	57.09480153	60.45993374	2.677287543
54.2781598347661	64.3731764527131	50.86986196	67.11854893	4.50428609
54.2781598347661	64.3731764527131	54.15102156	63.89433124	0.495436049
54.2781598347661	64.3731764527131	50.37372436	63.54183807	3.991959404
51.1962592017122	65.652912184262	47.89205446	67.3947139	3.735189713
51.1962592017122	65.652912184262	52.45383187	66.17944394	1.363350544

Solution x	Solution y	Original x	Original y	Radius
51.1962592017122	65.652912184262	50.29671492	64.07582579	2.617903286
49.5151439578133	61.3064018742565	49.52719402	60.88674536	0.419829482
47.5244765493481	65.6877602420425	45.68320409	63.6499192	2.984457028
47.5244765493481	65.6877602420425	44.98764045	56.96391467	10.72794423
47.5244765493481	65.6877602420425	48.65047008	56.26343732	11.1175127
45.4964352183785	70.1513767340573	45.59084573	70.21452412	0.113582292
45.4964352183785	70.1513767340573	44.42598809	67.45202223	3.872665591
44.0895456794903	71.6537972007775	43.59103477	70.75648589	1.830314492
44.0895456794903	71.6537972007775	42.13585343	68.94604524	4.750703238
44.0895456794903	71.6537972007775	42.95157888	64.84132436	9.17378456
44.0895456794903	71.6537972007775	44.96838238	64.05706864	9.942108139
42.6874119701557	73.1511389005075	42.58773685	73.94634336	0.801427016
42.6874119701557	73.1511389005075	44.13660931	71.38940487	5.060740493
40.2673238847719	68.7545271596841	37.43465738	70.14594443	3.15595335
40.2673238847719	68.7545271596841	41.30767537	70.05965636	2.389077221
39.7341742707433	67.5278163800693	39.73860453	66.92518954	1.039178085
39.7341742707433	67.5278163800693	38.18944723	65.54612606	4.457511574
39.7341742707433	67.5278163800693	41.72708173	62.5487287	8.265204335
39.7341742707433	67.5278163800693	43.40294282	59.60424206	9.536160415
38.5666518747687	64.8414956588561	39.12047899	68.75765335	3.957947734
38.5666518747687	64.8414956588561	36.88863481	65.11756178	1.700574542
38.5666518747687	64.8414956588561	36.99117209	62.09652931	3.164960791
38.5666518747687	64.8414956588561	40.91327599	65.05437313	3.322312195
39.830007925609	62.9325597852793	41.95981534	64.94436816	2.929752986
41.4107541583781	60.5440462530807	41.72170476	60.36141703	0.360615737
38.9450727521457	60.7316345086394	38.05290287	66.43336709	5.771110944
38.9450727521457	60.7316345086394	38.87334077	61.97418169	1.279905437
38.9450727521457	60.7316345086394	39.00311055	58.98114927	3.475306118
38.9450727521457	60.7316345086394	41.10546356	60.73573959	2.160394708
38.9450727521457	60.7316345086394	42.10911161	58.06602885	5.369736734
35.7454441627176	60.4560198819878	36.65639834	59.2724504	2.438593171
32.5323865884956	60.179248486972	32.47933058	60.09950546	0.095780428
32.5323865884956	60.179248486972	34.15128455	57.37934974	3.806785854
32.5323865884956	60.179248486972	33.45872958	53.85918585	6.545746658
32.5323865884956	60.179248486972	40.32660467	53.626561	11.22803277
31.7203162016786	62.7082308224448	31.78300706	62.74548174	0.072923073
31.7203162016786	62.7082308224448	35.39691212	60.01558524	7.016255469
31.7203162016786	62.7082308224448	38.55825219	62.0328479	8.230604564
31.7203162016786	62.7082308224448	37.67648628	59.01822185	8.663388767
31.7203162016786	62.7082308224448	36.93641703	55.80482127	9.247821291
29.5168003083827	65.0192846977178	29.47881008	65.01108227	0.038865631
29.5168003083827	65.0192846977178	32.28903103	63.37386507	5.529867185
29.5168003083827	65.0192846977178	37.36735143	64.72519961	8.210035462
30.4938375604154	67.8142409873125	28.77703399	67.75671878	2.359780417
30.4938375604154	67.8142409873125	32.14669335	66.5741861	2.169371802
31.469129313359	70.6042016703816	31.96159565	70.60936436	0.492493397
31.469129313359	70.6042016703816	33.85806756	68.2147305	8.272925857
31.469129313359	70.6042016703816	34.32584869	66.311045	8.8122254
31.469129313359	70.6042016703816	38.57181853	69.29967661	10.842735
31.469129313359	70.6042016703816	36.53251416	65.89826385	7.253690252
31.469129313359	70.6042016703816	39.83687168	68.05987049	8.931405029
30.1006605245545	74.2702970458285	32.43971284	75.52883521	2.656140818
29.5040258672735	75.0886116954506	28.44331265	74.98671685	1.065596119
29.5040258672735	75.0886116954506	29.09610379	74.18683092	3.584248474
29.5040258672735	75.0886116954506	28.17365085	71.94302821	4.360337135
30.475716267781	77.1609178866639	31.34183617	77.86791685	1.166905359
30.475716267781	77.1609178866639	29.81370195	76.77877617	0.987897175
31.4381478980765	79.2134776447931	30.96168192	84.99460949	5.800733164
31.4381478980765	79.2134776447931	29.7776223	79.3796747	3.220365403
31.4381478980765	79.2134776447931	29.05539546	78.84402949	4.430792212
31.4381478980765	79.2134776447931	31.54519137	79.16359507	3.505835342
31.4381478980765	79.2134776447931	35.96077646	77.38727187	5.108866084
31.4381478980765	79.2134776447931	35.03662295	76.31902131	4.632798788
32.2217604026654	80.8846733552004	32.56942546	80.98884638	0.362936649
32.2217604026654	80.8846733552004	38.19879917	73.45302115	11.60064907
32.2217604026654	80.8846733552004	33.57300136	70.51852673	11.82127081
30.0889210241271	82.1926110612772	29.49613778	81.77737157	0.723751207
30.0889210241271	82.1926110612772	34.30971303	75.90183293	10.30780315
29.6856726509524	84.1675791811692	31.03913924	88.81924735	5.700862296
29.6856726509524	84.1675791811692	31.92346769	85.96439053	5.672562244
29.6856726509524	84.1675791811692	28.34961296	82.66841267	2.008122438
29.1256855159354	86.9101976094683	29.03165996	90.53300961	3.624031953
29.1256855159354	86.9101976094683	28.95022635	86.79829568	0.208105648
34.4551038829613	86.7106114686876	35.55901251	90.85604615	4.28990011
34.4551038829613	86.7106114686876	32.77989789	83.25231939	4.247864371
38.0168471315667	86.5772234261673	38.21932161	86.88940242	0.372090901
38.0168471315667	86.5772234261673	38.24583972	80.95791524	10.77332683
38.0168471315667	86.5772234261673	38.20769452	77.89743741	10.9290231
38.0168471315667	86.5772234261673	36.44207057	76.13900165	11.50367704
38.8301092174924	84.9252634424967	38.25086273	84.70191635	0.879303979

Solution x	Solution y	Original x	Original y	Radius
40.0770174690356	82.3924478852149	38.78697828	81.20736169	1.751750667
40.2679640414275	82.2774099843362	41.14833132	82.10595877	1.515527703
40.2679640414275	82.2774099843362	41.95376322	74.60739468	10.5272795
41.3898659524511	81.6015095753254	32.21271953	85.45061531	9.951664756
41.3898659524511	81.6015095753254	40.55838899	87.88304878	7.94496914
41.3898659524511	81.6015095753254	34.03327785	85.06694553	9.82794583
41.3898659524511	81.6015095753254	45.3176187	83.7901857	4.538711056
41.3898659524511	81.6015095753254	46.03038143	83.79986665	6.928032766
41.3898659524511	81.6015095753254	38.00030199	82.20200968	9.151482372
41.3898659524511	81.6015095753254	46.93472918	83.75304242	7.122281837
41.3898659524511	81.6015095753254	36.17809574	80.13104248	8.234427368
41.3898659524511	81.6015095753254	40.58416037	81.54961967	7.064640642
41.3898659524511	81.6015095753254	48.20934555	82.30314786	7.596162818
41.3898659524511	81.6015095753254	40.77647626	81.23711291	8.680043042
41.3898659524511	81.6015095753254	44.47086767	80.17305261	4.558123438
41.3898659524511	81.6015095753254	45.32225765	79.26748614	4.954739166
41.3898659524511	81.6015095753254	40.76978451	74.94346594	8.186468819
41.3898659524511	81.6015095753254	41.14789047	74.75727523	7.341258219
43.4574981742244	80.3558451231403	43.12816365	79.63219046	0.795070626
43.4574981742244	80.3558451231403	39.75179858	71.51477588	9.864345808
44.46990587455	80.0293701195551	44.66930475	80.79724102	1.096402137
44.46990587455	80.0293701195551	44.56064253	79.77318093	0.271783078
45.3183841405368	81.3299024723931	45.13867401	81.86371268	0.563248674
45.3183841405368	81.3299024723931	47.92908542	80.11129273	4.896396861
45.3183841405368	81.3299024723931	50.78444002	76.12504454	8.918500215
45.3183841405368	81.3299024723931	47.34853229	74.63427391	8.300992216
47.5161195819789	80.5444246723737	49.77274656	84.13753559	4.242971999
47.5161195819789	80.5444246723737	46.11608956	79.13405595	3.077288175
47.5161195819789	80.5444246723737	49.62844822	78.65994225	3.895592856
47.5161195819789	80.5444246723737	47.14165764	77.84331314	3.855818645
49.9792982731585	78.1159020196312	49.13669956	77.10708156	1.314416719
49.9792982731585	78.1159020196312	49.39322363	67.57061768	11.53351655
52.0783342247857	76.638187724449	50.20394782	81.95454381	5.63710621
52.0783342247857	76.638187724449	53.61605765	80.93460352	4.795394132
52.0783342247857	76.638187724449	49.55654528	80.81624315	5.359214828
52.0783342247857	76.638187724449	55.58088554	76.52999392	3.50422197
52.0783342247857	76.638187724449	52.40986372	76.90026657	0.582033584
52.0783342247857	76.638187724449	51.90516717	74.10528304	4.497348507
52.0783342247857	76.638187724449	51.91696279	73.69595809	5.533020939
52.0783342247857	76.638187724449	49.38151416	71.84627519	5.560857427
51.7202722046272	74.9886240393566	52.24575767	74.98560476	1.544515511
51.7202722046272	74.9886240393566	52.68458788	66.68600654	11.1378938
51.3861612066966	73.4494018107688	51.17754367	73.39508539	0.21557261
51.3861612066966	73.4494018107688	53.04622082	62.56220406	11.46013038
53.6214842581342	70.9169896811724	53.60239056	70.80290226	0.11567415
55.6300243588567	72.0563149578617	55.72002047	71.91921816	0.163996439
55.6300243588567	72.0563149578617	59.0134746	66.34233581	8.63026105
55.6300243588567	72.0563149578617	57.97334153	65.39941546	9.414607276
57.925108137099	73.7858766445055	61.14896118	72.70410502	3.400508534
57.925108137099	73.7858766445055	58.20433528	69.50520456	8.582697416
56.9074549474699	77.3583901010146	58.21523833	76.77458472	1.432175303
56.9074549474699	77.3583901010146	59.09181099	73.44789922	8.247004523
56.9074549474699	77.3583901010146	55.90538334	73.56581582	5.910476566
56.9074549474699	77.3583901010146	53.92763119	74.12654413	8.444710151
56.9074549474699	77.3583901010146	56.84900895	69.27095699	9.651018813
55.9064962378419	80.8722918005884	51.91564321	83.24154723	4.641150631
55.9064962378419	80.8722918005884	56.64479831	82.24679775	3.64219376
55.9064962378419	80.8722918005884	55.73082902	81.05870461	0.265267923
61.5438089774817	82.1434643169627	61.67834468	82.51967341	0.399541158
61.5438089774817	82.1434643169627	58.40265516	82.89286098	3.789211097
61.5438089774817	82.1434643169627	60.70093329	80.64454551	3.209176581
61.5438089774817	82.1434643169627	58.81674593	76.2826012	7.335997979
61.5438089774817	82.1434643169627	57.06276587	74.98770524	9.477514768
61.5438089774817	82.1434643169627	56.76810138	74.93595817	10.01955077
61.5438089774817	82.1434643169627	53.90080059	74.55382457	11.74270355
63.0797381709092	80.1731562135085	61.30013954	82.69641043	3.087682485
63.0797381709092	80.1731562135085	63.68037897	79.29990004	1.33873582
68.2236956739152	73.574426733003	78.83068399	69.67274441	11.30182844
68.2236956739152	73.574426733003	70.83372488	78.21085961	5.320597925
68.2236956739152	73.574426733003	70.77169737	73.88064127	8.726232409
68.2236956739152	73.574426733003	74.07680751	69.16329968	10.96743145
68.2236956739152	73.574426733003	68.36889636	72.61479797	6.100291297
68.2236956739152	73.574426733003	70.36283848	70.39401036	6.760808749
68.2236956739152	73.574426733003	65.34735437	72.80394877	7.821760947
68.2236956739152	73.574426733003	60.79681015	75.33369853	8.472276725
68.2236956739152	73.574426733003	61.63608438	74.03409399	7.121975094
68.2236956739152	73.574426733003	63.47892732	68.70647259	6.807486056
67.5789552543644	72.29367937642	66.81087893	72.19337817	0.774597684
67.5789552543644	72.29367937642	63.48323083	69.36201841	5.452872617
67.5789552543644	72.29367937642	63.53725064	67.03413314	7.164195385

Solution x	Solution y	Original x	Original y	Radius
69.6222631199626	69.9923391710194	69.12634406	69.4594231	0.727966519
71.8978418598101	68.2473492000218	78.29263567	66.45988674	6.639910385
71.8978418598101	68.2473492000218	73.05372772	69.26625594	1.566755571
71.8978418598101	68.2473492000218	65.55566867	66.58332744	6.556838353
75.308235475484	69.2217655770044	81.47694776	70.94126153	6.403879885
75.308235475484	69.2217655770044	72.70378804	66.70645397	3.620764964
75.308235475484	69.2217655770044	72.84290598	65.67053988	5.910036243
74.8545391399825	74.639727328959	73.75840634	73.11670598	1.876459737
74.8545391399825	74.639727328959	67.45457311	72.85375456	11.61655168
74.3904269315886	80.182075018452	75.20998283	80.5662569	0.905134017
74.3904269315886	80.182075018452	72.09010058	81.417498	6.705862814
74.3904269315886	80.182075018452	74.46580568	79.0435318	7.178734541
74.3904269315886	80.182075018452	70.61748839	78.65460339	7.660924967
74.3904269315886	80.182075018452	68.84275879	76.03221479	10.79538264
74.3904269315886	80.182075018452	67.69295238	75.24403656	11.35995088
69.8810159541227	84.6220308979689	69.09548968	84.07624055	0.956524245
69.8810159541227	84.6220308979689	69.80433177	81.60817435	4.561618689
69.8810159541227	84.6220308979689	68.96890483	80.55619731	4.842060922
69.8810159541227	84.6220308979689	62.03157877	81.16617953	8.754951123
69.8810159541227	84.6220308979689	62.20174968	80.96664236	8.789809443
68.5678590175311	87.5522552206238	66.59307852	88.41880362	2.156539854
68.5678590175311	87.5522552206238	64.88497046	82.96772641	9.339812785
72.4118063074608	88.8366616204246	72.48804708	89.57044348	0.737731979
72.4118063074608	88.8366616204246	67.89989075	88.12316705	7.944934507
76.798231604409	86.2693283399839	76.68533256	86.49303137	0.250577812
76.798231604409	86.2693283399839	77.11333094	85.3156461	3.063152598
84.7511739969001	81.6145465435071	93.29522257	74.82458329	10.91349472
84.7511739969001	81.6145465435071	91.90328388	76.16243153	10.02897755
84.7511739969001	81.6145465435071	81.4352048	82.89764497	3.652744946
84.7511739969001	81.6145465435071	82.09017124	81.333147	9.364452955
89.6372582843691	78.754767790341	97.99058573	82.84537681	9.301137649
89.6372582843691	78.754767790341	91.59995025	72.67875795	6.385143329
89.6372582843691	78.754767790341	86.75397464	75.23932777	8.469131771
89.6372582843691	78.754767790341	83.77232341	73.14211564	8.533805631
92.0388057366078	84.8647214399085	94.75890926	85.83537613	2.888102094
92.0388057366078	84.8647214399085	93.12739448	86.70709298	11.17874385
84.2420350148756	89.2338240775082	91.04765146	90.60180149	7.6089096
84.2420350148756	89.2338240775082	87.63411723	89.72076827	4.425243646
84.2420350148756	89.2338240775082	82.53992082	88.87907996	1.738688046
85.912761246899	91.4357661729683	86.10921689	91.46882481	0.199217703
79.9077017809634	95.4416410622214	80.84419352	99.98848979	4.64228932
79.9077017809634	95.4416410622214	79.39161289	97.26593015	9.87516425
79.9077017809634	95.4416410622214	79.19703593	96.06011661	11.2419465
75.2654019953961	94.5870799816798	86.37403118	99.02923308	11.96387757
75.2654019953961	94.5870799816798	78.18108034	99.79242924	11.42083614
75.2654019953961	94.5870799816798	74.57969734	99.83821951	6.450291742
75.2654019953961	94.5870799816798	69.38304877	98.18671586	10.74668541
75.2654019953961	94.5870799816798	76.48394754	93.81500316	3.73579719
75.2654019953961	94.5870799816798	70.07355989	96.61021246	7.658895206
75.2654019953961	94.5870799816798	69.92952441	96.42807986	9.02685985
75.2654019953961	94.5870799816798	71.22771139	93.77569631	4.877275027
75.2654019953961	94.5870799816798	66.67195124	95.92017704	9.763847817
75.2654019953961	94.5870799816798	72.91384846	91.54886288	4.973733961
75.2654019953961	94.5870799816798	68.11557125	90.29313921	9.036263761
75.2654019953961	94.5870799816798	68.01446808	90.26524455	9.658401998
75.2654019953961	94.5870799816798	75.38279951	84.8495864	9.738201242
72.8839631011136	94.4041732857644	73.04972269	93.68364053	1.367275869
72.8839631011136	94.4041732857644	71.17046416	92.96230041	4.264714687
69.7351332408349	94.1623265869735	69.82339194	93.15949799	3.201208435
69.7351332408349	94.1623265869735	64.64609008	95.09261932	9.659748021
66.5823970712098	93.9201795055152	68.09186985	95.85522589	2.454162297
66.5823970712098	93.9201795055152	64.96530116	93.98228963	1.618288248
63.1450643310474	92.8535478750232	66.92699784	97.50570073	6.78636185
63.1450643310474	92.8535478750232	62.61309781	94.29391595	5.245785935
63.1450643310474	92.8535478750232	62.03675317	91.42777069	2.470705606
63.1450643310474	92.8535478750232	61.4906739	91.40517217	5.140621126
63.1450643310474	92.8535478750232	62.35255518	88.46202983	4.962229956
59.723377513313	91.7917712982726	57.58318464	98.55697919	7.09566511
59.723377513313	91.7917712982726	65.26732099	95.86741863	6.903660169
59.723377513313	91.7917712982726	63.88368354	92.98872817	4.684052733
59.723377513313	91.7917712982726	57.53422575	91.73216299	2.263638208
59.723377513313	91.7917712982726	53.29556121	92.47449182	6.766260463
59.723377513313	91.7917712982726	53.26472651	92.17526811	6.470026475
56.4305021875971	89.5960046885323	56.30399813	89.72916428	0.18367023
56.4305021875971	89.5960046885323	55.99099974	83.60147673	11.10984141
56.4305021875971	89.5960046885323	57.82109764	79.24611201	11.76834886
55.9054235491446	88.8898302843333	61.09603132	95.38804721	8.526033691
55.9054235491446	88.8898302843333	63.32241418	89.29380754	7.42798409
55.9054235491446	88.8898302843333	56.15571936	89.41500769	1.432185748
55.9054235491446	88.8898302843333	59.01602486	86.99268685	4.144714535

Solution x	Solution y	Original x	Original y	Radius
55.9054235491446	88.8898302843333	52.83415121	85.50123146	6.270496768
55.9054235491446	88.8898302843333	55.75342338	84.56592915	5.992730061
55.9054235491446	88.8898302843333	51.49657531	83.11057243	7.887384084
55.9054235491446	88.8898302843333	51.18829335	82.80979047	7.761910446
54.7394222412324	87.3216847415043	55.11001594	85.68607737	1.677066237
53.6263756181918	87.9093793906393	52.05342714	85.82620662	2.610320997
50.79433444364	90.8705257008216	51.95218378	92.57992082	2.064617824
50.79433444364	90.8705257008216	53.08761619	83.0335557	11.99564131
49.8868533449884	91.2361842163764	57.43254842	97.94119843	10.09429194
49.8868533449884	91.2361842163764	48.82360524	98.37839062	7.220914682
49.8868533449884	91.2361842163764	50.67630959	98.08417141	8.634086059
49.8868533449884	91.2361842163764	54.09260921	96.04789718	7.918650854
49.8868533449884	91.2361842163764	47.96746082	95.14523251	8.805162658
49.8868533449884	91.2361842163764	54.90972966	93.30800556	7.380299806
49.8868533449884	91.2361842163764	54.10050901	92.28618361	9.480891031
49.8868533449884	91.2361842163764	54.43632749	91.92787857	10.0796961
49.8868533449884	91.2361842163764	49.03663551	90.65504513	8.507710049
49.8868533449884	91.2361842163764	54.48965648	89.30641789	9.13140765
49.8868533449884	91.2361842163764	49.19512952	89.44346883	4.342724929
49.8868533449884	91.2361842163764	53.87450626	88.16447802	7.742268204
49.8868533449884	91.2361842163764	48.45592928	88.4082341	6.862006444
49.8868533449884	91.2361842163764	46.02083433	88.3362158	9.025977842
49.8868533449884	91.2361842163764	51.44475874	86.59474587	4.908082369
46.7179726438882	92.1563269797907	46.25821854	91.17761288	1.63636571
46.7179726438882	92.1563269797907	49.21219028	82.18677234	11.80432558
43.5509721660851	93.0759237876272	45.34071838	99.2752365	6.545950484
43.5509721660851	93.0759237876272	43.91518159	93.39792889	1.222268104
43.5509721660851	93.0759237876272	42.53215273	92.92397176	1.03008857
43.5509721660851	93.0759237876272	45.13861135	90.47060332	6.162353189
43.5509721660851	93.0759237876272	42.23200248	88.95299773	4.651433464
45.9929079390492	94.6712868112987	46.20732106	94.82215894	0.332990442
48.444107331737	96.2727018941059	52.71570498	99.46690315	5.481309266
48.444107331737	96.2727018941059	48.69087386	94.64188777	2.380405111
48.444107331737	96.2727018941059	45.33430047	93.58613905	5.098588574
48.444107331737	96.2727018941059	49.59427698	92.51123595	5.147122326
50.8962025291226	97.8747022778444	52.60387814	98.51053443	2.070061212
50.8962025291226	97.8747022778444	57.84005051	97.24933499	10.98084378
50.8962025291226	97.8747022778444	58.00620671	94.64720593	11.42342539
50.8962025291226	97.8747022778444	51.98537923	93.03310405	10.9895755
50.8962025291226	97.8747022778444	53.27314218	89.6748569	11.35118685
53.3427324794336	99.4730667815752	54.29998953	99.89190946	1.044878103
53.3427324794336	99.4730667815752	53.69991452	99.81161169	0.858562362
48.9674022616022	98.3735967779226	52.2623599	99.83573023	3.745784047
48.9674022616022	98.3735967779226	48.39934621	99.02729511	0.989182834
44.5636248170091	97.266978345462	44.56970667	97.22856143	0.038895351
41.8841338734064	97.0849579818656	41.23951851	98.4925435	2.263631388
41.8841338734064	97.0849579818656	47.31578899	98.13704672	11.87713881
39.1171391209978	96.8969934016128	48.86252985	99.44183304	10.4064769
39.1171391209978	96.8969934016128	39.47053756	98.01039691	1.338634383
39.1171391209978	96.8969934016128	44.53236455	98.59505273	8.99567986
39.1171391209978	96.8969934016128	39.44288188	96.38027853	1.997947716
39.1171391209978	96.8969934016128	39.84944538	96.227912	4.047622309
39.1171391209978	96.8969934016128	43.04035221	95.37042711	9.4350131
39.1171391209978	96.8969934016128	45.01212749	95.47966426	8.619068903
39.1171391209978	96.8969934016128	35.60188133	93.1465045	7.692381008
39.1171391209978	96.8969934016128	39.86881125	93.47781189	5.895861926
39.1171391209978	96.8969934016128	36.79414467	92.2553405	5.623371076
39.1171391209978	96.8969934016128	32.87814817	90.10176773	9.598818493
39.1171391209978	96.8969934016128	37.64776281	91.60925844	7.287109974
39.1171391209978	96.8969934016128	36.43143728	90.48214242	6.954373264
39.1171391209978	96.8969934016128	36.90788531	88.78292268	8.871911482
39.1171391209978	96.8969934016128	40.16683897	89.097423	10.1742901
39.1171391209978	96.8969934016128	39.57638463	86.69599702	10.21132869
37.0375194443712	98.4518041768073	36.49499514	99.8776323	1.525555131
37.0375194443712	98.4518041768073	37.35140359	99.57591236	4.551929256
37.0375194443712	98.4518041768073	37.87107476	99.67477247	5.142647072
37.0375194443712	98.4518041768073	43.63164404	99.67485887	11.34349589
37.0375194443712	98.4518041768073	36.31961338	94.1541845	11.14531248
37.0375194443712	98.4518041768073	44.01236363	95.54242778	10.44212715
37.0375194443712	98.4518041768073	41.14116704	94.61634345	11.9580341
36.8429225460073	97.4998598121726	35.84999591	97.26233792	1.02094072
37.1019500260729	97.1737453440773	37.35558564	97.30806318	0.287005759
37.3611844660431	96.3439476759905	37.83606476	96.13365876	0.51935799
35.7878316963117	95.6142586057078	36.86677729	93.06343809	3.595056547
35.569485061219	95.5129938047797	36.26720319	91.81523904	3.763004237
35.569485061219	95.5129938047797	33.71990859	84.56649705	11.87467854
31.7611428177013	95.7466032420198	30.08845088	94.04600611	2.38535719
31.7295179384381	96.1522233700282	23.23282295	99.37897746	9.140009252
31.7295179384381	96.1522233700282	27.03699297	98.99807723	9.045435578
31.7295179384381	96.1522233700282	31.65500689	99.46882276	7.475813284

Solution x	Solution y	Original x	Original y	Radius
31.7295179384381	96.1522233700282	35.92075185	99.04269187	5.09129157
31.7295179384381	96.1522233700282	31.89808649	95.62749105	8.151929048
31.7295179384381	96.1522233700282	33.84742868	94.52834747	8.71001742
31.7295179384381	96.1522233700282	30.51609732	92.20951413	7.873323153
31.7295179384381	96.1522233700282	30.46512782	92.10545477	8.699579279
31.7295179384381	96.1522233700282	34.28587406	93.01320732	5.515074689
31.7295179384381	96.1522233700282	33.91919319	90.52236574	7.193036058
31.7295179384381	96.1522233700282	32.33676606	89.56266763	6.977995049
28.4975112096065	97.6782126720143	23.65267964	99.40598609	5.864138835
28.4975112096065	97.6782126720143	27.50072899	99.76767751	2.315046026
28.4975112096065	97.6782126720143	28.69202489	99.34571575	3.476487599
27.0889105739185	98.3432818223058	27.32463884	98.08040747	2.022977234
25.3781872687777	99.150997861168	25.34553204	99.20543489	0.063480344
25.3781872687777	99.150997861168	25.64004891	98.33585155	1.834844509
25.2750237102253	97.0484856867154	25.35918107	97.93925835	0.894739291
25.0894112699497	93.265634841807	25.24294214	93.18181598	0.174920924
25.0894112699497	93.265634841807	30.18341718	92.15484297	6.43104448
25.0894112699497	93.265634841807	26.49994117	86.49656314	11.41565502
25.0894112699497	93.265634841807	30.78074407	88.67743671	9.308222123
25.0894112699497	93.265634841807	28.94608169	87.05476962	8.550013673
22.2608426660568	91.2446708432028	22.00240146	99.12603644	7.885601786
22.2608426660568	91.2446708432028	20.03955091	90.83830295	2.258156755
22.2608426660568	91.2446708432028	21.63379999	90.72848541	0.991362215
22.2608426660568	91.2446708432028	24.92385591	92.07997464	3.317074037
22.2608426660568	91.2446708432028	21.4032788	88.65695382	2.971051139
22.2608426660568	91.2446708432028	24.68088332	89.71453351	5.772547732
22.2608426660568	91.2446708432028	20.16675465	86.45561332	5.662375247
22.2608426660568	91.2446708432028	23.92476676	88.85275247	4.755388035
22.2608426660568	91.2446708432028	22.46431132	85.87828698	5.64815455
20.7818602900392	89.4975989033608	20.75129811	88.7330358	0.972274996
19.2961967546607	87.7426345795967	22.06521104	97.80973943	10.44097889
19.2961967546607	87.7426345795967	13.01348985	89.5505908	6.625491116
19.2961967546607	87.7426345795967	15.25088212	86.85170355	8.312417494
19.2961967546607	87.7426345795967	26.20322759	94.45704722	10.10698797
19.2961967546607	87.7426345795967	16.23739593	85.87006787	9.998633909
19.2961967546607	87.7426345795967	21.61123904	90.19731465	9.443600344
19.2961967546607	87.7426345795967	18.85500198	86.61471751	1.746017703
19.2961967546607	87.7426345795967	20.47481611	85.68176763	4.269604774
19.2961967546607	87.7426345795967	14.92906226	79.42060964	9.914113666
19.2961967546607	87.7426345795967	17.20155001	81.69531761	7.066943728
19.2961967546607	87.7426345795967	24.79158589	85.73273425	9.89839469
19.2961967546607	87.7426345795967	18.15807888	79.40011164	9.804701845
19.2961967546607	87.7426345795967	20.11668251	80.56671914	7.222669816
19.2961967546607	87.7426345795967	21.51917751	80.74471553	9.9567065
16.9044513276994	88.5652711829276	15.06397637	86.4956065	2.769631739
15.9634070698742	90.5215268946195	12.48771043	90.90107319	3.496358466
15.9634070698742	90.5215268946195	14.30638295	91.72702037	2.704929464
16.9500505928558	91.777418452621	16.85080568	91.45389056	0.616270698
16.9500505928558	91.777418452621	24.93956922	85.18138774	10.96633056
18.0687700650979	93.2014285064618	18.21730526	92.48725442	1.5701409
19.1876228480924	94.6256082380077	22.19955839	99.83998701	6.495340695
19.1876228480924	94.6256082380077	17.25875189	95.69940805	3.398739413
19.1876228480924	94.6256082380077	21.53298817	97.76613815	6.447332374
19.1876228480924	94.6256082380077	21.95406549	97.08230078	5.310921574
19.1876228480924	94.6256082380077	18.65944439	93.90622028	1.153549238
19.1876228480924	94.6256082380077	22.62104276	94.03699994	3.483508579
19.1876228480924	94.6256082380077	23.10855555	93.46528062	6.046811031
18.5871404229069	96.3998880307746	20.42707279	96.69258649	2.602601065
18.5871404229069	96.3998880307746	25.58817455	94.62259734	11.27075496
18.0717979312619	97.9225998969206	18.56973911	98.93410982	1.127429706
18.0717979312619	97.9225998969206	18.10270516	98.29192556	0.6619415
18.0717979312619	97.9225998969206	17.81960057	98.01765152	0.543902723
14.1489531442919	96.5808475224627	14.02380259	94.55773265	2.149671288
14.1489531442919	96.5808475224627	16.10416337	94.62212285	7.114799892
14.1489531442919	96.5808475224627	19.55892343	94.48515334	8.137719702
10.7261381555279	95.4101233348205	10.35439985	93.61856888	1.829714932
10.7261381555279	95.4101233348205	10.40564453	91.96900158	4.396700555
10.7261381555279	95.4101233348205	17.22630202	94.08640458	10.84424377
7.30766724181935	98.5236363363336	7.810086676	100	1.559511127
7.30766724181935	98.5236363363336	11.51332542	99.95442641	9.875636287
1.87322774588426	98.0731003100557	1.662890125	98.21483308	0.253633777
1.87322774588426	98.0731003100557	0.846436708	97.15575264	11.19775474
1.87322774588426	98.0731003100557	6.625140742	98.72893978	8.11126017
1.87322774588426	98.0731003100557	1.725004249	93.73701725	6.881927737
1.87322774588426	98.0731003100557	5.819691822	97.53170939	10.47278678
1.87322774588426	98.0731003100557	3.212591442	94.51392157	10.08518593
1.87322774588426	98.0731003100557	4.440109707	94.87692744	8.411496493
1.87322774588426	98.0731003100557	5.231683223	94.88567828	5.753061171
1.87322774588426	98.0731003100557	8.376403562	96.83801393	9.194583524
1.87322774588426	98.0731003100557	8.327911253	95.97957355	8.978439052

Solution x	Solution y	Original x	Original y	Radius
1.87322774588426	98.0731003100557	3.115821998	88.00026043	11.67905671
1.87322774588426	98.0731003100557	11.04946885	95.30278919	11.15137795
1.87322774588426	98.0731003100557	6.256438132	90.66257931	10.99795307
1.87322774588426	98.0731003100557	8.980893435	92.30918249	10.59560796
2.70408600532241	95.4077972522751	2.510162792	94.82470236	1.092397933
2.70408600532241	95.4077972522751	5.209294544	90.50333801	7.245222646
2.70408600532241	95.4077972522751	7.009024866	89.80852716	9.591229282
2.70408600532241	95.4077972522751	4.724328509	85.88211036	10.66842937
2.70408600532241	95.4077972522751	8.842438164	89.89183088	9.248878075
2.70408600532241	95.4077972522751	10.77763243	89.00986935	11.5413795
3.6199731513121	92.4697315265742	3.298576907	92.26869515	0.379092562
3.6199731513121	92.4697315265742	2.887848626	89.80188387	3.077223153
3.6199731513121	92.4697315265742	6.291693293	89.27097954	4.843225065
3.6199731513121	92.4697315265742	5.333729823	86.89695613	7.779774892
3.6199731513121	92.4697315265742	5.902742913	84.57417463	10.96205759
3.6199731513121	92.4697315265742	3.795442881	81.20966501	11.97973034
4.07102411783029	92.0452594425868	3.553988961	91.38716753	0.836905203
4.07102411783029	92.0452594425868	3.380314451	80.99890539	11.39696855
5.81801017737642	90.9086202967321	7.178182114	91.76838261	1.609117439
5.81801017737642	90.9086202967321	12.03430063	87.78817585	9.339380238
5.99991565811976	89.5530625636689	5.838459994	89.46110654	0.185805925
5.99991565811976	89.5530625636689	6.579193932	89.24907689	0.979496385
5.99991565811976	89.5530625636689	0.848777488	80.80421078	10.36784038
5.99991565811976	89.5530625636689	9.577914639	89.11916471	4.320583214
5.99991565811976	89.5530625636689	4.297539438	80.73294711	11.22405457
5.99991565811976	89.5530625636689	4.961462551	81.51420623	9.226598726
5.99991565811976	89.5530625636689	9.984816242	87.60870523	5.654212003
5.99991565811976	89.5530625636689	5.779054124	82.01317499	10.01915756
5.99991565811976	89.5530625636689	7.936374341	83.63932008	7.056138248
5.99991565811976	89.5530625636689	11.28159713	86.83718755	7.508047868
5.99991565811976	89.5530625636689	12.45480817	85.29988604	8.467366828
5.99991565811976	89.5530625636689	10.82142722	82.89323555	9.472743412
7.55891472791637	88.3211230746532	7.085383584	88.77850283	1.129697938
7.55891472791637	88.3211230746532	12.87616068	80.54131267	11.25097601
9.03583046923515	87.1540468227235	9.940095688	86.998178	0.917600499
9.03583046923515	87.1540468227235	12.63857375	82.42671014	6.575237335
9.03583046923515	87.1540468227235	19.16596982	83.58117432	11.91490763
9.03583046923515	87.1540468227235	14.09860615	77.68853822	11.70742841
5.90965450546372	86.092476346685	0.539457489	84.81338557	5.520424731
5.90965450546372	86.092476346685	3.105512661	84.71082736	5.063715926
5.90965450546372	86.092476346685	5.793118726	87.72031575	2.544917974
5.90965450546372	86.092476346685	6.359309777	87.06467249	5.433004527
5.90965450546372	86.092476346685	6.663988874	86.9326968	2.017737523
5.90965450546372	86.092476346685	6.810206318	85.20186256	3.122176307
5.90965450546372	86.092476346685	5.912402555	83.10767778	4.777473299
5.90965450546372	86.092476346685	9.921883095	86.8721598	5.099750684
5.90965450546372	86.092476346685	7.992357197	82.08091397	4.51998708
3.52181622442238	86.167339382355	2.643010323	87.48230483	1.581592217
3.52181622442238	86.167339382355	3.319354366	86.8534104	1.444683466
3.11036386708638	85.0781045472578	4.377655918	84.98459142	1.270737521
3.11036386708638	85.0781045472578	9.701793671	81.23141394	8.243525166
2.22751301919584	82.7409371286673	3.437419026	82.39656928	1.58437925
1.52374593603018	80.8778574674289	1.451959255	80.87244268	0.071990607
1.52374593603018	80.8778574674289	1.837820965	81.06813079	5.360711684
1.52374593603018	80.8778574674289	3.059490558	82.05603574	7.23908529
1.52374593603018	80.8778574674289	0.155166122	73.1143838	9.943054863
1.52374593603018	80.8778574674289	3.100034102	78.61964126	6.829391359
1.52374593603018	80.8778574674289	5.724809855	81.80721271	6.479054365
1.52374593603018	80.8778574674289	3.765987951	77.28123402	9.204063574
1.52374593603018	80.8778574674289	5.042739397	78.40053531	10.26257011
1.52374593603018	80.8778574674289	2.885089549	70.78781924	11.83875801
1.52374593603018	80.8778574674289	8.595205897	76.73972439	10.65699304
1.52374593603018	80.8778574674289	9.360499311	76.63383999	9.675555003
4.00798814487349	76.4547748202151	5.065657714	76.41830653	1.058298093
4.00798814487349	76.4547748202151	5.863440787	76.06172049	5.891195528
1.81448216031576	73.1117257202047	0.773453591	79.81662315	6.785233233
1.81448216031576	73.1117257202047	1.696022601	79.3379408	6.739019376
1.81448216031576	73.1117257202047	1.009741561	74.32200243	6.745106086
1.81448216031576	73.1117257202047	2.544714587	74.45838234	3.751572119
1.81448216031576	73.1117257202047	1.096851862	69.20060768	4.924336954
1.81448216031576	73.1117257202047	1.825477279	70.78130479	2.330446868
1.81448216031576	73.1117257202047	3.252339284	73.9521337	4.320781181
1.81448216031576	73.1117257202047	2.781332517	68.35625636	5.523577876
1.81448216031576	73.1117257202047	4.203561784	71.28689241	5.184520227
1.74668797950623	70.9709152060574	1.834626902	71.15202574	0.401994686
1.74668797950623	70.9709152060574	3.972668798	68.43095677	4.819982765
1.74668797950623	70.9709152060574	6.979895184	73.91637244	7.031194882
1.74668797950623	70.9709152060574	9.088863996	70.57778186	9.588159879
1.74668797950623	70.9709152060574	9.964092428	69.02740379	10.49120227
1.74668797950623	70.9709152060574	10.36857839	64.9958121	11.82219863

Solution x	Solution y	Original x	Original y	Radius
1.70101431287127	69.5286326505749	0.299902086	68.51958527	1.726641853
1.70101431287127	69.5286326505749	0.793870075	65.00803843	9.318627115
1.70101431287127	69.5286326505749	2.881941531	70.78732912	7.680996283
1.70101431287127	69.5286326505749	2.559418382	66.60707534	5.994415632
1.70101431287127	69.5286326505749	2.82031094	66.9400554	6.180554629
1.70101431287127	69.5286326505749	2.766374061	66.09545945	9.314186257
1.70101431287127	69.5286326505749	3.702577787	67.55965669	9.862533299
1.70101431287127	69.5286326505749	3.336609071	66.34370608	10.13002568
1.70101431287127	69.5286326505749	3.705228073	66.5975084	9.299418871
1.70101431287127	69.5286326505749	6.041792217	70.01715429	11.62482668
7.09091554052199	67.9151582563375	5.020361565	69.58798476	2.661868193
7.09091554052199	67.9151582563375	6.334374787	68.85467086	1.608457989
12.4770173782744	66.3028204766604	4.692804385	58.08052349	11.75765381
12.4770173782744	66.3028204766604	8.880939202	67.16779099	7.575125342
12.4770173782744	66.3028204766604	9.897889543	67.94003152	3.836811672
12.4770173782744	66.3028204766604	11.54525803	68.93314303	9.632544021
12.4770173782744	66.3028204766604	11.73654707	68.82383733	7.948897757
12.4770173782744	66.3028204766604	11.17807544	66.07771318	3.944211846
12.4770173782744	66.3028204766604	14.51945543	70.49107423	7.364687094
12.4770173782744	66.3028204766604	15.83973733	72.60736968	9.12349234
12.4770173782744	66.3028204766604	14.01917911	69.22007201	9.959122763
12.4770173782744	66.3028204766604	12.00297966	63.9466553	5.950994709
12.4770173782744	66.3028204766604	13.50520564	67.72241024	9.360297306
12.4770173782744	66.3028204766604	14.52745655	66.82146945	9.209129847
12.4770173782744	66.3028204766604	14.06057656	63.93249207	5.381459732
12.4770173782744	66.3028204766604	19.17901123	72.48982593	10.20159412
12.4770173782744	66.3028204766604	16.73656026	65.26611785	7.348251841
12.4770173782744	66.3028204766604	16.07158763	60.00636388	7.250262131
12.4770173782744	66.3028204766604	18.97844246	66.0992932	9.320379407
12.4770173782744	66.3028204766604	17.25601024	61.69443137	6.772109512
12.4770173782744	66.3028204766604	19.92687299	66.4828608	7.674542398
12.4770173782744	66.3028204766604	19.29354577	63.34226321	9.732805781
12.4770173782744	66.3028204766604	21.56136042	60.00845368	11.66584778
13.7405398082471	65.92458329312	14.11476256	66.58488992	0.845524181
15.5011046488526	65.3975557114548	15.77830732	66.19409337	0.843394073
16.3987279381223	65.0401339528879	16.63383213	64.77854357	0.351715097
15.3200970391744	68.9015409761174	16.29427026	68.63097998	1.605088602
15.3200970391744	68.9015409761174	20.75020952	68.82081849	6.986664743
14.1948102439274	72.9299698146108	13.34199807	71.15108407	2.435319437
14.1948102439274	72.9299698146108	14.67447984	73.22055772	0.560824618
12.7399556202147	74.2957540740205	10.28504553	75.43578797	2.70670664
12.7399556202147	74.2957540740205	11.56644578	72.10851879	2.482161061
9.47962907602738	77.9303552208013	9.018582074	78.03824041	0.473501375
9.47962907602738	77.9303552208013	8.675234817	76.17385221	4.360484441
9.47962907602738	77.9303552208013	13.78543979	72.75062985	9.733830208
9.47962907602738	77.9303552208013	18.79013692	77.54174683	11.83768723
15.1036558319074	80.176001819613	10.08146406	81.46406963	5.184740001
15.1036558319074	80.176001819613	18.16441332	83.32201509	4.389263708
15.1036558319074	80.176001819613	19.29153506	80.52426775	5.162100755
15.1036558319074	80.176001819613	16.93400358	77.9224885	2.955652193
15.1036558319074	80.176001819613	18.46683587	77.29301103	4.716670657
15.9033659552429	77.0646058185932	15.50686687	76.44859369	0.73258615
15.9033659552429	77.0646058185932	18.15532249	77.80652015	5.054973135
15.9033659552429	77.0646058185932	18.31523717	76.27495825	7.153261702
15.9033659552429	77.0646058185932	16.80968797	72.84815948	5.35823493
15.9033659552429	77.0646058185932	18.49430275	75.1491321	9.770365975
15.9033659552429	77.0646058185932	17.24413003	73.14298035	6.329084859
15.9033659552429	77.0646058185932	20.16006997	73.55306832	7.784192094
15.9033659552429	77.0646058185932	24.84752889	78.21896812	11.0945574
15.9033659552429	77.0646058185932	22.95922483	75.83051285	9.548150341
15.9033659552429	77.0646058185932	21.60880813	73.64895737	8.789616797
15.9033659552429	77.0646058185932	22.14002238	72.37729838	10.56803504
17.1747318022762	77.2899347037585	17.38954679	82.23173111	4.9464631
17.1747318022762	77.2899347037585	19.47269695	75.25893863	3.538510883
21.0372215533722	76.252935296403	21.16552744	75.92926841	0.348170438
21.4889848391785	76.9837296738102	21.04749508	76.84597788	0.462481096
23.4732627226971	80.19359497955	23.53960858	80.471438	0.285654541
23.4732627226971	80.19359497955	25.47356848	81.94258519	6.220239291
23.4732627226971	80.19359497955	24.67927032	81.21698222	7.738446369
23.4732627226971	80.19359497955	22.96398221	79.24584246	5.253467184
23.4732627226971	80.19359497955	24.57644237	79.57543571	7.621327433
23.4732627226971	80.19359497955	27.46499326	78.56518576	6.680683032
23.4732627226971	80.19359497955	22.95220857	73.2582761	8.329429805
23.4732627226971	80.19359497955	24.37529212	73.10827156	9.946110191
23.4732627226971	80.19359497955	31.67974116	78.20082263	10.5302733
23.8553344000156	75.7031607947676	25.63863856	75.55318582	1.789599458
23.4405234432717	74.0966483575927	23.86908483	73.83689183	0.501137023
23.1229036683168	72.8665452757485	22.68191696	72.90808337	0.442938698
23.1229036683168	72.8665452757485	25.39416892	74.01493111	4.846769394
23.1229036683168	72.8665452757485	23.39691794	71.43920824	2.45996491

Solution x	Solution y	Original x	Original y	Radius
23.1229036683168	72.8665452757485	24.66562586	67.58605744	8.251747258
23.1229036683168	72.8665452757485	26.6523776	66.91672378	7.970867369
23.1229036683168	72.8665452757485	30.01509861	69.93828769	10.72586107
23.3213805008145	69.8104839156889	21.52581462	69.05739134	1.947101759
23.3213805008145	69.8104839156889	21.2618816	68.31108552	3.123606085
24.1916472811203	68.8368771388804	24.34494447	68.89894191	0.165384594
24.1916472811203	68.8368771388804	25.66105506	62.27941228	9.39136023
24.1916472811203	68.8368771388804	27.36103425	64.84526011	5.82414556
24.3153661716094	65.7437011048593	21.61039636	65.83676525	4.44331993
24.3153661716094	65.7437011048593	24.00842436	69.26671548	3.536360214
24.3153661716094	65.7437011048593	26.03259253	67.05188068	2.852941681
24.3153661716094	65.7437011048593	25.20403775	63.98638021	4.126692706
24.3153661716094	65.7437011048593	26.46280572	62.61127777	3.79783788
22.81138601924	64.1452947432262	22.58317288	64.23875961	0.246610864
22.81138601924	64.1452947432262	26.36495426	64.10386589	5.012038977
22.81138601924	64.1452947432262	28.66025221	61.13181458	8.682831908
22.7763440486834	62.5849634673318	21.30645349	61.8915326	1.625246019
22.7763440486834	62.5849634673318	24.58618772	59.92581691	6.813403422
24.8330605226958	60.9663920260014	25.84588775	61.17671521	1.034434548
24.8330605226958	60.9663920260014	28.86030824	61.83789689	5.323228343
24.8330605226958	60.9663920260014	28.38294287	59.7022254	6.876187581
23.7157569312046	58.8944362336017	20.97945435	58.66863495	2.745603401
23.7157569312046	58.8944362336017	24.05460087	58.82740751	0.345409995
25.527249776854	56.5599579837032	25.6524776	56.5792119	0.126699333
25.527249776854	56.5599579837032	28.17203359	56.51587977	4.557563307
24.089456846456	52.6790999305795	19.40209516	41.66020767	11.97444555
24.089456846456	52.6790999305795	22.06521443	57.50548607	6.030659205
24.089456846456	52.6790999305795	22.00300591	49.77440842	6.521574248
24.089456846456	52.6790999305795	22.68802089	46.28526246	10.38254064
24.089456846456	52.6790999305795	23.29263587	57.34435722	5.760491154
24.089456846456	52.6790999305795	24.68488711	59.85199485	7.587909595
24.089456846456	52.6790999305795	24.77779172	44.04083387	11.013687
24.089456846456	52.6790999305795	25.08011935	60.4806985	8.52356797
24.089456846456	52.6790999305795	23.68432498	51.4412716	4.840858032
24.089456846456	52.6790999305795	26.36749261	61.24478927	10.05967123
24.089456846456	52.6790999305795	24.61643689	54.01115924	7.411713322
24.089456846456	52.6790999305795	27.13020332	56.00735022	9.113612959
24.089456846456	52.6790999305795	26.97467166	54.66512134	11.66012717
24.089456846456	52.6790999305795	29.89833465	58.88393924	9.428399067
24.089456846456	52.6790999305795	28.94274384	52.01860718	4.898024634
24.089456846456	52.6790999305795	30.18073163	48.32029982	9.58620967
24.089456846456	52.6790999305795	30.62796082	46.77730777	8.83821808
24.089456846456	52.6790999305795	30.55507662	47.73107042	10.01719534
24.089456846456	52.6790999305795	31.80593192	45.60640645	10.76621751
24.089456846456	52.6790999305795	31.52001616	50.89228775	10.98721573
24.089456846456	52.6790999305795	33.50828257	58.48410354	11.3670918
24.089456846456	52.6790999305795	34.17044541	50.63731129	11.2605766
22.4664051113425	49.3822763089507	22.81585575	48.67591425	0.788075572
22.4664051113425	49.3822763089507	23.73647568	45.21539639	5.188751838
22.4664051113425	49.3822763089507	28.08331623	42.02257662	9.317039589
22.4664051113425	49.3822763089507	26.567735	46.7768569	5.167125033
18.9963573528072	50.0658201863893	18.13426387	49.15791018	1.2520007
18.5534236758772	51.8280134387952	14.81228179	50.29125842	4.356482226
18.5534236758772	51.8280134387952	20.37447933	52.92580791	2.126357542
18.5534236758772	51.8280134387952	20.72246404	50.29048837	3.507005939
15.5413622375962	54.5346846783575	15.36448886	54.97389236	0.473484508
14.6434208357318	55.3415846025737	6.810990128	49.52757429	9.894324521
14.6434208357318	55.3415846025737	11.86612062	56.83051802	3.1512409
14.6434208357318	55.3415846025737	16.47526591	49.4455512	9.818184126
14.6434208357318	55.3415846025737	16.54761864	53.09785344	6.228334506
14.6434208357318	55.3415846025737	17.45311026	57.02027397	4.698442012
14.6434208357318	55.3415846025737	18.10483235	51.48322234	8.264928029
14.6434208357318	55.3415846025737	20.16713628	56.2637712	7.589009856
14.6434208357318	55.3415846025737	20.53092136	55.63617906	5.894866268
14.6434208357318	55.3415846025737	22.84438078	60.01413405	9.832099483
13.3234420946216	55.0288727989599	13.21771043	55.16074821	0.169027539
12.2332081523509	52.7822221268085	12.24975114	50.92735248	3.387131358
12.2332081523509	52.7822221268085	18.80954314	50.67936902	11.57690137
10.6416706534705	49.502531845162	10.84189087	50.74783931	3.28397178
10.6416706534705	49.502531845162	12.77181014	48.33401693	2.429592834
10.2221687246103	48.8208824473321	8.811692105	48.50504439	1.445405816
10.2221687246103	48.8208824473321	10.30388261	47.84277995	0.981509885
9.46268044617278	51.4037923709794	7.880864255	53.63419396	2.73437995
9.46268044617278	51.4037923709794	10.16802995	51.02082052	0.802611588
6.17246552236635	59.4609423739418	0.073554416	50.20291794	11.48330524
6.17246552236635	59.4609423739418	1.282619347	62.39268391	6.209124989
6.17246552236635	59.4609423739418	3.164572856	61.67055704	3.732266773
6.17246552236635	59.4609423739418	3.390983182	60.32064994	8.156128877
6.17246552236635	59.4609423739418	3.684518627	54.75346427	10.66155854
6.17246552236635	59.4609423739418	3.857750749	53.93522034	9.829595519

Solution x	Solution y	Original x	Original y	Radius
6.17246552236635	59.4609423739418	8.011277516	61.69215045	10.57580758
6.17246552236635	59.4609423739418	8.933612257	64.19415642	8.119454693
6.17246552236635	59.4609423739418	8.077114598	60.52651503	4.01884632
6.17246552236635	59.4609423739418	8.689838933	62.80875147	6.672826006
6.17246552236635	59.4609423739418	10.63863267	61.64507704	8.169031835
6.17246552236635	59.4609423739418	9.891024822	52.16610985	9.993987041
6.17246552236635	59.4609423739418	11.71156616	63.23151575	10.95254356
6.17246552236635	59.4609423739418	10.83705181	59.65376627	8.510330825
6.17246552236635	59.4609423739418	14.35540419	64.70998039	9.721773775
6.17246552236635	59.4609423739418	13.17908278	60.05355856	7.781969298
6.17246552236635	59.4609423739418	13.89109091	56.92730438	9.141496171
3.65095481971571	54.267398386654	0.102323447	55.05645207	3.635297833
3.65095481971571	54.267398386654	3.166581108	54.38581172	2.806090341
3.65095481971571	54.267398386654	3.200690229	54.90401263	3.339909369
3.65095481971571	54.267398386654	5.351054934	54.87903352	3.370669882
3.71366781188041	49.9118849615793	0.224660494	41.43611847	9.809410917
3.71366781188041	49.9118849615793	0.715064701	54.34039001	5.620649576
3.71366781188041	49.9118849615793	1.250751092	48.74029716	5.852672895
3.71366781188041	49.9118849615793	5.668356774	43.14782971	8.305775856
3.71366781188041	49.9118849615793	5.283007933	51.8957834	3.483971696
3.71366781188041	49.9118849615793	8.013859219	41.41457221	9.523443187
3.71366781188041	49.9118849615793	6.962926975	47.87740863	8.307462013
3.71366781188041	49.9118849615793	7.342191074	50.36568708	3.656790591
3.71366781188041	49.9118849615793	8.736047039	47.86465463	7.075947311
3.71366781188041	49.9118849615793	8.915897502	48.83105962	5.482065711
3.71366781188041	49.9118849615793	10.20301226	47.6234059	9.015245558
3.71366781188041	49.9118849615793	11.99216143	50.52822644	8.464820885
2.62141954801916	44.6268864059245	0.094225631	39.91558536	5.346313369
2.62141954801916	44.6268864059245	1.775610616	46.38397362	1.950063647
7.26160813315613	42.8785087383525	6.302525489	40.0085763	3.025946417
7.26160813315613	42.8785087383525	6.668915236	38.80565327	8.512380576
7.26160813315613	42.8785087383525	7.974625907	40.8370263	8.509762243
7.26160813315613	42.8785087383525	9.196765131	46.15569372	11.9809647
7.26160813315613	42.8785087383525	9.954481978	42.50823893	10.6166074
7.26160813315613	42.8785087383525	12.31993183	42.07287161	11.95610617
7.26160813315613	42.8785087383525	14.44281578	41.35822358	11.77700274
9.81758928001454	42.1305470755058	9.832177112	38.08691559	4.043657799
10.5549115044766	42.3520978252617	2.885836634	40.60849192	7.864786769
10.5549115044766	42.3520978252617	7.871697725	40.35198819	6.3641027
10.5549115044766	42.3520978252617	9.020444459	42.86210706	2.418478506
10.5549115044766	42.3520978252617	9.755265232	43.18329059	1.339232837
10.5549115044766	42.3520978252617	10.71615729	46.62293177	5.678630364
10.5549115044766	42.3520978252617	12.97854061	40.66549102	4.434042673
10.5549115044766	42.3520978252617	14.50630809	38.16565664	6.420525444
16.704985228613	44.2000772000738	8.078510661	52.12465727	11.74516273
16.704985228613	44.2000772000738	9.265122262	48.10149258	9.899762573
16.704985228613	44.2000772000738	17.44262234	43.68368222	10.91295355
16.704985228613	44.2000772000738	17.47416259	43.6041515	0.973016574
16.704985228613	44.2000772000738	17.93093151	43.30092715	5.511425972
16.704985228613	44.2000772000738	17.80089583	46.64512233	2.679415185
16.704985228613	44.2000772000738	18.21138052	45.58660191	4.414503197
16.704985228613	44.2000772000738	18.21468575	45.65080463	4.897381571
16.704985228613	44.2000772000738	19.18169919	47.05766373	3.954790614
16.704985228613	44.2000772000738	22.79879511	41.59634367	7.012240784
16.704985228613	44.2000772000738	23.40792676	43.64379836	8.702120093
16.9593934945102	34.2750063874597	17.16840861	23.65521269	10.62185038
16.9593934945102	34.2750063874597	10.78091353	34.08373955	6.747292093
16.9593934945102	34.2750063874597	18.71921477	25.10440199	9.380442313
16.9593934945102	34.2750063874597	12.65054039	38.20990532	8.455350331
16.9593934945102	34.2750063874597	13.48749824	42.29987548	9.005353542
16.9593934945102	34.2750063874597	18.69463352	36.26547074	6.160741982
16.9593934945102	34.2750063874597	23.06731773	35.0375678	8.814338039
17.0930225065592	29.0618025017058	14.86812736	22.17705421	8.397529002
17.0930225065592	29.0618025017058	20.73212412	24.23741148	6.929326091
17.0930225065592	29.0618025017058	18.74305811	29.30240259	6.990859055
17.0930225065592	29.0618025017058	24.70443529	26.12365999	8.158816457
17.0930225065592	29.0618025017058	19.64225061	34.99214308	6.554722745
17.0930225065592	29.0618025017058	22.33900559	31.60235215	6.287046338
17.0930225065592	29.0618025017058	22.07359754	33.01769228	8.049766298
16.6181162616921	28.5645525202036	16.76117492	28.31246812	0.289848796
16.6181162616921	28.5645525202036	19.77510428	38.58926296	11.91376449
16.6181162616921	28.5645525202036	25.40396983	32.32053998	11.43146897
6.35625373034666	26.2268170394539	2.197761157	16.16441336	10.88783855
6.35625373034666	26.2268170394539	5.722550995	17.38650207	10.68361364
6.35625373034666	26.2268170394539	0.438114408	29.42535326	10.7393682
6.35625373034666	26.2268170394539	4.281409798	24.72152663	3.095213609
6.35625373034666	26.2268170394539	2.694391803	27.62826968	5.298497076
6.35625373034666	26.2268170394539	1.354188569	31.31594018	7.295671947
6.35625373034666	26.2268170394539	3.815111582	26.65111472	5.810017463
6.35625373034666	26.2268170394539	3.430192849	27.39779729	6.526989384

Solution x	Solution y	Original x	Original y	Radius
6.35625373034666	26.2268170394539	2.518275748	30.45426362	5.70976178
6.35625373034666	26.2268170394539	6.719406227	25.73868862	2.345987396
6.35625373034666	26.2268170394539	10.62327399	24.29073933	10.64782213
6.35625373034666	26.2268170394539	8.026602483	29.17059173	9.758103666
6.35625373034666	26.2268170394539	9.320660383	27.08555662	10.8588123
6.35625373034666	26.2268170394539	9.442374955	27.32019574	10.87002293
6.35625373034666	26.2268170394539	14.14878683	27.98719075	10.13344558
6.35625373034666	26.2268170394539	11.00474377	35.14184161	10.56540176
5.14817548167879	22.2445652366875	6.772905892	23.04434695	2.6690689
4.00038865367976	18.4610573863645	0.867278095	18.04823486	3.160190534
4.00038865367976	18.4610573863645	4.953508892	23.81507206	11.32693583
6.49782944494174	14.4469264259633	5.801300438	5.23076571	10.356567
6.49782944494174	14.4469264259633	3.082410661	9.043855976	9.949435792
6.49782944494174	14.4469264259633	3.177857831	14.97802426	5.317837399
6.49782944494174	14.4469264259633	7.319977879	15.37807435	6.081166637
6.49782944494174	14.4469264259633	5.677247541	18.04924585	6.000363709
6.49782944494174	14.4469264259633	10.89890727	16.02503912	4.675459945
6.49782944494174	14.4469264259633	5.584406208	23.81184943	9.409363681
6.49782944494174	14.4469264259633	12.36712067	15.90584574	8.460729812
6.49782944494174	14.4469264259633	14.9958336	14.5728326	8.817791313
6.49782944494174	14.4469264259633	10.79914705	20.42039499	9.255684285
9.65962710941533	9.05592506439869	8.988027099	7.925934732	1.314505506
9.65962710941533	9.05592506439869	8.465864182	8.874062551	11.71772619
9.65962710941533	9.05592506439869	8.679954371	15.22687294	10.6053774
9.65962710941533	9.05592506439869	12.63680518	12.91935497	10.77386908
17.0615013991976	8.81801500135643	18.20950886	6.619599382	6.369371766
24.3999735551828	8.58214143124587	20.19850768	8.627828216	7.471216408
24.3999735551828	8.58214143124587	29.15811552	9.518746656	4.849447835
30.0385943823441	8.40090576176049	32.11403346	10.63014558	3.943215754
33.5561013726322	8.28784611077153	34.15723352	12.84614068	4.597761329
33.5561013726322	8.28784611077153	36.57027062	15.62107689	9.745800746
41.9828936231359	6.31380543757758	42.34346606	5.769949569	0.652527155
43.8926321195726	17.4539435688417	44.45005227	17.91363181	0.722516784
43.8926321195726	17.4539435688417	39.25918273	24.78783876	9.890531084
43.8926321195726	17.4539435688417	42.45831495	25.01806118	11.16727795
36.844627349729	17.6076817651208	35.62470684	10.73896033	6.976212454
36.844627349729	17.6076817651208	38.07401644	11.09458783	6.973490769
36.844627349729	17.6076817651208	38.46066343	17.33665094	2.23318621
36.844627349729	17.6076817651208	38.38951699	19.65672727	4.440566438
36.844627349729	17.6076817651208	39.07927218	20.57348801	5.646872091
35.3315793015651	18.1254912632227	35.94447387	20.12395641	2.090335546
35.3315793015651	18.1254912632227	35.85991513	20.90404301	8.748151694
30.1978970194891	19.5209842466397	21.65865806	17.99154884	8.718780186
30.1978970194891	19.5209842466397	35.53984032	15.99196501	8.611862088
30.1978970194891	19.5209842466397	28.82263126	20.36706254	2.386009522
30.1978970194891	19.5209842466397	30.90434674	20.96780911	1.948898626
30.1978970194891	19.5209842466397	29.56587444	24.57869021	7.997446269
26.126443179357	20.6277301195894	18.39694528	22.72524013	8.568057279
26.126443179357	20.6277301195894	27.39065822	19.10906735	2.166651987
26.126443179357	20.6277301195894	25.83818458	22.03803134	1.439459118
24.3604730512564	19.2325016580965	24.23492671	17.98856994	1.250251176
24.3604730512564	19.2325016580965	21.70527032	21.60018691	8.932392927
24.3604730512564	19.2325016580965	24.09498187	20.3828805	10.45340098
24.3604730512564	19.2325016580965	28.59013959	24.83311171	10.05513054
23.8306164304217	19.8603315155195	23.64941173	19.80991504	0.188087651
23.8306164304217	19.8603315155195	23.31975826	27.34182644	8.782240679
23.8306164304217	19.8603315155195	26.37919279	28.3108891	11.05276225
24.9675726844969	26.9853316469482	24.87958822	27.09583401	0.141251684
24.9675726844969	26.9853316469482	25.99458773	34.37910238	11.0175516
27.8901103857092	26.7871995040003	27.26619514	25.90196542	1.092233728
31.2295367425827	26.5608035453943	30.34406593	27.74432368	1.723178802
34.0776100323792	26.3677174946916	34.82834577	24.45085722	2.058629996
34.0776100323792	26.3677174946916	36.2315122	27.60710766	7.544747892
37.3196714121647	29.8025756499756	37.07046765	30.04479215	0.347521723
37.3196714121647	29.8025756499756	40.05041388	28.81118981	7.168813073
37.3196714121647	29.8025756499756	37.51752459	33.09106605	9.30247437
37.3196714121647	29.8025756499756	39.35568633	35.06788426	9.948736286
37.3196714121647	29.8025756499756	41.09480481	34.92509896	6.686212606
39.5678113946328	32.0488807554255	36.77121212	29.70512597	4.799880351
39.5678113946328	32.0488807554255	40.57036155	31.31828969	1.240512039
41.4565865189848	35.7334162776783	44.21687698	34.39769027	3.557457265
41.4565865189848	35.7334162776783	44.94410764	36.28576006	3.530989553
39.9841989586843	37.1986320096989	38.78467609	39.06908374	2.608214338
39.9841989586843	37.1986320096989	40.81010844	38.77304558	5.734432078
39.9841989586843	37.1986320096989	39.91233765	41.2977364	9.100834641
38.403245088574	38.7718848172911	38.90241804	39.45548462	0.84645279
38.403245088574	38.7718848172911	38.72818734	43.64397508	6.801536894
35.5218444972429	40.2663940461546	30.83636789	38.35208021	5.711258926
35.5218444972429	40.2663940461546	35.17250587	39.36136713	1.66175135
35.5218444972429	40.2663940461546	34.31056081	43.95356429	3.881034988

Solution x	Solution y	Original x	Original y	Radius
35.5218444972429	40.2663940461546	39.58652985	43.55288071	5.227108341
31.211668883397	35.2763156758683	31.17947294	31.40633137	3.870118229
31.211668883397	35.2763156758683	31.80606468	35.45021175	0.619311075
27.9484849855957	34.0632971728068	27.42853428	33.27622768	0.943306484
27.7158975873191	38.9776524911973	23.91492832	35.50451908	5.452232026
27.7158975873191	38.9776524911973	28.54401437	40.13690379	5.278992328
27.7158975873191	38.9776524911973	29.90863496	38.4851443	2.311172422
27.7158975873191	38.9776524911973	30.41452332	39.55317391	2.75931255
25.7431905611724	44.0196887781549	25.71821347	44.02373583	0.02530284
25.7431905611724	44.0196887781549	25.73174612	44.02606181	0.711901016
25.7431905611724	44.0196887781549	26.12441872	44.96485891	2.839436564
25.7431905611724	44.0196887781549	27.06311365	42.64274924	7.281813729
25.7431905611724	44.0196887781549	29.65914735	42.12761495	5.483604448
25.7431905611724	44.0196887781549	30.28185343	43.77834378	7.043480934
25.7431905611724	44.0196887781549	30.33187934	43.75504148	8.637269115
25.7431905611724	44.0196887781549	32.06711817	41.12824267	9.236365321
25.7431905611724	44.0196887781549	34.06373355	42.77086753	11.54083384
28.5106648737446	47.3442191142487	27.37711129	46.43616017	2.003178979
31.2812104336258	50.672438897798	28.72359173	49.06807614	3.019170961
31.2812104336258	50.672438897798	31.12121771	52.61678334	1.950915934
35.073792202447	52.0819947134638	32.83493269	54.50530143	5.131563652
35.073792202447	52.0819947134638	34.68773061	48.27076221	4.719701242
38.8663739712682	53.4915505295359	33.45977848	51.47641849	7.198818879
38.8663739712682	53.4915505295359	35.40868681	49.33377596	6.467074744
38.8663739712682	53.4915505295359	37.58124673	53.7047325	6.278048118
38.8663739712682	53.4915505295359	39.86159624	55.58185516	2.315133001
38.8663739712682	53.4915505295359	41.84687745	52.15158968	3.267858024
39.9319484330001	49.5649542658501	39.67150404	49.44131071	0.288303678
39.9319484330001	49.5649542658501	39.96945525	49.46230999	2.614076519
39.9319484330001	49.5649542658501	42.25980634	46.86827481	6.991437475
42.7919868366256	45.5713130096832	40.57741767	42.47262	3.80870253
42.7919868366256	45.5713130096832	43.66555329	47.77139353	2.714393217
43.1314232877476	45.0973376658115	43.11381093	45.00092033	0.098012743
45.4174785838391	46.6212365357023	41.57443341	43.13832473	5.186489261
45.4174785838391	46.6212365357023	49.48945411	49.44119699	4.953096168
45.4174785838391	46.6212365357023	47.38308024	49.71863955	4.361961303
49.3424978121447	49.3141442030828	50.26037041	48.95030273	0.987355419
48.2923608534564	54.1304848477953	52.59359138	61.87082203	8.855134315
48.2923608534564	54.1304848477953	40.92420024	52.54921675	7.535927257
48.2923608534564	54.1304848477953	54.43373891	52.12894009	7.548403707
48.2923608534564	54.1304848477953	45.47068469	56.96814934	4.238980951
48.2923608534564	54.1304848477953	48.91348948	54.77748717	1.998111236
51.3183799772121	55.2641145259586	52.64945222	62.68533593	7.539647236
51.3183799772121	55.2641145259586	55.80484172	50.30189669	7.040116877
51.3183799772121	55.2641145259586	46.15723029	56.4070148	5.286178878
51.3183799772121	55.2641145259586	48.01348394	55.67625048	3.794373864
53.6821307645686	55.5990228195692	59.77266019	58.01872841	6.553588622
53.6821307645686	55.5990228195692	55.16481024	55.42346911	2.604442543
53.6821307645686	55.5990228195692	53.50308144	57.04941766	6.080321585
53.6821307645686	55.5990228195692	52.57887869	54.16196226	4.016092555
55.0192076839597	55.788466854474	55.40337389	57.61168804	1.863254992
58.3941651110565	53.6908860433793	58.50503897	53.8647284	0.206189664
58.3941651110565	53.6908860433793	53.70737401	57.8077763	11.42963583
58.3941651110565	53.6908860433793	53.22205568	50.84724902	8.874987766
59.9639791363404	52.6637260691735	64.66140077	51.58253517	4.820243123
59.9639791363404	52.6637260691735	56.36080227	54.43871329	4.01664825
63.1356878392167	48.4217983805783	64.75792457	49.92103542	4.153788299
63.1356878392167	48.4217983805783	63.21772914	46.4808445	2.251010045
66.5029340036814	43.9183506330628	74.78372311	42.05088328	8.48875153
66.5029340036814	43.9183506330628	66.65703205	47.7722791	4.863538053
66.5029340036814	43.9183506330628	63.12520069	41.24941139	6.279661735
66.5029340036814	43.9183506330628	64.47235297	44.07915445	7.777532307
66.5029340036814	43.9183506330628	63.41360315	44.69674786	7.070238855
66.5029340036814	43.9183506330628	59.28037529	42.02965748	8.171091803
68.6893934478453	40.9941193388069	69.67922342	40.74675918	1.020269779
68.6893934478453	40.9941193388069	70.24663893	43.40548551	10.39433718
68.6893934478453	40.9941193388069	63.76560063	37.45231942	11.55334525
60.499869672741	37.1487099919954	59.48412304	31.97998889	5.267581898
60.499869672741	37.1487099919954	58.09138733	33.97784367	4.941158085
60.499869672741	37.1487099919954	61.01859213	37.82208646	0.850005209
56.3067009896095	40.6980887055331	62.83458953	32.37480154	11.26631142
56.3067009896095	40.6980887055331	63.54041364	40.47906672	10.09103037
56.3067009896095	40.6980887055331	57.56166222	41.97700689	1.823459763
56.3067009896095	40.6980887055331	57.48443808	43.25173204	5.068521277
56.3067009896095	40.6980887055331	57.35658457	43.71456461	10.0633535
56.3067009896095	40.6980887055331	51.33580352	40.30660727	4.986289138
56.3067009896095	40.6980887055331	52.03099226	42.50134863	7.192186477
56.3067009896095	40.6980887055331	47.65008175	45.51867646	10.88958897
56.3067009896095	40.6980887055331	48.35826716	45.69665672	9.422444764
53.3053726459169	43.2386123936364	53.79810347	45.16180718	1.985311525

Solution x	Solution y	Original x	Original y	Radius
53.3053726459169	43.2386123936364	51.65508094	43.85648581	1.762166358
51.1889978297848	41.0525234227128	58.14893689	37.55022655	9.288752836
51.1889978297848	41.0525234227128	54.69460289	37.32086801	6.733868048
51.1889978297848	41.0525234227128	51.12261026	42.05252276	1.177483398
51.1889978297848	41.0525234227128	43.74535734	43.87626012	7.961235625
51.1889978297848	41.0525234227128	45.94832838	45.50704308	7.19052718
51.2402692923063	39.8890693398195	56.1557774	36.1071959	6.201998603
51.2402692923063	39.8890693398195	49.90577559	41.072269	2.801182703
48.2386104729252	39.2330058160029	48.20619517	39.24794213	0.03569097
48.2386104729252	39.2330058160029	47.22851165	47.89903616	11.51868038
48.2386104729252	39.2330058160029	45.78512338	48.76667443	10.70444172
51.0330822332788	34.019653403723	47.52772375	30.54529654	5.345510096
51.0330822332788	34.019653403723	53.48089128	34.57431179	2.509863553
51.0330822332788	34.019653403723	50.32982697	35.43640834	1.581696088
51.9576401048244	31.398762611718	51.19858704	31.0981292	0.816420237
51.9576401048244	31.398762611718	54.00076983	32.50218762	8.205190824
51.9576401048244	31.398762611718	58.48548965	38.49282405	11.79894595
51.9576401048244	31.398762611718	55.55130491	39.21526309	11.86807905
51.9576401048244	31.398762611718	49.81718199	39.89953162	11.40867509
52.9402391287065	29.169080251295	51.08696185	26.42044109	3.4213392
52.9402391287065	29.169080251295	46.26887105	26.53209753	8.81744986
52.9402391287065	29.169080251295	48.88810081	29.6929228	11.17097838
52.9402391287065	29.169080251295	49.49892788	30.73465222	9.148611436
53.1932871477444	28.5948714196144	50.20668952	26.40233109	3.704996422
53.1932871477444	28.5948714196144	55.07321291	28.85442279	3.578504928
58.3871012289236	24.0454910338581	60.71671796	14.8721563	10.90485749
58.3871012289236	24.0454910338581	62.17589976	23.53474989	5.377142852
58.3871012289236	24.0454910338581	63.04507341	24.29862677	4.664845393
58.3871012289236	24.0454910338581	50.59311922	22.75724468	8.529458236
58.3871012289236	24.0454910338581	59.97712424	27.07719444	8.051501149
58.3871012289236	24.0454910338581	59.11600598	27.89604561	6.714910247
58.3871012289236	24.0454910338581	51.99282443	27.99909333	9.260790549
58.3871012289236	24.0454910338581	55.9549233	32.80200534	9.08801586
63.3259707615583	6.82524131271252	63.24920239	4.015695007	2.810594924
66.7158432888568	16.5961077716583	72.1570689	9.179080442	9.589007965
66.7158432888568	16.5961077716583	65.51501196	11.68636529	7.30737771
66.7158432888568	16.5961077716583	70.71952594	19.54937922	6.168002999
66.7158432888568	16.5961077716583	62.61153544	17.95816147	4.324411312
66.7158432888568	16.5961077716583	66.92261807	21.4897109	4.897969721
66.7158432888568	16.5961077716583	66.17419814	21.15751135	7.122166774
66.7158432888568	16.5961077716583	64.88897514	21.58345165	5.371825022
70.9507148684808	20.5408713539798	71.29498477	19.86081824	1.460834206
70.9507148684808	20.5408713539798	67.26622281	20.02005982	10.98398776
75.0691003314747	24.3771286493422	75.00767938	29.50135545	5.124594895

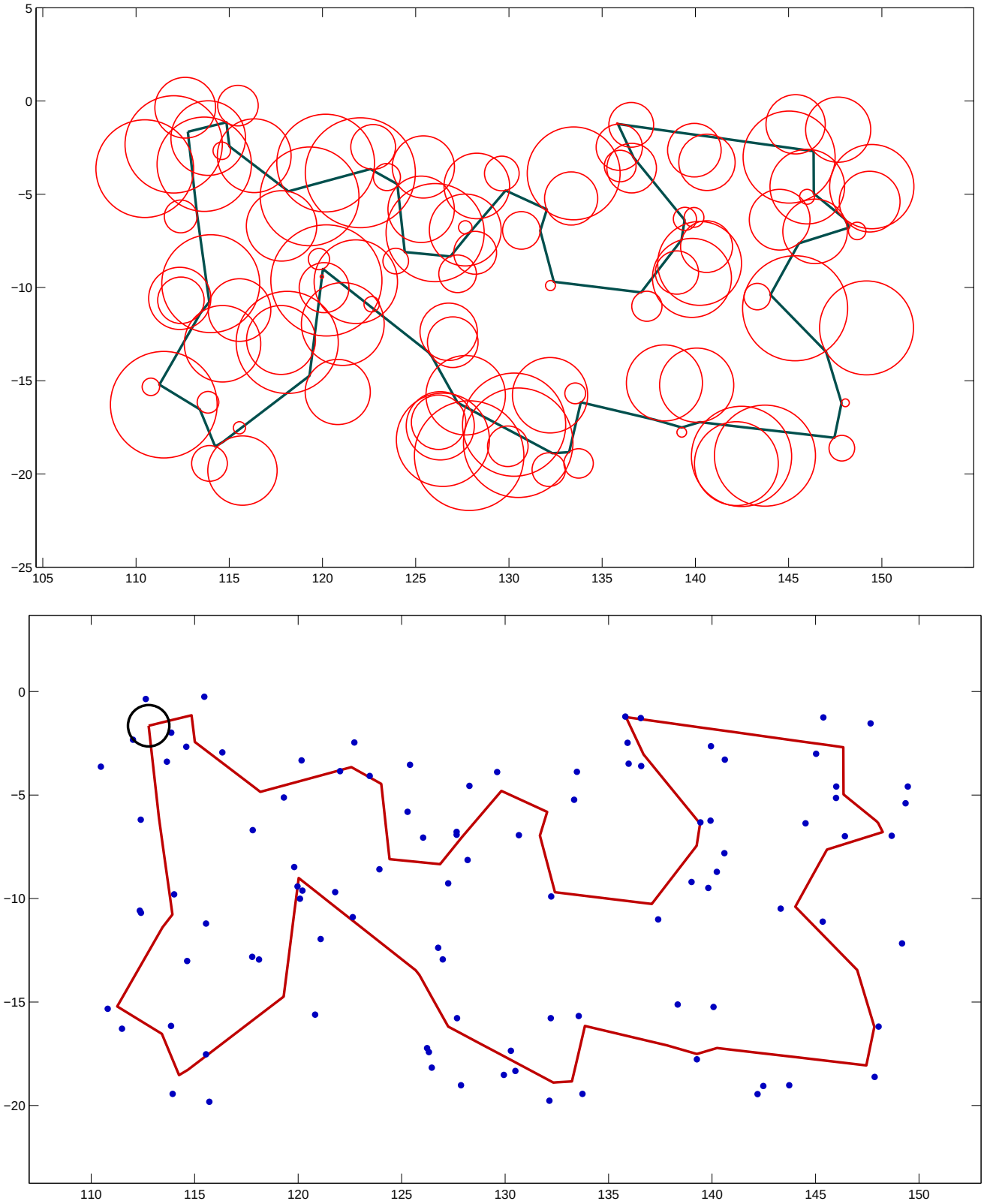

Figure N.56: $kroD100$, arbitrary radius, 2D, Euclidean, Length = 141.8346659

Table N-59: Solution for $kroD100$, arbitrary radius, 2D, Euclidean

Total distance: 141.834665853582				
Depot: x 2.78 y 1.65				
Solution x	Solution y	Original x	Original y	Radius
2.95013976061259	3.17851507753485	0.47	3.63	2.62
3.11919121203799	4.69725129197947	2.02	2.33	2.61
3.27316587889105	6.08054065622135	2.4	6.19	0.88
3.51702137992237	7.82918577318493	4.01	9.8	2.63
3.78226699627139	9.73121524734546	2.35	10.59	1.67
3.92764508627842	10.773692156931	5.55	11.21	1.68
3.44718151246427	11.3876779416051	2.41	10.69	1.25
2.61699890320568	12.836666366196	4.64	13.02	2.05
1.90466605198472	14.0799620563082	1.49	16.29	2.86
1.255297089298	15.2133614108588	0.8	15.33	0.47
3.41909572326745	16.5368334098235	3.86	16.16	0.58
4.24412224388249	18.5294454103262	3.94	19.44	0.96
4.67049267570437	18.2775913243434	5.71	19.82	1.86
5.84425919966044	17.3806295764975	5.55	17.53	0.33
8.05728748731298	15.6894929076398	8.11	12.95	2.74
9.30297267775572	14.7375734394434	10.82	15.61	1.75
9.53747894535716	12.8790787072329	7.78	12.82	1.85
9.80815121803639	10.7339709792093	11.79	9.69	2.24
9.96404249644512	9.49853266208451	9.97	9.42	0.09
10.0260043233264	9.00748661812819	9.81	8.48	0.57
10.9982511035662	9.77450274143969	11.09	11.96	2.22
11.4038085028704	10.0944511199412	10.09	10.01	1.34
12.2530604948239	10.7644351840112	12.64	10.9	0.41
12.7590494094831	11.1636149481053	10.21	9.62	2.98
15.6804496254798	13.4683381741887	16.77	12.38	1.54
15.8585994271999	13.6946739321545	16.99	12.94	1.36
16.4015814639336	14.6661212753914	17.68	15.78	2.13
17.2516915391357	16.1870491867492	16.23	17.23	1.46
17.8789380762578	16.5208815927753	16.32	17.42	1.83
18.6233790783544	16.9170870088703	16.46	18.17	2.5
19.8567392987533	17.5735037653767	19.94	18.52	1.09
20.6197559488043	17.9795951643636	17.87	19.02	2.94
22.3314755984262	18.8906041305487	22.14	19.77	0.9
22.5287490049019	18.8786920683042	20.28	17.36	2.77
23.2304179587904	18.8363228153419	23.74	19.44	0.79
23.4226771840927	18.0113182189287	20.5	18.33	2.94
23.6794747595345	16.909379283358	22.21	15.78	2.02
23.8550510898381	16.1559672828956	23.56	15.68	0.56
27.8229591773265	17.0933901798987	28.34	15.12	2.04
29.2690870261153	17.5100016029245	29.27	17.77	0.26
30.2408048333166	17.2226562256013	30.07	15.24	1.99
32.3588894579925	17.4686892396094	32.2	19.45	2.25
34.0718269799696	17.6676609628102	32.48	19.06	2.69
35.7847645257934	17.8666324850504	33.73	19.02	2.71
37.4558566366403	18.0607432236867	37.86	18.62	0.69
37.8402111589534	16.1994149972133	38.05	16.19	0.21
37.0102795051426	13.4516836482517	39.18	12.17	2.52
34.0236011423015	10.394892521051	33.32	10.49	0.71
34.8171199784643	8.95974657145591	35.35	11.12	2.82
35.5509488312099	7.63255475422941	34.52	6.37	1.63
38.2469386944537	6.78735853253264	38.68	6.97	0.47
38.0254104631447	6.34992765980029	39.35	5.4	1.63
37.937011748851	6.25976249414805	39.46	4.59	2.26
36.8526040539233	5.37632176926466	36.42	6.99	1.73
36.3509631693769	4.96764690210663	35.99	5.14	0.4
36.3423796467408	2.69168424695197	37.66	1.54	1.75
35.7360465356649	2.60749437108846	36	4.59	2
34.3286393978568	2.41207284712381	35.38	1.25	1.59
32.7014498426921	2.18613461967315	35.03	3.01	2.47
31.0527837173526	1.95721480953319	30.62	3.29	1.51
29.3958463712921	1.72714682089273	29.95	2.64	1.44
27.740169598959	1.49725496011292	26.56	1.28	1.2
26.2865767476084	1.29542349840105	25.92	2.48	1.24
25.8422072065602	1.23372121087957	25.81	1.21	0.04
26.6892969576969	3.03710720181483	25.97	3.49	0.85
27.7149871569216	4.29332831589599	26.58	3.6	1.33
29.0072378770507	5.87602145891884	29.44	6.32	0.62
29.4188725945025	6.38017408943757	29.93	6.24	0.53
29.2585024497183	7.44571026979352	29.82	9.49	2.12
29.2583188811048	7.4466932766929	30.6	7.81	1.39
28.3337347868043	8.64588974837189	30.23	8.71	2.25
27.8521453695708	9.27051705321266	29.01	9.2	1.16
27.0870017727636	10.2629176017686	27.4	11.01	0.81
22.4071648442497	9.69625354490939	22.23	9.9	0.27
21.6797965668125	6.96027051194323	20.67	6.94	1.01
22.034493059126	5.81356801431382	23.34	5.23	1.43
21.7552447332416	5.68546791030155	23.47	3.88	2.49
19.8207777473815	4.79806844244065	19.62	3.89	0.93
19.2403650807071	5.47951739875136	18.28	4.56	1.76
18.5535092886687	6.28593859689555	16.04	7.06	2.63
17.9280974303673	7.0202200912591	18.19	8.14	1.15
17.9274479577145	7.02098047620992	17.66	6.78	0.36
16.8602028543944	8.33824993411435	17.25	9.27	1.01
16.2934289793506	8.28285863005724	17.66	6.92	1.93
14.4150768957503	8.09928582126718	13.93	8.59	0.69
14.2270986590252	6.38116089042692	15.29	5.81	1.78
14.0257987401772	4.5412719215539	13.46	4.08	0.73
14.0170345073539	4.46116618277992	15.41	3.54	1.67
12.5726317854503	3.65091670965715	12.72	2.46	1.2
11.1540157238652	4.03587683130548	9.31	5.12	2.65
9.7674988162464	4.4121263879111	12.03	3.85	2.95
8.17220170450889	4.84503101771187	7.81	6.7	1.89
7.89956891828757	4.63749481956796	10.17	3.33	2.62
5.6298928744125	2.90974866996629	3.87	1.99	2
5.00765477298717	2.43608209546748	4.6	2.67	0.47
4.95543130808178	2.00922183168992	6.34	2.94	1.98
4.89391076155609	1.50636994521381	3.66	3.39	2.53
4.84987139483383	1.14640421298371	5.47	0.25	1.09
3.76134894654514	1.41123967088806	2.64	0.36	1.63

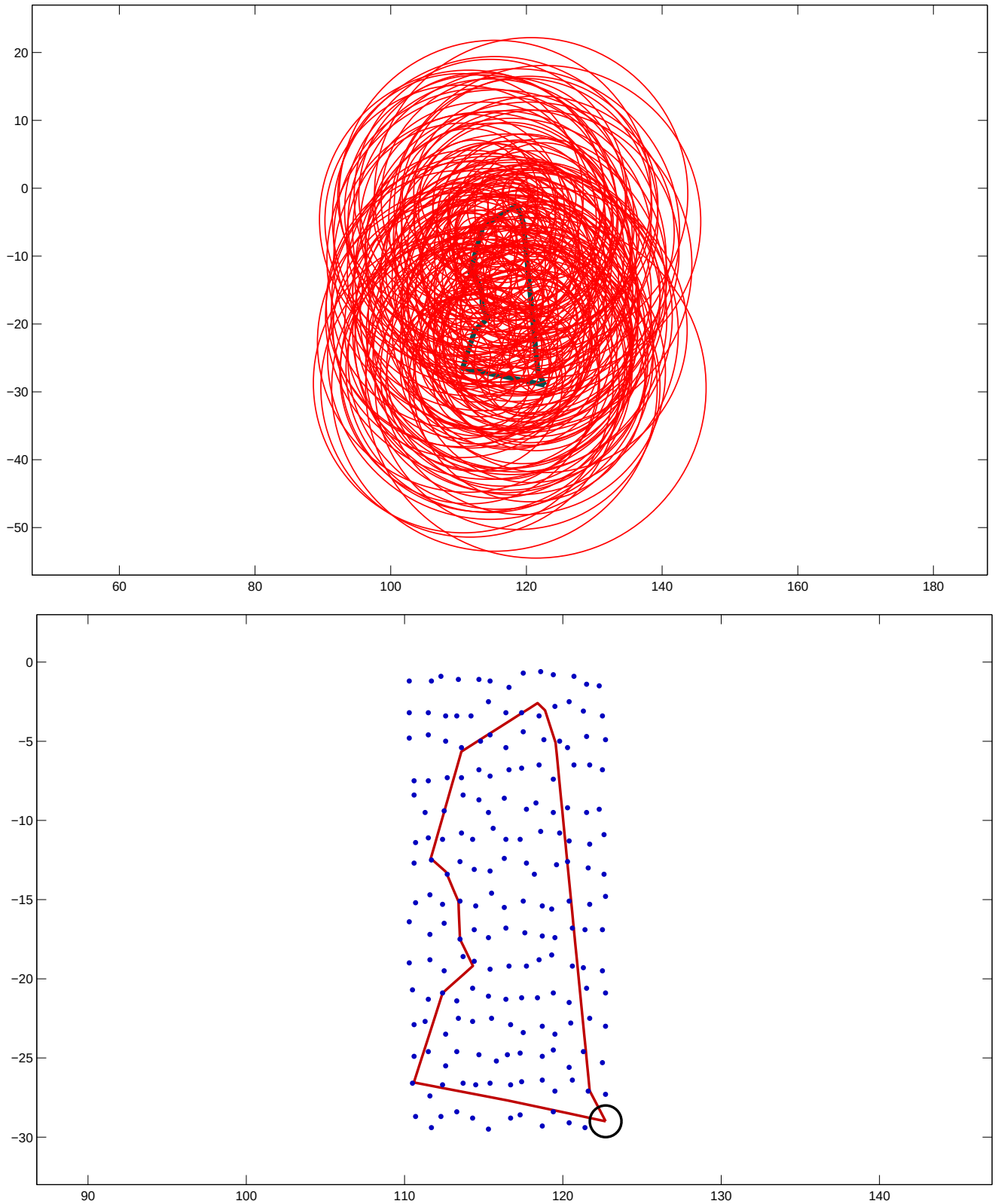

Figure N.57: *rat*195, arbitrary radius, 2D, Euclidean, Length = 68.2240033

Table N-60: Solution for *rat*195, arbitrary radius, 2D, Euclidean

Total distance: 68.2240033373067				
Depot: x 12.7 y 29				
Solution x	Solution y	Original x	Original y	Radius
11.552361136006	28.7556226526229	9.4	24.5	16.1
10.4017690249381	28.5106164424849	10.5	22.8	15.1
9.25117687507624	28.2656102245987	9.5	27.1	21
8.10058472062018	28.0206040056458	8.7	29.3	21
6.95626959430837	27.77693441253	7.3	28.6	1.1
6.50194769477039	27.6801914529281	6.7	26.7	1
4.42386416472978	27.2828285051347	9.4	28.4	5.1
4.42386416472978	27.2828285051347	4.3	28.8	4
2.51135459682382	26.9171259597571	3.3	28.4	7.1
0.585997752136222	26.5489668085694	0.5	26.6	0.1
1.03943709307794	25.1369157530075	0.6	24.9	4.1
1.49695911913808	23.7121508510059	0.6	22.9	14
1.95094511143952	22.2983974737864	1.5	24.6	5
1.95094511143952	22.2983974737864	3.4	22.5	5
2.40000000000001	20.9	2.4	20.9	0
3.01598990739024	20.3506605827472	1.6	18.8	10
3.63927585699956	19.7948145600963	5.5	22.5	14.1
3.63927585699956	19.7948145600963	6.6	19.2	8.1
4.32081580743757	19.1870176567799	5.4	19.4	1.1
4.07416648911612	18.6800808350642	6.4	16.8	6
3.78723191380111	18.0903459751238	5.3	17.4	8
3.5	17.5	3.5	17.5	0
3.47382773921899	16.8621125093234	4.4	16.9	1
3.44873327193592	16.2504937050501	6.7	28.8	14.1
3.44873327193592	16.2504937050501	2.4	26.7	11
3.44873327193592	16.2504937050501	8.7	24.9	12.1
3.44873327193592	16.2504937050501	3.3	24.6	9.1
3.44873327193592	16.2504937050501	2.6	23.5	8
3.44873327193592	16.2504937050501	4.3	22.7	8
3.44873327193592	16.2504937050501	1.5	21.3	6
3.44873327193592	16.2504937050501	3.3	21.4	7
3.44873327193592	16.2504937050501	2.5	19.5	6
3.44873327193592	16.2504937050501	2.4	15.3	3.1
3.42149091148545	15.586525044215	5.4	13.2	3.1
3.40242754273289	15.1219001274622	3.5	15.1	0.1
3.08042065623458	14.3615014589364	0.7	15.2	7.1
2.78793463737641	13.6708144307743	2.7	13.4	5.1
2.60571146466241	13.240506062082	3.5	12.6	1.1
1.65657687635623	12.3939847971925	0.6	12.7	1.1
1.87428884385194	11.6330058553613	1.5	11.1	2
2.09812612651758	10.8506168074913	1.5	7.5	4
2.32036445663817	10.0738166530136	2.7	7.3	3
2.32036445663817	10.0738166530136	3.7	8.4	3.1
2.54420173585829	9.29142761703534	11.4	29.4	25.1
2.54420173585829	9.29142761703534	1.7	29.4	22
2.54420173585829	9.29142761703534	5.3	29.5	24
2.54420173585829	9.29142761703534	0.7	28.7	22.1
2.54420173585829	9.29142761703534	10.7	0.9	23.1
2.54420173585829	9.29142761703534	1.6	27.4	19.1
2.54420173585829	9.29142761703534	0.3	1.2	18.1
2.54420173585829	9.29142761703534	7.5	0.7	14.1
2.54420173585829	9.29142761703534	1.7	1.2	10
2.54420173585829	9.29142761703534	3.4	1.1	18.1
2.54420173585829	9.29142761703534	4.7	1.1	20.1
2.54420173585829	9.29142761703534	5.4	1.2	23
2.54420173585829	9.29142761703534	4.5	26.7	21.1
2.54420173585829	9.29142761703534	10.4	2.5	19
2.54420173585829	9.29142761703534	3.7	26.6	21.1
2.54420173585829	9.29142761703534	6.6	1.6	18
2.54420173585829	9.29142761703534	9.5	2.8	19
2.54420173585829	9.29142761703534	12.7	4.9	23
2.54420173585829	9.29142761703534	1.5	3.2	14.1
2.54420173585829	9.29142761703534	5.8	25.2	22.1
2.54420173585829	9.29142761703534	6.5	24.8	19.1
2.54420173585829	9.29142761703534	4.7	24.8	24
2.54420173585829	9.29142761703534	3.3	3.4	20.1
2.54420173585829	9.29142761703534	4.2	3.4	10.1
2.54420173585829	9.29142761703534	12.7	20.9	21
2.54420173585829	9.29142761703534	0.3	4.8	20
2.54420173585829	9.29142761703534	11.7	6.5	20.1
2.54420173585829	9.29142761703534	1.5	4.6	22
2.54420173585829	9.29142761703534	7.5	4.4	14.1
2.54420173585829	9.29142761703534	1.3	22.7	22.1
2.54420173585829	9.29142761703534	5.4	4.6	24
2.54420173585829	9.29142761703534	2.6	5	9.1
2.54420173585829	9.29142761703534	6.7	22.9	22
2.54420173585829	9.29142761703534	4.8	5	21.1
2.54420173585829	9.29142761703534	3.6	5.4	18.1
2.54420173585829	9.29142761703534	8.5	6.5	24.1
2.54420173585829	9.29142761703534	0.5	20.7	19
2.54420173585829	9.29142761703534	8.4	21.2	24
2.54420173585829	9.29142761703534	9.4	7.4	19
2.54420173585829	9.29142761703534	11.5	9.5	21
2.54420173585829	9.29142761703534	0.6	7.5	17.1
2.54420173585829	9.29142761703534	7.4	21.2	20.1
2.54420173585829	9.29142761703534	6.4	21.3	20
2.54420173585829	9.29142761703534	0.6	8.4	8.1
2.54420173585829	9.29142761703534	5.3	21.1	15.1
2.54420173585829	9.29142761703534	0.3	19	19.1
2.54420173585829	9.29142761703534	3.6	7.3	22
2.54420173585829	9.29142761703534	11.7	15.3	18
2.54420173585829	9.29142761703534	4.3	20.6	21.1
2.54420173585829	9.29142761703534	9.4	9.5	13
2.54420173585829	9.29142761703534	10.6	16.8	19.1
2.54420173585829	9.29142761703534	10.4	11.3	24
2.54420173585829	9.29142761703534	8.5	18.8	23
2.54420173585829	9.29142761703534	7.7	19.2	23
2.54420173585829	9.29142761703534	1.3	9.5	7
2.54420173585829	9.29142761703534	9.5	17.4	17
2.54420173585829	9.29142761703534	6.3	8.6	20
2.54420173585829	9.29142761703534	10.4	15.1	18
2.54420173585829	9.29142761703534	0.3	16.4	19
2.54420173585829	9.29142761703534	2.5	9.4	11.1
2.54420173585829	9.29142761703534	0.7	11.4	12.1
2.54420173585829	9.29142761703534	4.4	18.9	24
2.54420173585829	9.29142761703534	8.6	10.7	14
2.54420173585829	9.29142761703534	3.7	18.6	17
2.54420173585829	9.29142761703534	1.6	17.2	21.1
2.54420173585829	9.29142761703534	5.3	9.5	19.1
2.54420173585829	9.29142761703534	7.6	17.1	19.1
2.54420173585829	9.29142761703534	8.7	15.4	17
2.54420173585829	9.29142761703534	2.4	11.2	8
2.54420173585829	9.29142761703534	1.7	12.5	18.1
2.54420173585829	9.29142761703534	7.3	11.2	18.1
2.54420173585829	9.29142761703534	5.6	10.5	25
2.54420173585829	9.29142761703534	2.5	16.5	10
2.54420173585829	9.29142761703534	3.6	10.8	22
2.54420173585829	9.29142761703534	1.6	14.7	11
2.54420173585829	9.29142761703534	8.2	13.4	18
2.54420173585829	9.29142761703534	6.4	11.2	12
2.54420173585829	9.29142761703534	7.7	12.7	23
2.54420173585829	9.29142761703534	4.3	11.2	10
2.54420173585829	9.29142761703534	7.5	15.1	23.1
2.54420173585829	9.29142761703534	4.5	15.4	20.1
2.54420173585829	9.29142761703534	4.4	13.1	16
2.76829071617772	8.50815880028354	4.7	8.7	4.1
2.99212799252861	7.72576977645219	4.7	6.8	3
2.99212799252861	7.72576977645219	5.4	7.2	3.1
3.21297488922778	6.95383316681015	2.6	3.4	4.1
3.58507281424177	5.65322167875835	0.3	3.2	4.1
3.71459367221625	5.57082732533037	6.4	5.4	8
4.31404206585532	5.18948980511492	7.4	6.7	8
4.31404206585532	5.18948980511492	6.6	6.8	7.1
4.9134904544338	4.80815228815149	5.3	2.5	9.1
5.49813600908048	4.43623155542628	7.4	3.2	9
5.49813600908048	4.43623155542628	8.8	4.9	12
6.10843587453523	4.04799090039616	2.3	0.9	8
6.10843587453523	4.04799090039616	11.3	3.1	7
6.10843587453523	4.04799090039616	6.4	3.2	5.1
6.70232302611592	3.67019115002073	8.5	3.4	3.1
7.30423329919741	3.28728751146881	12.5	3.4	10.1
7.30423329919741	3.28728751146881	9.8	5	13
7.89768719682286	2.90976337395311	12.3	1.5	5
7.89768719682286	2.90976337395311	9.4	0.8	3
8.40033062868416	2.5900080759028	8.6	0.6	2
8.87197137607501	3.044221868189	11.5	1.4	3.1
9.54221633438083	5.1087580196581	11.5	4.7	2
9.54636274023595	5.15104296009757	10.3	5.4	2
9.62935935151455	5.99744025674182	12.5	6.8	14.1
9.71234492428211	6.84372498322611	10.7	6.5	12
9.79549169433244	7.69165359671954	12.3	9.3	13.1
9.79549169433244	7.69165359671954	12.6	10.9	9
9.87820195464856	8.53513069650092	11.7	11.5	9.1
9.87820195464856	8.53513069650092	11.6	13	12

Solution x	Solution y	Original x	Original y	Radius
9.96090790448298	9.37856383803259	10.3	9.2	4
10.052818760964	10.3158683984786	12.6	13.4	4
10.1062952763801	10.8612204884771	9.8	10.8	8.1
10.1709596777202	11.5206663743497	12.7	14.8	9
10.2284256857009	12.1067032114566	8.7	23	11
10.2284256857009	12.1067032114566	9.4	20.9	9.1
10.2876035436045	12.7101975179218	10.3	12.6	10
10.28770113422	12.7111927445652	7.7	9.3	10.1
10.2877987249408	12.7121879711983	9.6	12.8	5
10.2877987249408	12.7121879711983	6.3	12.4	4
10.503942778302	14.9164184979474	8.3	8.9	9
10.583471985882	15.7274549343234	5.5	14.6	9.1
10.6623137658466	16.5314809952624	6.3	15.5	11
10.7423584537175	17.3477742829426	8.7	17.3	13.1
10.7770201318171	17.7012530223233	12.5	16.9	2
10.9092877047549	19.0501136940135	11.4	16.9	15
10.9092877047549	19.0501136940135	9.3	15.6	5.1
10.9983352325906	19.9582176646658	10.6	19.2	11
10.9983352325906	19.9582176646658	9.3	18.5	9.1
11.0859462012515	20.8516716510904	2.3	28.7	13
11.0859462012515	20.8516716510904	12.5	25.3	5
11.0859462012515	20.8516716510904	8.7	26.4	9.1
11.0859462012515	20.8516716510904	10.4	25.6	8.1
11.0859462012515	20.8516716510904	12.7	23	4.1
11.0859462012515	20.8516716510904	2.6	25.5	11
11.0859462012515	20.8516716510904	7.3	24.7	8
11.0859462012515	20.8516716510904	12.5	19.5	5.1
11.0859462012515	20.8516716510904	11.3	19.3	6.1
11.174098719602	21.7506483451309	10.4	21.5	16
11.2619215397499	22.6462627864175	7.5	23.4	15.1
11.350074058183	23.5452394809974	11.7	22.5	14.1
11.350074058183	23.5452394809974	11.5	20.6	14
11.4404993416788	24.4673937633888	12.7	27.3	3.1
11.4404993416788	24.4673937633888	9.5	23.5	3.1
11.5259569548719	25.338887899758	11.3	24.6	14.1
11.6125577299918	26.2220399650012	10.4	29.1	17.1
11.6125577299918	26.2220399650012	10.6	26.4	17
11.6958556701255	27.0715098173951	11.6	27.1	0.1
12.2070392795839	28.0532537194793	7.4	26.5	18
12.2070392795839	28.0532537194793	5.4	26.6	19.1

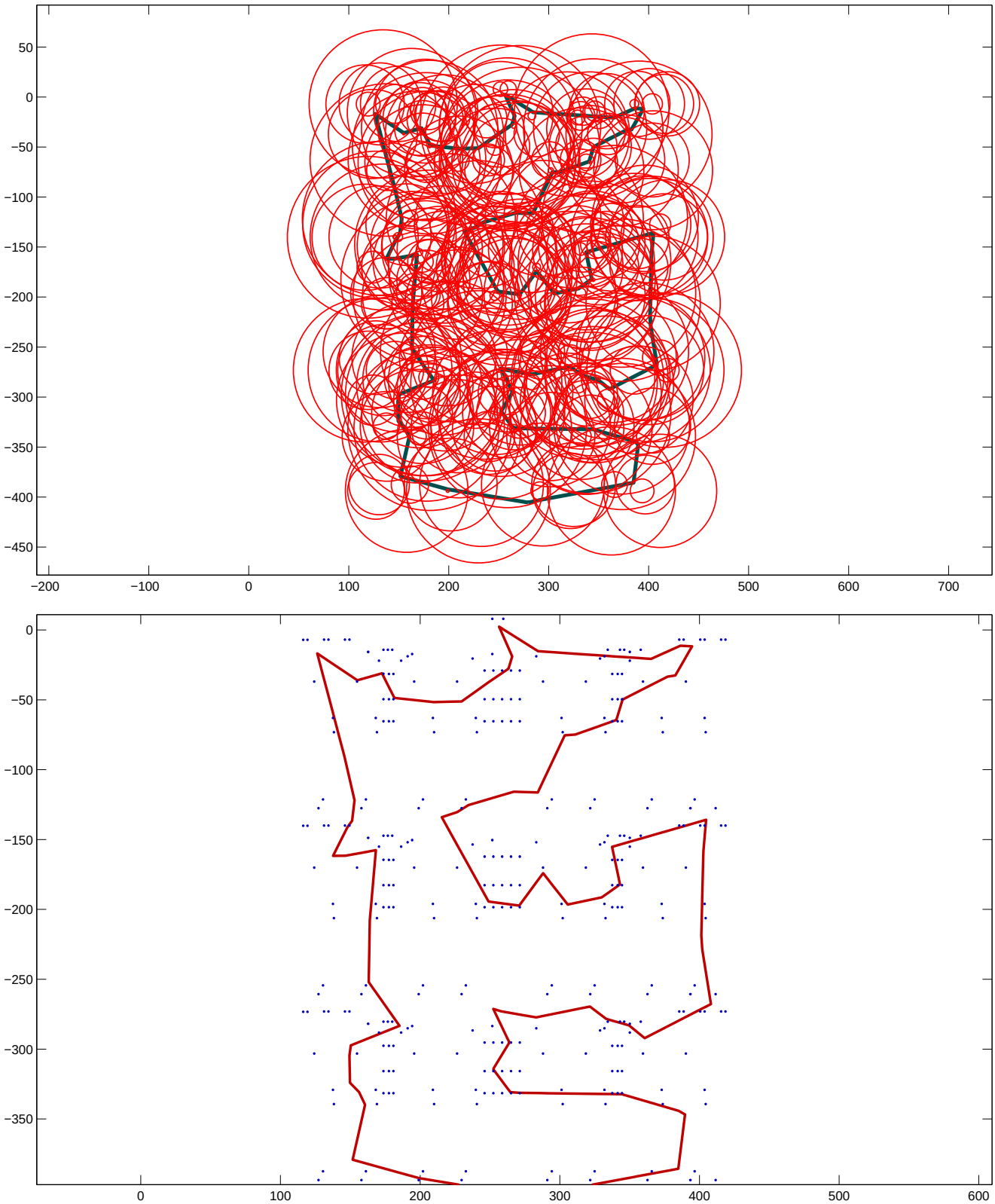

Figure N.58: *lin*318, arbitrary radius, 2D, Euclidean, Length = 2080.5741441

Table N-61: Solution for *lin*318, arbitrary radius, 2D, Euclidean

Total distance: 2080.57414412218 Depot: x 169.3 y 405.5				
Solution x	Solution y	Original x	Original y	Radius
179.221622098293	403.396895741194	211.8	393.8	37.7
182.82147305009	402.633828758687	181.1	393.8	9
182.82147305009	402.633828758687	122.8	387.5	61.9
243.606215908839	391.408052292374	255.9	387.5	12.9
243.606215908839	391.408052292374	263.8	339.4	73.1
245.699094222266	391.021537829594	215	387.5	42
245.699094222266	391.021537829594	184.3	387.5	61.5
257.84470002797	388.778477707248	286.6	387.5	29.3
269.21364888068	386.678851219855	231.5	315.8	80.7
274.838247124859	385.640095764656	283.5	393.8	11.9
279.639158233149	346.796984654617	301.6	393.8	56.6
279.639158233149	346.796984654617	294.5	339.4	16.6
275.088155345585	344.166234631626	305.5	273.1	77.3
256.724530347174	338.794511136734	252.8	393.8	64.1
256.724530347174	338.794511136734	293.7	329.2	38.2
256.724530347174	338.794511136734	248	280.4	61.5
256.724530347174	338.794511136734	231.5	331.6	33.6
234.49603284965	332.292236109755	234.6	331.6	0.7
224.963366397801	332.162850621166	234.6	315.8	30.3
216.517481956717	332.048215965114	222.8	339.4	9.8
216.517481956717	332.048215965114	148.8	331.6	79
199.203931591613	331.813222628385	227.6	315.8	32.6
199.203931591613	331.813222628385	142.5	315.8	63.6
199.203931591613	331.813222628385	142.5	331.6	70.4
181.311190325327	331.570367777215	161.4	315.8	25.4
181.311190325327	331.570367777215	155.1	315.8	37.1
181.311190325327	331.570367777215	161.4	295.3	52.8
175.358930109983	331.489578841502	227.6	331.6	65.9
175.358930109983	331.489578841502	178	303.2	29.3
175.358930109983	331.489578841502	224.4	280.4	71.8
175.358930109983	331.489578841502	234.6	297.7	68.2
161.413392907297	331.300299099044	161.4	331.6	0.3
157.15927247119	330.977458063408	155.1	331.6	4.2
154.514839747395	330.776774651219	119.7	393.8	72
150.36087865057	325.164279119851	130.7	339.4	25.3
150.36087865057	325.164279119851	192.1	339.4	44.1
150.36087865057	325.164279119851	70.9	331.6	81.8
142.466041052218	314.497414289989	136.2	315.8	6.4
142.466041052218	314.497414289989	99.2	329.2	46.6
142.466041052218	314.497414289989	67.7	297.7	81
142.621125931459	313.826701278989	116.5	303.2	28.2
149.500405240656	302.492674445397	136.2	295.3	62.2
153.901414775833	295.241746584566	155.1	295.3	1.2
152.578070726712	292.490937121035	136.2	331.6	42.4
148.934814206464	284.917770515416	141.7	283.5	8.5
148.934814206464	284.917770515416	129.9	329.2	48.2
142.351714975518	271.233610471794	122.8	254.4	25.8
147.862875439954	272.933963985188	142.5	295.3	23
163.08515212066	275.569016798629	148.8	315.8	45
163.08515212066	275.569016798629	191.3	329.2	60.6
173.089301334876	277.300785564844	173.2	285.1	7.8
182.977476391748	275.29849736916	148.8	295.3	39.6
193.230554635702	273.222318967018	181.1	260.7	21.4
193.230554635702	273.222318967018	252.8	260.7	64.9
193.230554635702	273.222318967018	184.3	254.4	21.5
203.43823870001	271.155332515497	240.2	288.2	74.7
203.43823870001	271.155332515497	236.2	280.4	68.9
211.553679962588	269.512011057425	211.8	260.7	12.9
211.553679962588	269.512011057425	215	254.4	15.5
223.233826032046	278.358660064237	218.9	286.7	9.4
223.233826032046	278.358660064237	283.5	260.7	62.8
223.233826032046	278.358660064237	222	329.2	53.4
223.233826032046	278.358660064237	286.6	254.4	68.8
229.020163256978	280.018249289418	222	285.1	76.7
234.812805314828	281.679646771058	227.6	297.7	31.3
234.812805314828	281.679646771058	278.7	273.1	72.9
239.5975043704	283.051954433262	240.2	281.9	1.3
247.177424358386	289.237832710174	208.7	303.2	47.1
247.177424358386	289.237832710174	231.5	297.7	23.7
250.758946537904	292.160668366143	249.6	303.2	11.1
270.924029649813	281.783359078517	280.3	303.2	54.2
288.584304246237	272.695068321834	301.6	260.7	17.7
288.584304246237	272.695068321834	263.8	206.3	78
293.662517196486	270.081729805966	263	329.2	67.9
298.178620004284	267.757663153099	275.6	273.1	24
298.178620004284	267.757663153099	308.7	273.1	11.8
292.042548224429	228.705358026088	233.1	280.4	78.4
292.042548224429	228.705358026088	234.6	198.5	64.9
291.331676501181	218.604911693827	293.7	273.1	71.8
291.331676501181	218.604911693827	290.6	273.1	54.5
291.331676501181	218.604911693827	231.5	164.6	80.6
291.860848247846	197.022224096474	293.7	196.1	3.7
291.860848247846	197.022224096474	293.7	140	60.8
291.966756506367	192.702672339018	308.7	140	57.3
292.040114106577	189.710726141318	255.9	254.4	74.1
292.559932608054	168.509511888144	278.7	140	31.7
292.559932608054	168.509511888144	283.5	127.6	48.7
292.559932608054	168.509511888144	227.6	164.6	68.2
292.708871772694	162.434908928684	227.6	182.7	69
292.815622966384	158.080976326526	240.2	155.1	52.7
294.02828656684	144.441782058398	294.5	206.3	67.1
294.02828656684	144.441782058398	280.3	170.1	29.1
294.791776547507	135.854580148071	301.6	127.6	10.7
282.851615628864	139.289751940835	255.9	121.3	72.9
266.099834660518	144.109221604997	252.8	127.6	21.2
266.099834660518	144.109221604997	233.1	147.3	53.4
263.326520635123	144.907101111931	305.5	140	43.2
250.43943678472	148.614701507555	236.2	147.3	14.3
250.43943678472	148.614701507555	249.6	170.1	30.4
243.339508604705	150.657343373612	286.6	121.3	53.2
243.339508604705	150.657343373612	231.5	198.5	54.9
235.369621383609	152.950271479352	240.2	148.8	12
235.369621383609	152.950271479352	290.6	140	58.6
235.369621383609	152.950271479352	191.3	196.1	65.9
227.401360016404	155.24273186884	222	152	6.3
229.318776651998	164.269561484711	227.6	198.5	71.7
229.318776651998	164.269561484711	208.7	170.1	55.8
231.229073977602	173.262874792337	248	147.3	33
231.229073977602	173.262874792337	224.4	147.3	27.7
231.229073977602	173.262874792337	222.8	206.3	36.2
233.10987296926	182.117315323473	234.6	164.6	25.4
233.10987296926	182.117315323473	275.6	140	63.7
233.10987296926	182.117315323473	234.6	182.7	1.6
224.695620532887	188.073587804117	231.5	182.7	62.1
219.960225670707	191.425674306859	222	196.1	5.1
195.658576134968	196.527767097964	263	196.1	74.1
195.658576134968	196.527767097964	192.1	206.3	10.4
191.39604224776	191.096376446484	142.5	182.7	52.7
191.39604224776	191.096376446484	148.8	182.7	49.8
191.39604224776	191.096376446484	148.8	198.5	59.7
191.39604224776	191.096376446484	142.5	198.5	69.8
191.39604224776	191.096376446484	155.1	198.5	57.2
191.39604224776	191.096376446484	161.4	182.7	56.9
184.775936148291	182.660928776432	218.9	153.6	44.9
184.775936148291	182.660928776432	136.2	162.2	53.2
178.057033903053	174.099593371069	178	170.1	4
173.128020859547	180.763028258465	155.1	162.2	51.3
168.126586418852	187.524368371299	173.2	152	43.5
168.126586418852	187.524368371299	130.7	206.3	42
160.981095141439	197.184216218678	129.9	196.1	31.1
160.893398056829	197.302772172402	161.4	198.5	1.3
139.016710581159	194.368881325599	136.2	198.5	5
132.959471997872	183.470016567653	100	206.3	53.6
132.959471997872	183.470016567653	70.1	147.3	74.2
132.959471997872	183.470016567653	119.7	127.6	64
126.134837760659	171.190367247621	116.5	170.1	39
119.310431646419	158.91112841163	142.5	162.2	56.6
112.486211595645	146.632224743969	155.1	182.7	57.9
112.486211595645	146.632224743969	63.8	147.3	52
112.486211595645	146.632224743969	67.7	164.6	53.4
105.487269105716	134.038940707578	89	127.6	17.7
116.621288013609	130.363006151399	127.6	153.6	25.7
116.621288013609	130.363006151399	161.4	162.2	60.1
124.614435743247	125.308468901418	84.3	150.4	61.5
124.614435743247	125.308468901418	122.8	121.3	4.4
151.369760960415	117.433821837189	136.2	65.4	54.2
151.369760960415	117.433821837189	136.2	182.7	73.4
157.080228375313	115.7840450416	148.8	162.2	66
157.080228375313	115.7840450416	148.8	49.6	66.7
157.080228375313	115.7840450416	141.7	150.4	56
174.214629046664	116.338043383364	181.1	127.6	13.2
193.559197391462	75.3519161165694	192.1	73.2	2.6
193.559197391462	75.3519161165694	191.3	63	18.3
201.032339308144	74.8885450473305	211.8	127.6	53.8

Solution x	Solution y	Original x	Original y	Radius
211.131216074436	71.3039123515848	234.6	65.4	24.2
211.131216074436	71.3039123515848	222	63	20.4
212.594683758798	70.7844492162101	161.4	65.4	60
212.594683758798	70.7844492162101	184.3	121.3	57.9
222.943369474755	67.111145852088	215	121.3	69.7
222.943369474755	67.111145852088	227.6	65.4	8.3
230.487207527635	64.4334331849677	231.5	65.4	1.4
234.906730040101	49.8567424439004	234.6	49.6	0.4
239.917605603515	47.3029011503882	161.4	49.6	79.4
239.917605603515	47.3029011503882	161.4	29.1	80.6
267.1533324984	33.421949081269	227.6	31.5	39.6
267.1533324984	33.421949081269	290.6	6.9	35.4
267.1533324984	33.421949081269	278.7	6.9	32.7
267.1533324984	33.421949081269	294.5	73.2	59.4
272.710184054802	32.5298896197156	293.7	63	37
279.576534651812	20.6354929330145	308.7	6.9	32.2
281.916517660398	16.5820025190984	305.5	6.9	29.6
284.716738658296	11.7312540469982	293.7	6.9	10.2
276.392800294015	11.2279865634969	275.6	6.9	4.4
255.380190029193	20.6805187176305	240.2	15.7	16
255.380190029193	20.6805187176305	231.5	49.6	41.1
255.380190029193	20.6805187176305	263	63	43
250.442829295917	20.352005862703	263.8	73.2	55.8
250.442829295917	20.352005862703	222.8	73.2	62.4
245.47442206689	20.0214273022902	248	14.2	37.6
240.504031727196	19.6907167982799	240.2	22	3.2
240.504031727196	19.6907167982799	236.2	14.2	10.1
238.457869176957	19.5545730713692	249.6	37	20.7
229.667046270932	18.9696657447865	222	18.9	14.4
229.666048477187	18.96959935471	227.6	49.6	30.7
216.89760230162	18.0966701610482	218.9	20.5	7.4
211.05976277631	17.6975597086613	280.3	37	73
211.05976277631	17.6975597086613	224.4	14.2	14.2
200.523866402127	16.9772613688935	208.7	37	62.2
200.523866402127	16.9772613688935	234.6	31.5	69.7
186.696587196343	16.0319440305646	178	37	22.7
186.696587196343	16.0319440305646	141.7	17.3	52.8
186.696587196343	16.0319440305646	148.8	65.4	68.2
180.939399706981	15.6383476966016	231.5	31.5	56.7
174.408078287986	15.1918270199325	173.2	18.9	3.9
150.63648743242	0.234229760858429	149.6	-7.9	8.2
146.47900507423	-2.3817475138877	141.7	-7.9	7.3
155.943603630156	18.9096177360331	233.1	14.2	77.3
153.248600127917	27.735332086678	155.1	29.1	2.3
153.248600127917	27.735332086678	136.2	29.1	21.8
145.371005590576	33.0874483814411	142.5	29.1	81.1
139.258844596955	37.2401117877017	127.6	20.5	20.4
139.258844596955	37.2401117877017	85.8	37	59.3
129.221641274342	44.4045684013656	136.2	49.6	8.7
119.721718140511	51.1855200512567	142.5	49.6	28.5
119.721718140511	51.1855200512567	130.7	73.2	24.6
119.721718140511	51.1855200512567	129.9	63	16
119.721718140511	51.1855200512567	63.8	65.4	57.7
119.721718140511	51.1855200512567	58.3	63	68.9
111.107462467651	51.3681454478467	116.5	37	49.6
99.6847531393432	51.610311049291	99.2	63	11.4
99.6847531393432	51.610311049291	66.9	14.2	52
99.6847531393432	51.610311049291	52.8	15.7	64.3
99.683758780435	51.6102049815687	155.1	49.6	57
97.2542050949502	51.3510458203626	63.8	49.6	33.5
94.7748328253763	51.086572550444	155.1	65.4	62
83.8730407480231	49.9236844751432	142.5	65.4	66.7
83.8730407480231	49.9236844751432	148.8	29.1	68.3
71.5819384191291	48.6125993758784	70.9	49.6	1.2
71.5819384191291	48.6125993758784	67.7	65.4	19.9
66.0050627064739	37.5854935607412	81.1	18.9	25.4
66.0050627064739	37.5854935607412	63.8	14.2	23.68
64.9278304377624	35.455492055797	100	73.2	54.1
63.3639456047654	32.3632368518011	63.8	31.4	27.9
63.3639456047654	32.3632368518011	76.4	22	28.1
62.697812288887	31.0460974883831	84.3	17.3	27.4
62.6973609804705	31.0452051203462	70.1	14.2	18.4
45.056892088188	36.012384248473	44.9	37	1
27.3229368720433	24.1498623247339	36.2	6.9	19.4
27.3229368720433	24.1498623247339	6.3	7.1	39.2
27.3221056854908	24.1493063311054	70.9	65.4	71.5
27.3221056854908	24.1493063311054	60.6	22	36.4
22.6067350804039	20.9951215325893	24.4	6.9	74.1
16.3136874501756	16.7856040514407	9.4	7.1	11.9
20.079202488939	31.0189149140897	39.4	6.9	37.7

Solution x	Solution y	Original x	Original y	Radius
20.079202488939	31.0189149140897	67.7	31.5	48.5
23.8204839732365	45.160625062896	21.3	6.9	41
23.8204839732365	45.160625062896	20.5	121.3	76.9
27.5610072196236	59.2994690835962	28.3	73.2	20.4
31.2935636458383	73.4081993910982	14.2	37	44.6
31.2935636458383	73.4081993910982	24.4	140	73
31.2935636458383	73.4081993910982	9.4	140.2	80.8
35.6527518776529	89.8855418729817	59.1	73.2	29.3
35.6527518776529	89.8855418729817	70.9	31.5	68.2
35.6527518776529	89.8855418729817	92.1	121.3	64.6
38.3841077273058	101.713587961066	67.7	49.6	74
43.01279957188	121.757983787696	51.2	121.3	8.2
43.01279957188	121.757983787696	52.8	148.8	54.4
42.9581105156742	122.230686293236	48	127.6	40.8
41.3049742125518	136.519498632914	81.1	152	42.7
41.3043876536178	136.520308539463	39.4	140	4.5
41.3043876536178	136.520308539463	27.6	63	76.3
37.9954152370864	141.089258521398	85.8	170.1	56
37.9954152370864	141.089258521398	36.2	140	2.1
32.7548653893662	151.565237877877	6.3	140.2	53.1
27.6916851199345	161.686651521271	14.2	170.1	15.9
36.4388501331662	161.61471722135	27.6	196.1	35.6
36.4388501331662	161.61471722135	70.9	182.7	40.4
47.5824920283777	159.576814954709	70.9	198.5	76.6
47.5824920283777	159.576814954709	66.9	147.3	43.6
58.3117084125579	157.614701097714	60.6	155.1	3.4
58.0651824566185	160.452052470867	76.4	155.1	19.1
57.302622815915	169.228611859405	63.8	164.5	10.7
57.302622815915	169.228611859405	70.9	164.6	21.9
56.7062592797434	176.092362795573	58.3	196.1	20.4
56.6348531851423	176.914199847544	21.3	140	51.1
55.9123090075584	185.230206866096	67.7	182.7	29.6
55.4724133340666	190.293116530072	17.3	127.6	73.4
54.8351557233023	197.627531508241	67.7	198.5	13.7
54.2703943026941	204.127562100055	63.8	198.5	60.1
54.1716842383732	205.263649889827	44.9	170.1	42
54.1716842383732	205.263649889827	99.2	196.1	46.1
53.9647845034802	207.644929882903	28.3	206.3	25.7
53.5369419477302	231.354334240509	59.1	206.3	26
53.5369419477302	231.354334240509	89	260.7	48.3
53.5369419477302	231.354334240509	6.3	273.3	71.7
53.5369419477302	231.354334240509	39.4	273.1	61.9
53.5369419477302	231.354334240509	21.3	273.1	71.9
53.1640625	252.017890751891	17.3	260.7	36.9
53.1640625	252.017890751891	70.9	315.8	68
53.1640625	252.017890751891	119.7	260.7	67.1
53.1640625	252.017890751891	52.8	281.9	48.7
56.1047243704393	256.192004325166	76.4	288.2	37.9
58.8297798090026	260.060075977064	63.8	182.7	81.7
58.8297798090026	260.060075977064	51.2	254.4	9.5
64.4500099772689	268.037694568262	36.2	273.1	28.7
64.4500099772689	268.037694568262	63.8	315.8	50.8
75.2508026790841	283.368847002432	81.1	285.1	6.1
63.6351478453115	288.029265142726	63.8	280.4	22
63.6351478453115	288.029265142726	127.6	286.7	75.6
63.6351478453115	288.029265142726	70.1	280.4	10
63.6351478453115	288.029265142726	20.5	254.4	56.1
40.3333344295013	297.37838908799	9.4	273.3	39.2
40.1246158010644	298.931148816311	70.9	297.7	30.8
40.1246158010644	298.931148816311	92.1	254.4	70.4
39.3599802466378	304.619645726509	24.4	273.1	45.5
39.3599802466378	304.619645726509	14.2	303.2	25.2
39.3599802466378	304.619645726509	48	260.7	54.8
39.3599802466378	304.619645726509	84.3	283.5	54.6
39.3599802466378	304.619645726509	66.9	280.4	41.3
39.7665037118186	324.079825449235	27.6	329.2	13.2
46.296151034885	330.736038613988	67.7	315.8	26.1
46.296151034885	330.736038613988	100	339.4	61.5
46.8369974593858	331.876796276335	58.3	329.2	56.8
50.6112675539301	339.837517381415	59.1	339.4	8.5
50.6110754871046	339.838498763265	63.8	297.6	81.2
50.6110754871046	339.838498763265	44.9	303.2	67.2
50.6110754871046	339.838498763265	60.6	288.2	62.7
50.6110754871046	339.838498763265	63.8	331.6	16.8
50.6110754871046	339.838498763265	85.8	303.2	50.8
41.6679165863713	379.213545967589	28.3	339.4	44.9
41.6679165863713	379.213545967589	17.3	393.8	28.4
49.7146755057862	381.429205172516	51.2	387.5	18.6
49.7146755057862	381.429205172516	20.5	387.5	30.2
70.6638924525954	387.197531079756	48	393.8	61.4

Solution x	Solution y	Original x	Original y	Radius
89.3213662080165	392.334829784515	92.1	387.5	46.4
89.3213662080165	392.334829784515	67.7	331.6	72.5
89.3213662080165	392.334829784515	89	393.8	1.5

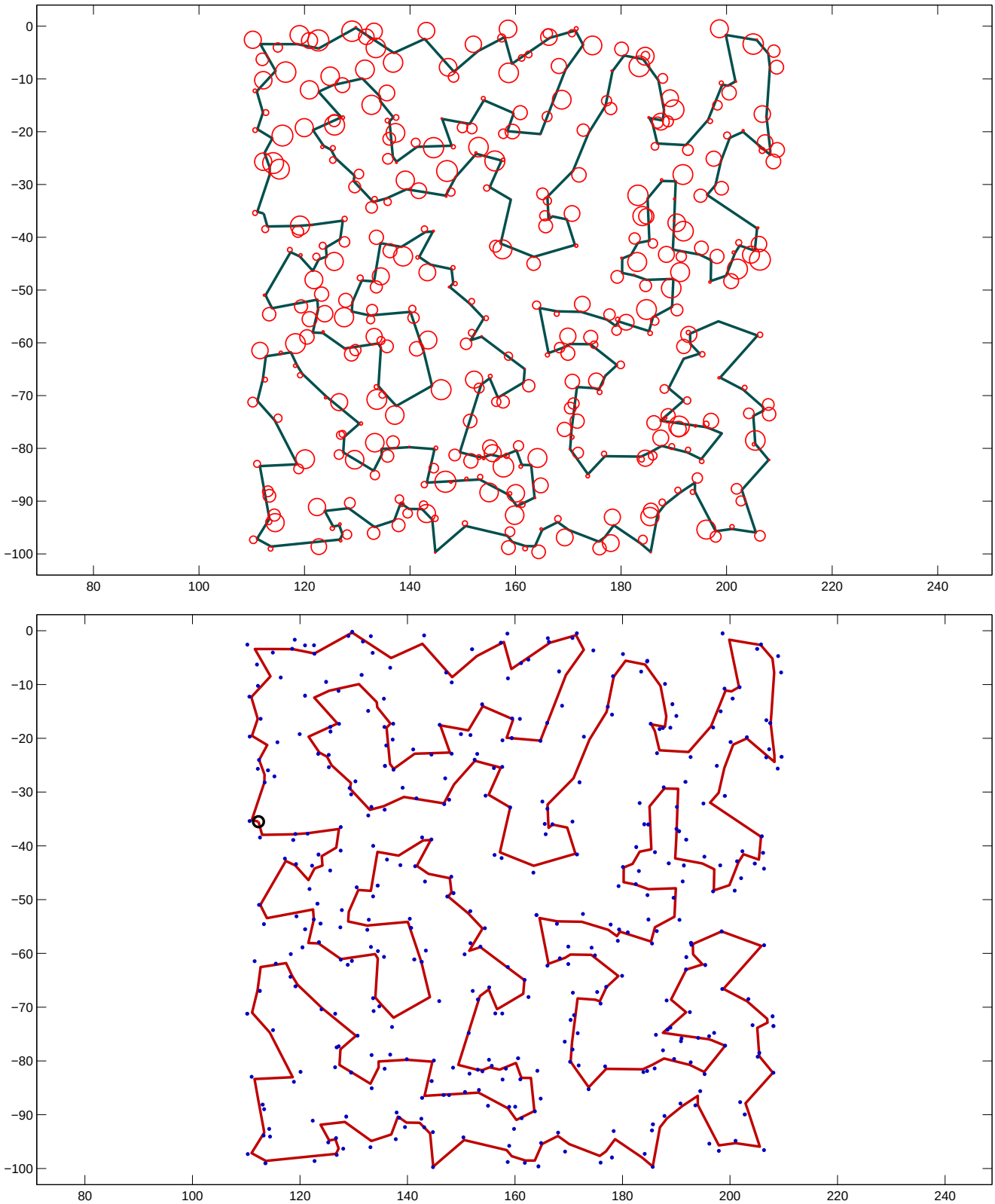

Figure N.59: $rd400$, arbitrary radius, 2D, Euclidean, Length = 1252.3799373

Table N-62: Solution for $rd400$, arbitrary radius, 2D, Euclidean

Total distance: 1252.37993725512 Depot: x 2.28315 y 35.5085				
Solution x	Solution y	Original x	Original y	radius
1.05081677048514	35.1761730973 52	0.642906	35.395	0.4629
3.384726863149	28.1945855278125	3.44571	28.2052	0.0619
3.40795850116187	27.1408572193907	4.056	25.9589	1.9713
3.41624008235794	26.7652293662848	5.25835	27.1001	1.8723
3.41624008235794	26.7652293662848	2.1823	25.6845	1.6403
2.40930435044788	24.0310314418927	2.38826	24.0295	0.0211
3.91612958339908	21.2606342782223	5.81823	20.7452	1.9707
1.07764495192919	19.5460418114574	0.65945	19.6999	0.4456
2.13572939920797	16.3778145088876	2.68873	16.3883	0.5531
0.956223776273717	12.3429413377152	0.613562	12.2624	0.352
2.74470672076706	10.4081411473221	2.19732	10.251	1.6516
4.52295119352452	8.48441473548622	6.43447	8.70233	1.9239
3.03532107072169	5.88077019996128	2.00806	6.28968	1.1788
1.6169365354681	3.39832132114241	0.219756	2.58493	1.6167
4.79181459717429	3.40691996729802	4.96047	4.06059	0.8823
8.64626068963443	3.41735706659698	9.0496	1.67955	1.784
8.64724303136505	3.41754416210068	8.57052	3.36732	0.0917
10.6690194620296	3.82369665679488	10.9477	2.73525	1.5193
12.7023977986423	4.23217987021277	12.7116	4.29147	0.06
12.7023977986423	4.23217987021277	12.6307	2.70835	1.996
19.7234130780489	0.339816986730818	19.7287	0.198716	0.1412
20.94297325482	1.14076800661467	19.0116	0.977048	1.9383
23.0808317712654	2.54481510236359	23.5387	4.13129	1.8604
23.0808317712654	2.54481510236359	21.7245	2.01127	1.4575
23.0808317712654	2.54481510236359	23.1984	1.0131	1.5757
26.9395700785671	5.07905678017761	26.7979	6.90196	1.8284
32.7821335275947	2.42786062268842	33.1085	0.882753	1.5792
38.3156652231984	8.63012151253822	38.2491	9.61738	0.9895
38.8225256575538	8.19650561711466	37.2177	7.79249	1.6549
42.8837988233565	4.7221092575093	42.0178	3.44287	1.5448
46.7849301595735	2.67863584770918	47.3917	2.23053	0.7543
47.9267342127357	2.08054043700795	48.5894	0.54797	1.6697
49.3323821369855	7.11925218544386	48.6979	8.85907	1.8519
50.9976787679653	5.98154236759972	51.1528	6.04103	0.6171
52.7431652643743	4.78904883417496	52.4925	5.37248	0.635
56.5069784816717	2.2176648235357	56.3237	2.07366	1.5607
56.5069784816717	2.2176648235357	56.1254	1.40532	0.8975
60.0415309843013	1.20542543118433	60.7013	1.36116	0.6779
61.3602222490842	0.827773307373025	61.5069	0.482106	0.3755
62.8085604448846	3.5479214396879	64.5769	3.66176	1.772
59.4725951735041	8.242120875126	58.2097	7.56071	1.435
57.8340523665217	12.4448740434959	58.7637	13.9566	1.7747
56.3106437777914	16.3523156430273	55.9929	17.1432	0.9443
54.7145013095212	20.4463147408506	54.7387	20.4852	0.0458
50.7743653023282	20.1077185859984	49.4045	19.961	1.3777
48.4467371840708	19.9076942779276	47.6864	20.3976	0.9045
49.6154886540422	16.6070033051447	50.9211	16.4053	1.3211
49.4483136596708	16.385661820933	49.4944	16.327	0.0746
44.0069703035162	14.0342107232556	43.8962	13.6901	0.3615
41.3146493750505	18.5253600410604	41.7205	19.4188	0.9813
39.816332263634	18.2558195340571	39.9475	19.2268	0.9798
36.1019926899194	17.587645112896	36.0033	17.5038	0.1295
37.8962313172234	22.6549050640925	38.2173	22.874	0.3887
34.4691652520507	22.7675772903104	34.4638	23.0393	1.9126
31.3455601839561	22.8702725764818	31.0765	22.0815	0.8334
27.4459538576406	25.6814390250178	27.4222	25.8428	0.1631
26.7476867557045	24.7702573723931	25.8125	25.1372	1.0046
26.5151119089412	22.302234983465	26.0672	21.3383	1.195
26.3193865866071	20.2252503849977	27.2482	20.2425	1.7718
26.1126611415028	18.0315339479083	25.7178	17.895	0.4178
26.825956931573	17.280713938025	27.3595	17.3028	0.534
24.3779211793839	14.23499677102	22.6997	14.9199	1.8126
24.2843260876153	13.2823126724243	25.6231	12.6549	1.4785
20.9730578795877	9.92554846550876	21.4744	8.21886	1.7788
18.3472378642634	10.5149180388623	17.1854	11.1942	1.4044
15.43034250124	11.169619986698	14.8737	9.51072	1.7498
12.6502583688414	12.4335136236921	10.9524	12.0779	1.7347
16.97744156848	17.2573732191147	17.2907	17.3232	0.3201
14.5974904270882	18.3355770071279	15.6993	18.7479	1.8907
14.5974904270882	18.3355770071279	15.6444	17.8995	1.1341
11.5960266191512	19.695348455465	9.96077	19.2347	1.6989
13.6067497238147	22.6581616050212	13.4	22.8874	0.3087
15.0433579369289	23.4303379159372	15.3759	23.0999	0.4688
15.8800183460601	25.0108965159652	15.3897	25.3897	0.6196

Solution x	Solution y	Original x	Original y	Radius
19.4802598541438	28.3119146613578	20.3288	28.022	0.8967
19.3016479738314	29.3507352057652	19.5262	30.4483	1.1203
19.3016479738314	29.3507352057652	19.247	29.2712	0.0965
23.016081882253	33.3149838385591	22.7183	34.3604	1.087
23.6338945900419	33.1486937103236	23.2874	32.7742	0.5102
25.5364089689617	32.6366140107183	25.7714	33.2927	0.6969
29.3354230095599	30.9175083616816	29.1053	29.2049	1.728
33.058625715272	31.5099629935676	31.6686	31.1822	1.4884
36.776103455264	32.1015089023157	36.8488	32.2474	0.163
37.5103530652297	30.7197166608817	37.7688	31.4408	0.766
38.6452326653146	28.5839773174617	37.0272	27.4581	1.9712
42.5557514829748	24.191463755221	42.4972	23.9973	0.2028
42.5557514829748	24.191463755221	42.987	22.9253	1.8509
44.9812129530094	24.8304954648837	46.0829	25.5503	1.8965
47.3492214916964	25.4543901409615	47.6331	25.3181	0.3149
45.1058992096759	30.5051953157244	44.5404	30.686	0.5937
49.1012916261048	32.8671977439455	49.1148	32.8614	0.0147
47.1866945905537	41.1923456675844	46.2037	41.7062	1.1092
49.2906856120723	42.0361140573447	47.522	42.292	1.7871
53.4876262762837	43.7192228474667	53.4254	44.9898	1.2721
61.2511099863683	41.4571439354717	61.5258	41.6034	0.3112
59.7046361222781	36.6084647596878	60.6972	35.5066	1.483
56.9915057324301	36.0458484571819	56.9788	35.9946	0.0528
56.2425958464834	36.6646033518127	55.717	37.8511	1.2977
56.1743765372632	35.1914136960761	55.5492	35.9315	0.9688
56.0417519735611	32.3274052537016	55.099	31.771	1.0947
56.0417519735611	32.3274052537016	56.0389	33.1015	0.7741
60.8812392399042	27.4297509587462	62.0154	28.1819	1.3609
63.8546911019167	20.2317005916969	62.8285	19.7058	1.1531
67.0476084323579	15.0867083306481	67.267	14.1516	0.9605
67.048146946555	15.0858657142113	68.0574	15.6194	1.1416
68.3694330873866	8.52920086497484	68.2389	8.47105	0.1429
70.5726271609971	5.56596636753177	70.1018	4.34543	1.3082
74.1968316744314	6.28227388704183	73.4709	7.6166	1.9485
74.1968316744314	6.28227388704183	74.5771	5.70821	1.6887
74.1968316744314	6.28227388704183	74.632	5.60444	0.8055
77.0677046575522	10.2658589225381	77.911	9.90186	0.9185
77.7064107541341	13.5780271332404	79.2919	13.6517	1.5872
78.1563273634089	15.9111827363869	80.035	15.8589	1.8794
77.8907231341242	17.8687737598085	76.9072	18.2917	1.0706
77.8907231341242	17.8687737598085	78.906	18.0381	1.0293
75.3750087238178	17.4043840114555	75.2455	17.3084	0.1612
76.0252915935354	18.6604295769451	77.5205	18.1054	1.5949
76.8751158062261	22.2390744397638	76.419	22.7841	0.7107
82.2866386731034	22.5424383567602	82.6839	23.4883	1.0259
86.4751090977276	17.7624777099492	86.8707	18.0065	0.4648
87.7429079389711	14.6418774803346	88.2698	14.9994	0.9013
89.1794461492516	11.1059372459267	88.9914	10.7701	0.3849
90.2479973408177	11.2827950582739	90.4883	12.6216	1.3602
91.6715664214529	10.4691810455465	91.7898	10.5225	0.1297
89.847377171852	1.66319519256535	88.6343	0.494442	1.6845
93.4825988374953	2.27617381816313	95.0473	3.39817	1.9254
95.7104574266838	2.65183902675721	95.7659	2.55349	0.1129
97.9023562550984	5.19579719261991	98.9579	4.73211	1.1529
98.2081763406791	7.80616179721863	99.5164	7.77478	1.3086
97.6864276014589	15.3932685668692	96.7716	16.6523	1.5563
97.5636781123866	17.1782474773233	97.4766	17.1802	0.0871
98.2437062517208	23.1443575282886	97.2905	22.0419	1.4574
98.2437062517208	23.1443575282886	99.5853	23.4577	1.3777
98.2797078118022	24.4073167758708	98.8743	25.646	1.374
96.6247165906919	23.0013492903206	96.7473	23.5618	0.5737
93.1173885411598	20.0217786071392	93.1464	19.8146	0.2092
90.5919278743247	21.1677008443338	90.11	20.7153	0.661
88.9331370070088	25.537834892445	87.5589	25.1226	1.4356
87.8842478731015	30.1409300211316	89.036	30.7257	1.2917
86.297178488101	31.9666963107263	85.0689	32.1301	1.2391
95.7654769772531	38.3159295963553	95.9404	38.2332	0.1935
95.3557171214972	42.5470048108709	96.3235	44.2629	1.97
95.3548098589578	42.5465842461494	94.61	43.2995	1.6034
95.3548098589578	42.5465842461494	96.1419	41.3034	1.4714
92.4936801642214	41.5569890915006	92.3029	41.017	0.5727
91.5802388527337	43.018588902498	91.3249	42.8902	0.2858
90.6727148646045	45.3361759966245	92.0634	46.0336	1.8841
89.9001117437697	47.3092093288383	90.8764	48.3318	1.4138
86.9902563324108	48.2958640243549	86.8559	48.4797	0.2277
87.0630032542588	44.3371055141623	88.1955	43.6361	1.3319
84.8320016914781	43.2761761020525	85.2354	42.0312	1.3087
81.6052784609475	42.6796745128329	81.4209	43.6493	0.987
79.8017089099121	42.327154759857	78.6058	43.2582	1.5156
79.9967908474679	38.7679855876703	81.8496	38.8539	1.8548

Solution x	Solution y	Original x	Original y	Radius
80.0756902711983	36.6877955533746	80.0506	36.8529	0.167
80.0756902711983	36.6877955533746	80.5435	37.2793	1.6755
80.2186241466426	32.9194547337123	80.1207	32.7664	0.1817
80.3524196091771	29.3920084827782	81.7106	28.112	1.8663
77.7747384473081	29.3370104235276	77.6794	29.1288	0.229
75.0269588873615	32.6617969431906	73.2088	32.0501	1.9183
75.1873374220948	36.5166178703721	74.0572	35.987	1.8168
75.1873374220948	36.5166178703721	74.7866	36.0265	1.4465
75.358990014353	40.6424458670552	76.05	41.1841	0.878
73.1827905690623	41.0826057998038	72.565	40.2263	1.0559
71.8846366877001	43.3477680045212	73.064	44.6995	1.7939
70.2266972129821	44.0184636636706	70.0979	43.9308	0.1558
70.2024936294461	46.7585045706506	69.2786	47.5055	1.1881
72.4496362395041	47.2189904369868	72.4782	47.1166	0.1063
74.8328209376608	48.0673295613872	74.6616	49.1772	1.123
79.9194599398484	47.8848775211165	79.5061	49.6701	1.8387
79.9194599398484	47.8848775211165	81.1997	46.621	1.799
79.6614978433249	53.1760052672571	80.6139	53.7748	1.125
76.0377528513944	55.141439039467	74.8357	53.7031	1.8745
76.0377528513944	55.141439039467	76.3859	55.8636	0.8017
75.3096333271022	57.7976741623672	75.5117	58.1702	0.4238
72.2836521370258	56.830917296841	70.983	56.1077	1.4882
69.5064577778567	55.9436433620853	69.3672	55.5594	0.4087
68.9711901198066	56.7858193369424	69.1414	57.6653	0.8958
67.336294401264	55.6130250083833	67.8108	54.6502	1.0734
62.4225218942609	54.1279054597511	62.6521	52.6724	1.4735
57.8608087884313	54.0395021918853	57.8122	54.5104	0.4734
54.5557018855179	53.4163796064089	54.0007	52.8659	0.7817
56.236864445092	61.9493850091409	56.0439	62.2937	0.3947
57.8527118720067	61.3510477676814	58.3448	60.9201	0.9763
59.342485203303	60.7993949047811	59.9164	61.9972	1.3282
60.3131667376274	60.2188561556233	59.9164	58.75	1.5215
64.183144492669	60.2628024930242	64.2573	58.953	1.3119
64.183144492669	60.2628024930242	64.8783	60.379	0.7048
69.2213878365861	64.2122621877504	69.9395	64.1832	0.7187
67.0093541051795	66.2554554973304	66.9764	66.2314	0.0408
65.7653282069565	68.9251735972188	65.9297	69.3415	0.4476
64.9743595648353	68.6067907310399	65.3011	67.1869	1.457
61.637398898505	68.3738704153492	60.771	67.3196	1.3646
61.2188111206872	71.6964536273204	60.356	72.3736	1.0968
61.2188111206872	71.6964536273204	60.9907	71.4945	1.0514
60.9462434263018	73.8600146842622	61.6789	74.8507	1.3431
60.6074134601909	76.5495360975441	59.2712	76.4167	1.3428
60.4968402363521	78.0646363558601	60.7208	77.8844	0.3957
60.345016607003	80.144965300704	60.2539	80.1704	0.0946
61.5525469153192	81.8461591725336	61.8453	80.8454	1.0427
63.7222285776911	84.9028527439064	63.6977	85.2552	0.3532
66.9549411155251	81.4762286646228	66.7645	81.0279	0.4871
73.7790346372017	81.5521589310551	73.8931	82.0767	0.5368
73.7790346372017	81.5521589310551	74.5996	81.8744	1.5343
75.629820018892	80.6822593526566	75.9957	81.402	0.8074
77.7270897131349	79.5331634890423	77.5352	78.0347	1.5107
79.9338339948016	80.0884208236398	79.6042	79.6519	0.547
82.5201963243764	80.7391970202436	82.6909	80.2719	0.4975
85.1915235675842	82.0427272178177	85.2864	82.465	0.4328
89.0943649571875	77.1647424680166	89.1084	77.1611	0.0145
86.5773672546269	76.1355592709006	87.0562	74.7862	1.4318
86.0040956458224	75.962083760758	86.1254	75.412	0.5633
83.853870844973	75.6584253508865	84.0931	75.7357	0.2514
80.6993444210454	75.2129338010024	80.9911	75.8316	1.9298
80.6993444210454	75.2129338010024	80.8889	76.3527	1.4712
77.5041858391352	74.7616970292941	76.2214	75.1456	1.339
78.4604173517433	73.9198421209321	78.3667	74.2083	0.3033
78.4604173517433	73.9198421209321	78.9206	73.8168	1.3456
81.8391593222981	70.9452273608666	82.5413	70.9361	0.7022
79.0219785858876	68.5921369648946	78.2186	68.7569	0.8201
81.852064283158	63.0256073616605	81.8209	62.9891	0.048
84.9020536758772	62.039291774767	85.3959	62.1638	0.5093
83.1186430736573	60.1781854278465	81.8774	60.6902	1.3427
83.0834448762752	58.2644992165256	82.7455	58.0479	0.4014
83.0834448762752	58.2644992165256	82.834	58.4111	1.5249
88.4475329888722	55.9173979430074	88.4474	55.9131	0.0043
95.8473640247002	58.6235322749218	96.3481	58.4969	0.5165
88.7844881749759	66.5987821814966	88.5712	66.6382	0.2169
93.1643761210145	68.8817738661212	93.4248	68.5015	0.4609
96.9253481769234	72.1834199707943	97.9153	71.697	1.103
96.9692957939122	72.8792361000567	98.0725	73.509	1.2703
95.0670447395391	73.8462350665461	94.2046	73.3577	0.9912
95.2634435035581	76.6586473800449	95.4573	78.5053	1.8568
95.4353415251815	79.120213352114	95.1537	79.2325	0.3032

Solution x	Solution y	Original x	Original y	Radius
97.9682256292299	82.1952231106662	98.0879	82.1977	0.1197
92.8820392227304	87.8739079299157	91.8947	87.6684	1.0085
93.6494442220827	90.1897256952903	92.7385	89.9534	0.9411
95.5541906070805	95.9377272745048	96.3227	96.5824	1.0031
91.0348944710143	95.2769930315289	91.0373	94.8618	0.4152
87.9183550691807	95.6958164731252	86.1563	95.4019	1.7864
87.9183550691807	95.6958164731252	87.9339	96.7331	1.0374
83.995565827609	88.1663823375086	83.5669	88.2708	0.4412
83.9996653695716	86.481112025802	84.4594	85.6238	0.9728
81.1201174469964	88.4040304002009	80.7777	87.9354	0.5804
78.2594804028229	90.6856107266188	77.8131	90.2453	0.627
76.9534098939343	92.3699523929525	75.6586	91.7899	1.4188
76.6058169665827	94.2504462568801	75.4786	92.9344	1.7328
75.610419709913	99.6355925051535	75.6359	99.7073	0.0761
73.6314318708807	97.9511268546133	74.1314	97.2935	0.8261
68.6108981455369	94.5538286202486	68.3546	93.0491	1.5264
66.9293073811749	96.8195913164979	68.0526	97.9535	1.5961
65.768695489717	97.6641505172167	65.9332	98.9174	1.264
60.0861918707524	95.4729658289579	59.3326	96.8644	1.5824
57.9889377501315	93.9608149336356	58.0371	93.3465	0.6162
55.0416545398127	95.4513074733388	54.8665	95.2849	0.2416
53.6783406131857	98.5288757248788	54.3707	99.6057	1.2802
51.9088734815745	98.5094711414433	51.8363	98.9629	0.4592
49.392436994949	97.7132217011059	48.6626	98.7924	1.3028
48.4561206894313	96.5740704402897	48.9418	95.7946	0.9184
40.5355801548661	94.7059126035366	40.4171	94.2218	0.4984
34.7966894449044	99.6553045132441	34.7579	99.7518	0.104
34.2121752905676	93.5016577897874	33.1283	92.3481	1.7117
34.2121752905676	93.5016577897874	34.7487	93.2543	0.5908
32.2721877133755	91.4981270528806	32.5896	90.759	0.8044
29.823836970902	91.4742690999169	29.5533	92.3189	0.8869
28.2247055248667	90.3561067962972	27.9893	89.6021	0.7899
28.2247055248667	90.3561067962972	28.4623	90.5817	0.4301
26.9898620974083	93.6835673257119	27.8353	94.5623	1.2194
23.2881604993716	94.8968797434584	23.1083	96.0553	1.1723
18.3528066398023	91.3375691493103	18.6101	90.3489	1.0216
13.8307679732447	91.862723688172	12.3803	91.1149	1.6319
15.4439694983197	94.7938694916811	15.2733	95.1553	0.3997
16.5981729666088	94.577465009679	16.7243	94.3593	0.252
17.1945508201738	96.2791153251067	18.064	96.3276	0.8708
16.7131318045822	97.2795368220684	16.854	97.4806	0.2455
11.4979589428415	97.802751712068	12.7313	98.6134	1.4759
3.66750268382593	98.5883461996349	3.57801	99.0366	0.4571
0.986342002387218	97.1440787130113	0.299018	97.3272	0.7113
3.36173827021608	93.3208754179177	4.28894	92.6489	1.1451
3.36173827021608	93.3208754179177	3.24988	93.8751	0.5654
3.27410768664991	92.8413007791519	4.45069	94.0863	1.713
2.74726590279649	89.9581000759338	3.35356	88.986	1.2038
2.29321663128276	87.4732757881706	3.06059	88.1315	1.011
1.54213554369373	83.3628872313177	1.02508	82.9527	0.66
8.64958355376669	83.0160416943422	10.1219	82.045	1.7637
8.64958355376669	83.0160416943422	8.89064	83.8954	0.9118
4.36576692024235	74.7079264687202	4.99968	74.2733	0.7686
1.08659988113375	71.0138014297512	0.194865	71.2335	0.9184
2.10691853927716	66.8950933332556	2.55217	66.9796	0.4532
2.68535711547189	62.5481216789076	1.5771	61.4642	1.5502
5.31236046598714	62.139013292258	5.52590	61.9092	0.3328
7.42569081909664	61.8099002111556	8.30742	60.1487	1.8807
8.55040500932886	64.1966301190141	8.25408	64.3565	0.3367
9.55022608587001	65.8305599052926	9.17265	66.1356	0.4854
14.1711577325087	70.2301119503185	14.0141	70.4084	0.2376
17.1822457725068	72.6824744620397	16.576	71.2313	1.5967
20.4121404822798	75.3130427502054	20.7262	75.308	0.3141
17.8214878838661	77.5651170599332	17.2306	77.2747	0.6584
17.5279502502731	77.8202915166395	16.8354	77.4785	0.7723
17.3462064834307	80.7616387221351	16.5471	81.1813	0.9026
20.258088053038	82.5147779664687	19.5225	82.1483	1.7523
23.1118684125904	84.2329363266902	23.3569	85.0798	0.8816
24.6357325063513	81.1997457943588	25.7615	81.4539	1.1541
24.6120991154659	80.1000513185274	23.3293	78.9181	1.7443
27.2823584174378	79.9388320715652	26.7929	78.8352	1.2073
29.8819105643132	79.7818968170646	29.8827	79.684	0.0979
34.6331021351551	80.1457116844993	34.9224	79.9328	0.3592
33.9041954731629	83.3236864571837	34.4937	83.7515	0.8917
33.1771505756695	86.4935441136601	32.7208	86.88	0.598
37.4942937856412	86.2342956956293	37.7453	86.3505	0.2766
38.7124827774522	86.1611395965178	36.723	86.3354	1.9971
40.9146464472611	86.0288987322874	40.7053	85.7824	0.3234
43.2024649301052	85.8915122614261	43.3068	85.4106	0.4921
45.9786157497655	87.3625289922727	44.9959	88.3516	1.7636

Solution x	Solution y	Original x	Original y	Radius
48.7066349830962	88.8080412943335	48.934	88.5471	0.3461
48.7066349830962	88.8080412943335	50.0418	88.5256	1.6597
50.2582350692487	90.9605282178889	49.8328	92.6571	1.7491
51.6298715906765	90.2897627270881	51.2472	90.6526	0.5448
53.6049514474796	89.3238991446579	53.7144	89.3849	0.1253
53.3899872207436	87.160438582166	54.7886	87.0165	1.406
52.9647565922708	83.1640098473049	54.169	81.8375	1.7916
51.2007958417819	83.1473301912164	50.9984	83.4341	0.351
50.1885838022945	80.3835058350572	50.5772	79.5094	0.9566
48.6027845157074	81.0224996358633	48.3206	81.4332	0.4983
47.15511160309	81.6058356871439	45.6946	80.9262	1.6109
47.1542410349815	81.6063277350771	47.7087	83.4773	1.9514
45.2696990607354	81.1894634400942	45.1636	79.7971	1.3964
43.9336105696001	81.7073816323137	43.9629	81.9344	0.2289
42.6290427379442	81.5590934561751	41.546	82.3742	1.3555
42.6290427379442	81.5590934561751	43.0779	81.6476	0.4575
39.4412414073849	80.7258632368938	38.4806	81.2568	1.0976
41.3528190748252	74.6608005025913	41.4131	74.8199	1.287
43.4754995608532	67.9259310110116	42.1545	66.9856	1.6215
43.4754995608532	67.9259310110116	43.1006	68.5786	0.9291
45.1174451465665	66.7063073315875	45.2184	66.3382	0.3817
46.6465008651656	70.357632595755	46.3399	71.17	0.8683
47.0872256904986	70.1434094639117	47.6475	71.1843	1.1821
51.5293616722014	67.5099513241527	52.5118	68.1256	1.1594
51.7430994060784	64.9688058190269	51.793	64.9464	0.0547
47.9975897710165	62.163633933882	48.6743	62.5481	0.7783
43.5682145207087	58.8462681218464	43.5841	58.7522	0.0954
41.47928205215	59.5113577262396	40.6271	60.1839	1.0856
42.3833530503199	58.0126493456426	41.7302	58.1199	0.6619
43.9723929150244	55.3784399771491	44.4217	55.3301	0.4519
41.3024636029319	52.5532733015584	41.6783	52.1535	0.5487
37.5521853524812	49.4235127797935	37.4105	49.4356	0.1422
38.1897121562163	48.6744584897195	38.5534	48.7846	0.38
37.8771539450056	46.015530176001	38.1612	45.7549	0.3855
33.8950449789123	45.1961145089544	33.2771	46.652	1.5816
31.751627831289	43.7301604654993	31.4339	43.8079	0.3271
34.3316060465543	38.9050209248679	34.4656	38.8185	0.1595
32.9155723814325	38.9999296673294	32.7353	38.4372	0.5909
28.3484335503671	41.8197272354775	28.6889	43.6077	1.8201
26.5726630570937	41.5024814645671	26.2003	42.5604	1.3196
24.4103236250286	41.1161738013278	23.6339	40.0124	1.3495
23.1815245890054	48.3630211311464	24.4594	47.3987	1.6009
23.1815245890054	48.3630211311464	23.6126	49.4214	1.1428
20.8551794512863	48.2013596573632	20.5641	47.7219	0.5609
19.0878926176282	52.2656655585921	17.8085	51.9553	1.3165
18.9691385515932	54.0673356257835	17.5187	55.1629	1.8177
22.5629419091074	54.8377135057077	22.5447	55.6169	0.7794
22.9493760330338	54.7736267847118	22.8193	53.7552	1.0267
30.0785177971215	54.1322108882916	30.4468	53.5688	0.6731
30.7937631882676	56.267825694926	30.6696	55.2626	1.0672
31.7589305846185	59.1496697890803	33.4192	59.483	1.6934
32.1402747598875	60.2883145519348	31.2678	61.1344	1.3636
32.5751046375951	61.5866725251043	32.641	61.5676	0.0686
34.1794253583412	68.1338928004497	35.9094	68.8825	1.885
27.4052282420851	71.9560568968871	27.1361	73.6904	1.7551
25.1087562673113	69.4870174129363	23.7167	70.7298	1.8661
24.8904896255974	69.2322603210188	24.7619	69.8637	0.6444
24.0163644255823	68.211991063014	23.6206	68.344	0.4172
24.4854907188771	60.9495520991162	25.6513	60.6643	1.2002
23.9867315043174	60.1258168607944	23.2085	58.8069	1.5314
23.9867315043174	60.1258168607944	24.5176	59.5849	0.7579
20.439032356269	60.6501390784207	19.6656	61.3862	1.0677
19.0577333185978	60.8542844176865	18.9042	62.1271	1.3155
17.6262781022923	61.0658422795042	17.6011	61.1721	0.1092
13.45894502544	58.1404518207209	13.5318	57.9262	0.2263
11.5553066377683	58.0576025138964	10.4725	58.878	1.3585
12.0744711082771	55.8456251126933	10.9638	55.5178	1.4157
12.5785264623291	53.6980219555244	12.5872	53.6987	0.0087
12.5785264623291	53.6980219555244	13.8308	54.4775	1.5454
12.438573160833	51.8230021717497	13.2524	50.7626	1.3367
8.23648796875391	52.6185903596442	9.35555	53.1101	1.2462
3.85872396844165	53.4474399594564	3.30116	54.5758	1.2586
2.62203498570811	50.9872385720101	2.40393	50.9808	0.2182
7.35531063696777	42.8118790655455	7.21925	42.3799	0.4529
9.1047076954404	43.6263252269986	9.27453	43.3967	0.2856
11.5794572466696	46.3753756620436	11.7937	48.0467	1.685
12.7063351880419	44.1999812560115	12.2621	43.6923	0.6746
14.1961222174911	43.6648495876338	15.6372	44.5891	1.712
14.0470658729996	41.9235684620943	13.4598	41.6191	0.6615
16.7648643087493	40.3355277385236	17.5856	40.8861	0.9883

Solution x	Solution y	Original x	Original y	Radius
17.2528430346313	36.8669227884202	17.6023	36.5196	0.4927
11.4164375176901	37.6515877579242	11.4258	37.7412	0.0901
8.70535396980385	37.8541084917798	9.16001	37.8018	1.821
8.70535396980385	37.8541084917798	8.75416	38.928	1.075
2.96253794543138	37.947570206288	2.57158	38.4711	0.6534

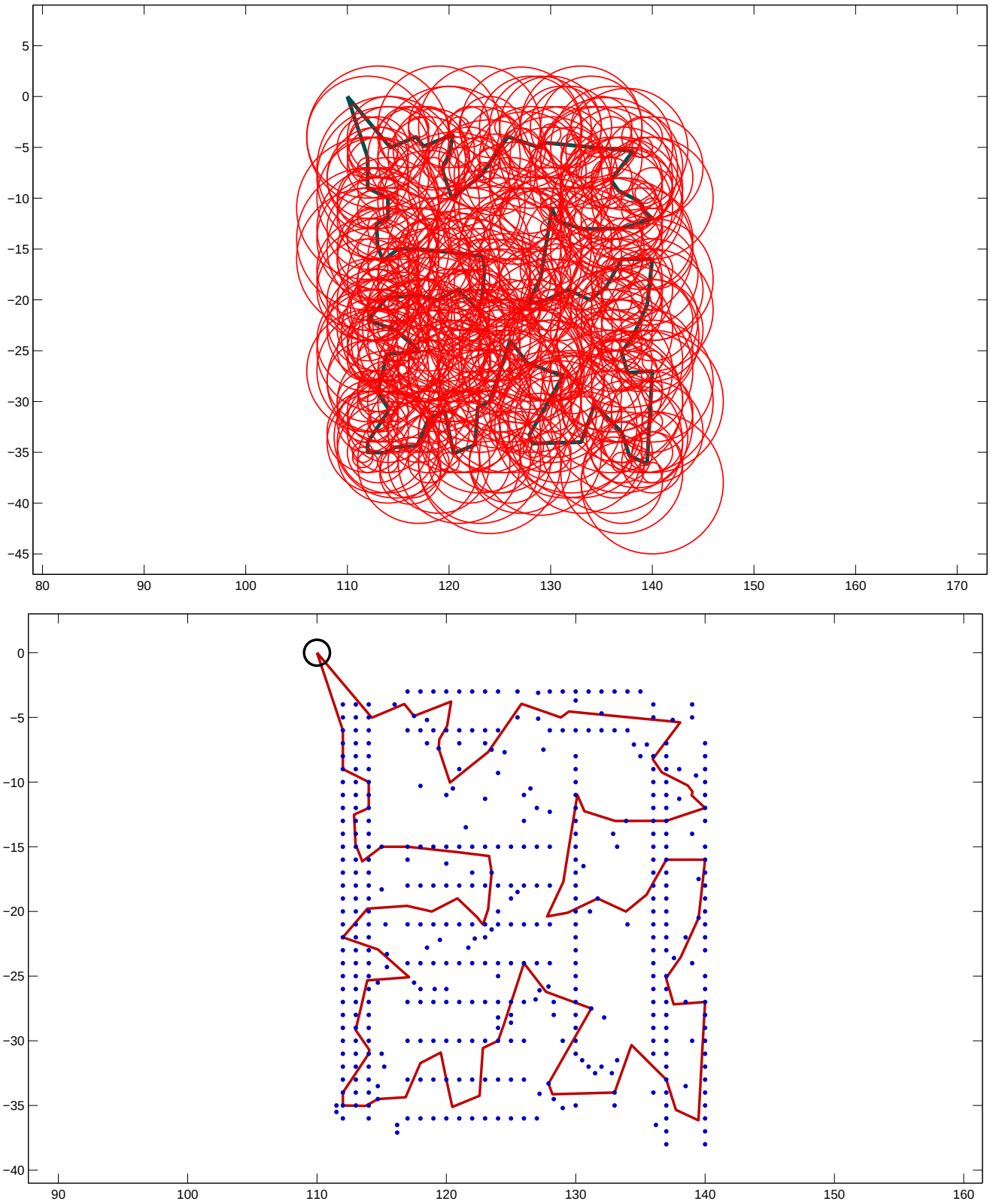

Figure N.60: *pcb*442, arbitrary radius, 2D, Euclidean, Length = 235.1877045

Table N-63: Solution for *pcb*442, arbitrary radius, 2D, Euclidean

Total distance: 235.18770447592				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
4.23434972606063	5.02784764265292	2	5	3
4.23434972606063	5.02784764265292	3	5	3
4.23434972606063	5.02784764265292	3	6	3
4.23434972606063	5.02784764265292	6	4	3
4.23434972606063	5.02784764265292	4	6	1
6.75389742043691	3.96924378787408	7	3	1
7.5	4.9	7.5	4.9	0
7.9326890523588	4.73072348905542	4	4	4
7.9326890523588	4.73072348905542	4	5	4
7.9326890523588	4.73072348905542	8	3	2
10.3705027637237	3.77700272169443	11	3	1
10.3196234754	4.08458966230233	12	3	2
10.0585629712051	5.66281114962991	11	6	1
9.45581002129909	6.70601496095168	3	4	7
9.45581002129909	6.70601496095168	9	3	6
9.45581002129909	6.70601496095168	10	3	4
9.45581002129909	6.70601496095168	13	3	6
9.45581002129909	6.70601496095168	4	7	7
9.45581002129909	6.70601496095168	4	8	7
9.45581002129909	6.70601496095168	8.5	5.2	4
9.45581002129909	6.70601496095168	7	6	5
9.45581002129909	6.70601496095168	8	6	4
9.45581002129909	6.70601496095168	9	6	1
9.45581002129909	6.70601496095168	10	6	7
9.45581002129909	6.70601496095168	8.5	7	1
9.45581002129909	6.70601496095168	12	6	3
9.45581002129909	6.70601496095168	13	6	5
9.45581002129909	6.70601496095168	11	7	2
9.45581002129909	6.70601496095168	11	9	5
9.45581002129909	6.70601496095168	14	9.3	7
9.45581002129909	6.70601496095168	10.5	10.5	7
9.40000000000001	7.4	9.4	7.4	0
10.2822624841028	10.0406627860506	10	11	1
10.2822624841028	10.0406627860506	12	15	6
13.2245713645071	7.68050792938968	17.1	3.1	6
13.2245713645071	7.68050792938968	13	7	3
13.2245713645071	7.68050792938968	13.5	7.5	1
13.2245713645071	7.68050792938968	16.5	10.5	6
13.2245713645071	7.68050792938968	16	11	5
13.2245713645071	7.68050792938968	13	11.3	4
13.2245713645071	7.68050792938968	16	13	6
14.4572535770048	5.90193828026231	14	6	1
14.4572535770048	5.90193828026231	14.5	7.7	4
15.8094610596806	3.95091211609776	15.5	3	1
15.8094610596806	3.95091211609776	17.5	7.5	6
16.7003714379001	4.26153697410212	14	3	3
16.7003714379001	4.26153697410212	17.1	5.1	2
18.8505745543193	5.011227004726	19	6	1
19.4747114210772	4.55092414988248	24	3	5
19.4747114210772	4.55092414988248	22	3	4
19.4747114210772	4.55092414988248	21	3	4
19.4747114210772	4.55092414988248	20	3	5
19.4747114210772	4.55092414988248	19	3	5
19.4747114210772	4.55092414988248	18	3	5
19.4747114210772	4.55092414988248	20	3.7	1
19.4747114210772	4.55092414988248	21	6	5
19.4747114210772	4.55092414988248	15.5	5	4
19.4747114210772	4.55092414988248	20	6	5
19.4747114210772	4.55092414988248	18	6	5
22.9567421727265	4.88586027673916	25	3	3
22.9567421727265	4.88586027673916	22	4.7	1
22.9567421727265	4.88586027673916	23	6	2
22.9567421727265	4.88586027673916	22	6	3
27.5	5.3228756555323	29	4	2
27.5	5.3228756555323	26	4	2
28.0802233765939	5.39244230535939	29	5	1
28.0802233765939	5.39244230535939	30	7	5
28.0802233765939	5.39244230535939	27.5	5.2	6
28.0802233765939	5.39244230535939	26	5	6
28.0802233765939	5.39244230535939	27	7	6
28.0802233765939	5.39244230535939	25.5	7.1	7
28.0802233765939	5.39244230535939	27	9	6
28.0802233765939	5.39244230535939	25	8	7
25.9497190922574	8.2248595461287	23	3	6
25.9497190922574	8.2248595461287	30	10	6
25.9497190922574	8.2248595461287	24	6	5
25.9497190922574	8.2248595461287	27	10	6
25.9497190922574	8.2248595461287	26	9	5
25.9497190922574	8.2248595461287	27	11	6
25.9497190922574	8.2248595461287	26	11	6
25.9497190922574	8.2248595461287	26	12	5
25.9497190922574	8.2248595461287	26	13	5
25.9497190922574	8.2248595461287	20	8	6
25.9497190922574	8.2248595461287	20	9	6
26.0413603548831	8.35709743339861	30	8	4
26.0413603548831	8.35709743339861	28	9	4
26.0413603548831	8.35709743339861	27	8	4
26.0413603548831	8.35709743339861	26	8	2
26.0413603548831	8.35709743339861	24.5	7.1	2
26.0413603548831	8.35709743339861	27	12	4
26.6581347669597	9.24709985488183	26	10	1
28.6611924152499	10.2693665379166	29.3	9.5	1
28.6611924152499	10.2693665379166	27	15	7
29.0317541634481	10.75	30	9	2
29.0317541634481	10.75	30	11	1
28.9608150863359	11.0228098669337	28	11.3	1
30	12	30	12	0
29.3999999983093	12.2000000012679	30	13	1
29.3999999983093	12.2000000012679	30	15	4
29.3999999983093	12.2000000012679	29	14	5
27	13	27	13	0
25.9207793505418	13.0031428945429	26	14	1
23.0512136563216	13.0114988972479	23.9	13	1
23.0512136563216	13.0114988972479	22.9	14	1
20.6704449219481	12.2580406974542	20	13	1
20.6704449219481	12.2580406974542	20	14	6
20.6704449219481	12.2580406974542	20	16	7
20.6704449219481	12.2580406974542	18	15	6
20.6704449219481	12.2580406974542	17	15	6
20.6704449219481	12.2580406974542	15	15	7
20.1237999528059	10.9923071962278	20	10	1
20.1237999528059	10.9923071962278	20	11	1
19.7806808540557	13.125972463202	18	12.3	3
19.7806808540557	13.125972463202	17	12	3
19.2451661547273	16.4560486168076	20	12	5
19.2451661547273	16.4560486168076	20.6	16.5	2
19.2451661547273	16.4560486168076	21.1	20	4
19.2451661547273	16.4560486168076	20	17	3
19.2451661547273	16.4560486168076	16	15	5
19.2451661547273	16.4560486168076	18	18	3
19.2451661547273	16.4560486168076	16	18	4
19.2451661547273	16.4560486168076	15.5	18.5	5
19.1855670440706	16.8266633407107	20	15	2
19.0441211752942	17.7062387491871	20	18	1
19.0441211752942	17.7062387491871	15	18	7
18.334264113384	19.2263886997633	17	18	2
18.334264113384	19.2263886997633	15	21	6
17.791465167884	20.3887857265848	18	21	1
17.791465167884	20.3887857265848	17	21	1
19.3862461510157	20.0965015858013	20	22	2
19.3862461510157	20.0965015858013	20	21	2
19.3862461510157	20.0965015858013	20	19	2
19.3862461510157	20.0965015858013	20	20	1
21.7	19	21.7	19	0
23.8758334609908	20.0077386077295	24	21	1
23.8758334609908	20.0077386077295	20	23	7
25.4713580918285	18.7103279810037	27	20	2
25.4713580918285	18.7103279810037	26	20	2
26.1601110645701	17.4891482942892	27	17	1
26.1601110645701	17.4891482942892	26	17	1
27	16	27	16	0
27.0014778039593	15.999999870875	30	21	6
27.0014778039593	15.999999870875	27	14	2
27.0014778039593	15.999999870875	27	18	3
27.0014778039593	15.999999870875	26	15	5
27.0014778039593	15.999999870875	27	19	5
27.0014778039593	15.999999870875	26	16	3
27.0014778039593	15.999999870875	26	18	5
27.0014778039593	15.999999870875	26	19	5
27.0014778039593	15.999999870875	23.2	15	6
28.9413727270559	15.9999998953819	30	17	2
28.9413727270559	15.9999998953819	30	18	6
28.9413727270559	15.9999998953819	30	19	5
28.9413727270559	15.9999998953819	29.5	17.5	5

Solution x	Solution y	Original x	Original y	Radius
30	16	30	16	0
29.6600492488371	19.0595567604668	30	20	1
29.5	20.5	29.5	20.5	0
28.1302530527279	23.5065020286659	29	24	1
28.1302530527279	23.5065020286659	26	23	6
27.9581364308868	23.7555553479762	30	22	4
27.9581364308868	23.7555553479762	27	26	3
27.9581364308868	23.7555553479762	27	25	2
27.9581364308868	23.7555553479762	27	23	3
27.9581364308868	23.7555553479762	27	22	2
27.9581364308868	23.7555553479762	27	21	4
27.9581364308868	23.7555553479762	26	24	3
27.9581364308868	23.7555553479762	26	22	3
27.9581364308868	23.7555553479762	26	21	4
26.9869845038931	25.1608153881784	26	25	1
27.5710201870133	27.1790639817723	28.5	27	2
27.5710201870133	27.1790639817723	27	28	1
29.999000000125	26.9999995	30	26	1
29.999000000125	26.9999995	30	25	4
29.999000000125	26.9999995	30	23	5
29.999000000125	26.9999995	28.5	22	6
30	27	30	27	0
29.8319993138374	29.9857868783105	30	29	1
29.8319993138374	29.9857868783105	27.6	23.6	7
29.6656377053111	32.9424446168824	30	32	1
29.485583226942	36.1424596898122	30	37	1
29.485583226942	36.1424596898122	30	36	3
28.2431358518883	35.5667205410506	27	38	4
28.2431358518883	35.5667205410506	30	35	2
28.2431358518883	35.5667205410506	30	34	3
28.2431358518883	35.5667205410506	27	34	2
27.7494676269786	35.3379590072276	27	36	1
27.7494676269786	35.3379590072276	26.2	36.5	3
27	33	27	33	0
26.1798046781224	32.1857941232377	30	38	7
26.1798046781224	32.1857941232377	27	37	6
26.1798046781224	32.1857941232377	30	33	5
26.1798046781224	32.1857941232377	27	35	3
26.1798046781224	32.1857941232377	28.5	33.5	5
26.1798046781224	32.1857941232377	30	31	4
26.1798046781224	32.1857941232377	30	30	7
26.1798046781224	32.1857941232377	26	34	7
26.1798046781224	32.1857941232377	29	30	7
26.1798046781224	32.1857941232377	23	35	6
26.1798046781224	32.1857941232377	30	28	6
26.1798046781224	32.1857941232377	27	32	7
26.1798046781224	32.1857941232377	27	31	3
26.1798046781224	32.1857941232377	27	30	6
26.1798046781224	32.1857941232377	26	30	7
26.1798046781224	32.1857941232377	22.8	32.5	7
26.1798046781224	32.1857941232377	26	29	5
26.1798046781224	32.1857941232377	21.5	32.5	7
26.1798046781224	32.1857941232377	27	27	7
26.1798046781224	32.1857941232377	22	32	7
26.1798046781224	32.1857941232377	21	32	6
26.1798046781224	32.1857941232377	26	27	6
26.1798046781224	32.1857941232377	26	26	7
26.1798046781224	32.1857941232377	20	29	7
25.23164976848	31.2445635255543	26	31	1
24.3114809482144	30.3311143107134	27	29	3
24.3114809482144	30.3311143107134	23.2	31.5	2
24.3114809482144	30.3311143107134	26	28	3
24.3114809482144	30.3311143107134	22.2	28.2	3
23	34	23	34	0
18.1995766552298	34.1290948503961	20	35	2
18.1995766552298	34.1290948503961	18.3	34.5	1
18.1995766552298	34.1290948503961	17.2	34.1	1
17.9	33.3	17.9	33.3	0
17.9956462166162	33.1318945719346	16	33	2
17.9956462166162	33.1318945719346	16	30	7
17.9956462166162	33.1318945719346	15	30	7
19.1958134498638	31.0225099091084	20	30	3
19.1958134498638	31.0225099091084	18.3	28	7
19.9771712853935	29.649214122649	19	35.2	6
19.9771712853935	29.649214122649	15	33	6
19.9771712853935	29.649214122649	20.5	31.5	4
19.9771712853935	29.649214122649	20	28	2
19.9771712853935	29.649214122649	20	27	3
19.9771712853935	29.649214122649	15	28.6	6
19.9771712853935	29.649214122649	20	26	4

Solution x	Solution y	Original x	Original y	Radius
19.9771712853935	29.649214122649	20	25	5
19.9771712853935	29.649214122649	15	27	6
19.9771712853935	29.649214122649	17.9	25.8	5
19.9771712853935	29.649214122649	17.2	26.1	6
19.9771712853935	29.649214122649	18	24	6
21.2	27.5	21.2	27.5	0
17.7100882739025	26.2136920702515	19	30	4
17.7100882739025	26.2136920702515	16.9	26.8	1
17.7100882739025	26.2136920702515	20	24	4
17.7100882739025	26.2136920702515	15	24	4
16	24	16	24	0
15.547816185013	25.3751953197601	14	25	3
15.547816185013	25.3751953197601	17	24	2
14.9879948388392	27.0777410046884	14	27	1
14.4393462556706	28.7463074886588	20	31	6
14.4393462556706	28.7463074886588	14	29	1
14.4393462556706	28.7463074886588	14	28.2	3
14.4393462556706	28.7463074886588	15	28	3
14.4393462556706	28.7463074886588	18.3	27	5
14.4393462556706	28.7463074886588	12	27	3
14.4393462556706	28.7463074886588	13	24	5
14.4393462556706	28.7463074886588	14	24	5
14	30	14	30	0
12.8269352844432	30.562297105935	12	30	1
12.8269352844432	30.562297105935	16	27	7
12.5668321724608	34.2450942124923	9	36	5
12.5668321724608	34.2450942124923	12	36	4
12.5668321724608	34.2450942124923	17	36	5
12.5668321724608	34.2450942124923	16	36	4
12.5668321724608	34.2450942124923	15	36	3
12.5668321724608	34.2450942124923	12	33	4
12.5668321724608	34.2450942124923	14	33	4
12.5668321724608	34.2450942124923	13	30	5
10.4632533310093	35.1137740969093	10	36	1
10.4632533310093	35.1137740969093	11	36	6
10.4632533310093	35.1137740969093	13	36	6
10.4632533310093	35.1137740969093	14	36	7
10.4632533310093	35.1137740969093	13	33	6
9.9999995	33.000999999875	9	33	1
9.9999995	33.000999999875	11	30	7
10	33	10	33	0
9.57038450356689	30.9030119186504	10	30	1
9.57038450356689	30.9030119186504	13	27	7
7.99064677776975	31.7266169444244	4	32	4
7.99064677776975	31.7266169444244	8	33	4
7.99064677776975	31.7266169444244	11	33	4
7.99064677776975	31.7266169444244	9	30	2
6.8496207708496	34.36395977154	6.2	37.1	3
6.8496207708496	34.36395977154	6.2	36.5	3
6.8496207708496	34.36395977154	8	36	2
6.8496207708496	34.36395977154	5.2	32	3
6.8496207708496	34.36395977154	7	33	3
4.7	34.5	4.7	34.5	0
3.75535983547027	35.0303860614147	4	36	1
3.75535983547027	35.0303860614147	3	35	3
3.75535983547027	35.0303860614147	4	35	5
3.75535983547027	35.0303860614147	3	34	5
3.75535983547027	35.0303860614147	7	36	6
3.75535983547027	35.0303860614147	4	34	5
3.75535983547027	35.0303860614147	4.7	33.5	6
2.03459977583536	35.0005989393476	2	36	1
2.03459977583536	35.0005989393476	1.5	35.5	1
2.03459977583536	35.0005989393476	1.5	35	1
2	35	2	35	0
2	34	2	34	0
2.99999999882022	32.4999995461775	3	33	1
2.99999999882022	32.4999995461775	3	32	1
4	31	4	31	0
4.04428108611692	30.7057189138831	2	33	4
4.04428108611692	30.7057189138831	4	33	4
4.04428108611692	30.7057189138831	2	31	3
4.04428108611692	30.7057189138831	2	30	3
4.04428108611692	30.7057189138831	3	31	3
4.04428108611692	30.7057189138831	3	30	2
4.04428108611692	30.7057189138831	2	28	4
4.04428108611692	30.7057189138831	3	29	2
4.04428108611692	30.7057189138831	5	31	1
4.04428108611692	30.7057189138831	4	29	3
2.98601329718328	29.1666666666667	2	32	3
2.98601329718328	29.1666666666667	2	29	1

Solution x	Solution y	Original x	Original y	Radius
3.42439422349658	27.2986683592743	3	28	1
3.42439422349658	27.2986683592743	4	27	1
3.88561808316413	25.3333333333333	4	30	5
3.88561808316413	25.3333333333333	2	26	2
3.88561808316413	25.3333333333333	2	25	3
3.88561808316413	25.3333333333333	2	24	5
3.88561808316413	25.3333333333333	3	26	2
3.88561808316413	25.3333333333333	2	23	3
3.88561808316413	25.3333333333333	3	24	3
3.88561808316413	25.3333333333333	4	26	3
3.88561808316413	25.3333333333333	3	23	5
3.88561808316413	25.3333333333333	3	22	5
3.88561808316413	25.3333333333333	4	25	4
3.88561808316413	25.3333333333333	4	24	4
3.88561808316413	25.3333333333333	5.4	24.3	5
3.88561808316413	25.3333333333333	5.3	21	5
5.4490833814307	25.2100434287932	4.7	25.5	1
5.4490833814307	25.2100434287932	8.5	22.8	7
5.4490833814307	25.2100434287932	9.5	22.2	7
7.11769323150844	25.078462154339	2	27	6
7.11769323150844	25.078462154339	3	27	6
7.11769323150844	25.078462154339	4	28	6
7.11769323150844	25.078462154339	3	25	6
7.11769323150844	25.078462154339	7	30	5
7.11769323150844	25.078462154339	8	30	5
7.11769323150844	25.078462154339	7	27	2
7.11769323150844	25.078462154339	5.4	23.3	6
7.11769323150844	25.078462154339	8	27	3
7.11769323150844	25.078462154339	7.5	25.5	3
7.11769323150844	25.078462154339	9	27	6
7.11769323150844	25.078462154339	8	26	2
7.11769323150844	25.078462154339	7	24	6
7.11769323150844	25.078462154339	10	27	5
7.11769323150844	25.078462154339	9.1	26	5
7.11769323150844	25.078462154339	11	27	5
7.11769323150844	25.078462154339	8	24	6
7.11769323150844	25.078462154339	10	26	4
7.11769323150844	25.078462154339	9	24	5
7.11769323150844	25.078462154339	10	24	4
7.11769323150844	25.078462154339	11	24	5
7.11769323150844	25.078462154339	12	24	5
4.71193927660455	22.9403036169773	2	20	4
4.71193927660455	22.9403036169773	4	23	1
4.71193927660455	22.9403036169773	4	22	2
4.71193927660455	22.9403036169773	7	21	3
2	22	2	22	0
3.89921843042127	19.7864507310281	2	21	3
3.89921843042127	19.7864507310281	3	18	2
3.89921843042127	19.7864507310281	3	21	3
3.89921843042127	19.7864507310281	3	19	2
3.89921843042127	19.7864507310281	4	18	3
3.89921843042127	19.7864507310281	4	21	2
3.89921843042127	19.7864507310281	4	19	1
3.89921843042127	19.7864507310281	4	20	1
6.96759877141068	19.5682978499687	2	19	5
6.96759877141068	19.5682978499687	3	20	4
6.96759877141068	19.5682978499687	5	18.3	4
6.96759877141068	19.5682978499687	7	16	5
6.96759877141068	19.5682978499687	9	15	5
6.96759877141068	19.5682978499687	10	21	4
8.87599924272006	20.0077178767134	9	21	1
8.87599924272006	20.0077178767134	14	21	7
10.8559991477279	18.9895775636831	11	18	1
12.366228449191	20.4364008556629	8	18	5
12.366228449191	20.4364008556629	10	16.3	5
12.366228449191	20.4364008556629	11.7	22.8	3
12.366228449191	20.4364008556629	11	21	2
12.366228449191	20.4364008556629	12.2	22.1	5
12.366228449191	20.4364008556629	12	21	4
12.366228449191	20.4364008556629	13	21	4
12.366228449191	20.4364008556629	13.5	21.4	3
12.366228449191	20.4364008556629	15	19	3
12.366228449191	20.4364008556629	14	20	5
12.828995925648	21.0147296784358	13	22	1
13.2307692307692	19.8461538461538	8	21	6
13.2307692307692	19.8461538461538	9	18	6
13.2307692307692	19.8461538461538	12	17	6
13.2307692307692	19.8461538461538	12	18	6
13.2307692307692	19.8461538461538	13	18	5
13.2307692307692	19.8461538461538	14	18	2

Solution x	Solution y	Original x	Original y	Radius
13.2307692307692	19.8461538461538	16	21	3
13.5	17	13.5	17	0
13.3032280420622	15.7172927147487	13	15	1
13.3032280420622	15.7172927147487	14	15	1
10.9692697017133	15.4282959706644	8	15	3
10.9692697017133	15.4282959706644	11.5	13.5	2
10.9692697017133	15.4282959706644	10	15	2
10.9692697017133	15.4282959706644	11	15	1
10.9692697017133	15.4282959706644	10	18	3
7	15	7	15	0
5	15	5	15	0
3.5	16.1339745962156	3	17	1
3.5	16.1339745962156	4	17	1
2.97754899654593	14.7892917672416	2	15	1
2.97754899654593	14.7892917672416	2	17	5
2.97754899654593	14.7892917672416	2	18	5
2.97754899654593	14.7892917672416	3	15	4
2.97754899654593	14.7892917672416	3	16	4
2.97754899654593	14.7892917672416	4	16	5
2.97754899654593	14.7892917672416	7	18	7
2.92016571013275	13.7280232451566	4	13	2
2.85479181583078	12.5189710508196	2	12	1
2.85479181583078	12.5189710508196	2	14	7
2.85479181583078	12.5189710508196	2	16	7
2.85479181583078	12.5189710508196	4	14	4
4	12	4	12	0
4	10	4	10	0
3.1999999992353	9.59999999898041	2	4	6
3.1999999992353	9.59999999898041	3	7	3
3.1999999992353	9.59999999898041	2	8	4
3.1999999992353	9.59999999898041	2	10	3
3.1999999992353	9.59999999898041	3	9	2
3.1999999992353	9.59999999898041	3	10	6
3.1999999992353	9.59999999898041	4	9	1
3.1999999992353	9.59999999898041	3	11	2
3.1999999992353	9.59999999898041	2	13	4
3.1999999992353	9.59999999898041	3	12	4
3.1999999992353	9.59999999898041	4	11	5
3.1999999992353	9.59999999898041	3	13	6
3.1999999992353	9.59999999898041	3	14	6
3.1999999992353	9.59999999898041	4	15	6
3.1999999992353	9.59999999898041	8	10.3	5
2	9	2	9	0
2	6	2	6	0
1.99900000012492	6.0000005	2	7	1
1.99900000012492	6.0000005	3	8	5
1.99900000012492	6.0000005	2	11	7

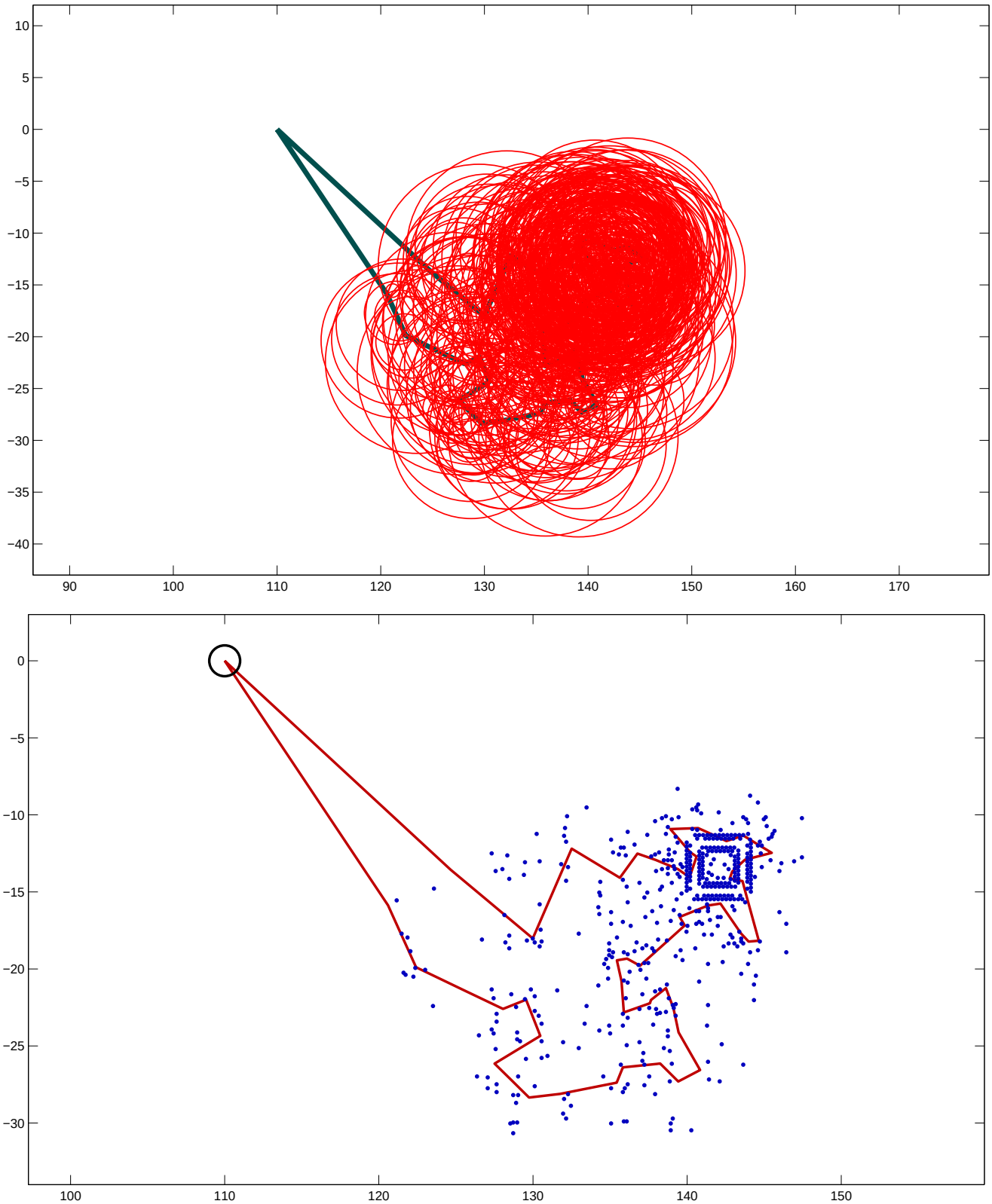

Figure N.61: $d493$, arbitrary radius, 2D, Euclidean, Length = 140.1198753

Table N-64: Solution for $d493$, arbitrary radius, 2D, Euclidean

Total distance: 140.119875334979				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
10.5938030185342	15.8679363801322	11.163	15.552	0.651
12.4136150941297	19.8913535046681	12.37	19.934	0.061
12.4136150941297	19.8913535046681	12.243	20.505	2.717
12.4136150941297	19.8913535046681	12.052	18.854	6.347
12.4136150941297	19.8913535046681	11.862	17.965	2.45
12.4136150941297	19.8913535046681	11.735	20.378	7.485
12.4136150941297	19.8913535046681	11.608	20.251	6.345
12.4136150941297	19.8913535046681	11.481	17.711	3.058
15.6108475820576	21.4248672066968	17.577	25.204	4.26
15.6108475820576	21.4248672066968	13.005	20.061	3.941
16.657830503447	21.9270398973667	19.037	26.982	6.169
18.0548249195631	22.5970911978761	20.117	21.775	2.22
18.0548249195631	22.5970911978761	17.45	24.188	1.702
19.5495488781825	21.9962183562805	21.577	21.394	2.115
19.5495488781825	21.9962183562805	19.482	21.966	0.074
20.4722558362205	24.3460779038199	22.974	25.141	2.625
20.4722558362205	24.3460779038199	20.561	24.696	0.361
20.4722558362205	24.3460779038199	18.974	24.569	2.27
17.5080317009491	26.1453029557272	18.91	22.474	4.101
17.5080317009491	26.1453029557272	17.64	22.918	3.23
17.5080317009491	26.1453029557272	16.497	24.315	2.342
17.5080317009491	26.1453029557272	17.069	27.046	1.002
17.5080317009491	26.1453029557272	19.037	28.189	3.611
17.5080317009491	26.1453029557272	16.37	26.982	2.311
17.5080317009491	26.1453029557272	17.069	27.744	2.549
18.5886903633273	27.2070042499784	17.64	27.49	0.99
18.5886903633273	27.2070042499784	17.64	27.998	1.574
18.5886903633273	27.2070042499784	18.72	29.967	7.58
19.7476042535894	28.3455877365877	17.323	23.934	5.56
19.7476042535894	28.3455877365877	19.545	25.839	4.367
19.7476042535894	28.3455877365877	20.117	27.617	1.231
19.7476042535894	28.3455877365877	22.276	28.125	2.538
19.7476042535894	28.3455877365877	18.91	28.697	3.011
19.7476042535894	28.3455877365877	18.974	29.967	3.376
19.7476042535894	28.3455877365877	18.529	30.03	2.079
19.7476042535894	28.3455877365877	18.72	30.665	3.298
21.7549072389526	28.108937275863	21.958	29.395	1.302
25.4287847388577	27.3798888019281	20.561	25.776	5.596
25.4287847388577	27.3798888019281	27.165	25.458	2.59
25.4287847388577	27.3798888019281	27.102	25.966	2.428
25.4287847388577	27.3798888019281	27.229	26.22	2.987
25.4287847388577	27.3798888019281	25.832	27.998	0.738
25.4287847388577	27.3798888019281	22.022	28.443	5.071
25.4287847388577	27.3798888019281	25.07	30.03	3.224
25.8316055887836	26.3887958082681	25.705	26.22	0.211
25.8316055887836	26.3887958082681	25.07	27.744	6.389
25.8316055887836	26.3887958082681	25.959	27.744	5.865
25.8316055887836	26.3887958082681	22.466	28.887	7.763
25.8316055887836	26.3887958082681	18.72	28.189	7.716
25.8316055887836	26.3887958082681	22.149	29.713	6.925
25.8316055887836	26.3887958082681	26.086	29.903	5.939
25.8316055887836	26.3887958082681	28.943	30.03	6.569
25.8316055887836	26.3887958082681	30.277	30.475	7.266
28.0272857840393	26.1633495534936	33.642	26.22	5.615
28.2471732723644	26.1407721236603	28.499	25.141	1.031
28.2471732723644	26.1407721236603	29.007	26.157	0.76
29.4216871047323	27.3069604396783	31.356	26.03	3.642
29.4216871047323	27.3069604396783	28.943	30.475	3.204
30.840606693917	26.5648031594407	32.245	24.887	2.188
30.840606693917	26.5648031594407	31.42	27.173	0.84
29.4446175307587	24.1158171906294	28.753	24.379	0.74
29.4446175307587	24.1158171906294	32.118	27.3	5.473
29.338722757477	23.616872560655	29.261	22.283	1.411
29.338722757477	23.616872560655	28.753	23.998	1.239
29.1109589925018	22.5437165447583	29.134	22.537	0.024
29.1109589925018	22.5437165447583	28.88	27.3	4.959
28.6245480691569	21.2441837983307	27.927	21.458	1.027
28.6245480691569	21.2441837983307	28.689	21.013	0.24
27.6493593453172	22.0149860311977	27.102	21.648	0.659
27.6493593453172	22.0149860311977	29.261	23.045	3.259
27.6493593453172	22.0149860311977	29.07	29.713	9.61
27.5895156644498	22.2236257450383	27.991	22.601	0.551
27.5895156644498	22.2236257450383	27.229	27.554	5.774
27.5895156644498	22.2236257450383	27.927	28.125	6.761

Solution x	Solution y	Original x	Original y	Radius
25.8950132566117	22.8253612255742	24.308	23.998	2.157
25.8950132566117	22.8253612255742	26.149	23.172	0.891
25.8950132566117	22.8253612255742	25.006	24.188	1.627
25.7446647911069	20.7814349051055	25.895	20.759	0.152
25.7446647911069	20.7814349051055	21.958	24.76	6.761
25.7446647911069	20.7814349051055	26.086	24.95	5.746
25.7446647911069	20.7814349051055	24.562	26.982	7.031
25.7446647911069	20.7814349051055	26.149	27.49	8.339
25.7446647911069	20.7814349051055	27.546	26.982	8.192
25.7446647911069	20.7814349051055	25.895	29.903	9.341
25.4412066379199	19.4423503341299	24.943	19.108	0.6
25.4412066379199	19.4423503341299	25.133	19.235	5.738
25.4412066379199	19.4423503341299	20.561	18.219	9.121
25.4412066379199	19.4423503341299	20.434	18.537	8.447
25.4412066379199	19.4423503341299	25.451	17.965	5.492
25.4412066379199	19.4423503341299	25.07	17.076	5.925
25.4412066379199	19.4423503341299	24.308	16.441	3.717
25.4412066379199	19.4423503341299	25.895	18.918	7.438
25.4412066379199	19.4423503341299	20.498	17.457	7.365
25.4412066379199	19.4423503341299	23.482	22.41	8.804
25.4412066379199	19.4423503341299	26.594	18.854	6.988
25.4412066379199	19.4423503341299	26.149	20.886	5.887
25.4412066379199	19.4423503341299	26.34	17.203	3.101
25.4412066379199	19.4423503341299	19.863	21.331	9.178
25.4412066379199	19.4423503341299	26.848	19.743	9.863
25.4412066379199	19.4423503341299	24.371	15.235	7.737
25.4412066379199	19.4423503341299	20.434	15.806	8.615
25.4412066379199	19.4423503341299	27.102	18.664	5.391
25.4412066379199	19.4423503341299	24.308	15.044	9.423
25.4412066379199	19.4423503341299	26.022	21.902	6.288
25.4412066379199	19.4423503341299	18.466	18.664	8.295
25.4412066379199	19.4423503341299	23.355	23.553	6.4
25.4412066379199	19.4423503341299	26.149	15.679	9.977
25.4412066379199	19.4423503341299	27.356	20.632	8.262
25.4412066379199	19.4423503341299	20.117	22.728	7.823
25.4412066379199	19.4423503341299	25.832	22.918	6.514
25.4412066379199	19.4423503341299	18.212	18.283	7.954
25.4412066379199	19.4423503341299	24.371	14.346	7.57
25.4412066379199	19.4423503341299	27.864	18.854	5.87
25.4412066379199	19.4423503341299	27.292	16.632	9.708
25.4412066379199	19.4423503341299	24.943	23.68	9.291
25.4412066379199	19.4423503341299	18.593	21.648	9.517
25.4412066379199	19.4423503341299	20.561	23.553	7.372
25.4412066379199	19.4423503341299	28.118	18.092	9.723
25.4412066379199	19.4423503341299	26.911	22.601	7.439
25.4412066379199	19.4423503341299	25.832	23.68	9.355
25.4412066379199	19.4423503341299	27.737	16.251	9.503
25.4412066379199	19.4423503341299	27.546	22.537	5.492
25.4412066379199	19.4423503341299	21.831	13.203	7.88
25.4412066379199	19.4423503341299	27.419	15.044	7.778
25.4412066379199	19.4423503341299	28.245	22.855	6.887
25.4412066379199	19.4423503341299	27.8	23.617	6.658
25.4412066379199	19.4423503341299	28.626	22.791	9.57
25.4412066379199	19.4423503341299	19.482	13.076	9.717
25.4412066379199	19.4423503341299	28.372	14.663	8.657
25.4412066379199	19.4423503341299	25.197	12.441	9.295
25.4412066379199	19.4423503341299	29.07	22.347	8.48
25.4412066379199	19.4423503341299	17.64	23.426	9.913
25.4412066379199	19.4423503341299	20.942	25.649	8.469
25.4412066379199	19.4423503341299	26.911	24.76	7.931
25.4412066379199	19.4423503341299	22.149	11.742	9.67
25.4412066379199	19.4423503341299	25.705	12.123	8.029
25.4412066379199	19.4423503341299	25.07	11.615	8.154
25.4412066379199	19.4423503341299	28.753	13.457	9.22
25.4412066379199	19.4423503341299	28.181	12.441	9.321
25.4412066379199	19.4423503341299	29.007	12.949	8.697
25.4412066379199	19.4423503341299	28.88	25.331	8.431
25.4412066379199	19.4423503341299	30.202	13.491	9.735
25.4412066379199	19.4423503341299	34.087	18.918	9.955
26.1007832571723	19.3319776048951	26.149	19.045	0.291
26.1007832571723	19.3319776048951	26.911	14.409	5.204
26.1007832571723	19.3319776048951	28.245	14.854	5.84
26.1007832571723	19.3319776048951	30.594	17.076	5.185
26.1007832571723	19.3319776048951	29.388	13.838	7.053
26.1007832571723	19.3319776048951	33.322	13.361	9.946
26.9433022071152	19.7908532807412	26.975	20.061	0.272
27.30701462532	19.4638332551568	27.229	19.616	0.171
27.825206270332	18.997918304591	22.974	17.711	5.019
27.825206270332	18.997918304591	24.943	18.791	4.875
27.825206270332	18.997918304591	24.943	18.346	3.687

Solution x	Solution y	Original x	Original y	Radius
27.825206270332	18.997918304591	24.879	19.934	4.656
27.825206270332	18.997918304591	25.197	18.918	4.006
27.825206270332	18.997918304591	24.244	21.077	4.835
27.825206270332	18.997918304591	24.879	20.632	4.555
27.825206270332	18.997918304591	26.276	20.188	3.614
27.825206270332	18.997918304591	25.832	16.949	3.416
27.825206270332	18.997918304591	27.356	18.473	1.404
27.825206270332	18.997918304591	27.483	19.616	4.477
27.825206270332	18.997918304591	27.229	15.362	4.245
27.825206270332	18.997918304591	28.245	21.331	3.596
27.825206270332	18.997918304591	28.689	18.156	4.491
27.825206270332	18.997918304591	28.308	15.933	3.661
27.825206270332	18.997918304591	29.261	19.172	3.212
27.825206270332	18.997918304591	28.054	22.918	3.972
27.825206270332	18.997918304591	28.816	21.902	4.368
27.825206270332	18.997918304591	29.705	19.426	2.488
27.825206270332	18.997918304591	29.642	17.076	3.024
27.825206270332	18.997918304591	31.356	19.68	4.172
27.825206270332	18.997918304591	30.657	15.246	4.816
27.825206270332	18.997918304591	31.61	17.775	4.415
28.8382558321728	18.0870682731031	29.578	18.791	1.065
28.8382558321728	18.0870682731031	29.134	16.187	3.747
28.8382558321728	18.0870682731031	30.975	17.076	3.584
28.8382558321728	18.0870682731031	31.015	14.076	6.371
28.8382558321728	18.0870682731031	30.658	10.98	9.268
29.8498659892782	17.177512467137	30.023	17.203	0.175
29.8498659892782	17.177512467137	30.594	16.251	2.691
29.8498659892782	17.177512467137	31.102	17.775	2.111
29.8498659892782	17.177512467137	30.785	16.251	3.205
29.8498659892782	17.177512467137	31.356	16.06	3.559
29.8498659892782	17.177512467137	31.293	15.806	3.238
29.8498659892782	17.177512467137	31.991	17.203	2.464
29.8498659892782	17.177512467137	31.991	16.632	2.73
29.5146500125032	16.6259994938368	28.943	16.886	0.628
29.5146500125032	16.6259994938368	29.515	16.505	0.121
31.3555444036994	15.8835894158263	30.722	15.473	0.772
31.3555444036994	15.8835894158263	31.242	15.473	0.426
32.1599285776814	15.7568654044676	32.282	15.473	0.309
32.1599285776814	15.7568654044676	32.087	14.661	1.421
32.1599285776814	15.7568654044676	32.944	15.933	2.412
32.1599285776814	15.7568654044676	33.322	15.473	2.231
32.1599285776814	15.7568654044676	33.127	14.661	2.812
32.1599285776814	15.7568654044676	33.452	15.246	2.23
32.1599285776814	15.7568654044676	33.095	14.011	2.901
32.1599285776814	15.7568654044676	33.769	15.679	3.318
32.1599285776814	15.7568654044676	34.135	14.726	3.323
32.1599285776814	15.7568654044676	33.907	13.036	3.305
33.494360447734	17.6978539746402	32.69	18.346	1.033
33.494360447734	17.6978539746402	33.388	17.584	0.393
33.9899044641874	18.2252835718943	24.752	19.362	9.904
33.9899044641874	18.2252835718943	26.721	18.283	8.04
33.9899044641874	18.2252835718943	28.054	17.013	8.339
33.9899044641874	18.2252835718943	29.324	15.489	9.524
33.9899044641874	18.2252835718943	30.15	16.06	8.901
33.9899044641874	18.2252835718943	30.785	20.823	6.267
33.9899044641874	18.2252835718943	30.785	16.949	7.677
33.9899044641874	18.2252835718943	30.462	15.473	6.788
33.9899044641874	18.2252835718943	29.197	13.52	8.532
33.9899044641874	18.2252835718943	28.753	12.949	9.829
33.9899044641874	18.2252835718943	30.982	15.473	9.722
33.9899044641874	18.2252835718943	29.705	13.393	8.359
33.9899044641874	18.2252835718943	31.483	16.822	9.589
33.9899044641874	18.2252835718943	30.202	14.011	8.617
33.9899044641874	18.2252835718943	31.356	16.251	5.882
33.9899044641874	18.2252835718943	29.975	13.621	8.631
33.9899044641874	18.2252835718943	28.816	12.25	9.823
33.9899044641874	18.2252835718943	30.202	13.751	8.941
33.9899044641874	18.2252835718943	31.112	15.246	8.972
33.9899044641874	18.2252835718943	29.975	13.361	8.8
33.9899044641874	18.2252835718943	31.356	22.347	9.352
33.9899044641874	18.2252835718943	30.787	14.466	9.289
33.9899044641874	18.2252835718943	31.372	15.246	6.866
33.9899044641874	18.2252835718943	31.502	15.473	5.299
33.9899044641874	18.2252835718943	30.787	13.946	7.399
33.9899044641874	18.2252835718943	29.975	12.841	8.339
33.9899044641874	18.2252835718943	32.309	19.553	9.666
33.9899044641874	18.2252835718943	31.177	14.433	9.897
33.9899044641874	18.2252835718943	32.372	18.537	3.113
33.9899044641874	18.2252835718943	30.202	12.971	8.778
33.9899044641874	18.2252835718943	31.762	15.473	7.919

Solution x	Solution y	Original x	Original y	Radius
33.9899044641874	18.2252835718943	32.182	16.632	9.605
33.9899044641874	18.2252835718943	31.293	23.68	6.085
33.9899044641874	18.2252835718943	30.202	12.711	9.036
33.9899044641874	18.2252835718943	30.787	13.426	9.125
33.9899044641874	18.2252835718943	31.437	14.433	8.72
33.9899044641874	18.2252835718943	31.892	15.246	6.832
33.9899044641874	18.2252835718943	32.022	15.473	6.4
33.9899044641874	18.2252835718943	31.697	14.433	8.117
33.9899044641874	18.2252835718943	31.827	14.661	8.515
33.9899044641874	18.2252835718943	32.817	17.775	7.615
33.9899044641874	18.2252835718943	31.61	13.901	7.404
33.9899044641874	18.2252835718943	33.071	18.346	7.578
33.9899044641874	18.2252835718943	32.412	15.246	8.256
33.9899044641874	18.2252835718943	32.542	15.473	5.858
33.9899044641874	18.2252835718943	33.261	18.537	7.388
33.9899044641874	18.2252835718943	32.347	14.661	7.755
33.9899044641874	18.2252835718943	31.015	12.516	8.72
33.9899044641874	18.2252835718943	33.071	16.187	6.12
33.9899044641874	18.2252835718943	32.477	14.433	7.82
33.9899044641874	18.2252835718943	33.515	18.219	4.061
33.9899044641874	18.2252835718943	33.515	18.029	3.593
33.9899044641874	18.2252835718943	32.372	14.092	6.932
33.9899044641874	18.2252835718943	33.515	20.315	2.143
33.9899044641874	18.2252835718943	32.932	15.246	6.384
33.9899044641874	18.2252835718943	33.642	18.346	5.973
33.9899044641874	18.2252835718943	33.062	15.473	7.07
33.9899044641874	18.2252835718943	32.867	14.661	8.465
33.9899044641874	18.2252835718943	31.632	12.353	8.922
33.9899044641874	18.2252835718943	31.502	12.126	9.301
33.9899044641874	18.2252835718943	30.787	11.313	9.249
33.9899044641874	18.2252835718943	33.96	19.68	7.146
33.9899044641874	18.2252835718943	33.095	14.271	9.731
33.9899044641874	18.2252835718943	33.322	14.401	5.546
33.9899044641874	18.2252835718943	33.095	13.751	7.425
33.9899044641874	18.2252835718943	34.341	21.013	9.585
33.9899044641874	18.2252835718943	32.412	12.353	7.931
33.9899044641874	18.2252835718943	34.468	20.442	9.777
33.9899044641874	18.2252835718943	34.595	18.791	4.79
33.9899044641874	18.2252835718943	33.095	13.231	6.668
33.9899044641874	18.2252835718943	33.322	13.621	7.179
33.9899044641874	18.2252835718943	31.957	11.541	8.595
33.9899044641874	18.2252835718943	32.672	12.353	8.34
33.9899044641874	18.2252835718943	34.341	22.029	7.918
33.9899044641874	18.2252835718943	34.135	14.986	7.609
33.9899044641874	18.2252835718943	33.322	13.101	6.817
33.9899044641874	18.2252835718943	32.087	11.313	9.723
33.9899044641874	18.2252835718943	34.135	14.466	7.813
33.9899044641874	18.2252835718943	33.907	13.816	8.76
33.9899044641874	18.2252835718943	34.135	13.946	7.157
33.9899044641874	18.2252835718943	33.907	13.296	9.748
33.9899044641874	18.2252835718943	34.404	14.028	9.888
33.9899044641874	18.2252835718943	34.135	13.426	8.117
33.9899044641874	18.2252835718943	33.907	12.776	9.552
33.9899044641874	18.2252835718943	33.387	11.313	9.319
33.9899044641874	18.2252835718943	34.135	12.126	8.535
33.9899044641874	18.2252835718943	35.992	16.314	6.3
33.9899044641874	18.2252835718943	33.96	11.234	9.284
33.9899044641874	18.2252835718943	36.436	18.918	5.753
33.9899044641874	18.2252835718943	34.785	12.504	9.071
33.9899044641874	18.2252835718943	34.849	11.996	7.912
33.9899044641874	18.2252835718943	33.833	10.282	9.452
33.9899044641874	18.2252835718943	35.992	13.647	9.144
34.6532500325495	18.1707357070318	34.722	18.219	0.084
34.5002750447107	17.6061112124646	36.436	17.076	2.007
34.1307742332083	16.271104413864	32.944	17.965	2.152
34.1307742332083	16.271104413864	33.907	14.336	1.948
33.8869763184621	15.3902627943667	33.582	15.473	0.316
33.5969051568779	14.2990811248606	33.322	13.881	0.777
33.5969051568779	14.2990811248606	33.907	14.076	0.382
33.5960717143225	14.2985285187558	33.907	14.791	0.855
33.5960717143225	14.2985285187558	33.907	13.556	0.805
32.7654931408832	14.127158089196	32.217	14.433	0.628
32.7654931408832	14.127158089196	32.835	14.173	0.155
32.9292703095507	13.6784888607049	32.69	13.52	0.287
32.9292703095507	13.6784888607049	33.095	13.491	0.844
32.9292703095507	13.6784888607049	33.095	12.971	2.042
32.9292703095507	13.6784888607049	33.907	12.516	2.372
32.9292703095507	13.6784888607049	34.976	10.282	4.446
33.748094541261	12.9145537125271	32.542	12.126	1.441
33.748094541261	12.9145537125271	33.322	12.321	0.752

Solution x	Solution y	Original x	Original y	Radius
33.748094541261	12.9145537125271	34.135	12.906	0.387
34.6252195088946	12.6881635094218	34.135	14.206	1.632
34.6252195088946	12.6881635094218	34.135	13.166	1.621
34.6252195088946	12.6881635094218	35.42	12.949	1.498
35.4876480321012	12.4655665097631	37.452	12.758	1.986
34.5583010268617	11.8981268884177	34.722	11.742	0.519
34.5583010268617	11.8981268884177	36.119	13.139	3.085
34.5583010268617	11.8981268884177	36.944	13.012	3.218
33.6439170936958	11.3398234167984	33.647	11.313	0.027
33.6439170936958	11.3398234167984	34.135	11.866	1.771
33.6439170936958	11.3398234167984	35.484	11.425	2.932
33.6439170936958	11.3398234167984	34.595	9.202	3.337
33.6439170936958	11.3398234167984	37.452	10.218	4.761
32.5480561907309	11.7021277530179	32.835	12.613	0.955
32.5480561907309	11.7021277530179	32.347	11.313	0.438
32.5480561907309	11.7021277530179	32.997	11.541	0.865
32.0326238432831	11.4635052722126	32.217	11.541	0.2
32.0326238432831	11.4635052722126	32.867	11.313	1.814
32.0326238432831	11.4635052722126	33.642	10.155	3.353
32.0326238432831	11.4635052722126	35.103	10.155	3.418
32.0326238432831	11.4635052722126	34.087	8.758	5.137
31.1808745222072	11.0691830395713	29.388	8.313	3.288
30.7202672514709	10.8559421726693	30.34	9.647	1.289
30.7202672514709	10.8559421726693	30.912	9.901	0.974
28.9096728026915	10.9234821829126	27.419	11.298	1.537
28.9096728026915	10.9234821829126	28.753	10.79	0.508
28.9096728026915	10.9234821829126	29.451	10.155	0.94
30.1915021482074	12.4099891915596	24.625	19.68	9.202
30.1915021482074	12.4099891915596	24.244	15.997	8.356
30.1915021482074	12.4099891915596	27.737	18.664	7.927
30.1915021482074	12.4099891915596	29.959	17.584	6.004
30.1915021482074	12.4099891915596	27.991	13.647	2.618
30.1915021482074	12.4099891915596	30.531	18.664	6.676
30.1915021482074	12.4099891915596	29.007	14.409	6.619
30.1915021482074	12.4099891915596	28.372	13.52	4.868
30.1915021482074	12.4099891915596	29.642	15.108	5.237
30.1915021482074	12.4099891915596	27.673	12.695	3.999
30.1915021482074	12.4099891915596	29.515	14.028	5.055
30.1915021482074	12.4099891915596	30.202	14.791	5.659
30.1915021482074	12.4099891915596	29.134	13.33	6.084
30.1915021482074	12.4099891915596	29.975	14.401	4.095
30.1915021482074	12.4099891915596	26.149	11.107	6.643
30.1915021482074	12.4099891915596	29.975	13.881	2.974
30.1915021482074	12.4099891915596	28.816	12.568	3.752
30.1915021482074	12.4099891915596	29.197	12.441	7.211
30.1915021482074	12.4099891915596	29.975	13.101	5.333
30.1915021482074	12.4099891915596	31.047	14.661	2.465
30.1915021482074	12.4099891915596	30.787	14.206	3.808
30.1915021482074	12.4099891915596	31.632	15.246	4.737
30.1915021482074	12.4099891915596	30.787	13.686	6.343
30.1915021482074	12.4099891915596	29.975	12.581	3.034
30.1915021482074	12.4099891915596	28.626	11.234	4.284
30.1915021482074	12.4099891915596	31.567	14.661	2.638
30.1915021482074	12.4099891915596	29.388	11.804	6.15
30.1915021482074	12.4099891915596	29.975	12.321	7.85
30.1915021482074	12.4099891915596	31.015	13.556	2.877
30.1915021482074	12.4099891915596	30.787	13.166	1.867
30.1915021482074	12.4099891915596	29.261	11.425	8.741
30.1915021482074	12.4099891915596	31.015	13.296	5.495
30.1915021482074	12.4099891915596	29.975	12.061	7.414
30.1915021482074	12.4099891915596	30.787	12.906	6.569
30.1915021482074	12.4099891915596	32.152	15.246	4.552
30.1915021482074	12.4099891915596	31.399	13.754	6.233
30.1915021482074	12.4099891915596	27.927	10.409	7.95
30.1915021482074	12.4099891915596	31.015	13.036	5.03
30.1915021482074	12.4099891915596	29.975	11.801	8.467
30.1915021482074	12.4099891915596	30.202	11.996	1.233
30.1915021482074	12.4099891915596	31.957	14.433	4.494
30.1915021482074	12.4099891915596	31.015	12.776	4.762
30.1915021482074	12.4099891915596	30.787	12.386	7.465
30.1915021482074	12.4099891915596	31.991	14.092	3.28
30.1915021482074	12.4099891915596	28.372	10.218	4.687
30.1915021482074	12.4099891915596	31.547	13.203	3.992
30.1915021482074	12.4099891915596	31.275	12.613	5.931
30.1915021482074	12.4099891915596	30.982	12.126	5.546
30.1915021482074	12.4099891915596	28.626	10.091	7.98
30.1915021482074	12.4099891915596	32.607	14.661	4.485
30.1915021482074	12.4099891915596	29.007	10.282	4.077
30.1915021482074	12.4099891915596	31.737	12.885	5.959
30.1915021482074	12.4099891915596	30.657	11.541	6.88

Solution x	Solution y	Original x	Original y	Radius
30.1915021482074	12.4099891915596	31.372	12.353	3.954
30.1915021482074	12.4099891915596	31.242	12.126	5.83
30.1915021482074	12.4099891915596	32.737	14.433	4.264
30.1915021482074	12.4099891915596	30.527	11.313	2.614
30.1915021482074	12.4099891915596	30.34	10.917	4.723
30.1915021482074	12.4099891915596	32.436	13.231	5.906
30.1915021482074	12.4099891915596	31.177	11.541	1.55
30.1915021482074	12.4099891915596	31.892	12.353	3.015
30.1915021482074	12.4099891915596	31.047	11.313	6.138
30.1915021482074	12.4099891915596	31.762	12.126	6.006
30.1915021482074	12.4099891915596	31.437	11.541	2.677
30.1915021482074	12.4099891915596	32.152	12.353	7.264
30.1915021482074	12.4099891915596	31.307	11.313	7.443
30.1915021482074	12.4099891915596	32.022	12.126	7.596
30.1915021482074	12.4099891915596	31.697	11.541	4.577
30.1915021482074	12.4099891915596	31.567	11.313	7.667
30.1915021482074	12.4099891915596	32.282	12.126	3.133
30.1915021482074	12.4099891915596	31.827	11.313	3.091
30.1915021482074	12.4099891915596	33.095	12.711	5.532
30.1915021482074	12.4099891915596	32.932	12.353	3.826
30.1915021482074	12.4099891915596	32.802	12.126	6.243
30.1915021482074	12.4099891915596	33.322	12.841	4.98
30.1915021482074	12.4099891915596	30.658	9.71	8.685
30.1915021482074	12.4099891915596	32.477	11.541	3.772
30.1915021482074	12.4099891915596	30.594	9.52	7.585
30.1915021482074	12.4099891915596	33.322	12.581	6.265
30.1915021482074	12.4099891915596	33.062	12.126	4.87
30.1915021482074	12.4099891915596	32.182	10.98	7.118
30.1915021482074	12.4099891915596	32.737	11.541	5.142
30.1915021482074	12.4099891915596	32.607	11.313	7.65
30.1915021482074	12.4099891915596	34.135	13.686	4.602
30.1915021482074	12.4099891915596	30.721	9.329	3.502
30.1915021482074	12.4099891915596	34.135	12.646	4.083
30.1915021482074	12.4099891915596	33.452	11.541	4.46
30.1915021482074	12.4099891915596	32.055	9.837	5.02
30.1915021482074	12.4099891915596	34.135	12.386	5.584
30.1915021482074	12.4099891915596	33.907	11.996	7.29
30.1915021482074	12.4099891915596	32.944	10.536	3.833
30.1915021482074	12.4099891915596	34.849	13.393	6.061
30.1915021482074	12.4099891915596	34.087	11.615	4.861
30.1915021482074	12.4099891915596	34.595	11.996	4.778
30.1915021482074	12.4099891915596	33.96	10.536	7.536
30.1915021482074	12.4099891915596	35.293	11.552	5.688
30.1915021482074	12.4099891915596	35.547	11.234	6.26
30.1915021482074	12.4099891915596	35.674	11.044	6.002
30.2146126292647	12.4367900883856	30.202	12.451	0.019
30.6126611473948	12.7048384608277	30.787	12.646	0.184
30.6126611473948	12.7048384608277	33.127	11.313	2.902
30.6126611473948	12.7048384608277	35.166	10.726	5.004
30.3805101297846	13.3889348550597	30.202	13.231	0.532
30.1576877651421	14.0455414876148	25.895	12.123	4.686
30.1576877651421	14.0455414876148	29.975	14.921	2.292
30.1576877651421	14.0455414876148	29.975	14.661	0.642
30.1576877651421	14.0455414876148	29.975	14.141	0.982
30.1576877651421	14.0455414876148	30.202	14.271	0.592
30.1576877651421	14.0455414876148	31.307	14.661	1.899
30.1576877651421	14.0455414876148	31.015	13.816	1.481
30.1576877651421	14.0455414876148	31.275	14.173	1.24
30.1576877651421	14.0455414876148	32.672	15.246	2.909
30.1576877651421	14.0455414876148	32.802	15.473	3.005
30.1576877651421	14.0455414876148	33.322	14.141	3.297
29.4041595150613	13.5205271418264	29.578	13.203	0.362
27.9754308664162	12.9277547097373	28.753	13.838	1.257
27.9754308664162	12.9277547097373	27.927	12.568	0.363
27.9754308664162	12.9277547097373	28.499	12.949	0.524
26.7758178321932	12.5100331670682	26.594	11.933	0.605
25.6386652500383	14.0854085539519	25.07	16.314	2.3
25.6386652500383	14.0854085539519	26.086	14.663	1.968
25.6386652500383	14.0854085539519	25.832	14.219	0.235
25.6386652500383	14.0854085539519	26.022	12.631	1.625
22.513186980364	12.1953624360981	22.085	10.853	1.409
22.513186980364	12.1953624360981	22.212	10.091	4.948
22.513186980364	12.1953624360981	23.482	9.52	3.464
21.2593026675595	15.0853858012627	22.149	14.282	1.97
21.2593026675595	15.0853858012627	22.276	13.393	3.052
21.2593026675595	15.0853858012627	25.578	12.568	5.855
21.2593026675595	15.0853858012627	22.022	11.361	6.97
19.9872346629308	18.0173229750838	19.99	18.029	0.012
19.9872346629308	18.0173229750838	18.021	13.52	4.982
19.9872346629308	18.0173229750838	18.339	12.631	6.166

Solution x	Solution y	Original x	Original y	Radius
19.9872346629308	18.0173229750838	20.244	11.234	6.925
19.8824971740411	17.9297516105949	20.117	18.283	0.424
19.8824971740411	17.9297516105949	19.609	18.156	3.821
19.8824971740411	17.9297516105949	18.466	17.838	4.44
19.8824971740411	17.9297516105949	20.371	23.045	6.483
19.8824971740411	17.9297516105949	18.148	16.505	6.09
19.8824971740411	17.9297516105949	17.323	21.331	8.168
19.8824971740411	17.9297516105949	19.418	13.901	6.882
19.8824971740411	17.9297516105949	17.45	21.902	6.347
19.8824971740411	17.9297516105949	16.688	18.092	8.156
19.8824971740411	17.9297516105949	20.434	13.012	7.723
19.8824971740411	17.9297516105949	18.974	24.125	8.219
19.8824971740411	17.9297516105949	19.164	24.696	8.537
19.8824971740411	17.9297516105949	17.577	13.647	6.049
19.8824971740411	17.9297516105949	13.513	22.41	8.854
16.9289071083513	15.4602458846298	18.466	14.155	2.196
14.6572173520784	13.56087916066	17.323	12.504	3.533
14.6572173520784	13.56087916066	13.576	14.79	1.637

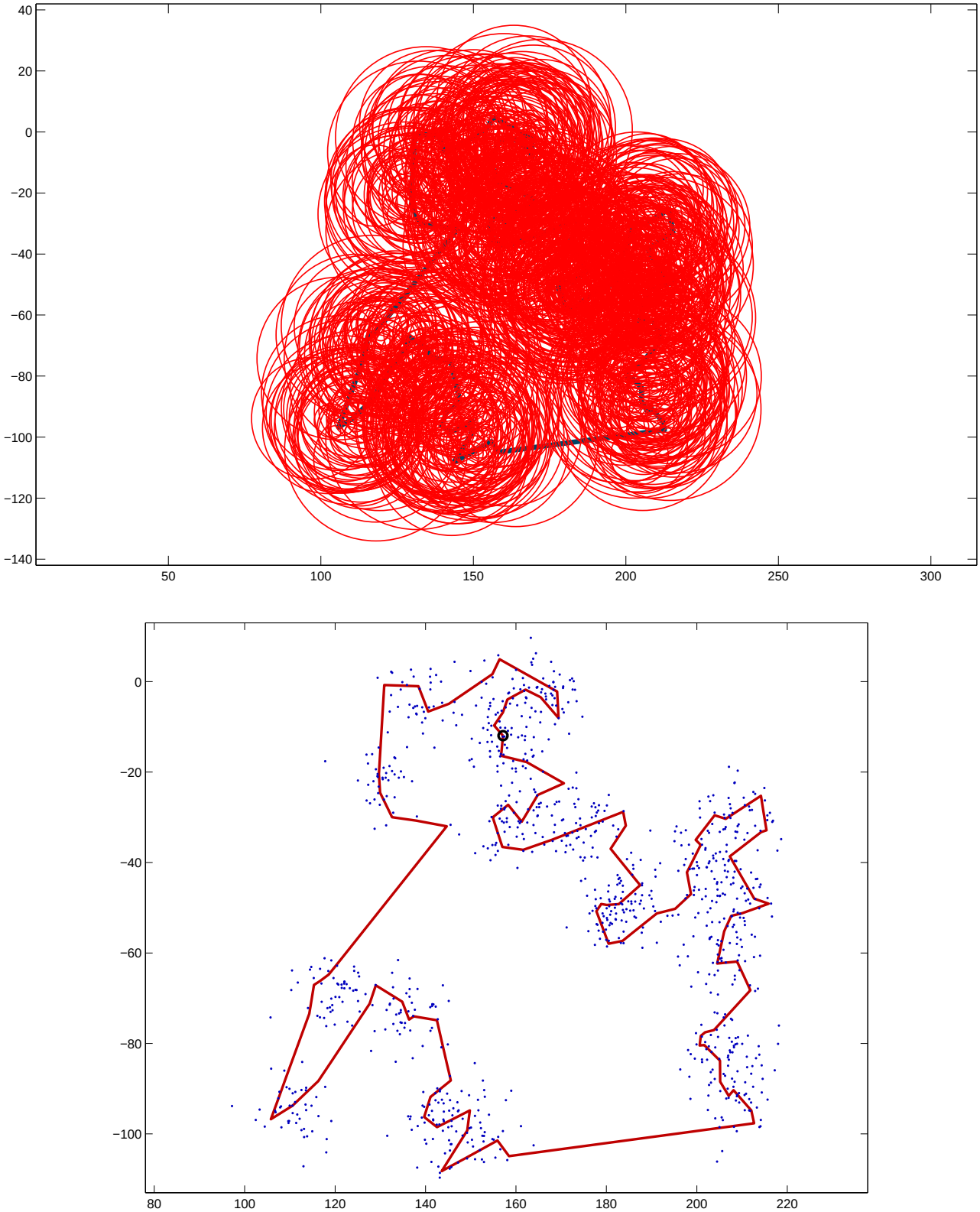

Figure N.62: $dsj1000$, arbitrary radius, 2D, Euclidean, Length = 653.1284948

Table N-65: Solution for $dsj1000$, arbitrary radius, 2D, Euclidean

Total distance: 653.128494795868 Depot: x 47.1287 y 11.9659				
Solution x	Solution y	Original x	Original y	Radius
47.0294146788823	13.0169170923605	47.1015	12.1757	0.8443
47.0294146788823	13.0169170923605	48.2378	10.888	5.8133
47.0294146788823	13.0169170923605	43.984	9.2005	7.1984
47.0294146788823	13.0169170923605	45.0418	3.8658	10.1722
47.0294146788823	13.0169170923605	42.4139	3.5597	13.287
47.0294146788823	13.0169170923605	58.3955	-2.2935	20.2689
47.0294146788823	13.0169170923605	53.5826	-3.7128	20.6553
47.0294146788823	13.0169170923605	43.0131	-4.6452	20.9992
47.0294146788823	13.0169170923605	53.289	-9.6645	25.3042
46.7102607810439	16.3954245650896	46.503	16.5426	0.2542
46.7102607810439	16.3954245650896	40.2335	17.1357	11.2782
46.7102607810439	16.3954245650896	47.2642	16.1804	3.1622
46.7102607810439	16.3954245650896	46.213	15.3079	3.873
46.7102607810439	16.3954245650896	36.7928	9.6586	12.2244
46.7102607810439	16.3954245650896	33.7832	8.5886	17.2676
46.7102607810439	16.3954245650896	44.3097	5.4051	11.9467
46.7102607810439	16.3954245650896	36.4235	4.5159	16.6099
46.7102607810439	16.3954245650896	30.7839	5.7178	20.1469
46.7102607810439	16.3954245650896	49.2438	-0.5725	17.8927
46.7102607810439	16.3954245650896	44.8479	-0.9391	19.1888
46.7102607810439	16.3954245650896	32.3564	-1.4633	25.6089
46.7102607810439	16.3954245650896	31.0065	-1.0714	23.9753
49.627564778746	17.1144971580821	49.9971	19.9155	3.9588
49.627564778746	17.1144971580821	51.539	18.7116	3.3237
49.627564778746	17.1144971580821	51.6732	17.1776	3.9198
52.3546915115483	17.78669381654	52.4859	17.4578	0.3541
52.3546915115483	17.78669381654	44.3034	16.6265	9.4533
52.3546915115483	17.78669381654	48.0446	14.6778	8.8581
52.3546915115483	17.78669381654	53.4554	15.0784	7.1719
52.3546915115483	17.78669381654	47.5448	13.9665	6.8471
52.3546915115483	17.78669381654	44.7075	13.3055	12.6011
52.3546915115483	17.78669381654	43.7175	13.3612	11.2776
52.3546915115483	17.78669381654	47.4524	12.1509	13.8821
52.3546915115483	17.78669381654	40.2323	12.6508	15.4062
52.3546915115483	17.78669381654	53.965	12.2967	9.8572
52.3546915115483	17.78669381654	57.2331	12.7874	7.0243
52.3546915115483	17.78669381654	47.6091	10.2274	11.8474
52.3546915115483	17.78669381654	55.3647	9.0137	9.4748
52.3546915115483	17.78669381654	43.7681	7.8375	19.4193
52.3546915115483	17.78669381654	46.8369	6.4403	14.1993
52.3546915115483	17.78669381654	44.0031	6.0986	17.8329
52.3546915115483	17.78669381654	49.309	3.6922	20.878
52.3546915115483	17.78669381654	52.3291	3.6705	19.2214
52.3546915115483	17.78669381654	52.2056	3.4977	20.8953
52.3546915115483	17.78669381654	61.565	4.5717	20.8967
52.3546915115483	17.78669381654	55.5686	2.3786	17.8085
52.3546915115483	17.78669381654	54.6465	1.327	23.7327
52.3546915115483	17.78669381654	54.5841	1.3	17.8466
52.3546915115483	17.78669381654	58.2987	1.8222	22.9315
52.3546915115483	17.78669381654	43.4311	0.4843	25.8563
52.3546915115483	17.78669381654	58.6741	1.1796	18.8015
52.3546915115483	17.78669381654	60.4167	1.4088	18.4179
52.3546915115483	17.78669381654	63.0749	1.8033	22.3131
52.3546915115483	17.78669381654	51.545	-0.7619	25.0267
52.3546915115483	17.78669381654	56.047	-0.6998	25.6513
52.3546915115483	17.78669381654	61.9524	-0.333	23.4378
52.3546915115483	17.78669381654	39.9467	-2.3317	24.6235
52.3546915115483	17.78669381654	59.6709	-1.5476	26.9171
52.3546915115483	17.78669381654	57.7878	-4.3732	27.1183
55.6042208911743	19.636540736941	53.2794	21.4994	2.9791
55.6042208911743	19.636540736941	55.9782	19.9329	2.6736
60.6023547996635	22.4818068155577	69.5886	28.6002	10.8714
60.6023547996635	22.4818068155577	63.3795	20.1125	3.6505
58.6269907336401	23.3619262222038	61.643	23.6955	3.0344
58.6269907336401	23.3619262222038	70.5469	25.0661	16.1699
58.6269907336401	23.3619262222038	63.4243	4.3429	22.7299
54.8321468320717	25.0527151315796	54.2786	24.4277	0.8349
54.8321468320717	25.0527151315796	53.9046	16.3668	12.2702
54.8321468320717	25.0527151315796	52.0827	15.9727	11.4211
54.8321468320717	25.0527151315796	55.8132	15.4408	11.5975
54.8321468320717	25.0527151315796	53.4617	5.8056	21.7012
54.8321468320717	25.0527151315796	64.6914	7.7788	22.2178
54.8321468320717	25.0527151315796	58.5415	3.6684	22.039
54.8321468320717	25.0527151315796	56.514	2.6652	22.7885
54.8321468320717	25.0527151315796	50.9668	1.717	23.9816
54.8321468320717	25.0527151315796	57.7618	2.6586	24.3155
54.8321468320717	25.0527151315796	55.7669	1.6852	24.4965
54.8321468320717	25.0527151315796	50.0191	-2.6033	29.6269
54.8321468320717	25.0527151315796	62.4332	-0.684	29.6949
53.4850085165714	27.2986624981921	52.7074	28.2489	1.3637
53.4850085165714	27.2986624981921	54.5895	27.7676	3.8179
53.4850085165714	27.2986624981921	54.3108	6.5803	23.4136
53.4850085165714	27.2986624981921	48.7027	4.8736	25.6148
53.4850085165714	27.2986624981921	52.0607	4.6851	25.9984
53.4850085165714	27.2986624981921	58.8992	5.3006	25.2792
51.794975429176	30.1162834459279	47.9603	31.0225	3.9403
51.794975429176	30.1162834459279	53.8796	31.7093	3.1598
51.284237227047	30.9677856096985	51.473	33.7115	2.7502
51.284237227047	30.9677856096985	51.0819	30.8837	1.7131
48.278488468032	27.2329909727825	48.493	25.186	2.0582
48.278488468032	27.2329909727825	46.6598	16.011	13.039
48.278488468032	27.2329909727825	48.9393	11.7496	17.8826
48.278488468032	27.2329909727825	53.1154	7.9184	19.9574
46.2033595460586	28.9259212189839	50.3352	41.2014	12.9522
46.2033595460586	28.9259212189839	44.3651	39.5082	12.4052
46.2033595460586	28.9259212189839	40.9959	37.9409	12.8365
46.2033595460586	28.9259212189839	45.4526	36.121	8.6374
46.2033595460586	28.9259212189839	45.9581	33.5048	9.009
46.2033595460586	28.9259212189839	47.4903	33.2139	11.8665
46.2033595460586	28.9259212189839	44.1303	30.8739	4.2334
46.2033595460586	28.9259212189839	47.9812	30.2306	11.8841
46.2033595460586	28.9259212189839	49.5432	29.0024	8.1871
46.2033595460586	28.9259212189839	50.1386	26.6573	9.4164
44.8727099666282	30.0114900114011	44.6028	29.9319	0.2814
44.8727099666282	30.0114900114011	47.4152	28.2569	4.917
44.8727099666282	30.0114900114011	49.9475	19.2284	17.8419
44.8727099666282	30.0114900114011	52.1655	19.1446	15.5087
44.8727099666282	30.0114900114011	45.9074	18.6439	15.0199
44.8727099666282	30.0114900114011	18.7531	32.536	27.0946
44.8727099666282	30.0114900114011	39.7266	17.3977	17.8866
44.8727099666282	30.0114900114011	53.7123	16.59	19.1512
44.8727099666282	30.0114900114011	23.1689	25.59	25.7524
44.8727099666282	30.0114900114011	44.2621	15.3855	17.5289
44.8727099666282	30.0114900114011	45.8725	14.3747	19.0119
44.8727099666282	30.0114900114011	41.9974	13.5778	24.1613
44.8727099666282	30.0114900114011	17.7323	26.9057	28.6742
44.8727099666282	30.0114900114011	51.9742	12.9315	19.8738
44.8727099666282	30.0114900114011	50.5069	12.3029	19.1593
44.8727099666282	30.0114900114011	44.5228	11.8645	25.0082
44.8727099666282	30.0114900114011	20.5322	21.5891	28.8292
44.8727099666282	30.0114900114011	22.5923	19.795	27.7634
44.8727099666282	30.0114900114011	43.7231	10.6871	24.1762
44.8727099666282	30.0114900114011	49.0558	10.279	25.3924
44.8727099666282	30.0114900114011	46.5714	10.174	27.098
44.8727099666282	30.0114900114011	52.3173	10.0275	24.0147
44.8727099666282	30.0114900114011	20.7311	19.0512	27.1888
44.8727099666282	30.0114900114011	46.3909	8.819	24.8054
44.8727099666282	30.0114900114011	38.0686	7.3443	25.6467
44.8727099666282	30.0114900114011	47.7278	5.7114	28.1097
44.8727099666282	30.0114900114011	41.1669	5.3004	27.2131
44.8727099666282	30.0114900114011	47.0712	4.3382	28.9099
46.9906498124409	36.5559731762961	45.4903	38.3462	2.3358
46.9906498124409	36.5559731762961	46.003	37.4534	29.0578
46.9906498124409	36.5559731762961	43.7884	36.8808	16.446
46.9906498124409	36.5559731762961	48.325	36.101	13.1633
46.9906498124409	36.5559731762961	44.7872	36.1398	5.7289
46.9906498124409	36.5559731762961	42.8212	36.4305	19.4237
46.9906498124409	36.5559731762961	45.6407	35.658	25.0567
46.9906498124409	36.5559731762961	51.7623	34.8081	20.8873
46.9906498124409	36.5559731762961	58.8785	37.4935	17.2077
46.9906498124409	36.5559731762961	48.6326	32.1618	29.9479
46.9906498124409	36.5559731762961	55.9275	34.3566	23.3784
46.9906498124409	36.5559731762961	54.3132	33.4794	25.0485
46.9906498124409	36.5559731762961	64.4232	44.0581	28.7966
46.9906498124409	36.5559731762961	37.4272	33.8061	15.7441
46.9906498124409	36.5559731762961	47.3356	31.1656	22.3253
46.9906498124409	36.5559731762961	50.8592	31.2824	23.4486
46.9906498124409	36.5559731762961	46.9054	30.8841	23.9447
46.9906498124409	36.5559731762961	50.5738	30.8854	21.7078
46.9906498124409	36.5559731762961	52.5136	31.162	28.7958
46.9906498124409	36.5559731762961	61.1452	36.2851	29.605
46.9906498124409	36.5559731762961	46.4115	30.3033	28.1751
46.9906498124409	36.5559731762961	58.4334	33.3219	26.7455
46.9906498124409	36.5559731762961	64.2784	38.8059	29.0239

Solution x	Solution y	Original x	Original y	Radius
46.9906498124409	36.5559731762961	61.1622	34.1592	28.1161
46.9906498124409	36.5559731762961	65.211	38.9167	22.6036
46.9906498124409	36.5559731762961	54.7376	29.7596	17.0277
46.9906498124409	36.5559731762961	58.6228	31.6703	25.6598
46.9906498124409	36.5559731762961	54.8257	29.6059	17.9639
46.9906498124409	36.5559731762961	46.684	28.1154	27.5206
46.9906498124409	36.5559731762961	47.5893	27.8934	19.7112
46.9906498124409	36.5559731762961	46.7677	27.4481	29.3514
46.9906498124409	36.5559731762961	45.985	27.4123	25.7471
46.9906498124409	36.5559731762961	53.915	28.4629	20.5718
46.9906498124409	36.5559731762961	66.7168	38.698	29.069
46.9906498124409	36.5559731762961	64.9829	35.6055	27.8112
46.9906498124409	36.5559731762961	60.1802	30.671	27.7411
46.9906498124409	36.5559731762961	47.7428	26.438	28.0445
46.9906498124409	36.5559731762961	55.1607	27.7715	18.2237
46.9906498124409	36.5559731762961	66.9624	36.7077	25.6742
46.9906498124409	36.5559731762961	55.089	27.0379	20.8338
46.9906498124409	36.5559731762961	65.4552	32.6167	29.012
46.9906498124409	36.5559731762961	54.6523	25.2022	28.2307
46.9906498124409	36.5559731762961	50.8742	24.2729	23.767
46.9906498124409	36.5559731762961	64.1748	30.2745	28.016
46.9906498124409	36.5559731762961	46.7163	23.0055	28.4765
46.9906498124409	36.5559731762961	49.1449	22.3659	23.3416
46.9906498124409	36.5559731762961	62.9268	27.0211	28.5574
46.9906498124409	36.5559731762961	45.9242	19.9	25.1738
46.9906498124409	36.5559731762961	49.1677	19.2175	29.9217
46.9906498124409	36.5559731762961	40.715	18.8306	23.0792
46.9906498124409	36.5559731762961	47.2412	18.0641	26.9311
46.9906498124409	36.5559731762961	49.3862	17.5735	29.4535
46.9906498124409	36.5559731762961	51.32	11.9016	29.8963
51.603341960022	37.1930835806406	51.6292	37.4529	0.2611
51.603341960022	37.1930835806406	53.589	37.6567	4.7875
51.603341960022	37.1930835806406	61.2083	54.3519	20.9342
51.603341960022	37.1930835806406	50.1654	34.298	3.7703
51.603341960022	37.1930835806406	56.2795	36.0371	11.477
51.603341960022	37.1930835806406	50.3723	32.2399	6.6627
51.603341960022	37.1930835806406	65.3289	43.5846	21.6754
51.603341960022	37.1930835806406	62.6603	37.129	12.7997
51.603341960022	37.1930835806406	64.8516	39.5774	16.3435
51.603341960022	37.1930835806406	68.022	53.7678	25.621
51.603341960022	37.1930835806406	61.5106	34.0654	10.912
51.603341960022	37.1930835806406	69.2681	55.3133	27.1365
51.603341960022	37.1930835806406	63.8645	34.3723	14.5693
51.603341960022	37.1930835806406	57.9508	29.6187	14.7612
51.603341960022	37.1930835806406	69.8977	54.8286	26.5823
51.603341960022	37.1930835806406	70.6462	49.6735	27.2687
51.603341960022	37.1930835806406	70.4096	46.4113	21.9243
51.603341960022	37.1930835806406	63.5739	32.9982	17.0906
51.603341960022	37.1930835806406	70.916	53.3608	25.4746
51.603341960022	37.1930835806406	71.8327	48.0379	28.84
51.603341960022	37.1930835806406	64.2717	31.7627	14.3523
51.603341960022	37.1930835806406	66.5887	34.1226	18.4197
51.603341960022	37.1930835806406	58.5931	27.1316	12.8934
51.603341960022	37.1930835806406	73.2561	47.9132	27.6156
51.603341960022	37.1930835806406	72.7013	43.6681	23.6645
51.603341960022	37.1930835806406	72.9198	44.5581	29.4271
51.603341960022	37.1930835806406	72.4926	42.7909	23.9047
51.603341960022	37.1930835806406	59.5552	26.5288	17.0515
51.603341960022	37.1930835806406	72.9378	43.4347	22.409
51.603341960022	37.1930835806406	73.6395	46.5004	26.6417
51.603341960022	37.1930835806406	54.0368	23.8586	14.1498
51.603341960022	37.1930835806406	73.6428	45.1426	25.8084
51.603341960022	37.1930835806406	76.0043	50.5809	29.1787
51.603341960022	37.1930835806406	63.8119	26.0212	22.8759
51.603341960022	37.1930835806406	76.5498	52.218	29.3359
51.603341960022	37.1930835806406	66.7482	27.6121	22.4893
51.603341960022	37.1930835806406	75.9853	41.4015	28.8962
51.603341960022	37.1930835806406	75.4748	37.8532	28.9661
51.603341960022	37.1930835806406	63.3607	23.5913	24.1094
58.0202164488442	34.9545718999379	58.126	35.24	0.3044
58.0202164488442	34.9545718999379	60.9493	37.7343	9.1697
58.0202164488442	34.9545718999379	60.137	35.2014	3.3879
58.0202164488442	34.9545718999379	67.8488	53.6384	21.5605
58.0202164488442	34.9545718999379	60.8351	33.4935	6.3537
58.0202164488442	34.9545718999379	63.453	34.6286	7.4277
58.0202164488442	34.9545718999379	62.464	33.4003	5.2338
58.0202164488442	34.9545718999379	60.463	30.4795	7.3122
58.0202164488442	34.9545718999379	70.7664	48.6137	19.7705
58.0202164488442	34.9545718999379	56.8778	27.618	8.9898
58.0202164488442	34.9545718999379	55.4854	26.8201	10.8698

Solution x	Solution y	Original x	Original y	Radius
58.0202164488442	34.9545718999379	72.0385	47.603	19.8624
58.0202164488442	34.9545718999379	72.1444	51.2772	22.7706
58.0202164488442	34.9545718999379	72.4429	44.8985	21.9495
58.0202164488442	34.9545718999379	58.9981	26.6128	10.0374
58.0202164488442	34.9545718999379	67.4673	33.2544	16.5328
58.0202164488442	34.9545718999379	67.7055	32.9993	14.8259
58.0202164488442	34.9545718999379	63.132	27.7543	11.7407
58.0202164488442	34.9545718999379	66.7818	30.0369	10.9633
58.0202164488442	34.9545718999379	69.1853	30.9522	13.139
58.0202164488442	34.9545718999379	67.5765	27.7962	15.1317
58.0202164488442	34.9545718999379	75.9022	40.5634	19.0711
58.0202164488442	34.9545718999379	77.4079	49.147	24.2468
58.0202164488442	34.9545718999379	67.242	26.9141	16.4624
58.0202164488442	34.9545718999379	62.5649	23.4331	17.3284
58.0202164488442	34.9545718999379	72.6191	32.6684	20.9501
58.0202164488442	34.9545718999379	70.1037	27.3839	17.3373
58.0202164488442	34.9545718999379	52.0306	12.0787	25.2448
62.2049296409248	33.3112677957431	62.0243	36.102	3.1072
67.3154738629595	31.3043969662969	63.2951	31.2899	4.0204
67.3154738629595	31.3043969662969	67.6588	29.7348	2.8615
67.3154738629595	31.3043969662969	68.2062	28.5319	2.9167
70.2606170567753	30.1478622603239	68.3701	31.308	5.8267
70.2606170567753	30.1478622603239	68.3676	27.331	4.5622
73.7073157709291	28.794370815129	73.7989	28.6287	0.1893
73.7073157709291	28.794370815129	90.6179	26.4649	21.9514
73.7073157709291	28.794370815129	93.6487	25.1273	25.1293
74.2858277696482	31.8583808419794	67.8857	28.9512	7.9175
74.2858277696482	31.8583808419794	71.5231	31.8286	7.639
74.2858277696482	31.8583808419794	79.7169	32.9378	5.5373
70.9467594115571	36.9660605036468	68.0366	38.8903	3.4888
70.9467594115571	36.9660605036468	72.2401	34.2889	2.9732
75.3900488265236	42.4429261446989	75.73	42.7229	0.4404
75.3900488265236	42.4429261446989	89.3668	41.343	15.2017
75.3900488265236	42.4429261446989	90.0385	42.8005	21.625
75.3900488265236	42.4429261446989	87.5726	32.8781	19.8465
75.3900488265236	42.4429261446989	90.1236	40.724	15.0486
75.3900488265236	42.4429261446989	91.1842	48.1207	17.5671
75.3900488265236	42.4429261446989	90.4784	41.2284	19.2596
75.3900488265236	42.4429261446989	91.9756	47.4725	19.7423
75.3900488265236	42.4429261446989	92.2396	41.0703	23.428
75.3900488265236	42.4429261446989	92.634	40.1716	17.8594
75.3900488265236	42.4429261446989	90.72	30.049	25.9851
75.3900488265236	42.4429261446989	92.4351	33.0022	23.0347
75.3900488265236	42.4429261446989	95.7654	46.8722	22.8599
75.3900488265236	42.4429261446989	95.0864	33.2234	27.2565
75.3900488265236	42.4429261446989	98.0879	44.5657	26.354
75.3900488265236	42.4429261446989	98.0763	43.3554	27.4576
75.3900488265236	42.4429261446989	97.4429	30.1528	27.9419
75.3900488265236	42.4429261446989	103.0838	43.6629	28.7382
76.4852329805167	43.7928668884608	66.0257	55.1875	16.5761
76.4852329805167	43.7928668884608	67.5609	49.631	13.5732
76.4852329805167	43.7928668884608	69.1689	51.2673	13.4858
76.4852329805167	43.7928668884608	70.5497	45.0925	13.3393
76.4852329805167	43.7928668884608	73.3859	52.8201	15.2561
76.4852329805167	43.7928668884608	73.2283	44.0709	10.2788
76.4852329805167	43.7928668884608	74.5598	39.2546	7.8873
76.4852329805167	43.7928668884608	79.533	47.2684	8.9398
76.4852329805167	43.7928668884608	86.5983	36.2039	13.6175
76.4852329805167	43.7928668884608	87.5583	39.2312	14.1099
76.4852329805167	43.7928668884608	88.2545	36.066	15.726
76.4852329805167	43.7928668884608	89.1249	38.0318	15.9201
77.4757474535932	45.013790580443	77.8794	45.0468	0.405
77.4757474535932	45.013790580443	77.9223	44.6051	3.0325
77.4757474535932	45.013790580443	87.5129	47.9594	13.3149
77.4757474535932	45.013790580443	89.6611	52.1615	14.4321
77.4757474535932	45.013790580443	93.4265	31.4744	21.1215
77.4757474535932	45.013790580443	98.3613	42.0392	22.2209
77.4757474535932	45.013790580443	99.0651	51.1078	22.694
72.7579517768141	49.2021580507777	66.2863	51.2705	7.8797
72.7579517768141	49.2021580507777	67.7991	50.1342	7.0884
72.7579517768141	49.2021580507777	70.1179	52.2878	5.6226
72.7579517768141	49.2021580507777	70.694	53.8562	5.7549
72.7579517768141	49.2021580507777	74.3979	53.0985	4.2274
72.7579517768141	49.2021580507777	77.9078	47.2474	6.5423
70.1013419405376	49.390435868776	70.0624	50.1219	0.7325
70.1013419405376	49.390435868776	80.8872	43.1227	14.1296
70.1013419405376	49.390435868776	88.4465	41.4478	21.203
70.1013419405376	49.390435868776	90.014	39.915	25.9424
70.1013419405376	49.390435868776	93.2846	41.9379	28.0563
70.1013419405376	49.390435868776	95.1396	47.3596	26.132

Solution x	Solution y	Original x	Original y	Radius
70.1013419405376	49.390435868776	98.2152	53.7701	29.4627
68.8446397547188	49.1654802114229	67.4955	46.0347	3.4091
68.8446397547188	49.1654802114229	68.7356	47.889	2.3048
67.7881839429387	50.7783051718056	66.949	50.6855	0.8443
67.7881839429387	50.7783051718056	67.4683	58.2291	22.4924
67.7881839429387	50.7783051718056	69.1565	53.343	16.8114
67.7881839429387	50.7783051718056	69.4154	51.8752	4.1739
67.7881839429387	50.7783051718056	68.5789	56.8701	16.6688
67.7881839429387	50.7783051718056	70.8564	51.5507	19.1375
67.7881839429387	50.7783051718056	69.9782	57.1009	18.2604
67.7881839429387	50.7783051718056	71.0505	50.768	14.6692
67.7881839429387	50.7783051718056	70.5527	57.3223	18.2025
67.7881839429387	50.7783051718056	71.8965	50.0142	19.3441
67.7881839429387	50.7783051718056	72.0304	52.5053	20.8079
67.7881839429387	50.7783051718056	73.2401	49.0047	19.489
67.7881839429387	50.7783051718056	73.5268	49.2611	16.8647
67.7881839429387	50.7783051718056	72.7757	56.7077	24.2193
67.7881839429387	50.7783051718056	73.6611	50.4924	19.7557
67.7881839429387	50.7783051718056	73.911	51.0144	19.7234
67.7881839429387	50.7783051718056	73.8072	55.2741	22.0263
67.7881839429387	50.7783051718056	73.2116	57.797	20.4365
67.7881839429387	50.7783051718056	76.4125	46.981	12.1404
67.7881839429387	50.7783051718056	77.6289	48.4559	16.6228
67.7881839429387	50.7783051718056	77.8264	55.5164	14.0686
67.7881839429387	50.7783051718056	77.9705	58.8491	15.3336
67.7881839429387	50.7783051718056	77.5882	39.4219	18.0454
67.7881839429387	50.7783051718056	79.9479	46.2913	20.0233
67.7881839429387	50.7783051718056	80.7698	50.729	24.0359
67.7881839429387	50.7783051718056	80.8076	41.6004	22.8911
67.7881839429387	50.7783051718056	81.1686	57.7423	24.938
67.7881839429387	50.7783051718056	82.0477	53.0979	18.2605
67.7881839429387	50.7783051718056	87.2346	40.5435	24.2659
67.7881839429387	50.7783051718056	88.0225	60.7529	27.571
67.7881839429387	50.7783051718056	89.3464	46.1786	28.4968
67.7881839429387	50.7783051718056	89.0134	41.3658	27.9234
67.7881839429387	50.7783051718056	90.2672	64.2791	29.5547
67.7881839429387	50.7783051718056	93.0102	50.1223	27.268
67.7881839429387	50.7783051718056	92.1801	41.0349	29.4376
67.7881839429387	50.7783051718056	93.3823	48.5086	29.5211
67.7881839429387	50.7783051718056	93.3932	53.1876	28.8804
69.1781938722175	54.4754271768627	68.2826	55.0673	4.1147
70.4819647846582	57.9431766389487	70.1344	58.5671	0.7142
70.4819647846582	57.9431766389487	85.8477	60.7859	18.5843
70.4819647846582	57.9431766389487	95.1558	61.2395	27.409
73.5665064582049	57.3349893072975	73.7963	57.8273	0.5433
73.5665064582049	57.3349893072975	84.6532	51.7406	13.6619
73.5665064582049	57.3349893072975	87.8413	47.1867	18.3729
73.5665064582049	57.3349893072975	86.2321	62.729	16.3953
73.5665064582049	57.3349893072975	92.749	64.7326	21.2415
73.5665064582049	57.3349893072975	95.0304	53.2116	22.3786
73.5665064582049	57.3349893072975	94.5987	62.0376	22.0196
73.5665064582049	57.3349893072975	93.9444	64.9	23.8239
73.5665064582049	57.3349893072975	97.9579	54.2407	26.2321
73.5665064582049	57.3349893072975	102.6402	60.9181	29.8857
75.9153325074447	55.4404712730369	65.7303	47.3671	12.9967
75.9153325074447	55.4404712730369	67.6648	48.1141	12.6345
75.9153325074447	55.4404712730369	70.2011	52.705	12.1835
75.9153325074447	55.4404712730369	70.6191	48.182	10.2546
75.9153325074447	55.4404712730369	71.2619	53.5794	11.3066
75.9153325074447	55.4404712730369	72.0723	49.2863	10.8405
75.9153325074447	55.4404712730369	72.0955	52.6394	7.0709
75.9153325074447	55.4404712730369	74.4488	50.3129	5.5377
75.9153325074447	55.4404712730369	74.8417	48.5823	11.9548
75.9153325074447	55.4404712730369	75.2757	50.6388	7.5436
75.9153325074447	55.4404712730369	75.5201	48.6107	10.8007
75.9153325074447	55.4404712730369	75.5587	49.1352	7.8556
75.9153325074447	55.4404712730369	76.2244	51.9684	3.4858
75.9153325074447	55.4404712730369	76.379	48.6237	7.5959
75.9153325074447	55.4404712730369	78.2967	50.1808	11.8299
75.9153325074447	55.4404712730369	78.0993	54.3894	5.6239
75.9153325074447	55.4404712730369	80.0004	48.0282	9.8035
81.158625628905	51.2605850281739	80.3964	49.7264	1.7131
81.158625628905	51.2605850281739	96.2485	47.1277	17.9146
81.158625628905	51.2605850281739	97.3108	57.82	22.7988
81.158625628905	51.2605850281739	99.5817	52.1789	22.5087
81.158625628905	51.2605850281739	101.161	45.7653	23.4902
83.2396270336868	50.731005837734	83.5076	51.7826	1.0852
83.2396270336868	50.731005837734	87.1149	58.1702	8.6573
83.2396270336868	50.731005837734	89.2688	56.3248	12.5008
83.2396270336868	50.731005837734	91.9732	45.8332	12.7139

Solution x	Solution y	Original x	Original y	Radius
83.2396270336868	50.731005837734	92.8209	56.9207	12.3836
83.2396270336868	50.731005837734	92.9131	56.6287	15.0729
83.2396270336868	50.731005837734	93.9129	43.6355	15.3805
83.2396270336868	50.731005837734	95.0864	47.4256	15.4813
83.2396270336868	50.731005837734	94.6877	57.1733	13.9646
83.2396270336868	50.731005837734	95.4289	57.3916	14.9929
83.2396270336868	50.731005837734	93.0933	68.7697	21.8016
83.2396270336868	50.731005837734	95.9041	59.3009	16.7412
83.2396270336868	50.731005837734	96.4356	62.0951	20.9554
83.2396270336868	50.731005837734	98.2004	50.3921	18.7026
83.2396270336868	50.731005837734	100.0845	45.3198	20.4175
83.2396270336868	50.731005837734	101.377	48.1816	20.458
83.2396270336868	50.731005837734	95.9481	74.251	27.2231
83.2396270336868	50.731005837734	102.543	45.6081	21.8293
83.2396270336868	50.731005837734	104.1102	44.8822	24.3902
83.2396270336868	50.731005837734	103.9916	60.6173	27.4308
85.2024400124581	50.2299970886568	85.9154	51.5363	1.4882
85.2024400124581	50.2299970886568	90.3356	51.1932	6.8103
85.2024400124581	50.2299970886568	92.412	50.9961	8.4715
85.2024400124581	50.2299970886568	94.5838	45.9916	12.3529
85.2024400124581	50.2299970886568	94.5355	44.3621	13.4241
85.2024400124581	50.2299970886568	93.6083	38.4774	16.8124
85.2024400124581	50.2299970886568	96.0562	52.3857	12.0834
85.2024400124581	50.2299970886568	94.6788	63.8911	17.5158
85.2024400124581	50.2299970886568	96.8097	54.0588	13.9289
85.2024400124581	50.2299970886568	96.2133	40.5576	17.1844
85.2024400124581	50.2299970886568	99.6903	41.4772	20.1453
85.2024400124581	50.2299970886568	99.3413	60.508	18.4113
85.2024400124581	50.2299970886568	98.4258	65.8894	20.8311
85.2024400124581	50.2299970886568	101.778	67.1686	23.9527
88.7045575046111	46.9721151243303	89.352	47.1855	0.6817
88.7045575046111	46.9721151243303	90.4865	46.0315	3.9724
88.7045575046111	46.9721151243303	91.0332	34.8187	16.4532
88.7045575046111	46.9721151243303	94.5726	47.3613	6.423
88.7045575046111	46.9721151243303	94.4684	44.7163	7.0613
88.7045575046111	46.9721151243303	95.46	44.379	10.525
88.7045575046111	46.9721151243303	97.7133	51.9341	11.5332
88.7045575046111	46.9721151243303	96.5473	37.5774	13.5522
88.7045575046111	46.9721151243303	96.6051	36.0943	18.2734
88.7045575046111	46.9721151243303	95.8908	32.6754	17.855
88.7045575046111	46.9721151243303	98.8606	57.9963	15.8873
88.7045575046111	46.9721151243303	98.7317	39.6579	13.6077
88.7045575046111	46.9721151243303	100.5945	52.9653	16.0066
88.7045575046111	46.9721151243303	97.9141	29.0493	23.1555
88.7045575046111	46.9721151243303	99.0228	31.9463	24.3368
88.7045575046111	46.9721151243303	102.0152	42.2262	18.485
88.7045575046111	46.9721151243303	100.5275	34.9543	18.18
88.7045575046111	46.9721151243303	103.8062	50.1176	16.2282
88.7045575046111	46.9721151243303	103.8959	45.4099	16.5891
88.7045575046111	46.9721151243303	103.4615	37.3033	18.992
88.7045575046111	46.9721151243303	102.9211	31.879	24.191
88.7045575046111	46.9721151243303	101.7295	28.4449	24.6989
88.7045575046111	46.9721151243303	106.6231	51.946	20.5204
88.7045575046111	46.9721151243303	107.8221	37.3636	23.6325
87.8045051878483	42.1565329863168	81.9079	40.1742	6.2209
87.8045051878483	42.1565329863168	85.9182	41.843	3.5933
87.8045051878483	42.1565329863168	89.5287	45.4109	3.6829
90.8506316780588	36.114070983732	91.1655	36.0648	0.3187
90.8506316780588	36.114070983732	92.8093	39.7693	4.7222
90.8506316780588	36.114070983732	94.3087	39.6383	5.7437
90.8506316780588	36.114070983732	95.1298	37.6897	8.2516
90.8506316780588	36.114070983732	95.8598	39.2349	9.5298
90.8506316780588	36.114070983732	96.156	30.1327	15.6026
90.8506316780588	36.114070983732	97.1838	29.5842	15.6415
90.8506316780588	36.114070983732	98.5493	33.1624	15.8362
90.8506316780588	36.114070983732	97.3283	27.0933	16.7318
90.8506316780588	36.114070983732	101.1976	33.4905	15.926
90.8506316780588	36.114070983732	100.6297	27.3107	20.9684
90.8506316780588	36.114070983732	98.3241	22.4412	19.863
90.8506316780588	36.114070983732	100.384	25.6874	21.4485
90.8506316780588	36.114070983732	102.4997	24.4075	22.2451
90.8506316780588	36.114070983732	105.5782	30.6326	17.6401
90.8506316780588	36.114070983732	106.6895	31.0233	23.9388
90.8506316780588	36.114070983732	105.0575	26.2706	21.5332
90.8506316780588	36.114070983732	106.8535	30.7643	22.1596
89.7579845208202	35.0037668621233	85.065	35.2948	4.702
89.7579845208202	35.0037668621233	91.8795	37.1845	3.6728
89.7579845208202	35.0037668621233	91.9372	36.8319	3.8859
90.8702631397911	33.5512548392918	85.525	32.0217	5.5598
90.8702631397911	33.5512548392918	86.512	33.4131	8.2137

Solution x	Solution y	Original x	Original y	Radius
90.8702631397911	33.5512548392918	92.7124	33.4453	14.4155
90.8702631397911	33.5512548392918	93.9312	28.9768	14.5805
90.8702631397911	33.5512548392918	96.2582	32.5713	16.7348
90.8702631397911	33.5512548392918	97.0499	25.7334	22.9168
93.9275644058814	29.5587626010331	92.942	26.4511	3.2602
93.9275644058814	29.5587626010331	92.5592	25.4331	8.84
93.9275644058814	29.5587626010331	98.3827	22.3334	15.4136
93.9275644058814	29.5587626010331	97.1071	18.8552	18.2973
93.9275644058814	29.5587626010331	99.0428	19.6959	17.7192
95.7772192215968	30.1371557606062	96.0238	29.4057	0.7719
95.7772192215968	30.1371557606062	97.5011	28.0267	4.1233
95.7772192215968	30.1371557606062	105.6149	29.5786	12.2754
96.3637720798677	30.3494162321649	85.1876	33.113	12.2337
96.3637720798677	30.3494162321649	93.6941	39.0671	9.1173
96.3637720798677	30.3494162321649	90.6435	28.0536	9.6928
96.3637720798677	30.3494162321649	96.3928	32.1668	2.1401
96.3637720798677	30.3494162321649	98.5859	34.5756	9.3554
96.3637720798677	30.3494162321649	98.9301	33.2654	6.2044
96.3637720798677	30.3494162321649	99.272	31.5703	3.1541
96.3637720798677	30.3494162321649	101.5683	27.6266	8.8382
102.288235495834	26.4798868213701	102.211	28.3893	3.0468
102.288235495834	26.4798868213701	102.9016	24.8202	1.7694
104.180764648416	25.2437921721112	104.9423	23.521	1.8836
104.761256004239	28.8456157840981	106.1692	29.0085	2.1859
105.411480787396	32.8801234252988	108.656	34.8419	3.7915
104.231986917801	33.2753869694943	104.0844	32.9988	0.3135
97.2886533662854	38.6306124412116	94.1971	38.0204	3.1512
97.2886533662854	38.6306124412116	97.0806	39.3994	0.8811
97.2886533662854	38.6306124412116	98.4033	39.6451	2.523
98.3870401387196	40.5310237545452	97.0063	39.6578	6.2182
99.5213541213288	42.4935959550946	96.6284	43.246	6.0243
99.5213541213288	42.4935959550946	96.8865	41.9997	5.9999
100.654135076309	44.4535156322873	97.5519	44.8528	3.8542
100.654135076309	44.4535156322873	99.7789	45.6905	1.6891
101.786916388318	46.4134351004197	96.2085	41.8253	7.8844
101.786916388318	46.4134351004197	98.9198	48.0008	5.0724
101.786916388318	46.4134351004197	100.6036	46.802	2.256
102.697519135524	47.9889446067902	101.7941	49.0832	1.419
102.697519135524	47.9889446067902	103.3956	43.6231	9.5596
105.884012086111	49.0931798277463	106.4442	49.0895	0.5602
100.030364549391	51.2082178196396	100.3439	52.2486	1.0866
100.030364549391	51.2082178196396	100.8862	48.4618	10.9264
100.030364549391	51.2082178196396	102.9297	48.0592	14.2478
100.030364549391	51.2082178196396	105.6501	47.8555	11.3295
97.6035790091083	51.7987346351889	94.3452	48.7818	4.4406
97.6035790091083	51.7987346351889	98.1036	50.8139	1.1045
97.6035790091083	51.7987346351889	99.5987	51.3246	2.5606
96.2834279920738	54.706904410332	94.6583	60.3511	8.4724
96.2834279920738	54.706904410332	97.7455	51.8526	5.024
96.2834279920738	54.706904410332	99.7259	57.0659	5.4613
96.0367586283844	55.2502949501801	92.1982	53.9806	4.0431
96.0367586283844	55.2502949501801	94.4551	58.0456	10.0481
96.0367586283844	55.2502949501801	94.8477	58.3247	10.8435
96.0367586283844	55.2502949501801	95.479	61.1306	12.7416
96.0367586283844	55.2502949501801	98.4228	65.0226	19.713
96.0367586283844	55.2502949501801	102.1595	55.9791	15.0641
96.0367586283844	55.2502949501801	97.5653	74.5618	26.0912
94.505426194908	62.3387040302659	88.7937	67.447	7.6628
94.505426194908	62.3387040302659	93.2379	56.4517	7.5848
94.505426194908	62.3387040302659	93.5538	62.1822	5.8892
94.505426194908	62.3387040302659	95.4724	61.7777	4.4248
98.9106731641757	61.8907440723588	99.0429	61.6589	0.2669
98.9106731641757	61.8907440723588	97.9014	66.9835	12.1626
98.9106731641757	61.8907440723588	99.9754	58.6633	10.7282
98.9106731641757	61.8907440723588	100.6388	53.8259	11.1764
98.9106731641757	61.8907440723588	99.4285	63.8276	13.2796
98.9106731641757	61.8907440723588	100.6854	61.817	3.0255
98.9106731641757	61.8907440723588	102.8738	56.4102	11.5644
100.512202443914	65.3569054520294	98.7715	55.3698	10.7015
100.512202443914	65.3569054520294	98.9521	56.5952	9.6017
101.850319165324	68.2529696372349	102.9023	68.4164	1.0646
93.7937562154175	77.0574012166464	94.549	73.3405	4.2829
93.7937562154175	77.0574012166464	94.6945	78.572	1.7622
91.8417916404313	77.5419423223055	91.0116	75.887	1.8515
90.885359903436	78.3258828444209	89.835	77.746	1.1998
90.885359903436	78.3258828444209	94.6798	69.1984	14.7127
90.885359903436	78.3258828444209	88.0687	81.4777	18.8265
90.885359903436	78.3258828444209	93.9524	73.145	21.3513
90.885359903436	78.3258828444209	89.95	80.2132	25.9539
90.885359903436	78.3258828444209	91.1291	78.4897	23.993

Solution x	Solution y	Original x	Original y	Radius
90.885359903436	78.3258828444209	89.5631	83.3752	25.9016
90.885359903436	78.3258828444209	94.4072	76.9857	17.5737
90.885359903436	78.3258828444209	96.2521	73.5638	18.6663
90.885359903436	78.3258828444209	92.1151	81.2598	24.5532
90.885359903436	78.3258828444209	96.1169	76.0362	25.7488
90.885359903436	78.3258828444209	88.3633	87.3681	27.6489
90.885359903436	78.3258828444209	91.1677	84.1211	16.3324
90.885359903436	78.3258828444209	94.0795	80.8773	27.9293
90.885359903436	78.3258828444209	92.288	83.6157	16.0638
90.885359903436	78.3258828444209	97.816	74.8015	15.0437
90.885359903436	78.3258828444209	97.1852	78.7831	16.1734
90.885359903436	78.3258828444209	93.4941	85.8189	18.0194
90.885359903436	78.3258828444209	93.0994	86.3608	27.9466
90.885359903436	78.3258828444209	97.7624	79.6432	23.8114
90.885359903436	78.3258828444209	103.5291	67.906	21.3267
90.885359903436	78.3258828444209	88.6062	92.2681	22.8388
90.885359903436	78.3258828444209	99.1261	78.6323	23.8719
90.885359903436	78.3258828444209	98.2007	80.5294	24.0186
90.885359903436	78.3258828444209	96.9541	82.6989	14.592
90.885359903436	78.3258828444209	98.567	80.2017	23.8946
90.885359903436	78.3258828444209	98.2345	80.86	27.4352
90.885359903436	78.3258828444209	98.9119	80.0767	14.6996
90.885359903436	78.3258828444209	97.8831	81.9659	26.0286
90.885359903436	78.3258828444209	93.1284	88.6615	29.2956
90.885359903436	78.3258828444209	96.9343	84.943	15.8069
90.885359903436	78.3258828444209	100.0565	80.1054	29.4827
90.885359903436	78.3258828444209	95.9325	86.7596	20.5114
90.885359903436	78.3258828444209	92.5654	91.5305	28.4592
90.885359903436	78.3258828444209	96.2545	87.1498	21.7369
90.885359903436	78.3258828444209	101.0606	82.9382	16.7992
90.885359903436	78.3258828444209	97.7943	87.7833	29.1465
90.885359903436	78.3258828444209	101.1477	85.2681	21.9848
90.885359903436	78.3258828444209	102.2936	85.0217	21.6835
90.885359903436	78.3258828444209	103.8313	82.5056	18.7916
90.885359903436	78.3258828444209	100.7126	88.5952	21.6123
90.885359903436	78.3258828444209	108.1531	76.0691	21.0274
90.885359903436	78.3258828444209	98.656	92.6213	22.9191
90.885359903436	78.3258828444209	95.504	96.351	27.717
90.885359903436	78.3258828444209	104.3617	84.8664	23.8168
90.885359903436	78.3258828444209	100.5649	91.4192	20.5542
90.885359903436	78.3258828444209	99.3782	93.0601	23.8531
90.885359903436	78.3258828444209	107.981	80.0957	26.4329
90.885359903436	78.3258828444209	101.602	92.3175	24.3611
90.885359903436	78.3258828444209	107.2392	85.9448	25.7344
90.885359903436	78.3258828444209	104.3693	90.8389	29.9766
90.6179310376097	80.4594975216506	88.6759	82.3658	2.7213
90.6179310376097	80.4594975216506	99.3434	90.9979	16.5588
90.6179310376097	80.4594975216506	98.2349	98.4363	21.6189
91.6345750491386	80.3512016743395	91.86	79.7087	0.6809
91.6345750491386	80.3512016743395	98.5933	78.8152	8.4088
91.6345750491386	80.3512016743395	97.3132	81.5365	6.4549
91.6345750491386	80.3512016743395	97.4314	81.946	7.1176
91.6345750491386	80.3512016743395	103.6911	80.62	12.7759
91.6345750491386	80.3512016743395	103.1106	83.2736	15.1682
91.6345750491386	80.3512016743395	102.0461	86.7072	14.3206
91.6345750491386	80.3512016743395	105.6506	92.4297	20.7058
92.3379858797675	81.0484457298274	92.0851	66.8651	14.1856
92.3379858797675	81.0484457298274	86.3374	85.7586	11.3801
92.3379858797675	81.0484457298274	93.1133	78.1389	7.0122
92.3379858797675	81.0484457298274	92.6699	80.64	12.8577
92.3379858797675	81.0484457298274	91.14	83.5499	11.1932
92.3379858797675	81.0484457298274	93.2494	81.8793	4.3234
92.3379858797675	81.0484457298274	94.9909	83.4209	6.6825
92.3379858797675	81.0484457298274	97.0865	83.6094	9.8674
92.3379858797675	81.0484457298274	93.9684	87.8762	12.1102
92.3379858797675	81.0484457298274	101.2985	78.2917	13.0659
92.3379858797675	81.0484457298274	95.2026	90.5293	13.6073
92.3379858797675	81.0484457298274	99.0152	86.155	11.2918
92.3379858797675	81.0484457298274	98.3726	88.4744	13.4661
95.1308464102418	83.8168214728666	96.8706	83.0827	1.8883
95.1308464102418	83.8168214728666	96.8345	90.0197	11.1201
95.1308464102418	83.8168214728666	98.9319	91.3958	11.9055
95.1308464102418	83.8168214728666	98.853	91.6792	14.5242
95.1308464102418	83.8168214728666	102.4507	89.6037	13.3753
95.1308464102418	83.8168214728666	104.5599	87.8351	14.6615
95.1308464102418	83.8168214728666	100.6204	94.7646	15.4911
95.1308464102418	83.8168214728666	102.0076	93.075	14.2567
95.1718870872312	88.4807146925438	92.7178	89.1801	2.5518
95.1718870872312	88.4807146925438	92.4623	94.734	13.3072
95.1718870872312	88.4807146925438	95.7576	96.9635	15.3189

Solution x	Solution y	Original x	Original y	Radius
95.1718870872312	88.4807146925438	98.8373	99.4165	17.0801
96.3074524051845	90.3476825814252	96.5235	92.1962	1.8611
96.3074524051845	90.3476825814252	95.6122	103.8055	14.657
97.0672996405512	91.5969372323972	97.0347	92.0258	0.4301
98.1219121017785	90.3402559103985	98.1138	89.594	0.7463
98.1219121017785	90.3402559103985	100.8882	91.1406	9.708
98.1219121017785	90.3402559103985	104.1034	98.3317	13.8815
101.1363263891	93.7776420488598	101.8123	94.891	1.3025
102.043509232854	94.8121175228382	103.2876	94.1817	1.3947
102.436928549629	96.5872730223328	101.583	94.8217	5.6707
102.436928549629	96.5872730223328	104.1728	96.9352	2.9606
102.673191937282	97.6533223425871	103.8628	98.4843	1.4511
95.451616942963	98.6210981991479	94.0924	96.5838	3.4463
91.0346941295719	99.2130174630077	95.0373	98.5247	4.6173
87.5126869611354	99.6850085603771	94.4828	106.1237	9.4889
48.452748668021	104.919487310205	48.0764	105.8084	0.9653
45.9013195847471	101.46808380005	46.0729	100.678	0.8085
45.9013195847471	101.46808380005	42.9285	106.2179	10.4101
41.5110395773374	103.903811228577	40.5226	102.8002	3.2203
41.5110395773374	103.903811228577	42.4716	105.6496	1.9926
38.9694279986766	105.290620057522	39.1965	105.4524	4.0584
35.296651942284	107.294638887504	35.3466	107.7036	0.412
33.5778647882047	108.232480331753	33.1686	108.6172	0.5617
36.093746768213	104.23114265749	35.4006	103.6799	1.122
36.093746768213	104.23114265749	37.1983	106.347	4.5493
36.093746768213	104.23114265749	35.7224	107.36	11.5177
36.093746768213	104.23114265749	33.1638	109.6815	13.4189
39.2363470904431	99.2330539856076	35.9551	95.9225	5.5858
39.2363470904431	99.2330539856076	39.196	99.7694	4.3434
39.2363470904431	99.2330539856076	42.5793	100.4271	3.5498
39.2363470904431	99.2330539856076	42.9226	100.4615	4.0129
39.4292395303545	97.6957296396641	31.7515	71.3679	28.4179
39.4292395303545	97.6957296396641	34.9317	80.2335	24.9565
39.4292395303545	97.6957296396641	42.6808	88.2098	26.1251
39.4292395303545	97.6957296396641	33.2241	90.2072	24.6184
39.4292395303545	97.6957296396641	47.7789	92.5461	17.3786
39.4292395303545	97.6957296396641	34.7819	91.1147	26.8877
39.4292395303545	97.6957296396641	37.0706	93.0168	27.7874
39.4292395303545	97.6957296396641	32.2034	92.5655	28.0393
39.4292395303545	97.6957296396641	41.6896	94.8028	26.2925
39.4292395303545	97.6957296396641	34.0163	93.2553	18.0121
39.4292395303545	97.6957296396641	32.8593	93.0881	18.3654
39.4292395303545	97.6957296396641	36.1694	94.3523	28.0801
39.4292395303545	97.6957296396641	37.3296	94.7968	26.3816
39.4292395303545	97.6957296396641	40.9431	96.0349	13.182
39.4292395303545	97.6957296396641	34.0458	95.0903	23.4922
39.4292395303545	97.6957296396641	29.3468	93.7461	24.255
39.4292395303545	97.6957296396641	29.7064	94.0211	26.0785
39.4292395303545	97.6957296396641	31.4281	94.9219	25.0918
39.4292395303545	97.6957296396641	42.0978	97.503	9.3352
39.4292395303545	97.6957296396641	35.7481	97.1257	23.4808
39.4292395303545	97.6957296396641	51.1106	98.2963	24.3822
39.4292395303545	97.6957296396641	34.0464	97.1856	23.2445
39.4292395303545	97.6957296396641	42.2565	98.7398	24.1013
39.4292395303545	97.6957296396641	40.065	98.6098	21.6771
39.4292395303545	97.6957296396641	31.6916	96.8159	27.5118
39.4292395303545	97.6957296396641	39.7333	98.7582	18.7088
39.4292395303545	97.6957296396641	47.126	99.3914	14.4896
39.4292395303545	97.6957296396641	31.7064	96.988	27.9597
39.4292395303545	97.6957296396641	43.0828	99.6317	26.6664
39.4292395303545	97.6957296396641	35.0473	98.5367	21.3919
39.4292395303545	97.6957296396641	26.6904	96.1713	25.5008
39.4292395303545	97.6957296396641	36.8108	99.4487	12.3219
39.4292395303545	97.6957296396641	26.1674	96.1159	22.0166
39.4292395303545	97.6957296396641	26.55	96.735	21.6617
39.4292395303545	97.6957296396641	33.8351	99.3235	26.1581
39.4292395303545	97.6957296396641	38.189	100.3805	26.8425
39.4292395303545	97.6957296396641	44.7902	101.1589	13.5802
39.4292395303545	97.6957296396641	45.0704	101.2748	15.9718
39.4292395303545	97.6957296396641	40.2693	101.3043	10.0221
39.4292395303545	97.6957296396641	28.2891	98.27	21.2566
39.4292395303545	97.6957296396641	42.8352	101.6931	21.2677
39.4292395303545	97.6957296396641	39.3246	101.8921	13.7336
39.4292395303545	97.6957296396641	35.2228	101.4244	27.011
39.4292395303545	97.6957296396641	53.9006	102.5381	26.8445
39.4292395303545	97.6957296396641	26.9511	99.1097	22.0884
39.4292395303545	97.6957296396641	46.5537	103.4177	24.5733
39.4292395303545	97.6957296396641	35.7306	102.2767	20.2694
39.4292395303545	97.6957296396641	35.5571	102.295	22.4132
39.4292395303545	97.6957296396641	42.0156	103.5929	23.2765

Solution x	Solution y	Original x	Original y	Radius
39.4292395303545	97.6957296396641	29.8552	101.3038	17.7782
39.4292395303545	97.6957296396641	45.465	105.2608	13.9094
39.4292395303545	97.6957296396641	34.3074	104.3145	24.0514
39.4292395303545	97.6957296396641	40.9527	105.6227	16.0561
39.4292395303545	97.6957296396641	32.8361	107.2479	24.978
39.7915047012525	94.8085304645234	41.599	92.4813	2.9467
39.7915047012525	94.8085304645234	37.1788	95.0118	2.6206
36.5485494933955	96.4607444079016	38.2186	96.6747	1.6837
36.5485494933955	96.4607444079016	33.0573	97.9271	8.5196
36.5485494933955	96.4607444079016	32.4952	97.9758	7.8091
36.5485494933955	96.4607444079016	31.3011	106.2109	16.9428
36.5485494933955	96.4607444079016	28.1717	107.4546	16.9459
32.5300380664016	98.5080865277689	35.7859	98.3251	3.261
32.5300380664016	98.5080865277689	31.6341	101.1443	2.7843
29.6896239650161	96.2612014703183	29.1897	96.4145	0.5229
29.6896239650161	96.2612014703183	29.7849	97.5299	6.777
29.6896239650161	96.2612014703183	30.1816	102.1772	8.5674
31.0914885723874	91.8309378243533	29.5221	90.7635	1.898
31.0914885723874	91.8309378243533	9.17	97.1621	26.9226
31.0914885723874	91.8309378243533	8.0611	104.093	29.9646
35.5788198967173	88.1822540127637	42.9721	90.3177	7.6955
35.5788198967173	88.1822540127637	37.9917	90.5379	3.3721
35.5788198967173	88.1822540127637	35.4152	92.5489	4.9112
35.3410546747739	87.1534591499408	35.4073	87.2216	1.8355
34.811047577969	84.8601525310861	35.1535	70.6086	16.7445
34.811047577969	84.8601525310861	33.517	80.8699	7.8126
34.811047577969	84.8601525310861	32.6009	89.9531	11.1863
34.811047577969	84.8601525310861	33.1881	90.5996	12.9818
34.811047577969	84.8601525310861	32.1756	91.0244	9.1133
34.811047577969	84.8601525310861	33.6244	92.4492	13.8672
34.811047577969	84.8601525310861	44.0393	95.7757	16.7138
34.811047577969	84.8601525310861	35.2297	94.8683	10.0169
34.811047577969	84.8601525310861	30.8807	93.5109	15.6566
34.811047577969	84.8601525310861	33.9629	96.8355	13.8521
33.6499548766794	79.8361753982275	23.9369	61.5866	22.0202
33.6499548766794	79.8361753982275	32.2488	71.8762	10.0488
33.6499548766794	79.8361753982275	23.527	73.6169	21.6834
33.6499548766794	79.8361753982275	25.3366	76.538	21.2393
33.6499548766794	79.8361753982275	40.8939	84.3555	20.2802
33.6499548766794	79.8361753982275	29.376	80.5861	14.4218
33.6499548766794	79.8361753982275	27.1736	83.2653	16.1862
33.6499548766794	79.8361753982275	48.9533	90.4759	19.0092
33.6499548766794	79.8361753982275	43.1057	91.7939	21.808
33.6499548766794	79.8361753982275	39.6285	91.4521	19.1143
32.5042314900388	74.8787030769704	32.697	74.6737	0.2814
32.5042314900388	74.8787030769704	24.7401	75.4523	27.8452
32.5042314900388	74.8787030769704	21.3934	72.6127	27.5896
32.5042314900388	74.8787030769704	14.5018	68.1646	28.3495
32.5042314900388	74.8787030769704	15.0856	70.6386	28.271
32.5042314900388	74.8787030769704	18.7356	77.2891	27.8207
32.5042314900388	74.8787030769704	6.6701	63.5082	29.6501
32.5042314900388	74.8787030769704	17.9606	81.6588	21.1617
32.5042314900388	74.8787030769704	9.3844	71.5303	26.9324
32.5042314900388	74.8787030769704	7.5677	74.3816	29.6105
32.5042314900388	74.8787030769704	30.7482	95.8761	28.9897
32.5042314900388	74.8787030769704	21.5395	100.4343	29.9057
27.3977159490709	74.0251088150988	26.4587	69.6793	4.4461
27.3977159490709	74.0251088150988	27.6433	72.5657	2.8004
27.024945659294	74.2753646204273	22.1344	71.2137	6.3651
27.024945659294	74.2753646204273	25.4767	75.481	1.9623
26.3614727010639	74.7207809090897	26.4747	67.9787	12.3016
26.3614727010639	74.7207809090897	24.5076	73.115	8.9241
26.3614727010639	74.7207809090897	24.3218	77.9732	3.9436
26.3614727010639	74.7207809090897	21.1184	76.9048	8.7289
26.3614727010639	74.7207809090897	23.4089	84.0628	9.7975
25.1258385976319	71.5096109466709	26.2205	72.9044	6.2191
25.1258385976319	71.5096109466709	22.9431	70.0987	5.5998
25.1258385976319	71.5096109466709	24.5354	72.6275	5.9717
24.8443544605501	70.778088845494	28.241	67.9653	4.4101
24.8443544605501	70.778088845494	25.7737	68.9159	2.2837
18.9934676324382	67.1518715732682	18.9682	67.082	0.0743
18.9934676324382	67.1518715732682	14.7433	68.1941	9.3958
17.6361963383372	71.2207101581223	18.2654	71.5277	0.7001
17.6361963383372	71.2207101581223	2.7376	84.0979	22.8219
17.6361963383372	71.2207101581223	2.5704	90.3092	25.529
17.6361963383372	71.2207101581223	-0.7351	89.6931	28.3044
16.0457123671313	73.6174202647601	15.4332	72.9689	2.4401
16.0457123671313	73.6174202647601	9.1707	70.0865	9.3679
15.1760435177837	74.9279319472702	33.839	67.1668	20.2124
15.1760435177837	74.9279319472702	26.4833	65.6457	15.8608

Solution x	Solution y	Original x	Original y	Radius
15.1760435177837	74.9279319472702	22.8228	67.5784	16.2582
15.1760435177837	74.9279319472702	27.2709	73.9256	19.9916
15.1760435177837	74.9279319472702	31.105	77.2121	19.85
15.1760435177837	74.9279319472702	24.1578	73.3792	11.3579
15.1760435177837	74.9279319472702	22.0857	71.4539	17.4147
15.1760435177837	74.9279319472702	24.4797	75.354	15.2855
15.1760435177837	74.9279319472702	26.6151	77.1467	15.3985
15.1760435177837	74.9279319472702	15.3124	65.205	17.4654
15.1760435177837	74.9279319472702	23.796	77.2181	18.2059
15.1760435177837	74.9279319472702	12.0444	66.3239	13.9456
15.1760435177837	74.9279319472702	12.0587	67.8257	15.0634
15.1760435177837	74.9279319472702	10.5042	66.7806	12.8873
15.1760435177837	74.9279319472702	11.6475	70.8021	20.1612
15.1760435177837	74.9279319472702	10.0835	69.723	14.2892
15.1760435177837	74.9279319472702	13.7649	76.0563	11.1171
15.1760435177837	74.9279319472702	12.73	75.2001	18.6111
15.1760435177837	74.9279319472702	9.4578	72.6847	17.4171
15.1760435177837	74.9279319472702	8.3117	72.2049	15.4861
15.1760435177837	74.9279319472702	6.6564	74.2265	11.3789
9.31045432622199	83.766830730206	31.4455	71.7336	27.0146
9.31045432622199	83.766830730206	31.4187	76.5703	26.413
9.31045432622199	83.766830730206	5.8502	91.8647	18.0105
9.31045432622199	83.766830730206	3.5998	89.8159	20.0402
9.31045432622199	83.766830730206	3.5503	90.3653	9.6646
9.31045432622199	83.766830730206	4.7737	93.7785	12.9549
9.31045432622199	83.766830730206	1.2023	90.7259	19.1166
9.31045432622199	83.766830730206	-4.1255	85.596	25.3799
9.31045432622199	83.766830730206	1.1743	92.9818	22.3694
9.31045432622199	83.766830730206	-2.3037	90.7079	19.8948
9.31045432622199	83.766830730206	8.1477	101.1634	26.7278
9.31045432622199	83.766830730206	-0.0468	93.7668	20.328
9.31045432622199	83.766830730206	2.1469	96.6722	20.9499
9.31045432622199	83.766830730206	0.6138	95.4238	17.1272
9.31045432622199	83.766830730206	-2.5612	92.1356	25.3912
9.31045432622199	83.766830730206	-1.9602	93.9224	23.076
9.31045432622199	83.766830730206	-2.1508	94.1499	24.1365
9.31045432622199	83.766830730206	3.811	100.5395	22.995
9.31045432622199	83.766830730206	-0.339	97.1979	24.9263
9.31045432622199	83.766830730206	3.1448	100.72	20.6463
9.31045432622199	83.766830730206	-0.3116	97.6012	20.2615
9.31045432622199	83.766830730206	-3.2639	94.8889	23.5193
9.31045432622199	83.766830730206	-7.5489	96.9207	21.6
6.27763948734251	88.3369974391152	7.8142	89.6258	2.0055
6.27763948734251	88.3369974391152	6.3198	96.0864	13.0595
6.27763948734251	88.3369974391152	3.4538	93.5151	19.9908
6.27763948734251	88.3369974391152	0.6193	91.0377	11.2677
6.27763948734251	88.3369974391152	2.5533	99.1767	13.4676
6.27763948734251	88.3369974391152	-1.8619	98.5581	15.9681
0.565910641483327	93.7746264649941	-1.2335	86.0108	9.9154
0.565910641483327	93.7746264649941	3.5924	94.7451	6.9732
0.565910641483327	93.7746264649941	0.5802	93.7511	6.2472
0.565910641483327	93.7746264649941	1.6453	95.7178	2.5699
0.565910641483327	93.7746264649941	4.9579	99.4405	7.1688
0.565910641483327	93.7746264649941	1.4019	97.5847	8.9245
-4.2135662851786	96.7578723531878	-5.5457	98.4014	2.1156
-4.2135662851786	96.7578723531878	3.0162	107.1796	15.3823
-2.49702291472215	92.0476798944169	3.1184	98.924	10.2515
-2.49702291472215	92.0476798944169	-3.1358	95.2162	4.3309
-2.49702291472215	92.0476798944169	-6.686	94.6391	5.5087
-0.990847567716756	87.9147366130794	-0.1009	90.0487	2.3121
-0.990847567716756	87.9147366130794	-0.171	97.1566	11.053
-0.990847567716756	87.9147366130794	-12.8049	93.8535	19.948
4.28444579922032	73.4393340339686	6.0914	73.9114	1.8676
4.53833892937217	71.8819447243211	8.8648	72.0358	5.5515
4.53833892937217	71.8819447243211	4.0089	72.186	2.2824
5.32522308362023	67.0551699703201	0.4838	63.8626	5.7993
5.50388470343621	66.9415460867579	31.4906	71.3219	26.6563
5.50388470343621	66.9415460867579	22.6268	64.3936	24.3192
5.50388470343621	66.9415460867579	26.9783	71.0141	24.9531
5.50388470343621	66.9415460867579	22.8762	75.7017	22.7687
5.50388470343621	66.9415460867579	14.2076	63.0144	24.0324
5.50388470343621	66.9415460867579	14.2239	63.9607	12.6801
5.50388470343621	66.9415460867579	16.7224	69.1113	26.0784
5.50388470343621	66.9415460867579	14.0233	68.3418	20.9704
5.50388470343621	66.9415460867579	13.2613	67.7948	9.5466
5.50388470343621	66.9415460867579	12.5389	66.9051	25.9958
5.50388470343621	66.9415460867579	11.4442	66.9869	21.9247
5.50388470343621	66.9415460867579	11.4886	67.7219	21.8599
5.50388470343621	66.9415460867579	7.6803	61.1857	15.0459
5.50388470343621	66.9415460867579	8.4928	63.9998	9.7983

Solution x	Solution y	Original x	Original y	Radius
5.50388470343621	66.9415460867579	10.9416	69.7746	20.3266
5.50388470343621	66.9415460867579	9.0002	73.0359	24.3533
5.50388470343621	66.9415460867579	5.2812	65.5492	11.3895
5.50388470343621	66.9415460867579	4.4426	63.6871	23.1902
5.50388470343621	66.9415460867579	7.0214	70.8048	24.0693
5.50388470343621	66.9415460867579	9.9143	75.8382	21.3192
5.50388470343621	66.9415460867579	8.0472	76.1743	21.0495
5.50388470343621	66.9415460867579	1.7661	66.5446	26.4568
5.50388470343621	66.9415460867579	0.3096	68.1954	12.3905
5.50388470343621	66.9415460867579	-4.2807	74.2616	26.6495
6.61966722156698	66.2319389121547	6.9842	66.7632	0.6443
8.59729202317338	64.7708269893794	12.0877	66.3858	4.791
8.59729202317338	64.7708269893794	9.6606	65.5604	2.866
8.59729202317338	64.7708269893794	4.7342	63.0935	4.7706
8.59809631804009	64.7702327589804	10.7344	66.9849	3.0771
10.8968635577001	61.8825056173036	12.0097	66.7734	5.0159
15.4198331664533	56.2007201020879	31.0449	71.9995	23.5272
15.4198331664533	56.2007201020879	15.1112	64.361	9.0815
15.4198331664533	56.2007201020879	10.4334	62.822	8.2889
15.4198331664533	56.2007201020879	9.1569	61.6426	9.3858
34.6884568128876	31.9953464312712	35.5392	31.6783	0.9079
34.6884568128876	31.9953464312712	25.2224	21.1268	20.0558
34.6884568128876	31.9953464312712	24.0847	21.2619	18.4856
34.6884568128876	31.9953464312712	21.7951	21.835	24.0928
34.6884568128876	31.9953464312712	23.1615	20.5337	18.9562
34.6884568128876	31.9953464312712	16.9754	26.2994	25.4942
34.6884568128876	31.9953464312712	21.1889	21.267	20.9082
34.6884568128876	31.9953464312712	19.3676	20.9011	22.1053
34.6884568128876	31.9953464312712	17.3215	22.815	26.1071
34.6884568128876	31.9953464312712	19.0397	19.3917	27.4702
34.6884568128876	31.9953464312712	22.0744	6.6433	29.8611
27.9522657674252	30.7346144003023	28.099	29.8348	0.9117
27.9522657674252	30.7346144003023	27.0312	22.0371	12.0381
27.9522657674252	30.7346144003023	20.8129	26.0745	16.1762
27.9522657674252	30.7346144003023	21.4132	25.3225	11.064
27.9522657674252	30.7346144003023	18.7218	26.0511	18.3773
27.9522657674252	30.7346144003023	20.5046	21.2685	15.1676
27.9522657674252	30.7346144003023	19.4476	21.0876	13.323
27.9522657674252	30.7346144003023	22.0389	18.6688	16.6692
27.9522657674252	30.7346144003023	15.0509	21.8739	20.7664
27.9522657674252	30.7346144003023	18.1963	16.0602	17.912
27.9522657674252	30.7346144003023	16.9397	16.157	23.6795
27.9522657674252	30.7346144003023	21.6596	11.213	23.4533
27.9522657674252	30.7346144003023	28.0443	7.2557	23.7219
27.9522657674252	30.7346144003023	27.9452	7.0873	24.5101
27.9522657674252	30.7346144003023	24.5208	1.7631	29.7307
22.6051102285855	29.9904535543927	21.3113	31.7798	2.2081
22.6051102285855	29.9904535543927	22.8581	29.0039	5.9592
22.6051102285855	29.9904535543927	19.8821	27.2321	8.0149
19.9359732636887	24.5623055293234	19.5225	24.6717	0.4277
19.9359732636887	24.5623055293234	24.5729	19.8583	11.2071
19.9359732636887	24.5623055293234	19.6457	23.2311	5.0904
19.9359732636887	24.5623055293234	21.2889	20.2133	12.2867
19.9359732636887	24.5623055293234	18.4916	22.031	8.3539
19.9359732636887	24.5623055293234	23.3217	16.9506	12.0877
19.9359732636887	24.5623055293234	23.1228	16.7524	13.0518
19.9359732636887	24.5623055293234	25.9081	14.4892	15.0463
19.9359732636887	24.5623055293234	17.2669	18.1061	10.6475
19.9359732636887	24.5623055293234	23.9142	5.5856	20.6816
19.6862999943963	20.4263448679281	19.4151	20.4264	0.2712
19.6862999943963	20.4263448679281	19.6468	14.5775	7.1553
19.6862999943963	20.4263448679281	7.8039	17.6061	13.3149
19.6862999943963	20.4263448679281	22.4003	2.9895	21.9707
20.8658701405629	0.753584886176985	19.4163	-0.8394	2.1538
27.1077058779381	0.967857001245117	31.9656	14.6164	14.4873
27.1077058779381	0.967857001245117	29.4417	11.4808	11.6626
27.1077058779381	0.967857001245117	29.6205	6.6839	7.8815
27.1077058779381	0.967857001245117	31.7997	5.4917	9.7028
27.1077058779381	0.967857001245117	33.6792	4.7017	13.2435
27.1077058779381	0.967857001245117	27.6562	5.4902	8.29
27.1077058779381	0.967857001245117	26.4488	5.1021	9.3497
27.1077058779381	0.967857001245117	33.4349	0.0139	13.2105
27.1077058779381	0.967857001245117	24.8641	0.1355	6.251
27.1077058779381	0.967857001245117	22.4229	-2.1641	7.0873
28.4272655530832	1.0131563505025	31.1391	0.2266	2.8236
28.4272655530832	1.0131563505025	27.3755	-1.0984	2.359
29.3654315400233	3.4354935191537	29.2451	9.0499	5.6713
29.3654315400233	3.4354935191537	31.0707	1.7474	2.3995
30.6041395658013	6.63382804360699	29.9497	8.0977	1.6035
30.6041395658013	6.63382804360699	26.246	7.8923	7.1855

Solution x	Solution y	Original x	Original y	Radius
30.6041395658013	6.63382804360699	22.6294	-1.9579	16.8768
35.1733769565714	4.91148050014888	36.2059	6.8965	2.2375
35.1733769565714	4.91148050014888	29.2732	5.6917	15.7976
35.1733769565714	4.91148050014888	28.1449	5.3771	15.5333
35.1733769565714	4.91148050014888	31.1128	-2.8096	18.9309
44.8012966706134	-1.6585627840226	49.5265	1.5006	5.684
44.8012966706134	-1.6585627840226	42.4155	0.0668	2.9443
46.3706234913214	-4.94414761437479	46.0937	-5.8176	0.9163
51.6081343366954	-2.00654379028968	53.8048	-5.0553	14.1877
56.9476892348692	0.988294138070256	62.5325	1.766	5.6387
56.9476892348692	0.988294138070256	58.2864	0.0731	2.2981
59.1096934749317	2.2009144952129	62.7821	-0.0838	4.3251
59.3777268400345	7.21307251336283	61.7542	11.527	4.9252
59.3777268400345	7.21307251336283	60.5785	6.8128	2.6428
59.3777268400345	7.21307251336283	58.0725	5.2013	2.9904
59.4227676552466	8.05532457737231	59.4358	8.0877	0.0349
59.4227676552466	8.05532457737231	60.2628	6.0605	10.0471
59.4227676552466	8.05532457737231	56.6752	3.9284	9.6519
59.4227676552466	8.05532457737231	58.0726	3.0503	10.1594
59.4227676552466	8.05532457737231	60.4719	1.0667	17.5347
59.4227676552466	8.05532457737231	54.4331	-6.2551	16.56
55.4620303126806	3.46551452406316	55.5508	6.709	3.2447
55.4620303126806	3.46551452406316	57.3839	0.9502	3.1655
54.6994335855007	3.07852316181959	58.6318	9.4344	7.474
54.6994335855007	3.07852316181959	50.2911	5.2466	6.9728
54.6994335855007	3.07852316181959	56.6229	3.2945	3.6572
54.6994335855007	3.07852316181959	54.7597	1.1902	4.007
54.6994335855007	3.07852316181959	58.2741	0.1622	6.0785
52.1136984961757	1.76635233008824	51.8363	2.0767	1.2126
52.1136984961757	1.76635233008824	52.8937	1.339	0.8894
52.1136984961757	1.76635233008824	51.7765	0.7553	1.0658
48.1031415365279	3.94419142620575	44.2937	4.7268	3.889
48.1031415365279	3.94419142620575	48.302	2.6164	1.3426
47.4390162636489	5.84700902497759	46.0043	6.8606	2.7263
47.4390162636489	5.84700902497759	53.412	-4.2453	16.6165
47.1018589578814	6.81301488399442	42.7704	10.2739	5.5443
47.1018589578814	6.81301488399442	51.2901	7.6487	4.2708
47.1018589578814	6.81301488399442	45.5397	7.2979	4.7628
45.1623873090094	9.71204075810914	44.5689	9.75	0.5947
45.1623873090094	9.71204075810914	48.4975	2.4432	10.4173
45.1623873090094	9.71204075810914	27.2842	5.8331	18.4271
45.1623873090094	9.71204075810914	28.6989	1.5656	19.8786
45.1623873090094	9.71204075810914	25.8989	0.7413	22.2466
45.1623873090094	9.71204075810914	36.4279	-4.3699	20.2708
45.1623873090094	9.71204075810914	26.7943	-2.6353	24.1177

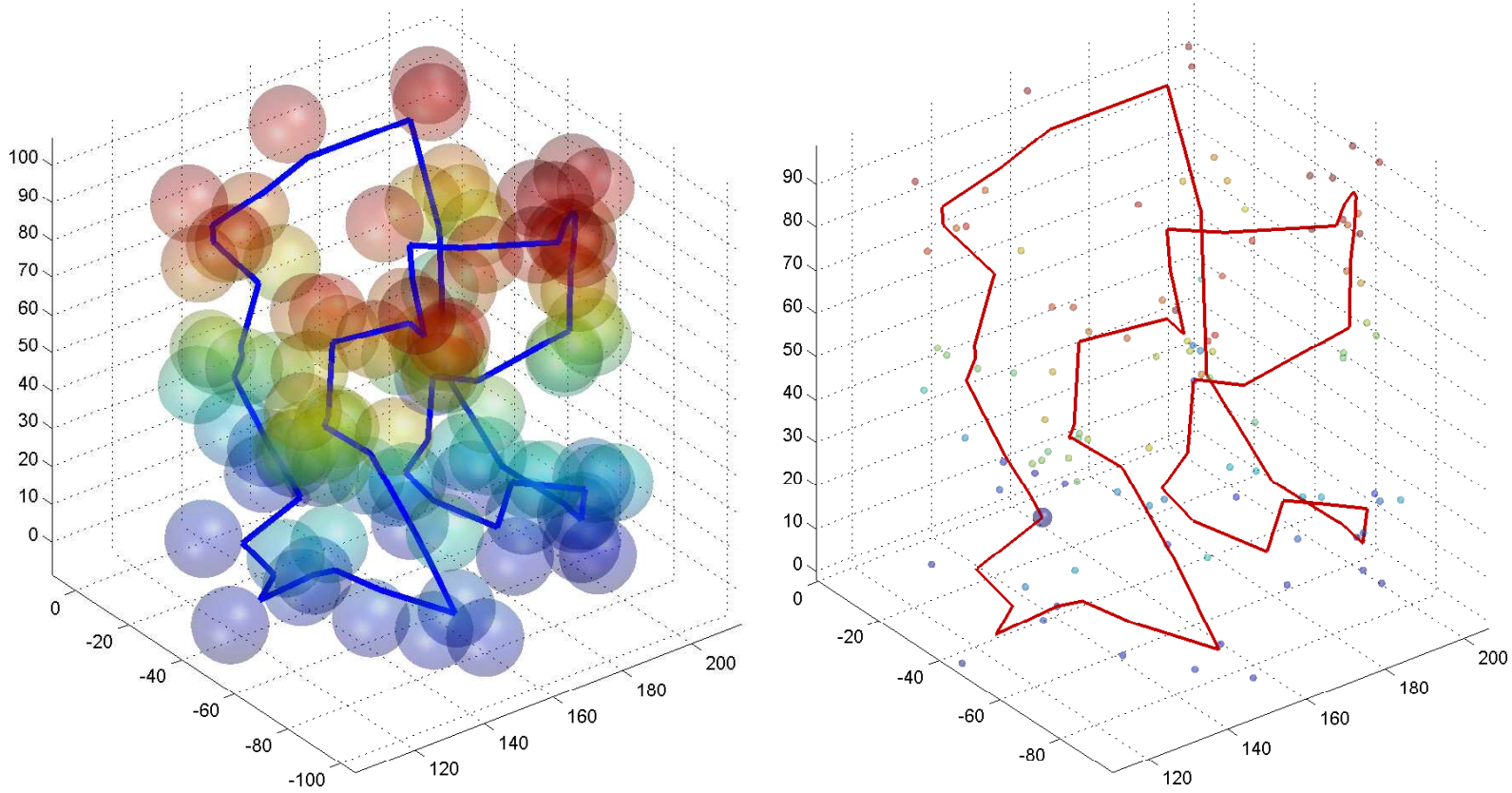

Figure N.63: *team*1_100, Equal Radius, 3D, Euclidean, Length = 820.7271442

Table N-66: Solution for *team*1_100, Equal Radius, 3D, Euclidean

Total distance: 820.72714423349 Depot: x 50 y 10 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
23.1387828016896	23.1213053272826	3.47365756038969	16.123	17.568	4.443
19.6079884086673	39.7327474730795	3.82739569103208	27.219	44.51	3.327
9.18067631096295	47.8819983758495	4.60798172648983	1.527	46.599	0.05
11.5327371149281	59.8774026887315	14.2026572563105	8.64100000000001	64.188	15.551
12.3140509261134	63.8621894594216	17.3899668097801	5.777	62.003	23.29
14.6129352593358	69.3308432279722	20.2961726547803	11.878	70.444	28.798
21.226702900732	77.3518037751634	16.5516237318984	20.735	74.659	7.978
30.5148598905933	89.1366548142078	13.4900713368478	36.762	86.092	10.176
32.2998173577461	91.4012124892831	12.901738621301	36.924	96.636	7.226
31.5927608725282	90.7939670096625	15.0399286225436	24.053	94.189	12.551
25.4999733338268	85.5618839473588	33.4627998303197	27.59	93.644	36.826
18.0713327695333	77.9424624496506	54.0141823471339	20.393	83.793	60.447
12.1679536385072	68.7825223304107	58.8405622456475	5.739	68.535	65.134
13.2611425176854	66.9831332575768	57.5740487952029	11.844	68.394	54.009
14.3428315565686	65.2026785784811	56.3208437080583	7.235	62.367	51.584
14.3429654763974	65.2025453647574	56.320766750407	13.454	69.007	48.213
14.3429654763974	65.2025453647574	56.320766750407	11.123	60.442	50.101
16.8930404518084	62.4824208330738	55.2383284828931	17.374	67.529	56.063
21.5627333751075	57.50063365323	53.2561113511591	18.45	52.954	46.14
21.5627333751075	57.50063365323	53.2561113511591	25.201	54.507	48.664
21.562746401892	57.5006224415155	53.2561085172211	25.923	53.185	46.671
21.1760463177044	58.7204025007484	62.6042474651812	20.103	52.347	63.856
20.8556551732337	59.7308751511013	70.3481874385807	26.732	55.612	72.392
20.6895313793013	60.2547550650801	74.363792553369	19.619	52.734	79.19
20.9747805925089	64.2120984261945	76.8538313871691	26.213	68.977	77.227
20.9747805925089	64.2120984261945	76.8538313871691	21.299	57.593	80.779
22.6059037469751	86.8359228212276	91.09008551462	19.881	93.181	96.862
26.6063100439286	83.9196190738561	86.9007003084069	30.503	90.056	84.685
29.1727508621357	82.0487298565621	84.2130033650924	33.443	88.578	84.328
32.3950943928351	79.6996704839929	80.8384599938482	33.626	83.869	72.958
43.0158165761536	61.3113369214018	83.5684486221683	43.243	58.404	75.054
47.7412869901487	54.0470903122385	87.9095785592262	47.232	45.27	89.834
54.8400975942335	63.9863066545454	89.2138451646529	62.352	63.144	84.329
54.8400975942335	63.9863066545454	89.2138451646529	52.975	65.56	80.551
64.5883086341107	77.8243751905564	93.2207278388141	63.631	81.224	94.784
68.3671678760512	83.1890703285683	94.7740175254738	67.643	91.829	97.188
72.4206729587242	79.0343351464461	93.6607329159616	74.447	77.382	91.404
75.4721338379568	75.9067733531793	92.8227589847508	76.154	71.763	97.979
77.601415112269	73.7244086516147	92.2380580016123	73.523	67.727	97.567
84.7894072329096	67.3855308249965	89.8384016431702	87.633	63.432	97.407
86.2318765344832	66.38092214349	87.7823155646921	93.946	64.003	91.762
87.6157624729769	64.1374359124701	79.4150130888332	93.456	57.69	77.108
86.5136369340196	65.184373744143	77.9939004855816	89.091	59.886	77.014
83.8505675577279	67.7144392530317	74.5619928244022	77.919	74.057	76.926
85.110551667317	65.8789535455323	67.1286271326011	86.785	67.217	67.68
86.5323785979289	63.8076351940738	58.7400503701661	91.043	63.691	55.511
87.0870324803709	62.9996835565988	55.4681221350627	94.619	62.103	50.624
84.4007884426112	62.7163036878856	54.8264503745477	87.173	60.998	48.592
84.4007884426112	62.7163036878856	54.8264503745477	87.18	60.86	47.333
62.4242957061469	60.3970932023357	49.5761297915797	59.534	67.732	45.235
57.7584957242601	56.3232718699737	50.1727376935487	57.142	56.857	57.493
57.7584957242601	56.3232718699737	50.1727376935487	57.243	55.792	50.963
55.1249411444879	54.0238048531564	50.5095749313148	53.958	52.681	59.332
55.1249411444879	54.0238048531564	50.5095749313148	55.281	51.871	55.993
54.7418427814257	53.7011226017754	50.242227161651	49.571	48.14	55.073
52.8837652320685	54.2174906391281	34.3755296377145	59.007	60.213	31.626
49.3669405055551	51.9147282750229	27.7987427145729	42.804	54.74	25.734
48.5275909645308	51.3651691502652	26.2292705345701	40.978	46.49	25.743
50.8282915563419	52.8332775752705	22.8328079109568	49.02	51.541	23.534
53.824210571067	54.7450148250258	18.4100148466772	51.29	49.58	11.489
64.7233762695923	64.9857030313465	12.1963050203433	68.193	67.124	4.172
65.9837378240877	68.7163879642134	25.1785638129404	61.493	65.592	32.325
68.6093193310342	71.3218895246399	25.0872594970036	66.957	73.797	28.023
68.6093193310342	71.3218895246399	25.0872594970036	66.971	72.201	17.644
71.5788713310393	74.2687602364403	24.9839695848873	67.179	79.746	30.609
78.6524664512016	79.96590650725	24.0026564674725	81.476	87.316	28.362
80.7374591095525	76.7288163703438	19.1111327179296	78.214	79.218	18.292
83.7796261140242	72.0058077969778	11.9742520680721	87.252	72.952	19.479
83.7796261140242	72.0058077969778	11.9742520680721	84.146	71.427	3.869
84.8364397010072	70.3651136103047	9.49509377215956	85.968	75.194	1.985
87.1673833981727	60.5236400630677	8.61331860223451	94.894	61.262	13.169
87.4891628725148	57.4591080458331	8.1092907669214	93.694	56.925	1.612
83.6572735710768	41.9863141768292	11.2521356684935	74.679	41.865	10.639
91.4989858902522	10.1370030959984	18.84494104784	93.574	3.255	13.429
91.1952633742982	10.3065929577801	23.6579310749201	92.889	3.855	22.202
90.5839293725458	10.6478018456538	33.3478241861854	94.926	4.006	36.794

Solution x	Solution y	Solution z	Original x	Original y	Original z
90.5839293725458	10.6478018456538	33.3478241861854	89.359	10.839	25.32
89.0185626493337	11.5218284263721	58.1570613972328	95.317	17.864	59.209
87.2445522041931	10.6128139913115	66.841336196796	91.007	13.249	70.645
87.2445522041931	10.6128139913115	66.841336196796	91.857	16.502	66.492
87.2445522041931	10.6128139913115	66.841336196796	85.554	10.061	65.642
82.9067030214022	8.39029708198451	88.0751815946682	88.457	8.185	95.157
81.7635589739884	8.30708703553448	88.0262089135681	85.841	12.653	93.498
54.8138798021642	6.34652625291435	86.8704466404696	53.754	0.148	93.309
41.1744629415142	7.9849789867011	83.4993768918507	40.868	2.981	76.025
21.1931990152919	14.2943907538447	84.2951930030308	15.772	12.549	91.264
20.0395493137987	16.2891616541476	81.1552871789512	19.569	24.449	84.923
20.0395188193149	16.2892006081949	81.1552025285924	12.414	20.962	80.147
26.6209930825019	14.4024370870078	73.6237921507247	26.839	11.732	76.118
36.7183619164574	11.5077946477354	62.0688746378521	45.293	9.057	63.281
30.1897637388898	13.3652682717467	48.6270586675361	21.459	12.53	50.646
30.1556974555961	13.5632105231253	47.4229647931947	22.494	14.202	49.345
30.1124760102615	13.8144186872986	45.8949435987173	33.341	22.178	45.103
29.994862319953	13.6539018085103	45.3123775888629	25.542	20.506	48.088
28.9931613456881	12.288311914992	40.3537616450574	20.541	9.26	39.729
34.4301549811745	11.8304423924355	29.0817742223571	29.447	11.243	26.345
39.2257235232053	11.4266323796214	19.1402294537097	33.5	17.352	15.52
47.2288040410573	9.5865134623779	5.86798895835012	46.154	2.083	10.72
47.2288040410573	9.5865134623779	5.86798895835012	53.405	3.041	5.972
48.4320380978292	9.76604985591912	3.32020252750748	54.032	12.197	7.44

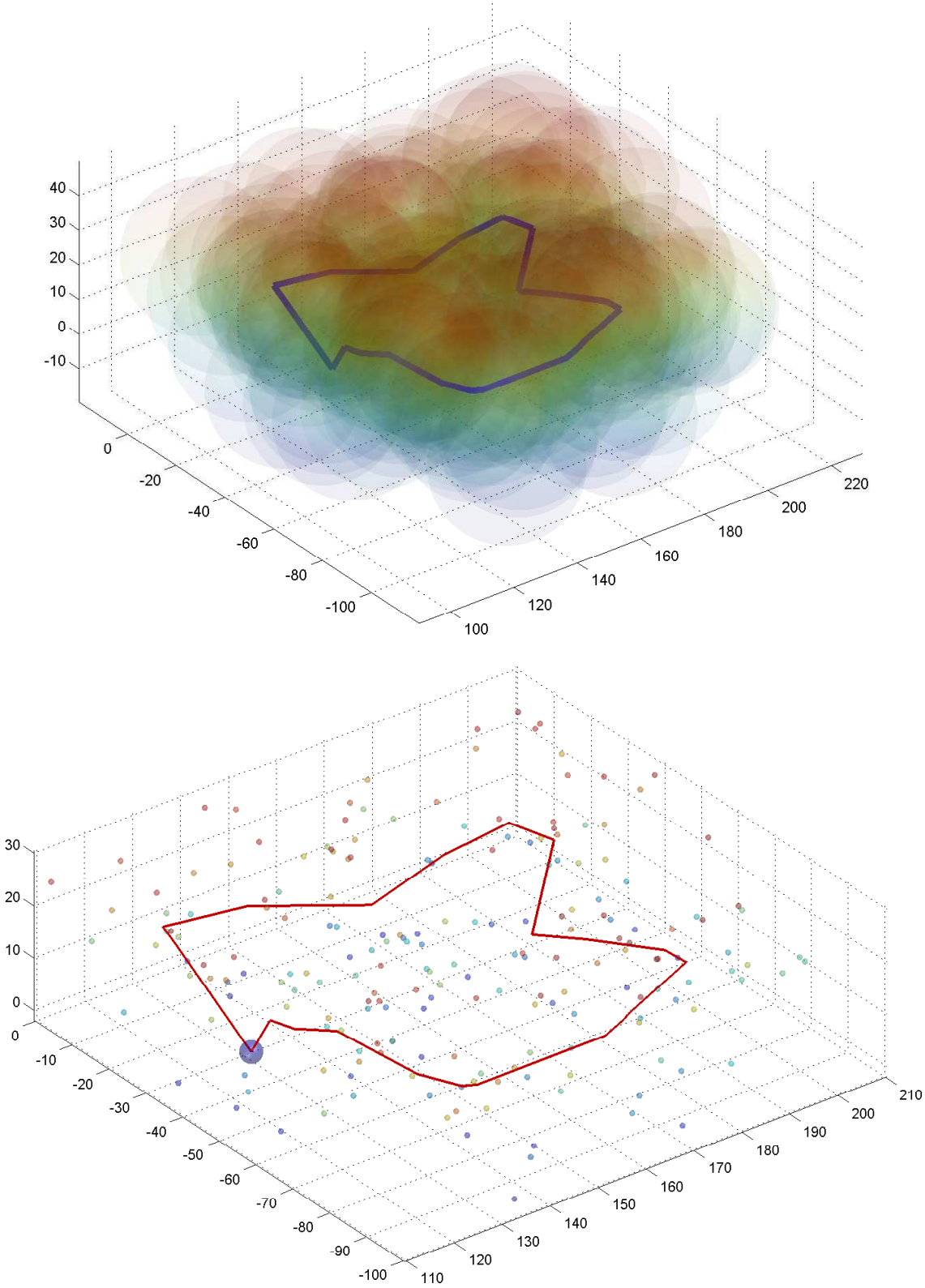

Figure N.64: *team*2_200, Equal Radius, 3D, Euclidean, Length = 283.2377140

Table N-67: Solution for *team*2_200, Equal Radius, 3D, Euclidean

Total distance: 283.237713959944 Depot: x 19.5535 y 32.6157 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
17.5967718319241	28.5643048870124	5.43921245893337	25.954135	17.869355	4.361083
15.9620590247735	25.1798319898963	9.98311147996043	1.87583499999999	21.036865	8.472142
14.7356791982177	22.6405667646767	13.3923008447623	10.613375	27.61233	15.443404
13.5444209040533	20.174011320718	16.7038262746139	3.09506	32.271765	28.722779
13.5377860005858	18.9351117000662	17.3407037858713	11.54701	17.37734	26.244082
13.5377860005858	18.9351117000662	17.3407037858713	16.776285	16.423415	15.502152
13.5316569873837	17.7886115457969	17.9300539972634	15.031135	2.9821155	24.523433
13.5316569873837	17.7886115457969	17.9300539972634	21.673354	6.8005655	13.961641
13.5278638510134	17.0779497010609	18.2953517600922	7.39533	10.545265	21.25087
13.5243927933097	16.4271056617514	18.629896031377	0.024124999999998	3.6794065	26.062187
15.8046354429927	16.5508089478411	18.4170920444171	6.5851	6.152225	13.546134
15.8046354429927	16.5508089478411	18.4170920444171	10.44323	18.54025	17.132759
19.8796395946458	16.7718748953052	18.0367738051762	20.9699	7.87089	11.180156
23.8283210520239	16.9860898424773	17.6682451228539	26.97316	5.55935	2.320922
25.4203297620777	17.0724515038475	17.5196636026855	28.448025	4.56492	10.374303
25.4203297620777	17.0724515038475	17.5196636026855	22.373755	32.6144	28.047693
25.4203297620777	17.0724515038475	17.5196636026855	27.827995	16.04415	0.143676
27.0239485850926	17.1594448498133	17.3700019929688	25.46019	34.06066	24.177315
28.7208485480909	17.2514962736537	17.2116337329666	34.77264	14.924575	26.641448
28.7208485480909	17.2514962736537	17.2116337329666	25.662895	8.989655	21.265898
30.4961148796664	17.347798959562	17.0459508030457	34.695715	0.250565	26.535311
32.3573950481162	17.8538334802223	16.6412117581607	32.973595	9.54291	20.606347
34.384023778149	18.4048237016221	16.200516328659	40.16046	1.62977	24.917947
36.9737657697939	19.1089058210832	15.6373713052045	42.845635	9.79738	11.955362
39.3774047506576	19.7623992966581	15.1146901173638	54.294115	8.069135	15.776464
39.3774047506576	19.7623992966581	15.1146901173638	46.358401	11.954405	18.491997
40.2289667138634	19.9939222048496	14.9295114571252	49.796921	18.777515	27.389734
40.2289667138634	19.9939222048496	14.9295114571252	47.997827	21.94091	22.00424
40.9476575366636	20.1893198689894	14.7732264775064	44.38625	27.294685	26.050788
40.9476575366636	20.1893198689894	14.7732264775064	40.19826	27.52955	29.10549
41.6700083073646	20.3857123396497	14.6161457461397	39.58443	28.150345	20.548662
41.6700083073646	20.3857123396497	14.6161457461397	26.379295	27.934205	23.031473
44.5190133420581	21.1602884479001	13.9966249425839	57.51838	10.00522	23.910843
44.5190133420581	21.1602884479001	13.9966249425839	54.207021	15.63022	20.585643
44.8125604336388	21.2400935131538	13.932794910091	49.707097	15.54357	19.872896
45.1002542882314	21.3183075293952	13.8702374086373	30.249755	29.28668	9.627144
45.4457263374506	21.4122286077101	13.7951169743122	50.337118	13.87323	4.749218
45.4457263374506	21.4122286077101	13.7951169743122	33.169445	12.82499	1.129185
47.5538132845526	21.9853216469218	13.3367161659778	45.420784	35.70231	13.427579
49.646890475806	22.5543336420591	12.8815792353949	47.801417	19.06334	7.814097
49.646890475806	22.5543336420591	12.8815792353949	46.870011	29.816545	8.525673
51.8958407910539	23.1657230357067	12.3925483111639	50.608737	39.047145	0.30438
54.2764135616064	22.7580353229285	12.6786797154574	51.719243	33.03008	9.909651
56.928049988232	22.3039243658357	12.9973920020172	57.95186	28.956245	5.320699
59.6374285685782	21.8399225938104	13.3230460633333	57.48649	24.517395	4.703245
59.6374285685782	21.8399225938104	13.3230460633333	49.216563	20.76273	2.277188
64.9259756401849	20.9342478130553	13.9587016742168	69.52818	17.90893	23.466902
69.2687159891759	20.1905386917405	14.4806714107696	67.794775	0.2453923	14.617193
69.8985225182209	20.2054599590255	14.554464144292	67.61759	1.570395	20.822479
70.8823878494794	20.2287587814146	14.6697428063591	74.60069	8.85595	6.459838
70.8823878494794	20.2287587814146	14.6697428063591	69.299455	6.449115	15.081267
71.8535162971464	20.2517594619788	14.7835261716437	58.979255	16.987345	1.276103
75.0751788516874	20.3280657513641	15.1610011625001	78.44886	5.02628	2.732259
75.9890730656248	20.4619940878164	15.3616949992838	73.44882	27.71684	3.250298
75.9890730656248	20.4619940878164	15.3616949992838	63.31789	20.756115	1.726904
78.1140091841561	20.7733915548334	15.8283368570228	87.144585	5.62369	21.911356
78.1140091841561	20.7733915548334	15.8283368570228	82.741185	8.18936	9.780027
79.1844956943759	20.9302681034953	16.063421366166	89.544625	11.14329	6.653118
80.0869184865921	21.0625169502528	16.2615993033531	86.845365	25.906095	9.026374
80.0869184865921	21.0625169502528	16.2615993033531	80.066985	32.520545	19.480329
80.9949810741282	21.1955892781857	16.4610154706296	91.09643	22.6866	6.913126
81.8395080198425	21.319351360052	16.6464797906272	99.37313	13.042045	19.983146
81.8395080198425	21.319351360052	16.6464797906272	96.04228	11.46233	26.220597
81.9083978861659	21.3294453940824	16.661610428557	79.01289	29.7258	2.755744
81.9831335029304	21.3403951149238	16.6780258551849	92.761655	9.792985	28.945088
81.9831337033328	21.3403953469361	16.6780257318159	93.997115	11.43328	4.127594
82.0330297033348	21.9671665394738	16.7617337652215	86.016245	7.495035	26.90563
82.1082280608681	22.9117368712576	16.8878850861132	94.4971	12.154995	26.111766
82.3285000764715	25.678073842617	17.2573506499954	95.62369	24.314785	12.804988
82.554677430781	28.5185700240314	17.6367210543773	92.788305	33.10169	27.022649
82.554677430781	28.5185700240314	17.6367210543773	90.572985	26.136825	24.857885
82.7389529468978	30.8328691813159	17.9458132450613	99.67714	33.98061	22.565216
82.86671474799	32.4374670212247	18.1601188043258	97.982935	40.137435	28.75306
81.7328818061543	33.4133947850582	17.4914550899509	94.955665	36.40187	7.771411
80.5282538175341	34.4502511295696	16.7810377403872	88.660005	37.051535	6.873362
79.3623184218202	35.453789241151	16.0934307864789	89.661665	37.28143	20.914346

Solution x	Solution y	Solution z	Original x	Original y	Original z
79.3623184218202	35.453789241151	16.0934307864789	83.48933	38.25693	16.203282
78.0647441284832	36.570626150289	15.3281882619537	78.52122	37.890255	25.630233
78.0647441284832	36.570626150289	15.3281882619537	79.319755	37.96047	22.926601
76.6556849985246	37.783428885415	14.4972032189092	74.17807	43.76639	28.605582
75.2233511310373	39.0162572431268	13.6524879373258	63.437195	41.00367	26.99622
74.0267282541177	40.0461939269361	12.9467803789064	71.273045	32.62062	26.349189
72.5543783362605	41.3134675484499	12.0784721483548	65.72564	44.111465	7.622314
71.223704992656	42.4587898260969	11.2937122612992	64.595135	34.78327	9.989898
71.223704992656	42.4587898260969	11.2937122612992	61.04328	37.44322	1.978623
70.1336368422039	43.3970230806438	10.6508474225375	53.824634	40.64213	16.603226
69.3046262950736	44.1105483638005	10.1619353965735	49.52113	41.29678	9.327678
69.3046254563394	44.1105490697472	10.1619348664266	53.302235	56.10093	10.554691
69.3046251304295	44.1105493307329	10.1619346419148	50.972003	40.60627	2.976184
70.0738014166595	45.0614207926522	10.2093143209441	51.37375	46.298003	11.79476
73.0378699010312	48.725835632522	10.3917430882184	62.26967	64.78212	6.975531
73.5350729361885	49.3405017553876	10.4223797933227	70.55475	53.342402	18.770686
74.0163329495742	49.9354588718605	10.4520336257572	65.705495	54.4013975	3.082521
74.0163329495742	49.9354588718605	10.4520336257572	69.610075	41.75992	4.719164
74.5624191731768	50.610554297845	10.4856809975439	87.57797	41.66484	5.551613
75.1251863507855	51.3062690236928	10.5203518857925	91.6164	43.026115	2.808093
75.9951302407913	53.7583713284003	10.9930497839135	84.61874	44.121625	19.170305
77.0504764443319	56.7330898909019	11.566461732812	92.878595	53.021252	1.55944
78.1718684837577	59.8939703503161	12.1757488311005	95.92709	54.202926	8.883113
79.3514092999407	63.2188266557156	12.8166230968436	93.854515	65.44994	7.938496
80.306490943297	65.910903410689	13.33555664029	92.344515	62.02096	28.826016
80.4605665893366	66.9902380225138	13.2666360755125	81.466395	54.091358	0.343064
80.4605665893366	66.9902380225138	13.2666360755125	68.40623	74.741575	8.582781
80.6924678581479	68.614801068304	13.1628944597498	98.425325	63.29758	13.439936
81.0023871683951	70.7859235752683	13.0242413902936	98.53739	80.25874	11.354076
80.6175904928771	70.9654873321871	13.0397915195491	97.272905	80.426715	12.650593
79.497352760485	71.4882492525642	13.0850542374625	91.37176	83.481715	13.123111
79.497352760485	71.4882492525642	13.0850542374625	86.26193	79.048	11.651774
78.1863843920427	72.1000171658052	13.138022699307	87.254685	75.06877	11.123991
78.1863843920427	72.1000171658052	13.138022699307	81.449	70.90379	9.10693
76.7091721829496	72.7893630700642	13.19770776994	79.72973	69.6285	5.76607
76.7091721829496	72.7893630700642	13.19770776994	75.60926	70.05143	9.458663
75.2297044824533	73.4797616267976	13.2574865879877	82.980165	82.460215	28.432538
75.2297044824533	73.4797616267976	13.2574865879877	84.72455	82.62255	16.621981
72.7840737993837	74.6210329951428	13.3563107560892	74.635475	75.231085	23.616275
70.3012596967676	75.779655616917	13.4566364280861	67.24276	72.18951	20.816233
70.3012596967676	75.779655616917	13.4566364280861	63.17424	62.764205	21.920947
67.9983828498713	76.8543133291539	13.5496948587257	74.234205	84.088705	29.630347
67.9983828498713	76.8543133291539	13.5496948587257	64.30468	84.91	26.009678
65.7621434536111	77.8978729476212	13.6400630980952	61.393495	78.21387	27.829379
65.7621434536111	77.8978729476212	13.6400630980952	58.86286	75.490835	22.793064
63.940704431449	78.7478636969145	13.7136710301501	63.457115	71.302795	28.410692
61.9885464483207	79.6588563360233	13.7925624630494	56.10401	69.44853	29.951816
61.4543176702756	79.9728926855708	13.7346100270687	65.23767	90.033385	6.608827
60.917319181338	80.2885578145206	13.6763562899393	69.51155	98.000325	10.150379
58.8184291999978	81.0423874821883	13.5427933422542	48.983044	68.08194	24.712405
58.047870919112	81.319103554208	13.4937099899435	51.801592	75.702955	19.859805
58.047870919112	81.319103554208	13.4937099899435	45.96408	75.36881	19.356846
57.3579942810016	81.5668448112274	13.449762289976	52.486843	76.711165	9.36826
56.7011385319878	81.8027281697321	13.4079171880536	55.7501	90.920415	19.617278
56.7011385319878	81.8027281697321	13.4079171880536	59.609455	83.27302	29.920795
56.0175334529198	82.0482171798772	13.3643687423937	67.48261	90.51293	17.817861
55.2510296832124	82.3234766196922	13.3155437671162	58.9163	98.60932	2.300231
53.2525236416562	82.5593507975466	13.4962416439938	59.88564	90.256965	29.954013
48.9684292652207	83.0650885589201	13.8837145111431	51.725585	96.536445	28.40681
47.2848498122146	83.2469057327002	14.0178589800422	58.59379	93.155945	12.405414
47.2848498122146	83.2469057327002	14.0178589800422	54.766852	92.295455	6.553331
44.7402676620705	83.5216951117895	14.2205948428549	38.950185	86.058925	28.399966
44.7402676620705	83.5216951117895	14.2205948428549	49.200624	76.95068	27.905495
42.5107049555364	83.7624789708493	14.3982457728131	49.437672	97.29667	7.39626
39.7680211721257	84.0586653649996	14.6167658397889	36.34587	87.597465	1.344209
37.2737716531796	84.3280186875963	14.8154890788071	43.88264	75.9979	6.534575
37.2737716531796	84.3280186875963	14.8154890788071	30.1948	77.47401	0.923346
34.9310011961918	84.5810029351356	15.0021339512254	31.22881	79.877355	13.445056
34.9310011961918	84.5810029351356	15.0021339512254	33.93752	71.055425	5.905417
32.6789067308278	84.8241986262065	15.181552632837	39.89323	90.309885	11.775799
32.6789067308278	84.8241986262065	15.181552632837	40.48646	81.157135	14.786912
29.7030641375763	85.1455545809756	15.4186364173511	37.353615	96.195315	18.415189
29.7030641375763	85.1455545809756	15.4186364173511	30.09705	94.85711	4.685105
26.3049482692867	85.5125062198167	15.6893662298303	24.384515	97.907795	0.111537
25.5740773724916	85.4997591942633	15.8659388756323	23.602775	87.83846	18.275699
25.5740773724916	85.4997591942633	15.8659388756323	16.17437	80.77798	18.674423
24.9418297228554	85.4887337515188	16.0186863874328	28.966505	91.93771	20.861988
24.9418297228554	85.4887337515188	16.0186863874328	32.35548	77.08328	26.131092
24.2539529875502	85.4767374903647	16.1848714384881	20.60172	86.45345	23.44328
23.6041590580502	85.465405909017	16.3418566401935	23.159665	94.99055	21.634541

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.6041590580502	85.465405909017	16.3418566401935	20.26183	95.676245	17.846167
22.9948817128125	85.4547811229538	16.4890556192693	10.636965	99.941455	22.606097
22.3127574844208	81.2037702868803	15.7510290718291	12.30828	95.415795	18.734286
21.390918131057	75.4580548912915	14.7535975030572	1.401765	76.07236	14.516115
21.5004622567455	74.3852329874909	14.5721550831794	4.81189000000001	71.48163	19.467897
21.617270120172	73.2411762865102	14.3786677915292	8.96414	75.77293	21.604208
21.7433197545356	72.0065668943647	14.1698678003261	10.302265	79.88844	24.724981
21.7433197545356	72.0065668943647	14.1698678003261	10.737535	78.399525	25.651463
21.9943484559369	69.547609711538	13.7540104565724	14.99811	70.439575	28.594361
21.9943484559369	69.547609711538	13.7540104565724	19.19225	67.891335	25.986874
22.2652726311021	66.89378368151	13.3051939464632	27.294235	67.36467	25.05905
22.2652726311021	66.89378368151	13.3051939464632	22.77816	61.91876	23.535116
22.5053013217533	64.5425747756875	12.907555509545	27.03592	58.11764	25.51317
22.7015627322763	62.6201358582737	12.5824283110788	16.28216	64.658715	7.376906
22.9019520350977	60.6572756829577	12.2504660603808	15.17562	59.299125	20.231796
22.9019520350977	60.6572756829577	12.2504660603808	18.601355	58.3359	16.263038
23.091566320774	58.8001121492995	11.9363746147754	22.32618	58.45293	10.978007
23.091566320774	58.8001121492995	11.9363746147754	24.393135	53.387308	3.209069
23.2508780191122	57.239799669746	11.672487055713	27.85894	70.297015	5.978866
23.2508780191122	57.239799669746	11.672487055713	25.726765	62.875185	13.655865
23.5009137598063	54.7906879479575	11.2582884890239	42.291825	54.317701	14.78098
23.7057446259423	52.7844173239528	10.9189896558707	42.753335	50.906813	15.568394
23.8044382427133	51.8179849812974	10.755551434172	39.724355	52.657318	1.123019
23.895550730466	50.9258073197257	10.6046688141261	36.49954	48.989475	3.669737
23.895550730466	50.9258073197257	10.6046688141261	35.65863	43.345715	7.513468
23.9724854045621	50.1724847594197	10.4772681801958	41.00732	41.27668	4.938398
23.8843610054744	50.1240989681646	10.4923717205539	40.184205	46.1874365	21.269314
23.127493469414	49.7083933536224	10.6220868472002	23.528225	48.047471	10.497692
22.3881847273277	49.3023328935619	10.7487932768897	35.347265	40.483415	12.676508
21.5766449019131	48.8566010237061	10.8878788400266	29.577285	38.20107	12.365171
20.7395537289478	48.396843262533	11.0313462593305	21.779985	37.899125	15.006029
19.931527293755	47.9530566812208	11.1698341871657	21.800035	44.699325	19.798588
19.931527293755	47.9530566812208	11.1698341871657	15.566305	47.445917	16.822861
19.1566757344449	47.5274897561856	11.3026349548889	7.79806000000001	41.063165	21.758433
18.5293486997892	47.1829521502514	11.4101517254769	4.535275	41.40327	15.496926
18.5293486997892	47.1829521502514	11.4101517254769	8.071465	45.7971455	5.631658
18.0424381191741	46.9155366220476	11.4936023252576	7.76846999999999	43.27595	27.165517
17.6949154660434	46.7246773243688	11.5531620791456	5.35044999999999	59.245825	2.02242
16.240531299439	45.2208273523854	12.2275684916586	2.26291999999999	54.336059	8.412226
14.8967253020953	43.8313431643564	12.8506984674104	1.56824	43.114435	27.74491
15.7093029783144	41.8743150840153	10.6083636599922	6.09162499999999	39.029145	21.745986
16.9120777729165	38.9774809276359	7.28922487660198	4.493385	48.2428075	1.749018
16.9120777729165	38.9774809276359	7.28922487660198	2.888575	34.539165	0.815621
18.0667933733247	36.1964233715767	4.10272823312022	24.567885	37.86062	12.401465

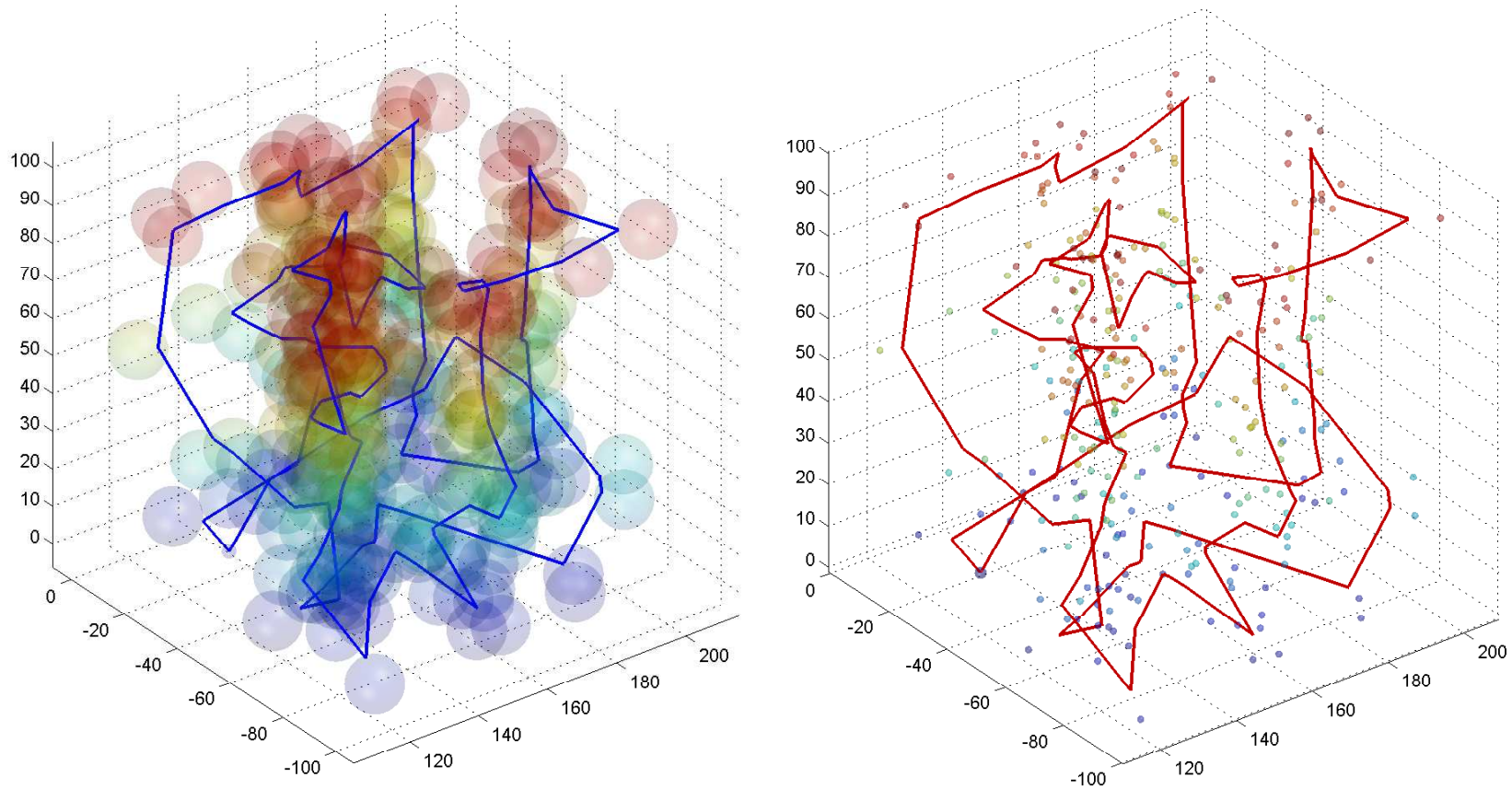

Figure N.65: *team*3_300, Equal Radius, 3D, Euclidean, Length = 1484.4105362

Table N-68: Solution for *team*3_300, Equal Radius, 3D, Euclidean

Total distance: 1484.41053620068 Depot: x 23.55 y 20.83 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
27.0467094786362	24.6551674794599	10.9025473624355	23.55	20.83	14.19
28.2835406306378	26.0081868699951	14.7588289458719	27.74	25.63	13.28
30.0173371825553	27.9048548990071	20.1645676454872	25.65	24.53	24.47
42.1044510142605	39.2292853126299	33.6035496583513	40.11	39.6	39.05
43.4289439934699	40.470240927436	35.0762004915906	40.4	40.19	35.32
45.081478163471	42.0185449006031	36.9135789038819	42.56	42.28	42.23
45.9357322394596	42.8189341878309	37.8634090847452	41.07	43.98	42.76
57.5925657759184	50.3334837929002	44.685305446481	63.26	50.77	40.6
59.4916589803984	56.5715067490919	57.3328119799196	60.94	57.56	60.13
60.1286308466248	58.6640033555364	61.5754371361117	58.75	56.63	68.13
67.854774456031	74.718916370008	54.2098790634083	68.17	79.21	59.57
78.6204795269712	88.9672626000351	31.9590240554862	85.6	88.65	32.39
77.7313080441017	90.9869799499065	28.8264496850691	78.98	97.83	29.61
70.1524043253832	86.4521495859752	10.2502230962224	70.23	90.73	4.71
70.1523938325535	86.4521245625131	10.250222195044	74.49	84.46	5.13
60.8327171391209	72.0286929664099	13.0352544081321	60.12	71.05	6.63
57.1296099966127	66.2975570360459	14.1418855482353	54.05	68.39	12.29
52.7315770203164	59.4909507865595	15.4562200274629	49.78	61.48	16.59
48.7388223667371	53.3115809175407	16.6494447508494	47.3	55.25	23.22
45.6284546512586	48.2797253754326	17.2573950686198	42.95	44.74	22.67
45.6647795992513	48.0157699746476	15.2611600318864	45.6	43.93	17.79
45.7205970975002	47.6098113376343	12.1914427541066	43.21	42.35	12.25
45.764091713623	47.2936185862294	9.80037292626092	45.71	40.8	10.89
45.8196362320352	46.8896865931973	6.74584836917369	51.12	47.54	2.22
43.7810414559518	46.3549015987752	6.4027076202691	45.6	41.81	1.51
42.9639936743543	46.1404622608871	6.26513588751027	42.59	39.16	5.9
35.5017114460496	49.1057699422176	5.2247844733434	37.85	53.76	4.29
25.123918138498	53.2295293017204	3.7779934722712	27.4	59.84	3.43
17.6738426546085	55.3102321230863	2.81723495460888	11.46	53.07	0.5
21.051066166197	60.91020865268	5.74800174642344	16.79	62.67	10.23
21.9625388523168	62.4215576326116	6.53892198823684	20.64	65	8.49
22.6859583416704	63.6210973963146	7.16666943937241	25.62	68.98	3.75
22.6423232921608	63.419922153379	8.68446772187592	24.47	65.24	5.9
22.5769892046046	63.1186483119004	10.9574703864332	22.65	62.2	11.71
22.5167721815051	62.8409757247023	13.0524129322682	27.36	59.94	13.4
22.4654880189099	62.6044477090422	14.8368884009849	27.64	62.78	13.86
22.3971806226213	62.2893416219806	17.2141976345634	20.56	61.44	16.14
22.3191525352046	61.9293953986992	19.9298192980727	19.86	66.11	18.19
22.1068619275797	60.9500121541732	27.3192068817639	24.49	66.27	29.11
22.0311085455468	60.600561832171	29.9558772037343	23.19	66.22	32.78
22.006792605174	60.4884072149541	30.8022869712288	22.17	64.94	33.7
21.9869209007622	60.3967604240191	31.4939457780705	25.01	63.12	37.19
21.7294992831126	60.1243011115032	31.4101419873661	25.24	60.77	36.77
16.5120705779337	54.6020371579394	29.7118670791606	15.54	52.83	23.01
13.8623377338171	52.3026356384943	33.1884669267323	11.18	57.92	34.05
5.90379242799544	45.3963447453829	43.6303547911644	2.56999999999999	49.67	48.06
4.97785811254393	38.9322020159142	44.8015451976877	3.20999999999999	36.35	38.54
4.47455540414494	18.7764123623559	59.9274116665758	3.36	12.54	56.95
8.05346935358621	19.3589828442093	87.9539361364214	5.58	22.9	91.06
8.340295340347	19.4056719453724	90.200095560187	4.01000000000001	20.5	95.59
25.66963715652	15.9583406685106	88.9862344711245	24.66	9.13	90.15
42.5979580284396	13.8744862058848	87.6008812919777	45.09	11.7	92.12
45.0917230209009	13.5674831057475	87.3968055989656	45.57	12.76	80.46
46.5765136663133	13.4378255298065	87.764989257909	46.38	12.31	81.64
49.9795745637301	13.1406553116192	88.6087221012842	54.5	15.91	93.18
49.9795754166591	13.1406538689638	88.6087209023091	50.3	13.28	95.6
50.6788116232774	11.7481579742116	86.4019999240782	55.24	13.37	88.36
51.6479404993105	9.81833443952241	83.3436952024618	48	4	84.7
52.7022562705779	9.05224043388117	81.0515558619176	50.52	8.68	79.3
53.6276329868179	8.37984712864883	79.0397306175321	52.96	3.75	74.52
53.7452052168598	8.29441418810462	78.7841194188607	50.97	4.59	83.57
54.1923553683546	7.96942802885216	77.8119273899517	52.67	4.65	71.84
59.1640962881708	11.0478656326758	81.0360435542277	57.66	15.51	81.33
62.4432315966296	13.0783102719698	83.1625849125165	62.16	16.88	79.65
66.0007813498728	15.2811578752808	85.4696693888116	63.35	21.49	87.32
82.6837302021764	15.447697666494	91.6673369957626	85.76	19.27	96.66
85.8011832442577	9.10385496605923	86.3523321100382	88.21	3.61	89.96
86.0369148232152	8.78177211523512	83.8955161695618	87.06	2.89	85.23
86.3580029169665	8.34302073604702	80.5491164318453	86.49	3.97	82.84
87.0279752780871	7.42713183036184	73.5650845624086	84.21	1.15	74
87.2635731635928	7.10506812921608	71.1093854893602	84.57	2.19	72.59
87.6399881406447	6.59054214426058	67.1859010012791	90.45	0.18	67.28
87.6161456085198	6.74628275319856	66.0260252085052	90.14	0.74	66.47
87.5218862229067	7.36230586938433	61.4371325657125	83.63	6.61	58.86
87.4745985544857	7.67125162897842	59.1356823179841	83.5	4.83	59.12
87.4245959883268	7.99789339569772	56.7023688781802	83.98	4.24	58.09

Solution x	Solution y	Solution z	Original x	Original y	Original z
87.3290269207071	8.62239081181976	52.0502465966367	83.08	5.9	51.4
87.2468353371317	9.15936489083088	48.0500398285695	86.71	7.9	46.76
87.1801173234307	9.59511990606611	44.8037858430614	83.08	6.85	43.86
87.1249369232169	9.95540834243451	42.1196571515453	85.18	6.81	41.52
87.0717234911778	10.3028046838369	39.5315291284735	90.71	5.35	36.18
85.9553534948916	12.1127262443689	37.7749100151246	86.46	7.15	36.07
81.1074443215166	19.9722819033813	30.1463446385641	78.01	26.19	31.01
83.568425862569	13.1084727640266	20.2352683465247	78.41	15.88	16.4
84.0205842105778	12.2038928961348	19.1695790202309	84.85	7.49	23.97
85.0248304535858	10.1947712403775	16.8027893929861	84.22	4.25	20.41
86.634914033974	8.15756993340095	12.7400779036766	91.86	5.09	13.18
86.998149822252	7.69798937386921	11.8236006127345	89.81	1.33	12.56
86.9762073027221	8.38952002043445	10.0293016568142	85.34	3.13	7.91
86.9567005548139	9.00414076923357	8.43451958303223	90.79	7.27	2.84
78.3089798153448	17.1513299856674	9.70720613595912	76.81	16.4	5.21
70.8228441449106	24.2041582511984	10.8089857618552	63.88	23.81	11.61
75.0931937640012	29.2091133953023	10.4680517960944	75.98	28.26	8.37
79.8110107384636	34.7385315996546	10.0913965420631	74.93	38.63	8.7
88.7101862652377	45.1684050285605	9.38108538151654	92.92	45.3	3.79
88.9353260098516	46.6565158767594	10.7026961923213	87.92	47.46	7.48
89.2308860891005	48.6100289026766	12.4376442338392	89.33	46.23	11.31
89.6878716736279	51.6302537204896	15.1199921947025	90.65	58.26	13.09
89.5887105186435	50.8507800469323	18.053003626933	91.08	56.32	19.58
89.4879754356984	50.0589750546006	21.032433497029	90.93	51.78	26.41
89.4585023884944	49.8274293285696	21.9036700500764	85.21	44.35	20.93
89.597365630654	49.5932798985183	23.8097456526795	89.11	45.94	22.79
89.7505129762615	49.3350407458195	25.9118950641879	86.88	55.34	28.08
90.8578609839236	47.1697425641723	30.4865272366103	85.02	48.75	32.58
92.2102727749321	44.5253883790578	36.0732717944332	92.82	43.5	36.14
93.4073428514178	42.1847707437153	41.0183010582687	98.41	37.64	42.84
90.241441463519	44.0785983626141	43.4028960878006	84.47	44.91	39.53
89.6043430921783	45.5477111504339	47.2940772086256	87.56	46.99	46.13
88.9213885347048	47.1225590238103	51.465312138179	85.43	53	49.96
88.965102018936	47.2778374202991	53.8870488579983	93.86	49.11	54.34
88.965102018936	47.2778374202991	53.8870488579983	92	48.8	50.4
89.0750793401338	47.6684652561879	59.9786837606009	85.85	46.49	60.83
89.1622503797536	47.9780693079941	64.8068200202865	84.47	48.16	64.66
89.2585590482569	48.3201168980289	70.1407814027138	92.59	46.16	69.75
89.3721648845574	48.7236084474806	76.4328284600956	88.92	43.62	77.06
89.4592548736003	49.0329301889995	81.2565794671021	89.36	56.03	81.08
89.465469453508	49.0286366157787	81.5818609453703	96.43	49.73	81.64
89.3718706447623	48.9756216293411	84.4666140545069	89.59	51.88	82.73
89.2398559795048	48.9008862616014	88.5344437581722	85.78	45.37	88.36
89.1122384198065	48.8286422076421	92.4667359005869	92.09	44.08	96.66
86.149729414763	53.1689481421233	94.0216504080688	82.42	49.99	99.02
85.1057282794712	55.5403891946305	94.2733579063143	87.26	54.53	99.96
77.4130353355094	73.0145905947336	96.128413447988	70.7	73.7	97.99
78.3162623419692	74.3332784149395	95.8544015882322	72.93	73.7	97.12
86.4061491674644	86.1449150196546	93.4001270804865	92.92	88.46	92.3
65.1741833145519	92.238757787758	95.3251788141585	66.26	99.07	96.4
50.4004367809724	92.4639594988666	96.00513228004	48.98	92.03	89.79
47.9928088114227	92.5006540482232	96.1159239679336	47.48	94.9	89.56
42.7698906336529	92.4533987577212	96.7053418125001	42.37	92.45	91.48
36.5211338547056	92.3968817420733	97.4105543485491	30.69	95.98	98.88
37.727137922817	89.8637506926502	96.7067108545427	35.46	90.5	93.34
39.1197716890768	86.9386810607801	95.893982517217	34.79	81.57	97.09
49.0183096389405	83.4988776591829	91.7129442132029	53.35	83.14	97.2
51.6449555319588	82.1637819840903	87.905573284579	57.57	78.44	87.74
48.5586002372631	84.4951119503772	83.3651147729953	51.75	85.81	80.64
46.1232273716421	86.3346365936682	79.7825303267418	40.14	88.25	82.87
45.950037273615	86.6460285800176	78.7032461343619	44.75	90.08	82.93
45.6306255606361	87.2203440417963	76.7128022019653	46.92	92.94	79.18
44.8821544625361	88.5661854191486	72.0487831240867	41.11	92.55	72.93
44.4165381613441	89.4034162574725	69.147352039204	48.68	92.55	68.87
44.0102628554938	90.1339640926636	66.6156474815666	39.18	94.86	64.79
44.0102600737719	90.1339697184587	66.6156256107004	38.08	89.48	68.3
44.0102571825483	90.1339754518245	66.6156035245166	37.88	93.16	68.12
44.4007413527811	90.656030415421	62.6910646528147	39.28	92.99	62.54
44.8103084053327	91.2036245095629	58.5745712421806	39.7	88.73	54.48
44.8103147544773	91.2036322435473	58.5745162685626	42.93	88.78	59.49
44.8103211113959	91.2036400025536	58.5744609476363	39.31	87.14	57.08
45.8649772263159	92.2114794008004	54.6795997092954	47.67	92.59	55.65
47.0449672140524	93.3390752342281	50.3219313731168	48.42	91.53	51.1
48.4456701300337	94.6775737592913	45.1492000014868	47.08	88.26	42.71
48.8259730358299	95.1515294137767	43.9065253315105	46.8	93.43	44.07
49.2396903932871	95.6671255911786	42.5546607114336	54.83	99.88	42.57
47.933458479216	95.1228516495668	39.6293516552991	45.57	93.71	36.64
47.2528396931994	94.8392745543209	38.1052102621278	50.91	90.3	36.65
46.7125488224918	94.6141506712909	36.8953075952005	49.11	94.31	36.24
46.1616259513251	94.3845950494378	35.6615917145912	48.89	93.1	33.02

Solution x	Solution y	Solution z	Original x	Original y	Original z
45.6895493403799	94.1878914434941	34.6044468128365	46.89	94.85	27.74
45.6895472839447	94.1878905482737	34.6044478970565	49.91	91.9	29.51
40.212742520654	92.9181077878859	38.4427196607592	40.13	86.48	38.33
38.2753399833705	92.4690452560728	39.8007330775979	37.93	93.92	46.64
36.7804720185142	91.6411618884552	38.7746430480945	38.36	90.43	43.39
30.91065486657	88.3905386781849	34.7456217907306	28.82	81.78	35.71
30.2540919780771	89.3417784806421	33.7163999690891	24.67	93.34	35.07
30.3089102054541	89.3387124864767	33.6137104809416	24.2	92.42	34.13
36.052583353538	89.0202461092963	22.8487708781181	38.99	86.42	22.62
38.3817204557151	88.8911239905441	18.4835396425924	40.14	85.47	20.22
41.3700971537881	88.7254526588279	12.8827357757987	42.78	91.87	12.41
43.3978918833198	88.6130337844256	9.08228205521224	44.33	87.3	2.27
43.3978927197065	88.6130338673933	9.08228113484157	47.56	92.03	4.61
42.5344802298028	87.4199799729465	10.0070747664546	48.25	85.26	10.69
40.8023592010724	85.0264672325052	11.8623966810845	41.11	86.33	11.14
38.4127996402559	81.7244887593151	14.4219149939948	36.6	82.94	12.12
34.7547329602677	76.6696587548565	18.3401640758125	39.42	71.54	17.38
32.2292228553673	74.494885461133	20.586709836194	35.58	76.06	26.53
31.2072177711137	73.6448428345892	21.2930231584013	31.99	67.74	24.97
22.8001530633944	79.0206630034828	19.1455217476239	21.1	78.12	20.54
16.5898753969452	82.991796135985	17.5591562490339	12.07	80.14	22.08
7.33991840460678	93.5760729000023	10.5809685070947	5.54000000000001	99.29	6.96
6.10224552272442	84.0479690933033	16.4247472732084	8.59999999999999	80.56	11.38
5.23756250901438	77.391518184392	20.5073716178606	4.15000000000001	75.92	20.91
4.71019665953777	73.3315940837674	22.9973997948801	4.20999999999999	66.53	21.42
4.61738219623763	79.6034743917071	32.7660968365029	0.620000000000005	84.95	30.66
5.82566381698385	81.5546562435918	39.099313477379	2.01000000000001	79.01	40.57
7.10923292801394	83.6274120321161	45.8271505453791	4.8	88.51	50.28
8.38261419628985	82.2096829605574	45.8224530420485	9.41	84.38	51.54
11.1848652012563	79.0898026979641	45.8122088129688	8.95	75.43	49.37
12.9085680457622	77.1707064571863	45.8058930614457	8.67	72.77	42.39
16.0005142935382	74.4223535958154	46.0557377784004	11.74	69.17	44.25
21.1943345838295	70.2859951725876	46.5530908183158	20.35	68.75	46.32
26.0018857541332	66.4572650113253	47.0134513156964	28.86	67.84	42.89
28.5875161846938	64.3980851831294	47.261028923524	35.37	65.99	46.58
27.9823444597526	63.0291421806277	47.5552539554105	28.77	62.05	46.68
27.3926964733619	61.695308414708	47.8419346101436	22.51	60.15	43.07
27.5272299327847	60.4747191010866	48.9236569193326	23.5	55.84	45.92
27.5533400151737	60.2378737747681	49.1335515546655	30.85	54.39	47.15
26.907861909312	60.3208651959257	50.7790469486848	30.36	58.14	54.2
26.4310474502738	60.3821489134613	51.9946381625508	21.39	62.71	50.33
25.9868444411979	60.4392363675534	53.1270885194574	19.65	58.2	51.17
25.381088517254	60.627309248026	55.3245650275078	23.78	67.37	54.34
24.3184991386292	60.9243625322548	59.2149541291902	25.86	63.85	60.16
23.359472341447	61.1924768753703	62.7261717262057	25.84	61.09	65.42
22.6773910918572	61.3832169464971	65.223417155563	27.62	60.61	68.71
22.3583305210764	61.4724706690657	66.3916309554948	26.15	61.96	69.66
22.0988069076195	61.5450752515694	67.341872252181	27.28	65.47	69.94
18.333614492727	60.511103373957	72.751541321487	13.36	65	72.75
17.9982723193669	60.4190249151359	73.2332197558158	12.14	56.76	74.37
19.3098443709626	61.6831746830298	74.5583662945619	21.99	57.15	79.17
20.8609005300157	65.1597320128596	75.5950607156297	26.5	63.44	75.23
22.0336710444902	67.7885526021359	76.3789556778959	24.03	65.56	79.56
23.3078136274391	70.644590672693	77.2306064796141	23.52	71.05	74.38
24.658172286346	73.6714348586311	78.1331986870816	24.25	76.66	84.45
26.64164696623	75.2900367699275	74.6868763568773	27.35	82.24	75.13
26.6824155698367	75.2522376717885	74.5972965068881	32.42	78.27	77.18
27.7660966479986	74.2483337753404	72.2158891749575	28.95	69.72	73.23
28.6650235009494	73.4155921318683	70.2405458603296	34.24	70.46	67.21
24.3484772474804	74.993119883352	69.6211073434243	23.47	70.49	67.86
18.3867598150798	77.1718752534555	68.7655536022302	16.99	78.36	62.01
14.4770996112828	78.2401149311414	71.6895024697216	16.07	82.14	77.28
7.35752086427892	76.4654698571924	71.195054886485	5.06999999999999	73.15	76.92
6.95807958592435	76.5288020457068	70.8181597141943	6.62000000000001	72.96	75.87
5.97046484853841	76.685361116435	69.8863430422566	2.98999999999999	72.09	73.38
4.04272595609022	76.9909184675126	68.0676730767956	0.909999999999997	72.43	63.78
3.85716854565538	78.4367439426243	68.2656728854518	3.44	75.58	64.88
3.52974120230316	80.9879220878191	68.6150083016317	2.19	82.13	61.84
2.86238859041833	87.09893932002	70.1314768028364	1.01000000000001	87.83	68.27
2.28724985390046	92.3657664236148	71.4384363327169	1.23999999999999	99.01	69.5
3.90451214280117	85.2286928616834	79.0064959921852	6.36	80.44	74.53
4.09640834200643	84.2110885093618	80.3546863066375	1.20999999999999	81.97	77.86
4.3113673579676	83.0711680268138	81.8649169155394	1.36	82.41	81.26
4.53642381444183	81.8776955091087	83.4460884578174	8.06	78.36	80.59
4.74100559655258	80.7928183334883	84.8833732987672	11.23	82.6	85.27
4.9521587867555	79.6734347712775	86.3663974292554	8.28999999999999	81.45	86.91
5.17098433478772	78.5133879828851	87.9032936769691	4.75	76.37	88.59
5.35751268305853	77.524572922967	89.2133351362609	0.760000000000005	80.97	91.36
5.67239653795352	75.8550614012867	91.4252201225107	0.969999999999999	75.78	96.61
9.31739036211837	73.2073954146337	91.5412286058834	10.66	76.44	91.14

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.9851029195423	69.8167620319796	91.6898336708924	12.82	66.49	92.89
17.4043813353376	67.3330664208308	91.7986469862309	21.49	69.2	86.43
18.114853857157	66.1912393915363	92.532972524606	22.6	70.1	92.91
19.0506370763717	64.6873614985369	93.5001330335962	24.86	66.05	97.16
17.3377322800057	60.106476551307	93.3364450288773	20.88	59.51	94.7
15.3945231308493	54.9097119304062	93.1507448495635	9.06999999999999	51.92	93.4
20.6364370851563	53.0986315118697	92.6811562840986	21.75	55.19	94.83
25.6681749332598	51.3601709533664	92.2304013461081	27.18	54.04	89.82
29.5971881865865	50.002724948852	91.8784622211226	30.83	54.42	86.59
29.8029111807268	49.924200787318	91.8680137706879	33.01	55.55	89.21
41.077702767458	41.1618801243522	92.9201976550328	40	38.77	99.41
42.6228254652334	40.2272730022538	92.5210087124009	47.34	38.25	97.3
42.9288323757812	39.5264155130764	88.9107436980599	43.96	42.1	91.03
43.5559692889382	38.0903637044547	81.5134824751158	42.62	44.81	79.79
43.6687349061676	37.7586796978813	80.3877449474052	43.21	42.61	80.16
43.7982278716116	37.3777919890917	79.0950336562064	41.97	43.22	75.7
44.2991520577196	35.8374768332042	77.214485475471	41.47	31.69	75.83
44.5738838378493	34.9926646693191	76.1832156097576	45.57	28.26	77.82
44.8409023912761	35.8644588060132	72.7007667936622	44.15	32.64	73.77
45.2727406215552	37.2742742308565	67.0688807588396	45.42	39.91	67.31
45.6399423287765	38.4731122976358	62.2798814866535	42.69	39.78	60.49
45.8517161145773	39.1645563003447	59.5178936666384	42.72	42.84	54.45
51.1895322106601	35.1390740713208	60.7610664027119	49.85	30.56	58.41
53.9490418533758	33.0579722613777	61.4037456793377	53.73	28.37	56.21
59.0039807482618	31.3161313300427	64.7745464470903	58.02	32.46	71.61
60.1034610830902	30.8354371749718	64.5594794379158	61.27	24.41	67.08
65.2812316485688	33.7894211698044	61.1223364450303	65.16	40.78	60.78
68.8176537666534	31.7169039554524	59.0194447912231	71.33	32.23	64.13
74.8483089430525	28.1826316595855	55.4334142019211	79.79	30.32	50.96
72.9542560369216	20.4887097272568	59.2441589260194	73.63	17.07	53.58
72.3925121458132	18.2066933082	60.374400100137	77.94	16.73	64.38
65.6639447931272	10.0473077043655	61.8010584390884	67	3.94	64.95
64.9036023085848	10.3069441022716	61.4374478776842	60.89	11.99	66.92
62.6428146922232	10.9950455983539	58.376200371116	64.87	11.36	51.75
58.9987225773517	11.4491260127904	59.500246318768	56.94	12.18	54.17
56.4050960504742	11.7723285312252	60.3002801026737	56.85	15.49	62.45
54.1111406750417	12.0581933218575	61.0078767527347	52.03	16.04	55.64
53.2989869833055	12.0359747218862	61.4576602050105	55.38	10.13	64.28
52.4600819874904	12.0130244432009	61.9222587735443	53.87	15.51	67.82
47.4759051005634	10.7521110750288	62.5107716910305	43.23	11.54	68.02
47.1086297069236	9.95443457144996	60.6588516815929	51.38	10.51	60.31
46.6947566633111	9.05564631981617	58.5722069691025	52.67	8.88	54.93
42.3572649693472	6.86302100425379	55.2590427726688	44.53	2.72	56.05
36.9850704968662	4.14734833485425	51.1554782960143	31.22	0.18	51
40.2652628153426	7.10420010523513	48.4218849605167	41.49	2.29	43.49
45.1848958590727	12.7833388354508	45.144574167991	44.72	11.87	38.22
47.0824295918743	15.0589812637572	45.5176099024855	51.98	10.99	46.43
48.8272905581997	17.1515174216657	45.8606336095763	52.12	16.84	52.03
48.9942413124524	17.6216127196449	45.5436528007663	45.63	23.76	45.59
56.2675333242236	15.9924170867919	40.71499662356	56.31	21.31	38.26
60.4473056807066	15.0561156661697	37.9401310314966	66.87	17.1	39.83
60.1606306173668	14.302869918334	36.6859808027507	56.38	14.32	39.64
59.7845309079222	13.3146802010487	35.0406514232878	55.4	11.17	38.22
59.2757233675062	11.9778380430983	32.814829314576	53.85	15.08	32.9
58.4223714946383	9.73571535427085	29.0816550456928	51.86	7.7	30.42
59.0553559232972	7.57497389272399	24.2949450791549	55.5	8.86	22.02
59.4884077369795	6.09675872497467	21.0202296449199	64.3	1.03	20.6
54.630322376788	8.32067955458834	12.2876640679959	54.22	8.18	8.6
53.1003261579842	9.0211284570983	9.53746363231473	56.26	10.34	5.55
52.2768572570757	9.39812881310426	8.05725722689325	54.15	15.54	5.27
51.2578267432932	8.67428270679639	7.27224111270819	48.26	14.58	6.53
49.5805596708867	7.48298808529026	5.98017147609592	47.45	7.49	9.86
47.7113878415722	6.1553992156172	4.54027738440396	50.21	0.82	0.76
24.5881155488811	9.47352193047083	2.56828715973272	19.48	4.75	3.34

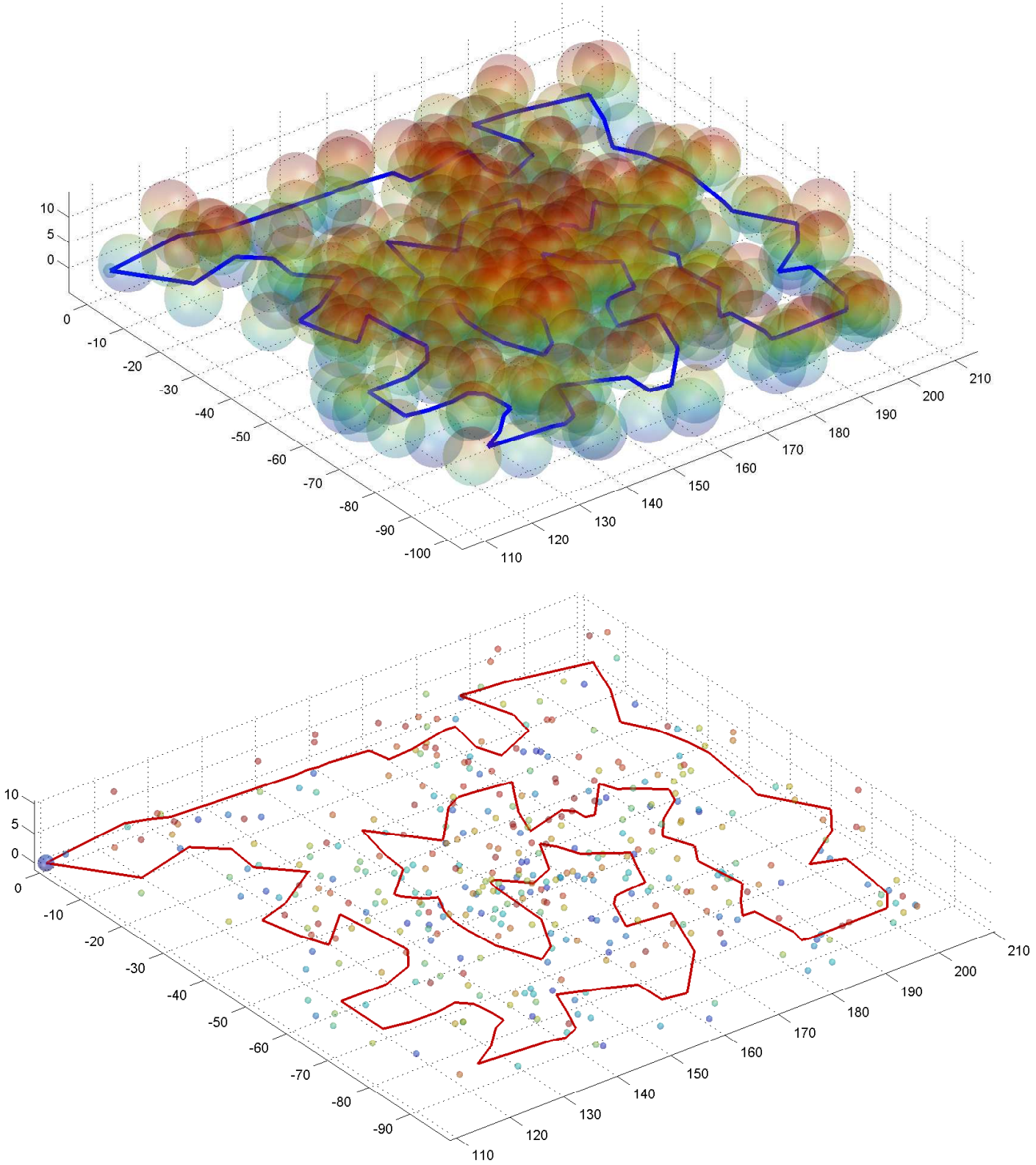

Figure N.66: *team*4_400, Equal Radius, 3D, Euclidean, Length = 753.8129109

Table N-69: Solution for *team*4_400, Equal Radius, 3D, Euclidean

Total distance: 753.812910893862 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
2.93674240771496	14.5649015655224	3.67249191060193	2.12502499999999	13.8908	8.215003
3.71283744455528	18.4139763571347	4.64302265553415	0.610974999999996	22.331075	4.829551
6.31189897729151	18.2973064853327	5.15350736950946	5.29819999999999	16.16745	9.485319
11.7127529600668	18.0548699490072	6.21428702167027	12.5519	14.734025	9.438961
12.2634306509399	18.0301508305656	6.32244579656121	12.54795	14.295525	6.980367
12.7812216379464	18.0069079554604	6.42414528632256	14.259	13.428825	7.786985
17.5698225040982	22.1749010340393	6.32272132822328	20.9892	20.7572	9.683969
18.3064223523093	24.1142988039405	5.29257747056255	20.995625	24.282225	3.380339
18.3064223523093	24.1142988039405	5.29257747056255	21.1268	22.989225	6.335554
18.3064223523093	24.1142988039405	5.29257747056255	20.686175	21.9667	1.804567
18.5923048105545	24.8670010495293	4.89276659966138	14.358825	25.883825	4.414924
18.9240443253149	25.7404406846193	4.42882407342716	15.2685	27.387025	1.441223
21.1463462234984	27.570091939528	4.21085845259438	19.9845	27.40155	0.660019
24.8433908321262	30.613918758677	3.8482496603649	28.216025	27.287675	5.4487
25.1757260044966	30.9763894747449	3.78753651555675	29.46595	31.229925	1.232208
25.1757260044966	30.9763894747449	3.78753651555675	27.65685	28.081275	4.203862
24.7072016585722	31.6129572267978	4.33249070413753	25.49855	33.45475	4.180424
24.2703968021013	32.2064287876704	4.84055104884482	22.793175	31.8095	6.267813
23.8786072252835	32.7387396577661	5.29625286778888	26.51415	33.575825	9.461971
20.6257366088932	34.9023377133128	5.38722606686558	18.476575	32.50015	2.42942
18.5094470915075	36.3099559518779	5.44641103036715	18.77905	36.01655	4.45503
16.2020277304345	37.8447013841482	5.51094128273354	19.322625	41.061025	7.646061
16.2020277304345	37.8447013841482	5.51094128273354	15.806625	40.87695	9.361797
14.9494481944428	38.6778341746807	5.54597011027704	17.095675	43.177	5.934841
9.18517942127454	40.4696405426175	5.55249158625527	4.729125	38.22055	5.844342
10.8485494861952	45.3061932072666	5.12812393116064	8.7059	46.626875	9.397095
11.114158513355	46.078500038737	5.06035990542182	13.3837	46.032275	5.26473
11.3649114278438	46.8076100677899	4.99638610563144	14.24105	46.110125	0.966331
11.9549148708958	49.9350464963433	5.35952381027034	8.9679	51.422725	2.23495
12.2368971091959	51.4297531017594	5.53307996024455	11.134375	51.580675	9.341968
12.2368971091959	51.4297531017594	5.53307996024455	9.352575	52.2461	8.408063
12.4396903470419	52.5047019175808	5.65789644926087	10.71515	57.182775	5.281599
12.8874163835959	52.1544531667454	5.79844018929253	11.458875	55.406825	8.437123
15.7864047671728	49.8866274858855	6.70845043906878	17.219275	51.795125	6.528901
17.5777172566363	48.4853120374233	7.27075416172507	19.292975	43.870425	8.142944
17.8540993910896	50.0181469487598	7.17915862799491	19.028925	48.6519	8.742576
18.2182010448956	52.0374804202917	7.05849200132474	21.4066	50.274675	5.660638
19.0873241401801	56.8576987592436	6.77045622584887	22.891175	56.122525	6.014662
19.9762765761928	61.7878988679098	6.47584868475692	24.44465	63.1281	8.275156
19.1401540315713	62.9794660172759	5.93733699862241	21.668825	63.73225	4.392072
18.2473925151814	64.251749883527	5.3623465426186	21.0091	68.35155	4.610936
16.5276575404352	64.4979072769723	4.94890746854605	17.272875	64.973225	8.378801
13.5254917860507	64.9276268588151	4.2271620124241	18.3822	65.772725	3.391578
13.5254917860507	64.9276268588151	4.2271620124241	12.50315	65.202575	6.796126
13.5254917860507	64.9276268588151	4.2271620124241	8.8531	66.09375	2.882202
5.44121728764972	64.5082412161971	4.01481343388298	2.20627500000001	60.72485	3.544594
5.3958585136415	64.9210513222278	4.05785854600949	2.404275	62.37445	1.602613
4.89328242134344	69.4949909634255	4.53479919756734	1.692025	67.9044	4.763979
4.89328242134344	69.4949909634255	4.53479919756734	0.331024999999997	69.303175	3.842333
4.12948883382897	76.4463048471642	5.25963739583797	0.00154999999999461	79.256375	5.511897
8.28076534452865	77.553235258431	5.42065852046939	8.347775	79.0334	0.64524
12.6645222829845	78.5801673338247	6.05464011452438	12.1212	83.525275	6.555356
16.0019828407135	78.4578932134699	6.43405108701807	19.41455	76.0326	9.16761
16.0019828407135	78.4578932134699	6.43405108701807	13.11545	76.27845	9.886291
17.2416875499563	78.8071650802214	6.05858156559094	16.4015	79.860725	3.65876
18.4643032060957	79.1516223020282	5.68828788494646	20.9401	75.2051	6.209147
18.9040764126825	79.2755230748144	5.55509364865893	22.467675	76.02705	4.2329
19.3469388123505	82.9116696575409	5.62151892165997	24.1584	82.49565	6.916419
19.3469388123505	82.9116696575409	5.62151892165997	22.609375	83.218325	5.878629
19.4804859269236	85.7558809675008	5.61645467632271	23.831575	88.204275	5.345531
16.9338625753249	87.1512912767198	5.77834494317601	13.92855	83.165725	6.067072
12.9436535426646	91.2295966884905	5.99919603239382	15.45105	94.471525	3.135131
6.96743673584139	95.7471883918227	7.07673930891562	2.307925	97.449675	7.701639
21.1832041961206	94.9642262575466	5.69195915939414	22.27635	97.920025	9.573749
24.5272073118186	94.3118871821208	4.74713294236344	26.6212	98.85125	4.844028
29.0800858155977	90.770205244006	3.09148626808885	32.22375	93.28635	0.1273
30.3793845084323	87.0472320886711	3.61442778622906	27.4824	83.15295	4.645899
30.3793845084323	87.0472320886711	3.61442778622906	30.896	84.86835	8.084952
30.3793845084323	87.0472320886711	3.61442778622906	32.733925	86.47665	2.244896
30.3793845084323	87.0472320886711	3.61442778622906	33.324025	88.862275	2.512368
30.3793845084323	87.0472320886711	3.61442778622906	27.27955	90.9405	3.131217
32.3234116129302	82.2245444040996	3.31249811445036	30.46345	78.65395	2.876347
32.6767067098087	81.3480965847585	3.25762614939126	31.60195	76.5275	2.478681
32.7177254440888	81.3852600115925	3.26880638231022	29.5312	77.759375	2.944562
32.7177254440888	81.3852600115925	3.26880638231022	29.23795	80.022375	0.178216
34.3875663837963	82.8981627123242	3.72394785902257	35.60905	81.995775	1.580638

Solution x	Solution y	Solution z	Original x	Original y	Original z
36.1802388876124	84.5223527646761	4.2125691225571	36.3513	83.686975	3.385766
38.3586431913342	86.496021636691	4.80632795233951	40.913925	82.729825	6.876661
38.3586431913342	86.496021636691	4.80632795233951	42.31835	87.347525	7.738111
41.5751751232778	89.5899488821587	5.6398315440759	43.9034	88.387225	9.898098
43.3059644898318	93.1360642052393	4.09072361135798	40.290225	96.689525	2.280132
47.4980458817161	93.7870630609822	4.01698582188188	49.100125	97.070175	0.603113
47.4980466804837	93.7870629653953	4.01698605534124	48.99045	98.5583	3.927321
52.2358863915225	89.0329200516965	5.86405176730106	49.4347	86.0537	7.963635
53.4460876720386	87.8185538886572	6.33585420252797	56.428075	90.20545	9.562383
55.2858873797697	83.3639409253696	6.05223310236638	54.01775	81.8894	8.14471
55.2858873797697	83.3639409253696	6.05223310236638	56.13655	83.451075	6.561985
56.4602257100736	80.5205748584376	5.87119824461263	60.2356	81.956375	8.121308
57.6296453486854	77.6891165634489	5.69092124258058	59.360575	77.3659	4.085186
58.4702837933166	75.6537206348065	5.5613291363592	63.106325	74.44845	6.994666
58.1096482028035	75.2942710873639	5.35267252129736	55.289875	75.9977	8.05121
58.1096482028035	75.2942710873639	5.35267252129736	60.77085	76.3761	8.633151
55.2821789715024	72.4760964794676	3.71675718425565	53.249925	71.4317	1.507319
55.2821789715024	72.4760964794676	3.71675718425565	52.726325	74.9715	6.042198
53.6857758885309	70.8849433387329	2.79311041121637	49.5023	72.1454	0.362105
53.8617742244101	70.3246999481212	2.89636621355266	50.03295	71.692275	1.548117
54.5596887740489	68.1030759852712	3.30582529985139	55.5813	65.9389	1.049446
54.9526172377582	66.8522935319756	3.53635176922027	52.902425	64.80215	1.303032
55.2547246337759	65.8906156717711	3.71359444700916	53.6353	62.58645	0.328338
55.944892207369	65.3968735027808	4.60880956958705	53.3194	62.871025	8.033264
56.8870680651077	65.4058445887273	4.77170247711084	56.708375	61.084725	7.280884
59.4787694751041	65.6215549187567	5.10744416215242	61.692525	66.479075	4.622593
61.2103942478983	65.7656810965801	5.33176652678474	63.9561	69.944325	5.325084
62.382502999705	62.2911627875385	5.81129757927639	62.138225	61.218175	0.933898
62.382502999705	62.2911627875385	5.81129757927639	62.481725	64.778425	2.883198
63.2754970440552	59.762658155132	6.49199407670551	67.662425	58.9604	5.24713
63.4273421448	59.3327104175194	6.60774000840868	66.095725	55.876775	6.205798
63.4273421448	59.3327104175194	6.60774000840868	68.048425	58.486425	8.31929
62.8820116612091	58.7370770913341	6.50867635461541	63.23165	61.378	8.16167
62.1032749434583	57.886507312638	6.36721237291897	61.732525	60.28975	3.358698
62.1032749434583	57.886507312638	6.36721237291897	63.564825	58.6141	2.885043
60.1887005160032	55.7953245109216	6.01941243043289	57.767975	55.4125	2.368927
60.1887005160032	55.7953245109216	6.01941243043289	59.205025	55.76	1.820366
60.1887005160032	55.7953245109216	6.01941243043289	61.491825	51.7088	3.765748
60.1887005160032	55.7953245109216	6.01941243043289	61.751375	53.5726	3.689653
60.1887005160032	55.7953245109216	6.01941243043289	60.964225	55.767775	5.605242
60.1887005160032	55.7953245109216	6.01941243043289	62.1796	60.091575	6.795975
58.2841984760004	53.715145911527	5.67344518231534	55.9361	51.897075	1.720125
58.2841984760004	53.715145911527	5.67344518231534	59.0369	52.162425	0.980631
55.6159085678325	51.6222276905814	6.85933103362298	58.59885	48.807625	9.719414
54.8033499792389	51.1334473735141	7.09981386059441	56.7604	48.090675	9.498427
54.1486291316947	50.7396116010441	7.29358342851515	54.870925	48.098925	4.394617
54.1486291316947	50.7396116010441	7.29358342851515	56.4549	49.1402	6.740043
53.4067462772285	50.293345037066	7.51314924723598	52.0729	45.66175	8.843258
53.4067460428466	50.2933452937459	7.51314921835856	51.464375	46.273425	9.764247
52.2944962022533	53.0270841921584	6.77416026280665	50.075475	49.526025	6.785114
52.2944962022533	53.0270841921584	6.77416026280665	47.81055	52.508825	5.320082
52.0210965329262	53.6990618357253	6.59251262579679	50.9611	51.5263	9.096967
52.0210965329262	53.6990618357253	6.59251262579679	51.8225	53.851	9.626807
51.5706491856881	54.8061997291019	6.29323290846616	53.1029	58.71345	6.825055
51.40341481976	55.2172378169413	6.18212192379933	51.0767	59.931625	7.815468
51.1710660686496	54.6902178607449	5.50825442370131	50.342	58.1772	6.133715
50.7491639183549	53.733245195599	4.28463865888055	47.802925	54.5327	5.178486
50.7491639183549	53.733245195599	4.28463865888055	51.731775	54.063975	3.386729
50.3173086072568	52.7536964730461	3.03215617766108	54.099275	51.121125	0.198175
50.3173086072568	52.7536964730461	3.03215617766108	46.119125	55.3112	3.945632
50.3173086072568	52.7536964730461	3.03215617766108	55.262125	52.9866	2.328913
49.0090527103166	51.4756720087365	3.13083646619216	50.5204	51.7746	0.922891
49.0090527103166	51.4756720087365	3.13083646619216	44.413025	51.821425	3.225875
48.6967587426821	51.1705936537371	3.15439346713887	51.332325	47.3944	1.206534
48.6967587426821	51.1705936537371	3.15439346713887	52.703075	49.56845	2.111726
47.4382225037737	50.4277395236734	3.38333838232979	48.801425	47.111675	0.180447
46.2531629608264	49.7282554978954	3.59891751833025	43.10885	48.272275	1.575949
45.7183235170242	49.4125648930112	3.6962129594456	47.35915	48.071	7.780887
45.7183235170242	49.4125648930112	3.6962129594456	46.718325	46.79505	7.837302
45.0655900922478	49.2242999465429	3.54944836363346	43.5222	45.0811	1.214529
44.364595886951	50.155621904091	4.0011496309541	40.7628	47.39015	6.093812
43.9824459255017	51.1292277182002	4.26147931091296	42.80595	50.969325	5.199786
43.6166336953306	52.0612096966655	4.51067935089496	44.549375	51.8385	4.639375
43.6166336953306	52.0612096966655	4.51067935089496	43.054225	52.07985	5.94327
43.2462694387174	53.0047888317754	4.76298032528235	45.616825	55.349625	8.112205
43.2462694387174	53.0047888317754	4.76298032528235	43.47965	52.4779	9.729662
43.2462694387174	53.0047888317754	4.76298032528235	41.3638	51.811825	0.610596
43.2462694387174	53.0047888317754	4.76298032528235	41.89655	53.797625	8.251962
43.2462694387174	53.0047888317754	4.76298032528235	40.529725	53.231175	6.058478
43.2462694387174	53.0047888317754	4.76298032528235	39.658325	53.39295	5.48876

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.2462694387174	53.0047888317754	4.76298032528235	38.966475	52.166125	2.317575
43.2462694387174	53.0047888317754	4.76298032528235	40.703325	55.537825	6.299364
43.2462694387174	53.0047888317754	4.76298032528235	41.323875	57.06515	2.903463
43.2462694387174	53.0047888317754	4.76298032528235	41.765825	57.606275	4.678763
43.2462694387174	53.0047888317754	4.76298032528235	40.468775	56.35765	3.688499
42.5055929584788	61.0150327045657	5.26097876663055	45.110025	59.219325	7.835164
42.5055929584788	61.0150327045657	5.26097876663055	44.541975	62.0002	4.336081
42.5055929584788	61.0150327045657	5.26097876663055	42.114525	60.87195	6.966651
42.5055929584788	61.0150327045657	5.26097876663055	39.243575	59.34405	2.988695
42.5055929584788	61.0150327045657	5.26097876663055	38.122975	58.912025	4.096565
42.5055929584788	61.0150327045657	5.26097876663055	43.7645	63.186425	9.005722
42.5055929584788	61.0150327045657	5.26097876663055	42.88515	65.09985	8.113938
42.264510574758	63.6237248778558	5.42315917219421	44.4217	64.703925	2.042243
42.1004051450502	65.3994008253608	5.53355201395042	44.898775	67.784675	2.145396
41.8168299501502	65.7444625469092	5.84983788357958	46.228875	65.56925	6.129679
41.8168299501502	65.7444625469092	5.84983788357958	42.3891	68.379025	5.906332
41.3052401815617	66.3669929284621	6.420455559161	45.884675	65.715725	8.319043
41.3052401815617	66.3669929284621	6.420455559161	37.615325	65.262725	9.608735
40.7984326347519	67.4850177706731	6.18673940496142	39.7753	66.19835	5.821872
40.2446077305788	68.7067635667582	5.93134102516719	41.683175	67.299925	9.367966
40.2446077305788	68.7067635667582	5.93134102516719	40.205375	70.4585	3.559151
38.6579090768923	72.2070381407375	5.19963068731374	40.4153	76.30845	7.455735
36.8825323348556	72.353816710653	3.69782560943388	36.110325	75.95995	0.32151
36.111923562732	71.2855083823219	3.916187401253	39.430175	70.428325	1.436461
33.7027141922649	67.9455795487685	4.5988664100835	34.7277	67.482525	7.589491
33.7027141922649	67.9455795487685	4.5988664100835	31.583525	68.6781	7.867205
32.6999286281159	66.5554003707361	4.88301836111771	28.20205	68.6988	5.301267
31.4216850319078	61.3296412031838	5.5981794908804	30.688625	60.637275	0.70091
30.7692481132557	58.5582215249727	6.20296004430198	26.5978	58.30075	8.947543
31.4575368553433	56.8067418787523	5.86539595996278	30.732825	57.781	6.904491
32.3146890684104	54.6255577785255	5.4450156333979	36.8297	55.690525	7.310631
32.3146890684104	54.6255577785255	5.4450156333979	32.800625	59.186225	6.71386
32.3245531874535	54.5874638820782	5.43595544698251	29.2116	52.625	7.111098
32.3245531874535	54.5874638820782	5.43595544698251	28.87265	55.2137	3.915468
32.3343132095612	54.5497722276917	5.42699092171354	30.1798	54.1346	0.93414
33.3110484265001	52.2877831279338	5.64853620641665	34.822	51.041775	1.965488
33.3110484265001	52.2877831279338	5.64853620641665	30.804475	50.3614	3.667235
33.7347375588967	51.3065720555442	5.74464046093629	37.074525	51.14655	9.462196
33.446685879625	48.3050222017803	4.24567047763002	37.32375	47.164775	1.301487
33.1001654714426	47.9560755646557	4.25787910039734	36.34605	45.558575	2.970524
32.7277301854317	47.5810326241366	4.27100074966733	34.241775	45.041325	3.482667
32.7277301854317	47.5810326241366	4.27100074966733	31.916925	49.63125	4.365548
32.360396985856	47.2111275055562	4.28394265250756	33.276075	49.648225	0.482877
32.360396985856	47.2111275055562	4.28394265250756	31.24645	46.9846	0.258005
30.9751530742814	45.8161769745452	4.33274407426317	26.549225	47.5983	5.827804
30.943988600698	44.9441724193492	4.15341471223629	28.231575	43.86655	5.176578
30.943988600698	44.9441724193492	4.15341471223629	27.251975	44.47235	3.840979
30.9194754389779	44.2582720535767	4.0123579698212	27.2689	42.18555	1.296271
33.4039617821211	42.5111439158559	5.28370300081157	35.77655	45.5234	7.314779
34.6005493310463	41.669686944811	5.89601324017121	38.0514	44.25295	8.429467
34.9565221783154	39.2294888920708	5.74264679731776	37.4906	38.735475	3.373994
35.2013795908433	37.5509873905957	5.63715281748119	39.47365	37.672175	3.042346
35.1745708173301	37.2197238503293	5.66191105377708	36.0198	39.389875	2.90819
35.1432392271475	36.8325740682034	5.69084617180887	37.4986	37.94785	9.024015
35.1432392271475	36.8325740682034	5.69084617180887	35.05695	38.887125	3.774047
35.1432392271475	36.8325740682034	5.69084617180887	31.7652	39.5927	8.134315
35.1432392271475	36.8325740682034	5.69084617180887	31.8731	36.0461	3.846108
35.1432392271475	36.8325740682034	5.69084617180887	32.29465	34.1886	4.533526
35.1432392271475	36.8325740682034	5.69084617180887	30.2641	36.115	4.866777
36.2613553685731	29.4948503181698	6.36614069433828	33.989075	25.3104	7.891632
36.2613569795651	29.4948508462076	6.3661399863627	34.098725	26.483975	3.010898
38.1886823225519	30.2616187501569	5.74324092556784	39.217825	28.48755	6.718496
40.1402730694071	31.0380404710557	5.1124994421122	42.344525	27.231625	2.735005
42.3917353430768	33.5897642202557	4.97361808846739	43.312375	33.022625	9.818329
45.4108869440518	37.0115652615322	4.78735899729307	45.015525	41.584025	2.803346
45.4108873502013	37.0115651885038	4.78735918125461	44.89855	41.381	7.163397
45.453590959488	36.979070923184	4.79254145630669	43.242475	40.8624	6.853519
46.0207595351663	36.5474961084518	4.86137022910636	49.0937	40.0849	6.606023
48.2785830432352	34.0927760432911	4.96338705783962	48.825175	33.4678	4.421401
50.1680252773964	32.0385616110102	5.04875845883914	49.014675	34.9475	8.94848
50.1680252773964	32.0385616110102	5.04875845883914	53.51985	31.610925	8.734185
50.7877285430309	31.344267112421	5.04573408735879	49.821325	32.088775	0.505787
50.7877285430309	31.344267112421	5.04573408735879	53.08505	32.116125	1.177184
51.9046954034197	30.0928540647418	5.04028166551138	49.48335	26.949275	8.082485
53.6798644514262	28.8501104243346	4.6455513972166	53.429725	29.230175	5.838259
55.6956300320978	27.4389319269527	4.19732147632339	54.7913	22.79115	2.590985
56.2931187790908	27.5919821235088	4.26000805469502	56.18475	25.5187	0.990177
56.9938666723682	27.7714827342211	4.33352837171872	52.727475	27.05645	3.021539
56.9938666723682	27.7714827342211	4.33352837171872	58.5251	25.335175	8.213376
58.0779291790818	28.0491714032653	4.44726527352065	57.8987	27.066925	9.346556

Solution x	Solution y	Solution z	Original x	Original y	Original z
64.1318555057491	29.6376005846376	4.88449669221741	68.792375	27.90175	4.368368
64.1318547050215	29.6376019276207	4.88449707875167	65.757275	28.49595	9.473031
63.9487480540556	29.9193690313993	4.89664608596266	67.6691	30.587025	1.957775
62.5073028839169	32.1374688512776	4.99228824670328	59.25755	30.092125	1.789844
62.5073028839169	32.1374688512776	4.99228824670328	59.6161	30.5374	8.744708
60.4198102975458	35.541089302591	5.17466980566462	59.82755	37.21565	1.143092
59.7840497586385	36.5776816124203	5.23021675765635	60.313175	36.907775	7.157937
59.7840497586385	36.5776816124203	5.23021675765635	59.92645	35.207	4.720771
59.0599344739324	37.7583344568431	5.29348329459638	55.894525	37.29925	9.136585
58.8958472450084	38.6962163467652	4.88242211448641	54.125425	38.6935	6.380106
58.6269342176016	41.1864780980541	3.73866598416858	55.460475	43.213925	0.442759
58.7625080540142	41.2437873630323	3.82607617156935	56.281125	43.406775	0.357518
60.0685943750409	41.7958897556149	4.6681657526159	57.24125	42.40615	5.476964
60.0685943750409	41.7958897556149	4.6681657526159	58.980725	40.369175	5.096252
63.0407559641784	43.0522686029231	6.58444173307426	64.48255	39.62755	9.929967
63.2457829488146	43.3282436394297	6.60326067462965	64.627025	39.598675	9.161247
64.1708576591109	44.5734272985899	6.68816910688974	60.81405	45.86495	6.053591
64.1708576591109	44.5734272985899	6.68816910688974	61.33205	47.81805	9.220678
64.3008800162588	44.6559877242324	6.66355642203877	63.06625	46.073225	9.963062
64.4350448950634	44.7411785090191	6.63815956118632	65.024675	48.473875	9.912197
66.2501081609335	44.6110265137793	5.00146718117603	64.04505	44.910675	0.523975
68.1751928897838	44.4430616921853	4.63226513960539	70.163125	48.595475	2.681471
68.5292796285985	44.0528433602222	4.69473060119904	70.38585	48.289775	4.820236
70.2248351627199	42.1842702406549	4.99385007037472	69.4258	42.661825	9.2188
72.7353781934839	39.4175498300134	5.4367414610181	76.046775	40.829925	8.304908
73.3094256364129	38.7849254154707	5.53801102047814	72.419975	34.998125	8.679512
74.168144573867	38.8258316020192	5.00639963659795	75.0516	36.4713	6.125794
75.0172280216286	38.8662787976921	4.48075335260109	76.5757	39.19325	8.28894
75.0172280216286	38.8662787976921	4.48075335260109	77.736325	41.257125	4.306668
75.693100806194	38.8984748876709	4.06233728537437	74.186175	37.664625	1.593253
75.693100806194	38.8984748876709	4.06233728537437	74.4851	34.7013	1.961771
76.5658724141143	38.9400501208498	3.52202641087623	77.267275	35.3236	0.141297
78.828469630304	41.0789484713663	3.76100709348656	82.455325	37.974875	2.274181
79.836617195906	42.3659778617809	3.96309416774572	80.128375	42.2928	0.877447
80.8970294407347	43.7197298350176	4.1756579281784	83.98185	43.958725	1.112514
81.3648094638333	44.3169107728964	4.26942624549754	80.003925	44.278875	7.256115
81.3648094638333	44.3169107728964	4.26942624549754	84.710775	44.260425	5.70064
81.7269989100836	44.7792918533198	4.34202850644214	83.247325	46.458225	8.799584
81.7269989100836	44.7792918533198	4.34202850644214	85.82305	42.253575	5.699647
81.7269989100836	44.7792918533198	4.34202850644214	86.306375	44.08645	5.63357
81.7895053179836	46.1196551755873	3.10605033141703	85.726975	46.8848	0.120938
80.9782175377815	46.6802478545339	3.07836425675631	83.835575	49.221375	2.182226
79.9711688299143	47.376109473756	3.04399760741991	79.556325	49.1563	6.397826
79.9711688299143	47.376109473756	3.04399760741991	82.166	45.384	5.835084
77.3371355152826	49.196203572542	2.95410616250306	74.018375	45.692475	4.261669
76.5168617904827	50.1825545686945	2.82328355130651	75.70595	48.354275	5.510084
75.4585233237843	51.4551702180638	2.6544927919332	74.97575	51.8098	4.043794
74.4713424692177	52.6422213195975	2.49705071823338	70.20275	51.264575	0.287703
74.5061747168898	56.9733990057238	3.52933608700998	74.7548	56.66355	6.610021
74.5061747168898	56.9733990057238	3.52933608700998	75.12385	56.355025	6.655597
74.5337223854568	60.3987405325407	4.34572571725441	78.897475	61.3791	6.581026
72.4170251632041	63.8915111187469	4.19260052907063	68.033375	62.578975	2.177441
72.2743180718719	65.4747670602625	4.45007523377162	67.8084	64.88	6.618444
72.2009653834928	67.7261253347881	4.75125979021532	73.97555	66.71955	2.504
72.2009653834928	67.7261253347881	4.75125979021532	74.919425	66.332825	2.561604
72.2009653834928	67.7261253347881	4.75125979021532	75.320425	66.338125	2.101527
72.2009653834928	67.7261253347881	4.75125979021532	72.106325	71.513625	4.730422
72.2009653834928	67.7261253347881	4.75125979021532	74.758025	68.76505	2.771423
72.2009653834928	67.7261253347881	4.75125979021532	76.3481	68.05155	4.299693
71.9520798358508	75.364928118161	5.7731723021077	75.94035	77.0935	8.244154
69.9215708460678	77.6620865685856	4.99751019981343	67.97015	74.943825	1.28227
69.9215708460678	77.6620865685856	4.99751019981343	69.349625	77.516575	1.446757
69.3417388229616	78.388831921951	4.81867925945505	65.721375	76.70655	7.829144
69.3417388229616	78.388831921951	4.81867925945505	67.096325	78.407125	5.545343
67.925879065648	80.6579675415442	4.0538663346007	64.2971	80.8087	0.617407
68.7324337367725	82.5251675148375	5.3129815992413	71.96685	79.285825	7.324255
68.7324337367725	82.5251675148375	5.3129815992413	66.686275	83.4025	9.789982
71.4028428630491	88.5824968510184	3.68855760722112	75.589675	88.707575	0.958209
71.3117316649778	88.7733275053211	3.75176200347938	75.8385	89.39705	2.129044
69.6509214523271	92.2518809166535	4.9038928688158	72.88955	91.55335	2.086078
69.6509214523271	92.2518809166535	4.9038928688158	72.374675	95.981125	5.386278
69.1892015239412	93.2189421991595	5.22419108360013	66.508125	91.303225	8.984758
69.1817686272408	93.2423893123908	5.22735886315042	64.46975	94.91155	5.12346
70.0686483226234	93.8331613312409	5.39176126264736	67.679475	96.828325	2.179153
70.0686483226234	93.8331613312409	5.39176126264736	71.306475	97.9771	2.882666
73.4007826830874	95.3202287065121	6.49772529622764	72.222075	99.2555	9.348041
75.6685018234643	95.2540537903062	6.46698244339914	74.44305	98.0205	8.628544
82.8296872550638	95.0450803939446	6.36990085092297	84.730325	97.611875	9.216212
83.8436266540323	95.0154922310666	6.35615507606149	86.192975	99.203225	7.750239
85.5876077599171	92.7228944672591	5.58149974745701	84.25115	92.664475	5.874601

Solution x	Solution y	Solution z	Original x	Original y	Original z
85.5876077599171	92.7228944672591	5.58149974745701	89.0595	90.291	3.16566
85.5876077599171	92.7228944672591	5.58149974745701	84.77555	95.283075	3.666391
85.5876077599171	92.7228944672591	5.58149974745701	84.9479	97.513325	6.355392
88.7963832170649	88.5047027440497	4.15620193043217	92.685275	90.310575	1.584168
89.2078878657081	84.4704037047226	4.39991308367496	91.03755	80.9252	1.385966
89.2078878657081	84.4704037047226	4.39991308367496	87.858275	88.334025	4.100051
89.2078878657081	84.4704037047226	4.39991308367496	92.480625	84.1266	1.286063
89.2078878657081	84.4704037047226	4.39991308367496	90.195175	89.03695	6.180904
88.9382492390881	78.344529078566	5.35601155499934	91.825175	77.123475	9.251483
86.1836719687936	73.0902783177676	2.99704115607457	82.150425	71.4598	0.532397
88.8566409216119	72.1475670494204	4.30027197648805	91.08095	71.69145	1.548548
90.5754245715655	71.5413826368278	5.13828167665714	91.5733	68.725	1.37953
90.5754245715655	71.5413826368278	5.13828167665714	90.314475	71.662575	4.957094
91.8956352135028	71.0757682483492	5.7819636313996	94.404	75.185075	7.131673
92.8807809263733	69.6971746949614	6.23611235482098	90.725625	70.444425	7.760216
94.4233318585717	67.5385603546477	6.94722290699746	98.93765	68.322275	8.948906
92.714457277323	62.505289556482	6.24245702665856	92.124775	61.791725	6.696503
91.4202251004928	58.6932955094581	5.7086960775258	94.377175	57.5521	6.223661
90.1876676517573	55.0629569396062	5.20037074472737	85.3769	55.416	3.88436
90.8031107214379	52.2034908036951	5.23928092434084	95.486225	52.746525	3.57388
91.1939313416524	44.1627939391212	5.81148112252883	94.807975	43.25145	7.382414
91.3014769356856	41.950156522137	5.9689390844902	95.9689	41.808	7.756384
91.0008615269105	39.7631293215879	5.96939261715764	92.049975	40.056175	5.962344
90.6767883567096	37.4054429538592	5.96988153938201	87.349525	37.1432	9.692858
90.8423845310464	34.4014185057707	5.31610603330868	90.921925	35.308625	2.502062
90.8423845310464	34.4014185057707	5.31610603330868	94.997925	34.851	5.629957
91.1053531172579	29.6309820637773	4.27790089799662	95.640625	28.68455	2.397586
88.1021502600196	24.6292951719103	4.41396497817244	83.1155	24.690275	4.773978
93.2976107023362	15.4418707491109	3.89265917040524	96.9141	16.74635	0.695888
94.941030822255	9.41135413227965	4.87769761201335	94.81355	7.137025	0.426722
95.0440898132751	9.15193850751687	5.12892845858108	99.82775	8.49955	3.828547
95.0440894504161	9.15193087983843	5.12893729018285	98.6909	7.723575	8.237085
94.181600054551	8.89450115483729	5.0932189546718	94.09005	9.358875	9.999877
88.7298658041119	7.26731959216794	4.86744969536354	87.3023	11.937375	5.783418
81.86113169367	5.21717219972751	4.58299329861538	79.6523	4.144625	8.31435
81.86113169367	5.21717219972751	4.58299329861538	82.33615	2.420325	8.700274
79.094179489095	4.51354071141585	4.29796578823165	77.882675	4.11235	4.515775
77.0310612794571	3.98889346032231	4.08544149482309	77.335225	0.00945	1.073545
73.8758779825058	4.20381943060477	4.52354361226527	69.817575	1.306825	4.894499
74.4603587312897	6.31229859473951	4.57273479838173	71.829525	5.85575	2.05089
75.6957697563025	10.768977600804	4.67671082816597	76.1173	11.832075	5.793623
76.5436596492905	13.827690367435	4.74807139686122	81.52085	13.687775	5.204149
75.8215738914774	17.1455428238833	4.67512809787103	77.472675	18.057475	0.141489
75.7354383256915	17.5413192224295	4.6664265660621	77.750225	18.79385	0.265085
74.9759894446066	19.4350083916273	5.2889044539661	76.538875	22.08605	1.37194
74.9759894446066	19.4350083916273	5.2889044539661	77.464	15.628175	3.533669
74.8481493380113	19.7537768671591	5.39368799781307	76.27055	23.463675	8.429053
74.8231725126074	19.7472480582199	5.37432371185066	75.41995	23.365625	8.701179
70.5925533650372	18.6413944960999	2.09435590610257	65.789175	19.559925	1.053267
70.5925533650372	18.6413944960999	2.09435590610257	66.273425	16.5814	2.463993
70.5925533650372	18.6413944960999	2.09435590610257	75.3053	17.780525	0.662947
66.5379923366821	17.6375041385456	4.51232175085294	64.881075	21.1972	7.607995
66.5379912006211	17.6375036529805	4.51232229802077	62.8697	20.929125	3.670375
65.5259354295289	14.1218234950482	6.7296481129143	68.784175	11.8632	9.776368
64.0929100643274	13.5979828940363	6.52784066566484	64.181275	8.885925	4.857898
61.1086900779021	14.5967556269842	6.84858988371134	59.666825	17.15215	3.601254
61.1086900779021	14.5967556269842	6.84858988371134	58.66755	14.455925	4.659081
60.4074365573317	14.8314554084449	6.92396182178193	56.7601	13.3255	9.545614
60.4074365573317	14.8314554084449	6.92396182178193	62.944875	12.9098	8.420704
60.4074365573317	14.8314554084449	6.92396182178193	61.5062	10.2838	8.047741
58.7634840794603	15.3816633729197	7.10065654727204	58.962525	15.549225	6.884037
57.0891614300845	15.9420358139728	7.28061550226756	56.680125	15.845675	6.62366
55.5007659239411	16.473649622584	7.45133889214623	56.46315	20.9863	9.377425
55.5007659239411	16.473649622584	7.45133889214623	56.145325	18.970525	8.712859
55.0975157613666	16.4973301103865	7.44796726603746	56.707375	20.9848	8.081779
53.1979833694468	16.6088795875167	7.43208561194151	53.686425	15.19815	7.953267
51.1148101856201	16.7312133726404	7.41466859371639	47.99765	20.639375	7.512605
50.4403037866918	12.7105213514599	7.27386728857446	54.0981	10.209075	9.589747
46.0695324843134	8.7037558972099	4.95338084294949	44.6523	7.1683	9.495828
44.9477733837841	7.68461016149953	4.15184868302538	46.59205	4.24755	0.914106
42.7776847827654	7.8787728840996	4.53934441485607	43.2503	8.7931	9.432262
40.4172308390505	8.00430232417498	4.51510927442878	40.4237	12.94705	3.760655
40.4172308390505	8.00430232417498	4.51510927442878	40.718225	8.45085	2.325605
33.3287976538244	7.64097424090105	4.55533674855854	33.240325	8.160175	9.454403
31.1625707286275	7.52994090999863	4.56762720357597	32.636425	9.71905	0.854223
31.1625707286275	7.52994090999863	4.56762720357597	32.5307	9.603625	5.102178
31.1625707286275	7.52994090999863	4.56762720357597	28.471925	7.124375	1.494169
25.020461656228	7.21511508833206	4.60247160551852	25.090375	4.2535	0.574579
17.8238356506503	6.94699687593733	4.78015328133894	17.13825	10.254625	1.09375
14.2161026503511	6.34711626904908	5.3863865165434	13.011825	10.0758	8.49229

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.0760784688176	5.71389781764881	5.25008129472317	16.533825	6.314025	5.413684
13.0760784688176	5.71389781764881	5.25008129472317	12.34295	3.720825	3.558355
11.0166553446373	4.57000564888243	5.00384954094187	10.7326	2.49095	9.542224
3.7813688623667	1.5686136735611	1.71752671373986	2.34935	1.70725	1.418964

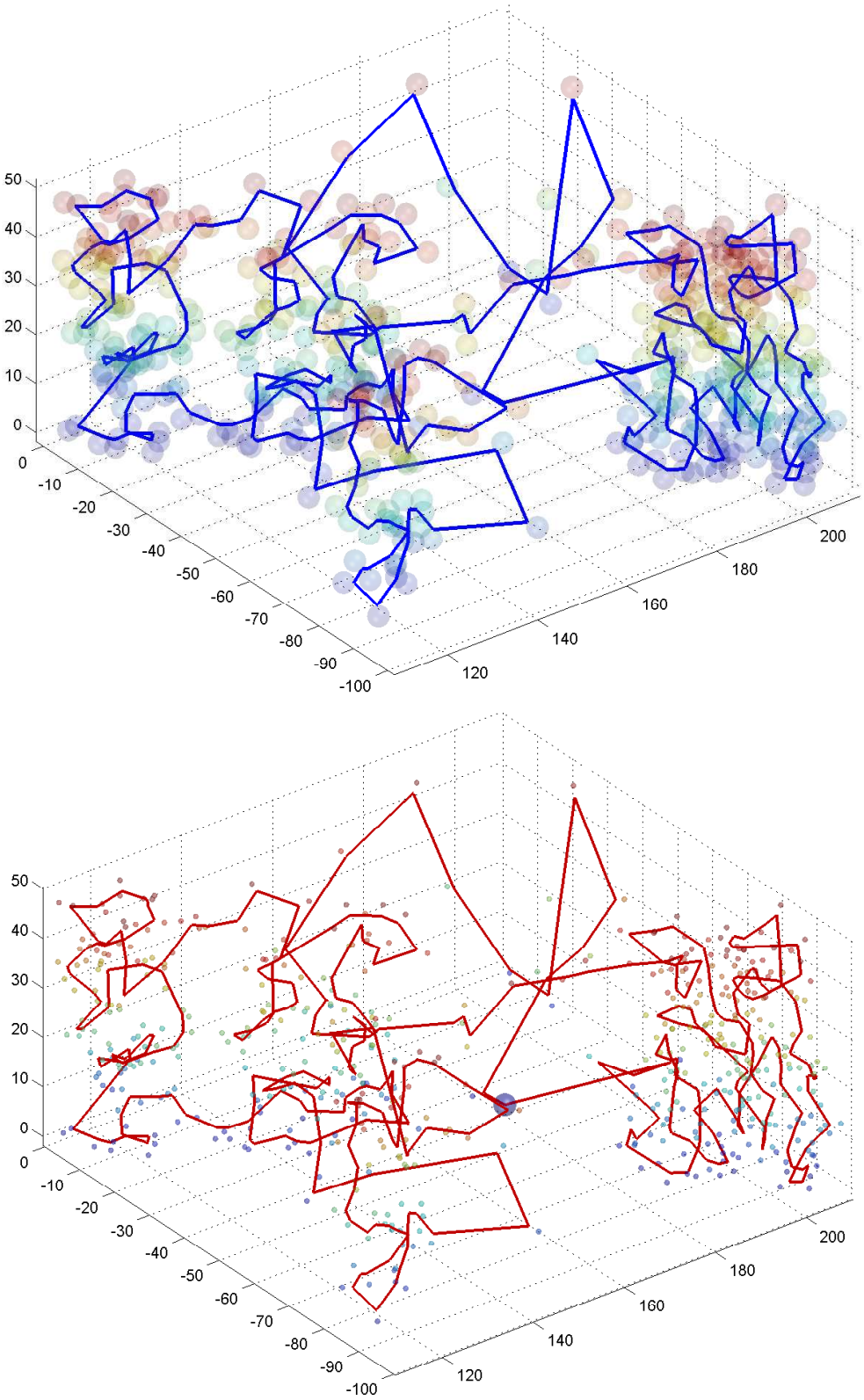

Figure N.67: *team*5_499, Equal Radius, 3D, Euclidean, Length = 1924.5265029

Table N-70: Solution for *team*5_499, Equal Radius, 3D, Euclidean

Total distance: 1924.52650293003 Depot: x 70 y 40 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
66.7616165222286	38.0641608711625	2.6585177665477	64.954	37.309	2.2557
78.8944213225705	40.192812111838	22.4098937146876	78.1743	38.6355	23.4376
84.470238418619	43.3494751973507	28.1377718589387	84.8772	45.0654	27.1944
90.6419001155837	44.7966088413416	36.353529328745	91.1956	46.5873	37.0515
97.1271302262344	24.6668958649033	45.4967891277534	97.6128	23.6668	47.1593
94.6050009430647	23.8842631957235	25.3573970990993	92.9329	22.8145	25.5988
92.4153309078281	23.2540729615174	6.6566618715035	92.0943	24.688	5.2999
93.667866856	10.6058612344639	5.55607922145533	94.4757	9.4701	4.1216
85.0949203642349	5.97920583508593	22.5004378636148	84.9979	3.9891	22.3271
73.2546121904353	9.49091549720073	47.7682774664869	73.9225	9.6395	49.6476
58.227794341624	9.80808893540842	40.3758072930988	57.0413	9.9678	41.9779
45.0907371298111	9.61884257738879	26.3408399770972	43.1416	9.2079	26.5197
51.7651036247086	12.8491067339435	14.9610038258721	52.9148	12.3625	13.3985
46.502790465077	19.5931625159944	20.390341805049	47.312	20.115	22.1433
42.5306290787413	21.6002381981115	19.369757922867	41.315	20.08	19.8292
39.3903431302055	24.5674700719281	18.0637054460072	37.4163	24.6203	17.7469
44.3054105900842	28.4367507998239	17.7393174191232	45.5527	26.8832	17.5652
47.121719753223	30.784626947153	17.5581813280594	47.2249	31.4694	15.6819
48.2999626772774	31.4744404504502	18.3951383656034	49.5874	32.9921	18.1971
47.548137047657	29.1493466127366	20.6066732031233	48.0614	30.3792	22.0976
46.7713148289192	26.7564285091261	22.812460764122	48.2875	25.5427	23.29
43.6106479370195	25.9831952963552	24.5030017614013	41.7938	26.8087	24.3703
44.9591009467533	23.0294131773718	26.6379292872783	44.6412	21.1681	25.9788
47.742061707368	23.6844291278699	31.4552194463837	49.2796	22.4102	31.3443
48.472436174816	27.0411324609986	38.1160147003391	49.7446	26.3767	39.5089
43.7919285276189	33.514047015724	39.3073712018822	41.9344	32.8635	38.9519
43.6664501377479	34.5888883729634	39.5712401231531	44.5785	34.1629	40.8334
43.4178001353314	36.7189127976952	40.0941756071516	42.5333	36.3249	41.241
43.161750803418	38.9122899941413	40.6326675438943	44.7486	39.7162	41.5468
39.5520766039307	41.9495436390875	39.9903879138796	37.6461	42.0792	39.3984
45.806968720239	46.2631059905666	42.7459795110103	47.084	47.7144	42.2332
44.4596379056813	42.7913764830253	46.9441733675639	45.8095	43.1051	48.3862
42.41937363466	40.4604291900846	48.078657200084	43.5486	39.6053	49.4906
37.8587182811929	37.5308098632915	48.4458370823402	38.1953	36.049	49.7462
34.0813672728196	37.1637923758316	47.1399297591788	33.3877	38.8388	47.9844
25.149128340245	34.2682536264157	42.789991741429	24.2607	34.0424	42.9391
23.9989238826377	33.8953920402339	42.2298507932951	22.8416	32.9746	42.6888
23.6798500013139	33.7919533950506	42.0744611141819	22.0871	33.226	43.1435
23.6791367619194	34.0575366336229	32.1860630210317	23.8984	35.8981	31.4349
23.5977825029051	33.4002783710773	31.5386540755145	22.2385	33.2025	32.4261
23.334137314431	31.2707714182269	29.4411444087331	24.4655	29.9184	30.3851
22.2872229127584	28.2847928042272	25.3135326737928	23.4789	26.9268	25.8998
22.0038138468498	27.4763800010618	24.1960366992906	21.333	28.4534	22.585
22.1517755787377	25.7398996833405	24.0083662481595	20.1974	25.6106	23.6453
22.2630679320643	24.4518709554262	23.8694423834608	20.821	23.0825	24.0822
24.6912475267635	24.0427220677943	23.2722756989567	24.5672	24.4137	22.4773
27.0625805043027	23.6431531697453	22.6890889250248	27.0718	22.4926	21.0532
29.8538810891089	24.1463862209619	23.3867344135389	30.3241	25.8121	22.3846
32.0489082432913	23.5141329210817	24.6634614905253	32.1965	21.571	25.1134
33.8377132864149	24.7731009653139	25.3641619908255	35.5448	24.2684	24.4525
34.2203897869146	27.1943058347654	27.5072441530396	35.1494	28.8106	26.783
32.9635365301064	27.5168435649641	31.9764481861473	33.916	28.6484	33.3227
29.4324342344891	25.04255553635	32.9046462025447	29.0027	23.8765	31.3376
27.4515894924203	24.52615782893	35.1181897293415	25.9644	23.203	35.3119
29.3830804755465	28.5661118619896	38.5103395188197	28.8128	30.4765	38.3516
31.7239873865295	27.4381933402473	40.9854103078848	31.0534	27.3935	41.3669
35.933643207052	25.4098719170154	45.4363229552881	37.8149	25.869	45.9364
30.5373278156657	20.3933295741227	48.0357496903979	29.6006	20.2054	49.7928
30.0052752911667	15.6153013964574	40.1009988881221	30.7692	16.7931	38.6765
28.1350326946396	9.82299113417055	37.0274092811987	28.6149	8.2266	35.9223
22.2077717966986	14.3527308653185	41.3468143055732	22.1476	14.8515	41.0167
18.9524454913411	16.8405626587374	43.7191071542351	17.8934	15.1905	44.1135
18.8963000152004	16.8894577724201	43.7609234547867	19.3111	17.5672	45.5963
12.8968755091268	18.4742091353238	40.7093473947796	12.295	19.9912	41.8654
11.4366409179182	18.3902786822947	39.4610195860068	12.3192	17.7013	37.8038
2.11482560383403	19.4328908198755	36.6386929011624	0.782799999999995	19.7397	35.1787
3.30712269493448	18.4671648340812	42.5729267683596	4.753	19.8404	42.7266
3.51461104927297	16.8905227957646	47.5045462725948	4.024	17.3232	48.8138
3.53368565416395	16.7456045328123	47.9578390394292	3.76260000000001	17.1174	49.9096
2.69935023048973	13.4724950715998	44.013088581771	2.4914	14.471	42.2927
2.52583012290737	11.5019377150922	43.7168830456826	2.4532	11.1564	41.7483
2.09033111926628	5.50835109531672	47.0058790066065	1.2192	5.9144	48.7598
2.45560185686166	3.42397135694031	47.0156628135476	1.2646	1.8964	47.5137
8.52599111213783	3.48144420223085	44.9691671121182	8.8668	5.4121	44.5737
10.8113620361139	2.31933141220859	44.3711059273557	11.5459	0.8736	43.2005
11.8179278431194	4.5639116400598	46.6229558667203	12.1595	5.1953	46.5778

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.2787909565949	5.59161220686637	47.6539860479821	12.5256	4.7007	49.4275
13.5402310181037	11.1975946297349	48.1093354126576	13.2666	12.9678	48.999
14.3820532321355	10.1626685262675	46.8325001573463	15.7685	10.3669	47.703
15.6791750195905	8.56792921270252	44.8649247054116	16.1355	6.6685	45.2938
16.3365659689045	9.60117335566492	42.3253162296017	18.0288	10.2093	41.4498
14.8325012615801	9.50513970482974	41.8767333883757	15.3812	8.8682	40.3179
12.950474677465	9.38498008323594	41.3154412857593	12.9432	8.6486	42.1679
10.1595034048275	9.20681189750833	40.4830762806108	9.9074	11.0867	39.8487
8.7195567696732	8.65782376189365	40.1884372478561	8.098	10.1576	40.7441
6.69495563039797	7.88591922178048	39.7741760766464	5.4781	9.3534	39.1694
5.9957931860902	6.61552660825682	39.8160768726508	4.1301	7.1548	40.2018
5.97116580900031	6.5708252653943	39.8175570148494	5.49809999999999	6.1028	41.7036
5.09436795369663	4.60400606467312	38.0987178239462	5.6082	3.0104	39.1925
4.94097687358901	4.41631498624431	37.7931550230998	3.9756	4.3104	38.409
4.78377422357427	4.22396568697386	37.480001806054	4.1027	5.9391	36.7092
3.84576714895873	2.92987551043138	35.5776380164172	3.8933	3.6617	34.8265
3.12300421200311	1.93276814674432	34.1118476920449	2.4773	0.052	34.3258
3.0780258241525	2.53447598031272	32.9995997086215	2.87569999999999	1.3778	31.3806
3.27326564019263	6.13814514475347	32.390242231053	1.4037	6.1535	31.8542
3.44050966982407	9.21628101304091	31.8698928539004	2.67230000000001	10.4123	33.2768
4.23815866730388	10.1037036646129	30.2718129233432	5.0355	11.9367	30.2057
4.046105606067	8.42204854077325	28.2798505675933	5.6246	7.277	28.7239
3.03657405642444	6.78063447844412	25.4697066007243	2.7247	6.6491	25.454
2.28753702472174	5.56276724405566	23.3846831102523	0.421099999999996	5.2548	22.7354
3.9781794212858	4.98887528649359	22.550718875978	3.9473	4.1638	20.7291
4.50396956549247	5.0581537931661	22.8359680538203	4.0211	5.0495	22.5141
5.19379853577709	5.14905380061238	23.210208715174	5.20059999999999	6.8919	22.4547
9.38742688713302	5.70163993260329	25.4852772179875	10.2894	7.4847	25.4008
9.52627089400997	5.47170734472614	25.646200331727	9.7281	5.4172	24.1163
9.7407324959589	5.11654386732297	25.8947639504218	10.526	3.779	24.6321
10.7053726609569	3.58786682416738	31.0759073291541	9.9632	1.8111	30.9688
10.7620391364552	3.49802400383583	31.3802960818129	9.42529999999999	3.1222	32.8197
10.7620909506747	3.49802094169965	31.3803030000359	10.6256	1.7583	32.3574
17.1209252024508	5.14331080973918	31.0051179508543	18.6523	3.9117	30.6336
17.2163043969176	6.92239214895943	31.3025449018017	18.047	6.7045	32.7171
17.2945227889507	8.38123339621968	31.5464365246101	15.5961	8.5134	30.9972
17.4008721473764	10.3643828373811	31.8779778087125	17.3372	11.1211	33.7282
17.6566871626978	12.1150167104688	29.4893196123136	16.6256	12.3206	29.6782
18.0270105306665	14.6491701753745	26.0315938264038	19.0819	14.2893	25.2658
18.1270235244416	15.3335499531499	25.0977789318223	19.7672	14.9362	24.0245
16.0273231464922	18.1910536635261	23.5932150813423	16.5052	19.9903	24.3242
14.6614675864826	18.2511548169125	22.3292721978457	15.42	17.0914	20.8872
13.5326044376249	18.5791644057179	21.814466893592	13.9396	19.5452	20.1112
12.2462230643069	18.552360326223	21.9257019657015	12.6858	19.6571	22.2672
9.26178846320384	18.4902167746094	22.1837642339425	9.20950000000001	19.5087	23.9042
5.55159491635433	18.0712869057392	21.9294504086649	5.3173	19.9696	21.9865
3.05638991796121	17.7894147106276	21.7584111664868	1.5116	19.0597	21.7588
3.16034473249962	16.5251270350114	21.6716745599126	2.785	16.9995	21.2146
3.34867272185298	14.2346089224966	21.5145634389253	2.3396	12.8751	20.4499
3.54721031614336	14.2131283134444	21.6836061004067	3.6086	13.0876	23.3357
5.14141124548662	15.5312173789554	20.9099512589687	4.8686	17.5054	20.7421
6.29724242796749	14.9559593904711	20.5577597764211	6.693	16.2603	19.0942
11.0731555320847	11.8616595074626	19.7441853412191	11.8636	12.6991	19.7066
13.3447718642015	10.389884374042	19.357204128545	12.8565	9.4609	19.9198
15.625051840943	8.91249531695956	18.9687482750622	15.4595	7.4752	20.3496
16.9947861217699	8.56253768152679	18.2646634633472	18.8587	8.5087	18.9878
15.6707020520367	7.85714690909895	14.7909639922248	16.2452	9.322	13.5564
13.1633631443929	4.74563512237564	12.4149086881135	13.8628	4.3052	10.5937
10.8803466539728	3.42796122164827	13.1292903880367	11.5168	3.287	14.9558
9.37274593294906	2.55789118635473	13.6007922484512	8.02670000000001	2.1019	15.008
10.0923699177459	2.34942586141489	11.4595784369712	8.95990000000001	2.5066	9.8186
10.3265397019279	2.30552014012935	11.4644211900361	10.31	1.5005	9.6337
13.7767942041669	1.79319495001373	11.8405268281628	13.7484	0.7577	11.0651
17.0630427633233	1.30529207714492	12.19880765107	18.2952	1.0836	13.7585
17.309245186615	1.32771302076515	10.0527530636899	19.0824	1.094	9.1576
14.7011920620794	1.74922808921048	8.50248370103508	14.8098	1.8409	8.2695
12.3391081815651	2.13099855873241	7.09845763216153	13.2084	1.5682	5.3875
10.9237579815762	2.37631490932416	6.34450072244925	11.169	1.5527	6.9406
2.95351099684157	3.75779282665642	2.09896093805025	1.729	2.5191	1.116
2.87285686250449	5.23931714989325	2.39043167614753	1.2522	5.4022	3.551
4.35887799369968	9.51420890810817	2.02805018098998	2.5621	10.2967	1.629
5.33818361683356	11.2565429236484	1.9404381921917	4.24299999999999	12.8676	1.4876
8.2778917149613	11.7283577968144	2.4137398675166	8.40090000000001	11.7989	4.4087
12.9739440778255	12.4261043962959	0.996286914098957	14.7479	11.7757	0.3405
9.38383421395264	16.5309940743786	2.69060809926661	9.00749999999999	17.4052	0.9316
8.09368773058029	17.8319522720994	4.05929276285635	8.65000000000001	19.7295	4.359
4.06557583791661	16.235739521293	6.28463453674018	2.2625	16.1551	5.423
4.72982908398255	15.2285488535829	9.64085818371244	3.5607	15.7968	11.1608
8.91457265406004	12.1925418543477	10.3796950586265	8.6382	10.3371	11.0732
11.3807315863734	12.9981843262816	9.87813616574115	11.3126	12.1774	8.305

Solution x	Solution y	Solution z	Original x	Original y	Original z
14.080357709165	13.8801103250073	9.32912881673947	15.3264	12.7877	8.2093
14.6082202767535	15.5061251072135	10.0615397042408	14.5843	15.7568	10.6354
14.9422691713918	16.5351453306188	10.5250586875997	14.7151	17.4542	12.2868
17.0918224303824	17.5741616182518	6.34503799679872	15.9493	16.7531	4.9236
19.0979884754115	18.7381629829445	5.07722935488536	19.5822	17.4941	4.8723
21.9192905436605	20.3751663718848	3.29430575781148	20.9805	20.9752	1.6334
22.4006428513192	20.5503924765913	3.19501010594023	21.8127	22.4456	3.4445
23.7716448461609	20.9776308093457	2.90781726903521	23.4201	21.9457	1.1934
27.6578945585436	21.5745069747918	3.11285475059027	28.392	21.3903	1.2616
29.7600483360611	22.141819087807	4.7788447972776	30.4469	21.4825	3.8833
33.6827267985764	23.2004322291834	7.88762623795282	33.6715	23.2449	9.8871
37.2357297081531	24.026700858008	5.09684948344132	38.8284	23.4703	6.171
38.1964563867256	24.7945289516115	2.97654972522437	37.9243	23.9119	1.2026
41.9904935376605	30.4751739940965	4.05696621664228	43.0635	31.4686	2.6925
41.675499332283	31.2734870032025	7.42676033922854	40.4113	32.0356	8.7762
46.0388637786107	29.4735091252896	6.911156377914	45.8434	28.1097	8.3609
47.3428406779285	29.1165909311324	6.57831452117078	47.7847	28.4345	6.8217
48.141954145316	28.8978564802415	6.37434792573821	49.2766	27.3707	5.7576
48.2501380946109	32.6395869613196	7.36097316112048	48.8851	33.6728	5.7706
47.293180685307	36.3899702872524	11.6292934952397	47.2998	37.9687	10.4015
46.770510771429	38.1437334922831	14.1805729085381	47.3754	37.9401	16.076
43.9616379058559	41.5771432665358	11.9834919247692	42.0622	41.0674	12.3472
43.7584556022744	46.7447756172165	8.61135608979288	44.7377	48.2657	7.7582
37.1102739642589	43.2167495612709	10.0035205265669	36.302	43.7274	11.7602
33.7594336060224	39.1918732841803	6.90933985190759	32.6566	40.0511	6.9534
30.7086107310457	35.5273069360125	4.09216843870575	29.5705	36.67	2.9094
29.8723773025923	32.7646363662448	3.41242104871728	30.555	31.3009	2.2328
29.3373940095741	32.8499107308409	3.84160548010849	28.4031	32.2444	2.4033
26.9736386556845	33.2265428508406	5.73768235855135	27.0476	34.4285	7.3345
22.4248263051752	30.2807968014406	4.37767497111166	20.5677	31.0115	4.2467
22.9865490603356	28.2402470817181	4.01805020257036	22.5985	27.2784	2.308
25.5849851107922	25.9320955932101	8.24334637086375	26.5855	26.5008	8.649
26.2082601392719	25.3784627932506	9.25685304192958	27.7157	24.2487	8.5851
26.0371941959759	25.1636196216554	14.4554555207282	25.1657	24.0751	15.8892
30.2449657433037	30.4177560289798	13.9116931972721	30.1704	30.5441	13.3093
33.1783798962976	34.0806315546187	13.5326221921182	33.7228	34.609	11.6821
34.4931731422271	35.9592060574175	16.1448935289033	36.1356	35.5262	17.2008
32.4965728598305	38.6466155859626	16.5775084419112	32.6554	40.5505	15.9859
28.7895891342222	36.0712769405295	19.3709845164151	29.0396	36.1372	21.3542
26.2090109797686	34.4233834862889	18.3945817762692	26.8183	32.6012	18.9499
21.9838038303305	33.180545923362	16.5821294743628	20.8616	31.8567	15.5881
22.2813576605619	36.545929640523	18.4006187594368	20.4824	37.2243	17.8497
22.485973324117	37.2033157452473	18.828148233552	23.8226	36.8408	17.9115
23.4943076915719	40.4424067242119	20.9347493676142	23.1185	40.5549	22.8959
25.283470239794	43.4624710117566	18.9966636365323	27.2789	43.4795	19.1307
23.5126135929635	46.8475223694279	16.5483909565826	22.5313	48.1754	17.677
23.4443983033745	47.9239531234388	12.1623121581525	25.2216	48.8368	12.0716
21.9152311152309	48.5700765962973	6.58640280139847	22.4944	48.7727	6.2361
21.0695239891045	48.9274048717834	3.50267606736808	20.1897	48.2132	1.8547
27.1954620807932	57.8843924032572	9.2528171327787	25.8602	58.6207	10.547
45.2039126440771	70.086936546645	12.7697173463295	47.0351	69.5204	13.3405
38.3377782856533	88.074411485138	8.7585863524178	39.3354	89.658	8.0536
18.4828208492899	86.6354798404902	13.5606702812737	17.1642	87.7833	12.5892
17.4826008643343	84.7354577264916	15.6990304569363	17.8311	84.5721	16.3475
16.9761264682783	83.7732966933516	16.7819241924692	17.8246	84.0918	18.5648
16.0999341198763	82.7767431291699	16.7975693421099	15.4215	81.5375	18.2132
15.583522897674	83.0904120929706	14.1030199989707	13.6279	83.3943	14.3913
15.4081538800073	83.326800705857	11.6467206264451	13.617	84.1913	11.8486
15.3403272200856	83.4261908699407	10.5668477297777	17.0206	82.7787	9.6966
12.5525495830599	84.7893646950679	7.61442269592325	12.6448	83.0865	6.5696
11.3336088409332	85.5673819732338	6.44891762126831	10.8331	85.8288	6.1261
10.6769636189165	85.9864956530203	5.82105583987618	11.6247	87.7046	5.4339
5.93690087997599	86.7185768222776	2.56563628202429	5.387	87.7604	0.9494
3.58692982015219	82.9819435965454	6.25804913755728	2.625	81.2761	5.8521
4.25519130974325	84.4328218454545	9.4324740948929	3.3964	83.4982	10.9781
4.85003063987863	85.3011859542601	9.69976124593835	4.4842	86.5445	8.1765
7.92171674490329	87.952964851812	12.4804489894754	7.74030000000001	89.8119	11.7653
11.6805806957925	88.4517776579957	16.6338767027316	13.2856	89.4879	17.2258
10.2963420428734	86.7894080268737	17.2273982320379	10.6041	85.0219	16.3433
9.71733026226197	86.8216650216599	17.7316312678037	9.9966	85.8576	17.8499
9.07065495925026	86.8576871875881	18.2947861788058	8.87560000000001	85.3213	18.2881
8.52409420246642	86.8881144155204	18.7707613512485	9.2565	85.6186	20.1316
4.96408876411599	87.8192335178379	20.6789624802422	5.1953	87.1361	22.5444
2.18158682858953	89.0252653814481	20.6417649111022	1.0919	90.7016	20.5918
2.13672272297669	84.1635598767255	20.7845143607532	2.5389	82.9669	19.2333
1.64282140666509	83.518143254427	22.6772670862308	0.247299999999996	82.0871	22.6092
2.80091498000169	84.4088151893676	26.8324912980252	2.0599	86.005	27.783
4.04879232282722	83.2137303306902	27.7199107113692	5.1015	81.8103	26.7596
4.22450049255349	83.6559202013886	30.4851152936849	6.0677	84.3942	30.725
2.18619524957549	83.572097037297	35.6202693906586	1.19329999999999	81.8445	35.7922

Solution x	Solution y	Solution z	Original x	Original y	Original z
1.50440910488598	86.8978245642269	41.9698662557094	1.5647	88.8122	41.3941
1.42419609195754	86.9788277211818	42.719321990174	1.82250000000001	87.776	42.1327
1.27347270199709	87.1310215907511	44.1281280141211	2.696	85.7661	44.4643
1.09390631010287	87.3105656788044	45.4703036409515	1.983	86.3665	46.2259
1.00842234882707	87.3960511765441	46.109555546254	0.775099999999995	88.6342	47.6629
1.21990799714149	84.5475565796119	45.0326406231292	0.0289999999999964	82.9455	44.9095
4.00992601684949	85.2421751622593	44.2482534729709	5.09099999999999	83.7862	45.0917
6.71080042817164	87.4308717330051	42.480488670969	7.6764	88.6806	43.7076
8.40994557756237	87.7295144109267	37.0761421048532	6.7503	86.812	36.4409
8.92820266302716	87.8484226785413	35.6908256157992	7.47969999999999	86.7529	34.8532
9.48537868355058	88.0587295604999	34.7104363958987	9.52200000000001	88.7288	32.8263
10.2395995624569	87.3883950482563	36.0313375804951	11.8372	87.4011	35.0448
13.5172120020704	84.4750434217893	41.7718406282399	14.2245	83.0966	40.7659
14.3380949149776	83.7454637490876	43.2094572184704	15.9151	82.9337	42.2853
14.954582484375	82.9309301444982	45.9550516694142	16.072	81.5553	45.6344
15.0772215282855	82.7688590887345	46.5012757323245	13.8296	81.5783	47.5142
17.34921642421	83.6499449059062	47.6347678166319	18.7876	82.3448	48.1119
17.8735901908636	87.4623532652165	48.3617312163387	17.0519	88.8308	49.5668
18.7106126056534	87.4441226870724	47.5734174632344	19.3715	86.9483	48.882
25.596935288544	87.2941254999368	41.0879124869552	26.3736	85.6358	40.2837
28.0981046054202	95.4988063012717	39.0985732918681	29.7505	96.621	38.9958
19.0835861724638	96.1268816568536	37.7567429052868	17.7167	97.5636	38.0165
18.9378181191264	90.2770008644993	35.7114596061373	19.5543	89.8549	35.5989
18.8908598683704	88.3919712032767	35.0524014756436	19.4915	88.9148	34.46
18.7908399799774	84.378009716756	33.6490284242824	19.7188	83.0222	34.7895
16.2084900134108	82.3103582528879	28.6768340392831	14.2132	82.4414	28.7174
16.6264255642368	81.8346298049659	27.6617745461131	16.887	83.4344	26.4901
16.8015272321203	81.3789933466946	27.3094252582338	16.4864	81.6235	25.3496
16.9323710317918	81.1150717125377	27.3912295625552	16.2773	81.3093	25.7994
23.0625732443829	68.7502265245735	31.2234211209057	23.9463	67.9458	29.6197
24.8731573649777	61.129974417806	41.1029247023613	25.0595	61.5431	43.0509
25.1792532087862	49.0612838672091	34.3893151048876	24.5323	49.8988	32.6923
25.2280919109624	48.1319059777871	33.9596469422539	23.5397	47.0618	33.8948
26.0232701632258	47.7292937646379	33.5827065900674	27.0169	46.6583	34.9486
28.7624094663328	47.5794685273678	28.283851728954	28.4876	46.0461	28.1502
31.0082559751096	47.4567847383527	23.9393201507323	31.0932	49.2942	23.7876
31.4863901731556	47.430686897704	23.0143780919771	32.0319	48.7602	21.6234
31.5602515809383	46.267793234457	23.1577905202631	32.0569	46.2162	23.8838
31.623196608351	45.2767061630774	23.2800142548123	30.9136	43.9894	21.9238
33.3270944046125	44.0967178755888	26.5444377534726	32.7117	42.3778	27.3609
35.0579932879865	45.2926762641809	27.6328653783847	35.3466	47.2689	27.5268
36.8307297090658	43.2743256739014	29.2722291613788	37.7223	44.0563	30.8827
37.7262836431542	38.6798695882589	28.536917913876	36.9556	37.1182	29.5204
42.1005147163477	38.5456559728064	23.5268955847901	41.4412	38.9568	21.684
43.7189380731929	38.1874322652207	23.7249710280282	44.3864	36.3116	23.5359
44.9059576137639	39.6057813765513	24.1337795410141	45.8348	38.3992	25.1619
52.2883955122812	48.4268487295575	26.6763057860821	54.1532	48.4548	25.954
49.0042972241515	55.5807129429471	32.415631611835	49.5234	55.0957	34.2852
45.2950656341908	62.2526738506872	32.8442794153734	44.1821	62.8241	31.2839
46.1263428200906	73.5669094674372	47.8719042743683	44.9743	74.4953	49.2176
59.6384195534334	71.6847206783705	44.1124414529486	59.4827	70.1321	42.8614
63.4583351213647	72.3433227620191	44.0288212426958	63.7544	71.2264	45.6612
71.5910192679874	74.0705753326708	43.3946815018199	72.5026	72.4828	42.5897
74.2298383346596	76.7419688368062	44.058242698603	73.5352	77.8165	42.524
76.0302808038937	78.5526895986559	44.5201213462588	76.8895	78.6378	42.7161
77.4944989743279	80.3728131678161	45.7976066225734	78.4966	80.8407	46.208
77.8097809203292	80.7648395548457	46.072703286857	79.6279	80.9538	46.8845
76.1789028442775	81.8260801651832	45.8045053006376	76.7822	82.9894	44.8431
75.4048102226719	82.3297208591265	45.6772423326964	74.3211	82.1244	47.3456
73.0281667712267	85.0294394218127	42.946970908374	71.0504	85.2637	43.1302
74.2305520038108	86.097453265053	41.3585631553759	73.8575	87.669	40.179
78.2910723927826	82.9734834992649	41.9097896216543	78.0272	82.0721	40.7931
79.7528191374008	81.8488874595853	42.1082760888361	80.1131	82.5047	41.0389
83.0014042670313	79.3496215167198	42.5494648018711	84.7887	79.7551	43.3502
81.8501118259917	76.3275258447009	41.1680951191472	82.0065	75.6791	41.5159
81.2580384828519	74.7735408212485	40.4577921220995	79.4655	74.4467	41.2824
81.4481148002332	73.855905864029	39.7234391505876	82.7574	74.2926	38.276
80.5722568859417	71.4504950093039	39.5629733623953	80.5183	71.0301	37.6084
78.0079233851672	64.9793257454251	43.1711427803503	77.6803	63.0066	43.1391
77.7126082802923	70.6776335964065	46.3594097369455	78.8402	71.1237	45.9036
77.550984516642	73.7938411781775	48.1030062115153	76.1087	74.9228	48.9063
80.7956074192628	73.9840902759598	47.8056205217875	81.6179	74.1421	49.6219
84.9671063800608	74.0184310517698	43.8111664416172	84.8025	72.2361	43.599
87.5839943638151	74.0401262748586	41.3053751541909	89.2994	73.1482	41.8171
87.4673344928358	75.4777735955424	37.9962230191855	89.0638	74.5581	37.2181
86.2458307819292	77.9107657394092	34.3437504761065	84.4928	76.9707	34.1362
85.7399938712507	79.9206777722898	31.6924716475996	84.0326	80.947	31.8699
86.2047450566236	80.1398010038772	30.8541388286112	84.6626	79.7388	29.6454
87.1409746319466	80.5303901834629	29.7883126147211	87.485	79.3312	28.225
88.4989003251668	83.1504642352558	30.0343163857056	90.256	83.0105	30.9795

Solution x	Solution y	Solution z	Original x	Original y	Original z
87.3474595606344	88.3041128079567	28.5169282202637	88.3919	89.421	29.806
86.3188917301909	89.8229921915407	27.2079336841744	88.0059	90.774	26.7084
85.613616526926	90.5342022887877	26.5642692306231	85.3838	89.3565	26.2565
84.068891576268	92.0920686173207	25.1543917161459	82.1226	91.9552	25.5944
84.1816156451508	92.4296746945944	24.7808990302648	83.1514	91.319	24.221
84.8468859784925	94.4222801038609	22.5765782016803	84.785	93.3953	20.8615
85.495243618924	97.008116980099	21.8964785001358	86.994	98.105	22.6387
83.9018928239147	97.6832129084614	20.234480849068	83.9295	97.9734	19.8967
82.8359818667331	98.1348103950585	19.1226964257649	81.2522	99.2612	19.5952
83.1811310636181	97.4787449255584	17.1045268919647	84.3334	97.0716	17.1577
83.4022427221869	97.0584415505834	15.8116009083025	83.3686	96.8014	16.23
83.7311537082771	96.4332173723483	13.8882453480612	84.0572	98.2927	13.228
84.1293019876011	95.3163155640852	11.3792219877193	83.6163	95.496	9.4544
86.4275920975471	93.0459376833749	14.0010738282151	88.3602	93.5594	13.9637
85.9830942341969	91.2721013400148	15.5425703895714	84.3608	92.148	16.0712
85.4886099291604	89.2981387187522	17.2578856639144	85.8291	89.3215	18.2752
85.2825912017161	88.4758520011747	17.9724067131492	84.1657	89.6201	18.7606
84.8501362734397	86.7493481743375	19.4725993174802	83.3441	85.5151	19.0157
85.5938175379161	86.469044824604	20.7563603668527	84.7929	84.8117	21.5385
86.4554055442005	86.8179540117841	21.4993605988494	85.5265	86.4226	22.7788
87.2468638132355	87.138510364519	22.181796352617	88.176	88.8141	22.7557
87.2558370204044	86.6079971726586	22.2829379005862	87.8356	87.4643	21.4217
87.2937746055032	84.3702779592936	22.7095474176231	86.8895	84.3247	23.0154
87.3266337547776	82.4308348648994	23.0792837678749	88.1669	82.2879	22.5207
87.3563176250934	80.6778320367985	23.4134708819791	88.7272	81.0174	24.4065
87.4706149339157	73.9194398540566	24.7017928286183	88.9513	72.6403	24.2874
83.0701789838958	72.8492554765044	26.8993522600228	82.4808	71.6064	25.4475
78.7305808325577	72.2119145566947	29.7303066684954	77.364	70.7565	29.611
78.8337017685208	75.8661616764866	32.5948002628026	80.2922	75.8098	32.7263
78.9001539063252	78.2231202139881	34.442378970386	77.9819	77.7483	36.1545
79.3822981799797	79.6186901837588	34.516377365746	78.4301	80.0876	35.2889
79.7330215909399	80.6338886428755	34.5702059138434	80.2014	81.5949	36.2605
79.8890222245676	81.6924274628245	32.1085327068752	79.7775	80.296	30.6811
80.1267857580552	83.880279558187	31.2039101909839	81.0772	83.8409	29.4446
79.6882990644183	85.5467931132007	31.6670066984264	81.0134	86.425	30.4534
79.6875662908421	85.5486596104988	31.6677606712616	79.415	85.235	33.6242
79.0504866849492	87.7937482114211	31.3184986952513	80.026	88.4312	32.9439
78.9571549133942	88.0614274547469	31.2510318714664	80.4141	88.4668	31.9981
78.8459426773932	88.3804095570307	31.1706411806099	80.7173	88.9602	30.7691
78.7158302968853	88.7240706120753	31.085300068295	76.9521	88.589	30.1519
80.5332553187763	95.1913555983065	31.7524584729008	80.252	96.9762	30.8948
83.2139129845027	92.8546360374085	35.9524634689287	85.1326	93.3031	36.2953
82.1954533887533	91.4674812360695	37.2127359732425	80.5965	92.0964	38.2365
82.5550042591368	90.2845488940756	37.3370976228701	82.7904	89.3622	35.5781
83.2305720357774	88.2587414744041	39.9785321471769	81.9044	86.793	39.6738
83.3304901718479	88.1866804587025	40.1651704085861	81.9035	87.9149	41.5399
84.7468843401478	87.7955690384349	40.8529082725127	85.4655	89.4614	40.2893
86.5891862492822	87.2867185121113	41.7473999255664	87.3294	86.7915	39.9582
88.3601381634602	86.7997101182488	42.6228378116223	89.6546	85.279	42.7332
88.2044057445264	87.9580183377904	43.0530273242374	89.697	88.1654	44.368
87.4690362405301	89.3429176234555	43.1200655309339	87.2864	89.2526	43.6381
86.7364387195132	90.7225867480627	43.1868447616862	88.3323	91.5035	43.0727
85.6639694551227	92.7421363255587	43.2846430316461	84.5701	92.5098	41.6265
83.7318716178207	97.9271612238433	44.6461844826717	82.0258	98.9707	44.6731
90.0185430369264	98.6364409247747	46.0617459272778	91.162	99.965	45.0985
90.5129273010917	97.8625436238297	47.0170869092952	89.983	98.6224	48.7896
93.9880195195886	92.563236893329	48.0229158702573	95.9324	92.1458	48.2362
90.3313871146755	90.2949321617565	48.0405265510286	89.5983	91.5249	48.4013
86.4242929168247	87.8708206738993	48.0592658454986	85.7193	87.9646	47.7548
85.1656833382169	87.0900245198841	48.0653195200579	84.4799	87.8799	46.3607
84.3088744476832	86.4540470578488	48.2161547485074	83.1803	86.2205	46.5816
84.3088561519627	86.4540295880463	48.2161689318785	82.5335	87.3296	48.5022
84.5059384322031	85.4875376904232	48.5491691083182	83.0689	84.7397	49.7222
86.9608748226572	83.4578420882923	48.0730998460126	86.675	81.8002	49.155
88.3981374269987	83.3278085561383	47.2208638740968	87.8518	83.2273	45.632
88.8556496959635	83.2864302377279	46.9496022982158	87.8874	83.7559	45.2883
89.4036629045108	83.2367506922119	46.6252204199153	89	83.7031	44.7227
94.559815939538	82.105801036998	46.8812111661219	94.6937	81.204	45.1011
97.7130633508554	81.7542621835467	47.7343990345211	99.1691	80.9928	48.8748
95.5544014481825	85.4483669901961	42.8487632802997	97.0785	86.7219	43.0832
94.2565075424533	87.3817944236497	40.1495372973607	92.7639	86.5161	40.1878
93.3193067642773	88.7780502464044	38.2003111052114	94.4683	90.0421	37.16
89.5203920840753	88.2909189590586	37.383809043806	88.5666	89.9178	38.0498
88.2903713714025	87.2245948020061	36.6672346686407	87.6085	88.0524	34.9791
87.5037929518174	85.7611717901463	36.9197289166148	85.5459	86.1581	36.8243
87.6462716532972	83.9350762613851	37.2488096755573	85.9222	83.4369	36.366
88.3118337272218	81.4514050468255	37.956485713912	87.0156	79.966	38.2934
89.4292205327483	81.3640230990527	38.0370701129644	89.7033	80.1502	39.6028
90.2797624713172	81.5591775948192	37.7592041687176	89.9071	81.4441	38.6007
92.0499048386606	81.9652144385025	37.1809607552018	92.5909	80.0433	37.2966

Solution x	Solution y	Solution z	Original x	Original y	Original z
97.0271507952847	83.4291010556488	35.5089623374537	98.6006	82.3388	36.0882
97.604366391938	86.4317476629617	33.2940128894931	99.0472	85.7396	32.4859
97.7398984551571	87.1365893709848	32.7740475337567	99.7041	87.1751	32.3993
95.3446989903159	91.9792365681252	29.7903235496387	96.6676	92.6743	28.4611
91.8105934727642	94.3099670990413	29.6409575116279	91.4519	94.5103	31.5983
90.0304871333403	95.4982276539234	28.7925714240795	88.2673	94.5543	28.7709
90.0304804553742	95.4982879811454	28.7925464624886	88.2817	96.351	29.2562
90.5497826482292	95.9183084238756	28.3464693443611	89.0976	96.4455	27.3307
92.5447441218902	97.531944557807	26.6324081752365	93.3103	99.0843	27.6346
93.2925536426529	97.4086469277607	24.695236423777	93.255	98.1789	24.6576
94.0529772120398	97.2832677646435	22.7253966234633	93.4254	97.8126	20.9017
94.9172763708268	96.8143862055687	23.1340569842047	96.1791	97.5552	24.4974
95.0508196161056	94.0306427531962	21.7358480820662	96.5452	93.172	22.7505
95.0508106603321	94.0304992243089	21.7357571933901	94.509	92.4532	22.8398
95.6237356375249	93.3496444349908	18.2804969304079	95.3031	91.4204	17.8619
96.6597944250872	95.2447911006931	15.2161432335667	97.9735	93.9042	14.8216
97.6059830073365	96.9763546991393	12.4168155209541	99.292	98.0492	12.4987
97.2272444823174	96.9767561874413	11.7901136408924	98.1513	96.345	10.1326
96.2053778205921	97.2961826687102	11.7076469618713	96.6476	96.9796	12.6166
94.4388760236005	97.8483345669379	11.5648865003003	94.2258	98.7848	13.3192
92.5429391863171	98.1283849362304	10.7752586138187	92.0809	99.3222	11.7562
91.7702101063916	98.2425222073224	10.4534391874008	90.7381	99.8897	10.9244
91.7224017548054	98.1624906265727	10.3810405582907	90.6972	96.9626	11.6096
91.4664297156729	97.5400210670623	8.94800902676009	92.8113	98.2407	8.6156
90.8775426660941	96.108335206999	5.65243335054445	89.931	94.5372	6.4495
90.3934183297465	94.8681376355443	2.41613727271611	89.3359	93.6392	1.2449
92.1119283410454	96.4157696944013	2.53270911506999	92.093	98.3621	2.0725
94.6617285988974	94.5178480004942	3.68594246735708	95.4796	96.129	4.4906
95.0659319204628	94.2165539810898	3.86879200221634	96.0605	94.495	5.5816
95.5942253136803	91.9396788230372	1.7782364385405	96.809	92.5136	0.2967
94.8909277500079	89.7362395911202	1.56463310457502	94.7976	88.4491	0.0367
94.0486452951368	89.5443220091993	4.99735834442051	92.1839	88.8237	5.0595
95.2034658395418	90.1530515981685	9.09814496799003	94.4375	89.8165	9.7901
95.6225739910438	90.3739676865067	10.5864423523788	94.8083	91.5304	12.0006
96.4877930124212	89.7141442583542	10.6290322387378	96.671	90.7145	10.1968
98.1026569094787	88.4825374513709	10.7087593851861	99.7949	88.8243	9.6989
97.2538678615912	83.4749792117286	14.4537297960921	97.0848	81.6578	13.6354
97.0369059434285	83.8764217968002	18.6162307918676	97.4362	85.8361	18.6294
96.7206900808134	83.5852405397806	22.1920084534512	96.8293	85.3988	23.0282
96.439481058032	82.0220094073969	23.7984933764446	97.0965	81.0307	25.4066
95.1306551919455	82.3482924451116	22.4980306439443	94.7529	81.9671	23.1963
92.395404534836	83.03015886738	19.7803055768179	93.0738	84.8753	19.4127
90.2702486158831	83.2605113142047	17.8236087831569	90.1019	83.486	18.038
88.1774975780054	83.4873464837113	15.8967453342605	87.5661	81.6563	15.3738
87.0380636396703	84.9413973000446	14.8196500501218	87.1273	84.0324	13.0404
86.4519143764947	85.7882463949984	14.4971953780824	85.6153	86.7737	15.008
86.2190325851956	86.1247331004797	14.36913330106	85.8774	87.324	15.9329
85.0093933851295	87.218783452627	12.0799625569338	83.3685	88.3604	12.0152
87.1182704441043	86.0913131591487	9.14281933867274	87.314	87.2617	7.5328
88.6261368746648	83.1676742469834	9.26402081729434	90.3741	83.7882	8.516
89.4454366826896	80.1974164619275	9.63613300223928	89.4354	80.1567	8.4369
90.7168804385974	75.587560746772	10.2138280522739	89.4099	75.3847	11.7139
91.6313209537707	72.5043513298503	10.53087068762	93.093	71.3467	11.2543
86.7910215897558	72.3151204617969	7.90476034643823	85.22	71.0885	8.0711
87.7457951572706	76.5895284082641	4.71875891979212	89.379	76.0987	3.6739
86.9311764835269	79.6416424734608	3.65532163688209	86.8222	80.0693	3.9589
86.4689424679671	81.3734148589829	3.0519062907304	86.0867	81.533	3.6186
86.0396718283757	82.98170365377	2.49151698393108	86.7862	83.711	0.7854
86.03959707759	82.9817707982203	2.49158213416969	87.7484	83.7546	3.1863
84.6057416040105	84.0109740155238	3.46083834350939	85.8335	84.6274	4.9143
83.8279453413697	84.4666693947378	3.83022083148641	84.2824	83.9445	3.7257
82.3415119404891	85.3375519107311	4.53614684223999	81.7913	86.2239	2.8298
77.7499108724141	87.6663486028734	7.97720968700368	77.1151	89.3423	7.0894
74.7486578749564	86.9381134205245	12.4923564492564	74.9451	88.4605	13.7746
72.5202576492332	84.4218850029564	13.7321208674459	71.008	83.9726	12.5028
72.5266838664771	83.8888993497411	14.6176349000707	72.6803	81.9225	14.2859
72.2396529045773	85.0559868020961	20.2439502455374	70.8501	86.3243	19.985
72.1761704663435	85.3140464485059	21.4880901566306	72.3356	86.155	20.9164
72.0603629431978	85.7851366548899	23.7595387569442	70.0787	86.0551	23.7512
72.3755932654849	86.3977703546941	27.0324381485767	72.5273	88.3137	27.5858
72.4751646290292	83.7203605180041	29.8744644032799	70.5598	83.7819	30.4468
73.5855176644804	81.4297073114664	31.9639034380227	73.6161	81.1388	33.9424
73.6842658321648	81.2784567374895	31.7072927883419	75.5773	80.7384	32.0605
73.2564475009678	80.6448614724997	29.9387361349252	73.1002	79.4037	30.5501
72.6474632302965	79.7429380687219	27.4209480494956	70.8021	79.2974	26.7913
74.6726700353029	79.5557816277403	26.0435230078348	75.4182	80.175	27.0139
76.5321252259567	79.3839463594796	24.7787975872098	76.3867	80.9989	23.608
78.2288700634787	78.5697180348056	24.1457512098508	79.7296	78.3022	25.4406
78.7715854624228	77.3035959068869	19.8249440504713	77.1908	76.3248	19.088
78.9923146120964	77.3350793163743	19.6274671639826	79.3483	75.3688	19.5443

Solution x	Solution y	Solution z	Original x	Original y	Original z
82.8972345686946	78.4964012439764	16.063666249651	84.7658	77.8153	16.2748
82.1132454417131	80.1600880864177	13.8400595725901	83.5177	79.6473	12.5117
80.4550671152098	82.3027610937075	12.0990714319352	79.3747	83.7664	12.9303
80.6297605333347	81.9837546254635	9.58597003510538	80.3025	81.1115	9.6723
80.8103480972811	81.6539595189775	6.98784967143625	82.7718	81.5009	6.6283
79.6679909769755	81.4242806371998	4.61016692584743	78.9268	79.6337	5.1041
79.0010938140755	81.3314283529238	3.17101353235574	77.4302	82.5606	3.0237
79.2406533615992	80.5098626213143	1.77428972772676	80.7551	80.6861	0.4798
76.7647014113548	78.5964135726716	1.61109618573814	75.2812	79.5319	0.6498
75.8900236915457	75.9933003051716	2.35285556748296	76.4126	75.548	2.1999
75.2428710525713	74.0671662352777	2.90174369904042	73.6863	74.2382	1.6716
73.8346337632915	69.8606501991203	4.10422307608065	73.6361	68.0431	3.2936
73.0144029558417	72.2687351500684	8.69141182915995	73.5126	71.3248	10.3828
71.4965681020441	75.7671797562052	8.90554815853966	70.0314	77.1275	8.8524
72.2006169505806	75.5232453980681	8.98384236891409	71.4242	75.4202	7.9198
75.7667560507506	74.2876921727382	9.38003543351025	75.9291	73.9471	7.416
78.1688444860374	73.4767753209993	9.79592603895886	79.9937	73.4457	8.9779
76.9805638563068	72.7980586335997	11.6833481978819	77.4087	74.0915	13.1093
76.95927941397	72.7859109342752	11.7171974168273	76.1847	74.2911	12.7823
76.2815537331408	69.589720617807	13.0326057286617	75.6074	70.2776	13.8577
74.4370880461149	60.8914218510689	16.6123365489246	73.1545	60.0435	17.8914
85.3103637053096	56.9988466652167	8.34825318605072	84.5964	57.5663	6.5683
97.2799175443315	52.0100391307174	4.49230318978299	99.2739	52.0431	4.3408

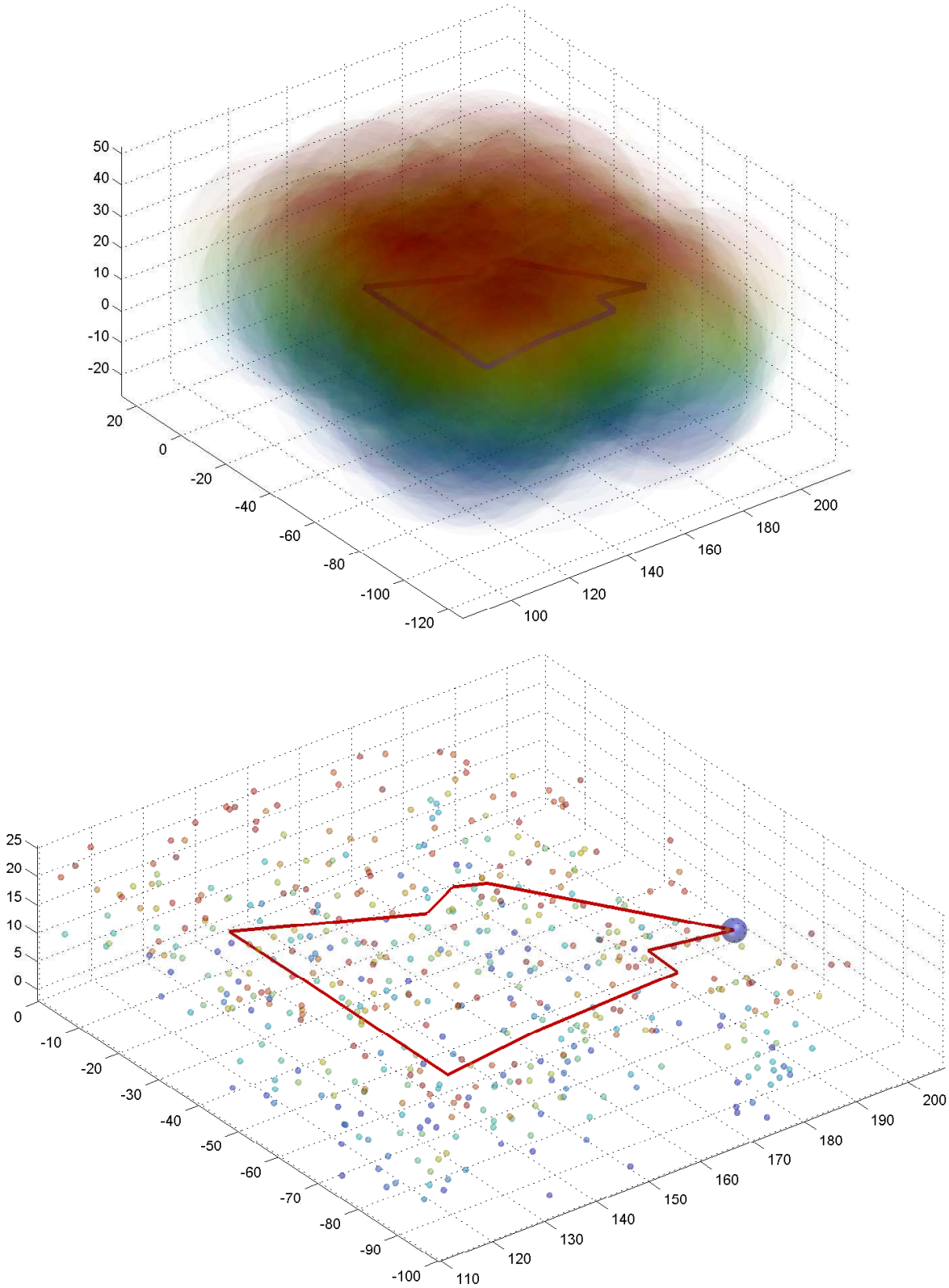

Figure N.68: *team*6_500, Equal Radius, 3D, Euclidean, Length = 236.9636115

Table N-71: Solution for *team*6_500, Equal Radius, 3D, Euclidean

Total distance: 236.963611477309 Depot: x 95 y 50 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
88.2625046449579	44.5647803799159	1.77759537126038	77.8566059	47.3210428	1.4302369
83.210532404343	40.4892928484584	3.11049446014881	78.2442809	33.2914556	24.7068001
83.210532404343	40.4892928484584	3.11049446014881	73.9542296	35.1681427	22.8323041
81.2162733461659	38.8805127322985	3.63666013225212	76.8303918	30.6898889	19.4810071
79.5510697353652	37.5371818862347	4.07600686243575	77.5184606	26.3492827	20.0048231
79.5510697353652	37.5371818862347	4.07600686243575	78.3681704	28.4149174	19.0447715
78.2584886979967	36.4944430548493	4.4170361848178	75.1791401	28.4357222	11.5456464
78.2584886979967	36.4944430548493	4.4170361848178	70.5957341	27.6007009	14.8208364
77.2013581235211	35.6416463599155	4.69594438324268	78.8734057	30.5074156	10.2492504
76.1590815774758	34.800832722285	4.97093477297658	73.6483802	37.1698351	8.0638871
75.1268954502404	33.9681609089266	5.24326541822278	73.6393721	37.6930766	12.5724621
75.1268954502404	33.9681609089266	5.24326541822278	72.24704	39.7077335	13.756154
74.124245487013	33.1593190809046	5.50780579149597	76.1612584	37.0439506	15.0269683
74.124245487013	33.1593190809046	5.50780579149597	74.2228108	38.6099587	15.750928
73.1187174550642	32.3481569820551	5.77310661742226	68.3855742	35.3493495	17.8360025
72.1623901610446	31.5766862080466	6.02542694015232	75.8801773	29.7113355	20.1473913
71.2143656708618	30.8119130944124	6.27555636297376	65.5247054	34.4819771	22.2818751
71.2143656708618	30.8119130944124	6.27555636297376	58.429274	38.9397266	17.4146787
70.3627109976786	30.1248826834769	6.50026015541975	62.1996928	26.9322785	20.2466983
70.3627109976786	30.1248826834769	6.50026015541975	57.0336699	24.3925592	19.6603049
69.6922509491833	29.5840243111703	6.67715848549559	71.3343578	25.5495623	21.1336705
69.6922509491833	29.5840243111703	6.67715848549559	67.6344777	29.9025036	14.033884
69.0306756962651	29.050333062703	6.85171241140197	71.8742878	17.8343061	13.6189325
69.0306756962651	29.050333062703	6.85171241140197	67.7860652	18.0440513	10.7235759
68.4082396146103	28.5482150461404	7.01593941425472	70.9135058	14.8761766	3.8438809
68.4082396146103	28.5482150461404	7.01593941425472	72.0757838	18.033427	9.5185824
67.7964331613584	28.0546706764941	7.17736087087329	72.9487249	9.0752285	0.6396625
67.7964331613584	28.0546706764941	7.17736087087329	68.4102584	6.9403941	4.658299
67.2458460143906	27.6105116125421	7.32262965992673	54.6678163	5.1970784	7.0182008
66.8918213011218	27.3249208859987	7.41603775102203	61.3811866	10.1841347	3.2294003
66.8918213011218	27.3249208859987	7.41603775102203	54.100404	16.0525172	0.8678853
66.5712993986222	27.0663571346089	7.5006065775043	58.3586123	20.3359236	6.4801103
66.2532776450843	26.809810111167	7.58451567705116	56.0727891	23.8686819	7.47443
65.9404702477547	26.5574692190604	7.66704884673617	60.5482992	13.7850738	16.8556106
65.9404702477547	26.5574692190604	7.66704884673617	52.3761166	17.3066951	24.8659343
65.6761040088611	26.3442058946091	7.73680111188577	75.2339764	1.1053279	6.9329867
64.7538294560375	26.2912048027842	7.94410546814915	72.320279	3.8462993	6.5608426
63.7591414921334	26.2340449677563	8.16768538366519	72.8917692	2.6849909	9.1068195
62.6417747773437	26.1698358782568	8.41883963978596	62.1748486	23.5386262	9.8971034
62.6417747773437	26.1698358782568	8.41883963978596	62.0390375	27.7696953	8.7011853
61.5983580445859	26.1098751228088	8.65337220061726	64.943613	1.686391	19.5930668
61.0765237804701	26.0798869242812	8.77066713364776	73.9903157	3.2090585	6.7443046
60.4327553275973	26.0428929946446	8.91536535078287	57.1362338	5.5136309	23.5708492
59.8160786930824	26.0074601111597	9.05397456512001	52.4413086	6.2567644	20.6204114
59.2502428185547	25.9749451522788	9.18115901646279	55.2537104	1.3428502	19.4907476
59.062349005542	26.0703425603829	9.18243623605387	70.2907843	10.4186099	14.6666305
59.062349005542	26.0703425603829	9.18243623605387	64.1033853	11.196525	7.8712992
58.8661933333375	26.1699348523225	9.18376966951893	79.9570853	14.106802	16.0131314
58.8661933333375	26.1699348523225	9.18376966951893	71.2868972	13.7571779	21.261272
58.6186198133561	26.2956339223947	9.18545241733617	73.292725	7.8305571	19.3842603
58.6186198133561	26.2956339223947	9.18545241733617	70.8086056	11.5809577	17.5154997
58.2962281643168	26.4593211020025	9.18764357158383	67.4654721	12.1137109	23.8276929
57.957410999553	26.6313481700064	9.18994619790006	69.6772126	28.9703915	6.8785128
57.957410999553	26.6313481700064	9.18994619790006	66.7264937	28.6241638	4.754423
57.6061573685168	26.8096895993773	9.19233350641983	68.9038468	16.8104734	21.7337542
57.6061573685168	26.8096895993773	9.19233350641983	70.2766166	21.7580017	19.3250026
57.213428854694	27.0090894187995	9.19500235878581	65.5339196	33.299582	2.2513726
57.213428854694	27.0090894187995	9.19500235878581	65.884583	36.2103636	0.6036001
56.805264965881	27.2163267235378	9.19777632219186	59.7400431	37.5401839	2.8523374
56.805264965881	27.2163267235378	9.19777632219186	57.8811625	36.8910334	2.4827855
56.4148915389956	27.4145310788352	9.20042963899432	57.9145816	37.4787407	0.4915272
56.0327386168146	27.608561555721	9.20302723609391	57.9600279	34.4089577	5.7051211
56.0327386168146	27.608561555721	9.20302723609391	54.9748886	31.6899499	9.1125802
55.6553020378552	27.800197217218	9.20559284993549	56.9481598	35.7189477	11.6860928
55.2814140649511	27.9900310643401	9.20813434562211	56.98499	36.3050676	16.2652139
55.2814140649511	27.9900310643401	9.20813434562211	55.5353048	38.1752447	17.6684542
54.9209360420443	28.1730560765687	9.21058462833837	61.8021468	40.7857588	11.6604123
54.9209360420443	28.1730560765687	9.21058462833837	56.2067364	40.2417677	14.7422616
54.5696826798551	28.3513974789187	9.2129722350329	55.1300701	40.0588307	9.3430467
54.5696826798551	28.3513974789187	9.2129722350329	51.5218465	39.5765057	8.1668107
54.2373431134852	28.5201354533045	9.21523137027335	51.2078647	35.5791539	12.2358489
54.2373431134852	28.5201354533045	9.21523137027335	48.2549784	40.2375649	15.7273532
53.9209577196249	28.680772710998	9.2173820441099	51.358437	31.183912	20.2786449
53.9209577196249	28.680772710998	9.2173820441099	44.7688336	34.8472485	18.3927145
53.6157237167502	28.83574782048	9.21945687695841	54.8328865	43.6672378	22.5503676
53.6157237167502	28.83574782048	9.21945687695841	49.7681271	46.8278362	16.9025729

Solution x	Solution y	Solution z	Original x	Original y	Original z
53.3242448027096	28.9837386859421	9.22143817735007	58.3317264	48.8464518	15.1551224
53.3242448027096	28.9837386859421	9.22143817735007	55.3536754	50.0230289	15.6187386
53.0460564289168	29.1249813980794	9.22332916850204	63.3830619	45.6708392	19.4411223
53.0460564289168	29.1249813980794	9.22332916850204	62.9728444	48.2610974	18.088966
52.7604522634468	29.2699898385781	9.22527044485422	65.8501112	46.5185477	18.4012114
52.4653519077191	29.4198200667931	9.22727616749599	67.7343836	45.7338412	11.9249335
52.4653519077191	29.4198200667931	9.22727616749599	64.136723	44.5156078	8.6797357
52.14932437	29.5802759449998	9.22942406231382	61.0935569	52.6920317	4.4207174
51.8373594443013	29.7386689948422	9.23154442107379	58.9987357	45.7674431	3.4982849
51.8373594443013	29.7386689948422	9.23154442107379	53.5581269	47.7413894	5.6200486
51.5275805202952	29.8959520823822	9.23365009167782	53.1446811	48.4277704	1.8438372
51.2234915536432	30.0503462292682	9.23571721476552	54.2235528	56.265496	3.5115961
50.2538617294524	29.8438208999972	9.38600325785698	53.3341085	54.2742297	9.8426206
50.2538617294524	29.8438208999972	9.38600325785698	49.3212736	48.3119567	9.5488066
49.1195874307439	29.6022282760195	9.56180827347366	43.0965371	49.287121	4.5164689
48.0239052447502	29.3688543390333	9.7316317289478	34.2887402	41.9043439	6.835982
47.0444867137788	29.1602416644979	9.8834348431464	42.5831476	37.1399223	7.4293369
47.0444867137788	29.1602416644979	9.8834348431464	40.4352515	45.1450838	11.9573703
46.1367714461472	28.9668999596183	10.0241242604798	45.1705924	33.2150554	0.7183829
45.2417923615275	28.7762707180093	10.162839683162	51.6262531	32.9510025	3.9807244
45.2417923615275	28.7762707180093	10.162839683162	48.3601763	34.0464698	9.5017871
44.3444173847932	28.5851314120688	10.301926546302	44.2906965	51.8898251	11.3116798
43.3878237794863	28.3813784057479	10.4501918013752	37.4597811	44.2188485	16.422469
42.4793084993883	28.1878645216663	10.591005051043	49.4509792	19.23293	17.9552005
42.4793084993883	28.1878645216663	10.591005051043	44.272376	24.1529526	16.7575015
41.67811639118	28.0172104026919	10.7151840713714	37.6481264	47.8813096	6.5793036
40.8339877393363	27.8374092746725	10.8460177354135	34.4981613	43.6098189	6.3838863
40.002995067311	27.6604037770047	10.9748151915425	38.9701661	21.3778805	18.3750053
40.002995067311	27.6604037770047	10.9748151915425	39.7157151	22.5518047	13.0027284
39.1897581384065	27.4871799445401	11.1008606024514	45.092729	13.545129	18.3076608
39.1897581384065	27.4871799445401	11.1008606024514	46.2315326	17.3070005	18.3576471
38.3570991053443	27.3098198996929	11.229916358724	47.2237184	11.5265695	11.522225
38.3570991053443	27.3098198996929	11.229916358724	41.2499501	12.693222	14.1376671
37.4899778365094	27.1251204548161	11.3643136116101	45.3795945	10.2393952	3.6711995
37.4899778365094	27.1251204548161	11.3643136116101	41.0252369	15.6288565	6.5265879
36.5097660681165	26.9163339196111	11.5162391408503	37.7928549	6.0601138	4.720283
36.5097660681165	26.9163339196111	11.5162391408503	33.6893922	8.5224136	7.0176775
35.561617303396	26.7143762658754	11.6631951012811	42.0438698	1.2746098	8.4709115
35.561617303396	26.7143762658754	11.6631951012811	43.6411268	3.9331303	13.8180098
34.3243843001125	26.4508442104576	11.8549570461417	41.5241877	2.2495139	17.9679654
34.3243843001125	26.4508442104576	11.8549570461417	33.5301093	3.5426558	21.7233363
33.2060226390783	26.2126296974408	12.0282952810364	39.0651937	2.4238303	22.4127866
32.1516615749402	25.9880445455366	12.1917153103827	34.237799	1.769458	21.0926833
31.2671235266563	25.7996311375742	12.3288137571789	31.6461166	7.3585956	24.5416178
31.2671235266563	25.7996311375742	12.3288137571789	33.7088519	9.9711832	22.3346661
30.449445182406	25.6254587270088	12.4555492012007	38.5584867	8.9239146	23.1054293
30.449445182406	25.6254587270088	12.4555492012007	30.8819888	13.4626957	23.5805357
29.6345634879071	25.4518818956285	12.5818511438964	33.6742877	16.0147514	17.7329183
29.6345634879071	25.4518818956285	12.5818511438964	36.6688954	15.3802855	11.2906359
28.7959142266305	25.2732435516734	12.7118371271705	33.7699504	15.2531662	14.0155756
27.9458644220148	25.0921772839956	12.8435901972863	31.9710737	13.1659452	6.9350237
27.0793520892348	24.907605177809	12.9778950268762	29.8399494	3.731908	9.1569031
27.0793520892348	24.907605177809	12.9778950268762	28.9980611	9.3107142	10.3932004
26.2097027704172	24.7223653956414	13.1126862173962	30.2787157	8.2280249	1.312123
26.2097027704172	24.7223653956414	13.1126862173962	26.3324067	9.9110212	1.9657306
25.3056269546757	24.5297940763223	13.2528137561896	18.0605132	3.6100683	1.3230623
25.3056269546757	24.5297940763223	13.2528137561896	17.3929381	9.8303298	1.4719335
24.6224930726375	24.3842819034806	13.358695924993	15.3634563	8.946465	9.6121679
23.983405351657	24.2481512286309	13.4577510596749	20.1050057	16.8211128	11.4177964
23.350419257308	24.113320116319	13.5558604646166	24.4057133	14.819481	14.2616378
23.350419257308	24.113320116319	13.5558604646166	16.5956207	19.4929376	15.3111277
22.7333988936987	23.9818897543368	13.6514952320803	12.2844966	12.8434228	15.9512599
22.7333988936987	23.9818897543368	13.6514952320803	16.5565287	18.5575743	19.3585299
22.1623181397545	23.8602440858628	13.7400094024264	15.2275578	8.2482088	20.735321
22.1623181397545	23.8602440858628	13.7400094024264	14.9649191	8.2569823	17.1672819
21.6428435536654	23.7495906351435	13.8205248083852	19.95828	6.5164086	22.2907726
21.6428435536654	23.7495906351435	13.8205248083852	14.7546051	14.610274	24.9337615
21.1520878383292	23.645054389609	13.8965888706817	25.3620642	2.9418291	18.8013171
21.1520878383292	23.645054389609	13.8965888706817	25.7941467	5.022901	22.6635913
20.6638263986097	23.5410500058757	13.972266383146	21.5694811	0.9567502	13.1824134
20.6638263986097	23.5410500058757	13.972266383146	21.5004558	1.4444458	11.8706015
20.1967926471531	23.4415676179006	14.0446537818731	15.0419936	3.4632806	14.5409941
19.7459985381763	23.3455443531003	14.1145241230181	11.2137447	2.0282324	10.133715
19.7459985381763	23.3455443531003	14.1145241230181	10.2956976	4.6843351	8.4372721
19.348235508586	23.2608168294051	14.1761749460334	6.43216459999999	5.6038094	17.9548593
19.348235508586	23.2608168294051	14.1761749460334	9.8269964	6.8843491	16.4620329
18.9902636646521	23.184564839579	14.2316583061339	9.4518233	0.0818322	21.8708164
18.7024051532654	23.1232471403059	14.276274447484	7.7653349	6.167634	7.7136991
18.4254496289316	23.064251732488	14.3192006727494	1.18933079999999	3.3623299	20.9336159
18.4254496081213	23.0642517478936	14.319200668117	3.796854	1.0310825	8.8837938

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.4236539841561	23.4125065626943	14.3200110967429	1.16963010000001	7.0254341	24.7260216
18.4216184458641	23.8069794699769	14.3209297040638	2.4227502	13.8762399	13.6085461
18.4195344417461	24.2108819489834	14.3218703328342	4.41833269999999	14.4467589	21.446539
18.4195344417461	24.2108819489834	14.3218703328342	8.8711802	13.2955279	17.3948906
18.4173372965457	24.6367031506411	14.3228619826803	9.1420339	20.9818632	21.7425538
18.4173372965457	24.6367031506411	14.3228619826803	13.6477983	21.6503409	20.9429038
18.415163330283	25.0580760116793	14.3238429081856	4.4919615	30.1971308	23.0431363
18.415163330283	25.0580760116793	14.3238429081856	9.78612250000001	28.4044715	22.2738758
18.4131715200089	25.4443958190312	14.3247416313982	1.44105020000001	27.5670412	20.5926225
18.4112286578824	25.8213327714653	14.3256183549636	1.0903939	26.3844516	18.4073439
18.4093142943674	26.1928238002406	14.3264822992404	3.1062568	26.7803784	17.2167375
18.4074337711542	26.5578099629657	14.3273310311389	6.7702019	28.6398243	6.655852
18.4074337711542	26.5578099629657	14.3273310311389	11.5512784	26.7283657	10.5788887
18.4056705020596	26.9000920397536	14.3281269319276	10.881307	21.222109	11.4410052
18.4039168820722	27.2404859494563	14.3289184657439	10.0346396	20.0550826	11.5771729
18.4021493041787	27.5835693348695	14.3297162825511	10.2638739	16.7343669	2.745395
18.4021493041787	27.5835693348695	14.3297162825511	15.820225	13.1438067	8.0447276
18.400279256025	27.9465219552591	14.3305603811761	17.2034005	24.1027648	4.0750954
18.400279256025	27.9465219552591	14.3305603811761	14.6392528	26.7492086	4.8139494
18.3984029175776	28.3107016555792	14.3314073606992	19.7989907	26.8559855	1.6393695
18.3984029175776	28.3107016555792	14.3314073606992	27.922577	21.764341	5.4511195
18.3965340108574	28.6734790527716	14.332251039182	23.260163	19.1726271	1.8635456
18.3965340108574	28.6734790527716	14.332251039182	24.4888337	25.329984	1.2423959
18.3945751987232	29.0537080757068	14.3331353667844	30.6527015	22.708305	8.3283902
18.3925781057889	29.4413601719732	14.334036972163	31.6418617	23.7354033	9.0609597
18.3925781057889	29.4413601719732	14.334036972163	35.4889656	25.3753347	12.2670294
18.3905533460136	29.8343341628323	14.3349510147796	34.0986738	23.3047286	4.238405
18.3905533460136	29.8343341628323	14.3349510147796	34.7673517	23.4200763	4.8203284
18.3883904902337	30.2539917916496	14.3359273778198	37.3849664	18.6565566	4.7787046
18.385971175269	30.723280186824	14.3370194737181	39.7052051	20.7340789	2.9027737
18.3828201354444	31.3343350866049	14.3384415366706	38.4714341	30.1541626	2.0837059
18.3828201354444	31.3343350866049	14.3384415366706	38.9767874	28.6595996	7.54261
18.3795859221046	31.9613923178623	14.3399010866841	41.3950957	34.602479	9.5059407
18.3795859221046	31.9613923178623	14.3399010866841	32.8302989	42.2309887	13.616708
18.3766798373983	32.5250049465713	14.3412124596152	40.565033	30.2350611	14.624538
18.3766798373983	32.5250049465713	14.3412124596152	44.6441662	33.1239716	16.5654644
18.3737617446596	33.0909148629196	14.3425293499347	39.21475	31.0795566	21.1487172
18.3708045911973	33.6643214534197	14.3438637661889	37.130172	34.1670861	22.6509329
18.3708045911973	33.6643214534197	14.3438637661889	36.1244237	41.0242921	19.6707957
18.3680159148261	34.2052030894634	14.3451221170849	36.9545772	32.1019086	19.1323386
18.3680159148261	34.2052030894634	14.3451221170849	35.0133629	33.6653342	20.0549291
18.3651973017679	34.7518716470805	14.3463938850643	31.5115819	30.4349931	13.1711147
18.3651973017679	34.7518716470805	14.3463938850643	33.8398153	32.0377234	11.3609992
18.3622844484816	35.3167005088323	14.3477081450036	28.9097869	26.1468646	19.859402
18.3622844484816	35.3167005088323	14.3477081450036	25.434095	30.36432	15.4263508
18.3591996263545	35.9146576300717	14.349099814614	21.8832831	32.2702186	24.0783885
18.3560632037195	36.5226262063149	14.3505146903173	25.6408756	32.9849766	23.8146293
18.3560632037195	36.5226262063149	14.3505146903173	23.0786229	38.1227731	23.1605385
18.3528902055521	37.1377934142611	14.3519460259264	26.2175773	40.5220972	21.9150058
18.3497642080888	37.7439593219603	14.3533562239789	30.0937988	44.3308943	14.5383671
18.3467319443353	38.3320472197457	14.3547242538279	32.3078962	45.114069	10.6720814
18.3438141583132	38.8980279359332	14.3560407603523	25.3533813	42.3962835	8.9845466
18.3438141583132	38.8980279359332	14.3560407603523	28.2512087	43.1796715	6.8189779
18.3409856137716	39.4468677862771	14.3573172386045	24.3319298	37.4283803	9.9719727
18.3381182373966	40.0032701992618	14.3586112829615	21.2205961	30.6755865	15.8621351
18.3351155165224	40.5858372620824	14.3599663032271	13.0553452	35.1491327	19.4677587
18.3351155165224	40.5858372620824	14.3599663032271	18.0420031	31.0087706	14.9562459
18.3318965446475	41.2102294370331	14.3614187424685	11.1949114	32.5347928	13.765914
18.3318965446475	41.2102294370331	14.3614187424685	11.8541821	36.7134083	15.5034658
18.3284405562193	41.8804178524365	14.3629779711281	4.5207011	34.7763494	11.5308277
18.3284405562193	41.8804178524365	14.3629779711281	7.3492035	35.5012058	13.5793477
18.3246291471739	42.6192480157516	14.3646974482218	6.820668	39.0713932	12.1631417
18.3207110752936	43.3787281270043	14.3664651013743	12.1928408	37.3702852	11.5867049
18.3207110752936	43.3787281270043	14.3664651013743	14.7299938	38.6202015	11.4606651
18.3165221736307	44.1904722304099	14.3683549016588	13.5198617	39.2703319	6.7423337
18.3165221736307	44.1904722304099	14.3683549016588	15.6671545	41.9038059	9.4975475
18.3121496219983	45.0375708220245	14.3703277377611	2.4253981	44.8523436	2.2881323
18.3121496219983	45.0375708220245	14.3703277377611	2.57466789999999	43.4683609	15.573931
18.3121496219983	45.0375708220245	14.3703277377611	2.27936	46.9159446	7.984275
18.3121496219983	45.0375708220245	14.3703277377611	5.3360715	49.6056788	2.051856
18.3121496219983	45.0375708220245	14.3703277377611	6.5220454	46.8393292	9.3610404
18.3121496219983	45.0375708220245	14.3703277377611	12.7057803	46.3942459	23.5548248
18.3121496219983	45.0375708220245	14.3703277377611	13.919931	46.2670929	1.9535236
18.3121496219983	45.0375708220245	14.3703277377611	16.0956015	47.1989931	18.8482809
18.3121496219983	45.0375708220245	14.3703277377611	18.6253841	45.1799856	19.5247549
18.3121496219983	45.0375708220245	14.3703277377611	20.3277951	46.570702	14.9318681
18.3121496219983	45.0375708220245	14.3703277377611	22.4746551	48.1041051	9.2672876
18.3121496219983	45.0375708220245	14.3703277377611	25.8175111	47.2716024	20.9185995
18.308259192656	45.7915794671952	14.3720831699108	6.1363219	48.8674613	19.7646406
18.308259192656	45.7915794671952	14.3720831699108	9.4077401	50.7341371	22.0830838

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.3045414880946	46.512385219949	14.3737606026276	39.4220046	48.156385	14.5273965
18.3007629836297	47.2447660889708	14.3754652371195	39.5709227	52.0192185	20.9490324
18.2971937622987	47.9366917120132	14.3770752536024	20.6501388	50.1791373	13.3126618
18.2935785111779	48.6375239078833	14.3787060279118	21.0216738	51.8703093	12.3795264
18.2935785111779	48.6375239078833	14.3787060279118	23.2467308	53.1536864	15.3512789
18.2900783438721	49.316267379196	14.3802850057955	2.1729785	46.8604253	18.9044886
18.2864064206513	50.0282482199156	14.3819413933869	3.9184302	46.6238898	20.1933306
18.2826520670605	50.7562803037739	14.3836350025086	28.018456	49.9258106	18.7011667
18.2826520670605	50.7562803037739	14.3836350025086	38.9617732	51.3997809	16.210445
18.2788740268091	51.4889109903422	14.3853390443492	31.5095969	51.0684653	11.523883
18.2750951854536	52.2217210866449	14.3870434394785	32.3710377	53.6854	0.0060466
18.271408667341	52.9367275284898	14.3887063683774	3.9504558	53.4738105	7.1081084
18.2676221700089	53.6709938817534	14.390414314273	4.9451086	53.7479899	10.2966488
18.2638187791689	54.408506501912	14.3921298834482	24.284459	53.5118781	4.6981631
18.2599767207107	55.1535119280302	14.3938629127511	18.3784185	57.1026507	1.60641
18.2561411779304	55.8973151896818	14.3955931316235	15.5276897	59.9411898	0.034091
18.25236538099	56.629694516264	14.3972966141686	13.6466825	56.641223	0.3772494
18.2485530577825	57.3692281448224	14.3990166949914	2.2999767	55.3764405	4.437231
18.2446286961538	58.1304604082887	14.4007873579889	1.389212	56.8496436	7.9005554
18.2406531160561	58.9016397795825	14.4025811943963	22.9209187	53.7233909	24.603033
18.2366033871053	59.6869723557688	14.4044081626138	3.2029124	51.042154	21.6188315
18.2366033871053	59.6869723557688	14.4044081626138	4.944301	50.787374	18.9241415
18.2319171454399	60.594985244202	14.4065218099887	7.20936620000001	55.909681	20.1638147
18.2270483972636	61.538187185033	14.4087176213108	6.14577610000001	57.4553139	19.7085867
18.2219715048547	62.5215546239073	14.4110071896001	0.2763329	64.7359652	24.1588067
18.2219715048547	62.5215546239073	14.4110071896001	4.8021518	64.3437535	14.9149548
18.2169288677516	63.498671953531	14.4132815007911	29.6716712	65.8677857	16.615982
18.2169288677516	63.498671953531	14.4132815007911	32.7632095	61.4478694	17.2734289
18.2119322918137	64.4664142778601	14.4155342289365	3.24432779999999	74.1558976	22.7592184
18.2119322918137	64.4664142778601	14.4155342289365	0.933565799999997	72.1659561	13.9038289
18.2072843777864	65.3670215268841	14.4176301236203	2.73342340000001	77.6753662	22.8134911
18.2030803473913	66.1820298798637	14.4195261219866	2.2118306	78.338365	17.5236695
18.2030803473913	66.1820298798637	14.4195261219866	4.2645198	75.4568775	14.9212902
18.1993120409641	66.9129854860275	14.4212260887882	11.0262565	80.6460603	18.6716382
18.1957953675904	67.595350122499	14.4228127593844	16.6661596	74.8364156	22.1285239
18.1957953675904	67.595350122499	14.4228127593844	22.4809106	75.2843669	23.7038192
18.1923960815406	68.2549699266419	14.4243464283807	26.7897314	74.395765	23.1412606
18.1923960815406	68.2549699266419	14.4243464283807	19.7736057	66.4248411	22.4431961
18.188964817683	68.9206528775275	14.4258942553326	23.1076735	77.6165558	13.9842376
18.188964817683	68.9206528775275	14.4258942553326	21.5799527	71.4486566	7.5717836
18.1856584356614	69.5620883693157	14.4273857570544	15.7168362	72.1075902	13.3837018
18.1856584356614	69.5620883693157	14.4273857570544	20.1950128	67.681815	12.2807597
18.1823209142593	70.2094210242401	14.4288911101675	23.2409835	69.6045703	6.9223743
18.1823209142593	70.2094210242401	14.4288911101675	17.9198509	62.5969087	8.2401641
18.1788052903611	70.8910356258017	14.430476468131	18.5593029	70.8497614	1.5511613
18.1752636036863	71.5776694406509	14.4320735823697	12.9149435	73.6813943	7.0579
18.1752636036863	71.5776694406509	14.4320735823697	14.8230271	72.6203252	11.2037362
18.171665872878	72.2751434535629	14.4336959060819	6.9413921	77.9428724	3.7844258
18.1681066674657	72.9651634883319	14.4353008965388	1.90777989999999	84.1438746	3.0185488
18.1681066674657	72.9651634883319	14.4353008965388	4.0094679	79.3774545	3.2513282
18.1648854156614	73.5898056825782	14.4367536361156	2.2068367	85.97283	4.4333903
18.1619218264459	74.1646488658727	14.4380903379853	2.2885744	93.0945686	4.7870646
18.1619218264459	74.1646488658727	14.4380903379853	2.7731053	90.8551563	10.3958831
18.16099289422	74.3451099635367	14.4385096016232	9.81425009999999	65.891213	10.4751695
18.16099289422	74.3451099635367	14.4385096016232	8.7488745	58.9072962	5.1240813
18.1599168318024	74.5540045886734	14.4389949700023	6.2196931	67.2192158	1.3051514
18.1588187122134	74.7671493950265	14.4394902478079	6.6484375	67.6725429	4.7357573
18.1588187122134	74.7671493950265	14.4394902478079	9.6122245	63.4753738	1.8891309
18.15766145723	74.9917019025011	14.4400121074448	2.4095765	76.567725	8.2487866
18.1565061123921	75.2158996184004	14.4405331218902	1.295681	73.7881021	0.4861457
18.1565061123921	75.2158996184004	14.4405331218902	6.0949397	74.0865476	5.2825592
18.155311126355	75.4477500993749	14.441072030513	7.5281123	85.6801168	11.1420674
18.155311126355	75.4477500993749	14.441072030513	5.6520223	82.6769432	10.5413091
18.154183239462	75.6666245264765	14.4415807240326	9.5621792	88.5032381	1.7950294
18.1531252124302	75.8719878896858	14.4420579960755	0.795030699999998	63.4582891	12.408302
18.1531252124302	75.8719878896858	14.4420579960755	6.65024940000001	63.3598676	12.1766222
18.1518974937255	76.1101740673547	14.4426116631308	9.22639889999999	90.0124515	4.4717238
18.1518974937255	76.1101740673547	14.4426116631308	11.9839899	90.8471274	5.5312557
18.1507854478436	76.3260167686944	14.4431133018134	13.5790401	86.3111074	8.8070912
18.1507854478436	76.3260167686944	14.4431133018134	19.6994488	87.7215703	8.9292535
18.1497165146664	76.5335142591786	14.4435955396289	19.6070156	87.5155962	19.7643343
18.1497165146664	76.5335142591786	14.4435955396289	20.4274735	84.2677658	10.0950289
18.14866577108	76.7374924572388	14.4440695610023	20.5127244	86.7993916	9.2772764
18.14866577108	76.7374924572388	14.4440695610023	25.8819635	79.9487476	10.2285525
18.1476110276467	76.9422345366585	14.4445453786989	13.4475731	91.4293541	19.9118277
18.1476110276467	76.9422345366585	14.4445453786989	13.1891897	88.2938542	23.4034575
18.1466062994993	77.1373038931178	14.444998660572	6.5131248	96.1438685	22.6159881
18.1466062994993	77.1373038931178	14.444998660572	5.93926279999999	95.2323551	18.983803
18.1457349970001	77.3065302062787	14.4453918544064	4.0389978	87.3302987	23.4710958
18.1457349970001	77.3065302062787	14.4453918544064	3.4980922	86.0326352	18.0570339

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.1448873921408	77.4711514384887	14.4457743591437	5.5712407	90.2337915	20.7281907
18.1448873921408	77.4711514384887	14.4457743591437	8.45094570000001	92.4898096	19.3229772
18.1440534846403	77.6331462936177	14.4461507312936	2.92961390000001	91.7761922	24.0474062
18.1432395531564	77.7913008858889	14.4465181473584	5.3401207	99.7769332	23.3119522
18.1431790390989	77.8029080351941	14.446545659036	9.41537220000001	53.1681384	17.4096726
18.1431790390989	77.8029080351941	14.446545659036	16.954408	52.9270638	19.3144339
18.14310743886	77.8165286635892	14.4465782293565	16.1987878	59.3187745	15.8426137
18.14310743886	77.8165286635892	14.4465782293565	17.0586402	58.0717087	14.4615884
18.1430346710995	77.8303318731921	14.4466113779604	18.1200543	57.6122523	16.2352309
18.1430346710995	77.8303318731921	14.4466113779604	20.3908302	60.0437447	17.3381089
18.1429560622928	77.8452041840255	14.4466471747039	15.1928212	63.8863652	20.6093336
18.1428746150812	77.8606334205484	14.4466841922779	18.474215	58.4012448	21.6380189
18.1427879881441	77.8770452688155	14.4467232499093	20.4303529	56.6155569	23.1754411
18.1427879881441	77.8770452688155	14.4467232499093	19.3270801	51.9549025	21.8491926
18.142472936148	77.9379490449453	14.4468665657006	25.824676	62.4300357	22.6279041
18.1421538425271	77.9996051555932	14.4470118035145	28.3264783	80.6515072	10.7169993
18.1421538425271	77.9996051555932	14.4470118035145	32.0336769	81.0046037	12.2328895
18.1418249480673	78.0631667009525	14.4471614312171	27.0999394	87.1794445	14.318048
18.1418249480673	78.0631667009525	14.4471614312171	31.00496	87.5127119	14.2496673
18.1414985679939	78.1262565647502	14.447309845761	26.8042407	95.3391438	15.0909578
18.1414985679939	78.1262565647502	14.447309845761	30.1525293	91.7059859	19.8161573
18.141181361163	78.1876025234825	14.4474539862815	17.6447354	95.7025091	24.4008135
18.141181361163	78.1876025234825	14.4474539862815	23.9936704	92.6751712	13.4234383
18.1408724799143	78.2473461288487	14.4475943111619	14.3875276	98.8261078	17.7695633
18.1408724799143	78.2473461288487	14.4475943111619	16.4819632	98.2716229	22.9610856
18.1405859288647	78.3027952984907	14.4477244260536	1.8947773	99.155621	15.7943163
18.1403406696056	78.35022142374	14.4478356461636	0.604558600000004	98.8714353	15.0611354
18.2669560049197	78.3296191564589	14.4436853879273	0.0137857999999937	97.6201473	12.5524591
19.6346873040533	78.1070751965739	14.3988634207435	2.8109458	93.7321232	7.4419786
21.4597440754579	77.8101267279123	14.3390536022438	20.7475398	95.759314	10.8106372
21.4597440754579	77.8101267279123	14.3390536022438	21.4283979	90.119601	10.9146393
23.3694986573889	77.4993976257989	14.2764672749399	22.9057445	97.6296948	0.3244356
25.5012577785827	77.1525516620447	14.2066039571934	33.8269693	93.4852631	8.3635932
27.4653025097556	76.8329881235036	14.1422369120409	34.617789	91.6565199	3.2534463
27.4653025097556	76.8329881235036	14.1422369120409	37.489488	92.2138591	10.0537289
29.1560267185843	76.5578911005476	14.0868254411476	28.8394854	85.6978668	0.4508897
30.9194066722403	76.2709728689026	14.0290327740325	25.1363027	82.596723	1.6788626
30.9194066722403	76.2709728689026	14.0290327740325	34.482979	80.365325	2.7097027
32.7987550227497	75.9651842445732	13.9674372668974	21.6218153	70.9164832	0.5487705
32.7987550227497	75.9651842445732	13.9674372668974	21.4467307	69.0185063	0.8942161
35.3689463353114	75.546999642662	13.8831955336943	23.3330747	67.4297538	2.1722534
35.3689463353114	75.546999642662	13.8831955336943	23.9069485	59.9121563	8.8002389
38.4500357795179	75.045694183589	13.7821796524706	38.128444	50.990683	1.5244057
38.6920145026633	75.0700199676969	13.8066675463103	45.6990417	60.3070344	11.94067
38.9310706220123	75.0940528307094	13.8308599337071	48.6878693	60.2173135	5.6974781
39.1657510402578	75.1176467633088	13.8546098530355	45.5118999	65.9532613	1.4856264
39.1657510402578	75.1176467633088	13.8546098530355	43.0002757	59.9692573	5.0791111
39.3982598704293	75.141023737582	13.878140470553	37.415218	67.1119326	2.4786359
39.3982598704293	75.141023737582	13.878140470553	33.1471098	60.1558513	4.4414558
39.6405854728364	75.1653879234121	13.902664718499	30.51178	74.0433946	6.2558417
39.6405854728364	75.1653879234121	13.902664718499	29.1113171	69.2428114	2.3178943
39.8929742830796	75.1907630673609	13.9282073069956	35.1926471	70.9963316	12.3857242
40.1433370958674	75.2159343864337	13.9535447695105	26.1534967	60.2417469	15.9637624
40.4087643015008	75.2426197005381	13.9804066233438	32.5068688	76.0167984	20.6942387
40.6760305096684	75.2694893877465	14.007454281173	37.7594155	72.4638416	24.7804303
40.9429340578624	75.2963224770763	14.0344650383007	43.8195847	68.1613988	20.4285954
40.9429340578624	75.2963224770763	14.0344650383007	44.3710695	67.9205927	10.1383529
41.2126920410465	75.3234431529871	14.061764972928	50.7478618	74.0551131	24.8207298
41.2126920410465	75.3234431529871	14.061764972928	50.8238583	67.1806384	20.6239323
41.4663542006103	75.3489469782566	14.0874363061168	45.8972803	89.1189208	23.3584238
41.4663542006103	75.3489469782566	14.0874363061168	35.4564008	78.9241199	21.2236154
41.724198769534	75.3748710317718	14.1135308033331	40.9379615	91.8870672	23.915222
41.724198769534	75.3748710317718	14.1135308033331	40.3910959	90.932739	23.935083
41.9835629180998	75.4009476471873	14.139778975796	40.8799687	90.9919823	19.2349904
42.2414843025052	75.4268791923078	14.1658811201455	38.0621359	81.3957333	12.1235509
42.5066385772701	75.4535375286069	14.1927151164783	37.6570142	81.9317057	5.2409906
42.5066385772701	75.4535375286069	14.1927151164783	40.9923031	81.1407106	10.4646561
42.7819796565238	75.4812193970413	14.2205797878108	38.2308224	97.9753907	0.1604725
44.6351941858879	75.667524105199	14.4080718785235	49.4827685	84.8462228	4.1362821
44.6351941858879	75.667524105199	14.4080718785235	39.6568849	80.0063838	5.1586736
46.1947950655812	75.8243106153365	14.5658582513921	61.6781701	59.473286	10.2741841
48.2018602932056	76.026085606879	14.7689209223082	49.7030604	90.8227548	10.5216088
48.2018602932056	76.026085606879	14.7689209223082	48.3895216	84.8378656	6.8593636
50.1373141447455	76.2206567916076	14.9647348826456	44.680977	94.9895485	20.4805113
51.9558683963566	76.4034698063949	15.1487163998902	50.0446513	86.3510967	14.724494
53.5286663715966	76.5615738322133	15.3078320816529	56.5514993	98.5201232	15.0548231
55.070444242366	76.7165584398988	15.4638089885019	63.7965883	99.8649883	6.5257645
56.0728076832938	76.8173387083412	15.5652263233798	61.1689993	94.8861498	0.1686343
56.0728076832938	76.8173387083412	15.5652263233798	61.0866811	94.7582572	1.1597592
56.9835654624958	76.9089084578891	15.6573745772071	65.7364961	88.9695394	1.2659879

Solution x	Solution y	Solution z	Original x	Original y	Original z
56.9835654624958	76.9089084578891	15.6573745772071	67.7945884	81.6777909	13.5506647
57.8518401425897	76.996209576625	15.7452259647722	72.4289329	91.88372	3.0217722
57.8518401425897	76.996209576625	15.7452259647722	71.4909917	88.8238404	7.979611
58.5438666049135	77.0657952354727	15.8152479514949	74.8496365	95.8479299	7.1137605
58.5438666049135	77.0657952354727	15.8152479514949	71.5874534	94.5399994	3.1033191
58.8622402055658	77.0978121911784	15.8474637205975	68.523768	98.3881808	6.8534875
59.1607475947912	77.1278315018386	15.8776692989342	67.0620012	97.8077872	5.6584534
59.1607475947912	77.1278315018386	15.8776692989342	67.3268965	96.007007	6.0328841
59.4455744856844	77.1564750829194	15.9064905223515	66.5761879	96.7049476	8.0800553
59.4455744856844	77.1564750829194	15.9064905223515	62.5782193	94.8345715	12.3846974
59.729685495107	77.1850464398165	15.9352390860242	66.3729212	97.9005203	11.9390694
59.729685495107	77.1850464398165	15.9352390860242	64.4754864	95.6952093	9.6236824
59.9991297255587	77.2121428888634	15.9625036368194	64.0121883	92.7907393	13.624016
59.9991297255587	77.2121428888634	15.9625036368194	63.9530194	87.4245185	17.4311618
60.2635726091755	77.238736468593	15.9892621549493	62.4719528	86.6470186	17.4140053
60.2635726091755	77.238736468593	15.9892621549493	56.1389342	85.561632	20.0765614
60.5358454790437	77.2661173016229	16.0168127509524	60.774398	89.648206	21.5223541
60.8085172984705	77.2935382666524	16.0444036814666	64.3381393	93.722702	21.2607142
61.0784451768943	77.3206833911887	16.071717012252	61.0630253	98.699805	24.8594975
61.3475089262145	77.3477415212662	16.0989427842534	64.9776601	99.8572829	20.7305349
61.3475089262145	77.3477415212662	16.0989427842534	62.6982725	97.3778678	18.7400798
61.6172182245693	77.3748642789937	16.1262335782365	70.4834315	96.1070737	18.6164445
61.6172182245693	77.3748642789937	16.1262335782365	68.0410206	93.0677269	14.2384361
61.8891418232094	77.4022097661683	16.1537483588695	76.9820609	94.8106777	15.132467
61.8891418232094	77.4022097661683	16.1537483588695	75.0360354	91.1497098	19.4705099
62.1285617964597	77.4262874224542	16.1779749531798	61.0701287	98.8683739	3.7920781
62.3776940031816	77.4513415220439	16.2031839863555	61.4066356	99.633296	10.2157007
62.6190998234426	77.4756185680592	16.2276112382096	62.3573907	96.159986	6.7572642
62.8642069169915	77.5002675868452	16.2524128154348	63.2522018	99.6147456	0.7669575
63.1244667513349	77.5099700592378	16.2903277531502	79.9522127	98.0359405	21.2412381
63.1430400340996	77.3904675848475	16.2779439838977	75.4923392	99.8090463	23.5616918
63.2080296068348	76.9723562625615	16.2346169615827	77.3466754	92.4222135	24.9773835
63.2768916857053	76.5293317003088	16.188708032833	75.6464183	86.4517504	17.8073467
63.2768916857053	76.5293317003088	16.188708032833	69.765468	86.0199863	16.8900143
63.346338113956	76.0825435913877	16.1424092186385	78.2121151	82.5216358	9.4131561
63.346338113956	76.0825435913877	16.1424092186385	72.4566884	79.8068651	12.2176684
63.4149219101629	75.6412970520909	16.0966849573022	77.1265753	88.6843079	7.3792466
63.4870745718284	75.1770944070427	16.0485816106314	77.2293497	82.6694496	0.4080071
63.4870745718284	75.1770944070427	16.0485816106314	75.4040099	79.0607348	6.3376777
63.5604910751511	74.7047534058779	15.9996352427225	75.0689318	72.4744486	0.4051745
63.6314770730074	74.2480434386785	15.9523088865397	74.4567732	73.8913977	2.9219836
63.6314770730074	74.2480434386785	15.9523088865397	68.5426632	70.6500378	2.313903
63.6991538878819	73.8126185104413	15.9071883762558	73.7932186	65.1929118	21.2635249
63.7645135696156	73.392098807085	15.8636122893224	56.5346421	68.6367247	22.9662555
63.7645135696156	73.392098807085	15.8636122893224	64.4880133	60.4854675	12.6069191
63.8257971615496	72.9978063554727	15.8227538554751	61.6425082	72.8564323	6.6704147
63.8879573704679	72.5978745434553	15.7813110807349	64.4543682	70.2655389	2.1929672
63.9503644075467	72.1963539489247	15.7397037552512	64.6626599	65.39963	6.8345581
63.9503644075467	72.1963539489247	15.7397037552512	57.0800315	64.0172849	6.0370203
64.0095589405107	71.8155013373584	15.7002382095596	63.772212	68.1836695	14.3458559
64.0095589405107	71.8155013373584	15.7002382095596	58.1838222	68.9986011	16.3418061
64.0687558227702	71.4346393193128	15.6607715643092	66.0988248	58.3515559	13.6719306
64.0687558227702	71.4346393193128	15.6607715643092	65.5436157	56.992435	13.1266946
64.1221607659093	71.0910401957996	15.6251662408452	69.6306367	57.4599551	14.1507992
64.172986470759	70.7640361512408	15.5912805437689	79.155929	54.6404138	23.5670664
64.172986470759	70.7640361512408	15.5912805437689	70.748982	60.565778	20.2126548
64.2173671949677	70.4785172406591	15.5616930874007	67.7686962	50.942416	23.8888342
64.2173671949677	70.4785172406591	15.5616930874007	57.7424662	53.0431767	19.7584506
64.2525142172116	70.2524293384755	15.5382632402341	57.0032853	47.929495	24.4820709
64.2525142172116	70.2524293384755	15.5382632402341	47.6524078	52.2249928	24.4877735
64.2746603240564	70.1099551974388	15.5234988469833	41.3355343	82.7796974	17.0555529
64.2746603240564	70.1099551974388	15.5234988469833	45.3945603	79.9114427	16.0984045
64.310576560073	69.8788993092392	15.4995544260083	45.3765455	76.9954785	11.855076
64.310576560073	69.8788993092392	15.4995544260083	47.2434466	72.8348775	10.3871125
64.3494450203176	69.6288472232875	15.4736416554842	45.412979	71.2677197	7.8505587
64.3888188576235	69.3755412866215	15.4473918804903	53.0250996	68.7918887	2.0307378
64.3888188576235	69.3755412866215	15.4473918804903	50.0180258	68.4527432	3.6702061
64.4292485233527	69.1154395257987	15.4204381853884	57.8283627	65.6998258	15.4827548
64.4292485233527	69.1154395257987	15.4204381853884	46.8228713	71.844353	9.3127449
64.4713084287944	68.8448452472621	15.3923973283497	54.3749565	73.471727	7.5546522
64.5147860625688	68.565127473943	15.3634112002041	57.43771	71.1535593	20.5447257
64.5147860625688	68.565127473943	15.3634112002041	56.7397866	71.0931061	18.3430984
64.5610241395795	68.2676441811604	15.3325841677728	56.0822206	62.8731122	23.9833277
64.6076248128085	67.9678224624778	15.301514891545	44.8729194	51.9811136	24.4648411
64.8204372768624	67.8420082939763	15.1943707516003	51.8847181	57.7017397	23.1071854
64.8204372768624	67.8420082939763	15.1943707516003	46.3458684	54.8708712	24.5219613
65.0399293477034	67.7122451347084	15.0838634866221	43.3709663	79.9295648	12.3122786
65.2987055801501	67.5592573462018	14.9535779872479	43.6827488	74.1878852	3.8851851
65.2987055801501	67.5592573462018	14.9535779872479	42.9598051	72.0704928	1.9046969
65.7051769802523	67.3189524730131	14.7489326165326	46.0567355	72.019762	4.0391076

Solution x	Solution y	Solution z	Original x	Original y	Original z
66.1382311235678	67.0629319241082	14.5309036511422	46.3729602	74.0499355	16.6434815
66.6156028870295	66.7807109779479	14.2905622238174	49.7783583	78.4397036	19.1457188
66.6156028870295	66.7807109779479	14.2905622238174	47.9098314	77.7959758	13.7573709
67.2075812043711	66.430735170972	13.9925202707284	52.878421	80.2956919	22.1921533
67.2075812043711	66.430735170972	13.9925202707284	51.7496653	79.9144917	22.4057667
68.0017870193479	65.9612036409111	13.5926638201465	59.1397084	81.6064397	24.1713239
68.0017870193479	65.9612036409111	13.5926638201465	55.0653569	81.234009	22.9552522
69.1033849952858	65.3099436818616	13.0380464657536	63.6802314	81.8267454	23.9676687
70.3722837920081	64.5597758005557	12.3991988118641	69.1126526	61.5737532	13.3447692
71.5870773688677	63.84159527081	11.7875913619933	67.3900644	74.174693	20.6721334
72.8968569868253	63.0672595461148	11.1281618427564	73.2290706	73.9762718	17.115174
72.8968569868253	63.0672595461148	11.1281618427564	66.8428254	74.9418962	18.8280244
74.4377047250796	62.1563175122867	10.3523979325902	78.4106856	73.5257917	13.7197973
74.4377047250796	62.1563175122867	10.3523979325902	77.5651358	71.0148631	15.8380209
75.9696174836595	61.2506562265015	9.58113206654019	73.3690079	50.7128517	12.3210863
77.4764619497684	60.3598162030531	8.82248848551706	67.1669184	49.4371849	3.0262948
78.975836107831	59.4733937934536	8.06760793043794	63.3053921	48.8331121	7.8682203
80.5979961187727	58.5143820578283	7.2509098053764	69.2934493	49.5142976	7.1641629
82.271691941709	57.5249028763362	6.40826507778	75.4422908	46.5496079	10.6773392
83.9415032385157	56.5377209215448	5.56757548453328	79.80288	56.0883078	18.4129389
83.9415032385157	56.5377209215448	5.56757548453328	74.3685871	61.179785	20.6768635
86.3020880216479	55.1421538071357	4.3790996206626	78.4065879	56.8222853	10.2773712
88.9231638595186	53.5925861766087	3.0594756752551	77.1618533	52.0527053	6.1051205
91.5422366079757	52.0442074587313	1.74086369725581	77.6409989	49.4044045	6.2831565

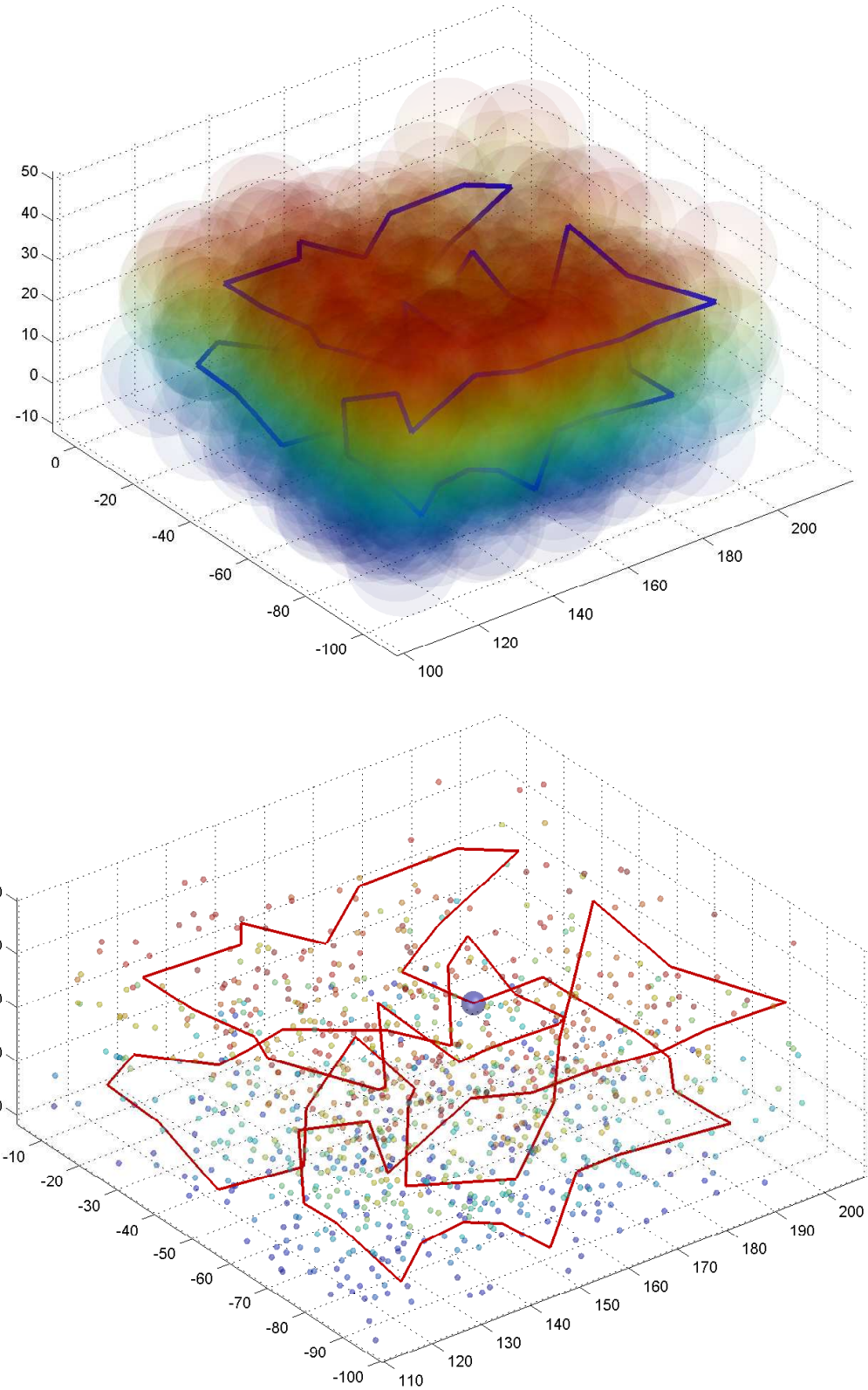

Figure N.69: *bonus*1000, Equal Radius, 3D, Euclidean, Length = 941.3484337

Table N-72: Solution for *bonus*1000, Equal Radius, 3D, Euclidean

Total distance: 941.348433677378 Depot: x 80 y 20 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
80.3750535845215	25.007532753957	3.62217001826328	87.03899122	21.09553754	1.216015821
81.1439873679416	35.2739776169492	11.0483418383122	87.56748283	36.27406643	21.13489416
81.1439873679416	35.2739776169492	11.0483418383122	86.50661976	33.33916758	0.489048022
80.9305495153075	37.3377590060738	12.4879496778033	74.55729645	43.48740037	20.58508364
80.9305495153075	37.3377590060738	12.4879496778033	84.85983095	39.85329756	21.28837281
80.9305495153075	37.3377590060738	12.4879496778033	73.13866372	41.71405139	17.04301109
80.9305495153075	37.3377590060738	12.4879496778033	82.01891737	31.58538586	22.96295297
80.9305495153075	37.3377590060738	12.4879496778033	88.13068149	33.9074779	16.96093724
80.9305495153075	37.3377590060738	12.4879496778033	74.78372311	42.05088328	3.322634156
80.9305495153075	37.3377590060738	12.4879496778033	75.19376171	39.75388964	3.378695446
80.9305495153075	37.3377590060738	12.4879496778033	75.00767938	29.50135545	13.77877729
82.9956519778814	45.7227845741735	10.7934469835968	77.14427045	45.25079579	0.327384457
85.5962208095518	55.6353689187543	9.08351675417708	95.77662579	57.68215173	3.069360741
85.5962208095518	55.6353689187543	9.08351675417708	90.50689197	55.43830225	17.11301088
85.5962208095518	55.6353689187543	9.08351675417708	79.86750899	54.35421653	8.27403967
85.5962208095518	55.6353689187543	9.08351675417708	84.14082278	54.46253046	0.380513445
85.5962208095518	55.6353689187543	9.08351675417708	85.71414415	51.67250379	7.296357424
85.5962208095518	55.6353689187543	9.08351675417708	78.92131522	50.41345477	7.556720976
85.5962208095518	55.6353689187543	9.08351675417708	77.77449926	46.72256252	10.92269156
83.1131346128409	67.9980352669498	10.8509334361602	91.90328388	76.16243153	11.12653143
83.1131346128409	67.9980352669498	10.8509334361602	83.77232341	73.14211564	19.82850896
83.1131346128409	67.9980352669498	10.8509334361602	78.29263567	66.45988674	19.86750284
83.1131346128409	67.9980352669498	10.8509334361602	72.70378804	66.70645397	9.083647724
83.1131346128409	67.9980352669498	10.8509334361602	76.04244622	64.45001766	13.22117777
83.1131346128409	67.9980352669498	10.8509334361602	85.16088414	60.47696067	19.97453885
83.1131346128409	67.9980352669498	10.8509334361602	87.34079917	59.37931572	10.08579475
83.1131346128409	67.9980352669498	10.8509334361602	75.75634139	60.02200009	5.726434896
74.5380313191905	80.3724842472917	13.3108305868994	77.11333094	85.3156461	2.683835286
74.5380313191905	80.3724842472917	13.3108305868994	70.83372488	78.21085961	24.5182183
74.5380313191905	80.3724842472917	13.3108305868994	82.09017124	81.333147	13.10533341
74.5380313191905	80.3724842472917	13.3108305868994	67.69295238	75.24403656	20.54681948
74.5380313191905	80.3724842472917	13.3108305868994	74.46580568	79.0435318	1.384862598
74.5380313191905	80.3724842472917	13.3108305868994	68.36889636	72.61479797	11.90493723
74.5380313191905	80.3724842472917	13.3108305868994	73.75840634	73.11670598	12.48249331
74.5380313191905	80.3724842472917	13.3108305868994	74.07680751	69.16329968	17.32839223
74.5380313191905	80.3724842472917	13.3108305868994	70.36283848	70.39401036	9.239076068
76.433454959053	93.0841677881085	12.2375879550067	80.84419352	99.98848979	20.3915349
76.433454959053	93.0841677881085	12.2375879550067	86.37403118	99.02923308	15.37465632
76.433454959053	93.0841677881085	12.2375879550067	78.18108034	99.79242924	3.657350909
76.433454959053	93.0841677881085	12.2375879550067	69.38304877	98.18671586	10.95698255
76.433454959053	93.0841677881085	12.2375879550067	69.92952441	96.42807986	14.30332435
76.433454959053	93.0841677881085	12.2375879550067	79.39161289	97.26593015	10.2457076
76.433454959053	93.0841677881085	12.2375879550067	64.64609008	95.09261932	13.24961232
76.433454959053	93.0841677881085	12.2375879550067	70.07355989	96.61021246	6.954740599
76.433454959053	93.0841677881085	12.2375879550067	79.19703593	96.06011661	13.22486099
76.433454959053	93.0841677881085	12.2375879550067	73.04972269	93.68364053	0.740152131
76.433454959053	93.0841677881085	12.2375879550067	71.17046416	92.96230041	3.31475723
76.433454959053	93.0841677881085	12.2375879550067	86.10921689	91.46882481	10.98097302
76.433454959053	93.0841677881085	12.2375879550067	82.53992082	88.87907996	14.07314191
76.433454959053	93.0841677881085	12.2375879550067	75.38279951	84.8495864	16.86303573
58.3321367548161	86.7773758757686	9.91632845153705	57.43254842	97.94119843	9.821238574
58.3321367548161	86.7773758757686	9.91632845153705	58.00620671	94.64720593	1.304858734
58.3321367548161	86.7773758757686	9.91632845153705	61.09603132	95.38804721	2.385400865
58.3321367548161	86.7773758757686	9.91632845153705	62.35255518	88.46202983	5.064300638
58.3321367548161	86.7773758757686	9.91632845153705	67.89989075	88.12316705	3.528198384
58.3321367548161	86.7773758757686	9.91632845153705	55.75342338	84.56592915	0.703415223
58.3321367548161	86.7773758757686	9.91632845153705	58.40265516	82.89286098	16.95320583
58.3321367548161	86.7773758757686	9.91632845153705	60.70093329	80.64454551	19.95511414
58.3321367548161	86.7773758757686	9.91632845153705	61.67834468	82.51967341	13.24261796
58.3321367548161	86.7773758757686	9.91632845153705	69.09548968	84.07624055	12.89569188
58.3321367548161	86.7773758757686	9.91632845153705	62.03157877	81.16617953	8.458189727
58.3321367548161	86.7773758757686	9.91632845153705	57.82109764	79.24611201	0.587934441
58.3321367548161	86.7773758757686	9.91632845153705	63.68037897	79.29990004	5.705664659
48.0526925467473	89.1006183119776	11.5211881801343	44.53236455	98.59505273	17.96036731
48.0526925467473	89.1006183119776	11.5211881801343	52.2623599	99.83573023	14.38314162
48.0526925467473	89.1006183119776	11.5211881801343	50.67630959	98.08417141	16.59101162
48.0526925467473	89.1006183119776	11.5211881801343	54.09260921	96.04789718	12.52208915
48.0526925467473	89.1006183119776	11.5211881801343	49.59427698	92.51123595	3.551090207
48.0526925467473	89.1006183119776	11.5211881801343	54.90972966	93.30800556	12.19693664
48.0526925467473	89.1006183119776	11.5211881801343	51.98537923	93.03310405	5.658677856
48.0526925467473	89.1006183119776	11.5211881801343	49.03663551	90.65504513	13.8830876
48.0526925467473	89.1006183119776	11.5211881801343	53.26472651	92.17526811	13.38443287
48.0526925467473	89.1006183119776	11.5211881801343	54.43632749	91.92787857	15.4166252
48.0526925467473	89.1006183119776	11.5211881801343	54.10050901	92.28618361	12.05829408
48.0526925467473	89.1006183119776	11.5211881801343	46.02083433	88.3362158	14.03418258
48.0526925467473	89.1006183119776	11.5211881801343	57.53422575	91.73216299	13.63995038

Solution x	Solution y	Solution z	Original x	Original y	Original z
48.0526925467473	89.1006183119776	11.5211881801343	45.13867401	81.86371268	20.6390675
48.0526925467473	89.1006183119776	11.5211881801343	56.30399813	89.72916428	6.343295144
48.0526925467473	89.1006183119776	11.5211881801343	40.58416037	81.54961967	6.0287924
48.0526925467473	89.1006183119776	11.5211881801343	53.87450626	88.16447802	6.291517338
48.0526925467473	89.1006183119776	11.5211881801343	49.77274656	84.13753559	18.23448828
48.0526925467473	89.1006183119776	11.5211881801343	52.05342714	85.82620662	0.803032132
48.0526925467473	89.1006183119776	11.5211881801343	51.49657531	83.11057243	16.78262105
48.0526925467473	89.1006183119776	11.5211881801343	55.99099974	83.60147673	17.9737132
48.0526925467473	89.1006183119776	11.5211881801343	48.20934555	82.30314786	4.491594241
48.0526925467473	89.1006183119776	11.5211881801343	53.08761619	83.0335557	12.88369987
48.0526925467473	89.1006183119776	11.5211881801343	51.18829335	82.80979047	5.597845952
48.0526925467473	89.1006183119776	11.5211881801343	46.11608956	79.13405595	12.05021293
48.0526925467473	89.1006183119776	11.5211881801343	45.32225765	79.26748614	7.718311017
48.0526925467473	89.1006183119776	11.5211881801343	47.92908542	80.11129273	4.265931676
48.0526925467473	89.1006183119776	11.5211881801343	47.14165764	77.84331314	10.33249494
48.0526925467473	89.1006183119776	11.5211881801343	55.73082902	81.05870461	7.770192012
37.4555175032	95.8507213046813	3.97296834544909	26.20322759	94.45704722	0.043122659
37.4555175032	95.8507213046813	3.97296834544909	37.35140359	99.57591236	15.11952707
37.4555175032	95.8507213046813	3.97296834544909	41.23951851	98.4925435	12.0504117
37.4555175032	95.8507213046813	3.97296834544909	39.47053756	98.01039691	0.046804559
37.4555175032	95.8507213046813	3.97296834544909	48.86252985	99.44183304	4.964951227
37.4555175032	95.8507213046813	3.97296834544909	35.55901251	90.85604615	4.893665446
37.4555175032	95.8507213046813	3.97296834544909	44.01236363	95.54242778	0.007676566
37.4555175032	95.8507213046813	3.97296834544909	46.20732106	94.82215894	11.38854737
37.4555175032	95.8507213046813	3.97296834544909	45.33430047	93.58613905	11.44191552
37.4555175032	95.8507213046813	3.97296834544909	43.91518159	93.39792889	6.973666169
37.4555175032	95.8507213046813	3.97296834544909	47.96746082	95.14523251	6.669541987
37.4555175032	95.8507213046813	3.97296834544909	36.90788531	88.78292268	9.064555312
37.4555175032	95.8507213046813	3.97296834544909	38.21932161	86.88940242	6.390388464
37.4555175032	95.8507213046813	3.97296834544909	46.25821854	91.17761288	0.218810451
37.4555175032	95.8507213046813	3.97296834544909	42.23200248	88.95299773	4.136491045
30.2250547528074	92.5164587464088	9.60655327144611	37.87107476	99.67477247	15.46291348
30.2250547528074	92.5164587464088	9.60655327144611	23.92476676	88.85275247	0.073261016
30.2250547528074	92.5164587464088	9.60655327144611	33.71990859	84.56649705	17.88810749
30.2250547528074	92.5164587464088	9.60655327144611	38.25086273	84.70191635	10.62939488
22.1442292407169	92.7449418926612	12.8140094521646	21.53298817	97.76613815	23.69582939
22.1442292407169	92.7449418926612	12.8140094521646	17.22630202	94.08640458	22.99978352
22.1442292407169	92.7449418926612	12.8140094521646	22.06521104	97.80973943	1.986453498
22.1442292407169	92.7449418926612	12.8140094521646	27.03699297	98.99807723	18.13725322
22.1442292407169	92.7449418926612	12.8140094521646	27.32463884	98.08040747	18.9687539
22.1442292407169	92.7449418926612	12.8140094521646	25.58817455	94.62259734	16.80660453
22.1442292407169	92.7449418926612	12.8140094521646	30.46512782	92.10545477	16.97866967
22.1442292407169	92.7449418926612	12.8140094521646	30.51609732	92.20951413	14.80192542
22.1442292407169	92.7449418926612	12.8140094521646	33.84742868	94.52834747	10.85109907
22.1442292407169	92.7449418926612	12.8140094521646	26.49994117	86.49656314	20.04082186
22.1442292407169	92.7449418926612	12.8140094521646	24.93956922	85.18138774	19.5490822
22.1442292407169	92.7449418926612	12.8140094521646	29.03165996	90.53300961	6.710005169
22.1442292407169	92.7449418926612	12.8140094521646	24.79158589	85.73273425	15.36547182
22.1442292407169	92.7449418926612	12.8140094521646	32.87814817	90.10176773	12.94837243
22.1442292407169	92.7449418926612	12.8140094521646	31.03913924	88.81924735	11.29281098
22.1442292407169	92.7449418926612	12.8140094521646	28.95022635	86.79829568	12.40202554
22.1442292407169	92.7449418926612	12.8140094521646	28.34961296	82.66841267	14.80317352
14.0846327314503	92.1222898407628	11.4825241034095	3.319354366	86.8534104	10.89284525
14.0846327314503	92.1222898407628	11.4825241034095	5.793118726	87.72031575	18.95737877
14.0846327314503	92.1222898407628	11.4825241034095	6.29169329299999	89.27097954	11.1353809
14.0846327314503	92.1222898407628	11.4825241034095	18.10270516	98.29192556	19.61359774
14.0846327314503	92.1222898407628	11.4825241034095	18.56973911	98.93410982	17.86986814
14.0846327314503	92.1222898407628	11.4825241034095	14.02380259	94.55773265	18.6627295
14.0846327314503	92.1222898407628	11.4825241034095	17.81960057	98.01765152	13.9964983
14.0846327314503	92.1222898407628	11.4825241034095	6.663988874	86.9326968	14.76370285
14.0846327314503	92.1222898407628	11.4825241034095	22.19955839	99.83998701	15.37683497
14.0846327314503	92.1222898407628	11.4825241034095	10.77763243	89.00986935	18.62168793
14.0846327314503	92.1222898407628	11.4825241034095	9.98481624199999	87.60870523	18.9809529
14.0846327314503	92.1222898407628	11.4825241034095	5.902742913	84.57417463	9.395938461
14.0846327314503	92.1222898407628	11.4825241034095	17.25875189	95.69940805	8.290437664
14.0846327314503	92.1222898407628	11.4825241034095	23.23282295	99.37897746	14.24859303
14.0846327314503	92.1222898407628	11.4825241034095	13.01348985	89.5505908	15.47048063
14.0846327314503	92.1222898407628	11.4825241034095	11.28159713	86.83718755	19.13922705
14.0846327314503	92.1222898407628	11.4825241034095	21.95406549	97.08230078	10.07565883
14.0846327314503	92.1222898407628	11.4825241034095	19.55892343	94.48515334	9.227774263
14.0846327314503	92.1222898407628	11.4825241034095	22.62104276	94.03699994	18.3046068
14.0846327314503	92.1222898407628	11.4825241034095	20.03955091	90.83830295	21.35984013
14.0846327314503	92.1222898407628	11.4825241034095	23.10855555	93.46528062	15.33870171
14.0846327314503	92.1222898407628	11.4825241034095	15.06397637	86.4956065	14.41870487
14.0846327314503	92.1222898407628	11.4825241034095	21.61123904	90.19731465	15.12916055
14.0846327314503	92.1222898407628	11.4825241034095	25.24294214	93.18181598	14.28875041
14.0846327314503	92.1222898407628	11.4825241034095	12.63857375	82.42671014	11.06948651
14.0846327314503	92.1222898407628	11.4825241034095	24.92385591	92.07997464	15.00916266
14.0846327314503	92.1222898407628	11.4825241034095	21.4032788	88.65695382	8.541884
14.0846327314503	92.1222898407628	11.4825241034095	24.68088332	89.71453351	6.983081462

Solution x	Solution y	Solution z	Original x	Original y	Original z
14.0846327314503	92.1222898407628	11.4825241034095	18.16441332	83.32201509	7.61422766
10.221766772625	91.6794718515704	5.38162589674464	0.846436707999999	97.15575264	0.271481864
10.221766772625	91.6794718515704	5.38162589674464	2.510162792	94.82470236	6.564520873
10.221766772625	91.6794718515704	5.38162589674464	4.44010970700001	94.87692744	8.233710837
10.221766772625	91.6794718515704	5.38162589674464	3.298576907	92.26869515	0.703140302
10.221766772625	91.6794718515704	5.38162589674464	8.37640356200001	96.83801393	4.582503625
10.221766772625	91.6794718515704	5.38162589674464	7.009024866	89.80852716	6.686928303
10.221766772625	91.6794718515704	5.38162589674464	7.085383584	88.77850283	10.21283209
10.221766772625	91.6794718515704	5.38162589674464	10.40564453	91.96900158	9.717112894
10.221766772625	91.6794718515704	5.38162589674464	3.10551266100001	84.71082736	3.992777578
10.221766772625	91.6794718515704	5.38162589674464	4.724328509	85.88211036	2.778795893
10.221766772625	91.6794718515704	5.38162589674464	4.377655918	84.98459142	5.210127271
10.221766772625	91.6794718515704	5.38162589674464	8.842438164	89.89183088	2.824200169
10.221766772625	91.6794718515704	5.38162589674464	6.35930977699999	87.06467249	1.39262333
10.221766772625	91.6794718515704	5.38162589674464	6.810206318	85.20186256	2.844617135
10.221766772625	91.6794718515704	5.38162589674464	20.42707279	96.69258649	1.544902576
10.221766772625	91.6794718515704	5.38162589674464	12.45480817	85.29988604	5.441763796
10.221766772625	91.6794718515704	5.38162589674464	15.25088212	86.85170355	0.622562014
10.221766772625	91.6794718515704	5.38162589674464	12.87616068	80.54131267	1.790579055
10.221766772625	91.6794718515704	5.38162589674464	20.47481611	85.68176763	4.096992025
8.97676055927838	76.0174561756834	9.70211580388185	1.45195925500001	80.87244268	12.37991353
8.97676055927838	76.0174561756834	9.70211580388185	0.848777487999996	80.80421078	5.669295757
8.97676055927838	76.0174561756834	9.70211580388185	3.437419026	82.39656928	11.4164042
8.97676055927838	76.0174561756834	9.70211580388185	0.773453591000006	79.81662315	5.077053724
8.97676055927838	76.0174561756834	9.70211580388185	4.297539438	80.73294711	0.059971047
8.97676055927838	76.0174561756834	9.70211580388185	3.10003410199999	78.61964126	7.805263196
8.97676055927838	76.0174561756834	9.70211580388185	5.724809855	81.80721271	6.405774196
8.97676055927838	76.0174561756834	9.70211580388185	5.04273939700001	78.40053531	10.86923314
8.97676055927838	76.0174561756834	9.70211580388185	3.252339284	73.9521337	6.052632886
8.97676055927838	76.0174561756834	9.70211580388185	2.885089549	70.78781924	5.964704064
8.97676055927838	76.0174561756834	9.70211580388185	2.881941531	70.78732912	3.789169139
8.97676055927838	76.0174561756834	9.70211580388185	9.360499311	76.63383999	11.96842635
8.97676055927838	76.0174561756834	9.70211580388185	8.595205897	76.73972439	1.498449057
8.97676055927838	76.0174561756834	9.70211580388185	2.781332517	68.35625636	3.710000307
8.97676055927838	76.0174561756834	9.70211580388185	6.04179221699999	70.01715429	8.958731963
8.97676055927838	76.0174561756834	9.70211580388185	6.334374787	68.85467086	8.438723386
8.97676055927838	76.0174561756834	9.70211580388185	14.09860615	77.68853822	13.45994873
8.97676055927838	76.0174561756834	9.70211580388185	9.088863996	70.57778186	13.84286783
8.97676055927838	76.0174561756834	9.70211580388185	17.20155001	81.69531761	4.530646889
8.97676055927838	76.0174561756834	9.70211580388185	15.50686687	76.44859369	16.39940441
8.97676055927838	76.0174561756834	9.70211580388185	18.15532249	77.80652015	16.99185344
8.97676055927838	76.0174561756834	9.70211580388185	19.29153506	80.52426775	7.949521468
8.97676055927838	76.0174561756834	9.70211580388185	11.73654707	68.82383733	18.16264782
8.97676055927838	76.0174561756834	9.70211580388185	16.93400358	77.9224885	0.924123088
8.97676055927838	76.0174561756834	9.70211580388185	13.78543979	72.75062985	12.01531817
8.97676055927838	76.0174561756834	9.70211580388185	13.34199807	71.15108407	14.18117491
8.97676055927838	76.0174561756834	9.70211580388185	18.79013692	77.54174683	13.67079469
8.97676055927838	76.0174561756834	9.70211580388185	16.80968797	72.84815948	15.34934359
8.97676055927838	76.0174561756834	9.70211580388185	13.50520564	67.72241024	17.09707449
8.97676055927838	76.0174561756834	9.70211580388185	15.83973733	72.60736968	8.73861151
8.97676055927838	76.0174561756834	9.70211580388185	16.29427026	68.63097998	5.127480774
6.23567062302902	71.0627351052601	11.9268308043761	3.380314451	80.99890539	17.02151813
6.23567062302902	71.0627351052601	11.9268308043761	1.834626902	71.15202574	0.775939504
6.23567062302902	71.0627351052601	11.9268308043761	1.825477279	70.78130479	1.056192161
6.23567062302902	71.0627351052601	11.9268308043761	0.793870075000001	65.00803843	8.045595465
6.23567062302902	71.0627351052601	11.9268308043761	3.336609071	66.34370608	12.08281041
6.23567062302902	71.0627351052601	11.9268308043761	2.82031094	66.9400554	1.18723785
6.23567062302902	71.0627351052601	11.9268308043761	3.16457285600001	61.67055704	18.73530868
6.23567062302902	71.0627351052601	11.9268308043761	10.36857839	64.9958121	20.62230905
6.23567062302902	71.0627351052601	11.9268308043761	8.01127751600001	61.69215045	17.84993877
6.23567062302902	71.0627351052601	11.9268308043761	8.93361225699999	64.19415642	15.31500377
6.23567062302902	71.0627351052601	11.9268308043761	12.00297966	63.9466553	16.56981835
6.23567062302902	71.0627351052601	11.9268308043761	10.63863267	61.64507704	12.52958841
6.23567062302902	71.0627351052601	11.9268308043761	11.71156616	63.23151575	10.39694521
6.23567062302902	71.0627351052601	11.9268308043761	16.73656026	65.26611785	12.28815231
3.36630931096565	73.3756272280637	27.6328234937279	3.05949055799999	82.05603574	19.35294441
3.36630931096565	73.3756272280637	27.6328234937279	1.09685186199999	69.20060768	38.65184391
3.36630931096565	73.3756272280637	27.6328234937279	4.961462551	81.51420623	19.50536364
3.36630931096565	73.3756272280637	27.6328234937279	0.155166121999997	73.1143838	18.2350269
3.36630931096565	73.3756272280637	27.6328234937279	1.009741561	74.32200243	17.21598932
3.36630931096565	73.3756272280637	27.6328234937279	3.765987951	77.28123402	18.22137656
3.36630931096565	73.3756272280637	27.6328234937279	2.544714587	74.45838234	20.47608884
3.36630931096565	73.3756272280637	27.6328234937279	3.702577787	67.55965669	35.63856131
3.36630931096565	73.3756272280637	27.6328234937279	0.299902086000003	68.51958527	21.52036301
3.36630931096565	73.3756272280637	27.6328234937279	5.020361565	69.58798476	32.44258164
3.36630931096565	73.3756272280637	27.6328234937279	4.203561784	71.28689241	26.51244139
3.36630931096565	73.3756272280637	27.6328234937279	2.559418382	66.60707534	29.94444397
3.36630931096565	73.3756272280637	27.6328234937279	5.065657714	76.41830653	16.15003851
3.36630931096565	73.3756272280637	27.6328234937279	5.863440787	76.06172049	20.11271942
3.36630931096565	73.3756272280637	27.6328234937279	3.972668798	68.43095677	28.84137669

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.36630931096565	73.3756272280637	27.6328234937279	2.76637406099999	66.09545945	29.36453565
3.36630931096565	73.3756272280637	27.6328234937279	3.705228073	66.5975084	22.49684982
3.36630931096565	73.3756272280637	27.6328234937279	9.964092428	69.02740379	34.44916177
3.36630931096565	73.3756272280637	27.6328234937279	8.88093920200001	67.16779099	33.76570468
3.36630931096565	73.3756272280637	27.6328234937279	10.28504553	75.43578797	21.16629174
3.36630931096565	73.3756272280637	27.6328234937279	9.89788954300001	67.94003152	30.38024953
3.36630931096565	73.3756272280637	27.6328234937279	11.17807544	66.07771318	32.92555185
3.36630931096565	73.3756272280637	27.6328234937279	11.54525803	68.93314303	25.95468917
3.36630931096565	73.3756272280637	27.6328234937279	8.689838933	62.80875147	27.12937634
10.1064653583213	83.2993629735305	31.4409850325218	2.643010323	87.48230483	39.26134045
10.1064653583213	83.2993629735305	31.4409850325218	1.83782096500001	81.06813079	39.8464095
10.1064653583213	83.2993629735305	31.4409850325218	0.539457489	84.81338557	26.32883597
10.1064653583213	83.2993629735305	31.4409850325218	5.333729823	86.89695613	31.50319232
10.1064653583213	83.2993629735305	31.4409850325218	12.48771043	90.90107319	36.2773466
10.1064653583213	83.2993629735305	31.4409850325218	1.696022601	79.3379408	35.04130759
10.1064653583213	83.2993629735305	31.4409850325218	14.30638295	91.72702037	37.41288443
10.1064653583213	83.2993629735305	31.4409850325218	9.940095688	86.998178	38.16021851
10.1064653583213	83.2993629735305	31.4409850325218	7.992357197	82.08091397	36.27596397
10.1064653583213	83.2993629735305	31.4409850325218	5.779054124	82.01317499	31.17715184
10.1064653583213	83.2993629735305	31.4409850325218	5.912402555	83.10767778	28.97692543
10.1064653583213	83.2993629735305	31.4409850325218	3.795442881	81.20966501	27.41200193
10.1064653583213	83.2993629735305	31.4409850325218	7.936374341	83.63932008	31.96057141
10.1064653583213	83.2993629735305	31.4409850325218	12.03430063	87.78817585	32.36153594
10.1064653583213	83.2993629735305	31.4409850325218	10.82142722	82.89323555	36.78865334
10.1064653583213	83.2993629735305	31.4409850325218	10.08146406	81.46406963	37.62633094
10.1064653583213	83.2993629735305	31.4409850325218	9.921883095	86.8721598	22.00737941
10.1064653583213	83.2993629735305	31.4409850325218	9.701793671	81.23141394	32.23008983
10.1064653583213	83.2993629735305	31.4409850325218	16.23739593	85.87006787	34.99641701
10.1064653583213	83.2993629735305	31.4409850325218	20.75129811	88.7330358	32.51930493
10.1064653583213	83.2993629735305	31.4409850325218	14.92906226	79.42060964	37.22040132
10.1064653583213	83.2993629735305	31.4409850325218	20.16675465	86.45561332	33.59426088
10.1064653583213	83.2993629735305	31.4409850325218	8.675234817	76.17385221	29.29611493
10.1064653583213	83.2993629735305	31.4409850325218	18.85500198	86.61471751	28.9549492
10.1064653583213	83.2993629735305	31.4409850325218	9.01858207399999	78.03824041	22.65782791
10.1064653583213	83.2993629735305	31.4409850325218	6.979895184	73.91637244	25.14533012
10.1064653583213	83.2993629735305	31.4409850325218	19.16596982	83.58117432	33.35557023
10.1064653583213	83.2993629735305	31.4409850325218	17.38954679	82.23173111	30.2609052
10.1064653583213	83.2993629735305	31.4409850325218	11.56644578	72.10851879	29.32762892
10.1064653583213	83.2993629735305	31.4409850325218	18.46683587	77.29301103	30.42019724
10.1064653583213	83.2993629735305	31.4409850325218	18.15807888	79.40011164	23.44302335
10.1064653583213	83.2993629735305	31.4409850325218	18.31523717	76.27495825	29.81755027
6.1710815151614	93.4427117516967	27.9211601335517	1.662890125	98.21483308	37.96621421
6.1710815151614	93.4427117516967	27.9211601335517	5.231683223	94.88567828	37.04813984
6.1710815151614	93.4427117516967	27.9211601335517	7.810086676	100	26.21604958
6.1710815151614	93.4427117516967	27.9211601335517	5.819691822	97.53170939	24.16806715
6.1710815151614	93.4427117516967	27.9211601335517	3.212591442	94.51392157	23.83849287
6.1710815151614	93.4427117516967	27.9211601335517	1.72500424899999	93.73701725	20.97210735
6.1710815151614	93.4427117516967	27.9211601335517	6.625140742	98.72893978	20.20468371
6.1710815151614	93.4427117516967	27.9211601335517	11.51332542	99.95442641	21.54207323
6.1710815151614	93.4427117516967	27.9211601335517	3.553988961	91.38716753	22.96960314
6.1710815151614	93.4427117516967	27.9211601335517	5.209294544	90.50333801	29.97691556
6.1710815151614	93.4427117516967	27.9211601335517	5.838459994	89.46110654	32.98505569
6.1710815151614	93.4427117516967	27.9211601335517	10.35439985	93.61856888	31.55963283
6.1710815151614	93.4427117516967	27.9211601335517	3.115821998	88.00026043	26.66042774
6.1710815151614	93.4427117516967	27.9211601335517	8.327911253	95.97957355	16.39239366
6.1710815151614	93.4427117516967	27.9211601335517	6.256438132	90.66257931	27.09179537
6.1710815151614	93.4427117516967	27.9211601335517	11.04946885	95.30278919	26.87229799
6.1710815151614	93.4427117516967	27.9211601335517	2.88784862599999	89.80188387	16.96831616
6.1710815151614	93.4427117516967	27.9211601335517	7.17818211399999	91.76838261	25.47562666
6.1710815151614	93.4427117516967	27.9211601335517	8.980893435	92.30918249	24.9496481
6.1710815151614	93.4427117516967	27.9211601335517	6.57919393199999	89.24907689	23.95110219
6.1710815151614	93.4427117516967	27.9211601335517	9.577914639	89.11916471	27.81169318
25.8363530276976	89.8986920595869	33.3443245590391	22.00240146	99.12603644	39.9893956
25.8363530276976	89.8986920595869	33.3443245590391	16.10416337	94.62212285	35.78598723
25.8363530276976	89.8986920595869	33.3443245590391	16.85080568	91.45389056	39.93862668
25.8363530276976	89.8986920595869	33.3443245590391	18.65944439	93.90622028	36.26618878
25.8363530276976	89.8986920595869	33.3443245590391	18.21730526	92.48725442	38.15120003
25.8363530276976	89.8986920595869	33.3443245590391	25.64004891	98.33585155	37.39052093
25.8363530276976	89.8986920595869	33.3443245590391	23.65267964	99.40598609	29.7230242
25.8363530276976	89.8986920595869	33.3443245590391	25.35918107	97.93925835	33.70510702
25.8363530276976	89.8986920595869	33.3443245590391	25.34553204	99.20543489	30.35671629
25.8363530276976	89.8986920595869	33.3443245590391	27.50072899	99.76767751	31.96071673
25.8363530276976	89.8986920595869	33.3443245590391	28.69202489	99.34571575	27.8214658
25.8363530276976	89.8986920595869	33.3443245590391	22.46431132	85.87828698	39.40664672
25.8363530276976	89.8986920595869	33.3443245590391	21.63379999	90.72848541	25.0330528
25.8363530276976	89.8986920595869	33.3443245590391	31.89808649	95.62749105	29.09944527
25.8363530276976	89.8986920595869	33.3443245590391	35.60188133	93.1465045	36.33325574
25.8363530276976	89.8986920595869	33.3443245590391	30.08845088	94.04600611	25.46859145
25.8363530276976	89.8986920595869	33.3443245590391	30.18341718	92.15484297	29.45540328
25.8363530276976	89.8986920595869	33.3443245590391	34.28587406	93.01320732	33.5082721

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.8363530276976	89.8986920595869	33.3443245590391	32.33676606	89.56266763	36.70990188
25.8363530276976	89.8986920595869	33.3443245590391	30.78074407	88.67743671	34.14412331
25.8363530276976	89.8986920595869	33.3443245590391	36.79414467	92.2553405	34.07762876
25.8363530276976	89.8986920595869	33.3443245590391	25.47356848	81.94258519	37.44485814
25.8363530276976	89.8986920595869	33.3443245590391	24.67927032	81.21698222	36.79859251
25.8363530276976	89.8986920595869	33.3443245590391	28.94608169	87.05476962	32.15968695
25.8363530276976	89.8986920595869	33.3443245590391	37.64776281	91.60925844	32.09349115
25.8363530276976	89.8986920595869	33.3443245590391	29.49613778	81.77737157	38.35679407
25.8363530276976	89.8986920595869	33.3443245590391	31.92346769	85.96439053	34.03343791
25.8363530276976	89.8986920595869	33.3443245590391	22.96398221	79.24584246	32.40861489
25.8363530276976	89.8986920595869	33.3443245590391	24.84752889	78.21896812	35.91459865
25.8363530276976	89.8986920595869	33.3443245590391	30.96168192	84.99460949	29.50639116
25.8363530276976	89.8986920595869	33.3443245590391	32.21271953	85.45061531	28.67707968
25.8363530276976	89.8986920595869	33.3443245590391	27.46499326	78.56518576	33.59652638
25.8363530276976	89.8986920595869	33.3443245590391	34.03327785	85.06694553	30.01520061
38.0438129005774	90.3012894463815	30.2700474319214	36.49499514	99.8776323	35.60714208
38.0438129005774	90.3012894463815	30.2700474319214	35.92075185	99.04269187	36.73360907
38.0438129005774	90.3012894463815	30.2700474319214	31.65500689	99.46882276	25.89517482
38.0438129005774	90.3012894463815	30.2700474319214	39.44288188	96.38027853	38.94704805
38.0438129005774	90.3012894463815	30.2700474319214	37.83606476	96.13365876	36.97541326
38.0438129005774	90.3012894463815	30.2700474319214	35.84999591	97.26233792	26.33021041
38.0438129005774	90.3012894463815	30.2700474319214	37.35558564	97.30806318	23.47070651
38.0438129005774	90.3012894463815	30.2700474319214	44.56970667	97.22856143	30.36827838
38.0438129005774	90.3012894463815	30.2700474319214	45.01212749	95.47966426	34.75016178
38.0438129005774	90.3012894463815	30.2700474319214	42.53215273	92.92397176	36.17653823
38.0438129005774	90.3012894463815	30.2700474319214	36.31961338	94.1541845	22.11569666
38.0438129005774	90.3012894463815	30.2700474319214	39.86881125	93.47781189	29.627917
38.0438129005774	90.3012894463815	30.2700474319214	36.86677729	93.06343809	25.83290646
38.0438129005774	90.3012894463815	30.2700474319214	39.84944538	96.227912	20.60442108
38.0438129005774	90.3012894463815	30.2700474319214	41.14116704	94.61634345	23.98672915
38.0438129005774	90.3012894463815	30.2700474319214	33.91919319	90.52236574	22.93790886
38.0438129005774	90.3012894463815	30.2700474319214	36.26720319	91.81523904	18.88940672
38.0438129005774	90.3012894463815	30.2700474319214	36.43143728	90.48214242	22.55722277
38.0438129005774	90.3012894463815	30.2700474319214	39.57638463	86.69599702	34.69521123
38.0438129005774	90.3012894463815	30.2700474319214	45.13861135	90.47060332	31.83589749
38.0438129005774	90.3012894463815	30.2700474319214	40.16683897	89.097423	24.82067356
38.0438129005774	90.3012894463815	30.2700474319214	40.55838899	87.88304878	23.6255072
38.0438129005774	90.3012894463815	30.2700474319214	32.77989789	83.25231939	22.10896744
38.0438129005774	90.3012894463815	30.2700474319214	48.45592928	88.4082341	31.5542414
38.0438129005774	90.3012894463815	30.2700474319214	40.77647626	81.23711291	32.65865455
38.0438129005774	90.3012894463815	30.2700474319214	41.14833132	82.10595877	30.01446557
38.0438129005774	90.3012894463815	30.2700474319214	46.03038143	83.79986665	30.96050312
38.0438129005774	90.3012894463815	30.2700474319214	38.78697828	81.20736169	22.75217398
38.0438129005774	90.3012894463815	30.2700474319214	46.93472918	83.75304242	25.57195373
49.8731361395752	91.1269668494778	30.7248084318172	43.63164404	99.67485887	36.08960829
49.8731361395752	91.1269668494778	30.7248084318172	43.04035221	95.37042711	39.63020675
49.8731361395752	91.1269668494778	30.7248084318172	48.82360524	98.37839062	35.9745595
49.8731361395752	91.1269668494778	30.7248084318172	52.71570498	99.46690315	35.19170787
49.8731361395752	91.1269668494778	30.7248084318172	53.69991452	99.81161169	33.42740223
49.8731361395752	91.1269668494778	30.7248084318172	48.39934621	99.02729511	30.05026749
49.8731361395752	91.1269668494778	30.7248084318172	45.34071838	99.2752365	24.31073394
49.8731361395752	91.1269668494778	30.7248084318172	54.29998953	99.89190946	28.80232628
49.8731361395752	91.1269668494778	30.7248084318172	47.31578899	98.13704672	24.13193979
49.8731361395752	91.1269668494778	30.7248084318172	57.84005051	97.24933499	35.2604133
49.8731361395752	91.1269668494778	30.7248084318172	52.60387814	98.51053443	27.61605738
49.8731361395752	91.1269668494778	30.7248084318172	48.69087386	94.64188777	30.6210566
49.8731361395752	91.1269668494778	30.7248084318172	57.58318464	98.55697919	27.3972425
49.8731361395752	91.1269668494778	30.7248084318172	49.19512952	89.44346883	37.79505672
49.8731361395752	91.1269668494778	30.7248084318172	51.95218378	92.57992082	30.72068519
49.8731361395752	91.1269668494778	30.7248084318172	51.44475874	86.59474587	38.70943792
49.8731361395752	91.1269668494778	30.7248084318172	56.15571936	89.41500769	36.83882342
49.8731361395752	91.1269668494778	30.7248084318172	45.3176187	83.7901857	37.67961833
49.8731361395752	91.1269668494778	30.7248084318172	54.48965648	89.30641789	34.42411824
49.8731361395752	91.1269668494778	30.7248084318172	53.29556121	92.47449182	25.90682802
49.8731361395752	91.1269668494778	30.7248084318172	61.4906739	91.40517217	33.71736683
49.8731361395752	91.1269668494778	30.7248084318172	53.27314218	89.6748569	31.66096453
49.8731361395752	91.1269668494778	30.7248084318172	52.83415121	85.50123146	31.48102764
49.8731361395752	91.1269668494778	30.7248084318172	49.21219028	82.18677234	33.0110742
49.8731361395752	91.1269668494778	30.7248084318172	55.11001594	85.68607737	27.25029831
49.8731361395752	91.1269668494778	30.7248084318172	53.61605765	80.93460352	33.38542247
49.8731361395752	91.1269668494778	30.7248084318172	51.91564321	83.24154723	26.19545671
49.8731361395752	91.1269668494778	30.7248084318172	56.64479831	82.24679775	31.938846
49.8731361395752	91.1269668494778	30.7248084318172	50.20394782	81.95454381	24.2461412
64.0243187368257	91.4020267333078	29.5418151720353	63.88368354	92.98872817	38.82161587
64.0243187368257	91.4020267333078	29.5418151720353	62.03675317	91.42777069	38.34727303
64.0243187368257	91.4020267333078	29.5418151720353	62.61309781	94.29391595	17.98130243
64.0243187368257	91.4020267333078	29.5418151720353	59.01602486	86.99268685	19.95901958
64.0243187368257	91.4020267333078	29.5418151720353	64.88497046	82.96772641	30.52764719
64.0243187368257	91.4020267333078	29.5418151720353	61.30013954	82.69641043	22.92622968
64.0243187368257	91.4020267333078	29.5418151720353	68.96890483	80.55619731	30.92710539

Solution x	Solution y	Solution z	Original x	Original y	Original z
72.6730647350591	91.6452186609547	30.4618464516314	74.57969734	99.83821951	39.01985633
72.6730647350591	91.6452186609547	30.4618464516314	66.67195124	95.92017704	38.76714707
72.6730647350591	91.6452186609547	30.4618464516314	64.96530116	93.98228963	34.40488013
72.6730647350591	91.6452186609547	30.4618464516314	66.92699784	97.50570073	24.16462464
72.6730647350591	91.6452186609547	30.4618464516314	65.26732099	95.86741863	25.98441419
72.6730647350591	91.6452186609547	30.4618464516314	76.48394754	93.81500316	33.05082675
72.6730647350591	91.6452186609547	30.4618464516314	68.01446808	90.26524455	37.65674979
72.6730647350591	91.6452186609547	30.4618464516314	68.09186985	95.85522589	22.47153407
72.6730647350591	91.6452186609547	30.4618464516314	69.82339194	93.15949799	27.73705762
72.6730647350591	91.6452186609547	30.4618464516314	71.22771139	93.77569631	25.9346523
72.6730647350591	91.6452186609547	30.4618464516314	66.59307852	88.41880362	32.58136924
72.6730647350591	91.6452186609547	30.4618464516314	72.91384846	91.54886288	27.04740893
72.6730647350591	91.6452186609547	30.4618464516314	63.32241418	89.29380754	27.27800065
72.6730647350591	91.6452186609547	30.4618464516314	72.48804708	89.57044348	25.63543235
72.6730647350591	91.6452186609547	30.4618464516314	68.11557125	90.29313921	19.6765572
72.6730647350591	91.6452186609547	30.4618464516314	76.68533256	86.49303137	21.67959601
72.6730647350591	91.6452186609547	30.4618464516314	69.80433177	81.60817435	25.92271927
94.7222839070609	84.0024322489087	24.3255861458951	94.75890926	85.83537613	36.18471901
94.7222839070609	84.0024322489087	24.3255861458951	87.63411723	89.72076827	28.65831969
94.7222839070609	84.0024322489087	24.3255861458951	91.04765146	90.60180149	20.03455373
94.7222839070609	84.0024322489087	24.3255861458951	93.12739448	86.70709298	18.39915073
94.7222839070609	84.0024322489087	24.3255861458951	97.99058573	82.84537681	12.83735391
94.7222839070609	84.0024322489087	24.3255861458951	93.29522257	74.82458329	19.9847248
94.7222839070609	84.0024322489087	24.3255861458951	91.59995025	72.67875795	22.12004218
79.3578723950473	73.2135520154643	31.4161818884214	72.09010058	81.417498	36.30236671
79.3578723950473	73.2135520154643	31.4161818884214	81.4352048	82.89764497	33.18556014
79.3578723950473	73.2135520154643	31.4161818884214	75.20998283	80.5662569	34.55930276
79.3578723950473	73.2135520154643	31.4161818884214	86.75397464	75.23932777	39.5614605
79.3578723950473	73.2135520154643	31.4161818884214	70.61748839	78.65460339	33.23222305
79.3578723950473	73.2135520154643	31.4161818884214	68.84275879	76.03221479	29.69910657
79.3578723950473	73.2135520154643	31.4161818884214	70.77169737	73.88064127	33.24954023
79.3578723950473	73.2135520154643	31.4161818884214	67.45457311	72.85375456	29.93900874
79.3578723950473	73.2135520154643	31.4161818884214	81.47694776	70.94126153	23.66230135
79.3578723950473	73.2135520154643	31.4161818884214	78.83068399	69.67274441	24.24069079
79.3578723950473	73.2135520154643	31.4161818884214	74.85083054	64.74645556	30.78568814
79.3578723950473	73.2135520154643	31.4161818884214	72.84290598	65.67053988	28.7186167
79.792680160196	52.1254686866545	34.0110685422648	91.19333201	55.09349477	31.72721103
79.792680160196	52.1254686866545	34.0110685422648	71.61626861	44.97765672	39.11549021
79.792680160196	52.1254686866545	34.0110685422648	79.30599483	40.28434635	35.54252376
77.1525315794756	53.6941479161034	30.2483933056751	83.91646182	55.69492785	39.74024442
77.1525315794756	53.6941479161034	30.2483933056751	72.73426073	54.95021428	39.57914747
77.1525315794756	53.6941479161034	30.2483933056751	77.87000631	52.21112855	39.93820594
77.1525315794756	53.6941479161034	30.2483933056751	67.27809665	56.79217526	31.19414535
77.1525315794756	53.6941479161034	30.2483933056751	86.51848331	50.71555717	36.90102142
77.1525315794756	53.6941479161034	30.2483933056751	69.70404765	60.5822767	24.01827102
77.1525315794756	53.6941479161034	30.2483933056751	83.55927983	59.64747077	24.27812457
77.1525315794756	53.6941479161034	30.2483933056751	83.19197135	53.48639501	32.18766969
77.1525315794756	53.6941479161034	30.2483933056751	88.60564442	53.67349247	30.97358927
77.1525315794756	53.6941479161034	30.2483933056751	71.99750065	50.82091856	33.04720741
77.1525315794756	53.6941479161034	30.2483933056751	72.13050555	55.03070373	28.54528132
77.1525315794756	53.6941479161034	30.2483933056751	78.85550393	52.04144231	24.20403351
77.1525315794756	53.6941479161034	30.2483933056751	76.57028534	49.55513485	21.13053287
67.0858799147952	59.6752860712355	15.9016674916193	55.40337389	57.61168804	14.09596446
67.0858799147952	59.6752860712355	15.9016674916193	63.59211348	50.34808715	9.20862338
67.0858799147952	59.6752860712355	15.9016674916193	67.10787364	49.80646667	13.82525922
67.0858799147952	59.6752860712355	15.9016674916193	66.65703205	47.7722791	14.44067044
62.1038607470526	64.6771481833748	8.24493162635498	61.63608438	74.03409399	0.746346368
62.1038607470526	64.6771481833748	8.24493162635498	61.14896118	72.70410502	7.635652533
62.1038607470526	64.6771481833748	8.24493162635498	66.81087893	72.19337817	6.977880898
62.1038607470526	64.6771481833748	8.24493162635498	54.15102156	63.89433124	1.875052021
62.1038607470526	64.6771481833748	8.24493162635498	59.0134746	66.34233581	2.610073656
62.1038607470526	64.6771481833748	8.24493162635498	69.12634406	69.4594231	3.844630021
62.1038607470526	64.6771481833748	8.24493162635498	53.04622082	62.56220406	2.597564218
62.1038607470526	64.6771481833748	8.24493162635498	56.20333441	63.09635143	9.893720293
62.1038607470526	64.6771481833748	8.24493162635498	61.64088805	64.72462094	13.53456764
62.1038607470526	64.6771481833748	8.24493162635498	65.55566867	66.58332744	7.127202217
62.1038607470526	64.6771481833748	8.24493162635498	65.09617026	64.32634731	13.59892336
62.1038607470526	64.6771481833748	8.24493162635498	65.33791464	63.72798066	4.706052333
62.1038607470526	64.6771481833748	8.24493162635498	59.77266019	58.01872841	1.019723189
62.1038607470526	64.6771481833748	8.24493162635498	61.56325619	58.635877	0.997422198
62.1038607470526	64.6771481833748	8.24493162635498	71.85259834	57.85616299	9.805797889
62.1038607470526	64.6771481833748	8.24493162635498	62.81703196	55.94894639	0.04067048
62.1038607470526	64.6771481833748	8.24493162635498	70.94365949	58.14560753	5.076539278
62.1038607470526	64.6771481833748	8.24493162635498	68.52022941	55.69012612	11.12241046
46.5980341936409	74.8197901076452	3.96699525893355	38.00030199	82.20200968	0.019607641
46.5980341936409	74.8197901076452	3.96699525893355	36.17809574	80.13104248	5.688631409
46.5980341936409	74.8197901076452	3.96699525893355	38.24583972	80.95791524	3.839199962
46.5980341936409	74.8197901076452	3.96699525893355	44.47086767	80.17305261	3.885836986
46.5980341936409	74.8197901076452	3.96699525893355	49.55654528	80.81624315	0.169379697
46.5980341936409	74.8197901076452	3.96699525893355	38.19879917	73.45302115	2.159211899

Solution x	Solution y	Solution z	Original x	Original y	Original z
46.5980341936409	74.8197901076452	3.96699525893355	41.95376322	74.60739468	6.926728294
46.5980341936409	74.8197901076452	3.96699525893355	39.75179858	71.51477588	1.359571846
46.5980341936409	74.8197901076452	3.96699525893355	41.30767537	70.05965636	6.684179381
46.5980341936409	74.8197901076452	3.96699525893355	44.13660931	71.38940487	9.812814914
46.5980341936409	74.8197901076452	3.96699525893355	52.24575767	74.98560476	14.55357765
46.5980341936409	74.8197901076452	3.96699525893355	39.83687168	68.05987049	1.771904532
46.5980341936409	74.8197901076452	3.96699525893355	51.91696279	73.69595809	14.416915
46.5980341936409	74.8197901076452	3.96699525893355	53.90080059	74.55382457	8.588853077
46.5980341936409	74.8197901076452	3.96699525893355	51.17754367	73.39508539	6.606709632
46.5980341936409	74.8197901076452	3.96699525893355	58.21523833	76.77458472	1.682398914
46.5980341936409	74.8197901076452	3.96699525893355	47.89205446	67.3947139	7.919602812
46.5980341936409	74.8197901076452	3.96699525893355	53.60239056	70.80290226	5.406808424
46.5980341936409	74.8197901076452	3.96699525893355	50.86986196	67.11854893	6.466301231
46.5980341936409	74.8197901076452	3.96699525893355	52.45383187	66.17944394	1.57361944
46.5980341936409	74.8197901076452	3.96699525893355	50.29671492	64.07582579	3.765527546
27.8286118214239	69.9664458239716	7.02940517544607	23.53960858	80.471438	3.12432842
27.8286118214239	69.9664458239716	7.02940517544607	24.57644237	79.57543571	13.43961074
27.8286118214239	69.9664458239716	7.02940517544607	21.04749508	76.84597788	0.391094884
27.8286118214239	69.9664458239716	7.02940517544607	22.95922483	75.83051285	0.740171728
27.8286118214239	69.9664458239716	7.02940517544607	21.60880813	73.64895737	1.318444959
27.8286118214239	69.9664458239716	7.02940517544607	29.05539546	78.84402949	14.28609887
27.8286118214239	69.9664458239716	7.02940517544607	20.75020952	68.82081849	3.659175109
27.8286118214239	69.9664458239716	7.02940517544607	23.39691794	71.43920824	1.906907845
27.8286118214239	69.9664458239716	7.02940517544607	28.44331265	74.98671685	9.740464776
27.8286118214239	69.9664458239716	7.02940517544607	31.34183617	77.86791685	6.462154326
27.8286118214239	69.9664458239716	7.02940517544607	24.34494447	68.89894191	6.614252607
27.8286118214239	69.9664458239716	7.02940517544607	24.66562586	67.58605744	10.297776
27.8286118214239	69.9664458239716	7.02940517544607	22.58317288	64.23875961	11.9213097
27.8286118214239	69.9664458239716	7.02940517544607	26.6523776	66.91672378	14.68008016
27.8286118214239	69.9664458239716	7.02940517544607	34.30971303	75.90183293	2.096267325
27.8286118214239	69.9664458239716	7.02940517544607	35.03662295	76.31902131	1.401481412
27.8286118214239	69.9664458239716	7.02940517544607	36.44207057	76.13900165	9.824805701
27.8286118214239	69.9664458239716	7.02940517544607	21.56136042	60.00845368	9.387366518
27.8286118214239	69.9664458239716	7.02940517544607	22.84438078	60.01413405	11.39370551
27.8286118214239	69.9664458239716	7.02940517544607	27.36103425	64.84526011	12.45761345
27.8286118214239	69.9664458239716	7.02940517544607	29.47881008	65.01108227	16.71360152
27.8286118214239	69.9664458239716	7.02940517544607	25.84588775	61.17671521	8.212138725
27.8286118214239	69.9664458239716	7.02940517544607	25.08011935	60.4806985	0.592321921
27.8286118214239	69.9664458239716	7.02940517544607	28.86030824	61.83789689	13.23528428
27.8286118214239	69.9664458239716	7.02940517544607	37.43465738	70.14594443	13.87115315
27.8286118214239	69.9664458239716	7.02940517544607	33.85806756	68.2147305	3.068667124
27.8286118214239	69.9664458239716	7.02940517544607	28.66025221	61.13181458	11.59083816
27.8286118214239	69.9664458239716	7.02940517544607	28.38294287	59.7022254	11.36065683
27.8286118214239	69.9664458239716	7.02940517544607	34.32584869	66.311045	4.144300462
27.8286118214239	69.9664458239716	7.02940517544607	32.28903103	63.37386507	1.032108002
27.8286118214239	69.9664458239716	7.02940517544607	36.53251416	65.89826385	3.47943245
27.8286118214239	69.9664458239716	7.02940517544607	36.88863481	65.11756178	9.028914476
27.8286118214239	69.9664458239716	7.02940517544607	32.47933058	60.09950546	10.14811096
27.8286118214239	69.9664458239716	7.02940517544607	37.36735143	64.72519961	6.841621681
36.2151472812056	59.4000968824268	6.98285831745083	39.12047899	68.75765335	13.33882614
36.2151472812056	59.4000968824268	6.98285831745083	36.99117209	62.09652931	16.1628835
36.2151472812056	59.4000968824268	6.98285831745083	33.50828257	58.48410354	3.557102036
36.2151472812056	59.4000968824268	6.98285831745083	36.65639834	59.2724504	14.55953297
36.2151472812056	59.4000968824268	6.98285831745083	34.15128455	57.37934974	2.952751483
36.2151472812056	59.4000968824268	6.98285831745083	38.55825219	62.0328479	1.356643655
36.2151472812056	59.4000968824268	6.98285831745083	38.87334077	61.97418169	4.472466865
36.2151472812056	59.4000968824268	6.98285831745083	31.12121771	52.61678334	1.82071962
36.2151472812056	59.4000968824268	6.98285831745083	44.96838238	64.05706864	11.93558957
36.2151472812056	59.4000968824268	6.98285831745083	33.45977848	51.47641849	1.316430254
36.2151472812056	59.4000968824268	6.98285831745083	42.10911161	58.06602885	13.19335194
36.2151472812056	59.4000968824268	6.98285831745083	37.58124673	53.7047325	1.291628295
36.2151472812056	59.4000968824268	6.98285831745083	43.40294282	59.60424206	0.51389979
36.2151472812056	59.4000968824268	6.98285831745083	44.98764045	56.96391467	9.231659535
36.2151472812056	59.4000968824268	6.98285831745083	45.47068469	56.96814934	6.687113785
36.2151472812056	59.4000968824268	6.98285831745083	40.92420024	52.54921675	3.399585878
44.8577092840457	48.5111488767687	6.93488085193905	35.40868681	49.33377596	1.880059691
44.8577092840457	48.5111488767687	6.93488085193905	48.20619517	39.24794213	0.08063613
44.8577092840457	48.5111488767687	6.93488085193905	51.33580352	40.30660727	1.042528676
44.9213377244691	50.1564335204885	10.2591750246135	34.68773061	48.27076221	5.003934468
44.9213377244691	50.1564335204885	10.2591750246135	46.15723029	56.4070148	19.959172
44.9213377244691	50.1564335204885	10.2591750246135	49.52719402	60.88674536	13.02441036
44.9213377244691	50.1564335204885	10.2591750246135	49.48945411	49.44119699	20.62289914
44.9213377244691	50.1564335204885	10.2591750246135	53.70737401	57.8077763	9.994366281
44.9213377244691	50.1564335204885	10.2591750246135	53.22205568	50.84724902	15.61737169
44.9213377244691	50.1564335204885	10.2591750246135	43.74535734	43.87626012	1.779657186
44.9213377244691	50.1564335204885	10.2591750246135	54.43373891	52.12894009	7.9067999
44.9213377244691	50.1564335204885	10.2591750246135	53.79810347	45.16180718	4.496135918
39.1414977078068	41.864452837279	18.1450789271198	29.65914735	42.12761495	24.52937867
39.1414977078068	41.864452837279	18.1450789271198	32.06711817	41.12824267	27.14001544
39.1414977078068	41.864452837279	18.1450789271198	31.80606468	35.45021175	24.23960074

Solution x	Solution y	Solution z	Original x	Original y	Original z
39.1414977078068	41.864452837279	18.1450789271198	39.91233765	41.2977364	28.26450372
39.1414977078068	41.864452837279	18.1450789271198	42.25980634	46.86827481	24.73500352
39.1414977078068	41.864452837279	18.1450789271198	40.57741767	42.47262	24.8981708
39.1414977078068	41.864452837279	18.1450789271198	35.17250587	39.36136713	13.28284014
39.1414977078068	41.864452837279	18.1450789271198	38.90241804	39.45548462	22.15074575
39.1414977078068	41.864452837279	18.1450789271198	41.09480481	34.92509896	27.7383049
39.1414977078068	41.864452837279	18.1450789271198	39.58652985	43.55288071	14.45846769
39.1414977078068	41.864452837279	18.1450789271198	43.11381093	45.00092033	20.21315796
39.1414977078068	41.864452837279	18.1450789271198	47.65008175	45.51867646	25.16647853
39.1414977078068	41.864452837279	18.1450789271198	37.07046765	30.04479215	18.0646406
39.1414977078068	41.864452837279	18.1450789271198	47.22851165	47.89903616	20.36250944
39.1414977078068	41.864452837279	18.1450789271198	37.51752459	33.09106605	16.01141602
39.1414977078068	41.864452837279	18.1450789271198	38.78467609	39.06908374	12.83761672
39.1414977078068	41.864452837279	18.1450789271198	45.78512338	48.76667443	13.05604142
39.1414977078068	41.864452837279	18.1450789271198	41.57443341	43.13832473	6.475589725
39.1414977078068	41.864452837279	18.1450789271198	40.81010844	38.77304558	7.861958026
39.1414977078068	41.864452837279	18.1450789271198	40.57036155	31.31828969	15.51939441
39.1414977078068	41.864452837279	18.1450789271198	49.90577559	41.072269	23.3893886
39.1414977078068	41.864452837279	18.1450789271198	44.21687698	34.39769027	11.89272829
25.0266558402762	47.1984420654993	12.1992564241861	17.80089583	46.64512233	2.63462135
25.0266558402762	47.1984420654993	12.1992564241861	26.97467166	54.66512134	21.38913798
25.0266558402762	47.1984420654993	12.1992564241861	27.13020332	56.00735022	18.32075531
25.0266558402762	47.1984420654993	12.1992564241861	19.77510428	38.58926296	16.64922472
25.0266558402762	47.1984420654993	12.1992564241861	23.73647568	45.21539639	11.53681715
25.0266558402762	47.1984420654993	12.1992564241861	26.567735	46.7768569	17.70634543
25.0266558402762	47.1984420654993	12.1992564241861	23.91492832	35.50451908	14.65205958
25.0266558402762	47.1984420654993	12.1992564241861	25.73174612	44.02606181	8.459085063
25.0266558402762	47.1984420654993	12.1992564241861	30.33187934	43.75504148	14.96541955
25.0266558402762	47.1984420654993	12.1992564241861	34.17044541	50.63731129	14.2756352
25.0266558402762	47.1984420654993	12.1992564241861	28.54401437	40.13690379	8.087159098
25.0266558402762	47.1984420654993	12.1992564241861	29.90863496	38.4851443	12.83287597
25.0266558402762	47.1984420654993	12.1992564241861	34.31056081	43.95356429	5.695822859
16.7000649636577	57.4108219506678	8.93249827799475	10.83705181	59.65376627	0.709551762
16.7000649636577	57.4108219506678	8.93249827799475	15.77830732	66.19409337	0.808180704
16.7000649636577	57.4108219506678	8.93249827799475	13.17908278	60.05355856	0.206865651
16.7000649636577	57.4108219506678	8.93249827799475	16.07158763	60.00636388	16.82852088
16.7000649636577	57.4108219506678	8.93249827799475	13.89109091	56.92730438	11.2581209
16.7000649636577	57.4108219506678	8.93249827799475	17.45311026	57.02027397	2.53786626
16.7000649636577	57.4108219506678	8.93249827799475	20.53092136	55.63617906	20.16527215
16.7000649636577	57.4108219506678	8.93249827799475	16.54761864	53.09785344	0.161381972
16.7000649636577	57.4108219506678	8.93249827799475	16.47526591	49.4455512	6.794569926
16.7000649636577	57.4108219506678	8.93249827799475	20.16713628	56.2637712	6.937664837
16.7000649636577	57.4108219506678	8.93249827799475	18.80954314	50.67936902	11.76647286
16.7000649636577	57.4108219506678	8.93249827799475	18.13426387	49.15791018	7.430088572
16.7000649636577	57.4108219506678	8.93249827799475	20.72246404	50.29048837	10.84675569
16.7000649636577	57.4108219506678	8.93249827799475	25.6524776	56.5792119	5.011755882
16.7000649636577	57.4108219506678	8.93249827799475	24.61643689	54.01115924	6.209992422
16.7000649636577	57.4108219506678	8.93249827799475	28.17203359	56.51587977	9.985576368
3.93285140007993	51.2548211532712	6.19925734683055	1.28261934699999	62.39268391	2.604217434
3.93285140007993	51.2548211532712	6.19925734683055	0.715064701000003	54.34039001	17.34040242
3.93285140007993	51.2548211532712	6.19925734683055	0.0735544159999932	50.20291794	9.32702938
3.93285140007993	51.2548211532712	6.19925734683055	3.200690229	54.90401263	9.791910202
3.93285140007993	51.2548211532712	6.19925734683055	3.857750749	53.93522034	16.19502855
3.93285140007993	51.2548211532712	6.19925734683055	0.0942256310000005	39.91558536	7.02793547
3.93285140007993	51.2548211532712	6.19925734683055	1.77561061599999	46.38397362	3.634697851
3.93285140007993	51.2548211532712	6.19925734683055	5.28300793299999	51.8957834	3.767703534
3.93285140007993	51.2548211532712	6.19925734683055	8.078510661	52.12465727	17.30721805
3.93285140007993	51.2548211532712	6.19925734683055	7.342191074	50.36568708	15.52547031
3.93285140007993	51.2548211532712	6.19925734683055	6.810990128	49.52757429	10.46442277
3.93285140007993	51.2548211532712	6.19925734683055	6.962926975	47.87740863	12.6680673
3.93285140007993	51.2548211532712	6.19925734683055	5.668356774	43.14782971	2.118277692
3.93285140007993	51.2548211532712	6.19925734683055	9.89102482200001	52.16610985	9.967821485
3.93285140007993	51.2548211532712	6.19925734683055	8.91589750200001	48.83105962	4.105846181
3.93285140007993	51.2548211532712	6.19925734683055	10.84189087	50.74783931	12.90312929
3.93285140007993	51.2548211532712	6.19925734683055	8.81169210500001	48.50504439	3.044600386
3.93285140007993	51.2548211532712	6.19925734683055	11.99216143	50.52822644	12.13005328
3.93285140007993	51.2548211532712	6.19925734683055	7.871697725	40.35198819	7.19843067
3.93285140007993	51.2548211532712	6.19925734683055	10.20301226	47.6234059	3.00365475
3.93285140007993	51.2548211532712	6.19925734683055	9.020444459	42.86210706	4.331128313
6.0711223552974	32.5315731228653	9.63030308540029	0.224660494000005	41.43611847	14.21171956
6.0711223552974	32.5315731228653	9.63030308540029	1.354188569	31.31594018	20.59719751
6.0711223552974	32.5315731228653	9.63030308540029	0.438114408000004	29.42535326	2.454773911
6.0711223552974	32.5315731228653	9.63030308540029	3.43019284899999	27.39779729	20.1502757
6.0711223552974	32.5315731228653	9.63030308540029	2.694391803	27.62826968	12.84474665
6.0711223552974	32.5315731228653	9.63030308540029	5.584406208	23.81184943	17.55438576
6.0711223552974	32.5315731228653	9.63030308540029	7.974625907	40.8370263	13.38849506
6.0711223552974	32.5315731228653	9.63030308540029	6.668915236	38.80565327	2.074648475
6.0711223552974	32.5315731228653	9.63030308540029	9.954481978	42.50823893	15.05115407
6.0711223552974	32.5315731228653	9.63030308540029	8.02660248300001	29.17059173	11.48261049
6.0711223552974	32.5315731228653	9.63030308540029	11.00474377	35.14184161	13.52979102

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.0711223552974	32.5315731228653	9.63030308540029	9.320660383	27.08555662	0.10230943
9.63625051836698	14.3673127600554	6.89681198524289	0.867278095000003	18.04823486	8.201101929
9.63625051836698	14.3673127600554	6.89681198524289	3.082410661	9.043855976	8.462200359
9.63625051836698	14.3673127600554	6.89681198524289	5.801300438	5.23076571	0.128009607
9.63625051836698	14.3673127600554	6.89681198524289	8.67995437099999	15.22687294	13.91463376
9.63625051836698	14.3673127600554	6.89681198524289	10.89890727	16.02503912	12.34011368
9.63625051836698	14.3673127600554	6.89681198524289	12.63680518	12.91935497	10.56277797
9.63625051836698	14.3673127600554	6.89681198524289	14.9958336	14.5728326	1.422152891
9.63625051836698	14.3673127600554	6.89681198524289	18.20950886	6.619599382	5.445678785
14.1048121981679	15.6054205870935	11.5985317545895	8.98802709899999	7.925934732	19.26951737
14.1048121981679	15.6054205870935	11.5985317545895	20.19850768	8.627828216	19.22611956
14.1048121981679	15.6054205870935	11.5985317545895	21.65865806	17.99154884	8.745957007
14.1048121981679	15.6054205870935	11.5985317545895	23.64941173	19.80991504	13.65279264
22.2589734205195	27.564280583218	12.2026752664687	16.76117492	28.31246812	1.562447455
22.2589734205195	27.564280583218	12.2026752664687	23.06731773	35.0375678	21.55663613
22.2589734205195	27.564280583218	12.2026752664687	18.74305811	29.30240259	6.154559295
22.2589734205195	27.564280583218	12.2026752664687	22.33900559	31.60235215	9.968662506
22.2589734205195	27.564280583218	12.2026752664687	23.31975826	27.34182644	2.882941415
22.2589734205195	27.564280583218	12.2026752664687	24.70443529	26.12365999	11.74081492
22.2589734205195	27.564280583218	12.2026752664687	25.40396983	32.32053998	7.877867709
22.2589734205195	27.564280583218	12.2026752664687	25.99458773	34.37910238	4.84512326
22.2589734205195	27.564280583218	12.2026752664687	28.59013959	24.83311171	20.75915805
22.2589734205195	27.564280583218	12.2026752664687	29.56587444	24.57869021	18.08116751
22.2589734205195	27.564280583218	12.2026752664687	28.82263126	20.36706254	14.69297653
22.2589734205195	27.564280583218	12.2026752664687	30.34406593	27.74432368	15.48974465
22.2589734205195	27.564280583218	12.2026752664687	31.17947294	31.40633137	5.155453447
32.6640374167013	21.2623468339235	8.28887402269516	24.09498187	20.3828805	2.129534364
32.6640374167013	21.2623468339235	8.28887402269516	24.23492671	17.98856994	0.400117348
32.6640374167013	21.2623468339235	8.28887402269516	30.90434674	20.96780911	4.645040707
32.6640374167013	21.2623468339235	8.28887402269516	34.15723352	12.84614068	2.236297964
32.6640374167013	21.2623468339235	8.28887402269516	35.85991513	20.90404301	13.98769394
32.6640374167013	21.2623468339235	8.28887402269516	35.62470684	10.73896033	9.362523366
32.6640374167013	21.2623468339235	8.28887402269516	36.57027062	15.62107689	13.23399254
32.6640374167013	21.2623468339235	8.28887402269516	36.77121212	29.70512597	6.399428168
32.6640374167013	21.2623468339235	8.28887402269516	38.07401644	11.09458783	4.920078282
42.9431902545813	17.480949882608	6.91420107903301	42.34346606	5.769949569	4.366098536
42.9431902545813	17.480949882608	6.91420107903301	50.20668952	26.40233109	10.32749181
55.4297903597529	28.8502904188577	7.64905929369089	51.19858704	31.0981292	6.058142298
55.4297903597529	28.8502904188577	7.64905929369089	55.07321291	28.85442279	12.55016086
55.4297903597529	28.8502904188577	7.64905929369089	62.17589976	23.53474989	9.188656209
55.4297903597529	28.8502904188577	7.64905929369089	64.88897514	21.58345165	8.959362969
60.748492633427	39.2491727398768	7.69840042388429	64.75792457	49.92103542	3.951957012
60.748492633427	39.2491727398768	7.69840042388429	50.32982697	35.43640834	3.785700884
60.748492633427	39.2491727398768	7.69840042388429	57.35658457	43.71456461	3.914439364
60.748492633427	39.2491727398768	7.69840042388429	55.55130491	39.21526309	7.425393497
60.748492633427	39.2491727398768	7.69840042388429	57.56166222	41.97700689	5.193477838
60.748492633427	39.2491727398768	7.69840042388429	54.00076983	32.50218762	13.15428984
60.748492633427	39.2491727398768	7.69840042388429	54.69460289	37.32086801	4.721267047
60.748492633427	39.2491727398768	7.69840042388429	63.41360315	44.69674786	5.219771375
60.748492633427	39.2491727398768	7.69840042388429	69.67922342	40.74675918	12.58912096
60.748492633427	39.2491727398768	7.69840042388429	58.09138733	33.97784367	3.040604697
60.748492633427	39.2491727398768	7.69840042388429	63.76560063	37.45231942	9.842542758
60.748492633427	39.2491727398768	7.69840042388429	70.24663893	43.40548551	1.656037041
60.748492633427	39.2491727398768	7.69840042388429	59.11600598	27.89604561	4.171146498
58.9282699866805	40.7176127182571	23.8573234830082	48.35826716	45.69665672	26.59304148
58.9282699866805	40.7176127182571	23.8573234830082	50.26037041	48.95030273	24.30726963
58.9282699866805	40.7176127182571	23.8573234830082	49.81718199	39.89953162	25.94554765
58.9282699866805	40.7176127182571	23.8573234830082	51.65508094	43.85648581	22.32830057
58.9282699866805	40.7176127182571	23.8573234830082	52.03099226	42.50134863	22.51431543
58.9282699866805	40.7176127182571	23.8573234830082	55.9549233	32.80200534	27.96563646
58.9282699866805	40.7176127182571	23.8573234830082	62.83458953	32.37480154	31.54745986
58.9282699866805	40.7176127182571	23.8573234830082	58.48548965	38.49282405	23.12403661
58.9282699866805	40.7176127182571	23.8573234830082	63.12520069	41.24941139	24.07122315
58.9282699866805	40.7176127182571	23.8573234830082	63.21772914	46.4808445	18.00555738
58.9282699866805	40.7176127182571	23.8573234830082	59.28037529	42.02965748	18.78086606
58.9282699866805	40.7176127182571	23.8573234830082	58.14893689	37.55022655	17.10511358
58.9282699866805	40.7176127182571	23.8573234830082	64.47235297	44.07915445	14.05919317
58.9282699866805	40.7176127182571	23.8573234830082	56.1557774	36.1071959	13.13084437
56.7170534152353	48.801649893858	34.0517120262042	48.65047008	56.26343732	32.64491993
56.7170534152353	48.801649893858	34.0517120262042	57.09480153	60.45993374	34.61199265
56.7170534152353	48.801649893858	34.0517120262042	45.94832838	45.50704308	38.19660802
56.7170534152353	48.801649893858	34.0517120262042	48.91348948	54.77748717	32.9330217
56.7170534152353	48.801649893858	34.0517120262042	52.57887869	54.16196226	35.47497689
56.7170534152353	48.801649893858	34.0517120262042	47.38308024	49.71863955	31.58389373
56.7170534152353	48.801649893858	34.0517120262042	58.50503897	53.8647284	36.33438611
56.7170534152353	48.801649893858	34.0517120262042	55.16481024	55.42346911	31.47512835
56.7170534152353	48.801649893858	34.0517120262042	65.98277732	56.02257659	36.50214422
56.7170534152353	48.801649893858	34.0517120262042	57.48443808	43.25173204	37.88033317
56.7170534152353	48.801649893858	34.0517120262042	55.80484172	50.30189669	30.08035465
56.7170534152353	48.801649893858	34.0517120262042	51.12261026	42.05252276	30.83772297

Solution x	Solution y	Solution z	Original x	Original y	Original z
56.7170534152353	48.801649893858	34.0517120262042	63.54041364	40.47906672	32.95919177
56.7170534152353	48.801649893858	34.0517120262042	61.01859213	37.82208646	31.82775528
58.9456275266629	58.3655186098111	26.7955949317469	48.01348394	55.67625048	22.64155069
58.9456275266629	58.3655186098111	26.7955949317469	52.59359138	61.87082203	17.23711721
58.9456275266629	58.3655186098111	26.7955949317469	66.67873973	56.13517049	35.54640769
58.9456275266629	58.3655186098111	26.7955949317469	56.73611746	58.87824868	26.03485933
58.9456275266629	58.3655186098111	26.7955949317469	53.50308144	57.04941766	21.52167719
58.9456275266629	58.3655186098111	26.7955949317469	56.36080227	54.43871329	23.33898219
58.9456275266629	58.3655186098111	26.7955949317469	64.66140077	51.58253517	18.71344865
62.3630554809432	67.0668223381058	25.0799972909339	56.84900895	69.27095699	14.65228976
62.3630554809432	67.0668223381058	25.0799972909339	67.87575086	63.89107621	33.2359079
62.3630554809432	67.0668223381058	25.0799972909339	60.59756518	67.42291916	21.31629348
62.3630554809432	67.0668223381058	25.0799972909339	62.01287875	62.70691628	29.4740589
62.3630554809432	67.0668223381058	25.0799972909339	56.12304172	60.76926662	25.75259057
62.3630554809432	67.0668223381058	25.0799972909339	59.10597324	64.72617137	21.25191915
62.3630554809432	67.0668223381058	25.0799972909339	57.97334153	65.39941546	18.27090119
62.3630554809432	67.0668223381058	25.0799972909339	73.05372772	69.26625594	20.0928079
62.3630554809432	67.0668223381058	25.0799972909339	61.59665848	60.86573745	25.73038778
62.3630554809432	67.0668223381058	25.0799972909339	65.84999623	61.37790202	25.6974767
55.3797157470942	74.9338199479583	29.9591823425859	47.34853229	74.63427391	38.87043339
55.3797157470942	74.9338199479583	29.9591823425859	62.20174968	80.96664236	37.77358899
55.3797157470942	74.9338199479583	29.9591823425859	53.92763119	74.12654413	38.27376011
55.3797157470942	74.9338199479583	29.9591823425859	49.13669956	77.10708156	27.62901252
55.3797157470942	74.9338199479583	29.9591823425859	52.40986372	76.90026657	30.53428803
55.3797157470942	74.9338199479583	29.9591823425859	49.38151416	71.84627519	34.52041136
55.3797157470942	74.9338199479583	29.9591823425859	49.62844822	78.65994225	20.1083463
55.3797157470942	74.9338199479583	29.9591823425859	55.58088554	76.52999392	28.31600672
55.3797157470942	74.9338199479583	29.9591823425859	50.78444002	76.12504454	23.00978791
55.3797157470942	74.9338199479583	29.9591823425859	59.09181099	73.44789922	33.41304482
55.3797157470942	74.9338199479583	29.9591823425859	55.90538334	73.56581582	30.52666899
55.3797157470942	74.9338199479583	29.9591823425859	56.76810138	74.93595817	28.17323894
55.3797157470942	74.9338199479583	29.9591823425859	60.79681015	75.33369853	28.93747546
55.3797157470942	74.9338199479583	29.9591823425859	51.90516717	74.10528304	22.83711571
55.3797157470942	74.9338199479583	29.9591823425859	52.68458788	66.68600654	36.07142386
55.3797157470942	74.9338199479583	29.9591823425859	65.34735437	72.80394877	34.67473005
55.3797157470942	74.9338199479583	29.9591823425859	58.81674593	76.2826012	22.48412381
55.3797157470942	74.9338199479583	29.9591823425859	57.06276587	74.98770524	20.67544591
55.3797157470942	74.9338199479583	29.9591823425859	58.20433528	69.50520456	29.55764241
55.3797157470942	74.9338199479583	29.9591823425859	55.72002047	71.91921816	21.5952445
55.3797157470942	74.9338199479583	29.9591823425859	63.48323083	69.36201841	31.45080353
55.3797157470942	74.9338199479583	29.9591823425859	54.03625818	65.02303827	30.15017844
55.3797157470942	74.9338199479583	29.9591823425859	63.47892732	68.70647259	29.32775126
55.3797157470942	74.9338199479583	29.9591823425859	63.53725064	67.03413314	29.14142524
45.2019488693467	69.3215652686322	26.3800676169699	44.56064253	79.77318093	20.51948675
45.2019488693467	69.3215652686322	26.3800676169699	49.39322363	67.57061768	37.48715692
45.2019488693467	69.3215652686322	26.3800676169699	44.42598809	67.45202223	18.20113405
45.2019488693467	69.3215652686322	26.3800676169699	40.91327599	65.05437313	16.01674823
45.2019488693467	69.3215652686322	26.3800676169699	41.72170476	60.36141703	24.46424235
45.2019488693467	69.3215652686322	26.3800676169699	50.37372436	63.54183807	17.2232387
45.2019488693467	69.3215652686322	26.3800676169699	52.64945222	62.68533593	20.742851
37.7190916063495	71.3576896679791	27.3999812873144	38.20769452	77.89743741	37.44950686
37.7190916063495	71.3576896679791	27.3999812873144	32.56942546	80.98884638	22.4278796
37.7190916063495	71.3576896679791	27.3999812873144	33.57300136	70.51852673	38.6296637
37.7190916063495	71.3576896679791	27.3999812873144	31.67974116	78.20082263	20.94127433
37.7190916063495	71.3576896679791	27.3999812873144	35.96077646	77.38727187	28.20511129
37.7190916063495	71.3576896679791	27.3999812873144	44.66930475	80.79724102	25.59577081
37.7190916063495	71.3576896679791	27.3999812873144	41.14789047	74.75727523	32.931636
37.7190916063495	71.3576896679791	27.3999812873144	40.76978451	74.94346594	30.5932008
37.7190916063495	71.3576896679791	27.3999812873144	43.12816365	79.63219046	23.15451647
37.7190916063495	71.3576896679791	27.3999812873144	42.58773685	73.94634336	30.2774743
37.7190916063495	71.3576896679791	27.3999812873144	38.57181853	69.29967661	29.47346952
37.7190916063495	71.3576896679791	27.3999812873144	42.13585343	68.94604524	25.50967647
37.7190916063495	71.3576896679791	27.3999812873144	38.05290287	66.43336709	23.58284008
37.7190916063495	71.3576896679791	27.3999812873144	39.73860453	66.92518954	24.34934694
37.7190916063495	71.3576896679791	27.3999812873144	45.59084573	70.21452412	23.93560611
37.7190916063495	71.3576896679791	27.3999812873144	43.59103477	70.75648589	19.17067552
37.7190916063495	71.3576896679791	27.3999812873144	38.18944723	65.54612606	17.9243242
37.7190916063495	71.3576896679791	27.3999812873144	42.95157888	64.84132436	26.30910849
37.7190916063495	71.3576896679791	27.3999812873144	41.95981534	64.94436816	23.77879253
37.7190916063495	71.3576896679791	27.3999812873144	41.10546356	60.73573959	25.88754111
37.7190916063495	71.3576896679791	27.3999812873144	45.68320409	63.6499192	24.04332627
34.1407324018195	54.3813318432892	31.8743827421059	24.05460087	58.82740751	33.73414623
34.1407324018195	54.3813318432892	31.8743827421059	23.68432498	51.4412716	36.97532542
34.1407324018195	54.3813318432892	31.8743827421059	29.89833465	58.88393924	31.18403904
34.1407324018195	54.3813318432892	31.8743827421059	35.39691212	60.01558524	36.77171252
34.1407324018195	54.3813318432892	31.8743827421059	31.52001616	50.89228775	38.01036066
34.1407324018195	54.3813318432892	31.8743827421059	28.94274384	52.01860718	30.54475385
34.1407324018195	54.3813318432892	31.8743827421059	31.80593192	45.60640645	39.41102857
34.1407324018195	54.3813318432892	31.8743827421059	41.72708173	62.5487287	34.68501321
34.1407324018195	54.3813318432892	31.8743827421059	37.67648628	59.01822185	34.10509713

Solution x	Solution y	Solution z	Original x	Original y	Original z
34.1407324018195	54.3813318432892	31.8743827421059	39.86159624	55.58185516	39.85963663
34.1407324018195	54.3813318432892	31.8743827421059	39.00311055	58.98114927	34.60197054
34.1407324018195	54.3813318432892	31.8743827421059	30.62796082	46.77730777	34.94066727
34.1407324018195	54.3813318432892	31.8743827421059	30.18073163	48.32029982	32.22769732
34.1407324018195	54.3813318432892	31.8743827421059	30.55507662	47.73107042	32.65818922
34.1407324018195	54.3813318432892	31.8743827421059	30.28185343	43.77834378	32.70178342
34.1407324018195	54.3813318432892	31.8743827421059	28.72359173	49.06807614	23.44175989
34.1407324018195	54.3813318432892	31.8743827421059	32.83493269	54.50530143	23.93617923
34.1407324018195	54.3813318432892	31.8743827421059	41.84687745	52.15158968	38.57062516
34.1407324018195	54.3813318432892	31.8743827421059	36.93641703	55.80482127	27.58013236
34.1407324018195	54.3813318432892	31.8743827421059	33.45872958	53.85918585	23.94292918
34.1407324018195	54.3813318432892	31.8743827421059	34.06373355	42.77086753	33.9464291
34.1407324018195	54.3813318432892	31.8743827421059	40.32660467	53.626561	31.93108458
34.1407324018195	54.3813318432892	31.8743827421059	38.72818734	43.64397508	34.64285831
34.1407324018195	54.3813318432892	31.8743827421059	39.67150404	49.44131071	30.57444188
34.1407324018195	54.3813318432892	31.8743827421059	39.96945525	49.46230999	23.88525166
34.1407324018195	54.3813318432892	31.8743827421059	43.66555329	47.77139353	28.778171
23.6159526290778	70.1590868694463	27.1318171536398	21.51917751	80.74471553	21.88319617
23.6159526290778	70.1590868694463	27.1318171536398	22.68191696	72.90808337	38.77088424
23.6159526290778	70.1590868694463	27.1318171536398	23.86908483	73.83689183	36.6939804
23.6159526290778	70.1590868694463	27.1318171536398	21.2618816	68.31108552	38.60957073
23.6159526290778	70.1590868694463	27.1318171536398	25.63863856	75.55318582	34.2564448
23.6159526290778	70.1590868694463	27.1318171536398	19.92687299	66.4828608	36.85195291
23.6159526290778	70.1590868694463	27.1318171536398	29.81370195	76.77877617	33.99746475
23.6159526290778	70.1590868694463	27.1318171536398	29.7776223	79.3796747	28.90759999
23.6159526290778	70.1590868694463	27.1318171536398	31.54519137	79.16359507	27.34637643
23.6159526290778	70.1590868694463	27.1318171536398	32.43971284	75.52883521	28.48064207
23.6159526290778	70.1590868694463	27.1318171536398	31.96159565	70.60936436	21.8177247
23.6159526290778	70.1590868694463	27.1318171536398	32.14669335	66.5741861	28.83764483
23.6159526290778	70.1590868694463	27.1318171536398	31.78300706	62.74548174	25.97934086
22.3212653387449	70.0043203339048	27.0150243678884	21.16552744	75.92926841	33.87335876
22.3212653387449	70.0043203339048	27.0150243678884	20.11668251	80.56671914	21.763779
22.3212653387449	70.0043203339048	27.0150243678884	14.52745655	66.82146945	34.730647
22.3212653387449	70.0043203339048	27.0150243678884	14.67447984	73.22055772	21.75092301
22.3212653387449	70.0043203339048	27.0150243678884	17.24413003	73.14298035	27.78293034
22.3212653387449	70.0043203339048	27.0150243678884	14.35540419	64.70998039	34.26175056
22.3212653387449	70.0043203339048	27.0150243678884	14.51945543	70.49107423	24.26034768
22.3212653387449	70.0043203339048	27.0150243678884	18.49430275	75.1491321	23.37172362
22.3212653387449	70.0043203339048	27.0150243678884	14.01917911	69.22007201	23.43359605
22.3212653387449	70.0043203339048	27.0150243678884	19.47269695	75.25893863	20.7798111
22.3212653387449	70.0043203339048	27.0150243678884	14.11476256	66.58488992	23.55512122
22.3212653387449	70.0043203339048	27.0150243678884	22.14002238	72.37729838	30.29531679
22.3212653387449	70.0043203339048	27.0150243678884	22.95220857	73.2582761	29.61659281
22.3212653387449	70.0043203339048	27.0150243678884	25.39416892	74.01493111	32.17996221
22.3212653387449	70.0043203339048	27.0150243678884	20.16006997	73.55306832	21.43875646
22.3212653387449	70.0043203339048	27.0150243678884	21.52581462	69.05739134	31.57893426
22.3212653387449	70.0043203339048	27.0150243678884	24.37529212	73.10827156	29.72637521
22.3212653387449	70.0043203339048	27.0150243678884	18.97844246	66.0992932	30.20753751
22.3212653387449	70.0043203339048	27.0150243678884	19.17901123	72.48982593	17.20855307
22.3212653387449	70.0043203339048	27.0150243678884	16.63383213	64.77854357	18.98571058
22.3212653387449	70.0043203339048	27.0150243678884	24.00842436	69.26671548	26.32388978
22.3212653387449	70.0043203339048	27.0150243678884	29.09610379	74.18683092	25.64666307
22.3212653387449	70.0043203339048	27.0150243678884	25.20403775	63.98638021	32.83153178
22.3212653387449	70.0043203339048	27.0150243678884	21.30645349	61.8915326	27.89064267
22.3212653387449	70.0043203339048	27.0150243678884	21.61039636	65.83676525	18.75923326
22.3212653387449	70.0043203339048	27.0150243678884	28.17365085	71.94302821	19.49378883
22.3212653387449	70.0043203339048	27.0150243678884	25.66105506	62.27941228	31.77717439
22.3212653387449	70.0043203339048	27.0150243678884	26.03259253	67.05188068	24.42560707
22.3212653387449	70.0043203339048	27.0150243678884	28.77703399	67.75671878	24.26797752
22.3212653387449	70.0043203339048	27.0150243678884	30.01509861	69.93828769	21.72402497
22.3212653387449	70.0043203339048	27.0150243678884	26.36495426	64.10386589	19.00754119
22.3212653387449	70.0043203339048	27.0150243678884	26.46280572	62.61127777	22.19141047
22.3212653387449	70.0043203339048	27.0150243678884	24.68488711	59.85199485	22.75052505
22.3212653387449	70.0043203339048	27.0150243678884	24.58618772	59.92581691	21.04332426
22.3212653387449	70.0043203339048	27.0150243678884	26.36749261	61.24478927	19.91950535
11.9640800698451	54.006776857215	29.2053429527692	0.102323447000003	55.05645207	30.68754948
11.9640800698451	54.006776857215	29.2053429527692	3.166581108	54.38581172	37.35766501
11.9640800698451	54.006776857215	29.2053429527692	3.390983182	60.32064994	30.61068338
11.9640800698451	54.006776857215	29.2053429527692	3.684518627	54.75346427	34.67646632
11.9640800698451	54.006776857215	29.2053429527692	8.07711459799999	60.52651503	33.72017469
11.9640800698451	54.006776857215	29.2053429527692	1.250751092	48.74029716	30.02493246
11.9640800698451	54.006776857215	29.2053429527692	5.351054934	54.87903352	31.2051026
11.9640800698451	54.006776857215	29.2053429527692	4.692804385	58.08052349	25.21182896
11.9640800698451	54.006776857215	29.2053429527692	7.88086425500001	53.63419396	36.66849242
11.9640800698451	54.006776857215	29.2053429527692	14.06057656	63.93249207	34.35643485
11.9640800698451	54.006776857215	29.2053429527692	10.16802995	51.02082052	39.350114
11.9640800698451	54.006776857215	29.2053429527692	9.26512226200001	48.10149258	36.29819804
11.9640800698451	54.006776857215	29.2053429527692	15.36448886	54.97389236	39.50883453
11.9640800698451	54.006776857215	29.2053429527692	17.25601024	61.69443137	35.1920429
11.9640800698451	54.006776857215	29.2053429527692	11.86612062	56.83051802	27.8782456

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.9640800698451	54.006776857215	29.2053429527692	12.77181014	48.33401693	34.40572033
11.9640800698451	54.006776857215	29.2053429527692	19.29354577	63.34226321	29.80733532
11.9640800698451	54.006776857215	29.2053429527692	9.755265232	43.18329059	30.87649008
11.9640800698451	54.006776857215	29.2053429527692	8.736047039	47.86465463	22.63362148
11.9640800698451	54.006776857215	29.2053429527692	10.71615729	46.62293177	28.86994808
11.9640800698451	54.006776857215	29.2053429527692	18.10483235	51.48322234	38.87016683
11.9640800698451	54.006776857215	29.2053429527692	12.24975114	50.92735248	27.57127396
11.9640800698451	54.006776857215	29.2053429527692	13.21771043	55.16074821	22.9111302
11.9640800698451	54.006776857215	29.2053429527692	20.97945435	58.66863495	34.56781671
11.9640800698451	54.006776857215	29.2053429527692	14.81228179	50.29125842	28.12065032
11.9640800698451	54.006776857215	29.2053429527692	20.37447933	52.92580791	35.47903396
11.9640800698451	54.006776857215	29.2053429527692	22.06521443	57.50548607	32.39286042
11.9640800698451	54.006776857215	29.2053429527692	13.48749824	42.29987548	28.42807605
11.9640800698451	54.006776857215	29.2053429527692	23.29263587	57.34435722	30.94445508
11.9640800698451	54.006776857215	29.2053429527692	17.47416259	43.6041515	31.53434731
11.9640800698451	54.006776857215	29.2053429527692	22.00300591	49.77440842	32.73357505
11.9640800698451	54.006776857215	29.2053429527692	19.18169919	47.05766373	27.00382561
11.9640800698451	54.006776857215	29.2053429527692	18.21138052	45.58660191	25.83715904
16.4165748838205	44.806096341371	27.4235936284822	9.19676513100001	46.15569372	17.99642834
16.4165748838205	44.806096341371	27.4235936284822	18.21468575	45.65080463	39.25800482
16.4165748838205	44.806096341371	27.4235936284822	10.30388261	47.84277995	17.55376223
16.4165748838205	44.806096341371	27.4235936284822	17.44262234	43.68368222	35.8944745
16.4165748838205	44.806096341371	27.4235936284822	19.40209516	41.66020767	37.5577128
16.4165748838205	44.806096341371	27.4235936284822	23.40792676	43.64379836	35.72280889
16.4165748838205	44.806096341371	27.4235936284822	22.81585575	48.67591425	26.59144604
16.4165748838205	44.806096341371	27.4235936284822	17.93093151	43.30092715	17.11460176
16.4165748838205	44.806096341371	27.4235936284822	22.68802089	46.28526246	22.76975049
16.4165748838205	44.806096341371	27.4235936284822	25.71821347	44.02373583	30.1225615
16.4165748838205	44.806096341371	27.4235936284822	24.77779172	44.04083387	26.11612996
16.4165748838205	44.806096341371	27.4235936284822	26.12441872	44.96485891	27.03242338
16.4165748838205	44.806096341371	27.4235936284822	27.37711129	46.43616017	27.11673494
16.4165748838205	44.806096341371	27.4235936284822	28.08331623	42.02257662	27.79667825
16.4165748838205	44.806096341371	27.4235936284822	27.06311365	42.64274924	23.39166283
12.3307926859614	33.6672310914084	28.8645636875916	2.51827574799999	30.45426362	34.97941135
12.3307926859614	33.6672310914084	28.8645636875916	2.885836634	40.60849192	26.29324057
12.3307926859614	33.6672310914084	28.8645636875916	6.302525489	40.0085763	32.06550398
12.3307926859614	33.6672310914084	28.8645636875916	9.832177112	38.08691559	39.13126485
12.3307926859614	33.6672310914084	28.8645636875916	3.815111582	26.65111472	27.4138472
12.3307926859614	33.6672310914084	28.8645636875916	12.31993183	42.07287161	37.42873621
12.3307926859614	33.6672310914084	28.8645636875916	8.013859219	41.41457221	25.49555223
12.3307926859614	33.6672310914084	28.8645636875916	12.97854061	40.66549102	35.96453487
12.3307926859614	33.6672310914084	28.8645636875916	10.62327399	24.29073933	35.14972626
12.3307926859614	33.6672310914084	28.8645636875916	6.71940622700001	25.73868862	24.12156356
12.3307926859614	33.6672310914084	28.8645636875916	10.78091353	34.08373955	26.71276523
12.3307926859614	33.6672310914084	28.8645636875916	9.44237495500001	27.32019574	23.59921997
12.3307926859614	33.6672310914084	28.8645636875916	14.50630809	38.16565664	31.09752118
12.3307926859614	33.6672310914084	28.8645636875916	14.44281578	41.35822358	23.25943932
12.3307926859614	33.6672310914084	28.8645636875916	12.65054039	38.20990532	17.83269917
12.3307926859614	33.6672310914084	28.8645636875916	18.69463352	36.26547074	33.27071747
12.3307926859614	33.6672310914084	28.8645636875916	14.14878683	27.98719075	26.90047422
12.3307926859614	33.6672310914084	28.8645636875916	14.86812736	22.17705421	27.08627601
12.3307926859614	33.6672310914084	28.8645636875916	19.64225061	34.99214308	28.17560222
12.3307926859614	33.6672310914084	28.8645636875916	22.07359754	33.01769228	30.23180819
12.767385609139	19.6960802525854	28.3329404521711	2.197761157	16.16441336	29.99258788
12.767385609139	19.6960802525854	28.3329404521711	5.677247541	18.04924585	36.67897415
12.767385609139	19.6960802525854	28.3329404521711	6.772905892	23.04434695	34.36872103
12.767385609139	19.6960802525854	28.3329404521711	3.177857831	14.97802426	24.78576733
12.767385609139	19.6960802525854	28.3329404521711	4.281409798	24.72152663	26.34546352
12.767385609139	19.6960802525854	28.3329404521711	7.31997787899999	15.37807435	33.05725748
12.767385609139	19.6960802525854	28.3329404521711	4.953508892	23.81507206	25.41914679
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12.767385609139	19.6960802525854	28.3329404521711	10.79914705	20.42039499	35.93251466
12.767385609139	19.6960802525854	28.3329404521711	8.465864182	8.874062551	25.43796737
12.767385609139	19.6960802525854	28.3329404521711	12.36712067	15.90584574	24.47249551
12.767385609139	19.6960802525854	28.3329404521711	18.39694528	22.72524013	21.81072027
12.767385609139	19.6960802525854	28.3329404521711	18.71921477	25.10440199	21.46380598
24.502522173302	30.5050981815413	35.2057114111394	17.16840861	23.65521269	38.43535721
24.502522173302	30.5050981815413	35.2057114111394	22.79879511	41.59634367	39.45795983
24.502522173302	30.5050981815413	35.2057114111394	20.73212412	24.23741148	36.78766314
24.502522173302	30.5050981815413	35.2057114111394	21.70527032	21.60018691	37.91508039
24.502522173302	30.5050981815413	35.2057114111394	27.42853428	33.27622768	38.61257115
24.502522173302	30.5050981815413	35.2057114111394	26.37919279	28.3108891	38.48025156
24.502522173302	30.5050981815413	35.2057114111394	25.83818458	22.03803134	36.60516078
24.502522173302	30.5050981815413	35.2057114111394	24.87958822	27.09583401	32.67332021
24.502522173302	30.5050981815413	35.2057114111394	30.41452332	39.55317391	35.96788826
24.502522173302	30.5050981815413	35.2057114111394	27.26619514	25.90196542	35.39277783
24.502522173302	30.5050981815413	35.2057114111394	27.39065822	19.10906735	34.23380192
24.502522173302	30.5050981815413	35.2057114111394	30.83636789	38.35208021	33.99399048
24.502522173302	30.5050981815413	35.2057114111394	34.82834577	24.45085722	36.05632865
32.1919663620125	20.5423951830226	32.1278938347154	29.15811552	9.518746656	35.77137383

Solution x	Solution y	Solution z	Original x	Original y	Original z
32.1919663620125	20.5423951830226	32.1278938347154	32.11403346	10.63014558	35.85165647
32.1919663620125	20.5423951830226	32.1278938347154	35.94447387	20.12395641	25.28688733
32.1919663620125	20.5423951830226	32.1278938347154	35.53984032	15.99196501	21.54085765
32.1919663620125	20.5423951830226	32.1278938347154	38.38951699	19.65672727	24.71703453
32.1919663620125	20.5423951830226	32.1278938347154	38.46066343	17.33665094	24.22591115
44.332112977003	27.3374546518297	26.9842455346937	39.35568633	35.06788426	34.69629234
44.332112977003	27.3374546518297	26.9842455346937	39.25918273	24.78783876	35.71196052
44.332112977003	27.3374546518297	26.9842455346937	44.94410764	36.28576006	32.88778098
44.332112977003	27.3374546518297	26.9842455346937	36.2315122	27.60710766	22.87055815
44.332112977003	27.3374546518297	26.9842455346937	40.05041388	28.81118981	27.86495236
44.332112977003	27.3374546518297	26.9842455346937	39.07927218	20.57348801	18.57850652
44.332112977003	27.3374546518297	26.9842455346937	51.08696185	26.42044109	32.70824117
44.332112977003	27.3374546518297	26.9842455346937	50.59311922	22.75724468	32.75181399
44.332112977003	27.3374546518297	26.9842455346937	48.88810081	29.6929228	28.59078684
44.332112977003	27.3374546518297	26.9842455346937	53.48089128	34.57431179	29.79987824
44.332112977003	27.3374546518297	26.9842455346937	42.45831495	25.01806118	18.69304905
44.332112977003	27.3374546518297	26.9842455346937	51.99282443	27.99909333	30.19770488
44.332112977003	27.3374546518297	26.9842455346937	46.26887105	26.53209753	18.29584073
44.332112977003	27.3374546518297	26.9842455346937	47.52772375	30.54529654	17.6892221
44.332112977003	27.3374546518297	26.9842455346937	49.49892788	30.73465222	20.32700892
56.0750831414016	20.8421525358657	30.8443129814717	44.45005227	17.91363181	31.37577496
56.0750831414016	20.8421525358657	30.8443129814717	59.48412304	31.97998889	33.72997467
56.0750831414016	20.8421525358657	30.8443129814717	67.26622281	20.02005982	35.0966755
56.0750831414016	20.8421525358657	30.8443129814717	59.97712424	27.07719444	29.13491814
56.0750831414016	20.8421525358657	30.8443129814717	60.71671796	14.8721563	28.06290831
56.0750831414016	20.8421525358657	30.8443129814717	66.92261807	21.4897109	27.4812889
56.0750831414016	20.8421525358657	30.8443129814717	63.04507341	24.29862677	23.57575014
56.0750831414016	20.8421525358657	30.8443129814717	62.61153544	17.95816147	22.4620849
80.502299384914	14.9467184906726	26.5045518785431	83.75499038	5.857780347	33.63275215
80.502299384914	14.9467184906726	26.5045518785431	71.29498477	19.86081824	30.17263192
80.502299384914	14.9467184906726	26.5045518785431	77.03036191	15.51069798	15.03164451
89.5405532299427	19.5899439911894	25.0405880289727	94.15587216	20.2227246	36.0994515
89.5405532299427	19.5899439911894	25.0405880289727	90.81819821	18.2159484	35.33294835
89.5405532299427	19.5899439911894	25.0405880289727	95.99475962	18.1472698	27.39786086
89.5405532299427	19.5899439911894	25.0405880289727	94.17807015	30.5898166	23.81736257
89.5405532299427	19.5899439911894	25.0405880289727	94.43184685	8.796264511	23.29859307
89.5405532299427	19.5899439911894	25.0405880289727	93.53556787	11.2495411	17.39352488
75.836763457316	15.9106956741437	14.1634947699162	66.17419814	21.15751135	18.97034229
75.836763457316	15.9106956741437	14.1634947699162	85.22979418	8.715884504	12.16207554
75.836763457316	15.9106956741437	14.1634947699162	70.71952594	19.54937922	9.466423791
71.5792302948693	11.9282517473186	5.11064480516625	63.24920239	4.015695007	1.646238652
71.5792302948693	11.9282517473186	5.11064480516625	65.51501196	11.68636529	3.24100338
71.5792302948693	11.9282517473186	5.11064480516625	72.1570689	9.179080442	1.515121588
71.5792302948693	11.9282517473186	5.11064480516625	76.68650337	13.86956158	1.8774276

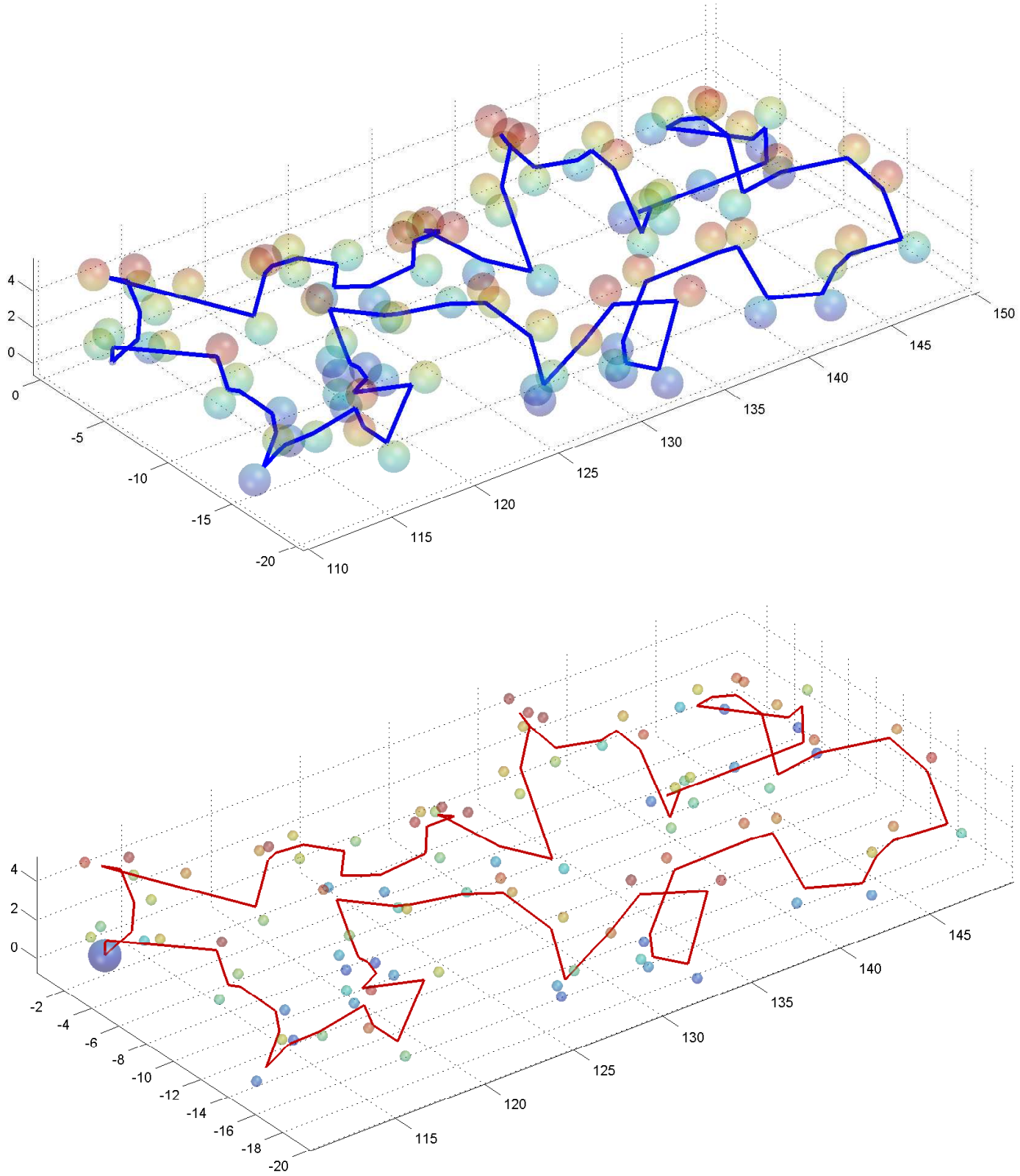


Figure N.70: $kroD100$, $r = 0.7798$, Equal Radius, 3D, Euclidean, Length = 202.0211690

Table N-73: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 3D, Euclidean

Total distance: 202.021168980618 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
1.87508038598328	2.82620124174717	1.4961624950941	2.02	2.33	2.08
1.14505296711928	3.89474646680904	2.38310966330691	0.469999999999999	3.63	2.67
1.64244386857521	6.32849825242723	3.12465012349012	2.40000000000001	6.19	3.07
2.44468383966461	10.2577743696119	4.32186921570739	2.41	10.69	4.97
2.94660639128946	10.4673244167335	2.45693490397534	2.34999999999999	10.59	1.97
3.64523401465372	10.4487739708371	2.11733944354771	4.01000000000001	9.8	2.35
4.86274971864404	11.4323553936607	0.873837461691167	5.55	11.21	0.58
4.14406158792519	12.6496439297788	0.664311875663304	4.64	13.02	0.19
1.43593043674267	15.2176733491371	0.907116516624662	0.799999999999997	15.33	0.47
2.03532507200936	16.0940068939512	2.3081740991633	1.48999999999999	16.29	2.83
3.40924329802515	16.5190574096231	2.65534592346486	3.86	16.16	2.13
4.97343342781258	17.7685321396744	4.03227104852263	5.55	17.53	4.5
4.53014510571816	19.0001847997792	3.73234328597957	3.94	19.44	3.99
5.74007931338066	19.2273863048851	2.58596544949769	5.70999999999999	19.82	2.08
10.0707221551134	15.5147033754926	2.52609837546452	10.82	15.61	2.72
8.54289839703983	12.9647782899266	1.47843732221041	7.78	12.82	1.55
8.54294817355945	12.9647323446513	1.47840405618629	8.11	12.95	0.83
10.4900934170636	11.4666969489954	0.8596866893512	11.09	11.96	0.79
11.1680810355836	9.95482508700169	0.518819535725702	11.79	9.69	0.13
10.8112454947103	9.76432107803517	0.765152030236117	10.21	9.62	0.29
10.6898713417271	9.61916877126051	1.25387204710697	9.97	9.42	1.03
10.4941160345054	9.3572700529078	2.17324933098185	10.09	10.01	2.31
10.2664985665429	8.85186892237471	3.53870902148336	9.81	8.48	4.05
12.5766570350657	10.1465184632277	2.9893454461254	12.64	10.9	3.18
14.1371690168145	9.23484366952131	2.10646164491956	13.93	8.59	1.72
16.68014673255	9.71573060203986	1.96101208867176	17.25	9.27	1.67
16.8547585986419	12.465814912593	3.21958018283865	16.77	12.38	3.99
16.9329348635476	13.0814121570038	3.10223912475182	16.99	12.94	3.45
17.2367295349815	15.4738267768465	2.64620469848738	17.68	15.78	3.21
16.6912499390141	17.1301389120742	1.16769630459051	16.23	17.23	0.85
16.642534476263	17.2780677565927	1.03564715788191	16.32	17.42	0.34
17.0674573597504	17.7041758498435	1.82138634371249	16.46	18.17	1.97
18.2343874091744	18.4370923585609	3.46184568153989	17.87	19.02	3.83
20.3034435853267	17.9684703262773	4.45285322678062	20.28	17.36	4.94
23.1172929127465	19.254604835574	4.23876511996644	23.74	19.44	4.67
21.9078143920051	19.3994719053773	0.965676450648083	22.14	19.77	0.32
20.6887206114406	18.4086245646261	1.30261886340185	19.94	18.52	1.49
20.8481681009738	18.1800397869385	1.26828095314994	20.5	18.33	0.82
22.2071845138986	16.2317230536087	0.97563837677551	22.21	15.78	0.34
23.9211788615055	15.776006804893	3.4455800402505	23.56	15.68	4.13
28.3172207199886	15.6261632820828	3.38725193644013	28.34	15.12	3.98
29.5298380868694	15.6498599380696	3.29484924570622	30.07	15.24	3.68
29.8302334647451	17.6115269948731	1.28877313791881	29.27	17.77	0.77
32.12102831904	18.8534688927273	1.30074610519807	32.48	19.06	0.64
32.6851613156265	19.1362214842443	2.58629897277324	32.2	19.45	3.11
33.7641653206069	18.9585602619526	2.94336814016761	33.73	19.02	3.72
37.3819951594855	18.2248881772681	2.19275866824352	37.86	18.62	1.72
37.970556678793	15.9610425842563	3.69880601858907	38.05	16.19	4.44
38.4939852507883	12.5354163939617	3.61709292419602	39.18	12.17	3.68
35.5952747453343	11.1364779464056	3.22995535326594	35.35	11.12	3.97
33.9687002099122	10.2553502302007	2.28363200504089	33.32	10.49	1.92
35.7418897165871	6.77457302013854	3.21085079902898	36.42	6.99	3.53
35.7838728084287	5.15362988003968	3.26806537233907	35.99	5.14	4.02
35.782098334727	4.79700565790356	3.24044091503653	36	4.59	3.96
35.5950857901213	3.30605633972607	2.52152991229205	35.03	3.01	2.97
35.860836738874	1.83965990926748	1.31087388601847	35.38	1.25	1.14
37.3357971733583	2.14492542519968	0.740212387232313	37.66	1.54	0.37
38.9998685946711	4.47138237822773	0.818312532636973	39.46	4.59	0.2
39.0751470334102	5.37909686110371	1.8005330371219	39.35	5.4	2.53
38.2700956410446	6.51159008707391	0.699521533146486	38.68	6.97	0.22
34.5299277507858	6.61987508979181	0.762744733548403	34.52	6.37	0.69
30.4069430571821	6.73925636413229	0.832447445293008	29.93	6.24	0.47
29.9970703482921	7.86201080364612	1.64160150123838	30.6	7.81	2.03
29.7274023400808	8.60061731375499	2.17388564632339	30.23	8.71	2.76
29.3377878639591	8.9628584019794	2.19428809337458	29.82	9.49	1.92
27.8297375180949	10.3646476709465	2.27334832042283	27.4	11.01	2.19
28.3538694890082	8.90632810005866	2.66361258926453	29.01	9.2	2.88
29.3086460140582	6.24937344711628	3.37458886468788	29.44	6.32	4.14
30.026190954606	3.58808300921011	2.89178957213176	30.62	3.29	3.3
29.6002018496126	3.03550921542594	2.27385734129756	29.95	2.64	1.7
27.0321660996149	3.03312509418599	2.78687490475239	26.58	3.6	2.5
26.4339252780256	1.96834794072614	3.61406221464702	26.56	1.28	3.27
25.9299787752167	1.82074904892656	4.45022533696782	25.81	1.21	4.92
25.7385651571569	2.44486286973479	4.44795252980004	25.92	2.48	4.76
25.5459190531465	3.07299052863372	4.44566366772136	25.97	3.49	4.95
24.0316201849479	4.38223752591878	3.42108256120161	23.47	3.88	3.22

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.5852652006236	5.51232430803809	2.9842886908873	23.34	5.23	2.71
22.1511747661122	9.14324328763494	1.58089047674565	22.23	9.9	1.41
20.8326798451101	7.01149652042891	1.70928486148957	20.67	6.94	0.95
19.4901921825284	4.64694373712592	2.62521529777043	19.62	3.89	2.49
18.8359182339991	5.092899397801	3.14725256036585	18.28	4.56	3.27
18.0142554584518	7.181091214668	4.3405101124747	17.66	6.92	4.8
17.8772535796974	7.52926867551751	4.53946816004121	18.19	8.14	4.91
16.6891914998269	7.09704862613315	4.23956472488856	16.04	7.06	4.67
16.9950119965562	6.60162260678595	2.50615418732642	17.66	6.78	2.14
15.3388702983253	5.44037521481699	1.47489502685599	15.29	5.81	0.79
14.098682935689	4.20183108196824	1.30050849199929	13.46	4.08	0.87
14.664395469322	3.67869457458279	2.09852204569319	15.41	3.54	2.28
12.7224243158464	3.2298596764744	2.90589055333729	12.72	2.46	3.03
11.9621248641026	3.50118510302741	3.15043515120865	12.03	3.85	2.73
10.5684718147967	3.99853395918377	3.59870493946039	10.17	3.33	3.55
9.37844997990416	4.98754614344879	4.10458158625754	9.31	5.12	4.87
7.90340085443846	6.0050759163721	2.70125090000619	7.81	6.7	2.36
6.27529136446698	2.94505810351174	2.8268359189829	6.34	2.94	3.58
5.17745707785872	0.881721540426229	2.91134165643544	5.47	0.25	2.56
3.25233279781445	0.801325898408492	4.04410481795044	2.64	0.36	4.24
3.66697656901144	1.66049284527444	4.13302058277559	3.87	1.99	4.81
3.89167908279991	2.34899328959621	2.63231809214482	4.59999999999999	2.67	2.69
3.53691785237356	2.64134542914592	1.43016790982022	3.66	3.39	1.25

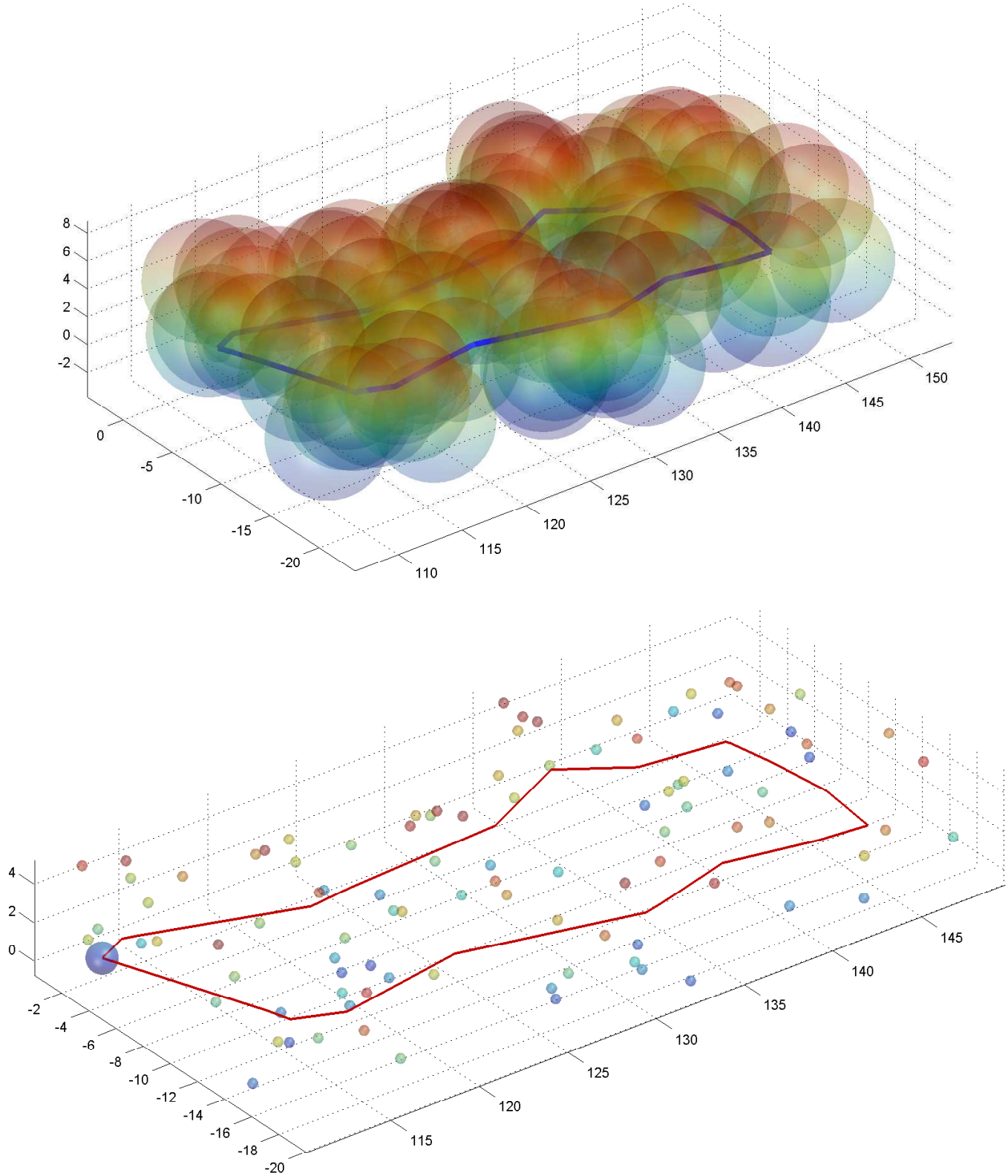


Figure N.71: $kroD100$, $r = 3.899$, Equal Radius, 3D, Euclidean, Length = 91.6690992

Table N-74: Solution for $kroD100$, $r = 3.899$, Equal Radius, 3D, Euclidean

Total distance: 91.6690992015274 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
2.94930261905321	3.22377044900588	0.258766448786467	3.66	3.39	1.25
2.94930261905321	3.22377044900588	0.258766448786467	4.59999999999999	2.67	2.69
3.11730753194976	4.78553217242823	0.515557959442766	0.469999999999999	3.63	2.67
3.11730753194976	4.78553217242823	0.515557959442766	2.40000000000001	6.19	3.07
3.92360725825304	12.280295171642	1.74786515211664	4.01000000000001	9.8	2.35
3.92360725825304	12.280295171642	1.74786515211664	2.34999999999999	10.59	1.97
3.92360725825304	12.280295171642	1.74786515211664	5.55	11.21	0.58
3.92360725825304	12.280295171642	1.74786515211664	2.41	10.69	4.97
3.92360725825304	12.280295171642	1.74786515211664	4.64	13.02	0.19
3.92360725825304	12.280295171642	1.74786515211664	7.78	12.82	1.55
3.92360725825304	12.280295171642	1.74786515211664	3.86	16.16	2.13
4.0778362338296	13.8232670078441	1.94910354400946	0.799999999999997	15.33	0.47
4.65961933605431	14.7144630212411	2.30614472287916	1.48999999999999	16.29	2.83
5.54813541124683	16.0755135340444	2.85143352707422	3.94	19.44	3.99
5.67926523017397	16.051545124331	2.84991157360181	5.70999999999999	19.82	2.08
7.1441250940498	15.7837507099851	2.83290008610813	5.55	17.53	4.5
10.4786068031971	15.1741516956871	2.79415241364492	8.11	12.95	0.83
10.4786068031971	15.1741516956871	2.79415241364492	11.09	11.96	0.79
11.4971760025795	14.9879510700654	2.78232170153205	10.82	15.61	2.72
12.6497291114663	14.7772585539347	2.76893619408813	12.64	10.9	3.18
15.1926174893425	15.2125866646796	2.64402979588072	16.77	12.38	3.99
16.1674258878039	15.3794897836943	2.59613664919939	16.23	17.23	0.85
16.1674258878039	15.3794897836943	2.59613664919939	16.32	17.42	0.34
16.9285219739959	15.5097915659256	2.55875740997873	16.99	12.94	3.45
17.7324447230886	15.6474370985829	2.51927155007671	17.68	15.78	3.21
17.7324447230886	15.6474370985829	2.51927155007671	16.46	18.17	1.97
18.8145224179119	15.8326963620555	2.46612358899122	17.87	19.02	3.83
20.4882810319722	16.1192218053857	2.38389529560746	20.28	17.36	4.94
20.4882810319722	16.1192218053857	2.38389529560746	19.94	18.52	1.49
22.1963427715937	16.4116195318759	2.29997683694479	22.14	19.77	0.32
22.55587950891	16.3754927475543	2.33981223964101	22.21	15.78	0.34
22.55587950891	16.3754927475543	2.33981223964101	20.5	18.33	0.82
23.1832045112471	16.3124579174367	2.40932279550702	23.74	19.44	4.67
25.7301962728585	15.5109715331365	2.31470423321577	23.56	15.68	4.13
25.7301962728585	15.5109715331365	2.31470423321577	28.34	15.12	3.98
27.2184147082354	15.0426571634146	2.25941551117785	29.27	17.77	0.77
27.6751337824341	14.8989269399098	2.24245086672203	27.4	11.01	2.19
30.0176060426701	15.2875968390816	2.17317677802039	30.07	15.24	3.68
32.4596413290652	15.6927908235315	2.10095692941897	32.2	19.45	3.11
33.0135251299356	15.6932470302813	2.06048015756897	32.48	19.06	0.64
33.8192601486885	15.6939129490364	2.00159662098644	33.73	19.02	3.72
35.2876463417444	15.6951370806703	1.89428867031234	37.86	18.62	1.72
35.3080845542862	15.5315703872252	1.89202649582857	38.05	16.19	4.44
35.7422146957009	12.0568327539327	1.84396408912664	39.18	12.17	3.68
35.7200667908566	8.717485275581	1.56426397160959	33.32	10.49	1.92
35.7200667908566	8.717485275581	1.56426397160959	34.52	6.37	0.69
35.7160570059207	8.11418280224097	1.51372946034131	35.99	5.14	4.02
35.7160570059207	8.11418280224097	1.51372946034131	35.35	11.12	3.97
35.7160570059207	8.11418280224097	1.51372946034131	36.42	6.99	3.53
35.7078522060808	6.82320309233327	1.34298963505089	38.68	6.97	0.22
35.6999893456407	5.58587092507018	1.17934706508835	39.35	5.4	2.53
35.6965278003883	5.05133270300113	1.10865379483732	39.46	4.59	0.2
35.617935124587	4.78240796558412	1.09039182125199	37.66	1.54	0.37
35.2760348786371	4.83269621490459	1.15344353231924	35.38	1.25	1.14
34.3699374543953	4.96596903034668	1.32053479202723	35.03	3.01	2.97
34.3699374543953	4.96596903034668	1.32053479202723	36	4.59	3.96
31.6365520184369	5.36799577369967	1.8245632659042	29.93	6.24	0.47
31.6365520184369	5.36799577369967	1.8245632659042	30.6	7.81	2.03
30.6724599771877	5.50979719745966	2.00234597098067	30.23	8.71	2.76
30.0426772048969	5.6024271749196	2.11848141370928	29.82	9.49	1.92
29.4804535347211	5.46413349992361	2.23589187916552	29.01	9.2	2.88
27.3601189249101	4.94256982564091	2.67868546271024	26.56	1.28	3.27
27.3601189249101	4.94256982564091	2.67868546271024	26.58	3.6	2.5
27.3601189249101	4.94256982564091	2.67868546271024	29.95	2.64	1.7
27.3601189249101	4.94256982564091	2.67868546271024	29.44	6.32	4.14
27.3601189249101	4.94256982564091	2.67868546271024	30.62	3.29	3.3
26.7726291722454	4.79805975140758	2.80137339121543	25.97	3.49	4.95
26.3046371198825	4.68294257419573	2.8991061557369	25.92	2.48	4.76
25.9241519085409	4.58934928593379	2.97856493215282	25.81	1.21	4.92
23.7185254339149	5.38763147360964	2.67193675659814	23.34	5.23	2.71
23.7185254339149	5.38763147360964	2.67193675659814	23.47	3.88	3.22
21.5002841221132	6.19049037867663	2.3635487049929	22.23	9.9	1.41
20.5043425832817	6.18875411562293	2.32124903373182	20.67	6.94	0.95
19.5139604176161	6.18702472839395	2.27918908787077	19.62	3.89	2.49
18.5428097306174	6.18533476237309	2.23794631334038	17.66	6.78	2.14
18.5428097306174	6.18533476237309	2.23794631334038	18.28	4.56	3.27

Solution x	Solution y	Solution z	Original x	Original y	Original z
17.7452327278987	6.18394907262696	2.20407482004556	17.25	9.27	1.67
17.0304046459872	6.1827005279438	2.17371873328256	17.66	6.92	4.8
17.0304046459872	6.1827005279438	2.17371873328256	18.19	8.14	4.91
14.6082504719634	6.17846190615212	2.07084164700559	13.46	4.08	0.87
14.6082504719634	6.17846190615212	2.07084164700559	13.93	8.59	1.72
13.3235896707725	6.17621504989931	2.01628132275594	12.72	2.46	3.03
13.3235896707725	6.17621504989931	2.01628132275594	15.41	3.54	2.28
13.3235896707725	6.17621504989931	2.01628132275594	15.29	5.81	0.79
13.3235896707725	6.17621504989931	2.01628132275594	16.04	7.06	4.67
11.5920304712677	6.23931516456533	1.91544988920244	11.79	9.69	0.13
11.1513906655899	6.25534074475522	1.88977694000955	9.97	9.42	1.03
11.1513906655899	6.25534074475522	1.88977694000955	10.21	9.62	0.29
11.0635460989166	6.25853397316461	1.8846614590812	10.09	10.01	2.31
10.4568486128155	5.90676516186547	1.80081840809244	7.81	6.7	2.36
10.4568486128155	5.90676516186547	1.80081840809244	9.81	8.48	4.05
9.75597752917822	5.50038885346637	1.70395985195182	9.31	5.12	4.87
9.06285059357155	5.09850191760576	1.60817009896944	10.17	3.33	3.55
9.06285059357155	5.09850191760576	1.60817009896944	12.03	3.85	2.73
5.6266901023704	3.106200019474	1.13334224543935	5.47	0.25	2.56
4.28427009520615	2.32786024401545	0.947820830933383	3.87	1.99	4.81
4.28427009520615	2.32786024401545	0.947820830933383	6.34	2.94	3.58
3.65964306070722	1.96631530883583	0.836724960471923	2.64	0.36	4.24
3.22572306422791	1.81028018460103	0.423977157197233	2.02	2.33	2.08

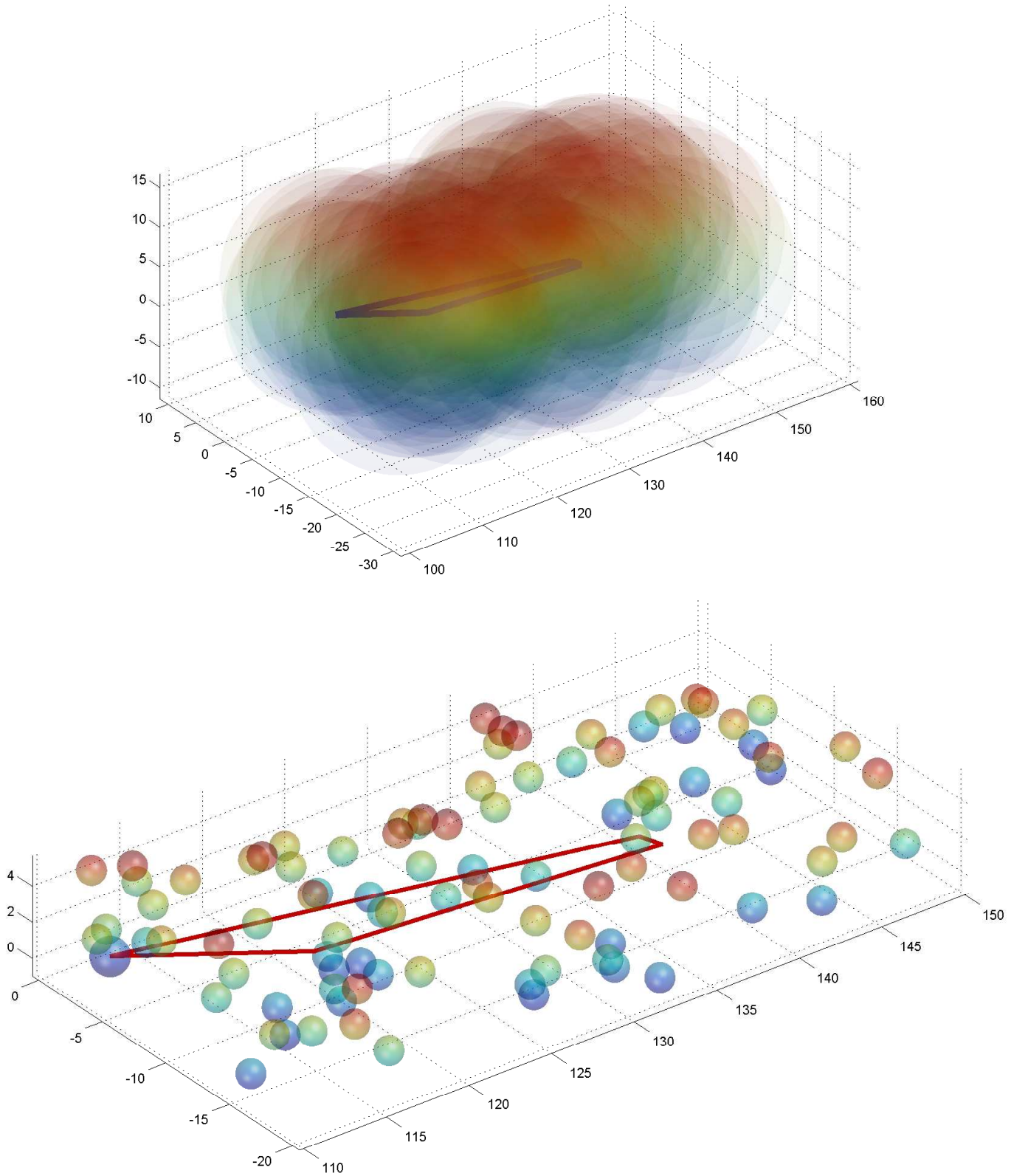


Figure N.72: $kroD100$, $r = 11.697$, Equal Radius, 3D, Euclidean, Length = 58.9262218

Table N-75: Solution for $kroD100$, $r = 11.697$, Equal Radius, 3D, Euclidean

Total distance: 58.9262217579219 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
3.99507320779227	2.00530263714498	0.046879604396695	2.64	0.36	4.24
5.6087989262201	2.47723309409015	0.109123957859373	5.47	0.25	2.56
5.6087989262201	2.47723309409015	0.109123957859373	3.87	1.99	4.81
7.58150849941794	3.05416099171592	0.185167850564081	6.34	2.94	3.58
7.58150849941794	3.05416099171592	0.185167850564081	4.59999999999999	2.67	2.69
10.1310536227513	3.79976774339136	0.283430540268435	10.17	3.33	3.55
10.1310536227513	3.79976774339136	0.283430540268435	9.31	5.12	4.87
12.8208470134164	4.58633314731125	0.387086861712614	12.03	3.85	2.73
12.8208470134164	4.58633314731125	0.387086861712614	12.72	2.46	3.03
15.927522536347	5.49477707201978	0.506810538072525	15.41	3.54	2.28
19.3449302732967	6.49407297985486	0.638509635384755	15.29	5.81	0.79
19.3449302732967	6.49407297985486	0.638509635384755	13.46	4.08	0.87
27.6321712491554	8.91798725215426	0.957704108568459	35.38	1.25	1.14
28.9282737141265	9.29694391025434	1.00765228885741	37.66	1.54	0.37
28.9511168805878	9.42842055426928	1.02031202467349	39.46	4.59	0.2
29.0266786996987	9.86288877405335	1.06217895864607	38.68	6.97	0.22
29.1033781591666	10.303884584484	1.10467388284248	38.05	16.19	4.44
29.1338894735592	10.4792791516798	1.12157610419739	39.18	12.17	3.68
29.1638249749361	10.6513623305433	1.13815883073644	32.2	19.45	3.11
29.1638249749361	10.6513623305433	1.13815883073644	33.73	19.02	3.72
29.1880995501116	10.7908942456404	1.15160660951171	37.86	18.62	1.72
29.1517667621096	10.7882122093527	1.15226081289791	35.99	5.14	4.02
29.1517667621096	10.7882122093527	1.15226081289791	39.35	5.4	2.53
28.6445194195225	10.7508507853523	1.16145260260414	35.03	3.01	2.97
28.6445194195225	10.7508507853523	1.16145260260414	36	4.59	3.96
27.7450601852958	10.6846006890276	1.17775341045596	34.52	6.37	0.69
27.7450601852958	10.6846006890276	1.17775341045596	36.42	6.99	3.53
25.3660473047776	10.5093827759008	1.22086020812506	17.25	9.27	1.67
25.3660473047776	10.5093827759008	1.22086020812506	17.66	6.78	2.14
25.3660473047776	10.5093827759008	1.22086020812506	20.67	6.94	0.95
25.3660473047776	10.5093827759008	1.22086020812506	18.19	8.14	4.91
25.3660473047776	10.5093827759008	1.22086020812506	22.23	9.9	1.41
25.3660473047776	10.5093827759008	1.22086020812506	17.66	6.92	4.8
25.3660473047776	10.5093827759008	1.22086020812506	16.04	7.06	4.67
25.3660473047776	10.5093827759008	1.22086020812506	16.77	12.38	3.99
25.3660473047776	10.5093827759008	1.22086020812506	16.99	12.94	3.45
25.3660473047776	10.5093827759008	1.22086020812506	18.28	4.56	3.27
25.3660473047776	10.5093827759008	1.22086020812506	19.62	3.89	2.49
25.3660473047776	10.5093827759008	1.22086020812506	23.34	5.23	2.71
25.3660473047776	10.5093827759008	1.22086020812506	23.47	3.88	3.22
25.3660473047776	10.5093827759008	1.22086020812506	17.68	15.78	3.21
25.3660473047776	10.5093827759008	1.22086020812506	22.21	15.78	0.34
25.3660473047776	10.5093827759008	1.22086020812506	23.56	15.68	4.13
25.3660473047776	10.5093827759008	1.22086020812506	27.4	11.01	2.19
25.3660473047776	10.5093827759008	1.22086020812506	20.28	17.36	4.94
25.3660473047776	10.5093827759008	1.22086020812506	26.58	3.6	2.5
25.3660473047776	10.5093827759008	1.22086020812506	25.97	3.49	4.95
25.3660473047776	10.5093827759008	1.22086020812506	25.92	2.48	4.76
25.3660473047776	10.5093827759008	1.22086020812506	29.01	9.2	2.88
25.3660473047776	10.5093827759008	1.22086020812506	25.81	1.21	4.92
25.3660473047776	10.5093827759008	1.22086020812506	29.82	9.49	1.92
25.3660473047776	10.5093827759008	1.22086020812506	26.56	1.28	3.27
25.3660473047776	10.5093827759008	1.22086020812506	29.44	6.32	4.14
25.3660473047776	10.5093827759008	1.22086020812506	30.23	8.71	2.76
25.3660473047776	10.5093827759008	1.22086020812506	28.34	15.12	3.98
25.3660473047776	10.5093827759008	1.22086020812506	29.93	6.24	0.47
25.3660473047776	10.5093827759008	1.22086020812506	30.6	7.81	2.03
25.3660473047776	10.5093827759008	1.22086020812506	23.74	19.44	4.67
25.3660473047776	10.5093827759008	1.22086020812506	29.95	2.64	1.7
25.3660473047776	10.5093827759008	1.22086020812506	30.07	15.24	3.68
25.3660473047776	10.5093827759008	1.22086020812506	30.62	3.29	3.3
25.3660473047776	10.5093827759008	1.22086020812506	29.27	17.77	0.77
25.3660473047776	10.5093827759008	1.22086020812506	33.32	10.49	1.92
25.3660473047776	10.5093827759008	1.22086020812506	35.35	11.12	3.97
25.0901428839718	10.4890610134838	1.22586372376277	32.48	19.06	0.64
22.3826549408777	10.2896761335188	1.27495469636924	20.5	18.33	0.82
22.3826549408777	10.2896761335188	1.27495469636924	19.94	18.52	1.49
20.4742389720824	10.1491392913454	1.30955979967025	17.87	19.02	3.83
20.4742389720824	10.1491392913454	1.30955979967025	22.14	19.77	0.32
18.5048230580642	10.0041287707547	1.34526998817373	16.46	18.17	1.97
16.7842316613031	9.87744044334342	1.37646918671663	16.23	17.23	0.85
16.7842316613031	9.87744044334342	1.37646918671663	16.32	17.42	0.34
15.1427434541672	9.75658069351077	1.4062345588723	13.93	8.59	1.72
15.1427434541672	9.75658069351077	1.4062345588723	11.79	9.69	0.13
13.7094396329526	9.65104582469878	1.43222721682167	10.82	15.61	2.72
12.4104560459801	9.55540083273952	1.4557840362938	12.64	10.9	3.18

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.0666337314552	9.45645715927971	1.48015370430904	9.81	8.48	4.05
11.0666337314552	9.45645715927971	1.48015370430904	7.81	6.7	2.36
9.90397247995241	9.37084984425389	1.50123859114354	1.48999999999999	16.29	2.83
9.90397247995241	9.37084984425389	1.50123859114354	0.799999999999997	15.33	0.47
9.57145335946718	9.34636855765451	1.50726994762838	3.86	16.16	2.13
9.57145335946718	9.34636855765451	1.50726994762838	5.70999999999999	19.82	2.08
9.26395696243327	9.32372522422637	1.51284707680709	3.94	19.44	3.99
8.88022736996997	8.86956194466515	1.42330954867066	10.09	10.01	2.31
8.88022736996997	8.86956194466515	1.42330954867066	9.97	9.42	1.03
8.51256102298055	8.43440385046925	1.33751850980521	5.55	17.53	4.5
8.07307567816258	7.91425301447941	1.23497154364093	10.21	9.62	0.29
7.64133557238604	7.40327010612642	1.13423218067745	11.09	11.96	0.79
7.1759929532033	6.85252993044864	1.0256553195902	8.11	12.95	0.83
6.67271359724162	6.25690006822023	0.908229055851002	7.78	12.82	1.55
6.67271359724162	6.25690006822023	0.908229055851002	5.55	11.21	0.58
6.09878959007474	5.57767673199033	0.774323381203157	4.64	13.02	0.19
6.09878959007474	5.57767673199033	0.774323381203157	2.34999999999999	10.59	1.97
5.45934515867837	4.8209128348381	0.625131079458583	4.01000000000001	9.8	2.35
4.7836446285289	4.02124887600461	0.467481672684098	2.41	10.69	4.97
4.7836446285289	4.02124887600461	0.467481672684098	2.02	2.33	2.08
4.08377212109818	3.19297818721307	0.30419205596079	2.40000000000001	6.19	3.07
4.08377212109818	3.19297818721307	0.30419205596079	0.469999999999999	3.63	2.67
3.43492076857885	2.42507849608143	0.152803560669946	3.66	3.39	1.25

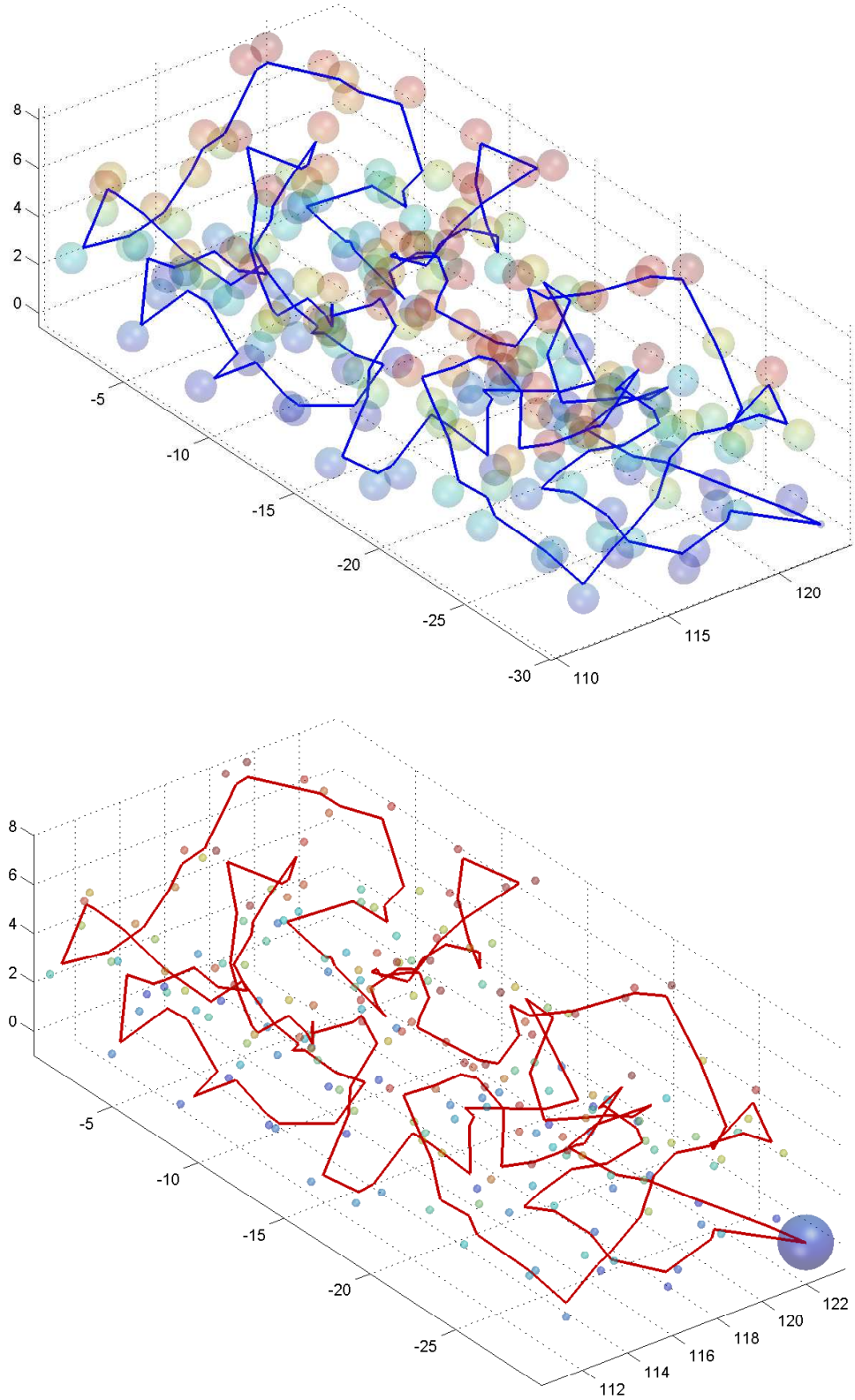


Figure N.73: $rat195$, $r = 0.578$, Equal Radius, 3D, Euclidean, Length = 291.2583706

Table N-76: Solution for $rat195$, $r = 0.578$, Equal Radius, 3D, Euclidean

Total distance: 291.258370618718 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
12.1635984016542	27.5143400901241	0.179652829412625	12.7	27.3	0.2
10.9588696382846	24.8290588015531	0.506502876903808	11.3	24.6	0.1
10.1177334536295	23.2171341648143	0.818136584487609	10.5	22.8	0.7
9.0956614383927	22.674759502035	1.16787178204626	8.7	23	0.9
7.94467666907056	21.3603751043632	2.09186996207148	7.40000000000001	21.2	2.2
9.43317200447834	21.0369496165305	2.33943880011955	9.40000000000001	20.9	2.9
12.2387754664273	20.6409792579675	1.9670511040903	12.7	20.9	2.2
12.1280550792022	19.6864433367037	1.10122414461073	12.5	19.5	0.7
11.1896627935758	19.359553555671	1.33576345283593	11.3	19.3	1.9
10.6601359171807	19.1905467735119	1.37478163643345	10.6	19.2	0.8
8.97993260224754	18.6500106587166	1.58504867668579	8.5	18.8	1.3
9.097680665063	18.0711104301375	2.26957645411054	9.3	18.5	2.6
9.20886395225654	17.5104081609958	2.92429964851119	8.7	17.3	3.1
9.60123454325989	17.305670313131	3.20807586052579	9.5	17.4	3.2
10.9144969746744	16.6204080249619	4.15787322387466	11.4	16.9	4.3
10.6433399837057	15.4228338461283	4.4869033934314	10.4	15.1	4.9
11.1882516100618	15.3668997485378	3.4397789384444	11.7	15.3	3.7
12.4050180399607	15.2440669027987	0.923327225684345	12.7	14.8	0.7
12.1495674338922	16.4916734674857	0.311071883543017	12.5	16.9	0.1
10.7253936822634	16.3958028210343	0.393681577897125	10.6	16.8	0
9.10420919608903	15.9667977825505	0.798531698540115	9.3	15.6	1.2
8.52697933565811	15.816339178356	0.94021637440671	8.7	15.4	1.1
7.75868213241954	15.6160804541362	1.12879742324092	7.5	15.1	1.1
7.23034133868251	16.8412201000569	1.53879352520754	7.59999999999999	17.1	1.9
6.79966458683529	17.1500775276965	1.47240771044015	6.40000000000001	16.8	1.7
5.3501472289844	19.0507229562645	0.857826485194425	5.40000000000001	19.4	0.4
3.57592990566887	19.1288696462623	2.70254908761814	3.7	18.6	2.9
2.56331425792169	19.3497047455623	3.64548444945905	2.5	19.5	4.2
1.24797814342381	18.7793505193541	1.75797249079704	1.59999999999999	18.8	1.3
0.711809136580399	18.6241205218466	1.55235687957379	0.299999999999997	19	1.4
0.530179759292778	16.7867763094123	1.46263771669408	0.299999999999997	16.4	1.1
1.68451232197921	16.761414710752	3.53314122899719	1.59999999999999	17.2	3.9
2.52284425537347	15.781427567106	3.89533267562156	2.40000000000001	15.3	3.6
3.94154815835904	15.4713260819976	5.03087734688578	4.5	15.4	4.9
3.27541058140986	15.4500273821511	6.39859605168706	3.5	15.1	6.8
2.50171063839916	15.9801437784016	6.6473513197302	2.5	16.5	6.9
1.26934175979734	15.1365389895436	6.22314036113448	0.700000000000003	15.2	6.3
1.73122525731061	14.5615364747095	5.84561144022059	1.59999999999999	14.7	5.3
2.50322748889759	13.6152059700125	5.6009493872084	2.7	13.4	6.1
3.50463944347352	12.3144439774262	3.70251449784236	3.5	12.6	3.2
3.8961115177537	11.43385504154	3.64098472138361	4.3	11.2	3.3
3.35718104435875	11.0926223196052	4.36468888184745	3.59999999999999	10.8	4.8
1.78206435594885	11.3513209141087	4.33744950851523	1.5	11.1	3.9
0.874515457491924	12.1920652248394	5.32698544634926	0.599999999999994	12.7	5.3
1.00671530894486	11.2538008269742	6.23241470542742	0.700000000000003	11.4	6.7
1.71936754535618	9.84465093229883	6.49857146934431	1.3	9.5	6.3
3.3663244288591	8.06607164018481	7.16647887080293	3.7	8.4	7.5
4.91525746734126	5.50349804963727	7.54059672585884	4.8	5	7.8
6.72013737408373	6.32217381817867	6.40221464623018	6.59999999999999	6.8	6.1
7.11406358113602	6.20202813955498	6.36594479268798	7.40000000000001	6.7	6.3
8.38845877802976	4.99035361608895	6.30433008941687	8.8	4.9	6.7
8.0795330744521	3.79217660981366	4.25907226740351	8.5	3.4	4.2
7.41447016783253	3.73953460723627	3.40682717996905	7.40000000000001	3.2	3.2
7.10943223381055	4.04127374759089	3.12990536291151	7.5	4.4	2.9
5.92715077937203	4.56123266311838	2.56613305016449	5.40000000000001	4.6	2.8
6.27618308447333	4.88535399728695	1.53214966628383	6.40000000000001	5.4	1.3
6.30129183717223	3.15776993484343	0.867941611508668	6.40000000000001	3.2	0.3
6.19328955025566	1.90936141962519	1.12987656654985	6.59999999999999	1.6	1.4
5.18736933702093	1.47266586666981	0.763168684470158	5.40000000000001	1.2	0.3
4.7957943843674	1.36095820563779	0.706762947075286	4.7	1.1	0.2
3.50305846748496	1.50325416360739	1.59893952697916	3.40000000000001	1.1	2
2.17345875333039	3.0455817413522	1.40565779098635	2.59999999999999	3.4	1.3
0.810718025155666	4.62631130505376	1.2075666225877	0.299999999999997	4.8	1
2.51053351943683	5.1458143365043	2.2478963248962	2.59999999999999	5	2.8
3.06606386974066	5.59289618385199	1.791428895143	3.59999999999999	5.4	1.9
3.17100897345966	7.1934907903198	0.37243397243816	3.59999999999999	7.3	0
1.15878090911048	8.44852013097777	0.639621997916243	0.599999999999994	8.4	0.5
2.1795562909188	9.56456020140195	1.44798190112696	2.5	9.4	1.9
2.22682574090342	11.2767171540779	0.846085513270475	2.40000000000001	11.2	0.3
2.14640712407137	12.1529954170241	0.880028557332105	1.7	12.5	1
4.32730509760808	12.5729933842615	0.325973510922498	4.40000000000001	13.1	0.1
6.73201605951979	11.1340293345067	0.484420398672189	7.3	11.2	0.4
6.01205788081759	10.3892812089418	0.789915085897083	5.59999999999999	10.5	0.4
5.4103055385514	9.38786144749467	1.4438146235912	5.3	9.5	2
5.24538016610995	8.87665694561768	1.27373894647039	4.7	8.7	1.2
5.79817789599319	8.51090489627585	1.1726193235644	6.3	8.6	0.9

Solution x	Solution y	Solution z	Original x	Original y	Original z
5.35840109681455	7.66448860716688	1.7414736396295	5.40000000000001	7.2	1.4
4.43361091865361	7.00783345027636	3.53103655283449	4.7	6.8	4
2.8800253591121	7.1944619152545	3.33901494363828	2.7	7.3	2.8
1.67685053702247	7.12146503006072	4.52996665802241	1.5	7.5	4.4
0.922657028637929	7.07570689882426	5.27649966947902	0.599999999999994	7.5	5.5
0.924145398193062	4.6497403686746	5.79907932242374	1.5	4.6	5.8
0.69040210494417	3.31702019681741	6.09015007144502	0.299999999999997	3.2	6.5
1.88154913455379	1.25925536047689	4.92702883063386	2.3	0.9	5.1
1.44178004159748	1.31290531247879	4.22721050197966	1.7	1.2	4.1
0.667471011608711	1.40736751192096	2.99502950480313	0.299999999999997	1.2	2.6
1.76857500126876	2.69417611957397	3.67806421385684	1.5	3.2	3.6
3.08636823323639	3.00382974431353	4.36262196923474	3.3	3.4	4
4.28893565678088	2.93904846718174	5.46280800055485	4.2	3.4	5.8
5.27605450200517	2.4102865871353	5.92950674310752	5.3	2.5	6.5
7.40881482433328	0.934555219186104	5.12033999949255	7.5	0.7	4.6
8.91228385328554	0.817294080141615	7.16486035668594	8.59999999999999	0.6	7.6
9.35760466001311	0.905426373436299	7.33327922496542	9.40000000000001	0.8	7.9
11.2679210968751	1.61004402910309	6.47578931521381	11.5	1.4	6.7
11.8742357352123	1.8336829494917	6.2036299767714	12.3	1.5	6
11.8696925606021	3.00911214945939	6.23569217331219	11.3	3.1	6.2
12.4297766242049	4.72364316859908	6.32045619760882	12.7	4.9	6.8
12.0901958335773	6.41352760175591	4.42955419436295	12.5	6.8	4.3
11.23986334811	6.38805931613788	3.92650205940633	10.7	6.5	4.1
11.5938908109887	6.10577542043431	3.00916069117127	11.7	6.5	2.6
11.80358415779	4.82239216093482	2.77869146670084	11.5	4.7	3.2
12.0071620556893	3.57647093104578	2.55494216772532	12.5	3.4	2.8
10.7054341851932	1.40698475040725	1.17752759220261	10.7	0.9	0.9
10.0950151261673	2.55179886237402	1.71175875395828	10.4	2.5	2.2
9.86958250651295	2.95768370660134	1.8845134137625	9.5	2.8	2.3
9.77465965480938	4.91194334314103	1.67069104366606	9.8	5	1.1
9.74871018880484	5.24763661317954	1.81663766072722	10.3	5.4	1.9
8.88338932545403	6.58921606564118	2.37675336461674	8.5	6.5	2.8
8.97709986460492	7.48456620123521	2.04957578125588	9.40000000000001	7.4	2
9.15597371336497	9.19362517820133	1.42505335725829	9.40000000000001	9.5	1
8.70891743669303	9.27193556903707	2.0689206698804	8.3	8.9	1.9
8.21484107843767	9.53331806597345	3.07922765751899	7.7	9.3	3.2
8.80759664997714	10.4036938897093	4.04923282670676	8.59999999999999	10.7	4.5
9.66357516134723	10.3088697947504	3.67251411115316	9.8	10.8	3.4
10.3850484058784	9.70016414396361	3.57692468856511	10.3	9.2	3.3
11.293962560667	9.91020746896115	3.94876921897663	11.5	9.5	4.3
12.0561869241363	10.8632186734882	3.80764813839352	12.6	10.9	4
11.7132100238271	11.3444379094955	3.45651657564079	11.7	11.5	2.9
10.6142997524566	12.1150927645449	5.38713972149846	10.3	12.6	5.4
10.809140551231	11.2155040078834	6.60056400883141	10.4	11.3	7
12.1000922011839	9.84013555628526	7.15126335260761	12.3	9.3	7.2
12.1991958474248	13.0080787441283	7.55915033496336	12.6	13.4	7.7
11.5533085199159	13.0136579598476	7.4095719562312	11.6	13	7.6
9.76245713528174	13.0291275560038	6.994835020094	9.59999999999999	12.8	7.5
8.54468071175285	13.1159639100418	6.53311667083306	8.2	13.4	6.9
7.57461212618672	12.5479291380667	4.94335722152264	7.7	12.7	4.4
6.56259932582239	11.7416503526479	5.31941970845959	6.40000000000001	11.2	5.2
6.17100964596301	12.5721959467237	5.96353519951782	6.3	12.4	6.5
5.85086793173103	13.193175976822	6.06160206268454	5.40000000000001	13.2	5.7
5.81202341791891	14.8089593247575	6.96061326300156	5.5	14.6	7.4
5.84764575124493	15.4756270487157	7.24102053815706	6.3	15.5	7.6
5.0729317503403	17.0203682921217	7.22797239010328	5.3	17.4	7.6
4.46105882151723	17.3077333319571	6.80510466544434	4.40000000000001	16.9	6.4
4.04830402918476	17.6721648764731	6.66169884678103	3.5	17.5	6.6
4.39602890943783	18.9026549126865	6.480759344487	4.40000000000001	18.9	6.5
4.78873766493884	20.2923251224582	6.27641272103958	4.3	20.6	6.3
5.29996447071646	20.7540023892353	6.16300167507413	5.3	21.1	5.7
6.20437357806188	20.7929306215421	7.00328730289814	6.40000000000001	21.3	7.2
6.76062634811026	19.5661045516289	7.48256551545022	6.59999999999999	19.2	7.9
7.64054869896276	19.5662885591147	6.7431513721209	7.7	19.2	6.3
8.67841283468977	20.7275635308411	7.11731180524491	8.40000000000001	21.2	7.3
10.4576410968315	20.989773860246	7.1346156221143	10.4	21.5	7.4
11.156573131188	21.0493807707098	7.11916332884384	11.5	20.6	7
11.6414973063935	22.2549440458694	7.37979803404097	11.7	22.5	7.9
12.3189610320713	23.3664757957029	4.93364435578712	12.7	23	4.7
12.0616015827016	25.2010520019251	3.26345730128738	12.5	25.3	2.9
10.8067611048935	26.0873088582803	3.13995371773562	10.6	26.4	2.7
10.7101995319441	26.0467225072326	3.40429524470587	10.4	25.6	3.6
11.2108564127186	27.3229695652234	4.2353950121096	11.6	27.1	4.6
11.2148154960136	28.9537955948387	4.61732257505333	11.4	29.4	4.3
10.3774807216304	28.96482518409	6.53847888545328	10.4	29.1	7.1
9.3087207853369	28.0405362286902	4.74332717044915	9.40000000000001	28.4	4.3
8.48450205088223	26.9284179081934	4.20823820630455	8.7	26.4	4.3
7.498536284195	26.9511159314781	3.64766374871969	7.40000000000001	26.5	3.3
5.28569237211133	29.0667553474817	3.71766568258688	5.3	29.5	4.1
3.96260795220802	28.9229573692901	2.55291540596019	4.3	28.8	2.1

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.45848486597765	28.8994306449457	2.25600188250428	3.3	28.4	2.5
2.00597846335445	29.000684119315	1.28462111539317	1.7	29.4	1
1.95235245930887	27.4095905376325	1.5862876043234	1.59999999999999	27.4	1.8
1.93491007850227	26.8920601191271	1.68440994483282	2.40000000000001	26.7	1.4
1.10532657584436	24.9895971661313	2.56589886177928	0.599999999999994	24.9	2.3
1.18726137305933	24.4175026322624	3.04947352848984	1.5	24.6	3.5
0.876320318674999	23.1559172738849	3.23844988895283	0.599999999999994	22.9	2.8
1.13733910551468	22.2840435932298	4.43311310788824	1.3	22.7	4.8
1.21070492850747	21.6981862198938	4.90305240852046	1.5	21.3	4.6
0.925257489675999	20.9449074595669	6.49461285897409	0.5	20.7	6.8
2.13873603289589	21.2308449214284	6.59543322414145	2.40000000000001	20.9	6.2
2.87210871212127	21.7426245970692	7.01669078463143	3.3	21.4	7.2
3.01848598326202	22.5146879140082	7.16604604637567	3.40000000000001	22.5	7.6
2.89221775717002	23.4701488992975	7.00147654774575	2.59999999999999	23.5	7.4
2.77369306126	24.3670271776468	6.84699522280398	3.3	24.6	6.9
2.14324302704634	25.1672895874461	6.62144395682141	2.59999999999999	25.5	6.5
0.911749724709168	26.6714091865564	6.19930933164193	0.5	26.6	5.8
1.07087964777436	28.3150613961398	7.08010065004544	0.700000000000003	28.7	7.3
2.08959530994217	28.2468632756301	7.00934218242014	2.3	28.7	7.3
3.89925376795283	27.1123901061212	6.22156846139767	3.7	26.6	6.4
4.47242838684342	26.8450661683242	5.9588207856644	4.5	26.7	5.4
6.41169423670773	26.5131540768844	7.43518437375766	6.7	26.7	7.9
6.33166697888841	25.2278797543326	6.02502874774057	5.8	25.2	5.8
7.58394021502684	23.9334076061073	5.09380764140254	7.5	23.4	5.3
9.07828953975579	23.8938433823687	3.63365565276934	9.5	23.5	3.6
9.00956051393567	24.3165057041838	3.28467116272723	9.40000000000001	24.5	2.9
8.69642712107077	24.4536639449103	3.33277206646534	8.7	24.9	3.7
7.50525687997063	24.186420324801	2.86789981302143	7.3	24.7	2.7
6.57237599822763	23.3760888445646	2.59811210144451	6.7	22.9	2.9
5.39894722396626	23.0678440269115	1.93775641013443	5.5	22.5	1.9
4.6799496024866	23.0492787891519	1.56024523878448	4.3	22.7	1.3
4.9471039625177	24.5155723344447	1.96167871602405	4.7	24.8	2.4
6.07077269656332	25.1263850217136	0.908138788271574	6.5	24.8	0.7
5.92408643761485	26.5257845093819	0.532186191555687	5.40000000000001	26.6	0.3
6.93144565425224	28.3835655257047	0.52726191582408	6.7	28.8	0.2
7.34783165677889	28.5034559125677	0.777580212007547	7.3	28.6	0.6
8.60298580363612	28.8648531233958	1.53214041765388	8.7	29.3	1.9
9.63228901659696	27.6625367127217	1.01171311319761	9.5	27.1	1

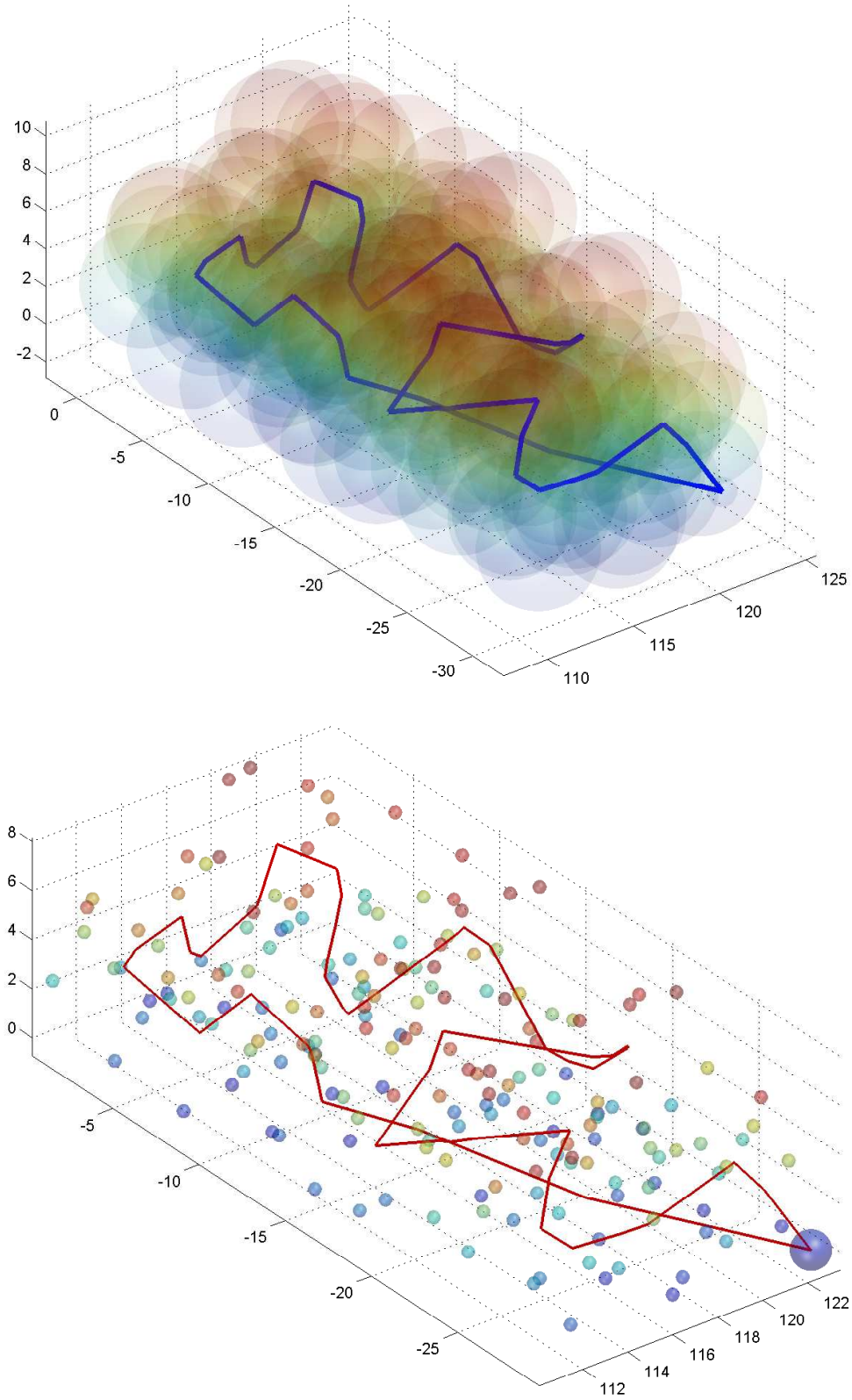


Figure N.74: $rat195$, $r = 2.89$, Equal Radius, 3D, Euclidean, Length = 112.4047408

Table N-77: Solution for $rat195$, $r = 2.89$, Equal Radius, 3D, Euclidean

Total distance: 112.404740757691 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
10.9445739914417	27.2399565488439	0.479608169997479	9.5	27.1	1
10.1589073886379	26.452218021897	0.694266517812645	11.3	24.6	0.1
9.48092725735168	25.7724557652244	0.879501776940576	10.4	25.6	3.6
8.65529781271766	24.9446537471602	1.10508557478586	10.5	22.8	0.7
8.38998919186118	24.678652389817	1.17757177817206	8.7	24.9	3.7
8.15472520779183	24.4427747946539	1.24184652885716	9.40000000000001	24.5	2.9
7.91363475863929	24.2010537627284	1.30771250683779	8.7	23	0.9
7.68265168615437	23.9694672282602	1.37081787308379	6.5	24.8	0.7
7.44093402367444	23.7271155983253	1.43685728567212	6.7	22.9	2.9
7.24279447304707	23.5284545226728	1.49099105951684	7.3	24.7	2.7
7.02733229026947	23.31242325921	1.54985865138741	4.7	24.8	2.4
6.7369426867879	22.3201794310493	1.58987649567015	4.3	22.7	1.3
6.51137215118429	21.5493973052819	1.62096411846386	5.5	22.5	1.9
6.25953072211107	20.6888371227938	1.65567282979106	7.40000000000001	21.2	2.2
5.95687769598075	19.6546556048988	1.69738376628194	8.5	18.8	1.3
5.71075144399586	18.8136511825024	1.73130559836263	5.40000000000001	19.4	0.4
5.43818574318932	17.8822975615064	1.76887341285962	7.59999999999999	17.1	1.9
5.20340429437329	17.0800517935775	1.80123347042989	6.40000000000001	16.8	1.7
4.97519732727852	16.30026695484	1.83268749680705	7.5	15.1	1.1
3.67020360906666	14.2360268152976	2.10630583349894	4.40000000000001	13.1	0.1
3.04385341535588	13.2452700072842	2.2376335412155	2.40000000000001	11.2	0.3
2.91757563944655	13.2776270461297	2.7326057042514	1.7	12.5	1
2.63542993075014	13.3499216122472	3.83854580474479	1.59999999999999	14.7	5.3
2.50676613559004	13.3828909313428	4.34287360123204	4.5	15.4	4.9
2.43376342826019	13.3782257427986	4.55163411464062	2.40000000000001	15.3	3.6
2.35124950181711	13.372952722864	4.78759339746837	0.700000000000003	15.2	6.3
2.35124951935308	13.3729526828393	4.78759341913457	3.5	15.1	6.8
2.40742959338588	12.8729178552013	4.81053685851687	2.7	13.4	6.1
2.46707174284357	12.3420675807487	4.83489414671587	0.599999999999994	12.7	5.3
2.46707174284357	12.3420675807487	4.83489414671587	3.5	12.6	3.2
2.53737133840313	11.7163573045552	4.863603911271	1.5	11.1	3.9
2.60012507190395	11.1578103423741	4.88923195762118	0.700000000000003	11.4	6.7
2.69272580631521	10.3335984513118	4.92705027568842	3.59999999999999	10.8	4.8
2.79146569658738	9.4547415783229	4.96737567591214	3.7	8.4	7.5
2.71270823547236	9.13012592487289	4.61994770097959	1.3	9.5	6.3
2.58879525177861	8.61939431983805	4.0733273505051	0.599999999999994	7.5	5.5
2.47596988944306	8.1543602920378	3.57561337202623	1.5	7.5	4.4
2.36506372873059	7.69723665849483	3.08636506556349	2.5	9.4	1.9
2.2434049655032	7.19579329563711	2.5496845233207	3.59999999999999	7.3	0
2.24340494018713	7.1957932600577	2.5496845160114	0.599999999999994	8.4	0.5
2.14078380871783	6.45610731963987	2.77539036404755	3.59999999999999	5.4	1.9
2.14078380871783	6.45610731963987	2.77539036404755	2.7	7.3	2.8
2.03608273888116	5.70143239242969	3.00567009666062	2.59999999999999	5	2.8
1.94160235001127	5.02042849308697	3.21347064576803	0.299999999999997	4.8	1
1.72597372160134	3.46617221951333	3.6877328427452	0.299999999999997	1.2	2.6
1.88881855835743	3.5095604353839	3.92551707080638	1.7	1.2	4.1
2.06743799582219	3.55715126762776	4.18633474862444	2.3	0.9	5.1
2.06743799582219	3.55715126762776	4.18633474862444	1.5	3.2	3.6
2.15965911455672	3.58172215707195	4.32099646066046	0.299999999999997	3.2	6.5
2.89195308598531	3.76105257458452	4.71167361900453	1.5	4.6	5.8
3.88952074777991	4.00533939801753	5.24387438095293	4.8	5	7.8
4.03874942603302	3.88796047815507	4.91052753573843	4.2	3.4	5.8
4.20031832252215	3.76087459332227	4.54961611701375	5.3	2.5	6.5
4.48649292209822	3.53577603909727	3.91036655934825	3.3	3.4	4
4.80284835878324	3.28693716197331	3.20370323764762	3.40000000000001	1.1	2
4.82143855400706	3.2723130876188	3.16216784571806	5.40000000000001	4.6	2.8
4.84019881704513	3.25755494701303	3.12025243630448	2.59999999999999	3.4	1.3
5.5574543388876	2.94176201338186	2.56462763229834	6.40000000000001	5.4	1.3
5.87081954034356	2.61916146099951	2.36181182130101	4.7	1.1	0.2
6.10399511941618	2.56058019468153	2.40535970588008	5.40000000000001	1.2	0.3
6.42319587947168	2.48038627886623	2.46497308051771	6.59999999999999	1.6	1.4
6.73603923772815	2.40178974307622	2.52339941337375	6.40000000000001	3.2	0.3
7.14903714046835	2.29803110315899	2.60053013427896	7.40000000000001	3.2	3.2
7.55785179957978	2.19532317516234	2.67687938220917	7.5	4.4	2.9
8.03571199432305	2.07526798465877	2.76612254050981	8.5	3.4	4.2
8.47585501950807	1.96468882670425	2.84832205603503	9.5	2.8	2.3
8.87517753827035	1.864366153021	2.92289920566847	10.7	0.9	0.9
9.03297756958159	1.94805850985155	3.52859206779356	10.4	2.5	2.2
9.24494764122576	2.06048101686252	4.34220074018151	7.5	0.7	4.6
9.51433913675906	2.20335756192639	5.37619047574964	8.59999999999999	0.6	7.6
9.51433915409763	2.20335757985244	5.37619049657485	9.40000000000001	0.8	7.9
9.656654101566	2.45790415421936	5.3171754933293	11.5	1.4	6.7
9.8143455584776	2.73995139492183	5.25178507637192	12.3	1.5	6
10.0899567420833	3.23290913427208	5.1374983207393	11.3	3.1	6.2
10.3527018956466	3.70285473495034	5.02854658023303	8.8	4.9	6.7
10.6266842752236	4.19289663394944	4.91493578038932	12.7	4.9	6.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.6043014670927	4.3056179268799	4.78451091170874	12.5	3.4	2.8
10.4005846598614	4.68277682026712	4.57578149645348	11.5	4.7	3.2
10.2044886111308	5.04582678948403	4.37486040675183	12.5	6.8	4.3
9.98897406770504	5.24119857847113	4.23635099362102	10.7	6.5	4.1
9.78139827633416	5.42937297091102	4.10294384339189	11.7	6.5	2.6
9.57979862743676	5.61212923536559	3.97337745279481	10.3	5.4	1.9
9.38912777273444	5.78497817026508	3.85083505198705	9.8	5	1.1
8.9266534293875	6.23195804061407	3.7562440615731	9.40000000000001	7.4	2
8.56905534436801	6.57757216575446	3.6831040544423	8.5	6.5	2.8
8.21996958714372	6.91495902324695	3.61170514104437	8.3	8.9	1.9
8.06104582318011	7.06855493836809	3.57920046329231	7.40000000000001	6.7	6.3
7.83507075333364	7.28695529297319	3.53298327389357	6.59999999999999	6.8	6.1
7.30866028409294	7.85029804383014	3.33376743523638	4.7	6.8	4
7.2163980915944	8.40376679580064	3.10314927231731	5.40000000000001	7.2	1.4
7.07586985221693	9.24667877410659	2.75192945903158	4.7	8.7	1.2
7.08190013828587	9.30227172109055	2.7397966371771	5.3	9.5	2
7.0878312024569	9.35694945847761	2.72786351946553	9.40000000000001	9.5	1
7.05094302860795	9.469766777603	2.73953666788378	6.3	8.6	0.9
7.0115584994096	9.59022032074403	2.7519999731605	5.59999999999999	10.5	0.4
7.01441535160667	9.62991059950921	2.7908826652599	7.3	11.2	0.4
7.04214629580548	10.0150158819043	3.16807661212945	7.7	9.3	3.2
7.07206624515293	10.4305204384373	3.57504531022887	4.3	11.2	3.3
7.19993438747758	10.8754490502277	4.04569839632612	6.40000000000001	11.2	5.2
7.30606608404439	11.2447480087325	4.43634881287213	6.3	12.4	6.5
7.3448620398427	11.3797481289595	4.57915425927586	5.40000000000001	13.2	5.7
7.9576715031712	11.3511577415604	4.7513844569569	7.7	12.7	4.4
8.63921245376379	11.319360492424	4.94293137359101	8.2	13.4	6.9
8.98268509346197	11.3009899859593	5.03709699520869	8.59999999999999	10.7	4.5
9.3433428056823	11.2817000661098	5.1359735454141	9.8	10.8	3.4
9.70483848873519	11.2623651228859	5.23507952120673	10.3	9.2	3.3
10.1960792420466	11.2789375926714	5.41403150944201	11.5	9.5	4.3
10.5483790883981	11.2908221170702	5.54236902139193	11.7	11.5	2.9
10.7140524201199	11.2950096493363	5.6279039786869	12.6	10.9	4
10.7140524201199	11.2950096493363	5.6279039786869	10.3	12.6	5.4
10.8499800186147	11.2984450761515	5.69808130421624	12.3	9.3	7.2
10.9128552109877	11.5722118329141	5.62979500721817	10.4	11.3	7
10.9832811183386	11.8788559524412	5.55330804327413	9.59999999999999	12.8	7.5
11.0519627381729	12.1779062926805	5.47871543380556	11.6	13	7.6
11.1140506885649	12.4482465857278	5.4112841071303	12.6	13.4	7.7
11.0741129941372	13.6710501756107	4.4669104866428	10.4	15.1	4.9
11.0461475576859	14.5271695463183	3.80572299642623	11.7	15.3	3.7
11.0223970574297	15.2542175952666	3.24421663871758	11.4	16.9	4.3
11.0037481036591	15.8250491637234	2.80335530553043	12.7	14.8	0.7
10.9986991484102	15.8476076367344	2.79343734981579	8.7	15.4	1.1
11.0832843694293	16.2604932337106	2.75146188833269	9.3	15.6	1.2
11.2124906528896	16.8912193335818	2.68734284655542	12.5	16.9	0.1
11.2255864685374	17.2203644903136	2.76318428569855	10.6	16.8	0
11.2255864685374	17.2203644903136	2.76318428569855	10.6	19.2	0.8
11.2381604066838	17.5364240057086	2.83600604695109	8.7	17.3	3.1
11.252545535888	17.8980160528712	2.91931898733782	9.5	17.4	3.2
11.252545535888	17.8980160528712	2.91931898733782	9.3	18.5	2.6
11.2671687925647	18.265593011486	3.00401107904576	12.5	19.5	0.7
11.1624045123595	18.7122367587524	3.37486726846661	11.3	19.3	1.9
11.0436330085892	19.2186019178194	3.79530947611151	12.7	20.9	2.2
10.8704172641362	19.9570726227445	4.40847470111938	9.40000000000001	20.9	2.9
10.6972871582665	20.6951779181241	5.02133638215619	11.5	20.6	7
10.5893062551091	21.1555354877668	5.40357874279432	12.7	23	4.7
10.4714940394706	21.2810645263751	5.58546549729702	11.7	22.5	7.9
9.7912495637699	21.2817148926746	5.4293401365913	9.5	23.5	3.6
9.12227055417971	21.0156551460116	5.48771869873115	7.5	23.4	5.3
8.88780611522597	20.7721694792624	5.52450973503812	10.4	21.5	7.4
8.39363735682562	20.2589918813381	5.60205222878956	8.40000000000001	21.2	7.3
7.81845017217164	19.6616813228638	5.6923072597514	6.40000000000001	21.3	7.2
7.2341148233714	19.0548689494361	5.78399736563323	7.7	19.2	6.3
6.62156557855434	18.4187578263128	5.8801144302292	6.59999999999999	19.2	7.9
5.92565636694981	17.6960812323047	5.98931067423	5.3	17.4	7.6
5.41342999271535	17.1641509633859	6.06968578501775	5.5	14.6	7.4
5.31599509975769	17.2260128272169	6.00241593822361	4.40000000000001	16.9	6.4
5.21707538800438	17.2888173831541	5.93412098107403	6.3	15.5	7.6
4.70887139106043	17.6114749102702	5.58325847881371	4.40000000000001	18.9	6.5
4.25344471626978	17.900624766136	5.26883251353342	4.3	20.6	6.3
4.02887746450493	17.9044807134303	5.0630055211395	3.5	17.5	6.6
3.78481098783938	17.9086716730451	4.8393067625109	2.5	16.5	6.9
2.62927872105989	17.9285334307964	3.78021645734277	1.59999999999999	17.2	3.9
1.80539486078864	17.9426909406987	3.02509516534615	0.299999999999997	16.4	1.1
1.85039803332654	18.2659970216106	3.17901844412175	0.299999999999997	19	1.4
1.90718670619393	18.6739724271599	3.37325135816414	1.59999999999999	18.8	1.3
1.9894908600517	19.2652510423812	3.65475243627847	3.7	18.6	2.9
2.10455140254552	20.0918485919165	4.04828530870052	2.5	19.5	4.2
2.10455140254552	20.0918485919165	4.04828530870052	1.5	21.3	4.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
2.19760230540108	20.7603298572753	4.36654174076603	1.3	22.7	4.8
2.24704756115267	21.1155486199632	4.53565804959566	0.5	20.7	6.8
2.38493284995994	21.5721120851664	4.64467577619431	0.599999999999994	22.9	2.8
2.54021629707913	21.8783462839665	4.7799015862181	2.40000000000001	20.9	6.2
2.70877385564603	22.2107599975491	4.92668749804448	3.3	21.4	7.2
2.85660376014859	22.5022966843376	5.05542349942291	5.3	21.1	5.7
3.19662668648262	23.3137032064914	5.3851085665646	3.40000000000001	22.5	7.6
3.51786675853268	24.0802880515084	5.69658214691664	2.59999999999999	23.5	7.4
3.89162645544843	24.9722060178042	6.05897939823015	3.3	24.6	6.9
4.3056948467995	25.960317897418	6.46046055709149	6.7	26.7	7.9
4.08073831914885	26.104685915109	6.36312973714512	5.8	25.2	5.8
3.77851798317647	26.2986393139881	6.23236964354988	4.5	26.7	5.4
3.46096173305443	26.502434577283	6.09497434889348	3.7	26.6	6.4
3.12746606897376	26.7164590675899	5.95068265544208	2.59999999999999	25.5	6.5
2.77843969913869	26.9404509545876	5.79967130751656	2.3	28.7	7.3
2.49668296980482	27.1212709381539	5.67776529460251	0.700000000000003	28.7	7.3
2.44255596172735	27.031117871851	4.95031948404775	0.5	26.6	5.8
2.37484250264161	26.9183231122581	4.04017315622809	1.5	24.6	3.5
2.33688100965773	26.8550971999581	3.53001612808945	0.599999999999994	24.9	2.3
2.59703388893971	27.1302909512361	3.2977515258646	2.40000000000001	26.7	1.4
2.84816144119883	27.3959360520664	3.07354457975339	1.59999999999999	27.4	1.8
3.11087669506566	27.6738379223004	2.838992114864	1.7	29.4	1
3.72119390061749	27.7485661555475	2.84370055754563	3.3	28.4	2.5
4.39704702041863	27.8313193338343	2.84891563666765	4.3	28.8	2.1
5.0921634870877	27.9164313915612	2.85427977821495	5.40000000000001	26.6	0.3
6.1407486400324	28.0883871497747	2.94462119101198	6.7	28.8	0.2
6.5661968654765	28.1286617483894	3.11413927759361	7.3	28.6	0.6
7.07807900116693	28.1771182615864	3.31809596078496	5.3	29.5	4.1
7.07807900116693	28.1771182615864	3.31809596078496	7.40000000000001	26.5	3.3
8.12903054406709	28.2766036425794	3.73683928012815	8.7	29.3	1.9
9.24075343408245	28.3818417310886	4.17979558195471	10.6	26.4	2.7
9.4503745706546	28.4016849000016	4.26331661840935	9.40000000000001	28.4	4.3
9.4503745706546	28.4016849000016	4.26331661840935	11.6	27.1	4.6
9.58092713399748	28.4140427282103	4.3153336588354	8.7	26.4	4.3
9.72321986593263	28.4275116887023	4.37202845218811	10.4	29.1	7.1
10.5014939222195	28.2067850008978	3.4926265443024	11.4	29.4	4.3
11.4258133362028	27.9446363950181	2.44820145899954	12.5	25.3	2.9
12.0935905707385	28.4977295469712	1.16514786145181	12.7	27.3	0.2

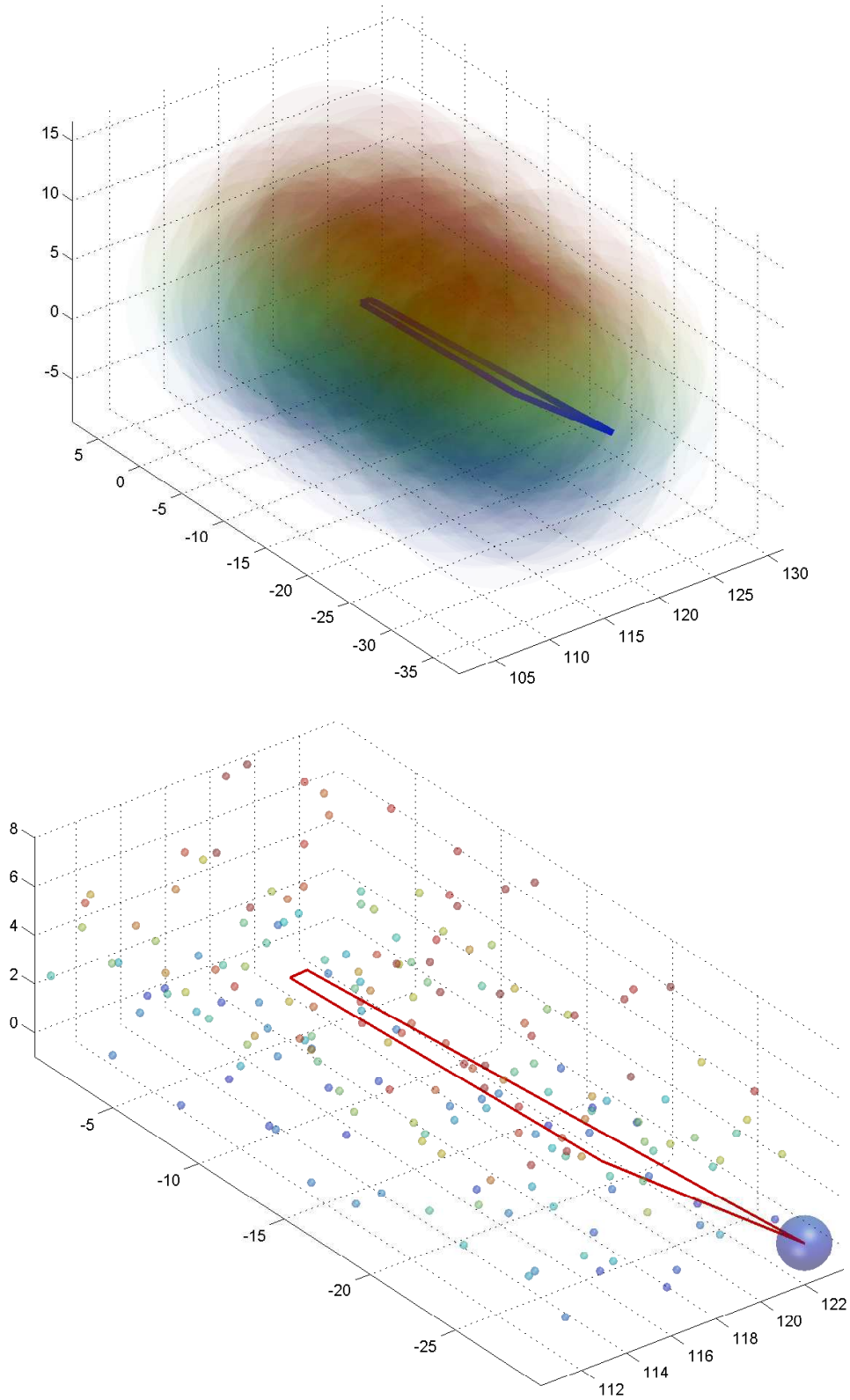


Figure N.75: $rat195$, $r = 8.67$, Equal Radius, 3D, Euclidean, Length = 47.8893374

Table N-78: Solution for $rat195$, $r = 8.67$, Equal Radius, 3D, Euclidean

Total distance: 47.8893373681168 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
11.889754836679	26.088562354437	0.484480648179042	12.7	27.3	0.2
11.0686258086841	23.1377181712984	0.97555369134319	6.7	28.8	0.2
11.0686258086841	23.1377181712984	0.97555369134319	12.5	19.5	0.7
9.78046918899849	18.5083559425445	1.74600032376858	12.5	16.9	0.1
8.70323759664845	14.637038195031	2.39031561135886	10.6	16.8	0
7.29038999502153	9.55959189492845	3.23533004314398	11.4	16.9	4.3
7.29038999502153	9.55959189492845	3.23533004314398	9.3	15.6	1.2
7.29038999502153	9.55959189492845	3.23533004314398	12.7	14.8	0.7
7.29038999502153	9.55959189492845	3.23533004314398	8.7	15.4	1.1
7.29038999502153	9.55959189492845	3.23533004314398	11.7	15.3	3.7
7.29038999502153	9.55959189492845	3.23533004314398	7.5	15.1	1.1
7.29038999502153	9.55959189492845	3.23533004314398	10.4	15.1	4.9
7.29038999502153	9.55959189492845	3.23533004314398	12.6	13.4	7.7
7.29038999502153	9.55959189492845	3.23533004314398	10.3	12.6	5.4
7.29038999502153	9.55959189492845	3.23533004314398	2.40000000000001	15.3	3.6
7.29038999502153	9.55959189492845	3.23533004314398	7.7	12.7	4.4
7.29038999502153	9.55959189492845	3.23533004314398	8.2	13.4	6.9
7.29038999502153	9.55959189492845	3.23533004314398	5.5	14.6	7.4
7.29038999502153	9.55959189492845	3.23533004314398	11.6	13	7.6
7.29038999502153	9.55959189492845	3.23533004314398	11.7	11.5	2.9
7.29038999502153	9.55959189492845	3.23533004314398	4.40000000000001	13.1	0.1
7.29038999502153	9.55959189492845	3.23533004314398	3.5	15.1	6.8
7.29038999502153	9.55959189492845	3.23533004314398	9.59999999999999	12.8	7.5
7.29038999502153	9.55959189492845	3.23533004314398	5.40000000000001	13.2	5.7
7.29038999502153	9.55959189492845	3.23533004314398	12.6	10.9	4
7.29038999502153	9.55959189492845	3.23533004314398	7.3	11.2	0.4
7.29038999502153	9.55959189492845	3.23533004314398	9.8	10.8	3.4
7.29038999502153	9.55959189492845	3.23533004314398	1.59999999999999	14.7	5.3
7.29038999502153	9.55959189492845	3.23533004314398	6.3	12.4	6.5
7.29038999502153	9.55959189492845	3.23533004314398	3.5	12.6	3.2
7.29038999502153	9.55959189492845	3.23533004314398	10.4	11.3	7
7.29038999502153	9.55959189492845	3.23533004314398	8.59999999999999	10.7	4.5
7.29038999502153	9.55959189492845	3.23533004314398	2.7	13.4	6.1
7.29038999502153	9.55959189492845	3.23533004314398	6.40000000000001	11.2	5.2
7.29038999502153	9.55959189492845	3.23533004314398	9.40000000000001	9.5	1
7.29038999502153	9.55959189492845	3.23533004314398	5.59999999999999	10.5	0.4
7.29038999502153	9.55959189492845	3.23533004314398	1.7	12.5	1
7.29038999502153	9.55959189492845	3.23533004314398	4.3	11.2	3.3
7.29038999502153	9.55959189492845	3.23533004314398	11.5	9.5	4.3
7.29038999502153	9.55959189492845	3.23533004314398	10.3	9.2	3.3
7.29038999502153	9.55959189492845	3.23533004314398	2.40000000000001	11.2	0.3
7.29038999502153	9.55959189492845	3.23533004314398	7.7	9.3	3.2
7.29038999502153	9.55959189492845	3.23533004314398	8.3	8.9	1.9
7.29038999502153	9.55959189492845	3.23533004314398	3.59999999999999	10.8	4.8
7.29038999502153	9.55959189492845	3.23533004314398	5.3	9.5	2
7.29038999502153	9.55959189492845	3.23533004314398	12.3	9.3	7.2
7.29038999502153	9.55959189492845	3.23533004314398	0.599999999999994	12.7	5.3
7.29038999502153	9.55959189492845	3.23533004314398	6.3	8.6	0.9
7.29038999502153	9.55959189492845	3.23533004314398	1.5	11.1	3.9
7.29038999502153	9.55959189492845	3.23533004314398	4.7	8.7	1.2
7.29038999502153	9.55959189492845	3.23533004314398	9.40000000000001	7.4	2
7.29038999502153	9.55959189492845	3.23533004314398	2.5	9.4	1.9
7.29038999502153	9.55959189492845	3.23533004314398	0.700000000000003	11.4	6.7
7.29038999502153	9.55959189492845	3.23533004314398	12.5	6.8	4.3
7.29038999502153	9.55959189492845	3.23533004314398	11.7	6.5	2.6
7.29038999502153	9.55959189492845	3.23533004314398	10.7	6.5	4.1
7.29038999502153	9.55959189492845	3.23533004314398	5.40000000000001	7.2	1.4
7.29038999502153	9.55959189492845	3.23533004314398	8.5	6.5	2.8
7.29038999502153	9.55959189492845	3.23533004314398	1.3	9.5	6.3
7.29038999502153	9.55959189492845	3.23533004314398	3.59999999999999	7.3	0
7.29038999502153	9.55959189492845	3.23533004314398	3.7	8.4	7.5
7.29038999502153	9.55959189492845	3.23533004314398	7.40000000000001	6.7	6.3
7.29038999502153	9.55959189492845	3.23533004314398	10.3	5.4	1.9
7.29038999502153	9.55959189492845	3.23533004314398	6.59999999999999	6.8	6.1
7.29038999502153	9.55959189492845	3.23533004314398	0.599999999999994	8.4	0.5
7.29038999502153	9.55959189492845	3.23533004314398	4.7	6.8	4
7.29038999502153	9.55959189492845	3.23533004314398	2.7	7.3	2.8
7.29038999502153	9.55959189492845	3.23533004314398	9.8	5	1.1
7.29038999502153	9.55959189492845	3.23533004314398	6.40000000000001	5.4	1.3
7.29038999502153	9.55959189492845	3.23533004314398	11.5	4.7	3.2
7.29038999502153	9.55959189492845	3.23533004314398	1.5	7.5	4.4
7.29038999502153	9.55959189492845	3.23533004314398	12.7	4.9	6.8
7.29038999502153	9.55959189492845	3.23533004314398	0.599999999999994	7.5	5.5
7.29038999502153	9.55959189492845	3.23533004314398	7.5	4.4	2.9
7.29038999502153	9.55959189492845	3.23533004314398	8.8	4.9	6.7
7.29038999502153	9.55959189492845	3.23533004314398	3.59999999999999	5.4	1.9

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.29038999502153	9.55959189492845	3.23533004314398	5.40000000000001	4.6	2.8
7.29038999502153	9.55959189492845	3.23533004314398	12.5	3.4	2.8
7.29038999502153	9.55959189492845	3.23533004314398	2.59999999999999	5	2.8
7.29038999502153	9.55959189492845	3.23533004314398	8.5	3.4	4.2
7.29038999502153	9.55959189492845	3.23533004314398	4.8	5	7.8
7.29038999502153	9.55959189492845	3.23533004314398	9.5	2.8	2.3
7.29038999502153	9.55959189492845	3.23533004314398	7.40000000000001	3.2	3.2
7.29038999502153	9.55959189492845	3.23533004314398	6.40000000000001	3.2	0.3
7.29038999502153	9.55959189492845	3.23533004314398	11.3	3.1	6.2
7.29038999502153	9.55959189492845	3.23533004314398	10.4	2.5	2.2
7.29038999502153	9.55959189492845	3.23533004314398	3.3	3.4	4
7.29038999502153	9.55959189492845	3.23533004314398	4.2	3.4	5.8
7.29038999502153	9.55959189492845	3.23533004314398	5.3	2.5	6.5
6.78355395297334	7.73812353960804	3.53855066776453	1.5	3.2	3.6
6.78355395297334	7.73812353960804	3.53855066776453	11.5	1.4	6.7
6.78355395297334	7.73812353960804	3.53855066776453	7.5	0.7	4.6
6.78355395297334	7.73812353960804	3.53855066776453	9.40000000000001	0.8	7.9
6.78355395297334	7.73812353960804	3.53855066776453	8.59999999999999	0.6	7.6
6.78355395297334	7.73812353960804	3.53855066776453	2.3	0.9	5.1
6.77714904925082	7.71507697338873	3.54239048801236	12.3	1.5	6
6.43456594540763	7.66207260089868	3.48688796231468	6.59999999999999	1.6	1.4
6.08145522182402	7.60744130309972	3.42968373151548	10.7	0.9	0.9
6.08145522182402	7.60744130309972	3.42968373151548	5.40000000000001	1.2	0.3
6.08145522182402	7.60744130309972	3.42968373151548	4.7	1.1	0.2
6.08145522182402	7.60744130309972	3.42968373151548	3.40000000000001	1.1	2
6.08145522182402	7.60744130309972	3.42968373151548	1.7	1.2	4.1
6.08145522182402	7.60744130309972	3.42968373151548	0.299999999999997	1.2	2.6
6.10088527257611	7.92500949894909	3.4267732718154	2.59999999999999	3.4	1.3
6.12079363728465	8.25062835326895	3.42379678000161	0.299999999999997	4.8	1
6.14301433279913	8.61413481316987	3.42048395567347	0.299999999999997	3.2	6.5
6.2331331453242	10.0864432481325	3.4069859498944	1.5	4.6	5.8
6.468135886781	13.927071562914	3.37185523785013	0.700000000000003	15.2	6.3
6.68125150834751	17.4088909971951	3.33995570104686	0.299999999999997	16.4	1.1
7.00301889876229	22.6662464081121	3.29182840369634	9.5	27.1	1
7.00301889876229	22.6662464081121	3.29182840369634	10.6	26.4	2.7
7.00301889876229	22.6662464081121	3.29182840369634	8.7	29.3	1.9
7.00301889876229	22.6662464081121	3.29182840369634	11.3	24.6	0.1
7.00301889876229	22.6662464081121	3.29182840369634	12.5	25.3	2.9
7.00301889876229	22.6662464081121	3.29182840369634	11.6	27.1	4.6
7.00301889876229	22.6662464081121	3.29182840369634	7.3	28.6	0.6
7.00301889876229	22.6662464081121	3.29182840369634	9.40000000000001	28.4	4.3
7.00301889876229	22.6662464081121	3.29182840369634	10.4	25.6	3.6
7.00301889876229	22.6662464081121	3.29182840369634	9.40000000000001	24.5	2.9
7.00301889876229	22.6662464081121	3.29182840369634	8.7	26.4	4.3
7.00301889876229	22.6662464081121	3.29182840369634	10.5	22.8	0.7
7.00301889876229	22.6662464081121	3.29182840369634	7.40000000000001	26.5	3.3
7.00301889876229	22.6662464081121	3.29182840369634	8.7	24.9	3.7
7.00301889876229	22.6662464081121	3.29182840369634	8.7	23	0.9
7.00301889876229	22.6662464081121	3.29182840369634	9.5	23.5	3.6
7.00301889876229	22.6662464081121	3.29182840369634	7.3	24.7	2.7
7.00301889876229	22.6662464081121	3.29182840369634	10.4	29.1	7.1
7.00301889876229	22.6662464081121	3.29182840369634	6.5	24.8	0.7
7.00301889876229	22.6662464081121	3.29182840369634	12.7	23	4.7
7.00301889876229	22.6662464081121	3.29182840369634	5.40000000000001	26.6	0.3
7.00301889876229	22.6662464081121	3.29182840369634	12.7	20.9	2.2
7.00301889876229	22.6662464081121	3.29182840369634	5.3	29.5	4.1
7.00301889876229	22.6662464081121	3.29182840369634	4.3	28.8	2.1
7.00301889876229	22.6662464081121	3.29182840369634	6.7	22.9	2.9
7.00301889876229	22.6662464081121	3.29182840369634	9.40000000000001	20.9	2.9
7.00301889876229	22.6662464081121	3.29182840369634	7.5	23.4	5.3
7.00301889876229	22.6662464081121	3.29182840369634	4.7	24.8	2.4
7.00301889876229	22.6662464081121	3.29182840369634	7.40000000000001	21.2	2.2
7.00301889876229	22.6662464081121	3.29182840369634	3.3	28.4	2.5
7.00301889876229	22.6662464081121	3.29182840369634	5.8	25.2	5.8
7.00301889876229	22.6662464081121	3.29182840369634	5.5	22.5	1.9
7.00301889876229	22.6662464081121	3.29182840369634	11.3	19.3	1.9
7.00301889876229	22.6662464081121	3.29182840369634	10.6	19.2	0.8
7.00301889876229	22.6662464081121	3.29182840369634	4.5	26.7	5.4
7.00301889876229	22.6662464081121	3.29182840369634	6.7	26.7	7.9
7.00301889876229	22.6662464081121	3.29182840369634	11.7	22.5	7.9
7.00301889876229	22.6662464081121	3.29182840369634	4.3	22.7	1.3
7.00301889876229	22.6662464081121	3.29182840369634	2.40000000000001	26.7	1.4
7.00301889876229	22.6662464081121	3.29182840369634	10.4	21.5	7.4
7.00301889876229	22.6662464081121	3.29182840369634	11.5	20.6	7
7.00301889876229	22.6662464081121	3.29182840369634	8.5	18.8	1.3
7.00301889876229	22.6662464081121	3.29182840369634	3.7	26.6	6.4
7.00301889876229	22.6662464081121	3.29182840369634	9.3	18.5	2.6
7.00301889876229	22.6662464081121	3.29182840369634	1.59999999999999	27.4	1.8
7.00301889876229	22.6662464081121	3.29182840369634	8.40000000000001	21.2	7.3
7.00301889876229	22.6662464081121	3.29182840369634	5.40000000000001	19.4	0.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.00301889876229	22.6662464081121	3.29182840369634	5.3	21.1	5.7
7.00301889876229	22.6662464081121	3.29182840369634	6.40000000000001	21.3	7.2
7.00301889876229	22.6662464081121	3.29182840369634	9.5	17.4	3.2
7.00301889876229	22.6662464081121	3.29182840369634	3.3	24.6	6.9
7.00301889876229	22.6662464081121	3.29182840369634	2.59999999999999	25.5	6.5
7.00301889876229	22.6662464081121	3.29182840369634	1.5	24.6	3.5
7.00301889876229	22.6662464081121	3.29182840369634	7.7	19.2	6.3
7.00301889876229	22.6662464081121	3.29182840369634	2.3	28.7	7.3
7.00301889876229	22.6662464081121	3.29182840369634	8.7	17.3	3.1
7.00301889876229	22.6662464081121	3.29182840369634	0.599999999999994	24.9	2.3
7.00301889876229	22.6662464081121	3.29182840369634	7.59999999999999	17.1	1.9
7.00301889876229	22.6662464081121	3.29182840369634	4.3	20.6	6.3
7.00301889876229	22.6662464081121	3.29182840369634	3.40000000000001	22.5	7.6
7.00301889876229	22.6662464081121	3.29182840369634	2.59999999999999	23.5	7.4
7.00301889876229	22.6662464081121	3.29182840369634	0.5	26.6	5.8
7.00301889876229	22.6662464081121	3.29182840369634	6.40000000000001	16.8	1.7
7.00301889876229	22.6662464081121	3.29182840369634	0.599999999999994	22.9	2.8
7.00301889876229	22.6662464081121	3.29182840369634	1.3	22.7	4.8
7.00301889876229	22.6662464081121	3.29182840369634	6.59999999999999	19.2	7.9
7.00301889876229	22.6662464081121	3.29182840369634	3.7	18.6	2.9
7.00301889876229	22.6662464081121	3.29182840369634	3.3	21.4	7.2
7.00301889876229	22.6662464081121	3.29182840369634	1.5	21.3	4.6
7.00301889876229	22.6662464081121	3.29182840369634	2.40000000000001	20.9	6.2
7.00301889876229	22.6662464081121	3.29182840369634	2.5	19.5	4.2
7.00301889876229	22.6662464081121	3.29182840369634	4.40000000000001	18.9	6.5
7.00301889876229	22.6662464081121	3.29182840369634	1.59999999999999	18.8	1.3
7.00301889876229	22.6662464081121	3.29182840369634	5.3	17.4	7.6
7.00301889876229	22.6662464081121	3.29182840369634	0.299999999999997	19	1.4
7.00301889876229	22.6662464081121	3.29182840369634	4.40000000000001	16.9	6.4
7.00301889876229	22.6662464081121	3.29182840369634	3.5	17.5	6.6
7.00301889876229	22.6662464081121	3.29182840369634	0.5	20.7	6.8
7.00301889876229	22.6662464081121	3.29182840369634	4.5	15.4	4.9
7.00301889876229	22.6662464081121	3.29182840369634	1.59999999999999	17.2	3.9
7.00301889876229	22.6662464081121	3.29182840369634	6.3	15.5	7.6
7.00301889876229	22.6662464081121	3.29182840369634	2.5	16.5	6.9
7.11372011089274	24.4768976829083	3.27526252876034	0.700000000000003	28.7	7.3
8.42877619187838	25.5416200227528	2.50419964369996	1.7	29.4	1
10.6038458612194	27.3026841336289	1.22894479107392	11.4	29.4	4.3

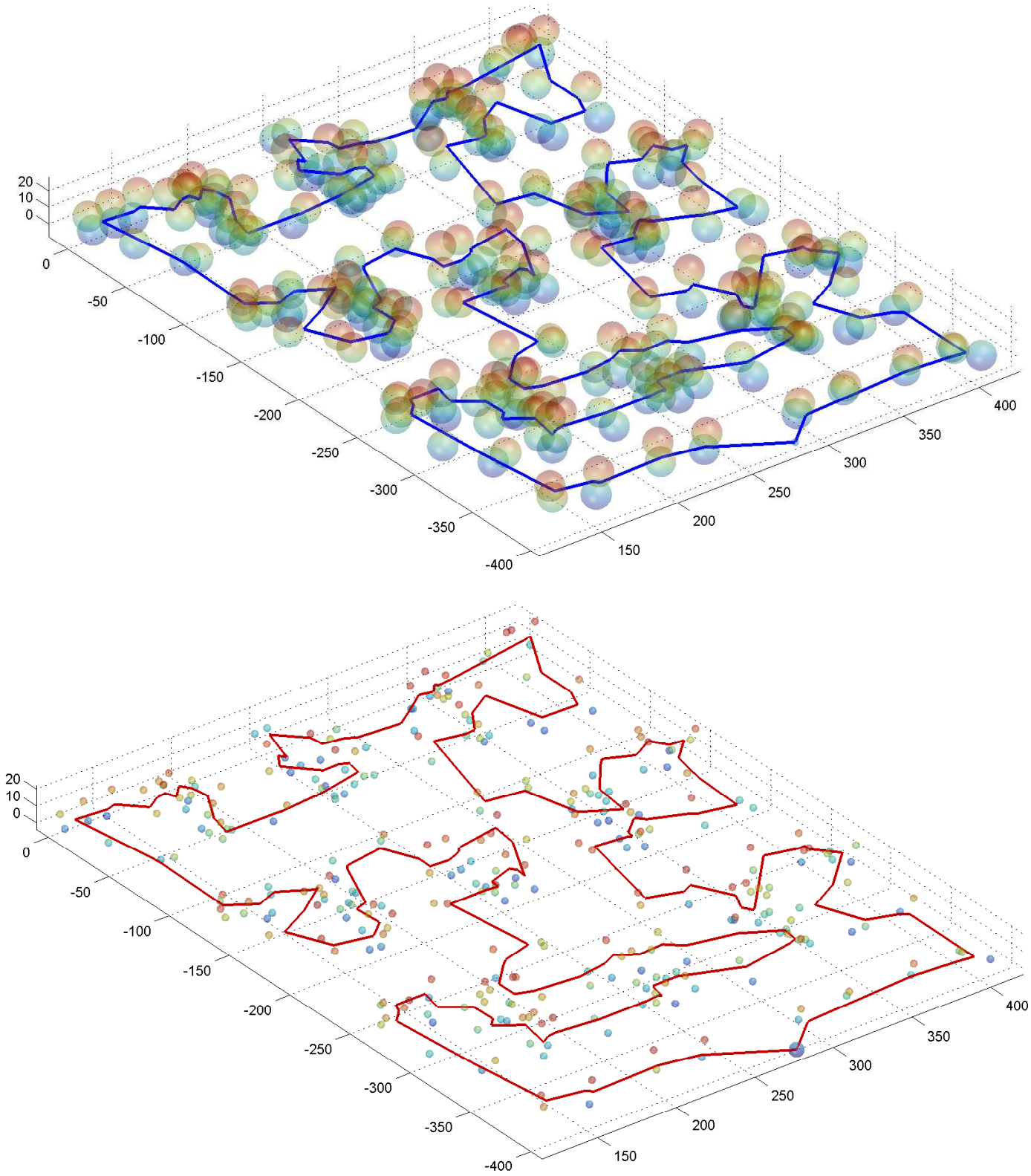


Figure N.76: $lin318$, $r = 8.268$, Equal Radius, 3D, Euclidean, Length = 3044.2699927

Table N-79: Solution for *lin*318, $r = 8.268$, Equal Radius, 3D, Euclidean

Total distance: 3044.2699927169 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
122.753373702826	394.229833546455	8.40283440176766	122.8	387.5	3.6
118.318603219337	393.781524498574	9.64822028198275	119.7	393.8	17.8
91.8094753352166	391.184375357685	11.303994849802	92.1	387.5	18.7
86.2253771709551	390.958831270765	11.0107262395454	89	393.8	11
52.7140977752121	389.605599041148	9.25074404341592	51.2	387.5	1.4
46.2067301750923	390.201904943827	12.1751757221171	48	393.8	19.4
23.3029888224844	388.187743039905	13.6906247681249	17.3	393.8	14.6
23.2290724279518	384.791191116308	13.412707785277	20.5	387.5	17.4
22.2592007916967	340.219149541369	9.7657389197009	28.3	339.4	12.9
22.0279240275261	329.588824945154	8.89596001616618	27.6	329.2	2.8
18.0709338791947	302.847722530596	10.3761032419849	14.2	303.2	5.3
14.0947289105241	275.976201415445	11.8635407615473	6.3	273.3	11.2
15.2586236403173	274.834933438068	12.0729010688645	9.40000000000001	273.3	14
18.0527405859949	272.09500757654	12.5754811418494	21.3	273.1	15.8
20.0234602662817	270.162551634687	12.9299639549913	24.4	273.1	19.3
22.9574634496147	264.808123544242	11.5443234675884	17.3	260.7	14.5
24.9425446041038	261.185440060113	10.6067778867043	20.5	254.4	9
44.269554139059	260.297720933954	10.0323630500372	48	260.7	17.4
46.7421106117694	259.95025427142	6.90500364862247	51.2	254.4	2.7
44.142461714697	270.805723990665	7.13749441025864	39.4	273.1	0.8
44.1373758376996	270.8270149689	7.13793337947511	36.2	273.1	6.7
52.7355315396356	279.369504483948	8.02979616310781	52.8	281.9	9
57.2763343152736	283.880880119463	8.50062166267065	63.8	280.4	12.2
58.498098356096	288.687401427195	7.53684774943548	60.6	288.2	12.5
60.312631245915	295.826039688992	6.10550360096964	67.7	297.7	2.9
58.657783718167	297.631998676403	6.60894655831089	63.8	297.6	5.2
53.1534820806452	303.639819323354	8.28364872671749	44.9	303.2	8.5
61.0495309163732	314.181097220988	10.5350155831502	63.8	315.8	14.7
62.8327268140237	316.56164811429	11.0434162440762	67.7	315.8	13.4
63.9253343837837	318.020270634443	11.3549207057776	70.9	315.8	15.2
63.6864909841201	327.500204846765	9.70897506509599	58.3	329.2	7.6
63.5956026275739	331.10372158221	9.08330048532611	67.7	331.6	4.4
63.5331130885888	333.580992595174	8.6531679954344	59.1	339.4	4.8
66.6375201180157	333.1192867046	10.784199877284	63.8	331.6	18.4
70.9702690223207	333.003728209709	11.1523329270731	70.9	331.6	19.3
96.1737954020425	333.013675605882	9.3360806974837	99.2	329.2	7.7
100.121202253254	333.01523119379	9.05163465221283	100	339.4	3.8
126.331977320839	331.756093521892	8.20868874435629	129.9	329.2	5.1
129.552193065251	331.601400932154	8.10512816283251	130.7	339.4	10.6
134.971150046474	330.457877604506	7.64607624605028	136.2	331.6	10.8
139.595381858603	329.482055555344	7.25435265609923	142.5	331.6	14.7
143.214806143112	328.092810409595	5.18653312433236	148.8	331.6	0.2
142.282520051305	321.533821662558	7.91726091997312	142.5	315.8	4.2
142.235849074672	321.205492334527	8.05396261564998	136.2	315.8	9.7
148.171541622519	321.748388845388	8.5007181432638	148.8	315.8	8.4
153.842555020891	322.267076287856	8.92755458658273	155.1	315.8	5.4
157.127053714541	322.567394626432	9.17474193256706	161.4	315.8	7.1
159.42066333219	325.763319816013	10.3471151308611	155.1	331.6	14.3
163.747309841795	326.753062005837	9.94005351255976	161.4	331.6	4.6
187.785748919851	332.25235882072	7.67845887325378	191.3	329.2	9.3
192.633813344346	333.361392244718	7.22231387289287	192.1	339.4	1.6
220.518486132917	332.967103192173	10.8338682391378	222.8	339.4	15.5
222.647015607487	331.553580266203	10.1744354226781	222	329.2	14.2
224.858633971478	330.084876386886	9.48927079551118	227.6	331.6	9.8
226.709574907497	328.855694371637	8.91583996854676	231.5	331.6	8.7
227.921165095043	328.051098999719	8.54047151629412	234.6	331.6	5.2
227.614156659598	320.040167645695	9.94331779079649	234.6	315.8	11.2
226.485135128478	319.434925689081	9.96977702304189	231.5	315.8	7.2
223.565198525815	317.869592108234	10.0381899700609	227.6	315.8	6.5
206.40216946274	308.668583558608	10.4402644247166	208.7	303.2	16.2
180.475534060992	298.484653750952	7.82434239977677	178	303.2	1.5
170.871070286232	292.493826886358	9.22465846161025	173.2	285.1	12.1
162.473032786053	292.21589891183	8.64672867497709	161.4	295.3	10.8
156.145843543599	292.006532252544	8.21128352933858	155.1	295.3	0.7
148.687623604147	290.655048013209	10.1679203069992	148.8	295.3	14.4
141.924242910299	289.429460249457	11.9422749430362	141.7	283.5	17.7
139.402389774474	290.215977946823	11.4005655285845	142.5	295.3	13.4
134.644397226797	291.699837596143	10.3786657829016	136.2	295.3	3.1
128.656342909472	292.79749109221	10.5268426603004	127.6	286.7	5.8
115.859570114481	295.143314662918	10.8434524435335	116.5	303.2	9.1
86.9265752002888	295.03888238381	12.7021258555493	85.8	303.2	13.4
76.8575189879809	292.148215872974	13.1303247321174	70.9	297.7	11.7
76.188387403953	289.50923210531	13.7260417893451	76.4	288.2	6.4
75.2535264801583	285.822214027306	14.5583290468627	81.1	285.1	18.2
74.355063200871	282.278751017822	15.3582086482787	66.9	280.4	18.4
75.544294623556	281.028619619788	15.075450794705	70.1	280.4	12.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
78.1823774313673	278.255560718327	14.448235319476	84.3	283.5	16.3
91.4757093349842	263.51315793349	11.0700121664569	89	260.7	3.7
95.5915179767749	260.373915488036	12.0743290001757	92.1	254.4	16.6
114.202662738259	254.530808224683	11.4162615840141	119.7	260.7	11.7
114.723012778402	253.372542289623	11.3376125244765	122.8	254.4	9.9
106.34961995081	205.329707803745	13.3635673224863	100	206.3	18
105.641953789679	201.26991437139	13.5348272749365	99.2	196.1	13.9
128.385737548722	200.243012356084	12.969976932471	130.7	206.3	18.1
132.219956278771	198.550572876444	11.5956500778988	129.9	196.1	10
136.620502115323	196.608158690886	10.0183212924536	136.2	198.5	8.4
141.619135641686	194.401754315641	8.2266091347388	142.5	198.5	1.1
141.619760825249	194.40135132601	8.2265815026378	148.8	198.5	8.3
141.827704880794	188.496673524907	7.95717468126619	136.2	182.7	6.2
141.827785283742	188.496667444084	7.95719431846981	142.5	182.7	2.1
147.416288506794	188.911298259525	10.2073866262707	148.8	182.7	9.2
152.478403129573	189.286941272674	12.2456422676476	155.1	182.7	16.5
155.228484680119	192.466231161639	11.9486927170857	155.1	198.5	17.6
159.646730968481	192.704048847008	7.02966683811356	161.4	198.5	1.4
162.859215606131	185.077208006291	8.48325006855765	161.4	182.7	0.7
169.828614306079	169.298296217762	12.5725327744246	178	170.1	11.6
167.971249697642	157.66627618799	16.2144349713402	173.2	152	19.2
161.681858784862	157.399978175183	15.0639440601129	161.4	162.2	17.4
154.917387081291	157.113560705606	13.8265467523308	155.1	162.2	15.7
145.555848412103	156.717152686654	12.114066119774	141.7	150.4	15.8
144.049144739031	158.184144113865	10.7463141861715	148.8	162.2	5.3
140.674057752232	159.24017642068	10.200980984426	142.5	162.2	2.7
136.199528171539	160.498437160414	9.79102308226475	136.2	162.2	1.7
121.655469837628	163.705284044894	12.6572018345813	116.5	170.1	13.6
121.817670651433	154.461209004076	12.7533850524226	127.6	153.6	18.6
117.948400108656	130.237568033106	8.65845952479682	119.7	127.6	15.5
117.537104983786	127.662618844523	8.22320990982844	122.8	121.3	7.8
96.0325539904849	128.531166333345	6.12197993239296	92.1	121.3	6.9
94.1739308569425	131.034436329438	5.55848390006975	89	127.6	0.1
86.8584179318481	148.246496492779	6.09237735481045	84.3	150.4	4.3
84.7365239488536	153.23902259522	6.2472387460739	81.1	152	7.1
82.7451167808919	157.924529920161	6.39257814548126	76.4	155.1	3.4
79.9665919328619	164.462075838414	6.59537744543174	85.8	170.1	5
74.477007257302	167.260715564013	7.60653267243838	70.9	164.6	8.4
71.2347194334417	168.913641711174	8.20385636579513	67.7	164.6	2.1
70.5324995195572	169.298909914284	8.3633662077242	63.8	164.5	8.3
68.4120203965514	181.477780177521	10.9106438045644	63.8	182.7	4.6
68.0510773574873	183.550954575356	11.3442429132507	67.7	182.7	12.4
67.6743626702472	185.714728736413	11.7967926890637	70.9	182.7	16.9
66.2052036127562	194.154292437808	13.5622688864298	70.9	198.5	18.8
63.7321821029309	195.41396121574	12.036085138602	67.7	198.5	11.8
60.0757734804724	197.276479146521	9.77963379579796	63.8	198.5	2.5
59.6076649813439	197.463233370067	9.64932766335182	58.3	196.1	1.6
56.2376566908658	199.438198869272	11.282991715918	59.1	206.3	14.9
32.7931094983485	199.462060946773	14.6106089153754	28.3	206.3	15.8
30.3335886249782	193.520951098333	14.4798676121914	27.6	196.1	18.7
21.8830414927238	173.108212545484	14.0306827023416	14.2	170.1	13.5
41.2467672539597	164.130110804659	15.4983835517849	44.9	170.1	19.9
54.1565726404214	154.087626604687	14.2935104904771	52.8	148.8	15.5
58.1334907248811	150.994012171067	13.9223523043492	60.6	155.1	13.8
63.0626060144625	147.15969680761	13.4623175902056	70.1	147.3	17.8
62.7531542141236	146.434011252605	12.6315616158908	63.8	147.3	12.9
62.4295121167237	145.67505395871	11.7627159570406	66.9	147.3	5
48.9859711656456	129.163516918623	7.47406909741941	51.2	121.3	6.2
45.5415264792791	130.482992397788	7.41386947819796	48	127.6	5.5
37.7534175803958	133.466343256699	7.27778251593367	39.4	140	3.5
35.9454299212832	134.158979992966	7.24616757761295	36.2	140	1.4
24.1447264426461	134.469873973235	11.1881661599817	24.4	140	15.5
20.4433500973857	134.567334707685	12.424594718006	21.3	140	9.6
13.2030946175521	134.757903803038	14.8431705723773	9.40000000000001	140.2	11.5
12.1135917655114	134.786605352697	15.2070989472321	6.3	140.2	17.5
13.1596113624676	127.213060004695	14.3540588703258	17.3	127.6	16.4
14.167216016413	119.917113726678	13.5323404802472	20.5	121.3	8.4
20.0793542680076	72.5443709790616	8.7078463197894	28.3	73.2	9.3
20.5466939491386	63.1834812359338	7.71011534506891	27.6	63	3.4
16.4133808324036	36.7302437401865	8.21272560407556	14.2	37	6.3
12.4708077726849	11.4976420545947	8.69212714518514	9.40000000000001	7.1	2.4
12.4708086038646	11.4976326695657	8.69213263401016	6.3	7.1	12
20.5884834580196	11.3014821896527	8.02706481248584	21.3	6.9	14.1
25.3628245977756	11.1861521872443	7.63589879764413	24.4	6.9	1.6
33.5199838966088	10.9891343175719	6.96757152598382	36.2	6.9	0.3
36.7620106426003	12.627747334243	9.45267165987113	39.4	6.9	14.8
46.767715197068	28.9756124438991	11.806525548076	44.9	37	12.5
55.883335900526	23.1138377568111	11.8282096648481	52.8	15.7	13.8
59.2175260494225	22.3133513520192	11.5532137538631	60.6	22	16.9
61.9666189027687	21.6533365344454	11.3264798164101	63.8	14.2	14.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
66.2233445644267	24.2234906298374	9.32493994174138	63.8	31.4	12.4
67.0128353988848	24.7002074234349	8.95360568915889	70.9	31.5	11.6
67.0132180282733	24.7004375752854	8.95342500185098	67.7	31.5	4.3
71.0737539738895	20.9290652517947	11.2126311251141	66.9	14.2	11.4
71.6601538931439	20.3844872145413	11.5390028199285	70.1	14.2	16.8
76.4371011384547	21.6759452738814	9.59853101304496	81.1	18.9	10.9
78.4662297343316	22.2245246323993	8.77430934129459	84.3	17.3	5.6
78.4801143900819	23.5633770019303	8.93389283169932	76.4	22	1.9
78.6012791280659	35.2543499548192	10.3269740544442	85.8	37	14
72.3764939886842	47.0915903258326	8.67506326308863	70.9	49.6	14.9
70.9687005272087	49.7687084602187	8.30145446113059	67.7	49.6	9.5
69.7430257260199	52.0995019480794	7.97618018144617	63.8	49.6	2.8
66.31284065303	65.023865741614	8.73586247395531	58.3	63	8.5
65.9471333158235	66.5276890872713	8.82473015724764	63.8	65.4	13.7
65.5722233228971	68.0694231171948	8.91584065225851	59.1	73.2	9.3
69.235156654968	68.03432326611	8.85714090659016	67.7	65.4	8.4
74.038241028574	67.9882965098079	8.78016947425336	70.9	65.4	6.9
98.3902425994386	67.7550311826077	8.38992787401101	100	73.2	14.4
100.803515861227	67.1269792768799	7.68260145758871	99.2	63	0.7
125.960844194034	65.3176436299545	8.07935637341966	129.9	63	9.4
129.657407452982	65.051778589755	8.13766240434268	130.7	73.2	7.2
135.712360453404	63.9640924488153	8.30884030856588	136.2	65.4	3.7
141.715800140967	62.885658688449	8.47856078492752	142.5	65.4	2.7
147.414855111239	61.8619009068473	8.63967995832517	148.8	65.4	6.2
152.18591777639	61.0048470617844	8.77456264887643	155.1	65.4	8.7
154.941158950766	60.5099197959265	8.85244616835131	161.4	65.4	7.2
154.657895187832	54.4873752841818	10.6864058435588	155.1	49.6	5.1
154.612724683575	53.5271238556232	10.9788042635711	161.4	49.6	13.6
149.800449204165	50.9496276119287	10.8044741183305	148.8	49.6	18.9
142.84199388614	47.4699842628512	8.08160787568785	142.5	49.6	0.1
138.262027921895	44.4215823656056	8.87555517012265	136.2	49.6	6.3
124.545178936563	35.2916402532481	11.2534324090293	116.5	37	12.1
130.432411383249	26.2167453564234	11.2410731361518	127.6	20.5	16.5
137.666999688876	23.5872827295978	6.7847055211778	136.2	29.1	0.8
137.881203659577	23.5027505090184	6.66202066479098	142.5	29.1	2.7
140.362499618162	15.6759242277353	6.45745617345571	141.7	17.3	2
145.564267878531	-0.731582510299203	6.02873496690697	141.7	-7.9	4.6
145.56427810491	-0.731582655213414	6.02873699807129	149.6	-7.9	5.2
152.26602998849	24.4434621788469	13.3124395738616	148.8	29.1	19.2
158.349574268701	26.3725430042501	8.49656764122719	155.1	29.1	1.4
163.0518879786	26.5850675611954	8.06377394492333	161.4	29.1	11.5
171.788662566981	26.9799527612292	7.25963248547233	173.2	18.9	8.3
179.282558394921	29.0848114950883	6.31613544587958	178	37	4.3
206.405302607753	29.1953120514703	4.87690981657971	208.7	37	3.4
218.581299196811	21.2805277260481	5.61552614256089	222	18.9	3.1
221.261310693774	19.5384919051192	5.77807090637348	224.4	14.2	0.3
223.651959009917	21.4015532646458	11.7943153359291	218.9	20.5	18.5
229.510283580287	23.8480605051064	12.4183410379596	227.6	31.5	14.9
230.623478891114	23.9204283165383	12.4121638765464	231.5	31.5	11.2
231.258697644896	23.9617391735098	12.4086372997499	234.6	31.5	11.8
235.105873724588	19.1571353007404	12.7941784129618	233.1	14.2	19.1
236.417306566073	18.5946691572309	11.9880100747505	240.2	22	17.8
239.121601844977	17.4347930859825	10.3256970967966	236.2	14.2	3.3
242.661044140704	16.9620976889023	10.2044188857191	240.2	15.7	7.9
248.205847770826	16.2215680716476	10.0143903929693	248	14.2	2
275.629359946402	13.1140865718987	11.2492657620237	275.6	6.9	6.7
280.50793938839	12.5613167867594	11.4688910574828	278.7	6.9	10.2
291.019097558378	11.3704495630189	11.9422581801906	290.6	6.9	18.4
294.807984483891	10.9411318868888	12.1128574351718	293.7	6.9	18.6
301.955529003097	10.1314787353313	12.4345688546234	305.5	6.9	5.7
302.872916009579	10.4652282455902	13.5422740403177	308.7	6.9	18.2
288.388029620167	38.6553517873568	10.0513327580462	280.3	37	9.6
290.174807419316	60.6994738603814	8.28377248383955	293.7	63	15.4
289.157011503382	67.6347024555555	4.27323084147744	294.5	73.2	1.3
267.49062066967	66.5457158536078	4.03418721093467	263.8	73.2	0.8
263.489723877908	62.0596771630991	5.99062256942419	263	63	0.7
248.099558567152	44.8034482135085	13.5163592008413	249.6	37	15.8
236.791467264955	51.3265546385631	12.9377331891026	234.6	49.6	6
234.745287222296	52.5068861721848	12.8330186410696	231.5	49.6	10.4
233.05119324247	53.4841170508508	12.746320195123	227.6	49.6	17.6
228.280735599729	61.7435797094823	8.48039404803205	234.6	65.4	4.6
228.280653368383	61.7436686518136	8.48035555720254	231.5	65.4	1.8
225.61002274644	62.948526999413	9.15124562701344	227.6	65.4	13.5
223.030832975215	64.1121404897272	9.79917222741488	222	63	7.9
220.471133669899	65.2669687894874	10.4422061575389	222.8	73.2	10.5
196.770444665566	68.7063493235466	15.8767950665302	191.3	63	18.3
195.762457171339	74.7795350775744	15.0415629180215	192.1	73.2	7.8
188.433831203195	119.658710804837	9.09772909406406	184.3	121.3	14.5
187.89108074303	122.982153213185	8.65751321890119	181.1	127.6	7.7
209.706981124902	127.545861549665	9.34531586578216	215	121.3	10.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
211.217361102192	131.328777559047	8.92724733642092	211.8	127.6	10.4
217.697128547761	147.558210990731	7.13373241738843	224.4	147.3	2.3
216.794654399813	152.694392901497	8.67631609259871	222	152	14.6
216.118187992535	156.544152177005	9.83251150639413	218.9	153.6	11.5
214.606976721117	165.144345581542	12.4151597844363	208.7	170.1	15.4
228.996615189752	165.159000765944	8.1429210848819	227.6	164.6	1.4
235.145222661145	165.165263554538	6.31743252919983	234.6	164.6	0.1
235.145222661145	165.165263554538	6.31743252919983	231.5	164.6	6.5
243.713734106151	165.174003369862	3.7735365367643	249.6	170.1	0.7
242.361818582735	157.460599078127	6.25312745266888	240.2	155.1	5.1
241.525340673279	152.688676442274	7.78718488076331	240.2	148.8	5.8
241.094439882099	150.230557410028	8.57740778630087	236.2	147.3	7.3
240.857160960597	148.876934219434	9.01255475740573	233.1	147.3	11.4
244.756786990976	144.017771399573	9.38011729845452	248	147.3	4.5
254.859127507793	131.429480232013	10.3324321127534	252.8	127.6	3.3
257.71744687124	128.843647995835	11.6451046140476	255.9	121.3	14.5
274.698238503163	135.069027201139	10.7751424379381	275.6	140	4.2
278.349751629589	134.779621937169	12.8980342444298	278.7	140	19.3
283.674589626457	131.24952251746	12.3235692660097	283.5	127.6	15
287.189347568275	128.919366106403	11.9443530248936	286.6	121.3	15.1
298.325868229387	131.578983711708	6.86590551911279	301.6	127.6	0.4
302.440194634513	138.66645864038	11.3658114743766	308.7	140	16.6
300.863928244286	139.803524169522	10.2991801256107	305.5	140	11.2
297.504105433328	142.227369381142	8.02571604021619	293.7	140	9.3
294.767619229489	144.201433047354	6.17400277772424	290.6	140	0.4
287.099770435179	170.921012780595	9.66867423690788	280.3	170.1	14.3
288.449277691139	194.991401065594	7.25580899133669	293.7	196.1	5.6
288.75574316721	200.457362889061	6.70785255347122	294.5	206.3	5.6
265.606133329866	198.770589039521	9.09929032588413	263.8	206.3	6.2
261.488815313787	197.539287736765	9.89971286693855	263	196.1	17.9
238.288691233939	191.197410860562	11.7940768381298	234.6	198.5	10.6
233.20850664395	187.42914295088	12.636737645637	231.5	182.7	19.2
232.186195846104	187.624133963284	11.0769507557802	234.6	182.7	13.3
229.04249000265	188.223797420057	6.28055881465081	227.6	182.7	0.3
227.415887382894	192.920429752388	6.65797624307958	222	196.1	3.2
227.154346233506	193.675621932643	6.71867485014524	231.5	198.5	1.6
223.704401779241	196.516452897744	9.20410016592916	227.6	198.5	10.4
218.949337111676	200.431996754359	12.6297486177723	222.8	206.3	17
196.801811180605	202.161485338091	15.5386983839609	191.3	196.1	16.7
195.707213851374	208.733106892544	15.2440463811004	192.1	206.3	17
188.444346011303	252.337036839279	13.2889118910947	184.3	254.4	16.9
187.84625731569	255.927769874554	13.1279234953034	181.1	260.7	13.4
209.602162614351	259.831654173015	11.1231111972332	211.8	260.7	3.2
213.162075357996	260.281087938385	13.8868281979111	215	254.4	19.4
224.62234718408	277.232563141212	12.423747858941	224.4	280.4	17.9
226.620489678139	280.188051300884	12.1686009077916	233.1	280.4	17.3
225.96265531951	285.996435602027	7.94077100690501	218.9	286.7	3.7
226.399810384137	286.470220194556	7.85795901016598	222	285.1	1.9
230.046294428791	290.422038148728	7.16711340455372	227.6	297.7	4.1
230.475537386696	290.362451726441	7.27238940042603	231.5	297.7	7.4
230.925957612355	290.299929013649	7.38285867909561	234.6	297.7	7.7
235.999807061146	285.07224471474	8.96134218117311	240.2	288.2	11.3
239.173085571194	281.802686001142	9.94855849244992	236.2	280.4	11.1
242.911098619788	277.951271270014	11.1114604990626	248	280.4	9.5
242.911098619788	277.951271270014	11.1114604990626	240.2	281.9	12.5
255.307846820001	265.178435493646	14.9678079975702	252.8	260.7	8.8
258.420482707685	261.971331149598	15.9361218051504	255.9	254.4	18.1
276.431171383099	265.581965621338	15.1115325066949	275.6	273.1	17.9
277.055645575038	265.707197110357	15.0829511345348	278.7	273.1	18.4
284.982918039533	261.608239192403	11.9869691683878	286.6	254.4	15.7
287.170847456787	262.424089680211	9.80503904265779	283.5	260.7	2.6
297.235837629218	266.407941638644	6.79068892932654	301.6	260.7	2.7
300.730505813186	272.195104495445	7.39277431723953	305.5	273.1	0.7
300.730520123343	272.195137672548	7.39278672661331	308.7	273.1	9.4
297.29133218315	275.584565490327	7.59733628833247	293.7	273.1	6.2
294.2815776427	278.550801879227	7.77633515498691	290.6	273.1	10.7
275.752014836952	296.81225988862	8.87839876572308	280.3	303.2	11.5
257.351455474701	306.060092323677	7.60837738193725	249.6	303.2	7.3
266.427611762664	327.520516527773	7.36163959658063	263	329.2	0.8
268.652051015684	332.780319135374	7.30111759433614	263.8	339.4	8.3
288.728046359415	334.987015110284	4.58598359445205	293.7	329.2	1.4
290.739274732839	341.00169734128	6.61308157910395	294.5	339.4	13.8
295.323987511601	388.597149685553	2.27927636704975	301.6	393.8	0.9
287.217012282641	389.388172071953	3.49059741789605	286.6	387.5	8.3
282.259823875868	389.871845617694	4.23124040483667	283.5	393.8	11.4
258.159635951607	391.616902772367	6.7308055412286	255.9	387.5	4.9
252.331456484943	392.038949241813	7.33531300260247	252.8	393.8	15.4
216.547613787674	393.705268240255	6.86786124989627	215	387.5	7.3
211.071116461608	393.960300375186	6.79626397584462	211.8	393.8	13.7
186.058090034163	395.125266553966	6.46920966083088	184.3	387.5	3.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
183.504352770923	396.138287407613	6.74276431280242	181.1	393.8	14.3

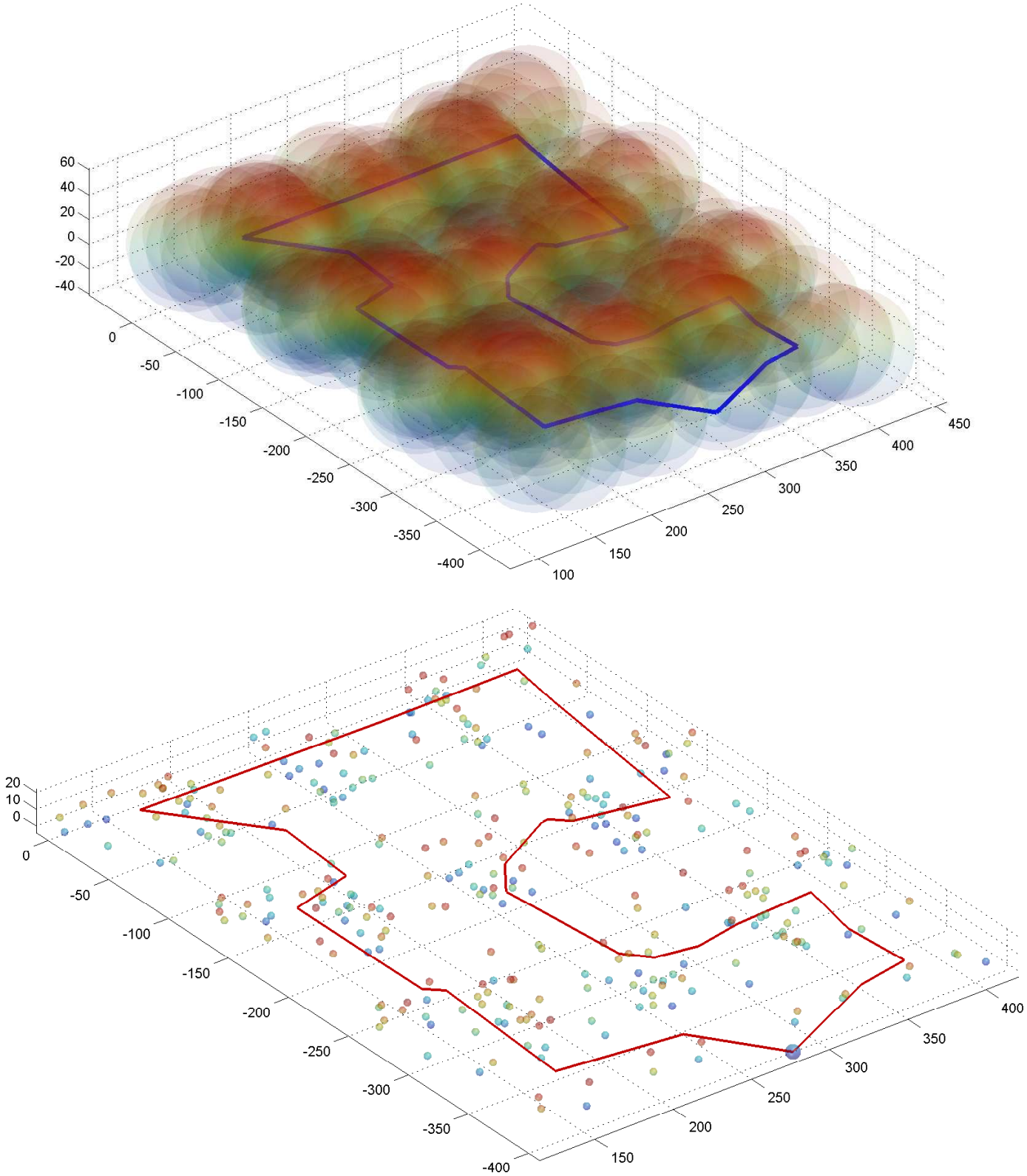


Figure N.77: $lin318$, $r = 41.34$, Equal Radius, 3D, Euclidean, Length = 1443.4266756

Table N-80: Solution for *lin*318, $r = 41.34$, Equal Radius, 3D, Euclidean

Total distance: 1443.4266755713 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
185.984311468857	398.261911724771	0.862150799320112	181.1	393.8	14.3
198.365330961898	392.89038712269	1.50191260101185	184.3	387.5	3.8
215.297961599429	385.544855898955	2.37680404814834	211.8	393.8	13.7
234.996244638732	376.99925093877	3.39446788410442	222.8	339.4	15.5
240.532173249266	375.831706978683	3.31407341195909	215	387.5	7.3
247.909224734462	374.275854610168	3.20693862577065	252.8	393.8	15.4
254.886582070459	372.804345620015	3.10559554534859	255.9	387.5	4.9
262.063836254	371.290698570401	3.00134599354153	283.5	393.8	11.4
267.801838950298	370.08063799921	2.91799120227429	301.6	393.8	0.9
267.000299783948	364.297664071736	3.22430564722872	286.6	387.5	8.3
265.675780782201	354.741076809764	3.73055894387875	294.5	339.4	13.8
264.642386716511	347.285208976937	4.12550772273478	234.6	331.6	5.2
263.9721200935	342.449481076696	4.38163974834474	263.8	339.4	8.3
263.315248141751	337.710328160774	4.63266083892118	227.6	331.6	9.8
262.783654346919	333.875066140398	4.83579767650383	231.5	331.6	8.7
262.29270510306	330.333061829734	5.0233993167765	222	329.2	14.2
263.731505328726	323.247222304326	4.84887593556375	263	329.2	0.8
265.238406704873	315.826027651397	4.66609326315933	293.7	329.2	1.4
267.030358989381	307.001268832722	4.44877371381884	280.3	303.2	11.5
268.703850172062	298.759821293541	4.245804122717	278.7	273.1	18.4
269.660103381087	294.050377861573	4.12979035677352	293.7	273.1	6.2
270.296093340455	290.918170748012	4.05262324902488	290.6	273.1	10.7
270.8317763078	288.279965238102	3.98762472143599	301.6	260.7	2.7
270.801253931539	288.28279394722	3.98841459089388	305.5	273.1	0.7
270.770204875896	288.285675613084	3.98921823888208	308.7	273.1	9.4
269.999691436109	288.356265524427	4.00928436452076	283.5	260.7	2.6
269.19728980555	288.42978040824	4.03018129238708	286.6	254.4	15.7
269.19728980555	288.42978040824	4.03018129238708	275.6	273.1	17.9
262.837219340766	289.011868523695	4.19578986814866	255.9	254.4	18.1
258.366295869609	289.421204581718	4.31226649485588	252.8	260.7	8.8
254.238463791946	289.799156129418	4.41981332302112	248	280.4	9.5
250.325303671613	290.15746229946	4.52176997142531	249.6	303.2	7.3
246.503786718313	290.507366146628	4.62133682484119	234.6	297.7	7.7
242.991780522977	290.828941233896	4.71284231429127	240.2	281.9	12.5
239.564688189838	291.142749109317	4.80213752700194	240.2	288.2	11.3
236.157589800483	291.454726826919	4.89091224322333	231.5	297.7	7.4
232.869200167921	291.755839148181	4.97659516049745	234.6	315.8	11.2
232.869200167921	291.755839148181	4.97659516049745	231.5	315.8	7.2
229.69674852183	292.046321229998	5.0592548014172	227.6	315.8	6.5
229.69674852183	292.046321229998	5.0592548014172	227.6	297.7	4.1
226.691328802564	292.321508819914	5.13756294572534	236.2	280.4	11.1
226.691328802564	292.321508819914	5.13756294572534	233.1	280.4	17.3
223.415689684633	292.621413345913	5.22290711301557	222	285.1	1.9
223.415689684633	292.621413345913	5.22290711301557	224.4	280.4	17.9
220.167033195201	292.918831592572	5.3075454590948	215	254.4	19.4
214.199380092443	294.018199022288	5.26503054540193	218.9	286.7	3.7
208.022530431063	295.156077802286	5.22101072532129	211.8	260.7	3.2
200.0349815194	296.62745337124	5.16406181503427	208.7	303.2	16.2
191.420580797697	298.21425016297	5.10261973321983	192.1	339.4	1.6
187.42693954251	297.61874264053	5.18722124712691	191.3	329.2	9.3
182.814338960663	296.930927105378	5.28492389281621	178	303.2	1.5
178.352241438615	296.265558344234	5.37944221657806	155.1	295.3	0.7
174.739647739631	295.726878795629	5.45597612183675	173.2	285.1	12.1
171.221560198012	295.202295932654	5.53051152511572	161.4	315.8	7.1
167.84995614863	294.6995560308	5.60194351289003	161.4	331.6	4.6
167.84995614863	294.6995560308	5.60194351289003	155.1	331.6	14.3
166.06382201489	294.433279774051	5.639790503486	148.8	331.6	0.2
164.111824587741	292.765652026683	5.88226305236378	148.8	315.8	8.4
164.111824587741	292.765652026683	5.88226305236378	155.1	315.8	5.4
162.062696379218	291.015051228665	6.13679988907985	161.4	295.3	10.8
160.025011122596	289.27422818588	6.38991497061083	148.8	295.3	14.4
158.064741193739	287.59954214083	6.63341385878333	136.2	315.8	9.7
158.064741193739	287.59954214083	6.63341385878333	142.5	315.8	4.2
155.916577234872	285.764354685401	6.90024989430335	136.2	295.3	3.1
155.916577234872	285.764354685401	6.90024989430335	142.5	295.3	13.4
153.96993701712	284.10132995931	7.14205302128713	127.6	286.7	5.8
153.96993701712	284.10132995931	7.14205302128713	141.7	283.5	17.7
152.380937952366	282.743837446117	7.33943163796655	116.5	303.2	9.1
150.213270786077	269.813140106034	8.19324068608486	181.1	260.7	13.4
148.417230553819	259.099396183524	8.90065615561645	184.3	254.4	16.9
146.671126227106	248.683581571151	9.58839487716381	119.7	260.7	11.7
144.510878865894	235.797290602795	10.439261595898	122.8	254.4	9.9
139.708040318426	207.147852439261	12.3310070014892	100	206.3	18
139.4312758654	205.497269846864	12.4399912561384	99.2	196.1	13.9
141.304034506209	202.920159616498	12.5601086367045	130.7	206.3	18.1
143.285864324185	200.192953055284	12.6872219646326	129.9	196.1	10

Solution x	Solution y	Solution z	Original x	Original y	Original z
143.285864324185	200.192953055284	12.6872219646326	136.2	198.5	8.4
145.370290207576	197.32455660399	12.8209177659563	142.5	198.5	1.1
147.489388592966	194.408442266532	12.9568385933801	155.1	198.5	17.6
147.489388592966	194.408442266532	12.9568385933801	148.8	198.5	8.3
149.606115016051	191.495574902816	13.09260736283	136.2	182.7	6.2
149.606115016051	191.495574902816	13.09260736283	142.5	182.7	2.1
151.707693459337	188.603543995882	13.227405050865	148.8	162.2	5.3
151.707693459337	188.603543995882	13.227405050865	148.8	182.7	9.2
153.454770496478	186.199329643672	13.3394639083744	136.2	162.2	1.7
153.454770496478	186.199329643672	13.3394639083744	142.5	162.2	2.7
154.900075173907	184.210377319574	13.4321654562693	127.6	153.6	18.6
157.784045878767	182.591283645287	13.378701208068	155.1	182.7	16.5
160.706297088776	180.950698086784	13.3245272791145	161.4	198.5	1.4
163.764591856483	179.233734181514	13.2678319035788	161.4	182.7	0.7
166.874635323414	177.48771647182	13.2101775795653	141.7	150.4	15.8
171.357526585653	174.970942543934	13.1270788216523	155.1	162.2	15.7
176.245384974237	172.226811400215	13.0364747311317	161.4	162.2	17.4
181.581279296292	169.231143219111	12.9375669319718	178	170.1	11.6
187.107970091355	166.128356879301	12.8351225471929	173.2	152	19.2
193.011313839025	162.814110039659	12.725696958162	181.1	127.6	7.7
196.904966871546	160.628120357908	12.6535156238741	184.3	121.3	14.5
199.166809399994	160.376528860396	12.5762152695777	211.8	127.6	10.4
201.057993015161	160.16605088565	12.5115763909487	215	121.3	10.5
204.056424304247	163.252677929652	12.5496907766684	236.2	147.3	7.3
204.056424304247	163.252677929652	12.5496907766684	233.1	147.3	11.4
204.436153120948	163.644123707268	12.5545456701626	224.4	147.3	2.3
205.066619018329	164.293959180838	12.5626020024007	222	152	14.6
205.066619018329	164.293959180838	12.5626020024007	218.9	153.6	11.5
205.897455043638	165.150344198535	12.5732203015183	231.5	164.6	6.5
205.897455043638	165.150344198535	12.5732203015183	227.6	164.6	1.4
206.945152492221	166.230509475889	12.58663063692	227.6	182.7	0.3
207.98034227998	167.29788529653	12.5998890115509	222	196.1	3.2
208.922822476019	168.269741075099	12.6119649021886	191.3	196.1	16.7
209.843145595331	169.218668346641	12.6237513379478	192.1	206.3	17
216.460555829408	169.865528980158	12.1950107309675	222.8	206.3	17
220.212533567716	170.232323067009	11.9518880128399	208.7	170.1	15.4
224.323056471957	170.634165627392	11.6855362263842	227.6	198.5	10.4
228.118180643152	171.005181000183	11.4396169291553	234.6	198.5	10.6
231.536560667556	171.339370593446	11.2181058736675	231.5	182.7	19.2
234.97687780975	171.675704840553	10.9951734862749	231.5	198.5	1.6
238.441393360199	172.014406590238	10.7706721994416	234.6	164.6	0.1
242.031051292144	172.36534141021	10.5380628747649	234.6	182.7	13.3
245.77397091945	172.731259152415	10.2955226690032	240.2	148.8	5.8
249.809308037017	173.125762374873	10.034034942274	240.2	155.1	5.1
254.268683872446	173.561718415727	9.74507154891189	249.6	170.1	0.7
258.926934597629	174.017116007954	9.44322157904016	263	196.1	17.9
263.418565679317	174.45622612343	9.15216693335721	263.8	206.3	6.2
267.825108878856	174.88701997797	8.86662694985484	294.5	206.3	5.6
268.07423718831	171.031654825475	9.05767301875697	293.7	196.1	5.6
268.568303123813	163.386320351027	9.43652056055234	280.3	170.1	14.3
269.087946703731	155.345298791637	9.8349743019589	248	147.3	4.5
269.559366917003	148.050382518327	10.196457090462	252.8	127.6	3.3
269.915248816029	142.543158826818	10.4693551915133	308.7	140	16.6
270.151222123051	138.891892160372	10.6502908900245	305.5	140	11.2
270.38221996718	135.317696036998	10.8274070041862	293.7	140	9.3
270.61842586153	131.662928671313	11.0085153539296	278.7	140	19.3
270.864226682018	127.859722537675	11.196978822364	283.5	127.6	15
271.106982971522	124.103636713565	11.3831066798344	290.6	140	0.4
271.387179906367	119.768292572767	11.5979375194325	301.6	127.6	0.4
271.696838124979	114.977167049192	11.8353514614873	286.6	121.3	15.1
272.018680869095	109.99751837777	12.0821056384438	275.6	140	4.2
272.588418431693	101.182415567761	12.51890290398	255.9	121.3	14.5
273.442333776208	87.970367265271	13.1735417625653	263.8	73.2	0.8
274.116914586441	77.5331663363343	13.6907034818493	263	63	0.7
274.665668077271	69.0428589525038	14.1114053334111	234.6	65.4	4.6
275.342855270226	61.6937082058095	14.5241883366894	294.5	73.2	1.3
276.13896888308	53.0538922818913	15.0094655269624	293.7	63	15.4
277.02347602067	43.4546845360372	15.548626788171	280.3	37	9.6
277.835085612091	34.6463215897825	16.0433652236291	305.5	6.9	5.7
277.862466807117	34.3492813588377	16.0600452530864	308.7	6.9	18.2
275.267416903948	34.2895763371451	16.0084180679749	293.7	6.9	18.6
272.020300858974	34.2148723036131	15.9438201521967	290.6	6.9	18.4
267.686314953226	34.1151725258426	15.8576027867747	278.7	6.9	10.2
262.720183649118	34.0009384438418	15.7588095558479	275.6	6.9	6.7
256.596278359147	33.8600893445411	15.6369819969397	248	14.2	2
251.272982893116	33.7376436269343	15.53107980582	236.2	14.2	3.3
246.972393615712	33.6387101228327	15.4455212645258	233.1	14.2	19.1
243.248669198007	33.5530409705107	15.3714379012567	249.6	37	15.8
239.41175300782	33.4647718720867	15.2951025528947	240.2	15.7	7.9
235.625103463102	33.3776580387297	15.2197665902761	240.2	22	17.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
235.625103463102	33.3776580387297	15.2197665902761	234.6	31.5	11.8
231.85918718061	33.2910226953735	15.1448422156125	231.5	31.5	11.2
228.144176905131	33.2055590957028	15.0709301876767	224.4	14.2	0.3
228.144176905131	33.2055590957028	15.0709301876767	222	18.9	3.1
228.144176905131	33.2055590957028	15.0709301876767	218.9	20.5	18.5
228.144176905131	33.2055590957028	15.0709301876767	227.6	31.5	14.9
228.144176905131	33.2055590957028	15.0709301876767	234.6	49.6	6
228.144176905131	33.2055590957028	15.0709301876767	231.5	49.6	10.4
228.144176905131	33.2055590957028	15.0709301876767	227.6	49.6	17.6
224.861137515998	33.130036617734	15.0056089984231	208.7	37	3.4
224.861137515998	33.130036617734	15.0056089984231	222	63	7.9
221.986611531264	33.0639153813196	14.9484148403973	231.5	65.4	1.8
221.986611531264	33.0639153813196	14.9484148403973	227.6	65.4	13.5
218.01142636478	32.9725172661033	14.8693168561136	222.8	73.2	10.5
193.349536825287	32.4059383003249	14.3785877357591	192.1	73.2	7.8
188.069207748978	32.1732196187253	14.291396655781	191.3	63	18.3
182.566990031903	31.9307288802965	14.2005389214328	178	37	4.3
177.389740150148	31.7025746303026	14.1150446769863	161.4	49.6	13.6
173.047215006123	31.5112213436356	14.0433294380291	173.2	18.9	8.3
168.775823817989	31.3230099112142	13.9727864351384	148.8	29.1	19.2
165.190325306604	31.1650310498722	13.9135655087261	161.4	29.1	11.5
161.726893199333	31.0124345328598	13.8563580317492	161.4	65.4	7.2
158.157977034602	30.8551956834666	13.7974073153314	148.8	65.4	6.2
158.157977034602	30.8551956834666	13.7974073153314	155.1	65.4	8.7
155.150897834389	30.722724014903	13.7477325754519	155.1	49.6	5.1
152.14587988418	30.5903439652996	13.6980912882325	148.8	49.6	18.9
149.196593120901	30.4604198645069	13.6493697720242	142.5	65.4	2.7
146.518247980806	30.3424391297669	13.6051208795487	129.9	63	9.4
146.518247980806	30.3424391297669	13.6051208795487	136.2	65.4	3.7
144.693654519877	30.2620781705107	13.5749713891445	142.5	49.6	0.1
142.878414738152	30.1821293399908	13.5449761022401	136.2	29.1	0.8
142.878414738152	30.1821293399908	13.5449761022401	155.1	29.1	1.4
141.009841966528	30.0998308805824	13.5141006629291	141.7	17.3	2
141.009841966528	30.0998308805824	13.5141006629291	142.5	29.1	2.7
139.104578231658	30.0159151050865	13.4826205721991	149.6	-7.9	5.2
134.834384314793	29.8277473737043	13.4120542481987	141.7	-7.9	4.6
128.076883428522	29.529902011332	13.3003901409063	136.2	49.6	6.3
120.446133209226	29.1935580519908	13.1743112492573	127.6	20.5	16.5
112.210859374945	28.8305625574516	13.0382557813997	116.5	37	12.1
103.579971960148	28.450124403642	12.8956706042559	84.3	17.3	5.6
97.0230593515588	28.1611171480134	12.7873263370439	85.8	37	14
91.120039270507	27.9009351831558	12.6897777629795	81.1	18.9	10.9
85.7433048067372	27.6639545658964	12.6009188412887	76.4	22	1.9
80.8039484450428	27.4462555037462	12.5192826030164	67.7	31.5	4.3
76.3544273637039	27.2501494604866	12.4457369623195	70.9	31.5	11.6
72.0719160223202	27.0614059377172	12.3749489144674	63.8	31.4	12.4
68.0176156555897	26.8827225225938	12.3079303695528	63.8	14.2	14.4
64.093743484175	26.7097883637684	12.2430665462672	60.6	22	16.9
60.2508964162867	26.5404258934592	12.179540999435	70.1	14.2	16.8
56.1502998832941	26.3597023060297	12.1117552199213	66.9	14.2	11.4
51.7370593056326	26.1651984082953	12.0388016065934	52.8	15.7	13.8
47.3033025349034	25.9697917460587	11.9655071351798	39.4	6.9	14.8
43.1747859227345	25.7878416533287	11.8972553114733	6.3	7.1	12
43.4110582180568	26.0819105846435	11.8892995670038	9.40000000000001	7.1	2.4
44.5832186810794	27.5408402221681	11.8498248110423	21.3	6.9	14.1
44.5832186810794	27.5408402221681	11.8498248110423	24.4	6.9	1.6
46.3927772774007	29.7931693416395	11.7888670125041	36.2	6.9	0.3
48.5453764123384	32.4725289380601	11.7163400444992	14.2	37	6.3
51.582989145513	36.2535880418208	11.613967782332	44.9	37	12.5
54.6545615585932	40.0769393074174	11.5104467967005	63.8	49.6	2.8
57.4309537830122	43.5328292173387	11.4168827934833	27.6	63	3.4
60.4153501602785	47.2476378074665	11.3163076877336	28.3	73.2	9.3
63.3309685627219	50.8194906874599	11.2207730617622	58.3	63	8.5
66.1198018311579	54.2360339368179	11.1293950493849	63.8	65.4	13.7
68.7823601328546	57.4978898685394	11.0421562517704	59.1	73.2	9.3
71.3305413564063	60.6196365680936	10.9586673808781	67.7	65.4	8.4
73.872776694368	63.7340942241706	10.875372073873	70.9	65.4	6.9
76.4522347655026	66.894138555593	10.7908538811218	67.7	49.6	9.5
79.5058444086731	70.6350088660347	10.6907889140683	70.9	49.6	14.9
83.3995397338639	75.4049698563496	10.5631794918841	99.2	63	0.7
87.323177873386	80.2115922542811	10.4345846290165	100	73.2	14.4
91.1847055197558	84.9421258896921	10.3080234620069	130.7	73.2	7.2
88.656163077223	108.760914438703	11.2019524563835	122.8	121.3	7.8
87.7906814229538	116.914572578328	11.5080021810279	119.7	127.6	15.5
87.1023858570684	123.399051183705	11.7514015703789	92.1	121.3	6.9
86.3861286112353	130.146954882663	12.0046886769942	89	127.6	0.1
85.6368201436101	137.206240640677	12.2696637233361	84.3	150.4	4.3
84.9824537775909	143.371129537774	12.5010706979475	116.5	170.1	13.6
81.6973526502562	144.276053097987	12.5261604979971	81.1	152	7.1
78.435143409412	145.174659616536	12.5510764304816	85.8	170.1	5

Solution x	Solution y	Solution z	Original x	Original y	Original z
75.161433299297	146.076415242323	12.5760818889075	66.9	147.3	5
72.0448404745801	146.934881262944	12.5998885596199	76.4	155.1	3.4
68.9139694779998	147.797275358544	12.6238047555825	70.1	147.3	17.8
68.9139694779998	147.797275358544	12.6238047555825	63.8	164.5	8.3
65.9647486373177	148.609619729804	12.6463343692546	70.9	164.6	8.4
63.020417957456	149.420609029406	12.668827398101	67.7	164.6	2.1
60.0756082790701	150.231721598358	12.6913250687802	60.6	155.1	13.8
57.1313956427896	151.042665772148	12.7138183750358	52.8	148.8	15.5
57.1313956427896	151.042665772148	12.7138183750358	63.8	147.3	12.9
54.0732663618404	151.884988859241	12.7371809154087	39.4	140	3.5
54.0732663618404	151.884988859241	12.7371809154087	48	127.6	5.5
51.0793517902772	152.70963721253	12.7600508028121	51.2	121.3	6.2
47.6920284660913	153.642677871177	12.7859206453224	21.3	140	9.6
44.8285108540909	154.431416535419	12.8077923469093	17.3	127.6	16.4
44.8285108540909	154.431416535419	12.8077923469093	20.5	121.3	8.4
44.8285023055203	154.43142860941	12.8077936058249	6.3	140.2	17.5
44.8285023055203	154.43142860941	12.8077936058249	9.40000000000001	140.2	11.5
44.8305700044226	157.870602214734	12.826044710246	36.2	140	1.4
44.8329374087384	161.801535627835	12.8469057049637	24.4	140	15.5
44.8361227574093	167.07531722335	12.8748935572101	14.2	170.1	13.5
44.8391295086692	172.065872262096	12.9013780922538	44.9	170.1	19.9
44.8421769240937	177.12272949644	12.9282139864594	67.7	182.7	12.4
44.8450962200187	181.965533834791	12.9539136210937	63.8	182.7	4.6
44.8480415370635	186.849802416226	12.9798333491358	70.9	182.7	16.9
44.8511726573827	192.038617448547	13.0073690062324	70.9	198.5	18.8
44.8540891488775	196.876791567857	13.0330435724158	59.1	206.3	14.9
44.8567977124545	201.37516124146	13.0569146852912	63.8	198.5	2.5
44.8595829344483	206.000932230689	13.0814619707155	58.3	196.1	1.6
44.8626379808102	211.071967391957	13.1083723888671	67.7	198.5	11.8
44.8661789902489	216.94459920666	13.1395362407234	27.6	196.1	18.7
44.8715261030434	225.753457693383	13.1862810709745	28.3	206.3	15.8
44.8804805416804	240.246722564562	13.2631770869181	20.5	254.4	9
44.886702341899	250.415594176429	13.3171362187183	17.3	260.7	14.5
44.8917126448725	258.636891476871	13.3607623014758	6.3	273.3	11.2
45.7739507751049	259.636057311459	13.4171890941122	9.40000000000001	273.3	14
47.1023735292145	261.141050598636	13.5021501102077	21.3	273.1	15.8
47.1023735292145	261.141050598636	13.5021501102077	36.2	273.1	6.7
48.5393597188025	262.768899363033	13.594058181494	39.4	273.1	0.8
50.0087412757185	264.433346945365	13.6880417156087	24.4	273.1	19.3
50.0087412757185	264.433346945365	13.6880417156087	52.8	281.9	9
51.5549953724336	266.184645043817	13.7869482770614	48	260.7	17.4
51.5549953724336	266.184645043817	13.7869482770614	51.2	254.4	2.7
53.1538871858945	267.995875303726	13.8892138711307	92.1	254.4	16.6
53.0342741298981	270.216016828952	13.8725923336133	89	260.7	3.7
52.8784763535264	273.107973835323	13.8509409740544	70.1	280.4	12.5
52.7268268104694	275.922916834508	13.8298653188675	60.6	288.2	12.5
52.5826002995752	278.60005373959	13.8098200468042	63.8	280.4	12.2
52.4376791067623	281.290092295217	13.7896781185326	66.9	280.4	18.4
52.2900084098243	284.031180498314	13.769154176712	81.1	285.1	18.2
52.1412929932442	286.791682639667	13.7484847253446	84.3	283.5	16.3
51.9840502054774	289.710528727435	13.726630147813	76.4	288.2	6.4
51.8225281037826	292.708835114422	13.7041806394917	63.8	297.6	5.2
51.6631997528519	295.666425156285	13.6820357004104	70.9	297.7	11.7
51.5032351907648	298.635837415477	13.6598021841404	85.8	303.2	13.4
51.3493372146696	301.492701822805	13.6384101707345	70.9	315.8	15.2
51.2065386869695	304.14350761936	13.6185597165384	67.7	315.8	13.4
51.0695084014682	306.687233788373	13.5995104706607	63.8	315.8	14.7
50.9348382478547	309.187156099187	13.5807891584483	63.8	331.6	18.4
50.9348382478547	309.187156099187	13.5807891584483	70.9	331.6	19.3
50.8300770523241	311.131835341652	13.5662233202168	58.3	329.2	7.6
50.7314308183252	312.962995863759	13.5525071802689	67.7	297.7	2.9
50.6231403786446	314.97322109725	13.5374508484778	44.9	303.2	8.5
50.5077895404298	317.114554669058	13.5214137851501	14.2	303.2	5.3
50.054446150675	325.529565121597	13.4584069317551	27.6	329.2	2.8
49.6199858568886	333.594058809812	13.3980227529361	67.7	331.6	4.4
49.1605289785054	342.122709927641	13.3341647351916	59.1	339.4	4.8
48.6739022867177	351.155933203635	13.2665325911748	28.3	339.4	12.9
48.0637851244228	362.482415041983	13.1817536594296	20.5	387.5	17.4
47.8736037610543	366.012167450078	13.1553129666772	17.3	393.8	14.6
55.4254684274518	366.338470053433	12.7225871613868	51.2	387.5	1.4
63.5606869507087	366.689991295332	12.2564289385383	48	393.8	19.4
76.4549696084439	367.247181591351	11.5175231810126	92.1	387.5	18.7
85.9274116689759	367.656511169465	10.9747141112494	89	393.8	11
94.8120602593565	368.0404458121	10.4655715751313	100	339.4	3.8
103.070209819446	368.397334238623	9.99232799664801	99.2	329.2	7.7
122.688537120033	369.24522723653	8.86808008550973	129.9	329.2	5.1
124.088173961991	369.305689643545	8.78787839490487	130.7	339.4	10.6
125.594739778924	369.370742674728	8.70154943520037	136.2	331.6	10.8
126.978623124363	369.430462259326	8.62225654609149	142.5	331.6	14.7
135.91327077199	377.045310165271	6.80197302744025	122.8	387.5	3.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
145.973534271249	385.619543597827	4.75236690505711	119.7	393.8	17.8

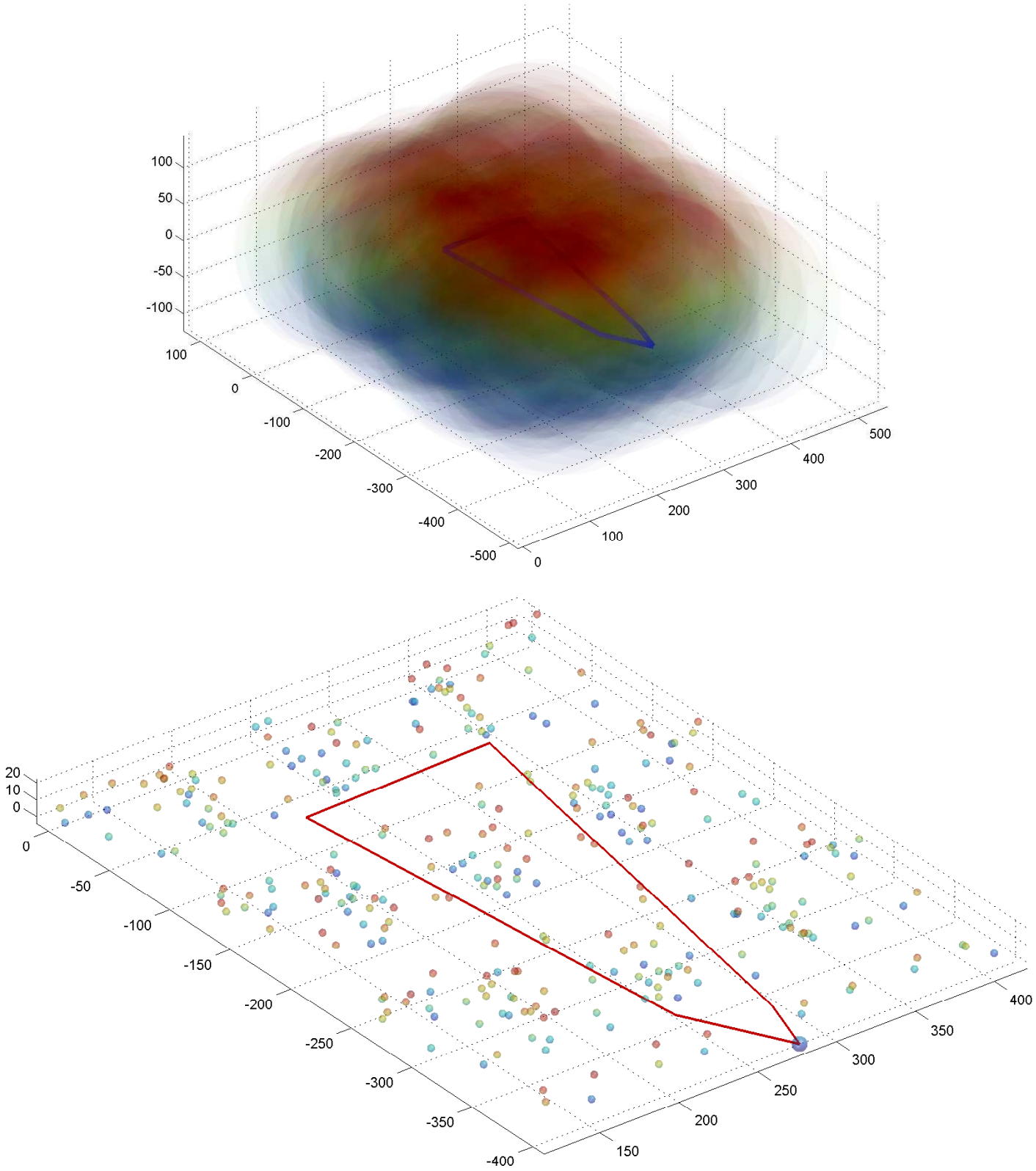


Figure N.78: $lin318$, $r = 124.02$, Equal Radius, 3D, Euclidean, Length = 766.8309750

Table N-81: Solution for $lin318$, $r = 124.02$, Equal Radius, 3D, Euclidean

Total distance: 766.830975029988 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
156.914599689001	386.692972486195	1.45081566854068	119.7	393.8	17.8
146.970962660914	371.593776350926	2.61554292180033	48	393.8	19.4
139.870105235926	360.811565539469	3.4473479079191	122.8	387.5	3.6
133.020199715993	350.410271193951	4.24975755203252	17.3	393.8	14.6
132.661649449463	347.616577855428	4.32465076516863	20.5	387.5	17.4
132.2256266633	344.220462639148	4.41567328323688	129.9	329.2	5.1
132.2256266633	344.220462639148	4.41567328323688	136.2	331.6	10.8
131.803326138135	340.931266624349	4.5038137498376	142.5	331.6	14.7
131.377158405367	337.611012777792	4.59280150379305	130.7	339.4	10.6
130.947237921151	334.260719926764	4.68260856606113	155.1	331.6	14.3
130.516056958674	330.900346006889	4.77269037416139	161.4	331.6	4.6
130.516056958674	330.900346006889	4.77269037416139	148.8	331.6	0.2
130.085227284046	327.54259912986	4.86270521437177	155.1	315.8	5.4
130.085227284046	327.54259912986	4.86270521437177	148.8	315.8	8.4
129.678303177025	324.371176231364	4.94772574614694	178	303.2	1.5
129.678303177025	324.371176231364	4.94772574614694	161.4	315.8	7.1
129.298800144781	321.413501451783	5.02701632509959	173.2	285.1	12.1
129.298800144781	321.413501451783	5.02701632509959	161.4	295.3	10.8
128.956947521605	318.749288809151	5.09843944176967	155.1	295.3	0.7
128.956947521605	318.749288809151	5.09843944176967	148.8	295.3	14.4
128.644708518541	316.315880691202	5.16367510787043	136.2	295.3	3.1
128.644708518541	316.315880691202	5.16367510787043	142.5	315.8	4.2
128.36140676239	314.108002733103	5.22286484701854	142.5	295.3	13.4
128.088070477541	311.977790503564	5.27997242703523	141.7	283.5	17.7
127.818470332219	309.876688979966	5.33629948548563	127.6	286.7	5.8
127.551301584013	307.794526691393	5.39211886797315	116.5	303.2	9.1
127.551301584013	307.794526691393	5.39211886797315	136.2	315.8	9.7
127.284191892148	305.712822907001	5.44792590662405	99.2	329.2	7.7
127.284191892148	305.712822907001	5.44792590662405	100	339.4	3.8
127.029269766077	303.726117371606	5.50118632994176	92.1	387.5	18.7
127.029269766077	303.726117371606	5.50118632994176	89	393.8	11
126.749270948601	301.544073450463	5.55968337073409	51.2	387.5	1.4
126.38414620644	298.698736367892	5.63596272511509	67.7	331.6	4.4
126.38414620644	298.698736367892	5.63596272511509	59.1	339.4	4.8
126.001450604187	295.716508771001	5.71591277797947	70.9	331.6	19.3
125.607159702937	292.643951676571	5.79828438371712	63.8	331.6	18.4
125.607159702937	292.643951676571	5.79828438371712	28.3	339.4	12.9
125.164038985404	289.191043620417	5.89085354506597	63.8	315.8	14.7
125.164038985404	289.191043620417	5.89085354506597	58.3	329.2	7.6
124.696422061526	285.54731471233	5.98853871449919	70.9	315.8	15.2
124.696422061526	285.54731471233	5.98853871449919	67.7	315.8	13.4
124.210164812276	281.758363899647	6.0901166281956	85.8	303.2	13.4
124.210164812276	281.758363899647	6.0901166281956	70.9	297.7	11.7
123.728771922752	278.007310228399	6.19067803305614	67.7	297.7	2.9
123.728771922752	278.007310228399	6.19067803305614	63.8	297.6	5.2
123.256978722032	274.331043272488	6.28923536916244	44.9	303.2	8.5
123.256978722032	274.331043272488	6.28923536916244	14.2	303.2	5.3
122.759631395617	270.45572595404	6.3931292644678	6.3	273.3	11.2
122.759631395617	270.45572595404	6.3931292644678	27.6	329.2	2.8
122.240176683534	266.408375571707	6.50163517838647	9.40000000000001	273.3	14
121.769107133303	262.738027831378	6.60003391489647	119.7	260.7	11.7
121.310475192268	259.164631521934	6.69583287301461	24.4	273.1	19.3
120.86876221997	255.723023314757	6.78809851394334	89	260.7	3.7
120.442758076538	252.403790870235	6.87708320110735	92.1	254.4	16.6
120.035049038822	249.227081203249	6.96224651144834	17.3	260.7	14.5
120.035049038822	249.227081203249	6.96224651144834	21.3	273.1	15.8
119.643210898797	246.173973916404	7.04409616813081	122.8	254.4	9.9
119.260941359367	243.195438251826	7.12394646866045	20.5	254.4	9
118.888357334394	240.292331724691	7.20177464366057	51.2	254.4	2.7
118.522609750329	237.442469491139	7.27817546048041	48	260.7	17.4
118.522609750329	237.442469491139	7.27817546048041	36.2	273.1	6.7
118.147369190129	234.518656572916	7.35655882692407	52.8	281.9	9
118.147369190129	234.518656572916	7.35655882692407	39.4	273.1	0.8
117.745318019693	231.386010612787	7.44054088182037	60.6	288.2	12.5
117.316452270769	228.044515933637	7.53012209923156	70.1	280.4	12.5
117.316452270769	228.044515933637	7.53012209923156	63.8	280.4	12.2
116.84491875126	224.370716910775	7.62861264062082	66.9	280.4	18.4
116.342380107893	220.455422744807	7.73357772234789	81.1	285.1	18.2
116.342380107893	220.455422744807	7.73357772234789	76.4	288.2	6.4
115.724501088213	215.641762722843	7.86262833234065	84.3	283.5	16.3
115.031745575287	210.244942708913	8.00731334448818	142.5	198.5	1.1
114.353744866313	204.963204508974	8.14891489740415	136.2	198.5	8.4
113.690419282587	199.795931285722	8.2874481640965	129.9	196.1	10
113.690419282587	199.795931285722	8.2874481640965	130.7	206.3	18.1
113.035885168338	194.697353730351	8.42413762318634	99.2	196.1	13.9
112.39474112245	189.703024302261	8.5580316251955	100	206.3	18

Solution x	Solution y	Solution z	Original x	Original y	Original z
112.39474112245	189.703024302261	8.5580316251955	70.9	198.5	18.8
111.760220890561	184.760092277411	8.69054591366711	58.3	196.1	1.6
111.137314266317	179.907530971772	8.82063753524068	63.8	182.7	4.6
110.534958546607	175.214964575218	8.94643968524446	70.9	182.7	16.9
110.534958546607	175.214964575218	8.94643968524446	67.7	182.7	12.4
109.953944356056	170.688462720592	9.06778889629985	67.7	164.6	2.1
109.953944356056	170.688462720592	9.06778889629985	63.8	164.5	8.3
109.419943049645	166.528026160822	9.17932401546579	76.4	155.1	3.4
108.908741519391	162.545138532317	9.28609921702466	116.5	170.1	13.6
108.908741519391	162.545138532317	9.28609921702466	127.6	153.6	18.6
108.394129992921	158.535595515484	9.39358842785336	70.1	147.3	17.8
108.394129992921	158.535595515484	9.39358842785336	66.9	147.3	5
107.92438270918	154.875568977476	9.49170777107139	67.7	198.5	11.8
107.92438270918	154.875568977476	9.49170777107139	63.8	198.5	2.5
107.396903258569	150.765958963127	9.60187956769923	59.1	206.3	14.9
107.396903258569	150.765958963127	9.60187956769923	28.3	206.3	15.8
106.748795279053	145.717101932524	9.7372319946262	85.8	170.1	5
106.748795279053	145.717101932524	9.7372319946262	81.1	152	7.1
106.078707492816	140.497300539457	9.87716839012305	60.6	155.1	13.8
106.078707492816	140.497300539457	9.87716839012305	63.8	147.3	12.9
105.421611922364	135.379157869607	10.0143817268483	70.9	164.6	8.4
104.741086207264	130.078749798397	10.156482456672	84.3	150.4	4.3
104.044170881158	124.650866891813	10.3020020830188	89	127.6	0.1
104.044170881158	124.650866891813	10.3020020830188	92.1	121.3	6.9
103.366356237646	119.371926575069	10.443531786277	119.7	127.6	15.5
103.366356237646	119.371926575069	10.443531786277	122.8	121.3	7.8
102.693646586486	114.132137995305	10.5840042732701	52.8	148.8	15.5
102.693646586486	114.132137995305	10.5840042732701	44.9	170.1	19.9
102.693646586486	114.132137995305	10.5840042732701	48	127.6	5.5
102.693646586486	114.132137995305	10.5840042732701	51.2	121.3	6.2
102.693646586486	114.132137995305	10.5840042732701	39.4	140	3.5
102.693646586486	114.132137995305	10.5840042732701	27.6	196.1	18.7
102.693646586486	114.132137995305	10.5840042732701	36.2	140	1.4
102.693646586486	114.132137995305	10.5840042732701	24.4	140	15.5
102.693646586486	114.132137995305	10.5840042732701	14.2	170.1	13.5
102.693646586486	114.132137995305	10.5840042732701	21.3	140	9.6
102.693646586486	114.132137995305	10.5840042732701	20.5	121.3	8.4
102.693646586486	114.132137995305	10.5840042732701	17.3	127.6	16.4
102.693646586486	114.132137995305	10.5840042732701	9.40000000000001	140.2	11.5
102.693646586486	114.132137995305	10.5840042732701	6.3	140.2	17.5
102.693646586486	114.132137995305	10.5840042732701	28.3	73.2	9.3
102.693646586486	114.132137995305	10.5840042732701	27.6	63	3.4
102.693646586486	114.132137995305	10.5840042732701	14.2	37	6.3
102.102554220356	109.527883559835	10.707429938593	58.3	63	8.5
102.102554220356	109.527883559835	10.707429938593	63.8	49.6	2.8
101.605859919213	105.658791377113	10.8111502300933	70.9	49.6	14.9
101.143559924793	102.057516540442	10.9076883630436	67.7	49.6	9.5
101.143559924793	102.057516540442	10.9076883630436	70.9	31.5	11.6
100.725808138234	98.8035363866253	10.9949178602869	67.7	31.5	4.3
100.725808138234	98.8035363866253	10.9949178602869	63.8	31.4	12.4
100.332561063022	95.7405197639538	11.077028752337	44.9	37	12.5
99.9425459820474	92.7025683146755	11.1584673208155	24.4	6.9	1.6
99.6433443636755	90.3717265701907	11.2209498688861	9.40000000000001	7.1	2.4
99.4622663918351	88.9608779118597	11.2587695521242	21.3	6.9	14.1
99.4622663918351	88.9608779118597	11.2587695521242	6.3	7.1	12
101.764742884863	88.9584009513775	11.2992743679621	59.1	73.2	9.3
101.764742884863	88.9584009513775	11.2992743679621	63.8	65.4	13.7
104.168106892434	88.9558081317254	11.3415496262476	67.7	65.4	8.4
106.484322611981	88.9533027580895	11.3822890096991	99.2	63	0.7
106.484322611981	88.9533027580895	11.3822890096991	70.9	65.4	6.9
108.586317664346	88.9510115246078	11.4192485094804	100	73.2	14.4
110.50297493027	88.9489149597646	11.4529439763093	39.4	6.9	14.8
110.50297493027	88.9489149597646	11.4529439763093	36.2	6.9	0.3
113.120863489016	88.9460990136348	11.4990136832107	60.6	22	16.9
113.120863489016	88.9460990136348	11.4990136832107	63.8	14.2	14.4
115.978170592934	88.9430533667572	11.5493236636514	70.1	14.2	16.8
115.978170592934	88.9430533667572	11.5493236636514	66.9	14.2	11.4
119.154492042598	88.9397026048991	11.6052813116869	76.4	22	1.9
119.154492042598	88.9397026048991	11.6052813116869	84.3	17.3	5.6
122.583829352195	88.936116622748	11.6657224342055	85.8	37	14
122.583829352195	88.936116622748	11.6657224342055	81.1	18.9	10.9
126.305539597077	88.9322462633947	11.7313323388308	116.5	37	12.1
126.305539597077	88.9322462633947	11.7313323388308	136.2	29.1	0.8
129.732626177849	88.9287209388193	11.7917804040691	141.7	-7.9	4.6
129.732626177849	88.9287209388193	11.7917804040691	52.8	15.7	13.8
133.994533862701	88.9242999209104	11.8669224497298	130.7	73.2	7.2
133.994533862701	88.9242999209104	11.8669224497298	136.2	65.4	3.7
138.114016156663	88.9200462592012	11.9395798384222	129.9	63	9.4
138.114016156663	88.9200462592012	11.9395798384222	136.2	49.6	6.3
142.270508835813	88.9157409072532	12.0128859000605	142.5	49.6	0.1

Solution x	Solution y	Solution z	Original x	Original y	Original z
142.270508835813	88.9157409072532	12.0128859000605	148.8	29.1	19.2
146.443258593519	88.9113887797187	12.0864571350431	155.1	49.6	5.1
146.443258593519	88.9113887797187	12.0864571350431	161.4	49.6	13.6
150.460535116479	88.9071916101144	12.1572884102677	148.8	49.6	18.9
154.513502802574	88.9029494387777	12.2287456136065	148.8	65.4	6.2
154.513502802574	88.9029494387777	12.2287456136065	142.5	65.4	2.7
158.745992858459	88.8985041843408	12.3033635168041	155.1	65.4	8.7
158.745992858459	88.8985041843408	12.3033635168041	161.4	65.4	7.2
163.012334472625	88.8940187996111	12.3785840677166	149.6	-7.9	5.2
167.555107666427	88.8892689256048	12.4587092438875	192.1	73.2	7.8
171.934977901339	88.8846895523784	12.535967929515	191.3	63	18.3
176.188171678278	88.8802437507722	12.6109968673788	178	37	4.3
176.188171678278	88.8802437507722	12.6109968673788	161.4	29.1	11.5
180.819599444261	88.8754095023861	12.6926977381874	208.7	37	3.4
185.323741032305	88.8707047757832	12.7721480927582	218.9	20.5	18.5
189.642817513166	88.8661869154929	12.8483228412667	227.6	31.5	14.9
189.642817513166	88.8661869154929	12.8483228412667	234.6	31.5	11.8
193.56052124064	88.8620637707093	12.9173884274366	227.6	49.6	17.6
197.380159225368	88.8580254449214	12.9847064797794	231.5	49.6	10.4
197.380159225368	88.8580254449214	12.9847064797794	231.5	31.5	11.2
201.020784195672	88.8541477004992	13.0488416691426	249.6	37	15.8
201.020784195672	88.8541477004992	13.0488416691426	240.2	22	17.8
204.316489434021	88.8506130476434	13.106876673784	263.8	73.2	0.8
204.316489434021	88.8506130476434	13.106876673784	263	63	0.7
207.186628634904	88.8474975578527	13.1573839305129	234.6	65.4	4.6
207.186628634904	88.8474975578527	13.1573839305129	234.6	49.6	6
209.991919562217	88.8444428091498	13.2067435478879	222	63	7.9
209.991919562217	88.8444428091498	13.2067435478879	231.5	65.4	1.8
212.827044716339	88.8413494910444	13.2566274677625	222.8	73.2	10.5
212.827044716339	88.8413494910444	13.2566274677625	227.6	65.4	13.5
215.73139041101	88.838171766377	13.3077277669394	308.7	6.9	18.2
215.640781541473	89.5513030434815	13.2778197656849	305.5	6.9	5.7
215.524695587562	90.4650204036067	13.2395007072922	290.6	6.9	18.4
215.524695587562	90.4650204036067	13.2395007072922	293.7	6.9	18.6
215.379119401177	91.6108848328014	13.1914471960061	127.6	20.5	16.5
215.379119401177	91.6108848328014	13.1914471960061	248	14.2	2
215.223763079253	92.8336789318933	13.1401613616888	275.6	6.9	6.7
215.223763079253	92.8336789318933	13.1401613616888	278.7	6.9	10.2
215.034296226708	94.3249099347243	13.0776137207643	141.7	17.3	2
214.826429844991	95.9608959520075	13.0089877745137	155.1	29.1	1.4
214.826429844991	95.9608959520075	13.0089877745137	142.5	29.1	2.7
214.602037481864	97.7268918434974	12.9348988045097	173.2	18.9	8.3
214.602037481864	97.7268918434974	12.9348988045097	222	18.9	3.1
214.343977329296	99.7578420657058	12.849685974104	224.4	14.2	0.3
214.343977329296	99.7578420657058	12.849685974104	236.2	14.2	3.3
214.035006130338	102.189461676426	12.7476526058302	233.1	14.2	19.1
213.691611097059	104.891998259907	12.6342444996201	240.2	15.7	7.9
213.302764634546	107.952247384637	12.5058191329005	293.7	63	15.4
213.302764634546	107.952247384637	12.5058191329005	280.3	37	9.6
212.799916392349	111.909166680403	12.3397158354864	294.5	73.2	1.3
212.261252743431	116.147252192972	12.1618020526527	215	121.3	10.5
211.731256018989	120.3168415419	11.9867670718829	301.6	127.6	0.4
211.258381596293	124.036497709569	11.830637951727	184.3	121.3	14.5
211.258381596293	124.036497709569	11.830637951727	211.8	127.6	10.4
210.795890514602	127.674082697125	11.6779674529325	305.5	140	11.2
210.795890514602	127.674082697125	11.6779674529325	308.7	140	16.6
210.39363160567	130.839618201573	11.545162187733	173.2	152	19.2
210.39363160567	130.839618201573	11.545162187733	181.1	127.6	7.7
209.944499277553	134.373734645522	11.3968771389377	155.1	162.2	15.7
209.944499277553	134.373734645522	11.3968771389377	161.4	162.2	17.4
209.522556467558	137.693686242163	11.2575645696795	141.7	150.4	15.8
209.092542199669	141.077003234457	11.1155815354086	148.8	162.2	5.3
209.092542199669	141.077003234457	11.1155815354086	142.5	162.2	2.7
208.654582166139	144.522861590449	10.9709645724756	136.2	182.7	6.2
208.654582166139	144.522861590449	10.9709645724756	136.2	162.2	1.7
208.244573536656	147.749081840532	10.8355725710688	148.8	182.7	9.2
208.244573536656	147.749081840532	10.8355725710688	142.5	182.7	2.1
207.883596827567	150.589791040347	10.7163771432595	155.1	182.7	16.5
207.54619876037	153.245062990078	10.6049708958211	148.8	198.5	8.3
207.54619876037	153.245062990078	10.6049708958211	155.1	198.5	17.6
207.260113775531	155.496684422811	10.5105152006464	161.4	198.5	1.4
207.260113775531	155.496684422811	10.5105152006464	161.4	182.7	0.7
207.007314726162	157.486429622855	10.4270536561744	181.1	260.7	13.4
206.799754504211	159.120160526641	10.3585304917192	192.1	206.3	17
206.799754504211	159.120160526641	10.3585304917192	222.8	206.3	17
206.609277867366	160.619414844752	10.2956468073324	191.3	196.1	16.7
206.422159177677	162.092236249077	10.2338713487163	263.8	206.3	6.2
206.422159177677	162.092236249077	10.2338713487163	294.5	206.3	5.6
206.251826463067	163.43290143969	10.1776378129475	178	170.1	11.6
206.069526834185	164.867725661924	10.1174517955177	293.7	196.1	5.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
206.069526834185	164.867725661924	10.1174517955177	290.6	140	0.4
205.898173446644	166.21640360043	10.0608812483076	208.7	170.1	15.4
205.898173446644	166.21640360043	10.0608812483076	218.9	153.6	11.5
205.705781508707	167.730632373097	9.99736347650185	222	152	14.6
205.705781508707	167.730632373097	9.99736347650185	233.1	147.3	11.4
205.502014006289	169.334369053688	9.93008850281018	224.4	147.3	2.3
205.289774459424	171.004775089137	9.86001585109435	236.2	147.3	7.3
205.289774459424	171.004775089137	9.86001585109435	240.2	148.8	5.8
205.0574367466	172.833344595896	9.78330680593481	252.8	127.6	3.3
204.811971702622	174.765191257042	9.70226174335869	255.9	121.3	14.5
204.811971702622	174.765191257042	9.70226174335869	283.5	127.6	15
204.524243925269	177.029523721324	9.60725694173294	286.6	121.3	15.1
204.199799411509	179.582713332865	9.50012471051042	278.7	140	19.3
204.199799411509	179.582713332865	9.50012471051042	293.7	140	9.3
203.81134431845	182.639471158311	9.37185170847147	275.6	140	4.2
203.39173089227	185.941335254989	9.23328801165559	249.6	170.1	0.7
203.39173089227	185.941335254989	9.23328801165559	248	147.3	4.5
202.941848153257	189.481301288759	9.08472579131353	234.6	164.6	0.1
202.941848153257	189.481301288759	9.08472579131353	240.2	155.1	5.1
202.463813867288	193.242688857149	8.92686116007675	227.6	164.6	1.4
201.971626324145	197.115414860288	8.76431859466211	227.6	182.7	0.3
201.971626324145	197.115414860288	8.76431859466211	234.6	182.7	13.3
201.470860053096	201.055662316944	8.59893505777407	222	196.1	3.2
200.97429110116	204.962940129835	8.43493332725808	231.5	198.5	1.6
200.481176579207	208.84310482233	8.2720685625292	227.6	198.5	10.4
200.481176579207	208.84310482233	8.2720685625292	234.6	198.5	10.6
199.986782331645	212.733489871143	8.10877210648616	231.5	182.7	19.2
199.986782331645	212.733489871143	8.10877210648616	231.5	164.6	6.5
199.420318440479	217.190972284047	7.92167215738689	263	196.1	17.9
199.420318440479	217.190972284047	7.92167215738689	280.3	170.1	14.3
198.719226818394	222.707490658368	7.69009368613297	286.6	254.4	15.7
198.051893063032	227.958260843887	7.46967491530867	255.9	254.4	18.1
198.051893063032	227.958260843887	7.46967491530867	252.8	260.7	8.8
197.420911443947	232.923105518704	7.2612680203556	248	280.4	9.5
196.825598779528	237.60740602681	7.0646492938792	234.6	297.7	7.7
196.825598779528	237.60740602681	7.0646492938792	275.6	273.1	17.9
196.29785741896	241.760322288115	6.89036585471652	240.2	281.9	12.5
196.29785741896	241.760322288115	6.89036585471652	240.2	288.2	11.3
195.812402303631	245.58081385726	6.73006254829255	236.2	280.4	11.1
195.340306988898	249.296303997711	6.57417695884564	224.4	280.4	17.9
195.340306988898	249.296303997711	6.57417695884564	233.1	280.4	17.3
194.890404812007	252.837344504734	6.4256285637012	208.7	303.2	16.2
194.890404812007	252.837344504734	6.4256285637012	231.5	297.7	7.4
194.483428352368	256.040768375211	6.29126441667535	222	285.1	1.9
194.483428352368	256.040768375211	6.29126441667535	227.6	297.7	4.1
194.096309866439	259.088017764729	6.16346253997978	218.9	286.7	3.7
193.712740633241	262.107352016014	6.03683320289065	283.5	260.7	2.6
193.712740633241	262.107352016014	6.03683320289065	290.6	273.1	10.7
193.327619280896	265.138855058768	5.90968689271438	184.3	254.4	16.9
193.327619280896	265.138855058768	5.90968689271438	215	254.4	19.4
192.912066124803	268.409880411124	5.77249092916512	211.8	260.7	3.2
192.490577386748	271.727585595232	5.63333202838675	301.6	260.7	2.7
192.490577386748	271.727585595232	5.63333202838675	308.7	273.1	9.4
191.963153297616	275.879073355635	5.45917416491207	293.7	273.1	6.2
191.963153297616	275.879073355635	5.45917416491207	305.5	273.1	0.7
191.31858065495	280.952569542363	5.24630387895991	278.7	273.1	18.4
190.621142445903	286.442082822233	5.0159628304192	280.3	303.2	11.5
189.92521116329	291.91975777205	4.78611882396925	249.6	303.2	7.3
189.219129612144	297.477302894292	4.55291884712207	191.3	329.2	9.3
189.219129612144	297.477302894292	4.55291884712207	192.1	339.4	1.6
188.547105997344	302.766882624914	4.33097131976027	222.8	339.4	15.5
187.898991611746	307.868306573726	4.11692274470124	222	329.2	14.2
187.898991611746	307.868306573726	4.11692274470124	227.6	331.6	9.8
187.249827522429	312.977984661341	3.90252243922774	231.5	331.6	8.7
187.249827522429	312.977984661341	3.90252243922774	234.6	331.6	5.2
186.599544498418	318.096429429903	3.68774539180683	227.6	315.8	6.5
185.923806617046	323.415224490445	3.46455781894127	231.5	315.8	7.2
185.217640529219	328.97351168081	3.23131730777504	234.6	315.8	11.2
184.473046839699	334.834201099033	2.98537643048238	263	329.2	0.8
183.687701128065	341.015525430921	2.725963334909	293.7	329.2	1.4
182.74259166986	348.454104321417	2.41374427670206	294.5	339.4	13.8
181.553315275366	357.814025796245	2.02081351364662	263.8	339.4	8.3
180.203979801853	368.432468797949	1.57492635476946	301.6	393.8	0.9
178.879393026253	372.93552694679	1.3835817709236	286.6	387.5	8.3
178.879393026253	372.93552694679	1.3835817709236	283.5	393.8	11.4
177.538609203572	377.493571369487	1.18990588711667	255.9	387.5	4.9
176.199802025471	382.044815743362	0.996527248960135	215	387.5	7.3
174.880475240775	386.52983135568	0.805962352204304	252.8	393.8	15.4
173.615100771961	390.831084449453	0.623253580311371	211.8	393.8	13.7
172.410295532018	394.926413717707	0.449298004955566	181.1	393.8	14.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
171.055949433931	399.530632662256	0.253649714732177	184.3	387.5	3.8

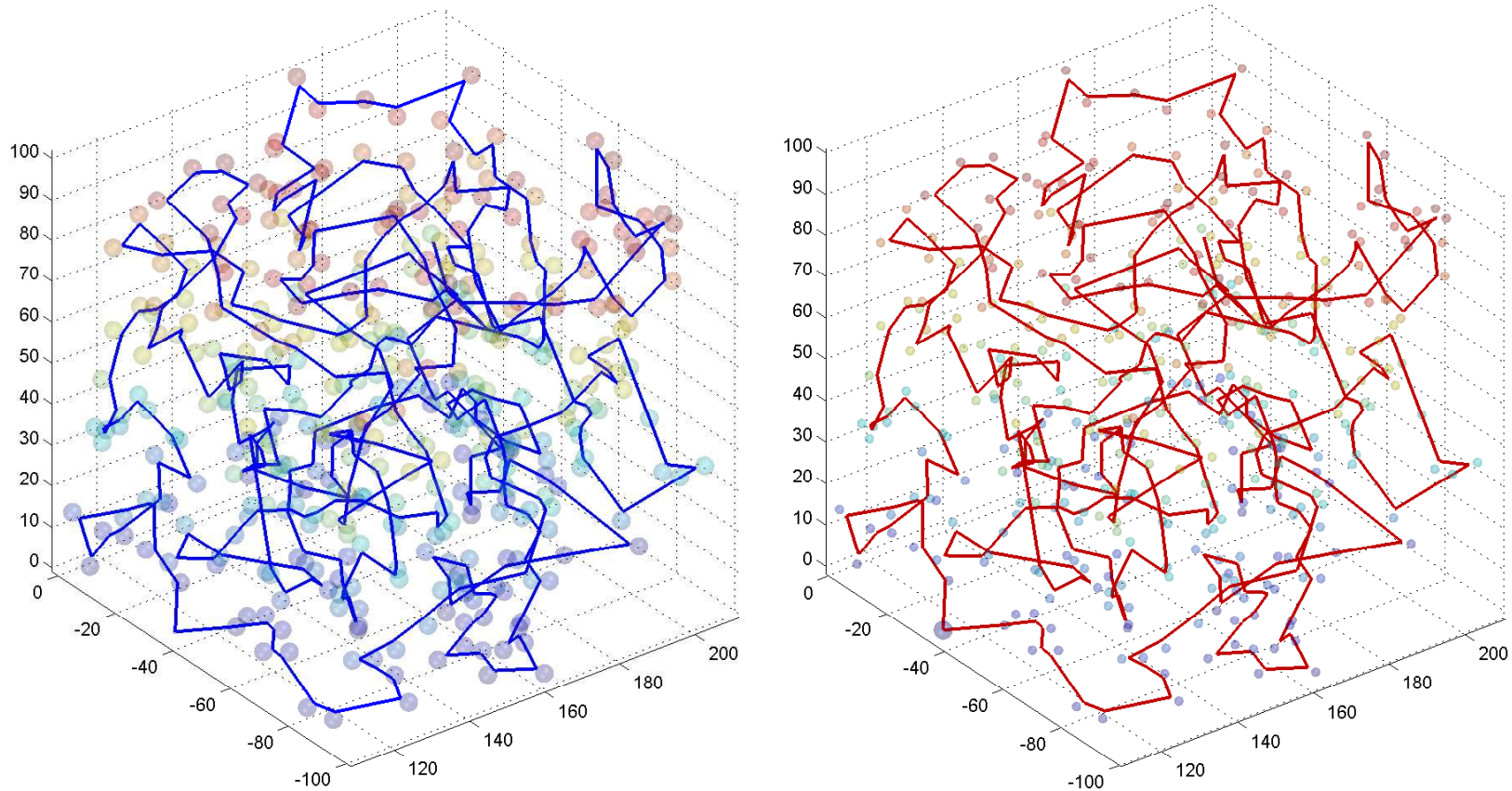


Figure N.79: $rd400$, $r = 1.9910618$, Equal Radius, 3D, Euclidean, Length = 3218.1975430

Table N-82: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 3D, Euclidean

Total distance: 3218.19754303697 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
11.8720531480384	23.7606847905745	3.2643047391566	13.4	22.8874	2.3331
6.97023691660789	22.3364271530572	12.3931727413112	5.81823	20.7452	12.0688
4.24873346559311	25.7672180939797	25.7592359313621	5.25835000000001	27.1001	26.8402
3.32783407274938	25.1388892481134	26.1348813034995	2.1823	25.6845	27.6693
2.21009842071842	18.9072218847377	22.1929411264765	0.659450000000007	19.6999	21.228
0.743492232325963	4.32162105480355	13.9622379644297	0.219756000000004	2.58493	14.7832
2.90161881535279	5.71958475772487	4.34300536562399	2.00806	6.28968	2.6575
9.18446207789908	3.65760352563559	6.59129615745507	9.0496	1.67955	6.7742
11.8939667161371	4.31029625425481	7.38463135296185	12.7116	4.29147	5.5693
20.4072673768235	6.65633327482545	12.688273493229	21.4744	8.21886	12.0685
23.0209100942303	2.74656985186594	19.0052876760813	23.1984	1.0131	19.9686
24.6344895457727	11.5453111297084	18.8240891717228	25.6231	12.6549	17.499
16.8614713926967	15.8430892321241	32.9353394830317	17.2907	17.3232	33.1257
16.2610059198282	16.1751076507201	34.0254496154961	15.6444	17.8995	34.8069
16.0293612663094	9.4247872883261	36.1264267856348	14.8737	9.51072	37.7455
17.6404676376822	2.35748298602708	35.6928594101596	19.0116	0.977048	36.1157
12.4958055505702	3.25263912645881	33.3742754417118	12.6307	2.70835	31.4638
9.2630883495132	4.32930828933914	33.8634989046916	8.57052	3.36732	32.2638
6.22888572699043	5.5886736763884	34.678252129801	4.96047	4.06059	34.5353
3.40676122454713	9.57690215925907	36.0990128277216	2.19732	10.251	34.6682
2.77587819771429	14.4171338741697	44.1975047342774	2.68873000000001	16.3883	43.9305
2.5462056760729	12.4885608505128	51.0746775683313	0.613562000000002	12.2624	51.4967
7.26688542101132	10.4449090980651	59.3631968783955	6.43447000000001	8.70233	59.8478
11.0682092018499	11.1522900032158	63.8597520420774	10.9524	12.0779	65.6188
21.9127362537169	3.32516895823968	56.9791330838318	21.7245	2.01127	55.495
26.5092583378148	4.93245590152314	59.5102469814778	26.7979	6.90196	59.464
31.3038551628568	1.61443110743578	62.6991244327889	33.1085	0.882753	62.284
23.4205286288085	2.16068367013946	72.789104075479	23.5387	4.13129	73.048
19.2619925190355	1.02648705389852	77.8166120812434	19.7287	0.198716	79.5663
12.8488262414108	3.29582290104693	75.834293816531	10.9477	2.73525	75.6448
18.3119572998319	10.0482954252896	74.7188345529198	17.1854	11.1942	73.5432
27.1168660659835	16.3397489032512	75.4634866919913	27.3595	17.3028	77.1892
34.0579893208663	17.8701082781412	68.6452289764438	36.0033	17.5038	68.4307
28.0404023582996	21.3761918750616	64.2465735596866	26.0672	21.3383	63.983
33.0003327110642	24.1039706551847	62.2963582954498	34.4638	23.0393	61.4662
33.6184501451183	30.780498372423	62.916720212182	31.6686	31.1822	62.9487
36.0622954482384	38.2329056255105	63.6138739529942	34.4656	38.8185	62.9703
38.2922209866628	45.0314525948462	64.2500675890283	38.1612	45.7549	62.3997
39.3056776682157	47.3157825567247	65.8402038107351	38.5534	48.7846	64.7262
41.8236288653623	50.4995692076157	69.7386770523642	41.6783	52.1535	70.8377
47.5562483128883	42.45293599894	67.5944743075804	47.522	42.292	65.6102
54.4002546301489	33.5094503115511	71.3718967709082	55.099	31.771	70.6981
54.8993664735303	39.2869765871171	79.9008460673046	55.717	37.8511	81.0117
54.7488568468993	45.9980739618718	87.3027266713524	53.4254	44.9898	88.3964
55.3868340423656	51.4899759684083	92.1129577100191	54.0007	52.8659	92.5002
62.221996969242	51.0425261057948	95.3648774767409	62.6521	52.6724	96.4246
69.2856011157467	44.6206723380036	95.6516100874862	70.0979	43.9308	97.3335
72.3583658986538	41.5293700081216	85.6908453026405	72.565	40.2263	84.1996
74.0928627008833	57.8002708254187	93.5797405869256	75.5117	58.1702	94.9268
69.6430318846019	62.5346117385788	91.6812725111719	69.9395	64.1832	90.6048
65.31263459244	60.7505607162811	93.7477945685547	64.8783	60.379	95.6551
61.4232711581155	59.9905632305653	88.1673237055388	59.9164	58.75	88.5608
60.7716440075306	63.5692001376304	77.2219140072969	59.9164	61.9972	76.3491
62.0351977071844	70.5924712606212	68.391824225654	60.9907	71.4945	66.9566
66.4995457273649	70.1597900750637	70.0693429137107	65.9297	69.3415	71.7927
76.9091637207153	69.8402345486351	72.4522333858478	78.2186	68.7569	71.4148
79.3350112207747	74.9930967586685	79.708435464197	80.9911	75.8316	78.9882
79.2437602934727	77.0010727719686	84.0976760132215	80.8889	76.3527	85.0129
75.3270976591832	82.0239198567459	89.7518868304557	74.5996	81.8744	91.5993
76.3782381651685	91.1582243539911	80.5140538759756	75.4786	92.9344	80.494
76.7609506895206	90.9342949700343	80.0833409958458	75.6586	91.7899	79.8395
84.6085690713881	86.342573041182	71.2513535763027	84.4594	85.6238	69.4005
92.2363562908068	88.0826962225434	78.2034114544145	92.7385	89.9534	78.6648
96.1473793564454	81.8702677311646	81.7532280375847	98.0879	82.1977	81.4504
95.9172861229306	78.5024159081842	83.8040841600984	95.1537	79.2325	85.4918
96.1754407030586	74.1118617514883	85.0139965031055	98.0725	73.509	85.0617
90.3455330720567	66.9894402742097	87.3738192281914	88.5712	66.6382	86.5414
95.5195183900742	60.1170263187912	96.5424861664253	96.3481	58.4969	97.3507
92.6631991810941	67.8227807536144	96.4506876230517	93.4248	68.5015	98.1606
88.3999070868504	75.0330302511795	93.6681134907143	87.0562	74.7862	94.9506
87.6392361462624	76.3196232196325	93.1715135456344	86.1254	75.412	92.2501
85.7847550177295	82.8359408503841	91.8954485895912	85.2864	82.465	90.0038
84.5815856926552	87.794557440843	91.6010534823634	83.5669	88.2708	89.9554
86.3022208727328	95.5935967601727	97.6374897779299	87.9339	96.7331	97.5762
85.8238492489183	95.674654705877	98.0393616747907	86.1563	95.4019	99.9835
76.1306336751892	98.4138124280962	94.9162928838274	75.6359	99.7073	96.3469

Solution x	Solution y	Solution z	Original x	Original y	Original z
65.5396914285043	98.6731422368401	87.7368008012684	65.9332	98.9174	85.8003
55.1912151224244	97.8901860629745	89.7122228632669	54.3707	99.6057	90.3024
50.2464082586527	92.1790936440879	89.3547486419323	51.2472	90.6526	88.5593
38.3468454871194	87.7727167434681	91.5154655345441	37.7453	86.3505	90.2585
32.4104581353442	90.0211056207318	97.6571590812691	32.5896	90.759	99.4978
29.5813542846818	89.1408583993171	95.6765335348838	28.4623	90.5817	94.8789
26.0485899788257	75.2358827745382	93.3043472309927	27.1361	73.6904	92.6772
16.8050465845726	75.9040269421066	95.730078468836	16.8354	77.4785	96.9485
6.77225314677587	73.4311202993481	95.8753292453717	4.99968	74.2733	96.2118
14.3117558417924	56.3757060637828	91.1701278430602	13.8308	54.4775	90.8096
17.8290576718634	59.2260302297784	91.3661264818688	17.6011	61.1721	91.0121
22.210507111948	57.3441955291452	92.4807311572894	23.2085	58.8069	93.3912
31.4651294861836	45.7532719814692	92.191413417331	31.4339	43.8079	91.7683
42.0181250737998	57.1496154514818	97.1212764852474	41.7302	58.1199	97.2119
43.0931686136426	58.3105866751386	97.6234798503294	43.5841	58.7522	99.5019
47.2102250633367	63.3822496111414	87.9062404689647	48.6743	62.5481	86.8455
44.7268630020766	68.6162477713906	86.2379515673272	43.1006	68.5786	87.3861
42.76570005669	80.0641854880132	80.1907868400254	43.0779	81.6476	81.3569
40.5578089427976	81.9547344468885	72.7260092485921	41.546	82.3742	71.0491
30.8909212692963	81.3757740517924	75.1564521981012	29.8827	79.684	74.8634
26.7174947130096	88.645205795527	78.7249106686078	27.9893	89.6021	79.9213
12.0313210945963	96.7762925453135	78.7185159274394	12.7313	98.6134	79.0339
4.81383338709858	98.4630271228456	78.388116157463	3.57801000000001	99.0366	79.8401
1.98625122697146	96.2985233107393	63.2916186119334	0.299018000000004	97.3272	63.0477
3.72167915174126	92.510914817069	53.2321046162277	3.24988	93.8751	52.5027
4.08132118897832	91.7259948574641	51.1474325986732	4.28894	92.6489	49.3954
4.1214435022424	89.7909038197801	51.6520935078527	3.06059000000001	88.1315	51.3598
18.5266665870555	94.9557012295464	59.9138430809827	18.064	96.3276	61.2807
26.0602350609977	93.6625533366325	59.9951994804382	27.8353	94.5623	59.9313
20.1929634152328	81.8536515789419	60.8155372335621	19.5225	82.1483	62.667
15.7117691733368	71.423732634484	59.9339230496219	14.0141	70.4084	60.1608
17.1640534181063	71.2628301429708	59.5431763122844	16.576	71.2313	59.4946
22.2457435914268	70.6997410352719	58.1758215978944	23.7167	70.7298	59.5174
23.4182266395752	69.86318887889	51.4990483298286	23.6206	68.344	50.228
23.5921883285646	77.6717263223933	51.1922729330257	23.3293	78.9181	52.7226
24.9827456590865	79.6761183351987	43.8006007212008	25.7615	81.4539	44.2448
25.5943738720298	80.2355400280084	38.2951053932574	26.7929	78.8352	37.5421
22.825400890723	85.3627668175629	32.4296668834986	23.3569	85.0798	30.5318
17.241385751468	92.4398460781331	34.6704140635146	16.7243	94.3593	34.7835
15.9196514586622	82.5717402901167	36.0629782161933	16.5471	81.1813	37.3426
10.6349520985098	82.9479603927826	28.9056370732952	8.89064000000001	83.8954	29.0611
11.4671795802437	81.53581726453	25.8949276957294	10.1219	82.045	24.5182
16.099448716076	77.6627862984555	23.1724705882325	17.2306	77.2747	24.7644
19.8341955503669	73.7640410421655	17.8331547225254	20.7262	75.308	17.3361
24.918499774874	68.4553031785188	10.5641365537557	24.7619	69.8637	9.1655
30.7198901097802	61.0794624066947	3.98862506304802	31.2678	61.1344	2.0752
31.9590715445581	54.8710025283984	10.5516982779996	30.6696	55.2626	12.0174
35.434204835999	49.6588537014698	12.2831257926238	37.4105	49.4356	12.3771
29.7049971283987	44.4245801163599	13.9218807997145	28.6889	43.6077	12.417
27.4556323641614	41.838597918283	23.1205186588314	26.2003	42.5604	24.4871
35.9271914758066	31.7658565186954	22.9491521355498	36.8488	32.2474	21.2512
37.9174766595837	28.6604003647826	23.6957272039014	37.0272	27.4581	25.0096
46.9067504753408	25.0760461742764	20.4280004749466	47.6331	25.3181	18.59
50.1898738367321	21.5873619851003	25.6873258166331	49.4045	19.961	26.5255
62.2311247867529	26.7223603898034	29.7030841321346	62.0154	28.1819	31.0401
75.5898635135215	24.2614288417856	26.7496401188886	76.419	22.7841	27.7958
80.9104808243551	28.1441753597801	21.0596747765399	81.7106	28.112	19.2367
80.2075791479419	33.5626771633773	31.1242339336896	80.1207	32.7664	32.9471
80.1829032123559	36.7584961026128	30.289214575972	80.5435	37.2793	30.7227
80.1706847081728	38.3435377114564	29.8750577984336	81.8496	38.8539	28.9342
74.872408654531	45.0668707310062	30.635644431387	73.064	44.6995	31.3834
75.6387970466255	48.7211213466097	29.6773427105911	74.6616	49.1772	30.6996
76.5810154974448	53.2135717912556	28.4991814769884	74.8357	53.7031	27.6754
77.4835967911926	54.8390053825317	28.2842914000974	76.3859	55.8636	29.5918
81.0764224180044	59.3983282147005	26.7630749940513	81.8774	60.6902	25.477
80.8470684286576	58.645560494709	28.447263033295	82.7455	58.0479	28.4959
79.179649026453	54.8873306013993	37.1791722117941	80.6139	53.7748	37.9975
72.0798423155009	55.9844600221998	41.5814235682348	70.983	56.1077	39.9244
68.3230377343983	56.573156650626	44.3230225975329	67.8108	54.6502	44.2592
64.071002031143	57.9769122782986	47.5869997906017	64.2573	58.953	49.3124
58.8688757154396	56.1979579631376	45.2837303186314	57.8122	54.5104	45.2899
58.3332166523736	60.4931966303275	43.4458581634526	58.3448	60.9201	41.5011
58.0260865171019	62.189987740327	45.3213127885349	56.0439	62.2937	45.4781
60.3903399699116	67.2158031333238	50.8060872711668	60.771	67.3196	52.7577
60.4412881660282	73.4690418175922	41.6148714249597	61.6789	74.8507	42.3385
60.1440372251757	74.6338775817598	39.2136650553628	59.2712	76.4167	39.0582
64.2546893007232	68.7963037567844	29.1694003506487	65.3011	67.1869	28.6409
61.7222341873614	72.8986876701593	27.0409685890197	60.356	72.3736	25.6911
62.1716564155587	79.635169439794	27.9682875331219	60.2539	80.1704	27.9583
62.1717802516325	79.6356100711145	27.9683502757086	61.8453	80.8454	29.5157

Solution x	Solution y	Solution z	Original x	Original y	Original z
64.8551134805332	80.464464786906	23.1667420286481	66.7645	81.0279	23.2022
61.6391071001481	79.5623950771825	16.9580359756192	60.7208	77.8844	16.4053
61.9957597564902	84.2224302729587	13.7304589288698	63.6977	85.2552	13.695
54.4074895540291	87.2894783135884	8.32920646049431	54.7886	87.0165	7.4948
49.9325988910818	89.098140308147	5.14407714735255	48.934	88.5471	3.512
49.8391588024653	92.7805277857308	8.59424693559572	49.8328	92.6571	10.5815
49.8085066825432	94.5016898802328	7.3418971780308	48.9418	95.7946	8.5835
50.5551877107223	97.9541836870941	2.7389843702865	51.8363	98.9629	1.5963
41.2470400862359	95.4541567072047	4.40470204149084	40.4171	94.2218	3.0792
35.3278809658904	98.4045451738863	12.0940642275373	34.7579	99.7518	13.4448
34.3573672675016	87.6218842312944	6.88734087071653	32.7208	86.88	6.0296
40.0223709985041	84.6795527957218	7.35310685606458	40.7053	85.7824	6.0265
45.8742270406695	81.6397246234343	7.83465268700591	45.1636	79.7971	7.5816
49.6709455171959	80.5521813768985	8.22490099259728	50.5772	79.5094	6.7911
52.2189921636732	81.8838757836422	12.5061802129117	54.169	81.8375	12.9059
49.8895776797718	82.7577695347658	14.2384992502341	50.9984	83.4341	15.7476
44.6979474774816	84.040561003806	16.6791892874885	43.3068	85.4106	16.2891
44.7698805791028	83.3473702456418	17.3325248225256	43.9629	81.9344	16.1851
45.5258626039562	80.3037130161991	21.3454602219521	45.6946	80.9262	23.2292
46.0402072278721	70.7956304410479	18.4287239174407	47.6475	71.1843	17.3202
46.1070344056176	67.8460425987285	17.5938020624464	45.2184	66.3382	18.5431
50.8277061230418	67.2423718166078	10.403704118875	52.5118	68.1256	10.9937
52.7688866611777	65.3060648853652	2.59915931295476	51.793	64.9464	0.9013
67.0267158859307	65.7598608164663	7.16061802824071	66.9764	66.2314	9.0944
85.1086818236403	63.8543698827805	2.72049567314765	85.3959	62.1638	1.7086
96.564926973121	70.2871513160641	4.23918157031902	97.9153	71.697	3.8476
89.6401309171733	55.1735986116018	13.1504746987326	88.4474	55.9131	14.5629
89.2842860695499	49.1578269284494	13.8001672219655	90.8764	48.3318	12.9357
85.0339341480254	43.7046826049672	16.6716319387869	85.2354	42.0312	17.7315
79.0106168528312	48.2749819252039	13.1278949280276	79.5061	49.6701	11.7965
70.9216714082568	47.1318972918679	15.0403570412129	69.2786	47.5055	16.1011
72.5589141775895	45.6121356844632	12.7099798968366	72.4782	47.1166	11.4083
80.2879304388076	36.376750414048	3.75149276624252	80.0506	36.8529	1.8328
90.7998896684977	22.5787675174497	5.66674265901569	90.11	20.7153	5.7932
97.6592278234107	24.1030775385917	5.9579325375118	98.8743	25.646	5.6301
97.7077523164953	23.2139068675084	6.22805490664035	99.5853	23.4577	6.8435
97.7858692740991	16.6444096197433	8.12123634024729	97.4766	17.1802	10.0021
97.9225020093137	5.49723942014593	11.306227095607	98.9579	4.73211	12.8251
95.8521938452559	3.72138112387874	9.16220190252505	95.7659	2.55349	7.5519
89.8271348984394	8.96510614997143	17.398534386908	88.9914	10.7701	17.3091
89.6218021287418	2.21495677971955	25.6012677402707	88.6343	0.494442	25.7719
98.3412017039332	8.66852149527888	35.2586094963499	99.5164	7.77478	36.5945
97.0629751111064	20.1942758797428	33.6004974953067	97.2905	22.0419	32.8941
93.3327862614402	11.2736164309457	39.6924799159721	91.7898	10.5225	38.6828
94.4744856170923	4.94174955783009	48.7117028638164	95.0473	3.39817	49.8314
89.2783531855281	15.4126039383895	45.9178263956391	88.2698	14.9994	45.4757
87.8476878374241	18.295592201515	45.1485596632521	86.8707	18.0065	43.4379
87.0542912150891	23.2648287929603	46.4918546182768	87.5589	25.1226	45.9834
80.6796464443119	17.3349955488228	54.1243509390041	78.906	18.0381	53.555
79.7706279058551	15.7122591484205	56.1020908893231	80.035	15.8589	58.0701
73.2561962674527	6.75809460635539	49.3615148321341	74.632	5.60444	48.5009
62.4186698475286	2.24775224082287	45.9390358434946	60.7013	1.36116	46.4176
69.4149280389191	6.89441643583601	37.8429465496385	68.2389	8.47105	37.5341
76.1891798829754	9.77219754401673	31.1520750798295	77.911	9.90186	32.1435
78.0852722967558	12.0728117292673	22.590835523943	79.2919	13.6517	22.466
73.7934560945377	6.12885074440024	7.81201071422309	74.5771	5.70821	6.0306
71.1284782470566	6.02856853701553	9.31638478548929	70.1018	4.34543	9.0382
66.1607699886202	13.2823756807549	16.0017611804786	67.267	14.1516	17.4107
59.9124521019217	14.9026761613535	15.6590381812846	58.7637	13.9566	16.9818
56.3650288130112	19.3899164658261	11.4901554289137	54.7387	20.4852	11.8363
61.5324422082898	18.5971656896259	4.08311557924843	62.8285	19.7058	3.0557
57.2126376752815	8.66880664045987	3.54899015624131	58.2097	7.56071	2.229
49.0387088351349	2.78159890801718	8.0147017025113	47.3917	2.23053	7.041
50.152434751751	1.47831668531246	13.616616649337	48.5894	0.54797	14.4264
54.2912467243309	2.03796647754755	17.4557283529205	56.1254	1.40532	17.903
47.7947513234244	7.39207996317451	20.3046890076542	48.6979	8.85907	21.303
39.5954658268966	9.06871009375288	20.6966928005183	38.2491	9.61738	19.3363
39.0735933190947	7.29977007637876	30.4972570857645	37.2177	7.79249	31.0238
42.0075621348734	5.24917995819571	36.1004173729943	42.0178	3.44287	36.938
47.6244002734252	16.1872751677963	40.0688793656716	49.4944	16.327	40.7382
43.0706275728149	21.660171094738	39.5212106786814	42.987	22.9253	37.986
37.161705461174	22.0447506870981	47.6064733120342	38.2173	22.874	49.077
31.8649025694135	20.8133700380118	49.7362430543525	31.0765	22.0815	48.5077
26.4501110737342	19.553656806112	51.9144054091366	25.7178	17.895	52.7372
24.1473955045495	24.4106910057459	50.9267456368126	25.8125	25.1372	50.1121
20.8414703871762	30.087876046132	49.9762155438753	19.5262	30.4483	48.5255
21.9775724618893	32.7036634717559	52.8832109185409	22.7183	34.3604	52.0641
22.0911075172284	33.0498700768818	57.8941168884432	23.2874	32.7742	59.4617
17.0763950094101	34.6067567324784	56.5648424495481	17.6023	36.5196	56.7286
10.5011799213846	36.4807725378285	54.8199171182223	9.16001	37.8018	54.1714

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.7686840245196	25.0566564912374	58.9574910048458	15.3897	25.3897	58.7078
15.0616725830939	20.5353361555281	60.5950318853107	15.6993	18.7479	59.9926
14.1235935841955	22.4945416741197	63.6193284956334	15.3759	23.0999	65.044
3.86257143205091	24.2851829200432	63.393565627901	2.38826	24.0295	62.08
4.36801579160361	26.4449207601314	69.01904550834	3.44571000000001	28.2052	68.896
5.62530867972306	26.3089948284932	73.2131454385469	4.056	25.9589	74.3875
18.4560516257919	27.7002127276533	81.7501363658897	19.247	29.2712	80.817
25.5217031131428	26.3807510553059	88.5007586979229	27.4222	25.8428	88.2494
22.2287690429764	27.7738859971714	94.1413776015066	20.3288	28.022	94.6827
27.6314543787503	27.940887970169	96.8632503428386	29.1053	29.2049	97.3043
25.7748171537926	21.057994322452	97.6165750715391	27.2482	20.2425	98.6789
22.1651075981447	16.8353095184306	96.6590525890934	22.6997	14.9199	96.5597
11.4845583915848	20.505792255026	95.3601312724148	9.96077	19.2347	95.1963
9.0216819242155	37.9052499799099	94.8623325915538	8.75416	38.928	96.5496
8.98415029681878	41.5502124926863	88.0687627916961	9.27453	43.3967	88.7547
8.63994107140797	43.3030090898865	80.4489178436642	7.21925	42.3799	79.403
13.8591052554484	48.9567981121407	75.8575707297145	13.2524	50.7626	76.4367
18.2572638226342	50.0692405271707	71.9212986396732	17.8085	51.9553	71.4677
23.8453499617829	49.2539394509391	67.873255137757	24.4594	47.3987	68.2546
31.4332057223328	53.2146855724736	60.0053337092715	30.4468	53.5688	58.3124
42.7511498236358	55.9132644897475	58.2995671723366	44.4217	55.3301	59.2126
41.275698704495	61.3896623335729	51.6052334383591	40.6271	60.1839	50.1596
41.1662285454042	66.9332988251993	48.980523002344	42.1545	66.9856	47.2528
35.5813419412915	79.2318462378289	52.3535500647937	34.9224	79.9328	54.0968
35.8230868522634	82.324580399036	45.7061346082078	34.4937	83.7515	46.1073
37.0546298848309	84.4503276270301	38.572517725409	36.723	86.3354	38.0239
39.1690228085673	80.1860803811437	34.2774985959388	38.4806	81.2568	32.7466
41.9289718707476	74.7259056042833	29.6501040427048	41.4131	74.8199	27.7293
44.4304259437098	71.5559112422567	30.8045797609645	46.3399	71.17	31.2162
37.067507396156	67.7930139326165	30.4301224932089	35.9094	68.8825	29.2317
32.4718532957619	61.2335540332268	33.0505238736053	33.4192	59.483	33.0004
31.6106116676625	61.1924425086526	33.3539384920217	32.641	61.5676	34.0062
25.5219091819179	60.9019850321914	35.4991009363461	25.6513	60.6643	37.4717
20.4763760529189	61.0063826238107	34.4204985861626	18.9042	62.1271	34.907
21.8318133943312	54.9096204117696	30.1226824816722	22.5447	55.6169	28.4034
21.7697551528822	50.171728540731	29.6257452989719	23.6126	49.4214	29.6987
16.8345662455262	44.8966521844076	28.674194983765	15.6372	44.5891	30.235
16.0059677654497	42.0956408509424	29.9846466449169	17.5856	40.8861	25.0628
14.3396171226826	40.8338399887688	22.2069953182164	13.4598	41.6191	22.5554
10.6337902687011	38.027671962789	16.0296787960882	11.4258	37.7412	14.2255
2.14169170317398	36.2805752129931	18.385230653879	0.642905999999996	35.395	17.4189
2.65469172417986	39.4742467927031	25.6367008045752	2.57158	38.4711	27.3546
3.82269321800662	49.6756772320107	24.6868353787358	2.40393	50.9808	25.185
13.4905039429207	52.6664795293445	20.7233347395876	12.5872	53.6987	19.2898
21.4032860954644	55.0957931886323	17.5048767039363	22.8193	53.7552	17.9075
23.2090246348511	59.05279418362	14.8946839246985	24.5176	59.5849	13.4915
18.7655277861589	61.266066317506	18.8186524486692	19.6656	61.3862	20.5906
9.34991413771137	64.4836516943207	20.4863242319868	8.25408	64.3565	18.8288
1.47509217671387	69.7797239688779	31.4970036987795	0.194864999999993	71.2335	31.0366
1.79528671109317	65.9331118825956	44.8363673604539	2.55217	66.9796	45.1209
2.16221422631	61.523867753374	60.1262606124365	1.5771	61.4642	62.0285
6.55867606021911	59.792136641905	53.915366108793	8.30742000000001	60.1487	54.798
8.79064682298178	58.2882509872498	48.7584953758165	10.4725	58.878	47.8708
5.21624597996009	55.0336678685663	47.1629592232328	3.30116	54.5758	46.8676
9.13588519246135	54.0643299452964	46.9380543454703	9.35554999999999	53.1101	48.6717
16.4541188520636	53.4865462182879	44.1274773645612	17.5187	55.1629	44.2721
20.3316236782391	47.4750616690533	40.8445967867122	20.5641	47.7219	38.8826
23.5292804453388	40.7184051181867	43.3659660366883	23.6339	40.0124	41.5074
26.1944081406054	35.17308016428	45.811647637472	25.7714	33.2927	46.3113
31.170698540896	39.6685713917794	45.6021329636265	32.7353	38.4372	45.6112
33.9616234201811	44.8047325698477	45.410492370528	33.2771	46.652	45.1216
45.2101343639377	40.7066882349753	47.3189084406362	46.2037	41.7062	48.7254
49.7101929765301	34.3178251487311	43.7640500598335	49.1148	32.8614	42.5439
54.2595750812823	35.2905418210639	45.628441001723	55.5492	35.9315	44.2535
56.3898558638816	34.9734577912463	50.5292859443048	56.0389	33.1015	51.1098
57.6681566602984	36.0642823861889	52.5459530947533	56.9788	35.9946	54.4126
59.4199335210579	36.9885518792304	52.0588736747331	60.6972	35.5066	52.4287
61.9129478617046	39.7281954599745	50.8866583772922	61.5258	41.6034	50.3406
72.7997411106082	33.9781335670159	51.3732829429822	73.2088	32.0501	51.6558
77.5857496054541	39.9190889755533	50.2801262217826	76.05	41.1841	50.3284
80.6533221771704	43.6114706499971	49.5904738526141	81.4209	43.6493	50.298
81.684466307347	44.8527385070474	49.3586484312455	81.1997	46.621	50.135
87.1403005960922	44.424385875094	46.1472552157044	88.1955	43.6361	47.6404
91.4913327055551	44.5048910186558	42.3202087245618	91.3249	42.8902	41.6597
92.133754568152	44.5167816304018	41.7551388576413	92.0634	46.0336	40.4672
95.1027566199286	42.1846908550428	41.266095250512	96.1419	41.3034	39.8142
94.7811102998539	43.0657708940445	53.702315717661	94.61	43.2995	53.8065
94.6293886311412	43.4814035755352	59.5688896752135	96.3235	44.2629	60.2644
92.8924131410514	42.908534527655	61.6417923457351	92.3029	41.017	61.4442
88.0737984259743	47.0066744409058	70.4108484503444	86.8559	48.4797	70.9689

Solution x	Solution y	Solution z	Original x	Original y	Original z
93.9588382930325	38.0388980639112	74.7313867832853	95.9404	38.2332	74.7444
91.0161853338976	30.8767741659475	77.7954692344971	89.036	30.7257	77.9388
95.843684618345	23.63047149669	80.5750704086789	96.7473	23.5618	82.348
96.1834136013089	17.2169695177189	75.0278068449277	96.7716	16.6523	73.2113
91.6140102046042	14.2534488899592	83.7079177656252	90.4883	12.6216	83.5226
91.8426184331349	19.1239119917483	95.4411755258696	93.1464	19.8146	96.7782
75.6401287687685	16.6975100775659	93.7324211298583	75.2455	17.3084	91.8789
69.0320370811609	14.4712182779652	96.3789966853036	68.0574	15.6194	97.6814
64.3438759532126	4.36688193465115	92.9915286146923	64.5769	3.66176	91.1441
61.3661370323622	1.58370191256209	96.9077766827555	61.5069	0.482106	98.5604
53.3363629053637	6.64415339801752	88.7426496136506	52.4925	5.37248	88.2454
52.6915859670657	7.05046466267889	88.0870303890039	51.1528	6.04103	87.327
54.4761494364667	15.8534706395249	85.8651051467676	55.9929	17.1432	85.8884
44.6698621291548	15.5114034254425	83.2457332607574	43.8962	13.6901	83.4665
41.0907029766095	19.0078766005181	81.4272303349493	39.9475	19.2268	79.8118
41.7728529844992	20.9700256339198	84.8024796843351	41.7205	19.4188	86.0496
42.6792583205051	24.5931812606841	88.1938522697789	42.4972	23.9973	88.7768
44.0169225724093	29.9401495658693	93.1986452653957	44.5404	30.686	94.969
39.1312930736196	30.4832509375411	77.7250050285847	37.7688	31.4408	76.6336
44.8171339295781	25.0771465494079	76.6400947490424	46.0829	25.5503	78.1024
47.6274608978948	20.4628407553148	74.1301801949264	47.6864	20.3976	74.364
50.6423338950414	15.5126759268934	71.4375797658538	50.9211	16.4053	69.6798
56.8247637216587	3.65687040400155	67.8213548510015	56.3237	2.07366	66.7228
72.5943824026868	9.08154868343336	78.1065562477287	73.4709	7.6166	79.1313
76.6117451632555	17.3681815531549	78.9557486912731	76.9072	18.2917	80.6948
78.1410387078127	19.5145869795354	73.8979540697438	77.5205	18.1054	72.6356
80.8141971485428	24.0322980260449	69.7762725956318	82.6839	23.4883	70.1916
83.6814509794232	31.2247971774493	63.2656921308231	85.0689	32.1301	62.1612
78.52968203797	30.7470544017557	65.0757554542708	77.6794	29.1288	65.8649
75.900808970909	36.2761822996567	64.1608112737256	74.0572	35.987	63.4666
75.9828732743724	36.7850793478546	64.1979602960771	74.7866	36.0265	64.8468
76.9709810743922	42.9122018993662	64.6454571253451	78.6058	43.2582	65.7281
71.0500918079947	55.7168927733693	60.2332616632533	69.3672	55.5594	61.2856
70.8074758293268	56.73546223872	59.752478192659	69.1414	57.6653	59.1832
81.2847463718724	59.1262567622606	59.6208109235337	82.834	58.4111	60.6469
80.7978965474293	63.9368553885245	54.8118268581203	81.8209	62.9891	53.3907
78.4875217235617	73.2516503275617	48.9944480898813	78.3667	74.2083	50.3369
78.0075760087963	75.1866670571435	47.7859493970647	76.2214	75.1456	46.9071
79.5939415351911	77.8444036351133	47.2565202991118	79.6042	79.6519	48.0916
82.1126627503897	75.6948718736402	43.4328655977216	84.0931	75.7357	43.6346
80.891161281551	73.9948728502163	40.2045346810533	78.9206	73.8168	40.4273
81.6358159488255	72.4997856677964	36.8110525190398	82.5413	70.9361	35.9747
78.0748596662543	78.2634194233476	35.1021714744588	77.5352	78.0347	33.1993
77.028606871492	80.8499280243521	35.931578340201	75.9957	81.402	37.5418
81.3997727072341	87.7712872844627	25.4593050330492	80.7777	87.9354	23.575
92.3068555455355	93.6425096407382	32.8060701303615	91.0373	94.8618	33.7328
95.1717173805251	95.1517641498856	34.7046923841155	96.3227	96.5824	35.4748
92.8157506728402	88.0224084546436	33.0899149756904	91.8947	87.6684	31.3605
94.4051142760289	79.8223641214523	40.0514850666284	95.4573	78.5053	38.9919
93.3205973389865	75.141772303623	49.4688400928093	94.2046	73.3577	49.4797
88.0210704454357	77.6130558999588	60.6940979703605	89.1084	77.1611	62.2997
82.4657874397236	80.0529445818075	61.7644068319797	82.6909	80.2719	62.172
75.5467291495257	83.0918238508617	63.0974865238592	73.8931	82.0767	63.5442
76.038398598887	89.9258813976488	62.4842351848634	77.8131	90.2453	61.6399
73.4982159186314	95.7965750977975	63.3371430366816	74.1314	97.2935	62.187
68.5332949451368	97.1037417880248	68.2239655766867	68.0526	97.9535	69.9593
67.0551496483234	94.363314531994	64.2136082238999	68.3546	93.0491	63.4728
59.7113458058388	94.9245179799621	60.5331151692709	59.3326	96.8644	60.2925
52.7034503756183	90.467390154091	57.1540289737694	53.7144	89.3849	55.8234
46.7017772529208	88.0840268579843	55.7710019528643	44.9959	88.3516	56.7624
48.1527171034412	83.3912992322423	48.3857388043267	48.3206	81.4332	48.7053
48.5975607563271	84.5885730653876	43.9355492057406	47.7087	83.4773	42.5429
50.9532590265433	88.1503447452115	42.6771817875235	50.0418	88.5256	42.3177
54.6518040156702	93.7422240628709	40.7015194772473	54.8665	95.2849	41.9419
56.1245588217481	93.8261582089638	37.53056625459	58.0371	93.3465	37.2538
47.8956789922918	97.7064164234779	26.865213298229	48.6626	98.7924	25.383
34.9562220506359	94.2344539611235	26.4705143353826	34.7487	93.2543	26.9859
33.1988217406208	93.7628968718451	26.4168948475834	33.1283	92.3481	27.8161
30.0250091007235	93.835013574333	25.3927374512324	29.5533	92.3189	26.5937
22.7583172914433	94.280652094536	22.7992682186969	23.1083	96.0553	21.9675
14.8400085749658	94.3708379127552	20.1838622936387	15.2733	95.1553	18.4059
6.3721964861877	93.9367935737387	18.6780834358175	4.45068999999999	94.0863	19.178
11.7116031610404	92.6252128611549	14.2481206495688	12.3803	91.1149	15.3598
17.1946786494719	91.7336522386179	9.13536640002905	18.6101	90.3489	8.9268
16.0976910423608	95.6899205436515	6.52190064076584	16.854	97.4806	6.0907
4.76410478104516	87.8356349595542	3.60381937655033	3.35356	88.986	2.7967
3.00230567583571	82.8785742016573	3.929667107404	1.02508	82.9527	3.7072
7.28680037095873	65.8254668680971	6.17433209965822	9.17265	66.1356	6.7326
7.36547210737388	62.6355026186329	6.37368913480705	5.52590000000001	61.9092	6.1438
11.657663004272	57.5925775754652	7.30660638248983	13.5318	57.9262	6.7229

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.2486917671168	55.5530020711516	8.20262808925908	10.9638	55.5178	10.1729
10.8235438950288	48.9023692995737	4.7332934892612	11.7937	48.0467	6.2423
10.5053551913111	44.1752344482832	2.2367209985078	12.2621	43.6923	1.4336

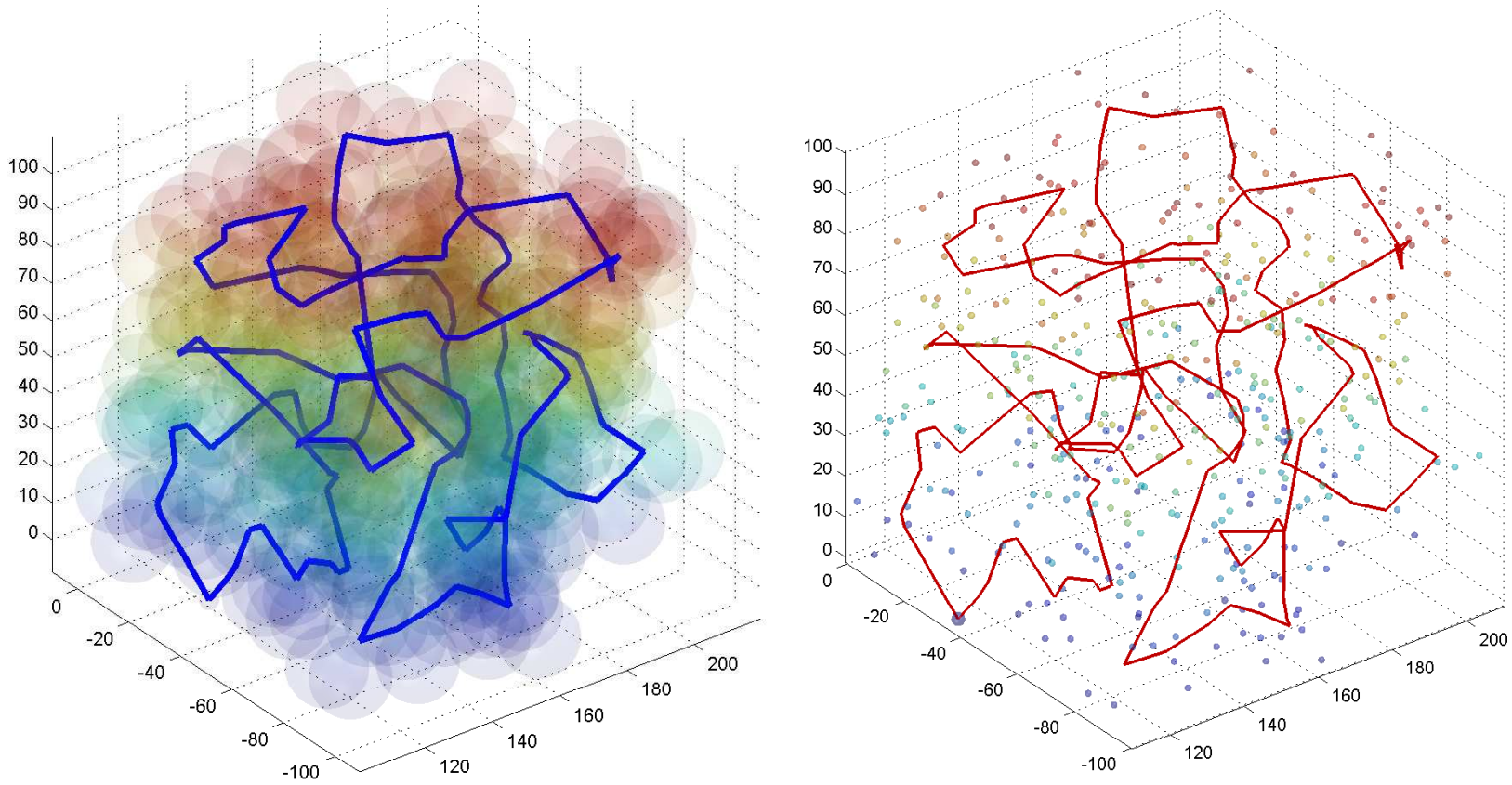


Figure N.80: $rd400$, $r = 9.955309$, Equal Radius, 3D, Euclidean, Length = 1552.7226465

Table N-83: Solution for $rd400$, $r = 9.955309$, Equal Radius, 3D, Euclidean

Total distance: 1552.72264650564 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
4.95149927390571	39.1156894641003	6.40531244417478	12.2621	43.6923	1.4336
6.09582889395527	40.9115557305928	10.2086785567255	11.7937	48.0467	6.2423
6.51314248846347	41.6650408186455	12.8452041785767	11.4258	37.7412	14.2255
6.89050022662877	42.3463867832491	15.2292987091938	0.642905999999996	35.395	17.4189
7.78751313059658	43.9659868331574	20.896392457264	2.57158	38.4711	27.3546
8.76542040818455	45.1948972106505	21.6818686257702	13.4598	41.6191	22.5554
9.70952952991263	46.3813356450152	22.4401978712276	17.5856	40.8861	25.0628
9.70953653445659	46.3813453086144	22.440203732702	15.6372	44.5891	30.235
9.27567263749089	50.1111639945734	20.8853143044478	2.40393	50.9808	25.185
8.82591801583109	53.9776006920446	19.2734693224988	12.5872	53.6987	19.2898
8.33897504027567	58.163732851558	17.5283501049059	10.9638	55.5178	10.1729
7.86076359845602	62.2748005181059	15.8145253165497	9.17265	66.1356	6.7326
7.86076352983301	62.2748007121503	15.8145254575561	5.52590000000001	61.9092	6.1438
7.23722296892234	65.0787646248362	19.5871809722455	8.25408	64.3565	18.8288
6.5197412865954	68.305172867995	23.9282227032161	0.194864999999993	71.2335	31.0366
12.8639108958853	69.0356440048177	21.2775433513463	17.2306	77.2747	24.7644
15.1119198481715	67.2427288944506	18.9296598152523	20.7262	75.308	17.3361
17.7336055320367	64.5307943402095	15.9800880859864	19.6656	61.3862	20.5906
20.3223612801448	61.8529229420696	13.0675648018379	24.7619	69.8637	9.1655
20.6189993539508	61.5029937227619	12.7300902726561	13.5318	57.9262	6.7229
23.5946026719596	59.8068222575337	11.4829760061382	24.5176	59.5849	13.4915
26.4696337466227	58.1679804039569	10.2780130514238	31.2678	61.1344	2.0752
27.5929812577323	55.2179251409386	12.3155689008132	30.6696	55.2626	12.0174
28.6540927102915	52.4313084390714	14.2402412087426	22.8193	53.7552	17.9075
29.8589960401198	49.2670764042672	16.4257269104295	37.4105	49.4356	12.3771
31.0578979770179	46.1186040329075	18.6003284969149	28.6889	43.6077	12.417
32.873043723757	41.3517967836134	21.8926884752458	36.8488	32.2474	21.2512
31.1274244391807	44.8362254602855	25.1885380257135	26.2003	42.5604	24.4871
29.2016892912017	48.6801782770256	28.824453699577	23.6126	49.4214	29.6987
27.9178139771017	51.2429213761079	31.2485003245161	22.5447	55.6169	28.4034
27.1211991243027	52.8330458614728	32.7525671484029	33.4192	59.483	33.0004
26.7590205947886	53.5559946061919	33.4363896637291	32.641	61.5676	34.0062
25.3923327748424	53.666164861456	34.4694189331435	25.6513	60.6643	37.4717
24.277235355365	53.7560531217939	35.3122798585914	18.9042	62.1271	34.907
22.457320476941	49.4684984853272	39.18298866499	17.5187	55.1629	44.2721
21.2907898628609	46.7202323554999	41.6640474727923	20.5641	47.7219	38.8826
19.8585564427402	43.3459860590949	44.7102233936671	23.6339	40.0124	41.5074
18.2486143673247	39.55307777582	48.1343593288108	25.7714	33.2927	46.3113
16.8485731178396	37.7590463401477	50.2228176936425	22.7183	34.3604	52.0641
15.551441682315	36.0968874895195	52.1577613173374	19.5262	30.4483	48.5255
14.048692388119	34.1712505435586	54.3994268249359	17.6023	36.5196	56.7286
12.3467616662213	31.9903804876211	56.9382115957614	9.16001	37.8018	54.1714
8.08172943546492	26.5251197899061	63.3004026744863	3.44571000000001	28.2052	68.896
7.0006906784144	25.1398644802842	64.9129992011786	4.056	25.9589	74.3875
6.90045552613093	21.8791827889856	61.5964244648661	2.38826	24.0295	62.08
6.76850725417727	17.5867811552132	57.2304422623268	0.613562000000002	12.2624	51.4967
7.51288365157238	17.7050629827692	57.3900856296921	6.43447000000001	8.70233	59.8478
9.32407921785511	17.9928620184262	57.7785207087202	10.9524	12.0779	65.6188
12.6054008936778	19.5649141445589	57.2074171681975	15.6993	18.7479	59.9926
15.4402273233176	20.9230541087288	56.7140238654269	15.3759	23.0999	65.044
18.6186321847232	22.4457997187349	56.1608325107743	15.3897	25.3897	58.7078
22.5961898028438	24.351413058675	55.4685542945826	23.2874	32.7742	59.4617
23.5869149951606	24.8260611567348	55.2961207533922	26.0672	21.3383	63.983
25.0431985672346	25.5237522559777	55.0426623071454	25.7178	17.895	52.7372
27.0124361829731	26.4671955998874	54.6999244024454	25.8125	25.1372	50.1121
29.1254156168877	27.4795051110996	54.3321678540826	34.4638	23.0393	61.4662
29.8428063550629	28.0764577036474	53.9154961464176	31.6686	31.1822	62.9487
30.8973882285465	28.9539931487405	53.3029820280606	31.0765	22.0815	48.5077
32.3173744108933	30.1355868980422	52.4782370517405	38.2173	22.874	49.077
36.0978798654476	35.4583565322789	50.2779140261916	32.7353	38.4372	45.6112
38.7181101751603	39.1475153676218	48.752895228997	33.2771	46.652	45.1216
43.662081621877	40.0063120043179	48.6107772656303	46.2037	41.7062	48.7254
47.5008629389557	40.6731306226363	48.5004294217202	49.1148	32.8614	42.5439
52.6407045185115	41.9304491189467	48.6189006464745	56.0389	33.1015	51.1098
53.3339571187219	42.1000315183251	48.634880639848	55.5492	35.9315	44.2535
54.0039236747905	42.2639168035885	48.6503241807068	56.9788	35.9946	54.4126
54.5881458386109	42.4068255045732	48.6637918275773	60.6972	35.5066	52.4287
56.2176806818256	45.6066010306572	47.4920448331412	61.5258	41.6034	50.3406
58.8532890152868	50.7819229573009	45.5968614554442	57.8122	54.5104	45.2899
60.748240741534	54.5028799898474	44.2342600273806	64.2573	58.953	49.3124
61.7123354386301	56.3959918148701	43.5410084007664	70.983	56.1077	39.9244
61.0618607886145	57.5799212076004	43.6028541679228	67.8108	54.6502	44.2592
59.7992527482594	59.8779932992269	43.7228982262406	58.3448	60.9201	41.5011
58.6169339890463	62.0299303600796	43.8353087966137	56.0439	62.2937	45.4781
57.510950706178	64.0429291816281	43.9404616036417	60.771	67.3196	52.7577
54.3082320256638	68.1621616874115	42.5503703890681	61.6789	74.8507	42.3385

Solution x	Solution y	Solution z	Original x	Original y	Original z
53.3106094566037	69.0852236100217	42.1933236152121	59.2712	76.4167	39.0582
47.3957801101882	72.1410647439439	41.0676128847256	46.3399	71.17	31.2162
43.7715905489428	74.2975703383588	42.1858938589972	42.1545	66.9856	47.2528
36.6336408312482	78.5448844603862	44.3883740246916	34.9224	79.9328	54.0968
34.4602829850361	79.7272047559332	42.3051338788867	34.4937	83.7515	46.1073
32.0789143762374	81.0226822927487	40.0225028973395	38.4806	81.2568	32.7466
30.8033193923965	81.7166144813762	38.7997989974176	36.723	86.3354	38.0239
29.2795009382135	82.5455807602449	37.3391638364056	25.7615	81.4539	44.2448
27.0368697665308	83.765581744579	35.1895227134167	26.7929	78.8352	37.5421
23.935879168289	85.4525325870439	32.217115339547	16.5471	81.1813	37.3426
22.3382812709811	86.3632842121188	30.6244299887084	23.3569	85.0798	30.5318
20.6722656666271	87.3130386680379	28.9635383396585	16.7243	94.3593	34.7835
18.3857291772254	88.038313359935	25.5077592719629	23.1083	96.0553	21.9675
16.5079329990252	87.7559596012082	23.6550032176533	15.2733	95.1553	18.4059
15.8032956752842	87.6500068777556	22.9597639813628	8.89064000000001	83.8954	29.0611
14.2762149492005	87.5734234921837	20.7247381993984	10.1219	82.045	24.5182
12.6105424692654	87.4898893063247	18.286870733446	12.3803	91.1149	15.3598
11.2830266539527	87.423313892451	16.343925918017	4.45068999999999	94.0863	19.178
8.4518080730828	85.8896847795156	9.6507695481962	1.02508	82.9527	3.7072
8.90035800795727	86.0403765751913	9.72429788835413	3.35356	88.986	2.7967
17.4530008273281	88.9136667033356	11.1262770225357	16.854	97.4806	6.0907
21.4313474470346	89.2446041162528	12.3446850248291	18.6101	90.3489	8.9268
28.2780900848297	89.8141546864051	14.4415705833388	32.7208	86.88	6.0296
33.0265020613552	90.8101830267533	17.6736212071734	29.5533	92.3189	26.5937
33.4650237885325	90.9021669657392	17.972112722857	33.1283	92.3481	27.8161
33.9901337594975	90.9098033333981	17.6487146742889	34.7579	99.7518	13.4448
34.1738235346414	90.9124773424848	17.53558412108	34.7487	93.2543	26.9859
38.616454042468	90.9771724689671	14.7995385682426	43.3068	85.4106	16.2891
41.1069359285418	91.0134420072292	13.2657430496337	43.9629	81.9344	16.1851
44.3675570185675	91.6478389470118	10.9566070560457	40.4171	94.2218	3.0792
45.8808549453896	91.9422746453408	9.88490067489188	48.9418	95.7946	8.5835
47.111365145826	92.181690076831	9.01346140576471	49.8328	92.6571	10.5815
48.2754673808334	92.4081849406931	8.18905158368971	51.8363	98.9629	1.5963
48.7406625870431	90.8485895662476	9.00556934885935	40.7053	85.7824	6.0265
49.4050293601771	89.6169801872798	9.82557220190858	48.934	88.5471	3.512
50.202338655869	88.1389204157594	10.8096597188306	54.7886	87.0165	7.4948
50.9467637831126	86.7588976802875	11.7284745475014	45.1636	79.7971	7.5816
51.9851815025864	85.4357738336669	12.9083365050321	50.5772	79.5094	6.7911
53.1048692653246	84.0090971837545	14.180537550508	50.9984	83.4341	15.7476
54.2177381714694	82.5911086723025	15.4449910889212	54.169	81.8375	12.9059
55.3883717928333	81.0995183563988	16.7750768999047	63.6977	85.2552	13.695
57.3550365585824	78.5936417433857	19.0096206128559	60.7208	77.8844	16.4053
59.1841373487769	76.2630468090322	21.0878626656494	61.8453	80.8454	29.5157
59.3649965044527	75.748950460781	21.1010938628607	60.2539	80.1704	27.9583
59.5751786411534	75.1515029191159	21.1164702441422	66.7645	81.0279	23.2022
60.1650152576409	73.4748988207624	21.1596239713929	60.356	72.3736	25.6911
60.7046733441636	71.9409250890063	21.1991060284163	65.3011	67.1869	28.6409
58.7504682803279	69.1234285874275	13.8983990073207	66.9764	66.2314	9.0944
53.5792129076219	68.1362935433853	10.1610090217263	51.793	64.9464	0.9013
51.6462736418268	69.2690920647306	12.9646501109167	52.5118	68.1256	10.9937
49.10941679703	70.7558178935315	16.6442445234089	47.6475	71.1843	17.3202
46.7894667807225	72.1154265580405	20.0092268720433	45.2184	66.3382	18.5431
43.2666852079473	74.17996166178	25.1188612034923	35.9094	68.8825	29.2317
44.2668243719232	77.4262340486228	26.2839505780836	41.4131	74.8199	27.7293
45.7356008903828	82.1936189857849	27.9949712136865	45.6946	80.9262	23.2292
48.3207804951979	90.5846449627117	31.0065316475094	48.6626	98.7924	25.383
49.8255376850812	90.3423211307394	37.1083559270114	58.0371	93.3465	37.2538
50.5080441816208	90.2324141020855	39.8759465229218	50.0418	88.5256	42.3177
51.1028601980162	90.1366288934373	42.2879443733141	47.7087	83.4773	42.5429
51.7147911336226	90.0380882336438	44.7693391709288	54.8665	95.2849	41.9419
52.5367352344442	89.9057242363416	48.1023455138991	48.3206	81.4332	48.7053
53.4056561215692	89.7657968092916	51.6258408656378	44.9959	88.3516	56.7624
57.0316559262492	89.9961387261512	54.7883227509539	53.7144	89.3849	55.8234
61.669940728131	90.2907831753143	58.833683873223	59.3326	96.8644	60.2925
66.8354228384612	90.6189090831527	63.3388424191486	74.1314	97.2935	62.187
66.8354233149157	90.618908999134	63.3388429721563	68.0526	97.9535	69.9593
67.552898671857	89.1638506210733	63.3101918826294	68.3546	93.0491	63.4728
68.4016961926577	87.4424666080054	63.276296740254	77.8131	90.2453	61.6399
69.2054225363478	80.9989210445467	63.5214069569188	73.8931	82.0767	63.5442
70.0701850807513	74.0660596906607	63.7851301997933	60.9907	71.4945	66.9566
70.8393001052999	72.3441007269952	63.669378974145	65.9297	69.3415	71.7927
72.4715117720153	68.9467910376099	63.2881088380634	78.2186	68.7569	71.4148
73.3938072018834	65.1959315673426	61.5997130694393	69.1414	57.6653	59.1832
73.5409705975866	64.5974215202632	61.3302996059166	69.3672	55.5594	61.2856
76.6246960718068	66.1517098958456	59.8495978047646	82.834	58.4111	60.6469
79.466278922496	69.1653172103477	57.9354441698132	81.8209	62.9891	53.3907
83.0383884973758	72.9536885209024	55.5291844881871	82.6909	80.2719	62.172
83.1480719183311	73.0700151937852	55.4553074706429	89.1084	77.1611	62.2997
84.521448003539	75.6396955557242	49.1092326118914	94.2046	73.3577	49.4797
84.5830067746536	76.0938900207533	48.0750543073981	79.6042	79.6519	48.0916

Solution x	Solution y	Solution z	Original x	Original y	Original z
84.6416340504879	76.5264556596565	47.0901241762396	78.3667	74.2083	50.3369
84.716818195019	77.081181466028	45.8270412910638	76.2214	75.1456	46.9071
84.8243445103424	77.87453755858	44.0206089497359	78.9206	73.8168	40.4273
84.9164937643779	78.5544425461732	42.4724985735723	84.0931	75.7357	43.6346
85.0181628857222	79.3045871127079	40.7644552778343	82.5413	70.9361	35.9747
85.1470873751849	80.0247483611022	39.6808864024762	75.9957	81.402	37.5418
85.2224451781314	80.4457051491066	39.0475053593881	77.5352	78.0347	33.1993
87.5372674446884	83.4558064340537	36.8378432965224	95.4573	78.5053	38.9919
91.2590400220175	88.295496895778	33.2851012871099	96.3227	96.5824	35.4748
90.9880303576273	87.6270044041377	32.2397363811343	91.8947	87.6684	31.3605
90.7215186678228	86.9696069591197	31.2117219757162	91.0373	94.8618	33.7328
89.4277851715593	83.7783775057114	26.2213898373056	80.7777	87.9354	23.575
91.6273848473901	69.8046722513095	11.3302072182063	97.9153	71.697	3.8476
87.7257958003036	63.1073518118027	11.3413298080795	85.3959	62.1638	1.7086
85.4100828467886	58.44557609961	13.5141228150727	88.4474	55.9131	14.5629
83.4625097081915	54.524905874135	15.3414958411512	90.8764	48.3318	12.9357
81.6579225082578	52.4082203848055	16.7080097091911	79.5061	49.6701	11.7965
80.0591405155308	50.5329345351227	17.9186787218164	85.2354	42.0312	17.7315
78.5125379152365	50.1432316212321	18.7250241054751	72.4782	47.1166	11.4083
78.5125361509219	50.1432313032381	18.7250256601536	69.2786	47.5055	16.1011
80.2139142756011	50.9932427569279	23.9571236146637	81.8774	60.6902	25.477
80.4600264224238	50.3279104442549	25.0336575485098	82.7455	58.0479	28.4959
80.7196719151388	49.6259937025432	26.1693875070661	76.3859	55.8636	29.5918
81.0152423687024	48.8269594792351	27.4622580674811	74.8357	53.7031	27.6754
81.4608214108381	47.6224013709506	29.4112813034078	74.6616	49.1772	30.6996
81.958187588541	46.2778465939234	31.5868241246382	80.6139	53.7748	37.9975
82.209041729129	45.4926326682935	32.3434467990761	73.064	44.6995	31.3834
82.6310385415644	44.1717113257852	33.6162737171318	81.8496	38.8539	28.9342
83.0461513153476	42.8723378265311	34.8683372131979	80.5435	37.2793	30.7227
83.4503100139161	41.6072507261812	36.0873617217102	80.1207	32.7664	32.9471
85.3828059252359	41.1463042079402	39.9138353764935	92.0634	46.0336	40.4672
86.4395376892119	40.8942565408174	42.0062209750779	96.1419	41.3034	39.8142
86.4103601564822	40.6267324456155	44.1057188124545	91.3249	42.8902	41.6597
86.3733748653465	40.2876099061593	46.7671031115488	88.1955	43.6361	47.6404
86.3368573835341	39.9527746506868	49.3948413552722	94.61	43.2995	53.8065
85.1719599797849	39.2665799151734	50.5516399632856	81.1997	46.621	50.135
83.9365039888091	38.538822523466	51.778506852055	81.4209	43.6493	50.298
82.6032325231708	37.7534460114632	53.1025105725328	76.05	41.1841	50.3284
81.4052119695168	37.0477410690212	54.292199933512	73.2088	32.0501	51.6558
82.7950765734961	37.9653935555378	59.200349945434	74.0572	35.987	63.4666
82.8272107475539	37.9865962518929	59.3137364395461	74.7866	36.0265	64.8468
85.1668281280569	38.9238272193277	61.4208525672281	78.6058	43.2582	65.7281
88.1219536278245	40.1076183426254	64.0823135719169	96.3235	44.2629	60.2644
88.0801801007698	40.0170646772594	64.9955970461339	92.3029	41.017	61.4442
88.0326876818745	39.9141136269068	66.0339133379017	86.8559	48.4797	70.9689
88.2745785198832	36.1646114651307	68.7390429394833	95.9404	38.2332	74.7444
87.3197226141069	33.2249849913289	69.7595956429354	85.0689	32.1301	62.1612
86.2158021221052	29.8264387366013	70.9394763236216	77.6794	29.1288	65.8649
86.1449845953163	27.5581344330314	72.153066342667	89.036	30.7257	77.9388
86.0721905139148	25.2265499836419	73.4005106337311	82.6839	23.4883	70.1916
86.0002829752763	22.9233692923536	74.6327586608147	77.5205	18.1054	72.6356
88.6017082594855	20.5042835399972	77.3973822371773	96.7716	16.6523	73.2113
88.199356433857	19.790164319723	80.7091047316211	96.7473	23.5618	82.348
87.6999438091657	18.9037759232425	84.8197304401706	90.4883	12.6216	83.5226
87.1908797403342	18.000257182629	89.0097939058397	93.1464	19.8146	96.7782
79.6450086165252	14.2382225672984	88.6570149649104	76.9072	18.2917	80.6948
76.7977636146998	12.8187137288763	88.5238997486119	75.2455	17.3084	91.8789
73.731056319932	11.2897899056419	88.3805260380816	73.4709	7.6166	79.1313
67.0530430860833	9.1818302748032	91.2521376608969	64.5769	3.66176	91.1441
63.8038292941294	8.15620012767749	92.6493436185028	61.5069	0.482106	98.5604
63.8020071243757	8.15842362751709	92.6481457786816	68.0574	15.6194	97.6814
59.1202240371844	12.2442474158193	89.2842939816324	52.4925	5.37248	88.2454
57.6797799309702	13.5013242492476	88.2493443601516	51.1528	6.04103	87.327
54.6497195345416	16.7455649479204	85.9004921830656	55.9929	17.1432	85.8884
51.4807151820968	20.1385719879494	83.4439350659551	43.8962	13.6901	83.4665
49.0245559261069	23.3009643872838	81.3241864701315	42.4972	23.9973	88.7768
48.9061962336521	23.4533530016212	81.2220344698252	46.0829	25.5503	78.1024
48.7959395674951	23.5953097494149	81.1268769073673	39.9475	19.2268	79.8118
48.764667886424	23.8311440392052	81.0214480305198	41.7205	19.4188	86.0496
48.4192795383105	26.4357692020118	79.8570537826825	47.6864	20.3976	74.364
47.6810373779268	32.0029430140063	77.3682617154643	37.7688	31.4408	76.6336
47.8146594784379	33.6214956852854	76.6790736957809	55.717	37.8511	81.0117
47.3436591442442	34.4898761777453	75.8686028073221	55.099	31.771	70.6981
44.0614479727418	40.5412896906398	70.22078939488	47.522	42.292	65.6102
42.1410844433398	44.0818634735077	66.9163549809831	41.6783	52.1535	70.8377
41.4989512633867	45.2657670256319	65.811413603751	34.4656	38.8185	62.9703
40.3046463507353	47.4840800417243	63.7485202812298	38.5534	48.7846	64.7262
39.1878813601669	49.5583710128118	61.8195589796718	38.1612	45.7549	62.3997
37.871477725942	52.003478335493	59.5457636481571	44.4217	55.3301	59.2126
36.5296835664819	54.495725224395	57.2281242640343	40.6271	60.1839	50.1596

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.5015643773839	53.9295849430595	59.079572421106	30.4468	53.5688	58.3124
26.9876476401104	53.4213387906739	60.7416795118122	24.4594	47.3987	68.2546
18.7071179760973	60.7257358280199	54.342356801568	23.6206	68.344	50.228
13.1338466189258	61.1566102284987	53.0042188657753	10.4725	58.878	47.8708
10.1915337294226	61.3840819155209	52.2977716943586	9.35554999999999	53.1101	48.6717
8.38713933217519	61.5235784185196	51.8645366930837	3.30116	54.5758	46.8676
7.90058011360881	62.5718443663849	52.2675346079817	2.55217	66.9796	45.1209
7.87922860765235	63.3638956788406	53.4990570489301	8.30742000000001	60.1487	54.798
7.85657444626597	64.2042840427176	54.8057354308718	1.5771	61.4642	62.0285
11.0280642014253	68.5860087194084	55.672950097886	14.0141	70.4084	60.1608
12.9919845271461	71.2993519459376	56.2099627038516	16.576	71.2313	59.4946
14.6017097106498	73.5233409205452	56.6501244248745	23.7167	70.7298	59.5174
14.3982084577116	76.6832599731942	56.5106442975549	23.3293	78.9181	52.7226
12.6907705143004	80.6632885081047	56.9249144885571	19.5225	82.1483	62.667
9.49411260716985	88.1146774957994	57.7005006021425	3.06059000000001	88.1315	51.3598
8.7138345180214	89.9334957971698	57.8898144931042	4.28894	92.6489	49.3954
8.58995328875943	90.960476125164	58.8493668479838	3.24988	93.8751	52.5027
8.42190052611657	92.3536298487772	60.1510517382992	0.299018000000004	97.3272	63.0477
15.3669595138969	93.0532263692303	62.4402756366044	18.064	96.3276	61.2807
18.6221130731454	93.381119805207	63.5132257315019	27.8353	94.5623	59.9313
12.1205549765163	92.2010665249509	75.1007157507553	12.7313	98.6134	79.0339
10.3207874140434	91.8744106490467	78.308372475323	3.57801000000001	99.0366	79.8401
11.2751417587508	80.2688848298069	91.3353531050282	4.99968	74.2733	96.2118
17.2684654248932	81.5955152345527	91.5173043394695	16.8354	77.4785	96.9485
23.9588423717954	83.0764415300758	91.720410669136	27.1361	73.6904	92.6772
27.0814673603833	84.5411887460752	91.7492453431576	28.4623	90.5817	94.8789
29.1502898528233	85.51162786522	91.7683481113413	32.5896	90.759	99.4978
31.7838139228645	84.777177138381	87.6201440547594	37.7453	86.3505	90.2585
33.5699379702515	84.2790266697034	84.8067065752851	27.9893	89.6021	79.9213
35.2481177301035	83.8109803656667	82.1632984395936	29.8827	79.684	74.8634
40.6028150302469	84.7921254723481	80.6601472536804	41.546	82.3742	71.0491
44.7766745317848	86.3000006058923	82.1692903749603	43.0779	81.6476	81.3569
51.498078853015	88.728221122026	84.5995507862008	51.2472	90.6526	88.5593
57.1717622684685	90.7779353530732	86.6509876078402	54.3707	99.6057	90.3024
65.610059746715	91.2160655510951	88.4646640283599	65.9332	98.9174	85.8003
73.2733861538871	91.6139495773762	90.1117753697924	75.4786	92.9344	80.494
77.3333972309874	91.804148476781	91.1568129892296	75.6359	99.7073	96.3469
81.0929966308465	91.9802687787176	92.1245181109285	87.9339	96.7331	97.5762
81.0929967403177	91.9802686891988	92.1245180666368	86.1563	95.4019	99.9835
81.1328204890191	90.0661658521198	89.644569977296	83.5669	88.2708	89.9554
81.1694627924075	88.3045432878295	87.3621905959752	75.6586	91.7899	79.8395
81.5457490144455	87.5393306400553	87.1685355783714	85.2864	82.465	90.0038
81.8275653188375	86.966235934311	87.0235052757427	74.5996	81.8744	91.5993
84.24822394403	82.7138109617221	85.7487182593332	86.1254	75.412	92.2501
84.8564472218596	82.6134423225399	83.6174355165599	80.8889	76.3527	85.0129
85.6174350995751	82.4878602192584	80.9508660595556	80.9911	75.8316	78.9882
86.2784361353225	82.3787810348963	78.6346390022228	92.7385	89.9534	78.6648
86.2784379814558	82.3787795741489	78.634629080228	84.4594	85.6238	69.4005
88.6324471574338	79.0859573214273	81.3101703038652	98.0879	82.1977	81.4504
88.6261889840698	76.4259462364242	83.0356274856144	95.1537	79.2325	85.4918
88.6189493926847	73.347948383975	85.0322194512327	98.0725	73.509	85.0617
88.6112645585483	70.0792688169347	87.1524967283248	87.0562	74.7862	94.9506
88.6048533870747	67.3527695737101	88.9210813468692	88.5712	66.6382	86.5414
88.5974116859351	64.1873056876016	90.9744106062563	93.4248	68.5015	98.1606
88.5926355811343	62.1547087229285	92.2928937088848	96.3481	58.4969	97.3507
79.4252349699911	58.0232677941667	91.8057530715051	75.5117	58.1702	94.9268
74.2860318765318	55.7072086441795	91.5326647084367	69.9395	64.1832	90.6048
71.7442308325827	54.5617100233672	91.3975977914419	64.8783	60.379	95.6551
69.4965615413024	49.884894059648	89.3776627357336	70.0979	43.9308	97.3335
68.5673664820283	48.544694663689	87.9320830159205	72.565	40.2263	84.1996
64.07265206844	50.4060377199193	86.835377656092	62.6521	52.6724	96.4246
59.802702103312	52.1715106681165	85.7770030996163	53.4254	44.9898	88.3964
58.0986107530952	54.3202235927757	84.7368629346551	59.9164	58.75	88.5608
56.5270761366935	56.3017997156061	83.7776322676424	59.9164	61.9972	76.3491
52.1647716692665	57.1465818871917	85.5504011691324	54.0007	52.8659	92.5002
47.9719862420474	57.9585371377849	87.25427862733	48.6743	62.5481	86.8455
43.7733457288598	58.7716253068564	88.9605363474115	43.1006	68.5786	87.3861
42.3997438344708	58.5054153685432	89.6203723181099	43.5841	58.7522	99.5019
39.7280161204647	57.9846118499209	89.0769768425374	41.7302	58.1199	97.2119
26.9956704768585	55.5026830085413	86.4873641433505	23.2085	58.8069	93.3912
22.9822034466251	54.7203302173823	85.6710718236414	17.6011	61.1721	91.0121
21.2646460617673	53.2073743118629	84.3109159231949	13.8308	54.4775	90.8096
18.58970599277	50.2530637530207	81.2452404846584	17.8085	51.9553	71.4677
17.4716831691412	48.3224932791912	82.3732120318192	13.2524	50.7626	76.4367
15.4670157199767	44.8608785300351	84.3957241265396	7.21925	42.3799	79.403
15.873387336079	42.6410302100427	87.2930341651738	9.27453	43.3967	88.7547
16.2818964115439	40.4095042454808	90.2055854920747	8.75416	38.928	96.5496
26.7322816339089	35.0333516003305	91.8693634217565	31.4339	43.8079	91.7683
34.74947680525	30.5932356374046	93.1697197405242	44.5404	30.686	94.969
31.3562039012392	28.6146581495974	92.4715845439464	29.1053	29.2049	97.3043

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.2962523870484	26.8304360416319	91.8420273203236	27.4222	25.8428	88.2494
25.7411205202803	25.340567995171	91.3163320900666	27.2482	20.2425	98.6789
23.158812054226	23.8348520286016	90.7850467177944	20.3288	28.022	94.6827
20.541420230182	22.3086797738886	90.2465438014413	22.6997	14.9199	96.5597
17.854236697453	21.126676390898	89.4324646036641	9.96077	19.2347	95.1963
18.2557835817184	20.5037590209039	85.427602523149	19.247	29.2712	80.817
18.5175902576402	14.6332029880872	80.0199074624589	27.3595	17.3028	77.1892
18.6656957305754	11.3117792394565	76.9603714313549	17.1854	11.1942	73.5432
18.7776027459217	8.80226330427223	74.6487227593779	19.7287	0.198716	79.5663
18.7776028118636	8.80226205090881	74.6487211596518	10.9477	2.73525	75.6448
22.0086460311405	7.63421050164418	69.6301628906079	23.5387	4.13129	73.048
25.980159719255	6.19848022835208	63.4614808370324	21.7245	2.01127	55.495
30.0261133285076	7.20014618870299	63.4508891191421	26.7979	6.90196	59.464
37.2165940295542	8.98030842771197	63.4320812750743	36.0033	17.5038	68.4307
37.8729801859008	9.04168747511844	63.3731083368309	33.1085	0.882753	62.284
48.5118196425068	10.0365698962805	62.4173740657681	50.9211	16.4053	69.6798
53.7874279848685	8.79262422963905	59.8285254735464	56.3237	2.07366	66.7228
63.6069152225866	7.40669135780057	53.7740348764926	60.7013	1.36116	46.4176
72.5398515773512	8.66864254406619	51.841012712084	74.632	5.60444	48.5009
78.5521784931251	9.51800899435304	50.5399922482239	80.035	15.8589	58.0701
80.4386876587102	9.60564052070508	49.9027152347897	78.906	18.0381	53.555
87.9778073803063	9.95582131094463	47.3559861329549	95.0473	3.39817	49.8314
88.3914820787335	12.1851424283958	45.6552627933192	88.2698	14.9994	45.4757
88.7551855097175	14.1451668388533	44.1599827458123	86.8707	18.0065	43.4379
89.0565270218061	15.7691227404855	42.9210860899411	87.5589	25.1226	45.9834
90.5679124090391	14.7126381986275	38.341642334756	91.7898	10.5225	38.6828
91.9232996810635	13.7652031664994	34.2348721995513	99.5164	7.77478	36.5945
91.9233015423418	13.7652021401855	34.2348609729262	97.2905	22.0419	32.8941
91.741857928801	9.83846956161503	24.3088832163408	88.6343	0.494442	25.7719
92.3420566167396	10.0121159633931	19.1966146560635	88.9914	10.7701	17.3091
92.83192893174	10.1538435893186	15.0240719444206	98.9579	4.73211	12.8251
93.0348772824125	10.2125590606266	13.2954498971415	95.7659	2.55349	7.5519
91.8204979929441	15.7968244523474	11.3324118399728	97.4766	17.1802	10.0021
90.7437135787137	20.7483713481798	9.59179565112655	99.5853	23.4577	6.8435
90.5638443784038	21.5755201206517	9.30102764139353	98.8743	25.646	5.6301
87.4866759523259	24.2541550613351	8.96710789965493	90.11	20.7153	5.7932
81.5222452109378	29.4461249055076	8.31987420337417	80.0506	36.8529	1.8328
76.5342847763321	26.6408156072794	15.1611514302784	81.7106	28.112	19.2367
71.2267219248141	23.6557551762696	22.4407845371591	76.419	22.7841	27.7958
68.3269329636601	22.0248666583606	26.4180139411729	62.0154	28.1819	31.0401
69.1789378947798	13.4979875758086	28.9927637057711	77.911	9.90186	32.1435
69.1789378074396	13.4979868631392	28.9927638805463	68.2389	8.47105	37.5341
69.425525688631	12.5081891301757	23.1407004636458	79.2919	13.6517	22.466
68.6392646759817	11.4144299797753	17.449477897093	67.267	14.1516	17.4107
67.8507401639475	10.3175205777533	11.7418631397639	74.5771	5.70821	6.0306
66.2482323096782	10.909108285972	11.1295283004673	70.1018	4.34543	9.0382
62.493641446042	12.295156569577	9.69485804825649	62.8285	19.7058	3.0557
59.3939215205124	11.1875080602921	10.5330782104771	58.2097	7.56071	2.229
56.7174240615995	10.2310926181451	11.2568520107372	58.7637	13.9566	16.9818
53.479059502479	9.07390181126659	12.132565267436	56.1254	1.40532	17.903
52.7760118497683	9.00845640253075	12.182799459819	48.5894	0.54797	14.4264
52.5721152489769	8.98947522878558	12.1973691181315	47.3917	2.23053	7.041
50.3714869003819	12.3019891220452	15.4516409087994	54.7387	20.4852	11.8363
48.0626627295069	14.3210055299912	18.5853540241905	48.6979	8.85907	21.303
45.4469754792725	16.6083700951911	22.1355655789192	47.6331	25.3181	18.59
43.9594810853389	17.9091541393729	24.1545071735525	49.4045	19.961	26.5255
42.4754052166609	19.2069497378065	26.1688087656462	37.0272	27.4581	25.0096
43.248995191435	15.777974022323	31.871308529166	42.987	22.9253	37.986
43.3968861136383	15.122454480872	32.9614666677782	49.4944	16.327	40.7382
39.9148314161041	11.8118797907956	31.9735883788149	42.0178	3.44287	36.938
36.5442699018387	11.2448268886261	29.9062387641054	37.2177	7.79249	31.0238
32.9849386225237	10.6460155087518	27.7231011050755	38.2491	9.61738	19.3363
26.4213575401375	9.55514393081375	23.7783853991529	25.6231	12.6549	17.499
23.1974862825587	9.0193326971777	21.840828357182	21.4744	8.21886	12.0685
21.9050481384544	8.94625575600094	23.4726735569805	23.1984	1.0131	19.9686
16.5201743860207	8.64179054714332	30.2716686002401	19.0116	0.977048	36.1157
15.373191028334	9.33534212047639	30.8464044622512	12.6307	2.70835	31.4638
14.17795049339	10.0580737764175	31.445321532294	14.8737	9.51072	37.7455
13.0988227665975	10.7105953040467	31.9860558479207	15.6444	17.8995	34.8069
12.2302750326049	11.235784887225	32.4212714395014	17.2907	17.3232	33.1257
11.3216935353367	11.7851823409555	32.876547204835	8.57052	3.36732	32.2638
10.0716156091158	12.5410728908095	33.502941582176	4.96047	4.06059	34.5353
6.99040998107552	14.7839183930662	35.0970581814091	2.68873000000001	16.3883	43.9305
6.73082642232231	15.5978346568806	32.5265948914305	2.19732	10.251	34.6682
6.27859349906757	17.0157896693786	28.0484895617658	2.1823	25.6845	27.6693
6.21694105277976	17.2090978965732	27.4379991804184	5.25835000000001	27.1001	26.8402
6.0633501150855	14.6626542395335	22.0058118960003	0.659450000000007	19.6999	21.228
5.82602429328398	10.7277524802491	13.6117141016486	0.219756000000004	2.58493	14.7832
6.72850165144013	10.7027930297031	10.2815875199375	12.7116	4.29147	5.5693
6.72850160102219	10.7027931963142	10.2815872579658	9.0496	1.67955	6.7742

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.63538607804826	11.0338753697095	10.0864057332533	2.00806	6.28968	2.6575
5.49983524148685	17.4197509603917	7.45467372447624	5.81823	20.7452	12.0688
4.49152010618846	23.0900841871538	5.11782255459067	13.4	22.8874	2.3331

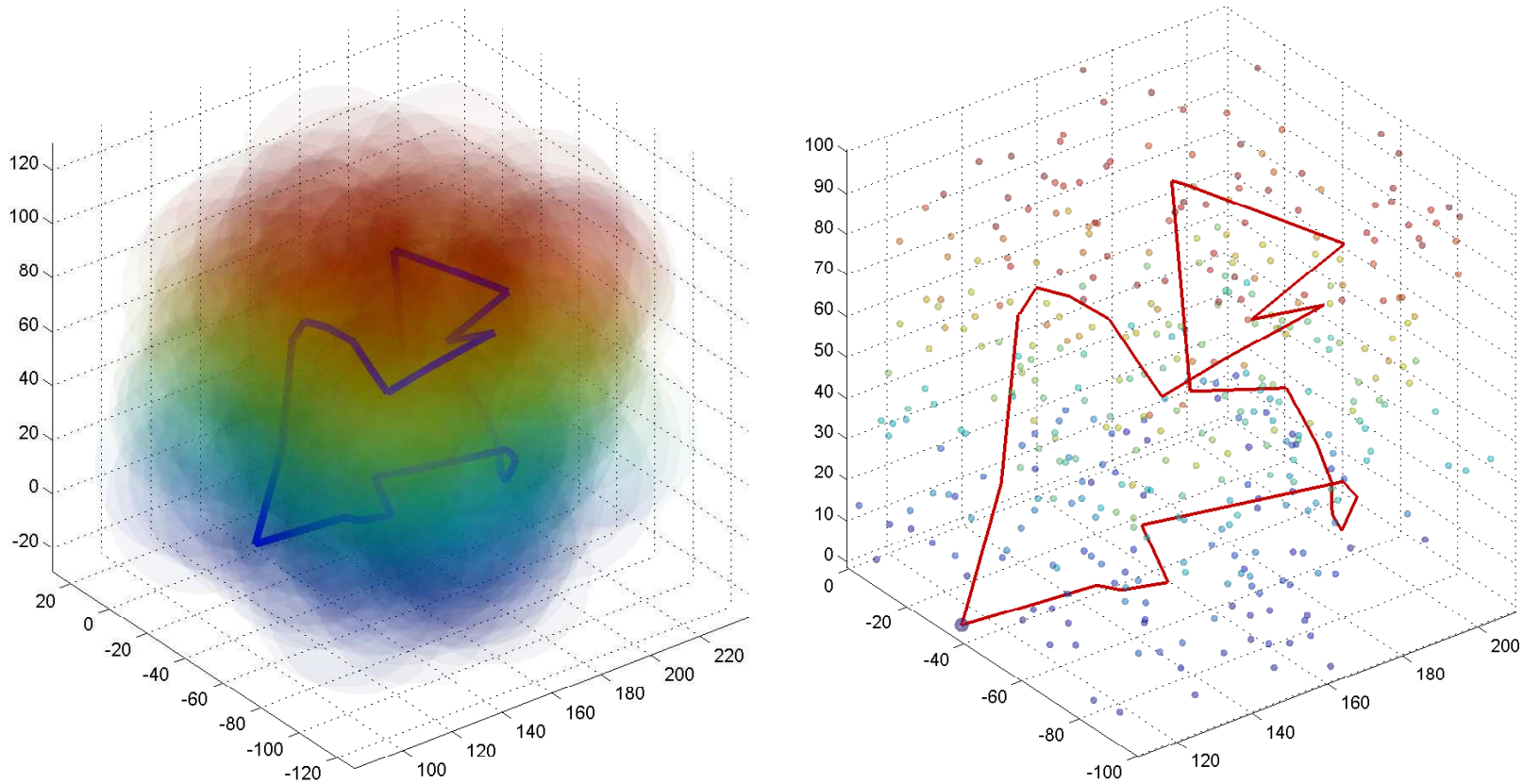


Figure N.81: $rd400$, $r = 29.865927$, Equal Radius, 3D, Euclidean, Length = 539.9541466

Table N-84: Solution for $rd400$, $r = 29.865927$, Equal Radius, 3D, Euclidean

Total distance: 539.954146564889 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
6.33587258932393	32.6310499160893	3.28470279353459	13.4	22.8874	2.3331
9.70629633389173	30.2380398831896	6.01639638272408	5.81823	20.7452	12.0688
9.70629633389173	30.2380398831896	6.01639638272408	0.659450000000007	19.6999	21.228
12.3081160244762	28.390739315565	8.12514414595517	2.00806	6.28968	2.6575
15.0295939426541	26.4584727839373	10.3308900037336	9.0496	1.67955	6.7742
17.346689319241	24.8133202455874	12.2088868352895	12.7116	4.29147	5.5693
19.6643225613691	23.1677894153127	14.0873146399815	0.219756000000004	2.58493	14.7832
22.8530778070526	20.9037530072872	16.6717924922974	2.19732	10.251	34.6682
25.6655298083799	18.9068866606905	18.9512875397967	4.96047	4.06059	34.5353
25.6655624116098	18.9068656028534	18.9513116258353	8.57052	3.36732	32.2638
25.6655943599114	18.9068449696164	18.9513352208266	19.0116	0.977048	36.1157
25.6655943599114	18.9068449696164	18.9513352208266	14.8737	9.51072	37.7455
25.665624418964	18.9068255530284	18.9513574114152	12.6307	2.70835	31.4638
25.6656541989402	18.9068063131727	18.9513793955658	23.1984	1.0131	19.9686
25.6656541989402	18.9068063131727	18.9513793955658	21.4744	8.21886	12.0685
25.6656835818984	18.9067873465692	18.9514010884157	25.6231	12.6549	17.499
25.6657126610937	18.9067685832791	18.9514225562203	47.3917	2.23053	7.041
25.6578168486434	18.9192349887905	19.0208779390701	38.2491	9.61738	19.3363
25.6578168486434	18.9192349887905	19.0208779390701	37.2177	7.79249	31.0238
25.64958859127	18.9322260406241	19.0932548992838	48.5894	0.54797	14.4264
25.64958859127	18.9322260406241	19.0932548992838	48.6979	8.85907	21.303
25.6305013706993	18.962363043613	19.2611840094503	47.6331	25.3181	18.59
25.6305013706993	18.962363043613	19.2611840094503	49.4045	19.961	26.5255
25.6112537044412	18.9927525005138	19.4305203321094	36.8488	32.2474	21.2512
25.6112537044412	18.9927525005138	19.4305203321094	42.987	22.9253	37.986
25.592941405138	19.0216640872594	19.5916216790842	28.6889	43.6077	12.417
25.592941405138	19.0216640872594	19.5916216790842	26.2003	42.5604	24.4871
25.5740418516349	19.0515030682297	19.7578920051033	11.4258	37.7412	14.2255
25.5740418516349	19.0515030682297	19.7578920051033	13.4598	41.6191	22.5554
25.5549459058622	19.0816527210929	19.9258952223542	17.5856	40.8861	25.0628
25.5361596546797	19.1113132872131	20.0911742687868	0.642905999999996	35.395	17.4189
25.8177767357992	19.4357553326574	25.0190135702221	15.6372	44.5891	30.235
26.0044261705816	19.6507965330829	28.2852926221097	2.1823	25.6845	27.6693
26.0044261705816	19.6507965330829	28.2852926221097	5.25835000000001	27.1001	26.8402
26.2164583831661	19.8950788434099	31.9956781069144	15.6444	17.8995	34.8069
26.4264983002294	20.1370639938098	35.6711609175626	17.2907	17.3232	33.1257
26.4264983002294	20.1370639938098	35.6711609175626	37.0272	27.4581	25.0096
26.6889822664595	20.4394678601219	40.2642935621992	2.68873000000001	16.3883	43.9305
26.9460895063988	20.7356755901946	44.7633063809344	0.613562000000002	12.2624	51.4967
27.1241123690687	20.940774709456	47.8785565012918	6.43447000000001	8.70233	59.8478
27.2537822687518	21.0901689579388	50.1477418781859	10.9524	12.0779	65.6188
27.2537822687518	21.0901689579388	50.1477418781859	15.6993	18.7479	59.9926
27.353587511618	21.2051598408121	51.8944041133935	17.1854	11.1942	73.5432
27.4239780067821	21.286262160514	53.1263380830161	21.7245	2.01127	55.495
27.4239780067821	21.286262160514	53.1263380830161	42.0178	3.44287	36.938
27.576793934978	21.4623238794737	55.8005903246181	33.1085	0.882753	62.284
27.576793934978	21.4623238794737	55.8005903246181	26.7979	6.90196	59.464
27.7153941104474	21.6220093146945	58.2261223764626	23.5387	4.13129	73.048
27.8274820843964	21.7511517276422	60.1877656704959	10.9477	2.73525	75.6448
27.8350161200012	21.7598322130558	60.3196574995772	25.7178	17.895	52.7372
27.8425509893451	21.7685136290268	60.4515631803341	25.8125	25.1372	50.1121
27.8425509893451	21.7685136290268	60.4515631803341	31.0765	22.0815	48.5077
27.8500223581254	21.7771217968594	60.5823552299779	19.7287	0.198716	79.5663
27.8500291037381	21.7771381339575	60.582360214804	49.4944	16.327	40.7382
27.9271957448296	21.9822065051965	60.651950964349	32.7353	38.4372	45.6112
27.9271957448296	21.9822065051965	60.651950964349	33.2771	46.652	45.1216
27.9748647067698	22.108884128943	60.6949376809124	49.1148	32.8614	42.5439
27.7675289611438	22.7708773027158	61.5016916332338	38.2173	22.874	49.077
27.5447733325708	23.4821080302875	62.3684494608159	25.7714	33.2927	46.3113
27.5447733325708	23.4821080302875	62.3684494608159	23.6339	40.0124	41.5074
27.294745783433	24.2804321863419	63.3413442850236	19.5262	30.4483	48.5255
27.0373306861293	25.1023553349929	64.3429982506522	17.6023	36.5196	56.7286
27.0373306861293	25.1023553349929	64.3429982506522	22.7183	34.3604	52.0641
26.7796441777968	25.9251398270843	65.3457028578274	15.3897	25.3897	58.7078
26.7796441777968	25.9251398270843	65.3457028578274	23.2874	32.7742	59.4617
26.522638238502	26.7457585942575	66.3457685918041	2.38826	24.0295	62.08
26.522638238502	26.7457585942575	66.3457685918041	9.16001	37.8018	54.1714
26.26425022253	27.5707966441513	67.3512199814417	4.056	25.9589	74.3875
26.26425022253	27.5707966441513	67.3512199814417	3.44571000000001	28.2052	68.896
26.0389245829812	28.2902499992281	68.2279998617444	15.3759	23.0999	65.044
25.8072396374125	29.030011651725	69.1295286015162	26.0672	21.3383	63.983
25.8072396374125	29.030011651725	69.1295286015162	34.4638	23.0393	61.4662
25.5436429216016	29.8716972324691	70.1552672603294	27.3595	17.3028	77.1892
25.5436429216016	29.8716972324691	70.1552672603294	36.0033	17.5038	68.4307
25.2556633224252	30.7912853371073	71.2759420271379	27.4222	25.8428	88.2494
25.2556633224252	30.7912853371073	71.2759420271379	19.247	29.2712	80.817

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.980463486161	31.6700475893374	72.3468633913352	22.6997	14.9199	96.5597
24.8984917714663	31.9317585792992	72.6658138484874	9.96077	19.2347	95.1963
25.1329456403947	33.0095270933521	72.8299934976423	27.2482	20.2425	98.6789
25.5219778653009	34.7976332156821	73.1023604525643	20.3288	28.022	94.6827
25.9365679750794	36.7031983299034	73.3926173880167	29.1053	29.2049	97.3043
26.3762990077664	38.724317535483	73.7004754340164	44.5404	30.686	94.969
26.8336809236337	40.8265689489535	74.020698019377	55.717	37.8511	81.0117
26.8336807993957	40.8265774795343	74.0206987473111	41.7205	19.4188	86.0496
26.8336807993957	40.8265774795343	74.0206987473111	42.4972	23.9973	88.7768
26.8336806631854	40.8265861984014	74.0206994813839	37.7688	31.4408	76.6336
26.8336806631854	40.8265861984014	74.0206994813839	31.6686	31.1822	62.9487
26.83368053418	40.826594937395	74.020700232929	39.9475	19.2268	79.8118
26.83368053418	40.826594937395	74.020700232929	46.0829	25.5503	78.1024
26.8336803896975	40.8266038797572	74.0207009992924	24.4594	47.3987	68.2546
26.8336802534601	40.826612745854	74.0207017699949	38.5534	48.7846	64.7262
26.8336801112715	40.8266215464715	74.020702543313	34.4656	38.8185	62.9703
26.8336801112715	40.8266215464715	74.020702543313	38.1612	45.7549	62.3997
26.8336799557667	40.8266303604487	74.0207033357868	13.2524	50.7626	76.4367
26.8336799557667	40.8266303604487	74.0207033357868	17.8085	51.9553	71.4677
26.833679817579	40.8266390744315	74.0207041286853	23.2085	58.8069	93.3912
26.8336796819189	40.8266476297213	74.02070490067	13.8308	54.4775	90.8096
26.8336796819189	40.8266476297213	74.02070490067	17.6011	61.1721	91.0121
26.8336795651597	40.826655862387	74.0207056391884	7.21925	42.3799	79.403
26.8336794598097	40.8266641391195	74.0207063842839	8.75416	38.928	96.5496
26.8336794598097	40.8266641391195	74.0207063842839	9.27453	43.3967	88.7547
26.8336793610525	40.8266724614992	74.0207071380936	47.522	42.292	65.6102
26.8336792559375	40.8266808945659	74.020707909703	55.099	31.771	70.6981
26.6619289856083	45.5154105900457	74.457471753266	31.4339	43.8079	91.7683
26.4815151718063	50.4407859954682	74.9162864801783	30.4468	53.5688	58.3124
26.3000295231129	55.3957274461328	75.3778739160738	43.5841	58.7522	99.5019
25.5454328141343	58.5641275120217	74.7995455138933	41.7302	58.1199	97.2119
24.2685862270472	63.9253918764952	73.8209708285325	43.1006	68.5786	87.3861
22.9245882182636	69.5685998058648	72.7909313141108	4.99968	74.2733	96.2118
22.8535073802531	70.9385664457913	72.1721495348788	16.8354	77.4785	96.9485
22.8535073802531	70.9385664457913	72.1721495348788	27.1361	73.6904	92.6772
22.7770389987512	72.4123791100187	71.5064585480656	1.5771	61.4642	62.0285
22.6885982496966	74.1169335613182	70.7365510843393	8.30742000000001	60.1487	54.798
22.5885261420394	76.04566202592	69.8653961276629	12.7313	98.6134	79.0339
22.5149692238386	77.4633516603727	69.2250568310976	18.064	96.3276	61.2807
22.5149692238386	77.4633516603727	69.2250568310976	27.8353	94.5623	59.9313
22.4573219851546	78.5744084653942	68.7232143460185	0.299018000000004	97.3272	63.0477
22.4573219851546	78.5744084653942	68.7232143460185	3.06059000000001	88.1315	51.3598
22.4513300791141	78.689849069006	68.6710713526739	3.24988	93.8751	52.5027
22.4465856341492	78.7812449124081	68.6297888159382	3.57801000000001	99.0366	79.8401
22.4465857737416	78.7812453689677	68.6297883783411	4.28894	92.6489	49.3954
23.7342435074291	78.847470812048	68.9349747445619	14.0141	70.4084	60.1608
25.1349972951641	78.9195125817276	69.2669647653795	16.576	71.2313	59.4946
26.6361300455171	78.9967167281712	69.622744499911	34.9224	79.9328	54.0968
28.0954739025218	79.071771669386	69.9686200524093	19.5225	82.1483	62.667
28.0954739025218	79.071771669386	69.9686200524093	23.3293	78.9181	52.7226
29.7630435821979	79.1575360472596	70.3638465175215	27.9893	89.6021	79.9213
29.7630435821979	79.1575360472596	70.3638465175215	29.8827	79.684	74.8634
31.4411909004343	79.2438445077546	70.7615783346858	41.546	82.3742	71.0491
33.0325353343958	79.3256892540746	71.1387374051116	43.0779	81.6476	81.3569
34.5148842944642	79.4019288988052	71.4900634603446	37.7453	86.3505	90.2585
35.9415782326449	79.4753057362577	71.8281976192231	53.7144	89.3849	55.8234
35.9415782326449	79.4753057362577	71.8281976192231	44.9959	88.3516	56.7624
37.097697604079	79.5347672684901	72.1022074100155	28.4623	90.5817	94.8789
38.3889271937729	79.601177258285	72.4082378252794	32.5896	90.759	99.4978
45.4490538867521	79.7509137914699	73.5513777028379	51.2472	90.6526	88.5593
51.6776625913188	79.8830161129705	74.5598838974442	54.3707	99.6057	90.3024
56.8370344415355	79.9924430373128	75.3952703156517	65.9332	98.9174	85.8003
60.7261399233338	80.0749309276156	76.0249870193757	68.3546	93.0491	63.4728
64.5968532775186	80.1570282575146	76.6517236176484	92.7385	89.9534	78.6648
64.5968532963033	80.157028196607	76.6517236334623	68.0526	97.9535	69.9593
64.5968533190401	80.1570281384858	76.651723655325	75.6359	99.7073	96.3469
64.3811822548271	79.3853601328472	76.2302092561836	85.2864	82.465	90.0038
64.1383193843939	78.5164000382621	75.7555506327086	74.5996	81.8744	91.5993
64.1383193843939	78.5164000382621	75.7555506327086	80.8889	76.3527	85.0129
63.8909920469777	77.6314670119682	75.2721662741865	83.5669	88.2708	89.9554
63.5513102571099	76.4160892433553	74.6082824273028	75.4786	92.9344	80.494
63.1697422760799	75.0508425820581	73.8625352810037	75.6586	91.7899	79.8395
62.7267649587191	73.4658727182379	72.9967683552117	84.4594	85.6238	69.4005
62.1884956941526	71.5399491818414	71.9447622144288	80.9911	75.8316	78.9882
62.1884956941526	71.5399491818414	71.9447622144288	78.2186	68.7569	71.4148
61.6144162131569	69.4859027049247	70.8227687951571	73.8931	82.0767	63.5442
60.9942543750341	67.2669744432468	69.6107123978912	81.8209	62.9891	53.3907
60.4929829218555	65.473435135417	68.631016187592	64.2573	58.953	49.3124
60.0727754250823	63.9699394154186	67.8097508526929	60.771	67.3196	52.7577
59.6925110290879	62.6093579693439	67.0665495001196	56.0439	62.2937	45.4781

Solution x	Solution y	Solution z	Original x	Original y	Original z
59.6925110290879	62.6093579693439	67.0665495001196	57.8122	54.5104	45.2899
59.4326808216378	61.6796874360994	66.558725640367	46.2037	41.7062	48.7254
60.5838414862761	62.482641408263	67.8363592793688	41.6783	52.1535	70.8377
60.5838414862761	62.482641408263	67.8363592793688	44.4217	55.3301	59.2126
62.5139652556132	63.8289453790116	69.9785690086389	48.6743	62.5481	86.8455
64.5040810164983	65.2170966306577	72.1873675452971	53.4254	44.9898	88.3964
67.5985107080037	67.3755390020478	75.6218616328733	62.6521	52.6724	96.4246
70.1449069258512	69.1517076407315	78.4480734488193	82.6909	80.2719	62.172
72.7535423671249	70.9712902462413	81.3433670954426	89.1084	77.1611	62.2997
75.5584133878638	72.9277594266277	84.4564913448616	87.9339	96.7331	97.5762
75.5372936958975	72.7627393413343	84.4391406408458	96.3481	58.4969	97.3507
75.5188241133116	72.6184266061011	84.4239673516315	86.1563	95.4019	99.9835
75.3573061147767	71.3563398614734	84.2912698810795	98.0879	82.1977	81.4504
75.3573061147767	71.3563398614734	84.2912698810795	95.1537	79.2325	85.4918
75.1478566287055	69.7196919854799	84.1191896593095	98.0725	73.509	85.0617
75.1478566287055	69.7196919854799	84.1191896593095	88.5712	66.6382	86.5414
74.9297737310892	68.0155912623833	83.9400176847009	93.4248	68.5015	98.1606
74.7000284298164	66.2203417317502	83.7512612668128	87.0562	74.7862	94.9506
74.7000284298164	66.2203417317502	83.7512612668128	86.1254	75.412	92.2501
74.4358522558973	64.1560266113901	83.5342135210088	75.5117	58.1702	94.9268
74.1835854110514	62.1847827810304	83.3269520584123	64.8783	60.379	95.6551
73.9395453357745	60.2778227408726	83.1264493200559	69.9395	64.1832	90.6048
73.9395453357745	60.2778227408726	83.1264493200559	59.9164	58.75	88.5608
73.7056109843765	58.4498200342158	82.9342474002674	59.9164	61.9972	76.3491
73.4729160961972	56.6314944878282	82.7430627438734	65.9297	69.3415	71.7927
73.4729160961972	56.6314944878282	82.7430627438734	60.9907	71.4945	66.9566
73.1683588665011	54.2515794273349	82.4928290863907	54.0007	52.8659	92.5002
72.8796963739367	51.9958826445403	82.2556566081578	82.834	58.4111	60.6469
72.8796963739367	51.9958826445403	82.2556566081578	69.3672	55.5594	61.2856
72.5671792106007	49.5537506099895	81.9988808226883	69.1414	57.6653	59.1832
72.2374467489662	46.9770919873519	81.7279608933731	86.8559	48.4797	70.9689
71.9044401984041	44.3748368262724	81.4543494904814	70.0979	43.9308	97.3335
71.5717376401433	41.7749623709251	81.180987779334	72.565	40.2263	84.1996
71.2539259589293	39.2914742801296	80.9198643339768	95.9404	38.2332	74.7444
70.9264239011668	36.7322376774833	80.6507755479289	78.6058	43.2582	65.7281
70.5837275198854	34.0542706220865	80.3692034892946	85.0689	32.1301	62.1612
70.5837275198854	34.0542706220865	80.3692034892946	74.7866	36.0265	64.8468
70.2600989301097	31.5253205848161	80.1033002202192	74.0572	35.987	63.4666
70.2600989301097	31.5253205848161	80.1033002202192	73.2088	32.0501	51.6558
69.9762873738256	29.3075470041791	79.8701132227113	77.5205	18.1054	72.6356
69.9762873738256	29.3075470041791	79.8701132227113	77.6794	29.1288	65.8649
69.7228296540853	27.3269940024107	79.661869020483	73.4709	7.6166	79.1313
69.5158473138987	25.7096287621026	79.4918127346725	93.1464	19.8146	96.7782
69.1278936174869	23.6280592709692	79.1836768095592	90.4883	12.6216	83.5226
68.7801147259586	21.7620404619526	78.9074515803826	61.5069	0.482106	98.5604
68.8595183129708	21.7275560270618	78.310552670431	64.5769	3.66176	91.1441
68.943637027638	21.6910236715082	77.6782083815039	52.4925	5.37248	88.2454
68.943637027638	21.6910236715082	77.6782083815039	55.9929	17.1432	85.8884
69.0366529924577	21.6506270122402	76.978981068916	75.2455	17.3084	91.8789
69.0366529924577	21.6506270122402	76.978981068916	76.9072	18.2917	80.6948
69.1359388826182	21.6075069845328	76.2326196981853	68.0574	15.6194	97.6814
69.2447356655651	21.5602560363181	75.4147617889696	96.7473	23.5618	82.348
69.2447356655651	21.5602560363181	75.4147617889696	89.036	30.7257	77.9388
69.3592072862436	21.5105400439005	74.5542456870489	96.7716	16.6523	73.2113
69.3592072862436	21.5105400439005	74.5542456870489	82.6839	23.4883	70.1916
69.4575606581003	21.4678250827605	73.8148983820432	51.1528	6.04103	87.327
69.5839944525758	21.4129136144332	72.864460766632	43.8962	13.6901	83.4665
69.9589096987133	21.2500699603035	70.0460561387929	47.6864	20.3976	74.364
70.3809206527728	21.0667660179158	66.8736006268461	50.9211	16.4053	69.6798
70.8294895555373	20.8719249034271	63.5014976891774	56.9788	35.9946	54.4126
71.2247558355779	20.7002380022256	60.5301050650071	56.3237	2.07366	66.7228
71.6854042029131	20.5001515257982	57.0672070039338	74.632	5.60444	48.5009
72.080390582882	20.3285887730806	54.0979261863604	56.0389	33.1015	51.1098
72.456710487573	20.1651362655138	51.2689757929156	95.0473	3.39817	49.8314
72.737797390158	20.0430480493881	49.1559426849493	80.035	15.8589	58.0701
73.0315410879348	19.9154621495867	46.9477620984099	78.906	18.0381	53.555
73.3349464994207	19.7836793865779	44.6669491805831	60.7013	1.36116	46.4176
73.6387525343514	19.6517245686299	42.3831310790334	88.2698	14.9994	45.4757
73.9461090313189	19.5182270669104	40.0726200307423	99.5164	7.77478	36.5945
74.1570512140876	19.4266076712077	38.4869040597909	76.419	22.7841	27.7958
74.3547256401506	19.3407513919163	37.0009279350755	62.0154	28.1819	31.0401
74.3547256401506	19.3407513919163	37.0009279350755	73.064	44.6995	31.3834
74.537629747822	19.2613104161587	35.6259867286703	87.5589	25.1226	45.9834
74.7339524028654	19.1760403690892	34.1501714333795	81.7106	28.112	19.2367
74.9081802879375	19.1003677545086	32.8404513375373	97.2905	22.0419	32.8941
74.9081802879375	19.1003677545086	32.8404513375373	80.1207	32.7664	32.9471
75.0762413227195	19.0273737427427	31.5770889697584	91.7898	10.5225	38.6828
75.0762413227195	19.0273737427427	31.5770889697584	86.8707	18.0065	43.4379
75.2620717141091	18.9466605401849	30.1801436831262	88.6343	0.494442	25.7719
75.2620717141091	18.9466605401849	30.1801436831262	88.9914	10.7701	17.3091

Solution x	Solution y	Solution z	Original x	Original y	Original z
75.4178901093614	18.8789834776901	29.0088083078497	77.911	9.90186	32.1435
75.4178901093614	18.8789834776901	29.0088083078497	68.2389	8.47105	37.5341
75.5906919853301	18.8039282716615	27.7097974137301	79.2919	13.6517	22.466
75.7628564136734	18.7291498145938	26.415577950835	67.267	14.1516	17.4107
75.7628564136734	18.7291498145938	26.415577950835	54.7387	20.4852	11.8363
75.9149653482878	18.6630818904406	25.2721240550118	56.1254	1.40532	17.903
75.9149653482878	18.6630818904406	25.2721240550118	58.7637	13.9566	16.9818
76.0513174201082	18.6038585492373	24.2471249263254	74.5771	5.70821	6.0306
76.0513174201082	18.6038585492373	24.2471249263254	70.1018	4.34543	9.0382
76.1621839479987	18.5557059541832	23.4137118194194	58.2097	7.56071	2.229
76.1621852820205	18.5557065349237	23.4137115946157	95.7659	2.55349	7.5519
76.3002166570052	19.1748216589694	23.6691044102832	98.9579	4.73211	12.8251
76.5741511047294	20.4034952663873	24.1759423400174	62.8285	19.7058	3.0557
76.9004944044093	21.8672345809614	24.7797431251067	97.4766	17.1802	10.0021
77.2576169807803	23.4690286162677	25.4404891866111	99.5853	23.4577	6.8435
77.2576169807803	23.4690286162677	25.4404891866111	98.8743	25.646	5.6301
77.7907680737147	25.860340874366	26.4269018516783	90.11	20.7153	5.7932
78.4569993145425	28.8485634459328	27.659535704938	80.0506	36.8529	1.8328
79.197221912374	32.1686510739409	29.0290637894187	72.4782	47.1166	11.4083
79.197221912374	32.1686510739409	29.0290637894187	69.2786	47.5055	16.1011
79.7825188590762	34.793827976711	30.1119515379188	85.2354	42.0312	17.7315
79.7825188590762	34.793827976711	30.1119515379188	79.5061	49.6701	11.7965
80.2993772735507	37.1120278045145	31.0682189468515	81.8496	38.8539	28.9342
80.2993772735507	37.1120278045145	31.0682189468515	80.5435	37.2793	30.7227
80.8461272266271	39.5642951589856	32.0797886726062	96.1419	41.3034	39.8142
80.8461272266271	39.5642951589856	32.0797886726062	91.3249	42.8902	41.6597
81.3411785306612	41.7846850221274	32.9957089177973	92.0634	46.0336	40.4672
81.3411785306612	41.7846850221274	32.9957089177973	88.1955	43.6361	47.6404
81.7998690371801	43.8419890233909	33.8443564489693	94.61	43.2995	53.8065
81.7998690371801	43.8419890233909	33.8443564489693	92.3029	41.017	61.4442
81.8528440832143	44.0795839817578	33.9423723181304	60.6972	35.5066	52.4287
81.8528440832143	44.0795839817578	33.9423723181304	55.5492	35.9315	44.2535
81.9346732196768	44.4465953643596	34.0937759502019	96.3235	44.2629	60.2644
81.6067709270116	45.9258567399667	33.5076899232129	81.1997	46.621	50.135
81.6067709270116	45.9258567399667	33.5076899232129	76.05	41.1841	50.3284
81.2375813988287	47.5913781245241	32.8478087989536	81.4209	43.6493	50.298
80.8389627355773	49.389663639897	32.1353270869783	67.8108	54.6502	44.2592
80.8389627355773	49.389663639897	32.1353270869783	61.5258	41.6034	50.3406
80.2828061547935	51.8986488199651	31.1412702471404	80.6139	53.7748	37.9975
80.2828061547935	51.8986488199651	31.1412702471404	70.983	56.1077	39.9244
79.7425368704017	54.3359618637319	30.175609120249	74.6616	49.1772	30.6996
79.1857855749569	56.8476334858507	29.1804885490541	76.3859	55.8636	29.5918
79.1857855749569	56.8476334858507	29.1804885490541	74.8357	53.7031	27.6754
78.627553506171	59.3659915844585	28.1827206417319	94.2046	73.3577	49.4797
78.1445786519795	60.8949838265909	27.3699381952326	88.4474	55.9131	14.5629
77.6501835476055	62.4601323494984	26.5379377870987	90.8764	48.3318	12.9357
77.6501835476055	62.4601323494984	26.5379377870987	82.7455	58.0479	28.4959
77.0448786292023	64.3764031180587	25.51929327811	85.3959	62.1638	1.7086
77.0448786292023	64.3764031180587	25.51929327811	95.4573	78.5053	38.9919
76.5295682075601	66.0077625482747	24.6520971961157	81.8774	60.6902	25.477
75.9803701944881	67.7464034537498	23.7278734628656	97.9153	71.697	3.8476
72.8428993049566	71.992948768273	22.8480477416559	66.9764	66.2314	9.0944
69.6918707211218	76.2578503380587	21.96442261327	51.793	64.9464	0.9013
69.1914777099871	77.449143475909	22.0561608183513	52.5118	68.1256	10.9937
68.6657883677034	78.7006625638098	22.1525378915204	60.7208	77.8844	16.4053
68.6657883677034	78.7006625638098	22.1525378915204	66.7645	81.0279	23.2022
68.1280028072854	79.9809789531384	22.2511321122153	63.6977	85.2552	13.695
67.6026148717307	81.2317792096343	22.3474529892752	54.169	81.8375	12.9059
67.088473184747	82.4558051031674	22.4417117989385	54.7886	87.0165	7.4948
66.6030571209541	83.611440940461	22.5307030481826	51.8363	98.9629	1.5963
66.8115122467623	83.8835224798827	23.4097511056103	49.8328	92.6571	10.5815
67.0410706515922	84.183150141302	24.3777954568084	48.9418	95.7946	8.5835
67.327545711731	84.5570693018242	25.5858615161309	58.0371	93.3465	37.2538
67.592954594227	84.9034857579957	26.705074038785	61.8453	80.8454	29.5157
67.8600935399805	85.2521597961359	27.8315803883477	48.6626	98.7924	25.383
67.8600935399805	85.2521597961359	27.8315803883477	59.2712	76.4167	39.0582
68.1232499264303	85.5956248551599	28.9412616345393	80.7777	87.9354	23.575
68.1232499264303	85.5956248551599	28.9412616345393	77.5352	78.0347	33.1993
68.3935004012865	85.9483556377185	30.0808761588119	91.0373	94.8618	33.7328
68.3935004012865	85.9483556377185	30.0808761588119	91.8947	87.6684	31.3605
68.6371707797861	86.2663996851357	31.1084217123058	96.3227	96.5824	35.4748
68.1645519389859	86.2536911166801	31.7450830960775	75.9957	81.402	37.5418
67.6861904914011	86.2408283049349	32.389480480389	82.5413	70.9361	35.9747
67.6861904914011	86.2408283049349	32.389480480389	78.9206	73.8168	40.4273
67.182517709497	86.2272857071274	33.0679753751329	61.6789	74.8507	42.3385
66.6953081728059	86.2141854712186	33.724292281339	84.0931	75.7357	43.6346
66.1973173395131	86.2007955912718	34.3951327254364	79.6042	79.6519	48.0916
66.1973173395131	86.2007955912718	34.3951327254364	76.2214	75.1456	46.9071
65.7106737104035	86.1877107730952	35.0506869446045	78.3667	74.2083	50.3369
65.2372655571599	86.1749819081625	35.6884117424126	77.8131	90.2453	61.6399

Solution x	Solution y	Solution z	Original x	Original y	Original z
64.990114212522	86.1683362116474	36.0213493593423	74.1314	97.2935	62.187
62.3567584458321	85.0132606318767	35.7337519602186	59.3326	96.8644	60.2925
59.1248325102345	83.5956329595943	35.380783261676	54.8665	95.2849	41.9419
55.9692650573965	82.2114979169303	35.0361542073584	50.0418	88.5256	42.3177
53.0111146791449	80.9139556016819	34.7130851212995	60.2539	80.1704	27.9583
53.0111146791449	80.9139556016819	34.7130851212995	60.356	72.3736	25.6911
49.9765843588409	79.5829095967001	34.3816740611426	65.3011	67.1869	28.6409
46.6382195169621	78.1185936690791	34.0170815927057	47.7087	83.4773	42.5429
43.2503244147977	76.6325508580003	33.647080060062	48.3206	81.4332	48.7053
43.2503244147977	76.6325508580003	33.647080060062	58.3448	60.9201	41.5011
38.7943973904242	74.6780367073002	33.1604332155265	40.6271	60.1839	50.1596
34.7849353622596	72.9193567113353	32.7225472117612	42.1545	66.9856	47.2528
30.4575062532695	71.0212057673254	32.2499345318888	23.7167	70.7298	59.5174
27.3654450304163	69.6649251568754	31.9122443060844	23.6126	49.4214	29.6987
24.8512379965225	68.5621107231779	31.6376662308192	3.30116	54.5758	46.8676
24.9336832045208	68.6830104588764	31.3180270629851	20.5641	47.7219	38.8826
25.021920521065	68.812403216319	30.9759329349658	9.35554999999999	53.1101	48.6717
25.021920521065	68.812403216319	30.9759329349658	17.5187	55.1629	44.2721
25.1714436397394	69.0316646923285	30.3962367500044	10.4725	58.878	47.8708
25.1714436397394	69.0316646923285	30.3962367500044	23.6206	68.344	50.228
25.3529257259867	69.2977889268516	29.6926387525912	18.9042	62.1271	34.907
25.3529257259867	69.2977889268516	29.6926387525912	25.6513	60.6643	37.4717
25.5358664357396	69.5660531473162	28.9833852611035	33.4192	59.483	33.0004
25.7166125183458	69.8311000072083	28.2826393703534	35.9094	68.8825	29.2317
25.7166125183458	69.8311000072083	28.2826393703534	32.641	61.5676	34.0062
25.8913885991274	70.0873941119288	27.6050372438436	46.3399	71.17	31.2162
26.0604679745615	70.3353352675803	26.9495201162942	38.4806	81.2568	32.7466
26.2258528119174	70.5778588786538	26.3083263063715	36.723	86.3354	38.0239
26.3922460680254	70.8218604664481	25.663223331091	25.7615	81.4539	44.2448
26.3922460680254	70.8218604664481	25.663223331091	34.4937	83.7515	46.1073
26.5907981151056	71.1130166882814	24.8934441494237	16.5471	81.1813	37.3426
26.8012688539151	71.4216490644183	24.077457932972	23.3569	85.0798	30.5318
26.8012688539151	71.4216490644183	24.077457932972	26.7929	78.8352	37.5421
27.02394049499	71.7481708884954	23.2141708677044	16.7243	94.3593	34.7835
27.26988105626	72.1088124361052	22.2606726192241	23.1083	96.0553	21.9675
27.26988105626	72.1088124361052	22.2606726192241	29.5533	92.3189	26.5937
27.497887708712	72.4431576467003	21.3767026788598	34.7487	93.2543	26.9859
27.497887708712	72.4431576467003	21.3767026788598	33.1283	92.3481	27.8161
27.7207821976745	72.7700073783931	20.5125521119224	34.7579	99.7518	13.4448
27.857922666542	72.9711115404247	19.9808643407899	32.7208	86.88	6.0296
27.857922666542	72.9711115404247	19.9808643407899	45.1636	79.7971	7.5816
27.9816328456845	73.1525233116242	19.5012439134837	40.4171	94.2218	3.0792
27.9816328456845	73.1525233116242	19.5012439134837	40.7053	85.7824	6.0265
28.0211606031247	73.2104879483283	19.3479984334887	47.6475	71.1843	17.3202
28.0211606031247	73.2104879483283	19.3479984334887	45.2184	66.3382	18.5431
28.060474304918	73.2681388887018	19.1955822671002	50.9984	83.4341	15.7476
28.060474304918	73.2681388887018	19.1955822671002	43.9629	81.9344	16.1851
28.0981943458094	73.3234539182005	19.0493427375634	45.6946	80.9262	23.2292
28.0981943458094	73.3234539182005	19.0493427375634	41.4131	74.8199	27.7293
28.1355806757853	73.3782798139861	18.9043962019313	43.3068	85.4106	16.2891
28.1727924126088	73.4328501228047	18.7601259488338	48.934	88.5471	3.512
27.6796150589309	73.1709233659577	18.7090732810279	50.5772	79.5094	6.7911
27.1061660334258	72.8663635743298	18.6497106331448	31.2678	61.1344	2.0752
27.1061660334258	72.8663635743298	18.6497106331448	30.6696	55.2626	12.0174
26.5793875091472	72.5865919269376	18.5951800153514	37.4105	49.4356	12.3771
26.5793875091472	72.5865919269376	18.5951800153514	22.5447	55.6169	28.4034
26.1059372414813	72.3351438669411	18.5461702848843	24.5176	59.5849	13.4915
26.1059372414813	72.3351438669411	18.5461702848843	22.8193	53.7552	17.9075
25.6774623630035	72.1075829888503	18.5018171978434	24.7619	69.8637	9.1655
25.254951237658	71.8831896613394	18.4580817547744	20.7262	75.308	17.3361
25.254951237658	71.8831896613394	18.4580817547744	17.2306	77.2747	24.7644
24.8508057943588	71.6685503944944	18.4162474622663	16.854	97.4806	6.0907
23.4880012858569	70.9447846167869	18.2751584209186	18.6101	90.3489	8.9268
22.0715084192379	70.1925046901209	18.1285098020026	8.89064000000001	83.8954	29.0611
20.6995507980139	69.4638767919007	17.9864717579933	10.1219	82.045	24.5182
19.3479666203827	68.7460688318074	17.8465427855116	3.35356	88.986	2.7967
19.1648716971774	68.5426691228458	17.8770755579796	1.02508	82.9527	3.7072
18.9853785113405	68.3432706610521	17.9070078841884	12.3803	91.1149	15.3598
18.9853785113405	68.3432706610521	17.9070078841884	15.2733	95.1553	18.4059
18.7812203806393	68.116471273989	17.941052964888	4.45068999999999	94.0863	19.178
15.7924035834817	64.7963448447913	18.4393850435621	2.55217	66.9796	45.1209
14.6454519428788	62.3097553425626	16.8738530247561	0.194864999999993	71.2335	31.0366
13.3677641972249	59.5397325063072	15.1298733377826	8.25408	64.3565	18.8288
13.3677641972249	59.5397325063072	15.1298733377826	19.6656	61.3862	20.5906
12.0621308170658	56.7091306856255	13.3477525750146	5.52590000000001	61.9092	6.1438
12.0621308170658	56.7091306856255	13.3477525750146	9.17265	66.1356	6.7326
10.8502157428962	54.0817070183521	11.6935521647601	13.5318	57.9262	6.7229
9.66714854720939	51.5168282706089	10.0787298294266	2.40393	50.9808	25.185
8.43671791665415	48.8492677480675	8.3992583615227	11.7937	48.0467	6.2423
7.26539788038897	46.3098653073412	6.80047395036228	2.57158	38.4711	27.3546

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.09636833614434	43.7754317427154	5.20481163614186	10.9638	55.5178	10.1729
6.09636833614434	43.7754317427154	5.20481163614186	12.5872	53.6987	19.2898
4.24616178423881	39.7642362426003	2.67938725902484	12.2621	43.6923	1.4336

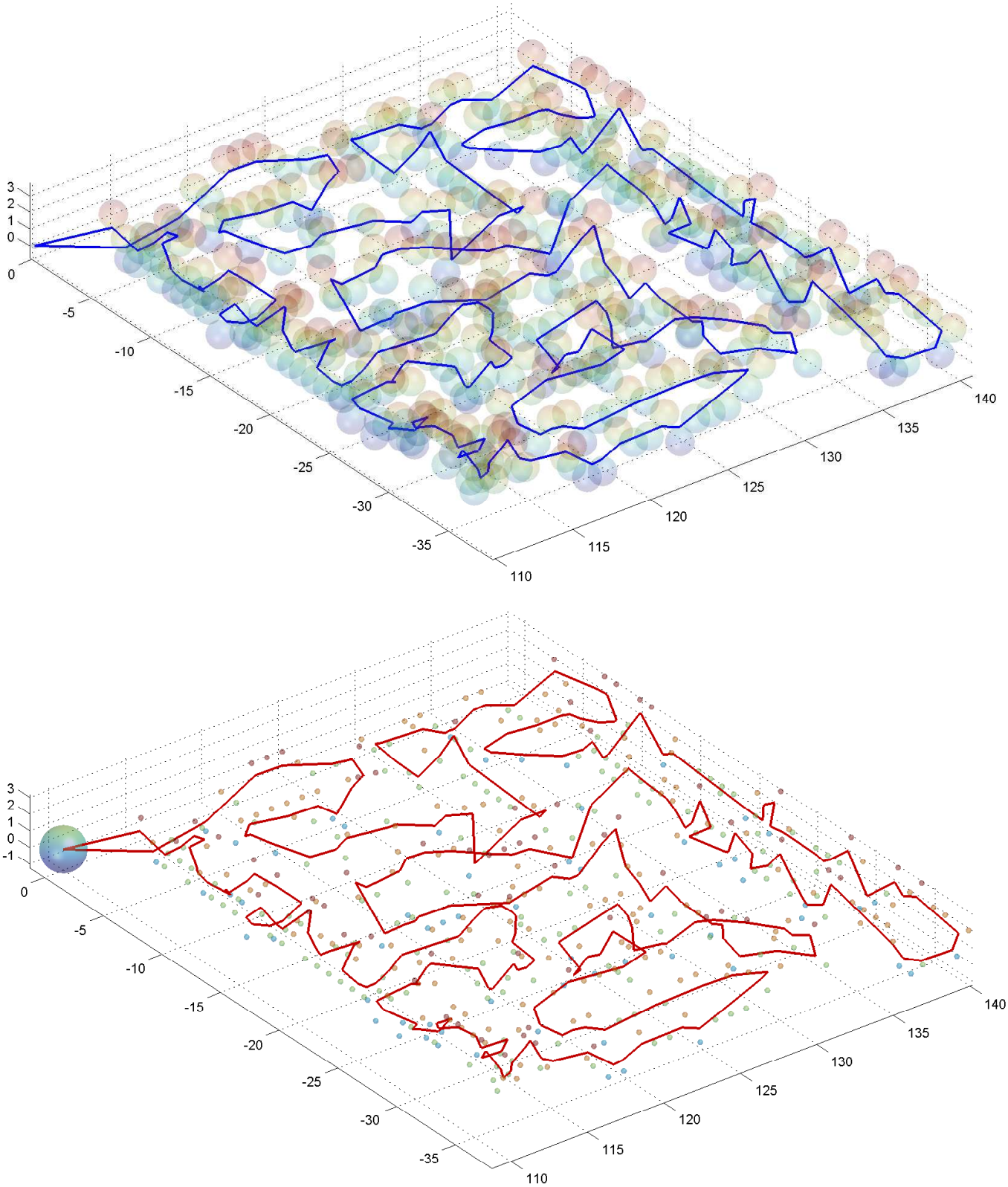


Figure N.82: *pcb*442, $r = 0.76$, Equal Radius, 3D, Euclidean, Length = 404.4897874

Table N-85: Solution for $pcb442$, $r = 0.76$, Equal Radius, 3D, Euclidean

Total distance: 404.489787351544 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
1.92014688815561	4.00782296017548	2.24424550471785	2	4	3
2.18478797502993	4.76524283018794	1.77501750539534	2	5	2
2.43210489748472	5.47307435671332	1.33650814651637	2	6	1
2.87303283570913	5.44921564673799	1.35863400922209	3	6	1
3.11278414700557	5.43624013200533	1.37066712224885	3	5	1
3.49706421509792	5.41544325394267	1.38995577688847	4	5	1
3.66497975859065	6.36514222008167	2.4237754739387	4	6	3
3.60685044221552	6.78221469852408	2.55645141278126	4	7	2
3.51190117307038	7.46343116690223	2.77315993941887	4	8	3
2.50889163039506	7.45912534742916	2.67161591632443	2	7	3
2.32882770735341	8.31754280719588	1.93894586927272	2	9	2
2.62968541939152	7.9828058814067	1.42520118427872	2	8	1
2.8781928511634	7.74520296469818	1.08624750033604	3	7	1
3.09261731343979	8.28284662419627	0.699300658115653	3	8	0
3.28210944469883	8.77131083659463	0.585289273044123	3	9	1
3.45174433336791	9.20858923755962	0.483225881079862	4	9	0
3.51842633380862	9.64415296612694	0.468041359438834	4	10	0
2.81775691740903	10.1788523014106	1.28417742671274	3	10	2
2.62779203259599	10.3340119690414	1.26817108717288	2	10	1
2.58326746777446	10.6455968090043	1.33436553030871	2	11	1
2.78200725327086	10.8284562964907	1.54615073005103	3	11	1
3.31140125341732	11.3155546118017	2.11029378112995	3	12	2
3.69768811212786	11.4566257265697	2.47302410380706	4	11	3
3.8606766960271	12.1093151640119	2.37174367703554	4	12	2
4.04276155091874	12.8384753723646	2.25859785388635	4	13	3
4.46946345225415	14.4782877224746	1.84523959155683	5	15	2
3.95464542843932	14.4072529500457	1.5032550288302	4	14	1
3.81490063950807	14.3879659130092	1.41043167753082	4	15	1
3.32250225003281	14.3172007967055	1.08590956771273	3	15	1
2.89975009123661	13.8192893634376	0.731365678022928	3	14	0
2.56729265427913	13.4080581549873	0.707875083395516	3	13	1
2.30760166348884	13.0868443009398	0.689523124610789	2	13	0
2.1499319435146	12.7449629795742	1.01240025444857	2	12	1
2.09347766291707	14.100117617231	2.25244287123344	2	14	3
2.23066241926453	15.211166197039	1.69267908365576	2	15	1
2.31596827819627	15.6481562815071	1.59495671944771	2	16	1
2.85781350283681	16.0468874994694	2.12852175596284	3	16	2
3.40511514315273	16.4496339945821	2.66746183631261	3	17	3
3.47266054749255	16.454807511606	2.69558768203874	4	16	3
3.45618496563162	16.5874662435078	2.66580862903013	4	17	3
2.67798326861123	17.3433848001763	2.00530771526497	2	17	2
2.61910124190133	17.7948064808109	1.73098670672552	3	18	2
2.55587145476663	18.27954289834	1.43641760756594	2	18	1
2.55085997786018	18.5673013510079	1.29483708894027	2	19	1
3.04171969184404	18.6207050652033	1.34273724558432	3	19	2
3.9861405650629	18.6442337504049	1.29843671536814	4	18	1
4.38849876385916	18.6542707889594	1.27957494873949	5	18.3	1
4.27524343701036	18.9451127220293	1.48429115299667	4	19	1
3.93459371368057	19.8199087644232	2.10004050959038	4	20	2
3.68131611146789	20.470327364808	2.55785596113189	4	21	3
3.3569366462718	20.3838903236129	2.44970222999748	3	20	3
2.95681717162005	20.4446483469736	1.92829884845574	3	21	2
2.47091496154484	20.5184126137514	1.29511223564464	2	20	1
2.5503719039301	20.9792537212845	1.14327575314915	2	21	1
2.66384126706073	21.6373615181449	0.926439293305296	2	22	1
2.96405001419566	21.9513849443366	0.75759342399018	3	22	0
3.3132956662168	22.3093616537349	1.04967680335021	3	23	1
3.71862871549961	22.3623053564831	1.31260239110185	4	22	1
4.05215122763207	22.4058684830992	1.52894628873419	4	23	2
5.48387165364167	21.6623914143727	1.67591436225347	5.3	21	2
7.07575835295901	21.5548302295705	1.51381079847401	7	21	1
7.97103381616094	21.5186785521054	1.44531202427071	8	21	2
8.58333339348346	21.5022116115542	1.38958540154967	9	21	1
8.85451726017895	22.1487785502265	1.83316882285609	8.5	22.8	2
9.44297906761288	21.9530514655265	1.99795790898026	9.5	22.2	2
10.1345230666722	21.7230393586234	2.19161393769055	10	21	2
11.0441578846801	21.5439798498555	2.47109606163474	11	21	3
11.9466102963722	21.7426221221332	2.37896981755154	12.2	22.1	3
12.224990682389	21.7016759162968	2.13131074269281	12	21	2
12.6878621606524	21.633652822224	1.71954245108665	13	21	2
12.9324764804378	21.690980666072	1.41334206229522	13.5	21.4	1
12.7324887199143	21.9432142849646	1.45409895623007	13	22	1
11.9244370968293	22.9623823746875	1.61876492627016	11.7	22.8	2
11.458286963505	23.5503189170814	1.71376029450729	12	24	2
11.0578304512686	23.9416458906075	1.7555415454358	11	24	1
10.667559445201	24.3229338762308	1.83362021315685	10	24	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.5430052977853	25.9267211718072	1.80860139185745	10	26	2
10.5014188866337	26.4623014599276	1.80024538852677	11	27	2
9.91532189157317	26.5105098335993	1.57518036411845	10	27	1
9.41400243133002	26.4071730222172	1.55965834855436	9.09999999999999	26	1
8.89972661235227	26.7627121551494	2.28498639862306	9	27	3
7.89167749258031	26.6233822663607	1.37086079797117	8	27	1
7.62453832231287	26.5864620342425	1.12861858831431	7	27	1
7.92848304261301	25.8774385027772	0.746637846515591	8	26	0
8.05396912438863	25.4738302976937	0.840671391778334	7.5	25.5	1
8.37867894949424	24.4295501955134	1.0839708891171	9	24	1
7.95651039366595	24.385536915494	1.25869707110637	8	24	1
6.83867762419146	24.2689885749494	1.72135169314166	7	24	2
5.51715722656064	24.1312111706533	2.26829742497851	5.40000000000001	24.3	3
5.3052289716456	24.0452615586017	2.11492273024026	5.40000000000001	23.3	2
4.34447826013704	24.3474515806557	1.58156386309666	4	24	1
4.11931372931726	25.0109953245398	1.96420051632984	4.7	25.5	2
3.82083129269319	25.1561029401381	2.13008190857291	4	25	2
3.1785104693582	25.4683736445915	2.48705576354023	3	26	3
2.70050063325891	24.7406935121414	1.85979112716157	2	25	2
2.40916897587169	24.0661220965744	1.2928182514884	3	24	1
2.25753912282707	23.7150332158702	0.997734306947166	2	23	1
2.38838682425967	24.1642075043663	0.632293092496134	2	24	0
2.90440215962124	25.1239800048751	0.383179124890874	3	25	0
3.2857420799547	25.8332578021198	0.199090796127432	4	26	0
2.63891165861511	26.276429057475	0.304930863716957	2	26	0
2.58559230446522	26.7681411400509	0.574644068659796	2	27	1
3.05230548823707	27.0470660631263	0.463290186412739	3	27	0
3.39261289828322	27.2504163046622	0.382069549362082	4	27	0
3.34492819371852	27.5815554836342	0.532477534253338	3	28	0
3.49816471196881	28.397826329911	1.59073432012701	4	28	2
3.47563204385958	28.5408733612684	1.69693900836874	4	29	2
2.95769601129354	28.5590798877109	1.74312040326747	3	29	2
2.44719283647517	28.5770162882363	1.78863382706278	2	28	2
2.31771880271374	28.9641503435528	1.68947377592653	2	29	1
2.33331389659079	29.8834375062901	2.17260579650667	3	30	2
2.33994598087109	30.2748281493668	2.37830590678592	2	30	3
2.3594672647931	30.5604244627428	2.4948646596019	2	31	3
2.95872849594583	30.5992855718997	2.01179412229112	3	31	2
3.46718394086533	30.6322466393132	1.60191949082793	4	31	2
3.95497082710055	30.4290845161531	0.625670638815568	4	30	0
4.29209274146348	31.2070754072145	1.14955425384596	5	31	1
4.57537204494211	31.8610738097922	1.58994551990889	5.2	32	2
4.11082493449919	32.1576552940401	1.45717714507358	4	32	1
3.77891607313561	32.3695572955322	1.36231023112808	4	33	1
3.04739845244158	32.379476358488	1.40530285362612	3	33	1
2.8712690231647	32.3818513615331	1.41565678833508	3	32	2
2.48544776632768	32.3870390887021	1.43834524720148	2	32	1
2.22068373646533	33.0850356106881	2.27773057978805	2	33	3
2.44490063228544	34.078364755543	1.51315602869091	3	34	1
2.3409835450754	34.2649287792389	1.51575965768794	2	34	1
2.02475941347186	34.8326837013282	1.52367763983793	1.5	35	1
2.15677192602055	35.2005332375531	1.93948495199652	1.5	35.5	2
2.17858082527977	35.2613203878561	2.00819089045867	2	36	2
2.41956331772477	35.0418015755611	2.36768331214382	2	35	3
2.94395823087298	34.8022135947147	2.44319096390771	3	35	2
3.74621083080923	34.4356746183774	2.5587197782743	4	35	3
4.11257123124773	34.2140985423657	2.57921656907543	4	34	3
4.37601289341126	34.0547695276077	2.59395965218987	4.7	33.5	3
4.6046612141817	34.742373747277	1.71398275842569	4.7	34.5	1
4.66046793478222	35.6253083288471	1.96847112685272	4	36	2
6.16586842893227	36.6156761071244	2.41530237467754	6.2	37.1	3
6.52920734749814	36.5286010718855	2.11748062169875	6.2	36.5	2
7.41064838592011	36.3173561465818	1.3949856753955	7	36	1
8.24756550834674	36.1167907607068	0.708997135254798	8	36	0
8.84319304909002	36.0743090644999	0.739928066224195	9	36	0
10.1434063631271	36.0192471516723	1.25389779936356	10	36	2
11.0222265263524	35.9929539743646	1.25527740855273	11	36	1
11.9822847817691	35.9642302877956	1.25678447195032	12	36	1
12.8468655791444	35.9383633532432	1.2581407252818	13	36	2
14.058764018682	35.8560378011516	0.743926966951491	14	36	0
14.9630254525422	35.6915232980867	0.926654651610878	15	36	1
15.8887842061692	35.5230988804513	1.11372673379006	16	36	1
16.8228319837516	35.3531632516801	1.30247617889117	17	36	1
18.7711923089029	34.9986444099978	1.6962067132319	19	35.2	1
19.2610087743943	34.8873923027858	1.86282367936111	20	35	2
18.4017354597199	34.4113645039513	1.84384963015809	18.3	34.5	2
17.6586408990521	33.9996951274785	1.82743996664855	17.9	33.3	2
17.1166140364937	33.8985226724415	1.77552352196409	17.2	34.1	2
15.9302754432487	33.6770710961224	1.6619024584931	16	33	2
14.9833863720446	33.5548952252447	1.54500481880134	15	33	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.9119097359792	33.4166485975479	1.41272184157891	14	33	1
13.0707846676998	33.3081188444371	1.30887865090026	13	33	2
11.9860220877193	33.1966469266218	1.10826195986548	12	33	1
11.0193872481971	33.0973127397256	0.929491877150659	11	33	1
10.0800652418843	33.0007851609713	0.755773600420414	10	33	0
8.85208553311747	32.8671492758281	1.26646393670621	9	33	2
8.16959578210094	32.7561760305665	1.30043503381757	8	33	2
7.62272761504818	32.5734961138276	1.08893763975282	7	33	1
7.84173423824555	30.3893309276089	0.633228508131418	8	30	0
7.64535385579273	30.1104074680165	1.6140811322258	7	30	2
8.96769306009729	30.0127833273014	1.96329274587881	9	30	2
10.0281750508393	29.9344920379664	2.24335029124828	10	30	3
10.9919406536554	29.8286181789289	2.07934333249908	11	30	2
11.9551587977852	29.7228037879174	1.91542961652101	12	30	2
12.9274963169017	29.6159868813139	1.74996314499794	13	30	2
13.9676711408528	29.5017156274489	1.57294934539729	14	30	1
13.9783781094518	29.4991334552367	1.57271503003938	14	29	1
14.9188212124446	29.523865045673	1.84322021930777	15	30	2
15.3980173139884	29.5364666775021	1.98105604413542	16	30	2
15.1124351463917	28.5880499345762	2.22299380720769	15	28.6	2
14.7930978666491	27.5275270748893	2.49353018883232	15	27	3
14.5557431151685	27.5555341176803	2.23646670389197	15	28	2
13.8691918338409	27.6365217740587	1.49293618409261	14	28.2	1
13.3153725652068	27.2720490364693	1.36428497239342	13	27	2
12.6762148608745	26.9309655855746	0.339959520963498	12	27	0
13.410630751596	26.5925893725445	0.253506494520959	14	27	0
13.5678280549645	25.183754427984	0.597547838452028	14	25	0
13.5555555505571	24.5087054147432	0.899097163277458	13	24	1
14.0662995221226	24.5054687546728	1.01868122216882	14	24	1
14.9649724706649	24.4997629328988	1.2291000027202	15	24	1
16.1178082128564	24.4924446096724	1.49903837417584	16	24	2
17.0068870387388	24.486818521819	1.70719546589343	17	24	2
17.4457452583508	24.4840326735427	1.8099501649274	18	24	2
17.2813870523859	25.5468795275802	1.63826733875275	17.9	25.8	2
17.1238329695305	25.9391504465647	1.51559288251553	17.2	26.1	2
16.9559277020203	26.3571937617483	1.38485816566906	16.9	26.8	2
16.5978509991385	26.9543178620943	0.467003599936903	16	27	0
17.9696437545891	27.6090713398744	0.687751763563467	18.3	27	1
18.1528652839842	27.7452773623428	0.700765889306646	18.3	28	0
19.4298760402975	28.4787630371552	1.84719233565528	20	28	2
19.5827865369664	29.8247815061453	2.54473748197463	19	30	3
19.9380292515629	30.1716968450258	2.53351278005733	20	30	3
20.7800991348959	30.9940266455816	2.50690787550666	20.5	31.5	3
22.0493247828224	31.6634759240512	2.11266757830981	22	32	2
22.588360071383	31.9477763458183	1.94523527243087	23.2	31.5	2
22.7096468220497	32.49329974381	1.75458425733685	22.8	32.5	1
22.8793881345583	33.7765876542576	2.28365771226451	23	34	3
22.7876485517269	34.3670597731098	1.36317958936605	23	35	1
21.6335197181184	32.5942239403413	1.25777464275799	21.5	32.5	2
21.1702085397059	31.8410155783882	0.93326720959354	21	32	1
20.5486011652907	30.8304493226501	0.497890616156673	20	31	0
20.6937183133023	29.2337499004052	0.795746508470508	20	29	1
21.4567076533638	28.1648493153553	0.845445688013084	22.2	28.2	1
21.1848705653478	27.667527151419	0.741155209389459	21.2	27.5	0
20.4303177321312	26.5722739162909	1.54230953458406	20	27	2
20.320835089198	26.2028406821416	1.65842426288865	20	26	1
20.09667965298	25.128416800621	2.25718938603486	20	25	3
20.0621732701725	23.8519148396442	0.742839464100123	20	24	0
20.1646447060175	22.7766066890373	1.29247660396544	20	23	2
20.2883815205926	21.9564531504483	1.45044449849564	20	22	2
20.3848652292876	21.3169205929358	1.57362298525971	20	21	1
20.8819527546661	20.1230824086458	2.26854059680139	21.1	20	2
21.1693620305208	19.4328349316105	2.67033035394613	21.7	19	3
20.127371553854	19.6778178878756	2.31928089446445	20	19	2
20.0692659896947	19.7026198514673	2.30405205342955	20	20	3
17.8312108754646	20.630031721074	1.64205683876557	18	21	1
17.1611807109963	20.746139000399	1.69798152149717	17	21	1
15.9710555151083	20.8033736945126	2.26644398698258	16	21	3
15.1369777178772	20.6602883197053	1.97352102427613	15	21	2
14.5828345946991	20.5652285764875	1.77890739580286	14	21	2
14.5423143478465	20.3116513330238	1.56830430982 36	14	20	2
14.4389903654528	19.1516154408716	0.489780677354277	15	19	0
12.9130348705602	18.2295228140037	0.509231350636008	13	18	1
12.1995924640536	17.798412038295	0.518326247753046	12	18	0
11.8009674521929	17.5575367869058	0.523407530348996	12	17	1
11.1255344285949	17.3570417859151	0.385253916616591	11	18	0
10.1159213434851	17.025147583221	0.195772060484926	10	16.3	0
9.71727330025905	17.3339112169191	0.232365134978585	10	18	0
8.88476428602448	17.5309668804731	0.413203494483988	9	18	1
8.00473781499853	17.5617069814165	0.385512788630743	8	18	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.51316476503851	17.5788220416619	0.36996595096683	7	18	0
7.42129800175647	15.907601347162	1.83567173467108	7	16	2
7.38589639949674	15.2634720477758	2.40060875403314	7	15	3
8.26766963275478	15.0398393036222	1.7101889675407	8	15	1
9.01699696030272	14.9151691404412	1.68143838374752	9	15	1
9.92886368273263	14.7634557181434	1.64645301101664	10	15	2
10.755530858177	14.6259177237803	1.61473553697946	11	15	1
11.4582504245136	14.2575124831104	1.95488605771574	11.5	13.5	2
12.2365699265515	14.8280588168961	2.29852098266484	12	15	3
12.8868769270292	15.1716302129865	2.27488374652855	13	15	2
13.4661362652326	15.4776650240108	2.25382855960706	14	15	2
14.0752506913258	16.8067287225688	2.54247995430035	13.5	17	3
14.4245083914049	17.4702400341608	2.65831174667584	14	18	3
14.9966910645815	17.6469347570445	2.51940206416951	15	18	3
15.6474578709158	17.8478975551811	2.36141525714447	15.5	18.5	2
16.0025125453044	17.8442373163579	2.33972949093806	16	18	3
16.7758934332774	17.8362677865709	2.29248958178955	17	18	3
17.8258403982916	17.6997690827327	1.68255854156527	18	18	2
19.8769875351264	17.433095970667	0.49101112961609	20	18	0
20.2121419199781	17.125604143282	0.486275100157393	20	17	0
20.7913990697002	16.5941475953905	0.478094613220016	20.6	16.5	1
22.865103241476	14.6915474204445	0.448871770540007	23.2	15	1
23.2303235209217	14.3564731379896	0.443715871351823	22.9	14	1
24.046346947606	13.6078025446329	0.432160867894348	23.9	13	0
25.8295335532901	13.5502968602449	1.33061255790768	26	13	1
26.5472386986419	13.5271579718007	1.69223939646245	27	13	2
26.5569637034563	14.0551691982806	1.61504070841714	27	14	1
26.5512035563211	14.1774850226608	1.60841043441759	26	14	2
26.5144817763207	14.9573065213758	1.56609173309601	27	15	1
26.5102874687052	15.0464163254519	1.56125905734638	26	15	1
26.4808837614062	15.9285565828246	1.52681489288132	26	16	1
26.4762083276705	16.0686807897881	1.52133242755237	27	16	2
26.4490228926336	16.8841520547821	1.48950515337724	27	17	2
26.4132577054319	17.0753225746193	1.45474415589253	26	17	2
26.2791913428517	17.7919106955351	1.32446014559673	26	18	2
26.2645353377904	18.0358264226172	1.18814849192726	27	18	1
26.16045266878	18.8778914953057	0.732768576034428	26	19	0
26.2594722768674	19.3137028660943	1.19818057019408	26	20	1
26.7715428939512	19.3241584780099	2.35166812315429	27	19	3
26.6040297934883	20.2902463575042	1.58014331480227	27	20	1
26.518321843063	20.5894084966106	1.42072151486801	27	21	1
25.7964439130803	20.779599865775	1.54423734318035	26	21	2
24.707503659092	21.0665018917701	1.73051653500125	24	21	2
26.3730419508332	21.9641705355777	0.661177922347287	26	22	0
26.5269227804431	22.0389156134168	0.593539712012802	27	22	0
26.2464851442077	22.9924737960411	2.28111587500077	26	23	3
26.4805821940579	23.2551717538801	1.84651562582515	27	23	2
26.8582198447987	23.6790142828329	1.14534454117732	27.6	23.6	1
26.3643895629912	24.1744367499138	0.643737469740976	26	24	0
26.3890320180783	24.7575881271548	0.976875918115365	26	25	1
26.4008632920314	25.0375378206991	1.13679957556883	27	25	1
26.4212847975754	25.520746498126	1.41284377267483	26	26	1
26.782999781226	26.130185608866	2.28336275668947	27	26	3
26.6974044685435	26.8464219044792	1.73992514037981	26	27	2
26.6859213262071	27.3169641015119	1.35807986012106	27	27	1
26.6720524612118	27.8850877300865	0.897054359425587	26	28	1
26.6648636095628	28.1796089444118	0.658050513484315	27	28	0
26.3989327872824	28.9380262019682	0.643908138606615	26	29	0
26.3847861183114	29.1824942394767	0.761329110499383	27	29	1
26.3142571334879	30.40110786228	1.3466658544061	26	31	1
26.5009771436608	30.4295418072583	1.78769375407357	26	30	2
26.7799366962398	30.4720846069417	2.44654255412997	27	30	3
26.7618588519429	30.8919202166445	2.37566482567885	27	31	3
26.7144795824711	31.9922171407868	2.18992595786857	27	32	2
26.6730738001062	32.9538065558049	2.0276032161206	27	33	2
26.6390731944277	33.7434276425668	1.89430997906402	27	34	2
26.6252618813779	34.0642808807406	1.84014836627803	26	34	2
26.5875609698124	34.9399713325045	1.69232357831902	27	35	2
26.5405718248408	36.0313514368528	1.50807886348067	26.2	36.5	2
26.9702610789127	36.3825166703284	0.656052018654739	27	36	0
27.148691896313	36.8141076361355	0.721726589661965	27	37	0
27.3836902035504	37.3672186380953	0.826861486668295	27	38	1
29.5691019138602	37.1643417421098	0.604091594510065	30	37	0
29.8238393122335	37.3702486043778	1.61271658453024	30	38	2
29.7084012344919	36.0549758472691	1.93393456831209	30	36	2
29.6224931651255	35.0761201426139	2.17298719071387	30	35	2
29.5381916919682	34.1155900074215	2.40756549964391	30	34	3
29.2135644945015	33.4411234806655	2.25488479509825	28.5	33.5	2
29.4258015655636	32.8182808564085	2.29892050999606	30	33	2
29.6495039960171	32.1617796532789	2.34533437104839	30	32	3

Solution x	Solution y	Solution z	Original x	Original y	Original z
29.5583399046588	30.8474564009859	1.26406904209741	30	31	1
29.5000025731997	30.0066370175241	0.572333444517895	30	30	0
29.4999983190045	30.0066304756829	0.572332806335494	29	30	0
29.6773588171015	28.7218672944638	1.66955918194948	30	29	2
29.7750850453097	28.0139292338601	2.27417197891867	30	28	3
29.3959960248388	27.0477342410418	1.45880901252935	30	27	1
29.1549762509238	26.758527441421	1.30050575228615	28.5	27	1
29.2906278842045	25.9370603199569	1.26539227632994	30	26	1
29.2945404989214	25.0032166696782	1.2814787694362	30	25	1
29.2957983219451	23.9996343982376	1.2999425941262	29	24	2
29.3077958722948	23.1189197939125	1.29037039993807	30	23	1
29.0582549139793	22.336403505756	1.3908838604555	28.5	22	1
29.7632624995919	21.77656761598	2.31324016191615	30	22	3
29.9226685838677	20.6379585340882	1.59424824501421	30	20	2
29.9384724726303	20.5776589124186	1.05802030003433	29.5	20.5	1
29.9522235778449	20.5252093720608	0.591521356908462	30	21	0
29.8669394509046	19.1000516055616	0.741529397232376	30	19	0
29.8008158203855	18.1075282648524	0.882428032226785	30	18	1
29.7599195026764	17.4936821542443	0.969566325919477	29.5	17.5	1
29.7215270555925	16.9174181009017	1.0513694423967	30	17	1
29.6625389892911	16.0320244994231	1.17705925770357	30	16	1
29.5980299982093	15.0637843086624	1.3145107696767	30	15	1
29.530564966773	14.0511984937554	1.45825848750342	29	14	2
29.7379908477701	13.1889572585601	1.31206863399461	30	13	2
29.8752389159122	12.1269799256191	0.738861283261056	30	12	0
29.6579805905726	10.5491549175122	2.49269275639253	30	11	3
29.6471568496417	10.4938551998443	2.54260097454909	30	10	3
27.9874742978382	11.0823385866051	1.96521880872168	28	11.3	2
26.9498985828634	11.45025509725	1.60427363504586	27	11	1
26.7492019708854	11.5214564128101	1.53450843141039	27	12	1
26.404775048866	11.5786087882325	1.48599529565849	26	12	1
26.1657930530755	10.9514837949349	2.25988932893091	26	11	3
26.2953974742611	9.96400826183427	1.28256704554416	27	10	1
26.0868828766476	9.64865766345757	1.08254242432498	26	10	1
25.6733326878108	9.02321477512361	0.685823029357574	26	9	0
24.1639223728413	7.4406509629703	0.59042930135997	24.5	7.1	0
23.0209778488332	6.39229682176095	0.650589308434931	23	6	0
22.7122797095607	6.25089734790912	0.914488586914101	22	6	1
23.94925276739	6.57942246433867	1.5108206075475	24	6	2
25.0704735674833	7.18987962077656	1.80623286388695	25.5	7.1	2
25.2981650498211	7.31384997883914	1.86622051562076	25	8	2
26.0588097736782	7.50609390034018	2.01108806022244	26	8	2
26.6213432784319	7.6482635288342	2.11822363261726	27	7	2
26.9646533120628	7.96241209327808	2.2417506309001	27	8	3
27.3862663111445	8.34549024103835	2.00427763584107	27	9	2
28.2949000569983	8.6508336174237	1.60722144741805	28	9	1
29.2381965643649	8.84984711155485	1.38869784756918	29.3	9.5	1
29.4076123956664	8.77044002631441	1.4171137632856	30	9	1
29.6005489346904	7.73751033009853	2.40911711556191	30	8	3
29.4421160031723	7.10746679870854	2.49521024251195	30	7	3
28.8024383158696	5.14297190150397	2.64157056401747	29	5	2
28.6177606920681	4.57579159010629	2.68383243520104	29	4	3
27.4602220464395	4.51128671877252	2.14348229726104	27.5	5.2	2
26.083575995369	4.43452799997143	1.50085984372983	26	5	1
25.7565507499654	4.215091793077	1.5111878035799	26	4	1
24.7966063241659	3.57096385693112	1.54148700589774	25	3	2
24.1881878780308	3.41733264636421	1.39335253539942	24	3	2
22.9944724082365	3.3623029844816	0.668064391122009	23	3	0
22.3424317633872	3.67094445006455	0.899137675679887	22	3	1
21.9283608361858	3.94489267979868	1.04779888837024	22	4.7	1
20.7984463466148	3.52194600021007	1.48565483521155	21	3	2
20.178837467566	3.50810790903571	1.50943078790113	20	3.7	2
19.9171267575694	3.50227026712989	1.51947342554273	20	3	2
19.0104582447626	3.48201453002146	1.55425709197378	19	3	1
18.134597713671	3.46246892230326	1.5878840951085	18	3	1
17.651070273141	3.55151275337047	1.73530895890881	17.1	3.1	2
17.7218515738402	5.12633957263778	1.4361208844229	17.1	5.1	1
17.8210748976603	6.06068181675551	1.29927901560388	18	6	1
17.9085629991068	6.88455184293898	1.17861552541965	17.5	7.5	1
19.2575591037665	6.49533607232275	1.49525509220826	19	6	2
19.7125918317218	6.36410352700721	1.60202053149352	20	6	1
20.5952079524703	6.39729239470059	2.49412840191349	21	6	3
20.2283327980441	8.17816035681129	1.70265605617719	20	8	1
20.1819545617106	9.00121642558648	1.70054518602123	20	9	1
20.1251016774553	10.0076761953965	1.69709105586928	20	10	1
20.068750783485	11.0052733044677	1.69367643632153	20	11	1
20.0124639799139	12.0017424236518	1.69026995626355	20	12	1
19.9565877124381	12.9909496477456	1.6868954266866	20	13	2
19.9023198018414	13.9516865505623	1.68361954509363	20	14	2
19.860445837137	14.6929979787307	1.68108610022335	20	15	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.6123880549192	15.526670394263	2.54908956744254	20	16	3
18.2528347845954	15.1827532217969	2.30697876761183	18	15	3
17.2705589495387	15.0181186479661	1.6110151648569	17	15	2
16.2141927811395	14.8410644934922	0.862549456728421	16	15	1
15.580071732004	14.7347830928032	0.413256251460208	15	15	0
16.5490683652261	13.379706156038	1.10930686135746	16	13	1
17.3190972829067	12.3030514560364	1.66241124864504	18	12.3	2
17.01629861433	11.9488804049914	1.56903587648574	17	12	2
16.3776000750476	11.2018098637554	1.37207156233794	16	11	2
16.1021196214537	10.6664930414706	0.625759413871222	16.5	10.5	0
14.1032365199104	10.0429632739377	1.12227377971866	14	9.3	1
12.9559213609826	10.6502996150279	1.60814539934486	13	11.3	2
11.0380400209113	9.72184391507848	1.23472880838317	11	9	1
10.3880678965887	10.1344248745487	1.34316798756848	10.5	10.5	2
9.96231839751596	10.2688961483415	1.2041319510861	10	11	1
8.58286732171108	9.81246823099462	1.01347228384394	8	10.3	1
8.19111212273711	6.99618378204234	0.694383741269437	8.5	7	0
7.94539740996748	5.57707048022056	0.642458332692466	8.5	5.2	1
7.74168959451106	5.38447561125126	0.533359719339044	7.5	4.9	0
7.60390002063465	5.94047614878843	1.54243614754356	7	6	2
8.0699964573777	6.13061964490912	1.58303548673067	8	6	2
8.83578523799201	6.44301921718953	1.64974296750406	9	6	2
9.47395971942574	6.70336369571579	1.70533027294767	9.40000000000001	7.4	2
10.0504123527931	6.61577150136724	1.62185167527206	10	6	2
10.9213291165265	6.48345111001496	1.49571935037837	11	7	1
11.0904618373418	6.45775721029009	1.47122292941754	11	6	2
11.7558661946293	6.35665432366054	1.37486120201626	12	6	2
12.8846846483733	6.50000083283414	0.560630367315358	13	7	0
12.8846866497843	6.49999929143696	0.560630739686895	13	6	0
13.7000935942926	6.69305684989567	1.91438584244562	14	6	2
14.0168088512019	7.09540748372647	2.61683383579418	13.5	7.5	3
14.1607645530273	7.10019780972166	2.67943797969235	14.5	7.7	3
14.9922573438807	5.0889814440774	2.44153581882493	15.5	5	3
14.9996487016429	3.40116234944184	1.40782434550305	15.5	3	1
14.1489632023291	3.33111441084041	1.64159793408243	14	3	1
12.9818076346394	3.23502659401378	1.96238463227278	13	3	2
11.8922052949906	3.14532354799829	2.2618520417363	12	3	3
10.9942921970333	3.12071541426352	2.26303820115998	11	3	3
10.1626243875811	3.09793025611496	2.26408909997158	10	3	3
8.76396660228006	3.14263801106149	1.61216455332475	9	3	1
8.26124031427101	3.15870595783446	1.37784053854424	8	3	2
6.83560084893833	3.20429162158465	0.713329642530045	7	3	0
5.95739153683614	3.32193137217797	0.659410774860621	6	4	1
4.11271633916874	3.45027834248212	0.487455732893621	4	4	1
3.28476304603447	3.34084256859479	0.249045720959299	3	4	0

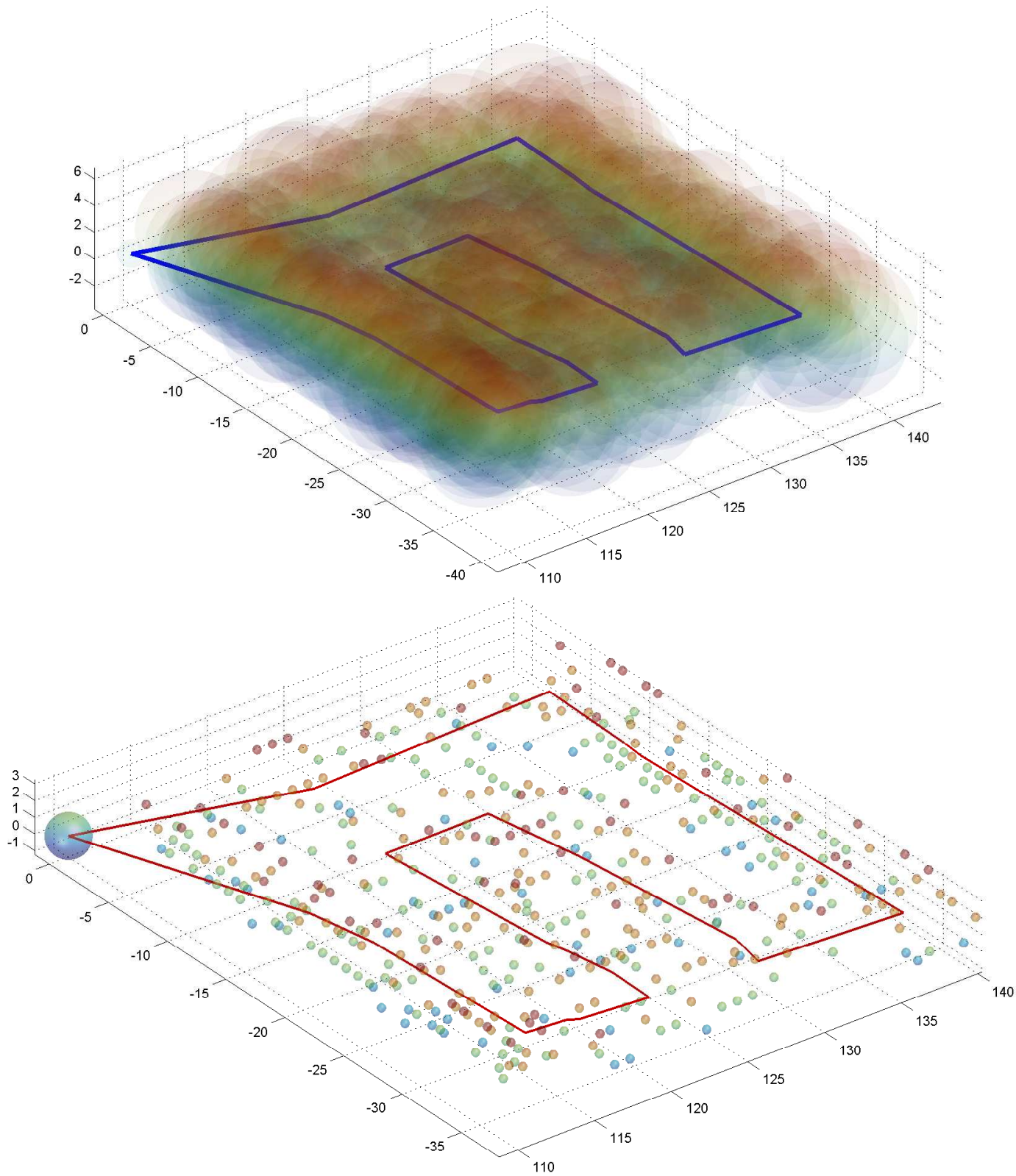


Figure N.83: *pcb*442, $r = 3.8$, Equal Radius, 3D, Euclidean, Length = 154.8098921

Table N-86: Solution for $pcb442$, $r = 3.8$, Equal Radius, 3D, Euclidean

Total distance: 154.809892103611 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
3.74850169276799	1.67012935077194	0.336417906043212	3	5	1
5.45748546360231	2.43147257735608	0.489783638827654	6	4	1
6.73973072674364	3.00269522343183	0.604857637958337	7	6	2
7.3341764938546	3.2674957106439	0.658200306914917	7	3	0
7.3341764938546	3.2674957106439	0.658200306914917	9	3	1
7.88483824790858	3.51281272065379	0.707618499147586	7.5	4.9	0
8.41605036790249	3.7494694232047	0.755292439975198	8	3	2
8.41605036790249	3.7494694232047	0.755292439975198	8.5	5.2	1
8.94177121168612	3.98368544743484	0.802473066272508	8	6	2
9.45911432989392	4.21417004194611	0.848902183253359	10	3	3
9.96844509611104	4.4410861820351	0.894612328470948	9	6	2
10.4875316693402	4.67234904116683	0.941198426304517	11	3	3
10.4875316693402	4.67234904116683	0.941198426304517	12	3	3
10.9288425034867	4.86896231655526	0.980805670075596	13	3	2
10.9288425034867	4.86896231655526	0.980805670075596	14	3	1
11.0818817050323	4.93714419667681	0.99454172792994	11	6	2
11.0818817050323	4.93714419667681	0.99454172792994	12	6	2
11.2249252483167	5.00087279678386	1.00738070855736	10	6	2
11.3749306091709	5.06770300142587	1.02084446223191	8.5	7	0
11.3749306091709	5.06770300142587	1.02084446223191	9.40000000000001	7.4	2
11.9364998913615	5.31789553010985	1.07124320090931	11	7	1
11.9364998913615	5.31789553010985	1.07124320090931	11	9	1
12.6130171655943	5.3735886145357	1.1311945275136	13	7	0
13.2516919697694	5.42616622445164	1.18779244721664	13	6	0
13.9191098163557	5.48111005439832	1.24693782842991	14	6	2
13.9191098163557	5.48111005439832	1.24693782842991	13.5	7.5	3
14.5929337955639	5.53658112559663	1.30665081279761	14.5	7.7	3
15.2263387239578	5.58872483330513	1.36278180999194	15.5	5	3
15.8392372392689	5.63918038775273	1.41709546009044	15.5	3	1
16.5557088231206	5.6981625073721	1.4805876255525	17.1	3.1	2
17.2390587070771	5.75441805561884	1.54114456193122	17.1	5.1	1
17.9576077694821	5.81357142117737	1.60482091444751	19	3	1
17.9576077694821	5.81357142117737	1.60482091444751	18	3	1
18.6063224122389	5.86697557230681	1.66230875206321	20	3	2
18.6063224122389	5.86697557230681	1.66230875206321	20	3.7	2
19.0058761940138	5.8998669950313	1.69771610776141	19	6	2
19.0058761940138	5.8998669950313	1.69771610776141	18	6	1
19.4570112159046	5.93700459682692	1.73769455286163	17.5	7.5	1
19.4570112159046	5.93700459682692	1.73769455286163	20	9	1
19.9537941376578	5.97790014786695	1.78171806776347	20	6	1
19.9537941376578	5.97790014786695	1.78171806776347	20	8	1
20.4525896346557	6.01896102707153	1.82591985470975	21	6	3
20.927084518478	6.05802135422779	1.86796801075158	22	4.7	1
21.369218640801	6.09441764634113	1.90714837359053	21	3	2
21.8986466950898	6.1379997156496	1.95406462026588	22	3	1
22.4971012005252	6.18726361729601	2.00709772996949	23	3	0
23.1510740918727	6.2594903353143	2.07673811838526	24	3	2
23.7118231420812	6.32141925420339	2.13645058265953	25	3	2
24.0571616655288	6.35955500970554	2.17322324626354	26	4	1
24.0571616655288	6.35955500970554	2.17322324626354	26	5	1
24.2850992763067	6.38472504074858	2.19749363822668	24.5	7.1	0
24.2850992763067	6.38472504074858	2.19749363822668	22	6	1
24.5706815241275	6.41626133137306	2.22790260799866	24	6	2
24.5706815241275	6.41626133137306	2.22790260799866	23	6	0
24.9404759400855	6.45709852411645	2.26727946305681	25	8	2
25.3148060201315	6.49843666510369	2.30713934142965	25.5	7.1	2
25.3148060201315	6.49843666510369	2.30713934142965	26	8	2
25.6836711790286	6.53917124246551	2.3464172262276	27	7	2
25.6836711790286	6.53917124246551	2.3464172262276	27	8	3
26.0015506429392	6.57427458234636	2.38026537083723	27.5	5.2	2
26.2986567612775	6.60708391238965	2.4119013497752	29	4	3
26.3257323607781	6.97616658482254	2.37692375968401	29	5	2
26.3709199871003	7.59167899031268	2.31858650130948	30	7	3
26.3709199871003	7.59167899031268	2.31858650130948	30	8	3
26.4134322434324	8.17101464895344	2.26368554184196	26	9	0
26.4134322434324	8.17101464895344	2.26368554184196	26	10	1
26.4436026139097	8.5821971914182	2.22472174431893	27	9	2
26.4728359775338	8.98061357379423	2.18696784936747	28	9	1
26.4728359775338	8.98061357379423	2.18696784936747	27	10	1
26.499191787099	9.33982190772771	2.15292977543045	29.3	9.5	1
26.5238356015413	9.67570018847144	2.12110258308711	30	9	1
26.5675994735304	10.2720267415054	2.06459087567763	30	10	3
26.6195267350775	10.9795312715616	1.99754159429058	30	11	3
26.6691442483955	11.6555269073569	1.93347799522132	30	13	2
26.6893567829362	11.9309065568919	1.90738275909332	29	14	2
26.7049000275376	12.142682783181	1.88731525418714	30	12	0

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.6045644489473	14.0306644945151	1.84573222176711	23.9	13	0
26.6045644489473	14.0306644945151	1.84573222176711	22.9	14	1
26.6084222949158	14.1233749926174	1.84570246182637	23.2	15	1
26.6114995972479	14.1973439898082	1.84567757884067	30	15	1
26.6141204042646	14.2603185440181	1.84565609391488	28	11.3	2
26.6141204042646	14.2603185440181	1.84565609391488	27	11	1
26.6178794290644	14.3506464073419	1.84562527834888	26	11	3
26.6178794290644	14.3506464073419	1.84562527834888	26	12	1
26.626236473323	14.5514272590639	1.84555645232832	27	12	1
26.6361669941957	14.7900112237871	1.84547460375279	26	13	1
26.6471461784336	15.0537875259827	1.8453840631069	27	13	2
26.6471461784336	15.0537875259827	1.8453840631069	27	14	1
26.6602069760065	15.3675664861657	1.84527612330799	26	14	2
26.674364009282	15.7076743129524	1.84515895991606	26	15	1
26.6891093979184	16.0619114881384	1.8450368623308	27	15	1
26.7048850845123	16.440895945806	1.84490613791735	27	16	2
26.7048850845123	16.440895945806	1.84490613791735	26	16	1
26.7215260925141	16.8406623662148	1.84476814344476	30	16	1
26.7429366201839	17.354960627927	1.84458985086587	30	17	1
26.7656285886578	17.900016578027	1.84440057576809	29.5	17.5	1
26.7894217745113	18.471511605438	1.84420192619823	30	18	1
26.815707618986	19.1028568116854	1.84398220756367	30	19	0
26.8404128409294	19.6961849215316	1.84377447629123	29.5	20.5	1
26.861243063605	20.1964432654571	1.84359932681244	30	21	0
26.8685442494349	20.3717483221179	1.84353698385084	30	22	3
26.8713078894388	20.4380798833768	1.84351369260026	27	19	3
26.8713078894388	20.4380798833768	1.84351369260026	26	18	2
26.8743819465855	20.5118610850374	1.84348775719102	27	17	2
26.8743819465855	20.5118610850374	1.84348775719102	26	17	2
26.8874127723668	20.8246380400394	1.84337764396234	30	20	2
26.8874127723668	20.8246380400394	1.84337764396234	27	20	1
26.9027958107694	21.1938665818935	1.84324757234792	30	23	1
26.9027958107694	21.1938665818935	1.84324757234792	28.5	22	1
26.9077113052953	21.3118222703997	1.84320574520078	27	18	1
26.9077113052953	21.3118222703997	1.84320574520078	26	19	0
26.9175058594094	21.5468702666541	1.84312228175352	26	20	1
26.9283101862777	21.8061539041177	1.8430302222607	26	22	0
26.9283101862777	21.8061539041177	1.8430302222607	26	21	2
26.9395129447591	22.0749992528936	1.84293471099181	27	22	0
26.9507475624235	22.3446092725044	1.84283891403584	27	21	1
26.9628998209383	22.6362445565159	1.84273530807543	26	24	0
26.9628998209383	22.6362445565159	1.84273530807543	24	21	2
26.982878772308	23.1157734156973	1.84256515668564	26	23	3
27.0031864560411	23.6031897200204	1.8423920930652	27	23	2
27.0246413033424	24.1181430106876	1.84220920368665	27.6	23.6	1
27.0472689515554	24.6612504885987	1.84201631587087	29	24	2
27.0717805430709	25.2495889016754	1.84180739231495	30	25	1
27.0972997286999	25.8621139825827	1.84158980331648	30	26	1
27.1217097961535	26.4480076274884	1.84138159230197	30	27	1
27.1431760441374	26.9632212004975	1.84119833982121	30	28	3
27.159221424767	27.3482894609795	1.84106128983879	30	29	2
27.1700263372569	27.6075641650225	1.84096879241629	27	25	1
27.1700263372569	27.6075641650225	1.84096879241629	26	25	1
27.1919411145155	28.1335056778134	1.84078156380735	28.5	27	1
27.1919411145155	28.1335056778134	1.84078156380735	27	27	1
27.2194970528888	28.7948810752862	1.84054635840642	30	31	1
27.2194970528888	28.7948810752862	1.84054635840642	30	30	0
27.2243723098566	28.9118381144276	1.84050411568848	29	30	0
27.2289281696229	29.0211325813443	1.8404646175929	27	26	3
27.2347649930209	29.1611578385155	1.84041406657825	26	26	1
27.2451944687975	29.411383918364	1.84032373781868	26	28	1
27.2451944687975	29.411383918364	1.84032373781868	26	27	2
27.2589343612487	29.7410569463019	1.84020488145398	27	29	1
27.2589343612487	29.7410569463019	1.84020488145398	27	28	0
27.2757663931327	30.1449503026359	1.84005950059214	26	31	1
27.2757663931327	30.1449503026359	1.84005950059214	26	29	0
27.2937880006678	30.5773987144306	1.8399039630993	26	30	2
27.3128143932215	31.0339690141364	1.83973993513451	27	31	3
27.3128143932215	31.0339690141364	1.83973993513451	27	30	3
27.3339697951257	31.5416546685268	1.83955774457812	27	32	2
27.354714402538	32.0394845208434	1.83937923481163	30	32	3
27.3754704000189	32.5375948634064	1.839200692911	30	33	2
27.3947889934238	33.0011836810343	1.83903416134024	27	33	2
27.4146726126666	33.4783779652319	1.83886354724076	30	34	3
27.4321622909761	33.8980400694737	1.83871244624024	27	34	2
27.4498672976978	34.3228897309462	1.83855975119801	28.5	33.5	2
27.4691804814924	34.7863847481182	1.83839389002789	30	36	2
27.4845965403517	35.1563071866317	1.83826095927356	30	38	2
27.4133772731488	35.1446520715104	1.83346159461679	30	37	0
27.4133772731488	35.1446520715104	1.83346159461679	30	35	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.0039225656972	35.0776464931344	1.80586670821332	27	35	2
26.6215210718542	35.0150677714639	1.78009494093682	27	37	0
26.6215210718542	35.0150677714639	1.78009494093682	27	36	0
26.1931772778626	34.9449708676607	1.7512267408943	27	38	1
25.4369261412735	34.8212157532065	1.70025959082525	26.2	36.5	2
24.5541340531501	34.6767534838394	1.6407646247641	26	34	2
23.4691716147957	34.4992085062845	1.56764496231483	23	35	1
22.4857556961663	34.3382800101908	1.5013684493954	23	34	3
21.4190636585467	34.1637245922618	1.42948027225804	20	35	2
20.5830837656615	34.0269221130558	1.37314000436649	19	35.2	1
19.9235833688426	33.918998584534	1.32869312773079	18.3	34.5	2
19.3832491977532	33.830575571127	1.29227724006751	17	36	1
19.071857062039	33.7796176467139	1.27129083232687	16	36	1
19.1544002439348	33.2632047327004	1.2893584218298	17.2	34.1	2
19.1544002439348	33.2632047327004	1.2893584218298	17.9	33.3	2
19.249426715823	32.6686689214339	1.31015924627799	16	33	2
19.249426715823	32.6686689214339	1.31015924627799	20.5	31.5	3
19.3524043756832	32.0243891573366	1.33270061662617	21.5	32.5	2
19.4573607363936	31.3677160506584	1.35567550638678	22.8	32.5	1
19.4573607363936	31.3677160506584	1.35567550638678	23.2	31.5	2
19.4136268403934	30.8954168362872	1.35164286301591	22	32	2
19.4136268403934	30.8954168362872	1.35164286301591	21	32	1
19.3508865021125	30.2178676689726	1.34585907085487	20	31	0
19.2831285001996	29.486136313742	1.33961346332875	20	29	1
19.2831285001996	29.486136313742	1.33961346332875	20	28	2
19.2319287758158	28.9332075647937	1.3348930969202	20	30	3
19.2319287758158	28.9332075647937	1.3348930969202	19	30	3
19.1665591373286	28.2272624203046	1.32886714509593	22.2	28.2	1
19.1665591373286	28.2272624203046	1.32886714509593	21.2	27.5	0
19.1065166600379	27.5788289918007	1.32333139647996	20	27	2
19.051205640355	26.981486119025	1.31823137385668	18.3	28	0
19.051205640355	26.981486119025	1.31823137385668	18.3	27	1
18.9924382798722	26.3468135579728	1.3128127575968	16	27	0
18.9273471303762	25.6438495000528	1.30681086831019	16.9	26.8	2
18.8530053955901	24.8409830575545	1.29995635935684	17.2	26.1	2
18.7667089437463	23.9090098481559	1.29200000871424	15	24	1
18.7474271318286	23.7008559561361	1.2902214046345	16	24	2
18.7286206231118	23.4978382603788	1.28848668975062	17	24	2
18.709952714645	23.2963192642956	1.28676477053145	17.9	25.8	2
18.709952714645	23.2963192642956	1.28676477053145	18	24	2
18.6879025956071	23.0582863318995	1.28473098114292	20	26	1
18.6879025956071	23.0582863318995	1.28473098114292	20	25	3
18.6401840219398	22.5430879705223	1.28033123851081	20	24	0
18.583258764072	21.928462706036	1.27508338580448	20	23	2
18.583258764072	21.928462706036	1.27508338580448	20	22	2
18.520184169777	21.2474430014932	1.26926880051898	20	21	1
18.4602353829417	20.6001950408009	1.26374202910721	17	21	1
18.4001094346197	19.9510357126899	1.25819895135436	15	19	0
18.3907192018858	19.8496985394164	1.25733213631855	16	21	3
18.3907192018858	19.8496985394164	1.25733213631855	15	21	2
18.3781446101274	19.7140065167991	1.25617153274874	15.5	18.5	2
18.3671162297591	19.5950050514993	1.2551537226881	17	18	3
18.3671162297591	19.5950050514993	1.2551537226881	16	18	3
18.3585672850974	19.5027623223184	1.254364904101	21.1	20	2
18.3495109261004	19.4050441673521	1.25352924354867	21.7	19	3
18.2331652460882	18.5092923656971	1.22864722275523	15	18	3
18.2039662633169	18.2844812670334	1.22240719508915	20	20	3
18.1667688341388	17.998092434185	1.21445722722548	20	19	2
18.1667688341388	17.998092434185	1.21445722722548	18	21	1
18.1023423203078	17.5020807298727	1.20068420333324	18	18	2
18.0369892085174	16.9989332241002	1.18671341681204	20	17	0
18.0369892085174	16.9989332241002	1.18671341681204	20	18	0
17.9582153445723	16.3924683022087	1.16987090085257	20.6	16.5	1
17.8735860619742	15.7409261193293	1.15177510195666	20	16	3
17.776603648493	14.9942867928179	1.13103526444497	20	15	1
17.6756735443951	14.217255890077	1.10945048004675	20	14	2
17.5723511369564	13.4218080433846	1.08735303354282	20	12	1
17.5723511369564	13.4218080433846	1.08735303354282	20	13	2
17.4994345910453	12.8604238057727	1.07176278867816	20	10	1
17.4994345910453	12.8604238057727	1.07176278867816	20	11	1
17.1550527436463	12.8622521125919	1.07090475363145	18	12.3	2
17.1550527436463	12.8622521125919	1.07090475363145	17	12	2
16.8045291988758	12.8641133913814	1.0700315081596	16	13	1
16.4792798267897	12.8658406267543	1.06922182859203	18	15	3
16.4792798267897	12.8658406267543	1.06922182859203	17	15	2
16.0163399381653	12.8682986902166	1.06806634186654	16	15	1
15.566924583916	12.8706849033804	1.06694514739614	15	15	0
15.1563309731516	12.8728651304973	1.06592197070408	16.5	10.5	0
15.1563309731516	12.8728651304973	1.06592197070408	16	11	2
14.59035579311	12.8758707861393	1.06450987857414	14	15	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
14.0803322621374	12.8785795172458	1.0632389742576	13	15	2
13.6527444652966	12.8808506654822	1.06217558145509	13	11.3	2
13.2549576179037	12.8829637452475	1.06118722648664	14	9.3	1
10.7743781331417	12.896113440906	1.05497641501813	8	10.3	1
10.7901943424066	13.1554666181493	1.05980867636667	10	11	1
10.8096110786004	13.473856742523	1.06574142486251	10.5	10.5	2
10.8096110786004	13.473856742523	1.06574142486251	11.5	13.5	2
10.8513347335572	14.15799660435	1.07849227818665	8	15	1
10.8871868354389	14.7458694306972	1.08944900440271	9	15	1
10.8871868354389	14.7458694306972	1.08944900440271	10	15	2
10.9227886958617	15.3296317774157	1.10032946120078	11	15	1
10.9227886958617	15.3296317774157	1.10032946120078	10	16.3	0
10.9568714904953	15.8884815909731	1.11074581271888	12	15	3
10.9954849619116	16.521615203693	1.1225471982044	10	18	0
10.9954849619116	16.521615203693	1.1225471982044	11	18	0
11.0238976720454	16.9874945673787	1.13123041704056	12	17	1
11.0238976720454	16.9874945673787	1.13123041704056	12	18	0
11.0500828933621	17.4168524225106	1.13923287697395	13.5	17	3
11.0776995131781	17.8696767519038	1.14767303943773	8	18	1
11.0776995131781	17.8696767519038	1.14767303943773	9	18	1
11.1062286271432	18.3374689349203	1.15639188106231	13	18	1
11.1360724708975	18.8268168124565	1.16551275501255	14	18	3
11.1795382465712	19.5394871915595	1.17879878701913	14	20	2
11.2175820018931	20.1632562675502	1.19042718543374	13.5	21.4	1
11.2175820018931	20.1632562675502	1.19042718543374	14	21	2
11.2433981059372	20.5865420882304	1.19831724111465	13	22	1
11.2656358242202	20.9511589447792	1.2051132779205	12	21	2
11.2656358242202	20.9511589447792	1.2051132779205	13	21	2
11.2876351198393	21.3118675076063	1.21183631379377	9	21	1
11.3112570594437	21.6991798057353	1.21905562488466	11	21	3
11.336637717203	22.1153273173861	1.22681265270722	9.5	22.2	2
11.336637717203	22.1153273173861	1.22681265270722	10	21	2
11.3661631479749	22.5994304528212	1.23583712473213	8.5	22.8	2
11.3959021192679	23.0870395414247	1.24492719870614	11.7	22.8	2
11.3959021192679	23.0870395414247	1.24492719870614	12.2	22.1	3
11.4309156761269	23.6611304905188	1.25563006026213	11	24	1
11.4654136040391	24.2267680116413	1.26617533587742	10	24	2
11.5017457133342	24.8224778282249	1.277281569869	9	24	1
11.5466722875582	25.559098703058	1.29101620698248	8	26	0
11.6320875809766	26.0878332146696	1.32020777759541	8	27	1
11.662741577017	26.2775722826414	1.33068445232794	9.09999999999999	26	1
11.6947048630929	26.4754153263056	1.34160863699835	9	27	3
11.6947048630929	26.4754153263056	1.34160863699835	10	26	2
11.7267880751079	26.6739988479703	1.35257388432032	10	27	1
11.7587011341237	26.8715271330223	1.36348091714706	11	27	2
11.7905951283545	27.0689362824093	1.37438138667143	10	30	3
11.7905951283545	27.0689362824093	1.37438138667143	15	28.6	2
11.7905951283545	27.0689362824093	1.37438138667143	15	28	2
11.7905951283545	27.0689362824093	1.37438138667143	15	27	3
11.7905951283545	27.0689362824093	1.37438138667143	14	25	0
11.7905951283545	27.0689362824093	1.37438138667143	12	24	2
11.7905951283545	27.0689362824093	1.37438138667143	13	24	1
11.7905951283545	27.0689362824093	1.37438138667143	14	24	1
11.8547892043658	27.5083965896524	1.37757054740768	12	27	0
11.8547892043658	27.5083965896524	1.37757054740768	13	27	2
11.9274287220768	28.0056847149657	1.38118003708711	14	28.2	1
11.9274287220768	28.0056847149657	1.38118003708711	14	27	0
12.0086465239084	28.5617189309839	1.38521702622119	11	30	2
12.0086465239084	28.5617189309839	1.38521702622119	12	30	2
12.0749479517759	29.0156132288547	1.38851148033643	13	30	2
12.1368515258258	29.4393958338088	1.39158714138197	14	30	1
12.1368515258258	29.4393958338088	1.39158714138197	14	29	1
12.1986950808507	29.8627711993893	1.39466007755894	15	30	2
12.2574027208304	30.2646764818082	1.39757715783253	16	30	2
12.2547110139725	31.4111586112419	1.3787184715419	15	33	2
12.2534518773446	31.9498085318076	1.36985181576511	14	33	1
12.2523221997346	32.4332722370517	1.36189311692643	13	33	2
12.2512138537591	32.9076487507619	1.35408393624975	12	33	1
12.250062271752	33.4003563375434	1.34597346627298	14	36	0
12.250062271752	33.4003563375434	1.34597346627298	15	36	1
11.830656767057	33.4275106841799	1.39167107243214	13	36	2
11.3062247674705	33.4614657245076	1.44881028306674	12	36	1
10.7158378770261	33.4996915817571	1.51313439419516	10	33	0
10.1736892022739	33.5347940024122	1.57220443720974	11	36	1
9.54092599644665	33.5757643063628	1.64114514142461	10	36	2
8.87911106894482	33.6186159694891	1.71325030346792	8	36	0
8.3687015676463	33.651663749846	1.76886242785909	7	36	1
7.97531925185983	33.6771340396441	1.81172554363343	9	36	0
7.48537102677514	33.7088576860326	1.86510912653672	6.2	37.1	3
7.48537102677514	33.7088576860326	1.86510912653672	6.2	36.5	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.43552729254962	33.6596561859743	1.85479528937856	11	33	1
7.28713171448975	33.5131676373101	1.82409575834124	9	33	2
7.12800205615302	33.3560848482749	1.79117719912044	7	33	1
6.9792078427097	33.2092040956721	1.76039603351306	8	30	0
6.9792078427097	33.2092040956721	1.76039603351306	9	30	2
6.4811288377316	33.1834751926077	1.7744619573507	5	31	1
6.4811288377316	33.1834751926077	1.7744619573507	8	33	2
6.00164678314334	33.1587085660084	1.78800049550545	4	32	1
6.00164678314334	33.1587085660084	1.78800049550545	4	31	2
5.67870942696757	33.1420460302253	1.79711244558367	4.7	33.5	3
5.67870942696757	33.1420460302253	1.79711244558367	5.2	32	2
5.37514215083206	33.126385613393	1.80567695367942	4	35	3
5.37514215083206	33.126385613393	1.80567695367942	4	34	3
5.11381845765214	33.1129066635473	1.81304885975684	4	36	2
5.11381845765214	33.1129066635473	1.81304885975684	3	35	2
4.9007124826198	33.1019169537962	1.819059828077	4.7	34.5	1
4.9007124826198	33.1019169537962	1.819059828077	4	33	1
4.68761696139615	33.0909275141562	1.82507061139117	3	34	1
4.68761696139615	33.0909275141562	1.82507061139117	3	33	1
4.49706014880296	33.0811016241256	1.8304453232385	1.5	35	1
4.49706014880296	33.0811016241256	1.8304453232385	2	34	1
4.42272892705684	33.0772711057475	1.83254112981742	2	36	2
4.42272892705684	33.0772711057475	1.83254112981742	1.5	35.5	2
4.42051579645992	32.8170414233403	1.82407060098955	2	35	3
4.41614280514574	32.3034759300008	1.80735327112193	2	33	3
4.41139032079258	31.7453948242434	1.78918685490988	2	32	1
4.40673989928901	31.1992149725563	1.77140806992974	3	32	2
4.40184288951184	30.624142956075	1.75268869736698	2	31	3
4.40184288951184	30.624142956075	1.75268869736698	3	31	2
4.39674187205802	30.0251288760541	1.73318999290313	2	30	3
4.39674187205802	30.0251288760541	1.73318999290313	3	29	2
4.39253918209828	29.5313958275131	1.71711880563618	4	29	2
4.39253918209828	29.5313958275131	1.71711880563618	4	28	2
4.38921269838524	29.1404670357564	1.70439412705205	3	30	2
4.38921269838524	29.1404670357564	1.70439412705205	4	30	0
4.38548270846361	28.7021783285169	1.69012786909798	7	30	2
4.38073093326273	28.1440708149434	1.67196112769769	7	27	1
4.37695342139705	27.7002600577759	1.65751496894336	4	27	0
4.37695342139705	27.7002600577759	1.65751496894336	4	26	0
4.37413288141369	27.36872740837	1.64672364484134	3	28	0
4.37413288141369	27.36872740837	1.64672364484134	3	27	0
4.3713669696952	27.0436010674901	1.63614083464312	2	29	1
4.3713669696952	27.0436010674901	1.63614083464312	2	28	2
4.36682058488519	26.5096022138952	1.61875884809554	2	27	1
4.36210373633037	25.9555822146518	1.60072511458309	2	25	2
4.35817466402317	25.49392974845	1.5856981252872	3	26	3
4.35817466402317	25.49392974845	1.5856981252872	4	25	2
4.35431897446502	25.0408642192931	1.57095062599429	4.7	25.5	2
4.35431897446502	25.0408642192931	1.57095062599429	5.40000000000001	24.3	3
4.35069399937957	24.6148762312056	1.55708450734346	7.5	25.5	1
4.35069399937957	24.6148762312056	1.55708450734346	8	24	1
4.34901217873421	24.4167273720814	1.55063396616534	7	24	2
4.34739572536003	24.2262614636176	1.544433530106	5.40000000000001	23.3	2
4.34586146158098	24.0454546189219	1.53854753192462	3	22	0
4.3445715854596	23.8934150594105	1.53359803646811	3	24	1
4.34328166113099	23.7413771570446	1.52864858954931	2	26	0
4.34328166113099	23.7413771570446	1.52864858954931	3	25	0
4.3396790776164	23.3175716370831	1.51485081353245	2	24	0
4.3396790776164	23.3175716370831	1.51485081353245	2	23	1
4.33601799108111	22.8869082984227	1.5008296938243	3	23	1
4.33601799108111	22.8869082984227	1.5008296938243	4	24	1
4.33206852467421	22.4224401110667	1.48570804499109	4	23	2
4.33206852467421	22.4224401110667	1.48570804499109	4	22	1
4.32814891828212	21.9615180898805	1.47070184725159	3	21	2
4.32459530690997	21.5435252708284	1.45709324004945	3	20	3
4.32459530690997	21.5435252708284	1.45709324004945	3	19	2
4.32243989862206	21.2897488333912	1.4488311165857	4	20	2
4.32044082774289	21.0543449716423	1.44116715463158	2	22	1
4.32044082774289	21.0543449716423	1.44116715463158	2	21	1
4.31833570349306	20.8064605313857	1.43309686076443	4	21	3
4.31620677136814	20.5557862350026	1.4249356927938	5.3	21	2
4.31620677136814	20.5557862350026	1.4249356927938	7	21	1
4.31390290430609	20.2846271940724	1.41610750604012	7	18	0
4.31390290430609	20.2846271940724	1.41610750604012	8	21	2
4.22203719574864	19.6118933875562	1.39538677718504	2	19	1
4.22203719574864	19.6118933875562	1.39538677718504	2	20	1
4.14258101669992	19.0300337822014	1.3774650723993	5	18.3	1
4.06894525283354	18.4907962867029	1.36085613126141	4	18	1
4.06894525283354	18.4907962867029	1.36085613126141	4	19	1
3.99682893303223	17.9626858371953	1.34459001268542	2	18	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.99682893303223	17.9626858371953	1.34459001268542	3	18	2
3.92827019449294	17.4606264511021	1.32912631784832	2	16	1
3.92827019449294	17.4606264511021	1.32912631784832	2	17	2
3.87788524747363	17.0916506428407	1.3177615177388	3	16	2
3.83241830503674	16.7586888902871	1.30750595292649	3	17	3
3.83241830503674	16.7586888902871	1.30750595292649	4	17	3
3.78535849460138	16.4140628249301	1.29689112462213	7	16	2
3.73721263881835	16.0614810554099	1.28603141068233	4	16	3
3.6891171077085	15.709268194371	1.2751830354913	5	15	2
3.6891171077085	15.709268194371	1.2751830354913	7	15	3
3.55095181511986	15.1209321203473	1.22742339548753	3	14	0
3.432474761259	14.6164353655344	1.18646917375167	3	15	1
3.432474761259	14.6164353655344	1.18646917375167	4	15	1
3.30718601356392	14.0829300435767	1.14316087453248	2	14	3
3.30718601356392	14.0829300435767	1.14316087453248	2	15	1
3.17922706970903	13.5380511772518	1.09892985987276	4	13	3
3.05511835431324	13.0095687098416	1.05602957731487	2	13	0
3.05511835431324	13.0095687098416	1.05602957731487	3	13	1
2.93718455527485	12.5073808784563	1.01526380351806	2	11	1
2.93718455527485	12.5073808784563	1.01526380351806	2	12	1
2.84524962234967	12.1159070798275	0.983484404491802	3	12	2
2.75372612659191	11.7261851642245	0.951847213357658	4	11	3
2.75372612659191	11.7261851642245	0.951847213357658	4	14	1
2.62865209638876	11.1935901580782	0.908613489599866	3	10	2
2.62865209638876	11.1935901580782	0.908613489599866	3	11	1
2.51858672365361	10.7249080861564	0.870567457435779	2	10	1
2.41703976747941	10.292500644908	0.835465808247532	4	10	0
2.41703976747941	10.292500644908	0.835465808247532	4	12	2
2.27742811468264	9.69799447448848	0.787207691809479	4	9	0
2.14474791507118	9.13300564626991	0.741345573935265	3	8	0
2.14474791507118	9.13300564626991	0.741345573935265	3	9	1
2.02621704223321	8.62827144181448	0.700374114127779	2	8	1
2.02621704223321	8.62827144181448	0.700374114127779	2	9	2
1.90955629289117	8.13149998442668	0.66004894864183	4	8	3
1.77667224418974	7.56563981131932	0.614116605427225	2	6	1
1.77667224418974	7.56563981131932	0.614116605427225	3	6	1
1.67649396882915	7.13905493862072	0.579488780187265	3	7	1
1.57419695458574	6.70344603175182	0.544128824095557	4	6	3
1.57419695458574	6.70344603175182	0.544128824095557	4	7	2
1.44935931520254	6.17184096451992	0.500978812825713	2	7	3
1.29842177132947	5.52908471031597	0.448807202023136	4	5	1
1.14352551030431	4.86947269504064	0.395267539057211	4	4	1
0.997109621216666	4.24598398017722	0.344659321233783	3	4	0
0.849128354606336	3.61583831711895	0.293511114969898	2	5	2
0.644604144903866	2.74491532066655	0.222818157862491	2	4	3

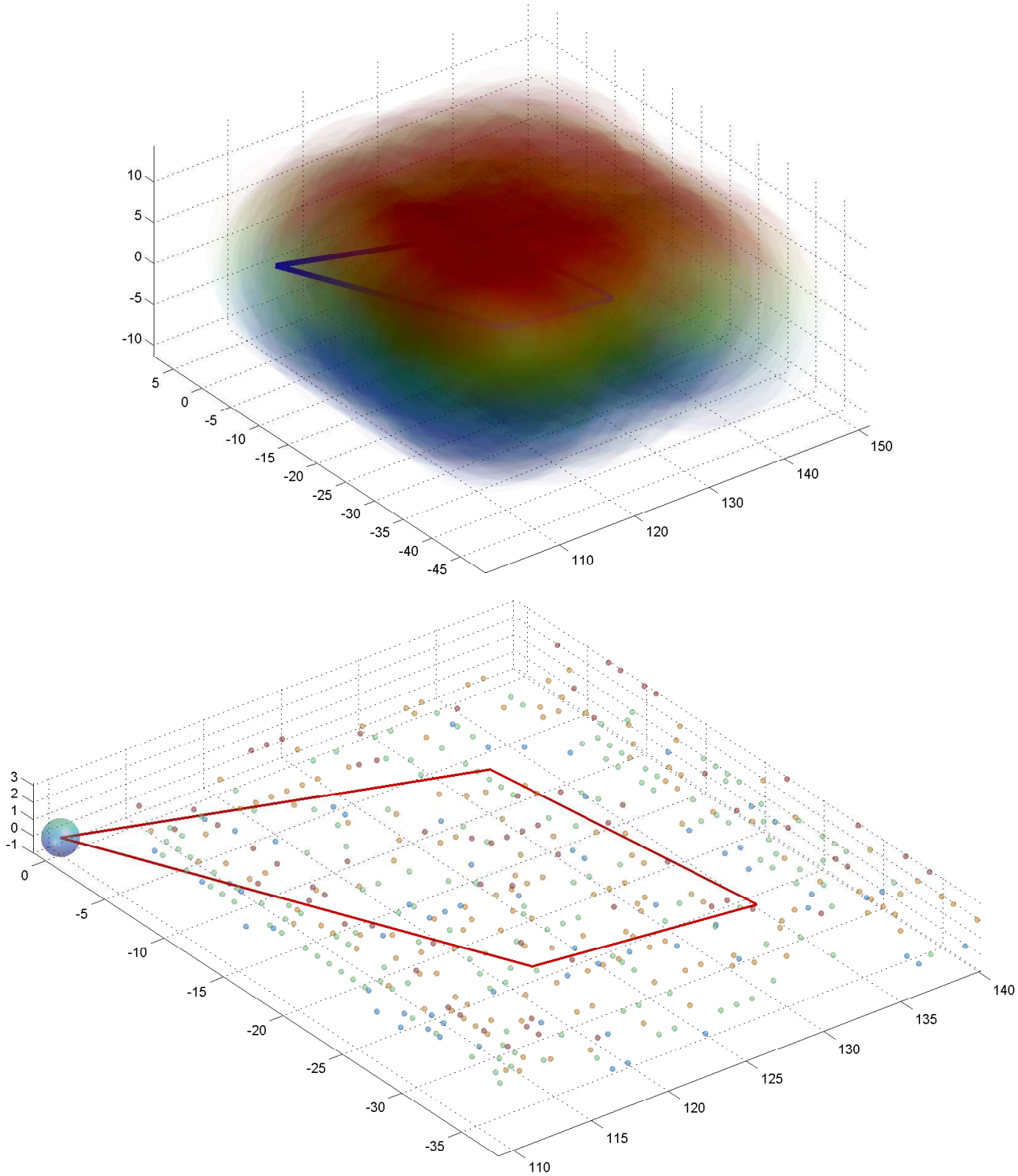


Figure N.84: *pcb*442, $r = 11.4$, Equal Radius, 3D, Euclidean, Length = 83.7221517

Table N-87: Solution for *pcb*442, $r = 11.4$, Equal Radius, 3D, Euclidean

Total distance: 83.7221517026943 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
1.22370099941075	0.651711855307054	0.118957251565035	6	4	1
2.22528264929039	1.18512768009293	0.216321965036569	7	3	0
3.08001943452244	1.64034120610561	0.299412325340414	9	3	1
3.77649871853876	2.01127517886514	0.367118713256676	8	3	2
4.43479524527481	2.36187184302723	0.431112482139703	10	3	3
5.03478699825533	2.68141309283052	0.489437668287419	11	3	3
5.57086967663174	2.96691453885531	0.541549818326878	10	6	2
6.05796257139544	3.22623371322611	0.588899180194202	9.40000000000001	7.4	2
6.5040099923163	3.46387274329097	0.632258027898237	9	6	2
6.93047658964109	3.69099340857603	0.673712891650961	8	6	2
7.34989965123357	3.91436284434516	0.71448259793684	7	6	2
7.77178558960553	4.1390438896983	0.755491379839867	8.5	5.2	1
8.19382860069321	4.36380857999984	0.796515255929119	7.5	4.9	0
8.62865906749553	4.5953833689794	0.838782119652484	11	6	2
9.04985796068077	4.81969849361115	0.879723862718876	8.5	7	0
9.47805588225577	5.04774100976463	0.921346018382124	11	9	1
9.47805588225577	5.04774100976463	0.921346018382124	11	7	1
9.8849320127933	5.26442831937445	0.960895577048804	8	10.3	1
10.2959873831847	5.48334131230902	1.00085136373287	13	7	0
10.2959873831847	5.48334131230902	1.00085136373287	13	6	0
10.688276032343	5.6922598448528	1.03898295819156	10	11	1
11.0738553574623	5.89760524985668	1.0764622623983	13.5	7.5	3
11.0738553574623	5.89760524985668	1.0764622623983	12	6	2
11.4470367201184	6.09634794663884	1.11273649746016	12	3	3
11.8323194725057	6.30153533652196	1.15018727412487	13	3	2
12.2214005639573	6.50874552111727	1.18800761035963	10.5	10.5	2
12.6242747227651	6.72330134742323	1.22716861096976	13	11.3	2
13.0197173288168	6.93389940465537	1.26560709968867	14	9.3	1
13.4115041016723	7.14255046434362	1.30369032199572	14.5	7.7	3
13.8014479793767	7.35022000589074	1.34159461440144	15.5	5	3
13.8014479793767	7.35022000589074	1.34159461440144	14	6	2
14.2050273415176	7.5651511035221	1.38082495413758	14	3	1
14.6435146576843	7.79867274664997	1.42344890905783	15.5	3	1
15.1072015049763	8.04561465156191	1.46852275992516	17.1	3.1	2
15.579061489706	8.29690929043153	1.51439128012359	18	3	1
16.0393262455767	8.54202837205657	1.55913237174907	16	11	2
16.5163610494625	8.79607865433317	1.6055038669855	13	15	2
17.0057879622727	9.05672817637814	1.65307967827013	16	13	1
17.4998595005219	9.31985140176334	1.70110646393002	16.5	10.5	0
18.0125712512449	9.59290169095707	1.75094483288376	25	3	2
18.0125712512449	9.59290169095707	1.75094483288376	24	3	2
18.5019975743284	9.85355074116925	1.79852012442833	26	5	1
18.5019975743284	9.85355074116925	1.79852012442833	26	4	1
18.9157528305522	10.0739002999846	1.83873976013429	28	9	1
19.2713085984442	10.2632551916439	1.87330169297895	30	10	3
19.2713085984442	10.2632551916439	1.87330169297895	30	9	1
19.4171831393745	10.3409421340252	1.88748093788817	30	8	3
19.5281042582726	10.4000141978105	1.89826256724323	30	7	3
19.6101905597445	10.4437298363156	1.90624138640428	29	5	2
19.6872090357825	10.4847465014142	1.91372760688287	29	4	3
19.7047803586138	10.6212975095261	1.91342380133469	27.5	5.2	2
19.7224762791472	10.758816425976	1.91311780717076	17.1	5.1	1
19.7406917381387	10.9003739897137	1.9128031631103	20	3	2
19.7594240925047	11.0459491280467	1.91247980477648	21	3	2
19.7788689237866	11.1970616882243	1.91214436670635	26	8	2
19.7986144395111	11.3505113316715	1.91180371545015	27	7	2
19.8189336706887	11.5084199589251	1.91145316375587	27	8	3
19.8395770815589	11.6688481389288	1.91109698416443	27	9	2
19.8603576842553	11.8303424686117	1.91073837938268	26	10	1
19.8812026203919	11.992336635929	1.91037862778305	26	9	0
19.9026826164834	12.1592662981351	1.91000788987618	20	12	1
19.9244510468742	12.328438012058	1.90963234674918	26	11	3
19.9462427403097	12.4977896917053	1.90925609285371	18	12.3	2
19.9687276909036	12.6725299048961	1.9088680007639	17	12	2
19.9921042537948	12.8542003496521	1.9084646701462	13.5	17	3
20.0147245849355	13.0299932162596	1.90807443920684	13	18	1
20.0363786582362	13.1982760594949	1.90770095018069	14	18	3
20.0575787787416	13.3630304705614	1.9073353126694	16	18	3
20.0787683109393	13.5277022381804	1.90696989419298	20	23	2
20.0982814835168	13.6793454334593	1.90663302578318	20	25	3
20.0997505801015	13.6907690262778	1.906607608277	20	22	2
20.1011404053783	13.7015749326327	1.90658356884782	17	21	1
20.1024864376843	13.7120394388372	1.90656031331327	14	20	2
20.1037896876286	13.7221704346944	1.90653780084289	15.5	18.5	2
20.1037896876286	13.7221704346944	1.90653780084289	15	19	0
20.1049637519714	13.7312959019747	1.90651753328449	13.5	21.4	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.1060706067414	13.7398983671172	1.90649843000534	18	21	1
20.1071361164139	13.7481792825357	1.90648003683234	20	21	1
20.1081655014497	13.7561793939583	1.906462256525	14	21	2
20.1091912857734	13.7641513016018	1.90644452958998	17	15	2
20.1102241803045	13.7721783914891	1.90642668129352	15	15	0
20.1112839260387	13.7804140145603	1.9064083826156	16	15	1
20.1123613341929	13.7887867613762	1.90638978239059	20	11	1
20.1134471216457	13.7972246321385	1.90637104634814	20	10	1
20.1145370480691	13.8056946240348	1.90635225012429	20	3.7	2
20.1156820387994	13.8145925408726	1.90633252262307	19	3	1
20.1169038876569	13.8240876948648	1.90631149197579	22	3	1
20.1182057765624	13.8342050990685	1.90628909435279	23	3	0
20.1260404375777	13.8950794696567	1.90615360480508	27	10	1
20.1344333705314	13.9602930497348	1.90600852756547	27	11	1
20.1431173576005	14.0277695740737	1.90585849045813	29.3	9.5	1
20.1522785550264	14.0989568942294	1.90570029015203	30	11	3
20.161631171036	14.1716349652327	1.90553861274944	27	14	1
20.1708142290007	14.2429961355778	1.90537977924146	26	14	2
20.1796998662337	14.312046047812	1.90522597086921	14	15	2
20.1887872225409	14.3826619267382	1.90506882798679	18	15	3
20.1976887308826	14.4518325690862	1.90491486231532	17	18	3
20.2060871516749	14.5170921636157	1.90476951579329	20	16	3
20.2060871516749	14.5170921636157	1.90476951579329	18	18	2
20.2140046930724	14.5786133179564	1.90463241432859	20.6	16.5	1
20.2140046930724	14.5786133179564	1.90463241432859	20	17	0
20.2216732209087	14.6381983890533	1.9044996454751	22.9	14	1
20.2294943521537	14.6989689631569	1.904364257767	26	15	1
20.2373008205555	14.7596261808342	1.90422911362844	26	16	1
20.2448742330567	14.8184729756952	1.90409797790904	23.2	15	1
20.2523472515833	14.876539535318	1.90396859314437	20	18	0
20.2596310527027	14.9331354114351	1.90384248588495	20	20	3
20.2596310527027	14.9331354114351	1.90384248588495	20	19	2
20.2662681032973	14.9847058225078	1.90372746671459	21.7	19	3
20.2726377276426	15.0341983252101	1.90361704900332	24	21	2
20.2726377276426	15.0341983252101	1.90361704900332	21.1	20	2
20.2785563865585	15.0801869353152	1.90351439971085	26	21	2
20.2785563865585	15.0801869353152	1.90351439971085	26	20	1
20.2843694465814	15.1253555280651	1.90341352486123	27	20	1
20.290124868077	15.1700766575761	1.90331360110532	27	21	1
20.2954351414027	15.2113395603677	1.90322130131898	22	4.7	1
20.3015970653489	15.2592193668105	1.90311431255084	20	9	1
20.3015970653489	15.2592193668105	1.90311431255084	20	8	1
20.3078501830604	15.3078070130958	1.90300583151678	21	6	3
20.3143208250433	15.358084474518	1.90289361594033	23	6	0
20.3212071125645	15.4115911517733	1.90277423988763	22	6	1
20.3286925961967	15.4697530523261	1.90264453373505	24.5	7.1	0
20.3368540267751	15.5331665387392	1.90250318247264	25	8	2
20.3368540267751	15.5331665387392	1.90250318247264	24	6	2
20.3468317834003	15.6106909508577	1.90233054247303	25.5	7.1	2
20.3578448886768	15.6962578935337	1.90214012802497	28	11.3	2
20.3692705787796	15.7850304812382	1.90194263313171	30	15	1
20.3803939976236	15.8714566360208	1.90175033725513	29	14	2
20.3914936605718	15.95769877562	1.90155847209515	30	17	1
20.4020590607922	16.0397915154826	1.90137575991361	26	17	2
20.4124624128692	16.1206245708197	1.90119583965857	29.5	17.5	1
20.4224076162999	16.1978992481304	1.90102373695046	26	18	2
20.4321055742072	16.273252504209	1.90085586851524	27	19	3
20.4413787403912	16.345305258754	1.90069525541265	30	18	1
20.4502606614823	16.4143185483089	1.90054136178899	30	19	0
20.4587125085333	16.4799903412125	1.9003948862681	26	19	0
20.4672338145453	16.5462013964968	1.90024724699209	30	22	3
20.4744565430142	16.6023225852974	1.90012202174502	26	24	0
20.4744565430142	16.6023225852974	1.90012202174502	26	22	0
20.4812342300311	16.6549861241192	1.90000440577253	27	23	2
20.4812342300311	16.6549861241192	1.90000440577253	26	23	3
20.4861273705062	16.6930082661212	1.89991923064281	20	6	1
20.4861273705062	16.6930082661212	1.89991923064281	17.5	7.5	1
20.4931099831449	16.747264306305	1.89979797633778	19	6	2
20.5011941845427	16.8100792259248	1.89965767207159	18	6	1
20.5214788178302	16.9676927731981	1.89930573922723	26	12	1
20.5430830830519	17.1355597029241	1.89893093851545	27	12	1
20.5663194316909	17.3161074045914	1.89852790448798	30	12	0
20.5975165758909	17.5585033807757	1.89798692703762	20	14	2
20.5975165758909	17.5585033807757	1.89798692703762	20	13	2
20.6330198435281	17.8343525333949	1.89737163664008	30	13	2
20.6743866513099	18.1557530216649	1.89665509664054	27	13	2
20.718351719299	18.4973374817484	1.89589397088638	23.9	13	0
20.718351719299	18.4973374817484	1.89589397088638	20	15	1
20.7683543941991	18.8858255829109	1.89502890260943	26	13	1
20.8236055867211	19.3150887807126	1.89407344452373	27	15	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.8824683503022	19.7724094090502	1.89305606119741	27	18	1
20.9416117887014	20.2319097715919	1.89203436633398	27	17	2
20.9416117887014	20.2319097715919	1.89203436633398	27	16	2
21.0081402235132	20.7487838440942	1.89088586698959	30	16	1
21.089377168531	21.3799259596454	1.88948495506762	30	20	2
21.1721330881653	22.0228729329564	1.88805774717474	30	21	0
21.1721330881653	22.0228729329564	1.88805774717474	29.5	20.5	1
21.257835285171	22.6887128160083	1.8865802927881	30	23	1
21.3408749246302	23.3338670447635	1.88514755995142	29	24	2
21.3408749246302	23.3338670447635	1.88514755995142	27.6	23.6	1
21.423461656546	23.9755008845854	1.88372235555581	30	27	1
21.4968596645315	24.5457475024301	1.88245406705624	28.5	27	1
21.5684150672711	25.1016778657021	1.88121810594392	29	30	0
21.6316784980712	25.5931863357989	1.88012513002039	27	35	2
21.6585542941921	25.8019906161572	1.87965991154577	26	34	2
21.6823002890794	25.9864799425153	1.87924864157253	26	31	1
21.6823002890794	25.9864799425153	1.87924864157253	26	30	2
21.7053936014787	26.1658985898328	1.87884854757938	27	29	1
21.7053936014787	26.1658985898328	1.87884854757938	26	29	0
21.7280464972517	26.3418969293724	1.87845592647007	27	28	0
21.7280464972517	26.3418969293724	1.87845592647007	26	28	1
21.7502009589733	26.5140241906123	1.87807183093551	27	27	1
21.7502009589733	26.5140241906123	1.87807183093551	26	27	2
21.7720079687133	26.6834533808426	1.87769365193557	26	26	1
21.7940535899061	26.8547361994536	1.8773113355081	27	26	3
21.816154258111	27.0264469100531	1.87692803561043	30	25	1
21.8386068137474	27.2008909319531	1.87653865672349	30	26	1
21.8614118411545	27.3780720439427	1.87614324138372	30	30	0
21.8836018707103	27.5504750551016	1.8757584938366	30	31	1
21.9051746854907	27.7180823802768	1.87538446891055	27	36	0
21.9243847108434	27.8673334385676	1.87505133825218	26.2	36.5	2
21.9417578542605	28.0023141941678	1.87474999140386	30	28	3
21.9600684560019	28.1445760982421	1.87443247114553	30	29	2
21.9791595068	28.2928993695089	1.87410150198516	30	33	2
21.996873921572	28.4305279466882	1.87379439276005	28.5	33.5	2
22.0129254695608	28.555238653896	1.87351609860632	26	25	1
22.029931315121	28.6873618959282	1.87322132039822	27	22	0
22.0481590404027	28.828976445169	1.87290543069171	28.5	22	1
22.0671414146752	28.9764532099225	1.87257649114152	27	25	1
22.0864403974946	29.1263892010446	1.87224209960891	27	30	3
22.105462331519	29.2741738907339	1.87191241659742	27	31	3
22.1244682355598	29.4218341405517	1.87158298062679	27	32	2
22.1436390595985	29.5707746755662	1.87125072769163	27	33	2
22.1630964412674	29.7219398066221	1.87091359372468	30	38	2
22.1042127541502	29.7110648962733	1.86968504248438	27	34	2
22.0475389287609	29.7005985265401	1.86850270915921	30	37	0
21.9366164097274	29.6801138352944	1.86618840109	23	34	3
21.8329246923869	29.6609654073118	1.86402513727939	23	35	1
21.7347100149316	29.642829138424	1.86197629541356	27	37	0
21.6297069602768	29.6234391540518	1.8597858230739	27	38	1
21.5166453185641	29.6025612213247	1.8574272824766	30	36	2
21.3638667251398	29.5743492352667	1.85424026001454	30	35	2
21.1809190031497	29.5405659159931	1.85042388900815	30	34	3
20.9665069084137	29.500970384579	1.84595085781813	23.2	31.5	2
20.7533903719961	29.4616153767839	1.84150508014593	22	32	2
20.5423221069514	29.4226384205394	1.83710198582159	20.5	31.5	3
20.3347891074228	29.3843137222199	1.83277249894554	17.9	33.3	2
20.1344662872741	29.3473202892002	1.82859337043997	16	33	2
19.9466627231059	29.3126395492446	1.82467554410623	20	30	3
19.7620617062519	29.2785507589009	1.82082461262442	30	32	3
19.4586944847442	29.2225238995455	1.81449531965254	20	24	0
19.1637565680625	29.1680565824423	1.80834237473765	22.2	28.2	1
18.8700823282739	29.1138222720462	1.80221570631687	19	30	3
18.5803301251799	29.0603131357756	1.79617098373342	13	36	2
18.3107333660437	29.0105288256425	1.79054715599801	21	32	1
18.0384614043571	28.9602512937081	1.78486766755103	21.5	32.5	2
17.7592967886267	28.9087010279625	1.77904442145663	22.8	32.5	1
17.4698672079835	28.8552540140459	1.77300686069909	18.3	27	1
17.18670543796	28.802965757984	1.76710025221219	20	26	1
16.9034357825537	28.7506578450197	1.76119142610871	20	27	2
16.6164031372036	28.6976546460162	1.75520402395465	20	28	2
16.3228788837162	28.6434521386443	1.74908110295279	21.2	27.5	0
16.0199916761537	28.5875202348911	1.74276280545617	20	29	1
15.7132692672453	28.5308801567286	1.73636451183202	20	31	0
15.4016784411857	28.4733409332891	1.72986464916262	20	35	2
15.0686625502217	28.4118424394932	1.72291737501009	19	35.2	1
14.722109848236	28.3478417591409	1.71568731086271	18.3	34.5	2
14.3671116633029	28.2822798751127	1.70828079250409	17.2	34.1	2
14.007118815035	28.2157953182164	1.70077004096745	17	36	1
13.6335925885729	28.1468079140928	1.6929763580791	16	36	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.2495560829783	28.075876730374	1.68496297987746	15	36	1
12.8553648277204	28.0030686490349	1.67673756464222	14	36	0
12.4501314042544	27.9282207962594	1.66828177418397	15	33	2
12.0425195160554	27.8529310125913	1.65977590978825	14	33	1
11.6381307220439	27.7782336907237	1.65133679896541	3	35	2
11.5723120908934	27.7660805274309	1.64996383937578	3	34	1
11.5147823224785	27.7554585119957	1.64876392676282	12	30	2
11.4574041841543	27.7448646088549	1.6475671975117	13	30	2
11.3993546826057	27.7341468424337	1.64635648148978	16.9	26.8	2
11.3394542899137	27.7230872108521	1.64510711942929	17.9	25.8	2
11.3394542899137	27.7230872108521	1.64510711942929	17.2	26.1	2
11.276908161644	27.7115388065332	1.64380247300296	18	24	2
11.276908161644	27.7115388065332	1.64380247300296	17	24	2
11.2119617800413	27.6995471166523	1.64244767251719	16	24	2
11.1460374847874	27.6873749182168	1.64107245405695	15	24	1
11.1460374847874	27.6873749182168	1.64107245405695	14	24	1
11.0783821060071	27.6748833648845	1.63966116331973	13	24	1
11.0107144265723	27.6623897573182	1.63824967250532	12	27	0
11.0107144265723	27.6623897573182	1.63824967250532	14	25	0
10.9431210980879	27.6499101554475	1.63683982741741	14	28.2	1
10.9431210980879	27.6499101554475	1.63683982741741	14	27	0
10.8757966898338	27.6374803091901	1.63543562892778	14	29	1
10.8093068671568	27.625204549473	1.63404884193956	14	30	1
10.7440144890234	27.6131498242765	1.63268702376649	13	33	2
10.6806566972972	27.6014520389294	1.63136548206826	15	27	3
10.6161208210898	27.5895368076714	1.6300193608302	13	27	2
10.5518960070328	27.5776791474889	1.62867976447822	18.3	28	0
10.5518960070328	27.5776791474889	1.62867976447822	16	27	0
10.4807090547266	27.5645361619692	1.6271949490541	12	36	1
10.4085286068385	27.5512093712216	1.62568928106836	16	30	2
10.4085286068385	27.5512093712216	1.62568928106836	15	30	2
10.3320979209077	27.5370979578703	1.6240949308804	11	36	1
10.2545551995313	27.5227808589687	1.62247725527189	15	28.6	2
10.2545551995313	27.5227808589687	1.62247725527189	15	28	2
10.1704727811631	27.5072568477574	1.62072322184098	10	36	2
10.0840418996705	27.491298875575	1.61892002077378	9	36	0
9.99712629185029	27.4752511191523	1.61710667661404	8	36	0
9.91080817244381	27.4593135045623	1.61530583266583	7	36	1
9.82557867547983	27.4435767910667	1.61352772493836	6.2	36.5	2
9.74134092601859	27.4280230623111	1.61177028404887	6.2	37.1	3
9.65780146754119	27.4125980248451	1.61002732361944	4	36	2
9.5774617943803	27.3977638317698	1.60835116871965	1.5	35	1
9.50784266488633	27.3849094563262	1.6068988021927	2	34	1
9.44128342534206	27.3726202771627	1.60551036994391	2	36	2
9.43063442250067	27.341743461314	1.60369946050313	1.5	35.5	2
9.3971497088006	27.244658900583	1.59800520496595	7	33	1
9.3971497088006	27.244658900583	1.59800520496595	4	24	1
9.36693705710621	27.1570601506069	1.59286740700096	2	35	3
9.33447865853516	27.0629499759834	1.58734769126213	4	35	3
9.3006759211305	26.9649417146329	1.58159934326556	8	33	2
9.26695076714719	26.867158503847	1.57586418642091	9	33	2
9.23323440506419	26.7694010786764	1.57013052175165	10	33	0
9.19940025750834	26.6713025269133	1.56437684406078	11	33	1
9.16492407055836	26.5713430148434	1.55851399076498	12	33	1
9.12923517260403	26.4678682203375	1.55244491491887	11	30	2
9.09382072483388	26.3651894682597	1.54642251292546	10	30	3
9.0582816024029	26.2621495014604	1.54037888986561	9	30	2
9.0224535243228	26.1582719246214	1.53428612429479	8	30	0
8.98656219241376	26.05421101823	1.52818262710566	9	27	3
8.95164325001033	25.9529693968899	1.5222444819027	10	26	2
8.91800114554241	25.8554296781199	1.51652347754526	11	27	2
8.88507322613154	25.7599606572208	1.51092392964658	10	27	1
8.85310058230212	25.6672610933798	1.50548684512713	9.09999999999999	26	1
8.82234817628347	25.5780989906229	1.50025727893232	8	27	1
8.79261960441642	25.4919050614983	1.49520182688851	8	26	0
8.76373574860968	25.4081598905834	1.49029002996919	8	24	1
8.73559354698935	25.3265643783587	1.4855043559447	7.5	25.5	1
8.707839925386	25.2460949288648	1.48078476234833	7	27	1
8.68033893716381	25.1663574788439	1.47610813131243	7	30	2
8.65248225119686	25.085588754129	1.47137101116143	5.2	32	2
8.65248225119686	25.085588754129	1.47137101116143	5	31	1
8.6240355449744	25.0031098245647	1.46653355691584	4	31	2
8.6240355449744	25.0031098245647	1.46653355691584	3	31	2
8.59535194701127	24.9199441565366	1.46165581495954	4	32	1
8.59535194701127	24.9199441565366	1.46165581495954	3	32	2
8.5654149072592	24.8331447454152	1.4565649191756	4	33	1
8.5654149072592	24.8331447454152	1.4565649191756	3	33	1
8.53291835436866	24.7389250864525	1.45103877224839	4.7	34.5	1
8.49627084847643	24.6326712060403	1.44480674223066	4	34	3
8.49627084847643	24.6326712060403	1.44480674223066	4.7	33.5	3

Solution x	Solution y	Solution z	Original x	Original y	Original z
8.45172678368209	24.5035242679161	1.4372318643362	2	32	1
8.40548993665543	24.3694695085535	1.42936912845895	2	33	3
8.34912706951245	24.2060584292277	1.4197844663828	2	31	3
8.34912706951245	24.2060584292277	1.4197844663828	2	30	3
8.28952329534943	24.0332519487673	1.40964863680326	2	29	1
8.23047089182026	23.8620438600108	1.39960658053465	4	30	0
8.23047089182026	23.8620438600108	1.39960658053465	3	30	2
8.16844958618931	23.6822290143083	1.38905966197623	4	29	2
8.16844958618931	23.6822290143083	1.38905966197623	3	29	2
8.10492632155866	23.4980598456525	1.37825731034294	4	28	2
8.10492632155866	23.4980598456525	1.37825731034294	2	28	2
8.04159747731644	23.3144540689895	1.36748800385399	4	27	0
8.04159747731644	23.3144540689895	1.36748800385399	4	26	0
7.9809301075183	23.1385642834845	1.35717134794338	3	28	0
7.9809301075183	23.1385642834845	1.35717134794338	3	27	0
7.91999454805885	22.9618963541643	1.34680911557679	2	27	1
7.91999454805885	22.9618963541643	1.34680911557679	2	26	0
7.86000602290335	22.7879729646087	1.33660793298422	3	25	0
7.86000602290335	22.7879729646087	1.33660793298422	2	25	2
7.80226734914001	22.6205715939112	1.32678933608344	2	23	1
7.80226734914001	22.6205715939112	1.32678933608344	3	22	0
7.75076988018145	22.4712638478886	1.31803207174141	3	26	3
7.75076988018145	22.4712638478886	1.31803207174141	4	25	2
7.6984135832006	22.3194654140335	1.30912874487783	4.7	25.5	2
7.6984135832006	22.3194654140335	1.30912874487783	5.40000000000001	24.3	3
7.6469693739387	22.1703110658827	1.30038051137907	7	24	2
7.5965331684111	22.0240793260209	1.29180369267671	9	24	1
7.54725162724839	21.8811958888118	1.28342323319421	8.5	22.8	2
7.49943838833269	21.7425698561701	1.27529246261025	2	22	1
7.49943838833269	21.7425698561701	1.27529246261025	2	21	1
7.45085338921234	21.601703776165	1.26703044407995	9	21	1
7.40268150264552	21.4620355247452	1.25883867849881	9.5	22.2	2
7.35426946447063	21.3216712982731	1.25060607407361	10	24	2
7.30477683180796	21.1781746538059	1.24218971053735	8	21	2
7.25608165229671	21.036989422935	1.23390895716054	11	24	1
7.20612303422101	20.8921416686306	1.22541335658446	12	24	2
7.15423210335717	20.7416925483943	1.21658916336186	11.7	22.8	2
7.10093739181698	20.5871740573379	1.20752625587033	7	21	1
7.04831206299932	20.4345954698822	1.19857718175504	12.2	22.1	3
6.99402069353322	20.2771873852903	1.18934479132129	11	21	3
6.93939543179437	20.1188115250305	1.18005561909896	12	21	2
6.88452042831395	19.9597118331493	1.17072398107396	13	21	2
6.82902781218223	19.7988217040922	1.161287320921	13	22	1
6.77223597589702	19.6341649650124	1.15162973545356	15	21	2
6.71278076306933	19.4617860651115	1.14151923795035	16	21	3
6.64920927806833	19.2774720140551	1.13070874821777	5.3	21	2
6.58650714259862	19.0956785912891	1.12004609564798	4	23	2
6.58650714259862	19.0956785912891	1.12004609564798	10	21	2
6.52280656379263	18.9109919123734	1.10921366578021	5.40000000000001	23.3	2
6.45781850998621	18.7225741044555	1.09816231018772	3	24	1
6.45781850998621	18.7225741044555	1.09816231018772	2	24	0
6.38975829413064	18.5252527998381	1.08658860205636	3	23	1
6.32048272489432	18.3244084688349	1.07480824472849	4	22	1
6.25023176432201	18.1207361385909	1.06286202769679	3	20	3
6.18072281544971	17.9192142589754	1.05104195354583	3	19	2
6.11289864128145	17.7225757529958	1.03950834763637	2	18	1
6.0476465967964	17.533392903633	1.02841211540152	4	18	1
5.98424235998058	17.3495662009131	1.01763009037809	4	17	3
5.92294022443764	17.1718330276906	1.00720550863269	4	16	3
5.86444921473857	17.0022489605445	0.997258950798086	7	16	2
5.80841488860747	16.839787181648	0.987730155317445	4	21	3
5.80841488860747	16.839787181648	0.987730155317445	3	21	2
5.74851271928625	16.6661099302146	0.977543599286692	3	17	3
5.6909494852141	16.4992120258973	0.967754784788331	15	18	3
5.62822478123986	16.3173529858309	0.957088232107122	12	15	3
5.56649472927828	16.1383785535207	0.946590818174514	11.5	13.5	2
5.5064449638254	15.9642757026718	0.936379147840475	11	15	1
5.44663569041165	15.7908702281819	0.926208379012344	10	15	2
5.38651304928041	15.6165560549604	0.915984321712228	9	15	1
5.32643361424725	15.4423666908581	0.905767617534243	8	15	1
5.26726526122089	15.2708181594137	0.895705853129778	10	16.3	0
5.20822422849352	15.0996389242873	0.885665749430196	12	17	1
5.14771058688038	14.9241907584563	0.875375230902126	12	18	0
5.08505210243882	14.7425248814421	0.86471998846565	11	18	0
5.02073077985965	14.5560385315261	0.853781991129544	10	18	0
4.95490412248606	14.3651882438029	0.842588023050798	9	18	1
4.8874145297241	14.1695171742435	0.831111279135712	8	18	1
4.81810641006555	13.968574380776	0.819325302268979	7	18	0
4.74670175264555	13.7615540991887	0.807182826204915	5	18.3	1
4.67328648677636	13.5487058796876	0.794698462376946	4	10	0

Solution x	Solution y	Solution z	Original x	Original y	Original z
4.60530219363899	13.3516004320403	0.783137612815873	4	19	1
4.53425689713544	13.1456218371622	0.771056252606247	4	20	2
4.45737767261377	12.9227314002906	0.757982846994599	2	20	1
4.37536922897908	12.6849720154401	0.744037242185415	2	19	1
4.28925008521935	12.4352957260012	0.729392622815954	3	18	2
4.19894858449776	12.1734945766601	0.714036777213154	2	17	2
4.10632521026294	11.904962019836	0.698286066944975	3	11	1
4.01704234313338	11.646111873401	0.683103372270301	3	14	0
4.01704234313338	11.646111873401	0.683103372270301	3	13	1
3.92915926960993	11.3913181709254	0.668158684756849	4	13	3
3.84125747537638	11.1364695179317	0.653210783718958	3	12	2
3.7552438799113	10.8870939499871	0.638583958307224	2	12	1
3.67158382425804	10.6445405026339	0.624357353075697	3	15	1
3.58607176571628	10.3966171640365	0.609815806372671	2	16	1
3.58607176571628	10.3966171640365	0.609815806372671	2	15	1
3.49588266723622	10.1351337549558	0.594478916858082	2	13	0
3.40586394996181	9.87414337613983	0.579171002872839	2	11	1
3.31731663024564	9.61741755208355	0.564113299227879	2	10	1
3.23101708719211	9.36720715719352	0.549437832032613	2	14	3
3.14167238711417	9.10816810016005	0.534244522335397	7	15	3
3.14167238711417	9.10816810016005	0.534244522335397	3	8	0
3.04727706296475	8.8344866471876	0.518192347897749	4	11	3
3.04727706296475	8.8344866471876	0.518192347897749	3	10	2
2.953049956448	8.56129260049027	0.502168776110805	4	9	0
2.86200980829045	8.29733891073477	0.486687168701124	3	16	2
2.75952349280071	8.00020154746196	0.469259121370515	5	15	2
2.64485595844124	7.66775109819781	0.449759653051096	4	15	1
2.51666843489141	7.29610684328864	0.427961125106343	3	9	1
2.51666843489141	7.29610684328864	0.427961125106343	2	9	2
2.39185029729163	6.93423315476515	0.406735620635752	4	14	1
2.25000112771527	6.5229857484578	0.38261400514048	4	12	2
2.09569026899129	6.07561225287992	0.356373299276354	2	8	1
2.09569026899129	6.07561225287992	0.356373299276354	3	7	1
1.94380874286077	5.63528180745949	0.330545723041901	2	7	3
1.79256912365464	5.19681290395724	0.304827286377293	4	6	3
1.64102380514451	4.75745887168975	0.279056852331442	2	6	1
1.48987698920007	4.31926022991754	0.253354183733631	2	5	2
1.34028298152469	3.88556435277191	0.227915568421029	2	4	3
1.19412033011909	3.46181941650789	0.203060463930276	3	5	1
1.04668914223502	3.03439930362304	0.177989659754449	4	5	1
0.895983292168395	2.59748883435613	0.152362021917583	3	4	0
0.750017613796004	2.17432842376139	0.127540528892125	4	4	1
0.606994998762204	1.75970607103814	0.103219495087524	3	6	1
0.447722910547981	1.29797101540308	0.0761353405697527	4	8	3
0.243052035531903	0.704617101346443	0.0413310161597344	4	7	2

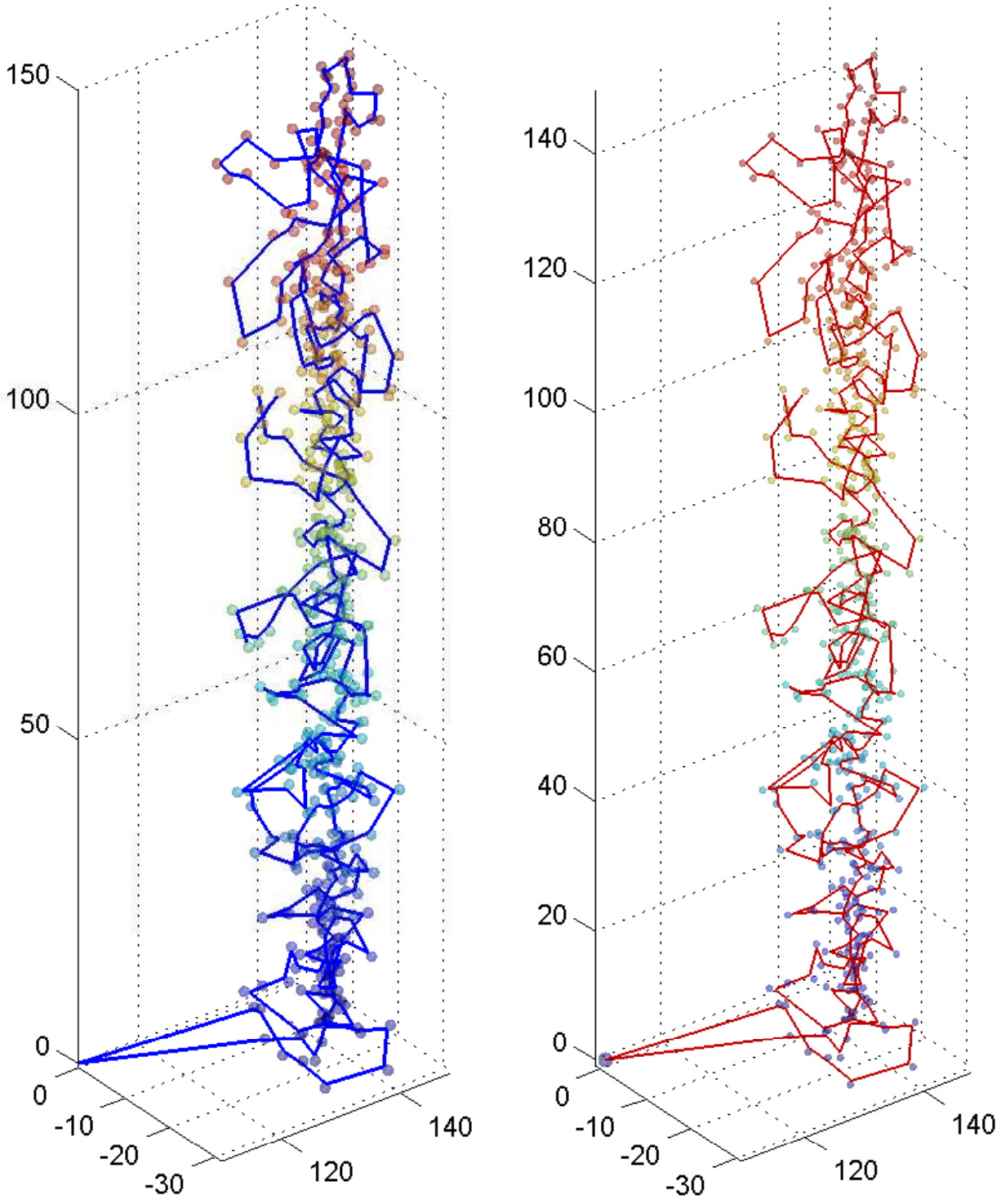


Figure N.85: $d493$, $r = 0.74904$, Equal Radius, 3D, Euclidean, Length = 1353.1372138

Table N-88: Solution for $d493$, $r = 0.74904$, Equal Radius, 3D, Euclidean

Total distance: 1353.137213823 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
18.5226837411532	13.7062145478394	8.07386360201224	18.466	14.155	8.671
19.925053416467	13.558741412719	7.18293381391346	20.434	13.012	7.24
20.1303457078789	18.552681196717	3.18377572389255	20.117	18.283	2.485
20.3047977165969	22.619040572652	2.92853034509731	20.117	22.728	3.645
20.6779746434684	27.1589795358324	1.97361737811013	20.117	27.617	1.782
28.6962288779723	29.2877264966559	2.7744983314212	29.07	29.713	2.284
30.7442525984287	27.3329333111829	7.02393252221954	31.42	27.173	7.305
26.2431927761605	27.0516231142211	8.26387985596904	25.959	27.744	8.296
23.1987358994635	24.2853220107397	9.26981398887343	23.355	23.553	9.247
16.6770537679855	26.3269437090701	11.1621526860555	16.37	26.982	10.968
12.8144408223415	20.5369008830176	15.829878598857	12.37	19.934	15.842
14.0867073373517	22.1062754940216	17.0918461001198	13.513	22.41	17.465
16.2202686780333	23.76232687408	18.2993408241806	16.497	24.315	17.876
17.6710333880973	23.3815272268068	21.7068134283115	17.64	23.426	22.454
19.5075600323773	22.557066721285	18.2925785596748	19.482	21.966	17.833
21.0120144585644	25.0953861132292	18.2008272214431	20.942	25.649	17.701
22.2801683090159	25.0150710434134	19.7897442110621	22.974	25.141	19.537
22.4637572212186	24.5311922057339	23.1349301091357	21.958	24.76	23.638
25.5306612965839	22.7123158309971	23.8807459887986	25.832	22.918	24.535
26.2204422981517	21.8008830662763	23.2889811681881	26.022	21.902	22.93
26.9930960163049	20.7800590505148	22.6264623499279	26.975	20.061	22.417
28.2692516368687	22.5987624099476	22.5929471168314	28.626	22.791	23.223
28.9012658906007	25.4981658097939	18.5355714820327	29.007	26.157	18.195
28.4009810247732	21.5588080015906	18.5506106866803	28.245	21.331	19.247
28.4428929140297	18.7881114653805	16.4040756308066	28.689	18.156	16.722
28.3519584335235	18.7539741732067	16.0655733838167	27.864	18.854	16.375
27.6186310627768	18.478759381302	13.3338354742084	28.118	18.092	12.931
25.315549841427	19.3913008880797	11.7579776562134	24.625	19.68	11.726
29.597711330375	17.5103267980119	9.3161080298221	29.959	17.584	8.664
29.7354357923426	16.6332383326693	10.8051093210461	29.134	16.187	10.819
31.3686011991022	15.9485997536718	13.6566044115453	31.112	15.246	13.662
32.0782587967216	15.7449181219094	14.8430312117255	31.632	15.246	15.179
35.2759636995168	16.1377497545268	17.9249142076654	35.992	16.314	18.057
31.6839787870804	14.8860052204711	19.581148893416	31.242	15.473	19.727
31.3897062553145	14.3290494068065	19.7519847609401	31.61	13.901	20.326
30.6225289362419	14.1125992445003	19.16985273734	30.787	13.426	19.207
29.8816482815011	13.9052139166576	18.6077688458257	29.975	14.141	17.903
25.9497933286016	11.8205477376988	19.2513007678357	26.149	11.107	19.141
22.7617628701475	11.4758170989879	19.9010282924762	22.022	11.361	19.929
25.7071495098367	12.0714482836549	20.279195853823	25.895	12.123	19.556
28.9545050801297	12.7096855658953	21.6802443088695	28.816	12.25	22.231
29.6049361945915	12.8395310118469	21.9579113968922	30.202	12.451	21.726
29.7085903597103	13.6073496882332	22.7193112380914	29.705	13.393	23.437
29.9722712744454	16.1903148390909	22.1941261930153	29.515	16.505	21.691
31.4901383325075	17.4478438667466	23.184235081897	31.102	17.775	23.735
32.4438392839604	17.8379869994499	23.3110774525979	32.944	17.965	22.768
32.9257122599697	18.4780058729223	26.8567439613608	33.515	18.219	27.24
29.4147599044331	21.1625172019575	28.9046232049187	28.689	21.013	29.015
30.7844872140506	23.2231633996653	29.4865393093892	31.293	23.68	29.18
29.07831456134	22.8011264138973	32.3986652783553	29.261	22.283	32.908
25.6793384534232	25.5926452367025	32.904645389225	25.705	26.22	32.496
21.2401637073171	25.0062157006909	36.2079304213991	20.561	24.696	36.269
26.2119511035474	29.1696471549556	39.5743011906385	26.086	29.903	39.661
32.9343301336481	25.974985335143	42.3168651735001	33.642	26.22	42.336
30.641052517232	21.4929848517994	43.9652533646779	30.785	20.823	44.268
29.3452181735367	22.5142715029951	43.3791301916623	29.261	23.045	43.901
28.054420065686	22.9126133860695	42.0486488307871	27.8	23.617	42.03
26.5965556514763	20.4846423070459	39.4260026950653	26.149	20.886	38.979
26.51667484032	17.6212156075443	38.4293583805603	26.34	17.203	39.025
26.8499743689318	15.5294086052264	35.9417291054236	27.419	15.044	35.984
24.9365954362634	15.3386382275206	33.2650716135198	24.308	15.044	33.546
23.9831734344895	15.758725030332	29.3566163761987	24.244	15.997	28.696
19.9125542673567	13.6742837211138	31.6611293519158	19.482	13.076	31.528
19.9827144111795	17.7826157678383	35.6832104251309	20.561	18.219	35.874
18.7793080591735	17.7972529590844	36.1963664708412	18.212	18.283	36.255
19.9913796594603	11.8753728201513	37.9393678268046	20.244	11.234	37.646
18.6873189585628	13.3519541571631	41.4856345562474	18.021	13.52	41.784
24.2907990779282	13.604196211721	43.2756719570894	24.371	14.346	43.342
25.4844044961806	13.218056827157	43.6328454062715	25.578	12.568	43.273
27.4415483098722	13.4931380671283	44.7873552324257	27.991	13.647	44.302
28.1256478363308	13.4694381767417	46.4614617318238	28.499	12.949	46.85
27.2863655455355	16.0902113102536	47.0897036691638	27.737	16.251	47.666
25.9085744544636	18.2985470998276	46.9011269865113	25.895	18.918	46.48
24.7751971271203	17.4073654803706	48.6452276602111	25.07	17.076	49.249
19.6799367273119	18.1178913866613	47.629997561869	19.609	18.156	48.051
12.7540704317356	19.0836190609392	46.2489280403734	12.052	18.854	46.124

Solution x	Solution y	Solution z	Original x	Original y	Original z
17.0123587413589	23.16575169644	46.883522820205	17.64	22.918	47.209
17.0700127532002	27.2597479221503	45.7895346217838	17.069	27.744	45.218
17.1651621304717	26.6807959607339	51.7909900354297	17.069	27.046	52.438
17.7888200342528	24.2115865576144	50.6629284993193	17.323	23.934	50.146
20.4202195679514	22.4533946848331	51.4514539016248	20.117	21.775	51.546
24.1513621813898	21.712866587792	52.2008836898856	24.244	21.077	52.586
28.2585671391593	23.8651871489005	51.2647129206703	28.753	24.379	51.035
26.2025919614603	19.3086179387649	53.3311818834655	26.594	18.854	52.883
24.2910400577834	16.2849813764608	55.3025961588696	24.308	16.441	56.035
22.6199451523052	13.2735976583109	54.8935754881739	22.276	13.393	54.239
22.0573602292685	11.5967292168082	55.2676414366179	22.085	10.853	55.182
19.1850967104836	17.9365871753804	58.3912768181255	18.466	17.838	58.207
18.624891023779	23.6222292803875	61.5509382927362	18.974	24.125	61.119
18.0110574863548	24.5715043125647	63.0071928196755	17.45	24.188	63.322
18.9656334037024	30.1647945889338	66.4853163314978	18.72	30.665	66.986
21.9222994624951	28.8626389700114	63.8548154830244	22.466	28.887	64.369
22.5060984204642	28.5567598685111	63.1510807419965	22.022	28.443	62.892
25.0557497627684	27.2211376725158	60.0782768187252	25.07	27.744	59.542
26.2749608180663	25.6743872347312	59.4982243504108	26.086	24.95	59.469
27.0857465307392	26.0263568958611	59.2832189678028	27.102	25.966	59.543
28.5200927746391	26.6488886905027	58.9027080537872	28.88	27.3	58.991
28.7994005654357	25.2910179321891	58.2796718418746	28.499	25.141	57.61
30.969503443642	22.5709652878767	59.954121063611	31.356	22.347	59.353
33.3508396897932	18.9611157590357	63.9498754809203	34.087	18.918	64.082
31.2314618233093	17.2513685557177	65.4554136120705	30.594	17.076	65.103
31.4550029580691	16.7197803975219	66.9877762335372	31.991	17.203	67.188
31.3558372473217	15.9104646455441	68.3727515212759	31.356	16.251	69.04
31.3081114415757	15.1465499589945	68.297430966882	31.307	14.661	68.868
31.2865386662662	15.0555945377613	67.9548037141349	31.762	15.473	67.554
30.8592152066335	14.5019260293703	67.4226331940989	31.437	14.433	67.041
29.993561793567	13.3845165885036	66.3495703814378	30.202	12.711	66.602
29.4301362691357	13.1805521243524	65.653483149947	28.753	13.457	65.491
30.2920676698908	12.0720184203852	64.881830093514	30.202	11.996	64.142
32.1270726163519	10.4043179371345	66.1970247366064	32.055	9.837	66.681
34.6105176658258	11.8268870179146	64.8627006910983	34.849	11.996	64.173
35.1664643957256	12.0305436135269	66.5265260619734	35.484	11.425	66.484
36.8506092258742	12.6537038978835	71.5757254928388	37.452	12.758	72.01
31.4151337231733	12.0473897514028	71.5617964205991	31.307	11.313	71.461
30.9439222177753	12.2435184744493	71.5950595632748	31.015	12.776	72.117
29.0942491117902	12.3496851002915	71.1028052581607	28.816	12.568	71.763
25.3694057443381	12.2144687206069	68.8447798738314	25.07	11.615	69.179
21.4673156253769	13.1850573280362	65.5046187040706	21.831	13.203	64.85
19.458169956132	13.5608781810389	64.8882657399952	19.418	13.901	64.222
17.6023300662249	13.1991185144218	65.713205540131	17.323	12.504	65.716
13.2288565426029	19.4410626153886	69.0021054689458	13.005	20.061	68.646
12.4018003642787	18.3598826436444	73.5717522361953	11.862	17.965	73.909
17.6209327450881	21.526527406715	75.8497047320505	17.45	21.902	76.475
19.2484703891769	21.751277924318	75.4453827399039	19.863	21.331	75.529
18.7292358691558	24.569735760363	74.2222120480409	19.164	24.696	74.306
18.2425455464584	27.207599146304	73.0772046101792	17.64	27.49	72.733
21.8524425740362	28.8772157366254	73.9299624290948	21.958	29.395	74.461
24.3998512522155	27.6220986849634	71.9054503164205	24.562	26.982	72.259
25.9249385558244	27.5456255016471	70.1118646756418	25.832	27.998	69.522
26.8185822521955	26.8089936128077	70.1408954589697	27.546	26.982	70.094
25.4043622106405	23.544625715359	70.4982171276094	24.943	23.68	69.938
23.2025116170561	18.3839956960325	71.0988998366392	22.974	17.711	70.862
24.012802916773	21.9415176437959	74.4799709177238	23.482	22.41	74.725
26.5333515591549	22.0003888464084	75.3233140998849	26.911	22.601	75.564
27.266518696206	20.0159721865549	75.1822863106311	27.483	19.616	74.587
27.2189551976014	19.6567259977948	76.641146792343	26.848	19.743	76.594
27.1051214128171	18.7937709878472	80.1450621013423	26.721	18.283	80.536
27.2343408160808	18.9277039658414	80.194147057756	27.737	18.664	80.683
27.6561481546585	21.271134636947	79.6302008402233	27.102	21.648	79.965
28.4336701953298	22.2772222660676	78.9797871087951	28.816	21.902	78.963
31.1452234084366	25.787822305983	76.7109009052089	31.356	26.03	76.034
31.636058702301	26.7460238162502	81.5764131732636	32.118	27.3	81.725
28.2895504694896	23.5366690742796	88.1706154288267	28.054	22.918	87.821
27.5744790993714	23.0096666309009	89.9087064907768	28.245	22.855	90.204
26.9848605860153	22.7339036467564	90.8705294634321	27.546	22.537	91.326
26.4920290509526	22.6460544294468	91.2482880717775	26.149	23.172	91.657
26.0059780300454	20.7285598899263	91.1653690110151	25.895	20.759	90.426
25.552609634234	18.8455905963174	91.2320171737329	24.943	18.791	91.664
25.9465284256857	17.200473081092	90.721191854931	25.832	16.949	91.413
26.5852492755572	14.5936743062065	89.8479502473806	26.911	14.409	89.199
25.3950110423385	12.0025769992472	92.8009174500509	25.705	12.123	93.472
23.7061959741262	9.97889651843608	92.6991532707713	23.482	9.52	92.151
22.023924694894	10.5553800220214	99.8832127821897	22.212	10.091	100.44
18.3908513751685	16.2540854076381	100.252860773917	18.148	16.505	99.59
17.4004199249814	18.3216984902622	103.072655219008	16.688	18.092	103.09
17.0706881039405	21.0265069760121	106.373642752913	17.323	21.331	107.01

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.299118265776	20.4021015654756	101.177474388683	11.608	20.251	101.424
12.6632567202365	20.8385862026612	95.1708667552982	12.243	20.505	94.648
17.4578326692046	24.7972343344866	94.4322182289319	17.577	25.204	95.05
20.2417189860299	25.7967104878459	91.3234532674427	20.561	25.776	90.646
19.9123211949993	26.4653658544	93.5572160827943	19.545	25.839	93.739
19.5351283545622	28.2999758757147	97.9145149874603	18.91	28.697	98.028
22.3006989828774	28.0795136411972	101.542603830013	22.276	28.125	102.29
26.6356299585005	27.1431767687829	96.648079922406	27.229	27.554	96.447
25.3267312236801	24.0628772914715	95.2003848326988	25.006	24.188	94.535
25.1323392237788	20.0054505442029	96.2567698927316	24.752	19.362	96.308
28.6487772626664	22.2266592676324	96.8131224213697	29.134	22.537	96.334
28.4656630525858	22.0780433399617	101.479219459455	29.07	22.347	101.831
28.302208424538	22.0020990455643	101.613910164122	27.991	22.601	101.939
27.2605100423916	20.276360417718	102.356487723715	27.229	19.616	102.004
25.471582549956	21.0727755382108	105.951196841286	24.879	20.632	106.077
26.0865584638796	23.502576640517	108.802047359887	25.832	23.68	109.484
28.0568530949815	24.2731237310639	106.897017800435	28.753	23.998	106.929
27.5124035628549	25.6072216057638	105.430819486201	27.165	25.458	104.784
28.824169801327	29.5066366318904	106.913740854504	28.943	30.03	106.391
28.9551749542093	29.7370632735598	107.675551292637	28.943	30.475	107.548
29.720514862155	29.9814831192928	112.209611322663	30.277	30.475	112.299
28.0745647954222	27.8845278316718	118.414914396091	27.927	28.125	119.109
28.2586698025746	25.7495745653419	116.957002202977	28.88	25.331	116.966
26.4997831814972	25.1814692663026	115.657488240403	26.911	24.76	115.286
24.2976630374051	24.4747347232361	114.035870978669	24.308	23.998	113.458
19.1022392400566	27.7558742891689	116.246068731232	18.72	28.189	115.769
18.0565402841434	27.5724324988512	119.506310220219	17.64	27.998	119.961
20.1495157010753	23.8785058822517	119.853862699226	20.561	23.553	119.319
19.6293120809046	22.6816950911248	122.951821694053	18.91	22.474	122.979
20.3052646019517	22.3290189850506	124.537655725534	20.371	23.045	124.747
20.9421194394046	21.6703303995164	126.007736284731	21.577	21.394	126.294
19.1940064566225	22.0250601391806	126.479817069463	18.593	21.648	126.239
19.1514643233962	24.2191934580252	128.255294482287	18.974	24.569	127.812
19.1086401534377	26.4494582640679	130.061493698142	19.037	26.982	129.54
19.142761032142	29.2935098308707	133.736258540641	18.974	29.967	133.455
19.2899062315282	29.4880605691503	134.930762027923	18.72	29.967	135.012
21.4180442423882	29.5628995652646	141.750335371591	22.149	29.713	141.818
19.1850832155565	28.8483744878434	146.23337039979	19.037	28.189	146.557
19.006692820875	29.6290644430223	146.555701271102	18.529	30.03	146.971
24.4738434305078	29.7863406858558	143.057120698653	25.07	30.03	143.44
25.8444964548562	28.1703229095296	136.59322698503	26.149	27.49	136.669
26.1652531616048	29.2654304835947	128.14003926608	25.895	29.903	127.854
27.7335133080468	26.463523622764	125.541507937035	27.229	26.22	125.044
31.7726552122295	24.523600084511	124.994986044168	32.245	24.887	125.449
33.8201927341483	21.8491111625601	123.234681175655	34.341	22.029	122.727
33.1571429398864	18.4040921490426	124.104101229322	33.515	18.029	124.645
30.4242523146613	16.9304186809354	121.935342643763	30.594	16.251	121.669
28.327892126595	17.6841531873747	121.251802835031	28.054	17.013	121.063
27.1977855941435	18.4116042303731	120.92484837844	27.102	18.664	121.623
25.8658006248587	19.2172435987436	120.341050449247	25.133	19.235	120.496
26.8104692955158	19.9129239713365	119.337098571338	26.276	20.188	119.025
27.9263505339753	20.731910125811	118.154742423869	27.927	21.458	117.97
29.6243782269738	18.7687478807826	117.168386535455	29.578	18.791	116.421
31.6820999051612	16.4673634466655	117.912566217456	31.991	16.632	118.575
31.9224341892833	15.933303475397	117.712805572729	31.502	15.473	118.128
32.608030016183	15.0425574039632	117.112640153797	32.217	14.433	117.304
33.4911836806339	14.5137620282053	116.423114120593	33.907	14.791	115.865
33.4714383155015	12.9809654054968	117.124105321347	33.907	12.516	116.73
32.5655135831908	11.8891278810519	118.849398349156	32.087	11.313	118.866
33.1727044688809	12.6199280047598	119.905306746133	33.322	13.101	119.477
33.7692608382357	13.3373652332358	120.944074599837	34.135	13.946	120.705
33.8446850280886	13.1522364719458	122.505361662962	33.907	13.816	122.673
33.8546059410588	13.1277262930577	122.710756446154	33.322	13.621	122.895
34.3310287782066	12.5364118757064	124.58670009079	33.907	11.996	124.886
35.4980611742494	13.0916764254843	125.483056709465	35.992	13.647	125.389
34.7505608967361	9.92201485693586	129.067927307317	34.595	9.202	128.931
34.8741031417902	10.6096883873685	130.870491669927	34.976	10.282	131.121
34.9175625156815	10.8517170161666	131.504712581326	35.547	11.234	131.369
34.7383883645805	11.913831628018	135.038204010532	34.595	11.996	135.081
34.6628255192571	12.3635618580325	136.533908756494	34.135	11.866	136.659
34.5539207990646	13.0969394958547	138.93101546688	33.907	12.776	139.011
34.527339192069	13.2903434591713	139.559790357206	34.404	14.028	139.514
34.5725889761919	13.074682620034	140.795759067058	34.785	12.504	141.232
34.0422380012006	14.3880654856793	141.012983481976	33.907	14.336	141.111
33.5791634406932	15.5351305186786	141.202739558785	33.322	15.473	140.664
32.0187524454123	19.4031627353757	141.844361112382	31.356	19.68	141.631
33.4062760448741	20.2694422722697	142.805572587709	33.515	20.315	142.968
33.870404970653	20.5591368787923	143.126980731602	34.341	21.013	142.761
34.2920480273007	20.0741891195434	146.648372090898	34.468	20.442	147.277
33.2077004102152	16.1647480313713	145.2019356461	32.944	15.933	144.54

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.4078823388489	15.7077390303359	145.977022956338	33.769	15.679	145.826
33.7212378735975	14.9918722752787	147.190777646218	33.582	15.473	147.748
34.2241831915605	13.6598149635756	147.896147976229	33.907	13.556	148.567
36.8451820456008	10.6465148369794	146.927269400576	37.452	10.218	146.804
32.2212425462591	12.4974977993044	147.336061246769	31.892	12.353	146.679
30.3832240296261	13.7484471740536	148.776809212706	29.975	13.881	149.391
30.7722105271671	13.9479154921268	147.532270023458	30.787	14.206	147.62
31.3175505292666	14.2276745288558	145.786081601748	31.991	14.092	145.487
30.0802156967534	14.7988288202262	145.093567481249	29.975	14.661	145.197
28.6954903839089	15.4380810599922	144.318513517868	28.245	14.854	144.187
27.220320312595	17.909346039113	143.220399654082	27.356	18.473	143.695
24.6226508545363	19.5287678332757	139.99569960041	24.879	19.934	139.42
19.0100127338571	18.1566146466578	140.733379486126	18.466	18.664	140.644
17.9693721894505	13.2620539645158	142.03616009376	18.339	12.631	142.199
11.8266198010618	15.3536964533872	141.546251532515	11.163	15.552	141.832
14.0612348275259	14.8239315981139	138.894436253327	13.576	14.79	138.325
17.2662519177298	14.3160993847131	137.02505376727	17.577	13.647	137.156
20.8066539890834	18.0261591695016	132.809883649294	20.434	18.537	132.408
25.04255978033	17.7537168787249	132.186529731558	25.451	17.965	131.595
26.4836970925302	15.6943331815178	136.373744380192	26.149	15.679	137.044
28.2358173668293	14.8988594059928	135.78220677989	28.372	14.663	135.085
29.0389215796588	14.8423542192348	136.671697292273	29.324	15.489	136.921
29.658398320385	13.2020665380492	137.517951642163	29.007	12.949	137.787
31.0743059453692	11.485832202387	138.259945752869	31.697	11.541	138.673
29.7259952699659	8.90708050630309	137.100904405428	29.388	8.313	137.407
30.7940162458754	10.4271029529868	132.027198183344	30.912	9.901	131.507
30.8927065744201	12.5498975194727	131.442713610242	30.787	12.386	130.829
31.0097211679216	15.0574087026003	130.754302395189	30.462	15.473	131.052
31.4873234540608	15.4579273845501	130.311203992878	31.356	16.06	129.885
32.103310616442	15.0911275932594	130.420011960831	32.347	14.661	129.857
32.8763757894445	15.1121295042025	131.58256584377	32.867	14.661	131.697
33.1735942282957	15.120399841859	132.030126712716	33.127	14.661	132.624
35.8979031839666	18.4375308272223	131.43758082982	36.436	18.918	131.64
31.987637694151	16.1341893910928	127.793567129319	32.282	15.473	127.6
29.1944904554277	16.2632222167508	126.186043740426	28.943	16.886	125.854
27.3886374113902	13.1381613741063	126.130971402648	27.673	12.695	125.598
26.5687511691015	12.6246577029921	126.630042383645	26.594	11.933	126.917
24.0328166921577	14.5748836289103	126.662015834991	24.371	15.235	126.557
20.4942739559233	15.672924956263	126.883446268535	20.434	15.806	127.618
12.0976904177317	17.7553774664575	124.074857786374	11.481	17.711	124.498
12.2394391325404	20.0555203449304	116.672387399421	11.735	20.378	116.222
20.0535651415484	17.6059449048177	115.63247895896	20.498	17.457	115.048
20.3216648371218	17.5742852410574	118.47145726897	19.99	18.029	118.966
22.5949502378603	14.8803452970683	119.159899615521	22.149	14.282	119.226
27.4634749933333	12.9284695722173	119.951633028464	27.927	12.568	120.417
26.9927813485664	14.6671539668487	116.413835799196	27.229	15.362	116.263
25.6406398985016	12.9816729929226	114.460678841407	25.197	12.441	114.729
26.0114555544646	13.3661885021997	109.32462883672	26.022	12.631	109.182
26.3380572926236	14.8164890885485	104.8036465354	26.086	14.663	104.115
27.6593321363401	16.2012565224568	105.902248026801	27.292	16.632	106.393
29.4091716667247	16.5121047103168	105.871119004538	29.642	17.076	106.306
30.6659103427875	15.6932900389765	104.97292690692	31.293	15.806	105.367
30.8389110337532	15.3581699339794	104.490144886763	31.372	15.246	104.804
31.275718821258	14.5108225882787	103.268825240652	31.957	14.433	102.967
30.1109598917562	13.9504336562984	102.89193363502	30.202	14.011	102.151
29.436374167783	13.621367261796	102.886719899776	28.753	13.838	102.669
29.8031242781188	12.7871188314369	103.281031932981	29.197	12.441	103.553
30.6686475938499	12.0636600782054	103.54500896789	31.177	11.541	103.36
30.188243610753	12.7120634881485	104.258356131459	29.975	13.361	103.951
29.8708989459876	12.641247082117	105.588030805421	29.578	13.203	105.988
30.0013621132681	12.0907617186813	105.808920394197	29.388	11.804	105.494
30.5819650342732	9.96004481877653	106.712158143853	30.721	9.329	106.333
30.5961609037595	10.0581131953841	107.474440058244	30.34	9.647	108.046
31.6768271673438	12.0110882456802	107.37179176019	31.275	12.613	107.178
32.3091762041767	12.1043390157837	107.494389860983	32.477	11.541	107.287
32.7396147237848	12.1679273115732	107.577941080638	32.932	12.353	108.278
33.0041458998285	12.1375166170803	107.335765801174	33.095	12.711	107.498
34.0789242825168	12.0133270335192	106.352561287539	34.135	12.126	105.614
35.105341744758	11.5290763637222	107.524582016236	35.674	11.044	107.474
34.7961526305942	12.0290201815999	108.31514148154	34.722	11.742	108.413
34.3695907092171	12.718957415439	109.406014409056	34.135	13.426	109.486
34.6534288851658	10.6294098763289	111.261797790562	35.103	10.155	111.634
32.5885216903923	11.3823750056204	110.843781941678	32.347	11.313	110.138
31.812415622762	11.8923095011398	111.630659527524	31.632	12.353	111.341
31.5677007749678	12.0530710267474	111.87881951066	30.982	12.126	111.418
30.4078597109995	13.1428742960682	114.162956757668	29.975	13.101	114.777
31.3070585301652	13.8724146974054	113.228269177145	31.015	14.076	113.16
32.7347633467091	15.0303581466013	111.744508742936	33.452	15.246	111.765
31.4520132903596	15.1802510566949	110.589351037016	31.047	14.661	110.232
31.4061669368019	16.7864084634338	110.528072649633	30.975	17.076	111.068

Solution x	Solution y	Solution z	Original x	Original y	Original z
32.6268695572055	18.9315528770163	108.778038928457	32.309	19.553	108.506
34.1690219318008	18.386316880512	108.57396364707	34.722	18.219	109.051
34.0076042905237	18.3346858461786	106.484759765031	34.595	18.791	106.414
33.4715885283518	18.0948077848789	101.502216023077	32.817	17.775	101.585
33.0924160923892	17.9260014218856	97.775977877189	33.071	18.346	97.156
32.9627815976029	15.7333966231278	98.5439815736044	32.802	15.473	97.861
32.8480460881965	13.0579108488449	99.7145228083224	33.322	12.581	100.045
31.5987914951421	13.0830304070648	99.394828022321	31.737	12.885	98.954
29.3804845815226	13.1279478874819	98.8278048704772	28.753	12.949	99.196
29.627379519128	13.6080610223685	97.5530622757089	29.515	14.028	97.711
29.932337621002	14.2003125704469	95.9786067336265	30.202	14.791	95.605
29.6515628257059	13.5539285712106	95.8890434686218	30.202	13.231	95.497
28.0594889960752	11.6548706898575	96.0127286443148	27.419	11.298	96.166
29.0649286399506	11.7775873280284	95.6612168688597	29.261	11.425	96.137
30.5233299725394	11.9561578122936	95.1504880572294	30.527	11.313	94.769
32.2092568761827	12.3898184810427	94.6943118628182	32.412	12.353	94.929
32.9033728560007	12.5683212859226	94.5065061906621	33.322	12.321	95.076
34.127346292565	13.3279386909295	93.3198352321896	34.849	13.393	93.121
32.1813551031765	13.8683355101875	92.918360128603	31.697	14.433	93.007
32.2274007629841	13.2708845260417	92.6715782050417	31.547	13.203	92.722
32.3217482780625	12.0677353795835	92.1741472154504	32.737	11.541	92.508
31.6634603905587	11.8146017683337	91.0700805794713	31.957	11.541	90.999
30.5181908940758	11.3745530479007	89.1497397162699	30.34	10.917	88.584
30.3550395765134	13.0178500890824	90.0461962059184	29.975	12.841	90.667
30.5989970769934	14.6177630537851	90.1937040052942	29.975	14.921	90.476
30.8226300431708	14.8658150962481	90.1459593924274	30.722	15.473	90.573
32.0881180713917	14.9381175608689	89.1241714276478	32.542	15.473	89.387
32.4973290376192	14.601284103676	88.3479674878727	32.412	15.246	88.024
33.1460421678502	14.0627940201432	87.1214642686136	32.737	14.433	86.615
34.0190251083113	13.3216303150091	86.1837690169043	34.135	12.646	86.486
34.8806103509151	13.3521326778991	84.6954190000223	35.42	12.949	84.367
34.2302550554582	14.3014845713819	84.4289487653696	34.135	14.986	84.727
34.0942446182086	14.1212924565192	84.1395027362026	34.135	14.466	84.176
33.7215365091595	13.6274818310265	83.3465195247711	33.907	13.296	83.348
33.4930850086081	13.3248945488882	82.8604755959837	34.135	13.166	82.509
32.6115496889086	12.7394033125533	81.975974324065	32.672	12.353	81.337
32.1644484020162	12.9244129560356	82.3181990549401	32.152	12.353	82.503
30.7660348381398	13.5041029212879	83.3883286154056	31.015	13.556	83.741
29.9123725312519	13.857765777848	84.0412753760141	29.388	13.838	84.576
30.189544686432	14.0400140121179	83.6618146679872	29.975	13.621	83.535
32.6038751836926	15.6277551599629	80.3569576649445	33.071	16.187	80.531
32.611088556979	15.0698887496872	78.5310099074897	33.062	15.473	78.089
32.318238510761	14.6312743373589	78.2475361784144	32.835	14.173	77.958
31.1738797135167	14.1535207067645	77.9326698523508	30.787	14.466	78.121
30.9108025629765	14.0437221150613	77.8602951265513	30.202	14.271	77.775
32.0673546596036	12.2729212841373	77.7069431325106	32.802	12.126	77.71
31.3962596013947	11.8159026208661	77.6433272594878	31.437	11.541	78.241
31.1545829316269	11.6513752901221	77.6203613272108	31.047	11.313	78.28
29.3488127555077	10.9485203630437	76.1211925634329	29.007	10.282	76.107
29.2238415762013	11.4744413848012	75.7269551746785	28.626	11.234	75.345
29.4373066404624	12.998170616503	75.0788627407747	29.197	13.52	74.598
30.157171155122	12.7161602273382	75.8249629487502	29.975	12.581	76.539
30.5400748809614	12.6893888808541	75.6828982319991	30.787	12.906	76.252
30.8866906282451	12.6650877274023	75.5540785080195	30.787	12.646	75.914
31.6864188222898	12.6087772584278	75.256583691809	31.502	12.126	74.715
32.0346812663874	12.6150370619759	75.1648300787953	32.282	12.126	74.654
32.3111667416009	12.8906257717542	75.3361606532026	32.835	12.613	75.794
32.3190094612366	14.309229744246	75.1076163243546	32.477	14.433	75.823
32.3197568553817	14.6136142668969	75.0539145309998	32.087	14.661	75.705
32.3240498527222	16.2308147257075	74.7664858162812	32.182	16.632	75.383
32.785392791082	18.019499227297	72.2543650400562	33.261	18.537	71.995
31.003785951606	16.968320429701	71.6670549249854	30.785	16.251	71.611
30.4631853557398	18.1674792620121	71.447089997923	30.531	18.664	72.004
29.6442445946126	18.7101028553091	70.0694824360996	29.705	19.426	70.279
28.7674321876408	19.1492410746819	68.5741839220355	29.261	19.172	68.315
27.2751910724717	19.8961368229111	66.0308193055235	27.356	20.632	65.916
25.5233062097318	18.7163923649884	63.7129250139754	24.943	18.346	64.008
25.3328860781629	18.5206898788201	59.974428053082	25.197	18.918	59.354
26.3594334644059	14.6683391413366	61.4161404287628	25.832	14.219	61.701
28.537959680071	13.9709748205652	61.316836164929	28.372	13.52	60.757
30.2532227306138	13.4327929305342	61.2507426973419	30.202	12.971	61.507
30.8923065501507	13.232232985316	61.2259265584882	31.015	12.516	61.408
32.4264587840867	14.2337219676866	60.7569384806321	33.095	14.011	61.011
32.405548039965	14.5780271145987	60.5142120783367	32.672	15.246	60.724
31.5319720163464	14.2552623131971	58.7621325347073	31.827	14.661	58.532
30.7933405650518	13.9820050801743	57.2816500096855	31.275	14.173	56.999
30.1708194777839	13.7516727203654	56.0348037435627	29.975	14.401	55.717
29.0303932495641	10.3619368399567	53.4414581237019	28.626	10.091	52.872
30.8218769780067	9.98136704577776	55.3692767783596	30.658	9.71	56.048
32.6175997872646	10.4962795954377	54.7991801657616	32.944	10.536	54.126

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.7440235209946	11.1526505298132	57.962010673883	33.387	11.313	58.128
34.1581464594002	11.3937692980137	59.1243960825525	33.96	11.234	59.829
36.2301284704551	12.8529592328222	57.7737259545021	36.944	13.012	57.936
33.6423968870465	13.7742102661547	54.4509660294946	34.135	14.206	54.088
33.5214305900647	13.7901501650054	54.3400394017028	33.322	14.141	54.817
33.326668695523	13.8157917683229	54.1615212002811	32.69	13.52	54.423
33.1778758639196	14.2208447602418	53.1670566572681	32.607	14.661	52.963
35.3910137980778	13.3188556131104	51.353835063176	36.119	13.139	51.404
33.8300276420795	13.4431162290973	49.8013862664554	33.907	13.036	49.61
33.1114204223421	13.5004703089036	49.0867827589703	33.095	12.971	48.557
32.8806308376229	13.7443314314965	49.0753064970619	33.322	13.881	49.4
31.4033477956417	15.3052289606375	49.0029808706914	30.657	15.246	48.98
31.4123102153031	15.3184335567837	49.0030151311653	30.982	15.473	49.591
33.191736720462	17.8603955628943	48.9510075780578	33.642	18.346	49.307
33.0032333116328	17.7390231077206	48.6107324349477	33.388	17.584	48.735
31.9113859154553	17.0360710486865	46.6406443840299	31.483	16.822	46.955
30.8734369266975	16.3677489526588	44.7662561865648	30.785	16.949	44.302
30.2266017256089	14.9677049864913	44.0680333645291	29.642	15.108	43.621
30.5261233959331	13.6805954013323	44.1383489836153	31.015	13.816	44.684
30.9849898620964	11.5713071879315	44.2194803088485	30.658	10.98	44.543
32.0270985593914	11.7232831406136	43.5044981611248	32.607	11.313	43.742
32.6024474465769	13.1933375503559	41.331136092227	33.095	13.231	40.765
32.1698778803119	13.4453169268017	41.5256293132703	32.372	14.092	41.845
30.840108663725	13.2813238756837	41.6203412399615	30.787	13.686	41.698
29.7216687224426	13.1426295489248	41.6999111294434	29.134	13.33	42.125
30.0016778221133	12.5484469150093	40.7524183231102	29.975	11.801	40.794
30.1194740936573	12.7203652019386	40.3799201901888	29.975	12.321	39.763
30.5105786135317	13.4882123250506	40.2667394367834	31.015	13.296	40.037
30.6817918310475	13.8245658458204	40.2171958548775	30.202	13.751	40.213
32.8472536999131	18.0781708362164	39.5909022801518	32.372	18.537	39.944
33.8316209216038	18.9900499654293	39.1478882209029	33.96	19.68	39.41
35.9440613860496	16.9735872772119	35.9712935185462	36.436	17.076	35.413
33.9371116688682	14.5298460181091	37.606090873643	34.135	14.726	38.301
33.3169594322519	13.7863343137809	37.8863012204074	33.095	13.491	38.538
33.2734680048098	13.7467575863136	37.6669132320049	33.322	13.361	37.986
33.1720211345653	13.6544408994124	37.1554887873787	33.095	14.271	36.737
32.9348575552562	11.7204856943653	36.0286136925219	32.217	11.541	36.145
33.3330631288969	10.8257481557101	35.346116490973	33.642	10.155	35.22
32.3326454204174	12.937403244939	34.6994590785496	32.436	13.231	35.38
31.6320391921849	14.3207818942181	34.1320775212773	31.567	14.661	34.796
30.5280188871622	16.3270302648663	32.6480518897105	30.15	16.06	32.059
30.5139024443691	16.7768971074841	32.6646190536242	30.023	17.203	33.037
31.3101883678959	17.0980070706453	32.0744178486407	31.61	17.775	32.188
32.3082651645018	15.4777517115789	30.1135953178297	32.022	15.473	29.854
32.7083079849135	14.8284096152006	29.3279420994646	33.322	14.401	29.372
31.9906728380602	14.9294440191377	28.4015269278442	32.152	15.246	27.742
30.8794685524721	14.3921546348272	28.7423003776638	30.787	13.946	28.148
30.1924092425277	14.1887257172173	29.1531697399783	30.202	13.491	28.883
29.2803595180692	13.9988221598222	29.7288205700626	29.007	14.409	30.293
28.4516111636042	12.2303358501239	28.9149141481001	28.181	12.441	28.249
28.1511720427589	10.8484651717549	28.9952296680231	27.927	10.409	29.559
28.7660617031372	10.2798551234507	25.9391404525749	28.372	10.218	25.305
30.5036890171488	10.1733455669901	26.4270319850965	30.594	9.52	26.782
33.5527820317648	11.7371201849541	26.3932075186868	34.087	11.615	26.904
33.8057758819859	13.336933209147	24.472139990736	33.907	14.076	24.403
33.6369486635523	11.9215128687202	23.3063722232529	33.062	12.126	22.872
33.9134593995903	10.963688223697	22.9099804216114	33.833	10.282	23.21
33.9877192859539	11.0138071947003	22.7443903243973	33.96	10.536	22.989
34.5891824080441	11.4196717486592	21.4037802601745	35.293	11.552	21.184
33.3511955042098	11.4583828591014	20.7203835157568	32.867	11.313	21.273
32.3763899588875	11.626653184925	19.4721991630611	31.827	11.313	19.849
32.0712195283101	11.6815432023443	19.0759461642922	32.182	10.98	18.901
31.2758262539469	11.8310515200725	18.044905644032	30.657	11.541	18.351
31.0020267072674	11.9883982676737	17.4002311634005	31.242	12.126	17.355
30.7118850066932	12.1551177458218	16.7170771579289	29.975	12.061	16.621
31.4892048799628	12.6472671564283	15.5724753784978	31.372	12.353	15.396
32.5047898317981	13.2904537192169	14.0772089767015	33.095	13.751	14.049
31.2820839437412	12.1453409732042	12.2868084444519	31.762	12.126	11.712
29.4228728112307	11.1192971098087	11.5133428926272	28.753	10.79	11.577
30.6712221149987	11.6553010932801	10.7369260547693	30.787	11.313	10.711
32.1254512304295	12.2799681762566	9.83251755489906	32.022	12.126	9.107
33.8005740456213	13.1659112325114	9.99399458584953	34.135	13.686	10.417
34.190181720241	11.9949494565711	8.46422853600213	34.135	12.386	7.828
34.5219215686511	10.7254482144196	8.1854349380263	35.166	10.726	7.803
34.1169049572672	9.44561984832699	8.34354641087334	34.087	8.758	8.639
33.7305754755765	10.7396172073401	7.29041488513665	33.647	11.313	7.765
33.6048464716268	11.0423887898502	6.66426140182477	33.452	11.541	6.941
33.4764010287014	11.3516211394605	6.02444381667919	32.997	11.541	6.26
33.2510237970805	11.8949434608673	4.89992988650629	32.542	12.126	4.969
33.496601088498	12.2003854819962	3.93615094439863	33.322	12.841	4.069

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.6240392008253	12.3584977155738	3.43627258533741	34.135	12.906	3.426
32.7506997774357	11.542656039757	0.715685817676226	33.127	11.313	0.11
32.0741055202452	11.6402350753045	0.839792535586002	31.567	11.313	0.396
31.3357801592356	13.0084043262219	2.66750513661604	31.399	13.754	2.704
31.1335794879843	12.718462856872	3.01926556052876	30.787	13.166	3.014
29.7860337896238	10.7852521656237	5.36450656632164	29.451	10.155	5.592
30.7566763306719	13.0664738002637	5.78716060312549	31.015	13.036	5.79
31.2274300788634	14.1731251771195	5.9921994756677	31.177	14.433	6.693
32.1115471949507	15.3583688794262	4.67096409966343	31.892	15.246	4.139
32.2507426628269	15.5450075094141	4.46298749900478	32.932	15.246	4.376
32.2554963462732	17.8389880771621	2.69866003404298	32.69	18.346	2.359
28.4657484135076	16.5968276415694	3.2146463546927	28.308	15.933	3.524
26.2561722405293	18.5013197289218	2.27893253973301	26.149	19.045	2.783
25.1506039489732	18.7065486396265	0.900476315083638	24.943	19.108	0.303
24.705219005223	16.3253760142106	2.64375504555935	25.07	16.314	3.298
21.657043488296	12.2535755271138	1.59946366138667	22.149	11.742	1.36

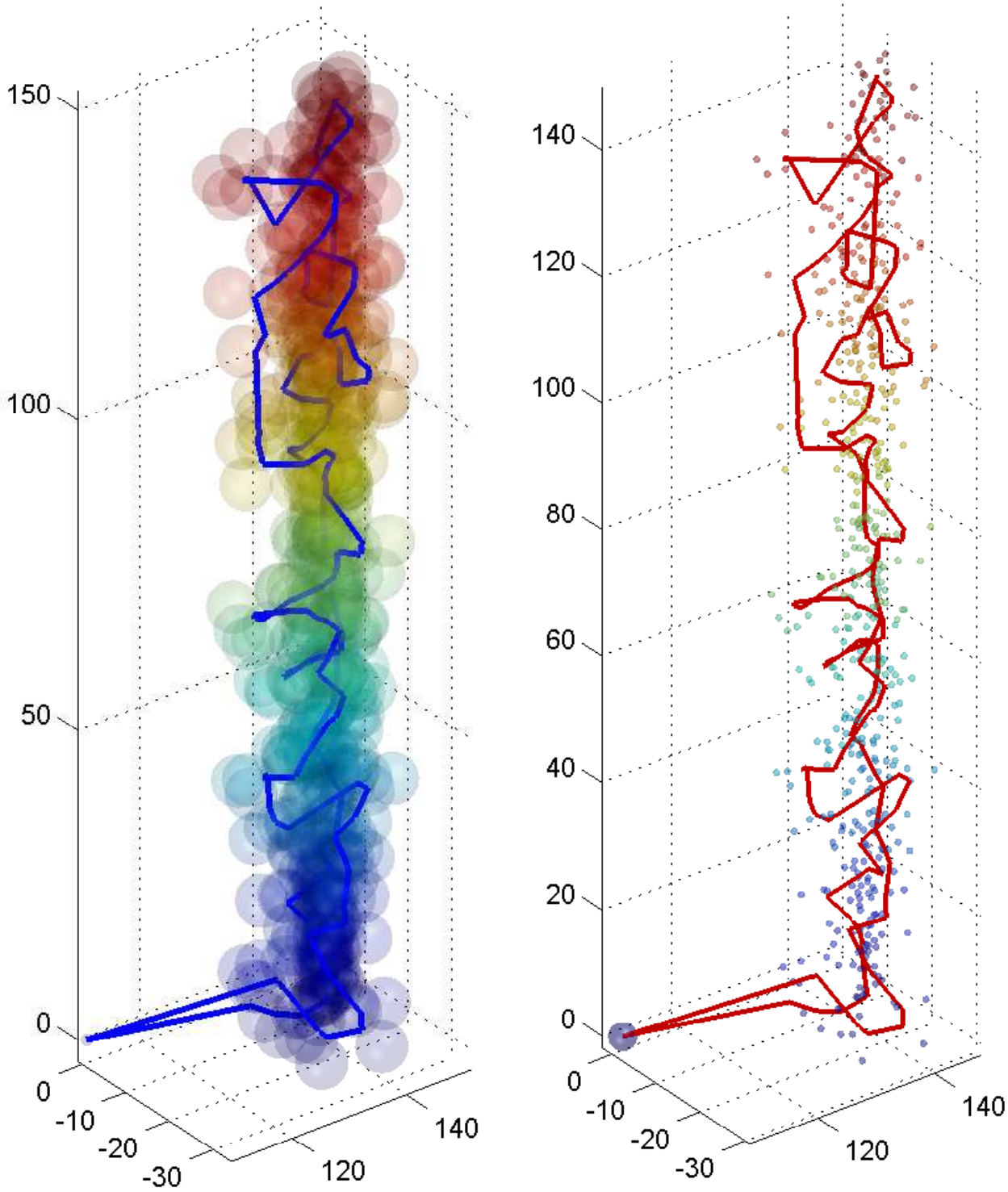


Figure N.86: $d493$, $r = 3.7452$, Equal Radius, 3D, Euclidean, Length = 665.0555151

Table N-89: Solution for $d493$, $r = 3.7452$, Equal Radius, 3D, Euclidean

Total distance: 665.055515089365 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
18.5314402255163	13.2552732023589	5.03606719277754	18.466	14.155	8.671
19.5348728658816	13.7639949653163	4.5021583272402	20.434	13.012	7.24
21.3556028833863	14.6870698110957	3.53338661809228	22.149	11.742	1.36
21.9216307581281	15.1041402762558	3.30028231317708	20.117	18.283	2.485
23.9332846081562	15.6641367644269	2.79063168925519	25.07	16.314	3.298
25.3347815226419	16.054280413434	2.43556443048777	24.943	19.108	0.303
26.3391121441718	15.9054775612116	2.48341137162036	26.149	19.045	2.783
28.4040250008849	15.5995376366618	2.58178386366793	28.308	15.933	3.524
30.5648339750671	15.2793894011553	2.68472459483685	32.69	18.346	2.359
30.9953825621399	14.5261673626622	2.79229585816203	31.892	15.246	4.139
31.4293527657351	13.7669597914958	2.90072228732621	34.135	12.906	3.426
31.4293527657351	13.7669597914958	2.90072228732621	33.322	12.841	4.069
31.6036917229149	13.4619609698911	2.94427904978482	31.567	11.313	0.396
31.712304588782	13.271946726569	2.97141441985636	33.127	11.313	0.11
31.7584681013292	13.1075100315792	3.50424348468464	31.399	13.754	2.704
31.8099866112829	12.9239983387149	4.09888162862298	30.787	13.166	3.014
31.8099866112829	12.9239983387149	4.09888162862298	32.932	15.246	4.376
31.8759473935766	12.6890420134009	4.86021680066629	32.542	12.126	4.969
31.8759473935766	12.6890420134009	4.86021680066629	31.015	13.036	5.79
31.9328332806418	12.4864116906051	5.51680577273199	31.177	14.433	6.693
31.9846654533779	12.301783240839	6.11506326830271	29.451	10.155	5.592
32.0402035286168	12.1039523213283	6.7560996975155	32.997	11.541	6.26
32.0402035286168	12.1039523213283	6.7560996975155	33.452	11.541	6.941
32.093787605584	11.9130820517843	7.37458131154088	35.166	10.726	7.803
32.093787605584	11.9130820517843	7.37458131154088	33.647	11.313	7.765
32.1229856273658	11.809078611029	7.71158707472503	34.087	8.758	8.639
31.7776213442282	12.2215374263466	8.23229763554473	34.135	12.386	7.828
31.7776213442282	12.2215374263466	8.23229763554473	32.022	12.126	9.107
31.3324762324092	12.7531626749686	8.90345138064125	34.135	13.686	10.417
30.9670923452532	13.1895302327251	9.45434540248523	30.787	11.313	10.711
30.9670923452532	13.1895302327251	9.45434540248523	31.762	12.126	11.712
30.652242845934	13.5655456854585	9.92904727233261	28.753	10.79	11.577
30.2998852262794	14.3676303679632	10.5521978813041	29.959	17.584	8.664
29.9859290752379	14.4843253237105	11.7178288286769	29.134	16.187	10.819
29.9859290752379	14.4843253237105	11.7178288286769	31.112	15.246	13.662
29.7623931131979	14.5674148801891	12.5477592113205	33.095	13.751	14.049
29.7623931131979	14.5674148801891	12.5477592113205	31.632	15.246	15.179
29.1187756435431	14.7675369850848	13.652988455823	31.372	12.353	15.396
28.3383870525559	15.0101974742676	14.9930399641444	29.975	12.061	16.621
28.3156840060309	15.0190612145585	15.0287424200818	28.118	18.092	12.931
27.9111294477541	15.1770349434576	15.664905366617	27.864	18.854	16.375
27.6848972770387	14.9531187585594	15.9663743003605	28.689	18.156	16.722
27.6848972770387	14.9531187585594	15.9663743003605	29.975	14.141	17.903
25.400234582865	12.691830210023	19.0108768591507	22.022	11.361	19.929
26.6277550931132	12.7802908915255	19.3807138759265	26.149	11.107	19.141
26.6277550931132	12.7802908915255	19.3807138759265	25.895	12.123	19.556
28.6023210662206	12.922586980828	19.9756287480361	30.657	11.541	18.351
28.6023210662206	12.922586980828	19.9756287480361	30.202	12.451	21.726
29.1631799276768	12.9630051842197	20.1446082633984	30.787	13.426	19.207
29.6429660066048	12.9975809155408	20.2891615468726	28.816	12.25	22.231
29.6429660066048	12.9975809155408	20.2891615468726	29.705	13.393	23.437
30.0207552850725	13.0248063144985	20.4029846279017	29.515	16.505	21.691
30.8080397730444	13.0294994452197	20.6188676090393	31.242	12.126	17.355
30.8080397730444	13.0294994452197	20.6188676090393	32.182	10.98	18.901
31.7146618960246	13.0349026218689	20.8674744578808	31.827	11.313	19.849
31.7146618960246	13.0349026218689	20.8674744578808	32.867	11.313	21.273
32.4685688205479	13.0393963259219	21.0742048159533	33.833	10.282	23.21
32.5648204768695	13.1576195501761	21.0256558427224	33.96	10.536	22.989
32.9851598496581	13.6739026180846	20.813642137492	35.293	11.552	21.184
32.9851598496581	13.6739026180846	20.813642137492	33.062	12.126	22.872
33.7064593978232	14.5598289243401	20.4498468964732	35.992	16.314	18.057
33.3790814521693	14.4880730949446	21.0039661872911	31.242	15.473	19.727
33.0349875338883	14.4126534488615	21.5863788854079	31.61	13.901	20.326
32.6685692633793	14.3323406997756	22.2065778506238	32.944	17.965	22.768
32.0933698552425	14.2062656425305	23.1801603236185	31.102	17.775	23.735
31.5692317334917	13.7035079467158	24.1823960112816	33.907	14.076	24.403
30.8507171067589	13.01430682859	25.5563120039772	28.372	10.218	25.305
30.9243843455783	13.1164319501824	25.790513192207	30.594	9.52	26.782
30.9243843455783	13.1164319501824	25.790513192207	28.181	12.441	28.249
31.4935255629192	13.8974926240426	26.9773548420819	34.087	11.615	26.904
31.4935255629192	13.8974926240426	26.9773548420819	33.322	14.401	29.372
31.724087565862	14.2138984229308	27.4581399924241	30.787	13.946	28.148
31.724087565862	14.2138984229308	27.4581399924241	30.202	13.491	28.883
31.9446301511565	14.5165543138855	27.9180319986307	32.152	15.246	27.742
32.1596747060928	14.8116650331859	28.3664590836271	32.022	15.473	29.854
32.1596747060928	14.8116650331859	28.3664590836271	29.007	14.409	30.293

Solution x	Solution y	Solution z	Original x	Original y	Original z
32.2639334557939	14.9547462610117	28.5838777971467	33.515	18.219	27.24
32.6690371223649	14.962752513393	30.8284683002571	31.61	17.775	32.188
32.799191558349	14.9653264259335	31.5496482770817	30.15	16.06	32.059
32.9304482734061	14.96792224862	32.2769370717012	30.023	17.203	33.037
32.9304482734061	14.96792224862	32.2769370717012	31.567	14.661	34.796
33.5906710710738	14.7943339973259	34.5617470685326	36.436	17.076	35.413
33.3628363845556	14.3923196182942	35.1447683802669	33.095	14.271	36.737
33.1734879663715	14.0582137560369	35.6293030710984	32.436	13.231	35.38
32.9924227704339	13.7387235588947	36.092641047074	33.642	10.155	35.22
32.6956319879479	13.7373232213537	36.764905208124	32.217	11.541	36.145
32.3734669539988	13.7358029142389	37.4946444960042	34.135	14.726	38.301
32.0549842042783	13.7343000608021	38.2160432724634	33.322	13.361	37.986
32.0549842042783	13.7343000608021	38.2160432724634	33.095	13.491	38.538
31.6895063179366	13.7325750923396	39.0438907118308	33.095	13.231	40.765
31.400431778174	13.7312112219056	39.6986775028709	29.975	12.321	39.763
31.400431778174	13.7312112219056	39.6986775028709	31.015	13.296	40.037
31.1510382510532	13.7300347358264	40.2635826691666	30.202	13.751	40.213
30.909608293636	13.7288958634617	40.8104495138683	29.975	11.801	40.794
30.909608293636	13.7288958634617	40.8104495138683	29.134	13.33	42.125
30.7299646299014	13.7280486900803	41.2173637037579	30.787	13.686	41.698
30.5552583848013	13.7272248343346	41.6130941298278	32.372	14.092	41.845
30.5552583848013	13.7272248343346	41.6130941298278	31.015	13.816	44.684
30.443829727469	13.7266996123275	41.8654937562788	32.607	11.313	43.742
29.8362725409184	13.991316714359	42.4938540096806	30.658	10.98	44.543
28.6109223195508	14.5250740471713	43.761128793165	28.499	12.949	46.85
28.3684025415929	14.6307040854623	44.0119470269442	29.642	15.108	43.621
28.3684025415929	14.6307040854623	44.0119470269442	27.991	13.647	44.302
28.1120551281656	14.7423569033754	44.2770659474021	25.578	12.568	43.273
27.9002959259722	14.8345884222369	44.4960709172582	24.371	14.346	43.342
27.9557645638602	15.308200157147	45.6191921633822	30.785	16.949	44.302
27.9557645638602	15.308200157147	45.6191921633822	27.737	16.251	47.666
28.0218520848809	15.8724808911869	46.9573266402926	25.895	18.918	46.48
28.1436244081238	15.9267545164795	47.4438419134383	25.07	17.076	49.249
29.6673202345029	15.7680747676245	48.847210796866	31.483	16.822	46.955
29.6673202345029	15.7680747676245	48.847210796866	30.657	15.246	48.98
30.8887308643061	15.6408760633919	49.9721649461479	33.388	17.584	48.735
31.3473774287346	15.5931124914451	50.3945867189834	33.642	18.346	49.307
31.6198520587673	15.3903639071981	50.8320967400498	33.095	12.971	48.557
31.6198520587673	15.3903639071981	50.8320967400498	33.322	13.881	49.4
32.0011321477426	15.1066532018855	51.4443109387275	33.907	13.036	49.61
32.0011321477426	15.1066532018855	51.4443109387275	30.982	15.473	49.591
32.5094832586662	14.7283900508199	52.2605613438025	32.607	14.661	52.963
32.9671102012613	14.3878704382	52.9953644223091	36.119	13.139	51.404
33.115244239749	14.1651598816209	53.91562763477	34.135	14.206	54.088
33.2549863785008	13.9550661890288	54.7837568756364	32.944	10.536	54.126
33.2549863785008	13.9550661890288	54.7837568756364	32.69	13.52	54.423
33.3828621969321	13.7628121060053	55.5781680297206	33.322	14.141	54.817
33.5297640364905	13.5419531644223	56.4907764323503	36.944	13.012	57.936
32.238706980036	13.4212205863828	57.3230604627074	33.387	11.313	58.128
32.238706980036	13.4212205863828	57.3230604627074	33.96	11.234	59.829
31.8586798348008	13.397942827651	57.5491727672851	33.095	14.011	61.011
31.8230800181556	13.3957625439989	57.5703564802297	31.827	14.661	58.532
31.7877089991653	13.393596250481	57.5914040239511	32.672	15.246	60.724
30.6935384776838	13.1075196017806	57.7967061359022	31.015	12.516	61.408
30.6935384776838	13.1075196017806	57.7967061359022	30.202	12.971	61.507
30.4226620071156	13.0371028434453	57.660530966971	28.372	13.52	60.757
29.7909578312714	12.8351033302228	57.1894879866323	29.975	14.401	55.717
29.7909578312714	12.8351033302228	57.1894879866323	31.275	14.173	56.999
29.0242736792613	12.5899415996331	56.6177960029469	30.658	9.71	56.048
28.0058940266893	12.2643008185697	55.8584294003183	28.626	10.091	52.872
24.4231028000079	13.4357675602593	56.5564508477586	22.085	10.853	55.182
23.959694766949	14.0457888484822	56.8974004696382	22.276	13.393	54.239
23.0715676996374	15.2148995228131	57.5508335723864	24.308	16.441	56.035
22.0049294702462	16.6189973022353	58.3356050309386	18.466	17.838	58.207
25.2377566577384	17.5355391913579	60.0657726909699	25.832	14.219	61.701
26.3037021964649	18.1311695650084	60.5253484712193	24.943	18.346	64.008
27.2220556027794	18.6126230076259	60.7889847276138	25.197	18.918	59.354
29.5466323746557	19.8312996795376	61.456323420743	31.356	22.347	59.353
30.3486842718917	18.9543644558624	63.8579428608427	34.087	18.918	64.082
30.166126872922	18.8118703472112	64.2376544261924	27.356	20.632	65.916
31.7523451618702	15.4133508562264	65.7516323930081	30.594	17.076	65.103
31.7523451618702	15.4133508562264	65.7516323930081	28.753	13.457	65.491
32.2722247156761	14.2995220814256	66.2478206333282	30.202	11.996	64.142
32.3671031366181	14.1585017482696	66.3395789163718	31.991	17.203	67.188
32.3671031366181	14.1585017482696	66.3395789163718	31.307	14.661	68.868
32.4837118337986	13.9851830162635	66.4523523540849	31.437	14.433	67.041
32.4837118337986	13.9851830162635	66.4523523540849	31.762	15.473	67.554
32.6098172410221	13.7977490092897	66.5743099799285	34.849	11.996	64.173
32.6550194507375	13.5817501677349	67.063267928553	35.484	11.425	66.484
32.6766199499265	13.4785322901895	67.2969212962859	32.055	9.837	66.681

Solution x	Solution y	Solution z	Original x	Original y	Original z
32.7701205733037	13.5019268406646	67.8739598570129	30.202	12.711	66.602
32.9615319245688	13.5498167063213	69.0552465617386	31.356	16.251	69.04
33.1958677070417	13.6084434297216	70.5014328545539	30.785	16.251	71.611
33.7630945570238	13.264135322385	71.6070943349513	37.452	12.758	72.01
33.0465663445981	13.1402521650307	72.3990557497414	31.502	12.126	74.715
32.7244816944597	13.0845670999422	72.7550432234067	32.282	12.126	74.654
32.4569719822487	13.0383176791097	73.0507111793741	31.307	11.313	71.461
32.4569719822487	13.0383176791097	73.0507111793741	31.015	12.776	72.117
32.1773887106466	12.9899808756505	73.3597236433186	28.816	12.568	71.763
32.1773887106466	12.9899808756505	73.3597236433186	29.197	13.52	74.598
31.9501590469015	12.9076592840865	75.0483222217324	28.626	11.234	75.345
31.9463235533418	12.9062677401753	75.0768215292356	31.437	11.541	78.241
31.9463235533418	12.9062677401753	75.0768215292356	29.975	12.581	76.539
31.9430975913308	12.9050975716903	75.1007922287792	32.182	16.632	75.383
31.9010294909509	12.8788968533432	75.4072370133951	30.787	12.646	75.914
31.9010294909509	12.8788968533432	75.4072370133951	30.787	12.906	76.252
31.8627208189767	12.8550376235181	75.6862955140377	32.477	14.433	75.823
31.8627208189767	12.8550376235181	75.6862955140377	32.087	14.661	75.705
31.8235505839243	12.8306418129525	75.9716301989692	30.787	14.466	78.121
31.8235505839243	12.8306418129525	75.9716301989692	30.202	14.271	77.775
31.7964489063986	12.8137626340366	76.1690494490049	32.802	12.126	77.71
31.7964489063986	12.8137626340366	76.1690494490049	32.835	12.613	75.794
31.7701603075317	12.7973898739535	76.3605456845792	29.007	10.282	76.107
31.7665630648716	12.841280228417	77.5705916215767	31.047	11.313	78.28
31.7634001241264	12.8798617725949	78.6342461526859	32.835	14.173	77.958
31.7596217892625	12.9259577396315	79.9050909426956	33.071	16.187	80.531
31.7596217892625	12.9259577396315	79.9050909426956	33.062	15.473	78.089
31.7550212969721	12.9820787391002	81.4524172787851	32.152	12.353	82.503
31.7550212969721	12.9820787391002	81.4524172787851	32.672	12.353	81.337
31.7514199290862	13.0260131474101	82.6636527158204	33.907	13.296	83.348
31.7485285167097	13.0612878977079	83.6360987350429	35.42	12.949	84.367
31.6380579153977	13.0752510990323	83.9067204255083	34.135	14.466	84.176
31.6380579153977	13.0752510990323	83.9067204255083	34.135	13.166	82.509
31.4696216083384	13.0965410145199	84.319342686711	34.135	14.986	84.727
31.2563524865934	13.1234978346506	84.8417946455396	31.015	13.556	83.741
31.0200695864611	13.1533634881573	85.42062448734	29.388	13.838	84.576
31.0200695864611	13.1533634881573	85.42062448734	29.975	13.621	83.535
30.7064819013615	13.1929999524393	86.1888315871243	30.34	10.917	88.584
30.7064819013615	13.1929999524393	86.1888315871243	34.135	12.646	86.486
30.4484053124674	13.2256199026449	86.8210530049011	32.412	15.246	88.024
30.4484053124674	13.2256199026449	86.8210530049011	32.737	14.433	86.615
30.161411804417	13.2618950497756	87.5241142008727	32.542	15.473	89.387
29.3264674339264	12.9663150664477	88.3407750532563	30.722	15.473	90.573
29.3264674339264	12.9663150664477	88.3407750532563	29.975	14.921	90.476
28.4300360486188	12.6489659223098	89.2175719769854	29.975	12.841	90.667
27.4993745821491	12.3194990083992	90.1278489018556	26.911	14.409	89.199
26.2688920187672	11.883892211572	91.3313803875034	23.482	9.52	92.151
26.812476938821	12.6991081107823	91.6616772747916	25.705	12.123	93.472
27.4240254993949	13.6162460472506	92.0332706153698	25.832	16.949	91.413
29.447361983927	13.6884058919664	93.0829563463309	31.697	14.433	93.007
29.447361983927	13.6884058919664	93.0829563463309	31.547	13.203	92.722
30.1023357706566	13.7117591454769	93.4227475250383	31.957	11.541	90.999
30.8041218966886	13.8716837547934	93.9910384829297	32.737	11.541	92.508
31.4173010399348	14.0114165086233	94.4875771282522	34.849	13.393	93.121
31.3963548035801	14.1395279364726	94.8639775763045	33.322	12.321	95.076
31.3963548035801	14.1395279364726	94.8639775763045	32.412	12.353	94.929
31.3728094611028	14.2835355871828	95.2870834570618	29.261	11.425	96.137
31.3728094611028	14.2835355871828	95.2870834570618	30.527	11.313	94.769
31.3329452369013	14.5273391817996	96.00341391513	30.202	13.231	95.497
31.2864747501809	14.8115486187919	96.8384647791343	30.202	14.791	95.605
31.2280061820851	15.1691472301929	97.8891483355891	33.071	18.346	97.156
31.1552256796056	15.3079053552651	98.5102958988642	32.802	15.473	97.861
31.0733600422958	15.4639846558905	99.2089827240302	32.817	17.775	101.585
30.9623055238308	15.3703355485744	99.2216143455444	33.322	12.581	100.045
30.0161903520652	14.6264441447701	99.3169130186907	31.737	12.885	98.954
30.0161903520652	14.6264441447701	99.3169130186907	29.515	14.028	97.711
29.0292201195485	13.8504303628901	99.4163274704284	30.202	14.011	102.151
29.0292201195485	13.8504303628901	99.4163274704284	28.753	12.949	99.196
27.7926932166415	12.8782087736379	99.5408811730527	27.419	11.298	96.166
25.5060771148242	11.6546079878163	101.294819359178	22.212	10.091	100.44
26.7280774866762	12.11784288773	103.59606995135	29.197	12.441	103.553
26.7280774866762	12.11784288773	103.59606995135	28.753	13.838	102.669
27.2607402507278	12.3197627612575	104.599169112483	26.086	14.663	104.115
28.0083638234319	12.6031699865906	106.007080363089	26.022	12.631	109.182
28.8767845566751	12.7509882227144	106.035995636411	29.388	11.804	105.494
28.8767845566751	12.7509882227144	106.035995636411	29.975	13.361	103.951
29.5840691553464	12.8713783925625	106.059538910542	31.275	12.613	107.178
29.5840691553464	12.8713783925625	106.059538910542	29.578	13.203	105.988
30.1541756381472	12.968418446317	106.078512176744	31.293	15.806	105.367
30.1541756381472	12.968418446317	106.078512176744	31.372	15.246	104.804

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.4461742329898	13.0181197312051	106.088225651057	31.957	14.433	102.967
30.6450621525452	12.9680925109837	106.324615743729	31.177	11.541	103.36
31.061317989135	12.8633854561207	106.819359105287	30.721	9.329	106.333
31.4920607217735	12.7550340903135	107.331320747049	30.34	9.647	108.046
31.855221444393	12.6636827570763	107.762957773027	34.135	12.126	105.614
32.2152059227502	12.5731304379278	108.190819395177	32.477	11.541	107.287
32.5869995359407	12.4796075462213	108.632716715367	32.932	12.353	108.278
32.9551211937513	12.3870083225598	109.070249668485	34.722	11.742	108.413
32.9551211937513	12.3870083225598	109.070249668485	35.674	11.044	107.474
33.1492349322254	12.3381806358551	109.300964387064	35.103	10.155	111.634
33.0304287446548	12.6899251072465	109.157686953376	31.632	12.353	111.341
33.0304287446548	12.6899251072465	109.157686953376	30.982	12.126	111.418
32.8593766105239	13.1963507570786	108.951402502135	32.347	11.313	110.138
32.5871342185872	14.0023639676605	108.623085177709	34.135	13.426	109.486
32.5871342185872	14.0023639676605	108.623085177709	33.095	12.711	107.498
32.0105820683285	15.7093255675099	107.927779908805	31.047	14.661	110.232
32.0105820683285	15.7093255675099	107.927779908805	29.642	17.076	106.306
31.8156191926611	16.2865427940674	107.692660128401	34.722	18.219	109.051
31.337727252252	17.1334406357293	107.232044259395	34.595	18.791	106.414
30.7490123100599	17.9366862639422	106.792472814725	32.309	19.553	108.506
30.0679747990756	18.8658959497858	106.283968331323	27.292	16.632	106.393
28.6996180690211	20.7329209881309	105.262266407649	27.229	19.616	102.004
28.5721931924393	21.1763023232361	105.353524795216	29.07	22.347	101.831
28.5721931924393	21.1763023232361	105.353524795216	27.991	22.601	101.939
28.4954588429308	21.4282814146217	105.516920101128	24.879	20.632	106.077
28.5609002702071	23.1867250930543	106.489564470984	28.753	23.998	106.929
28.6121114476646	24.5628004817346	107.250710011058	27.165	25.458	104.784
28.7037051273097	27.0239815945545	108.612063194756	28.943	30.03	106.391
28.6989992170786	27.070428026554	108.833844201459	28.943	30.475	107.548
28.6582942237227	27.4723607848348	110.752882199416	30.277	30.475	112.299
27.5772065522324	25.9889709072911	111.860854599619	25.832	23.68	109.484
27.1406262698539	25.3554767991417	113.983387506718	24.308	23.998	113.458
26.884629533065	24.9840146281696	115.227975787921	26.911	24.76	115.286
26.6355453950871	24.622582863542	116.438957410015	27.927	21.458	117.97
26.2236968136906	25.0922955655118	116.786889315569	28.88	25.331	116.966
25.6000021963906	25.8036131569007	117.313791103908	27.927	28.125	119.109
21.2922523047946	27.2285590884388	118.316077171694	18.72	28.189	115.769
21.1871026269474	27.2393716587997	119.028757176151	17.64	27.998	119.961
21.2190707594493	27.2316524853746	119.072045693597	20.561	23.553	119.319
25.8998597329917	27.4740638348491	125.003249778262	25.895	29.903	127.854
27.4181113242521	25.5945486951065	124.624148081532	27.229	26.22	125.044
29.5286443608726	22.9818229712223	124.097160980622	32.245	24.887	125.449
30.8009964300751	21.4067144395739	123.779457434787	34.341	22.029	122.727
30.1454443521193	19.5450099399399	124.033168704715	33.515	18.029	124.645
28.9098227504226	17.500771563864	124.258204993841	30.594	16.251	121.669
27.562602165903	15.2719177861675	124.503574261715	27.673	12.695	125.598
27.2570136673573	14.7663487391165	124.559230025499	26.594	11.933	126.917
27.2082630061195	14.8395076421686	124.369957617007	24.371	15.235	126.557
27.2082630061195	14.8395076421686	124.369957617007	28.943	16.886	125.854
26.5363992264064	15.847719959337	121.761656930657	27.102	18.664	121.623
26.5363992264064	15.847719959337	121.761656930657	28.054	17.013	121.063
26.2147779068106	16.3303609964126	120.513035536552	25.133	19.235	120.496
26.0628506975224	16.5583528033548	119.92319798487	26.276	20.188	119.025
25.65448705729	15.585770375371	119.030362177933	22.149	14.282	119.226
26.3325766174949	15.1860785308722	118.265254912654	27.927	12.568	120.417
27.2879096277406	14.8164889661118	116.731917704729	25.197	12.441	114.729
28.0583337567961	14.9625665795542	116.24276949313	27.229	15.362	116.263
28.9398460167205	15.1297093703749	115.683091655431	29.975	13.101	114.777
29.5713385556149	15.249442889455	115.282151319363	29.578	18.791	116.421
30.8644328558289	15.4945966347854	114.461150284058	33.452	15.246	111.765
30.864432896961	15.4945966664576	114.461150294002	30.975	17.076	111.068
31.0705728519863	15.3115710362316	115.371948939506	33.907	14.791	115.865
31.0705728519863	15.3115710362316	115.371948939506	31.015	14.076	113.16
31.3935041563735	15.0248483975546	116.798767392743	31.502	15.473	118.128
31.3935041563735	15.0248483975546	116.798767392743	32.217	14.433	117.304
31.6029850466871	14.8388569053225	117.724327397642	33.907	12.516	116.73
31.8229615102648	14.6435468024584	118.696257090603	31.991	16.632	118.575
32.0745695524556	14.4201519447994	119.807945719047	33.322	13.101	119.477
32.0745695524556	14.4201519447994	119.807945719047	32.087	11.313	118.866
32.4302053293825	14.104393379751	121.379263101408	34.135	13.946	120.705
32.8283220714187	13.750917260382	123.138275448927	33.322	13.621	122.895
32.8283220714187	13.750917260382	123.138275448927	33.907	13.816	122.673
33.274882598064	13.3544293814032	125.111328636359	35.992	13.647	125.389
33.5435904102081	13.115852529863	126.298566751532	33.907	11.996	124.886
33.931391301054	12.7715364434628	128.011997940566	34.595	9.202	128.931
34.0231645504041	13.9062739715639	129.23894589104	32.347	14.661	129.857
34.0231645504041	13.9062739715639	129.23894589104	32.282	15.473	127.6
34.1078207879399	14.9530033789721	130.37073307866	30.462	15.473	131.052
34.5761241945802	15.7017913829003	131.16735160525	36.436	18.918	131.64
34.2595265053803	15.1157451479963	131.514864595532	31.356	16.06	129.885

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.8697359863953	14.3942155131805	131.942720952197	33.127	14.661	132.624
33.8697359863953	14.3942155131805	131.942720952197	32.867	14.661	131.697
33.5055913302626	13.7201562031559	132.342426988952	35.547	11.234	131.369
33.250023114795	13.2470746445484	132.622954521836	34.976	10.282	131.121
32.8193759514565	12.975892640777	133.062149309613	30.787	12.386	130.829
32.3918640679175	12.706684941686	133.498146717599	30.912	9.901	131.507
31.952874003837	12.6220782059311	134.304214538798	34.595	11.996	135.081
31.4419848193049	12.5236119439699	135.24230062856	28.372	14.663	135.085
31.4868613954537	11.4121129140164	137.536660170436	29.388	8.313	137.407
31.7019740555246	11.4654354571855	138.0641949677	29.007	12.949	137.787
31.7019740555246	11.4654354571855	138.0641949677	34.135	11.866	136.659
32.1016718210944	11.5645125419485	139.044398272867	31.697	11.541	138.673
32.5384981162055	11.6727929167693	140.115654011141	34.404	14.028	139.514
32.5384981162055	11.6727929167693	140.115654011141	33.907	12.776	139.011
32.9531274607992	11.7755713891211	141.13247444174	33.907	14.336	141.111
32.9531274607992	11.7755713891211	141.13247444174	33.322	15.473	140.664
33.6220290156259	11.8940881815101	142.790870577268	34.785	12.504	141.232
34.6039308744277	12.0680624315595	145.225296841378	37.452	10.218	146.804
33.0132587013371	13.9167140012271	146.241968335825	33.907	13.556	148.567
33.0132587013371	13.9167140012271	146.241968335825	33.582	15.473	147.748
32.3976336029119	14.6321736703322	146.635438859079	29.975	13.881	149.391
32.4241860241647	14.9124885528943	146.513147767367	30.787	14.206	147.62
32.453544444538	15.2224270003029	146.377932905675	31.892	12.353	146.679
32.5080191869833	15.7975379461328	146.127031294063	31.991	14.092	145.487
32.5080191869833	15.7975379461328	146.127031294063	29.975	14.661	145.197
32.594612091887	16.7117942098873	145.728170680124	33.769	15.679	145.826
32.594612091887	16.7117942098873	145.728170680124	32.944	15.933	144.54
32.7022281721737	17.8480920053096	145.232440480169	34.468	20.442	147.277
32.4366461613511	18.0661734548247	144.539202945094	33.515	20.315	142.968
32.2749469934263	18.198950039057	144.117126770123	34.341	21.013	142.761
29.8768659208197	17.4082110488338	141.987102629984	28.245	14.854	144.187
29.3982380922808	17.3318088624489	141.414603548524	27.356	18.473	143.695
29.3982380922808	17.3318088624489	141.414603548524	31.356	19.68	141.631
26.7632901667129	16.9112598711173	138.262881049622	24.879	19.934	139.42
26.2679730631203	16.8279594489221	137.666072967819	29.324	15.489	136.921
23.5716677176974	16.3744707734278	134.417202301102	26.149	15.679	137.044
23.5716677176974	16.3744707734278	134.417202301102	25.451	17.965	131.595
20.9281054489479	15.9105517253043	131.328991802796	20.434	18.537	132.408
20.9281054489479	15.9105517253043	131.328991802796	20.434	15.806	127.618
18.3149512226668	15.5009705346112	136.872595820191	17.577	13.647	137.156
16.8382859540967	15.2695229880632	140.005239363157	18.339	12.631	142.199
15.7253546771553	16.0175804716978	140.640069675131	13.576	14.79	138.325
14.6698318733521	16.7270501607876	141.242153221739	11.163	15.552	141.832
16.0644458356108	19.8606437033936	142.072291743327	18.466	18.664	140.644
19.1963636633408	26.897897121449	143.936575522122	19.037	28.189	146.557
19.5892625004674	27.7807146653716	144.170448064775	18.529	30.03	146.971
22.0718679331226	28.357861339788	141.942773074455	25.07	30.03	143.44
22.2024136721251	28.0949201559535	140.566192752825	22.149	29.713	141.818
22.494375718317	27.5068651525249	137.487516001151	26.149	27.49	136.669
20.8754863418895	26.9140524258225	134.767218111962	18.72	29.967	135.012
20.687874042197	26.7656321539484	134.371738178002	18.974	29.967	133.455
19.1763782355607	24.067098322808	130.29656967204	19.037	26.982	129.54
19.1763782355607	24.067098322808	130.29656967204	18.974	24.569	127.812
18.166495959196	22.2641062557087	127.573807129556	21.577	21.394	126.294
17.9517050552351	22.0719781211418	127.282723644077	18.593	21.648	126.239
17.7484964129237	21.8902101993087	127.007336361485	20.371	23.045	124.747
16.7992817318611	21.0411463442031	125.720956154624	18.91	22.474	122.979
14.7250631689219	19.2254429900244	123.398432962038	11.481	17.711	124.498
16.5766138164627	18.7000999857466	117.808848993088	19.99	18.029	118.966
17.1077690733213	18.5493967682745	116.205382605059	20.498	17.457	115.048
14.9253717177725	19.2865251658492	114.592048524499	11.735	20.378	116.222
15.4223455021963	19.085958928419	105.57521460612	17.323	21.331	107.01
15.4223455021963	19.085958928419	105.57521460612	16.688	18.092	103.09
15.6784915689739	18.9825794013867	100.927781031848	18.148	16.505	99.59
15.0015247200458	19.7080980561636	99.9354516234207	11.608	20.251	101.424
14.8143537272885	21.0294861335647	97.3200000214856	12.243	20.505	94.648
18.0402835565627	23.5964972588708	97.2728565553641	17.577	25.204	95.05
19.2730789720915	24.5774807369693	97.2548437586888	19.545	25.839	93.739
20.618466691051	25.3675506789162	98.1777644427431	18.91	28.697	98.028
22.0749696217662	26.0976854452307	99.1473716853059	22.276	28.125	102.29
24.7698248020902	24.7419585048391	96.7142249024111	27.229	27.554	96.447
25.1913310284083	23.9600968035139	96.0587947556188	25.006	24.188	94.535
25.5618422905742	23.2728267310893	95.4826610027003	29.134	22.537	96.334
25.2533031207074	22.7309853097049	94.7507067270555	24.752	19.362	96.308
24.838990428113	22.500583432646	93.219240305231	27.546	22.537	91.326
24.6712943482836	22.4073270875022	92.5993523175453	24.943	18.791	91.664
24.42733922025	22.8385671594002	91.9894322263828	25.895	20.759	90.426
24.1522283630874	23.3248809433995	91.3016166635584	26.149	23.172	91.657
23.8118438787899	23.9265778405827	90.4505991344317	20.561	25.776	90.646
25.2077173293482	24.0642900626275	88.3766926788779	28.245	22.855	90.204

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.5182172528578	24.2563563179818	86.1658582557089	28.054	22.918	87.821
29.4924257165475	24.6922573895301	81.148313734805	32.118	27.3	81.725
29.8091386441628	23.8810977843929	78.6827673634676	31.356	26.03	76.034
29.2752153814404	22.3509455774867	78.3850827350508	28.816	21.902	78.963
28.8394175612951	21.1020165805406	78.1421156612945	27.102	21.648	79.965
28.8394175612951	21.1020165805406	78.1421156612945	26.848	19.743	76.594
28.6515034841156	20.5634899071873	78.0373539792081	27.737	18.664	80.683
28.5656579742118	20.3174739648949	77.9894961100408	26.721	18.283	80.536
28.8289630754697	19.8885840672119	76.835276803382	26.911	22.601	75.564
29.2478690340613	19.2062357675382	74.9989586853017	27.483	19.616	74.587
29.6817683611119	18.49946551569	73.0969169644815	33.261	18.537	71.995
29.1616743563549	18.2325235049382	72.6069319361932	30.531	18.664	72.004
28.5649348553852	17.9262425882765	72.0447382463026	29.705	19.426	70.279
27.916363570288	17.5933586311767	71.4337130907462	29.261	19.172	68.315
25.2454900005052	15.9921008529441	70.0548285291866	22.974	17.711	70.862
23.8392690488182	15.1490311344821	69.3288439228739	25.07	11.615	69.179
20.852078284294	14.8602047455627	68.0627732169171	21.831	13.203	64.85
19.4274768149551	14.9020800550106	67.8309162032311	19.418	13.901	64.222
19.2124291563898	14.9258371621415	67.8587297220643	17.323	12.504	65.716
15.2299150351194	18.5156592538355	71.2321560136439	13.005	20.061	68.646
14.9407496061571	18.8258141789652	71.957890374368	11.862	17.965	73.909
18.1572426353324	21.8003183612712	72.798589514615	17.45	21.902	76.475
18.9838886034368	22.5348450965117	72.861760934998	19.863	21.331	75.529
19.8136272379529	23.2721198026898	72.9251689895466	19.164	24.696	74.306
20.5240564447818	23.9033805760582	72.9794591039235	23.482	22.41	74.725
20.8691753374173	25.60850416033	72.4902484439644	17.64	27.49	72.733
21.8502213336326	26.527564731744	72.0541914289201	21.958	29.395	74.461
22.8658424517799	26.7694392137557	70.9731458669639	24.562	26.982	72.259
23.8026745189975	26.992548281156	69.975965178693	27.546	26.982	70.094
23.6727881371184	27.0265811844399	69.8187399772348	24.943	23.68	69.938
23.1725386573526	27.1576520826524	69.2132019254839	25.832	27.998	69.522
21.0064889911154	27.7251594440635	66.5912413210017	18.72	30.665	66.986
20.8222623841693	26.7774756010197	65.0226430289715	22.022	28.443	62.892
20.8222623841693	26.7774756010197	65.0226430289715	22.466	28.887	64.369
20.677122386457	26.0308578832166	63.7868489801316	17.45	24.188	63.322
21.4766621232299	25.9391106346269	62.8983787486582	18.974	24.125	61.119
23.8233052288251	25.6698171942368	60.2907070096511	25.07	27.744	59.542
24.8551807001012	25.5514070107061	59.1440559615037	26.086	24.95	59.469
25.7264496836531	25.4514271429287	58.1758759293722	28.88	27.3	58.991
25.7762398863715	25.0683997022426	57.3832379156396	28.499	25.141	57.61
25.7762398863715	25.0683997022426	57.3832379156396	27.102	25.966	59.543
26.0353929505856	23.0747766290322	53.2576429386047	28.753	24.379	51.035
25.5602094773372	22.4535084314921	52.9196697770921	26.594	18.854	52.883
23.974161379042	23.0598887786763	52.2094780613464	24.244	21.077	52.586
21.3604022166658	24.0591825939303	51.0391023832914	20.117	21.775	51.546
18.9758136332188	24.970862837163	49.9713432297417	17.069	27.046	52.438
18.324694404283	24.8675645753628	48.810944615109	17.323	23.934	50.146
17.5378625077438	24.7427358131611	47.4086869807928	17.069	27.744	45.218
16.7082062393321	22.6937226806264	46.7748678142771	17.64	22.918	47.209
15.6148730281678	19.9935016866074	45.9396091785041	12.052	18.854	46.124
17.246216507239	18.897614877878	45.2414111659477	19.609	18.156	48.051
19.0638730193961	16.8528183280358	40.7412977750529	18.021	13.52	41.784
20.0304598899552	15.7654515677389	38.3482453043784	18.212	18.283	36.255
20.8911019687649	14.7702020160735	36.5957331016487	20.244	11.234	37.646
21.1009687092213	14.6767002820211	36.1776960325957	20.561	18.219	35.874
22.3402572408695	14.1245705428694	33.7091447910443	19.482	13.076	31.528
23.612432823161	14.0158945849762	32.7286507815995	24.308	15.044	33.546
24.9066119057417	13.905339026839	31.7311980738835	24.244	15.997	28.696
26.4320574262888	13.19417175959	31.5676047504654	27.927	10.409	29.559
27.8196866965345	16.01348976816	34.4867639525404	27.419	15.044	35.984
28.890635385494	18.1893918977563	36.7397230122911	26.34	17.203	39.025
29.6138676818543	19.6588217753007	38.2611919917905	26.149	20.886	38.979
30.0669148781815	20.3521444153561	38.9942609598934	32.372	18.537	39.944
30.4197932818426	20.8921722213646	39.5652473984921	33.96	19.68	39.41
30.6258740690058	22.21912063	40.7963931485698	30.785	20.823	44.268
30.7032948403368	23.1538143655856	40.8047685378445	29.261	23.045	43.901
30.7993855029092	24.3139215327295	40.8151660100529	33.642	26.22	42.336
29.285080897183	25.1073021807776	39.937284749712	27.8	23.617	42.03
26.7878968442048	26.4156376816726	38.4896021405224	26.086	29.903	39.661
24.2321008748649	25.1737435697831	35.7021599442882	20.561	24.696	36.269
25.5206282250848	24.704315525186	33.2736641282762	25.705	26.22	32.496
26.5393776031254	24.3331719680081	31.3536221712127	29.261	22.283	32.908
27.6035266712605	24.0549650313992	28.6568221504441	31.293	23.68	29.18
27.4685153073916	23.995546811797	27.412975977306	25.832	22.918	24.535
27.4685153073916	23.995546811797	27.412975977306	28.689	21.013	29.015
27.1028181943869	23.8345983461229	24.043820023931	28.626	22.791	23.223
27.1028181943869	23.8345983461229	24.043820023931	26.022	21.902	22.93
26.9755236317775	23.7785732997503	22.8710646598168	26.975	20.061	22.417
26.7338106216291	24.4181202388905	20.7344545790158	28.245	21.331	19.247
26.7108038236198	24.4730597071366	20.6277672463267	29.007	26.157	18.195

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.550020232732	23.8914965778338	20.5283780409899	21.958	24.76	23.638
20.8192444446982	23.6495831911629	20.4870369894184	17.64	23.426	22.454
21.510115646547	23.5876424180204	19.0369031685775	19.482	21.966	17.833
22.1138226492955	23.5335162084834	17.7697250277176	20.942	25.649	17.701
22.1138226492955	23.5335162084834	17.7697250277176	22.974	25.141	19.537
24.5625781686425	23.3139746558424	12.6298024976843	24.625	19.68	11.726
25.5861024338897	24.4574772013916	10.7445095707717	23.355	23.553	9.247
26.8402083085163	25.8585900855578	8.43449339707964	25.959	27.744	8.296
27.7222925284972	26.844072770863	6.80972835474664	31.42	27.173	7.305
27.0786613913083	27.7860112484807	4.80348663466549	29.07	29.713	2.284
21.979417672314	26.4291443636176	4.8063887095529	20.117	27.617	1.782
21.0641394827177	25.6102486458795	5.84092708854339	20.117	22.728	3.645
18.060897905989	23.9820742444677	10.9351863210853	16.37	26.982	10.968
15.9787813685108	22.8532700047716	14.4669938710561	16.497	24.315	17.876
15.5149264179955	22.3392972566321	14.3005382866939	13.513	22.41	17.465
14.1932658080652	20.4362934771514	13.0823274769535	12.37	19.934	15.842

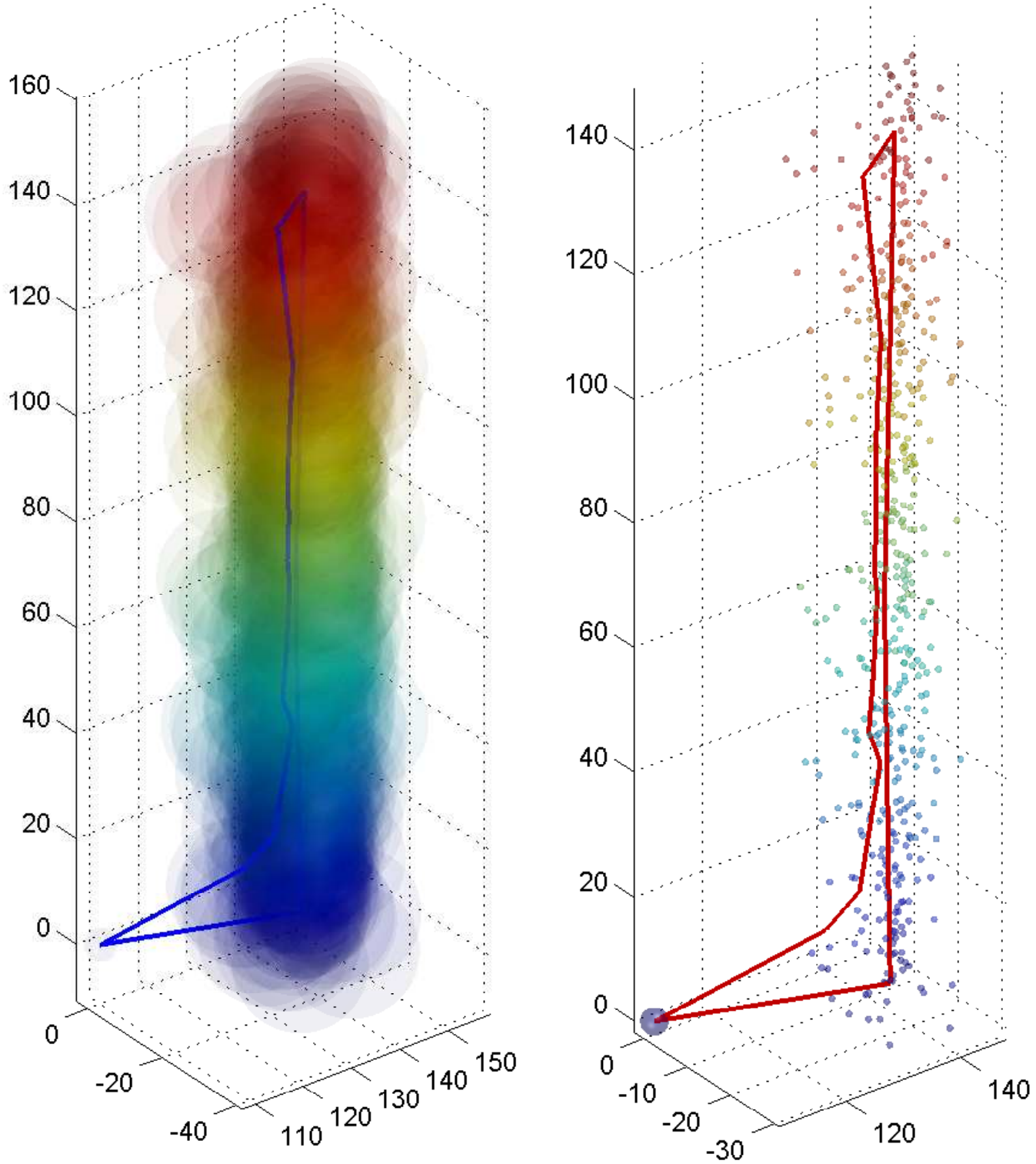


Figure N.87: $d493$, $r = 11.2356$, Equal Radius, 3D, Euclidean, Length = 335.5919249

Table N-90: Solution for $d493$, $r = 11.2356$, Equal Radius, 3D, Euclidean

Total distance: 335.591924884086 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
12.0522953059056	12.469998823261	12.0413366012331	12.37	19.934	15.842
14.895251882511	15.4114909672093	14.881706432631	13.513	22.41	17.465
16.7912982932016	17.3732515700175	16.7760266947523	16.37	26.982	10.968
17.7970321682593	17.8332334058578	18.0922544673314	19.482	21.966	17.833
17.7970321682593	17.8332334058578	18.0922544673314	16.497	24.315	17.876
18.6973107119343	18.2449840265193	19.2704716025641	20.942	25.649	17.701
19.5611308433694	18.6400594684991	20.4009764262962	17.64	23.426	22.454
20.3894317181683	19.0188897625811	21.484994736828	22.974	25.141	19.537
20.3894317181683	19.0188897625811	21.484994736828	26.022	21.902	22.93
21.0644625743866	19.3276208029058	22.3684224207209	29.975	14.141	17.903
21.1480037793237	19.375266426429	22.4941838554638	29.007	26.157	18.195
21.348885379818	19.3786187383595	23.5767810058442	28.245	21.331	19.247
21.348885379818	19.3786187383595	23.5767810058442	26.975	20.061	22.417
21.5849254282265	19.3825578406658	24.8488561872471	29.515	16.505	21.691
21.8475845205758	19.386941301173	26.264389001276	28.626	22.791	23.223
22.1329995974861	19.3917046394976	27.8025599524956	28.181	12.441	28.249
22.388804769846	19.3959732680602	29.1811508233496	21.958	24.76	23.638
22.7254705341889	19.4015926867519	30.9955327782323	31.293	23.68	29.18
23.0619136590144	19.4072082394894	32.8087091379505	20.561	18.219	35.874
23.3715178002222	19.4123756115002	34.4772408414116	18.212	18.283	36.255
23.6725627845831	19.4174002037565	36.0996456649485	20.244	11.234	37.646
23.9554472180545	19.4221215073445	37.6241783269054	26.086	29.903	39.661
24.0416030726048	19.4235594757751	38.0884818172089	20.561	24.696	36.269
24.0416030726048	19.4235594757751	38.0884818172089	25.705	26.22	32.496
24.1440695633917	19.4252698932351	38.6406857858695	33.322	13.361	37.986
24.2157887768607	19.4264659223303	39.0271809438441	18.021	13.52	41.784
24.2849063785092	19.4276185436864	39.3996557979219	31.015	13.816	44.684
24.338141432633	19.4285061651401	39.6865391486122	30.202	13.751	40.213
24.338141432633	19.4285061651401	39.6865391486122	31.015	13.296	40.037
24.3896534383724	19.4293650559694	39.9641369013874	26.149	20.886	38.979
24.3896534383724	19.4293650559694	39.9641369013874	27.8	23.617	42.03
24.4407439796949	19.4302168850295	40.2394632850678	29.975	12.321	39.763
24.4407439796949	19.4302168850295	40.2394632850678	29.975	11.801	40.794
24.4911046132373	19.4310565483897	40.5108560625169	29.134	13.33	42.125
24.4911046132373	19.4310565483897	40.5108560625169	30.787	13.686	41.698
24.5393526962498	19.4318609847247	40.7708642598558	33.96	19.68	39.41
24.5393526962498	19.4318609847247	40.7708642598558	30.785	20.823	44.268
24.5864260534672	19.4326458222882	41.0245417996686	29.261	23.045	43.901
24.5864260534672	19.4326458222882	41.0245417996686	31.483	16.822	46.955
24.6276003187629	19.4333322447623	41.2464291402258	32.372	18.537	39.944
24.6692776638861	19.4340270651639	41.4710276236768	30.785	16.949	44.302
24.7099529873094	19.434705171771	41.6902262436988	33.642	26.22	42.336
24.6629867007488	19.3538520272712	42.0100947541187	27.991	13.647	44.302
24.6629867007488	19.3538520272712	42.0100947541187	29.642	15.108	43.621
24.6178135679785	19.2760857452625	42.3177511292436	24.371	14.346	43.342
24.6178135679785	19.2760857452625	42.3177511292436	25.578	12.568	43.273
24.5738730329371	19.2004414804739	42.6170126923452	30.658	10.98	44.543
24.5342036517954	19.1321495907286	42.8871865776186	25.895	18.918	46.48
24.4950228976885	19.0646988037909	43.1540328056466	32.607	11.313	43.742
23.2553368228251	18.731952921021	46.9660584957952	12.052	18.854	46.124
23.27949517124	18.7187915901309	47.1133004335461	17.069	27.744	45.218
23.3632124410067	18.6731827795441	47.6235826672543	17.64	22.918	47.209
23.4496233980501	18.6261063419853	48.1502855352704	28.753	24.379	51.035
23.5301603120115	18.5822303123786	48.6411805186839	19.609	18.156	48.051
23.6123698056217	18.5374430002338	49.1422715164143	20.117	21.775	51.546
23.6926587376671	18.49370216327	49.6316536329106	33.388	17.584	48.735
23.6926587376671	18.49370216327	49.6316536329106	33.642	18.346	49.307
23.7691489225968	18.4520308672393	50.0978814568292	30.657	15.246	48.98
23.7691489225968	18.4520308672393	50.0978814568292	30.982	15.473	49.591
23.8450192045524	18.4106972568181	50.5603314621583	33.095	12.971	48.557
23.9275116562898	18.3657554549574	51.0631461436246	17.069	27.046	52.438
24.0325772267847	18.3085186378723	51.7035720717488	17.323	23.934	50.146
24.1486952745294	18.2452604317793	52.4113741989137	24.244	21.077	52.586
24.2653000344585	18.1817370992306	53.1221426117796	26.594	18.854	52.883
24.3823215143868	18.1179867470336	53.8354511190868	22.276	13.393	54.239
24.3823215143868	18.1179867470336	53.8354511190868	24.308	16.441	56.035
24.4959499035296	18.056084989388	54.5280747413233	28.626	10.091	52.872
24.613718322459	17.991927492514	55.2459393956896	32.944	10.536	54.126
24.6525791106539	18.0084129556151	56.1526167721518	22.085	10.853	55.182
24.6525791106539	18.0084129556151	56.1526167721518	25.832	14.219	61.701
24.6877190152447	18.0233199934237	56.9724610273916	29.975	14.401	55.717
24.6877190152447	18.0233199934237	56.9724610273916	31.275	14.173	56.999
24.7240588170388	18.0387359661244	57.8203044135808	18.466	17.838	58.207
24.7605579823027	18.0542195375091	58.6718659697701	31.827	14.661	58.532
24.7605579823027	18.0542195375091	58.6718659697701	32.672	15.246	60.724
24.7940606504791	18.0684319259767	59.4535025385439	28.88	27.3	58.991

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.828227231101	18.0829261239834	60.2506305127516	25.197	18.918	59.354
24.828227231101	18.0829261239834	60.2506305127516	26.086	24.95	59.469
24.8638582361029	18.0980415422813	61.0819300222694	28.499	25.141	57.61
24.9042274111151	18.1151669492814	62.0237929155172	28.372	13.52	60.757
24.9042274111151	18.1151669492814	62.0237929155172	30.202	12.971	61.507
24.9470428138092	18.1333299770115	63.0227437838008	19.418	13.901	64.222
24.9889484754366	18.1511070797213	64.0004675907791	32.055	9.837	66.681
24.8574883235548	18.3386834028621	64.4222354379256	25.07	11.615	69.179
24.732026283787	18.5177013841684	64.8247563079153	21.831	13.203	64.85
24.6050457833246	18.6988860634983	65.2321485285012	24.943	18.346	64.008
24.6050457833246	18.6988860634983	65.2321485285012	27.356	20.632	65.916
24.4773680743393	18.8810656178259	65.6417765834168	25.07	27.744	59.542
24.4773680743393	18.8810656178259	65.6417765834168	27.102	25.966	59.543
24.2743856517947	19.1706947442529	66.2930324988778	18.974	24.125	61.119
24.0595312906723	19.4772631269564	66.9823864790417	17.45	24.188	63.322
23.8425695630812	19.786838229819	67.678505330876	22.022	28.443	62.892
23.6105347276493	20.1179200191929	68.4229986370383	22.466	28.887	64.369
23.3708889425056	20.4598610223394	69.1919225982837	13.005	20.061	68.646
23.1665217810919	20.7514645383904	69.8476382312667	18.72	30.665	66.986
23.1037137757948	20.7419234499991	70.5250122170013	24.943	23.68	69.938
23.040240628289	20.7322813247095	71.2095595344669	22.974	17.711	70.862
22.9764763557585	20.7225949955855	71.8972465563322	27.546	26.982	70.094
22.908915429494	20.7123321144178	72.6258813388719	25.832	27.998	69.522
22.8336755324674	20.7009031840852	73.4373359472036	24.562	26.982	72.259
22.7563206756236	20.6891530425472	74.2716003432825	11.862	17.965	73.909
22.7717505311394	20.698481124077	74.8750487893265	19.164	24.696	74.306
22.7872939680283	20.7078778639824	75.4829386157597	21.958	29.395	74.461
22.8031606344764	20.7174700426557	76.1034689138787	19.863	21.331	75.529
22.8031606344764	20.7174700426557	76.1034689138787	17.45	21.902	76.475
22.8190623691528	20.7270833791046	76.7253682160294	17.64	27.49	72.733
22.8381754814704	20.738638890911	77.472883816798	23.482	22.41	74.725
22.8583607360065	20.7508429626529	78.2623423239345	26.911	22.601	75.564
22.8798616688687	20.7638429860388	79.103273277151	27.102	21.648	79.965
22.9011516356491	20.7767154445013	79.9359523591928	31.356	26.03	76.034
22.9498214726127	20.806155635944	81.839861882355	32.118	27.3	81.725
22.9387262213644	20.7936951058395	83.5808915594079	29.975	13.621	83.535
22.9271997434195	20.7807526879038	85.3892847944158	26.911	14.409	89.199
22.9177274087625	20.7701112944075	86.8760371877506	28.245	22.855	90.204
22.9092455883206	20.7605796068909	88.2076782796565	27.546	22.537	91.326
22.9014781757637	20.7518486170967	89.4274079616011	25.895	20.759	90.426
22.8938180044874	20.7432377369757	90.6303483636246	24.943	18.791	91.664
22.8862757038938	20.7347588883138	91.8148342062586	23.482	9.52	92.151
22.8796013668094	20.7778077688574	92.4638058742303	26.149	23.172	91.657
22.8728222954518	20.8215316339315	93.1229548799851	29.134	22.537	96.334
22.8665388592561	20.8620641895621	93.7339757561481	19.545	25.839	93.739
22.8602793850159	20.9024424744056	94.3426702628807	17.577	25.204	95.05
22.8541634769292	20.9418962042862	94.9374223736985	25.832	16.949	91.413
22.847587711894	20.9843129750961	95.5768528317922	28.054	22.918	87.821
22.8382722197566	21.0443783260475	96.4824253498177	24.752	19.362	96.308
22.8289377145001	21.1045686556335	97.3898728221786	12.243	20.505	94.648
22.8080456821456	21.2391243756825	99.4190529134978	22.212	10.091	100.44
22.8022335490712	21.2765937218393	99.9841397339699	20.561	25.776	90.646
22.7876585464535	21.3705405786839	101.40096516267	11.608	20.251	101.424
22.788089287086	21.3996411719821	101.832470496195	18.91	28.697	98.028
22.7885543205003	21.4310444544071	102.298120441515	27.229	27.554	96.447
22.7891118824047	21.4686347000533	102.855512721681	25.006	24.188	94.535
22.7898326075852	21.5170872470327	103.573976177212	18.148	16.505	99.59
22.7906434470308	21.5715230648431	104.38116232887	16.688	18.092	103.09
22.7914787018501	21.6276069565883	105.212785543481	22.276	28.125	102.29
22.7923722146469	21.687550217069	106.101636943117	27.165	25.458	104.784
22.7932901019978	21.7491123164989	107.014492685281	17.323	21.331	107.01
22.7942110707243	21.8108886330526	107.93052401784	28.943	30.03	106.391
22.7952538290145	21.8807032642955	108.965740956998	25.832	23.68	109.484
22.7962952059818	21.9504310203364	109.999669133826	28.943	30.475	107.548
22.7984500830918	22.0922098500494	112.101935853989	30.277	30.475	112.299
22.6565679834246	22.0374583613436	113.671130682011	27.927	21.458	117.97
22.5340620505549	21.9901867717438	115.025957616193	11.735	20.378	116.222
22.4805694209723	21.969548344409	115.617458200648	20.561	23.553	119.319
22.429876042064	21.9499902440684	116.177997071661	18.72	28.189	115.769
22.429876042064	21.9499902440684	116.177997071661	17.64	27.998	119.961
22.383143149733	21.9319603841878	116.694737635888	18.91	22.474	122.979
22.341306026452	21.9158197675274	117.15733253646	27.229	26.22	125.044
22.3120139650769	21.904519592155	117.481200733526	31.502	15.473	118.128
22.2627208086381	21.8887512280392	117.992923289387	20.498	17.457	115.048
22.2109247064835	21.872182629353	118.530630401968	19.99	18.029	118.966
22.1601160834367	21.8559297038984	119.058085829259	24.308	23.998	113.458
22.1043495252645	21.8380913124907	119.637011829882	26.911	24.76	115.286
22.0432839259772	21.8185583391369	120.27094957168	28.88	25.331	116.966
21.9755462440613	21.7968916271171	120.974153303158	27.927	28.125	119.109
21.9021992353196	21.7734309373658	121.735590039579	26.276	20.188	119.025

Solution x	Solution y	Solution z	Original x	Original y	Original z
21.8240429687535	21.7484325553493	122.546954713333	30.594	16.251	121.669
21.7331709512582	21.7193676259796	123.490331952412	27.673	12.695	125.598
21.6798220152444	21.7023015477692	124.044171138949	24.371	15.235	126.557
21.6288175301838	21.6859852466952	124.573671124135	20.371	23.045	124.747
21.5774644370941	21.6695575852882	125.10679069965	20.434	15.806	127.618
21.5280122525843	21.6537379269605	125.620175895631	18.593	21.648	126.239
21.4787096589608	21.6379662289804	126.13200848957	19.037	26.982	129.54
21.432386676428	21.6231473642204	126.612907403011	21.577	21.394	126.294
21.3858901072025	21.6082729787419	127.095608424495	11.481	17.711	124.498
21.27308303726	21.572197172274	128.266689970531	18.974	24.569	127.812
21.1593158823565	21.535813917772	129.447737880791	25.895	29.903	127.854
21.0230001991408	21.4922224033528	130.862876211752	25.451	17.965	131.595
20.8880911652085	21.4490797756463	132.26340990819	20.434	18.537	132.408
20.7528258044189	21.4058233540153	133.667643308009	18.974	29.967	133.455
20.6140265935497	21.3614376708581	135.10856401451	18.72	29.967	135.012
20.4721552557862	21.3160708230332	136.581379685914	22.149	29.713	141.818
20.3790727827168	21.2862995909335	137.547688386448	26.149	27.49	136.669
20.2799877643494	21.2546097304133	138.576313396441	11.163	15.552	141.832
20.5168171815932	21.4159991848545	138.926360471982	18.466	18.664	140.644
20.7586573331238	21.5808032728849	139.28381472651	25.07	30.03	143.44
20.9243341793729	21.6937051511454	139.528691811604	24.879	19.934	139.42
20.9243341793729	21.6937051511454	139.528691811604	27.356	18.473	143.695
21.0807851873826	21.80032001006	139.759933575554	18.529	30.03	146.971
21.4264598612918	21.5541968882959	139.740194304258	19.037	28.189	146.557
21.8511703157935	21.2517996855397	139.715941827015	17.577	13.647	137.156
22.2391746344986	20.9755375709125	139.693785329513	13.576	14.79	138.325
23.7233948261131	19.9187554633433	139.609030695053	18.339	12.631	142.199
27.400179418076	17.3008535189902	139.39902374886	28.245	14.854	144.187
28.2107800388597	16.7236979153564	139.352735461739	29.975	14.661	145.197
29.0121490619242	16.1531150652686	139.306974500688	30.787	14.206	147.62
29.717170983739	15.6511323521227	139.266715408505	31.991	14.092	145.487
29.717170983739	15.6511323521227	139.266715408505	31.892	12.353	146.679
30.3180050162787	15.2233323972488	139.232405962009	33.907	13.556	148.567
30.6698910642785	14.9727864116518	139.212312168311	37.452	10.218	146.804
30.6654306399964	14.9748511657798	139.093063408398	33.769	15.679	145.826
30.6654306399964	14.9748511657798	139.093063408398	33.582	15.473	147.748
30.6606637266841	14.9770577989137	138.965620958919	34.468	20.442	147.277
30.6606637266841	14.9770577989137	138.965620958919	29.975	13.881	149.391
30.645560133767	14.9840496128967	138.561833091575	33.515	20.315	142.968
30.645560133767	14.9840496128967	138.561833091575	34.341	21.013	142.761
30.6285699796887	14.9919147995258	138.107608924056	33.322	15.473	140.664
30.6285699796887	14.9919147995258	138.107608924056	31.356	19.68	141.631
30.6107463127344	15.0001658599058	137.631101333181	34.785	12.504	141.232
30.6107463127344	15.0001658599058	137.631101333181	32.944	15.933	144.54
30.5893292533777	15.0100803986919	137.058526440891	34.404	14.028	139.514
30.5893292533777	15.0100803986919	137.058526440891	33.907	14.336	141.111
30.5657255101391	15.0210071883751	136.427491649484	26.149	15.679	137.044
30.5657255101391	15.0210071883751	136.427491649484	29.007	12.949	137.787
30.541893245224	15.0320397710856	135.790347278763	28.372	14.663	135.085
30.541893245224	15.0320397710856	135.790347278763	29.324	15.489	136.921
30.5183621644655	15.0429329390625	135.161255004528	34.135	11.866	136.659
30.5183621644655	15.0429329390625	135.161255004528	33.907	12.776	139.011
30.4923184835065	15.0549892189272	134.464989431325	29.388	8.313	137.407
30.4923184835065	15.0549892189272	134.464989431325	31.697	11.541	138.673
30.4615769024945	15.0692201311072	133.643125902514	31.356	16.06	129.885
30.4615769024945	15.0692201311072	133.643125902514	30.462	15.473	131.052
30.4340983495734	15.0819406213325	132.908499787597	32.347	14.661	129.857
30.4079730754412	15.094034671941	132.210053309461	36.436	18.918	131.64
30.3819715657938	15.1060714356744	131.514914992222	32.867	14.661	131.697
30.3819715657938	15.1060714356744	131.514914992222	33.127	14.661	132.624
30.355532417351	15.1183107877869	130.808076428058	30.787	12.386	130.829
30.355532417351	15.1183107877869	130.808076428058	30.912	9.901	131.507
30.3292216236942	15.1304907476767	130.104669224477	34.976	10.282	131.121
30.3024590843093	15.1428798319836	129.389184433771	35.547	11.234	131.369
30.3024590843093	15.1428798319836	129.389184433771	34.595	11.996	135.081
30.2690955322372	15.1583245875622	128.497221766185	35.992	13.647	125.389
30.2690955322372	15.1583245875622	128.497221766185	34.595	9.202	128.931
30.2384838589508	15.1724954896015	127.678829348799	32.282	15.473	127.6
30.2080008382123	15.186606832123	126.863876133824	26.594	11.933	126.917
30.1776898763726	15.2006385213603	126.053522637963	28.943	16.886	125.854
30.1476184889359	15.2145593046783	125.249573728393	33.515	18.029	124.645
30.1179227091174	15.2283062168674	124.455666344162	33.322	13.621	122.895
30.1179227091174	15.2283062168674	124.455666344162	33.907	11.996	124.886
30.0892640152217	15.2415730654567	123.689484994247	32.245	24.887	125.449
30.0561972534007	15.2568808087345	122.805451992084	34.341	22.029	122.727
30.0233177688992	15.2721019071099	121.92642481313	34.135	13.946	120.705
30.0233177688992	15.2721019071099	121.92642481313	33.907	13.816	122.673
29.9910120813972	15.2870573929545	121.062737907177	32.087	11.313	118.866
29.9910120813972	15.2870573929545	121.062737907177	33.322	13.101	119.477
29.9613816741819	15.3007744164535	120.270574521094	27.927	12.568	120.417

Solution x	Solution y	Solution z	Original x	Original y	Original z
29.9318221228851	15.3144586359209	119.480305351351	22.149	14.282	119.226
29.9318221228851	15.3144586359209	119.480305351351	25.133	19.235	120.496
29.9023242220219	15.3281142893405	118.691685247881	28.054	17.013	121.063
29.9023242220219	15.3281142893405	118.691685247881	27.102	18.664	121.623
29.8699999298412	15.3430783363894	117.827500906937	33.907	14.791	115.865
29.8391500809655	15.3573598355376	117.00273634606	29.578	18.791	116.421
29.8391500809655	15.3573598355376	117.00273634606	31.991	16.632	118.575
29.8081256096895	15.3717221550011	116.173303096685	25.197	12.441	114.729
29.8081256096895	15.3717221550011	116.173303096685	27.229	15.362	116.263
29.7785925211791	15.3853940730536	115.383741915564	29.975	13.101	114.777
29.7785925211791	15.3853940730536	115.383741915564	32.217	14.433	117.304
29.7483678387504	15.3993861317488	114.575690344262	31.015	14.076	113.16
29.7189714910637	15.4129947285592	113.7897842694	30.982	12.126	111.418
29.69102331451	15.4259329249325	113.042595043934	32.347	11.313	110.138
29.6648400812728	15.4380540687709	112.342591399129	35.103	10.155	111.634
29.6648400812728	15.4380540687709	112.342591399129	33.907	12.516	116.73
29.6364299893411	15.451206077499	111.583051452566	34.135	13.426	109.486
29.6364299893411	15.451206077499	111.583051452566	33.452	15.246	111.765
29.609339179498	15.4637473460306	110.858782435778	31.047	14.661	110.232
29.609339179498	15.4637473460306	110.858782435778	31.632	12.353	111.341
29.582338623036	15.4762468321191	110.136926171512	27.292	16.632	106.393
29.582338623036	15.4762468321191	110.136926171512	26.022	12.631	109.182
29.5573744737191	15.4878036060778	109.469512966947	26.086	14.663	104.115
29.5573744737191	15.4878036060778	109.469512966947	24.879	20.632	106.077
29.5364928612641	15.4974704373901	108.911246325099	31.293	15.806	105.367
29.5364928612641	15.4974704373901	108.911246325099	29.642	17.076	106.306
29.5170838654844	15.5064555402086	108.392349862817	31.372	15.246	104.804
29.4986554061422	15.514986711649	107.899667871741	34.595	18.791	106.414
29.4986554061422	15.514986711649	107.899667871741	34.722	18.219	109.051
29.4803376001214	15.5234666690858	107.409943913833	32.309	19.553	108.506
29.4803376001214	15.5234666690858	107.409943913833	30.975	17.076	111.068
29.4608894620208	15.5324699137939	106.890000353071	28.753	23.998	106.929
29.4414365901488	15.5414753822431	106.369930074856	27.229	19.616	102.004
29.4234073624452	15.5498217856396	105.887920712264	27.991	22.601	101.939
29.4234073624452	15.5498217856396	105.887920712264	29.07	22.347	101.831
29.4080783818131	15.5569181377109	105.478102050958	30.202	14.011	102.151
29.4080783818131	15.5569181377109	105.478102050958	28.753	13.838	102.669
29.3936280988583	15.5636077011369	105.091775166695	31.177	11.541	103.36
29.3936280988583	15.5636077011369	105.091775166695	29.975	13.361	103.951
29.3795338216346	15.5701324536481	104.714965964677	29.197	12.441	103.553
29.3656616909805	15.5765543614443	104.344095738476	29.388	11.804	105.494
29.3656616909805	15.5765543614443	104.344095738476	29.578	13.203	105.988
29.351536897488	15.5830932346124	103.966470381258	30.721	9.329	106.333
29.3370566145378	15.5897966746155	103.579340890395	30.34	9.647	108.046
29.3216953577633	15.5969079487922	103.168658403201	31.275	12.613	107.178
29.3216953577633	15.5969079487922	103.168658403201	32.477	11.541	107.287
29.3050407735073	15.6046179469216	102.723398353956	32.932	12.353	108.278
29.2869655001977	15.6129856340847	102.240155716925	35.674	11.044	107.474
29.2869655001977	15.6129856340847	102.240155716925	34.722	11.742	108.413
29.2609860851726	15.6250124084828	101.545590339988	34.135	12.126	105.614
29.2609860851726	15.6250124084828	101.545590339988	33.095	12.711	107.498
29.2281508456314	15.640212879253	100.667727546769	33.322	12.581	100.045
29.2281508456314	15.640212879253	100.667727546769	31.957	14.433	102.967
29.1951921797931	15.6554704649192	99.78656430825	32.802	15.473	97.861
29.1637894337114	15.6700077752034	98.9469999602075	29.515	14.028	97.711
29.1637894337114	15.6700077752034	98.9469999602075	31.737	12.885	98.954
29.1335128643739	15.6840237345272	98.1375442267371	27.419	11.298	96.166
29.1335128643739	15.6840237345272	98.1375442267371	28.753	12.949	99.196
29.1045518977996	15.6974306603934	97.363261666459	33.071	18.346	97.156
29.1045518977996	15.6974306603934	97.363261666459	32.817	17.775	101.585
29.0729199484639	15.7120740061704	96.5175667907255	30.202	14.791	95.605
29.0729199484639	15.7120740061704	96.5175667907255	33.322	12.321	95.076
29.0432788238927	15.7257957506584	95.7250984107577	30.527	11.313	94.769
29.0432788238927	15.7257957506584	95.7250984107577	30.202	13.231	95.497
29.0146899674802	15.7390303609313	94.9607629157866	29.261	11.425	96.137
28.9856110297584	15.7524918320709	94.1833241572926	25.705	12.123	93.472
28.9573287511313	15.7655845013664	93.4271846062097	31.547	13.203	92.722
28.9296436801879	15.7784006983821	92.6870117189398	31.697	14.433	93.007
28.9296436801879	15.7784006983821	92.6870117189398	32.412	12.353	94.929
28.9009198658322	15.7916977325074	91.9190661757783	34.849	13.393	93.121
28.8714868796031	15.8053230466384	91.1321594261004	31.957	11.541	90.999
28.8714868796031	15.8053230466384	91.1321594261004	32.737	11.541	92.508
28.8417721084862	15.8190787826526	90.3377179200483	30.722	15.473	90.573
28.8121941550137	15.8327711718728	89.5469339291083	29.975	14.921	90.476
28.7823887394143	15.8465688479728	88.7500679110491	30.34	10.917	88.584
28.7823887394143	15.8465688479728	88.7500679110491	29.975	12.841	90.667
28.7521355407305	15.8605737980407	87.9412287894158	32.412	15.246	88.024
28.7521355407305	15.8605737980407	87.9412287894158	32.542	15.473	89.387
28.7211849804197	15.8749015451822	87.1137434341004	34.135	14.986	84.727
28.7211849804197	15.8749015451822	87.1137434341004	34.135	12.646	86.486

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.6923607438979	15.8882449658174	86.3431068745156	32.737	14.433	86.615
28.6634507571081	15.9016280740775	85.5701769826171	29.388	13.838	84.576
28.6352324769392	15.9146909759677	84.8157402790009	35.42	12.949	84.367
28.6072481150585	15.9276455855268	84.0675565135602	33.907	13.296	83.348
28.6072481150585	15.9276455855268	84.0675565135602	34.135	14.466	84.176
28.579621708942	15.9404344754831	83.3289418247806	32.152	12.353	82.503
28.579621708942	15.9404344754831	83.3289418247806	31.015	13.556	83.741
28.5523573058229	15.95305577775	82.6000046215955	32.672	12.353	81.337
28.5258107762297	15.9653447568316	81.8902602683075	27.737	18.664	80.683
28.4999182261237	15.9773309871477	81.198000323617	26.721	18.283	80.536
28.4745259056561	15.9890856435227	80.5191141423104	33.071	16.187	80.531
28.4745259056561	15.9890856435227	80.5191141423104	34.135	13.166	82.509
28.4478750257388	16.0014228924847	79.8065767608372	32.835	14.173	77.958
28.4478750257388	16.0014228924847	79.8065767608372	33.062	15.473	78.089
28.4229781969765	16.0129481492398	79.140935993987	32.802	12.126	77.71
28.3987270349087	16.0241745070305	78.4925576063072	31.047	11.313	78.28
28.3987270349087	16.0241745070305	78.4925576063072	31.437	11.541	78.241
28.3745959142976	16.0353452785806	77.8473874950855	28.626	11.234	75.345
28.3745959142976	16.0353452785806	77.8473874950855	29.007	10.282	76.107
28.3523844745977	16.0456273812552	77.2535425419535	29.975	12.581	76.539
28.3523844745977	16.0456273812552	77.2535425419535	30.787	12.906	76.252
28.330820860027	16.0556095833245	76.677017563009	28.816	21.902	78.963
28.3082392735511	16.0660630162229	76.0732744874865	37.452	12.758	72.01
28.2910805678141	16.0740061179012	75.6145140529185	30.787	12.646	75.914
28.2739352757222	16.0819430095697	75.1561120680169	27.483	19.616	74.587
28.2739352757222	16.0819430095697	75.1561120680169	26.848	19.743	76.594
28.2567793453797	16.0898848096253	74.6974247391365	31.502	12.126	74.715
28.2567793453797	16.0898848096253	74.6974247391365	32.282	12.126	74.654
28.2397270143732	16.0977786494886	74.2415070217829	32.835	12.613	75.794
28.22235258115	16.1058215953059	73.7769769476559	32.087	14.661	75.705
28.22235258115	16.1058215953059	73.7769769476559	32.477	14.433	75.823
28.2042700453838	16.1141923305611	73.2935137695226	30.202	14.271	77.775
28.2042700453838	16.1141923305611	73.2935137695226	30.787	14.466	78.121
28.1837025808896	16.1237133891221	72.7436089965812	32.182	16.632	75.383
28.1623705545896	16.133588372378	72.1732613096268	30.531	18.664	72.004
28.1623705545896	16.133588372378	72.1732613096268	33.261	18.537	71.995
28.1413233752872	16.1433314772185	71.6105293357273	29.705	19.426	70.279
28.120828532568	16.1528188870284	71.0625653979668	29.261	19.172	68.315
28.1013177776435	16.1618507389655	70.540913666199	31.356	16.251	69.04
28.1013177776435	16.1618507389655	70.540913666199	30.785	16.251	71.611
28.08209341966	16.1707500027235	70.0269193033683	28.816	12.568	71.763
28.08209341966	16.1707500027235	70.0269193033683	31.015	12.776	72.117
28.0618750835054	16.1801093941034	69.4863474479498	31.307	11.313	71.461
28.0618750835054	16.1801093941034	69.4863474479498	29.197	13.52	74.598
28.0390820023993	16.1906606610336	68.876931279537	30.202	12.711	66.602
28.0172297563863	16.2007764051762	68.292671077143	28.753	13.457	65.491
27.9964328188925	16.210403632007	67.7366276066324	31.437	14.433	67.041
27.9964328188925	16.210403632007	67.7366276066324	31.307	14.661	68.868
27.9754325449574	16.2201249766897	67.1751464393687	30.594	17.076	65.103
27.9754325449574	16.2201249766897	67.1751464393687	31.991	17.203	67.188
27.9550311029188	16.2295690914937	66.6296761800391	34.087	18.918	64.082
27.9550311029188	16.2295690914937	66.6296761800391	31.762	15.473	67.554
27.9352317611368	16.2387344637348	66.100303954248	34.849	11.996	64.173
27.9352317611368	16.2387344637348	66.100303954248	35.484	11.425	66.484
27.9155565818169	16.2478423315468	65.5742490337164	17.323	12.504	65.716
27.9077808737295	16.2875876717726	64.181836081355	33.095	14.011	61.011
27.9007436435195	16.3235569750491	62.9217099256417	33.96	11.234	59.829
27.8945228142695	16.3553523376074	61.8078090775044	30.202	11.996	64.142
27.8878706592172	16.3893535749378	60.6166267415004	31.015	12.516	61.408
27.8810642256129	16.4241440289367	59.3977938360692	33.387	11.313	58.128
27.8745604146333	16.4573872629727	58.2331638484463	30.658	9.71	56.048
27.8685551831711	16.4880810677715	57.1578481573731	36.944	13.012	57.936
27.8622217586103	16.5204541749373	56.0236954833064	31.356	22.347	59.353
27.8549445293267	16.5576543068844	54.7204325810099	33.322	14.141	54.817
27.8476952456269	16.5947117546864	53.4221670306013	32.607	14.661	52.963
27.8476952456269	16.5947117546864	53.4221670306013	32.69	13.52	54.423
27.8404387034245	16.6318067623189	52.1225831764817	34.135	14.206	54.088
27.8326955363214	16.6713908430715	50.7357954137985	36.119	13.139	51.404
27.8247000438007	16.7122660343932	49.3037711231839	33.907	13.036	49.61
27.8167008491171	16.7531602842665	47.8710770330645	33.322	13.881	49.4
27.80835640187	16.7958204821738	46.3765125456542	25.07	17.076	49.249
27.7993185476957	16.8420279922144	44.7576693922693	27.737	16.251	47.666
27.7895664555274	16.8918894378382	43.010812069324	28.499	12.949	46.85
27.7785015917526	16.9484669373049	41.0286645808959	33.642	10.155	35.22
27.7746513573467	16.9681478984495	40.3391460697171	26.34	17.203	39.025
27.7709406531445	16.987115282708	39.6746271328889	32.217	11.541	36.145
27.7675538225438	17.0044265834932	39.068128713158	33.095	13.491	38.538
27.7642058834883	17.021539042519	38.4685960667275	32.372	14.092	41.845
27.7606304644643	17.0398149476998	37.8283000897417	33.095	13.231	40.765
27.7568193635223	17.059296290061	37.1457693476308	31.567	14.661	34.796

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.7531871358711	17.0778628645808	36.4952877609684	27.419	15.044	35.984
27.7496112076963	17.0961415711366	35.854891453048	34.135	14.726	38.301
27.7458347357716	17.1154460943282	35.1785533697125	32.436	13.231	35.38
27.7420503233929	17.1347913352853	34.5007879341372	33.095	14.271	36.737
27.738092042373	17.155025930883	33.7918619791286	36.436	17.076	35.413
27.7339127028243	17.1763914013121	33.0433132753528	31.61	17.775	32.188
27.7339127028243	17.1763914013121	33.0433132753528	29.261	22.283	32.908
27.72985878753	17.1971154930252	32.3172341383289	30.023	17.203	33.037
27.7257679260575	17.2180286341938	31.5845304558988	19.482	13.076	31.528
27.7257679260575	17.2180286341938	31.5845304558988	24.308	15.044	33.546
27.7215269692229	17.239709682258	30.8249178019802	27.927	10.409	29.559
27.7215269692229	17.239709682258	30.8249178019802	30.15	16.06	32.059
27.7172882713677	17.2613794934194	30.0656962318012	29.007	14.409	30.293
27.7130241757754	17.2831793629971	29.3019167055795	24.244	15.997	28.696
27.7088195663743	17.3046750670746	28.5487932957568	28.372	10.218	25.305
27.7088195663743	17.3046750670746	28.5487932957568	30.594	9.52	26.782
27.7050966284939	17.3237074911065	27.881972130838	28.689	21.013	29.015
27.7012946765818	17.3431442921455	27.2009807588912	25.832	22.918	24.535
27.6977599512621	17.3612142471195	26.567879435574	29.705	13.393	23.437
27.6944071051636	17.3783539621145	25.9673710712501	33.322	14.401	29.372
27.6907785047023	17.3969044506731	25.3174304588333	34.087	11.615	26.904
27.6869282961414	17.4165889092778	24.6277548136128	35.992	16.314	18.057
27.6848975585373	17.4269697452085	24.2640531725945	32.944	17.965	22.768
27.6829035274205	17.4371627931073	23.9069307210477	28.816	12.25	22.231
27.6829035274205	17.4371627931073	23.9069307210477	30.202	12.451	21.726
27.6809856496588	17.4469663475305	23.5634549195211	31.61	13.901	20.326
27.6809856496588	17.4469663475305	23.5634549195211	32.867	11.313	21.273
27.6792017338716	17.456084640063	23.2439887145348	32.152	15.246	27.742
27.6792017338716	17.456084640063	23.2439887145348	32.022	15.473	29.854
27.6771028312242	17.4668142757931	22.86806280107	30.202	13.491	28.883
27.6771028312242	17.4668142757931	22.86806280107	30.787	13.946	28.148
27.6746133144601	17.4795422181863	22.4221177546766	33.907	14.076	24.403
27.6720389838206	17.4927040772997	21.960968066732	33.062	12.126	22.872
27.6720389838206	17.4927040772997	21.960968066732	33.96	10.536	22.989
27.669305171021	17.5066820744564	21.4712187364144	33.833	10.282	23.21
27.669305171021	17.5066820744564	21.4712187364144	35.293	11.552	21.184
27.6663468834224	17.5218091398771	20.9412009447414	31.827	11.313	19.849
27.6634354745264	17.5366963721132	20.4195861301236	30.657	11.541	18.351
27.6634354745264	17.5366963721132	20.4195861301236	32.182	10.98	18.901
27.660683714636	17.55076674557	19.9265927782351	33.515	18.219	27.24
27.6571415558853	17.5688815321917	19.2918809402532	30.787	13.426	19.207
27.6535945575108	17.5870211325666	18.6562986946149	26.149	11.107	19.141
27.6499991460397	17.6054085884601	18.012030259238	22.022	11.361	19.929
27.6461862370912	17.6249088860769	17.3287653663173	25.895	12.123	19.556
27.6421945019289	17.6453243520365	16.6134309220715	31.242	15.473	19.727
27.6379359195793	17.6671057978778	15.8502285568228	31.242	12.126	17.355
27.6334796737044	17.6898992170186	15.0515628645188	31.762	12.126	11.712
27.62933339431	17.7111065708733	14.3084718938846	34.135	13.686	10.417
27.6255865978322	17.7302699549413	13.6370012711946	32.932	15.246	4.376
27.6246887176901	17.7348598841676	13.4761834046748	31.177	14.433	6.693
27.6238362411621	17.7392174535961	13.3235074713678	31.102	17.775	23.735
27.6120824157317	17.7993560986311	11.2165776186567	35.166	10.726	7.803
27.6089149129751	17.8155646422398	10.6486251323043	29.975	12.061	16.621
27.6052945258163	17.8340918263116	9.99942562316821	34.087	8.758	8.639
27.5875690731839	17.8621099004693	9.84863829834954	27.864	18.854	16.375
27.5875690731839	17.8621099004693	9.84863829834954	28.689	18.156	16.722
27.568221493552	17.8926921006702	9.68405272048476	31.372	12.353	15.396
27.5474502351396	17.9255247279277	9.5073569208878	24.625	19.68	11.726
27.5474502351396	17.9255247279277	9.5073569208878	28.118	18.092	12.931
27.5262866944309	17.958977417745	9.32732347608394	31.632	15.246	15.179
27.5262866944309	17.958977417745	9.32732347608394	33.095	13.751	14.049
27.5023811777482	17.9967643928041	9.12396626660205	29.134	16.187	10.819
27.4782109072672	18.0349698585706	8.9183567556798	29.959	17.584	8.664
27.4782109072672	18.0349698585706	8.9183567556798	31.112	15.246	13.662
27.4529546956522	18.0748918588098	8.70350964753477	31.015	13.036	5.79
27.4279999756517	18.114337268942	8.49122685123369	29.451	10.155	5.592
27.4032522022865	18.153455551298	8.28070418002557	28.753	10.79	11.577
27.4032522022865	18.153455551298	8.28070418002557	30.787	11.313	10.711
27.3756227118935	18.197129054051	8.04566891208674	32.022	12.126	9.107
27.3756227118935	18.197129054051	8.04566891208674	33.647	11.313	7.765
27.3455697380629	18.244633436574	7.79001898132341	34.135	12.386	7.828
27.3140746555412	18.294417415998	7.52210227765169	33.452	11.541	6.941
27.2811403429904	18.3464764516024	7.2419432526708	32.997	11.541	6.26
27.2469565215398	18.4005106504391	6.9511557377299	32.542	12.126	4.969
27.2469565215398	18.4005106504391	6.9511557377299	33.322	12.841	4.069
27.212066773142	18.4556607606986	6.65436348287982	34.135	12.906	3.426
27.1771448273205	18.510861782182	6.35729720776584	33.127	11.313	0.11
27.066307509689	18.654342372645	6.23162456206074	31.567	11.313	0.396
26.9477557074271	18.807809460167	6.09720481039635	30.787	13.166	3.014
26.9477557074271	18.807809460167	6.09720481039635	31.399	13.754	2.704

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.823100200809	18.9691779164411	5.95586445102553	28.308	15.933	3.524
26.823100200809	18.9691779164411	5.95586445102553	31.892	15.246	4.139
26.6944685991147	19.1356935165248	5.8100158391365	32.69	18.346	2.359
26.6944685991147	19.1356935165248	5.8100158391365	31.42	27.173	7.305
26.571161766855	19.2953158697354	5.67020421427008	29.07	29.713	2.284
26.1160785260527	18.9648274845086	5.57309622120835	25.959	27.744	8.296
25.5756426302293	18.5723556768703	5.45777442452915	20.117	27.617	1.782
24.7193203166404	17.9505125971176	5.27504176826935	26.149	19.045	2.783
23.8351587005654	17.3084538661902	5.08636791238559	24.943	19.108	0.303
22.9262241624307	16.6484064013908	4.8924071098151	23.355	23.553	9.247
21.793591674482	15.8259168419823	4.65070869591187	20.117	22.728	3.645
20.5460154245722	14.9199588697949	4.38448052324305	25.07	16.314	3.298
19.0991309207623	13.8692698378827	4.07571932964581	20.117	18.283	2.485
17.4805557171783	12.693903288015	3.7303197210565	22.149	11.742	1.36
15.6282354640443	11.3487982843548	3.33504021036474	20.434	13.012	7.24
13.0540281217147	9.47948015857367	2.78571029923572	18.466	14.155	8.671

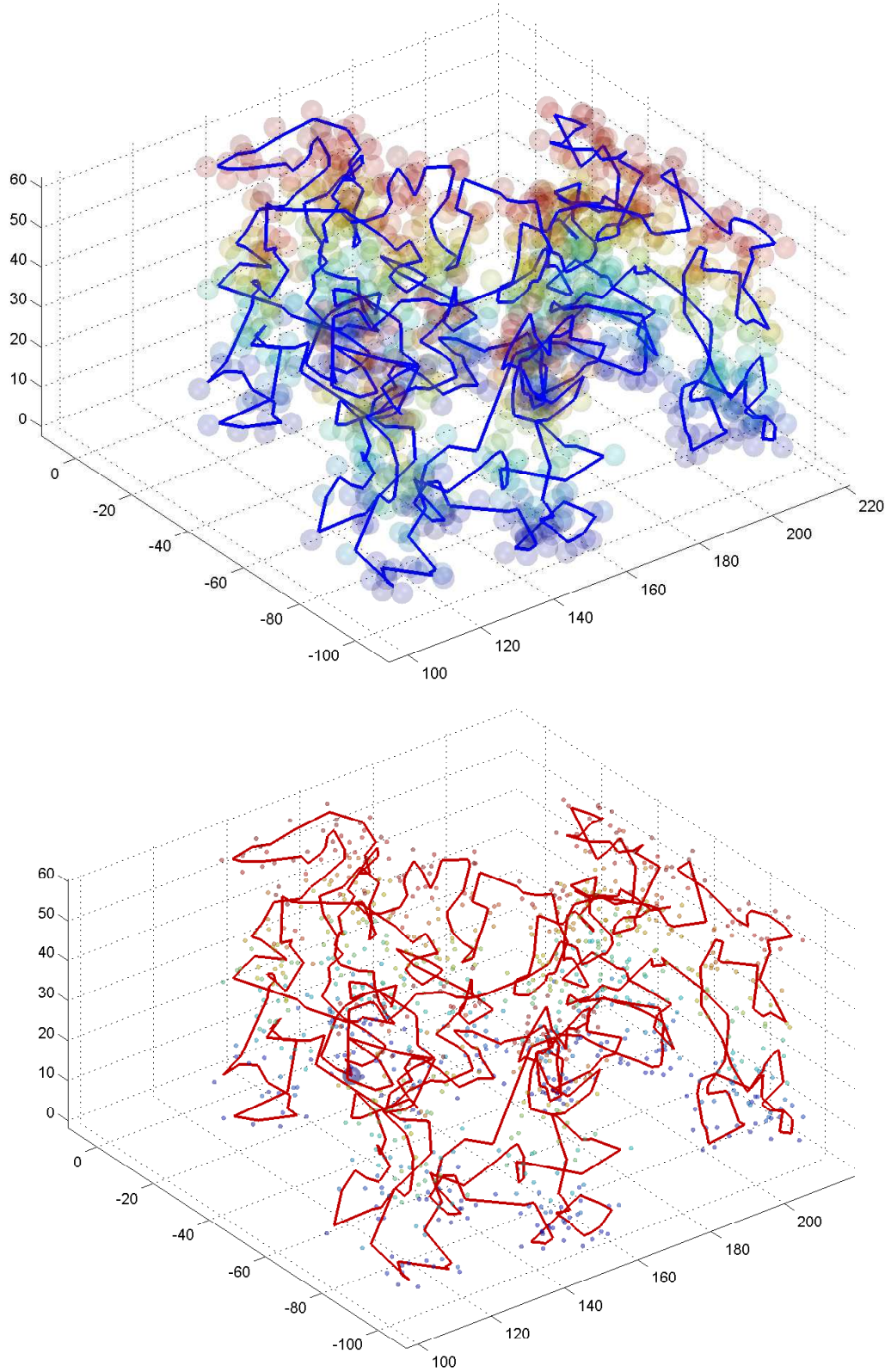


Figure N.88: $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Euclidean, Length = 3147.8652319

Table N-91: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Euclidean

Total distance: 3147.86523193103 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
44.9471708834168	9.19745841118172	1.28191312929757	42.7704	10.2739	1.2183
43.8508014118154	5.23752455638501	2.82460813482202	42.4139	3.5597	1.814
47.3306641691155	4.95790846429452	9.02193412964186	47.0712	4.3382	9.7807
48.464743925993	4.86678429891747	11.0416282450107	48.4975	2.4432	11.2037
48.5502977359787	4.89635885737534	11.1924297069544	48.302	2.6164	11.9932
50.0526341015476	5.82183901522537	13.6112493537657	48.7027	4.8736	15.3944
53.9761642425676	8.34053696833201	16.4779630270933	53.1154	7.9184	18.71
59.4556430332835	11.7525563565705	18.1668908779654	61.7542	11.527	18.9198
55.2231148409138	15.7072216073728	16.68558162422	53.4554	15.0784	17.1477
54.5796923481034	16.3083976560531	16.4603986579337	53.9046	16.3668	14.1276
52.5047452560217	19.2099467665886	19.2613703394515	53.2794	21.4994	19.0176
51.8392360035208	19.1114974894991	19.9150641004013	49.9971	19.9155	18.5508
49.8908240471633	18.4652465207336	22.8843346743991	51.6732	17.1776	23.9169
49.4528614221663	18.3737789990354	23.4444256184453	49.9475	19.2284	25.6639
47.9255279658744	17.4369372697174	23.0523432952754	47.2412	18.0641	21.8927
46.983812896609	16.8593022784295	22.8105908053945	48.0446	14.6778	22.9405
46.4068798148196	16.6296438046343	22.6687286381559	46.6598	16.011	21.0885
45.9273897684743	16.4387731025366	22.5508261529676	45.8725	14.3747	21.2711
43.9940630126732	17.2993067379714	23.0862324604157	44.3034	16.6265	25.3299
42.3330071487971	18.0386564085426	23.5462203028402	40.715	18.8306	21.9165
41.6197956552242	18.1983055570782	28.3141569537655	40.2335	17.1357	30.0024
44.2413786340409	20.7439221697104	28.0815429454548	45.9242	19.9	29.6168
46.8629212661494	26.0246932430222	25.98947635812	45.985	27.4123	27.7797
47.8425234392508	27.5509922784778	25.0533997676079	47.7428	26.438	23.4687
49.5218261877422	30.1674793460293	23.4487195602131	50.5738	30.8854	25.5173
50.0881247962771	31.0866487875894	22.7846831573172	52.5136	31.162	22.8965
49.0756444042196	32.6889854863062	21.4874215374419	50.3723	32.2399	19.4829
46.1521579548938	36.6009194839105	19.3761926118227	43.7884	36.8808	19.8614
48.6144098546175	39.5988652314158	16.369484270168	50.3352	41.2014	16.9793
46.602442219714	38.5395459968119	11.1744883471196	45.4903	38.3462	11.2293
45.6778178638828	38.0527267211231	8.7870615651403	45.4526	36.121	9.3446
44.3633382765476	37.3606505980863	5.39300160500252	44.3651	39.5082	4.2576
43.771307843414	36.2748580256554	4.27546470246391	45.6407	35.658	2.8521
42.6977210030721	35.5894788707069	3.82023995806396	42.8212	36.4305	1.5446
39.8422786209022	33.5447607744077	3.28688893714661	37.4272	33.8061	3.3013
43.0667726860009	29.9600751938264	2.51098895933913	44.1303	30.8739	2.5661
46.0580561220568	26.6346429808272	1.79120448288184	47.5893	27.8934	1.3329
47.5220742583463	25.0070824700352	1.43892205844888	46.7163	23.0055	0.3229
52.0023221854715	25.1093457872099	2.65887444189207	54.0368	23.8586	2.2143
50.5758997636836	29.021251859718	5.30686356823273	50.8592	31.2824	4.4654
49.0142697547795	28.3655169803388	8.71883183108772	46.7677	27.4481	8.8301
50.3508469318422	28.8983221048184	11.0530354290409	49.5432	29.0024	13.3417
53.2433051683893	29.3353070203604	9.88703068193337	54.5895	27.7676	11.1642
54.0554422117492	29.8556799405567	9.15100374777055	53.915	28.4629	8.3577
55.046294219079	30.4905630993099	8.25300951326992	54.8257	29.6059	7.5612
56.1365448976315	31.1891353663048	7.26493198761359	57.9508	29.6187	7.6435
58.986979304017	34.734339344293	3.40942788138767	58.126	35.24	1.1949
62.998157357544	36.4445913418862	5.01130248731269	62.6603	37.129	7.3175
66.6704038130471	37.1902882411033	4.06165115459716	68.0366	38.8903	2.9918
66.7775572604951	35.9194001287285	4.68503453357844	66.9624	36.7077	4.2616
67.0745895552123	32.3965660080013	6.41302315328072	68.3701	31.308	4.6701
67.0406631790661	31.9493039945714	6.76791369849706	67.6588	29.7348	5.9837
66.4980744359136	32.1663442292702	8.40292852270107	67.4673	33.2544	9.192
66.1921755286132	32.2887196297677	9.32472744166589	66.5887	34.1226	10.8677
65.3102720371659	30.8633179059705	9.5389177160243	63.2951	31.2899	8.2512
64.4155753169261	25.7453535451545	11.5275674432072	63.3607	23.5913	11.9128
66.0684500243728	27.6334740634651	11.6748807773758	66.7482	27.6121	12.1372
67.1366533364536	28.8537124172866	11.7700885570547	66.7818	30.0369	13.8618
68.1685453688776	29.4570277447109	11.0928933406696	68.2062	28.5319	10.0866
69.1081681653166	30.0063957561146	10.4762518925311	69.1853	30.9522	12.1629
71.4550407263566	31.3785364020336	8.93607507456282	71.5231	31.8286	8.0149
72.485043913679	31.9807473023012	8.26012150455886	72.2401	34.2889	7.5435
74.2782302390853	30.9543012557391	7.82596925369706	73.7989	28.6287	7.3132
79.622186963274	31.8625949133102	7.49175150431066	79.7169	32.9378	5.3155
84.435610702715	31.9565459866558	8.67472328857641	85.525	32.0217	10.845
85.3510714009385	31.9191678121493	6.50536711258289	86.512	33.4131	7.017
86.5253728761515	31.8712084363305	3.72264443431486	85.1876	33.113	2.1197
87.2941275626666	31.4836067647539	3.33310528815896	87.5726	32.8781	1.3636
90.4699314076731	28.8810692766803	2.91673849372541	90.6179	26.4649	2.7134
92.9800763579161	31.5403402438284	2.96568505536619	93.4265	31.4744	1.0443
94.0838405930247	32.7096798265923	2.98720291444365	96.3928	32.1668	2.4627
93.21707841669	36.1305067814709	3.79703821298826	91.1655	36.0648	5.0962
94.1736653186109	39.6523627406393	3.45532552457596	92.634	40.1716	1.8791
94.3757357687402	40.3963189559744	3.3831451989532	95.8598	39.2349	3.852
95.2021272251048	43.4387939568549	3.08795820011634	96.6284	43.246	1.131
95.4711126450632	46.6540697627872	3.58343840305802	95.7654	46.8722	1.8076

Solution x	Solution y	Solution z	Original x	Original y	Original z
95.7853704451709	50.4105082700318	4.16231659378733	98.2004	50.3921	3.9008
95.6783908378082	53.5923427988934	4.69258545877796	96.8097	54.0588	2.5941
95.5409041214728	55.7205669288142	5.17236255675175	93.2379	56.4517	4.9219
96.576350368534	57.1461651232158	5.70134977174822	95.9041	59.3009	4.8034
96.9636699583145	57.1560620555243	5.99343430840123	98.8606	57.9963	4.7298
97.8681287968306	56.5613464548055	8.77752714912805	97.3108	57.82	10.7791
98.3218954013406	55.9184358536641	8.73890986129066	98.9521	56.5952	10.596
99.257626158045	54.5926566437911	8.65928459225384	98.2152	53.7701	7.2972
99.9881314263916	53.5576541945938	8.59712132460868	100.6388	53.8259	6.8403
100.512458825668	52.8147710189373	8.55250007657756	100.3439	52.2486	6.1962
101.195787588288	51.9950443054897	8.93149654293294	99.5987	51.3246	10.6347
102.959694950354	50.0959257964203	9.69270060029553	103.8062	50.1176	9.3383
104.032394601286	48.9410024689098	10.1556226549421	106.4442	49.0895	9.9061
102.08188992449	45.8714252518891	11.7438391186704	104.1102	44.8822	12.643
101.550157081225	45.2011883251119	12.0751901924065	102.543	45.6081	13.7083
100.745561776604	44.1870178830175	12.5765763936941	102.0152	42.2262	11.91
98.5127748117827	42.956250208811	13.9125450444207	98.0879	44.5657	15.6818
96.6407466681309	41.1612915493815	14.4055990946177	97.0806	39.3994	12.7921
94.2845403573062	40.1825806001154	15.9043274174297	94.1971	38.0204	14.8005
94.107182959215	40.1454468369334	16.0370690008867	94.3087	39.6383	18.4042
92.9121760902946	40.2298997847014	15.3975716166494	92.8093	39.7693	16.6418
90.3937991462054	40.4078710534182	14.0498826813988	89.0134	41.3658	15.8043
90.1350958263428	40.3757261222319	13.7653012039841	89.3668	41.343	14.5671
89.8693415410037	40.3427054649141	13.4729635687491	89.1249	38.0318	13.3915
87.9939943619341	42.3141414672136	10.6771635788509	85.9182	41.843	9.5066
90.2373593933042	44.9638356816759	10.3900016280409	89.5287	45.4109	8.5583
92.4477845913908	47.5745788467966	10.1071240644778	94.5726	47.3613	8.9492
91.6244562718351	49.9736920054196	11.309449135115	92.412	50.9961	13.3675
88.8256136640369	51.2786327296559	8.77154109374912	89.6611	52.1615	6.6683
85.4304152056522	51.3321732308105	9.13149698101985	84.6532	51.7406	11.3965
82.6128476608454	50.8461887407084	6.50840413754724	82.0477	53.0979	5.7932
78.235679620011	46.589312440401	2.71490508225544	79.9479	46.2913	1.0177
76.3174243665889	44.7840591693239	1.15013413026718	75.73	42.7229	0.0066
75.8441520484006	47.0291586755666	1.94908058549886	73.6395	46.5004	2.2066
75.4375505658892	48.9581641099539	2.63553405366384	75.2757	50.6388	0.889
75.361416405875	49.1486336803893	3.14181919109891	73.911	51.0144	2.5794
75.3794517690787	49.2552063867186	3.90005365224914	73.6611	50.4924	3.9757
75.3934018447372	49.3376681402714	4.48680881682817	73.5268	49.2611	4.4383
75.4090474417579	49.4301487680417	5.14483416422126	77.6289	48.4559	5.3003
75.3518686434886	49.7447084266961	7.05436168134131	76.2244	51.9684	6.7104
75.2078245539016	50.5360790134823	11.86025464212	76.5498	52.218	12.9878
73.1662991116693	48.6121851414299	13.3623822789246	71.8965	50.0142	14.8598
73.1442792198262	48.5914394770683	13.3785871185955	72.0723	49.2863	13.9841
73.1225208204282	48.5709399268674	13.3945993621101	70.7664	48.6137	12.8047
73.3595363830119	48.1136896052334	13.9190463819207	71.8327	48.0379	13.6369
73.7270667104372	47.4046314141565	14.7322684015354	73.2561	47.9132	17.0605
75.0445192170042	45.2784751686372	14.1469024762438	73.2283	44.0709	14.6285
77.3350275812074	41.5821632693986	13.1292048170581	77.5882	39.4219	14.211
78.342778669225	42.6621855042701	10.8362238472415	77.8794	45.0468	10.8339
78.6663924220783	42.5103781941522	10.2827377416897	80.8872	43.1227	9.5119
78.6151368458068	42.4698745566054	10.252262521261	80.8076	41.6004	10.0065
75.8000437554524	40.2450748203808	8.57841677574619	75.4748	37.8532	8.3059
75.1522858756673	41.2432366349597	8.24924725187952	75.9022	40.5634	8.2476
73.322607472454	44.0626809352307	7.31947014538005	73.6428	45.1426	7.6389
72.5074077539014	45.3188622643182	6.90521208470972	72.9198	44.5581	6.5665
70.5211261374932	48.3796196588435	5.8958553830592	68.7356	47.889	4.3235
70.5901061992944	49.5748134867536	6.19788382367277	70.6462	49.6735	6.8503
70.651098352919	50.6315634428332	6.46492798904618	72.1444	51.2772	8.2689
70.6510970337952	50.6315669405789	6.46492716827658	71.0505	50.768	8.8572
69.8393142280692	52.4308333500546	5.34919683858945	70.916	53.3608	4.8842
69.4261124956919	53.3466402896369	4.78130150814336	67.8488	53.6384	2.957
71.1096882537325	55.2716765470525	6.4887915044666	72.7757	56.7077	5.4576
70.768377649394	55.3239157050715	8.710131139893	70.5527	57.3223	8.5137
70.1360573112145	55.4206924875577	12.8254864194137	69.9782	57.1009	12.9468
69.7444884517715	55.4806198799471	15.3739252071105	68.022	53.7678	15.3935
69.6914539229064	56.2602849819308	20.0877125446928	70.1344	58.5671	20.707
69.394749395866	55.1285509937692	21.5476327523235	71.2619	53.5794	21.4252
69.3947380072777	55.1285410384908	21.5476538971898	70.694	53.8562	23.1583
65.9962591422477	55.6811722397406	21.9458749288389	66.0257	55.1875	22.0287
62.0982272574464	56.3150384474689	22.4026305522773	61.2083	54.3519	23.523
35.1476169393846	77.8430972206306	17.295591324735	34.9317	80.2335	16.9208
31.1115110917066	73.1272961315631	17.7259784482741	31.4455	71.7336	19.6874
28.5203613913442	72.1127758040833	15.7489179854942	27.2709	73.9256	16.4296
26.3091312254776	71.2469928028161	14.0617287544032	25.7737	68.9159	14.4865
24.8968389355813	72.127851657812	12.4209689470703	24.5354	72.6275	12.2334
23.9893365270739	72.6938708188116	11.3666572094487	22.1344	71.2137	11.8857
22.6218585206506	74.0532115028609	9.26444578572433	21.3934	72.6127	7.7423
22.5082472072999	76.1483951392354	8.81692785468037	21.1184	76.9048	10.6601
22.7248095337841	77.4119398910844	8.12335832871833	23.796	77.2181	9.3562
23.4484249360993	81.6339207402001	5.80587560168915	23.4089	84.0628	5.796

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.389146508518	77.0283818410203	3.3111036897016	26.6151	77.1467	3.8306
24.7689663623821	75.1687709034376	2.30376744829606	25.4767	75.481	0.001
24.7163905442282	74.0987782262952	2.59270187613094	23.527	73.6169	0.5641
24.6376530829903	72.4960347250906	3.02552291637495	24.5076	73.115	4.3052
24.531013303813	70.3250731151996	3.611802405527	22.9431	70.0987	4.2047
24.4764021232224	69.213537778651	3.91196562663218	22.8228	67.5784	3.2098
28.7269791751047	68.4025368100903	7.24999325574128	28.241	67.9653	9.5896
31.9442137508849	68.4593376043005	6.33304733248224	33.839	67.1668	7.1332
31.6915730415779	71.8066212575481	3.01740627922133	31.4906	71.3219	1.4719
31.6367285789331	72.5332179324699	2.29767594720475	31.0449	71.9995	0.0029
32.4388821017689	76.2908348932346	3.42545155619664	31.4187	76.5703	2.7936
33.5410178980105	81.4536780560596	4.97498260839972	33.517	80.8699	6.7304
35.164179274431	89.0572085313864	7.25701839443696	33.2241	90.2072	6.3544
35.8370789203534	90.1184679015304	7.83035641416405	34.7819	91.1147	8.0437
36.3336638756581	90.9016519084807	8.25346702532421	37.9917	90.5379	9.9912
35.5926874265302	94.0801747890954	7.14783955983574	35.2297	94.8683	9.4168
35.2313536206442	95.6654433916472	6.47970473970653	34.0458	95.0903	5.2592
34.9563707450846	96.8718697497144	5.97124033821638	35.7481	97.1257	4.802
34.7686495318417	97.6954559899176	5.62412955075139	33.9629	96.8355	4.449
34.5524792492109	98.6438547835961	5.22441423024036	35.7859	98.3251	5.4495
34.1378458888886	100.462959984126	4.45772639600423	35.7306	102.2767	4.1846
31.9693900093014	100.538697335707	3.89895948870234	30.1816	102.1772	4.0412
32.1527204836281	98.6821569050881	3.23848636362511	33.0573	97.9271	5.3628
32.4309939525949	94.8828417592913	1.60741539096737	30.8807	93.5109	0.3364
36.553260901726	94.2321667888907	3.01141987612256	37.0706	93.0168	1.0492
37.9982552280487	94.0040954972497	3.50359966482002	37.3296	94.7968	3.7833
40.9477156755703	93.5385797192053	4.50823113214547	41.6896	94.8028	3.024
43.4847622521405	93.1381464718983	5.37239031719476	43.1057	91.7939	5.1823
47.6932680866178	92.4739189626188	6.80591724891329	48.9533	90.4759	7.3728
47.9169401158918	93.4239973053286	6.80667237655723	47.7789	92.5461	5.4276
49.0154951375545	98.0902382769841	6.81040084500544	51.1106	98.2963	5.5983
47.3391097375431	104.212926692505	8.66200223760028	48.0764	105.8084	10.3389
44.3126930479769	104.100627602351	5.51816913784027	45.465	105.2608	3.7217
43.7414460284794	103.964428074672	5.23283537377785	42.9285	106.2179	5.6354
42.020062623703	103.44532352097	4.33709837219379	40.9527	105.6227	4.1926
41.0106347402246	102.636760314274	3.72897378964546	40.5226	102.8002	1.3549
39.6692169907498	100.922738718077	5.3205084794291	39.7333	98.7582	4.2197
39.1266000656206	100.788987951259	6.21959958797265	40.065	98.6098	6.7408
38.4722392287391	100.843167781482	7.11826988761532	40.2693	101.3043	8.6864
35.6220950620331	100.891695669681	9.79188089133562	35.0473	98.5367	9.9491
35.0220287967885	101.280298470964	10.4159023667843	35.5571	102.295	9.2843
33.8363352544749	102.048154201871	11.648930172499	31.6341	101.1443	12.133
35.2332713472439	105.158748549359	13.3085623493912	37.1983	106.347	12.5162
31.5454245747478	107.071418860805	18.8598326075742	33.1686	108.6172	19.7963
30.5007024010867	107.237580774704	19.9006661015587	28.1717	107.4546	19.2451
32.5489274538607	107.431923687752	27.9523599732235	33.1638	109.6815	28.6324
32.8001590671939	105.039050220195	30.855601306472	31.3011	106.2109	32.3658
33.4434286133824	102.898619044435	32.5607337130302	34.3074	104.3145	33.9426
34.4084825532732	99.6874185069417	35.1188379080206	33.8351	99.3235	37.4512
34.8044505550999	99.2640801467384	34.6522545957905	36.8108	99.4487	34.5912
34.9852971958645	99.0707246235311	34.4391410136334	34.0464	97.1856	33.2284
37.7788562176282	99.8951575992472	34.2040405663417	38.189	100.3805	31.8594
44.0354138759734	101.094405469583	37.7833373289959	46.0729	100.678	36.5278
44.8711772237795	103.219890886364	44.1581923148512	46.5537	103.4177	45.8992
43.3812949214608	103.506901877226	43.8727993040265	42.8352	101.6931	44.9574
41.8062328144347	103.810327550446	43.5710871587468	42.0156	103.5929	44.0945
39.7527914504771	104.205910860248	43.177740952058	39.3246	101.8921	42.5744
38.7985440212327	104.466837683507	43.0117218455357	39.1965	105.4524	44.823
35.0403218463076	105.49447475594	42.3578459013108	35.3466	107.7036	41.395
34.220997402266	105.435894165409	42.3405476805998	32.8361	107.2479	41.504
32.2495089348686	101.256341917191	44.0050123325313	29.8552	101.3038	43.5974
33.3384978633622	97.2309160359106	46.0887292853849	32.4952	97.9758	48.1403
33.6443654958307	96.1003003397911	46.6739825095976	35.9551	95.9225	47.402
31.7566941397227	93.4167829478798	47.3285429193022	32.1756	91.0244	47.2823
28.4716826842181	95.6898690239978	48.2375913764178	26.6904	96.1713	46.6576
28.5279118724616	97.5641989053057	53.5019134653024	26.55	96.735	54.3574
28.530974971181	97.6664364959887	53.7890724242902	26.9511	99.1097	54.9389
29.8404287269692	97.0068352242646	54.314741460567	29.7849	97.5299	53.9895
31.7058152305707	96.0671746051902	55.0636087074248	30.7482	95.8761	57.2879
32.5003880521352	95.6726082535327	55.3606295630577	31.4281	94.9219	54.3744
34.7281818164163	94.5662803768849	56.1933917150572	33.6244	92.4492	56.3457
36.4784785883283	93.6971566471064	56.8476547858409	35.4152	92.5489	58.019
38.2637991955079	92.8106496927814	57.5150040527372	39.6285	91.4521	58.9959
37.5722229763534	95.23024153016	54.2962440868628	37.1788	95.0118	52.8478
37.413755212701	95.7846318014317	53.5587439918705	36.1694	94.3523	52.0418
37.7151413043381	99.736424609156	51.2631798114468	39.196	99.7694	49.3378
36.3279398504766	102.186078376879	51.8699028643026	35.4006	103.6799	50.1937
36.0288930412129	103.089501399733	57.4378890340089	35.2228	101.4244	59.0123
36.7749445133886	105.27853805449	58.1044880842106	35.7224	107.36	58.7833
41.2193757949416	103.71888701232	57.5024730982444	42.4716	105.6496	56.7244

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.7833430155176	100.850076335001	57.6605985650881	44.7902	101.1589	57.6534
44.9816292776148	99.5093196124155	57.7345077973887	47.126	99.3914	58.8698
44.4190319205323	98.6915141841267	57.063482047917	43.0828	99.6317	56.4863
44.0016183926241	98.0847626474436	56.5656288510057	42.0978	97.503	57.9578
43.1769078132841	94.6483842559832	51.8317934186013	44.0393	95.7757	50.8289
42.5220964011902	91.919951094892	48.0732133008992	41.599	92.4813	48.0171
41.5015429887262	87.6675521344953	42.2152961248069	42.6808	88.2098	40.1619
40.6753186077058	86.5813906756194	42.2284762368079	40.8939	84.3555	43.1765
37.1812300801257	88.7314660733456	39.7313004381862	35.4073	87.2216	40.4202
34.3855431172202	91.5542442684065	36.9040239117212	32.8593	93.0881	38.0081
34.3934993830995	91.5491261710843	35.8370967580646	32.2034	92.5655	35.5696
35.0868574001416	91.2224933163805	32.2739454850155	33.1881	90.5996	30.8927
41.4173620195213	92.1836342596704	28.6896533224096	42.9721	90.3177	28.7365
43.665950390626	98.3221033864565	24.8597326137464	42.2565	98.7398	22.9258
44.4009501569754	99.0141355028869	24.9437110283077	42.9226	100.4615	26.2167
45.3514456447381	99.8820921465285	25.0385953517477	45.0704	101.2748	27.009
51.573888980879	101.85291167578	21.1627540758051	53.9006	102.5381	21.0284
42.8197404256342	99.4566008127636	17.0527185500072	42.5793	100.4271	14.8388
39.8661112105369	97.5011341765637	17.9913090646717	40.9431	96.0349	18.7884
38.108192967472	96.3373011586479	18.5499268147236	38.2186	96.6747	17.5328
33.3865845532023	93.2113486903541	20.0503370547995	34.0163	93.2553	22.3961
30.9338542843898	91.6138919031039	20.6496714376652	29.5221	90.7635	22.4343
31.2095708241804	91.689560451657	18.4155910270463	32.6009	89.9531	17.4409
30.0789405859428	93.6463001051937	16.5554144966141	29.3468	93.7461	14.2413
30.2305546497019	95.0540062253835	18.3924495597717	31.6916	96.8159	17.5787
29.4932602618292	96.1898675239098	21.979960977145	28.2891	98.27	21.6276
29.5175127809868	96.1023638292523	23.2445948841071	29.1897	96.4145	23.036
29.5451362548405	96.0026935376979	24.6850617893465	31.7064	96.988	25.1942
28.4576130491716	95.2532791359889	27.6684079046464	29.7064	94.0211	29.3487
26.0878062687929	96.163909582073	27.9630605375656	26.1674	96.1159	30.3905
20.7425706061419	98.2243024895886	27.7328788611312	21.5395	100.4343	27.1149
8.559926826644	102.090923070247	27.4231758764771	8.0611	104.093	26.141
4.86610005883273	99.9080460800512	29.6394733528481	3.1448	100.72	31.1491
5.08696324423272	98.8749470669175	29.2036100049708	3.11839999999999	98.924	29.022
5.87355179462904	95.1955980222484	27.6513075753949	3.5924	94.7451	26.9481
7.32590104430314	91.8298898485419	26.389467759862	7.8142	89.6258	27.2865
7.84771902836562	95.1242900125639	20.3876900770797	9.17	97.1621	20.3835
7.34928559213319	94.7982985391078	19.32396505467	6.3198	96.0864	20.0555
5.29454157983734	93.4544542425467	14.9389254960352	5.8502	91.8647	13.1882
2.51478441709982	95.9633351726786	15.5120043150315	0.613799999999998	95.4238	16.9249
2.64946314856982	97.6202212494228	14.679144515857	1.4019	97.5847	15.4849
3.23066502105618	104.770462078387	11.0849799692503	3.0162	107.1796	11.3112
4.04193064682181	101.944339624956	8.85910430196811	3.81100000000001	100.5395	9.9764
4.37536696036798	100.782771719709	7.94425213532608	2.55330000000001	99.1767	7.9857
6.20841500576785	99.9437701386012	6.37245537171589	8.1477	101.1634	5.5645
4.61806746624562	94.1843375011913	5.10414238410035	4.77370000000001	93.7785	6.1602
3.51468363501549	90.1884471957458	4.22418444975217	2.57040000000001	90.3092	4.6781
2.50046234532557	86.5154517172232	3.41533281194304	2.7376	84.0979	3.4333
0.611789433126347	90.2693971342207	2.46251252085222	-0.100899999999996	90.0487	0.1507
-0.883164464295248	95.0729881306038	3.8931131183895	-0.171000000000006	97.1566	2.8672
-2.18194088462236	94.8855650681374	5.47947351390126	-1.9602	93.9224	5.6614
-3.37219300743459	94.7138030531363	6.93328345007255	-2.1508	94.1499	7.6254
-4.99109850919066	94.480183615966	8.91065933320605	-6.68600000000001	94.6391	7.4364
-10.3803901987652	93.7024677452951	15.4933458635074	-12.8049	93.8535	15.5008
-3.62434068969922	91.8599445255188	23.8561352396794	-2.5612	92.1356	23.79
-2.13099229654399	91.4526781517263	25.7046358037131	-0.735100000000003	89.6931	26.6301
-3.65853136988464	96.8924638828898	26.736843080504	-5.5457	98.4014	26.4862
-2.09995209638976	96.8636528316411	27.30034649041	-0.338999999999999	97.1979	25.6607
-1.56085969454239	96.5995788896358	29.0720751040383	-0.311599999999999	97.6012	28.6474
-0.734938529519439	96.1950021112894	31.7864677924504	1.64530000000001	95.7178	31.8751
-0.949634754402666	96.1918221683275	32.2977515608471	-3.1358	95.2162	31.8855
-1.0619684358293	96.6429053201853	35.261758171409	-1.86190000000001	98.5581	36.524
0.973249358233105	92.0896264820734	36.9372350145949	0.619299999999996	91.0377	37.0534
1.57066607736662	90.7530694294763	37.4290479408377	3.5998	89.8159	36.4775
-2.3514613779363	87.2025588196056	43.1709230769838	-4.1255	85.596	43.5867
0.587320224430371	89.8646974270518	45.246792019321	1.20229999999999	90.7259	43.7677
2.05778032242058	91.1967321766594	46.2854892823936	3.55029999999999	90.3653	48.0124
2.07116248948978	93.374127314851	45.6279737228166	3.4538	93.5151	43.6356
1.57429491423875	94.7591661671823	45.9228078263354	2.1469	96.6722	44.5395
-0.885114015495191	95.0846382665717	49.324028937717	0.580200000000005	93.7511	50.7296
-1.32751611490576	95.1880736359188	49.8006719931181	-3.26390000000001	94.8889	48.3647
-5.30117925646306	96.5261350358743	55.9979216080014	-7.5489	96.9207	56.8305
-0.541398188054274	96.116251518475	57.374742368401	-0.0468000000000046	93.7668	57.0052
3.31231352575158	97.7572534870971	58.9278302037803	4.95789999999999	99.4405	59.5277
1.35973313776788	93.1829110483834	58.3821639356239	1.1743	92.9818	59.2535
0.0207536949599785	90.0460608558193	58.0079723890797	-2.30370000000001	90.7079	58.2529
-0.773144470284592	85.5762299805188	57.4038397365791	-1.23350000000001	86.0108	56.7294
-2.54959124623811	75.5744205204702	56.0520176873884	-4.2807	74.2616	57.1387
3.93194087871869	72.3242783545386	49.6557750556192	4.0089	72.186	49.5614
7.93566653237224	70.3166217216531	45.7047324320119	9.3844	71.5303	46.4336

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.4050610033634	69.0783439271147	43.2678241441484	11.4886	67.7219	43.0579
10.8003101013204	68.8801473642146	42.8777761894997	12.0097	66.7734	42.888
10.9977412933755	71.7838925924109	40.2738562376435	9.45780000000001	72.6847	40.961
11.1237649696256	73.6371356109033	38.6119578959581	12.73	75.2001	37.6748
8.77253218026826	73.0384718961623	38.4334143906192	8.8648	72.0358	37.3381
7.07607846462135	72.606527466935	38.304593630175	6.09139999999999	73.9114	36.5077
2.392407606129	68.7698442252301	40.8761226526772	0.309600000000003	68.1954	39.7657
3.7455389963277	67.1669504546424	45.5330177566128	5.2812	65.5492	44.5709
5.26005277246125	65.35718129213	51.2325710960359	4.4426	63.6871	51.0243
6.1954401674997	64.2394453434832	54.7526904131707	4.7342	63.0935	56.3188
8.39501771015738	64.8404442356165	55.1409841681831	8.4928	63.9998	55.0759
11.04526813532	65.5645808613127	55.60883580051	11.4442	66.9869	57.5373
12.8472529480588	64.9894639074866	54.4165998260017	14.2076	63.0144	54.8035
13.1207195628784	66.139464612885	53.2022825087557	15.3124	65.205	52.7286
13.4837685078015	68.291864348154	51.0195215176648	14.0233	68.3418	48.6515
13.251255079195	69.0431897828641	51.8253092120002	10.9416	69.7746	52.0032
15.8832131497877	70.6521354809693	54.4622945364495	15.4332	72.9689	53.8868
19.0011703458212	71.5507847314865	57.6346004385167	18.2654	71.5277	59.9496
23.6398452327937	72.5460089029877	56.8139595985314	24.1578	73.3792	57.4094
25.507035051279	72.9466121954873	56.4836297043337	26.9783	71.0141	56.5271
26.9046820068472	75.5884985398084	55.9199490354366	25.3366	76.538	54.326
29.2404036673722	78.161087865234	56.0261300004816	29.376	80.5861	55.9809
33.7391124483011	71.945675694684	56.4829348328334	35.1535	70.6086	57.9365
31.7449231476775	72.4592669452622	51.5216480405048	32.697	74.6737	51.2201
30.9610743691108	72.4459451585417	49.80516136985	32.2488	71.8762	47.8257
28.2902079002095	73.1019193132458	49.6458269272961	27.6433	72.5657	51.9251
26.3757040538783	73.7586918763802	48.9094984957568	24.7401	75.4523	49.5075
26.8552062641879	69.983324689526	45.1815289986446	26.4587	69.6793	44.9112
27.1146202740259	67.9408321177354	43.1646822930811	26.4833	65.6457	42.68
29.7619159186912	72.0631254779404	41.113427093428	31.7515	71.3679	39.9054
29.2165573426941	76.536610087278	41.0678773081905	31.105	77.2121	42.4385
27.2892108991967	80.9013727060955	40.0482454411295	27.1736	83.2653	40.5956
26.0234588415655	77.9078382612608	37.6822915851783	24.3218	77.9732	38.2426
25.2816374994251	76.1534027926618	36.2956618958106	24.4797	75.354	37.647
24.6359521032318	74.6263343345466	35.0887327831606	22.8762	75.7017	33.805
24.6088950761682	72.4168779377667	34.216551888261	26.2205	72.9044	33.175
24.5726064752124	69.4543047285061	33.0470829916127	26.4747	67.9787	32.7219
19.522592800475	68.4284732050589	31.9670812426097	18.9682	67.082	33.9115
15.2838234050497	68.3591505425136	29.736842556686	15.0856	70.6386	28.9208
14.068273882528	67.7612063399408	29.2775095761266	14.7433	68.1941	29.0053
11.7988306187883	66.6448380455757	28.4199278400601	12.0444	66.3239	28.7604
8.82972841511665	65.1842983635564	27.2979551891471	6.9842	66.7632	27.251
8.09679898011596	62.7286828178865	26.4730383140682	7.6803	61.1857	24.6436
8.24212132005809	63.9161850002552	33.1012091520565	6.67010000000001	63.5082	34.9077
8.52638442962947	64.0431516033177	33.0888870613407	10.4334	62.822	33.9682
8.97454907453576	67.1247953052458	31.7322060059712	10.7344	66.9849	31.9545
9.39455053795193	70.0128848005376	30.4607350409782	11.6475	70.8021	30.9107
9.10946267185604	70.3995742811696	30.1631878527267	7.0214	70.8048	31.3366
9.10946141784973	71.4834117871084	28.665888501451	8.3117	72.2049	29.6247
9.10945185405136	73.5871462713916	25.7596206730882	9.9143	75.8382	26.191
8.04348336629874	72.9668138954645	21.926460577637	6.65640000000001	74.2265	20.3804
9.51892716209949	70.4824261482127	21.6652385307694	9.1707	70.0865	21.5855
10.7228460867455	68.4552392110163	21.4520932586852	10.5042	66.7806	23.1982
11.0228637627641	68.3570246863497	21.0588414603923	12.5389	66.9051	22.2814
12.1722342169253	68.161624338227	18.9448507410111	12.0587	67.8257	18.5408
13.0459407450315	68.0130888022418	17.3378788029071	13.2613	67.7948	17.1077
13.7474670873515	67.893824904247	16.0475906757317	14.5018	68.1646	16.8217
14.7272005290103	67.7272641296339	14.2456065397382	16.7224	69.1113	14.1768
14.1342450371703	65.4579992388804	10.3836922621677	14.2239	63.9607	10.3191
13.9774888968411	64.8580898237644	9.36274658319936	15.1112	64.361	7.2726
11.1458882192088	64.2488332745104	10.9572810761475	9.6606	65.5604	9.552
8.78974173865733	63.0653528816601	13.21385425863	9.15690000000001	61.6426	15.1483
3.35961619428119	65.4467774407746	11.1473623654021	1.76609999999999	66.5446	12.6159
1.98643664461193	64.495314865865	2.5443959774895	0.483800000000002	63.8626	0.7436
9.98727760347357	67.4849490395825	5.06339101972857	12.0877	66.3858	4.5331
9.89036702620352	68.5704784704232	5.74233364360483	10.0835	69.723	3.7551
9.63867995734469	71.3897887480069	7.50566310610605	9.00020000000001	73.0359	5.8372
9.90787326398561	74.5724888399659	12.5334993405549	7.5677	74.3816	13.1566
10.0300664509153	74.8003365023057	12.8524928059856	8.0472	76.1743	13.1381
13.6449709118704	77.1867786777756	17.5999102456119	13.7649	76.0563	18.1156
17.054541088755	79.437666800815	22.0776629985676	17.9606	81.6588	21.6946
18.7202940390542	76.5165226117486	28.1621579134233	18.7356	77.2891	30.4652
20.0364025488638	71.5911646800936	25.6106431063811	22.0857	71.4539	26.9077
22.0742387149303	63.7038375595233	21.4773073373363	22.6268	64.3936	19.9605
22.7550251034145	61.0689961480211	20.0965437754751	23.9369	61.5866	18.0383
20.6479466340599	33.6855637528968	22.0060695601147	18.7531	32.536	21.0115
26.0899504751143	29.6842188910218	25.7060395124922	28.099	29.8348	27.0633
23.8292747099127	27.5258280543628	24.1894008071664	22.8581	29.0039	22.5241
22.261157447485	24.9147246445972	23.6068995304244	20.8129	26.0745	22.3222
20.6393610339442	22.2142231296461	23.0044617773826	20.5322	21.5891	20.6595

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.8929565821884	19.8823670998446	25.3286562147547	17.2669	18.1061	25.0094
19.2770782433608	20.2056898903673	26.0094369921572	19.0397	19.3917	26.8913
19.6171946932484	20.491973663391	26.6122277608191	18.4916	22.031	28.1174
21.607139580849	19.8820231748975	26.9226028078602	23.1615	20.5337	28.672
22.1872321386418	17.1738273149251	23.6329307869078	23.1228	16.7524	24.3445
23.0940568211784	12.9402601329986	18.4903699831093	21.6596	11.213	17.563
29.5963038094328	15.1374425681382	16.6351718430776	31.9656	14.6164	16.7619
25.1680625553948	19.485226472791	14.3491198497353	24.5729	19.8583	16.0395
22.093509167605	22.5039229791218	12.7618859922798	20.5046	21.2685	13.3595
19.7384253355799	24.8162274726376	11.5460747269713	19.8821	27.2321	11.7559
15.7803977893726	22.1112279915846	9.15313223597891	15.0509	21.8739	10.7741
10.1435308445454	18.2588731026413	5.74518088746803	7.8039	17.6061	5.7787
17.0066609503004	17.8469683966078	2.08604022604491	16.9397	16.157	0.3423
21.3158097433433	19.9225994263457	2.24054119764756	21.2889	20.2133	0.1771
24.8206916903896	21.6108293637409	2.36621906124049	27.0312	22.0371	1.4535
21.8038485950761	22.1385794880166	5.33561029382266	19.6457	23.2311	5.559
23.8627863657915	20.3203956364509	7.185175887969	25.2224	21.1268	9.0297
23.8627871548626	20.3203937907687	7.1851762784274	24.0847	21.2619	9.4135
24.8183283289831	17.1119785387616	6.15167074532487	23.3217	16.9506	6.2856
27.7669916045224	7.21130842760456	2.96243097902704	28.0443	7.2557	0.5495
28.8371638507236	2.31345815082434	4.63048285960588	31.0707	1.7474	5.3999
26.0097275318446	-0.403865711165668	4.62089739513627	26.7943	-2.6353	5.1743
21.2660380990811	-0.173742430067627	3.72135208663792	19.4163	-0.8394	2.2943
23.4335966050323	3.47069628978985	9.47481397515862	23.9142	5.5856	8.3806
24.0110892735395	4.08667442987364	11.6514562283051	22.4003	2.9895	12.1851
25.5479669984349	5.72602103284498	17.444013632311	26.246	7.8923	16.6585
26.0242217948888	6.23400165854106	19.2391135150951	26.4488	5.1021	19.0029
26.8367810632824	7.10066509463991	22.3018725248511	28.1449	5.3771	22.529
27.3498991645895	7.64796377656917	24.2359207468748	29.2451	9.0499	23.6495
27.5233277884317	8.0106339495702	27.1068295806764	29.9497	8.0977	27.1858
27.4837783825184	8.04582689137404	27.3997973707695	27.2842	5.8331	28.3822
27.1453665140018	10.7534842537604	30.4060054310081	29.4417	11.4808	30.7206
24.1098874104716	14.0592945960724	34.6177360178249	25.9081	14.4892	36.1934
20.8170909305379	16.1458078198987	36.6305774412272	19.6468	14.5775	38.07
20.5076231801291	16.7823961739203	36.6816848034426	18.1963	16.0602	36.4885
20.1080813749064	19.1608929302604	36.9111701087699	20.7311	19.0512	39.2565
19.7848905197103	21.0573539379991	37.0761314256147	21.1889	21.267	39.0474
19.2870498883143	23.1287702040787	37.0598287680207	17.3215	22.815	38.4524
19.1287548328827	24.2614163111528	36.973323511443	19.5225	24.6717	34.6116
18.8525310119179	25.4716934252688	37.4340906572453	17.7323	26.9057	35.8248
20.401750820439	29.5582081077065	45.735831742911	21.3113	31.7798	46.1078
19.0407093649302	26.3900144891178	49.139105351502	16.9754	26.2994	50.4148
20.5525289646923	25.2345360902966	49.212462519006	21.4132	25.3225	51.4824
20.8316704903557	24.934615088194	48.9673405441325	23.1689	25.59	48.8728
20.0714235430259	21.8537962904918	47.224871942193	21.7951	21.835	45.5134
20.0713337932059	21.8534341876631	47.2246680917256	19.3676	20.9011	45.1036
20.1991643929068	21.7462420842124	47.6974963775984	19.4151	20.4264	46.5071
20.7551877027059	21.2799206352661	49.7545842432449	22.5923	19.795	49.1879
21.5659068896591	20.5608479587849	57.922510227793	22.0389	18.6688	59.3708
21.3660885468	21.7295496222952	58.1428725848776	19.4476	21.0876	59.2618
20.8090015374191	24.9879510529154	58.7572493145473	18.7218	26.0511	59.401
34.485534611658	31.6017126401087	56.5594281629889	35.5392	31.6783	58.7469
40.8774734855239	35.6346633280959	50.4048059342277	40.9959	37.9409	51.1587
44.8253030045182	35.5056252694608	45.5846195223165	46.003	37.4534	46.4333
45.6900226991444	35.4306199714769	44.4750144159705	44.7872	36.1398	42.3342
46.7935488154224	35.0627712796565	44.4823615470735	45.9581	33.5048	45.1742
48.962582279421	34.3397445042064	44.4967967660705	48.6326	32.1618	43.4727
50.2730972911133	34.2818906682745	44.6747839932898	51.473	33.7115	46.7085
51.0922546103594	34.7994957545688	42.7839532754017	50.1654	34.298	41.7388
51.5871136906921	35.1121862330124	41.64168636451	51.7623	34.8081	42.2217
52.3074580404683	35.5673544247693	39.978944428714	51.6292	37.4529	39.3047
52.471434274051	35.6709688547258	39.6004401411249	53.589	37.6567	38.7584
52.1688636810959	34.5876618810477	39.0872870999225	54.3132	33.4794	38.814
49.7797240220168	32.145490550932	37.7554005278541	51.0819	30.8837	36.7669
49.0196938105225	31.3686002805991	37.3317105683617	47.9812	30.2306	39.2099
48.4135077380942	30.7795258601706	36.011783686832	47.9603	31.0225	36.0363
47.841697071815	30.2238556694462	34.7667054338651	46.684	28.1154	34.4272
48.0149111353631	30.8077105896241	34.2221913982541	46.4115	30.3033	33.5708
48.2710910341421	31.6712264120511	33.4168574391767	46.9054	30.8841	31.5685
49.4293656333995	34.1081703491869	32.1369853854438	48.325	36.101	31.2943
55.125656767666	32.7186625311032	32.2348786081351	55.9275	34.3566	30.6301
56.3983090130127	32.0782595202344	32.548015757068	58.4334	33.3219	33.0094
56.198793074919	27.5394185960952	32.5794373942002	58.5931	27.1316	32.5338
55.8118781302492	26.2575997138498	32.5949467266564	55.4854	26.8201	32.387
55.2853257110937	24.5131740048228	32.616052753241	54.6523	25.2022	31.3259
53.733748173427	19.3729025746845	32.6782499622482	51.539	18.7116	33.0294
53.7019280881894	19.2674884492138	32.679525184181	52.4859	17.4578	33.7507
57.0047349890265	21.1539839704221	28.3743166660004	55.9782	19.9329	26.5423
62.4816032196353	24.9177945175427	24.409375383399	62.5649	23.4331	22.9907
65.670316082705	27.1091489611418	22.1009324765834	67.242	26.9141	23.9429

Solution x	Solution y	Solution z	Original x	Original y	Original z
68.4020087556751	29.1166256564859	19.8190997071765	70.1037	27.3839	19.7642
70.4411076067488	31.9608618731589	17.4993644925883	72.6191	32.6684	16.6889
67.6063325588653	32.543909199982	17.4782543756636	67.7055	32.9993	17.0949
64.6494550141043	33.1520681055715	17.4562390188224	64.2717	31.7627	18.8904
62.4965589883209	33.5948765799083	17.4402014222283	61.5106	34.0654	15.2705
59.924318794954	33.718611385592	20.6946034101521	58.6228	31.6703	20.587
58.6669407138951	35.5919118742612	23.7920868587736	56.2795	36.0371	23.7369
59.8687724847099	36.5208956622537	26.01968168445	58.8785	37.4935	28.0133
61.3243074031396	36.2739937100003	25.6948614944706	61.1622	34.1592	24.5106
64.4594776746443	36.765517279218	25.578177465477	64.9829	35.6055	23.509
73.3723184695251	39.859326789387	28.0458834776088	74.5598	39.2546	26.0148
77.8786209141842	42.1977839813974	31.0903446347034	77.9223	44.6051	30.7678
82.0470875518769	40.6807480751845	34.4498598464752	81.9079	40.1742	36.8216
85.7453037033496	40.5858500706968	31.8534600302727	87.2346	40.5435	32.6709
86.628745848259	40.5631829518183	31.2332272261872	88.4465	41.4478	32.5802
89.12210382154	39.0970091046781	25.5330833189184	87.5583	39.2312	23.679
91.1975595949555	38.4802174756568	24.9610143108638	91.9372	36.8319	23.3371
92.2598982230642	39.6526343460589	26.1476015521913	93.6083	38.4774	26.0941
93.3228534349654	40.825732484453	27.334880302401	92.1801	41.0349	29.4683
93.3228976579727	40.8257614964204	27.3348829997094	93.6941	39.0671	28.969
94.0400172846244	41.3226179376876	27.3608021801098	93.9129	43.6355	26.629
95.302246834052	40.7965484787105	27.8305930274883	96.2133	40.5576	25.5914
96.6950566298364	40.2035927092684	28.5772079516578	98.7317	39.6579	27.3708
96.586958506799	40.0901307186942	29.6595214125022	98.4033	39.6451	29.8224
96.4903750138071	39.9887592063178	30.6265373563154	96.8865	41.9997	31.9305
96.1905178029	38.9663319201046	31.290452764293	97.0063	39.6578	31.3742
95.5580276617952	36.8097352246295	32.6908527402842	96.6051	36.0943	31.9245
94.8468841038266	34.3849624006144	34.2653994790055	92.7124	33.4453	33.5856
95.7517824496722	33.2677688644061	35.8461248354732	95.8908	32.6754	36.0409
96.369918500112	32.5046211611166	36.9259143775063	98.5493	33.1624	37.7737
95.4043336025639	30.8691118767758	37.7381053933061	97.1838	29.5842	37.1942
94.0633824713588	28.5978656590278	38.8660239403802	92.942	26.4511	38.6789
95.8037328051922	32.4426609207699	41.500699352884	95.0864	33.2234	41.4865
96.6993772123546	34.4213087177569	42.8565891184465	98.5859	34.5756	44.3792
94.8344207347537	36.3593449326136	42.0458147535519	96.5473	37.5774	41.1201
92.0703313918764	39.2315691545852	40.844259469534	92.2396	41.0703	39.2658
90.8766551227443	38.7352276344087	41.7495192832535	91.8795	37.1845	41.8015
88.7744213515663	37.861126218036	43.343786375019	88.2545	36.066	42.1212
88.2663691501003	37.6498712458729	43.7290807230954	86.5983	36.2039	44.7429
89.8886686208916	40.0757953413346	43.0835501618088	90.014	39.915	40.6629
90.5461131625778	41.1271504104974	43.2867071449386	90.4784	41.2284	44.1276
91.1357938621243	42.0701410490886	43.4689245173451	90.0385	42.8005	44.3862
91.650427604327	42.8931214880474	43.6279517651578	93.2846	41.9379	42.3812
93.2127546807666	45.3915601105978	44.1107610028669	91.9732	45.8332	46.1527
93.6772786635594	46.0985570871582	44.2184432253262	93.3823	48.5086	44.2946
95.8087648366903	44.1126183851471	44.4482034693655	96.2085	41.8253	45.162
97.7792842093784	47.4338430994653	42.8542525934378	98.9198	48.0008	44.9228
98.8867726799651	49.5575998528394	41.3909255393707	98.1036	50.8139	41.2796
99.3197775839916	50.3879459011457	40.8187904317057	97.7455	51.8526	39.6885
100.707238813858	50.7063700701377	40.6626388497787	100.5945	52.9653	41.549
104.569237538721	50.6883871486733	39.8822138188995	106.6231	51.946	40.2003
102.671681380367	46.4525526813893	37.8098965205368	103.8959	45.4099	37.4639
102.23060760558	45.4679606312124	37.3282061897692	103.3956	43.6231	38.3961
102.0800961168	45.369578172522	37.1747607170577	103.0838	43.6629	35.7673
99.9856566797446	45.7002963014976	36.7881864255225	99.7789	45.6905	34.3678
99.1015767911693	45.8486081460616	37.1126417709592	100.0845	45.3198	38.3951
97.4831749572801	46.120110523002	37.7065881471474	97.5519	44.8528	38.2336
95.7314047238401	46.4139886235905	38.3494788404548	95.1396	47.3596	38.3213
94.7199567747095	46.5836678448177	38.7206783774564	94.4684	44.7163	40.2539
93.5352085996797	47.1837039931075	38.8526895336358	94.3452	48.7818	37.6589
91.719023657124	48.1035379516323	39.0550614096012	90.4865	46.0315	39.3528
90.7186672628292	48.8275369177265	39.1535951629583	89.352	47.1855	40.3099
88.2836572670222	51.3234853916143	39.1085767205039	85.9154	51.5363	38.6114
89.2176339748338	52.0457771378285	39.4696846991178	90.3356	51.1932	37.7625
91.3938872557186	53.7288279771758	40.3111267277647	93.3932	53.1876	39.0419
91.6832612510037	54.8062970722168	41.2582800848691	92.9131	56.6287	40.2251
91.2380928246386	55.2180583955312	43.5983207271074	89.2688	56.3248	44.4917
94.7831747341389	53.5370263804328	46.1107372942216	95.0304	53.2116	46.2852
96.6592576484928	52.6474071246311	47.4403322790414	97.9579	54.2407	46.7851
98.0415053063147	51.9919577679066	48.4199437804312	97.7133	51.9341	48.5236
99.6621495788458	51.223460046638	49.5685098758258	99.5817	52.1789	51.8005
101.668667112488	49.6362294554377	49.4040599434167	100.8862	48.4618	50.2894
103.456586463345	48.2219281953204	49.2575194497047	105.6501	47.8555	48.2801
102.093957732667	47.5108331237869	50.4117518122809	102.9297	48.0592	51.9744
101.069777532005	46.9763588763185	51.2792971326222	101.161	45.7653	49.9947
98.6389936865015	45.707848992219	53.3383259551263	98.0763	43.3554	53.563
98.0961145448994	46.6302565119275	53.9457569241249	96.2485	47.1277	52.4491
97.207322302453	50.3770102914602	57.9572018052421	99.0651	51.1078	59.3413
93.2773248842578	52.0069486065981	58.6526710436774	92.1982	53.9806	59.5699
92.2269167810207	47.903862218208	56.6786095590393	91.1842	48.1207	54.4953

Solution x	Solution y	Solution z	Original x	Original y	Original z
92.4957362581705	45.7175808371717	57.3525691793442	94.5838	45.9916	57.9488
92.6176599343061	44.7260754250699	57.6582337675252	94.5355	44.3621	59.1041
90.0322788525326	40.6806738069532	56.7104162800679	90.1236	40.724	54.2833
87.1261031352391	36.2034219612999	57.3766971401085	85.065	35.2948	58.2863
91.1742470584078	35.1401401759025	55.0411260588012	91.0332	34.8187	52.6374
92.1371001261172	35.033529308218	55.4998353631483	92.4351	33.0022	54.3205
95.1166949983053	34.7036376607926	56.9193179121697	96.2582	32.5713	56.693
95.7636455148941	35.7295283497	57.6488216268514	95.1298	37.6897	58.9361
98.7547779543573	34.0700158672744	56.6987786999022	100.5275	34.9543	58.1047
99.7994661459831	32.3807500761621	55.1972630861934	101.1976	33.4905	53.5496
99.8973338165244	28.8612458910937	54.6957009404177	101.7295	28.4449	56.1482
99.9058847765326	28.554399613984	54.6519755147663	102.211	28.3893	55.4005
99.5313349232185	23.0710631943096	53.6935618832362	98.3827	22.3334	54.4737
99.4479057363497	21.8497147468106	53.4801023937715	99.0428	19.6959	54.528
101.46234156	26.3343022892417	44.8332778968103	100.384	25.6874	43.9589
102.075642631312	27.6996516330622	42.2007283535019	101.5683	27.6266	39.8262
103.898250713538	29.4010941314216	44.530366496369	106.1692	29.0085	43.7624
104.342884527508	31.0222317114609	46.8606776762294	105.5782	30.6326	47.1426
104.63682581434	32.0939931144047	48.401299688566	106.6895	31.0233	49.137
104.598127035987	32.5228530982412	48.8662135280934	104.0844	32.9988	51.1923
106.873804540251	35.1569495092275	42.0576315203776	107.8221	37.3636	42.4217
107.540741243168	33.2330525069727	32.2802759671983	108.656	34.8419	30.8419
105.748939989077	29.2728951769569	30.3417781393103	105.6149	29.5786	27.9356
104.175338827018	25.0648799907366	31.3822736053905	104.9423	23.521	33.0938
99.6273017995408	24.3872988324112	27.3015781461151	98.3241	22.4412	26.657
99.5288849943956	27.4741292448668	26.2844075862978	100.6297	27.3107	24.1251
98.8647119117644	30.5335726773721	26.4210543603973	99.0228	31.9463	24.4512
98.5813528868461	30.9118518635108	27.3180927109928	98.9301	33.2654	27.8083
97.8371658979665	29.8641280176272	28.5196788885652	97.4429	30.1528	28.42
97.0254563574187	28.7213423104674	29.8302880131983	97.5011	28.0267	29.587
96.2486616463895	27.6277148903584	31.0845218337485	97.3283	27.0933	33.194
95.2653021794125	27.2345264740618	30.8133006129691	93.9312	28.9768	31.8553
94.7140815170356	26.8372999138272	30.5517050701426	93.6487	25.1273	31.9089
92.9894508522667	27.8546363182013	25.2648428369281	90.6435	28.0536	25.8632
92.2423315571584	28.6729475697191	20.4921393175587	90.72	30.049	19.1921
93.4456769323033	27.6327953448223	20.1460616906162	92.5592	25.4331	20.672
95.6139068534427	27.2532595894429	19.3859457358879	97.0499	25.7334	20.6225
96.1170804153617	27.8823668668783	18.2257932944479	96.156	30.1327	19.1399
97.3625723666128	28.7404918935134	15.0352624285778	96.0238	29.4057	14.5945
98.3661541251537	29.4319422049794	12.4644311703581	99.272	31.5703	11.7517
98.2088181510271	28.1565569840542	11.6284247332577	97.9141	29.0493	9.3885
97.8239959158504	20.8311728221247	10.4478647996107	97.1071	18.8552	9.2302
102.416553605723	25.3813937475761	17.5662986495152	102.9016	24.8202	19.8795
102.41655475379	25.3813952665889	17.5662998950707	102.4997	24.4075	19.7902
103.206587787714	27.1750791604439	16.9293569295204	105.0575	26.2706	17.0665
104.756847565629	30.6948294598765	15.6794835369644	106.8535	30.7643	14.4546
104.172286981334	31.6786353106073	15.92145737982	102.9211	31.879	13.8489
101.768764570448	37.3661575525169	19.149594249876	103.4615	37.3033	20.8908
99.3834435625095	41.7776856725325	21.0978462524416	99.6903	41.4772	23.4888
98.7697657993962	42.8582946603577	21.0610727674628	98.3613	42.0392	20.5386
97.8384997544142	44.498142997997	21.0052712682191	95.46	44.379	21.4845
98.844910563228	47.0620904294163	20.4396728562762	100.6036	46.802	22.0951
99.5337357209407	49.0204993660821	19.939037622869	101.377	48.1816	18.5975
101.113952633195	55.4470747734398	18.791080953184	102.1595	55.9791	16.6639
101.112794715819	55.4525072155314	18.7956469129162	102.8738	56.4102	20.1678
95.7288258274521	57.3316142226832	18.941311011797	94.6877	57.1733	21.1304
93.995332963406	58.4441465263091	16.8862547673609	92.8209	56.9207	15.4027
93.5723944821022	61.596225127599	16.5002227146399	94.5987	62.0376	18.5629
93.3811662065225	63.0213647516976	16.3256824401726	93.5538	62.1822	15.7085
92.8459810179991	67.0097539982058	15.8371621567394	93.0933	68.7697	14.1811
92.1629769339289	66.6613542580867	18.0542177802441	92.0851	66.8651	17.5763
90.5657656978485	65.8466130875899	23.2388666881867	88.7937	67.447	23.6857
90.9202682746794	64.400583616297	25.5344313448722	92.749	64.7326	27.0986
87.8728664338385	61.5169960172885	26.001708691464	88.0225	60.7529	26.1198
86.3341115441065	60.0609646707423	26.2376492327259	87.1149	58.1702	24.9275
80.5493490342732	58.0171046538269	28.6772645885681	81.1686	57.7423	31.0101
75.2557333973329	56.5195015182246	28.9509488294196	73.2116	57.797	29.252
75.4841581144442	55.2021747862451	28.7936489515589	73.8072	55.2741	29.1095
76.0639307468754	51.8585646520223	28.3943805730461	76.0043	50.5809	30.4596
76.4573228686971	50.7272429482049	26.7038355170827	76.379	48.6237	27.9163
76.7385866438308	50.0838970867363	25.4328987687952	75.5587	49.1352	25.3998
76.9556742962326	49.5873388354393	24.4519462255932	75.5201	48.6107	22.753
79.5718262730788	49.8518203205494	24.6365197893111	80.3964	49.7264	23.6683
80.7511882740534	49.9710485464952	24.7197292182077	80.7698	50.729	27.0276
83.1667699879836	50.0552587488421	24.4020902734133	83.5076	51.7826	22.7284
87.2155110002629	48.6211955532518	25.3652596648289	87.5129	47.9594	27.6836
88.0856196978108	48.512554591881	24.7662039757683	87.8413	47.1867	25.6907
90.07691847341	48.263905897753	23.395227315389	89.3464	46.1786	22.3858
91.9340150470949	48.3237964965693	22.319392520795	91.9756	47.4725	20.0446
92.4426634512544	48.5397238453811	22.5514150963941	93.0102	50.1223	20.798

Solution x	Solution y	Solution z	Original x	Original y	Original z
95.7165153413725	49.2148017051232	25.1168051975138	95.0864	47.4256	26.3676
99.7824445223363	50.0532639931631	28.3028134990745	101.7941	49.0832	29.2585
97.9654529191479	52.6069337791784	28.1913725975104	96.0562	52.3857	26.7058
98.0969987199838	54.7691329637629	29.3052985437382	98.7715	55.3698	27.9452
98.24347274944	57.1767237596854	30.5456473520099	99.9754	58.6633	29.714
95.8636320002747	58.759656055156	33.7710179560001	94.4551	58.0456	35.6169
96.6088509839617	60.502414726189	32.8465768139473	95.479	61.1306	33.7151
98.117741441354	64.0310889736739	30.9748349224027	98.4228	65.0226	33.0945
99.7923040620924	67.9471960313517	28.8975191126589	101.778	67.1686	27.7348
99.5157220010558	77.3135814181403	26.8392514873751	101.2985	78.2917	28.1682
98.6421885662361	78.9875369105991	25.769086454423	98.2345	80.86	27.262
96.9347797953094	80.3062777365496	20.1115745399184	96.9541	82.6989	20.5312
96.4427697978781	80.510862923008	18.4553721307905	98.2007	80.5294	17.4055
96.2734741012764	80.5812548387417	17.8854802276889	97.1852	78.7831	16.5303
96.2029966536389	80.662425568388	17.8099459349613	97.8831	81.9659	16.6355
93.3198721677961	81.8672766326455	16.6637678495081	92.288	83.6157	17.9977
91.5301959497074	80.8851791073503	13.6615969440064	91.1291	78.4897	13.7054
90.796850120152	81.6258144509943	12.0547224515134	88.6759	82.3658	11.13
91.543301483909	81.5613373294086	11.8599285909574	91.14	83.5499	11.0268
95.8290297032711	81.1911509253596	10.7414848753699	96.8706	83.0827	11.4782
96.1168034978198	81.1662982781554	10.6663855066534	97.3132	81.5365	12.7479
97.0351071805365	80.9646273928651	9.80810869404084	98.9119	80.0767	11.0692
97.6099873355327	81.0300214532339	8.05606868876256	98.5933	78.8152	8.2256
99.4804696932475	81.5834935110753	1.89191436571372	100.0565	80.1054	0.0522
99.350198771845	83.6861380952417	2.24482372740221	101.1477	85.2681	2.6541
98.6526559293067	83.80805673829	2.21296243698847	99.0152	86.155	1.7016
92.9325426247422	84.4794710412615	2.02367882558086	93.0994	86.3608	2.8092
88.6598499340833	84.9808935820962	1.8822411636488	88.3633	87.3681	2.2205
88.6013874096905	84.9597978918653	1.87616914734794	86.3374	85.7586	1.5055
91.0542079365052	80.8854644733344	2.54693944802847	93.2494	81.8793	2.8544
91.3707661094958	79.7720950286467	2.67059620383283	91.86	79.7087	2.2114
91.6549005962601	78.7727577941011	2.78158728122167	89.835	77.746	1.5427
94.4978230925089	73.9535784058023	4.26032957003276	93.9524	73.145	3.1932
96.3567261611901	70.8024631438645	5.22723904764589	94.6798	69.1984	4.5089
99.0272520800475	68.2253757913113	6.54881481689761	98.4258	65.8894	6.8362
102.402849262806	69.3525735383551	7.3397302399285	103.5291	67.906	8.9335
107.098114170835	75.738951048763	4.92412906866583	108.1531	76.0691	2.761
107.344968928935	79.8365362118442	10.314288255314	107.981	80.0957	12.6444
105.611116801008	81.6748683465773	6.81819976972665	103.8313	82.5056	7.2236
105.321323971898	81.9821185644382	6.23388653819214	103.6911	80.62	5.0557
106.031096738318	85.8151266448859	4.5361192055218	107.2392	85.9448	2.4326
103.942032670896	91.5953006619545	7.43534802139849	105.6506	92.4297	8.9472
102.895711643029	92.4135274203653	7.43746353980524	102.0076	93.075	9.5996
102.36695900203	92.841468828973	6.49048897178983	100.8882	91.1406	6.6906
101.208614201321	93.779027922779	4.41593082960479	99.3782	93.0601	2.9898
102.849679165704	95.8751491682282	4.4727604028884	104.1728	96.9352	2.733
102.405804710663	96.7377048678136	8.50948387237761	104.1034	98.3317	9.2012
100.45384601408	95.9420295290554	11.1330348628211	101.8123	94.891	12.8509
96.7981465873201	96.1288982326165	12.3433644806606	95.504	96.351	10.2996
96.2879041770101	96.1315886884479	12.8835357212496	95.7576	96.9635	11.4638
95.3670112660938	96.1364768989678	13.8584211905087	95.0373	98.5247	13.5608
94.452219181416	96.1210500152916	14.8323421834133	92.4623	94.734	14.7003
96.1409061173298	101.666026821787	22.2071158556393	95.6122	103.8055	23.229
100.702547700325	94.488960902532	23.0868356171579	101.583	94.8217	23.7006
102.618416017635	91.4746216886241	23.4563098260573	104.3693	90.8389	25.0156
101.626866556984	90.3548521188734	21.7201434822449	100.7126	88.5952	23.1233
100.515688655058	89.24117560373	19.1911252365272	98.1138	89.594	19.2781
101.038075025133	87.9784984119795	16.7861226132801	102.4507	89.6037	15.6617
100.996207154731	87.3851820682048	16.2375805680258	102.0461	86.7072	16.2393
100.963424454315	86.9206147070134	15.8080741300577	102.2936	85.0217	15.0829
95.7304150784438	89.5365721631234	14.41407493283	95.2026	90.5293	12.2607
95.4777363356555	89.523245247705	14.7323728926894	93.9684	87.8762	13.7783
93.3513385960919	89.9690221246201	18.4273735160941	92.7178	89.1801	18.823
92.4441203800371	90.159217277409	20.0038341113218	93.1284	88.6615	20.1351
90.3413656323795	90.6000552474659	23.6577462774558	88.6062	92.2681	23.9863
90.3686971201031	90.5372124338458	23.7278980684886	92.5654	91.5305	24.0262
91.1786625620612	86.403998083589	27.812934867481	93.4941	85.8189	27.3685
90.1185244617018	83.0019283430155	31.9776470879469	89.5631	83.3752	32.5568
89.539674328725	81.1443605664536	34.2516312629779	88.0687	81.4777	36.1559
89.9606776232774	80.5552046103485	34.0852022993242	89.95	80.2132	31.6802
91.7983599512216	78.2976419232681	35.4768863138435	93.1133	78.1389	33.5399
92.7267136432096	77.1571683735411	36.1799591142047	94.4072	76.9857	34.4342
93.7406111950036	75.3638927148802	37.8212150843151	94.549	73.3405	36.7472
93.8144952387255	75.3767219994931	38.5168525605913	95.9481	74.251	38.8025
93.4178260750586	75.7046147360555	40.0333411839526	91.0116	75.887	40.3125
95.6908121073546	76.4050132344361	44.0776739216141	94.6945	78.572	44.5388
96.1377140875551	76.3846630653854	44.730135766375	97.5653	74.5618	43.9951
96.8360218834623	76.5837644913636	46.1199317022825	97.816	74.8015	47.4482
96.791496958257	79.3596260364521	46.8728469173728	98.567	80.2017	48.301
93.0232979470215	82.7122930040373	45.2911477717135	91.1677	84.1211	45.979

Solution x	Solution y	Solution z	Original x	Original y	Original z
93.7257105988086	82.2974920206416	44.3132008006016	92.1151	81.2598	42.8198
93.8662023650639	82.2789209344372	44.2385583013817	92.6699	80.64	42.9825
95.0728255667009	82.1192879465977	43.5973646943156	94.0795	80.8773	41.7611
97.5533759773301	81.952578095445	42.5571162077718	97.7624	79.6432	41.8331
98.4413283952845	82.3771734348754	42.3189847217804	97.0865	83.6094	41.2641
102.446522229858	84.2923281421244	41.2448687918391	104.3617	84.8664	42.6246
101.731963012477	84.7820564566504	36.8302077909119	103.1106	83.2736	35.5168
99.1961135781181	87.2737226310853	34.3115578301362	97.7943	87.7833	36.2243
98.4126585090107	88.0437837428035	33.532433625327	96.2545	87.1498	32.8659
99.1046401378115	90.6288107832199	32.6184187907448	99.3434	90.9979	30.2293
99.2014550826176	91.1239393682869	33.019703068412	98.853	91.6792	31.3431
99.4102341328477	92.1916456515985	33.8850059386563	100.5649	91.4192	35.2273
99.5220227947591	92.7633538808626	34.3483573575678	101.602	92.3175	35.5214
97.3676187501367	98.2465436886713	36.5074935044662	98.8373	99.4165	35.0062
95.1854647896456	103.799790295328	38.6944405974413	94.4828	106.1237	38.6118
96.5121952694188	97.5938109961669	41.5217234423516	98.2349	98.4363	43.0129
96.9955383313559	92.1515150827485	43.3308962492226	96.8345	90.0197	42.1774
97.2463133606296	92.4972060907344	44.7120493852519	97.0347	92.0258	44.3343
97.6585122775169	93.0654226016873	46.9822792538057	96.5235	92.1962	47.4754
98.0348899296935	93.5842586385162	49.0552083082731	98.9319	91.3958	49.6094
98.2556427082423	94.222083862333	50.6981765184915	100.6204	94.7646	50.8195
97.7669000589303	94.5621048568409	51.9294378844903	98.656	92.6213	53.0887
96.0974238303081	96.1463712689075	55.0483309074761	94.0924	96.5838	56.3482
102.312047148383	96.769643478945	54.3229173120116	103.8628	98.4843	53.5771
102.469769428136	93.6961275798698	55.4236171453836	103.2876	94.1817	57.6589
102.238238645373	88.5486897550062	55.8502106221794	104.5599	87.8351	55.8078
100.14840580791	85.1286263037982	56.2171682692453	101.0606	82.9382	56.7378
98.6286463169319	85.4689206756069	55.961365862439	96.9343	84.943	57.6208
98.2061280196499	86.2232532313444	54.4731313805271	95.9325	86.7596	55.1395
98.137276445587	86.5786659294362	53.6582460771157	98.3726	88.4744	52.1576
97.2994959582188	83.3118475309177	54.2001687729731	94.9909	83.4209	53.4521
97.3319270172235	81.9636872744201	54.5419670612641	97.4314	81.946	52.8698
97.3981941542557	79.2086664570183	55.24044908564	99.1261	78.6323	53.6332
97.0491983140591	75.8347740500016	56.5358589655808	96.1169	76.0362	57.1147
96.7616576790987	73.0549928397552	57.6031610201727	96.2521	73.5638	59.9232
96.6093648229569	67.2840599978036	57.8294643524483	97.9014	66.9835	57.8832
96.5290350457437	64.2402415629029	57.9488236099569	94.6788	63.8911	59.4837
96.8909948563857	62.9281934345793	57.6725981680052	95.1558	61.2395	57.4763
96.8910466391073	62.9281779247382	57.6725915017239	96.4356	62.0951	55.4366
99.0044688036106	62.4441448994193	57.7462559423884	99.4285	63.8276	59.6975
101.182326419249	61.7489617494329	57.5652709588989	102.6402	60.9181	59.3218
102.385543789463	62.4298375343319	51.994760495141	100.6854	61.817	51.0639
102.612956073312	62.5585233917341	50.9418766096999	103.9916	60.6173	50.4601
102.327647932813	66.2127175045747	43.9883870303346	102.9023	68.4164	43.143
100.097889513429	61.2312607770747	41.7269496909163	99.3413	60.508	43.9191
99.7349929832545	60.4020194325469	41.3023766949977	99.0429	61.6589	39.3422
99.0565461669875	58.7755939937889	40.5394072345249	99.7259	57.0659	38.9488
96.6435169164823	59.4676411073477	42.4048956307011	95.4289	57.3916	42.7453
95.8449371138312	60.6059853701778	43.2467050424285	95.4724	61.7777	41.2303
94.4626032857294	62.5764292791461	44.7039265629321	93.9444	64.9	44.2206
93.7242662421024	60.4686527304591	47.5351874295626	94.8477	58.3247	47.7413
93.138534601959	60.7155722133411	48.1623741623573	94.6583	60.3511	50.0221
89.8868631035857	62.003190099752	50.5944954011813	90.2672	64.2791	51.3539
87.2091037211405	60.9607912575198	51.6927221504033	86.2321	62.729	51.1705
85.2500926575287	60.1981826372389	52.496167952806	85.8477	60.7859	54.7762
79.446540281585	57.864675045175	54.3481838570581	77.9705	58.8491	56.0075
79.0010361931472	55.7158825782903	53.0070496859617	77.8264	55.5164	53.7679
78.5258088900458	53.4237236125407	51.576433971802	78.0993	54.3894	50.2798
77.993032349538	50.8539834620694	49.9725724418395	77.4079	49.147	51.5989
77.8053797778014	48.6961357381185	45.6025212352027	76.4125	46.981	46.4216
77.7601255513912	48.1757625202251	44.5486473828655	78.2967	50.1808	43.2865
77.6866417314835	47.6235519574762	43.8044467898291	80.0004	48.0282	43.1849
77.6638781304035	47.5227521403698	43.6734222921688	79.533	47.2684	42.1428
77.6120063383698	47.4910710774655	43.6600999757382	77.9078	47.2474	41.2613
76.6378833287142	46.9588360109661	43.7759964692463	74.8417	48.5823	43.578
75.1121111843412	43.5358275103021	44.3668426469097	75.9853	41.4015	43.6031
73.5033224543865	43.8268134180715	45.395293531905	72.7013	43.6681	47.6828
72.7050912218555	44.4395288371752	43.1695324477354	70.5497	45.0925	44.08
72.1340484640818	44.9028505959147	41.4045647733988	72.4926	42.7909	40.5929
71.8790856505262	45.1097120308677	40.6165576982587	72.9378	43.4347	40.5471
70.8695248600333	45.9288805872234	37.4962038191799	72.4429	44.8985	35.9587
70.5060395211904	46.1922012723752	37.1940014792036	72.0385	47.603	37.589
69.554022697485	46.8818809240088	36.4024976457423	70.6191	48.182	36.9413
67.5518789983641	48.3323068881438	34.7379253823249	66.949	50.6855	34.7495
66.1879984108439	45.4826947287922	32.5770806708654	65.3289	43.5846	33.8262
65.9594154803772	45.1376791116378	28.8561191479614	64.4232	44.0581	27.3148
68.6066608138075	46.8423575661673	28.5630407575696	70.4096	46.4113	26.9931
68.5532166509185	48.0889645956213	29.6715757534185	67.5609	49.631	28.0783
68.5647614274192	48.8663967249411	30.5065724050055	67.6648	48.1141	30.5928
68.5806876083074	49.938169203525	31.6577095784427	67.7991	50.1342	31.512

Solution x	Solution y	Solution z	Original x	Original y	Original z
68.5962304725593	50.9843088511103	32.7813143844321	70.8564	51.5507	32.2844
68.6044023446806	51.5344033808375	33.3721336377448	70.0624	50.1219	34.6274
68.6168997544282	52.3764955242467	34.276574704123	70.2011	52.705	34.7749
68.624951315225	52.9179985246865	34.8581785953599	68.2826	55.0673	33.7791
68.784689887158	53.2672062549191	36.6317620713477	69.1689	51.2673	37.9561
68.7309901003875	54.553123116065	37.4880809339859	69.1565	53.343	39.551
68.6292455515867	56.2707922369239	38.4021561961707	67.4683	58.2291	37.5546
70.1670345785462	56.1445525865223	41.1025093612809	68.5789	56.8701	42.2821
70.8414339672125	56.0891903527075	42.2867553680175	69.8977	54.8286	42.1718
72.280849504218	55.9710255512	44.8143402373401	73.7963	57.8273	45.2128
72.1656750789882	53.299979251762	47.674347891779	74.3979	53.0985	48.6112
71.9994083548989	53.125634696763	47.8099503587888	70.1179	52.2878	46.5219
72.1536027152582	52.1638307640855	50.4785547210542	72.0955	52.6394	50.8408
72.2804769131468	51.3724387808902	52.6743321174913	74.4488	50.3129	52.3971
72.1676829446594	51.0906503243326	53.7104639862087	73.2401	49.0047	54.3428
71.2745479452187	51.9682938455167	55.0757869222621	73.3859	52.8201	55.9097
70.5952635381913	52.6353191056551	56.1135434523826	72.0304	52.5053	58.0692
69.8101222479292	53.1197901804456	56.3838993848223	69.2681	55.3133	57.276
69.0219779069289	51.7687491847556	55.9579692199758	69.4154	51.8752	55.6067
68.0946945616547	50.1791962717382	55.4568463214186	66.2863	51.2705	54.2569
67.0713484988255	47.0952296091871	54.9744420031719	67.4955	46.0347	52.8305
66.0904954670925	46.0441865417027	56.4211887561041	65.7303	47.3671	58.4265
62.6256482768194	37.3652469827026	57.2481244027588	62.0243	36.102	59.234
62.3326839385269	35.8790579729845	51.6141217545792	60.137	35.2014	51.7925
62.2751695877723	35.5872941174985	50.5080672386444	61.1452	36.2851	50.8184
62.1955978603484	35.1835980384743	48.9776786789644	60.8351	33.4935	47.8851
64.6920894056942	37.5643249493223	47.5154417974147	64.8516	39.5774	48.8657
64.6920991502832	37.5643270600361	47.5154303875227	66.7168	38.698	48.2341
64.6444881352293	37.331969584014	46.6031106601822	64.2784	38.8059	47.0778
64.5139781452389	36.6950254899746	44.1021924735331	65.211	38.9167	43.4098
64.2641387483949	35.5983505213332	40.7744591482826	63.453	34.6286	41.047
64.0544084933191	34.6777317712094	37.9809332701569	63.8645	34.3723	36.4179
64.0081088457946	34.474499306157	37.3642397036054	65.4552	32.6167	36.7679
62.0885835301013	35.6083623214681	34.935024834768	60.9493	37.7343	34.646
62.1666599288148	33.9551019087926	33.7587430788511	62.464	33.4003	33.7046
62.220508678588	32.8148447808083	32.9474588501518	63.5739	32.9982	33.2424
62.2919155714919	31.3027854894117	31.8716404970013	60.463	30.4795	30.5011
64.4223836956267	30.2989070309183	32.0326230064693	64.1748	30.2745	31.4674
67.3312986378592	28.9282173130957	32.2524292785776	69.5886	28.6002	31.4169
66.706280542391	28.7634416144602	32.8333558085974	67.5765	27.7962	32.158
64.8869960584317	28.2838267811521	34.5242921012258	63.132	27.7543	33.1939
64.5671933333837	28.199515635956	34.8215320459305	63.8119	26.0212	34.0563
62.8183634024194	28.6001780041524	37.0857625940597	62.9268	27.0211	37.7555
61.775453194791	28.8391196478892	38.4360284817973	60.1802	30.671	38.4138
61.9241497277569	26.8177548122684	41.0727695873146	59.5552	26.5288	41.5263
62.5121003666298	25.9634882287317	42.1702810357001	61.643	23.6955	42.1255
66.3131404646284	26.7455637358028	46.448533763308	68.3676	27.331	45.292
67.9466495397432	26.8809928526179	52.5647956729752	67.8857	28.9512	53.8343
68.3462264082399	25.6718452750992	53.1645019728897	70.5469	25.0661	53.9959
63.5562123011382	22.5073584824354	53.1850039743284	63.3795	20.1125	53.5518
58.794664054772	26.5963422388536	52.0429295082409	58.9981	26.6128	49.6223
56.3294242625193	28.6524827939814	52.2377293648057	55.1607	27.7715	51.8295
54.9231041561445	29.8254400581739	52.3488596246817	53.8796	31.7093	51.2249
54.8221732642953	29.0890332756549	53.3335274234188	52.7074	28.2489	52.4902
54.6693859577029	27.9661329681389	54.8361009486388	54.7376	29.7596	56.3053
54.5873576343084	27.3634136424318	55.6425792890166	56.8778	27.618	56.4108
54.2226833467034	26.5962173856487	56.5412062842381	55.089	27.0379	56.5554
53.6924744654372	25.4807810554506	57.8477316389497	54.2786	24.4277	59.9569
50.9721738128464	25.8649591941143	55.0585738179579	50.8742	24.2729	53.2264
50.0016056717011	26.9845409333655	55.1228814851856	50.1386	26.6573	56.0437
48.6985771302601	28.4876300262536	55.2092104476578	47.4152	28.2569	57.2588
47.7213638431711	30.9257964282206	53.768901163581	47.4903	33.2139	54.5514
46.9468790470133	29.4181558258404	50.3701515722436	44.6028	29.9319	49.9927
46.9831331741778	29.3534703478533	50.2652429717321	47.3356	31.1656	48.6863
48.1795778774465	25.1262460090172	47.2825412834528	48.493	25.186	47.2334
49.221762350437	21.4440438542452	44.6844060563637	49.1449	22.3659	43.2644
50.0771719328757	18.4217460917014	42.5518993536944	52.1655	19.1446	41.5432
49.561811641988	13.8030162918638	40.500191643197	47.5448	13.9665	39.1563
49.8645294175727	12.8763949245315	40.3712226435148	48.9393	11.7496	40.9103
50.0650202529553	12.2626910686396	40.2858058728397	51.9742	12.9315	39.5168
50.2531479778557	11.6868372605865	40.2056562697609	51.32	11.9016	40.4537
50.4378443396764	11.1214877088405	40.12696858817	48.2378	10.888	40.0435
51.7327561494032	7.15777313164325	39.5753004309153	50.2911	5.2466	39.9878
54.0104251604448	6.9207072471239	38.819676807767	55.5508	6.709	40.6861
54.2075008818658	6.90657577175834	38.459195561713	55.3647	9.0137	38.8085
54.633356936555	6.74046759928115	37.5275952153973	53.4617	5.8056	38.0578
55.8929854306532	6.24910637745333	34.7720399617476	54.3108	6.5803	34.1725
58.0194990138273	5.41956124796079	30.1201279678984	58.0726	3.0503	30.5544
58.8924898919909	5.07909513305509	28.2103649793415	60.5785	6.8128	27.9807
58.9557404889025	4.48480773831293	27.2482292622554	60.2628	6.0605	25.9406

Solution x	Solution y	Solution z	Original x	Original y	Original z
58.7484426630292	3.03530057890074	25.8475344367397	57.7618	2.6586	23.6599
60.885821577388	1.10966683911147	28.7038495902941	62.7821	-0.0838	27.7653
60.6569683022275	0.654165499135795	32.8604848486003	59.6709	-1.5476	33.1451
61.3728886284281	2.32183449790 3	37.7286861791087	61.565	4.5717	36.954
61.5898557332181	2.82720872405596	39.204026700504	63.4243	4.3429	39.6925
61.082421267101	2.58128506653505	39.8222154125654	62.5325	1.766	39.3982
58.6855392062444	1.4196427795427	42.7422680828175	60.4167	1.4088	44.4464
57.6578200272946	1.00755836144971	43.6084541842515	57.3839	0.9502	46.0215
56.7280304719977	0.585569256298593	42.3468243750993	55.7669	1.6852	42.4618
55.9681240865592	0.240679544140523	41.3157069279472	55.5686	2.3786	41.1094
54.3393039930596	-0.498582985678789	39.1055626624624	52.8937	1.339	38.4463
53.7853491970896	-3.440893777953	36.9486143028232	53.412	-4.2453	38.3008
53.0685563150858	-7.24811878983662	34.1576046528865	53.289	-9.6645	34.2743
51.8027653090631	-4.16614022395097	31.2561222144542	50.0191	-2.6033	31.7826
53.1465291027233	-4.07347833528541	28.751133870282	53.5826	-3.7128	29.3577
55.4069831307624	-3.91760425156743	24.5372872491014	57.7878	-4.3732	24.6962
54.1153563892086	-3.15841463875105	20.6533261052175	53.8048	-5.0553	19.1679
53.6209839450537	-0.791403844490954	19.7174549341365	51.7765	0.7553	20.0441
55.6383838096393	-0.670646120027888	18.410204195436	56.047	-0.6998	19.4659
58.4747756121621	-0.500862567640239	16.5722598696907	58.3955	-2.2935	14.9348
61.3685234218631	1.17050296785409	16.1122759309781	63.0749	1.8033	17.7213
61.2362378380562	1.66514407339793	13.0899725138841	61.9524	-0.333	11.9086
60.2823190662593	4.48923772181687	10.4638156803641	58.0725	5.2013	11.1785
60.7850471488856	6.0720400028327	8.26654331593252	59.4358	8.0877	8.3998
60.7968139563188	6.0725631950148	8.24874825926338	58.8992	5.3006	6.9433
63.21924469959	6.20815941624728	4.75529258817846	64.6914	7.7788	3.6297
61.4142414342676	1.18070911747077	4.05635531482092	62.4332	-0.684	2.8792
59.8399279450911	1.26625575163073	4.94079965593748	58.6741	1.1796	4.0744
58.9426277458883	1.31500856687457	5.4448985342895	58.2864	0.0731	4.559
58.121028859991	1.35964776012193	5.90646846587262	58.2741	0.1622	8.0145
57.594191783797	1.58367474036999	5.84198460001148	58.5415	3.6684	5.0311
56.691930534759	1.93849472561376	5.74229918656132	54.5841	1.3	6.274
56.5669907185046	1.98763514668456	5.72849368446307	56.6752	3.9284	4.2715
53.3846009798299	1.54429830742695	6.63223333095705	52.3291	3.6705	6.1162
51.2391231738731	-0.051796946056669	7.70705001792881	51.545	-0.7619	6.4521
46.4311440581636	-3.62861757782723	10.1156958033314	46.0937	-5.8176	9.1179
43.3751524487865	-2.36668992497465	13.7753221216773	44.8479	-0.9391	15.0769
38.8014029470546	-2.0720589131145	16.8523986805224	39.9467	-2.3317	18.5214
32.6027460143063	-1.67275312247913	21.0226484262266	32.3564	-1.4633	20.5286
24.8728822771452	-1.17480963380293	26.2230440355945	22.6294	-1.9579	25.7184
25.5539998057272	-0.249100960348983	27.8699477422918	24.8641	0.1355	28.7608
25.9358343054164	0.269852850083691	28.793202373729	24.5208	1.7631	30.0851
30.3414733548241	-0.570559464405088	30.0255329109974	31.1128	-2.8096	30.5667
34.631910863632	4.95588097872513	30.2386215593404	36.4235	4.5159	28.6582
34.6630424347289	5.10535657159789	30.3066222236988	36.2059	6.8965	29.7476
33.6855931588546	4.94147419120458	31.3399108269176	33.6792	4.7017	30.2163
31.1752467384172	4.52059453702174	33.9936659120966	31.7997	5.4917	35.1341
29.7811607159452	4.28685833245651	35.4673917361186	29.6205	6.6839	35.8272
28.4494129328742	3.91019018204116	36.8631975973779	28.6989	1.5656	37.4478
24.3857152764398	5.90218181993678	40.0219353121604	22.0744	6.6433	40.1203
27.8917102438626	5.29268380185272	42.102862888216	27.9452	7.0873	43.7392
28.3824294969775	4.99073643814953	42.2014199619664	29.2732	5.6917	40.0529
33.8791887993251	1.54265195566067	43.4279612853797	33.4349	0.0139	45.2628
41.9956971334162	0.484502420575454	40.9234287056064	42.4155	0.0668	38.5675
44.6474263759141	0.611442259450215	43.0041747037161	43.4311	0.4843	45.1031
48.0711284707458	0.80423924432308	44.4104926458453	49.2438	-0.5725	42.7886
48.7935856409116	1.02759996605591	44.9735919725674	49.5265	1.5006	43.2383
50.1129047233345	1.43549419855333	46.0018967486634	50.9668	1.717	44.4164
52.4678787754563	2.16358377819333	47.8374242927462	54.6465	1.327	47.163
52.4595286244178	2.36280879854673	48.1479690647744	52.0607	4.6851	47.5572
52.5589803973894	2.28563913210311	49.371937362473	52.2056	3.4977	49.7426
52.6406210041569	2.22228867318003	50.3766862518819	54.7597	1.1902	50.9644
50.860247122486	3.00761973277294	53.2868559644361	51.8363	2.0767	53.9783
48.2152520720513	4.17434377209732	57.6103034602037	49.309	3.6922	59.7251
47.3418245790199	4.55951368990471	57.6556646687631	47.7278	5.7114	59.7593
45.7255881105744	5.10970913006337	57.4785041670308	44.3097	5.4051	59.4302
45.3847429304032	5.30063788616221	56.5956740290894	45.5397	7.2979	57.1732
44.9028739716544	5.57055953640955	55.3475905324783	46.8369	6.4403	54.1626
43.577486974112	5.62317885077007	54.1024805082395	44.2937	4.7268	51.9613
38.9927403601267	7.10623481116931	54.013720209012	38.0686	7.3443	51.7798
36.3493550817526	8.0459269369649	57.0439526937023	36.7928	9.6586	58.8057
34.6179309717242	6.97371917385991	56.8645950184588	33.7832	8.5886	57.2507
31.4461892232187	5.00957380177636	56.536035795623	30.7839	5.7178	56.2846
29.1937726557545	3.61473317382579	56.3027088278029	27.6562	5.4902	56.4427
26.253393218816	0.538063841671439	55.8652048702311	25.8989	0.7413	53.4706
24.679759053722	-1.27076731428653	56.292841049859	22.4229	-2.1641	56.3911
27.3766714259558	-1.52982649984797	56.5771326282515	27.3755	-1.0984	56.1861
30.3896951449964	-1.81925189348121	56.8947472774076	31.1391	0.2266	57.7289
30.5988613957833	-1.83934043991258	56.916795563559	31.0065	-1.0714	59.1851
36.7830416267794	-3.48574341889082	54.6665579830537	36.4279	-4.3699	52.432

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.323259164988	-3.83865143597797	55.639778914209	43.0131	-4.6452	57.9101
53.4392284664767	-4.18502943705433	56.5838478491127	54.4331	-6.2551	57.3764
57.5913262163154	0.965584625735245	55.1522054745579	56.514	2.6652	55.8183
58.1112720717322	1.61057161343915	54.972927078348	60.4719	1.0667	55.1539
57.9249360015795	2.57032601212379	54.6959308282449	58.2987	1.8222	52.9601
57.6214462893814	4.13348926935508	54.2447800069936	56.6229	3.2945	52.4352
56.9237363431996	7.72714200591303	53.2076102005401	58.6318	9.4344	53.4701
53.2497685947395	8.68914705528432	51.6386193771412	51.2901	7.6487	52.6277
52.6693855148887	11.2579727512388	48.550103458024	53.965	12.2967	46.7771
49.6994878706938	11.2319304625122	49.6007095770538	47.6091	10.2274	48.878
50.6400932241429	13.1335865150787	52.0752980654818	50.5069	12.3029	52.6774
51.7313707270389	15.339869805715	54.946287084186	53.7123	16.59	54.3027
50.9586694638062	16.0595634598629	57.7633279172833	52.0827	15.9727	59.9151
46.9342142743646	17.3444374835229	56.398978751385	45.9074	18.6439	58.1761
42.1207894506497	17.0022112868365	50.6572585542486	39.7266	17.3977	50.5452
44.9051905460416	15.9024906523185	47.6845269470516	47.2642	16.1804	48.1934
44.1447584829899	14.7415284437214	44.8390603838276	46.213	15.3079	43.6977
42.5432412267147	13.2675428462426	42.1742958620062	40.2323	12.6508	42.5989
44.0342373564878	12.2759910188805	37.9718587431766	43.7175	13.3612	37.2361
44.7890466868852	11.7740204785632	35.8443872940023	44.7075	13.3055	33.9605
45.5032985031428	9.95038587270295	35.760733759097	46.3909	8.819	37.7186
45.4725259800172	9.40358012392879	34.6284527583864	43.7681	7.8375	35.3656
45.5061855595209	7.98478012478457	31.4110162318189	44.0031	6.0986	31.1209
47.1691750684313	8.7559405350252	28.8287821009213	49.0558	10.279	28.6803
46.1376267039208	7.48314995700074	27.0219642545069	46.0043	6.8606	27.4465
45.1701792835812	6.28944957786112	25.327421234483	45.0418	3.8658	25.2247
43.9803674192606	8.33960804488431	23.0537104309643	43.7231	10.6871	23.6231
42.8393097229578	7.01720301331313	19.0406074457805	41.1669	5.3004	18.6447
44.7509768646083	8.84385085016994	16.1305338208078	43.984	9.2005	15.6271
46.1725967882961	10.202249329218	13.9664606486394	44.5689	9.75	12.1988
46.1726910333174	10.2023379397292	13.9663232743998	44.5228	11.8645	13.3212
48.5927160337187	10.9251057094053	11.9316330877651	47.1015	12.1757	10.5923
50.7572160396318	11.5715233401183	10.1118187787705	52.3173	10.0275	11.1526
52.3329512911203	12.3146993261385	8.46794129184167	52.0306	12.0787	8.641
54.9903936291823	13.5680693854224	5.69559535474334	57.2331	12.7874	5.1838
54.4226012411712	14.3260280979075	5.26804451878442	55.8132	15.4408	3.6174
49.234815774221	16.9599407354597	5.25815532629881	49.1677	19.2175	6.1526
48.5627487142492	16.6701390427559	5.00300550173365	49.3862	17.5735	5.4967
46.9134592921997	15.9589534811351	4.37686555412001	46.503	16.5426	2.0548
45.2499746422681	14.7199747891394	5.23091155664607	44.2621	15.3855	4.7212
43.9481548254879	13.7503657578425	5.89928053213935	41.9974	13.5778	7.3366
45.6277153100323	12.6209726475695	4.2268134138121	47.4524	12.1509	5.76
45.9126496585943	12.3570053303928	3.62276113139842	46.5714	10.174	4.4604

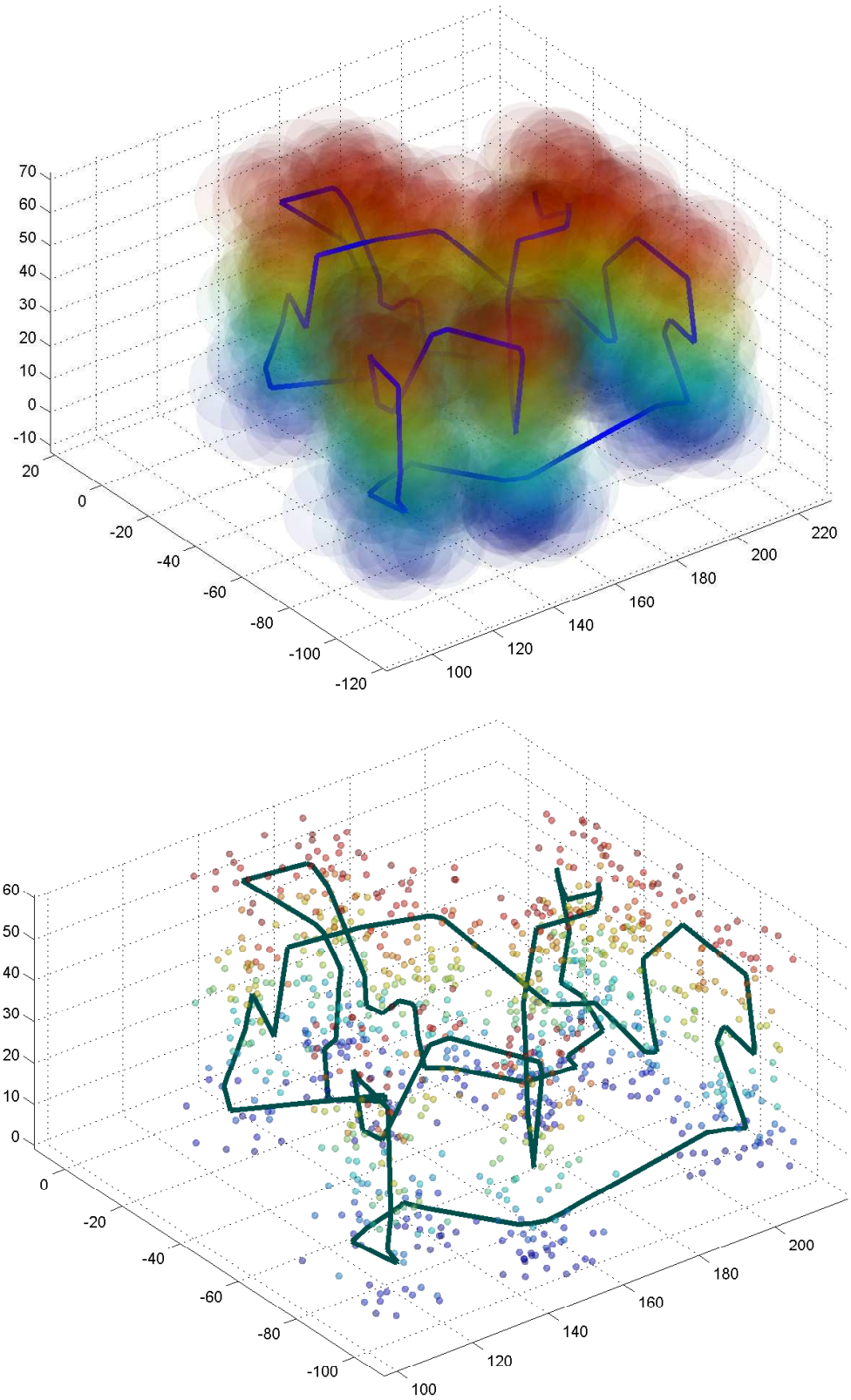


Figure N.89: $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Euclidean, Length = 1021.2515482

Table N-92: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Euclidean

Total distance: 1021.25154821172 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
47.3285032924788	13.6366670958896	0.648834632319019	41.9974	13.5778	7.3366
47.5099115601365	15.153613779601	1.23793320378791	46.503	16.5426	2.0548
47.6858562884108	16.6248739731833	1.80928956092464	55.8132	15.4408	3.6174
47.8587356862249	18.0705027957101	2.37069202053239	44.2621	15.3855	4.7212
48.043962441447	19.6193809995582	2.97219099249774	49.3862	17.5735	5.4967
48.2342256131137	21.2103745449177	3.59004511130807	49.1677	19.2175	6.1526
48.4295212790197	22.8434503267335	4.22424143189818	46.7163	23.0055	0.3229
48.6356402160322	24.5670313385484	4.89358525630497	46.7677	27.4481	8.8301
48.8181633452472	26.0933018072374	5.48630373460212	47.5893	27.8934	1.3329
49.001724012053	27.6282481883141	6.08239134143486	44.1303	30.8739	2.5661
49.1782534747981	29.1043992671576	6.65564584140074	58.126	35.24	1.1949
48.4075817226353	29.9987698675967	7.84100789415542	50.8592	31.2824	4.4654
47.566397023505	30.9749749614129	9.13482735241179	44.3651	39.5082	4.2576
46.8961315407066	31.7528114800121	10.1657478975583	50.3352	41.2014	16.9793
46.0046919740014	31.1974984855261	10.1051378445718	45.4903	38.3462	11.2293
45.0037740139468	30.5739873431333	10.0370844233315	45.4526	36.121	9.3446
43.8994861924028	29.8860834434774	9.96200292296152	45.6407	35.658	2.8521
42.4960680773227	29.0118401822217	9.86658357902566	42.8212	36.4305	1.5446
38.6112148733567	26.5918188653626	9.60245422327041	37.4272	33.8061	3.3013
32.2963533743399	22.6580542023022	9.17312011282105	27.0312	22.0371	1.4535
29.5988986814363	20.9777062890349	8.98972124419172	24.0847	21.2619	9.4135
27.4594000898866	19.6449304097409	8.84425744951396	19.8821	27.2321	11.7559
26.0865239738903	18.7897127344691	8.7509147514881	24.5729	19.8583	16.0395
24.7372871886143	17.9492212366662	8.65917845345091	20.5046	21.2685	13.3595
23.490755077697	17.1727086396248	8.57442467576933	19.6457	23.2311	5.559
22.2850984647107	16.4216591244062	8.49244986683307	15.0509	21.8739	10.7741
21.2875456615481	15.8002455396636	8.42462424424063	21.2889	20.2133	0.1771
20.2138420179284	15.1313948836015	8.35162086671998	16.9397	16.157	0.3423
19.2896233537536	14.5556640123524	8.28878109788028	7.8039	17.6061	5.7787
19.8205658514276	13.505913837054	8.55878548690657	23.3217	16.9506	6.2856
20.3814927092637	12.3968813693486	8.84403842018035	25.2224	21.1268	9.0297
21.1861646057289	10.8059345412032	9.25324661247969	21.6596	11.213	17.563
21.9285839245564	9.33806861841903	9.6307961636305	23.9142	5.5856	8.3806
22.5943116814444	8.02183221072047	9.96934481264307	19.4163	-0.8394	2.2943
22.9533994755849	7.84272278597269	10.364334916549	28.0443	7.2557	0.5495
23.420653778062	7.60966057587034	10.8783050720722	31.0707	1.7474	5.3999
23.8104489047278	7.41523451876805	11.3070719519374	26.7943	-2.6353	5.1743
24.8837460393552	7.04404695882662	12.6681876537092	22.4003	2.9895	12.1851
26.0042339960813	6.65653928632189	14.0891491379273	31.9656	14.6164	16.7619
26.8479368294344	6.36475414453463	15.1591020038783	26.246	7.8923	16.6585
27.697469880984	6.07095269675619	16.2364485104102	29.2451	9.0499	23.6495
28.4053245068864	5.82614892310394	17.1341234874506	26.4488	5.1021	19.0029
29.1236779947163	5.5777142450515	18.0451125079649	28.1449	5.3771	22.529
29.8114381775765	5.33985986918658	18.9173041106413	32.3564	-1.4633	20.5286
30.4323416857441	5.12512707385839	19.7047107018282	39.9467	-2.3317	18.5214
30.2168759024266	5.55159961646969	20.550688480315	41.1669	5.3004	18.6447
29.8194754779686	6.33818191588336	22.1110188066873	36.2059	6.8965	29.7476
29.5445497857585	6.88234566521469	23.1904598984646	36.4235	4.5159	28.6582
29.2939098724805	7.378439743761	24.174544913117	31.7997	5.4917	35.1341
29.2939098724805	7.378439743761	24.174544913117	33.6792	4.7017	30.2163
29.1851342545065	7.59373925265266	24.6016245697985	31.1128	-2.8096	30.5667
29.1851342545065	7.59373925265266	24.6016245697985	24.8641	0.1355	28.7608
29.0309918037152	7.91095763590372	25.1819209805606	22.6294	-1.9579	25.7184
28.6919626870414	8.6086737891463	26.4582608022026	27.2842	5.8331	28.3822
28.35343365897	9.30536149102701	27.7327185956031	29.9497	8.0977	27.1858
27.9998644638649	10.0330029342955	29.0637989686027	24.5208	1.7631	30.0851
27.5972088970952	10.8616689123362	30.579678164182	28.6989	1.5656	37.4478
27.2870541177683	11.4999646627985	31.7473186365446	29.2732	5.6917	40.0529
27.0420821062637	12.0041105417985	32.669563114792	27.9452	7.0873	43.7392
26.874379555371	12.5041954998146	32.5677152275351	29.6205	6.6839	35.8272
26.690201765639	13.0534089892136	32.4558619184735	25.9081	14.4892	36.1934
26.5082638677729	13.5959430337756	32.3453689074123	22.0744	6.6433	40.1203
26.1723791441481	14.5975405786015	32.1413853115704	29.4417	11.4808	30.7206
25.8158132598737	15.6608083292506	31.9248424715887	19.6468	14.5775	38.07
25.4591145839051	16.7244721000429	31.7082186385596	18.1963	16.0602	36.4885
25.1134004705228	17.7553803653122	31.4982651401088	20.7311	19.0512	39.2565
24.7832993603732	18.7397311221955	31.2977924584648	23.1228	16.7524	24.3445
24.4505785201862	19.7318936602185	31.09572930419	23.1615	20.5337	28.672
24.1248741462738	20.703133189081	30.8979272144537	19.0397	19.3917	26.8913
23.8042305902547	21.6592814662784	30.7031987103842	17.2669	18.1061	25.0094
23.4769022959811	22.6353630628985	30.5044110076534	18.4916	22.031	28.1174
23.1599756720003	23.5804271709742	30.3119401945408	20.5322	21.5891	20.6595
22.8563612386655	24.4857944696694	30.1275540298186	20.8129	26.0745	22.3222
22.5896427215418	25.2811395854745	29.9655744362809	18.7531	32.536	21.0115
22.7788748966388	25.2630949782434	30.9449817537731	22.8581	29.0039	22.5241
23.0793310781493	25.2344439777598	32.5000530046977	28.099	29.8348	27.0633

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.471165120678	25.1970789920808	34.5280705705079	17.7323	26.9057	35.8248
23.8658596314546	25.1594410019066	36.5708945259613	17.3215	22.815	38.4524
23.8658596314546	25.1594410019066	36.5708945259613	19.5225	24.6717	34.6116
24.302530762897	25.1177998357057	38.8309785300834	21.1889	21.267	39.0474
24.7495761556266	25.0751695238904	41.1447564004426	19.3676	20.9011	45.1036
25.1345893105329	25.0384549693372	43.1374716236597	19.4151	20.4264	46.5071
25.4792788467782	25.0055859584617	44.9214818025205	21.3113	31.7798	46.1078
25.8222018272601	24.9728851952788	46.6963482234395	22.5923	19.795	49.1879
25.8222018272601	24.9728851952788	46.6963482234395	21.7951	21.835	45.5134
26.1609332188033	24.9405844773997	48.449518715513	16.9754	26.2994	50.4148
26.1609332188033	24.9405844773997	48.449518715513	23.1689	25.59	48.8728
26.4856678419991	24.9096185981093	50.1302457112722	19.4476	21.0876	59.2618
26.4856679167663	24.9096186235378	50.1302457691232	18.7218	26.0511	59.401
26.576314968586	24.9219257774412	50.1288345018687	22.0389	18.6688	59.3708
29.2369011956476	25.2831347435763	50.0874172912439	21.4132	25.3225	51.4824
35.006292224201	26.0664051942739	49.9976060556198	35.5392	31.6783	58.7469
39.4267021792355	26.6665310663929	49.9287909098238	40.9959	37.9409	51.1587
41.0888710863634	26.8921918883563	49.9029157618358	44.6028	29.9319	49.9927
42.5916274426916	27.0962105609445	49.8795223106656	46.003	37.4534	46.4333
43.3672257498282	27.2015090455387	49.8674486813461	50.1386	26.6573	56.0437
44.0155355815832	27.2895266012966	49.8573564861382	45.9074	18.6439	58.1761
45.3516100105346	27.5672788918628	49.746195642467	47.3356	31.1656	48.6863
46.6108004193819	27.8290480533039	49.641432035008	47.4152	28.2569	57.2588
47.8597148301982	28.0886809986374	49.5375236653477	47.4903	33.2139	54.5514
49.0981209223148	28.3461294434646	49.4344898509916	50.8742	24.2729	53.2264
50.3230333885271	28.6007727416063	49.3325788190185	48.493	25.186	47.2334
51.625034281747	28.8714417906296	49.2242539683797	54.2786	24.4277	59.9569
52.4883265006165	29.0509077952109	49.1524321988788	55.089	27.0379	56.5554
53.3251712091956	29.2248757285115	49.0828108513862	56.8778	27.618	56.4108
54.1163663684821	29.3893537462926	49.0169874700952	52.7074	28.2489	52.4902
54.9401714623541	29.5606109611758	48.9484509896857	54.7376	29.7596	56.3053
55.7845646441492	29.7361481756919	48.8782016339263	53.8796	31.7093	51.2249
56.6574407363884	29.9176066275261	48.805582496124	51.473	33.7115	46.7085
57.6143209303786	30.1165284458709	48.7259742530295	55.1607	27.7715	51.8295
58.6362731188609	30.3289778904081	48.6409520421615	58.9981	26.6128	49.6223
59.6766767386543	30.5452631732215	48.5543946631996	63.3795	20.1125	53.5518
59.9896150095508	30.6666287439377	48.5016922533668	60.137	35.2014	51.7925
60.300521236404	30.7872062144933	48.4493320490139	62.0243	36.102	59.234
60.7198059697459	30.8953144652266	48.2488085733296	61.1452	36.2851	50.8184
61.1372138710027	31.0029387786999	48.0491826680958	60.8351	33.4935	47.8851
61.554516184785	31.1105358566101	47.8496072661746	66.7168	38.698	48.2341
61.554516184785	31.1105358566101	47.8496072661746	64.8516	39.5774	48.8657
61.898954083343	31.1993456229571	47.6848791044506	64.2784	38.8059	47.0778
62.2264506986286	31.2837872586292	47.5282530706252	67.8857	28.9512	53.8343
62.5473317149992	31.3665231364123	47.3747909208554	70.5469	25.0661	53.9959
63.3933573765923	32.056646947751	46.3805878781713	68.3676	27.331	45.292
64.206175327534	32.7196825566233	45.4254085230668	61.643	23.6955	42.1255
65.2590215469233	33.5785135723521	44.1881619255074	63.5739	32.9982	33.2424
65.789064971194	34.0108835427063	43.5652823905394	62.464	33.4003	33.7046
66.2205490620542	34.3628562989369	43.058224317739	59.5552	26.5288	41.5263
66.8359034879271	34.8648163028033	42.3350916100724	63.453	34.6286	41.047
67.4715066858535	35.3832935817344	41.5881638255695	60.1802	30.671	38.4138
68.2448653517616	36.0141408154452	40.6793535821271	65.4552	32.6167	36.7679
69.0331127529006	36.6571329597377	39.7530471763888	63.8645	34.3723	36.4179
69.86825463456	37.3383777710517	38.7716332490237	69.5886	28.6002	31.4169
70.6095068614214	37.9430345035026	37.9005525245499	65.211	38.9167	43.4098
71.5546587953909	38.7140160117787	36.7898610430813	75.9853	41.4015	43.6031
72.5441235349215	39.5211440203381	35.6270962226254	72.4926	42.7909	40.5929
73.609585407063	40.3902639237009	34.37502457342	72.9378	43.4347	40.5471
74.8379813036027	41.3922915794927	32.9314830206249	72.4429	44.8985	35.9587
76.1715457697757	42.4801066484508	31.3643540749035	77.9223	44.6051	30.7678
77.4155595217406	43.4948741774163	29.9024587244688	80.3964	49.7264	23.6683
78.1428101867935	44.0881092568594	29.047831923343	75.5201	48.6107	22.753
78.7621264142098	44.5933000874257	28.3200435575212	76.379	48.6237	27.9163
79.3689272668266	45.0882819841038	27.6069623767554	75.5587	49.1352	25.3998
79.9572407863096	45.5681835042178	26.9156063117122	73.2561	47.9132	17.0605
80.8470336881296	45.898194164667	26.768373659705	80.7698	50.729	27.0276
81.7124415257287	46.2191614019521	26.6251755905128	76.0043	50.5809	30.4596
82.6948139013862	46.5835075931848	26.4626245175873	81.1686	57.7423	31.0101
83.8111566584699	46.6797357890781	26.1614951072397	83.5076	51.7826	22.7284
84.9081949983649	46.7742997628958	25.8655720253552	87.5129	47.9594	27.6836
85.9743750385918	46.8662036392453	25.5779722361879	87.2346	40.5435	32.6709
87.11580314099	46.9645942296309	25.2700777423068	93.6941	39.0671	28.969
87.9362328903524	47.035314088357	25.0487680409396	93.6083	38.4774	26.0941
88.6306625149707	47.0951726309093	24.8614453999505	87.5583	39.2312	23.679
89.353130504247	47.1574481015814	24.666560326836	88.4465	41.4478	32.5802
90.1661632315576	47.2275303396064	24.4472474051627	96.8865	41.9997	31.9305
90.7389113908138	47.2769000528407	24.2927477594036	97.0063	39.6578	31.3742
90.7422411165447	47.2771847892601	24.2918510506271	98.4033	39.6451	29.8224
90.9360697419985	47.5747524094529	23.9822503977369	98.7317	39.6579	27.3708

Solution x	Solution y	Solution z	Original x	Original y	Original z
91.3356601058067	48.1881965455537	23.3439951136115	93.9129	43.6355	26.629
91.7706874696195	48.8560412200714	22.6491381106948	95.46	44.379	21.4845
92.2096980992853	49.5300004220002	21.9479189525885	87.8413	47.1867	25.6907
92.7124182776872	50.3017614871102	21.1449402415288	89.3464	46.1786	22.3858
93.2818716413821	51.1759648880758	20.2353731847431	91.9756	47.4725	20.0446
93.8955948168288	52.1181265392121	19.2550972630371	92.412	50.9961	13.3675
94.4755317766944	53.0084212597921	18.3287865587184	84.6532	51.7406	11.3965
95.8380315379931	55.1000135952615	16.152583631522	89.6611	52.1615	6.6683
96.5024789107657	56.1200187413323	15.0913139199114	93.2379	56.4517	4.9219
96.9112351493561	56.7475240429635	14.4384220839505	96.8097	54.0588	2.5941
97.0404429387038	57.0097679699934	14.5348572498754	98.2152	53.7701	7.2972
97.0404429387038	57.0097679699934	14.5348572498754	99.5987	51.3246	10.6347
97.1836003959104	57.3003242367562	14.6417039637689	100.6388	53.8259	6.8403
97.1836003959104	57.3003242367562	14.6417039637689	100.3439	52.2486	6.1962
97.3561289353343	57.6504924193772	14.770472101939	98.9521	56.5952	10.596
97.3561289353343	57.6504924193772	14.770472101939	97.3108	57.82	10.7791
97.5295161965349	58.0024037356326	14.8998811977503	95.9041	59.3009	4.8034
97.7150829065536	58.3790346820413	15.0383804990776	98.8606	57.9963	4.7298
97.9180063020399	58.7908930409334	15.1898340204506	98.4258	65.8894	6.8362
98.0809117873731	59.121530712388	15.31141955793	103.5291	67.906	8.9335
97.9527718361449	59.0603400771614	16.1295636874957	93.0933	68.7697	14.1811
97.7965613672789	58.9857449612947	17.1269435785964	102.1595	55.9791	16.6639
97.7965613672789	58.9857449612947	17.1269435785964	94.6877	57.1733	21.1304
97.6510238112547	58.9162465919352	18.0561734958608	93.5538	62.1822	15.7085
97.6510238112547	58.9162465919352	18.0561734958608	92.8209	56.9207	15.4027
97.4969313440307	58.8426627895549	19.0400277367001	102.8738	56.4102	20.1678
97.4969313440307	58.8426627895549	19.0400277367001	101.377	48.1816	18.5975
97.3436391357399	58.7694607300725	20.0187695064858	94.5987	62.0376	18.5629
97.1873065194712	58.6948066936502	21.0169248436072	92.0851	66.8651	17.5763
96.9939791324528	58.6024860513133	22.2512991981852	88.7937	67.447	23.6857
97.121977179786	58.0315935362708	23.9562369127684	88.0225	60.7529	26.1198
97.121977179786	58.0315935362708	23.9562369127684	87.1149	58.1702	24.9275
97.2433093110168	57.4904340689056	25.5723666090007	101.7941	49.0832	29.2585
97.3272129724058	57.1162114375938	26.6899375811089	96.0562	52.3857	26.7058
97.3272129724058	57.1162114375938	26.6899375811089	95.0864	47.4256	26.3676
97.400855321835	56.787756514142	27.6708260513036	99.9754	58.6633	29.714
97.400855321835	56.787756514142	27.6708260513036	98.7715	55.3698	27.9452
97.4731473156104	56.4653240882155	28.6337266946889	95.479	61.1306	33.7151
97.4731473156104	56.4653240882155	28.6337266946889	94.4551	58.0456	35.6169
97.5336072899363	56.1956646840543	29.4390225839342	99.7259	57.0659	38.9488
97.5336072899363	56.1956646840543	29.4390225839342	97.7455	51.8526	39.6885
97.5613598216827	56.0718847554347	29.8086662622797	93.3932	53.1876	39.0419
97.5613598216827	56.0718847554347	29.8086662622797	93.0102	50.1223	20.798
97.6337586219887	55.7489685939371	30.7730205849147	98.4228	65.0226	33.0945
97.6337586219887	55.7489685939371	30.7730205849147	92.749	64.7326	27.0986
97.7570537690519	55.1990377590944	32.4153801587188	98.1036	50.8139	41.2796
97.8333591696253	54.8586952360276	33.4317689611154	99.7789	45.6905	34.3678
97.9015029102563	54.5547561602851	34.3394416799237	103.0838	43.6629	35.7673
97.7213291542581	54.8301296685808	34.8611438998536	106.6231	51.946	40.2003
97.7213291542581	54.8301296685808	34.8611438998536	100.5945	52.9653	41.549
97.5562508011969	55.0824315636539	35.3391317309097	95.1396	47.3596	38.3213
97.3895046671644	55.3372824834232	35.8219506976901	94.3452	48.7818	37.6589
97.3895046671644	55.3372824834232	35.8219506976901	90.3356	51.1932	37.7625
97.2247138057053	55.5891449888355	36.2991094104238	89.2688	56.3248	44.4917
97.1293796171801	55.7348512281835	36.5751435113157	85.9154	51.5363	38.6114
97.1293800509815	55.7348529299554	36.5751455777853	89.352	47.1855	40.3099
97.3289414974725	56.5133686422067	37.5037394786462	92.9131	56.6287	40.2251
97.5243375908559	57.2756294771013	38.4129456371294	95.4289	57.3916	42.7453
97.7106702409904	58.0025278129756	39.2799728914983	95.0304	53.2116	46.2852
97.8880151294707	58.6943647404699	40.1051797737157	99.0429	61.6589	39.3422
98.0618187059537	59.3723851008965	40.9139068222646	95.4724	61.7777	41.2303
98.2332258361176	60.0410594522857	41.7114858555411	97.9579	54.2407	46.7851
98.4059401732866	60.7148368815212	42.5151513745517	99.3413	60.508	43.9191
98.5760891650294	61.3785995304961	43.3068724614938	94.8477	58.3247	47.7413
98.7448241997102	62.0368452902599	44.0920132912599	94.6583	60.3511	50.0221
98.9047666690203	62.6607825804201	44.8362327918626	93.9444	64.9	44.2206
99.0660215024507	63.2898455035985	45.5865652625336	102.9023	68.4164	43.143
99.2208683463619	63.8939024458488	46.3070721821822	103.9916	60.6173	50.4601
99.371308520862	64.4807660150527	47.0070715640602	100.6854	61.817	51.0639
99.5190449848015	65.057080937692	47.6944888791009	95.1558	61.2395	57.4763
99.6182790293138	65.444172055777	48.1562061723334	96.4356	62.0951	55.4366
99.7134513227127	65.8154180211567	48.5990236645607	102.6402	60.9181	59.3218
99.7134482136729	65.8154766510363	48.5990211236446	94.6788	63.8911	59.4837
99.6597424851076	66.8328644448275	48.5554066808328	99.4285	63.8276	59.6975
99.5238900175204	69.406829804024	48.4450586321214	97.9014	66.9835	57.8832
99.3526349237575	72.651678127436	48.3059499784948	96.2521	73.5638	59.9232
99.2948857822393	73.7456602366013	48.2590570286966	97.816	74.8015	47.4482
99.2380866914924	74.8216431666485	48.2129356784671	97.5653	74.5618	43.9951
99.1810841815131	75.9014865946162	48.1666486231516	94.6945	78.572	44.5388
99.1268482024304	76.9289329622604	48.1226072782412	97.4314	81.946	52.8698

Solution x	Solution y	Solution z	Original x	Original y	Original z
99.0779682446877	77.8548918953154	48.0829170375187	98.567	80.2017	48.301
99.0303586115323	78.7568010881468	48.0442572358297	99.1261	78.6323	53.6332
98.9825156173861	79.6631299307812	48.0054080646172	96.1169	76.0362	57.1147
98.9256901498311	80.7396350482596	47.9592638442608	97.7624	79.6432	41.8331
98.8681373905811	81.829912924538	47.9125294486874	94.0795	80.8773	41.7611
98.8102309393548	82.92691014914	47.865506462878	94.9909	83.4209	53.4521
98.7525704116517	84.0192284033011	47.8186847014044	96.9343	84.943	57.6208
98.695661551553	85.0972815983772	47.7724754379201	95.9325	86.7596	55.1395
98.6403043179792	86.1459489820332	47.7275255683253	98.3726	88.4744	52.1576
98.5867200592175	87.1610300760375	47.6840153596738	98.656	92.6213	53.0887
98.5389060619156	88.0667557245118	47.645194281258	101.0606	82.9382	56.7378
98.4686401308511	89.3978899752725	47.5881352811807	94.0924	96.5838	56.3482
98.4686401308511	89.3978899752725	47.5881352811807	98.9319	91.3958	49.6094
98.4686401492763	89.3978900708307	47.5881352284229	103.2876	94.1817	57.6589
98.4686400669002	89.3978905212236	47.5881344469225	104.5599	87.8351	55.8078
98.4686399880059	89.3978909639699	47.5881336820334	100.6204	94.7646	50.8195
98.4686399116601	89.3978914026315	47.5881329270737	103.8628	98.4843	53.5771
98.0765362356874	90.3806843291846	45.228056052922	96.5235	92.1962	47.4754
97.6834717526131	91.3658870713889	42.8621937454961	96.8345	90.0197	42.1774
97.2993378280817	92.3287069831648	40.5500829502633	97.0347	92.0258	44.3343
96.8604823643669	93.4286849329793	37.9086008781109	98.2349	98.4363	43.0129
96.3117499879035	94.8040649671969	34.6057650924094	94.4828	106.1237	38.6118
96.1420507193748	95.1182802261816	33.3366190552537	98.8373	99.4165	35.0062
95.9672911659934	95.4418654632383	32.0296274048241	95.6122	103.8055	23.229
95.9163714224187	94.820402094718	32.2195617347993	101.583	94.8217	23.7006
95.8625180042419	94.1631331261592	32.4204384096473	88.6062	92.2681	23.9863
95.8084916878443	93.5037591897887	32.6219589172181	92.5654	91.5305	24.0262
95.7544428017395	92.8441112400412	32.82356336142	104.3693	90.8389	25.0156
95.6930526712218	92.0948562642943	33.0525523160375	98.853	91.6792	31.3431
95.6300419273113	91.3258197585344	33.2875869734615	99.3434	90.9979	30.2293
95.5653976679716	90.5368459309896	33.5287155039597	101.602	92.3175	35.5214
95.4981719492706	89.7163632468387	33.779473714811	100.5649	91.4192	35.2273
95.4287427911371	88.8689853942089	34.0384514096171	97.7943	87.7833	36.2243
95.3601050789957	88.0312664469686	34.2944767506134	89.5631	83.3752	32.5568
95.295967979044	87.2484813253643	34.5337141996261	96.2545	87.1498	32.8659
95.2314126153291	86.4605880355237	34.7745120774252	91.1677	84.1211	45.979
95.2314148219987	86.4605809656153	34.7745066825617	104.3617	84.8664	42.6246
95.2314148219987	86.4605809656153	34.7745066825617	97.0865	83.6094	41.2641
95.3559163256962	86.0346140441202	34.4408086408251	92.6699	80.64	42.9825
95.3559163256962	86.0346140441202	34.4408086408251	92.1151	81.2598	42.8198
95.4991257101983	85.5446393496578	34.0569677582968	88.0687	81.4777	36.1559
95.6415703317551	85.0572812440094	33.6751766919691	89.95	80.2132	31.6802
95.7767145306613	84.5949003867731	33.3129524943508	91.0116	75.887	40.3125
96.1664774011772	83.8509152579655	32.404322826141	95.9481	74.251	38.8025
96.4811475977039	83.2502711824727	31.6707578555835	94.549	73.3405	36.7472
96.7388697535772	82.7583325308232	31.0699556641796	103.1106	83.2736	35.5168
97.0067944139758	82.2469183166599	30.4453679938657	101.2985	78.2917	28.1682
97.2510690931854	81.7806479727722	29.8759142750977	94.4072	76.9857	34.4342
97.4987738967523	81.3078306718765	29.2984648141324	93.1133	78.1389	33.5399
97.7556342290089	80.8175376202755	28.6996723341028	93.4941	85.8189	27.3685
98.0236246370212	80.3059995102944	28.0749332890058	100.7126	88.5952	23.1233
98.294077991261	79.7897595367547	27.4444515403169	98.2345	80.86	27.262
98.5629432581081	79.2765514341302	26.8176726074946	98.2007	80.5294	17.4055
98.7851630644735	78.8523811747325	26.2996350965382	101.778	67.1686	27.7348
98.8699520405261	80.0670080450221	24.162720017519	96.9541	82.6989	20.5312
98.9434143666245	81.1193652518331	22.3112972637682	92.288	83.6157	17.9977
99.0034909485402	81.9799532921394	20.7972638231398	93.1284	88.6615	20.1351
99.0552669209094	82.7216313032771	19.4924326094305	97.8831	81.9659	16.6355
99.1051359847477	83.4359897472322	18.2356658529838	92.7178	89.1801	18.823
99.1519834585399	84.1070645798463	17.0550487879626	98.1138	89.594	19.2781
99.1984547782793	84.7727546462762	15.8839050608936	102.2936	85.0217	15.0829
99.2444013012838	85.4309274547677	14.7259865476399	102.0461	86.7072	16.2393
99.2912788423362	86.1024407399413	13.5445973758914	102.4507	89.6037	15.6617
99.3389305204323	86.7850491212214	12.343687392924	101.8123	94.891	12.8509
99.382475350007	87.4088275573386	11.2462776060674	104.1034	98.3317	9.2012
99.3838966054088	87.4291791579479	11.2104748956176	95.0373	98.5247	13.5608
99.4468646218214	87.428989054145	10.941872187194	95.7576	96.9635	11.4638
99.510690312292	87.4287964846003	10.6696105166007	95.504	96.351	10.2996
99.510690312292	87.4287964846003	10.6696105166007	92.4623	94.734	14.7003
99.5792972394368	87.428589716511	10.3769518180978	96.8706	83.0827	11.4782
99.5792972394368	87.428589716511	10.3769518180978	97.3132	81.5365	12.7479
99.6499149601012	87.4283771112129	10.0757151158893	99.0152	86.155	1.7016
99.7167006705441	87.4281759035593	9.79082532252379	105.6506	92.4297	8.9472
99.7811145955579	87.4279814823383	9.51605315726216	100.8882	91.1406	6.6906
99.8452775303414	87.4277878259815	9.24235193900982	99.3782	93.0601	2.9898
99.9082513458609	87.4275976756953	8.97372409433879	104.1728	96.9352	2.733
99.77679385359	86.7601998506275	8.6962126214263	102.0076	93.075	9.5996
99.6330971752602	86.0306649094551	8.39286358608955	107.981	80.0957	12.6444
99.5041889230937	85.3762066171363	8.1207325512268	103.8313	82.5056	7.2236
99.3787651007813	84.7394379989038	7.85595730609555	107.2392	85.9448	2.4326

Solution x	Solution y	Solution z	Original x	Original y	Original z
99.2498064813651	84.0847238659877	7.58371955301408	101.1477	85.2681	2.6541
99.121540382311	83.433525803607	7.31294376014924	97.1852	78.7831	16.5303
98.9966451293724	82.7994395701932	7.04928374428419	108.1531	76.0691	2.761
98.5298153473318	82.6236717369412	7.03762547422041	100.0565	80.1054	0.0522
98.0656671678396	82.4489135754973	7.02603417092698	103.6911	80.62	5.0557
97.5716825936701	82.2629216509368	7.01369776687202	98.5933	78.8152	8.2256
97.086552709816	82.0802636497259	7.00158249903405	98.9119	80.0767	11.0692
96.5978191393082	81.8962488424769	6.98937724271822	93.0994	86.3608	2.8092
96.121173850094	81.7167854793803	6.97747387148115	93.2494	81.8793	2.8544
95.6586959727371	81.5426563787508	6.96592430892116	89.835	77.746	1.5427
95.249572346545	81.3886158541754	6.95570714428345	91.86	79.7087	2.2114
94.8528656663598	81.2392505791467	6.94580008094813	93.9524	73.145	3.1932
94.4769370688694	81.0977085793816	6.93641190368449	94.6798	69.1984	4.5089
92.9944938726013	81.5713029982883	7.10897162497609	91.1291	78.4897	13.7054
91.5670069669391	82.0273420363246	7.27513485992549	88.6759	82.3658	11.13
90.2510062116104	82.4477663872014	7.42832087526626	91.14	83.5499	11.0268
88.9519257268083	82.8627868770751	7.5795367880684	95.2026	90.5293	12.2607
87.1008651062722	83.4541487345346	7.79500214824028	93.9684	87.8762	13.7783
84.2632692479176	84.3606754856526	8.12529706675609	88.3633	87.3681	2.2205
80.2928485729714	85.629107047461	8.58745870162482	86.3374	85.7586	1.5055
56.625433860786	93.1898521192601	11.3423662940341	48.9533	90.4759	7.3728
51.3512540937306	94.874823301985	11.9563256617815	53.9006	102.5381	21.0284
49.1445227483234	95.3453841550885	11.9541297838649	51.1106	98.2963	5.5983
46.906980144977	95.8225130545879	11.9519038992268	47.7789	92.5461	5.4276
44.6041557239173	96.3135648142676	11.949615722341	35.7859	98.3251	5.4495
43.9039740271612	96.4628705426605	11.9489192958773	45.465	105.2608	3.7217
42.5524211424259	96.6973645465491	11.9959808311641	39.7333	98.7582	4.2197
41.3573681225535	96.9047045549367	12.0375931431542	40.065	98.6098	6.7408
40.2187191413686	97.1022575395857	12.0772414287305	40.5226	102.8002	1.3549
39.9942257799345	97.135762016304	12.0951980444671	37.3296	94.7968	3.7833
39.9942257799345	97.135762016304	12.0951980444671	37.0706	93.0168	1.0492
39.9270201105903	97.1520637910094	12.1161026198026	35.7306	102.2767	4.1846
39.862447005222	97.1677269593159	12.1361882618087	40.9527	105.6227	4.1926
39.862447005222	97.1677269593159	12.1361882618087	42.9285	106.2179	5.6354
39.7940246456041	97.1843242053764	12.157471035003	48.0764	105.8084	10.3389
38.1788404336646	97.576080973162	12.6598594156584	37.9917	90.5379	9.9912
36.4518168303326	97.994962109962	13.1970339444226	30.1816	102.1772	4.0412
36.1115115758306	98.0775084745948	13.3028829818481	42.5793	100.4271	14.8388
36.1115115758306	98.0775084745948	13.3028829818481	40.9431	96.0349	18.7884
35.7466800750965	98.1660039551599	13.4163606367456	38.2186	96.6747	17.5328
35.3793330358018	98.255109633063	13.5306206857915	31.6916	96.8159	17.5787
35.3793330358018	98.255109633063	13.5306206857915	29.1897	96.4145	23.036
35.1701472202852	98.3058509772525	13.5956861522863	31.6341	101.1443	12.133
34.9655298129984	98.3554841923156	13.6593306364256	35.0473	98.5367	9.9491
34.7614784464272	98.4049801033426	13.7227990481542	35.2297	94.8683	9.4168
34.5566927273447	98.45465414898	13.7864958672749	29.3468	93.7461	14.2413
34.3578956007424	98.50287560705	13.8483299760466	28.1717	107.4546	19.2451
34.2417988783532	97.787589733808	13.5379601648743	37.1983	106.347	12.5162
34.0946683252752	96.8811185181814	13.1446349256281	35.5571	102.295	9.2843
33.9378441858395	95.9149305862868	12.7253988218526	40.2693	101.3043	8.6864
33.7566849144798	94.798842158628	12.2411242683412	43.1057	91.7939	5.1823
33.7457655790156	94.7315483975129	12.2119229290435	41.6896	94.8028	3.024
33.4473461664545	94.0594023406663	12.1403128946437	33.0573	97.9271	5.3628
33.1328512849519	93.3510487070437	12.0648451881456	33.9629	96.8355	4.449
32.7990538427423	92.5992189592286	11.9847453899866	35.7481	97.1257	4.802
32.4162381719574	91.7369830575027	11.8928825493389	34.0458	95.0903	5.2592
32.0070364436445	90.815316641379	11.7946876938086	30.8807	93.5109	0.3364
31.4317736922172	89.5196241431098	11.6566407326225	34.7819	91.1147	8.0437
30.8256066319354	88.1543247466338	11.5111774639032	33.2241	90.2072	6.3544
30.1854107250605	86.7123808325966	11.3575480977265	32.6009	89.9531	17.4409
29.4299451784807	85.0108109263153	11.1762563815244	34.9317	80.2335	16.9208
28.747069512339	83.4727384493384	11.0123842157324	33.517	80.8699	6.7304
28.092993146277	81.9995318474369	10.8554232373465	26.6151	77.1467	3.8306
27.5881653198365	80.8624834809486	10.7342784262445	23.4089	84.0628	5.796
27.0745029145401	79.7055361008593	10.611013570715	31.4187	76.5703	2.7936
26.6062365013856	78.6508357875709	10.4986426092068	24.5076	73.115	4.3052
26.2304841462762	77.8045091882171	10.4084726905803	22.9431	70.0987	4.2047
25.9888209735711	77.2601984813236	10.3504806044611	21.3934	72.6127	7.7423
25.7697341226142	76.7667375476148	10.2979062336219	21.1184	76.9048	10.6601
25.5548990610534	76.2828530641054	10.2463521745625	23.796	77.2181	9.3562
25.3402427224717	75.7993710644794	10.1948409992834	22.8228	67.5784	3.2098
25.2019183040614	75.4878155666439	10.1616473095121	27.2709	73.9256	16.4296
25.062559176363	75.1739294984534	10.1282052828339	22.1344	71.2137	11.8857
24.9275326560598	74.8698019878015	10.0958029555587	33.839	67.1668	7.1332
24.9275323570345	74.8698015207359	10.0958029228505	28.241	67.9653	9.5896
24.9275320573997	74.8698010539597	10.0958028901945	31.0449	71.9995	0.0029
24.7198035147664	74.6305328787218	10.1428258392385	31.4906	71.3219	1.4719
24.412905600264	74.2770345711586	10.2122970422503	31.4455	71.7336	19.6874
22.2413276471725	71.7757675188124	10.7038498652589	22.6268	64.3936	19.9605
22.04585841389	71.5506174407613	10.7481001160038	24.5354	72.6275	12.2334

Solution x	Solution y	Solution z	Original x	Original y	Original z
21.8486111204552	71.3234192607972	10.7927528461578	25.7737	68.9159	14.4865
21.6522405458416	71.0972309672087	10.837207055941	23.9369	61.5866	18.0383
20.9563004610951	71.1902088381008	10.4260950795394	25.4767	75.481	0.001
19.8086957393792	71.1952340618191	10.1449262852828	23.527	73.6169	0.5641
18.5606378762041	71.2006991100568	9.83914571283867	14.5018	68.1646	16.8217
17.4228688543462	71.2056811864783	9.56038652723983	16.7224	69.1113	14.1768
16.2804911341061	71.2106834119862	9.28049815435527	14.2239	63.9607	10.3191
15.2041256978651	71.2153966119844	9.01678312507309	13.2613	67.7948	17.1077
14.1294263238002	71.2201024984514	8.75347633507001	15.1112	64.361	7.2726
13.0417307198717	71.2248653122858	8.48698540682799	12.0877	66.3858	4.5331
12.0127246288038	71.2293712383365	8.23487367568772	1.76609999999999	66.5446	12.6159
11.9589579827363	71.2296067139781	8.22170109888819	9.6606	65.5604	9.552
11.9063881190397	71.2298370078765	8.20882169243398	12.0587	67.8257	18.5408
11.8534636470612	71.2300689046835	8.19585547134019	9.15690000000001	61.6426	15.1483
9.61297260605744	71.5270335793832	7.41918109266987	10.0835	69.723	3.7551
7.49157189698192	71.8082144402725	6.68378968089842	0.483800000000002	63.8626	0.7436
6.95546195801602	74.0449632279483	7.35475087153047	9.00020000000001	73.0359	5.8372
6.3670796850414	76.4997970140585	8.09113161918705	7.5677	74.3816	13.1566
5.74180558496914	79.1085491008315	8.87368349689619	8.0472	76.1743	13.1381
5.02253444743698	82.1094705417594	9.77387539019859	2.7376	84.0979	3.4333
4.30581543727341	85.0997390144884	10.6708718085494	2.57040000000001	90.3092	4.6781
3.74071180378439	87.4574463439839	11.3781175293422	-0.100899999999996	90.0487	0.1507
3.22707798396604	89.6585052670412	12.0902784265071	5.8502	91.8647	13.1882
2.73276491326058	91.7767701818882	12.7756499063423	-0.171000000000006	97.1566	2.8672
2.53841140526006	92.6096288527526	13.0451179434691	-1.9602	93.9224	5.6614
2.34106907568071	93.4552955007275	13.3187297562249	-2.1508	94.1499	7.6254
2.14129862239506	94.311367364346	13.5957079361636	8.1477	101.1634	5.5645
1.88329007380167	94.7187156192045	13.9470764356535	2.55330000000001	99.1767	7.9857
1.88329007380167	94.7187156192045	13.9470764356535	4.77370000000001	93.7785	6.1602
1.583422623948	95.1921511548967	14.3554504880211	3.81100000000001	100.5395	9.9764
1.28493136391928	95.6634139259618	14.7619504102417	3.0162	107.1796	11.3112
0.730004676861284	95.552143738154	15.5934174738043	1.4019	97.5847	15.4849
0.730004676861284	95.552143738154	15.5934174738043	0.613799999999998	95.4238	16.9249
0.193050062366495	95.4444771927593	16.3979567217755	-6.68600000000001	94.6391	7.4364
-1.05420956925487	95.1944005002554	18.2668026191571	-12.8049	93.8535	15.5008
-0.628839506532586	95.098541516573	21.2643109989935	6.3198	96.0864	20.0555
-0.199375147671859	95.0017596693594	24.2906722371513	7.8142	89.6258	27.2865
0.078418985893336	94.9391586695407	26.2482346777822	8.0611	104.093	26.141
0.078418985893336	94.9391586695407	26.2482346777822	9.17	97.1621	20.3835
0.147378190969306	94.8037420452733	27.3510278565572	3.1448	100.72	31.1491
0.147378190969306	94.8037420452733	27.3510278565572	3.11839999999999	98.924	29.022
0.207779388160304	94.6851307919981	28.3169624452751	-0.311599999999999	97.6012	28.6474
0.26816026818797	94.5665594694664	29.282571891717	-5.5457	98.4014	26.4862
0.26816026818797	94.5665594694664	29.282571891717	-0.338999999999999	97.1979	25.6607
0.339826104359389	94.4258278350639	30.428648290562	-2.5612	92.1356	23.79
0.427585124034195	94.2534942011275	31.8320834404291	-0.735100000000003	89.6931	26.6301
0.530022420988544	94.0523373344246	33.4702498049342	1.64530000000001	95.7178	31.8751
0.530022420988544	94.0523373344246	33.4702498049342	3.5924	94.7451	26.9481
0.670038640598833	93.7773873994947	35.7093724485415	-1.86190000000001	98.5581	36.524
0.670038640598833	93.7773873994947	35.7093724485415	-3.1358	95.2162	31.8855
0.838394905344813	93.446787888148	38.4016938721301	0.619299999999996	91.0377	37.0534
0.838394905344813	93.446787888148	38.4016938721301	3.5998	89.8159	36.4775
1.02711034008635	93.0762107381589	41.4195943661374	-4.1255	85.596	43.5867
1.02711034008635	93.0762107381589	41.4195943661374	1.20229999999999	90.7259	43.7677
1.16432665575473	92.8067614593448	43.6139277351991	3.55029999999999	90.3653	48.0124
1.27986257339303	92.5798844192569	45.4615574375191	2.1469	96.6722	44.5395
1.27986257339303	92.5798844192569	45.4615574375191	3.4538	93.5151	43.6356
1.40745221081121	92.3293362560331	47.5019505671279	-3.26390000000001	94.8889	48.3647
1.40745221081121	92.3293362560331	47.5019505671279	0.580200000000005	93.7511	50.7296
1.52111180140925	92.1061416201437	49.3195784464725	-0.0468000000000046	93.7668	57.0052
1.59953676653824	91.9521367748097	50.5737440152732	-7.5489	96.9207	56.8305
1.59953692195221	91.9521366584552	50.5737442338924	4.95789999999999	99.4405	59.5277
1.95429387606885	90.3287353489228	50.4977705163561	1.1743	92.9818	59.2535
2.42437482343712	88.1776003226237	50.3970995290003	-2.30370000000001	90.7079	58.2529
3.26032342447186	84.3522194133211	50.218075125464	-1.23350000000001	86.0108	56.7294
4.53852880077649	78.5030395799321	49.944333988657	-4.2807	74.2616	57.1387
5.92777589177169	75.7966745567842	49.2124757267397	4.0089	72.186	49.5614
7.18538486000091	73.3467502363871	48.5499641391992	4.4426	63.6871	51.0243
7.75184564869436	72.2432403104659	48.2515523048777	8.4928	63.9998	55.0759
8.0767982280388	71.6102079301436	48.0803676035976	11.4442	66.9869	57.5373
8.32119826792916	71.1340984190779	47.9516183354387	14.2076	63.0144	54.8035
8.32119827572923	71.1340983814494	47.9516182612433	4.7342	63.0935	56.3188
8.47785353951824	71.0944234306062	47.1624838882425	10.9416	69.7746	52.0032
8.64764822556637	71.0514207710223	46.307160731121	14.0233	68.3418	48.6515
8.64764822556637	71.0514207710223	46.307160731121	15.3124	65.205	52.7286
8.9442141351889	70.9763109954354	44.8132429335951	12.0097	66.7734	42.888
9.21483004159211	70.9077735838913	43.4500444537228	5.2812	65.5492	44.5709
9.21483004159211	70.9077735838913	43.4500444537228	11.4886	67.7219	43.0579
9.48525394506728	70.8392848182987	42.0878131886238	9.3844	71.5303	46.4336
9.7851356149678	70.763335225397	40.5771921413065	9.45780000000001	72.6847	40.961

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.7851356149678	70.763335225397	40.5771921413065	12.73	75.2001	37.6748
10.0606706312334	70.6935514877409	39.1892138497119	0.309600000000003	68.1954	39.7657
10.0606706312334	70.6935514877409	39.1892138497119	6.09139999999999	73.9114	36.5077
10.3787558116776	70.6129907032904	37.5868977842081	6.67010000000001	63.5082	34.9077
10.6654363755332	70.540383978939	36.1427778192095	10.7344	66.9849	31.9545
10.9217692752784	70.4754634783427	34.8515293477104	10.4334	62.822	33.9682
11.1683721718153	70.4130074117553	33.6092935627041	6.9842	66.7632	27.251
11.3702282548148	70.3618843494696	32.5924641391467	12.0444	66.3239	28.7604
11.5562609444762	70.3147688622029	31.6553428620479	7.6803	61.1857	24.6436
12.6170473080797	71.8156160253259	30.9560302434363	10.5042	66.7806	23.1982
14.0018043705616	73.7748062461353	30.0431383606323	13.7649	76.0563	18.1156
14.001804472777	73.7748063787836	30.043138365317	17.9606	81.6588	21.6946
14.0018044942367	73.774806390078	30.0431384195817	6.65640000000001	74.2265	20.3804
14.0974120407612	73.7998259918253	30.230516964417	9.1707	70.0865	21.5855
14.2111022809474	73.8295776901468	30.453335180143	7.0214	70.8048	31.3366
14.3257844921761	73.8595889453374	30.678097405056	9.9143	75.8382	26.191
14.3257844921761	73.8595889453374	30.678097405056	15.0856	70.6386	28.9208
14.4432529163491	73.8903292638582	30.9083201161628	8.8648	72.0358	37.3381
14.4432529163491	73.8903292638582	30.9083201161628	14.7433	68.1941	29.0053
14.555748231053	73.9197681216139	31.128796037476	8.3117	72.2049	29.6247
14.555748231053	73.9197681216139	31.128796037476	11.6475	70.8021	30.9107
14.6706681925671	73.9498414456524	31.3540237717055	12.5389	66.9051	22.2814
15.2398334309313	74.0987869583198	32.4695028432468	22.0857	71.4539	26.9077
15.8636827534707	74.2620428259891	33.692152404076	18.7356	77.2891	30.4652
16.5058448685997	74.4300908878476	34.9506919874175	18.9682	67.082	33.9115
17.1669896994996	74.6031066459034	36.2464340440998	26.4747	67.9787	32.7219
17.7215135505823	74.7482192554616	37.3332152652719	26.2205	72.9044	33.175
18.2807916932637	74.8945758999537	38.4293143146668	22.8762	75.7017	33.805
18.874945355481	75.0500591231019	39.5937639122113	24.4797	75.354	37.647
19.4628289387355	75.2039013846569	40.7459254270973	24.3218	77.9732	38.2426
20.0524613439222	75.3582011014006	41.9015146313345	27.1736	83.2653	40.5956
20.5248285939822	75.4818130149282	42.8272836693908	26.4587	69.6793	44.9112
20.9519279312379	75.5935787621529	43.6643346422293	26.4833	65.6457	42.68
21.3733026627223	75.7038459629677	44.4901651551431	31.7515	71.3679	39.9054
22.1029955484946	75.9134929128312	45.9863296652771	31.105	77.2121	42.4385
22.8056805948681	76.1153793314978	47.427116171722	32.2488	71.8762	47.8257
23.3512057899564	76.2721108908364	48.5456599616653	24.7401	75.4523	49.5075
23.8897627295033	76.4268405787633	49.6499160434256	15.4332	72.9689	53.8868
24.4529993631237	76.5886620110609	50.8047769587288	18.2654	71.5277	59.9496
25.3056073217648	77.0518423764064	51.1018759448773	24.1578	73.3792	57.4094
26.1971998005708	77.5362018779059	51.4125597507394	26.9783	71.0141	56.5271
27.1335327215261	78.0448675921971	51.7388341326926	25.3366	76.538	54.326
28.0954718633221	78.5674448982409	52.0740314442259	35.1535	70.6086	57.9365
28.7953375387942	79.932243677042	52.033788145482	27.6433	72.5657	51.9251
29.7597804185173	81.8129895083262	51.9783295782398	32.697	74.6737	51.2201
31.0702660114669	84.3685462170277	51.902969696117	29.376	80.5861	55.9809
32.7716037666702	87.6862939849386	51.8051293930745	35.4073	87.2216	40.4202
33.8285595891301	89.7474484674578	51.7443515686399	35.4152	92.5489	58.019
34.7328419024436	91.5108771662552	51.6923529366792	39.6285	91.4521	58.9959
35.521299698513	93.0484384890908	51.6470147649264	36.1694	94.3523	52.0418
36.2891039094855	94.5457236053111	51.6028643521083	37.1788	95.0118	52.8478
37.0510516279238	96.0315880904381	51.5590508098813	42.0978	97.503	57.9578
37.6886439170603	97.2749487535476	51.5223883913003	47.126	99.3914	58.8698
37.4931788627451	97.7261709170523	51.1303882529204	44.7902	101.1589	57.6534
37.260929140111	98.2623104275474	50.6646153819406	39.196	99.7694	49.3378
37.0322023015685	98.7903168158326	50.2059084558846	35.4006	103.6799	50.1937
36.8158101035086	99.2898480182597	49.7719396887993	32.8361	107.2479	41.504
36.8158100801525	99.2898480696963	49.7719396493656	26.9511	99.1097	54.9389
36.8158100801525	99.2898480696963	49.7719396493656	26.55	96.735	54.3574
36.8158100579361	99.289848121336	49.7719396099273	35.7224	107.36	58.7833
36.8158100579361	99.289848121336	49.7719396099273	35.2228	101.4244	59.0123
36.7831072222414	99.3022936020579	49.5692060376551	29.8552	101.3038	43.5974
36.7831072222414	99.3022936020579	49.5692060376551	32.4952	97.9758	48.1403
36.7532827230034	99.3136436985318	49.3843160624978	30.7482	95.8761	57.2879
36.7532827230034	99.3136436985318	49.3843160624978	33.6244	92.4492	56.3457
36.71838248155	99.3269254606249	49.1679599878633	26.6904	96.1713	46.6576
36.71838248155	99.3269254606249	49.1679599878633	32.1756	91.0244	47.2823
36.6863196156788	99.3391274043639	48.9691937248133	29.7849	97.5299	53.9895
36.6863196156788	99.3391274043639	48.9691937248133	31.4281	94.9219	54.3744
36.6529055083074	99.351843619588	48.7620506006538	42.4716	105.6496	56.7244
36.6529055083074	99.351843619588	48.7620506006538	43.0828	99.6317	56.4863
36.5034957182843	99.4087073871408	47.835805489827	44.0393	95.7757	50.8289
36.5034957182843	99.4087073871408	47.835805489827	41.599	92.4813	48.0171
36.3294852113904	99.4749347043086	46.7570476669187	35.9551	95.9225	47.402
36.1561807294429	99.5408931999664	45.6826676793053	46.5537	103.4177	45.8992
35.9481060027568	99.6200865920884	44.3927247293858	42.0156	103.5929	44.0945
35.9481060027568	99.6200865920884	44.3927247293858	42.8352	101.6931	44.9574
35.7304884657668	99.7029121771536	43.0436214839398	39.1965	105.4524	44.823
35.5003326725034	99.7905100653484	41.6167872718269	35.3466	107.7036	41.395
35.2774385966727	99.8753438090161	40.2349729712256	39.3246	101.8921	42.5744

Solution x	Solution y	Solution z	Original x	Original y	Original z
35.2774385966727	99.8753438090161	40.2349729712256	33.8351	99.3235	37.4512
35.0558125288327	99.9596947545317	38.8610210889847	46.0729	100.678	36.5278
34.8540544521692	100.036483216669	37.6102401928549	32.8593	93.0881	38.0081
34.6492713201588	100.114423273596	36.3407048759353	34.0464	97.1856	33.2284
34.6492713201588	100.114423273596	36.3407048759353	32.2034	92.5655	35.5696
34.4610202712172	100.186071091025	35.1736594986677	36.8108	99.4487	34.5912
34.2729095114758	100.257665361975	34.0074844335622	34.3074	104.3145	33.9426
34.0855697937239	100.328966020878	32.8460898470633	31.3011	106.2109	32.3658
33.904300444718	100.397956157838	31.7223284840778	29.7064	94.0211	29.3487
33.904300444718	100.397956157838	31.7223284840778	33.1881	90.5996	30.8927
33.7396091743095	100.460636272302	30.7013427964688	33.1638	109.6815	28.6324
33.5956974785778	100.515407696977	29.8091789805572	28.2891	98.27	21.6276
33.5009188292298	100.55147879143	29.2216130850962	21.5395	100.4343	27.1149
33.5952037107871	100.564468852348	29.052042008324	31.7064	96.988	25.1942
33.687709483076	100.577213795281	28.8856706854674	33.1686	108.6172	19.7963
34.5702433278766	99.2302414986712	29.1130615493188	26.1674	96.1159	30.3905
35.5614254629386	97.7174433689383	29.3684459570926	29.5221	90.7635	22.4343
36.1916203880328	96.7556040625589	29.530818879012	34.0163	93.2553	22.3961
36.8012644840039	95.8251314092364	29.6878964872624	38.189	100.3805	31.8594
37.4527091824817	94.8308616410684	29.85574320376	42.9226	100.4615	26.2167
38.1645356960916	93.744435820678	30.0391458677519	42.2565	98.7398	22.9258
39.0245044359501	92.4319106402984	30.2607164600277	45.0704	101.2748	27.009
41.4787984317896	88.6860090555475	30.8930582546024	42.6808	88.2098	40.1619
43.3413705413021	85.8432407658624	31.3729401896554	40.8939	84.3555	43.1765
46.1410507187496	82.0888361130874	30.8597378963484	42.9721	90.3177	28.7365
60.8339662950232	62.3851752894652	28.1667229109599	61.2083	54.3519	23.523
63.1414895902274	59.2907609914938	27.7437548306826	66.0257	55.1875	22.0287
64.7133164402837	57.1829205971522	27.4556444586346	70.1344	58.5671	20.707
65.944699792099	55.53160816956	27.2299401197954	68.022	53.7678	15.3935
66.3646841876786	54.9211259430322	27.6829148928786	71.2619	53.5794	21.4252
66.8153456561967	54.2660532193013	28.1689775327698	70.694	53.8562	23.1583
67.284544248184	53.58403534883	28.6750343526393	73.2116	57.797	29.252
67.7514126505737	52.90540331125	29.1785779596777	73.8072	55.2741	29.1095
68.2002151077245	52.2530306023992	29.6626361403455	64.4232	44.0581	27.3148
68.6046830737171	51.665101478982	30.0988769688595	70.8564	51.5507	32.2844
68.9900816607494	51.1048907186532	30.5145501659218	67.7991	50.1342	31.512
69.3673560376873	50.5564888992358	30.9214608025919	67.6648	48.1141	30.5928
69.7364846158796	50.0199275231918	31.3195856511522	67.5609	49.631	28.0783
70.1141807035992	49.4709124527986	31.726950984073	70.4096	46.4113	26.9931
70.4886496842965	48.9265881214719	32.1308356275756	74.5598	39.2546	26.0148
70.6611769303479	48.9544684768382	33.0968117776206	66.949	50.6855	34.7495
70.6611769303479	48.9544684768382	33.0968117776206	65.3289	43.5846	33.8262
70.8331756455588	48.9822634669685	34.0598287132978	70.0624	50.1219	34.6274
71.0039499692249	49.0098605946001	35.0159901474573	70.2011	52.705	34.7749
71.0039499692249	49.0098605946001	35.0159901474573	68.2826	55.0673	33.7791
71.1812619746082	49.0385136601645	36.0087521721033	67.4683	58.2291	37.5546
71.3506258828366	49.0658823934819	36.9570131952706	70.6191	48.182	36.9413
71.5210046389166	49.0934150843134	37.9109559253299	72.0385	47.603	37.589
71.6925887530473	49.1211425746706	38.8716475616756	69.1565	53.343	39.551
71.6925887530473	49.1211425746706	38.8716475616756	69.1689	51.2673	37.9561
71.8680993891915	49.1495044473315	39.8543231564582	68.5789	56.8701	42.2821
72.0348012960365	49.1764430896012	40.7876805643508	73.7963	57.8273	45.2128
72.0348012960365	49.1764430896012	40.7876805643508	69.8977	54.8286	42.1718
72.1728916954916	49.1987589128299	41.560847439225	79.533	47.2684	42.1428
72.1728916954916	49.1987589128299	41.560847439225	77.9078	47.2474	41.2613
72.3068364136532	49.2204049292615	42.3108037128111	80.0004	48.0282	43.1849
72.4353077081578	49.2411666967376	43.0301161236523	70.5497	45.0925	44.08
72.5646857471608	49.2620748807824	43.7545044555143	78.2967	50.1808	43.2865
72.6937077624829	49.2829256520818	44.4769002697476	74.3979	53.0985	48.6112
72.8155962182939	49.3026237850104	45.1593563732153	76.4125	46.981	46.4216
72.8155962182939	49.3026237850104	45.1593563732153	74.8417	48.5823	43.578
72.9390553050754	49.3225757877916	45.8506066286255	72.7013	43.6681	47.6828
73.0611568850051	49.3423084591122	46.5342563563151	67.4955	46.0347	52.8305
73.1715463097733	49.3601484813628	47.1523303723632	70.1179	52.2878	46.5219
73.2845229020242	49.3784065346859	47.7848894056176	72.0955	52.6394	50.8408
73.3948818282254	49.3962415972524	48.4027922055098	66.2863	51.2705	54.2569
73.4962113178683	49.4126175016598	48.970139209907	69.2681	55.3133	57.276
73.5693661838473	49.4244405382876	49.3797379816971	65.7303	47.3671	58.4265
74.2911172838417	49.6006625897944	49.4306376647591	73.2401	49.0047	54.3428
75.0309291621708	49.7812942795333	49.4828111616314	74.4488	50.3129	52.3971
75.7810365648674	49.9644396401129	49.5357108625414	69.4154	51.8752	55.6067
76.6645588597347	50.1801591534925	49.5980199121857	73.3859	52.8201	55.9097
77.5990037810782	50.4083116627641	49.6639204974168	72.0304	52.5053	58.0692
78.8236628884931	50.707321623438	49.7502893947615	77.4079	49.147	51.5989
80.0961551742326	51.0180101116735	49.8400320689876	78.0993	54.3894	50.2798
81.4006597166092	51.3365144353848	49.9320325371371	77.8264	55.5164	53.7679
82.7941125779751	51.6767358165612	50.0303063856908	77.9705	58.8491	56.0075
84.6245367195859	52.1236443142929	50.1594006967791	86.2321	62.729	51.1705
85.7927281761074	52.4088673838219	50.2417874841186	85.8477	60.7859	54.7762
86.855291389623	52.6683007059193	50.3167247287858	90.2672	64.2791	51.3539

Solution x	Solution y	Solution z	Original x	Original y	Original z
88.4060737443013	51.0233909481088	50.2765362081319	92.1982	53.9806	59.5699
89.900626377111	49.4381233633366	50.237805139035	94.5355	44.3621	59.1041
90.4431937824022	48.8626231073492	50.2237460900379	94.5838	45.9916	57.9488
90.9193798056585	48.3575333537528	50.2114072094446	91.1842	48.1207	54.4953
91.3948278854016	47.8532263690273	50.1990874961789	97.7133	51.9341	48.5236
91.8590550584424	47.3608213909925	50.1870585689287	99.5817	52.1789	51.8005
92.3029491924743	46.8899837120265	50.1755565578678	99.0651	51.1078	59.3413
92.8479138100593	46.0994054650039	49.9871408599388	90.0385	42.8005	44.3862
93.3719110603029	45.339244534937	49.8059744439227	90.4784	41.2284	44.1276
93.8670186944275	44.6209933298517	49.6347961953099	90.014	39.915	40.6629
94.2794790994838	44.022637657657	49.4921920435695	93.2846	41.9379	42.3812
94.6726597609179	43.4522510353481	49.3562536461372	105.6501	47.8555	48.2801
94.8591044450337	43.1817773549209	49.2917922415201	102.9297	48.0592	51.9744
95.0461858073581	42.9103800809669	49.2271107197441	96.2085	41.8253	45.162
95.2311358790013	42.6420747485758	49.163166109976	98.9198	48.0008	44.9228
95.2311358790013	42.6420747485758	49.163166109976	93.3823	48.5086	44.2946
95.4270768718907	42.357825070448	49.0954215283789	101.161	45.7653	49.9947
95.4270768718907	42.357825070448	49.0954215283789	100.8862	48.4618	50.2894
95.6267375595293	42.0681792224705	49.0263908594928	96.2485	47.1277	52.4491
95.8343320885037	41.7670239132369	48.9546171733482	98.0763	43.3554	53.563
96.0436033745408	41.4634361717461	48.8822637537456	100.5275	34.9543	58.1047
96.0436033745408	41.4634361717461	48.8822637537456	95.1298	37.6897	58.9361
96.2200611260627	41.2077745835177	48.0244221216763	98.5859	34.5756	44.3792
96.3812012204505	40.9743068227302	47.2410421614522	96.5473	37.5774	41.1201
96.5283343618916	40.7611334072708	46.5257532414903	91.8795	37.1845	41.8015
96.5283343618916	40.7611334072708	46.5257532414903	88.2545	36.066	42.1212
96.6500449719833	40.5847941499257	45.9340506668094	107.8221	37.3636	42.4217
96.6500449719833	40.5847941499257	45.9340506668094	103.3956	43.6231	38.3961
96.6500449105693	40.5847941336745	45.9340505402177	103.8959	45.4099	37.4639
96.0371244851558	40.2704050901916	45.8104020076279	100.0845	45.3198	38.3951
95.3189513479005	39.9020277144391	45.6655203626371	97.5519	44.8528	38.2336
94.5430853929336	39.5040569323518	45.5090001156531	94.4684	44.7163	40.2539
93.7626890204689	39.1037617990519	45.3515659493158	90.4865	46.0315	39.3528
93.0291505437258	38.7275016819248	45.2035847905512	91.9732	45.8332	46.1527
92.2709250954001	38.3385772269689	45.0506230896036	90.1236	40.724	54.2833
91.5023194448233	37.9443261427918	44.8955663946435	92.2396	41.0703	39.2658
90.73577119066	37.5511300497325	44.7409248592006	81.9079	40.1742	36.8216
90.8328738505148	36.6147836163182	45.6069859920563	86.5983	36.2039	44.7429
91.0768511202639	34.262052031969	47.7830343201763	85.065	35.2948	58.2863
91.8727036708184	33.097487939196	47.5501422145074	91.0332	34.8187	52.6374
92.7381839510659	31.8310406064409	47.2968745298939	92.4351	33.0022	54.3205
93.6813487897701	30.450921255853	47.0208735320358	96.2582	32.5713	56.693
94.8017560920306	28.8114521691966	46.6930050402721	98.3827	22.3334	54.4737
95.3185767444763	28.0551920394958	46.5417674463036	99.0428	19.6959	54.528
95.3389099080938	28.0604069924979	46.4267343232824	102.211	28.3893	55.4005
95.3624350843726	28.0664406371745	46.2936428655937	101.7295	28.4449	56.1482
95.3624350843726	28.0664406371745	46.2936428655937	101.1976	33.4905	53.5496
95.4107879476449	28.0788422177609	46.0200949826339	104.0844	32.9988	51.1923
95.4675234642679	28.0933939935864	45.6991278231548	106.6895	31.0233	49.137
95.4675234642679	28.0933939935864	45.6991278231548	105.5782	30.6326	47.1426
96.0113114022257	28.2328634307711	42.6229329322447	106.1692	29.0085	43.7624
96.0113114022257	28.2328634307711	42.6229329322447	101.5683	27.6266	39.8262
96.4459932117668	28.344350212166	40.1639501789821	100.384	25.6874	43.9589
96.4459932117668	28.344350212166	40.1639501789821	97.1838	29.5842	37.1942
96.8868791753932	28.4574278697105	37.6698638185281	92.942	26.4511	38.6789
96.8868791753932	28.4574278697105	37.6698638185281	95.0864	33.2234	41.4865
97.4469322013366	28.6010663188746	34.501617137788	98.5493	33.1624	37.7737
97.4469322013366	28.6010663188746	34.501617137788	95.8908	32.6754	36.0409
98.1347529625542	28.7774678555774	30.6105267370136	108.656	34.8419	30.8419
98.0764223169916	28.7090216630821	29.9910573919587	104.9423	23.521	33.0938
98.0764223169916	28.7090216630821	29.9910573919587	97.3283	27.0933	33.194
98.0127912643408	28.6343558245811	29.3152973150592	93.6487	25.1273	31.9089
97.9482106042116	28.5585756581744	28.6294519680182	93.9312	28.9768	31.8553
97.9482106042116	28.5585756581744	28.6294519680182	92.7124	33.4453	33.5856
97.8741192629452	28.4716354010062	27.8426011909775	105.6149	29.5786	27.9356
97.8741192629452	28.4716354010062	27.8426011909775	100.6297	27.3107	24.1251
97.8034573219164	28.3887193105895	27.0921717528317	97.5011	28.0267	29.587
97.7314013825235	28.3041674523083	26.3269380240786	97.4429	30.1528	28.42
97.7314013825235	28.3041674523083	26.3269380240786	96.6051	36.0943	31.9245
97.6402851660618	28.19724976511	25.3592788572685	98.3241	22.4412	26.657
97.5487249151698	28.0898109865549	24.3869037137472	99.0228	31.9463	24.4512
97.5487249151698	28.0898109865549	24.3869037137472	98.9301	33.2654	27.8083
97.4494432018527	27.9733116325717	23.3325248660935	96.156	30.1327	19.1399
97.3584141285325	27.8664961853639	22.3657920178598	90.72	30.049	19.1921
97.3584141285325	27.8664961853639	22.3657920178598	90.6435	28.0536	25.8632
97.2700965602301	27.7628626465725	21.4278578649879	92.5592	25.4331	20.672
97.1851997745443	27.6632432020175	20.5262545468395	102.9016	24.8202	19.8795
97.1020383071339	27.5656600085105	19.6430806699298	97.0499	25.7334	20.6225
97.0197512302605	27.469102899974	18.7691942073728	102.4997	24.4075	19.7902
96.9368230692733	27.3717935256087	17.8884996089901	97.1071	18.8552	9.2302

Solution x	Solution y	Solution z	Original x	Original y	Original z
96.8344327296435	28.2488082929049	17.9984537969354	105.0575	26.2706	17.0665
96.7232058194678	29.2015139773576	18.1178966813797	96.0238	29.4057	14.5945
96.6105595516673	30.1663791946805	18.2388637591996	106.8535	30.7643	14.4546
96.4896249964569	31.2022386474469	18.3687311934859	102.9211	31.879	13.8489
96.3657732854313	32.2630854860131	18.5017312413883	103.4615	37.3033	20.8908
96.2559926277421	33.2034029042968	18.6196216536202	96.2133	40.5576	25.5914
96.173059439678	33.9137563679932	18.7086823789837	99.6903	41.4772	23.4888
96.1038606956827	34.5064668312261	18.7829943682571	92.8093	39.7693	16.6418
96.0380145048626	35.070461602626	18.8537062996445	94.3087	39.6383	18.4042
95.9746497626729	35.6132019904384	18.9217535800501	98.3613	42.0392	20.5386
95.9156096369951	36.1189001839358	18.9851568299667	100.6036	46.802	22.0951
95.9113081854008	36.1557454815798	18.9897767951154	92.1801	41.0349	29.4683
96.1989178557092	36.8947806327884	17.9155920362807	91.9372	36.8319	23.3371
96.5512233061497	37.8000686543442	16.599762179056	89.0134	41.3658	15.8043
96.8756112568291	38.6336112525274	15.3882119394333	98.0879	44.5657	15.6818
97.1646486654228	39.3763115762125	14.3086988964117	97.0806	39.3994	12.7921
97.1646486654228	39.3763115762125	14.3086988964117	94.1971	38.0204	14.8005
97.4635913880519	40.1444672093957	13.1921873959981	104.1102	44.8822	12.643
97.4635913880519	40.1444672093957	13.1921873959981	102.543	45.6081	13.7083
97.691434493683	40.729920449867	12.3412313346717	103.8062	50.1176	9.3383
97.7547786018185	40.8926821597871	12.1046554281673	106.4442	49.0895	9.9061
97.0247427172459	40.5459668846553	11.5572734505417	102.0152	42.2262	11.91
96.2373725934054	40.1720232104605	10.9669022095474	94.5726	47.3613	8.9492
95.4503341963226	39.7982364848294	10.3767797329051	96.6284	43.246	1.131
94.7687912637153	39.4745510563262	9.86575767609916	89.1249	38.0318	13.3915
94.120216922348	39.1665229683982	9.3794555082328	91.1655	36.0648	5.0962
93.5309071802237	38.8866407466243	8.93759000922967	96.3928	32.1668	2.4627
93.0109062960608	38.6396749710086	8.54769227329458	99.272	31.5703	11.7517
92.4094747720119	38.3540370000351	8.09673776435981	97.9141	29.0493	9.3885
91.727409184293	38.0301064805121	7.58532365828536	93.4265	31.4744	1.0443
91.1529075658613	37.7572587764715	7.15456103280934	90.6179	26.4649	2.7134
90.9503804496901	37.960814416024	7.1124107748138	87.5726	32.8781	1.3636
90.7479443055612	38.1642786355019	7.07027945645496	85.1876	33.113	2.1197
90.5496973284687	38.3635324331942	7.029020001335	86.512	33.4131	7.017
90.351161599275	38.5630764549152	6.98770045875346	79.7169	32.9378	5.3155
90.2263317779121	39.3230139440915	6.94067986393679	95.8598	39.2349	3.852
90.1026999883013	40.0756609424986	6.89411031719518	92.634	40.1716	1.8791
89.9802518354882	40.8211057443231	6.84798640569704	89.5287	45.4109	8.5583
89.8656358227005	41.5188761418588	6.80481238159424	95.7654	46.8722	1.8076
89.7640706030915	42.1372036768202	6.76655387529417	98.2004	50.3921	3.9008
87.6055730815691	42.6076091356511	7.2379575528698	85.9182	41.843	9.5066
85.612776467815	43.0419035869955	7.67317579361543	82.0477	53.0979	5.7932
84.5767680809776	43.2676850411569	7.89943938215609	85.525	32.0217	10.845
82.656185019877	43.6862444107551	8.31888884290213	89.3668	41.343	14.5671
79.7501454151479	44.3195702702932	8.95354240022966	75.2757	50.6388	0.889
78.6154219850907	44.5668647528991	9.20136450089623	73.911	51.0144	2.5794
77.79230686505	44.7462494898828	9.38113199153406	72.2401	34.2889	7.5435
77.4472730926982	44.8214429856633	9.45648698802506	77.5882	39.4219	14.211
77.1021365784165	44.8966588806942	9.53186439631826	75.4748	37.8532	8.3059
76.7594457956844	44.9713418088819	9.60670765945154	75.9022	40.5634	8.2476
76.4194250380217	45.0454428930441	9.68096779446674	80.8076	41.6004	10.0065
76.4194250380217	45.0454428930441	9.68096779446674	77.8794	45.0468	10.8339
76.068570076413	45.121905112935	9.75759406737487	80.8872	43.1227	9.5119
75.7050831516563	45.2011202350217	9.83697911976807	79.9479	46.2913	1.0177
75.7050831516563	45.2011202350217	9.83697911976807	77.6289	48.4559	5.3003
75.2959167473756	45.290290332867	9.9263404367627	73.5268	49.2611	4.4383
74.8941266199433	45.377852920986	10.0140907927796	72.1444	51.2772	8.2689
74.5062207224021	45.4623897038371	10.0988088481619	73.6428	45.1426	7.6389
74.1182854231427	45.546932894248	10.1835333320586	72.9198	44.5581	6.5665
73.7305764074844	45.6314267766597	10.2682084114812	76.2244	51.9684	6.7104
73.3319696349488	45.7182955975668	10.3552635192657	67.8488	53.6384	2.957
73.3319692721506	45.7182956415572	10.3552636440061	69.9782	57.1009	12.9468
73.3176905312612	45.700899786887	10.3572856660705	72.7757	56.7077	5.4576
73.3176905312612	45.700899786887	10.3572856660705	70.5527	57.3223	8.5137
73.1541972420825	45.5017297431967	10.3804348490555	71.8965	50.0142	14.8598
72.9896556660542	45.3012826422903	10.4037324289731	72.0723	49.2863	13.9841
72.8245978442637	45.1002066288329	10.4271030726802	76.5498	52.218	12.9878
72.6479276337091	44.8849843278862	10.4521179300335	68.7356	47.889	4.3235
72.4735317197761	44.6725325621916	10.4768107530713	73.6611	50.4924	3.9757
72.289492708766	44.4483335115924	10.5028689670627	70.916	53.3608	4.8842
72.0759832440482	44.1882333445413	10.5330999296835	70.6462	49.6735	6.8503
71.8575695326704	43.9221587783262	10.564025293053	71.0505	50.768	8.8572
71.6301439363281	43.6451058641491	10.5962266621819	70.7664	48.6137	12.8047
71.3984487098659	43.3628516452968	10.6290325491331	71.8327	48.0379	13.6369
71.1609406127866	43.0735161374459	10.6626614530463	73.2283	44.0709	14.6285
70.9217278242897	42.7821039873303	10.6965316830262	73.6395	46.5004	2.2066
70.6576918067462	42.4604520239185	10.7339166839632	75.73	42.7229	0.0066
69.8402483109537	41.4646401046932	10.8496590607783	68.0366	38.8903	2.9918
69.0929163627699	40.5542371435268	10.9554740386738	66.9624	36.7077	4.2616
68.4249303276435	39.7404925206327	11.050054088607	62.6603	37.129	7.3175

Solution x	Solution y	Solution z	Original x	Original y	Original z
67.8394261791441	39.0272264979696	11.1329551450562	66.5887	34.1226	10.8677
67.2996689991492	38.3696891221192	11.2093786985225	67.4673	33.2544	9.192
66.7945925600308	37.7543995809552	11.2808916525955	66.7818	30.0369	13.8618
66.3534879318982	37.2170405135754	11.3433467477108	67.7055	32.9993	17.0949
65.9336354920984	36.7055708653034	11.4027926940661	61.5106	34.0654	15.2705
65.5445766188831	36.2316139176719	11.4578785212738	63.2951	31.2899	8.2512
65.1812757545176	35.7890354486101	11.5093172590516	73.7989	28.6287	7.3132
64.7503676936367	35.2640950467535	11.5703280821665	71.5231	31.8286	8.0149
64.2990049504425	34.7142367825603	11.6342351012876	69.1853	30.9522	12.1629
63.8459640655419	34.1623343516579	11.6983797511914	72.6191	32.6684	16.6889
63.3133707954283	33.5135213383258	11.7737883660124	70.1037	27.3839	19.7642
62.7746996465875	33.0203373462286	11.7487180556168	68.3701	31.308	4.6701
62.1962198176747	32.4907061919502	11.7217957985883	67.6588	29.7348	5.9837
61.5950901573691	31.9403378341121	11.6938200612063	68.2062	28.5319	10.0866
60.9662119813001	31.364564166431	11.6645534656706	66.7482	27.6121	12.1372
60.3199507896451	30.7728753786571	11.6344781189077	57.9508	29.6187	7.6435
59.7098164546448	30.2142627283955	11.6060836411534	63.3607	23.5913	11.9128
59.1281108826515	29.6816781798322	11.5790116108874	54.0368	23.8586	2.2143
58.770858147081	29.5984560157513	13.4784780319042	53.915	28.4629	8.3577
58.770858147081	29.5984560157513	13.4784780319042	54.8257	29.6059	7.5612
58.2020761083285	29.4659584562211	16.5025707232141	49.5432	29.0024	13.3417
57.5762329470606	29.3201679953153	19.8300448357388	49.9971	19.9155	18.5508
57.4998347432403	29.3361739237987	20.4202266450308	53.2794	21.4994	19.0176
57.4231213883826	29.3522461654751	21.0128448928057	62.5649	23.4331	22.9907
57.4231213883826	29.3522461654751	21.0128448928057	54.5895	27.7676	11.1642
57.3186652137584	29.3741302805725	21.819776134273	58.6228	31.6703	20.587
57.2127411182649	29.3963218401292	22.6380470172303	56.2795	36.0371	23.7369
57.2127411182649	29.3963218401292	22.6380470172303	58.8785	37.4935	28.0133
57.1262887449915	29.4144343149346	23.3058997870786	64.9829	35.6055	23.509
57.1262887449915	29.4144343149346	23.3058997870786	61.1622	34.1592	24.5106
57.0372936757186	29.4330791439196	23.9933937286242	67.242	26.9141	23.9429
56.9402759165355	29.4534041013115	24.7428614148172	64.2717	31.7627	18.8904
56.8168998463329	29.4792494123009	25.6959397999957	64.1748	30.2745	31.4674
56.7112265640247	29.501387009039	26.5122686504751	63.132	27.7543	33.1939
56.6217826777676	29.5201253587758	27.203228649885	67.5765	27.7962	32.158
56.0653854219467	29.6134803990381	27.8608441235742	63.8119	26.0212	34.0563
55.5036453182117	29.7077321350765	28.5247746579656	62.9268	27.0211	37.7555
55.158408204935	29.7813446274222	28.7368557754941	52.5136	31.162	22.8965
54.8146915154283	29.8546329622471	28.948002944097	50.5738	30.8854	25.5173
54.4811488981987	29.9257520414604	29.1529001372906	60.9493	37.7343	34.646
54.1101160275965	30.0048650023678	29.3808282680028	54.6523	25.2022	31.3259
53.7393864852937	30.0839133691773	29.6085700628698	55.4854	26.8201	32.387
53.3677263966995	30.1631602059132	29.8368834953446	58.5931	27.1316	32.5338
52.9824429583909	30.2453118376301	30.0735658717374	60.463	30.4795	30.5011
52.5680856000547	30.3336625699636	30.3281086347796	58.4334	33.3219	33.0094
52.1394958691537	30.425047869606	30.5913944672483	55.9275	34.3566	30.6301
51.7043596776244	30.5178289458526	30.8587018383567	51.7623	34.8081	42.2217
51.3882060469817	30.4415965083007	30.672376441027	54.3132	33.4794	38.814
51.3882060469817	30.4415965083007	30.672376441027	53.589	37.6567	38.7584
50.9104321845728	30.3263933064549	30.3908017349907	51.6292	37.4529	39.3047
49.874342638161	30.0765657285962	29.7802042174767	48.325	36.101	31.2943
48.840050510622	29.8271714468026	29.1706646514612	50.3723	32.2399	19.4829
47.9638109161801	29.6158878660088	28.6542666941728	43.7884	36.8808	19.8614
47.3524060679561	28.5527690617982	28.9949083399755	47.7428	26.438	23.4687
46.7424671881055	27.4921995900005	29.3347334986371	45.985	27.4123	27.7797
46.1400229192808	26.4446615222708	29.6703830542615	40.715	18.8306	21.9165
46.1470474058937	26.4116813451611	29.9342091852103	45.9242	19.9	29.6168
46.1542438173907	26.3778938834469	30.20449292633	44.3034	16.6265	25.3299
46.1542438173907	26.3778938834469	30.20449292633	47.2412	18.0641	21.8927
46.1877049962471	26.2207634514046	31.4613509178863	40.2335	17.1357	30.0024
46.2216054581909	26.0615759946535	32.7346848571152	46.684	28.1154	34.4272
46.2216054581909	26.0615759946535	32.7346848571152	46.4115	30.3033	33.5708
46.254378741694	25.9076800723009	33.9656872631231	46.9054	30.8841	31.5685
46.2896531961969	25.7420348683813	35.2906562375203	47.9812	30.2306	39.2099
46.3222845585549	25.5888022050016	36.5163421243974	47.9603	31.0225	36.0363
46.3222845585549	25.5888022050016	36.5163421243974	44.7872	36.1398	42.3342
46.3766863773654	25.2413099124307	36.8117633519903	51.0819	30.8837	36.7669
46.4342435112838	24.8736625323753	37.1243194894184	48.6326	32.1618	43.4727
46.4342435112838	24.8736625323753	37.1243194894184	50.1654	34.298	41.7388
46.507799898869	24.4038192883372	37.5237578877447	45.9581	33.5048	45.1742
46.7772997923622	22.6823557450192	38.9872775513099	49.1449	22.3659	43.2644
47.0175486594313	21.1477419720671	40.2919444245518	52.1655	19.1446	41.5432
47.2345501246734	19.7616261330718	41.4703640711491	43.7175	13.3612	37.2361
47.4364966734092	18.4716755551146	42.5670280458331	47.5448	13.9665	39.1563
47.6317329994123	17.2245885981921	43.6272512645192	40.2323	12.6508	42.5989
47.8100671271507	16.085469276003	44.5956846485504	39.7266	17.3977	50.5452
47.9649167360509	15.0963614848053	45.4365840901929	46.213	15.3079	43.6977
48.1247465211773	14.0754435617039	46.3045272896441	47.2642	16.1804	48.1934
48.286405800444	13.042840230357	47.1824049612015	50.5069	12.3029	52.6774
48.4308556965075	12.1201635075772	47.9668272951245	47.6091	10.2274	48.878

Solution x	Solution y	Solution z	Original x	Original y	Original z
48.5706297966317	11.2273543408208	48.7258573829674	53.965	12.2967	46.7771
48.7165461221142	10.2953109966821	49.5182429235438	58.6318	9.4344	53.4701
48.8205858591239	9.63075849039821	50.0832183210305	52.0827	15.9727	59.9151
48.8388627450494	9.13395894206791	50.2926965365237	53.7123	16.59	54.3027
48.8598354326521	8.56388003683867	50.5330737407534	45.5397	7.2979	57.1732
48.8796730603128	8.0246568814353	50.7604402392129	46.8369	6.4403	54.1626
48.8989687033903	7.50016798749291	50.9815938168928	51.2901	7.6487	52.6277
48.918238015245	6.97639542181194	51.202445335154	56.6229	3.2945	52.4352
48.9362895123508	6.4857261813278	51.4093386189483	54.7597	1.1902	50.9644
48.9532441392433	6.02487255375078	51.6036599521015	57.3839	0.9502	46.0215
48.9679411217019	5.62539075740282	51.7721033156341	54.6465	1.327	47.163
48.9822825894069	5.23557236957468	51.9364720751344	52.0607	4.6851	47.5572
48.9968179775892	4.84048247208146	52.1030636802026	52.2056	3.4977	49.7426
49.0112910037585	4.4470872651626	52.2689407485816	58.2987	1.8222	52.9601
49.0249668042875	4.07536215323035	52.4256804241764	60.4719	1.0667	55.1539
48.6102179149443	3.57494665247073	52.5809112708546	51.8363	2.0767	53.9783
48.1988311838077	3.07858783093417	52.7348837371873	54.4331	-6.2551	57.3764
47.4197234417767	2.90478932557985	52.7094173944068	56.514	2.6652	55.8183
46.3409386325433	2.66413935513676	52.6741555416837	49.309	3.6922	59.7251
45.1656033424938	2.40195065169436	52.6357377772007	47.7278	5.7114	59.7593
43.8523521198495	2.10899511915017	52.5928119658883	44.2937	4.7268	51.9613
42.5371812218158	1.81561128659981	52.5498234815877	44.3097	5.4051	59.4302
41.0938635962797	1.49363992687184	52.5026461984468	43.0131	-4.6452	57.9101
39.6321437237718	1.16756416870411	52.4548673724694	36.4279	-4.3699	52.432
38.3688486282289	0.885753931222517	52.4135745268452	36.7928	9.6586	58.8057
37.0010708792381	0.580635439045881	52.3688665984428	33.7832	8.5886	57.2507
35.7389303110583	0.299082868537688	52.3276117023676	30.7839	5.7178	56.2846
34.6484126696515	0.0558163870653274	52.2919666970209	31.1391	0.2266	57.7289
33.6681618961175	-0.162851498002134	52.2599260224353	22.4229	-2.1641	56.3911
34.0697332608295	-0.115167516125307	51.9015198516012	25.8989	0.7413	53.4706
34.0697332608295	-0.115167516125307	51.9015198516012	27.6562	5.4902	56.4427
34.681229051718	-0.0425558901452412	51.3557537407439	31.0065	-1.0714	59.1851
35.4772759517515	0.0519705923301395	50.6452734896554	27.3755	-1.0984	56.1861
37.2228251089808	0.259249729250346	49.0873488092241	38.0686	7.3443	51.7798
39.0042818445109	0.470793177272952	47.497375543562	33.4349	0.0139	45.2628
41.0222453623195	0.710422718341622	45.6963162828119	43.4311	0.4843	45.1031
42.8751656106901	0.930453525702095	44.042560766826	42.4155	0.0668	38.5675
44.4897804296099	1.12218501259402	42.6014976188009	43.7681	7.8375	35.3656
45.5937676752355	1.25327879597064	41.6161776003331	49.2438	-0.5725	42.7886
46.6508892646099	1.3788073228932	40.6726858268085	49.5265	1.5006	43.2383
47.6996444301753	1.50334223336139	39.7366612823448	50.9668	1.717	44.4164
48.7740628874492	1.63092454255107	38.7777320009894	55.7669	1.6852	42.4618
49.7500353701397	1.74681661358004	37.9066669977367	55.5686	2.3786	41.1094
50.6644564710398	1.85539958215643	37.0905374137465	53.289	-9.6645	34.2743
51.0290678204377	2.15334711060247	36.7753167400529	60.4167	1.4088	44.4464
51.2111866200947	2.36356200127639	36.5026996875605	53.412	-4.2453	38.3008
51.4001238912763	2.58164736658738	36.2198759306153	62.5325	1.766	39.3982
51.5490681061299	2.75356989341877	35.9969191957556	52.8937	1.339	38.4463
51.699657232004	2.92739112781472	35.7715001801758	50.2911	5.2466	39.9878
51.8529601121149	3.10434465067608	35.5420189309294	55.5508	6.709	40.6861
51.8529601121149	3.10434465067608	35.5420189309294	55.3647	9.0137	38.8085
52.0031938396369	3.27775549938737	35.3171319288995	51.32	11.9016	40.4537
52.0031938396369	3.27775549938737	35.3171319288995	51.9742	12.9315	39.5168
52.1466805600017	3.44337838349779	35.1023446504813	48.2378	10.888	40.0435
52.1466805600017	3.44337838349779	35.1023446504813	48.9393	11.7496	40.9103
52.2972374001634	3.61716192524919	34.8769740448296	63.4243	4.3429	39.6925
52.3958000577983	4.00352030196228	34.2464225245732	61.565	4.5717	36.954
52.4969636884575	4.4000742986131	33.5992310364579	54.3108	6.5803	34.1725
52.5969098998254	4.79185628325161	32.9598276239745	59.6709	-1.5476	33.1451
52.7047984034372	5.2147716368948	32.2696127442294	58.0726	3.0503	30.5544
52.8114776563901	5.63294666430182	31.5871353756416	46.3909	8.819	37.7186
52.9357248743574	6.11998874782202	30.7922595515724	44.7075	13.3055	33.9605
53.0643870618986	6.62434077440072	29.9691298492587	44.0031	6.0986	31.1209
53.2051172653101	7.17600018359276	29.0687883117868	46.0043	6.8606	27.4465
53.3464862872929	7.73016332067188	28.1643615367	45.8725	14.3747	21.2711
53.3464870833924	7.73016640820259	28.1643565519745	48.0446	14.6778	22.9405
53.3464870833924	7.73016640820259	28.1643565519745	51.6732	17.1776	23.9169
53.3464878775711	7.7301694832097	28.1643515839089	49.0558	10.279	28.6803
53.3464886687445	7.730172543886	28.164346638777	52.4859	17.4578	33.7507
53.3464886687445	7.730172543886	28.164346638777	51.539	18.7116	33.0294
53.5371852648651	8.04897323236232	27.1264582427191	55.9782	19.9329	26.5423
53.5371853267858	8.04897257723664	27.126456730585	49.9475	19.2284	25.6639
53.5371853782988	8.04897194576863	27.1264552842211	46.6598	16.011	21.0885
53.5371854270694	8.0489713405773	27.1264538827867	53.4617	5.8056	38.0578
53.5371854704038	8.0489707350026	27.1264525053895	53.5826	-3.7128	29.3577
53.5371854704038	8.0489707350026	27.1264525053895	50.0191	-2.6033	31.7826
53.6953193966447	7.55584267071799	25.1974694989637	62.7821	-0.0838	27.7653
53.7357207377618	7.40746955110924	24.5820227224626	60.2628	6.0605	25.9406
53.7357207377618	7.40746955110924	24.5820227224626	60.5785	6.8128	27.9807
53.7784846927155	7.25041818542646	23.93057254881	61.7542	11.527	18.9198

Solution x	Solution y	Solution z	Original x	Original y	Original z
53.7784846927155	7.25041818542646	23.93057254881	53.4554	15.0784	17.1477
53.8100220206034	7.13460004572598	23.4501815322328	53.1154	7.9184	18.71
53.84031970013	7.02333484597962	22.9886779629503	51.7765	0.7553	20.0441
53.84031970013	7.02333484597962	22.9886779629503	48.7027	4.8736	15.3944
53.8659194831075	6.92932298852563	22.5987413011615	57.7878	-4.3732	24.6962
53.8826619239146	6.83437261872963	21.6761900645422	45.0418	3.8658	25.2247
53.9023669764832	6.72261931200135	20.5903823801824	43.7231	10.6871	23.6231
53.9377696149389	6.521830726208	18.6395126152338	53.8048	-5.0553	19.1679
53.9377696149389	6.521830726208	18.6395126152338	56.047	-0.6998	19.4659
53.9683345888996	6.34848047671206	16.9552443465216	63.0749	1.8033	17.7213
53.9683345888996	6.34848047671206	16.9552443465216	57.7618	2.6586	23.6599
54.0136787960583	6.09130524468392	14.4565563330818	58.3955	-2.2935	14.9348
54.0136787960583	6.09130524468392	14.4565563330818	61.9524	-0.333	11.9086
54.0431550207614	5.92413181679959	12.8323066422752	58.2741	0.1622	8.0145
54.0431550207614	5.92413181679959	12.8323066422752	58.5415	3.6684	5.0311
54.0595967449373	5.83088615636334	11.9263289541878	58.2864	0.0731	4.559
54.0711138599494	5.76557052744329	11.2917179193337	59.4358	8.0877	8.3998
54.0711138599494	5.76557052744329	11.2917179193337	52.3173	10.0275	11.1526
54.0822875240141	5.70220279834345	10.6760334598337	56.6752	3.9284	4.2715
54.0924296450476	5.64468543607385	10.117190893732	52.0306	12.0787	8.641
54.0924296450476	5.64468543607385	10.117190893732	53.9046	16.3668	14.1276
54.1098201013245	5.54606018414525	9.15894488397106	64.6914	7.7788	3.6297
54.1098188334444	5.5460597369422	9.15894389616816	62.4332	-0.684	2.8792
54.1098188334444	5.5460597369422	9.15894389616816	58.6741	1.1796	4.0744
53.8232921108001	5.47534033732893	8.96990133707648	58.8992	5.3006	6.9433
53.5328327881691	5.40365043751688	8.77826409915713	58.0725	5.2013	11.1785
53.2343449022809	5.32997946704474	8.58132951343321	57.2331	12.7874	5.1838
52.9221557651146	5.2529270407808	8.37535502343871	47.4524	12.1509	5.76
52.6261266503389	5.17986222835745	8.18004312375523	47.1015	12.1757	10.5923
52.3345946743617	5.10790708187447	7.98769850585713	44.5689	9.75	12.1988
52.3345946743617	5.10790708187447	7.98769850585713	44.5228	11.8645	13.3212
52.0893849132637	5.04738358874071	7.82591749543105	43.984	9.2005	15.6271
51.9039283472466	5.00160800247948	7.70356132896242	48.4975	2.4432	11.2037
51.9039283472466	5.00160800247948	7.70356132896242	48.302	2.6164	11.9932
51.7217606236556	4.95664430256874	7.58337488025708	52.3291	3.6705	6.1162
51.5406083677937	4.91193138930428	7.46385831649995	46.0937	-5.8176	9.1179
51.4368319483662	5.07785710788834	7.28829124007736	44.8479	-0.9391	15.0769
50.983716579631	5.802323778193	6.52172879885777	47.0712	4.3382	9.7807
50.5113702312518	6.55753709713601	5.72263291418215	54.5841	1.3	6.274
49.9608026159861	7.43781169961108	4.79120810801503	51.545	-0.7619	6.4521
49.1934955687404	8.66461166029567	3.49311994742635	42.4139	3.5597	1.814
48.4639000833371	9.83112047930733	2.25882731272208	42.7704	10.2739	1.2183
47.8171075701383	10.8652431503823	1.16461417907459	46.5714	10.174	4.4604

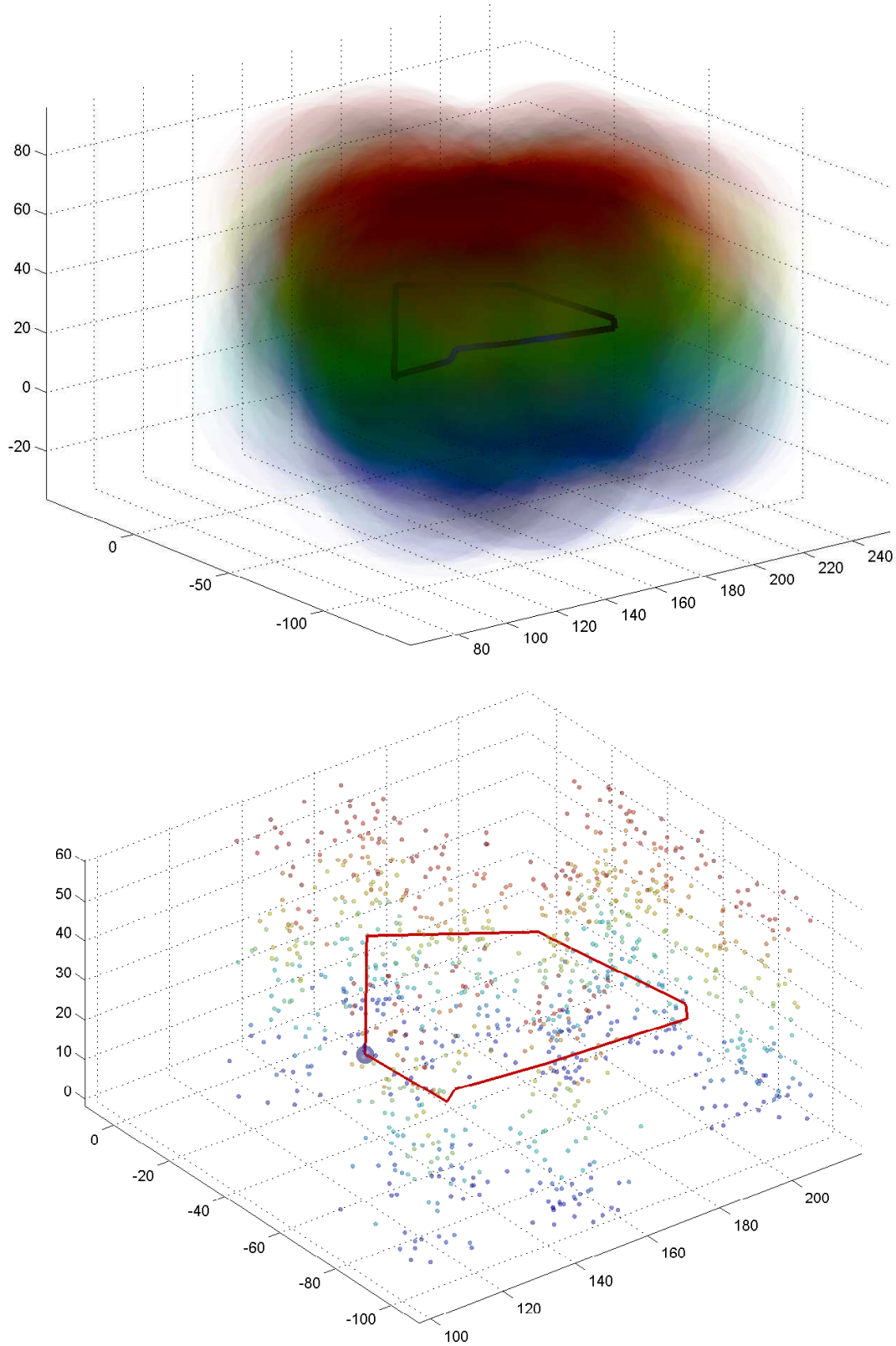


Figure N.90: $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Euclidean, Length = 270.3985457

Table N-93: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Euclidean

Total distance: 270.398545673663 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
47.0584085931933	12.0886716468683	0.0710777984994451	42.7704	10.2739	1.2183
46.9886691460831	12.2104792760507	0.141597444135584	42.4139	3.5597	1.814
46.9187951346601	12.3325219403414	0.212253156669192	47.0712	4.3382	9.7807
46.8482395811029	12.4557549950198	0.283598038960832	48.4975	2.4432	11.2037
46.7765799455552	12.5809164554559	0.356059353489698	48.302	2.6164	11.9932
46.7037057138357	12.708199353238	0.429748849916507	48.7027	4.8736	15.3944
46.6297661600601	12.8373429726892	0.504515587422247	53.1154	7.9184	18.71
46.5551761999167	12.9676226233189	0.579940012090852	61.7542	11.527	18.9198
46.4803349539745	13.0983411941928	0.65561853748482	53.4554	15.0784	17.1477
46.4054294799495	13.2291719621373	0.731362013384739	53.9046	16.3668	14.1276
46.3307209176631	13.3596587995297	0.806906370408463	53.2794	21.4994	19.0176
46.256161454389	13.4898852041606	0.882299957073535	49.9971	19.9155	18.5508
46.1818857515883	13.6196159677117	0.957406601082404	47.2412	18.0641	21.8927
46.1082009812969	13.7483145845305	1.03191569962122	46.6598	16.011	21.0885
46.0353877395486	13.8754909675194	1.10554351844966	45.8725	14.3747	21.2711
45.9636372428222	14.0008111381488	1.17809670319888	48.0446	14.6778	22.9405
45.8931560349511	14.1239143427685	1.24936639981578	51.6732	17.1776	23.9169
45.8242556494737	14.244256451498	1.31903758866437	49.9475	19.2284	25.6639
45.756207967441	14.3631092175421	1.38784653567299	55.9782	19.9329	26.5423
45.6888350709306	14.4807834014923	1.45597315138436	62.5649	23.4331	22.9907
45.6220145020284	14.5974928935804	1.5235412611295	67.242	26.9141	23.9429
45.5560498387969	14.7127074697158	1.59024389547994	70.1037	27.3839	19.7642
45.4903937298893	14.8273831372568	1.65663452651032	72.6191	32.6684	16.6889
45.4283279194304	14.9357879542302	1.71939469458829	67.7055	32.9993	17.0949
45.3667807445559	15.0432869257458	1.78163042858919	66.7818	30.0369	13.8618
45.3055907914231	15.1501619732117	1.84350494532573	69.1853	30.9522	12.1629
45.2447296891955	15.2564626484525	1.90504693284705	68.2062	28.5319	10.0866
45.1840410273664	15.3624621385207	1.96641454883591	66.7482	27.6121	12.1372
45.1234038170735	15.4683717659527	2.02773013920443	63.3607	23.5913	11.9128
45.0629253285451	15.5740041650155	2.08888523394397	63.2951	31.2899	8.2512
45.0020845835393	15.6802692801325	2.15040663209044	57.9508	29.6187	7.6435
44.9410693156262	15.7868392093949	2.21210450144706	54.8257	29.6059	7.5612
44.8799755957334	15.8935461533613	2.2738816961759	53.915	28.4629	8.3577
44.8189532779128	16.0001283741892	2.3355866858191	54.5895	27.7676	11.1642
44.7582745352136	16.1061104910388	2.3969442547879	49.5432	29.0024	13.3417
44.6981087128445	16.2111967266266	2.45778316790892	46.7677	27.4481	8.8301
44.6384123342103	16.3154630107633	2.51814738406464	50.8592	31.2824	4.4654
44.5791772212428	16.4189236293277	2.57804517234753	58.126	35.24	1.1949
44.5205891493193	16.5212541103403	2.63728867339895	62.6603	37.129	7.3175
44.4625239362193	16.6226713555394	2.69600347386838	68.0366	38.8903	2.9918
44.4050424083892	16.7230691258654	2.75412805427585	66.9624	36.7077	4.2616
44.3476900252995	16.8232413258647	2.8121220446148	68.3701	31.308	4.6701
44.2904077692746	16.9232910357868	2.87004512176114	67.6588	29.7348	5.9837
44.2332756352966	17.0230785368348	2.92781639607259	67.4673	33.2544	9.192
44.1763390589093	17.1225244758449	2.98538992648886	66.5887	34.1226	10.8677
44.1196670485089	17.2215083199958	3.0426959295083	61.5106	34.0654	15.2705
44.0633134354598	17.3199360451609	3.09967997366172	64.2717	31.7627	18.8904
44.007332954774	17.4177120457297	3.15628670968197	64.9829	35.6055	23.509
43.9527426740413	17.51305990317	3.21148769370868	61.1622	34.1592	24.5106
43.8988038234847	17.6072699576454	3.26602996007775	58.6228	31.6703	20.587
43.8451297736795	17.70101749276	3.32030445800991	56.2795	36.0371	23.7369
43.7919890380482	17.7938335220333	3.37403967288793	58.8785	37.4935	28.0133
43.741313481759	17.8823438295296	3.42528212930354	55.9275	34.3566	30.6301
43.6922310949574	17.9680714764877	3.47491359247917	58.4334	33.3219	33.0094
43.6784772458948	17.9920940302286	3.48882132855296	60.463	30.4795	30.5011
43.6648348770582	18.0159218689107	3.50261633520638	58.5931	27.1316	32.5338
43.6513026329753	18.0395573605	3.51629998492717	55.4854	26.8201	32.387
43.6378329722326	18.0630835415011	3.52992035073253	54.6523	25.2022	31.3259
43.6243784422958	18.086583293326	3.54352541471384	52.4859	17.4578	33.7507
43.6109813105113	18.1099827922009	3.55707243887324	51.539	18.7116	33.0294
43.5975781131914	18.133392884107	3.57062559653623	45.9242	19.9	29.6168
43.5841952718856	18.1567674212316	3.58415816942996	40.2335	17.1357	30.0024
43.5708813230533	18.1800216295577	3.59762108213575	40.715	18.8306	21.9165
43.5576445308067	18.2031410757626	3.6110059721702	44.3034	16.6265	25.3299
43.5444418849673	18.2262008823979	3.62435633528594	43.7231	10.6871	23.6231
43.5312936078029	18.2491657308316	3.63765172266469	41.1669	5.3004	18.6447
43.5182037279081	18.2720285856665	3.65088805957416	43.984	9.2005	15.6271
43.5051805970516	18.2947748605638	3.66405690093969	44.5689	9.75	12.1988
43.492264105915	18.3173348819439	3.67711790780272	44.5228	11.8645	13.3212
43.479464269997	18.339691155926	3.69006095631009	47.1015	12.1757	10.5923
43.4667776674311	18.3618496578177	3.70288950324392	52.3173	10.0275	11.1526
43.4541660425229	18.383877203694	3.71564223516776	52.0306	12.0787	8.641
43.4415647715334	18.4058866641698	3.72838449939623	55.8132	15.4408	3.6174
43.4289087000396	18.4279918374314	3.74118217230396	57.2331	12.7874	5.1838
43.4161607806804	18.4502574306455	3.7540727227952	64.6914	7.7788	3.6297
43.4032879012951	18.4727412785968	3.76708962936539	62.4332	-0.684	2.8792

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.3902836917581	18.4954545083249	3.78023933326338	58.6741	1.1796	4.0744
43.3771346542934	18.5184206960419	3.79353548516342	58.2864	0.0731	4.559
43.3638528119268	18.5416188422575	3.80696592513672	58.2741	0.1622	8.0145
43.3504671790903	18.5649982695024	3.82050131654673	58.0725	5.2013	11.1785
43.3370130301716	18.5884973666836	3.8341059932232	59.4358	8.0877	8.3998
43.32351540224	18.6120724031461	3.84775463382645	58.8992	5.3006	6.9433
43.3099963701036	18.6356848224476	3.86142491792054	58.5415	3.6684	5.0311
43.2964770382363	18.6592977635216	3.87509550387401	56.6752	3.9284	4.2715
43.28296868507	18.6828915280547	3.88875498587564	52.3291	3.6705	6.1162
43.2694891756657	18.7064349139663	3.90238530246778	54.5841	1.3	6.274
43.2560177873773	18.7299641155529	3.91600740617541	51.545	-0.7619	6.4521
43.242539588975	18.7535052122617	3.92963639374889	46.0937	-5.8176	9.1179
43.2290654320767	18.7770392506001	3.94326129315772	44.8479	-0.9391	15.0769
43.2154975153614	18.8007370517042	3.9569810013895	39.9467	-2.3317	18.5214
43.2018095911156	18.8246444602631	3.9708220592977	32.3564	-1.4633	20.5286
43.1879872023562	18.8487867279462	3.984799083247	31.1128	-2.8096	30.5667
43.173728648192	18.8736907575432	3.99921716388351	22.6294	-1.9579	25.7184
42.9770644707285	19.3440754335609	4.19596792713399	24.8641	0.1355	28.7608
42.7652433065196	19.850712813209	4.40788236079181	24.5208	1.7631	30.0851
42.5596475960736	20.3424599336738	4.61356860969511	27.2842	5.8331	28.3822
42.3585266043857	20.8235043407504	4.8147781666686	29.9497	8.0977	27.1858
42.1630691656605	21.2910025567984	5.01032167129794	29.2451	9.0499	23.6495
41.9727408982909	21.7462327244023	5.2007337384312	28.1449	5.3771	22.529
41.7855728636092	22.1939041831972	5.3879841763107	26.4488	5.1021	19.0029
41.6005070681986	22.6365474626404	5.57313144465219	26.246	7.8923	16.6585
41.415912461493	23.0780637415751	5.75780731260708	21.6596	11.213	17.563
41.228335879787	23.5267123552023	5.9454664683832	22.4003	2.9895	12.1851
41.0338539466373	23.9918773004242	6.14003401389895	23.9142	5.5856	8.3806
40.8292403639911	24.4812753009109	6.34473766865838	19.4163	-0.8394	2.2943
40.5835484781059	25.0689250538376	6.5905376923388	26.7943	-2.6353	5.1743
40.2995789107117	25.7481279934534	6.87463222423574	31.0707	1.7474	5.3999
39.989227753285	26.49043086502	7.18511993177427	28.0443	7.2557	0.5495
39.6599861026289	27.277916332641	7.51450641968629	23.3217	16.9506	6.2856
39.3259237958166	28.0769319143482	7.84871568107253	25.2224	21.1268	9.0297
38.9927395586904	28.8738473021369	8.182046498601	24.0847	21.2619	9.4135
38.6616712128851	29.6657018507075	8.51326051441019	19.6457	23.2311	5.559
38.3338674687358	30.4497480573265	8.84120850685252	27.0312	22.0371	1.4535
38.0038584751439	31.2390688195845	9.17136272021853	21.2889	20.2133	0.1771
37.6696640632018	32.0384003444792	9.50570418433756	16.9397	16.157	0.3423
37.3274284295824	32.8569650237817	9.84809039093581	7.8039	17.6061	5.7787
36.9737463968809	33.7029074411293	10.2019280366953	15.0509	21.8739	10.7741
36.6210482589867	34.5464966110096	10.5547813894639	19.8821	27.2321	11.7559
36.2661108871737	35.3954416172081	10.9098750028519	20.5046	21.2685	13.3595
35.9010009599467	36.2687174797092	11.2751456702808	24.5729	19.8583	16.0395
35.5170242798437	37.1871191206791	11.6592914145453	31.9656	14.6164	16.7619
35.1003045216063	38.1838361666881	12.0761946577565	23.1228	16.7524	24.3445
34.6505858634372	39.2594804868877	12.5261113384705	23.1615	20.5337	28.672
34.1754292042131	40.3959677971225	13.0014772318863	18.4916	22.031	28.1174
33.6774089957081	41.5871404975027	13.499716748995	19.0397	19.3917	26.8913
33.1408468201544	42.8704985291137	14.036515207794	17.2669	18.1061	25.0094
32.5344089571839	44.320986452875	14.6432201219527	20.5322	21.5891	20.6595
31.8872593920639	45.8688494168111	15.2906546607401	20.8129	26.0745	22.3222
31.2367426441831	47.4247661241291	15.9414578686561	22.8581	29.0039	22.5241
30.6192178002136	48.901772077456	16.5592546481422	28.099	29.8348	27.0633
29.9596486115513	50.4793403347144	17.2191142831107	18.7531	32.536	21.0115
29.1661075443419	52.3773449103031	18.0130047586862	23.9369	61.5866	18.0383
28.4530824965354	54.0827698089532	18.7263437485682	22.6268	64.3936	19.9605
27.7474348033575	55.7705494318042	19.4323021007321	22.0857	71.4539	26.9077
27.0562620814878	57.4237075383252	20.1237790838807	18.7356	77.2891	30.4652
26.4258843368734	58.9314551062942	20.7544343439966	17.9606	81.6588	21.6946
25.8604434143919	60.2838856621739	21.3201242144978	13.7649	76.0563	18.1156
25.3312591505127	61.5495969327001	21.8495414830511	8.0472	76.1743	13.1381
24.8426933720662	62.7181562474901	22.338322389723	7.5677	74.3816	13.1566
24.3749320867031	63.8369550463244	22.8062896568939	9.00020000000001	73.0359	5.8372
23.9153393641014	64.93621614823	23.2660847673857	10.0835	69.723	3.7551
23.450398217104	66.0482697058284	23.73123065823	12.0877	66.3858	4.5331
22.9691268961831	67.1993820626143	24.2127139121158	15.1112	64.361	7.2726
22.4632822856456	68.4092692672662	24.7187812697596	14.2239	63.9607	10.3191
21.9300535325853	69.6846544046351	25.2522448125365	9.6606	65.5604	9.552
21.3735195436968	71.0157815307384	25.8090238126273	9.15690000000001	61.6426	15.1483
20.7895951704689	72.4124216530235	26.3932052351866	1.76609999999999	66.5446	12.6159
20.1857062895985	73.8568134813804	26.9973599524702	0.483800000000002	63.8626	0.7436
19.3927354367351	75.7534555478321	27.7906799661688	2.7376	84.0979	3.4333
18.6350418304522	77.5657211272204	28.5487073200977	-0.100899999999996	90.0487	0.1507
18.4226729814713	78.0736684082805	28.7611696594695	2.57040000000001	90.3092	4.6781
18.2138129667788	78.5732231867592	28.9701216292487	4.77370000000001	93.7785	6.1602
18.0106918828218	79.0590514441486	29.1733321308549	8.1477	101.1634	5.5645
17.8268437940222	79.4987821798749	29.3572611223597	3.0162	107.1796	11.3112
17.7767287357086	79.6186481252677	29.4073982135621	3.81100000000001	100.5395	9.9764
17.7280413070986	79.7350994365657	29.4561070463193	2.55330000000001	99.1767	7.9857

Solution x	Solution y	Solution z	Original x	Original y	Original z
17.6806589327438	79.8484292963608	29.5035102533884	-0.171000000000006	97.1566	2.8672
17.6759419733077	79.9073964945949	29.5917973921393	-1.9602	93.9224	5.6614
17.6711523093319	79.9672725997025	29.6814453543336	-2.1508	94.1499	7.6254
17.6662884412152	80.028076385104	29.7724822410775	-6.68600000000001	94.6391	7.4364
17.6608506472357	80.0960548977345	29.8742612739341	-12.8049	93.8535	15.5008
17.6523105560268	80.2028151043559	30.0341046370786	0.613799999999998	95.4238	16.9249
17.6436686911953	80.3108477306786	30.1958530606476	1.4019	97.5847	15.4849
17.6349409125898	80.4199544541573	30.3592096218978	5.8502	91.8647	13.1882
17.6261818217858	80.5294525383913	30.5231521558619	6.3198	96.0864	20.0555
17.6174253541502	80.6389177212286	30.6870454632838	9.17	97.1621	20.3835
17.6087313602745	80.7476017504881	30.8497692621969	8.0611	104.093	26.141
17.600140745782	80.8549932638905	31.0105579333492	3.1448	100.72	31.1491
17.5916863814845	80.9606813147073	31.1687962133912	3.11839999999999	98.924	29.022
17.5833192297903	81.0652789937102	31.3254020096289	3.5924	94.7451	26.9481
17.5749809368448	81.1695158566498	31.4814676026794	7.8142	89.6258	27.2865
17.5666171021904	81.2740720125425	31.6380112532118	-0.735100000000003	89.6931	26.6301
17.5582303030273	81.3789152473232	31.7949847272356	-2.5612	92.1356	23.79
17.5498110460914	81.4841642517524	31.9525657249595	-5.5457	98.4014	26.4862
17.541373642874	81.5896401309636	32.1104863988517	-0.338999999999999	97.1979	25.6607
17.5329480193767	81.6949687316831	32.2681865776202	-0.311599999999999	97.6012	28.6474
17.5245745695231	81.7996450458398	32.4249101678007	1.64530000000001	95.7178	31.8751
17.5162766682851	81.903376841255	32.5802196417732	-3.1358	95.2162	31.8855
17.5080624488063	82.0060624417898	32.7339627645415	-1.86190000000001	98.5581	36.524
17.4998833911502	82.1083084750263	32.8870477634106	0.619299999999996	91.0377	37.0534
17.4917289694698	82.2102465301635	33.0396716550943	3.5998	89.8159	36.4775
17.4835744078541	82.3121863638973	33.192298199943	-4.1255	85.596	43.5867
17.475468356668	82.4135197499658	33.344016765006	1.20229999999999	90.7259	43.7677
17.4673669107488	82.5147956013528	33.4956491741646	3.4538	93.5151	43.6356
17.4592786376855	82.615906817036	33.6470350735688	2.1469	96.6722	44.5395
17.4512329323229	82.7164859180962	33.7976242706949	3.55029999999999	90.3653	48.0124
17.4432562390705	82.8162022383365	33.9469217162852	0.580200000000005	93.7511	50.7296
17.4353963376089	82.9144584754646	34.0940331218011	-3.26390000000001	94.8889	48.3647
17.4277086302381	83.0105619996242	34.2379214829745	-7.5489	96.9207	56.8305
17.5421188255677	83.0078739587642	34.2254461874497	4.95789999999999	99.4405	59.5277
17.6580818769308	83.0051494346618	34.2128015613831	1.1743	92.9818	59.2535
17.7747536083254	83.0024082593374	34.2000796575389	-0.0468000000000046	93.7668	57.0052
17.8923100947127	82.9996462966325	34.1872612749632	-2.30370000000001	90.7079	58.2529
18.0121989922945	82.9968295354258	34.1741885613141	-1.23350000000001	86.0108	56.7294
18.1346134343496	82.9939534401899	34.1608404538386	-4.2807	74.2616	57.1387
18.2609837097304	82.9909844060528	34.1470609976057	4.0089	72.186	49.5614
18.3896103051328	82.9879623648671	34.1330355036051	9.3844	71.5303	46.4336
18.5207085068706	82.984882259654	34.1187404987556	11.4886	67.7219	43.0579
18.652844974482	82.9817777636583	34.1043322798347	12.0097	66.7734	42.888
18.7851278114133	82.9786698286527	34.0899081054835	9.45780000000001	72.6847	40.961
18.916833901586	82.9755754425475	34.0755468254742	12.73	75.2001	37.6748
19.0478114894106	82.9724981709257	34.0612649837319	8.8648	72.0358	37.3381
19.1780384307224	82.9694385335143	34.0470649960768	6.09139999999999	73.9114	36.5077
19.3083155489263	82.9663777173043	34.032859535226	0.309600000000003	68.1954	39.7657
19.439064830082	82.9633058082744	34.0186025877367	5.2812	65.5492	44.5709
19.5712535556225	82.9602000829744	34.0041886763413	4.4426	63.6871	51.0243
19.705387929522	82.9570486489223	33.9895626032121	4.7342	63.0935	56.3188
19.8431782012401	82.9538113243402	33.9745378821362	8.4928	63.9998	55.0759
19.982721668075	82.9505328120328	33.9593219841964	11.4442	66.9869	57.5373
20.123057618747	82.9472356830491	33.9440196693039	14.2076	63.0144	54.8035
20.2637868829822	82.943929314054	33.9286744654275	15.3124	65.205	52.7286
20.4046525729672	82.9406197410829	33.9133143837431	14.0233	68.3418	48.6515
20.5457391688723	82.9373049797914	33.8979302098271	10.9416	69.7746	52.0032
20.6872517232863	82.9339802106747	33.8824995890358	15.4332	72.9689	53.8868
20.8294667487642	82.9306389386071	33.8669923675753	18.2654	71.5277	59.9496
20.9722594864068	82.9272840923768	33.8514221548604	24.1578	73.3792	57.4094
21.1151985980662	82.9239258068372	33.8358359822256	26.9783	71.0141	56.5271
21.2578863064319	82.9205734259499	33.8202772268538	27.6433	72.5657	51.9251
21.4004101938872	82.9172248920758	33.8047363377564	24.7401	75.4523	49.5075
21.5427146331855	82.913881511195	33.7892193815951	25.3366	76.538	54.326
21.6844634715373	82.9105511800458	33.7737630159887	29.376	80.5861	55.9809
21.8252477899059	82.9072435060728	33.7584118290603	35.1535	70.6086	57.9365
21.9637400610762	82.9039896777244	33.7433105784657	32.697	74.6737	51.2201
22.1010542933628	82.9007635242501	33.7283377872501	32.2488	71.8762	47.8257
22.2376707788275	82.8975537632451	33.7134410816928	26.4587	69.6793	44.9112
22.373574927453	82.8943607369901	33.6986220536568	26.4833	65.6457	42.68
22.508919104004	82.8911808647 13	33.6838640906163	31.7515	71.3679	39.9054
22.6444477322024	82.8879966577164	33.6690860163418	31.105	77.2121	42.4385
22.7800176271708	82.8848114786206	33.6543034473064	27.1736	83.2653	40.5956
22.9151968215616	82.8816354745132	33.6395634862887	24.3218	77.9732	38.2426
23.0492889983632	82.8784850050542	33.6249420598118	24.4797	75.354	37.647
23.1820583555438	82.8753656111247	33.6104648795653	22.8762	75.7017	33.805
23.3133135345838	82.8722817898046	33.5961528084101	26.2205	72.9044	33.175
23.4437045496814	82.8692182713313	33.5819349661121	26.4747	67.9787	32.7219
23.5732777139161	82.8661739684478	33.5678063011456	18.9682	67.082	33.9115
23.7020246062934	82.8631490786045	33.5537677348223	15.0856	70.6386	28.9208

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.8313946506163	82.8601095496814	33.5396612162459	14.7433	68.1941	29.0053
23.9626148318029	82.8570265555545	33.5253529539259	12.0444	66.3239	28.7604
24.0964294930722	82.8538826087129	33.5107617840422	6.9842	66.7632	27.251
24.233328850756	82.850667139522	33.4958386526127	7.6803	61.1857	24.6436
24.3737539371977	82.8473669416431	33.4805222699475	6.67010000000001	63.5082	34.9077
24.5162906599392	82.8440180818593	33.4649800330323	10.4334	62.822	33.9682
24.6600630616288	82.8406401910232	33.4493030569596	10.7344	66.9849	31.9545
24.8043797743443	82.8372495114092	33.4335667296823	11.6475	70.8021	30.9107
24.949072682596	82.8338499929447	33.417789381413	7.0214	70.8048	31.3366
25.094648924367	82.8304297196929	33.4019157157449	8.3117	72.2049	29.6247
25.2414003591974	82.8269818357337	33.3859139060027	9.9143	75.8382	26.191
25.389735061303	82.8234967555373	33.3697394528436	6.65640000000001	74.2265	20.3804
25.5399580442481	82.8199673125664	33.3533590951622	9.1707	70.0865	21.5855
25.6918946090047	82.8163976122026	33.3367918833874	10.5042	66.7806	23.1982
25.8452897833133	82.8127936454163	33.3200656207191	12.5389	66.9051	22.2814
25.9999931291602	82.8091589477296	33.3031967102397	12.0587	67.8257	18.5408
26.1558159427352	82.805497952322	33.2862057276366	13.2613	67.7948	17.1077
26.3125462605074	82.8018156386931	33.2691157869439	14.5018	68.1646	16.8217
26.4699196772103	82.7981182176546	33.2519557226822	16.7224	69.1113	14.1768
26.6275615750371	82.7944144891931	33.234766384116	22.1344	71.2137	11.8857
26.7850675996264	82.7907139534611	33.2175918600139	24.5354	72.6275	12.2334
26.9423014138502	82.7870198131556	33.2004470204772	23.796	77.2181	9.3562
27.0990963804234	82.7833359833076	33.1833500315057	21.1184	76.9048	10.6601
27.2555950119778	82.779659115443	33.1662853596131	21.3934	72.6127	7.7423
27.4119334763242	82.7759860110072	33.1492381546827	22.8228	67.5784	3.2098
27.5682425229124	82.7723135983739	33.1321941530311	22.9431	70.0987	4.2047
27.7245387383671	82.7686414884456	33.115151551596	24.5076	73.115	4.3052
27.8807857718181	82.7649705356288	33.0981143164099	23.527	73.6169	0.5641
28.0370331785187	82.7612995742789	33.0810770384277	25.4767	75.481	0.001
28.1929732577682	82.7576358334981	33.064073267121	26.6151	77.1467	3.8306
28.3490331558824	82.7539692771133	33.0470564323784	23.4089	84.0628	5.796
28.5056544089224	82.7502895291421	33.0299783903782	33.517	80.8699	6.7304
28.6633352763423	82.746584883333	33.0127848125354	31.4187	76.5703	2.7936
28.8210722228842	82.7428789159156	32.9955851240262	31.0449	71.9995	0.0029
28.9759573294292	82.7392399466967	32.9786964040268	31.4906	71.3219	1.4719
29.1288930595451	82.7356467739967	32.9620202490829	33.839	67.1668	7.1332
29.280018952798	82.7320961203483	32.9455414496805	28.241	67.9653	9.5896
29.4293385039706	82.7285879029629	32.9292596218752	25.7737	68.9159	14.4865
29.576998240714	82.7251186783483	32.9131587912271	27.2709	73.9256	16.4296
29.7229979134446	82.7216884525781	32.8972389808011	31.4455	71.7336	19.6874
29.8698241590976	82.7182388046019	32.8812290472891	34.9317	80.2335	16.9208
30.0173342956563	82.7147730876562	32.8651445423816	32.6009	89.9531	17.4409
30.1647340835792	82.7113099616306	32.8490720728807	29.3468	93.7461	14.2413
30.3131726463656	82.7078224289333	32.8328863324207	31.6916	96.8159	17.5787
30.4628744558403	82.7043052160676	32.8165628454047	29.5221	90.7635	22.4343
30.6153922666592	82.7007218408763	32.7999323034481	34.0163	93.2553	22.3961
30.7698449286373	82.6970930065693	32.7830907826371	31.7064	96.988	25.1942
30.9252731586808	82.6934412513609	32.7661428864354	29.1897	96.4145	23.036
31.0817066527219	82.6897658782182	32.749085374803	28.2891	98.27	21.6276
31.2389612923712	82.6860712143189	32.731938320442	21.5395	100.4343	27.1149
31.3963480076993	82.6823734484361	32.7147768647492	26.1674	96.1159	30.3905
31.5529279105609	82.6786946395715	32.6977033854777	29.7064	94.0211	29.3487
31.7085412279603	82.675038540862	32.6807353030391	33.1881	90.5996	30.8927
31.8636684860922	82.6713938604813	32.6638202243869	42.9721	90.3177	28.7365
32.018394146387	82.6677586146835	32.646948934421	46.0729	100.678	36.5278
32.1709385263873	82.6641746160718	32.6303154924439	46.5537	103.4177	45.8992
32.3208219069068	82.6606531352201	32.6139722082526	42.8352	101.6931	44.9574
32.469531260835	82.657159235957	32.5977569400982	42.0156	103.5929	44.0945
32.6168064026509	82.6536990318675	32.581698057675	39.3246	101.8921	42.5744
32.7624367524816	82.6502774709118	32.565818521894	39.1965	105.4524	44.823
32.9065829770904	82.6468907787414	32.5501008152613	35.3466	107.7036	41.395
33.0502845214421	82.6435145349327	32.5344315941249	32.8361	107.2479	41.504
33.1944267957857	82.6401279379551	32.5187143126635	29.8552	101.3038	43.5974
33.3390990241328	82.6367288919674	32.5029392416258	26.6904	96.1713	46.6576
33.4844837122644	82.633313109324	32.4870864794541	26.55	96.735	54.3574
33.6315075517218	82.6298588188617	32.4710549804104	26.9511	99.1097	54.9389
33.780874140951	82.626349491812	32.4547680210017	29.7849	97.5299	53.9895
33.9322500780146	82.6227929623624	32.4382619534628	31.4281	94.9219	54.3744
34.0853301495588	82.6191963998992	32.4215700588301	30.7482	95.8761	57.2879
34.2396924674549	82.61556971305	32.4047383439991	35.2228	101.4244	59.0123
34.394536092249	82.6119317190717	32.3878541444533	35.7224	107.36	58.7833
34.560976719738	82.6080212701489	32.3697054118265	42.4716	105.6496	56.7244
34.7243287780296	82.604183383027	32.3518934595028	44.7902	101.1589	57.6534
34.8843870193378	82.6004228770111	32.3344406716681	47.126	99.3914	58.8698
35.0403805583071	82.5967578641051	32.3174311070173	43.0828	99.6317	56.4863
35.1946748318321	82.5931327710635	32.3006068349569	42.0978	97.503	57.9578
35.3483010987735	82.5895233708003	32.2838554051039	39.6285	91.4521	58.9959
35.5015945362968	82.5859217884954	32.2671402696835	35.4152	92.5489	58.019
35.6554218142065	82.582307663287	32.2503669252548	33.6244	92.4492	56.3457
35.8104353205651	82.5786656685973	32.2334642345545	37.1788	95.0118	52.8478

Solution x	Solution y	Solution z	Original x	Original y	Original z
35.9680085642401	82.5749635382881	32.2162824240095	36.1694	94.3523	52.0418
36.1277922807244	82.571209477438	32.1988595791538	32.1756	91.0244	47.2823
36.2888308436092	82.5674259337317	32.1812999056246	35.9551	95.9225	47.402
36.4515909134482	82.5636019451038	32.1635525158117	32.4952	97.9758	48.1403
36.6149592567174	82.5597636627622	32.1457388023918	35.4006	103.6799	50.1937
36.7787617207173	82.5559151778563	32.1278777562081	39.196	99.7694	49.3378
36.9421157188201	82.5520772246835	32.1100656168906	44.0393	95.7757	50.8289
37.1047255421725	82.5482567505815	32.0923346305517	41.599	92.4813	48.0171
37.2664495118192	82.5444570849623	32.0747002458558	42.6808	88.2098	40.1619
37.4274208870672	82.5406750994886	32.0571479252017	40.8939	84.3555	43.1765
37.5883572203641	82.5368939365636	32.0395994290038	35.4073	87.2216	40.4202
37.7496979355811	82.5331032734004	32.022006839663	32.8593	93.0881	38.0081
37.9117975416835	82.529294782815	32.0043314987427	32.2034	92.5655	35.5696
38.0745468491969	82.5254710289725	31.9865853137475	34.0464	97.1856	33.2284
38.237558254107	82.5216411188962	31.9688105459205	33.8351	99.3235	37.4512
38.4010017934013	82.5178010563048	31.9509886594407	36.8108	99.4487	34.5912
38.5649371815558	82.5139494377434	31.9331131414361	38.189	100.3805	31.8594
38.7292561658778	82.5100888065437	31.9151957939564	34.3074	104.3145	33.9426
38.8941739657541	82.5062141053935	31.8972131524482	31.3011	106.2109	32.3658
39.0598190863693	82.5023223149599	31.8791512044976	33.1638	109.6815	28.6324
39.2265864770052	82.4984041582884	31.8609668824166	28.1717	107.4546	19.2451
39.3934160090598	82.4944845403369	31.8427757804369	33.1686	108.6172	19.7963
39.5611465538883	82.4905437554782	31.8244864304472	37.1983	106.347	12.5162
39.7293973041209	82.486590752373	31.8061403474072	35.5571	102.295	9.2843
39.8974703955755	82.4826419253548	31.7878136274031	31.6341	101.1443	12.133
40.0659419232829	82.478683738887	31.7694434611887	35.0473	98.5367	9.9491
40.2352709971055	82.474705408487	31.7509797798603	35.2297	94.8683	9.4168
40.4052107724667	82.4707127338174	31.7324494998687	37.9917	90.5379	9.9912
40.5758703024941	82.4667031539289	31.7138407297181	34.7819	91.1147	8.0437
40.7472006368997	82.462677818372	31.6951588067426	33.2241	90.2072	6.3544
40.919001872035	82.4586414228502	31.6764255338271	30.8807	93.5109	0.3364
41.094191913986	82.454525411935	31.6573227325878	37.0706	93.0168	1.0492
41.269895848742	82.4503973316071	31.638163885492	37.3296	94.7968	3.7833
41.4456827900719	82.4462673046361	31.6189959799447	34.0458	95.0903	5.2592
41.6214162867691	82.4421385344117	31.5998338986517	33.9629	96.8355	4.449
41.7978286845745	82.4379938151775	31.580597782961	35.7481	97.1257	4.802
41.9755881812183	82.4338174497254	31.561214770181	35.7859	98.3251	5.4495
42.155480767885	82.4295909729327	31.5415991541673	33.0573	97.9271	5.3628
42.3382512640103	82.4252968833841	31.5216697224132	30.1816	102.1772	4.0412
42.573456651193	82.4197709049646	31.4960226482448	35.7306	102.2767	4.1846
42.8160449206205	82.4140714713213	31.4695705261407	40.5226	102.8002	1.3549
43.553082714686	82.3852358582167	31.4064063228772	40.9527	105.6227	4.1926
44.3432331745086	82.354322239945	31.3386903806291	42.9285	106.2179	5.6354
45.1464371793394	82.3228979201	31.2698557734109	45.465	105.2608	3.7217
45.9174632796955	82.2927325558336	31.2037788306381	48.0764	105.8084	10.3389
46.6878309158764	82.2625929931953	31.1377583275027	53.9006	102.5381	21.0284
47.4611765032852	82.232336964851	31.0714826282226	45.0704	101.2748	27.009
48.2377019376766	82.201956580114	31.0049344262997	42.9226	100.4615	26.2167
49.0262851698446	82.1711044874483	30.9373528745495	42.2565	98.7398	22.9258
49.8380095535148	82.1393470550825	30.8677881262995	40.9431	96.0349	18.7884
50.6765897624389	82.1065389469593	30.7959218317002	38.2186	96.6747	17.5328
51.5503329078092	82.0723551553432	30.7210420746542	42.5793	100.4271	14.8388
52.4777757706443	82.036070441122	30.6415602513682	40.2693	101.3043	8.6864
53.5002095200958	81.9960693276687	30.5539377030902	40.065	98.6098	6.7408
54.6452382600781	81.9512717983439	30.4558087619206	39.7333	98.7582	4.2197
56.1668086801255	81.8917423439406	30.3254102118506	41.6896	94.8028	3.024
58.0586278832141	81.8177268178446	30.1632813957236	43.1057	91.7939	5.1823
60.2534934379923	81.7318542384303	29.9751816315511	48.9533	90.4759	7.3728
62.6352209976615	81.6386702345229	29.7710679893517	47.7789	92.5461	5.4276
65.4869198361982	81.5270988943224	29.5266779426602	51.1106	98.2963	5.5983
69.2264025839634	81.3807933976936	29.2062050603467	86.3374	85.7586	1.5055
71.7814449393458	81.2808293123777	28.9872384039593	88.3633	87.3681	2.2205
73.7613736605202	81.2033664786109	28.8175588453917	93.0994	86.3608	2.8092
75.2798270003525	81.1439587243151	28.6874275975011	93.2494	81.8793	2.8544
76.5925854879228	81.0925987504893	28.5749243194153	91.86	79.7087	2.2114
77.7930731611561	81.0456313817253	28.4720425969399	89.835	77.746	1.5427
78.9270187569351	81.0012674693243	28.3748635008886	93.9524	73.145	3.1932
79.9723343618058	80.9603711050374	28.2852799873688	94.6798	69.1984	4.5089
80.9377981593157	80.9225988583191	28.2025397630585	98.4258	65.8894	6.8362
81.8075654885446	80.8885706186257	28.1280007162628	103.5291	67.906	8.9335
82.58144553706	80.8582938264471	28.0616792132172	108.1531	76.0691	2.761
82.6798723237475	80.8544430474235	28.0532440341138	103.6911	80.62	5.0557
82.7770551351839	80.8506409385298	28.0449154650339	103.8313	82.5056	7.2236
82.8731473390695	80.8468814988486	28.0366803594562	107.981	80.0957	12.6444
82.9683129532343	80.8431583097546	28.0285246652266	102.2936	85.0217	15.0829
83.0626984330548	80.8394656406066	28.020435829907	102.0461	86.7072	16.2393
83.1561395169669	80.8358099167808	28.0124279306568	102.4507	89.6037	15.6617
83.2482637634189	80.8322057093792	28.0045328860138	101.8123	94.891	12.8509
83.3389925891457	80.8286560943694	27.9967574304105	104.1034	98.3317	9.2012
83.4280947720734	80.8251701195671	27.9891213815365	104.1728	96.9352	2.733

Solution x	Solution y	Solution z	Original x	Original y	Original z
83.4398671621961	80.8027064303178	28.0186412916967	99.3782	93.0601	2.9898
83.4517078579053	80.7801124001386	28.0483324778993	100.8882	91.1406	6.6906
83.4635746660481	80.7574685357203	28.0780891402826	102.0076	93.075	9.5996
83.4754363207745	80.7348345004144	28.1078328803673	105.6506	92.4297	8.9472
83.4873650341988	80.7120725063293	28.1377447753894	107.2392	85.9448	2.4326
83.4995129125167	80.6888923125079	28.168206229385	101.1477	85.2681	2.6541
83.5117391875005	80.6655625226945	28.1988642699742	99.0152	86.155	1.7016
83.5240232034452	80.642122550277	28.229667104007	100.0565	80.1054	0.0522
83.5363926153187	80.6185196263352	28.2606840679663	98.5933	78.8152	8.2256
83.5488691371336	80.5947123145717	28.2919696276686	98.9119	80.0767	11.0692
83.5614771726187	80.5706540515499	28.3235849726853	96.8706	83.0827	11.4782
83.5741733358417	80.5464276270179	28.3554213092092	97.3132	81.5365	12.7479
83.5869241391754	80.5220969396598	28.3873946634339	97.1852	78.7831	16.5303
83.5997339818072	80.4976535922614	28.419516070024	98.2007	80.5294	17.4055
83.6125889758137	80.4731240871225	28.4517507015307	97.8831	81.9659	16.6355
83.6254557878016	80.4485720326522	28.4840149672686	96.9541	82.6989	20.5312
83.6383288618855	80.4240080305673	28.516294939941	92.288	83.6157	17.9977
83.6511508968	80.3995414213607	28.5484469313468	91.1291	78.4897	13.7054
83.6639959647402	80.3750308609184	28.580656679852	88.6759	82.3658	11.13
83.6768430303581	80.3505164885484	28.6128714378372	91.14	83.5499	11.0268
83.6897112165916	80.3259618155094	28.6451391553729	93.9684	87.8762	13.7783
83.7026051111345	80.3013580884059	28.6774713395517	95.2026	90.5293	12.2607
83.7155201674376	80.2767139820711	28.7098565848735	92.4623	94.734	14.7003
83.7285356090534	80.2518783207846	28.7424935605806	95.504	96.351	10.2996
83.7416111485063	80.2269279807485	28.7752812336341	95.7576	96.9635	11.4638
83.7547542339563	80.2018487484532	28.8082382851737	95.0373	98.5247	13.5608
83.7679290802917	80.1767089092188	28.8412749786327	95.6122	103.8055	23.229
83.7811364721689	80.1515069628692	28.8743932916788	101.583	94.8217	23.7006
83.7943958786941	80.1262057616331	28.9076420354303	104.3693	90.8389	25.0156
83.8077027789271	80.1008139316982	28.9410098730654	100.7126	88.5952	23.1233
83.8210218574348	80.0753988616074	28.9744082485197	98.1138	89.594	19.2781
83.8343258165477	80.0500126420028	29.0077687075869	92.7178	89.1801	18.823
83.8475920568359	80.0246983958699	29.0410345837997	93.1284	88.6615	20.1351
83.8608400203748	79.9994190247696	29.0742546278476	88.6062	92.2681	23.9863
83.8740815657952	79.9741519007265	29.1074585816097	92.5654	91.5305	24.0262
83.8873452820683	79.9488424736166	29.1407181282132	93.4941	85.8189	27.3685
83.9006147309764	79.9235221073222	29.1739920517119	98.2345	80.86	27.262
83.913911083329	79.8981504055564	29.2073334354618	101.2985	78.2917	28.1682
83.9272411028738	79.8727144634713	29.240759236578	94.4072	76.9857	34.4342
83.9405772623729	79.8472668034605	29.274200437202	93.1133	78.1389	33.5399
83.9539132504122	79.8218194703072	29.3076412079841	89.95	80.2132	31.6802
83.9672404355851	79.7963889362886	29.3410599038416	89.5631	83.3752	32.5568
83.9805526203814	79.7709870293701	29.3744409828239	88.0687	81.4777	36.1559
83.9938327289434	79.7456463312571	29.4077416278818	91.0116	75.887	40.3125
84.0071017096329	79.720326866831	29.4410143706205	94.549	73.3405	36.7472
84.020327101327	79.6950905786556	29.474177807975	95.9481	74.251	38.8025
84.0334818796082	79.6699890336922	29.5071641756801	97.5653	74.5618	43.9951
84.0465712469469	79.6450123032874	29.5399865210459	97.816	74.8015	47.4482
84.0596028271555	79.6201458388127	29.5726639617635	98.567	80.2017	48.301
84.0725551240546	79.5954306604071	29.6051425928373	94.6945	78.572	44.5388
84.0854433024959	79.5708378297026	29.6374604395685	91.1677	84.1211	45.979
84.0982470531864	79.5464061009929	29.6695665773766	92.1151	81.2598	42.8198
84.1109709829457	79.5221266841671	29.7014725547686	92.6699	80.64	42.9825
84.1236381712391	79.4979555392772	29.7332362463718	94.0795	80.8773	41.7611
84.1362541015982	79.4738822027914	29.7648714024341	97.7624	79.6432	41.8331
84.1488658493832	79.4498168459771	29.7964960682036	97.0865	83.6094	41.2641
84.1614526032104	79.4257991814047	29.8280580599434	104.3617	84.8664	42.6246
84.1740318416161	79.4017958598238	29.8596012060119	103.1106	83.2736	35.5168
84.1866096086348	79.3777953478911	29.8911406588162	97.7943	87.7833	36.2243
84.1992436624946	79.3536874293595	29.9228212597841	96.2545	87.1498	32.8659
84.2119488772195	79.3294437213634	29.9546803060485	99.3434	90.9979	30.2293
84.2246731819016	79.3051635875479	29.9865872215923	98.853	91.6792	31.3431
84.2374483083579	79.2807864771011	30.0186215771378	100.5649	91.4192	35.2273
84.2503379807983	79.256190790252	30.0509431681578	101.602	92.3175	35.5214
84.2633152330494	79.2314279830225	30.0834843736376	98.8373	99.4165	35.0062
84.2763221270534	79.2066086137232	30.1160999076654	94.4828	106.1237	38.6118
84.2893369539601	79.1817741070641	30.1487353350146	98.2349	98.4363	43.0129
84.302385780852	79.1568747207629	30.1814560214441	96.8345	90.0197	42.1774
84.3154627072287	79.1319217128508	30.2142471701283	97.0347	92.0258	44.3343
84.3285325642541	79.1069821943849	30.2470205903342	96.5235	92.1962	47.4754
84.3415976627307	79.0820517583795	30.2797820755872	98.9319	91.3958	49.6094
84.3546538373224	79.0571383544343	30.3125211791765	98.3726	88.4744	52.1576
84.3677016506016	79.0322409060371	30.3452393154703	98.656	92.6213	53.0887
84.3807207486391	79.0073982515881	30.3778854463536	94.0924	96.5838	56.3482
84.393666641276	78.9826952813283	30.4103480174108	100.6204	94.7646	50.8195
84.4065329087675	78.9581442488408	30.4426109231616	103.8628	98.4843	53.5771
84.4171344974808	78.9379146789073	30.4691949184591	103.2876	94.1817	57.6589
84.2522930248455	78.1133610303884	30.5032176249839	104.5599	87.8351	55.8078
84.0711405712899	77.2072163875415	30.5406071205937	101.0606	82.9382	56.7378
83.8849273026708	76.2757553674315	30.5790413894225	96.9343	84.943	57.6208

Solution x	Solution y	Solution z	Original x	Original y	Original z
83.6924433294611	75.3129266684747	30.6187700488172	95.9325	86.7596	55.1395
83.4920297887784	74.3104334036045	30.6601353480877	94.9909	83.4209	53.4521
83.2874315843539	73.2870077396412	30.7023643840614	97.4314	81.946	52.8698
83.0778103468153	72.2384564311072	30.7456301398496	99.1261	78.6323	53.6332
82.863984303726	71.1688725397448	30.7897637063041	96.1169	76.0362	57.1147
82.6467596383059	70.082288285698	30.8345987498527	96.2521	73.5638	59.9232
82.4250840080499	68.973439883195	30.8803524526011	97.9014	66.9835	57.8832
82.2055767963671	67.8754383744042	30.9256585655204	99.4285	63.8276	59.6975
81.9917821752275	66.8060123757454	30.9697855433677	102.6402	60.9181	59.3218
81.7941550215539	65.8174593880312	31.0105753734257	103.9916	60.6173	50.4601
81.5999804195646	64.8461774507945	31.0506524579678	100.6854	61.817	51.0639
81.4083884867127	63.8878149734849	31.0901963889952	96.4356	62.0951	55.4366
81.219177440598	62.9413620851589	31.1292488923441	95.1558	61.2395	57.4763
81.0323802360273	62.0069836859696	31.1678031563923	94.6788	63.8911	59.4837
80.8456755855995	61.0730688745687	31.2063382274944	85.8477	60.7859	54.7762
80.6609017319876	60.1488114078137	31.244474885628	86.2321	62.729	51.1705
80.4772488276072	59.2301606672091	31.2823802332864	90.2672	64.2791	51.3539
80.2938198137888	58.3126301244278	31.3202393297913	94.6583	60.3511	50.0221
80.1118064368624	57.402181178109	31.3578061803172	94.8477	58.3247	47.7413
79.9315453597085	56.5004976194122	31.3950113327263	89.2688	56.3248	44.4917
79.7522310227339	55.6035488031159	31.4320212163328	95.0304	53.2116	46.2852
79.5748099039833	54.7160694020709	31.4686404407892	97.9579	54.2407	46.7851
79.3989635382721	53.8364668574713	31.5049346728852	97.7133	51.9341	48.5236
79.2251427938172	52.9669957862126	31.5408109489664	99.5817	52.1789	51.8005
79.0527610609977	52.1047219986795	31.5763903272564	99.0651	51.1078	59.3413
78.8809641665874	51.2453726191243	31.6118491371582	92.1982	53.9806	59.5699
78.7086052063282	50.3832111536422	31.647424034134	91.1842	48.1207	54.4953
78.5388831133918	49.5342400804532	31.6824546125817	90.1236	40.724	54.2833
78.3753981283464	48.7164688860225	31.7161976964576	85.065	35.2948	58.2863
78.2236227556959	47.9572714132084	31.7475238152305	91.0332	34.8187	52.6374
78.0796986429821	47.2373490584621	31.7772291315737	92.4351	33.0022	54.3205
77.9455320712508	46.5662366596017	31.8049202784377	96.2582	32.5713	56.693
77.8343007816846	46.0098510158552	31.82787735588	100.5275	34.9543	58.1047
77.834049365613	46.0085932820703	31.8279292748088	95.1298	37.6897	58.9361
77.8337986490927	46.0073390507964	31.82798104872	94.5355	44.3621	59.1041
77.8335488253599	46.0060892866696	31.8280326378833	94.5838	45.9916	57.9488
77.8332993183747	46.0048411061217	31.8280841627308	96.2485	47.1277	52.4491
77.8330500768743	46.003594249653	31.8281356323394	98.0763	43.3554	53.563
77.8327998348662	46.0023423854552	31.828187310348	101.161	45.7653	49.9947
77.8325489086789	46.0010870943676	31.8282391301263	100.8862	48.4618	50.2894
77.8322970343898	45.9998270573982	31.8282911464835	102.9297	48.0592	51.9744
77.832043775086	45.9985600914837	31.8283434505028	105.6501	47.8555	48.2801
77.8317894502132	45.9972877957202	31.8283959760445	106.6231	51.946	40.2003
77.8315349775446	45.9960147603906	31.8284485300241	100.5945	52.9653	41.549
77.8312803823194	45.9947411152104	31.8285011099539	97.7455	51.8526	39.6885
77.8310261459801	45.9934692699168	31.8285536143457	98.1036	50.8139	41.2796
77.8307722761555	45.992199260569	31.828606042424	98.9198	48.0008	44.9228
77.830518426975	45.9909293540281	31.828658467033	93.3823	48.5086	44.2946
77.8302649556246	45.9896613369558	31.8287108133688	91.9732	45.8332	46.1527
77.8300116281266	45.9883940372872	31.828763131153	90.0385	42.8005	44.3862
77.8297583485823	45.9871269735718	31.8288154399609	90.4784	41.2284	44.1276
77.8295050320102	45.9858597174559	31.8288677574117	86.5983	36.2039	44.7429
77.829251508995	45.984591425268	31.8289201194442	88.2545	36.066	42.1212
77.8289977320625	45.9833218583486	31.8289725347664	91.8795	37.1845	41.8015
77.8287438011153	45.9820515162917	31.8290249829917	90.014	39.915	40.6629
77.8284897563277	45.9807806031706	31.8290774555424	92.2396	41.0703	39.2658
77.828235613557	45.979509199598	31.8291299472332	93.2846	41.9379	42.3812
77.827981206248	45.9782364736107	31.8291824936766	96.2085	41.8253	45.162
77.8277263745022	45.9769616246924	31.8292351288873	96.5473	37.5774	41.1201
77.8274711003759	45.975684562997	31.8292878541058	98.5859	34.5756	44.3792
77.8272152863037	45.9744048000903	31.8293406922805	95.0864	33.2234	41.4865
77.8269590910444	45.9731231295231	31.8293936098977	98.5493	33.1624	37.7737
77.8267029568102	45.9718417615084	31.8294465153089	95.8908	32.6754	36.0409
77.8264468100087	45.9705603285818	31.8294994243311	92.7124	33.4453	33.5856
77.8261904959059	45.9692780579312	31.8295523683646	96.6051	36.0943	31.9245
77.8259341808509	45.9679957812439	31.8296053129975	97.0063	39.6578	31.3742
77.8256780392712	45.9667143711736	31.8296582218765	96.8865	41.9997	31.9305
77.8254221998967	45.965434472418	31.8297110694954	98.4033	39.6451	29.8224
77.8251666317799	45.9641559301953	31.8297638614567	98.7317	39.6579	27.3708
77.8249117106387	45.9628806243145	31.8298165200318	96.2133	40.5576	25.5914
77.8246574041665	45.9616083934945	31.8298690507112	93.9129	43.6355	26.629
77.8244035938719	45.9603386461349	31.8299214796264	95.0864	47.4256	26.3676
77.8241503311768	45.9590716394072	31.8299737946957	96.0562	52.3857	26.7058
77.8238975874326	45.9578072314196	31.8300260022421	98.7715	55.3698	27.9452
77.8236450771837	45.956543994513	31.8300781599086	99.9754	58.6633	29.714
77.8233927631876	45.9552817439594	31.8301302777582	101.778	67.1686	27.7348
77.8231415006818	45.954024756927	31.8301821739644	98.4228	65.0226	33.0945
77.8228907349809	45.9527702587515	31.8302339681061	95.479	61.1306	33.7151
77.8226403041715	45.9515174399236	31.8302856917379	94.4551	58.0456	35.6169
77.8223902470361	45.9502664940377	31.8303373370543	99.7259	57.0659	38.9488

Solution x	Solution y	Solution z	Original x	Original y	Original z
77.822140426686	45.9490167328102	31.8303889336788	99.0429	61.6589	39.3422
77.8218909174571	45.947768527146	31.8304404654076	95.4724	61.7777	41.2303
77.8216414244299	45.9465204058274	31.8304919926604	93.9444	64.9	44.2206
77.8213920853489	45.9452730605197	31.8305434881565	102.9023	68.4164	43.143
77.8211425238057	45.9440246015095	31.830595027721	99.3413	60.508	43.9191
77.8208925495402	45.9427740805976	31.8306466523904	95.4289	57.3916	42.7453
77.820642036603	45.9415208687921	31.8306983876633	92.9131	56.6287	40.2251
77.8203909389227	45.9402647324621	31.8307502432915	93.3932	53.1876	39.0419
77.8201389635728	45.9390042023111	31.83080228073	90.3356	51.1932	37.7625
77.8198862103634	45.9377397766069	31.8308544789042	85.9154	51.5363	38.6114
77.8196328440866	45.9364722804554	31.8309068046228	89.352	47.1855	40.3099
77.8193786662956	45.9352007209519	31.8309592993583	90.4865	46.0315	39.3528
77.8191238460993	45.9339259448384	31.8310119277596	94.3452	48.7818	37.6589
77.818869001904	45.9326510449681	31.831064560989	95.1396	47.3596	38.3213
77.8186142481341	45.9313765960629	31.8311171753065	94.4684	44.7163	40.2539
77.8183590900511	45.9301001255348	31.8311698741541	97.5519	44.8528	38.2336
77.8181039115297	45.9288235534699	31.8312225765818	100.0845	45.3198	38.3951
77.8178490840488	45.9275487379183	31.8312752061932	103.3956	43.6231	38.3961
77.8175947305517	45.9262762941573	31.8313277381144	103.8959	45.4099	37.4639
77.8173411537799	45.9250077361139	31.8313801095969	103.0838	43.6629	35.7673
77.817087898817	45.9237407885088	31.8314324143536	99.7789	45.6905	34.3678
77.8168346532852	45.9224738895719	31.8314847187003	101.7941	49.0832	29.2585
77.8165818405507	45.9212091559205	31.8315369343099	100.6036	46.802	22.0951
77.8163289294027	45.9199439310759	31.8315891692548	101.377	48.1816	18.5975
77.8160757122221	45.9186771770633	31.8316414655264	102.8738	56.4102	20.1678
77.8158221069548	45.9174084826944	31.8316938435949	102.1595	55.9791	16.6639
77.8155678790346	45.9161366754602	31.8317463515581	97.3108	57.82	10.7791
77.8153132020321	45.9148626245299	31.8317989491498	98.9521	56.5952	10.596
77.815057786086	45.9135848800276	31.8318517005427	98.2152	53.7701	7.2972
77.8148017206584	45.9123038899096	31.8319045848883	100.6388	53.8259	6.8403
77.8145451822822	45.9110205358321	31.8319575665632	100.3439	52.2486	6.1962
77.814288347059	45.9097356993526	31.8320106058134	99.5987	51.3246	10.6347
77.8140313574375	45.9084500950074	31.8320636811566	103.8062	50.1176	9.3383
77.813774448421	45.9071648968667	31.8321167385725	106.4442	49.0895	9.9061
77.8135172676489	45.905878340708	31.8321698504385	104.1102	44.8822	12.643
77.8132600729373	45.9045917187321	31.8322229663593	102.543	45.6081	13.7083
77.8130028891977	45.9033051543184	31.8322760820629	102.0152	42.2262	11.91
77.8127454983174	45.9020175540773	31.8323292376557	98.0879	44.5657	15.6818
77.8124879312698	45.9007290713575	31.8323824342897	97.0806	39.3994	12.7921
77.8122299895485	45.899438713047	31.8324357061689	94.1971	38.0204	14.8005
77.8119717318509	45.8981467738819	31.832489043492	94.3087	39.6383	18.4042
77.8117129450628	45.8968521854967	31.8325424930212	92.8093	39.7693	16.6418
77.8114538091203	45.8955558484497	31.8325960147163	89.0134	41.3658	15.8043
77.8111946430047	45.8942593597787	31.8326495433338	89.3668	41.343	14.5671
77.8109352686887	45.8929618277627	31.8327031154942	89.1249	38.0318	13.3915
77.8106755463488	45.891662553237	31.8327567599998	85.525	32.0217	10.845
77.8104157789983	45.8903630565946	31.8328104161164	86.512	33.4131	7.017
77.8101559166217	45.8890630844648	31.8328640941044	87.5726	32.8781	1.3636
77.8098956826482	45.8877612515862	31.8329178450276	85.1876	33.113	2.1197
77.8096350560151	45.8864574508212	31.8329716762521	79.7169	32.9378	5.3155
77.8093744571245	45.8851537850603	31.8330255041029	73.7989	28.6287	7.3132
77.8091136810891	45.883849230422	31.8330793714389	71.5231	31.8286	8.0149
77.8088529560939	45.8825449270083	31.8331332296054	72.2401	34.2889	7.5435
77.8085923305453	45.8812411178049	31.8331870679771	75.4748	37.8532	8.3059
77.8083322677692	45.8799401213953	31.833240790443	75.9022	40.5634	8.2476
77.8080728986883	45.8786425943042	31.8332943663654	77.5882	39.4219	14.211
77.8078134040437	45.8773444387233	31.8333479713366	73.2283	44.0709	14.6285
77.8075534902589	45.8760441852884	31.8334016620188	73.2561	47.9132	17.0605
77.8072931262618	45.8747416778305	31.8334554488037	71.8327	48.0379	13.6369
77.8070321237217	45.8734359743276	31.8335093664365	70.7664	48.6137	12.8047
77.8067704961678	45.8721271426659	31.8335634117829	72.0723	49.2863	13.9841
77.8065083058037	45.8708154948151	31.8336175742061	71.8965	50.0142	14.8598
77.8062455963999	45.869501249191	31.8336718451378	76.5498	52.218	12.9878
77.805982739223	45.868186261171	31.8337261482088	72.1444	51.2772	8.2689
77.805719956257	45.866871642583	31.8337804332801	71.0505	50.768	8.8572
77.8054572548938	45.865557430156	31.8338347040441	70.6462	49.6735	6.8503
77.80519477801	45.8642443381022	31.8338889292208	68.7356	47.889	4.3235
77.8049323199909	45.8629313394201	31.8339431511988	67.8488	53.6384	2.957
77.8046703153221	45.8616206069192	31.8339972768611	70.916	53.3608	4.8842
77.8044085438013	45.8603110397069	31.834051355806	72.7757	56.7077	5.4576
77.8041471202576	45.859003212321	31.8341053617304	70.5527	57.3223	8.5137
77.8038858470137	45.8576961357585	31.8341593354707	69.9782	57.1009	12.9468
77.8036246601409	45.856389490084	31.8342132927784	68.022	53.7678	15.3935
77.8033633300994	45.8550821272597	31.8342672773062	61.2083	54.3519	23.523
77.8031016624627	45.8537730768836	31.8343213353016	66.0257	55.1875	22.0287
77.8028396118561	45.8524621091333	31.8343754724635	70.1344	58.5671	20.707
77.8025773550208	45.8511501051757	31.8344296504091	70.694	53.8562	23.1583
77.8023145602631	45.8498354084768	31.8344839415413	71.2619	53.5794	21.4252
77.8020512962094	45.8485183622188	31.8345383284579	75.5201	48.6107	22.753
77.8017874919117	45.8471986116224	31.8345928269372	75.5587	49.1352	25.3998

Solution x	Solution y	Solution z	Original x	Original y	Original z
77.8015234245342	45.8458775430679	31.8346473798576	76.379	48.6237	27.9163
77.8012592112575	45.8445557433203	31.8347019630404	76.0043	50.5809	30.4596
77.8009950571746	45.8432342390081	31.8347565349423	73.8072	55.2741	29.1095
77.8007311899187	45.8419141690888	31.8348110468316	73.2116	57.797	29.252
77.800467916042	45.8405970671474	31.8348654356356	81.1686	57.7423	31.0101
77.8002068702338	45.8392911095608	31.8349193649339	80.7698	50.729	27.0276
77.7999465386516	45.837988724161	31.8349731469156	80.3964	49.7264	23.6683
77.7996860237452	45.8366854213519	31.835026965931	83.5076	51.7826	22.7284
77.7994254720461	45.8353819342074	31.8350807916156	87.1149	58.1702	24.9275
77.7991654407404	45.834081050363	31.8351345094922	88.0225	60.7529	26.1198
77.7989050604234	45.8327784221249	31.8351882993266	92.749	64.7326	27.0986
77.7986442756589	45.8314737740851	31.8352421726518	88.7937	67.447	23.6857
77.7983821308546	45.8301623263614	31.8352963270568	92.0851	66.8651	17.5763
77.7981191713442	45.8288468084529	31.8353506477288	93.0933	68.7697	14.1811
77.7978559909645	45.8275301909305	31.8354050090527	93.5538	62.1822	15.7085
77.7975926394692	45.826212724847	31.8354594035846	94.5987	62.0376	18.5629
77.7973296053451	45.8248968538195	31.8355137305207	94.6877	57.1733	21.1304
77.7970672257381	45.8235842653952	31.8355679244181	92.8209	56.9207	15.4027
77.7968061263457	45.8222780870142	31.8356218505782	92.412	50.9961	13.3675
77.7965463594698	45.8209785806321	31.8356755025072	94.5726	47.3613	8.9492
77.7962875413751	45.8196838203887	31.8357289555323	89.5287	45.4109	8.5583
77.7960294826853	45.8183928588627	31.8357822513162	85.9182	41.843	9.5066
77.795771883359	45.8171041958225	31.8358354527253	80.8076	41.6004	10.0065
77.7955145003579	45.8158166151921	31.8358886110812	80.8872	43.1227	9.5119
77.7952566691434	45.8145267862711	31.8359418619885	77.8794	45.0468	10.8339
77.794998294403	45.8132342327537	31.8359952293451	73.6428	45.1426	7.6389
77.7947392925728	45.8119385394571	31.8360487256397	72.9198	44.5581	6.5665
77.7944791059845	45.8106369176839	31.8361024685594	73.5268	49.2611	4.4383
77.7942179313238	45.8093303508195	31.8361564145624	73.6611	50.4924	3.9757
77.7939557353206	45.8080186735199	31.8362105723454	73.911	51.0144	2.5794
77.7936927391821	45.8067029926414	31.8362648961185	75.2757	50.6388	0.889
77.7934296574606	45.8053868820422	31.8363192353101	73.6395	46.5004	2.2066
77.7931662144625	45.8040689634335	31.8363736531688	75.73	42.7229	0.0066
77.7929023914841	45.8027491424549	31.8364281482062	79.9479	46.2913	1.0177
77.792640006471	45.8014365106942	31.8364823435337	77.6289	48.4559	5.3003
77.7923784812695	45.8001281776041	31.8365363652571	76.2244	51.9684	6.7104
77.7921169287021	45.7988197053066	31.8365903954841	82.0477	53.0979	5.7932
77.7918554592202	45.7975116448435	31.8366444042636	84.6532	51.7406	11.3965
77.791592158778	45.7961944223179	31.8366987996502	89.6611	52.1615	6.6683
77.7913266460188	45.7948661304032	31.8367536510018	93.2379	56.4517	4.9219
77.7910593026209	45.7935286801263	31.8368088792146	95.9041	59.3009	4.8034
77.7907903757419	45.7921833103895	31.836864435033	98.8606	57.9963	4.7298
77.7058933389607	45.3675112114985	31.8543877596534	96.8097	54.0588	2.5941
77.5953845334158	44.8147202451406	31.8771979802315	98.2004	50.3921	3.9008
77.4771066404494	44.2230683570474	31.9016115948886	95.7654	46.8722	1.8076
77.3532466375992	43.6034964612908	31.9271770418329	96.6284	43.246	1.131
77.3315414194778	43.4949525257276	31.9316536127114	95.8598	39.2349	3.852
77.2205359732134	42.9396879181026	31.954565243849	92.634	40.1716	1.8791
76.796928926033	40.8213585485421	32.0419146000628	91.1655	36.0648	5.0962
76.5933482301341	39.8030077183307	32.0839349907518	96.3928	32.1668	2.4627
76.3287755427869	38.8618252117529	32.2300225540953	93.4265	31.4744	1.0443
76.228043335926	38.5034596736388	32.2856506140747	90.6179	26.4649	2.7134
75.844279720866	37.1382563193348	32.4975558539549	97.1071	18.8552	9.2302
75.8442796411836	37.1382561792879	32.4975559159615	97.9141	29.0493	9.3885
75.8442795615073	37.1382560392596	32.4975559764679	99.272	31.5703	11.7517
75.8442794818608	37.1382558992807	32.4975560361857	96.0238	29.4057	14.5945
75.8442794021947	37.1382557592773	32.4975560957875	96.156	30.1327	19.1399
75.8442793225519	37.1382556193407	32.497556157056	90.72	30.049	19.1921
75.8442792429654	37.1382554794678	32.4975562161388	90.6435	28.0536	25.8632
75.844279163464	37.138255339744	32.4975562796802	92.5592	25.4331	20.672
75.8442790840446	37.1382552001351	32.4975563416407	97.0499	25.7334	20.6225
75.8442790047397	37.1382550607136	32.4975564009492	98.3241	22.4412	26.657
75.8442789254404	37.1382549213601	32.497556461023	104.9423	23.521	33.0938
75.8442788461699	37.1382547821651	32.4975565242089	105.6149	29.5786	27.9356
75.8442787668422	37.1382546429821	32.4975565851523	108.656	34.8419	30.8419
75.8442786874958	37.1382545038505	32.4975566436159	107.8221	37.3636	42.4217
75.8442786080941	37.1382543647728	32.4975567043331	106.1692	29.0085	43.7624
75.8442785285599	37.1382542256305	32.4975567650084	105.5782	30.6326	47.1426
75.8442784489461	37.1382540865146	32.4975568259654	106.6895	31.0233	49.137
75.844278369316	37.138253947444	32.4975568866717	104.0844	32.9988	51.1923
75.844278289685	37.1382538084831	32.4975569472123	101.1976	33.4905	53.5496
75.8442782100849	37.1382536696708	32.4975570077967	102.211	28.3893	55.4005
75.8442781305336	37.1382535310322	32.4975570684536	101.7295	28.4449	56.1482
75.8442780510549	37.1382533925895	32.4975571290364	98.3827	22.3334	54.4737
75.8442779716323	37.1382532543942	32.4975571895326	99.0428	19.6959	54.528
75.8442778767022	37.1382531926696	32.4975571928427	100.384	25.6874	43.9589
75.8442777817888	37.1382531310056	32.4975571951918	101.5683	27.6266	39.8262
75.8442776869479	37.1382530694108	32.497557196904	97.1838	29.5842	37.1942
75.8442775921447	37.1382530078519	32.4975571975612	92.942	26.4511	38.6789
75.8442774972906	37.1382529462868	32.4975572005772	93.6487	25.1273	31.9089

Solution x	Solution y	Solution z	Original x	Original y	Original z
75.8442774024458	37.138252884726	32.4975572019819	93.9312	28.9768	31.8553
75.8442773075864	37.1382528231793	32.4975572031475	97.3283	27.0933	33.194
75.8442772127709	37.1382527616511	32.4975572054374	97.5011	28.0267	29.587
75.8442771178927	37.1382527001129	32.4975572072428	97.4429	30.1528	28.42
75.8442770229874	37.1382526385539	32.4975572089692	98.9301	33.2654	27.8083
75.8442769280824	37.1382525770059	32.497557211291	99.0228	31.9463	24.4512
75.8442768331069	37.1382525154407	32.4975572127468	100.6297	27.3107	24.1251
75.8442767380939	37.1382524538733	32.4975572157575	102.4997	24.4075	19.7902
75.844276643005	37.1382523923031	32.4975572170637	102.9016	24.8202	19.8795
75.8442765478088	37.1382523307263	32.4975572199394	105.0575	26.2706	17.0665
75.8442764525176	37.1382522691417	32.4975572228364	106.8535	30.7643	14.4546
75.7344202425115	37.0718344814061	32.5024232469703	102.9211	31.879	13.8489
75.6209321868805	37.0032209219689	32.5074501384615	103.4615	37.3033	20.8908
75.5053861527189	36.9333631325105	32.5125681892902	99.6903	41.4772	23.4888
75.3884005651118	36.8626350046695	32.5177500070169	98.3613	42.0392	20.5386
75.2695399759482	36.790773270099	32.5230148754219	95.46	44.379	21.4845
75.1490297515635	36.7179141816025	32.5283528146621	93.0102	50.1223	20.798
75.027431892179	36.644397518915	32.5337389302982	91.9756	47.4725	20.0446
74.9048259117948	36.5702713551286	32.5391696990607	89.3464	46.1786	22.3858
74.7815279309239	36.4957268131944	32.5446311198103	87.8413	47.1867	25.6907
74.6580647325256	36.4210823821211	32.5500998598366	87.5129	47.9594	27.6836
74.5348135744015	36.3465661500159	32.5555592098841	87.5583	39.2312	23.679
74.411070675463	36.2717526166121	32.5610403407596	91.9372	36.8319	23.3371
74.2869516744918	36.1967116967262	32.5665381299955	93.6083	38.4774	26.0941
74.1624792410722	36.1214570968247	32.572051574655	93.6941	39.0671	28.969
74.0374097245204	36.0458415075942	32.5775914679686	92.1801	41.0349	29.4683
73.9116761415692	35.9698244314278	32.5831607750021	88.4465	41.4478	32.5802
73.7853495062357	35.8934488015026	32.5887563520928	87.2346	40.5435	32.6709
73.6586171551114	35.8168278798275	32.5943698988409	81.9079	40.1742	36.8216
73.5316437187409	35.740061199612	32.5999941275397	77.9223	44.6051	30.7678
73.4052288308946	35.6636322132909	32.6055936151894	74.5598	39.2546	26.0148
73.2792544749136	35.5874695680355	32.6111735884863	70.4096	46.4113	26.9931
73.1548753485426	35.5122713839156	32.6166829019986	64.4232	44.0581	27.3148
73.0314987703871	35.4376793297909	32.6221478071465	65.3289	43.5846	33.8262
72.9089314467238	35.3635765425009	32.6275768702625	67.6648	48.1141	30.5928
72.7878468337203	35.2903701867983	32.6329402575233	67.5609	49.631	28.0783
72.6680527984691	35.2179440998477	32.6382464778988	67.7991	50.1342	31.512
72.5491119568463	35.1460338430881	32.6435149070299	66.949	50.6855	34.7495
72.4304653420716	35.0743014707895	32.6487703050313	70.0624	50.1219	34.6274
72.3121071219653	35.002743456903	32.654012929804	70.8564	51.5507	32.2844
72.1939241598203	34.9312914003646	32.6592477906798	70.2011	52.705	34.7749
72.0755632008193	34.8597317267513	32.6644905371668	68.2826	55.0673	33.7791
71.9566824679274	34.7878578006714	32.6697563059612	67.4683	58.2291	37.5546
71.8372178478321	34.7156308597803	32.6750479377648	68.5789	56.8701	42.2821
71.7171092910947	34.6430145985289	32.6803680937248	69.8977	54.8286	42.1718
71.5965542190255	34.570128376189	32.6857080284539	69.1565	53.343	39.551
71.4757153023954	34.4970705424404	32.691060535801	69.1689	51.2673	37.9561
71.3547473174418	34.423934674283	32.6964187601742	70.6191	48.182	36.9413
71.2338210001719	34.3508239979326	32.7017751386816	72.0385	47.603	37.589
71.1131910739327	34.2778925184531	32.707118389071	72.4429	44.8985	35.9587
70.9928409616524	34.2051302135362	32.7124492435863	72.9378	43.4347	40.5471
70.8729279641916	34.1326321860924	32.7177607370779	72.4926	42.7909	40.5929
70.7533988073561	34.0603662266095	32.7230552274169	70.5497	45.0925	44.08
70.633983759526	33.9881692578599	32.7283446630607	72.7013	43.6681	47.6828
70.514304953838	33.9158128247746	32.7336457829135	75.9853	41.4015	43.6031
70.3937958898312	33.8429544259006	32.7389836782618	77.9078	47.2474	41.2613
70.2727571637374	33.7697757989699	32.7443450336733	79.533	47.2684	42.1428
70.15076362919	33.6960199040931	32.7497486818353	80.0004	48.0282	43.1849
70.027691040802	33.6216116234755	32.7552001264721	78.2967	50.1808	43.2865
69.9037675474734	33.5466888936074	32.7606892614277	74.8417	48.5823	43.578
69.7787110291909	33.4710811461774	32.766228582886	76.4125	46.981	46.4216
69.6529785300262	33.3950647058374	32.7717978460772	77.4079	49.147	51.5989
69.5272377401676	33.3190432532858	32.7773674767533	74.4488	50.3129	52.3971
69.4014889820301	33.2430169834086	32.7829374597084	73.2401	49.0047	54.3428
69.2755464033492	33.1668735315663	32.7885160286043	72.0955	52.6394	50.8408
69.1497778449645	33.0908352918493	32.7940868891932	70.1179	52.2878	46.5219
69.0234758390873	33.0144745352582	32.7996813782667	73.7963	57.8273	45.2128
68.8968850528739	32.937939187603	32.8052886573521	74.3979	53.0985	48.6112
68.7686849841142	32.8604308838227	32.8109672196195	78.0993	54.3894	50.2798
68.6381307270171	32.781499261565	32.8167500591713	77.8264	55.5164	53.7679
68.503634787439	32.7001845380128	32.8227074941145	77.9705	58.8491	56.0075
68.2610107398937	32.5534967345476	32.8334544222622	73.3859	52.8201	55.9097
68.009171494559	32.4012375031238	32.8446095327195	72.0304	52.5053	58.0692
67.7475783532748	32.2430811517337	32.8561966873985	69.2681	55.3133	57.276
67.4743381041276	32.077883071265	32.8682997447584	69.4154	51.8752	55.6067
67.1966662335328	31.9100056738622	32.8805990971665	66.2863	51.2705	54.2569
66.9166433893078	31.7407069002457	32.8930025831123	67.4955	46.0347	52.8305
66.6374626734987	31.5719172762477	32.9053687646814	65.7303	47.3671	58.4265
66.3588225720178	31.4034545215282	32.9177110014455	62.0243	36.102	59.234
66.0841094188777	31.2373659656612	32.929879297517	60.137	35.2014	51.7925

Solution x	Solution y	Solution z	Original x	Original y	Original z
65.8144104448396	31.0743089445474	32.9418254920715	61.1452	36.2851	50.8184
65.5495524669513	30.914178756078	32.9535572586761	60.8351	33.4935	47.8851
65.2882005260722	30.756168285199	32.9651337272769	64.2784	38.8059	47.0778
65.0299535357702	30.6000350329311	32.9765726632951	64.8516	39.5774	48.8657
64.7726868834367	30.4444944696535	32.9879681758191	66.7168	38.698	48.2341
64.5151532328623	30.2887924665137	32.9993755148993	65.211	38.9167	43.4098
64.2572024697388	30.1328382703171	33.0108013281421	63.453	34.6286	41.047
63.9981434489121	29.9762140237323	33.0222762307219	65.4552	32.6167	36.7679
63.739290252412	29.8197142152822	33.0337420151436	63.8645	34.3723	36.4179
63.4805511074379	29.6632833608002	33.0452027486897	60.9493	37.7343	34.646
63.2216768217016	29.5067708000581	33.0566694688056	62.464	33.4003	33.7046
62.9626435356812	29.3501621070844	33.0681432325831	63.5739	32.9982	33.2424
62.7031989371007	29.1933047346058	33.0796352165346	64.1748	30.2745	31.4674
62.4429000475533	29.0359308580829	33.0911650415712	69.5886	28.6002	31.4169
62.182751143468	28.8786476561238	33.1026882242859	67.5765	27.7962	32.158
61.9231644343757	28.7217043456597	33.1141865064199	63.132	27.7543	33.1939
61.6647077751181	28.5654442447569	33.1256347351747	63.8119	26.0212	34.0563
61.4091672096154	28.4109471834547	33.1369537973955	62.9268	27.0211	37.7555
61.1581059268231	28.2591582552296	33.1480744537383	60.1802	30.671	38.4138
60.9110056179484	28.1097640962095	33.1590196600414	59.5552	26.5288	41.5263
60.6654898642652	27.9613279427504	33.1698946797749	61.643	23.6955	42.1255
60.4191221404062	27.8123766906599	33.1808074359705	68.3676	27.331	45.292
60.1714286717377	27.6626239047078	33.1917789131978	67.8857	28.9512	53.8343
59.9201846673953	27.5107244992907	33.2029076613113	70.5469	25.0661	53.9959
59.665420145438	27.356696622012	33.2141923475976	63.3795	20.1125	53.5518
59.4088778445144	27.2015939092871	33.2255557789718	58.9981	26.6128	49.6223
59.1537791514872	27.0473639917411	33.2368552640341	55.1607	27.7715	51.8295
58.9011864998314	26.8946492098707	33.248043745874	52.7074	28.2489	52.4902
58.6507627400202	26.7432457252109	33.2591361587744	53.8796	31.7093	51.2249
58.4024177368539	26.5930990450789	33.2701364932492	54.7376	29.7596	56.3053
58.1552020011091	26.4436351126187	33.2810868083976	56.8778	27.618	56.4108
57.9089215472189	26.2947366437634	33.2919956950345	55.089	27.0379	56.5554
57.6638037638281	26.1465411151641	33.3028530801179	54.2786	24.4277	59.9569
57.4203397983404	25.9993454702914	33.3136372105701	50.8742	24.2729	53.2264
57.1791448337813	25.8535216452756	33.3243208337738	50.1386	26.6573	56.0437
56.9407427123875	25.7093863515053	33.334880748599	47.4152	28.2569	57.2588
56.705148770139	25.5669488577934	33.3453162762537	47.4903	33.2139	54.5514
56.4724186408337	25.4262428006512	33.3556249522083	44.6028	29.9319	49.9927
56.2423478990289	25.2871445821975	33.3658158305996	47.3356	31.1656	48.6863
56.0142627033294	25.1492468064161	33.3759187599207	48.493	25.186	47.2334
55.7875499319269	25.0121787830364	33.385960898894	49.1449	22.3659	43.2644
55.5616287914617	24.8755893690853	33.3959679726631	52.1655	19.1446	41.5432
55.3363169921208	24.7393683549518	33.4059480564977	51.9742	12.9315	39.5168
55.1121758422389	24.6038551009058	33.4158762871713	51.32	11.9016	40.4537
54.8899308879058	24.469488266871	33.4257205281763	48.9393	11.7496	40.9103
54.6708622924284	24.3370418272236	33.4354240756731	48.2378	10.888	40.0435
54.4562431829127	24.207285502147	33.444930536671	47.5448	13.9665	39.1563
54.2466049651609	24.0805405749088	33.454216371053	46.213	15.3079	43.6977
54.0418046974673	23.9567206221775	33.4632879112851	47.2642	16.1804	48.1934
53.8412929347642	23.8354934549835	33.4721694949263	47.6091	10.2274	48.878
53.6427397298812	23.7154504101732	33.4809643255994	53.965	12.2967	46.7771
53.4454044129047	23.5961436907067	33.4897052086176	58.6318	9.4344	53.4701
53.2487553583496	23.4772518815039	33.498415694596	51.2901	7.6487	52.6277
53.0513509184497	23.3579033740227	33.5071596388657	50.5069	12.3029	52.6774
52.8537218438028	23.2384190562498	33.5159135314294	53.7123	16.59	54.3027
52.6570006827496	23.1194836587946	33.5246272060408	52.0827	15.9727	59.9151
52.4619062145221	23.0015317485033	33.5332688263933	45.9074	18.6439	58.1761
52.2695414436464	22.8852301921174	33.5417895360886	39.7266	17.3977	50.5452
52.0804908941998	22.7709323852334	33.5501634442416	40.2323	12.6508	42.5989
51.8942813073678	22.6583521985387	33.5584115138659	43.7175	13.3612	37.2361
51.7093637623992	22.5465531703387	33.5666023539941	44.7075	13.3055	33.9605
51.5240769320181	22.4345308770033	33.5748095535109	49.0558	10.279	28.6803
51.3385018195365	22.3223342916351	33.5830295228855	46.0043	6.8606	27.4465
51.1527396167782	22.2100245924007	33.5912577816151	45.0418	3.8658	25.2247
50.9678336620725	22.0982325721321	33.5994481129469	44.0031	6.0986	31.1209
50.7848661623216	21.9876125226234	33.6075525834218	43.7681	7.8375	35.3656
50.6046401309232	21.8786499359172	33.6155356230211	46.3909	8.819	37.7186
50.4269177023106	21.7712010002725	33.6234077667649	50.2911	5.2466	39.9878
50.2505330316062	21.6645608573071	33.6312206559502	53.4617	5.8056	38.0578
50.0740333876182	21.5578512014919	33.6390386381306	54.3108	6.5803	34.1725
49.8961164575005	21.4502846679073	33.6469193962959	55.3647	9.0137	38.8085
49.716910043391	21.3419385229151	33.6548572717702	55.5508	6.709	40.6861
49.5369416872757	21.2331317113288	33.6628288965686	55.7669	1.6852	42.4618
49.3574489802894	21.1246124660168	33.6707794526295	55.5686	2.3786	41.1094
49.1795775512109	21.0170734244883	33.6786581945445	52.8937	1.339	38.4463
49.0044339078149	20.9111835708193	33.6864161096075	53.412	-4.2453	38.3008
48.8329618876273	20.807513539363	33.6940113926467	53.289	-9.6645	34.2743
48.6663444661135	20.7067785433903	33.7013916432074	50.0191	-2.6033	31.7826
48.5024135838648	20.6076677989926	33.7086528952673	53.5826	-3.7128	29.3577
48.3403417027291	20.5096809863731	33.7158318050661	57.7878	-4.3732	24.6962

Solution x	Solution y	Solution z	Original x	Original y	Original z
48.1799051948834	20.4126829041719	33.7229382775679	53.8048	-5.0553	19.1679
48.0206923430786	20.3164246306257	33.7299905473712	51.7765	0.7553	20.0441
47.8612986003298	20.2200569928414	33.7370508312671	56.047	-0.6998	19.4659
47.7015626933094	20.1234824872987	33.7441262738756	58.3955	-2.2935	14.9348
47.541210099879	20.0265351393443	33.7512290332984	61.9524	-0.333	11.9086
47.3795668329294	19.9288074638479	33.7583889594307	63.0749	1.8033	17.7213
47.2168311870624	19.8304193481663	33.7655972732085	57.7618	2.6586	23.6599
47.0525115462961	19.7310735646394	33.7728757520759	60.2628	6.0605	25.9406
46.8872766829955	19.6311744480515	33.7801947709425	60.5785	6.8128	27.9807
46.7213657959732	19.5308666168101	33.787543734248	58.0726	3.0503	30.5544
46.5546494860401	19.4300718367058	33.7949283758426	62.7821	-0.0838	27.7653
46.3869387197674	19.3286758210354	33.8023570642593	59.6709	-1.5476	33.1451
46.218001420955	19.2265382571431	33.80984008287	61.565	4.5717	36.954
46.0479939593353	19.1237536857808	33.8173705046765	63.4243	4.3429	39.6925
45.8766753858079	19.0201764305278	33.8249590026656	62.5325	1.766	39.3982
45.7036591076787	18.9155727608982	33.8326226989079	60.4167	1.4088	44.4464
45.5298599559451	18.8104957739908	33.8403210729791	57.3839	0.9502	46.0215
45.3556517323268	18.705171466365	33.8480375665828	54.6465	1.327	47.163
45.1809727350029	18.5995625329926	33.8557749120669	54.7597	1.1902	50.9644
45.0057758133746	18.4936404643395	33.8635351988201	56.6229	3.2945	52.4352
44.8297285994088	18.3872043112187	33.8713331485132	58.2987	1.8222	52.9601
44.6525702784576	18.2800963833971	33.8791803135828	60.4719	1.0667	55.1539
44.47393829881	18.1720974850445	33.8870927532584	56.514	2.6652	55.8183
44.2953426559698	18.0641205478642	33.8950035818925	54.4331	-6.2551	57.3764
44.1214781072049	17.9590039761087	33.9027048490596	43.0131	-4.6452	57.9101
43.9524664368877	17.8568214039422	33.9101911597145	36.4279	-4.3699	52.432
43.7877068687842	17.7572096113347	33.9174891224409	31.1391	0.2266	57.7289
43.6292894410128	17.6614322160556	33.9245061627599	31.0065	-1.0714	59.1851
43.4796470890163	17.5709601454715	33.931134515586	27.3755	-1.0984	56.1861
43.338563470393	17.4856625989196	33.9373837625299	22.4229	-2.1641	56.3911
43.3385634657416	17.4856625987832	33.9373837558099	25.8989	0.7413	53.4706
43.338563461189	17.4856625986711	33.9373837483672	27.6562	5.4902	56.4427
43.3385634566707	17.4856625985669	33.9373837412698	30.7839	5.7178	56.2846
43.3385634521678	17.4856625984667	33.9373837340693	33.7832	8.5886	57.2507
43.3385634476606	17.4856625983676	33.9373837267844	36.7928	9.6586	58.8057
43.3385634431361	17.485662598276	33.9373837204248	38.0686	7.3443	51.7798
43.3385634385919	17.4856625981973	33.9373837133301	44.2937	4.7268	51.9613
43.3385634340481	17.4856625981233	33.9373837059374	46.8369	6.4403	54.1626
43.33856342951	17.4856625980551	33.9373836983116	45.5397	7.2979	57.1732
43.3385634249657	17.4856625979968	33.9373836907287	44.3097	5.4051	59.4302
43.3385634204095	17.4856625979477	33.9373836834983	47.7278	5.7114	59.7593
43.3385634158504	17.4856625979089	33.9373836761694	49.309	3.6922	59.7251
43.3385634112774	17.48566259788	33.9373836695092	51.8363	2.0767	53.9783
43.3385634066844	17.4856625978535	33.9373836626747	52.2056	3.4977	49.7426
43.3385634020665	17.4856625978289	33.9373836555345	52.0607	4.6851	47.5572
43.3385633974149	17.4856625978083	33.9373836484428	50.9668	1.717	44.4164
43.3385633927224	17.4856625977914	33.9373836410692	49.5265	1.5006	43.2383
43.338563387982	17.4856625977862	33.9373836335937	49.2438	-0.5725	42.7886
43.3385633832023	17.4856625978039	33.9373836255338	43.4311	0.4843	45.1031
43.3385633784097	17.485662597849	33.9373836191111	42.4155	0.0668	38.5675
43.3385633736233	17.4856625979254	33.9373836102063	33.4349	0.0139	45.2628
43.33856336887	17.4856625980243	33.937383603929	28.6989	1.5656	37.4478
43.3385633641832	17.48566259813	33.937383595861	22.0744	6.6433	40.1203
43.3385633595568	17.4856625982305	33.9373835879393	27.9452	7.0873	43.7392
43.3385633550027	17.4856625983215	33.9373835810673	29.2732	5.6917	40.0529
43.3385633505035	17.485662598407	33.9373835743625	29.6205	6.6839	35.8272
43.3385633460134	17.4856625984942	33.9373835670502	31.7997	5.4917	35.1341
43.3385633415295	17.4856625986005	33.9373835606867	33.6792	4.7017	30.2163
43.3385633370242	17.4856625987455	33.9373835536945	36.4235	4.5159	28.6582
43.3385633324907	17.4856625989315	33.9373835460645	36.2059	6.8965	29.7476
43.3385633279483	17.4856625991488	33.9373835383487	29.4417	11.4808	30.7206
43.3385633234203	17.4856625993859	33.9373835297912	25.9081	14.4892	36.1934
43.3385633189177	17.4856625996307	33.9373835219409	19.6468	14.5775	38.07
43.3385633144547	17.4856625998804	33.9373835148972	18.1963	16.0602	36.4885
43.3385633100266	17.4856626001267	33.937383507207	20.7311	19.0512	39.2565
43.3385633056477	17.4856626003703	33.9373834999896	21.1889	21.267	39.0474
43.3385633013199	17.4856626006089	33.9373834926946	17.3215	22.815	38.4524
43.3385632970285	17.4856626008263	33.9373834862302	19.5225	24.6717	34.6116
43.3385632927711	17.4856626010238	33.9373834786576	17.7323	26.9057	35.8248
43.3385632885491	17.4856626011933	33.9373834697243	21.3113	31.7798	46.1078
43.3385632843302	17.4856626013291	33.9373834614975	16.9754	26.2994	50.4148
43.3385632801213	17.4856626014288	33.9373834540266	21.4132	25.3225	51.4824
43.3385632759004	17.4856626014998	33.9373834470125	23.1689	25.59	48.8728
43.3385632716834	17.4856626015604	33.9373834399333	21.7951	21.835	45.5134
43.3385632674759	17.4856626016213	33.9373834324915	19.3676	20.9011	45.1036
43.3385632633032	17.4856626017051	33.9373834248536	19.4151	20.4264	46.5071
43.338563259181	17.485662601821	33.9373834171473	22.5923	19.795	49.1879
43.3385632551538	17.485662601979	33.9373834084866	22.0389	18.6688	59.3708
43.3385632512215	17.4856626021723	33.9373834011042	19.4476	21.0876	59.2618
43.3385632473425	17.4856626023833	33.9373833937732	18.7218	26.0511	59.401

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.389696447306	17.4111948389023	33.479530024138	35.5392	31.6783	58.7469
43.4447405686973	17.3310314133779	32.9866577707033	40.9959	37.9409	51.1587
43.5027498894498	17.2465496273882	32.4672347563439	46.003	37.4534	46.4333
43.5634000091495	17.1582219199634	31.9241657033663	44.7872	36.1398	42.3342
43.6268415112104	17.0658289871712	31.356102257002	45.9581	33.5048	45.1742
43.6931185887557	16.9693064639035	30.7626486868063	48.6326	32.1618	43.4727
43.7615377873119	16.8696642608948	30.150014268104	51.473	33.7115	46.7085
43.8324489847212	16.766392832686	29.5150661430762	51.7623	34.8081	42.2217
43.9053493227928	16.6602245168905	28.8623069719707	50.1654	34.298	41.7388
43.9802434269569	16.5511525747707	28.1916953329333	51.6292	37.4529	39.3047
44.0571778192102	16.4391092538965	27.5028146611003	53.589	37.6567	38.7584
44.1363618238657	16.3237897055816	26.793790642092	54.3132	33.4794	38.814
44.2175186981926	16.2055969654352	26.0671012754095	51.0819	30.8837	36.7669
44.3003525805406	16.0849619132497	25.3253957513207	47.9812	30.2306	39.2099
44.3853602319095	15.9611610939614	24.5642260179921	47.9603	31.0225	36.0363
44.4725705485597	15.8341524296765	23.7833333535775	46.684	28.1154	34.4272
44.5618831856265	15.7040820551733	22.983616257291	46.4115	30.3033	33.5708
44.6535099725066	15.5706414737086	22.1631779855525	48.325	36.101	31.2943
44.7476935192562	15.4334773664294	21.3198461900132	46.9054	30.8841	31.5685
44.8439456814051	15.2933006375193	20.4579917637971	45.985	27.4123	27.7797
44.9416094079782	15.1510681784625	19.5834980006549	47.7428	26.438	23.4687
45.0401424159994	15.0075697409194	18.7012205546445	50.5738	30.8854	25.5173
45.139680766471	14.8626071736231	17.809941120486	52.5136	31.162	22.8965
45.2403303603615	14.7160262433131	16.9087114389632	50.3723	32.2399	19.4829
45.3423245836493	14.5674870509295	15.9954417215157	43.7884	36.8808	19.8614
45.4465216916194	14.4157396642981	15.0624470047346	50.3352	41.2014	16.9793
45.5527984986976	14.2609634921577	14.1108303720392	45.4903	38.3462	11.2293
45.6591233796325	14.1061172868541	13.1587832458292	45.4526	36.121	9.3446
45.764263021449	13.9529971937337	12.2173489140069	44.3651	39.5082	4.2576
45.8664598731659	13.8041628350296	11.3022647457394	45.6407	35.658	2.8521
45.9653159702023	13.6601937936078	10.4170941847482	42.8212	36.4305	1.5446
46.0607090950786	13.5212680601385	9.56293156517466	37.4272	33.8061	3.3013
46.1532610533694	13.3864800605431	8.73420912408892	44.1303	30.8739	2.5661
46.243306687758	13.2553421480008	7.9279286426723	47.5893	27.8934	1.3329
46.3312443868959	13.127274125889	7.1405228839259	46.7163	23.0055	0.3229
46.4176435400651	13.0014467592458	6.36689343927144	54.0368	23.8586	2.2143
46.5035697868658	12.8763081067702	5.59749845089319	49.1677	19.2175	6.1526
46.5895735877502	12.751056503879	4.82740902181524	49.3862	17.5735	5.4967
46.6761356397884	12.6249918939827	4.05232095469329	46.503	16.5426	2.0548
46.7636743794706	12.4975048928161	3.26848753671396	44.2621	15.3855	4.7212
46.8524336732696	12.3682403467777	2.47372516182376	41.9974	13.5778	7.3366
46.9431677356613	12.2360998465251	1.66128045623484	47.4524	12.1509	5.76
47.0349874467501	12.1023782560396	0.839114678083405	46.5714	10.174	4.4604

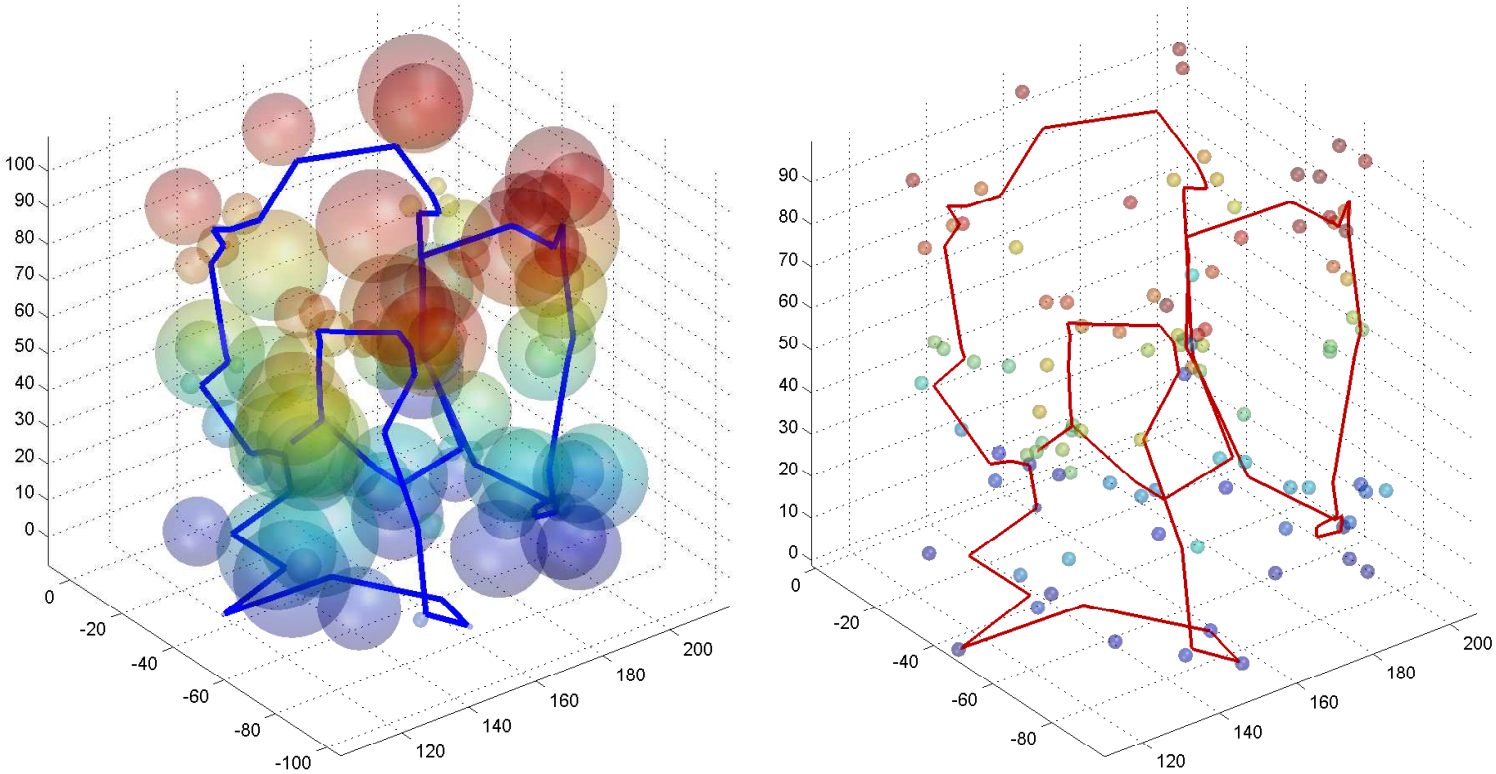


Figure N.91: *team*1_100, arbitrary radius, 3D, Euclidean, Length = 907.5928493

Table N-94: Solution for *team*1_100, arbitrary radius, 3D, Euclidean

Total distance: 907.592849301374 Depot: x 50 y 10 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
23.0875695048443	21.963434309891	3.42725749344214	16.123	17.568	4.443	8.298
23.8064313760819	41.854977315877	2.98818008641321	27.219	44.51	3.327	4.337
1.98380500736445	46.7578401953157	0.243752361531011	1.527	46.599	0.05	0.521
12.00664343416	61.7306070537159	10.4834047941669	5.777	62.003	23.29	14.244
14.0292114494328	64.7520509652231	12.5497248409915	8.64100000000001	64.188	15.551	14.025
16.8285422492368	68.9338737619004	15.4096107696434	11.878	70.444	28.798	14.354
27.7779112826763	78.4861410424984	12.501505050608	20.735	74.659	7.978	9.97
36.5844390657823	86.1689848533062	10.1625297735303	36.762	86.092	10.176	0.194
36.5241550365364	96.1171409535338	7.56375478544792	36.924	96.636	7.226	0.737
25.649282127571	94.2339295610034	13.5182402513055	24.053	94.189	12.551	1.867
25.335025255357	91.3587705730665	36.1255634452006	27.59	93.644	36.826	3.286
20.9519803990408	84.0345882657872	60.3609707995951	20.393	83.793	60.447	0.615
29.7330899342865	84.4841475265009	73.5264793232007	33.626	83.869	72.958	3.982
27.4125845581976	85.8674664508864	81.8605425072759	33.443	88.578	84.328	7.057
25.3818254645374	85.9769978763301	84.9411465732745	30.503	90.056	84.685	13.109
23.616374126631	86.0722195444834	87.6192862984207	19.881	93.181	96.862	12.244
22.5893645491146	68.2530054382167	79.9226583599549	26.213	68.977	77.227	4.574
21.3641269962806	59.2206892399647	76.6131729257615	21.299	57.593	80.779	4.473
21.1814086980113	57.8908196248156	76.0549008919181	19.619	52.734	79.19	6.234
21.6879905130592	58.0955224364556	73.1711409392867	26.732	55.612	72.392	5.676
19.8237551594175	60.0238215299558	67.2170502103085	20.103	52.347	63.856	8.385
17.24336471158	64.029947864968	59.7453509259188	5.739	68.535	65.134	13.479
16.6492153058522	65.3517349918904	56.8677638856185	11.844	68.394	54.009	13.519
16.5885499785324	65.4866954060511	56.5739493216669	17.374	67.529	56.063	2.247
14.2867951222314	63.2802308870902	53.7689682535739	13.454	69.007	48.213	9.443
12.8610986535254	61.9135567845567	52.031575745724	7.235	62.367	51.584	12.76
11.3465904777041	60.4617476526025	50.1859548615251	11.123	60.442	50.101	0.24
18.2450061195439	57.5113971524464	49.3767299894721	18.45	52.954	46.14	14.862
25.1612322103095	54.5534293930574	48.5654158513581	25.201	54.507	48.664	0.116
27.0427995897601	54.3010630136574	46.4063091835387	25.923	53.185	46.671	1.603
43.1346837346855	52.1427291696548	27.9408028126009	40.978	46.49	25.743	6.437
43.1354147296981	52.1428420063229	27.940129823613	42.804	54.74	25.734	7.11
49.8571407891521	53.180411139676	21.7517897818861	51.29	49.58	11.489	10.97
53.6127169541112	57.0260847048009	25.9375301405553	49.02	51.541	23.534	12.697
57.7633368960991	61.2762793880291	30.5635626070396	59.007	60.213	31.626	2.987
59.9343954961613	63.4994223697538	32.9832946619918	61.493	65.592	32.325	2.691
58.5273546742137	59.9947928708147	41.3706526340326	59.534	67.732	45.235	9.572
56.9205226762211	55.9925277136288	50.9489639137818	57.243	55.792	50.963	0.38
55.7138010914412	55.0073933680464	54.2444072950008	55.281	51.871	55.993	9.377
55.0346142486885	54.4529239762652	56.0992035451172	57.142	56.857	57.493	5.652
55.0342831938782	54.4526537122972	56.1001076248151	53.958	52.681	59.332	10.486
54.8165074355434	54.2748675495382	56.6948325725185	49.571	48.14	55.073	8.233
54.2174726017419	55.7227776043377	75.0037768102727	43.243	58.404	75.054	12.71
54.0572678431318	56.1100039855656	79.900286819791	52.975	65.56	80.551	9.534
54.0628225347303	55.251379927089	83.740990296239	47.232	45.27	89.834	13.543
60.526921675385	62.3469310402688	88.4016874991688	62.352	63.144	84.329	5.122
68.65848838545	71.2728379272549	94.2646499056659	73.523	67.727	97.567	6.866
68.9752563678065	72.9208549272129	94.5230467551238	76.154	71.763	97.979	8.051
69.1287311838446	79.7708026186515	95.0254102712077	63.631	81.224	94.784	14.134
69.2673976215265	85.9598170299038	95.4793020656907	67.643	91.829	97.188	6.325
74.6474739261964	78.0083749072839	90.8498658281242	74.447	77.382	91.404	0.86
80.0686522423727	72.9578487373145	84.960063899335	77.919	74.057	76.926	8.389
87.6295079607003	66.7191344045368	85.986658883721	87.633	63.432	97.407	11.884
87.6302776710626	66.7186483879976	85.9862449587497	93.946	64.003	91.762	8.979
89.3318929370798	64.4344761020988	76.3499632980623	89.091	59.886	77.014	4.603
89.3947005959602	64.40817223798	76.0026184727634	93.456	57.69	77.108	14.427
90.911022516601	63.7731363063085	67.6169125662421	86.785	67.217	67.68	10.959
93.0759106445035	62.8664808987789	55.6444444428066	91.043	63.691	55.511	7.01
93.9435054042436	62.5031321554781	50.846389993608	94.619	62.103	50.624	0.816
90.722303789598	64.5856063444689	46.6810297336052	87.18	60.86	47.333	5.182
87.5489890263466	67.0847443044639	42.1882415015288	87.173	60.998	48.592	11.762
76.5256725147394	75.7661352722662	26.581398523777	67.179	79.746	30.609	10.928
76.5257046024006	75.7663116128449	26.5804147177075	66.957	73.797	28.023	11.351
76.5376108864888	75.8317440874342	26.2153665663916	81.476	87.316	28.362	12.684
76.7291949676887	76.9812316708523	19.393737472245	78.214	79.218	18.292	2.902
73.9302472373572	73.4600838828938	16.0758413137762	66.971	72.201	17.644	7.244
76.0140227463888	70.933270871833	11.8030053482798	68.193	67.124	4.172	11.572
80.6232851284247	69.9855154618882	10.615696049477	84.146	71.427	3.869	10.315
83.396038153801	69.4153827696448	9.90145654107565	85.968	75.194	1.985	10.133
83.7705917191494	69.1482479361324	10.0236223439437	87.252	72.952	19.479	10.77
89.9258888846211	61.4144404845829	7.60606607589943	94.894	61.262	13.169	7.46
91.6620675515314	56.8223775795973	3.94963131474862	93.694	56.925	1.612	3.099
81.2222533694606	40.9028996488347	10.5032676997518	74.679	41.865	10.639	6.615
90.824953593959	9.95540324718747	21.0273122588192	93.574	3.255	13.429	10.497
90.9461295506296	9.18618715761366	23.0211379050312	92.889	3.855	22.202	5.733
90.7050870496473	9.31700509668534	25.6072939193801	89.359	10.839	25.32	9.385

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
90.2828750863455	9.54614677548458	30.1372239945173	94.926	4.006	36.794	11.26
87.1500736001559	11.2463787049241	63.749263518395	85.554	10.061	65.642	2.745
90.7357007726026	14.485012448778	63.7709256370241	95.317	17.864	59.209	7.295
90.2635534361095	14.3894918330445	65.7693062248952	91.857	16.502	66.492	2.743
88.8527495685153	13.6200413634434	69.7216028021042	91.007	13.249	70.645	2.373
80.4877501099445	11.0206341790417	84.3209035942087	85.841	12.653	93.498	10.749
80.4868114018102	11.0203449171524	84.3210910898041	88.457	8.185	95.157	13.747
55.7100396618606	4.72542057793346	86.1226453125398	53.754	0.148	93.309	8.742
42.6313747294469	7.65372402966066	76.2822172354002	40.868	2.981	76.025	5.001
42.377423797163	7.81811202684383	76.0684488462489	45.293	9.057	63.281	13.174
29.4197805341562	13.0771169881473	80.4152470399932	26.839	11.732	76.118	5.19
20.8588893293919	17.5696621109147	85.4839158381086	15.772	12.549	91.264	9.192
19.4184218127812	23.5886817463365	84.4421801668531	19.569	24.449	84.923	0.997
16.8012788313757	21.9930977434436	79.4204692716556	12.414	20.962	80.147	4.565
23.6512869775887	18.7148953688814	51.0908326470544	21.459	12.53	50.646	6.577
23.6515822508507	18.7149577318619	51.0898792717034	22.494	14.202	49.345	13.068
24.4347637979158	18.8803681370987	48.561157520403	25.542	20.506	48.088	2.023
24.1631165909529	17.9232016828194	47.4328730459095	33.341	22.178	45.103	10.381
22.2403712024782	11.1482841580806	39.4467652492518	20.541	9.26	39.729	2.556
29.6495336556875	12.8472404145997	26.5168965038783	29.447	11.243	26.345	5.69
34.7150997207222	14.0087989060571	17.6768818034746	33.5	17.352	15.52	4.16
47.1363103747158	5.0952359156905	9.89106929363789	46.154	2.083	10.72	3.275
53.1908408769776	3.22050840811531	5.95431946148416	53.405	3.041	5.972	0.28
51.9055397651083	5.95135222345007	3.55586284302731	54.032	12.197	7.44	11.442

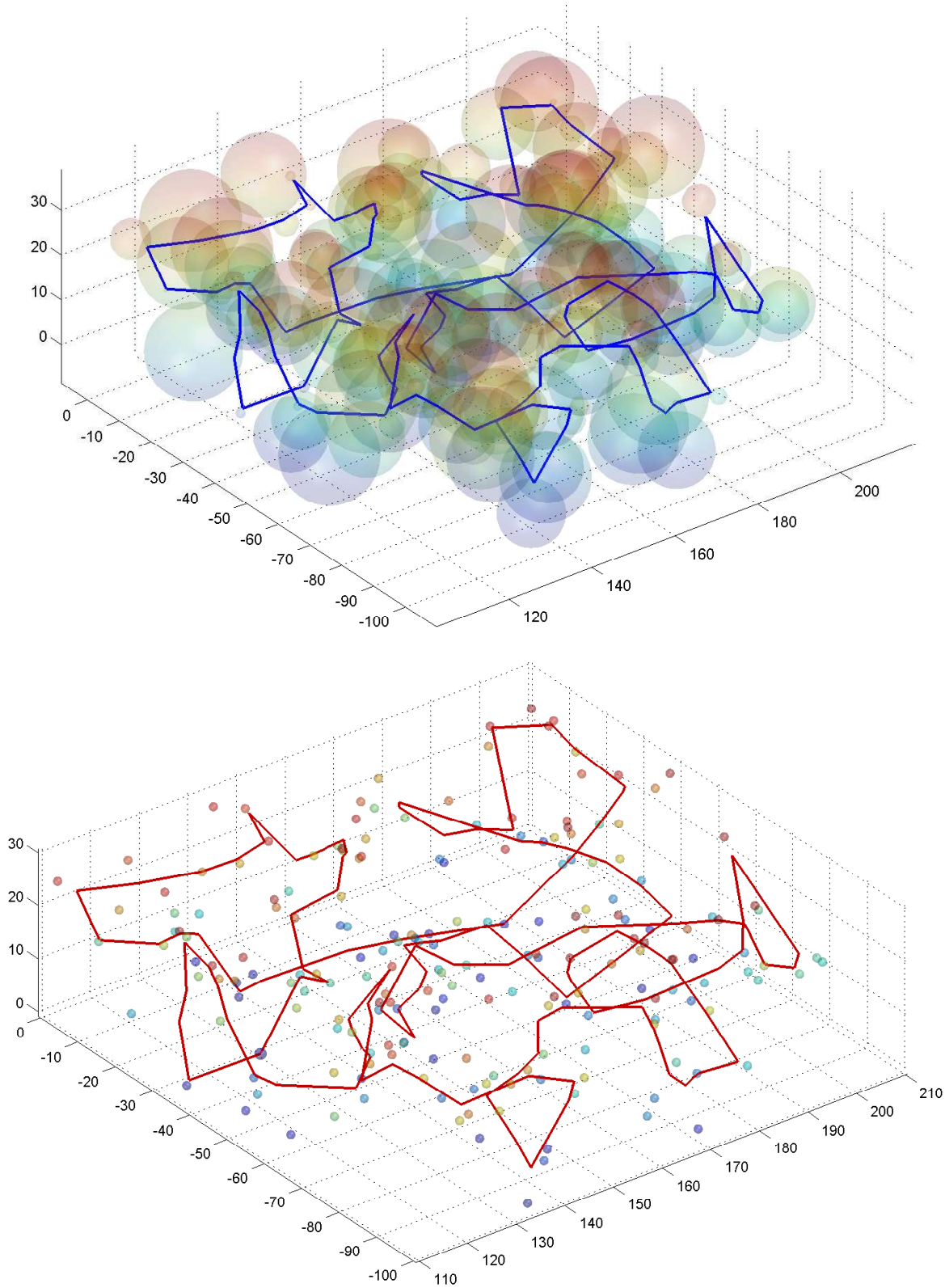


Figure N.92: *team*2_200, arbitrary radius, 3D, Euclidean, Length = 1055.9478421

Table N-95: Solution for *team*2_200, arbitrary radius, 3D, Euclidean

Total distance: 1055.94784213946 Depot: x 19.5535 y 32.6157 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
3.6483602809389	34.1749471149149	1.36116646038048	2.888575	34.539165	0.815621	1.003767
4.88789046217131	29.9260784918454	9.95285345864449	1.87583499999999	21.036865	8.472142	9.501742
6.39055890516225	29.896838925598	15.1980324995634	10.613375	27.61233	15.443404	4.807428
3.32890771827049	33.3834985152478	27.0664517322928	3.09506	32.271765	28.722779	2.008496
2.64557263777628	40.8652195622877	26.0678551634372	1.56824	43.114435	27.74491	3.00535
4.18706643234489	40.6509029815018	22.645122111433	7.76846999999999	43.27595	27.165517	8.308131
4.68968728001859	40.5810227196394	21.5291026968062	6.09162499999999	39.029145	21.745986	2.102568
4.68980183271741	40.5812927403898	21.5281466808682	7.79806000000001	41.063165	21.758433	5.901659
5.36160387519791	42.1648479266291	15.9215252505113	4.535275	41.40327	15.496926	1.201293
7.87082240067153	46.2294722398962	6.39812309522968	8.071465	45.7971455	5.631658	0.90257
7.6890117722395	50.2943307897694	7.1166712377719	4.493385	48.2428075	1.749018	7.3014
7.59063387576258	52.4938292600313	7.50547823985634	2.26291999999999	54.336059	8.412226	5.709688
12.0206071013085	57.304323490036	7.84122781661046	5.35044999999999	59.245825	2.02242	9.802178
16.5189307425383	62.1890396379089	8.18215769916442	16.28216	64.658715	7.376906	2.608407
21.6598130334818	59.3458285169566	11.0045413304853	25.726765	62.875185	13.655865	6.002164
21.8008057812987	58.4346480886728	11.0215998864441	22.32618	58.45293	10.978007	1.401145
22.077989310027	56.6433205041988	11.0551359926388	24.393135	53.387308	3.209069	8.804674
21.8884238098152	54.0775890541903	13.6637765320929	23.528225	48.047471	10.497692	7.005381
21.5507851924804	53.6263962354939	15.4791932132914	15.566305	47.445917	16.822861	8.70734
25.057544956655	56.802420878536	22.2545129649425	18.601355	58.3359	16.263038	9.106551
26.5536677040172	58.157439603749	25.1451337230357	27.03592	58.11764	25.51317	0.607949
24.4580525692818	59.3555902223248	24.7585048801202	27.294235	67.36467	25.05905	8.501742
19.6769479728472	62.0891471671445	23.876418755143	22.77816	61.91876	23.535116	9.100277
18.5151832036792	62.7533765584936	23.662079788743	15.17562	59.299125	20.231796	5.903506
16.0078102187216	66.6847232303211	24.5100031554106	19.19225	67.891335	25.986874	4.001137
14.4076838205657	69.1935845795066	25.0511209807463	14.99811	70.439575	28.594361	3.802058
10.9633555749451	72.4018499008247	22.437800310259	10.737535	78.399525	25.651463	6.808137
10.9627158212956	72.4024458049521	22.4373149098686	4.81189000000001	71.48163	19.467897	9.90886
6.96126112297065	76.1296528474927	19.4012847187267	1.401765	76.07236	14.516115	7.401092
8.45266820420247	77.7593204084107	20.9174468372506	8.96414	75.77293	21.604208	2.204212
10.4234398104811	79.9127917129468	22.9209299425791	10.302265	79.88844	24.724981	1.80828
13.4269949309048	82.8972439877871	20.6674680254803	16.17437	80.77798	18.674423	4.001447
14.3066808521777	88.0410371384884	19.9474081760188	20.60172	86.45345	23.44328	9.802386
15.0312695909849	92.2779294246159	19.3543018990766	12.30828	95.415795	18.734286	4.20063
16.0568127271758	92.2967258963479	19.4083625550951	10.636965	99.941455	22.606097	9.901623
19.7413882912612	92.3642579765882	19.6025919944268	23.159665	94.99055	21.634541	6.103619
23.9747761842243	92.4418489186298	19.8257516575562	20.26183	95.676245	17.846167	5.307169
26.9376693190566	92.4961538342476	19.9819382467366	23.602775	87.83846	18.275699	8.306271
28.7650775109959	92.5296472143733	20.07826866994	28.966505	91.93771	20.861988	1.002586
36.2273720398576	94.9273250713773	17.5370773901675	37.353615	96.195315	18.415189	1.909791
37.5856858187535	91.8556684316496	12.1900261131373	39.89323	90.309885	11.775799	2.808165
28.6745458875085	93.5923330258249	3.79743298041642	30.09705	94.85711	4.685105	8.906507
28.33463581923	93.6585770524663	3.47730256427209	24.384515	97.907795	0.111537	6.707286
30.4183119830578	86.7796199848472	4.78024518927837	36.34587	87.597465	1.344209	6.900084
30.9102314059817	84.534093964411	5.30560050032281	30.1948	77.47401	0.923346	8.506801
32.1494277781854	78.8773793886139	6.62902535341665	31.22881	79.877355	13.445056	7.509507
32.7952625201154	75.9292568376832	7.31875761205549	27.85894	70.297015	5.978866	7.608202
32.7961515735437	75.9290553151396	7.31916867490484	33.93752	71.055425	5.905417	5.201316
37.3669103831574	78.2009137748989	10.8241325371082	43.88264	75.9979	6.534575	8.106066
39.7015284850398	80.788968858742	15.050626852994	40.48646	81.157135	14.786912	0.906206
38.5172348802676	82.2912067988639	22.3546222537392	32.35548	77.08328	26.131092	8.907943
40.6472293716348	85.8582981096322	25.6921761697337	38.950185	86.058925	28.399966	3.201927
50.9017896224191	94.0549176662458	25.9264777843183	51.725585	96.536445	28.40681	3.603979
54.8728746009109	92.2148173127321	19.2469208376138	55.7501	90.920415	19.617278	1.606912
56.1995499031215	93.4566887673044	13.1556640590979	58.59379	93.155945	12.405414	9.907152
56.639161888859	93.8681999695328	11.1372425876164	49.437672	97.29667	7.39626	8.8097
58.9864866405902	93.7124210645031	8.87594193317353	54.766852	92.295455	6.553331	9.502154
60.1046806107487	93.6382127345855	7.79872720377983	58.9163	98.60932	2.300231	7.507171
65.1080554571564	90.4749489394704	6.82331243627	65.23767	90.033385	6.608827	0.507723
68.7357685965034	96.5211340099148	10.5041155447338	69.51155	98.000325	10.150379	1.707329
66.4384552622429	91.1083402948711	17.8770023971943	67.48261	90.51293	17.817861	1.203441
63.3779109655636	85.6513484022758	25.8096163160895	64.30468	84.91	26.009678	1.203546
61.8655683596624	85.0601925395856	27.4408240980336	59.88564	90.256965	29.954013	6.102678
60.4257597168491	82.7857372314581	28.8855357711842	59.609455	83.27302	29.920795	1.405546
60.1757185080135	77.6550131729744	28.5602520584243	58.86286	75.490835	22.793064	6.800719
60.1170289166626	76.4507309736212	28.4839014979337	61.393495	78.21387	27.829379	9.209541
60.065013082066	75.3833907108635	28.4162329128612	63.457115	71.302795	28.410692	5.306378
55.2347606459141	76.0401694475863	28.115079086723	56.10401	69.44853	29.951816	7.107666
49.4379076278718	76.8283790334947	27.7536606725739	49.200624	76.95068	27.905495	0.307107
50.5613451071416	74.3958522450834	23.6046137715684	48.983044	68.08194	24.712405	6.601797
51.2123614095853	74.458963614237	21.9147906831781	45.96408	75.36881	19.356846	5.908922
55.0586696376163	74.5117694561448	15.5816897896913	51.801592	75.702955	19.859805	5.507245
55.8968304736893	74.5232765335388	14.2016243280788	52.486843	76.711165	9.36826	6.306844
64.4716100997425	72.1697191278603	11.6370295515011	62.26967	64.78212	6.975531	9.008592
68.4125763338404	71.9761569483359	11.0495509336636	68.40623	74.741575	8.582781	3.705743
73.5352191186606	71.2593592850694	10.7010846719973	75.60926	70.05143	9.458663	2.801868

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
77.7170968086988	70.6742004229095	10.4166137156765	79.72973	69.6285	5.76607	6.503827
83.1309716969769	69.9166514834373	10.0483365795729	81.449	70.90379	9.10693	4.00725
85.4244332065605	69.5957335922033	9.89232460331346	87.254685	75.06877	11.123991	5.900928
93.3668200645942	65.626851068722	8.67562927437596	93.854515	65.44994	7.938496	0.901393
94.1595163388355	64.7112147511588	13.7064366945696	98.425325	63.29758	13.439936	4.501834
92.6963702753961	63.6332703299088	25.9574929980072	92.344515	62.02096	28.826016	3.309346
94.2059427104291	79.5894740914715	14.168944499577	98.53739	80.25874	11.354076	5.208919
93.9085847120363	79.8641473958487	14.1418032173787	97.272905	80.426715	12.650593	7.307128
91.0990812895332	82.4593208770975	13.8853664613205	91.37176	83.481715	13.123111	1.3041
87.1667260489438	82.5623432165453	15.7065919883926	86.26193	79.048	11.651774	6.603528
84.8718750625033	82.6224651813884	16.7694260783182	84.72455	82.62255	16.621981	0.208434
80.5530772704431	82.86347535923	26.0750541313898	82.980165	82.460215	28.432538	3.407507
74.5890026123543	83.5409503838996	29.1620053514468	74.234205	84.088705	29.630347	0.803281
72.3072777637995	75.1889100556445	25.5117520491203	74.635475	75.231085	23.616275	3.002518
69.8579357634763	68.1963392663592	22.9009589405938	67.24276	72.18951	20.816233	5.208708
68.0016748951535	62.8969422720551	20.9223405987373	63.17424	62.764205	21.920947	7.706659
66.2708084047478	57.9555311480121	19.0773822254892	70.55475	53.342402	18.770686	6.30295
53.3827943756465	54.8692695556283	15.0919312706564	53.302235	56.10093	10.554691	4.70213
44.7930680030573	51.6468121776426	16.6397508374816	42.291825	54.317701	14.78098	4.104253
43.6689425517402	50.3677974610075	17.3908791014191	42.753335	50.906813	15.568394	6.308285
40.5242657840483	46.7898268368074	19.4921175479434	40.184205	46.1874365	21.269314	1.907077
37.8343217650312	44.9325641848789	12.6336495738228	35.347265	40.483415	12.676508	6.900943
35.8557879119271	43.5664923068845	7.58904247051337	35.65863	43.345715	7.513468	0.305492
38.3941074088651	47.2529235717414	4.30341477089852	36.49954	48.989475	3.669737	8.009904
39.1841509955562	48.4003131234904	3.28077402686969	39.724355	52.657318	1.123019	4.803105
41.0803942097481	41.3555586885992	4.94192138525937	41.00732	41.27668	4.938398	0.107583
46.3473383783147	40.2863383627599	6.36208126987254	50.608737	39.047145	0.30438	7.509385
47.1531480195436	40.1772664548939	7.62947539543143	50.972003	40.60627	2.976184	8.001002
47.9826912463188	40.0649820384917	8.93419823487199	49.52113	41.29678	9.327678	2.009713
47.4190255756948	38.5920080835884	10.2275596250093	51.37375	46.298003	11.79476	8.802177
46.4311767037821	36.0105564701892	12.494232248982	45.420784	35.70231	13.427579	1.409626
48.0550443028742	35.2668033947618	11.7301300996577	53.824634	40.64213	16.603226	9.902994
51.0804539484436	33.8811253318829	10.3065399208395	46.870011	29.816545	8.525673	7.806658
51.9187006369304	33.4971971399907	9.91210746542272	51.719243	33.03008	9.909651	0.507925
57.8405843944719	31.1765153075966	7.19313316751257	57.95186	28.956245	5.320699	2.906543
64.2238515789053	35.0396463687512	9.58797428176205	64.595135	34.78327	9.989898	0.604254
65.4884714787407	40.6229957633744	7.43219583401204	61.04328	37.44322	1.978623	7.908259
66.0007577737832	42.8847610241454	6.55890909705872	65.72564	44.111465	7.622314	4.10252
66.000964505082	42.8856737500112	6.55855668584433	69.610075	41.75992	4.719164	4.204327
66.6193580242841	53.3069829100827	3.55999474314746	65.705495	54.4013975	3.082521	1.503619
79.8090682701446	51.4804273268973	6.29429300571559	81.466395	54.091358	0.343064	6.706774
85.1688959917243	50.6959908991397	7.49891137370841	92.878595	53.021252	1.55944	10.006179
90.9560581493919	49.8490119420911	8.79957301766586	95.92709	54.202926	8.883113	6.608684
90.9727686316845	48.0030479463177	9.17834755405483	91.6164	43.026115	2.808093	8.109517
91.0049626303968	44.4466620609001	9.90808466417002	87.57797	41.66484	5.551613	6.902275
91.031509829359	41.5140597694181	10.5098272051815	94.955665	36.40187	7.771411	7.002314
91.0307996829506	41.5140169124462	10.5105299536135	88.660005	37.051535	6.873362	7.30023
84.2226490990801	41.1031414731458	17.2477573266459	84.61874	44.121625	19.170305	3.6006
82.0464325579214	39.740122647566	18.4493347118337	83.48933	38.25693	16.203282	8.302552
78.8395406174793	37.7315660451567	20.2199897803432	80.066985	32.520545	19.480329	5.404485
77.5223073005637	37.6789079627372	20.9552878248066	79.319755	37.96047	22.926601	9.501655
76.0074274896292	37.6183487036323	21.8009149057979	78.52122	37.890255	25.630233	6.801958
73.5424678181813	37.5198087895066	23.1768898444675	74.17807	43.76639	28.605582	8.300269
70.3816897619631	36.2155957432017	23.8462891783029	63.437195	41.00367	26.99622	9.004095
70.2455962989791	31.9610243206432	22.9539693050781	71.273045	32.62062	26.349189	3.608079
69.9414703295656	22.4534014130515	20.9599162829146	69.52818	17.90893	23.466902	5.206535
69.5400046251315	9.90273250357709	18.3276390227158	69.299455	6.449115	15.081267	5.10428
69.3754158584412	4.7573414406744	17.248485743427	67.61759	1.570395	20.822479	5.100981
69.8350703812593	4.17070929994463	15.8997321920927	67.794775	0.2453923	14.617193	4.606064
76.4171654231151	7.65571324181997	9.81863780136244	74.60069	8.85595	6.459838	4.00271
79.0106246484057	8.0918741571499	9.60557528956078	78.44886	5.02628	2.732259	8.808511
82.5461933881736	8.68647640304668	9.31511513581125	82.741185	8.18936	9.780027	0.708018
88.4126875764255	10.6357113069953	7.95951010764616	89.544625	11.14329	6.653118	1.801549
88.3284467437964	10.5148471585519	8.71704380043696	93.997115	11.43328	4.127594	7.703152
86.5664052134668	7.98676580309444	24.5621620684693	87.144585	5.62369	21.911356	7.10022
86.3437756750332	7.66734896120442	26.5641534363378	86.016245	7.495035	26.90563	0.503562
90.0255475341292	9.20688771115814	26.2029070119288	92.761655	9.792985	28.945088	7.707934
93.0933230213264	10.489682931812	25.9019044305925	94.4971	12.154995	26.111766	9.50306
95.6405334018553	11.5548030397009	25.6519784336026	96.04228	11.46233	26.220597	0.702338
98.0233449326381	14.0993363441108	21.8041077179843	99.37313	13.042045	19.983146	2.501137
96.7397991489709	21.6283567691415	22.5991251942457	90.572985	26.136825	24.857885	8.602133
94.9634184169306	32.0482540100414	23.6994017772457	92.788305	33.10169	27.022649	4.109114
94.9635355130725	32.0491850397681	23.6990561298219	97.982935	40.137435	28.75306	10.003975
94.6978298638819	31.887265068663	22.7718939560431	89.661665	37.28143	20.914346	7.609892
94.6979196536772	31.8867068748546	22.7710691182014	99.67714	33.98061	22.565216	5.405501
94.8525635872775	24.774932202907	12.8762119458512	95.62369	24.314785	12.804988	0.900802
90.5823531051863	23.3951416155165	7.74172967135384	91.09643	22.6866	6.913126	1.205359
84.2989579428369	24.9438844439643	6.10655439068956	86.845365	25.906095	9.026374	8.100197
79.3487805763226	26.1640133262573	4.8183325320976	79.01289	29.7258	2.755744	7.100822
73.4525472385948	27.6173277832689	3.28391134285409	73.44882	27.71684	3.250298	0.105102

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
64.1362220182423	23.6023724386951	2.94905208072398	63.31789	20.756115	1.726904	3.203825
60.670230979007	22.1086715926499	2.8244727807805	57.48649	24.517395	4.703245	9.301244
57.7667175695092	20.8573756245284	2.72011089056264	58.979255	16.987345	1.276103	4.304944
49.5791834602761	19.1748822478876	3.05098961870136	49.216563	20.76273	2.277188	1.803198
48.0324103520406	18.8490246113752	3.11729498638353	47.801417	19.06334	7.814097	4.70736
42.9918040896511	17.740424033533	2.50107443355005	50.337118	13.87323	4.749218	8.600173
32.8690577201798	15.5140881807798	1.26355584956509	33.169445	12.82499	1.129185	2.709158
28.4111585339311	15.5374270640251	0.780906156980992	27.827995	16.04415	0.143676	1.001454
26.5964248143651	10.5424236964965	6.28865192423172	25.954135	17.869355	4.361083	7.603419
26.1098411926824	9.20311610607281	7.76544085731578	26.97316	5.55935	2.320922	8.204253
25.6753145321632	8.00709388118842	9.08423600933761	28.448025	4.56492	10.374303	4.604428
22.8751234808878	8.52244917406215	10.3763591541815	21.673354	6.8005655	13.961641	8.80316
21.3349568640108	8.80590589787255	11.0870552341162	20.9699	7.87089	11.180156	1.008062
17.0241545412443	12.0148956081815	13.2578565442051	16.776285	16.423415	15.502152	7.709348
10.9387333460586	16.5449233311682	16.32230699801	10.44323	18.54025	17.132759	2.209906
6.59974718809315	6.37423024287936	13.8857382874289	6.5851	6.152225	13.546134	0.405995
3.07330507530077	4.79894242143676	23.7196150533777	0.024124999999998	3.6794065	26.062187	4.00481
8.96849383955325	6.79791221285334	23.3940631896144	7.39533	10.545265	21.25087	8.903739
13.1054660797403	8.20069724564937	23.1656058731833	11.54701	17.37734	26.244082	9.803906
19.1803792065416	8.63654883190323	22.3293755163912	15.031135	2.9821155	24.523433	9.903269
25.6424582667289	9.10017799825576	21.4398505447206	25.662895	8.989655	21.265898	0.207105
31.4387496661821	10.6590589462502	22.3887089640162	32.973595	9.54291	20.606347	2.603527
34.6935760403811	13.9506187362647	26.1352696539784	34.77264	14.924575	26.641448	1.100481
37.5708055469696	7.94956100349784	25.30907079323	34.695715	0.250565	26.535311	8.309293
40.1471445538493	2.57607263858653	24.5692728211639	40.16046	1.62977	24.917947	1.008583
44.6855417044285	9.37904480122918	17.0227334843786	42.845635	9.79738	11.955362	5.407265
46.8973377970681	10.8775548371163	17.9936399851806	46.358401	11.954405	18.491997	1.303234
49.0360169529449	11.146392734894	18.3309739942337	54.294115	8.069135	15.776464	6.606257
48.9281568955132	12.2092657295854	19.2883577193555	57.51838	10.00522	23.910843	10.000856
47.8871609036981	15.992437704825	22.1771004981348	54.207021	15.63022	20.585643	7.700153
47.6504985298257	16.8525124746056	22.8338337272593	49.707097	15.54357	19.872896	9.000518
47.0572497373789	19.0084880176744	24.4800868138658	49.796921	18.777515	27.389734	4.003148
44.7646765038037	22.4096568850048	25.512647211228	47.997827	21.94091	22.00424	8.509285
42.6618700757721	25.529295187753	26.4597376716704	44.38625	27.294685	26.050788	2.501465
40.8183431450838	26.9635545384673	27.1794307568996	40.19826	27.52955	29.10549	2.101085
38.7379822106804	28.291252759879	22.1315994775659	39.58443	28.150345	20.548662	1.800561
30.8854490248206	31.0703868168692	23.4104523585654	26.379295	27.934205	23.031473	5.600223
25.4959419703414	32.9778175063505	24.2881805835151	22.373755	32.6144	28.047693	4.900414
25.4958838510434	32.9782489725042	24.2872803284928	25.46019	34.06066	24.177315	5.200669
25.1454528267641	35.5797711932803	18.859199131038	21.800035	44.699325	19.798588	9.804285
24.9661252301543	36.9110581456659	16.0814662808117	21.779985	37.899125	15.006029	3.504901
27.5872209055073	37.521664649497	13.9342251114229	24.567885	37.86062	12.401465	3.403033
29.4211792427222	37.9489008646682	12.4318186736803	29.577285	38.20107	12.365171	0.303974
30.0242217273936	29.6142462269069	9.53288099844876	30.249755	29.28668	9.627144	0.408718

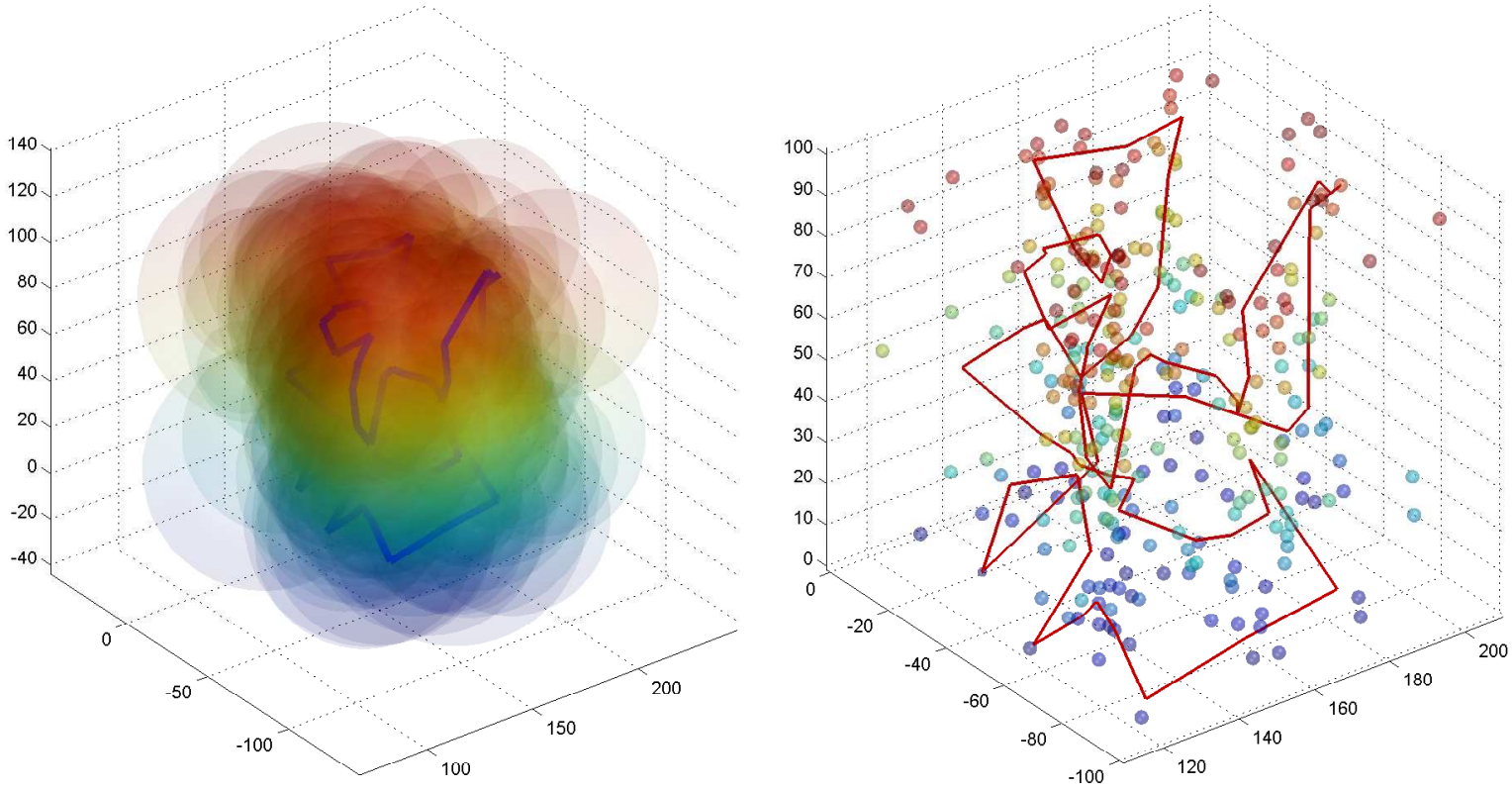


Figure N.93: *team*3_300, arbitrary radius, 3D, Euclidean, Length = 1053.3802816

Table N-96: Solution for *team*3_300, arbitrary radius, 3D, Euclidean

Total distance: 1053.3802816014 Depot: x 23.55 y 20.83 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
36.6588394129503	18.9242333982525	4.69166760175068	47.45	7.49	9.86	16.55
47.8221724323964	17.301305029447	8.68703638303874	48.26	14.58	6.53	3.5
48.9866161086233	17.1632007748305	9.13093962421689	54.22	8.18	8.6	10.41
54.0814865739446	16.558943741816	11.0731799907687	54.15	15.54	5.27	39.45
57.8703396999503	16.1095817464794	12.5175471331307	63.88	23.81	11.61	9.81
61.8850889562746	7.43434094457403	17.1651581272464	56.26	10.34	5.55	24.93
63.3617635091753	4.24347981534246	18.8746070720612	50.21	0.82	0.76	29.59
64.573556269479	1.62498653376814	20.2774197897211	64.3	1.03	20.6	0.73
68.4249162234623	3.10845729238113	19.4510423447253	85.34	3.13	7.91	40.46
68.4249162234623	3.10845729238113	19.4510423447253	55.5	8.86	22.02	30.33
73.1493635338364	4.92822471402095	18.4373285627266	89.81	1.33	12.56	26.05
76.6857141759496	6.29035986127163	17.6785419306674	84.22	4.25	20.41	43.87
80.5521510010075	7.77963788405715	16.8489295073452	84.85	7.49	23.97	13.74
85.827090558557	9.81144453618612	15.717097783505	91.86	5.09	13.18	8.07
86.2023005674982	13.2201029153252	16.2123165463825	78.41	15.88	16.4	33.29
86.6319356464433	17.123193875332	16.7793674987988	76.81	16.4	5.21	34.4
87.0506778714061	20.9273276915019	17.3320418378799	90.79	7.27	2.84	30.18
87.2928697346003	23.1275594865527	17.6516971019815	74.93	38.63	8.7	25.85
87.2928697346003	23.1275594865527	17.6516971019815	75.98	28.26	8.37	25
88.2645688563737	31.9551216580308	18.9341878762291	87.92	47.46	7.48	19.28
88.2646771477525	31.9561054489733	18.934330804039	92.92	45.3	3.79	44.4
88.91773301036	37.888900174695	19.7962623331602	89.11	45.94	22.79	8.83
88.9569922699097	38.2455569066829	19.8480784420346	85.21	44.35	20.93	35.25
89.1203907913463	39.7299782376149	20.0637388757202	92.82	43.5	36.14	36.84
89.1838665860875	40.3066346799164	20.1475169962972	84.47	44.91	39.53	21.75
89.242050018917	40.8352116835825	20.224310058657	89.33	46.23	11.31	10.42
90.2353682272336	46.5178232957506	28.1008449501291	90.65	58.26	13.09	31.68
90.2354699690148	46.5184053443116	28.1016517140863	86.88	55.34	28.08	10.88
90.2355717108881	46.5189873929447	28.1024584779801	90.93	51.78	26.41	5.57
90.3780389954703	46.4096477071604	34.3974818434148	87.56	46.99	46.13	41.58
90.3780389954703	46.4096477071604	34.3974818434148	91.08	56.32	19.58	17.84
90.5043547339205	46.3127038869702	39.9788365741035	98.41	37.64	42.84	22.32
90.6777742148474	46.1796092650945	47.6415041590325	85.43	53	49.96	9.41
90.7403429749306	46.1315894846491	50.4061508986264	92	48.8	50.4	13.39
90.8316889742146	46.0614839717876	54.4423413460563	93.86	49.11	54.34	7.68
91.0245938170858	45.9134348604763	62.9659848852114	85.85	46.49	60.83	8.76
91.1008502942671	45.8549101346581	66.3354338105421	92.59	46.16	69.75	30.13
91.1008502942671	45.8549101346581	66.3354338105421	84.47	48.16	64.66	27.36
91.3119356289346	45.6929080178155	75.6623962304324	88.92	43.62	77.06	3.46
96.3534438397427	49.7371051045253	81.6178940773475	96.43	49.73	81.64	0.08
92.430336889129	52.7613694529285	83.137961466168	89.59	51.88	82.73	4.09
90.3271824346109	54.3826596764847	83.9528605947209	89.36	56.03	81.08	3.45
90.326563593739	54.3830077855195	83.9535647652085	92.09	44.08	96.66	37.36
90.326563593739	54.3830077855195	83.9535647652085	85.78	45.37	88.36	33.83
84.5768135806707	57.6173453051387	90.496126078293	87.26	54.53	99.96	10.31
84.5759956933341	57.6179203895328	90.4961444697089	82.42	49.99	99.02	11.64
71.802117902679	66.9104645283995	90.4953242892247	92.92	88.46	92.3	39.57
71.802117902679	66.9104645283995	90.4953242892247	72.93	73.7	97.12	16.22
70.3838864032527	67.9421777650507	90.4952332342376	70.7	73.7	97.99	18.06
64.7850761386699	72.0151141572319	90.4948737718881	66.26	99.07	96.4	34.13
59.7923206755356	75.6471671125371	90.494553219195	51.75	85.81	80.64	36.53
55.679313708944	78.6392341604915	90.4942891246419	47.48	94.9	89.56	26.29
55.679313708944	78.6392341604915	90.4942891246419	57.57	78.44	87.74	7.54
52.0821895443519	81.2560147143326	90.4940581502716	53.35	83.14	97.2	7.08
46.5753818474868	85.1992756201402	90.3437648745787	34.79	81.57	97.09	35.28
46.5753818474868	85.1992756201402	90.3437648745787	33.01	55.55	89.21	36.48
38.9690297793647	90.6459576480259	90.1361702841524	30.69	95.98	98.88	13.17
39.1948140003435	90.6230997880651	88.0472128660098	48.98	92.03	89.79	41.59
39.1948140003435	90.6230997880651	88.0472128660098	35.46	90.5	93.34	36.39
39.3438894590456	90.6080077025584	86.6679655303592	40.14	88.25	82.87	7.74
40.779292109731	90.4626906709768	73.3876083059123	44.75	90.08	82.93	11.27
40.7793995622169	90.4626797926825	73.3866141552065	42.37	92.45	91.48	18.71
40.7793995622169	90.4626797926825	73.3866141552065	46.92	92.94	79.18	12.72
40.7793995622169	90.4626797926825	73.3866141552065	39.18	94.86	64.79	14.97
40.7793995622169	90.4626797926825	73.3866141552065	39.28	92.99	62.54	15.28
40.785818648287	90.462029938581	73.3272247145124	41.11	92.55	72.93	2.15
40.9773964429801	89.0219247155055	69.811604048781	48.68	92.55	68.87	20.63
40.9773964429801	89.0219247155055	69.811604048781	37.88	93.16	68.12	38.09
41.0484063881806	88.4881373527595	68.5085090794808	38.08	89.48	68.3	35.64
41.080528266849	88.2466746440076	67.9190443068424	42.93	88.78	59.49	12.51
41.3378811487138	86.3121330487988	63.1963933187157	39.7	88.73	54.48	41.5
41.4164400974743	85.7215991535158	61.7547672834533	39.31	87.14	57.08	5.32
43.5998262126225	82.9924168743153	62.8162163416957	47.67	92.59	55.65	35.3
43.5998262126225	82.9924168743153	62.8162163416957	48.42	91.53	51.1	30.91
43.6004239566904	82.9916697076691	62.8165069342487	68.17	79.21	59.57	25.07
43.6003160398086	82.9908141105172	62.8170132024193	37.93	93.92	46.64	38.41

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
43.6003160398086	82.9908141105172	62.8170132024193	47.08	88.26	42.71	25.21
43.6002081230353	82.989958513606	62.8175194710192	46.8	93.43	44.07	39.27
43.600100205982	82.989102916338	62.8180257389567	54.83	99.88	42.57	28.66
42.2673255877318	77.2539945324212	66.8982558115341	58.75	56.63	68.13	26.43
34.0722967392868	77.5874172680369	71.8873504228265	32.42	78.27	77.18	49.72
34.0722967392868	77.5874172680369	71.8873504228265	34.24	70.46	67.21	46.56
28.5172565569311	77.8134294938891	75.2692324844638	27.35	82.24	75.13	4.58
25.6301162061623	76.1600717722064	77.3705755160081	24.25	76.66	84.45	7.23
23.4138156889746	73.8710792084658	74.1821692853629	23.52	71.05	74.38	2.83
23.3828938660924	73.8926568221091	74.1368616534585	28.95	69.72	73.23	21.24
21.0988012233987	75.4865236214727	70.7901370016009	27.28	65.47	69.94	12.73
20.8164674141653	75.6835394752992	70.3764525148957	26.15	61.96	69.66	39.04
20.5797899975087	75.8486958786706	70.0296651868803	23.47	70.49	67.86	29.96
20.5792654115855	75.8490619411756	70.0288965466187	16.07	82.14	77.28	24.27
20.5792654115855	75.8490619411756	70.0288965466187	16.99	78.36	62.01	10.94
19.9748702895666	76.2708158943241	69.1433178937466	27.62	60.61	68.71	40.48
19.4854101398707	76.6123670331332	68.4261452723115	25.84	61.09	65.42	17.04
19.4854101398707	76.6123670331332	68.4261452723115	25.86	63.85	60.16	38.15
10.3406096023384	82.9937168539729	55.0268945477907	8.95	75.43	49.37	30.95
10.2743125783723	83.0399797001976	54.9297540521975	2.01000000000001	79.01	40.57	42.13
9.45462908655253	83.6119645236109	53.7287278843294	9.41	84.38	51.54	2.32
5.50729190828977	81.9983345160494	60.5316050679594	4.8	88.51	50.28	18.34
4.54804136686026	81.6062029625338	62.1847862754191	2.19	82.13	61.84	2.44
4.66822426605836	81.2463333371152	63.1896594395459	1.01000000000001	87.83	68.27	21.8
6.02610407551644	77.1803663565417	74.5431632327237	0.909999999999997	72.43	63.78	18.26
6.02621596576574	77.1800313177905	74.5440987697924	6.36	80.44	74.53	34.29
6.02632785614864	77.1796962791286	74.545034306877	2.98999999999999	72.09	73.38	6.04
6.29158868620753	76.7456523917799	76.1476364125694	6.62000000000001	72.96	75.87	3.81
6.33011660202089	76.7896212301582	76.4549199299781	5.06999999999999	73.15	76.92	4.26
6.33023977515475	76.7897617976	76.4559023093211	1.20999999999999	81.97	77.86	14.68
6.33036294829374	76.7899023652324	76.4568846886362	1.36	82.41	81.26	36.76
6.51147669739532	76.9965924237906	77.9013727537619	8.06	78.36	80.59	4.56
7.45215002930969	78.0701049946318	85.4037940181591	11.23	82.6	85.27	5.9
7.37862856101027	77.9759614189795	86.2353937764214	0.760000000000005	80.97	91.36	8.89
10.4331399359114	76.0173090185899	87.3782246889262	8.28999999999999	81.45	86.91	44.4
12.0256991961739	74.9961080496703	87.9740731452903	0.969999999999999	75.78	96.61	17.69
12.0265021140011	74.9955931923687	87.9743735532162	12.82	66.49	92.89	17.6
15.9067217306696	72.507469740227	89.4261392802841	10.66	76.44	91.14	43.81
15.9067217306696	72.507469740227	89.4261392802841	1.23999999999999	99.01	69.5	41.19
15.9075246485524	72.5069548831666	89.4264396884742	4.75	76.37	88.59	18.12
20.1541370728388	69.7838884558719	91.0152894592557	22.6	70.1	92.91	3.11
19.4336447161382	68.5648128082341	89.8718510010658	21.49	69.2	86.43	28.99
17.4934663738616	65.2820236500152	86.7927411474448	24.03	65.56	79.56	12.46
17.1399767136598	64.6839181892856	86.2317450383786	27.18	54.04	89.82	49.76
17.1399767136598	64.6839181892856	86.2317450383786	3.44	75.58	64.88	32.57
13.9953902673481	59.3632662627432	81.2412108725507	24.86	66.05	97.16	20.4
13.9953902673481	59.3632662627432	81.2412108725507	20.88	59.51	94.7	36.31
13.4517675991044	58.4434542917663	80.3784681638377	13.36	65	72.75	29.08
12.9498403634869	57.5941920537271	79.5818981382186	12.14	56.76	74.37	5.34
12.4066135011594	56.1446154579685	82.6052299976106	21.99	57.15	79.17	10.23
12.4066135011594	56.1446154579685	82.6052299976106	26.5	63.44	75.23	28.82
10.7857696703564	51.8194675804699	91.6260418068882	9.06999999999999	51.92	93.4	2.47
13.2708026651605	50.4112671807621	91.1548097339925	5.58	22.9	91.06	47.89
17.92925916525	47.7714470427609	90.2714354668133	21.75	55.19	94.83	18.06
21.2140988479314	45.9100180463513	89.6485375888193	30.83	54.42	86.59	13.2
22.0150012811407	43.7614734032423	89.6466100602118	4.01000000000001	20.5	95.59	30.01
26.852894290628	43.0816039045195	88.6210022551059	24.66	9.13	90.15	37.86
28.736187219417	42.8169446501611	88.2217541040395	40	38.77	99.41	18.88
38.6959380521084	41.4173000979132	86.1103394541759	47.34	38.25	97.3	14.49
38.6963711828321	41.417360306474	86.1094401362648	43.96	42.1	91.03	13.34
38.6968043133523	41.4174205152426	86.1085408182695	43.21	42.61	80.16	13.5
41.5439984236867	41.813203198392	80.1968532138788	42.62	44.81	79.79	3.21
42.8615019726634	38.6714881343044	75.3274895432825	41.97	43.22	75.7	4.65
43.2480293542747	37.749776315411	73.8989226656921	41.47	31.69	75.83	27.11
44.1322399727771	35.641290197841	70.6309669700479	44.15	32.64	73.77	10.23
44.1322399727771	35.641290197841	70.6309669700479	45.42	39.91	67.31	7.33
44.5300311560802	34.6927187143914	69.160770119531	42.69	39.78	60.49	10.22
46.3866724017378	29.9907474657333	68.3725753777241	60.94	57.56	60.13	37.6
46.9996823898573	28.438290763268	68.1123359507961	49.85	30.56	58.41	44.85
46.9996823898573	28.438290763268	68.1123359507961	42.72	42.84	54.45	48.6
47.6020792460675	26.9127119372249	67.8566021062866	58.02	32.46	71.61	35.22
47.6020792460675	26.9127119372249	67.8566021062866	64.87	11.36	51.75	35.55
48.2458915938798	25.2822476746582	67.5832862353976	53.87	15.51	67.82	48.76
48.2458915938798	25.2822476746582	67.5832862353976	53.73	28.37	56.21	48.55
48.2462544789117	25.2813286634555	67.583132180656	56.85	15.49	62.45	20.36
52.1905146996036	15.2924319691935	65.9086863242213	56.94	12.18	54.17	13.04
52.194058576156	14.8735892256212	66.3541343443753	51.38	10.51	60.31	13.35
52.1989774890751	14.2921894073288	66.9724663642299	55.38	10.13	64.28	5.89
51.6304681927804	12.6399407198461	70.0478572631453	43.23	11.54	68.02	40.96
50.6855969683737	9.8938781263063	75.1592038364198	52.67	4.65	71.84	26.24

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
49.7547107866149	7.18845998072541	80.19489743189	46.38	12.31	81.64	40.75
49.0689299796251	5.1953869861513	83.9046770140383	48	4	84.7	1.79
51.3596326235273	6.92154553029331	84.3805584128246	45.09	11.7	92.12	48.9
51.3596326235273	6.92154553029331	84.3805584128246	45.57	28.26	77.82	48.56
57.538065034953	11.5773018317756	85.6640953692647	50.3	13.28	95.6	17.44
58.3702523809715	12.2043963991685	85.8369779253406	54.5	15.91	93.18	18.5
59.9990930227882	13.4318092125695	86.1753611164479	84.57	2.19	72.59	42.77
59.9990930227882	13.4318092125695	86.1753611164479	55.24	13.37	88.36	7.67
59.9990930227882	13.4318092125695	86.1753611164479	50.97	4.59	83.57	36.43
59.9990930227882	13.4318092125695	86.1753611164479	50.52	8.68	79.3	38.38
59.9990930227882	13.4318092125695	86.1753611164479	45.57	12.76	80.46	29.32
59.9990930227882	13.4318092125695	86.1753611164479	52.96	3.75	74.52	34.45
59.9990930227882	13.4318092125695	86.1753611164479	61.27	24.41	67.08	39.95
59.9990930227882	13.4318092125695	86.1753611164479	52.03	16.04	55.64	40.73
61.473427160315	14.5427929623128	86.4816461955447	57.66	15.51	81.33	35.11
64.0171461579594	16.4596125917238	87.0100907212358	62.16	16.88	79.65	21
64.8583748203695	17.0935195635046	87.1848512937953	63.35	21.49	87.32	4.65
79.318312718091	17.1888749921734	89.3133215897325	85.76	19.27	96.66	9.99
79.3183394867833	17.1885705438878	89.3123694370775	88.21	3.61	89.96	26.68
79.4998247148822	15.1244770350814	82.8569801371938	87.06	2.89	85.23	20.41
79.792522599554	11.7955253933415	72.4457855629706	84.21	1.15	74	11.63
79.6624585336014	11.7838644083728	71.0971800225124	86.49	3.97	82.84	35.89
79.6624585336014	11.7838644083728	71.0971800225124	90.45	0.18	67.28	30.09
79.1954356822841	11.7419934337361	66.254714461984	90.14	0.74	66.47	21.22
79.113874917536	11.7346810061154	65.4090281039687	83.5	4.83	59.12	37.8
78.5613097579471	11.6851407394049	59.679593539793	83.08	5.9	51.4	14.32
78.5612137637399	11.6851321330445	59.6785981951075	73.63	17.07	53.58	49.78
78.5525095539064	11.6843517451175	59.5883459255789	77.94	16.73	64.38	14.1
78.530540270666	11.6823820459079	59.360550546151	83.63	6.61	58.86	7.21
78.0975790746933	11.6889468156886	55.3093272465705	83.98	4.24	58.09	15.73
77.9147009102374	11.6917196827513	53.598134019254	67	3.94	64.95	32.81
77.9145946437392	11.6917212935594	53.597139682874	60.89	11.99	66.92	21.62
77.1136400487344	11.7038657462992	46.1025976993067	71.33	32.23	64.13	42.89
77.1135337825403	11.703867357726	46.1016033628952	79.79	30.32	50.96	35.55
77.1134275156529	11.7038689689835	46.1006090265576	86.71	7.9	46.76	17.03
77.1134275156529	11.7038689689835	46.1006090265576	86.46	7.15	36.07	18.46
77.1133212494655	11.7038705805056	46.0996146901454	90.71	5.35	36.18	17.99
69.8492789165779	14.6690051204162	41.8194289005703	78.01	26.19	31.01	23.38
69.8492789165779	14.6690051204162	41.8194289005703	56.38	14.32	39.64	21.79
68.4688955584025	15.2324679460573	41.0060664654727	85.18	6.81	41.52	43.66
68.4688955584025	15.2324679460573	41.0060664654727	83.08	6.85	43.86	42.38
66.6456860067161	15.9766904378345	39.9317784847826	66.87	17.1	39.83	1.15
62.4760985877817	15.6295747461306	37.8695377264012	55.4	11.17	38.22	24.33
59.1174102115991	15.3499659561657	36.2083606155721	51.86	7.7	30.42	17.94
54.1952822420657	14.9402017653533	33.7739202634701	53.85	15.08	32.9	0.95
53.2651136913076	14.2200192116396	35.9953535136172	56.31	21.31	38.26	24.49
50.8306865889875	12.3351652537148	41.8092644952346	44.72	11.87	38.22	20.59
49.885375716252	11.6032587859434	44.0668607338537	45.63	23.76	45.59	13.71
49.454433129419	11.2696017043403	45.0960400086362	51.98	10.99	46.43	14.06
48.2496347837449	10.3367871819649	47.9733454547905	52.67	8.88	54.93	8.37
42.9503298439947	9.90149654644285	47.464500857998	41.49	2.29	43.49	8.71
36.4700298464674	12.8582264013298	48.6279904541619	44.53	2.72	56.05	49.48
32.2629703239599	14.7777576735747	49.3833366559356	52.12	16.84	52.03	26.81
27.4902643344366	16.9553732590018	50.2402404682547	31.22	0.18	51	17.31
17.5895674499782	21.472708262254	52.017836855093	3.36	12.54	56.95	17.51
17.7637534255743	29.227304330344	50.7791629606614	3.20999999999999	36.35	38.54	37.4
18.1820285082713	47.848517774316	47.8047190597793	2.56999999999999	49.67	48.06	15.72
18.1822290653268	47.8494842009609	47.8045584471772	23.5	55.84	45.92	18.38
19.9549640258798	56.3917838879707	46.3848949589334	30.36	58.14	54.2	13.13
19.6199548191108	59.3467574599331	45.1284261428189	11.18	57.92	34.05	14
19.8949122572896	60.5059331355555	45.1875835439063	8.67	72.77	42.39	28.82
19.8951427700691	60.5069049401686	45.1876331387893	11.74	69.17	44.25	18.09
19.8951427700691	60.5069049401686	45.1876331387893	22.51	60.15	43.07	23.44
21.0176480130133	65.2392038967384	45.4291413802946	21.39	62.71	50.33	35.55
21.0176480130133	65.2392038967384	45.4291413802946	30.85	54.39	47.15	33.55
21.4850996264926	67.2099035156045	45.5297141930359	20.35	68.75	46.32	2.07
25.0896647571362	67.4321597142732	43.8563139350778	23.78	67.37	54.34	23.49
26.2846541296997	67.5058423291201	43.3015465424534	19.65	58.2	51.17	41.68
26.2846541296997	67.5058423291201	43.3015465424534	25.24	60.77	36.77	37.65
26.285559737653	67.5058981688144	43.3011261186629	35.37	65.99	46.58	42.77
26.285559737653	67.5058981688144	43.3011261186629	28.77	62.05	46.68	31.17
27.9717458070774	67.6098677669034	42.5183231994792	28.86	67.84	42.89	0.99
26.5015668010173	66.3303439535101	37.8854140473764	25.01	63.12	37.19	28.84
25.4980889138826	65.4569986797896	34.7231991723942	22.17	64.94	33.7	3.52
28.192631448739	65.1779973654099	32.7769837780675	23.19	66.22	32.78	5.11
34.201612995962	64.555808725945	28.4368138805422	24.49	66.27	29.11	27.9
40.6791782672742	63.8851014680828	23.7581951440674	31.99	67.74	24.97	46.93
40.6791782672742	63.8851014680828	23.7581951440674	42.95	44.74	22.67	47.83
47.7697677339847	63.1509198767748	18.6368006747297	49.78	61.48	16.59	3.32
46.0656407074858	68.262524939802	21.874581170039	54.05	68.39	12.29	14.97

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
46.0656407074858	68.262524939802	21.874581170039	47.3	55.25	23.22	13.14
44.9850576598204	71.5037817629163	23.9276500106146	40.14	85.47	20.22	26.51
43.0638364425513	77.2665701658922	27.5779011616406	35.58	76.06	26.53	8.78
41.8642911939774	80.8646594495059	29.8569939467738	38.99	86.42	22.62	12.82
40.5222463649937	84.8901825539957	32.4068307765472	24.67	93.34	35.07	18.16
41.8078214795335	85.1248024576275	32.8367863863414	40.13	86.48	38.33	6.39
43.0130050921863	85.3447508358975	33.2398552607415	38.36	90.43	43.39	47.27
43.0130050921863	85.3447508358975	33.2398552607415	46.89	94.85	27.74	49.64
47.8112017587361	86.2204309377748	34.8445932812098	45.57	93.71	36.64	20.17
49.2302242022245	86.4794052695168	35.3191797336773	49.11	94.31	36.24	17.31
49.2311586750745	86.4795758126045	35.3194922645522	50.91	90.3	36.65	4.38
54.8061124450611	76.1162219826	34.6933918405603	48.89	93.1	33.02	36.74
54.8061124450611	76.1162219826	34.6933918405603	49.91	91.9	29.51	43.61
60.1599540588279	66.1638938083118	34.092123750112	65.16	40.78	60.78	37.77
60.1599540588279	66.1638938083118	34.092123750112	85.02	48.75	32.58	30.39
61.2998509168834	64.0449251729634	33.9641069007871	63.26	50.77	40.6	14.97
65.3068248474982	72.8970937190844	21.9102554824094	78.98	97.83	29.61	29.46
65.3070836521438	72.8976654678306	21.9094769430549	85.6	88.65	32.39	40.1
69.9012653016175	83.0470905149053	8.0891891887683	74.49	84.46	5.13	5.64
63.0246527462428	84.3769109346291	8.23886781291166	44.33	87.3	2.27	27.93
63.0246527462428	84.3769109346291	8.23886781291166	60.12	71.05	6.63	24.74
55.5813346077573	85.8163209204555	8.40088020937102	70.23	90.73	4.71	37.84
55.5813346077573	85.8163209204555	8.40088020937102	42.78	91.87	12.41	35.26
49.5368751210431	86.9852135693114	8.53244606601335	47.56	92.03	4.61	9.48
44.0389634275755	88.0484142050897	8.65211763658119	48.25	85.26	10.69	49.96
41.5552351632034	88.5287245791772	8.70618080480472	41.11	86.33	11.14	3.31
28.6033634089788	91.4300862571013	8.5672267507471	36.6	82.94	12.12	44.77
28.6033634089788	91.4300862571013	8.5672267507471	39.42	71.54	17.38	47.2
21.7227380171634	92.971422124755	8.49340658333697	25.62	68.98	3.75	43.08
21.7227380171634	92.971422124755	8.49340658333697	27.4	59.84	3.43	47.68
18.5214756604783	93.6885400873075	8.45906008779626	24.2	92.42	34.13	40.35
18.5214756604783	93.6885400873075	8.45906008779626	28.82	81.78	35.71	43.64
9.46552076422333	95.7171755595087	8.36189594731836	5.54000000000001	99.29	6.96	5.49
9.60826037292787	95.1703843501133	8.6233289416846	0.620000000000005	84.95	30.66	36.73
11.7243064700058	87.0644657023267	12.4989485013079	8.59999999999999	80.56	11.38	41.43
13.7330460761446	79.3696004155682	16.1780374256582	12.07	80.14	22.08	6.18
13.8070918091124	79.1733392553655	16.1740330169761	21.1	78.12	20.54	28.48
14.7728146526555	76.613652729705	16.121806752769	4.15000000000001	75.92	20.91	36
16.3409028891076	72.4573738370958	16.0370049095666	4.20999999999999	66.53	21.42	21.01
18.3536746882936	67.1224438213039	15.9281552741144	19.86	66.11	18.19	2.9
18.059054228872	66.0452370820342	14.4830358087041	27.64	62.78	13.86	15.95
17.8478621287086	65.2730667168988	13.4471361925401	27.36	59.94	13.4	22.06
17.460598677969	63.8571359676555	11.5476042869412	22.65	62.2	11.71	11.7
17.3488923875127	63.4487095754217	10.9996829882756	20.64	65	8.49	4.42
16.1383406980064	61.0660507092136	8.69821599873105	16.79	62.67	10.23	4.76
12.6775119873854	54.2543010698479	2.11858505015163	20.56	61.44	16.14	30.47
12.6775119873854	54.2543010698479	2.11858505015163	15.54	52.83	23.01	26.09
12.1939289514862	53.302492540847	1.19921063537462	11.46	53.07	0.5	1.04
27.8099730583763	47.5973548338948	9.9588567385548	24.47	65.24	5.9	32.36
27.8099730583763	47.5973548338948	9.9588567385548	43.21	42.35	12.25	16.43
28.8109424928847	47.2316624403293	10.5203394296213	37.85	53.76	4.29	19.4
28.8109424928847	47.2316624403293	10.5203394296213	45.6	41.81	1.51	23.25
33.257781613431	45.6070621580994	13.0147443512972	51.12	47.54	2.22	20.96
34.59649859075	39.2370979419907	28.2368061196663	42.59	39.16	5.9	36.88
34.5965794538471	39.2367131745172	28.2377255842665	45.71	40.8	10.89	34.61
34.5966603168623	39.236328406733	28.2386450487437	45.6	43.93	17.79	19.94
34.5967411799984	39.2359436392222	28.2395645133248	40.4	40.19	35.32	32.32
34.5968220430836	39.2355588715919	28.2404839778606	41.07	43.98	42.76	16.59
28.1738507062996	28.6579056906136	23.590859692566	42.56	42.28	42.23	38.94
28.1738507062996	28.6579056906136	23.590859692566	40.11	39.6	39.05	36.03
26.7447114732468	26.3043310849946	22.5562978311226	25.65	24.53	24.47	2.83
24.6352371807843	22.6896196369967	7.6623304513979	27.74	25.63	13.28	7.06
24.1966822982097	21.9381293004095	4.56590838049025	23.55	20.83	14.19	11.78
24.1965459452782	21.9378956539228	4.56494566703474	19.48	4.75	3.34	45.94

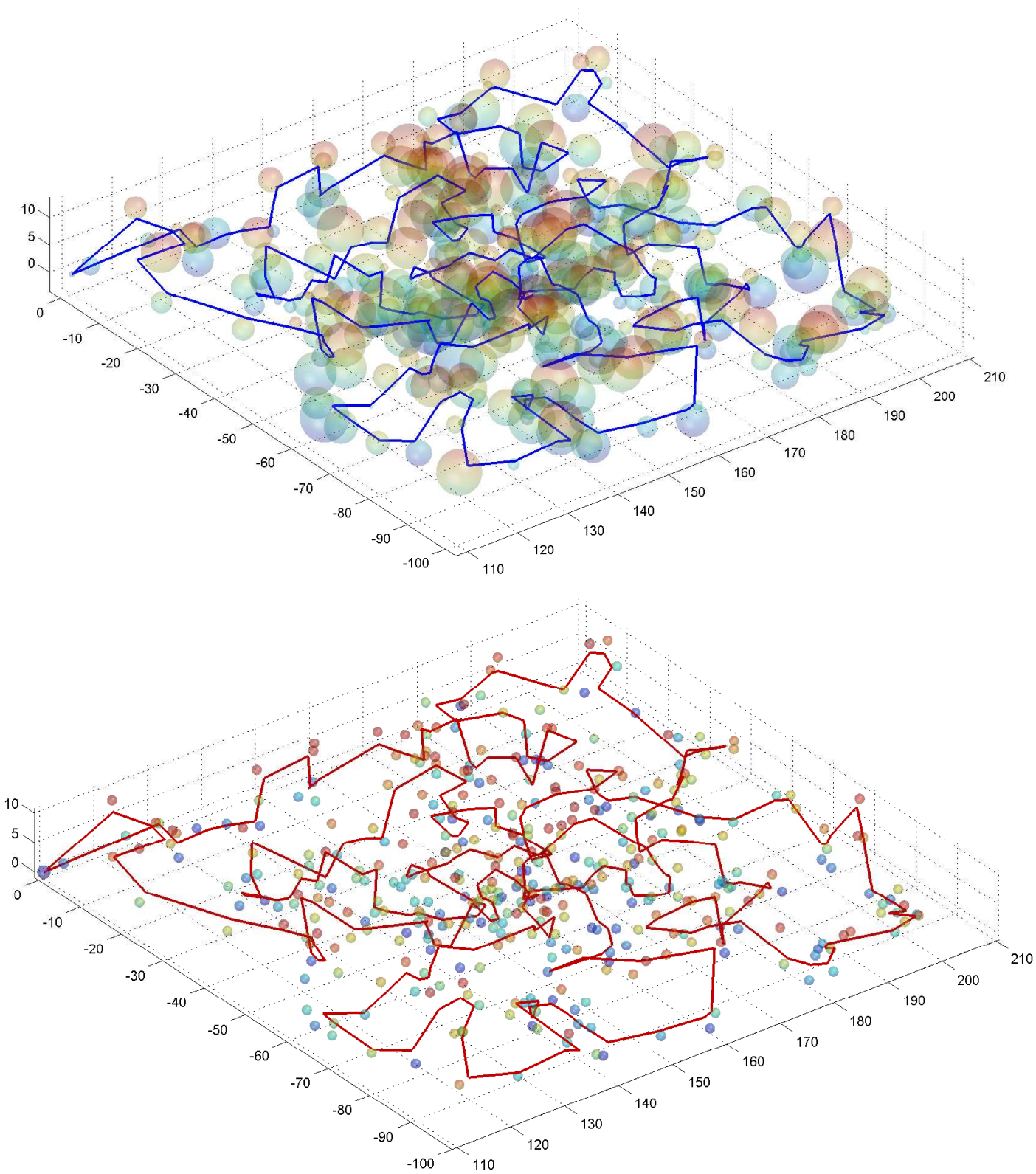


Figure N.94: *team*4_400, arbitrary radius, 3D, Euclidean, Length = 1276.8955588

Table N-97: Solution for *team*4_400, arbitrary radius, 3D, Euclidean

Total distance: 1276.89555880446 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
3.83388710823007	1.47192628298507	1.236168853002	2.34935	1.70725	1.418964	1.5141472
11.1858895303066	4.29454606862	3.60669155154527	12.34295	3.720825	3.558355	1.2923936
16.4918468123294	6.3316373513354	5.31750331098015	16.533825	6.314025	5.413684	0.10641
18.3181962860851	8.44868780678404	2.43708303262041	17.13825	10.254625	1.09375	2.541304
25.1258371260509	6.71582815826854	1.41726034568256	25.090375	4.2535	0.574579	2.6027734
28.310925509781	7.56014841614121	1.50801987845076	28.471925	7.124375	1.494169	0.46477
32.0590444314102	9.35628348785173	1.64575228567934	32.636425	9.71905	0.854223	1.0447423
32.7837882269062	9.35380192081008	4.97497981578402	32.5307	9.603625	5.102178	0.3776832
34.3299717581526	8.52772081026811	7.82527149262265	33.240325	8.160175	9.454403	1.9941137
42.9258019354863	7.95276618946338	8.28212108455807	43.2503	8.7931	9.432262	1.4609189
42.9267930741377	7.95263683676564	8.28209088433309	44.6523	7.1683	9.495828	2.2507146
41.8976185626437	9.82075769401708	4.3868331836021	40.4237	12.94705	3.760655	3.5125829
42.2526261342103	8.98252831180734	3.60150468386087	40.718225	8.45085	2.325605	2.0651849
46.3710701769772	6.46931660155851	2.59686493081567	46.59205	4.24755	0.914106	2.7958463
53.8435692408741	10.8422557665184	7.74624587456834	54.0981	10.209075	9.589747	1.9657569
55.4012137232444	12.6122272246426	6.9888096470351	53.686425	15.19815	7.953267	3.2492576
55.8068186570184	12.8619601554698	6.78549398877348	56.7601	13.3255	9.545614	3.6207209
55.8068186570184	12.8619601554698	6.78549398877348	56.680125	15.845675	6.62366	3.207153
57.5337037369136	13.9252114846606	5.91986671755603	58.962525	15.549225	6.884037	2.3682429
59.1262130159587	14.9057265960325	5.12159747378562	59.666825	17.15215	3.601254	2.7658857
59.9086686507006	13.6928626439574	5.83578866037112	58.66755	14.455925	4.659081	1.8727735
61.7846891886819	10.784892145315	7.54813800362238	61.5062	10.2838	8.047741	0.7604293
62.0548910690961	10.7995023835472	7.444490175866	62.944875	12.9098	8.420704	2.4896628
64.146572199452	9.84290471032046	5.95866109389836	64.181275	8.885925	4.857898	1.4590044
67.3879718055758	12.1086940250904	7.94200253211357	68.784175	11.8632	9.776368	2.318307
66.2727628438573	16.7513319557572	2.90905590104961	66.273425	16.5814	2.463993	0.4764014
65.9658025050609	18.6128748946676	3.08802534124102	65.789175	19.559925	1.053267	2.251298
65.722688093471	20.1713300916015	4.67853975795881	62.8697	20.929125	3.670375	3.2881032
65.4418711392447	21.9714720023841	6.5157126063524	64.881075	21.1972	7.607995	1.4515751
65.7941890499742	28.421110990504	9.34609399930943	65.757275	28.49595	9.473031	0.1519096
68.1956030457115	29.2786657024963	4.31901483721911	67.6691	30.587025	1.957775	2.7503569
71.5597585855713	26.6105505297138	6.23256805205537	68.792375	27.90175	4.368368	3.9463741
75.4457267448954	23.5285888465356	8.44293004870961	75.41995	23.365625	8.701179	0.3064542
78.5040263617537	23.7323500418666	6.27010197053276	76.27055	23.463675	8.429053	3.2776576
80.6088033274148	23.8725820619449	4.77472250845118	83.1155	24.690275	4.773978	2.6366931
77.6918726621741	22.0274613919091	2.33078903571461	77.750225	18.79385	0.265085	3.8375488
76.9903086046549	21.5836831865529	1.74298776583924	76.538875	22.08605	1.37194	0.7706109
76.2508821439411	18.4248549663912	1.09893032670281	77.472675	18.057475	0.141489	1.59513
75.9782688452849	17.922887569899	1.10125747540376	75.3053	17.780525	0.662947	0.815641
77.4109410980592	15.5854718773407	3.10342273799037	77.464	15.628175	3.533669	3.5672263
78.4573309277291	13.8782789315044	4.56575671337112	81.52085	13.687775	5.204149	3.1351213
76.1293515092529	11.8216635164883	5.7486856757371	76.1173	11.832075	5.793623	0.047676
72.1484011892302	5.7005736330563	2.97163092629801	71.829525	5.85575	2.05089	0.986674
71.070100118464	2.08071946570596	4.34182314615194	69.817575	1.306825	4.894499	1.5726355
76.4215464166433	1.32834271930452	3.20957873507733	77.335225	0.00945	1.073545	2.6715027
77.3596515127615	2.00160380281001	4.32505749913241	77.882675	4.11235	4.515775	3.3455297
80.1012437039609	3.96919542629533	7.5850200267572	79.6523	4.144625	8.31435	0.8742129
81.0731111482262	4.2465548998372	7.67419935285616	82.33615	2.420325	8.700274	2.4460605
87.3078248186957	11.9139829311384	5.79545889621911	87.3023	11.937375	5.783418	0.026883
94.0613150060446	9.47405541857121	8.63915771215568	94.09005	9.358875	9.999877	1.3658877
97.4156192106173	8.50952522177451	6.86880353264034	98.6909	7.723575	8.237085	2.0288551
98.8275958282816	8.53676529255683	4.01401055867515	99.82775	8.49955	3.828547	1.0178851
96.0939321271683	8.73189289205084	1.48484834648503	94.81355	7.137025	0.426722	2.3027404
96.3044815213101	16.6711339547881	1.08306493275222	96.9141	16.74635	0.695888	0.7260841
93.7631970999347	27.3640812036787	2.32422205884921	95.640625	28.68455	2.397586	2.2964659
91.9744816608622	34.8904504080054	3.19782652195673	90.921925	35.308625	2.502062	1.329223
93.0144286785927	36.5139429650127	4.49962078005582	94.997925	34.851	5.629957	2.8244109
94.6295268736948	41.6082914325079	7.25259367817281	95.9689	41.808	7.756384	1.4448559
94.4494798339508	41.7872641196971	7.27585189034577	94.807975	43.25145	7.382414	1.5111964
91.9660719531852	40.9950866337987	7.32284640717527	92.049975	40.056175	5.962344	1.6551621
88.3268759171528	40.3157084565601	8.06926188529366	87.349525	37.1432	9.692858	3.6954146
86.8437757723578	41.7369759900184	7.56521181528811	85.82305	42.253575	5.699647	2.2900333
85.2275911420501	43.2857800028554	7.01593141539529	86.306375	44.08645	5.63357	1.9276333
84.4468901247299	43.9221651414354	6.85715957437209	84.710775	44.260425	5.70064	3.5456061
82.7481770599743	45.3068643206328	6.51169170002808	82.166	45.384	5.835084	0.895923
82.9781971242741	46.436854535031	8.40898203349116	83.247325	46.458225	8.799584	0.4748225
79.5728349927455	48.3363545983059	6.51816672485597	79.556325	49.1563	6.397826	0.8288938
78.7013573409733	47.6807616359371	6.19083947278216	80.003925	44.278875	7.256115	3.7953033
75.7115463122038	46.7805538179878	4.89053067968943	75.70595	48.354275	5.510084	2.7185379
74.2464750049694	46.3394326085161	4.25335153414295	74.018375	45.692475	4.261669	0.6860415
72.6727767218239	48.5970665291553	3.06105941413499	70.38585	48.289775	4.820236	2.9015796
72.3753338901295	49.2042251384493	2.66010251941722	70.163125	48.595475	2.681471	3.4643229
71.5500377982616	50.888872225434	1.54759135435847	70.20275	51.264575	0.287703	1.88246
74.2713260686474	52.6555154033787	3.50068995322867	74.97575	51.8098	4.043794	1.2273588
75.4305952313841	55.6388873911365	4.26845493618742	74.7548	56.66355	6.610021	2.6437784
75.7952362483706	56.5772860924613	4.50995109133872	75.12385	56.355025	6.655597	2.2591934

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
77.654326196807	61.1754993575559	5.42092643326325	78.897475	61.3791	6.581026	1.7125137
75.3395975553671	66.3491322013401	2.1953293179174	75.320425	66.338125	2.101527	0.0963723
75.1690976707566	67.2434250153009	2.59696579385253	74.919425	66.332825	2.561604	3.2122786
75.1086179927174	67.5606480567131	2.73943411618967	74.758025	68.76505	2.771423	2.7316723
75.1086179927174	67.5606480567131	2.73943411618967	73.97555	66.71955	2.504	2.6718873
74.7340263568039	69.5254294670479	3.62183784986163	72.106325	71.513625	4.730422	3.4765924
75.8059692538817	69.542157179121	3.52623567722261	76.3481	68.05155	4.299693	1.7646676
79.914866821103	71.7165731061172	2.00288875869057	82.150425	71.4598	0.532397	2.6881218
75.3390320055475	76.8722131070609	7.07619300613661	75.94035	77.0935	8.244154	1.3321727
72.2123566315095	78.5730126302856	6.82355406703326	71.96685	79.285825	7.324255	0.9050284
69.3111589446324	76.3776175434694	3.19816259608603	69.349625	77.516575	1.446757	2.180516
67.9658732276432	75.3596126570803	1.51706814085422	67.97015	74.943825	1.28227	0.4775226
64.9591590288616	79.6084019136485	1.49874037674394	64.2971	80.8087	0.617407	1.6296583
65.249930897365	78.4295829334158	4.04526220951946	67.096325	78.407125	5.545343	2.3790582
65.6760592147257	76.7020149623311	7.77720889772489	65.721375	76.70655	7.829144	0.0690749
62.9661189696826	75.0497138140632	7.20202293253738	63.106325	74.44845	6.994666	0.6512855
60.6807995518705	75.3538731930858	7.30308313475162	60.77085	76.3761	8.633151	1.6799218
58.327117851283	75.4875097878083	7.175469046594	59.360575	77.3659	4.085186	3.7611478
55.5042795539849	75.6477839940091	7.02241816099337	55.289875	75.9977	8.05121	1.1076205
53.6710247919279	75.5597175601804	6.33108905142554	52.726325	74.9715	6.042198	1.1497459
55.4815958035665	78.5913116853687	6.64847060015494	54.01775	81.8894	8.14471	3.9555254
57.4037686933405	81.8097703077738	6.98541705418091	56.13655	83.451075	6.561985	2.1163693
59.9637009498858	82.7268611390987	7.61438569222983	60.2356	81.956375	8.121308	0.9615343
63.9872203380636	85.1472835249775	8.10649074253599	66.686275	83.4025	9.789982	3.6281274
65.201620230083	90.699796757335	6.31764560985761	66.508125	91.303225	8.984758	3.030605
65.9065420689111	94.0401447502731	5.17899151353027	64.46975	94.91155	5.12346	1.6813097
68.5230744320604	96.1065565465287	4.14966748482247	67.679475	96.828325	2.179153	2.2617553
70.7408275412504	97.3400543487342	4.13642724970694	71.306475	97.9771	2.882666	1.5158171
71.9514025801526	97.4334353704763	6.37812836481127	72.222075	99.2555	9.348041	3.494791
72.4238564502762	96.3538197739557	5.7233397783123	74.44305	98.0205	8.628544	3.9109049
73.4748641221542	93.9521359981115	4.26671452914499	72.374675	95.981125	5.386278	3.0465832
74.3186611785774	92.0239539412862	3.09726884509613	72.88955	91.55335	2.086078	1.8128248
75.2091898471092	91.0990275417269	2.75192292307733	75.589675	88.707575	0.958209	3.3878078
75.964666347549	90.3143699912461	2.45895015824411	75.8385	89.39705	2.129044	0.982971
84.243007290783	95.441848978843	4.2084706430609	84.77555	95.283075	3.666391	0.7763126
85.1999490171938	97.1745139818948	5.93793972135937	84.9479	97.513325	6.355392	1.6436369
86.0294920266002	98.6765068811463	7.43716214823266	86.192975	99.203225	7.750239	0.6341733
85.8785914586283	97.6120554584566	7.10402673187488	84.730325	97.611875	9.216212	2.4041303
85.2523240262882	93.1943626155425	5.72144350180619	84.25115	92.664475	5.874601	1.1430606
87.5511380059089	91.7999387560702	4.4250834414718	87.858275	88.334025	4.100051	3.4946441
88.2912556409037	91.3509950782623	4.00771199941297	90.195175	89.03695	6.180904	3.7016857
89.9392104605752	90.35137151716	3.0783875733248	89.0595	90.291	3.16566	1.201812
91.4359276638905	89.4434863141322	2.2343499000535	92.685275	90.310575	1.584168	1.653919
91.4535897846502	84.1182870697324	2.04660796386976	92.480625	84.1266	1.286063	1.2780059
91.3831127258326	81.2095995720599	2.00341637356299	91.03755	80.9252	1.385966	0.7625888
93.7646004791319	76.194256401889	6.46109813587502	91.825175	77.123475	9.251483	3.5229343
94.4055312399222	75.1500987716774	7.03886410683029	94.404	75.185075	7.131673	0.0991926
97.7025456664376	69.2356054631408	8.4356881626859	98.93765	68.322275	8.948906	1.6195826
91.9892470542312	70.3078269798576	6.08599622584935	90.725625	70.444425	7.760216	2.1020018
91.3042935554471	70.4649018258375	5.18181088199121	90.314475	71.662575	4.957094	1.5699234
91.4341389875556	69.8062715950815	4.652304907576	91.08095	71.69145	1.548548	3.6485541
91.7153689641565	68.3702861266694	3.96495819063558	91.5733	68.725	1.37953	2.6135119
93.1628404789409	61.5598605718987	5.01956607864154	92.124775	61.791725	6.696503	2.9459173
93.9992714697682	57.6244108078083	5.6289775612926	94.377175	57.5521	6.223661	0.7082996
93.5201471906973	54.7722459607736	4.32386474292512	95.486225	52.746525	3.57388	2.9208705
86.1772334409999	54.5608083305968	3.66644754521253	85.3769	55.416	3.88436	1.1913741
85.5825983891277	50.7637450646062	2.36691012711284	83.835575	49.221375	2.182226	3.0061312
84.9971115648114	47.0250986522491	1.08736575667621	85.726975	46.8848	0.120938	1.2191665
83.5516148368888	44.3658638889585	1.434293831733	83.98185	43.958725	1.112514	0.6740969
82.0964955309237	42.9611971847021	2.01547755842013	80.128375	42.2928	0.877447	2.9296913
79.6543349083215	40.6037123191126	2.99089176571794	77.736325	41.257125	4.306668	2.4159837
79.9088709582014	38.7797183431066	2.43502659452874	82.455325	37.974875	2.274181	2.6754574
77.1909613812321	36.0343692154165	1.4908135471277	77.267275	35.3236	0.141297	1.527158
76.6350432931399	35.8616634433531	1.97678857304811	74.186175	37.664625	1.593253	3.0650817
75.591102295619	35.5373444480084	2.889386035351	74.4851	34.7013	1.961771	1.668137
74.2370675963431	35.592387756451	5.90310894680413	75.0516	36.4713	6.125794	3.1806421
73.3091875047515	35.6301075943137	7.96832423080861	72.419975	34.998125	8.679512	1.302263
76.2576610559284	39.1407913970895	8.29577336448694	76.5757	39.19325	8.28894	0.3224087
75.4351824043857	39.6424548045302	8.39579895591758	76.046775	40.829925	8.304908	1.3388025
69.4443250485538	42.3050310660724	9.1348676147751	69.4258	42.661825	9.2188	0.367001
65.6538381187073	40.1121611554372	8.69421463780752	64.48255	39.62755	9.929967	1.7702677
64.7949065874956	39.615252658484	8.59436183708319	64.627025	39.598675	9.161247	0.591454
60.9252121620588	37.1538990028045	6.52343719398356	60.313175	36.907775	7.157937	0.9152904
60.3599644809475	36.5722371251276	4.7282885460103	59.92645	35.207	4.720771	1.4324328
60.1748002210806	37.8314977828992	1.98041281676124	59.82755	37.21565	1.143092	1.095882
61.4461094864698	42.8356213272986	1.06041054773194	64.04505	44.910675	0.523975	3.3686945
58.7981778514433	42.7432997474161	1.27365779380981	55.460475	43.213925	0.442759	3.4716194
57.6878744597263	42.7045881153866	1.36307455482024	56.281125	43.406775	0.357518	1.8663211
57.814817770609	41.3147878079072	3.42933693852276	57.24125	42.40615	5.476964	2.5354041
57.8848263913392	40.5483173468372	4.56887389898797	58.980725	40.369175	5.096252	1.2293142

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
54.2635063371656	38.6815332316102	6.4273856556491	54.125425	38.6935	6.380106	0.1464412
55.1107840656171	37.2872272176216	8.59434248849194	55.894525	37.29925	9.136585	0.9531114
51.7989180502498	35.2074301070057	8.58204856933076	53.51985	31.610925	8.734185	3.9899375
49.3160235389923	34.3502341081203	8.55095638889151	49.014675	34.9475	8.94848	2.6167984
46.1944628133556	33.2725448208658	8.5118670457448	43.312375	33.022625	9.818329	3.1742295
48.464855211512	32.6172819232148	5.9472544497362	48.825175	33.4678	4.421401	2.052047
51.3345031066598	31.7890667569745	2.70572890135869	49.821325	32.088775	0.505787	2.6868713
52.9459811677759	31.3634711353552	2.01231573574482	53.08505	32.116125	1.177184	1.1328164
56.507152559222	29.018976465954	1.85887441755222	59.25755	30.092125	1.789844	2.9531507
55.894234314829	26.5717562427247	1.83637500222759	56.18475	25.5187	0.990177	1.3818024
55.2426766223928	26.6780171788393	2.86088391180515	54.7913	22.79115	2.590985	3.9863921
53.6150516418703	26.9434622222279	5.42016076125467	52.727475	27.05645	3.021539	2.9182147
52.7112672165894	27.0908582354574	6.84127015882484	49.48335	26.949275	8.082485	3.4612295
54.8699297000104	27.4366936718909	7.45280601674128	53.429725	29.230175	5.838259	2.9604889
57.1050811857173	27.794782985359	8.08600997738561	59.6161	30.5374	8.744708	3.7763801
56.8663373360538	25.4087934351503	8.07120139139175	57.8987	27.066925	9.346556	3.9092312
56.6540843978509	23.2875471541615	8.05803564586952	58.5251	25.335175	8.213376	2.8927993
56.4533770901061	21.2816896276672	8.04558680719916	56.707375	20.9848	8.081779	0.3923879
54.7258266895653	21.3616876541364	7.81340715803421	56.46315	20.9863	9.377425	3.1469731
54.1039189567721	21.3904864713207	7.72982403944494	56.145325	18.970525	8.712859	3.3151033
48.5388795780584	21.6481894053304	6.98189516173615	47.99765	20.639375	7.512605	1.2618593
42.1781385184548	26.8501014619253	3.26271442153875	42.344525	27.231625	2.735005	0.6721026
38.8821943566217	26.9750816751739	4.43941157225448	39.217825	28.48755	6.718496	2.7558001
35.3730167605634	26.3876173008751	4.55894747238171	33.989075	25.3104	7.891632	3.7659631
34.0737218453745	26.5565858366049	3.10143525506336	34.098725	26.483975	3.010898	0.1187202
29.7146412265126	29.4491127096365	2.18775116338754	29.46595	31.229925	1.232208	2.0362226
27.6805566013178	27.5849517539396	3.55834844427325	27.65685	28.081275	4.203862	0.8146082
26.2367491658205	26.2531653353541	4.52076649435822	28.216025	27.287675	5.4487	2.41843
21.6793435905804	22.0493564804184	7.55865918620468	20.9892	20.7572	9.683969	2.581261
21.3403937496784	22.4315776093799	6.0194630784464	21.1268	22.989225	6.335554	2.3000479
20.6417191233428	23.2194480534015	2.84672425385004	20.686175	21.9667	1.804567	1.6301674
20.1339264259854	25.1487535507629	1.94421409757573	20.995625	24.282225	3.380339	3.5058599
19.6521654813792	26.9791547960853	1.08797011656813	19.9845	27.40155	0.660019	0.687027
16.3095245864505	27.1180736961413	2.74016383311264	15.2685	27.387025	1.441223	1.686213
15.7741266209399	27.0904977493698	3.40518069658297	14.358825	25.883825	4.414924	2.1162985
18.4287549407612	32.2812284342891	3.44310064450341	18.476575	32.50015	2.42942	1.0381531
19.4200208353041	34.1085085443272	4.35496491364806	18.77905	36.01655	4.45503	2.0153111
22.8330832961834	32.4422506150277	5.71820227545404	22.793175	31.8095	6.267813	0.8390697
25.1446348531872	33.2962682867735	4.9224389657376	25.49855	33.45475	4.180424	0.8372327
26.5194783084715	33.5810711095659	9.44048104125302	26.51415	33.575825	9.461971	0.0227537
30.3632468396645	36.078383190235	6.05647759503576	32.29465	34.1886	4.533526	3.1017705
31.0784030386336	36.543023102008	5.42686335256664	31.8731	36.0461	3.846108	1.8377332
31.0784941323238	36.5438360008377	5.42743858941587	30.2641	36.115	4.866777	1.0777196
31.4488211688546	39.4796217390213	7.51875676431353	31.7652	39.5927	8.134315	0.7012804
28.2995867466402	43.0907857058371	3.7076262344282	27.2689	42.18555	1.296271	2.7742388
28.2701758656927	43.3352061548489	3.78954527717837	27.251975	44.47235	3.840979	3.7272714
28.1135724051124	44.636664208571	4.22573621657737	28.231575	43.86655	5.176578	3.8908642
27.8819068103617	46.5619317838731	4.870999675276	26.549225	47.5983	5.827804	1.9405088
30.9813309770112	47.0973471390354	3.45419045983306	30.804475	50.3614	3.667235	3.2757758
31.9093478538636	47.0941851421312	3.02341584863948	31.24645	46.9846	0.258005	2.8458636
33.2307535134657	47.1102600342154	2.97543452372205	34.241775	45.041325	3.482667	2.3579528
33.960331776319	47.9343841517893	2.73587237787803	31.916925	49.63125	4.365548	3.3038515
35.1886989586452	49.321935272111	2.33252906688533	33.276075	49.648225	0.482877	3.6486347
35.6152733114147	49.8037892943249	2.1924601286817	34.822	51.041775	1.965488	1.4877525
37.6809227427022	50.3167276054385	1.92999284198232	37.32375	47.164775	1.301487	3.8061293
39.4986335321099	50.7680979203525	1.69902924893371	38.966475	52.166125	2.317575	3.6894736
41.2027436857099	51.1912589763723	1.48249988068759	41.3638	51.811825	0.610596	1.0822466
42.9924827147147	50.7796683998836	2.51047912081016	44.413025	51.821425	3.225875	1.9013123
42.9924827147147	50.7796683998836	2.51047912081016	44.549375	51.8385	4.639375	3.4753711
42.9923683045807	50.7786750087932	2.51048831119445	43.054225	52.07985	5.94327	3.6716308
42.9923683045807	50.7786750087932	2.51048831119445	42.80595	50.969325	5.199786	2.8313705
42.7539210935679	48.604567289489	2.06312774951522	43.10885	48.272275	1.575949	0.6882847
41.7909108570913	47.9880241968606	2.89440907396931	43.5222	45.0811	1.214529	3.7775081
40.2537650149035	47.0039045806117	4.22129042128522	40.7628	47.39015	6.093812	2.9963842
38.1503862161241	45.6572683330093	6.03695029708426	36.34605	45.558575	2.970524	3.6813731
37.0536785833123	44.9551283953674	6.98364031751557	35.77655	45.5234	7.314779	1.4365385
37.3849968451555	44.0652134859679	7.31094600401785	38.0514	44.25295	8.429467	1.3154571
37.4176234994425	40.0468209404258	6.42852623625158	37.4986	37.94785	9.024015	3.3389816
37.3839889318102	39.0354544516022	4.2059601658321	35.05695	38.887125	3.774047	2.3714259
37.5423351116599	38.8772839313416	3.86583122342379	36.0198	39.389875	2.90819	1.9831699
37.6684262509281	38.7513326745381	3.59498638562987	37.4906	38.735475	3.373994	0.2840973
39.4279626863085	38.1031340558507	3.2726789025078	39.47365	37.672175	3.042346	0.4907813
44.0442074933602	40.7217779618064	4.74210344794412	45.015525	41.584025	2.803346	2.3336041
44.4362950187276	40.890136923476	5.25734331219279	43.242475	40.8624	6.853519	1.9934273
45.9747429971345	41.3327284561246	5.85602098493635	44.89855	41.381	7.163397	2.1076985
47.1767295357865	41.6785243186328	6.32376650360547	49.0937	40.0849	6.606023	2.5088011
47.312601463393	44.9693665546309	7.07958946815824	46.718325	46.79505	7.837302	2.1962207
47.4366423375002	47.9736507289897	7.76959713922674	47.35915	48.071	7.780887	0.1249376
51.0553515069159	47.2270819387783	8.09371349201015	51.464375	46.273425	9.764247	1.9665818
51.2433551232807	47.2642767287339	7.96773561066226	52.0729	45.66175	8.843258	2.0135272

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
54.9413321149225	47.9958955267494	5.48978641855872	54.870925	48.098925	4.394617	1.102256
56.6876182175854	48.128357005851	6.40029888387182	56.4549	49.1402	6.740043	1.0924331
57.5806868097867	48.1637392816863	6.85145112066187	56.7604	48.090675	9.498427	3.4617573
60.3650442046695	48.2740517860889	8.25802673143608	63.06625	46.073225	9.963062	3.8790845
60.3650442046695	48.2740517860889	8.25802673143608	60.81405	45.86495	6.053591	3.5607331
60.3650442046695	48.2740517860889	8.25802673143608	58.59885	48.807625	9.719414	3.714657
61.3776354832565	48.3141695289157	8.76955782078765	61.33205	47.81805	9.220678	0.6721027
64.0908310795363	49.3567938683583	9.24320129201648	65.024675	48.473875	9.912197	1.4488497
66.5625666996526	55.9732780865787	7.36575986904888	66.095725	55.876775	6.205798	1.2540995
67.3556235254005	57.930230805035	6.98133626262448	68.048425	58.486425	8.31929	1.6060654
67.5204261915464	59.210581169558	5.63355297199576	67.662425	58.9604	5.24713	0.4817437
67.3224416475043	62.4075690278511	4.54162082068355	68.033375	62.578975	2.177441	2.4747025
66.7071490652147	64.4976641753993	5.3802536918853	67.8084	64.88	6.618444	1.7006027
63.8347482746412	67.9158497827989	5.08399759938321	63.9561	69.944325	5.325084	2.046353
62.0828612025309	66.3567080450036	4.52000004038807	61.692525	66.479075	4.622593	0.4217361
62.2720982454754	63.7752900888035	3.24476972421971	62.481725	64.778425	2.883198	1.7172899
62.4576597959267	61.2440112963607	1.99430828957186	62.138225	61.218175	0.933898	1.1077798
63.2205578020257	59.0959234505375	2.90705537888909	63.564825	58.6141	2.885043	0.5925861
62.0882669204255	59.9784276686932	3.6044207329299	61.732525	60.28975	3.358698	0.5327791
62.0883524325526	59.9782849074163	3.60540678916267	62.1796	60.091575	6.795975	3.7726122
62.2753420962919	59.6661178260907	5.76161291293726	63.23165	61.378	8.16167	3.0992482
60.8780315106551	55.9949213782829	5.30546168339598	60.964225	55.767775	5.605242	0.3858666
60.2738310281958	55.4356224982651	4.49251946370288	61.751375	53.5726	3.689653	2.857714
59.7475610331299	54.9484628608735	3.78443157982956	61.491825	51.7088	3.765748	3.6794322
58.6116002694641	54.6809193165449	2.63806625791818	59.0369	52.162425	0.980631	3.0447964
58.473178934073	54.771447593715	2.59649047199444	59.205025	55.76	1.820366	2.6513752
57.7802276254502	55.2246414573188	2.38835779957618	57.767975	55.4125	2.368927	0.1892578
56.4952105408859	54.0521056470323	2.17868561968923	55.9361	51.897075	1.720125	2.2731123
54.9802519810216	52.6697551880335	1.93149506358824	55.262125	52.9866	2.328913	3.5612885
53.7042421992069	51.5054365502338	1.72329377271997	54.099275	51.121125	0.198175	2.2154275
52.3261839433437	50.2480017879871	1.49844191392204	52.703075	49.56845	2.111726	0.9899267
50.9727767617626	49.377512934125	1.08112007507455	51.332325	47.3944	1.206534	2.0193416
50.9674675637084	49.3784788815723	1.07945421574684	48.801425	47.111675	0.180447	3.261649
50.5911109003187	51.687550377796	1.14607955166168	50.5204	51.7746	0.922891	0.2497815
50.7104561767892	53.6211653901225	2.93689570536145	51.731775	54.063975	3.386729	1.2006342
46.677766999328	55.0241325122327	4.07162088823971	46.119125	55.3112	3.945632	0.6405949
47.6716070096448	54.2765755068979	5.0191770945681	47.802925	54.5327	5.178486	0.3289734
48.895235167945	52.4247701550242	6.09631165136346	47.81055	52.508825	5.320082	1.4515793
50.002466243715	50.7491168295574	7.07098449237616	50.075475	49.526025	6.785114	1.2581756
50.9158505300716	51.9056503660679	8.673990548797	50.9611	51.5263	9.096967	0.5699678
51.8126235924299	53.8511511508253	9.61051598438954	51.8225	53.851	9.626807	0.0190516
50.9152828484029	58.2653762098172	6.9114585291397	50.342	58.1772	6.133715	0.970213
50.9466804497312	58.349082443258	6.92838089187905	53.1029	58.71345	6.825055	3.7092457
51.4009893772704	59.5602729991199	7.17323958577403	51.0767	59.931625	7.815468	0.8096439
52.904804015838	60.7021744001273	6.08830656441594	53.3194	62.871025	8.033264	3.2245451
53.5808850634898	61.2155474101507	5.60054516717	56.708375	61.084725	7.280884	3.5527238
53.8869844252403	63.6522635968831	1.91649891388754	53.6353	62.58645	0.328338	1.9291342
54.1317599118965	65.0682281014416	1.59289459362107	52.902425	64.80215	1.303032	2.0317535
54.2497394006773	65.7507091761578	1.43692042774591	55.5813	65.9389	1.049446	1.399502
51.9381261048599	69.7910064754448	1.31173187876199	53.249925	71.4317	1.507319	2.1097265
49.2612820995175	70.6435911384008	1.04562006571552	49.5023	72.1454	0.362105	1.6675468
46.4662480853061	70.6137776564862	1.18009726233496	50.03295	71.692275	1.548117	4.0015227
43.0008979247889	70.5768148832065	1.34682513044803	44.898775	67.784675	2.145396	3.8144474
39.5990536861287	70.5405302976765	1.51049717848679	39.430175	70.428325	1.436461	0.2158504
40.1008750817364	72.4579272781502	2.90927460124428	40.205375	70.4585	3.559151	2.1049867
41.2105010203848	76.6976743707836	6.00224990842221	40.4153	76.30845	7.455735	1.7018987
43.0633794657398	80.7357675376341	6.95333729475283	40.913925	82.729825	6.876661	3.0771461
45.1443552283296	85.2709691974798	8.02150849132226	42.31835	87.347525	7.738111	3.5183382
45.8894058114956	85.9935217398518	8.2762212960542	43.9034	88.387225	9.898098	3.5077797
49.610592033403	87.7961145657945	8.58634026961827	49.4347	86.0537	7.963635	2.0059997
55.0454083470894	90.4288134428212	9.03927118206449	56.428075	90.20545	9.562383	1.4950934
48.8744467510294	97.7469920599047	3.81776838251335	48.99045	98.5583	3.927321	0.8268489
47.9407391978048	97.2991546093697	3.00904093598864	49.100125	97.070175	0.603113	2.680503
40.9527345097546	95.1316636836612	2.10026025842685	40.290225	96.689525	2.280132	1.7024114
34.3223781274656	91.7205985634367	1.03364258138011	32.22375	93.28635	0.1273	2.7707895
33.8644751031306	89.3565308553028	1.4175864843828	33.324025	88.862275	2.512368	2.0476207
33.3050738876411	86.4684442225915	1.88663643671336	32.733925	86.47665	2.244896	0.6742613
33.9448324699655	83.4020550435846	1.61007163464287	36.3513	83.686975	3.385766	3.004223
34.2237577145654	81.8315558820632	1.43383763309253	35.60905	81.995775	1.580638	1.4026949
34.579843977738	77.626180152563	0.926463451841242	36.110325	75.95995	0.32151	2.3419359
32.301282116506	77.9483157155116	1.61982247738652	30.46345	78.65395	2.876347	2.8521408
32.301282116506	77.9483157155116	1.61982247738652	31.60195	76.5275	2.478681	2.2545249
30.0113608463286	78.2720571887107	2.31663845804895	29.5312	77.759375	2.944562	0.9421706
29.3634351299046	79.8042605528412	1.31824341287205	29.23795	80.022375	0.178216	1.1674686
28.6982847932185	81.7067319318183	4.26072852658335	27.4824	83.15295	4.645899	2.409453
28.2955401028044	82.8586671258076	6.04238566831827	30.896	84.86835	8.084952	3.8695341
24.1995418617108	82.537460575697	6.90338908437205	24.1584	82.49565	6.916419	0.0600879
24.4145106543906	85.4527607430116	6.52905240304002	22.609375	83.218325	5.878629	2.9452111
24.7226788715575	89.6319795935699	5.99242228495107	23.831575	88.204275	5.345531	3.750467
24.8466315721012	91.3129618622714	5.77657719581216	27.27955	90.9405	3.131217	3.6132742

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
24.9547224561072	97.0205134980046	5.38607069797694	26.6212	98.85125	4.844028	2.5342758
22.5046316119089	96.8105878874715	6.02520431824972	22.27635	97.920025	9.573749	3.7249339
15.4125376513131	94.9366841060314	3.96211089102108	15.45105	94.471525	3.135131	0.9496062
5.38151558959453	95.6299745261503	6.94025539523029	2.307925	97.449675	7.701639	3.6521191
12.9538647556903	84.3041802451934	5.70791885807322	12.1212	83.525275	6.555356	1.4206244
13.8396203805434	83.2770704927832	5.45907335282979	13.92855	83.165725	6.067072	0.6244747
16.6401857621138	80.0352733520205	4.23340303148251	16.4015	79.860725	3.65876	0.6462605
21.0615964758797	76.5638119746262	4.77857965714889	22.467675	76.02705	4.2329	1.6009174
18.9798822841626	76.4568680631464	6.72944275283384	20.9401	75.2051	6.209147	3.2102784
18.6579519584845	76.4403294482936	7.03113737351975	19.41455	76.0326	9.16761	2.3028676
14.2579411343907	76.9037252970115	6.76179213813999	13.11545	76.27845	9.886291	3.3850773
8.05704286057484	78.4244317644197	2.66486409238487	8.347775	79.0334	0.64524	2.1293776
1.3871631263237	77.9893906844376	4.99061202660504	0.00154999999999461	79.256375	5.511897	1.9485664
1.91124775725527	71.3734388375855	4.62105652119027	0.331024999999997	69.303175	3.842333	2.7183647
2.17734938667918	68.0142131309199	4.43341520242787	1.692025	67.9044	4.763979	0.5973869
2.79170006208912	65.3502213053594	4.00972741022723	2.404275	62.37445	1.602613	3.9363141
3.31545660350166	63.0790688091406	3.64851760774619	2.20627500000001	60.72485	3.544594	2.6045019
8.86160489333044	65.8935121326724	3.08179602233545	8.8531	66.09375	2.882202	0.2828521
12.5679517984688	65.6738670970406	4.76153005725595	12.50315	65.202575	6.796126	2.0894727
17.0591483162517	65.407710919327	6.79696157115289	17.272875	64.973225	8.378801	1.6542893
19.0284402392695	65.9735593422956	5.28659360516925	18.3822	65.772725	3.391578	2.0122239
20.4464833079124	66.3874302768588	5.21170112717606	21.0091	68.35155	4.610936	2.1296062
21.8375131589481	64.9784658186415	5.7140571174689	21.668825	63.73225	4.392072	1.824597
24.5153592882051	63.5882204393966	7.85769961468799	24.44465	63.1281	8.275156	0.6252843
29.0553004525649	66.13613807643	6.81186699075576	28.20205	68.6988	5.301267	3.0947027
31.7438417893306	66.2789309299846	6.95928388550453	31.583525	68.6781	7.867205	2.5702207
35.2867354799135	66.423490427194	7.13694292905465	34.7277	67.482525	7.589491	2.9420086
39.9510035580293	66.6138051864829	7.3708352266453	37.615325	65.262725	9.608735	3.9137176
39.9510035580293	66.6138051864829	7.3708352266453	41.683175	67.299925	9.367966	2.7312469
40.112603384118	66.2558098359201	6.24729184863553	39.7753	66.19835	5.821872	0.5459462
41.3271950627376	66.0613379513079	6.39723534071241	42.3891	68.379025	5.906332	3.3982575
42.8974462089312	65.8099202429746	6.59108568429647	42.88515	65.09985	8.113938	2.6385081
44.4476768293793	65.5617080882807	6.78246416302826	45.884675	65.715725	8.319043	2.1094453
44.4476428023742	65.5614424474992	6.78150069162821	46.228875	65.56925	6.129679	2.8726006
44.3094354107857	64.4824774318733	2.86809240237506	44.4217	64.703925	2.042243	0.8623628
43.6683338457979	62.7194438192697	4.53675132720288	44.541975	62.0002	4.336081	1.1492733
42.9791212323522	61.8953767734622	5.61917431582117	43.7645	63.186425	9.005722	3.8299193
42.1231567620373	60.8719304515988	6.96348467473279	42.114525	60.87195	6.966651	0.0091942
44.8098136320347	59.0511838984363	7.80136128754679	45.110025	59.219325	7.835164	0.3457469
44.8419642531898	55.6100872038263	8.36186246654935	45.616825	55.349625	8.112205	0.8547389
43.2780858066841	52.8346393623161	9.41510446481489	43.47965	52.4779	9.729662	0.5165632
41.7798098996004	52.7933193205567	8.77428834714023	41.89655	53.797625	8.251962	3.5360134
39.9391028655008	52.7425555647357	7.98701366301289	37.074525	51.14655	9.462196	3.5957201
39.9391028655008	52.7425555647357	7.98701366301289	40.529725	53.231175	6.058478	3.1574837
39.9567864577105	53.7628108087968	6.17932354337382	39.658325	53.39295	5.48876	0.8383044
40.6084566932001	55.434362743287	6.08729835541098	40.703325	55.537825	6.299364	0.2543153
40.6146230461758	55.7343270785341	5.62842278895258	40.468775	56.35765	3.688499	2.0428185
40.6273641500534	56.3541270303049	4.68027311107643	41.765825	57.606275	4.678763	1.8921573
40.6390527012311	56.9227225195397	3.81045442502682	41.323875	57.06515	2.903463	1.1453823
39.7009662422132	57.3145764423175	4.16716344936684	39.243575	59.34405	2.988695	2.5403868
38.6332610741239	57.7605741882813	4.57316021004115	38.122975	58.912025	4.096565	1.3466157
36.8185137425607	55.7227317522485	7.26154085395215	36.8297	55.690525	7.310631	0.0597683
33.730520463311	56.9465102382387	4.95524611940256	32.800625	59.186225	6.71386	2.9956219
31.4800703293082	57.3101113196635	2.58193911031237	30.688625	60.637275	0.70091	3.9031621
30.3088877193045	55.0145685142616	2.15950029207972	30.1798	54.1346	0.93414	1.5141057
29.5877057542305	54.8224248160613	4.19582914334324	28.87265	55.2137	3.915468	1.0577671
28.9078756566891	54.6412985355002	6.1153983092064	29.2116	52.625	7.111098	2.2691686
27.8055386914779	56.3592169226128	7.45031003859926	30.732825	57.781	6.904491	3.9919808
26.5921999970818	58.2501245115898	8.91964349667844	26.5978	58.30075	8.947543	0.0580748
24.4240532881859	55.6010774541723	8.02297290899638	22.891175	56.122525	6.014662	3.1174634
20.7292542602148	51.0867627889476	6.49493169475108	21.4066	50.274675	5.660638	1.3469706
18.9819177181525	50.3480576082241	6.72123327085341	17.219275	51.795125	6.528901	2.288647
18.565933744437	48.5533017465285	7.08571843913736	19.028925	48.6519	8.742576	3.3340627
17.8119842856354	45.3003989703898	7.74632918855711	17.095675	43.177	5.934841	3.0748926
17.8119842856354	45.3003989703898	7.74632918855711	19.292975	43.870425	8.142944	2.0965358
17.1647435326565	42.5078877005444	8.3134421590622	19.322625	41.061025	7.646061	2.6823985
15.9994436791465	41.4148777529793	8.88700419958336	15.806625	40.87695	9.361797	0.7429492
14.5520391740663	45.0459097008922	4.29200175934283	13.3837	46.032275	5.26473	2.1621199
13.9903881510882	46.454898110153	2.50895448220534	14.24105	46.110125	0.966331	1.6004334
11.5493322000385	51.4020719375555	4.4454845611802	8.9679	51.422725	2.23495	3.3986294
10.7665625327527	53.9932481567613	5.88756648998481	10.71515	57.182775	5.281599	3.2469865
10.191708746198	52.451498569084	7.74599684479385	11.458875	55.406825	8.437123	3.5619902
10.0594788968762	52.0968599905818	8.17347953869441	9.352575	52.2461	8.408063	0.7596151
10.4183578396276	51.376015545675	8.70123284993489	11.134375	51.580675	9.341968	0.9823989
8.84690593746122	46.6878344718136	8.35862325259709	8.7059	46.626875	9.397095	1.0497725
5.91074712956412	37.7386956212528	7.1549919372058	4.729125	38.22055	5.844342	1.829267
1.84064295583589	22.3138666092866	6.09752223085596	0.610974999999996	22.331075	4.829551	1.7663891
2.22866220834496	13.9935692478149	8.18372618645205	2.12502499999999	13.8908	8.215003	0.1492663
6.46778364029048	13.8940887368897	7.99353632790354	5.29819999999999	16.16745	9.485319	3.2389206
11.77524235258	13.7695375086406	7.75541517872237	12.5519	14.734025	9.438961	2.0899186

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
11.9358087452401	13.7011559874175	7.63522709706075	12.54795	14.295525	6.980367	1.0755618
12.0566444188385	12.1521782399953	7.88919196701877	14.259	13.428825	7.786985	2.5476741
12.2125462078487	10.153693193115	8.2168561595383	13.011825	10.0758	8.49229	0.8489863
9.98033773852629	3.7225228314915	8.36597848905121	10.7326	2.49095	9.542224	1.8617797

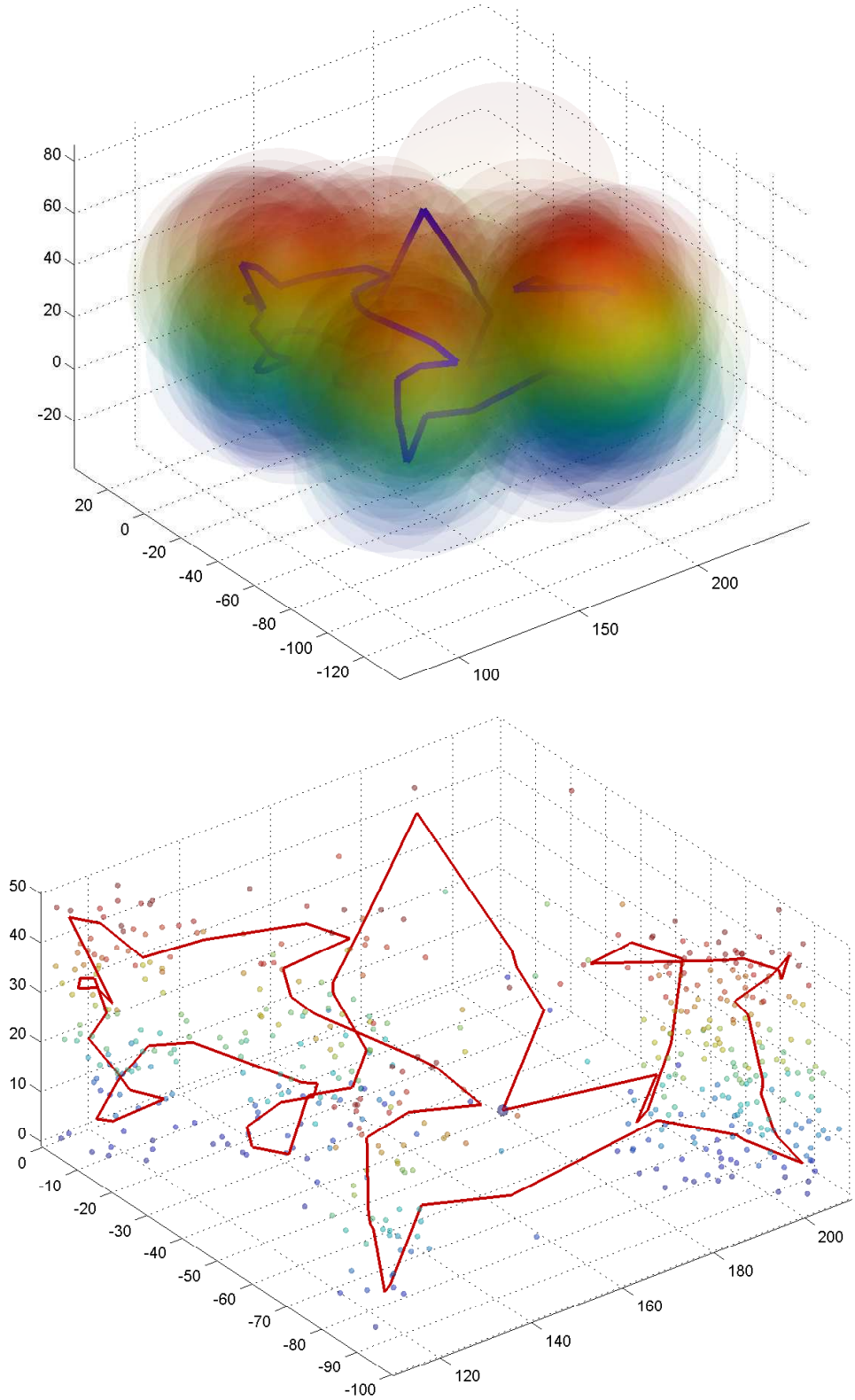


Figure N.95: *team*5_499, arbitrary radius, 3D, Euclidean, Length = 840.4766474

Table N-98: Solution for *team*5_499, arbitrary radius, 3D, Euclidean

Total distance: 840.47664744407 Depot: x 70 y 40 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
81.7456614216263	46.1709033934869	2.14246642572386	64.954	37.309	2.2557	38.0588
81.7456614216263	46.1709033934869	2.14246642572386	84.5964	57.5663	6.5683	31.6899
94.1572593384881	52.6916742961644	4.40640276913127	99.2739	52.0431	4.3408	5.158
92.046564417129	54.6128471408148	4.92850253181003	91.1956	46.5873	37.0515	33.1213
91.3134016281456	55.2977683167282	5.0460689237689	84.8772	45.0654	27.1944	32.4975
86.5316141849054	59.7649172218547	5.81285289680028	73.1545	60.0435	17.8914	34.4744
86.5308884115347	59.7655952398265	5.81296927826014	75.6074	70.2776	13.8577	26.094
85.1501912810515	61.0554434446519	6.03437110217896	76.1847	74.2911	12.7823	17.8739
81.1155365413073	64.8246207591177	6.68134856799673	75.9291	73.9471	7.416	36.4707
78.2859734535839	67.4680005706877	7.13508343118396	73.6361	68.0431	3.2936	6.0588
78.3538856227135	67.8079058537775	7.61511881906305	73.5126	71.3248	10.3828	18.5601
78.3540003199622	67.8084799217561	7.61592955360447	71.4242	75.4202	7.9198	25.4968
78.5226645834106	68.652656715158	8.80812860744824	70.0314	77.1275	8.8524	35.8588
78.8108164088039	70.0948774218787	10.8449225680563	79.9937	73.4457	8.9779	4.0141
78.9084971459293	71.0752314215606	13.4915990696292	77.4087	74.0915	13.1093	5.5705
78.9085317342132	71.0755785603127	13.4925362453534	79.3483	75.3688	19.5443	27.2443
78.9085663224989	71.0759256990518	13.493473421082	82.4808	71.6064	25.4475	18.1512
78.9102295838962	71.092618701518	13.5385397758651	77.1908	76.3248	19.088	8.3165
78.9102641721867	71.0929658402304	13.5394769516035	79.7296	78.3022	25.4406	15.676
79.3252921928997	75.2583142730098	24.7847327576784	73.1002	79.4037	30.5501	12.7865
79.3915607358123	75.92340562763	26.5802901756807	72.5273	88.3137	27.5858	14.2003
79.394805697162	75.9210885959674	26.5879594003421	80.7173	88.9602	30.7691	17.7309
79.3951811056629	75.9208205390397	26.5888466511189	75.4182	80.175	27.0139	23.5169
79.3951811056629	75.9208205390397	26.5888466511189	76.3867	80.9989	23.608	33.1367
79.3955565141451	75.9205524820884	26.5897339018963	70.5598	83.7819	30.4468	31.7327
79.3955565141451	75.9205524820884	26.5897339018963	73.6161	81.1388	33.9424	38.2238
79.3959319226137	75.9202844251192	26.5906211526746	76.9521	88.589	30.1519	36.7425
79.3959319226137	75.9202844251192	26.5906211526746	81.0134	86.425	30.4534	31.9429
79.3963073310833	75.9200163681502	26.5915084034522	81.0772	83.8409	29.4446	24.7807
79.396682739572	75.9197483112003	26.5923956542277	78.4301	80.0876	35.2889	24.8331
79.396682739572	75.9197483112003	26.5923956542277	79.415	85.235	33.6242	23.8334
81.9315461749293	74.1097529795558	32.5833612665549	84.0326	80.947	31.8699	25.7062
84.3055224159059	72.4146373915553	38.1940821084105	87.0156	79.966	38.2934	12.6359
84.3058978244117	72.4143693346253	38.1949693591848	82.7574	74.2926	38.276	14.8137
84.6646397084398	72.1582130604848	39.042829757975	89.0638	74.5581	37.2181	18.603
84.6646397084398	72.1582130604848	39.042829757975	92.5909	80.0433	37.2966	19.5797
84.9548885525938	71.9509636012269	39.7288118185438	89.2994	73.1482	41.8171	4.9668
83.3176984859244	70.6763337635162	40.5085057170567	84.8025	72.2361	43.599	24.0623
83.3176984859244	70.6763337635162	40.5085057170567	84.7887	79.7551	43.3502	24.4915
82.5500925253019	70.0787162267786	40.8740697106688	80.5183	71.0301	37.6084	20.9716
82.5500925253019	70.0787162267786	40.8740697106688	77.9819	77.7483	36.1545	19.944
81.2495801405114	69.0662058047602	41.493424643083	80.2922	75.8098	32.7263	14.5911
80.3253220155198	68.3466271287887	41.9335925544908	79.4655	74.4467	41.2824	12.4177
80.1038618573356	68.1742099236146	42.039060549032	75.5773	80.7384	32.0605	16.9072
79.0422608263612	67.347703347499	42.5446364860541	76.8895	78.6378	42.7161	24.9962
79.0422608263612	67.347703347499	42.5446364860541	81.6179	74.1421	49.6219	15.9576
79.0422608263612	67.347703347499	42.5446364860541	79.6279	80.9538	46.8845	23.4026
77.8281298131463	66.4024449901288	43.1228531737876	77.6803	63.0066	43.1391	3.3991
76.313425784639	67.8170491787942	43.8870316844684	78.8402	71.1237	45.9036	4.6244
65.0739553168134	71.4653502504476	45.5795373176977	63.7544	71.2264	45.6612	1.3435
69.8244583506698	75.2062525052436	45.7908299288078	59.4827	70.1321	42.8614	13.0297
69.8244583506698	75.2062525052436	45.7908299288078	74.3211	82.1244	47.3456	8.5161
70.8937069560334	76.0482590092014	45.8383879005757	72.5026	72.4828	42.5897	37.2859
72.1849087709453	77.0650480741887	45.8958178661163	44.1821	62.8241	31.2839	34.6478
72.1849087709453	77.0650480741887	45.8958178661163	70.8021	79.2974	26.7913	26.617
73.7310418187593	78.2825890343706	45.9645866147064	77.364	70.7565	29.611	18.9213
73.7310418187593	78.2825890343706	45.9645866147064	79.7775	80.296	30.6811	29.6152
75.0027359587368	79.2840161672322	46.0211488600088	73.8575	87.669	40.179	25.5244
76.1745435268015	80.2067851022429	46.0732683589494	76.7822	82.9894	44.8431	3.1025
80.1384830725956	83.32828766711	46.2495758821492	87.3294	86.7915	39.9582	10.1629
81.1529623207773	84.1271645274757	46.2946977460975	78.0272	82.0721	40.7931	8.7342
81.1537474875021	84.1277828264583	46.2947326686213	73.5352	77.8165	42.524	36.1475
81.1537474875021	84.1277828264583	46.2947326686213	80.2014	81.5949	36.2605	32.3848
82.0950734764816	84.8690533187099	46.3366008055501	82.5335	87.3296	48.5022	23.2737
82.0950734764816	84.8690533187099	46.3366008055501	87.2864	89.2526	43.6381	24.3141
83.3012897977313	85.8189182498778	46.3902506681123	83.1803	86.2205	46.5816	0.461
83.9974778370367	85.8287701203404	46.2080448851056	76.1087	74.9228	48.9063	26.6713
83.9974778370367	85.8287701203404	46.2080448851056	80.1131	82.5047	41.0389	19.9521
84.4959152645285	85.8358235854223	46.0775942324998	83.0689	84.7397	49.7222	17.7189
84.4959152645285	85.8358235854223	46.0775942324998	84.4799	87.8799	46.3607	17.7516
84.741883019889	85.8393043101597	46.0132197429394	87.8518	83.2273	45.632	10.2812
86.0911262847106	85.8583976261569	45.6600968381876	89.6546	85.279	42.7332	10.469
86.0911262847106	85.8583976261569	45.6600968381876	88.3323	91.5035	43.0727	13.825
87.6055352923368	85.8798282022625	45.2637468764879	89	83.7031	44.7227	2.6411
88.6472639545263	88.3748042371935	45.189944970213	89.5983	91.5249	48.4013	17.2739
89.0959308637757	89.4493769818147	45.1581588963703	91.162	99.965	45.0985	25.8943

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
90.3336166083257	92.4136771709654	45.0704743452	89.983	98.6224	48.7896	7.2459
90.3340750935791	92.4133010176329	45.0696691744463	82.0258	98.9707	44.6731	16.4132
90.3515545983309	92.3989603736314	45.0389724719332	81.9044	86.793	39.6738	18.7468
90.3515545983309	92.3989603736314	45.0389724719332	81.9035	87.9149	41.5399	16.8426
90.3520130835948	92.3985842203061	45.0381673011818	85.4655	89.4614	40.2893	13.9477
90.3520130835948	92.3985842203061	45.0381673011818	84.5701	92.5098	41.6265	11.4862
90.3524715688598	92.3982080669755	45.0373621304334	84.4928	76.9707	34.1362	35.8799
90.3524715688598	92.3982080669755	45.0373621304334	84.6626	79.7388	29.6454	28.8542
92.1373164092832	90.9338745075435	41.9028995905212	88.2673	94.5543	28.7709	14.161
92.1639457622689	90.9108471487442	41.9089322838298	94.4683	90.0421	37.16	36.408
94.3033733467061	89.0608071900516	42.393604609481	82.7904	89.3622	35.5781	32.2308
94.3033733467061	89.0608071900516	42.393604609481	86.675	81.8002	49.155	31.4898
94.3033733467061	89.0608071900516	42.393604609481	88.0059	90.774	26.7084	31.4291
94.3033733467061	89.0608071900516	42.393604609481	85.1326	93.3031	36.2953	30.9423
94.3033733467061	89.0608071900516	42.393604609481	85.7193	87.9646	47.7548	30.5682
94.3033733467061	89.0608071900516	42.393604609481	95.9324	92.1458	48.2362	31.1565
96.3088468230495	87.326602186336	42.8479305785453	89.697	88.1654	44.368	35.3374
96.363673296366	87.2791917636438	42.8603511323802	94.6937	81.204	45.1011	23.1601
96.7210486980185	86.9701563920559	42.9413120332543	99.1691	80.9928	48.8748	24.2662
96.988764605013	86.738652811259	43.0019612026079	97.0785	86.7219	43.0832	0.1222
96.7977902964678	86.5009994840845	42.5554696240275	92.7639	86.5161	40.1878	5.447
95.2597755910602	84.587054508691	38.9596424202451	98.6006	82.3388	36.0882	4.9458
93.2292659952781	84.503748559972	38.2872164890824	99.0472	85.7396	32.4859	19.7408
93.2292659952781	84.503748559972	38.2872164890824	99.7041	87.1751	32.3993	20.8453
88.931072374634	84.3274061376034	36.8638216590698	89.9071	81.4441	38.6007	15.7904
86.9566870022901	84.2464028294582	36.209981888257	85.9222	83.4369	36.366	1.3228
86.9568780101955	84.2472556586471	36.2094958858342	97.0965	81.0307	25.4066	20.0164
87.4305571979843	86.362180789734	35.0042618896428	87.485	79.3312	28.225	14.9303
87.4307482058981	86.3630336189021	35.0037758871871	85.5459	86.1581	36.8243	23.0206
87.4307482058981	86.3630336189021	35.0037758871871	88.5666	89.9178	38.0498	22.668
87.6274761238938	87.2414019387134	34.5032194463824	87.6085	88.0524	34.9791	0.9405
87.6333970847499	87.2418320586353	34.4757393005842	91.4519	94.5103	31.5983	21.3367
87.6333970847499	87.2418320586353	34.4757393005842	93.3103	99.0843	27.6346	24.3725
88.2131533529873	87.2839476859231	31.7849958806311	80.4141	88.4668	31.9981	26.3631
89.1439672112511	87.351565727461	27.4649367758865	90.256	83.0105	30.9795	8.936
89.1645776704282	87.3530629558102	27.3692802643789	88.9513	72.6403	24.2874	19.8606
89.1647882752704	87.3530782550311	27.3683028128279	82.0065	75.6791	41.5159	28.4662
89.1647882752704	87.3530782550311	27.3683028128279	71.0504	85.2637	43.1302	27.4246
89.1647882752704	87.3530782550311	27.3683028128279	78.4966	80.8407	46.208	27.0644
89.1647882752704	87.3530782550311	27.3683028128279	85.5265	86.4226	22.7788	27.3567
89.1647882752704	87.3530782550311	27.3683028128279	89.7033	80.1502	39.6028	26.8819
89.1647882752704	87.3530782550311	27.3683028128279	87.8356	87.4643	21.4217	27.6715
89.1647882752704	87.3530782550311	27.3683028128279	85.8291	89.3215	18.2752	27.9965
89.1647882752704	87.3530782550311	27.3683028128279	87.8874	83.7559	45.2883	28.0801
89.1647882752704	87.3530782550311	27.3683028128279	84.3608	92.148	16.0712	27.0972
89.1647882752704	87.3530782550311	27.3683028128279	93.0738	84.8753	19.4127	27.0049
89.1647882752704	87.3530782550311	27.3683028128279	84.785	93.3953	20.8615	25.851
89.1647882752704	87.3530782550311	27.3683028128279	80.252	96.9762	30.8948	27.7656
89.1647882752704	87.3530782550311	27.3683028128279	81.2522	99.2612	19.5952	19.7395
89.1647882752704	87.3530782550311	27.3683028128279	96.8293	85.3988	23.0282	25.2212
89.1647882752704	87.3530782550311	27.3683028128279	83.9295	97.9734	19.8967	22.5699
89.1647882752704	87.3530782550311	27.3683028128279	95.3031	91.4204	17.8619	25.4609
89.1647882752704	87.3530782550311	27.3683028128279	96.5452	93.172	22.7505	16.1374
89.1647882752704	87.3530782550311	27.3683028128279	96.1791	97.5552	24.4974	14.7422
89.1647882752704	87.3530782550311	27.3683028128279	96.6476	96.9796	12.6166	23.7398
89.6188573251235	87.3860637851697	25.2608938524035	88.3919	89.421	29.806	7.2563
89.6190679299095	87.3860790843997	25.2599164008404	89.0976	96.4455	27.3307	23.7594
89.6323483565487	87.387043834989	25.198279746615	93.255	98.1789	24.6576	39.9406
89.7713938222985	87.3971446922889	24.552946742204	88.176	88.8141	22.7557	24.7619
90.2345949850662	87.4307935970637	22.4031533945735	96.6676	92.6743	28.4611	10.3882
90.5611955309918	87.4545192430683	20.8873461644423	93.4254	97.8126	20.9017	10.7468
90.664878649894	87.3835286611834	20.3031853246744	88.7272	81.0174	24.4065	30.12
90.664878649894	87.3835286611834	20.3031853246744	88.1669	82.2879	22.5207	36.2685
90.6650521714376	87.3834098530692	20.3022076872643	94.7529	81.9671	23.1963	38.2984
90.8872027915354	87.2313059967604	19.0505893043832	97.4362	85.8361	18.6294	6.7092
90.461600131783	87.2148671602624	17.8130781344055	86.994	98.105	22.6387	12.5626
90.4612749354006	87.2148545996193	17.8121325713229	84.7929	84.8117	21.5385	17.1593
90.4612749354006	87.2148545996193	17.8121325713229	84.1657	89.6201	18.7606	13.6552
90.4609497390135	87.2148420389859	17.8111870082417	83.1514	91.319	24.221	39.4372
90.4609497390135	87.2148420389859	17.8111870082417	80.5965	92.0964	38.2365	36.4049
90.4606245426204	87.2148294783505	17.8102414451627	85.3838	89.3565	26.2565	14.2439
90.4602993462206	87.2148169177211	17.8092958820856	86.8895	84.3247	23.0154	31.0852
90.4599741498172	87.214804357106	17.8083503190097	83.3441	85.5151	19.0157	31.408
90.459648953415	87.2147917965048	17.8074047559334	87.5661	81.6563	15.3738	27.3837
90.459648953415	87.2147917965048	17.8074047559334	90.1019	83.486	18.038	37.2389
90.4593237570091	87.214779235909	17.8064591928582	84.7658	77.8153	16.2748	28.1634
90.4517546164279	87.2144868805486	17.7844506471018	89.4099	75.3847	11.7139	13.3372
89.5615745011193	90.0932478126982	15.9475655073808	85.22	71.0885	8.0711	39.2361
89.4542863389481	90.4402079063043	15.726176561601	89.379	76.0987	3.6739	38.3025
89.4542863389481	90.4402079063043	15.726176561601	97.0848	81.6578	13.6354	37.2835

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
89.4417597778149	90.4807176591777	15.7003280224925	78.9268	79.6337	5.1041	28.7763
89.4417597778149	90.4807176591777	15.7003280224925	83.5177	79.6473	12.5117	24.9276
88.9219323478723	92.1617920565481	14.6276649060395	85.8774	87.324	15.9329	11.0712
88.9219323478723	92.1617920565481	14.6276649060395	94.509	92.4532	22.8398	10.0411
88.5461517180362	93.3770322532745	13.8522421446749	88.3602	93.5594	13.9637	0.2833
89.1999352333466	93.6994414874548	12.3215631505604	83.6163	95.496	9.4544	6.5288
90.2382737249588	93.9191324774522	10.9147344936629	90.7381	99.8897	10.9244	39.8736
90.2388629317498	93.9192571414461	10.9139361865501	92.0809	99.3222	11.7562	13.6093
90.2394521385287	93.9193818054383	10.9131378794281	97.9735	93.9042	14.8216	16.4454
91.6496146745162	94.2177430856375	9.00253057513031	83.3686	96.8014	16.23	13.9298
91.6496146745162	94.2177430856375	9.00253057513031	84.3334	97.0716	17.1577	13.2701
91.6502038812619	94.2178677496312	9.00173226798431	94.2258	98.7848	13.3192	33.585
91.8535634913174	94.2608944429768	8.72620349364578	84.0572	98.2927	13.228	11.5023
91.8535634913174	94.2608944429768	8.72620349364578	94.4375	89.8165	9.7901	6.7853
91.8535634913174	94.2608944429768	8.72620349364578	99.7949	88.8243	9.6989	10.9809
91.8535634913174	94.2608944429768	8.72620349364578	92.8113	98.2407	8.6156	11.443
91.8535634913174	94.2608944429768	8.72620349364578	98.1513	96.345	10.1326	8.7509
91.8541526981104	94.2610191069609	8.72540518653288	90.6972	96.9626	11.6096	12.1171
91.8541526981104	94.2610191069609	8.72540518653288	96.809	92.5136	0.2967	11.7087
92.70619372273	94.4412933834678	7.57098804903631	92.093	98.3621	2.0725	32.0505
93.9079974320741	94.6955702148642	5.94268287283282	95.4796	96.129	4.4906	2.5755
93.0811208122912	93.2356224091248	6.27250195575347	94.7976	88.4491	0.0367	36.0251
92.8546936299792	92.835838615396	6.36281773416278	96.671	90.7145	10.1968	32.754
91.2129855958801	89.9372101790409	7.01765138686689	81.7913	86.2239	2.8298	19.3521
91.2129855958801	89.9372101790409	7.01765138686689	87.314	87.2617	7.5328	16.5203
89.4891882227063	86.8936434069033	7.70522828589665	80.026	88.4312	32.9439	31.2606
89.4891882227063	86.8936434069033	7.70522828589665	93.093	71.3467	11.2543	21.4346
89.4891882227063	86.8936434069033	7.70522828589665	86.8222	80.0693	3.9589	26.0963
89.4891882227063	86.8936434069033	7.70522828589665	87.1273	84.0324	13.0404	22.6844
89.4891882227063	86.8936434069033	7.70522828589665	86.0867	81.533	3.6186	7.8826
89.4891882227063	86.8936434069033	7.70522828589665	82.1226	91.9552	25.5944	29.2899
89.4891882227063	86.8936434069033	7.70522828589665	85.8335	84.6274	4.9143	15.0275
89.4891882227063	86.8936434069033	7.70522828589665	86.7862	83.711	0.7854	21.1375
89.4891882227063	86.8936434069033	7.70522828589665	92.1839	88.8237	5.0595	30.3052
89.4891882227063	86.8936434069033	7.70522828589665	88.2817	96.351	29.2562	29.8948
89.4891882227063	86.8936434069033	7.70522828589665	94.8083	91.5304	12.0006	29.5468
89.4891882227063	86.8936434069033	7.70522828589665	89.931	94.5372	6.4495	17.4038
89.4891882227063	86.8936434069033	7.70522828589665	89.3359	93.6392	1.2449	11.0562
89.4891882227063	86.8936434069033	7.70522828589665	96.0605	94.495	5.5816	12.9494
89.4891882227063	86.8936434069033	7.70522828589665	99.292	98.0492	12.4987	20.4892
88.4749421945321	85.1028728998267	8.10978403746346	87.7484	83.7546	3.1863	5.1562
88.073000118363	84.3956111739648	8.46232852990985	84.2824	83.9445	3.7257	9.6857
88.072546767488	84.3948134527408	8.46272616521168	90.3741	83.7882	8.516	6.0655
87.7051991904448	83.7484245796036	8.78492774729301	89.4354	80.1567	8.4369	4.0019
86.3624918517391	83.86151023942	9.52630840074844	76.4126	75.548	2.1999	18.6216
86.3624918517391	83.86151023942	9.52630840074844	80.7551	80.6861	0.4798	19.901
85.5720929295495	83.9280793136751	9.96272998915391	77.4302	82.5606	3.0237	33.5083
85.3495824842609	83.9468196157876	10.0855899246802	75.2812	79.5319	0.6498	38.4796
81.3939650553	84.2799701176888	12.2696981557897	82.7718	81.5009	6.6283	13.2622
79.9472290497901	84.4018172978908	13.0685185970719	80.3025	81.1115	9.6723	15.7523
78.4820072180223	84.5252213921473	13.8775460641073	73.6863	74.2382	1.6716	25.5224
78.4075916032217	84.5314888234971	13.9186349329972	77.1151	89.3423	7.0894	37.2077
78.4075916032217	84.5314888234971	13.9186349329972	85.6153	86.7737	15.008	37.7006
78.4067185543308	84.5315623535262	13.9191169900155	83.3685	88.3604	12.0152	8.2767
78.4058455053842	84.5316358835167	13.9195990469388	79.3747	83.7664	12.9303	2.2827
75.1049047068104	84.8096481336335	15.7422252624765	72.6803	81.9225	14.2859	4.2531
74.3473064553124	84.8734546668428	16.1605358317019	71.008	83.9726	12.5028	10.613
74.3473064553124	84.8734546668428	16.1605358317019	74.9451	88.4605	13.7746	8.2599
69.8854192797835	85.2492442827739	18.6241827228503	72.3356	86.155	20.9164	38.7669
69.1859695049444	85.3081534286342	19.0103864084975	70.8501	86.3243	19.985	34.4665
69.1850964560775	85.3082269586654	19.0108684655589	70.0787	86.0551	23.7512	4.8813
37.642249539194	84.5353136661602	14.5949155314356	25.8602	58.6207	10.547	28.7536
37.6412779008479	84.5355206069541	14.5948011005301	47.0351	69.5204	13.3405	24.0774
37.6403062631111	84.5357275504468	14.5946866693316	39.3354	89.658	8.0536	8.4792
18.8360071589703	83.3908770004454	18.7108575951151	16.2773	81.3093	25.7994	7.8184
18.835377912146	83.3910990312146	18.7101127791837	13.2856	89.4879	17.2258	21.8166
18.8207750170984	83.3962516961649	18.6928278265276	16.4864	81.6235	25.3496	21.8233
18.8207750170984	83.3962516961649	18.6928278265276	16.887	83.4344	26.4901	34.5743
17.8320781986029	83.7451155745302	17.522541324336	15.4215	81.5375	18.2132	38.9838
16.6103476214012	84.1762059335764	16.0764207474005	17.8246	84.0918	18.5648	15.5287
15.4142979455545	84.5982347300947	14.660697789651	17.1642	87.7833	12.5892	37.7116
15.4142979455545	84.5982347300947	14.660697789651	5.1953	87.1361	22.5444	37.283
9.46139853531832	86.6987286005056	7.61445495472722	11.6247	87.7046	5.4339	3.2321
9.46056792106384	86.6988570007411	7.61391311218571	12.6448	83.0865	6.5696	35.3802
8.05455927826799	86.9162042562281	6.69671953897847	5.387	87.7604	0.9494	6.3922
7.87943532671603	86.7762790886012	8.13211727070972	10.8331	85.8288	6.1261	11.4013
7.87943532671603	86.7762790886012	8.13211727070972	4.4842	86.5445	8.1765	5.1195
7.50474449555023	86.4768987058873	11.2032582596728	2.625	81.2761	5.8521	30.3022
7.50462395277067	86.4768023914361	11.2042462844522	17.0206	82.7787	9.6966	29.1615
7.50462395277067	86.4768023914361	11.2042462844522	10.6041	85.0219	16.3433	25.6845

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
7.50450340999552	86.476706076985	11.2052343092322	3.3964	83.4982	10.9781	22.6969
7.4079371446844	86.3995490093284	11.9967365479683	7.74030000000001	89.8119	11.7653	8.6997
7.23602058563721	86.2621865653838	13.4058450461347	13.617	84.1913	11.8486	7.3733
7.23602058563721	86.2621865653838	13.4058450461347	9.9966	85.8576	17.8499	5.4423
6.51568250880757	85.6866317987736	19.3100724202259	9.2565	85.6186	20.1316	2.8621
5.93860820003087	85.5727529881486	20.4592668057495	2.5389	82.9669	19.2333	4.4555
5.33790339631838	85.8021256985142	23.0932717723347	0.247299999999996	82.0871	22.6092	6.3206
5.33428537120234	85.8061317559944	23.1197135275095	14.2132	82.4414	28.7174	14.4019
4.69570873097419	86.5131955905616	27.7866482424487	5.1015	81.8103	26.7596	31.1473
4.68465194606664	86.5254382127862	27.8674549758393	17.8311	84.5721	16.3475	18.6031
4.68465194606664	86.5254382127862	27.8674549758393	13.6279	83.3943	14.3913	17.0874
4.68465194606664	86.5254382127862	27.8674549758393	8.87560000000001	85.3213	18.2881	16.0341
4.68465194606664	86.5254382127862	27.8674549758393	2.696	85.7661	44.4643	16.7328
4.37007156603886	86.8737572489737	30.1665150148833	6.0677	84.3942	30.725	37.1993
4.37007156603886	86.8737572489737	30.1665150148833	7.47969999999999	86.7529	34.8532	25.8983
3.66763115993925	87.651534053285	35.3001871861259	1.19329999999999	81.8445	35.7922	20.336
3.66763115993925	87.651534053285	35.3001871861259	2.0599	86.005	27.783	20.2991
3.66749709509085	87.6516824965722	35.3011669775359	0.0289999999999964	82.9455	44.9095	21.0457
3.66749709509085	87.6516824965722	35.3011669775359	1.0919	90.7016	20.5918	28.434
3.59426486080217	87.7327689066521	35.8363730867631	5.09099999999999	83.7862	45.0917	25.4049
3.59426486080217	87.7327689066521	35.8363730867631	1.983	86.3665	46.2259	17.6822
3.59413079597587	87.7329173499611	35.837352878173	9.52200000000001	88.7288	32.8263	27.8783
3.50834650987184	87.8279020124691	36.4642936375377	6.7503	86.812	36.4409	32.5272
2.99824031749087	88.3927169645635	40.1923227531239	1.5647	88.8122	41.3941	1.9171
6.61769727347505	87.7357195627093	40.3518524995212	1.82250000000001	87.776	42.1327	36.7171
6.61769727347505	87.7357195627093	40.3518524995212	0.775099999999995	88.6342	47.6629	34.6112
9.22939130514912	87.2616495739598	40.4669644627886	7.6764	88.6806	43.7076	9.6476
13.6977635283951	86.4505586167129	40.6639105551618	14.2245	83.0966	40.7659	3.3966
14.8383986195643	87.0633817984748	40.6943636694968	26.3736	85.6358	40.2837	33.6814
14.8383986195643	87.0633817984748	40.6943636694968	19.7188	83.0222	34.7895	29.297
18.2963744891063	88.9212307845493	40.78668599362	19.4915	88.9148	34.46	6.4477
20.7741766183025	90.2524668409995	40.8528392362245	17.7167	97.5636	38.0165	31.3797
22.4613139113076	91.1589064542372	40.8978830076616	19.5543	89.8549	35.5989	33.619
22.4613139113076	91.1589064542372	40.8978830076616	11.8372	87.4011	35.0448	35.7247
25.0193488854036	92.5332487958329	40.9661782844123	29.7505	96.621	38.9958	6.5556
20.46742532254	85.7048501771862	46.7891363361271	19.3715	86.9483	48.882	2.6697
20.4672383707277	85.7038704373544	46.7892081614863	13.8296	81.5783	47.5142	24.0124
19.8343588145033	82.387201216318	47.0323553686325	18.7876	82.3448	48.1119	1.5043
19.9992674480452	80.856178552633	46.670921097802	17.0519	88.8308	49.5668	13.9972
20.4159594600367	76.987582016756	45.7576469828136	15.9151	82.9337	42.2853	11.014
20.4160637186022	76.9866140730093	45.7574184766767	16.072	81.5553	45.6344	6.7432
20.9415670755063	72.1078032053309	44.6056590609508	23.9463	67.9458	29.6197	30.7026
21.616603065671	65.8407192185181	43.1261645099197	44.9743	74.4953	49.2176	27.6089
21.8837214322387	63.3607716455843	42.5407136834078	24.5323	49.8988	32.6923	23.3971
22.8017063844661	54.8381254346183	40.5287393030878	25.0595	61.5431	43.0509	18.8768
23.2157834179804	50.9938010314666	39.62119452568	27.0169	46.6583	34.9486	30.8141
23.7100677852179	46.4048249918401	38.5378567965957	23.5397	47.0618	33.8948	4.6924
24.5834713757238	38.566329178605	38.0896573975769	23.8984	35.8981	31.4349	7.2024
25.4260322210836	35.4867132719601	41.2191074153187	22.8416	32.9746	42.6888	3.8923
25.5686398129716	34.9654729120634	41.7487824563763	24.2607	34.0424	42.9391	1.9949
26.5426858235489	34.8459887047674	41.7179967820106	22.0871	33.226	43.1435	33.6947
27.9097430075103	34.6782946331565	41.6747896001343	22.2385	33.2025	32.4261	37.3358
28.4222693466538	34.615424082691	41.6585907073321	28.8128	30.4765	38.3516	39.1387
32.2134288447626	34.1503702761671	41.5387674735235	33.916	28.6484	33.3227	11.305
33.5980534748198	33.9805211860731	41.4950051078974	32.1965	21.571	25.1134	23.9954
34.5704244020808	33.8612424269766	41.4642724117109	33.3877	38.8388	47.9844	13.1359
34.5704244020808	33.8612424269766	41.4642724117109	31.0534	27.3935	41.3669	17.9341
34.5714164741839	33.8611207315258	41.4642410563319	37.6461	42.0792	39.3984	22.0605
36.3553563345975	33.6422885102053	41.407857932444	47.084	47.7144	42.2332	24.8395
41.8555074498456	32.9675963128748	41.2340204119185	44.7486	39.7162	41.5468	12.5268
41.856499521949	32.9674746174327	41.2339890565209	44.5785	34.1629	40.8334	2.9998
40.4787130236864	30.9939432967583	41.7182209539989	41.9344	32.8635	38.9519	35.1115
40.4787130236864	30.9939432967583	41.7182209539989	48.2875	25.5427	23.29	34.7388
40.4781518340378	30.9931394528378	41.7184181876917	38.1953	36.049	49.7462	32.0805
40.4775906444235	30.9923356088944	41.7186154213902	45.8095	43.1051	48.3862	19.6777
38.5364730481725	28.2118927449376	42.4008336892325	19.3111	17.5672	45.5963	32.0992
37.297850811244	26.4376991278613	42.8361554534559	37.8149	25.869	45.9364	3.1941
34.5657990793326	23.3771470400632	41.6586556938281	42.5333	36.3249	41.241	34.2929
34.5657990793326	23.3771470400632	41.6586556938281	41.7938	26.8087	24.3703	25.8964
30.7406201242954	19.0920306329081	40.0100238580088	29.6006	20.2054	49.7928	12.7079
30.0697367472041	18.3404805768504	39.7208766768737	30.7692	16.7931	38.6765	37.8932
28.1210501894118	16.1574848713719	38.8810030763897	10.6256	1.7583	32.3574	24.4015
25.1962605920204	12.8810199643405	37.6204341654172	28.6149	8.2266	35.9223	6.0195
25.1953152420996	12.880718507742	37.6203099178981	18.6523	3.9117	30.6336	19.4015
23.8971938543617	12.4667688759204	37.4496975786556	18.047	6.7045	32.7171	18.9999
23.896248504438	12.4664674193296	37.4495733311364	18.0288	10.2093	41.4498	31.7011
23.8953031545124	12.466165962746	37.4494490836143	16.1355	6.6685	45.2938	36.4875
20.4933147429115	11.3813276894347	37.0023250865259	15.5961	8.5134	30.9972	9.1422
14.3762995290909	9.43071192404568	36.1983644965865	5.6246	7.277	28.7239	11.7089
14.3755004584753	9.43039506302517	36.1988754616003	16.6256	12.3206	29.6782	7.479

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
14.3748990060088	9.43002865842211	36.199585393004	15.3812	8.8682	40.3179	15.4856
14.3748990060088	9.43002865842211	36.199585393004	12.9432	8.6486	42.1679	15.3773
14.3742975535876	9.42966225380575	36.2002953244389	22.1476	14.8515	41.0167	12.414
14.3742975535876	9.42966225380575	36.2002953244389	17.3372	11.1211	33.7282	21.5037
14.0161652528634	9.21148819757103	36.6230209389582	4.1301	7.1548	40.2018	37.1524
14.0161652528634	9.21148819757103	36.6230209389582	5.49809999999999	6.1028	41.7036	36.5373
14.0155638003945	9.21112179296905	36.6237308703604	11.5459	0.8736	43.2005	30.4629
13.6975187854662	9.01736890341948	36.9991389943241	17.8934	15.1905	44.1135	13.0517
13.6975187854662	9.01736890341948	36.9991389943241	9.9074	11.0867	39.8487	12.9373
13.3714577581026	8.8187326699358	37.3840089111825	15.7685	10.3669	47.703	18.5804
8.48356929579334	5.8410333417663	43.1534847421181	13.2666	12.9678	48.999	29.5528
8.48296784330456	5.84066693720785	43.154194673526	12.5256	4.7007	49.4275	23.5883
8.08733430521596	5.59964718973194	43.6211852850067	8.8668	5.4121	44.5737	1.245
2.57550625260011	3.72143976849216	45.9443882781563	1.2646	1.8964	47.5137	2.7408
2.57542312047225	3.72224842008713	45.9438058937063	1.2192	5.9144	48.7598	28.8322
2.51490464482532	4.3109302433753	45.5198419731505	3.6086	13.0876	23.3357	29.6311
2.51490464482532	4.3109302433753	45.5198419731505	3.76260000000001	17.1174	49.9096	21.877
2.51490464482532	4.3109302433753	45.5198419731505	12.1595	5.1953	46.5778	17.8764
2.51490464482532	4.3109302433753	45.5198419731505	2.4532	11.1564	41.7483	29.4831
2.13655184063789	7.9912836246143	42.8692809467961	5.6082	3.0104	39.1925	11.8319
1.98617628917245	9.45403242717776	41.8158209373951	4.024	17.3232	48.8138	37.3677
1.79374318735546	11.3258878363888	40.4677255924732	2.4914	14.471	42.2927	5.3662
1.27753599110051	16.3471930336368	36.8514216262286	12.295	19.9912	41.8654	28.6871
1.10894112565461	17.9871669532624	35.6703255102229	3.9756	4.3104	38.409	39.2995
1.10885799353615	17.9879756048689	35.6697431257878	4.753	19.8404	42.7266	29.0972
1.10885799353615	17.9879756048689	35.6697431257878	5.4781	9.3534	39.1694	25.1036
1.10877486141921	17.9887842564788	35.669160741357	0.782799999999995	19.7397	35.1787	1.8473
2.84006038526547	11.2265278155083	35.0701677530448	8.098	10.1576	40.7441	7.8091
2.8190465227711	10.960774401601	34.9435613842699	5.0355	11.9367	30.2057	6.6489
2.74324747779231	10.0021759527074	34.4868798839784	2.67230000000001	10.4123	33.2768	24.6134
2.74324747779231	10.0021759527074	34.4868798839784	2.87569999999999	1.3778	31.3806	25.9254
2.46413612341009	6.47237250795097	32.8052623753677	1.4037	6.1535	31.8542	1.4597
3.02841730810856	5.92922224482401	33.0152594861906	2.4773	0.052	34.3258	34.0937
4.2993822128746	4.70585179851244	33.4882487724458	3.8933	3.6617	34.8265	1.7453
7.18402523692211	4.23609114551539	32.1675428317412	4.1027	5.9391	36.7092	6.8207
7.91202271928434	4.11753762941291	31.8342362131743	9.42529999999999	3.1222	32.8197	2.062
8.6742543358174	6.54944250816355	25.7571396096929	10.2894	7.4847	25.4008	1.9001
6.78459715121934	6.32757943524162	23.5844505315953	5.20059999999999	6.8919	22.4547	22.5304
6.78459715121934	6.32757943524162	23.5844505315953	4.0211	5.0495	22.5141	26.717
5.08228106303075	6.1277119228486	21.6271624175717	3.9473	4.1638	20.7291	2.4396
4.85146917853615	10.0902205721476	20.4749748561548	15.3264	12.7877	8.2093	21.1927
4.85146917853615	10.0902205721476	20.4749748561548	4.8686	17.5054	20.7421	8.1304
4.85146917853615	10.0902205721476	20.4749748561548	9.7281	5.4172	24.1163	13.7083
4.85146917853615	10.0902205721476	20.4749748561548	10.526	3.779	24.6321	20.82
4.85146917853615	10.0902205721476	20.4749748561548	2.2625	16.1551	5.423	18.392
4.85146917853615	10.0902205721476	20.4749748561548	2.7247	6.6491	25.454	8.9474
4.85146917853615	10.0902205721476	20.4749748561548	0.421099999999996	5.2548	22.7354	12.1971
4.85141333339887	10.0911793041841	20.474696083482	2.3396	12.8751	20.4499	24.3453
4.66923025345623	13.2188409259939	19.5652588634805	20.821	23.0825	24.0822	38.9893
4.66923025345623	13.2188409259939	19.5652588634805	12.3192	17.7013	37.8038	29.1964
4.6691744082876	13.2197996580308	19.5649800908155	1.5116	19.0597	21.7588	16.8413
4.60766688106314	14.2757411095944	19.2579416374819	2.785	16.9995	21.2146	3.817
6.37664697284096	14.8147409662654	16.127311747455	5.3173	19.9696	21.9865	36.3373
6.37664697284096	14.8147409662654	16.127311747455	13.8628	4.3052	10.5937	36.3913
6.85259009407704	14.9597585766325	15.2850175010607	11.8636	12.6991	19.7066	36.7112
6.85259009407704	14.9597585766325	15.2850175010607	6.693	16.2603	19.0942	35.4947
7.19258798335331	15.0633543142068	14.6833105908095	3.5607	15.7968	11.1608	5.1124
11.6520234126339	15.428343223074	12.1650640044242	16.2452	9.322	13.5564	31.0488
11.6520234126339	15.428343223074	12.1650640044242	8.65000000000001	19.7295	4.359	27.9816
14.3647464635835	15.6503699835743	10.6331872526616	14.5843	15.7568	10.6354	0.244
13.485074076175	14.698353838091	9.87453221360144	11.3126	12.1774	8.305	11.447
11.9305657277195	13.0160035927527	8.53387901491211	8.40090000000001	11.7989	4.4087	5.5639
11.5190712295675	12.5706680103377	8.17899419640606	14.7479	11.7757	0.3405	30.4615
10.7186782542219	11.7044511406659	7.48871202412514	9.00749999999999	17.4052	0.9316	24.0927
10.2754877914983	11.2248129216114	7.10649168629151	8.6382	10.3371	11.0732	27.1817
10.2754877914983	11.2248129216114	7.10649168629151	11.5168	3.287	14.9558	27.8697
8.18864671068209	8.96635108373468	5.30673929149256	4.24299999999999	12.8676	1.4876	6.736
7.58790914965316	6.94244245051658	4.85863361891331	9.9632	1.8111	30.9688	39.4027
7.58790914965316	6.94244245051658	4.85863361891331	13.2084	1.5682	5.3875	22.8241
7.58790914965316	6.94244245051658	4.85863361891331	8.95990000000001	2.5066	9.8186	22.9145
7.58790914965316	6.94244245051658	4.85863361891331	11.169	1.5527	6.9406	37.2188
7.58790914965316	6.94244245051658	4.85863361891331	2.5621	10.2967	1.629	12.6169
7.39225814177209	6.28328649074882	4.71269248222932	1.2522	5.4022	3.551	7.2247
7.1823377452863	5.57605644198716	4.55610744565178	1.729	2.5191	1.116	7.1357
11.5339061081884	3.83547552719515	7.12988418536875	10.31	1.5005	9.6337	14.7461
14.0722391875461	2.82016931792748	8.63120553064358	14.8098	1.8409	8.2695	1.2782
14.3287002756552	3.85041992608287	10.1039466723718	19.0824	1.094	9.1576	39.3681
14.7733269307811	5.63656567419901	12.6572382837777	18.2952	1.0836	13.7585	19.3439
15.0524482986739	6.75784655449484	14.2601070194622	13.7484	0.7577	11.0651	20.4003
15.3878934607067	8.10539016463932	16.1864178001142	8.02670000000001	2.1019	15.008	25.3395

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
15.7034059299799	9.37286071536297	17.9982642803103	15.4595	7.4752	20.3496	3.0314
15.9677579141972	10.6638805432815	18.5799259755884	18.8587	8.5087	18.9878	16.8623
16.2541918192936	12.0627424495221	19.2101752950138	19.7672	14.9362	24.0245	14.1421
16.4277538402887	12.910370128822	19.5920691435874	15.42	17.0914	20.8872	16.8786
16.4279373585459	12.9112663798666	19.5924729444224	19.0819	14.2893	25.2658	6.4132
17.4221897002986	17.7669117908598	21.7801566030963	12.8565	9.4609	19.9198	9.659
17.6994529591645	19.1209865879623	22.3902273678564	13.9396	19.5452	20.1112	16.1224
17.7441969391635	19.3395034509669	22.4886789087264	16.5052	19.9903	24.3242	2.3082
19.09853922088	20.5658851205082	21.8012783137239	21.333	28.4534	22.585	38.4741
19.09853922088	20.5658851205082	21.8012783137239	15.9493	16.7531	4.9236	36.5644
19.0992330009304	20.5665133510101	21.8009261835232	9.20950000000001	19.5087	23.9042	29.1422
19.1124319998908	20.5784652859337	21.7942269907929	20.1974	25.6106	23.6453	21.4356
19.1131257799233	20.5790935164529	21.793874860588	25.9644	23.203	35.3119	29.8543
19.1131257799233	20.5790935164529	21.793874860588	12.6858	19.6571	22.2672	29.725
20.5754754160089	21.9032778952303	21.0516547692905	29.0396	36.1372	21.3542	26.8002
20.5754754160089	21.9032778952303	21.0516547692905	23.8226	36.8408	17.9115	22.7865
23.2490285895093	24.3242292997821	19.694684549779	20.4824	37.2243	17.8497	26.8839
23.2490285895093	24.3242292997821	19.694684549779	25.1657	24.0751	15.8892	31.1219
23.2497223695053	24.3248575303508	19.6943324195898	26.8183	32.6012	18.9499	9.1398
23.2797292050879	24.3520292698247	19.6791023572627	24.5672	24.4137	22.4773	9.9276
23.3127883563893	24.3819649368284	19.6623230830353	23.4789	26.9268	25.8998	12.6384
23.3328744821963	24.4001532902501	19.6521283095269	24.4655	29.9184	30.3851	29.8304
23.3335682622501	24.4007815207489	19.6517761793269	29.0027	23.8765	31.3376	31.6897
23.3647779658099	24.4290424782775	19.6359355987437	35.1494	28.8106	26.783	32.8637
27.0041681657976	27.7245769162574	17.7887519442898	41.315	20.08	19.8292	34.9881
28.5274029108504	29.1038938378935	17.0156294557619	37.4163	24.6203	17.7469	31.2894
31.9450043967763	32.1985944143774	15.2810152900824	28.4031	32.2444	2.4033	13.356
31.9457818130359	32.1992215632485	15.2809672458027	30.3241	25.8121	22.3846	12.6672
31.9457818130359	32.1992215632485	15.2809672458027	27.0718	22.4926	21.0532	16.8129
31.9465592293267	32.1998487120803	15.2809192015102	47.2998	37.9687	10.4015	27.2808
31.9465592293267	32.1998487120803	15.2809192015102	36.302	43.7274	11.7602	22.8064
31.9473366455834	32.2004758609538	15.2808711572143	44.7377	48.2657	7.7582	29.7234
33.9866823622653	33.8456348063424	15.154839683645	36.1356	35.5262	17.2008	3.41
33.8377293963074	33.7439190524452	14.4055599996384	49.5234	55.0957	34.2852	33.4236
33.8377293963074	33.7439190524452	14.4055599996384	37.7223	44.0563	30.8827	29.1657
33.4708215455776	33.4933680944692	12.5598994957715	20.8616	31.8567	15.5881	16.439
33.4706282717408	33.493236113254	12.5589272683376	33.7228	34.609	11.6821	1.4413
32.8485640028454	32.0164916567413	11.8215242128567	30.1704	30.5441	13.3093	13.1238
32.8482113476671	32.0156544738466	11.8211061708419	32.6566	40.0511	6.9534	38.6421
32.8482113476671	32.0156544738466	11.8211061708419	43.0635	31.4686	2.6925	35.4855
32.3800991189327	30.9043833018083	11.2661998894792	40.4113	32.0356	8.7762	16.7439
30.9096145982113	27.4135387914582	9.52306860327513	37.9243	23.9119	1.2026	11.4323
30.9091315923297	27.4127176129182	9.52276467709392	28.392	21.3903	1.2616	19.1959
30.9086485864062	27.4118964344127	9.52246075088562	33.6715	23.2449	9.8871	5.013
30.8703773774032	27.4090033804967	9.50801517848731	45.8434	28.1097	8.3609	15.1991
30.8703773774032	27.4090033804967	9.50801517848731	27.7157	24.2487	8.5851	7.9151
30.0254693733543	27.3451338439995	9.1891023477998	38.8284	23.4703	6.171	29.4494
29.3689655182729	27.295506426396	8.94130317717339	30.4469	21.4825	3.8833	31.6307
28.181757887298	27.2057612428867	8.49318842320268	26.5855	26.5008	8.649	2.5361
27.2703377223412	27.1368637923886	8.14917039380337	30.555	31.3009	2.2328	18.8032
25.7546720929685	27.0222892963268	7.57707825834724	22.5985	27.2784	2.308	18.0514
25.7546720929685	27.0222892963268	7.57707825834724	21.8127	22.4456	3.4445	26.3083
23.8702254559863	26.8798373278125	6.86578871614365	14.7151	17.4542	12.2868	14.2143
23.8693527519885	26.8799206031987	6.86530762057949	19.5822	17.4941	4.8723	10.5093
22.4217092652293	29.7556309808682	5.96375034436945	23.4201	21.9457	1.1934	16.8924
22.4217092652293	29.7556309808682	5.96375034436945	20.9805	20.9752	1.6334	15.7265
21.6764887925042	31.2359942837608	5.49964506670323	20.5677	31.0115	4.2467	1.6881
21.8248330347797	33.905387864831	6.27888522290187	27.0476	34.4285	7.3345	22.5144
21.8248330347797	33.905387864831	6.27888522290187	29.5705	36.67	2.9094	21.5656
22.2213509494168	41.0405615786499	8.36176040617519	28.4876	46.0461	28.1502	21.3519
22.2213819888209	41.0415379300861	8.36197435576973	20.1897	48.2132	1.8547	9.8947
24.558514338123	42.0231651984776	16.8212374143609	22.4944	48.7727	6.2361	18.9786
24.6590318774805	42.0653839364148	17.1850611929742	25.2216	48.8368	12.0716	29.4028
25.1768740323629	42.2828847500666	19.0593937039564	22.5313	48.1754	17.677	10.3014
25.1771386860808	42.2829959082671	19.0603516195396	32.6554	40.5505	15.9859	13.7264
25.3506067668862	42.3558548918171	19.6882202670995	23.1185	40.5549	22.8959	4.3029
26.7874381094455	43.3346229747583	19.9832232260464	27.2789	43.4795	19.1307	3.5918
28.5916151850071	44.5636265476938	20.3536476786577	31.0932	49.2942	23.7876	14.8063
31.8150600485877	46.7594337404963	21.0154690003764	32.0319	48.7602	21.6234	2.1023
32.616773903792	45.9294399117177	20.7616714982216	32.0569	46.2162	23.8838	8.3019
33.7070604552399	44.8006941839091	20.4165209337671	54.1532	48.4548	25.954	21.9974
33.7070604552399	44.8006941839091	20.4165209337671	47.3754	37.9401	16.076	18.8601
36.3182148315352	42.0974330251201	19.5899111497329	35.5448	24.2684	24.4525	19.4434
36.3188933617836	42.0967305601438	19.5896963482921	32.7117	42.3778	27.3609	10.9453
39.0236943999214	39.296519319332	18.7334410347535	36.9556	37.1182	29.5204	17.3813
39.0379968197603	39.2817123935547	18.7289133327976	45.8348	38.3992	25.1619	22.4696
39.0379968197603	39.2817123935547	18.7289133327976	30.9136	43.9894	21.9238	22.4068
41.8512217250238	36.369252631985	17.838334300087	48.0614	30.3792	22.0976	10.3406
41.851900255253	36.368550166994	17.8381194986338	48.8851	33.6728	5.7706	37.4425
41.8525787854846	36.3678477020063	17.8379046971762	35.3466	47.2689	27.5268	39.4146

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
41.8525787854846	36.3678477020063	17.8379046971762	42.0622	41.0674	12.3472	34.7982
41.853257315719	36.3671452370208	17.8376898957201	41.4412	38.9568	21.684	5.527
42.8676042288231	35.3170178472972	17.5165793871714	44.3864	36.3116	23.5359	25.6737
44.3665588448385	33.7651885295254	17.0420572387383	49.5874	32.9921	18.1971	32.9977
45.6916535402881	32.3933519452188	16.6225737079908	45.5527	26.8832	17.5652	29.6166
46.6991332929812	31.3503339744753	16.3036371320392	47.2249	31.4694	15.6819	0.8229
46.7640938309191	30.1830350252451	17.0380663208505	47.7847	28.4345	6.8217	34.5556
47.137106186034	23.4802431933444	21.2552601976405	49.2766	27.3707	5.7576	19.0778
47.1616776087855	23.0387105415447	21.533059185403	52.9148	12.3625	13.3985	18.1234
47.2680279485567	21.1276633451662	22.7354322639823	47.312	20.115	22.1433	1.1739
47.2960045498948	21.0213950126366	24.9924839966113	44.6412	21.1681	25.9788	2.8359
49.8131677830938	20.6990322921108	28.0253282908756	43.1416	9.2079	26.5197	35.1675
51.3686304623451	20.499830590077	29.8994523257278	49.2796	22.4102	31.3443	3.4493
53.6512885940841	20.2074999566987	32.6497494009043	43.5486	39.6053	49.4906	27.6035
55.7489836849526	19.301172256736	34.1552451729317	57.0413	9.9678	41.9779	25.5663
62.5641783032135	16.3566072868232	39.046445406018	49.7446	26.3767	39.5089	17.8751
72.5994347301424	12.0207863213896	46.2486533165025	73.9225	9.6395	49.6476	4.3559
77.4045301112514	23.1806380369107	31.7820801365385	97.6128	23.6668	47.1593	38.6763
78.7901822941193	26.3988202747956	27.6103339428664	92.9329	22.8145	25.5988	15.1532
80.0925486736335	29.4235708662388	23.6893341269392	78.1743	38.6355	23.4376	9.4129
84.6547216973323	24.8398962782573	16.6479614363454	84.9979	3.9891	22.3271	21.6131
90.1609921115459	25.4771298152212	6.28145695587768	94.4757	9.4701	4.1216	35.9228
90.1614605149292	25.4771840229474	6.2805751056674	92.0943	24.688	5.2999	2.3066

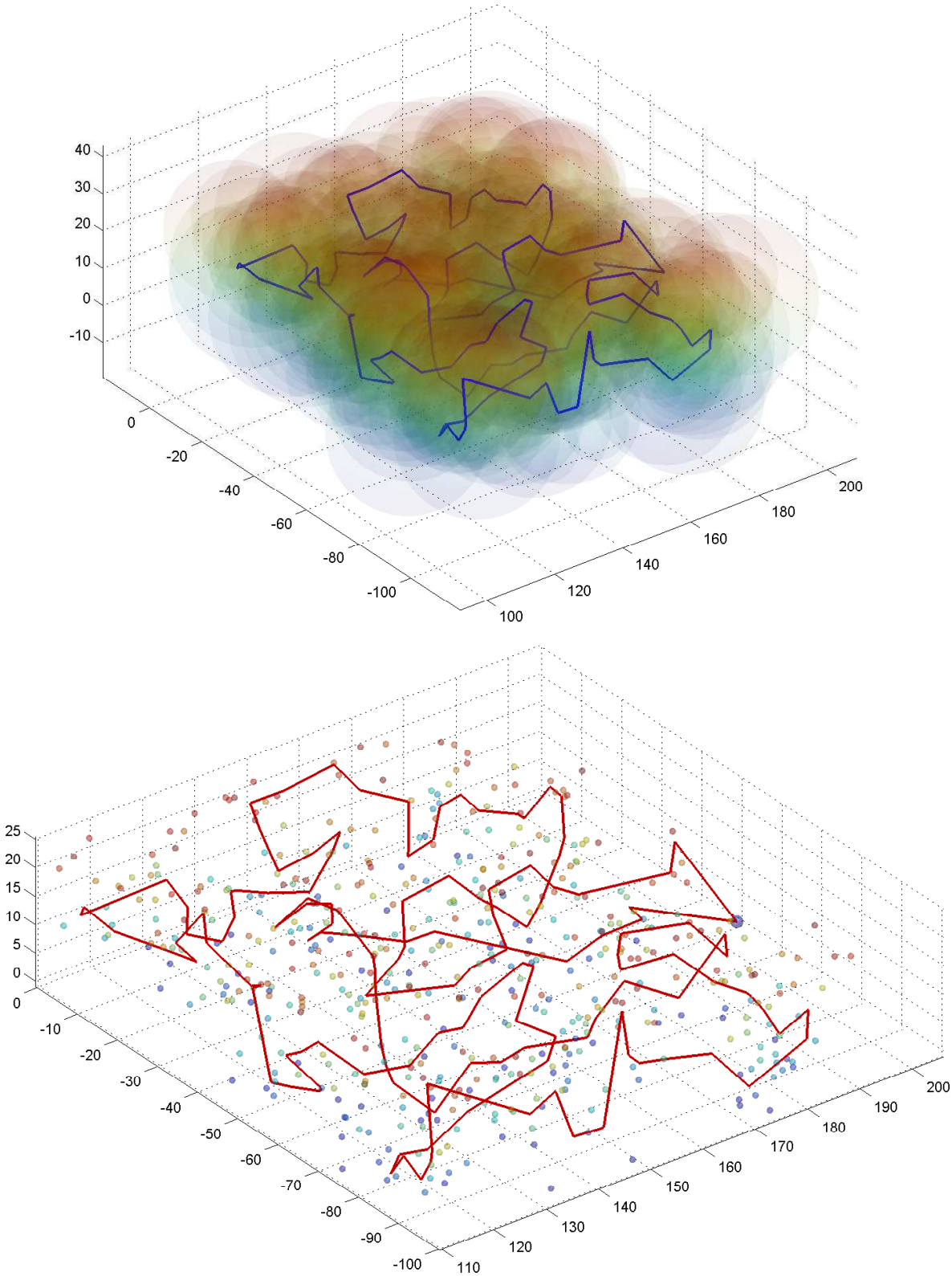


Figure N.96: *team*6_500, arbitrary radius, 3D, Euclidean, Length = 1076.3516198

Table N-99: Solution for *team*6_500, arbitrary radius, 3D, Euclidean

Total distance: 1076.35161980633 Depot: x 95 y 50 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
78.2431634991731	45.0215218616254	6.15973841004525	77.8566059	47.3210428	1.4302369	13.3824609
78.2431634991731	45.0215218616254	6.15973841004525	73.6483802	37.1698351	8.0638871	9.29445
77.5097215317541	49.2578978726738	6.28162236599886	77.6409989	49.4044045	6.2831565	0.1967239
73.1424547905901	49.5272799054434	6.36332169709901	77.1618533	52.0527053	6.1051205	6.548551
69.3801225315526	49.7593483378146	6.43370424698952	69.2934493	49.5142976	7.1641629	0.775327
61.8895987486541	50.7665889966726	4.98687377127921	61.0935569	52.6920317	4.4207174	2.1590612
60.6130175083428	49.0131206193077	5.17689814159894	53.1446811	48.4277704	1.8438372	14.7395753
58.5745099206865	46.2130961873563	5.4803383569362	58.9987357	45.7674431	3.4982849	9.2369593
58.5745099206865	46.2130961873563	5.4803383569362	53.5581269	47.7413894	5.6200486	13.1857928
56.0164237597342	42.6993965944522	5.86111997569861	59.7400431	37.5401839	2.8523374	7.0381524
55.4468284042638	41.9170198974004	5.94590658432594	57.9600279	34.4089577	5.7051211	11.7355261
52.9096517619723	38.4320408085699	6.32357577401721	62.1748486	23.5386262	9.8971034	19.2663276
52.9096517619723	38.4320408085699	6.32357577401721	57.8811625	36.8910334	2.4827855	11.1609103
50.8911582942254	35.6595071945851	6.62403681508307	54.9748886	31.6899499	9.1125802	11.8489378
50.8911582942254	35.6595071945851	6.62403681508307	48.2549784	40.2375649	15.7273532	18.4484604
49.5775279220825	33.8551494381385	6.81957607253287	51.6262531	32.9510025	3.9807244	3.6157759
49.5775279220825	33.8551494381385	6.81957607253287	48.3601763	34.0464698	9.5017871	2.951746
45.636873435272	31.914996222653	5.52513634503102	45.1705924	33.2150554	0.7183829	5.0012449
39.7603760298941	27.9559591725993	6.83724038558029	38.9767874	28.6595996	7.54261	1.2675438
37.8979209732183	24.251922861731	6.19821774420878	26.3324067	9.9110212	1.9657306	19.0585155
37.8979209732183	24.251922861731	6.19821774420878	45.3795945	10.2393952	3.6711995	17.2768189
37.8979209732183	24.251922861731	6.19821774420878	54.100404	16.0525172	0.8678853	18.9251989
37.8979209732183	24.251922861731	6.19821774420878	27.922577	21.764341	5.4511195	14.2606988
37.8979209732183	24.251922861731	6.19821774420878	39.7052051	20.7340789	2.9027737	9.9402181
37.8979209732183	24.251922861731	6.19821774420878	34.0986738	23.3047286	4.238405	16.797077
37.8979209732183	24.251922861731	6.19821774420878	34.7673517	23.4200763	4.8203284	8.3957645
37.8979209732183	24.251922861731	6.19821774420878	35.4889656	25.3753347	12.2670294	17.6050983
37.8979209732183	24.251922861731	6.19821774420878	38.4714341	30.1541626	2.0837059	8.9883187
37.8979209732183	24.251922861731	6.19821774420878	40.565033	30.2350611	14.624538	16.7047972
36.6740532439896	22.2724775254214	5.90075725660196	37.3849664	18.6565566	4.7787046	3.8521791
31.5460836277084	25.7146239467563	7.84304592124157	19.7989907	26.8559855	1.6393695	13.3335104
31.5460836277084	25.7146239467563	7.84304592124157	30.6527015	22.708305	8.3283902	3.2179614
31.5463343241891	25.7150622091389	7.84390909987811	31.6418617	23.7354033	9.0609597	2.3258089
33.0281891028246	30.0051124643089	12.2429787218079	33.8398153	32.0377234	11.3609992	2.359689
32.8667628616869	29.9348725028323	15.8856231313092	39.21475	31.0795566	21.1487172	8.3251067
32.8667628616869	29.9348725028323	15.8856231313092	31.5115819	30.4349931	13.1711147	4.1547529
28.7671292859484	29.1470350140363	16.9471996159512	28.9097869	26.1468646	19.859402	4.1835746
24.8630286231192	29.9708846033041	16.4248170596134	25.434095	30.36432	15.4263508	1.6710488
21.3762240045955	30.7066757164851	15.9582702062835	21.2205961	30.6755865	15.8621351	0.1855493
24.833478782818	34.4583863315217	21.6999291730856	25.6408756	32.9849766	23.8146293	2.7008855
25.9337624575492	40.4998363667522	21.9307674786556	26.2175773	40.5220972	21.9150058	0.2851225
25.0915227591726	42.9494291972404	22.100867593887	25.8175111	47.2716024	20.9185995	14.9058581
25.0915227591726	42.9494291972404	22.100867593887	30.0937988	44.3308943	14.5383671	9.1718387
23.017458833976	48.9816928309304	22.5197489545621	23.2467308	53.1536864	15.3512789	11.4161743
23.017458833976	48.9816928309304	22.5197489545621	28.018456	49.9258106	18.7011667	6.3626175
20.407775842365	56.5717656818766	23.0468048590499	20.4303529	56.6155569	23.1754411	0.1377486
19.5765463222042	58.0329280231641	22.0508263483579	25.824676	62.4300357	22.6279041	7.6620297
19.5765463222042	58.0329280231641	22.0508263483579	22.9209187	53.7233909	24.603033	7.2787759
17.4057238558656	61.0798114615899	19.7952403829198	15.1928212	63.8863652	20.6093336	3.6655736
18.9782587819687	59.3699227384004	16.258114285698	16.1987878	59.3187745	15.8426137	8.6880066
18.9782587819687	59.3699227384004	16.258114285698	18.474215	58.4012448	21.6380189	5.4896057
20.0618299598169	58.1917065368444	13.8208216147271	21.0216738	51.8703093	12.3795264	6.5542883
23.9410731888988	53.9736291084303	5.09518257843298	24.284459	53.5118781	4.6981631	0.6991082
22.3895397878489	56.3367178446009	5.7135825378704	18.3784185	57.1026507	1.60641	10.6506348
20.9321337232911	58.5564443775978	6.29446583834945	23.9069485	59.9121563	8.8002389	8.0586758
18.492644671346	62.2719487231998	7.266781288907	17.9198509	62.5969087	8.2401641	1.1752301
18.8160865873082	63.578911798207	4.68858775487412	15.5276897	59.9411898	0.034091	6.7609848
18.8160865873082	63.578911798207	4.68858775487412	23.3330747	67.4297538	2.1722534	6.4618896
21.2256590220969	68.1300350938807	2.067917757053	21.4467307	69.0185063	0.8942161	4.517097
22.0693782539935	69.7236249753771	1.15028206506475	21.6218153	70.9164832	0.5487705	1.4089143
27.5518030220555	66.9491062026179	2.19799319860655	29.1113171	69.2428114	2.3178943	9.8595935
33.263265637545	64.0586771100823	3.2894742546383	33.1471098	60.1558513	4.4414558	4.0709462
37.5857795009447	66.0460924727366	2.87811626772246	37.415218	67.1119326	2.4786359	1.1509522
42.4761350969418	65.5287860041481	3.41754065040021	32.7632095	61.4478694	17.2734289	19.7763438
42.4761350969418	65.5287860041481	3.41754065040021	43.0002757	59.9692573	5.0791111	5.8261393
43.8677402072862	65.990616800647	3.39358161602374	42.9598051	72.0704928	1.9046969	12.5037762
47.6768530431522	67.2547437947084	3.32800077060621	50.0180258	68.4527432	3.6702061	3.7667027
49.4037948039027	67.8278624686873	3.29826831345941	46.0567355	72.019762	4.0391076	17.1499692
52.0838261005233	68.7172821514348	3.25212667115339	53.0250996	68.7918887	2.0307378	1.5438111
52.8600328259894	69.6686587662094	6.75526271513389	46.8228713	71.844353	9.3127449	6.908088
52.8600328259894	69.6686587662094	6.75526271513389	48.6878693	60.2173135	5.6974781	11.2892676
52.860484934537	69.6688380797387	6.75613646825657	54.3749565	73.471727	7.5546522	4.4215583
52.860484934537	69.6688380797387	6.75613646825657	47.2434466	72.8348775	10.3871125	7.3999265
53.9087842411031	69.6436120655953	7.59768374062367	45.412979	71.2677197	7.8505587	19.9703759
53.9087842411031	69.6436120655953	7.59768374062367	50.8238583	67.1806384	20.6239323	19.5280512
58.4972394523818	69.5331966169257	11.2811756037688	45.3765455	76.9954785	11.855076	19.7202249

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
58.4972394523818	69.5331966169257	11.2811756037688	58.1838222	68.9986011	16.3418061	5.0984315
62.6024585088579	70.0250285377368	8.78945076930197	57.0800315	64.0172849	6.0370203	9.5428133
63.5180458545196	70.1347218516072	8.2337211728193	64.6626599	65.39963	6.8345581	5.0684212
63.5180458545196	70.1347218516072	8.2337211728193	61.6781701	59.473286	10.2741841	14.5751959
66.1829839812361	70.4539987544913	6.61619664071426	64.4543682	70.2655389	2.1929672	6.7382235
66.1829839812361	70.4539987544913	6.61619664071426	61.6425082	72.8564323	6.6704147	8.9988257
68.0287807057772	70.6751371979448	5.49586238160419	74.4567732	73.8913977	2.9219836	9.1604579
68.0287807057772	70.6751371979448	5.49586238160419	68.5426632	70.6500378	2.313903	3.2232857
68.2373282724365	70.7113263612856	5.74030956585129	75.4040099	79.0607348	6.3376777	12.6702712
68.2379732287902	70.7114382802631	5.74106554564234	77.2293497	82.6694496	0.4080071	19.9727905
68.2379732287902	70.7114382802631	5.74106554564234	75.0689318	72.4744486	0.4051745	14.9698309
73.8130572191832	71.6788798988035	12.2758507844817	78.4106856	73.5257917	13.7197973	15.5467792
73.8130572191832	71.6788798988035	12.2758507844817	73.2290706	73.9762718	17.115174	18.8679238
74.3498018669323	71.7720209366437	12.9049912630866	69.1126526	61.5737532	13.3447692	13.1055803
74.3498018669323	71.7720209366437	12.9049912630866	66.0988248	58.3515559	13.6719306	17.5072809
75.8366910840851	72.030040099456	14.6478352741036	77.5651358	71.0148631	15.8380209	2.331233
73.0777083229052	76.0502513646245	14.2731580795503	78.2121151	82.5216358	9.4131561	10.3605913
73.0777083229052	76.0502513646245	14.2731580795503	67.7945884	81.6777909	13.5506647	7.7525837
72.4060447682181	77.0289560681469	14.1819443840252	72.4566884	79.8068651	12.2176684	3.4026054
69.2625196653914	75.2440392686559	18.1549750462729	66.8428254	74.9418962	18.8280244	11.9134957
67.3520709219649	74.1592723417476	20.569548255912	67.3900644	74.174693	20.6721334	0.1104763
62.9041663608143	71.8789217190217	20.1887786956744	63.772212	68.1836695	14.3458559	14.1434905
58.0869758421229	69.4092456322144	19.7763958441674	57.8283627	65.6998258	15.4827548	5.6799674
57.9394019517518	69.4198014753667	19.8667204331021	56.0822206	62.8731122	23.9833277	7.9532835
55.7228593437307	71.953034653286	20.1639827744372	57.43771	71.1535593	20.5447257	13.3451357
55.7228593437307	71.953034653286	20.1639827744372	56.7397866	71.0931061	18.3430984	12.7871715
53.9650168737498	73.9620305006835	20.399728473828	56.5346421	68.6367247	22.9662555	7.6638079
53.9650168737498	73.9620305006835	20.399728473828	51.8847181	57.7017397	23.1071854	17.2459771
52.9001073477398	75.1790899710779	20.5425443692378	50.7478618	74.0551131	24.8207298	4.9191824
51.2276655173292	78.0507423883188	19.6978387895443	49.7783583	78.4397036	19.1457188	1.598943
53.9927826379328	79.6422461733283	20.5512841148196	51.7496653	79.9144917	22.4057667	15.0357032
53.9927826379328	79.6422461733283	20.5512841148196	47.9098314	77.7959758	13.7573709	9.5350991
57.1923351158698	81.4837956976481	21.5388166347314	55.0653569	81.234009	22.9552522	5.9096312
58.2781984628214	82.1087803080157	21.8739651816599	56.1389342	85.561632	20.0765614	4.4417673
58.2781984628214	82.1087803080157	21.8739651816599	59.1397084	81.6064397	24.1713239	2.5044765
62.4387004832531	86.7688344549573	17.627702777253	62.4719528	86.6470186	17.4140053	0.2482165
65.0717321347543	91.5015020884685	16.955973291651	79.9522127	98.0359405	21.2412381	18.7966063
65.0717321347543	91.5015020884685	16.955973291651	77.3466754	92.4222135	24.9773835	14.6923437
65.0717321347543	91.5015020884685	16.955973291651	64.9776601	99.8572829	20.7305349	14.8646935
65.0717321347543	91.5015020884685	16.955973291651	70.4834315	96.1070737	18.6164445	17.0458905
65.0717321347543	91.5015020884685	16.955973291651	75.0360354	91.1497098	19.4705099	11.023678
65.0717321347543	91.5015020884685	16.955973291651	61.4066356	99.633296	10.2157007	16.0904388
65.0717321347543	91.5015020884685	16.955973291651	75.6464183	86.4517504	17.8073467	11.7494177
65.0717321347543	91.5015020884685	16.955973291651	64.3381393	93.722702	21.2607142	16.872102
65.0717321347543	91.5015020884685	16.955973291651	62.5782193	94.8345715	12.3846974	11.8936571
65.0717321347543	91.5015020884685	16.955973291651	64.0121883	92.7907393	13.624016	9.0477095
65.0717321347543	91.5015020884685	16.955973291651	69.765468	86.0199863	16.8900143	10.8561261
65.0717321347543	91.5015020884685	16.955973291651	60.774398	89.648206	21.5223541	12.5083419
65.0717321347543	91.5015020884685	16.955973291651	63.9530194	87.4245185	17.4311618	11.3124411
65.0717321347543	91.5015020884685	16.955973291651	52.878421	80.2956919	22.1921533	17.8391178
65.2133205326292	92.5668150749066	16.7083514512387	63.2522018	99.6147456	0.7669575	18.4401179
65.2133205326292	92.5668150749066	16.7083514512387	71.5874534	94.5399994	3.1033191	16.9233519
65.2133205326292	92.5668150749066	16.7083514512387	61.0630253	98.699805	24.8594975	11.0127062
65.2133205326292	92.5668150749066	16.7083514512387	62.6982725	97.3778678	18.7400798	9.4559017
65.2133205326292	92.5668150749066	16.7083514512387	61.0866811	94.7582572	1.1597592	17.8354325
66.2117648938109	94.1922085459324	14.8215124409217	68.0410206	93.0677269	14.2384361	2.2249974
66.5236690941949	97.7475139632358	12.0972011977114	66.3729212	97.9005203	11.9390694	0.2667237
72.497475098972	97.1345516041763	14.0681135135574	75.4923392	99.8090463	23.5616918	10.3077719
72.497475098972	97.1345516041763	14.0681135135574	76.9820609	94.8106777	15.132467	5.1618551
72.9847260631187	96.0980487256783	8.19100560390653	74.8496365	95.8479299	7.1137605	2.1681576
70.9940841428493	96.0111333978363	7.30177240583478	72.4289329	91.88372	3.0217722	10.9387068
70.9940841428493	96.0111333978363	7.30177240583478	71.4909917	88.8238404	7.979611	8.4049975
66.9625852790476	95.8351101302159	5.50087469673155	67.0620012	97.8077872	5.6584534	8.2792999
64.8038780971983	95.7408567079159	4.53656563062429	66.5761879	96.7049476	8.0800553	4.0776062
62.3377581500029	95.6331810928287	3.43493318255564	68.523768	98.3881808	6.8534875	8.1618794
62.3377581500029	95.6331810928287	3.43493318255564	63.7965883	99.8649883	6.5257645	5.4396338
62.3377581500029	95.6331810928287	3.43493318255564	61.0701287	98.8683739	3.7920781	7.9054547
62.3377581500029	95.6331810928287	3.43493318255564	64.4754864	95.6952093	9.6236824	6.985863
62.3377581500029	95.6331810928287	3.43493318255564	62.3573907	96.159986	6.7572642	5.0891887
62.3377581500029	95.6331810928287	3.43493318255564	61.1689993	94.8861498	0.1686343	3.5486281
57.6700177272446	92.4164898245585	9.36496643615519	77.1265753	88.6843079	7.3792466	19.9105474
57.6700177272446	92.4164898245585	9.36496643615519	67.3268965	96.007007	6.0328841	10.9024154
57.6700177272446	92.4164898245585	9.36496643615519	56.5514993	98.5201232	15.0548231	8.4190197
57.6700177272446	92.4164898245585	9.36496643615519	65.7364961	88.9695394	1.2659879	13.1578882
57.6700177272446	92.4164898245585	9.36496643615519	63.6802314	81.8267454	23.9676687	19.0132656
57.6700177272446	92.4164898245585	9.36496643615519	50.0446513	86.3510967	14.724494	11.408718
50.4904746479843	89.938457129233	9.77352906561847	49.7030604	90.8227548	10.5216088	1.4005809
50.4904746479843	89.938457129233	9.77352906561847	40.9923031	81.1407106	10.4646561	14.9699296
48.2089186102222	86.7123816645484	8.41990504573556	48.3895216	84.8378656	6.8593636	2.445755
44.3942402084505	88.9736058026287	12.1506106673454	44.680977	94.9895485	20.4805113	12.4233676

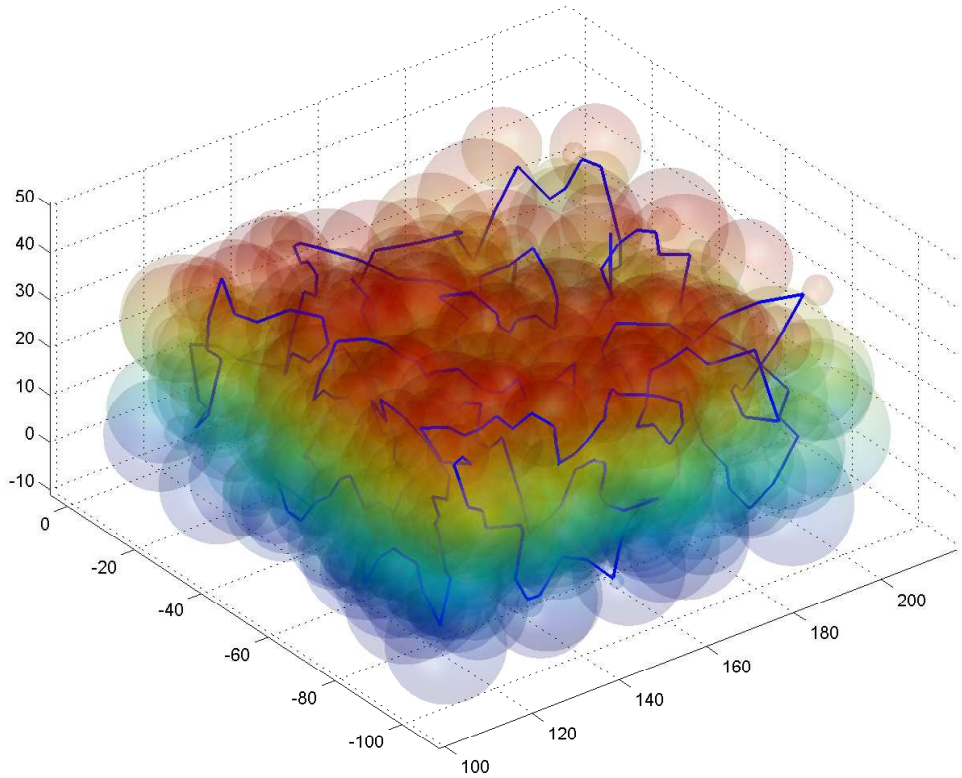
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
44.3942402084505	88.9736058026287	12.1506106673454	37.489488	92.2138591	10.0537289	7.9102312
44.3942402084505	88.9736058026287	12.1506106673454	49.4827685	84.8462228	4.1362821	10.3517087
44.3942402084505	88.9736058026287	12.1506106673454	45.3945603	79.9114427	16.0984045	10.2225307
42.0714144920141	90.8909631455396	18.9401136021361	40.8799687	90.9919823	19.2349904	1.5621823
40.9741463172908	91.7966940377215	22.147373296147	40.3910959	90.932739	23.935083	16.8734606
40.9741463172908	91.7966940377215	22.147373296147	45.8972803	89.1189208	23.3584238	14.0274616
40.88358564673	91.8714466037063	22.4120776035069	40.9379615	91.8870672	23.915222	1.5042087
35.3123396663932	95.3977619274084	9.23676446771855	33.8269693	93.4852631	8.3635932	7.8640695
34.1177192405591	96.1538958670317	6.41163378438607	38.2308224	97.9753907	0.1604725	7.7014595
28.4874750081276	95.9550596523319	6.68308304020647	22.9057445	97.6296948	0.3244356	8.6251096
26.7352475456758	93.7764268711585	14.2628249053611	26.8042407	95.3391438	15.0909578	3.8148041
26.7352475456758	93.7764268711585	14.2628249053611	30.1525293	91.7059859	19.8161573	6.8413479
21.0424824106223	94.8246754835493	12.737652746929	5.5712407	90.2337915	20.7281907	18.9787731
21.0424824106223	94.8246754835493	12.737652746929	8.45094570000001	92.4898096	19.3229772	15.3075709
21.0424824106223	94.8246754835493	12.737652746929	20.7475398	95.759314	10.8106372	2.1619272
21.0424824106223	94.8246754835493	12.737652746929	23.9936704	92.6751712	13.4234383	7.0508341
21.0424824106223	94.8246754835493	12.737652746929	21.4283979	90.119601	10.9146393	12.23519
21.0424824106223	94.8246754835493	12.737652746929	19.6070156	87.5155962	19.7643343	13.0351264
21.0424824106223	94.8246754835493	12.737652746929	34.617789	91.6565199	3.2534463	17.1587159
21.0424824106223	94.8246754835493	12.737652746929	19.6994488	87.7215703	8.9292535	12.92719
21.0424824106223	94.8246754835493	12.737652746929	27.0999394	87.1794445	14.318048	15.3093219
21.0424824106223	94.8246754835493	12.737652746929	28.8394854	85.6978668	0.4508897	18.7042447
21.0424824106223	94.8246754835493	12.737652746929	31.00496	87.5127119	14.2496673	15.7467648
21.0424824106223	94.8246754835493	12.737652746929	25.1363027	82.596723	1.6788626	16.9876139
16.4060461151479	94.1370361638393	15.4455343754497	5.3401207	99.7769332	23.3119522	19.3172668
16.4060461151479	94.1370361638393	15.4455343754497	6.5131248	96.1438685	22.6159881	18.9754882
16.4060461151479	94.1370361638393	15.4455343754497	16.4819632	98.2716229	22.9610856	9.7324435
16.4060461151479	94.1370361638393	15.4455343754497	17.6447354	95.7025091	24.4008135	18.1912178
12.0455727160227	93.4903254402233	17.9922416297051	14.3875276	98.8261078	17.7695633	6.6290931
8.20424385897667	92.9206101156055	20.2357457722036	13.1891897	88.2938542	23.4034575	7.7896989
3.36803059719573	92.2033414460957	23.0603059723444	2.92961390000001	91.7761922	24.0474062	1.1614786
2.18413899666294	94.3187417642472	19.1268087191652	5.93926279999999	95.2323551	18.983803	4.2724995
0.757316628397319	96.8682154295546	14.3861704654927	0.604558600000004	98.8714353	15.0611354	2.1193873
0.356613925643657	97.0725188872903	12.7051360320305	0.0137857999999937	97.6201473	12.5524591	0.6638812
1.72310069200201	93.3483855510261	7.99905944043281	2.8109458	93.7321232	7.4419786	1.5519124
2.0578719021419	92.4360220330382	6.84613279799568	1.8947773	99.155621	15.7943163	13.566985
2.0578719021419	92.4360220330382	6.84613279799568	2.2885744	93.0945686	4.7870646	2.1740904
2.0578719021419	92.4360220330382	6.84613279799568	2.7731053	90.8551563	10.3958831	11.768651
2.0578719021419	92.4360220330382	6.84613279799568	11.9839899	90.8471274	5.5312557	12.6071325
2.0578719021419	92.4360220330382	6.84613279799568	5.6520223	82.6769432	10.5413091	11.1746738
2.60661680992449	87.3525500192058	8.48086913445292	4.0389978	87.3302987	23.4710958	15.0585227
2.60661680992449	87.3525500192058	8.48086913445292	2.2068367	85.97283	4.4333903	4.2948267
2.60661680992449	87.3525500192058	8.48086913445292	3.4980922	86.0326352	18.0570339	13.3409157
2.60661680992449	87.3525500192058	8.48086913445292	7.5281123	85.6801168	11.1420674	14.3445898
2.60661680992449	87.3525500192058	8.48086913445292	2.4095765	76.567725	8.2487866	13.9285738
2.59718514791453	84.1638602131779	3.91837824812895	1.90777989999999	84.1438746	3.0185488	1.1337425
4.86355034348983	82.6129114212031	4.56937961073292	4.0094679	79.3774545	3.2513282	4.1542009
6.11063503328973	81.7594900509878	4.92759805756926	6.9413921	77.9428724	3.7844258	8.4884288
6.11063503328973	81.7594900509878	4.92759805756926	6.0949397	74.0865476	5.2825592	7.6811646
9.60016080639255	84.2086106319679	5.70364846490651	9.5621792	88.5032381	1.7950294	5.8071138
16.2820240701098	85.3072607566467	10.4307192872422	9.22639889999999	90.0124515	4.4717238	19.4614621
16.2820240701098	85.3072607566467	10.4307192872422	13.4475731	91.4293541	19.9118277	11.6363893
17.2226028280902	85.0910607643234	10.4495535402395	13.5790401	86.3111074	8.8070912	4.776713
20.5934202434006	84.3162498315946	10.517051167842	20.4274735	84.2677658	10.0950289	6.7799767
23.9693940470797	83.5402536564355	10.5846520477475	20.5127244	86.7993916	9.2772764	6.7971193
27.3810308139326	82.7560600486652	10.6529670452254	28.3264783	80.6515072	10.7169993	7.0901709
32.8523434034607	81.4984325076269	10.7625252240904	34.482979	80.365325	2.7097027	8.2940253
32.8523434034607	81.4984325076269	10.7625252240904	32.0336769	81.0046037	12.2328895	2.6979108
35.00523172034	81.00357289502	10.8056349140988	39.6568849	80.0063838	5.1586736	8.4281529
35.00523172034	81.00357289502	10.8056349140988	43.6827488	74.1878852	3.8851851	13.0248043
35.006208187052	81.0033604668748	10.8056721571291	37.6570142	81.9317057	5.2409906	6.23332
37.2339394932924	79.8866539649214	13.2701179521452	38.0621359	81.3957333	12.1235509	6.4246672
37.5426279828975	79.7319160691984	13.6116070980761	41.3355343	82.7796974	17.0555529	5.9611972
37.5426279828975	79.7319160691984	13.6116070980761	43.3709663	79.9295648	12.3122786	6.4309473
36.5970046957537	74.8152329805495	13.3845946354202	30.51178	74.0433946	6.2558417	12.6878142
36.5970046957537	74.8152329805495	13.3845946354202	46.3729602	74.0499355	16.6434815	10.9997053
36.0101882381111	71.7641337212301	13.243719678461	35.1926471	70.9963316	12.3857242	1.4121083
41.1594151700072	69.5525595924869	19.9867237089394	43.8195847	68.1613988	20.4285954	3.0343172
37.1640267892831	71.948868425873	23.0774122082139	37.7594155	72.4638416	24.7804303	1.8761545
32.6870038694582	72.9385010048081	22.3340526129769	32.5068688	76.0167984	20.6942387	18.6744309
32.6870038694582	72.9385010048081	22.3340526129769	44.3710695	67.9205927	10.1383529	17.6190773
27.5795921585337	74.0674791499423	21.4860239952955	26.7897314	74.395765	23.1412606	1.8631854
23.7302667706737	74.6449908123684	17.6694134253167	12.9149435	73.6813943	7.0579	16.8344008
23.7302667706737	74.6449908123684	17.6694134253167	16.6661596	74.8364156	22.1285239	8.962299
23.7302667706737	74.6449908123684	17.6694134253167	25.8819635	79.9487476	10.2285525	9.3875474
23.7302667706737	74.6449908123684	17.6694134253167	22.4809106	75.2843669	23.7038192	6.1954617
23.7302667706737	74.6449908123684	17.6694134253167	23.1076735	77.6165558	13.9842376	6.3711973
23.7302667706737	74.6449908123684	17.6694134253167	35.4564008	78.9241199	21.2236154	15.1810796
23.7302667706737	74.6449908123684	17.6694134253167	20.1950128	67.681815	12.2807597	11.7719782
23.7302667706737	74.6449908123684	17.6694134253167	29.6716712	65.8677857	16.615982	16.7115843

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
20.2831442174593	72.907761506763	17.1564752244906	18.5593029	70.8497614	1.5511613	16.4543343
20.2831442174593	72.907761506763	17.1564752244906	21.5799527	71.4486566	7.5717836	10.0338577
20.2831442174593	72.907761506763	17.1564752244906	19.7736057	66.4248411	22.4431961	8.3807699
20.2831442174593	72.907761506763	17.1564752244906	23.2409835	69.6045703	6.9223743	11.4000663
20.2831442174593	72.907761506763	17.1564752244906	26.1534967	60.2417469	15.9637624	15.8350837
16.2231278208501	73.111462934221	14.6145868665632	15.7168362	72.1075902	13.3837018	1.9558061
14.6112533556659	73.1923348054924	13.6054271152194	14.8230271	72.6203252	11.2037362	2.4779351
9.72692292659512	74.475151309836	15.2322380516233	11.0262565	80.6460603	18.6716382	8.6895387
3.69167431489228	76.0602440166765	17.2423821771429	2.2118306	78.338365	17.5236695	2.7310978
3.41506228320517	73.9306797338648	17.5811385881455	2.73342340000001	77.6753662	22.8134911	7.9974461
3.2521436404915	72.6764113806588	17.7806589581858	4.2645198	75.4568775	14.9212902	4.1743619
2.41727759736744	66.2489944564226	18.8030881946692	0.2763329	64.7359652	24.1588067	5.9629374
3.88992352125265	60.1906336777973	13.8227064962679	1.295681	73.7881021	0.4861457	19.2219951
3.88992352125265	60.1906336777973	13.8227064962679	3.24432779999999	74.1558976	22.7592184	17.4562068
3.88992352125265	60.1906336777973	13.8227064962679	0.933565799999997	72.1659561	13.9038289	13.4077909
3.88992352125265	60.1906336777973	13.8227064962679	0.795030699999998	63.4582891	12.408302	17.1080484
3.88992352125265	60.1906336777973	13.8227064962679	1.389212	56.8496436	7.9005554	9.3148689
3.88992352125265	60.1906336777973	13.8227064962679	6.6484375	67.6725429	4.7357573	18.7895827
3.88992352125265	60.1906336777973	13.8227064962679	4.8021518	64.3437535	14.9149548	13.9826688
3.88992352125265	60.1906336777973	13.8227064962679	3.2029124	51.042154	21.6188315	12.1504864
3.88992352125265	60.1906336777973	13.8227064962679	3.9504558	53.4738105	7.1081084	13.2039761
3.88992352125265	60.1906336777973	13.8227064962679	6.14577610000001	57.4553139	19.7085867	10.5969023
3.88992352125265	60.1906336777973	13.8227064962679	9.6122245	63.4753738	1.8891309	15.5818673
3.88992352125265	60.1906336777973	13.8227064962679	6.1363219	48.8674613	19.7646406	18.2256529
3.88992352125265	60.1906336777973	13.8227064962679	9.81425009999999	65.891213	10.4751695	15.3270767
3.88992352125265	60.1906336777973	13.8227064962679	7.20936620000001	55.909681	20.1638147	8.5307974
3.88992352125265	60.1906336777973	13.8227064962679	9.4077401	50.7341371	22.0830838	15.2153276
3.88992352125265	60.1906336777973	13.8227064962679	9.41537220000001	53.1681384	17.4096726	17.5248196
3.88992352125265	60.1906336777973	13.8227064962679	13.6466825	56.641223	0.3772494	16.9874359
3.88992352125265	60.1906336777973	13.8227064962679	17.0586402	58.0717087	14.4615884	18.9407433
3.88992352125265	60.1906336777973	13.8227064962679	16.954408	52.9270638	19.3144339	16.3581023
3.88992352125265	60.1906336777973	13.8227064962679	18.1200543	57.6122523	16.2352309	15.16683
3.88992352125265	60.1906336777973	13.8227064962679	20.3908302	60.0437447	17.3381089	17.1200275
5.12922774944228	54.6301972949269	10.2085103249619	4.9451086	53.7479899	10.2966488	0.9055154
8.70034729153376	58.8962033553152	5.12432099897266	8.7488745	58.9072962	5.1240813	0.0497795
8.35987797273013	59.0478860031556	4.78892050410637	6.2196931	67.2192158	1.3051514	9.1371587
6.46211213149576	54.1645357820186	4.0111027674176	2.2999767	55.3764405	4.437231	4.3558776
5.59387533033923	50.3979893507293	3.38120783418874	5.3360715	49.6056788	2.051856	1.5688834
5.55830569997124	48.410906185303	9.7759055074189	2.4253981	44.8523436	2.2881323	11.7215543
5.55830569997124	48.410906185303	9.7759055074189	2.57466789999999	43.4683609	15.573931	9.7340669
5.55830038824335	48.4106094467835	9.77686045141549	2.27936	46.9159446	7.984275	4.2205505
5.55830038824335	48.4106094467835	9.77686045141549	6.5220454	46.8393292	9.3610404	1.8896117
5.21217083342023	46.3249563525473	18.1924728657167	3.9184302	46.6238898	20.1933306	2.4013658
7.19535824621263	45.2644001806988	17.3170555119386	6.65024940000001	63.3598676	12.1766222	19.9843888
7.19535824621263	45.2644001806988	17.3170555119386	4.944301	50.787374	18.9241415	6.1768296
7.19535824621263	45.2644001806988	17.3170555119386	12.7057803	46.3942459	23.5548248	11.1678278
7.19535824621263	45.2644001806988	17.3170555119386	16.0956015	47.1989931	18.8482809	14.2319044
7.19535824621263	45.2644001806988	17.3170555119386	19.3270801	51.9549025	21.8491926	14.5767542
7.19535824621263	45.2644001806988	17.3170555119386	18.6253841	45.1799856	19.5247549	17.6321283
7.19535824621263	45.2644001806988	17.3170555119386	20.6501388	50.1791373	13.3126618	16.3804834
10.6879864079837	41.3067151089486	14.4020063271168	2.1729785	46.8604253	18.9044886	11.1913394
10.6879864079837	41.3067151089486	14.4020063271168	20.3277951	46.570702	14.9318681	10.9961913
12.1932150086522	36.9124161069887	11.7213456330902	24.4888337	25.329984	1.2423959	19.8782132
12.1932150086522	36.9124161069887	11.7213456330902	12.1928408	37.3702852	11.5867049	0.8140869
12.1932150086522	36.9124161069887	11.7213456330902	13.5198617	39.2703319	6.7423337	5.6665967
12.1932150086522	36.9124161069887	11.7213456330902	13.919931	46.2670929	1.9535236	15.1163989
12.1932150086522	36.9124161069887	11.7213456330902	14.7299938	38.6202015	11.4606651	5.5606508
12.1932150086522	36.9124161069887	11.7213456330902	23.0786229	38.1227731	23.1605385	15.8911359
12.1932150086522	36.9124161069887	11.7213456330902	24.3319298	37.4283803	9.9719727	13.053577
12.1932150086522	36.9124161069887	11.7213456330902	22.4746551	48.1041051	9.2672876	15.816336
12.1932150086522	36.9124161069887	11.7213456330902	25.3533813	42.3962835	8.9845466	16.55549
10.5995741436094	32.4282154038004	14.6843357232556	11.1949114	32.5347928	13.765914	2.918689
9.48184607474001	29.2831423693151	16.7624809150718	10.2638739	16.7343669	2.745395	18.8298176
9.48184607474001	29.2831423693151	16.7624809150718	1.44105020000001	27.5670412	20.5926225	9.0702473
9.48184607474001	29.2831423693151	16.7624809150718	4.4919615	30.1971308	23.0431363	9.6799472
9.48184607474001	29.2831423693151	16.7624809150718	6.7702019	28.6398243	6.655852	18.6590849
9.48184607474001	29.2831423693151	16.7624809150718	4.5207011	34.7763494	11.5308277	18.0479256
9.48184607474001	29.2831423693151	16.7624809150718	7.3492035	35.5012058	13.5793477	9.3339917
9.48184607474001	29.2831423693151	16.7624809150718	14.6392528	26.7492086	4.8139494	14.0759419
9.48184607474001	29.2831423693151	16.7624809150718	6.820668	39.0713932	12.1631417	16.2462105
9.48184607474001	29.2831423693151	16.7624809150718	13.0553452	35.1491327	19.4677587	12.3752896
9.48184607474001	29.2831423693151	16.7624809150718	11.8541821	36.7134083	15.5034658	16.0938551
9.48184607474001	29.2831423693151	16.7624809150718	18.0420031	31.0087706	14.9562459	9.8590332
9.48184607474001	29.2831423693151	16.7624809150718	21.8832831	32.2702186	24.0783885	16.0376904
9.48184607474001	29.2831423693151	16.7624809150718	15.6671545	41.9038059	9.4975475	18.2677056
9.56363897230861	28.3873237887327	21.714369323864	9.78612250000001	28.4044715	22.2738758	0.6023624
6.78419811670958	27.4177266674603	18.6987002198003	1.0903939	26.3844516	18.4073439	6.0462866
5.37540774317682	26.92627563046	17.1701749393376	3.1062568	26.7803784	17.2167375	2.2743131
10.2334943150275	25.844074507081	11.6524705979824	11.5512784	26.7283657	10.5788887	1.9160125
8.67861164366168	22.7570403667939	12.1850593630752	10.881307	21.222109	11.4410052	15.2562401

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
8.67861164366168	22.7570403667939	12.1850593630752	13.6477983	21.6503409	20.9429038	10.1300266
7.66978020367831	20.8022161683569	12.4847669094515	10.0346396	20.0550826	11.5771729	2.640927
3.9025975620274	13.5025033596299	13.6039360892907	2.4227502	13.8762399	13.6085461	1.5263186
3.86719978836607	11.4840803073311	13.8761512993139	4.41833269999999	14.4467589	21.446539	11.646626
3.86719978836607	11.4840803073311	13.8761512993139	9.1420339	20.9818632	21.7425538	15.7590069
3.77387505940337	6.16259367780567	14.5938351198467	1.18933079999999	3.3623299	20.9336159	7.3969025
3.77387505940337	6.16259367780567	14.5938351198467	9.8269964	6.8843491	16.4620329	6.8651251
5.27255671579553	3.35903802941245	11.332142995799	3.796854	1.0310825	8.8837938	3.6866637
6.51938047580228	3.7807017838243	11.681978790708	10.2956976	4.6843351	8.4372721	13.6376992
6.51938047580228	3.7807017838243	11.681978790708	15.3634563	8.946465	9.6121679	13.8278483
10.0387199735221	4.97090851407692	12.6694406453086	11.2137447	2.0282324	10.133715	19.8233424
10.0387199735221	4.97090851407692	12.6694406453086	7.7653349	6.167634	7.7136991	19.726704
12.9668430075439	5.96117149324555	13.4910180422403	9.4518233	0.0818322	21.8708164	12.2091392
12.9668430075439	5.96117149324555	13.4910180422403	6.43216459999999	5.6038094	17.9548593	10.5758755
12.9668430075439	5.96117149324555	13.4910180422403	15.0419936	3.4632806	14.5409941	4.5348945
12.9668430075439	5.96117149324555	13.4910180422403	21.5004558	1.4444458	11.8706015	10.4654737
12.9668430075439	5.96117149324555	13.4910180422403	15.2275578	8.2482088	20.735321	10.0059049
12.9668430075439	5.96117149324555	13.4910180422403	14.9649191	8.2569823	17.1672819	11.1052011
12.9677585151568	5.96148110890471	13.4912749156613	1.16963010000001	7.0254341	24.7260216	16.3262783
12.9677585151568	5.96148110890471	13.4912749156613	8.8711802	13.2955279	17.3948906	15.7653907
18.3026267612444	7.76568154199325	14.9881405779679	14.7546051	14.610274	24.9337615	12.5838102
18.3026267612444	7.76568154199325	14.9881405779679	24.4057133	14.819481	14.2616378	14.1480218
18.3035731819776	7.76594435167152	14.9883282448774	25.3620642	2.9418291	18.8013171	9.3612642
18.3035731819776	7.76594435167152	14.9883282448774	25.7941467	5.022901	22.6635913	13.154074
18.2279503729166	9.2552949914128	14.4360479215252	21.5694811	0.9567502	13.1824134	13.3401903
18.2055581788256	9.69629738769076	14.2725156401985	19.95828	6.5164086	22.2907726	19.0088103
18.1624927181401	10.544449196405	13.9580043841618	12.2844966	12.8434228	15.9512599	16.9324181
18.1624927181401	10.544449196405	13.9580043841618	16.5565287	18.5575743	19.3585299	18.4350632
18.0132744857137	13.4832235299806	12.8682494637335	16.5956207	19.4929376	15.3111277	6.6403358
18.0135386277695	13.4828387393607	12.8673650627197	17.2034005	24.1027648	4.0750954	19.2446407
19.5887007240079	11.1882122464978	7.59340459155506	15.820225	13.1438067	8.0447276	7.149623
20.05526893442	10.5085363198549	6.03124012498267	18.0605132	3.6100683	1.3230623	8.5868999
20.05526893442	10.5085363198549	6.03124012498267	17.3929381	9.8303298	1.4719335	5.6745961
23.475306599948	14.991517650634	5.5733317797013	23.260163	19.1726271	1.8635456	5.5937891
26.2084519507663	14.4113097425812	8.69442620006191	20.1050057	16.8211128	11.4177964	7.104643
26.2084519507663	14.4113097425812	8.69442620006191	31.9710737	13.1659452	6.9350237	6.1525799
29.2134816275792	9.610147429117	9.97612224470183	28.9980611	9.3107142	10.3932004	0.5567948
30.9732217813981	8.79605568817282	9.14712076738716	29.8399494	3.731908	9.1569031	5.1894117
32.4386456553603	8.78346666271426	8.5191672670018	30.2787157	8.2280249	1.312123	8.4927039
36.7385369562642	8.74652755987384	6.6766070145259	33.6893922	8.5224136	7.0176775	19.9918892
36.7385369562642	8.74652755987384	6.6766070145259	33.6742877	16.0147514	17.7329183	19.9827348
36.8906855843884	8.74522047902343	6.61140935881418	37.7928549	6.0601138	4.720283	3.405887
41.2790043769397	13.5234810678151	7.43727512653058	41.0252369	15.6288565	6.5265879	2.3078897
47.1350559221604	11.5978471585794	11.5473412678559	47.2237184	11.5265695	11.522225	0.1165005
45.9067299841706	15.0760168940003	17.0598717335182	49.4509792	19.23293	17.9552005	5.5356339
45.906541387607	15.0765387234381	17.0607036742458	52.3761166	17.3066951	24.8659343	10.3802999
40.1202050442409	16.6060583865693	16.4422139713721	46.2315326	17.3070005	18.3576471	18.9782971
39.4542734486082	16.7820860834999	16.3710339023596	38.9701661	21.3778805	18.3750053	5.0370217
34.0020396187402	15.2010345611934	14.3976690105476	33.7699504	15.2531662	14.0155756	0.4500872
32.7717037614509	12.072750249421	20.8697244588743	30.8819888	13.4626957	23.5805357	3.5848945
32.7717037614509	12.072750249421	20.8697244588743	39.7157151	22.5518047	13.0027284	19.2813071
35.6454678312423	6.48281289809104	20.8042995828065	33.5301093	3.5426558	21.7233363	3.7368294
36.4152284349559	4.9855036219019	20.7867750295637	34.237799	1.769458	21.0926833	3.8958604
40.4195132100545	4.5795809901768	20.4416304892361	41.5241877	2.2495139	17.9679654	5.9346817
43.3360614331125	4.28392447647678	20.1902420899031	42.0438698	1.2746098	8.4709115	18.5219549
43.3360614331125	4.28392447647678	20.1902420899031	39.0651937	2.4238303	22.4127866	9.0370307
43.3360614331125	4.28392447647678	20.1902420899031	52.4413086	6.2567644	20.6204114	17.7872557
43.3360614331125	4.28392447647678	20.1902420899031	43.6411268	3.9331303	13.8180098	18.3321607
43.3360614331125	4.28392447647678	20.1902420899031	31.6461166	7.3585956	24.5416178	12.8469017
43.3360614331125	4.28392447647678	20.1902420899031	38.5584867	8.9239146	23.1054293	8.3130054
43.3360614331125	4.28392447647678	20.1902420899031	33.7088519	9.9711832	22.3346661	13.226048
43.3360614331125	4.28392447647678	20.1902420899031	45.092729	13.545129	18.3076608	9.6124868
43.3360614331125	4.28392447647678	20.1902420899031	36.6688954	15.3802855	11.2906359	16.9765386
55.0224239337404	1.64201719441232	19.4326616459602	55.2537104	1.3428502	19.4907476	0.3825811
55.4343728859684	7.65095409880871	17.59967934538	57.1362338	5.5136309	23.5708492	10.1201436
55.4343728859684	7.65095409880871	17.59967934538	41.2499501	12.693222	14.1376671	15.4469364
60.3314633495448	13.3091105844975	16.4707540342558	60.5482992	13.7850738	16.8556106	0.6493638
62.1637822440213	11.0371285568697	7.58199690188429	58.3586123	20.3359236	6.4801103	10.6167883
62.1639780943969	11.0368857124223	7.58104681283332	64.1033853	11.196525	7.8712992	1.9674937
62.5523461227433	10.2976909844413	4.72265575540378	61.3811866	10.1841347	3.2294003	1.9011369
62.5533259129346	10.2975210327473	4.7227612428585	68.4102584	6.9403941	4.658299	16.8109375
62.5533259129346	10.2975210327473	4.7227612428585	54.6678163	5.1970784	7.0182008	9.6677205
68.0907269849646	9.42102865302123	5.27809637427147	72.320279	3.8462993	6.5608426	12.1872623
68.0907269849646	9.42102865302123	5.27809637427147	72.9487249	9.0752285	0.6396625	6.7256814
68.0907269849646	9.42102865302123	5.27809637427147	70.9135058	14.8761766	3.8438809	6.3074316
73.0564909253091	4.6101914397789	7.09225945488866	73.9903157	3.2090585	6.7443046	1.7193821
72.1191180063722	7.37374477222241	9.32532511882155	72.8917692	2.6849909	9.1068195	5.1292918
69.9074369477628	13.8942002576057	14.59412342519	75.2339764	1.1053279	6.9329867	16.7841753
69.9074369477628	13.8942002576057	14.59412342519	64.943613	1.686391	19.5930668	14.0946653
69.9074369477628	13.8942002576057	14.59412342519	73.292725	7.8305571	19.3842603	14.0833606

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
69.9074369477628	13.8942002576057	14.59412342519	79.9570853	14.106802	16.0131314	15.0949781
69.9074369477628	13.8942002576057	14.59412342519	70.2907843	10.4186099	14.6666305	7.1185577
69.9074369477628	13.8942002576057	14.59412342519	70.8086056	11.5809577	17.5154997	15.5821047
69.9074369477628	13.8942002576057	14.59412342519	71.2868972	13.7571779	21.261272	15.5198317
69.9074369477628	13.8942002576057	14.59412342519	67.4654721	12.1137109	23.8276929	14.0781794
69.9074369477628	13.8942002576057	14.59412342519	71.8742878	17.8343061	13.6189325	6.5081686
69.9074369477628	13.8942002576057	14.59412342519	70.2766166	21.7580017	19.3250026	9.1846004
70.3964753373421	17.693112603632	13.3419561932742	72.0757838	18.033427	9.5185824	4.1897587
69.3491865345304	22.141199148823	15.5516093045211	68.9038468	16.8104734	21.7337542	18.4978064
69.3491865345304	22.141199148823	15.5516093045211	67.7860652	18.0440513	10.7235759	17.8951575
68.077603798765	27.5419159282531	18.234495709329	62.1996928	26.9322785	20.2466983	11.912547
68.077603798765	27.5419159282531	18.234495709329	56.98499	36.3050676	16.2652139	14.2729457
67.0846919379171	31.7590505267323	20.3294199976781	65.5247054	34.4819771	22.2818751	3.6959394
71.025097705584	28.2357236302673	16.5485452923499	70.5957341	27.6007009	14.8208364	1.8901283
72.6823696024328	27.9398542965609	17.44884224591	71.3343578	25.5495623	21.1336705	6.1682291
76.7692730023993	27.2102277262861	19.669012911111	77.5184606	26.3492827	20.0048231	1.1896541
76.6410943834902	28.1923046215045	19.6932682240579	75.8801773	29.7113355	20.1473913	15.8480612
76.6410943834902	28.1923046215045	19.6932682240579	73.9542296	35.1681427	22.8323041	17.0431609
76.3177674864345	30.6695658443869	19.7544515602795	78.2442809	33.2914556	24.7068001	5.9254971
75.3849719739334	32.1186637260664	18.1881379779683	78.3681704	28.4149174	19.0447715	15.9637623
75.3849719739334	32.1186637260664	18.1881379779683	76.8303918	30.6898889	19.4810071	15.6982902
74.5855214071599	33.3606102124171	16.8457320069867	78.8734057	30.5074156	10.2492504	17.7741551
73.6449567322275	34.8217774309593	15.2663728160074	76.1612584	37.0439506	15.0269683	3.365582
71.8233149158843	35.9969576739143	13.4124997177361	73.6393721	37.6930766	12.5724621	4.535198
71.8233149158843	35.9969576739143	13.4124997177361	72.24704	39.7077335	13.756154	3.7506664
71.8226151720639	35.9970745322126	13.4117949463377	74.2228108	38.6099587	15.750928	8.4402478
71.8226151720639	35.9970745322126	13.4117949463377	67.7343836	45.7338412	11.9249335	10.9613064
71.8219154282364	35.9971913904909	13.4110901749432	75.4422908	46.5496079	10.6773392	15.4085245
71.8219154282364	35.9971913904909	13.4110901749432	68.3855742	35.3493495	17.8360025	5.6398572
68.9313602272626	36.6684573542151	9.28278498131238	61.8021468	40.7857588	11.6604123	13.1222565
68.9313602272626	36.6684573542151	9.28278498131238	51.5218465	39.5765057	8.1668107	17.6859637
68.9307916873374	36.6685893847	9.28197298974587	58.429274	38.9397266	17.4146787	18.6397178
67.3522160779581	37.0351777711217	7.02744352892846	64.136723	44.5156078	8.6797357	8.3082067
65.7423688136406	36.3352531502573	3.73245854704452	57.9145816	37.4787407	0.4915272	9.8427718
65.4412516841033	36.2043343414789	3.11614143194021	65.5339196	33.299582	2.2513726	4.4914809
65.4412516841033	36.2043343414789	3.11614143194021	65.884583	36.2103636	0.6036001	2.551361
63.1173294907056	35.575814830505	5.35382258748136	66.7264937	28.6241638	4.754423	9.8453178
61.2627539968823	35.0742331021859	7.13957452017725	75.1791401	28.4357222	11.5456464	18.0653964
61.2627539968823	35.0742331021859	7.13957452017725	69.6772126	28.9703915	6.8785128	10.4491408
60.728434759514	34.9297230672933	7.65406509494419	67.6344777	29.9025036	14.033884	17.8609779
60.728434759514	34.9297230672933	7.65406509494419	62.0390375	27.7696953	8.7011853	7.3539199
59.8247508491626	35.0655859164144	8.40736210251951	56.0727891	23.8686819	7.47443	15.5553362
56.9464317910272	35.498321966395	10.8066846337939	56.2067364	40.2417677	14.7422616	19.6165059
56.9464317910272	35.498321966395	10.8066846337939	44.7688336	34.8472485	18.3927145	19.5683767
56.8044236942043	35.5196718997793	10.9250604159378	56.9481598	35.7189477	11.6860928	0.7997132
56.8035579794151	35.5197452528183	10.9255555494908	55.1300701	40.0588307	9.3430467	5.0900091
53.2268966258177	32.6595844352071	14.7980799643227	55.5353048	38.1752447	17.6684542	10.1702798
53.2263002627318	32.6591075394466	14.7987256589129	51.358437	31.183912	20.2786449	5.9744983
53.2263002627318	32.6591075394466	14.7987256589129	51.2078647	35.5791539	12.2358489	4.4951633
53.2256906644477	32.6586198725093	14.7993506156236	57.0336699	24.3925592	19.6603049	10.3178167
49.4408975554335	33.9443211888503	15.3374095927359	44.272376	24.1529526	16.7575015	13.4087757
49.4408975554335	33.9443211888503	15.3374095927359	36.9545772	32.1019086	19.1323386	17.1509479
46.2507711653794	35.0280131070711	15.7909287406032	44.6441662	33.1239716	16.5654644	11.3823841
41.1812670023615	36.7501331886842	16.5116265896362	37.130172	34.1670861	22.6509329	7.7958056
41.1808348238672	36.7507747357625	16.5109928396102	35.0133629	33.6653342	20.0549291	15.142596
38.8007288840842	40.2839209331274	13.0207866796149	37.4597811	44.2188485	16.422469	8.3563058
38.8007288840842	40.2839209331274	13.0207866796149	39.4220046	48.156385	14.5273965	18.6805968
37.9497443293059	41.5471642164893	11.7728962053386	40.4352515	45.1450838	11.9573703	4.3768484
37.021859629878	41.8323365708612	10.9308534994181	41.3950957	34.602479	9.5059407	10.330203
37.021859629878	41.8323365708612	10.9308534994181	32.8302989	42.2309887	13.616708	9.1323516
36.3893177959426	42.0267394362294	10.3568304146875	42.5831476	37.1399223	7.4293369	8.4151487
36.3893177959426	42.0267394362294	10.3568304146875	34.2887402	41.9043439	6.835982	4.1016802
36.3893177959426	42.0267394362294	10.3568304146875	34.4981613	43.6098189	6.3838863	7.4849006
36.3893177959426	42.0267394362294	10.3568304146875	37.6481264	47.8813096	6.5793036	7.0802754
29.1313194283296	43.3075176954638	7.02149579974697	28.2512087	43.1796715	6.8189779	0.9121146
41.7379464216011	49.1493990041268	7.0622256107692	43.0965371	49.287121	4.5164689	2.8888775
43.6912257001691	50.6579734129925	10.1972267412264	45.5118999	65.9532613	1.4856264	17.6961201
43.6912257001691	50.6579734129925	10.1972267412264	54.2235528	56.265496	3.5115961	13.6774223
43.6912257001691	50.6579734129925	10.1972267412264	32.3710377	53.6854	0.0060466	15.9945905
43.6912257001691	50.6579734129925	10.1972267412264	36.1244237	41.0242921	19.6707957	15.4858909
43.6912257001691	50.6579734129925	10.1972267412264	38.128444	50.990683	1.5244057	14.1351688
43.6912257001691	50.6579734129925	10.1972267412264	32.3078962	45.114069	10.6720814	14.2581658
43.6912257001691	50.6579734129925	10.1972267412264	31.5095969	51.0684653	11.523883	15.7915136
43.6912257001691	50.6579734129925	10.1972267412264	44.2906965	51.8898251	11.3116798	3.7343282
43.6912257001691	50.6579734129925	10.1972267412264	38.9617732	51.3997809	16.210445	12.7914782
48.1172595229738	51.442932883053	11.395688215121	49.3212736	48.3119567	9.5488066	3.8293124
49.6862516109916	51.8302430536656	11.8913807561682	53.3341085	54.2742297	9.8426206	4.845343
49.0470052227302	49.1466371134313	16.9279531825124	49.7681271	46.8278362	16.9025729	2.4284766
48.1026185259776	49.9644715680832	19.3088051529098	39.5709227	52.0192185	20.9490324	18.7792196
46.4908917343789	51.3602194267399	23.3720590288657	47.6524078	52.2249928	24.4877735	17.0127082

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
46.4908917343789	51.3602194267399	23.3720590288657	45.6990417	60.3070344	11.94067	16.3509992
46.4905404931754	51.3605235999903	23.3729445277369	44.8729194	51.9811136	24.4648411	2.0479424
50.239378408182	50.5714065365819	23.3267093018802	46.3458684	54.8708712	24.5219613	8.2955698
53.4670626229583	49.8919904812772	23.2869015938628	54.8328865	43.6672378	22.5503676	6.4152555
56.0608511168124	49.3460072108785	23.254911858839	57.0032853	47.929495	24.4820709	2.0977627
58.3037379073068	52.0766962739683	19.9701488622831	57.7424662	53.0431767	19.7584506	1.1375089
60.0120494825858	51.9203432385992	18.8693751157618	58.3317264	48.8464518	15.1551224	16.6689028
60.0120494825858	51.9203432385992	18.8693751157618	55.3536754	50.0230289	15.6187386	10.7398558
63.6785415381356	51.5847678975066	16.5068212452015	63.3830619	45.6708392	19.4411223	11.4259131
63.6785415381356	51.5847678975066	16.5068212452015	63.3053921	48.8331121	7.8682203	9.0739339
63.9311685178292	51.6503522303053	16.6267650853599	69.6306367	57.4599551	14.1507992	8.6491765
63.9311685178292	51.6503522303053	16.6267650853599	65.8501112	46.5185477	18.4012114	5.7590293
63.9311685178292	51.6503522303053	16.6267650853599	62.9728444	48.2610974	18.088966	5.9042331
66.2184109762089	53.5738035539636	17.5088126890751	73.3690079	50.7128517	12.3210863	17.0196572
66.2184109762089	53.5738035539636	17.5088126890751	67.1669184	49.4371849	3.0262948	15.5982026
68.127401797259	55.1791650446936	18.244992105318	64.4880133	60.4854675	12.6069191	17.3914578
68.127401797259	55.1791650446936	18.244992105318	65.5436157	56.992435	13.1266946	17.084027
71.5251945639758	58.0365311589032	19.5553101558192	67.7686962	50.942416	23.8888342	9.9071922
73.5569246432168	59.745109948125	20.3388224879543	73.7932186	65.1929118	21.2635249	5.5307734
73.5569246432168	59.745109948125	20.3388224879543	70.748982	60.565778	20.2126548	4.327335
74.329003285807	60.3943877207954	20.6365653493221	74.3685871	61.179785	20.6768635	0.787426
79.0254267912672	55.3707229361775	22.1490246073892	79.155929	54.6404138	23.5670664	1.6003827
83.1359602328302	53.9887432529981	16.4496982418792	79.80288	56.0883078	18.4129389	5.2865846
88.3464650060691	52.2369481991426	9.22524232647793	78.4065879	56.8222853	10.2773712	18.7893207



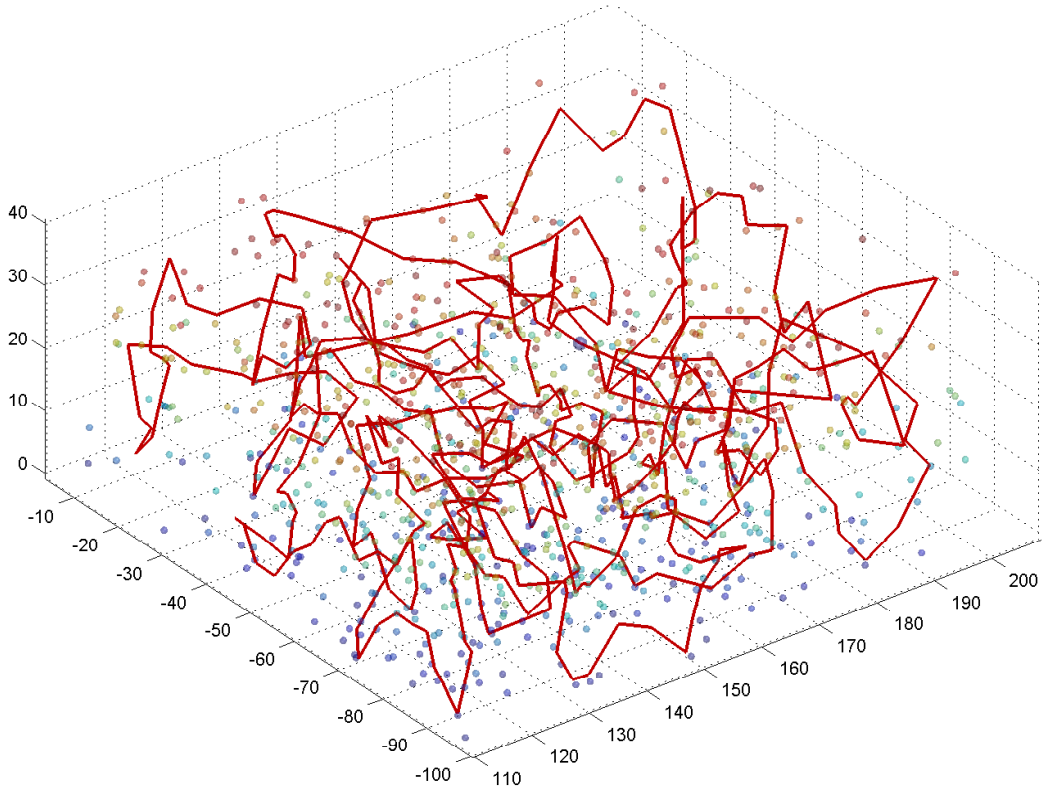


Figure N.97: *bonus*1000, arbitrary radius, 3D, Euclidean, Length = 2689.4131928

Table N-100: Solution for *bonus*1000, arbitrary radius, 3D, Euclidean

Total distance: 2689.41319283233 Depth: x 80 y 20 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
81.7101899278075	32.523700576	0.489048021999998	86.50661976	33.33916758	0.489048022	4.865256989
78.0260395849087	44.130280147	0.327384457	77.14427045	45.25079579	0.327384457	1.425858377
78.8138623437393	50.054061915	7.556720976	78.92131522	50.41345477	7.556720976	0.375112442
76.9091373240261	46.972198745	10.92269156	77.77449926	46.72256252	10.92269156	0.900649502
73.3560516502123	44.365847906	11.2951426657154	74.78372311	42.05088328	3.322634156	8.48875153
73.3560516502123	44.365847906	11.2951426657154	73.13866372	41.71405139	17.04301109	6.333819835
69.8029659942836	41.75949715	12.58912096	69.67922342	40.74675918	12.58912096	1.020269779
66.7407892971646	43.170859061	7.42538459456424	75.19376171	39.75388964	3.378695446	11.99616742
66.7407892971646	43.170859061	7.42538459456424	70.24663893	43.40548551	1.656037041	10.39433718
66.7407892971646	43.170859061	7.42538459456424	63.76560063	37.45231942	9.842542758	11.55334525
66.7407892971646	43.170859061	7.42538459456424	63.41360315	44.69674786	5.219771375	7.070238855
66.7407892971646	43.170859061	7.42538459456424	64.47235297	44.07915445	14.05919317	7.777532307
66.7407892971646	43.170859061	7.42538459456424	55.55130491	39.21526309	7.425393497	11.86807905
66.7407892971646	43.170859061	7.42538459456424	63.59211348	50.34808715	9.20862338	9.725987624
63.8401611643727	44.639330027	16.8704586854384	74.55729645	43.48740037	20.58508364	11.94062462
63.8401611643727	44.639330027	16.8704586854384	58.14893689	37.55022655	17.10511358	9.288752836
63.8401611643727	44.639330027	16.8704586854384	66.65703205	47.7722791	14.44067044	4.863538053
63.8401611643727	44.639330027	16.8704586854384	67.10787364	49.80646667	13.82525922	8.845260172
63.8401611643727	44.639330027	16.8704586854384	59.28037529	42.02965748	18.78086606	8.171091803
63.8401611643727	44.639330027	16.8704586854384	63.21772914	46.4808445	18.00555738	2.251010045
63.8401611643727	44.639330027	16.8704586854384	58.48548965	38.49282405	23.12403661	11.79894595
59.7736425843028	40.551336112	24.07122315	63.12520069	41.24941139	24.07122315	6.279661735
55.707124002506	36.463342198	23.8394871399303	62.83458953	32.37480154	31.54745986	11.26631142
55.707124002506	36.463342198	23.8394871399303	49.49892788	30.73465222	20.32700892	9.148611436
55.707124002506	36.463342198	23.8394871399303	52.03099226	42.50134863	22.51431543	7.192186477
55.707124002506	36.463342198	23.8394871399303	48.88810081	29.6929228	28.59078684	11.17097838
55.6082587593277	35.906123586	29.7998782682088	63.54041364	40.47906672	32.95919177	10.09103037
55.6082587593277	35.906123586	29.7998782682088	53.48089128	34.57431179	29.79987824	2.509863553
60.4135094364871	38.419065345	31.82775528	61.01859213	37.82208646	31.82775528	0.850005209
60.0996301661232	45.982577073	39.1154828914958	71.61626861	44.97765672	39.11549021	11.56039904
60.0996301661232	45.982577073	39.1154828914958	57.48443808	43.25173204	37.88033317	5.068521277
58.4930460651158	53.658887811	36.33438611	58.50503897	53.8647284	36.33438611	0.206189664
56.681350462011	57.814763272	34.61199265	57.09480153	60.45993374	34.61199265	2.677287543
54.5131687619441	59.689917644	30.15017844	54.03625818	65.02303827	30.15017844	5.354401863
52.8120356316711	56.342234374	32.1102999728804	55.80484172	50.30189669	30.08035465	7.040116877
52.8120356316711	56.342234374	32.1102999728804	55.16481024	55.42346911	31.47512835	2.604442543
52.8120356316711	56.342234374	32.1102999728804	52.57887869	54.16196226	35.47497689	4.016092555
48.0877309450987	56.596984725	32.9330217	48.91348948	54.77748717	32.9330217	1.998111236
43.5823225332861	60.695433442	33.7661087352191	52.68458788	66.68600654	36.07142386	11.1378938
43.5823225332861	60.695433442	33.7661087352191	37.67648628	59.01822185	34.10509713	8.663388767
43.5823225332861	60.695433442	33.7661087352191	41.72708173	62.5487287	34.68501321	8.265204335
43.5823225332861	60.695433442	33.7661087352191	38.57181853	69.29967661	29.47346952	10.842735
42.4742476813448	58.81097398	34.60197054	39.00311055	58.98114927	34.60197054	3.475306118
42.2418539403152	58.52737265	37.1715069327319	49.39322363	67.57061768	37.48715692	11.53351655
42.2418539403152	58.52737265	37.1715069327319	35.39691212	60.01558524	36.77171252	7.016255469
40.382786228564	53.326150877	39.8596366300019	41.84687745	52.15158968	38.57062516	3.267858024
40.382786228564	53.326150877	39.8596366300019	39.86159624	55.58185516	39.85963663	2.315133001
39.252211369718	44.972020407	35.6315643847821	39.35568633	35.06788426	34.69629234	9.948736286
39.252211369718	44.972020407	35.6315643847821	45.94832838	45.50704308	38.19660802	7.19052718
39.252211369718	44.972020407	35.6315643847821	38.72818734	43.64397508	34.64285831	6.801536894
39.252211369718	44.972020407	35.6315643847821	30.62796082	46.77730777	34.94066727	8.83821808
43.2534021411153	48.325871111	31.4031693959397	39.91233765	41.2977364	28.26450372	9.100834641
43.2534021411153	48.325871111	31.4031693959397	43.66555329	47.77139353	28.778171	2.714393217
43.2534021411153	48.325871111	31.4031693959397	47.38308024	49.71863955	31.58389373	4.361961303
39.9163523214154	49.289099245	30.57444188	39.67150404	49.44131071	30.57444188	0.288303678
41.3851320871199	47.26475336	23.88525166	39.96945525	49.46230999	23.88525166	2.614076519
43.0166904859123	44.987724984	20.21315796	43.11381093	45.00092033	20.21315796	0.098012743
40.5419588408021	42.152792481	24.8981708	40.57741767	42.47262	24.8981708	3.80870253
38.0672284289506	39.317859624	22.15074575	38.90241804	39.45548462	22.15074575	0.84645279
32.2041965915281	35.924592597	24.23960074	31.80606468	35.45021175	24.23960074	0.619311075
30.1302251558268	37.046054699	33.99399048	30.83636789	38.35208021	33.99399048	5.711258926
27.3899661549339	34.218745384	38.61257115	27.42853428	33.27622768	38.61257115	0.943306484
28.0562536764563	38.167516835	36.3316526194464	30.28185343	43.77834378	32.70178342	7.043480934
28.0562536764563	38.167516835	36.3316526194464	30.41452332	39.55317391	35.96788826	2.75931255
28.0562536764563	38.167516835	36.3316526194464	22.79879511	41.59634367	39.45795983	7.012240784
26.3863306728553	38.513993337	34.2305261179304	26.37919279	28.3108891	38.48025156	11.05276225
26.3863306728553	38.513993337	34.2305261179304	22.07359754	33.01769228	30.23180819	8.049766298
26.3863306728553	38.513993337	34.2305261179304	31.80593192	45.60640645	39.41102857	10.76621751
26.3863306728553	38.513993337	34.2305261179304	23.40792676	43.64379836	35.72280889	8.702120093
26.3863306728553	38.513993337	34.2305261179304	17.44262234	43.68368222	35.8944745	10.91295355
25.7230760117925	43.998904611	30.1225615	25.71821347	44.02373583	30.1225615	0.02530284
25.9273658274499	45.053783913	27.11673494	27.37711129	46.43616017	27.11673494	2.003178979
25.4366274173392	45.445933468	24.3198765336483	19.77510428	38.58926296	16.64922472	11.91376449
25.4366274173392	45.445933468	24.3198765336483	26.12441872	44.96485891	27.03242338	2.839436564
25.4366274173392	45.445933468	24.3198765336483	26.97467166	54.66512134	21.38913798	11.66012717
25.4366274173392	45.445933468	24.3198765336483	14.44281578	41.35822358	23.25943932	11.77700274

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
27.361947555434	46.801311056	22.8120098840804	29.65914735	42.12761495	24.52937867	5.483604448
27.361947555434	46.801311056	22.8120098840804	26.567735	46.7768569	17.70634543	5.167125033
28.8089223800439	49.259895971	24.2124193066652	32.06711817	41.12824267	27.14001544	9.236365321
28.8089223800439	49.259895971	24.2124193066652	27.06311365	42.64274924	23.39166283	7.281813729
28.8089223800439	49.259895971	24.2124193066652	33.45872958	53.85918585	23.94292918	6.545746658
28.8089223800439	49.259895971	24.2124193066652	28.72359173	49.06807614	23.44175989	3.019170961
28.8089223800439	49.259895971	24.2124193066652	27.13020332	56.00735022	18.32075531	9.113612959
29.4253845761461	51.242450765	27.7966782497139	34.06373355	42.77086753	33.9464291	11.54083384
29.4253845761461	51.242450765	27.7966782497139	36.93641703	55.80482127	27.58013236	9.247821291
29.4253845761461	51.242450765	27.7966782497139	28.08331623	42.02257662	27.79667825	9.317039589
29.4253845761461	51.242450765	27.7966782497139	30.55507662	47.73107042	32.65818922	10.01719534
29.4253845761461	51.242450765	27.7966782497139	24.77779172	44.04083387	26.11612996	11.013687
29.4253845761461	51.242450765	27.7966782497139	30.18073163	48.32029982	32.22769732	9.58620967
29.4253845761461	51.242450765	27.7966782497139	22.68802089	46.28526246	22.76975049	10.38254064
29.4253845761461	51.242450765	27.7966782497139	28.94274384	52.01860718	30.54475385	4.898024634
29.4253845761461	51.242450765	27.7966782497139	31.52001616	50.89228775	38.01036066	10.98721573
29.4253845761461	51.242450765	27.7966782497139	29.89833465	58.88393924	31.18403904	9.428399067
30.5858778816426	56.962439323	23.93617923	32.83493269	54.50530143	23.93617923	5.131563652
31.7463704483913	62.68242991	25.97934086	31.78300706	62.74548174	25.97934086	0.072923073
31.7551667932266	66.420345779	28.83764483	32.14669335	66.5741861	28.83764483	2.169371802
28.2444719733253	65.842760248	23.0896080636701	26.46280572	62.61127777	22.19141047	3.79783788
28.2444719733253	65.842760248	23.0896080636701	28.77703399	67.75671878	24.26797752	2.359780417
28.2444719733253	65.842760248	23.0896080636701	26.03259253	67.05188068	24.42560707	2.852941681
31.7639638817563	70.158264115	21.8177247	31.96159565	70.60936436	21.8177247	0.492493397
29.4402810911921	65.01618661	16.71360152	29.47881008	65.01108227	16.71360152	0.038865631
22.2451579956565	65.301248673	19.4136182837203	21.56136042	60.00845368	9.387366518	11.66584778
22.2451579956565	65.301248673	19.4136182837203	24.58618772	59.92581691	21.04332426	6.813403422
22.2451579956565	65.301248673	19.4136182837203	24.68488711	59.85199485	22.75052505	7.587909595
22.2451579956565	65.301248673	19.4136182837203	26.36495426	64.10386589	19.00754119	5.012038977
22.2451579956565	65.301248673	19.4136182837203	26.6523776	66.91672378	14.68008016	7.970867369
22.2451579956565	65.301248673	19.4136182837203	30.01509861	69.93828769	21.72402497	10.72586107
22.2451579956565	65.301248673	19.4136182837203	21.61039636	65.83676525	18.75923326	4.44331993
22.2451579956565	65.301248673	19.4136182837203	19.17901123	72.48982593	17.20855307	10.20159412
22.2451579956565	65.301248673	19.4136182837203	13.50520564	67.72241024	17.09707449	9.360297306
22.2451579956565	65.301248673	19.4136182837203	14.01917911	69.22007201	23.43359605	9.959122763
16.9533188468084	64.925620921	18.98571058	16.63383213	64.77854357	18.98571058	0.351715097
14.2808675569083	65.75584211	23.55512122	14.11476256	66.58488992	23.55512122	0.845524181
12.6397749099782	61.43845368	21.9287132426997	16.07158763	60.00636388	16.82852088	7.250262131
12.6397749099782	61.43845368	21.9287132426997	12.00297966	63.9466553	16.56981835	5.950994709
12.6397749099782	61.43845368	21.9287132426997	8.689838933	62.80875147	27.12937634	6.672826006
13.1611523693031	55.32003253	22.9111302	13.21771043	55.16074821	22.9111302	0.169027539
12.0890145732072	53.689424173	27.9972705545818	14.81228179	50.29125842	28.12065032	4.356482226
12.0890145732072	53.689424173	27.9972705545818	12.24975114	50.92735248	27.57127396	3.387131358
12.0890145732072	53.689424173	27.9972705545818	11.86612062	56.83051802	27.8782456	3.1512409
9.55452526283034	52.142223123	28.2104961895212	9.19676513100001	46.15569372	17.99642834	11.9809647
9.55452526283034	52.142223123	28.2104961895212	10.71615729	46.62293177	28.86994808	5.678630364
9.55452526283034	52.142223123	28.2104961895212	8.736047039	47.86465463	22.63362148	7.075947311
9.55452526283034	52.142223123	28.2104961895212	8.078510661	52.12465727	17.30721805	11.74516273
9.55452526283034	52.142223123	28.2104961895212	9.26512226200001	48.10149258	36.29819804	9.899762573
9.55452526283034	52.142223123	28.2104961895212	4.692804385	58.08052349	25.21182896	11.75765381
9.55452526283034	52.142223123	28.2104961895212	3.684518627	54.75346427	34.67646632	10.66155854
6.57684925147407	53.102645099	31.2051026	5.351054934	54.87903352	31.2051026	3.370669882
3.59917370377264	54.063067156	30.6627496898425	1.250751092	48.74029716	30.02493246	5.852672895
3.59917370377264	54.063067156	30.6627496898425	0.102323447000003	55.05645207	30.68754948	3.635297833
5.20274718635568	54.019409275	35.4619013242765	3.390983182	60.32064994	30.61068338	8.156128877
5.20274718635568	54.019409275	35.4619013242765	3.166581108	54.38581172	37.35766501	2.806090341
7.87562767024093	52.873463813	36.66849242	7.88086425500001	53.63419396	36.66849242	2.73437995
10.5485081093532	51.727518285	39.350114	10.16802995	51.02082052	39.350114	0.802611588
15.3318517759978	54.501534021	39.50883453	15.36448886	54.97389236	39.50883453	0.473484508
19.9219293053537	54.478398302	36.7426310519879	22.00300591	49.77440842	32.73357505	6.521574248
19.9219293053537	54.478398302	36.7426310519879	23.68432498	51.4412716	36.97532542	4.840858032
19.9219293053537	54.478398302	36.7426310519879	22.06521443	57.50548607	32.39286042	6.030659205
19.9219293053537	54.478398302	36.7426310519879	20.37447933	52.92580791	35.47903396	2.126357542
21.8367316327603	56.735755958	34.56781671	20.97945435	58.66863495	34.56781671	2.745603401
23.7515339606818	58.993113614	33.73414623	24.05460087	58.82740751	33.73414623	0.345409995
22.7538485388949	62.842915004	32.83153178	25.20403775	63.98638021	32.83153178	4.126692706
21.7561631228452	66.692716388	35.9840265756984	19.29354577	63.34226321	29.80733532	9.732805781
21.7561631228452	66.692716388	35.9840265756984	17.25601024	61.69443137	35.1920429	6.772109512
21.7561631228452	66.692716388	35.9840265756984	19.92687299	66.4828608	36.85195291	7.674542398
21.7561631228452	66.692716388	35.9840265756984	21.2618816	68.31108552	38.60957073	3.123606085
21.7561631228452	66.692716388	35.9840265756984	14.35540419	64.70998039	34.26175056	9.721773775
21.7561631228452	66.692716388	35.9840265756984	14.52745655	66.82146945	34.730647	9.209129847
22.7450860361399	72.469672195	38.77088424	22.68191696	72.90808337	38.77088424	0.442938698
24.34823875565	73.983690438	36.6939804	23.86908483	73.83689183	36.6939804	0.501137023
26.7410796332719	75.739645787	34.2564448	25.63863856	75.55318582	34.2564448	1.789599458
29.1339205970423	77.495601211	33.99746475	29.81370195	76.77877617	33.99746475	0.987897175
29.767683534909	81.10649251	38.35679407	29.49613778	81.77737157	38.35679407	0.723751207
32.1343079464204	80.436187328	32.7794529952609	33.57300136	70.51852673	38.6296637	11.82127081
32.1343079464204	80.436187328	32.7794529952609	40.77647626	81.23711291	32.65865455	8.680043042
32.1343079464204	80.436187328	32.7794529952609	38.20769452	77.89743741	37.44950686	10.9290231

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
32.1343079464204	80.436187328	32.7794529952609	34.03327785	85.06694553	30.01520061	9.82794583
32.1343079464204	80.436187328	32.7794529952609	39.57638463	86.69599702	34.69521123	10.21132869
32.1343079464204	80.436187328	32.7794529952609	27.46499326	78.56518576	33.59652638	6.680683032
32.1343079464204	80.436187328	32.7794529952609	32.21271953	85.45061531	28.67707968	9.951664756
32.1343079464204	80.436187328	32.7794529952609	30.96168192	84.99460949	29.50639116	5.800733164
32.1343079464204	80.436187328	32.7794529952609	24.84752889	78.21896812	35.91459865	11.0945574
32.1343079464204	80.436187328	32.7794529952609	31.92346769	85.96439053	34.03343791	5.672562244
32.1343079464204	80.436187328	32.7794529952609	28.94608169	87.05476962	32.15968695	8.550013673
32.1343079464204	80.436187328	32.7794529952609	30.78074407	88.67743671	34.14412331	9.308222123
30.4261521667065	79.135671915	32.0525363934694	24.37529212	73.10827156	29.72637521	9.946110191
30.4261521667065	79.135671915	32.0525363934694	29.7776223	79.3796747	28.90759999	3.220365403
30.4261521667065	79.135671915	32.0525363934694	24.67927032	81.21698222	36.79859251	7.738446369
31.0975444442793	76.968497011	26.6970944985053	35.96077646	77.38727187	28.20511129	5.108866084
31.0975444442793	76.968497011	26.6970944985053	32.43971284	75.52883521	28.48064207	2.656140818
31.0975444442793	76.968497011	26.6970944985053	29.09610379	74.18683092	25.64666307	3.584248474
31.0975444442793	76.968497011	26.6970944985053	31.54519137	79.16359507	27.34637643	3.505835342
32.7083776940161	80.653562488	22.4278796	32.56942546	80.98884638	22.4278796	0.362936649
35.9412617100087	80.424711191	22.10896744	32.77989789	83.25231939	22.10896744	4.247864371
39.1741457233153	80.195859885	22.75217398	38.78697828	81.20736169	22.75217398	1.751750667
42.4070297459478	79.967008608	23.15451647	43.12816365	79.63219046	23.15451647	0.795070626
43.5776176370636	80.69566891	25.59577081	44.66930475	80.79724102	25.59577081	1.096402137
42.3652079097136	81.20261189	30.01446557	41.14833132	82.10595877	30.01446557	1.515527703
43.6333535364434	79.868117356	36.1367220856667	40.76978451	74.94346594	30.5932008	8.186468819
43.6333535364434	79.868117356	36.1367220856667	41.14789047	74.75727523	32.931636	7.341258219
43.6333535364434	79.868117356	36.1367220856667	46.03038143	83.79986665	30.96050312	6.928032766
43.6333535364434	79.868117356	36.1367220856667	45.3176187	83.7901857	37.67961833	4.538711056
43.0497363735565	74.601203423	30.2774743	42.58773685	73.94634336	30.2774743	0.801427016
48.8556381869494	78.391097064	27.62901252	49.13669956	77.10708156	27.62901252	1.314416719
54.2030916932532	84.275389745	27.2502983118427	51.91564321	83.24154723	26.19545671	4.641150631
54.2030916932532	84.275389745	27.2502983118427	55.11001594	85.68607737	27.25029831	1.677066237
53.5159402353301	80.773074157	33.0807572522593	53.92763119	74.12654413	38.27376011	8.444710151
53.5159402353301	80.773074157	33.0807572522593	56.64479831	82.24679775	31.938846	3.64219376
53.5159402353301	80.773074157	33.0807572522593	52.83415121	85.50123146	31.48102764	6.270496768
52.8074064979139	77.270677378	30.3256767508434	55.58088554	76.52999392	28.31600672	3.50422197
52.8074064979139	77.270677378	30.3256767508434	52.40986372	76.90026657	30.53428803	0.582033584
52.7136822414572	76.27638855	34.0800855515447	49.38151416	71.84627519	34.52041136	5.560857427
52.7136822414572	76.27638855	34.0800855515447	53.61605765	80.93460352	33.38542247	4.795394132
55.3737638440963	76.756096304	38.8704333900004	62.20174968	80.96664236	37.77358899	8.789809443
55.3737638440963	76.756096304	38.8704333900004	47.34853229	74.63427391	38.87043339	8.300992216
65.7365976142456	79.27236487	36.3023667140363	70.77169737	73.88064127	33.24954023	8.726232409
65.7365976142456	79.27236487	36.3023667140363	70.61748839	78.65460339	33.23222305	7.660924967
65.7365976142456	79.27236487	36.3023667140363	72.09010058	81.417498	36.30236671	6.705862814
70.9103799103937	80.036654387	30.92710539	68.96890483	80.55619731	30.92710539	4.842060922
76.0841622393663	80.800943816	34.55930276	75.20998283	80.5662569	34.55930276	0.905134017
83.9002400266629	82.274597906	35.808146521448	86.75397464	75.23932777	39.5614605	8.469131771
83.9002400266629	82.274597906	35.808146521448	81.4352048	82.89764497	33.18556014	3.652744946
91.9002166208098	85.42426775	36.18471901	94.75890926	85.83537613	36.18471901	2.888102094
84.7196293597036	86.390822057	28.65831969	87.63411723	89.72076827	28.65831969	4.425243646
76.8982175421996	86.625202562	21.67959601	76.68533256	86.49303137	21.67959601	0.250577812
73.2116453404786	89.426728378	25.63543235	72.48804708	89.57044348	25.63543235	0.737731979
70.1734152896122	92.099485787	26.6722771066433	63.32241418	89.29380754	27.27800065	7.42798409
70.1734152896122	92.099485787	26.6722771066433	72.91384846	91.54886288	27.04740893	4.973733961
70.1734152896122	92.099485787	26.6722771066433	71.22771139	93.77569631	25.9346523	4.877275027
70.1734152896122	92.099485787	26.6722771066433	69.82339194	93.15949799	27.73705762	3.201208435
70.1734152896122	92.099485787	26.6722771066433	65.26732099	95.86741863	25.98441419	6.903660169
70.1734152896122	92.099485787	26.6722771066433	66.92699784	97.50570073	24.16462464	6.78636185
70.5098104761423	95.43513577	22.47153407	68.09186985	95.85522589	22.47153407	2.454162297
76.7831601842447	97.739299185	20.3915349404733	86.37403118	99.02923308	15.37465632	11.96387757
76.7831601842447	97.739299185	20.3915349404733	80.84419352	99.98848979	20.3915349	4.64228932
73.5504451935909	94.778559745	35.1537540750879	68.01446808	90.26524455	37.65674979	9.658401998
73.5504451935909	94.778559745	35.1537540750879	76.48394754	93.81500316	33.05082675	3.73579719
73.5504451935909	94.778559745	35.1537540750879	74.57969734	99.83821951	39.01985633	6.450291742
67.5002319400254	90.375263896	32.58136924	66.59307852	88.41880362	32.58136924	2.156539854
64.4524884026857	92.447402034	34.40488013	64.96530116	93.98228963	34.40488013	1.618288248
60.4407189221849	91.634146415	38.7444087932844	53.27314218	89.6748569	31.66096453	11.35118685
60.4407189221849	91.634146415	38.7444087932844	61.4906739	91.40517217	33.71736683	5.140621126
60.4407189221849	91.634146415	38.7444087932844	54.48965648	89.30641789	34.42411824	9.13140765
60.4407189221849	91.634146415	38.7444087932844	62.03675317	91.42777069	38.34727303	2.470705606
60.4407189221849	91.634146415	38.7444087932844	63.88368354	92.98872817	38.82161587	4.684052733
60.4407189221849	91.634146415	38.7444087932844	66.67195124	95.92017704	38.76714707	9.763847817
60.4407189221849	91.634146415	38.7444087932844	57.84005051	97.24933499	35.2604133	10.98084378
56.4289473630275	90.820889077	36.83882342	56.15571936	89.41500769	36.83882342	1.432185748
52.5751653988902	90.820569948	36.4837101327988	48.45592928	88.4082341	31.5542414	6.862006444
52.5751653988902	90.820569948	36.4837101327988	51.44475874	86.59474587	38.70943792	4.908082369
52.5751653988902	90.820569948	36.4837101327988	49.19512952	89.44346883	37.79505672	4.342724929
49.9216787340584	92.953680102	30.7205419367294	53.29556121	92.47449182	25.90682802	6.766260463
49.9216787340584	92.953680102	30.7205419367294	51.95218378	92.57992082	30.72068519	2.064617824
49.9216787340584	92.953680102	30.7205419367294	45.13861135	90.47060332	31.83589749	6.162353189
47.2647811046313	95.087414346	30.6210566	48.69087386	94.64188777	30.6210566	2.380405111
44.6078887923137	97.221146993	30.36827838	44.56970667	97.22856143	30.36827838	0.038895351

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
47.8402904728388	98.211244032	30.05026749	48.39934621	99.02729511	30.05026749	0.989182834
50.8478699991793	98.873171754	25.1872600782611	50.67630959	98.08417141	16.59101162	8.634086059
50.8478699991793	98.873171754	25.1872600782611	57.58318464	98.55697919	27.3972425	7.09566511
50.8478699991793	98.873171754	25.1872600782611	45.34071838	99.2752365	24.31073394	6.545950484
53.3034052748027	99.577918898	28.8023262798846	52.60387814	98.51053443	27.61605738	2.070061212
53.3034052748027	99.577918898	28.8023262798846	54.29998953	99.89190946	28.80232628	1.044878103
52.9480691409837	99.397054268	33.42740223	53.69991452	99.81161169	33.42740223	0.858562362
49.5930349294266	97.562196589	35.19170787	52.71570498	99.46690315	35.19170787	5.481309266
46.2380002405041	95.727339675	35.9745595	48.82360524	98.37839062	35.9745595	7.220914682
42.8829660747361	93.892482193	36.1765382337071	37.64776281	91.60925844	32.09349115	7.287109974
42.8829660747361	93.892482193	36.1765382337071	42.53215273	92.92397176	36.17653823	1.03008857
40.6150958753436	95.059023368	38.94704805	39.44288188	96.38027853	38.94704805	1.997947716
38.3472262202842	96.225564599	36.97541326	37.83606476	96.13365876	36.97541326	0.51935799
36.8619257768942	97.532810243	34.4148051624061	45.01212749	95.47966426	34.75016178	8.619068903
36.8619257768942	97.532810243	34.4148051624061	36.79414467	92.2553405	34.07762876	5.623371076
36.8619257768942	97.532810243	34.4148051624061	34.28587406	93.01320732	33.5082721	5.515074689
36.8619257768942	97.532810243	34.4148051624061	35.60188133	93.1465045	36.33325574	7.692381008
36.8619257768942	97.532810243	34.4148051624061	31.89808649	95.62749105	29.09944527	8.151929048
36.8619257768942	97.532810243	34.4148051624061	35.92075185	99.04269187	36.73360907	5.09129157
35.3766263078978	98.840053573	35.6071420732937	43.04035221	95.37042711	39.63020675	9.4350131
35.3766263078978	98.840053573	35.6071420732937	36.49499514	99.8776323	35.60714208	1.525555131
32.659850668629	99.004781939	33.2886002341304	43.63164404	99.67485887	36.08960829	11.34349589
32.659850668629	99.004781939	33.2886002341304	31.65500689	99.46882276	25.89517482	7.475813284
29.0333390556685	99.096852588	31.1755100800676	28.69202489	99.34571575	27.8214658	3.476487599
29.0333390556685	99.096852588	31.1755100800676	27.50072899	99.76767751	31.96071673	2.315046026
25.6808500051034	98.23028329	29.7230242	23.65267964	99.40598609	29.7230242	5.864138835
25.4068274229577	99.188923375	30.35671629	25.34553204	99.20543489	30.35671629	0.063480344
25.9548724057628	97.271643018	33.70510702	25.35918107	97.93925835	33.70510702	0.894739291
27.7985846191404	94.553787787	34.9249526692907	32.33676606	89.56266763	36.70990188	6.977995049
27.7985846191404	94.553787787	34.9249526692907	30.18341718	92.15484297	29.45540328	6.43104448
25.3211861777963	96.528925726	37.39052093	25.64004891	98.33585155	37.39052093	1.834844509
22.2115991349523	94.921585321	39.9893956	22.00240146	99.12603644	39.9893956	7.885601786
19.1020117401345	93.314244392	37.1518379962302	18.21730526	92.48725442	38.15120003	1.5701409
19.1020117401345	93.314244392	37.1518379962302	18.65944439	93.90622028	36.26618878	1.153549238
16.5856156234032	91.775051499	39.93862668	16.85080568	91.45389056	39.93862668	0.616270698
14.0692195835039	90.23585794	37.41288443	14.30638295	91.72702037	37.41288443	2.704929464
11.5528234979534	88.696664626	36.2773466	12.48771043	90.90107319	36.2773466	3.496358466
9.03642745086746	87.157471417	38.16021851	9.940095688	86.998178	38.16021851	0.917600499
3.4829711560796	86.153633135	39.4360724353888	1.83782096500001	81.06813079	39.8464095	5.360711684
3.4829711560796	86.153633135	39.4360724353888	2.643010323	87.48230483	39.26134045	1.581592217
6.00755685085012	89.538113648	32.98505569	5.838459994	89.46110654	32.98505569	0.185805925
9.58656291790241	93.402779776	33.2063623891486	16.10416337	94.62212285	35.78598723	7.114799892
9.58656291790241	93.402779776	33.2063623891486	10.35439985	93.61856888	31.55963283	1.829714932
5.74568012057401	95.770691468	37.04813984	5.231683223	94.88567828	37.04813984	5.753061171
1.90479732425922	98.138603166	37.96621421	1.662890125	98.21483308	37.96621421	0.253633777
5.03454793318247	98.309925468	27.9212668384277	11.51332542	99.95442641	21.54207323	9.875636287
5.03454793318247	98.309925468	27.9212668384277	6.625140742	98.72893978	20.20468371	8.11126017
8.16429888092455	98.48124766	26.21604958	7.810086676	100	26.21604958	1.559511127
12.3153052394399	94.273734486	19.13922705	11.28159713	86.83718755	19.13922705	7.508047868
12.3153052394399	94.273734486	19.13922705	13.01348985	89.5505908	15.47048063	6.625491116
12.3153052394399	94.273734486	19.13922705	14.02380259	94.55773265	18.6627295	2.149671288
17.5575302888037	97.916491265	19.61359774	18.10270516	98.29192556	19.61359774	0.6619415
17.7964163284566	98.113701618	17.86986814	18.56973911	98.93410982	17.86986814	1.127429706
17.4156053545482	97.653483923	13.9964983	17.81960057	98.01765152	13.9964983	0.543902723
16.8525322165841	97.028971962	8.14047274240208	22.06521104	97.80973943	1.986453498	10.44097889
16.8525322165841	97.028971962	8.14047274240208	23.23282295	99.37897746	14.24859303	9.140009252
16.8525322165841	97.028971962	8.14047274240208	17.25875189	95.69940805	8.290437664	3.398739413
16.8525322165841	97.028971962	8.14047274240208	8.37640356200001	96.83801393	4.582503625	9.194583524
20.9958628172044	95.23971428	1.544902576	20.42707279	96.69258649	1.544902576	2.602601065
25.1391933084391	93.450456627	0.073261016	23.92476676	88.85275247	0.073261016	4.755388035
29.9130292804226	94.048233033	6.710005169	29.03165996	90.53300961	6.710005169	3.624031953
34.7950195378094	95.077367805	4.89258255517569	44.01236363	95.54242778	0.007676566	10.44212715
34.7950195378094	95.077367805	4.89258255517569	35.55901251	90.85604615	4.893665446	4.28990011
34.7950195378094	95.077367805	4.89258255517569	33.84742868	94.52834747	10.85109907	8.71001742
34.7950195378094	95.077367805	4.89258255517569	26.20322759	94.45704722	0.043122659	10.10698797
39.5737078321595	96.675744181	0.046804559	39.47053756	98.01039691	0.046804559	1.338634383
44.8928921850864	91.282043903	1.11472944445703	42.23200248	88.95299773	4.136491045	4.651433464
44.8928921850864	91.282043903	1.11472944445703	46.25821854	91.17761288	0.218810451	1.63636571
45.0659041193525	92.985888869	6.973666169	43.91518159	93.39792889	6.973666169	1.222268104
46.4852502514759	95.005565589	11.38854737	46.20732106	94.82215894	11.38854737	0.332990442
47.5502599417953	93.862109064	12.1969366397167	54.43632749	91.92787857	15.4166252	10.0796961
47.5502599417953	93.862109064	12.1969366397167	49.03663551	90.65504513	13.8830876	8.507710049
47.5502599417953	93.862109064	12.1969366397167	54.90972966	93.30800556	12.19693664	7.380299806
47.5502599417953	93.862109064	12.1969366397167	54.09260921	96.04789718	12.52208915	7.918650854
47.5502599417953	93.862109064	12.1969366397167	47.96746082	95.14523251	6.669541987	8.805162658
48.8088419533149	98.385174502	14.3831416200058	48.86252985	99.44183304	4.964951227	10.4064769
48.8088419533149	98.385174502	14.3831416200058	52.2623599	99.83573023	14.38314162	3.745784047
41.3672303614637	97.663177005	14.1527599018398	47.31578899	98.13704672	24.13193979	11.87713881
41.3672303614637	97.663177005	14.1527599018398	41.23951851	98.4925435	12.0504117	2.263631388
41.3672303614637	97.663177005	14.1527599018398	37.35140359	99.57591236	15.11952707	4.551929256

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
40.7069718193586	93.12303501	13.5321235609224	33.71990859	84.56649705	17.88810749	11.87467854
40.7069718193586	93.12303501	13.5321235609224	36.90788531	88.78292268	9.064555312	8.871911482
40.7069718193586	93.12303501	13.5321235609224	45.33430047	93.58613905	11.44191552	5.098588574
40.7069718193586	93.12303501	13.5321235609224	44.53236455	98.59505273	17.96036731	8.99567986
40.7069718193586	93.12303501	13.5321235609224	36.31961338	94.1541845	22.11569666	11.14531248
37.8106075905932	94.973528364	17.5465320847477	36.43143728	90.48214242	22.55722277	6.954373264
37.8106075905932	94.973528364	17.5465320847477	36.26720319	91.81523904	18.88940672	3.763004237
37.8106075905932	94.973528364	17.5465320847477	37.87107476	99.67477247	15.46291348	5.142647072
37.4617250136509	97.041404711	23.47070651	37.35558564	97.30806318	23.47070651	0.287005759
38.4524740033221	95.743668	24.372341604437	33.91919319	90.52236574	22.93790886	7.193036058
38.4524740033221	95.743668	24.372341604437	39.84944538	96.227912	20.60442108	4.047622309
38.4524740033221	95.743668	24.372341604437	36.86677729	93.06343809	25.83290646	3.595056547
38.4524740033221	95.743668	24.372341604437	39.86881125	93.47781189	29.627917	5.895861926
35.2884153349407	96.409725926	26.33021041	35.84999591	97.26233792	26.33021041	1.02094072
31.4285307761875	96.019357268	25.46859145	30.08845088	94.04600611	25.46859145	2.38535719
27.9205521119214	96.147191428	18.9687539	27.32463884	98.08040747	18.9687539	2.022977234
25.3172408963241	93.340173248	14.28875041	25.24294214	93.18181598	14.28875041	0.174920924
24.0777237757946	93.439888717	15.00916266	24.92385591	92.07997464	15.00916266	3.317074037
22.8382061887783	93.539604126	13.9322743944853	27.03699297	98.99807723	18.13725322	9.045435578
22.8382061887783	93.539604126	13.9322743944853	21.95406549	97.08230078	10.07565883	5.310921574
22.8382061887783	93.539604126	13.9322743944853	22.19955839	99.83998701	15.37683497	6.495340695
21.7736285722462	92.263470916	21.1125693084886	23.10855555	93.46528062	15.33870171	6.046811031
21.7736285722462	92.263470916	21.1125693084886	20.03955091	90.83830295	21.35984013	2.258156755
21.7736285722462	92.263470916	21.1125693084886	22.62104276	94.03699994	18.3046068	3.483508579
21.2001430301439	91.389634799	24.588865710722	19.16596982	83.58117432	33.35557023	11.91490763
21.2001430301439	91.389634799	24.588865710722	21.63379999	90.72848541	25.0330528	0.991362215
21.2001430301439	91.389634799	24.588865710722	17.22630202	94.08640458	22.99978352	10.84424377
21.2001430301439	91.389634799	24.588865710722	21.53298817	97.76613815	23.69582939	6.447332374
21.2001430301439	91.389634799	24.588865710722	11.04946885	95.30278919	26.87229799	11.15137795
20.5773208194321	88.324001082	32.51930493	20.75129811	88.7330358	32.51930493	0.972274996
19.9544983585283	85.258367432	28.9549492	18.85500198	86.61471751	28.9549492	1.746017703
19.8602817947787	81.540639923	28.9158903143029	20.11668251	80.56671914	21.763779	7.222669816
19.8602817947787	81.540639923	28.9158903143029	22.96398221	79.24584246	32.40861489	5.253467184
19.8602817947787	81.540639923	28.9158903143029	18.46683587	77.29301103	30.42019724	4.716670657
19.8602817947787	81.540639923	28.9158903143029	17.38954679	82.23173111	30.2609052	4.9464631
20.86977452576	81.491575659	36.2261017943439	25.47356848	81.94258519	37.44485814	6.220239291
20.86977452576	81.491575659	36.2261017943439	20.16675465	86.45561332	33.59426088	5.662375247
20.86977452576	81.491575659	36.2261017943439	22.46431132	85.87828698	39.40664672	5.64815455
21.4924106460228	76.049143442	33.87335876	21.16552744	75.92926841	33.87335876	0.348170438
23.0231026844052	70.939714668	29.2795721842732	25.66105506	62.27941228	31.77717439	9.39136023
23.0231026844052	70.939714668	29.2795721842732	24.00842436	69.26671548	26.32388978	3.536360214
23.0231026844052	70.939714668	29.2795721842732	18.97844246	66.0992932	30.20753751	9.320379407
23.0231026844052	70.939714668	29.2795721842732	25.39416892	74.01493111	32.17996221	4.846769394
23.0231026844052	70.939714668	29.2795721842732	22.95220857	73.2582761	29.61659281	8.329429805
23.0231026844052	70.939714668	29.2795721842732	18.31523717	76.27495825	29.81755027	7.153261702
22.2184895554566	67.237664246	31.57893426	21.52581462	69.05739134	31.57893426	1.947101759
22.2757125276904	61.271483644	27.89064267	21.30645349	61.8915326	27.89064267	1.625246019
22.3329355504576	55.305302944	25.7681922967681	20.53092136	55.63617906	20.16527215	5.894866268
22.3329355504576	55.305302944	25.7681922967681	23.29263587	57.34435722	30.94445508	5.760491154
22.3901584398102	49.339122292	26.59144604	22.81585575	48.67591425	26.59144604	0.788075572
20.4136458170417	46.541366586	27.00382561	19.18169919	47.05766373	27.00382561	3.954790614
18.4371331657892	43.743610897	31.53434731	17.47416259	43.6041515	31.53434731	0.973016574
17.9546474843311	41.162223216	29.6061605232127	19.64225061	34.99214308	28.17560222	6.554722745
17.9546474843311	41.162223216	29.6061605232127	18.69463352	36.26547074	33.27071747	6.160741982
17.9546474843311	41.162223216	29.6061605232127	14.50630809	38.16565664	31.09752118	6.420525444
16.0474671726929	44.406301108	22.1748909560525	17.93093151	43.30092715	17.11460176	5.511425972
16.0474671726929	44.406301108	22.1748909560525	18.21138052	45.58660191	25.83715904	4.414503197
10.1552106214907	47.220676792	17.55376223	10.30388261	47.84277995	17.55376223	0.981509885
4.26295407034974	50.035052475	16.6561134530499	0.224660494000005	41.43611847	14.21171956	9.809410917
4.26295407034974	50.035052475	16.6561134530499	0.715064701000003	54.34039001	17.34040242	5.620649576
6.22560995480221	49.662496745	15.52547031	7.342191074	50.36568708	15.52547031	3.656790591
8.18826580763329	49.289941093	11.6314070443783	9.954481978	42.50823893	15.05115407	10.6166074
8.18826580763329	49.289941093	11.6314070443783	10.20301226	47.6234059	3.00365475	9.015245558
8.18826580763329	49.289941093	11.6314070443783	11.99216143	50.52822644	12.13005328	8.464820885
8.18826580763329	49.289941093	11.6314070443783	10.84189087	50.74783931	12.90312929	3.28397178
8.18826580763329	49.289941093	11.6314070443783	9.89102482200001	52.16610985	9.967821485	9.993987041
8.18826580763329	49.289941093	11.6314070443783	6.962926975	47.87740863	12.6680673	8.307462013
8.18826580763329	49.289941093	11.6314070443783	6.810990128	49.52757429	10.46442277	9.894324521
8.18826580763329	49.289941093	11.6314070443783	3.857750749	53.93522034	16.19502855	9.829595519
8.37148595362441	48.186304232	9.52257499240677	7.974625907	40.8370263	13.38849506	8.509762243
8.37148595362441	48.186304232	9.52257499240677	8.91589750200001	48.83105962	4.105846181	5.482065711
8.55470618077103	47.082667433	3.044600386	8.81169210500001	48.50504439	3.044600386	1.445405816
7.98421172689245	41.807334218	4.331128313	9.020444459	42.86210706	4.331128313	2.418478506
7.41371696223278	36.532001031	5.10651359661551	9.320660383	27.08555662	0.10230943	10.8588123
7.41371696223278	36.532001031	5.10651359661551	11.00474377	35.14184161	13.52979102	10.56540176
7.41371696223278	36.532001031	5.10651359661551	8.02660248300001	29.17059173	11.48261049	9.758103666
7.41371696223278	36.532001031	5.10651359661551	7.871697725	40.35198819	7.19843067	6.3641027
7.41371696223278	36.532001031	5.10651359661551	6.668915236	38.80565327	2.074648475	8.512380576
7.41371696223278	36.532001031	5.10651359661551	5.668356774	43.14782971	2.118277692	8.305775856
7.41371696223278	36.532001031	5.10651359661551	0.438114408000004	29.42535326	2.454773911	10.7393682

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
5.28286432766541	41.204420149	7.02793547	0.0942256310000005	39.91558536	7.02793547	5.346313369
3.68954949886631	46.01036128	3.634697851	1.77561061599999	46.38397362	3.634697851	1.950063647
3.42780118576837	50.556372642	3.767703534	5.28300793299999	51.8957834	3.767703534	3.483971696
3.1660528733124	55.102384005	9.791910202	3.200690229	54.90401263	9.791910202	3.339909369
2.90430456180182	59.648395368	13.1755560018015	10.36857839	64.9958121	20.62230905	11.82219863
2.90430456180182	59.648395368	13.1755560018015	0.0735544159999932	50.20291794	9.32702938	11.48330524
2.90430456180182	59.648395368	13.1755560018015	6.04179221699999	70.01715429	8.958731963	11.62482668
2.31101479811949	63.591275854	18.73530868	3.16457285600001	61.67055704	18.73530868	3.732266773
1.71772503838736	67.534156346	21.52036301	0.299902086000003	68.51958527	21.52036301	1.726641853
2.9785080057303	70.188401381	15.2919109625045	8.01127751600001	61.69215045	17.84993877	10.57580758
2.9785080057303	70.188401381	15.2919109625045	9.088863996	70.57778186	13.84286783	9.588159879
2.9785080057303	70.188401381	15.2919109625045	3.336609071	66.34370608	12.08281041	10.13002568
2.9785080057303	70.188401381	15.2919109625045	0.793870075000001	65.00803843	8.045595465	9.318627115
2.9785080057303	70.188401381	15.2919109625045	3.705228073	66.5975084	22.49684982	9.299418871
2.9785080057303	70.188401381	15.2919109625045	1.009741561	74.32200243	17.21598932	6.745106086
2.9785080057303	70.188401381	15.2919109625045	0.155166121999997	73.1143838	18.2350269	9.943054863
4.23929099314729	72.842646438	17.544860144652	2.885089549	70.78781924	5.964704064	11.83875801
4.23929099314729	72.842646438	17.544860144652	5.863440787	76.06172049	20.11271942	5.891195528
4.23929099314729	72.842646438	17.544860144652	2.544714587	74.45838234	20.47608884	3.751572119
4.23929099314729	72.842646438	17.544860144652	4.961462551	81.51420623	19.50536364	9.226598726
4.23929099314729	72.842646438	17.544860144652	3.380314451	80.99890539	17.02151813	11.39696855
5.54303101578029	75.473791001	16.15003851	5.065657714	76.41830653	16.15003851	1.058298093
7.73588651643891	76.345760034	21.16629174	10.28504553	75.43578797	21.16629174	2.70670664
8.78670131985609	77.625402829	22.65782791	9.01858207399999	78.03824041	22.65782791	0.473501375
6.94519337821458	73.755590546	26.1066335134795	9.964092428	69.02740379	34.44916177	10.49120227
6.94519337821458	73.755590546	26.1066335134795	2.76637406099999	66.09545945	29.36453565	9.314186257
6.94519337821458	73.755590546	26.1066335134795	8.675234817	76.17385221	29.29611493	4.360484441
6.94519337821458	73.755590546	26.1066335134795	3.765987951	77.28123402	18.22137656	9.204063574
6.94519337821458	73.755590546	26.1066335134795	5.779054124	82.01317499	31.17715184	10.01915756
9.97635921477475	70.20254181	29.3276289229565	9.89788954300001	67.94003152	30.38024953	3.836811672
9.97635921477475	70.20254181	29.3276289229565	11.56644578	72.10851879	29.32762892	2.482161061
7.84231477908544	69.122790367	28.6424446121261	8.88093920200001	67.16779099	33.76570468	7.575125342
7.84231477908544	69.122790367	28.6424446121261	6.979895184	73.91637244	25.14533012	7.031194882
7.84231477908544	69.122790367	28.6424446121261	3.972668798	68.43095677	28.84137669	4.819982765
7.84231477908544	69.122790367	28.6424446121261	2.559418382	66.60707534	29.94444397	5.994415632
7.84231477908544	69.122790367	28.6424446121261	4.203561784	71.28689241	26.51244139	5.184520227
8.73943649070686	64.489989558	33.77783847953	14.06057656	63.93249207	34.35643485	5.381459732
8.73943649070686	64.489989558	33.77783847953	11.17807544	66.07771318	32.92555185	3.944211846
8.73943649070686	64.489989558	33.77783847953	8.07711459799999	60.52651503	33.72017469	4.01884632
7.20434992197248	71.109739383	32.44258164	5.020361565	69.58798476	32.44258164	2.661868193
4.89263792064958	72.337660856	38.65184391	1.09685186199999	69.20060768	38.65184391	4.924336954
6.65523876796986	76.93282758	36.472242103787	14.92906226	79.42060964	37.22040132	9.914113666
6.65523876796986	76.93282758	36.472242103787	3.702577787	67.55965669	35.63856131	9.862533299
6.65523876796986	76.93282758	36.472242103787	9.701793671	81.23141394	32.23008983	8.243525166
6.65523876796986	76.93282758	36.472242103787	10.82142722	82.89323555	36.78865334	9.472743412
6.65523876796986	76.93282758	36.472242103787	1.696022601	79.3379408	35.04130759	6.739019376
8.41783928890635	81.527992144	32.7254759750387	10.08146406	81.46406963	37.62633094	5.184740001
8.41783928890635	81.527992144	32.7254759750387	5.912402555	83.10767778	28.97692543	4.777473299
8.41783928890635	81.527992144	32.7254759750387	7.992357197	82.08091397	36.27596397	4.51998708
10.180439878834	86.123156744	27.0451963828311	16.23739593	85.87006787	34.99641701	9.998633909
10.180439878834	86.123156744	27.0451963828311	9.921883095	86.8721598	22.00737941	5.099750684
10.180439878834	86.123156744	27.0451963828311	12.03430063	87.78817585	32.36153594	9.339380238
10.180439878834	86.123156744	27.0451963828311	7.936374341	83.63932008	31.96057141	7.056138248
10.180439878834	86.123156744	27.0451963828311	9.577914639	89.11916471	27.81169318	4.320583214
10.180439878834	86.123156744	27.0451963828311	5.333729823	86.89695613	31.50319232	7.779774892
10.180439878834	86.123156744	27.0451963828311	5.209294544	90.50333801	29.97691556	7.245222646
7.42379477843178	88.753029938	23.95110219	6.57919393199999	89.24907689	23.95110219	0.979496385
6.2558663080285	90.449825638	25.47562666	7.17818211399999	91.76838261	25.47562666	1.609117439
3.83976287817841	89.238662233	26.32883597	0.539457489	84.81338557	26.32883597	5.520424731
4.13612635056333	90.785896893	22.96960314	3.553988961	91.38716753	22.96960314	0.836905203
4.57184971245094	89.070444519	20.2951852717865	3.795442881	81.20966501	27.41200193	11.97973034
4.57184971245094	89.070444519	20.2951852717865	8.980893435	92.30918249	24.9496481	10.59560796
4.57184971245094	89.070444519	20.2951852717865	6.256438132	90.66257931	27.09179537	10.99795307
4.57184971245094	89.070444519	20.2951852717865	3.115821998	88.00026043	26.66042774	11.67905671
4.57184971245094	89.070444519	20.2951852717865	3.212591442	94.51392157	23.83849287	10.08518593
4.57184971245094	89.070444519	20.2951852717865	5.819691822	97.53170939	24.16806715	10.47278678
5.30393664944276	88.902226844	18.6483275389357	3.05949055799999	82.05603574	19.35294441	7.23908529
5.30393664944276	88.902226844	18.6483275389357	5.793118726	87.72031575	18.95737877	2.544917974
5.30393664944276	88.902226844	18.6483275389357	2.88784862599999	89.80188387	16.96831616	3.077223153
5.30393664944276	88.902226844	18.6483275389357	1.72500424899999	93.73701725	20.97210735	6.881927737
6.0907310968915	88.842640537	15.0715260987251	9.98481624199999	87.60870523	18.9809529	5.654212003
6.0907310968915	88.842640537	15.0715260987251	6.663988874	86.9326968	14.76370285	2.017737523
6.0907310968915	88.842640537	15.0715260987251	6.29169329299999	89.27097954	11.1353809	4.843225065
6.46549921094791	89.72293959	10.21283209	7.085383584	88.77850283	10.21283209	1.129697938
6.01010304531137	91.868051955	9.71711289401655	10.77763243	89.00986935	18.62168793	11.5413795
6.01010304531137	91.868051955	9.71711289401655	10.40564453	91.96900158	9.717112894	4.396700555
6.01010304531137	91.868051955	9.71711289401655	8.327911253	95.97957355	16.39239366	8.978439052
3.17580429688263	93.958529957	6.564520873	2.510162792	94.82470236	6.564520873	1.092397933
3.49554212661218	91.944787952	0.703140302	3.298576907	92.26869515	0.703140302	0.379092562
4.00529737791061	89.618563014	1.83121888234507	4.297539438	80.73294711	0.059971047	11.22405457

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
4.00529737791061	89.618563014	1.83121888234507	5.902742913	84.57417463	9.395938461	10.96205759
4.00529737791061	89.618563014	1.83121888234507	8.842438164	89.89183088	2.824200169	9.248878075
4.00529737791061	89.618563014	1.83121888234507	4.724328509	85.88211036	2.778795893	10.66842937
4.00529737791061	89.618563014	1.83121888234507	7.009024866	89.80852716	6.686928303	9.591229282
4.00529737791061	89.618563014	1.83121888234507	4.44010970700001	94.87692744	8.233710837	8.411496493
4.00529737791061	89.618563014	1.83121888234507	0.846436707999999	97.15575264	0.271481864	11.19775474
4.51505213940401	87.292337987	3.17652777864513	5.724809855	81.80721271	6.405774196	6.479054365
4.51505213940401	87.292337987	3.17652777864513	6.810206318	85.20186256	2.844617135	3.122176307
4.51505213940401	87.292337987	3.17652777864513	6.35930977699999	87.06467249	1.39262333	5.433004527
4.51505213940401	87.292337987	3.17652777864513	3.10551266100001	84.71082736	3.992777578	5.063715926
3.9254425842921	86.172142239	5.210127271	4.377655918	84.98459142	5.210127271	1.270737521
3.19803210146074	85.413830174	10.89284525	3.319354366	86.8534104	10.89284525	1.444683466
2.34042614779202	83.110615421	11.4164042	3.437419026	82.39656928	11.4164042	1.58437925
1.48281759996803	80.807401077	12.37991353	1.45195925500001	80.87244268	12.37991353	0.071990607
1.73461854101136	76.165831214	8.30615083809496	8.595205897	76.73972439	1.498449057	10.65699304
1.73461854101136	76.165831214	8.30615083809496	9.360499311	76.63383999	11.96842635	9.675555003
1.73461854101136	76.165831214	8.30615083809496	2.881941531	70.78732912	3.789169139	7.680996283
1.73461854101136	76.165831214	8.30615083809496	3.252339284	73.9521337	6.052632886	4.320781181
1.73461854101136	76.165831214	8.30615083809496	5.04273939700001	78.40053531	10.86923314	10.26257011
1.73461854101136	76.165831214	8.30615083809496	3.10003410199999	78.61964126	7.805263196	6.829391359
1.73461854101136	76.165831214	8.30615083809496	0.773453591000006	79.81662315	5.077053724	6.785233233
1.73461854101136	76.165831214	8.30615083809496	0.848777487999996	80.80421078	5.669295757	10.36784038
1.98641634372954	71.524261811	0.775939504	1.834626902	71.15202574	0.775939504	0.401994686
3.3297023003081	69.55936792	1.056192161	1.825477279	70.78130479	1.056192161	2.330446868
4.67298977171222	67.594474131	2.60421755996669	1.28261934699999	62.39268391	2.604217434	6.209124989
4.67298977171222	67.594474131	2.60421755996669	2.82031094	66.9400554	1.18723785	6.180554629
4.67298977171222	67.594474131	2.60421755996669	2.781332517	68.35625636	3.710000307	5.523577876
7.91110843282847	68.536790202	8.438723386	6.334374787	68.85467086	8.438723386	1.608457989
13.0058717597475	69.104794075	14.8709303251672	10.63863267	61.64507704	12.52958841	8.169031835
13.0058717597475	69.104794075	14.8709303251672	16.80968797	72.84815948	15.34934359	5.35823493
13.0058717597475	69.104794075	14.8709303251672	8.93361225699999	64.19415642	15.31500377	8.119454693
13.0058717597475	69.104794075	14.8709303251672	13.34199807	71.15108407	14.18117491	2.435319437
13.0058717597475	69.104794075	14.8709303251672	11.73654707	68.82383733	18.16264782	7.948897757
15.0859547796316	67.657846401	5.53893448855824	16.73656026	65.26611785	12.28815231	7.348251841
15.0859547796316	67.657846401	5.53893448855824	16.29427026	68.63097998	5.127480774	1.605088602
15.8057966196078	65.351147404	0.808180586126307	20.75020952	68.82081849	3.659175109	6.986664743
15.8057966196078	65.351147404	0.808180586126307	15.77830732	66.19409337	0.808180704	0.843394073
16.6484621134752	59.278105634	0.927191426431351	25.08011935	60.4806985	0.592321921	8.52356797
16.6484621134752	59.278105634	0.927191426431351	20.16713628	56.2637712	6.937664837	7.589009856
16.6484621134752	59.278105634	0.927191426431351	16.54761864	53.09785344	0.161381972	6.228334506
16.6484621134752	59.278105634	0.927191426431351	17.45311026	57.02027397	2.53786626	4.698442012
16.6484621134752	59.278105634	0.927191426431351	13.17908278	60.05355856	0.206865651	7.781969298
16.6484621134752	59.278105634	0.927191426431351	10.83705181	59.65376627	0.709551762	8.510330825
17.3495451785756	54.29548706	7.51271320253867	18.80954314	50.67936902	11.76647286	11.57690137
17.3495451785756	54.29548706	7.51271320253867	16.47526591	49.4455512	6.794569926	9.818184126
17.3495451785756	54.29548706	7.51271320253867	22.84438078	60.01413405	11.39370551	9.832099483
17.3495451785756	54.29548706	7.51271320253867	13.89109091	56.92730438	11.2581209	9.141496171
17.3495451785756	54.29548706	7.51271320253867	11.71156616	63.23151575	10.39694521	10.95254356
18.0506248386357	49.312874409	2.63462135	17.80089583	46.64512233	2.63462135	2.679415185
19.1741998458202	48.843608131	8.0523852388839	20.72246404	50.29048837	10.84675569	3.507005939
19.1741998458202	48.843608131	8.0523852388839	18.13426387	49.15791018	7.430088572	1.2520007
25.0202533196666	44.050138535	8.45791762062684	28.54401437	40.13690379	8.087159098	5.278992328
25.0202533196666	44.050138535	8.45791762062684	25.73174612	44.02606181	8.459085063	0.711901016
25.0202533196666	44.050138535	8.45791762062684	23.73647568	45.21539639	11.53681715	5.188751838
26.1430591835583	39.494592014	14.6019754821268	25.99458773	34.37910238	4.84512326	11.0175516
26.1430591835583	39.494592014	14.6019754821268	30.33187934	43.75504148	14.96541955	8.637269115
26.1430591835583	39.494592014	14.6019754821268	23.91492832	35.50451908	14.65205958	5.452232026
26.1430591835583	39.494592014	14.6019754821268	23.06731773	35.0375678	21.55663613	8.814338039
29.4207544646187	40.42746206	14.2756352	25.40396983	32.32053998	7.877867709	11.43146897
29.4207544646187	40.42746206	14.2756352	34.17044541	50.63731129	14.2756352	11.2605766
31.9036771580754	39.651902454	12.83287597	29.90863496	38.4851443	12.83287597	2.311172422
36.360130766839	40.03052121	12.8376167199999	38.78467609	39.06908374	12.83761672	2.608214338
36.360130766839	40.03052121	12.8376167199999	35.17250587	39.36136713	13.28284014	1.66175135
37.1803188285019	41.851076904	14.45846769	39.58652985	43.55288071	14.45846769	5.227108341
38.0005069112339	43.671632636	6.86511533353457	43.74535734	43.87626012	1.779657186	7.961235625
38.0005069112339	43.671632636	6.86511533353457	40.81010844	38.77304558	7.861958026	5.734432078
38.0005069112339	43.671632636	6.86511533353457	41.57443341	43.13832473	6.475589725	5.186489261
38.0005069112339	43.671632636	6.86511533353457	34.31056081	43.95356429	5.695822859	3.881034988
39.1351967228554	49.850516934	5.00393633739055	35.40868681	49.33377596	1.880059691	6.467074744
39.1351967228554	49.850516934	5.00393633739055	34.68773061	48.27076221	5.003934468	4.719701242
41.5062662551301	56.468567441	8.1023041972466	40.92420024	52.54921675	3.399585878	7.535927257
41.5062662551301	56.468567441	8.1023041972466	45.47068469	56.96814934	6.687113785	4.238980951
41.5062662551301	56.468567441	8.1023041972466	42.10911161	58.06602885	13.19335194	5.369736734
39.270854000235	62.034619518	4.04297377044721	44.96838238	64.05706864	11.93558957	9.942108139
39.270854000235	62.034619518	4.04297377044721	38.87334077	61.97418169	4.472466865	1.279905437
39.270854000235	62.034619518	4.04297377044721	39.83687168	68.05987049	1.771904532	8.931405029
39.270854000235	62.034619518	4.04297377044721	36.53251416	65.89826385	3.47943245	7.253690252
39.270854000235	62.034619518	4.04297377044721	39.75179858	71.51477588	1.359571846	9.864345808
39.270854000235	62.034619518	4.04297377044721	33.85806756	68.2147305	3.068667124	8.272925857
38.5890221036971	65.142797158	9.028914476	36.88863481	65.11756178	9.028914476	1.700574542

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
40.5276589458514	68.28986507	8.08671392136516	44.13660931	71.38940487	9.812814914	5.060740493
40.5276589458514	68.28986507	8.08671392136516	41.30767537	70.05965636	6.684179381	2.389077221
38.9539280596494	67.379745205	13.8711534778636	39.12047899	68.75765335	13.33882614	3.957947734
38.9539280596494	67.379745205	13.8711534778636	37.43465738	70.14594443	13.87115315	3.15595335
37.9395209588064	65.451241599	16.01674823	40.91327599	65.05437313	16.01674823	3.322312195
36.9251137628209	63.522737941	20.1798118413633	42.95157888	64.84132436	26.30910849	9.17378456
36.9251137628209	63.522737941	20.1798118413633	38.18944723	65.54612606	17.9243242	4.457511574
36.9251137628209	63.522737941	20.1798118413633	38.05290287	66.43336709	23.58284008	5.771110944
35.9107066115782	61.594234304	14.55953297	36.65639834	59.2724504	14.55953297	2.438593171
34.4978813860014	60.906244023	14.6189601824116	33.50828257	58.48410354	3.557102036	11.3670918
34.4978813860014	60.906244023	14.6189601824116	36.99117209	62.09652931	16.1628835	3.164960791
34.4978813860014	60.906244023	14.6189601824116	28.66025221	61.13181458	11.59083816	8.682831908
34.4978813860014	60.906244023	14.6189601824116	26.36749261	61.24478927	19.91950535	10.05967123
32.4964741928154	60.005271777	10.14811096	32.47933058	60.09950546	10.14811096	0.095780428
31.0959638490208	55.801336394	6.56337781987837	33.45977848	51.47641849	1.316430254	7.198818879
31.0959638490208	55.801336394	6.56337781987837	28.17203359	56.51587977	9.985576368	4.557563307
31.0959638490208	55.801336394	6.56337781987837	28.38294287	59.7022254	11.36065683	6.876187581
34.1808939933299	58.432657806	2.63982576166478	43.40294282	59.60424206	0.51389979	9.536160415
34.1808939933299	58.432657806	2.63982576166478	37.58124673	53.7047325	1.291628295	6.278048118
34.1808939933299	58.432657806	2.63982576166478	38.55825219	62.0328479	1.356643655	8.230604564
34.1808939933299	58.432657806	2.63982576166478	34.15128455	57.37934974	2.952751483	3.806785854
34.1808939933299	58.432657806	2.63982576166478	37.36735143	64.72519961	6.841621681	8.210035462
34.1808939933299	58.432657806	2.63982576166478	32.28903103	63.37386507	1.032108002	5.529867185
34.1808939933299	58.432657806	2.63982576166478	34.32584869	66.311045	4.144300462	8.8122254
30.6780640976384	54.516701195	1.82071962	31.12121771	52.61678334	1.82071962	1.950915934
25.7693604421652	56.628111002	5.011755882	25.6524776	56.5792119	5.011755882	0.126699333
25.6514381460333	60.743791914	9.13128050157026	24.61643689	54.01115924	6.209992422	7.411713322
25.6514381460333	60.743791914	9.13128050157026	28.86030824	61.83789689	13.23528428	5.323228343
25.6514381460333	60.743791914	9.13128050157026	25.84588775	61.17671521	8.212138725	1.034434548
25.6514381460333	60.743791914	9.13128050157026	27.36103425	64.84526011	12.45761345	5.82414556
22.8228929114622	64.296649373	11.9213097	22.58317288	64.23875961	11.9213097	0.246610864
24.183914243505	68.861241378	6.614252607	24.34494447	68.89894191	6.614252607	0.165384594
22.4431725522639	72.699646198	1.906907845	23.39691794	71.43920824	1.906907845	2.45996491
20.7024290190519	76.538052275	0.391094884	21.04749508	76.84597788	0.391094884	0.462481096
18.2975728131823	79.783827775	2.77127628541042	21.60880813	73.64895737	1.318444959	8.789616797
18.2975728131823	79.783827775	2.77127628541042	16.93400358	77.9224885	0.924123088	2.955652193
18.2975728131823	79.783827775	2.77127628541042	17.20155001	81.69531761	4.530646889	7.066943728
18.2975728131823	79.783827775	2.77127628541042	15.25088212	86.85170355	0.622562014	8.312417494
18.2975728131823	79.783827775	2.77127628541042	12.45480817	85.29988604	5.441763796	8.467366828
23.6706614736101	80.217619844	3.12432842	23.53960858	80.471438	3.12432842	0.285654541
30.5970508706675	77.643039573	1.40148141199775	36.44207057	76.13900165	9.824805701	11.50367704
30.5970508706675	77.643039573	1.40148141199775	35.03662295	76.31902131	1.401481412	4.632798788
30.5970508706675	77.643039573	1.40148141199775	34.30971303	75.90183293	2.096267325	10.30780315
30.5970508706675	77.643039573	1.40148141199775	36.17809574	80.13104248	5.688631409	8.234427368
30.5970508706675	77.643039573	1.40148141199775	22.95922483	75.83051285	0.740171728	9.548150341
30.3873217434902	77.196671495	6.462154326	31.34183617	77.86791685	6.462154326	1.166905359
27.6289898241793	74.958039773	9.740464776	28.44331265	74.98671685	9.740464776	1.065596119
24.8706573659038	72.719408819	16.7551747417104	24.66562586	67.58605744	10.297776	8.251747258
24.8706573659038	72.719408819	16.7551747417104	28.17365085	71.94302821	19.49378883	4.360337135
24.8706573659038	72.719408819	16.7551747417104	24.57644237	79.57543571	13.43961074	7.621327433
24.8706573659038	72.719408819	16.7551747417104	20.16006997	73.55306832	21.43875646	7.784192094
18.578802549053	72.594412584	20.4856617370788	22.14002238	72.37729838	30.29531679	10.56803504
18.578802549053	72.594412584	20.4856617370788	19.47269695	75.25893863	20.7798111	3.538510883
18.578802549053	72.594412584	20.4856617370788	13.78543979	72.75062985	12.01531817	9.733830208
18.578802549053	72.594412584	20.4856617370788	18.49430275	75.1491321	23.37172362	9.770365975
18.578802549053	72.594412584	20.4856617370788	14.51945543	70.49107423	24.26034768	7.364687094
18.578802549053	72.594412584	20.4856617370788	21.51917751	80.74471553	21.88319617	9.9567065
18.578802549053	72.594412584	20.4856617370788	11.54525803	68.93314303	25.95468917	9.632544021
18.578802549053	72.594412584	20.4856617370788	18.15807888	79.40011164	23.44302335	9.804701845
15.1667403525613	73.481734529	21.8140935281333	17.24413003	73.14298035	27.78293034	6.329084859
15.1667403525613	73.481734529	21.8140935281333	14.67447984	73.22055772	21.75092301	0.560824618
16.1306717526284	76.832715982	16.39940441	15.50686687	76.44859369	16.39940441	0.73258615
17.2272386733005	80.265370805	12.6738136906443	15.83973733	72.60736968	8.73861151	9.12349234
17.2272386733005	80.265370805	12.6738136906443	19.29153506	80.52426775	7.949521468	5.162100755
17.2272386733005	80.265370805	12.6738136906443	18.15532249	77.80652015	16.99185344	5.054973135
17.2272386733005	80.265370805	12.6738136906443	12.63857375	82.42671014	11.06948651	6.575237335
17.1244595775491	84.644858294	14.41870487	15.06397637	86.4956065	14.41870487	2.769631739
19.9292699680848	86.412716899	8.26803715757197	14.09860615	77.68853822	13.45994873	11.70742841
19.9292699680848	86.412716899	8.26803715757197	20.47481611	85.68176763	4.096992025	4.269604774
19.9292699680848	86.412716899	8.26803715757197	18.16441332	83.32201509	7.61422766	4.389263708
19.9292699680848	86.412716899	8.26803715757197	12.87616068	80.54131267	1.790579055	11.25097601
19.9292699680848	86.412716899	8.26803715757197	21.4032788	88.65695382	8.541884	2.971051139
19.9292699680848	86.412716899	8.26803715757197	19.55892343	94.48515334	9.227774263	8.137719702
25.6617760777704	87.002279058	11.8242454221179	18.79013692	77.54174683	13.67079469	11.83768723
25.6617760777704	87.002279058	11.8242454221179	31.03913924	88.81924735	11.29281098	5.700862296
25.6617760777704	87.002279058	11.8242454221179	24.93956922	85.18138774	19.5490822	10.96633056
25.6617760777704	87.002279058	11.8242454221179	26.49994117	86.49656314	20.04082186	11.41565502
25.6617760777704	87.002279058	11.8242454221179	30.51609732	92.20951413	14.80192542	7.873323153
25.6617760777704	87.002279058	11.8242454221179	30.46512782	92.10545477	16.97866967	8.699579279
25.6617760777704	87.002279058	11.8242454221179	24.68088332	89.71453351	6.983081462	5.772547732

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
25.6617760777704	87.002279058	11.8242454221179	21.61123904	90.19731465	15.12916055	9.443600344
25.6617760777704	87.002279058	11.8242454221179	25.58817455	94.62259734	16.80660453	11.27075496
28.8158174476483	86.639417715	12.40202554	28.95022635	86.79829568	12.40202554	0.208105648
29.4178626146358	83.259970747	14.2860988698901	31.67974116	78.20082263	20.94127433	10.5302733
29.4178626146358	83.259970747	14.2860988698901	29.05539546	78.84402949	14.28609887	4.430792212
29.4178626146358	83.259970747	14.2860988698901	32.87814817	90.10176773	12.94837243	9.598818493
29.4178626146358	83.259970747	14.2860988698901	24.79158589	85.73273425	15.36547182	9.89839469
30.2909099488734	83.182145798	14.80317352	28.34961296	82.66841267	14.80317352	2.008122438
37.3727345722068	84.747374308	10.62939488	38.25086273	84.70191635	10.62939488	0.879303979
38.4780512856104	86.621987772	6.390388464	38.21932161	86.88940242	6.390388464	0.372090901
45.7421216071639	82.131112167	3.6967689700539	38.19879917	73.45302115	2.159211899	11.60064907
45.7421216071639	82.131112167	3.6967689700539	49.55654528	80.81624315	0.169379697	5.359214828
45.7421216071639	82.131112167	3.6967689700539	47.92908542	80.11129273	4.265931676	4.896396861
45.7421216071639	82.131112167	3.6967689700539	45.32225765	79.26748614	7.718311017	4.954739166
45.7421216071639	82.131112167	3.6967689700539	44.47086767	80.17305261	3.885836986	4.558123438
45.7421216071639	82.131112167	3.6967689700539	48.20934555	82.30314786	4.491594241	7.596162818
45.7421216071639	82.131112167	3.6967689700539	40.58416037	81.54961967	6.0287924	7.064640642
45.7421216071639	82.131112167	3.6967689700539	38.24583972	80.95791524	3.839199962	10.77332683
45.7421216071639	82.131112167	3.6967689700539	38.00030199	82.20200968	0.019607641	9.151482372
50.8957368144544	87.727953882	2.16570823649185	55.75342338	84.56592915	0.703415223	5.992730061
50.8957368144544	87.727953882	2.16570823649185	52.05342714	85.82620662	0.803032132	2.610320997
50.8957368144544	87.727953882	2.16570823649185	49.59427698	92.51123595	3.551090207	5.147122326
56.2133850889387	89.569401862	6.343295144	56.30399813	89.72916428	6.343295144	0.18367023
60.3044721182024	89.24826498	5.56921645727893	57.82109764	79.24611201	0.587934441	11.76834886
60.3044721182024	89.24826498	5.56921645727893	62.03157877	81.16617953	8.458189727	8.754951123
60.3044721182024	89.24826498	5.56921645727893	67.89989075	88.12316705	3.528198384	7.944934507
60.3044721182024	89.24826498	5.56921645727893	62.35255518	88.46202983	5.064300638	4.962229956
60.3044721182024	89.24826498	5.56921645727893	53.87450626	88.16447802	6.291517338	7.742268204
60.3044721182024	89.24826498	5.56921645727893	54.10050901	92.28618361	12.05829408	9.480891031
60.3044721182024	89.24826498	5.56921645727893	61.09603132	95.38804721	2.385400865	8.526033691
60.3044721182024	89.24826498	5.56921645727893	58.00620671	94.64720593	1.304858734	11.42342539
60.3044721182024	89.24826498	5.56921645727893	51.98537923	93.03310405	5.658677856	10.9895755
60.3044721182024	89.24826498	5.56921645727893	57.43254842	97.94119843	9.821238574	10.09429194
59.3501697603005	90.38071736	13.63995038	57.53422575	91.73216299	13.63995038	2.263638208
59.0983532698374	90.990371987	15.9194008367884	53.26472651	92.17526811	13.38443287	6.470026475
59.0983532698374	90.990371987	15.9194008367884	62.61309781	94.29391595	17.98130243	5.245785935
59.8281837775691	88.194977836	19.95901958	59.01602486	86.99268685	19.95901958	4.144714535
60.5580142846161	85.399583684	16.95320583	58.40265516	82.89286098	16.95320583	3.789211097
61.287844794309	82.604189539	13.24261796	61.67834468	82.51967341	13.24261796	0.399541158
55.5170323586712	81.215733456	7.770192012	55.73082902	81.05870461	7.770192012	0.265267923
48.8975157635612	80.45063135	12.0502129908912	41.95376322	74.60739468	6.926728294	10.5272795
48.8975157635612	80.45063135	12.0502129908912	47.14165764	77.84331314	10.33249494	3.855818645
48.8975157635612	80.45063135	12.0502129908912	46.11608956	79.13405595	12.05021293	3.077288175
48.8975157635612	80.45063135	12.0502129908912	51.18829335	82.80979047	5.597845952	7.761910446
48.8975157635612	80.45063135	12.0502129908912	51.49657531	83.11057243	16.78262105	7.887384084
48.8975157635612	80.45063135	12.0502129908912	46.02083433	88.3362158	14.03418258	9.025977842
47.345849945826	82.084373302	18.23448828	49.77274656	84.13753559	18.23448828	4.242971999
45.7941841296127	83.71811525	22.3827860071466	53.08761619	83.0335557	12.88369987	11.99564131
45.7941841296127	83.71811525	22.3827860071466	55.99099974	83.60147673	17.9737132	11.10984141
45.7941841296127	83.71811525	22.3827860071466	50.20394782	81.95454381	24.2461412	5.63710621
45.7941841296127	83.71811525	22.3827860071466	46.93472918	83.75304242	25.57195373	7.122281837
45.7941841296127	83.71811525	22.3827860071466	49.21219028	82.18677234	33.0110742	11.80432558
45.7941841296127	83.71811525	22.3827860071466	40.55838899	87.88304878	23.6255072	7.94496914
45.7941841296127	83.71811525	22.3827860071466	40.16683897	89.097423	24.82067356	10.1742901
45.7941841296127	83.71811525	22.3827860071466	41.14116704	94.61634345	23.98672915	11.9580341
45.3132458408217	81.741643169	20.6390675	45.13867401	81.86371268	20.6390675	0.563248674
44.832307551297	79.76517108	20.51948675	44.56064253	79.77318093	20.51948675	0.271783078
47.8320276865895	77.686074386	20.1083463	49.62844822	78.65994225	20.1083463	3.895592856
50.8317478071724	75.606977652	14.55357765	52.24575767	74.98560476	14.55357765	1.544515511
53.3538687536146	73.737757397	19.7599361286352	53.90080059	74.55382457	8.588853077	11.74270355
53.3538687536146	73.737757397	19.7599361286352	51.91696279	73.69595809	14.416915	5.533020939
53.3538687536146	73.737757397	19.7599361286352	51.90516717	74.10528304	22.83711571	4.497348507
53.3538687536146	73.737757397	19.7599361286352	50.78444002	76.12504454	23.00978791	8.918500215
55.875989261218	71.868537116	21.5952445	55.72002047	71.91921816	21.5952445	0.163996439
60.7711404923482	69.228215976	26.7221163246116	65.84999623	61.37790202	25.6974767	9.405960407
60.7711404923482	69.228215976	26.7221163246116	59.10597324	64.72617137	21.25191915	7.277653794
60.7711404923482	69.228215976	26.7221163246116	62.01287875	62.70691628	29.4740589	7.75530817
60.7711404923482	69.228215976	26.7221163246116	60.59756518	67.42291916	21.31629348	6.033901052
60.7711404923482	69.228215976	26.7221163246116	63.53725064	67.03413314	29.14142524	7.164195385
60.7711404923482	69.228215976	26.7221163246116	63.47892732	68.70647259	29.32775126	6.807486056
60.7711404923482	69.228215976	26.7221163246116	63.48323083	69.36201841	31.45080353	5.452872617
60.7711404923482	69.228215976	26.7221163246116	58.20433528	69.50520456	29.55764241	8.582697416
60.7711404923482	69.228215976	26.7221163246116	60.79681015	75.33369853	28.93747546	8.472276725
60.7711404923482	69.228215976	26.7221163246116	59.09181099	73.44789922	33.41304482	8.247004523
61.5213176441886	74.6427745	29.0316187803575	67.69295238	75.24403656	20.54681948	11.35995088
61.5213176441886	74.6427745	29.0316187803575	57.06276587	74.98770524	20.67544591	9.477514768
61.5213176441886	74.6427745	29.0316187803575	58.81674593	76.2826012	22.48412381	7.335997979
61.5213176441886	74.6427745	29.0316187803575	65.34735437	72.80394877	34.67473005	7.821760947
61.5213176441886	74.6427745	29.0316187803575	56.76810138	74.93595817	28.17323894	10.01955077
61.5213176441886	74.6427745	29.0316187803575	55.90538334	73.56581582	30.52666899	5.910476566

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
61.5213176441886	74.6427745	29.0316187803575	64.88497046	82.96772641	30.52764719	9.339812785
62.9148765126961	80.159176949	22.2270487991586	60.70093329	80.64454551	19.95511414	3.209176581
62.9148765126961	80.159176949	22.2270487991586	61.30013954	82.69641043	22.92622968	3.087682485
67.3712442715519	82.091825022	23.396568720502	67.45457311	72.85375456	29.93900874	11.61655168
67.3712442715519	82.091825022	23.396568720502	70.83372488	78.21085961	24.5182183	5.320597925
67.3712442715519	82.091825022	23.396568720502	69.80433177	81.60817435	25.92271927	4.561618689
67.3712442715519	82.091825022	23.396568720502	68.11557125	90.29313921	19.6765572	9.036263761
69.2036520035349	85.026629703	12.89569188	69.09548968	84.07624055	12.89569188	0.956524245
71.1928457971611	89.339065406	9.08459866130007	79.19703593	96.06011661	13.22486099	11.2419465
71.1928457971611	89.339065406	9.08459866130007	70.07355989	96.61021246	6.954740599	7.658895206
71.1928457971611	89.339065406	9.08459866130007	64.64609008	95.09261932	13.24961232	9.659748021
71.1928457971611	89.339065406	9.08459866130007	69.92952441	96.42807986	14.30332435	9.02685985
71.1928457971611	89.339065406	9.08459866130007	69.38304877	98.18671586	10.95698255	10.74668541
74.2590366652003	86.192802275	2.00082351780221	74.46580568	79.0435318	1.384862598	7.178734541
74.2590366652003	86.192802275	2.00082351780221	77.11333094	85.3156461	2.683835286	3.063152598
73.9578656286298	92.66152522	0.740152129361053	71.17046416	92.96230041	3.31475723	4.264714687
73.9578656286298	92.66152522	0.740152129361053	73.04972269	93.68364053	0.740152131	1.367275869
79.9949333072422	91.996557433	3.657350909	78.18108034	99.79242924	3.657350909	11.42083614
86.0320010040754	91.331589662	11.1030054518552	93.12739448	86.70709298	18.39915073	11.17874385
86.0320010040754	91.331589662	11.1030054518552	86.10921689	91.46882481	10.98097302	0.199217703
86.0320010040754	91.331589662	11.1030054518552	79.39161289	97.26593015	10.2457076	9.87516425
84.1425694339801	88.24333378	14.2975975562037	75.38279951	84.8495864	16.86303573	9.738201242
84.1425694339801	88.24333378	14.2975975562037	82.53992082	88.87907996	14.07314191	1.738688046
89.4806876131295	84.121402545	16.3678714257716	91.90328388	76.16243153	11.12653143	10.02897755
89.4806876131295	84.121402545	16.3678714257716	82.09017124	81.333147	13.10533341	9.364452955
89.4806876131295	84.121402545	16.3678714257716	97.99058573	82.84537681	12.83735391	9.301137649
89.4806876131295	84.121402545	16.3678714257716	91.04765146	90.60180149	20.03455373	7.6089096
85.9165235963292	75.588863928	22.12004218	78.83068399	69.67274441	24.24069079	11.30182844
85.9165235963292	75.588863928	22.12004218	83.77232341	73.14211564	19.82850896	8.533805631
85.9165235963292	75.588863928	22.12004218	91.59995025	72.67875795	22.12004218	6.385143329
85.9165235963292	75.588863928	22.12004218	93.29522257	74.82458329	19.9847248	10.91349472
76.9814499685937	69.806411835	27.884623165032	74.07680751	69.16329968	17.32839223	10.96743145
76.9814499685937	69.806411835	27.884623165032	72.84290598	65.67053988	28.7186167	5.910036243
76.9814499685937	69.806411835	27.884623165032	74.85083054	64.74645556	30.78568814	10.29426937
76.9814499685937	69.806411835	27.884623165032	81.47694776	70.94126153	23.66230135	6.403879885
76.9814499685937	69.806411835	27.884623165032	68.84275879	76.03221479	29.69910657	10.79538264
74.3822412622278	70.096782753	20.0928079	73.05372772	69.26625594	20.0928079	1.566755571
73.2568505785288	71.308518223	12.48249331	73.75840634	73.11670598	12.48249331	1.876459737
71.4622683310721	70.107713697	9.083647724	72.70378804	66.70645397	9.083647724	3.620764964
69.2017164793791	70.183477138	3.844630021	69.12634406	69.4594231	3.844630021	0.727966519
67.0663830605492	71.462133196	6.977880898	66.81087893	72.19337817	6.977880898	0.774597684
65.454882066237	71.241596437	13.59892336	65.09617026	64.32634731	13.59892336	6.924546531
65.454882066237	71.241596437	13.59892336	70.36283848	70.39401036	9.239076068	6.760808749
65.454882066237	71.241596437	13.59892336	68.36889636	72.61479797	11.90493723	6.100291297
64.0248151372234	74.518746115	7.635652533	61.14896118	72.70410502	7.635652533	3.400508534
63.0811067313305	78.102784181	5.70566465521725	61.63608438	74.03409399	0.746346368	7.121975094
63.0811067313305	78.102784181	5.70566465521725	63.68037897	79.29990004	5.705664659	1.33873582
59.1367978635854	75.692774532	1.682398914	58.21523833	76.77458472	1.682398914	1.432175303
55.1924889969405	73.282764882	6.03234177830697	53.04622082	62.56220406	2.597564218	11.46013038
55.1924889969405	73.282764882	6.03234177830697	59.0134746	66.34233581	2.610073656	8.63026105
55.1924889969405	73.282764882	6.03234177830697	56.84900895	69.27095699	14.65228976	9.651018813
51.375100092965	73.308812509	6.606709632	51.17754367	73.39508539	6.606709632	0.21557261
53.5076620273609	70.736516914	5.406808424	53.60239056	70.80290226	5.406808424	0.11567415
52.1150953663112	65.693827144	2.8016905353002	50.29671492	64.07582579	3.765527546	2.617903286
52.1150953663112	65.693827144	2.8016905353002	52.45383187	66.17944394	1.57361944	1.363350544
54.1720924934513	63.399343468	1.875052021	54.15102156	63.89433124	1.875052021	0.495436049
56.3314037461976	58.701338744	4.71605662991368	54.43373891	52.12894009	7.9067999	7.548403707
56.3314037461976	58.701338744	4.71605662991368	59.77266019	58.01872841	1.019723189	6.553588622
56.3314037461976	58.701338744	4.71605662991368	56.20333441	63.09635143	9.893720293	7.090992634
58.4907132115615	54.003330065	0.04067048	62.81703196	55.94894639	0.04067048	5.494902887
60.6500231505962	49.305321881	3.951957012	64.75792457	49.92103542	3.951957012	4.153788299
57.307222390214	43.782627525	5.193477838	57.56166222	41.97700689	5.193477838	1.823459763
53.2611775213844	43.250479793	4.496135918	53.79810347	45.16180718	4.496135918	1.985311525
48.2415702446283	39.252680213	0.08063613	48.20619517	39.24794213	0.08063613	0.03569097
50.6134563646774	36.244877355	3.84317932485931	57.35658457	43.71456461	3.914439364	10.0633535
50.6134563646774	36.244877355	3.84317932485931	50.32982697	35.43640834	3.785700884	1.581696088
50.6134563646774	36.244877355	3.84317932485931	51.33580352	40.30660727	1.042528676	4.986289138
51.6704553396223	31.764374133	6.0581423223972	54.69460289	37.32086801	4.721267047	6.733868048
51.6704553396223	31.764374133	6.0581423223972	51.19858704	31.0981292	6.058142298	0.816420237
56.85492763056	33.111573716	7.74547313301404	59.11600598	27.89604561	4.171146498	6.714910247
56.85492763056	33.111573716	7.74547313301404	58.09138733	33.97784367	3.040604697	4.941158085
56.85492763056	33.111573716	7.74547313301404	56.1557774	36.1071959	13.13084437	6.201998603
53.1557338500336	31.571082655	12.55016086	55.07321291	28.85442279	12.55016086	3.578504928
49.4565400752196	30.030591595	10.3274918132962	54.00076983	32.50218762	13.15428984	8.205190824
49.4565400752196	30.030591595	10.3274918132962	50.20668952	26.40233109	10.32749181	3.704996422
45.2102427821272	31.136285359	12.9085848657271	47.52772375	30.54529654	17.6892221	5.345510096
45.2102427821272	31.136285359	12.9085848657271	44.21687698	34.39769027	11.89272829	3.557457265
41.2493612468268	30.455222376	15.2242738506601	46.26887105	26.53209753	18.29584073	8.81744986
41.2493612468268	30.455222376	15.2242738506601	40.57036155	31.31828969	15.51939441	1.240512039
37.2884797121406	29.774159393	18.0646406	37.07046765	30.04479215	18.0646406	0.347521723

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
37.0813656298037	24.433297165	20.8116253221705	35.53984032	15.99196501	21.54085765	8.611862088
37.0813656298037	24.433297165	20.8116253221705	36.2315122	27.60710766	22.87055815	7.544747892
37.0813656298037	24.433297165	20.8116253221705	29.56587444	24.57869021	18.08116751	7.997446269
37.7527702451943	21.172558772	25.28688733	35.94447387	20.12395641	25.28688733	2.090335546
40.0559903518334	18.858081548	23.869117703806	39.07927218	20.57348801	18.57850652	5.646872091
40.0559903518334	18.858081548	23.869117703806	38.46066343	17.33665094	24.22591115	2.23318621
40.0559903518334	18.858081548	23.869117703806	38.38951699	19.65672727	24.71703453	4.440566438
44.753212805077	18.569470351	31.37577496	44.45005227	17.91363181	31.37577496	0.722516784
51.6532524051221	23.046292763	32.70824117	51.08696185	26.42044109	32.70824117	3.4213392
58.6775064374357	26.783003829	34.0268500411059	67.26622281	20.02005982	35.0966755	10.98398776
58.6775064374357	26.783003829	34.0268500411059	55.9549233	32.80200534	27.96563646	9.08801586
58.6775064374357	26.783003829	34.0268500411059	59.48412304	31.97998889	33.72997467	5.267581898
59.0782540438221	23.6256598	32.7518139899873	60.71671796	14.8721563	28.06290831	10.90485749
59.0782540438221	23.6256598	32.7518139899873	59.97712424	27.07719444	29.13491814	8.051501149
59.0782540438221	23.6256598	32.7518139899873	51.99282443	27.99909333	30.19770488	9.260790549
59.0782540438221	23.6256598	32.7518139899873	50.59311922	22.75724468	32.75181399	8.529458236
65.5732973560399	21.092038981	22.7896689192133	66.17419814	21.15751135	18.97034229	7.122166774
65.5732973560399	21.092038981	22.7896689192133	62.61153544	17.95816147	22.4620849	4.324411312
65.5732973560399	21.092038981	22.7896689192133	63.04507341	24.29862677	23.57575014	4.664845393
65.5732973560399	21.092038981	22.7896689192133	66.92261807	21.4897109	27.4812889	4.897969721
72.2508926673788	18.756156903	30.17263192	71.29498477	19.86081824	30.17263192	1.460834206
81.85862004874	13.034171806	33.63275215	83.75499038	5.857780347	33.63275215	7.422722871
90.3099782050236	11.688205951	23.2985929855684	93.53556787	11.2495411	17.39352488	9.93311926
90.3099782050236	11.688205951	23.2985929855684	94.43184685	8.796264511	23.29859307	5.035188817
90.6001341701677	16.068218425	27.39786086	95.99475962	18.1472698	27.39786086	6.014618976
90.8902897566529	20.448230358	35.33294835	90.81819821	18.2159484	35.33294835	2.233445753
91.2109283549318	25.772133982	36.0994515	94.15587216	20.2227246	36.0994515	8.426061551
91.5315669526999	31.096037664	22.6088686280714	88.13068149	33.9074779	16.96093724	7.167241247
91.5315669526999	31.096037664	22.6088686280714	94.17807015	30.5898166	23.81736257	2.95308255
87.541701445451	36.20575223	21.13489416	87.56748283	36.27406643	21.13489416	0.073017187
82.8297525794481	39.402127512	22.9629528770722	82.01891737	31.58538586	22.96295297	7.858683337
82.8297525794481	39.402127512	22.9629528770722	84.85983095	39.85329756	21.28837281	7.318048431
78.3978629289244	45.29837434	35.54252376	79.30599483	40.28434635	35.54252376	6.78710395
73.9659729556296	51.194621078	26.8093517116125	76.57028534	49.55513485	21.13053287	6.459051132
73.9659729556296	51.194621078	26.8093517116125	72.13050555	55.03070373	28.54528132	5.622701454
69.5340842805647	57.090867848	24.01827102	69.70404765	60.5822767	24.01827102	3.495543351
64.7329330753821	55.401717395	15.7734700748718	68.52022941	55.69012612	11.12241046	6.004927032
64.7329330753821	55.401717395	15.7734700748718	64.66140077	51.58253517	18.71344865	4.820243123
58.331411501239	56.218687171	20.3253705027081	53.70737401	57.8077763	9.994366281	11.42963583
58.331411501239	56.218687171	20.3253705027081	56.36080227	54.43871329	23.33898219	4.01664825
58.331411501239	56.218687171	20.3253705027081	53.50308144	57.04941766	21.52167719	6.080321585
58.331411501239	56.218687171	20.3253705027081	56.73611746	58.87824868	26.03485933	10.42122905
58.331411501239	56.218687171	20.3253705027081	57.97334153	65.39941546	18.27090119	9.414607276
58.331411501239	56.218687171	20.3253705027081	56.12304172	60.76926662	25.75259057	8.549372537
62.4291192195512	58.96288812	25.73038778	61.59665848	60.86573745	25.73038778	4.870665397
67.1128572642233	58.765677849	31.19414535	67.27809665	56.79217526	31.19414535	1.980408171
66.5268269384052	61.707089068	33.2359079	67.87575086	63.89107621	33.2359079	2.566981804
67.5643364185859	57.431250922	35.54640769	66.67873973	56.13517049	35.54640769	1.600074425
68.0158155690801	56.09682401	36.50214422	65.98277732	56.02257659	36.50214422	2.034393571
72.8040579125104	54.920776749	39.57914747	72.73426073	54.95021428	39.57914747	0.075751006
78.2279085848074	53.476665324	39.93820594	77.87000631	52.21112855	39.93820594	1.783848909
83.651758928634	52.032553121	36.90102142	86.51848331	50.71555717	36.90102142	3.154772102
83.5918335556235	53.107731191	32.7866927840599	71.99750065	50.82091856	33.04720741	11.82057255
83.5918335556235	53.107731191	32.7866927840599	83.19197135	53.48639501	32.18766969	0.813698186
83.5918335556235	53.107731191	32.7866927840599	83.91646182	55.69492785	39.74024442	10.80258547
89.0325913189751	55.174831586	31.72721103	91.19333201	55.09349477	31.72721103	2.162271031
84.96999014788	57.599667501	23.8034268996781	78.85550393	52.04144231	24.20403351	8.272925398
84.96999014788	57.599667501	23.8034268996781	85.16088414	60.47696067	19.97453885	4.793291165
83.2603612847001	62.054195859	19.8675028387646	90.50689197	55.43830225	17.11301088	10.39640446
83.2603612847001	62.054195859	19.8675028387646	78.29263567	66.45988674	19.86750284	6.639910385
89.0631493977109	59.846241984	21.8007231173003	87.34079917	59.37931572	10.08579475	11.8500657
89.0631493977109	59.846241984	21.8007231173003	88.60564442	53.67349247	30.97358927	11.4446079
89.0631493977109	59.846241984	21.8007231173003	83.55927983	59.64747077	24.27812457	10.99948591
94.8659372469969	57.638286656	3.069360741	95.77662579	57.68215173	3.069360741	0.911744354
80.0524082244993	54.437306505	8.27403967	79.86750899	54.35421653	8.27403967	0.202710806
77.665482102237	56.820583058	6.81047967233134	85.71414415	51.67250379	7.296357424	10.80797757
77.665482102237	56.820583058	6.81047967233134	84.14082278	54.46253046	0.380513445	9.425227564
77.665482102237	56.820583058	6.81047967233134	76.04244622	64.45001766	13.22117777	10.41499903
75.2785551649976	59.203861541	5.7264348958831	71.85259834	57.85616299	9.805797889	6.145303146
75.2785551649976	59.203861541	5.7264348958831	75.75634139	60.02200009	5.726434896	0.947433566
70.9288718976454	58.226208684	5.076539278	70.94365949	58.14560753	5.076539278	0.08194644
65.5410429625541	62.907059757	4.70605233300002	61.56325619	58.635877	0.997422198	7.786489382
65.5410429625541	62.907059757	4.70605233300002	65.33791464	63.72798066	4.706052333	0.84567857
65.5410429625541	62.907059757	4.70605233300002	65.55566867	66.58332744	7.127202217	6.556838353
61.1832678781947	63.42506073	13.53456764	61.64088805	64.72462094	13.53456764	1.377778269
55.2328557217514	59.420262345	14.5103334988738	53.22205568	50.84724902	15.61737169	8.874987766
55.2328557217514	59.420262345	14.5103334988738	55.40337389	57.61168804	14.09596446	1.863254992
55.2328557217514	59.420262345	14.5103334988738	52.59359138	61.87082203	17.23711721	8.855134315
55.2328557217514	59.420262345	14.5103334988738	52.64945222	62.68533593	20.742851	7.539647236
49.930682550892	61.002735874	13.02441036	49.52719402	60.88674536	13.02441036	0.419829482

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
48.6035853611014	63.727921573	7.91962232315136	50.86986196	67.11854893	6.466301231	4.50428609
48.6035853611014	63.727921573	7.91962232315136	47.89205446	67.3947139	7.919602812	3.735189713
47.338309467302	66.134519367	17.2232386998095	50.37372436	63.54183807	17.2232387	3.991959404
47.338309467302	66.134519367	17.2232386998095	44.42598809	67.45202223	18.20113405	3.872665591
44.9345743528325	69.513524696	19.17067552	43.59103477	70.75648589	19.17067552	1.830314492
45.5019059145023	70.143879613	23.93560611	45.59084573	70.21452412	23.93560611	0.113582292
43.1312890515784	68.440634887	25.50967647	42.13585343	68.94604524	25.50967647	4.750703238
40.7606723410072	66.737390493	24.34934694	39.73860453	66.92518954	24.34934694	1.039178085
42.7560456046787	64.231921737	24.0433262289076	45.68320409	63.6499192	24.04332627	2.984457028
42.7560456046787	64.231921737	24.0433262289076	41.95981534	64.94436816	23.77879253	2.929752986
42.3886255683864	62.196241172	25.88754111	41.10546356	60.73573959	25.88754111	2.160394708
42.0212057240035	60.160561653	24.46424235	41.72170476	60.36141703	24.46424235	0.360615737
45.4318337312523	55.591196751	19.8621404858835	44.98764045	56.96391467	9.231659535	10.72794423
45.4318337312523	55.591196751	19.8621404858835	48.01348394	55.67625048	22.64155069	3.794373864
45.4318337312523	55.591196751	19.8621404858835	46.15723029	56.4070148	19.959172	5.286178878
47.1391831432661	50.715125862	23.4941989062986	49.81718199	39.89953162	25.94554765	11.40867509
47.1391831432661	50.715125862	23.4941989062986	45.78512338	48.76667443	13.05604142	10.70444172
47.1391831432661	50.715125862	23.4941989062986	49.48945411	49.44119699	20.62289914	4.953096168
47.1391831432661	50.715125862	23.4941989062986	47.65008175	45.51867646	25.16647853	10.88958897
47.1391831432661	50.715125862	23.4941989062986	48.35826716	45.69665672	26.59304148	9.422444764
47.1391831432661	50.715125862	23.4941989062986	42.25980634	46.86827481	24.73500352	6.991437475
47.1391831432661	50.715125862	23.4941989062986	48.65047008	56.26343732	32.64491993	11.1175127
47.1391831432661	50.715125862	23.4941989062986	40.32660467	53.626561	31.93108458	11.22803277
49.4474651806411	48.389895903	24.30726963	50.26037041	48.95030273	24.30726963	0.987355419
50.6004523449335	45.268218362	22.32830057	51.65508094	43.85648581	22.32830057	1.762166358
50.5260766123588	43.789496663	23.3893886	49.90577559	41.072269	23.3893886	2.801182703
50.4517009046418	42.310774947	29.9051707746661	47.22851165	47.89903616	20.36250944	11.51868038
50.4517009046418	42.310774947	29.9051707746661	51.12261026	42.05252276	30.83772297	1.177483398
45.4830223863846	36.873730853	32.88778098	44.94410764	36.28576006	32.88778098	3.530989553
40.5143439077426	31.436687002	32.6940641967995	40.05041388	28.81118981	27.86495236	7.168813073
40.5143439077426	31.436687002	32.6940641967995	41.09480481	34.92509896	27.7383049	6.686212606
35.5456654072618	25.999642952	36.05632865	34.82834577	24.45085722	36.05632865	2.058629996
30.5769868859043	20.562598876	37.8542556395166	39.25918273	24.78783876	35.71196052	9.890531084
30.5769868859043	20.562598876	37.8542556395166	21.70527032	21.60018691	37.91508039	8.932392927
30.9751051104746	14.405300238	35.85165647	32.11403346	10.63014558	35.85165647	3.943215754
29.5311534984653	14.353825452	35.77137383	29.15811552	9.518746656	35.77137383	4.849447835
28.3708439632793	17.978730904	34.23380192	27.39065822	19.10906735	34.23380192	2.166651987
27.2105342277341	21.603636362	36.60516078	25.83818458	22.03803134	36.60516078	1.439459118
26.5629553207718	25.066245207	35.39277783	27.26619514	25.90196542	35.39277783	1.092233728
24.7446441045209	27.137572768	32.67332021	24.87958822	27.09583401	32.67332021	0.141251684
19.6647936469854	30.21770754	36.78766314	20.73212412	24.23741148	36.78766314	6.929326091
14.5849429347492	33.297842349	31.0811404511702	19.40209516	41.66020767	37.5577128	11.97444555
14.5849429347492	33.297842349	31.0811404511702	9.44237495500001	27.32019574	23.59921997	10.87002293
14.5849429347492	33.297842349	31.0811404511702	10.62327399	24.29073933	35.14972626	10.64782213
14.5849429347492	33.297842349	31.0811404511702	12.31993183	42.07287161	37.42873621	11.95610617
9.91602443759513	37.123311017	25.7595323679289	14.14878683	27.98719075	26.90047422	10.13344558
9.91602443759513	37.123311017	25.7595323679289	12.65054039	38.20990532	17.83269917	8.455350331
9.91602443759513	37.123311017	25.7595323679289	10.78091353	34.08373955	26.71276523	6.747292093
9.91602443759513	37.123311017	25.7595323679289	13.48749824	42.29987548	28.42807605	9.005353542
9.91602443759513	37.123311017	25.7595323679289	8.013859219	41.41457221	25.49555223	9.523443187
9.91602443759513	37.123311017	25.7595323679289	2.885836634	40.60849192	26.29324057	7.864786769
9.32781546850555	40.071602155	32.06550398	6.302525489	40.0085763	32.06550398	3.025946417
11.0895995608484	43.06885069	30.87649008	9.755265232	43.18329059	30.87649008	1.339232837
13.1446249253806	46.04094923	35.1168961183702	18.10483235	51.48322234	38.87016683	8.264928029
13.1446249253806	46.04094923	35.1168961183702	12.77181014	48.33401693	34.40572033	2.429592834
14.1580877580384	42.907019109	39.2580048200001	18.21468575	45.65080463	39.25800482	4.897381571
14.1580877580384	42.907019109	39.2580048200001	12.97854061	40.66549102	35.96453487	4.434042673
11.1671261651231	37.064592415	39.13126485	9.832177112	38.08691559	39.13126485	4.043657799
8.17616457227473	31.22216572	34.97941135	2.51827574799999	30.45426362	34.97941135	5.70976178
7.28228122001347	25.664359462	34.36872103	6.772905892	23.04434695	34.36872103	2.6690689
6.82853529511785	22.370435066	40.4993513441126	17.16840861	23.65521269	38.43535721	10.62185038
6.82853529511785	22.370435066	40.4993513441126	10.79914705	20.42039499	35.93251466	9.255684285
6.37478955483819	19.076510693	30.80849489187	8.465864182	8.874062551	25.43796737	11.71772619
6.37478955483819	19.076510693	30.80849489187	4.953508892	23.81507206	25.41914679	11.32693583
6.37478955483819	19.076510693	30.80849489187	7.31997787899999	15.37807435	33.05725748	6.081166637
6.37478955483819	19.076510693	30.80849489187	5.677247541	18.04924585	36.67897415	6.000363709
6.37478955483819	19.076510693	30.80849489187	2.197761157	16.16441336	29.99258788	10.88783855
5.39570258625454	19.811300503	24.78576733	3.177857831	14.97802426	24.78576733	5.317837399
4.81467629189007	24.013729405	25.5570196895684	3.43019284899999	27.39779729	20.1502757	6.526989384
4.81467629189007	24.013729405	25.5570196895684	4.281409798	24.72152663	26.34546352	3.095213609
4.81467629189007	24.013729405	25.5570196895684	3.815111582	26.65111472	27.4138472	5.810017463
5.80749586943578	23.577189982	24.12156356	6.71940622700001	25.73868862	24.12156356	2.345987396
3.82185671453097	24.45026883	20.59719751	1.354188569	31.31594018	20.59719751	7.295671947
3.7125959108735	22.428526257	12.84474665	2.694391803	27.62826968	12.84474665	5.298497076
4.01844135402973	18.286927813	8.201101929	0.867278095000003	18.04823486	8.201101929	3.160190534
9.34663974470283	14.525760306	8.19251747675398	14.9958336	14.5728326	1.422152891	8.817791313
9.34663974470283	14.525760306	8.19251747675398	10.89890727	16.02503912	12.34011368	4.675459945
12.9731968595868	10.245883062	5.445678785	18.20950886	6.619599382	5.445678785	6.369371766
11.4833938252552	9.50921904	7.31842021626404	5.801300438	5.23076571	0.128009607	10.356567
11.4833938252552	9.50921904	7.31842021626404	3.082410661	9.043855976	8.462200359	9.949435792

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
9.99359093184327	8.772555132	19.26951737	8.98802709899999	7.925934732	19.26951737	1.314505506
13.8122211381521	12.505252466	19.22611956	20.19850768	8.627828216	19.22611956	7.471216408
13.3302753691712	18.849039035	19.5312896041266	12.63680518	12.91935497	10.56277797	10.77386908
13.3302753691712	18.849039035	19.5312896041266	14.86812736	22.17705421	27.08627601	8.397529002
13.3302753691712	18.849039035	19.5312896041266	12.36712067	15.90584574	24.47249551	8.460729812
13.3302753691712	18.849039035	19.5312896041266	8.67995437099999	15.22687294	13.91463376	10.6053774
13.3302753691712	18.849039035	19.5312896041266	5.584406208	23.81184943	17.55438576	9.409363681
13.3302753691712	18.849039035	19.5312896041266	5.72255099500001	17.38650207	24.6119319	10.68361364
20.4748338360793	20.873412361	16.3355572806051	28.59013959	24.83311171	20.75915805	10.05513054
20.4748338360793	20.873412361	16.3355572806051	24.70443529	26.12365999	11.74081492	8.158816457
20.4748338360793	20.873412361	16.3355572806051	21.65865806	17.99154884	8.745957007	8.718780186
20.4748338360793	20.873412361	16.3355572806051	18.71921477	25.10440199	21.46380598	9.380442313
20.4748338360793	20.873412361	16.3355572806051	18.39694528	22.72524013	21.81072027	8.568057279
23.6922355096192	19.993062762	13.65279264	23.64941173	19.80991504	13.65279264	0.188087651
27.6945350842751	22.469546893	14.69297653	28.82263126	20.36706254	14.69297653	2.386009522
31.0409863361353	26.168364565	15.48974465	30.34406593	27.74432368	15.48974465	1.723178802
35.3357172032606	27.722820559	10.5284317994036	42.45831495	25.01806118	18.69304905	11.16727795
35.3357172032606	27.722820559	10.5284317994036	36.77121212	29.70512597	6.399428168	4.799880351
35.3357172032606	27.722820559	10.5284317994036	35.85991513	20.90404301	13.98769394	8.748151694
35.3357172032606	27.722820559	10.5284317994036	37.51752459	33.09106605	16.01141602	9.30247437
29.3089004772569	28.018297461	5.155453447	31.17947294	31.40633137	5.155453447	3.870118229
23.1666171324001	28.104637873	9.968662506	22.33900559	31.60235215	9.968662506	6.287046338
17.0243338300284	28.190978562	1.562447455	16.76117492	28.31246812	1.562447455	0.289848796
20.8601266328945	23.670855243	2.8234148280987	24.09498187	20.3828805	2.129534364	10.45340098
20.8601266328945	23.670855243	2.8234148280987	23.31975826	27.34182644	2.882941415	8.782240679
20.8601266328945	23.670855243	2.8234148280987	18.74305811	29.30240259	6.154559295	6.990859055
24.6959175667791	19.150729753	0.400117348	24.23492671	17.98856994	0.400117348	1.250251176
30.309319038174	19.111967551	4.645040707	30.90434674	20.96780911	4.645040707	1.948898626
34.5291465770773	14.726763556	6.03434430218435	38.07401644	11.09458783	4.920078282	6.973490769
34.5291465770773	14.726763556	6.03434430218435	34.15723352	12.84614068	2.236297964	4.597761329
38.7489740348812	10.341559716	14.5302595805122	36.57027062	15.62107689	13.23399254	9.745800746
38.7489740348812	10.341559716	14.5302595805122	35.62470684	10.73896033	9.362523366	6.976212454
42.9688014246431	5.956356032	4.366098536	42.34346606	5.769949569	4.366098536	0.652527155
60.9876816517213	5.684517279	1.646238652	63.24920239	4.015695007	1.646238652	2.810594924
64.3307262538854	16.242274365	8.83018300305194	65.51501196	11.68636529	3.24100338	7.30737771
64.3307262538854	16.242274365	8.83018300305194	64.88897514	21.58345165	8.959362969	5.371825022
67.0560159322358	21.276845685	9.188656209	62.17589976	23.53474989	9.188656209	5.377142852
73.4124847415417	24.631362954	13.77877729	75.00767938	29.50135545	13.77877729	5.124594895
76.516304226188	18.055820433	10.953334900663	70.71952594	19.54937922	9.466423791	6.168002999
76.516304226188	18.055820433	10.953334900663	77.03036191	15.51069798	15.03164451	4.834719524
82.8506039300725	11.154525011	12.16207554	85.22979418	8.715884504	12.16207554	3.406980154
80.5548960787585	13.098881211	3.93751077214405	87.03899122	21.09553754	1.216015821	10.64878101
80.5548960787585	13.098881211	3.93751077214405	72.1570689	9.179080442	1.515121588	9.589007965
78.2591882526276	15.043237511	1.8774276	76.68650337	13.86956158	1.8774276	1.962359022

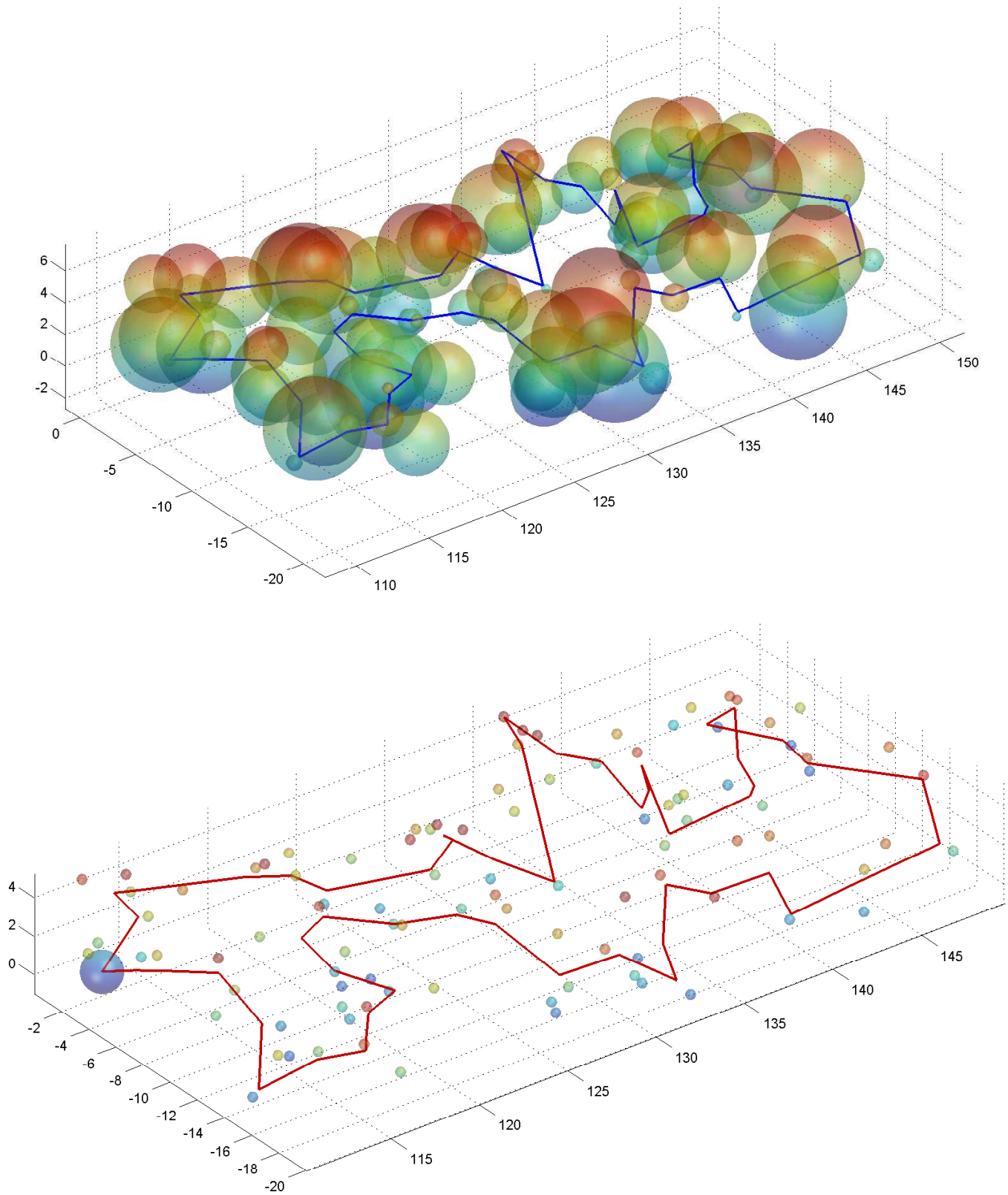


Figure N.98: $kroD100$, arbitrary radius, 3D, Euclidean, Length = 171.5675052

Table N-101: Solution for *kroD*100, arbitrary radius, 3D, Euclidean

Total distance: 171.567505229782 Depot: x 2.78 y 1.65 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
3.52677306602141	1.97277426699412	1.26325518816124	3.66	3.39	1.25	2.53
4.31181736940954	2.31209031123451	2.59125069056568	4.59999999999999	2.67	2.69	0.47
3.85729516936608	1.12527552142555	3.47224623286834	2.64	0.36	4.24	1.63
4.80067134579704	1.15334574092536	3.24991650964295	3.87	1.99	4.81	2
5.32131780552152	1.16883761069623	3.12721340800013	5.47	0.25	2.56	1.09
7.21112349914244	2.02515600667886	3.14300850864056	6.34	2.94	3.58	1.98
9.62021381996242	3.11677522061967	3.16314386394723	9.31	5.12	4.87	2.65
9.76247654279756	3.13082597191319	3.12413451397907	10.17	3.33	3.55	2.62
11.308827432123	3.28355286841551	2.70011541098907	12.03	3.85	2.73	2.95
12.184209278653	3.37001084861722	2.46008021764693	12.72	2.46	3.03	1.2
13.5408077620401	4.17387076129166	1.58941530826682	13.46	4.08	0.87	0.73
14.9051359382508	5.05203042894135	1.88308296185534	15.41	3.54	2.28	1.67
15.916818033722	5.70320688858449	2.10084457599638	15.29	5.81	0.79	1.78
17.4687615413667	6.7021265022199	2.43489586345532	17.66	6.78	2.14	0.36
18.2166166826485	7.37891920095046	4.04828800082458	18.19	8.14	4.91	1.15
18.4274005040492	6.99680077162528	3.83240752063606	17.66	6.92	4.8	1.93
18.4994260907263	6.86622957345158	3.7586403969619	16.04	7.06	4.67	2.63
19.176176760086	5.63938540814373	3.06552628505335	18.28	4.56	3.27	1.76
19.6317389507331	4.8135217063293	2.59894886403416	19.62	3.89	2.49	0.93
20.8348024760837	7.08124598447514	1.93640241065519	20.67	6.94	0.95	1.01
22.2199571400502	9.6424008206802	1.49026084834954	22.23	9.9	1.41	0.27
23.6924964818262	6.60640904811899	2.87169218458645	23.34	5.23	2.71	1.43
24.3437031437919	5.26379088591272	3.48260780683874	23.47	3.88	3.22	2.49
25.3841631615758	3.11863390245667	4.45869315052552	25.97	3.49	4.95	0.85
25.517264600111	2.54365911791313	4.59465191072988	25.92	2.48	4.76	1.24
25.8179573627221	1.2447193044411	4.90179971764916	25.81	1.21	4.92	0.04
26.6989239726443	2.14370636721607	4.00896641602489	26.56	1.28	3.27	1.2
27.4705840683248	2.93115101547409	3.22691199821212	26.58	3.6	2.5	1.33
29.4199868493058	3.72076774132561	2.49033356843874	29.95	2.64	1.7	1.44
29.4207467953334	3.72140289936899	2.49019552389912	30.62	3.29	3.3	1.51
29.868770898485	6.09480716106136	0.976033631934283	29.93	6.24	0.47	0.53
29.8463428242756	6.65170694974252	2.1798601721748	30.6	7.81	2.03	1.39
29.4224813769426	6.67457387881093	3.63169845336538	29.44	6.32	4.14	0.62
28.6952658028704	8.68767834901197	2.950447844839	29.01	9.2	2.88	1.16
28.0322113240153	10.5231699031736	2.32930290237841	27.4	11.01	2.19	0.81
29.6216761069282	10.3347504339489	2.30823800544604	29.82	9.49	1.92	2.12
31.2480349250793	10.1419574503977	2.28668416793379	30.23	8.71	2.76	2.25
33.0542941292138	9.92783856483483	2.26274613206102	33.32	10.49	1.92	0.71
33.5826445776965	9.54258127209606	2.44009641868759	35.35	11.12	3.97	2.82
34.6944701030497	6.91017452649592	2.21796324041736	34.52	6.37	0.69	1.63
35.2587805752312	6.05576047628839	2.89489750579539	36.42	6.99	3.53	1.73
35.87723310408	5.11937076975935	3.6367793559263	35.99	5.14	4.02	0.4
35.9716806010359	4.4605980449809	3.08181163120853	36	4.59	3.96	2
36.0979279559295	3.58002082288967	2.33998989878639	35.03	3.01	2.97	2.47
36.2466677087674	2.5425588209067	1.46600425929132	35.38	1.25	1.14	1.59
36.7670629159994	2.76101201716996	1.24993921264086	37.66	1.54	0.37	1.75
37.672414346782	4.38611297825216	1.27130713749178	39.46	4.59	0.2	2.26
38.3031728117543	5.5183209874332	1.28619415426583	39.35	5.4	2.53	1.63
38.5528365442674	6.98190101721008	0.672313852668167	38.68	6.97	0.22	0.47
38.2796547727634	11.7025086867537	2.50967173033998	39.18	12.17	3.68	2.52
38.022762586524	16.1416308561864	4.2374696337981	38.05	16.19	4.44	0.21
37.4139544978833	18.211807073642	2.05244840940032	37.86	18.62	1.72	0.69
35.4232189419752	18.1079837617806	1.81072369842281	33.73	19.02	3.72	2.71
32.5337351979282	17.9572879428481	1.45986923781301	32.2	19.45	3.11	2.25
31.4421285041678	17.8639355701382	1.28654505767091	32.48	19.06	0.64	2.69
29.4218542595377	17.6911652455321	0.965768652619038	29.27	17.77	0.77	0.26
28.9824569944759	16.6443655194323	2.78272206147396	30.07	15.24	3.68	1.99
28.4033516085084	16.8948995827339	2.97634764733572	28.34	15.12	3.98	2.04
24.0741523496782	18.7678080795661	4.42382886174874	23.74	19.44	4.67	0.79
23.4995493999824	16.1843812166541	3.89431946782972	23.56	15.68	4.13	0.56
22.5001817442736	17.2619317238422	1.68166796233662	22.21	15.78	0.34	2.02
21.9030072222911	19.050003184626	0.805220577845982	22.14	19.77	0.32	0.9
21.4535999436177	18.7521669566073	1.10330486782266	20.5	18.33	0.82	2.94
20.8028360500874	18.3208855276349	1.53494556968917	19.94	18.52	1.49	1.09
19.7487460663086	17.6223070439102	2.23410564273981	20.28	17.36	4.94	2.77
19.5502865286138	17.5288806454046	2.17609183971995	17.87	19.02	3.83	2.94
18.1252324127241	16.8580270890343	1.75951940890883	16.46	18.17	1.97	2.5
17.2794944018229	16.4598902513553	1.51229291414831	16.32	17.42	0.34	1.83
17.2786197167371	16.4594784874751	1.5120372258466	16.23	17.23	0.85	1.46
16.9952745408042	14.132843522305	2.04598686282484	17.68	15.78	3.21	2.13
16.8380952747595	12.8421960026265	2.34218320549226	16.99	12.94	3.45	1.36
16.7808503930477	12.3721405919781	2.45005828075337	16.77	12.38	3.99	1.54
16.4870698540171	9.88957017536709	1.90274533324254	17.25	9.27	1.67	1.01
14.1270949508334	9.18469987189064	2.00911181700037	13.93	8.59	1.72	0.69
12.5945342312525	10.5080243420462	3.06869884347449	12.64	10.9	3.18	0.41
9.94995523308765	8.60894186266757	3.51270443070576	9.81	8.48	4.05	0.57

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
9.10779416854534	8.07009613336972	2.46328059553984	7.81	6.7	2.36	1.89
9.92894852769652	9.44403178432661	1.10640189764526	9.97	9.42	1.03	0.09
9.87052836957419	9.93607132472223	1.25743898647992	10.21	9.62	0.29	2.98
9.87041558999343	9.93702120093729	1.2577305614141	11.79	9.69	0.13	2.24
9.74886917716542	10.9607369441096	1.57197167160727	10.09	10.01	2.31	1.34
9.58464276029187	12.3439217976557	1.99655588537678	8.11	12.95	0.83	2.74
9.53142254360476	12.7921652602985	2.13414928187643	11.09	11.96	0.79	2.22
9.53142254360476	12.7921652602985	2.13414928187643	7.78	12.82	1.55	1.85
9.29976661359811	14.743270627637	2.7330631524661	10.82	15.61	2.72	1.75
5.61449308066871	17.5850540403826	4.18108042521129	5.55	17.53	4.5	0.33
4.51766646190681	18.8076191700092	3.55641500873737	3.94	19.44	3.99	0.96
4.60742299775536	18.7153566463054	3.09177419183314	5.70999999999999	19.82	2.08	1.86
3.47163248804057	16.5826488914775	2.04670179961551	3.86	16.16	2.13	0.58
2.46230448060886	15.9789081954942	1.42525459479774	1.48999999999999	16.29	2.83	2.86
1.21936520668963	15.2354302979232	0.659972089705997	0.799999999999997	15.33	0.47	0.47
2.80525813832968	13.2879257127298	1.06432151608714	4.64	13.02	0.19	2.05
4.15110676568557	11.6351998210005	1.40746772215627	5.55	11.21	0.58	1.68
3.59182045190079	11.0617447923026	2.41932969457281	4.01000000000001	9.8	2.35	2.63
3.04092003011073	10.4968880909305	3.41601989742323	2.34999999999999	10.59	1.97	1.67
2.79136427036289	10.2410101842163	3.86751669463293	2.41	10.69	4.97	1.25
2.67756078485108	6.51256766257891	2.29973373839209	2.40000000000001	6.19	3.07	0.88
2.62090715594076	4.29526468424214	1.33006667836642	0.469999999999999	3.63	2.67	2.62
2.64094347486636	3.96211757907974	1.162556794816	2.02	2.33	2.08	2.61

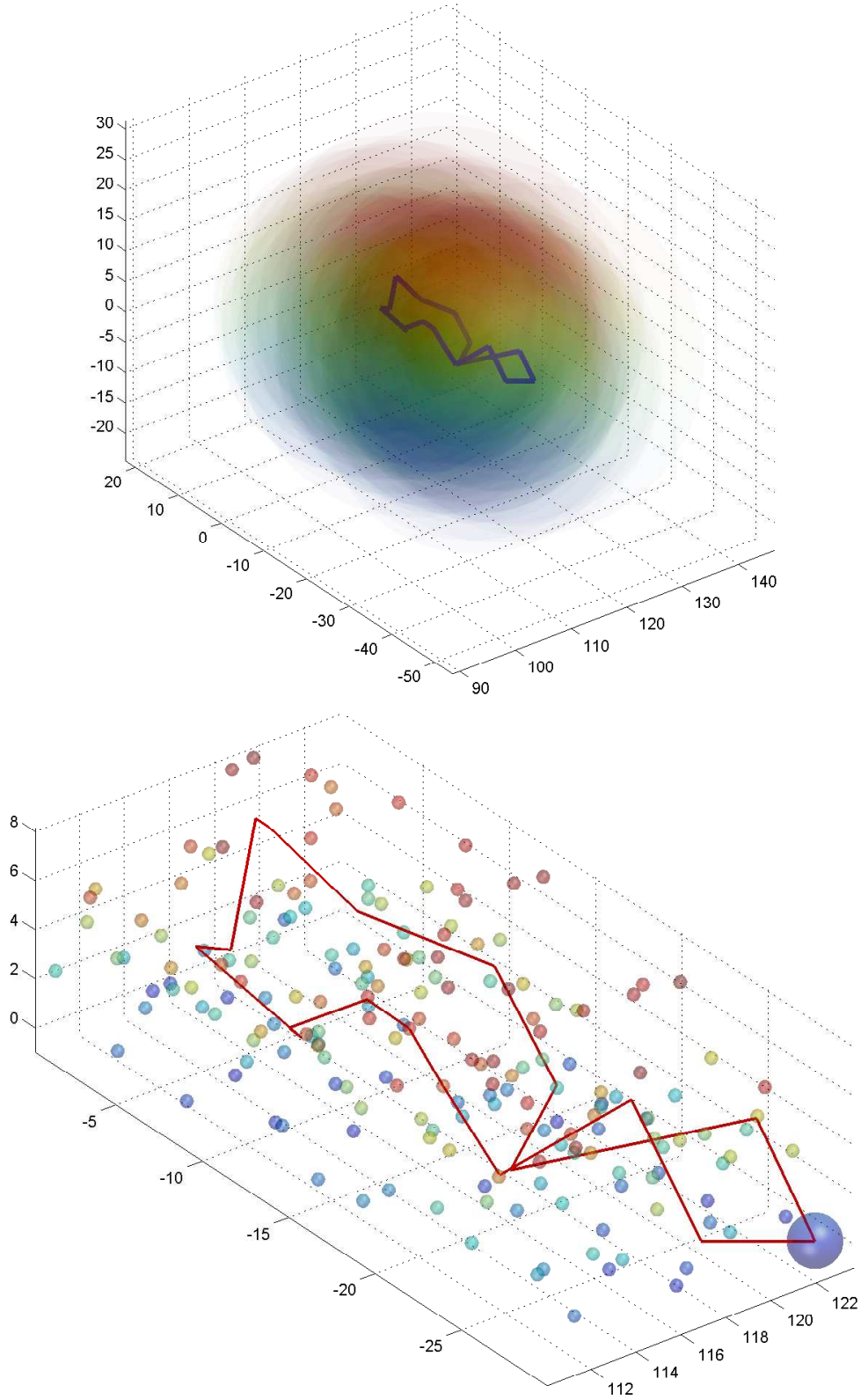


Figure N.99: *rat*195, arbitrary radius, 3D, Euclidean, Length = 84.4702017

Table N-102: Solution for *rat*195, arbitrary radius, 3D, Euclidean

Total distance: 84.4702017102714 Depot: x 12.7 y 29 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
12.4322992525074	28.5399905801089	1.07531477041867	11.3	24.6	0.1	14.1
12.4322992525074	28.5399905801089	1.07531477041867	10.5	22.8	0.7	15.1
12.1906534985623	28.1247533269452	2.04597044013316	12.7	27.3	0.2	3.1
11.7337190854508	27.3395701098746	3.88140918171805	9.40000000000001	28.4	4.3	5.1
11.5781074403214	27.0721714447719	4.50647841241382	11.6	27.1	4.6	0.1
11.0971270515186	26.3688347465196	4.15581032920824	12.5	25.3	2.9	5
10.5918204555132	25.6299258822694	3.78740675281996	10.4	25.6	3.6	8.1
10.5918204555132	25.6299258822694	3.78740675281996	7.3	24.7	2.7	8
10.3104272676386	25.2184451643877	3.58225159038292	8.7	26.4	4.3	9.1
10.3104272676386	25.2184451643877	3.58225159038292	9.40000000000001	20.9	2.9	9.1
9.76071574666712	24.4146030634971	3.18147374200824	6.7	28.8	0.2	14.1
9.26700331525433	23.6926483235145	2.8215231161717	12.7	23	4.7	4.1
8.79953215263448	23.0090661405014	2.48070419637251	9.5	23.5	3.6	3.1
8.33524077816323	22.3301337558168	2.14220356279586	8.7	24.9	3.7	12.1
8.33524077816323	22.3301337558168	2.14220356279586	8.7	23	0.9	11
7.85624848055284	21.6297042394405	1.7929849359081	10.6	26.4	2.7	17
7.85624848055284	21.6297042394405	1.7929849359081	9.40000000000001	24.5	2.9	16.1
7.38884142264975	20.9462157967993	1.45221275297015	1.7	29.4	1	22
7.38884142264975	20.9462157967993	1.45221275297015	9.3	18.5	2.6	9.1
6.89732704423828	20.2274752656501	1.09386466037389	5.5	22.5	1.9	14.1
6.43120586967943	19.5458671677919	0.754029975706945	5.40000000000001	19.4	0.4	1.1
7.04695548971759	19.1120063052138	0.813280415745897	6.40000000000001	16.8	1.7	6
7.04695548971759	19.1120063052138	0.813280415745897	9.3	15.6	1.2	5.1
7.7086810428833	18.6457505254795	0.876954884753334	9.5	17.4	3.2	17
8.33986455072193	18.2010148535965	0.937690448986975	10.6	19.2	0.8	11
9.03269742016207	17.7128406728983	1.00435821608533	8.7	17.3	3.1	13.1
9.77516354957822	17.1896946007558	1.07580193853206	8.7	15.4	1.1	17
10.516308221483	16.6674796351394	1.14711850365151	12.5	19.5	0.7	5.1
10.516308221483	16.6674796351394	1.14711850365151	11.3	19.3	1.9	6.1
10.8947704170222	16.4008129104257	1.18353598718973	12.5	16.9	0.1	2
11.0128030701038	14.8928980006326	2.27684206901394	11.4	16.9	4.3	15
11.0787880434989	14.0499133025116	2.88804386065587	10.4	29.1	7.1	17.1
11.0787880434989	14.0499133025116	2.88804386065587	7.5	23.4	5.3	15.1
11.0787880434989	14.0499133025116	2.88804386065587	11.7	22.5	7.9	14.1
11.0787880434989	14.0499133025116	2.88804386065587	10.4	21.5	7.4	16
11.0787880434989	14.0499133025116	2.88804386065587	11.5	20.6	7	14
11.0787880434989	14.0499133025116	2.88804386065587	12.7	14.8	0.7	9
11.0787880434989	14.0499133025116	2.88804386065587	12.6	10.9	4	9
11.1384042396908	13.2882922762818	3.44025333693696	10.3	12.6	5.4	10
11.2081869026857	12.3967905254449	4.08663217312333	12.6	13.4	7.7	4
11.0664575560156	11.6200005680249	4.0519217925199	9.59999999999999	12.8	7.5	5
10.806298857718	10.1941232267921	3.98820734129732	11.7	11.5	2.9	9.1
10.806298857718	10.1941232267921	3.98820734129732	10.3	9.2	3.3	4
10.694004270831	9.57865924833618	3.96070571240946	9.8	10.8	3.4	8.1
10.5490901234532	8.7844140431703	3.92521535420877	8.59999999999999	10.7	4.5	14
10.5490901234532	8.7844140431703	3.92521535420877	12.5	6.8	4.3	14.1
10.3981397001284	7.95708522640111	3.88824667521271	4.40000000000001	13.1	0.1	16
10.3981397001284	7.95708522640111	3.88824667521271	9.40000000000001	9.5	1	13
10.2325751191107	7.04965916110838	3.84769890002549	9.8	5	1.1	13
10.0351722383299	5.96773379309052	3.79935373136019	10.3	5.4	1.9	2
9.96556925614607	5.74803904010441	3.93968673283554	11.5	4.7	3.2	2
9.59733193551175	4.83739399325757	4.58156752664551	12.5	3.4	2.8	10.1
8.80835681135868	2.8862710364611	5.95684360586364	12.3	1.5	6	5
8.80835681135868	2.8862710364611	5.95684360586364	9.40000000000001	0.8	7.9	3
8.69049574671516	2.59480249482626	6.16228925142661	11.5	1.4	6.7	3.1
8.41129153318835	2.2179926308295	6.43961689036116	8.59999999999999	0.6	7.6	2
7.90038105496467	2.68941102197053	6.11152962979873	7.5	4.4	2.9	14.1
7.53750379335303	3.02423878858559	5.87850366625394	7.40000000000001	6.7	6.3	8
7.1518202105583	3.38011000585945	5.63083235134259	6.59999999999999	6.8	6.1	7.1
7.1518202105583	3.38011000585945	5.63083235134259	7.40000000000001	3.2	3.2	9
7.15115557191925	3.38072326962126	5.63040554572159	5.3	2.5	6.5	9.1
6.37599606891286	4.09596490338367	5.1326276209166	7.7	9.3	3.2	10.1
5.73004741592209	4.69198335987998	4.7178239853013	1.3	9.5	6.3	7
5.73004741592209	4.69198335987998	4.7178239853013	8.5	3.4	4.2	3.1
5.73004741592209	4.69198335987998	4.7178239853013	6.40000000000001	3.2	0.3	5.1
5.73004741592209	4.69198335987998	4.7178239853013	11.3	3.1	6.2	7
5.72938277732754	4.69259662366559	4.71739717964552	1.7	1.2	4.1	10
5.58077092051076	4.82972115949423	4.62196430273919	8.3	8.9	1.9	9
5.58077092051076	4.82972115949423	4.62196430273919	10.7	6.5	4.1	12
5.34841812168378	5.04411367514267	4.47275617969243	2.40000000000001	11.2	0.3	8
5.34841812168378	5.04411367514267	4.47275617969243	2.5	9.4	1.9	11.1
5.05235742111975	5.31728963216888	4.28263726792121	0.599999999999994	8.4	0.5	8.1
4.62365164984102	5.71285753163417	4.00733874035773	4.7	8.7	1.2	4.1
4.62292259187821	5.71343025920876	4.00696396360797	5.40000000000001	7.2	1.4	3.1
4.36015927153501	5.73739156503512	4.13347292825713	6.40000000000001	5.4	1.3	8
4.22452159716681	5.74976032166242	4.19877649331116	2.59999999999999	3.4	1.3	4.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
3.91921489840435	5.77760114554194	4.34576821918696	2.59999999999999	5	2.8	9.1
2.92557892245104	5.86821050256987	4.82416017484719	4.7	6.8	4	3
2.92557892245104	5.86821050256987	4.82416017484719	2.7	7.3	2.8	3
2.92468093773259	5.86829238951565	4.82459251496045	2.3	0.9	5.1	8
2.92378295302279	5.86837427647572	4.82502485508899	0.299999999999997	3.2	6.5	4.1
2.91522765284952	7.69938563056961	4.56997182716605	1.5	7.5	4.4	4
2.91392757698746	7.97762878474608	4.53121359772905	3.7	8.4	7.5	3.1
2.90621319566081	9.37549210046661	4.33195168376437	11.4	29.4	4.3	25.1
2.90621319566081	9.37549210046661	4.33195168376437	5.3	29.5	4.1	24
2.90621319566081	9.37549210046661	4.33195168376437	6.7	22.9	2.9	22
2.90621319566081	9.37549210046661	4.33195168376437	4.7	24.8	2.4	24
2.90621319566081	9.37549210046661	4.33195168376437	5.8	25.2	5.8	22.1
2.90621319566081	9.37549210046661	4.33195168376437	4.5	26.7	5.4	21.1
2.90621319566081	9.37549210046661	4.33195168376437	8.5	18.8	1.3	23
2.90621319566081	9.37549210046661	4.33195168376437	3.7	26.6	6.4	21.1
2.90621319566081	9.37549210046661	4.33195168376437	8.40000000000001	21.2	7.3	24
2.90621319566081	9.37549210046661	4.33195168376437	10.6	16.8	0	19.1
2.90621319566081	9.37549210046661	4.33195168376437	7.7	19.2	6.3	23
2.90621319566081	9.37549210046661	4.33195168376437	4.3	20.6	6.3	21.1
2.90621319566081	9.37549210046661	4.33195168376437	1.3	22.7	4.8	22.1
2.90621319566081	9.37549210046661	4.33195168376437	0.700000000000003	28.7	7.3	22.1
2.90621319566081	9.37549210046661	4.33195168376437	11.7	15.3	3.7	18
2.90621319566081	9.37549210046661	4.33195168376437	4.40000000000001	18.9	6.5	24
2.90621319566081	9.37549210046661	4.33195168376437	7.5	15.1	1.1	23.1
2.90621319566081	9.37549210046661	4.33195168376437	1.59999999999999	17.2	3.9	21.1
2.90621319566081	9.37549210046661	4.33195168376437	6.3	15.5	7.6	11
2.90621319566081	9.37549210046661	4.33195168376437	7.7	12.7	4.4	23
2.90621319566081	9.37549210046661	4.33195168376437	11.6	13	7.6	12
2.90621319566081	9.37549210046661	4.33195168376437	7.3	11.2	0.4	18.1
2.90621319566081	9.37549210046661	4.33195168376437	10.4	11.3	7	24
2.90621319566081	9.37549210046661	4.33195168376437	6.40000000000001	11.2	5.2	12
2.90621319566081	9.37549210046661	4.33195168376437	5.59999999999999	10.5	0.4	25
2.90621319566081	9.37549210046661	4.33195168376437	3.59999999999999	10.8	4.8	22
2.90621319566081	9.37549210046661	4.33195168376437	12.3	9.3	7.2	13.1
2.90621319566081	9.37549210046661	4.33195168376437	9.40000000000001	7.4	2	19
2.90621319566081	9.37549210046661	4.33195168376437	11.7	6.5	2.6	20.1
2.90621319566081	9.37549210046661	4.33195168376437	8.5	6.5	2.8	24.1
2.90621319566081	9.37549210046661	4.33195168376437	3.59999999999999	7.3	0	22
2.90621319566081	9.37549210046661	4.33195168376437	12.7	4.9	6.8	23
2.90621319566081	9.37549210046661	4.33195168376437	8.8	4.9	6.7	12
2.90621319566081	9.37549210046661	4.33195168376437	3.59999999999999	5.4	1.9	18.1
2.90621319566081	9.37549210046661	4.33195168376437	5.40000000000001	4.6	2.8	24
2.90621319566081	9.37549210046661	4.33195168376437	4.8	5	7.8	21.1
2.90621319566081	9.37549210046661	4.33195168376437	9.5	2.8	2.3	19
2.90621319566081	9.37549210046661	4.33195168376437	10.4	2.5	2.2	19
2.90621319566081	9.37549210046661	4.33195168376437	1.5	4.6	5.8	22
2.90621319566081	9.37549210046661	4.33195168376437	4.2	3.4	5.8	10.1
2.90621319566081	9.37549210046661	4.33195168376437	6.59999999999999	1.6	1.4	18
2.90621319566081	9.37549210046661	4.33195168376437	10.7	0.9	0.9	23.1
2.90621319566081	9.37549210046661	4.33195168376437	1.5	3.2	3.6	14.1
2.90621319566081	9.37549210046661	4.33195168376437	5.40000000000001	1.2	0.3	23
2.90621319566081	9.37549210046661	4.33195168376437	4.7	1.1	0.2	20.1
2.90621319566081	9.37549210046661	4.33195168376437	7.5	0.7	4.6	14.1
2.90621319566081	9.37549210046661	4.33195168376437	3.40000000000001	1.1	2	18.1
2.90621319566081	9.37549210046661	4.33195168376437	0.299999999999997	1.2	2.6	18.1
2.90166835988126	10.1990266265651	4.21455890165777	9.5	27.1	1	21
2.90166835988126	10.1990266265651	4.21455890165777	8.7	29.3	1.9	21
2.90166835988126	10.1990266265651	4.21455890165777	7.40000000000001	26.5	3.3	18
2.90166835988126	10.1990266265651	4.21455890165777	6.5	24.8	0.7	19.1
2.90166835988126	10.1990266265651	4.21455890165777	5.40000000000001	26.6	0.3	19.1
2.90166835988126	10.1990266265651	4.21455890165777	12.7	20.9	2.2	21
2.90166835988126	10.1990266265651	4.21455890165777	7.40000000000001	21.2	2.2	20.1
2.90166835988126	10.1990266265651	4.21455890165777	1.59999999999999	27.4	1.8	19.1
2.90166835988126	10.1990266265651	4.21455890165777	5.3	21.1	5.7	15.1
2.90166835988126	10.1990266265651	4.21455890165777	6.40000000000001	21.3	7.2	20
2.90166835988126	10.1990266265651	4.21455890165777	7.59999999999999	17.1	1.9	19.1
2.90166835988126	10.1990266265651	4.21455890165777	0.599999999999994	22.9	2.8	14
2.90166835988126	10.1990266265651	4.21455890165777	3.7	18.6	2.9	17
2.90166835988126	10.1990266265651	4.21455890165777	10.4	15.1	4.9	18
2.90166835988126	10.1990266265651	4.21455890165777	0.299999999999997	19	1.4	19.1
2.90166835988126	10.1990266265651	4.21455890165777	0.5	20.7	6.8	19
2.90166835988126	10.1990266265651	4.21455890165777	4.5	15.4	4.9	20.1
2.90166835988126	10.1990266265651	4.21455890165777	8.2	13.4	6.9	18
2.90166835988126	10.1990266265651	4.21455890165777	0.299999999999997	16.4	1.1	19
2.90166835988126	10.1990266265651	4.21455890165777	1.7	12.5	1	18.1
2.90166835988126	10.1990266265651	4.21455890165777	11.5	9.5	4.3	21
2.90166835988126	10.1990266265651	4.21455890165777	5.3	9.5	2	19.1
2.90166835988126	10.1990266265651	4.21455890165777	6.3	8.6	0.9	20
2.90166835988126	10.1990266265651	4.21455890165777	0.700000000000003	11.4	6.7	12.1
2.90166835988126	10.1990266265651	4.21455890165777	0.599999999999994	7.5	5.5	17.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.90166835988126	10.1990266265651	4.21455890165777	0.299999999999997	4.8	1	20
2.90166835988126	10.1990266265651	4.21455890165777	3.3	3.4	4	20.1
2.89637143550338	11.1588412636296	4.0777397301245	4.3	11.2	3.3	10
2.89134018396811	12.0705153454806	3.94778287555711	3.5	12.6	3.2	1.1
2.30526949523015	12.4778517854036	4.53150887333983	1.5	11.1	3.9	2
1.66930578428193	12.9198653495728	5.1649282866085	0.599999999999994	12.7	5.3	1.1
1.66985092091383	12.9205499158182	5.16541222369956	2.40000000000001	15.3	3.6	3.1
2.09831506303097	13.4586023223881	5.54577500335364	1.59999999999999	14.7	5.3	11
2.59999538916421	14.0885974150661	5.99113437988177	2.7	13.4	6.1	5.1
2.91617951432237	14.4856519472617	6.27182221524466	6.3	12.4	6.5	4
2.91672465096784	14.4863365134973	6.27230615233446	5.40000000000001	13.2	5.7	3.1
3.43615718219529	15.1386242923283	6.73342478947124	3.5	15.1	6.8	0.1
3.45426735087447	15.8084711710618	6.69557643752507	5.5	14.6	7.4	9.1
3.47596383077968	16.6109661474018	6.65023307140531	4.40000000000001	16.9	6.4	1
3.48480623857533	16.9380232507043	6.6317533669716	2.5	16.5	6.9	10
3.48480623857533	16.9380232507043	6.6317533669716	0.700000000000003	15.2	6.3	7.1
3.5	17.5	6.6	3.5	17.5	6.6	0
3.22157363121205	18.3605905945492	6.49875404759297	6.59999999999999	19.2	7.9	8.1
3.22157363121205	18.3605905945492	6.49875404759297	5.3	17.4	7.6	8
3.0659633077934	18.8415679577088	6.44216847555429	3.3	21.4	7.2	7
2.95699496154803	19.1783792096758	6.40254362242433	3.40000000000001	22.5	7.6	5
2.69213884946952	19.9970253743676	6.30623230884289	3.3	24.6	6.9	9.1
2.69213884946952	19.9970253743676	6.30623230884289	2.59999999999999	23.5	7.4	8
2.40000000000001	20.9	6.2	2.40000000000001	20.9	6.2	0
2.195724449571	21.5336669659795	6.15705583813119	1.59999999999999	18.8	1.3	10
1.75494685776073	22.9009681385626	6.06439264733596	1.5	21.3	4.6	6
1.75494685776073	22.9009681385626	6.06439264733596	2.5	19.5	4.2	6
1.35000949597291	24.1570921772845	5.97926402843944	4.3	22.7	1.3	8
1.34970331061133	24.158041970549	5.97919966013139	2.40000000000001	26.7	1.4	11
1.34939712526264	24.1589917638155	5.97913529179144	3.3	28.4	2.5	7.1
1.34939712526264	24.1589917638155	5.97913529179144	0.599999999999994	24.9	2.3	4.1
1.20077325712897	24.6200260648794	5.94789059574163	1.5	24.6	3.5	5
0.580677809129938	26.5435749200122	5.81753001604	0.5	26.6	5.8	0.1
2.43954659295652	26.6455466867218	6.22555131404839	2.59999999999999	25.5	6.5	11
4.12419869790297	26.7379614676927	6.59533208846519	2.3	28.7	7.3	13
6.19552115054745	26.8515877827878	7.04998692094505	6.7	26.7	7.9	1
7.95099058824998	28.3289290415821	1.73986623565571	4.3	28.8	2.1	4
8.07597399707313	28.4341106769864	1.36180383851517	7.3	28.6	0.6	1.1

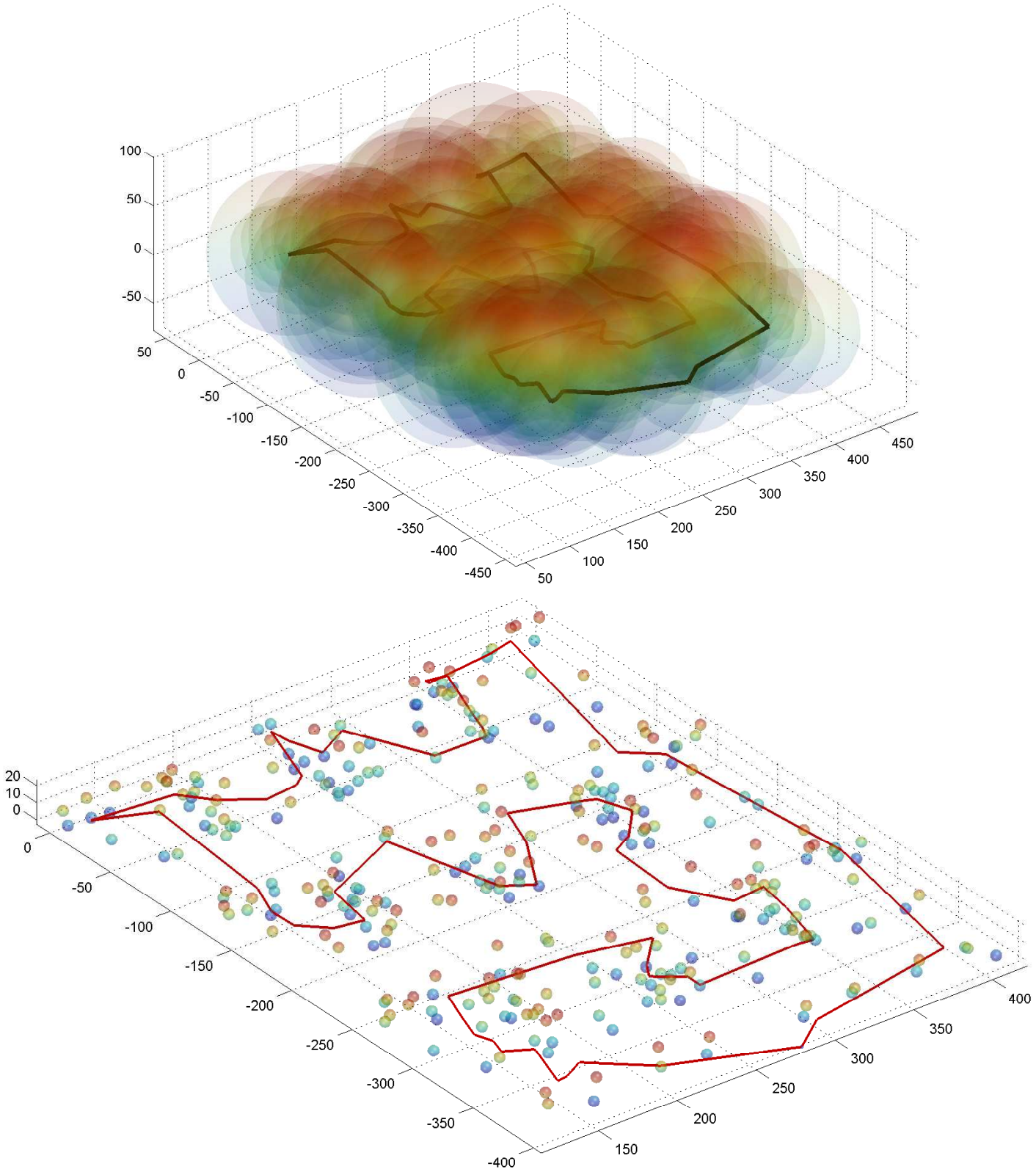


Figure N.100: *lin*318, arbitrary radius, 3D, Euclidean, Length = 2189.4262342

Table N-103: Solution for *lin*318, arbitrary radius, 3D, Euclidean

Total distance: 2189.42623422614 Depot: x 169.3 y 405.5 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
143.004346158094	401.1961169213	3.53109896541414	122.8	387.5	3.6	61.9
116.749005878485	396.898831954768	7.05678444554094	119.7	393.8	17.8	72
89.5918219494582	392.453939781986	10.7035735004789	89	393.8	11	1.5
77.3395957835284	382.200122653423	11.1086434969941	92.1	387.5	18.7	46.4
58.2293022740633	366.206828668838	11.7404476019692	63.8	315.8	14.7	50.8
56.4460705805618	367.126208990905	11.6617227201053	48	393.8	19.4	61.4
45.6780784867149	372.677859950755	11.1863449337165	51.2	387.5	1.4	18.6
38.1756572148184	374.737533877598	11.8816694127348	17.3	393.8	14.6	28.4
40.9195032263142	367.425589415627	11.2418730586819	20.5	387.5	17.4	30.2
45.5593445776935	355.061096587638	10.1599780672538	70.9	331.6	19.3	81.8
51.5866233566084	338.999288163276	8.75456716195939	59.1	339.4	4.8	8.5
51.3648085637401	337.85485476362	8.99347004312454	63.8	331.6	18.4	16.8
50.721736273001	337.178131633279	8.83088101988198	67.7	331.6	4.4	72.5
49.1995245918156	335.576265327073	8.44601777231302	58.3	329.2	7.6	56.8
41.3178074763322	327.282112120303	6.45327054786095	28.3	339.4	12.9	44.9
39.9243929669474	325.81578272791	6.10097128911262	27.6	329.2	2.8	13.2
42.428377827125	315.840228414241	6.87669604984219	67.7	315.8	13.4	26.1
41.9282063186001	313.920071378725	6.77251163847165	44.9	303.2	8.5	67.2
39.3668697557885	304.087107545268	6.23899249108303	14.2	303.2	5.3	25.2
39.527304222469	303.616069117302	6.22355003107398	63.8	297.6	5.2	81.2
41.4645498122083	297.928281593401	6.03708242625301	21.3	273.1	15.8	71.9
41.4648720666258	297.927335448614	6.0370514079719	24.4	273.1	19.3	45.5
45.3615680978221	286.486566359384	5.6619786776117	20.5	254.4	9	56.1
45.3618903521457	286.485620214566	5.66194765932674	6.3	273.3	11.2	71.7
45.3622126067356	286.484674069837	5.6619166410873	9.40000000000001	273.3	14	39.2
46.7819123959821	282.70776713231	5.50919630684213	36.2	273.1	6.7	28.7
48.5694008425614	277.952412813982	5.31691214470538	39.4	273.1	0.8	61.9
49.1614132359357	276.377449316089	5.25322803303816	60.6	288.2	12.5	62.7
50.0516959083427	274.008980921375	5.15745836734939	52.8	281.9	9	48.7
50.3439931651759	273.231366318465	5.12601531776185	17.3	260.7	14.5	36.9
54.1090698698796	263.21492372236	4.72099783798541	51.2	254.4	2.7	9.5
59.8567396418677	266.643533645698	6.74193324826403	48	260.7	17.4	54.8
59.8575617847497	266.644024071782	6.74222232150279	70.9	315.8	15.2	68
59.8583839276508	266.644514497846	6.7425113947226	67.7	297.7	2.9	81
59.8592060705272	266.645004923969	6.74280046791148	66.9	280.4	18.4	41.3
68.9649033344289	272.076750926099	9.94444924983576	63.8	280.4	12.2	22
71.6483509841906	273.677485671141	10.887974591854	70.1	280.4	12.5	10
82.2491400709617	280.001086769004	14.6153111971088	76.4	288.2	6.4	37.9
82.2499622138495	280.001577195137	14.6156002702486	70.9	297.7	11.7	30.8
82.7861123500705	280.32140242229	14.8041156772868	81.1	285.1	18.2	6.1
88.6524913849862	280.276771874953	14.4229238135659	89	260.7	3.7	48.3
91.9541816587814	280.251653016923	14.2083829687452	92.1	254.4	16.6	70.4
109.058829094763	280.121522332445	13.0969381181611	84.3	283.5	16.3	54.6
113.532800950887	280.087484495799	12.8062234868812	85.8	303.2	13.4	50.8
113.533798817648	280.087476904112	12.8061586463513	100	339.4	3.8	61.5
121.093291735079	280.029966244802	12.3149486927766	122.8	254.4	9.9	25.8
132.600659711093	281.785223016282	11.732954172497	127.6	286.7	5.8	75.6
137.518111135132	282.535298102634	11.4842498944795	119.7	260.7	11.7	67.1
142.250395444006	283.257129025033	11.2449107020823	141.7	283.5	17.7	8.5
153.773053000788	285.01471787939	10.6621435284203	148.8	295.3	14.4	39.6
156.792610219857	285.475300863062	10.5094271449074	142.5	295.3	13.4	23
165.883473446722	286.861960086392	10.0496498228022	173.2	285.1	12.1	7.8
160.52176326884	291.300202501561	5.90043387421712	178	303.2	1.5	29.3
158.853955999292	292.680757004101	4.60978359373983	161.4	295.3	10.8	52.8
155.269480038105	295.647865124651	1.83589892672538	155.1	295.3	0.7	1.2
154.682901540638	296.501843936643	2.14028781962586	136.2	295.3	3.1	62.2
151.556492443104	301.053471921768	3.76265238908633	161.4	315.8	7.1	25.4
151.555949223241	301.05426277619	3.76293427818517	155.1	315.8	5.4	37.1
150.957475007215	301.925559996539	4.07349611794031	148.8	315.8	8.4	45
144.426843593954	311.433273844982	7.46238884059919	142.5	315.8	4.2	63.6
143.050467686911	313.437090510112	8.17662149848794	99.2	329.2	7.7	46.6
142.349320854592	314.457865211967	8.5404624895975	116.5	303.2	9.1	28.2
142.349320854592	314.457865211967	8.5404624895975	136.2	315.8	9.7	6.4
148.151592945809	321.113263240206	9.53832098458009	130.7	339.4	10.6	25.3
148.152245932614	321.114012237673	9.53843328341191	142.5	331.6	14.7	70.4
148.152898919426	321.114761235133	9.5385455822496	148.8	331.6	0.2	79
151.383447822809	324.820307669128	10.0941262996567	129.9	329.2	5.1	48.2
154.731179526618	328.660266582466	10.6698598230499	136.2	331.6	10.8	42.4
155.318089769674	329.333472037978	10.7707950116584	155.1	331.6	14.3	4.2
161.510313165732	331.518976023736	4.86695715149975	161.4	331.6	4.6	0.3
172.318966348773	331.836311839553	5.41159936000774	192.1	339.4	1.6	44.1
181.886151679298	332.117198972364	5.89368459862105	191.3	329.2	9.3	60.6
196.695200838963	332.551984102867	6.63990455026957	222	329.2	14.2	53.4
210.067255659917	332.944579875729	7.3137151844318	231.5	331.6	8.7	33.6
221.796472272894	333.288942973011	7.90474397312261	222.8	339.4	15.5	9.8
224.940180475008	332.736798030923	7.26367293675195	227.6	331.6	9.8	65.9

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
234.12374855515	331.123842842452	5.3909421969969	234.6	331.6	5.2	0.7
234.937193132933	326.001966420799	6.05955374877592	231.5	315.8	7.2	80.7
235.744346170801	320.919704127197	6.72299406566071	227.6	315.8	6.5	32.6
236.561167243664	315.776567630377	7.39438092576217	234.6	315.8	11.2	30.3
237.338723316143	310.880664042893	8.03349396399877	234.6	297.7	7.7	68.2
238.006029556812	306.678951254399	8.5819870458913	227.6	297.7	4.1	31.3
238.679126651277	302.440776608892	9.13523980545787	249.6	303.2	7.3	11.1
238.785262414503	298.671108215551	9.70478162912638	208.7	303.2	16.2	47.1
239.133581726518	286.299700928174	11.573920714615	240.2	288.2	11.3	74.7
239.235372563621	282.684350619305	12.1201473772881	240.2	281.9	12.5	1.3
237.363137444185	282.308517395857	11.6548625880215	248	280.4	9.5	61.5
234.179850976281	281.669503179987	10.8637574361088	252.8	260.7	8.8	64.9
231.678237942498	281.167328395587	10.2420606931848	236.2	280.4	11.1	68.9
229.256744714941	280.681236870096	9.64027508194694	233.1	280.4	17.3	78.4
226.85609702729	280.199329892869	9.04367010412478	224.4	280.4	17.9	71.8
224.677423103393	279.761981999988	8.50222964935886	222	285.1	1.9	76.7
222.918129858268	279.408820803881	8.06501298648435	218.9	286.7	3.7	9.4
220.628616905933	276.66643324207	8.44503543563174	231.5	297.7	7.4	23.7
213.341963486359	267.938450959812	9.65450285341548	211.8	260.7	3.2	12.9
205.283736990034	258.286275665146	10.992039103787	215	254.4	19.4	15.5
201.095295775786	253.269344239215	11.6872531408406	181.1	260.7	13.4	21.4
201.048645466397	241.734628374457	12.2825075389512	184.3	254.4	16.9	21.5
200.923670078754	210.833306939403	13.8771848382499	192.1	206.3	17	10.4
203.827740549322	208.550482375865	13.0391889489806	231.5	198.5	1.6	54.9
203.82850724848	208.549879690963	13.0389677109841	191.3	196.1	16.7	65.9
203.829273946491	208.549277006919	13.0387464733188	222.8	206.3	17	36.2
205.252141260993	207.430792998185	12.6281651894632	234.6	198.5	10.6	64.9
216.586019718182	198.521486039476	9.35767167392826	227.6	182.7	0.3	69
220.981900212577	195.065983131906	8.08920054194424	222	196.1	3.2	5.1
225.355696665589	190.48643647369	9.68659245641616	227.6	198.5	10.4	71.7
229.062354769704	186.605411429528	11.0403329992231	231.5	182.7	19.2	62.1
233.26154178824	182.208688230753	12.5739542984285	234.6	182.7	13.3	1.6
232.989179728361	179.336724527962	12.0787991744846	231.5	164.6	6.5	80.6
232.042176608442	169.350905363116	10.357144914076	249.6	170.1	0.7	30.4
232.042083557947	169.349924177889	10.3569757480125	234.6	164.6	0.1	25.4
231.63580448048	165.065851791322	9.61835919475548	227.6	164.6	1.4	68.2
231.284117941204	161.357438839815	8.97899203570559	248	147.3	4.5	33
230.763615330904	155.868919280767	8.03271686043254	240.2	148.8	5.8	12
227.568686873668	154.677105310294	8.1364294394139	240.2	155.1	5.1	52.7
224.583765566064	153.563630975496	8.23332478859523	233.1	147.3	11.4	53.4
223.713993066055	153.23917707821	8.2615589708147	236.2	147.3	7.3	14.3
221.747237433581	152.505512206624	8.32540292178282	222	152	14.6	6.3
208.342272355523	147.561432813524	8.16960369407545	224.4	147.3	2.3	27.7
208.048465656916	147.453069709744	8.16618892660342	218.9	153.6	11.5	44.9
199.274631890347	144.217065018941	8.06421504542481	211.8	127.6	10.4	53.8
199.273693725851	144.216719000898	8.06420414160346	208.7	170.1	15.4	55.8
186.667465437249	139.567233278547	7.91768822494919	215	121.3	10.5	69.7
186.666527272754	139.566887260501	7.91767732113469	181.1	127.6	7.7	13.2
184.537204543616	145.460694285826	7.99599548516389	184.3	121.3	14.5	57.9
184.53686478403	145.461634715121	7.99600798179673	173.2	152	19.2	43.5
181.309953168233	154.393486393132	8.1146963307014	161.4	162.2	17.4	60.1
176.06585207231	168.90876872129	8.30757842395049	178	170.1	11.6	4
168.632473294721	182.841525209116	5.16732783863995	155.1	162.2	15.7	51.3
165.439609673118	188.826070471479	3.81849425375697	155.1	182.7	16.5	57.9
164.153364551758	191.236944545739	3.27511662542754	161.4	182.7	0.7	56.9
160.8528785106	197.423211899489	1.88081749389388	161.4	198.5	1.4	1.3
156.507349224602	196.882763101211	2.98642679373886	155.1	198.5	17.6	57.2
152.212790905489	196.348653483703	4.07906780073954	148.8	198.5	8.3	59.7
148.048732259664	195.830773950389	5.13850650207553	142.5	198.5	1.1	69.8
143.81045364018	195.303663738151	6.21682858724747	130.7	206.3	18.1	42
139.334351639879	194.746975734622	7.35565874300262	136.2	198.5	8.4	5
137.6143686444	188.210778068798	7.41649904870934	142.5	182.7	2.1	52.7
136.127128572716	182.559038886264	7.46910652960084	136.2	182.7	6.2	73.4
134.720350717119	177.213068747116	7.51886781512889	148.8	182.7	9.2	49.8
133.550060940091	172.765789426644	7.5602638809249	148.8	162.2	5.3	66
133.359966134181	172.043400200218	7.56698798695891	129.9	196.1	10	31.1
132.326828549609	168.117319877446	7.60353243758131	116.5	170.1	13.6	39
126.975615869112	147.781897434323	7.7928167495176	136.2	162.2	1.7	53.2
123.844434148605	135.882930596169	7.9035734320099	142.5	162.2	2.7	56.6
123.088249224519	133.009312792437	7.93032134783647	127.6	153.6	18.6	25.7
122.207503525474	129.66234509574	7.96147521890137	141.7	150.4	15.8	56
121.07027798306	125.340715080411	8.00170122224553	122.8	121.3	7.8	4.4
113.273760616741	129.620122289725	8.72637852384995	119.7	127.6	15.5	64
107.894614391688	132.572665782024	9.22636410285746	92.1	121.3	6.9	64.6
97.705162597403	138.165523459875	10.1734618210196	89	127.6	0.1	17.7
84.8741937816411	145.208275856215	11.3660855488268	76.4	155.1	3.4	19.1
84.873320049707	145.208755436303	11.366166761184	84.3	150.4	4.3	61.5
78.6309191989364	148.635127935055	11.9463904771269	81.1	152	7.1	42.7
78.6300454670107	148.635607515159	11.9464716894812	66.9	147.3	5	43.6
69.9688279465909	153.389637409724	12.7515215807089	63.8	147.3	12.9	52

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
69.4435069105099	153.677979308408	12.8003495392165	70.1	147.3	17.8	74.2
66.6139797280064	155.231070058747	13.0633506972517	52.8	148.8	15.5	54.4
63.3822559994993	157.00492121845	13.3637355105559	60.6	155.1	13.8	3.4
63.2189588553982	158.286954943956	13.3171903749976	63.8	164.5	8.3	10.7
62.8022360295556	161.558614795489	13.198410449201	70.9	164.6	8.4	21.9
62.4473817223599	164.34454947443	13.0972651129231	67.7	164.6	2.1	53.4
62.3664015165738	164.980318936468	13.0741830550617	85.8	170.1	5	56
62.1215255642162	166.902821217463	13.0043852451072	70.9	198.5	18.8	76.6
61.8901766678067	168.719123842873	12.938443094078	67.7	182.7	12.4	29.6
61.8900503969715	168.720115185546	12.9384071026833	63.8	198.5	2.5	60.1
61.2875603260272	173.45021903412	12.7666773400274	70.9	182.7	16.9	40.4
59.8865978837409	184.449069389302	12.3673561676737	100	206.3	18	53.6
59.8864716129073	184.450060731975	12.3673201762634	99.2	196.1	13.9	46.1
59.4930514090065	187.538773074039	12.2551823103222	63.8	182.7	4.6	81.7
59.4929251381949	187.539764416715	12.2551463189114	67.7	198.5	11.8	13.7
47.7558264073038	185.655340201748	12.394935810986	58.3	196.1	1.6	20.4
44.4972743782761	185.132170509034	12.4337454895043	59.1	206.3	14.9	26
41.8260470327166	184.703297431992	12.4655600383695	28.3	206.3	15.8	25.7
36.5396221063103	177.302388880655	11.6537341138805	44.9	170.1	19.9	42
30.83782205625	169.319962080339	10.7781201448496	27.6	196.1	18.7	35.6
29.6372238588327	167.63914421678	10.5937466823276	14.2	170.1	13.5	15.9
32.3524325878492	156.879964468777	7.81896267388391	6.3	140.2	17.5	53.1
32.3526699692373	156.87902383057	7.81872008402531	24.4	140	15.5	73
33.4443807251198	152.553053717483	6.70305577703584	17.3	127.6	16.4	73.4
36.3963395466174	140.855737097262	3.68632709630268	21.3	140	9.6	51.1
36.3965769279966	140.854796459052	3.68608450644554	9.40000000000001	140.2	11.5	80.8
36.6205475515967	139.96729919413	3.45719965344676	36.2	140	1.4	2.1
37.0082419375612	138.77506615741	3.58469926876288	39.4	140	3.5	4.5
43.1387494142341	119.922604587307	5.60081649673714	51.2	121.3	6.2	8.2
43.2641171391696	108.477620389335	6.5092665055132	20.5	121.3	8.4	76.9
43.4617320726663	90.4370583350745	7.94124284696462	48	127.6	5.5	40.8
43.5674782904688	80.7833650310419	8.70750856288832	28.3	73.2	9.3	20.4
43.7471590337861	64.3800129648258	10.0095308025618	27.6	63	3.4	76.3
43.885278930555	51.7708457889009	11.0103881689776	58.3	63	8.5	68.9
44.0429101289052	37.3804374200704	12.1526322952878	44.9	37	12.5	1
41.1428974852997	34.5715146709475	11.2857425228156	14.2	37	6.3	44.6
37.6778146240905	31.2152706688772	10.249938451465	21.3	6.9	14.1	41
30.1881686258265	23.9608758067384	8.01108698253933	6.3	7.1	12	39.2
21.4704165929833	15.5169499433912	5.40512242448317	39.4	6.9	14.8	37.7
19.2451609467839	13.3615899881568	4.73993520255078	9.40000000000001	7.1	2.4	11.9
21.8352101094349	14.3510621542106	5.23436995058786	24.4	6.9	1.6	74.1
26.9990656651909	16.3238012727425	6.2201387390197	36.2	6.9	0.3	19.4
44.220305343779	22.9028026187497	9.50763587098538	63.8	14.2	14.4	23.68
44.2212249884614	22.9031539490646	9.50781142914634	52.8	15.7	13.8	64.3
44.2221446331371	22.903505279392	9.5079869873179	60.6	22	16.9	36.4
46.038372401864	23.597355747557	9.85470092160109	66.9	14.2	11.4	52
49.8499850570813	25.0534997844414	10.5823295029162	76.4	22	1.9	28.1
59.8855677027795	28.887376653817	12.498100434179	70.1	14.2	16.8	18.4
62.0011118658437	31.5690775782516	12.6649142278036	84.3	17.3	5.6	27.4
62.1379177091217	31.8148448493767	12.6907091990444	63.8	31.4	12.4	27.9
63.677068902265	34.5798801699882	12.9809187260733	67.7	31.5	4.3	48.5
65.7042910321074	38.2217190331818	13.3631548411627	81.1	18.9	10.9	25.4
67.8528546793685	42.0815439657954	13.7682701357669	70.9	31.5	11.6	68.2
69.5718571624508	45.1696760442106	14.09239099161	85.8	37	14	59.3
71.5218440241567	48.6727639645549	14.4600643863099	70.9	49.6	14.9	1.2
75.6934878504797	49.4027065098262	13.4030456369035	59.1	73.2	9.3	29.3
75.6934878504797	49.4027065098262	13.4030456369035	67.7	65.4	8.4	19.9
81.4265233746598	50.405857189916	11.9503984677163	67.7	49.6	9.5	74
89.5458365874762	51.8265521081157	9.89311177988739	63.8	49.6	2.8	33.5
89.5467923032639	51.8267193366087	9.89286961885741	70.9	65.4	6.9	71.5
100.170114275758	53.6855584853142	7.20111268673016	100	73.2	14.4	54.1
100.171069991561	53.68572571377	7.20087052573447	99.2	63	0.7	11.4
104.978758104954	52.9627805707992	7.09542656493199	63.8	65.4	13.7	57.7
121.160934101857	50.529422284777	6.74051349429221	130.7	73.2	7.2	24.6
122.628125363371	49.4224704731666	6.68374682661768	129.9	63	9.4	16
123.499666938471	48.7649184940878	6.650026266721	136.2	65.4	3.7	54.2
126.726579764031	46.330309540973	6.52517470920665	148.8	65.4	6.2	68.2
129.153161509625	44.4995264324616	6.43128852733693	136.2	49.6	6.3	8.7
130.75660499863	39.7849868066136	6.32169061884043	142.5	65.4	2.7	66.7
136.699941536127	22.3100358434607	5.91545412764065	148.8	49.6	18.9	66.7
136.7002634509	22.3090893305285	5.91543212426706	142.5	49.6	0.1	28.5
138.984013569304	15.5942715102716	5.75933416587545	142.5	29.1	2.7	81.1
140.11672774614	12.2637979655203	5.68191137155689	155.1	49.6	5.1	57
141.066886587124	9.47008450607055	5.61696651737522	136.2	29.1	0.8	21.8
144.731005549949	-1.30337545957417	5.36651812035409	141.7	-7.9	4.6	7.3
144.731997956441	-1.30342585585821	5.36663032360285	149.6	-7.9	5.2	8.2
144.404339108479	13.8474106561288	7.03864480377873	127.6	20.5	16.5	20.4
145.551570918744	15.2006507290636	6.57170525748056	116.5	37	12.1	49.6
151.071146243791	21.7113754523029	4.32516016107434	141.7	17.3	2	52.8
155.670365782574	27.136476250081	2.45321287381651	155.1	29.1	1.4	2.3

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
161.678638344296	25.3587392911242	4.32994033423126	148.8	29.1	19.2	68.3
166.458468278431	23.944475878619	5.8229548664544	161.4	49.6	13.6	79.4
171.69117421863	22.3962147918987	7.45742840637698	173.2	18.9	8.3	3.9
175.190274114095	30.2465491549174	7.46866211881962	161.4	29.1	11.5	80.6
180.182662539237	41.4471215899068	7.48468998533091	178	37	4.3	22.7
184.05243969034	50.1290824033342	7.49711382186781	191.3	63	18.3	18.3
187.067183725958	56.8927505379121	7.50679261863447	155.1	65.4	8.7	62
190.098944298184	63.6945956119037	7.51652603762312	161.4	65.4	7.2	60
193.319518745303	70.9200500902599	7.52686552958295	192.1	73.2	7.8	2.6
205.912391427859	68.9058346571995	5.89556015947993	222.8	73.2	10.5	62.4
218.487685508003	66.8944307599569	4.26653197529137	222	63	7.9	20.4
230.524669171652	64.9691290891445	2.70723758379638	231.5	65.4	1.8	1.4
230.439349688953	62.2379769664599	6.37050466868785	227.6	65.4	13.5	8.3
231.574409276373	58.64204274194	6.3662264456965	234.6	65.4	4.6	24.2
233.572888562965	52.3107451363941	6.358693879577	231.5	49.6	10.4	41.1
234.419103757924	49.6298865118574	6.35550435442002	234.6	49.6	6	0.4
235.205871220292	43.1800983453036	8.93743918797492	227.6	49.6	17.6	30.7
235.205983747585	43.179175865347	8.93780846881356	208.7	37	3.4	62.2
235.247795022222	42.8364140011675	9.07502054800109	227.6	31.5	14.9	39.6
236.617094318638	31.6111262604146	13.5686508793988	249.6	37	15.8	20.7
236.765183555442	30.3971158334354	14.0546351774692	234.6	31.5	11.8	69.7
237.254450892275	26.3861836299286	15.6602642000374	231.5	31.5	11.2	56.7
237.598520125291	23.5655614623276	16.7893963342833	240.2	22	17.8	3.2
225.931846757314	20.1948374413653	16.2152665375452	218.9	20.5	18.5	7.4
230.321212539317	18.0708925952481	12.6124096983608	224.4	14.2	0.3	14.2
232.865099448547	17.5993939983928	12.4604507371049	222	18.9	3.1	14.4
239.933602663521	16.2892770234255	12.0382141014868	236.2	14.2	3.3	10.1
249.615133312695	14.4948466651303	11.4598884237347	233.1	14.2	19.1	77.3
251.776339062857	14.094276401812	11.3307889180906	240.2	15.7	7.9	16
263.777504477191	11.8699115465821	10.6138999506231	248	14.2	2	37.6
274.952657415338	9.79864463790098	9.94635285224078	275.6	6.9	6.7	4.4
276.780060190413	10.2564873787786	10.7567223055542	278.7	6.9	10.2	32.7
281.05396135128	11.3272828149536	12.6520018032466	305.5	6.9	5.7	29.6
286.092327814755	12.5896095666295	14.8862866425676	293.7	6.9	18.6	10.2
284.676671066593	23.3988036322075	13.7586987110352	290.6	6.9	18.4	35.4
284.178678671179	27.2012058671326	13.3620416879629	308.7	6.9	18.2	32.2
282.49084763787	40.0885764161981	12.0176636497654	280.3	37	9.6	73
279.970997331986	59.3287993126753	10.0105720065304	293.7	63	15.4	37
278.807059368154	68.2160036204456	9.08348126847131	294.5	73.2	1.3	59.4
276.467170147336	86.0821403236263	7.21973085782682	286.6	121.3	15.1	53.2
275.995629958438	89.6825678179255	6.84414332453372	263	63	0.7	43
273.569451586804	108.207561901285	4.91166259019706	263.8	73.2	0.8	55.8
272.159437143052	118.973674363279	3.78856884208811	252.8	127.6	3.3	21.2
276.700396850084	122.071179727785	3.35383623156549	255.9	121.3	14.5	72.9
283.867526578118	126.960063160175	2.66768502762797	283.5	127.6	15	48.7
292.322406005294	132.727353762245	1.85825000126202	301.6	127.6	0.4	10.7
292.517549729151	138.553805351512	2.12287284314856	275.6	140	4.2	63.7
292.71445018371	144.432708114832	2.38987788758687	308.7	140	16.6	57.3
293.142575004439	157.215331025407	2.97043262273937	305.5	140	11.2	43.2
293.30112166039	161.949095609644	3.18542836183656	278.7	140	19.3	31.7
293.600866025233	170.898633199298	3.59189395910527	290.6	140	0.4	58.6
293.615397531804	171.332503762358	3.61159927560406	293.7	140	9.3	60.8
293.956757549503	181.524569948928	4.07449740327729	280.3	170.1	14.3	29.1
294.361971612189	193.623141164949	4.62398420535205	263	196.1	17.9	74.1
294.429599987907	195.642337457023	4.71569104333784	293.7	196.1	5.6	3.7
294.76668515303	205.706768591723	5.17279229634338	294.5	206.3	5.6	67.1
294.911082179895	210.018064621584	5.36860056410055	263.8	206.3	6.2	78
295.159180139962	217.425583771236	5.7050315280151	255.9	254.4	18.1	74.1
295.51589778227	228.076186199963	6.18875519131531	283.5	260.7	2.6	62.8
295.658852417794	232.344416385869	6.38260750583529	286.6	254.4	15.7	68.8
296.37871477726	253.837516569136	7.35877024057661	305.5	273.1	0.7	77.3
296.994498139799	272.223105353671	8.19379760101617	301.6	260.7	2.7	17.7
296.994531579306	272.224103765208	8.19384294637773	308.7	273.1	9.4	11.8
294.704440746725	284.14553271046	8.46663213532209	278.7	273.1	18.4	72.9
294.70425214488	284.146514507097	8.46665460104593	293.7	273.1	6.2	71.8
294.704063543035	284.147496303733	8.46667706676476	275.6	273.1	17.9	24
291.146617469047	302.66634289206	8.89043006841479	290.6	273.1	10.7	54.5
288.273602518564	317.622275343976	9.23265555689974	280.3	303.2	11.5	54.2
284.78011968024	335.808151233618	9.64878944191514	293.7	329.2	1.4	38.2
283.717541671865	341.339568653928	9.77536075986062	263	329.2	0.8	67.9
282.86646398546	345.769987794239	9.87673875254181	294.5	339.4	13.8	16.6
280.777770612204	356.643010615169	10.1255380669079	263.8	339.4	8.3	73.1
278.963185498056	366.089119625463	10.3416863708465	301.6	393.8	0.9	56.6
275.788971797676	382.612989744927	10.7197898321634	286.6	387.5	8.3	29.3
275.290552778545	385.207588571766	10.7791601123471	283.5	393.8	11.4	11.9
261.756643449447	387.182113636569	10.2583675066951	255.9	387.5	4.9	12.9
248.881996406681	389.060455857869	9.76294369432534	252.8	393.8	15.4	64.1
228.336583568625	392.05792182463	8.97234440723524	215	387.5	7.3	42
209.02397587108	394.875528110354	8.22918416596458	211.8	393.8	13.7	37.7
198.309973840807	396.438643770961	7.81690321283017	184.3	387.5	3.8	61.5

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
184.190819042529	398.49855303078	7.27359003022957	181.1	393.8	14.3	9

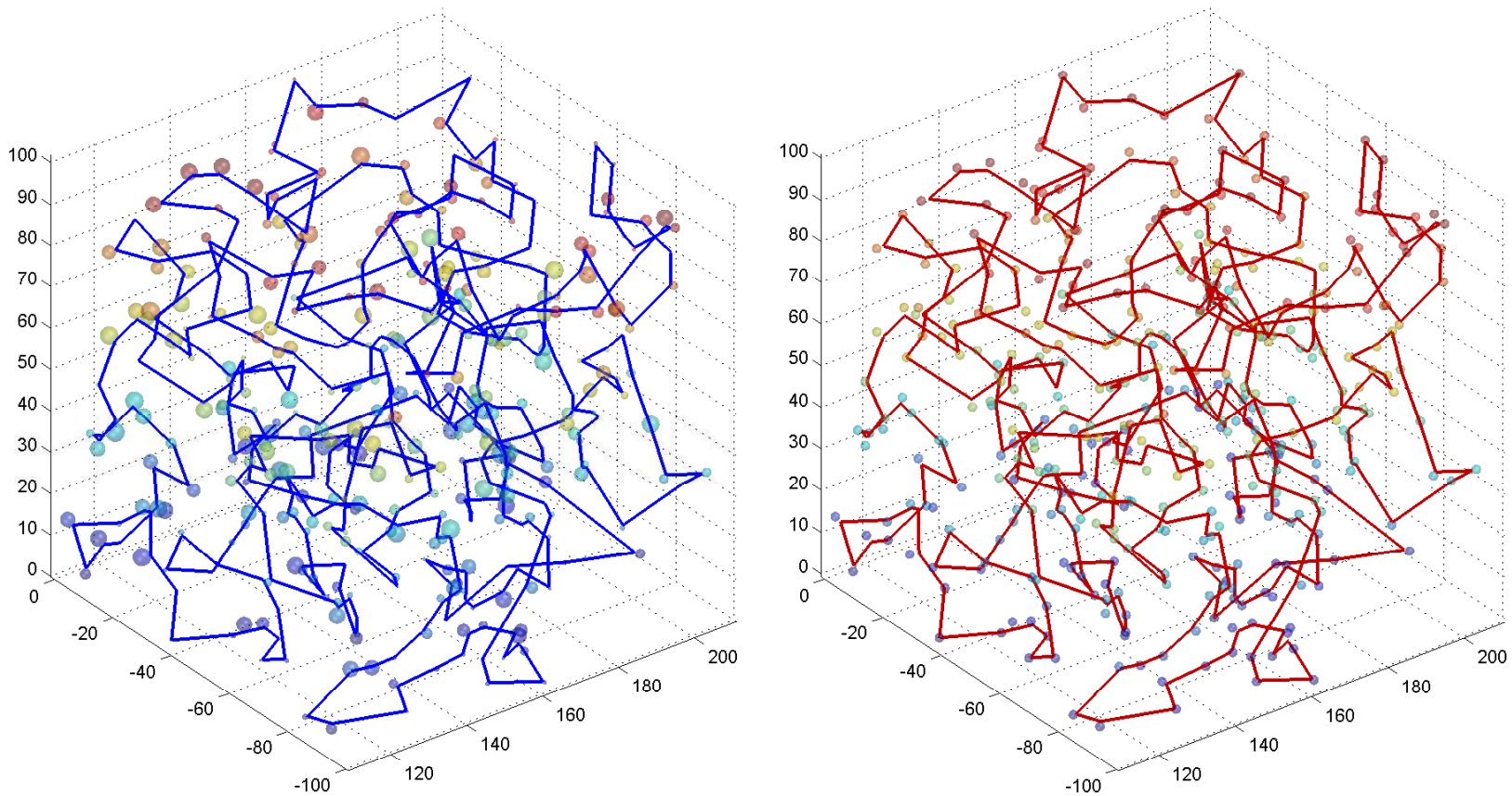


Figure N.101: $rd400$, arbitrary radius, 3D, Euclidean, Length = 3592.6013159

Table N-104: Solution for $rd400$, arbitrary radius, 3D, Euclidean

Total distance: 3592.6013158989 Depot: x 2.28315 y 35.5085 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
13.1631059056504	23.0239643745699	2.47637264100517	13.4	22.8874	2.3331	0.3087
7.12975169609047	22.1673165796109	12.4445043580795	5.81823	20.7452	12.0688	1.9707
4.21852189970348	25.9198610623444	25.8246701570701	5.25835000000001	27.1001	26.8402	1.8723
2.99857723628791	25.2645206132458	26.309927763186	2.1823	25.6845	27.6693	1.6403
0.964909424495033	19.4887797739249	21.4743374720365	0.659450000000007	19.6999	21.228	0.4456
0.504931955549665	4.00949018934078	14.0739596801354	0.219756000000004	2.58493	14.7832	1.6167
2.54201473118762	5.88558475669868	3.62763855679758	2.00806	6.28968	2.6575	1.1788
9.21154887897721	3.21944230912664	5.88810732037116	9.0496	1.67955	6.7742	1.784
12.694178585628	4.28623775952141	5.62647620117596	12.7116	4.29147	5.5693	0.06
20.5843823431679	6.7168700790508	12.4091233813089	21.4744	8.21886	12.0685	1.7788
23.0965778841029	2.3723428367568	19.1780801346962	23.1984	1.0131	19.9686	1.5757
24.9014723302924	11.8806987762061	18.5313895686167	25.6231	12.6549	17.499	1.4785
17.1427466446136	17.043275413917	33.0786251581378	17.2907	17.3232	33.1257	0.3201
16.1781571481513	17.02479329888	34.3209223216921	15.6444	17.8995	34.8069	1.1341
15.9319651946133	9.4900699764579	36.3521413260046	14.8737	9.51072	37.7455	1.7498
17.6283855068253	2.28271372939394	35.7429245193298	19.0116	0.977048	36.1157	1.9383
11.9915748214874	2.95193822393233	33.3389533130094	12.6307	2.70835	31.4638	1.996
8.58774681442357	3.39220898525383	32.350360182982	8.57052	3.36732	32.2638	0.0917
5.4613022683921	4.73680083908799	34.2700468566873	4.96047	4.06059	34.5353	0.8823
3.10011254489675	9.62937131323034	35.9036456510413	2.19732	10.251	34.6682	1.6516
2.60914456728135	15.8434084395732	43.9822586348036	2.68873000000001	16.3883	43.9305	0.5531
0.948143742985167	12.3651436595196	51.4592460590882	0.613562000000002	12.2624	51.4967	0.352
6.63474022194839	10.5823062723513	59.4914683236122	6.43447000000001	8.70233	59.8478	1.9239
10.6645628298243	12.7617133070836	64.0507651743278	10.9524	12.0779	65.6188	1.7347
14.1856880433411	19.5813774089751	60.7600898979098	15.6993	18.7479	59.9926	1.8907
15.3393296626689	24.9515807544569	59.1430223751186	15.3897	25.3897	58.7078	0.6196
15.682432040956	23.1776194138772	64.6979201817809	15.3759	23.0999	65.044	0.4688
26.0906855883772	22.4752848230797	63.61593163019	26.0672	21.3383	63.983	1.195
33.4073399060237	22.1620796819312	62.7975209017412	34.4638	23.0393	61.4662	1.9126
35.8890540256916	17.5646330177615	68.4265225238734	36.0033	17.5038	68.4307	0.1295
27.3123854648815	17.0342504817776	76.7300514653806	27.3595	17.3028	77.1892	0.534
17.8437439051551	10.4818184214748	74.5587959576147	17.1854	11.1942	73.5432	1.4044
12.375447883031	3.18440575358332	75.9056976456844	10.9477	2.73525	75.6448	1.5193
19.6967356500498	0.259428657822618	79.4428913556008	19.7287	0.198716	79.5663	0.1412
23.9028349727801	2.30714329321479	73.0793476273302	23.5387	4.13129	73.048	1.8604
31.6971755896392	1.50405539912409	62.6246161733717	33.1085	0.882753	62.284	1.5792
26.7477267443172	5.0889886057665	59.2323452394074	26.7979	6.90196	59.464	1.8284
22.5501544995292	3.16585985242482	55.8259428501794	21.7245	2.01127	55.495	1.4575
25.4895760824088	17.8340040613444	52.3925985216125	25.7178	17.895	52.7372	0.4178
26.3600154385191	24.2971946856965	50.1740602818392	25.8125	25.1372	50.1121	1.0046
31.2373388894549	22.7638436227762	48.9583590641444	31.0765	22.0815	48.5077	0.8334
38.0177577061432	22.8381091375072	48.7453640415266	38.2173	22.874	49.077	0.3887
43.3380197068846	21.9955901897996	39.5474914806671	42.987	22.9253	37.986	1.8509
49.4245334455152	16.3199098704426	40.713029488849	49.4944	16.327	40.7382	0.0746
42.0721972526298	4.85530942460007	36.3147321195973	42.0178	3.44287	36.938	1.5448
38.715985099744	7.31829447463646	30.5051726061899	37.2177	7.79249	31.0238	1.6549
38.9057530785083	9.35050748401969	20.0267317813521	38.2491	9.61738	19.3363	0.9895
47.9373815557566	7.50226405382927	20.297901531987	48.6979	8.85907	21.303	1.8519
55.2933698350293	1.68782973014269	17.7201877822594	56.1254	1.40532	17.903	0.8975
49.8758861679463	1.19609278134257	13.5821320982129	48.5894	0.54797	14.4264	1.6697
48.0330371885879	2.42045054329113	7.38969081973903	47.3917	2.23053	7.041	0.7543
57.4112175815039	8.4115154272697	3.06433283922101	58.2097	7.56071	2.229	1.435
62.0158220522306	19.0921738334882	3.59667790248912	62.8285	19.7058	3.0557	1.1531
54.7771797873384	20.4615914369841	11.8285810804609	54.7387	20.4852	11.8363	0.0458
59.7339691232376	15.0773047317202	16.0060137412364	58.7637	13.9566	16.9818	1.7747
66.7116476153397	13.7096350883223	16.7635439170506	67.267	14.1516	17.4107	0.9605
70.7870444036314	5.44017501943477	9.24643229748169	70.1018	4.34543	9.0382	1.3082
73.9008384881893	5.96475890654668	7.55656222633237	74.5771	5.70821	6.0306	1.6887
78.4292418081284	12.3281952704194	22.6188395065893	79.2919	13.6517	22.466	1.5872
77.1284970296661	10.0076433746602	31.6743078974832	77.911	9.90186	32.1435	0.9185
68.3238307086941	8.36166635738584	37.5693477438896	68.2389	8.47105	37.5341	0.1429
61.2698535980752	1.68180960532559	46.2346271967736	60.7013	1.36116	46.4176	0.6779
74.0773691132968	6.0436724896337	48.8859839513212	74.632	5.60444	48.5009	0.8055
79.5864044995224	15.7385012061992	56.2489985290757	80.035	15.8589	58.0701	1.8794
79.867802728756	17.7752492350137	53.8105454486069	78.906	18.0381	53.555	1.0293
87.0255502158794	23.8094167018583	46.2115117999146	87.5589	25.1226	45.9834	1.4356
87.1202943617876	18.0558516405713	43.826880860888	86.8707	18.0065	43.4379	0.4648
88.9861675241939	14.63173258941	45.0707556390246	88.2698	14.9994	45.4757	0.9013
94.3644584799028	4.76188028729461	48.6561609303802	95.0473	3.39817	49.8314	1.9254
91.8895699359213	10.5720462627667	38.7492320535009	91.7898	10.5225	38.6828	0.1297
97.0750196926259	20.6794307019556	33.3644832575895	97.2905	22.0419	32.8941	1.4574
98.737670347369	8.34807261891155	35.7128256489978	99.5164	7.77478	36.5945	1.3086
89.4177791536383	1.9845864285845	25.7155950466395	88.6343	0.494442	25.7719	1.6845
89.1320157694955	10.4118458120828	17.3144992785595	88.9914	10.7701	17.3091	0.3849
95.7657265544574	2.61847273148648	7.64422347766282	95.7659	2.55349	7.5519	0.1129
98.4307870834001	5.23896782654731	11.9337944817711	98.9579	4.73211	12.8251	1.1529

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
97.5189817543736	17.1554594120257	9.93014098247427	97.4766	17.1802	10.0021	0.0871
98.2208545653147	23.3870870919665	6.66641312017286	99.5853	23.4577	6.8435	1.3777
98.130401961554	24.5579148967772	6.0181238607896	98.8743	25.646	5.6301	1.374
90.3096396253842	21.3398979347338	5.70987869478301	90.11	20.7153	5.7932	0.661
80.063417866786	36.8172575201277	1.99544782789699	80.0506	36.8529	1.8328	0.167
72.4752597309605	47.0212986450172	11.4552967717688	72.4782	47.1166	11.4083	0.1063
70.2214228003786	47.5024949200289	15.3781492779029	69.2786	47.5055	16.1011	1.1881
78.9978500292324	48.4253694621379	13.0507509897657	79.5061	49.6701	11.7965	1.8387
85.1489865248159	43.1209535225773	17.0120101381277	85.2354	42.0312	17.7315	1.3087
89.7651024920872	48.7336257893842	13.711834217705	90.8764	48.3318	12.9357	1.4138
88.4502792201059	55.9119787843214	14.5599095206044	88.4474	55.9131	14.5629	0.0043
97.1727901811029	70.9128260743718	4.07200905330762	97.9153	71.697	3.8476	1.103
85.3351499412774	62.5857831391595	1.98721469923615	85.3959	62.1638	1.7086	0.5093
66.9782097115055	66.2193518029164	9.0554615114385	66.9764	66.2314	9.0944	0.0408
51.8203929051244	64.9570172676613	0.947441005369527	51.793	64.9464	0.9013	0.0547
51.5514579320412	67.5517160173265	10.6893833114344	52.5118	68.1256	10.9937	1.1594
45.4334570711539	66.5870614718789	18.3494164592328	45.2184	66.3382	18.5431	0.3817
46.8056193575645	71.1141856960904	18.147050275612	47.6475	71.1843	17.3202	1.1821
45.5429758310242	80.2355495042989	21.7817847816987	45.6946	80.9262	23.2292	1.6109
43.9916192754328	82.0733097341895	16.3647510477736	43.9629	81.9344	16.1851	0.2289
43.6305796905403	85.0405324573208	16.2696285889262	43.3068	85.4106	16.2891	0.4921
50.870746967753	83.1808443000189	15.5407975488679	50.9984	83.4341	15.7476	0.351
54.10425172104	81.6634221530455	14.6878470035848	54.169	81.8375	12.9059	1.7916
60.596490018908	78.23499687337	16.2703653825558	60.7208	77.8844	16.4053	0.3957
63.6693345354349	85.0013646020935	13.9389533381405	63.6977	85.2552	13.695	0.3532
66.3057811568885	81.1760630074602	23.1322631985652	66.7645	81.0279	23.2022	0.4871
61.6486304816655	80.6186354451263	28.5171399230837	61.8453	80.8454	29.5157	1.0427
60.3316050128845	80.1181636077726	27.9718074165577	60.2539	80.1704	27.9583	0.0946
61.0033858081225	72.7249164931512	26.5037737211708	60.356	72.3736	25.6911	1.0968
64.4668850144947	68.3315213704937	28.9826254397429	65.3011	67.1869	28.6409	1.457
59.9668281594985	75.2772482388728	39.2026402567739	59.2712	76.4167	39.0582	1.3428
60.6535055774999	74.0511199378903	42.0021138935952	61.6789	74.8507	42.3385	1.3431
60.3950588330425	67.3289549635467	51.4459401577866	60.771	67.3196	52.7577	1.3646
56.432575434746	62.3457835918726	45.4333027246028	56.0439	62.2937	45.4781	0.3947
58.0624966426272	60.5887534901579	42.3749855730767	58.3448	60.9201	41.5011	0.9763
58.2674170846951	54.5141098934402	45.1600108068684	57.8122	54.5104	45.2899	0.4734
61.2159572144041	41.6217548107998	50.3630942022474	61.5258	41.6034	50.3406	0.3112
59.7544544600963	36.6333826754422	52.630889637012	60.6972	35.5066	52.4287	1.483
56.9999710137751	35.9833831771521	54.3655488463378	56.9788	35.9946	54.4126	0.0528
56.0864584863022	33.8630557222684	50.9794087339545	56.0389	33.1015	51.1098	0.7741
54.9487713431001	35.3983839298326	44.7955757545793	55.5492	35.9315	44.2535	0.9688
49.119872766359	32.8725670410715	42.5520027301067	49.1148	32.8614	42.5439	0.0147
45.5771577714057	41.2084887215568	47.9572509525495	46.2037	41.7062	48.7254	1.1092
34.0056709034234	45.2679856616508	45.3564346437996	33.2771	46.652	45.1216	1.5816
32.4194413980873	38.9047769308928	45.4357919976321	32.7353	38.4372	45.6112	0.5909
24.4792459893686	39.2971333390921	42.2787196562078	23.6339	40.0124	41.5074	1.3495
25.1418837819063	33.5765921849349	46.217576105021	25.7714	33.2927	46.3113	0.6969
20.3953300650091	31.1100188605131	48.7741225447107	19.5262	30.4483	48.5255	1.1203
22.2590343541471	33.4398698398502	52.4151958427465	22.7183	34.3604	52.0641	1.087
23.007452629479	32.9355011741766	59.0668387066983	23.2874	32.7742	59.4617	0.5102
17.4360189948953	36.0719355128455	56.8498453062273	17.6023	36.5196	56.7286	0.4927
9.94985950256006	36.5071735613415	55.1794283466425	9.16001	37.8018	54.1714	1.821
2.39684391466555	24.0478154013494	62.086006037165	2.38826	24.0295	62.08	0.0211
3.46515109131319	28.1465276190453	68.8993474888791	3.44571000000001	28.2052	68.896	0.0619
5.3432643118944	26.9634888915236	73.2830655563344	4.056	25.9589	74.3875	1.9713
19.2146628235483	29.1869382980555	80.8511543936376	19.247	29.2712	80.817	0.0965
27.2660555329388	25.8899188345168	88.2488248129242	27.4222	25.8428	88.2494	0.1631
20.3321165588726	27.2814229370628	94.1771255699811	20.3288	28.022	94.6827	0.8967
11.6163302503842	19.6144066383987	95.2310035464167	9.96077	19.2347	95.1963	1.6989
22.1889416066421	16.6577599225549	96.6266889035048	22.6997	14.9199	96.5597	1.8126
26.0185476057584	20.8886438121206	97.5790234599182	27.2482	20.2425	98.6789	1.7718
28.2025764282334	29.0702224300673	95.8370113081173	29.1053	29.2049	97.3043	1.728
31.5221610249401	43.5022677917008	91.8444140901984	31.4339	43.8079	91.7683	0.3271
44.1024444306166	30.6669932899976	94.5686084988103	44.5404	30.686	94.969	0.5937
42.5304561232489	24.0566501050372	88.8403095841502	42.4972	23.9973	88.7768	0.2028
41.626766549194	20.2565564974433	85.547277612293	41.7205	19.4188	86.0496	0.9813
40.4116393284878	18.9374112114598	80.6247187246079	39.9475	19.2268	79.8118	0.9798
44.038531158204	14.0149422290336	83.3964884463762	43.8962	13.6901	83.4665	0.3615
55.2867121601949	16.5169344143148	85.8602461175321	55.9929	17.1432	85.8884	0.9443
51.63424413548	6.32361851305075	87.5899975032415	51.1528	6.04103	87.327	0.6171
52.696249294036	5.71287190265017	88.7412271652409	52.4925	5.37248	88.2454	0.635
61.4594618060309	0.673251729839982	98.2406920430677	61.5069	0.482106	98.5604	0.3755
64.4470361074831	4.24983830489723	92.8106183097493	64.5769	3.66176	91.1441	1.772
68.5005395373158	15.0158465889838	96.8196568883256	68.0574	15.6194	97.6814	1.1416
75.2786320028799	17.2831768409291	92.0346289396088	75.2455	17.3084	91.8789	0.1612
93.011534088885	19.7452656997147	96.634086916541	93.1464	19.8146	96.7782	0.2092
91.3351531847173	13.6811192294236	83.6245937547877	90.4883	12.6216	83.5226	1.3602
96.3503911664756	16.9952211994047	74.6697436429153	96.7716	16.6523	73.2113	1.5563
96.4707686227287	23.5750267556486	81.8455190149673	96.7473	23.5618	82.348	0.5737
90.3251389233745	30.7894612920951	77.9892403000709	89.036	30.7257	77.9388	1.2917

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
95.747253189137	38.2262534483198	74.7537970672646	95.9404	38.2332	74.7444	0.1935
86.8462809524297	48.253964118421	70.9406497665192	86.8559	48.4797	70.9689	0.2277
79.4450225094452	42.1306255387412	66.2949551613586	78.6058	43.2582	65.7281	1.5156
75.4822005476199	36.8136658981575	63.8523795773774	74.7866	36.0265	64.8468	1.4465
75.3492306935286	36.5481478216639	62.9220324017262	74.0572	35.987	63.4666	1.8168
73.8708774727946	33.596130141926	52.5784695563821	73.2088	32.0501	51.6558	1.9183
76.7660446659296	40.7232257864659	50.5423135238672	76.05	41.1841	50.3284	0.878
80.7928090352372	44.2106454021889	49.7836440138587	81.4209	43.6493	50.298	0.987
81.5397122757202	44.9384738885217	49.5965777339718	81.1997	46.621	50.135	1.799
87.3864489598026	43.8274397221742	46.5998313405286	88.1955	43.6361	47.6404	1.3319
91.3174385677126	43.1531401777946	41.7714516439688	91.3249	42.8902	41.6597	0.2858
92.3296272036398	44.2547605837487	41.0281689984601	92.0634	46.0336	40.4672	1.8841
95.3382257946963	41.9667167560045	40.8530150041959	96.1419	41.3034	39.8142	1.4714
95.1731158450289	42.7689525371103	53.7417043453784	94.61	43.2995	53.8065	1.6034
95.1027670521717	43.1107632539719	59.2332394942873	96.3235	44.2629	60.2644	1.97
92.3073403432365	40.7706401772843	60.9272160436689	92.3029	41.017	61.4442	0.5727
84.6260207996164	33.0305331404348	62.8881435902972	85.0689	32.1301	62.1612	1.2391
77.9027683371303	29.0890352558636	65.8959861881144	77.6794	29.1288	65.8649	0.229
81.658566332284	23.520145275243	70.1794526425467	82.6839	23.4883	70.1916	1.0259
78.2158037318927	19.1519060316902	73.6179868158989	77.5205	18.1054	72.6356	1.5949
76.7430544894931	17.7438319441394	79.789768948185	76.9072	18.2917	80.6948	1.0706
72.5749956552485	9.08639048262863	78.2182153421889	73.4709	7.6166	79.1313	1.9485
56.7273338148045	3.33335527311523	67.5510705188779	56.3237	2.07366	66.7228	1.5607
50.7376672327719	15.8135560340622	70.8466319110697	50.9211	16.4053	69.6798	1.3211
47.7944932396855	20.7129537161734	73.8154712545269	47.6864	20.3976	74.364	0.9045
45.1183775401118	25.167783422593	76.5149209474193	46.0829	25.5503	78.1024	1.8965
38.0207887235576	31.0454362855091	76.0278399679213	37.7688	31.4408	76.6336	0.766
32.4451023992467	32.1162337118081	63.8089090496924	31.6686	31.1822	62.9487	1.4884
34.5999157739795	38.7694437869118	63.0409612398546	34.4656	38.8185	62.9703	0.1595
38.0241989376393	45.6897561365828	62.7540970033332	38.1612	45.7549	62.3997	0.3855
38.7432764575571	48.5016398486205	64.8943680219211	38.5534	48.7846	64.7262	0.38
41.711643967169	51.7329888210816	70.4868008431777	41.6783	52.1535	70.8377	0.5487
47.6589960913144	42.4137393375991	67.3878777026916	47.522	42.292	65.6102	1.7871
54.7060470191146	32.7134120043499	71.092834922284	55.099	31.771	70.6981	1.0947
54.8777186439243	38.6454397893231	80.4212286653533	55.717	37.8511	81.0117	1.2977
54.2380422754287	44.3419441865319	87.6628239731686	53.4254	44.9898	88.3964	1.2721
71.8532326188788	40.5360638339441	84.9153921292891	72.565	40.2263	84.1996	1.0559
70.1502094489178	44.0057919962125	97.2073510322729	70.0979	43.9308	97.3335	0.1558
75.1205107928326	58.0564256321292	94.8100402577449	75.5117	58.1702	94.9268	0.4238
69.9175860089629	63.6381387348036	91.0727291444007	69.9395	64.1832	90.6048	0.7187
65.1069668454729	59.9533179772541	95.1420217123163	64.8783	60.379	95.6551	0.7048
61.9594699574653	53.8283483597945	95.8285720948924	62.6521	52.6724	96.4246	1.4735
54.1336140014431	53.2635487690912	93.1599455681262	54.0007	52.8659	92.5002	0.7817
43.5997197230406	58.72129007536	99.4130081510436	43.5841	58.7522	99.5019	0.0954
42.1685687697792	58.6100933615426	97.2870990690228	41.7302	58.1199	97.2119	0.6619
43.4840309683539	67.8137699292307	87.748374019707	43.1006	68.5786	87.3861	0.9291
49.0455200919559	63.1751066685673	87.1190126521768	48.6743	62.5481	86.8455	0.7783
59.0334300158747	59.4551197953831	87.5419122086839	59.9164	58.75	88.5608	1.5215
60.0104812582697	63.1425830955055	77.0149539790169	59.9164	61.9972	76.3491	1.3282
61.3864145590353	70.9621278183735	67.7723400370203	60.9907	71.4945	66.9566	1.0514
66.0926984236414	69.4907641224484	71.4034732079615	65.9297	69.3415	71.7927	0.4476
77.693810362829	69.1469930176873	71.9097619018364	78.2186	68.7569	71.4148	0.8201
79.6260294901329	74.7214368395283	79.7808211581005	80.9911	75.8316	78.9882	1.9298
79.6440580203168	76.7758876578025	84.3528166023055	80.8889	76.3527	85.0129	1.4712
75.1899721529209	81.9921749211782	90.1880359286805	74.5996	81.8744	91.5993	1.5343
76.2223093149921	91.3693172751646	80.4911087686617	75.4786	92.9344	80.494	1.7328
76.8223523144047	90.982900789028	79.7533242249211	75.6586	91.7899	79.8395	1.4188
84.5230019929409	86.0238252354014	70.2849627960159	84.4594	85.6238	69.4005	0.9728
92.6433865264648	89.0677467373274	78.3610880715721	92.7385	89.9534	78.6648	0.9411
97.9758178473937	82.2175807191074	81.4874194283443	98.0879	82.1977	81.4504	0.1197
95.359519989562	79.120804073794	85.299206147643	95.1537	79.2325	85.4918	0.3032
96.8654419574201	73.867572332099	85.2293271293566	98.0725	73.509	85.0617	1.2703
88.7667018433695	66.6609482302659	86.6325436078891	88.5712	66.6382	86.5414	0.2169
96.120509565902	58.9222488118944	97.1661648203488	96.3481	58.4969	97.3507	0.5165
93.2110239193711	68.2993010771701	97.8058547492102	93.4248	68.5015	98.1606	0.4609
87.675691036643	74.3845603819688	93.7238287439493	87.0562	74.7862	94.9506	1.4318
86.499309909099	75.7331629463884	92.5227767898932	86.1254	75.412	92.2501	0.5633
85.197816785653	82.5149127984746	90.4244870174899	85.2864	82.465	90.0038	0.4328
83.8277145244717	88.1410518309223	90.2867587730023	83.5669	88.2708	89.9554	0.4412
87.0723085604745	96.1570735010235	97.530896315667	87.9339	96.7331	97.5762	1.0374
85.9111277828123	96.1227162399732	98.3674741672515	86.1563	95.4019	99.9835	1.7864
75.6588483970638	99.6633043431388	96.2892028315061	75.6359	99.7073	96.3469	0.0761
65.6245833656272	98.9462285858527	87.0257063349053	65.9332	98.9174	85.8003	1.264
54.9859926826018	98.6097895711118	89.784240398749	54.3707	99.6057	90.3024	1.2802
51.0856420262868	90.9540301901968	88.1352175768999	51.2472	90.6526	88.5593	0.5448
43.2422206268228	81.999162746229	81.1146013884661	43.0779	81.6476	81.3569	0.4575
40.8760769397725	82.1565843977704	72.2072134629395	41.546	82.3742	71.0491	1.3555
29.9407829764518	79.7606957931095	74.8815254838778	29.8827	79.684	74.8634	0.0979
28.4577919879182	88.9836790712085	80.0696671866996	27.9893	89.6021	79.9213	0.7899
37.4981605613387	86.4740509694489	90.2713380608584	37.7453	86.3505	90.2585	0.2766

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
32.4627696471819	90.5362388277159	98.7353363079286	32.5896	90.759	99.4978	0.8044
28.6594635940975	90.2562698198197	95.0794186400074	28.4623	90.5817	94.8789	0.4301
26.208065838492	75.0823018331574	93.2079898754945	27.1361	73.6904	92.6772	1.7551
16.7820849668421	76.8850101070259	96.4572011661148	16.8354	77.4785	96.9485	0.7723
5.73166349337073	74.066110131057	96.1021711550714	4.99968	74.2733	96.2118	0.7686
17.6246638157467	61.2077511854677	91.1125906939088	17.6011	61.1721	91.0121	0.1092
21.7474305918046	58.7206227068022	92.9406243980039	23.2085	58.8069	93.3912	1.5314
14.8321500568809	53.7531215192242	91.7374119638017	13.8308	54.4775	90.8096	1.5454
8.9884415261611	39.715838406036	95.8567451721504	8.75416	38.928	96.5496	1.075
9.16584469287658	43.1361812763846	88.7112850410407	9.27453	43.3967	88.7547	0.2856
7.50564482168358	42.6537975048935	79.6222637063675	7.21925	42.3799	79.403	0.4529
13.5335705437994	49.6081653519728	75.8243351914468	13.2524	50.7626	76.4367	1.3367
18.010810872977	50.6987198292557	71.8042246427346	17.8085	51.9553	71.4677	1.3165
23.9155847070465	48.8377347737115	67.8115146163556	24.4594	47.3987	68.2546	1.6009
30.7697257041503	53.3986448252178	58.8779349822042	30.4468	53.5688	58.3124	0.6731
44.0510042395094	55.4400733068096	58.978710849025	44.4217	55.3301	59.2126	0.4519
41.1284382627253	60.8322496280441	50.8715199857727	40.6271	60.1839	50.1596	1.0856
41.2920355817296	66.8126081677865	48.6149641616213	42.1545	66.9856	47.2528	1.6215
34.9964062637743	79.8180913393691	53.7645506416882	34.9224	79.9328	54.0968	0.3592
33.8965171514848	83.2342972111598	46.5208248609882	34.4937	83.7515	46.1073	0.8917
26.6906280075528	81.3256721674866	43.5723228044359	25.7615	81.4539	44.2448	1.1541
26.0010815082196	79.363169563025	38.2849626431658	26.7929	78.8352	37.5421	1.2073
17.3939556596202	81.3043502108357	37.055579273601	16.5471	81.1813	37.3426	0.9026
22.7136112650651	85.2711357039272	31.1034544514904	23.3569	85.0798	30.5318	0.8816
16.6971291875983	94.132096506199	34.8890666583639	16.7243	94.3593	34.7835	0.252
4.71816094437243	91.6305167522489	49.0955351110714	4.28894	92.6489	49.3954	1.1451
3.28092079792587	89.1081786322795	51.2195352904896	3.06059000000001	88.1315	51.3598	1.011
3.13792007873847	93.4687637175279	52.8795726065635	3.24988	93.8751	52.5027	0.5654
0.92210884212605	96.994775064372	63.1325478322138	0.299018000000004	97.3272	63.0477	0.7113
3.83503253378818	98.9798292880964	79.4663930113109	3.57801000000001	99.0366	79.8401	0.4571
11.7974191390198	98.4999283394886	77.8966790321333	12.7313	98.6134	79.0339	1.4759
18.5999498806555	96.2144575674536	61.9576410279951	18.064	96.3276	61.2807	0.8708
26.7405262363842	94.0777562255535	60.1628687741119	27.8353	94.5623	59.9313	1.2194
20.5727030135188	82.6500528995022	61.3570866638448	19.5225	82.1483	62.667	1.7523
22.8459885677737	77.8138105709768	53.9833685776649	23.3293	78.9181	52.7226	1.7443
23.5677305134513	68.6163904367553	50.5395511312073	23.6206	68.344	50.228	0.4172
22.3645614571164	70.3467065216899	58.2896826230256	23.7167	70.7298	59.5174	1.8661
17.7137443170586	70.2571214903416	59.3099709017616	16.576	71.2313	59.4946	1.5967
14.0818124796714	70.1871624931929	60.1067375760942	14.0141	70.4084	60.1608	0.2376
2.80375305303249	61.7969775344145	61.1409745411677	1.5771	61.4642	62.0285	1.5502
6.46719790331223	59.8465350738231	54.554460511894	8.30742000000001	60.1487	54.798	1.8807
9.72034884590373	58.1145345679175	48.7056122096658	10.4725	58.878	47.8708	1.3585
8.75620760907957	54.1825237974094	48.4626298271006	9.35554999999999	53.1101	48.6717	1.2462
4.22068001402411	55.4258649501757	46.9938793898153	3.30116	54.5758	46.8676	1.2586
2.56007704910243	66.6872414186015	44.7747003777338	2.55217	66.9796	45.1209	0.4532
0.773769697201615	71.610382435462	31.641816937468	0.194864999999993	71.2335	31.0366	0.9184
8.88192370738858	83.059857692399	28.6961721736398	8.89064000000001	83.8954	29.0611	0.9118
10.8965509207735	81.5960745223291	26.0377458388753	10.1219	82.045	24.5182	1.7637
16.9205682873837	77.4942558349438	24.2266583031656	17.2306	77.2747	24.7644	0.6584
20.6613113663868	75.0228453363207	17.4507084334159	20.7262	75.308	17.3361	0.3141
24.9507232244562	69.491935166231	9.65681258713642	24.7619	69.8637	9.1655	0.6444
30.8412102050183	61.2179051645203	3.36766005521099	31.2678	61.1344	2.0752	1.3636
31.4173595217243	55.1655493145447	11.2621830099076	30.6696	55.2626	12.0174	1.0672
37.2699807185219	49.4562335265371	12.3700694155903	37.4105	49.4356	12.3771	0.1422
29.1995090449667	45.296406147683	12.864564475775	28.6889	43.6077	12.417	1.8201
23.4331278414944	53.8519469625732	17.0902067256857	22.8193	53.7552	17.9075	1.0267
24.2228815478889	59.2621856481881	14.1107002027778	24.5176	59.5849	13.4915	0.7579
20.4052077459965	60.6191068948376	20.5232810570918	19.6656	61.3862	20.5906	1.0677
22.5511044406784	55.2146178483252	27.735872911723	22.5447	55.6169	28.4034	0.7794
23.9201465319689	49.6897144794709	28.6312664841403	23.6126	49.4214	29.6987	1.1428
27.2429236188515	42.9611643502674	25.189715175589	26.2003	42.5604	24.4871	1.3196
36.7747119600316	32.2241362554797	21.3945135043344	36.8488	32.2474	21.2512	0.163
37.9948509216036	28.3693537773546	23.55395660714	37.0272	27.4581	25.0096	1.9712
47.5041137562261	25.2697974903064	18.8731809076803	47.6331	25.3181	18.59	0.3149
50.0484375582725	21.0233965234577	25.9299201665678	49.4045	19.961	26.5255	1.3777
62.1688599921433	27.0868499797372	30.2467751649331	62.0154	28.1819	31.0401	1.3609
76.1189943007621	23.3214240656562	27.4403089046242	76.419	22.7841	27.7958	0.7107
81.061248990859	27.9839282805375	20.9816975907151	81.7106	28.112	19.2367	1.8663
80.1347340712974	32.831471514857	32.7780330523215	80.1207	32.7664	32.9471	0.1817
80.2821580562446	36.1485176174078	31.1847034785078	80.5435	37.2793	30.7227	1.6755
80.3886199468194	38.5439226483521	30.0340792504973	81.8496	38.8539	28.9342	1.8548
74.7046689662295	45.1286247117253	30.7984773255239	73.064	44.6995	31.3834	1.7939
75.2514057472573	48.4246759096495	30.1105620755336	74.6616	49.1772	30.6996	1.123
76.0938889686433	53.5036493965108	29.0505109867801	74.8357	53.7031	27.6754	1.8745
76.8250436678467	55.4447741226572	29.0679101132297	76.3859	55.8636	29.5918	0.8017
81.5655002437301	59.7577567362177	26.3913912684764	81.8774	60.6902	25.477	1.3427
82.3724480880366	58.1734544540871	28.5745785233683	82.7455	58.0479	28.4959	0.4014
79.8508944100848	54.3779872754851	37.4321571124962	80.6139	53.7748	37.9975	1.125
71.7399436513963	55.5729964793018	41.0888173193335	70.983	56.1077	39.9244	1.4882
68.3502637036848	55.5612691835324	44.4356069591161	67.8108	54.6502	44.2592	1.0734

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
65.3343948335913	58.2282493316733	49.5013042037944	64.2573	58.953	49.3124	1.3119
68.9275018380652	56.8192169374804	58.98108946678	69.1414	57.6653	59.1832	0.8958
69.5745852434175	55.7653786082871	60.9999431013388	69.3672	55.5594	61.2856	0.4087
81.6662954635813	58.7968916495002	59.7452620855338	82.834	58.4111	60.6469	1.5249
81.800714582264	63.0128632412049	53.4271946198549	81.8209	62.9891	53.3907	0.048
78.3269692628519	74.0159138076889	50.1058157912497	78.3667	74.2083	50.3369	0.3033
77.1965687686149	75.5005447451524	47.75325666434	76.2214	75.1456	46.9071	1.339
79.626686535165	79.1592879837363	47.8548791577215	79.6042	79.6519	48.0916	0.547
83.8427430348015	75.75817916179	43.6303529702298	84.0931	75.7357	43.6346	0.2514
80.2464931926459	73.7230874056323	40.2178613422694	78.9206	73.8168	40.4273	1.3456
82.1565877813562	71.4665118789637	36.2271769048457	82.5413	70.9361	35.9747	0.7022
77.8918982321717	77.9469172666143	34.6646583360001	77.5352	78.0347	33.1993	1.5107
76.3448957116998	81.2290951300634	36.8346500718496	75.9957	81.402	37.5418	0.8074
80.9201859436834	87.9318295926471	24.137627023921	80.7777	87.9354	23.575	0.5804
91.2860071415261	94.6777079808154	33.4559499932681	91.0373	94.8618	33.7328	0.4152
95.6314921182999	95.9513555452199	35.1139341379849	96.3227	96.5824	35.4748	1.0031
92.3650659587532	87.8161411001698	32.2402730856194	91.8947	87.6684	31.3605	1.0085
94.3520495642582	79.6378701928591	39.9631942255258	95.4573	78.5053	38.9919	1.8568
93.8225624385759	74.2703393493194	49.5398178819911	94.2046	73.3577	49.4797	0.9912
89.1005733535411	77.1634913136409	62.2877302370787	89.1084	77.1611	62.2997	0.0145
82.5789838472428	79.8941399468438	62.4757735455755	82.6909	80.2719	62.172	0.4975
74.3634914590647	82.3117204035468	63.4362577693592	73.8931	82.0767	63.5442	0.5368
77.2271623623404	90.2165215143692	61.8612094745799	77.8131	90.2453	61.6399	0.627
73.9499446031753	96.655617279397	62.6795655121093	74.1314	97.2935	62.187	0.8261
68.4953894616052	97.3480104706937	68.5504511320969	68.0526	97.9535	69.9593	1.5961
67.3619534963293	94.0865481151943	63.99072980898	68.3546	93.0491	63.4728	1.5264
59.8120012345151	95.35672522412	60.2596216405452	59.3326	96.8644	60.2925	1.5824
53.653565895387	89.4579000417312	55.905071877804	53.7144	89.3849	55.8234	0.1253
46.4208360827081	87.8555327528515	55.8492957307606	44.9959	88.3516	56.7624	1.7636
48.2636307936113	81.9248204286859	48.6472762667333	48.3206	81.4332	48.7053	0.4983
48.6173967858693	84.3119738822985	44.0547040949675	47.7087	83.4773	42.5429	1.9514
51.4053032166925	89.1158896668332	43.0573088002209	50.0418	88.5256	42.3177	1.6597
54.8644555134778	95.0764550029598	41.8197645699052	54.8665	95.2849	41.9419	0.2416
57.4851006172764	93.6165443207469	37.2993542128173	58.0371	93.3465	37.2538	0.6162
47.9591073378324	97.7680254467928	25.7742067088991	48.6626	98.7924	25.383	1.3028
34.8529100835176	99.7104627505634	13.4358380895433	34.7579	99.7518	13.4448	0.104
40.627693465796	94.5624561977034	3.37585856995927	40.4171	94.2218	3.0792	0.4984
51.5193840593652	98.7460111254407	1.8480700193913	51.8363	98.9629	1.5963	0.4592
49.4003631736906	95.2378391127658	8.01499697434278	48.9418	95.7946	8.5835	0.9184
49.5996911339586	93.059142404693	8.89526959717789	49.8328	92.6571	10.5815	1.7491
49.1182103272574	88.6130847967151	3.79747814616152	48.934	88.5471	3.512	0.3461
53.5864551476296	86.5198962474582	6.96088196613978	54.7886	87.0165	7.4948	1.406
50.1534644279313	80.364730909585	6.85387547349266	50.5772	79.5094	6.7911	0.9566
45.7290191303412	80.9869425319561	7.11844892724682	45.1636	79.7971	7.5816	1.3964
40.5646465831754	85.5148275925992	6.14143121044152	40.7053	85.7824	6.0265	0.3234
32.8450456529494	87.1917904647259	6.52452799864438	32.7208	86.88	6.0296	0.598
19.2446329088324	90.9882869242296	8.44490902816732	18.6101	90.3489	8.9268	1.0216
16.7802525083004	97.2478091902046	6.11599814899986	16.854	97.4806	6.0907	0.2455
4.08874361324514	88.2813158802325	3.43861883144482	3.35356	88.986	2.7967	1.2038
1.30167003641182	83.4896630224042	3.97322380406397	1.02508	82.9527	3.7072	0.66
5.32669428793947	93.2523803716112	17.9649198126671	4.45068999999999	94.0863	19.178	1.713
11.9831385196924	92.2654935824154	16.4467658580955	12.3803	91.1149	15.3598	1.6319
15.3950068235285	94.7748618199129	18.4205400218241	15.2733	95.1553	18.4059	0.3997
22.8841375673521	94.9142440728212	22.1159246099538	23.1083	96.0553	21.9675	1.1723
29.8624892841815	92.9381183045059	26.0391170144042	29.5533	92.3189	26.5937	0.8869
32.0378069327184	92.9323590515651	26.6331447511105	33.1283	92.3481	27.8161	1.7117
34.342612828426	92.9262566988833	27.2625323222108	34.7487	93.2543	26.9859	0.5908
36.9168979386559	86.0472893583257	36.0572266012022	36.723	86.3354	38.0239	1.9971
39.090107285893	81.1650782783244	32.9090063880556	38.4806	81.2568	32.7466	1.0976
41.8354415736762	74.9975630805405	28.9319771906699	41.4131	74.8199	27.7293	1.287
45.5152935804339	71.3154997560585	30.9864197488949	46.3399	71.17	31.2162	0.8683
37.0396427545957	67.8317359375426	30.3141376197879	35.9094	68.8825	29.2317	1.885
33.195218499741	61.1200609236261	33.3711659367832	33.4192	59.483	33.0004	1.6934
32.6088558689617	61.5172895875478	33.972412765025	32.641	61.5676	34.0062	0.0686
25.5300968842012	61.0228472844334	36.3327383283243	25.6513	60.6643	37.4717	1.2002
19.68918164437	61.4205499281911	35.6913029159891	18.9042	62.1271	34.907	1.3155
18.1102100020669	54.9314633712369	42.5689892301669	17.5187	55.1629	44.2721	1.8177
20.1784973077251	48.0274591998346	38.6132434535658	20.5641	47.7219	38.8826	0.5609
17.2639152852403	44.0635758739156	30.1424485345792	15.6372	44.5891	30.235	1.712
16.7908262067375	41.4349223288965	25.2722410629454	17.5856	40.8861	25.0628	0.9883
13.9547033004451	41.2269872864761	22.3581676671993	13.4598	41.6191	22.5554	0.6615
11.3826391079862	37.7533623445312	14.3036487349619	11.4258	37.7412	14.2255	0.0901
1.01179516528354	35.5737238930271	17.6339696719619	0.642905999999996	35.395	17.4189	0.4629
2.49637589170123	38.8121247713342	26.8023518606355	2.57158	38.4711	27.3546	0.6534
2.55877769978636	50.8414369407289	25.1201049494824	2.40393	50.9808	25.185	0.2182
12.579957717296	53.7027965392652	19.292341201959	12.5872	53.6987	19.2898	0.0087
8.36488570378003	64.1512050979191	18.5860182272293	8.25408	64.3565	18.8288	0.3367
8.94100173992801	65.8191818587296	7.01866258664962	9.17265	66.1356	6.7326	0.4854
5.848718430231	61.9720851357547	6.19468772744321	5.52590000000001	61.9092	6.1438	0.3328
13.3209852900374	57.8941773369818	6.79868520381068	13.5318	57.9262	6.7229	0.2263

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
11.5356378570294	55.3221345621445	8.89269572266735	10.9638	55.5178	10.1729	1.4157
11.6104031547616	49.3167453145522	5.15023215879682	11.7937	48.0467	6.2423	1.685
11.6785740554194	43.840878746475	1.7377496146631	12.2621	43.6923	1.4336	0.6746

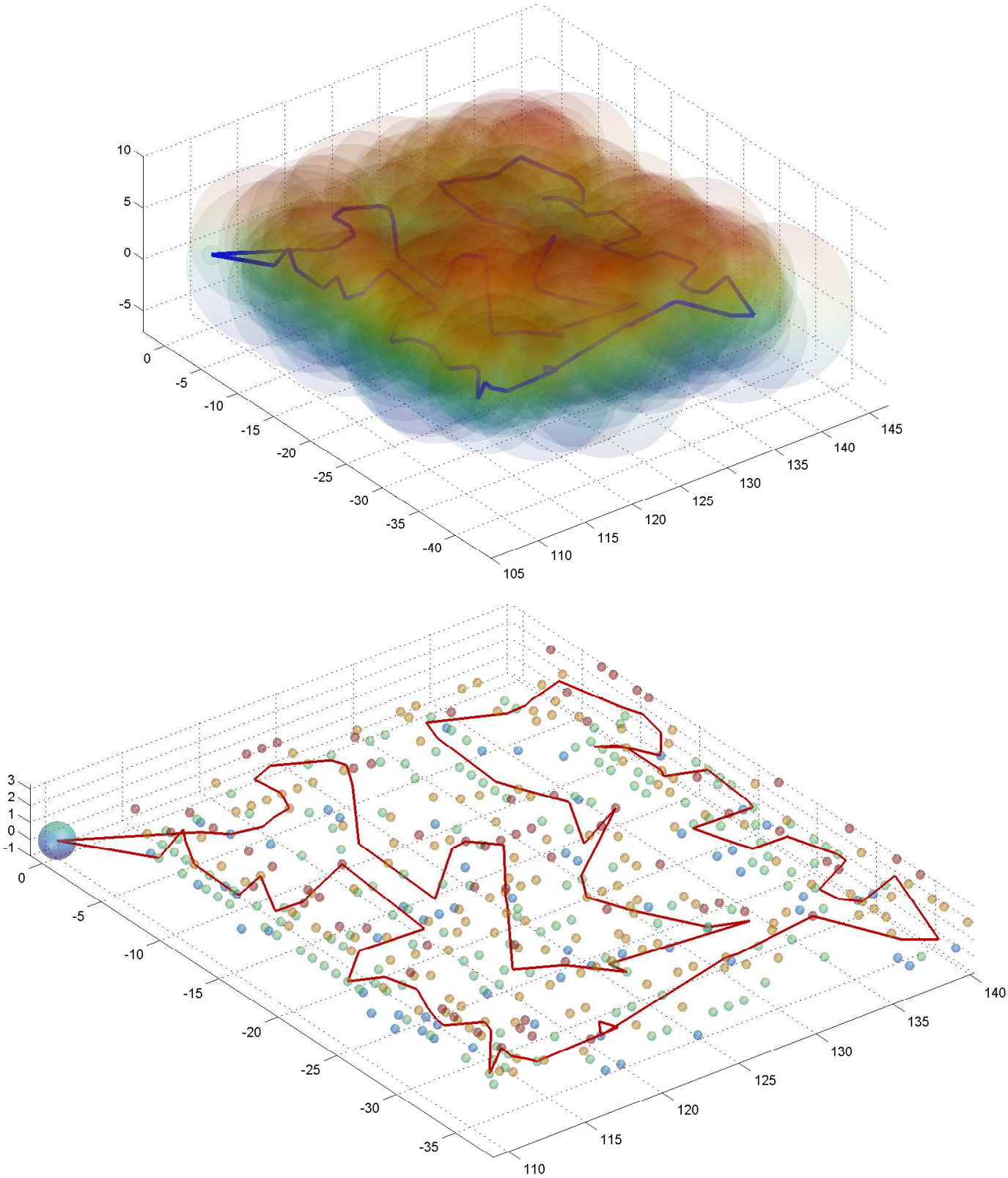


Figure N.102: *pcb*442, arbitrary radius, 3D, Euclidean, Length = 258.4042093

Table N-105: Solution for *pcb*442, arbitrary radius, 3D, Euclidean

Total distance: 258.404209260926 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
0.407272339219261	1.22181701765754	0.203636169609575	2	4	3	6
0.861915658160996	2.58574697448258	0.430957829080438	4	5	1	4
1.08602967948289	3.25808903844814	0.543014839741327	2	5	2	3
1.39999734751022	4.19999204253035	0.699998673755058	3	4	0	7
1.70032867020731	5.1009860106217	0.850164335103599	3	5	1	3
2	6	1	2	6	1	0
2.5925897949745	6.19386818948362	1.69066420875211	3	6	1	3
3.25999145835983	6.41221138951141	2.46852175147361	4	6	3	1
2.73450917737114	7.27683152185373	2.38043517137772	2	7	3	1
2.3608798453574	8.15337099511276	2.18691582085695	4	8	3	7
2	9	2	2	9	2	0
2.23776061162047	9.11888030581023	1.76223938837954	3	10	2	6
2.74820683568966	9.37410341784483	1.25179316431034	2	13	0	4
2.74820683568966	9.37410341784483	1.25179316431034	3	12	2	4
2.74820683568966	9.37410341784483	1.25179316431034	2	10	1	3
2.74820683568966	9.37410341784483	1.25179316431034	3	9	1	2
2.74820683568966	9.37410341784483	1.25179316431034	2	8	1	4
2.74820683568966	9.37410341784483	1.25179316431034	3	7	1	3
3.2090035578259	9.60450177891293	0.790996442174131	3	8	0	5
3.2090035578259	9.60450177891293	0.790996442174131	4	7	2	7
3.58381374547034	9.79190687273518	0.416186254529633	4	9	0	1
4	10	0	4	10	0	0
3.60945494071358	10.5954681026622	0.400195573018999	3	11	1	2
3.2109368017787	11.2030928425619	0.808561243451231	2	11	1	7
2.92637702120703	11.6369640914789	1.10015260208245	2	12	1	1
3.48969170605686	11.8274438617868	1.5722897148152	4	11	3	5
4	12	2	4	12	2	0
3.79106432712376	12.4840891760496	1.93617653800015	4	13	3	2
3.59217651460897	12.9448981784801	1.87542238937083	3	14	0	6
3.59217651460897	12.9448981784801	1.87542238937083	3	13	1	6
3.34321791169958	13.5217176650025	1.79937314510947	4	14	1	4
3.22705089364699	13.7908684341175	1.76388767129126	2	14	3	7
2.76801518336207	14.8544217164948	1.6236662901721	2	15	1	1
2.77448948846309	14.8671010214558	1.63223522306084	3	16	2	4
2.802762281703	14.9224705737321	1.66965509543102	2	18	1	5
2.80448715330454	14.9258485686736	1.6719380134106	2	16	1	7
2.90092559885838	15.1147140076952	1.79957712776848	3	15	1	4
2.95191118405927	15.2145643815601	1.8670580466665	4	15	1	6
3.07400940749622	15.45368202968	2.02865863002117	2	17	2	5
3.36118777352151	16.0160932871093	2.40874763008771	2	19	1	5
3.40216467128272	16.0963426071283	2.46298175745604	3	18	2	2
3.47466107153758	16.2383198469795	2.55893287170595	3	17	3	1
3.55283698379645	16.223422107203	2.55618470806085	4	17	3	1
4.42474419299553	15.4863174804372	2.22108669084433	4	16	3	5
5	15	2	5	15	2	0
7	15	3	7	15	3	0
7.20694610734553	15.8875524280746	2.69824196794637	8	15	1	3
7.41355886597006	16.7736752154508	2.39696999895878	7	16	2	5
7.62054496112457	17.6613991688196	2.09515364924432	8	18	1	5
7.82724593708068	18.5479003224641	1.79375303123717	9	18	1	6
8.03472996897497	19.4377598778595	1.49121059271634	10	21	2	4
8.25029981844961	20.3622979769031	1.17687783219369	9	21	1	1
7.43276625864057	20.2764055344034	1.15309041968378	7	21	1	3
6.62049632636339	20.1910661128991	1.12945616121652	8	21	2	6
5.65939953639713	20.0900905037614	1.10149155689221	5	18.3	1	4
4.34685653000497	19.9521909569606	1.06330109266813	4	20	2	1
4.31087308969853	19.9484104328884	1.06225409938064	4	19	1	1
4.18995216640464	20.0585034615406	1.06587075134614	3	19	2	2
4.18995216640464	20.0585034615406	1.06587075134614	4	18	1	3
3.91695232000899	20.307057466374	1.07403596687476	2	20	1	4
3.63239693471668	20.5661322609382	1.08254680072872	4	21	3	2
3.37483845157375	20.7923669434674	1.06952262270571	3	20	3	4
3.09961590189533	21.0341174201908	1.05560521002171	3	21	2	3
2.82376327872143	21.2764213412431	1.04165593524342	5.3	21	2	5
2.55181327373691	21.5152972728498	1.02790400863658	2	21	1	3
2.27586225673163	21.7576876197273	1.0139497604771	4	22	1	2
2	22	1	2	22	1	0
2.24431098620043	22.2789344923695	1.09175910022731	2	23	1	3
2.54073022433565	22.6173619650623	1.20308918489668	2	24	0	5
2.54073022433565	22.6173619650623	1.20308918489668	3	22	0	5
2.91190663863459	23.0411411253682	1.34249680761009	3	23	1	5
3.28118210557953	23.462749934718	1.48119046599006	4	23	2	1
3.28517910457263	23.4761775239647	1.48097308817599	5.40000000000001	23.3	2	6
3.4314428664936	23.9675385808095	1.47301848194242	5.40000000000001	24.3	3	5
3.53894316362101	24.3286769770558	1.46717203841677	4	24	1	4
3.64607502223265	24.6885776398432	1.46134563263194	4	25	2	4

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
3.79963178750353	25.2044389678837	1.45299439203003	3	24	1	3
3.86793231175633	25.433888964649	1.44927984131171	4.7	25.5	2	1
3.79766764526372	25.7554740780698	1.33132924101976	2	25	2	3
3.689588965602	26.2501251792819	1.14990170785824	3	26	3	2
3.60742427183754	26.6261739668117	1.01197498664485	2	26	0	2
3.5651485273837	26.9346637634404	0.916714669191705	4	26	0	3
3.5559572749403	27.0017331351418	0.896003936690172	4	27	0	1
3.25092478818226	27.9347403676134	0.965804292316278	3	28	0	1
3.22682391563286	28.0172390631246	0.984113816909261	2	28	2	4
3.12265959429311	28.3737996245647	1.0632478484926	3	27	0	6
3.00890879714137	28.7631752494637	1.14966476249478	2	27	1	6
3.00890879714137	28.7631752494637	1.14966476249478	3	25	0	6
2.9765880052426	28.8738112082832	1.17421899110476	2	29	1	1
3.23036077583336	29.4010366302754	1.37898572789807	4	29	2	3
3.44373788838961	29.8443380843186	1.55115760828565	3	30	2	2
3.44373788838961	29.8443380843186	1.55115760828565	3	29	2	2
3.62063371343493	30.2118478677181	1.69389309881887	2	30	3	3
3.80941421867901	30.604048659014	1.84621821961446	3	31	2	3
3.80941421867901	30.604048659014	1.84621821961446	2	31	3	3
4	31	2	4	31	2	0
4.20035087862713	31.2569226292274	1.54272649214725	5	31	1	1
3.75827738232464	31.8080355520352	1.43368706563981	5.2	32	2	3
3.75827738232464	31.8080355520352	1.43368706563981	3	32	2	1
3.35043320782638	32.3164763360636	1.3330904561088	4	32	1	4
3.11080770562344	32.6152065517495	1.27398574262831	4	30	0	5
3.11080770562344	32.6152065517495	1.27398574262831	4	28	2	6
2.70957690480616	33.1154027435782	1.17502035161484	3	35	2	3
2.70957690480616	33.1154027435782	1.17502035161484	3	33	1	1
2.35154950677469	33.5617392180007	1.08671127522492	2	32	1	3
2	34	1	2	34	1	0
1.98778088955832	34.2313249205572	1.41377339936867	1.5	35	1	1
1.98786986045674	34.7108584540038	2.37319634992906	2	33	3	4
1.98786994334412	34.7113055349274	2.37409084343983	1.5	35.5	2	1
2	35	3	2	35	3	0
2.46942679707276	35.2374328255543	2.44511772223532	2	36	2	1
3.59892205316186	35.1025988178566	1.81613157191141	4	36	2	1
4.7	34.5	1	4.7	34.5	1	0
7.22842333579339	34.9130862434599	1.40155911991489	14	36	0	7
7.22842333579339	34.9130862434599	1.40155911991489	13	36	2	6
7.22842333579339	34.9130862434599	1.40155911991489	6.2	37.1	3	3
7.22842333579339	34.9130862434599	1.40155911991489	11	36	1	6
7.22842333579339	34.9130862434599	1.40155911991489	9	36	0	5
7.22842333579339	34.9130862434599	1.40155911991489	6.2	36.5	2	3
7.22842333579339	34.9130862434599	1.40155911991489	8	36	0	2
7.22842333579339	34.9130862434599	1.40155911991489	7	36	1	6
7.22842333579339	34.9130862434599	1.40155911991489	4	35	3	5
7.22842333579339	34.9130862434599	1.40155911991489	4	34	3	5
7.22842333579339	34.9130862434599	1.40155911991489	3	34	1	5
7.22842333579339	34.9130862434599	1.40155911991489	8	33	2	4
7.22842333579339	34.9130862434599	1.40155911991489	4.7	33.5	3	6
7.22842333579339	34.9130862434599	1.40155911991489	7	33	1	3
7.22842333579339	34.9130862434599	1.40155911991489	4	33	1	4
7.22842333579339	34.9130862434599	1.40155911991489	11	30	2	7
9.37433467008609	35.2636788200004	1.74236845141221	10	36	2	1
9.39945405869665	33.6350752057075	1.33885255949487	9	33	2	1
10	33	0	10	33	0	0
12.9272173564435	33.1111601630814	0.741067701943222	17	36	1	5
12.9272173564435	33.1111601630814	0.741067701943222	12	36	1	4
12.9272173564435	33.1111601630814	0.741067701943222	14	33	1	4
12.9272173564435	33.1111601630814	0.741067701943222	12	33	1	4
12.9272173564435	33.1111601630814	0.741067701943222	11	33	1	4
12.9272173564435	33.1111601630814	0.741067701943222	13	30	2	5
13.2461770748515	33.1232725531717	0.821816997883925	13	33	2	6
14.0016841179175	33.1519626982239	1.01308460677436	16	36	1	4
14.8453559676691	33.1840008675767	1.2266724152633	15	36	1	3
15.6957920397854	33.2162959065031	1.44197268221666	15	33	2	6
16.4472243979972	33.2448313110406	1.63220871848133	16	33	2	2
17.0888426247993	33.269196558097	1.79464370921772	17.2	34.1	2	1
17.9	33.3	2	17.9	33.3	2	0
18.5088294912935	33.5281944217025	2.1094721953543	18.3	34.5	2	1
19.5494667059981	33.6375152417275	2.3158140326201	19	35.2	1	6
19.5494667059981	33.6375152417275	2.3158140326201	21	32	1	6
20.4123434701835	33.7281620051799	2.48690879488731	20	35	2	2
21.2746527551272	33.8187491539121	2.65789103503122	21.5	32.5	2	7
22.1373294192791	33.9093748964938	2.82894612063942	22	32	2	7
23	34	3	23	34	3	0
24.3492905828566	34.5298076052235	2.34815339192178	22.8	32.5	1	7
24.5312998084888	34.6012746965313	2.26022415110897	23	35	1	6
24.8033519700354	34.7080977242508	2.12879487832881	26	34	2	7
25.4117574280269	34.9469920267604	1.83487224462385	26.2	36.5	2	3

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
25.867703935708	35.1260223535404	1.61460302134885	27	35	2	3
27.3948617236574	35.7256706712924	0.876828169370259	27	36	0	1
27.3958021373918	35.7259404531584	0.876621191707136	27	37	0	6
27.6506654477934	35.7990545518796	0.820527715926862	27	38	1	4
28.2391629753801	35.9678802071695	0.691003888900006	30	38	2	7
28.8913755504823	36.1549841650233	0.547456869585982	30	36	2	3
29.421726151616	36.3071288814321	0.430730738779602	30	37	0	1
29.4127397552683	35.3129288289367	1.00372767643379	30	35	2	2
29.4046557629676	34.4185655118955	1.51918475042546	30	33	2	5
29.3966938021082	33.5377038556713	2.02686027866277	30	34	3	3
29.38862403734	32.6449145709486	2.54141017405549	30	32	3	1
28.8741583533132	32.721393444841	2.42480037669227	28.5	33.5	2	5
28.2073448085541	32.8205198719182	2.27365912181648	30	31	1	4
27.601870152628	32.9105278499264	2.13642105979062	27	34	2	2
27	33	2	27	33	2	0
26.9871753640228	32.2898519678105	1.73629084856961	27	32	2	7
26.9738539685235	31.5521965040134	1.46236697975831	27	31	3	3
26.9642261943579	31.0190706601099	1.26439394099928	26	31	1	1
27.186527123174	30.1038116205929	0.98827462118301	27	29	1	3
27.3873405344307	29.2770211483767	0.738844882758738	26	29	0	5
27.5424730823792	28.6383082667648	0.546155208227129	27	28	0	1
28.6229688822563	28.4792360711024	1.02631592674787	28.5	27	1	2
28.6229688822563	28.4792360711024	1.02631592674787	26	28	1	3
29.5101371660065	28.3486258393626	1.4205639752951	30	29	2	1
30	27	1	30	27	1	0
29.5357900147393	26.3089927849544	1.16995432816838	30	26	1	1
29.00002610376	25.511472826739	1.36610563563254	30	30	0	7
29.00002610376	25.511472826739	1.36610563563254	29	30	0	7
29.00002610376	25.511472826739	1.36610563563254	30	28	3	6
29.00002610376	25.511472826739	1.36610563563254	27	30	3	6
29.00002610376	25.511472826739	1.36610563563254	26	30	2	7
29.00002610376	25.511472826739	1.36610563563254	30	25	1	4
29.00002610376	25.511472826739	1.36610563563254	27	27	1	7
29.00002610376	25.511472826739	1.36610563563254	30	23	1	5
29.00002610376	25.511472826739	1.36610563563254	26	27	2	6
29.00002610376	25.511472826739	1.36610563563254	30	22	3	4
29.00002610376	25.511472826739	1.36610563563254	26	26	1	7
29.00002610376	25.511472826739	1.36610563563254	27.6	23.6	1	7
29.00002610376	25.511472826739	1.36610563563254	28.5	22	1	6
29.00002610376	25.511472826739	1.36610563563254	26	23	3	6
28.4725604381384	24.7263053546778	1.55921882940649	29	24	2	1
28.0311169760951	24.6131176174686	1.49271755803775	27	25	1	2
27.2929749819498	24.4238552787378	1.38152012219354	27	26	3	3
26.5943272197709	24.2447194071898	1.27627229677184	26	25	1	1
26.3121698207634	23.6947019820508	1.33204074413771	26	24	0	3
25.896682086043	22.8847799503564	1.41416194977411	27	22	0	2
25.6331744477352	22.4861581404786	1.51157427581886	27	23	2	3
25.2587231697328	21.9197060750838	1.64999975024685	26	22	0	3
25.2587231697328	21.9197060750838	1.64999975024685	26	21	2	4
24.900186241935	21.3773284807912	1.7825420789789	24	21	2	1
25.8666605893308	21.1929915672766	1.61812089044563	27	19	3	5
26.7761588483828	21.0195217774388	1.46339274363724	26	19	0	5
27.6835495378862	20.8464539670924	1.30902314652963	27	20	1	2
27.6835495378862	20.8464539670924	1.30902314652963	26	20	1	2
28.5922460212703	20.6731371009748	1.15443140158937	30	21	0	6
28.5922460212703	20.6731371009748	1.15443140158937	27	21	1	4
29.5	20.5	1	29.5	20.5	1	0
29.6063616066766	19.8914228779359	1.08716933450597	30	20	2	1
29.6965000399672	19.000334083151	1.06720861071334	30	19	0	5
29.7723038682347	18.2509540517369	1.05042221646132	30	18	1	6
29.8482496448748	17.5001707498209	1.03360438842281	29.5	17.5	1	5
29.9241954982401	16.7493866894159	1.01678654339383	30	17	1	2
30	16	1	30	16	1	0
29.3694957992916	16.0807977871778	1.1832354711781	30	15	1	4
28.7412912837692	16.1613008745277	1.36580261389728	29	14	2	5
28.1135930070835	16.2417390884623	1.54822263482371	27	18	1	3
27.4877638084289	16.3219377839403	1.73009946920556	26	18	2	5
26.8039432608501	16.409567948839	1.92882959677187	26	17	2	1
26.876486170264	16.2580238053486	1.95516334146454	27	17	2	1
27	16	2	27	16	2	0
27.0000000011521	15.5000000000701	2.00000000093697	26	16	1	3
27.0000000011521	15.5000000000701	2.00000000093697	23.2	15	1	6
27.0000000015884	15.0000000000918	2.00000000102868	27	15	1	7
27.0000000025134	14.4999999998662	2.00000000064664	26	15	1	5
27	13.9999999998204	1.99999999888604	26	14	2	1
26.9999999999345	13.5000000002588	1.99999999888718	27	14	1	2
27	13	2	27	13	2	0
26.925322910601	12.5361343262608	1.82439628185724	26	13	1	5
26.8549804455337	12.099193632182	1.6589854434824	26	12	1	5
26.7871878720331	11.6780919085665	1.49957069869635	26	11	3	6

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
26.7132502264211	11.2188192910726	1.32570575027212	27	12	1	4
26.6385501578117	10.7548107758018	1.15004795464179	26	10	1	1
27.096891413488	10.9279927668995	1.10263259382545	27	11	1	6
27.5476876705339	11.098323918769	1.05599775864337	27	9	2	6
27.7735003612527	11.1836461332607	1.03263745536566	27	10	1	6
27.7744314628698	11.1839979454061	1.03254113302671	26	9	0	5
27.7753625645066	11.1843497575515	1.03244481087818	28	11.3	2	1
30	12	0	30	12	0	0
29.921883166482	12.1431755268912	1.49034366225578	30	13	2	1
29.7212545215892	10.8757413019435	2.04770764246327	30	11	3	1
29.6582851362791	10.6512012692461	2.0398565356246	30	10	3	6
29.333887552505	9.49444480019508	1.99941021284573	29.3	9.5	1	1
29.2873017698091	9.32667770097945	2.00658325625428	28	9	1	4
29.1036160209922	8.66517920267608	2.03486625853473	30	9	1	2
28.9211359985578	8.00802282445795	2.06296360687605	30	8	3	4
28.737624769026	7.34715282158691	2.09121973787058	27	8	3	4
28.5094093074441	6.52529165203793	2.12635919732623	30	7	3	5
28.2700871632808	5.66343252286585	2.16320881179074	29	4	3	2
28.2692900281191	5.66299408830211	2.16279366041189	29	5	2	1
28.0544639346775	5.67997503270266	2.1198640501022	27.5	5.2	2	6
27.5182276537489	5.7223618541905	2.01270569574753	27	7	2	6
26.9633428238463	5.76622276372772	1.90182071729156	25.5	7.1	2	7
26.316820211468	5.81732718157508	1.77262336795738	26	4	1	2
26.3158932637564	5.81769546597571	1.77255171225109	26	5	1	6
25.7807485568109	6.03031309695689	1.73118350377979	26	8	2	2
25.2893488509997	5.96676588263659	1.66150710487664	25	3	2	3
24.9509105702348	5.92299946276312	1.61351936924593	25	8	2	7
24.7133694070272	5.89228092752514	1.57983801009006	24.5	7.1	0	2
24.1058176003454	5.70492834870447	1.63015255324945	24	3	2	5
23.6612661487324	5.56784068218519	1.66696817583658	24	6	2	5
23.0595795925016	5.38229679032096	1.7167969841988	23	6	0	2
22.4158023986075	5.18377327659314	1.77011153878303	22	6	1	3
22.4158023986075	5.18377327659314	1.77011153878303	22	4.7	1	1
22.4148497809466	5.18347951513548	1.77019042983567	23	3	0	6
21.9848287410777	5.05087263130669	1.80580271275123	22	3	1	4
21.5799079232404	4.92600597711397	1.83933631481406	21	3	2	4
21.1710665670392	4.7999303375136	1.87319459678206	20	3	2	5
20.7634208234134	4.67422339429355	1.90695386249725	19	3	1	5
20.7634208234134	4.67422339429355	1.90695386249725	18	3	1	5
20.4655595869579	4.5823710243433	1.93162130162835	20	3.7	2	1
20.2300726524804	5.34983913672469	1.91721151668584	21	6	3	5
19.9830844419069	6.15479072593907	1.90209795076805	19	6	2	1
19.9727482137262	6.65230647771898	1.87963813398548	20	6	1	5
19.9588485167744	7.32134330470222	1.84943518752375	18	6	1	5
19.944959552179	7.98986358033253	1.81925555244514	17.5	7.5	1	6
19.9311131734845	8.65633407571265	1.78916845616128	20	8	1	6
19.9146334775903	9.44955457183774	1.75335937428205	20	9	1	6
19.8967961602536	10.3081218390247	1.71460029235022	20	11	1	1
19.8967961602536	10.3081218390247	1.71460029235022	20	10	1	1
19.892311275303	10.5239937096259	1.70485499035092	16	11	2	5
19.8778880826782	11.2182280259337	1.6735145269032	17	12	2	3
20.1374393415903	11.6557625212954	1.61980008145292	20	12	1	5
20.4958498712158	12.2599474900713	1.54562659874988	20	13	2	1
20.8158358051097	12.3979099953879	1.38979908074744	18	12.3	2	3
21.9608085200495	12.8915670292824	0.832217520018577	20	14	2	6
23.0176208350719	13.3472135543287	0.317568507555729	23.9	13	0	1
22.6527677185086	14.0224407987977	0.366948234962808	22.9	14	1	1
22.2189271863782	14.8253418176575	0.425664820324994	18	15	3	6
21.8545767782084	15.499638686407	0.474976520011385	20	15	1	2
21.4931997913885	16.1684327060711	0.52388578382832	20	16	3	7
21.0504268472409	16.9878647968982	0.583811286581846	20.6	16.5	1	2
20.6918576620312	17.6514624652166	0.632340543011324	20	18	0	1
21.2515421560409	18.4001221747092	1.94678022175971	20	17	0	3
21.7	19	3	21.7	19	3	0
21.2299898695038	19.2879135186023	2.84867268845765	21.1	20	2	4
20.7323032916439	19.5927807639541	2.68843450024662	20	19	2	2
20.2601882170634	19.8819837056306	2.53642946785399	20	20	3	1
19.7545381339046	20.1917291456342	2.37362730172109	20	23	2	7
19.2632959224912	20.4926487726136	2.21546397920891	20	21	1	2
18.7914967526544	20.7816582031844	2.06356066168309	20	22	2	2
18.5435566053652	20.9335385864837	1.983732343153	18	18	2	3
17.7016283424796	21.4492775331225	1.71266001777227	18	21	1	1
17.5032529266535	21.5707961131272	1.64878986509782	17	21	1	1
16.9042851484311	22.5387069874455	1.78872876065088	16	21	3	3
16.4197179379549	23.3217505661655	1.90193985924722	15	24	1	4
16	24	2	16	24	2	0
16.4707587322917	24.6784734229163	1.87598626287797	17	24	2	2
16.9537486043624	25.374574774366	1.7487504307387	17.2	26.1	2	6
17.3980959343686	26.0149831930637	1.63169434841013	16.9	26.8	2	1
18.1715048246344	26.3170752979409	1.29976411203197	20	25	3	5

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
18.9548238669091	26.6230382897581	0.963580654415968	18.3	27	1	5
19.7049702301401	26.9160440936034	0.641634187527205	20	24	0	4
20.4542630411812	27.2087165015022	0.32005404663381	20	26	1	4
21.2	27.5	0	21.2	27.5	0	0
21.5146471611218	28.7522513100148	0.632075553670124	22.2	28.2	1	3
21.5146471611218	28.7522513100148	0.632075553670124	20	27	2	3
21.8684264366231	30.1602429143984	1.34276123296321	23.2	31.5	2	2
21.2230087770612	29.9555932829068	1.2508106403135	20	31	0	6
20.3960715188901	29.6933872483431	1.13299953017961	20.5	31.5	3	4
20.3960715188901	29.6933872483431	1.13299953017961	19	30	3	4
19.650868822284	29.457097684543	1.02683288199146	20	30	3	3
19.650868822284	29.457097684543	1.02683288199146	20	28	2	2
18.9061631797412	29.2209657271073	0.920737047508285	20	29	1	7
18.9061631797412	29.2209657271073	0.920737047508285	18.3	28	0	7
18.162079961852	28.9850311286596	0.814729887877713	17.9	25.8	2	5
18.162079961852	28.9850311286596	0.814729887877713	18	24	2	6
17.4160207222434	28.7484699714081	0.708441210743836	16	30	2	7
17.4160207222434	28.7484699714081	0.708441210743836	16	27	0	7
16.670400609034	28.5120480527635	0.602215094545381	15	28	2	3
16.670400609034	28.5120480527635	0.602215094545381	15	27	3	6
15.9038107133493	28.2689770159978	0.493001480411031	13	27	2	7
14.7210096581855	27.8939333578619	0.324491591659356	14	25	0	3
14.4908568483259	27.8209562909649	0.291702455897593	14	27	0	1
14.3891349174996	28.2725269153105	0.438485360198865	12	27	0	3
14.2570075134781	28.8590754976214	0.629142811735551	14	28.2	1	3
14.1291835996561	29.4265197458394	0.813590404850591	14	29	1	1
14	30	1	14	30	1	0
12.9774713729498	29.8147290835057	1.38931862057829	15	30	2	7
12.2517248607275	29.6832318104333	1.66564011669147	15	28.6	2	6
11.5292051620113	29.5523191964005	1.94073303785537	12	30	2	1
10.4173715022355	29.3508671745856	2.36405377264173	10	30	3	1
10.2124859373115	29.019892986122	2.2486487091961	9	30	2	2
10.0981001416015	28.835113030335	2.18421908679014	7	30	2	5
9.65201983367716	28.1145104469841	1.93295725456531	8	30	0	5
9.3533908251917	27.6321021527179	1.76474971647341	7.5	25.5	1	3
9.15484825428787	27.3113744892874	1.65291745847823	10	27	1	5
8.92893807333667	26.9464369116145	1.52566995804858	7	27	1	2
9.0539702845044	26.7496038423841	1.52552965191264	8	26	0	2
9.35522917100327	26.3187932368158	1.55272945887373	8	27	1	3
9.57068274871227	26.0106871895601	1.57218214996086	10	26	2	4
9.79167024395127	25.6946674475429	1.59213448424786	11	27	2	5
10.0132118665694	25.3778552838729	1.61213684659391	9	27	3	6
10.2353564370836	25.0601808810337	1.63219364533935	7	24	2	6
10.458152938453	24.7415741919221	1.6523093076978	8	24	1	6
10.6817098499828	24.4218800923069	1.67249362697613	9.09999999999999	26	1	5
10.6817098499828	24.4218800923069	1.67249362697613	9	24	1	5
10.9047262406737	24.1029589606767	1.69262914273958	10	24	2	4
11.1273117265419	23.7846540425099	1.71272575331369	12.2	22.1	3	5
11.1273117265419	23.7846540425099	1.71272575331369	14	21	2	7
11.3514127217012	23.4641818902254	1.73295919524952	11	24	1	5
11.5766811582805	23.142040258939	1.7532980437476	9.5	22.2	2	7
11.8019796651188	22.8198556306532	1.77363961211869	12	24	2	5
12.0232665781493	22.5034077216666	1.79361898686212	13	24	1	5
12.2452671725288	22.185939232547	1.81366279646481	14	24	1	5
12.4474410199624	21.8968236799727	1.83191650347539	11.7	22.8	2	3
12.4604244498001	21.8782569310111	1.83308874123928	13	22	1	1
12.592118266913	21.5904810056792	1.94314257297732	8.5	22.8	2	7
12.5925113036208	21.5896221454273	1.94347102573483	11	21	3	2
13.2339827491381	20.7050563809108	2.17614368213277	13.5	21.4	1	3
13.59944497374	20.2010972672193	2.30870308969159	12	21	2	4
13.8403406669071	19.8689108690398	2.39608007298215	13	21	2	4
14.0833187753385	19.5338528986959	2.48421238980955	14	20	2	5
14.3284988500665	19.195758493678	2.57314339175001	15	21	2	6
14.5716405218857	18.8604749629218	2.66133501274326	15	19	0	3
14.8242387755052	18.5121511492992	2.75295670288521	15.5	18.5	2	5
15.022116476524	18.2392849863442	2.82473031388039	17	18	3	2
14.6071334761861	17.9014118905273	2.87251505868626	16	18	3	4
14.2340562781017	17.5976578873267	2.91547440929713	15	18	3	7
13.8668405059965	17.2986761732833	2.95775881107392	14	18	3	2
13.5	17	3	13.5	17	3	0
13.4984291840748	16.593182576188	2.66358304880358	17	15	2	6
13.4969313934375	16.2052773631092	2.34280552263744	16	15	1	5
13.4956039433724	15.8614878236641	2.05850938161591	14	15	2	1
13.4322360417776	15.9003677444049	2.00885611217633	13	15	2	1
12.9028709812698	16.225164219194	1.594060834918	16	13	1	6
12.5962330757064	16.4133045456362	1.3537881649848	15	15	0	7
12.2904479638426	16.6009216370596	1.11418372341628	13	18	1	5
11.9797422617144	16.7915578034021	0.870723647747558	12	17	1	6
11.6707542262034	16.9811400867933	0.628609483873745	12	18	0	6
11.3752661953821	17.1624393225066	0.397073537421225	11	18	0	1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
11.32987138694	16.5227382450103	0.47474851189606	10	16.3	0	5
11.2842104375101	15.8792867134098	0.552878873381792	10	18	0	3
11.2191054669892	14.9618310591414	0.664279888653954	7	18	0	7
11.2191054669892	14.9618310591414	0.664279888653954	11.5	13.5	2	2
11.2024294119988	14.7268330035281	0.692814257672106	9	15	1	5
11.1590214600945	14.1151304590852	0.767089536527903	11	15	1	1
11.1427273306166	13.8855145178837	0.794970391229422	10	15	2	2
11.063131648938	12.7638566078966	0.9311664083581	12	15	3	6
11.063131648938	12.7638566078966	0.9311664083581	11	9	1	5
11.0327513890902	12.3357397120222	0.983150007201152	10.5	10.5	2	7
10.9716473190174	11.4746645429634	1.08770506546355	8	10.3	1	5
10.956941989324	11.2674378347886	1.11286732738981	10	11	1	1
11.4476768074368	10.5213936562217	1.28769928677582	13	11.3	2	4
11.8955154074008	9.8405628424429	1.44724881631889	14	9.3	1	7
12.2758311188994	9.26238432282479	1.58274224206955	16.5	10.5	0	6
12.2758311188994	9.26238432282479	1.58274224206955	14.5	7.7	3	4
12.5170897526525	8.89560862394415	1.668694415715	13	7	0	3
12.6757493560493	8.65440487380216	1.72521938958826	13	6	0	5
13.4409428433125	7.49111227117448	1.99783156106151	12	6	2	3
13.4512153982908	7.47549532291947	2.00149132029949	13.5	7.5	3	1
14.2212240683597	6.24700103710213	1.70027334076314	14	6	2	1
14.6629725453272	5.54222263793702	1.52746673582574	15.5	5	3	4
15.1591859264426	4.75054934860122	1.33335412719571	17.1	5.1	1	2
15.0632921326372	4.3701827152214	1.30495007359472	17.1	3.1	2	6
14.910730166626	3.76503949550211	1.25976072412365	15.5	3	1	1
14.0429205740594	3.74159400216931	1.48130340931743	14	3	1	3
13.2649662866105	3.72057611831155	1.67990698958345	12	3	3	2
12.3801586728414	3.69667140147057	1.90578911527751	13	3	2	6
11.0330087263799	3.66027566327242	2.24970241072429	11	3	3	1
10.9429691353768	3.68709288988548	2.23977970205301	10	3	3	4
10.1998420128145	3.90842451364545	2.15788424262246	9	3	1	6
9.69337879560921	4.05926859590042	2.10207005594375	8	3	2	2
10.0061355701562	5.89421100857256	2.03228288066374	11	6	2	1
9.9194709171169	6.10950720105263	2.02766710688607	10	6	2	7
9.65957902744961	6.75514221378083	2.01382522199401	11	7	1	2
9.40000000000001	7.4	2	9.40000000000001	7.4	2	0
8.92054244671017	6.79199507713081	1.39466513810474	9	6	2	1
8.47355639603345	6.3501670165498	0.759616896487677	8.5	7	0	1
8.37600929712752	6.20486512546479	0.683505820822692	7	6	2	5
8.08965025740881	5.77831722751995	0.460074321694545	8.5	5.2	1	4
7.78813939312087	5.32919983451288	0.224820618970729	8	6	2	4
7.5	4.9	0	7.5	4.9	0	0
6.38705134411586	3.79012274062315	0	7	3	0	1
5.03005006461811	2.98486830764952	0	4	4	1	4
3.78232591909338	2.24445972109022	0	6	4	1	3

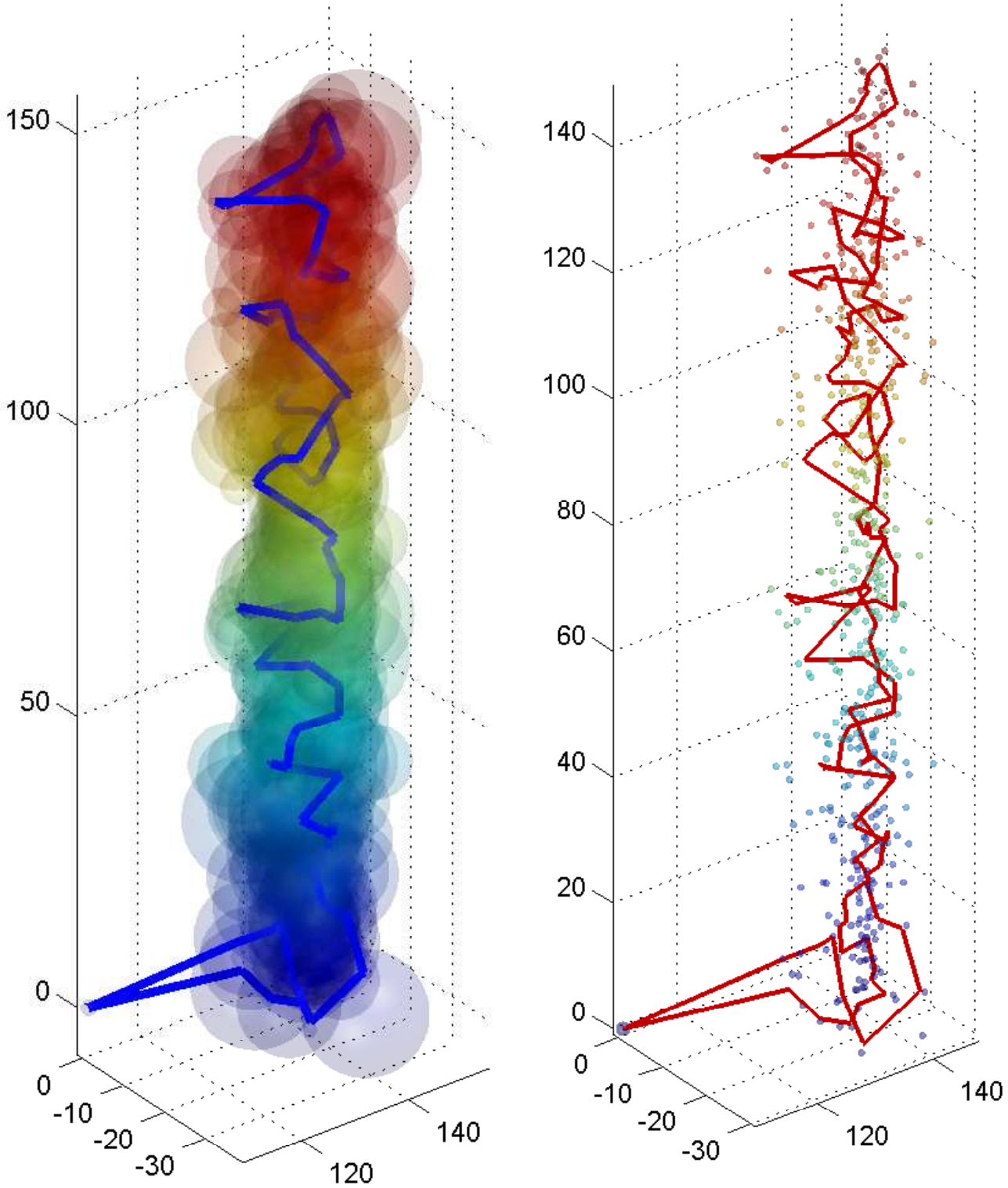


Figure N.103: $d493$, arbitrary radius, 3D, Euclidean, Length = 761.0654113

Table N-106: Solution for $d493$, arbitrary radius, 3D, Euclidean

Total distance: 761.065411297479 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
12.4145001845647	19.9033917777598	15.8136473933164	12.37	19.934	15.842	0.061
13.9629139171281	20.6362114512407	16.3266697445495	13.513	22.41	17.465	8.854
17.0624610869072	22.1031384526706	17.3536148407166	16.497	24.315	17.876	2.342
17.7769560211519	22.0688054642659	17.4837215978025	17.64	23.426	22.454	9.913
19.4308455190159	21.9893328350356	17.7848876535131	19.482	21.966	17.833	0.074
18.3508297863897	25.6219526594296	10.9331737836877	20.942	25.649	17.701	8.469
18.3094891841783	25.7610017735236	10.6709039963286	16.37	26.982	10.968	2.311
20.6215421397209	27.4307956097096	2.88930580883619	20.117	27.617	1.782	1.231
25.9442426944027	27.2617829586489	5.42299119160158	20.117	22.728	3.645	7.823
27.6653069467065	27.2071337006283	6.24224361667942	23.355	23.553	9.247	6.4
30.6662872742697	27.1118430373719	7.67075531847726	31.42	27.173	7.305	0.84
29.862494457755	26.6590122446862	11.3612909683904	28.118	18.092	12.931	9.723
29.862494457755	26.6590122446862	11.3612909683904	25.959	27.744	8.296	5.865
29.862494457755	26.6590122446862	11.3612909683904	29.07	29.713	2.284	9.61
28.4756392111719	25.8777029930446	17.728900338981	29.007	26.157	18.195	0.76
25.4436837778702	24.252851139039	19.5867859226968	22.974	25.141	19.537	2.625
25.5462359591217	23.9904774452042	19.7482239143334	21.958	24.76	23.638	6.761
25.8602154058411	23.1871780488715	20.2424925078683	25.832	22.918	24.535	6.514
26.6598440209145	21.1413729762088	21.5012726560252	28.626	22.791	23.223	9.57
26.8019176058841	20.7778855041054	21.7249256125174	26.022	21.902	22.93	6.288
27.082966754573	20.0588361429898	22.1673552571553	26.975	20.061	22.417	0.272
27.7251715956479	19.1481610601565	22.0570193224837	28.245	21.331	19.247	3.596
29.5144660940468	16.6108599977591	21.7496035478356	29.515	16.505	21.691	0.121
30.8526573815706	17.8376975639847	23.2591050214827	32.944	17.965	22.768	2.152
30.58986216124	18.2771028532563	24.0459358992829	31.102	17.775	23.735	2.111
29.7859476205073	19.6212837049429	26.4529232808348	33.515	18.219	27.24	4.061
28.9213299708945	21.0669628254237	29.0416607969975	28.689	21.013	29.015	0.24
28.4694208972257	22.6914174418125	31.8131215179742	31.293	23.68	29.18	6.085
28.469281593983	22.6919181856422	31.8139758306942	29.261	22.283	32.908	1.411
25.6769338222354	26.0284493944241	32.5799145706655	25.705	26.22	32.496	0.211
20.9202064804821	24.7265478649506	36.2500650500678	20.561	24.696	36.269	0.361
23.9125384555512	24.4709916216963	38.0358234232965	20.561	18.219	35.874	9.121
25.9364618501947	24.2981406234738	39.2436564011326	26.086	29.903	39.661	5.939
28.6675749665336	24.0648929000805	40.8735247098499	33.642	26.22	42.336	5.615
27.9073574347782	23.2345635485014	40.9424871190581	29.261	23.045	43.901	3.259
25.665159220039	20.7855763178543	41.1458860497383	27.8	23.617	42.03	6.658
23.5672763121614	18.4942140173432	41.3361935241172	26.149	20.886	38.979	5.887
22.1794211201693	16.978362538441	41.4620916983223	25.578	12.568	43.273	5.855
21.8400314220191	16.8014237973314	41.4423272989608	20.244	11.234	37.646	6.925
21.4986543219601	17.0873859869972	41.7852793467917	18.021	13.52	41.784	4.982
19.5703683080024	19.2719792176799	44.0295013760892	18.212	18.283	36.255	7.954
18.9368153866579	19.9897443303699	44.7668577106918	19.609	18.156	48.051	3.821
17.8223106757605	21.4121805554669	45.457939979555	12.052	18.854	46.124	6.347
17.6284302841379	23.3596493058694	46.0770582315085	17.64	22.918	47.209	3.23
17.3835973798559	25.8189202082402	46.8588830805228	17.069	27.744	45.218	2.549
17.3836347439066	25.8190623418489	46.8598722225578	17.323	23.934	50.146	5.56
17.5681934701582	26.5211213163163	51.7456761980253	17.069	27.046	52.438	1.002
20.7883602143053	23.8900643848555	51.6106383057021	20.117	21.775	51.546	2.22
23.2434912453702	24.0659336854043	51.5836914810834	24.244	21.077	52.586	4.835
24.9385927805843	24.1873595025142	51.5650865116303	26.594	18.854	52.883	6.988
28.2038797164926	24.4212630551541	51.5292476589829	28.753	24.379	51.035	0.74
27.6677482300268	25.213422110438	56.5045769723038	31.356	22.347	59.353	9.352
27.6676424099551	25.2135784644577	56.505558988359	28.88	27.3	58.991	4.959
27.5996523887318	25.3140367368545	57.1365095969238	28.499	25.141	57.61	1.031
27.2523101361623	25.4497433887144	57.4792195556674	26.086	24.95	59.469	5.746
27.2523101361623	25.4497433887144	57.4792195556674	25.07	27.744	59.542	6.389
25.800236134792	26.0170686265049	58.9119289196218	27.102	25.966	59.543	2.428
25.1356967076092	26.2767041219722	59.5676063163132	22.466	28.887	64.369	7.763
22.6970949442911	27.2294656859581	61.9736870291662	22.022	28.443	62.892	5.071
19.7711083300039	28.3726484646242	64.8606530361241	18.72	30.665	66.986	3.298
19.1165978026378	24.4362881552693	63.0819817586181	17.45	24.188	63.322	1.702
19.953053023901	21.9587308324626	61.6919483857647	18.974	24.125	61.119	8.219
21.3219292647958	17.9041571165966	59.4171300636516	25.197	18.918	59.354	4.006
21.3220784455911	17.9032856445736	59.4166628574839	18.466	17.838	58.207	4.44
21.5923306904868	16.3245498722051	58.5702847116458	24.308	16.441	56.035	3.717
22.0155139971672	13.8524349095543	57.2449558556658	22.276	13.393	54.239	3.052
22.3619369222452	11.8287319286998	56.1600256358671	22.085	10.853	55.182	1.409
24.9304444008236	13.7353589712711	60.1485404469162	28.372	13.52	60.757	4.868
25.8558178129979	14.4222723333654	61.5855094364365	25.832	14.219	61.701	0.235
27.5100877472939	15.701539852834	64.1122114568771	24.943	18.346	64.008	3.687
28.2098551001417	16.2426786523371	65.1810236929665	30.594	17.076	65.103	5.185
29.5277085198484	17.2617911604849	67.1938892496366	31.991	17.203	67.188	2.464
28.6970195683145	17.9752764149483	68.5269952827933	29.261	19.172	68.315	3.212
28.6970195683145	17.9752764149483	68.5269952827933	29.705	19.426	70.279	2.488
27.148745735764	17.5320851271324	68.4326116204042	27.356	20.632	65.916	8.262
24.6186265239704	16.8078416949846	68.2783742444776	22.974	17.711	70.862	5.019

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
22.367068278569	16.1633359904293	68.1411179878133	25.07	11.615	69.179	8.154
21.6287592964086	15.9519959649818	68.0961104826343	21.831	13.203	64.85	7.88
20.663383129965	15.6756583043995	68.0372604420361	19.418	13.901	64.222	6.882
18.4474976856259	15.0413638093588	67.9021790535036	17.323	12.504	65.716	3.533
14.6905632202939	18.0842933682873	71.6096107238528	13.005	20.061	68.646	3.941
13.8206767103831	18.761945816177	72.6716791401254	11.862	17.965	73.909	2.45
15.71038145559	22.139643386335	72.7741265654394	17.45	21.902	76.475	6.347
16.6776727789599	23.8685998709905	72.8265668816335	19.863	21.331	75.529	9.178
18.3076012272103	26.7819677435494	72.9149311002907	17.64	27.49	72.733	0.99
21.7979191066241	28.5991433395052	73.443065678188	21.958	29.395	74.461	1.302
25.6367416567437	27.8720210715492	70.2224623394412	25.832	27.998	69.522	0.738
27.6062676347434	25.5359889006113	75.0343394095096	27.546	26.982	70.094	8.192
27.6066131639396	25.5355790727208	75.0351835959081	24.943	23.68	69.938	9.291
27.6069586936771	25.5351692447673	75.0360277820542	23.482	22.41	74.725	8.804
27.8234057885655	25.2784444781229	75.564844977777	31.356	26.03	76.034	3.642
27.4487426836971	24.6835921819637	76.3659159475519	19.164	24.696	74.306	8.537
27.4487426836971	24.6835921819637	76.3659159475519	24.562	26.982	72.259	7.031
27.4487426836971	24.6835921819637	76.3659159475519	28.816	21.902	78.963	4.368
27.3896734379323	23.9158900302186	77.5043419142062	26.911	22.601	75.564	7.439
27.3823862801752	23.8211963066667	77.6447624483319	26.721	18.283	80.536	8.04
27.2642515943557	22.2858566709784	79.9215040942824	26.848	19.743	76.594	9.863
27.2642086151434	22.2852980802446	79.9223324234316	27.102	21.648	79.965	0.659
27.9009666681718	23.8121710102489	81.7985378579714	32.118	27.3	81.725	5.473
25.1330013664167	23.2751543115067	85.1532309357087	28.054	22.918	87.821	3.972
21.1226594500458	22.6541257956455	88.9584620826406	20.561	25.776	90.646	5.596
18.2244716707428	22.2053221147935	91.7084141342304	19.545	25.839	93.739	4.367
14.7025604012874	21.6051490383049	94.997748089255 4	12.243	20.505	94.648	2.717
15.7900806456512	22.6428816543818	97.2950620463953	11.608	20.251	101.424	6.345
17.1089839165437	23.740420333035	98.7758246961732	16.688	18.092	103.09	8.156
17.6275595197687	24.1719595818821	99.3580449456988	24.752	19.362	96.308	9.904
17.6275595197687	24.1719595818821	99.3580449456988	17.323	21.331	107.01	8.168
18.0864234772482	24.75378987561	99.2554011181748	17.577	25.204	95.05	4.26
19.2594628807728	26.1067302404901	99.5228241595401	18.91	28.697	98.028	3.011
22.3676618384661	25.6859826772142	102.125154793333	22.276	28.125	102.29	2.538
25.6055012056594	25.2476869513533	104.836025079907	27.165	25.458	104.784	2.59
27.9479904145651	24.930590884138	106.797262343322	28.753	23.998	106.929	1.239
27.816525201161	26.5390953526531	107.734481224761	28.943	30.03	106.391	6.569
27.727684590597	27.6260460904726	108.36780856123	28.943	30.475	107.548	3.204
26.209398050702	26.9864522740205	110.684524974704	25.832	23.68	109.484	9.355
25.8412955069068	26.8313855384108	111.246203940502	30.277	30.475	112.299	7.266
25.8407614230835	26.8311605521794	111.247018885693	26.911	24.76	115.286	7.931
24.0775827994353	26.0884098254505	113.937403662607	27.927	28.125	119.109	6.761
24.0769805470829	26.0881499562462	113.938158487157	24.308	23.998	113.458	2.157
21.3408090211271	25.9005501829575	117.453939141068	28.88	25.331	116.966	8.431
21.3401953908736	25.9005081106134	117.4547276129	20.561	23.553	119.319	7.372
18.9724148645588	25.7381663481034	120.497161279088	18.72	28.189	115.769	7.716
18.9724148645588	25.7381663481034	120.497161279088	18.91	22.474	122.979	4.101
18.2159812332657	26.7323544418681	120.698470636779	17.64	27.998	119.961	1.574
18.0918588125808	24.8118883178773	124.380557455054	20.371	23.045	124.747	6.483
18.0439381746003	24.0703977881271	125.802203782651	18.974	24.569	127.812	2.27
15.9990245340069	21.3998300575231	124.737713094438	18.593	21.648	126.239	9.517
15.5350763955943	20.7939342215866	124.496202469477	20.434	15.806	127.618	8.615
14.1603291340016	18.9985775453223	123.780571636694	11.481	17.711	124.498	3.058
16.2380520807928	18.66237670013	121.949511125188	11.735	20.378	116.222	7.485
19.9899603796626	18.0214399199061	118.975318992393	19.99	18.029	118.966	0.012
21.2654748481246	16.9783015122586	118.97710825361	20.498	17.457	115.048	7.365
22.1728553585086	16.236230109043	118.978380124423	22.149	14.282	119.226	1.97
23.3483296210731	17.1219217292633	118.748277716387	25.197	12.441	114.729	9.295
23.8718824708791	17.5164060589597	118.645789345649	26.276	20.188	119.025	3.614
25.3097563726522	18.5998056003095	118.364321063805	25.133	19.235	120.496	5.738
26.7606677832183	19.6930335639797	118.080299635108	27.102	18.664	121.623	5.391
27.7625140987664	20.4478963781306	117.884185890509	27.927	21.458	117.97	1.027
28.9784894435427	18.7726652702506	117.301043141215	29.578	18.791	116.421	1.065
28.96311671934	18.365318620681	117.609166256264	27.229	15.362	116.263	4.245
28.9483848355043	17.9749384448087	117.904457053664	28.054	17.013	121.063	8.339
28.8570488143687	15.5546744063301	119.73519229334	30.594	16.251	121.669	2.691
27.9644788735364	12.8462372736537	120.647105092492	27.927	12.568	120.417	0.363
26.8397620610953	12.3063470328539	126.483494576094	32.087	11.313	118.866	9.723
26.8397620610953	12.3063470328539	126.483494576094	27.673	12.695	125.598	3.999
26.8356168821566	12.3043572338173	126.505004748632	26.594	11.933	126.917	0.605
28.2144987926841	15.0368135611385	126.174972286817	24.371	15.235	126.557	7.737
29.1667166309976	16.9237725268368	125.947061232817	28.943	16.886	125.854	0.628
30.224446317937	19.0198188841344	125.693896279099	33.515	18.029	124.645	3.593
30.264980975975	19.4809483385576	125.697441998719	33.322	13.621	122.895	7.179
30.4170925465786	21.2113991897337	125.710746932648	34.341	22.029	122.727	7.918
30.6143189078325	23.4550840834865	125.727998178638	32.245	24.887	125.449	2.188
28.0713403454405	23.6074656010819	126.221835199386	27.229	26.22	125.044	2.987
24.3844260321502	21.9201248510854	127.936930648083	25.451	17.965	131.595	5.492
22.8830903313536	22.1551499713632	127.773190240449	21.577	21.394	126.294	2.115
22.1980981626719	24.1372244726483	130.293924068565	19.037	26.982	129.54	6.169

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
21.8361712166773	25.1844863069979	131.625795366498	20.434	18.537	132.408	8.447
21.0169962878241	27.5548283319292	134.640314309242	18.974	29.967	133.455	3.376
21.1569343802005	27.746853624169	135.610033005891	25.895	29.903	127.854	9.341
22.0428908828576	28.9625773547994	141.749380618419	26.149	27.49	136.669	8.339
22.0430310444242	28.9627696869127	141.750351887225	18.72	29.967	135.012	7.58
22.043171206126	28.9629620189354	141.75132315603	22.149	29.713	141.818	6.925
22.1444428964039	29.1019286641425	142.453098166402	25.07	30.03	143.44	3.224
18.9633161479493	28.7365058988792	145.40240716118	18.529	30.03	146.971	2.079
17.2887394911546	25.7589382052604	144.537666974727	19.037	28.189	146.557	3.611
15.0371116775259	21.7553148145007	143.374941445669	18.466	18.664	140.644	8.295
11.7157784870036	15.8496465294023	141.659827157074	11.163	15.552	141.832	0.651
13.9063741240295	15.3220451314765	139.837464847936	13.576	14.79	138.325	1.637
17.1800235773692	15.7855905802626	140.77278318186	17.577	13.647	137.156	6.049
20.7216461801723	16.2870807463249	141.784664446211	18.339	12.631	142.199	6.166
24.242724855458	16.7856619075346	142.79067607402	24.879	19.934	139.42	4.656
27.0970229814631	17.093288785532	143.718320989282	27.356	18.473	143.695	1.404
28.469302522678	16.3996824742284	144.231223152242	28.245	14.854	144.187	5.84
30.6797570172737	15.282428334947	145.057401414576	32.944	15.933	144.54	2.412
30.5417060262028	14.935329099926	145.322506273946	29.975	14.661	145.197	0.642
31.007553944185	14.6331625474077	145.982356057468	31.991	14.092	145.487	3.28
31.7310069852078	14.1639041794389	147.007089585876	30.787	14.206	147.62	3.808
31.7315471667212	14.1635537997665	147.007854725091	29.975	13.881	149.391	2.974
33.5586823723802	13.5954824511457	147.481913837942	31.892	12.353	146.679	3.015
34.0445226480972	13.444430680308	147.607967761442	37.452	10.218	146.804	4.761
33.9629976569831	13.7184979045033	147.780562657649	33.907	13.556	148.567	0.805
33.6423131688852	15.3082175148211	147.485197689817	33.582	15.473	147.748	0.316
33.5222614043001	16.7838937186012	145.285853751483	33.769	15.679	145.826	3.318
33.4375303000076	17.825407745481	143.7335827735	34.341	21.013	142.761	9.585
33.4081343833694	18.1867431295173	143.195049407014	33.515	20.315	142.968	2.143
33.0895141532926	16.1062593312406	141.164702884052	34.468	20.442	147.277	9.777
33.0894052020692	16.1055479134526	141.164008611511	31.356	19.68	141.631	4.172
33.071313865597	15.9874167295254	141.048724495381	33.322	15.473	140.664	2.231
32.9863107943712	15.4323754646791	140.507058960841	33.907	14.336	141.111	1.948
32.5730283838375	12.7337785016628	137.873495290553	34.785	12.504	141.232	9.071
32.5583269388786	12.6377827828062	137.779812963057	33.907	12.776	139.011	9.552
32.5583269388786	12.6377827828062	137.779812963057	34.404	14.028	139.514	9.888
32.4722776060757	12.0759092487305	137.231479997939	34.135	11.866	136.659	1.771
32.4717809874855	12.0752467720733	137.230919199709	34.595	11.996	135.081	4.778
32.4712843686933	12.0745842954967	137.230358401563	26.149	15.679	137.044	9.977
32.4712843686933	12.0745842954967	137.230358401563	29.324	15.489	136.921	9.524
32.2752164785887	11.8130349137106	137.00895218734	29.007	12.949	137.787	8.697
31.9684677204656	11.4038405684238	136.662562152283	28.372	14.663	135.085	8.657
31.4693585234654	10.7380424094618	136.098952665986	31.697	11.541	138.673	4.577
31.311208791753	10.5270747997853	135.920364629682	29.388	8.313	137.407	3.288
31.5865638741529	10.4789420067741	131.906527992128	30.912	9.901	131.507	0.974
31.5871432935282	10.4793678362647	131.905833051531	34.976	10.282	131.121	4.446
31.5871432935282	10.4793678362647	131.905833051531	35.547	11.234	131.369	6.26
31.5877227131685	10.4797936658487	131.905138111213	30.787	12.386	130.829	7.465
32.6056729225511	11.2279105520665	130.684235070934	34.595	9.202	128.931	3.337
32.6900702805631	13.2592206556278	130.225781684257	33.127	14.661	132.624	2.812
32.690016132129	13.2598916788813	130.225042227876	33.907	11.996	124.886	7.29
32.6899619838709	13.2605627023951	130.224302771717	32.867	14.661	131.697	8.465
32.649300307788	13.7644544167663	129.66902302829	32.347	14.661	129.857	7.755
32.5475216888616	15.0257292605432	128.279120791458	30.462	15.473	131.052	6.788
32.5127870263976	15.4561716584358	127.804780749507	32.282	15.473	127.6	0.309
32.6658001151392	15.5737496991271	127.807120097092	31.356	16.06	129.885	3.559
33.255412886033	16.0268190224982	127.816134525667	36.436	18.918	131.64	5.753
33.2553736135181	16.0266718521799	127.815146194463	35.992	13.647	125.389	9.144
33.0498156253762	15.2563674134334	122.642113214999	33.907	13.816	122.673	8.76
32.8878410297852	14.6493866955973	118.565891935857	31.991	16.632	118.575	2.73
32.852933542541	14.518574993127	117.68741698798	34.135	13.946	120.705	7.157
32.8528942698352	14.5184278234493	117.68642865669	33.322	13.101	119.477	6.817
32.8403663622849	14.4714809798982	117.371153719077	31.502	15.473	118.128	5.299
32.8403270894706	14.4713338099527	117.37016538783	33.907	12.516	116.73	2.372
32.8403270894706	14.4713338099527	117.37016538783	32.217	14.433	117.304	0.628
33.2269509081807	14.2820304524171	115.962510165364	33.907	14.791	115.865	0.855
33.1780858903208	14.1145464729209	115.59969411334	31.015	14.076	113.16	6.371
32.6332686691618	12.2472021135934	111.554511655473	29.975	13.101	114.777	5.333
32.6331472900712	12.246786091719	111.55361043801	31.632	12.353	111.341	8.922
32.6330259110537	12.2463700699231	111.5527092205	35.103	10.155	111.634	3.418
32.4690769861301	11.6844408591204	110.335415545576	32.347	11.313	110.138	0.438
33.2020812839294	13.8079345242161	109.908903516288	30.982	12.126	111.418	5.546
33.46386489785	14.5663146650746	109.756580445405	31.047	14.661	110.232	2.465
33.7806694146683	15.4840896296335	109.572241521708	33.452	15.246	111.765	2.23
34.0499883677129	16.2642979391889	109.415534477536	30.975	17.076	111.068	3.584
34.6973285583405	18.139626798823	109.038866785197	34.722	18.219	109.051	0.084
34.0209114172084	15.6671912622795	107.712925083917	32.309	19.553	108.506	9.666
33.8599848461514	15.0789726778817	107.397468649118	34.595	18.791	106.414	4.79
33.7105104101944	14.5326152309109	107.104463279167	31.293	15.806	105.367	3.238
33.7103989643945	14.5316933909417	107.104092077194	29.975	13.361	103.951	8.8

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
33.7103989643945	14.5316933909417	107.104092077194	31.372	15.246	104.804	6.866
33.7102875186807	14.5307715509043	107.103720875364	31.957	14.433	102.967	4.494
34.029383997446	13.1240345533966	107.688174787649	34.135	12.126	105.614	8.535
34.2991014791262	11.9349842525657	108.182186397054	34.722	11.742	108.413	0.519
33.7801565647527	11.6977867190541	108.05316769902	35.674	11.044	107.474	6.002
33.7801565647527	11.6977867190541	108.05316769902	34.135	13.426	109.486	8.117
33.191981350173	11.4289452770375	107.906937259623	33.095	12.711	107.498	5.532
32.7957725035238	11.2478470939219	107.808432403488	32.932	12.353	108.278	3.826
32.2961878128622	11.0194983188063	107.684226879307	32.477	11.541	107.287	3.772
31.0831540975066	10.4650485946019	107.382645280238	30.34	9.647	108.046	1.289
30.8030913223513	11.3726919228281	105.476875257803	30.721	9.329	106.333	3.502
30.7081469867614	11.6803925310528	104.830797937947	31.177	11.541	103.36	1.55
30.1608905856268	12.1973650165582	105.351006192648	29.388	11.804	105.494	6.15
30.1608905856268	12.1973650165582	105.351006192648	31.275	12.613	107.178	5.931
30.1602925411972	12.1979299655635	105.351574677901	29.197	12.441	103.553	7.211
29.4549031094478	12.8642843328208	106.022100620874	29.578	13.203	105.988	0.362
27.009238935991	13.0408251042429	107.958060594966	26.022	12.631	109.182	1.625
27.5831711284252	13.9139772652367	106.662611748902	27.292	16.632	106.393	9.708
28.0352008999884	14.6016729395749	105.642314645144	29.642	17.076	106.306	3.024
27.7421871488332	14.1353963555738	103.354464650881	28.753	13.838	102.669	1.257
26.3629719988738	14.1779806144912	102.655105193483	26.086	14.663	104.115	1.968
24.5800184204322	14.2330302862065	101.751021688853	22.212	10.091	100.44	4.948
23.9040964063414	15.7972943292824	101.44865726925	18.148	16.505	99.59	6.09
26.5362629090464	19.1873308051093	102.087709891769	24.879	20.632	106.077	4.555
27.0846679794932	19.706872153355	101.991690670155	27.229	19.616	102.004	0.171
27.9432997142992	22.200123596421	101.564001610939	27.991	22.601	101.939	0.551
29.1113727027061	22.5396138475992	96.343137949038	29.07	22.347	101.831	8.48
29.1115905985652	22.5396771772909	96.3421640338749	29.134	22.537	96.334	0.024
27.2589654254277	22.9766987543394	94.8579209083624	27.229	27.554	96.447	5.774
26.2103549715816	23.2240589181632	94.0178194771895	25.006	24.188	94.535	1.627
26.0959316275985	22.445558497186	92.1701739381926	26.149	23.172	91.657	0.891
26.095849581568	22.4448276825314	92.1694963111642	27.546	22.537	91.326	5.492
26.095767535819	22.4440968671231	92.1688186849143	28.245	22.855	90.204	6.887
25.9026280887827	20.7237264653092	90.5736536149818	25.895	20.759	90.426	0.152
25.8617343129223	19.5197297615257	90.9246603522513	24.943	18.791	91.664	4.875
25.7450388354936	16.0839289162683	91.9263156755027	25.832	16.949	91.413	3.416
25.745006245694	16.0829693922876	91.9265954104409	26.911	14.409	89.199	5.204
25.6092836657957	12.086960685742	93.0915705944237	23.482	9.52	92.151	3.464
26.2377858052573	12.0962341636882	93.6089236923215	25.705	12.123	93.472	8.029
26.2377858052573	12.0962341636882	93.6089236923215	32.412	12.353	94.929	7.931
27.8606795358888	12.1201792112472	94.944808150956	27.419	11.298	96.166	1.537
28.0469904477208	12.1817435130582	94.9838967557381	29.261	11.425	96.137	8.741
28.0469904477208	12.1817435130582	94.9838967557381	30.202	14.011	102.151	8.617
28.5868134634008	12.3601231449887	95.0971521430763	28.753	12.949	99.196	9.829
30.1192564366723	12.8665037723594	95.4186606977142	30.202	13.231	95.497	0.532
30.4796593203852	12.9855948961891	95.494273652703	29.515	14.028	97.711	5.055
31.2716990910535	13.2473167845928	95.660444759163	32.817	17.775	101.585	7.615
31.3871725609847	13.2854737160087	95.6846711205036	33.071	18.346	97.156	7.578
31.7190991779389	13.3951553919876	95.7543097300126	31.737	12.885	98.954	5.959
31.9342508320153	13.4662506579405	95.7994487734702	32.802	15.473	97.861	3.005
31.9348306529088	13.4657457536242	95.7988093367159	33.322	12.581	100.045	6.265
32.3926201961841	13.0671047264052	95.2939513238318	30.527	11.313	94.769	2.614
32.7733639238818	12.8156777851446	94.9353005157565	33.322	12.321	95.076	0.752
32.7730744596916	12.8160970811131	94.9344400499676	34.849	13.393	93.121	6.061
32.7727849956459	12.8165163769747	94.9335795840782	32.737	11.541	92.508	5.142
32.7724955324116	12.816935672326	94.9327191176672	31.957	11.541	90.999	8.595
31.4546777106903	14.725832290767	91.0153313048904	29.975	12.841	90.667	8.339
31.4543882470913	14.7262515858273	91.01447083846	31.697	14.433	93.007	8.117
31.2951990625086	14.9568416957793	90.541259809002	30.722	15.473	90.573	0.772
31.490621079596	14.859659534657	90.0950977702391	32.542	15.473	89.387	5.858
31.490621079596	14.859659534657	90.0950977702391	30.202	14.791	95.605	5.659
31.8743965397434	14.6688102569189	89.2189104741978	34.135	12.646	86.486	4.083
31.8743965397434	14.6688102569189	89.2189104741978	29.975	14.921	90.476	2.292
31.8743965397434	14.6688102569189	89.2189104741978	31.547	13.203	92.722	3.992
31.8747899930461	14.6686145949103	89.2180121920166	30.34	10.917	88.584	4.723
31.8751834460143	14.6684189326502	89.2171139097436	32.412	15.246	88.024	8.256
31.8755768993236	14.6682232704952	89.2162156275971	29.975	13.621	83.535	8.631
34.0687028885232	13.5775949338955	84.2091519245391	29.388	13.838	84.576	7.053
34.0687028885232	13.5775949338955	84.2091519245391	32.737	14.433	86.615	4.264
34.0690963418467	13.5773992717372	84.2082536423996	34.135	14.466	84.176	7.813
34.0690963418467	13.5773992717372	84.2082536423996	34.135	14.986	84.727	7.609
34.0694897950972	13.5772036098487	84.2073553601695	35.42	12.949	84.367	1.498
33.9105805075694	13.6420498924088	83.5106437675458	33.907	13.296	83.348	9.748
33.9103590435628	13.6421402656014	83.5096727956718	34.135	13.166	82.509	1.621
33.8231552390763	13.6777257396675	83.1273421168511	32.152	12.353	82.503	7.264
33.8231552390763	13.6777257396675	83.1273421168511	31.015	13.556	83.741	2.877
33.4285524912549	13.8473686577013	81.3094082978853	32.672	12.353	81.337	8.34
33.2639095180103	13.9181502069809	80.5508989775113	33.071	16.187	80.531	6.12
32.786614140912	14.1233434953457	78.3520005029144	31.047	11.313	78.28	6.138
32.786614140912	14.1233434953457	78.3520005029144	32.802	12.126	77.71	6.243

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
32.7864028960672	14.1234343106429	78.3510272977985	33.062	15.473	78.089	7.07
32.7864028960672	14.1234343106429	78.3510272977985	27.737	18.664	80.683	7.927
32.7240632927398	14.150234463727	78.0638290004704	32.835	14.173	77.958	0.155
30.6726469878166	14.0144537436879	77.5237243918891	30.202	14.271	77.775	0.592
30.7015231510668	13.5660081548286	76.9440127606662	29.007	10.282	76.107	4.077
30.7015231510668	13.5660081548286	76.9440127606662	32.282	12.126	74.654	3.133
30.7015231510668	13.5660081548286	76.9440127606662	29.975	12.581	76.539	3.034
30.7015231510668	13.5660081548286	76.9440127606662	31.437	11.541	78.241	2.677
30.7152335435088	13.3530948246179	76.6687771358765	30.787	12.906	76.252	6.569
30.7498285105711	12.8158345577736	75.9742536584767	30.787	12.646	75.914	0.184
30.3338126519804	14.1109752659285	75.6289357680082	29.197	13.52	74.598	8.532
29.7845666162249	15.8208860914489	75.1730294635945	27.483	19.616	74.587	4.477
30.2814639297436	15.3106721254601	75.1780664678738	32.182	16.632	75.383	9.605
31.1016319132696	14.4685215709546	75.1863801668364	32.087	14.661	75.705	1.421
31.7186818057758	13.8349341672237	75.1926350034812	28.626	11.234	75.345	4.284
32.35292892004	13.1836879008796	75.1990648828182	32.835	12.613	75.794	0.955
32.2899083491263	13.3313452373651	74.5518512957306	31.502	12.126	74.715	9.301
32.1480548207154	13.6637076934462	73.0950432884371	28.816	12.568	71.763	3.752
32.2475418112545	13.741955025123	72.9666141650104	30.785	16.251	71.611	3.205
32.2475418112545	13.741955025123	72.9666141650104	30.787	14.466	78.121	9.289
32.5777634599575	13.6780821798123	72.8271594750216	31.015	12.776	72.117	4.762
32.5786703964991	13.6779067567872	72.8267764699672	31.307	11.313	71.461	7.443
35.545642591458	13.1040230721657	71.5738057033546	37.452	12.758	72.01	1.986
34.0371269716304	13.353195513525	69.8821019230961	33.261	18.537	71.995	7.388
34.0371269716304	13.353195513525	69.8821019230961	32.477	14.433	75.823	7.82
33.9220126969201	13.3722096176926	69.7530083431862	31.356	16.251	69.04	5.882
33.9220126969201	13.3722096176926	69.7530083431862	30.531	18.664	72.004	6.676
32.8079875088746	13.556225284677	68.5037057143109	31.307	14.661	68.868	1.899
32.8080280786866	13.5558177727834	68.5027934160333	31.762	15.473	67.554	7.919
32.8101191477186	13.5348138915906	68.45577186894	28.753	13.457	65.491	9.22
32.8101191477186	13.5348138915906	68.45577186894	30.202	12.711	66.602	9.036
32.8868654436598	12.7639358663368	66.7300014005558	31.437	14.433	67.041	8.72
32.8869060140569	12.7635283562581	66.7290891014934	34.087	18.918	64.082	9.955
32.8869060140569	12.7635283562581	66.7290891014934	35.484	11.425	66.484	2.932
31.9021597981595	12.4905589686219	64.9879272706686	34.849	11.996	64.173	7.912
31.9016720303795	12.49042376047	64.987064831483	32.055	9.837	66.681	5.02
31.3818623826077	12.3463336760938	64.0679724814539	30.202	11.996	64.142	1.233
32.1738357751821	12.6015533991646	62.1566765458618	30.202	12.971	61.507	8.778
32.1738357751821	12.6015533991646	62.1566765458618	31.015	12.516	61.408	8.72
32.5843771144522	12.7338535852004	61.1659034448763	33.095	14.011	61.011	2.901
32.7746566544868	12.7951727560074	60.7066953140859	32.672	15.246	60.724	2.909
33.7531559595591	13.1105020958254	58.345249973057	33.387	11.313	58.128	9.319
33.7531559595591	13.1105020958254	58.345249973057	33.96	11.234	59.829	9.284
33.7535358821377	13.1106245291156	58.3443330930628	36.944	13.012	57.936	3.218
32.875132665904	13.3374662946906	57.1645829956957	30.658	9.71	56.048	8.685
32.875132665904	13.3374662946906	57.1645829956957	31.827	14.661	58.532	8.515
32.4212351435736	13.4546820771848	56.5549711478744	32.944	10.536	54.126	3.833
32.2381513419499	13.6226727445873	56.4448525426837	31.275	14.173	56.999	1.24
32.2784721787383	13.6327350236093	56.3091298980863	29.975	14.401	55.717	4.095
32.8196023852171	13.7677756322665	54.4876487262131	32.69	13.52	54.423	0.287
32.8300542407161	13.7717061517634	54.4555413596185	32.607	14.661	52.963	4.485
33.422709635487	13.9945798907933	52.6349452955773	33.907	13.036	49.61	3.305
33.422709635487	13.9945798907933	52.6349452955773	36.119	13.139	51.404	3.085
33.422709635487	13.9945798907933	52.6349452955773	34.135	14.206	54.088	1.632
33.422709635487	13.9945798907933	52.6349452955773	33.322	14.141	54.817	3.297
33.3249398425117	14.4868101019162	49.8865331209098	33.322	13.881	49.4	0.777
33.324036399624	14.5133826452437	49.875469606513	33.095	12.971	48.557	2.042
33.2886472996021	15.5542678648641	49.4420956155786	30.982	15.473	49.591	9.722
33.2452655414455	16.8302299316909	48.9108475015446	33.642	18.346	49.307	5.973
33.2318942178879	17.2235367519925	48.7470926270867	33.388	17.584	48.735	0.393
31.8939753530756	16.0275344052629	48.1151917429524	31.483	16.822	46.955	9.589
30.6816515186726	14.9438040509734	47.5426087184355	30.785	16.949	44.302	7.677
30.6809482992845	14.9431754248393	47.5422765864199	25.895	18.918	46.48	7.438
30.1690100005715	14.4855396665522	47.3004869332966	27.737	16.251	47.666	9.503
28.9259420678929	13.3743265835208	46.7133839904399	25.07	17.076	49.249	5.925
28.84474187707	13.3017393355546	46.6750328156694	28.499	12.949	46.85	0.524
28.8747202489895	13.3406156161241	46.5956399319479	33.322	13.361	37.986	9.946
28.8747202489895	13.3406156161241	46.5956399319479	27.991	13.647	44.302	2.618
29.1776858340379	13.7335042913501	45.7932850581466	28.626	10.091	52.872	7.98
29.6180962569259	14.304634953741	44.6269314923237	31.015	13.816	44.684	1.481
29.6181670190431	14.3051390210498	44.6260707316885	32.607	11.313	43.742	7.65
29.6181670190431	14.3051390210498	44.6260707316885	30.657	15.246	48.98	4.816
29.7247508400414	15.0643834477345	43.3295625935024	29.134	13.33	42.125	6.084
29.7247508400414	15.0643834477345	43.3295625935024	32.372	14.092	41.845	6.932
29.9084119329655	16.3726822263136	41.0954755136984	29.975	11.801	40.794	8.467
29.9084119329655	16.3726822263136	41.0954755136984	30.658	10.98	44.543	9.268
29.9084826947029	16.373186293114	41.0946147527341	31.015	13.296	40.037	5.495
29.9164309001183	16.4298050148708	40.9979310737531	33.095	13.231	40.765	6.668
29.940720551959	16.6028312816555	40.7024667110302	29.975	12.321	39.763	7.85
29.940720551959	16.6028312816555	40.7024667110302	30.787	13.686	41.698	6.343

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
29.9517467480957	16.6813759562432	40.5683417372549	32.372	18.537	39.944	3.113
29.4115979625973	16.5910122193242	40.101254432256	27.419	15.044	35.984	7.778
29.4115979625973	16.5910122193242	40.101254432256	24.371	14.346	43.342	7.57
29.2309082071235	16.5607834692714	39.9450047095777	26.34	17.203	39.025	3.101
29.2309082071235	16.5607834692714	39.9450047095777	29.642	15.108	43.621	5.237
29.2316635312724	16.5602136688492	39.9446809613591	33.96	19.68	39.41	7.146
29.2316635312724	16.5602136688492	39.9446809613591	30.785	20.823	44.268	6.267
30.2852195202002	14.840080071652	38.6436040425003	30.202	13.751	40.213	8.941
30.3097180971479	14.8000814138898	38.6133498122839	32.436	13.231	35.38	5.906
32.209196488388	11.6988157146629	36.2676103805232	32.217	11.541	36.145	0.2
32.7501408308873	12.7691771633649	37.1208613786948	33.642	10.155	35.22	3.353
32.7501408308873	12.7691771633649	37.1208613786948	34.135	14.726	38.301	3.323
33.1136325675803	13.4884139873054	37.6942096587636	33.095	13.491	38.538	0.844
33.9878502497564	15.0988690799675	36.4316494983988	33.095	14.271	36.737	9.731
34.6115978608158	16.2479157251198	35.5308230378001	36.436	17.076	35.413	2.007
33.1283383566284	16.5155271287256	34.6916152092619	31.567	14.661	34.796	2.638
30.1088637547806	17.0603041206186	32.9832384745075	30.023	17.203	33.037	0.175
30.0261853881363	16.9728494591143	32.8540968207005	30.202	13.491	28.883	9.735
29.9512953839469	16.8936330466742	32.7371200899717	31.61	17.775	32.188	4.415
29.2544986977448	16.1565815796106	31.6487408715194	24.308	15.044	33.546	9.423
28.8227604822477	15.6999013899963	30.9743762814196	30.15	16.06	32.059	8.901
28.8222921199373	15.6994059697315	30.9736447108437	24.244	15.997	28.696	8.356
28.8218237576789	15.698910549985	30.9729131398835	19.482	13.076	31.528	9.717
29.4643205757872	15.4718821344962	30.0843910338417	27.927	10.409	29.559	7.95
29.4643205757872	15.4718821344962	30.0843910338417	29.007	14.409	30.293	6.619
29.4648943673289	15.4716793832899	30.083597525672	30.787	13.946	28.148	7.399
29.8268751787068	15.3437721043376	29.5830067084002	32.022	15.473	29.854	6.4
30.7899731838038	15.0034582133993	28.2511186298901	33.322	14.401	29.372	5.546
32.8939954014604	14.2599949334696	25.3414228149377	28.181	12.441	28.249	9.321
32.9500533211722	14.2401865613745	25.2638991648809	32.152	15.246	27.742	4.552
32.9506271126284	14.2399838090223	25.2631056569423	30.594	9.52	26.782	7.585
33.1096385391598	14.183796035299	25.0432054843052	33.96	10.536	22.989	7.536
33.5315070234731	14.0347277345139	24.4597945831979	33.907	14.076	24.403	0.382
33.3693699896149	13.9573691005422	24.3260290348379	29.705	13.393	23.437	8.359
33.3693699896149	13.9573691005422	24.3260290348379	33.062	12.126	22.872	4.87
32.5738616608813	13.5778156067607	23.6697211988447	35.293	11.552	21.184	5.688
32.5731377635677	13.5774702198487	23.66912397145	33.833	10.282	23.21	9.452
31.7104057092206	13.1658428148528	22.9573549512712	34.087	11.615	26.904	4.861
30.8674140902132	12.7636345375239	22.261872937301	28.372	10.218	25.305	4.687
30.6058107455002	12.6388182794966	22.046045815592	28.816	12.25	22.231	9.823
30.2204608320815	12.4549598077314	21.7281254650899	30.202	12.451	21.726	0.019
31.4676659378876	12.4626661218643	21.1694239851617	32.867	11.313	21.273	1.814
31.3374230038366	13.3150552731022	20.6897477921838	32.182	10.98	18.901	7.118
31.3374230038366	13.3150552731022	20.6897477921838	31.827	11.313	19.849	3.091
31.1983921605946	14.2249545645862	20.1777090001859	31.61	13.901	20.326	7.404
31.0667993348354	15.0861811603334	19.6930601677835	31.242	15.473	19.727	0.426
30.1432996762325	14.5698778809644	18.9071476594397	35.992	16.314	18.057	6.3
29.669325769087	14.3048911411396	18.5037889423396	29.975	14.141	17.903	0.982
29.3476313251084	14.1250410631863	18.2300218193505	27.864	18.854	16.375	5.87
29.3476313251084	14.1250410631863	18.2300218193505	28.689	18.156	16.722	4.491
28.0739218837348	13.4129438502931	17.1460756480968	22.022	11.361	19.929	6.97
28.2409024708672	13.2891014692701	15.9941223396817	25.895	12.123	19.556	4.686
28.2409024708672	13.2891014692701	15.9941223396817	30.657	11.541	18.351	6.88
28.4812564620326	13.1108410734068	14.3359864982002	26.149	11.107	19.141	6.643
28.4812564620326	13.1108410734068	14.3359864982002	31.242	12.126	17.355	5.83
28.7293571283604	12.9268353228501	12.6244084028285	29.975	12.061	16.621	7.414
28.7294997777537	12.9267295244923	12.6234243002635	31.372	12.353	15.396	3.954
28.7296424275345	12.9266237270174	12.6224401976598	31.632	15.246	15.179	4.737
28.7297850766818	12.9265179284394	12.6214560950828	31.112	15.246	13.662	8.972
28.7297850766818	12.9265179284394	12.6214560950828	30.787	13.426	19.207	9.125
28.7299277264636	12.9264121300424	12.6204719925785	29.134	16.187	10.819	3.747
28.7299277264636	12.9264121300424	12.6204719925785	31.762	12.126	11.712	6.006
28.8139354742998	11.7565316854639	11.7341531469998	30.787	11.313	10.711	9.249
28.8139354742998	11.7565316854639	11.7341531469998	33.095	13.751	14.049	7.425
28.8522950562617	11.2223431252102	11.3294441196709	28.753	10.79	11.577	0.508
29.8892039796183	10.3931378499751	6.38878581604852	29.451	10.155	5.592	0.94
32.44846852273	11.0234317765768	7.31477820471239	31.177	14.433	6.693	9.897
33.6316368444653	11.3148216488274	7.74287184942721	33.647	11.313	7.765	0.027
33.6817130152717	11.8475826016139	6.22258032872393	31.567	11.313	0.396	7.667
33.6817130152717	11.8475826016139	6.22258032872393	31.015	13.036	5.79	5.03
33.6817130152717	11.8475826016139	6.22258032872393	31.399	13.754	2.704	6.233
33.6817130152717	11.8475826016139	6.22258032872393	32.022	12.126	9.107	7.596
33.6817130152717	11.8475826016139	6.22258032872393	31.892	15.246	4.139	6.832
33.6817130152717	11.8475826016139	6.22258032872393	33.322	12.841	4.069	4.98
33.6817130152717	11.8475826016139	6.22258032872393	33.452	11.541	6.941	4.46
33.6817130152717	11.8475826016139	6.22258032872393	34.087	8.758	8.639	5.137
33.6817130152717	11.8475826016139	6.22258032872393	32.932	15.246	4.376	6.384
33.6817130152717	11.8475826016139	6.22258032872393	34.135	12.386	7.828	5.584
33.6817130152717	11.8475826016139	6.22258032872393	35.166	10.726	7.803	5.004
33.6817130152717	11.8475826016139	6.22258032872393	34.135	13.686	10.417	4.602

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
33.6910086298884	11.9464788575512	5.94036909141984	32.997	11.541	6.26	0.865
33.7349051502186	12.4134936092295	4.60769217586319	32.542	12.126	4.969	1.441
33.7712337787805	12.7999920829582	3.5047747283687	34.135	12.906	3.426	0.387
33.0667169030495	13.0027885673443	2.46851320664	33.127	11.313	0.11	2.902
32.4680883875196	13.8420390002418	2.56388656596452	30.787	13.166	3.014	1.867
31.9775383999973	17.6044908230207	2.45724260266003	32.69	18.346	2.359	1.033
29.5680594697284	17.8326027852133	2.67790125733168	29.959	17.584	8.664	6.004
29.5670651576344	17.8326984759032	2.67794802005394	28.308	15.933	3.524	3.661
26.3898945163079	18.1384632613113	2.82737000265889	24.625	19.68	11.726	9.202
26.388899475058	18.1385423573252	2.82730969734014	25.07	16.314	3.298	2.3
26.090040757372	18.8078776242144	2.62495637750426	26.149	19.045	2.783	0.291
24.7909708661963	18.975771662669	0.868157331441115	24.943	19.108	0.303	0.6
20.4051529812959	18.0219474141014	2.65410176453715	20.117	18.283	2.485	0.424
18.1920520868466	14.8365048199967	5.94803030324106	22.149	11.742	1.36	9.67
17.8391579766111	14.3285641670152	6.47326963940637	20.434	13.012	7.24	7.723
17.7588644970934	14.2129931555581	6.59277667840112	18.466	14.155	8.671	2.196

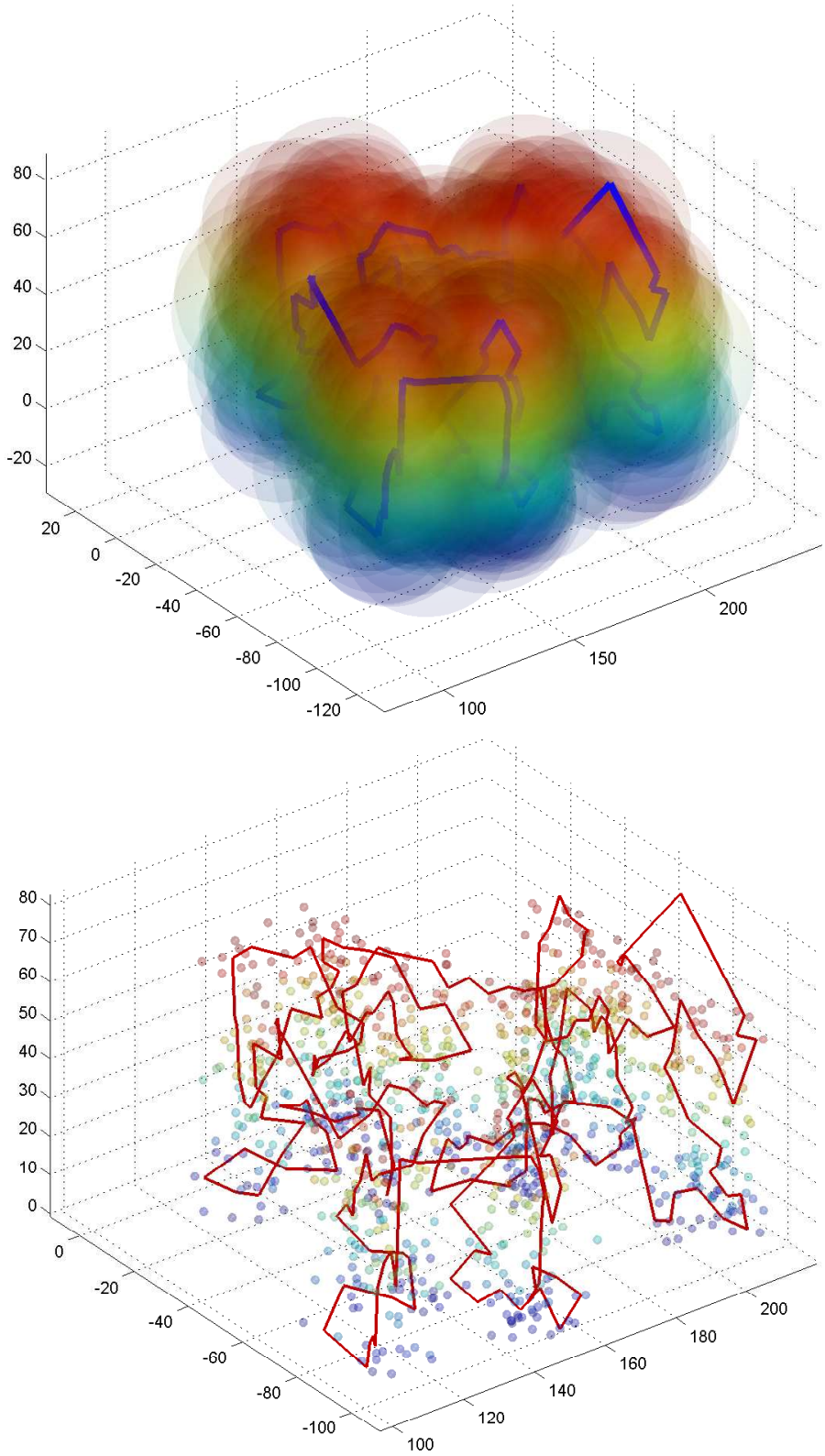


Figure N.104: $dsj1000$, arbitrary radius, 3D, Euclidean, Length = 2074.8438211

Table N-107: Solution for $dsj1000$, arbitrary radius, 3D, Euclidean

Total distance: 2074.84382108725 Depot: x 47.1287 y 11.9659 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
46.5176656985614	16.28882341	2.0548	46.503	16.5426	2.0548	0.2542
46.3698074051312	12.596970028	10.5923	47.1015	12.1757	10.5923	0.8443
45.1242015926803	9.537142697	12.1988	44.5689	9.75	12.1988	0.5947
46.2962331216839	5.550591164	15.6271	43.984	9.2005	15.6271	7.1984
47.4682638238551	1.56404134	11.9932	48.302	2.6164	11.9932	1.3426
46.5704565904221	-5.035098342	9.1179	46.0937	-5.8176	9.1179	0.9163
52.2998621823482	-0.756988393	7.37283229430252	47.4524	12.1509	5.76	13.8821
52.2998621823482	-0.756988393	7.37283229430252	42.4139	3.5597	1.814	13.287
52.2998621823482	-0.756988393	7.37283229430252	56.6752	3.9284	4.2715	9.6519
52.2998621823482	-0.756988393	7.37283229430252	48.4975	2.4432	11.2037	10.4173
52.2998621823482	-0.756988393	7.37283229430252	58.2741	0.1622	8.0145	6.0785
56.9959241755331	1.974661399	4.559	58.2864	0.0731	4.559	2.2981
59.417340770872	8.058081308	8.3998	59.4358	8.0877	8.3998	0.0349
58.0520664057707	8.065565733	10.3193978885666	57.2331	12.7874	5.1838	7.0243
58.0520664057707	8.065565733	10.3193978885666	58.0725	5.2013	11.1785	2.9904
57.2325939776183	17.785990249	14.5887556126397	44.2621	15.3855	4.7212	17.5289
57.2325939776183	17.785990249	14.5887556126397	55.8132	15.4408	3.6174	11.5975
57.2325939776183	17.785990249	14.5887556126397	54.0368	23.8586	2.2143	14.1498
57.2325939776183	17.785990249	14.5887556126397	53.9046	16.3668	14.1276	12.2702
57.2325939776183	17.785990249	14.5887556126397	53.4554	15.0784	17.1477	7.1719
57.2325939776183	17.785990249	14.5887556126397	70.1037	27.3839	19.7642	17.3373
57.2325939776183	17.785990249	14.5887556126397	67.242	26.9141	23.9429	16.4624
54.5216289299418	24.089266623	11.1642	54.5895	27.7676	11.1642	3.8179
51.8106601754094	30.392545052	8.17645896505564	37.4272	33.8061	3.3013	15.7441
51.8106601754094	30.392545052	8.17645896505564	45.4526	36.121	9.3446	8.6374
51.8106601754094	30.392545052	8.17645896505564	44.3651	39.5082	4.2576	12.4052
51.8106601754094	30.392545052	8.17645896505564	62.6603	37.129	7.3175	12.7997
47.936758496299	32.726614029	2.5661	44.1303	30.8739	2.5661	4.2334
46.664396539832	36.326928112	11.2293	45.4903	38.3462	11.2293	2.3358
51.3600212481886	29.663178572	20.2211085818109	46.5714	10.174	4.4604	27.098
51.3600212481886	29.663178572	20.2211085818109	41.9974	13.5778	7.3366	24.1613
51.3600212481886	29.663178572	20.2211085818109	52.0306	12.0787	8.641	25.2448
51.3600212481886	29.663178572	20.2211085818109	52.3173	10.0275	11.1526	24.0147
51.3600212481886	29.663178572	20.2211085818109	44.5228	11.8645	13.3212	25.0082
51.3600212481886	29.663178572	20.2211085818109	47.5893	27.8934	1.3329	19.7112
51.3600212481886	29.663178572	20.2211085818109	53.915	28.4629	8.3577	20.5718
51.3600212481886	29.663178572	20.2211085818109	50.8592	31.2824	4.4654	23.4486
51.3600212481886	29.663178572	20.2211085818109	54.8257	29.6059	7.5612	17.9639
51.3600212481886	29.663178572	20.2211085818109	45.8725	14.3747	21.2711	19.0119
51.3600212481886	29.663178572	20.2211085818109	49.5432	29.0024	13.3417	8.1871
51.3600212481886	29.663178572	20.2211085818109	57.9508	29.6187	7.6435	14.7612
51.3600212481886	29.663178572	20.2211085818109	47.2412	18.0641	21.8927	26.9311
51.3600212481886	29.663178572	20.2211085818109	63.3607	23.5913	11.9128	24.1094
51.3600212481886	29.663178572	20.2211085818109	40.715	18.8306	21.9165	23.0792
51.3600212481886	29.663178572	20.2211085818109	43.7231	10.6871	23.6231	24.1762
51.3600212481886	29.663178572	20.2211085818109	45.6407	35.658	2.8521	25.0567
51.3600212481886	29.663178572	20.2211085818109	49.9475	19.2284	25.6639	17.8419
51.3600212481886	29.663178572	20.2211085818109	66.7482	27.6121	12.1372	22.4893
51.3600212481886	29.663178572	20.2211085818109	50.3723	32.2399	19.4829	6.6627
51.3600212481886	29.663178572	20.2211085818109	49.0558	10.279	28.6803	25.3924
51.3600212481886	29.663178572	20.2211085818109	62.5649	23.4331	22.9907	17.3284
51.3600212481886	29.663178572	20.2211085818109	45.9242	19.9	29.6168	25.1738
51.3600212481886	29.663178572	20.2211085818109	58.6228	31.6703	20.587	25.6598
51.3600212481886	29.663178572	20.2211085818109	66.5887	34.1226	10.8677	18.4197
51.3600212481886	29.663178572	20.2211085818109	45.985	27.4123	27.7797	25.7471
51.3600212481886	29.663178572	20.2211085818109	50.5738	30.8854	25.5173	21.7078
51.3600212481886	29.663178572	20.2211085818109	66.9624	36.7077	4.2616	25.6742
51.3600212481886	29.663178572	20.2211085818109	43.7884	36.8808	19.8614	16.446
51.3600212481886	29.663178572	20.2211085818109	64.2717	31.7627	18.8904	14.3523
51.3600212481886	29.663178572	20.2211085818109	50.3352	41.2014	16.9793	12.9522
51.3600212481886	29.663178572	20.2211085818109	56.2795	36.0371	23.7369	11.477
51.3600212481886	29.663178572	20.2211085818109	46.9054	30.8841	31.5685	23.9447
51.3600212481886	29.663178572	20.2211085818109	55.9275	34.3566	30.6301	23.3784
51.3600212481886	29.663178572	20.2211085818109	48.325	36.101	31.2943	13.1633
51.3600212481886	29.663178572	20.2211085818109	58.8785	37.4935	28.0133	17.2077
51.3600212481886	29.663178572	20.2211085818109	63.8119	26.0212	34.0563	22.8759
51.3600212481886	29.663178572	20.2211085818109	58.4334	33.3219	33.0094	26.7455
51.3600212481886	29.663178572	20.2211085818109	54.3132	33.4794	38.814	25.0485
52.5061313676425	20.225577921	21.5972258925156	49.9971	19.9155	18.5508	3.9588
52.5061313676425	20.225577921	21.5972258925156	53.2794	21.4994	19.0176	2.9791
52.5061313676425	20.225577921	21.5972258925156	51.6732	17.1776	23.9169	3.9198
55.0898568036577	17.411197534	26.5423	55.9782	19.9329	26.5423	2.6736
56.9151399285465	12.443858859	18.9413057406729	46.6598	16.011	21.0885	13.039
56.9151399285465	12.443858859	18.9413057406729	61.7542	11.527	18.9198	4.9252
56.9151399285465	12.443858859	18.9413057406729	60.2628	6.0605	25.9406	10.0471
58.2009681160886	7.580695787	27.9807	60.5785	6.8128	27.9807	2.6428

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
59.4867965185408	2.717532714	27.7653	62.7821	-0.0838	27.7653	4.3251
55.5819082598929	2.266989732	21.782310479985	49.1677	19.2175	6.1526	29.9217
55.5819082598929	2.266989732	21.782310479985	52.3291	3.6705	6.1162	19.2214
55.5819082598929	2.266989732	21.782310479985	54.5841	1.3	6.274	17.8466
55.5819082598929	2.266989732	21.782310479985	51.545	-0.7619	6.4521	25.0267
55.5819082598929	2.266989732	21.782310479985	58.5415	3.6684	5.0311	22.039
55.5819082598929	2.266989732	21.782310479985	58.8992	5.3006	6.9433	25.2792
55.5819082598929	2.266989732	21.782310479985	58.6741	1.1796	4.0744	18.8015
55.5819082598929	2.266989732	21.782310479985	48.7027	4.8736	15.3944	25.6148
55.5819082598929	2.266989732	21.782310479985	64.6914	7.7788	3.6297	22.2178
55.5819082598929	2.266989732	21.782310479985	44.8479	-0.9391	15.0769	19.1888
55.5819082598929	2.266989732	21.782310479985	53.1154	7.9184	18.71	19.9574
55.5819082598929	2.266989732	21.782310479985	62.4332	-0.684	2.8792	29.6949
55.5819082598929	2.266989732	21.782310479985	61.9524	-0.333	11.9086	23.4378
55.5819082598929	2.266989732	21.782310479985	58.3955	-2.2935	14.9348	20.2689
55.5819082598929	2.266989732	21.782310479985	39.9467	-2.3317	18.5214	24.6235
55.5819082598929	2.266989732	21.782310479985	56.047	-0.6998	19.4659	25.6513
55.5819082598929	2.266989732	21.782310479985	63.0749	1.8033	17.7213	22.3131
55.5819082598929	2.266989732	21.782310479985	53.8048	-5.0553	19.1679	14.1877
55.5819082598929	2.266989732	21.782310479985	57.7618	2.6586	23.6599	24.3155
55.5819082598929	2.266989732	21.782310479985	57.7878	-4.3732	24.6962	27.1183
55.5819082598929	2.266989732	21.782310479985	53.5826	-3.7128	29.3577	20.6553
55.5819082598929	2.266989732	21.782310479985	50.0191	-2.6033	31.7826	29.6269
55.5819082598929	2.266989732	21.782310479985	54.3108	6.5803	34.1725	23.4136
55.5819082598929	2.266989732	21.782310479985	46.3909	8.819	37.7186	24.8054
55.5819082598929	2.266989732	21.782310479985	59.6709	-1.5476	33.1451	26.9171
55.5819082598929	2.266989732	21.782310479985	53.4617	5.8056	38.0578	21.7012
55.5819082598929	2.266989732	21.782310479985	61.565	4.5717	36.954	20.8967
55.5819082598929	2.266989732	21.782310479985	51.32	11.9016	40.4537	29.8963
55.5819082598929	2.266989732	21.782310479985	53.289	-9.6645	34.2743	25.3042
55.5819082598929	2.266989732	21.782310479985	63.4243	4.3429	39.6925	22.7299
55.5819082598929	2.266989732	21.782310479985	55.7669	1.6852	42.4618	24.4965
51.6770205524382	1.816447246	20.0441	51.7765	0.7553	20.0441	1.0658
47.24366635862	7.003065748	27.4465	46.0043	6.8606	27.4465	2.7263
42.8103123412208	12.189684397	26.0562599517073	31.9656	14.6164	16.7619	14.4873
42.8103123412208	12.189684397	26.0562599517073	48.0446	14.6778	22.9405	8.8581
42.8103123412208	12.189684397	26.0562599517073	44.3034	16.6265	25.3299	9.4533
42.8103123412208	12.189684397	26.0562599517073	45.0418	3.8658	25.2247	10.1722
42.8103123412208	12.189684397	26.0562599517073	40.2335	17.1357	30.0024	11.2782
42.8103123412208	12.189684397	26.0562599517073	33.6792	4.7017	30.2163	13.2435
42.8103123412208	12.189684397	26.0562599517073	44.7075	13.3055	33.9605	12.6011
42.8103123412208	12.189684397	26.0562599517073	43.7175	13.3612	37.2361	11.2776
41.1374509309385	16.445976184	33.0871127477139	61.1622	34.1592	24.5106	28.1161
41.1374509309385	16.445976184	33.0871127477139	23.1615	20.5337	28.672	18.9562
41.1374509309385	16.445976184	33.0871127477139	28.6989	1.5656	37.4478	19.8786
41.1374509309385	16.445976184	33.0871127477139	20.7311	19.0512	39.2565	27.1888
41.1374509309385	16.445976184	33.0871127477139	17.3215	22.815	38.4524	26.1071
41.1374509309385	16.445976184	33.0871127477139	39.7266	17.3977	50.5452	17.8866
41.1374509309385	16.445976184	33.0871127477139	47.3356	31.1656	48.6863	22.3253
41.1374509309385	16.445976184	33.0871127477139	21.7951	21.835	45.5134	24.0928
41.1374509309385	16.445976184	33.0871127477139	50.8742	24.2729	53.2264	23.767
41.1374509309385	16.445976184	33.0871127477139	22.5923	19.795	49.1879	27.7634
41.1374509309385	16.445976184	33.0871127477139	23.1689	25.59	48.8728	25.7524
48.3993617491808	17.620887689	33.0294	51.539	18.7116	33.0294	3.3237
52.1523998698929	17.576814592	33.7507	52.4859	17.4578	33.7507	0.3541
51.8016672894454	18.997234473	39.8787508353155	58.5931	27.1316	32.5338	12.8934
51.8016672894454	18.997234473	39.8787508353155	47.5448	13.9665	39.1563	6.8471
51.8016672894454	18.997234473	39.8787508353155	47.9812	30.2306	39.2099	11.8841
51.8016672894454	18.997234473	39.8787508353155	53.965	12.2967	46.7771	9.8572
47.2905976166674	15.280203261	43.6031900430823	24.5208	1.7631	30.0851	29.7307
47.2905976166674	15.280203261	43.6031900430823	48.2378	10.888	40.0435	5.8133
47.2905976166674	15.280203261	43.6031900430823	46.213	15.3079	43.6977	3.873
47.2905976166674	15.280203261	43.6031900430823	59.5552	26.5288	41.5263	17.0515
47.2905976166674	15.280203261	43.6031900430823	65.4552	32.6167	36.7679	29.012
47.2905976166674	15.280203261	43.6031900430823	51.7623	34.8081	42.2217	20.8873
47.2905976166674	15.280203261	43.6031900430823	47.6091	10.2274	48.878	11.8474
47.2905976166674	15.280203261	43.6031900430823	46.003	37.4534	46.4333	29.0578
47.2905976166674	15.280203261	43.6031900430823	46.8369	6.4403	54.1626	14.1993
47.2905976166674	15.280203261	43.6031900430823	55.1607	27.7715	51.8295	18.2237
47.2905976166674	15.280203261	43.6031900430823	53.7123	16.59	54.3027	19.1512
47.2905976166674	15.280203261	43.6031900430823	61.1452	36.2851	50.8184	29.605
47.2905976166674	15.280203261	43.6031900430823	45.9074	18.6439	58.1761	15.0199
47.2905976166674	15.280203261	43.6031900430823	55.089	27.0379	56.5554	20.8338
47.2905976166674	15.280203261	43.6031900430823	49.309	3.6922	59.7251	20.878
46.4146488978415	13.134456506	48.1934	47.2642	16.1804	48.1934	3.1622
44.8941157814112	8.677644947	57.1732	45.5397	7.2979	57.1732	4.7628
43.3735826649812	4.220833388	52.881304354462	48.6326	32.1618	43.4727	29.9479
43.3735826649812	4.220833388	52.881304354462	33.4349	0.0139	45.2628	13.2105
43.3735826649812	4.220833388	52.881304354462	44.2937	4.7268	51.9613	3.889
43.3735826649812	4.220833388	52.881304354462	36.4279	-4.3699	52.432	20.2708

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
43.3735826649812	4.220833388	52.881304354462	60.4719	1.0667	55.1539	17.5347
43.3735826649812	4.220833388	52.881304354462	25.8989	0.7413	53.4706	22.2466
43.3735826649812	4.220833388	52.881304354462	33.7832	8.5886	57.2507	17.2676
43.3735826649812	4.220833388	52.881304354462	30.7839	5.7178	56.2846	20.1469
43.3735826649812	4.220833388	52.881304354462	36.7928	9.6586	58.8057	12.2244
43.3735826649812	4.220833388	52.881304354462	44.3097	5.4051	59.4302	11.9467
43.3735826649812	4.220833388	52.881304354462	43.0131	-4.6452	57.9101	20.9992
43.3735826649812	4.220833388	52.881304354462	54.4331	-6.2551	57.3764	16.56
43.3735826649812	4.220833388	52.881304354462	31.0065	-1.0714	59.1851	23.9753
33.7178921863161	1.376620791	57.7289	31.1391	0.2266	57.7289	2.8236
28.9076134702128	0.693235372	56.2730022865762	27.6562	5.4902	56.4427	8.29
28.9076134702128	0.693235372	56.2730022865762	27.3755	-1.0984	56.1861	2.359
28.9076134702128	0.693235372	56.2730022865762	22.4229	-2.1641	56.3911	7.0873
28.141523221008	2.508132668	42.3459143774002	31.7997	5.4917	35.1341	9.7028
28.141523221008	2.508132668	42.3459143774002	29.6205	6.6839	35.8272	7.8815
27.3754329460157	4.323029934	40.6466104980386	31.1128	-2.8096	30.5667	18.9309
27.3754329460157	4.323029934	40.6466104980386	22.6294	-1.9579	25.7184	16.8768
27.3754329460157	4.323029934	40.6466104980386	29.2732	5.6917	40.0529	15.7976
26.6093416437894	6.137927226	28.7607999998303	23.1228	16.7524	24.3445	13.0518
26.6093416437894	6.137927226	28.7607999998303	29.4417	11.4808	30.7206	11.6626
26.6093416437894	6.137927226	28.7607999998303	24.8641	0.1355	28.7608	6.251
26.1189477754427	8.901033705	23.4128326526174	26.246	7.8923	16.6585	7.1855
26.1189477754427	8.901033705	23.4128326526174	29.2451	9.0499	23.6495	5.6713
25.6285536473519	11.664140037	23.6118462878035	24.5729	19.8583	16.0395	11.2071
25.6285536473519	11.664140037	23.6118462878035	26.4488	5.1021	19.0029	9.3497
25.6285536473519	11.664140037	23.6118462878035	17.2669	18.1061	25.0094	10.6475
31.4979259336953	8.515083167	27.1858	29.9497	8.0977	27.1858	1.6035
37.8152878596642	5.486798925	29.7476	36.2059	6.8965	29.7476	2.2375
44.1326497710107	2.458514689	38.5675	42.4155	0.0668	38.5675	2.9443
50.7848359971597	5.121234526	35.0656415560433	52.5136	31.162	22.8965	28.7958
50.7848359971597	5.121234526	35.0656415560433	36.4235	4.5159	28.6582	16.6099
50.7848359971597	5.121234526	35.0656415560433	44.0031	6.0986	31.1209	17.8329
50.7848359971597	5.121234526	35.0656415560433	58.0726	3.0503	30.5544	10.1594
50.7848359971597	5.121234526	35.0656415560433	54.6523	25.2022	31.3259	28.2307
50.7848359971597	5.121234526	35.0656415560433	43.7681	7.8375	35.3656	19.4193
50.7848359971597	5.121234526	35.0656415560433	46.684	28.1154	34.4272	27.5206
50.7848359971597	5.121234526	35.0656415560433	46.4115	30.3033	33.5708	28.1751
50.7848359971597	5.121234526	35.0656415560433	55.3647	9.0137	38.8085	9.4748
50.7848359971597	5.121234526	35.0656415560433	51.9742	12.9315	39.5168	19.8738
50.7848359971597	5.121234526	35.0656415560433	50.2911	5.2466	39.9878	6.9728
50.7848359971597	5.121234526	35.0656415560433	48.9393	11.7496	40.9103	17.8826
50.7848359971597	5.121234526	35.0656415560433	53.412	-4.2453	38.3008	16.6165
50.7848359971597	5.121234526	35.0656415560433	52.1655	19.1446	41.5432	15.5087
50.7848359971597	5.121234526	35.0656415560433	55.5686	2.3786	41.1094	17.8085
50.7848359971597	5.121234526	35.0656415560433	40.2323	12.6508	42.5989	15.4062
50.7848359971597	5.121234526	35.0656415560433	62.9268	27.0211	37.7555	28.5574
50.7848359971597	5.121234526	35.0656415560433	49.1449	22.3659	43.2644	23.3416
50.7848359971597	5.121234526	35.0656415560433	49.2438	-0.5725	42.7886	17.8927
50.7848359971597	5.121234526	35.0656415560433	60.1802	30.671	38.4138	27.7411
50.7848359971597	5.121234526	35.0656415560433	50.9668	1.717	44.4164	23.9816
50.7848359971597	5.121234526	35.0656415560433	43.4311	0.4843	45.1031	25.8563
50.7848359971597	5.121234526	35.0656415560433	60.4167	1.4088	44.4464	18.4179
50.7848359971597	5.121234526	35.0656415560433	27.9452	7.0873	43.7392	24.5101
50.7848359971597	5.121234526	35.0656415560433	52.0607	4.6851	47.5572	25.9984
50.7848359971597	5.121234526	35.0656415560433	54.6465	1.327	47.163	23.7327
50.7848359971597	5.121234526	35.0656415560433	52.2056	3.4977	49.7426	20.8953
50.7848359971597	5.121234526	35.0656415560433	38.0686	7.3443	51.7798	25.6467
50.7848359971597	5.121234526	35.0656415560433	50.5069	12.3029	52.6774	19.1593
50.7848359971597	5.121234526	35.0656415560433	58.2987	1.8222	52.9601	22.9315
50.7848359971597	5.121234526	35.0656415560433	56.514	2.6652	55.8183	22.7885
50.7848359971597	5.121234526	35.0656415560433	47.7278	5.7114	59.7593	28.1097
52.0829244251358	1.704616366	38.4463	52.8937	1.339	38.4463	0.8894
54.5838921929086	3.611716128	40.6861	55.5508	6.709	40.6861	3.2447
58.246739027606	1.665879897	43.0611450641	62.5325	1.766	39.3982	5.6387
58.246739027606	1.665879897	43.0611450641	57.3839	0.9502	46.0215	3.1655
53.6363835757058	1.739190326	47.1574564973092	49.5265	1.5006	43.2383	5.684
53.6363835757058	1.739190326	47.1574564973092	54.7597	1.1902	50.9644	4.007
52.7826712414551	2.83484262	53.9783	51.8363	2.0767	53.9783	1.2126
55.4652577695549	6.763446847	52.4724032049032	51.2901	7.6487	52.6277	4.2708
55.4652577695549	6.763446847	52.4724032049032	56.6229	3.2945	52.4352	3.6572
58.0437619266964	12.844558208	53.4701	58.6318	9.4344	53.4701	7.474
60.6222657120977	18.925669361	53.5518	63.3795	20.1125	53.5518	3.6505
63.2007694582115	25.006780394	42.1255	61.643	23.6955	42.1255	3.0344
65.7792734662125	31.087891613	45.292	68.3676	27.331	45.292	4.5622
67.7548901336807	38.044079253	35.7169459598801	75.4748	37.8532	8.3059	28.9661
67.7548901336807	38.044079253	35.7169459598801	63.132	27.7543	33.1939	11.7407
67.7548901336807	38.044079253	35.7169459598801	67.5765	27.7962	32.158	15.1317
67.7548901336807	38.044079253	35.7169459598801	69.5886	28.6002	31.4169	10.8714
67.7548901336807	38.044079253	35.7169459598801	63.5739	32.9982	33.2424	17.0906
67.7548901336807	38.044079253	35.7169459598801	64.4232	44.0581	27.3148	28.7966

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
67.7548901336807	38.044079253	35.7169459598801	71.8327	48.0379	13.6369	28.84
67.7548901336807	38.044079253	35.7169459598801	63.8645	34.3723	36.4179	14.5693
67.7548901336807	38.044079253	35.7169459598801	70.4096	46.4113	26.9931	21.9243
67.7548901336807	38.044079253	35.7169459598801	65.3289	43.5846	33.8262	21.6754
67.7548901336807	38.044079253	35.7169459598801	67.6648	48.1141	30.5928	12.6345
67.7548901336807	38.044079253	35.7169459598801	65.211	38.9167	43.4098	22.6036
67.7548901336807	38.044079253	35.7169459598801	72.4429	44.8985	35.9587	21.9495
67.7548901336807	38.044079253	35.7169459598801	70.8564	51.5507	32.2844	19.1375
67.7548901336807	38.044079253	35.7169459598801	72.4926	42.7909	40.5929	23.9047
67.7548901336807	38.044079253	35.7169459598801	72.9378	43.4347	40.5471	22.409
67.7548901336807	38.044079253	35.7169459598801	72.0385	47.603	37.589	19.8624
67.7548901336807	38.044079253	35.7169459598801	80.7698	50.729	27.0276	24.0359
67.7548901336807	38.044079253	35.7169459598801	73.8072	55.2741	29.1095	22.0263
67.7548901336807	38.044079253	35.7169459598801	89.3464	46.1786	22.3858	28.4968
67.7548901336807	38.044079253	35.7169459598801	64.8516	39.5774	48.8657	16.3435
67.7548901336807	38.044079253	35.7169459598801	69.1689	51.2673	37.9561	13.4858
67.7548901336807	38.044079253	35.7169459598801	87.2346	40.5435	32.6709	24.2659
67.7548901336807	38.044079253	35.7169459598801	70.5497	45.0925	44.08	13.3393
67.7548901336807	38.044079253	35.7169459598801	75.9853	41.4015	43.6031	28.8962
67.7548901336807	38.044079253	35.7169459598801	88.4465	41.4478	32.5802	21.203
67.7548901336807	38.044079253	35.7169459598801	69.1565	53.343	39.551	16.8114
67.7548901336807	38.044079253	35.7169459598801	72.7013	43.6681	47.6828	23.6645
67.7548901336807	38.044079253	35.7169459598801	67.4683	58.2291	37.5546	22.4924
67.7548901336807	38.044079253	35.7169459598801	69.8977	54.8286	42.1718	26.5823
67.7548901336807	38.044079253	35.7169459598801	81.1686	57.7423	31.0101	24.938
67.7548901336807	38.044079253	35.7169459598801	90.014	39.915	40.6629	25.9424
67.7548901336807	38.044079253	35.7169459598801	93.2846	41.9379	42.3812	28.0563
67.7548901336807	38.044079253	35.7169459598801	77.4079	49.147	51.5989	24.2468
59.6704376921546	35.270681719	34.7792270583555	55.4854	26.8201	32.387	10.8698
59.6704376921546	35.270681719	34.7792270583555	60.463	30.4795	30.5011	7.3122
59.6704376921546	35.270681719	34.7792270583555	62.464	33.4003	33.7046	5.2338
59.6704376921546	35.270681719	34.7792270583555	60.9493	37.7343	34.646	9.1697
59.6704376921546	35.270681719	34.7792270583555	63.453	34.6286	41.047	7.4277
51.5859852423111	32.497284202	36.4894910962363	47.9603	31.0225	36.0363	3.9403
51.5859852423111	32.497284202	36.4894910962363	51.0819	30.8837	36.7669	1.7131
51.587685559872	37.195121487	39.3047	51.6292	37.4529	39.3047	0.2611
50.5892654991424	35.682857009	41.3945124092282	53.589	37.6567	38.7584	4.7875
50.5892654991424	35.682857009	41.3945124092282	50.1654	34.298	41.7388	3.7703
49.5908454994866	34.170592455	44.7564937003837	44.7872	36.1398	42.3342	5.7289
49.5908454994866	34.170592455	44.7564937003837	51.473	33.7115	46.7085	2.7502
50.7308104341927	31.44574676	51.2249	53.8796	31.7093	51.2249	3.1598
51.4145411686334	28.682713015	52.4902	52.7074	28.2489	52.4902	1.3637
48.2094100402699	27.224569099	47.2334	48.493	25.186	47.2334	2.0582
44.4584108143601	29.690367966	49.9927	44.6028	29.9319	49.9927	0.2814
39.4591912569041	30.068162873	44.1355054137298	22.0744	6.6433	40.1203	29.8611
39.4591912569041	30.068162873	44.1355054137298	21.1889	21.267	39.0474	20.9082
39.4591912569041	30.068162873	44.1355054137298	17.7323	26.9057	35.8248	28.6742
39.4591912569041	30.068162873	44.1355054137298	45.9581	33.5048	45.1742	9.009
39.4591912569041	30.068162873	44.1355054137298	19.3676	20.9011	45.1036	22.1053
39.4591912569041	30.068162873	44.1355054137298	64.2784	38.8059	47.0778	29.0239
39.4591912569041	30.068162873	44.1355054137298	40.9959	37.9409	51.1587	12.8365
39.4591912569041	30.068162873	44.1355054137298	66.7168	38.698	48.2341	29.069
39.4591912569041	30.068162873	44.1355054137298	16.9754	26.2994	50.4148	25.4942
36.3766611588534	31.327670255	58.7469	35.5392	31.6783	58.7469	0.9079
42.5204635465315	28.724279985	57.2588	47.4152	28.2569	57.2588	4.917
47.1357626098388	26.266840841	59.9150999851367	47.4903	33.2139	54.5514	11.8665
47.1357626098388	26.266840841	59.9150999851367	52.0827	15.9727	59.9151	11.4211
50.818708804773	25.749545818	62.7836170302742	50.1386	26.6573	56.0437	9.4164
50.818708804773	25.749545818	62.7836170302742	56.8778	27.618	56.4108	8.9898
54.5016580444962	25.232251501	59.9569	54.2786	24.4277	59.9569	0.8349
60.5790172129519	33.351391066	59.234	62.0243	36.102	59.234	3.1072
63.3940926040669	35.261872488	52.1948848622969	58.9981	26.6128	49.6223	10.0374
63.3940926040669	35.261872488	52.1948848622969	60.8351	33.4935	47.8851	6.3537
63.3940926040669	35.261872488	52.1948848622969	60.137	35.2014	51.7925	3.3879
63.3940926040669	35.261872488	52.1948848622969	67.8857	28.9512	53.8343	7.9175
65.8701420208703	39.543731177	55.9100039418614	54.7376	29.7596	56.3053	17.0277
65.8701420208703	39.543731177	55.9100039418614	70.5469	25.0661	53.9959	16.1699
65.8701420208703	39.543731177	55.9100039418614	65.7303	47.3671	58.4265	12.9967
65.8701420208703	39.543731177	55.9100039418614	73.3859	52.8201	55.9097	15.2561
68.2893658712412	43.725208686	52.8305	67.4955	46.0347	52.8305	3.4091
70.70858951145	47.90668616	55.6067	69.4154	51.8752	55.6067	4.1739
73.9672793918941	49.512026892	54.2569000109233	66.2863	51.2705	54.2569	7.8797
73.9672793918941	49.512026892	54.2569000109233	72.0955	52.6394	50.8408	7.0709
78.895300644544	50.735193137	53.881221023253	92.1801	41.0349	29.4683	29.4376
78.895300644544	50.735193137	53.881221023253	74.8417	48.5823	43.578	11.9548
78.895300644544	50.735193137	53.881221023253	76.4125	46.981	46.4216	12.1404
78.895300644544	50.735193137	53.881221023253	78.2967	50.1808	43.2865	11.8299
78.895300644544	50.735193137	53.881221023253	90.4784	41.2284	44.1276	19.2596
78.895300644544	50.735193137	53.881221023253	90.0385	42.8005	44.3862	21.625
78.895300644544	50.735193137	53.881221023253	74.4488	50.3129	52.3971	5.5377

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
78.895300644544	50.735193137	53.881221023253	73.2401	49.0047	54.3428	19.489
78.895300644544	50.735193137	53.881221023253	92.4351	33.0022	54.3205	23.0347
78.895300644544	50.735193137	53.881221023253	90.1236	40.724	54.2833	15.0486
78.895300644544	50.735193137	53.881221023253	72.0304	52.5053	58.0692	20.8079
78.895300644544	50.735193137	53.881221023253	69.2681	55.3133	57.276	27.1365
78.895300644544	50.735193137	53.881221023253	77.8264	55.5164	53.7679	14.0686
78.895300644544	50.735193137	53.881221023253	95.0304	53.2116	46.2852	22.3786
78.895300644544	50.735193137	53.881221023253	91.1842	48.1207	54.4953	17.5671
78.895300644544	50.735193137	53.881221023253	77.9705	58.8491	56.0075	15.3336
78.895300644544	50.735193137	53.881221023253	96.2485	47.1277	52.4491	17.9146
78.895300644544	50.735193137	53.881221023253	98.0763	43.3554	53.563	27.4576
78.895300644544	50.735193137	53.881221023253	97.9579	54.2407	46.7851	26.2321
78.895300644544	50.735193137	53.881221023253	101.161	45.7653	49.9947	23.4902
78.895300644544	50.735193137	53.881221023253	86.2321	62.729	51.1705	16.3953
78.895300644544	50.735193137	53.881221023253	85.8477	60.7859	54.7762	18.5843
78.895300644544	50.735193137	53.881221023253	93.9444	64.9	44.2206	23.8239
78.895300644544	50.735193137	53.881221023253	99.5817	52.1789	51.8005	22.5087
78.895300644544	50.735193137	53.881221023253	99.0651	51.1078	59.3413	22.694
78.895300644544	50.735193137	53.881221023253	96.4356	62.0951	55.4366	20.9554
78.895300644544	50.735193137	53.881221023253	95.1558	61.2395	57.4763	27.409
78.895300644544	50.735193137	53.881221023253	103.9916	60.6173	50.4601	27.4308
76.4559802287841	54.032944111	50.2798	78.0993	54.3894	50.2798	5.6239
74.0166598124958	57.330695083	45.2128	73.7963	57.8273	45.2128	0.5433
75.6201395559415	51.517554136	45.6583538581093	77.9078	47.2474	41.2613	6.5423
75.6201395559415	51.517554136	45.6583538581093	70.1179	52.2878	46.5219	5.6226
75.6201395559415	51.517554136	45.6583538581093	74.3979	53.0985	48.6112	4.2274
80.5356765494225	45.74923293	50.7750268592386	88.2545	36.066	42.1212	15.726
80.5356765494225	45.74923293	50.7750268592386	79.533	47.2684	42.1428	8.9398
80.5356765494225	45.74923293	50.7750268592386	86.5983	36.2039	44.7429	13.6175
80.5356765494225	45.74923293	50.7750268592386	80.0004	48.0282	43.1849	9.8035
80.5356765494225	45.74923293	50.7750268592386	91.9732	45.8332	46.1527	12.7139
85.4512136616607	39.980911715	58.2863	85.065	35.2948	58.2863	4.702
90.5992043428189	37.033058954	58.9361	95.1298	37.6897	58.9361	8.2516
95.7471952384804	34.085205641	64.3288632810286	99.0428	19.6959	54.528	17.7192
95.7471952384804	34.085205641	64.3288632810286	96.2582	32.5713	56.693	16.7348
100.895192445991	31.137324876	55.4005	102.211	28.3893	55.4005	3.0468
100.895192445991	31.137324876	55.4005	101.7295	28.4449	56.1482	24.6989
104.067295550909	33.856887469	51.9744000193612	91.0332	34.8187	52.6374	16.4532
104.067295550909	33.856887469	51.9744000193612	98.3827	22.3334	54.4737	15.4136
104.067295550909	33.856887469	51.9744000193612	101.1976	33.4905	53.5496	15.926
104.067295550909	33.856887469	51.9744000193612	102.9297	48.0592	51.9744	14.2478
103.785208146705	32.905170491	51.1923	104.0844	32.9988	51.1923	0.3135
104.685396439767	30.613643546	43.7624000091293	98.5859	34.5756	44.3792	9.3554
104.685396439767	30.613643546	43.7624000091293	106.1692	29.0085	43.7624	2.1859
98.8125785683949	34.392122076	44.8008848806511	101.5683	27.6266	39.8262	8.8382
98.8125785683949	34.392122076	44.8008848806511	96.2085	41.8253	45.162	7.8844
94.2521299762959	34.380915359	41.8015	91.8795	37.1845	41.8015	3.6728
93.7120962313554	29.619041892	38.6789	92.942	26.4511	38.6789	3.2602
94.6716434306588	31.025996319	29.587	97.5011	28.0267	29.587	4.1233
95.1094220876205	32.986042371	24.4923440736547	76.5498	52.218	12.9878	29.3359
95.1094220876205	32.986042371	24.4923440736547	92.5592	25.4331	20.672	8.84
95.1094220876205	32.986042371	24.4923440736547	90.6435	28.0536	25.8632	9.6928
95.1094220876205	32.986042371	24.4923440736547	96.156	30.1327	19.1399	15.6026
95.1094220876205	32.986042371	24.4923440736547	76.0043	50.5809	30.4596	29.1787
95.1094220876205	32.986042371	24.4923440736547	93.6487	25.1273	31.9089	25.1293
95.1094220876205	32.986042371	24.4923440736547	98.3241	22.4412	26.657	19.863
95.1094220876205	32.986042371	24.4923440736547	93.9312	28.9768	31.8553	14.5805
95.1094220876205	32.986042371	24.4923440736547	93.6083	38.4774	26.0941	16.8124
95.1094220876205	32.986042371	24.4923440736547	92.7124	33.4453	33.5856	14.4155
95.1094220876205	32.986042371	24.4923440736547	100.6297	27.3107	24.1251	20.9684
95.1094220876205	32.986042371	24.4923440736547	93.6941	39.0671	28.969	9.1173
95.1094220876205	32.986042371	24.4923440736547	97.3283	27.0933	33.194	16.7318
95.1094220876205	32.986042371	24.4923440736547	96.2133	40.5576	25.5914	17.1844
95.1094220876205	32.986042371	24.4923440736547	93.9129	43.6355	26.629	15.3805
95.1094220876205	32.986042371	24.4923440736547	98.9301	33.2654	27.8083	6.2044
95.1094220876205	32.986042371	24.4923440736547	98.3613	42.0392	20.5386	22.2209
95.1094220876205	32.986042371	24.4923440736547	93.0102	50.1223	20.798	27.268
95.1094220876205	32.986042371	24.4923440736547	96.6051	36.0943	31.9245	18.2734
95.1094220876205	32.986042371	24.4923440736547	102.0152	42.2262	11.91	18.485
95.1094220876205	32.986042371	24.4923440736547	95.8908	32.6754	36.0409	17.855
95.1094220876205	32.986042371	24.4923440736547	98.7317	39.6579	27.3708	13.6077
95.1094220876205	32.986042371	24.4923440736547	99.6903	41.4772	23.4888	20.1453
95.1094220876205	32.986042371	24.4923440736547	97.1838	29.5842	37.1942	15.6415
95.1094220876205	32.986042371	24.4923440736547	103.4615	37.3033	20.8908	18.992
95.1094220876205	32.986042371	24.4923440736547	95.0864	47.4256	26.3676	15.4813
95.1094220876205	32.986042371	24.4923440736547	102.543	45.6081	13.7083	21.8293
95.1094220876205	32.986042371	24.4923440736547	92.2396	41.0703	39.2658	23.428
95.1094220876205	32.986042371	24.4923440736547	95.0864	33.2234	41.4865	27.2565
95.1094220876205	32.986042371	24.4923440736547	105.6149	29.5786	27.9356	12.2754
95.1094220876205	32.986042371	24.4923440736547	98.5493	33.1624	37.7737	15.8362

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
95.1094220876205	32.986042371	24.4923440736547	101.377	48.1816	18.5975	20.458
95.1094220876205	32.986042371	24.4923440736547	100.384	25.6874	43.9589	21.4485
95.1094220876205	32.986042371	24.4923440736547	95.1396	47.3596	38.3213	26.132
95.1094220876205	32.986042371	24.4923440736547	93.3932	53.1876	39.0419	28.8804
95.1094220876205	32.986042371	24.4923440736547	100.0845	45.3198	38.3951	20.4175
95.1094220876205	32.986042371	24.4923440736547	103.0838	43.6629	35.7673	28.7382
95.1094220876205	32.986042371	24.4923440736547	107.8221	37.3636	42.4217	23.6325
95.7046039324524	35.879594156	23.3371	91.9372	36.8319	23.3371	3.8859
96.5238169474876	38.71651667	12.7925479917697	94.1971	38.0204	14.8005	3.1512
96.5238169474876	38.71651667	12.7925479917697	97.0806	39.3994	12.7921	0.8811
94.0779081511733	37.546005197	13.0601259669857	95.8598	39.2349	3.852	9.5298
94.0779081511733	37.546005197	13.0601259669857	92.8093	39.7693	16.6418	4.7222
94.0779081511733	37.546005197	13.0601259669857	94.3087	39.6383	18.4042	5.7437
91.4776786241931	36.000657996	5.0962	91.1655	36.0648	5.0962	0.3187
94.5686577487685	33.285966233	2.4627	96.3928	32.1668	2.4627	2.1401
95.4187438995424	31.946129571	1.34683228723682	72.9198	44.5581	6.5665	29.4271
95.4187438995424	31.946129571	1.34683228723682	85.1876	33.113	2.1197	12.2337
95.4187438995424	31.946129571	1.34683228723682	93.4265	31.4744	1.0443	21.1215
95.4187438995424	31.946129571	1.34683228723682	97.1071	18.8552	9.2302	18.2973
95.4187438995424	31.946129571	1.34683228723682	92.634	40.1716	1.8791	17.8594
95.4187438995424	31.946129571	1.34683228723682	97.9141	29.0493	9.3885	23.1555
95.4187438995424	31.946129571	1.34683228723682	97.0499	25.7334	20.6225	22.9168
95.4187438995424	31.946129571	1.34683228723682	95.7654	46.8722	1.8076	22.8599
95.4187438995424	31.946129571	1.34683228723682	102.4997	24.4075	19.7902	22.2451
95.4187438995424	31.946129571	1.34683228723682	97.4429	30.1528	28.42	27.9419
95.4187438995424	31.946129571	1.34683228723682	99.0228	31.9463	24.4512	24.3368
95.4187438995424	31.946129571	1.34683228723682	102.9211	31.879	13.8489	24.191
95.4187438995424	31.946129571	1.34683228723682	105.0575	26.2706	17.0665	21.5332
95.4187438995424	31.946129571	1.34683228723682	98.0879	44.5657	15.6818	26.354
95.4187438995424	31.946129571	1.34683228723682	106.8535	30.7643	14.4546	22.1596
95.4187438995424	31.946129571	1.34683228723682	104.1102	44.8822	12.643	24.3902
96.2688282998399	30.606294528	11.7517	99.272	31.5703	11.7517	3.1541
96.7516102630935	29.148558344	14.5945	96.0238	29.4057	14.5945	0.7719
101.695367994434	26.114719489	19.8795	102.9016	24.8202	19.8795	1.7694
104.518819492276	25.356378222	33.0938	104.9423	23.521	33.0938	1.8836
105.443227918388	32.828552587	30.8419	108.656	34.8419	30.8419	3.7915
102.324035548299	37.766724047	31.3410869139959	98.2152	53.7701	7.2972	29.4627
102.324035548299	37.766724047	31.3410869139959	88.0225	60.7529	26.1198	27.571
102.324035548299	37.766724047	31.3410869139959	96.5473	37.5774	41.1201	13.5522
102.324035548299	37.766724047	31.3410869139959	103.3956	43.6231	38.3961	9.5596
102.324035548299	37.766724047	31.3410869139959	105.5782	30.6326	47.1426	17.6401
102.324035548299	37.766724047	31.3410869139959	106.6895	31.0233	49.137	23.9388
102.324035548299	37.766724047	31.3410869139959	106.6231	51.946	40.2003	20.5204
100.888807969872	40.078434895	29.8224	98.4033	39.6451	29.8224	2.523
100.980314629074	42.656323589	35.1000657053241	97.0063	39.6578	31.3742	6.2182
100.980314629074	42.656323589	35.1000657053241	96.8865	41.9997	31.9305	5.9999
101.071822077495	45.234212899	34.3678	99.7789	45.6905	34.3678	1.6891
101.163329572559	47.81210218	29.2585	101.7941	49.0832	29.2585	1.419
100.59383786993	49.057978878	22.0951000000346	98.2004	50.3921	3.9008	18.7026
100.59383786993	49.057978878	22.0951000000346	100.6036	46.802	22.0951	2.256
100.59383786993	49.057978878	22.0951000000346	103.8062	50.1176	9.3383	16.2282
100.59383786993	49.057978878	22.0951000000346	102.1595	55.9791	16.6639	15.0641
100.59383786993	49.057978878	22.0951000000346	98.7715	55.3698	27.9452	10.7015
100.59383786993	49.057978878	22.0951000000346	102.8738	56.4102	20.1678	11.5644
100.59383786993	49.057978878	22.0951000000346	103.8959	45.4099	37.4639	16.5891
98.3792421307963	56.28928819	20.5177924807837	95.9041	59.3009	4.8034	16.7412
98.3792421307963	56.28928819	20.5177924807837	98.8606	57.9963	4.7298	15.8873
98.3792421307963	56.28928819	20.5177924807837	92.0851	66.8651	17.5763	14.1856
98.3792421307963	56.28928819	20.5177924807837	99.9754	58.6633	29.714	10.7282
100.002558959309	55.33895346	17.3503729854549	93.3823	48.5086	44.2946	29.5211
100.002558959309	55.33895346	17.3503729854549	93.0933	68.7697	14.1811	21.8016
100.002558959309	55.33895346	17.3503729854549	98.4258	65.8894	6.8362	20.8311
100.002558959309	55.33895346	17.3503729854549	103.5291	67.906	8.9335	21.3267
100.002558959309	55.33895346	17.3503729854549	101.778	67.1686	27.7348	23.9527
100.002558959309	55.33895346	17.3503729854549	98.2345	80.86	27.262	27.4352
100.002558959309	55.33895346	17.3503729854549	107.981	80.0957	12.6444	26.4329
96.7559253152816	57.239622726	15.7085000000037	96.8097	54.0588	2.5941	13.9289
96.7559253152816	57.239622726	15.7085000000037	100.6388	53.8259	6.8403	11.1764
96.7559253152816	57.239622726	15.7085000000037	98.9521	56.5952	10.596	9.6017
96.7559253152816	57.239622726	15.7085000000037	93.5538	62.1822	15.7085	5.8892
105.921111866347	49.290006469	9.9061	106.4442	49.0895	9.9061	0.5602
99.4123026427383	51.584119831	8.94920000000002	94.5726	47.3613	8.9492	6.423
99.4123026427383	51.584119831	8.94920000000002	99.5987	51.3246	10.6347	2.5606
99.3112933134984	52.024433376	5.9428774466574	93.2379	56.4517	4.9219	7.5848
99.3112933134984	52.024433376	5.9428774466574	100.3439	52.2486	6.1962	1.0866
95.0696880511668	48.154910206	1.131	96.6284	43.246	1.131	6.0243
90.8280832625498	44.285386238	8.5583	89.5287	45.4109	8.5583	3.6829
86.5864780346015	40.415862401	11.3089272438672	86.512	33.4131	7.017	8.2137
86.5864780346015	40.415862401	11.3089272438672	85.9182	41.843	9.5066	3.5933
82.3448728302574	36.546339508	10.845	85.525	32.0217	10.845	5.5598

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
78.1032683772133	32.676815174	5.3155	79.7169	32.9378	5.3155	5.5373
73.8616629072476	28.807292573	7.3132	73.7989	28.6287	7.3132	0.1893
71.8696018930319	31.338874679	7.5435	72.2401	34.2889	7.5435	2.9732
69.5595270822858	31.338324989	6.54205784440267	47.7428	26.438	23.4687	28.0445
69.5595270822858	31.338324989	6.54205784440267	67.6588	29.7348	5.9837	2.8615
69.5595270822858	31.338324989	6.54205784440267	68.3701	31.308	4.6701	5.8267
69.5595270822858	31.338324989	6.54205784440267	71.5231	31.8286	8.0149	7.639
69.5595270822858	31.338324989	6.54205784440267	72.6191	32.6684	16.6889	20.9501
69.5595270822858	31.338324989	6.54205784440267	64.9829	35.6055	23.509	27.8112
69.5595270822858	31.338324989	6.54205784440267	64.1748	30.2745	31.4674	28.016
69.5595270822858	31.338324989	6.54205784440267	73.6428	45.1426	7.6389	25.8084
69.5595270822858	31.338324989	6.54205784440267	77.5882	39.4219	14.211	18.0454
69.5595270822858	31.338324989	6.54205784440267	73.6395	46.5004	2.2066	26.6417
69.5595270822858	31.338324989	6.54205784440267	70.6462	49.6735	6.8503	27.2687
69.5595270822858	31.338324989	6.54205784440267	70.7664	48.6137	12.8047	19.7705
69.5595270822858	31.338324989	6.54205784440267	87.5726	32.8781	1.3636	19.8465
69.5595270822858	31.338324989	6.54205784440267	90.6179	26.4649	2.7134	21.9514
69.5595270822858	31.338324989	6.54205784440267	80.8076	41.6004	10.0065	22.8911
69.5595270822858	31.338324989	6.54205784440267	73.6611	50.4924	3.9757	19.7557
69.5595270822858	31.338324989	6.54205784440267	72.1444	51.2772	8.2689	22.7706
69.5595270822858	31.338324989	6.54205784440267	79.9479	46.2913	1.0177	20.0233
69.5595270822858	31.338324989	6.54205784440267	73.2561	47.9132	17.0605	27.6156
69.5595270822858	31.338324989	6.54205784440267	70.916	53.3608	4.8842	25.4746
69.5595270822858	31.338324989	6.54205784440267	68.022	53.7678	15.3935	25.621
69.5595270822858	31.338324989	6.54205784440267	90.72	30.049	19.1921	25.9851
69.5595270822858	31.338324989	6.54205784440267	89.0134	41.3658	15.8043	27.9234
66.5300928064023	30.91890724	10.0866	68.2062	28.5319	10.0866	2.9167
61.6337511853627	33.158222436	5.10272297960051	42.8212	36.4305	1.5446	19.4237
61.6337511853627	33.158222436	5.10272297960051	63.2951	31.2899	8.2512	4.0204
61.6337511853627	33.158222436	5.10272297960051	66.7818	30.0369	13.8618	10.9633
61.6337511853627	33.158222436	5.10272297960051	61.5106	34.0654	15.2705	10.912
61.6337511853627	33.158222436	5.10272297960051	67.4673	33.2544	9.192	16.5328
61.6337511853627	33.158222436	5.10272297960051	69.1853	30.9522	12.1629	13.139
61.6337511853627	33.158222436	5.10272297960051	67.7055	32.9993	17.0949	14.8259
61.6337511853627	33.158222436	5.10272297960051	75.9022	40.5634	8.2476	19.0711
58.4275326633701	35.281682285	1.1949	58.126	35.24	1.1949	0.3044
66.8588703296322	39.013856498	2.9918	68.0366	38.8903	2.9918	3.4888
75.2902078443289	42.746030495	0.0066	75.73	42.7229	0.0066	0.4404
70.9192325455188	47.151536817	4.3235	68.7356	47.889	4.3235	2.3048
75.1016590832646	48.668361443	6.71040000000075	75.2757	50.6388	0.889	7.5436
75.1016590832646	48.668361443	6.71040000000075	76.2244	51.9684	6.7104	3.4858
77.6492890155735	45.380077564	10.8339	77.8794	45.0468	10.8339	0.405
77.6827568007628	45.73314021	19.5943754694158	73.5268	49.2611	4.4383	16.8647
77.6827568007628	45.73314021	19.5943754694158	71.0505	50.768	8.8572	14.6692
77.6827568007628	45.73314021	19.5943754694158	80.8872	43.1227	9.5119	14.1296
77.6827568007628	45.73314021	19.5943754694158	72.0723	49.2863	13.9841	10.8405
77.6827568007628	45.73314021	19.5943754694158	77.6289	48.4559	5.3003	16.6228
77.6827568007628	45.73314021	19.5943754694158	89.1249	38.0318	13.3915	15.9201
77.6827568007628	45.73314021	19.5943754694158	75.5201	48.6107	22.753	10.8007
77.6827568007628	45.73314021	19.5943754694158	66.0257	55.1875	22.0287	16.5761
77.6827568007628	45.73314021	19.5943754694158	71.2619	53.5794	21.4252	11.3066
77.6827568007628	45.73314021	19.5943754694158	89.3668	41.343	14.5671	15.2017
77.6827568007628	45.73314021	19.5943754694158	87.5583	39.2312	23.679	14.1099
77.6827568007628	45.73314021	19.5943754694158	84.6532	51.7406	11.3965	13.6619
77.6827568007628	45.73314021	19.5943754694158	87.5129	47.9594	27.6836	13.3149
77.7162245859132	46.086202857	23.6535106229366	73.2283	44.0709	14.6285	10.2788
77.7162245859132	46.086202857	23.6535106229366	74.5598	39.2546	26.0148	7.8873
77.7162245859132	46.086202857	23.6535106229366	75.5587	49.1352	25.3998	7.8556
77.7162245859132	46.086202857	23.6535106229366	76.379	48.6237	27.9163	7.5959
79.0561988887885	48.659360829	23.6683	80.3964	49.7264	23.6683	1.7131
79.132725031947	50.226588694	21.0093610572157	67.8488	53.6384	2.957	21.5605
79.132725031947	50.226588694	21.0093610572157	73.911	51.0144	2.5794	19.7234
79.132725031947	50.226588694	21.0093610572157	71.8965	50.0142	14.8598	19.3441
79.132725031947	50.226588694	21.0093610572157	61.2083	54.3519	23.523	20.9342
79.132725031947	50.226588694	21.0093610572157	67.5609	49.631	28.0783	13.5732
79.132725031947	50.226588694	21.0093610572157	70.5527	57.3223	8.5137	18.2025
79.132725031947	50.226588694	21.0093610572157	69.9782	57.1009	12.9468	18.2604
79.132725031947	50.226588694	21.0093610572157	82.0477	53.0979	5.7932	18.2605
79.132725031947	50.226588694	21.0093610572157	87.8413	47.1867	25.6907	18.3729
79.132725031947	50.226588694	21.0093610572157	73.2116	57.797	29.252	20.4365
79.132725031947	50.226588694	21.0093610572157	91.9756	47.4725	20.0446	19.7423
79.132725031947	50.226588694	21.0093610572157	92.749	64.7326	27.0986	21.2415
84.2146522807478	51.562049914	22.7284	83.5076	51.7826	22.7284	1.0852
89.2965795297598	52.897511148	21.012439711153	89.6611	52.1615	6.6683	14.4321
89.2965795297598	52.897511148	21.012439711153	92.412	50.9961	13.3675	8.4715
89.2965795297598	52.897511148	21.012439711153	95.46	44.379	21.4845	10.525
89.2965795297598	52.897511148	21.012439711153	92.8209	56.9207	15.4027	12.3836
89.2965795297598	52.897511148	21.012439711153	87.1149	58.1702	24.9275	8.6573
89.2965795297598	52.897511148	21.012439711153	96.0562	52.3857	26.7058	12.0834
89.2965795297598	52.897511148	21.012439711153	94.6877	57.1733	21.1304	13.9646

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
89.5541185877832	60.788100484	23.6857	88.7937	67.447	23.6857	7.6628
89.8116576409482	68.678689821	23.3641817047652	93.9524	73.145	3.1932	21.3513
89.8116576409482	68.678689821	23.3641817047652	97.1852	78.7831	16.5303	16.1734
89.8116576409482	68.678689821	23.3641817047652	92.288	83.6157	17.9977	16.0638
89.8116576409482	68.678689821	23.3641817047652	94.4072	76.9857	34.4342	17.5737
89.8116576409482	68.678689821	23.3641817047652	88.0687	81.4777	36.1559	18.8265
89.8116576409482	68.678689821	23.3641817047652	93.4941	85.8189	27.3685	18.0194
90.0691967546621	76.569279166	1.5427	89.835	77.746	1.5427	1.1998
91.3654935557869	79.240631429	2.2114	91.86	79.7087	2.2114	0.6809
91.3595074960428	80.67932335	2.8544	93.2494	81.8793	2.8544	4.3234
91.3535212754869	82.118015275	10.7123629264742	94.6798	69.1984	4.5089	14.7127
91.3535212754869	82.118015275	10.7123629264742	88.6759	82.3658	11.13	2.7213
91.3535212754869	82.118015275	10.7123629264742	86.3374	85.7586	1.5055	11.3801
91.3535212754869	82.118015275	10.7123629264742	91.14	83.5499	11.0268	11.1932
91.3535212754869	82.118015275	10.7123629264742	98.5933	78.8152	8.2256	8.4088
91.3535212754869	82.118015275	10.7123629264742	98.9119	80.0767	11.0692	14.6996
91.3535212754869	82.118015275	10.7123629264742	97.3132	81.5365	12.7479	6.4549
91.3535212754869	82.118015275	10.7123629264742	96.9541	82.6989	20.5312	14.592
91.3535212754869	82.118015275	10.7123629264742	93.9684	87.8762	13.7783	12.1102
91.3535212754869	82.118015275	10.7123629264742	95.2026	90.5293	12.2607	13.6073
91.3535212754869	82.118015275	10.7123629264742	102.0461	86.7072	16.2393	14.3206
91.3535212754869	82.118015275	10.7123629264742	92.4623	94.734	14.7003	13.3072
95.9247303534129	84.717021725	11.4782	96.8706	83.0827	11.4782	1.8883
99.1008547227771	89.726523669	5.0557	103.6911	80.62	5.0557	12.7759
102.276979461924	94.736025861	3.31148937355592	108.1531	76.0691	2.761	21.0274
102.276979461924	94.736025861	3.31148937355592	99.0152	86.155	1.7016	11.2918
102.276979461924	94.736025861	3.31148937355592	103.8313	82.5056	7.2236	18.7916
102.276979461924	94.736025861	3.31148937355592	100.8882	91.1406	6.6906	9.708
102.276979461924	94.736025861	3.31148937355592	102.4507	89.6037	15.6617	13.3753
102.276979461924	94.736025861	3.31148937355592	102.0076	93.075	9.5996	14.2567
102.276979461924	94.736025861	3.31148937355592	95.7576	96.9635	11.4638	15.3189
102.276979461924	94.736025861	3.31148937355592	105.6506	92.4297	8.9472	20.7058
102.276979461924	94.736025861	3.31148937355592	104.1728	96.9352	2.733	2.9606
102.276979461924	94.736025861	3.31148937355592	104.1034	98.3317	9.2012	13.8815
100.527342341027	94.677950558	12.8509	101.8123	94.891	12.8509	1.3025
96.9313021349831	94.313736309	13.5607978868579	101.1477	85.2681	2.6541	21.9848
96.9313021349831	94.313736309	13.5607978868579	95.0373	98.5247	13.5608	4.6173
96.9313021349831	94.313736309	13.5607978868579	95.6122	103.8055	23.229	14.657
94.8496585476849	90.582548705	18.823	92.7178	89.1801	18.823	2.5518
97.4472037147949	89.929578727	19.2781	98.1138	89.594	19.2781	0.7463
98.5591810657083	90.024476058	23.7005999782679	107.2392	85.9448	2.4326	25.7344
98.5591810657083	90.024476058	23.7005999782679	99.3782	93.0601	2.9898	23.8531
98.5591810657083	90.024476058	23.7005999782679	101.583	94.8217	23.7006	5.6707
98.5591810657083	90.024476058	23.7005999782679	98.8373	99.4165	35.0062	17.0801
94.9415230542677	82.615907951	28.6516430587439	90.2672	64.2791	51.3539	29.5547
94.9415230542677	82.615907951	28.6516430587439	88.3633	87.3681	2.2205	27.6489
94.9415230542677	82.615907951	28.6516430587439	100.0565	80.1054	0.0522	29.4827
94.9415230542677	82.615907951	28.6516430587439	89.95	80.2132	31.6802	25.9539
94.9415230542677	82.615907951	28.6516430587439	98.2007	80.5294	17.4055	24.0186
94.9415230542677	82.615907951	28.6516430587439	93.0994	86.3608	2.8092	27.9466
94.9415230542677	82.615907951	28.6516430587439	97.8831	81.9659	16.6355	26.0286
94.9415230542677	82.615907951	28.6516430587439	95.9481	74.251	38.8025	27.2231
94.9415230542677	82.615907951	28.6516430587439	89.5631	83.3752	32.5568	25.9016
94.9415230542677	82.615907951	28.6516430587439	97.5653	74.5618	43.9951	26.0912
94.9415230542677	82.615907951	28.6516430587439	93.1284	88.6615	20.1351	29.2956
94.9415230542677	82.615907951	28.6516430587439	102.2936	85.0217	15.0829	21.6835
94.9415230542677	82.615907951	28.6516430587439	92.1151	81.2598	42.8198	24.5532
94.9415230542677	82.615907951	28.6516430587439	94.0795	80.8773	41.7611	27.9293
94.9415230542677	82.615907951	28.6516430587439	92.5654	91.5305	24.0262	28.4592
94.9415230542677	82.615907951	28.6516430587439	95.504	96.351	10.2996	27.717
94.9415230542677	82.615907951	28.6516430587439	97.7943	87.7833	36.2243	29.1465
94.9415230542677	82.615907951	28.6516430587439	98.853	91.6792	31.3431	14.5242
94.9415230542677	82.615907951	28.6516430587439	101.602	92.3175	35.5214	24.3611
94.9415230542677	82.615907951	28.6516430587439	98.2349	98.4363	43.0129	21.6189
94.0370489299466	77.590297808	36.8898782907478	91.1291	78.4897	13.7054	23.993
94.0370489299466	77.590297808	36.8898782907478	94.549	73.3405	36.7472	4.2829
94.0370489299466	77.590297808	36.8898782907478	93.1133	78.1389	33.5399	7.0122
94.0370489299466	77.590297808	36.8898782907478	101.2985	78.2917	28.1682	13.0659
94.0370489299466	77.590297808	36.8898782907478	92.6699	80.64	42.9825	12.8577
94.0370489299466	77.590297808	36.8898782907478	88.6062	92.2681	23.9863	22.8388
94.0370489299466	77.590297808	36.8898782907478	97.816	74.8015	47.4482	15.0437
94.0370489299466	77.590297808	36.8898782907478	97.7624	79.6432	41.8331	23.8114
94.0370489299466	77.590297808	36.8898782907478	96.2545	87.1498	32.8659	21.7369
94.0370489299466	77.590297808	36.8898782907478	91.1677	84.1211	45.979	16.3324
94.0370489299466	77.590297808	36.8898782907478	100.7126	88.5952	23.1233	21.6123
94.0370489299466	77.590297808	36.8898782907478	97.0865	83.6094	41.2641	9.8674
94.0370489299466	77.590297808	36.8898782907478	103.1106	83.2736	35.5168	15.1682
94.0370489299466	77.590297808	36.8898782907478	98.567	80.2017	48.301	23.8946
94.0370489299466	77.590297808	36.8898782907478	99.3434	90.9979	30.2293	16.5588
94.0370489299466	77.590297808	36.8898782907478	99.1261	78.6323	53.6332	23.8719

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
94.0370489299466	77.590297808	36.8898782907478	104.3617	84.8664	42.6246	23.8168
94.0370489299466	77.590297808	36.8898782907478	100.5649	91.4192	35.2273	20.5542
94.0370489299466	77.590297808	36.8898782907478	95.9325	86.7596	55.1395	20.5114
94.0370489299466	77.590297808	36.8898782907478	98.656	92.6213	53.0887	22.9191
92.5921124556374	76.851381992	40.3125	91.0116	75.887	40.3125	1.8515
94.0405474777181	77.877916818	44.5388	94.6945	78.572	44.5388	1.7622
95.4889826412468	78.904451356	57.8831999996924	97.9014	66.9835	57.8832	12.1626
95.4889826412468	78.904451356	57.8831999996924	97.4314	81.946	52.8698	7.1176
95.4889826412468	78.904451356	57.8831999996924	94.9909	83.4209	53.4521	6.6825
95.988523247234	84.619944378	51.3996908108581	96.2521	73.5638	59.9232	18.6663
95.988523247234	84.619944378	51.3996908108581	96.8345	90.0197	42.1774	11.1201
95.988523247234	84.619944378	51.3996908108581	96.9343	84.943	57.6208	15.8069
95.988523247234	84.619944378	51.3996908108581	101.0606	82.9382	56.7378	16.7992
95.988523247234	84.619944378	51.3996908108581	98.3726	88.4744	52.1576	13.4661
95.988523247234	84.619944378	51.3996908108581	98.9319	91.3958	49.6094	11.9055
95.988523247234	84.619944378	51.3996908108581	104.5599	87.8351	55.8078	14.6615
95.988523247234	84.619944378	51.3996908108581	100.6204	94.7646	50.8195	15.4911
96.4880635479725	90.335437396	47.4754	96.5235	92.1962	47.4754	1.8611
96.9188370542453	92.440000178	44.3343	97.0347	92.0258	44.3343	0.4301
96.6919761899538	96.895549385	38.6118149270904	104.3693	90.8389	25.0156	29.9766
96.6919761899538	96.895549385	38.6118149270904	94.4828	106.1237	38.6118	9.4889
102.82397977331	97.471115048	53.5771	103.8628	98.4843	53.5771	1.4511
97.5195648946357	96.946463032	56.3482	94.0924	96.5838	56.3482	3.4463
102.857523506299	92.854966304	57.6589	103.2876	94.1817	57.6589	1.3947
98.5992107695464	74.998970365	82.6000087258214	102.6402	60.9181	59.3218	29.8857
98.5992107695464	74.998970365	82.6000087258214	96.1169	76.0362	57.1147	25.7488
94.3408993694381	57.142976888	58.2451851480258	97.7133	51.9341	48.5236	11.5332
94.3408993694381	57.142976888	58.2451851480258	94.8477	58.3247	47.7413	10.8435
94.3408993694381	57.142976888	58.2451851480258	92.1982	53.9806	59.5699	4.0431
96.9481066645953	55.081366265	55.1988519860634	100.8862	48.4618	50.2894	10.9264
96.9481066645953	55.081366265	55.1988519860634	94.6583	60.3511	50.0221	8.4724
99.555317859545	53.019743874	56.3138902705108	100.5275	34.9543	58.1047	18.18
99.555317859545	53.019743874	56.3138902705108	94.5838	45.9916	57.9488	12.3529
99.555317859545	53.019743874	56.3138902705108	94.5355	44.3621	59.1041	13.4241
99.555317859545	53.019743874	56.3138902705108	105.6501	47.8555	48.2801	11.3295
99.555317859545	53.019743874	56.3138902705108	94.6788	63.8911	59.4837	17.5158
99.555317859545	53.019743874	56.3138902705108	99.4285	63.8276	59.6975	13.2796
101.039075023656	60.22073557	51.0639	100.6854	61.817	51.0639	3.0255
102.522828654631	67.421726858	43.143	102.9023	68.4164	43.143	1.0646
99.1535073624091	61.901802493	39.3422	99.0429	61.6589	39.3422	0.2669
96.6056161231191	58.185803492	43.127181307202	99.7259	57.0659	38.9488	5.4613
96.6056161231191	58.185803492	43.127181307202	95.4724	61.7777	41.2303	4.4248
94.0577250824944	54.469805845	33.0945427280539	97.3108	57.82	10.7791	22.7988
94.0577250824944	54.469805845	33.0945427280539	90.3356	51.1932	37.7625	6.8103
94.0577250824944	54.469805845	33.0945427280539	94.5987	62.0376	18.5629	22.0196
94.0577250824944	54.469805845	33.0945427280539	94.4551	58.0456	35.6169	10.0481
94.0577250824944	54.469805845	33.0945427280539	92.9131	56.6287	40.2251	15.0729
94.0577250824944	54.469805845	33.0945427280539	89.2688	56.3248	44.4917	12.5008
94.0577250824944	54.469805845	33.0945427280539	95.479	61.1306	33.7151	12.7416
94.0577250824944	54.469805845	33.0945427280539	95.4289	57.3916	42.7453	14.9929
94.0577250824944	54.469805845	33.0945427280539	100.5945	52.9653	41.549	16.0066
94.0577250824944	54.469805845	33.0945427280539	98.4228	65.0226	33.0945	19.713
94.0577250824944	54.469805845	33.0945427280539	99.3413	60.508	43.9191	18.4113
95.4324428262576	51.711482565	40.2539	94.4684	44.7163	40.2539	7.0613
95.4324428262576	51.711482565	40.2539	94.3452	48.7818	37.6589	4.4406
95.4324428262576	51.711482565	40.2539	97.7455	51.8526	39.6885	5.024
97.0286340131699	50.560190762	41.2796	98.1036	50.8139	41.2796	1.1045
95.6453479067635	48.705694466	44.9228	98.9198	48.0008	44.9228	5.0724
94.2620618003851	46.851198171	38.4291172843931	90.4865	46.0315	39.3528	3.9724
94.2620618003851	46.851198171	38.4291172843931	97.5519	44.8528	38.2336	3.8542
89.6895764613528	47.777747433	40.3099	89.352	47.1855	40.3099	0.6817
85.8832466353617	50.048447385	38.6114	85.9154	51.5363	38.6114	1.4882
81.9488917563676	46.394964943	36.8216	81.9079	40.1742	36.8216	6.2209
78.0467830231728	47.635043931	30.7678	77.9223	44.6051	30.7678	3.0325
74.1643760018795	49.354666897	28.4918999815501	72.7757	56.7077	5.4576	24.2193
74.1643760018795	49.354666897	28.4918999815501	67.7991	50.1342	31.512	7.0884
74.1643760018795	49.354666897	28.4918999815501	70.6191	48.182	36.9413	10.2546
74.1643760018795	49.354666897	28.4918999815501	70.2011	52.705	34.7749	12.1835
74.1643760018795	49.354666897	28.4918999815501	68.5789	56.8701	42.2821	16.6688
70.7840848374737	50.247308314	34.6274	70.0624	50.1219	34.6274	0.7325
67.6334378795116	51.179855417	34.7495	66.949	50.6855	34.7495	0.8443
68.6202819821696	55.10082682	33.7791	68.2826	55.0673	33.7791	4.1147
69.6071260572362	59.021798268	20.8661015847163	70.694	53.8562	23.1583	5.7549
69.6071260572362	59.021798268	20.8661015847163	70.1344	58.5671	20.707	0.7142
45.2241910404971	97.174245052	26.2167	42.9721	90.3177	28.7365	7.6955
45.2241910404971	97.174245052	26.2167	42.9226	100.4615	26.2167	4.0129
45.5006351679183	100.106873733	36.5278	46.0729	100.678	36.5278	0.8085
42.6871340046306	99.955705523	45.8992	46.5537	103.4177	45.8992	24.5733
39.8736328969421	99.804537257	46.5210639598935	36.8108	99.4487	34.5912	12.3219
39.8736328969421	99.804537257	46.5210639598935	35.9551	95.9225	47.402	5.5858

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
39.8736328969421	99.804537257	46.5210639598935	32.4952	97.9758	48.1403	7.8091
39.8736328969421	99.804537257	46.5210639598935	39.196	99.7694	49.3378	4.3434
41.5471148048643	103.884442249	56.7244	42.4716	105.6496	56.7244	1.9926
38.4175544449604	98.793700568	66.5848802824523	42.0156	103.5929	44.0945	23.2765
38.4175544449604	98.793700568	66.5848802824523	47.126	99.3914	58.8698	14.4896
35.2879941057747	93.702958871	54.9886025295023	29.376	80.5861	55.9809	14.4218
35.2879941057747	93.702958871	54.9886025295023	32.1756	91.0244	47.2823	9.1133
35.2879941057747	93.702958871	54.9886025295023	33.6244	92.4492	56.3457	13.8672
35.2879941057747	93.702958871	54.9886025295023	35.4152	92.5489	58.019	4.9112
35.2879941057747	93.702958871	54.9886025295023	29.7849	97.5299	53.9895	6.777
35.2879941057747	93.702958871	54.9886025295023	42.0978	97.503	57.9578	9.3352
35.2879941057747	93.702958871	54.9886025295023	44.7902	101.1589	57.6534	13.5802
37.04899377678	92.61660779	52.8478	37.1788	95.0118	52.8478	2.6206
38.809993447733	91.530256708	48.0171	41.599	92.4813	48.0171	2.9467
33.818938738556	88.141474313	40.4202	35.4073	87.2216	40.4202	1.8355
23.9983448333813	87.549643192	33.9752997455247	6.67010000000001	63.5082	34.9077	29.6501
23.9983448333813	87.549643192	33.9752997455247	7.5677	74.3816	13.1566	29.6105
23.9983448333813	87.549643192	33.9752997455247	27.1736	83.2653	40.5956	16.1862
23.9983448333813	87.549643192	33.9752997455247	40.8939	84.3555	43.1765	20.2802
23.9983448333813	87.549643192	33.9752997455247	33.1881	90.5996	30.8927	12.9818
23.9983448333813	87.549643192	33.9752997455247	42.6808	88.2098	40.1619	26.1251
23.9983448333813	87.549643192	33.9752997455247	32.2034	92.5655	35.5696	28.0393
23.9983448333813	87.549643192	33.9752997455247	32.8593	93.0881	38.0081	18.3654
23.9983448333813	87.549643192	33.9752997455247	38.189	100.3805	31.8594	26.8425
23.9983448333813	87.549643192	33.9752997455247	33.8351	99.3235	37.4512	26.1581
23.9983448333813	87.549643192	33.9752997455247	36.1694	94.3523	52.0418	28.0801
23.9983448333813	87.549643192	33.9752997455247	26.6904	96.1713	46.6576	25.5008
23.9983448333813	87.549643192	33.9752997455247	34.3074	104.3145	33.9426	24.0514
23.9983448333813	87.549643192	33.9752997455247	31.4281	94.9219	54.3744	25.0918
23.9983448333813	87.549643192	33.9752997455247	29.8552	101.3038	43.5974	17.7782
23.9983448333813	87.549643192	33.9752997455247	30.7482	95.8761	57.2879	28.9897
23.9983448333813	87.549643192	33.9752997455247	32.8361	107.2479	41.504	24.978
28.9636765755793	95.942972883	23.036	29.1897	96.4145	23.036	0.5229
27.7550406320459	91.456251896	22.4343	29.5221	90.7635	22.4343	1.898
23.3692195310284	88.215104967	15.2235184077227	22.6268	64.3936	19.9605	24.3192
23.3692195310284	88.215104967	15.2235184077227	31.0449	71.9995	0.0029	23.5272
23.3692195310284	88.215104967	15.2235184077227	22.8762	75.7017	33.805	22.7687
23.3692195310284	88.215104967	15.2235184077227	9.9143	75.8382	26.191	21.3192
23.3692195310284	88.215104967	15.2235184077227	17.9606	81.6588	21.6946	21.1617
23.3692195310284	88.215104967	15.2235184077227	32.6009	89.9531	17.4409	11.1863
23.3692195310284	88.215104967	15.2235184077227	34.0458	95.0903	5.2592	23.4922
23.3692195310284	88.215104967	15.2235184077227	29.3468	93.7461	14.2413	24.255
23.3692195310284	88.215104967	15.2235184077227	34.0163	93.2553	22.3961	18.0121
23.3692195310284	88.215104967	15.2235184077227	35.7481	97.1257	4.802	23.4808
23.3692195310284	88.215104967	15.2235184077227	40.065	98.6098	6.7408	21.6771
23.3692195310284	88.215104967	15.2235184077227	35.0473	98.5367	9.9491	21.3919
23.3692195310284	88.215104967	15.2235184077227	42.2565	98.7398	22.9258	24.1013
23.3692195310284	88.215104967	15.2235184077227	5.8502	91.8647	13.1882	18.0105
23.3692195310284	88.215104967	15.2235184077227	28.2891	98.27	21.6276	21.2566
23.3692195310284	88.215104967	15.2235184077227	35.5571	102.295	9.2843	22.4132
23.3692195310284	88.215104967	15.2235184077227	26.1674	96.1159	30.3905	22.0166
23.3692195310284	88.215104967	15.2235184077227	34.0464	97.1856	33.2284	23.2445
30.9711954927694	88.251211204	6.46236441298762	14.5018	68.1646	16.8217	28.3495
30.9711954927694	88.251211204	6.46236441298762	33.517	80.8699	6.7304	7.8126
30.9711954927694	88.251211204	6.46236441298762	34.9317	80.2335	16.9208	24.9565
30.9711954927694	88.251211204	6.46236441298762	23.4089	84.0628	5.796	9.7975
30.9711954927694	88.251211204	6.46236441298762	48.9533	90.4759	7.3728	19.0092
30.9711954927694	88.251211204	6.46236441298762	33.2241	90.2072	6.3544	24.6184
30.9711954927694	88.251211204	6.46236441298762	43.1057	91.7939	5.1823	21.808
30.9711954927694	88.251211204	6.46236441298762	34.7819	91.1147	8.0437	26.8877
30.9711954927694	88.251211204	6.46236441298762	47.7789	92.5461	5.4276	17.3786
30.9711954927694	88.251211204	6.46236441298762	37.0706	93.0168	1.0492	27.7874
30.9711954927694	88.251211204	6.46236441298762	41.6896	94.8028	3.024	26.2925
30.9711954927694	88.251211204	6.46236441298762	30.8807	93.5109	0.3364	15.6566
30.9711954927694	88.251211204	6.46236441298762	37.3296	94.7968	3.7833	26.3816
30.9711954927694	88.251211204	6.46236441298762	35.2297	94.8683	9.4168	10.0169
30.9711954927694	88.251211204	6.46236441298762	33.9629	96.8355	4.449	13.8521
30.9711954927694	88.251211204	6.46236441298762	51.1106	98.2963	5.5983	24.3822
30.9711954927694	88.251211204	6.46236441298762	39.7333	98.7582	4.2197	18.7088
30.9711954927694	88.251211204	6.46236441298762	31.6916	96.8159	17.5787	27.5118
30.9711954927694	88.251211204	6.46236441298762	29.7064	94.0211	29.3487	26.0785
30.9711954927694	88.251211204	6.46236441298762	31.7064	96.988	25.1942	27.9597
30.9711954927694	88.251211204	6.46236441298762	35.7306	102.2767	4.1846	20.2694
30.9711954927694	88.251211204	6.46236441298762	8.1477	101.1634	5.5645	26.7278
34.823915417278	91.693840849	9.9912	37.9917	90.5379	9.9912	3.3721
37.5150966346317	95.560321528	5.4495	35.7859	98.3251	5.4495	3.261
40.5875362712865	98.8172165	11.6027088308264	53.9006	102.5381	21.0284	26.8445
40.5875362712865	98.8172165	11.6027088308264	45.465	105.2608	3.7217	13.9094
40.5875362712865	98.8172165	11.6027088308264	40.9527	105.6227	4.1926	16.0561
40.5875362712865	98.8172165	11.6027088308264	28.1717	107.4546	19.2451	16.9459

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
43.6599759470733	102.074111674	1.3549	40.5226	102.8002	1.3549	3.2203
47.3336445281781	105.191862572	10.3389	48.0764	105.8084	10.3389	0.9653
43.0708845230986	101.721841159	14.8388	42.5793	100.4271	14.8388	3.5498
38.8081242324676	98.251819801	17.5328	38.2186	96.6747	17.5328	1.6837
37.1835450154504	101.839565969	13.13179015462	45.0704	101.2748	27.009	15.9718
37.1835450154504	101.839565969	13.13179015462	42.9285	106.2179	5.6354	10.4101
37.1835450154504	101.839565969	13.13179015462	37.1983	106.347	12.5162	4.5493
33.5160979957845	103.179199388	11.8691922778703	40.9431	96.0349	18.7884	13.182
33.5160979957845	103.179199388	11.8691922778703	33.0573	97.9271	5.3628	8.5196
33.5160979957845	103.179199388	11.8691922778703	40.2693	101.3043	8.6864	10.0221
33.5160979957845	103.179199388	11.8691922778703	31.6341	101.1443	12.133	2.7843
33.5160979957845	103.179199388	11.8691922778703	30.1816	102.1772	4.0412	8.5674
33.2666087000069	108.064116656	19.7963	33.1686	108.6172	19.7963	0.5617
33.9276980279581	107.810449252	32.813761954818	8.0611	104.093	26.141	29.9646
33.9276980279581	107.810449252	32.813761954818	43.0828	99.6317	56.4863	26.6664
33.9276980279581	107.810449252	32.813761954818	35.2228	101.4244	59.0123	27.011
34.5887877603216	107.556781776	39.4142347568415	42.8352	101.6931	44.9574	21.2677
34.5887877603216	107.556781776	39.4142347568415	33.1638	109.6815	28.6324	13.4189
35.2498779680383	107.303114234	41.395	35.3466	107.7036	41.395	0.412
35.4732648704652	105.237116715	46.4235573522199	39.6285	91.4521	58.9959	19.1143
35.4732648704652	105.237116715	46.4235573522199	31.3011	106.2109	32.3658	16.9428
35.4732648704652	105.237116715	46.4235573522199	39.1965	105.4524	44.823	4.0584
34.2786097076686	103.684567324	50.1937	35.4006	103.6799	50.1937	1.122
28.7063432888849	102.150228375	51.2805910798252	44.0393	95.7757	50.8289	16.7138
28.7063432888849	102.150228375	51.2805910798252	39.3246	101.8921	42.5744	13.7336
28.7063432888849	102.150228375	51.2805910798252	35.7224	107.36	58.7833	11.5177
8.33670628748371	96.050943419	54.1904471768912	-4.2807	74.2616	57.1387	26.6495
8.33670628748371	96.050943419	54.1904471768912	3.55029999999999	90.3653	48.0124	9.6646
8.33670628748371	96.050943419	54.1904471768912	26.55	96.735	54.3574	21.6617
8.33670628748371	96.050943419	54.1904471768912	26.9511	99.1097	54.9389	22.0884
8.33670628748371	96.050943419	54.1904471768912	-2.30370000000001	90.7079	58.2529	19.8948
8.33670628748371	96.050943419	54.1904471768912	-0.0468000000000046	93.7668	57.0052	20.328
8.33670628748371	96.050943419	54.1904471768912	1.1743	92.9818	59.2535	22.3694
8.33670628748371	96.050943419	54.1904471768912	4.95789999999999	99.4405	59.5277	7.1688
8.33670628748371	96.050943419	54.1904471768912	-7.5489	96.9207	56.8305	21.6
5.11949320222008	93.426756491	55.0094512068375	-1.23350000000001	86.0108	56.7294	9.9154
5.11949320222008	93.426756491	55.0094512068375	0.580200000000005	93.7511	50.7296	6.2472
6.20361729000088	90.820811959	27.2865	7.8142	89.6258	27.2865	2.0055
5.12449504325153	91.766402302	21.362958921083	-1.9602	93.9224	5.6614	23.076
5.12449504325153	91.766402302	21.362958921083	0.613799999999998	95.4238	16.9249	17.1272
5.12449504325153	91.766402302	21.362958921083	3.81100000000001	100.5395	9.9764	22.995
5.12449504325153	91.766402302	21.362958921083	-0.311599999999999	97.6012	28.6474	20.2615
4.04537219038319	92.711991913	26.1162599711066	21.5395	100.4343	27.1149	29.9057
4.04537219038319	92.711991913	26.1162599711066	-2.1508	94.1499	7.6254	24.1365
4.04537219038319	92.711991913	26.1162599711066	1.20229999999999	90.7259	43.7677	19.1166
4.04537219038319	92.711991913	26.1162599711066	3.4538	93.5151	43.6356	19.9908
4.04537219038319	92.711991913	26.1162599711066	-12.8049	93.8535	15.5008	19.948
4.04537219038319	92.711991913	26.1162599711066	3.1448	100.72	31.1491	20.6463
4.04537219038319	92.711991913	26.1162599711066	2.1469	96.6722	44.5395	20.9499
4.04537219038319	92.711991913	26.1162599711066	-1.86190000000001	98.5581	36.524	15.9681
4.04537219038319	92.711991913	26.1162599711066	-3.26390000000001	94.8889	48.3647	23.5193
2.61561122973978	93.338118902	31.8751	1.64530000000001	95.7178	31.8751	2.5699
-0.686326045580358	95.153841363	31.0370787786922	6.3198	96.0864	20.0555	13.0595
-0.686326045580358	95.153841363	31.0370787786922	3.5924	94.7451	26.9481	6.9732
-0.686326045580358	95.153841363	31.0370787786922	0.619299999999996	91.0377	37.0534	11.2677
-0.686326045580358	95.153841363	31.0370787786922	3.11839999999999	98.924	29.022	10.2515
-0.686326045580358	95.153841363	31.0370787786922	-3.1358	95.2162	31.8855	4.3309
-3.98826263693108	96.969564737	26.4862	-5.5457	98.4014	26.4862	2.1156
-2.93916061148863	94.785141321	9.95494389536973	4.77370000000001	93.7785	6.1602	12.9549
-2.93916061148863	94.785141321	9.95494389536973	-0.171000000000006	97.1566	2.8672	11.053
-2.93916061148863	94.785141321	9.95494389536973	1.4019	97.5847	15.4849	8.9245
-2.93916061148863	94.785141321	9.95494389536973	-6.68600000000001	94.6391	7.4364	5.5087
-1.89005811833626	92.600718542	11.3112	3.0162	107.1796	11.3112	15.3823
-0.923539098553988	90.170899811	7.9857	2.55330000000001	99.1767	7.9857	13.4676
0.0429798816165743	87.741081099	0.1507	-0.100899999999996	90.0487	0.1507	2.3121
1.99777449610522	69.460792718	0.7436	0.483800000000002	63.8626	0.7436	5.7993
8.55675228725605	68.20529626	9.55200000340626	31.4906	71.3219	1.4719	26.6563
8.55675228725605	68.20529626	9.55200000340626	9.6606	65.5604	9.552	2.866
8.55675228725605	68.20529626	9.55200000340626	16.7224	69.1113	14.1768	26.0784
8.55675228725605	68.20529626	9.55200000340626	12.5389	66.9051	22.2814	25.9958
8.55675228725605	68.20529626	9.55200000340626	1.76609999999999	66.5446	12.6159	26.4568
8.55675228725605	68.20529626	9.55200000340626	9.00020000000001	73.0359	5.8372	24.3533
8.55675228725605	68.20529626	9.55200000340626	7.0214	70.8048	31.3366	24.0693
8.55675228725605	68.20529626	9.55200000340626	2.7376	84.0979	3.4333	22.8219
8.55675228725605	68.20529626	9.55200000340626	2.57040000000001	90.3092	4.6781	25.529
13.7824959734914	70.144316161	6.97336717301592	31.4455	71.7336	19.6874	27.0146
13.7824959734914	70.144316161	6.97336717301592	12.0877	66.3858	4.5331	4.791
13.7824959734914	70.144316161	6.97336717301592	31.4187	76.5703	2.7936	26.413
19.0082401137259	72.083336245	4.5063311212923	23.9369	61.5866	18.0383	22.0202
19.0082401137259	72.083336245	4.5063311212923	15.1112	64.361	7.2726	9.0815

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
19.0082401137259	72.083336245	4.5063311212923	23.527	73.6169	0.5641	21.6834
19.0082401137259	72.083336245	4.5063311212923	26.6151	77.1467	3.8306	15.3985
19.0082401137259	72.083336245	4.5063311212923	10.0835	69.723	3.7551	14.2892
19.0082401137259	72.083336245	4.5063311212923	8.0472	76.1743	13.1381	21.0495
24.2339839591521	74.022356652	0.42365555158383	22.9431	70.0987	4.2047	5.5998
24.2339839591521	74.022356652	0.42365555158383	25.4767	75.481	0.001	1.9623
24.5811331981455	71.43086486	12.3167129259664	24.5076	73.115	4.3052	8.9241
24.5811331981455	71.43086486	12.3167129259664	22.1344	71.2137	11.8857	6.3651
24.5811331981455	71.43086486	12.3167129259664	24.5354	72.6275	12.2334	5.9717
24.5811331981455	71.43086486	12.3167129259664	21.1184	76.9048	10.6601	8.7289
24.9282712727598	68.839372589	12.3664340782437	28.241	67.9653	9.5896	4.4101
24.9282712727598	68.839372589	12.3664340782437	25.7737	68.9159	14.4865	2.2837
16.1976344504444	67.83716347	15.5338949201586	33.839	67.1668	7.1332	20.2124
16.1976344504444	67.83716347	15.5338949201586	22.8228	67.5784	3.2098	16.2582
16.1976344504444	67.83716347	15.5338949201586	14.2239	63.9607	10.3191	12.6801
16.1976344504444	67.83716347	15.5338949201586	9.15690000000001	61.6426	15.1483	9.3858
16.1976344504444	67.83716347	15.5338949201586	27.2709	73.9256	16.4296	19.9916
16.1976344504444	67.83716347	15.5338949201586	13.2613	67.7948	17.1077	9.5466
16.1976344504444	67.83716347	15.5338949201586	7.6803	61.1857	24.6436	15.0459
16.1976344504444	67.83716347	15.5338949201586	12.0587	67.8257	18.5408	15.0634
16.1976344504444	67.83716347	15.5338949201586	10.5042	66.7806	23.1982	12.8873
16.1976344504444	67.83716347	15.5338949201586	23.796	77.2181	9.3562	18.2059
16.1976344504444	67.83716347	15.5338949201586	22.0857	71.4539	26.9077	17.4147
16.1976344504444	67.83716347	15.5338949201586	12.0444	66.3239	28.7604	13.9456
16.1976344504444	67.83716347	15.5338949201586	13.7649	76.0563	18.1156	11.1171
16.1976344504444	67.83716347	15.5338949201586	11.6475	70.8021	30.9107	20.1612
7.60045806235881	66.951211942	27.251	6.9842	66.7632	27.251	0.6443
8.6930188869312	69.02146731	30.8803951868907	9.1707	70.0865	21.5855	9.3679
8.6930188869312	69.02146731	30.8803951868907	10.7344	66.9849	31.9545	3.0771
6.74726091106002	73.864715127	30.8247896311424	31.7515	71.3679	39.9054	28.4179
6.74726091106002	73.864715127	30.8247896311424	6.65640000000001	74.2265	20.3804	11.3789
6.74726091106002	73.864715127	30.8247896311424	0.309600000000003	68.1954	39.7657	12.3905
6.74726091106002	73.864715127	30.8247896311424	-0.735100000000003	89.6931	26.6301	28.3044
6.74726091106002	73.864715127	30.8247896311424	9.17	97.1621	20.3835	26.9226
6.74726091106002	73.864715127	30.8247896311424	3.5998	89.8159	36.4775	20.0402
6.74726091106002	73.864715127	30.8247896311424	-2.5612	92.1356	23.79	25.3912
6.74726091106002	73.864715127	30.8247896311424	-4.1255	85.596	43.5867	25.3799
6.74726091106002	73.864715127	30.8247896311424	-0.338999999999999	97.1979	25.6607	24.9263
7.79607908377683	73.148511422	36.507699883677	5.2812	65.5492	44.5709	11.3895
7.79607908377683	73.148511422	36.507699883677	6.09139999999999	73.9114	36.5077	1.8676
10.5927660672198	71.650093293	37.3381	8.8648	72.0358	37.3381	5.5515
13.3894580648115	70.15167763	42.888	12.0097	66.7734	42.888	5.0159
16.1861502967153	68.653260727	33.9722034988763	21.3934	72.6127	7.7423	27.5896
16.1861502967153	68.653260727	33.9722034988763	26.4747	67.9787	32.7219	12.3016
16.1861502967153	68.653260727	33.9722034988763	14.7433	68.1941	29.0053	9.3958
16.1861502967153	68.653260727	33.9722034988763	10.4334	62.822	33.9682	8.2889
16.1861502967153	68.653260727	33.9722034988763	26.4833	65.6457	42.68	15.8608
16.1861502967153	68.653260727	33.9722034988763	24.4797	75.354	37.647	15.2855
16.1861502967153	68.653260727	33.9722034988763	8.3117	72.2049	29.6247	15.4861
16.1861502967153	68.653260727	33.9722034988763	11.4886	67.7219	43.0579	21.8599
16.1861502967153	68.653260727	33.9722034988763	12.73	75.2001	37.6748	18.6111
16.1861502967153	68.653260727	33.9722034988763	14.0233	68.3418	48.6515	20.9704
16.1861502967153	68.653260727	33.9722034988763	14.2076	63.0144	54.8035	24.0324
16.1861502967153	68.653260727	33.9722034988763	9.45780000000001	72.6847	40.961	17.4171
16.1861502967153	68.653260727	33.9722034988763	4.4426	63.6871	51.0243	23.1902
16.1861502967153	68.653260727	33.9722034988763	9.3844	71.5303	46.4336	26.9324
16.1861502967153	68.653260727	33.9722034988763	10.9416	69.7746	52.0032	20.3266
18.9828427792004	67.154842837	33.9115	18.9682	67.082	33.9115	0.0743
23.4809314813303	74.120289269	38.2425999997424	26.2205	72.9044	33.175	6.2191
23.4809314813303	74.120289269	38.2425999997424	24.3218	77.9732	38.2426	3.9436
26.4599797274308	74.125399815	44.9112	26.4587	69.6793	44.9112	4.4461
32.4182134073175	74.635437802	51.2201	32.697	74.6737	51.2201	0.2814
29.4391006536143	74.380418881	52.8076181106065	15.0856	70.6386	28.9208	28.271
29.4391006536143	74.380418881	52.8076181106065	18.7356	77.2891	30.4652	27.8207
29.4391006536143	74.380418881	52.8076181106065	32.2488	71.8762	47.8257	10.0488
29.4391006536143	74.380418881	52.8076181106065	31.105	77.2121	42.4385	19.85
29.4391006536143	74.380418881	52.8076181106065	15.3124	65.205	52.7286	17.4654
29.4391006536143	74.380418881	52.8076181106065	35.1535	70.6086	57.9365	16.7445
29.4391006536143	74.380418881	52.8076181106065	24.7401	75.4523	49.5075	27.8452
29.4391006536143	74.380418881	52.8076181106065	26.9783	71.0141	56.5271	24.9531
29.4391006536143	74.380418881	52.8076181106065	25.3366	76.538	54.326	21.2393
29.4391006536143	74.380418881	52.8076181106065	11.4442	66.9869	57.5373	21.9247
27.6481481111308	73.826918919	51.9251	27.6433	72.5657	51.9251	2.8004
22.8780830444401	73.018400728	57.4094	24.1578	73.3792	57.4094	11.3579
18.1080183855057	72.209881088	59.9496	18.2654	71.5277	59.9496	0.7001
13.2065952851491	71.970741969	53.8867999999993	8.4928	63.9998	55.0759	9.7983
13.2065952851491	71.970741969	53.8867999999993	15.4332	72.9689	53.8868	2.4401
5.53707678164936	70.490704897	49.5614	4.0089	72.186	49.5614	2.2824
6.99041585094999	58.89015438	56.3188	4.7342	63.0935	56.3188	4.7706
15.6529744859259	33.858784213	59.2618000004609	22.0389	18.6688	59.3708	16.6692

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
15.6529744859259	33.858784213	59.2618000004609	19.4476	21.0876	59.2618	13.323
17.2897819866908	32.47326122	59.401	18.7218	26.0511	59.401	18.3773
18.9265910503261	31.087739725	51.4824	21.4132	25.3225	51.4824	11.064
20.5633989401859	29.702217362	46.1078	21.3113	31.7798	46.1078	2.2081
19.4563041845699	20.69445159	46.5071	19.4151	20.4264	46.5071	0.2712
19.8086297654099	21.180865313	35.3190554802187	27.2842	5.8331	28.3822	18.4271
19.8086297654099	21.180865313	35.3190554802187	20.8129	26.0745	22.3222	16.1762
19.8086297654099	21.180865313	35.3190554802187	25.9081	14.4892	36.1934	15.0463
19.8086297654099	21.180865313	35.3190554802187	18.1963	16.0602	36.4885	17.912
19.8086297654099	21.180865313	35.3190554802187	19.6468	14.5775	38.07	7.1553
19.9255014302355	24.814938043	34.6116	19.5225	24.6717	34.6116	0.4277
19.8670653443509	22.997901637	28.1174	18.4916	22.031	28.1174	8.3539
27.3883333973802	29.263704675	27.0633	28.099	29.8348	27.0633	0.9117
24.1183960123821	25.087569391	18.2129431757294	19.8821	27.2321	11.7559	8.0149
24.1183960123821	25.087569391	18.2129431757294	22.8581	29.0039	22.5241	5.9592
22.2008107770245	19.142523822	5.559	19.6457	23.2311	5.559	5.0904
20.2832252378203	13.197478022	4.32368939042188	49.3862	17.5735	5.4967	29.4535
20.2832252378203	13.197478022	4.32368939042188	46.7163	23.0055	0.3229	28.4765
20.2832252378203	13.197478022	4.32368939042188	47.0712	4.3382	9.7807	28.9099
20.2832252378203	13.197478022	4.32368939042188	28.0443	7.2557	0.5495	23.7219
20.2832252378203	13.197478022	4.32368939042188	41.1669	5.3004	18.6447	27.2131
20.2832252378203	13.197478022	4.32368939042188	27.0312	22.0371	1.4535	12.0381
20.2832252378203	13.197478022	4.32368939042188	23.3217	16.9506	6.2856	12.0877
20.2832252378203	13.197478022	4.32368939042188	25.2224	21.1268	9.0297	20.0558
20.2832252378203	13.197478022	4.32368939042188	23.9142	5.5856	8.3806	20.6816
20.2832252378203	13.197478022	4.32368939042188	26.7943	-2.6353	5.1743	24.1177
20.2832252378203	13.197478022	4.32368939042188	24.0847	21.2619	9.4135	18.4856
20.2832252378203	13.197478022	4.32368939042188	21.2889	20.2133	0.1771	12.2867
20.2832252378203	13.197478022	4.32368939042188	32.3564	-1.4633	20.5286	25.6089
20.2832252378203	13.197478022	4.32368939042188	22.4003	2.9895	12.1851	21.9707
20.2832252378203	13.197478022	4.32368939042188	16.9397	16.157	0.3423	23.6795
20.2832252378203	13.197478022	4.32368939042188	21.6596	11.213	17.563	23.4533
20.2832252378203	13.197478022	4.32368939042188	20.5046	21.2685	13.3595	15.1676
20.2832252378203	13.197478022	4.32368939042188	20.5322	21.5891	20.6595	28.8292
20.2832252378203	13.197478022	4.32368939042188	15.0509	21.8739	10.7741	20.7664
20.2832252378203	13.197478022	4.32368939042188	19.0397	19.3917	26.8913	27.4702
20.2832252378203	13.197478022	4.32368939042188	7.8039	17.6061	5.7787	13.3149
20.2832252378203	13.197478022	4.32368939042188	18.7531	32.536	21.0115	27.0946
20.6160872473035	0.949276885	2.2943	19.4163	-0.8394	2.2943	2.1538
30.5561774599563	3.023804266	7.36551922896333	46.7677	27.4481	8.8301	29.3514
30.5561774599563	3.023804266	7.36551922896333	31.0707	1.7474	5.3999	2.3995
30.5561774599563	3.023804266	7.36551922896333	28.1449	5.3771	22.529	15.5333
38.8424387299693	7.494852133	1.2183	42.7704	10.2739	1.2183	5.5443

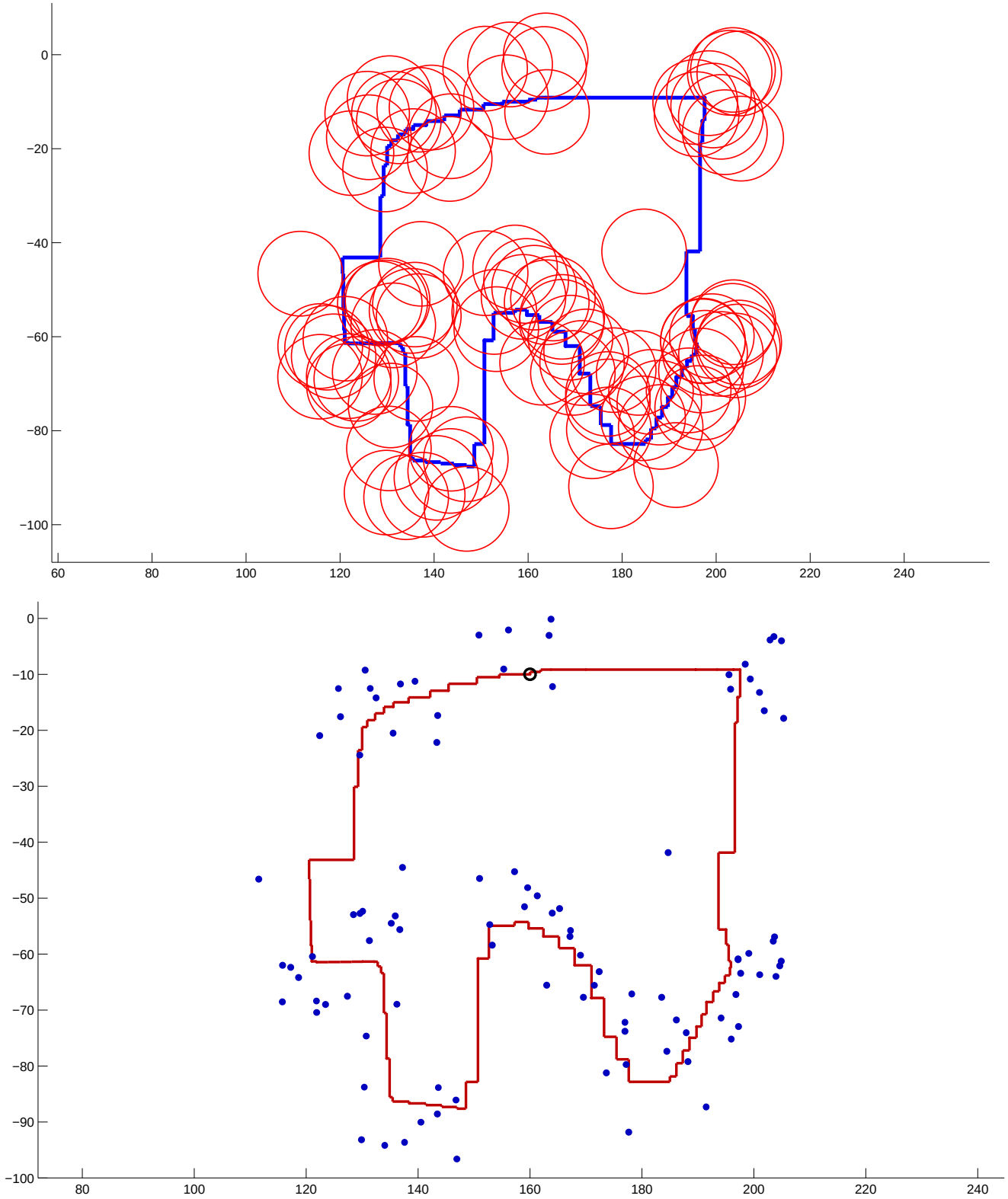


Figure N.105: *team*1_100, Equal Radius, 2D, Manhattan, Length = 372.7430207

Table N-108: Solution for *team*1_100, Equal Radius, 2D, Manhattan

Total distance: 372.743020674967			
Depot: x 50 y 10			
Solution x	Solution y	Original x	Original y
44.50990336708	10.5065126271945	40.868	2.981
44.50990336708	10.5065126271945	46.154	2.083
40.5065475458225	11.6903261336608	45.293	9.057
35.4421287787315	12.9194437742666	29.447	11.243
35.4421287787315	12.9194437742666	33.5	17.352
32.1688786239376	14.1228348401759	33.341	22.178
28.2945254506076	14.9893891942631	22.494	14.202
28.2945254506076	14.9893891942631	25.542	20.506
25.5818807907136	15.8135976052848	20.541	9.26
25.5818807907136	15.8135976052848	26.839	11.732
23.913283980571	16.9693957381175	21.459	12.53
22.3129360621636	18.1902781057158	16.123	17.568
20.8984178224476	19.4250783864342	15.772	12.549
20.0037514556654	23.5560649935858	12.414	20.962
19.275532839276	30.1097249014303	19.569	24.449
18.5445435268678	43.1624628591576	27.219	44.51
10.5270020882802	46.5989949850693	1.527	46.599
10.6841102669274	53.9977343074513	11.123	60.442
10.8407976349485	58.391227211082	8.641	64.188
10.8407976349485	58.391227211082	7.235	62.367
10.9990612838803	61.3026393200682	5.739	68.535
10.9990612838803	61.3026393200682	5.777	62.003
11.8779932366582	61.4439976573275	11.878	70.444
11.8779932366582	61.4439976573275	11.844	68.394
13.933826575342	61.4198905615832	13.454	69.007
16.0616678215911	61.3955774247459	17.374	67.529
18.1194674108741	61.3711173425273	18.45	52.954
20.1029994740968	61.3470023201996	21.299	57.593
20.1029994740968	61.3470023201996	20.103	52.347
22.1678942869852	61.3580830594233	19.619	52.734
22.1678942869852	61.3580830594233	25.923	53.185
22.7888911551075	62.2186279326946	25.201	54.507
23.3732843623499	63.4210505422209	26.732	55.612
23.8766326632579	70.5264646560615	26.213	68.977
24.3759010379998	78.6618600400965	20.393	83.793
24.3759010379998	78.6618600400965	20.735	74.659
24.9024469652262	85.5844207488805	24.053	94.189
25.4618061214681	86.3526041632808	19.881	93.181
28.4229503038647	86.681710820602	27.59	93.644
28.4229503038647	86.681710820602	30.503	90.056
31.3983206609281	86.9965925824253	33.626	83.869
34.2281816716495	87.3153055882445	36.762	86.092
36.9240042779782	87.6359966943407	36.924	96.636
38.5553434487633	82.8462899135523	33.443	88.578
40.6949323176632	60.7973856267418	43.243	58.404
40.6949323176632	60.7973856267418	42.804	54.74
42.6417606708972	54.944527332911	40.978	46.49
47.2320042575371	54.2700024906912	47.232	45.27
49.7562678805914	55.405893758774	49.02	51.541
49.7562678805914	55.405893758774	49.571	48.14
52.3934647156997	56.848999452741	53.958	52.681
52.3934647156997	56.848999452741	51.29	49.58
55.1707749740019	58.9467117697102	55.281	51.871
57.9614708544132	61.9931141440453	57.142	56.857
57.9614708544132	61.9931141440453	57.243	55.792
60.9931032072577	67.8454911674205	66.957	73.797
60.9931032072577	67.8454911674205	66.971	72.201
60.9931032072577	67.8454911674205	68.193	67.124
60.9931032072577	67.8454911674205	59.534	67.732
60.9931032072577	67.8454911674205	61.493	65.592
60.9931032072577	67.8454911674205	62.352	63.144
60.9931032072577	67.8454911674205	59.007	60.213
60.9931032072577	67.8454911674205	52.975	65.56
63.2260753471069	74.7896522187529	63.631	81.224
65.4527686811608	78.813450488358	67.179	79.746
67.642985525882	82.8289963611629	67.643	91.829
74.9920032238034	81.8619156365629	81.476	87.316
76.1482208859194	79.5091296049493	78.214	79.218
77.2975953857042	77.2242914390065	74.447	77.382
78.4893162599106	74.9702459570506	77.919	74.057
78.4893162599106	74.9702459570506	76.154	71.763
79.7436430882771	72.9483129380524	85.968	75.194
79.7436430882771	72.9483129380524	87.252	72.952
80.6490785994283	70.766574556313	84.146	71.427
81.5347397321205	68.5813143597864	86.785	67.217
81.5347397321205	68.5813143597864	73.523	67.727
82.7286736403749	66.6685017993724	87.18	60.86
83.8012074043889	65.1657845884238	87.633	63.432
83.8012074043889	65.1657845884238	87.173	60.998
84.8083907302242	63.8180647414722	91.043	63.691
85.7323104187106	62.481759581893	93.946	64.003
85.7323104187106	62.481759581893	94.619	62.103
85.8939963271873	61.261941212138	94.894	61.262
85.4914843265911	58.3150581827387	93.456	57.69
85.035353945205	55.6103935917193	93.694	56.925
85.035353945205	55.6103935917193	89.091	59.886
83.6790030124793	41.8649872767314	74.679	41.865
86.5901289499292	18.6357999835151	95.317	17.864
87.0724400594975	14.0951954801519	91.007	13.249
87.0724400594975	14.0951954801519	91.857	16.502
87.5395334773429	9.14800026822741	94.926	4.006
87.5395334773429	9.14800026822741	93.574	3.255
86.3455188012256	9.14800062927652	92.889	3.855
86.3455188012256	9.14800062927652	88.457	8.185
83.4247649535951	9.1480009960008	89.359	10.839
79.5888017847835	9.14800136254557	85.554	10.061
79.5888017847835	9.14800136254557	85.841	12.653
59.9681558968668	9.14800172832338	54.032	12.197
53.7539600079703	9.14800209366419	53.754	0.148
51.9153034169112	9.5653684598181	53.405	3.041

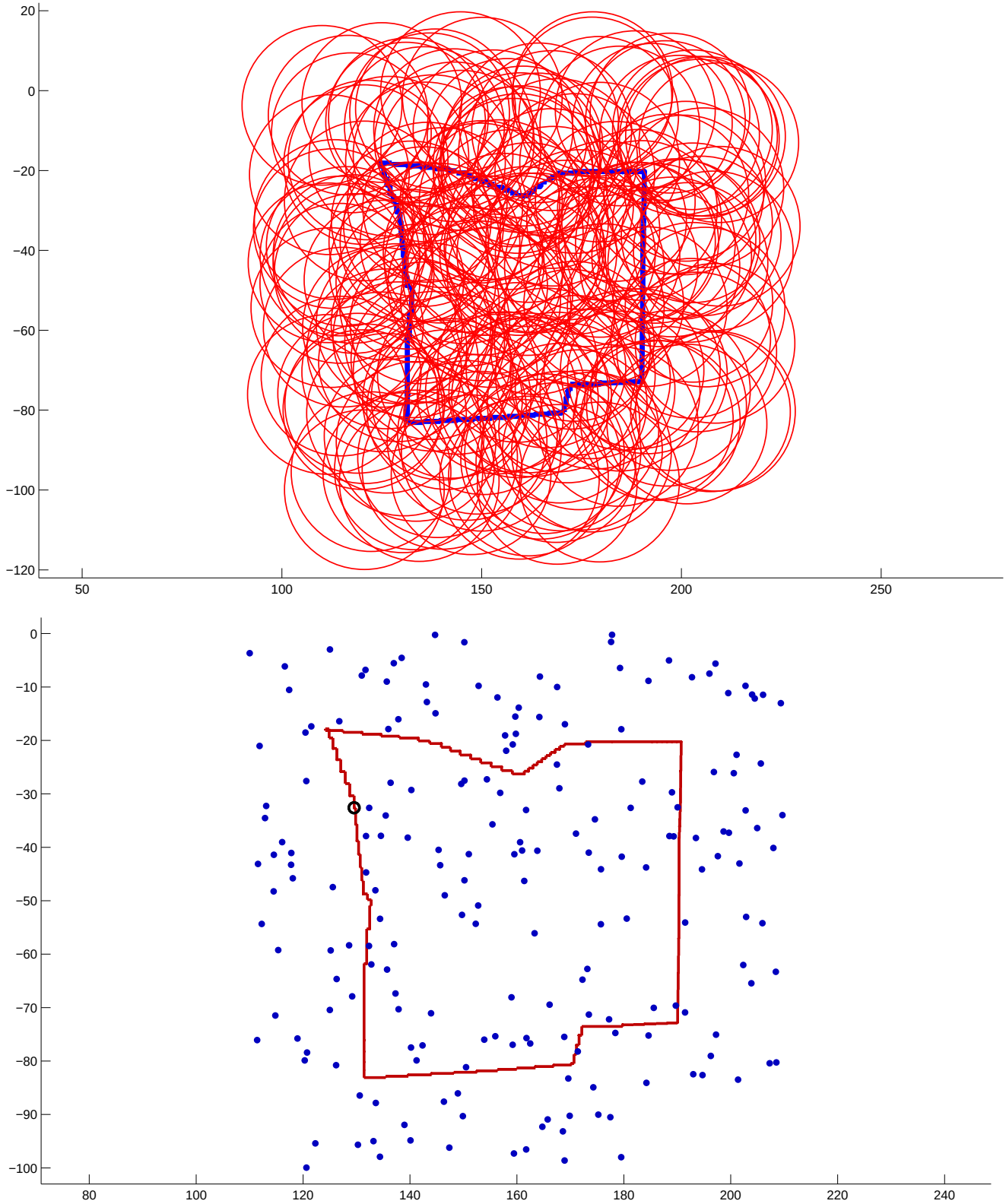


Figure N.106: *team*2_200, Equal Radius, 2D, Manhattan, Length = 278.4347435

Table N-109: Solution for *team*2_200, Equal Radius, 2D, Manhattan

Total distance: 278.434743491941 Depot: x 19.5535 y 32.6157			
Solution x	Solution y	Original x	Original y
19.8152606518301	35.6848763145492	2.888575	34.539165
19.8152606518301	35.6848763145492	6.091625	39.029145
20.0840635448781	38.8064149778017	1.56824	43.114435
20.0840635448781	38.8064149778017	4.535275	41.40327
20.3759221647184	41.2830533411936	7.79806	41.063165
20.3759221647184	41.2830533411936	7.76847	43.27595
20.6725143257494	43.7857769539053	8.071465	45.7971455
20.9716918554979	46.2796389450655	4.493385	48.2428075
21.2767919427949	48.7322039406763	2.26292	54.336059
21.2767919427949	48.7322039406763	21.779985	37.899125
21.2767919427949	48.7322039406763	24.567885	37.86062
21.2767919427949	48.7322039406763	21.800035	44.699325
21.2767919427949	48.7322039406763	29.577285	38.20107
21.2767919427949	48.7322039406763	24.393135	53.387308
21.2767919427949	48.7322039406763	23.528225	48.047471
21.2767919427949	48.7322039406763	35.347265	40.483415
21.2767919427949	48.7322039406763	35.65863	43.345715
21.2767919427949	48.7322039406763	36.49954	48.989475
22.0547665825893	49.8038944180434	40.184205	46.1874365
22.7533342588789	50.9067756848175	42.753335	50.906813
22.4637505010738	55.2785647888812	39.724355	52.657318
22.4637505010738	55.2785647888812	42.291825	54.317701
21.915327159885	61.7714149624638	5.35045	59.245825
21.915327159885	61.7714149624638	15.566305	47.445917
21.4017657234521	76.0730932065492	1.401765	76.07236
21.4017657234521	76.0730932065492	10.302265	79.88844
21.4017657234521	76.0730932065492	10.737535	78.399525
21.4017657234521	76.0730932065492	8.96414	75.77293
21.4017657234521	76.0730932065492	4.81189	71.48163
21.4017657234521	76.0730932065492	16.17437	80.77798
21.4017657234521	76.0730932065492	14.99811	70.439575
21.4017657234521	76.0730932065492	19.19225	67.891335
21.4017657234521	76.0730932065492	31.22881	79.877355
21.4017657234521	76.0730932065492	16.28216	64.658715
21.4017657234521	76.0730932065492	30.1948	77.47401
21.4017657234521	76.0730932065492	32.35548	77.08328
21.4017657234521	76.0730932065492	15.17562	59.299125
21.4017657234521	76.0730932065492	27.85894	70.297015
21.4017657234521	76.0730932065492	40.48646	81.157135
21.4017657234521	76.0730932065492	27.294235	67.36467
21.4017657234521	76.0730932065492	18.601355	58.3359
21.4017657234521	76.0730932065492	22.77816	61.91876
21.4017657234521	76.0730932065492	25.726765	62.875185
21.4017657234521	76.0730932065492	33.93752	71.055425
21.4017657234521	76.0730932065492	22.32618	58.45293
21.4017657234521	76.0730932065492	27.03592	58.11764
21.4017656445537	78.2261593320166	20.60172	86.45345
21.4017656445537	78.2261593320166	23.602775	87.83846
21.4017655657795	80.1913858183926	20.26183	95.676245
21.4017655657795	80.1913858183926	23.159665	94.99055
21.4017654875032	81.7190774723586	12.30828	95.415795
21.4017654114266	83.085621888533	10.636965	99.941455
25.4652292148795	82.8400863758452	24.384515	97.907795
29.7003367908388	82.5890542547861	30.09705	94.85711
29.7003367908388	82.5890542547861	28.966505	91.93771
34.0202608143155	82.3333714769717	36.34587	87.597465
34.0202608143155	82.3333714769717	38.950185	86.058925
38.1960022931318	82.0787550910267	37.353615	96.195315
42.5379666044647	81.821014789681	39.89323	90.309885
42.5379666044647	81.821014789681	49.437672	97.29667
46.3775367047128	81.5591184618552	51.725585	96.536445
49.9521589402501	81.2933044301685	54.766852	92.295455
53.4579489927288	81.0266232711138	59.88564	90.256965
53.4579489927288	81.0266232711138	55.7501	90.920415
56.8852280196885	80.759799669402	58.9163	98.60932
56.8852280196885	80.759799669402	58.59379	93.155945
60.1882334654639	80.4834134120317	69.51155	98.000325
60.1882334654639	80.4834134120317	67.48261	90.51293
60.6703653440817	78.7667074529624	65.23767	90.033385
61.1502901609496	77.0010438515106	64.30468	84.91
61.1502901609496	77.0010438515106	59.609455	83.27302
61.6292540897344	75.2051707560987	43.88264	75.9979
61.6292540897344	75.2051707560987	52.486843	76.711165
61.6292540897344	75.2051707560987	51.801592	75.702955
61.6292540897344	75.2051707560987	45.96408	75.36881
61.6292540897344	75.2051707560987	49.200624	76.95068
61.6292540897344	75.2051707560987	48.983044	68.08194
62.1400211910948	73.5295693286582	53.302235	56.10093
69.7681762537611	73.2366799353391	61.393495	78.21387
69.7681762537611	73.2366799353391	67.24276	72.18951
69.7681762537611	73.2366799353391	63.457115	71.302795
69.7681762537611	73.2366799353391	58.86286	75.490835
69.7681762537611	73.2366799353391	62.26967	64.78212
69.7681762537611	73.2366799353391	63.17424	62.764205
69.7681762537611	73.2366799353391	56.10401	69.44853
69.7681762537611	73.2366799353391	70.55475	53.342402
69.7681762537611	73.2366799353391	65.705495	54.4013975
71.8063655614008	73.1470119450273	68.40623	74.741575
73.8947970818394	73.057284136814	74.234205	84.088705
73.8947970818394	73.057284136814	74.635475	75.231085
76.0477997438211	72.967048420797	82.980165	82.460215
78.173592158592	72.8764227228284	91.37176	83.481715
78.173592158592	72.8764227228284	84.72455	82.62255
80.0307720146994	72.7843822200962	98.53739	80.25874
80.0307720146994	72.7843822200962	97.272905	80.426715
80.0757477697344	69.8121740364537	86.26193	79.048
80.0757477697344	69.8121740364537	87.254685	75.06877
80.1205612791546	66.6765236945305	81.449	70.90379
80.1654486601442	63.5366546108694	79.72973	69.6285
80.1654486601442	63.5366546108694	75.60926	70.05143
80.2107497349504	60.283354821115	92.344515	62.02096
80.2557962367371	57.0418752253958	98.425325	63.29758
80.2557962367371	57.0418752253958	93.854515	65.44994
80.2996784778356	48.9603326014124	95.92709	54.202926
80.2996784778356	48.9603326014124	92.878595	53.021252
80.3433029496079	38.2685483570982	99.67714	33.98061
80.3433029496079	38.2685483570982	97.982935	40.137435
80.3841882274993	37.1801165413108	91.6164	43.026115
80.4250276366715	36.0784654082796	92.788305	33.10169
80.4250276366715	36.0784654082796	94.955665	36.40187
80.4250276366715	36.0784654082796	89.661665	37.28143
80.4250276366715	36.0784654082796	88.660005	37.051535
80.4250276366715	36.0784654082796	87.57797	41.66484
80.4250276366715	36.0784654082796	84.61874	44.121625
80.4250276366715	36.0784654082796	81.466395	54.091358
80.4655708877081	34.7544106839433	74.17807	43.76639
80.4655708877081	34.7544106839433	69.610075	41.75992
80.506346379123	33.3730316409278	65.72564	44.111465
80.5473416431133	31.7737095629212	63.437195	41.00367
80.5889451038915	28.9047861805762	64.595135	34.78327
80.6310039403365	25.7613843729933	95.62369	24.314785
80.6310039403365	25.7613843729933	91.09643	22.6866
80.6310039403365	25.7613843729933	90.572985	26.136825
80.6310039403365	25.7613843729933	86.845365	25.906095
80.6310039403365	25.7613843729933	69.52818	17.90893
80.6310039403365	25.7613843729933	79.01289	29.7258
80.6310039403365	25.7613843729933	80.066985	32.520545
80.6310039403365	25.7613843729933	73.44882	27.71684
80.6733452198026	22.7919202168503	94.4971	12.154995
80.7153753988143	20.2453936080928	99.37313	13.042045
80.7153753988143	20.2453936080928	96.04228	11.46233
79.8914348364445	20.2453935278112	92.761655	9.792985
79.8914348364445	20.2453935278112	93.997115	11.43328
78.9967321697835	20.2453934495839	89.544625	11.14329
78.9967321697835	20.2453934495839	82.741185	8.18936
78.0886946145292	20.2453933728023	87.144585	5.62369
78.0886946145292	20.2453933728023	86.016245	7.495035
77.1473583616848	20.2453932994406	78.44886	5.02628
76.2109904977864	20.2453932273374	74.60069	8.85595
76.2109904977864	20.2453932273374	69.299455	6.449115
75.3098035478342	20.2453931566673	83.48933	38.25693
75.3098035478342	20.2453931566673	63.31789	20.756115
75.3098035478342	20.2453931566673	58.979255	16.987345
75.3098035478342	20.2453931566673	79.319755	37.96047
75.3098035478342	20.2453931566673	78.52122	37.890255
75.3098035478342	20.2453931566673	71.273045	32.62062
67.7947469392243	20.2453930846086	67.794775	0.2453923
67.7947469392243	20.2453930846086	67.61759	1.570395
62.8654707343551	20.6626685205911	57.51838	10.00522
62.8654707343551	20.6626685205911	54.294115	8.069135
58.8976483541247	21.0903385414543	42.845635	9.79738
57.9892683799309	21.6547503414154	46.358401	11.954405
57.9892683799309	21.6547503414154	50.337118	13.87323
57.1283214753788	22.2336661915057	54.207021	15.63022

Solution x	Solution y	Original x	Original y
57.1283214753788	22.2336661915057	49.707097	15.54357
56.2847550283748	22.8207340900543	49.796921	18.777515
55.451595843483	23.411013955681	47.801417	19.06334
54.6317867385523	24.0056748685165	57.48649	24.517395
54.6317867385523	24.0056748685165	57.95186	28.956245
53.8113452978927	24.6003400317745	61.04328	37.44322
52.9831351652526	25.183429693539	51.719243	33.03008
52.9831351652526	25.183429693539	50.608737	39.047145
52.171396745515	25.7533717888983	53.824634	40.64213
52.171396745515	25.7533717888983	50.972003	40.60627
51.3741582714602	26.298002223873	49.52113	41.29678
51.3741582714602	26.298002223873	51.37375	46.298003
49.1499747404193	25.6262245119032	41.00732	41.27668
47.1348133893858	24.914996481998	46.870011	29.816545
47.1348133893858	24.914996481998	45.420784	35.70231
45.1541041852666	24.1924376666053	39.58443	28.150345
45.1541041852666	24.1924376666053	44.38625	27.294685
43.2342838169035	23.4678601082868	40.19826	27.52955
41.3431634816097	22.7399747998454	49.216563	20.76273
41.3431634816097	22.7399747998454	47.997827	21.94091
39.3853411426036	22.0132016421843	27.827995	16.04415
39.3853411426036	22.0132016421843	34.77264	14.924575
37.5825973601643	21.303169274963	25.954135	17.869355
35.8728786961212	20.5966553360204	40.16046	1.62977
35.8728786961212	20.5966553360204	26.379295	27.934205
35.8728786961212	20.5966553360204	30.249755	29.28668
33.704314256467	20.0758815891354	33.169445	12.82499
31.5582115035091	19.5582230543787	34.695715	0.250565
31.5582115035091	19.5582230543787	32.973595	9.54291
28.0156770403888	19.1986404197635	26.97316	5.55935
24.5722800136685	18.8440780047036	28.448025	4.56492
24.5722800136685	18.8440780047036	25.662895	8.989655
21.0148752913408	18.4974414949752	21.673354	6.8005655
21.0148752913408	18.4974414949752	20.9699	7.87089
17.4982321806042	18.1564309607723	15.031135	2.9821155
14.1657036889491	17.8220998391444	0.024125	3.6794065
14.8606961053619	19.5417165705661	6.5851	6.152225
15.5779921772079	21.4910910165497	7.39533	10.545265
15.5779921772079	21.4910910165497	11.54701	17.37734
16.3147066135364	23.6091289507751	10.44323	18.54025
16.3147066135364	23.6091289507751	16.776285	16.423415
17.0590489049945	25.8380629085748	1.875835	21.036865
17.0590489049945	25.8380629085748	3.09506	32.271765
17.8822403683234	28.0842937622474	10.613375	27.61233
18.7217830320296	30.3531016481921	22.373755	32.6144
18.7217830320296	30.3531016481921	25.46019	34.06066

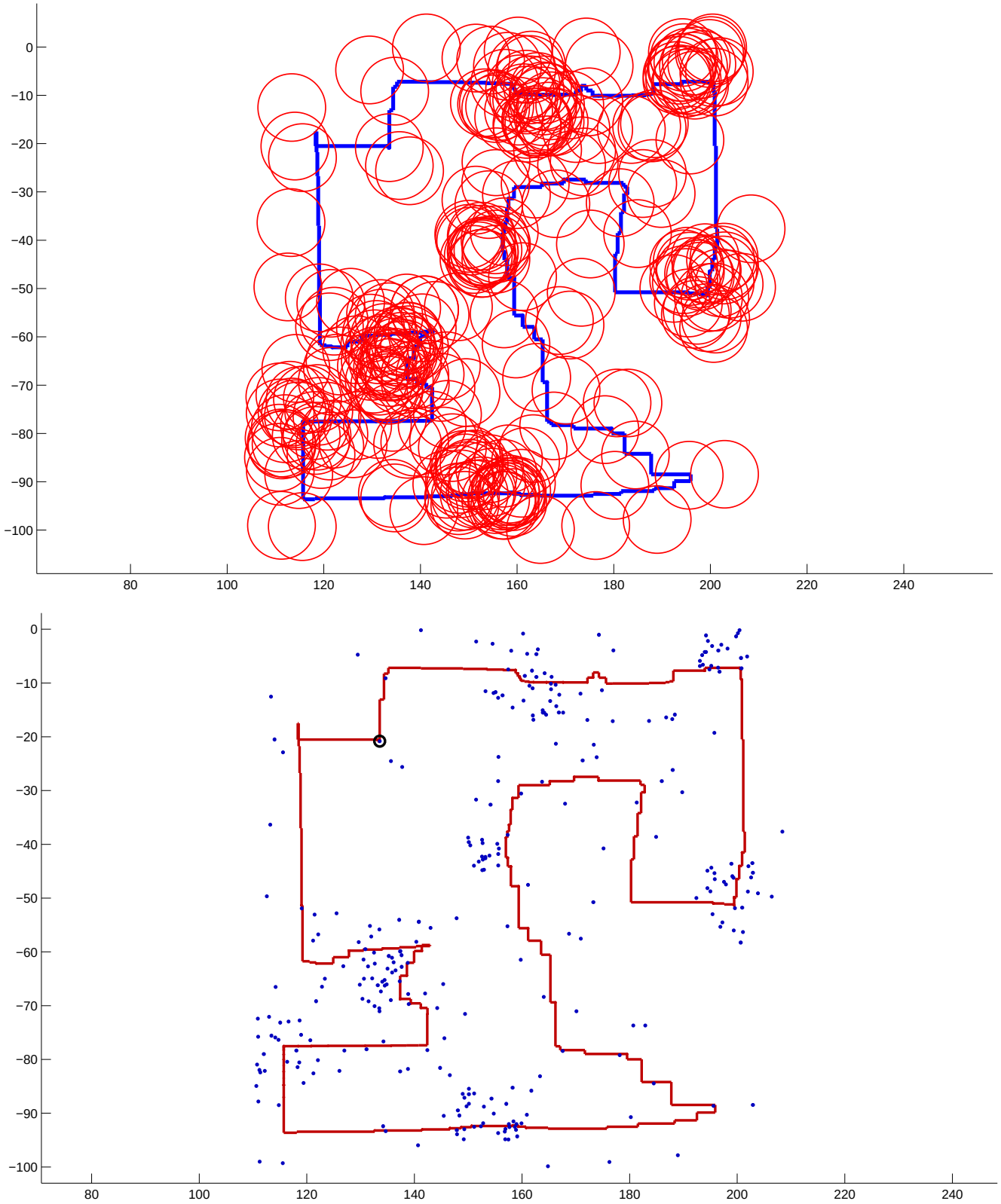


Figure N.107: *team*3_300, Equal Radius, 2D, Manhattan, Length = 558.7495354

Table N-110: Solution for *team*3_300, equal radius, 2D, Manhattan

Total distance: 558.749535387546			
Depot: x 23.55 y 20.83			
Solution x	Solution y	Original x	Original y
23.1432338440347	20.5142145958001	27.74	25.63
23.1432338440347	20.5142145958001	25.65	24.53
23.1432338440347	20.5142145958001	23.55	20.83
8.30980196286242	17.4896936869718	3.36	12.54
8.48312508629179	21.7619407601415	4.01	20.5
8.65870641391538	26.7359276887749	5.58	22.9
8.83648842015721	37.0033829837424	3.21	36.35
9.02026971907441	51.3510748652126	2.57	49.67
9.02026971907441	51.3510748652126	9.07	51.92
9.02026971907441	51.3510748652126	11.46	53.07
9.02026971907441	51.3510748652126	15.54	52.83
9.19956318852803	61.7526181332454	4.21	66.53
10.515476358336	61.9629254199727	13.36	65
11.7400192424186	62.1699995083712	11.74	69.17
11.7400192424186	62.1699995083712	12.82	66.49
14.9169296473476	60.9827805290876	16.79	62.67
17.8297221377723	59.7649013150902	11.18	57.92
17.8297221377723	59.7649013150902	12.14	56.76
17.8297221377723	59.7649013150902	21.39	62.71
17.8297221377723	59.7649013150902	20.56	61.44
17.8297221377723	59.7649013150902	22.65	62.2
17.8297221377723	59.7649013150902	20.88	59.51
17.8297221377723	59.7649013150902	19.65	58.2
17.8297221377723	59.7649013150902	22.51	60.15
17.8297221377723	59.7649013150902	21.99	57.15
17.8297221377723	59.7649013150902	21.75	55.19
17.8297221377723	59.7649013150902	23.5	55.84
20.5886992640723	59.5778108367953	19.86	66.11
20.5886992640723	59.5778108367953	20.64	65
24.0809582123204	59.3582063005447	25.84	61.09
24.0809582123204	59.3582063005447	25.24	60.77
27.1819240189985	59.136917524831	27.18	54.04
30.3152789189974	58.9218616061887	33.01	55.55
32.9002832059592	58.7097789734589	37.85	53.76
31.362186138072	59.8400766763637	30.36	58.14
31.362186138072	59.8400766763637	30.83	54.42
31.362186138072	59.8400766763637	30.85	54.39
29.9419392466152	62.0296774463057	27.4	59.84
28.6028722417644	64.4272870074854	27.62	60.61
28.6028722417644	64.4272870074854	27.36	59.94
27.3500005656815	68.7500347073463	20.35	68.75
27.3500005656815	68.7500347073463	21.49	69.2
27.3500005656815	68.7500347073463	23.52	71.05
27.3500005656815	68.7500347073463	22.6	70.1
27.3500005656815	68.7500347073463	25.62	68.98
27.3500005656815	68.7500347073463	23.47	70.49
27.3500005656815	68.7500347073463	27.28	65.47
27.3500005656815	68.7500347073463	23.78	67.37
27.3500005656815	68.7500347073463	24.86	66.05
27.3500005656815	68.7500347073463	28.77	62.05
27.3500005656815	68.7500347073463	24.49	66.27
27.3500005656815	68.7500347073463	27.64	62.78
27.3500005656815	68.7500347073463	23.19	66.22
27.3500005656815	68.7500347073463	26.5	63.44
27.3500005656815	68.7500347073463	22.17	64.94
27.3500005656815	68.7500347073463	25.86	63.85
27.3500005656815	68.7500347073463	24.47	65.24
27.3500005656815	68.7500347073463	24.03	65.56
27.3500005656815	68.7500347073463	25.01	63.12
27.3500005656815	68.7500347073463	26.15	61.96
29.3106883391691	69.5668482300867	31.99	67.74
29.3106883391691	69.5668482300867	28.95	69.72
29.3106883391691	69.5668482300867	28.86	67.84
31.1895976080198	70.4316854302222	34.24	70.46
31.1895976080198	70.4316854302222	35.37	65.99
32.4199994184747	71.5400031441859	35.58	76.06
32.4199994184747	71.5400031441859	39.42	71.54
32.3877191558331	77.3681668780151	36.6	82.94
30.8191472977636	77.3941890647977	34.79	81.57
28.5027132039419	77.4198809808758	32.42	78.27
25.6856444495949	77.4455278402826	28.82	81.78
25.6856444495949	77.4455278402826	27.35	82.24
20.8307928231132	77.4708878658787	21.1	78.12
20.8307928231132	77.4708878658787	24.25	76.66
13.9587128475867	77.4962472800785	11.23	82.6
13.9587128475867	77.4962472800785	12.07	80.14
10.8099039559299	77.5214087128254	9.41	84.38
10.8099039559299	77.5214087128254	16.07	82.14
10.8099039559299	77.5214087128254	16.99	78.36
8.38952379900951	77.5214088865037	8.95	75.43
8.38952379900951	77.5214088865037	10.66	76.44
5.71391109389998	77.5214090571931	0.97	75.78
5.71391109389998	77.5214090571931	0.91	72.43
5.71391090058378	77.8509286648478	6.62	72.96
5.71391090058378	77.8509286648478	8.67	72.77
5.71391070765833	78.2211918462422	2.99	72.09
5.71391070765833	78.2211918462422	5.07	73.15
5.71391051675309	79.0789677895828	4.15	75.92
5.71391051675309	79.0789677895828	4.75	76.37
5.71391032659062	80.0177796709055	2.01	79.01
5.71391032659062	80.0177796709055	3.44	75.58
5.71391013760962	81.1077568877579	8.06	78.36
5.71390994862213	82.2586654054542	6.36	80.44
5.71390994862213	82.2586654054542	8.6	80.56
5.71390975976318	83.4899055076653	8.29	81.45
5.71390957094839	84.7765166889733	1.01	87.83
5.71390957094839	84.7765166889733	0.62	84.95
5.71390957094839	84.7765166889733	1.36	82.41
5.71390957094839	84.7765166889733	1.21	81.97
5.71390957094839	84.7765166889733	0.76	80.97
5.71390938665921	87.039642273698	4.8	88.51
5.71390938665921	87.039642273698	2.19	82.13
5.71390920349494	93.6263074245754	1.24	99.01
8.14633441309036	93.4342311559623	5.54	99.29
22.6200186783988	93.2207892033576	24.67	93.34
22.6200186783988	93.2207892033576	24.2	92.42
31.454818150073	93.007245784931	30.69	95.98
31.454818150073	93.007245784931	35.46	90.5
36.6080467976835	92.7936297782422	37.93	93.92
36.6080467976835	92.7936297782422	37.88	93.16
36.6080467976835	92.7936297782422	38.36	90.43
36.6080467976835	92.7936297782422	39.7	88.73
36.6080467976835	92.7936297782422	40.14	88.25
38.6986441460031	92.590392835555	39.18	94.86
38.6986441460031	92.590392835555	41.11	92.55
38.6986441460031	92.590392835555	39.28	92.99
40.62222163927	92.3853090876202	38.08	89.48
40.62222163927	92.3853090876202	41.11	86.33
40.62222163927	92.3853090876202	40.13	86.48
40.62222163927	92.3853090876202	39.31	87.14
40.62222163927	92.3853090876202	40.14	85.47
40.62222163927	92.3853090876202	38.99	86.42
48.2502336231037	92.2600007867493	48.25	85.26
48.2502336231037	92.2600007867493	44.33	87.3
48.5371074103309	92.2776960324612	47.08	88.26
48.5371074103309	92.2776960324612	44.75	90.08
48.5371074103309	92.2776960324612	42.93	88.78
48.9010240870799	92.2954393056351	48.89	93.1
48.9010240870799	92.2954393056351	49.91	91.9
48.9010240870799	92.2954393056351	50.91	90.3
48.9010240870799	92.2954393056351	48.98	92.03
49.2587222655698	92.3131250223307	48.42	91.53
49.2587222655698	92.3131250223307	51.75	85.81
49.3256869644551	92.4996776143772	48.68	92.55
49.3256869644551	92.4996776143772	47.67	92.59
49.3256869644551	92.4996776143772	46.92	92.94
49.3256869644551	92.4996776143772	47.56	92.03
49.3256869644551	92.4996776143772	42.37	92.45
49.3256869644551	92.4996776143772	42.78	91.87
50.7886265031528	92.6927415447344	49.11	94.31
50.7886265031528	92.6927415447344	47.48	94.9
50.7886265031528	92.6927415447344	46.89	94.85
50.7886265031528	92.6927415447344	46.8	93.43
50.7886265031528	92.6927415447344	45.57	93.71
54.8300086637566	92.8799992304815	54.83	99.88
65.7635500669485	92.525529114528	66.26	99.07
71.5400970230907	91.9230139106193	70.23	90.73
78.362385485953	91.3277438923519	78.98	97.83
82.5058129065652	89.867054397088	85.6	88.65
85.9199990805847	88.4599938255357	92.92	88.46
77.7424807890427	84.2042805229146	74.49	84.46
72.2349705428543	79.9870590204301	70.7	73.7
69.5367314092775	78.9802759842106	68.17	79.21
69.5367314092775	78.9802759842106	72.93	73.7

Solution x	Solution y	Original x	Original y
61.6970262048581	78.2698231044409	57.57	78.44
57.1002331010712	77.5587465676198	53.35	83.14
56.2065761327668	69.3800684794035	60.12	71.05
56.2065761327668	69.3800684794035	54.05	68.39
55.2805637028534	60.5355047370489	60.94	57.56
53.5379287538811	57.9308329295873	58.75	56.63
51.1463307101931	55.5877025459109	49.78	61.48
51.1463307101931	55.5877025459109	47.3	55.25
49.3897508196392	47.7985486696783	51.12	47.54
49.3897508196392	47.7985486696783	45.6	43.93
47.9293367110871	44.1285254849788	43.96	42.1
47.9293367110871	44.1285254849788	43.21	42.61
47.9293367110871	44.1285254849788	43.21	42.35
47.9293367110871	44.1285254849788	42.72	42.84
47.9293367110871	44.1285254849788	41.97	43.22
47.9293367110871	44.1285254849788	42.56	42.28
47.3617915977296	42.4907505253209	42.95	44.74
47.3617915977296	42.4907505253209	42.62	44.81
47.3617915977296	42.4907505253209	41.07	43.98
47.0000005035715	38.7698311994402	40.4	40.19
47.0000005035715	38.7698311994402	40.11	39.6
47.0000005035715	38.7698311994402	40	38.77
47.2832483806922	37.6402093722484	42.69	39.78
47.2832483806922	37.6402093722484	42.59	39.16
47.5847973318586	36.3738928515567	45.6	41.81
47.5847973318586	36.3738928515567	45.71	40.8
47.5847973318586	36.3738928515567	47.34	38.25
47.5847973318586	36.3738928515567	45.42	39.91
47.9001930229006	33.6204078816994	49.85	30.56
47.9001930229006	33.6204078816994	44.15	32.64
48.2176590328613	31.3594916616832	45.57	28.26
48.2176590328613	31.3594916616832	41.47	31.69
49.34104888597	29.0009317252566	45.63	23.76
55.1586587632783	28.2551134510896	58.02	32.46
55.1586587632783	28.2551134510896	53.73	28.37
59.6753651128335	27.4479415669224	63.35	21.49
59.6753651128335	27.4479415669224	56.31	21.31
64.2127493435758	28.1390502120797	63.88	23.81
64.2127493435758	28.1390502120797	61.27	24.41
72.0096390739153	28.9316768598312	78.01	26.19
72.7899993704833	30.3200577878477	79.79	30.32
72.7899993704833	30.3200577878477	75.98	28.26
72.1352733395095	34.2003585076959	71.33	32.23
71.4865661696835	38.513316846597	74.93	38.63
70.8098582207646	42.7917919946398	65.16	40.78
70.2600006032669	50.7700840434888	63.26	50.77
85.5722413881253	50.9906522817462	89.36	56.03
85.5722413881253	50.9906522817462	86.88	55.34
85.5722413881253	50.9906522817462	87.26	54.53
85.5722413881253	50.9906522817462	85.43	53
87.5875593593711	51.17896311931	90.93	51.78
89.4314429066824	51.3668782000872	90.65	58.26
89.4314429066824	51.3668782000872	91.08	56.32
89.4314430960649	49.8721493294137	96.43	49.73
89.4314430960649	49.8721493294137	93.86	49.11
89.4314430960649	49.8721493294137	92	48.8
89.4273078920871	49.8721455372119	89.59	51.88
89.4273078920871	49.8721455372119	92.59	46.16
89.4231472249886	49.8721414775689	89.33	46.23
89.4231472249886	49.8721414775689	87.92	47.46
89.4231472249886	49.8721414775689	87.56	46.99
89.4231472249886	49.8721414775689	85.02	48.75
89.4231472249886	49.8721414775689	84.47	48.16
89.4190083875607	49.8721366164655	82.42	49.99
89.4190083875607	49.8721366164655	85.85	46.49
89.4190083875607	49.8721366164655	85.78	45.37
89.8613672200885	46.4646505798281	85.21	44.35
89.8613672200885	46.4646505798281	84.47	44.91
90.3798093784047	44.0363251641685	89.11	45.94
90.3798093784047	44.0363251641685	88.92	43.62
90.9086398251542	41.5191324060826	92.92	45.3
90.9086398251542	41.5191324060826	92.82	43.5
90.9086398251542	41.5191324060826	92.09	44.08
91.4099992501907	37.6399808500282	98.41	37.64
91.1330415091095	20.476108899924	85.76	19.27
90.8673566689174	9.3863091432955	90.79	7.27
90.8673566689174	9.3863091432955	86.46	7.15
90.8673566689174	9.3863091432955	86.71	7.9
90.8673566689174	9.3863091432955	85.18	6.81
90.8673566689174	9.3863091432955	84.85	7.49

Solution x	Solution y	Original x	Original y
90.6563057851983	7.55155757772771	91.86	5.09
90.6563057851983	7.55155757772771	88.21	3.61
90.6563057851983	7.55155757772771	87.06	2.89
90.6563057851983	7.55155757772771	86.49	3.97
90.6563057851983	7.55155757772771	85.34	3.13
90.5533865523471	7.35847836853526	89.81	1.33
90.5533865523471	7.35847836853526	90.71	5.35
90.4501305238108	7.18000121919413	90.45	0.18
90.4501305238108	7.18000121919413	90.14	0.74
83.9688548839794	7.69922143404111	84.21	1.15
83.9688548839794	7.69922143404111	84.57	2.19
83.9688548839794	7.69922143404111	84.22	4.25
83.9688548839794	7.69922143404111	83.98	4.24
83.9688548839794	7.69922143404111	83.5	4.83
83.9688548839794	7.69922143404111	83.08	5.9
83.9688548839794	7.69922143404111	83.63	6.61
83.9688548839794	7.69922143404111	83.08	6.85
78.1248236333489	9.68373569155981	76.81	16.4
77.4169113155408	9.84386991902547	78.41	15.88
76.6837810165022	9.99731031325045	77.94	16.73
73.6085085555209	10.0884760341902	73.63	17.07
66.8701128658509	10.099999615797	66.87	17.1
65.6120936580591	9.01130896952911	67	3.94
64.299983351903	8.03000100505511	64.3	1.03
63.22039042109	9.00134173199521	64.87	11.36
63.22039042109	9.00134173199521	60.89	11.99
62.1599530675724	9.87999963583459	62.16	16.88
62.1599530675724	9.87999963583459	56.94	12.18
57.6440886793404	9.8712821433249	55.4	11.17
57.6440886793404	9.8712821433249	57.66	15.51
57.6440886793404	9.8712821433249	56.38	14.32
57.6440886793404	9.8712821433249	56.85	15.49
54.5648707127819	9.86254196003409	53.85	15.08
54.5648707127819	9.86254196003409	54.15	15.54
54.5648707127819	9.86254196003409	54.5	15.91
54.5648707127819	9.86254196003409	53.87	15.51
52.1424861983595	9.85376304097703	50.3	13.28
52.1424861983595	9.85376304097703	52.03	16.04
52.1424861983595	9.85376304097703	52.12	16.84
51.1996756306122	9.72110832817013	46.38	12.31
51.1996756306122	9.72110832817013	48.26	14.58
50.4644562274212	9.58466054248559	45.57	12.76
49.8328220681664	9.44617608870966	45.09	11.7
49.8328220681664	9.44617608870966	44.72	11.87
49.8328220681664	9.44617608870966	43.23	11.54
49.7229331937866	9.23923098809738	55.24	13.37
49.7229331937866	9.23923098809738	51.98	10.99
49.7229331937866	9.23923098809738	51.38	10.51
49.5573043761795	8.81084130274759	56.26	10.34
49.5573043761795	8.81084130274759	55.38	10.13
49.5573043761795	8.81084130274759	51.86	7.7
49.5573043761795	8.81084130274759	52.67	8.88
49.2244699940988	8.20056578279989	55.5	8.86
49.2244699940988	8.20056578279989	50.97	4.59
49.2244699940988	8.20056578279989	54.22	8.18
48.8170928256409	7.59984333542701	50.21	0.82
48.8170928256409	7.59984333542701	52.96	3.75
48.8170928256409	7.59984333542701	52.67	4.65
46.4888755536602	7.49355087618961	48	4
46.4888755536602	7.49355087618961	50.52	8.68
43.4371102684631	7.38778071869444	44.53	2.72
43.4371102684631	7.38778071869444	47.45	7.49
39.0284059502518	7.2832195706537	41.49	2.29
31.2200007365069	7.18000087834172	31.22	0.18
25.1524424257602	8.25856354079874	19.48	4.75
24.351423203464	13.0822534065724	24.66	9.13

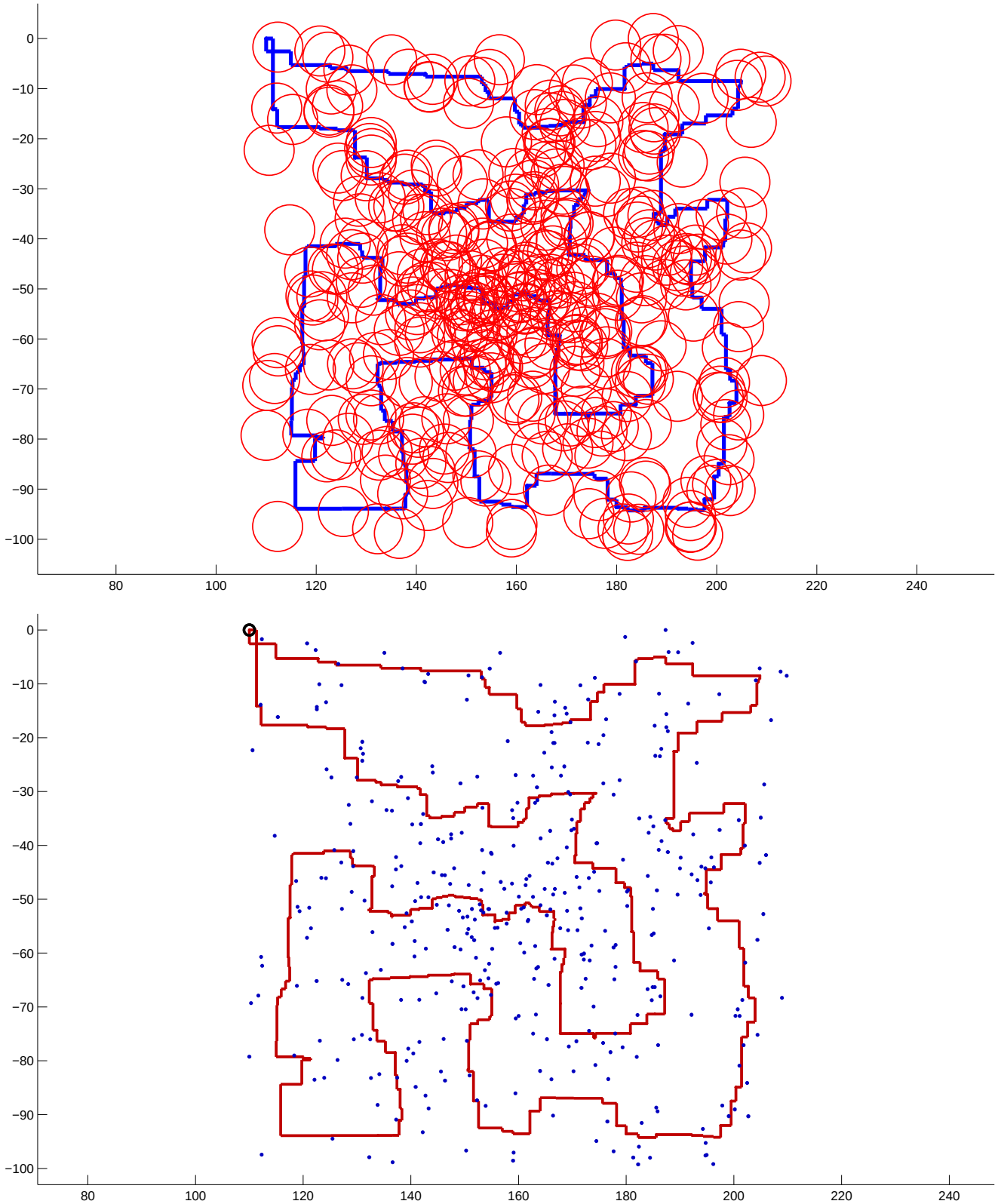


Figure N.108: *team*4_400, Equal Radius, 2D, Manhattan, Length = 829.1782830

Table N-111: Solution for *team*4_400, Equal Radius, 2D, Manhattan

Total distance: 829.178282978774			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
1.33993200611697	14.1046295486671	5.2982	16.16745
1.33993200611697	14.1046295486671	2.125025	13.8908
2.19586308523081	17.6797770581075	0.610975	22.331075
10.8686133157702	17.9835650019322	12.5519	14.734025
10.8686133157702	17.9835650019322	12.54795	14.295525
14.2668653702137	18.3255979890577	14.259	13.428825
17.74695143941	23.7634989774913	20.686175	21.9667
17.74695143941	23.7634989774913	21.1268	22.989225
17.74695143941	23.7634989774913	20.9892	20.7572
17.74695143941	23.7634989774913	14.358825	25.883825
17.74695143941	23.7634989774913	15.2685	27.387025
20.1028630644852	27.9135035287828	22.793175	31.8095
20.1028630644852	27.9135035287828	18.476575	32.50015
23.5277599999191	28.25159535114	28.216025	27.287675
23.5277599999191	28.25159535114	20.995625	24.282225
24.5117524147134	28.7686161680338	25.49855	33.45475
24.5117524147134	28.7686161680338	19.9845	27.40155
27.5062170674006	29.1166722539559	29.46595	31.229925
27.5062170674006	29.1166722539559	26.51415	33.575825
31.2884462409466	29.4024203823644	34.098725	26.483975
31.2884462409466	29.4024203823644	33.989075	25.3104
31.772302882645	30.5711373565697	32.29465	34.1886
31.772302882645	30.5711373565697	27.65685	28.081275
32.9564116990824	34.5017665589757	30.2641	36.115
32.9564116990824	34.5017665589757	35.05695	38.887125
33.5252040757202	34.9127010813371	37.4986	37.94785
33.5252040757202	34.9127010813371	31.7652	39.5927
35.7766747611124	34.6117494493359	36.0198	39.389875
35.7766747611124	34.6117494493359	37.4906	38.735475
35.7766747611124	34.6117494493359	31.8731	36.0461
38.0894108027453	33.8360259809198	39.47365	37.672175
40.0138257735919	32.8748615997084	39.217825	28.48755
42.344524962731	32.2316254281341	42.344525	27.231625
44.4933948024499	36.4469427701397	49.014675	34.9475
44.4933948024499	36.4469427701397	43.242475	40.8624
44.4933948024499	36.4469427701397	44.89855	41.381
45.0155250894271	36.5840245372308	45.015525	41.584025
45.0155250894271	36.5840245372308	43.312375	33.022625
49.9152710106407	35.7090342986732	53.08505	32.116125
49.9152710106407	35.7090342986732	49.0937	40.0849
50.9328382405514	35.097455657674	54.125425	38.6935
51.4381845001104	33.1401883627093	48.825175	33.4678
51.9637720705614	31.1533471126751	49.48335	26.949275
51.9637720705614	31.1533471126751	49.821325	32.088775
53.8729535529566	30.790342642118	53.429725	29.230175
53.8729535529566	30.790342642118	52.727475	27.05645
56.1334863195277	30.4574552689859	56.18475	25.5187
56.1334863195277	30.4574552689859	53.51985	31.610925
58.5250999957479	30.3351754642919	58.5251	25.335175
60.2808743669096	30.3351754433158	59.92645	35.207
60.2808743669096	30.3351754433158	57.8987	27.066925
64.4244869632523	30.3351754224698	68.792375	27.90175
63.8557982301412	31.1661055907245	65.757275	28.49595
63.2636035051826	32.0744192693154	67.6691	30.587025
62.2378401205297	33.2437381759824	59.25755	30.092125
62.2378401205297	33.2437381759824	59.6161	30.5374
61.5103737848888	35.589253990383	59.82755	37.21565
60.8071482215281	37.7143862878414	64.48255	39.62755
60.8071482215281	37.7143862878414	58.980725	40.369175
60.8071482215281	37.7143862878414	55.894525	37.29925
60.6527878821721	41.7916906634806	57.24125	42.40615
60.6527878821721	41.7916906634806	60.81405	45.86495
60.6527878821721	41.7916906634806	63.06625	46.073225
60.6527878821721	41.7916906634806	60.313175	36.907775
60.4604755112428	43.2139249785739	55.460475	43.213925
60.4604755112428	43.2139249785739	56.281125	43.406775
63.8081609665156	44.2394948671931	61.33205	47.81805
63.8081609665156	44.2394948671931	64.627025	39.598675
68.0930042243328	46.9276588068159	69.4258	42.661825
68.0930042243328	46.9276588068159	70.163125	48.595475
68.0930042243328	46.9276588068159	70.20275	51.264575
68.0930042243328	46.9276588068159	64.04505	44.910675
69.7078436389894	47.820482979453	74.018375	45.692475
69.7078436389894	47.820482979453	65.024675	48.473875
70.8731028111878	49.3837670293427	74.97575	51.8098
70.8731028111878	49.3837670293427	75.70595	48.354275
70.8731028111878	49.3837670293427	70.38585	48.289775
71.0243140549659	56.0326249691383	66.095725	55.876775
71.0243140549659	56.0326249691383	68.048425	58.486425
71.0243140549659	56.0326249691383	75.12385	56.355025
71.0243140549659	56.0326249691383	74.7548	56.66355
71.4163525257886	61.7176554121371	67.8084	64.88
71.4163525257886	61.7176554121371	67.662425	58.9604
72.5751896777447	63.3127643420172	74.919425	66.332825
72.5751896777447	63.3127643420172	68.033375	62.578975
75.8466798208468	64.8083714291355	78.897475	61.3791
77.1519050153394	71.3381235614864	82.150425	71.4598
75.3204256130849	71.3381252485687	75.320425	66.338125
75.3204256130849	71.3381252485687	73.97555	66.71955
75.3204256130849	71.3381252485687	76.3481	68.05155
73.8317628287017	73.1095411148601	75.94035	77.0935
73.8317628287017	73.1095411148601	74.758025	68.76505
70.7774741053891	74.8988719715934	69.349625	77.516575
70.7774741053891	74.8988719715934	71.96685	79.285825
70.7774741053891	74.8988719715934	72.106325	71.513625
64.2971004550945	75.8086993181081	64.2971	80.8087
64.0257076583915	75.6313894377776	59.360575	77.3659
64.0257076583915	75.6313894377776	67.096325	78.407125
64.0257076583915	75.6313894377776	67.97015	74.943825
63.9555541192382	74.9443232020217	63.9561	69.944325
63.9555541192382	74.9443232020217	65.721375	76.70655
59.6102960647802	74.9443161579423	55.289875	75.9977
59.6102960647802	74.9443161579423	63.106325	74.44845
59.6102960647802	74.9443161579423	60.77085	76.3761
57.7262516826406	74.9443091121135	52.726325	74.9715
57.7409914877169	69.3755341731132	55.5813	65.9389
57.7409914877169	69.3755341731132	53.249925	71.4317
57.7409914877169	69.3755341731132	61.692525	66.479075
57.7560134787084	63.6144383448154	53.6353	62.58645
57.7560134787084	63.6144383448154	62.481725	64.778425
57.7560134787084	63.6144383448154	62.138225	61.218175
57.7560134787084	63.6144383448154	52.902425	64.80215
58.0469997184159	62.1487525742709	62.1796	60.091575
58.0469997184159	62.1487525742709	53.3194	62.871025
58.4025299509905	60.9071983789404	63.23165	61.378
58.6084113987907	59.2728640297319	63.564825	58.6141
58.6084113987907	59.2728640297319	60.964225	55.767775
58.6084113987907	59.2728640297319	61.732525	60.28975
56.0331139383462	59.2728637496414	51.0767	59.931625
56.2228916851925	56.2102378471149	55.262125	52.9866
56.2228916851925	56.2102378471149	59.0369	52.162425
56.2228916851925	56.2102378471149	56.708375	61.084725
56.3576277189257	55.1795914267032	54.099275	51.121125
56.3576277189257	55.1795914267032	51.731775	54.063975
56.3576277189257	55.1795914267032	53.1029	58.71345
56.5538908839111	53.9738070111753	56.4549	49.1402
56.7513744429947	53.5726017740131	61.751375	53.5726
56.5846942300406	52.2827488216599	61.491825	51.7088
56.5846942300406	52.2827488216599	59.205025	55.76
56.5846942300406	52.2827488216599	58.59885	48.807625
56.5846942300406	52.2827488216599	57.767975	55.4125
53.8207824640909	51.4731131492588	51.332325	47.3944
53.8207824640909	51.4731131492588	56.7604	48.090675
52.4608710338585	51.1116731757899	47.81055	52.508825
52.0728999448994	50.6617505059789	52.0729	45.66175
51.1982350586551	51.0899278385232	47.802925	54.5327
51.1982350586551	51.0899278385232	51.464375	46.273425
51.1982350586551	51.0899278385232	48.801425	47.111675
51.1982350586551	51.0899278385232	54.870925	48.098925
51.1982350586551	51.0899278385232	55.9361	51.897075
49.3681379631845	52.5573227960446	45.616825	55.349625
49.3681379631845	52.5573227960446	52.703075	49.56845
48.2019662117968	53.7262887557727	43.47965	52.4779
48.2019662117968	53.7262887557727	50.342	58.1772
48.2019662117968	53.7262887557727	50.075475	49.526025
46.861135575872	53.9534338765786	41.89655	53.797625
46.861135575872	53.9534338765786	51.8225	53.851
46.861135575872	53.9534338765786	50.9611	51.5263
45.643937802839	54.2479124921002	45.110025	59.219325
45.643937448849	52.8791891756741	50.5204	51.7746
45.643937448849	52.8791891756741	41.3638	51.811825
44.2852708515788	52.8791874900999	40.703325	55.537825
43.3951281686507	52.8791858047003	41.765825	57.606275
43.3951281686507	52.8791858047003	41.323875	57.06515

Solution x	Solution y	Original x	Original y
43.3951281686507	52.8791858047003	43.10885	48.272275
43.3951281686507	52.8791858047003	40.468775	56.35765
43.3951281686507	52.8791858047003	38.966475	52.166125
43.3951232193044	51.1183729259028	47.35915	48.071
43.3951232193044	51.1183729259028	46.119125	55.3112
43.1423396987607	50.1642095005835	46.718325	46.79505
42.4637037009452	49.8725990091615	43.5222	45.0811
40.9474616188112	49.7297498400935	37.074525	51.14655
40.9474616188112	49.7297498400935	37.32375	47.164775
40.9474616188112	49.7297498400935	44.549375	51.8385
40.9474616188112	49.7297498400935	44.413025	51.821425
39.7797064888655	49.5850820587245	43.054225	52.07985
38.2275852911283	49.4370786036778	33.276075	49.648225
38.2275852911283	49.4370786036778	42.80595	50.969325
38.2275852911283	49.4370786036778	40.529725	53.231175
38.2275852911283	49.4370786036778	40.7628	47.39015
38.2275852911283	49.4370786036778	39.658325	53.39295
38.0513991313928	49.2529504597384	38.0514	44.25295
36.9158737446217	49.4633050338582	36.34605	45.558575
35.8252851129257	49.6840318906145	35.77655	45.5234
34.74013130913	49.920297778442	34.241775	45.041325
33.9589032824154	51.6745965779595	36.8297	55.690525
33.9589032824154	51.6745965779595	29.2116	52.625
31.4860858833223	51.8971210102421	28.87265	55.2137
31.4860858833223	51.8971210102421	31.24645	46.9846
31.4860858833223	51.8971210102421	34.822	51.041775
31.4860858833223	51.8971210102421	31.916925	49.63125
29.9572473635142	52.9823111074394	30.732825	57.781
26.5978004230768	53.3007495289629	26.5978	58.30075
26.3942460270255	52.550461599078	30.804475	50.3614
25.6737109017006	52.2284183737472	21.4066	50.274675
25.6737109017006	52.2284183737472	30.1798	54.1346
25.6737109017006	52.2284183737472	26.549225	47.5983
25.6737109017006	52.2284183737472	22.891175	56.122525
22.2192754383678	51.7951250610809	17.219275	51.795125
22.7803545848963	45.8031188455086	19.292975	43.870425
22.7803545848963	45.8031188455086	27.251975	44.47235
23.2315745724244	43.8665447338943	28.231575	43.86655
22.7106132390388	43.7855652507056	27.2689	42.18555
19.5729923753254	43.7066916286618	17.095675	43.177
19.5729923753254	43.7066916286618	19.028925	48.6519
19.5729923753254	43.7066916286618	15.806625	40.87695
19.1761665067616	42.3345446359901	19.322625	41.061025
18.7790497787734	41.016550397568	18.77905	36.01655
13.7801898024764	41.473573286967	14.24105	46.110125
13.7801898024764	41.473573286967	13.3837	46.032275
8.15951090006169	41.7567818835643	4.729125	38.22055
7.86508656241671	47.3116813894421	8.7059	46.626875
7.5691787999893	53.4334198800484	8.9679	51.422725
7.5691787999893	53.4334198800484	11.134375	51.580675
7.5691787999893	53.4334198800484	11.458875	55.406825
7.5691787999893	53.4334198800484	9.352575	52.2461
7.20627545220464	60.7248767960593	2.206275	60.72485
7.20627545220464	60.7248767960593	10.71515	57.182775
7.32590757921119	62.5587354798688	2.404275	62.37445
7.5031495204601	65.202574646015	12.50315	65.202575
6.72279235939938	66.6567039929671	8.8531	66.09375
5.90708921341074	68.1474675979167	1.692025	67.9044
5.26270738051976	69.6855724769588	0.331025	69.303175
5.13400612693437	76.3348716510311	8.347775	79.0334
5.00155053853106	79.2563748599839	0.00155	79.256375
10.0949715095076	79.5608081781528	13.11545	76.27845
10.0949715095076	79.5608081781528	12.1212	83.525275
11.4014994472127	79.8607259021231	16.4015	79.860725
9.76154112126083	84.385838493562	13.92855	83.165725
5.84346341491	93.9141447031588	2.307925	97.449675
15.1226423031375	93.8954140154218	15.45105	94.471525
23.8637267070537	93.8766743017989	22.27635	97.920025
23.8637267070537	93.8766743017989	27.27955	90.9405
26.5833252785402	93.8579145557475	26.6212	98.85125
27.8122190587788	91.0744189818274	23.831575	88.204275
27.8122190587788	91.0744189818274	32.22375	93.28635
28.3240243702467	88.8622749459175	33.324025	88.862275
28.0078075856647	85.2903997350898	24.1584	82.49565
28.0078075856647	85.2903997350898	32.733925	86.47665
27.4255735385075	82.8014053106748	29.23795	80.022375
27.4255735385075	82.8014053106748	22.609375	83.218325
27.4255735385075	82.8014053106748	30.896	84.86835
27.1185908258342	78.4767163092642	31.60195	76.5275
27.1185908258342	78.4767163092642	27.4824	83.15295

Solution x	Solution y	Original x	Original y
27.1185908258342	78.4767163092642	30.46345	78.65395
27.1185908258342	78.4767163092642	29.5312	77.759375
25.2854697679837	76.3717106691151	22.467675	76.02705
23.6995480173443	74.3234243620679	19.41455	76.0326
23.6995480173443	74.3234243620679	20.9401	75.2051
22.973135315585	69.3413649585412	21.0091	68.35155
22.2728754888973	64.9732252932323	17.272875	64.973225
22.9971783112124	64.775225849705	18.3822	65.772725
22.9971783112124	64.775225849705	21.668825	63.73225
26.1604034394596	64.5701539073172	24.44465	63.1281
29.8922100629062	64.3668701514561	31.583525	68.6781
29.8922100629062	64.3668701514561	30.688625	60.637275
29.8922100629062	64.3668701514561	28.20205	68.6988
33.2902430077376	64.1012760291713	37.615325	65.262725
33.2902430077376	64.1012760291713	32.800625	59.186225
37.5849544575302	63.9887449260173	39.7753	66.19835
37.5849544575302	63.9887449260173	39.243575	59.34405
38.1229750912651	63.9120255102336	38.122975	58.912025
38.1229750912651	63.9120255102336	42.88515	65.09985
38.1229750912651	63.9120255102336	41.683175	67.299925
38.1229750912651	63.9120255102336	34.7277	67.482525
41.0809902022015	65.7361114674956	43.7645	63.186425
41.0809902022015	65.7361114674956	44.4217	64.703925
41.0809902022015	65.7361114674956	44.898775	67.784675
41.0809902022015	65.7361114674956	39.430175	70.428325
41.0809902022015	65.7361114674956	42.114525	60.87195
41.0809902022015	65.7361114674956	45.884675	65.715725
43.5709557506115	66.6053019931453	44.541975	62.0002
43.5709557506115	66.6053019931453	46.228875	65.56925
45.0329494119081	71.6922748601505	50.03295	71.692275
44.6588504237759	72.3805802122652	49.5023	72.1454
42.4204717945076	73.1227769955831	40.4153	76.30845
42.4204717945076	73.1227769955831	42.3891	68.379025
42.4204717945076	73.1227769955831	40.205375	70.4585
41.0000858096638	76.1612124737793	36.110325	75.95995
40.7450800472047	81.4817272996429	40.913925	82.729825
40.7450800472047	81.4817272996429	36.3513	83.686975
40.6090506052923	81.9957749693927	35.60905	81.995775
41.6357600269791	87.4634101621628	43.9034	88.387225
41.6357600269791	87.4634101621628	42.31835	87.347525
42.5915229355499	92.4917816847542	40.290225	96.689525
46.9867159049927	93.0942612004484	49.100125	97.070175
48.9904500222122	93.5582992763029	48.99045	98.5583
52.1133385347255	89.3264826772295	49.4347	86.0537
52.1133385347255	89.3264826772295	56.428075	90.20545
54.0177501055831	86.8894006637491	54.01775	81.8894
56.9407766723	86.9162272360875	56.13655	83.451075
60.2498345998339	86.9431811695386	60.2356	81.956375
65.5882369261551	87.8926705987829	66.686275	83.4025
68.2142595729002	92.07642246444	72.88955	91.55335
68.2142595729002	92.07642246444	64.46975	94.91155
69.9935698956207	93.5819023606347	72.374675	95.981125
69.9935698956207	93.5819023606347	71.306475	97.9771
69.9935698956207	93.5819023606347	66.508125	91.303225
69.9935698956207	93.5819023606347	67.679475	96.828325
72.2220750507192	94.2554991816082	72.222075	99.2555
75.5896748731763	93.7075757828585	75.589675	88.707575
75.5896748731763	93.7075757828585	75.8385	89.39705
75.5896748731763	93.7075757828585	74.44305	98.0205
82.272429191722	93.8823869534122	84.25115	92.664475
82.272429191722	93.8823869534122	84.730325	97.611875
84.2858854968458	94.045092452151	84.9479	97.513325
86.1929749789816	94.2032241125584	86.192975	99.203225
87.5560513305223	92.015407356527	89.0595	90.291
87.5560513305223	92.015407356527	84.77555	95.283075
89.4946925657333	87.4743445394582	92.685275	90.310575
89.4946925657333	87.4743445394582	92.480625	84.1266
90.3768212566057	84.914461564977	91.03755	80.9252
90.3768212566057	84.914461564977	90.195175	89.03695
90.3768212566057	84.914461564977	87.858275	88.334025
91.4297277827093	75.5722805666564	90.314475	71.662575
92.5744529502137	72.8097698049553	94.404	75.185075
92.5744529502137	72.8097698049553	91.08095	71.69145
92.5744529502137	72.8097698049553	91.5733	68.725
92.5744529502137	72.8097698049553	91.825175	77.123475
93.9376492010928	68.3222750195672	98.93765	68.322275
92.6809071363571	66.1863772454692	92.124775	61.791725
92.6809071363571	66.1863772454692	90.725625	70.444425
91.8537569475913	59.1064718967249	94.377175	57.5521
90.9671098056937	53.9922128880304	95.486225	52.746525

Solution x	Solution y	Original x	Original y
86.9809522507541	51.7430379095553	85.3769	55.416
86.9809522507541	51.7430379095553	83.835575	49.221375
85.1263443936812	49.1475935354296	83.247325	46.458225
85.1263443936812	49.1475935354296	84.710775	44.260425
85.1263443936812	49.1475935354296	82.166	45.384
84.5510293004153	48.9262232742724	83.98185	43.958725
84.5510293004153	48.9262232742724	79.556325	49.1563
84.8734238843907	44.4967024580367	85.82305	42.253575
84.8734238843907	44.4967024580367	80.003925	44.278875
84.8734238843907	44.4967024580367	85.726975	46.8848
87.6464180987692	41.7084654444281	87.349525	37.1432
87.6464180987692	41.7084654444281	86.306375	44.08645
91.282644569175	40.6079391315701	94.807975	43.25145
91.282644569175	40.6079391315701	95.9689	41.808
91.282644569175	40.6079391315701	92.049975	40.056175
91.7054477422501	35.9649558675063	94.997925	34.851
92.1050906469817	32.2200843931739	95.640625	28.68455
88.1247763122948	33.969006006906	90.921925	35.308625
81.7121164345928	35.5957233247308	77.267275	35.3236
80.1283752663077	37.292799394303	80.128375	42.2928
78.5877909267283	36.9084187605861	76.046775	40.829925
78.5877909267283	36.9084187605861	77.736325	41.257125
78.5877909267283	36.9084187605861	82.455325	37.974875
78.5877909267283	36.9084187605861	76.5757	39.19325
78.5877909267283	36.9084187605861	74.186175	37.664625
77.9871809811802	35.9582677264275	75.0516	36.4713
77.4199755598733	34.9981249964432	72.419975	34.998125
77.4199755598733	34.9981249964432	74.4851	34.7013
78.8632162414009	22.5398274929447	76.27055	23.463675
78.8632162414009	22.5398274929447	83.1155	24.690275
78.8632162414009	22.5398274929447	77.472675	18.057475
78.8632162414009	22.5398274929447	75.41995	23.365625
79.6416717868614	19.1259895827687	75.3053	17.780525
79.6416717868614	19.1259895827687	77.464	15.628175
79.6416717868614	19.1259895827687	76.538875	22.08605
79.6416717868614	19.1259895827687	77.750225	18.79385
83.1234275617836	16.9653282320879	81.52085	13.687775
87.8354355067209	15.3311521051984	87.3023	11.937375
93.1468327609958	13.9949176942574	96.9141	16.74635
94.2684553403159	9.81004784120826	98.6909	7.723575
94.5476517600666	9.15554445085481	94.09005	9.358875
94.8277493509772	8.4995500442644	99.82775	8.49955
94.8277493509772	8.4995500442644	94.81355	7.137025
82.3634946236393	6.31436467488209	79.6523	4.144625
82.3634946236393	6.31436467488209	82.33615	2.420325
77.3352250533294	5.00945052908633	77.335225	0.00945
75.0559030207784	5.31901704164281	77.882675	4.11235
72.1319060797449	5.63258878982974	69.817575	1.306825
71.5979515256198	10.0741855755955	76.1173	11.832075
71.5979515256198	10.0741855755955	68.784175	11.8632
71.5979515256198	10.0741855755955	71.829525	5.85575
65.8601429193726	11.5428664567479	62.944875	12.9098
65.8601429193726	11.5428664567479	61.5062	10.2838
64.6364635264206	13.2786802915127	66.273425	16.5814
64.6364635264206	13.2786802915127	64.181275	8.885925
63.3735690165226	16.6643252281159	65.789175	19.559925
63.3735690165226	16.6643252281159	64.881075	21.1972
59.5869108376941	17.2542166771313	56.680125	15.845675
59.5869108376941	17.2542166771313	56.707375	20.9848
59.5869108376941	17.2542166771313	56.46315	20.9863
59.5869108376941	17.2542166771313	62.8697	20.929125
59.5869108376941	17.2542166771313	56.7601	13.3255
58.0481499075616	17.430551254549	58.962525	15.549225
58.0481499075616	17.430551254549	58.66755	14.455925
56.4090706472938	17.6113558124244	56.145325	18.970525
54.7913002022085	17.7911495457481	54.7913	22.79115
54.7913002022085	17.7911495457481	59.666825	17.15215
51.283223391832	17.1317545928799	47.99765	20.639375
50.5187896441462	14.6169403902201	53.686425	15.19815
49.6837056246577	11.9636947742049	54.0981	10.209075
44.5434070697488	10.6826157970661	43.2503	8.7931
44.5434070697488	10.6826157970661	40.718225	8.45085
44.5434070697488	10.6826157970661	40.4237	12.94705
43.8243722196993	9.08452359331443	44.6523	7.1683
43.0948975468652	7.60167236999789	46.59205	4.24755
31.7837550856229	7.07899874202846	33.240325	8.160175
31.7837550856229	7.07899874202846	32.636425	9.71905
31.7837550856229	7.07899874202846	32.5307	9.603625
31.7837550856229	7.07899874202846	28.471925	7.124375
24.4203694798386	6.5037283463985	25.090375	4.2535

Solution x	Solution y	Original x	Original y
16.0223265661736	5.94758272217429	17.13825	10.254625
16.0223265661736	5.94758272217429	12.34295	3.720825
12.7701258227226	5.29880786329272	13.011825	10.0758
12.7701258227226	5.29880786329272	16.533825	6.314025
12.7701258227226	5.29880786329272	10.7326	2.49095
4.91816256498561	2.56026887707645	2.34935	1.70725

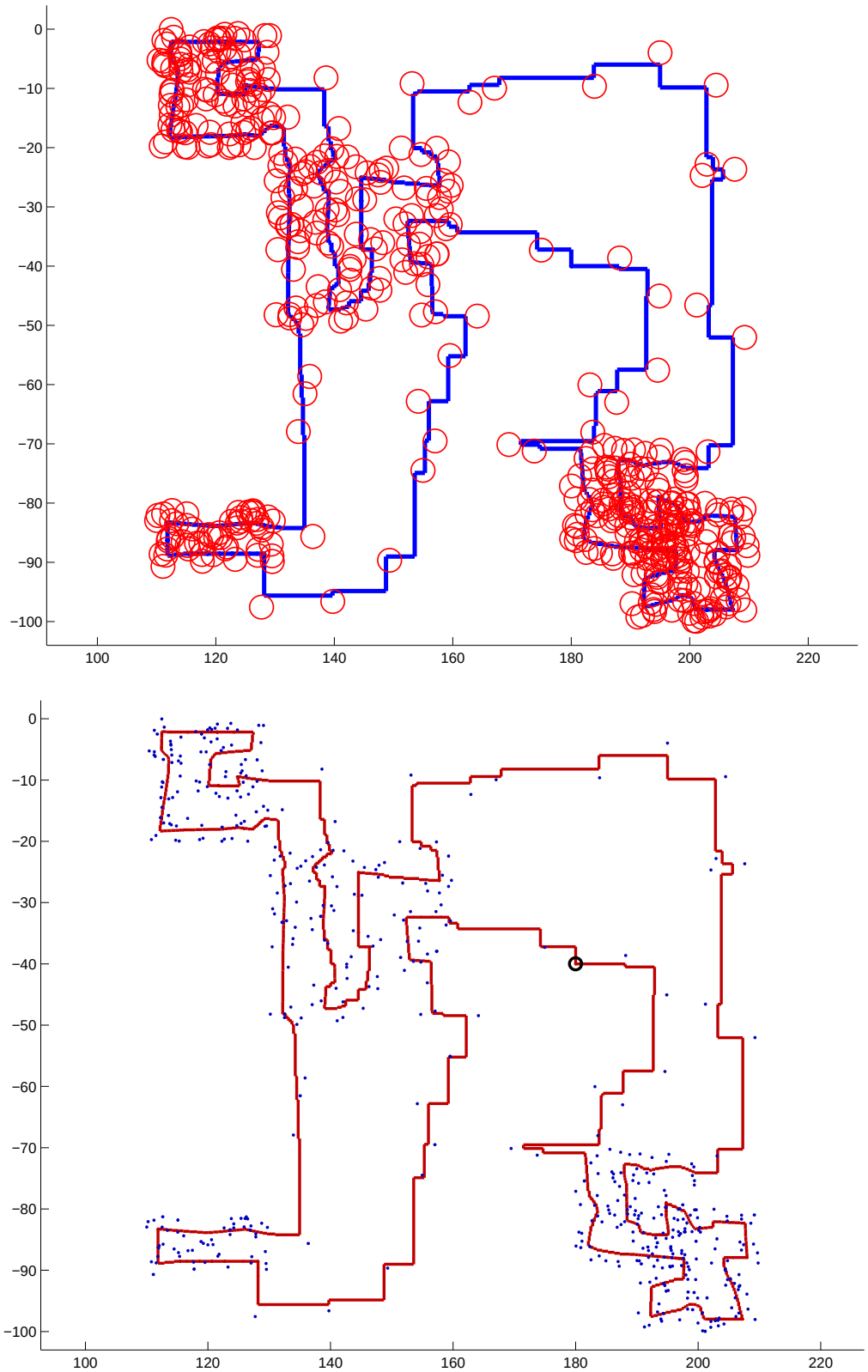


Figure N.109: *team*5_499, Equal Radius, 2D, Manhattan, Length = 842.1865257

Table N-112: Solution for *team*5_499, Equal Radius, 2D, Manhattan

Total distance: 842.1865256597			
Depot: x 70 y 40			
Solution x	Solution y	Original x	Original y
78.08297576642	40.4951184191802	78.1743	38.6355
82.8771963096944	45.065400198529	84.8772	45.0654
82.6613422127331	57.4801274233566	84.5964	57.5663
77.7504459904187	61.1020947509924	77.6803	63.0066
74.4923748691547	61.4390005537059	73.1545	60.0435
74.1583447517422	66.9726274904315	73.6361	68.0431
73.8356167520266	69.5321666792518	75.6074	70.2776
61.4827035827204	70.1321001311925	59.4827	70.1321
64.6872051253177	70.8317606073793	63.7544	71.2264
71.5530195659012	71.5007913116831	73.5126	71.3248
71.6752182933926	72.8113569958738	72.5026	72.4828
71.7955311035574	74.2245909919193	73.6863	74.2382
71.889798078475	75.6094388928353	71.4242	75.4202
71.9846463868919	77.0502112650411	70.0314	77.1275
72.2348717031511	78.1147323628708	70.8021	79.2974
72.6237785441369	78.5923430929584	73.5352	77.8165
72.9870737758717	79.1084783984968	73.1002	79.4037
73.348739165015	79.6149857159223	75.2812	79.5319
73.4891160772753	80.1750050398788	75.4182	80.175
73.5772957394806	80.7384002510763	75.5773	80.7384
73.3158303869159	81.4081574048949	73.6161	81.1388
73.0518660874955	82.0956947977144	72.6803	81.9225
72.7911442483224	82.7955650836151	74.3211	82.1244
72.4844864248472	83.677040735573	70.5598	83.7819
72.3432314773016	84.4201945810527	71.008	83.9726
72.2089020885205	85.2382080345153	71.0504	85.2637
72.0787043034942	86.0550986621977	70.0787	86.0551
72.454237085733	86.2767736824182	70.8501	86.3243
72.9422723133002	86.4975756853352	72.3356	86.155
73.4532638756272	86.7209127762494	72.5273	88.3137
74.3318627328151	86.8914949138502	73.8575	87.669
75.2780272295097	87.0585418408593	74.9451	88.4605
76.3173231142386	87.2157668789069	76.9521	88.589
77.1845127843294	87.3634143362508	77.1151	89.3423
78.7789031566663	87.4106638881563	80.026	88.4312
79.6995868002965	87.4570976200502	80.7173	88.9602
80.2432418354416	87.5012744149647	80.4141	88.4668
80.7792941154624	87.5451414652822	81.0134	86.425
81.3036620215821	87.5894186497106	81.9035	87.9149
81.8058282282946	87.6336072095109	81.7913	86.2239
82.3098670914938	87.6785028137316	81.9044	86.793
82.8328593233217	87.7236985807281	82.5335	87.3296
83.3682298917137	87.7690061219633	82.7904	89.3622
83.3682298917137	87.7690061219633	83.3685	88.3604
83.9965192175654	87.8127242017887	84.1657	89.6201
84.5801928688681	87.8540505265039	85.4655	89.4614
84.9894051385802	87.8932595921724	85.8291	89.3215
84.9894051385802	87.8932595921724	85.3838	89.3565
85.333447378912	87.930977354853	85.6153	86.7737
85.6712427611378	87.9690245791098	85.5265	86.4226
86.0150037901157	88.0078077163864	84.4799	87.8799
86.429787390342	88.0466553494215	85.7193	87.9646
86.429787390342	88.0466553494215	85.8774	87.324
86.8822628155226	88.0857051470522	87.314	87.2617
86.8822628155226	88.0857051470522	87.3294	86.7915
87.3000384518062	88.1254582416447	87.6085	88.0524
87.3000384518062	88.1254582416447	87.8356	87.4643
87.69699510254 92	88.16540374489	89.697	88.1654
87.6789080330504	88.8712659367133	88.176	88.8141
87.6789080330504	88.8712659367133	87.2864	89.2526
87.6608142838657	89.5585466323366	88.5666	89.9178
87.6608142838657	89.5585466323366	88.3919	89.421
87.6426315432205	90.2297540218772	88.0059	90.774
87.6244309588446	90.8677144766842	88.3323	91.5035
87.60619030941	91.4649037253949	89.5983	91.5249
86.0334281089458	91.7596057305769	85.1326	93.3031
85.2073833686582	91.9855751875369	84.785	93.3953
84.4583803668233	92.1930342928883	84.5701	92.5098
84.4583803668233	92.1930342928883	84.3608	92.148
83.713228075396	92.3991444696733	83.1514	91.319
83.0305035218141	92.6151076779893	82.1226	91.9552
82.4249929853179	92.8371618415628	80.5965	92.0964
82.3395867387505	95.0980949449703	83.6163	95.496
82.2520048925281	96.9761993231275	80.252	96.9762
82.2520047777966	97.5290307683398	81.2522	99.2612
82.7555802073705	97.3799211648854	82.0258	98.9707
83.4054850710624	97.205815219618	83.3686	96.8014
84.0588730958345	97.0333308547606	83.9295	97.9734
84.7230817894097	96.856087183583	84.0572	98.2927
85.5111430425313	96.6618924775762	84.3334	97.0716
86.4963241126461	96.4645085376833	86.994	98.105
87.2900262624685	96.2315913405083	89.0976	96.4455
87.6661286647677	95.9905900518667	88.2673	94.5543
88.0152815458736	95.7767295834275	88.2817	96.351
88.3602009575307	95.5594051942538	88.3602	93.5594
89.2265862594284	95.6080894440367	89.3359	93.6392
89.7292203918238	95.7981313586251	89.931	94.5372
90.2212128892309	96.0007089903029	91.4519	94.5103
90.4348565376836	96.6943228162562	90.6972	96.9626
90.6470651606606	97.3722998987058	89.983	98.6224
90.8673892465436	97.9139580003259	90.7381	99.8897
91.1620012389151	97.9649947250403	91.162	99.965
92.8837845105512	97.9649912231878	94.2258	98.7848
92.8837845105512	97.9649912231878	93.3103	99.0843
92.8837845105512	97.9649912231878	93.255	98.1789
92.8837845105512	97.9649912231878	92.0809	99.3222
92.8837845105512	97.9649912231878	92.8113	98.2407
92.8837845105512	97.9649912231878	92.093	98.3621
94.2166165773091	97.9649879132214	93.4254	97.8126
95.8151060862889	97.9649845053782	96.1791	97.5552
97.2937684581778	97.9649810975309	99.292	98.0492
97.1223621400868	97.2060110401393	98.1513	96.345
96.9434835588094	96.5479306277984	96.6476	96.9796
96.7659705944727	95.8628976385055	95.4796	96.129
96.597229012573	95.1486102467195	96.0605	94.495
96.4309158383897	94.4837987654826	97.9735	93.9042
96.2452759887896	93.9098821273188	96.5452	93.172
96.058135912895	93.3715592902362	96.6676	92.6743
95.8675355519343	92.865011502503	96.809	92.5136
95.6709837545184	92.3740417329217	95.9324	92.1458
95.4732061283258	91.8907638449585	96.671	90.7145
95.252833864647	91.5048949722159	95.3031	91.4204
95.0323226582369	91.1209570166868	94.8083	91.5304
94.8134764801533	90.7289833963923	94.509	92.4532
94.6029638100552	90.0973228179783	94.4683	90.0421
94.3934375043325	89.4694565006399	94.4375	89.8165
94.1839050136811	88.8236995984848	92.1839	88.8237
94.1839050099101	87.9245054955149	92.7639	86.5161
95.788473238867	87.9245054854906	94.7976	88.4491
98.0087335095532	87.924505475705	99.7949	88.8243
97.9645777894634	87.2375938251394	99.7041	87.1751
97.9183555580318	86.571749471338	97.0785	86.7219
97.8724079726856	85.8962672600639	97.4362	85.8361
97.8265817317466	85.2254693429512	96.8293	85.3988
97.7811081966902	84.5420829604091	99.0472	85.7396
97.7341617094791	83.2873623103088	98.6006	82.3388
97.6867788496586	82.3104790414291	99.1691	80.9928
96.8523800499722	82.2560397307351	97.0965	81.0307
95.9792011273438	82.2023648244894	97.0848	81.6578
94.8840681855071	82.1490235624762	94.6937	81.204
93.8321786306618	82.0961306352988	94.7529	81.9671
92.5908877660824	82.0433049062269	92.5909	80.0433
92.4291835188249	83.0086604887431	93.0738	84.8753
91.5801281224265	83.0770075876191	90.3741	83.7882
90.9077436892503	83.1443833103424	90.256	83.0105
90.276376227923	83.2118039718391	90.1019	83.486
89.6549694696377	83.2789952602559	89.6546	85.279
89.4153447423167	83.0557064369062	87.8874	83.7559
89.2092987774379	82.8150967100484	87.8518	83.2273
89.0172186257342	82.5679938922854	87.7484	83.7546
88.8471834952307	82.2737474596934	89	83.7031
88.6760366821086	81.9403582411104	88.1669	82.2879
88.5070295454797	81.6014260808199	87.5661	81.6563
88.3423596933465	81.2615472057003	89.9071	81.4441
88.16197102628	80.9140939572374	88.7272	81.0174
87.9790763062563	80.5650304186469	89.4354	80.1567
87.7802728364952	80.2309727680431	89.7033	80.1502
87.1143134388895	79.9135846603625	87.0156	79.966
86.4551079363818	79.5957449804702	87.485	79.3312
85.7050181034103	79.28302774721	86.8222	80.0693
84.7718093739247	78.9511474055623	84.4928	76.9707
84.7718083989918	79.3467647616233	84.7658	77.8153
84.7718074240733	79.8485216598822	83.5177	79.6473
84.7718064502313	80.3636427127742	84.7887	79.7551

Solution x	Solution y	Original x	Original y
84.7718064502313	80.3636427127742	84.6626	79.7388
84.7718054756501	80.9323053106179	84.0326	80.947
84.7718045011624	81.5009001002938	82.7718	81.5009
84.8694210444546	81.9984171704775	86.0867	81.533
84.9649745150969	82.52318655078	86.675	81.8002
85.0491946252463	83.3485038949108	86.7862	83.711
85.1272953189997	84.0324005473875	87.1273	84.0324
85.1171415377366	84.0918073863895	85.9222	83.4369
85.1069707598264	84.1515892084617	86.8895	84.3247
85.096660960638	84.2107501011622	85.5459	86.1581
84.6669766611102	84.2131881286104	85.8335	84.6274
84.185277429195	84.215625149403	84.2824	83.9445
83.7011174146836	84.2180621652807	84.7929	84.8117
83.7011174146836	84.2180621652807	83.3441	85.5151
83.1802998069277	84.2204954506666	83.1803	86.2205
82.3967519568993	84.074173555884	83.0689	84.7397
81.5369877022451	83.9254463109262	81.0772	83.8409
80.7241523119368	83.7770055740204	79.415	85.235
80.5484500901263	83.2146672576772	79.3747	83.7664
80.3805214731137	82.610315738962	80.7551	80.6861
80.1556631580675	82.5030307439754	80.1131	82.5047
79.9311836631841	82.3957781964829	80.2014	81.5949
79.7046174317279	82.289983404602	80.3025	81.1115
79.4707116466382	82.1871715648016	79.7775	80.296
79.2047470229422	82.1094817662053	79.6279	80.9538
78.9324704877518	82.033215253198	78.0272	82.0721
78.6709951563261	81.9569243506526	77.4302	82.5606
78.4297092116545	81.8797700707303	76.7822	82.9894
78.3836423603203	81.013863550397	76.3867	80.9989
78.3742047898635	80.4603691888918	78.4301	80.0876
78.364766574337	79.9225993807909	78.9268	79.6337
78.3553217328797	79.3972569631803	78.4966	80.8407
78.3458736215626	78.7357627690842	76.8895	78.6378
78.3364583198102	78.0875175868993	79.7296	78.3022
78.3270136214294	77.4161576616941	77.9819	77.7483
78.3175728022728	76.7245969769132	77.1908	76.3248
78.308150453551	76.0712507527226	76.4126	75.548
78.2993317230387	75.7857718363845	80.2922	75.8098
78.1827709927374	75.3353387366565	79.3483	75.3688
78.0633119477977	74.8838383146119	76.1087	74.9228
77.9931180742481	74.4052211654467	76.1847	74.2911
77.9291040873603	73.9471000071639	75.9291	73.9471
77.9291044341927	73.335606758023	77.4087	74.0915
77.9291047812285	72.6750080778853	77.364	70.7565
78.9491579205647	72.7869632914589	78.8402	71.1237
80.0337187903708	72.9093095382158	80.5183	71.0301
80.4977534006319	73.1811112467285	79.9937	73.4457
80.9777964672643	73.4506059232248	79.4655	74.4467
82.0064987490851	73.6790958075507	82.0065	75.6791
82.4714076799984	73.5479241454025	81.6179	74.1421
82.9715097439383	73.4148193665949	82.4808	71.6064
83.6564957553864	73.3072524447634	82.7574	74.2926
84.4561296167797	73.1968702322487	84.8025	72.2361
85.220002796753	73.0885044117456	85.22	71.0885
87.2845963537399	73.2811545622932	88.9513	72.6403
87.9184851341291	73.4899668545862	89.2994	73.1482
88.4352991562041	73.7025699795274	89.0638	74.5581
88.9245160704719	73.9092797701545	89.4099	75.3847
89.3790005847825	74.0986955686272	89.379	76.0987
93.1828632880797	70.2382295655639	93.093	71.3467
97.2738956992123	52.0431001919165	99.2739	52.0431
93.1956039615801	46.58730004156	91.1956	46.5873
93.7701106779656	25.382568399149	92.0943	24.688
95.6127961664717	23.666800268907	97.6128	23.6668
93.9099973196783	21.5974927261043	92.9329	22.8145
92.811686684133	9.84015817691896	94.4757	9.4701
84.9979000065551	5.98910432316058	84.9979	3.9891
73.8110030884346	8.21110708504058	73.9225	9.6395
57.8507613660796	9.42296539053168	57.0413	9.9678
52.8188988869036	10.5144508222242	52.9148	12.3625
44.0237357387597	10.9010124162243	43.1416	9.2079
43.3150023786241	20.0799998757668	41.315	20.08
44.8122806140602	20.7928292487832	44.6412	21.1681
46.3687115485608	21.481754093937	47.312	20.115
47.3559718902762	22.6104503855562	49.2796	22.4102
47.5528331139185	24.7473065180854	48.2875	25.5427
47.7445833142793	26.4349000364379	47.7847	28.4345
47.7445903995867	26.4061153356457	49.2766	27.3707
47.7445974520938	26.376692200774	49.7446	26.3767
45.9593040734551	26.2802227655621	45.8434	28.1097

Solution x	Solution y	Original x	Original y
44.4455489175355	26.0764765203311	45.5527	26.8832
41.9196620732969	25.8645403745476	41.7938	26.8087
39.528064766236	25.645599652184	37.8149	25.869
38.7458330418077	25.4213437202586	38.8284	23.4703
37.7756273817673	25.3231137376246	37.9243	23.9119
36.7691453156226	25.2282421816782	37.4163	24.6203
35.6486379190639	25.1342089690059	35.5448	24.2684
34.5506313072241	25.0413236967648	33.6715	23.2449
34.5506312916667	29.0091942278531	33.916	28.6484
34.5506312916667	29.0091942278531	35.1494	28.8106
34.5506312762086	34.8843729832302	33.7228	34.609
34.5506312762086	34.8843729832302	36.1356	35.5262
34.5506312638975	37.2116551782083	33.3877	38.8388
35.6808835898088	37.2116548148115	36.9556	37.1182
36.5679570779542	37.2116544488645	38.1953	36.049
36.3367055769778	41.1448851109812	37.6461	42.0792
36.076394305611	42.8189480333297	36.302	43.7274
35.8135921856617	44.1632318349068	37.7223	44.0563
34.527436381128	45.9183819678726	35.3466	47.2689
32.4927248169849	46.8820959309946	32.0319	48.7602
31.8026883069842	47.0851979837282	32.0569	46.2162
31.0931998165609	47.2941975087631	31.0932	49.2942
29.0169025312962	46.6582997580062	27.0169	46.6583
29.1225098511313	45.3174487869545	28.4876	46.0461
29.2293072327002	43.7140317726482	27.2789	43.4795
30.0172962974788	43.0882662271887	30.9136	43.9894
30.7116974863905	42.3777998154437	32.7117	42.3778
30.6913101494974	40.7047126332815	32.6554	40.5505
30.665850246249	39.9996962533789	32.6566	40.0511
30.0774741717547	37.6737232250689	29.5705	36.67
29.5200378525246	36.0536709520849	29.0396	36.1372
28.9823700076488	34.4060266136054	27.0476	34.4285
28.8183023099942	32.6012007247863	26.8183	32.6012
28.8662073245138	31.8933025636391	28.4031	32.2444
28.9142224762566	31.1607444191742	28.8128	30.4765
28.9622621727	30.477587029645	30.555	31.3009
29.0083610827064	29.3989415212188	30.1704	30.5441
29.0537250998864	27.3568171367306	30.3241	25.8121
29.0537343134721	27.3568091240109	31.0534	27.3935
28.2280511259143	26.2854720740026	26.5855	26.5008
27.6970952065713	25.099878686061	27.7157	24.2487
27.16570220235	24.075100627817	25.1657	24.0751
27.572924771346	23.5595032183903	25.9644	23.203
28.1370603453686	23.079929151861	29.0027	23.8765
28.6525694942555	22.5621042823207	27.0718	22.4926
29.3684429040171	22.0507287771812	28.392	21.3903
30.1964977542414	21.57099989066	32.1965	21.571
29.8197299728851	20.4349619324461	30.4469	21.4825
29.4241169827073	18.9385874456904	29.6006	20.2054
29.0226280393528	16.418528572815	30.7692	16.7931
28.299777345606	10.1659891251855	28.6149	8.2266
19.8663130361036	10.0381125063002	18.8587	8.5087
18.7868280208139	9.92752608327581	18.0288	10.2093
17.8263236690174	9.81643401462325	17.3372	11.1211
16.9653574142292	9.70125515460115	16.2452	9.322
16.1787320929151	9.58684176787034	15.5961	8.5134
15.4595008983301	9.47520247135582	15.4595	7.4752
15.1141825549179	9.47520248735133	15.3812	8.8682
14.76439107753	9.47520256756009	12.9432	8.6486
14.8948824398795	10.0030810432889	15.7685	10.3669
15.023273621573	10.5159324720174	14.7479	11.7757
15.1525264643786	10.9678023084786	16.6256	12.3206
14.6737469570364	10.9678005430193	15.3264	12.7877
13.2665996306895	10.967798774357	13.2666	12.9678
11.6956291353654	10.9170980007969	9.9074	11.0867
11.6956291353654	10.9170980007969	12.8565	9.4609
11.6956291353654	10.9170980007969	11.3126	12.1774
11.6956291353654	10.9170980007969	11.8636	12.6991
10.1599730209394	10.8660967501131	8.4009	11.7989
10.1287841908135	10.5086677869957	8.6382	10.3371
10.0980019777413	10.1575998543158	8.098	10.1576
10.2749884630664	8.16061568647574	10.2894	7.4847
10.4519312909124	6.48821218799898	8.8668	5.4121
10.7725913270608	6.05630890298855	9.7281	5.4172
11.1170978325702	5.64743626984568	10.526	3.779
12.1735783996271	5.53086305054258	12.5256	4.7007
13.1721173935103	5.41604614921172	12.1595	5.1953
14.3839706928175	5.30173065839903	13.8628	4.3052
15.7567349225751	5.18975630916446	16.1355	6.6685
16.9416476226441	5.07189378312107	18.047	6.7045

Solution x	Solution y	Original x	Original y
17.1065814674188	3.8582422375476	18.6523	3.9117
17.2591351632484	2.61751223458401	18.2952	1.0836
17.3925650586587	2.1637971494369	19.0824	1.094
14.229717539208	2.16379735095425	13.7484	0.7577
14.229717539208	2.16379735095425	14.8098	1.8409
11.5332649829685	2.16379755260148	9.9632	1.8111
11.5332649829685	2.16379755260148	10.31	1.5005
11.5332649829685	2.16379755260148	10.6256	1.7583
11.5332649829685	2.16379755260148	11.5459	0.8736
11.5332649829685	2.16379755260148	11.169	1.5527
11.5332649829685	2.16379755260148	13.2084	1.5682
11.5332649829685	2.16379755260148	11.5168	3.287
9.16401146776445	2.16379868709631	8.9599	2.5066
9.16401146776445	2.16379868709631	9.4253	3.1222
6.69627885047724	2.16379880688414	5.6082	3.0104
6.69627885047724	2.16379880688414	8.0267	2.1019
3.94730102550946	2.16379886993212	3.9473	4.1638
3.19794822479818	2.10760210646573	2.8757	1.3778
2.4773200432914	2.05200185730575	2.4773	0.052
2.46795989811002	2.55377901963779	1.2646	1.8964
2.45863631209963	3.10190760929343	1.729	2.5191
2.44932556277023	3.68055182079976	3.9756	4.3104
2.43996212587123	4.18583839118559	3.8933	3.6617
2.43055835695787	4.73685074480066	4.0211	5.0495
2.42110194032989	5.25479973700504	0.4211	5.2548
2.57926242005767	5.43731608632654	1.2522	5.4022
2.74539337615757	5.62009847915136	1.2192	5.9144
2.92641689769573	5.79980748617456	1.4037	6.1535
3.1254432864136	5.9759065067095	2.7247	6.6491
3.32688896360536	6.1489847058197	4.1027	5.9391
3.52373099874713	6.3230510589011	5.4981	6.1028
3.55789587307888	6.64925041368309	5.2006	6.8919
3.59128821959075	6.96439370778135	4.1301	7.1548
3.62459804800149	7.27700150328251	5.6246	7.277
3.55894242334828	9.05482083348226	5.4781	9.3534
3.45992738043755	9.80075553479947	2.5621	10.2967
3.36239234372249	10.502454245337	2.6723	10.4123
3.26579199522827	11.210777678856	2.4532	11.1564
3.17032492435983	11.9234542154987	5.0355	11.9367
3.05368686357542	12.6304261943743	4.243	12.8676
2.93373134949344	13.3145035404662	3.6086	13.0876
2.81237231406647	14.0144842156589	2.3396	12.8751
2.69242275104298	14.8514165300636	2.4914	14.471
2.57286199392236	15.7256184748827	3.5607	15.7968
2.45091299031411	16.5910889653964	3.7626	17.1174
2.32386046736403	17.3672009378139	2.2625	16.1551
2.19701652446318	18.3254867660979	0.7828	19.7397
2.71370526901534	18.2944225991341	1.5116	19.0597
3.33170329251192	18.2631688489803	2.785	16.9995
4.00482199926317	18.2322053891327	4.024	17.3232
4.67643929630343	18.2013781836316	4.753	19.8404
5.33428764798373	18.1699429885856	4.8686	17.5054
6.02407960928173	18.1386054660799	6.693	16.2603
6.07785475990892	18.1261926236684	5.3173	19.9696
7.96406706418281	18.0985697503725	8.65	19.7295
9.03320689141296	18.0702061824291	9.0075	17.4052
10.1067905993339	18.041917470695	9.2095	19.5087
12.1396567945008	18.0130513582914	12.295	19.9912
12.6637872212068	17.9527149306703	12.3192	17.7013
13.2008032848466	17.8924973069073	12.6858	19.6571
13.8973614304864	17.826552697512	13.9396	19.5452
14.5842997206348	17.7568023151968	14.5843	15.7568
15.1997062831968	17.832220131985	14.7151	17.4542
15.8421097541021	17.9082318318438	15.42	17.0914
15.8421097541021	17.9082318318438	15.9493	16.7531
16.5052001666616	17.9902981489869	16.5052	19.9903
17.5790662332599	17.554110293029	19.3111	17.5672
18.1299035746297	17.1161207670835	19.5822	17.4941
18.5771065840698	16.6565941191446	17.8934	15.1905
19.0819002722708	16.289302375863	19.0819	14.2893
20.0986110281944	16.4344961614456	19.7672	14.9362
21.2418088655805	16.5902910743427	22.1476	14.8515
21.4871619133328	19.8173319915093	20.9805	20.9752
21.7391991449789	21.62051546272	20.821	23.0825
22.0245284193198	22.396556389026	21.8127	22.4456
22.3121539809462	23.1690022498516	23.4201	21.9457
22.5671978103207	24.4137001882501	24.5672	24.4137
22.1974021528148	25.6106000785078	20.1974	25.6106
22.2648992834182	26.6999231691179	23.4789	26.9268
22.3312778512767	27.7372060804104	21.333	28.4534

Solution x	Solution y	Original x	Original y
22.3985034728552	28.6382206102901	22.5985	27.2784
22.4654977717894	29.9183998176893	24.4655	29.9184
22.4428443258704	30.8347233024202	20.5677	31.0115
22.4211897785708	31.6095943205587	20.8616	31.8567
22.3997640810594	32.3377428805146	22.0871	33.226
22.3783606562465	32.9969599603528	22.2385	33.2025
22.3569654548747	33.6452376141548	22.8416	32.9746
22.3355400211516	34.3399827746194	24.2607	34.0424
22.3116268974324	35.869681481914	23.8226	36.8408
22.2871570480186	36.635080508873	23.8984	35.8981
22.2621363924677	37.7835217737691	20.4824	37.2243
22.2381292741114	41.1306025507813	23.1185	40.5549
22.2140398331599	46.1915170441069	23.5397	47.0618
22.1897024912613	48.2131994332657	20.1897	48.2132
22.6707137676712	48.7435398965803	22.4944	48.7727
23.1575240773058	49.273012122554	22.5313	48.1754
23.6782832779219	49.8765070186385	25.2216	48.8368
23.9731618503287	51.3874557274847	24.5323	49.8988
24.2521120913279	58.3239255806678	25.8602	58.6207
24.4887219709473	62.1834445668967	25.0595	61.5431
24.7204993504523	68.5107563627734	23.9463	67.9458
24.9593836899761	84.2215843616637	26.3736	85.6358
20.9743864702869	84.0863548255754	19.7188	83.0222
19.6498035290032	83.9583740068724	18.7876	82.3448
18.9573499022256	83.8482678276551	17.8246	84.0918
18.3561894293587	83.7376359595031	17.8311	84.5721
17.7855338361549	83.6253212105132	17.0206	82.7787
17.2587050708899	83.5150054368278	16.887	83.4344
16.745281675652	83.4048446115194	16.4864	81.6235
16.2773007239972	83.3093033585286	16.2773	81.3093
15.9393407397003	83.3443561028026	15.9151	82.9337
15.601819105324	83.3794736826682	16.072	81.5553
15.1796258385479	83.4176980272597	15.4215	81.5375
14.687231995628	83.4602979983537	14.2245	83.0966
14.210263748807	83.5029899115203	14.2132	82.4414
13.7333443129262	83.5460254421496	13.8296	81.5783
13.1213022793945	83.6187956059427	13.6279	83.3943
12.4821169718756	83.6917342697434	13.617	84.1913
11.7295347135735	83.7641600641334	12.6448	83.0865
10.8645198371744	83.837245072256	10.8331	85.8288
10.4336957025289	83.8474331295303	10.6041	85.0219
9.99659893431517	83.8575967428414	9.9966	85.8576
9.15550821780252	83.7934547785497	9.2565	85.6186
8.25283341971341	83.7220613454899	8.8756	85.3213
6.99375020884381	83.6464554981459	6.0677	84.3942
5.97189264263285	83.5700346411325	5.091	83.7862
5.07918865780178	83.4934324235963	5.1015	81.8103
4.17639286600122	83.420908701197	3.3964	83.4982
3.36053565848402	83.3483406374253	2.5389	82.9669
2.62500118226329	83.2761032492515	2.625	81.2761
2.2530483054405	83.2761033443385	1.1933	81.8445
1.95822260569349	83.2761034398696	0.029	82.9455
1.85549265845398	83.2761035372196	0.2473	82.0871
1.8554927958688	86.2638461263168	1.8225	87.776
1.8554927958688	86.2638461263168	1.983	86.3665
1.8554927958688	86.2638461263168	2.0599	86.005
1.8554927958688	86.2638461263168	2.696	85.7661
1.85549293771615	87.7470035244012	0.7751	88.6342
1.85549307998414	88.8531035292896	1.0919	90.7016
2.90424203510798	88.6990056230566	1.5647	88.8122
4.48419960246822	88.5445034196152	4.4842	86.5445
5.48361596783394	88.5445037422461	5.387	87.7604
5.48361596783394	88.5445037422461	5.1953	87.1361
6.5829406071241	88.5445040661151	6.7503	86.812
7.57581764343944	88.5445043900881	7.4797	86.7529
8.63848769244738	88.5445047134812	7.7403	89.8119
8.63848769244738	88.5445047134812	7.6764	88.6806
10.6663722685392	88.5445050383301	9.522	88.7288
10.6663722685392	88.5445050383301	11.6247	87.7046
12.7395602768538	88.5445053629677	13.2856	89.4879
12.7395602768538	88.5445053629677	11.8372	87.4011
15.7639265160556	88.5445056889053	17.1642	87.7833
16.9720910099009	88.5445060138889	17.0519	88.8308
18.166452626776	88.5445063403296	19.3715	86.9483
18.1664531553606	89.5833580200821	19.4915	88.9148
18.1664536833262	90.8958351481169	19.5543	89.8549
18.1664542104713	95.6148219299768	17.7167	97.5636
29.7105040369653	94.8451291152658	29.7505	96.621
38.7274904192471	89.0120096074311	39.3354	89.658
43.5794219720205	74.9053534924487	44.9743	74.4953

Solution x	Solution y	Original x	Original y
45.2994166189347	69.4536208193515	47.0351	69.5204
45.9740919137099	62.7938412343063	44.1821	62.8241
49.2349294578592	55.2109683087618	49.5234	55.0957
52.1531970356677	48.4548006772719	54.1532	48.4548
48.3846401433466	48.0869727730842	47.084	47.7144
46.6356588183843	47.7306074640827	44.7377	48.2657
46.5318139210011	43.3736838491667	45.8095	43.1051
46.4291510065485	39.6755491388286	47.3754	37.9401
46.1970774519229	39.5779611643232	47.2998	37.9687
45.4280982909648	39.5092765376757	45.8348	38.3992
44.609580043067	39.4416180847726	44.7486	39.7162
43.7797222248763	39.3738065409499	43.5486	39.6053
42.9714527203534	39.3058600290824	42.0622	41.0674
42.8534203059182	38.2051515413705	41.4412	38.9568
42.7420925815347	36.6309433480423	44.3864	36.3116
42.6212853346681	35.3402859082792	42.5333	36.3249
42.5007163070098	33.6989609977737	41.9344	32.8635
42.3815652373527	32.3792057749716	40.4113	32.0356
43.5509092171304	32.3792050240752	43.0635	31.4686
44.8562695303177	32.3792042589586	44.5785	34.1629
46.6033555556372	32.3792035166874	47.2249	31.4694
48.0613999960331	32.3792027672395	48.0614	30.3792
49.3477958845353	33.3586411352951	48.8851	33.6728
50.7512897943518	34.2989165625171	49.5874	32.9921
64.2505269329109	37.2066293015441	64.954	37.309

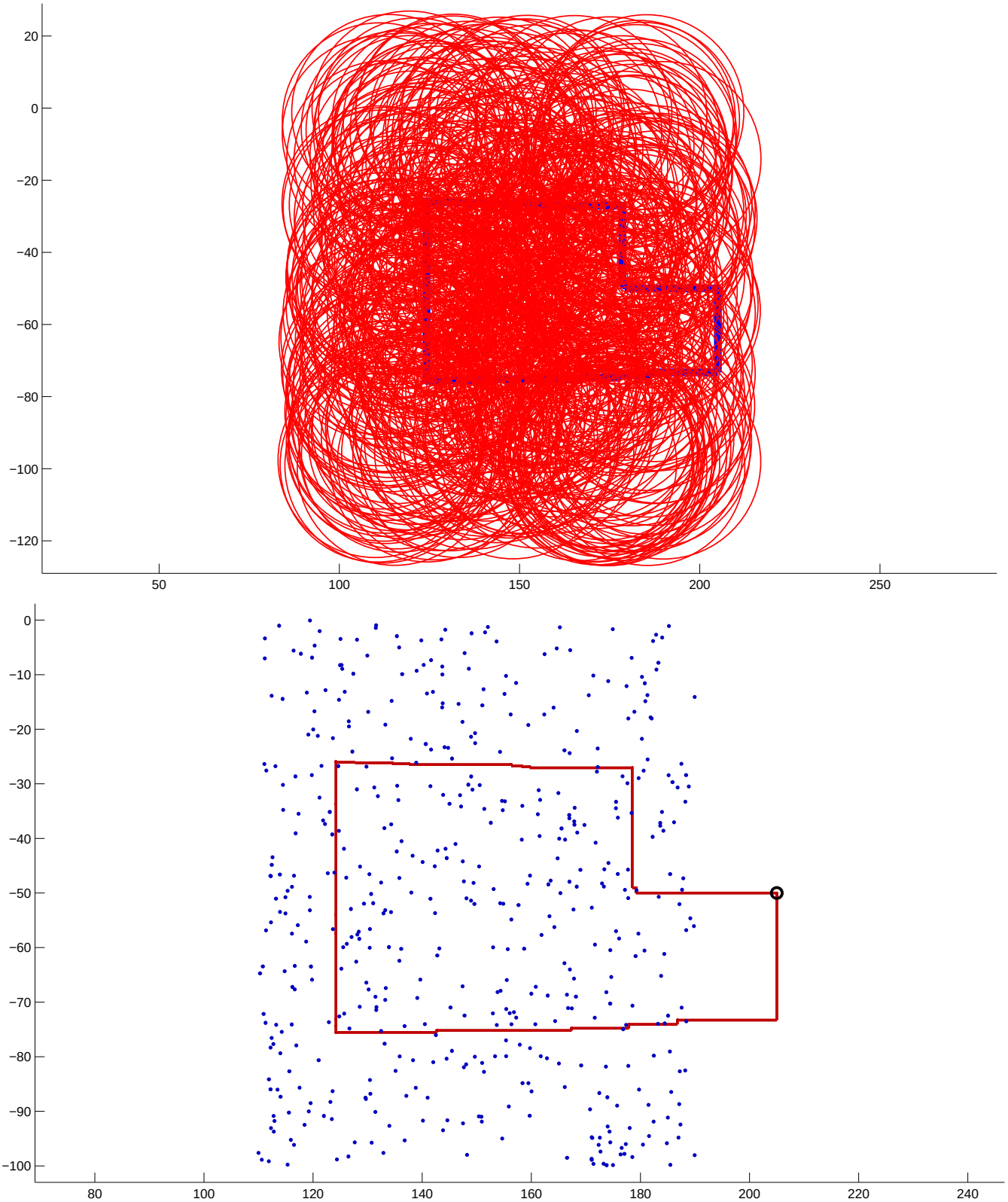


Figure N.110: *team*6_500, Equal Radius, 2D, Manhattan, Length = 260.7953578

Table N-113: Solution for *team*6_500, Equal Radius, 2D, Manhattan

Total distance: 260.795357755211			
Depot: x 95 y 50			
Solution x	Solution y	Original x	Original y
69.1665123023754	49.0712811410046	43.0965371	49.287121
69.1665123023754	49.0712811410046	44.2906965	51.8898251
69.1665123023754	49.0712811410046	47.6524078	52.2249928
69.1665123023754	49.0712811410046	46.3458684	54.8708712
69.1665123023754	49.0712811410046	55.3536754	50.0230289
69.1665123023754	49.0712811410046	57.0032853	47.929495
69.1665123023754	49.0712811410046	58.3317264	48.8464518
69.1665123023754	49.0712811410046	53.3341085	54.2742297
69.1665123023754	49.0712811410046	48.6878693	60.2173135
69.1665123023754	49.0712811410046	51.8847181	57.7017397
69.1665123023754	49.0712811410046	54.2235528	56.265496
69.1665123023754	49.0712811410046	57.7424662	53.0431767
69.1665123023754	49.0712811410046	58.9987357	45.7674431
69.1665123023754	49.0712811410046	63.3053921	48.8331121
69.1665123023754	49.0712811410046	62.9728444	48.2610974
69.1665123023754	49.0712811410046	61.0935569	52.6920317
69.1665123023754	49.0712811410046	63.3830619	45.6708392
69.1665123023754	49.0712811410046	67.1669184	49.4371849
69.1665123023754	49.0712811410046	65.8501112	46.5185477
69.1665123023754	49.0712811410046	64.136723	44.5156078
69.1665123023754	49.0712811410046	50.8238583	67.1806384
69.1665123023754	49.0712811410046	67.7686962	50.942416
69.1665123023754	49.0712811410046	69.2934493	49.5142976
69.1665123023754	49.0712811410046	56.0822206	62.8731122
69.1665123023754	49.0712811410046	67.7343836	45.7338412
69.1665123023754	49.0712811410046	57.0800315	64.0172849
69.1665123023754	49.0712811410046	61.6781701	59.473286
69.1665123023754	49.0712811410046	53.0250996	68.7918887
69.1665123023754	49.0712811410046	65.5436157	56.992435
69.1665123023754	49.0712811410046	57.8283627	65.6998258
69.1665123023754	49.0712811410046	73.3690079	50.7128517
69.1665123023754	49.0712811410046	66.0988248	58.3515559
69.1665123023754	49.0712811410046	64.4880133	60.4854675
69.1665123023754	49.0712811410046	56.5346421	68.6367247
69.1665123023754	49.0712811410046	75.4422908	46.5496079
69.1665123023754	49.0712811410046	77.6409989	49.4044045
69.1665123023754	49.0712811410046	69.6306367	57.4599551
69.1665123023754	49.0712811410046	58.1838222	68.9986011
69.1665123023754	49.0712811410046	56.7397866	71.0931061
69.1665123023754	49.0712811410046	77.8566059	47.3210428
69.1665123023754	49.0712811410046	57.43771	71.1535593
69.1665123023754	49.0712811410046	77.1618533	52.0527053
69.1665123023754	49.0712811410046	64.6626599	65.39963
69.1665123023754	49.0712811410046	72.24704	39.7077335
69.1665123023754	49.0712811410046	69.1126526	61.5737532
69.1665123023754	49.0712811410046	68.3855742	35.3493495
69.1665123023754	49.0712811410046	70.748982	60.565778
69.1665123023754	49.0712811410046	63.772212	68.1836695
69.1665123023754	49.0712811410046	74.2228108	38.6099587
69.1665123023754	49.0712811410046	79.155929	54.6404138
69.1665123023754	49.0712811410046	73.6393721	37.6930766
69.1665123023754	49.0712811410046	73.6483802	37.1698351
69.1665123023754	49.0712811410046	61.6425082	72.8564323
69.1665123023754	49.0712811410046	64.4543682	70.2655389
69.1665123023754	49.0712811410046	78.4065879	56.8222853
69.1665123023754	49.0712811410046	74.3685871	61.179785
69.1665123023754	49.0712811410046	67.6344777	29.9025036
69.1665123023754	49.0712811410046	79.80288	56.0883078
69.1665123023754	49.0712811410046	66.7264937	28.6241638
69.1665123023754	49.0712811410046	62.1748486	23.5386262
69.1665123023754	49.0712811410046	73.9542296	35.1681427
69.1665123023754	49.0712811410046	76.1612584	37.0439506
69.1665123023754	49.0712811410046	69.6772126	28.9703915
69.1665123023754	49.0712811410046	73.7932186	65.1929118
69.1665123023754	49.0712811410046	68.5426632	70.6500378
69.1665123023754	49.0712811410046	70.5957341	27.6007009
69.1665123023754	49.0712811410046	67.3900644	74.174693
69.1665123023754	49.0712811410046	66.8428254	74.9418962
69.1665123023754	49.0712811410046	78.2442809	33.2914556
69.1665123023754	49.0712811410046	71.3343578	25.5495623
69.1665123023754	49.0712811410046	76.8303918	30.6898889
69.1665123023754	49.0712811410046	75.8801773	29.7113355
69.1665123023754	49.0712811410046	75.1791401	28.4357222
69.1665123023754	49.0712811410046	78.8734057	30.5074156
69.1665123023754	49.0712811410046	73.2290706	73.9762718
69.1665123023754	49.0712811410046	75.0689318	72.4744486
69.1665123023754	49.0712811410046	78.3681704	28.4149174
69.1665123023754	49.0712811410046	74.4567732	73.8913977
69.1665123023754	49.0712811410046	77.5651358	71.0148631
69.1665123023754	49.0712811410046	77.5184606	26.3492827
69.1665123023754	49.0712811410046	78.4106856	73.5257917
68.501661167069	27.0754446630085	70.2766166	21.7580017
68.501661167069	27.0754446630085	71.8742878	17.8343061
68.501661167069	27.0754446630085	72.0757838	18.033427
68.501661167069	27.0754446630085	70.9135058	14.8761766
68.501661167069	27.0754446630085	71.2868972	13.7571779
68.501661167069	27.0754446630085	70.8086056	11.5809577
68.501661167069	27.0754446630085	70.2907843	10.4186099
68.501661167069	27.0754446630085	68.4102584	6.9403941
68.501661167069	27.0754446630085	64.943613	1.686391
68.501661167069	27.0754446630085	72.9487249	9.0752285
68.501661167069	27.0754446630085	73.292725	7.8305571
68.501661167069	27.0754446630085	79.9570853	14.106802
68.501661167069	27.0754446630085	72.320279	3.8462993
68.501661167069	27.0754446630085	72.8917692	2.6849909
68.501661167069	27.0754446630085	73.9903157	3.2090585
68.501661167069	27.0754446630085	75.2339764	1.1053279
49.7049079533799	26.8595827379447	65.5247054	34.4819771
49.7049079533799	26.8595827379447	65.5339196	33.299582
49.7049079533799	26.8595827379447	62.0390375	27.7696953
49.7049079533799	26.8595827379447	62.1996928	26.9322785
49.7049079533799	26.8595827379447	39.0651937	2.4238303
49.7049079533799	26.8595827379447	67.7860652	18.0440513
49.7049079533799	26.8595827379447	68.9038468	16.8104734
49.7049079533799	26.8595827379447	67.4654721	12.1137109
48.1845647110082	26.7026555842708	44.8729194	51.9811136
48.1845647110082	26.7026555842708	49.3212736	48.3119567
48.1845647110082	26.7026555842708	49.7681271	46.8278362
48.1845647110082	26.7026555842708	53.1446811	48.4277704
48.1845647110082	26.7026555842708	53.5581269	47.7413894
48.1845647110082	26.7026555842708	48.2549784	40.2375649
48.1845647110082	26.7026555842708	54.8328865	43.6672378
48.1845647110082	26.7026555842708	51.5218465	39.5765057
48.1845647110082	26.7026555842708	55.1300701	40.0588307
48.1845647110082	26.7026555842708	51.2078647	35.5791539
48.1845647110082	26.7026555842708	56.2067364	40.2417677
48.1845647110082	26.7026555842708	55.5353048	38.1752447
48.1845647110082	26.7026555842708	58.429274	38.9397266
48.1845647110082	26.7026555842708	57.9145816	37.4787407
48.1845647110082	26.7026555842708	56.98499	36.3050676
48.1845647110082	26.7026555842708	57.8811625	36.8910334
48.1845647110082	26.7026555842708	61.8021468	40.7857588
48.1845647110082	26.7026555842708	56.9481598	35.7189477
48.1845647110082	26.7026555842708	59.7400431	37.5401839
48.1845647110082	26.7026555842708	54.9748886	31.6899499
48.1845647110082	26.7026555842708	57.9600279	34.4089577
48.1845647110082	26.7026555842708	46.2315326	17.3070005
48.1845647110082	26.7026555842708	65.884583	36.2103636
48.1845647110082	26.7026555842708	49.4509792	19.23293
48.1845647110082	26.7026555842708	56.0727891	23.8686819
48.1845647110082	26.7026555842708	57.0336699	24.3925592
48.1845647110082	26.7026555842708	52.3761166	17.3066951
48.1845647110082	26.7026555842708	58.3586123	20.3359236
48.1845647110082	26.7026555842708	54.100404	16.0525172
48.1845647110082	26.7026555842708	60.5482992	13.7850738
48.1845647110082	26.7026555842708	61.3811866	10.1841347
48.1845647110082	26.7026555842708	64.1033853	11.196525
46.3016790115686	26.4690363620254	42.5831476	37.1399223
46.3016790115686	26.4690363620254	44.7688336	34.8472485
46.3016790115686	26.4690363620254	44.6441662	33.1239716
46.3016790115686	26.4690363620254	45.1705924	33.2150554
46.3016790115686	26.4690363620254	48.3601763	34.0464698
46.3016790115686	26.4690363620254	39.7157151	22.5518047
46.3016790115686	26.4690363620254	38.9701661	21.3778805
46.3016790115686	26.4690363620254	51.6262531	32.9510025
46.3016790115686	26.4690363620254	39.7052051	20.7340789
46.3016790115686	26.4690363620254	44.272376	24.1529526
46.3016790115686	26.4690363620254	37.3849664	18.6565566
46.3016790115686	26.4690363620254	41.0252369	15.6288565
46.3016790115686	26.4690363620254	36.6688954	15.3802855
46.3016790115686	26.4690363620254	41.2499501	12.693222
46.3016790115686	26.4690363620254	38.5584867	8.9239146
46.3016790115686	26.4690363620254	45.092729	13.545129
46.3016790115686	26.4690363620254	37.7928549	6.0601138

Solution x	Solution y	Original x	Original y
46.3016790115686	26.4690363620254	45.3795945	10.2393952
46.3016790115686	26.4690363620254	47.2237184	11.5265695
46.3016790115686	26.4690363620254	41.5241877	2.2495139
46.3016790115686	26.4690363620254	43.6411268	3.9331303
46.3016790115686	26.4690363620254	42.0438698	1.2746098
46.3016790115686	26.4690363620254	52.4413086	6.2567644
46.3016790115686	26.4690363620254	54.6678163	5.1970784
46.3016790115686	26.4690363620254	57.1362338	5.5136309
46.3016790115686	26.4690363620254	55.2537104	1.3428502
27.5954932248836	26.3058880707034	51.358437	31.183912
27.5954932248836	26.3058880707034	31.9710737	13.1659452
27.5954932248836	26.3058880707034	33.7088519	9.9711832
27.5954932248836	26.3058880707034	33.6893922	8.5224136
27.5954932248836	26.3058880707034	31.6461166	7.3585956
27.5954932248836	26.3058880707034	30.2787157	8.2280249
27.5954932248836	26.3058880707034	28.9980611	9.3107142
27.5954932248836	26.3058880707034	33.5301093	3.5426558
27.5954932248836	26.3058880707034	26.3324067	9.9110212
27.5954932248836	26.3058880707034	34.237799	1.769458
27.5954932248836	26.3058880707034	29.8399494	3.731908
27.5954932248836	26.3058880707034	25.7941467	5.022901
27.5954932248836	26.3058880707034	25.3620642	2.9418291
27.5954932248836	26.3058880707034	19.95828	6.5164086
27.5954932248836	26.3058880707034	21.5004558	1.4444458
27.5954932248836	26.3058880707034	21.5694811	0.9567502
27.5954932248836	26.3058880707034	18.0605132	3.6100683
27.5954932248836	26.3058880707034	15.0419936	3.4632806
24.4574342441142	26.1444858050987	40.4352515	45.1450838
24.4574342441142	26.1444858050987	37.4597811	44.2188485
24.4574342441142	26.1444858050987	34.4981613	43.6098189
24.4574342441142	26.1444858050987	32.3078962	45.114069
24.4574342441142	26.1444858050987	36.1244237	41.0242921
24.4574342441142	26.1444858050987	34.2887402	41.9043439
24.4574342441142	26.1444858050987	32.8302989	42.2309887
24.4574342441142	26.1444858050987	30.0937988	44.3308943
24.4574342441142	26.1444858050987	28.2512087	43.1796715
24.4574342441142	26.1444858050987	37.130172	34.1670861
24.4574342441142	26.1444858050987	41.3950957	34.602479
24.4574342441142	26.1444858050987	39.21475	31.0795566
24.4574342441142	26.1444858050987	36.9545772	32.1019086
24.4574342441142	26.1444858050987	35.0133629	33.6653342
24.4574342441142	26.1444858050987	38.4714341	30.1541626
24.4574342441142	26.1444858050987	25.3533813	42.3962835
24.4574342441142	26.1444858050987	40.565033	30.2350611
24.4574342441142	26.1444858050987	38.9767874	28.6595996
24.4574342441142	26.1444858050987	26.2175773	40.5220972
24.4574342441142	26.1444858050987	33.8398153	32.0377234
24.4574342441142	26.1444858050987	31.5115819	30.4349931
24.4574342441142	26.1444858050987	24.3319298	37.4283803
24.4574342441142	26.1444858050987	23.0786229	38.1227731
24.4574342441142	26.1444858050987	35.4889656	25.3753347
24.4574342441142	26.1444858050987	25.6408756	32.9849766
24.4574342441142	26.1444858050987	34.7673517	23.4200763
24.4574342441142	26.1444858050987	34.0986738	23.3047286
24.4574342441142	26.1444858050987	25.434095	30.36432
24.4574342441142	26.1444858050987	31.6418617	23.7354033
24.4574342441142	26.1444858050987	28.9097869	26.1468646
24.4574342441142	26.1444858050987	21.8832831	32.2702186
24.4574342441142	26.1444858050987	30.6527015	22.708305
24.4574342441142	26.1444858050987	21.2205961	30.6755865
24.4574342441142	26.1444858050987	24.4888337	25.329984
24.4574342441142	26.1444858050987	33.6742877	16.0147514
24.4574342441142	26.1444858050987	27.922577	21.764341
24.4574342441142	26.1444858050987	18.0420031	31.0087706
24.4574342441142	26.1444858050987	33.7699504	15.2531662
24.4574342441142	26.1444858050987	19.7989907	26.8559855
24.4574342441142	26.1444858050987	30.8819888	13.4626957
24.4574342441142	26.1444858050987	23.260163	19.1726271
24.4574342441142	26.1444858050987	14.6392528	26.7492086
24.4574342441142	26.1444858050987	17.2034005	24.1027648
24.4574342441142	26.1444858050987	24.4057133	14.819481
24.4574342441142	26.1444858050987	11.5512784	26.7283657
24.4574342441142	26.1444858050987	20.1050057	16.8211128
24.4574342441142	26.1444858050987	16.5956207	19.4929376
24.4574342441142	26.1444858050987	13.6477983	21.6503409
24.4574342441142	26.1444858050987	16.5565287	18.5575743
24.4574342441142	26.1444858050987	10.881307	21.222109
24.4574342441142	26.1444858050987	10.0346396	20.0550826
24.4574342441142	26.1444858050987	14.7546051	14.610274
24.4574342441142	26.1444858050987	15.820225	13.1438067

Solution x	Solution y	Original x	Original y
24.4574342441142	26.1444858050987	17.3929381	9.8303298
24.4574342441142	26.1444858050987	10.2638739	16.7343669
24.4574342441142	26.1444858050987	12.2844966	12.8434228
24.4574342441142	26.1444858050987	15.3634563	8.946465
24.4574342441142	26.1444858050987	15.2275578	8.2482088
24.4574342441142	26.1444858050987	14.9649191	8.2569823
17.6924322177717	26.0517844373847	1.1696301	7.0254341
14.1949117685455	25.948556068779	9.8269964	6.8843491
14.1949117685455	25.948556068779	10.2956976	4.6843351
14.1949117685455	25.948556068779	7.7653349	6.167634
14.1949117685455	25.948556068779	11.2137447	2.0282324
14.1949117685455	25.948556068779	6.4321646	5.6038094
14.1949117685455	25.948556068779	9.4518233	0.0818322
14.1949117685455	25.948556068779	3.796854	1.0310825
14.1949117685455	25.948556068779	1.1893308	3.3623299
14.1949110995095	33.6983888983069	2.2999767	55.3764405
14.1949110995095	33.6983888983069	11.1949114	32.5347928
14.1949110995095	33.6983888983069	4.5207011	34.7763494
14.1949110995095	33.6983888983069	9.7861225	28.4044715
14.1949110995095	33.6983888983069	6.7702019	28.6398243
14.1949110995095	33.6983888983069	4.4919615	30.1971308
14.1949110995095	33.6983888983069	9.1420339	20.9818632
14.1949110995095	33.6983888983069	3.1062568	26.7803784
14.1949110995095	33.6983888983069	1.4410502	27.5670412
14.1949110995095	33.6983888983069	1.0903939	26.3844516
14.1949110995095	33.6983888983069	8.8711802	13.2955279
14.1949110995095	33.6983888983069	4.4183327	14.4467589
14.1949110995095	33.6983888983069	2.4227502	13.8762399
14.1949104799124	53.9142648224465	37.415218	67.1119326
14.1949104799124	53.9142648224465	20.3277951	46.570702
14.1949104799124	53.9142648224465	18.6253841	45.1799856
14.1949104799124	53.9142648224465	16.0956015	47.1989931
14.1949104799124	53.9142648224465	13.919931	46.2670929
14.1949104799124	53.9142648224465	12.7057803	46.3942459
14.1949104799124	53.9142648224465	15.6671545	41.9038059
14.1949104799124	53.9142648224465	9.4077401	50.7341371
14.1949104799124	53.9142648224465	6.1363219	48.8674613
14.1949104799124	53.9142648224465	9.4153722	53.1681384
14.1949104799124	53.9142648224465	5.3360715	49.6056788
14.1949104799124	53.9142648224465	6.5220454	46.8393292
14.1949104799124	53.9142648224465	14.7299938	38.6202015
14.1949104799124	53.9142648224465	13.5198617	39.2703319
14.1949104799124	53.9142648224465	4.944301	50.787374
14.1949104799124	53.9142648224465	3.9184302	46.6238898
14.1949104799124	53.9142648224465	3.2029124	51.042154
14.1949104799124	53.9142648224465	12.1928408	37.3702852
14.1949104799124	53.9142648224465	7.2093662	55.909681
14.1949104799124	53.9142648224465	4.9451086	53.7479899
14.1949104799124	53.9142648224465	2.27936	46.9159446
14.1949104799124	53.9142648224465	2.1729785	46.8604253
14.1949104799124	53.9142648224465	11.8541821	36.7134083
14.1949104799124	53.9142648224465	3.9504558	53.4738105
14.1949104799124	53.9142648224465	13.0553452	35.1491327
14.1949104799124	53.9142648224465	2.4253981	44.8523436
14.1949104799124	53.9142648224465	6.1457761	57.4553139
14.1949104799124	53.9142648224465	2.5746679	43.4683609
14.1949104799124	53.9142648224465	6.820668	39.0713932
14.1949104799124	53.9142648224465	7.3492035	35.5012058
14.1949102318868	57.3689105942307	39.4220046	48.156385
14.1949102318868	57.3689105942307	38.9617732	51.3997809
14.1949102318868	57.3689105942307	37.6481264	47.8813096
14.1949102318868	57.3689105942307	38.128444	50.990683
14.1949102318868	57.3689105942307	39.5709227	52.0192185
14.1949102318868	57.3689105942307	31.5095969	51.0684653
14.1949102318868	57.3689105942307	32.3710377	53.6854
14.1949102318868	57.3689105942307	28.018456	49.9258106
14.1949102318868	57.3689105942307	25.8175111	47.2716024
14.1949102318868	57.3689105942307	33.1471098	60.1558513
14.1949102318868	57.3689105942307	22.4746551	48.1041051
14.1949102318868	57.3689105942307	32.7632095	61.4478694
14.1949102318868	57.3689105942307	24.284459	53.5118781
14.1949102318868	57.3689105942307	20.6501388	50.1791373
14.1949102318868	57.3689105942307	23.2467308	53.1536864
14.1949102318868	57.3689105942307	22.9209187	53.7233909
14.1949102318868	57.3689105942307	21.0216738	51.8703093
14.1949102318868	57.3689105942307	19.3270801	51.9549025
14.1949102318868	57.3689105942307	26.1534967	60.2417469
14.1949102318868	57.3689105942307	16.954408	52.9270638
14.1949102318868	57.3689105942307	23.9069485	59.9121563
14.1949102318868	57.3689105942307	20.4303529	56.6155569

Solution x	Solution y	Original x	Original y
14.1949102318868	57.3689105942307	29.6716712	65.8677857
14.1949102318868	57.3689105942307	25.824676	62.4300357
14.1949102318868	57.3689105942307	18.3784185	57.1026507
14.1949102318868	57.3689105942307	18.1200543	57.6122523
14.1949102318868	57.3689105942307	20.3908302	60.0437447
14.1949102318868	57.3689105942307	18.474215	58.4012448
14.1949102318868	57.3689105942307	29.1113171	69.2428114
14.1949102318868	57.3689105942307	17.0586402	58.0717087
14.1949102318868	57.3689105942307	13.6466825	56.641223
14.1949102318868	57.3689105942307	16.1987878	59.3187745
14.1949102318868	57.3689105942307	30.51178	74.0433946
14.1949102318868	57.3689105942307	23.3330747	67.4297538
14.1949102318868	57.3689105942307	15.5276897	59.9411898
14.1949102318868	57.3689105942307	17.9198509	62.5969087
14.1949102318868	57.3689105942307	23.2409835	69.6045703
14.1949102318868	57.3689105942307	19.7736057	66.4248411
14.1949102318868	57.3689105942307	20.1950128	67.681815
14.1949102318868	57.3689105942307	21.4467307	69.0185063
14.1949102318868	57.3689105942307	26.7897314	74.395765
14.1949102318868	57.3689105942307	15.1928212	63.8863652
14.1949102318868	57.3689105942307	21.6218153	70.9164832
14.1949102318868	57.3689105942307	21.5799527	71.4486566
14.1949102318868	57.3689105942307	8.7488745	58.9072962
14.1949102318868	57.3689105942307	18.5593029	70.8497614
14.1949102318868	57.3689105942307	22.4809106	75.2843669
14.1949102318868	57.3689105942307	9.6122245	63.4753738
14.1949102318868	57.3689105942307	23.1076735	77.6165558
14.1949102318868	57.3689105942307	9.8142501	65.891213
14.1949102318868	57.3689105942307	15.7168362	72.1075902
14.1949102318868	57.3689105942307	6.6502494	63.3598676
14.1949102318868	57.3689105942307	14.8230271	72.6203252
14.1949102318868	57.3689105942307	16.6661596	74.8364156
14.1949102318868	57.3689105942307	12.9149435	73.6813943
14.1949102318868	57.3689105942307	6.2196931	67.2192158
14.1949102318868	57.3689105942307	6.6484375	67.6725429
14.1949102318868	57.3689105942307	6.0949397	74.0865476
14.1949102318868	57.3689105942307	11.0262565	80.6460603
14.1949102318868	57.3689105942307	6.9413921	77.9428724
14.1949102318868	57.3689105942307	4.2645198	75.4568775
14.1949099166007	73.1847703918619	37.7594155	72.4638416
14.1949099166007	73.1847703918619	35.1926471	70.9963316
14.1949099166007	73.1847703918619	35.4564008	78.9241199
14.1949099166007	73.1847703918619	32.5068688	76.0167984
14.1949099166007	73.1847703918619	34.482979	80.365325
14.1949099166007	73.1847703918619	32.0336769	81.0046037
14.1949099166007	73.1847703918619	28.3264783	80.6515072
14.1949099166007	73.1847703918619	25.8819635	79.9487476
14.1949099166007	73.1847703918619	31.00496	87.5127119
14.1949099166007	73.1847703918619	28.8394854	85.6978668
14.1949099166007	73.1847703918619	25.1363027	82.596723
14.1949099166007	73.1847703918619	27.0999394	87.1794445
14.1949099166007	73.1847703918619	20.4274735	84.2677658
14.1949099166007	73.1847703918619	20.5127244	86.7993916
14.1949099166007	73.1847703918619	19.6070156	87.5155962
14.1949099166007	73.1847703918619	19.6994488	87.7215703
14.1949099166007	73.1847703918619	23.9936704	92.6751712
14.1949099166007	73.1847703918619	21.4283979	90.119601
14.1949099166007	73.1847703918619	3.2443278	74.1558976
14.1949099166007	73.1847703918619	13.5790401	86.3111074
14.1949099166007	73.1847703918619	2.4095765	76.567725
14.1949099166007	73.1847703918619	2.7334234	77.6753662
14.1949099166007	73.1847703918619	13.1891897	88.2938542
14.1949099166007	73.1847703918619	4.0094679	79.3774545
14.1949099166007	73.1847703918619	2.2118306	78.338365
14.1949099166007	73.1847703918619	5.6520223	82.6769432
14.1949099166007	73.1847703918619	13.4475731	91.4293541
14.1949099166007	73.1847703918619	17.6447354	95.7025091
14.1949099166007	73.1847703918619	7.5281123	85.6801168
14.1949099166007	73.1847703918619	11.9839899	90.8471274
14.1949099166007	73.1847703918619	9.5621792	88.5032381
14.1949099166007	73.1847703918619	9.2263989	90.0124515
14.1949099166007	73.1847703918619	1.9077799	84.1438746
14.1949099166007	73.1847703918619	3.4980922	86.0326352
14.1949099166007	73.1847703918619	4.0389978	87.3302987
14.1949099166007	73.1847703918619	2.2068367	85.97283
14.1949099166007	73.1847703918619	8.4509457	92.4898096
14.1949099166007	73.1847703918619	5.5712407	90.2337915
14.1949099166007	73.1847703918619	2.7731053	90.8551563
14.1949099166007	73.1847703918619	2.9296139	91.7761922
14.1949099166007	73.1847703918619	5.9392628	95.2323551

Solution x	Solution y	Original x	Original y
14.1949099166007	73.1847703918619	6.5131248	96.1438685
14.1949099166007	73.1847703918619	2.2885744	93.0945686
14.1949099166007	73.1847703918619	2.8109458	93.7321232
14.194909987601	74.425952015871	1.389212	56.8496436
14.194909987601	74.425952015871	4.8021518	64.3437535
14.194909987601	74.425952015871	0.7950307	63.4582891
14.194909987601	74.425952015871	0.2763329	64.7359652
14.194909987601	74.425952015871	0.9335658	72.1659561
14.194909987601	74.425952015871	1.295681	73.7881021
14.194909987601	74.425952015871	16.4819632	98.2716229
14.194909987601	74.425952015871	14.3875276	98.8261078
14.1949095777223	75.5411444531065	5.3401207	99.7769332
14.1949095777223	75.5411444531065	1.8947773	99.155621
14.1949095777223	75.5411444531065	0.0137858	97.6201473
14.1949095777223	75.5411444531065	0.6045586	98.8714353
32.6887885705581	75.1767287023679	38.0621359	81.3957333
32.6887885705581	75.1767287023679	37.6570142	81.9317057
32.6887885705581	75.1767287023679	40.3910959	90.932739
32.6887885705581	75.1767287023679	40.8799687	90.9919823
32.6887885705581	75.1767287023679	37.489488	92.2138591
32.6887885705581	75.1767287023679	40.9379615	91.8870672
32.6887885705581	75.1767287023679	34.617789	91.6565199
32.6887885705581	75.1767287023679	33.8269693	93.4852631
32.6887885705581	75.1767287023679	38.2308224	97.9753907
32.6887885705581	75.1767287023679	30.1525293	91.7059859
32.6887885705581	75.1767287023679	44.680977	94.9895485
32.6887885705581	75.1767287023679	26.8042407	95.3391438
32.6887885705581	75.1767287023679	22.9057445	97.6296948
32.6887885705581	75.1767287023679	20.7475398	95.759314
57.3947515536442	74.7830762703387	43.0002757	59.9692573
57.3947515536442	74.7830762703387	45.6990417	60.3070344
57.3947515536442	74.7830762703387	45.5118999	65.9532613
57.3947515536442	74.7830762703387	43.8195847	68.1613988
57.3947515536442	74.7830762703387	44.3710695	67.9205927
57.3947515536442	74.7830762703387	42.9598051	72.0704928
57.3947515536442	74.7830762703387	45.412979	71.2677197
57.3947515536442	74.7830762703387	43.6827488	74.1878852
57.3947515536442	74.7830762703387	46.0567355	72.019762
57.3947515536442	74.7830762703387	50.0180258	68.4527432
57.3947515536442	74.7830762703387	46.8228713	71.844353
57.3947515536442	74.7830762703387	39.6568849	80.0063838
57.3947515536442	74.7830762703387	47.2434466	72.8348775
57.3947515536442	74.7830762703387	46.3729602	74.0499355
57.3947515536442	74.7830762703387	40.9923031	81.1407106
57.3947515536442	74.7830762703387	45.3765455	76.9954785
57.3947515536442	74.7830762703387	43.3709663	79.9295648
57.3947515536442	74.7830762703387	41.3355343	82.7796974
57.3947515536442	74.7830762703387	50.7478618	74.0551131
57.3947515536442	74.7830762703387	45.3945603	79.9114427
57.3947515536442	74.7830762703387	47.9098314	77.7959758
57.3947515536442	74.7830762703387	54.3749565	73.471727
57.3947515536442	74.7830762703387	49.7783583	78.4397036
57.3947515536442	74.7830762703387	51.7496653	79.9144917
57.3947515536442	74.7830762703387	52.878421	80.2956919
57.3947515536442	74.7830762703387	48.3895216	84.8378656
57.3947515536442	74.7830762703387	49.4827685	84.8462228
57.3947515536442	74.7830762703387	45.8972803	89.1189208
57.3947515536442	74.7830762703387	55.0653569	81.234009
57.3947515536442	74.7830762703387	50.0446513	86.3510967
57.3947515536442	74.7830762703387	49.7030604	90.8227548
57.3947515536442	74.7830762703387	59.1397084	81.6064397
57.3947515536442	74.7830762703387	56.1389342	85.561632
57.3947515536442	74.7830762703387	63.6802314	81.8267454
57.3947515536442	74.7830762703387	62.4719528	86.6470186
57.3947515536442	74.7830762703387	67.7945884	81.6777909
57.3947515536442	74.7830762703387	60.774398	89.648206
57.3947515536442	74.7830762703387	63.9530194	87.4245185
57.3947515536442	74.7830762703387	65.7364961	88.9695394
57.3947515536442	74.7830762703387	56.5514993	98.5201232
57.3947515536442	74.7830762703387	61.0866811	94.7582572
57.3947515536442	74.7830762703387	61.1689993	94.8861498
57.3947515536442	74.7830762703387	64.0121883	92.7907393
57.3947515536442	74.7830762703387	62.5782193	94.8345715
57.3947515536442	74.7830762703387	64.3381393	93.722702
57.3947515536442	74.7830762703387	62.3573907	96.159986
57.3947515536442	74.7830762703387	61.0630253	98.699805
57.3947515536442	74.7830762703387	61.0701287	98.8683739
57.3947515536442	74.7830762703387	62.6982725	97.3778678
57.3947515536442	74.7830762703387	64.4754864	95.6952093
57.3947515536442	74.7830762703387	61.4066356	99.633296

Solution x	Solution y	Original x	Original y
57.3947515536442	74.7830762703387	68.0410206	93.0677269
57.3947515536442	74.7830762703387	63.2522018	99.6147456
57.3947515536442	74.7830762703387	66.5761879	96.7049476
57.3947515536442	74.7830762703387	67.3268965	96.007007
57.3947515536442	74.7830762703387	63.7965883	99.8649883
57.3947515536442	74.7830762703387	66.3729212	97.9005203
57.3947515536442	74.7830762703387	64.9776601	99.8572829
57.3947515536442	74.7830762703387	67.0620012	97.8077872
67.8801088126876	74.0680557114508	69.765468	86.0199863
67.8801088126876	74.0680557114508	71.4909917	88.8238404
67.8801088126876	74.0680557114508	71.5874534	94.5399994
67.8801088126876	74.0680557114508	70.4834315	96.1070737
67.8801088126876	74.0680557114508	68.523768	98.3881808
76.7758812885521	73.2991039485673	72.4566884	79.8068651
76.7758812885521	73.2991039485673	75.4040099	79.0607348
76.7758812885521	73.2991039485673	77.2293497	82.6694496
76.7758812885521	73.2991039485673	78.2121151	82.5216358
76.7758812885521	73.2991039485673	75.6464183	86.4517504
76.7758812885521	73.2991039485673	72.4289329	91.88372
76.7758812885521	73.2991039485673	77.1265753	88.6843079
76.7758812885521	73.2991039485673	75.0360354	91.1497098
76.7758812885521	73.2991039485673	77.3466754	92.4222135
76.7758812885521	73.2991039485673	74.8496365	95.8479299
76.7758812885521	73.2991039485673	76.9820609	94.8106777
76.7758812885521	73.2991039485673	75.4923392	99.8090463
76.7758812885521	73.2991039485673	79.9522127	98.0359405

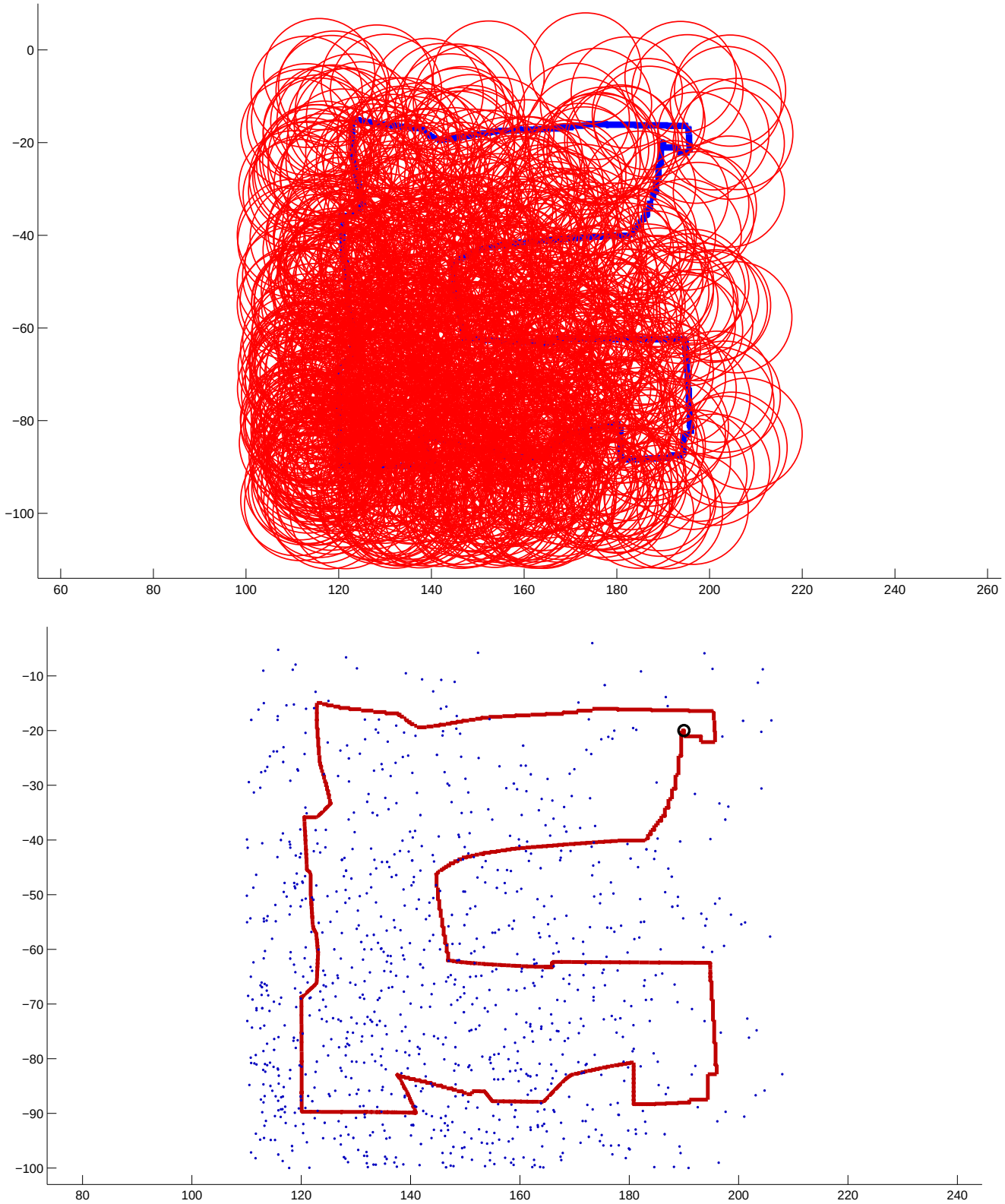


Figure N.111: *bonus*1000, Equal Radius, 2D, Manhattan, Length = 459.6460772

Table N-114: Solution for *bonus*1000, Equal Radius, 2D, Manhattan

Total distance: 459.646077232407 Depot: x 80 y 20			
Solution x	Solution y	Original x	Original y
79.4999803670163	24.6086767227837	82.01891737	31.58538586
79.4999803670163	24.6086767227837	75.00767938	29.50135545
78.9968755692155	28.119518804236	88.13068149	33.9074779
78.4468642884714	30.617357509367	86.50661976	33.33916758
78.4468642884714	30.617357509367	87.56748283	36.27406643
77.821574222091	32.5181073471599	84.85983095	39.85329756
77.1639909027568	34.1245153850936	79.30599483	40.28434635
77.1639909027568	34.1245153850936	75.19376171	39.75388964
76.5137602271967	35.6009453632235	77.14427045	45.25079579
76.5137602271967	35.6009453632235	77.77449926	46.72256252
75.8519162517505	36.4822535728012	74.78372311	42.05088328
75.8519162517505	36.4822535728012	74.55729645	43.48740037
75.2031292821425	37.3195915539898	73.13866372	41.71405139
74.5639531237831	38.1463019831523	70.24663893	43.40548551
74.5639531237831	38.1463019831523	71.61626861	44.97765672
73.9480078392799	38.9325832540182	69.67922342	40.74675918
73.9480078392799	38.9325832540182	63.54041364	40.47906672
73.4023979943465	39.7029089214146	71.99750065	50.82091856
73.4023979943465	39.7029089214146	67.10787364	49.80646667
73.1482701405716	39.9071729766442	76.57028534	49.55513485
72.8919536215223	40.1062137786301	78.92131522	50.41345477
67.8688850324276	40.197778418042	64.66140077	51.58253517
66.5767602561608	40.2769138846058	66.65703205	47.7722791
66.5767602561608	40.2769138846058	64.75792457	49.92103542
65.3458550366485	40.3551917162513	57.56166222	41.97700689
65.3458550366485	40.3551917162513	63.59211348	50.34808715
64.2428319908951	40.4327041199637	63.21772914	46.4808445
63.1590872755434	40.5100715014083	64.47235297	44.07915445
62.081538003742	40.5873887989045	63.12520069	41.24941139
62.081538003742	40.5873887989045	63.41360315	44.69674786
61.0099672415145	40.6646802894479	59.48412304	31.97998889
61.0099672415145	40.6646802894479	58.09138733	33.97784367
59.9869624055128	40.7425723120011	62.83458953	32.37480154
59.9869624055128	40.7425723120011	63.76560063	37.45231942
58.9358848887231	40.8210097276827	61.01859213	37.82208646
57.8864113325862	40.8995631976787	55.9549233	32.80200534
57.8864113325862	40.8995631976787	54.00076983	32.50218762
56.9034404644802	40.9789174721895	57.48443808	43.25173204
56.9034404644802	40.9789174721895	57.35658457	43.71456461
55.9296928940786	41.0581577896584	58.48548965	38.49282405
55.9296928940786	41.0581577896584	59.28037529	42.02965748
54.9462175340881	41.1374461457353	56.1557774	36.1071959
54.9462175340881	41.1374461457353	54.69460289	37.32086801
53.9716691336164	41.2169875469897	58.14893689	37.55022655
53.9716691336164	41.2169875469897	55.55130491	39.21526309
52.9860685193406	41.296715004917	53.48089128	34.57431179
52.00640397256	41.3766765173399	50.32982697	35.43640834
51.0427323304038	41.4568340506133	52.03099226	42.50134863
50.0839012497868	41.5369819280149	51.19858704	31.0981292
49.1164952159565	41.6181432348846	48.88810081	29.6929228
49.1164952159565	41.6181432348846	49.49892788	30.73465222
48.2433992551593	41.7577331293459	51.12261026	42.05252276
48.2433992551593	41.7577331293459	49.90577559	41.072269
47.3666620509677	41.8974182928496	51.33580352	40.30660727
47.3666620509677	41.8974182928496	49.81718199	39.89953162
46.4786061159782	42.0374578372913	48.20619517	39.24794213
45.5919542821807	42.1777747419999	47.52772375	30.54529654
45.5919542821807	42.1777747419999	44.21687698	34.39769027
44.455958171896	42.3554523684267	51.65508094	43.85648581
44.455958171896	42.3554523684267	43.74535734	43.87626012
43.2736357328727	42.5328208471399	53.79810347	45.16180718
43.2736357328727	42.5328208471399	48.35826716	45.69665672
43.2736357328727	42.5328208471399	47.65008175	45.51867646
43.2736357328727	42.5328208471399	50.26037041	48.95030273
43.2736357328727	42.5328208471399	45.94832838	45.50704308
43.2736357328727	42.5328208471399	49.48945411	49.44119699
43.2736357328727	42.5328208471399	47.22851165	47.89903616
43.2736357328727	42.5328208471399	43.11381093	45.00092033
43.2736357328727	42.5328208471399	47.38308024	49.71863955
43.2736357328727	42.5328208471399	45.78512338	48.76667443
43.2736357328727	42.5328208471399	39.58652985	43.55288071
43.2736357328727	42.5328208471399	43.66555329	47.77139353
43.2736357328727	42.5328208471399	35.17250587	39.36136713
43.2736357328727	42.5328208471399	42.25980634	46.86827481
43.2736357328727	42.5328208471399	38.72818734	43.64397508
43.2736357328727	42.5328208471399	34.06373355	42.77086753
43.2736357328727	42.5328208471399	32.06711817	41.12824267
43.2736357328727	42.5328208471399	39.96945525	49.46230999
43.2736357328727	42.5328208471399	34.31056081	43.95356429
43.2736357328727	42.5328208471399	39.67150404	49.44131071
43.2736357328727	42.5328208471399	34.68773061	48.27076221
42.5033223501486	42.6975327697779	41.57443341	43.13832473
41.7392499317998	42.8623267223767	40.57741767	42.47262
40.9818214379138	43.0272957593787	44.94410764	36.28576006
40.9818214379138	43.0272957593787	40.81010844	38.77304558
40.2160237950159	43.1941042815039	40.57036155	31.31828969
40.2160237950159	43.1941042815039	41.09480481	34.92509896
39.3945525485108	43.5378963385444	37.51752459	33.09106605
38.6016318144089	43.9056889603646	39.35568633	35.06788426
38.6016318144089	43.9056889603646	38.78467609	39.06908374
37.8102764335669	44.2880463622865	38.90241804	39.45548462
37.8102764335669	44.2880463622865	39.91233765	41.2977364
37.0158713451614	44.6768874106587	31.80606468	35.45021175
37.0158713451614	44.6768874106587	30.83636789	38.35208021
37.0158713451614	44.6768874106587	41.84687745	52.15158968
37.0158713451614	44.6768874106587	40.92420024	52.54921675
37.0158713451614	44.6768874106587	29.65914735	42.12761495
37.0158713451614	44.6768874106587	40.32660467	53.626561
37.0158713451614	44.6768874106587	30.33187934	43.75504148
37.0158713451614	44.6768874106587	30.28185343	43.77834378
37.0158713451614	44.6768874106587	31.80593192	45.60640645
37.0158713451614	44.6768874106587	35.40868681	49.33377596
37.0158713451614	44.6768874106587	28.08331623	42.02257662
37.0158713451614	44.6768874106587	39.86159624	55.58185516
37.0158713451614	44.6768874106587	37.58124673	53.7047325
37.0158713451614	44.6768874106587	30.62796082	46.77730777
37.0158713451614	44.6768874106587	34.17044541	50.63731129
37.0158713451614	44.6768874106587	30.55507662	47.73107042
37.0158713451614	44.6768874106587	33.45977848	51.47641849
37.0158713451614	44.6768874106587	30.18073163	48.32029982
37.0158713451614	44.6768874106587	36.93641703	55.80482127
37.0158713451614	44.6768874106587	27.37711129	46.43616017
37.0158713451614	44.6768874106587	31.52001616	50.89228775
37.0158713451614	44.6768874106587	28.72359173	49.06807614
37.0158713451614	44.6768874106587	33.45872958	53.85918585
37.0158713451614	44.6768874106587	31.12121771	52.61678334
37.0158713451614	44.6768874106587	32.83493269	54.50530143
37.0158713451614	44.6768874106587	28.94274384	52.01860718
36.5673723378133	44.9331544034415	29.90863496	38.4851443
36.5673723378133	44.9331544034415	30.41452332	39.55317391
36.1402030030721	45.1966363100493	28.54401437	40.13690379
36.1402030030721	45.1966363100493	27.06311365	42.64274924
35.7408210925788	45.4660296699494	26.12441872	44.96485891
35.7408210925788	45.4660296699494	26.567735	46.7768569
35.3698967756451	45.7360217234278	25.73174612	44.02606181
35.0139956848694	46.0080344752277	25.71821347	44.02373583
35.0139956848694	46.0080344752277	24.77779172	44.04083387
34.6880209369699	46.2852504821287	23.73647568	45.21539639
34.6880209369699	46.2852504821287	22.68802089	46.28526246
34.7614198524447	48.7163426203846	22.81585575	48.67591425
35.0006037731285	50.8428758916093	26.97467166	54.66512134
35.0006037731285	50.8428758916093	24.61643689	54.01115924
35.256836125661	52.5966210564861	34.15128455	57.37934974
35.256836125661	52.5966210564861	33.50828257	58.48410354
35.5138096362948	54.223263234676	25.6524776	56.5792119
35.77975503785	55.7789393298073	28.17203359	56.51587977
35.77975503785	55.7789393298073	27.13020332	56.00735022
36.0542200847043	57.3421734123623	36.65639834	59.2724504
36.0542200847043	57.3421734123623	35.39691212	60.01558524
36.328773414305	58.8840931788869	39.00311055	58.98114927
36.328773414305	58.8840931788869	37.67648628	59.01822185
36.6021691825468	60.4474248145556	38.87334077	61.97418169
36.6021691825468	60.4474248145556	38.55825219	62.0328479
36.8746318901993	62.0053500602119	45.59084573	70.21452412
36.8746318901993	62.0053500602119	43.59103477	70.75648589
36.8746318901993	62.0053500602119	44.13660931	71.38940487
36.8746318901993	62.0053500602119	29.89833465	58.88393924
36.8746318901993	62.0053500602119	28.38294287	59.7022254
36.8746318901993	62.0053500602119	28.66025221	61.13181458
36.8746318901993	62.0053500602119	26.36749261	61.24478927
36.8746318901993	62.0053500602119	38.19879917	73.45302115
36.8746318901993	62.0053500602119	25.84588775	61.17671521
36.8746318901993	62.0053500602119	26.46280572	62.61127777
36.8746318901993	62.0053500602119	25.66105506	62.27941228

Solution x	Solution y	Original x	Original y
36.8746318901993	62.0053500602119	27.36103425	64.84526011
36.8746318901993	62.0053500602119	26.36495426	64.10386589
36.8746318901993	62.0053500602119	25.20403775	63.98638021
36.8746318901993	62.0053500602119	26.6523776	66.91672378
36.8746318901993	62.0053500602119	26.03259253	67.05188068
37.179453376073	62.0563693033723	36.99117209	62.09652931
37.179453376073	62.0563693033723	37.36735143	64.72519961
37.4849721425805	62.1073888725005	32.28903103	63.37386507
37.7932041627484	62.1584120630271	32.47933058	60.09950546
37.7932041627484	62.1584120630271	31.78300706	62.74548174
38.1073801167925	62.2095218068812	28.86030824	61.83789689
38.4304999040556	62.2606716703223	29.47881008	65.01108227
38.4304999040556	62.2606716703223	28.77703399	67.75671878
38.7956871678592	62.3114337973253	30.01509861	69.93828769
39.2722368685341	62.3610369790381	32.14669335	66.5741861
39.2722368685341	62.3610369790381	31.96159565	70.60936436
39.8130713028148	62.4101260258992	33.57300136	70.51852673
40.3832677133382	62.4589627517261	34.32584869	66.311045
40.3832677133382	62.4589627517261	33.85806756	68.2147305
40.9864535683211	62.5076686932647	36.88863481	65.11756178
40.9864535683211	62.5076686932647	36.53251416	65.89826385
41.6077188533637	62.5563522869506	38.18944723	65.54612606
41.6077188533637	62.5563522869506	38.05290287	66.43336709
42.2447593280787	62.6050043353368	39.73860453	66.92518954
42.8892352268645	62.6536235101817	39.83687168	68.05987049
43.5431304872826	62.7021841878894	39.12047899	68.75765335
43.5431304872826	62.7021841878894	38.57181853	69.29967661
44.2296934942737	62.7505566157652	39.75179858	71.51477588
44.2296934942737	62.7505566157652	37.43465738	70.14594443
44.9962843339829	62.7985129120052	42.13585343	68.94604524
44.9962843339829	62.7985129120052	41.30767537	70.05965636
45.7951261089667	62.8462924116901	44.42598809	67.45202223
46.603299562083	62.8940406875399	42.95157888	64.84132436
46.603299562083	62.8940406875399	41.95981534	64.94436816
47.4441142664697	62.9417866462693	40.91327599	65.05437313
48.3182775007924	62.9895346140805	41.72708173	62.5487287
49.2280338190698	63.0373228081247	41.72170476	60.36141703
49.2280338190698	63.0373228081247	41.10546356	60.73573959
50.2555424371364	63.0852816695332	43.40294282	59.60424206
51.3438489148988	63.1333471925021	44.98764045	56.96391467
51.3438489148988	63.1333471925021	42.10911161	58.06602885
52.7818962398565	63.1818514269864	46.15723029	56.4070148
52.7818962398565	63.1818514269864	45.47068469	56.96814934
54.6593879490757	63.2308444310362	48.91348948	54.77748717
54.6593879490757	63.2308444310362	59.0134746	66.34233581
54.6593879490757	63.2308444310362	48.65047008	56.26343732
54.6593879490757	63.2308444310362	48.01348394	55.67625048
54.6593879490757	63.2308444310362	54.15102156	63.89433124
54.6593879490757	63.2308444310362	52.64945222	62.68533593
54.6593879490757	63.2308444310362	54.03625818	65.02303827
54.6593879490757	63.2308444310362	58.20433528	69.50520456
54.6593879490757	63.2308444310362	49.52719402	60.88674536
54.6593879490757	63.2308444310362	56.84900895	69.27095699
54.6593879490757	63.2308444310362	50.37372436	63.54183807
54.6593879490757	63.2308444310362	52.45383187	66.17944394
54.6593879490757	63.2308444310362	50.29671492	64.07582579
54.6593879490757	63.2308444310362	52.68458788	66.68600654
54.6593879490757	63.2308444310362	59.09181099	73.44789922
54.6593879490757	63.2308444310362	55.72002047	71.91921816
54.6593879490757	63.2308444310362	50.86986196	67.11854893
54.6593879490757	63.2308444310362	53.60239056	70.80290226
54.6593879490757	63.2308444310362	55.90538334	73.56581582
54.6593879490757	63.2308444310362	57.06276587	74.98770524
54.6593879490757	63.2308444310362	45.68320409	63.6499192
54.6593879490757	63.2308444310362	56.76810138	74.93595817
54.6593879490757	63.2308444310362	49.39322363	67.57061768
54.6593879490757	63.2308444310362	44.96838238	64.05706864
54.6593879490757	63.2308444310362	47.89205446	67.3947139
54.6593879490757	63.2308444310362	53.92763119	74.12654413
54.6593879490757	63.2308444310362	53.90080059	74.55382457
54.6593879490757	63.2308444310362	51.91696279	73.69595809
54.6593879490757	63.2308444310362	51.90516717	74.10528304
54.6593879490757	63.2308444310362	51.17754367	73.39508539
54.6593879490757	63.2308444310362	49.38151416	71.84627519
54.6593879490757	63.2308444310362	52.24575767	74.98560476
54.8001206301388	63.2308389237339	59.10597324	64.72617137
54.9406481690492	63.2308334068746	62.01287875	62.70691628
54.9406481690492	63.2308334068746	61.64088805	64.72462094
55.0795356021851	63.2308278904014	56.20333441	63.09635143
55.0795356021851	63.2308278904014	53.04622082	62.56220406

Solution x	Solution y	Original x	Original y
55.2187801109621	63.2308223750052	57.97334153	65.39941546
55.2187801109621	63.2308223750052	52.59359138	61.87082203
55.3583065722971	63.230816860129	63.48323083	69.36201841
55.3583065722971	63.230816860129	60.59756518	67.42291916
55.4953717973786	63.2308113450528	63.53725064	67.03413314
55.4953717973786	63.2308113450528	63.47892732	68.70647259
55.6298285431171	63.2308058282552	65.55566867	66.58332744
55.7618462933013	63.230800310841	57.09480153	60.45993374
55.7618462933013	63.230800310841	56.12304172	60.76926662
55.8939300776055	63.2307947933786	67.87575086	63.89107621
55.8939300776055	63.2307947933786	65.09617026	64.32634731
55.8939304947592	63.0886671449923	56.73611746	58.87824868
55.8939309119228	62.9471484898026	65.84999623	61.37790202
55.8939309119228	62.9471484898026	65.33791464	63.72798066
55.8939313287761	62.8060167788593	55.16481024	55.42346911
55.8939313287761	62.8060167788593	55.40337389	57.61168804
55.8939317457376	62.6668754081251	53.50308144	57.04941766
55.8939317457376	62.6668754081251	53.70737401	57.8077763
55.893932162897	62.5292414634515	54.43373891	52.12894009
55.893932162897	62.5292414634515	52.57887869	54.16196226
55.8939325803933	62.397194436229	53.22205568	50.84724902
55.8939329991728	62.3015660320271	55.80484172	50.30189669
57.6172750234836	62.3124781463608	58.50503897	53.8647284
57.6172750234836	62.3124781463608	56.36080227	54.43871329
59.4013033723401	62.3234328400618	61.59665848	60.86573745
61.1896014542981	62.3343861699967	61.56325619	58.635877
61.1896014542981	62.3343861699967	59.77266019	58.01872841
63.0419594939633	62.3453434019052	68.52022941	55.69012612
63.0419594939633	62.3453434019052	66.67873973	56.13517049
64.7357892281794	62.3563228081482	65.98277732	56.02257659
64.7357892281794	62.3563228081482	62.81703196	55.94894639
66.4883028768521	62.3673203769666	67.27809665	56.79217526
68.2648829383187	62.3783244271451	70.94365949	58.14560753
68.2648829383187	62.3783244271451	69.70404765	60.5822767
70.0335460799392	62.3893296035303	71.85259834	57.85616299
71.8134344437381	62.4003360518954	72.70378804	66.70645397
73.6175727531928	62.4113234587039	73.05372772	69.26625594
75.4724242219132	62.4222882338042	72.73426073	54.95021428
75.4724242219132	62.4222882338042	72.13050555	55.03070373
77.5764397880932	62.4332791313291	78.85550393	52.04144231
79.6433957303928	62.4443053698171	77.87000631	52.21112855
79.6433957303928	62.4443053698171	79.86750899	54.35421653
81.9605274886935	62.4553870592519	83.19197135	53.48639501
81.9605274886935	62.4553870592519	84.14082278	54.46253046
84.234800490299	62.4665235904009	86.51848331	50.71555717
84.3771056847606	62.4804983149287	83.91646182	55.69492785
84.5196829301873	62.4944763795181	85.71414415	51.67250379
84.5196829301873	62.4944763795181	88.60564442	53.67349247
84.6600484574992	62.5084530902809	90.50689197	55.43830225
84.7991781206406	62.5224363182774	95.77662579	57.68215173
84.8055785361445	63.1013540189697	91.19333201	55.09349477
84.8119745083249	63.7288685503875	87.34079917	59.37931572
84.8183794933871	64.3663929791129	83.55927983	59.64747077
84.8183794933871	64.3663929791129	85.16088414	60.47696067
84.82478699905	65.0249996675271	75.75634139	60.02200009
84.82478699905	65.0249996675271	76.04244622	64.45001766
84.8312097166802	65.7282934737415	74.85083054	64.74645556
84.8312097166802	65.7282934737415	72.84290598	65.67053988
85.0610372380621	69.1368459140599	78.29263567	66.45988674
85.0610372380621	69.1368459140599	78.83068399	69.67274441
85.2967807570388	72.9061306878458	81.47694776	70.94126153
85.2967807570388	72.9061306878458	83.77232341	73.14211564
85.536225872075	77.0038567674941	86.75397464	75.23932777
85.536225872075	77.0038567674941	82.09017124	81.333147
85.7768275338725	81.1026749531808	91.59995025	72.67875795
85.7768275338725	81.1026749531808	91.90328388	76.16243153
85.7768275338725	81.1026749531808	93.29522257	74.82458329
85.7768275338725	81.1026749531808	82.53992082	88.87907996
85.7768275338725	81.1026749531808	87.63411723	89.72076827
85.7768275338725	81.1026749531808	86.10921689	91.46882481
85.7768275338725	81.1026749531808	93.12739448	86.70709298
85.7768275338725	81.1026749531808	94.75890926	85.83537613
85.7768275338725	81.1026749531808	91.04765146	90.60180149
85.9905856452338	82.845375860321	97.99058573	82.84537681
84.362643854151	87.4936673854997	86.37403118	99.02923308
80.9684271014972	88.0513700552916	79.39161289	97.26593015
80.9684271014972	88.0513700552916	80.84419352	99.98848979
78.8040123308366	88.1413808987036	81.4352048	82.89764497
78.8040123308366	88.1413808987036	77.11333094	85.3156461
76.6717624465566	88.2319695593965	75.38279951	84.8495864

Solution x	Solution y	Original x	Original y
76.6717624465566	88.2319695593965	76.68533256	86.49303137
74.6521953782103	88.3230363657136	79.19703593	96.06011661
74.6521953782103	88.3230363657136	76.48394754	93.81500316
74.6521953782103	88.3230363657136	73.04972269	93.68364053
74.6521953782103	88.3230363657136	78.18108034	99.79242924
74.6521953782103	88.3230363657136	74.57969734	99.83821951
74.6521953782103	88.3230363657136	69.92952441	96.42807986
74.6521953782103	88.3230363657136	70.07355989	96.61021246
74.6521953782103	88.3230363657136	69.38304877	98.18671586
74.6521953782103	88.3230363657136	66.92699784	97.50570073
74.1713619319384	88.3230363610974	72.48804708	89.57044348
73.6952889008144	88.3230363470169	72.91384846	91.54886288
73.6952889008144	88.3230363470169	71.17046416	92.96230041
73.2261326775493	88.32303633285	71.22771139	93.77569631
73.2261326775493	88.32303633285	69.82339194	93.15949799
72.7662361917209	88.3230363186552	68.09186985	95.85522589
72.3172404720909	88.3230363046032	66.67195124	95.92017704
72.3172404720909	88.3230363046032	65.26732099	95.86741863
71.9029970612654	88.3230362906094	64.96530116	93.98228963
71.9029970612654	88.3230362906094	64.64609008	95.09261932
71.5155976801634	88.3230362765805	63.88368354	92.98872817
71.1394289995474	88.3230362625536	62.03675317	91.42777069
71.1394289995474	88.3230362625536	62.61309781	94.29391595
70.7958056349743	88.323036248308	61.09603132	95.38804721
70.7958056264084	87.5425171379419	59.01602486	86.99268685
70.7958056264084	87.5425171379419	61.4906739	91.40517217
70.7958056178347	86.7816887853921	63.32241418	89.29380754
70.7958056178347	86.7816887853921	62.35255518	88.46202983
70.7958056093112	86.0119763685277	66.59307852	88.41880362
70.7958056093112	86.0119763685277	68.01446808	90.26524455
70.7958056007199	85.2318523396196	68.11557125	90.29313921
70.7958055922014	84.440023751185	69.09548968	84.07624055
70.7958055922014	84.440023751185	67.89989075	88.12316705
70.7958055836229	83.6459432261599	75.20998283	80.5662569
70.7958055836229	83.6459432261599	72.09010058	81.417498
70.7958055750481	82.8731924460249	74.46580568	79.0435318
70.7958055665059	82.1140677278606	73.75840634	73.11670598
70.7958055579494	81.409103119362	69.80433177	81.60817435
70.7958055493872	80.7060475362315	74.07680751	69.16329968
70.0823065514213	80.8219133420077	68.84275879	76.03221479
70.0823065514213	80.8219133420077	70.83372488	78.21085961
69.3790083247698	80.9384611771994	70.61748839	78.65460339
69.3790083247698	80.9384611771994	68.96890483	80.55619731
68.682546984629	81.0553272140185	70.36283848	70.39401036
68.682546984629	81.0553272140185	69.12634406	69.4594231
67.9511924697404	81.1900409078139	70.77169737	73.88064127
67.9511924697404	81.1900409078139	68.36889636	72.61479797
67.217729033341	81.326991599073	67.69295238	75.24403656
66.4893169548701	81.4645774415327	66.81087893	72.19337817
65.7658261525949	81.6037958253372	67.45457311	72.85375456
65.7658261525949	81.6037958253372	65.34735437	72.80394877
65.0458202305899	81.7459728484637	61.14896118	72.70410502
64.3565150062075	81.8902144318498	64.88497046	82.96772641
64.3565150062075	81.8902144318498	61.67834468	82.51967341
63.6781156239777	82.0342306116902	61.63608438	74.03409399
63.6781156239777	82.0342306116902	60.79681015	75.33369853
63.0214658148903	82.1802745626166	63.68037897	79.29990004
63.0214658148903	82.1802745626166	62.20174968	80.96664236
62.3710180498372	82.3266743764165	62.03157877	81.16617953
61.7254587758123	82.4731855142907	58.81674593	76.2826012
61.7254587758123	82.4731855142907	58.21523833	76.77458472
61.099809897221	82.6211578581218	55.58088554	76.52999392
60.49350922361	82.7700645735688	60.70093329	80.64454551
60.49350922361	82.7700645735688	61.30013954	82.69641043
59.8895600264965	82.9192353708654	52.40986372	76.90026657
59.3172539517188	83.0698245077558	50.78444002	76.12504454
59.3172539517188	83.0698245077558	49.13669956	77.10708156
59.0235510962034	83.2462272422192	49.62844822	78.65994225
59.0235510962034	83.2462272422192	49.55654528	80.81624315
58.7513766959561	83.4259732205942	47.92908542	80.11129273
58.7513766959561	83.4259732205942	48.20934555	82.30314786
58.5166748652154	83.6104081278066	49.77274656	84.13753559
58.5166748652154	83.6104081278066	46.93472918	83.75304242
58.3174867181542	83.7946060158856	50.20394782	81.95454381
58.3174867181542	83.7946060158856	49.21219028	82.18677234
58.1241370923972	83.9799605647697	51.18829335	82.80979047
57.9324719209827	84.1656700809536	51.91564321	83.24154723
57.9324719209827	84.1656700809536	51.49657531	83.11057243
57.7435160789635	84.3520295356148	53.08761619	83.0335557
57.5554626073604	84.5387316875909	53.61605765	80.93460352

Solution x	Solution y	Original x	Original y
57.3682403309052	84.7261655608695	57.82109764	79.24611201
57.3682403309052	84.7261655608695	55.73082902	81.05870461
57.181564030884	84.9154336701397	58.40265516	82.89286098
57.181564030884	84.9154336701397	56.64479831	82.24679775
56.9951857048608	85.105747104507	55.99099974	83.60147673
56.9951857048608	85.105747104507	55.75342338	84.56592915
56.8094777702806	85.2967481082165	55.11001594	85.68607737
56.8094777702806	85.2967481082165	52.83415121	85.50123146
56.6250071546102	85.4881196138633	52.05342714	85.82620662
56.6250071546102	85.4881196138633	51.44475874	86.59474587
56.4423824484481	85.6797536809819	53.87450626	88.16447802
56.2603227875571	85.8712373826507	54.48965648	89.30641789
56.0787642199705	86.0624202022593	56.15571936	89.41500769
56.0787642199705	86.0624202022593	56.30399813	89.72916428
55.8975308810703	86.253062213519	57.53422575	91.73216299
55.8975308810703	86.253062213519	54.43632749	91.92787857
55.7166867986385	86.4422820441661	53.27314218	89.6748569
55.7166867986385	86.4422820441661	53.26472651	92.17526811
55.5370627784646	86.630611333663	51.98537923	93.03310405
55.5370627784646	86.630611333663	49.59427698	92.51123595
55.3599289490953	86.8168574074843	51.95218378	92.57992082
55.1835953090497	87.0023880671747	54.10050901	92.28618361
55.0077049000159	87.1874551125363	54.90972966	93.30800556
55.0077049000159	87.1874551125363	53.29556121	92.47449182
54.8325165445715	87.3714534725764	54.09260921	96.04789718
54.6578064392026	87.5536105868689	58.00620671	94.64720593
54.6578064392026	87.5536105868689	57.84005051	97.24933499
54.481594106429	87.7309057405895	57.43254842	97.94119843
54.481594106429	87.7309057405895	57.58318464	98.55697919
54.3000001265954	87.8919093947006	54.29998953	99.89190946
53.455482530712	87.8814072377814	53.69991452	99.81161169
52.3159495645989	87.8700441598466	52.2623599	99.83573023
51.3530875837295	87.8558603265549	52.60387814	98.51053443
51.3530875837295	87.8558603265549	52.71570498	99.46690315
50.1931427558664	87.8414954844513	50.67630959	98.08417141
50.1931427558664	87.8414954844513	48.82360524	98.37839062
49.0904460068543	87.8270603397317	48.39934621	99.02729511
49.0904460068543	87.8270603397317	47.31578899	98.13704672
48.0810364131661	87.8125244554237	48.86252985	99.44183304
47.0098261059792	87.7978591692605	49.19512952	89.44346883
47.0098261059792	87.7978591692605	45.13861135	90.47060332
45.952151867831	87.7832236275537	45.34071838	99.2752365
44.9590582860646	87.7684571883074	44.53236455	98.59505273
44.9590582860646	87.7684571883074	43.63164404	99.67485887
44.8566415225981	87.6447893114109	43.04035221	95.37042711
44.8566415225981	87.6447893114109	44.56970667	97.22856143
44.7547218732414	87.5192188014396	45.01212749	95.47966426
44.7547218732414	87.5192188014396	44.01236363	95.54242778
44.6531040686887	87.3922937910903	45.33430047	93.58613905
44.6531040686887	87.3922937910903	43.91518159	93.39792889
44.5516951221729	87.2646853427046	47.96746082	95.14523251
44.5516951221729	87.2646853427046	46.20732106	94.82215894
44.450100236371	87.1355243272606	48.69087386	94.64188777
44.3482701456948	87.0054528422339	49.03663551	90.65504513
44.3482701456948	87.0054528422339	46.25821854	91.17761288
44.2462340309608	86.8749140595761	48.45592928	88.4082341
44.1440956744705	86.7443456312544	46.03038143	83.79986665
44.1440956744705	86.7443456312544	46.02083433	88.3362158
44.0419373282801	86.6141054055137	45.13867401	81.86371268
44.0419373282801	86.6141054055137	45.3176187	83.7901857
43.9398281978912	86.4847339543066	44.47086767	80.17305261
43.9398281978912	86.4847339543066	44.66930475	80.79724102
43.8377974003396	86.3566769308424	43.12816365	79.63219046
43.7358908898421	86.2293496511022	45.32225765	79.26748614
43.7358908898421	86.2293496511022	44.56064253	79.77318093
43.633946199861	86.1034698778487	46.11608956	79.13405595
43.5319174745915	85.9783689267923	47.34853229	74.63427391
43.5319174745915	85.9783689267923	47.14165764	77.84331314
42.5877365139118	85.9463434320517	42.58773685	73.94634336
42.5877365139118	85.9463434320517	41.95376322	74.60739468
41.2395177574857	86.4925434387762	41.23951851	98.4925435
40.2644801660018	86.2760421165493	39.47053756	98.01039691
39.4028480787185	85.9595669547692	41.14789047	74.75727523
39.4028480787185	85.9595669547692	40.76978451	74.94346594
38.4723132968414	85.7003388049738	41.14833132	82.10595877
37.5394118415199	85.4424113531369	40.77647626	81.23711291
37.5394118415199	85.4424113531369	40.58416037	81.54961967
36.5915336911758	85.1873556456436	38.78697828	81.20736169
35.6423332682743	84.9335990320528	38.24583972	80.95791524
35.6423332682743	84.9335990320528	38.00030199	82.20200968

Solution x	Solution y	Original x	Original y
34.6831680054164	84.6819300012271	38.20769452	77.89743741
33.710146188282	84.4330033096253	35.96077646	77.38727187
33.710146188282	84.4330033096253	36.17809574	80.13104248
32.7219458979145	84.1879503613114	36.44207057	76.13900165
32.7219458979145	84.1879503613114	35.03662295	76.31902131
31.6932201787676	83.9499834742507	34.30971303	75.90183293
31.6932201787676	83.9499834742507	32.43971284	75.52883521
30.6450711071093	83.7187399973926	29.09610379	74.18683092
30.6450711071093	83.7187399973926	28.44331265	74.98671685
29.6457255959062	83.4965501851693	28.17365085	71.94302821
29.6457255959062	83.4965501851693	25.39416892	74.01493111
28.8142720613434	83.3150484872855	24.37529212	73.10827156
28.8142720613434	83.3150484872855	23.86908483	73.83689183
28.1294285982522	83.1478252361874	22.68191696	72.90808337
28.1294285982522	83.1478252361874	22.95220857	73.2582761
27.6518787868791	83.0057426596909	22.14002238	72.37729838
27.6518787868791	83.0057426596909	21.60880813	73.64895737
27.590802647703	82.9756058439322	20.16006997	73.55306832
27.590802647703	82.9756058439322	19.47269695	75.25893863
27.5908026416539	82.9756058414119	18.49430275	75.1491321
27.5908026416539	82.9756058414119	18.31523717	76.27495825
27.7250525472024	83.2081289847013	18.46683587	77.29301103
27.7250525472024	83.2081289847013	18.15532249	77.80652015
27.8683646690169	83.4584390618734	21.04749508	76.84597788
27.8683646690169	83.4584390618734	18.79013692	77.54174683
28.0171647162261	83.7223048121626	21.16552744	75.92926841
28.1682835209273	83.9950645143266	22.95922483	75.83051285
28.3206988672384	84.2747747178226	25.63863856	75.55318582
28.4736902744964	84.5608632925076	27.46499326	78.56518576
28.4736902744964	84.5608632925076	24.84752889	78.21896812
28.6272838902875	84.8530233210069	24.57644237	79.57543571
28.7815231388353	85.1478286460156	24.67927032	81.21698222
28.7815231388353	85.1478286460156	24.93956922	85.18138774
28.9367414792141	85.4446695202693	28.34961296	82.66841267
28.9367414792141	85.4446695202693	25.47356848	81.94258519
29.0924889750912	85.7444201212066	29.49613778	81.77737157
29.248322290627	86.0459870340911	29.05539546	78.84402949
29.4043580058335	86.3517176454238	29.81370195	76.77877617
29.4043580058335	86.3517176454238	29.7776223	79.3796747
29.5605024816185	86.6717020406159	31.67974116	78.20082263
29.5605024816185	86.6717020406159	31.34183617	77.86791685
29.7161543269759	87.0078398921777	31.54519137	79.16359507
29.871801697188	87.3506223408372	32.56942546	80.98884638
29.871801697188	87.3506223408372	32.77989789	83.25231939
30.0271170991846	87.7010630083669	33.71990859	84.56649705
30.0271170991846	87.7010630083669	32.21271953	85.45061531
30.1822284563767	88.0555979444648	38.21932161	86.88940242
30.1822284563767	88.0555979444648	34.03327785	85.06694553
30.3359426939516	88.4141807331484	38.25086273	84.70191635
30.4885044461574	88.7773658588048	40.55838899	87.88304878
30.4885044461574	88.7773658588048	36.90788531	88.78292268
30.637803306328	89.1438243035059	39.57638463	86.69599702
30.7855957124878	89.5143345352395	42.23200248	88.95299773
30.7855957124878	89.5143345352395	40.16683897	89.097423
30.9215184492507	89.8919471664209	42.53215273	92.92397176
30.9215184492507	89.8919471664209	41.14116704	94.61634345
30.921518454219	89.8919472028062	39.86881125	93.47781189
30.9215184581964	89.8919472391996	39.84944538	96.227912
30.9215184581964	89.8919472391996	39.44288188	96.38027853
30.9215184631252	89.8919472755952	37.87107476	99.67477247
30.6954953718901	89.8849539589654	37.35140359	99.57591236
30.6954953718901	89.8849539589654	36.49499514	99.8776323
30.3828367487491	89.8778842110126	35.92075185	99.04269187
30.3828367487491	89.8778842110126	31.65500689	99.46882276
30.0601262569809	89.8707884079357	35.84999591	97.26233792
29.732723544894	89.8636848834195	37.83606476	96.13365876
29.732723544894	89.8636848834195	37.35558564	97.30806318
29.3782904102119	89.8565628200615	36.31961338	94.1541845
29.0190558505261	89.8494383310175	36.86677729	93.06343809
29.0190558505261	89.8494383310175	35.60188133	93.1465045
28.6489878553971	89.8423119016243	37.64776281	91.60925844
28.6489878553971	89.8423119016243	36.79414467	92.2553405
28.260934659201	89.8351853867405	36.26720319	91.81523904
27.8657246247625	89.82805892724	36.43143728	90.48214242
27.8657246247625	89.82805892724	35.55901251	90.85604615
27.4543993265946	89.8209366056176	31.03913924	88.81924735
27.4543993265946	89.8209366056176	30.78074407	88.67743671
27.0405845194811	89.813823726461	30.96168192	84.99460949
27.0405845194811	89.813823726461	31.92346769	85.96439053
26.621384522072	89.8067246797804	32.87814817	90.10176773

Solution x	Solution y	Original x	Original y
26.621384522072	89.8067246797804	32.33676606	89.56266763
26.1940459925255	89.7996305809559	33.91919319	90.52236574
25.7591207763197	89.7925371379701	34.28587406	93.01320732
25.7591207763197	89.7925371379701	33.84742868	94.52834747
25.2960153621063	89.785434087704	31.89808649	95.62749105
24.8227995994226	89.7783234997475	30.08845088	94.04600611
24.344796473767	89.771209062465	30.46512782	92.10545477
24.344796473767	89.771209062465	30.51609732	92.20951413
23.8541200560835	89.7640944632371	29.03165996	90.53300961
23.8541200560835	89.7640944632371	30.18341718	92.15484297
23.3517689755571	89.7569853217004	28.95022635	86.79829568
22.8439014417135	89.7498825528871	28.94608169	87.05476962
22.8439014417135	89.7498825528871	26.49994117	86.49656314
22.3254968717914	89.7427897047422	24.79158589	85.73273425
21.8063261278837	89.7356996829979	24.68088332	89.71453351
21.8063261278837	89.7356996829979	24.92385591	92.07997464
21.8063261278837	89.7356996829979	25.24294214	93.18181598
21.8063261278837	89.7356996829979	26.20322759	94.45704722
21.8063261278837	89.7356996829979	25.58817455	94.62259734
21.8063261278837	89.7356996829979	23.10855555	93.46528062
21.8063261278837	89.7356996829979	28.69202489	99.34571575
21.8063261278837	89.7356996829979	27.32463884	98.08040747
21.8063261278837	89.7356996829979	22.62104276	94.03699994
21.8063261278837	89.7356996829979	27.03699297	98.99807723
21.8063261278837	89.7356996829979	27.50072899	99.76767751
21.8063261278837	89.7356996829979	25.35918107	97.93925835
21.8063261278837	89.7356996829979	25.64004891	98.33585155
21.8063261278837	89.7356996829979	25.34553204	99.20543489
21.8063261278837	89.7356996829979	21.95406549	97.08230078
21.8063261278837	89.7356996829979	22.06521104	97.80973943
21.8063261278837	89.7356996829979	23.65267964	99.40598609
21.8063261278837	89.7356996829979	23.23282295	99.37897746
21.8063261278837	89.7356996829979	21.53298817	97.76613815
21.8063261278837	89.7356996829979	20.42707279	96.69258649
21.8063261278837	89.7356996829979	22.00240146	99.12603644
21.8063261278837	89.7356996829979	22.19955839	99.83998701
21.8063261278837	89.7356996829979	18.10270516	98.29192556
21.8063261278837	89.7356996829979	17.81960057	98.01765152
21.8063261278837	89.7356996829979	18.56973911	98.93410982
17.3951989397776	89.7281302152194	22.96398221	79.24584246
17.3951989397776	89.7281302152194	23.53960858	80.471438
17.3951989397776	89.7281302152194	21.51917751	80.74471553
17.3951989397776	89.7281302152194	20.11668251	80.56671914
17.3951989397776	89.7281302152194	19.29153506	80.52426775
17.3951989397776	89.7281302152194	18.15807888	79.40011164
17.3951989397776	89.7281302152194	22.46431132	85.87828698
17.3951989397776	89.7281302152194	19.16596982	83.58117432
17.3951989397776	89.7281302152194	14.92906226	79.42060964
17.3951989397776	89.7281302152194	17.20155001	81.69531761
17.3951989397776	89.7281302152194	17.38954679	82.23173111
17.3951989397776	89.7281302152194	23.92476676	88.85275247
17.3951989397776	89.7281302152194	18.16441332	83.32201509
17.3951989397776	89.7281302152194	20.47481611	85.68176763
17.3951989397776	89.7281302152194	20.16675465	86.45561332
17.3951989397776	89.7281302152194	21.4032788	88.65695382
17.3951989397776	89.7281302152194	12.87616068	80.54131267
17.3951989397776	89.7281302152194	18.85500198	86.61471751
17.3951989397776	89.7281302152194	20.75129811	88.7330358
17.3951989397776	89.7281302152194	21.61123904	90.19731465
17.3951989397776	89.7281302152194	21.63379999	90.72848541
17.3951989397776	89.7281302152194	16.23739593	85.87006787
17.3951989397776	89.7281302152194	12.63857375	82.42671014
17.3951989397776	89.7281302152194	20.03955091	90.83830295
17.3951989397776	89.7281302152194	15.06397637	86.4956065
17.3951989397776	89.7281302152194	15.25088212	86.85170355
17.3951989397776	89.7281302152194	10.82142722	82.89323555
17.3951989397776	89.7281302152194	12.45480817	85.29988604
17.3951989397776	89.7281302152194	18.21730526	92.48725442
17.3951989397776	89.7281302152194	16.85080568	91.45389056
17.3951989397776	89.7281302152194	19.55892343	94.48515334
17.3951989397776	89.7281302152194	18.65944439	93.90622028
17.3951989397776	89.7281302152194	11.28159713	86.83718755
17.3951989397776	89.7281302152194	12.03430063	87.78817585
17.3951989397776	89.7281302152194	13.01348985	89.5505908
17.3951989397776	89.7281302152194	17.22630202	94.08640458
17.3951989397776	89.7281302152194	9.921883095	86.8721598
17.3951989397776	89.7281302152194	9.940095688	86.998178
17.3951989397776	89.7281302152194	14.30638295	91.72702037
17.3951989397776	89.7281302152194	9.984816242	87.60870523
17.3951989397776	89.7281302152194	10.77763243	89.00986935

Solution x	Solution y	Original x	Original y
17.3951989397776	89.7281302152194	12.48771043	90.90107319
17.3951989397776	89.7281302152194	17.25875189	95.69940805
17.3951989397776	89.7281302152194	16.10416337	94.62212285
17.3951989397776	89.7281302152194	9.577914639	89.11916471
17.3951989397776	89.7281302152194	14.02380259	94.55773265
17.3951989397776	89.7281302152194	8.842438164	89.89183088
17.3951989397776	89.7281302152194	10.40564453	91.96900158
17.3951989397776	89.7281302152194	7.085383584	88.77850283
17.3951989397776	89.7281302152194	6.579193932	89.24907689
17.3951989397776	89.7281302152194	7.009024866	89.80852716
17.3951989397776	89.7281302152194	10.35439985	93.61856888
17.3951989397776	89.7281302152194	8.980893435	92.30918249
17.3951989397776	89.7281302152194	11.04946885	95.30278919
17.3951989397776	89.7281302152194	7.178182114	91.76838261
17.3951989397776	89.7281302152194	8.327911253	95.97957355
13.541794948513	89.7209689773077	6.625140742	98.72893978
11.7216140438256	89.7137713850904	11.51332542	99.95442641
11.7216140438256	89.7137713850904	7.810086676	100
10.2254118853323	89.7065042121768	0.846436708	97.15575264
10.1823666435077	89.6983015008959	8.376403562	96.83801393
10.139390370698	89.690084060577	5.819691822	97.53170939
10.0965610771592	89.6818456885681	1.662890125	98.21483308
10.0894656497989	86.1830570944241	10.08146406	81.46406963
10.0894656497989	86.1830570944241	9.701793671	81.23141394
10.0894656497989	86.1830570944241	7.992357197	82.08091397
10.0894656497989	86.1830570944241	7.936374341	83.63932008
10.0894656497989	86.1830570944241	5.724809855	81.80721271
10.0894656497989	86.1830570944241	5.779054124	82.01317499
10.0894656497989	86.1830570944241	4.297539438	80.73294711
10.0894656497989	86.1830570944241	4.961462551	81.51420623
10.0894656497989	86.1830570944241	5.912402555	83.10767778
10.0894656497989	86.1830570944241	3.795442881	81.20966501
10.0894656497989	86.1830570944241	3.380314451	80.99890539
10.0894656497989	86.1830570944241	1.696022601	79.3379408
10.0894656497989	86.1830570944241	6.810206318	85.20186256
10.0894656497989	86.1830570944241	5.902742913	84.57417463
10.0894656497989	86.1830570944241	3.437419026	82.39656928
10.0894656497989	86.1830570944241	3.059490558	82.05603574
10.0894656497989	86.1830570944241	0.773453591	79.81662315
10.0894656497989	86.1830570944241	1.837820965	81.06813079
10.0894656497989	86.1830570944241	1.451959255	80.87244268
10.0894656497989	86.1830570944241	0.848777488	80.80421078
10.0894656497989	86.1830570944241	6.663988874	86.9326968
10.0894656497989	86.1830570944241	4.377655918	84.98459142
10.0894656497989	86.1830570944241	6.359309777	87.06467249
10.0894656497989	86.1830570944241	4.724328509	85.88211036
10.0894656497989	86.1830570944241	5.333729823	86.89695613
10.0894656497989	86.1830570944241	3.105512661	84.71082736
10.0894656497989	86.1830570944241	5.793118726	87.72031575
10.0894656497989	86.1830570944241	6.291693293	89.27097954
10.0894656497989	86.1830570944241	3.319354366	86.8534104
10.0894656497989	86.1830570944241	5.838459994	89.46110654
10.0894656497989	86.1830570944241	0.539457489	84.81338557
10.0894656497989	86.1830570944241	6.256438132	90.66257931
10.0894656497989	86.1830570944241	2.643010323	87.48230483
10.0894656497989	86.1830570944241	3.115821998	88.00026043
10.0894656497989	86.1830570944241	5.209294544	90.50333801
10.0894656497989	86.1830570944241	2.887848626	89.80188387
10.0894656497989	86.1830570944241	3.553988961	91.38716753
10.0894656497989	86.1830570944241	3.298576907	92.26869515
10.0894656497989	86.1830570944241	5.231683223	94.88567828
10.0894656497989	86.1830570944241	4.440109707	94.87692744
10.0894656497989	86.1830570944241	3.212591442	94.51392157
10.0894656497989	86.1830570944241	1.725004249	93.73701725
10.0894656497989	86.1830570944241	2.510162792	94.82470236
10.0826178710223	80.4955907157435	6.041792217	70.01715429
10.0826178710223	80.4955907157435	10.28504553	75.43578797
10.0757709786941	78.7242789564049	16.93400358	77.9224885
10.0689109969978	76.9867058437987	14.09860615	77.68853822
10.0620406405641	75.2585206387058	11.56644578	72.10851879
10.0620406405641	75.2585206387058	9.088863996	70.57778186
10.0551601549781	73.6600949121018	15.50686687	76.44859369
10.0482657350448	72.0392420778583	14.67447984	73.22055772
10.0413579566685	70.4188344285704	9.964092428	69.02740379
10.0344452634645	68.8260748438008	4.692804385	58.08052349
10.0344452634645	68.8260748438008	8.933612257	64.19415642
10.0344452634645	68.8260748438008	3.390983182	60.32064994
10.0344452634645	68.8260748438008	3.164572856	61.67055704
10.0344452634645	68.8260748438008	1.282619347	62.39268391
10.0344452634645	68.8260748438008	3.705228073	66.5975084

Solution x	Solution y	Original x	Original y
10.0344452634645	68.8260748438008	3.336609071	66.34370608
10.0344452634645	68.8260748438008	2.766374061	66.09545945
10.0344452634645	68.8260748438008	3.702577787	67.55965669
10.0344452634645	68.8260748438008	2.559418382	66.60707534
10.0344452634645	68.8260748438008	2.82031094	66.9400554
10.0344452634645	68.8260748438008	0.793870075	65.00803843
10.0344452634645	68.8260748438008	3.972668798	68.43095677
10.0344452634645	68.8260748438008	5.020361565	69.58798476
10.0344452634645	68.8260748438008	2.781332517	68.35625636
10.0344452634645	68.8260748438008	6.979895184	73.91637244
10.0344452634645	68.8260748438008	4.203561784	71.28689241
10.0344452634645	68.8260748438008	9.360499311	76.63383999
10.0344452634645	68.8260748438008	8.675234817	76.17385221
10.0344452634645	68.8260748438008	2.885089549	70.78781924
10.0344452634645	68.8260748438008	2.881941531	70.78732912
10.0344452634645	68.8260748438008	1.096851862	69.20060768
10.0344452634645	68.8260748438008	8.595205897	76.73972439
10.0344452634645	68.8260748438008	0.299902086	68.51958527
10.0344452634645	68.8260748438008	1.825477279	70.78130479
10.0344452634645	68.8260748438008	9.018582074	78.03824041
10.0344452634645	68.8260748438008	1.834626902	71.15202574
10.0344452634645	68.8260748438008	5.863440787	76.06172049
10.0344452634645	68.8260748438008	3.252339284	73.9521337
10.0344452634645	68.8260748438008	5.065657714	76.41830653
10.0344452634645	68.8260748438008	2.544714587	74.45838234
10.0344452634645	68.8260748438008	0.155166122	73.1143838
10.0344452634645	68.8260748438008	1.009741561	74.32200243
10.0344452634645	68.8260748438008	5.042739397	78.40053531
10.0344452634645	68.8260748438008	3.765987951	77.28123402
10.0344452634645	68.8260748438008	3.100034102	78.61964126
10.1882860955915	68.6798885059408	11.54525803	68.93314303
10.341977941453	68.5337952904519	13.50520564	67.72241024
10.341977941453	68.5337952904519	11.73654707	68.82383733
10.4951406413696	68.3879611482365	11.17807544	66.07771318
10.6482953264103	68.2424335793557	6.334374787	68.85467086
10.8019661778811	68.0969492073006	8.880939202	67.16779099
10.9559007447799	67.9516581635719	8.011277516	61.69215045
11.1103176507545	67.8071925156642	12.00297966	63.9466553
11.1103176507545	67.8071925156642	8.689838933	62.80875147
11.2650885902214	67.6637776300716	11.71156616	63.23151575
11.4199411926536	67.5208582360022	14.06057656	63.93249207
11.4199411926536	67.5208582360022	14.35540419	64.70998039
11.5743682889271	67.3786974989202	14.11476256	66.58488992
11.7286939881902	67.2367102592454	15.77830732	66.19409337
11.7286939881902	67.2367102592454	14.52745655	66.82146945
11.8825363835423	67.0950239511016	16.29427026	68.63097998
11.8825363835423	67.0950239511016	14.01917911	69.22007201
12.0359422567393	66.9532252782204	14.51945543	70.49107423
12.0359422567393	66.9532252782204	13.34199807	71.15108407
12.1892392051463	66.8109405145129	13.78543979	72.75062985
12.3425712518814	66.6681365269045	16.80968797	72.84815948
12.3425712518814	66.6681365269045	15.83973733	72.60736968
12.4951519994026	66.5240376133975	19.17901123	72.48982593
12.4951519994026	66.5240376133975	17.24413003	73.14298035
12.6461081354185	66.3781160048648	23.39691794	71.43920824
12.753649932878	66.1990266175924	24.34494447	68.89894191
12.753649932878	66.1990266175924	24.00842436	69.26671548
12.8226005164083	65.963588131567	24.66562586	67.58605744
12.8550310428322	65.3147382555869	21.2618816	68.31108552
12.8873867699718	64.6580399717933	21.52581462	69.05739134
12.8873867699718	64.6580399717933	20.75020952	68.82081849
12.9195955965092	63.9695811589661	21.61039636	65.83676525
12.9195955965092	63.9695811589661	19.92687299	66.4828608
12.9517104100854	63.2723635602009	18.97844246	66.0992932
12.9517104100854	63.2723635602009	16.73656026	65.26611785
12.983819380461	62.5690602031114	19.29354577	63.34226321
12.983819380461	62.5690602031114	16.63383213	64.77854357
13.0159305714986	61.8645378511452	16.07158763	60.00636388
13.0159305714986	61.8645378511452	17.25601024	61.69443137
13.0480780547165	61.1692416004222	21.56136042	60.00845368
13.0480780547165	61.1692416004222	21.30645349	61.8915326
13.0801192992409	60.4807026657657	25.08011935	60.4806985
13.0801192992409	60.4807026657657	22.58317288	64.23875961
13.0313135592432	59.9110324844893	24.68488711	59.85199485
13.0313135592432	59.9110324844893	22.84438078	60.01413405
12.9803584416325	59.3472989277119	24.05460087	58.82740751
12.9803584416325	59.3472989277119	24.58618772	59.92581691
12.9269652109617	58.7763198228322	23.29263587	57.34435722
12.9269652109617	58.7763198228322	22.06521443	57.50548607
12.8729347215476	58.2191098439311	20.16713628	56.2637712

Solution x	Solution y	Original x	Original y
12.8729347215476	58.2191098439311	20.97945435	58.66863495
12.8186349186885	57.667193207115	20.53092136	55.63617906
12.7642065688001	57.120686894186	22.00300591	49.77440842
12.7642065688001	57.120686894186	19.18169919	47.05766373
12.6949970704923	56.9956525503785	17.45311026	57.02027397
12.6257317074655	56.8707195042232	16.54761864	53.09785344
12.5564223115245	56.7461390462973	15.36448886	54.97389236
12.5564223115245	56.7461390462973	13.21771043	55.16074821
12.4871049416958	56.6219099433196	13.89109091	56.92730438
12.4871049416958	56.6219099433196	11.86612062	56.83051802
12.4178367724549	56.4977793116172	13.17908278	60.05355856
12.3485875876074	56.3734872363111	10.83705181	59.65376627
12.3485875876074	56.3734872363111	10.63863267	61.64507704
12.2794604271892	56.2486938160949	10.36857839	64.9958121
12.2794604271892	56.2486938160949	9.897889543	67.94003152
12.214564486999	55.8906184981384	7.880864255	53.63419396
12.214564486999	55.8906184981384	8.077114598	60.52651503
12.1499379517816	55.5318733732661	8.078510661	52.12465727
12.0854467935326	55.1757143019194	0.102323447	55.05645207
12.066452424093	54.8651039067564	0.715064701	54.34039001
12.0476120365344	54.5570181640152	9.891024822	52.16610985
12.0287787772839	54.2502543893102	10.84189087	50.74783931
12.0287787772839	54.2502543893102	10.16802995	51.02082052
12.0099460284156	53.9468655223084	11.99216143	50.52822644
12.0099460284156	53.9468655223084	12.24975114	50.92735248
11.9910915340742	53.6466031679226	8.915897502	48.83105962
11.9722411118778	53.3487798867288	8.736047039	47.86465463
11.9722411118778	53.3487798867288	8.811692105	48.50504439
11.9534043141471	53.0561559016264	6.962926975	47.87740863
11.9534043141471	53.0561559016264	6.810990128	49.52757429
11.9346096407427	52.7682015865511	7.342191074	50.36568708
11.9346096407427	52.7682015865511	5.283007933	51.8957834
11.9158713271546	52.4822401174698	5.351054934	54.87903352
11.9158713271546	52.4822401174698	3.684518627	54.75346427
11.8972159775416	52.1946944953748	3.857750749	53.93522034
11.8785911901231	51.9065662311241	3.166581108	54.38581172
11.8785911901231	51.9065662311241	3.200690229	54.90401263
11.8600276202488	51.6153505968747	18.10483235	51.48322234
11.8600276202488	51.6153505968747	12.77181014	48.33401693
11.8414699058908	51.3260270543326	16.47526591	49.4455512
11.8414699058908	51.3260270543326	14.81228179	50.29125842
11.8228958888539	51.0384638127148	18.13426387	49.15791018
11.8042911610002	50.752081270293	20.72246404	50.29048837
11.8042911610002	50.752081270293	18.80954314	50.67936902
11.785606914031	50.4668491537227	20.37447933	52.92580791
11.7668618443066	50.1804591596402	23.68432498	51.4412716
11.7327731641063	46.2654732362506	23.40792676	43.64379836
11.6750860616017	45.960266925035	22.79879511	41.59634367
11.523516301491	45.8364909333127	14.44281578	41.35822358
11.523516301491	45.8364909333127	13.48749824	42.29987548
11.3715216704892	45.7134093513641	12.97854061	40.66549102
11.2194436196073	45.5907390589917	12.31993183	42.07287161
11.2194436196073	45.5907390589917	9.954481978	42.50823893
11.0674202390005	45.4685723899116	1.250751092	48.74029716
11.0674202390005	45.4685723899116	0.073554416	50.20291794
11.021380467586	44.4505144996386	1.775610616	46.38397362
10.9755859694661	43.4145483226885	0.094225631	39.91558536
10.9755859694661	43.4145483226885	0.224660494	41.43611847
10.9309943866796	42.5912928912444	9.196765131	46.15569372
10.9309943866796	42.5912928912444	9.265122262	48.10149258
10.8864246291648	41.7434980537358	9.755265232	43.18329059
10.8864246291648	41.7434980537358	9.020444459	42.86210706
10.8418596274166	40.8933594987569	8.013859219	41.41457221
10.7973103189	40.0441731169776	9.832177112	38.08691559
10.7973103189	40.0441731169776	6.668915236	38.80565327
10.7527888505551	39.209036598824	7.871697725	40.35198819
10.7527888505551	39.209036598824	7.974625907	40.8370263
10.7083237099847	38.3708999245328	6.302525489	40.0085763
10.7083237099847	38.3708999245328	5.668356774	43.14782971
10.6640253514538	37.5127192961255	2.885836634	40.60849192
10.6198684658272	36.6391316664333	1.354188569	31.31594018
10.5760144681891	35.845865976909	0.438114408	29.42535326
10.5760147222325	35.8458659767361	10.20301226	47.6234059
10.5760147222325	35.8458659767361	10.30388261	47.84277995
12.802775682513	35.7732516803008	17.80089583	46.64512233
13.0390197676931	35.6049855567143	10.71615729	46.62293177
13.2796978638976	35.4266732093233	18.21138052	45.58660191
13.2796978638976	35.4266732093233	18.21468575	45.65080463
13.503100602426	35.2224399612571	17.93093151	43.30092715
13.503100602426	35.2224399612571	17.44262234	43.68368222

Solution x	Solution y	Original x	Original y
13.723156841235	35.0121091724836	14.50630809	38.16565664
13.723156841235	35.0121091724836	17.47416259	43.6041515
13.9418210252039	34.7979540867218	19.40209516	41.66020767
14.1587344429514	34.5814465689191	19.77510428	38.58926296
14.3744680517606	34.3640668653139	19.64225061	34.99214308
14.3744680517606	34.3640668653139	18.69463352	36.26547074
14.5886722903997	34.1465330816702	22.07359754	33.01769228
14.5886722903997	34.1465330816702	23.06731773	35.0375678
14.798579787889	33.9293372658424	10.78091353	34.08373955
14.798579787889	33.9293372658424	11.00474377	35.14184161
15.0105175229992	33.7121270694554	23.91492832	35.50451908
15.2193748398658	33.4941939149273	18.74305811	29.30240259
15.2193748398658	33.4941939149273	12.65054039	38.20990532
15.4285342365989	33.2762371234892	27.42853428	33.27622768
15.4285342365989	33.2762371234892	25.99458773	34.37910238
15.2559754748793	32.5100219601786	25.40396983	32.32053998
15.0796699839542	31.7478823943997	23.31975826	27.34182644
15.0796699839542	31.7478823943997	22.33900559	31.60235215
14.8996872656908	31.0136312651194	14.14878683	27.98719075
14.8996872656908	31.0136312651194	9.442374955	27.32019574
14.7213085602678	30.2988171791376	18.71921477	25.10440199
14.7213085602678	30.2988171791376	16.76117492	28.31246812
14.5421086975339	29.6042061158986	18.39694528	22.72524013
14.5421086975339	29.6042061158986	17.16840861	23.65521269
14.3616244118575	28.9469401166886	14.86812736	22.17705421
14.1811399825933	28.306281812983	10.79914705	20.42039499
14.1811399825933	28.306281812983	10.62327399	24.29073933
14.0021404533421	27.698078791007	6.772905892	23.04434695
13.8250332218475	27.1035138148375	6.719406227	25.73868862
13.6493308868666	26.5125443876299	9.320660383	27.08555662
13.6493308868666	26.5125443876299	8.026602483	29.17059173
13.4749259147438	25.9176024237653	2.694391803	27.62826968
13.4749259147438	25.9176024237653	2.518275748	30.45426362
13.3493025353244	24.5218542145433	3.430192849	27.39779729
13.2257543593263	23.0374088682436	4.281409798	24.72152663
13.2257543593263	23.0374088682436	3.815111582	26.65111472
13.1049064646893	21.4058250231805	5.584406208	23.81184943
13.1049064646893	21.4058250231805	4.953508892	23.81507206
12.9855045487671	19.6857435956343	5.677247541	18.04924585
12.9855045487671	19.6857435956343	5.722550995	17.38650207
12.8672781320486	18.0482341921002	0.867278095	18.04823486
12.8672781320486	18.0482341921002	2.197761157	16.16441336
12.8672781228421	16.7827023801648	3.177857831	14.97802426
12.8672781137332	15.5546146781993	3.082410661	9.043855976
12.8672781046133	14.9298358364315	5.801300438	5.23076571
13.8368502893327	15.1579647451045	7.319977879	15.37807435
14.8436882772643	15.3862051238625	10.89890727	16.02503912
14.8436882772643	15.3862051238625	8.679954371	15.22687294
15.9067329761661	15.614503794353	8.988027099	7.925934732
17.1121568305641	15.8485042833158	12.63680518	12.91935497
17.1121568305641	15.8485042833158	8.465864182	8.874062551
18.924377188887	16.0936690130655	14.9958336	14.5728326
18.924377188887	16.0936690130655	12.36712067	15.90584574
20.9546712742845	16.3393511436753	18.20950886	6.619599382
23.1811773295877	16.592519676544	20.19850768	8.627828216
25.5623377585909	16.8496053304033	28.82263126	20.36706254
25.5623377585909	16.8496053304033	27.39065822	19.10906735
27.860748199251	17.1050648087338	38.07401644	11.09458783
27.860748199251	17.1050648087338	34.15723352	12.84614068
27.860748199251	17.1050648087338	24.09498187	20.3828805
27.860748199251	17.1050648087338	23.64941173	19.80991504
27.860748199251	17.1050648087338	32.11403346	10.63014558
27.860748199251	17.1050648087338	24.23492671	17.98856994
27.860748199251	17.1050648087338	21.70527032	21.60018691
27.860748199251	17.1050648087338	21.65865806	17.99154884
27.860748199251	17.1050648087338	29.15811552	9.518746656
27.860748199251	17.1050648087338	20.73212412	24.23741148
28.3256150894371	17.4523088189097	35.53984032	15.99196501
28.3256150894371	17.4523088189097	30.90434674	20.96780911
28.7798542365216	17.7993585429641	29.56587444	24.57869021
29.2345308123651	18.1422416777522	28.59013959	24.83311171
29.2345308123651	18.1422416777522	27.26619514	25.90196542
29.6944832329442	18.4759031405338	25.83818458	22.03803134
29.6944832329442	18.4759031405338	24.70443529	26.12365999
30.1698807057936	18.8016027399192	26.37919279	28.3108891
30.1698807057936	18.8016027399192	24.87958822	27.09583401
30.6734751595144	19.1067284576963	30.34406593	27.74432368
31.1794705774835	19.4063313417666	31.17947294	31.40633137
32.9310069254654	19.2540731296675	37.07046765	30.04479215
34.1738351526962	19.0886096994916	36.2315122	27.60710766

Solution x	Solution y	Original x	Original y
35.4008079252396	18.9215503354528	40.05041388	28.81118981
35.4008079252396	18.9215503354528	36.77121212	29.70512597
36.4630551047021	18.742518967172	42.45831495	25.01806118
37.4821894183579	18.5621457979782	39.25918273	24.78783876
37.4821894183579	18.5621457979782	34.82834577	24.45085722
38.5174383043431	18.3800368872289	35.94447387	20.12395641
38.5174383043431	18.3800368872289	35.85991513	20.90404301
39.5884135227202	18.1977838564782	39.07927218	20.57348801
39.5884135227202	18.1977838564782	38.38951699	19.65672727
40.6797901046814	18.0154784471778	35.62470684	10.73896033
41.8351043233167	17.8352118291645	36.57027062	15.62107689
43.0373721235678	17.6554533416459	44.45005227	17.91363181
43.0373721235678	17.6554533416459	38.46066343	17.33665094
44.2800032092436	17.4760609473169	42.34346606	5.769949569
46.8012509542854	17.3474606485702	50.59311922	22.75724468
49.2505146862255	17.2184855959987	50.20668952	26.40233109
49.2505146862255	17.2184855959987	46.26887105	26.53209753
51.9551018710352	17.0867608621517	51.08696185	26.42044109
54.7983667077247	16.9536469078346	55.07321291	28.85442279
54.7983667077247	16.9536469078346	51.99282443	27.99909333
57.9786815262571	16.6750527066937	59.97712424	27.07719444
57.9786815262571	16.6750527066937	59.11600598	27.89604561
60.6561454039071	16.3504271864907	63.04507341	24.29862677
60.6561454039071	16.3504271864907	62.17589976	23.53474989
63.2492031161509	16.0156951113388	63.24920239	4.015695007
67.9564136934031	16.1446904516594	77.03036191	15.51069798
67.9564136934031	16.1446904516594	71.29498477	19.86081824
67.9564136934031	16.1446904516594	67.26622281	20.02005982
67.9564136934031	16.1446904516594	66.92261807	21.4897109
67.9564136934031	16.1446904516594	66.17419814	21.15751135
67.9564136934031	16.1446904516594	64.88897514	21.58345165
67.9564136934031	16.1446904516594	72.1570689	9.179080442
67.9564136934031	16.1446904516594	62.61153544	17.95816147
67.9564136934031	16.1446904516594	65.51501196	11.68636529
67.9564136934031	16.1446904516594	60.71671796	14.8721563
74.1084571715732	16.2737727150854	76.68650337	13.86956158
74.1084571715732	16.2737727150854	70.71952594	19.54937922
80.9790001610505	16.4028445394259	85.22979418	8.715884504
80.9790001610505	16.4028445394259	83.75499038	5.857780347
85.349751227092	16.5366114458919	94.43184685	8.796264511
85.4646339308593	18.1302050331886	93.53556787	11.2495411
85.5801237625885	20.0562340950297	94.15587216	20.2227246
85.5801237625885	20.0562340950297	95.99475962	18.1472698
85.6927853944335	22.1045385347659	94.17807015	30.5898166
83.1052753038166	21.0414213303649	87.03899122	21.09553754
83.1052753038166	21.0414213303649	90.81819821	18.2159484

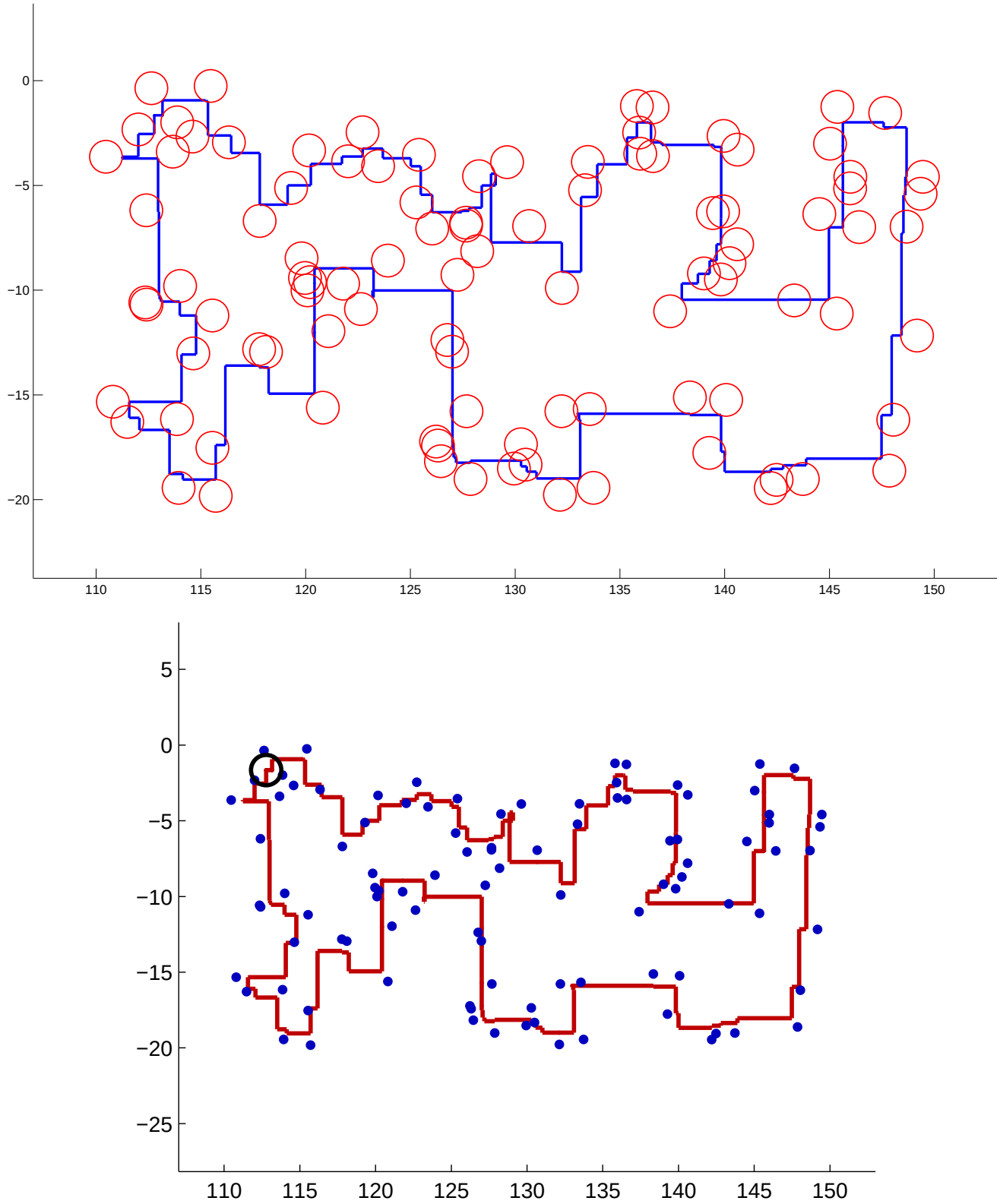


Figure N.112: $kroD100$, $r = 0.7798$, Equal Radius, 2D, Manhattan, Length = 191.4224578

Table N-115: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 2D, Manhattan

Total distance: 191.422457825805			
Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
3.16822125733421	1.64999970559597	3.87	1.99
3.16821597616745	0.933656179276822	2.64	0.36
5.22304054250399	0.975243585505444	5.47	0.25
5.34092479530418	2.61559552528045	4.6	2.67
6.44725054031724	3.44957320365391	6.34	2.94
7.81000001924515	5.92019623602692	7.81	6.7
9.1424693624774	4.99636661952637	9.31	5.12
10.248118963666	3.97163378152651	10.17	3.33
11.7306212994864	3.62158258223407	12.03	3.85
12.7200000042142	3.2398039226364	12.72	2.46
13.6834205112271	3.70329348358302	13.46	4.08
15.0184302118593	4.08290845618951	15.41	3.54
15.4960144516508	5.44350751826914	15.29	5.81
16.0400001379522	6.28019575371419	16.04	7.06
17.4516598637097	6.20943197170738	17.66	6.92
17.8061078998915	6.06369696432298	17.66	6.78
18.4031019689413	5.00003236995758	18.28	4.56
19.068594982159	4.44140497089795	19.62	3.89
18.8469104500635	7.7198051706937	18.19	8.14
20.6700002181838	7.71980459328189	20.67	6.94
22.2300000070265	9.12019512886423	22.23	9.9
23.1481907643022	5.55183019110671	23.34	5.23
23.9160381593881	3.98957848389683	23.47	3.88
25.342418323417	2.71529743537256	25.92	2.48
25.8099998500043	1.98980504514658	25.81	1.21
26.372257193902	2.02427810193697	26.56	1.28
26.4865528622512	2.94594037880806	25.97	3.49
26.9929638762035	3.06535507367021	26.58	3.6
29.4816595956975	3.16184875032618	29.95	2.64
29.840194365039	3.28999882519109	30.62	3.29
29.834445885199	5.74184000224092	29.93	6.24
29.8286880167865	6.5835167958043	29.44	6.32
29.8229447757801	7.80737541555949	30.6	7.81
29.6144931804924	8.59069974849912	30.23	8.71
29.283851315036	9.22067138904018	29.82	9.49
28.7228403144376	9.67924495613958	29.01	9.2
27.9514158607715	10.4586042999527	27.4	11.01
33.0155842898083	10.4514372048287	33.32	10.49
34.9652331025937	10.4442622272902	35.35	11.12
34.9776614429501	6.99838617962014	34.52	6.37
35.6401947674296	6.9884875474968	36.42	6.99
35.640195481433	5.11930716684051	36	4.59
35.6401961912854	4.62217003278203	35.99	5.14
35.6401968986764	3.10586472197648	35.03	3.01
35.6401976079146	1.98511570349236	35.38	1.25
37.5878811335443	2.22796990644888	37.66	1.54
38.6801930178256	4.58999997117788	39.46	4.59
38.623031340709	5.4664950655249	39.35	5.4
38.5306455237904	7.27927168014052	38.68	6.97
38.4367618699346	12.1642238659305	39.18	12.17
37.9682382513142	15.9654848924032	38.05	16.19
37.4828803620674	18.0437414470544	37.86	18.62
33.8873806261035	18.3605269664086	33.73	19.02
32.7899387390701	18.5315094846757	32.48	19.06
32.2000002364174	18.6701933267098	32.2	19.45
29.9963294646026	17.710045893231	29.27	17.77
29.8259373566215	15.9597842997386	30.07	15.24
28.339999941735	15.8998058532931	28.34	15.12
22.9805466563651	15.8998085359358	22.21	15.78
23.0475426325614	16.1771036454426	23.56	15.68
23.1029968607512	18.9901957411705	23.74	19.44
22.1399997703594	18.9901948002664	22.14	19.77
21.0179230538409	18.6668506495231	20.5	18.33
20.5532375034068	18.4118843497061	19.94	18.52
20.2799996141152	18.1398052074053	20.28	17.36
17.8700003231184	18.2401949266158	17.87	19.02
17.1787560243491	17.9876918594452	16.46	18.17
17.063302909555	17.5139451738498	16.32	17.42
17.0098045185905	17.23000277836	16.23	17.23
17.0098036441744	15.708959104109	17.68	15.78
17.0098027660012	13.3035156066143	16.99	12.94
17.0098018873279	12.0845251253505	16.77	12.38
17.0098010086256	10.0118890984548	17.25	9.27
13.1914077347937	10.3485980112251	12.64	10.9
13.2437316587164	8.9603110524567	13.93	8.59
11.8049994795299	8.96031119117136	11.79	9.69
10.5575633195323	8.96031132956443	9.97	9.42
10.4243247973724	8.96031146887109	9.81	8.48
10.4243251815835	9.66851946290859	10.09	10.01
10.4243255661986	10.1965355736308	10.21	9.62
10.4243259513346	12.0241979901767	11.09	11.96
10.4243263344836	14.9380348393563	10.82	15.61
8.23570746388032	13.6890859014359	8.11	12.95
7.77999966205795	13.5998040540537	7.78	12.82
6.16597009267383	17.3933201624327	5.55	17.53
5.71000012831057	19.0401955657942	5.71	19.82
4.13701454814762	18.7714653273496	3.94	19.44
3.50441228299323	16.670510729867	3.86	16.16
2.06790517591041	16.0960310916952	1.49	16.29
1.57980402562742	15.3300004148829	0.8	15.33
4.07841631695412	13.0690409411822	4.64	13.02
4.77019613117616	11.2100002993156	5.55	11.21
3.99310562183005	10.5445043526089	4.01	9.8
3.09613278276936	10.4369463862312	2.35	10.59
3.03703021623895	10.2725109528416	2.41	10.69
2.99783852212448	6.25779594660835	2.40	6.19
2.96045681063028	3.71062381051118	3.66	3.39
1.2498035131494	3.62999920361342	0.47	3.63
2.01496403416006	2.54405911977446	2.02	2.33

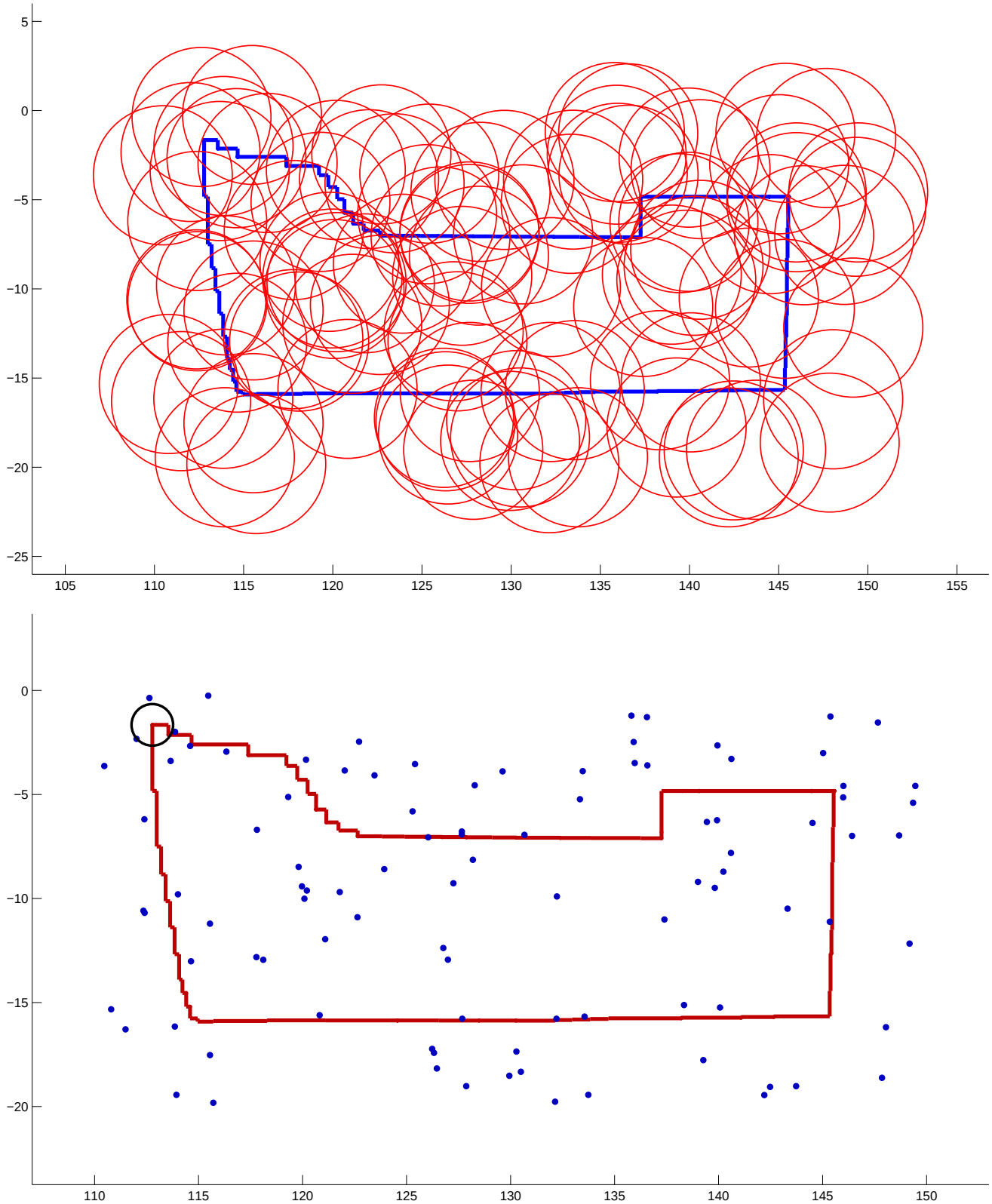


Figure N.113: $kroD100$, $r = 3.899$, Equal Radius, 2D, Manhattan, Length = 98.7090453

Table N-116: Solution for $kroD100$, $r = 3.899$, Equal Radius, 2D, Manhattan

Total distance: 98.7090453059581			
Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
3.55102418334879	2.13395208064649	5.47	0.25
3.55102418334879	2.13395208064649	0.47	3.63
4.66444634998628	2.59423195331289	2.64	0.36
4.66444634998628	2.59423195331289	3.87	1.99
4.66444634998628	2.59423195331289	2.02	2.33
4.66444634998628	2.59423195331289	3.66	3.39
4.66444634998628	2.59423195331289	4.6	2.67
7.38908298813796	3.10919153787779	6.34	2.94
7.38908298813796	3.10919153787779	10.17	3.33
9.22213749029022	3.6233806361012	12.72	2.46
9.74609679780286	4.28948874466833	12.03	3.85
10.242189209087	4.96978237709867	13.46	4.08
10.6492389446084	5.72074100719153	9.31	5.12
10.6492389446084	5.72074100719153	7.81	6.7
10.6492389446084	5.72074100719153	9.81	8.48
11.1388692846823	6.33944257885124	9.97	9.42
11.1388692846823	6.33944257885124	10.21	9.62
11.7274441109055	6.73326616872011	10.09	10.01
12.6507403151348	7.01040683512667	11.79	9.69
12.6507403151348	7.01040683512667	12.64	10.9
13.8124997945674	7.0198017275976	15.29	5.81
14.9014584170771	7.02920029777083	15.41	3.54
15.8944540157228	7.03865998972499	18.19	8.14
15.8944540157228	7.03865998972499	17.25	9.27
16.7050881669258	7.04805040535916	13.93	8.59
16.7050881669258	7.04805040535916	16.04	7.06
17.8753687979239	7.05740139823569	17.66	6.78
17.8753687979239	7.05740139823569	17.66	6.92
19.118190101858	7.06674399263652	20.67	6.94
20.2813908683222	7.076081707491	18.28	4.56
20.2813908683222	7.076081707491	19.62	3.89
22.3853471397784	7.08547244923867	23.47	3.88
22.3853471397784	7.08547244923867	23.34	5.23
23.8502409796229	7.09490479395297	22.23	9.9
26.2563863203079	7.10429715531878	29.01	9.2
27.2570717350787	7.11362006349941	27.4	11.01
27.2570726803443	6.8149554021845	29.82	9.49
27.2570736258086	4.8305231152904	25.81	1.21
27.6704337841848	4.83052276059072	26.56	1.28
28.2516463347689	4.83052230147915	25.92	2.48
28.2516463347689	4.83052230147915	26.58	3.6
29.0639810440074	4.83052189113458	25.97	3.49
29.0639810440074	4.83052189113458	29.95	2.64
29.0639810440074	4.83052189113458	30.62	3.29
29.0639810440074	4.83052189113458	29.44	6.32
29.0639810440074	4.83052189113458	29.93	6.24
30.279864002711	4.8305213972553	30.23	8.71
31.9250544105659	4.83052106864239	30.6	7.81
34.4729758644845	4.83052108710367	35.38	1.25
34.4729758644845	4.83052108710367	35.03	3.01
34.4729758644845	4.83052108710367	36	4.59
34.4729758644845	4.83052108710367	34.52	6.37
34.4729758644845	4.83052108710367	35.99	5.14
35.5684247979718	4.8305204525672	37.66	1.54
35.5684247730375	4.83052051654202	39.46	4.59
35.5684247730375	4.83052051654202	39.35	5.4
35.5329526321626	6.56914879192738	36.42	6.99
35.4975186790027	8.2647382933724	38.68	6.97
35.4615106265769	11.5105828897132	39.18	12.17
35.4221154546619	12.6443597497539	33.32	10.49
35.4221154546619	12.6443597497539	35.35	11.12
35.3831582194734	14.4443532162759	38.05	16.19
35.3438622652769	15.6662687902919	37.86	18.62
32.6534055612306	15.6992280368222	32.2	19.45
32.6534055612306	15.6992280368222	33.73	19.02
31.0863552637187	15.7293541674016	29.27	17.77
31.0863552637187	15.7293541674016	32.48	19.06
28.2002481154043	15.7587381335156	28.34	15.12
28.2002481154043	15.7587381335156	30.07	15.24
24.7073721480371	15.7881888596693	23.74	19.44
23.8234901085805	15.815774452761	23.56	15.68
22.9626158843839	15.8433782991079	22.21	15.78
22.13999986818	15.870999424567	22.14	19.77
20.261650257652	15.8686120769961	20.28	17.36
20.261650257652	15.8686120769961	20.5	18.33
18.4827341390826	15.8662185869503	17.87	19.02
18.4827341390826	15.8662185869503	19.94	18.52
16.5572720396877	15.8638101099067	16.77	12.38
14.5673014493406	15.8614098112592	10.82	15.61
14.5673014493406	15.8614098112592	16.99	12.94
14.5673014493406	15.8614098112592	16.23	17.23
14.5673014493406	15.8614098112592	17.68	15.78
14.5673014493406	15.8614098112592	16.32	17.42
14.5673014493406	15.8614098112592	16.46	18.17
11.0900000504246	15.8590007218493	11.09	11.96
8.29720665570804	15.8897849832399	8.11	12.95
5.7100014653189	15.920999522896	5.71	19.82
4.95800326793802	15.7662329494915	3.94	19.44
4.59071431391079	15.1966656057166	0.8	15.33
4.59071431391079	15.1966656057166	5.55	17.53
4.40769477824935	14.5450379830814	4.64	13.02
4.40769477824935	14.5450379830814	3.86	16.16
4.22546885895922	13.9012045135356	1.49	16.29
4.06643122195318	12.6793430424507	7.78	12.82
3.85091704770117	11.3871880856039	5.55	11.21
3.63248524901823	10.1272059118311	2.41	10.69
3.417043896976	8.84161810705518	4.01	9.8
3.20105823912738	7.49995469567519	2.35	10.59
2.989951211993	4.8264147096431	2.4	6.19

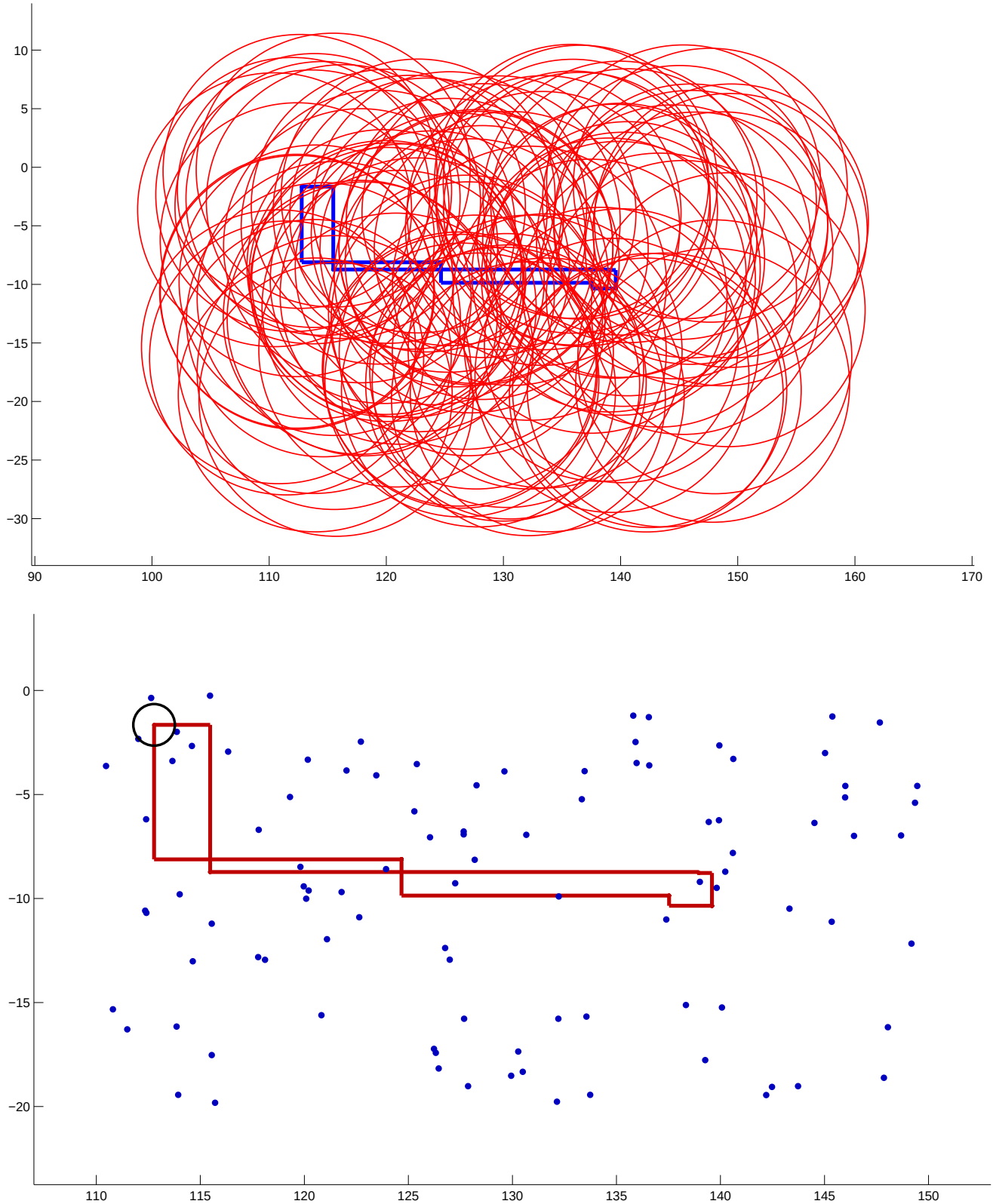


Figure N.114: $kroD100$, $r = 11.697$, Equal Radius, 2D, Manhattan, Length = 71.0158795577453

Table N-117: Solution for $kroD100$, $r = 11.697$, Equal Radius, 2D, Manhattan

Total distance: 71.0158795577453			
Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
5.47152306109201	8.72793385634012	5.71	19.82
5.47152306109201	8.72793385634012	3.94	19.44
5.47152306109201	8.72793385634012	5.55	17.53
5.47152306109201	8.72793385634012	1.49	16.29
5.47152306109201	8.72793385634012	0.8	15.33
5.47152306109201	8.72793385634012	3.86	16.16
5.47152306109201	8.72793385634012	4.64	13.02
5.47152306109201	8.72793385634012	5.55	11.21
5.47152306109201	8.72793385634012	2.41	10.69
5.47152306109201	8.72793385634012	4.01	9.8
5.47152306109201	8.72793385634012	2.35	10.59
5.47152306109201	8.72793385634012	2.4	6.19
5.47152306109201	8.72793385634012	0.47	3.63
5.47152306109201	8.72793385634012	5.47	0.25
5.47152306109201	8.72793385634012	4.6	2.67
5.47152306109201	8.72793385634012	3.66	3.39
5.47152306109201	8.72793385634012	2.02	2.33
5.47152306109201	8.72793385634012	3.87	1.99
5.47152306109201	8.72793385634012	2.64	0.36
28.9641375965317	8.77479169054519	39.35	5.4
28.9641375965317	8.77479169054519	39.46	4.59
28.9641375965317	8.77479169054519	36	4.59
28.9641375965317	8.77479169054519	37.66	1.54
28.9641375965317	8.77479169054519	35.03	3.01
28.9641375965317	8.77479169054519	35.38	1.25
28.9641375965317	8.77479169054519	25.81	1.21
29.5889201448206	10.349019634052	37.86	18.62
29.5889201448206	10.349019634052	38.05	16.19
29.5889201448206	10.349019634052	33.73	19.02
29.5889201448206	10.349019634052	32.2	19.45
29.5889201448206	10.349019634052	32.48	19.06
29.5889201448206	10.349019634052	39.18	12.17
29.5889201448206	10.349019634052	29.27	17.77
29.5889201448206	10.349019634052	35.35	11.12
29.5889201448206	10.349019634052	30.07	15.24
29.5889201448206	10.349019634052	33.32	10.49
29.5889201448206	10.349019634052	28.34	15.12
29.5889201448206	10.349019634052	36.42	6.99
29.5889201448206	10.349019634052	35.99	5.14
29.5889201448206	10.349019634052	34.52	6.37
29.5889201448206	10.349019634052	29.82	9.49
29.5889201448206	10.349019634052	30.23	8.71
29.5889201448206	10.349019634052	27.4	11.01
29.5889201448206	10.349019634052	30.6	7.81
29.5889201448206	10.349019634052	29.01	9.2
29.5889201448206	10.349019634052	29.93	6.24
29.5889201448206	10.349019634052	29.44	6.32
29.5889201448206	10.349019634052	30.62	3.29
29.5889201448206	10.349019634052	29.95	2.64
29.5889201448206	10.349019634052	22.23	9.9
29.5889201448206	10.349019634052	26.58	3.6
29.5889201448206	10.349019634052	25.97	3.49
29.5889201448206	10.349019634052	26.56	1.28
29.5889201448206	10.349019634052	23.34	5.23
29.5889201448206	10.349019634052	25.92	2.48
29.5889201448206	10.349019634052	23.47	3.88
27.5288599018189	9.86149716388081	38.68	6.97
27.5288599018189	9.86149716388081	23.74	19.44
27.5288599018189	9.86149716388081	22.14	19.77
27.5288599018189	9.86149716388081	23.56	15.68
27.5288599018189	9.86149716388081	20.5	18.33
27.5288599018189	9.86149716388081	19.94	18.52
27.5288599018189	9.86149716388081	22.21	15.78
27.5288599018189	9.86149716388081	20.28	17.36
14.6697144607301	8.1173981129215	17.87	19.02
14.6697144607301	8.1173981129215	16.46	18.17
14.6697144607301	8.1173981129215	16.32	17.42
14.6697144607301	8.1173981129215	17.68	15.78
14.6697144607301	8.1173981129215	16.23	17.23
14.6697144607301	8.1173981129215	16.99	12.94
14.6697144607301	8.1173981129215	16.77	12.38
14.6697144607301	8.1173981129215	20.67	6.94
14.6697144607301	8.1173981129215	17.25	9.27
14.6697144607301	8.1173981129215	10.82	15.61
14.6697144607301	8.1173981129215	18.19	8.14
14.6697144607301	8.1173981129215	17.66	6.92
14.6697144607301	8.1173981129215	17.66	6.78
14.6697144607301	8.1173981129215	12.64	10.9
14.6697144607301	8.1173981129215	19.62	3.89
14.6697144607301	8.1173981129215	16.04	7.06
14.6697144607301	8.1173981129215	11.09	11.96
14.6697144607301	8.1173981129215	18.28	4.56
14.6697144607301	8.1173981129215	13.93	8.59
14.6697144607301	8.1173981129215	11.79	9.69
14.6697144607301	8.1173981129215	15.29	5.81
14.6697144607301	8.1173981129215	8.11	12.95
14.6697144607301	8.1173981129215	7.78	12.82
14.6697144607301	8.1173981129215	10.09	10.01
14.6697144607301	8.1173981129215	10.21	9.62
14.6697144607301	8.1173981129215	9.97	9.42
14.6697144607301	8.1173981129215	15.41	3.54
14.6697144607301	8.1173981129215	9.81	8.48
14.6697144607301	8.1173981129215	13.46	4.08
14.6697144607301	8.1173981129215	12.03	3.85
14.6697144607301	8.1173981129215	12.72	2.46
14.6697144607301	8.1173981129215	7.81	6.7
14.6697144607301	8.1173981129215	9.31	5.12
14.6697144607301	8.1173981129215	10.17	3.33
14.6697144607301	8.1173981129215	6.34	2.94

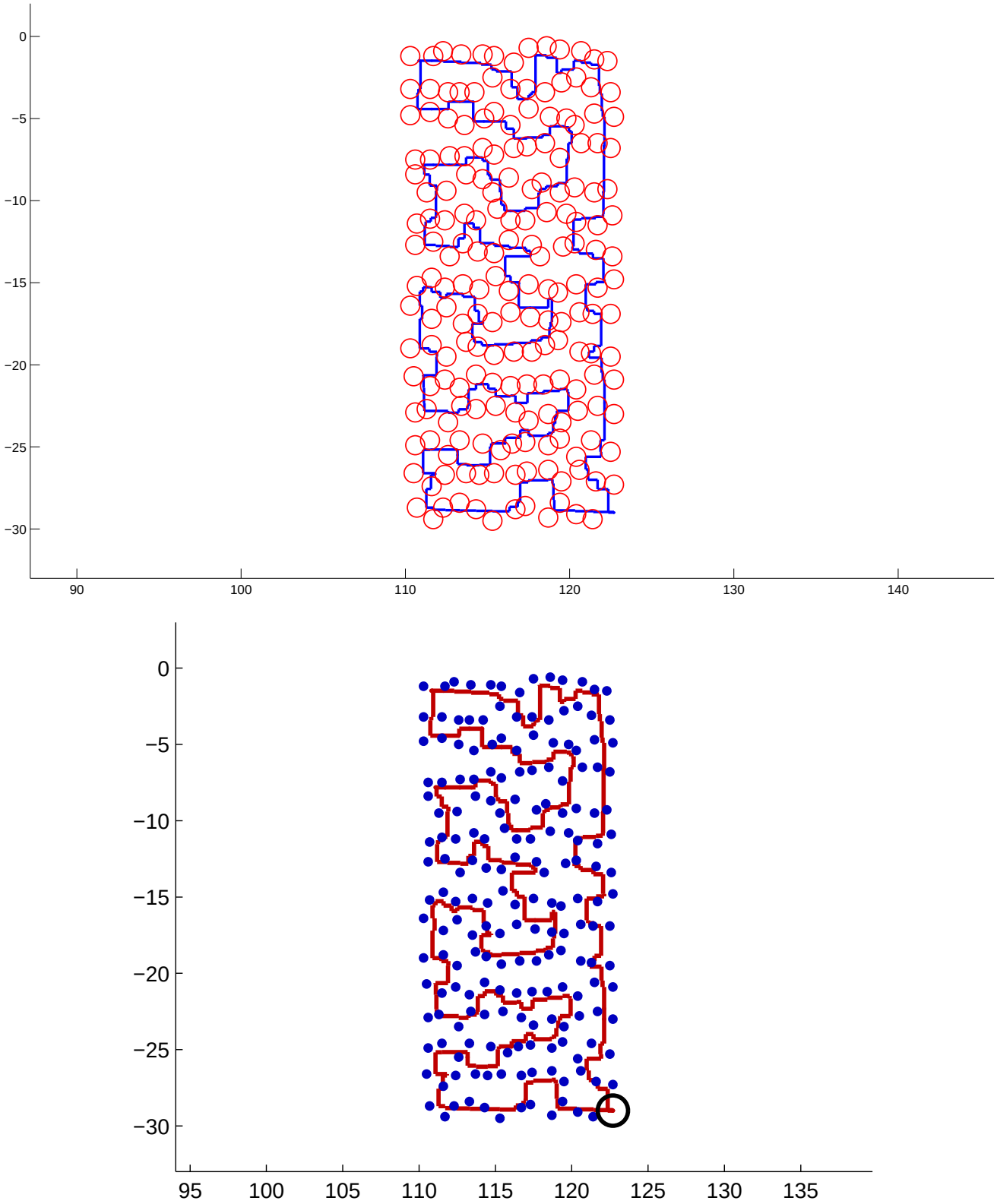


Figure N.115: $rat195$, $r = 0.578$, Equal Radius, 2D, Manhattan, Length = 189.1771060

Table N-118: Solution for $rat195$, $r = 0.578$, Equal Radius, 2D, Manhattan

Total distance: 189.177106028661			
Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
12.3523331500053	27.5742751103694	12.7	27.3
11.7052364026063	27.0009241528395	11.6	27.1
11.123807787335	26.3696557823412	10.6	26.4
10.9780020723517	25.5999994699356	10.4	25.6
11.9219978595827	25.300000232943	12.5	25.3
11.8780020440609	24.5999972335085	11.3	24.6
12.1219980637351	22.9999997232618	12.7	23
12.121998114702	22.3201712949946	11.7	22.5
12.1219981660108	20.899999573124	12.7	20.9
12.0149161107138	20.4790816547704	11.5	20.6
11.9471356946461	19.5675497008635	12.5	19.5
11.1780017339072	19.1999997870936	10.6	19.2
11.4879540063356	18.8529969165448	11.3	19.3
11.9219983183652	16.9000001297647	12.5	16.9
11.4852141056119	16.717900240907	11.4	16.9
11.0737162220221	16.5249183747185	10.6	16.8
10.9780015550351	15.0999988347463	10.4	15.1
11.5969267148448	14.9593968359458	11.7	15.3
12.1219983948464	14.8000011736217	12.7	14.8
12.0550248119877	13.5134014157396	12.6	13.4
11.4171746798683	13.2277354591373	11.6	13
10.579720485709	12.9759343717221	10.3	12.6
10.178001452727	12.8000010450745	9.6	12.8
10.2383526402429	11.1534112288573	9.8	10.8
10.7194975456139	11.0705152428094	10.4	11.3
11.5886355892053	10.9828946263737	11.7	11.5
12.0337627760912	10.8252403115339	12.6	10.9
12.0563280103657	9.47051888635333	12.3	9.3
12.0563280103657	9.47051888635333	11.5	9.5
12.0892112995139	6.67901107982874	12.5	6.8
12.0892112995139	6.67901107982874	11.7	6.5
12.1219986400512	4.8999993573475	12.7	4.9
12.0196524865563	4.55292094824939	11.5	4.7
11.9597840602591	3.48136297676727	12.5	3.4
11.8415683394501	3.01838910243895	11.3	3.1
11.7856630592778	1.72726180403407	12.3	1.5
11.3018821336618	1.59945170769664	11.5	1.4
10.6999998302061	1.47800126622588	10.7	0.9
10.2555754032113	2.02146537038698	10.4	2.5
9.50000003795959	2.2219987583743	9.5	2.8
9.2196963360125	1.30209211659088	9.4	0.8
8.5941113803519	1.15262509692705	8.6	0.6
7.90872004006526	1.10869707138996	7.5	0.7
7.92199877402655	3.40000137263622	8.5	3.4
7.68219804205594	3.57358370109698	7.4	3.2
7.50000052608536	3.82199879184044	7.5	4.4
6.81723804353177	3.09887156733106	6.4	3.2
6.47279813870949	2.13083278948789	6.6	1.6
5.52444536354714	2.01589025529823	5.3	2.5
5.24080280705623	1.71570914218747	5.4	1.2
4.61041604439423	1.61283449639026	4.7	1.1
3.4155939720382	1.54164312065269	3.4	1.1
2.30000007436955	1.47800105041855	2.3	0.9
1.60800340130324	1.47800098688125	1.7	1.2
0.806755113180174	1.47800092394623	0.3	1.2
0.921998881836174	3.20000065466637	1.5	3.2
0.800004924022929	3.4228895463619	0.3	3.2
0.737267060978397	4.42200155081514	0.3	4.8
1.59689618283963	4.42200053108918	1.5	4.6
2.60043872740607	4.42199951099336	2.6	5
2.6268323687511	3.97684547403678	2.6	3.4
3.30144211804927	3.97542637737379	3.3	3.4
4.13366389350284	3.9741818957631	4.2	3.4
4.13366511247615	5.17799423892778	3.6	5.4
4.77531365920396	5.17799731866	4.8	5
5.39999991058576	5.17800039990372	5.4	4.6
6.12062622248335	5.62424212050237	6.4	5.4
6.59999992961332	6.22199877282487	6.6	6.8
7.41122684901164	6.15507576850098	7.4	6.7
8.36002248861992	5.99698207433041	8.5	6.5
8.79999980934943	5.47800125244942	8.8	4.9
9.68446977160713	5.54099183391264	9.8	5
9.95991962022178	5.77870066781914	10.3	5.4
10.1219986795275	6.50000000496565	10.7	6.5
9.9215395450249	7.4427990679732	9.4	7.4
9.81999231702062	8.93244106563056	10.3	9.2
9.26916114207332	9.12660695444634	9.4	9.5
8.57004304182735	9.2870775707388	8.3	8.9
8.2032714696996	9.51382614429439	7.7	9.3
8.10729193179937	10.4500439534549	8.6	10.7
7.30000000776019	10.6219987030021	7.3	11.2
6.39999979541143	10.6219987183109	6.4	11.2
6.03154154246296	10.2578237546339	5.6	10.5
5.84133724885659	9.49733781648339	5.3	9.5
5.76006812012847	8.7236117461999	6.3	8.6
5.17451334311428	8.45663572067657	4.7	8.7
5.027495838937	7.57812888524912	5.4	7.2
4.7000003234043	7.37800119949529	4.7	6.8
3.69999883401745	7.82199880497821	3.7	8.4
3.43693801987033	7.82199854931445	3.6	7.3
2.66938305646553	7.82199829441865	2.7	7.3
1.70486195368527	7.82199804012746	1.5	7.5
1.08000289636746	7.82199778620197	0.6	7.5
1.14992810502045	8.4128180091538	0.6	8.4
1.48303547763413	9.08485803517488	1.3	9.5
1.92199877889016	9.40000000392288	2.5	9.4
1.8634992783622	11.0502500212269	2.4	11.2
1.54821504807575	11.2829694558465	1.5	11.1
1.24020739103658	11.5340217314768	0.7	11.4
1.17800128956857	12.7000045823377	0.6	12.7
1.84873325806308	12.7599901839586	1.7	12.5
2.70000007519961	12.8219986677687	2.7	13.4
3.23011881017824	12.3035933141971	3.5	12.6
3.59999992590772	11.3780012750684	3.6	10.8
4.15378356873697	11.661184743895	4.3	11.2
4.54266628446828	12.5895884353071	4.4	13.1
5.41229289607897	12.7519730479261	5.4	13.2
6.3216293338844	12.8786659685352	6.3	12.4
7.34018682055452	13.0604297085814	7.7	12.7
7.62199857107133	13.3999997718547	8.2	13.4
6.07800142127975	14.6000000590346	5.5	14.6
6.40431726872582	14.9778820099561	6.3	15.5
6.92199847864613	15.0999993731585	7.5	15.1
6.90675527130855	16.5219984039881	6.4	16.8
7.59999997371422	16.5219984903011	7.6	17.1
8.6999999976598	15.9780015314442	8.7	15.4
8.89841463962198	16.0044545730434	9.3	15.6
8.92199837825287	17.4000007210818	9.5	17.4
8.84605966510621	17.7126264675232	8.7	17.3
8.77315304941533	18.3276652885154	9.3	18.5
8.29296506986354	18.5097253928715	8.5	18.8
7.64470654688063	18.6696732610136	7.7	19.2
6.57721576643611	18.7512180703032	6.6	19.2
5.39999994677832	18.8219983896197	5.4	19.4
4.66377182757296	18.6202422477958	4.4	18.9
4.19222646708062	18.3794547985992	3.7	18.6
4.07800150773133	17.4999988865662	3.5	17.5
4.72199847561814	17.400000922193	5.3	17.4
4.47109279803763	16.7191617600655	4.4	16.9
4.22787183463831	15.8535662401569	4.5	15.4
3.50000000935587	15.6780014285588	3.5	15.1
2.50000159183632	15.9219985410681	2.5	16.5
2.12473762745708	15.5633785906936	2.4	15.3
1.60000015798401	15.2780013799394	1.6	14.7
1.08201023893855	15.5388703126389	0.7	15.2
0.878001432581456	16.4000002024899	0.3	16.4
1.02199851938119	17.2000051316002	1.6	17.2
0.878001542146222	19.0000002797381	0.3	19
1.46500936706892	19.2069556374609	1.6	18.8
1.92199841904332	19.4999998970905	2.5	19.5
1.89279373163396	20.6408087290651	2.4	20.9
1.07800162623045	20.6999946424927	0.5	20.7
1.10632810032723	21.405611127357	1.5	21.3
1.13372357468975	22.3408851469155	1.3	22.7
1.16077680474658	22.8064424728557	0.6	22.9
2.60000014444947	22.9219982186301	2.6	23.5
3.24091197520406	22.7124628231104	3.4	22.5
3.77366004500489	22.5198447233136	4.3	22.7
3.84622469234903	21.4974998133034	3.3	21.4
4.29999998753551	21.1780016652863	4.3	20.6
5.05307062928311	21.4612926718311	5.3	21.1
5.50000107545084	21.9219982125988	5.5	22.5
6.39999773138956	21.8780017326181	6.4	21.3
6.69999979880335	22.3219981897302	6.7	22.9

Solution x	Solution y	Original x	Original y
7.43217322278979	21.7293883839412	7.4	21.2
8.40476501584234	21.5935748106336	8.4	21.2
9.39999961846566	21.4780017888626	9.4	20.9
9.86621742512361	21.6534262072039	10.4	21.5
9.9219980924878	22.8000007496415	10.5	22.8
9.2331836588655	23.0949891674032	8.7	23
9.12186392221847	23.5866588371894	9.5	23.5
8.99572411859086	24.1498592230626	9.4	24.5
8.69999413011415	24.3219980171178	8.7	24.9
7.49999977057368	23.9780018801489	7.5	23.4
6.99613371912628	24.4448057992037	7.3	24.7
6.07196262767843	24.7900465292195	6.5	24.8
6.07196262767843	24.7900465292195	5.8	25.2
5.22899425542556	24.9772322053187	4.7	24.8
5.15769163406749	26.0864160125436	5.4	26.6
4.50000008294158	26.1219979998116	4.5	26.7
3.72556191052999	26.0487423916927	3.7	26.6
3.17800174685418	25.4999988921178	2.6	25.5
3.17800109712714	25.1649800445708	3.3	24.6
1.51451499896262	25.1727887898215	1.5	24.6
1.09090956331063	25.1934347807095	0.6	24.9
1.07800197916953	26.600004692085	0.5	26.6
1.82199801188027	26.6999985036801	2.4	26.7
1.55983601784074	27.559951934172	1.6	27.4
1.2780021065129	28.7000019834661	0.7	28.7
1.71396684527905	28.8309067058441	1.7	29.4
2.43869663112974	28.8529506248756	2.3	28.7
3.32349663188096	28.8751213194995	3.3	28.4
4.30678514730293	28.8985184610905	4.3	28.8
5.29999996889191	28.9219978008374	5.3	29.5
6.33931763286478	28.6551670800421	6.7	28.8
6.83576493888086	28.3510535239352	7.3	28.6
6.99056594170133	27.1619923914613	6.7	26.7
7.47910890415989	27.038293551161	7.4	26.5
8.70000075356749	26.9780020826436	8.7	26.4
8.95663800579095	27.2230776510134	9.5	27.1
9.01501137195544	28.2305534874375	9.4	28.4
9.06944070790415	28.8692644973848	8.7	29.3
10.3335870528394	28.9142701171857	10.4	29.1
11.4321923837291	28.9586272219466	11.4	29.4

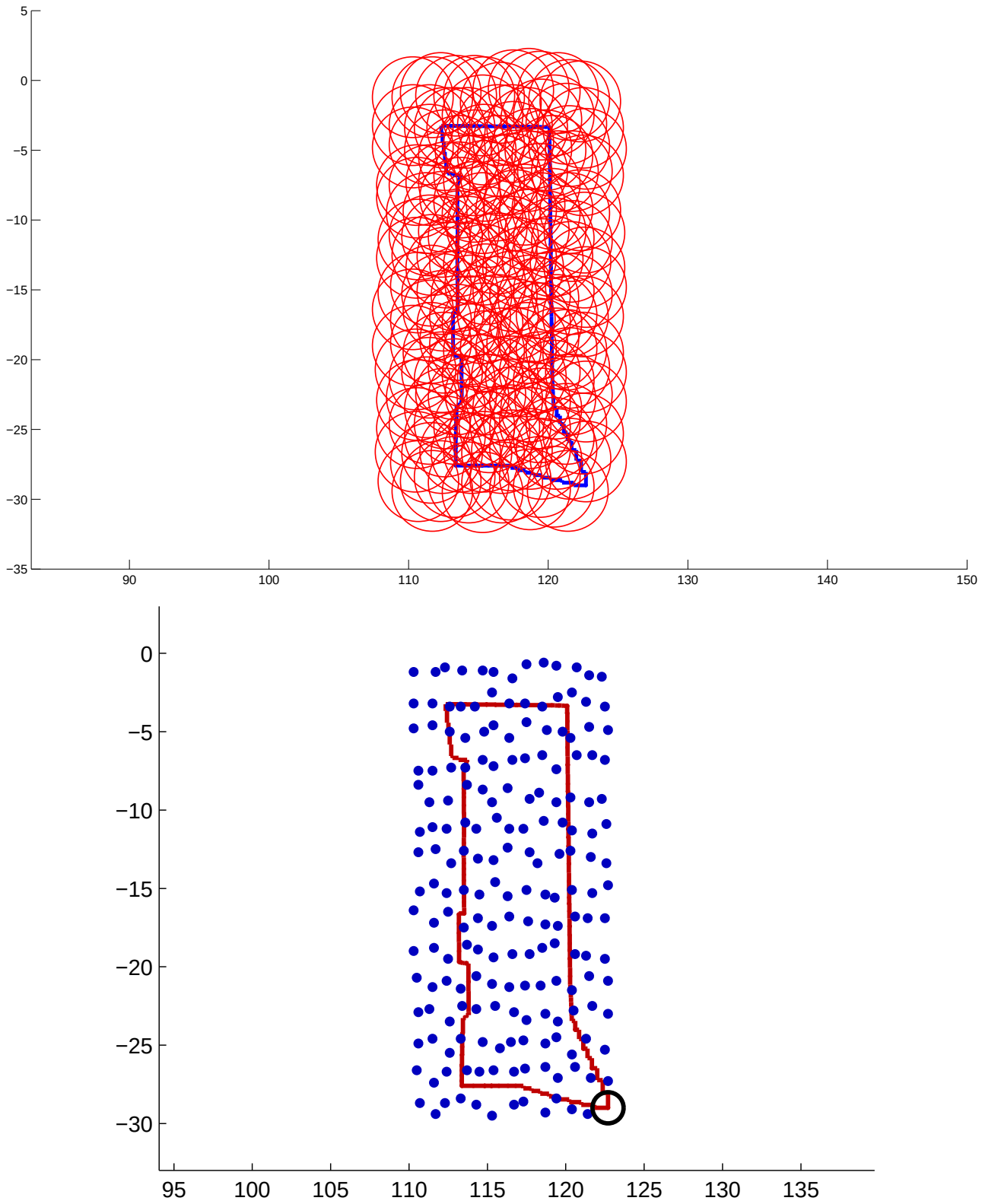


Figure N.116: $rat195$, $r = 2.89$, Equal Radius, 2D, Manhattan, Length = 74.2568924

Table N-119: Solution for $rat195$, $r = 2.89$, Equal Radius, 2D, Manhattan

Total distance: 74.2568924324595			
Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
11.8196514356774	28.8123442947768	11.4	29.4
10.9929093703462	28.6332120391577	10.4	29.1
10.2210405038954	28.4548522784121	8.7	29.3
9.56454400088465	28.2756302592849	9.4	28.4
8.92665019790047	28.0986844842998	7.3	28.6
8.37208324608896	27.9221530113441	8.7	26.4
7.81346006351848	27.7533782069328	6.7	26.7
7.29999988309548	27.5900001657484	7.3	24.7
6.80425185134185	27.5900001585222	6.7	28.8
6.31534638313896	27.5900001512613	6.5	24.8
5.72484463421341	27.5900001442976	3.7	26.6
5.26575297787591	27.5900001374533	5.3	29.5
5.26575297787591	27.5900001374533	4.3	28.8
4.8343152125704	27.5900001304736	2.3	28.7
4.8343152125704	27.5900001304736	7.4	26.5
4.10820320756487	27.5900001235462	4.5	26.7
3.36833305168489	27.5900001166418	0.7	28.7
3.36914098147209	27.2732644999947	3.3	24.6
3.36914098147209	27.2732644999947	1.7	29.4
3.36994988040493	26.9407732212397	1.6	27.4
3.37076061851232	26.6082358726022	2.4	26.7
3.37157243421406	26.2814034155286	5.8	25.2
3.37157243421406	26.2814034155286	2.6	23.5
3.37157243421406	26.2814034155286	0.5	26.6
3.37157243421406	26.2814034155286	3.3	28.4
3.37968969120406	25.6236217760433	1.5	24.6
3.37968969120406	25.6236217760433	2.6	25.5
3.38783917248202	25.0991477527483	4.7	24.8
3.39597117007071	24.5992348366494	1.3	22.7
3.39597117007071	24.5992348366494	5.4	26.6
3.40411470310477	24.2584133055777	3.3	21.4
3.40411470310477	24.2584133055777	0.6	24.9
3.43317352357251	23.2695678262695	0.6	22.9
3.62595698165809	23.082631872542	5.5	22.5
3.80999984588854	22.900024327353	6.7	22.9
3.80502522255983	22.2232592913437	4.3	22.7
3.80004402417471	21.551754789455	6.4	21.3
3.79500141008135	20.9607099422042	4.3	20.6
3.79500141008135	20.9607099422042	1.5	21.3
3.78999392420985	20.3887205667836	5.3	21.1
3.78496308325631	19.8016465826303	6.6	19.2
3.66816736115918	19.7793948412067	5.4	19.4
3.66816736115918	19.7793948412067	3.7	18.6
3.54846673444875	19.7579237133833	2.4	20.9
3.43080889276433	19.7364235024488	2.5	19.5
3.31444203522199	19.7150411353387	3.5	17.5
3.31444203522199	19.7150411353387	3.4	22.5
3.19623211873511	19.6921041575807	0.5	20.7
3.18828967418222	18.9989237596961	0.3	19
3.18723991931894	18.4255110214006	4.4	18.9
3.18618726230298	17.8503677674955	1.6	18.8
3.18513882963207	17.2424094270447	1.6	17.2
3.18409439585541	16.6509641063662	0.7	15.2
3.18307139691652	16.6000001023715	0.3	16.4
3.51692859200158	16.6000000027813	6.4	16.8
3.5145177655716	16.237511171308	4.4	16.9
3.51210177407223	15.8710589130128	6.3	15.5
3.50964956732516	15.577497347717	5.3	17.4
3.50964956732516	15.577497347717	2.5	16.5
3.50718647273008	15.2025250874252	2.4	15.3
3.50718647273008	15.2025250874252	1.6	14.7
3.50474318788172	14.8455595524853	4.5	15.4
3.5022945810563	14.4859029613633	3.5	15.1
3.49984641452774	14.123419976136	5.5	14.6
3.49738413510543	13.7549597040454	2.7	13.4
3.49492725686112	13.394406166749	5.4	13.2
3.4924572422195	13.0410701002171	1.7	12.5
3.49000011665774	12.6999999932381	0.6	12.7
3.49400786328272	12.4035997523815	4.4	13.1
3.49400786328272	12.4035997523815	3.5	12.6
3.49801455258955	12.1042775547245	6.3	12.4
3.50195465522292	11.7569130359644	0.7	11.4
3.50597668621674	11.476536687729	2.4	11.2
3.50999988585133	11.1999999865333	6.4	11.2
3.5075351677871	10.7168744923548	4.3	11.2
3.5050688474884	10.2286431405499	3.6	10.8
3.5050688474884	10.2286431405499	1.5	11.1
3.50261041851907	9.69776301721006	5.3	9.5
3.50014738832722	9.17910421928056	6.3	8.6
3.49762329159384	8.91455083526154	4.7	8.7
3.49509643715436	8.65255945838298	5.4	7.2
3.49509643715436	8.65255945838298	5.6	10.5
3.49254315840291	8.15789461124373	1.3	9.5
3.49000010324474	7.49999822300527	0.6	7.5
3.53339351303978	7.3675549843788	3.7	8.4
3.57675556335209	7.23376079476713	2.5	9.4
3.57675556335209	7.23376079476713	1.5	7.5
3.62120247244116	7.08891543991142	2.7	7.3
3.62120247244116	7.08891543991142	4.7	6.8
3.66559760145748	6.94464575601493	3.6	7.3
3.7099998926648	6.7999980458675	6.6	6.8
3.15854620389833	6.66974592230121	1.5	4.6
2.77472804545359	6.55325832237145	0.6	8.4
2.68727997787126	5.82053866712142	3.6	5.4
2.59927285155931	5.11795537151953	2.6	5
2.51135285191678	4.42599752434029	0.3	4.8
2.42649867443637	3.6827132808123	1.7	1.2
2.34353709526137	3.24354023641124	0.3	1.2
2.69731190938199	3.24998165074479	0.3	3.2
3.15166704659598	3.25643681277972	3.3	3.4
3.60554443281134	3.26289958323502	3.4	1.1
3.60554443281134	3.26289958323502	2.3	0.9
4.3174733958724	3.26948413293061	5.4	1.2
4.3174733958724	3.26948413293061	6.4	3.2
4.3174733958724	3.26948413293061	6.6	1.6
4.3174733958724	3.26948413293061	1.5	3.2
4.94260155513442	3.27623567907591	7.4	3.2
4.94260155513442	3.27623567907591	2.6	3.4
5.51497595918238	3.28298431077909	4.7	1.1
5.51497595918238	3.28298431077909	5.4	4.6
6.16573207955128	3.28975271976754	5.3	2.5
6.85888193831063	3.29653083579936	8.8	4.9
6.85888193831063	3.29653083579936	9.5	2.8
6.85888193831063	3.29653083579936	7.5	0.7
6.85888193831063	3.29653083579936	4.2	3.4
6.85888193831063	3.29653083579936	4.8	5
7.59173539190027	3.30333030064385	7.5	4.4
8.34068844399614	3.3101187390629	9.8	5
8.34068844399614	3.3101187390629	10.3	5.4
8.34068844399614	3.3101187390629	6.4	5.4
8.71860887167583	3.31612583919635	8.5	3.4
9.10199551570675	3.3221328558139	11.5	4.7
9.30135915560037	3.32809722122394	8.6	0.6
9.55883452198702	3.33419485209749	11.5	1.4
9.73485591370463	3.34038126870506	9.4	0.8
9.91540590854353	3.34660528978158	10.7	0.9
10.0871218405948	3.35287055933688	12.3	1.5
10.0923354718149	3.81994957828847	12.5	3.4
10.0923354718149	3.81994957828847	11.3	3.1
10.0975574248065	4.33470642141481	10.4	2.5
10.1027848852712	4.92460597175785	11.7	6.5
10.108005430055	5.42108662766726	12.7	4.9
10.1132025093641	6.0034787594489	8.5	6.5
10.1184086738599	6.57017737505886	7.4	6.7
10.1236602894271	7.11485433811103	10.7	6.5
10.1236602894271	7.11485433811103	12.5	6.8
10.1288908494865	7.71316463717545	9.4	7.4
10.1341265905066	8.32713733073351	7.7	9.3
10.1393930028884	8.81906998669464	11.5	9.5
10.1393930028884	8.81906998669464	9.4	9.5
10.1446558886603	9.28767808393362	10.3	9.2
10.1499189381203	9.76195974687162	8.3	8.9
10.1499189381203	9.76195974687162	9.8	10.8
10.1552018064639	10.2548658368124	8.6	10.7
10.1604988684778	10.7408001881718	12.6	10.9
10.1657661967894	11.2218803699869	7.3	11.2
10.1657661967894	11.2218803699869	7.7	12.7
10.1657661967894	11.2218803699869	12.3	9.3
10.1716058379728	11.7476806339723	10.4	11.3
10.1716058379728	11.7476806339723	11.7	11.5
10.1774318887003	12.307679222472	10.3	12.6
10.1774318887003	12.307679222472	9.6	12.8
10.1832658154655	12.863499043048	11.6	13
10.1890883361905	13.4239166919471	8.2	13.4

Solution x	Solution y	Original x	Original y
10.1890883361905	13.4239166919471	12.6	13.4
10.1949019664857	14.0116824134731	8.7	15.4
10.2007321365104	14.5397620030599	12.7	14.8
10.2065282442457	15.0560081807854	11.7	15.3
10.2065282442457	15.0560081807854	10.4	15.1
10.2123141508838	15.5840241027593	12.5	16.9
10.2180627440189	15.9799840328836	7.5	15.1
10.2180627440189	15.9799840328836	7.6	17.1
10.2243805417146	16.4526705578658	9.5	17.4
10.2307057954982	16.9132005352149	9.3	15.6
10.2370411216366	17.4189273250968	10.6	16.8
10.2370411216366	17.4189273250968	11.4	16.9
10.2433651853763	17.9776343154443	9.3	18.5
10.2433651853763	17.9776343154443	8.5	18.8
10.2497169138806	18.5091628752384	7.7	19.2
10.2561193145354	18.9579859666301	12.5	19.5
10.2561193145354	18.9579859666301	8.7	17.3
10.2625095806222	19.4837388118671	10.6	19.2
10.2625095806222	19.4837388118671	11.3	19.3
10.2688911271029	20.04961330974	9.4	20.9
10.2752814608977	20.6026975927759	12.7	20.9
10.2816381188345	21.1469415068677	7.4	21.2
10.2936329035993	21.4097120416962	11.5	20.6
10.3056077332178	21.6820976367757	10.4	21.5
10.317586973992	21.9591650936559	8.4	21.2
10.3296204427373	22.2517203211498	11.7	22.5
10.3416312002895	22.5462071265757	10.5	22.8
10.3536459262238	22.8432255293551	8.7	23
10.3656964339505	23.1438468563907	12.7	23
10.3776733790119	23.4531854085023	7.5	23.4
10.6045348041795	24.0147690625484	9.5	23.5
10.6045348041795	24.0147690625484	9.4	24.5
10.847214554811	24.6179361801545	8.7	24.9
11.1196421915658	25.2258050129958	12.5	25.3
11.1196421915658	25.2258050129958	10.6	26.4
11.3892688634478	25.8291493888118	10.4	25.6
11.6684985336134	26.4674996107635	11.3	24.6
11.6684985336134	26.4674996107635	9.5	27.1
12.0062071334603	27.2282868358842	11.6	27.1
12.3518558814694	28.0382871483514	12.7	27.3

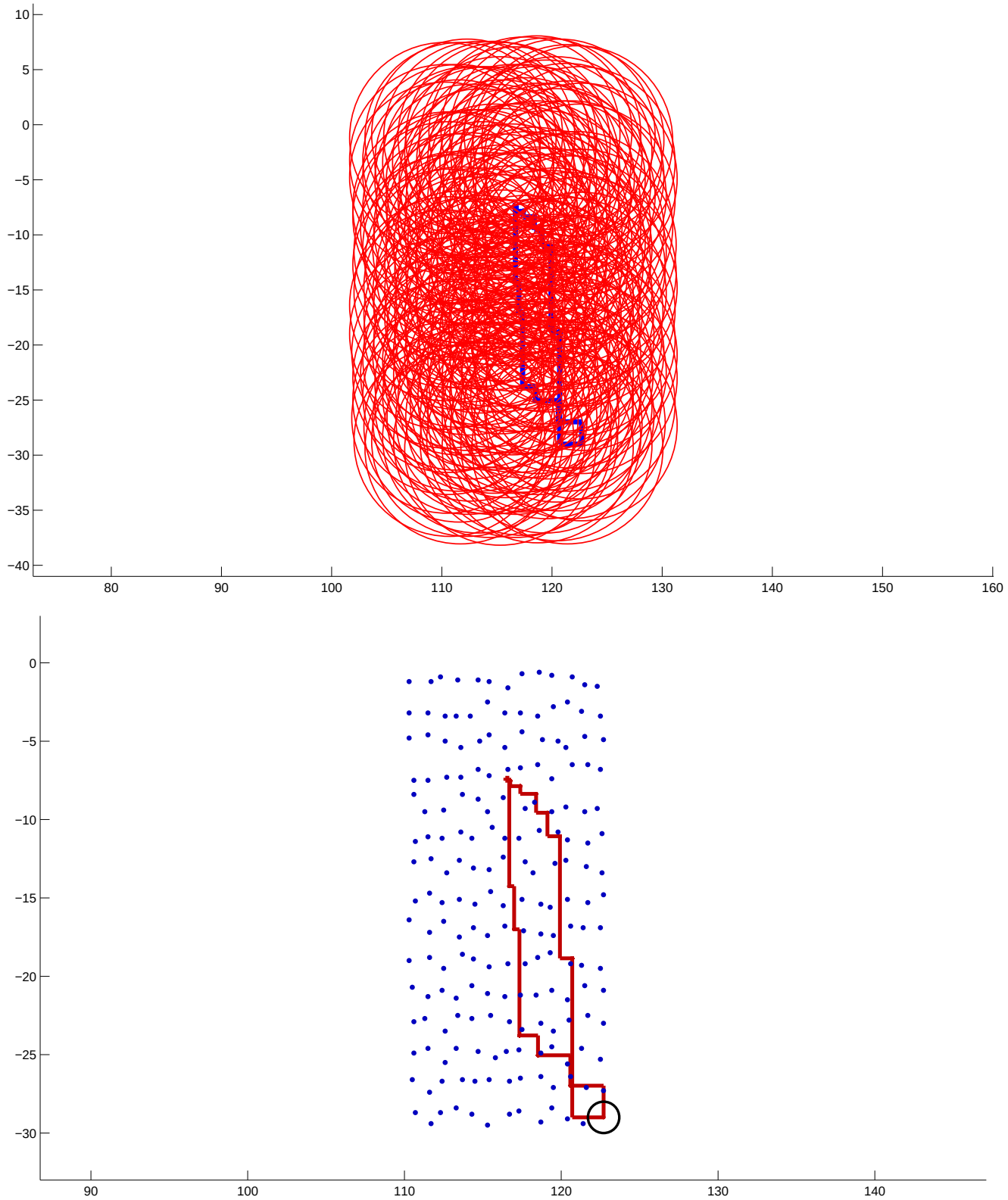


Figure N.117: $rat195$, $r = 8.67$, Equal Radius, 2D, Manhattan, Length = 55.8775337

Table N-120: Solution for $rat195$, $r = 8.67$, Equal Radius, 2D, Manhattan

Total distance: 55.8775337121406			
Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
10.6964783676724	18.8501530483466	5.5	14.6
10.6964783676724	18.8501530483466	6.3	15.5
10.6964783676724	18.8501530483466	7.5	15.1
10.6964783676724	18.8501530483466	5.3	17.4
10.6964783676724	18.8501530483466	6.4	16.8
10.6964783676724	18.8501530483466	8.7	15.4
10.6964783676724	18.8501530483466	7.6	17.1
10.6964783676724	18.8501530483466	5.4	19.4
10.6964783676724	18.8501530483466	9.3	15.6
10.6964783676724	18.8501530483466	6.6	19.2
10.6964783676724	18.8501530483466	8.7	17.3
10.6964783676724	18.8501530483466	9.5	17.4
10.6964783676724	18.8501530483466	7.7	19.2
10.6964783676724	18.8501530483466	8.5	18.8
10.6964783676724	18.8501530483466	10.6	16.8
10.6964783676724	18.8501530483466	6.4	21.3
10.6964783676724	18.8501530483466	9.3	18.5
10.6964783676724	18.8501530483466	11.4	16.9
10.6964783676724	18.8501530483466	7.4	21.2
10.6964783676724	18.8501530483466	8.4	21.2
10.6964783676724	18.8501530483466	10.6	19.2
10.6964783676724	18.8501530483466	9.4	20.9
10.6964783676724	18.8501530483466	11.3	19.3
10.6964783676724	18.8501530483466	7.5	23.4
10.6964783676724	18.8501530483466	8.7	23
10.6964783676724	18.8501530483466	10.4	21.5
10.6964783676724	18.8501530483466	12.5	19.5
10.6964783676724	18.8501530483466	11.5	20.6
10.6964783676724	18.8501530483466	9.5	23.5
10.6964783676724	18.8501530483466	10.5	22.8
10.6964783676724	18.8501530483466	12.7	20.9
10.6964783676724	18.8501530483466	9.4	24.5
10.6964783676724	18.8501530483466	11.7	22.5
10.6964783676724	18.8501530483466	12.7	23
10.6964783676724	18.8501530483466	11.3	24.6
10.6964783676724	18.8501530483466	12.5	25.3
9.91230010802187	11.0672770334907	6.3	12.4
9.91230010802187	11.0672770334907	8.2	13.4
9.91230010802187	11.0672770334907	6.4	11.2
9.91230010802187	11.0672770334907	7.3	11.2
9.91230010802187	11.0672770334907	7.7	9.3
9.91230010802187	11.0672770334907	8.3	8.9
9.91230010802187	11.0672770334907	12.7	14.8
9.91230010802187	11.0672770334907	9.4	9.5
9.91230010802187	11.0672770334907	11.7	11.5
9.91230010802187	11.0672770334907	10.3	9.2
9.91230010802187	11.0672770334907	12.5	16.9
9.91230010802187	11.0672770334907	12.6	10.9
9.91230010802187	11.0672770334907	11.5	9.5
9.91230010802187	11.0672770334907	9.4	7.4
9.91230010802187	11.0672770334907	12.3	9.3
9.91230010802187	11.0672770334907	10.7	6.5
9.91230010802187	11.0672770334907	10.3	5.4
9.91230010802187	11.0672770334907	11.7	6.5
9.91230010802187	11.0672770334907	12.5	6.8
9.91230010802187	11.0672770334907	11.5	4.7
9.91230010802187	11.0672770334907	12.7	4.9
9.11703222448108	9.5636923425459	4.3	11.2
9.11703222448108	9.5636923425459	7.7	12.7
9.11703222448108	9.5636923425459	5.6	10.5
9.11703222448108	9.5636923425459	5.3	9.5
9.11703222448108	9.5636923425459	4.7	8.7
9.11703222448108	9.5636923425459	9.6	12.8
9.11703222448108	9.5636923425459	10.4	15.1
9.11703222448108	9.5636923425459	10.3	12.6
9.11703222448108	9.5636923425459	6.3	8.6
9.11703222448108	9.5636923425459	8.6	10.7
9.11703222448108	9.5636923425459	5.4	7.2
9.11703222448108	9.5636923425459	11.6	13
9.11703222448108	9.5636923425459	9.8	10.8
9.11703222448108	9.5636923425459	11.7	15.3
9.11703222448108	9.5636923425459	10.4	11.3
9.11703222448108	9.5636923425459	12.6	13.4
9.11703222448108	9.5636923425459	6.6	6.8
9.11703222448108	9.5636923425459	7.4	6.7
9.11703222448108	9.5636923425459	8.5	6.5
9.11703222448108	9.5636923425459	8.8	4.9
9.11703222448108	9.5636923425459	9.8	5
9.11703222448108	9.5636923425459	11.3	3.1
9.11703222448108	9.5636923425459	12.5	3.4
8.39219190332891	8.35910856264312	3.6	5.4
8.39219190332891	8.35910856264312	9.5	2.8
8.39219190332891	8.35910856264312	10.4	2.5
8.39219190332891	8.35910856264312	9.4	0.8
8.39219190332891	8.35910856264312	10.7	0.9
8.39219190332891	8.35910856264312	11.5	1.4
8.39219190332891	8.35910856264312	12.3	1.5
7.38637027591784	7.86832325091967	1.5	11.1
7.38637027591784	7.86832325091967	0.6	8.4
7.38637027591784	7.86832325091967	7.5	4.4
7.38637027591784	7.86832325091967	6.6	1.6
7.38637027591784	7.86832325091967	8.5	3.4
7.38637027591784	7.86832325091967	1.5	3.2
7.38637027591784	7.86832325091967	3.4	1.1
7.38637027591784	7.86832325091967	7.5	0.7
7.38637027591784	7.86832325091967	8.6	0.6
6.74798715957319	7.52352765177425	0.7	11.4
6.74798715957319	7.52352765177425	3.7	8.4
6.74798715957319	7.52352765177425	2.5	9.4
6.74798715957319	7.52352765177425	4.7	6.8
6.74798715957319	7.52352765177425	3.6	7.3
6.74798715957319	7.52352765177425	1.3	9.5
6.74798715957319	7.52352765177425	2.7	7.3
6.74798715957319	7.52352765177425	4.8	5
6.74798715957319	7.52352765177425	5.4	4.6
6.74798715957319	7.52352765177425	1.5	7.5
6.74798715957319	7.52352765177425	6.4	5.4
6.74798715957319	7.52352765177425	0.6	7.5
6.74798715957319	7.52352765177425	4.2	3.4
6.74798715957319	7.52352765177425	2.6	5
6.74798715957319	7.52352765177425	5.3	2.5
6.74798715957319	7.52352765177425	6.4	3.2
6.74798715957319	7.52352765177425	3.3	3.4
6.74798715957319	7.52352765177425	1.5	4.6
6.74798715957319	7.52352765177425	2.6	3.4
6.74798715957319	7.52352765177425	4.7	1.1
6.74798715957319	7.52352765177425	7.4	3.2
6.74798715957319	7.52352765177425	5.4	1.2
6.74798715957319	7.52352765177425	0.3	4.8
6.74798715957319	7.52352765177425	0.3	3.2
6.74798715957319	7.52352765177425	2.3	0.9
6.74798715957319	7.52352765177425	1.7	1.2
6.43107109376389	7.33016205016583	0.3	1.2
6.6820953395212	14.2467440205864	5.4	13.2
6.6820953395212	14.2467440205864	4.4	13.1
6.6820953395212	14.2467440205864	4.5	15.4
6.6820953395212	14.2467440205864	3.5	15.1
6.6820953395212	14.2467440205864	2.7	13.4
6.6820953395212	14.2467440205864	3.5	12.6
6.6820953395212	14.2467440205864	2.4	15.3
6.6820953395212	14.2467440205864	1.6	14.7
6.6820953395212	14.2467440205864	1.7	12.5
6.6820953395212	14.2467440205864	3.5	17.5
6.6820953395212	14.2467440205864	2.5	16.5
6.6820953395212	14.2467440205864	0.7	15.2
6.6820953395212	14.2467440205864	0.6	12.7
6.6820953395212	14.2467440205864	1.6	17.2
6.6820953395212	14.2467440205864	0.3	16.4
6.6820953395212	14.2467440205864	1.6	18.8
6.6820953395212	14.2467440205864	0.3	19
6.99290957581056	16.9977665689338	3.6	10.8
6.99290957581056	16.9977665689338	2.4	11.2
6.99290957581056	16.9977665689338	3.7	18.6
6.99290957581056	16.9977665689338	2.5	19.5
6.99290957581056	16.9977665689338	2.4	20.9
7.33115827158392	23.7775990201632	4.4	16.9
7.33115827158392	23.7775990201632	4.3	22.7
7.33115827158392	23.7775990201632	3.4	22.5
7.33115827158392	23.7775990201632	6.7	22.9
7.33115827158392	23.7775990201632	1.5	21.3
7.33115827158392	23.7775990201632	4.7	24.8
7.33115827158392	23.7775990201632	0.5	20.7
7.33115827158392	23.7775990201632	2.6	23.5
7.33115827158392	23.7775990201632	5.8	25.2

Solution x	Solution y	Original x	Original y
7.33115827158392	23.7775990201632	6.5	24.8
7.33115827158392	23.7775990201632	3.3	24.6
7.33115827158392	23.7775990201632	1.3	22.7
7.33115827158392	23.7775990201632	5.4	26.6
7.33115827158392	23.7775990201632	4.5	26.7
7.33115827158392	23.7775990201632	0.6	22.9
7.33115827158392	23.7775990201632	3.7	26.6
7.33115827158392	23.7775990201632	2.6	25.5
7.33115827158392	23.7775990201632	1.5	24.6
7.33115827158392	23.7775990201632	2.4	26.7
7.33115827158392	23.7775990201632	0.6	24.9
7.33115827158392	23.7775990201632	4.3	28.8
7.33115827158392	23.7775990201632	3.3	28.4
7.33115827158392	23.7775990201632	1.6	27.4
7.33115827158392	23.7775990201632	0.5	26.6
7.33115827158392	23.7775990201632	2.3	28.7
7.33115827158392	23.7775990201632	1.7	29.4
7.33115827158392	23.7775990201632	0.7	28.7
8.51791379033736	25.0410560589242	4.4	18.9
8.51791379033736	25.0410560589242	4.3	20.6
8.51791379033736	25.0410560589242	5.3	21.1
8.51791379033736	25.0410560589242	5.5	22.5
8.51791379033736	25.0410560589242	3.3	21.4
8.51791379033736	25.0410560589242	7.3	24.7
8.51791379033736	25.0410560589242	6.7	26.7
8.51791379033736	25.0410560589242	8.7	24.9
8.51791379033736	25.0410560589242	7.4	26.5
8.51791379033736	25.0410560589242	5.3	29.5
8.51791379033736	25.0410560589242	8.7	26.4
8.51791379033736	25.0410560589242	6.7	28.8
8.51791379033736	25.0410560589242	7.3	28.6
8.51791379033736	25.0410560589242	10.4	25.6
8.51791379033736	25.0410560589242	9.5	27.1
8.51791379033736	25.0410560589242	10.6	26.4
8.51791379033736	25.0410560589242	9.4	28.4
8.51791379033736	25.0410560589242	8.7	29.3
8.51791379033736	25.0410560589242	10.4	29.1
10.5772117004139	26.9764316240375	11.6	27.1
10.5772117004139	26.9764316240375	12.7	27.3
10.5772117004139	26.9764316240375	11.4	29.4

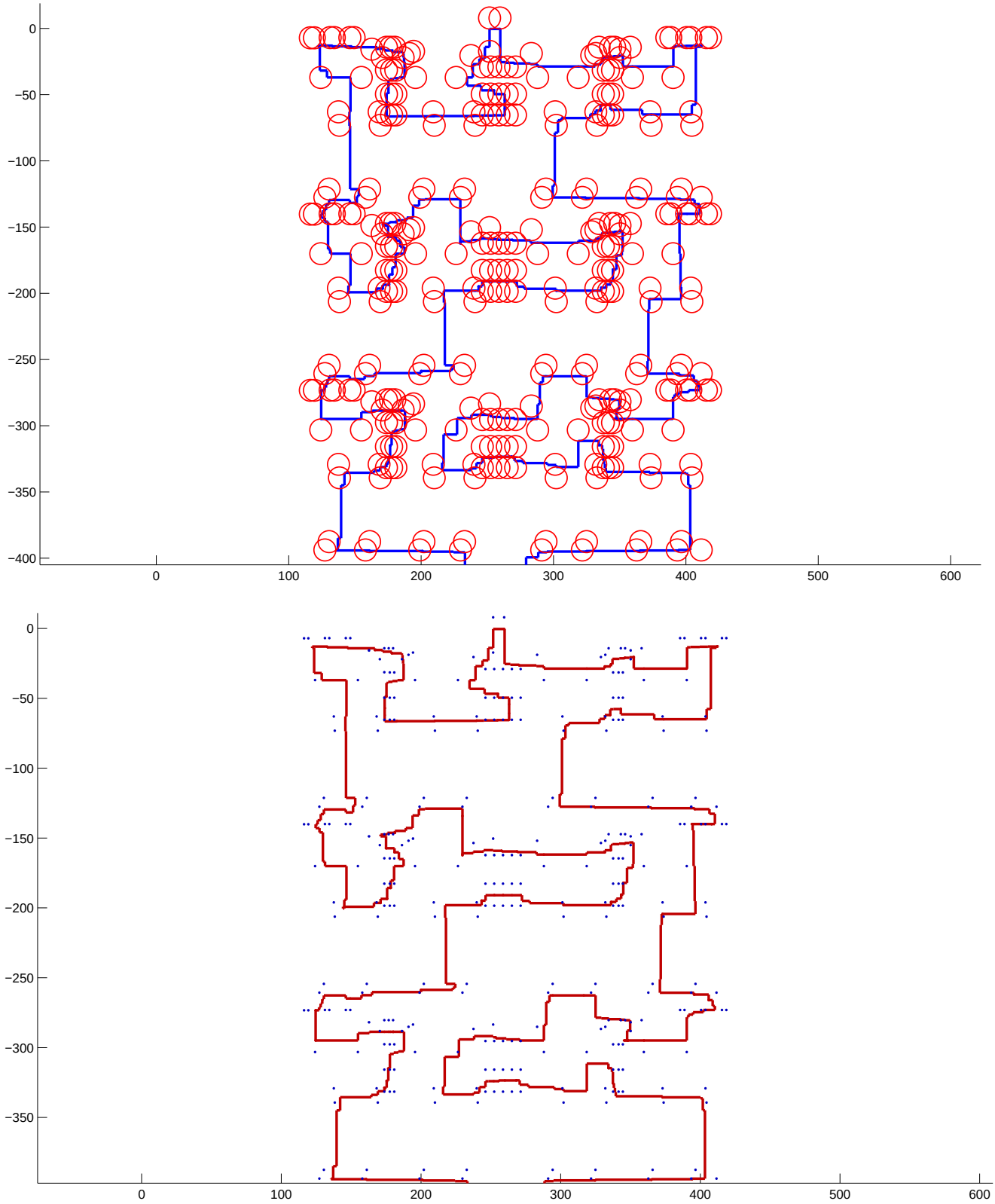


Figure N.118: $lin318$, $r = 8.268$, Equal Radius, 2D, Manhattan, Length = 3339.8459111

Table N-121: Solution for $lin318$, $r = 8.268$, Equal Radius, 2D, Manhattan

Total distance: 3339.84591105749			
Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
123.176236626991	395.601246304476	122.8	387.5
114.42937751332	395.115873590866	119.7	393.8
91.0516545359751	394.635148052614	92.1	387.5
91.0516545359751	394.635148052614	89	393.8
50.8210789266597	394.204115631549	51.2	387.5
50.8210789266597	394.204115631549	48	393.8
25.5680113957152	393.800009564598	17.3	393.8
27.132225189311	384.884969558124	20.5	387.5
29.5736213720165	344.914265268573	28.3	339.4
32.1383750714056	335.539723618644	27.6	329.2
54.4266623743482	333.821157903583	59.1	339.4
59.0589216508071	331.195336279845	58.3	329.2
63.8156447754213	328.679763555906	70.9	331.6
63.8156447754213	328.679763555906	63.8	331.6
65.4341855062929	323.768160082294	63.8	315.8
65.4341855062929	323.768160082294	67.7	331.6
66.6224308843715	314.891736481473	70.9	315.8
66.6224308843715	314.891736481473	67.7	315.8
67.7402753402636	304.553494998625	63.8	297.6
70.5028695082617	303.572905947565	67.7	297.7
73.8120502675118	302.694474802589	70.9	297.7
77.7012880477575	301.869546418471	85.8	303.2
77.8461797506329	288.667996968797	84.3	283.5
75.1225882514775	288.667999107573	81.1	285.1
70.0999892301157	288.66800125173	70.1	280.4
70.0999892301157	288.66800125173	76.4	288.2
68.077883030396	288.668003653976	60.6	288.2
66.9000174015165	288.668006098795	66.9	280.4
63.8000079214918	288.668009518081	63.8	280.4
53.0582452545472	289.725845323339	52.8	281.9
44.8953115722764	294.934761821609	44.9	303.2
14.5680192148595	294.940186396649	14.2	303.2
14.5680076920293	273.299999201811	9.4	273.3
14.5680076920293	273.299999201811	6.3	273.3
17.0124867299967	271.233200467392	24.4	273.1
18.2008755506095	268.567005682658	21.3	273.1
19.331707111292	265.355272664042	17.3	260.7
20.4999998891741	262.668008299256	20.5	254.4
36.2000015013093	264.831991641317	36.2	273.1
39.4000001608019	264.831991906077	39.4	273.1
47.3399047459823	262.522601364657	48	260.7
54.9428423099907	260.290850176165	51.2	254.4
90.0151834560921	258.65569241143	92.1	254.4
90.0151834560921	258.65569241143	89	260.7
112.785011306997	257.104425779144	119.7	260.7
114.531992269774	254.399982779912	122.8	254.4
107.918737224036	206.998903227193	100	206.3
107.239113082068	198.031996105558	99.2	196.1
130.700003489787	198.03199442281	130.7	206.3
133.439607469579	194.846686073445	136.2	198.5
133.439607469579	194.846686073445	129.9	196.1
136.199998240069	190.968008020289	136.2	182.7
142.499999953497	190.968007124684	142.5	198.5
142.499999953497	190.968007124684	142.5	182.7
148.799999845306	190.968007055341	148.8	198.5
148.799999845306	190.968007055341	148.8	182.7
155.099999394799	190.968007537775	155.1	182.7
161.400026706639	190.968008792128	161.4	182.7
162.300298293486	195.015631725413	155.1	198.5
167.781697691779	196.574521946059	161.4	198.5
192.100000335189	198.031990658843	191.3	196.1
192.100000335189	198.031990658843	192.1	206.3
222.799998818027	198.031990677974	222.8	206.3
226.13402733642	195.794884592224	222	196.1
226.13402733642	195.794884592224	227.6	198.5
229.864351075192	193.411712314937	231.5	198.5
233.314129053712	190.555993877608	234.6	198.5
233.314129053712	190.555993877608	234.6	182.7
234.837014908725	182.108854307231	227.6	182.7
234.837014908725	182.108854307231	231.5	182.7
237.555246501932	171.372248629127	234.6	164.6
241.638819519167	168.66779504451	249.6	170.1
242.153644951755	153.146355131363	248	147.3
239.053352514451	153.550287771832	240.2	148.8
235.815475074107	153.963742439686	240.2	155.1
235.815475074107	153.963742439686	236.2	147.3
231.865281563096	154.403770910178	233.1	147.3
227.123040021312	154.899841253452	224.4	147.3
225.928752973914	158.783922001289	231.5	164.6
225.928752973914	158.783922001289	222	152
221.578490509717	160.269735382647	227.6	164.6
221.578490509717	160.269735382647	218.9	153.6
208.699998851317	161.83199106243	208.7	170.1
178.000000152992	161.831991346257	178	170.1
172.685947738901	160.04476533333	173.2	152
158.860849786953	159.598891434526	155.1	162.2
158.860849786953	159.598891434526	161.4	162.2
147.723665116676	159.142016083115	148.8	162.2
147.723665116676	159.142016083115	142.5	162.2
141.700000817928	158.668008764226	141.7	150.4
134.852908374052	159.778987024138	136.2	162.2
127.427155169312	160.862569516777	127.6	153.6
119.650001054	162.455562151841	116.5	170.1
119.650000550878	134.268638758076	119.7	127.6
119.650000057117	128.944439032971	122.8	121.3
92.8467271718546	129.374843226284	92.1	121.3
88.5107001191253	133.811474525603	89	127.6
83.9947331296553	142.847868355906	84.3	150.4
79.125814123888	144.906058135312	81.1	152
71.3247031756524	146.225859595006	70.1	147.3
71.3247031756524	146.225859595006	66.9	147.3
65.9616843446763	147.511478909955	63.8	147.3
61.0680063988791	148.800000919962	52.8	148.8
64.9810774952195	157.312275189188	63.8	164.5
64.9810774952195	157.312275189188	60.6	155.1
71.0449465018366	160.189984034577	67.7	164.6
71.0449465018366	160.189984034577	76.4	155.1
74.1516158818816	165.08843593356	70.9	164.6
77.5319925548837	170.100000589051	85.8	170.1
70.746025532186	180.345771114181	63.8	182.7
68.3197211095693	185.722821472055	70.9	182.7
68.3197211095693	185.722821472055	67.7	182.7
65.7742535190315	193.552150280564	70.9	198.5
65.7742535190315	193.552150280564	67.7	198.5
61.0505175557265	196.442105979627	63.8	198.5
61.0505175557265	196.442105979627	58.3	196.1
56.3172576565727	199.211580707293	59.1	206.3
34.1463629732284	200.453634948648	28.3	206.3
35.0757180787401	194.229416576702	27.6	196.1
36.6319929316862	170.100001696563	44.9	170.1
21.3237205368853	166.839496079272	14.2	170.1
19.7466801853794	145.93925072788	24.4	140
17.3156800933227	142.927234700031	21.3	140
14.5680065452627	140.200000934235	6.3	140.2
16.0158116084047	137.22021502236	9.4	140.2
18.2235201677082	132.874801610308	17.3	127.6
20.5000076883893	129.568007538367	20.5	121.3
36.2000006970209	131.731993701428	36.2	140
39.3999969998963	131.73199396659	39.4	140
41.4087157838248	126.773132449695	48	127.6
42.9319937481283	121.300000105102	51.2	121.3
36.3625039453561	73.5517758859335	28.3	73.2
35.8680041953456	63.0000009259338	27.6	63
36.6319941914641	36.9999579704343	44.9	37
18.9234080353927	31.8576232019814	14.2	37
13.4955871572724	13.9740469593442	9.4	7.1
12.146361184457	12.9463678104293	6.3	7.1
23.2394088424144	13.5120178744157	24.4	6.9
23.2394088424144	13.5120178744157	21.3	6.9
37.9306061063276	14.1989949203271	39.4	6.9
37.9306061063276	14.1989949203271	36.2	6.9
56.9973409983955	15.3939822333325	63.8	14.2
56.9973409983955	15.3939822333325	52.8	15.7
62.5252725809594	16.628281394573	60.6	22
69.1081783695261	17.7524512441499	70.1	14.2
69.1081783695261	17.7524512441499	66.9	14.2
76.3370984789577	18.9712331118745	84.3	17.3
76.7430967871231	22.0482549056819	76.4	22
77.1493559684626	25.1265184227088	81.1	18.9
77.5319935735149	37.000004390948	85.8	37
73.1817062229863	37.6014040887797	70.9	31.5
69.5613863453536	38.2492871370504	67.7	31.5
66.5323439982945	38.9820435710251	63.8	31.4
65.3006894221501	48.7157311048046	70.9	49.6

Solution x	Solution y	Original x	Original y
65.3006894221501	48.7157311048046	63.8	49.6
63.9617038651679	56.9746312685224	58.3	63
63.9617038651679	56.9746312685224	67.7	49.6
63.9617027605447	62.0767576724286	63.8	65.4
63.9617014343175	66.5124160684834	59.1	73.2
72.7286070306995	66.3337562004518	70.9	65.4
72.7286070306995	66.3337562004518	67.7	65.4
99.8929353010598	66.155694445788	100	73.2
99.8929353010598	66.155694445788	99.2	63
129.79879877962	65.9721849144487	130.7	73.2
129.79879877962	65.9721849144487	136.2	65.4
135.141356629129	65.7803235276241	129.9	63
144.875102457073	65.5900709453397	148.8	65.4
144.875102457073	65.5900709453397	142.5	65.4
153.131992554053	65.399976867412	161.4	65.4
153.131992422743	60.739484423736	155.1	65.4
153.131992337141	54.2758900682028	155.1	49.6
153.131992281231	49.6000007108754	161.4	49.6
145.061611423564	46.7045038530383	148.8	49.6
145.061611423564	46.7045038530383	142.5	49.6
135.515644530272	43.1987592812992	136.2	49.6
124.76800678606	37.0000010725959	116.5	37
129.071064816162	26.9996934743707	127.6	20.5
134.08868298134	22.8794254341738	136.2	29.1
138.189149944048	13.9698416887547	141.7	17.3
141.700000115318	0.368006181200439	141.7	-7.9
149.599978192521	0.368006228509199	149.6	-7.9
149.844208509986	25.4537425218662	142.5	29.1
153.976633069246	25.9652518000823	148.8	29.1
160.397840883145	26.4630112774284	155.1	29.1
160.397840883145	26.4630112774284	161.4	29.1
172.65693423606	26.945559436964 7	173.2	18.9
178.000000205413	28.7319951679268	178	37
208.69999915435	28.7319932960324	208.7	37
221.57017126713	27.1779862735708	227.6	31.5
221.57017126713	27.1779862735708	218.9	20.5
225.906943838535	25.7059988258668	231.5	31.5
225.906943838535	25.7059988258668	222	18.9
227.089126225042	21.7922195023863	224.4	14.2
231.987858471487	21.3599665722707	233.1	14.2
235.930918101252	20.9789840857537	240.2	22
235.930918101252	20.9789840857537	236.2	14.2
239.223322885954	20.6229365053579	240.2	15.7
242.390910648205	20.2743663839898	248	14.2
242.390904200206	28.7319972576109	234.6	31.5
249.60000178781	28.73199721024	249.6	37
280.299950914186	28.7319969742168	280.3	37
280.539225483548	13.4654847465658	275.6	6.9
282.958304934903	13.2726059354535	278.7	6.9
289.589773786355	13.0936815343949	290.6	6.9
295.479619710829	12.9183819510376	293.7	6.9
302.85364288924	12.7463775626953	308.7	6.9
301.556116236698	13.825948277876	305.5	6.9
297.521936402825	57.6636109519663	293.7	63
294.500000273563	64.931991174177	294.5	73.2
263.800001153323	64.9319914976643	263.8	73.2
256.999608243351	61.4687636810111	263	63
233.050057331731	57.7214079764429	234.6	65.4
233.050057331731	57.7214079764429	231.5	49.6
233.05005181117	57.7214079784025	234.6	49.6
227.794205489938	57.8249421311858	227.6	49.6
225.500058252764	61.993238869171	227.6	65.4
225.500058252764	61.993238869171	231.5	65.4
221.690362414745	64.7575861320613	222	63
217.845177375022	67.6331187547098	222.8	73.2
195.88274612117	69.3337745626671	191.3	63
193.361470027889	78.7549949067058	192.1	73.2
190.954762064204	118.608037467964	184.3	121.3
189.368006648249	127.600006579716	181.1	127.6
214.623238521416	128.103804840088	211.8	127.6
214.623238521416	128.103804840088	215	121.3
255.17166104673	128.653061160855	252.8	127.6
255.17166104673	128.653061160855	255.9	121.3
286.022915766829	129.307661865218	283.5	127.6
286.022915766829	129.307661865218	286.6	121.3
296.55667887708	132.648704618458	301.6	127.6
300.432009370833	139.996925632089	308.7	140
298.069587573614	139.998936519826	293.7	140
298.069587573614	139.998936519826	305.5	140
290.880156449493	140.000955729543	290.6	140

Solution x	Solution y	Original x	Original y
283.867998648465	140.002981450635	275.6	140
284.499850199462	144.508598097722	278.7	140
285.209378499417	170.04512715676	280.3	170.1
285.943092131916	195.215198599161	293.7	196.1
286.460868760071	204.368011312526	294.5	206.3
262.999970810975	204.368012799573	263	196.1
262.338745555125	212.209147699848	263.8	206.3
261.670914944799	251.11428178283	255.9	254.4
261.068003892	260.700001777694	252.8	260.7
285.469715879222	262.018360034847	286.6	254.4
285.469715879222	262.018360034847	283.5	260.7
296.006172865982	266.011379743305	301.6	260.7
296.006172865982	266.011379743305	293.7	273.1
298.811931526771	270.232786816584	305.5	273.1
300.431998188812	273.100001438154	308.7	273.1
292.193609911572	274.698463492743	290.6	273.1
284.805292094603	276.333793656093	278.7	273.1
281.514976311036	278.250773921476	275.6	273.1
280.30000205353	294.93199147581	280.3	303.2
249.600001215338	294.931992062314	249.6	303.2
238.157604107404	294.931991324616	231.5	297.7
238.157604107404	294.931991324616	234.6	297.7
235.390901618595	294.931990610637	227.6	297.7
237.606271493966	287.761003446888	240.2	288.2
239.731984265156	280.399986283386	248	280.4
236.079476751625	280.019895915543	236.2	280.4
232.419108433216	279.63958971525	224.4	280.4
232.419108433216	279.63958971525	233.1	280.4
232.419108433216	279.63958971525	240.2	281.9
224.577975367708	279.142962499771	222	285.1
219.133670566442	278.612824904028	218.9	286.7
214.999999680363	262.668008837916	215	254.4
206.599170404419	262.668008667514	211.8	260.7
184.299999143875	262.668008436836	184.3	254.4
181.948335236934	267.317751377734	181.1	260.7
179.696502741896	283.826516460793	173.2	285.1
177.999990313715	294.931992347586	178	303.2
160.12589637752	294.17423022541	155.1	295.3
160.12589637752	294.17423022541	161.4	295.3
151.067703829132	293.409506660194	148.8	295.3
143.415566462631	292.637859229478	142.5	295.3
143.415566462631	292.637859229478	136.2	295.3
141.699996673095	291.768008732929	141.7	283.5
128.028976311871	294.166635622798	127.6	286.7
117.152098062669	306.648025318142	116.5	303.2
106.985459908929	327.919552062481	99.2	329.2
105.846366694261	333.553635284365	100	339.4
127.828038244308	332.231813552614	130.7	339.4
131.858235799887	328.201249690374	129.9	329.2
136.172077781082	324.062410389173	136.2	315.8
138.355785160028	324.04832114858	136.2	331.6
142.087650030232	324.034154791122	142.5	331.6
145.528494408931	324.019952120937	148.8	331.6
145.568727144797	323.47081104426	142.5	315.8
150.090264674634	323.457596504617	148.8	315.8
158.250001576327	323.444436999849	161.4	315.8
158.250003365246	323.444437013415	155.1	315.8
160.679857534949	326.581789597488	155.1	331.6
166.851043474996	328.209486123939	161.4	331.6
185.415225948923	329.660683137316	191.3	329.2
192.100002377293	331.13198494176	192.1	339.4
208.700000030553	311.468012204734	208.7	303.2
224.204218055164	314.674390166196	227.6	315.8
224.204218055164	314.674390166196	231.5	315.8
226.757740216638	317.420566973037	234.6	315.8
227.422454827223	325.56965878272	222	329.2
227.422454827223	325.56965878272	227.6	331.6
228.138199715192	328.850591869337	231.5	331.6
228.837205976694	331.836147866838	234.6	331.6
229.498104942915	334.854199255835	222.8	339.4
262.994616355855	335.59412330866	263	329.2
262.994616355855	335.59412330866	263.8	339.4
290.148100439519	336.384081437304	293.7	329.2
291.80096710332	344.848690962933	294.5	339.4
293.331987327357	393.800012401067	301.6	393.8
284.107053933334	394.173001017086	286.6	387.5
284.107053933334	394.173001017086	283.5	393.8
254.985011408747	394.577571474761	255.9	387.5
254.985011408747	394.577571474761	252.8	393.8
214.664395470304	395.023034418943	215	387.5

Solution x	Solution y	Original x	Original y
214.664395470304	395.023034418943	211.8	393.8
184.899105348988	395.555963411996	184.3	387.5
178.468572377655	399.359358139228	181.1	393.8

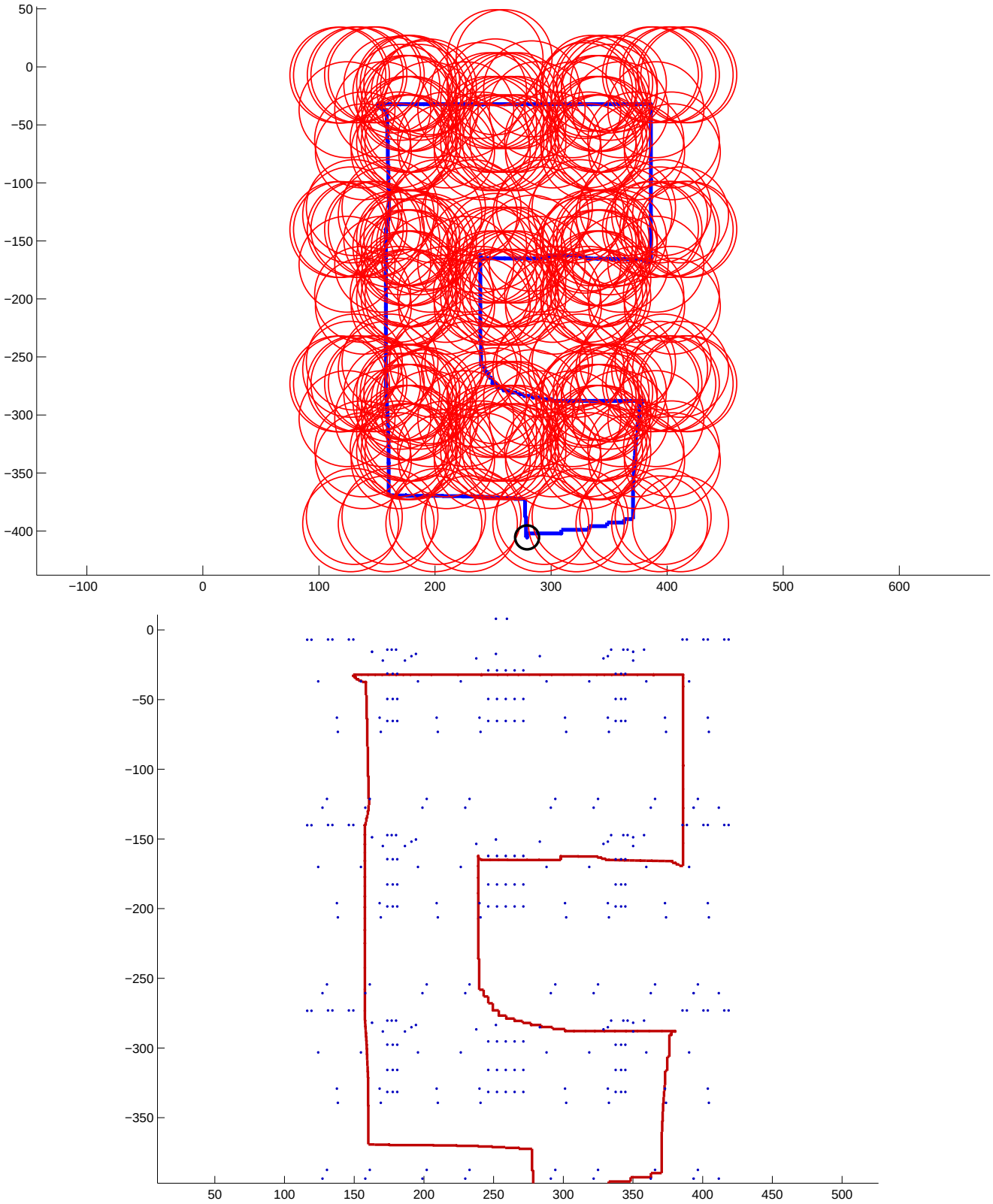


Figure N.119: $lin318$, $r = 41.34$, Equal Radius, 2D, Manhattan, Length = 1529.0861960

Table N-122: Solution for *lin*318, $r = 41.34$, Equal Radius, 2D, Manhattan

Total distance: 1529.08619604337			
Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
168.421692659447	388.305396716693	181.1	393.8
168.421692659447	388.305396716693	184.3	387.5
167.54048362365	372.347799608686	192.1	339.4
157.985747017953	371.648505380226	161.4	331.6
157.985747017953	371.648505380226	155.1	331.6
148.320523473725	371.13244640341	148.8	331.6
138.675091393248	370.654812539444	142.5	331.6
138.675091393248	370.654812539444	136.2	331.6
128.7256376938	370.229037026185	130.7	339.4
128.7256376938	370.229037026185	129.9	329.2
113.384740746877	369.94822717515	119.7	393.8
113.384740746877	369.94822717515	122.8	387.5
96.5999867495186	369.665485445795	100	339.4
96.5999867495186	369.665485445795	99.2	329.2
64.9785873791596	369.41177908512	89	393.8
64.9785873791596	369.41177908512	92.1	387.5
64.9785873791596	369.41177908512	48	393.8
64.9785873791596	369.41177908512	51.2	387.5
64.9785873791596	369.41177908512	70.9	331.6
64.9785873791596	369.41177908512	67.7	331.6
64.9785873791596	369.41177908512	59.1	339.4
64.9785873791596	369.41177908512	63.8	331.6
64.9785873791596	369.41177908512	58.3	329.2
54.6734545857206	369.197689663195	20.5	387.5
50.2646586176036	368.980008603694	17.3	393.8
50.1028511588164	341.330748523959	28.3	339.4
50.1028511588164	341.330748523959	27.6	329.2
49.9419362129282	321.334097502279	44.9	303.2
49.9419362129282	321.334097502279	52.8	281.9
49.7810368356696	317.079508548022	67.7	315.8
49.7810368356696	317.079508548022	63.8	315.8
49.6198643824553	312.890283761386	70.9	315.8
49.4585367616683	308.704151615367	67.7	297.7
49.2971070119802	304.62694181811	85.8	303.2
49.2971070119802	304.62694181811	70.9	297.7
49.1341332310979	300.685803060554	84.3	283.5
49.1341332310979	300.685803060554	81.1	285.1
48.9674859910216	297.659418211127	76.4	288.2
48.9674859910216	297.659418211127	70.1	280.4
48.8000240924372	294.795381271961	66.9	280.4
48.8000240924372	294.795381271961	63.8	280.4
48.6321615005115	292.054509624653	63.8	297.6
48.6321615005115	292.054509624653	60.6	288.2
48.4639717744768	289.327104178974	48	260.7
48.4639717744768	289.327104178974	51.2	254.4
48.2957892040417	286.991392665739	39.4	273.1
48.1278420055175	284.690242320958	36.2	273.1
48.1278420055175	284.690242320958	24.4	273.1
47.960536140846	282.455918990019	21.3	273.1
47.7938189472659	280.255076449711	14.2	303.2
47.7938189472659	280.255076449711	9.4	273.3
47.6400020007712	273.300001545494	6.3	273.3
47.6400019736457	257.934621222476	17.3	260.7
47.6400019473991	242.444343298333	20.5	254.4
47.6400019219817	224.851811056149	28.3	206.3
47.6400019219817	224.851811056149	27.6	196.1
47.6400018975391	215.361223564544	59.1	206.3
47.6400018975391	215.361223564544	58.3	196.1
47.6400018725539	207.02726722755	63.8	198.5
47.640001847589	199.000432461062	70.9	198.5
47.640001847589	199.000432461062	67.7	198.5
47.6400018215663	191.138059275243	70.9	182.7
47.6400018215663	191.138059275243	67.7	182.7
47.6400017946577	183.858101979879	70.9	164.6
47.6400017675093	177.271253055279	67.7	164.6
47.6400017675093	177.271253055279	60.6	155.1
47.6400017395969	171.445588694747	85.8	170.1
47.6400017103724	165.748411612819	63.8	182.7
47.6400017103724	165.748411612819	63.8	164.5
47.6400016803222	159.861536455728	44.9	170.1
47.6400019986039	153.882874671087	14.2	170.1
47.6400019986039	153.882874671087	36.2	140
47.6400016292669	146.957993543694	52.8	148.8
47.6400016292669	146.957993543694	39.4	140
47.6400016007365	140.199938334482	24.4	140
47.6400016007365	140.199938334482	21.3	140
47.6400016007365	140.199938334482	9.4	140.2
47.6400016007365	140.199938334482	6.3	140.2
47.6400016007365	140.199938334482	17.3	127.6
47.6400016007365	140.199938334482	20.5	121.3
48.1922582775734	137.766059989384	63.8	147.3
48.7426630902513	135.315006789397	70.1	147.3
48.7426630902513	135.315006789397	66.9	147.3
49.2868041792823	132.80760312592	76.4	155.1
49.8228317911805	130.139471550287	84.3	150.4
49.8228317911805	130.139471550287	81.1	152
50.3001140078956	125.738206499781	89	127.6
50.7599984309023	121.300022833553	92.1	121.3
50.2867530322058	105.280165096326	48	127.6
50.2867530322058	105.280165096326	51.2	121.3
49.8142557539586	83.728471779821	59.1	73.2
49.3415746921035	64.0228180500601	58.3	63
49.3415746921035	64.0228180500601	63.8	49.6
48.8674836642955	46.8818410068554	76.4	22
48.3850317688868	37.3702112256704	84.3	17.3
48.3850317688868	37.3702112256704	81.1	18.9
45.6184133968451	36.3905496709007	44.9	37
42.866379922952	35.4115200673989	28.3	73.2
42.866379922952	35.4115200673989	70.1	14.2
40.9971190353671	33.7956316432379	27.6	63
40.9971190353671	33.7956316432379	14.2	37
39.2128467630887	32.1148016486944	6.3	7.1
40.9724569718095	32.1148020004941	21.3	6.9
40.9724569718095	32.1148020004941	9.4	7.1
45.2611573821653	32.1148023505312	24.4	6.9
49.9659972207737	32.1148027068802	39.4	6.9
49.9659972207737	32.1148027068802	36.2	6.9
55.0619874230512	32.1148029158893	66.9	14.2
55.0619874230512	32.1148029158893	52.8	15.7
60.0807724580876	32.1148031322711	60.6	22
60.0807724580876	32.1148031322711	63.8	14.2
65.0932903324259	32.1148033616116	63.8	31.4
70.148559777207	32.1148037165488	70.9	31.5
70.148559777207	32.1148037165488	67.7	31.5
75.2578406551164	32.1148040163158	85.8	37
75.2578406551164	32.1148040163158	70.9	49.6
80.3573111439793	32.1148041419436	63.8	65.4
80.3573111439793	32.1148041419436	67.7	49.6
86.6137602140206	32.1148044944018	67.7	65.4
95.4171644592758	32.1148048138162	100	73.2
95.4171644592758	32.1148048138162	70.9	65.4
114.504539744663	32.1148047568976	142.5	49.6
114.504539744663	32.1148047568976	99.2	63
131.245590527861	32.1148043943269	130.7	73.2
131.245590527861	32.1148043943269	136.2	65.4
131.245590527861	32.1148043943269	148.8	49.6
131.245590527861	32.1148043943269	129.9	63
131.245590527861	32.1148043943269	161.4	29.1
131.245590527861	32.1148043943269	136.2	49.6
131.245590527861	32.1148043943269	155.1	29.1
131.245590527861	32.1148043943269	148.8	29.1
131.245590527861	32.1148043943269	142.5	29.1
131.245590527861	32.1148043943269	136.2	29.1
131.245590527861	32.1148043943269	141.7	17.3
131.245590527861	32.1148043943269	116.5	37
131.245590527861	32.1148043943269	127.6	20.5
142.963686885392	32.1148065002153	149.6	-7.9
142.963686885392	32.1148065002153	141.7	-7.9
150.031101019681	32.1148053737874	148.8	65.4
150.031101019681	32.1148053737874	142.5	65.4
157.736139641811	32.1148055079101	161.4	65.4
157.736139641811	32.1148055079101	155.1	65.4
165.545011585829	32.1148061287055	173.2	18.9
173.31818405517	32.1148053768958	155.1	49.6
173.31818405517	32.1148053768958	178	37
181.686653093168	32.1148059934214	161.4	49.6
181.686653093168	32.1148059934214	191.3	63
190.48990517478	32.1148059805068	192.1	73.2
196.537802879986	32.1148064048425	208.7	37
202.508985842542	32.1148067756797	218.9	20.5
208.318160320773	32.1148069333996	222	18.9
214.024567971268	32.1148068666015	227.6	31.5
214.024567971268	32.1148068666015	231.5	31.5
219.463349403849	32.1148067957962	227.6	49.6

Solution x	Solution y	Original x	Original y
219.463349403849	32.1148067957962	231.5	49.6
224.75221191428	32.1148067501486	222.8	73.2
224.75221191428	32.1148067501486	222	63
233.48950796971	32.1148069253081	227.6	65.4
233.48950796971	32.1148069253081	231.5	65.4
243.204704384585	32.1148070539553	234.6	65.4
243.204704384585	32.1148070539553	234.6	49.6
254.788745332123	32.1148063853263	263	63
254.788745332123	32.1148063853263	234.6	31.5
254.788745332123	32.1148063853263	224.4	14.2
254.788745332123	32.1148063853263	249.6	37
254.788745332123	32.1148063853263	240.2	22
254.788745332123	32.1148063853263	233.1	14.2
254.788745332123	32.1148063853263	236.2	14.2
254.788745332123	32.1148063853263	240.2	15.7
254.788745332123	32.1148063853263	248	14.2
254.788745332123	32.1148063853263	280.3	37
254.788745332123	32.1148063853263	275.6	6.9
254.788745332123	32.1148063853263	278.7	6.9
275.94012667123	32.1148082431346	308.7	6.9
275.940126679138	34.4595135130525	305.5	6.9
275.940126679443	40.58997393978	290.6	6.9
275.940126679443	40.58997393978	293.7	6.9
275.940126677223	97.3036053143306	255.9	121.3
275.940126677223	97.3036053143306	286.6	121.3
275.940126677223	97.3036053143306	301.6	127.6
275.940126677223	97.3036053143306	263.8	73.2
275.940126677223	97.3036053143306	294.5	73.2
275.940126677223	97.3036053143306	293.7	63
275.940126670052	114.149561494168	275.6	140
275.940126663919	127.907666861334	278.7	140
275.940126663919	127.907666861334	290.6	140
275.940126657452	140.315871488984	293.7	140
275.940126657452	140.315871488984	305.5	140
275.940126649271	153.03073931528	308.7	140
275.940126639839	169.360497231826	294.5	206.3
273.243672301582	168.28393130772	280.3	170.1
270.553976022808	167.206497906049	263.8	206.3
270.553976022808	167.206497906049	263	196.1
268.114683226594	165.890046420159	293.7	196.1
268.114683226594	165.890046420159	252.8	127.6
268.114683226594	165.890046420159	283.5	127.6
263.069953012249	165.810013154422	249.6	170.1
258.231709803759	165.72996130007	248	147.3
253.565978718064	165.649965632865	233.1	147.3
253.565978718064	165.649965632865	236.2	147.3
249.389531145198	165.570088875086	240.2	148.8
245.327979808016	165.490264169144	234.6	164.6
245.327979808016	165.490264169144	240.2	155.1
241.407610796929	165.410467275445	231.5	164.6
237.581678804206	165.330680175964	227.6	182.7
233.856609700709	165.250854018341	231.5	182.7
233.856609700709	165.250854018341	234.6	182.7
230.189052697504	165.170970362199	231.5	198.5
230.189052697504	165.170970362199	234.6	198.5
226.500402284846	165.090774417034	227.6	198.5
222.84145039697	165.010417325691	222.8	206.3
222.84145039697	165.010417325691	222	196.1
219.980380957129	164.198174555402	208.7	170.1
219.980380957129	164.198174555402	227.6	164.6
217.16013572161	163.38594967786	218.9	153.6
217.16013572161	163.38594967786	222	152
214.349262662528	162.583999276218	211.8	127.6
214.349262662528	162.583999276218	215	121.3
200.709117280132	162.519737647992	173.2	152
200.709117280132	162.519737647992	224.4	147.3
188.20049009882	162.455582538755	181.1	127.6
188.20049009882	162.455582538755	184.3	121.3
188.200489056639	163.383094177749	155.1	182.7
188.200489056639	163.383094177749	178	170.1
188.200487631642	164.278786142122	161.4	182.7
188.200487631642	164.278786142122	191.3	196.1
188.200486363731	165.144325681619	192.1	206.3
172.616385792166	165.12241792869	161.4	198.5
172.616385792166	165.12241792869	155.1	198.5
164.076772596924	165.100449737275	148.8	182.7
164.076772596924	165.100449737275	142.5	182.7
156.980175527596	165.078475536003	155.1	162.2
150.012687555739	165.056518514293	148.8	198.5
150.012687555739	165.056518514293	142.5	198.5

Solution x	Solution y	Original x	Original y
143.612904118545	165.03451983625	136.2	182.7
137.413980443167	165.012522794174	136.2	198.5
131.350766204126	164.990505810089	130.7	206.3
131.350766204126	164.990505810089	129.9	196.1
130.174093224442	163.58058287177	116.5	170.1
129.00002197717	162.172429664779	119.7	127.6
129.00002197717	162.172429664779	122.8	121.3
129.000021305668	169.486970066624	141.7	150.4
129.000021305668	169.486970066624	127.6	153.6
129.000020637234	177.827687640746	161.4	162.2
129.000020637234	177.827687640746	148.8	162.2
129.000019967291	188.941229770647	142.5	162.2
129.000019967291	188.941229770647	136.2	162.2
129.000019294558	207.263966626268	99.2	196.1
129.000019000015	235.761749458499	92.1	254.4
129.000019000015	235.761749458499	100	206.3
129.665775580541	258.178945591388	89	260.7
132.867547963406	263.037090981008	119.7	260.7
136.136228502192	267.937438973646	122.8	254.4
139.485391062441	273.002889167429	116.5	303.2
139.485391062441	273.002889167429	127.6	286.7
143.765459511548	276.751339975858	136.2	315.8
143.765459511548	276.751339975858	136.2	295.3
149.141804748558	278.893679204911	148.8	315.8
149.141804748558	278.893679204911	142.5	315.8
155.106980035167	280.571483005894	161.4	315.8
155.106980035167	280.571483005894	155.1	315.8
160.864215810547	282.040759598319	148.8	295.3
166.872582634924	283.502812281221	142.5	295.3
166.872582634924	283.502812281221	141.7	283.5
174.262863620279	284.958578190921	173.2	285.1
174.262863620279	284.958578190921	155.1	295.3
182.308365730724	286.411548866504	161.4	295.3
191.299998191576	287.859997816563	191.3	329.2
191.299998191576	287.859997816563	178	303.2
197.656444520252	287.859997029897	181.1	260.7
197.656444520252	287.859997029897	184.3	254.4
205.927391209669	287.859996193262	227.6	315.8
212.647875940763	287.859995374061	208.7	303.2
212.647875940763	287.859995374061	218.9	286.7
219.510777763651	287.859994578732	211.8	260.7
219.510777763651	287.859994578732	215	254.4
227.061125317354	287.859993747707	222	285.1
227.061125317354	287.859993747707	224.4	280.4
234.998984297322	287.859992936557	233.1	280.4
234.998984297322	287.859992936557	236.2	280.4
243.201643168769	287.859992121425	240.2	281.9
251.681877057148	287.859991301472	240.2	288.2
260.71201047694	287.859990513421	255.9	254.4
270.433819626932	287.859989710333	301.6	260.7
270.326335791749	288.139298274558	305.5	273.1
270.326335791749	288.139298274558	308.7	273.1
267.578275554452	290.297650104077	227.6	297.7
267.578275554452	290.297650104077	231.5	297.7
267.578275554452	290.297650104077	234.6	297.7
267.578275554452	290.297650104077	249.6	303.2
267.578275554452	290.297650104077	248	280.4
267.578275554452	290.297650104077	280.3	303.2
267.578275554452	290.297650104077	252.8	260.7
267.578275554452	290.297650104077	275.6	273.1
267.578275554452	290.297650104077	278.7	273.1
267.578275554452	290.297650104077	290.6	273.1
267.578275554452	290.297650104077	293.7	273.1
267.578275554452	290.297650104077	283.5	260.7
267.578275554452	290.297650104077	286.6	254.4
266.100030061669	306.293661700891	293.7	329.2
264.544855840829	316.376371004491	234.6	315.8
263.04575874781	326.655576890946	222	329.2
262.674807798144	330.917126377462	227.6	331.6
262.31010762578	335.185426240014	234.6	331.6
261.948148577498	339.527084923302	222.8	339.4
261.948148577498	339.527084923302	231.5	315.8
261.610764071874	345.610465217258	231.5	331.6
261.277346087195	352.317990487165	263.8	339.4
261.277346087195	352.317990487165	263	329.2
260.943813802059	360.103575710676	294.5	339.4
260.595489871499	389.72450512317	301.6	393.8
252.865877915421	392.715985045642	283.5	393.8
252.865877915421	392.715985045642	286.6	387.5
238.277413368998	395.789011326895	255.9	387.5

Solution x	Solution y	Original x	Original y
222.5899250473	398.918890939145	252.8	393.8
198.734121299229	402.111879644137	211.8	393.8
198.734121299229	402.111879644137	215	387.5

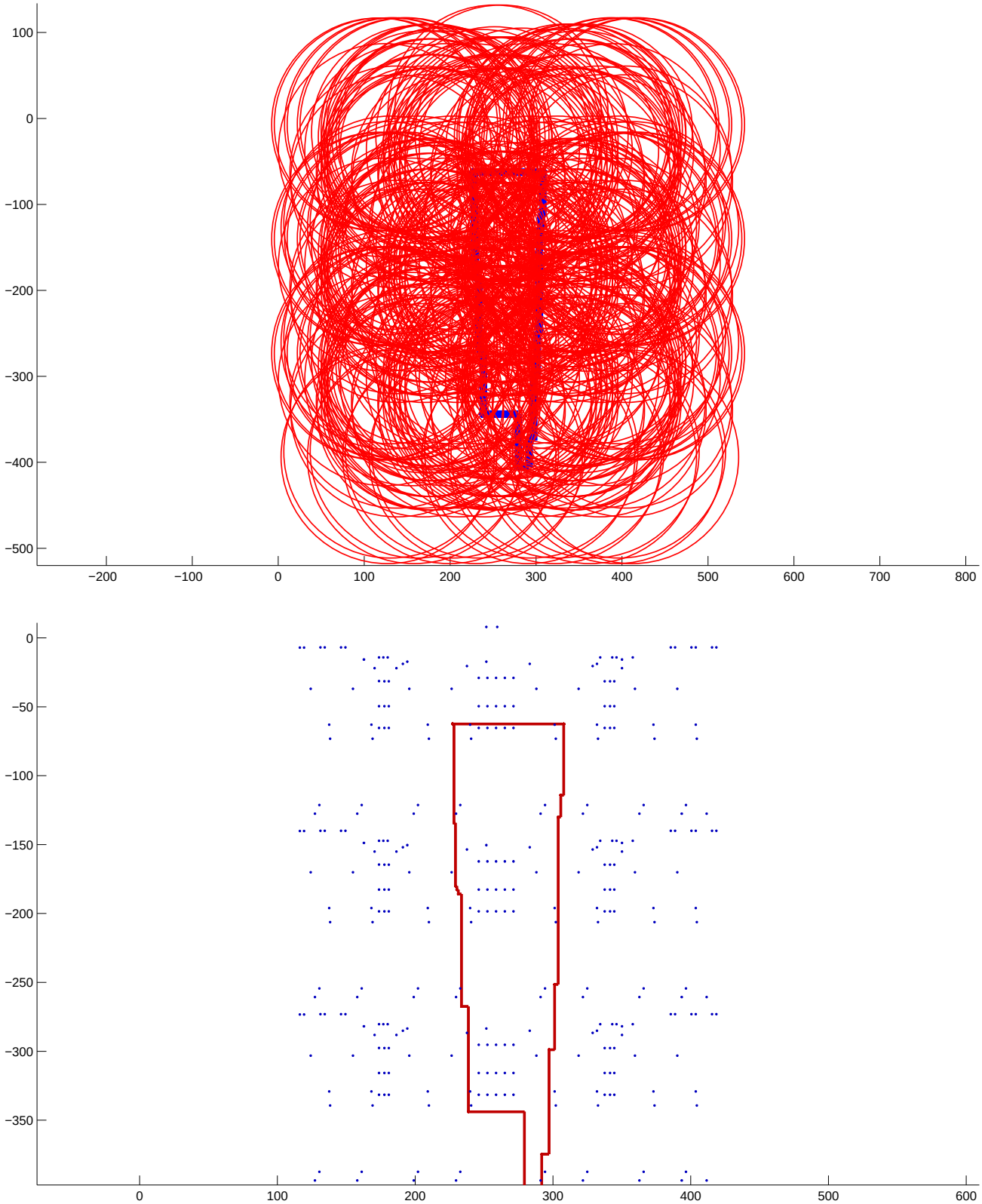


Figure N.120: $lin318$, $r = 124.02$, Equal Radius, 2D, Manhattan, Length = 847.1658812

Table N-123: Solution for $lin318$, $r = 124.02$, Equal Radius, 2D, Manhattan

Total distance: 847.165881190547			
Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
181.933889075554	374.684488006079	301.6	393.8
181.933889075554	374.684488006079	283.5	393.8
181.933889075554	374.684488006079	286.6	387.5
181.933889075554	374.684488006079	252.8	393.8
181.933889075554	374.684488006079	255.9	387.5
181.933889075554	374.684488006079	211.8	393.8
181.933889075554	374.684488006079	215	387.5
181.933889075554	374.684488006079	181.1	393.8
181.933889075554	374.684488006079	184.3	387.5
187.158668487983	298.851246554601	294.5	339.4
187.158668487983	298.851246554601	293.7	329.2
187.158668487983	298.851246554601	263	329.2
187.158668487983	298.851246554601	280.3	303.2
187.158668487983	298.851246554601	249.6	303.2
187.158668487983	298.851246554601	234.6	297.7
187.158668487983	298.851246554601	231.5	297.7
187.158668487983	298.851246554601	248	280.4
187.158668487983	298.851246554601	240.2	288.2
187.158668487983	298.851246554601	227.6	297.7
187.158668487983	298.851246554601	240.2	281.9
187.158668487983	298.851246554601	236.2	280.4
187.158668487983	298.851246554601	233.1	280.4
187.158668487983	298.851246554601	252.8	260.7
187.158668487983	298.851246554601	255.9	254.4
187.158668487983	298.851246554601	222	285.1
187.158668487983	298.851246554601	218.9	286.7
187.158668487983	298.851246554601	224.4	280.4
187.158668487983	298.851246554601	211.8	260.7
187.158668487983	298.851246554601	215	254.4
191.278061529167	251.497010770924	263.8	339.4
191.278061529167	251.497010770924	308.7	273.1
191.278061529167	251.497010770924	305.5	273.1
191.278061529167	251.497010770924	293.7	273.1
191.278061529167	251.497010770924	290.6	273.1
191.278061529167	251.497010770924	301.6	260.7
191.278061529167	251.497010770924	278.7	273.1
191.278061529167	251.497010770924	275.6	273.1
191.278061529167	251.497010770924	283.5	260.7
191.278061529167	251.497010770924	286.6	254.4
191.278061529167	251.497010770924	294.5	206.3
191.278061529167	251.497010770924	293.7	196.1
193.82974663954	129.987933498909	293.7	63
193.82974663954	129.987933498909	294.5	73.2
193.82974663954	129.987933498909	301.6	127.6
193.82974663954	129.987933498909	308.7	140
193.82974663954	129.987933498909	305.5	140
193.82974663954	129.987933498909	286.6	121.3
193.82974663954	129.987933498909	283.5	127.6
193.82974663954	129.987933498909	293.7	140
193.82974663954	129.987933498909	290.6	140
193.82974663954	129.987933498909	278.7	140
193.82974663954	129.987933498909	275.6	140
193.82974663954	129.987933498909	255.9	121.3
193.82974663954	129.987933498909	280.3	170.1
193.82974663954	129.987933498909	263.8	206.3
193.82974663954	129.987933498909	263	196.1
195.728949442197	114.252251340155	263	63
195.728949442197	114.252251340155	263.8	73.2
195.728949442197	114.252251340155	252.8	127.6
195.728949442197	114.252251340155	248	147.3
195.728949442197	114.252251340155	215	121.3
195.728949442197	114.252251340155	240.2	148.8
195.728949442197	114.252251340155	236.2	147.3
195.728949442197	114.252251340155	233.1	147.3
195.728949442197	114.252251340155	240.2	155.1
195.728949442197	114.252251340155	211.8	127.6
195.728949442197	114.252251340155	249.6	170.1
195.728949442197	114.252251340155	224.4	147.3
195.728949442197	114.252251340155	234.6	164.6
195.728949442197	114.252251340155	222	152
195.728949442197	114.252251340155	231.5	164.6
195.728949442197	114.252251340155	218.9	153.6
195.728949442197	114.252251340155	227.6	164.6
195.728949442197	114.252251340155	234.6	182.7
195.728949442197	114.252251340155	231.5	182.7
195.728949442197	114.252251340155	227.6	182.7
195.728949442197	114.252251340155	231.5	198.5
195.728949442197	114.252251340155	227.6	198.5
195.728949442197	114.252251340155	208.7	170.1
195.728949442197	114.252251340155	222	196.1
197.828150875444	62.4733434086325	308.7	6.9
197.828150875444	62.4733434086325	305.5	6.9
197.828150875444	62.4733434086325	293.7	6.9
197.828150875444	62.4733434086325	290.6	6.9
197.828150875444	62.4733434086325	278.7	6.9
197.828150875444	62.4733434086325	275.6	6.9
197.828150875444	62.4733434086325	280.3	37
197.828150875444	62.4733434086325	248	14.2
197.828150875444	62.4733434086325	240.2	15.7
197.828150875444	62.4733434086325	236.2	14.2
197.828150875444	62.4733434086325	233.1	14.2
197.828150875444	62.4733434086325	240.2	22
197.828150875444	62.4733434086325	249.6	37
197.828150875444	62.4733434086325	224.4	14.2
197.828150875444	62.4733434086325	234.6	31.5
197.828150875444	62.4733434086325	222	18.9
197.828150875444	62.4733434086325	231.5	31.5
197.828150875444	62.4733434086325	218.9	20.5
197.828150875444	62.4733434086325	227.6	31.5
197.828150875444	62.4733434086325	234.6	49.6
197.828150875444	62.4733434086325	231.5	49.6
197.828150875444	62.4733434086325	227.6	49.6
197.828150875444	62.4733434086325	208.7	37
197.828150875444	62.4733434086325	234.6	65.4
197.828150875444	62.4733434086325	231.5	65.4
197.828150875444	62.4733434086325	227.6	65.4
197.828150875444	62.4733434086325	222	63
197.828150875444	62.4733434086325	222.8	73.2
197.828150875444	62.4733434086325	191.3	63
197.828150875444	62.4733434086325	192.1	73.2
117.271866871538	62.4733445571778	6.3	7.1
117.271866871538	62.4733445571778	9.4	7.1
117.271866871538	62.4733445571778	21.3	6.9
117.271866871538	62.4733445571778	24.4	6.9
117.271866871538	62.4733445571778	36.2	6.9
117.271866871538	62.4733445571778	39.4	6.9
117.271866871538	62.4733445571778	14.2	37
117.271866871538	62.4733445571778	52.8	15.7
117.271866871538	62.4733445571778	63.8	14.2
117.271866871538	62.4733445571778	66.9	14.2
117.271866871538	62.4733445571778	44.9	37
117.271866871538	62.4733445571778	60.6	22
117.271866871538	62.4733445571778	70.1	14.2
117.271866871538	62.4733445571778	27.6	63
117.271866871538	62.4733445571778	63.8	31.4
117.271866871538	62.4733445571778	76.4	22
117.271866871538	62.4733445571778	67.7	31.5
117.271866871538	62.4733445571778	81.1	18.9
117.271866871538	62.4733445571778	28.3	73.2
117.271866871538	62.4733445571778	84.3	17.3
117.271866871538	62.4733445571778	70.9	31.5
117.271866871538	62.4733445571778	63.8	49.6
117.271866871538	62.4733445571778	67.7	49.6
117.271866871538	62.4733445571778	70.9	49.6
117.271866871538	62.4733445571778	58.3	63
117.271866871538	62.4733445571778	85.8	37
117.271866871538	62.4733445571778	63.8	65.4
117.271866871538	62.4733445571778	59.1	73.2
117.271866871538	62.4733445571778	67.7	65.4
117.271866871538	62.4733445571778	141.7	-7.9
117.271866871538	62.4733445571778	70.9	65.4
117.271866871538	62.4733445571778	149.6	-7.9
117.271866871538	62.4733445571778	127.6	20.5
117.271866871538	62.4733445571778	116.5	37
117.271866871538	62.4733445571778	141.7	17.3
117.271866871538	62.4733445571778	173.2	18.9
117.271866871538	62.4733445571778	99.2	63
117.271866871538	62.4733445571778	136.2	29.1
117.271866871538	62.4733445571778	142.5	29.1
117.271866871538	62.4733445571778	178	37
117.271866871538	62.4733445571778	100	73.2
117.271866871538	62.4733445571778	148.8	29.1
117.271866871538	62.4733445571778	161.4	29.1
117.271866871538	62.4733445571778	155.1	29.1

Solution x	Solution y	Original x	Original y
117.271866871538	62.4733445571778	136.2	49.6
117.271866871538	62.4733445571778	142.5	49.6
117.271866871538	62.4733445571778	129.9	63
117.271866871538	62.4733445571778	148.8	49.6
117.271866871538	62.4733445571778	136.2	65.4
117.271866871538	62.4733445571778	161.4	49.6
117.271866871538	62.4733445571778	130.7	73.2
117.271866871538	62.4733445571778	155.1	49.6
117.271866871538	62.4733445571778	142.5	65.4
117.271866871538	62.4733445571778	92.1	121.3
117.271866871538	62.4733445571778	148.8	65.4
117.271866871538	62.4733445571778	161.4	65.4
117.271866871538	62.4733445571778	155.1	65.4
117.271866871538	62.4733445571778	122.8	121.3
117.271866871538	62.4733445571778	119.7	127.6
118.189912535786	134.244242223525	66.9	147.3
118.189912535786	134.244242223525	89	127.6
118.189912535786	134.244242223525	70.1	147.3
118.189912535786	134.244242223525	76.4	155.1
118.189912535786	134.244242223525	81.1	152
118.189912535786	134.244242223525	84.3	150.4
118.189912535786	134.244242223525	70.9	164.6
118.189912535786	134.244242223525	184.3	121.3
118.189912535786	134.244242223525	85.8	170.1
118.189912535786	134.244242223525	181.1	127.6
118.189912535786	134.244242223525	127.6	153.6
118.189912535786	134.244242223525	116.5	170.1
118.189912535786	134.244242223525	99.2	196.1
118.189912535786	134.244242223525	141.7	150.4
118.189912535786	134.244242223525	173.2	152
118.189912535786	134.244242223525	136.2	162.2
118.189912535786	134.244242223525	142.5	162.2
118.189912535786	134.244242223525	148.8	162.2
118.189912535786	134.244242223525	161.4	162.2
118.189912535786	134.244242223525	155.1	162.2
119.213293501418	180.07532862353	60.6	288.2
119.213293501418	180.07532862353	63.8	280.4
119.213293501418	180.07532862353	66.9	280.4
119.213293501418	180.07532862353	70.1	280.4
119.213293501418	180.07532862353	81.1	285.1
119.213293501418	180.07532862353	84.3	283.5
119.213293501418	180.07532862353	89	260.7
119.213293501418	180.07532862353	92.1	254.4
119.213293501418	180.07532862353	119.7	260.7
119.213293501418	180.07532862353	122.8	254.4
119.213293501418	180.07532862353	181.1	260.7
119.213293501418	180.07532862353	184.3	254.4
119.213293501418	180.07532862353	234.6	198.5
119.213293501418	180.07532862353	222.8	206.3
119.213293501418	180.07532862353	100	206.3
119.213293501418	180.07532862353	192.1	206.3
119.213293501418	180.07532862353	178	170.1
119.213293501418	180.07532862353	130.7	206.3
119.213293501418	180.07532862353	191.3	196.1
119.213293501418	180.07532862353	136.2	182.7
119.213293501418	180.07532862353	129.9	196.1
119.213293501418	180.07532862353	136.2	198.5
119.213293501418	180.07532862353	142.5	182.7
119.213293501418	180.07532862353	142.5	198.5
119.213293501418	180.07532862353	148.8	182.7
119.213293501418	180.07532862353	161.4	182.7
119.213293501418	180.07532862353	148.8	198.5
119.213293501418	180.07532862353	155.1	182.7
119.213293501418	180.07532862353	161.4	198.5
119.213293501418	180.07532862353	155.1	198.5
120.194543771838	182.704376299265	51.2	121.3
120.194543771838	182.704376299265	48	127.6
120.194543771838	182.704376299265	36.2	140
120.194543771838	182.704376299265	39.4	140
120.194543771838	182.704376299265	52.8	148.8
120.194543771838	182.704376299265	63.8	147.3
120.194543771838	182.704376299265	44.9	170.1
120.194543771838	182.704376299265	60.6	155.1
120.194543771838	182.704376299265	63.8	164.5
120.194543771838	182.704376299265	67.7	164.6
120.194543771838	182.704376299265	59.1	206.3
120.194543771838	182.704376299265	63.8	182.7
120.194543771838	182.704376299265	58.3	196.1
120.194543771838	182.704376299265	67.7	182.7
120.194543771838	182.704376299265	63.8	198.5

Solution x	Solution y	Original x	Original y
120.194543771838	182.704376299265	70.9	182.7
120.194543771838	182.704376299265	67.7	198.5
120.194543771838	182.704376299265	70.9	198.5
121.264175143121	185.878112468949	20.5	121.3
121.264175143121	185.878112468949	17.3	127.6
121.264175143121	185.878112468949	6.3	140.2
121.264175143121	185.878112468949	9.4	140.2
121.264175143121	185.878112468949	21.3	140
121.264175143121	185.878112468949	24.4	140
121.264175143121	185.878112468949	14.2	170.1
123.582656237393	267.438990866259	28.3	339.4
123.582656237393	267.438990866259	27.6	329.2
123.582656237393	267.438990866259	14.2	303.2
123.582656237393	267.438990866259	6.3	273.3
123.582656237393	267.438990866259	9.4	273.3
123.582656237393	267.438990866259	44.9	303.2
123.582656237393	267.438990866259	21.3	273.1
123.582656237393	267.438990866259	24.4	273.1
123.582656237393	267.438990866259	17.3	260.7
123.582656237393	267.438990866259	36.2	273.1
123.582656237393	267.438990866259	20.5	254.4
123.582656237393	267.438990866259	39.4	273.1
123.582656237393	267.438990866259	52.8	281.9
123.582656237393	267.438990866259	48	260.7
123.582656237393	267.438990866259	51.2	254.4
123.582656237393	267.438990866259	28.3	206.3
123.582656237393	267.438990866259	27.6	196.1
128.646216424796	343.884139047145	17.3	393.8
128.646216424796	343.884139047145	20.5	387.5
128.646216424796	343.884139047145	48	393.8
128.646216424796	343.884139047145	51.2	387.5
128.646216424796	343.884139047145	89	393.8
128.646216424796	343.884139047145	92.1	387.5
128.646216424796	343.884139047145	59.1	339.4
128.646216424796	343.884139047145	119.7	393.8
128.646216424796	343.884139047145	58.3	329.2
128.646216424796	343.884139047145	63.8	331.6
128.646216424796	343.884139047145	122.8	387.5
128.646216424796	343.884139047145	67.7	331.6
128.646216424796	343.884139047145	70.9	331.6
128.646216424796	343.884139047145	234.6	331.6
128.646216424796	343.884139047145	63.8	315.8
128.646216424796	343.884139047145	231.5	331.6
128.646216424796	343.884139047145	222.8	339.4
128.646216424796	343.884139047145	67.7	315.8
128.646216424796	343.884139047145	227.6	331.6
128.646216424796	343.884139047145	70.9	315.8
128.646216424796	343.884139047145	100	339.4
128.646216424796	343.884139047145	222	329.2
128.646216424796	343.884139047145	234.6	315.8
128.646216424796	343.884139047145	63.8	297.6
128.646216424796	343.884139047145	231.5	315.8
128.646216424796	343.884139047145	99.2	329.2
128.646216424796	343.884139047145	67.7	297.7
128.646216424796	343.884139047145	227.6	315.8
128.646216424796	343.884139047145	70.9	297.7
128.646216424796	343.884139047145	192.1	339.4
128.646216424796	343.884139047145	85.8	303.2
128.646216424796	343.884139047145	76.4	288.2
128.646216424796	343.884139047145	130.7	339.4
128.646216424796	343.884139047145	191.3	329.2
128.646216424796	343.884139047145	129.9	329.2
128.646216424796	343.884139047145	208.7	303.2
128.646216424796	343.884139047145	136.2	331.6
128.646216424796	343.884139047145	142.5	331.6
128.646216424796	343.884139047145	116.5	303.2
128.646216424796	343.884139047145	148.8	331.6
128.646216424796	343.884139047145	136.2	315.8
128.646216424796	343.884139047145	161.4	331.6
128.646216424796	343.884139047145	155.1	331.6
128.646216424796	343.884139047145	142.5	315.8
128.646216424796	343.884139047145	178	303.2
128.646216424796	343.884139047145	148.8	315.8
128.646216424796	343.884139047145	161.4	315.8
128.646216424796	343.884139047145	155.1	315.8
128.646216424796	343.884139047145	136.2	295.3
128.646216424796	343.884139047145	127.6	286.7
128.646216424796	343.884139047145	142.5	295.3
128.646216424796	343.884139047145	148.8	295.3
128.646216424796	343.884139047145	173.2	285.1

Solution x	Solution y	Original x	Original y
128.646216424796	343.884139047145	161.4	295.3
128.646216424796	343.884139047145	141.7	283.5
128.646216424796	343.884139047145	155.1	295.3

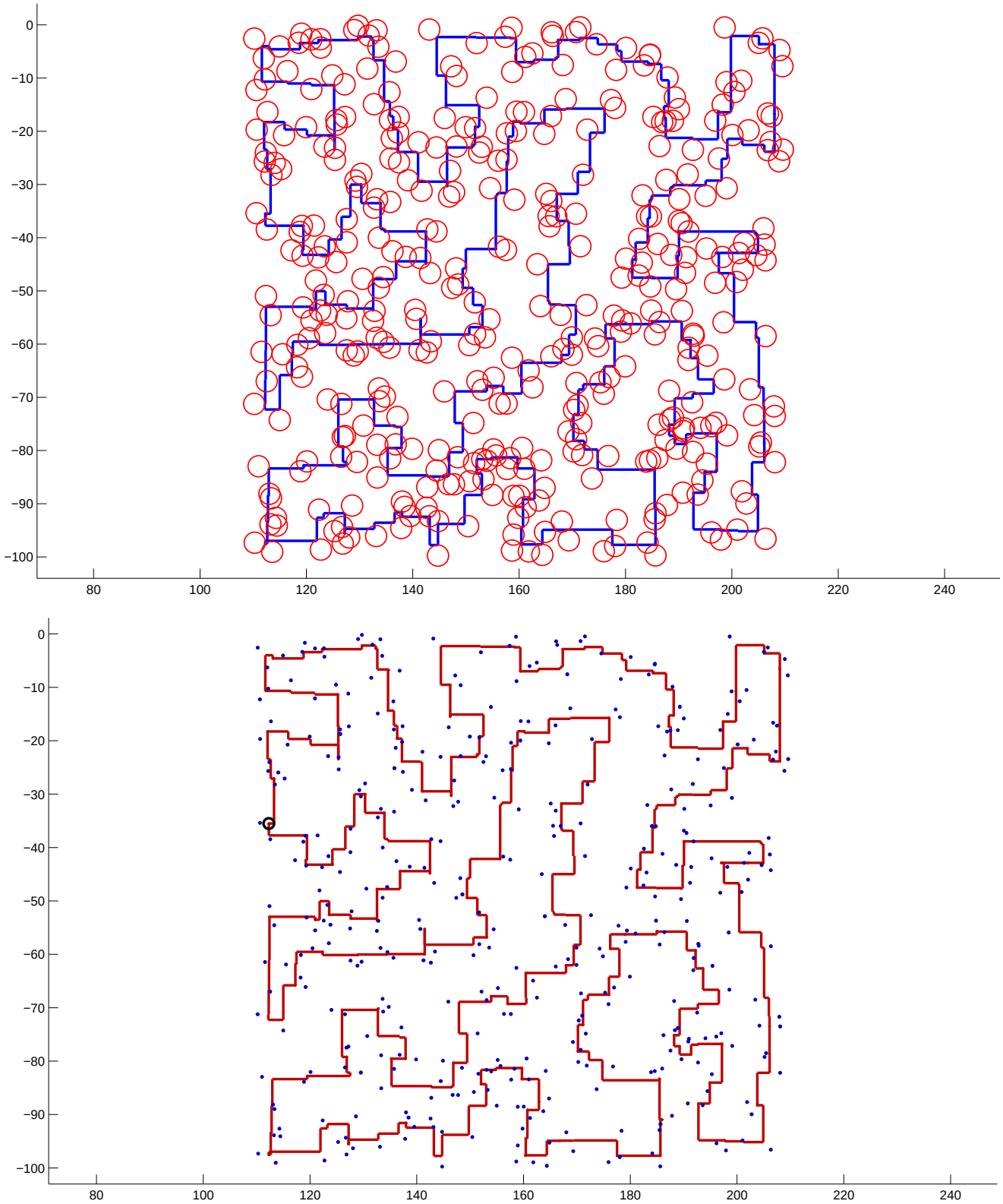


Figure N.121: $rd400$, $r = 1.9910618$, Equal Radius, 2D, Manhattan, Length = 1257.3570213

Table N-124: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 2D, Manhattan

Total distance: 1257.35702126831 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
3.26727874448613	27.100102774391	5.25835	27.1001
3.26727874448613	27.100102774391	3.44571	28.2052
3.26727874448613	27.100102774391	4.056	25.9589
3.26727874448613	27.100102774391	2.1823	25.6845
2.65162415586116	23.4598895671008	2.38826	24.0295
2.04886391624326	18.2737536782509	0.65945	19.6999
2.04886391624326	18.2737536782509	2.68873	16.3883
5.91903147907159	19.6752381395137	5.81823	20.7452
10.0988874170838	20.7813143598486	9.96077	19.2347
15.2995809318332	23.4006692268752	15.3897	25.3897
15.2995809318332	23.4006692268752	15.3759	23.0999
15.2995809318332	23.4006692268752	13.4	22.8874
15.299628924661	17.3231997128227	17.2907	17.3232
15.299628924661	17.3231997128227	15.6993	18.7479
15.299628924661	17.3231997128227	15.6444	17.8995
15.2230938407756	11.3382877234495	17.1854	11.1942
15.2230938407756	11.3382877234495	14.8737	9.51072
10.9071912676756	11.016601787384	10.9524	12.0779
6.43356441330123	10.6740387819622	6.43447	8.70233
1.71083984625477	10.6171447485958	0.613562	12.2624
1.71083984625477	10.6171447485958	2.19732	10.251
1.6276675490502	3.99281756644805	0.219756	2.58493
3.0402639862271	4.58705925447878	4.96047	4.06059
3.0402639862271	4.58705925447878	2.00806	6.28968
8.80222688352077	3.41011220515154	8.57052	3.36732
8.80222688352077	3.41011220515154	9.0496	1.67955
12.2918246882185	2.86813275769084	12.7116	4.29147
12.2918246882185	2.86813275769084	12.6307	2.70835
12.2918246882185	2.86813275769084	10.9477	2.73525
19.7286995671702	2.18978692419518	19.0116	0.977048
19.7286995671702	2.18978692419518	19.7287	0.198716
22.3164847275023	2.71678522676971	23.5387	4.13129
22.3164847275023	2.71678522676971	23.1984	1.0131
22.3164847275023	2.71678522676971	21.7245	2.01127
22.6170902272762	6.65713913630851	21.4744	8.21886
24.8068288316931	6.90194788742932	26.7979	6.90196
24.6136464714502	14.3711064626754	25.6231	12.6549
24.6136464714502	14.3711064626754	22.6997	14.9199
25.713256433527	17.1716885649289	27.3595	17.3028
26.3355834105125	19.6014997113582	27.2482	20.2425
26.3355834105125	19.6014997113582	26.0672	21.3383
26.3355834105125	19.6014997113582	25.7178	17.895
27.2246640816175	23.8942250774961	27.4222	25.8428
27.2246640816175	23.8942250774961	25.8125	25.1372
30.627167295519	23.9935027061378	31.0765	22.0815
30.9937353492175	29.477256544687	31.6686	31.1822
30.9937353492175	29.477256544687	29.1053	29.2049
36.4548514649308	30.2956890985982	37.7688	31.4408
36.4548514649308	30.2956890985982	36.8488	32.2474
36.4548606482932	27.0555759974369	37.0272	27.4581
36.4548698265937	23.0393154806221	38.2173	22.874
36.4548698265937	23.0393154806221	34.4638	23.0393
41.3033166935899	22.559586571798	42.4972	23.9973
41.3033166935899	22.559586571798	42.987	22.9253
41.7123615201256	19.1894694791946	41.7205	19.4188
41.7123615201256	19.1894694791946	39.9475	19.2268
42.4882987457391	15.0980007130357	43.8962	13.6901
36.2596395634088	15.5292980042198	36.0033	17.5038
36.2596236205906	9.53778905909437	38.2491	9.61738
36.2596236205906	9.53778905909437	37.2177	7.79249
34.5163978757133	2.29065581835398	33.1085	0.882753
41.9100514941841	2.39609978285024	42.0178	3.44287
48.3884317510009	2.49954423869648	47.3917	2.23053
48.3884317510009	2.49954423869648	48.5894	0.54797
49.4071034216086	6.99858569049419	48.6979	8.85907
49.4071034216086	6.99858569049419	51.1528	6.04103
52.7624420342461	6.56657121459643	52.4925	5.37248
56.9116507421705	6.17600986119972	58.2097	7.56071
57.3521675360842	2.84845286935248	56.3237	2.07366
57.3521675360842	2.84845286935248	56.1254	1.40532
61.506899949325	2.47318004326076	60.7013	1.36116
61.506899949325	2.47318004326076	61.5069	0.482106
64.7945787804344	3.68018431581634	64.5769	3.66176
68.4351573146544	4.89088588903339	70.1018	4.34543
69.2282033137947	6.89954475306135	68.2389	8.47105
74.2946915896858	7.3562401353256	73.4709	7.6166
74.2946915896858	7.3562401353256	74.5771	5.70821
74.2946915896858	7.3562401353256	74.632	5.60444
76.7028535814612	10.4172604369077	77.911	9.90186
78.1328140500826	15.2706192549629	80.035	15.8589
78.1328140500826	15.2706192549629	79.2919	13.6517
77.2365761499309	17.3084023827098	75.2455	17.3084
77.2365761499309	17.3084023827098	76.9072	18.2917
77.2365761499309	17.3084023827098	77.5205	18.1054
77.2365761499309	17.3084023827098	78.906	18.0381
77.572325175899	21.2492195162027	76.419	22.7841
82.6838999712391	21.4972227433293	82.6839	23.4883
87.3750427760361	16.4248830180407	86.8707	18.0065
87.3750427760361	16.4248830180407	88.2698	14.9994
89.8116506772124	10.7490319701428	90.4883	12.6216
89.8116506772124	10.7490319701428	88.9914	10.7701
89.8116506772124	10.7490319701428	91.7898	10.5225
89.8116449810377	2.10013466165704	88.6343	0.494442
95.0846674726005	3.64609459412312	95.0473	3.39817
95.0846674726005	3.64609459412312	95.7659	2.55349
98.003977136911	6.4798007484479	99.5164	7.77478
98.003977136911	6.4798007484479	98.9579	4.73211
98.0039769546195	16.7464503827957	96.7716	16.6523
98.0039769546195	16.7464503827957	97.4766	17.1802
98.0039767754116	23.8552077647615	96.7473	23.5618
98.0039767754116	23.8552077647615	98.8743	25.646
98.0039767754116	23.8552077647615	99.5853	23.4577
96.0962408875526	22.5566143512406	97.2905	22.0419
91.9714297439309	21.4220324445068	90.11	20.7153
91.9714297439309	21.4220324445068	93.1464	19.8146
89.1390054431917	25.1760695253354	87.5589	25.1226
88.0618760631174	29.2647075791515	89.036	30.7257
85.0688998069236	30.1390221102673	85.0689	32.1301
81.7106006688558	30.1030772139077	81.7106	28.112
78.9388064189129	30.5209881780877	77.6794	29.1288
78.4182560041796	32.0662893943579	80.1207	32.7664
74.9332640910858	32.8186559327249	73.2088	32.0501
74.5491841776564	36.27058899812	74.0572	35.987
74.5491841776564	36.27058899812	74.7866	36.0265
74.1705973194196	40.8925504213909	72.565	40.2263
74.1705973194196	40.8925504213909	76.05	41.1841
71.8958549720903	44.118888414873	70.0979	43.9308
71.8958549720903	44.118888414873	73.064	44.6995
71.2696768969161	47.5055032977411	69.2786	47.5055
71.2696768969161	47.5055032977411	72.4782	47.1166
74.8332811926809	47.5945082944643	74.6616	49.1772
79.5131739911489	47.6790339944376	79.5061	49.6701
79.5131739911489	47.6790339944376	81.1997	46.621
79.7963229745128	43.4794802928473	78.6058	43.2582
79.7963229745128	43.4794802928473	81.4209	43.6493
80.0505963434959	38.8439776550013	81.8496	38.8539
80.0505963434959	38.8439776550013	80.0506	36.8529
80.0505963434959	38.8439776550013	80.5435	37.2793
94.4674005812378	39.3514520873856	95.9404	38.2332
94.9060996108299	42.8645516438737	94.61	43.2995
94.9060996108299	42.8645516438737	96.3235	44.2629
94.9060996108299	42.8645516438737	96.1419	41.3034
92.0678357927704	42.8645525365102	91.3249	42.8902
92.0678357927704	42.8645525365102	92.3029	41.017
87.0436912407292	42.8645534545491	85.2354	42.0312
87.0436912407292	42.8645534545491	88.1955	43.6361
87.5408922547501	46.6772726126065	86.8559	48.4797
90.3061443506918	46.9067183413623	90.8764	48.3318
90.3061443506918	46.9067183413623	92.0634	46.0336
90.4078752585249	55.8673777156652	88.4474	55.9131
94.5349512501313	58.7584667386442	96.3481	58.4969
95.0605863652947	68.1260829012284	93.4248	68.5015
95.9696122103726	71.6327053435034	97.9153	71.697
96.0845259804118	73.5110878761926	94.2046	73.3577
96.0845259804118	73.5110878761926	98.0725	73.509
96.0906666710975	78.6543265407484	95.4573	78.5053
96.0906666710975	78.6543265407484	95.1537	79.2325
96.0968147649019	82.1977004981828	98.0879	82.1977
93.7942246011884	88.2652466791108	91.8947	87.6684
93.7942246011884	88.2652466791108	92.7385	89.9534
94.9147984338942	95.1744790376654	96.3227	96.5824
91.1697010399585	94.9978050913863	91.0373	94.8618
87.6718849699619	94.8216225391784	86.1563	95.4019
87.6718849699619	94.8216225391784	87.9339	96.7331

Solution x	Solution y	Original x	Original y
82.7687834460068	87.9353998476004	80.7777	87.9354
82.7687834460068	87.9353998476004	83.5669	88.2708
84.8859568851	84.0165384470939	85.2864	82.465
84.8859568851	84.0165384470939	84.4594	85.6238
87.1551461294849	76.774822503993	86.1254	75.412
87.1551461294849	76.774822503993	87.0562	74.7862
87.1551461294849	76.774822503993	89.1084	77.1611
82.5850513003	76.9256577849929	80.9911	75.8316
82.5850513003	76.9256577849929	84.0931	75.7357
81.3876391369548	78.7666027657877	79.6042	79.6519
81.3876391369548	78.7666027657877	82.6909	80.2719
79.2407137941428	77.2140056122466	77.5352	78.0347
79.2407137941428	77.2140056122466	80.8889	76.3527
78.2124809781145	75.1455995094484	76.2214	75.1456
78.2124809781145	75.1455995094484	78.3667	74.2083
78.2124809781145	75.1455995094484	78.9206	73.8168
79.2452027519367	70.1878461069572	78.2186	68.7569
82.638595367161	69.284056447891	82.5413	70.9361
86.5801184549101	66.6381998423613	88.5712	66.6382
83.6363947171519	62.6387080282812	81.8209	62.9891
83.6363947171519	62.6387080282812	85.3959	62.1638
82.2338146417255	59.2519563611183	82.7455	58.0479
82.2338146417255	59.2519563611183	82.834	58.4111
82.2338146417255	59.2519563611183	81.8774	60.6902
80.5674565213078	55.7443036246868	80.6139	53.7748
74.9875032593291	55.6883829954416	74.8357	53.7031
74.9875032593291	55.6883829954416	76.3859	55.8636
74.9874737190509	56.249374606755	75.5117	58.1702
68.9969720990974	56.2493811489265	67.8108	54.6502
68.9969720990974	56.2493811489265	69.3672	55.5594
68.9969720990974	56.2493811489265	69.1414	57.6653
68.9969720990974	56.2493811489265	70.983	56.1077
66.2483775967995	58.9530043603026	64.2573	58.953
66.2483775967995	58.9530043603026	64.8783	60.379
67.9484212863398	64.1831982696333	69.9395	64.1832
66.0020374436232	67.5478872253173	65.3011	67.1869
66.0020374436232	67.5478872253173	66.9764	66.2314
66.0020374436232	67.5478872253173	65.9297	69.3415
62.0530936100158	68.5391570185118	60.771	67.3196
61.1502772852863	73.1871421819288	60.9907	71.4945
61.1502772852863	73.1871421819288	60.356	72.3736
61.1502772852863	73.1871421819288	61.6789	74.8507
60.1956234037988	78.1801732921606	59.2712	76.4167
60.1956234037988	78.1801732921606	60.7208	77.8844
60.1956234037988	78.1801732921606	60.2539	80.1704
62.2630628173016	79.8045722137433	61.8453	80.8454
64.7734200116114	81.0279014124221	66.7645	81.0279
64.7734173276788	83.5797192204468	63.6977	85.2552
75.450656477099	83.3170281188337	73.8931	82.0767
75.450656477099	83.3170281188337	74.5996	81.8744
75.450656477099	83.3170281188337	75.9957	81.402
75.4788032703356	90.9433179771723	75.4786	92.9344
75.9483804497113	90.9433211593317	75.6586	91.7899
75.9483804497113	90.9433211593317	77.8131	90.2453
75.6359106991532	97.7162160820313	74.1314	97.2935
75.6359106991532	97.7162160820313	75.6359	99.7073
67.5211418477873	97.7162125228952	65.9332	98.9174
67.5211418477873	97.7162125228952	68.0526	97.9535
67.5211407179223	94.8573465950583	68.3546	93.0491
59.3616216424298	94.8900542738754	59.3326	96.8644
56.8135926381685	94.9100749438527	54.8665	95.2849
56.8135926381685	94.9100749438527	58.0371	93.3465
54.3559687417756	97.6343429243706	54.3707	99.6057
50.3138043394827	97.6797768549737	48.6626	98.7924
50.3138043394827	97.6797768549737	51.8363	98.9629
50.4088332220078	94.5040116014108	49.8328	92.6571
50.4088332220078	94.5040116014108	48.9418	95.7946
50.7258979677985	89.1504720252965	48.934	88.5471
50.7258979677985	89.1504720252965	50.0418	88.5256
50.7258979677985	89.1504720252965	51.2472	90.6526
52.878297962166	87.5778783025026	54.7886	87.0165
52.878297962166	87.5778783025026	53.7144	89.3849
52.8782168613924	83.3534881918814	54.169	81.8375
49.6959205527714	83.3534183422676	47.7087	83.4773
49.6959205527714	83.3534183422676	50.9984	83.4341
49.6959201905624	81.2948243593764	50.5772	79.5094
49.6959201905624	81.2948243593764	48.3206	81.4332
44.7493651442631	81.6263247233351	45.1636	79.7971
44.7493651442631	81.6263247233351	45.6946	80.9262
44.7493651442631	81.6263247233351	43.9629	81.9344

Solution x	Solution y	Original x	Original y
44.7493651442631	81.6263247233351	43.0779	81.6476
42.0383682595463	84.3034397731873	41.546	82.3742
42.0383682595463	84.3034397731873	43.3068	85.4106
42.0383682595463	84.3034397731873	40.7053	85.7824
43.0048205510718	88.3516015256396	44.9959	88.3516
39.7440755984485	93.7892210464922	40.4171	94.2218
34.757900105949	97.760719574626	34.7579	99.7518
33.1936662239754	92.4594289280477	32.5896	90.759
33.1936662239754	92.4594289280477	34.7487	93.2543
33.1936662239754	92.4594289280477	33.1283	92.3481
27.9893040522564	91.5931785405902	27.9893	89.6021
27.9893040522564	91.5931785405902	28.4623	90.5817
27.9893040522564	91.5931785405902	29.5533	92.3189
26.5956523472503	93.5668726000451	27.8353	94.5623
22.7845736671958	94.7136767686102	23.1083	96.0553
17.229700610858	95.525287877787	16.7243	94.3593
17.229700610858	95.525287877787	18.064	96.3276
17.229700610858	95.525287877787	15.2733	95.1553
17.229700610858	95.525287877787	16.854	97.4806
17.229755219339	91.7838356284084	18.6101	90.3489
13.2549385611926	92.6079745014258	12.3803	91.1149
11.9674795272787	96.9648787480109	12.7313	98.6134
2.2800760709282	97.5267112208217	3.57801	99.0366
2.2800760709282	97.5267112208217	0.299018	97.3272
2.65275444367143	93.5018385312532	4.28894	92.6489
2.65275444367143	93.5018385312532	4.45069	94.0863
2.65275444367143	93.5018385312532	3.24988	93.8751
2.7941271269757	88.5398632219717	3.06059	88.1315
2.7941271269757	88.5398632219717	3.35356	88.986
2.93324616284673	83.3588507683315	1.02508	82.9527
9.49837462901687	82.7757359585471	10.1219	82.045
9.49837462901687	82.7757359585471	8.89064	83.8954
17.5314230482415	82.1482976774614	19.5225	82.1483
16.874549019694	79.2248060475943	17.2306	77.2747
16.874549019694	79.2248060475943	16.8354	77.4785
16.874549019694	79.2248060475943	16.5471	81.1813
16.0051751189337	70.4083898015654	16.576	71.2313
16.0051751189337	70.4083898015654	14.0141	70.4084
22.792184013614	70.1545545670076	23.6206	68.344
22.792184013614	70.1545545670076	24.7619	69.8637
22.792184013614	70.1545545670076	23.7167	70.7298
22.717275976059	75.3080041813879	20.7262	75.308
26.7945222652104	75.5752656781969	27.1361	73.6904
27.8970279655707	79.5373906453812	29.8827	79.684
27.8970279655707	79.5373906453812	26.7929	78.8352
25.2216081655056	79.5374195584968	23.3293	78.9181
25.2216081655056	79.5374195584968	25.7615	81.4539
25.2779180317258	84.6707633076007	23.3569	85.0798
32.8630443744444	84.8940092532089	34.4937	83.7515
32.8630443744444	84.8940092532089	32.7208	86.88
36.6196603212313	84.7546652039225	37.7453	86.3505
36.6196603212313	84.7546652039225	36.723	86.3354
36.8324317716394	80.3208971021153	38.4806	81.2568
36.8324317716394	80.3208971021153	34.9224	79.9328
39.422022816224	74.8199000057757	41.4131	74.8199
37.9004761176751	68.8825039158331	35.9094	68.8825
43.9407192511641	67.8652616284212	45.2184	66.3382
43.9407192511641	67.8652616284212	42.1545	66.9856
43.9407192511641	67.8652616284212	43.1006	68.5786
47.0142655496084	69.2966028581787	47.6475	71.1843
47.0142655496084	69.2966028581787	46.3399	71.17
50.5207235057682	68.1255947990731	52.5118	68.1256
50.4213966772706	63.5031084570753	48.6743	62.5481
50.4213966772706	63.5031084570753	51.793	64.9464
57.9683273205864	62.0405689243988	56.0439	62.2937
57.9683273205864	62.0405689243988	58.3448	60.9201
57.9683273205864	62.0405689243988	59.9164	61.9972
59.3878001728339	58.2176781732723	59.9164	58.75
60.6610233940395	52.6724050183294	62.6521	52.6724
57.8424987795515	52.5584638621353	57.8122	54.5104
55.6923256903488	51.9829264036178	54.0007	52.8659
55.416475138095	44.9898006665619	53.4254	44.9898
59.5347243983449	41.6033997601486	61.5258	41.6034
59.3149681710441	36.8657165343031	60.6972	35.5066
57.2232494183721	36.6146991394194	55.717	37.8511
57.2232494183721	36.6146991394194	55.5492	35.9315
57.2232494183721	36.6146991394194	56.9788	35.9946
57.0900743972454	31.770999417246	56.0389	33.1015
57.0900743972454	31.770999417246	55.099	31.771
61.0400598978961	27.6281703037781	62.0154	28.1819

Solution x	Solution y	Original x	Original y
63.3200300826086	20.2695642802847	62.8285	19.7058
66.0701547887054	15.7428074262746	68.0574	15.6194
66.0701547887054	15.7428074262746	67.267	14.1516
58.7987579618781	15.9013022347419	58.7637	13.9566
54.738695827004	18.4941262588465	54.7387	20.4852
54.738695827004	18.4941262588465	55.9929	17.1432
50.1059064725182	18.2218431361296	49.4045	19.961
50.1059064725182	18.2218431361296	49.4944	16.327
50.1059064725182	18.2218431361296	50.9211	16.4053
48.874101792358	20.9977595878087	47.6864	20.3976
47.957993397201	25.5681306860558	47.6331	25.3181
47.957993397201	25.5681306860558	46.0829	25.5503
47.6621398599195	31.6083427019797	49.1148	32.8614
45.9361682961573	32.0001170684958	44.5404	30.686
45.6253302912449	42.138331261688	47.522	42.292
45.6253302912449	42.138331261688	46.2037	41.7062
39.9788809186184	45.7571994139742	38.1612	45.7549
39.4015741778935	49.4355996303976	38.5534	48.7846
39.4015741778935	49.4355996303976	37.4105	49.4356
41.3333567802821	52.6476737305706	41.6783	52.1535
43.1014497083798	56.8205091960415	44.4217	55.3301
43.1014497083798	56.8205091960415	43.5841	58.7522
43.1014497083798	56.8205091960415	41.7302	58.1199
40.6270954045477	58.192824646968	40.6271	60.1839
31.4831374123116	55.2689120438309	30.4468	53.5688
31.4831374123116	55.2689120438309	30.6696	55.2626
31.4831395748831	59.9478079466522	33.4192	59.483
31.4831395748831	59.9478079466522	32.641	61.5676
31.4831395748831	59.9478079466522	31.2678	61.1344
24.3083149697798	60.0402993870533	25.6513	60.6643
24.3083149697798	60.0402993870533	24.5176	59.5849
24.3083149697798	60.0402993870533	23.2085	58.8069
18.9042002613595	60.1360256186709	19.6656	61.3862
18.9042002613595	60.1360256186709	18.9042	62.1271
18.9042002613595	60.1360256186709	17.6011	61.1721
12.3534065649223	59.5311186389097	13.5318	57.9262
12.3534065649223	59.5311186389097	10.4725	58.878
7.456873898032	61.6840104010238	8.30742	60.1487
7.456873898032	61.6840104010238	5.5259	61.9092
7.27053399245175	65.8103379290835	8.25408	64.3565
7.27053399245175	65.8103379290835	9.17265	66.1356
4.99968054444429	72.2822245841122	4.99968	74.2733
2.18594002584405	71.2335000666227	0.194865	71.2335
2.25839984889544	66.6791064434775	2.55217	66.9796
2.33071144710721	61.1059792890131	1.5771	61.4642
2.40389175228857	52.9718726720167	2.40393	50.9808
2.40389175228857	52.9718726720167	3.30116	54.5758
10.9638005743213	53.5267265892067	9.35555	53.1101
10.9638005743213	53.5267265892067	10.9638	55.5178
11.7937009488147	50.0377728572279	11.7937	48.0467
13.5858082105957	52.5962296846611	13.2524	50.7626
13.5858082105957	52.5962296846611	13.8308	54.4775
13.5858082105957	52.5962296846611	12.5872	53.6987
17.6088338256795	53.3076942481007	17.8085	51.9553
17.6088338256795	53.3076942481007	17.5187	55.1629
22.5440434624271	53.625826052494	22.8193	53.7552
22.5440434624271	53.625826052494	22.5447	55.6169
22.5521189509834	47.7835791667528	23.6126	49.4214
22.5521189509834	47.7835791667528	24.4594	47.3987
22.5521189509834	47.7835791667528	20.5641	47.7219
26.8769180669231	44.4329809259483	28.6889	43.6077
26.8769180669231	44.4329809259483	26.2003	42.5604
32.4745260145986	44.8298449396643	33.2771	46.652
32.4745260145986	44.8298449396643	31.4339	43.8079
32.47452743824	38.8185098590562	34.4656	38.8185
32.47452743824	38.8185098590562	32.7353	38.4372
24.6222126516286	38.401021043427	23.6339	40.0124
23.9450024922454	33.517149102517	25.7714	33.2927
23.9450024922454	33.517149102517	22.7183	34.3604
23.9450024922454	33.517149102517	23.2874	32.7742
20.3288002977209	30.0130717340478	19.5262	30.4483
20.3288002977209	30.0130717340478	19.247	29.2712
20.3288002977209	30.0130717340478	20.3288	28.022
18.288852448513	36.0672122572057	17.6023	36.5196
16.6167782123903	40.3179295123545	17.5856	40.8861
14.1953581124752	43.2159787524045	15.6372	44.5891
14.1953581124752	43.2159787524045	12.2621	43.6923
14.1953581124752	43.2159787524045	13.4598	41.6191
9.21032214519511	42.3798986761324	9.27453	43.3967
9.21032214519511	42.3798986761324	7.21925	42.3799

Solution x	Solution y	Original x	Original y
9.43472807937569	37.7411997636237	11.4258	37.7412
9.43472807937569	37.7411997636237	8.75416	38.928
9.43472807937569	37.7411997636237	9.16001	37.8018
2.29362807955923	36.504105516478	2.57158	38.4711
2.29362807955923	36.504105516478	0.642906	35.395

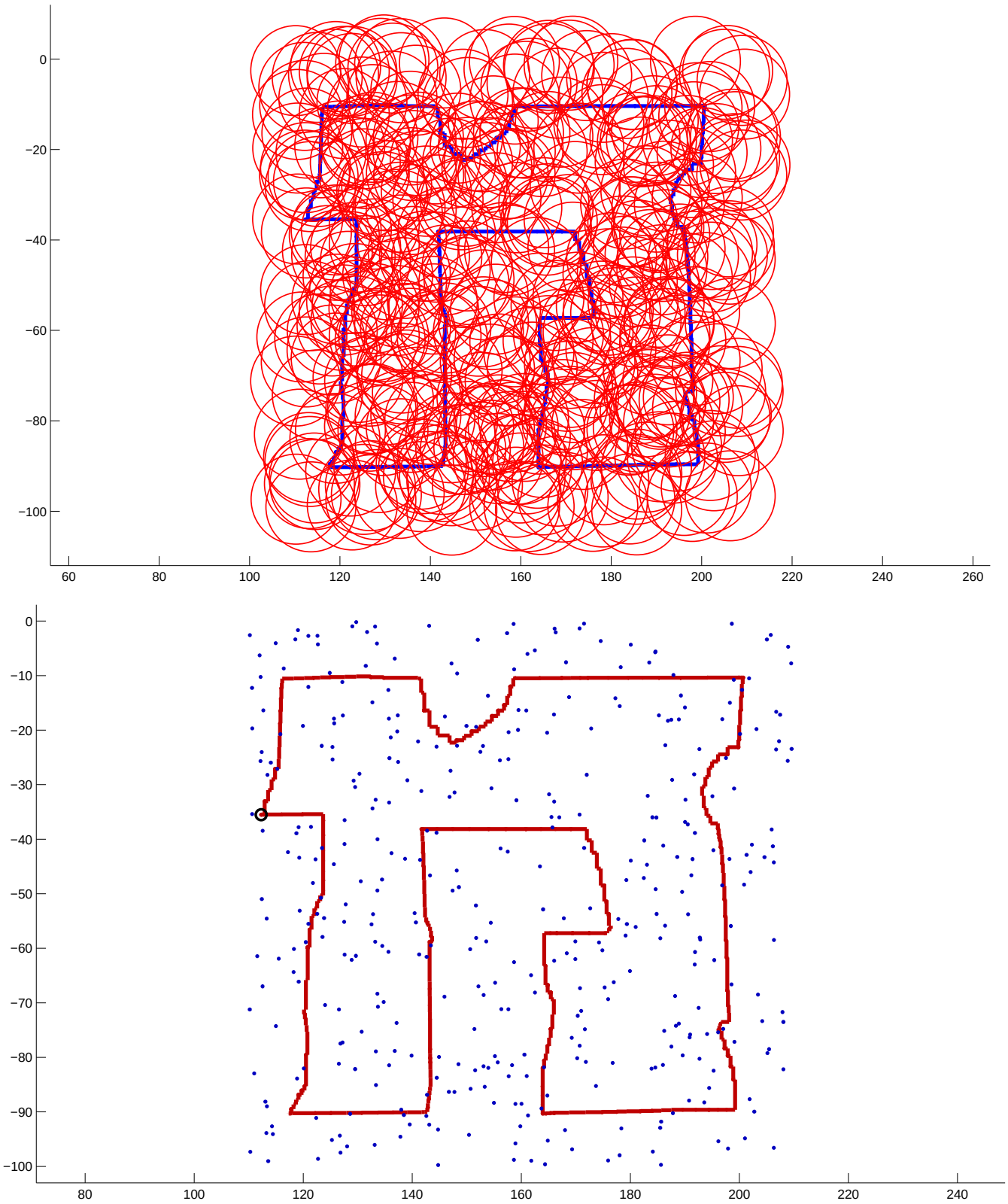


Figure N.122: $rd400$, $r = 9.955309$, Equal Radius, 2D, Manhattan, Length = 528.3877623

Table N-125: Solution for $rd400$, $r = 9.955309$, Equal Radius, 2D, Manhattan

Total distance: 528.387762291707 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
2.91409136117146	33.0439221768861	2.1823	25.6845
2.91409136117146	33.0439221768861	0.642906	35.395
3.55516236986935	30.9984098297572	3.44571	28.2052
4.19751592453588	29.0306465677479	5.25835	27.1001
4.83844344128504	27.1139294755192	2.38826	24.0295
4.83844344128504	27.1139294755192	4.056	25.9589
5.48924492986524	25.3042994934072	15.3897	25.3897
5.58248242729408	23.1354820302402	15.3759	23.0999
5.66228131374775	21.0195744548373	13.4	22.8874
5.74132164615472	18.7684764460382	5.81823	20.7452
5.74132164615472	18.7684764460382	9.96077	19.2347
5.82019646716086	16.4565278761151	0.613562	12.2624
5.82019646716086	16.4565278761151	2.68873	16.3883
5.82019646716086	16.4565278761151	0.65945	19.6999
5.90000599608712	14.2402075665578	6.43447	8.70233
5.90000599608712	14.2402075665578	10.9524	12.0779
5.97954011978426	12.304586888798	4.96047	4.06059
5.97954011978426	12.304586888798	8.57052	3.36732
6.05856481211566	11.4107624782651	2.00806	6.28968
6.13793454958743	10.5550331861604	0.219756	2.58493
8.28386953306588	10.4968320630502	12.7116	4.29147
10.1761901272476	10.4388941264386	14.8737	9.51072
11.9633842100457	10.3809769566304	2.19732	10.251
11.9633842100457	10.3809769566304	17.1854	11.1942
11.9633842100457	10.3809769566304	21.4744	8.21886
11.9633842100457	10.3809769566304	15.6444	17.8995
11.9633842100457	10.3809769566304	15.6993	18.7479
11.9633842100457	10.3809769566304	17.2907	17.3232
13.0910629722354	10.3220995138558	9.0496	1.67955
14.9868838345671	10.2651142235899	10.9477	2.73525
14.9868838345671	10.2651142235899	12.6307	2.70835
17.6032517216607	10.2089994683734	19.0116	0.977048
19.7287004202098	10.1540271626815	19.7287	0.198716
22.3826232417732	10.2794800163585	23.5387	4.13129
22.3826232417732	10.2794800163585	26.7979	6.90196
24.7760435741554	10.4064364135906	21.7245	2.01127
24.7760435741554	10.4064364135906	23.1984	1.0131
31.0454510801251	10.5490952382995	33.1085	0.882753
31.6321406324895	13.1343749490827	37.2177	7.79249
32.1951566478779	16.3907186927682	22.6997	14.9199
32.1951566478779	16.3907186927682	25.6231	12.6549
32.1951566478779	16.3907186927682	25.7178	17.895
32.1951566478779	16.3907186927682	27.3595	17.3028
32.1951566478779	16.3907186927682	26.0672	21.3383
32.1951566478779	16.3907186927682	27.2482	20.2425
32.1951566478779	16.3907186927682	38.2491	9.61738
32.1951566478779	16.3907186927682	31.0765	22.0815
32.1951566478779	16.3907186927682	36.0033	17.5038
32.1951566478779	16.3907186927682	34.4638	23.0393
32.1951566478779	16.3907186927682	39.9475	19.2268
32.1951566478779	16.3907186927682	38.2173	22.874
33.1550996638034	19.3915360168544	25.8125	25.1372
34.6638094292558	20.9755753821514	27.4222	25.8428
36.8488007041535	22.2920901929779	36.8488	32.2474
38.1190708509758	21.8625234112378	37.0272	27.4581
38.1190708509758	21.8625234112378	37.7688	31.4408
39.5043990194581	21.0285230385479	41.7205	19.4188
40.8765342858157	20.2018584948374	42.987	22.9253
40.8765342858157	20.2018584948374	42.4972	23.9973
42.2207033760471	19.348240071632	47.6331	25.3181
43.429295301456	18.4190236800055	46.0829	25.5503
44.5966643948842	17.4011310406832	43.8962	13.6901
44.5966643948842	17.4011310406832	49.4944	16.327
45.7351731532503	16.4184287548264	47.6864	20.3976
45.7351731532503	16.4184287548264	49.4045	19.961
46.8358350467728	15.3856010896571	55.9929	17.1432
46.8358350467728	15.3856010896571	54.7387	20.4852
47.4038464839376	13.7140237790085	50.9211	16.4053
47.9672544014511	11.9921483213858	51.1528	6.04103
47.9672544014511	11.9921483213858	48.6979	8.85907
48.5232062625738	10.4934887341187	48.5894	0.54797
48.902695328318	10.4779879650756	42.0178	3.44287
48.902695328318	10.4779879650756	47.3917	2.23053
53.3583794574056	10.463352600734	58.2097	7.56071
53.3583794574056	10.463352600734	52.4925	5.37248
57.4006497543961	10.4487596588149	60.7013	1.36116
57.4006497543961	10.4487596588149	56.1254	1.40532
57.4006497543961	10.4487596588149	56.3237	2.07366
59.0899250177118	10.4345687561563	58.7637	13.9566
60.8087647002998	10.4203715545527	62.8285	19.7058
62.2423621234276	10.4060713656366	70.1018	4.34543
62.2423621234276	10.4060713656366	61.5069	0.482106
62.2423621234276	10.4060713656366	64.5769	3.66176
65.9412475174985	10.4006854176358	67.267	14.1516
69.6539983110327	10.3952991674059	74.632	5.60444
69.6539983110327	10.3952991674059	74.5771	5.70821
69.6539983110327	10.3952991674059	73.4709	7.6166
72.2516396222186	10.38992180451	68.0574	15.6194
75.2616508619468	10.3845429751171	68.2389	8.47105
75.2616508619468	10.3845429751171	76.9072	18.2917
75.2616508619468	10.3845429751171	75.2455	17.3084
79.2237001224894	10.3791562168789	79.2919	13.6517
79.2237001224894	10.3791562168789	80.035	15.8589
79.2237001224894	10.3791562168789	78.906	18.0381
79.2237001224894	10.3791562168789	77.5205	18.1054
84.1490590678402	10.3737513715709	86.8707	18.0065
84.1490590678402	10.3737513715709	77.911	9.90186
89.9048630881094	10.3683415973572	99.5164	7.77478
89.9048630881094	10.3683415973572	88.6343	0.494442
90.3617796451989	10.3683417961551	95.7659	2.55349
90.7517365632232	10.3683414469292	98.9579	4.73211
90.6010613335418	11.5335098766265	95.0473	3.39817
90.4460523884349	13.8396844282946	88.9914	10.7701
90.4460523884349	13.8396844282946	90.4883	12.6216
90.2913436382191	16.3049229799263	91.7898	10.5225
90.2913436382191	16.3049229799263	97.4766	17.1802
90.2913436382191	16.3049229799263	96.7716	16.6523
90.1332296176055	19.0437773576727	93.1464	19.8146
89.9751954755953	21.7547503619159	88.2698	14.9994
89.9751954755953	21.7547503619159	98.8743	25.646
89.8065054088099	23.1290721523445	99.5853	23.4577
89.8065054088099	23.1290721523445	97.2905	22.0419
89.8065054088099	23.1290721523445	96.7473	23.5618
89.8065054088099	23.1290721523445	90.11	20.7153
87.8476254320253	24.4341002103897	87.5589	25.1226
87.8476254320253	24.4341002103897	82.6839	23.4883
86.0807381025331	25.753030523277	77.6794	29.1288
84.9890435922792	26.8823351678188	76.419	22.7841
84.371412100567	28.6037694558773	81.7106	28.112
83.7647220216169	30.3393781554848	85.0689	32.1301
83.1641104833051	32.0500945354832	73.2088	32.0501
83.4655601735041	34.2922276569792	74.0572	35.987
83.9674276233071	35.7127438290165	74.7866	36.0265
84.6700624112484	37.1094549568034	76.05	41.1841
86.0508005412269	38.0626728945729	89.036	30.7257
86.0508005412269	38.0626728945729	95.9404	38.2332
86.1867050148825	39.0363336884913	94.61	43.2995
86.1867050148825	39.0363336884913	92.3029	41.017
86.1867050148825	39.0363336884913	91.3249	42.8902
86.3141055338935	39.7886710895166	80.0506	36.8529
86.3141055338935	39.7886710895166	90.8764	48.3318
86.4352019185118	40.231270535738	80.1207	32.7664
86.4352019185118	40.231270535738	92.0634	46.0336
86.5768714718531	41.4559924300264	80.5435	37.2793
86.5768714718531	41.4559924300264	85.2354	42.0312
86.5768714718531	41.4559924300264	81.8496	38.8539
86.7211657507777	42.8132618059783	96.1419	41.3034
86.8546054073292	44.475696780081	86.8559	48.4797
86.8546054073292	44.475696780081	81.4209	43.6493
86.8546054073292	44.475696780081	78.6058	43.2582
86.9914774549548	46.1773211503652	96.3235	44.2629
87.1181585675098	48.5514088635132	81.1997	46.621
87.2461536743044	51.0546330026777	88.4474	55.9131
87.2461536743044	51.0546330026777	88.1955	43.6361
87.3735894691978	54.1431611638146	82.834	58.4111
87.3735894691978	54.1431611638146	82.7455	58.0479
87.3735894691978	54.1431611638146	80.6139	53.7748
87.3735894691978	54.1431611638146	79.5061	49.6701
87.5081480379304	58.521619528366	85.3959	62.1638
87.5081480379304	58.521619528366	81.8209	62.9891
87.5081480379304	58.521619528366	81.8774	60.6902
87.6454235399011	61.6939372927033	88.5712	66.6382
87.6454235399011	61.6939372927033	96.3481	58.4969
87.7758330564168	67.7572257514837	93.4248	68.5015

Solution x	Solution y	Original x	Original y
87.7758330564168	67.7572257514837	87.0562	74.7862
87.7758330564168	67.7572257514837	86.1254	75.412
87.9061854165347	70.4705959684516	80.8889	76.3527
87.9061854165347	70.4705959684516	80.9911	75.8316
87.9061854165347	70.4705959684516	82.5413	70.9361
88.0448739876395	71.8436437524503	97.9153	71.697
88.117188953651	73.5090174469671	98.0725	73.509
86.6564076428417	73.769612200486	78.2186	68.7569
86.4944760269856	74.2453038355774	78.9206	73.8168
86.3311014437624	74.7222087268758	77.5352	78.0347
86.3311014437624	74.7222087268758	78.3667	74.2083
86.1767108635631	75.1455598911804	76.2214	75.1456
86.7237933742762	76.7364037735929	84.0931	75.7357
87.2806184916247	78.3583794581353	84.4594	85.6238
87.2806184916247	78.3583794581353	85.2864	82.465
87.2806184916247	78.3583794581353	89.1084	77.1611
87.854188131322	79.7255019860029	94.2046	73.3577
87.854188131322	79.7255019860029	82.6909	80.2719
88.3884546830433	81.6830892345112	95.1537	79.2325
88.3884546830433	81.6830892345112	95.4573	78.5053
88.88433220161	84.0863808643877	98.0879	82.1977
88.88433220161	84.0863808643877	91.8947	87.6684
89.2195087796254	89.6072373152734	96.3227	96.5824
87.6710628927816	89.6072320784015	91.0373	94.8618
86.061992059567	89.6072268377284	87.9339	96.7331
84.4118825693804	89.6072215206069	92.7385	89.9534
84.4118825693804	89.6072215206069	86.1563	95.4019
81.9993273227465	89.6072163949494	83.5669	88.2708
79.6041937279067	89.6072111657269	79.6042	79.6519
77.5384632324238	89.6961167977353	75.9957	81.402
75.6760922728341	89.7863545586692	75.6359	99.7073
73.9395196359911	89.8376041574442	74.1314	97.2935
73.9395196359911	89.8376041574442	80.7777	87.9354
73.9395196359911	89.8376041574442	75.4786	92.9344
73.9395196359911	89.8376041574442	77.8131	90.2453
71.8470571122346	89.8884735671226	74.5996	81.8744
71.8470571122346	89.8884735671226	73.8931	82.0767
69.3089636014634	89.9402625532021	66.7645	81.0279
67.4775984265604	89.9930944910472	75.6586	91.7899
67.4775984265604	89.9930944910472	68.0526	97.9535
64.8460356916057	90.0452696924516	65.9332	98.9174
64.8460356916057	90.0452696924516	68.3546	93.0491
61.8248347397214	90.0965326713699	63.6977	85.2552
58.7592330929095	90.1479857761611	54.7886	87.0165
56.0554914313925	90.1995367330566	59.3326	96.8644
56.0554914313925	90.1995367330566	54.3707	99.6057
56.0554914313925	90.1995367330566	51.8363	98.9629
55.2768127218811	90.2458517046543	58.0371	93.3465
55.2768127218811	90.2458517046543	54.8665	95.2849
55.2768127218811	90.2458517046543	48.9418	95.7946
54.5812235876289	90.2916682298874	49.8328	92.6571
54.5812235876289	90.2916682298874	51.2472	90.6526
53.91821019369	90.3374149250697	48.6626	98.7924
53.9182102931274	88.6676502299048	53.7144	89.3849
53.9182103926144	87.0023763390243	50.0418	88.5256
53.9182104922336	85.3233704954216	44.9959	88.3516
53.9182104922336	85.3233704954216	48.934	88.5471
53.9182105949146	81.9343922119058	43.9629	81.9344
53.9182105949146	81.9343922119058	45.6946	80.9262
54.1825358460551	80.5843639755421	45.1636	79.7971
54.1825358460551	80.5843639755421	48.3206	81.4332
54.4765074037802	79.3132608932122	47.7087	83.4773
54.7802150094363	77.9297104660612	54.169	81.8375
54.7802150094363	77.9297104660612	50.9984	83.4341
55.0886828587331	76.3893546019666	50.5772	79.5094
55.4017432351043	74.7994224914594	61.8453	80.8454
55.4017432351043	74.7994224914594	60.2539	80.1704
55.4017432351043	74.7994224914594	60.7208	77.8844
55.4017432351043	74.7994224914594	59.2712	76.4167
55.6899914373453	72.1536099491873	61.6789	74.8507
55.9743893612829	69.3415048854842	65.9297	69.3415
55.4230777829179	68.0897831873482	60.356	72.3736
55.4230777829179	68.0897831873482	60.9907	71.4945
55.4230777829179	68.0897831873482	60.771	67.3196
54.8339895561499	66.7455229625222	46.3399	71.17
54.8339895561499	66.7455229625222	47.6475	71.1843
54.8339895561499	66.7455229625222	52.5118	68.1256
54.8339895561499	66.7455229625222	51.793	64.9464
54.4451238861404	63.2134291116173	45.2184	66.3382
54.4451238861404	63.2134291116173	57.8122	54.5104

Solution x	Solution y	Original x	Original y
54.1937281573418	57.2315918296114	44.4217	55.3301
55.3410359276232	57.2315914370555	54.0007	52.8659
56.511424472309	57.2315909111358	62.6521	52.6724
56.511424472309	57.2315909111358	48.6743	62.5481
59.4022633974939	57.2315906123115	64.2573	58.953
59.4022633974939	57.2315906123115	59.9164	61.9972
59.4022633974939	57.2315906123115	58.3448	60.9201
59.4022633974939	57.2315906123115	56.0439	62.2937
62.4686579296974	57.2315900928811	67.8108	54.6502
62.4686579296974	57.2315900928811	59.9164	58.75
65.3011395041441	57.2315897760988	65.3011	67.1869
65.7303206642873	56.8713512775812	66.9764	66.2314
66.1446049170592	56.4149614918747	69.9395	64.1832
66.1446049170592	56.4149614918747	75.5117	58.1702
66.4305893873968	55.8636048555319	76.3859	55.8636
66.0620596516751	53.7438442324353	74.8357	53.7031
66.0620596516751	53.7438442324353	70.983	56.1077
66.0620596516751	53.7438442324353	69.1414	57.6653
66.0620596516751	53.7438442324353	69.3672	55.5594
65.6471325104585	51.4131524885226	64.8783	60.379
65.6471325104585	51.4131524885226	70.0979	43.9308
65.2188324043424	48.4959729576879	74.6616	49.1772
65.2188324043424	48.4959729576879	72.4782	47.1166
65.2188324043424	48.4959729576879	69.2786	47.5055
64.5743164313232	45.3761599453826	73.064	44.6995
63.8484214089646	42.4672654765411	72.565	40.2263
62.9212650385096	40.2096403545563	60.6972	35.5066
62.0154092273995	38.1372106631728	62.0154	28.1819
59.0977515675819	38.1372104723417	56.9788	35.9946
59.0977515675819	38.1372104723417	61.5258	41.6034
56.2682647849506	38.1372103738446	55.099	31.771
53.6084081353989	38.1372102418536	56.0389	33.1015
50.8520452268073	38.1372100995238	55.5492	35.9315
50.8520452268073	38.1372100995238	55.717	37.8511
50.8520452268073	38.1372100995238	53.4254	44.9898
47.1644389928109	38.1372099975366	44.5404	30.686
47.1644389928109	38.1372099975366	49.1148	32.8614
44.004072876334	38.1372098130584	46.2037	41.7062
44.004072876334	38.1372098130584	47.522	42.292
40.4788983344902	38.1372096668847	38.1612	45.7549
37.409463120031	38.1372095703753	34.4656	38.8185
34.5574684811437	38.1372094478918	32.7353	38.4372
31.8357304263452	38.1372093393785	22.7183	34.3604
31.6746721740591	38.1372092304981	23.2874	32.7742
31.745876666354	38.5089850281244	29.1053	29.2049
31.8187022270345	39.3922834668303	31.6686	31.1822
31.8916221846556	40.421468864843	25.7714	33.2927
31.9661832765358	42.4854036244877	23.6339	40.0124
31.9661832765358	42.4854036244877	26.2003	42.5604
32.0420260123254	44.9095343679082	28.6889	43.6077
32.0420260123254	44.9095343679082	31.4339	43.8079
32.1180168331088	47.4605670832657	24.4594	47.3987
32.1945947950269	50.033476941435	30.4468	53.5688
32.2712755663122	52.4756533499738	22.8193	53.7552
32.351903339469	54.3639134219704	22.5447	55.6169
32.5612033754097	54.9869569019656	24.5176	59.5849
32.5612033754097	54.9869569019656	25.6513	60.6643
32.7964510640556	55.4861353314749	33.2771	46.652
32.7964510640556	55.4861353314749	37.4105	49.4356
33.0282017848163	56.077959798064	38.5534	48.7846
33.2507866148898	56.7794519377343	41.6783	52.1535
33.4436632522309	57.7813410612021	40.6271	60.1839
33.4436632522309	57.7813410612021	41.7302	58.1199
33.628789684738	58.7532840585182	43.5841	58.7522
33.4729839817223	58.7710125411574	33.4192	59.483
33.4729839817223	58.7710125411574	30.6696	55.2626
33.3179950506495	58.7888778612165	31.2678	61.1344
33.3179950506495	58.7888778612165	32.641	61.5676
33.1638102438889	58.8067599797715	23.2085	58.8069
33.1765773187701	66.1119946685731	23.6206	68.344
33.1897208780377	67.4348610142661	42.1545	66.9856
33.2027517320971	68.7898925188231	43.1006	68.5786
33.2149816279124	70.4580321540308	41.4131	74.8199
33.227085940652	71.7070624675803	35.9094	68.8825
33.2391851769443	72.9963129845669	23.7167	70.7298
33.2391851769443	72.9963129845669	24.7619	69.8637
33.2516413278792	78.5097148601387	23.3293	78.9181
33.2516413278792	78.5097148601387	26.7929	78.8352
33.2683445628031	79.3235271947256	25.7615	81.4539
33.2851619908369	80.1159157469712	29.8827	79.684

Solution x	Solution y	Original x	Original y
33.2851619908369	80.1159157469712	34.9224	79.9328
33.3020069952797	80.918856396136	27.1361	73.6904
33.3020069952797	80.918856396136	38.4806	81.2568
33.3189016569673	82.2005378850591	43.0779	81.6476
33.3352601393387	83.75454041028	41.546	82.3742
33.351489368427	85.4105994563979	43.3068	85.4106
33.2539808520122	86.1540163129177	40.7053	85.7824
33.1556912651216	86.9032142468144	36.723	86.3354
33.0572614162214	87.6575454184106	34.4937	83.7515
33.0572614162214	87.6575454184106	37.7453	86.3505
32.9585170062577	88.4398606499811	32.7208	86.88
32.8598649069048	89.2311915641608	33.1283	92.3481
32.8598649069048	89.2311915641608	32.5896	90.759
32.7612815191943	90.0123159570376	34.7579	99.7518
32.231191120973	90.0380094358708	34.7487	93.2543
31.6976760296398	90.0636782576584	40.4171	94.2218
29.0507215901698	90.0887375172817	29.5533	92.3189
26.4247583591236	90.1137924065739	28.4623	90.5817
26.4247583591236	90.1137924065739	27.9893	89.6021
23.700181549217	90.1388609189638	23.1083	96.0553
23.700181549217	90.1388609189638	27.8353	94.5623
20.7657299889514	90.1638696349524	19.5225	82.1483
20.7657299889514	90.1638696349524	23.3569	85.0798
17.9021463921089	90.1890068508076	18.064	96.3276
15.0665620727322	90.2141061409842	15.2733	95.1553
15.0665620727322	90.2141061409842	16.7243	94.3593
12.171332795163	90.2391593751683	12.7313	98.6134
12.171332795163	90.2391593751683	16.854	97.4806
7.96947624386056	90.263992674468	3.57801	99.0366
7.33849489061012	90.2877417881957	0.299018	97.3272
7.77257155197069	89.4828354161103	3.24988	93.8751
7.77257155197069	89.4828354161103	4.45069	94.0863
8.2229017312149	88.6299753731785	4.28894	92.6489
8.68088449071647	87.7561386202688	12.3803	91.1149
9.13456623947104	86.8671412718328	3.35356	88.986
9.13456623947104	86.8671412718328	3.06059	88.1315
9.13456623947104	86.8671412718328	1.02508	82.9527
9.68374954806562	86.0697503374732	8.89064	83.8954
9.68374954806562	86.0697503374732	10.1219	82.045
10.235260783698	85.3018610951192	18.6101	90.3489
10.235260783698	85.3018610951192	16.5471	81.1813
10.5076104861478	79.5109523503316	16.8354	77.4785
10.5076104861478	79.5109523503316	17.2306	77.2747
10.7708896071649	75.3080075670704	20.7262	75.308
10.6156533631804	74.1118922280226	14.0141	70.4084
10.4597863610958	72.9628472733989	8.25408	64.3565
10.4597863610958	72.9628472733989	16.576	71.2313
10.3037090967434	72.0841497362014	4.99968	74.2733
10.3037090967434	72.0841497362014	9.17265	66.1356
10.150175312341	71.2334999154481	0.194865	71.2335
10.4787531677268	65.8290674515351	2.55217	66.9796
10.8213355077481	59.8473199579979	1.5771	61.4642
10.8213355077481	59.8473199579979	5.5259	61.9092
10.8213355077481	59.8473199579979	8.30742	60.1487
10.8213355077481	59.8473199579979	10.4725	58.878
10.8213355077481	59.8473199579979	10.9638	55.5178
10.8213355077481	59.8473199579979	13.5318	57.9262
10.8213355077481	59.8473199579979	9.35555	53.1101
10.8213355077481	59.8473199579979	17.6011	61.1721
10.8213355077481	59.8473199579979	18.9042	62.1271
10.8213355077481	59.8473199579979	19.6656	61.3862
10.8213355077481	59.8473199579979	12.5872	53.6987
10.8213355077481	59.8473199579979	13.8308	54.4775
10.8213355077481	59.8473199579979	17.5187	55.1629
11.1619888113908	56.5660090448454	3.30116	54.5758
11.1619888113908	56.5660090448454	13.2524	50.7626
11.5158163884076	54.0767823462727	2.40393	50.9808
12.0394715419807	52.6860354550044	11.7937	48.0467
12.5645579963997	51.3627344135171	9.27453	43.3967
13.111474280602	50.2960897229349	13.4598	41.6191
13.6572901081466	49.4214466399799	23.6126	49.4214
13.6572910091509	47.5707343984595	12.2621	43.6923
13.6572910091509	47.5707343984595	15.6372	44.5891
13.6572919100946	45.8822163378612	17.8085	51.9553
13.6572928106659	43.953290048726	7.21925	42.3799
13.657293711481	42.0934497283876	20.5641	47.7219
13.6572946113097	39.2757331842667	17.6023	36.5196
13.6572946113097	39.2757331842667	17.5856	40.8861
13.6572955105528	36.5811308645057	19.247	29.2712
13.6572955105528	36.5811308645057	19.5262	30.4483

Solution x	Solution y	Original x	Original y
13.6572964082601	35.4111300635953	20.3288	28.022
9.82150254702535	35.4436387791366	8.75416	38.928
9.82150254702535	35.4436387791366	11.4258	37.7412
6.01068719990683	35.4761012653634	2.57158	38.4711
6.01068719990683	35.4761012653634	9.16001	37.8018

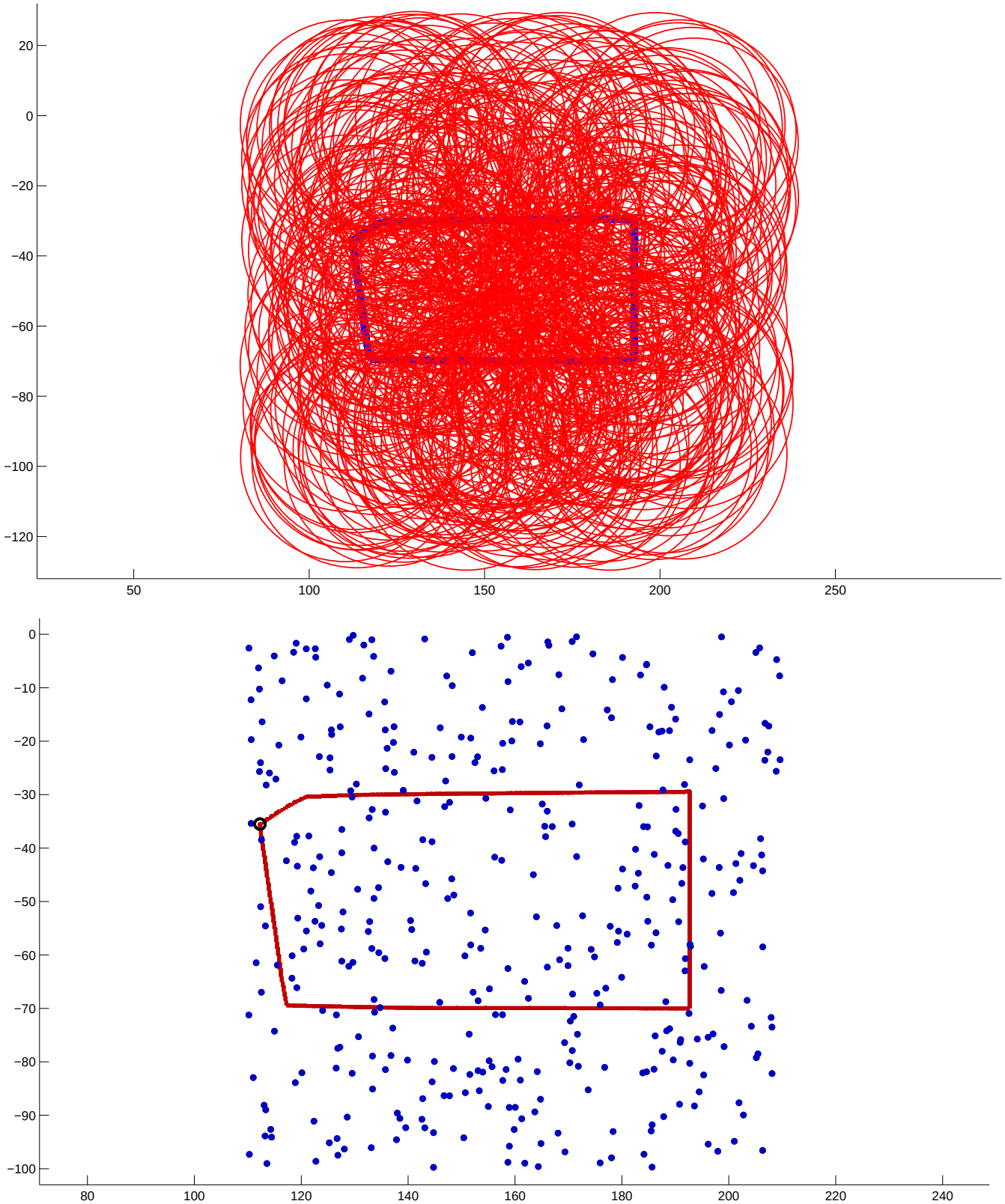


Figure N.123: $rd400$, $r = 29.865927$, Equal Radius, 2D, Manhattan, Length = 242.0228866

Table N-126: Solution for $rd400$, $r = 29.865927$, Equal Radius, 2D, Manhattan

Total distance: 242.022886637549 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
2.71082545767958	35.1865685312295	2.19732	10.251
3.13900938593594	34.8746572162777	2.00806	6.28968
3.56963729076079	34.5864140666886	0.642906	35.395
3.56963729076079	34.5864140666886	3.44571	28.2052
4.00181332128273	34.2981766140423	5.25835	27.1001
4.43404287127424	34.0106541931029	4.056	25.9589
4.43404287127424	34.0106541931029	2.1823	25.6845
4.86735650862614	33.7243431050656	2.38826	24.0295
5.30141047324287	33.4385850460244	5.81823	20.7452
5.30141047324287	33.4385850460244	0.65945	19.6999
5.73678604536818	33.1546714290553	2.68873	16.3883
5.73678604536818	33.1546714290553	0.613562	12.2624
6.17517128827463	32.8749748729314	6.43447	8.70233
6.61398414899526	32.5994847154346	8.57052	3.36732
7.04679588214114	32.3578490067178	15.3897	25.3897
7.47831528532052	32.1152675915056	15.3759	23.0999
7.47831528532052	32.1152675915056	13.4	22.8874
7.90833243128289	31.8724155896752	15.6993	18.7479
7.90833243128289	31.8724155896752	15.6444	17.8995
8.3362916832443	31.6308422434932	17.2907	17.3232
8.76257280228378	31.3898950534873	9.96077	19.2347
8.76257280228378	31.3898950534873	10.9524	12.0779
9.18942032129243	31.1505429477967	9.0496	1.67955
9.61713190146517	30.9460885209283	10.9477	2.73525
10.0436526350181	30.7480648899269	17.1854	11.1942
10.0436526350181	30.7480648899269	14.8737	9.51072
10.4667031324946	30.5518186049873	4.96047	4.06059
10.893430461998	30.3588561723093	0.219756	2.58493
13.7797508462771	30.2569521540374	12.6307	2.70835
16.7144022629451	30.1561643575709	12.7116	4.29147
19.7764875203405	30.0560659157694	19.7287	0.198716
20.5035649381701	30.0463492112348	21.7245	2.01127
20.5035649381701	30.0463492112348	19.0116	0.977048
21.2516329972142	30.0366859013837	23.1984	1.0131
21.9990881015117	30.0270443771239	26.7979	6.90196
21.9990881015117	30.0270443771239	23.5387	4.13129
22.74262287833	30.0174127252873	21.4744	8.21886
23.4894660752881	30.0077837547998	25.6231	12.6549
23.4894660752881	30.0077837547998	22.6997	14.9199
24.2390120420038	29.9981552776042	27.2482	20.2425
24.2390120420038	29.9981552776042	25.7178	17.895
24.9892140700713	29.9885276188014	25.8125	25.1372
24.9892140700713	29.9885276188014	26.0672	21.3383
25.7416181538706	29.9789039592201	29.1053	29.2049
25.7416181538706	29.9789039592201	27.4222	25.8428
26.4925982776301	29.9692830388256	19.247	29.2712
26.4925982776301	29.9692830388256	20.3288	28.022
27.2541512363254	29.9596694410187	17.6023	36.5196
27.2541512363254	29.9596694410187	19.5262	30.4483
28.0283665628926	29.9500604307336	23.2874	32.7742
28.8062938584261	29.9404521963399	24.4594	47.3987
29.5878198423854	29.9308282327779	34.4656	38.8185
30.3663047328611	29.9211894057539	25.7714	33.2927
31.1490389150305	29.9115495857063	23.6339	40.0124
31.1490389150305	29.9115495857063	22.7183	34.3604
31.9451794558885	29.9018990859413	26.2003	42.5604
32.7464207223978	29.8922275279845	28.6889	43.6077
33.5517757297102	29.8825273095212	33.2771	46.652
33.5517757297102	29.8825273095212	31.4339	43.8079
34.3610338951107	29.872732496822	32.7353	38.4372
34.3610338951107	29.872732496822	31.6686	31.1822
35.1775084348803	29.8629049190024	36.8488	32.2474
35.1775084348803	29.8629049190024	37.0272	27.4581
35.9955524030451	29.8530601180389	38.2173	22.874
35.9955524030451	29.8530601180389	34.4638	23.0393
36.8168568609315	29.8432326626979	31.0765	22.0815
37.6445487454718	29.8334115105415	36.0033	17.5038
37.6445487454718	29.8334115105415	27.3595	17.3028
38.4861428683678	29.8236169338858	38.2491	9.61738
39.3294181203031	29.813848247134	37.2177	7.79249
40.1772918287665	29.8041029855219	33.1085	0.882753
42.8880104166585	29.7946543917951	48.5894	0.54797
43.7955541465918	29.7855277939194	42.0178	3.44287
44.7112953031801	29.7764234195593	47.3917	2.23053
45.6201728236041	29.7673461268083	51.1528	6.04103
45.6201728236041	29.7673461268083	52.4925	5.37248
46.5117950736406	29.7582950355303	43.8962	13.6901
46.5117950736406	29.7582950355303	48.6979	8.85907
47.4119798333078	29.7492515927968	49.4944	16.327
48.3143383978835	29.7402065553661	50.9211	16.4053
49.218611998387	29.7311650170669	54.7387	20.4852
49.218611998387	29.7311650170669	55.9929	17.1432
50.117998279982	29.7221274992386	49.4045	19.961
50.117998279982	29.7221274992386	47.6864	20.3976
51.0273282546709	29.7131008498396	44.5404	30.686
51.0273282546709	29.7131008498396	47.6331	25.3181
51.9489478394737	29.7040704271038	46.0829	25.5503
51.9489478394737	29.7040704271038	37.7688	31.4408
52.8933657404664	29.6950352569666	42.4972	23.9973
52.8933657404664	29.6950352569666	42.987	22.9253
53.8605081676904	29.6859936003015	41.7205	19.4188
53.8605081676904	29.6859936003015	39.9475	19.2268
54.8635850119832	29.6769452791306	56.1254	1.40532
55.8614153415118	29.6679225739939	56.3237	2.07366
56.8608402326885	29.6589387327182	55.099	31.771
57.8649902305672	29.6499378021651	56.9788	35.9946
57.8649902305672	29.6499378021651	56.0389	33.1015
58.8784221051938	29.6409051043211	55.717	37.8511
58.8784221051938	29.6409051043211	55.5492	35.9315
59.9057252971573	29.6318276433525	46.2037	41.7062
59.9057252971573	29.6318276433525	49.1148	32.8614
60.9771074509293	29.6226887415853	61.5258	41.6034
62.0500520312106	29.6134766660161	60.6972	35.5066
62.0500520312106	29.6134766660161	62.0154	28.1819
63.1362798903697	29.6042055588035	64.5769	3.66176
63.1362798903697	29.6042055588035	70.1018	4.34543
64.2086180004774	29.5950203997106	74.5771	5.70821
64.2086180004774	29.5950203997106	74.632	5.60444
65.2205910940392	29.5858956490576	58.7637	13.9566
65.2205910940392	29.5858956490576	58.2097	7.56071
66.271480090489	29.5767925483357	60.7013	1.36116
67.3873468218145	29.5677330045364	61.5069	0.482106
68.9202811826841	29.558797196391	77.911	9.90186
70.4297957832812	29.5498626317716	68.2389	8.47105
71.9636064947666	29.540941713353	73.4709	7.6166
73.508209595384	29.5320382513527	88.2698	14.9994
75.0059013482973	29.5231290630998	67.267	14.1516
76.5429992874257	29.5142301100554	62.8285	19.7058
76.5429992874257	29.5142301100554	68.0574	15.6194
78.1793642537682	29.5053443398098	78.906	18.0381
79.8251102986321	29.4964607687628	76.419	22.7841
79.8251102986321	29.4964607687628	76.9072	18.2917
81.5202156901418	29.4875825741628	88.6343	0.494442
81.6179804997486	29.4806700917126	75.2455	17.3084
81.6179804997486	29.4806700917126	77.5205	18.1054
81.7161809589566	29.473759828429	80.035	15.8589
81.7161809589566	29.473759828429	79.2919	13.6517
81.8146903155109	29.4668586299784	86.8707	18.0065
81.9131556094116	29.4599562847368	93.1464	19.8146
82.0114237934212	29.4530507322993	87.5589	25.1226
82.0114237934212	29.4530507322993	90.11	20.7153
82.1098251808656	29.4461466187609	96.7473	23.5618
82.1098251808656	29.4461466187609	97.2905	22.0419
82.2079058325531	29.4392392970908	98.8743	25.646
82.2079058325531	29.4392392970908	99.5853	23.4577
82.3055916030917	29.4323254539654	95.9404	38.2332
82.3055916030917	29.4323254539654	89.036	30.7257
82.4031240813266	29.4253683914969	80.1207	32.7664
82.4031240813266	29.4253683914969	85.0689	32.1301
82.500924839828	29.4183969956843	81.7106	28.112
82.500924839828	29.4183969956843	82.6839	23.4883
82.5988931472245	29.4114385084171	98.9579	4.73211
82.6895175687831	29.4045948422712	95.7659	2.55349
82.6895175707193	29.8620344404027	95.0473	3.39817
82.6895175724583	30.4403475618459	90.4883	12.6216
82.6895175741974	31.0256637538642	88.9914	10.7701
82.6895175741974	31.0256637538642	91.7898	10.5225
82.6895175759221	31.633164044494	99.5164	7.77478
82.689517576718	32.5191385530386	73.2088	32.0501
82.689517576718	32.5191385530386	77.6794	29.1288
82.6895175778901	33.4123576983402	96.7716	16.6523
82.6895175778901	33.4123576983402	97.4766	17.1802
82.6895175786631	34.3533194599476	74.0572	35.987
82.6895175786631	34.3533194599476	74.7866	36.0265

Solution x	Solution y	Original x	Original y
82.6895175797004	35.2982705138207	72.565	40.2263
82.6895175797004	35.2982705138207	76.05	41.1841
82.6895175808781	36.2412341158044	70.0979	43.9308
82.6895175808781	36.2412341158044	73.064	44.6995
82.6895175822249	37.1774449347305	69.2786	47.5055
82.6895175822249	37.1774449347305	72.4782	47.1166
82.6895175837762	38.1029082758381	74.6616	49.1772
82.6895175853992	39.0225021218806	79.5061	49.6701
82.6895175853992	39.0225021218806	81.1997	46.621
82.6895175870754	39.9342496868081	78.6058	43.2582
82.6895175870754	39.9342496868081	81.4209	43.6493
82.6895175888538	40.8487874413847	80.0506	36.8529
82.6895175888538	40.8487874413847	80.5435	37.2793
82.6895175907645	41.7792560014589	81.8496	38.8539
82.6895175927251	42.7161427338787	85.2354	42.0312
82.6895175946947	43.6570092534223	88.1955	43.6361
82.6895175946947	43.6570092534223	91.3249	42.8902
82.6895175965857	44.6054792216667	92.3029	41.017
82.6895175965857	44.6054792216667	96.1419	41.3034
82.6895175982887	45.5688367306375	94.61	43.2995
82.6895175982887	45.5688367306375	96.3235	44.2629
82.6895175997393	46.544381175724	90.8764	48.3318
82.6895175997393	46.544381175724	92.0634	46.0336
82.689517601091	47.5292017010414	86.8559	48.4797
82.6895176024985	48.5200912105155	88.4474	55.9131
82.6895176038933	49.5105831458916	96.3481	58.4969
82.6895176050764	50.4965451381844	85.3959	62.1638
82.6895176062785	51.4786152175097	78.2186	68.7569
82.6895176062785	51.4786152175097	88.5712	66.6382
82.6895176074773	52.4355649542842	81.8774	60.6902
82.6895176074773	52.4355649542842	81.8209	62.9891
82.6895176087211	53.3903832502628	80.6139	53.7748
82.6895176087211	53.3903832502628	82.834	58.4111
82.6895176100394	54.3565151804766	75.5117	58.1702
82.6895176100394	54.3565151804766	82.7455	58.0479
82.6895176115414	55.3320745430157	77.5352	78.0347
82.6895176115414	55.3320745430157	79.6042	79.6519
82.6895176129801	56.2373978116856	74.5996	81.8744
82.6895176129801	56.2373978116856	75.9957	81.402
82.6895176144611	57.0369469082249	73.8931	82.0767
82.6895176160377	57.7928124426065	76.3859	55.8636
82.6895176178534	58.5599421540457	93.4248	68.5015
82.6895176178534	58.5599421540457	97.9153	71.697
82.6895176178534	58.5599421540457	98.0725	73.509
82.6895176188771	59.3027647084192	74.8357	53.7031
82.6895176200327	60.0544818518145	67.8108	54.6502
82.6895176200327	60.0544818518145	69.3672	55.5594
82.6895176214216	60.8192837095133	69.1414	57.6653
82.6895176214216	60.8192837095133	70.983	56.1077
82.6895176228883	61.5920384564642	69.9395	64.1832
82.6895176244598	62.366826555137	80.8889	76.3527
82.6895176244598	62.366826555137	82.6909	80.2719
82.6895176261146	63.1333560328355	80.9911	75.8316
82.6895176278363	63.8976973415742	76.2214	75.1456
82.6895176278363	63.8976973415742	78.3667	74.2083
82.6895176297701	64.6609205448805	78.9206	73.8168
82.6895176317918	65.4248419964161	82.5413	70.9361
82.6895176317918	65.4248419964161	84.0931	75.7357
82.6895176338822	66.1910774908038	86.1254	75.412
82.6895176359673	66.9572537652773	87.0562	74.7862
82.6895176359673	66.9572537652773	89.1084	77.1611
82.6895176380298	67.7242266603367	94.2046	73.3577
82.689517640009	68.4941322233282	95.4573	78.5053
82.689517640009	68.4941322233282	95.1537	79.2325
82.6895176417869	69.2619415172946	98.0879	82.1977
82.6895176417869	69.2619415172946	92.7385	89.9534
82.6895176433167	70.009670517729	96.3227	96.5824
81.4190998534148	70.0044808346715	91.0373	94.8618
80.1134144269234	69.9992907109244	86.1563	95.4019
80.1134144269234	69.9992907109244	87.9339	96.7331
78.7420608524076	69.9940993546545	83.5669	88.2708
78.7420608524076	69.9940993546545	91.8947	87.6684
77.3478288617557	69.9889032847502	85.2864	82.465
77.3478288617557	69.9889032847502	84.4594	85.6238
75.9511924373961	69.9837079524648	77.8131	90.2453
75.9511924373961	69.9837079524648	80.7777	87.9354
74.5667868616335	69.9785124510317	75.6586	91.7899
74.5667868616335	69.9785124510317	75.4786	92.9344
73.2049982810585	69.9733191207438	75.6359	99.7073
69.8349262433306	69.9683332818978	74.1314	97.2935

Solution x	Solution y	Original x	Original y
66.2682923214247	69.9633494043281	65.9332	98.9174
62.7838443604616	69.9583775499441	59.3326	96.8644
59.5084488962967	69.9534075107201	68.3546	93.0491
59.5084488962967	69.9534075107201	68.0526	97.9535
52.8337306481298	69.9484423615753	51.8363	98.9629
52.8337306481298	69.9484423615753	54.3707	99.6057
44.5145098736621	69.9437102394947	47.522	42.292
44.5145098736621	69.9437102394947	53.4254	44.9898
44.5145098736621	69.9437102394947	54.0007	52.8659
44.5145098736621	69.9437102394947	41.6783	52.1535
44.5145098736621	69.9437102394947	38.5534	48.7846
44.5145098736621	69.9437102394947	44.4217	55.3301
44.5145098736621	69.9437102394947	37.4105	49.4356
44.5145098736621	69.9437102394947	48.6743	62.5481
44.5145098736621	69.9437102394947	38.1612	45.7549
44.5145098736621	69.9437102394947	57.8122	54.5104
44.5145098736621	69.9437102394947	43.5841	58.7522
44.5145098736621	69.9437102394947	41.7302	58.1199
44.5145098736621	69.9437102394947	62.6521	52.6724
44.5145098736621	69.9437102394947	51.793	64.9464
44.5145098736621	69.9437102394947	40.6271	60.1839
44.5145098736621	69.9437102394947	56.0439	62.2937
44.5145098736621	69.9437102394947	59.9164	58.75
44.5145098736621	69.9437102394947	45.2184	66.3382
44.5145098736621	69.9437102394947	58.3448	60.9201
44.5145098736621	69.9437102394947	52.5118	68.1256
44.5145098736621	69.9437102394947	30.4468	53.5688
44.5145098736621	69.9437102394947	47.6475	71.1843
44.5145098736621	69.9437102394947	59.9164	61.9972
44.5145098736621	69.9437102394947	30.6696	55.2626
44.5145098736621	69.9437102394947	46.3399	71.17
44.5145098736621	69.9437102394947	42.1545	66.9856
44.5145098736621	69.9437102394947	64.2573	58.953
44.5145098736621	69.9437102394947	43.1006	68.5786
44.5145098736621	69.9437102394947	33.4192	59.483
44.5145098736621	69.9437102394947	64.8783	60.379
44.5145098736621	69.9437102394947	32.641	61.5676
44.5145098736621	69.9437102394947	31.2678	61.1344
44.5145098736621	69.9437102394947	60.771	67.3196
44.5145098736621	69.9437102394947	50.5772	79.5094
44.5145098736621	69.9437102394947	35.9094	68.8825
44.5145098736621	69.9437102394947	48.3206	81.4332
44.5145098736621	69.9437102394947	41.4131	74.8199
44.5145098736621	69.9437102394947	60.9907	71.4945
44.5145098736621	69.9437102394947	65.3011	67.1869
44.5145098736621	69.9437102394947	45.1636	79.7971
44.5145098736621	69.9437102394947	60.356	72.3736
44.5145098736621	69.9437102394947	25.6513	60.6643
44.5145098736621	69.9437102394947	66.9764	66.2314
44.5145098736621	69.9437102394947	45.6946	80.9262
44.5145098736621	69.9437102394947	47.7087	83.4773
44.5145098736621	69.9437102394947	50.9984	83.4341
44.5145098736621	69.9437102394947	65.9297	69.3415
44.5145098736621	69.9437102394947	59.2712	76.4167
44.5145098736621	69.9437102394947	43.9629	81.9344
44.5145098736621	69.9437102394947	54.169	81.8375
44.5145098736621	69.9437102394947	61.6789	74.8507
44.5145098736621	69.9437102394947	43.0779	81.6476
44.5145098736621	69.9437102394947	48.934	88.5471
44.5145098736621	69.9437102394947	50.0418	88.5256
44.5145098736621	69.9437102394947	60.7208	77.8844
44.5145098736621	69.9437102394947	41.546	82.3742
44.5145098736621	69.9437102394947	43.3068	85.4106
44.5145098736621	69.9437102394947	60.2539	80.1704
44.5145098736621	69.9437102394947	38.4806	81.2568
44.5145098736621	69.9437102394947	44.9959	88.3516
44.5145098736621	69.9437102394947	54.7886	87.0165
44.5145098736621	69.9437102394947	51.2472	90.6526
44.5145098736621	69.9437102394947	49.8328	92.6571
44.5145098736621	69.9437102394947	61.8453	80.8454
44.5145098736621	69.9437102394947	23.6206	68.344
44.5145098736621	69.9437102394947	34.9224	79.9328
44.5145098736621	69.9437102394947	40.7053	85.7824
44.5145098736621	69.9437102394947	53.7144	89.3849
44.5145098736621	69.9437102394947	24.7619	69.8637
44.5145098736621	69.9437102394947	27.1361	73.6904
44.5145098736621	69.9437102394947	48.9418	95.7946
44.5145098736621	69.9437102394947	23.7167	70.7298
44.5145098736621	69.9437102394947	37.7453	86.3505
44.5145098736621	69.9437102394947	34.4937	83.7515

Solution x	Solution y	Original x	Original y
44.5145098736621	69.9437102394947	36.723	86.3354
44.5145098736621	69.9437102394947	66.7645	81.0279
44.5145098736621	69.9437102394947	29.8827	79.684
44.5145098736621	69.9437102394947	48.6626	98.7924
44.5145098736621	69.9437102394947	63.6977	85.2552
44.5145098736621	69.9437102394947	26.7929	78.8352
44.5145098736621	69.9437102394947	54.8665	95.2849
44.5145098736621	69.9437102394947	58.0371	93.3465
44.5145098736621	69.9437102394947	40.4171	94.2218
44.5145098736621	69.9437102394947	32.7208	86.88
44.5145098736621	69.9437102394947	25.7615	81.4539
44.5145098736621	69.9437102394947	32.5896	90.759
44.5145098736621	69.9437102394947	34.7487	93.2543
44.5145098736621	69.9437102394947	33.1283	92.3481
39.141417127648	69.9390624959901	27.9893	89.6021
39.141417127648	69.9390624959901	28.4623	90.5817
34.7938465000804	69.9344239334739	34.7579	99.7518
31.0057849977487	69.9067535638548	18.064	96.3276
29.2275681247384	69.8787094282158	23.1083	96.0553
27.5283159207901	69.8506090721725	27.8353	94.5623
25.8320365628579	69.8224626622314	16.7243	94.3593
25.8320365628579	69.8224626622314	15.2733	95.1553
24.3431371324052	69.7941475504213	20.7262	75.308
22.8684169962482	69.7658744750929	23.3293	78.9181
22.8684169962482	69.7658744750929	19.5225	82.1483
21.409202145285	69.7376271274697	23.3569	85.0798
21.409202145285	69.7376271274697	29.5533	92.3189
19.9120587057284	69.7093090510186	3.06059	88.1315
19.9120587057284	69.7093090510186	3.35356	88.986
18.5962057449057	69.6809287934	17.2306	77.2747
17.2845277216774	69.6525824415935	16.8354	77.4785
17.2845277216774	69.6525824415935	16.5471	81.1813
15.9797064517757	69.624282094269	10.1219	82.045
14.6891623556154	69.5960059398924	16.854	97.4806
13.3789676484175	69.5675815662945	12.7313	98.6134
12.0834012742207	69.5388682240796	8.89064	83.8954
12.0834012742207	69.5388682240796	1.02508	82.9527
10.8181359991221	69.5101608226979	4.99968	74.2733
10.8181359991221	69.5101608226979	0.194865	71.2335
9.58134788476249	69.481657601457	3.24988	93.8751
8.36718996738824	69.4531033259558	0.299018	97.3272
7.39692782485616	69.4241356661929	3.57801	99.0366
7.22552376299936	68.596103132563	4.28894	92.6489
7.05428352995801	67.7396434992498	4.45069	94.0863
6.88323725829326	66.8218985031213	2.55217	66.9796
6.71265094175254	65.916442611105	16.576	71.2313
6.71265094175254	65.916442611105	14.0141	70.4084
6.54192474989223	65.0227766544515	12.3803	91.1149
6.37070891369532	64.0538440451342	18.6101	90.3489
6.19564185843667	62.7175756952454	5.5259	61.9092
6.19564185843667	62.7175756952454	9.17265	66.1356
6.02092320830131	61.4085942926503	8.25408	64.3565
5.84627430273035	60.1070037252031	10.4725	58.878
5.84627430273035	60.1070037252031	8.30742	60.1487
5.671608630191	58.8267953549342	3.30116	54.5758
5.671608630191	58.8267953549342	1.5771	61.4642
5.49711381102681	57.5647234033669	2.40393	50.9808
5.32281167352856	56.321183859322	11.7937	48.0467
5.14840222912639	55.098624291588	13.2524	50.7626
5.14840222912639	55.098624291588	12.5872	53.6987
4.97369642315304	53.8972433370292	9.35555	53.1101
4.97369642315304	53.8972433370292	10.9638	55.5178
4.79890245567013	52.708624652276	13.8308	54.4775
4.79890245567013	52.708624652276	13.5318	57.9262
4.62384018866149	51.5249766858463	17.8085	51.9553
4.62384018866149	51.5249766858463	17.5187	55.1629
4.44833394988765	50.355593247541	18.9042	62.1271
4.44833394988765	50.355593247541	17.6011	61.1721
4.27214097650129	49.1634818941671	19.6656	61.3862
4.09551017446412	47.9568639744803	24.5176	59.5849
3.91783615871068	46.7269870901077	22.5447	55.6169
3.91783615871068	46.7269870901077	23.2085	58.8069
3.73857814619443	45.464271440958	22.8193	53.7552
3.55851807686901	44.1910646489311	23.6126	49.4214
3.55851807686901	44.1910646489311	20.5641	47.7219
3.37692597047234	42.9146170085075	17.5856	40.8861
3.37692597047234	42.9146170085075	13.4598	41.6191
3.19487214768991	41.6614125005171	15.6372	44.5891
3.19487214768991	41.6614125005171	12.2621	43.6923
3.01228098897818	40.4143274857679	9.27453	43.3967

Solution x	Solution y	Original x	Original y
2.82970702628282	39.1705688340906	2.57158	38.4711
2.64766527592278	37.9382665877485	7.21925	42.3799
2.64766527592278	37.9382665877485	8.75416	38.928
2.46572403363197	36.7178256089142	11.4258	37.7412
2.46572403363197	36.7178256089142	9.16001	37.8018

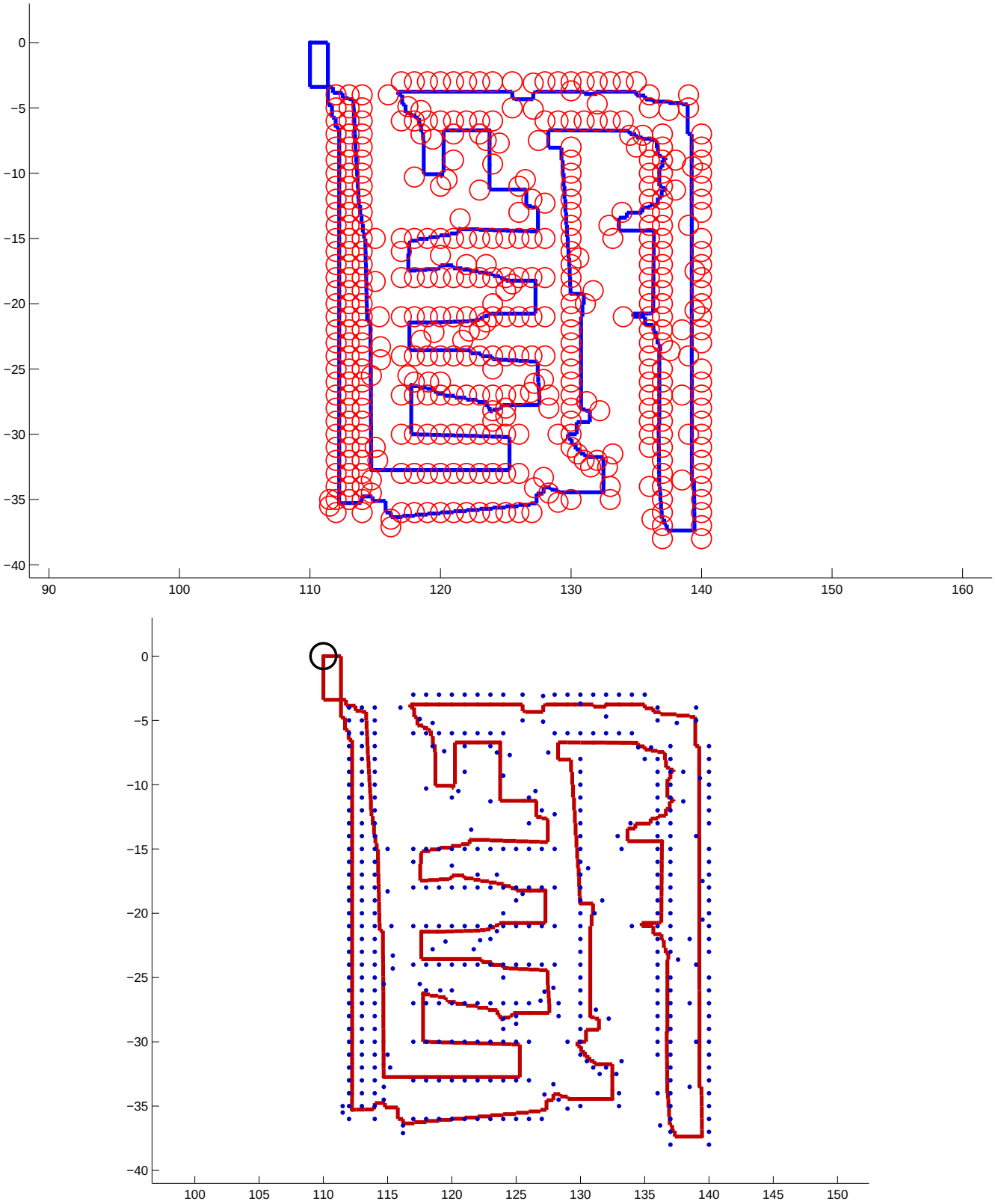


Figure N.124: $pcb442$, $r = 0.76$, Equal Radius, 2D, Manhattan, Length = 366.3747216

Table N-127: Solution for *pcb*442, $r = 0.76$, Equal Radius, 2D, Manhattan

Total distance: 366.374721614667			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
1.36954999151436	4.78721172307067	2	5
1.68381960047445	5.75790903409274	2	6
1.96396556480279	6.51333965538385	2	7
2.23999921121496	7.00000013265767	3	7
2.23999925916432	7.99409312875564	2	8
2.23999930297522	8.98488873472658	2	9
2.23999934657641	9.96397327652738	2	10
2.23999939012256	10.9131602419796	2	11
2.23999943481526	11.7933309912827	2	12
2.23999947868569	12.5325346146891	2	13
2.23999952310484	13.0000008572535	3	13
2.23999955752927	13.9999988440401	3	14
2.23999958211051	14.4225569728159	2	14
2.2399996090965	14.9999987024466	3	15
2.2399996269741	15.3178982543175	2	15
2.23999964733861	15.6811703780422	2	16
2.23999966576361	16.0000022313995	3	16
2.23999967931894	16.9999977600925	3	17
2.23999968573753	17.3179844650028	2	17
2.23999969338114	17.6812711397803	2	18
2.2399997012056	18.0000016521659	3	18
2.23999970290843	18.5762972204736	2	19
2.23999970441538	19.0000016924497	3	19
2.23999970379889	19.999997647377	3	20
2.23999969545247	20.3179255494516	2	20
2.2399996894458	20.6812559558697	2	21
2.23999968217275	21.0000016053738	3	21
2.23999966895691	21.5762171747568	2	22
2.23999965665494	22.0000016087597	3	22
2.23999963956273	22.9999979270392	3	23
2.23999961803888	23.3177654624786	2	23
2.23999959566544	23.6811624989205	2	24
2.23999957395384	24.0000018551472	3	24
2.23999954776254	24.9999982129391	3	25
2.23999951395767	25.3176889946023	2	25
2.23999948071139	25.6811407682654	2	26
2.23999944766932	26.000001586266	3	26
2.23999941229565	26.9999984619183	3	27
2.23999936192227	27.3176094336879	2	27
2.23999931536923	27.6811225576465	2	28
2.239999268684	28.0000013293084	3	28
2.23999927984161	28.9999987360254	3	29
2.23999921503609	29.3175118826166	2	29
2.23999915204901	29.6810987504904	2	30
2.23999908774221	30.0000010995753	3	30
2.23999900933326	30.999998959005	3	31
2.23999891304999	31.3173633304074	2	31
2.23999881619959	31.6810465507219	2	32
2.23999871956434	32.000000865756	3	32
2.2399988832144	32.9999994772044	3	33
2.23999866558006	33.4215231199753	2	33
2.23999876925329	33.9999998435461	3	34
2.23462907350694	34.4018625472737	2	34
2.22935644334338	34.9304961242903	1.5	35
2.22571102391494	35.2742888315456	1.5	35.5
2.22571113456991	35.2742889374055	2	36
2.55182267689329	35.2665013598042	2	35
3.17921343587602	35.2587562736603	3	35
3.89504559468995	35.2510284767285	4	36
3.94758265393551	35.0049242958556	4	35
4.00000027685506	34.760001392542	4	34
4.79354325272293	35.1075417645693	4.7	34.5
5.78941704628909	35.9962445086652	6.2	36.5
6.2000000020567	36.3399985831908	6.2	37.1
7.07969231203614	36.2471347670849	7	36
8.02985405898484	36.156469056334	8	36
9.00925370915162	36.0670725967591	9	36
10.0005315564399	35.9782333457318	10	36
10.9966683648636	35.889311697858	11	36
11.9947735008433	35.7996483575858	12	36
12.9934651210822	35.7084643371941	13	36
13.9915359064098	35.6146991038361	14	36
14.9863339056904	35.5166555680575	15	36
15.9682917001227	35.4109422899612	16	36
16.8904905265233	35.287205236532	17	36
17.3629849684639	34.542487533404	17.2	34.1
17.9000000234982	34.060001628675	17.9	33.3
18.4295019059027	34.2534948046782	18.3	34.5
19.0025112450212	34.4413741998336	19	35.2
20.1794736601277	34.444085181561	20	35
22.4788886597587	34.4467861080439	23	35
22.4788880887681	33.7600252529507	23	34
22.4788874971451	32.6513868534511	22.8	32.5
22.4788869211903	31.7400024709986	23.2	31.5
21.9904726130549	31.7400005910811	22	32
21.4999997635196	31.7399987481243	21.5	32.5
21.0857744206751	31.4866008448351	21	32
20.6992410789156	31.1597884557786	20.5	31.5
20.3496521193102	30.7810867246142	20	31
20.0511847593826	30.3572760261524	20	30
19.7600016648871	29.9999999714284	19	30
20.4333060669322	29.0612788430877	20	29
21.4399986746708	28.2000001341179	22.2	28.2
21.1106120919811	28.0930752021952	21.2	27.5
20.7600012951699	27.9999997241071	20	28
20.7600011946918	26.9999999631975	20	27
20.7600011610812	26.0000000138151	20	26
20.7600011375549	24.9999999734977	20	25
20.760001151581	24.0000000401931	20	24
20.760001187598	23.0000000440002	20	23
20.7600012630534	22.0000000538611	20	22
20.7600013819142	21.0000001473706	20	21
20.8702471000156	20.0852402201639	21.1	20
20.9788885239213	19.2399998865448	21.7	19
19.9999989924376	19.2399998258306	20	20
19.9658538940558	18.6649826001961	20	19
19.9316965699124	17.9332650705894	20	18
19.8974898647454	17.1701890038641	20	17
19.8631881286561	16.4936936845666	20.6	16.5
19.8049132366478	15.7728353871951	20	16
19.7459799831122	14.9050947520353	20	15
19.6861821529046	13.9619150164882	20	14
19.6252042103098	12.984832924392	20	13
19.5625981470672	11.9939834215633	20	12
19.4976857986615	10.9982105717958	20	11
19.429310391288	10.0019335591707	20	10
19.3550632685162	9.01090625944696	20	9
19.2672924102416	8.05320456937566	20	8
18.2600007139103	7.50000010697863	17.5	7.5
18.2600007728935	6.71414394665257	18	6
19.0285834980796	6.72016801435219	19	6
20.0022475236616	6.72643639304052	20	6
20.9997062506947	6.73301787314241	21	6
21.9993783286571	6.74004047968241	22	6
22.9991290792716	6.74777639706093	23	6
23.9927451992021	6.75711015514049	24	6
24.4937462898259	7.01914103696907	24.5	7.1
24.9961476506541	7.27646285005181	25	8
25.493423006159	7.36453756458411	25.5	7.1
25.9917654063774	7.45473686037359	26	8
26.4896078512624	7.53742194045258	27	7
26.5747448442922	8.08726174140143	27	8
26.6560852508009	8.6761842933856	26	9
26.9497149632241	8.84006237879489	27	9
27.2399988726909	9.00000013087194	28	9
27.0003682837962	9.57000721995496	27	10
26.7600009453151	10.0000007914914	26	10
26.7600009338365	10.9999997086182	26	11
27.0008133560249	11.1485167729585	27	11
27.2399988417361	11.3000000850673	28	11.3
26.9438088623455	11.8769045135246	27	12
26.6434252690109	12.4188126682773	27	13
26.0353710946605	12.6378084422401	26	12
25.4677732715314	13.0235376909051	26	13
24.2772567729469	13.4159378056493	23.9	13
23.6600008427009	13.9999999934041	22.9	14
23.6600008594152	14.3950211843709	23.2	15
26.3507251005101	14.3950210082382	27	14
26.346372863875	14.5783901748061	26	14
26.3420459437824	14.9080783160764	26	15
26.3377256423632	15.2269669505711	27	15
26.3333248215954	15.8687210903555	27	16
26.3288642204535	16.3136013532374	26	16
26.3244123416103	16.8704049053159	27	17

Solution x	Solution y	Original x	Original y
26.3198898533965	17.2650790928684	26	17
26.3153753754831	17.7215009498376	26	18
26.3108688578304	18.1142349413385	27	18
26.3062727048789	18.6771480338283	26	19
26.3016849907207	19.126782682189	27	19
26.2969753649691	19.9781581238051	27	20
26.2921448116625	20.7280285885962	27	21
26.1214561349348	20.7410554227702	26	21
25.9540579749649	20.7540362982276	26	20
24.7600016742986	21.0000001030139	24	21
25.6725915359324	21.6276064152892	26	22
26.3094248353819	22.0874514081411	27	22
26.4873199111245	22.6916866652932	27	23
26.6328188314198	23.1087245957497	26	23
26.8399997974658	23.6000000456447	27.6	23.6
26.7600008032543	23.9999952327699	26	24
26.7600005027196	24.5766054990677	27	25
26.7600001990557	25.0000014139768	26	25
26.7599999633034	25.9999964698882	26	26
26.7599997382677	26.3175641447292	27	26
26.759999513088	26.6813614928033	27	27
26.7599992910439	27.0000205474305	26	27
26.7599990716816	27.9999847779993	26	28
26.7599988641516	28.3763018351091	27	28
26.7599986569901	28.8439909416704	27	29
26.7599984566631	29.2788891283962	27	30
26.7069832386858	29.2788891782854	26	29
26.7143499624072	30.026007996061	26	30
26.7220778514782	30.9312042857866	26	31
26.7303638385441	31.4248874258111	27	31
26.7386250477299	32.1744814297072	27	32
26.7468713517474	33.0550247822854	27	33
26.7551050726965	33.9892049244082	26	34
26.8022927685869	34.4435395462523	27	34
26.8488532826645	35.1077763331702	27	35
26.8951373573699	35.8265697900027	27	36
26.9412409118777	36.4701395413509	26.2	36.5
27.1379510931274	36.9255635493282	27	37
27.340373920743	37.3669930133708	27	38
29.462598039065	37.4625999858857	30	38
29.4539825865736	36.8182820103618	30	37
29.4452785817175	35.9541539599448	30	36
29.4364902976949	35.0254221203778	30	35
29.4276112826388	34.1488086023942	30	34
29.4186234221765	33.4853046566662	30	33
29.2591776746066	33.4727584009513	28.5	33.5
29.2586548367667	32.0166206960636	30	32
29.2581283270445	31.0286880699558	30	31
29.2575979542569	30.4026000697701	29	30
29.2570677959462	29.9504551896516	30	30
29.2565330987366	28.9976687915822	30	29
29.2559941667826	28.0044647799815	30	28
29.2554507532515	27.1074461941894	30	27
29.2548973877919	26.9581451446914	28.5	27
29.2543691873881	25.9977494733441	30	26
29.2538362077512	24.9995867865607	30	25
29.2532981900177	23.9987140940658	29	24
29.252760325058	23.0023561884484	30	23
29.2522168415061	22.0620858293897	28.5	22
29.2516897715046	21.9113743059146	30	22
29.2511515074616	21.0231181792867	30	21
29.2506065670333	20.4990738954124	29.5	20.5
29.250061482936	19.9760343027362	30	20
29.2495086349244	18.9997694151248	30	19
29.2489477392896	18.0212311744993	30	18
29.2483775871056	17.5004146263148	29.5	17.5
29.2478072639663	16.9809847579955	30	17
29.2472258833047	15.9993897894683	30	16
29.2466325784155	14.9998383282651	30	15
29.2460256654147	13.9987173309525	29	14
29.2454189249565	12.9999259884532	30	13
29.2447945344784	11.9999663566053	30	12
29.2441488140751	11.0000063439276	30	11
29.2434763753127	10.0003129721166	30	10
29.2427686629671	9.02288469043126	30	9
29.2419990963259	8.81221626835372	29.3	9.5
29.2412289814374	7.99922341471208	30	8
29.2402984626505	6.99960994219484	30	7
28.9317572401148	4.72942268254196	29	4
28.5003006349023	4.63147911811956	29	5

Solution x	Solution y	Original x	Original y
27.462013952694	4.52300445601247	27.5	5.2
26.223843475913	4.36089607233982	26	5
25.6756054582123	4.05744683439885	26	4
24.9999999812636	3.76000120328372	25	3
24.0000000020814	3.76000117442664	24	3
23.0000000051231	3.76000115876907	23	3
22.0002801287319	3.76000129137425	22	3
21.9999002606072	3.94000001886098	22	4.7
20.9999999793996	3.76000174244829	21	3
20.0000001176124	3.76000117956039	20	3
19.5686844343472	3.76000110822844	20	3.7
18.9999999195733	3.76000136120461	19	3
18.0000000505996	3.76000145604822	18	3
17.283946084123	3.81726160665625	17.1	3.1
17.0999996617554	4.33999932689363	17.1	5.1
15.6989651544924	4.28483527975429	15.5	5
15.4999996721799	3.76000119416213	15.5	3
14.0000000543179	3.76000103218461	14	3
13.0000000010079	3.76000095941754	13	3
11.9999999995147	3.76000094614956	12	3
11.0000000012866	3.76000092387104	11	3
10.0000000047329	3.76000091584042	10	3
9.00000001100234	3.76000093009987	9	3
8.00000002869052	3.76000097341438	8	3
7.00000024154824	3.76000104669102	7	3
6.76000079967378	4.00000022596648	6	4
7.06265920145863	4.74532732835284	7.5	4.9
7.31797796595035	5.38695173527655	7	6
7.75915853596368	5.59901157592911	8	6
8.14267939335757	5.78838573775385	8.5	5.2
8.37006639045845	6.21320987634666	9	6
8.51672420355057	6.86547352325187	8.5	7
8.66377327752842	7.47065139401614	9.4	7.4
8.71392711411536	10.0816402216995	8	10.3
9.99999995721123	10.2399992717961	10	11
10.1305992158513	9.94396012718998	10.5	10.5
10.2400184736076	8.99996344400634	11	9
10.240161410086	6.72105428401879	10	6
10.9352119641959	6.72100466572398	11	6
11.3972856247924	6.72095439161331	11	7
12.0369820557159	6.72090417643229	12	6
12.8931691904223	6.72085369128804	13	6
13.2916275607704	6.72080292705062	13	7
13.7589464595758	6.72075279137656	14	6
13.7589465935412	7.27583378573032	13.5	7.5
13.7589466450625	7.76411818153529	14.5	7.7
13.7589466952241	9.38292689696285	14	9.3
13.7589467601536	11.2599967908374	13	11.3
15.6058772119146	11.2599987396233	16	11
16.4999610770103	11.2600006966956	16.5	10.5
16.5700892747686	12.5228616576508	16	13
16.9858254486562	12.6169467593422	17	12
17.3952000113917	12.7276179112236	18	12.3
17.4625979507359	14.4625978891213	18	15
16.8214799063823	14.4334810381342	17	15
15.9489272451353	14.4032515114081	16	15
14.9843564588204	14.3717146616706	15	15
13.987565761548	14.3383590059095	14	15
12.9520931407679	14.3021446897214	13	15
11.5000000978192	14.2600012006419	11.5	13.5
11.3799718107634	14.6203115052502	12	15
10.733364634258	14.7630755963183	11	15
9.92985379558054	14.9005519242796	10	15
9.08513278027198	15.0363796630347	9	15
8.29397558371254	15.1728560038789	8	15
7.66874929419085	15.3130612030521	7	15
7.59933364612111	16.1501189244622	7	16
7.53740191107731	17.4625981889492	7	18
8.15711514414559	17.4116069510396	8	18
8.98792170327354	17.3562024229257	9	18
9.79291753551885	17.2930960182852	10	18
10.0000000592784	17.0600009017	10	16.3
10.954469138594	17.2908113770113	11	18
11.6809029192699	17.3951262991001	12	17
12.2098853831199	17.5069896486842	12	18
12.8723815016809	17.6088138994934	13	18
13.4736440982433	17.7057937773654	13.5	17
14.0202149441317	17.8851534121755	14	18
14.5748190880689	18.0613069168152	15	18
15.0000000315988	18.2399992497708	15	19

Solution x	Solution y	Original x	Original y
15.5531712208278	18.2399994270898	15.5	18.5
16.1266609889604	18.2399995990194	16	18
16.7495038793002	18.2399997700589	17	18
17.2788888846636	18.2399999355782	18	18
17.2788888771041	20.760000116735	18	21
16.6722100951788	20.7600003157043	17	21
15.8605830942629	20.7600005147603	16	21
14.9483558090537	20.7600007138725	15	21
14.0000002418333	20.7600009120411	14	20
13.6941280616098	20.9303837431434	14	21
13.3552340976776	21.0989139217255	13.5	21.4
12.9979762836878	21.258751550254	13	22
12.6361567601786	21.3051023288976	13	21
12.1893818586062	21.3524309299572	12.2	22.1
11.6628772147813	21.373936723645	12	21
10.9332100319289	21.3957136279822	11	21
10.1602479492458	21.417719619291	10	21
9.50000003220777	21.4399989293143	9.5	22.2
8.88022873797342	21.4399989981664	9	21
8.19203173590263	21.4399990632161	8	21
7.61967917599634	21.4399991287766	7	21
7.61967915898028	23.5600008157563	7	24
8.052083509477	23.560000857017	8	24
8.50000032976422	23.5600008967627	8.5	22.8
9.18509747623735	23.5600009618172	9	24
10.0299620974723	23.5600010247601	10	24
10.9073314776569	23.5600010876275	11	24
11.6999999694805	23.5600011503903	11.7	22.8
12.3121214440077	23.7994616151355	12	24
13.1035244511359	24.0268366984377	13	24
13.9632811149259	24.2558110446003	14	25
14.4311644182769	24.2970722699307	14	24
15.1477620630247	24.3392043886671	15	24
15.9716400415707	24.382048179149	16	24
16.7782516283338	24.4257437489273	17	24
17.4146879025036	24.4706820741912	18	24
17.4498504534291	25.5680766205482	17.2	26.1
17.4857231806884	26.0399069693081	17.9	25.8
17.5208212165572	26.6121882703511	16.9	26.8
17.5587313459416	27.0327229198072	18.3	27
17.5788884315768	27.7600023687117	18.3	28
16.0000001376424	27.7600024558127	16	27
15.0000004936999	27.7600025572352	15	27
14.7683428096668	27.9378713428631	15	28
14.5246384497395	28.1141261113002	15	28.6
14.0000000053358	28.2399985362737	14	29
13.776313513273	27.9059619603404	14	28.2
13.538957527153	27.5271212711487	14	27
12.8203043501117	27.3563045770743	13	27
11.9687575947431	27.1978975473053	12	27
11.0993653209516	27.0443775447478	11	27
10.2966302946402	26.8920153697845	10	27
9.65945940268765	26.7371048527742	9	27
9.50066319687309	26.5188697992938	10	26
8.93370027363177	26.4118282127151	9.1	26
8.28317979321302	26.3109737139609	8	26
7.76000127975176	26.2141435774039	7.5	25.5
7.76000123370403	26.6426577891188	8	27
7.76000119055357	27.0000001512652	7	27
7.76000125285563	29.9999975054665	7	30
8.35720370326641	30.0250628700791	8	30
9.15421383196346	30.0501438971421	9	30
10.058432090376	30.0752556333698	10	30
11.0121719761528	30.1004129691479	11	30
11.981000618758	30.1256315378183	12	30
12.9395226726796	30.1509278751676	13	30
13.8546315817058	30.176320139413	14	30
14.6676499838033	30.2018316003938	15	30
15.2776252623844	30.2275155801567	16	30
15.2858562078855	32.7399982539096	16	33
14.6797996512018	32.7399983011617	15	33
13.8628432747622	32.7399983483315	14	33
12.9403607615772	32.7399983961543	13	33
11.9710200727852	32.7399984436364	12	33
10.9809249072072	32.7399984912218	11	33
9.97823388839404	32.7399985389635	10	33
8.95885107820712	32.7399985865099	9	33
7.89958153589923	32.7399986340868	8	33
6.71422020824113	32.739998681426	7	33
4.70000964733997	32.739998729107	4.7	33.5

Solution x	Solution y	Original x	Original y
4.69537215549784	32.7068386850565	4	33
4.69175421330918	32.1253609064437	4	32
4.68819124953865	31.7377370221315	5.2	32
4.68461501705434	31.2455296560152	5	31
4.68103402400391	30.8198636292904	4	31
4.67750802083232	29.9649602319588	4	30
4.67401814555772	28.9922006378138	4	29
4.67056156091014	27.9987127095121	4	28
4.6671361878486	27.0079373441509	4	27
4.66374024008275	26.0517478389273	4	26
4.66037272242934	25.2522644335013	4	25
4.65705308908061	24.9154550065228	4.7	25.5
4.65373233284889	24.3218440083711	5.4	24.3
4.65018138000397	23.8885608619163	4	24
4.64665881307451	23.3637369138429	4	23
4.64328472922106	23.2563560511133	5.4	23.3
4.63666875381048	21.3669326173222	5.3	21
4.39373299693095	21.3539768609852	4	22
4.37540974214863	20.7374593110587	4	21
4.357263303068	19.942148330626	4	20
4.33925203265238	19.1067137826401	4	19
4.32136558488641	18.351823597329	5	18.3
4.30245669021768	17.713033732008	4	18
4.28368430465153	16.8838023961305	4	17
4.26501713586974	15.9644929332537	4	16
4.24644267029844	15.0177801266847	5	15
4.14406960617353	14.546819771555	4	15
4.04389409712417	13.8653374785376	4	14
3.94415376275688	13.1231074695436	4	13
3.84393623184975	12.4393562027347	4	12
3.74148366007861	11.9602117905487	3	12
3.70254121917296	11.1394442344084	3	11
3.67081334013963	10.7203603836699	4	11
3.6386549504923	10.2261141713388	4	10
3.60601622682964	9.79462780653116	3	10
3.57524107630506	9.20006250000334	3	9
3.54575721038194	8.74317934157463	4	9
3.51560682827342	8.17485832883395	4	8
3.48472852783098	7.68701329909567	3	8
3.45478124227901	6.96865801896303	4	7
3.42392030816441	6.22007719872737	4	6
3.39157625288874	5.69789009327498	3	6
3.35984140868712	5.00814263128519	4	5
3.32599090701942	4.33112457426157	4	4
2.96347269081114	4.26236294021603	3	5
2.50305330281031	3.85436974524629	3	4
1.75864214954095	3.40173579669339	2	4

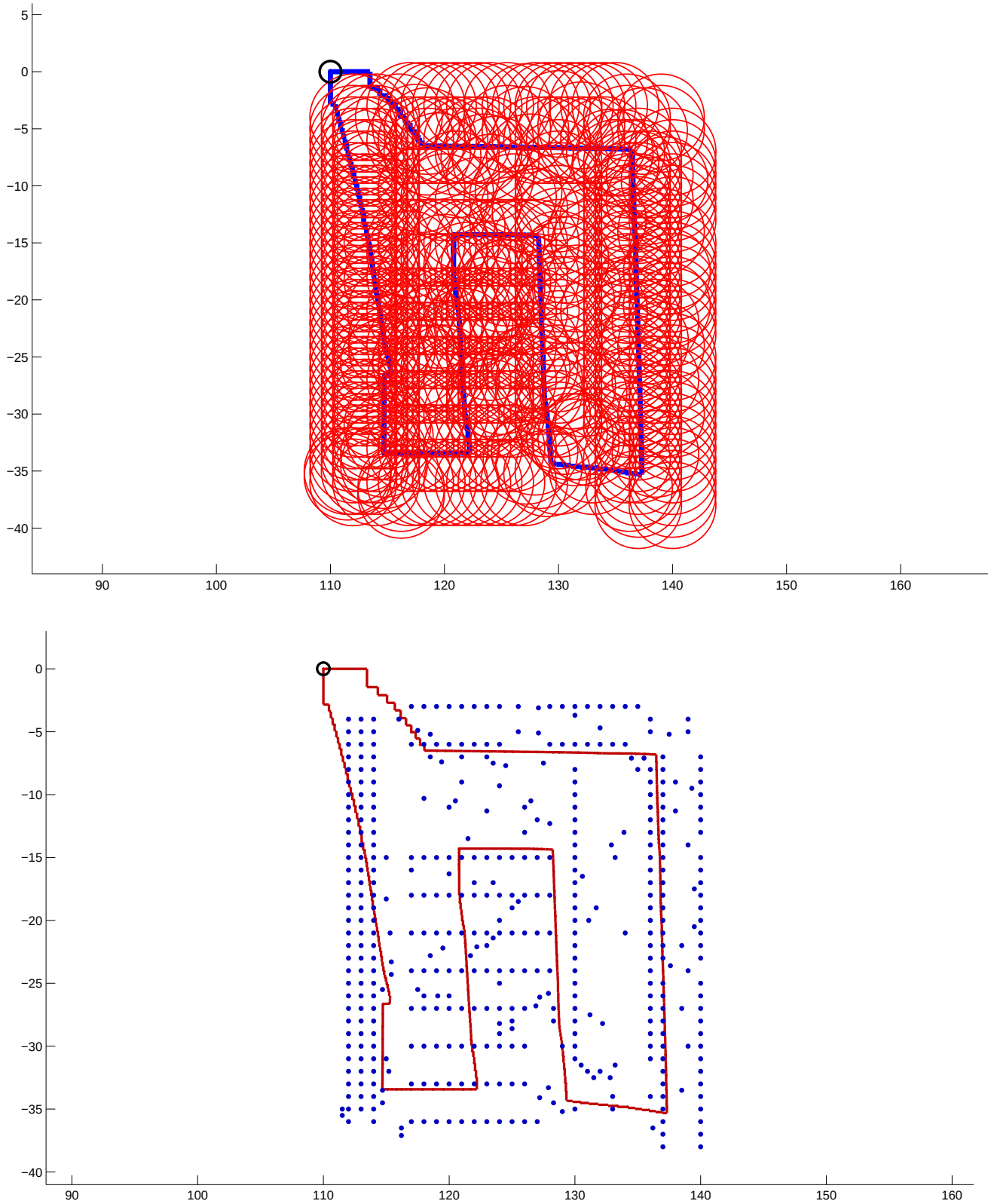


Figure N.125: $pcb442$, $r = 3.8$, Equal Radius, 2D, Manhattan, Length = 167.5629495

Table N-128: Solution for *pcb*442, $r = 3.8$, Equal Radius, 2D, Manhattan

Total distance: 167.56294949006			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
3.46584542430213	1.46052671185953	6	4
4.32951067877507	2.09718175481029	7	3
5.06429313938236	2.70489946670065	8	3
5.68081125518053	3.30330199678359	9	3
6.14694237655603	3.92225142597578	8.5	5.2
6.14694237655603	3.92225142597578	7.5	4.9
6.57112126134638	4.4925260525009	8	6
6.98606038205818	5.03818643884527	10	6
6.98606038205818	5.03818643884527	9	6
7.33544572891404	5.53813964458158	7	6
7.68972509127536	6.03449810415869	9.4	7.4
7.68972509127536	6.03449810415869	8.5	7
8.03248253242211	6.50483463697495	8	10.3
9.01153446312622	6.51283982887542	12	6
9.01153446312622	6.51283982887542	11	6
9.71130458864704	6.52085009771395	11	9
9.71130458864704	6.52085009771395	11	7
10.353308515384	6.52884810800984	10	3
11.0574723859764	6.53690542559675	11	3
11.7860190916576	6.54502264995113	12	3
12.4961026900189	6.55320542856747	13	7
12.4961026900189	6.55320542856747	13	6
13.206617395441	6.56138818469561	14	3
13.206617395441	6.56138818469561	13	3
13.7940412553448	6.56975292656214	13.5	7.5
14.3977547368322	6.57811187187729	14	9.3
14.3977547368322	6.57811187187729	14.5	7.7
15.0296797926982	6.58644374358551	15.5	5
15.0296797926982	6.58644374358551	14	6
15.6906389767833	6.59478409783057	15.5	3
16.4043814905596	6.60320991940026	17.1	3.1
17.027390781975	6.61171339970104	18	6
17.027390781975	6.61171339970104	17.1	5.1
17.6519298912723	6.62022546641891	19	6
18.2667223474139	6.62873953489285	19	3
18.2667223474139	6.62873953489285	18	3
18.7596257036601	6.63755808319671	20	8
18.7596257036601	6.63755808319671	17.5	7.5
19.2645647181775	6.6463568643054	20	9
19.7668296642164	6.65513501233618	20	10
20.2688722689025	6.6638611078748	21	3
20.2688722689025	6.6638611078748	20	3
20.6414186440059	6.67305019055516	20	3.7
21.0303621269516	6.68226924068637	21	6
21.0303621269516	6.68226924068637	20	6
21.4356217113492	6.69149340772919	24	6
21.8172392741953	6.70072225275508	23	6
21.8172392741953	6.70072225275508	22	6
22.198207941427	6.7099565319756	22	4.7
22.5874387507531	6.71920289256874	22	3
23.500354368799	6.72914727054577	24	3
23.500354368799	6.72914727054577	23	3
24.4943866319424	6.74075676545826	26	4
24.4943866319424	6.74075676545826	25	3
24.8462850108851	6.75414593184743	25.5	7.1
24.8462850108851	6.75414593184743	24.5	7.1
25.2044933070255	6.76752165204369	25	8
25.5704811145636	6.78088104392919	27	8
25.5704811145636	6.78088104392919	26	8
25.9323472462011	6.79420677050959	29	5
26.1961950609435	6.80767556428001	27.5	5.2
26.1961950609435	6.80767556428001	26	5
26.460154493554	6.8211950937488	29	4
26.4745413739176	7.39019444774829	30	7
26.4745413739176	7.39019444774829	27	7
26.4887170120244	8.02493223761555	29.3	9.5
26.4887170120244	8.02493223761555	28	9
26.5028173568035	8.57465672560601	30	8
26.5167337765875	9.1949908802844	30	9
26.5305129322181	9.84222634765396	30	11
26.5305129322181	9.84222634765396	30	10
26.5438377716933	10.2908858333511	28	11.3
26.5438377716933	10.2908858333511	27	11
26.557153020509	10.7272710335604	30	12
26.557153020509	10.7272710335604	27	13
26.5701636680304	11.0418537956145	27	10
26.5701636680304	11.0418537956145	27	9
26.5831800727712	11.3750835242175	26	10
26.5831800727712	11.3750835242175	26	9
26.5962187842138	11.7378836522646	26	11
26.6092768991958	12.1061972257133	27	12
26.6092768991958	12.1061972257133	26	12
26.6223482385491	12.4784920477938	23.9	13
26.6354717044946	12.8462888783196	27	14
26.6354717044946	12.8462888783196	26	14
26.6486063297199	13.2033989688886	26	15
26.6486063297199	13.2033989688886	26	13
26.6617655261927	13.5525798498006	26	17
26.6617655261927	13.5525798498006	26	16
26.6749701216449	13.8069940570556	27	17
26.6749701216449	13.8069940570556	27	16
26.6881551473313	14.0311093373937	22.9	14
26.703372216538	14.2524631752805	23.2	15
26.718815742805	14.4624198289296	27	15
26.7342786000764	14.6720120373974	29	14
26.7497215189353	14.884055324629	30	13
26.7640319583315	15.5685264337853	30	15
26.7782513387801	16.307264356874	30	16
26.7923962515587	17.0813943679369	29.5	17.5
26.7923962515587	17.0813943679369	30	17
26.8064201634961	17.8602454015874	26	19
26.820479866922	18.6154376530074	24	21
26.820479866922	18.6154376530074	26	18
26.8348636935486	18.9433140571194	26	21
26.8348636935486	18.9433140571194	26	20
26.8492844133872	19.2568812804063	27	21
26.8492844133872	19.2568812804063	27	20
26.8637197584932	19.5621205945394	27	19
26.8637197584932	19.5621205945394	27	18
26.8781741685177	19.8797922797505	30	18
26.8923598497668	20.3228224425761	30	19
26.9064541051715	20.8243792309344	29.5	20.5
26.9064541051715	20.8243792309344	30	20
26.9204352581825	21.3742560198526	30	21
26.9343670440951	21.944171587267	30	23
26.9343670440951	21.944171587267	30	22
26.9481634977574	22.4757545596866	29	24
26.9481634977574	22.4757545596866	27.6	23.6
26.961937543541	22.9723785171527	30	25
26.9754735118696	23.3127155119559	27	23
26.9890109891813	23.6564777134454	26	25
27.0025600891271	23.9944991745379	28.5	22
27.0025600891271	23.9944991745379	27	22
27.0161122629016	24.3680589942718	26	22
27.0296894140733	24.7712543048172	26	24
27.0296894140733	24.7712543048172	26	23
27.0432983999305	25.2054526987992	27	25
27.056923825789	25.6447680144216	27	27
27.056923825789	25.6447680144216	27	26
27.0705483642398	26.0757548205233	26	26
27.0841994838147	26.5110519269236	26	27
27.0978743925615	26.9457184643494	28.5	27
27.1115494498607	27.3835519222458	30	27
27.1115494498607	27.3835519222458	30	26
27.1250985447784	27.8774717157959	30	29
27.1250985447784	27.8774717157959	30	28
27.1385490359323	28.3467349632808	29	30
27.1519922080155	28.7951498993153	27	29
27.1519922080155	28.7951498993153	27	28
27.1654402021363	29.2580958600657	26	28
27.1789053827575	29.7410845434962	30	30
27.1923353568764	30.2217800054314	30	31
27.2057297915667	30.689079914447	26	30
27.2057297915667	30.689079914447	26	29
27.2191586670153	31.2001947587194	26	31
27.2326183573572	31.7202488246593	27	31
27.2326183573572	31.7202488246593	27	30
27.246110458074	32.292933125761	30	32
27.246110458074	32.292933125761	27	32
27.2595424752373	32.8949759359456	28.5	33.5
27.272977196326	33.4949123308389	30	34
27.272977196326	33.4949123308389	30	33
27.2863278445709	34.1080553019338	27	34
27.2997046735789	34.7339772371772	30	36

Solution x	Solution y	Original x	Original y
27.2997046735789	34.7339772371772	30	35
27.312996999171	35.3129908622892	30	38
26.9434699902126	35.2355017200666	30	37
26.4154912392879	35.1550100141466	27	38
25.8837846216135	35.0726923839591	27	37
25.8837846216135	35.0726923839591	27	36
25.3346479863955	34.9895786258095	26.2	36.5
24.786763217901	34.9060630072172	27	35
24.2101144156353	34.8226200774782	27	33
24.2101144156353	34.8226200774782	26	34
23.3909189433211	34.7416161562631	23	35
23.3909189433211	34.7416161562631	23	34
22.6374842900435	34.6611098793032	23.2	31.5
21.863381548681	34.5833398264058	22	32
21.1094493167727	34.5068009705847	20	35
20.406741645372	34.4302829236426	19	35.2
20.406741645372	34.4302829236426	18.3	34.5
19.8148129998117	34.3538794486649	17	36
19.3675402388635	34.2759267045741	16	36
19.3236233416604	33.6069397385575	17.2	34.1
19.3236233416604	33.6069397385575	17.9	33.3
19.2800343396074	32.9558564239518	22.8	32.5
19.2800343396074	32.9558564239518	21.5	32.5
19.234226618058	32.3868922248652	21	32
19.1883128943968	31.8324138528889	20.5	31.5
19.1883128943968	31.8324138528889	20	31
19.1422441904073	31.3079277423905	20	30
19.0961703272146	30.8067429219157	20	29
19.0961703272146	30.8067429219157	19	30
19.0500874156089	30.347701513346	18.3	28
19.004200072714	29.9249679724992	18.3	27
18.958555042049	29.5544977059893	22.2	28.2
18.9111278066176	29.2283409220249	21.2	27.5
18.8632806745867	28.9196076908928	16.9	26.8
18.8159477490322	28.6306433002902	16	30
18.7694497792745	28.3266229106816	15	28.6
18.7459562008108	27.7354447412965	20	28
18.7224315214018	27.146348118142	20	27
18.698878273558	26.5659458375329	15	27
18.6773560434094	25.7365819439968	16	27
18.6559782291014	24.8151807015002	15	24
18.6368907421467	24.4256339583649	16	24
18.6178852602574	24.0447374931977	17	24
18.5989213132193	23.6671739234369	17.9	25.8
18.5989213132193	23.6671739234369	17.2	26.1
18.5800296832908	23.2406836096881	20	26
18.5800296832908	23.2406836096881	20	25
18.5610686054419	22.7267315242678	20	23
18.5610686054419	22.7267315242678	20	22
18.5420627931486	22.2290137976813	20	21
18.5230377780339	21.7518335214133	20	24
18.5230377780339	21.7518335214133	18	24
18.5039882477604	21.1981482678343	18	21
18.5039882477604	21.1981482678343	17	21
18.4849938147676	20.6612254831403	21.1	20
18.4659289417796	20.1440753085105	20	20
18.4468481132089	19.6331042648984	16	21
18.4468481132089	19.6331042648984	15.5	18.5
18.4279913460406	19.1381270189205	21.7	19
18.4089559531529	18.6521680801611	20	19
18.3899041195486	18.1657999153024	16	18
18.3899041195486	18.1657999153024	15	19
18.3712131833747	17.6306953802574	18	18
18.3712131833747	17.6306953802574	17	18
18.3525675996358	17.0947860453018	20	15
18.3338939177591	16.6058497711172	20	18
18.3151967816643	16.1001333873818	20.6	16.5
18.3151967816643	16.1001333873818	20	17
18.2964125291705	15.5825014556509	20	16
18.2776065985582	15.0627756987842	20	12
18.2586290688106	14.709703340737	20	14
18.2396276922111	14.3625119784863	20	11
17.9396216083349	14.3517370223975	20	13
17.6303976575606	14.3409651579887	17	12
17.3290448201295	14.3302103165716	17	15
17.3290448201295	14.3302103165716	16	15
17.0387123989193	14.319442212831	18	15
17.0387123989193	14.319442212831	18	12.3
16.7427882434486	14.3086782506737	15	15
16.7427882434486	14.3086782506737	14	15

Solution x	Solution y	Original x	Original y
16.4765976951151	14.2978982936627	16.5	10.5
15.7188379948005	14.295951295042	16	11
14.9382430809684	14.2940079478849	16	13
14.9382430809684	14.2940079478849	13	11.3
14.4266952648041	14.2920693209723	15	18
13.4779782720416	14.2901126525877	14	18
10.8000023439324	14.2881395244709	10.5	10.5
10.8000021767767	14.4376407680896	10	11
10.8000020509911	14.6179466576989	11.5	13.5
10.8000020509911	14.6179466576989	10	15
10.8000018613491	14.8002887753896	11	15
10.8000016977157	14.9828707342693	13	15
10.8000016977157	14.9828707342693	12	15
10.8000015352963	15.1663732776169	13.5	17
10.8000015352963	15.1663732776169	12	17
10.8000013731156	15.3391835360841	12	18
10.8000012096844	15.5053903851396	9	18
10.8000012096844	15.5053903851396	8	18
10.8000010471892	15.5902294871318	11	18
10.8000010471892	15.5902294871318	10	18
10.800000884683	15.6733658257616	13	18
10.8000007223241	15.7547508572581	10	16.3
10.8000005598819	15.8362061276144	9	15
10.8000003973374	15.9181780659129	8	15
10.800000227346	15.9999948209004	7	16
10.8000002365141	18.0000005856275	7	18
10.858152543572	18.5926653665049	11	21
10.858152543572	18.5926653665049	10	21
10.9164716755405	19.1316285092097	8	21
10.9769649866458	19.5811895826966	9.5	22.2
11.0381133866243	19.9878789665347	11.7	22.8
11.0381133866243	19.9878789665347	12	21
11.0988944558299	20.3561000400268	13	22
11.0988944558299	20.3561000400268	12.2	22.1
11.1590073307627	20.7026082750657	13.5	21.4
11.2186687814104	21.0458410493262	15	21
11.2465561640595	21.4205595043717	14	21
11.2742996048531	21.8030539400734	14	20
11.2742996048531	21.8030539400734	13	21
11.3017083593949	22.2453175651446	9	21
11.3292646647895	22.7111934269557	8.5	22.8
11.3570176070679	23.1797926001386	14	24
11.3846318196205	23.6375988530966	13	24
11.3846318196205	23.6375988530966	12	24
11.4122012235081	24.0969465017527	11	24
11.4122012235081	24.0969465017527	10	24
11.4398649408146	24.5672846734265	9	24
11.4676888744691	25.0520823938917	10	26
11.4956025414851	25.530621787849	14	27
11.4956025414851	25.530621787849	14	25
11.5232111055626	25.9958032922231	13	27
11.550782706513	26.4545283005694	8	27
11.57938488532	26.8747928260391	9	27
11.608166410993	27.2976316634183	12	27
11.608166410993	27.2976316634183	11	27
11.6369981364677	27.7336539176768	15	28
11.6653599449801	28.1644150281574	14	28.2
11.6936246414769	28.5991492710751	14	29
11.7217952065197	29.0333570812643	10	27
11.7500974228783	29.5065005072676	10	30
11.7500974228783	29.5065005072676	9	30
11.7786957768524	29.9751982289581	8	30
11.8502188489068	30.4119063251154	12	30
11.8502188489068	30.4119063251154	11	30
11.9221857277499	30.8656988467888	13	30
11.9941020395603	31.3337350320341	15	30
11.9941020395603	31.3337350320341	14	30
12.0632323873326	31.9011182049149	13	33
12.0632323873326	31.9011182049149	12	33
12.1324188353385	32.4541838309111	15	33
12.1324188353385	32.4541838309111	14	33
12.1999996520968	32.9999998467615	16	33
12.1999996344377	33.4309533929311	15	36
11.7273089823407	33.4309534154483	14	36
11.1041818623274	33.4309534377008	13	36
11.1041818623274	33.4309534377008	12	36
10.3330966405022	33.4309534594597	11	36
9.54996548744889	33.430953481379	10	36
9.54996548744889	33.430953481379	11	33
8.72611345388961	33.4309535050313	10	33

Solution x	Solution y	Original x	Original y
8.72611345388961	33.4309535050313	9	33
7.88059081785688	33.4309535254753	9	36
7.88059081785688	33.4309535254753	8	36
6.97480950389051	33.4309535465325	6.2	37.1
6.97480950389051	33.4309535465325	6.2	36.5
6.59725649578097	33.4309535677361	7	36
6.21885438096356	33.4309535899584	8	33
6.21885438096356	33.4309535899584	7	33
5.82614959252902	33.4309536097934	4.7	33.5
5.82614959252902	33.4309536097934	4	34
5.45885696183322	33.430953630016	4.7	34.5
5.09892435434106	33.4309536499764	4	36
5.09892435434106	33.4309536499764	4	35
4.76115130134832	33.4309536703109	2	36
4.6873264248643	33.4309536910411	1.5	35.5
4.68979908300392	33.2258919217844	1.5	35
4.69227738069199	32.9660025195955	2	35
4.69227738069199	32.9660025195955	2	34
4.69475689333561	32.6724064152023	3	35
4.69475689333561	32.6724064152023	3	34
4.69723678124525	32.3563291826043	3	33
4.69971722073657	32.0400662343336	4	33
4.70219755465523	31.7224460821417	5.2	32
4.70219755465523	31.7224460821417	4	32
4.70467676521591	31.4082609571083	5	31
4.70467676521591	31.4082609571083	4	31
4.70715531954221	31.1027851995623	3	32
4.70715531954221	31.1027851995623	3	31
4.70963487211974	30.7984930468877	2	32
4.70963487211974	30.7984930468877	2	31
4.71211853276731	30.4861902835295	2	33
4.71462256236785	29.4689953193761	2	30
4.7171295114711	28.4370572427792	2	29
4.7171295114711	28.4370572427792	2	28
4.71964208766873	27.4600848237676	2	26
4.72215898422989	26.64876996114	2	24
4.7339606485216	26.6452775613288	2	25
4.74580639382418	26.641804100249	2	27
4.75768176339506	26.6383361803761	4	30
4.75768176339506	26.6383361803761	3	30
4.88427809514017	26.6331228890055	4	29
5.01203391670066	26.6279023134568	4	28
5.14088604956883	26.6226799635758	3	29
5.27471226899519	26.6174439216657	7	30
5.28313917787969	26.4138843847126	7	27
5.29155983440938	26.2099783721946	3	28
5.29999971711308	26.0000001862443	9.1	26
5.23566224827594	25.701557337062	8	26
5.23566224827594	25.701557337062	7.5	25.5
5.16985868936986	25.4063791362542	8	24
5.10260295851022	25.1286328533423	7	24
5.10260295851022	25.1286328533423	5.4	24.3
5.03488750852446	24.8618199847953	4	25
4.96749464592406	24.5961694833041	4.7	25.5
4.96749464592406	24.5961694833041	4	26
4.90047073070771	24.3259518057196	4	27
4.83387634494193	24.0393227133667	3	27
4.83387634494193	24.0393227133667	3	26
4.76980025373642	23.6620934742024	3	25
4.70622539073132	23.2763085710749	3	24
4.64307792284943	22.8881297709968	5.4	23.3
4.64307792284943	22.8881297709968	4	24
4.57994161629371	22.4959386863206	4	23
4.57994161629371	22.4959386863206	4	22
4.51703085946266	22.1099329281936	3	23
4.45447564470018	21.720088340589	2	23
4.3927511623598	21.3161675785058	3	22
4.3927511623598	21.3161675785058	2	22
4.33192516340057	20.905164624649	2	21
4.33192516340057	20.905164624649	2	20
4.2722577096124	20.5098066664415	2	18
4.21406913512601	20.1793431420428	2	19
4.15643150927117	19.8594060902785	3	20
4.15643150927117	19.8594060902785	3	19
4.09918585508771	19.5461644641556	4	21
4.09918585508771	19.5461644641556	3	21
4.0421848770994	19.2219466434541	7	21
3.9830882612634	18.8505988513383	5.3	21
3.92370997517719	18.4596373552954	4	20
3.92370997517719	18.4596373552954	4	19

Solution x	Solution y	Original x	Original y
3.86435768857982	18.058703729597	5	18.3
3.80487177592134	17.6585387460446	4	17
3.80487177592134	17.6585387460446	4	16
3.74537404445731	17.2794245962487	4	18
3.68588907858444	16.8980265937911	3	18
3.68588907858444	16.8980265937911	3	17
3.62667757208631	16.5127735532662	2	17
3.62667757208631	16.5127735532662	2	16
3.56810269662114	16.131674358821	2	15
3.50987054034719	15.7609156756982	2	14
3.45200920312715	15.4062603579511	3	14
3.45200920312715	15.4062603579511	3	13
3.39437902053827	15.0803286045106	3	16
3.39437902053827	15.0803286045106	3	15
3.33692090882847	14.7528953784499	4	15
3.27942453664926	14.4254955458606	7	15
3.27942453664926	14.4254955458606	5	15
3.15875610996564	13.7951148337247	4	14
3.0378068362232	13.1661535209859	2	13
2.91777821678747	12.5445295080904	4	13
2.91777821678747	12.5445295080904	4	12
2.79666865902044	11.9325922545252	4	9
2.67358353684051	11.4375339498155	3	12
2.55056525599656	10.9390950923638	2	12
2.55056525599656	10.9390950923638	2	11
2.42860924050103	10.4328438979685	4	10
2.42860924050103	10.4328438979685	3	10
2.30549809420218	9.94058344228351	4	11
2.30549809420218	9.94058344228351	3	11
2.18086247811024	9.42612560030759	2	10
2.05661417018257	8.90758679026717	2	9
2.05661417018257	8.90758679026717	2	8
1.93280915471054	8.40199685967817	3	9
1.93280915471054	8.40199685967817	3	8
1.80793356882256	7.89775550513285	4	7
1.68113757338179	7.40928491251636	4	8
1.55219088055128	6.91311465523712	3	7
1.42241046137885	6.41740677012731	2	7
1.42241046137885	6.41740677012731	2	6
1.29222969938559	5.92265309382568	2	5
1.16180819286693	5.4386796473565	4	6
1.02713551750688	4.94348123589697	4	5
0.887230247588164	4.44806691804055	3	6
0.887230247588164	4.44806691804055	3	5
0.742098953137415	3.91565897318121	2	4
0.596164154542336	3.38297567375346	3	4
0.447030607955384	2.83835528943637	4	4

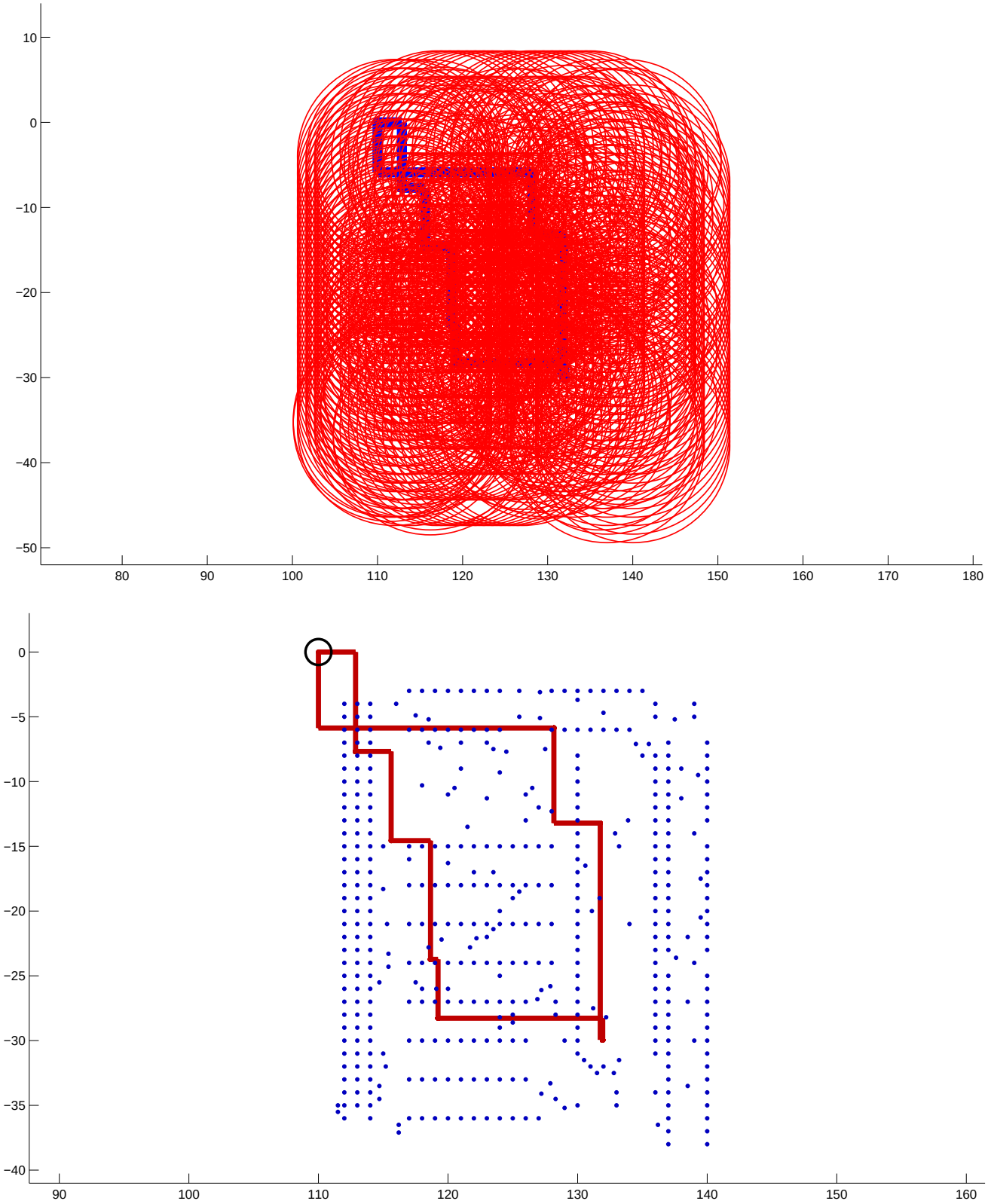


Figure N.126: $pcb442$, $r = 11.4$, Equal Radius, 2D, Manhattan, Length = 103.7559198

Table N-129: Solution for *pcb*442, $r = 11.4$, Equal Radius, 2D, Manhattan

Total distance: 103.755919819867			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
2.86541827249327	7.68393541303612	2	16
2.86541827249327	7.68393541303612	4	13
2.86541827249327	7.68393541303612	3	14
2.86541827249327	7.68393541303612	4	12
2.86541827249327	7.68393541303612	3	13
2.86541827249327	7.68393541303612	4	11
2.86541827249327	7.68393541303612	3	12
2.86541827249327	7.68393541303612	2	13
2.86541827249327	7.68393541303612	3	11
2.86541827249327	7.68393541303612	2	12
2.86541827249327	7.68393541303612	7	6
2.86541827249327	7.68393541303612	4	9
2.86541827249327	7.68393541303612	3	10
2.86541827249327	7.68393541303612	2	11
2.86541827249327	7.68393541303612	7.5	4.9
2.86541827249327	7.68393541303612	4	8
2.86541827249327	7.68393541303612	3	9
2.86541827249327	7.68393541303612	2	10
2.86541827249327	7.68393541303612	8	3
2.86541827249327	7.68393541303612	4	7
2.86541827249327	7.68393541303612	3	8
2.86541827249327	7.68393541303612	2	9
2.86541827249327	7.68393541303612	7	3
2.86541827249327	7.68393541303612	6	4
2.86541827249327	7.68393541303612	4	6
2.86541827249327	7.68393541303612	3	7
2.86541827249327	7.68393541303612	2	8
2.86541827249327	7.68393541303612	4	5
2.86541827249327	7.68393541303612	3	6
2.86541827249327	7.68393541303612	2	7
2.86541827249327	7.68393541303612	4	4
2.86541827249327	7.68393541303612	3	5
2.86541827249327	7.68393541303612	2	6
2.86541827249327	7.68393541303612	3	4
2.86541827249327	7.68393541303612	2	5
2.86541827249327	7.68393541303612	2	4
5.61027937689525	14.5665099315956	2	15
5.61027937689525	14.5665099315956	2	14
5.61027937689525	14.5665099315956	4	10
8.65311579573614	23.7295073783583	15	33
8.65311579573614	23.7295073783583	14	33
8.65311579573614	23.7295073783583	13	33
8.65311579573614	23.7295073783583	14	30
8.65311579573614	23.7295073783583	16	21
8.65311579573614	23.7295073783583	15	21
8.65311579573614	23.7295073783583	14	21
8.65311579573614	23.7295073783583	13.5	21.4
8.65311579573614	23.7295073783583	15.5	18.5
8.65311579573614	23.7295073783583	16	18
8.65311579573614	23.7295073783583	15	19
8.65311579573614	23.7295073783583	14	20
8.65311579573614	23.7295073783583	13	21
8.65311579573614	23.7295073783583	15	18
8.65311579573614	23.7295073783583	12	21
8.65311579573614	23.7295073783583	14	18
8.65311579573614	23.7295073783583	13	18
8.65311579573614	23.7295073783583	13.5	17
8.65311579573614	23.7295073783583	12	18
8.65311579573614	23.7295073783583	14	15
8.65311579573614	23.7295073783583	12	17
8.65311579573614	23.7295073783583	11	18
8.65311579573614	23.7295073783583	13	15
8.65311579573614	23.7295073783583	10	18
8.65311579573614	23.7295073783583	12	15
8.65311579573614	23.7295073783583	9	18
8.65311579573614	23.7295073783583	10	16.3
8.65311579573614	23.7295073783583	11	15
8.65311579573614	23.7295073783583	8	18
8.65311579573614	23.7295073783583	11.5	13.5
8.65311579573614	23.7295073783583	10	15
8.65311579573614	23.7295073783583	7	18
8.65311579573614	23.7295073783583	9	15
8.65311579573614	23.7295073783583	4	20
8.65311579573614	23.7295073783583	5	18.3
8.65311579573614	23.7295073783583	8	15
8.65311579573614	23.7295073783583	7	16
8.65311579573614	23.7295073783583	4	19
8.65311579573614	23.7295073783583	3	20
8.65311579573614	23.7295073783583	7	15
8.65311579573614	23.7295073783583	4	18
8.65311579573614	23.7295073783583	3	19
8.65311579573614	23.7295073783583	2	20
8.65311579573614	23.7295073783583	4	17
8.65311579573614	23.7295073783583	3	18
8.65311579573614	23.7295073783583	2	19
8.65311579573614	23.7295073783583	5	15
8.65311579573614	23.7295073783583	4	16
8.65311579573614	23.7295073783583	3	17
8.65311579573614	23.7295073783583	2	18
8.65311579573614	23.7295073783583	4	15
8.65311579573614	23.7295073783583	3	16
8.65311579573614	23.7295073783583	2	17
8.65311579573614	23.7295073783583	4	14
8.65311579573614	23.7295073783583	3	15
9.23158979528512	28.272521846681	17	36
9.23158979528512	28.272521846681	16	36
9.23158979528512	28.272521846681	15	36
9.23158979528512	28.272521846681	14	36
9.23158979528512	28.272521846681	13	36
9.23158979528512	28.272521846681	12	36
9.23158979528512	28.272521846681	11	36
9.23158979528512	28.272521846681	10	36
9.23158979528512	28.272521846681	12	33
9.23158979528512	28.272521846681	9	36
9.23158979528512	28.272521846681	11	33
9.23158979528512	28.272521846681	8	36
9.23158979528512	28.272521846681	6.2	37.1
9.23158979528512	28.272521846681	14	29
9.23158979528512	28.272521846681	13	30
9.23158979528512	28.272521846681	10	33
9.23158979528512	28.272521846681	7	36
9.23158979528512	28.272521846681	6.2	36.5
9.23158979528512	28.272521846681	14	28.2
9.23158979528512	28.272521846681	12	30
9.23158979528512	28.272521846681	9	33
9.23158979528512	28.272521846681	14	27
9.23158979528512	28.272521846681	11	30
9.23158979528512	28.272521846681	8	33
9.23158979528512	28.272521846681	13	27
9.23158979528512	28.272521846681	10	30
9.23158979528512	28.272521846681	7	33
9.23158979528512	28.272521846681	4	36
9.23158979528512	28.272521846681	4.7	34.5
9.23158979528512	28.272521846681	14	25
9.23158979528512	28.272521846681	12	27
9.23158979528512	28.272521846681	9	30
9.23158979528512	28.272521846681	4	35
9.23158979528512	28.272521846681	4.7	33.5
9.23158979528512	28.272521846681	14	24
9.23158979528512	28.272521846681	11	27
9.23158979528512	28.272521846681	8	30
9.23158979528512	28.272521846681	4	34
9.23158979528512	28.272521846681	3	35
9.23158979528512	28.272521846681	2	36
9.23158979528512	28.272521846681	5.2	32
9.23158979528512	28.272521846681	1.5	35.5
9.23158979528512	28.272521846681	13	24
9.23158979528512	28.272521846681	10	27
9.23158979528512	28.272521846681	7	30
9.23158979528512	28.272521846681	4	33
9.23158979528512	28.272521846681	3	34
9.23158979528512	28.272521846681	2	35
9.23158979528512	28.272521846681	1.5	35
9.23158979528512	28.272521846681	12	24
9.23158979528512	28.272521846681	10	26
9.23158979528512	28.272521846681	9	27
9.23158979528512	28.272521846681	5	31
9.23158979528512	28.272521846681	4	32
9.23158979528512	28.272521846681	3	33
9.23158979528512	28.272521846681	2	34
9.23158979528512	28.272521846681	9.1	26
9.23158979528512	28.272521846681	13	22
9.23158979528512	28.272521846681	11	24
9.23158979528512	28.272521846681	8	27

Solution x	Solution y	Original x	Original y
9.23158979528512	28.272521846681	4	31
9.23158979528512	28.272521846681	3	32
9.23158979528512	28.272521846681	2	33
9.23158979528512	28.272521846681	11.7	22.8
9.23158979528512	28.272521846681	12.2	22.1
9.23158979528512	28.272521846681	10	24
9.23158979528512	28.272521846681	8	26
9.23158979528512	28.272521846681	7	27
9.23158979528512	28.272521846681	4	30
9.23158979528512	28.272521846681	3	31
9.23158979528512	28.272521846681	2	32
9.23158979528512	28.272521846681	7.5	25.5
9.23158979528512	28.272521846681	9	24
9.23158979528512	28.272521846681	4	29
9.23158979528512	28.272521846681	3	30
9.23158979528512	28.272521846681	2	31
9.23158979528512	28.272521846681	11	21
9.23158979528512	28.272521846681	8	24
9.23158979528512	28.272521846681	4	28
9.23158979528512	28.272521846681	3	29
9.23158979528512	28.272521846681	2	30
9.23158979528512	28.272521846681	9.5	22.2
9.23158979528512	28.272521846681	8.5	22.8
9.23158979528512	28.272521846681	10	21
9.23158979528512	28.272521846681	7	24
9.23158979528512	28.272521846681	4	27
9.23158979528512	28.272521846681	3	28
9.23158979528512	28.272521846681	2	29
9.23158979528512	28.272521846681	4.7	25.5
9.23158979528512	28.272521846681	9	21
9.23158979528512	28.272521846681	4	26
9.23158979528512	28.272521846681	3	27
9.23158979528512	28.272521846681	2	28
9.23158979528512	28.272521846681	5.4	24.3
9.23158979528512	28.272521846681	8	21
9.23158979528512	28.272521846681	4	25
9.23158979528512	28.272521846681	3	26
9.23158979528512	28.272521846681	2	27
9.23158979528512	28.272521846681	5.4	23.3
9.23158979528512	28.272521846681	7	21
9.23158979528512	28.272521846681	4	24
9.23158979528512	28.272521846681	3	25
9.23158979528512	28.272521846681	2	26
9.23158979528512	28.272521846681	4	23
9.23158979528512	28.272521846681	3	24
9.23158979528512	28.272521846681	2	25
9.23158979528512	28.272521846681	5.3	21
9.23158979528512	28.272521846681	4	22
9.23158979528512	28.272521846681	3	23
9.23158979528512	28.272521846681	2	24
9.23158979528512	28.272521846681	4	21
9.23158979528512	28.272521846681	3	22
9.23158979528512	28.272521846681	2	23
9.23158979528512	28.272521846681	3	21
9.23158979528512	28.272521846681	2	22
9.23158979528512	28.272521846681	2	21
21.94074419993	29.9372157100036	30	38
21.94074419993	29.9372157100036	30	37
21.94074419993	29.9372157100036	30	36
21.94074419993	29.9372157100036	30	35
21.94074419993	29.9372157100036	27	38
21.94074419993	29.9372157100036	30	34
21.94074419993	29.9372157100036	27	37
21.94074419993	29.9372157100036	30	33
21.94074419993	29.9372157100036	27	36
21.94074419993	29.9372157100036	26.2	36.5
21.94074419993	29.9372157100036	28.5	33.5
21.94074419993	29.9372157100036	30	32
21.94074419993	29.9372157100036	27	35
21.94074419993	29.9372157100036	30	31
21.94074419993	29.9372157100036	27	34
21.94074419993	29.9372157100036	30	30
21.94074419993	29.9372157100036	27	33
21.94074419993	29.9372157100036	26	34
21.94074419993	29.9372157100036	30	29
21.94074419993	29.9372157100036	29	30
21.94074419993	29.9372157100036	27	32
21.94074419993	29.9372157100036	23	35
21.94074419993	29.9372157100036	30	28
21.94074419993	29.9372157100036	27	31

Solution x	Solution y	Original x	Original y
21.94074419993	29.9372157100036	30	27
21.94074419993	29.9372157100036	27	30
21.94074419993	29.9372157100036	26	31
21.94074419993	29.9372157100036	23	34
21.94074419993	29.9372157100036	30	26
21.94074419993	29.9372157100036	27	29
21.94074419993	29.9372157100036	26	30
21.94074419993	29.9372157100036	28.5	27
21.94074419993	29.9372157100036	22.8	32.5
21.94074419993	29.9372157100036	30	25
21.94074419993	29.9372157100036	27	28
21.94074419993	29.9372157100036	26	29
21.94074419993	29.9372157100036	20	35
21.94074419993	29.9372157100036	23.2	31.5
21.94074419993	29.9372157100036	19	35.2
21.94074419993	29.9372157100036	21.5	32.5
21.94074419993	29.9372157100036	27	27
21.94074419993	29.9372157100036	26	28
21.94074419993	29.9372157100036	22	32
21.94074419993	29.9372157100036	30	23
21.94074419993	29.9372157100036	29	24
21.94074419993	29.9372157100036	27	26
21.94074419993	29.9372157100036	26	27
21.94074419993	29.9372157100036	21	32
21.94074419993	29.9372157100036	18.3	34.5
21.94074419993	29.9372157100036	20.5	31.5
21.94074419993	29.9372157100036	30	22
21.94074419993	29.9372157100036	27	25
21.94074419993	29.9372157100036	26	26
21.94074419993	29.9372157100036	17.2	34.1
21.94074419993	29.9372157100036	17.9	33.3
21.94074419993	29.9372157100036	27.6	23.6
21.94074419993	29.9372157100036	26	25
21.94074419993	29.9372157100036	20	31
21.94074419993	29.9372157100036	28.5	22
21.94074419993	29.9372157100036	22.2	28.2
21.94074419993	29.9372157100036	27	23
21.94074419993	29.9372157100036	26	24
21.94074419993	29.9372157100036	20	30
21.94074419993	29.9372157100036	27	22
21.94074419993	29.9372157100036	26	23
21.94074419993	29.9372157100036	20	29
21.94074419993	29.9372157100036	19	30
21.94074419993	29.9372157100036	16	33
21.94074419993	29.9372157100036	21.2	27.5
21.94074419993	29.9372157100036	27	21
21.94074419993	29.9372157100036	26	22
21.94074419993	29.9372157100036	20	28
21.94074419993	29.9372157100036	27	20
21.94074419993	29.9372157100036	26	21
21.94074419993	29.9372157100036	20	27
21.94074419993	29.9372157100036	18.3	28
21.94074419993	29.9372157100036	26	20
21.94074419993	29.9372157100036	20	26
21.94074419993	29.9372157100036	16	30
21.94074419993	29.9372157100036	18.3	27
21.94074419993	29.9372157100036	24	21
21.94074419993	29.9372157100036	20	25
21.94074419993	29.9372157100036	15	30
21.94074419993	29.9372157100036	20	24
21.94074419993	29.9372157100036	17.9	25.8
21.94074419993	29.9372157100036	16.9	26.8
21.94074419993	29.9372157100036	15	28.6
21.94074419993	29.9372157100036	17.2	26.1
21.94074419993	29.9372157100036	20	23
21.94074419993	29.9372157100036	16	27
21.94074419993	29.9372157100036	15	28
21.94074419993	29.9372157100036	20	22
21.94074419993	29.9372157100036	18	24
21.94074419993	29.9372157100036	15	27
21.94074419993	29.9372157100036	21.1	20
21.94074419993	29.9372157100036	20	21
21.94074419993	29.9372157100036	17	24
21.94074419993	29.9372157100036	21.7	19
21.94074419993	29.9372157100036	20	20
21.94074419993	29.9372157100036	16	24
21.94074419993	29.9372157100036	20	19
21.94074419993	29.9372157100036	18	21
21.94074419993	29.9372157100036	15	24
21.94074419993	29.9372157100036	17	21

Solution x	Solution y	Original x	Original y
21.7440980312616	13.2092826096587	30	21
21.7440980312616	13.2092826096587	29.5	20.5
21.7440980312616	13.2092826096587	30	20
21.7440980312616	13.2092826096587	30	19
21.7440980312616	13.2092826096587	30	18
21.7440980312616	13.2092826096587	29.5	17.5
21.7440980312616	13.2092826096587	30	17
21.7440980312616	13.2092826096587	30	16
21.7440980312616	13.2092826096587	27	19
21.7440980312616	13.2092826096587	30	15
21.7440980312616	13.2092826096587	27	18
21.7440980312616	13.2092826096587	26	19
21.7440980312616	13.2092826096587	27	17
21.7440980312616	13.2092826096587	26	18
21.7440980312616	13.2092826096587	30	13
21.7440980312616	13.2092826096587	29	14
21.7440980312616	13.2092826096587	27	16
21.7440980312616	13.2092826096587	26	17
21.7440980312616	13.2092826096587	30	12
21.7440980312616	13.2092826096587	27	15
21.7440980312616	13.2092826096587	26	16
21.7440980312616	13.2092826096587	30	11
21.7440980312616	13.2092826096587	27	14
21.7440980312616	13.2092826096587	26	15
21.7440980312616	13.2092826096587	30	10
21.7440980312616	13.2092826096587	27	13
21.7440980312616	13.2092826096587	26	14
21.7440980312616	13.2092826096587	28	11.3
21.7440980312616	13.2092826096587	30	9
21.7440980312616	13.2092826096587	27	12
21.7440980312616	13.2092826096587	26	13
21.7440980312616	13.2092826096587	29.3	9.5
21.7440980312616	13.2092826096587	23.2	15
21.7440980312616	13.2092826096587	30	8
21.7440980312616	13.2092826096587	27	11
21.7440980312616	13.2092826096587	26	12
21.7440980312616	13.2092826096587	20	18
21.7440980312616	13.2092826096587	20.6	16.5
21.7440980312616	13.2092826096587	30	7
21.7440980312616	13.2092826096587	28	9
21.7440980312616	13.2092826096587	27	10
21.7440980312616	13.2092826096587	26	11
21.7440980312616	13.2092826096587	20	17
21.7440980312616	13.2092826096587	23.9	13
21.7440980312616	13.2092826096587	22.9	14
21.7440980312616	13.2092826096587	27	9
21.7440980312616	13.2092826096587	26	10
21.7440980312616	13.2092826096587	20	16
21.7440980312616	13.2092826096587	18	18
21.7440980312616	13.2092826096587	27	8
21.7440980312616	13.2092826096587	26	9
21.7440980312616	13.2092826096587	20	15
21.7440980312616	13.2092826096587	17	18
21.7440980312616	13.2092826096587	29	5
21.7440980312616	13.2092826096587	27	7
21.7440980312616	13.2092826096587	26	8
21.7440980312616	13.2092826096587	20	14
21.7440980312616	13.2092826096587	25	8
21.7440980312616	13.2092826096587	20	13
21.7440980312616	13.2092826096587	18	15
21.7440980312616	13.2092826096587	27.5	5.2
21.7440980312616	13.2092826096587	25.5	7.1
21.7440980312616	13.2092826096587	20	12
21.7440980312616	13.2092826096587	17	15
21.7440980312616	13.2092826096587	24.5	7.1
21.7440980312616	13.2092826096587	26	5
21.7440980312616	13.2092826096587	20	11
21.7440980312616	13.2092826096587	16	15
21.7440980312616	13.2092826096587	18	12.3
21.7440980312616	13.2092826096587	26	4
21.7440980312616	13.2092826096587	24	6
21.7440980312616	13.2092826096587	20	10
21.7440980312616	13.2092826096587	15	15
21.7440980312616	13.2092826096587	23	6
21.7440980312616	13.2092826096587	20	9
21.7440980312616	13.2092826096587	17	12
21.7440980312616	13.2092826096587	16	13
21.7440980312616	13.2092826096587	25	3
21.7440980312616	13.2092826096587	22	6
21.7440980312616	13.2092826096587	20	8

Solution x	Solution y	Original x	Original y
21.7440980312616	13.2092826096587	16.5	10.5
21.7440980312616	13.2092826096587	24	3
21.7440980312616	13.2092826096587	21	6
21.7440980312616	13.2092826096587	16	11
21.7440980312616	13.2092826096587	22	4.7
21.7440980312616	13.2092826096587	23	3
21.7440980312616	13.2092826096587	20	6
21.7440980312616	13.2092826096587	17.5	7.5
21.7440980312616	13.2092826096587	22	3
21.7440980312616	13.2092826096587	19	6
21.7440980312616	13.2092826096587	21	3
21.7440980312616	13.2092826096587	18	6
21.7440980312616	13.2092826096587	20	3.7
21.7440980312616	13.2092826096587	14	9.3
21.7440980312616	13.2092826096587	20	3
21.7440980312616	13.2092826096587	14.5	7.7
21.7440980312616	13.2092826096587	17.1	5.1
21.7440980312616	13.2092826096587	19	3
21.7440980312616	13.2092826096587	18	3
21.7440980312616	13.2092826096587	15.5	5
21.7440980312616	13.2092826096587	17.1	3.1
18.169054388742	5.87110608858719	29	4
18.169054388742	5.87110608858719	13	11.3
18.169054388742	5.87110608858719	13.5	7.5
18.169054388742	5.87110608858719	10.5	10.5
18.169054388742	5.87110608858719	10	11
18.169054388742	5.87110608858719	14	6
18.169054388742	5.87110608858719	13	7
18.169054388742	5.87110608858719	11	9
18.169054388742	5.87110608858719	13	6
18.169054388742	5.87110608858719	15.5	3
18.169054388742	5.87110608858719	8	10.3
18.169054388742	5.87110608858719	12	6
18.169054388742	5.87110608858719	11	7
18.169054388742	5.87110608858719	14	3
18.169054388742	5.87110608858719	11	6
18.169054388742	5.87110608858719	9.4	7.4
18.169054388742	5.87110608858719	13	3
18.169054388742	5.87110608858719	10	6
18.169054388742	5.87110608858719	8.5	7
18.169054388742	5.87110608858719	12	3
18.169054388742	5.87110608858719	9	6
18.169054388742	5.87110608858719	11	3
18.169054388742	5.87110608858719	8	6
18.169054388742	5.87110608858719	8.5	5.2
18.169054388742	5.87110608858719	10	3
18.169054388742	5.87110608858719	9	3

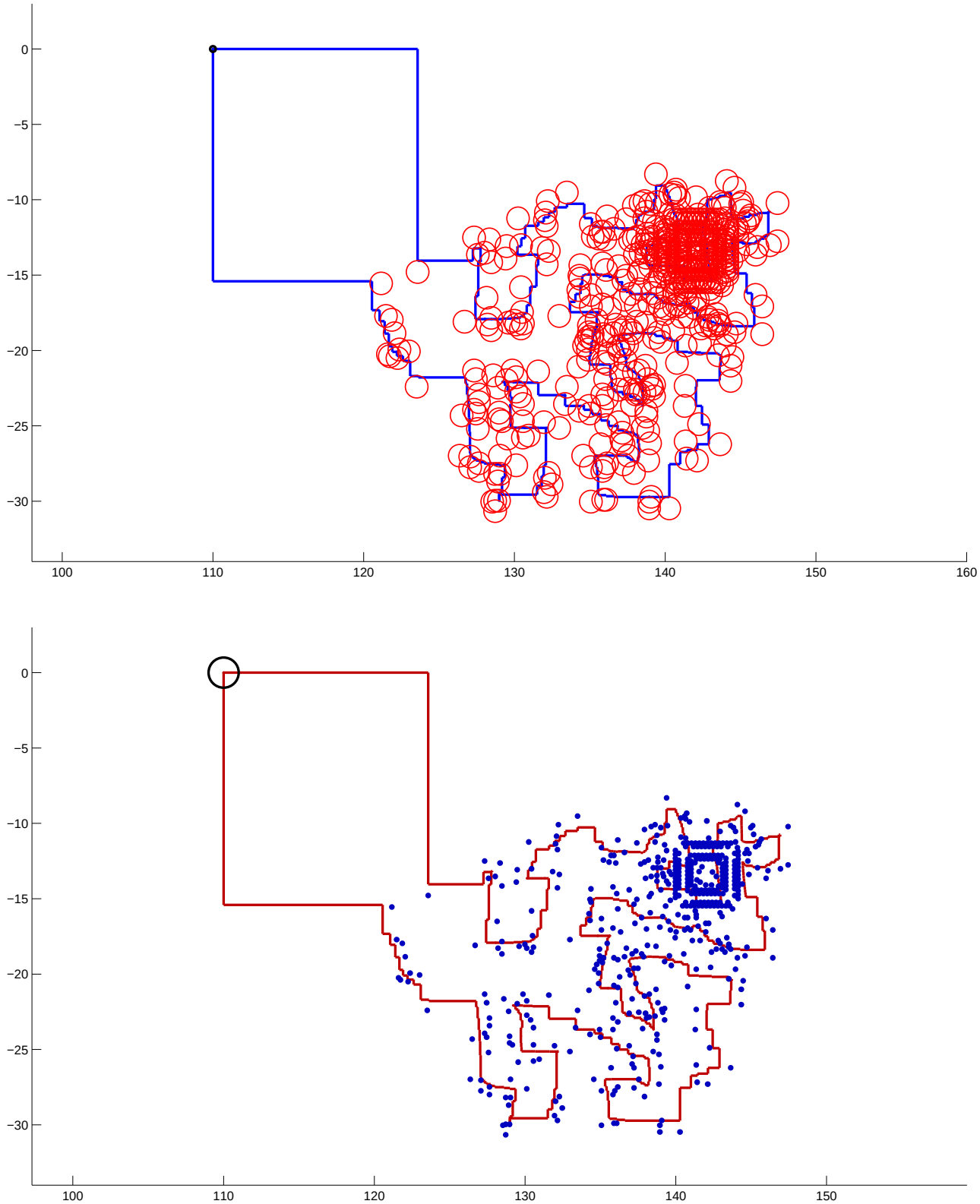


Figure N.127: $d493$, $r = 0.74904$, Equal Radius, 2D, Manhattan, Length = 256.2325549

Table N-130: Solution for $d493$, $r = 0.74904$, Equal Radius, 2D, Manhattan

Total distance: 256.232554880384			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
13.5759999843198	14.040958714209	13.576	14.79
17.2424819449572	13.2255742267275	17.323	12.504
17.8093482070789	13.1606518657603	18.339	12.631
17.7524774040864	14.0627021840612	18.466	14.155
17.7524774040864	14.0627021840612	18.021	13.52
17.7524774040864	14.0627021840612	17.577	13.647
17.5980233344466	16.3933490976657	18.148	16.505
17.4158182548334	17.9149582207672	16.688	18.092
18.0452351317031	17.9149584602493	18.466	17.838
18.0452351317031	17.9149584602493	18.212	18.283
18.4659998551149	17.9149587154204	18.466	18.664
19.2429932267209	17.8827925265624	19.609	18.156
19.7903877341474	17.8502059634514	19.99	18.029
20.2824015487222	17.8174171823094	20.434	18.537
20.4308234935851	17.7008718702868	20.117	18.283
20.6177084531599	17.5347796429418	20.561	18.219
20.8170742394401	16.9899033258724	20.498	17.457
21.0489113293711	15.7673450500521	20.434	15.806
21.452937022527	14.364048930153	22.149	14.282
21.5713391367249	13.6470003666731	22.276	13.393
21.3121474826828	13.6470002544712	21.831	13.203
20.1226610374278	13.6470001369913	19.418	13.901
20.1983913042317	13.0857857577341	19.482	13.076
20.4559309671851	12.5559989223385	20.434	13.012
20.7158682425847	11.727325755015	20.244	11.234
21.5917516986574	11.4778179770644	22.149	11.742
21.9492644082361	11.1670086560682	22.022	11.361
22.2981709761723	10.8359218752371	22.085	10.853
22.675640421616	10.5029227275887	22.212	10.091
23.4819999645937	10.2690411132652	23.482	9.52
24.6310122766445	11.2167827191757	25.07	11.615
25.1391549587253	11.7301539493514	25.197	12.441
25.5227391287115	11.8279592433201	25.578	12.568
25.6895970998662	11.8460635860002	25.705	12.123
25.8562209281174	11.8640712822587	25.895	12.123
26.0219991275777	11.8819910826053	26.022	12.631
26.1490009882619	11.8560293831978	26.149	11.107
26.8324255337456	11.9010445486763	26.594	11.933
27.6730004729101	11.9459588695486	27.673	12.695
27.8316766031682	11.877163199721	27.927	12.568
27.9736633507823	11.7646689835423	28.181	12.441
28.0857822862289	11.3586083105839	27.419	11.298
28.0857822862289	11.3586083105839	28.626	11.234
28.2331731929282	11.0295664043563	27.927	10.409
28.4474508562038	10.8927371637904	28.372	10.218
28.6834628204597	10.8017242002465	28.626	10.091
28.6834628204597	10.8017242002465	29.007	10.282
28.9041389169851	10.7519808009715	28.753	10.79
29.1326168858413	10.7021330969126	29.261	11.425
29.2618883774655	9.95227700751937	29.451	10.155
29.3879993016612	9.06204266804115	29.388	8.313
30.0067512462364	9.30230555838245	30.721	9.329
30.1106056518467	9.53157432279436	30.594	9.52
30.2066898765801	9.76221153530244	30.658	9.71
30.2970171818601	9.99723921570973	30.34	9.647
30.3870009451485	10.2582304517679	30.912	9.901
30.4646161748857	10.6425412474466	30.527	11.313
30.5404700050632	10.8090607189703	30.34	10.917
30.5404700050632	10.8090607189703	30.658	10.98
30.6169025889225	10.9681077073971	30.787	11.313
30.6169025889225	10.9681077073971	31.047	11.313
30.6874819692783	11.102603915753	30.657	11.541
30.7583244965165	11.226816941219	31.307	11.313
30.8238162869886	11.3483331632403	31.567	11.313
30.8360675493174	11.5548667998253	31.437	11.541
30.8480831071113	11.7635614962215	31.177	11.541
30.8600376002348	11.9863498743673	31.242	12.126
30.8600376002348	11.9863498743673	31.502	12.126
30.8715589323761	12.1754229468067	31.372	12.353
30.8829576754034	12.352999476484	31.632	12.353
30.8829581859141	12.5298381494427	31.015	12.776
30.8829581859141	12.5298381494427	31.015	12.516
30.8829587025668	12.6991334663694	31.275	12.613
30.8869249233348	12.8570870305609	30.787	12.906
30.8869249233348	12.8570870305609	30.787	12.646
30.9879537086016	12.8850024070115	31.737	12.885
30.9529710441291	12.9045229602131	31.015	13.296
30.9178884971498	12.9238695038395	30.787	13.166
30.8829602018998	12.9431297607117	30.787	13.686
30.8829602018998	12.9431297607117	30.787	13.426
30.8829597250494	12.9093923596474	31.015	13.556
30.8829597250494	12.9093923596474	31.015	13.036
30.8829592168702	12.871639119167	31.547	13.203
30.7879604281802	12.8293062688059	30.787	12.386
30.7879604281802	12.8293062688059	30.982	12.126
30.6203997285118	12.8099674112517	30.202	12.451
30.4731159679309	12.7908979742633	29.975	12.581
30.4731159679309	12.7908979742633	30.202	12.711
30.3487458601987	12.7720079048888	30.202	13.231
30.2280550725782	12.7528506386017	30.202	13.491
30.129070954871	12.6696888324942	30.202	11.996
30.0263084907405	12.60300573701	29.975	12.321
30.0263084907405	12.60300573701	29.975	12.061
29.9252566419025	12.5415280068743	29.975	11.801
29.5575976515744	12.5335897477275	29.388	11.804
29.5575973824084	12.7115088255759	29.975	13.101
29.5575973824084	12.7115088255759	29.975	12.841
29.557597122324	12.8611831757999	30.202	12.971
29.5575968412493	12.9990405700001	29.975	13.621
29.5575968412493	12.9990405700001	29.975	13.361
29.3853275609962	12.9990406473118	29.197	13.52
29.3853275609962	12.9990406473118	29.705	13.393
29.2071760991358	12.9990407786583	29.134	13.33
29.2071760991358	12.9990407786583	29.197	12.441
29.032852584285	12.9990409175828	29.578	13.203
28.8159779702767	12.9990409956924	28.816	12.25
28.7969857224397	13.1262974553849	29.007	12.949
28.7969857224397	13.1262974553849	28.816	12.568
28.777902835232	13.2814370587488	28.499	12.949
28.7589714528681	13.4497975419606	28.753	13.457
28.7589714528681	13.4497975419606	28.753	12.949
28.7400437431966	13.6470001510736	27.991	13.647
28.7400437431966	13.6470001510736	28.372	13.52
28.7571968669504	13.9064169842982	28.753	13.838
28.7743585762331	14.1706558465123	28.372	14.663
28.791951340937	14.349539798882	28.245	14.854
29.6202972749903	14.3673258781377	29.642	15.108
29.6202972749903	14.3673258781377	29.007	14.409
29.6202972749903	14.3673258781377	29.975	14.661
29.6202972749903	14.3673258781377	29.515	14.028
29.6202972749903	14.3673258781377	29.388	13.838
29.6202972749903	14.3673258781377	29.975	14.401
29.6202972749903	14.3673258781377	29.975	14.141
30.2753440941769	14.3775344299229	29.975	14.921
30.2753440941769	14.3775344299229	30.202	14.791
30.2753440941769	14.3775344299229	30.202	14.271
30.2753440941769	14.3775344299229	29.975	13.881
30.2753440941769	14.3775344299229	30.202	14.011
30.2753440941769	14.3775344299229	30.787	14.466
30.2753440941769	14.3775344299229	30.202	13.751
30.2753440941769	14.3775344299229	30.787	13.946
30.646564859782	14.3881053425103	30.787	14.206
30.646564859782	14.3881053425103	31.015	14.076
30.9385833142851	14.3987549484774	31.015	13.816
31.2159557121607	14.4095683146868	31.399	13.754
31.2159557121607	14.4095683146868	31.61	13.901
31.3780693821398	14.421080295838	31.991	14.092
31.4679588397262	14.4329815984008	32.217	14.433
31.4314450887048	14.595840014363	31.697	14.433
31.4314450887048	14.595840014363	31.957	14.433
31.3934933766714	14.7766894528646	31.177	14.433
31.3934933766714	14.7766894528646	31.275	14.173
31.3563296664419	15.078376502126	31.293	15.806
31.3563296664419	15.078376502126	31.762	15.473
31.3563296664419	15.078376502126	31.047	14.661
31.3563296664419	15.078376502126	31.307	14.661
31.3563296664419	15.078376502126	31.892	15.246
31.3563296664419	15.078376502126	31.567	14.661
31.3563296664419	15.078376502126	31.437	14.433
31.3563296664419	15.078376502126	31.827	14.661
31.3164542850808	15.1506583933676	31.372	15.246
31.2765534779134	15.2225033775251	30.657	15.246
31.2765534779134	15.2225033775251	31.112	15.246
31.2392236644113	15.2939511314149	30.722	15.473

Solution x	Solution y	Original x	Original y
31.2029908275598	15.3634701740757	30.462	15.473
31.4725617206647	15.3634705111865	30.982	15.473
31.4725617206647	15.3634705111865	31.242	15.473
31.8640525491542	15.3634709578673	31.502	15.473
32.347003253611	15.3634713114442	31.632	15.246
32.347003253611	15.3634713114442	32.022	15.473
32.347003253611	15.3634713114442	32.282	15.473
32.347003253611	15.3634713114442	32.152	15.246
32.347003253611	15.3634713114442	32.542	15.473
32.347003253611	15.3634713114442	32.412	15.246
32.347003253611	15.3634713114442	32.802	15.473
32.347003253611	15.3634713114442	32.087	14.661
32.347003253611	15.3634713114442	32.672	15.246
32.347003253611	15.3634713114442	33.062	15.473
32.347003253611	15.3634713114442	32.347	14.661
32.347003253611	15.3634713114442	32.932	15.246
32.347003253611	15.3634713114442	32.607	14.661
32.7366535317935	15.4026130205342	32.944	15.933
33.0597633309006	15.4380426877682	33.071	16.187
33.0597711706303	15.4380425043817	33.769	15.679
33.0349132125257	15.260624423615	33.322	15.473
33.0349132125257	15.260624423615	33.582	15.473
33.0089588064536	15.0511684613061	33.452	15.246
32.9825358246716	14.8261174717463	32.867	14.661
32.9825358246716	14.8261174717463	33.127	14.661
32.9560992065609	14.6173024813159	32.477	14.433
32.9560992065609	14.6173024813159	32.737	14.433
32.9303889549399	14.4295383156983	32.835	14.173
32.9047564015293	14.2511357638938	33.322	14.401
32.9047564015293	14.2511357638938	33.322	14.141
32.8783477802031	14.0709520021376	33.095	14.271
32.8783477802031	14.0709520021376	33.095	14.011
32.85162954296	13.8856078031168	33.322	13.881
32.8244085379607	13.700589531482	33.095	13.751
32.7969884874102	13.5137351429249	32.372	14.092
32.7969884874102	13.5137351429249	32.69	13.52
32.7969884874102	13.5137351429249	32.436	13.231
32.7969884874102	13.5137351429249	33.095	13.491
32.7969884874102	13.5137351429249	33.322	13.621
32.7969884874102	13.5137351429249	33.095	13.231
32.7969884874102	13.5137351429249	33.322	13.361
32.7969884874102	13.5137351429249	33.095	12.971
32.7969884874102	13.5137351429249	33.322	13.101
32.7694967081104	13.1108220636223	33.095	12.711
32.7694967081104	13.1108220636223	33.322	12.841
32.7402737579781	12.8606276490687	33.322	12.581
32.7090969355337	12.6628129568443	33.322	12.321
32.6721513512773	12.5361985002355	32.802	12.126
32.6721513512773	12.5361985002355	33.062	12.126
32.6337614512982	12.429559262806	32.835	12.613
32.6337614512982	12.429559262806	32.932	12.353
32.5945831133652	12.3217401933417	32.672	12.353
32.555323000954	12.2136142482001	32.022	12.126
32.555323000954	12.2136142482001	32.282	12.126
32.518060086077	12.1086197650055	32.152	12.353
32.518060086077	12.1086197650055	32.412	12.353
32.4816539601244	11.9965603452769	31.892	12.353
32.4816539601244	11.9965603452769	31.762	12.126
32.4622831326211	11.6552019192548	31.827	11.313
32.4460442078475	11.540997864186	31.697	11.541
32.5291164441728	11.4915679821558	31.957	11.541
32.5291164441728	11.4915679821558	32.217	11.541
32.6260524036658	11.4417124244154	32.542	12.126
32.6260524036658	11.4417124244154	32.477	11.541
32.7300405252603	11.3774518520609	32.182	10.98
32.7300405252603	11.3774518520609	32.997	11.541
32.7300405252603	11.3774518520609	32.867	11.313
32.7300405252603	11.3774518520609	33.127	11.313
32.7300405252603	11.3774518520609	33.452	11.541
32.7300405252603	11.3774518520609	33.387	11.313
32.7463332023066	11.2189980267394	32.737	11.541
32.7463332023066	11.2189980267394	32.607	11.313
32.7626698027628	11.0477613323499	32.087	11.313
32.7626698027628	11.0477613323499	32.347	11.313
32.7828897940341	9.98380004508469	32.055	9.837
33.1117090668408	9.88644026372702	32.944	10.536
33.5603189179215	9.74512975210113	33.642	10.155
33.9901627740743	9.59170255120743	34.595	9.202
34.0869989556095	9.50704247965458	34.087	8.758
34.3568499986138	10.1448060912666	35.103	10.155

Solution x	Solution y	Original x	Original y
34.3634960765177	10.3930447781164	34.976	10.282
34.3700449351307	10.6633485987454	33.96	10.536
34.3700449351307	10.6633485987454	33.833	10.282
34.3767168205271	11.1610082489285	33.647	11.313
34.4293989224799	11.1934711908834	33.96	11.234
34.4841571002829	11.2258106725204	34.135	11.866
34.4841571002829	11.2258106725204	34.087	11.615
34.5950005465447	11.2469584913766	34.595	11.996
34.7219147556628	11.2469585096167	34.722	11.742
34.8489993165523	11.246958449106	34.849	11.996
35.2515579305119	11.1314686227467	35.293	11.552
35.2515579305119	11.1314686227467	35.484	11.425
35.6059561729804	11.0023090817093	35.547	11.234
35.6059561729804	11.0023090817093	35.166	10.726
36.1198647110539	10.8767822350216	35.674	11.044
36.9223476205511	10.7476513935159	37.452	10.218
36.8373102609082	12.3932100837859	37.452	12.758
36.5891752107887	12.5846202701532	36.944	13.012
36.2799906631081	12.7478656360314	36.119	13.139
35.9919991911968	12.8979553173127	35.992	13.647
35.0989359160061	12.813988154268	34.849	13.393
35.0989359160061	12.813988154268	34.785	12.504
35.0989359160061	12.813988154268	35.42	12.949
34.6190017634518	12.7175332393637	33.907	12.776
34.5225833123471	12.6148973066114	34.135	12.126
34.4366625224918	12.52564481373	33.907	11.996
34.445181319243	12.7935708975035	34.135	13.166
34.445181319243	12.7935708975035	34.135	12.906
34.4537563326135	13.0173743819144	34.135	13.686
34.4537563326135	13.0173743819144	33.907	12.516
34.4537563326135	13.0173743819144	34.135	12.646
34.4537563326135	13.0173743819144	34.135	12.386
34.4698221075936	13.2260789609336	33.907	13.296
34.4698221075936	13.2260789609336	33.907	13.036
34.4866115230811	13.451085383741	33.907	13.556
34.5038199649016	13.6625824785777	34.135	13.946
34.5038199649016	13.6625824785777	34.135	13.426
34.5213523140026	13.8699551078816	33.907	14.076
34.5213523140026	13.8699551078816	33.907	13.816
34.5402884778466	14.0522472274605	34.404	14.028
34.5592740026672	14.2353834356031	33.907	14.336
34.5793628819101	14.4042439171603	34.135	14.206
34.5997495722838	14.5830845690403	34.135	14.986
34.5997495722838	14.5830845690403	34.135	14.466
34.6210598445731	14.7342216154268	34.135	14.726
34.6427425120045	14.885755377244	33.907	14.791
35.402695923457	16.1976521083619	35.992	16.314
35.7589739195752	17.1253560902026	36.436	17.076
35.9063430017688	18.3883421528769	36.436	18.918
34.2709009227546	18.3292377168417	33.642	18.346
34.2709009227546	18.3292377168417	34.722	18.219
34.2709009227546	18.3292377168417	34.087	18.918
34.2709009227546	18.3292377168417	34.595	18.791
33.7143375076611	18.2588837223444	33.071	18.346
33.7143375076611	18.2588837223444	33.515	18.219
33.4904782295975	18.1870513390344	33.515	18.029
33.2658085931563	18.1160186304206	33.388	17.584
33.0282015318472	18.0500387766468	32.944	17.965
33.0282015318472	18.0500387766468	32.817	17.775
32.808442430121	17.9857975645388	32.372	18.537
32.808442430121	17.9857975645388	33.261	18.537
32.4993338324968	17.7810719395684	32.69	18.346
32.1339999510922	17.4866846080605	31.61	17.775
32.1339999510922	17.4866846080605	31.991	17.203
31.9004522799543	17.154054913499	32.182	16.632
31.6182085324396	16.9268557565363	31.356	16.251
31.6182085324396	16.9268557565363	31.991	16.632
31.4869674273161	16.8678619853727	31.483	16.822
31.3559995423971	16.8090439687892	31.356	16.06
31.1019995992842	17.0259563252793	31.102	17.775
30.9310320186409	16.9912124476864	30.975	17.076
30.7590303987937	16.9563828680249	30.785	16.251
30.5803746116109	16.927528250106	30.594	16.251
30.3996249595719	16.9012635678675	30.594	17.076
30.3996249595719	16.9012635678675	30.785	16.949
30.1932602556152	16.8748269191522	30.023	17.203
29.995886200558	16.8481033302208	29.959	17.584
29.8463880128028	16.6669588348165	30.15	16.06
29.64721089022	16.5537242910835	29.642	17.076
29.4487475280094	16.4268418781179	28.943	16.886

Solution x	Solution y	Original x	Original y
29.3239996548692	16.2380319197625	29.324	15.489
29.1158796957802	16.244497736116	29.134	16.187
28.9073780741996	16.2509595918296	29.515	16.505
28.4626565859023	16.2574632027244	28.308	15.933
28.05400022002	16.2639590165137	28.054	17.013
27.7265678583375	16.110851717162	27.737	16.251
27.3989907200473	15.9544013198523	27.292	16.632
27.1321344782488	15.469062560152	27.229	15.362
27.1321344782488	15.469062560152	27.419	15.044
26.8161644120499	15.1249239997348	26.911	14.409
26.2522346004184	15.0513643726455	26.149	15.679
26.2522346004184	15.0513643726455	26.086	14.663
25.8320001211982	14.9680420782044	25.832	14.219
24.640043074624	15.0245437499701	24.371	14.346
24.5015464693604	15.5435319782438	24.244	15.997
24.5015464693604	15.5435319782438	24.371	15.235
24.5015464693604	15.5435319782438	24.308	15.044
24.3796602651288	16.2497774041773	25.07	16.314
24.0499437858151	16.7721550412115	24.308	16.441
23.6786610211018	17.4569999179455	22.974	17.711
24.8267613458992	17.4570000478004	25.07	17.076
25.6353398901145	17.457000125325	26.34	17.203
25.5573790491513	17.599856387575	25.832	16.949
25.4619120033941	18.4413509144075	25.451	17.965
25.4619120033941	18.4413509144075	24.943	18.791
25.4619120033941	18.4413509144075	25.895	18.918
25.3658708520632	18.7450731549951	24.943	18.346
25.3658708520632	18.7450731549951	24.943	19.108
25.283623736531	19.0676242722667	25.197	18.918
25.2020427661685	19.4063950359332	25.133	19.235
25.121010744479	19.7660238361708	24.752	19.362
25.121010744479	19.7660238361708	24.625	19.68
25.049328087281	20.3217517274918	24.879	19.934
25.049328087281	20.3217517274918	24.879	20.632
24.9798487979326	20.9370408088357	24.244	21.077
25.5012643683159	20.9370411471087	25.895	20.759
25.9074693435854	20.9370414919521	26.149	20.886
26.2760057220168	20.937041854738	26.276	20.188
26.36286040065	21.7921814063684	26.022	21.902
26.4528864716974	22.5656247022342	25.832	22.918
26.6779254407215	22.7615148130676	26.149	23.172
27.2068087681996	22.9029012171445	26.911	22.601
27.2068087681996	22.9029012171445	27.546	22.537
27.6953706326478	23.0688102258178	27.991	22.601
27.6953706326478	23.0688102258178	28.054	22.918
28.0156773324045	23.2755184659594	28.245	22.855
28.3028489615328	23.5166460977393	27.8	23.617
28.3028489615328	23.5166460977393	28.753	23.998
28.5166547010764	23.6682211024532	28.753	24.379
28.516654858361	22.9612067610653	28.626	22.791
28.516654858361	22.9612067610653	29.134	22.537
28.516654858361	22.9612067610653	29.261	23.045
28.5148696034197	22.5819510501228	29.07	22.347
28.5130726169576	22.2824013911375	29.261	22.283
28.3895577282176	21.9172090541155	28.816	21.902
28.2557586190595	21.5557409901779	28.689	21.013
28.0265564696764	21.404517806802	27.927	21.458
27.8022608119668	21.2522244879018	28.245	21.331
27.5416494943306	21.0972911202192	27.102	21.648
27.4113947142594	20.4802998590802	26.975	20.061
27.4113947142594	20.4802998590802	27.356	20.632
27.29968241429	20.0992189869764	26.848	19.743
27.1999160862203	19.8100874589048	27.483	19.616
27.0968518653044	19.5388160788422	27.229	19.616
26.9925104843707	19.2617552648435	26.594	18.854
26.8980416523279	19.0449994186597	26.149	19.045
26.9849059095728	18.965474511651	26.721	18.283
27.2490911094217	18.9336004516957	27.356	18.473
27.5026152700817	18.9024396770614	27.102	18.664
27.8065764838726	18.8716392404878	27.737	18.664
28.1180001881542	18.8410408411243	28.118	18.092
28.4143731665521	18.8591915198792	27.864	18.854
28.861910178305	18.8773580926007	28.689	18.156
28.861910178305	18.8773580926007	29.578	18.791
29.3511199638014	19.0401170966277	29.261	19.172
29.8637033544073	19.1996533884969	29.705	19.426
30.4275475001537	19.3532868035763	30.531	18.664
30.8228354456992	20.0903902352644	30.785	20.823
31.5203500157157	20.1360183114875	31.356	19.68
32.382491405746	20.183173381974	32.309	19.553

Solution x	Solution y	Original x	Original y
33.4937278531821	20.2354747517437	33.96	19.68
33.6057710215409	20.3386155850242	33.515	20.315
33.7189598555236	20.441998916151	34.468	20.442
33.6712559166601	21.0870903375846	34.341	21.013
33.6129892558458	21.9756441193945	34.341	22.029
32.0845053050203	22.4003847814973	31.356	22.347
32.0420426760722	23.6800001282084	31.293	23.68
32.4412257336015	24.918223056256	32.245	24.887
32.8929591360345	26.2200001606571	33.642	26.22
32.132634272938	26.6040277502476	32.118	27.3
31.4401194610454	26.7329977438732	31.356	26.03
30.9989850373799	27.5395307056326	31.42	27.173
30.2770000658189	29.7259587014153	30.277	30.475
28.9430000112644	29.7259586077907	29.07	29.713
28.9430000112644	29.7259586077907	28.943	30.03
28.9430000112644	29.7259586077907	28.943	30.475
26.628198524615	29.6645632191747	26.086	29.903
26.0860124353495	29.6007484266676	25.895	29.903
25.6079069494626	29.5353834419767	25.07	30.03
25.5508936697447	28.3886586682497	25.832	27.998
25.4923891411835	27.730548943513	26.149	27.49
25.4067270893254	27.4467940414419	25.07	27.744
25.4067270893254	27.4467940414419	25.959	27.744
25.3110418126628	26.9819925202989	24.562	26.982
25.705001467375	26.969051302821	25.705	26.22
27.2290006982175	26.9690512980848	27.229	26.22
27.4486366489116	27.1061622897898	27.546	26.982
27.6633876645874	27.2451959212439	27.229	27.554
27.9269980415318	27.3759584563811	27.927	28.125
28.1870563187701	27.1198008424582	28.88	27.3
28.2579580863249	26.1569999553893	29.007	26.157
28.1981199607363	25.5819772111361	28.88	25.331
27.9239188260672	25.4287805411194	28.499	25.141
27.2492336090132	25.2966553000682	27.102	25.966
26.8398069813574	25.0061881814815	26.911	24.76
26.8398069813574	25.0061881814815	27.165	25.458
26.2493978790769	24.6423882035903	26.086	24.95
25.7232767190786	24.2223885238105	25.832	23.68
25.1293878847111	23.9387553188727	24.943	23.68
24.6045883783377	23.6772021699955	24.308	23.998
24.6045883783377	23.6772021699955	25.006	24.188
23.360094051648	22.9657642008702	23.482	22.41
23.360094051648	22.9657642008702	23.355	23.553
21.5844720949111	22.1340692732408	21.577	21.394
20.4968739138881	22.1068328854526	20.117	21.775
19.8630001942551	22.0800421878511	19.863	21.331
19.2048848153387	22.0800420045593	18.593	21.648
19.3693147916854	22.3454289694567	18.91	22.474
19.5553562686575	22.597640027365	19.482	21.966
19.5553562686575	22.597640027365	20.117	22.728
19.7096596129588	23.0652139589138	20.371	23.045
19.8119583721533	23.5530002703846	20.561	23.553
19.7230420606487	24.1250000792876	18.974	24.125
19.7230420342861	24.5690000165657	18.974	24.569
19.741436309357	24.8325136393901	19.164	24.696
19.7603673062263	25.1237321182287	19.545	25.839
20.6754979225169	25.1295542747408	20.561	24.696
20.6754979225169	25.1295542747408	20.942	25.649
20.6754979225169	25.1295542747408	20.561	25.776
21.6157108576638	25.1352619130284	21.958	24.76
22.2249580903261	25.140999297387	22.974	25.141
22.0890724421495	27.6148844980377	22.276	28.125
21.9458655387362	28.3213608964393	22.022	28.443
21.8012102864768	28.9752523082677	22.466	28.887
21.8012102864768	28.9752523082677	21.958	29.395
21.505070121621	29.5614866993086	22.149	29.713
18.9923945449514	29.9672429266564	18.72	30.665
18.992394490551	29.4414987245501	18.91	28.697
18.992394490551	29.4414987245501	18.974	29.967
18.992394490551	29.4414987245501	18.72	29.967
18.992394490551	29.4414987245501	18.529	30.03
19.1784618806794	28.4211704861751	19.037	28.189
19.3679585965505	27.6169977735577	20.117	27.617
18.9946084254421	27.5549961875791	19.037	26.982
18.6056456283823	27.4975778857658	18.72	28.189
17.9899730617551	27.413620213987	17.64	27.998
17.7124766163802	27.2986941287249	17.64	27.49
17.4408720806269	27.18127372641	17.069	27.744
17.2621906079225	27.0054100588391	17.069	27.046
17.0896042849845	26.8283467898068	16.37	26.982

Solution x	Solution y	Original x	Original y
17.054549911938	25.3843392567864	17.577	25.204
17.0181841423724	24.4484970101264	16.497	24.315
16.9830712851071	23.6995334324962	17.64	23.426
16.9830712851071	23.6995334324962	17.323	23.934
16.9830712851071	23.6995334324962	17.45	24.188
16.9312700108915	22.9244664297169	17.64	22.918
16.8538842489403	22.1839976141315	17.45	21.902
16.7582024161103	21.7903276648772	17.323	21.331
13.6238055719982	21.6969293453596	13.513	22.41
13.0819771549192	20.6889453981861	13.005	20.061
12.6054353442549	20.361534619062	12.37	19.934
12.2020204773913	20.0942059461642	12.243	20.505
12.2020204773913	20.0942059461642	11.735	20.378
11.9034499080266	19.717267061899	11.608	20.251
11.6632125644619	18.8758073490325	12.052	18.854
11.3914144530989	18.0574561833394	11.862	17.965
11.0524705243308	17.328873582218	11.481	17.711
10.5508690320132	15.408385542222	11.163	15.552

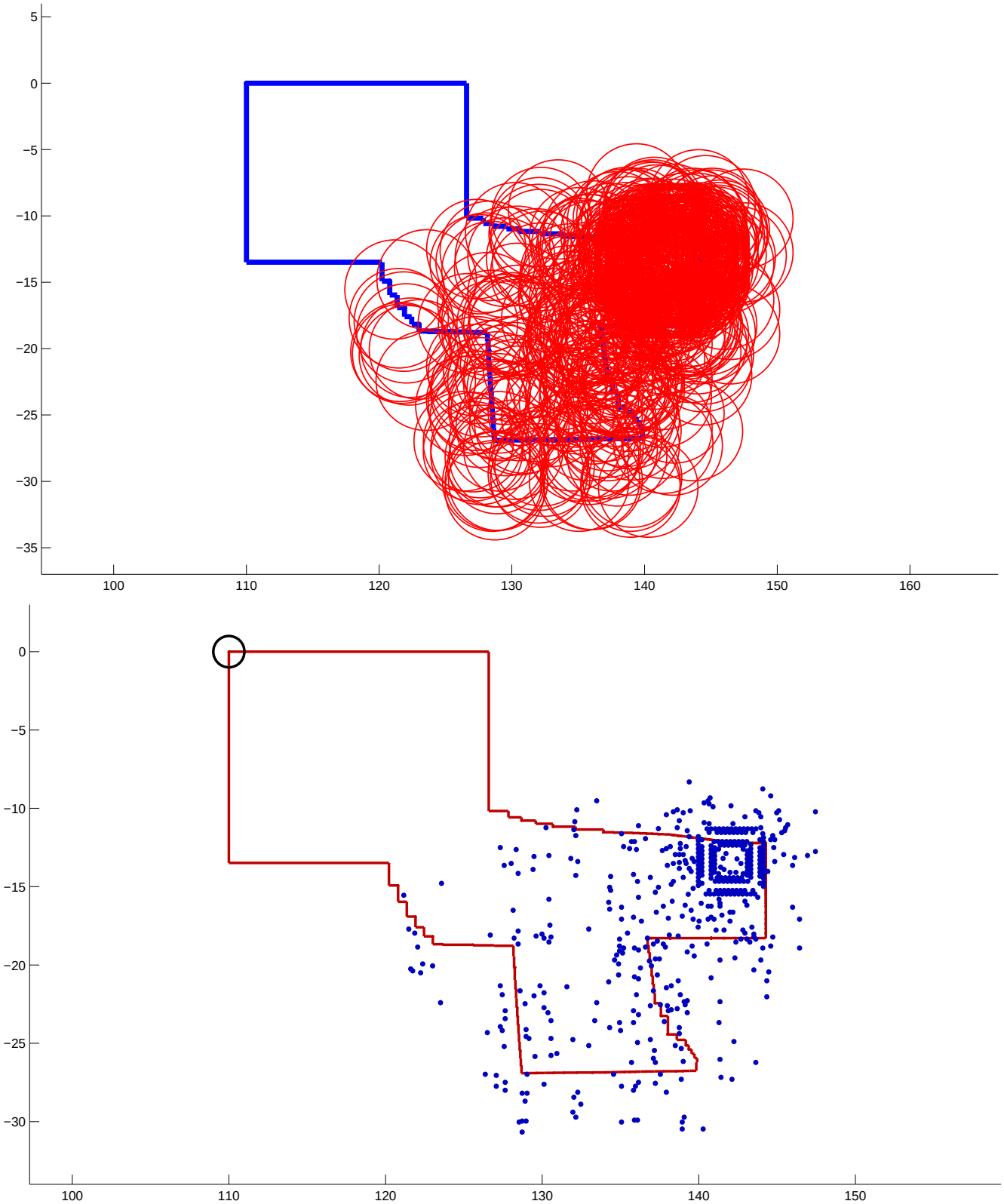


Figure N.128: $d493$, $r = 3.7452$, Equal Radius, 2D, Manhattan, Length = 128.8478750

Table N-131: Solution for $d493$, $r = 3.7452$, Equal Radius, 2D, Manhattan

Total distance: 128.847874969484			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
16.5866087036763	10.168569170007	17.577	13.647
17.8502521507058	10.5749939658769	18.466	14.155
18.6801548519998	10.7818889837217	17.323	12.504
18.6801548519998	10.7818889837217	18.339	12.631
19.5943877059702	10.981775439911	18.021	13.52
20.6846473564162	11.1723120728435	19.482	13.076
20.6846473564162	11.1723120728435	19.418	13.901
22.1447534818213	11.3503188960414	20.434	13.012
23.9192232096555	11.5254826861242	20.244	11.234
23.9192232096555	11.5254826861242	23.482	9.52
23.9192232096555	11.5254826861242	25.895	12.123
23.9192232096555	11.5254826861242	22.212	10.091
23.9192232096555	11.5254826861242	25.705	12.123
23.9192232096555	11.5254826861242	25.07	11.615
23.9192232096555	11.5254826861242	26.022	12.631
23.9192232096555	11.5254826861242	22.085	10.853
23.9192232096555	11.5254826861242	25.578	12.568
23.9192232096555	11.5254826861242	25.197	12.441
23.9192232096555	11.5254826861242	22.022	11.361
23.9192232096555	11.5254826861242	22.149	11.742
23.9192232096555	11.5254826861242	25.832	14.219
23.9192232096555	11.5254826861242	21.831	13.203
23.9192232096555	11.5254826861242	22.276	13.393
23.9192232096555	11.5254826861242	24.371	14.346
23.9192232096555	11.5254826861242	22.149	14.282
23.9192232096555	11.5254826861242	24.308	15.044
23.9192232096555	11.5254826861242	24.371	15.235
24.5856861040487	11.5433506588219	26.149	11.107
24.5856861040487	11.5433506588219	26.594	11.933
25.1927383584842	11.5612279295746	27.419	11.298
25.7608655379053	11.5791166531908	28.181	12.441
25.7608655379053	11.5791166531908	27.927	12.568
26.2527059717598	11.5969714739959	28.816	12.25
26.2527059717598	11.5969714739959	28.753	12.949
26.6671967474345	11.6147814194807	28.499	12.949
26.6671967474345	11.6147814194807	28.372	13.52
27.0515931829716	11.6325304832595	27.673	12.695
27.0515931829716	11.6325304832595	27.991	13.647
27.4298727454789	11.6502383974652	28.372	14.663
27.4298727454789	11.6502383974652	26.911	14.409
27.8024254097057	11.6677698149919	29.007	14.409
28.1607702353936	11.6852228687752	29.975	14.921
28.2992057210944	11.7007920176456	29.642	15.108
28.2992057210944	11.7007920176456	28.245	14.854
28.4175366030901	11.7156335879683	28.753	13.457
28.4175366030901	11.7156335879683	28.753	13.838
28.5359131308812	11.7304414564882	29.197	13.52
28.654092218029	11.7452331786206	29.007	12.949
28.654092218029	11.7452331786206	29.134	13.33
28.7722843733433	11.7600039861954	30.202	12.451
28.7722843733433	11.7600039861954	28.816	12.568
28.8901075685802	11.7747669749295	30.202	11.996
28.8901075685802	11.7747669749295	29.975	12.061
29.0071203501344	11.7895302050593	29.975	11.801
29.123873398669	11.8042949394502	29.261	11.425
29.2407989649217	11.8190643124448	28.753	10.79
29.2407989649217	11.8190643124448	28.626	11.234
29.3587741177918	11.8338502703442	28.372	10.218
29.3587741177918	11.8338502703442	27.927	10.409
29.4789228499091	11.848673212544	29.007	10.282
29.4789228499091	11.848673212544	28.626	10.091
29.6004785471876	11.8635330213518	29.388	8.313
29.6004785471876	11.8635330213518	29.451	10.155
29.7239274620128	11.8786961597356	30.34	9.647
29.8471240451211	11.8938918420214	30.912	9.901
29.8471240451211	11.8938918420214	30.658	9.71
29.9693110340979	11.9091510700289	30.787	12.386
30.0913097313762	11.9244026687961	30.658	10.98
30.0913097313762	11.9244026687961	30.34	10.917
30.2134338944145	11.939681385911	31.242	12.126
30.2134338944145	11.939681385911	30.982	12.126
30.3351009501266	11.954957305854	30.787	11.313
30.3351009501266	11.954957305854	30.527	11.313
30.4570118652909	11.9702549960755	31.372	12.353
30.4570118652909	11.9702549960755	31.275	12.613
30.5784924027639	11.985545130891	31.015	12.516
30.5784924027639	11.985545130891	31.015	12.776
30.7000542531233	12.0008270433443	30.787	12.646
30.7000542531233	12.0008270433443	30.787	12.906
30.8220881201488	12.0161000277299	31.015	13.036
30.8220881201488	12.0161000277299	31.015	13.296
30.9444664086307	12.0313549307747	31.737	12.885
30.9444664086307	12.0313549307747	31.547	13.203
31.0666003791087	12.0465970825734	31.991	14.092
31.188273953099	12.0618132255283	32.835	14.173
31.188273953099	12.0618132255283	32.372	14.092
31.3078105436858	12.0769696769047	32.436	13.231
31.3078105436858	12.0769696769047	32.69	13.52
31.426297380735	12.0921054096835	33.095	13.231
31.426297380735	12.0921054096835	33.095	13.491
31.5429914117703	12.1072167241802	33.095	12.971
31.6590166324985	12.1223226182363	33.095	12.711
31.7745025880274	12.1374266605734	32.835	12.613
31.8897128203851	12.1525302439633	32.932	12.353
31.8897128203851	12.1525302439633	32.672	12.353
32.004540308227	12.167639197723	32.802	12.126
32.004540308227	12.167639197723	32.542	12.126
32.1192304849014	12.1827597424567	32.282	12.126
32.1192304849014	12.1827597424567	32.022	12.126
32.2343898301476	12.1978944896583	32.412	12.353
32.2343898301476	12.1978944896583	32.152	12.353
32.3499655808652	12.213041770361	30.721	9.329
32.3499655808652	12.213041770361	30.594	9.52
32.3499655808652	12.213041770361	34.135	14.726
32.3499655808652	12.213041770361	34.135	14.986
32.3499655808652	12.213041770361	33.907	14.791
32.3499655808652	12.213041770361	33.127	14.661
32.3499655808652	12.213041770361	32.737	14.433
32.3499655808652	12.213041770361	33.452	15.246
32.3499655808652	12.213041770361	32.867	14.661
32.3499655808652	12.213041770361	33.582	15.473
32.3499655808652	12.213041770361	33.769	15.679
32.3499655808652	12.213041770361	32.477	14.433
32.3499655808652	12.213041770361	32.607	14.661
32.3499655808652	12.213041770361	33.322	15.473
32.3499655808652	12.213041770361	32.217	14.433
32.3499655808652	12.213041770361	31.61	13.901
32.3499655808652	12.213041770361	32.932	15.246
32.3499655808652	12.213041770361	32.347	14.661
32.3499655808652	12.213041770361	29.975	12.321
32.3499655808652	12.213041770361	31.399	13.754
32.3499655808652	12.213041770361	30.787	13.166
32.3499655808652	12.213041770361	33.062	15.473
32.3499655808652	12.213041770361	29.388	11.804
32.3499655808652	12.213041770361	31.957	14.433
32.3499655808652	12.213041770361	30.202	12.711
32.3499655808652	12.213041770361	31.015	13.556
32.3499655808652	12.213041770361	32.672	15.246
32.3499655808652	12.213041770361	32.087	14.661
32.3499655808652	12.213041770361	29.975	12.581
32.3499655808652	12.213041770361	30.787	13.426
32.3499655808652	12.213041770361	32.802	15.473
32.3499655808652	12.213041770361	31.697	14.433
32.3499655808652	12.213041770361	30.202	12.971
32.3499655808652	12.213041770361	31.015	13.816
32.3499655808652	12.213041770361	32.412	15.246
32.3499655808652	12.213041770361	31.827	14.661
32.3499655808652	12.213041770361	29.975	12.841
32.3499655808652	12.213041770361	31.275	14.173
32.3499655808652	12.213041770361	30.787	13.686
32.3499655808652	12.213041770361	32.542	15.473
32.3499655808652	12.213041770361	31.437	14.433
32.3499655808652	12.213041770361	30.202	13.231
32.3499655808652	12.213041770361	31.015	14.076
32.3499655808652	12.213041770361	31.567	14.661
32.3499655808652	12.213041770361	32.152	15.246
32.3499655808652	12.213041770361	29.975	13.101
32.3499655808652	12.213041770361	30.787	13.946
32.3499655808652	12.213041770361	32.282	15.473
32.3499655808652	12.213041770361	29.197	12.441
32.3499655808652	12.213041770361	31.177	14.433
32.3499655808652	12.213041770361	30.202	13.491
32.3499655808652	12.213041770361	31.892	15.246
32.3499655808652	12.213041770361	31.307	14.661

Solution x	Solution y	Original x	Original y
32.3499655808652	12.213041770361	29.975	13.361
32.3499655808652	12.213041770361	30.787	14.206
32.3499655808652	12.213041770361	32.022	15.473
32.3499655808652	12.213041770361	30.202	13.751
32.3499655808652	12.213041770361	31.632	15.246
32.3499655808652	12.213041770361	31.047	14.661
32.3499655808652	12.213041770361	29.578	13.203
32.3499655808652	12.213041770361	29.975	13.621
32.3499655808652	12.213041770361	30.787	14.466
32.3499655808652	12.213041770361	29.705	13.393
32.3499655808652	12.213041770361	31.762	15.473
32.3499655808652	12.213041770361	30.202	14.011
32.3499655808652	12.213041770361	31.372	15.246
32.3499655808652	12.213041770361	29.975	13.881
32.3499655808652	12.213041770361	31.502	15.473
32.3499655808652	12.213041770361	30.202	14.271
32.3499655808652	12.213041770361	31.112	15.246
32.3499655808652	12.213041770361	29.975	14.141
32.3499655808652	12.213041770361	31.242	15.473
32.3499655808652	12.213041770361	29.975	14.401
32.3499655808652	12.213041770361	29.388	13.838
32.3499655808652	12.213041770361	30.982	15.473
32.3499655808652	12.213041770361	31.293	15.806
32.3499655808652	12.213041770361	29.515	14.028
32.3499655808652	12.213041770361	30.657	15.246
32.3499655808652	12.213041770361	30.202	14.791
32.3499655808652	12.213041770361	29.975	14.661
32.3499655808652	12.213041770361	30.722	15.473
32.4421266432581	12.2130417536348	31.892	12.353
32.4421266432581	12.2130417536348	31.632	12.353
32.5350381551153	12.2130417369068	30.657	11.541
32.6289489402942	12.2130417201774	31.762	12.126
32.6289489402942	12.2130417201774	31.502	12.126
32.7238610643843	12.2130417034488	31.437	11.541
32.8194283478104	12.2130416867203	31.177	11.541
32.9158611063612	12.2130416699919	31.307	11.313
32.9158611063612	12.2130416699919	31.047	11.313
33.0142765026583	12.2130416532638	31.827	11.313
33.0142765026583	12.2130416532638	31.567	11.313
33.1141856798414	12.2130416365356	31.957	11.541
33.1141856798414	12.2130416365356	31.697	11.541
33.2155787958005	12.2130416198074	32.217	11.541
33.3175823513053	12.2130416030792	32.737	11.541
33.3175823513053	12.2130416030792	32.477	11.541
33.4205694650923	12.2130415863512	32.944	10.536
33.4205694650923	12.2130415863512	32.867	11.313
33.5244372480937	12.213041569623	32.607	11.313
33.6289141399437	12.2130415528957	32.347	11.313
33.7342055170497	12.2130415361696	32.182	10.98
33.7342055170497	12.2130415361696	32.087	11.313
33.8416767908162	12.213041519447	32.055	9.837
33.9514511210854	12.2130415027294	33.833	10.282
33.9514511210854	12.2130415027294	33.642	10.155
34.0619664668411	12.2130414860194	34.595	9.202
34.0619664668411	12.2130414860194	34.087	8.758
34.1722972592046	12.2130414693521	34.976	10.282
34.2824046107582	12.2130414526911	37.452	10.218
34.2824046107582	12.2130414526911	35.103	10.155
34.2824003684586	12.3095249049868	35.674	11.044
34.2824003684586	12.3095249049868	35.547	11.234
34.282396125966	12.4070749488988	35.484	11.425
34.2823918833886	12.5050577165376	35.166	10.726
34.2823918833886	12.5050577165376	35.293	11.552
34.282387640809	12.6043629180837	34.722	11.742
34.2823833984008	12.704055242968	37.452	12.758
34.2823833984008	12.704055242968	36.944	13.012
34.2823791544546	12.8034951410562	34.849	11.996
34.2823791544546	12.8034951410562	34.595	11.996
34.2823749107276	12.9036703997668	34.785	12.504
34.2823749107276	12.9036703997668	34.135	12.386
34.2823706671033	13.0042813461225	34.135	11.866
34.2823706671033	13.0042813461225	34.135	12.126
34.2823664236608	13.1057812363362	33.907	11.996
34.2823621803389	13.2077739492146	34.087	11.615
34.2823579370868	13.3105231212122	33.96	10.536
34.2823579370868	13.3105231212122	33.96	11.234
34.2823536940898	13.4169192050182	33.647	11.313
34.2823494512553	13.524645126269	33.387	11.313
34.2823494512553	13.524645126269	33.127	11.313
34.2823452089485	13.635696815095	33.452	11.541

Solution x	Solution y	Original x	Original y
34.2823452089485	13.635696815095	32.997	11.541
34.2823409671442	13.7499572043307	33.062	12.126
34.2823367256013	13.8653472748161	33.322	12.321
34.2823367256013	13.8653472748161	33.322	12.581
34.2823324844306	13.982590541134	33.322	12.841
34.2823282434409	14.1005755287296	33.322	13.101
34.2823282434409	14.1005755287296	33.322	13.361
34.2823240028051	14.2197208722622	33.322	13.621
34.2823197623369	14.3392906916279	33.095	13.751
34.2823155220947	14.4593035666894	33.322	13.881
34.2823155220947	14.4593035666894	33.322	14.141
34.2823112821735	14.580024047822	33.095	14.011
34.2823070424812	14.7011931997458	33.095	14.271
34.2823028030409	14.8227317414708	34.135	14.466
34.2823028030409	14.8227317414708	33.322	14.401
34.2822985638356	14.9449273495052	33.907	14.076
34.2822985638356	14.9449273495052	33.907	14.336
34.2822943248707	15.0681906145368	34.404	14.028
34.2822943248707	15.0681906145368	34.135	14.206
34.2822900860197	15.1927905318435	34.135	13.686
34.2822900860197	15.1927905318435	34.135	13.946
34.2822858473636	15.3194072921434	33.907	13.556
34.2822858473636	15.3194072921434	33.907	13.816
34.2822816089694	15.4486222244297	33.907	13.036
34.2822816089694	15.4486222244297	33.907	13.296
34.2822773708747	15.5826066964667	33.907	12.516
34.2822773708747	15.5826066964667	33.907	12.776
34.2822731332009	15.7278158728186	34.135	12.646
34.2822731332009	15.7278158728186	34.135	12.906
34.2822688958131	15.8862848498391	34.135	13.166
34.2822688958131	15.8862848498391	34.135	13.426
34.2822646587339	16.0546177709322	35.42	12.949
34.2822646587339	16.0546177709322	34.849	13.393
34.2822604212445	16.245348074543	36.119	13.139
34.2822604212445	16.245348074543	35.992	13.647
34.2822561812901	16.6451603654266	32.944	15.933
34.2822561812901	16.6451603654266	33.071	16.187
34.2822519421075	17.0560653475685	34.468	20.442
34.2822477028594	17.3617555581582	35.992	16.314
34.2822477028594	17.3617555581582	36.436	17.076
34.2822434628563	17.676927848684	36.436	18.918
34.2822392220631	17.982521657083	34.595	18.791
34.2822392220631	17.982521657083	34.087	18.918
34.2822349814588	18.2842611526581	34.341	22.029
33.6576118002837	18.2842612301604	34.722	18.219
33.0246207960253	18.2842613076802	34.341	21.013
32.3286031849033	18.284261385138	33.388	17.584
32.3286031849033	18.284261385138	33.515	18.029
31.6067983373827	18.2842614626239	33.642	18.346
31.6067983373827	18.2842614626239	33.515	18.219
30.7893949452027	18.2842615400977	33.515	20.315
30.7893949452027	18.2842615400977	33.96	19.68
30.7893949452027	18.2842615400977	32.309	19.553
30.7893949452027	18.2842615400977	33.261	18.537
30.7893949452027	18.2842615400977	32.182	16.632
30.7893949452027	18.2842615400977	33.071	18.346
30.7893949452027	18.2842615400977	31.991	16.632
30.7893949452027	18.2842615400977	31.356	16.06
30.7893949452027	18.2842615400977	31.356	16.251
30.7893949452027	18.2842615400977	32.817	17.775
30.7893949452027	18.2842615400977	32.69	18.346
30.7893949452027	18.2842615400977	31.356	19.68
30.7893949452027	18.2842615400977	30.462	15.473
30.7893949452027	18.2842615400977	32.944	17.965
30.7893949452027	18.2842615400977	32.372	18.537
30.7893949452027	18.2842615400977	31.991	17.203
30.7893949452027	18.2842615400977	31.483	16.822
30.7893949452027	18.2842615400977	30.785	16.251
30.7893949452027	18.2842615400977	30.594	16.251
30.7893949452027	18.2842615400977	30.15	16.06
30.7893949452027	18.2842615400977	30.975	17.076
30.7893949452027	18.2842615400977	30.785	16.949
30.7893949452027	18.2842615400977	31.61	17.775
30.7893949452027	18.2842615400977	29.324	15.489
30.7893949452027	18.2842615400977	30.594	17.076
30.7893949452027	18.2842615400977	31.102	17.775
30.7893949452027	18.2842615400977	30.531	18.664
30.7893949452027	18.2842615400977	29.705	19.426
30.7893949452027	18.2842615400977	29.515	16.505
30.7893949452027	18.2842615400977	29.134	16.187

Solution x	Solution y	Original x	Original y
30.7893949452027	18.2842615400977	30.023	17.203
30.7893949452027	18.2842615400977	29.642	17.076
30.7893949452027	18.2842615400977	29.261	19.172
30.7893949452027	18.2842615400977	29.959	17.584
30.7893949452027	18.2842615400977	29.578	18.791
30.7893949452027	18.2842615400977	28.943	16.886
30.7893949452027	18.2842615400977	28.689	18.156
28.1733967259878	18.2842616178189	30.785	20.823
28.1733967259878	18.2842616178189	27.419	15.044
28.1733967259878	18.2842616178189	28.308	15.933
28.1733967259878	18.2842616178189	27.356	20.632
28.1733967259878	18.2842616178189	27.229	15.362
28.1733967259878	18.2842616178189	27.737	16.251
28.1733967259878	18.2842616178189	27.483	19.616
28.1733967259878	18.2842616178189	28.054	17.013
28.1733967259878	18.2842616178189	26.975	20.061
28.1733967259878	18.2842616178189	27.229	19.616
28.1733967259878	18.2842616178189	27.864	18.854
28.1733967259878	18.2842616178189	27.292	16.632
28.1733967259878	18.2842616178189	26.848	19.743
28.1733967259878	18.2842616178189	26.149	15.679
28.1733967259878	18.2842616178189	27.737	18.664
28.1733967259878	18.2842616178189	28.118	18.092
28.1733967259878	18.2842616178189	27.356	18.473
28.1733967259878	18.2842616178189	27.102	18.664
28.1733967259878	18.2842616178189	26.594	18.854
28.1733967259878	18.2842616178189	26.149	19.045
28.1733967259878	18.2842616178189	26.34	17.203
28.1733967259878	18.2842616178189	26.721	18.283
28.1733967259878	18.2842616178189	25.832	16.949
28.1733967259878	18.2842616178189	25.895	18.918
28.1733967259878	18.2842616178189	25.451	17.965
26.971208412281	18.2842616955191	26.086	14.663
26.971208412281	18.2842616955191	25.07	16.314
26.8658501817337	18.2842617757591	24.244	15.997
26.7689982927604	18.2842618561994	24.308	16.441
26.6750668274891	18.2842619366926	22.974	17.711
26.7368100143023	18.7222627780122	25.07	17.076
26.7368100143023	18.7222627780122	24.943	18.346
26.7994587646066	19.1892627837488	25.197	18.918
26.7994587646066	19.1892627837488	24.943	18.791
26.8629216063011	19.6682829997003	25.133	19.235
26.8629216063011	19.6682829997003	24.943	19.108
26.9272903080683	20.1645732935987	24.752	19.362
26.9922967443954	20.6765042824974	26.149	20.886
26.9922967443954	20.6765042824974	26.276	20.188
27.0576497488398	21.1972718879879	24.879	19.934
27.0576497488398	21.1972718879879	24.625	19.68
27.124726891368	21.7994201314003	24.879	20.632
27.192538032833	22.4381818640456	23.482	22.41
27.192538032833	22.4381818640456	24.244	21.077
27.5846935894706	23.2547567435924	26.022	21.902
27.5846935894706	23.2547567435924	25.895	20.759
28.0294874613145	24.4341328783426	27.927	28.125
28.0294874613145	24.4341328783426	28.753	24.379
28.0294874613145	24.4341328783426	28.753	23.998
28.0294874613145	24.4341328783426	29.261	23.045
28.0294874613145	24.4341328783426	29.134	22.537
28.0294874613145	24.4341328783426	29.261	22.283
28.0294874613145	24.4341328783426	27.8	23.617
28.0294874613145	24.4341328783426	28.626	22.791
28.0294874613145	24.4341328783426	29.07	22.347
28.0294874613145	24.4341328783426	28.245	22.855
28.0294874613145	24.4341328783426	28.054	22.918
28.0294874613145	24.4341328783426	28.816	21.902
28.0294874613145	24.4341328783426	27.991	22.601
28.0294874613145	24.4341328783426	27.546	22.537
28.0294874613145	24.4341328783426	28.689	21.013
28.0294874613145	24.4341328783426	28.245	21.331
28.0294874613145	24.4341328783426	26.911	22.601
28.0294874613145	24.4341328783426	25.832	23.68
28.0294874613145	24.4341328783426	27.927	21.458
28.0294874613145	24.4341328783426	26.149	23.172
28.0294874613145	24.4341328783426	27.102	21.648
28.0294874613145	24.4341328783426	25.832	22.918
28.5962338393564	24.783329502819	28.499	25.141
29.1700450549805	25.1326940183007	32.118	27.3
29.1700450549805	25.1326940183007	31.356	22.347
29.3572703509028	25.3930621329941	31.293	23.68
29.3572703509028	25.3930621329941	28.88	25.331

Solution x	Solution y	Original x	Original y
29.5420785309625	25.6642654719369	32.245	24.887
29.7202048466636	25.9416728356883	31.356	26.03
29.8967996651528	26.2200001692352	33.642	26.22
29.8415777484444	26.7581823250253	30.277	30.475
29.4235751267217	26.766397755079	31.42	27.173
28.9903947294511	26.7746097960844	28.88	27.3
28.9903947294511	26.7746097960844	29.007	26.157
28.5648392988322	26.7828312470624	28.943	30.475
28.5648392988322	26.7828312470624	28.943	30.03
27.7527876695673	26.7905194151943	29.07	29.713
27.7527876695673	26.7905194151943	26.086	29.903
27.1638235037388	26.7981282710435	25.895	29.903
26.6545539901864	26.8057037022831	25.07	30.03
26.6545539901864	26.8057037022831	25.07	27.744
26.3047101716989	26.8131999311463	25.832	27.998
25.9590185893949	26.8206936911794	25.959	27.744
25.9590185893949	26.8206936911794	26.149	27.49
25.6161785871705	26.828184664854	27.229	27.554
25.6161785871705	26.828184664854	27.546	26.982
25.2561641982638	26.8356712434929	27.229	26.22
25.2561641982638	26.8356712434929	27.102	25.966
24.8733054436867	26.8431659987879	27.165	25.458
24.4661192946894	26.8506690014692	25.705	26.22
24.4661192946894	26.8506690014692	26.086	24.95
24.0366187988888	26.8581850736967	26.911	24.76
24.0366187988888	26.8581850736967	24.562	26.982
23.196480661508	26.8657431762885	22.149	29.713
23.196480661508	26.8657431762885	21.958	29.395
23.196480661508	26.8657431762885	22.022	28.443
23.196480661508	26.8657431762885	22.466	28.887
23.196480661508	26.8657431762885	22.276	28.125
23.196480661508	26.8657431762885	20.942	25.649
23.196480661508	26.8657431762885	20.561	24.696
23.196480661508	26.8657431762885	25.006	24.188
23.196480661508	26.8657431762885	21.958	24.76
23.196480661508	26.8657431762885	24.943	23.68
23.196480661508	26.8657431762885	24.308	23.998
23.196480661508	26.8657431762885	22.974	25.141
23.196480661508	26.8657431762885	23.355	23.553
22.2126498062398	26.8734911736202	20.117	27.617
22.2126498062398	26.8734911736202	20.561	25.776
21.4067679698527	26.8812413404201	19.037	26.982
21.4067679698527	26.8812413404201	19.545	25.839
20.7445098886456	26.8890003735726	18.72	28.189
20.7445098886456	26.8890003735726	19.037	28.189
20.1742854354962	26.896747714356	18.91	28.697
19.6294846134525	26.904488884408	18.529	30.03
19.6294846134525	26.904488884408	18.974	29.967
19.1681892485865	26.9121628222369	18.72	29.967
18.7200002806782	26.9197997186502	18.72	30.665
18.6804559875584	26.4559623185363	17.64	27.998
18.6804559875584	26.4559623185363	17.64	27.49
18.641091592162	25.9731650581887	17.069	27.744
18.6018831969079	25.4676719380465	16.37	26.982
18.6018831969079	25.4676719380465	17.069	27.046
18.5630757674248	24.9122601630281	16.497	24.315
18.5244512634544	24.3714694662774	17.323	23.934
18.4859169315706	23.8401647208205	18.974	24.569
18.4859169315706	23.8401647208205	19.164	24.696
18.4473397918155	23.2991508795335	17.577	25.204
18.4473397918155	23.2991508795335	17.45	24.188
18.4089311025223	22.7236161116294	20.561	23.553
18.4089311025223	22.7236161116294	20.371	23.045
18.3702233752855	22.1352054656991	20.117	22.728
18.3314077712956	21.5414176923443	18.593	21.648
18.3314077712956	21.5414176923443	19.863	21.331
18.2925165919512	20.9586972151669	18.974	24.125
18.2534927778884	20.1598062839601	17.64	23.426
18.2534927778884	20.1598062839601	17.64	22.918
18.2534927778884	20.1598062839601	17.45	21.902
18.2534927778884	20.1598062839601	17.323	21.331
18.2534927778884	20.1598062839601	18.91	22.474
18.2534927778884	20.1598062839601	19.482	21.966
18.2534927778884	20.1598062839601	20.117	21.775
18.2534927778884	20.1598062839601	18.466	18.664
18.2534927778884	20.1598062839601	21.577	21.394
18.2534927778884	20.1598062839601	19.609	18.156
18.2534927778884	20.1598062839601	20.117	18.283
18.2534927778884	20.1598062839601	20.434	18.537
18.2534927778884	20.1598062839601	20.498	17.457

Solution x	Solution y	Original x	Original y
18.2534927778884	20.1598062839601	19.99	18.029
18.2534927778884	20.1598062839601	20.561	18.219
18.2103321640529	19.4474389799461	18.466	17.838
18.1671671695637	18.7756709254232	20.434	15.806
16.937707040931	18.7428470923516	18.148	16.505
15.5834251808254	18.7102035177456	16.688	18.092
15.5834251808254	18.7102035177456	18.212	18.283
13.6353558750129	18.6776458269055	13.513	22.41
13.6353558750129	18.6776458269055	13.005	20.061
13.0153396875291	18.1737717844263	11.608	20.251
13.0153396875291	18.1737717844263	12.243	20.505
12.452766883906	17.591111845605	11.735	20.378
11.9126559331373	16.9117863780555	12.37	19.934
11.9126559331373	16.9117863780555	12.052	18.854
11.3592381927501	15.9639226422391	11.862	17.965
10.7995704601748	14.9204955555595	11.163	15.552
10.7995704601748	14.9204955555595	11.481	17.711
10.219339708446	13.4884332819971	13.576	14.79

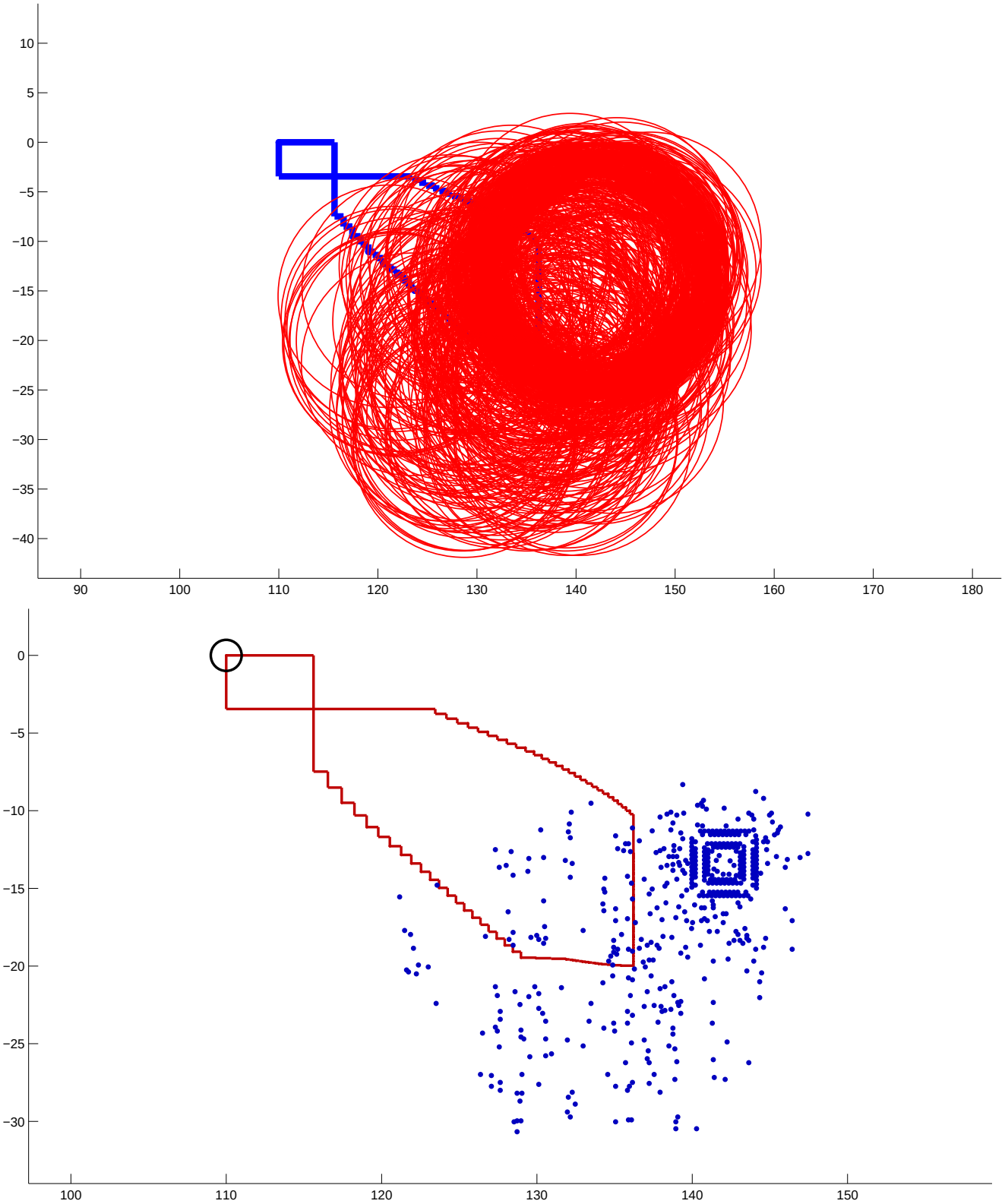


Figure N.129: $d493$, $r = 11.2356$, Equal Radius, 2D, Manhattan, Length = 92.4304507

Table N-132: Solution for $d493$, $r = 11.2356$, Equal Radius, 2D, Manhattan

Total distance: 92.430450735042			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
5.62058545239071	7.48377988342991	13.576	14.79
6.54122179676361	8.51339655228922	11.163	15.552
7.43233940094905	9.49023221353266	11.862	17.965
7.43233940094905	9.49023221353266	11.481	17.711
8.2493294061583	10.3034837351634	12.052	18.854
9.03865430973263	11.0550264016806	11.608	20.251
9.03865430973263	11.0550264016806	11.735	20.378
9.79019872276098	11.6862244911706	12.243	20.505
10.530485559605	12.2834151841491	13.005	20.061
10.530485559605	12.2834151841491	12.37	19.934
11.2627985257346	12.8473857905317	20.434	15.806
11.2627985257346	12.8473857905317	18.148	16.505
11.9160616227997	13.3975408126597	18.212	18.283
11.9160616227997	13.3975408126597	18.466	17.838
12.5380830269485	13.9323338548502	19.609	18.156
12.5380830269485	13.9323338548502	18.466	18.664
13.1311455987911	14.4533681827376	20.117	18.283
13.1311455987911	14.4533681827376	19.99	18.029
13.6957626433208	14.9650114827675	16.688	18.092
13.6957626433208	14.9650114827675	17.323	21.331
14.2564951442141	15.4674916254428	19.863	21.331
14.2564951442141	15.4674916254428	20.117	21.775
14.7925026152144	15.9492914802623	19.482	21.966
15.3214702994883	16.4236937128737	18.593	21.648
15.3214702994883	16.4236937128737	18.91	22.474
15.843987038241	16.8883766450877	17.64	22.918
15.843987038241	16.8883766450877	17.64	23.426
16.3657954435144	17.3422898034443	17.323	23.934
16.8887012503272	17.7905674507661	18.974	24.125
17.4099683082529	18.2338026616001	19.164	24.696
17.4099683082529	18.2338026616001	18.974	24.569
17.9295624249251	18.6677700726774	17.45	24.188
17.9295624249251	18.6677700726774	18.72	28.189
18.4513679981281	19.0788534770664	19.037	28.189
18.4513679981281	19.0788534770664	18.91	28.697
18.9730798420332	19.4576493372661	18.529	30.03
18.9730798420332	19.4576493372661	18.72	30.665
19.9511676244447	19.495707676326	22.149	29.713
19.9511676244447	19.495707676326	18.974	29.967
20.9196217715387	19.5329522800871	21.958	29.395
21.8810595450863	19.5699745990116	26.086	29.903
21.8810595450863	19.5699745990116	18.72	29.967
22.1025755642322	19.5998953138834	25.895	29.903
22.3117842741549	19.6292201530586	25.07	27.744
22.3117842741549	19.6292201530586	25.07	30.03
22.5151355586094	19.6581412143414	22.466	28.887
22.5151355586094	19.6581412143414	22.022	28.443
22.7197408479638	19.686913618558	22.276	28.125
22.9245874614702	19.7156017413326	19.545	25.839
22.9245874614702	19.7156017413326	20.117	27.617
23.1324542843679	19.7442333598292	20.942	25.649
23.1324542843679	19.7442333598292	20.561	25.776
23.3420101929817	19.7728253246141	21.958	24.76
23.3420101929817	19.7728253246141	20.561	24.696
23.5527758326245	19.8013980798009	20.561	23.553
23.7643618299273	19.829991629943	20.117	22.728
23.7643618299273	19.829991629943	20.371	23.045
23.9773934289346	19.8586570051958	17.577	25.204
23.9773934289346	19.8586570051958	16.497	24.315
24.1967196771053	19.8872757595767	13.513	22.41
24.1967196771053	19.8872757595767	16.37	26.982
24.5119323585029	19.9156751369315	17.069	27.046
24.846126107151	19.9439493032015	17.64	27.998
24.846126107151	19.9439493032015	17.069	27.744
25.4197402724826	19.9714511147611	19.037	26.982
25.4197402724826	19.9714511147611	17.64	27.49
26.2163999719845	19.9988253704694	30.277	30.475
26.2163999724454	19.8600101296487	28.943	30.475
26.2163999729061	19.7026569364146	17.45	21.902
26.2163999729061	19.7026569364146	29.07	29.713
26.2163999733672	19.5396561153965	28.943	30.03
26.2163999738272	19.3597502674466	24.244	21.077
26.2163999738272	19.3597502674466	24.879	20.632
26.216399974287	19.1806173117633	24.625	19.68
26.216399974287	19.1806173117633	24.879	19.934
26.2163999747465	19.0020432493056	24.752	19.362
26.2163999752061	18.8237253948329	24.943	19.108
26.2163999752061	18.8237253948329	25.133	19.235
26.2163999756658	18.6458135302348	24.943	18.791
26.2163999756658	18.6458135302348	25.197	18.918
26.2163999761262	18.4683338565175	25.895	18.918
26.2163999765868	18.2909940197637	26.149	19.045
26.2163999765868	18.2909940197637	26.594	18.854
26.2163999770491	18.1138392647907	20.434	18.537
26.2163999770491	18.1138392647907	20.561	18.219
26.2163999770491	18.1138392647907	21.577	21.394
26.2163999770491	18.1138392647907	23.482	22.41
26.2163999770491	18.1138392647907	20.498	17.457
26.2163999770491	18.1138392647907	27.102	18.664
26.2163999770491	18.1138392647907	26.276	20.188
26.2163999770491	18.1138392647907	26.848	19.743
26.2163999770491	18.1138392647907	25.895	20.759
26.2163999770491	18.1138392647907	25.07	16.314
26.2163999770491	18.1138392647907	27.229	19.616
26.2163999770491	18.1138392647907	25.832	16.949
26.2163999770491	18.1138392647907	27.356	18.473
26.2163999770491	18.1138392647907	23.355	23.553
26.2163999770491	18.1138392647907	27.864	18.854
26.2163999770491	18.1138392647907	26.149	20.886
26.2163999770491	18.1138392647907	26.975	20.061
26.2163999770491	18.1138392647907	27.737	18.664
26.2163999770491	18.1138392647907	27.483	19.616
26.2163999770491	18.1138392647907	26.34	17.203
26.2163999770491	18.1138392647907	22.149	14.282
26.2163999770491	18.1138392647907	26.022	21.902
26.2163999770491	18.1138392647907	27.356	20.632
26.2163999770491	18.1138392647907	28.118	18.092
26.2163999770491	18.1138392647907	22.974	25.141
26.2163999770491	18.1138392647907	24.308	23.998
26.2163999770491	18.1138392647907	22.276	13.393
26.2163999770491	18.1138392647907	29.261	19.172
26.2163999770491	18.1138392647907	26.149	15.679
26.2163999770491	18.1138392647907	28.689	18.156
26.2163999770491	18.1138392647907	24.943	23.68
26.2163999770491	18.1138392647907	27.292	16.632
26.2163999770491	18.1138392647907	25.832	22.918
26.2163999770491	18.1138392647907	27.102	21.648
26.2163999770491	18.1138392647907	29.578	18.791
26.2163999770491	18.1138392647907	21.831	13.203
26.2163999770491	18.1138392647907	28.054	17.013
26.2163999770491	18.1138392647907	29.705	19.426
26.2163999770491	18.1138392647907	25.006	24.188
26.2163999770491	18.1138392647907	26.149	23.172
26.2163999770491	18.1138392647907	27.927	21.458
26.2163999770491	18.1138392647907	26.086	14.663
26.2163999770491	18.1138392647907	27.737	16.251
26.2163999770491	18.1138392647907	25.832	23.68
26.2163999770491	18.1138392647907	26.911	22.601
26.2163999770491	18.1138392647907	28.245	21.331
26.2163999770491	18.1138392647907	28.689	21.013
26.2163999770491	18.1138392647907	27.229	15.362
26.2163999770491	18.1138392647907	30.531	18.664
26.2163999770491	18.1138392647907	28.943	16.886
26.2163999770491	18.1138392647907	27.546	22.537
26.2163999770491	18.1138392647907	28.308	15.933
26.2163999770491	18.1138392647907	29.959	17.584
26.2163999770491	18.1138392647907	27.419	15.044
26.2163999770491	18.1138392647907	26.911	14.409
26.2163999770491	18.1138392647907	29.642	17.076
26.2163999770491	18.1138392647907	27.991	22.601
26.2163999770491	18.1138392647907	28.816	21.902
26.2163999770491	18.1138392647907	30.023	17.203
26.2163999770491	18.1138392647907	29.134	16.187
26.2163999770491	18.1138392647907	28.054	22.918
26.2163999770491	18.1138392647907	29.515	16.505
26.2163999770491	18.1138392647907	31.356	19.68
26.2163999770491	18.1138392647907	26.086	24.95
26.2163999770491	18.1138392647907	28.245	22.855
26.2163999770491	18.1138392647907	31.102	17.775
26.2163999770491	18.1138392647907	28.245	14.854
26.2163999770491	18.1138392647907	29.07	22.347
26.2163999770491	18.1138392647907	28.626	22.791
26.2163999770491	18.1138392647907	27.8	23.617
26.2163999770491	18.1138392647907	30.594	17.076

Solution x	Solution y	Original x	Original y
26.2163999770491	18.1138392647907	29.261	22.283
26.2163999770491	18.1138392647907	24.562	26.982
26.2163999770491	18.1138392647907	30.785	20.823
26.2163999770491	18.1138392647907	26.911	24.76
26.2163999770491	18.1138392647907	29.134	22.537
26.2163999770491	18.1138392647907	28.372	14.663
26.2163999770491	18.1138392647907	29.324	15.489
26.2163999770491	18.1138392647907	31.61	17.775
26.2163999770491	18.1138392647907	32.372	18.537
26.2163999770491	18.1138392647907	30.785	16.949
26.2163999770491	18.1138392647907	32.309	19.553
26.2163999770491	18.1138392647907	30.975	17.076
26.2163999770491	18.1138392647907	25.705	26.22
26.2163999770491	18.1138392647907	30.15	16.06
26.2163999770491	18.1138392647907	29.261	23.045
26.2163999770491	18.1138392647907	30.594	16.251
26.2163999770491	18.1138392647907	27.991	13.647
26.2163999770491	18.1138392647907	32.69	18.346
26.2163999770491	18.1138392647907	29.642	15.108
26.2163999770491	18.1138392647907	30.785	16.251
26.2163999770491	18.1138392647907	29.007	14.409
26.2163999770491	18.1138392647907	27.165	25.458
26.2163999770491	18.1138392647907	31.483	16.822
26.2163999770491	18.1138392647907	33.261	18.537
26.2163999770491	18.1138392647907	33.071	18.346
26.2163999770491	18.1138392647907	28.753	23.998
26.2163999770491	18.1138392647907	31.991	17.203
26.2163999770491	18.1138392647907	28.372	13.52
26.2163999770491	18.1138392647907	28.753	13.838
26.2163999770491	18.1138392647907	32.944	17.965
26.2163999770491	18.1138392647907	30.462	15.473
26.2163999770491	18.1138392647907	32.817	17.775
26.2163999770491	18.1138392647907	29.975	14.921
26.2163999770491	18.1138392647907	27.102	25.966
26.2163999770491	18.1138392647907	31.356	16.251
26.2163999770491	18.1138392647907	28.753	24.379
26.2163999770491	18.1138392647907	34.087	18.918
26.2163999770491	18.1138392647907	30.722	15.473
26.2163999770491	18.1138392647907	28.753	13.457
26.2163999770491	18.1138392647907	33.515	18.219
26.2163999770491	18.1138392647907	31.356	16.06
26.2163999770491	18.1138392647907	33.642	18.346
26.2163999770491	18.1138392647907	29.975	14.661
26.2163999770491	18.1138392647907	31.991	16.632
26.2163999770491	18.1138392647907	30.202	14.791
26.2163999770491	18.1138392647907	30.657	15.246
26.2163999770491	18.1138392647907	27.229	26.22
26.2163999770491	18.1138392647907	33.515	18.029
26.2163999770491	18.1138392647907	29.515	14.028
26.2163999770491	18.1138392647907	31.293	15.806
26.2163999770491	18.1138392647907	30.982	15.473
26.2163999770491	18.1138392647907	29.388	13.838
26.2163999770491	18.1138392647907	32.182	16.632
26.2163999770491	18.1138392647907	29.975	14.401
26.2163999770491	18.1138392647907	26.149	27.49
26.2163999770491	18.1138392647907	28.499	25.141
26.2163999770491	18.1138392647907	33.96	19.68
26.2163999770491	18.1138392647907	29.197	13.52
26.2163999770491	18.1138392647907	31.356	22.347
26.2163999770491	18.1138392647907	25.959	27.744
26.2163999770491	18.1138392647907	31.242	15.473
26.2163999770491	18.1138392647907	28.753	12.949
26.2163999770491	18.1138392647907	34.595	18.791
26.2163999770491	18.1138392647907	33.388	17.584
26.2163999770491	18.1138392647907	29.134	13.33
26.2163999770491	18.1138392647907	33.515	20.315
26.2163999770491	18.1138392647907	25.832	27.998
26.2163999770491	18.1138392647907	29.975	14.141
26.2163999770491	18.1138392647907	31.112	15.246
26.2163999770491	18.1138392647907	30.202	14.271
26.2163999770491	18.1138392647907	31.502	15.473
26.2163999770491	18.1138392647907	29.007	12.949
26.2163999770491	18.1138392647907	29.975	13.881
26.2163999770491	18.1138392647907	31.372	15.246
26.2163999770491	18.1138392647907	30.202	14.011
26.2163999770491	18.1138392647907	28.88	25.331
26.2163999770491	18.1138392647907	31.762	15.473
26.2163999770491	18.1138392647907	29.705	13.393
26.2163999770491	18.1138392647907	30.787	14.466
26.2163999770491	18.1138392647907	29.975	13.621

Solution x	Solution y	Original x	Original y
26.2163999770491	18.1138392647907	29.578	13.203
26.2163999770491	18.1138392647907	31.047	14.661
26.2163999770491	18.1138392647907	31.632	15.246
26.2163999770491	18.1138392647907	30.202	13.751
26.2163999770491	18.1138392647907	34.722	18.219
26.2163999770491	18.1138392647907	27.546	26.982
26.2163999770491	18.1138392647907	32.022	15.473
26.2163999770491	18.1138392647907	30.787	14.206
26.2163999770491	18.1138392647907	29.975	13.361
26.2163999770491	18.1138392647907	31.307	14.661
26.2163999770491	18.1138392647907	31.892	15.246
26.2163999770491	18.1138392647907	30.202	13.491
26.2163999770491	18.1138392647907	31.177	14.433
26.2163999770491	18.1138392647907	27.229	27.554
26.2163999770491	18.1138392647907	32.282	15.473
26.2163999770491	18.1138392647907	30.787	13.946
26.2163999770491	18.1138392647907	29.975	13.101
26.2163999770491	18.1138392647907	33.071	16.187
26.2163999770491	18.1138392647907	32.152	15.246
26.2163999770491	18.1138392647907	31.567	14.661
26.2163999770491	18.1138392647907	34.468	20.442
26.2163999770491	18.1138392647907	31.015	14.076
26.2163999770491	18.1138392647907	30.202	13.231
26.2163999770491	18.1138392647907	31.293	23.68
26.2163999770491	18.1138392647907	31.437	14.433
26.2163999770491	18.1138392647907	32.944	15.933
26.2163999770491	18.1138392647907	32.542	15.473
26.2163999770491	18.1138392647907	30.787	13.686
26.2163999770491	18.1138392647907	31.275	14.173
26.2163999770491	18.1138392647907	29.975	12.841
26.2163999770491	18.1138392647907	29.007	26.157
26.2163999770491	18.1138392647907	31.827	14.661
26.2163999770491	18.1138392647907	32.412	15.246
26.2163999770491	18.1138392647907	31.015	13.816
26.2163999770491	18.1138392647907	30.202	12.971
26.2163999770491	18.1138392647907	31.697	14.433
26.2163999770491	18.1138392647907	32.802	15.473
26.2163999770491	18.1138392647907	34.341	21.013
26.2163999770491	18.1138392647907	30.787	13.426
26.2163999770491	18.1138392647907	29.975	12.581
26.2163999770491	18.1138392647907	32.087	14.661
26.2163999770491	18.1138392647907	32.672	15.246
26.2163999770491	18.1138392647907	31.015	13.556
26.2163999770491	18.1138392647907	30.202	12.711
26.2163999770491	18.1138392647907	36.436	18.918
26.2163999770491	18.1138392647907	31.957	14.433
26.2163999770491	18.1138392647907	33.062	15.473
26.2163999770491	18.1138392647907	30.787	13.166
26.2163999770491	18.1138392647907	31.399	13.754
26.2163999770491	18.1138392647907	32.347	14.661
26.2163999770491	18.1138392647907	32.932	15.246
26.2163999770491	18.1138392647907	31.61	13.901
26.2163999770491	18.1138392647907	31.015	13.296
26.2163999770491	18.1138392647907	32.217	14.433
26.2163999770491	18.1138392647907	33.322	15.473
26.2163999770491	18.1138392647907	30.787	12.906
26.2163999770491	18.1138392647907	31.991	14.092
26.2163999770491	18.1138392647907	32.607	14.661
26.2163999770491	18.1138392647907	31.015	13.036
26.2163999770491	18.1138392647907	32.477	14.433
26.2163999770491	18.1138392647907	27.927	28.125
26.2163999770491	18.1138392647907	33.769	15.679
26.2163999770491	18.1138392647907	33.582	15.473
26.2163999770491	18.1138392647907	30.787	12.646
26.2163999770491	18.1138392647907	28.88	27.3
26.2163999770491	18.1138392647907	32.867	14.661
26.2163999770491	18.1138392647907	33.452	15.246
26.2163999770491	18.1138392647907	31.015	12.776
26.2163999770491	18.1138392647907	32.372	14.092
26.2163999770491	18.1138392647907	32.737	14.433
26.2163999770491	18.1138392647907	31.547	13.203
26.2163999770491	18.1138392647907	34.341	22.029
26.2163999770491	18.1138392647907	33.127	14.661
26.2163999770491	18.1138392647907	31.015	12.516
26.2163999770491	18.1138392647907	31.275	12.613
26.2163999770491	18.1138392647907	32.835	14.173
26.2163999770491	18.1138392647907	33.095	14.271
26.2163999770491	18.1138392647907	31.737	12.885
26.2163999770491	18.1138392647907	33.322	14.401
26.2163999770491	18.1138392647907	31.372	12.353

Solution x	Solution y	Original x	Original y
26.2163999770491	18.1138392647907	33.095	14.011
26.2163999770491	18.1138392647907	33.907	14.791
26.2163999770491	18.1138392647907	32.245	24.887
26.2163999770491	18.1138392647907	34.135	14.986
26.2163999770491	18.1138392647907	32.69	13.52
26.2163999770491	18.1138392647907	33.322	14.141
26.2163999770491	18.1138392647907	32.436	13.231
26.2163999770491	18.1138392647907	31.632	12.353
26.2163999770491	18.1138392647907	33.095	13.751
26.2163999770491	18.1138392647907	36.436	17.076
26.2163999770491	18.1138392647907	31.356	26.03
26.2163999770491	18.1138392647907	34.135	14.726
26.2163999770491	18.1138392647907	33.322	13.881
26.2163999770491	18.1138392647907	31.892	12.353
26.2163999770491	18.1138392647907	33.907	14.336
26.2163999770491	18.1138392647907	33.095	13.491
26.2163999770491	18.1138392647907	34.135	14.466
26.2163999770491	18.1138392647907	35.992	16.314
26.2163999770491	18.1138392647907	33.322	13.621
26.2163999770491	18.1138392647907	32.152	12.353
26.2163999770491	18.1138392647907	33.907	14.076
26.2163999770491	18.1138392647907	33.095	13.231
26.2163999770491	18.1138392647907	34.135	14.206
26.2163999770491	18.1138392647907	33.322	13.361
26.2163999770491	18.1138392647907	32.412	12.353
26.2163999770491	18.1138392647907	33.907	13.816
26.2163999770491	18.1138392647907	33.095	12.971
26.2163999770491	18.1138392647907	34.135	13.946
26.2163999770491	18.1138392647907	33.322	13.101
26.2163999770491	18.1138392647907	32.835	12.613
26.2163999770491	18.1138392647907	32.672	12.353
26.2163999770491	18.1138392647907	33.907	13.556
26.2163999770491	18.1138392647907	34.404	14.028
26.2163999770491	18.1138392647907	33.095	12.711
26.2163999770491	18.1138392647907	34.135	13.686
26.2163999770491	18.1138392647907	33.322	12.841
26.2163999770491	18.1138392647907	32.932	12.353
26.2163999770491	18.1138392647907	31.42	27.173
26.2163999770491	18.1138392647907	33.907	13.296
26.2163999770491	18.1138392647907	34.135	13.426
26.2163999770491	18.1138392647907	33.322	12.581
26.2163999770491	18.1138392647907	33.907	13.036
26.2163999770491	18.1138392647907	34.135	13.166
26.2163999770491	18.1138392647907	33.322	12.321
26.2163999770491	18.1138392647907	33.907	12.776
26.2163999770491	18.1138392647907	34.135	12.906
26.2163999770491	18.1138392647907	33.907	12.516
26.2163999770491	18.1138392647907	32.118	27.3
26.2163999770491	18.1138392647907	34.849	13.393
26.2163999770491	18.1138392647907	34.135	12.646
26.2163999770491	18.1138392647907	34.135	12.386
26.2163999770491	18.1138392647907	33.642	26.22
26.2163999774847	17.991841479401	24.244	15.997
26.2163999774847	17.991841479401	26.721	18.283
26.2163999778988	17.8701939540732	25.451	17.965
26.2163999783138	17.7485541242939	22.974	17.711
26.2163999783138	17.7485541242939	24.943	18.346
26.2163999787299	17.6268717029106	24.371	15.235
26.2163999787299	17.6268717029106	24.308	15.044
26.216399979147	17.5057127755753	24.371	14.346
26.216399979147	17.5057127755753	25.832	14.219
26.2163999795653	17.3850409095112	25.197	12.441
26.2163999799846	17.2648204456199	25.07	11.615
26.2163999799846	17.2648204456199	25.705	12.123
26.2163999804052	17.145552856431	25.895	12.123
26.2163999808267	17.0267136239694	25.578	12.568
26.2163999808267	17.0267136239694	26.022	12.631
26.2163999812492	16.9086888486123	24.308	16.441
26.2163999812492	16.9086888486123	25.07	17.076
26.2163999816718	16.7903236846649	27.673	12.695
26.2163999816718	16.7903236846649	27.927	12.568
26.2163999820946	16.6727393528148	28.181	12.441
26.2163999820946	16.6727393528148	28.816	12.568
26.2163999825172	16.5558389057989	28.499	12.949
26.2163999829395	16.4391654575106	28.816	12.25
26.2163999833614	16.3228215242573	29.197	12.441
26.2163999833614	16.3228215242573	29.388	11.804
26.2163999837829	16.2071127617154	29.261	11.425
26.2163999837829	16.2071127617154	29.975	11.801
26.2163999842039	16.0921939849059	29.975	12.061

Solution x	Solution y	Original x	Original y
26.2163999846247	15.9775833824821	29.975	12.321
26.2163999850454	15.8632415080185	30.202	12.451
26.2163999850454	15.8632415080185	30.202	11.996
26.2163999854656	15.7494888055373	30.787	12.386
26.2163999854656	15.7494888055373	30.982	12.126
26.2163999858856	15.6363140867446	31.242	12.126
26.2163999858856	15.6363140867446	31.502	12.126
26.2163999863053	15.5237579658068	31.762	12.126
26.2163999863053	15.5237579658068	32.022	12.126
26.2163999867249	15.4117860733501	31.697	11.541
26.2163999867249	15.4117860733501	31.957	11.541
26.216399987144	15.3005519536146	31.437	11.541
26.216399987563	15.1896443516418	31.177	11.541
26.2163999879819	15.0790295323476	30.657	11.541
26.2163999879819	15.0790295323476	30.787	11.313
26.2163999884	14.968979714958	30.527	11.313
26.2163999888178	14.8592040580121	30.34	10.917
26.2163999888178	14.8592040580121	30.658	10.98
26.2163999892349	14.7500755298695	31.047	11.313
26.2163999892349	14.7500755298695	31.307	11.313
26.2163999896515	14.6414686832461	31.567	11.313
26.2163999900676	14.5331313490731	31.827	11.313
26.2163999900676	14.5331313490731	32.087	11.313
26.2163999904832	14.4253457081615	32.347	11.313
26.2163999904832	14.4253457081615	32.607	11.313
26.216399990898	14.3181184392707	32.182	10.98
26.216399990898	14.3181184392707	32.867	11.313
26.2163999913122	14.2115090791229	32.737	11.541
26.2163999917262	14.1051405977355	32.217	11.541
26.2163999917262	14.1051405977355	32.477	11.541
26.2163999921395	13.9992776584124	32.282	12.126
26.2163999921395	13.9992776584124	32.542	12.126
26.2163999925522	13.8937503480233	32.802	12.126
26.2163999929647	13.7883895507854	33.062	12.126
26.2163999929647	13.7883895507854	32.997	11.541
26.2163999933767	13.683440232201	33.127	11.313
26.2163999933767	13.683440232201	33.387	11.313
26.2163999937881	13.5790461643273	33.452	11.541
26.2163999937881	13.5790461643273	33.647	11.313
26.2163999941991	13.4751599550363	34.087	11.615
26.2163999941991	13.4751599550363	33.96	11.234
26.2163999946098	13.3718174765999	33.907	11.996
26.2163999950201	13.2686551943005	34.135	12.126
26.2163999950201	13.2686551943005	34.135	11.866
26.2163999954298	13.1658917248102	34.595	11.996
26.216399995839	13.063348881456	34.785	12.504
26.216399995839	13.063348881456	34.849	11.996
26.2163999962469	12.9611989825991	35.42	12.949
26.2163999962469	12.9611989825991	35.293	11.552
26.2163999966524	12.8595357368022	35.992	13.647
26.2163999966524	12.8595357368022	36.119	13.139
26.2163999970516	12.7579973372204	36.944	13.012
26.2163999970516	12.7579973372204	37.452	12.758
26.2163999965545	10.2180048177928	37.452	10.218
25.9820847498541	10.0041692729257	35.547	11.234
25.9820847498541	10.0041692729257	35.674	11.044
25.7342304807969	9.7889272452609	34.722	11.742
25.7342304807969	9.7889272452609	35.484	11.425
25.4720729445064	9.57132902849702	35.166	10.726
25.2007275022028	9.35288915436758	34.976	10.282
25.2007275022028	9.35288915436758	35.103	10.155
24.9061182625411	9.13298496926855	34.087	8.758
24.9061182625411	9.13298496926855	34.595	9.202
24.59216923288	8.91356941534836	33.96	10.536
24.59216923288	8.91356941534836	33.833	10.282
24.2567969815983	8.69230291531561	33.642	10.155
23.9086852874248	8.4701787292363	32.944	10.536
23.548933614891	8.24687277677313	32.055	9.837
23.1802498896588	8.02297251952311	30.912	9.901
22.8042633952419	7.79838472838891	22.212	10.091
22.8042633952419	7.79838472838891	23.482	9.52
22.4345757743535	7.57359724111897	30.658	9.71
22.4345757743535	7.57359724111897	30.594	9.52
22.0466590646725	7.34715646596642	29.388	8.313
22.0466590646725	7.34715646596642	30.721	9.329
21.6414137876198	7.12006678819538	29.451	10.155
21.6414137876198	7.12006678819538	30.34	9.647
21.2131959780404	6.89070475327078	28.753	10.79
21.2131959780404	6.89070475327078	29.007	10.282
20.7647377336309	6.658430223295	28.626	10.091

Solution x	Solution y	Original x	Original y
20.3045943270241	6.42491223434743	27.927	10.409
20.3045943270241	6.42491223434743	28.372	10.218
19.8168030067362	6.1882200361825	27.419	11.298
19.8168030067362	6.1882200361825	28.626	11.234
19.2625645422917	5.94298989144445	26.594	11.933
19.2625645422917	5.94298989144445	26.149	11.107
18.6628634969383	5.69094706738456	20.244	11.234
18.0656094914037	5.43778289466625	22.022	11.361
18.0656094914037	5.43778289466625	22.085	10.853
17.4587008118879	5.18151590696005	22.149	11.742
16.8415305993919	4.92266195687382	20.434	13.012
16.8415305993919	4.92266195687382	19.482	13.076
16.2088134153918	4.65491004532752	19.418	13.901
15.5583485294498	4.37738428200831	18.466	14.155
15.5583485294498	4.37738428200831	18.339	12.631
14.8737987033759	4.07859038252428	17.577	13.647
14.1690313229954	3.76617328105704	17.323	12.504
13.4548447471072	3.44854125840265	18.021	13.52

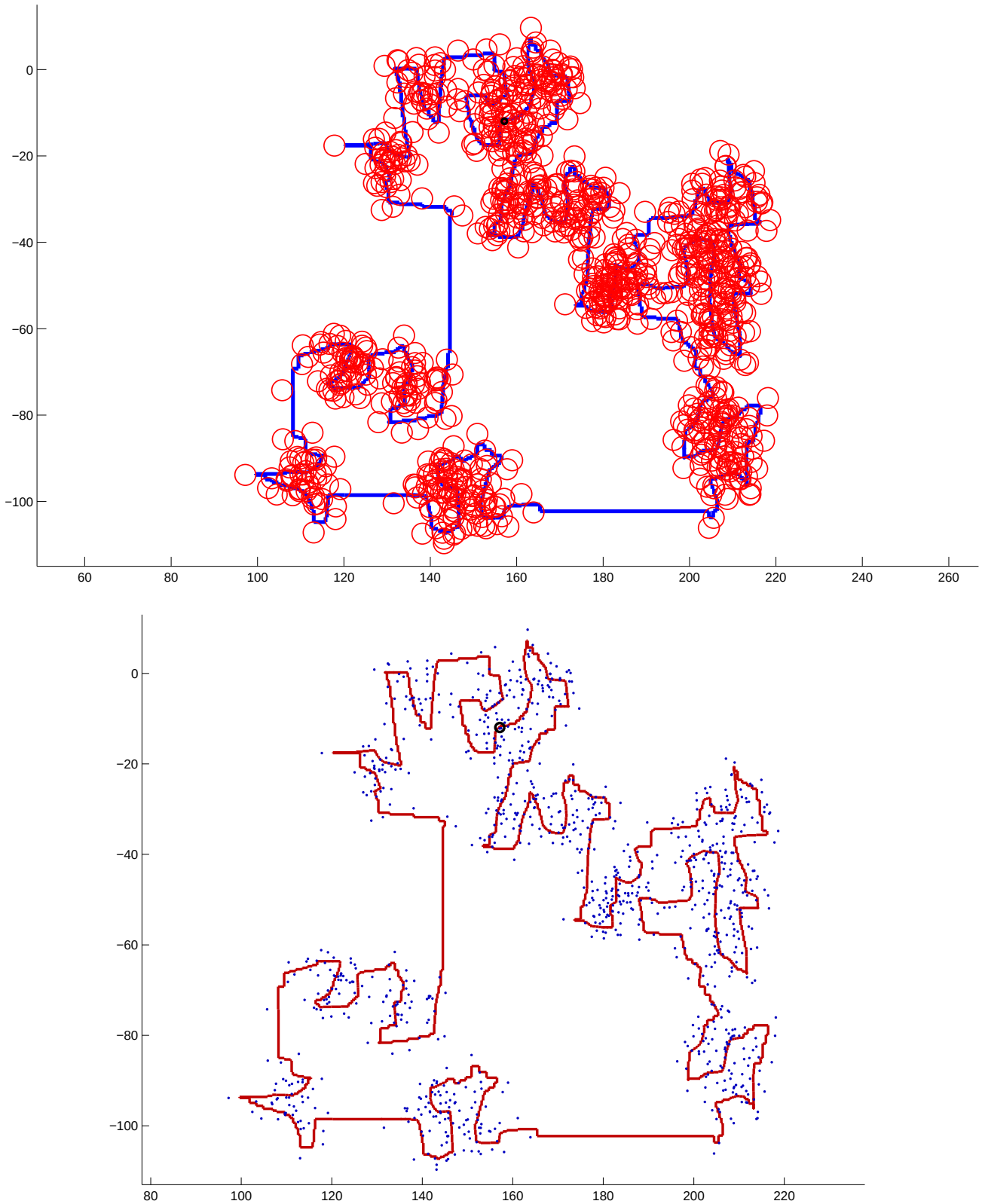


Figure N.130: $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Manhattan, Length = 1158.9926373

Table N-133: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Manhattan

Total distance: 1158.99263736746			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
46.797015033353	12.2494733308253	46.5714	10.174
46.797015033353	12.2494733308253	47.6091	10.2274
46.4303607738454	12.7660329251806	44.5228	11.8645
46.1382552410867	13.3882377256371	44.7075	13.3055
46.1382552410867	13.3882377256371	43.7175	13.3612
46.1111730491143	14.2262729273443	47.5448	13.9665
46.1111730491143	14.2262729273443	44.2621	15.3855
46.0845565285671	14.8173219348429	46.6598	16.011
46.0845565285671	14.8173219348429	46.213	15.3079
46.0845565285671	14.8173219348429	45.8725	14.3747
46.0578954372417	15.3601359135357	44.3034	16.6265
46.0578954372417	15.3601359135357	48.0446	14.6778
46.0312778185461	15.8274392676877	46.503	16.5426
46.004626180654	16.2798399032003	47.2642	16.1804
45.9778660706043	16.7347092056015	45.9074	18.6439
45.9511144263288	17.1128168816305	47.2412	18.0641
45.9242128396392	17.470781135562	45.9242	19.9
42.1538281276664	17.0744328716313	40.715	18.8306
41.3749260615036	16.2948215123201	39.7266	17.3977
40.7917975034243	15.2858578734822	40.2335	17.1357
40.250754092391	13.4622495117556	41.9974	13.5778
39.5963906741343	11.569561061383	40.2323	12.6508
38.9080094562853	9.07246925202618	36.7928	9.6586
38.9080094562853	9.07246925202618	38.0686	7.3443
38.5330779248365	7.1538497594876	36.2059	6.8965
38.3551640876139	5.98891709257195	36.4235	4.5159
40.5183246861697	5.98891799561619	41.1669	5.3004
42.4139068109906	5.98891892635888	42.4139	3.5597
42.7481437696657	6.3779534333319	44.0031	6.0986
42.7481437696657	6.3779534333319	44.3097	5.4051
42.7481437696657	6.3779534333319	44.2937	4.7268
42.9709260606887	7.17792950621979	43.7681	7.8375
43.1896039244072	7.93902724745948	42.7704	10.2739
43.4585126949575	8.1000711749649	43.984	9.2005
43.7230986607309	8.25788111478506	43.7231	10.6871
44.456090480082	7.87638544997451	44.5689	9.75
45.1761720254566	7.422762912166	45.5397	7.2979
45.8800164145504	6.97140707381227	46.3909	8.819
46.5287078776193	6.41062258325935	46.0043	6.8606
47.198681561291	5.8362802174135	46.8369	6.4403
47.198681561291	5.8362802174135	47.7278	5.7114
47.861880939229	5.24659966046862	50.2911	5.2466
47.7071772678352	4.68238767882848	48.7027	4.8736
47.5499334108479	4.11162211293528	47.0712	4.3382
47.3937288594171	3.53402308811407	45.0418	3.8658
47.3937288594171	3.53402308811407	49.309	3.6922
47.3026958069722	2.51971730343741	48.302	2.6164
47.3026958069722	2.51971730343741	48.4975	2.4432
47.2096344705861	1.50287793095008	49.5265	1.5006
47.0914664814734	0.486251367449885	49.2438	-0.5725
45.5373477796959	0.278220534629821	43.4311	0.4843
44.8447189192119	0.0668099159539928	42.4155	0.0668
44.8447191577223	-1.70410905713989	44.8479	-0.9391
44.84471939637	-3.73405678939243	46.0937	-5.8176
42.1484463182805	-3.31265982694409	43.0131	-4.6452
37.9489599220571	-2.85120055162966	39.9467	-2.3317
37.9489599220571	-2.85120055162966	36.4279	-4.3699
33.4091896561759	-2.26692168931571	31.1128	-2.8096
33.1470636189176	-1.09555544832828	31.0065	-1.0714
32.9317344795496	0.0635754543851661	31.1391	0.2266
32.9317344795496	0.0635754543851661	32.3564	-1.4633
32.7346973938558	1.59217135242012	33.4349	0.0139
32.7346973938558	1.59217135242012	31.0707	1.7474
32.5432971201624	4.05999799596292	33.6792	4.7017
32.3467613053126	6.12702965998368	31.7997	5.4917
32.3467613053126	6.12702965998368	30.7839	5.7178
32.1608969783831	8.9167283576992	33.7832	8.5886
31.965603390391	12.1871811570427	31.9656	14.6164
30.6884316830746	10.8195710842431	29.4417	11.4808
29.6330326101118	9.26172376828474	29.2451	9.0499
29.6330326101118	9.26172376828474	29.9497	8.0977
28.5754312401315	8.00266490052357	26.246	7.8923
28.2948355694093	6.91529957292126	29.6205	6.6839
28.2948355694093	6.91529957292126	28.0443	7.2557
28.2948355694093	6.91529957292126	27.9452	7.0873
28.0052745697071	5.80824705698904	29.2732	5.6917
27.7026096650121	4.71790501190495	28.1449	5.3771
27.7026096650121	4.71790501190495	27.6562	5.4902
27.7026096650121	4.71790501190495	27.2842	5.8331
27.4008031187921	3.18588931050606	26.4488	5.1021
27.4008031187921	3.18588931050606	28.6989	1.5656
27.0946033478397	0.853651415729054	25.8989	0.7413
27.0946033478397	0.853651415729054	27.3755	-1.0984
26.7943027781163	-0.206080787496667	26.7943	-2.6353
25.2088642986807	-0.206080138872425	24.8641	0.1355
23.6970200136138	-0.206079363711055	22.6294	-1.9579
22.6941214600061	-0.206078631644637	22.4229	-2.1641
21.7615095469247	-0.206077943451394	19.4163	-0.8394
22.1916182603991	1.4998000527353	22.4003	2.9895
22.616461194617	2.75780708962534	24.5208	1.7631
22.9377703816069	5.27599357896075	23.9142	5.5856
23.2488615055409	7.60283668472897	22.0744	6.6433
23.5768619148676	11.002338400179	21.6596	11.213
23.9614968656787	13.9148286442582	25.9081	14.4892
24.2778141730889	15.8824132496511	23.3217	16.9506
24.6072388436494	17.4229220540078	23.1228	16.7524
24.9640230801227	19.2653265225708	25.2224	21.1268
25.3134841372457	20.3193815111751	27.0312	22.0371
24.5189822694937	20.1638638515566	24.0847	21.2619
24.5189822694937	20.1638638515566	24.5729	19.8583
23.7514149786146	20.0059486846793	23.1615	20.5337
23.0160125589028	19.8467628639243	22.5923	19.795
22.3004221943418	19.6876939212963	22.0389	18.6688
21.5987226522946	19.5312954312028	20.5322	21.5891
21.5987226522946	19.5312954312028	20.5046	21.2685
21.2431886965529	19.2706502408574	21.1889	21.267
20.8895230004733	18.9673566274576	19.4151	20.4264
20.5865019277888	18.6134874881644	19.0397	19.3917
20.306436914068	18.2414866784124	21.2889	20.2133
19.9826525535341	17.6623160907413	20.7311	19.0512
19.6468007926935	17.0067190326605	19.6468	14.5775
18.229014850323	17.1541233478285	18.1963	16.0602
16.8188548518837	17.3041348480096	16.9397	16.157
15.3799636007605	17.4570619222802	17.2669	18.1061
10.233118862681	17.6060954204165	7.8039	17.6061
16.2230155305478	20.8217655771795	17.3215	22.815
16.2230155305478	20.8217655771795	15.0509	21.8739
17.501157688948	21.3485480087334	18.4916	22.031
18.6169976458083	21.8545583689382	19.4476	21.0876
18.6169976458083	21.8545583689382	19.3676	20.9011
19.5482502168649	22.415257106927	21.7951	21.835
19.8454605759842	23.2528046673774	19.6457	23.2311
20.1441575577865	24.091637251097	19.5225	24.6717
20.4483173544892	24.8922324849835	20.8129	26.0745
20.4483173544892	24.8922324849835	21.4132	25.3225
20.7396810370673	25.5900000128853	23.1689	25.59
20.0440294625423	25.9455023151744	18.7218	26.0511
19.4046189480586	26.2994006852352	16.9754	26.2994
19.6305074197181	27.0747738087855	19.8821	27.2321
19.8553304156301	27.8419050398307	17.7323	26.9057
20.293100457013	30.7746962009292	18.7531	32.536
22.810874824902	31.1758604025372	21.3113	31.7798
22.810874824902	31.1758604025372	22.8581	29.0039
28.1335203693458	31.7852668004545	28.099	29.8348
33.7026982614303	32.6424317545819	35.5392	31.6783
34.9979809290598	33.8060995526181	37.4272	33.8061
34.5405492491048	65.6302516780698	33.839	67.1668
34.1059496182848	69.0895165835675	35.1535	70.6086
33.6253061246486	70.746613236222	31.4906	71.3219
33.3114849412575	71.860223040863	31.4455	71.7336
33.3114849412575	71.860223040863	31.0449	71.9995
33.1185298461764	72.8930180131834	31.7515	71.3679
33.1185298461764	72.8930180131834	32.2488	71.8762
32.9431608494381	75.529302062243	32.697	74.6737
32.9431608494381	75.529302062243	31.4187	76.5703
32.7775794522077	77.4941700757172	31.105	77.2121
32.6193813439017	79.6680746533129	34.9317	80.2335
31.5989379254434	80.2295643426866	33.517	80.8699
29.2350467903995	80.7374720449184	29.376	80.5861
26.803878545023	81.2488746676207	27.1736	83.2653
23.4089000855047	81.6335806610115	23.4089	84.0628
20.389688089642	81.633553807208	17.9606	81.6588
20.7600081537406	78.4256709510246	18.7356	77.2891
22.5795403722815	77.7642461108114	24.3218	77.9732

Solution x	Solution y	Original x	Original y
22.5795403722815	77.7642461108114	21.1184	76.9048
24.185880659418	77.1467007343876	26.6151	77.1467
24.1142970255518	76.3299016643265	25.3366	76.538
24.1142970255518	76.3299016643265	23.796	77.2181
24.0422248268702	75.4284771705822	24.7401	75.4523
24.0422248268702	75.4284771705822	24.4797	75.354
24.0422248268702	75.4284771705822	22.8762	75.7017
23.9709912862296	74.5054966393808	25.4767	75.481
23.9709912862296	74.5054966393808	23.527	73.6169
23.8974340806958	73.4952267137915	24.5354	72.6275
23.8974340806958	73.4952267137915	24.5076	73.115
23.8974340806958	73.4952267137915	24.1578	73.3792
23.8226192017961	72.6126185599372	21.3934	72.6127
24.02292520441	72.5733340657169	22.1344	71.2137
24.02292520441	72.5733340657169	22.0857	71.4539
24.7116751866871	72.537550316229	26.2205	72.9044
25.3102633232672	72.5016945881854	27.2709	73.9256
25.3363841556739	71.8165967271874	26.4587	69.6793
25.3363841556739	71.8165967271874	26.9783	71.0141
25.3576999468596	71.7593276662119	27.6433	72.5657
25.3683504493122	70.0945455447629	22.9431	70.0987
25.8117807459003	67.9652995043646	28.241	67.9653
25.2953858258452	67.1062975754037	26.4747	67.9787
25.2953858258452	67.1062975754037	25.7737	68.9159
24.6957366773273	65.5722461364071	26.4833	65.6457
23.9368997860941	64.0158192345528	23.9369	61.5866
22.9486425383525	64.7258830762939	22.6268	64.3936
21.9873190925043	65.4522877674374	22.8228	67.5784
19.4093972993173	65.7817822611414	18.9682	67.082
17.1565597389362	66.0942258365578	15.3124	65.205
16.1618431153193	66.4354205243974	15.1112	64.361
15.6905192222243	67.7948010392395	13.2613	67.7948
15.7196243543723	68.331718547622	14.0233	68.3418
15.7486671336497	68.8678309415206	16.7224	69.1113
15.7777021215191	69.3967067364053	14.7433	68.1941
15.8067559666588	69.9820174131878	14.5018	68.1646
15.8361807293128	71.527700150955	18.2654	71.5277
15.1392879101696	72.1646847864041	15.0856	70.6386
14.4460703552832	72.9042974900856	15.4332	72.9689
13.6997451215969	73.6395506908007	13.7649	76.0563
12.01305602408	73.6752511024573	12.73	75.2001
9.87457920500471	73.7106219954346	9.00020000000001	73.0359
9.87457920500471	73.7106219954346	9.9143	75.8382
8.04719966828281	73.7450807962814	8.0472	76.1743
7.19016617050042	73.087173533403	7.5677	74.3816
7.19016617050042	73.087173533403	6.65640000000001	74.2265
7.19016617050042	73.087173533403	6.09139999999999	73.9114
6.43811920629884	72.1859988208314	4.0089	72.186
7.75955593756797	71.629237213165	9.45780000000001	72.6847
7.75955593756797	71.629237213165	7.0214	70.8048
8.65119255438007	71.0054837931195	9.3844	71.5303
8.65119255438007	71.0054837931195	8.8648	72.0358
8.65119255438007	71.0054837931195	8.3117	72.2049
9.49916909446694	70.2369757527786	11.6475	70.8021
9.92678172273578	69.2338922883924	10.9416	69.7746
9.92678172273578	69.2338922883924	10.0835	69.723
9.92678172273578	69.2338922883924	9.1707	70.0865
10.3462111542942	67.9800166203033	12.0097	66.7734
10.3462111542942	67.9800166203033	11.4442	66.9869
10.3462111542942	67.9800166203033	10.7344	66.9849
10.3462111542942	67.9800166203033	10.5042	66.7806
10.6675742017956	67.3361700784301	12.0587	67.8257
10.970261940325	66.6630168589904	11.4886	67.7219
11.2676555489936	65.9305191936357	12.0877	66.3858
11.2676555489936	65.9305191936357	12.5389	66.9051
11.5421728346531	65.0738364640369	12.0444	66.3239
11.8120182445798	64.0834142756528	14.2239	63.9607
11.853777888619	63.6149223422455	14.2076	63.0144
10.2143607254933	63.6149215410642	10.4334	62.822
10.2143607254933	63.6149215410642	9.15690000000001	61.6426
9.39967375723103	63.6149207451451	9.6606	65.5604
8.53852294704126	63.6149199498875	8.4928	63.9998
7.68029990937049	63.6149191552994	7.6803	61.1857
6.77938607546984	64.4567300832557	6.9842	66.7632
5.67397542966201	64.7417448465882	6.67010000000001	63.5082
5.67397542966201	64.7417448465882	4.7342	63.0935
4.63743908713938	65.0799829122199	5.2812	65.5492
3.52902411728969	65.4130682777371	4.4426	63.6871
2.05077200749827	65.8008858902428	1.76609999999999	66.5446
0.631142459921577	66.1781111061249	0.483800000000002	63.8626

Solution x	Solution y	Original x	Original y
-0.531236212747359	69.2298022559522	0.309600000000003	68.1954
-1.85148078864661	74.2616001012591	-4.2807	74.2616
-1.78428138623322	85.0309462753747	-4.1255	85.596
-0.508549716721589	85.3198442346326	-1.23350000000001	86.0108
0.902547920737945	85.6029516166362	2.7376	84.0979
1.12483902843582	88.1411899670381	-0.100899999999996	90.0487
1.39748706111698	88.729080675894	-0.735100000000003	89.6931
2.3878729899637	89.0721048624889	2.57040000000001	90.3092
2.3878729899637	89.0721048624889	1.20229999999999	90.7259
3.83413816032514	89.3546068300214	3.5998	89.8159
3.83413816032514	89.3546068300214	3.55029999999999	90.3653
5.3849806236387	89.6257977390175	7.8142	89.6258
4.7873482154944	90.7911547675122	5.8502	91.8647
4.12891899030971	91.7764496683878	4.77370000000001	93.7785
3.35214180329331	92.3562424428562	3.4538	93.5151
2.56844248220254	92.8952395903365	3.5924	94.7451
2.56844248220254	92.8952395903365	1.1743	92.9818
1.64529922891808	93.2885805635368	1.64530000000001	95.7178
0.999693098659165	93.2504041235242	0.580200000000005	93.7511
0.370039100999946	93.2123566394196	-0.0468000000000046	93.7668
0.370039100999946	93.2123566394196	0.613799999999998	95.4238
-0.298285677069543	93.1731994421063	0.619299999999996	91.0377
-2.30369966522862	93.1371194968721	-2.30370000000001	90.7079
-3.15947941128904	93.3761039682062	-2.5612	92.1356
-3.15947941128904	93.3761039682062	-1.9602	93.9224
-4.21696024682524	93.6204509787169	-2.1508	94.1499
-10.375680612029	93.8534959942656	-12.8049	93.8535
-8.17684474592099	94.9381783545182	-7.5489	96.9207
-6.66583468502851	95.5722858550074	-6.68600000000001	94.6391
-5.15051405489655	96.2472404140139	-5.5457	98.4014
-3.03692399084034	96.6476927769062	-3.1358	95.2162
-3.03692399084034	96.6476927769062	-1.86190000000001	98.5581
-2.17836951559306	96.938106517946	-0.311599999999999	97.6012
-2.17836951559306	96.938106517946	-3.26390000000001	94.8889
-0.369716484118868	97.5783685201804	1.4019	97.5847
-0.369716484118868	97.5783685201804	-0.171000000000006	97.1566
-0.369716484118868	97.5783685201804	-0.338999999999999	97.1979
0.737679090026163	98.2495330753015	2.1469	96.6722
1.44531067490868	99.3374096110804	3.11839999999999	98.924
2.03146207030571	100.519770316932	2.55330000000001	99.1767
2.03146207030571	100.519770316932	3.1448	100.72
2.55812524192504	101.976426724916	3.81100000000001	100.5395
3.01619881190116	104.750380472977	3.0162	107.1796
5.76080300881884	103.649884862938	8.0611	104.093
6.06212191239472	100.780598778014	8.1477	101.1634
6.06212191239472	100.780598778014	4.95789999999999	99.4405
6.3197958967111	98.5156194864154	6.3198	96.0864
10.1620276130649	98.5220925471982	9.17	97.1621
20.9992044448452	98.5285772527618	21.5395	100.4343
25.319107702193	98.5350421358121	26.55	96.735
25.319107702193	98.5350421358121	26.9511	99.1097
26.2356454979219	98.541542206754	26.6904	96.1713
26.2356454979219	98.541542206754	26.1674	96.1159
27.5220349248598	98.6483797716883	28.2891	98.27
28.6940439993783	98.7556590938816	29.1897	96.4145
29.0892939544037	99.4943768202078	29.7849	97.5299
29.4512645893782	100.969589305894	31.6341	101.1443
29.7155852956911	102.285943092737	29.8552	101.3038
29.9789082262497	103.80873381654	30.1816	102.1772
30.2400244092076	106.327977274004	28.1717	107.4546
31.7801741900057	106.789952352518	32.8361	107.2479
31.7801741900057	106.789952352518	31.3011	106.2109
33.1638005196468	107.252280330009	33.1638	109.6815
33.9575984538129	106.867944362102	33.1686	108.6172
34.8983444841989	106.406907486862	35.7224	107.36
34.8983444841989	106.406907486862	35.3466	107.7036
35.7141648429026	105.874418819027	37.1983	106.347
35.7141648429026	105.874418819027	34.3074	104.3145
36.7672803106994	105.45240193763	39.1965	105.4524
36.6684064420261	103.675405831882	35.4006	103.6799
36.5709702483822	101.898129306377	35.2228	101.4244
36.5709702483822	101.898129306377	35.7306	102.2767
36.5709702483822	101.898129306377	35.5571	102.295
36.4769114496859	100.066024115212	35.7859	98.3251
36.4769114496859	100.066024115212	36.8108	99.4487
36.3838529414511	99.04832113925	35.7481	97.1257
36.3838529414511	99.04832113925	38.189	100.3805
36.2818674876524	97.6372810538776	38.2186	96.6747
36.1694016863922	96.7815196823394	36.1694	94.3523
36.0257788506844	96.812384700333	37.3296	94.7968

Solution x	Solution y	Original x	Original y
36.0257788506844	96.812384700333	37.1788	95.0118
36.0257788506844	96.812384700333	35.9551	95.9225
35.1711496525442	96.8396827080025	35.2297	94.8683
35.1711496525442	96.8396827080025	34.0458	95.0903
34.5059796974433	96.8668658614708	33.9629	96.8355
34.5059796974433	96.8668658614708	34.0464	97.1856
34.5059796974433	96.8668658614708	35.0473	98.5367
33.8351006280772	96.8942803581014	33.8351	99.3235
33.2478930411983	96.4710008251459	31.7064	96.988
33.2478930411983	96.4710008251459	32.4952	97.9758
32.7695183825057	95.9766676250009	33.0573	97.9271
32.7695183825057	95.9766676250009	30.7482	95.8761
32.3877569849653	95.3265395895925	31.6916	96.8159
32.0224603921995	94.5512592577562	31.4281	94.9219
32.0224603921995	94.5512592577562	29.7064	94.0211
31.8983526473904	94.1428099801005	30.8807	93.5109
31.7760195185658	93.7461024677637	29.3468	93.7461
31.8274961173186	91.4755270070247	29.5221	90.7635
32.7970414522928	91.3130707719549	34.0163	93.2553
32.7970414522928	91.3130707719549	32.8593	93.0881
32.7970414522928	91.3130707719549	32.2034	92.5655
33.2844855968426	91.0617621097147	33.6244	92.4492
33.2844855968426	91.0617621097147	32.1756	91.0244
33.79054875322	90.7984990621687	32.6009	89.9531
33.79054875322	90.7984990621687	33.1881	90.5996
34.359349766658	90.5441723881122	34.7819	91.1147
34.9152537511156	90.2863309055327	33.2241	90.2072
34.9152537511156	90.2863309055327	35.4152	92.5489
35.4073003943759	89.6508195622196	35.4073	87.2216
37.0705988535074	90.5875804685122	37.0706	93.0168
38.316662610303	89.9383371934664	37.9917	90.5379
39.6127713052715	89.2631698420645	39.6285	91.4521
40.8938997955711	86.7847195209673	40.8939	84.3555
42.5628311845706	88.0892491623566	42.6808	88.2098
44.202430222415	89.3797406226748	42.9721	90.3177
46.5240804177847	90.4759003410723	48.9533	90.4759
45.9056801465721	91.5406932657089	47.7789	92.5461
44.6925539788152	92.2953850346431	43.1057	91.7939
43.7949291093665	93.10040260692	41.599	92.4813
43.4344374787573	94.3859293183714	41.6896	94.8028
43.1138605264737	95.5527448759642	44.0393	95.7757
42.7829014282433	96.6897816228775	40.9431	96.0349
42.7829014282433	96.6897816228775	42.0978	97.503
42.5024113950062	97.9362567012363	42.2565	98.7398
42.5024113950062	97.9362567012363	43.0828	99.6317
42.2147092400127	98.7638586206894	42.5793	100.4271
42.2147092400127	98.7638586206894	40.065	98.6098
41.984794285059	99.4620817472363	42.8352	101.6931
41.984794285059	99.4620817472363	39.7333	98.7582
41.8073056481439	99.6170271530879	42.9226	100.4615
41.625219640059	99.7693910108357	39.196	99.7694
41.6766172247859	100.888785990554	40.2693	101.3043
41.7285363017731	101.940198741413	39.3246	101.8921
41.8839898277497	103.425906235606	40.9527	105.6227
42.2026851041297	103.547965644163	42.0156	103.5929
42.2026851041297	103.547965644163	40.5226	102.8002
42.5637423004542	103.672183871782	42.4716	105.6496
42.928497858092	103.788680313721	42.9285	106.2179
45.044345779474	103.743970258784	45.465	105.2608
46.898036892038	103.698797250442	48.0764	105.8084
46.982218802164	102.937765454676	46.5537	103.4177
47.0666914718995	102.150434724469	45.0704	101.2748
47.1580339369163	101.552846497864	44.7902	101.1589
47.8117080291136	101.250622523388	46.0729	100.678
48.6604421933471	100.959421100807	47.126	99.3914
51.1106017770202	100.725519735446	51.1106	98.2963
55.3796624193111	102.272270887834	53.9006	102.5381
94.482800604184	103.694466174699	94.4828	106.1237
95.4581073834912	102.153147984052	95.6122	103.8055
96.4080610818529	99.4165019287553	98.8373	99.4165
96.0871043828288	98.3025644802183	95.0373	98.5247
96.0871043828288	98.3025644802183	98.2349	98.4363
95.6826162946129	97.075169402671	95.504	96.351
95.6826162946129	97.075169402671	95.7576	96.9635
95.2783171728277	95.95955855393	94.0924	96.5838
94.8915467740528	94.7340069460417	92.4623	94.734
96.4192990468585	94.2256445389568	96.5235	92.1962
97.9062423469532	93.8400240490131	97.0347	92.0258
97.9062423469532	93.8400240490131	98.853	91.6792
98.3915942281455	93.6946751701303	98.656	92.6213

Solution x	Solution y	Original x	Original y
98.8702530182585	93.5518082871624	98.9319	91.3958
99.343399326351	93.4271332630512	99.3434	90.9979
100.118338516042	93.482976186783	100.5649	91.4192
100.792490366302	93.5414980022171	100.8882	91.1406
101.283932122719	94.1096859551392	99.3782	93.0601
101.283932122719	94.1096859551392	101.602	92.3175
102.112873382757	95.0930018820685	100.6204	94.7646
102.112873382757	95.0930018820685	101.583	94.8217
102.112873382757	95.0930018820685	101.8123	94.891
103.221378334489	96.1412825901269	103.8628	98.4843
103.221379109245	96.0882326764974	104.1728	96.9352
103.221379109245	96.0882326764974	104.1034	98.3317
103.221379852796	94.0443339859242	102.0076	93.075
103.221379852796	94.0443339859242	103.2876	94.1817
103.221380595645	92.4296980411196	104.3693	90.8389
103.221380595645	92.4296980411196	105.6506	92.4297
103.181924444108	90.3629719481506	102.4507	89.6037
103.14187899268	88.5952014367418	100.7126	88.5952
103.251239591609	87.3704393929538	102.0461	86.7072
103.251239591609	87.3704393929538	104.5599	87.8351
103.360515664532	86.1850018727899	101.1477	85.2681
104.809918573002	85.9448023661518	107.2392	85.9448
104.766424922832	85.4772932022338	104.3617	84.8664
104.722901382659	85.0217261918366	103.1106	83.2736
104.722901382659	85.0217261918366	102.2936	85.0217
105.223604421537	81.8363241941221	103.6911	80.62
105.223604421537	81.8363241941221	103.8313	82.5056
105.942442409338	79.9173949760448	107.981	80.0957
106.435372789151	77.7868268406727	108.1531	76.0691
103.190087129106	78.6774496748686	101.2985	78.2917
101.876038166305	79.6500715971363	100.0565	80.1054
101.013779335685	80.5357631325992	101.0606	82.9382
99.9337892890404	80.6169866178799	98.5933	78.8152
99.9337892890404	80.6169866178799	99.1261	78.6323
99.4495820286163	80.7125675387046	98.567	80.2017
98.9865561096892	80.8086330561746	98.9119	80.0767
98.5251292458773	80.9053436168022	97.7624	79.6432
98.5251292458773	80.9053436168022	98.2007	80.5294
98.0912298432897	81.0040570847557	97.1852	78.7831
97.9172012495534	81.5537663270392	98.2345	80.86
97.9172012495534	81.5537663270392	97.8831	81.9659
97.7423858162661	82.1132097551862	97.3132	81.5365
97.5688155298961	82.6907511928116	97.4314	81.946
97.5688155298961	82.6907511928116	96.9541	82.6989
97.3973401204071	83.2936883889912	96.8706	83.0827
97.2272650024944	83.9040961613579	94.9909	83.4209
97.0962919663113	84.7003667506475	97.0865	83.6094
96.9653362478376	85.5806286283857	96.9343	84.943
96.9653362478376	85.5806286283857	99.0152	86.155
96.8197431658398	86.3540539230804	95.9325	86.7596
96.8197431658398	86.3540539230804	96.2545	87.1498
96.6772215341618	87.0592460796784	98.3726	88.4744
96.5147947759179	87.5254884490301	97.7943	87.7833
96.3481299906815	87.9848178581434	98.1138	89.594
95.4588442411448	88.1362261308611	95.2026	90.5293
95.4588442411448	88.1362261308611	96.8345	90.0197
94.402610838562	88.1836961798773	93.1284	88.6615
94.402610838562	88.1836961798773	93.9684	87.8762
93.5353762413947	88.2310924756377	93.4941	85.8189
92.8684075644569	88.5509030127112	93.0994	86.3608
92.1451461227375	89.0595390664872	92.7178	89.1801
91.3930161345292	89.5651910916466	92.5654	91.5305
88.7666276393999	89.8441833736298	88.6062	92.2681
88.7666237582347	87.7331699009133	88.3633	87.3681
88.7666198780935	85.7586000634912	86.3374	85.7586
89.0509556291414	83.5959814978423	88.0687	81.4777
89.4855510632377	83.2623625827714	88.6759	82.3658
89.9400704898317	82.9399866481057	89.5631	83.3752
90.4023706984898	82.6134542813058	91.14	83.5499
90.8474222599366	82.2751832416661	92.288	83.6157
91.2296139791188	81.8927847135449	93.2494	81.8793
91.2296139791188	81.8927847135449	91.1677	84.1211
91.5457690878585	81.1581423506467	92.6699	80.64
91.5457690878585	81.1581423506467	92.1151	81.2598
91.8444411040003	80.4506192722939	94.0795	80.8773
92.0439330450677	79.535711541702	89.95	80.2132
92.0439330450677	79.535711541702	91.86	79.7087
92.2959364132336	78.1872925626933	91.1291	78.4897
92.2959364132336	78.1872925626933	93.1133	78.1389
92.2959364132336	78.1872925626933	94.4072	76.9857

Solution x	Solution y	Original x	Original y
92.2959364132336	78.1872925626933	94.6945	78.572
92.2642173458782	77.7459927636079	89.835	77.746
92.9831236554405	76.607632056768	91.0116	75.887
94.4011835363549	75.7276030510851	96.1169	76.0362
95.3867681954764	74.8014993759646	97.816	74.8015
95.2309485509979	74.2446280308629	97.5653	74.5618
94.8043492777228	73.4429027404861	95.9481	74.251
94.3481475037578	72.566643333078	94.549	73.3405
94.3481475037578	72.566643333078	96.2521	73.5638
93.6241578135973	71.0394625280859	94.6798	69.1984
93.6241578135973	71.0394625280859	93.9524	73.145
92.4656351552561	69.1790031084406	93.0933	68.7697
91.2229292996532	67.4470038706139	88.7937	67.447
91.3623267017783	66.2265319456028	92.0851	66.8651
91.5151527120083	64.9000025793182	93.9444	64.9
90.8178531929574	64.1243184067944	92.749	64.7326
89.6736067310146	63.2273547680854	90.2672	64.2791
88.4321491238621	62.2212621306617	86.2321	62.729
87.9891802753811	60.701443291013	85.8477	60.7859
87.9891802753811	60.701443291013	88.0225	60.7529
87.6668971422856	59.0869714300153	87.1149	58.1702
87.3505649867536	57.6954084274927	89.2688	56.3248
82.3442438044681	57.3428172371367	81.1686	57.7423
79.3848807833213	56.9843843875708	77.9705	58.8491
78.9134463688241	54.8276995206821	78.0993	54.3894
78.9134463688241	54.8276995206821	77.8264	55.5164
78.4859552255194	52.465877092998	76.2244	51.9684
78.4859552255194	52.465877092998	76.5498	52.218
78.2896552976855	51.4522442410396	78.2967	50.1808
78.0933551834686	50.5750270526226	76.0043	50.5809
77.9219208060425	49.6976213495243	75.5587	49.1352
78.6256809692166	49.6976204429951	77.4079	49.147
78.6256809692166	49.6976204429951	77.6289	48.4559
79.5330032081078	49.6976195404886	79.533	47.2684
80.5029616165092	50.0165388820669	80.0004	48.0282
81.64680076115	50.408195778739	80.3964	49.7264
81.64680076115	50.408195778739	80.7698	50.729
81.64680076115	50.408195778739	83.5076	51.7826
82.0477003684316	50.6686644708269	82.0477	53.0979
84.2994539006694	50.4660238903398	84.6532	51.7406
86.3467597436015	50.2567264630223	85.9154	51.5363
88.6511704563954	50.0401686457884	89.6611	52.1615
89.1556951240497	49.3485840717718	90.3356	51.1932
89.5463803784711	47.4724996357122	87.5129	47.9594
89.5463803784711	47.4724996357122	87.8413	47.1867
89.5463803784711	47.4724996357122	89.352	47.1855
89.5463803784711	47.4724996357122	91.1842	48.1207
89.5463803784711	47.4724996357122	89.3464	46.1786
89.5463803784711	47.4724996357122	90.4865	46.0315
89.5463803784711	47.4724996357122	91.9756	47.4725
89.5454061920656	46.6063212413012	89.5287	45.4109
89.5444321640591	45.8316284015576	91.9732	45.8332
89.2804997195479	44.1446717261825	90.0385	42.8005
89.0095229237958	42.8762853629792	89.3668	41.343
89.0095229237958	42.8762853629792	90.4784	41.2284
88.6789101671606	42.3340867377718	88.4465	41.4478
88.6789101671606	42.3340867377718	89.0134	41.3658
88.3474356674793	41.843004753083	85.9182	41.843
88.6598819094049	41.2851036898129	87.2346	40.5435
88.9961237989763	40.7622004285871	87.5583	39.2312
89.4051500517071	40.3588165484092	89.1249	38.0318
89.891241614217	40.1784191106926	90.014	39.915
90.3748393704956	39.9987746021826	90.1236	40.724
90.8642635814624	39.8168592264035	92.1801	41.0349
90.8642635814624	39.8168592264035	92.2396	41.0703
91.2502697605175	39.6167415478676	92.8093	39.7693
91.6044202675138	39.4157079867715	91.8795	37.1845
91.9371979853458	39.2611357293627	91.9372	36.8319
92.6261124388668	39.3921861424514	92.634	40.1716
93.3148555168365	39.5221082475433	93.2846	41.9379
94.231178963718	39.5500669688078	93.6941	39.0671
94.231178963718	39.5500669688078	94.3087	39.6383
95.1860614488955	39.578056826171	96.5473	37.5774
95.2372936796869	39.6906071699322	97.0806	39.3994
95.2875122686996	39.8039547290219	97.0063	39.6578
95.3369818678979	39.9176316763116	95.1298	37.6897
95.3867338615593	40.051468101662	93.6083	38.4774
95.3867338615593	40.051468101662	94.1971	38.0204
95.4541214801826	40.7819225202786	96.2133	40.5576
95.4541214801826	40.7819225202786	95.8598	39.2349

Solution x	Solution y	Original x	Original y
95.5208954693029	41.6915096605746	96.2085	41.8253
95.5208954693029	41.6915096605746	96.8865	41.9997
95.5866144728834	42.5578184823222	96.6284	43.246
95.6518130307273	43.3655953579996	98.0763	43.3554
95.6586507177608	44.5657008787724	97.5519	44.8528
95.6586507177608	44.5657008787724	98.0879	44.5657
95.4241345279155	45.1437083521975	93.9129	43.6355
95.4241345279155	45.1437083521975	95.46	44.379
95.213002625648	46.0666077624435	94.5838	45.9916
95.213002625648	46.0666077624435	94.4684	44.7163
95.213002625648	46.0666077624435	94.5355	44.3621
95.0130187342102	47.9344119471149	93.3823	48.5086
95.0130187342102	47.9344119471149	94.3452	48.7818
95.0130187342102	47.9344119471149	94.5726	47.3613
95.0130187342102	47.9344119471149	95.0864	47.4256
95.0130187342102	47.9344119471149	95.1396	47.3596
95.0130187342102	47.9344119471149	95.7654	46.8722
95.0130187342102	47.9344119471149	96.2485	47.1277
94.8177852035639	50.8908499208115	93.0102	50.1223
94.8177852035639	50.8908499208115	92.412	50.9961
94.772782405559	52.0568105896893	95.0304	53.2116
94.772782405559	52.0568105896893	96.0562	52.3857
94.727403470947	53.0267338625649	96.8097	54.0588
94.6772300036991	53.4992817727767	93.3932	53.1876
94.6274422472729	53.9806008171332	92.1982	53.9806
94.7954287203023	56.1300653606341	92.8209	56.9207
94.9884364604256	57.4071938858157	92.9131	56.6287
94.9884364604256	57.4071938858157	93.2379	56.4517
94.9884364604256	57.4071938858157	94.6877	57.1733
94.9884364604256	57.4071938858157	94.4551	58.0456
94.9884364604256	57.4071938858157	95.4289	57.3916
94.9884364604256	57.4071938858157	94.8477	58.3247
94.9884364604256	57.4071938858157	97.3108	57.82
95.1238659713618	58.502047203593	95.9041	59.3009
95.2577535401236	59.5003065748733	95.1558	61.2395
95.2577535401236	59.5003065748733	95.479	61.1306
95.3913567445059	60.1338157923579	95.4724	61.7777
95.524738840567	60.6764584987741	94.6583	60.3511
95.6597021003132	61.2293674861576	94.5987	62.0376
95.7971209484661	61.7530019186471	96.4356	62.0951
95.9334141782882	62.2679925903833	93.5538	62.1822
96.5395666699952	62.8463292823754	94.6788	63.8911
97.6353330386725	63.31438802291	99.0429	61.6589
98.2746903816064	64.0442621950377	99.4285	63.8276
98.8639332564749	64.7884505269085	98.4228	65.0226
98.8639332564749	64.7884505269085	98.4258	65.8894
99.486660919148	65.457377540092	97.9014	66.9835
100.709551397635	65.8999610455521	101.778	67.1686
101.703180620294	66.3037681225111	103.5291	67.906
101.703178999961	66.3037673458235	102.9023	68.4164
101.660587188348	62.5872572231606	102.6402	60.9181
101.617546587598	61.1324787930648	99.3413	60.508
101.617546587598	61.1324787930648	100.6854	61.817
101.580444575776	60.5187914013946	103.9916	60.6173
101.304258556969	59.1816053861716	99.9754	58.6633
101.039989478464	57.957906057707	98.8606	57.9963
100.827763999815	56.7080994494772	99.7259	57.0659
100.827763999815	56.7080994494772	102.1595	55.9791
100.827763999815	56.7080994494772	102.8738	56.4102
100.579340784326	55.6663267387858	98.9521	56.5952
100.350668072099	54.3427697231477	97.9579	54.2407
100.350668072099	54.3427697231477	100.5945	52.9653
100.350668072099	54.3427697231477	98.7715	55.3698
100.350668072099	54.3427697231477	100.6388	53.8259
100.278499362469	53.4662260282574	99.5817	52.1789
100.278499362469	53.4662260282574	98.2152	53.7701
100.210349760105	52.6376384120687	99.5987	51.3246
100.210349760105	52.6376384120687	100.3439	52.2486
100.142526996676	51.9340860866156	98.1036	50.8139
100.142526996676	51.9340860866156	97.7455	51.8526
100.142526996676	51.9340860866156	97.7133	51.9341
100.142532162236	51.8512867204299	98.2004	50.3921
101.057759724077	51.8512799318398	99.0651	51.1078
104.195719150807	51.8512731551849	106.6231	51.946
104.131316482281	50.6185674961483	103.8062	50.1176
104.067027285834	49.4519390915629	106.4442	49.0895
103.736251014869	49.0885371786955	105.6501	47.8555
103.108938523438	48.8148415973041	102.9297	48.0592
102.488116926823	48.5464248458121	101.7941	49.0832
101.893024231766	48.2741011883719	100.8862	48.4618

Solution x	Solution y	Original x	Original y
101.893024231766	48.2741011883719	101.377	48.1816
101.349056430642	48.0008033113334	98.9198	48.0008
101.415172375327	47.2488954948625	100.6036	46.802
101.481561133085	46.5222267434803	99.7789	45.6905
101.481561133085	46.5222267434803	100.0845	45.3198
101.550362741106	45.9716934169561	101.161	45.7653
101.619294823888	45.4267141336158	102.543	45.6081
101.619294823888	45.4267141336158	103.8959	45.4099
101.680952233621	44.8821971051408	104.1102	44.8822
101.432391388828	44.0340466471592	103.0838	43.6629
101.164706217593	43.2309389228528	103.3956	43.6231
100.689727982381	42.1982985432438	102.0152	42.2262
100.175114711079	41.1632971731895	98.3613	42.0392
100.175114711079	41.1632971731895	99.6903	41.4772
99.775249625965	39.7121800343668	98.7317	39.6579
99.3928029063244	38.275078269775	98.4033	39.6451
99.0343284649087	36.0942934570497	96.6051	36.0943
99.7771573595295	35.9905087997408	98.5859	34.5756
100.7027580053	35.88972127442	100.5275	34.9543
101.647721727458	35.7898714112648	101.1976	33.4905
103.774959749921	35.7129217200306	103.4615	37.3033
106.141510838157	35.6344923004268	107.8221	37.3636
106.22676922653	34.8419016984636	108.656	34.8419
105.132049899948	31.4125662232695	102.9211	31.879
105.132049899948	31.4125662232695	104.0844	32.9988
105.132049899948	31.4125662232695	105.5782	30.6326
105.132049899948	31.4125662232695	106.6895	31.0233
105.132049899948	31.4125662232695	105.6149	29.5786
105.132049899948	31.4125662232695	106.8535	30.7643
104.610001058025	27.995703233569	106.1692	29.0085
104.610001058025	27.995703233569	105.0575	26.2706
103.943256393725	25.5149892759441	104.9423	23.521
102.880318555635	24.855388742346	102.9016	24.8202
101.815353026335	24.1969965624689	102.4997	24.4075
100.670629046602	23.5296017734771	100.384	25.6874
99.6771337032752	21.5567712929766	99.0428	19.6959
98.8248312867613	20.5729226936718	97.1071	18.8552
98.9581813751097	22.1634786189603	98.3827	22.3334
99.0924805900719	23.7219549026811	98.3241	22.4412
99.22873033689	25.8893361272741	97.3283	27.0933
99.22873033689	25.8893361272741	97.0499	25.7334
99.4218122759154	26.7599247704023	100.6297	27.3107
99.6097503247431	27.5796608035768	101.5683	27.6266
99.7817665789833	28.3892994156035	101.7295	28.4449
99.7817665789833	28.3892994156035	102.211	28.3893
99.5414999300925	28.867558052585	97.9141	29.0493
99.5414999300925	28.867558052585	97.5011	28.0267
99.3583248627447	29.4593554742899	97.4429	30.1528
99.3583248627447	29.4593554742899	97.1838	29.5842
99.2156906956637	29.9716857597991	99.272	31.5703
99.0728452136053	30.4249862826034	99.0228	31.9463
98.930109909048	30.8361805166256	98.9301	33.2654
98.2557465216532	30.8268646939825	98.5493	33.1624
97.1244266617858	30.8171926842235	96.3928	32.1668
96.1265437123898	30.8075022682759	96.2582	32.5713
95.1046784582719	30.797781771931	95.0864	33.2234
95.1046784582719	30.797781771931	95.8908	32.6754
94.5147604783699	29.3501969313449	96.156	30.1327
94.5147604783699	29.3501969313449	96.0238	29.4057
93.6487001191944	27.5565283111951	93.6487	25.1273
93.1698092284605	27.6767935817011	92.942	26.4511
92.6972794666249	27.7992146026982	92.5592	25.4331
92.2818670307778	28.1100158670819	90.6179	26.4649
92.0588088220082	28.9897571128399	90.6435	28.0536
91.8469928704628	30.0164637988578	90.72	30.049
91.8469928704628	30.0164637988578	93.4265	31.4744
91.8469928704628	30.0164637988578	93.9312	28.9768
91.3267529292929	32.3523246773442	92.7124	33.4453
91.3267529292929	32.3523246773442	92.4351	33.0022
90.6745838362784	33.7589953958943	91.1655	36.0648
89.3709513960611	33.9926062384929	91.0332	34.8187
86.9727674122631	34.2171422464115	85.065	35.2948
86.9727674122631	34.2171422464115	86.5983	36.2039
86.9727674122631	34.2171422464115	88.2545	36.066
86.9727674122631	34.2171422464115	86.512	33.4131
86.9727674122631	34.2171422464115	87.5726	32.8781
85.3024469700421	34.3738686156145	85.1876	33.113
85.3024469700421	34.3738686156145	85.525	32.0217
81.1205261144055	34.7973061078245	79.7169	32.9378
80.5640163520392	38.2754606524993	81.9079	40.1742

Solution x	Solution y	Original x	Original y
77.5683896970035	38.700097492718	75.4748	37.8532
76.9890300141759	39.2545997583974	74.5598	39.2546
77.1869701359676	39.8427745337484	77.5882	39.4219
77.3835121200085	40.4446537454679	75.9022	40.5634
77.5879661789789	41.0406410934043	75.9853	41.4015
77.8033884845309	41.6166619199119	75.73	42.7229
78.4147762043791	41.9059990474004	80.8076	41.6004
78.4579663130691	43.1227003585738	80.8872	43.1227
78.2147015572085	44.754584049779	79.9479	46.2913
77.763850022112	45.191646256575	77.9078	47.2474
77.3026014829855	45.5329697647582	76.4125	46.981
76.8714883176536	45.8479282152845	77.8794	45.0468
76.8714883176536	45.8479282152845	77.9223	44.6051
76.3789997624916	46.1944805925392	76.379	48.6237
75.5245894884595	46.1855551540962	75.5201	48.6107
74.7835087892766	45.959175334203	73.6395	46.5004
74.7835087892766	45.959175334203	73.6428	45.1426
74.1724398062618	45.7345881043911	72.9198	44.5581
73.6337748262259	45.5184928499716	72.7013	43.6681
73.6337748262259	45.5184928499716	72.9378	43.4347
73.2362298430874	45.3550747213192	73.2283	44.0709
72.8388223185723	45.1953203796313	72.4926	42.7909
72.8388205414249	45.64445678705	70.5497	45.0925
72.8388205414249	45.64445678705	72.4429	44.8985
72.8388187935898	46.4113000960887	70.4096	46.4113
72.8399241474811	47.1660215647916	71.8327	48.0379
72.8399241474811	47.1660215647916	73.2561	47.9132
72.8410278551933	47.8295299865256	70.7664	48.6137
72.8410278551933	47.8295299865256	70.6191	48.182
72.8421182204917	48.2980564032434	72.0385	47.603
72.8432079010025	48.7834798536754	72.0723	49.2863
72.8432079010025	48.7834798536754	73.2401	49.0047
72.8442970040726	49.252719197536	73.5268	49.2611
72.8453864714837	49.7217569106611	74.8417	48.5823
72.8464808820974	50.6388026765936	74.4488	50.3129
72.8464808820974	50.6388026765936	75.2757	50.6388
72.5696801139957	50.7407807562493	73.6611	50.4924
72.5696801139957	50.7407807562493	73.911	51.0144
72.2692272060846	50.8425966756139	70.0624	50.1219
72.0903892409382	50.9524725097583	70.6462	49.6735
72.0903892409382	50.9524725097583	71.8965	50.0142
71.9223825521892	51.0672944509405	71.0505	50.768
71.9223825521892	51.0672944509405	70.8564	51.5507
71.760033725922	51.1817806941217	72.1444	51.2772
71.596800987156	51.2961609408001	69.1689	51.2673
71.5945757454705	51.7336755562872	69.4154	51.8752
71.5923588414794	52.1578236586046	70.1179	52.2878
71.5901442660717	52.5788372501267	70.916	53.3608
71.5901442660717	52.5788372501267	71.2619	53.5794
71.58793120785	52.9686795562406	70.694	53.8562
71.5857193875935	53.3430245809538	69.1565	53.343
71.5857193875935	53.3430245809538	70.2011	52.705
71.733447384706	53.4193513566707	72.0304	52.5053
71.733447384706	53.4193513566707	72.0955	52.6394
71.8799317968801	53.4967617209738	73.3859	52.8201
72.0219666953697	53.5748945934945	74.3979	53.0985
72.0363720841667	54.9136006481438	73.8072	55.2741
72.0507094737953	56.1379086831882	73.7963	57.8273
71.6633203691511	56.1379000802274	72.7757	56.7077
71.6633203691511	56.1379000802274	73.2116	57.797
70.8868725556488	56.1378914757388	70.5527	57.3223
70.1344263727802	56.1378828710171	70.1344	58.5671
69.558938965401	56.0611776148705	69.9782	57.1009
68.967526578821	55.9837899827403	69.2681	55.3133
68.3659174137151	55.9067717281218	69.8977	54.8286
68.3659174137151	55.9067717281218	68.5789	56.8701
67.6022716285123	55.8305028746752	67.4683	58.2291
67.0752260737905	55.4157325738798	66.0257	55.1875
67.0752260737905	55.4157325738798	68.2826	55.0673
66.5395748565012	55.0119428618312	68.022	53.7678
65.8770860868642	54.6521049003758	67.8488	53.6384
63.6375193566232	54.351902554729	61.2083	54.3519
65.0202082155723	51.5143059155453	66.2863	51.2705
65.0202082155723	51.5143059155453	66.949	50.6855
65.6698646823837	50.0295048431295	67.5609	49.631
65.6698646823837	50.0295048431295	67.7991	50.1342
66.0232007165095	48.6572905219183	65.7303	47.3671
66.0232007165095	48.6572905219183	67.6648	48.1141
66.3471245633952	47.6397424990772	68.7356	47.889
66.3471245633952	47.6397424990772	67.4955	46.0347

Solution x	Solution y	Original x	Original y
66.4226128003855	44.624348296249	64.4232	44.0581
66.5019282198383	42.6880579499177	65.3289	43.5846
66.5822591298678	40.1446549565896	64.8516	39.5774
66.5822591298678	40.1446549565896	65.211	38.9167
66.6667958257218	38.8228123133681	64.2784	38.8059
66.8514130596373	37.5746955188892	66.7168	38.698
66.8514130596373	37.5746955188892	68.0366	38.8903
67.0294040878488	35.2646242170616	64.9829	35.6055
67.0294040878488	35.2646242170616	66.9624	36.7077
67.0294040878488	35.2646242170616	66.5887	34.1226
67.0294040878488	35.2646242170616	67.4673	33.2544
67.2284431870734	34.1265477324909	67.7055	32.9993
67.425375081776	33.135833103943	65.4552	32.6167
67.6490990614801	32.2795862033209	66.7818	30.0369
70.3744372846552	32.192710330855	68.3701	31.308
70.3744372846552	32.192710330855	69.1853	30.9522
70.3744372846552	32.192710330855	71.5231	31.8286
70.3744372846552	32.192710330855	72.6191	32.6684
71.2196510303354	32.107889270235	72.2401	34.2889
71.3696806778182	28.6287000457142	73.7989	28.6287
70.5382385436881	27.4807683357716	70.5469	25.0661
69.6570288354214	27.429279422232	70.1037	27.3839
68.7432668630403	27.3778066625431	68.2062	28.5319
68.7432668630403	27.3778066625431	69.5886	28.6002
67.7847281936134	27.3254868702714	67.6588	29.7348
67.7847281936134	27.3254868702714	67.8857	28.9512
67.2704635791317	26.8991683261449	68.3676	27.331
66.7212329364222	26.4637132818374	67.242	26.9141
66.1568166285624	26.0199837913879	66.7482	27.6121
66.1568166285624	26.0199837913879	67.5765	27.7962
64.6413358013446	24.6083689595526	63.8119	26.0212
63.3795000046125	22.5417193167388	63.3795	20.1125
62.3638111591354	24.090708804119	61.643	23.6955
62.3638111591354	24.090708804119	62.5649	23.4331
62.3638111591354	24.090708804119	63.3607	23.5913
61.2892984744469	26.1660066886725	58.9981	26.6128
61.0223192094564	27.1316000602386	58.5931	27.1316
61.2659325253532	27.7711962044662	59.5552	26.5288
61.2659325253532	27.7711962044662	62.9268	27.0211
61.5261524002438	28.8116412291395	63.132	27.7543
61.7662183542406	30.2184168412388	60.1802	30.671
61.7662183542406	30.2184168412388	60.463	30.4795
61.7662183542406	30.2184168412388	64.1748	30.2745
61.8045042344148	31.0027593465699	63.2951	31.2899
61.8424807349762	31.7626973535965	64.2717	31.7627
61.7783477319742	32.6200152278557	63.5739	32.9982
61.7127037860324	33.4245699050266	63.453	34.6286
61.7127037860324	33.4245699050266	63.8645	34.3723
61.6248595550705	33.7421503516287	62.464	33.4003
61.5363686694257	34.0632029765928	60.8351	33.4935
61.5363686694257	34.0632029765928	61.5106	34.0654
61.44843161601	34.3901576219394	61.1452	36.2851
61.44843161601	34.3901576219394	61.1622	34.1592
61.3612075984303	34.6771232181092	60.137	35.2014
61.2751014159636	34.9588396378669	62.0243	36.102
61.1882793187069	35.2294001964506	62.6603	37.129
60.9493048825997	35.3050808254294	60.9493	37.7343
59.2435789917642	35.1580244351068	58.8785	37.4935
58.4497415103903	34.7688775000342	58.126	35.24
57.6741601008853	34.3730952284286	56.2795	36.0371
57.1496404199719	33.8120371066112	55.9275	34.3566
56.6638433222895	33.2282427186845	54.3132	33.4794
56.4973900139538	32.4517945313831	58.4334	33.3219
56.3087135684281	31.4145611827545	58.6228	31.6703
55.9495440457181	29.9604084563082	57.9508	29.6187
55.4960895797678	28.6855529975448	56.8778	27.618
54.9851278299597	27.6615613211205	53.915	28.4629
54.9851278299597	27.6615613211205	54.5895	27.7676
54.9851278299597	27.6615613211205	55.1607	27.7715
54.9851278299597	27.6615613211205	55.089	27.0379
54.9851278299597	27.6615613211205	55.4854	26.8201
54.4973269364102	26.6663309528331	54.6523	25.2022
54.4973269364102	26.6663309528331	54.2786	24.4277
54.0367992028154	26.2878192402872	54.0368	23.8586
53.706801858442	28.4882490960104	54.7376	29.7596
53.706801858442	28.4882490960104	54.8257	29.6059
53.3362810650037	29.7054102158902	53.8796	31.7093
53.3362810650037	29.7054102158902	52.7074	28.2489
52.95421608642	30.5044018061452	52.5136	31.162
52.5782530129816	31.2647941567113	50.8592	31.2824

Solution x	Solution y	Original x	Original y
52.5782530129816	31.2647941567113	50.5738	30.8854
52.2965726450732	32.0935503373055	51.0819	30.8837
52.0305232155985	33.0952615186395	50.3723	32.2399
51.7870948097194	34.3185050035287	50.1654	34.298
51.7870948097194	34.3185050035287	51.473	33.7115
51.5592440730047	35.6388670112822	51.7623	34.8081
51.3303544194756	37.118328865315	53.589	37.6567
50.8425706038756	37.9291280331272	51.6292	37.4529
50.3352013429093	38.7721808759246	50.3352	41.2014
45.6790379273511	38.3665020442614	44.3651	39.5082
45.6790379273511	38.3665020442614	45.4903	38.3462
45.6790379273511	38.3665020442614	46.003	37.4534
43.4251191098711	37.9409018133819	40.9959	37.9409
44.856927365764	35.620609321382	45.9581	33.5048
44.856927365764	35.620609321382	42.8212	36.4305
45.2409994447488	35.4390845835714	45.6407	35.658
45.2409994447488	35.4390845835714	44.7872	36.1398
45.2409994447488	35.4390845835714	43.7884	36.8808
45.7051025857733	35.2389300254369	45.4526	36.121
46.174700013097	35.0351527463187	48.325	36.101
46.2703059276783	33.7222437742226	47.4903	33.2139
46.3645642043126	32.5095125403886	48.6326	32.1618
46.4449643350293	31.6088011996399	47.3356	31.1656
46.4449643350293	31.6088011996399	46.9054	30.8841
46.4449643350293	31.6088011996399	46.4115	30.3033
46.5245198993793	30.8880861104035	47.9812	30.2306
46.5245198993793	30.8880861104035	44.1303	30.8739
46.7164210773576	30.2356609158558	47.9603	31.0225
46.9023122135667	29.5341685820529	46.684	28.1154
46.9023122135667	29.5341685820529	44.6028	29.9319
47.2737013993948	28.6662045829333	46.7677	27.4481
47.2737013993948	28.6662045829333	45.985	27.4123
47.6934506553597	28.0179154226404	47.4152	28.2569
47.6934506553597	28.0179154226404	47.5893	27.8934
48.119156593566	27.365203535161	49.5432	29.0024
48.4561476034986	26.151248126345	50.1386	26.6573
48.7616285207568	24.7852223425175	47.7428	26.438
48.7616285207568	24.7852223425175	48.493	25.186
48.7616285207568	24.7852223425175	50.8742	24.2729
49.0150656840534	22.8983513622605	46.7163	23.0055
49.0150656840534	22.8983513622605	49.1449	22.3659
49.5169373850933	20.841476828648	49.1677	19.2175
49.5169373850933	20.841476828648	49.9475	19.2284
50.0156544462222	19.8580192149714	49.3862	17.5735
51.2026223049013	19.6654491296385	49.9971	19.9155
52.6261940045944	19.4718245038089	53.2794	21.4994
53.6776995644426	19.2448854704182	55.9782	19.9329
53.7771359187979	18.6437806087448	51.539	18.7116
53.8911775120466	18.028256611571	52.1655	19.1446
53.8911775120466	18.028256611571	52.4859	17.4578
54.0153603515916	17.2946555165816	51.6732	17.1776
54.2143836548403	16.636343014176	53.7123	16.59
54.415201510531	15.9798822891723	52.0827	15.9727
54.8420980051797	15.3278073368701	55.8132	15.4408
55.2516246032415	14.6708208940512	53.9046	16.3668
55.2516246032415	14.6708208940512	53.4554	15.0784
55.9188767513317	13.2725335242439	53.965	12.2967
57.5772245449098	12.4126839808564	57.2331	12.7874
59.3249814060147	11.5270009096089	61.7542	11.527
59.3249835760286	9.18720643761912	58.6318	9.4344
59.3249835760286	9.18720643761912	59.4358	8.0877
59.324985748116	7.28273810092511	58.0725	5.2013
59.8762715746982	7.28273691855314	58.8992	5.3006
60.6487817602476	7.2827357415334	60.2628	6.0605
61.450020114473	7.28273456666085	60.5785	6.8128
62.313370660279	7.28273339418306	64.6914	7.7788
62.1766614344318	5.64489595502269	61.565	4.5717
62.0412549066989	4.28653543965082	63.4243	4.3429
61.902501741128	2.91356430873593	62.5325	1.766
61.902501741128	2.91356430873593	63.0749	1.8033
61.7585336708127	1.95719932490985	62.7821	-0.0838
61.5959741244759	1.57415977658252	62.4332	-0.684
60.9414425387807	1.50686750630779	61.9524	-0.333
60.0850298659375	1.4423074995731	60.4167	1.4088
60.0850298659375	1.4423074995731	60.4719	1.0667
59.1783148831453	1.37789911553738	57.7618	2.6586
59.1783148831453	1.37789911553738	58.2987	1.8222
58.5207192758316	1.31207268465109	58.5415	3.6684
57.8514580656918	1.22661539013604	56.6229	3.2945
57.8514580656918	1.22661539013604	58.0726	3.0503

Solution x	Solution y	Original x	Original y
57.7140813972401	0.594550487169835	57.3839	0.9502
57.7140813972401	0.594550487169835	58.6741	1.1796
57.5752798338582	-0.0787347905034288	58.2741	0.1622
57.4351919198433	-0.762668611463967	58.2864	0.0731
57.2931750628097	-1.49446985259301	59.6709	-1.5476
56.7809737156158	-2.16816015765217	58.3955	-2.2935
56.1925694177815	-2.83334773754839	56.047	-0.6998
55.6227749836859	-4.31857196611404	57.7878	-4.3732
54.4142789076564	-5.7531753816034	53.8048	-5.0553
54.4142789076564	-5.7531753816034	54.4331	-6.2551
53.2889975875402	-7.23528093894267	53.289	-9.6645
53.013395766752	-5.43206405289458	53.412	-4.2453
52.7342045697694	-3.99019623707683	53.5826	-3.7128
52.4483190558072	-2.60329962311909	50.0191	-2.6033
52.6374446478982	-0.71448640461257	52.8937	1.339
52.6374446478982	-0.71448640461257	51.545	-0.7619
52.8281365670569	0.135163495425525	51.7765	0.7553
53.0233383994183	0.93545725762759	50.9668	1.717
53.2671446377246	1.54602764564871	52.2056	3.4977
53.2671446377246	1.54602764564871	51.8363	2.0767
53.5652464335915	1.9091094752147	54.5841	1.3
53.5652464335915	1.9091094752147	54.6465	1.327
53.8441058054713	2.29092872336143	55.5686	2.3786
54.1016980913234	2.67048666175847	56.514	2.6652
54.147343807307	3.05091521081679	54.7597	1.1902
54.147343807307	3.05091521081679	55.7669	1.6852
54.1915230029984	3.6506308257349	52.0607	4.6851
54.1915230029984	3.6506308257349	52.3291	3.6705
54.2459808932297	3.92839746394599	56.6752	3.9284
53.9687996002746	5.48675916024596	55.5508	6.709
53.6541305166324	6.50943643661679	53.4617	5.8056
53.6541305166324	6.50943643661679	54.3108	6.5803
53.3351509597021	7.59967980627286	51.2901	7.6487
53.0686508603123	8.67360825527331	55.3647	9.0137
52.3573602885063	9.45492527217258	52.3173	10.0275
52.3573602885063	9.45492527217258	53.1154	7.9184
51.575160060024	10.3935451265636	52.0306	12.0787
50.7393499335065	11.1244915417084	51.9742	12.9315
49.1335993447521	11.5781985640726	47.1015	12.1757
49.1335993447521	11.5781985640726	47.4524	12.1509
49.1335993447521	11.5781985640726	48.9393	11.7496
49.1335993447521	11.5781985640726	48.2378	10.888
49.1335993447521	11.5781985640726	50.5069	12.3029
49.1335993447521	11.5781985640726	49.0558	10.279
49.1335993447521	11.5781985640726	51.32	11.9016

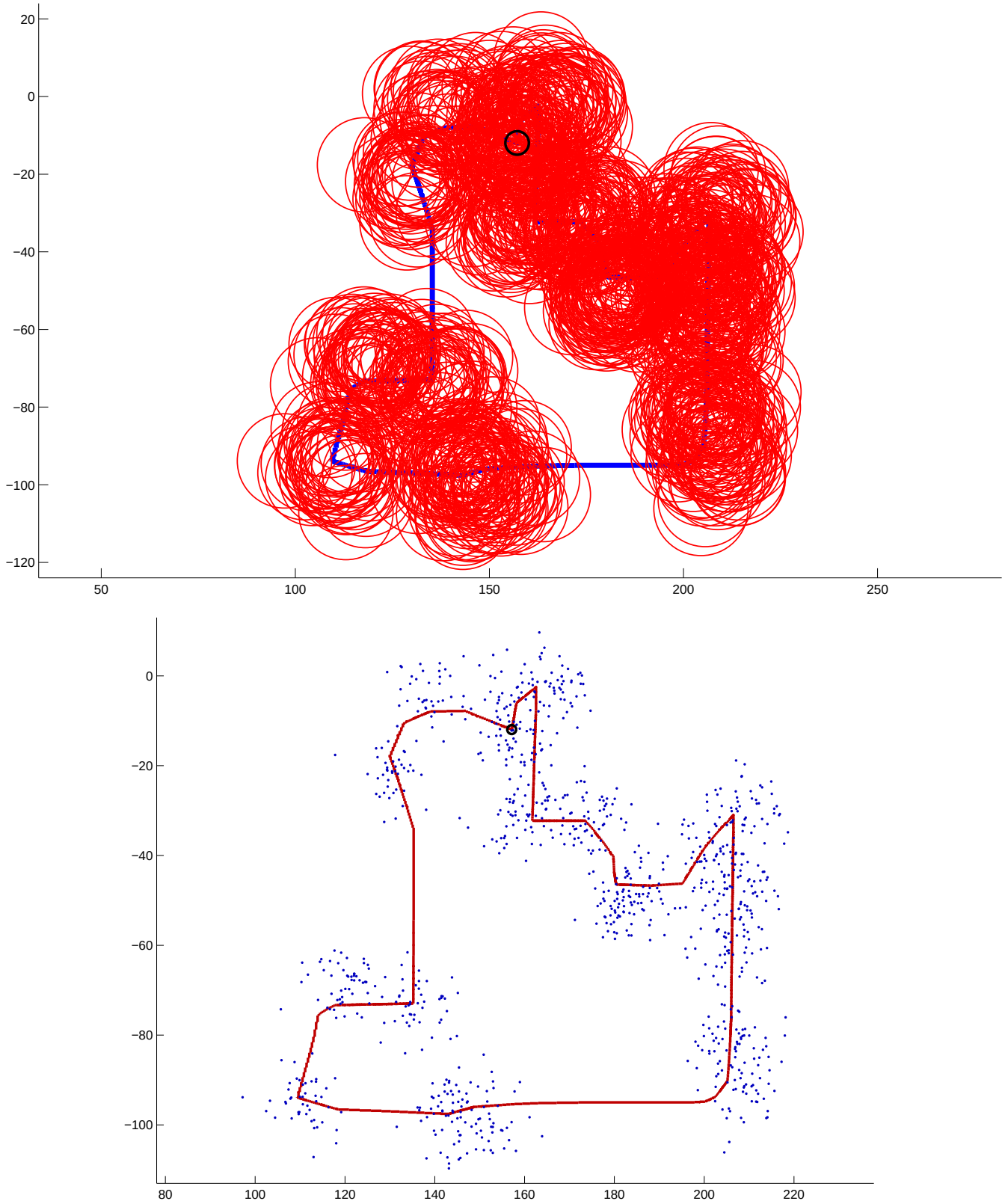


Figure N.131: $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Manhattan, Length = 436.5940805

Table N-134: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Manhattan

Total distance: 436.594080531301			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
47.2414991182516	11.3085252701787	47.4524	12.1509
47.2414991182516	11.3085252701787	48.9393	11.7496
47.3538828161661	10.6520374657863	47.1015	12.1757
47.3538828161661	10.6520374657863	47.6091	10.2274
47.4664990092165	9.99652331488619	48.2378	10.888
47.4664990092165	9.99652331488619	49.0558	10.279
47.5791582881887	9.34116769042518	46.5714	10.174
47.5791582881887	9.34116769042518	46.3909	8.819
47.692036920125	8.68702672696524	44.5689	9.75
47.692036920125	8.68702672696524	43.984	9.2005
47.8053750013757	8.03146251783201	45.5397	7.2979
47.8053750013757	8.03146251783201	43.7681	7.8375
47.9191361946268	7.37862090696022	46.8369	6.4403
47.9191361946268	7.37862090696022	46.0043	6.8606
48.0331088288866	6.72885625440669	44.0031	6.0986
48.0331088288866	6.72885625440669	44.3097	5.4051
48.147606031922	6.08276078524385	46.0937	-5.8176
48.2773429576738	5.95512265171763	43.0131	-4.6452
48.4149341427625	5.84030642844138	44.2937	4.7268
48.4149341427625	5.84030642844138	45.0418	3.8658
48.5533089633815	5.72563924560852	47.0712	4.3382
48.6918827808474	5.61104236224541	47.7278	5.7114
48.6918827808474	5.61104236224541	48.7027	4.8736
48.8307336410346	5.49647183396127	51.2901	7.6487
48.8307336410346	5.49647183396127	53.4617	5.8056
48.9691057127923	5.38171508232353	49.309	3.6922
49.1075632771721	5.26704780433761	48.302	2.6164
49.1075632771721	5.26704780433761	48.4975	2.4432
49.2463848898498	5.15266628933606	49.5265	1.5006
49.2463848898498	5.15266628933606	50.9668	1.717
49.3852431337982	5.03864408724938	49.2438	-0.5725
49.3852431337982	5.03864408724938	51.545	-0.7619
49.5241174999869	4.92531483556479	44.8479	-0.9391
49.5241174999869	4.92531483556479	50.0191	-2.6033
49.6638160024222	4.8129522635822	53.5826	-3.7128
49.6638160024222	4.8129522635822	53.412	-4.2453
49.8023360918291	4.70259293139453	53.8048	-5.0553
49.9399079651294	4.59387584915219	54.4331	-6.2551
50.0723063983583	4.49267958331813	56.047	-0.6998
50.2042037753611	4.39178324370983	58.2741	0.1622
50.2042037753611	4.39178324370983	58.2864	0.0731
50.3341476398302	4.29152696759862	58.3955	-2.2935
50.3341476398302	4.29152696759862	59.6709	-1.5476
50.4596659995697	4.19324513230758	60.4167	1.4088
50.4596659995697	4.19324513230758	60.4719	1.0667
50.5814662890104	4.09567266159074	58.5415	3.6684
50.7026722648947	3.99809825391884	58.0726	3.0503
50.7026722648947	3.99809825391884	58.2987	1.8222
50.8228587951718	3.90069795578633	57.3839	0.9502
50.8228587951718	3.90069795578633	58.6741	1.1796
50.9420406338833	3.80366440186028	56.514	2.6652
50.9420406338833	3.80366440186028	57.7618	2.6586
51.0605830321831	3.70674990957106	56.6752	3.9284
51.0605830321831	3.70674990957106	56.6229	3.2945
51.1786147770454	3.60983495234063	52.2056	3.4977
51.2967548800857	3.51292354840671	55.5686	2.3786
51.2967548800857	3.51292354840671	55.7669	1.6852
51.4145672059823	3.41615641365033	54.6465	1.327
51.4145672059823	3.41615641365033	54.7597	1.1902
51.5322183625588	3.31959605048417	54.5841	1.3
51.6498058615818	3.22312950432116	52.8937	1.339
51.7674705017146	3.12674925650162	51.8363	2.0767
51.7674705017146	3.12674925650162	51.7765	0.7553
51.8855032756292	3.03053143561817	62.5325	1.766
52.0013202854633	2.93450139162666	62.4332	-0.684
52.1144185434564	2.83921144960575	62.7821	-0.0838
52.2248179169603	2.7445346606067	63.4243	4.3429
52.3316570369979	2.64944528240792	52.0607	4.6851
52.3316570369979	2.64944528240792	52.3291	3.6705
52.4389089202434	2.55422825718358	61.565	4.5717
52.5453091659852	2.45880115872668	53.289	-9.6645
52.5453093222039	3.56848919202538	61.9524	-0.333
52.5453094787698	4.74863191290181	57.7878	-4.3732
52.5453096346794	6.13917235562341	63.0749	1.8033
52.5453097909934	7.77880000249602	64.6914	7.7788
52.5267836762887	8.28520978381168	61.7542	11.527
52.5082096190809	8.78555307023532	58.0725	5.2013
52.5082096190809	8.78555307023532	58.8992	5.3006
52.4896243199243	9.29706660024208	60.2628	6.0605
52.4710142381086	9.81534228724133	59.4358	8.0877
52.4710142381086	9.81534228724133	60.5785	6.8128
52.4523526640882	10.3439839282838	58.6318	9.4344
52.4336734608561	10.8747490763747	55.8132	15.4408
52.4336734608561	10.8747490763747	57.2331	12.7874
52.4149749530044	11.3990351080549	55.3647	9.0137
52.4149749530044	11.3990351080549	55.5508	6.709
52.3962690058844	11.9335376524615	53.1154	7.9184
52.3962690058844	11.9335376524615	54.3108	6.5803
52.3775678824732	12.4815514868412	51.32	11.9016
52.3775678824732	12.4815514868412	50.2911	5.2466
52.3589017496611	13.0447672093665	50.5069	12.3029
52.3402526589917	13.609622965707	53.4554	15.0784
52.3402526589917	13.609622965707	51.9742	12.9315
52.3216066803292	14.1750972786877	52.3173	10.0275
52.3029664363755	14.7471649929422	53.7123	16.59
52.3029664363755	14.7471649929422	53.9046	16.3668
52.2843134164784	15.31669362001	51.6732	17.1776
52.2843134164784	15.31669362001	52.4859	17.4578
52.265667616594	15.8830327459593	52.0306	12.0787
52.265667616594	15.8830327459593	53.965	12.2967
52.2470139649766	16.4613328676525	52.0827	15.9727
52.2283571931438	17.0411430252013	47.2642	16.1804
52.2283571931438	17.0411430252013	48.0446	14.6778
52.2097439706394	17.6279753294879	46.7163	23.0055
52.2097439706394	17.6279753294879	49.1449	22.3659
52.191161107779	18.1982765594159	46.503	16.5426
52.191161107779	18.1982765594159	46.6598	16.011
52.1726223755735	18.7769516323578	45.9074	18.6439
52.1541095211689	19.3568912801736	45.9242	19.9
52.1356234506066	19.9369183054565	49.1677	19.2175
52.1356234506066	19.9369183054565	49.9475	19.2284
52.1171500959559	20.5208169433281	49.9971	19.9155
52.1171500959559	20.5208169433281	51.539	18.7116
52.0986838240725	21.1099943356528	53.2794	21.4994
52.0986838240725	21.1099943356528	52.1655	19.1446
52.0802085158749	21.7034773140299	55.9782	19.9329
52.0617084169273	22.3008597033757	54.6523	25.2022
52.0617084169273	22.3008597033757	54.0368	23.8586
52.0431777990342	22.8941867713991	50.8742	24.2729
52.0431777990342	22.8941867713991	54.2786	24.4277
52.02463498507	23.4861848025707	48.493	25.186
52.0061093268727	24.0771630692655	49.5432	29.0024
52.0061093268727	24.0771630692655	50.1386	26.6573
51.987589771978	24.6593377549325	47.5893	27.8934
51.9690853774009	25.2378188172182	47.4152	28.2569
51.950594139152	25.8129626167074	45.985	27.4123
51.950594139152	25.8129626167074	47.7428	26.438
51.9321322256645	26.387439119969	46.684	28.1154
51.9321322256645	26.387439119969	46.7677	27.4481
51.9136965674216	26.9604979229496	44.1303	30.8739
51.9136965674216	26.9604979229496	44.6028	29.9319
51.8953228178334	27.5206862131543	46.4115	30.3033
51.8769636499195	28.0779282199988	47.3356	31.1656
51.8769636499195	28.0779282199988	46.9054	30.8841
51.8586268409507	28.6293867374853	47.9603	31.0225
51.8586268409507	28.6293867374853	47.9812	30.2306
51.8403044490058	29.1785287598058	48.6326	32.1618
51.8219849050073	29.7252695325549	47.4903	33.2139
51.8219849050073	29.7252695325549	45.9581	33.5048
51.8036939440106	30.264054718742	48.325	36.101
51.8036939440106	30.264054718742	45.4526	36.121
51.7854269709126	30.784433150747	45.6407	35.658
51.7854269709126	30.784433150747	44.7872	36.1398
51.76719994922	31.2884869862124	43.7884	36.8808
51.7490017291345	31.7793865254772	42.8212	36.4305
51.7308366261325	32.2585903471536	40.9959	37.9409
51.9939767067028	32.2585903443172	46.003	37.4534
52.2599141277008	32.2585903413859	44.3651	39.5082
52.2599141277008	32.2585903413859	45.4903	38.3462
52.540373299381	32.2585903382936	50.3352	41.2014
52.540373299381	32.2585903382936	51.6292	37.4529
52.8230908417015	32.2585903350586	53.589	37.6567
52.8230908417015	32.2585903350586	56.2795	36.0371
53.1046997778584	32.2585903317717	54.3132	33.4794

Solution x	Solution y	Original x	Original y
53.1046997778584	32.2585903317717	55.9275	34.3566
53.3855319324332	32.2585903284588	51.7623	34.8081
53.3855319324332	32.2585903284588	51.473	33.7115
53.6681355554795	32.2585903251235	50.1654	34.298
53.9522557449828	32.2585903217795	50.3723	32.2399
53.9522557449828	32.2585903217795	50.8592	31.2824
54.2392121578723	32.2585903184344	50.5738	30.8854
54.2392121578723	32.2585903184344	51.0819	30.8837
54.5291652697736	32.258590315095	52.5136	31.162
54.820094493854	32.2585903117602	53.8796	31.7093
54.820094493854	32.2585903117602	54.7376	29.7596
55.1119517739019	32.2585903084406	54.8257	29.6059
55.4042158107372	32.2585903051327	52.7074	28.2489
55.4042158107372	32.2585903051327	53.915	28.4629
55.6988363576444	32.2585903018531	54.5895	27.7676
55.6988363576444	32.2585903018531	55.1607	27.7715
55.9948233310296	32.2585902986114	55.089	27.0379
56.2915905602322	32.2585902953905	55.4854	26.8201
56.5891462011195	32.258590292191	57.9508	29.6187
56.5891462011195	32.258590292191	56.8778	27.618
56.886961257562	32.2585902890304	58.5931	27.1316
57.1845293426216	32.2585902858914	58.9981	26.6128
57.1845293426216	32.2585902858914	59.5552	26.5288
57.4812358002237	32.2585902827974	60.463	30.4795
57.7772991167945	32.2585902797129	60.1802	30.671
58.0729735413514	32.2585902766339	58.6228	31.6703
58.3689683290161	32.2585902735535	58.4334	33.3219
58.6654458542803	32.2585902704626	58.126	35.24
58.9626325985123	32.2585902673508	58.8785	37.4935
59.2603615690805	32.2585902642066	60.9493	37.7343
59.2603615690805	32.2585902642066	61.1452	36.2851
59.5576348469064	32.258590262975	62.6603	37.129
59.5576348469064	32.258590262975	62.0243	36.102
59.8536088539289	32.2585902597169	60.137	35.2014
59.8536088539289	32.2585902597169	61.1622	34.1592
60.1501496888836	32.2585902564177	60.8351	33.4935
60.1501496888836	32.2585902564177	61.5106	34.0654
60.4471465572423	32.2585902530864	64.9829	35.6055
60.4471465572423	32.2585902530864	63.8645	34.3723
60.7420005582961	32.2585902497215	63.453	34.6286
61.0364284182692	32.2585902463412	62.464	33.4003
61.0364284182692	32.2585902463412	63.5739	32.9982
61.3306630932451	32.258590242937	63.2951	31.2899
61.3306630932451	32.258590242937	64.2717	31.7627
61.624376569616	32.2585902395193	65.4552	32.6167
61.9172296710228	32.2585902360981	64.1748	30.2745
61.9172296710228	32.2585902360981	66.7818	30.0369
62.2084368401877	32.2585902326864	63.132	27.7543
62.4998655604921	32.2585902292878	62.9268	27.0211
62.4998655604921	32.2585902292878	63.8119	26.0212
62.7915856222101	32.2585902259363	61.643	23.6955
62.7915856222101	32.2585902259363	62.5649	23.4331
63.0853419096102	32.2585902226269	63.3607	23.5913
63.3794985946229	32.2585902192974	63.3795	20.1125
63.6505254480457	32.5437759835036	70.5469	25.0661
63.9157417178282	32.8368016352498	67.5765	27.7962
64.1801470064649	33.1320015794786	66.7482	27.6121
64.4441946247886	33.4296365092216	70.1037	27.3839
64.7060296559961	33.7310268755456	67.242	26.9141
64.9674114466359	34.0361268745008	67.8857	28.9512
65.2283524843812	34.3436362456488	67.6588	29.7348
65.4890708349478	34.6532818275517	73.7989	28.6287
65.7430372236698	34.970921678622	67.7055	32.9993
65.7430372236698	34.970921678622	68.3701	31.308
65.996703257021	35.2914135287998	66.5887	34.1226
65.996703257021	35.2914135287998	67.4673	33.2544
66.2507693272193	35.613761786773	66.7168	38.698
66.2507693272193	35.613761786773	68.0366	38.8903
66.5049888465392	35.9338091145958	64.2784	38.8059
66.5049888465392	35.9338091145958	65.211	38.9167
66.7610137821712	36.2517546245531	68.2062	28.5319
67.0168902705766	36.5750657543628	68.3676	27.331
67.2724542010397	36.9077425397774	69.5886	28.6002
67.5273673460877	37.2476677600687	69.1853	30.9522
67.7822130670328	37.591626096431	71.5231	31.8286
68.0362222419795	37.9395742226377	72.6191	32.6684
68.2891100426509	38.2914105746901	72.2401	34.2889
68.5413540675218	38.6460438707386	75.4748	37.8532
68.7916724673843	39.0016949661687	72.4429	44.8985
69.0412657940862	39.3537754988269	73.6395	46.5004

Solution x	Solution y	Original x	Original y
69.0412657940862	39.3537754988269	73.6428	45.1426
69.2882135785704	39.696639508707	72.9198	44.5581
69.2882135785704	39.696639508707	73.2283	44.0709
69.5340393914511	40.0354340535919	75.73	42.7229
69.7784162700844	40.3731544971154	81.9079	40.1742
69.8011536447174	40.8407625226457	75.9853	41.4015
69.8011536447174	40.8407625226457	75.9022	40.5634
69.8238568857975	41.3101106433215	72.9378	43.4347
69.8238568857975	41.3101106433215	72.4926	42.7909
69.8465535163998	41.7781345049182	72.7013	43.6681
69.8692457834669	42.2453962686751	64.8516	39.5774
69.8919650883622	42.7168622624166	64.4232	44.0581
69.9147158459737	43.1883010878205	79.533	47.2684
69.9373912980491	43.6479118049194	80.3964	49.7264
69.9563782502851	43.7688487714937	78.2967	50.1808
69.9563782502851	43.7688487714937	77.6289	48.4559
69.9752974178346	43.888113270447	77.4079	49.147
69.994192994712	44.0068563047759	75.5587	49.1352
69.994192994712	44.0068563047759	76.379	48.6237
70.0130635465823	44.1249413101516	74.8417	48.5823
70.0130635465823	44.1249413101516	75.5201	48.6107
70.0319165749057	44.2425315342811	73.5268	49.2611
70.0507656783176	44.359858099171	72.0723	49.2863
70.0507656783176	44.359858099171	73.2401	49.0047
70.069609825905	44.4767132936501	72.0385	47.603
70.069609825905	44.4767132936501	73.2561	47.9132
70.0884467302314	44.5933065983853	65.3289	43.5846
70.0884467302314	44.5933065983853	66.9624	36.7077
70.107319322022	44.7109565350681	71.8327	48.0379
70.1261883618355	44.8284632628148	70.7664	48.6137
70.1450577210746	44.945811257294	68.7356	47.889
70.1450577210746	44.945811257294	70.6191	48.182
70.1639353780377	45.0629643156851	70.5497	45.0925
70.1828145751391	45.1802140776164	65.7303	47.3671
70.1828145751391	45.1802140776164	67.4955	46.0347
70.2017197567598	45.2974847093268	67.7991	50.1342
70.2017197567598	45.2974847093268	67.6648	48.1141
70.2206424465097	45.4144625467368	67.5609	49.631
70.2395751520129	45.5312805491876	66.2863	51.2705
70.2395751520129	45.5312805491876	66.949	50.6855
70.2585374465004	45.6475416604494	69.1689	51.2673
70.2585374465004	45.6475416604494	69.4154	51.8752
70.2775115912603	45.763235627382	70.1179	52.2878
70.2775115912603	45.763235627382	70.2011	52.705
70.29649336433	45.8782042242451	70.916	53.3608
70.29649336433	45.8782042242451	71.2619	53.5794
70.3154753712115	45.9922046253388	70.694	53.8562
70.3154753712115	45.9922046253388	69.8977	54.8286
70.3344630871076	46.1049416895188	69.1565	53.343
70.3534581656162	46.2172699535348	67.8488	53.6384
70.3534581656162	46.2172699535348	68.022	53.7678
70.3724760503124	46.3286567126817	70.4096	46.4113
70.3914970151902	46.4402008489519	61.2083	54.3519
70.445108865758	46.4657684574262	67.4683	58.2291
70.6919164990462	46.4767911013796	70.1344	58.5671
70.986853117278	46.4867622107932	66.0257	55.1875
71.2873124252393	46.4967249683237	68.2826	55.0673
71.2873124252393	46.4967249683237	69.2681	55.3133
71.5924821379553	46.506671985276	68.5789	56.8701
71.5924821379553	46.506671985276	69.9782	57.1009
71.9067054365479	46.5165868132314	70.5527	57.3223
71.9067054365479	46.5165868132314	72.7757	56.7077
72.2235864990286	46.5264696007216	73.2116	57.797
72.2235864990286	46.5264696007216	73.7963	57.8273
72.5328425844992	46.5362966018009	74.3979	53.0985
72.5328425844992	46.5362966018009	73.8072	55.2741
72.8412271385181	46.5461130012161	72.0955	52.6394
72.8412271385181	46.5461130012161	73.3859	52.8201
73.1508219171476	46.5559257731566	73.6611	50.4924
73.4607395266166	46.5657408215865	73.911	51.0144
73.7709417336335	46.5755555450562	72.0304	52.5053
74.0824574203748	46.5853657559249	70.8564	51.5507
74.0824574203748	46.5853657559249	72.1444	51.2772
74.3973063455153	46.5951715848095	70.6462	49.6735
74.3973063455153	46.5951715848095	71.0505	50.768
74.7163547296278	46.6049778922875	70.0624	50.1219
75.0382552773647	46.6147845972132	71.8965	50.0142
75.3621178816971	46.6245912849537	74.4488	50.3129
75.6868848138155	46.6343963816252	76.4125	46.981
76.0119128772169	46.6442082123108	75.2757	50.6388

Solution x	Solution y	Original x	Original y
76.3378846647625	46.6540190537767	76.0043	50.5809
76.6646562149847	46.6638298467759	78.0993	54.3894
76.6646562149847	46.6638298467759	77.8264	55.5164
76.9905231913978	46.6736109069973	77.9078	47.2474
77.3166860360091	46.6833985568591	77.8794	45.0468
77.6433119408431	46.6931977140959	77.9223	44.6051
77.9705007815109	46.7030097319279	77.9705	58.8491
78.616705557516	46.6566261855889	76.2244	51.9684
78.616705557516	46.6566261855889	76.5498	52.218
79.278187873186	46.610122835995	74.5598	39.2546
79.9602899829987	46.5638005585696	79.9479	46.2913
80.6450881794272	46.5174916780747	80.8872	43.1227
81.3322222688328	46.4712368204078	77.5882	39.4219
82.035343020436	46.4251258034468	80.8076	41.6004
82.7449083644692	46.3791001485728	81.1686	57.7423
83.5045818871533	46.3322586218302	80.0004	48.0282
84.2784343593669	46.2854295670908	80.7698	50.729
85.0688946425755	46.2385734085773	87.1149	58.1702
85.2717011626254	45.9254384181758	85.9154	51.5363
85.4746420817744	45.6103772166254	89.6611	52.1615
85.676692083797	45.2918059910865	82.0477	53.0979
85.880189122771	44.9678854781122	83.5076	51.7826
85.880189122771	44.9678854781122	84.6532	51.7406
86.0851906298608	44.6371554741488	91.1842	48.1207
86.0851906298608	44.6371554741488	91.9756	47.4725
86.2882965825015	44.3041217289237	87.8413	47.1867
86.2882965825015	44.3041217289237	89.352	47.1855
86.4912332826392	43.9697318412545	87.5129	47.9594
86.6943265378247	43.634048648755	89.3464	46.1786
86.8972816222851	43.2977563256561	89.5287	45.4109
86.8972816222851	43.2977563256561	90.4865	46.0315
87.0997583092131	42.9601763545478	91.9732	45.8332
87.0997583092131	42.9601763545478	90.0385	42.8005
87.3013252117142	42.6219729132521	85.9182	41.843
87.3013252117142	42.6219729132521	87.2346	40.5435
87.5037678802674	42.2859593206083	86.512	33.4131
87.7068927992879	41.9584309677236	88.4465	41.4478
87.9101689125071	41.6313961587805	87.5583	39.2312
87.9101689125071	41.6313961587805	89.1249	38.0318
88.1139256049507	41.3077284312391	90.4784	41.2284
88.3175979306852	40.9844019026628	92.1801	41.0349
88.5209091455882	40.6613829859888	93.2846	41.9379
88.5209091455882	40.6613829859888	92.8093	39.7693
88.723214440225	40.3388644838567	92.2396	41.0703
88.723214440225	40.3388644838567	92.634	40.1716
88.9248952124761	40.0168170746798	89.0134	41.3658
89.1269086486318	39.6945942584179	90.1236	40.724
89.1269086486318	39.6945942584179	90.014	39.915
89.3292504425395	39.3725346864664	89.3668	41.343
89.5318845076255	39.0499120191108	91.8795	37.1845
89.5318845076255	39.0499120191108	91.9372	36.8319
89.7342588597762	38.7294999072991	91.1655	36.0648
89.9366498625316	38.4103853432818	79.7169	32.9378
90.1603273574043	38.1151613171227	91.0332	34.8187
90.3840841361978	37.8211968842857	87.5726	32.8781
90.3840841361978	37.8211968842857	92.4351	33.0022
90.6086599637043	37.5313889304013	85.525	32.0217
90.8352126720242	37.2445445749058	92.7124	33.4453
90.8352126720242	37.2445445749058	90.72	30.049
91.0619468086862	36.9625957906939	86.5983	36.2039
91.2900261722614	36.6809693136116	85.065	35.2948
91.5201602865299	36.400010537314	85.1876	33.113
91.7526213285046	36.1206677072849	88.2545	36.066
91.9862070829908	35.8413457680561	90.6435	28.0536
92.220675097493	35.5660498355269	95.0864	33.2234
92.4547514933911	35.2914086831748	92.942	26.4511
92.6890371558729	35.0220491280678	90.6179	26.4649
92.9247175787222	34.7575511788646	92.5592	25.4331
93.1610801345853	34.4989525678927	93.6487	25.1273
93.397716925243	34.2461573464237	95.8908	32.6754
93.397716925243	34.2461573464237	96.2582	32.5713
93.6339638910977	33.9940984267402	96.3928	32.1668
93.870006659386	33.7424784577489	97.3283	27.0933
93.870006659386	33.7424784577489	97.0499	25.7334
94.1045218790542	33.4972265030752	93.4265	31.4744
94.1045218790542	33.4972265030752	93.9312	28.9768
94.3402705581736	33.2537355306334	96.156	30.1327
94.5760597191546	33.0110441740552	96.0238	29.4057
94.5760597191546	33.0110441740552	97.1838	29.5842
94.8118590800133	32.7702230847373	97.4429	30.1528

Solution x	Solution y	Original x	Original y
94.8118590800133	32.7702230847373	97.9141	29.0493
95.0472831579083	32.5310952297949	97.5011	28.0267
95.2826863305085	32.2932615041607	100.6297	27.3107
95.5169489258614	32.0571801239636	106.8535	30.7643
95.7308870925652	31.8237603109464	100.384	25.6874
95.7308870925652	31.8237603109464	102.9016	24.8202
95.9408063592599	31.5973208122958	104.9423	23.521
95.9982109802522	31.5353918600772	100.5275	34.9543
95.9982109802522	31.5353918600772	101.1976	33.4905
96.0555196989991	31.4733453611338	98.5493	33.1624
96.0555196989991	31.4733453611338	98.9301	33.2654
96.1128513365863	31.4112517217859	99.272	31.5703
96.1128513365863	31.4112517217859	102.9211	31.879
96.1700604396085	31.3491496146677	98.3241	22.4412
96.1700604396085	31.3491496146677	98.3827	22.3334
96.2272512529709	31.2877596466737	99.0228	31.9463
96.2844533712034	31.2263579134926	105.6149	29.5786
96.3413749908871	31.1650225981074	101.5683	27.6266
96.3413749908871	31.1650225981074	106.1692	29.0085
96.397899246884	31.1039015209556	99.0428	19.6959
96.4539614036095	31.0451977235376	101.7295	28.4449
96.4539614036095	31.0451977235376	102.211	28.3893
96.5099089360684	30.9866002362928	97.1071	18.8552
96.5099091299899	31.9273647614718	105.5782	30.6326
96.5099093245572	32.8809484048769	104.0844	32.9988
96.5099095193233	33.8365836050083	106.6895	31.0233
96.509909714542	34.8421920492962	108.656	34.8419
96.5055497638179	34.8548125780967	103.4615	37.3033
96.5055497638179	34.8548125780967	107.8221	37.3636
96.5011805210482	34.8673713009803	102.4997	24.4075
96.4967851172317	34.8803156346037	105.0575	26.2706
96.4907916968919	35.3623742946295	96.6051	36.0943
96.4907916968919	35.3623742946295	98.5859	34.5756
96.4848083175162	35.8459882947237	99.6903	41.4772
96.4848083175162	35.8459882947237	96.5473	37.5774
96.4788253548557	36.32238087276	95.1298	37.6897
96.4728482461349	36.7984057814592	93.6083	38.4774
96.4728482461349	36.7984057814592	94.1971	38.0204
96.4668842849413	37.2735152325592	93.6941	39.0671
96.4609268873116	37.7478591281524	94.3087	39.6383
96.4609268873116	37.7478591281524	97.0063	39.6578
96.4549751563714	38.2205604019909	96.2085	41.8253
96.4549751563714	38.2205604019909	96.2133	40.5576
96.4490273697889	38.689527804727	95.8598	39.2349
96.4490273697889	38.689527804727	97.0806	39.3994
96.4430851048729	39.1593084416815	98.4033	39.6451
96.4371424028659	39.6295742212591	98.3613	42.0392
96.4311993227745	40.098528002657	96.6284	43.246
96.4311993227745	40.098528002657	96.8865	41.9997
96.4252632326054	40.5649229594184	98.7317	39.6579
96.4252632326054	40.5649229594184	102.0152	42.2262
96.4193227929308	41.0322219479307	103.3956	43.6231
96.4133722926495	41.4968699203824	98.0879	44.5657
96.4133722926495	41.4968699203824	98.0763	43.3554
96.4074264033674	41.9592171758918	99.7789	45.6905
96.401478603727	42.4188366501073	97.5519	44.8528
96.395533639212	42.8774285508771	100.0845	45.3198
96.395533639212	42.8774285508771	103.0838	43.6629
96.3895764377049	43.3346648467702	96.2485	47.1277
96.3895764377049	43.3346648467702	95.46	44.379
96.3836263610451	43.7896823805358	94.5838	45.9916
96.3836263610451	43.7896823805358	94.4684	44.7163
96.377684402625	44.2440365807454	94.5355	44.3621
96.377684402625	44.2440365807454	93.9129	43.6355
96.3717503116353	44.7008294967109	93.3823	48.5086
96.3717503116353	44.7008294967109	94.3452	48.7818
96.3658226013978	45.1521585672518	94.5726	47.3613
96.3658226013978	45.1521585672518	95.1396	47.3596
96.359900847469	45.6017955387366	95.0864	47.4256
96.359900847469	45.6017955387366	95.7654	46.8722
96.3539879128373	46.0509772467861	101.161	45.7653
96.3539879128373	46.0509772467861	103.8959	45.4099
96.3480651329295	46.5030869593084	102.9297	48.0592
96.3480651329295	46.5030869593084	102.543	45.6081
96.3421361567103	46.9564088364685	106.4442	49.0895
96.3421361567103	46.9564088364685	105.6501	47.8555
96.3361816948923	47.4035906894696	99.0651	51.1078
96.3361816948923	47.4035906894696	103.8062	50.1176
96.3302210543795	47.8459438539484	96.8097	54.0588
96.3302210543795	47.8459438539484	98.9198	48.0008

Solution x	Solution y	Original x	Original y
96.3242654356118	48.284054012526	96.0562	52.3857
96.3242654356118	48.284054012526	97.7133	51.9341
96.3183161502668	48.7178342500116	101.7941	49.0832
96.3183161502668	48.7178342500116	100.6036	46.802
96.3123585546206	49.1547799760966	98.1036	50.8139
96.3123585546206	49.1547799760966	97.7455	51.8526
96.3064025143924	49.5902144705728	98.2004	50.3921
96.300445900372	50.0259347154638	93.0102	50.1223
96.2944976729219	50.4625909245387	92.1982	53.9806
96.2885576053352	50.8969782232011	100.8862	48.4618
96.2885576053352	50.8969782232011	101.377	48.1816
96.2826043890103	51.3376283429078	92.412	50.9961
96.2766611284488	51.7795423072731	90.3356	51.1932
96.2707312596225	52.2231006833134	106.6231	51.946
96.2707312596225	52.2231006833134	104.1102	44.8822
96.2647684058471	52.697007110961	95.0304	53.2116
96.2588116894186	53.1715440823	93.3932	53.1876
96.2528633787649	53.6472375997143	98.2152	53.7701
96.2528633787649	53.6472375997143	97.9579	54.2407
96.2469150838756	54.1243071132311	99.5987	51.3246
96.2469150838756	54.1243071132311	99.5817	52.1789
96.2409644509766	54.6083762829629	100.5945	52.9653
96.2409644509766	54.6083762829629	100.6388	53.8259
96.2350078802475	55.0972555475678	98.7715	55.3698
96.2350078802475	55.0972555475678	98.9521	56.5952
96.2290518958013	55.586739731644	100.3439	52.2486
96.2290518958013	55.586739731644	99.7259	57.0659
96.223093859973	56.0810831635516	102.1595	55.9791
96.2171298570476	56.5768034754693	102.8738	56.4102
96.2171298570476	56.5768034754693	103.9916	60.6173
96.211141765136	57.0669604568138	95.4289	57.3916
96.2051598084707	57.5582235668192	94.6877	57.1733
96.1991834746316	58.0512240227431	94.4551	58.0456
96.1991834746316	58.0512240227431	94.8477	58.3247
96.193215311814	58.54654706697	97.3108	57.82
96.193215311814	58.54654706697	95.9041	59.3009
96.1872478295581	59.0443223603863	98.8606	57.9963
96.1872478295581	59.0443223603863	99.9754	58.6633
96.181268487125	59.5458018605833	93.2379	56.4517
96.1752945717324	60.0520934258458	92.9131	56.6287
96.1752945717324	60.0520934258458	92.8209	56.9207
96.1693273993081	60.5686170084746	89.2688	56.3248
96.1633705412615	61.0946346000337	85.8477	60.7859
96.1574309096589	61.6234730514931	95.4724	61.7777
96.1574309096589	61.6234730514931	96.4356	62.0951
96.1514864402546	62.154236512802	95.1558	61.2395
96.1514864402546	62.154236512802	95.479	61.1306
96.1455427881362	62.6901915201399	94.6583	60.3511
96.139601279475	63.2305935838393	93.5538	62.1822
96.139601279475	63.2305935838393	94.5987	62.0376
96.1336646392118	63.7770135891987	94.6788	63.8911
96.1336646392118	63.7770135891987	93.9444	64.9
96.1277293572678	64.325066871837	92.749	64.7326
96.1217958395864	64.8741899022678	88.0225	60.7529
96.1217958395864	64.8741899022678	90.2672	64.2791
96.1158776622673	65.4395101165806	88.7937	67.447
96.1099666305738	66.0026450908068	92.0851	66.8651
96.1099666305738	66.0026450908068	93.0933	68.7697
96.1040602499015	66.5645178158782	94.6798	69.1984
96.0981540950522	67.1247783777681	99.3413	60.508
96.0981540950522	67.1247783777681	96.1169	76.0362
96.0922401781621	67.6772464121457	86.2321	62.729
96.0922401781621	67.6772464121457	91.0116	75.887
96.0863517553828	68.2410016470825	98.4258	65.8894
96.0863517553828	68.2410016470825	97.9014	66.9835
96.0804592656731	68.8129081456621	99.4285	63.8276
96.0804592656731	68.8129081456621	98.4228	65.0226
96.074563727698	69.4027676459698	99.0429	61.6589
96.0686683976226	70.0151772731547	100.6854	61.817
96.0686683976226	70.0151772731547	102.6402	60.9181
96.0627632597444	70.7928458656785	101.778	67.1686
96.056855329198	71.5873555876647	102.9023	68.4164
96.056855329198	71.5873555876647	103.5291	67.906
96.0509389685545	72.4247377836334	103.6911	80.62
96.0450057498884	73.0916812039987	101.2985	78.2917
96.0390667114728	73.7472531147696	97.816	74.8015
96.0331312559945	74.4042354228304	97.5653	74.5618
96.0271994797916	75.0642063903313	98.5933	78.8152
96.0212663426182	75.7195949506887	108.1531	76.0691
96.0122054512395	75.9723524634802	93.9524	73.145

Solution x	Solution y	Original x	Original y
96.0122054512395	75.9723524634802	94.549	73.3405
96.0031611177685	76.227512077265	96.2521	73.5638
96.0031611177685	76.227512077265	95.9481	74.251
95.9941245034786	76.4847513984574	99.1261	78.6323
95.9941245034786	76.4847513984574	98.9119	80.0767
95.9850798856112	76.7410435382745	97.1852	78.7831
95.9850798856112	76.7410435382745	97.7624	79.6432
95.9760377300799	76.9969076257826	98.567	80.2017
95.9760377300799	76.9969076257826	98.2345	80.86
95.9669933089651	77.2516404030115	98.2007	80.5294
95.9579486102786	77.5059324637505	97.8831	81.9659
95.9579486102786	77.5059324637505	100.0565	80.1054
95.9488988915625	77.7590764680861	97.3132	81.5365
95.9488988915625	77.7590764680861	97.4314	81.946
95.9398501240618	78.0109353486047	96.9541	82.6989
95.9398501240618	78.0109353486047	97.0865	83.6094
95.9308004411574	78.260504354048	94.4072	76.9857
95.9308004411574	78.260504354048	94.6945	78.572
95.9217595854793	78.5112173378486	93.1133	78.1389
95.9127232269733	78.7624310225355	89.835	77.746
95.9127232269733	78.7624310225355	91.1291	78.4897
95.903701462964	79.0148946999548	88.0687	81.4777
95.903701462964	79.0148946999548	89.95	80.2132
95.8946974157894	79.2667529080124	91.86	79.7087
95.8946974157894	79.2667529080124	93.0994	86.3608
95.8856985683514	79.5165939729265	88.3633	87.3681
95.8767149086567	79.7580128240628	93.9684	87.8762
95.8767149086567	79.7580128240628	92.7178	89.1801
95.8677371866909	79.9910953304759	93.1284	88.6615
95.8587651092324	80.2206905834304	95.2026	90.5293
95.8497967838657	80.4436120061068	107.981	80.0957
95.796182066728	81.6622787028181	103.8313	82.5056
95.7424582239959	82.8853791167	107.2392	85.9448
95.6853019372989	83.7405166410045	104.3617	84.8664
95.6279601994221	84.5953260492982	101.0606	82.9382
95.5705897983254	85.463231912546	103.1106	83.2736
95.513103980812	86.3502074068362	101.583	94.8217
95.4553631752653	87.1487606869439	100.6204	94.7646
95.3974970055216	87.9086761227025	100.5649	91.4192
95.3395861826694	88.6630196088006	100.8882	91.1406
95.2816285189023	89.4151252011787	105.6506	92.4297
95.2230657618331	90.136625544511	104.1034	98.3317
95.131755557998	90.2660465263982	93.4941	85.8189
95.0406219433714	90.3959860275547	96.9343	84.943
95.0406219433714	90.3959860275547	95.9325	86.7596
94.9494917251568	90.5267914293031	96.2545	87.1498
94.8583759248506	90.6578726309978	99.0152	86.155
94.8583759248506	90.6578726309978	97.7943	87.7833
94.7670861116252	90.7895752925755	98.3726	88.4744
94.6757498561657	90.9214508810432	96.8345	90.0197
94.6757498561657	90.9214508810432	98.1138	89.594
94.5845091732119	91.053458106215	103.8628	98.4843
94.4840683956276	91.1720247736361	94.9909	83.4209
94.4840683956276	91.1720247736361	96.8706	83.0827
94.3834372519848	91.2924230330871	94.0795	80.8773
94.282888176926	91.4150562040776	92.6699	80.64
94.282888176926	91.4150562040776	92.1151	81.2598
94.1830519196387	91.5431687997414	93.2494	81.8793
94.1830519196387	91.5431687997414	92.288	83.6157
94.0835417024122	91.6737954440245	91.14	83.5499
94.0835417024122	91.6737954440245	91.1677	84.1211
93.9845374802292	91.8063717752524	88.6759	82.3658
93.9845374802292	91.8063717752524	89.5631	83.3752
93.8870185534974	91.9436686837643	86.3374	85.7586
93.7903652942539	92.0822967626001	101.1477	85.2681
93.7903652942539	92.0822967626001	102.2936	85.0217
93.6912907106618	92.2258210058806	102.0461	86.7072
93.6912907106618	92.2258210058806	100.7126	88.5952
93.5910650443999	92.3714030269109	104.5599	87.8351
93.4794080090504	92.5271511129525	102.4507	89.6037
93.4794080090504	92.5271511129525	104.3693	90.8389
93.3640221412137	92.6847604527879	103.2876	94.1817
93.2472042318668	92.84202833402	97.0347	92.0258
93.1303183318527	92.9995942578818	96.5235	92.1962
93.0133920241671	93.1574814038818	98.8373	99.4165
92.8959597422634	93.3143245743404	95.0373	98.5247
92.7785256561288	93.4707306206182	102.0076	93.075
92.6600707431988	93.6274429000589	101.8123	94.891
92.5405674010972	93.7840770202363	104.1728	96.9352
92.2648375187239	93.9147224303155	101.602	92.3175

Solution x	Solution y	Original x	Original y
91.98274949096	94.045776273159	99.3434	90.9979
91.98274949096	94.045776273159	98.853	91.6792
91.6948996314273	94.1777666560932	98.9319	91.3958
91.4039004037473	94.3102421281005	98.656	92.6213
91.4039004037473	94.3102421281005	99.3782	93.0601
91.1056917494447	94.4433780944884	95.7576	96.9635
91.1056917494447	94.4433780944884	98.2349	98.4363
90.8021656912593	94.5760851714052	95.504	96.351
90.4972860894363	94.7087745598556	92.4623	94.734
90.4972860894363	94.7087745598556	94.0924	96.5838
90.1918970299961	94.8414626690935	94.4828	106.1237
89.010942864409	94.9156416297033	88.6062	92.2681
89.010942864409	94.9156416297033	92.5654	91.5305
87.8456009648165	94.9898996968476	95.6122	103.8055
61.9616251207293	95.0600990606367	53.9006	102.5381
57.141211213545	95.1297462502435	51.1106	98.2963
53.0327830420395	95.1994812096116	48.0764	105.8084
51.2354456385494	95.2665668104779	48.9533	90.4759
49.4855777068053	95.3338857625962	47.7789	92.5461
47.7702746286407	95.4013567033037	42.9285	106.2179
46.8359399664246	95.4648585715005	45.465	105.2608
45.9185717268803	95.5279553657247	46.5537	103.4177
45.0019406083711	95.5908816033819	47.126	99.3914
44.0822323038068	95.6537892162587	46.0729	100.678
43.1592188165381	95.7166562484398	42.0156	103.5929
42.2472571782076	95.7793800540555	45.0704	101.2748
41.3275875623841	95.8420623709193	40.5226	102.8002
41.3275875623841	95.8420623709193	40.9527	105.6227
40.4239368418604	95.9043492146648	42.4716	105.6496
40.4239368418604	95.9043492146648	39.1965	105.4524
39.5191306112765	95.9660248033445	37.1983	106.347
38.6512543055635	96.0271903687465	35.3466	107.7036
38.5962689743117	96.0410532562934	34.3074	104.3145
38.5962689743117	96.0410532562934	35.7224	107.36
38.5419626457847	96.0548331500759	35.5571	102.295
38.5419626457847	96.0548331500759	35.4006	103.6799
38.4878577049895	96.0686039625697	35.7306	102.2767
38.4338308845749	96.0823699927396	33.8351	99.3235
38.4338308845749	96.0823699927396	35.2228	101.4244
38.3799858119556	96.096132593332	35.0473	98.5367
38.3262120036833	96.1098962715992	35.9551	95.9225
38.3262120036833	96.1098962715992	35.7859	98.3251
38.2725479816067	96.1236655628632	38.2186	96.6747
38.2725479816067	96.1236655628632	35.7481	97.1257
38.2189601648686	96.1374395380609	38.189	100.3805
38.2189601648686	96.1374395380609	36.8108	99.4487
38.165428205882	96.1511958998922	42.9721	90.3177
38.1118225474632	96.1649647812156	40.8939	84.3555
38.1118225474632	96.1649647812156	42.6808	88.2098
37.9715372212789	96.2040156671103	39.6285	91.4521
37.9715372212789	96.2040156671103	37.9917	90.5379
37.8313750595638	96.2431981434899	44.0393	95.7757
37.8313750595638	96.2431981434899	41.6896	94.8028
37.6904916906903	96.2824070824957	40.9431	96.0349
37.5494769934321	96.3216385237935	42.0978	97.503
37.5494769934321	96.3216385237935	42.2565	98.7398
37.4078793507379	96.3608704248175	43.0828	99.6317
37.2658063807824	96.400082083364	42.9226	100.4615
37.2658063807824	96.400082083364	42.5793	100.4271
37.1227771304083	96.4392411577412	44.7902	101.1589
37.1227771304083	96.4392411577412	42.8352	101.6931
36.9779588199937	96.4782921394911	40.2693	101.3043
36.9779588199937	96.4782921394911	39.3246	101.8921
36.8328042623308	96.5172781270714	39.196	99.7694
36.6875554976046	96.5562599612933	40.065	98.6098
36.6875554976046	96.5562599612933	39.7333	98.7582
36.5419311590038	96.5952460203656	31.3011	106.2109
36.3984874518258	96.6339273046112	43.1057	91.7939
36.3984874518258	96.6339273046112	41.599	92.4813
36.2536437364059	96.6727262209792	35.4073	87.2216
36.1090684181265	96.7116975419583	33.2241	90.2072
36.1090684181265	96.7116975419583	33.1881	90.5996
35.9653058217119	96.7508075005007	32.6009	89.9531
35.8220284190042	96.7900023746388	32.1756	91.0244
35.8220284190042	96.7900023746388	32.2034	92.5655
35.6796232071417	96.8293101138241	34.0163	93.2553
35.6796232071417	96.8293101138241	32.8593	93.0881
35.5377124090696	96.868692038765	33.6244	92.4492
35.3960332267262	96.9081270700746	34.7819	91.1147
35.3960332267262	96.9081270700746	35.4152	92.5489

Solution x	Solution y	Original x	Original y
35.2545292529184	96.9476961803363	37.0706	93.0168
35.112910915556	96.9873165961055	37.3296	94.7968
35.112910915556	96.9873165961055	37.1788	95.0118
34.9710214816994	97.0269948675836	36.1694	94.3523
34.829089123081	97.0667301440487	35.2297	94.8683
34.68718309365	97.1065336282732	33.1686	108.6172
34.5466420132326	97.145525150256	32.8361	107.2479
34.4064798585283	97.1842531362337	34.0458	95.0903
34.4064798585283	97.1842531362337	33.9629	96.8355
34.2664047101714	97.2230619923447	31.4281	94.9219
34.2664047101714	97.2230619923447	30.7482	95.8761
34.1268837216307	97.2619475663865	30.8807	93.5109
33.9876524208934	97.3008958846976	29.7064	94.0211
33.9876524208934	97.3008958846976	29.3468	93.7461
33.8492516707371	97.3399619225933	29.1897	96.4145
33.8492516707371	97.3399619225933	29.7849	97.5299
33.711564769356	97.3790563309861	31.6916	96.8159
33.5740012113331	97.4181742494103	31.7064	96.988
33.5740012113331	97.4181742494103	32.4952	97.9758
33.4365916852123	97.4573393602148	34.0464	97.1856
33.4365916852123	97.4573393602148	33.0573	97.9271
33.2990389384607	97.4965761622702	28.1717	107.4546
33.1638012460624	97.5354097132042	33.1638	109.6815
31.3110777044278	97.4501262556541	31.6341	101.1443
31.3110777044278	97.4501262556541	29.8552	101.3038
29.5011834843058	97.3647538860525	30.1816	102.1772
27.6924435076518	97.279249817994	29.5221	90.7635
25.8623962419777	97.1941354242489	26.6904	96.1713
24.0349208401972	97.1091253703806	28.2891	98.27
22.1540187080246	97.0241190730201	26.9511	99.1097
20.2016833012613	96.939078309411	26.55	96.735
18.1247030052295	96.8541107600575	26.1674	96.1159
15.7853808567325	96.769248772371	21.5395	100.4343
13.2643931977053	96.6842845552259	9.17	97.1621
10.8716575187459	96.5994099358087	8.1477	101.1634
8.56491201800361	96.5144477698551	3.0162	107.1796
8.13437674315472	96.3987166547168	3.1184	98.924
8.13437674315472	96.3987166547168	2.5533	99.1767
7.7144070167975	96.2829114886844	8.0611	104.093
7.2942910473534	96.1664944465319	6.3198	96.0864
6.87515290144336	96.0502324898007	1.4019	97.5847
6.4609841921082	95.9339894270763	2.1469	96.6722
6.05032146359683	95.817824395854	4.9579	99.4405
5.64061866605039	95.7015232064034	3.811	100.5395
5.23249594258567	95.5849550036113	1.1743	92.9818
5.23249594258567	95.5849550036113	0.5802	93.7511
4.83135396475851	95.4689073394574	1.6453	95.7178
4.83135396475851	95.4689073394574	0.6138	95.4238
4.43564339451585	95.3530042247649	4.7737	93.7785
4.03996497131644	95.2372725012242	5.8502	91.8647
3.64338255209911	95.1218416659555	7.8142	89.6258
3.24345782636686	95.0069369527961	3.1448	100.72
2.84385194157367	94.8916669818933	-0.3116	97.6012
2.44669211042887	94.7762972381855	3.4538	93.5151
2.04917266269916	94.6611025090427	3.5924	94.7451
1.65091427866065	94.5459925792554	-0.0468	93.7668
1.25390537903031	94.4310341980444	-0.171	97.1566
1.25390537903031	94.4310341980444	-0.339	97.1979
0.859044701297677	94.3159119972041	-1.8619	98.5581
0.859044701297677	94.3159119972041	-5.5457	98.4014
0.472409059457533	94.2002843598388	-3.2639	94.8889
0.0881389015442835	94.0847163151213	-3.1358	95.2162
0.0881389015442835	94.0847163151213	-6.686	94.6391
-0.288771056615559	93.9692162663248	-7.5489	96.9207
-0.658809755944162	93.8535024579277	-12.8049	93.8535
-0.361396127894579	92.7210990629927	-1.9602	93.9224
-0.361396127894579	92.7210990629927	-2.1508	94.1499
-0.0628581203141891	91.5954647424208	-2.5612	92.1356
0.236583999494002	90.4769925288417	-2.3037	90.7079
0.53696945817218	89.3669789291708	-4.1255	85.596
0.839583221205601	88.2907251205743	-0.1009	90.0487
1.1425729273289	87.2152326775857	-0.7351	89.6931
1.44635785494167	86.1371357419839	1.2023	90.7259
1.75031838031417	85.0442983425087	2.5704	90.3092
2.05400132257287	83.9311591116578	3.5503	90.3653
2.3570095356681	82.7840825134544	3.5998	89.8159
2.65941504320676	81.5921908163621	-1.2335	86.0108
2.96372234071551	80.3800513825977	0.6193	91.0377
3.27216752432665	78.7579699309172	2.7376	84.0979
3.58086806916705	77.0819161693275	0.3096	68.1954

Solution x	Solution y	Original x	Original y
3.89276449644177	75.6591427317282	4.4426	63.6871
4.19590576289836	75.34957081225	5.2812	65.5492
4.49800442777139	75.0506517256857	4.7342	63.0935
4.79758555149304	74.8641402910344	-4.2807	74.2616
5.10437572000214	74.6778461227796	4.0089	72.186
5.41163037375122	74.4919830019777	6.6564	74.2265
5.71844787338705	74.3062092969193	6.0914	73.9114
6.02515918453315	74.1205312288499	1.7661	66.5446
6.33511612659922	73.9369276319117	0.4838	63.8626
6.68741340195572	73.7704773516642	6.6701	63.5082
7.03986426954552	73.6076099347978	8.4928	63.9998
7.39046648849994	73.4472716650117	9.1569	61.6426
7.70250671928767	73.3240115785047	7.6803	61.1857
8.07586552313566	73.3160410448917	7.0214	70.8048
8.45005969591263	73.3080718136012	7.5677	74.3816
8.82496266355534	73.3000989533433	8.0472	76.1743
9.20054433536632	73.2921192536413	9.9143	75.8382
9.57595630778887	73.2841322061028	10.4334	62.822
9.94987419513163	73.2761637419065	15.1112	64.361
9.94987419513163	73.2761637419065	12.0444	66.3239
10.3131048845248	73.2682155975036	12.5389	66.9051
10.6750576837363	73.2602730144612	12.0587	67.8257
11.0364334338297	73.2523341605377	12.0877	66.3858
11.0364334338297	73.2523341605377	12.0097	66.7734
11.3969158070326	73.2444064885069	11.4442	66.9869
11.3969158070326	73.2444064885069	10.7344	66.9849
11.7582867949089	73.2364881568702	9.6606	65.5604
11.7582867949089	73.2364881568702	10.5042	66.7806
12.1228035123581	73.2285818840268	6.9842	66.7632
12.4924293673448	73.220681487732	11.4886	67.7219
12.4924293673448	73.220681487732	10.9416	69.7746
12.8639389317088	73.2127863410737	11.6475	70.8021
12.8639389317088	73.2127863410737	10.0835	69.723
13.2381334461033	73.2048934536328	9.1707	70.0865
13.2381334461033	73.2048934536328	9.3844	71.5303
13.6176966735479	73.1970021003897	8.8648	72.0358
13.6176966735479	73.1970021003897	8.3117	72.2049
14.0044488159318	73.1891082972675	14.2076	63.0144
14.3910219727217	73.181227518314	14.2239	63.9607
14.778043765482	73.1733567051154	12.73	75.2001
15.1664291841169	73.1654816412779	9.0002	73.0359
15.5598453305149	73.1576053217013	9.4578	72.6847
15.9583681681298	73.1497283990409	13.7649	76.0563
16.3585124317279	73.1418454204058	13.2613	67.7948
16.3585124317279	73.1418454204058	15.4332	72.9689
16.7623289480608	73.1339657006168	14.5018	68.1646
16.7623289480608	73.1339657006168	14.0233	68.3418
17.1707581812947	73.1260935355024	15.3124	65.205
17.1707581812947	73.1260935355024	14.7433	68.1941
17.5841131402714	73.1182326006225	18.9682	67.082
17.5841131402714	73.1182326006225	16.7224	69.1113
17.9977671385331	73.1103787107484	18.2654	71.5277
17.9977671385331	73.1103787107484	15.0856	70.6386
18.4144736914452	73.1025260723587	22.0857	71.4539
18.4144736914452	73.1025260723587	21.3934	72.6127
18.8275142812524	73.094672430157	22.1344	71.2137
19.2388501371147	73.0868192668679	22.8228	67.5784
19.2388501371147	73.0868192668679	22.9431	70.0987
19.6457646856148	73.0789727648535	26.4747	67.9787
19.6457646856148	73.0789727648535	25.7737	68.9159
20.040289412839	73.0711338794303	26.4587	69.6793
20.040289412839	73.0711338794303	26.9783	71.0141
20.4245774242102	73.0632985934222	27.2709	73.9256
20.4245774242102	73.0632985934222	26.2205	72.9044
20.8007280814755	73.0554603735059	24.5354	72.6275
21.1753795453613	73.0476226130325	24.5076	73.115
21.1753795453613	73.0476226130325	24.1578	73.3792
21.5477573777653	73.0397850750681	23.527	73.6169
21.5477573777653	73.0397850750681	24.4797	75.354
21.9186126209279	73.0319454473634	25.4767	75.481
22.2879259652803	73.0241035648998	24.7401	75.4523
22.2879259652803	73.0241035648998	25.3366	76.538
22.6551316628308	73.0162565294616	24.3218	77.9732
23.0217838885238	73.0084036288277	22.8762	75.7017
23.0217838885238	73.0084036288277	23.796	77.2181
23.3890133754571	73.0005454356907	21.1184	76.9048
23.7580930650418	72.9926848545067	18.7356	77.2891
23.7580930650418	72.9926848545067	17.9606	81.6588
24.1438827280971	72.9848001596935	27.1736	83.2653
24.1438827280971	72.9848001596935	23.4089	84.0628

Solution x	Solution y	Original x	Original y
24.5255096385383	72.9768098869908	29.376	80.5861
24.9020878102297	72.9688047142252	33.517	80.8699
25.2091316561887	72.9607014063275	34.9317	80.2335
25.2151605252658	71.9347826367896	32.697	74.6737
25.2211843964516	70.8980856538748	31.4187	76.5703
25.2272040949454	69.8239588904461	31.105	77.2121
25.2272040949454	69.8239588904461	26.6151	77.1467
25.2332206237448	68.6188353135293	31.0449	71.9995
25.2332206237448	68.6188353135293	27.6433	72.5657
25.2392357024461	67.3820131330482	32.2488	71.8762
25.2392357024461	67.3820131330482	31.4455	71.7336
25.2452416325641	66.0725554417806	31.7515	71.3679
25.2452416325641	66.0725554417806	31.4906	71.3219
25.2512389580074	64.6501100866755	33.839	67.1668
25.2512389580074	64.6501100866755	35.1535	70.6086
25.2572087855821	62.2967159995277	22.6268	64.3936
25.2631842829305	59.9342788638785	28.241	67.9653
25.2691578645508	57.2319611968396	23.9369	61.5866
25.2751349057639	54.4337400478699	26.4833	65.6457
25.2811098033906	33.8061000318192	37.4272	33.8061
25.0795517723483	33.1248323354983	35.5392	31.6783
24.8717381490027	32.4510940858643	28.099	29.8348
24.6634184755813	31.7824543692443	18.7531	32.536
24.4566043054608	31.1134751185887	21.3113	31.7798
24.2504582515679	30.4446061531163	22.8581	29.0039
24.0445527548216	29.7794130939069	19.5225	24.6717
23.8396941680708	29.1275704061925	18.7218	26.0511
23.8396941680708	29.1275704061925	17.7323	26.9057
23.6372463593719	28.4891890276376	16.9754	26.2994
23.4363373000524	27.8568663032322	15.0509	21.8739
23.2397622590736	27.2572796753911	19.8821	27.2321
23.0437191160988	26.6585880205272	20.8129	26.0745
22.8480115558222	26.0616226683824	23.1689	25.59
22.6521870898426	25.466155475231	18.4916	22.031
22.6521870898426	25.466155475231	17.3215	22.815
22.4582960037554	24.882777582259	21.4132	25.3225
22.2645517799637	24.2995838418729	19.6457	23.2311
22.2645517799637	24.2995838418729	19.4476	21.0876
22.0717982914034	23.7241383764664	19.3676	20.9011
21.8795725080596	23.1534351988631	20.5322	21.5891
21.8795725080596	23.1534351988631	20.5046	21.2685
21.6879483433275	22.5886697932002	21.7951	21.835
21.6879483433275	22.5886697932002	21.1889	21.267
21.4966304244833	22.028009932558	27.0312	22.0371
21.4966304244833	22.028009932558	25.2224	21.1268
21.3037987156652	21.4700396050939	24.0847	21.2619
21.1106380714625	20.9130987958565	24.5729	19.8583
21.1106380714625	20.9130987958565	22.5923	19.795
20.9168966941482	20.3604181769856	19.4151	20.4264
20.7235751371462	19.8084521334518	19.0397	19.3917
20.5306924686858	19.2577975805625	23.1615	20.5337
20.5306924686858	19.2577975805625	21.2889	20.2133
20.337436664557	18.7059793013671	22.0389	18.6688
20.1439809174151	18.1549646664266	23.1228	16.7524
20.1439809174151	18.1549646664266	20.7311	19.0512
19.9499901709098	17.6060999236778	7.8039	17.6061
20.3166852787627	16.7347106963332	17.2669	18.1061
20.6853082993689	15.8607703676609	16.9397	16.157
21.056371970323	14.9877046790453	23.3217	16.9506
21.426414823973	14.1101151653844	25.9081	14.4892
21.7940082671147	13.232746194458	18.1963	16.0602
21.7940082671147	13.232746194458	19.6468	14.5775
22.1656279160186	12.3439725417079	21.6596	11.213
22.5378446615482	11.4594674218346	22.0744	6.6433
22.9106947049675	10.5919791507437	19.4163	-0.8394
23.4195012583562	10.2983890303791	27.3755	-1.0984
23.6891276736672	10.1757324331941	25.8989	0.7413
23.6891276736672	10.1757324331941	24.8641	0.1355
23.9566833205386	10.0561006190432	23.9142	5.5856
24.224510105385	9.93670619202759	26.246	7.8923
24.4919703564672	9.81736999753632	22.4003	2.9895
24.7605786515885	9.69856345191503	24.5208	1.7631
25.0295960671497	9.58046613380402	27.2842	5.8331
25.2981843113921	9.462574873382	28.1449	5.3771
25.2981843113921	9.462574873382	27.6562	5.4902
25.5657132236053	9.34516998996932	28.0443	7.2557
25.5657132236053	9.34516998996932	27.9452	7.0873
25.8324806223074	9.22798980364917	29.9497	8.0977
25.8324806223074	9.22798980364917	29.6205	6.6839
26.0974595712064	9.11101975852561	29.2451	9.0499

Solution x	Solution y	Original x	Original y
26.3618656918955	8.99403466165079	31.9656	14.6164
26.3618656918955	8.99403466165079	29.4417	11.4808
26.6234498469891	8.87624971414689	22.6294	-1.9579
26.8982261038204	8.76415606588525	26.7943	-2.6353
27.1737042299686	8.65625318435056	33.7832	8.5886
27.1737042299686	8.65625318435056	33.6792	4.7017
27.4443018092301	8.54853938675565	31.7997	5.4917
27.7137725834056	8.4409599589251	30.7839	5.7178
27.7137725834056	8.4409599589251	29.2732	5.6917
27.9825372941602	8.33356963267148	31.0707	1.7474
27.9825372941602	8.33356963267148	28.6989	1.5656
28.2504192388039	8.22699757064857	26.4488	5.1021
28.2504192388039	8.22699757064857	31.0065	-1.0714
28.5175311595281	8.1214993727925	33.4349	0.0139
28.5175311595281	8.1214993727925	31.1391	0.2266
28.7807599733709	8.01730493949233	32.3564	-1.4633
29.0413652243319	7.91421510695369	22.4229	-2.1641
32.609326928441	7.84484427754251	31.1128	-2.8096
36.4278998785954	7.77619018014609	36.4279	-4.3699
36.9136709998625	7.96854050473343	39.9467	-2.3317
37.4038905295863	8.1661817797946	43.4311	0.4843
37.8898525478393	8.36636215174481	41.1669	5.3004
38.3763836508403	8.56698918791298	36.2059	6.8965
38.3763836508403	8.56698918791298	36.4235	4.5159
38.8712422563523	8.76861700149275	38.0686	7.3443
39.3690163254494	8.97052553403423	41.9974	13.5778
39.3690163254494	8.97052553403423	36.7928	9.6586
39.8711513489877	9.17150281439389	39.7266	17.3977
40.3761034246171	9.37020201602629	40.2323	12.6508
40.8832222615654	9.5684019943707	42.7704	10.2739
41.3906095632177	9.76655120293801	43.7231	10.6871
41.8977073561382	9.96456994182789	42.4139	3.5597
42.406138222352	10.1640328137446	42.4155	0.0668
42.9169530938736	10.3683817647564	44.5228	11.8645
43.4277492755797	10.5725115379652	44.7075	13.3055
43.4277492755797	10.5725115379652	43.7175	13.3612
43.939867020126	10.7758713676079	40.2335	17.1357
44.4591582179219	10.9777896725958	40.715	18.8306
44.9876661739559	11.1774520748213	44.3034	16.6265
44.9876661739559	11.1774520748213	44.2621	15.3855
45.5209667012581	11.3756907691329	46.213	15.3079
45.5209667012581	11.3756907691329	45.8725	14.3747
46.0565387751838	11.5731982763022	47.5448	13.9665
46.5925086741129	11.7705784941552	47.2412	18.0641
46.5925086741129	11.7705784941552	49.3862	17.5735

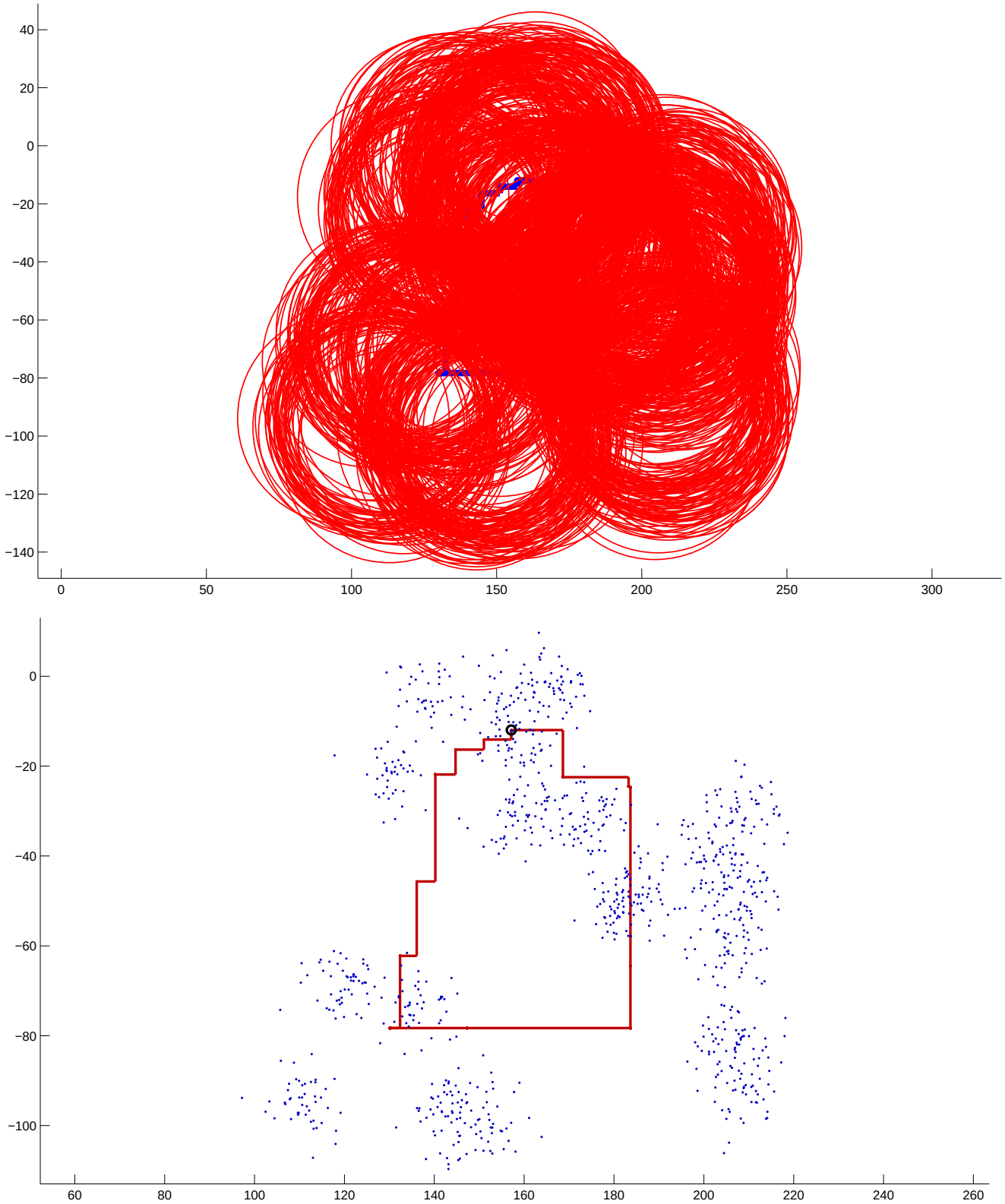


Figure N.132: $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Manhattan, Length = 239.7015872

Table N-135: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Manhattan

Total distance: 239.70158715181			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
58.6269398649828	22.4642715409775	48.302	2.6164
58.6269398649828	22.4642715409775	47.9812	30.2306
58.6269398649828	22.4642715409775	47.3356	31.1656
58.6269398649828	22.4642715409775	49.5432	29.0024
58.6269398649828	22.4642715409775	47.9603	31.0225
58.6269398649828	22.4642715409775	47.4903	33.2139
58.6269398649828	22.4642715409775	48.6326	32.1618
58.6269398649828	22.4642715409775	50.5738	30.8854
58.6269398649828	22.4642715409775	51.0819	30.8837
58.6269398649828	22.4642715409775	50.8592	31.2824
58.6269398649828	22.4642715409775	50.3723	32.2399
58.6269398649828	22.4642715409775	45.6407	35.658
58.6269398649828	22.4642715409775	48.325	36.101
58.6269398649828	22.4642715409775	50.1654	34.298
58.6269398649828	22.4642715409775	45.4526	36.121
58.6269398649828	22.4642715409775	51.473	33.7115
58.6269398649828	22.4642715409775	46.003	37.4534
58.6269398649828	22.4642715409775	51.7623	34.8081
58.6269398649828	22.4642715409775	45.4903	38.3462
58.6269398649828	22.4642715409775	51.6292	37.4529
58.6269398649828	22.4642715409775	44.3651	39.5082
58.6269398649828	22.4642715409775	53.589	37.6567
58.6269398649828	22.4642715409775	50.3352	41.2014
58.6269398649828	22.4642715409775	64.4232	44.0581
58.6269398649828	22.4642715409775	65.7303	47.3671
58.6269398649828	22.4642715409775	67.4955	46.0347
58.6269398649828	22.4642715409775	61.2083	54.3519
58.6269398649828	22.4642715409775	67.6648	48.1141
58.6269398649828	22.4642715409775	68.7356	47.889
58.6269398649828	22.4642715409775	70.4096	46.4113
58.6269398649828	22.4642715409775	67.5609	49.631
58.6269398649828	22.4642715409775	66.2863	51.2705
58.6269398649828	22.4642715409775	66.949	50.6855
58.6269398649828	22.4642715409775	67.7991	50.1342
58.6269398649828	22.4642715409775	70.6191	48.182
58.6269398649828	22.4642715409775	70.7664	48.6137
58.6269398649828	22.4642715409775	72.0385	47.603
58.6269398649828	22.4642715409775	71.8327	48.0379
58.6269398649828	22.4642715409775	70.0624	50.1219
58.6269398649828	22.4642715409775	70.6462	49.6735
73.2628428230552	24.4872320101077	46.3909	8.819
73.2628428230552	24.4872320101077	48.493	25.186
73.2628428230552	24.4872320101077	69.1689	51.2673
73.2628428230552	24.4872320101077	73.2561	47.9132
73.2628428230552	24.4872320101077	66.0257	55.1875
73.2628428230552	24.4872320101077	69.4154	51.8752
73.2628428230552	24.4872320101077	72.0723	49.2863
73.2628428230552	24.4872320101077	67.8488	53.6384
73.2628428230552	24.4872320101077	68.022	53.7678
73.2628428230552	24.4872320101077	71.0505	50.768
73.2628428230552	24.4872320101077	71.8965	50.0142
73.2628428230552	24.4872320101077	73.2401	49.0047
73.2628428230552	24.4872320101077	70.1179	52.2878
73.2628428230552	24.4872320101077	70.8564	51.5507
73.2628428230552	24.4872320101077	69.1565	53.343
73.2628428230552	24.4872320101077	73.5268	49.2611
73.2628428230552	24.4872320101077	70.2011	52.705
73.2628428230552	24.4872320101077	68.2826	55.0673
73.2628428230552	24.4872320101077	72.1444	51.2772
73.2628428230552	24.4872320101077	74.8417	48.5823
73.2628428230552	24.4872320101077	75.5201	48.6107
73.2628428230552	24.4872320101077	73.6611	50.4924
73.2628428230552	24.4872320101077	70.916	53.3608
73.2628428230552	24.4872320101077	72.0304	52.5053
73.2628428230552	24.4872320101077	70.694	53.8562
73.2628428230552	24.4872320101077	69.2681	55.3133
73.2628428230552	24.4872320101077	75.5587	49.1352
73.2628428230552	24.4872320101077	69.8977	54.8286
73.2628428230552	24.4872320101077	72.0955	52.6394
73.2628428230552	24.4872320101077	74.4488	50.3129
73.2628428230552	24.4872320101077	71.2619	53.5794
73.2628428230552	24.4872320101077	73.911	51.0144
73.2628428230552	24.4872320101077	76.379	48.6237
73.2628428230552	24.4872320101077	68.5789	56.8701
73.2628428230552	24.4872320101077	67.4683	58.2291
73.2628428230552	24.4872320101077	75.2757	50.6388
73.2628428230552	24.4872320101077	77.6289	48.4559
73.2628428230552	24.4872320101077	73.3859	52.8201
73.2628428230552	24.4872320101077	77.4079	49.147
73.2628428230552	24.4872320101077	76.0043	50.5809
73.2628428230552	24.4872320101077	69.9782	57.1009
73.2628428230552	24.4872320101077	74.3979	53.0985
73.2628428230552	24.4872320101077	70.5527	57.3223
73.2628428230552	24.4872320101077	76.2244	51.9684
73.2628428230552	24.4872320101077	78.2967	50.1808
73.2628428230552	24.4872320101077	70.1344	58.5671
73.2628428230552	24.4872320101077	76.5498	52.218
73.2628428230552	24.4872320101077	73.8072	55.2741
73.2628428230552	24.4872320101077	72.7757	56.7077
73.2628428230552	24.4872320101077	80.3964	49.7264
73.2628428230552	24.4872320101077	73.2116	57.797
73.2628428230552	24.4872320101077	80.7698	50.729
73.2628428230552	24.4872320101077	73.7963	57.8273
73.2628428230552	24.4872320101077	78.0993	54.3894
73.2628428230552	24.4872320101077	77.8264	55.5164
73.2628428230552	24.4872320101077	82.0477	53.0979
73.2628428230552	24.4872320101077	83.5076	51.7826
73.2628428230552	24.4872320101077	84.6532	51.7406
73.2628428230552	24.4872320101077	77.9705	58.8491
73.2628428230552	24.4872320101077	85.9154	51.5363
73.2628428230552	24.4872320101077	81.1686	57.7423
73.2628428230552	24.4872320101077	91.1842	48.1207
73.2628428230552	24.4872320101077	90.3356	51.1932
73.2628428230552	24.4872320101077	89.6611	52.1615
73.2628428230552	24.4872320101077	93.3823	48.5086
73.2628428230552	24.4872320101077	93.0102	50.1223
73.2628428230552	24.4872320101077	92.412	50.9961
73.2628428230552	24.4872320101077	87.1149	58.1702
73.2628428230552	24.4872320101077	89.2688	56.3248
73.2628428230552	24.4872320101077	92.1982	53.9806
73.4546735210036	24.5916754286946	49.2438	-0.5725
73.4546735210036	24.5916754286946	94.5726	47.3613
73.4546735210036	24.5916754286946	95.1396	47.3596
73.4546735210036	24.5916754286946	95.0864	47.4256
73.4546735210036	24.5916754286946	95.7654	46.8722
73.6578685934939	24.6989928307782	47.1015	12.1757
73.6578685934939	24.6989928307782	47.4524	12.1509
73.6578685934939	24.6989928307782	48.9393	11.7496
73.6578685934939	24.6989928307782	48.2378	10.888
73.6578685934939	24.6989928307782	47.6091	10.2274
73.6578685934939	24.6989928307782	47.5448	13.9665
73.6578685934939	24.6989928307782	49.0558	10.279
73.6578685934939	24.6989928307782	48.0446	14.6778
73.6578685934939	24.6989928307782	50.5069	12.3029
73.6578685934939	24.6989928307782	51.32	11.9016
73.6578685934939	24.6989928307782	52.0306	12.0787
73.6578685934939	24.6989928307782	51.9742	12.9315
73.6578685934939	24.6989928307782	47.7278	5.7114
73.6578685934939	24.6989928307782	52.3173	10.0275
73.6578685934939	24.6989928307782	53.965	12.2967
73.6578685934939	24.6989928307782	49.3862	17.5735
73.6578685934939	24.6989928307782	51.2901	7.6487
73.6578685934939	24.6989928307782	48.7027	4.8736
73.6578685934939	24.6989928307782	52.0827	15.9727
73.6578685934939	24.6989928307782	49.1677	19.2175
73.6578685934939	24.6989928307782	53.4554	15.0784
73.6578685934939	24.6989928307782	51.6732	17.1776
73.6578685934939	24.6989928307782	50.2911	5.2466
73.6578685934939	24.6989928307782	53.1154	7.9184
73.6578685934939	24.6989928307782	49.9475	19.2284
73.6578685934939	24.6989928307782	49.309	3.6922
73.6578685934939	24.6989928307782	49.9971	19.9155
73.6578685934939	24.6989928307782	52.4859	17.4578
73.6578685934939	24.6989928307782	48.4975	2.4432
73.6578685934939	24.6989928307782	57.2331	12.7874
73.6578685934939	24.6989928307782	51.539	18.7116
73.6578685934939	24.6989928307782	53.9046	16.3668
73.6578685934939	24.6989928307782	55.3647	9.0137
73.6578685934939	24.6989928307782	53.7123	16.59
73.6578685934939	24.6989928307782	55.8132	15.4408
73.6578685934939	24.6989928307782	52.0607	4.6851
73.6578685934939	24.6989928307782	52.1655	19.1446
73.6578685934939	24.6989928307782	49.1449	22.3659
73.6578685934939	24.6989928307782	53.4617	5.8056

Solution x	Solution y	Original x	Original y
73.6578685934939	24.6989928307782	54.3108	6.5803
73.6578685934939	24.6989928307782	49.5265	1.5006
73.6578685934939	24.6989928307782	52.3291	3.6705
73.6578685934939	24.6989928307782	52.2056	3.4977
73.6578685934939	24.6989928307782	55.5508	6.709
73.6578685934939	24.6989928307782	58.6318	9.4344
73.6578685934939	24.6989928307782	50.9668	1.717
73.6578685934939	24.6989928307782	51.8363	2.0767
73.6578685934939	24.6989928307782	61.7542	11.527
73.6578685934939	24.6989928307782	53.2794	21.4994
73.6578685934939	24.6989928307782	51.7765	0.7553
73.6578685934939	24.6989928307782	50.8742	24.2729
73.6578685934939	24.6989928307782	59.4358	8.0877
73.6578685934939	24.6989928307782	52.8937	1.339
73.6578685934939	24.6989928307782	55.9782	19.9329
73.6578685934939	24.6989928307782	51.545	-0.7619
73.6578685934939	24.6989928307782	56.6752	3.9284
73.6578685934939	24.6989928307782	50.1386	26.6573
73.6578685934939	24.6989928307782	58.0725	5.2013
73.6578685934939	24.6989928307782	55.5686	2.3786
73.6578685934939	24.6989928307782	54.5841	1.3
73.6578685934939	24.6989928307782	54.6465	1.327
73.6578685934939	24.6989928307782	56.6229	3.2945
73.6578685934939	24.6989928307782	54.7597	1.1902
73.6578685934939	24.6989928307782	58.8992	5.3006
73.6578685934939	24.6989928307782	60.5785	6.8128
73.6578685934939	24.6989928307782	56.514	2.6652
73.6578685934939	24.6989928307782	54.0368	23.8586
73.6578685934939	24.6989928307782	55.7669	1.6852
73.6578685934939	24.6989928307782	60.2628	6.0605
73.6578685934939	24.6989928307782	54.2786	24.4277
73.6578685934939	24.6989928307782	58.5415	3.6684
73.6578685934939	24.6989928307782	58.0726	3.0503
73.6578685934939	24.6989928307782	57.7618	2.6586
73.6578685934939	24.6989928307782	54.6523	25.2022
73.6578685934939	24.6989928307782	57.3839	0.9502
73.6578685934939	24.6989928307782	58.2987	1.8222
73.6578685934939	24.6989928307782	56.047	-0.6998
73.6578685934939	24.6989928307782	64.6914	7.7788
73.6578685934939	24.6989928307782	61.565	4.5717
73.6578685934939	24.6989928307782	52.7074	28.2489
73.6578685934939	24.6989928307782	53.5826	-3.7128
73.6578685934939	24.6989928307782	58.6741	1.1796
73.6578685934939	24.6989928307782	53.412	-4.2453
73.6578685934939	24.6989928307782	58.2741	0.1622
73.6578685934939	24.6989928307782	55.089	27.0379
73.6578685934939	24.6989928307782	58.2864	0.0731
73.6578685934939	24.6989928307782	55.4854	26.8201
73.6578685934939	24.6989928307782	54.5895	27.7676
73.6578685934939	24.6989928307782	53.915	28.4629
73.6578685934939	24.6989928307782	53.8048	-5.0553
73.6578685934939	24.6989928307782	55.1607	27.7715
73.6578685934939	24.6989928307782	60.4167	1.4088
73.6578685934939	24.6989928307782	63.4243	4.3429
73.6578685934939	24.6989928307782	60.4719	1.0667
73.6578685934939	24.6989928307782	63.3795	20.1125
73.6578685934939	24.6989928307782	52.5136	31.162
73.6578685934939	24.6989928307782	54.8257	29.6059
73.6578685934939	24.6989928307782	56.8778	27.618
73.6578685934939	24.6989928307782	54.7376	29.7596
73.6578685934939	24.6989928307782	54.4331	-6.2551
73.6578685934939	24.6989928307782	58.3955	-2.2935
73.6578685934939	24.6989928307782	62.5325	1.766
73.6578685934939	24.6989928307782	59.6709	-1.5476
73.6578685934939	24.6989928307782	63.0749	1.8033
73.6578685934939	24.6989928307782	61.643	23.6955
73.6578685934939	24.6989928307782	53.8796	31.7093
73.6578685934939	24.6989928307782	58.9981	26.6128
73.6578685934939	24.6989928307782	58.5931	27.1316
73.6578685934939	24.6989928307782	62.5649	23.4331
73.6578685934939	24.6989928307782	59.5552	26.5288
73.6578685934939	24.6989928307782	57.7878	-4.3732
73.6578685934939	24.6989928307782	61.9524	-0.333
73.6578685934939	24.6989928307782	62.7821	-0.0838
73.6578685934939	24.6989928307782	63.3607	23.5913
73.6578685934939	24.6989928307782	62.4332	-0.684
73.6578685934939	24.6989928307782	57.9508	29.6187
73.6578685934939	24.6989928307782	54.3132	33.4794
73.6578685934939	24.6989928307782	63.8119	26.0212
73.6578685934939	24.6989928307782	62.9268	27.0211

Solution x	Solution y	Original x	Original y
73.6578685934939	24.6989928307782	55.9275	34.3566
73.6578685934939	24.6989928307782	58.6228	31.6703
73.6578685934939	24.6989928307782	60.1802	30.671
73.6578685934939	24.6989928307782	63.132	27.7543
73.6578685934939	24.6989928307782	60.463	30.4795
73.6578685934939	24.6989928307782	58.4334	33.3219
73.6578685934939	24.6989928307782	56.2795	36.0371
73.6578685934939	24.6989928307782	58.126	35.24
73.6578685934939	24.6989928307782	67.242	26.9141
73.6578685934939	24.6989928307782	60.8351	33.4935
73.6578685934939	24.6989928307782	66.7482	27.6121
73.6578685934939	24.6989928307782	64.1748	30.2745
73.6578685934939	24.6989928307782	63.2951	31.2899
73.6578685934939	24.6989928307782	61.1622	34.1592
73.6578685934939	24.6989928307782	60.137	35.2014
73.6578685934939	24.6989928307782	67.5765	27.7962
73.6578685934939	24.6989928307782	61.5106	34.0654
73.6578685934939	24.6989928307782	70.5469	25.0661
73.6578685934939	24.6989928307782	68.3676	27.331
73.6578685934939	24.6989928307782	62.464	33.4003
73.6578685934939	24.6989928307782	64.2717	31.7627
73.6578685934939	24.6989928307782	58.8785	37.4935
73.6578685934939	24.6989928307782	63.5739	32.9982
73.6578685934939	24.6989928307782	68.2062	28.5319
73.6578685934939	24.6989928307782	66.7818	30.0369
73.6578685934939	24.6989928307782	67.8857	28.9512
73.6578685934939	24.6989928307782	67.6588	29.7348
73.6578685934939	24.6989928307782	61.1452	36.2851
73.6578685934939	24.6989928307782	70.1037	27.3839
73.6578685934939	24.6989928307782	65.4552	32.6167
73.6578685934939	24.6989928307782	63.453	34.6286
73.6578685934939	24.6989928307782	62.0243	36.102
73.6578685934939	24.6989928307782	69.5886	28.6002
73.6578685934939	24.6989928307782	63.8645	34.3723
73.6578685934939	24.6989928307782	60.9493	37.7343
73.6578685934939	24.6989928307782	68.3701	31.308
73.6578685934939	24.6989928307782	62.6603	37.129
73.6578685934939	24.6989928307782	69.1853	30.9522
73.6578685934939	24.6989928307782	64.9829	35.6055
73.6578685934939	24.6989928307782	67.7055	32.9993
73.6578685934939	24.6989928307782	66.5887	34.1226
73.6578685934939	24.6989928307782	67.4673	33.2544
73.6578685934939	24.6989928307782	73.7989	28.6287
73.6578685934939	24.6989928307782	64.2784	38.8059
73.6578685934939	24.6989928307782	71.5231	31.8286
73.6578685934939	24.6989928307782	66.9624	36.7077
73.6578685934939	24.6989928307782	65.211	38.9167
73.6578685934939	24.6989928307782	64.8516	39.5774
73.6578685934939	24.6989928307782	72.6191	32.6684
73.6578685934939	24.6989928307782	66.7168	38.698
73.6578685934939	24.6989928307782	72.2401	34.2889
73.6578685934939	24.6989928307782	68.0366	38.8903
73.6578685934939	24.6989928307782	65.3289	43.5846
73.6578685934939	24.6989928307782	79.7169	32.9378
73.6578685934939	24.6989928307782	75.4748	37.8532
73.6578685934939	24.6989928307782	74.5598	39.2546
73.6578685934939	24.6989928307782	72.4926	42.7909
73.6578685934939	24.6989928307782	70.5497	45.0925
73.6578685934939	24.6989928307782	97.1071	18.8552
73.6578685934939	24.6989928307782	72.7013	43.6681
73.6578685934939	24.6989928307782	72.9378	43.4347
73.6578685934939	24.6989928307782	75.9022	40.5634
73.6578685934939	24.6989928307782	77.5882	39.4219
73.6578685934939	24.6989928307782	90.6179	26.4649
73.6578685934939	24.6989928307782	73.2283	44.0709
73.6578685934939	24.6989928307782	72.4429	44.8985
73.6578685934939	24.6989928307782	75.9853	41.4015
73.6578685934939	24.6989928307782	72.9198	44.5581
73.6578685934939	24.6989928307782	85.525	32.0217
73.6578685934939	24.6989928307782	92.5592	25.4331
73.6578685934939	24.6989928307782	85.1876	33.113
73.6578685934939	24.6989928307782	75.73	42.7229
73.6578685934939	24.6989928307782	90.6435	28.0536
73.6578685934939	24.6989928307782	99.0428	19.6959
73.6578685934939	24.6989928307782	93.6487	25.1273
73.6578685934939	24.6989928307782	73.6428	45.1426
73.6578685934939	24.6989928307782	92.942	26.4511
73.6578685934939	24.6989928307782	86.512	33.4131
73.6578685934939	24.6989928307782	73.6395	46.5004
73.6578685934939	24.6989928307782	85.065	35.2948

Solution x	Solution y	Original x	Original y
73.6578685934939	24.6989928307782	87.5726	32.8781
73.6578685934939	24.6989928307782	98.3827	22.3334
73.6578685934939	24.6989928307782	98.3241	22.4412
73.6578685934939	24.6989928307782	90.72	30.049
73.6578685934939	24.6989928307782	81.9079	40.1742
73.6578685934939	24.6989928307782	80.8076	41.6004
73.6578685934939	24.6989928307782	77.9223	44.6051
73.6578685934939	24.6989928307782	97.0499	25.7334
73.6578685934939	24.6989928307782	86.5983	36.2039
73.6578685934939	24.6989928307782	93.9312	28.9768
73.6578685934939	24.6989928307782	77.8794	45.0468
73.6578685934939	24.6989928307782	76.4125	46.981
73.6578685934939	24.6989928307782	80.8872	43.1227
73.6578685934939	24.6989928307782	88.2545	36.066
73.6578685934939	24.6989928307782	97.3283	27.0933
73.6578685934939	24.6989928307782	93.4265	31.4744
73.6578685934939	24.6989928307782	77.9078	47.2474
73.6578685934939	24.6989928307782	96.0238	29.4057
73.6578685934939	24.6989928307782	92.4351	33.0022
73.6578685934939	24.6989928307782	97.5011	28.0267
73.6578685934939	24.6989928307782	91.0332	34.8187
73.6578685934939	24.6989928307782	100.384	25.6874
73.6578685934939	24.6989928307782	92.7124	33.4453
73.6578685934939	24.6989928307782	79.9479	46.2913
73.6578685934939	24.6989928307782	96.156	30.1327
73.6578685934939	24.6989928307782	97.1838	29.5842
73.6578685934939	24.6989928307782	87.5583	39.2312
73.6578685934939	24.6989928307782	79.533	47.2684
73.6578685934939	24.6989928307782	102.4997	24.4075
73.6578685934939	24.6989928307782	97.9141	29.0493
73.6578685934939	24.6989928307782	89.1249	38.0318
73.6578685934939	24.6989928307782	91.1655	36.0648
73.6578685934939	24.6989928307782	97.4429	30.1528
73.6578685934939	24.6989928307782	102.9016	24.8202
73.6578685934939	24.6989928307782	85.9182	41.843
73.6578685934939	24.6989928307782	87.2346	40.5435
73.6578685934939	24.6989928307782	100.6297	27.3107
73.6578685934939	24.6989928307782	80.0004	48.0282
73.6578685934939	24.6989928307782	95.0864	33.2234
73.6578685934939	24.6989928307782	104.9423	23.521
73.6578685934939	24.6989928307782	96.3928	32.1668
73.6578685934939	24.6989928307782	95.8908	32.6754
73.6578685934939	24.6989928307782	91.9372	36.8319
73.6578685934939	24.6989928307782	96.2582	32.5713
73.6578685934939	24.6989928307782	91.8795	37.1845
73.6578685934939	24.6989928307782	101.5683	27.6266
73.6578685934939	24.6989928307782	88.4465	41.4478
73.6578685934939	24.6989928307782	90.014	39.915
73.6578685934939	24.6989928307782	101.7295	28.4449
73.6578685934939	24.6989928307782	89.0134	41.3658
73.6578685934939	24.6989928307782	102.211	28.3893
73.6578685934939	24.6989928307782	89.3668	41.343
73.6578685934939	24.6989928307782	99.272	31.5703
73.6578685934939	24.6989928307782	90.1236	40.724
73.6578685934939	24.6989928307782	99.0228	31.9463
73.6578685934939	24.6989928307782	105.0575	26.2706
73.6578685934939	24.6989928307782	90.4784	41.2284
73.6578685934939	24.6989928307782	98.5493	33.1624
73.6578685934939	24.6989928307782	93.6083	38.4774
73.6578685934939	24.6989928307782	98.9301	33.2654
73.6578685934939	24.6989928307782	94.1971	38.0204
73.6578685934939	24.6989928307782	92.8093	39.7693
73.6578685934939	24.6989928307782	96.6051	36.0943
73.6578685934939	24.6989928307782	93.6941	39.0671
73.6578685934939	24.6989928307782	92.634	40.1716
73.6578685934939	24.6989928307782	95.1298	37.6897
73.6578685934939	24.6989928307782	90.0385	42.8005
73.6578685934939	24.6989928307782	98.5859	34.5756
73.6578685934939	24.6989928307782	92.1801	41.0349
73.6578685934939	24.6989928307782	92.2396	41.0703
73.6578685934939	24.6989928307782	94.3087	39.6383
73.6578685934939	24.6989928307782	96.5473	37.5774
73.6578685934939	24.6989928307782	101.1976	33.4905
73.6578685934939	24.6989928307782	102.9211	31.879
73.6578685934939	24.6989928307782	89.5287	45.4109
73.6578685934939	24.6989928307782	87.8413	47.1867
73.6578685934939	24.6989928307782	95.8598	39.2349
73.6578685934939	24.6989928307782	106.1692	29.0085
73.6578685934939	24.6989928307782	105.6149	29.5786
73.6578685934939	24.6989928307782	93.2846	41.9379

Solution x	Solution y	Original x	Original y
73.6578685934939	24.6989928307782	87.5129	47.9594
73.6578685934939	24.6989928307782	100.5275	34.9543
73.6578685934939	24.6989928307782	89.3464	46.1786
73.6578685934939	24.6989928307782	105.5782	30.6326
73.6578685934939	24.6989928307782	97.0806	39.3994
73.6578685934939	24.6989928307782	90.4865	46.0315
73.6578685934939	24.6989928307782	89.352	47.1855
73.6578685934939	24.6989928307782	97.0063	39.6578
73.6578685934939	24.6989928307782	96.2133	40.5576
73.6578685934939	24.6989928307782	104.0844	32.9988
73.6578685934939	24.6989928307782	93.9129	43.6355
73.6578685934939	24.6989928307782	106.8535	30.7643
73.6578685934939	24.6989928307782	106.6895	31.0233
73.6578685934939	24.6989928307782	91.9732	45.8332
73.6578685934939	24.6989928307782	96.2085	41.8253
73.6578685934939	24.6989928307782	98.4033	39.6451
73.6578685934939	24.6989928307782	98.7317	39.6579
73.6578685934939	24.6989928307782	96.8865	41.9997
73.6578685934939	24.6989928307782	94.5355	44.3621
73.6578685934939	24.6989928307782	94.4684	44.7163
73.6578685934939	24.6989928307782	91.9756	47.4725
73.6578685934939	24.6989928307782	95.46	44.379
73.6578685934939	24.6989928307782	96.6284	43.246
73.6578685934939	24.6989928307782	98.3613	42.0392
73.6578685934939	24.6989928307782	94.5838	45.9916
73.6578685934939	24.6989928307782	103.4615	37.3033
73.6578685934939	24.6989928307782	99.6903	41.4772
73.6578685934939	24.6989928307782	98.0763	43.3554
73.6578685934939	24.6989928307782	97.5519	44.8528
73.6578685934939	24.6989928307782	98.0879	44.5657
73.6578685934939	24.6989928307782	108.656	34.8419
73.6578685934939	24.6989928307782	102.0152	42.2262
73.6578685934939	24.6989928307782	107.8221	37.3636
73.6578719684061	64.4525692473888	94.3452	48.7818
73.6578719684061	64.4525692473888	96.2485	47.1277
73.6578719684061	64.4525692473888	100.0845	45.3198
73.6578719684061	64.4525692473888	99.7789	45.6905
73.6578719684061	64.4525692473888	103.0838	43.6629
73.6578719684061	64.4525692473888	98.9198	48.0008
73.6578719684061	64.4525692473888	101.161	45.7653
73.6578719684061	64.4525692473888	103.3956	43.6231
73.6578719684061	64.4525692473888	100.6036	46.802
73.6578719684061	64.4525692473888	102.543	45.6081
73.6578719684061	64.4525692473888	95.0304	53.2116
73.6578719684061	64.4525692473888	96.0562	52.3857
73.6578719684061	64.4525692473888	98.2004	50.3921
73.6578719684061	64.4525692473888	98.1036	50.8139
73.6578719684061	64.4525692473888	104.1102	44.8822
73.6578719684061	64.4525692473888	103.8959	45.4099
73.6578719684061	64.4525692473888	100.8862	48.4618
73.6578719684061	64.4525692473888	101.377	48.1816
73.6578719684061	64.4525692473888	97.7455	51.8526
73.6578719684061	64.4525692473888	97.7133	51.9341
73.6578719684061	64.4525692473888	99.0651	51.1078
73.6578719684061	64.4525692473888	96.8097	54.0588
73.6578719684061	64.4525692473888	101.7941	49.0832
73.6578719684061	64.4525692473888	99.5987	51.3246
73.6578719684061	64.4525692473888	102.9297	48.0592
73.6578719684061	64.4525692473888	99.5817	52.1789
73.6578719684061	64.4525692473888	98.2152	53.7701
73.6578719684061	64.4525692473888	97.9579	54.2407
73.6578719684061	64.4525692473888	100.3439	52.2486
73.6578719684061	64.4525692473888	95.4289	57.3916
73.6578719684061	64.4525692473888	105.6501	47.8555
73.6578719684061	64.4525692473888	100.5945	52.9653
73.6578719684061	64.4525692473888	103.8062	50.1176
73.6578719684061	64.4525692473888	98.7715	55.3698
73.6578719684061	64.4525692473888	100.6388	53.8259
73.6578719684061	64.4525692473888	97.3108	57.82
73.6578719684061	64.4525692473888	95.9041	59.3009
73.6578719684061	64.4525692473888	106.4442	49.0895
73.6578719684061	64.4525692473888	98.9521	56.5952
73.6578719684061	64.4525692473888	99.7259	57.0659
73.6578719684061	64.4525692473888	98.8606	57.9963
73.6578719684061	64.4525692473888	102.1595	55.9791
73.6578719684061	64.4525692473888	106.6231	51.946
73.6578719684061	64.4525692473888	99.9754	58.6633
73.6578719684061	64.4525692473888	102.8738	56.4102
73.6578719684061	64.4525692473888	99.3413	60.508
73.6578719684061	64.4525692473888	99.0429	61.6589

Solution x	Solution y	Original x	Original y
73.6578719684061	64.4525692473888	100.6854	61.817
73.6578719684061	64.4525692473888	99.4285	63.8276
73.6578719684061	64.4525692473888	98.4228	65.0226
73.6578719684061	64.4525692473888	102.6402	60.9181
73.6578719684061	64.4525692473888	103.9916	60.6173
73.6578719684061	64.4525692473888	101.778	67.1686
73.6578719684061	64.4525692473888	102.9023	68.4164
73.6578719684061	64.4525692473888	103.5291	67.906
73.6578719684061	64.4525692473888	108.1531	76.0691
73.6578743042103	78.3112658733038	93.3932	53.1876
73.6578743042103	78.3112658733038	85.8477	60.7859
73.6578743042103	78.3112658733038	88.0225	60.7529
73.6578743042103	78.3112658733038	86.2321	62.729
73.6578743042103	78.3112658733038	92.9131	56.6287
73.6578743042103	78.3112658733038	93.2379	56.4517
73.6578743042103	78.3112658733038	92.8209	56.9207
73.6578743042103	78.3112658733038	94.6877	57.1733
73.6578743042103	78.3112658733038	94.4551	58.0456
73.6578743042103	78.3112658733038	94.8477	58.3247
73.6578743042103	78.3112658733038	90.2672	64.2791
73.6578743042103	78.3112658733038	94.6583	60.3511
73.6578743042103	78.3112658733038	93.5538	62.1822
73.6578743042103	78.3112658733038	88.7937	67.447
73.6578743042103	78.3112658733038	95.1558	61.2395
73.6578743042103	78.3112658733038	95.479	61.1306
73.6578743042103	78.3112658733038	94.5987	62.0376
73.6578743042103	78.3112658733038	95.4724	61.7777
73.6578743042103	78.3112658733038	92.749	64.7326
73.6578743042103	78.3112658733038	96.4356	62.0951
73.6578743042103	78.3112658733038	94.6788	63.8911
73.6578743042103	78.3112658733038	93.9444	64.9
73.6578743042103	78.3112658733038	92.0851	66.8651
73.6578743042103	78.3112658733038	93.0933	68.7697
73.6578743042103	78.3112658733038	94.6798	69.1984
73.6578743042103	78.3112658733038	98.4258	65.8894
73.6578743042103	78.3112658733038	97.9014	66.9835
73.6578743042103	78.3112658733038	91.0116	75.887
73.6578743042103	78.3112658733038	93.9524	73.145
73.6578743042103	78.3112658733038	89.835	77.746
73.6578743042103	78.3112658733038	94.549	73.3405
73.6578743042103	78.3112658733038	88.0687	81.4777
73.6578743042103	78.3112658733038	91.1291	78.4897
73.6578743042103	78.3112658733038	96.2521	73.5638
73.6578743042103	78.3112658733038	89.95	80.2132
73.6578743042103	78.3112658733038	95.9481	74.251
73.6578743042103	78.3112658733038	88.6759	82.3658
73.6578743042103	78.3112658733038	93.1133	78.1389
73.6578743042103	78.3112658733038	94.4072	76.9857
73.6578743042103	78.3112658733038	91.86	79.7087
73.6578743042103	78.3112658733038	86.3374	85.7586
73.6578743042103	78.3112658733038	97.5653	74.5618
73.6578743042103	78.3112658733038	96.1169	76.0362
73.6578743042103	78.3112658733038	97.816	74.8015
73.6578743042103	78.3112658733038	89.5631	83.3752
73.6578743042103	78.3112658733038	94.6945	78.572
73.6578743042103	78.3112658733038	92.6699	80.64
73.6578743042103	78.3112658733038	92.1151	81.2598
73.6578743042103	78.3112658733038	91.14	83.5499
73.6578743042103	78.3112658733038	94.0795	80.8773
73.6578743042103	78.3112658733038	93.2494	81.8793
73.6578743042103	78.3112658733038	91.1677	84.1211
73.6578743042103	78.3112658733038	88.3633	87.3681
73.6578743042103	78.3112658733038	92.288	83.6157
73.6578743042103	78.3112658733038	97.1852	78.7831
73.6578743042103	78.3112658733038	97.7624	79.6432
73.6578743042103	78.3112658733038	98.5933	78.8152
73.6578743042103	78.3112658733038	99.1261	78.6323
73.6578743042103	78.3112658733038	94.9909	83.4209
73.6578743042103	78.3112658733038	98.2007	80.5294
73.6578743042103	78.3112658733038	98.567	80.2017
73.6578743042103	78.3112658733038	97.3132	81.5365
73.6578743042103	78.3112658733038	98.9119	80.0767
73.6578743042103	78.3112658733038	98.2345	80.86
73.6578743042103	78.3112658733038	93.4941	85.8189
73.6578743042103	78.3112658733038	97.4314	81.946
73.6578743042103	78.3112658733038	93.0994	86.3608
73.6578743042103	78.3112658733038	101.2985	78.2917
73.6578743042103	78.3112658733038	96.9541	82.6989
73.6578743042103	78.3112658733038	97.8831	81.9659
73.6578743042103	78.3112658733038	96.8706	83.0827

Solution x	Solution y	Original x	Original y
73.6578743042103	78.3112658733038	100.0565	80.1054
73.6578743042103	78.3112658733038	97.0865	83.6094
73.6578743042103	78.3112658733038	88.6062	92.2681
73.6578743042103	78.3112658733038	93.1284	88.6615
73.6578743042103	78.3112658733038	93.9684	87.8762
73.6578743042103	78.3112658733038	96.9343	84.943
73.6578743042103	78.3112658733038	92.7178	89.1801
73.6578743042103	78.3112658733038	95.9325	86.7596
73.6578743042103	78.3112658733038	96.2545	87.1498
73.6578743042103	78.3112658733038	101.0606	82.9382
73.6578743042103	78.3112658733038	92.5654	91.5305
73.6578743042103	78.3112658733038	103.6911	80.62
73.6578743042103	78.3112658733038	99.0152	86.155
73.6578743042103	78.3112658733038	97.7943	87.7833
73.6578743042103	78.3112658733038	95.2026	90.5293
73.6578743042103	78.3112658733038	103.8313	82.5056
73.6578743042103	78.3112658733038	103.1106	83.2736
73.6578743042103	78.3112658733038	101.1477	85.2681
73.6578743042103	78.3112658733038	98.3726	88.4744
73.6578743042103	78.3112658733038	96.8345	90.0197
73.6578743042103	78.3112658733038	92.4623	94.734
73.6578743042103	78.3112658733038	102.2936	85.0217
73.6578743042103	78.3112658733038	98.1138	89.594
73.6578743042103	78.3112658733038	107.981	80.0957
73.6578743042103	78.3112658733038	96.5235	92.1962
73.6578743042103	78.3112658733038	102.0461	86.7072
73.6578743042103	78.3112658733038	97.0347	92.0258
73.6578743042103	78.3112658733038	104.3617	84.8664
73.6578743042103	78.3112658733038	100.7126	88.5952
73.6578743042103	78.3112658733038	98.9319	91.3958
73.6578743042103	78.3112658733038	99.3434	90.9979
73.6578743042103	78.3112658733038	98.853	91.6792
73.6578743042103	78.3112658733038	94.0924	96.5838
73.6578743042103	78.3112658733038	98.656	92.6213
73.6578743042103	78.3112658733038	95.504	96.351
73.6578743042103	78.3112658733038	100.5649	91.4192
73.6578743042103	78.3112658733038	100.8882	91.1406
73.6578743042103	78.3112658733038	102.4507	89.6037
73.6578743042103	78.3112658733038	104.5599	87.8351
73.6578743042103	78.3112658733038	99.3782	93.0601
73.6578743042103	78.3112658733038	95.7576	96.9635
73.6578743042103	78.3112658733038	107.2392	85.9448
73.6578743042103	78.3112658733038	95.0373	98.5247
73.6578743042103	78.3112658733038	101.602	92.3175
73.6578743042103	78.3112658733038	102.0076	93.075
73.6578743042103	78.3112658733038	104.3693	90.8389
73.6578743042103	78.3112658733038	100.6204	94.7646
73.6578743042103	78.3112658733038	101.583	94.8217
73.6578743042103	78.3112658733038	98.2349	98.4363
73.6578743042103	78.3112658733038	101.8123	94.891
73.6578743042103	78.3112658733038	103.2876	94.1817
73.6578743042103	78.3112658733038	105.6506	92.4297
73.6578743042103	78.3112658733038	98.8373	99.4165
73.6578743042103	78.3112658733038	95.6122	103.8055
73.6578743042103	78.3112658733038	94.4828	106.1237
73.6578743042103	78.3112658733038	104.1728	96.9352
73.6578743042103	78.3112658733038	103.8628	98.4843
73.6578743042103	78.3112658733038	104.1034	98.3317
37.3129954431178	78.3112656402729	23.9369	61.5866
37.3129954431178	78.3112656402729	22.6268	64.3936
37.3129954431178	78.3112656402729	40.8939	84.3555
37.3129954431178	78.3112656402729	48.9533	90.4759
37.3129954431178	78.3112656402729	42.6808	88.2098
37.3129954431178	78.3112656402729	47.7789	92.5461
37.3129954431178	78.3112656402729	42.9721	90.3177
37.3129954431178	78.3112656402729	43.1057	91.7939
37.3129954431178	78.3112656402729	41.599	92.4813
37.3129954431178	78.3112656402729	44.0393	95.7757
37.3129954431178	78.3112656402729	39.6285	91.4521
37.3129954431178	78.3112656402729	47.126	99.3914
37.3129954431178	78.3112656402729	37.9917	90.5379
37.3129954431178	78.3112656402729	41.6896	94.8028
37.3129954431178	78.3112656402729	46.0729	100.678
37.3129954431178	78.3112656402729	40.9431	96.0349
37.3129954431178	78.3112656402729	51.1106	98.2963
37.3129954431178	78.3112656402729	42.0978	97.503
37.3129954431178	78.3112656402729	37.0706	93.0168
37.3129954431178	78.3112656402729	45.0704	101.2748
37.3129954431178	78.3112656402729	44.7902	101.1589
37.3129954431178	78.3112656402729	42.2565	98.7398

Solution x	Solution y	Original x	Original y
37.3129954431178	78.3112656402729	43.0828	99.6317
37.3129954431178	78.3112656402729	46.5537	103.4177
37.3129954431178	78.3112656402729	37.3296	94.7968
37.3129954431178	78.3112656402729	42.9226	100.4615
37.3129954431178	78.3112656402729	37.1788	95.0118
37.3129954431178	78.3112656402729	42.5793	100.4271
37.3129954431178	78.3112656402729	36.1694	94.3523
37.3129954431178	78.3112656402729	38.2186	96.6747
37.3129954431178	78.3112656402729	40.065	98.6098
37.3129954431178	78.3112656402729	42.8352	101.6931
37.3129954431178	78.3112656402729	39.7333	98.7582
37.3129954431178	78.3112656402729	48.0764	105.8084
37.3129954431178	78.3112656402729	35.2297	94.8683
37.3129954431178	78.3112656402729	45.465	105.2608
37.3129954431178	78.3112656402729	35.9551	95.9225
37.3129954431178	78.3112656402729	39.196	99.7694
37.3129954431178	78.3112656402729	40.2693	101.3043
37.3129954431178	78.3112656402729	35.7481	97.1257
37.3129954431178	78.3112656402729	42.0156	103.5929
37.3129954431178	78.3112656402729	53.9006	102.5381
37.3129954431178	78.3112656402729	38.189	100.3805
37.3129954431178	78.3112656402729	40.5226	102.8002
37.3129954431178	78.3112656402729	35.7859	98.3251
37.3129954431178	78.3112656402729	39.3246	101.8921
37.3129954431178	78.3112656402729	36.8108	99.4487
37.3129954431178	78.3112656402729	33.9629	96.8355
37.3129954431178	78.3112656402729	34.0464	97.1856
37.3129954431178	78.3112656402729	42.4716	105.6496
37.3129954431178	78.3112656402729	42.9285	106.2179
37.3129954431178	78.3112656402729	35.0473	98.5367
37.3129954431178	78.3112656402729	40.9527	105.6227
37.3129954431178	78.3112656402729	33.8351	99.3235
37.3129954431178	78.3112656402729	35.2228	101.4244
37.3129954431178	78.3112656402729	39.1965	105.4524
37.3129954431178	78.3112656402729	35.7306	102.2767
37.3129954431178	78.3112656402729	35.5571	102.295
37.3129954431178	78.3112656402729	35.4006	103.6799
37.3129954431178	78.3112656402729	37.1983	106.347
37.3129954431178	78.3112656402729	31.6341	101.1443
37.3129954431178	78.3112656402729	34.3074	104.3145
37.3129954431178	78.3112656402729	35.7224	107.36
37.3129954431178	78.3112656402729	35.3466	107.7036
37.3129954431178	78.3112656402729	32.8361	107.2479
37.3129954431178	78.3112656402729	31.3011	106.2109
37.3129954431178	78.3112656402729	33.1686	108.6172
37.3129954431178	78.3112656402729	33.1638	109.6815
37.3129954431178	78.3112656402729	28.1717	107.4546
20.1524466016091	78.3112651046877	33.839	67.1668
20.1524466016091	78.3112651046877	35.1535	70.6086
20.1524466016091	78.3112651046877	26.4833	65.6457
20.1524466016091	78.3112651046877	31.7515	71.3679
20.1524466016091	78.3112651046877	32.2488	71.8762
20.1524466016091	78.3112651046877	28.241	67.9653
20.1524466016091	78.3112651046877	31.4906	71.3219
20.1524466016091	78.3112651046877	31.4455	71.7336
20.1524466016091	78.3112651046877	31.0449	71.9995
20.1524466016091	78.3112651046877	26.4747	67.9787
20.1524466016091	78.3112651046877	32.697	74.6737
20.1524466016091	78.3112651046877	25.7737	68.9159
20.1524466016091	78.3112651046877	26.4587	69.6793
20.1524466016091	78.3112651046877	26.9783	71.0141
20.1524466016091	78.3112651046877	22.8228	67.5784
20.1524466016091	78.3112651046877	27.6433	72.5657
20.1524466016091	78.3112651046877	31.4187	76.5703
20.1524466016091	78.3112651046877	34.9317	80.2335
20.1524466016091	78.3112651046877	31.105	77.2121
20.1524466016091	78.3112651046877	27.2709	73.9256
20.1524466016091	78.3112651046877	26.2205	72.9044
20.1524466016091	78.3112651046877	22.9431	70.0987
20.1524466016091	78.3112651046877	33.517	80.8699
20.1524466016091	78.3112651046877	24.5354	72.6275
20.1524466016091	78.3112651046877	18.9682	67.082
20.1524466016091	78.3112651046877	24.5076	73.115
20.1524466016091	78.3112651046877	22.1344	71.2137
20.1524466016091	78.3112651046877	24.1578	73.3792
20.1524466016091	78.3112651046877	22.0857	71.4539
20.1524466016091	78.3112651046877	25.4767	75.481
20.1524466016091	78.3112651046877	23.527	73.6169
20.1524466016091	78.3112651046877	26.6151	77.1467
20.1524466016091	78.3112651046877	24.7401	75.4523

Solution x	Solution y	Original x	Original y
20.1524466016091	78.3112651046877	24.4797	75.354
20.1524466016091	78.3112651046877	25.3366	76.538
20.1524466016091	78.3112651046877	29.376	80.5861
20.1524466016091	78.3112651046877	21.3934	72.6127
20.1524466016091	78.3112651046877	35.4073	87.2216
20.1524466016091	78.3112651046877	16.7224	69.1113
20.1524466016091	78.3112651046877	22.8762	75.7017
20.1524466016091	78.3112651046877	18.2654	71.5277
20.1524466016091	78.3112651046877	23.796	77.2181
20.1524466016091	78.3112651046877	14.7433	68.1941
20.1524466016091	78.3112651046877	24.3218	77.9732
20.1524466016091	78.3112651046877	14.5018	68.1646
20.1524466016091	78.3112651046877	14.0233	68.3418
20.1524466016091	78.3112651046877	12.5389	66.9051
20.1524466016091	78.3112651046877	13.2613	67.7948
20.1524466016091	78.3112651046877	12.0097	66.7734
20.1524466016091	78.3112651046877	11.4442	66.9869
20.1524466016091	78.3112651046877	15.0856	70.6386
20.1524466016091	78.3112651046877	12.0587	67.8257
20.1524466016091	78.3112651046877	21.1184	76.9048
20.1524466016091	78.3112651046877	27.1736	83.2653
20.1524466016091	78.3112651046877	11.4886	67.7219
20.1524466016091	78.3112651046877	10.7344	66.9849
20.1524466016091	78.3112651046877	34.7819	91.1147
20.1524466016091	78.3112651046877	33.2241	90.2072
20.1524466016091	78.3112651046877	35.4152	92.5489
20.1524466016091	78.3112651046877	32.6009	89.9531
20.1524466016091	78.3112651046877	33.1881	90.5996
20.1524466016091	78.3112651046877	15.4332	72.9689
20.1524466016091	78.3112651046877	18.7356	77.2891
20.1524466016091	78.3112651046877	33.6244	92.4492
20.1524466016091	78.3112651046877	10.9416	69.7746
20.1524466016091	78.3112651046877	32.1756	91.0244
20.1524466016091	78.3112651046877	11.6475	70.8021
20.1524466016091	78.3112651046877	34.0163	93.2553
20.1524466016091	78.3112651046877	10.0835	69.723
20.1524466016091	78.3112651046877	32.8593	93.0881
20.1524466016091	78.3112651046877	32.2034	92.5655
20.1524466016091	78.3112651046877	23.4089	84.0628
20.1524466016091	78.3112651046877	9.1707	70.0865
20.1524466016091	78.3112651046877	34.0458	95.0903
20.1524466016091	78.3112651046877	29.5221	90.7635
20.1524466016091	78.3112651046877	9.3844	71.5303
20.1524466016091	78.3112651046877	13.7649	76.0563
20.1524466016091	78.3112651046877	12.73	75.2001
20.1524466016091	78.3112651046877	30.8807	93.5109
20.1524466016091	78.3112651046877	8.8648	72.0358
20.1524466016091	78.3112651046877	9.4578	72.6847
20.1524466016091	78.3112651046877	31.4281	94.9219
20.1524466016091	78.3112651046877	17.9606	81.6588
20.1524466016091	78.3112651046877	7.0214	70.8048
20.1524466016091	78.3112651046877	8.3117	72.2049
20.1524466016091	78.3112651046877	9.0002	73.0359
20.1524466016091	78.3112651046877	29.7064	94.0211
20.1524466016091	78.3112651046877	29.3468	93.7461
20.1524466016091	78.3112651046877	33.0573	97.9271
20.1524466016091	78.3112651046877	31.6916	96.8159
20.1524466016091	78.3112651046877	30.7482	95.8761
20.1524466016091	78.3112651046877	31.7064	96.988
20.1524466016091	78.3112651046877	32.4952	97.9758
20.1524466016091	78.3112651046877	9.9143	75.8382
20.1524466016091	78.3112651046877	7.5677	74.3816
20.1524466016091	78.3112651046877	29.1897	96.4145
20.1524466016091	78.3112651046877	6.6564	74.2265
20.1524466016091	78.3112651046877	29.7849	97.5299
20.1524466016091	78.3112651046877	6.0914	73.9114
20.1524466016091	78.3112651046877	8.0472	76.1743
20.1524466016091	78.3112651046877	4.0089	72.186
20.1524466016091	78.3112651046877	26.6904	96.1713
20.1524466016091	78.3112651046877	26.1674	96.1159
20.1524466016091	78.3112651046877	28.2891	98.27
20.1524466016091	78.3112651046877	26.55	96.735
20.1524466016091	78.3112651046877	29.8552	101.3038
20.1524466016091	78.3112651046877	30.1816	102.1772
20.1524466016091	78.3112651046877	26.9511	99.1097
20.1524466016091	78.3112651046877	21.5395	100.4343
20.1524466016091	78.3112651046877	2.7376	84.0979
20.1524466016091	78.3112651046877	7.8142	89.6258
20.1524466016091	78.3112651046877	5.8502	91.8647
20.1524466016091	78.3112651046877	3.5998	89.8159

Solution x	Solution y	Original x	Original y
20.1524466016091	78.3112651046877	3.5503	90.3653
20.1524466016091	78.3112651046877	-1.2335	86.0108
20.1524466016091	78.3112651046877	2.5704	90.3092
20.1524466016091	78.3112651046877	9.17	97.1621
20.1524466016091	78.3112651046877	4.7737	93.7785
20.1524466016091	78.3112651046877	1.2023	90.7259
20.1524466016091	78.3112651046877	-4.1255	85.596
20.1524466016091	78.3112651046877	6.3198	96.0864
20.1524466016091	78.3112651046877	3.4538	93.5151
20.1524466016091	78.3112651046877	-0.1009	90.0487
20.1524466016091	78.3112651046877	0.6193	91.0377
20.1524466016091	78.3112651046877	-0.7351	89.6931
20.1524466016091	78.3112651046877	3.5924	94.7451
20.1524466016091	78.3112651046877	1.1743	92.9818
20.1524466016091	78.3112651046877	-2.3037	90.7079
20.1524466016091	78.3112651046877	8.1477	101.1634
20.1524466016091	78.3112651046877	0.5802	93.7511
20.1524466016091	78.3112651046877	-0.0468	93.7668
20.1524466016091	78.3112651046877	1.6453	95.7178
20.1524466016091	78.3112651046877	4.9579	99.4405
20.1524466016091	78.3112651046877	2.1469	96.6722
20.1524466016091	78.3112651046877	-2.5612	92.1356
20.1524466016091	78.3112651046877	0.6138	95.4238
20.1524466016091	78.3112651046877	3.1184	98.924
20.1524466016091	78.3112651046877	-1.9602	93.9224
20.1524466016091	78.3112651046877	8.0611	104.093
20.1524466016091	78.3112651046877	1.4019	97.5847
20.1524466016091	78.3112651046877	-2.1508	94.1499
20.1524466016091	78.3112651046877	2.5533	99.1767
20.1524466016091	78.3112651046877	3.811	100.5395
20.1524466016091	78.3112651046877	-0.171	97.1566
20.1524466016091	78.3112651046877	-0.339	97.1979
20.1524466016091	78.3112651046877	3.1448	100.72
20.1524466016091	78.3112651046877	-0.3116	97.6012
20.1524466016091	78.3112651046877	-3.2639	94.8889
20.1524466016091	78.3112651046877	-3.1358	95.2162
20.1524466016091	78.3112651046877	-1.8619	98.5581
20.1524466016091	78.3112651046877	-6.686	94.6391
20.1524466016091	78.3112651046877	-5.5457	98.4014
20.1524466016091	78.3112651046877	3.0162	107.1796
20.1524466016091	78.3112651046877	-7.5489	96.9207
20.1524466016091	78.3112651046877	-12.8049	93.8535
22.3919786638281	62.2427744654881	14.2076	63.0144
22.3919786638281	62.2427744654881	15.1112	64.361
22.3919786638281	62.2427744654881	14.2239	63.9607
22.3919786638281	62.2427744654881	15.3124	65.205
22.3919786638281	62.2427744654881	10.4334	62.822
22.3919786638281	62.2427744654881	12.0444	66.3239
22.3919786638281	62.2427744654881	12.0877	66.3858
22.3919786638281	62.2427744654881	8.4928	63.9998
22.3919786638281	62.2427744654881	9.6606	65.5604
22.3919786638281	62.2427744654881	10.5042	66.7806
22.3919786638281	62.2427744654881	6.6701	63.5082
22.3919786638281	62.2427744654881	4.7342	63.0935
22.3919786638281	62.2427744654881	4.4426	63.6871
22.3919786638281	62.2427744654881	6.9842	66.7632
22.3919786638281	62.2427744654881	5.2812	65.5492
22.3919786638281	62.2427744654881	0.4838	63.8626
22.3919786638281	62.2427744654881	1.7661	66.5446
22.3919786638281	62.2427744654881	0.3096	68.1954
22.3919786638281	62.2427744654881	-4.2807	74.2616
26.1007731509965	45.6783788712407	9.1569	61.6426
26.1007731509965	45.6783788712407	7.6803	61.1857
30.2320889139781	21.8617356300259	46.5714	10.174
30.2320889139781	21.8617356300259	44.5228	11.8645
30.2320889139781	21.8617356300259	45.8725	14.3747
30.2320889139781	21.8617356300259	44.7075	13.3055
30.2320889139781	21.8617356300259	46.213	15.3079
30.2320889139781	21.8617356300259	47.2642	16.1804
30.2320889139781	21.8617356300259	46.6598	16.011
30.2320889139781	21.8617356300259	43.7231	10.6871
30.2320889139781	21.8617356300259	44.5689	9.75
30.2320889139781	21.8617356300259	43.7175	13.3612
30.2320889139781	21.8617356300259	46.503	16.5426
30.2320889139781	21.8617356300259	43.984	9.2005
30.2320889139781	21.8617356300259	42.7704	10.2739
30.2320889139781	21.8617356300259	47.2412	18.0641
30.2320889139781	21.8617356300259	44.2621	15.3855
30.2320889139781	21.8617356300259	41.9974	13.5778
30.2320889139781	21.8617356300259	44.3034	16.6265

Solution x	Solution y	Original x	Original y
30.2320889139781	21.8617356300259	40.2323	12.6508
30.2320889139781	21.8617356300259	45.9074	18.6439
30.2320889139781	21.8617356300259	45.9242	19.9
30.2320889139781	21.8617356300259	46.7163	23.0055
30.2320889139781	21.8617356300259	40.2335	17.1357
30.2320889139781	21.8617356300259	36.7928	9.6586
30.2320889139781	21.8617356300259	39.7266	17.3977
30.2320889139781	21.8617356300259	40.715	18.8306
30.2320889139781	21.8617356300259	38.0686	7.3443
30.2320889139781	21.8617356300259	47.7428	26.438
30.2320889139781	21.8617356300259	46.7677	27.4481
30.2320889139781	21.8617356300259	47.5893	27.8934
30.2320889139781	21.8617356300259	47.4152	28.2569
30.2320889139781	21.8617356300259	45.985	27.4123
30.2320889139781	21.8617356300259	46.684	28.1154
30.2320889139781	21.8617356300259	33.7832	8.5886
30.2320889139781	21.8617356300259	31.9656	14.6164
30.2320889139781	21.8617356300259	29.4417	11.4808
30.2320889139781	21.8617356300259	46.4115	30.3033
30.2320889139781	21.8617356300259	46.9054	30.8841
30.2320889139781	21.8617356300259	44.6028	29.9319
30.2320889139781	21.8617356300259	29.2451	9.0499
30.2320889139781	21.8617356300259	29.9497	8.0977
30.2320889139781	21.8617356300259	44.1303	30.8739
30.2320889139781	21.8617356300259	45.9581	33.5048
30.2320889139781	21.8617356300259	29.6205	6.6839
30.2320889139781	21.8617356300259	25.9081	14.4892
30.2320889139781	21.8617356300259	28.0443	7.2557
30.2320889139781	21.8617356300259	27.9452	7.0873
30.2320889139781	21.8617356300259	26.246	7.8923
30.2320889139781	21.8617356300259	21.6596	11.213
30.2320889139781	21.8617356300259	44.7872	36.1398
30.2320889139781	21.8617356300259	43.7884	36.8808
30.2320889139781	21.8617356300259	42.8212	36.4305
30.2320889139781	21.8617356300259	23.3217	16.9506
30.2320889139781	21.8617356300259	23.1228	16.7524
30.2320889139781	21.8617356300259	19.6468	14.5775
30.2320889139781	21.8617356300259	27.0312	22.0371
30.2320889139781	21.8617356300259	24.5729	19.8583
30.2320889139781	21.8617356300259	25.2224	21.1268
30.2320889139781	21.8617356300259	35.5392	31.6783
30.2320889139781	21.8617356300259	37.4272	33.8061
30.2320889139781	21.8617356300259	22.0389	18.6688
30.2320889139781	21.8617356300259	40.9959	37.9409
30.2320889139781	21.8617356300259	24.0847	21.2619
30.2320889139781	21.8617356300259	22.5923	19.795
30.2320889139781	21.8617356300259	23.1615	20.5337
30.2320889139781	21.8617356300259	18.1963	16.0602
30.2320889139781	21.8617356300259	20.7311	19.0512
30.2320889139781	21.8617356300259	21.2889	20.2133
30.2320889139781	21.8617356300259	16.9397	16.157
30.2320889139781	21.8617356300259	21.7951	21.835
30.2320889139781	21.8617356300259	21.1889	21.267
30.2320889139781	21.8617356300259	19.0397	19.3917
30.2320889139781	21.8617356300259	20.5046	21.2685
30.2320889139781	21.8617356300259	17.2669	18.1061
30.2320889139781	21.8617356300259	19.4151	20.4264
30.2320889139781	21.8617356300259	20.5322	21.5891
30.2320889139781	21.8617356300259	19.3676	20.9011
30.2320889139781	21.8617356300259	19.4476	21.0876
30.2320889139781	21.8617356300259	28.099	29.8348
30.2320889139781	21.8617356300259	23.1689	25.59
30.2320889139781	21.8617356300259	18.4916	22.031
30.2320889139781	21.8617356300259	19.6457	23.2311
30.2320889139781	21.8617356300259	21.4132	25.3225
30.2320889139781	21.8617356300259	19.5225	24.6717
30.2320889139781	21.8617356300259	20.8129	26.0745
30.2320889139781	21.8617356300259	17.3215	22.815
30.2320889139781	21.8617356300259	22.8581	29.0039
30.2320889139781	21.8617356300259	15.0509	21.8739
30.2320889139781	21.8617356300259	18.7218	26.0511
30.2320889139781	21.8617356300259	19.8821	27.2321
30.2320889139781	21.8617356300259	17.7323	26.9057
30.2320889139781	21.8617356300259	16.9754	26.2994
30.2320889139781	21.8617356300259	7.8039	17.6061
30.2320889139781	21.8617356300259	21.3113	31.7798
30.2320889139781	21.8617356300259	18.7531	32.536
34.7361482886599	16.3367400225207	46.8369	6.4403
34.7361482886599	16.3367400225207	46.0043	6.8606
34.7361482886599	16.3367400225207	45.5397	7.2979

Solution x	Solution y	Original x	Original y
34.7361482886599	16.3367400225207	43.7681	7.8375
34.7361482886599	16.3367400225207	47.0712	4.3382
34.7361482886599	16.3367400225207	44.0031	6.0986
34.7361482886599	16.3367400225207	44.3097	5.4051
34.7361482886599	16.3367400225207	44.2937	4.7268
34.7361482886599	16.3367400225207	45.0418	3.8658
34.7361482886599	16.3367400225207	41.1669	5.3004
34.7361482886599	16.3367400225207	42.4139	3.5597
34.7361482886599	16.3367400225207	43.4311	0.4843
34.7361482886599	16.3367400225207	44.8479	-0.9391
34.7361482886599	16.3367400225207	36.2059	6.8965
34.7361482886599	16.3367400225207	42.4155	0.0668
34.7361482886599	16.3367400225207	36.4235	4.5159
34.7361482886599	16.3367400225207	46.0937	-5.8176
34.7361482886599	16.3367400225207	33.6792	4.7017
34.7361482886599	16.3367400225207	43.0131	-4.6452
34.7361482886599	16.3367400225207	39.9467	-2.3317
34.7361482886599	16.3367400225207	31.7997	5.4917
34.7361482886599	16.3367400225207	30.7839	5.7178
34.7361482886599	16.3367400225207	29.2732	5.6917
34.7361482886599	16.3367400225207	28.1449	5.3771
34.7361482886599	16.3367400225207	33.4349	0.0139
34.7361482886599	16.3367400225207	27.6562	5.4902
34.7361482886599	16.3367400225207	27.2842	5.8331
34.7361482886599	16.3367400225207	31.0707	1.7474
34.7361482886599	16.3367400225207	36.4279	-4.3699
34.7361482886599	16.3367400225207	26.4488	5.1021
34.7361482886599	16.3367400225207	31.1391	0.2266
34.7361482886599	16.3367400225207	32.3564	-1.4633
34.7361482886599	16.3367400225207	28.6989	1.5656
34.7361482886599	16.3367400225207	31.0065	-1.0714
34.7361482886599	16.3367400225207	23.9142	5.5856
34.7361482886599	16.3367400225207	22.0744	6.6433
34.7361482886599	16.3367400225207	31.1128	-2.8096
34.7361482886599	16.3367400225207	25.8989	0.7413
34.7361482886599	16.3367400225207	24.5208	1.7631
34.7361482886599	16.3367400225207	27.3755	-1.0984
34.7361482886599	16.3367400225207	22.4003	2.9895
34.7361482886599	16.3367400225207	24.8641	0.1355
34.7361482886599	16.3367400225207	26.7943	-2.6353
34.7361482886599	16.3367400225207	22.6294	-1.9579
34.7361482886599	16.3367400225207	22.4229	-2.1641
34.7361482886599	16.3367400225207	19.4163	-0.8394
41.0551730091833	14.0926691287739	50.0191	-2.6033
41.0551730091833	14.0926691287739	53.289	-9.6645

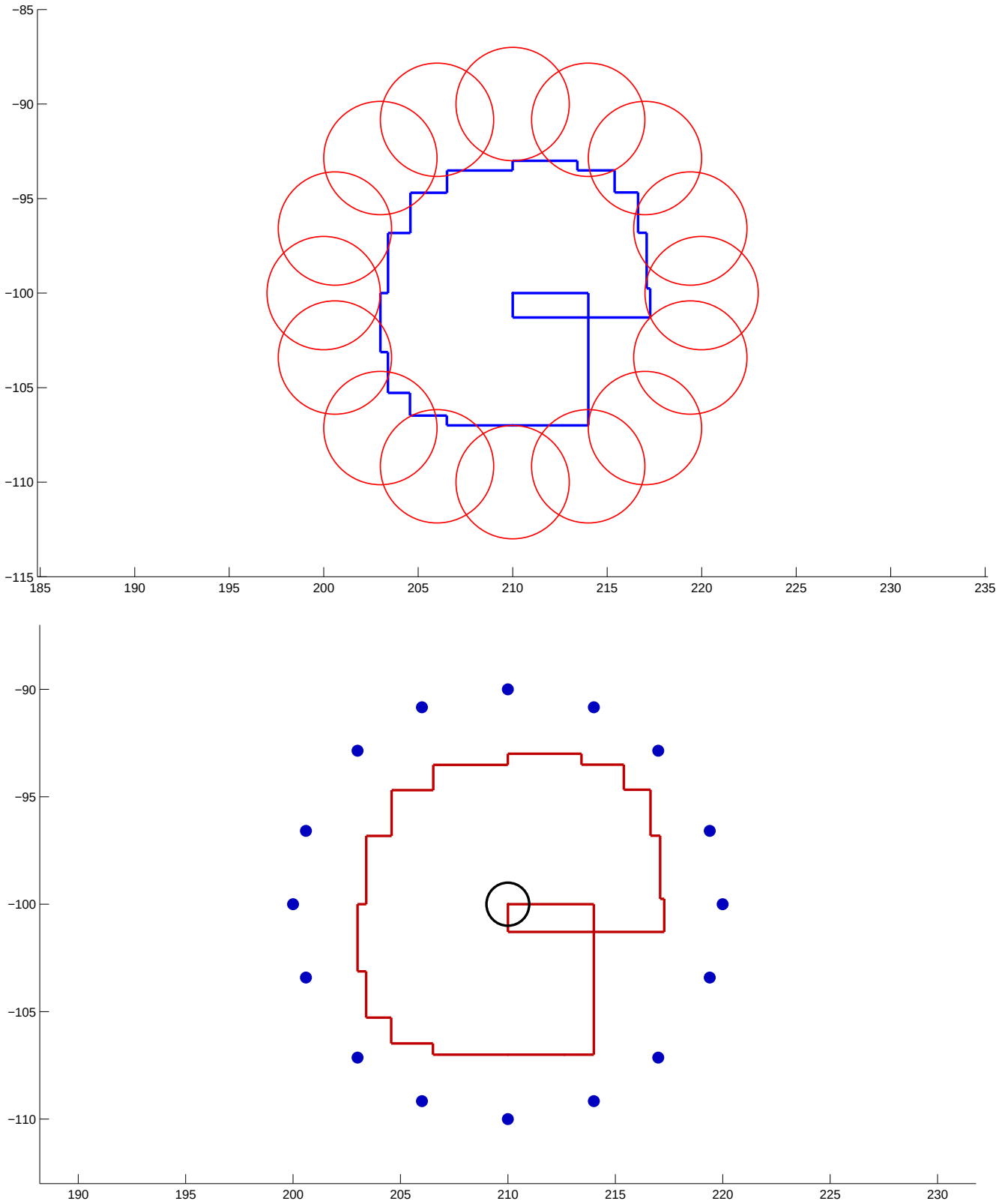


Figure N.133: *concentricCircles*1, Equal Radius, 2D, Manhattan, Length = 67.1448769

Table N-136: Solution for *concentricCircles*1, Equal Radius, 2D, Manhattan

Total distance: 67.1448768795923 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
104.003335373475	106.999998896481	107	107.1414284285
102.638065349221	106.999999357057	104	109.1651513899
99.9999999826841	106.999999817552	100	110
96.5127119741144	106.480635397701	96	109.1651513899
94.5672311443668	105.279715138244	93	107.1414284285
93.4015286899408	103.12389989848	90.6	103.4117444218
93.0000001073835	100.000000003058	90	100
93.4070000789662	96.8233006484983	90.6	96.5882555782
94.5890976023221	94.6916624693623	93	92.8585715715
96.5240686050965	93.5137615328527	96	90.8348486101
99.99999998716	93.0000001072805	100	90
103.423156599163	93.5079279022087	104	90.8348486101
105.396696222765	94.6735132766324	107	92.8585715715
106.635939198022	96.8116861477483	109.4	96.5882555782
107.089345759028	99.752196051988	110	100
107.278763547388	101.290339916045	109.4	103.4117444218

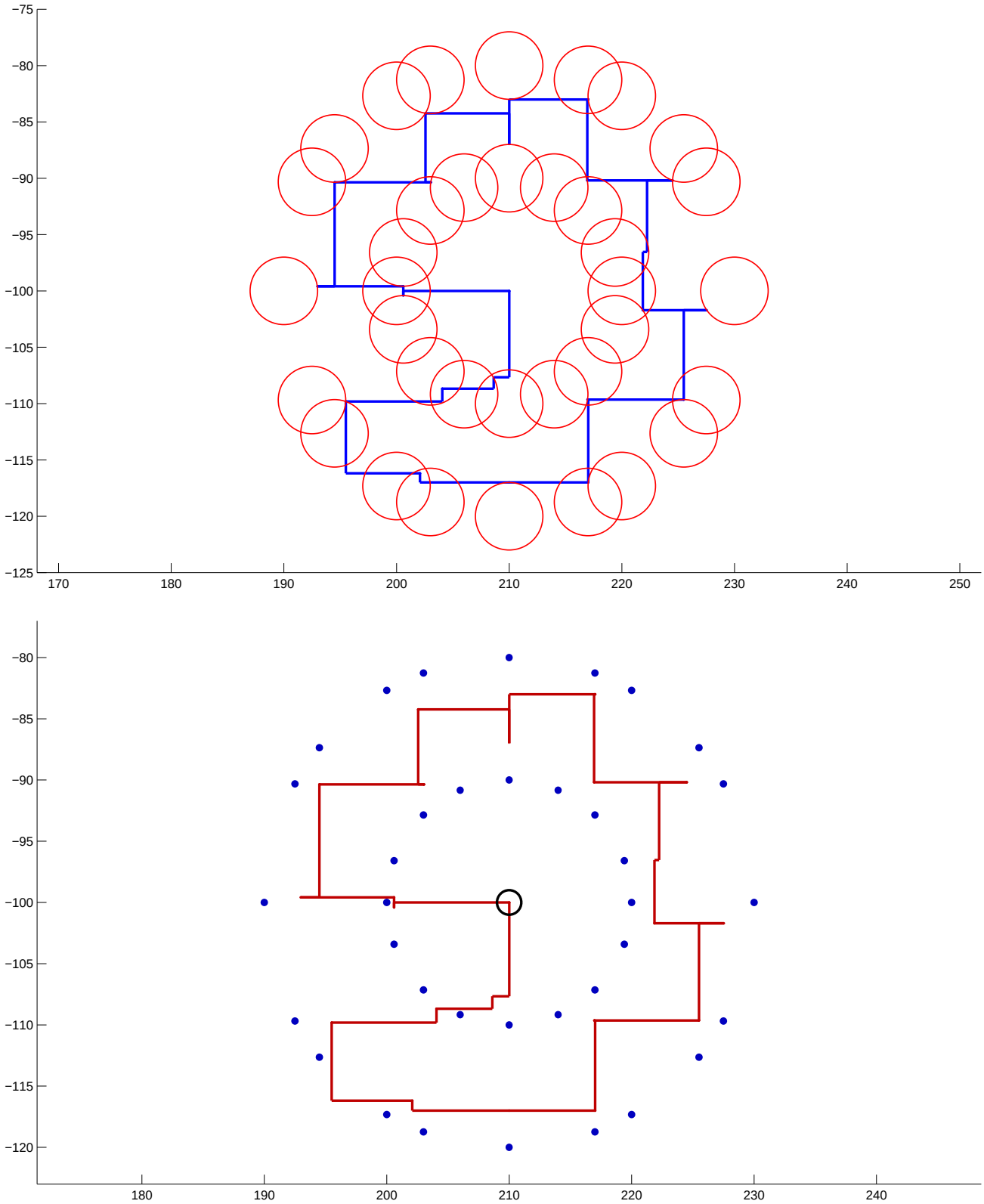


Figure N.134: *concentricCircles*2, Equal Radius, 2D, Manhattan, Length = 178.9802725

Table N-137: Solution for *concentricCircles*2, Equal Radius, 2D, Manhattan

Total distance: 178.980272472889 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
90.6002574860343	100.411743357555	90.6	103.4117444218
90.5979074802088	99.5882557878754	90.6	96.5882555782
90.5979074802088	99.5882557878754	90	100
82.971610838891	99.5882540515738	80	100
84.5000012435643	90.3607757948238	84.5	87.3607753402
84.5000012435643	90.3607757948238	82.5	90.3175416345
93.0376935902619	90.3607743307409	93	92.8585715715
93.0376935902619	90.3607743307409	96	90.8348486101
92.5661556138874	84.2334708365953	90	82.6794919243
92.5661556138874	84.2334708365953	93	81.2650060048
99.9991218991165	86.9999990632837	100	90
100.000969811183	83.0000008631577	100	80
107.017169235531	83.0000031764813	110	82.6794919243
107.017169235531	83.0000031764813	107	81.2650060048
106.929911233028	90.1901573463678	107	92.8585715715
106.929911233028	90.1901573463678	104	90.8348486101
114.502704248922	90.190158324002	115.5	87.3607753402
114.502704248922	90.190158324002	117.5	90.3175416345
112.243141076936	96.5394726376931	109.4	96.5882555782
111.867794608863	101.705872715166	109.4	103.4117444218
111.867794608863	101.705872715166	110	100
117.532205467622	101.705872177903	120	100
115.499995601173	109.639223303731	115.5	112.6392246598
115.499995601173	109.639223303731	117.5	109.6824583655
106.962306982201	109.639225031747	107	107.1414284285
106.962306982201	109.639225031747	104	109.1651513899
107.017168768192	116.99999573857	110	117.3205080757
107.017168768192	116.99999573857	107	118.7349939952
99.9999999656155	116.99999840746	100	120
92.0825500609324	116.191191180362	90	117.3205080757
92.0825500609324	116.191191180362	93	118.7349939952
85.497295463023	109.80984309021	84.5	112.6392246598
85.497295463023	109.80984309021	82.5	109.6824583655
94.0612184370058	108.679186981709	93	107.1414284285
94.0612184370058	108.679186981709	96	109.1651513899
98.6236118444585	107.663592769128	100	110

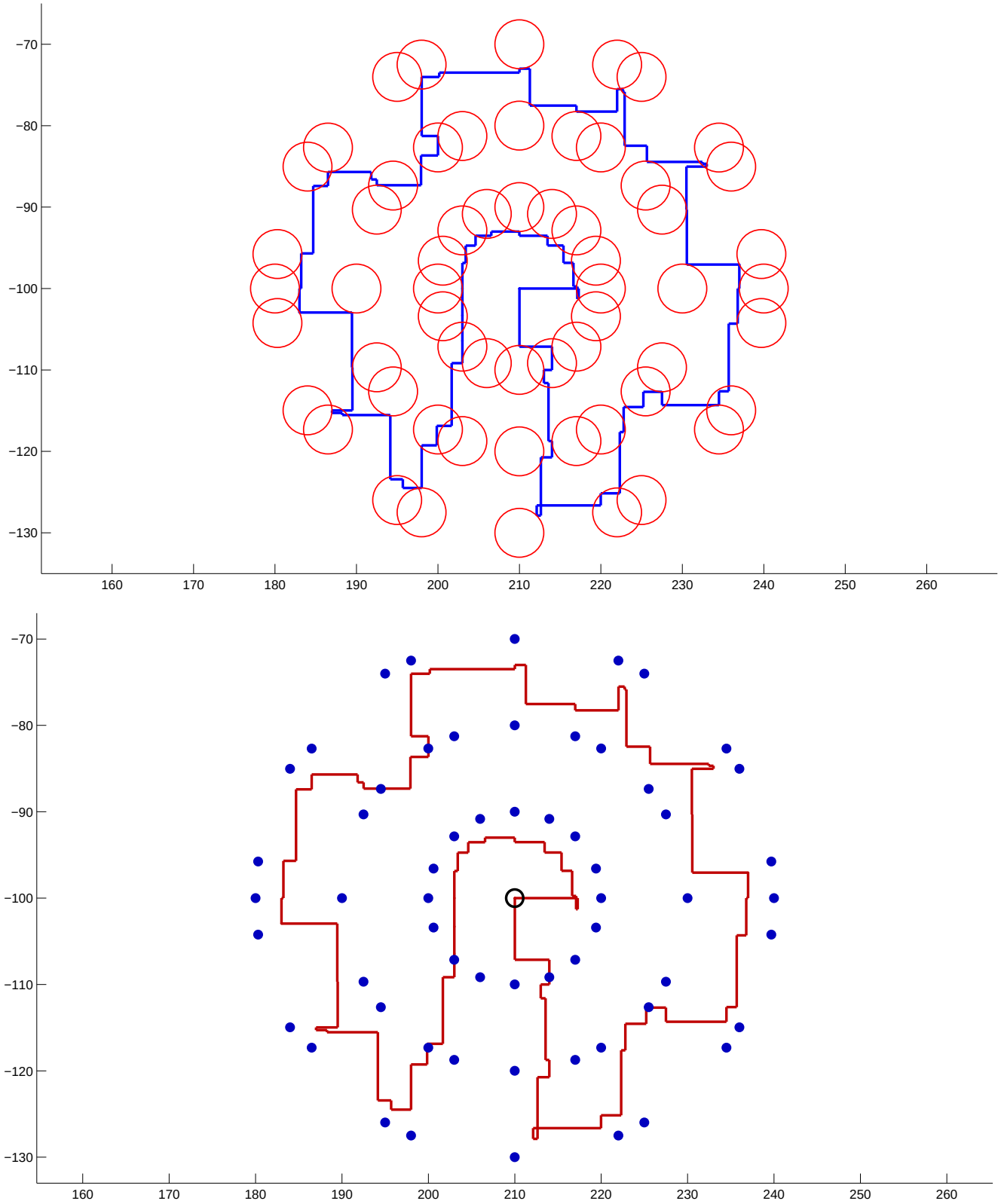


Figure N.135: *concentricCircles*3, Equal Radius, 2D, Manhattan, Length = 329.6879183

Table N-138: Solution for *concentricCircles*3, Equal Radius, 2D, Manhattan

Total distance: 329.68791825993 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
107.278663948832	101.290434518159	109.4	103.4117444218
107.100425361715	99.7560019208196	110	100
106.63171923788	96.8420651414785	109.4	96.5882555782
105.40766401299	94.7140821143924	107	92.8585715715
103.447253211686	93.5201088625482	104	90.8348486101
99.9999998293556	93.0000029616907	100	90
96.5556352553552	93.5242466192522	96	90.8348486101
94.6135718417684	94.7294559063185	93	92.8585715715
93.405890498703	96.8630704858886	90.6	96.5882555782
93.0000024753974	100.000001932128	90	100
93.0000006591518	103.302515051025	90.6	103.4117444218
92.9999988447061	106.418038931802	93	107.1414284285
92.9999970295892	109.165141323268	96	109.1651513899
91.6801052741598	116.864448215316	93	118.7349939952
89.8582737999774	119.262008068278	90	117.3205080757
87.9999997975463	124.495449947247	88	127.4954541697
85.6898814211499	123.425664664157	85	125.9807621135
84.1494107734108	115.534157394995	84.5	112.6392246598
78.2675202002103	115.276258938205	76.5	117.3132896932
77.0000033389889	114.966602666433	74	114.9666295471
79.4999968412504	109.682510955231	82.5	109.6824583655
79.452193460116	102.946622040323	80	100
73.0045118241908	102.937092728666	70.3	104.2320207939
73.0000026651795	100.000000122537	70	100
73.2202232783884	95.6827821614912	70.3	95.7679792061
74.6855835907587	87.412877085973	74	85.0333704529
76.5000046928442	85.6867125865125	76.5	82.6867103068
81.8132582643408	86.602742740532	84.5	87.3607753402
82.4999859835173	87.317539159375	82.5	90.3175416345
87.9257794020141	83.6575557498805	90	82.6794919243
89.9999974776865	81.2650027808422	93	81.2650060048
88.0000022893506	74.0192045952887	85	74.0192378865
90.1637911951732	73.4864629232812	88	72.5045458303
100.000005645818	73.000002664776	100	70
101.287104360017	77.5342197094961	100	80
106.999999054765	78.2650029799804	107	81.2650060048
111.999994881373	75.5045490164795	112	72.5045458303
112.710597793331	75.8407232308925	115	74.0192378865
112.919160671012	82.4578144119115	110	82.6794919243
115.654830065851	84.4535602503385	115.5	87.3607753402
122.453555802361	84.6823669155762	124.5	82.6867103068
122.999995956605	85.0333703033219	126	85.0333704529
120.500003764263	90.3175422562162	117.5	90.3175416345
120.547115286304	97.0532133855387	120	100
126.995607012516	97.0626592128887	129.7	95.7679792061
126.99999525609	99.9999999813811	130	100
126.796445683167	104.309688696758	129.7	104.2320207939
125.69148740258	112.614011809918	126	114.9666295471
124.499962436333	114.313284516013	124.5	117.3132896932
117.500006346128	112.682462825488	117.5	109.6824583655
115.216710811509	114.548373212256	115.5	112.6392246598
112.79794801366	117.625901228209	110	117.3205080757
112.318171607125	125.143182056141	115	125.9807621135
109.982924915548	126.639016549753	112	127.4954541697
102.12131890176	127.878671409088	100	130
102.632734866268	120.731204058389	100	120
103.999995673029	118.734995301847	107	118.7349939952
103.565508880944	111.60433855901	104	109.1651513899
103.000003705918	110.000002592254	100	110
103.999996167016	107.141427999436	107	107.1414284285

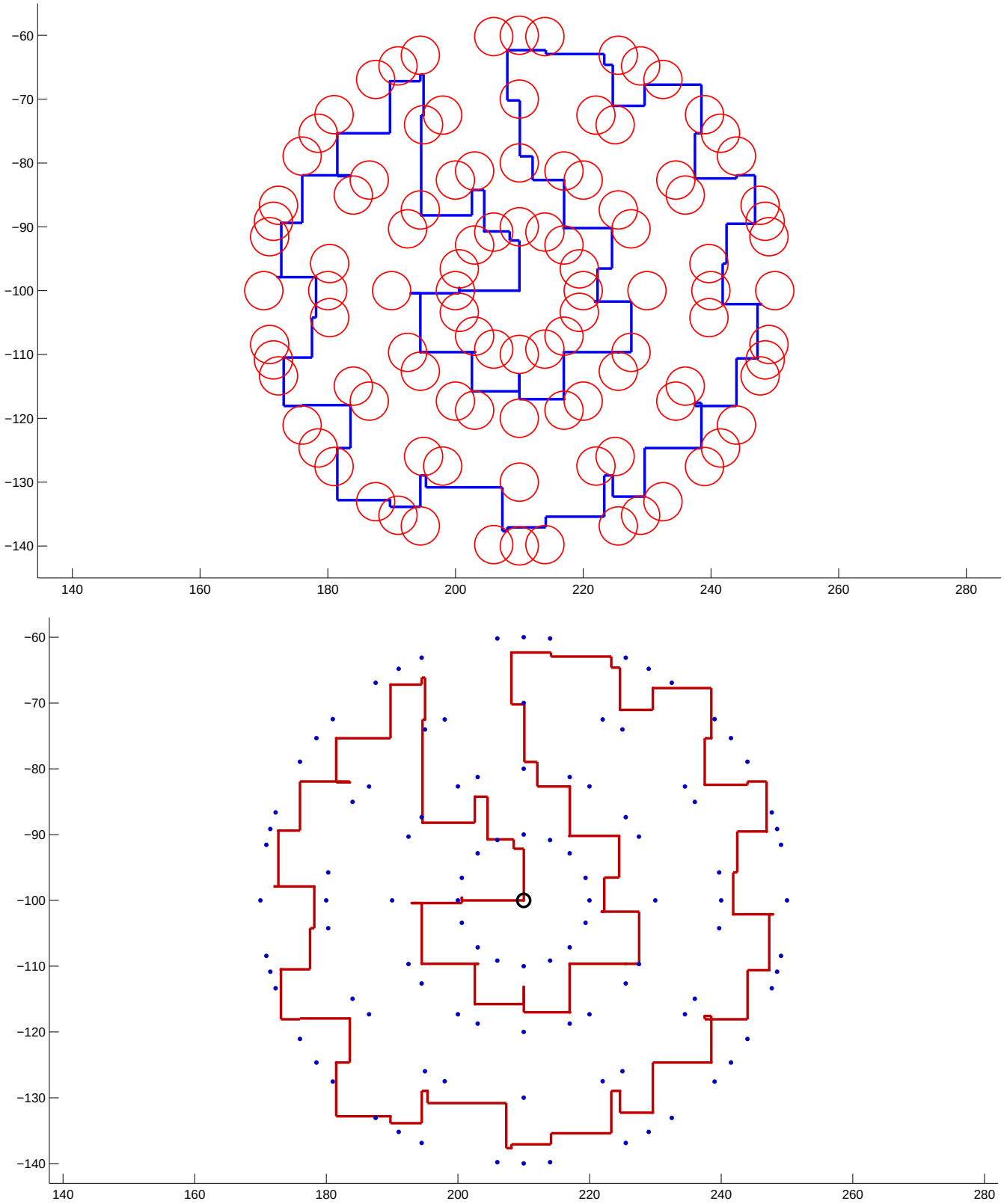


Figure N.136: *concentricCircles*4, Equal Radius, 2D, Manhattan, Length = 556.5211162

Table N-139: Solution for *concentricCircles*4, Equal Radius, 2D, Manhattan

Total distance: 556.521116172519 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
90.6004222299093	99.5882579374569	90.6	96.5882555782
90.6004222299093	99.5882579374569	90	100
90.595714705849	100.411746942249	90.6	103.4117444218
82.9716114562905	100.411751333198	80	100
84.5000032339317	109.639222961468	84.5	112.6392246598
84.5000032339317	109.639222961468	82.5	109.6824583655
93.0376919362138	109.63922668023	93	107.1414284285
93.0376919362138	109.63922668023	96	109.1651513899
92.5661567518471	115.766527080854	90	117.3205080757
92.5661567518471	115.766527080854	93	118.7349939952
99.9987920056214	113.000002708318	100	110
100.001350084379	116.999997121744	100	120
107.017167736701	116.999991036873	110	117.3205080757
107.017167736701	116.999991036873	107	118.7349939952
106.962308326093	109.639226222246	107	107.1414284285
106.962308326093	109.639226222246	104	109.1651513899
115.499997918241	109.639222354985	115.5	112.6392246598
115.499997918241	109.639222354985	117.5	109.6824583655
117.532204013267	101.70587276087	120	100
111.867797442586	101.705874118724	109.4	103.4117444218
111.867797442586	101.705874118724	110	100
112.238309254782	96.5300328676917	109.4	96.5882555782
114.502702770122	90.1901590213724	115.5	87.3607753402
114.502702770122	90.1901590213724	117.5	90.3175416345
106.929912521965	90.1901565259084	107	92.8585715715
106.929912521965	90.1901565259084	104	90.8348486101
106.999997472041	82.6794920136695	110	82.6794919243
106.999997472041	82.6794920136695	107	81.2650060048
102.062302246688	78.9525137016459	100	80
100.0813456949	70.206042093146	100	70
98.1213407848834	62.3218054357131	96	60.2005025157
98.1213407848834	62.3218054357131	100	60
104.145667879183	62.941352337863	104	60.2005025157
113.292026605222	64.6208743521629	115.5	63.125211865
114.620117432752	71.0433842756001	115	74.0192378865
114.620117432752	71.0433842756001	112	72.5045458303
119.611283507359	67.7376327827073	122.5	66.9281086117
119.611283507359	67.7376327827073	119	64.8005681864
128.499996883901	75.3474196220641	129	72.4500453721
128.499996883901	75.3474196220641	131.5	75.3474139288
127.488906064179	82.42891709846	124.5	82.6867103068
127.488906064179	82.42891709846	126	85.0333704529
133.999999076478	81.9286957819509	134	78.9286924943
136.899886461149	89.5230926744991	137.7	86.6317540418
136.899886461149	89.5230926744991	138.5	89.1487327929
136.899886461149	89.5230926744991	139.1	91.5625833337
132.434305735271	95.7600892623246	129.7	95.7679792061
131.826678868131	102.11606745748	129.7	104.2320207939
131.826678868131	102.11606745748	130	100
137.873319690113	102.115952272987	140	100
137.296783154265	110.613956720139	137.7	113.3682459582
137.296783154265	110.613956720139	138.5	110.8512672071
137.296783154265	110.613956720139	139.1	108.4374166663
133.999998372805	118.071303359947	134	121.0713075057
127.488906777706	117.571083263628	124.5	117.3132896932
127.488906777706	117.571083263628	126	114.9666295471
128.499995835958	124.652583447518	129	127.5499546279
128.499995835958	124.652583447518	131.5	124.6525860712
119.611282538458	132.262365531866	122.5	133.0718913883
119.611282538458	132.262365531866	119	135.1994318136
114.620118096909	128.956616955383	115	125.9807621135
114.620118096909	128.956616955383	112	127.4954541697
113.298799783849	135.404293326573	115.5	136.874788135
104.138183082808	137.079968558473	104	139.7994974843
98.1118313832867	137.668725311992	96	139.7994974843
98.1118313832867	137.668725311992	100	140
97.33986158986	130.811715416579	100	130
85.3798821654385	128.956616285951	85	125.9807621135
85.3798821654385	128.956616285951	88	127.4954541697
84.499998492494	133.874784716207	84.5	136.874788135
79.745352695996	132.821130842944	77.5	133.0718913883
79.745352695996	132.821130842944	81	135.1994318136
71.5000028621091	124.652594620404	71	127.5499546279
71.5000028621091	124.652594620404	68.5	124.6525860712
73.5651128867033	117.93494365426	74	114.9666295471
73.5651128867033	117.93494365426	76.5	117.3132896932
66.0000004673537	118.07130480915	66	121.0713075057
63.1001113840676	110.476907822064	62.3	113.3682459582
63.1001113840676	110.476907822064	61.5	110.8512672071
63.1001113840676	110.476907822064	60.9	108.4374166663
67.5298791073125	104.228479366845	70.3	104.2320207939
68.1733220843337	97.8839314653085	70.3	95.7679792061
68.1733220843337	97.8839314653085	70	100
62.1266761637605	97.8840459549111	60	100
62.717806286189	89.3892584488977	62.3	86.6317540418
62.717806286189	89.3892584488977	61.5	89.1487327929
62.717806286189	89.3892584488977	60.9	91.5625833337
66.0000003940164	81.9286943373782	66	78.9286924943
73.5651135199051	82.0650569270693	74	85.0333704529
73.5651135199051	82.0650569270693	76.5	82.6867103068
71.5000018192418	75.3474078295826	71	72.4500453721
71.5000018192418	75.3474078295826	68.5	75.3474139288
79.7494058675934	67.1938120080298	77.5	66.9281086117
79.7494058675934	67.1938120080298	81	64.8005681864
84.4999983104058	66.1252137579743	84.5	63.125211865
84.9999980151379	72.5045463425192	85	74.0192378865
84.9999980151379	72.5045463425192	88	72.5045458303
84.6213211991896	88.1962190576975	84.5	87.3607753402
84.6213211991896	88.1962190576975	82.5	90.3175416345
92.5661551888481	84.2334722190542	90	82.6794919243
92.5661551888481	84.2334722190542	93	81.2650060048
94.4966930339225	90.7244944057912	93	92.8585715715
94.4966930339225	90.7244944057912	96	90.8348486101
98.4811917526134	92.1492943766885	100	90

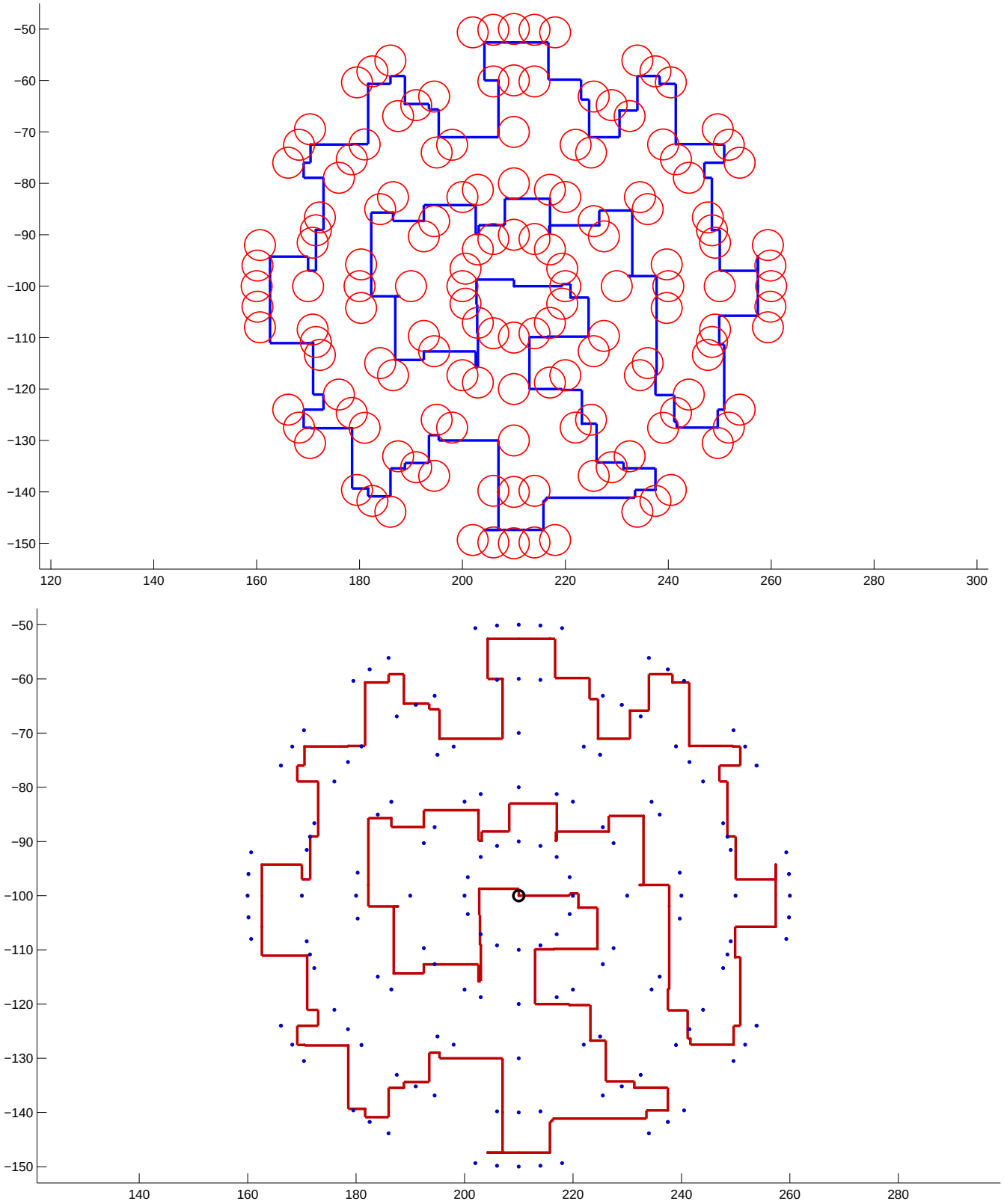


Figure N.137: *concentricCircles*5, Equal Radius, 2D, Manhattan, Length = 786.4112373

Table N-140: Solution for *concentricCircles*5, Equal Radius, 2D, Manhattan

Total distance: 786.411237311941 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
109.399999129746	99.5882589072156	109.4	96.5882555782
110.998723683029	102.213480332415	109.4	103.4117444218
110.998723683029	102.213480332415	110	100
114.502702051217	109.809842872915	115.5	112.6392246598
114.502702051217	109.809842872915	117.5	109.6824583655
106.419878726749	109.898167474404	107	107.1414284285
106.419878726749	109.898167474404	104	109.1651513899
103.000003265029	110.000028346306	100	110
103.000003496469	119.999984090022	100	120
109.35673898434	120.192330460193	110	117.3205080757
109.35673898434	120.192330460193	107	118.7349939952
113.200519659816	126.730848420506	115	125.9807621135
113.200519659816	126.730848420506	112	127.4954541697
116.055211452506	134.262350749666	115.5	136.874788135
121.303923412225	135.412934786442	122.5	133.0718913883
121.303923412225	135.412934786442	119	135.1994318136
127.499994950444	139.620070394068	130.5	139.6200706713
127.499994950444	139.620070394068	127.5	141.7582327212
123.546058197822	141.119084109694	124	143.8634243989
106.223024536363	141.656111866297	104	139.7994974843
105.733030222956	147.390942252963	108	149.355850717
105.733030222956	147.390942252963	104	149.8397431775
99.9970664596591	147.390946499342	100	150
94.2669793065612	147.390950737077	92	149.355850717
94.2669793065612	147.390950737077	96	149.8397431775
96.999995796995	139.999999779932	96	139.7994974843
96.999995796995	139.999999779932	100	140
96.9999961757367	130.000001999357	100	130
85.3798816773963	128.956616852968	85	125.9807621135
85.3798816773963	128.956616852968	88	127.4954541697
83.4892149806363	134.377980404595	84.5	136.874788135
78.8136997534665	135.429090515214	77.5	133.0718913883
78.8136997534665	135.429090515214	81	135.1994318136
75.9999998580709	140.863420378825	76	143.8634243989
71.6688022076983	139.331798435912	69.5	139.6200706713
71.6688022076983	139.331798435912	72.5	141.7582327212
68.5568831076253	127.625988941573	71	127.5499546279
68.5568831076253	127.625988941573	68.5	124.6525860712
60.4749819534584	127.529595030974	60.3799293287	130.5
60.4749819534584	127.529595030974	58.2417672788	127.5
59.1365788483648	124.000000091154	56.1365756011	124
62.9999967966811	121.071307055503	66	121.0713075057
60.9662185715903	111.07667814036	62.3	113.3682459582
60.9662185715903	111.07667814036	61.5	110.8512672071
60.9662185715903	111.07667814036	60.9	108.4374166663
52.609055080367	105.733030545572	50.644149283	108
52.609055080367	105.733030545572	50.1602568225	104
52.6090508495599	99.9967119968562	50	100
52.6090466250442	94.266978919039	50.644149283	92
52.6090466250442	94.266978919039	50.1602568225	96
59.9999991025368	96.9999973547078	60	100
61.5274562121567	89.0700174063443	62.3	86.6317540418
61.5274562121567	89.0700174063443	61.5	89.1487327929
61.5274562121567	89.0700174063443	60.9	91.5625833337
62.9999976568753	78.9286929366427	66	78.9286924943
59.1365778550923	75.9999999343338	56.1365756011	76
60.4765454306061	72.4710511554572	60.3799293287	69.5
60.4765454306061	72.4710511554572	58.2417672788	72.5
68.5574244972345	72.3737325691359	71	72.4500453721
68.5574244972345	72.3737325691359	68.5	75.3474139288
71.6717673941461	60.6733456031079	69.5	60.3799293287
71.6717673941461	60.6733456031079	72.5	58.2417672788
75.9999998408915	59.1365778540915	76	56.1365756011
78.8157120513032	64.5653514363075	77.5	66.9281086117
78.8157120513032	64.5653514363075	81	64.8005681864
83.479621864471	65.6233704209603	84.5	63.125211865
85.379882316983	71.0433843401926	85	74.0192378865
85.379882316983	71.0433843401926	88	72.5045458303
96.9999974334979	69.9999975736776	100	70
96.9999974546127	60.0000001705454	96	60.2005025157
96.9999974546127	60.0000001705454	100	60
94.2669789329223	52.6090466455095	92	50.644149283
94.2669789329223	52.6090466455095	96	50.1602568225
99.9967274562216	52.609050870337	100	50
105.733030566216	52.609055101356	108	50.644149283
105.733030566216	52.609055101356	104	50.1602568225
106.696488991653	59.8412382562376	104	60.2005025157
113.052522243339	63.7327110627256	115.5	63.125211865
114.620117930654	71.0433836932154	115	74.0192378865
114.620117930654	71.0433836932154	112	72.5045458303
120.521488005994	65.8520745639911	122.5	66.9281086117
120.521488005994	65.8520745639911	119	64.8005681864
124.000000089759	59.1365788456999	124	56.1365756011
128.327143328793	60.6712026353122	130.5	60.3799293287
128.327143328793	60.6712026353122	127.5	58.2417672788
131.442569838959	72.3740071457894	129	72.4500453721
131.442569838959	72.3740071457894	131.5	75.3474139288
139.524968878342	72.4701424715076	139.6200706713	69.5
139.524968878342	72.4701424715076	141.7582327212	72.5
140.863420377281	75.9999999571122	143.8634243989	76
137.000003771694	78.9286931257703	134	78.9286924943
138.469023044286	89.0704934600625	137.7	86.6317540418
138.469023044286	89.0704934600625	138.5	89.1487327929
138.469023044286	89.0704934600625	139.1	91.5625833337
140.000001156104	96.9999957217989	140	100
147.390950702699	94.2669792776515	149.355850717	92
147.390950702699	94.2669792776515	149.8397431775	96
147.390946473597	99.9963914153624	150	100
147.390942234797	105.733030260991	149.355850717	108
147.390942234797	105.733030260991	149.8397431775	104
139.900115183254	111.328755749408	137.7	113.3682459582
139.900115183254	111.328755749408	138.5	110.8512672071
139.900115183254	111.328755749408	139.1	108.4374166663
140.863419397638	123.999998166048	143.8634243989	124
139.620070126839	127.499994949876	139.6200706713	130.5
139.620070126839	127.499994949876	141.7582327212	127.5
131.631514871523	126.393597022403	129	127.5499546279
131.631514871523	126.393597022403	131.5	124.6525860712
131.151411816972	121.166700278551	134	121.0713075057
127.500004214175	117.313288681499	124.5	117.3132896932
127.500004214175	117.313288681499	126	114.9666295471
127.73398511561	101.966010147021	129.7	104.2320207939
127.73398511561	101.966010147021	130	100
127.733986737221	98.0339922453237	129.7	95.7679792061
122.266020803548	98.0339959741575	120	100
123.011093535144	85.2911638937663	124.5	82.6867103068
123.011093535144	85.2911638937663	126	85.0333704529
116.58679577712	88.1817603826045	115.5	87.3607753402
116.58679577712	88.1817603826045	117.5	90.3175416345
106.838203952595	89.8629346428391	107	92.8585715715
106.838203952595	89.8629346428391	104	90.8348486101
107.017167771806	83.0000076645541	110	82.6794919243
107.017167771806	83.0000076645541	107	81.2650060048
100.000000719624	83.0000028358017	100	80
98.2410269115684	88.1500053136663	100	90
93.1617987091319	89.8629349961546	93	92.8585715715
93.1617987091319	89.8629349961546	96	90.8348486101
92.5661556517644	84.2334728462998	90	82.6794919243
92.5661556517644	84.2334728462998	93	81.2650060048
82.5000009913679	87.3175389412392	84.5	87.3607753402
82.5000009913679	87.3175389412392	82.5	90.3175416345
76.4999995860786	85.6867128076906	74	85.0333704529
76.4999995860786	85.6867128076906	76.5	82.6867103068
72.2660132383988	98.0339896864072	70.3	95.7679792061
72.2660132383988	98.0339896864072	70	100
72.266011595648	101.9660076889	70.3	104.2320207939
77.7339801903117	101.966003947068	80	100
76.9348874500797	114.344975032938	74	114.9666295471
76.9348874500797	114.344975032938	76.5	117.3132896932
82.5000012688221	112.682461517786	84.5	112.6392246598
82.5000012688221	112.682461517786	82.5	109.6824583655
92.5661559475795	115.766526379503	90	117.3205080757
92.5661559475795	115.766526379503	93	118.7349939952
92.9999967735183	109.165150933861	93	107.1414284285
92.9999967735183	109.165150933861	96	109.1651513899
92.8535461523418	103.595102791085	90.6	103.4117444218
92.7124547698163	98.718408776904	90.6	96.5882555782
92.7124547698163	98.718408776904	90	100

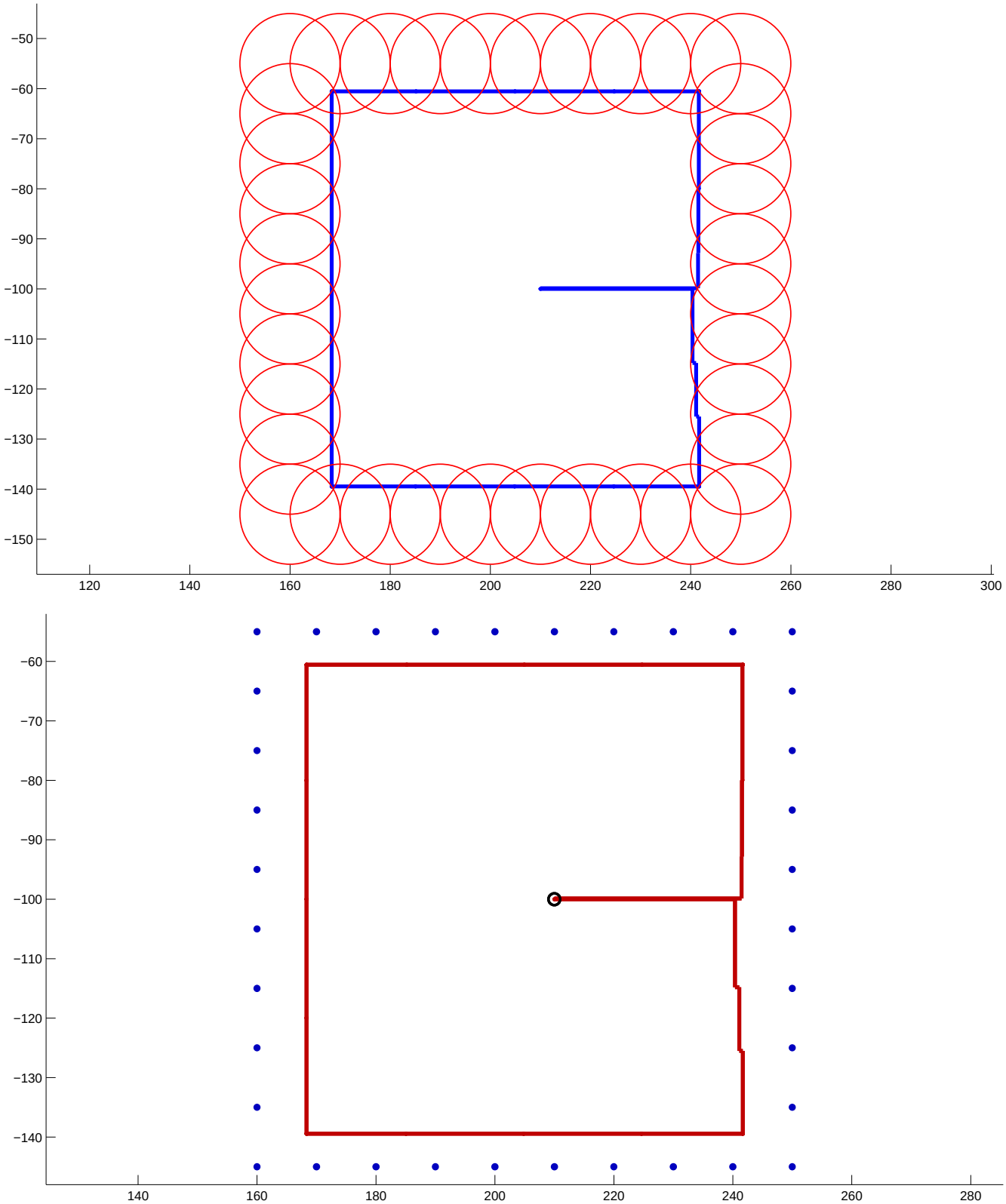


Figure N.138: *bubbles*1, Equal Radius, 2D, Manhattan, Length = 367.8889005

Table N-141: Solution for *bubbles*1, Equal Radius, 2D, Manhattan

Total distance: 367.888900469635 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
130.36545223654	114.798954435293	140	115
131.085048392094	125.50725652322	140	125
131.679104657468	139.453558967806	130	145
131.679104657468	139.453558967806	140	135
131.679104657468	139.453558967806	140	145
114.634548494998	139.453557856307	110	145
114.634548494998	139.453557856307	120	145
94.830628907505	139.453556694323	100	145
94.830628907505	139.453556694323	90	145
75.0493124127078	139.453555483865	80	145
75.0493124127078	139.453555483865	70	145
58.3208860726677	139.453554211394	60	145
58.3208860726677	139.453554211394	50	135
58.3208860726677	139.453554211394	50	145
58.3208862666162	119.976967858976	50	115
58.3208862666162	119.976967858976	50	125
58.3208864774294	99.9900091718358	50	105
58.3208864774294	99.9900091718358	50	95
58.3208867053417	80.0058700267098	50	85
58.3208867053417	80.0058700267098	50	75
58.3208869580602	60.5464368055202	60	55
58.3208869580602	60.5464368055202	50	65
58.3208869580602	60.5464368055202	50	55
75.1730084052796	60.5464350491768	80	55
75.1730084052796	60.5464350491768	70	55
94.9311686447369	60.5464333547541	100	55
94.9311686447369	60.5464333547541	90	55
114.726915444225	60.5464317103082	110	55
114.726915444225	60.5464317103082	120	55
131.679102797135	60.5464301149241	130	55
131.679102797135	60.5464301149241	140	65
131.679102797135	60.5464301149241	140	55
131.613118250929	79.9843978909158	140	85
131.613118250929	79.9843978909158	140	75
131.537487097972	92.8328587348257	140	95
131.459549667449	99.8745937181213	140	105

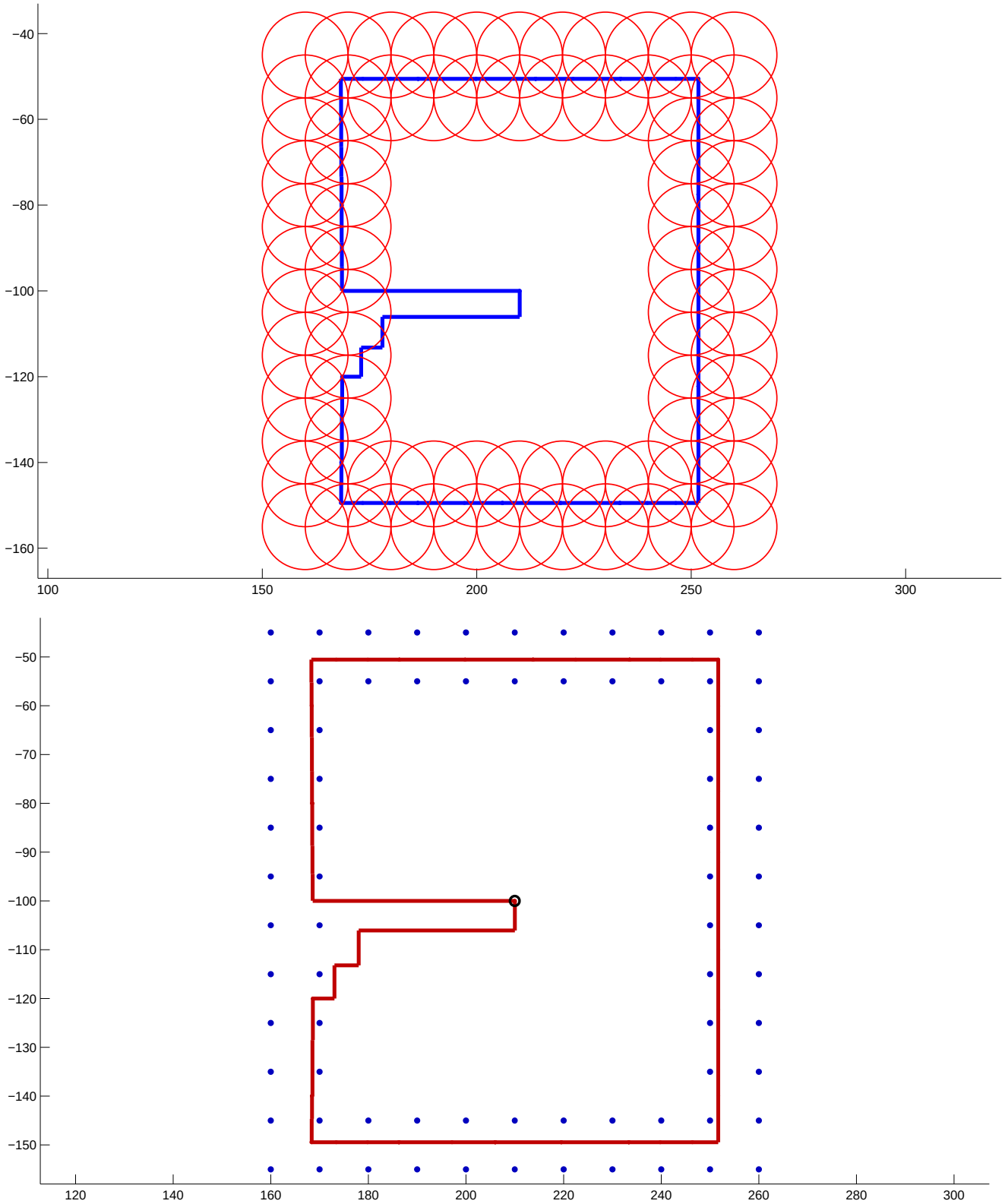


Figure N.139: *bubbles*2, Equal Radius, 2D, Manhattan, Length = 447.8889308

Table N-142: Solution for *bubbles*2, Equal Radius, 2D, Manhattan

Total distance: 447.888930814337 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
58.6092233492225	99.9344514146281	50	105
58.5697020293515	94.4633358721545	50	95
58.5303285632206	88.6999354919036	60	95
58.4909869777609	80.0032821568871	50	75
58.4909869777609	80.0032821568871	50	85
58.4909869777609	80.0032821568871	60	85
58.4560051711738	73.410315339695	60	75
58.4210070652451	66.4720047517511	60	65
58.3859745609042	60.0019906455918	50	55
58.3859745609042	60.0019906455918	50	65
58.3532148382512	55.2445737962698	60	55
58.3204336803454	50.5471141481729	50	45
63.4241372558328	50.5471148185225	60	45
69.8766981893204	50.5471154895198	70	55
76.3339663042918	50.5471161599933	70	45
76.3339663042918	50.5471161599933	80	45
76.3339663042918	50.5471161599933	80	55
89.8132660969935	50.5471168315501	90	45
89.8132660969935	50.5471168315501	90	55
103.733220344541	50.5471175031182	110	45
103.733220344541	50.5471175031182	100	45
103.733220344541	50.5471175031182	100	55
112.464841192328	50.5471181756973	110	55
123.505998656972	50.5471188479373	130	45
123.505998656972	50.5471188479373	120	45
123.505998656972	50.5471188479373	120	55
129.860855843755	50.5471195216582	130	55
136.396810734977	50.5471201950831	140	45
141.679567922669	50.5471208694965	150	45
141.679567916661	55.2746292738709	140	55
141.679567911077	60.0851887902534	150	55
141.679567911077	60.0851887902534	150	65
141.679567911077	60.0851887902534	140	65
141.679567900652	77.4982072631865	150	75
141.679567900652	77.4982072631865	140	75
141.679567900652	77.4982072631865	140	85
141.679567889918	90.0231429534302	150	85
141.679567889918	90.0231429534302	150	95
141.679567889918	90.0231429534302	140	95
141.679567876101	109.958654218356	150	115
141.679567876101	109.958654218356	150	105
141.679567876101	109.958654218356	140	105
141.679567859134	122.255668382694	150	125
141.679567859134	122.255668382694	140	125
141.679567859134	122.255668382694	140	115
141.679567842111	139.898440955269	150	145
141.679567842111	139.898440955269	150	135
141.679567842111	139.898440955269	140	135
141.679567820411	144.639609665178	140	145
141.679567799233	149.452871651091	150	155
136.396921812577	149.45287235077	140	155
129.786400561404	149.452873049055	130	145
123.357651535489	149.452873747828	130	155
123.357651535489	149.452873747828	120	155
123.357651535489	149.452873747828	120	145
109.540905970077	149.452874444308	110	155
109.540905970077	149.452874444308	110	145
95.9784909094067	149.452875140457	90	155
95.9784909094067	149.452875140457	100	155
95.9784909094067	149.452875140457	100	145
87.1312732694079	149.452875835025	90	145
76.2593629563589	149.452876530034	70	155
76.2593629563589	149.452876530034	80	155
76.2593629563589	149.452876530034	80	145
69.8271007690871	149.452877223092	70	145
63.4041317852778	149.452877916681	60	155
58.3204332957178	149.452878608736	50	155
58.3867128093409	144.664911005111	60	145
58.4529437382754	139.956786447106	50	145
58.4529437382754	139.956786447106	50	135
58.4529437382754	139.956786447106	60	135
58.5328878788646	128.522291246495	60	125
58.6127361648117	119.999878971922	50	125
58.6127361648117	119.999878971922	50	115
63.0479915073003	113.206983259647	60	115
68.0051491897628	106.054872821975	60	105

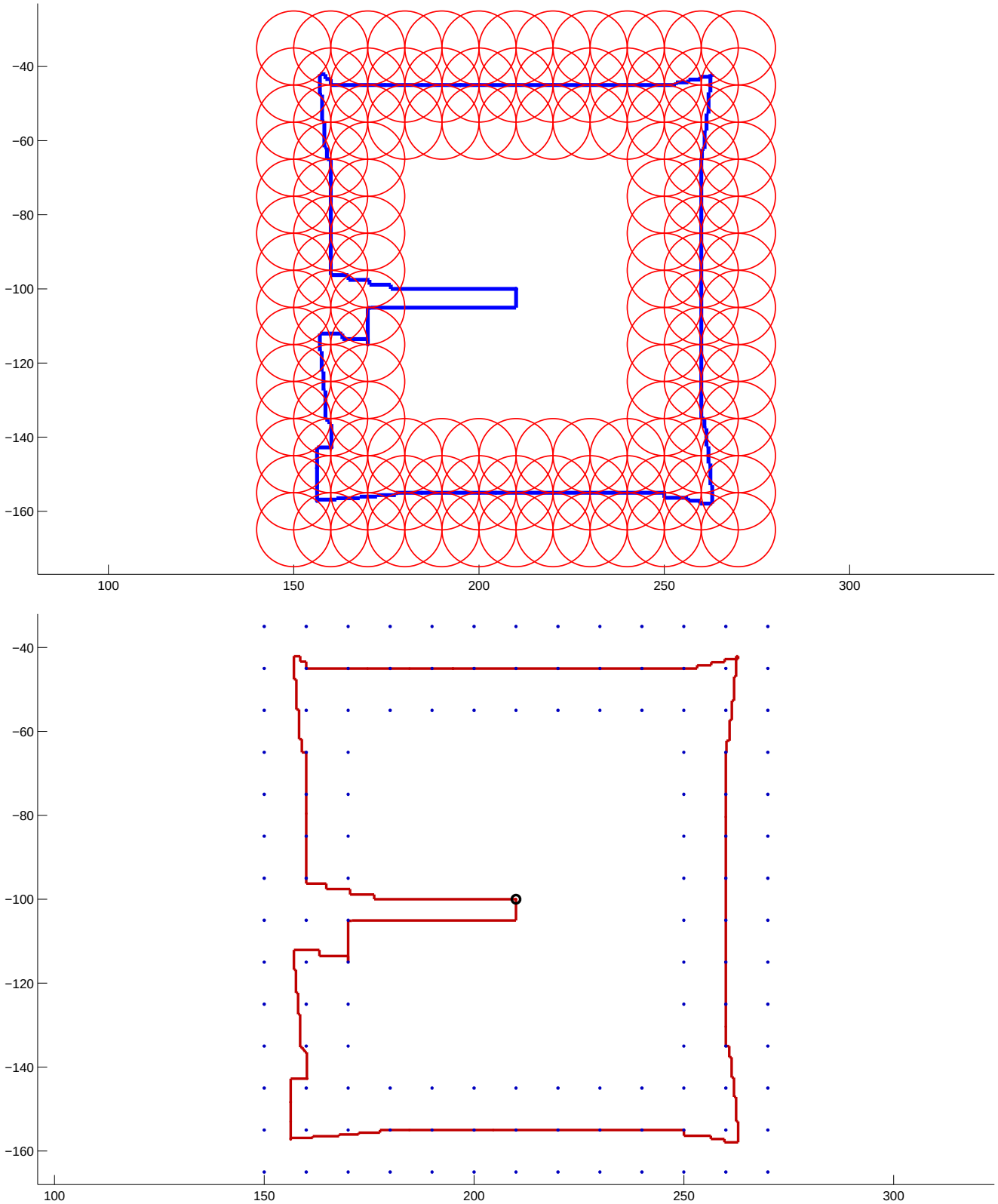


Figure N.140: *bubbles*3, Equal Radius, 2D, Manhattan, Length = 579.2363902

Table N-143: Solution for *bubbles*3, Equal Radius, 2D, Manhattan

Total distance: 579.236390195789			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
66.2022812742226	98.8832670057379	60	105
60.4496785432679	97.5633516724823	60	95
54.7853482243849	96.2724589743767	50	95
50.0000028770787	94.999991387713	40	95
50.0000019547459	85.006183210473	60	85
50.0000008200394	84.9964317243034	40	85
50.0000000150361	79.5996782060423	50	75
49.9999992116826	75.005691711793	40	75
49.9999992116826	75.005691711793	50	85
49.9999986306628	74.9964680214866	60	75
49.9999986306628	74.9964680214866	50	65
49.9999975402397	65.0000027203823	60	65
48.9684483874205	61.837423189296	40	65
48.2823618306363	54.786554502455	40	55
47.6555354767725	47.598549657394	40	45
47.0710685354736	42.0710706029555	40	35
48.5627921714911	43.3668563652001	50	35
50.0000040672953	44.9999987911571	50	55
59.9983603514992	44.999999257099	60	35
59.9983603514992	44.999999257099	50	45
59.9983603514992	44.999999257099	60	55
64.6077753507666	44.9999993166142	60	45
69.9999988423339	44.9999993811423	70	55
69.9999988423339	44.9999993811423	70	35
74.603349418958	44.9999993854125	70	45
79.9999994148236	44.9999993847815	80	55
79.9999994148236	44.9999993847815	80	35
84.9630904839363	44.9999993246295	90	45
84.9630904839363	44.9999993246295	80	45
90.002514141736	44.9999992736163	90	55
90.002514141736	44.9999992736163	90	35
90.002514141736	44.9999992736163	100	45
99.9945661042781	44.9999991367946	100	35
100.004395390524	44.9999990813306	110	45
100.004395390524	44.9999990813306	100	55
110.002686131382	44.9999988852998	110	35
110.002686131382	44.9999988852998	110	55
110.002686131382	44.9999988852998	120	45
119.993806203388	44.9999986173355	120	35
120.003175065828	44.9999984264148	120	55
129.996094316199	44.9999978690343	130	55
130.002227737623	44.9999974847241	130	45
130.008362312731	44.9999969051869	130	35
139.991798308139	44.9999964471485	140	35
140.000611588629	44.9999960495614	140	55
143.140629075596	44.2577683320001	140	45
146.528494025742	43.5136852671685	150	45
149.725074970366	42.7650853310781	150	35
152.928929578304	42.0710712199349	160	35
152.4519106658	46.956242497842	160	45
151.951716457626	52.6834751356958	160	55
151.414791222901	57.2944873508226	150	55
150.881445501781	62.2388121714931	160	65
150.15543014922	65.0014886534664	150	75
150.077697878721	65.0027055028978	150	65
150.000003069479	65.0039229144165	140	65
150.000002562572	74.999994306877	140	75
150.000002562572	74.999994306877	160	75
150.000002116831	80.3776759058611	150	85
150.000002215135	84.9960324453145	140	85
150.0000021442	85.0072669073945	160	85
150.000002090812	94.9915763124224	160	95
150.000002093506	94.9980307149996	150	95
150.000002045536	95.0044851992991	150	105
150.000002045536	95.0044851992991	140	95
150.000002255936	104.992337701977	160	105
150.000002286744	105.003453175767	140	105
150.000002528669	114.991002326966	160	115
150.000002680049	114.997485751191	150	115
150.000002779935	115.003969401124	140	115
150.000003083622	124.996339803039	140	125
150.000003634662	125.003314527906	150	125
150.000004207156	125.010292286728	160	125
150.000004626397	130.350270145779	150	135
150.000005009827	134.999998681618	140	135
150.823479605276	137.636376937545	160	135
151.375268196078	142.48864020313	150	145
151.931015237482	147.103489176199	160	145
152.44341899115	152.948249001479	160	155
152.928929558844	157.928925662439	160	165
149.667210929892	157.136689516967	150	155
146.431262981617	156.358953685089	150	165
140.000325746418	155.000004938958	140	145
139.986987512576	155.000005086649	140	155
139.973648332612	155.000003800413	130	155
139.973648332612	155.000003800413	140	165
130.009373323568	155.000004299038	130	165
129.997847436097	155.000003650974	130	145
120.009928837527	155.000003777804	120	165
120.00301929495	155.000003302844	120	155
119.996112729522	155.000003014372	120	145
110.003896354074	155.000002767458	110	145
109.997251027406	155.00000289775	110	155
109.990605782557	155.000002992985	110	165
100.002777342782	155.000002853322	100	145
99.9916214087766	155.000003012325	100	165
94.5825334340969	155.000003073073	90	155
90.0000003764902	155.000003105906	90	165
90.0000003764902	155.000003105906	80	155
90.0000003764902	155.000003105906	90	145
90.0000003764902	155.000003105906	100	155
80.0085507087838	155.000003420229	80	165
79.9982465972925	155.0000035182	80	145
74.582911392578	155.000003839334	70	155
70.0000020144395	155.000004254879	70	145
67.56440992484	155.634244267898	70	165
62.5023007572184	156.0558367102	60	155
57.8152395435085	156.479391893852	60	165
51.5575556402683	156.869956045819	50	165
46.3084860614388	157.240934503609	40	165
46.3084872016633	152.959260626004	40	155
46.3084883420475	148.343801093489	40	145
46.3084883420475	148.343801093489	50	155
46.3084894825315	142.759061533821	40	135
50.2543202170389	142.759060671983	60	145
50.1713003247108	136.466311654607	60	135
49.6487940609599	135.847441510574	50	135
49.1262939624146	135.233711516328	50	145
48.5624934761715	127.415300607581	40	125
48.0592959991049	122.295628908534	50	125
47.5533974819286	116.81073419737	40	115
47.0710691705773	112.071071067177	40	105
53.1429822828062	113.541837491553	50	115
59.997945757779	114.999996648988	60	125
59.9988498280068	105.132055477361	50	105
60.8800389383631	105.057630347018	60	115

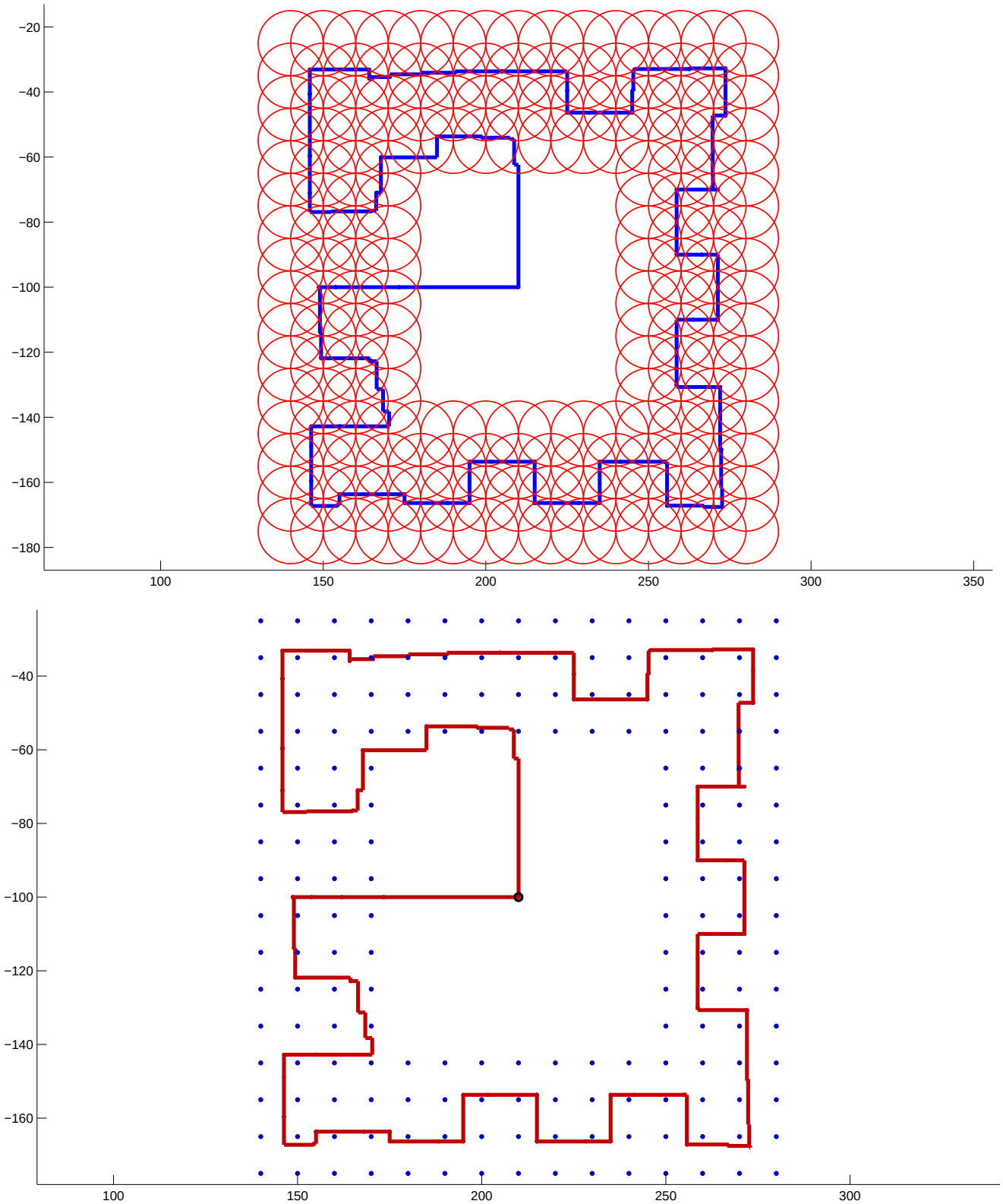


Figure N.141: *bubbles*4, Equal Radius, 2D, Manhattan, Length = 888.9576556

Table N-144: Solution for *bubbles*4, Equal Radius, 2D, Manhattan

Total distance: 888.957655638539 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
63.3645449680087	100.000000243416	60	105
63.3645449680087	100.000000243416	60	95
52.0357336705617	100.000000741021	50	105
52.0357336705617	100.000000741021	50	95
43.7915533553846	100.000001247475	40	105
43.7915533553846	100.000001247475	40	95
38.6602610286315	100.000001758382	30	105
38.6602610286315	100.000001758382	30	95
38.9799898953634	113.86075886725	40	115
38.9799898953634	113.86075886725	30	115
39.3363903911692	121.851172999469	40	125
39.3363903911692	121.851172999469	30	125
54.3854846328994	122.789240977366	60	115
54.3854846328994	122.789240977366	50	115
54.3854846328994	122.789240977366	60	125
54.3854846328994	122.789240977366	50	125
56.4356247039035	131.32981089829	60	135
58.3770465073128	138.236735292283	60	145
60.2543068806675	142.759095348751	70	145
45.1138403370532	142.759098414226	50	135
45.1138403370532	142.759098414226	40	135
45.1138403370532	142.759098414226	50	145
45.1138403370532	142.759098414226	40	145
36.3084469021948	142.759101485456	30	135
36.308443011258	148.94571459866	30	145
36.308439150015	159.615271880855	30	155
36.308439150015	159.615271880855	30	165
36.3084353397105	167.240885308933	30	175
44.4195891559508	166.937063800427	50	175
44.4195891559508	166.937063800427	40	175
45.0000013880329	163.660264326367	50	155
45.0000013880329	163.660264326367	40	155
45.0000013880329	163.660264326367	50	165
45.0000013880329	163.660264326367	40	165
58.1014818883529	163.660265269813	60	155
58.1014818883529	163.660265269813	60	165
65.0000003037396	163.66026621765	70	155
65.0000003037396	163.66026621765	70	165
65.0000055626697	166.339737574728	70	175
65.0000055626697	166.339737574728	60	175
78.2428915410386	166.339738390596	80	165
78.2428915410386	166.339738390596	80	175
84.9999906719434	166.339739083066	90	165
84.9999906719434	166.339739083066	90	175
84.9999923039859	153.660270314381	80	145
84.9999923039859	153.660270314381	80	155
91.6633036739187	153.660270959761	90	145
91.6633036739187	153.660270959761	90	155
104.999980237622	153.660271162255	100	145
104.999980237622	153.660271162255	100	155
104.999980237622	153.660271162255	110	145
104.999980237622	153.660271162255	110	155
104.999982558796	166.339718860157	100	165
104.999982558796	166.339718860157	100	175
104.999982558796	166.339718860157	110	165
104.999982558796	166.339718860157	110	175
118.34874154209	166.339718237482	120	165
118.34874154209	166.339718237482	120	175
124.999994520769	166.33971785491	130	165
124.999994520769	166.33971785491	130	175
124.999997250293	153.660268808976	120	145
124.999997250293	153.660268808976	120	155
131.457812812395	153.660268454435	130	145
131.457812812395	153.660268454435	130	155
144.999999950932	153.660268079512	140	145
144.999999950932	153.660268079512	140	155
144.999999950932	153.660268079512	150	145
144.999999950932	153.660268079512	150	155
145.728308259382	167.133415145232	140	165
145.728308259382	167.133415145232	140	175
145.728308259382	167.133415145232	150	165
145.728308259382	167.133415145232	150	175
157.112311020322	167.540688480569	160	165
157.112311020322	167.540688480569	160	175
162.92887193476	167.92897077448	170	175
162.651157258184	161.696404010858	170	165
162.362973461868	149.832689648689	160	145
162.362973461868	149.832689648689	170	145
162.362973461868	149.832689648689	160	155
162.362973461868	149.832689648689	170	155
162.01981487571	130.668601556776	160	125
162.01981487571	130.668601556776	170	125
162.01981487571	130.668601556776	160	135
162.01981487571	130.668601556776	170	135
148.660267049323	129.999999625539	140	125
148.660267049323	129.999999625539	140	135
148.660267049323	129.999999625539	150	125
148.660267049323	129.999999625539	150	135
148.660267132167	116.701324650802	140	115
148.660267248922	109.999998136163	140	105
153.785847455827	109.999995720907	150	105
153.785847455827	109.999995720907	150	115
161.339735805331	109.999993302897	160	105
161.339735805331	109.999993302897	170	105
161.339735805331	109.999993302897	160	115
161.339735805331	109.999993302897	170	115
161.33973527284	96.804075899138	170	95
161.339734704775	90.0000027103986	170	85
156.369752499146	89.9999998885735	160	95
156.369752499146	89.9999998885735	150	85
156.369752499146	89.9999998885735	160	85
152.362553249787	89.9999970989689	150	95
148.660262293609	89.9999942701879	140	95
148.660262293609	89.9999942701879	140	85
148.660262278529	78.7142355880137	150	75
148.660262134103	70.0000018500994	140	75
148.660262134103	70.0000018500994	140	65
161.339733886456	69.9999986232141	170	75
161.339733886456	69.9999986232141	170	65
159.840122301862	65.4440716811954	160	75
159.840122301862	65.4440716811954	150	65
159.840122301862	65.4440716811954	160	65
159.790700696346	55.1034991292155	150	55
159.790700696346	55.1034991292155	160	55
159.745789520402	47.2404859533864	150	45
163.692065250368	47.2404802264415	170	55
163.692065250368	47.2404802264415	160	45
163.692065250368	47.2404802264415	170	45
163.692069532782	38.5773695916282	170	35
163.692073765801	32.7595280940656	160	25
163.692073765801	32.7595280940656	170	25
152.598823792555	32.9504286061729	150	35
152.598823792555	32.9504286061729	150	25
152.598823792555	32.9504286061729	160	35
135.65675376856	33.1452655870257	130	25
135.65675376856	33.1452655870257	140	25
135.330196219846	39.3022250795857	130	35
135.330196219846	39.3022250795857	140	45
135.330196219846	39.3022250795857	140	35
134.999999134288	46.3397364668269	130	55
134.999999134288	46.3397364668269	130	45
134.999999134288	46.3397364668269	140	55
121.820518315472	46.3397368761645	120	55
115.000000316957	46.3397372513497	110	55
115.000000316957	46.3397372513497	110	45
114.999998387154	39.5104539365907	110	35
114.999998387154	39.5104539365907	120	45
114.999998387154	39.5104539365907	120	35
114.999996444709	33.6602602032145	120	25
107.996386245612	33.6602605146647	110	25
95.000000783699	33.6602608670947	100	35
95.000000783699	33.6602608670947	100	25
95.000000783699	33.6602608670947	90	35
95.000000783699	33.6602608670947	90	25
80.5490856978284	34.093796101433	80	35
80.5490856978284	34.093796101433	80	25
70.0920536001464	34.5974240983991	70	35
70.0920536001464	34.5974240983991	70	25
60.4822681470614	35.4162731262584	60	45
60.4822681470614	35.4162731262584	60	35
54.123846658068	35.8898952007569	50	45
54.123846658068	35.8898952007569	50	35
54.1238456752207	33.0914110560953	60	25
54.1238456752207	33.0914110560953	50	25

Solution x	Solution y	Original x	Original y
42.5730807327531	33.0914125145901	40	25
35.8761491014936	33.0914139999032	30	25
35.8761465316424	40.6640431900047	40	45
35.8761465316424	40.6640431900047	30	45
35.8761465316424	40.6640431900047	40	35
35.8761465316424	40.6640431900047	30	35
35.8761440040391	59.6336973687654	40	65
35.8761440040391	59.6336973687654	30	65
35.8761440040391	59.6336973687654	40	55
35.8761440040391	59.6336973687654	30	55
35.8761415083032	71.061459871027	40	75
35.8761415083032	71.061459871027	30	75
35.8761390284888	76.9085766803169	30	85
42.4572688476862	76.7137669632498	40	85
54.9450606388007	76.5102453335746	60	85
54.9450606388007	76.5102453335746	50	85
56.293967025627	70.9865340112066	60	75
56.293967025627	70.9865340112066	50	75
57.7492855811911	60.1170719887148	60	65
57.7492855811911	60.1170719887148	50	65
57.7492855811911	60.1170719887148	60	55
57.7492855811911	60.1170719887148	50	55
74.9999998129021	53.6602614385107	80	55
74.9999998129021	53.6602614385107	80	45
74.9999998129021	53.6602614385107	70	55
74.9999998129021	53.6602614385107	70	45
88.9515675495558	54.0422502371737	90	55
88.9515675495558	54.0422502371737	90	45
97.4075209355356	54.4742567623274	100	45
98.716416164256	62.3799087749655	100	55

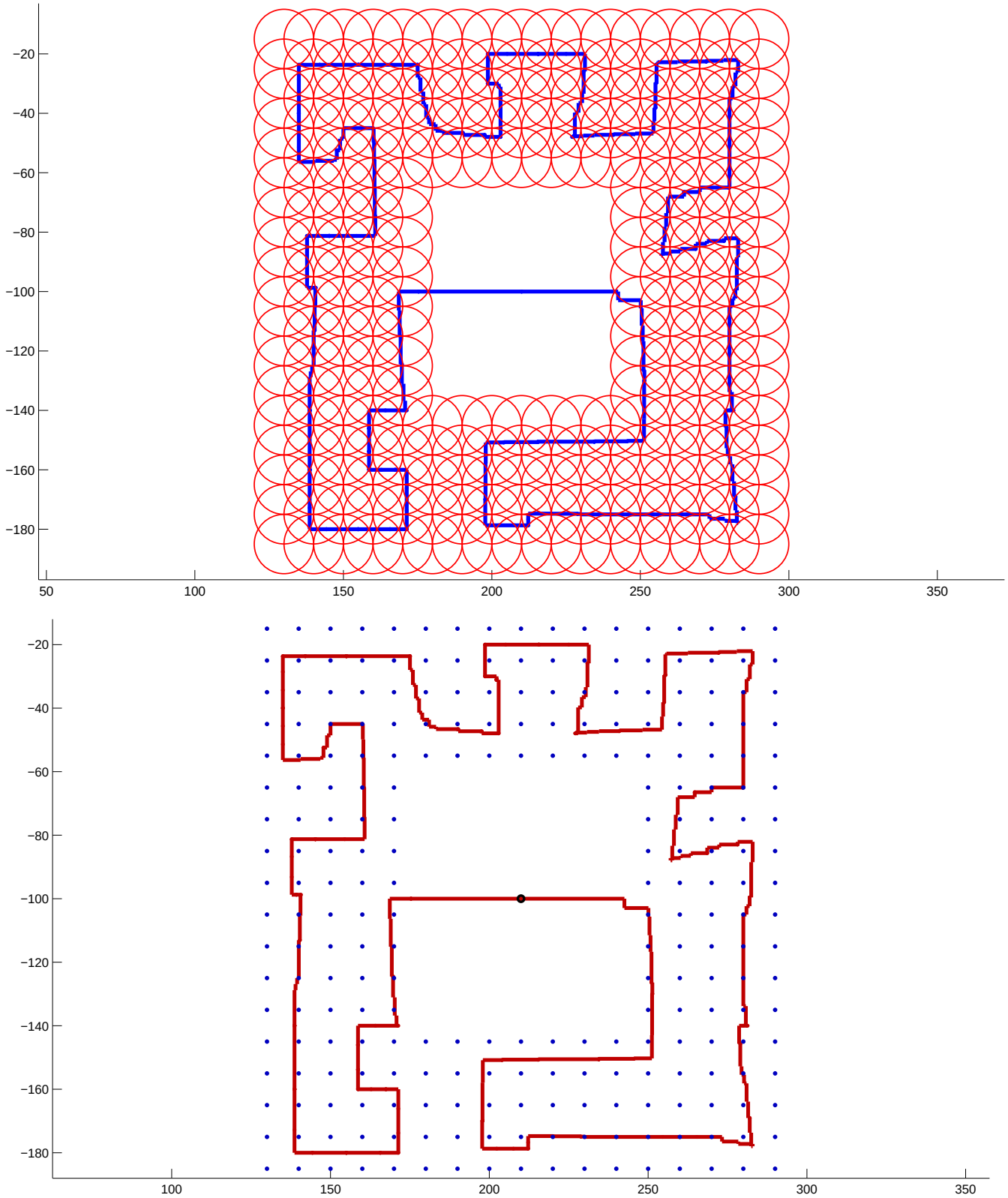


Figure N.142: *bubbles*5, Equal Radius, 2D, Manhattan, Length = 1182.1279772

Table N-145: Solution for *bubbles*5, Equal Radius, 2D, Manhattan

Total distance: 1182.12797722753 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
132.529879261826	102.9284848523	140	105
140.122918862735	105.636880670636	150	105
140.446197708857	111.490469831622	140	115
140.769789023013	116.735844741299	150	115
141.053569572314	126.397573098421	140	125
141.053569572314	126.397573098421	140	135
141.339740649946	129.99999963608	150	125
141.339740649946	129.99999963608	150	135
141.273075651463	142.95469192482	150	145
141.20526578704	150.281607619593	150	155
135.541038990084	150.407033479795	140	145
135.541038990084	150.407033479795	140	155
124.491430517833	150.532696388821	120	145
124.491430517833	150.532696388821	120	155
124.491430517833	150.532696388821	130	145
124.491430517833	150.532696388821	130	155
105.361813351881	150.659195419112	100	145
105.361813351881	150.659195419112	100	155
105.361813351881	150.659195419112	110	145
105.361813351881	150.659195419112	110	155
94.0457416884186	150.786766448194	90	145
94.0457416884186	150.786766448194	90	155
88.035141823774	150.914900547251	80	145
87.940576832208	157.908864740062	80	155
87.8474002393556	169.90638900232	90	165
87.8474002393556	169.90638900232	90	175
87.8474002393556	169.90638900232	80	165
87.8474002393556	169.90638900232	80	175
87.7590618340623	178.69150943233	80	185
92.3533529112436	178.691508233997	90	185
97.5907281560631	178.691507034035	100	185
102.240940969292	178.691505833808	110	185
102.24094187828	176.696454301743	100	175
102.240942788637	174.745679358761	100	165
110.064447776551	174.810484896538	110	165
110.064447776551	174.810484896538	110	175
118.832483404843	174.88130455568	120	165
118.832483404843	174.88130455568	120	175
120.000008228755	174.999994880917	120	185
129.989903654699	174.999996472651	130	165
129.998385401322	174.999997557061	130	175
130.006867830744	174.999998747509	130	185
139.993011972974	174.999999524087	140	185
140.00614024417	175.000000088359	140	165
144.59638054188	175.00000140874	140	175
149.990932032266	175.000002353493	150	185
150.003655763408	175.00000312231	150	165
150.003655763408	175.00000312231	150	175
155.375812680598	175.000004070818	160	175
159.999999299772	175.000005699456	160	165
163.265891887977	176.455151339764	160	185
168.394265158194	177.21196632883	170	185
172.928928468896	177.928927179401	180	185
172.470438615074	173.66864874719	180	175
171.989567414125	169.03963203989	170	165
171.989567414125	169.03963203989	170	175
171.517298597382	163.901691294795	180	165
170.999203993902	158.140364492919	180	155
170.216316648104	155.436840122822	170	155
169.435914413483	152.767142125097	160	155
169.023356264466	145.690656232718	160	145
169.023356264466	145.690656232718	170	145
168.660252734982	140.000012088473	160	135
169.997895979887	140.000012294418	170	135
171.339732565803	140.000012497249	180	145
170.791471292597	133.801149124926	180	135
170.000003798064	125.000714333529	160	125
170.000004654406	124.994504012514	170	125
170.000004310256	124.988292417485	180	125
170.000004371277	115.011425285512	180	115
170.000004422004	115.004756591222	170	115
170.000004082303	114.9980880709	160	115
170.000004369408	105.000001786668	160	105
170.980582450105	102.345076022033	170	105
171.968579217692	99.5899236275965	170	95
171.968579217692	99.5899236275965	180	105
171.968579217692	99.5899236275965	180	95
172.463448977846	88.5054939907266	180	85
172.928929879301	82.0710718204844	180	75
168.187178822379	82.952108036442	170	85
168.187178822379	82.952108036442	170	75
162.379478184701	83.9427271929373	160	75
158.631197542006	85.6417266689549	160	95
158.631197542006	85.6417266689549	160	85
153.453441887096	86.5182188429851	150	95
150.247281678042	87.2200823801304	150	85
147.07107027458	87.928929076961	140	95
147.594528054543	83.3404892861909	140	85
148.148167599902	78.2162603483144	150	75
148.698932992364	73.583308640483	140	75
149.323786225306	68.0503242727417	140	65
154.696580103773	66.4980714829077	150	65
154.696580103773	66.4980714829077	160	65
160.003869390457	64.9991451581613	160	55
169.759147906028	64.9957751528654	170	65
169.759147906028	64.9957751528654	170	55
169.999997358319	64.9937899028671	180	65
169.999998996768	54.9999998521938	180	55
170.000000912253	45.0053856792425	160	45
170.000000912253	45.0053856792425	170	45
170.000001083385	44.9928306141554	180	45
170.000001519674	35.0086001516159	180	35
170.000003214997	34.9989432125068	160	35
171.008247098553	30.8856425061526	170	35
172.02531456722	26.2708300825316	180	25
172.928927128959	22.0710686014577	180	15
167.949282317354	22.3139511363867	170	15
162.224370666647	22.5622690008015	160	25
162.224370666647	22.5622690008015	160	15
162.224370666647	22.5622690008015	170	25
152.537583258898	22.8139152307189	150	15
145.796377074062	23.0737785656896	140	15
145.438859805231	29.6011482062205	140	25
145.438859805231	29.6011482062205	150	35
145.438859805231	29.6011482062205	150	25
145.077830439279	38.1565312368592	140	45
145.077830439279	38.1565312368592	140	35
144.733850779093	42.6447405702348	150	45
144.385269206277	46.7950666753712	150	55
138.259777780873	47.0332646746404	140	55
130.907725229561	47.26468175754	130	55
130.907725229561	47.26468175754	130	45
124.535903029878	47.4914893718168	120	55
120.763533443187	47.7098441439337	120	45
117.071072548232	47.9289324917649	110	55
117.071072548232	47.9289324917649	110	45
117.950104068766	39.7827068357555	110	35
119.164389652242	36.5514631462387	120	35
120.374173421976	33.4076574971155	130	35
120.890433367016	25.9050460136315	120	25
120.890433367016	25.9050460136315	130	25
121.339742908847	20.0000011130356	130	15
115.027698805464	20.0000013085567	120	15
105.608160061044	20.0000015041127	100	15
105.608160061044	20.0000015041127	110	25
105.608160061044	20.0000015041127	110	15
95.1593909212251	20.0000016997925	90	15
88.6602559757031	20.0000018955016	80	15
88.6602566840524	29.999999973142	80	35
88.6602566840524	29.999999973142	80	25
92.2939454403372	31.0735697217922	100	35
92.2939454403372	31.0735697217922	100	25
92.2939454403372	31.0735697217922	90	35
92.2939454403372	31.0735697217922	90	25
92.9289302362037	47.928929941006	100	55
92.9289302362037	47.928929941006	100	45
87.5768103665994	47.2912133449066	90	55
87.5768103665994	47.2912133449066	90	45
80.227570700147	46.6085071454173	80	55
80.227570700147	46.6085071454173	80	45
73.2438813153751	45.8538209458001	70	55
71.0426954473393	43.6548983174993	70	45
68.8716271986171	41.4235932612466	60	45
67.8833363575566	36.9586808191686	70	35

Solution x	Solution y	Original x	Original y
66.8840809054586	32.7127035375488	60	35
65.9542103677277	27.9689024621432	70	25
65.0000006371285	23.6602560388726	70	15
65.0000006371285	23.6602560388726	60	25
65.0000006371285	23.6602560388726	60	15
44.9999995110557	23.6602548373809	50	25
44.9999995110557	23.6602548373809	50	15
44.9999995110557	23.6602548373809	40	25
44.9999995110557	23.6602548373809	40	15
32.0540302692864	23.6602541315411	30	25
32.0540302692864	23.6602541315411	30	15
25.000005625215	23.6602534264176	20	15
25.0000054290467	28.5770351632272	20	25
25.0000052329374	34.3459117309133	30	35
25.0000050367984	39.9815300101844	20	45
25.0000050367984	39.9815300101844	20	35
25.000004840809	45.6186457859175	30	45
25.000004644791	51.4128039691507	20	55
25.0000044487842	56.3397456252239	20	65
30.5697868544901	56.0072488560341	30	65
36.786902067697	55.6447649603556	40	65
37.7798757107493	52.4431776553597	40	55
37.7798757107493	52.4431776553597	30	55
38.8937803156769	48.5673315889892	40	45
40.0000040388265	45.0000023198562	40	35
49.9999673407241	45.0000023062902	50	35
50.1617035277718	49.8457865162842	50	45
50.3234968532024	55.6364594811094	60	55
50.3234968532024	55.6364594811094	50	55
50.4656377500282	64.9784026513197	60	65
50.4656377500282	64.9784026513197	50	65
50.5976013275811	74.3122064122809	60	75
50.5976013275811	74.3122064122809	50	75
50.7224096333521	81.2681942670566	60	85
44.4721375746139	81.2681945191028	50	85
35.2341725935677	81.2681947717387	40	85
35.2341725935677	81.2681947717387	30	85
35.2341725935677	81.2681947717387	40	75
35.2341725935677	81.2681947717387	30	75
27.7916482771987	81.2681950246872	20	75
27.791648277367	86.749003645983	20	85
27.7916482777613	93.2070784427753	20	95
27.7916482783382	98.731804505522	20	105
29.2676764302411	98.7318047610981	30	105
29.2676764302411	98.7318047610981	30	95
30.7224093175501	98.7318050159086	40	95
30.5363640280318	105.356983407075	40	105
30.3318024469884	113.069645645516	40	115
30.3318024469884	113.069645645516	30	115
30.0000022477948	115.00001477108	20	115
29.9999980589365	124.999983274704	40	125
29.4978924280919	126.877177014824	30	125
28.9952821406238	128.795935031404	20	125
28.6602592128434	139.999997879647	30	135
28.6602592128434	139.999997879647	20	135
28.6602592128434	139.999997879647	30	145
28.6602592128434	139.999997879647	20	145
28.6602580660074	160.000002127024	30	155
28.6602580660074	160.000002127024	20	155
28.6602580660074	160.000002127024	30	165
28.6602580660074	160.000002127024	20	165
28.6602573335532	172.77879486964	20	175
28.6602566117452	179.999995766588	20	185
34.3009754514854	179.999995883531	30	175
34.3009754514854	179.999995883531	30	185
44.9785262426504	179.999996076486	50	175
44.9785262426504	179.999996076486	50	185
44.9785262426504	179.999996076486	40	175
44.9785262426504	179.999996076486	40	185
55.6768781869456	179.999996257254	60	175
55.6768781869456	179.999996257254	60	185
61.3397427652809	179.999996665475	70	185
61.3395870363585	173.760364399336	70	175
61.3394312752275	166.149852971865	70	165
61.3392753391705	159.999119936702	70	155
57.4541888960138	159.998850205863	60	155
57.4541888960138	159.998850205863	60	165
52.7880895991893	159.998580249112	50	165
48.6592401723074	159.998310189548	40	165
48.6590843089151	153.801359283119	50	155

Solution x	Solution y	Original x	Original y
48.6590843089151	153.801359283119	40	155
48.6589285490812	146.050245248115	50	145
48.6589285490812	146.050245248115	40	145
48.6587728787052	140.00257275069	40	135
54.1349631508328	140.002572901211	50	135
61.3382564760558	140.002573088774	70	145
60.7838547518008	136.771784189436	60	145
60.2330837617916	131.054215065235	60	135
59.6826982000827	124.481340588857	60	125
59.6826982000827	124.481340588857	50	125
59.3035350337368	115.110746784664	60	115
59.3035350337368	115.110746784664	50	115
58.9689484669715	106.359545811043	50	105
58.6602577230101	99.9999995277929	50	95
65.3320702001452	99.9999997202316	60	105
65.3320702001452	99.9999997202316	60	95

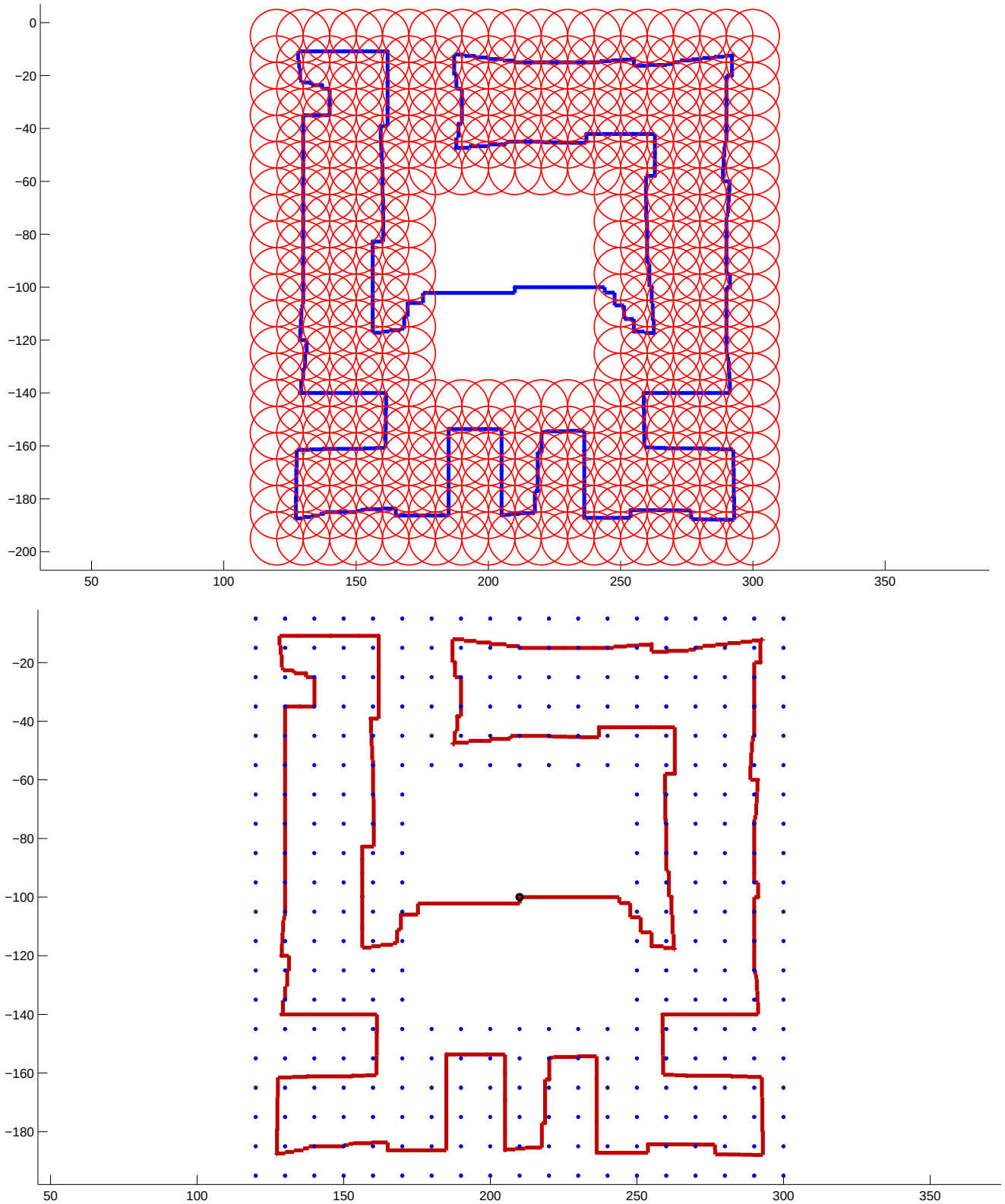


Figure N.143: *bubbles*6, Equal Radius, 2D, Manhattan, Length = 1451.2980253

Table N-146: Solution for *bubbles*6, Equal Radius, 2D, Manhattan

Total distance: 1451.29802531349 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
133.986313436665	102.042142120579	140	95
137.71476565003	106.870955391485	140	105
141.292805447976	112.016552475454	140	115
145.000698353056	116.746576725876	150	125
145.000698353056	116.746576725876	140	125
148.995505368829	117.335294949728	150	115
152.928928603366	117.928926875518	160	125
152.547180013412	112.631704481241	160	115
152.149464531939	106.12093024412	150	105
151.75389130294	99.9307277900919	160	105
151.75389130294	99.9307277900919	160	95
151.75389130294	99.9307277900919	150	95
150.873506213065	91.0418776540826	150	85
150.000003956441	85.0025407683375	140	85
150.00000031626	84.992574510909	160	85
149.99999607913	75.0000224825107	160	75
149.78692645349	73.4990948400796	150	75
149.78692645349	73.4990948400796	140	75
149.667790182703	65.1813823004908	140	65
149.561455852829	57.9289352865693	140	55
150.670571864395	57.9289345066704	150	55
151.786177125045	57.9289337275179	150	65
152.928923971423	57.9289329479513	160	65
152.928924719687	53.8243673252857	160	55
152.928925463639	49.4876555878814	150	45
152.928926209896	45.7141615534702	160	45
152.928926953018	42.0710699063349	160	35
144.543607926268	42.0710706745754	150	35
144.543607926268	42.0710706745754	140	35
144.543607926268	42.0710706745754	140	45
133.710703493867	42.0710714435721	130	35
127.071069503115	42.0710722130815	120	35
127.071068720792	43.763178648674	130	45
127.071067939581	45.4385434874551	130	55
120.69819640784	45.3492550536824	120	55
116.238366131738	45.2525862921806	120	45
111.302342645911	45.1559465667578	110	55
109.998685896898	45.000004117282	110	35
109.998685896898	45.000004117282	110	45
109.998685896898	45.000004117282	100	45
100.000001557215	45.000003930423	100	35
96.8576351338477	46.0250642744789	100	55
89.8062652617911	46.7106970160101	90	45
89.8062652617911	46.7106970160101	90	55
82.6088080388573	47.3412387360358	80	55
77.071070830502	47.9289297387539	70	55
77.8648762718255	43.4054065566056	70	45
78.7405108865056	38.3309176675384	70	35
78.7405108865056	38.3309176675384	80	35
78.7405108865056	38.3309176675384	80	45
79.9999967729164	34.9999984137047	90	35
79.9999968697158	25.0000008933373	90	25
77.9262394779144	19.9330990235807	70	15
77.9262394779144	19.9330990235807	70	25
77.9262394779144	19.9330990235807	80	25
77.0710708419489	12.0710699295463	70	5
81.0225404609743	12.6093051687947	80	5
85.2062577881159	13.1772439256161	80	15
90.2284280029095	13.741053592505	90	5
90.2284280029095	13.741053592505	90	15
95.460139092166	14.3712489847166	100	15
99.9993755082887	14.9999959554151	100	25
100.008977490979	14.9999961086428	100	5
109.991470114986	14.9999961638219	110	5
110.002197061808	14.999996461825	110	15
110.002197061808	14.999996461825	110	25
115.368804472873	14.999996444033	120	15
119.998093498048	14.9999965656614	120	25
120.008831024881	14.9999959192831	120	5
125.361195040638	14.9999955676476	130	15
129.999998492478	14.9999952048752	130	25
132.05933325069	14.5430955711389	130	5
136.491311718946	14.2422975072016	140	15
140.569711288176	13.9411248697251	140	5
145.000005408739	13.6602627751914	150	5
145.000005177703	16.3397434562176	140	25
150.679483315638	15.9935213879223	150	15
150.679483315638	15.9935213879223	150	25
157.566979234189	15.6078622462802	160	25
159.995969070603	14.9434024508371	160	15
162.434660444008	14.2790851594773	160	5
166.816739680286	13.8175741923148	170	15
170.892597690881	13.3546642882861	170	5
175.319152258935	12.9228222667692	180	15
179.190386009386	12.4882738426838	180	5
182.928927153748	12.0710710534116	190	5
182.080973334559	19.9358672259159	190	15
182.080973334559	19.9358672259159	190	25
182.080973334559	19.9358672259159	180	25
180.000003748979	25.0000019972669	170	25
180.000001761799	34.9936765285099	170	35
179.999999792715	35.0000229054734	180	35
179.99999924117	35.0063698880052	190	35
179.999994751218	44.9999902741538	190	45
179.541546480839	46.9686641813259	170	45
179.240557043708	50.7116351247883	180	45
178.939184616272	55.2397083356588	180	55
178.939184616272	55.2397083356588	170	55
178.660254375877	59.9999890500539	170	65
181.339732434692	59.9999887807142	190	55
181.123269372308	64.1677709995417	190	65
180.895830444737	67.967949378643	180	65
180.668791343744	72.056580013616	190	75
180.334123357382	73.535329125056	180	75
180.000005511851	75.000005279688	170	75
180.000004915425	84.989256219877	190	85
180.00000544425	85.001002859786	170	85
180.000006354416	88.2472414683595	180	85
180.000007238336	91.7293123230352	180	95
180.000006035533	95.0000013569399	170	95
181.339738277661	100.000000044298	190	105
181.339738277661	100.000000044298	190	95
180.00000617261	105.000001958329	180	105
180.00000617261	105.000001958329	170	105
180.000005371954	114.998321884812	170	115
180.000006381325	115.005408480943	180	115
180.000007708048	115.012496942542	190	115
180.000006538819	124.999991301852	170	125
180.328517010374	126.45470298185	180	125
180.657364733702	127.928218390841	190	125
180.888388625963	131.99528877232	180	135
181.119783846805	135.801125614982	190	135
181.339735097432	140.000003895806	190	145
173.314695460706	140.000003666436	180	145
173.314695460706	140.000003666436	170	145
173.314695460706	140.000003666436	170	135
156.625124630881	140.000003431263	160	145
156.625124630881	140.000003431263	160	135
156.625124630881	140.000003431263	150	135
148.66025935415	140.000003195115	140	135
148.746988905553	146.076674902844	150	145
148.746988905553	146.076674902844	140	145
148.835396191334	154.03895634845	140	155
148.925732517188	160.572610000087	140	165
152.711430032924	160.753863758989	150	165
156.873056029355	160.934131716634	160	165
156.873056029355	160.934131716634	160	155
156.873056029355	160.934131716634	150	155
172.350778599315	161.121721444071	180	165
172.350778599315	161.121721444071	170	165
172.350778599315	161.121721444071	170	155
177.706134181918	161.307786602973	180	155
182.46356123538	161.496116296253	190	155
182.623334435415	168.23901796511	190	165
182.780092764728	179.587431418722	190	185
182.780092764728	179.587431418722	190	175
182.780092764728	179.587431418722	180	175
182.928923206794	187.928928795418	190	195
179.247343550444	187.866378081835	180	195
175.406595863811	187.803536623796	180	185
170.954635184321	187.740802825415	170	195
166.768160676744	187.677738497933	160	195
166.689425335141	186.019939021971	170	185
166.610075944799	184.381350724161	170	175

Solution x	Solution y	Original x	Original y
162.331748421116	184.355174478865	160	185
158.315530848875	184.32899539963	160	175
150.308134805814	184.303175035823	150	185
150.308134805814	184.303175035823	150	175
143.731807184745	184.277594422608	140	175
143.731806846649	187.208343708075	150	195
139.644836505235	187.20834371212	140	195
135.499187114022	187.208343712021	140	185
130.726395776808	187.208343711963	130	195
126.268192315227	187.208343705538	120	195
126.268191960848	182.539978912277	120	185
126.268191604146	177.268897072074	130	185
126.268191604146	177.268897072074	130	175
126.268191604146	177.268897072074	120	175
126.268191247083	161.745233600441	130	165
126.268191247083	161.745233600441	120	165
126.268191247083	161.745233600441	120	155
126.268190891167	157.851799977979	130	155
126.268190537108	154.27759244299	130	145
119.602823800058	154.513193188824	120	145
111.534061293707	154.787416180168	110	145
110.094918863422	162.162569604111	110	165
110.094918863422	162.162569604111	110	155
108.663700038778	177.039583650114	110	185
108.663700038778	177.039583650114	110	175
108.663700038778	177.039583650114	100	175
107.567518659692	185.427185341273	110	195
101.903246568807	185.764551397826	100	195
98.4953384837363	186.051228290215	100	185
94.997839741795	186.338491607171	90	195
94.9978399760001	179.831646452658	90	185
94.9978402483204	169.255405973371	90	175
94.9978402483204	169.255405973371	90	165
94.9978402483204	169.255405973371	100	165
94.9978405113837	159.876091390687	100	155
94.9978409340467	153.659014388069	100	145
88.870350332477	153.659251583232	90	155
88.870350332477	153.659251583232	90	145
81.2293428180919	153.659489187609	80	145
75.0007955385109	153.659726932639	70	145
75.0003832470262	157.776714067171	70	155
74.999971040646	162.343939606527	70	165
74.999971040646	162.343939606527	80	165
74.999971040646	162.343939606527	80	155
74.9995584867523	177.623630812933	70	185
74.9995584867523	177.623630812933	70	175
74.9995584867523	177.623630812933	80	175
74.9991460617196	182.19401844185	80	185
74.9987332285905	186.340545953507	80	195
69.7669261500261	186.340785373169	70	195
64.3636681820326	186.341023953077	60	185
59.7362397162661	186.34126255959	60	195
55.003051738337	186.341502234098	50	195
55.0030517607253	183.662021921213	60	175
49.502118552023	183.910765933968	50	185
49.502118552023	183.910765933968	50	175
43.2736451578437	184.177882707818	40	175
41.6248080502874	184.588985977482	40	185
39.9999715874712	184.999996922187	40	195
30.0000204201634	185.000004343171	30	175
28.1066529891538	185.684126251992	30	185
26.1769289728716	186.370860367565	30	195
23.0136683320654	186.896538842545	20	185
20.0323272066692	187.425890915672	20	195
17.0710688071676	187.928924506923	10	195
17.2217960662275	179.589770053169	10	185
17.2217960662275	179.589770053169	10	175
17.2217960662275	179.589770053169	20	175
17.3804587899355	168.360639801335	10	165
17.5419127518395	161.50428620766	10	155
22.308809812044	161.313523076462	20	155
27.6687927400413	161.124895058071	20	165
27.6687927400413	161.124895058071	30	165
27.6687927400413	161.124895058071	30	155
43.0732222073604	160.934757258963	40	165
43.0732222073604	160.934757258963	40	155
43.0732222073604	160.934757258963	50	155
47.2382491123396	160.752185201773	50	165
51.0695236497244	160.568627380732	60	165
51.1613338056066	154.033328817711	60	155

Solution x	Solution y	Original x	Original y
51.2513144418268	146.086640750152	50	145
51.2513144418268	146.086640750152	60	145
51.3397433032882	140.000005275993	60	135
43.3060188148099	140.000005568822	40	145
43.3060188148099	140.000005568822	40	135
43.3060188148099	140.000005568822	50	135
26.6805283652495	140.000005860564	20	145
26.6805283652495	140.000005860564	30	145
26.6805283652495	140.000005860564	30	135
18.6602631977166	140.000006152664	10	145
19.251301328141	135.147655375553	10	135
20.0000441113845	130.493080141789	20	135
20.7490973263714	125.130514592284	20	125
20.7490973263714	125.130514592284	30	125
21.3397429053901	120.000003425742	30	115
18.6602613271218	120.000003725517	10	125
18.8800920171228	115.813535414463	10	115
19.1111979875828	112.009574742132	20	115
19.3420582586786	107.957578329426	10	105
19.6710858697317	106.469459677487	20	105
19.9999960408117	104.999994794283	30	105
19.9999967851427	95.0083079169191	10	95
19.9999976673786	94.997257699885	30	95
19.9999981690389	90.3650113563314	20	95
19.9999989109728	85.0043388571838	30	85
19.9999987264963	84.9982567442625	20	85
19.9999987812488	84.9921755658156	10	85
19.9999991346803	75.0069181598724	10	75
19.9999996255135	75.0004309575867	20	75
20.000000148963	74.993943840401	30	75
20.0000004161439	69.6184247153825	20	65
20.000000668269	65.0056133576725	30	65
20.0000007272218	64.9949825119493	10	65
20.0000010433425	55.006814071875	30	55
20.0000010750857	55.0007879725981	20	55
20.0000012964065	54.9947627467737	10	55
20.0000014648843	49.6194569411117	20	45
20.0000017765553	44.9999913598577	10	45
20.0000023515891	35.0046768714105	10	35
24.9596893674015	35.0030086335084	20	35
24.9596893674015	35.0030086335084	30	35
29.8684854069392	35.0013407623999	30	45
29.9999966251561	25.0000022792313	40	25
27.1549269065528	23.6503775979934	30	15
27.1549269065528	23.6503775979934	30	25
23.0640904460449	22.6494709477812	20	25
19.2790067811416	21.6344856584726	10	25
18.8529429603135	17.3328499410357	10	15
18.4725440388086	14.1288697686684	20	15
18.0910907250814	10.8765904844582	10	5
24.708943107682	10.8765914246146	20	5
35.4806855133233	10.8765923650073	30	5
35.4806855133233	10.8765923650073	40	5
35.4806855133233	10.8765923650073	40	15
45.4394278788321	10.8765933056734	50	5
51.9089118892578	10.8765942465722	60	5
51.9089123308791	16.3950226347147	60	15
51.9089127724492	22.7371033139653	50	15
51.9089127724492	22.7371033139653	50	25
51.9089127724492	22.7371033139653	60	25
51.9089132136399	32.6920362677557	50	35
51.9089132136399	32.6920362677557	60	35
51.9089136544969	39.1234029023461	60	45
49.1103027481086	39.1234030794008	40	35
49.2951749669626	44.1867193909378	40	45
49.4932152344265	48.4855008000498	50	45
49.6911497058613	53.2159859279117	40	55
49.9999955784733	55.0000073868484	60	55
49.999998900992	59.6212383592002	50	55
50.0000019552624	64.9999572873312	40	65
50.0790854226744	65.7588142386499	50	65
50.1581761876273	66.5203973137783	60	65
50.2076913972184	74.9376542185013	50	75
50.2076913972184	74.9376542185013	60	75
50.2543211728642	82.759057135061	60	85
46.3084930535987	82.7590584058158	40	75
46.3084913834784	87.0586610429771	40	85
46.3084897136671	91.7747991648878	50	85
46.3084880437983	99.8386320087805	40	105
46.3084880437983	99.8386320087805	40	95

Solution x	Solution y	Original x	Original y
46.3084880437983	99.8386320087805	50	95
46.3084863749119	110.610823694257	40	115
46.3084847062086	117.240933561671	40	125
49.4490398042926	116.750295096926	50	115
52.5647177996742	116.262135407816	50	125
56.8612127157409	115.694683694824	60	125
58.1936447823005	111.117430332974	60	115
59.5073833399338	105.979037857968	50	105
59.5073833399338	105.979037857968	60	105
65.3135975295411	102.180212852053	60	95

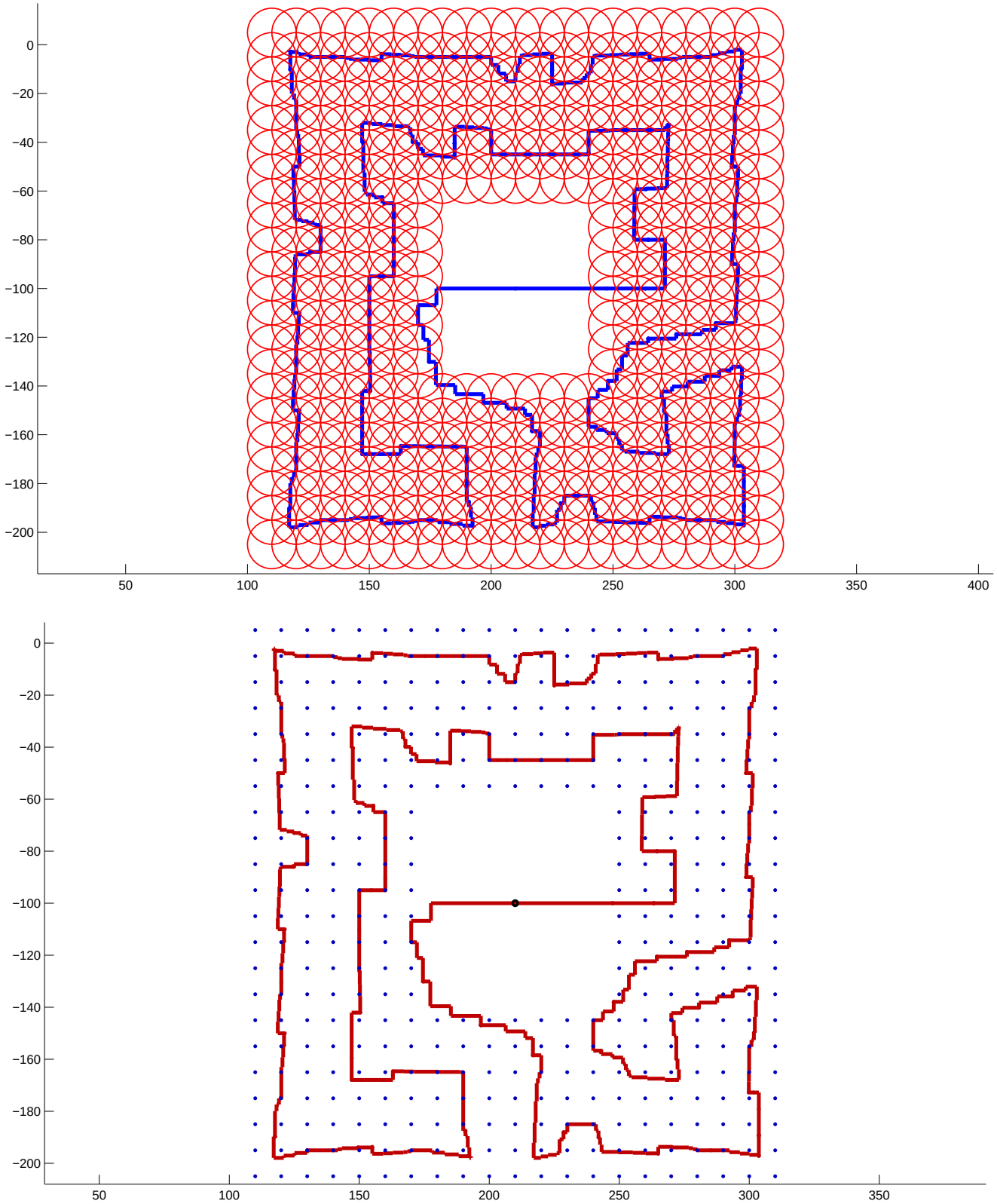


Figure N.144: *bubbles*7, Equal Radius, 2D, Manhattan, Length = 1875.5920201

Table N-147: Solution for *bubbles*7, Equal Radius, 2D, Manhattan

Total distance: 1875.59202011935			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
67.5642304482724	106.794290860732	60	105
60.0000062038102	114.999999888549	50	115
62.1842757873126	121.040721942058	60	115
64.4698315225773	130.082178889352	60	135
64.4698315225773	130.082178889352	60	125
67.3120448908452	139.608089983393	60	145
75.2327858590571	143.328986817057	70	145
86.7740033696305	146.904414217504	90	155
86.7740033696305	146.904414217504	80	145
86.7740033696305	146.904414217504	90	145
96.311801638012	149.274248365542	100	145
103.87343368957	151.850547868529	110	145
106.791129032191	158.46901336452	110	165
106.791129032191	158.46901336452	110	155
106.791129032191	158.46901336452	100	155
109.999991435608	164.999998735308	120	165
109.349830406759	167.329314369473	110	175
108.696766815409	169.230526688395	100	165
108.257376805569	176.146072697942	100	175
107.844242557537	184.349033282415	100	185
107.449217907408	192.113359392037	100	195
107.071072755498	197.928923599696	100	205
109.836192504111	197.334013190853	110	195
112.60293971876	196.7443955143	110	205
115.931874926844	196.085104799713	120	205
117.043378088051	190.792093047261	110	185
118.545745031825	188.077017367606	120	195
118.545745031825	188.077017367606	120	185
120.000006702609	185.00000892746	120	175
129.999989742614	185.000009117423	130	175
131.011192223279	187.471539393145	130	185
132.029449344566	190.046578243465	140	195
132.029449344566	190.046578243465	140	185
132.603838015481	192.860691298816	130	195
133.183864048575	195.591574035734	130	205
139.524264387329	195.789740132358	140	205
145.2329023384	195.975302047126	150	195
150.061308635055	196.161138876446	150	205
154.999979612694	196.339745182646	160	205
154.999979497593	193.660277602535	150	185
160.463664692763	193.909540150776	160	195
160.463664692763	193.909540150776	160	185
166.706883404398	194.176130405363	170	185
168.363506579541	194.588182739239	170	195
170.00003757123	194.999993018111	170	205
175.370810629215	194.99999987031	180	195
179.999992010831	195.000015195176	180	185
182.408086708714	195.735092388896	180	205
186.373837490788	196.247128689076	190	195
190.028219050615	196.761598159222	190	205
193.691508287239	197.240929451682	200	205
193.691506034232	189.27696049831	200	195
193.691506034232	189.27696049831	200	185
193.691506034232	189.27696049831	190	185
193.691503775932	179.167784591972	200	175
193.691501513916	172.75906305468	200	165
191.700053243438	172.759061369955	190	175
189.745686236115	172.759059695256	180	175
189.809510740863	168.458839237757	190	165
189.873336323964	164.536148995919	180	165
189.953454230482	155.236698110928	180	155
190.852043892553	152.596455516836	190	155
191.755724211897	149.869547196042	200	155
191.755724211897	149.869547196042	200	145
192.150597531856	143.700544398203	190	145
192.547637136579	137.290494754891	200	135
192.928928062256	132.071077627194	200	125
188.624095569019	133.589007965169	190	125
183.620868612714	135.856925183029	190	135
183.620868612714	135.856925183029	180	135
177.648503860054	138.210875876493	180	145
170.659525224447	140.208732987635	170	145
170.659525224447	140.208732987635	170	135
164.255771915755	142.234260667616	160	135
160.00000887348	145.000001534214	150	145
160.957459023394	151.004624541904	160	145
161.921782333497	159.77248175079	170	165
161.921782333497	159.77248175079	170	155
161.921782333497	159.77248175079	160	155
162.423621309616	163.896118937122	160	165
162.928924975928	167.928925031933	170	175
157.571566497981	167.452223203155	160	175
150.839029468389	166.947872462261	150	175
144.743098491033	166.407206904792	140	175
143.678130169809	164.116223298277	150	165
142.54595234747	161.791252473811	140	165
141.435065441228	159.358968602436	150	155
137.379147030956	158.02220979647	140	155
133.047956831378	156.72105721655	130	165
133.047956831378	156.72105721655	130	155
130.000008239172	154.999994962077	120	155
130.00000800774	145.00000176126	120	145
133.729145639835	141.611039695456	130	145
137.884918674116	137.944746220622	140	145
137.884918674116	137.944746220622	140	135
141.512479816093	133.225739525522	150	135
143.699347095366	127.510330464998	140	125
146.013444592838	122.323471203328	140	115
154.471837508801	120.584116890282	160	125
154.471837508801	120.584116890282	150	125
154.471837508801	120.584116890282	150	115
166.001433201882	118.777634988919	170	125
166.001433201882	118.777634988919	170	115
166.001433201882	118.777634988919	160	115
176.50799638663	116.968178055622	180	125
182.255531814628	114.23829507441	190	115
182.255531814628	114.23829507441	180	115
182.255531814628	114.23829507441	180	105
190.256744319527	113.12905919165	200	115
190.503893074302	106.354219883777	200	105
190.715030367179	102.368697238907	190	105
190.926381849447	98.1473379070355	190	95
191.138019399682	94.2490110463854	200	95
191.339734392405	89.9999979326188	200	85
188.660262964511	89.999998279414	180	95
188.93749201727	85.238735462386	190	85
188.93749201727	85.238735462386	180	85
189.236645895156	80.7238544101953	190	75
189.535362163194	76.9880305639863	180	75
189.999993733782	74.9999803759515	200	75
189.999999795057	69.6115913692985	190	65
190.000004287441	65.0000098887656	180	65
190.603994813083	62.5003449110216	200	65
190.9894495189	55.767436018189	200	55
191.339733968184	49.9999960821521	200	45
189.990001205343	49.9999964295226	190	55
188.660261416627	49.9999967753566	180	55
188.940346013581	45.2710426867648	190	45
188.940346013581	45.2710426867648	180	45
189.241544437467	40.7526652384722	190	35
189.542339059937	37.0074707979762	180	35
189.999994962066	34.9999619568788	200	35
190.000005932945	25.0000290604592	180	25
190.902363699812	22.5859944044029	190	25
191.810231142089	20.0941083617718	200	25
192.440745092834	10.229626936731	200	5
192.440745092834	10.229626936731	200	15
192.440745092834	10.229626936731	190	15
192.928927528874	2.07107467781662	200	-5
189.759362090087	2.76486982944239	190	-5
186.57187747202	3.51385685930077	190	5
183.176654503489	4.25806447138226	180	5
180.003057031849	4.99999383591432	180	15
179.990671720507	4.99999865153479	180	-5
170.000032190875	5.00000510541625	170	-5
168.338118195878	5.40530173732062	170	5
166.656182451963	5.81098126947131	170	15
160.481275066255	6.08348236314154	160	5
160.481275066255	6.08348236314154	160	15
155.000001197166	6.33973888801563	150	15
155.000001791952	3.6602630051436	160	-5
150.709720284064	3.84240798212792	150	-5
146.771070037872	4.03208000147676	150	5
142.54192104966	4.22156006783691	140	5

Solution x	Solution y	Original x	Original y
138.57229663103	4.41089529438074	140	-5
132.454308793287	4.62276375488463	130	-5
131.681354991137	8.07039250326513	130	5
130.914885260353	11.7462893483323	140	15
129.220260858615	13.6309344606602	130	15
127.517048892912	15.4910406261835	130	25
120.75327174511	15.9408218433785	120	25
114.999998946185	16.3397386370021	110	25
114.999999322612	10.4744480104109	120	5
114.999999322612	10.4744480104109	120	15
114.999999322612	10.4744480104109	110	15
114.999999694926	3.66026064089254	120	-5
110.738655298949	3.93556808679255	110	-5
106.856524914561	4.23099448055979	110	5
102.696037992131	4.52604396273461	100	-5
101.789801385325	7.95371216585605	100	5
100.892582986788	11.6003929414682	100	15
99.99999552431	14.9999944285964	100	25
96.1049679159607	11.8172839958274	90	15
92.9603466749476	8.28582403984807	90	5
89.9999944140673	5.00000437607468	90	-5
80.0039293657497	5.0000021940662	80	-5
79.9924311366467	5.00000098033276	80	5
79.9924311366467	5.00000098033276	80	15
70.0060705930685	4.99999938376307	70	15
69.9924432143723	4.99999733945948	70	-5
65.3653289291776	4.99999567843283	70	5
60.0000082579123	4.99999375433925	60	15
58.5137936670145	4.67078958386881	60	5
57.012090449147	4.34143726743681	60	-5
52.9450772149233	4.11079523305357	50	5
49.1443219683715	3.87990351585717	50	-5
45.0000018327437	3.6602583891567	40	-5
45.0000021814009	6.33973916841893	50	15
39.4613742512539	6.08105876471523	40	5
39.4613742512539	6.08105876471523	40	15
33.3559667327902	5.8064666790818	30	15
31.6654432281685	5.40304942821993	30	5
29.999978290686	5.00000319680087	30	-5
20.0073333187893	4.99999888762405	20	-5
20.0019694448148	4.99999672046641	20	5
19.9966057233141	4.99999458770349	20	15
15.1235360366254	3.99194537801727	10	5
10.9775363585466	2.97721736389758	10	-5
7.07106930415277	2.0710726536842	0	-5
7.56264710094968	10.2337831289054	0	5
7.56264710094968	10.2337831289054	0	15
7.56264710094968	10.2337831289054	10	15
8.19038227715038	20.0711415365921	0	25
9.09712839303681	22.5749009743893	10	25
9.99999695904587	25.0000193852856	20	25
10.000003339811	34.9999692875715	0	35
10.4029971416027	36.6657630866078	10	35
10.8063648844485	38.3568391315071	20	35
11.0809561666363	44.4582373260791	10	45
11.0809561666363	44.4582373260791	20	45
11.3397390175952	50.0000022360436	20	55
8.66025843506831	50.0000018882324	0	45
8.84075975918986	54.8857782756036	0	55
9.02835401828605	59.7176956601913	10	55
9.21573217238922	65.4411202086702	0	65
9.41543556775991	71.8209705992122	0	75
12.1281646754228	72.4034516348103	10	75
14.9363178418345	72.9810076857212	10	65
14.9363178418345	72.9810076857212	20	65
17.5114225636183	73.992881447975	20	75
19.9999949071829	75.0000095871216	30	75
19.9999950809105	85.0005923493311	20	95
19.9999952500901	85.0029539658034	30	85
14.8860882387359	85.9991181165111	10	85
14.8860882387359	85.9991181165111	20	85
9.7146218102931	87.01077803706	0	85
9.47682588723539	93.5865386786915	0	95
9.27065883746171	97.5584924609506	10	95
9.0643320878509	101.783889379957	10	105
8.85778666914685	105.71670400094	0	105
8.66026076295968	109.999999918364	0	115
11.3397391060996	109.99999965463	20	105
11.0566127264583	114.6911036864	10	115
11.0566127264583	114.6911036864	20	115

Solution x	Solution y	Original x	Original y
10.753710686573	119.213613155502	10	125
10.4513611789202	122.983914232259	20	125
10.0000052284264	125.000015708428	0	125
9.99999984597609	130.362355557812	10	135
9.99999444083443	134.999986518075	20	135
9.54288779899971	137.089473462842	0	135
9.24218864210475	141.515633788399	10	145
8.94110751708462	145.591412472886	0	145
8.66026291644838	150.00000163979	0	155
11.3397390396187	150.000001450818	20	145
11.0579058914258	154.673954934051	10	155
11.0579058914258	154.673954934051	20	155
10.7558946237054	159.203870159855	10	165
10.4544369443462	162.980562332322	20	165
10.0000045718199	165.000035118072	0	165
9.99999502229198	174.99997375054	20	175
9.09851799578055	177.40823903236	10	175
8.19326166651254	179.905809185256	0	175
7.55912265355276	189.751429977111	0	195
7.55912265355276	189.751429977111	0	185
7.55912265355276	189.751429977111	10	185
7.07107244271576	197.92892478207	0	205
10.9586152857849	197.023744691018	10	205
15.100435896432	196.007480859555	10	195
19.9957909648536	195.000005238854	20	185
20.0026144406416	195.00000307519	20	195
20.0094385369119	195.000004465852	20	205
29.9999704344486	194.999993101834	30	205
31.6561757835828	194.59550473961	30	195
33.337301719336	194.190942066766	30	185
39.4826399334202	193.917056539353	40	195
39.4826399334202	193.917056539353	40	185
44.9999964063133	193.660261450326	50	185
44.9999960634877	196.33973365418	40	205
49.1608219727792	196.130827037945	50	205
52.9440025474605	195.911562833719	50	195
57.0009269383007	195.692697427003	60	205
58.508211368917	195.345800394493	60	195
60.0000060205742	195.000008350588	60	185
68.0272604845831	195.90320559843	70	205
72.8993941321345	196.591380817346	70	195
78.2512713115263	197.284902257206	80	205
82.9289255443058	197.928925651746	90	205
82.3414460976437	193.891808845933	90	195
81.7146641458234	189.583331334862	90	185
80.8510785425432	187.496692211052	80	195
80.8510785425432	187.496692211052	80	185
80.0000058186551	184.999984244189	70	185
80.0000028818148	174.998283274932	70	175
80.0000028818148	174.998283274932	80	175
80.0000028818148	174.998283274932	80	165
80.0000006311536	174.990734469346	90	175
79.9999942076514	165.000421282526	90	165
78.7666221464357	164.856493719108	80	155
69.9750865185774	164.773931605729	70	165
69.9750865185774	164.773931605729	70	155
61.0894260238473	164.699143673074	60	155
57.1394589725235	164.630297401877	60	165
52.9289350895041	164.561458313228	50	155
52.9289340553586	166.234268852022	50	165
52.9289330206268	167.928920519914	60	175
48.8291239754782	167.928921478777	50	175
44.5006018430622	167.928922435079	40	165
40.7244891125965	167.928923391718	40	175
37.0710706930486	167.928924346474	30	175
37.0710717134116	159.539639771408	30	165
37.0710717134116	159.539639771408	30	155
37.0710717134116	159.539639771408	40	155
37.0710727350931	148.737866121252	30	145
37.0710737571691	142.071070878822	30	135
38.7635456410498	142.07106984856	40	145
40.4385409660811	142.071068815971	50	145
40.3569430476487	135.720341144059	50	135
40.2684115376221	131.287730261502	40	135
40.1799123482795	126.39982075745	40	125
40.1799123482795	126.39982075745	50	125
40.0000060864461	124.999990759546	30	125
40.000005142112	115.000004060345	30	115
40.0000050064762	110.361319673422	40	115
40.0000048437934	105.010415189432	40	105

Solution x	Solution y	Original x	Original y
40.0000048437934	105.010415189432	50	105
40.0000045793656	104.997820862116	30	105
40.0000049031944	95.0029474096106	30	95
44.6317529176746	94.9999604824926	40	95
49.9999947237994	94.9969738735515	60	95
49.9999950017616	90.3668687160749	50	95
49.9999954178446	85.002388984893	60	85
49.9999952685543	84.9899785579118	40	85
49.9999951111464	75.0105307319873	40	75
49.9999951111464	75.0105307319873	50	75
49.9999951111464	75.0105307319873	50	85
49.99999519614	74.9979612784152	60	75
49.9999946921456	65.0000043298831	60	65
45.4018964519311	62.6031226310154	40	55
45.4018964519311	62.6031226310154	50	55
45.4018964519311	62.6031226310154	50	65
41.9542991057131	61.4827702940671	40	65
38.6479408509053	60.3357026431076	30	65
38.0567654781628	52.4968583800412	30	55
37.5129127207323	40.3223191206002	30	35
37.5129127207323	40.3223191206002	30	45
37.5129127207323	40.3223191206002	40	45
37.0710710429761	32.0710713245417	30	25
41.06682740555	32.5082684921765	40	25
45.3029415528833	32.9638049422026	40	35
50.4249250748039	33.4162576935192	50	25
55.7775676538683	33.9023047165937	60	25
56.7780248075579	36.8495707015404	60	35
57.7604088244365	39.8986697340968	50	35
57.7604088244365	39.8986697340968	50	45
59.8845847691437	42.6927445769772	60	45
62.0083781402549	45.3963108889184	60	55
69.1142111208167	45.9000031011519	70	55
75.0000018389759	46.3397385404178	80	55
75.0000014837239	40.4594433285885	70	35
75.0000014837239	40.4594433285885	70	45
75.0000014837239	40.4594433285885	80	45
75.0000011288509	33.6602593643895	70	25
79.167497838983	33.8866619372034	80	25
82.9907928205331	34.125711435913	80	35
87.0996754052969	34.3644936686147	90	25
88.5574860547015	34.7250994841032	90	35
90.0011263378638	35.0856726194078	100	35
90.0036947036236	44.9999939074993	90	55
93.2552730630763	44.9999947041404	90	45
96.7288041640822	44.9999952053235	100	45
100.000019327789	44.99999589569	100	55
109.994704197713	44.9999958902564	110	55
110.002605432384	44.9999957749792	110	45
110.010506931498	44.9999955341791	110	35
120.000000158319	44.9999957241885	120	55
129.992723862544	44.9999953459041	130	55
129.994101033317	44.7133195641602	130	35
129.994101033317	44.7133195641602	130	45
129.994101033317	44.7133195641602	120	45
129.995864865244	35.2619469535306	120	35
138.227144062283	35.2000156634555	140	45
139.114485384179	35.1000237011768	140	35
140.000044777835	35.0000062194624	140	25
149.993254893151	35.0000010894446	150	25
150.006518694829	34.9999985324577	150	35
150.006518694829	34.9999985324577	150	45
159.999975733487	34.9999940322516	160	45
161.434615190462	33.3632250090409	160	25
162.928937111425	32.0710830651591	170	25
162.783586292789	35.8150494532907	160	35
162.638589423441	39.6316434909321	170	35
162.490068522318	46.0233283481912	170	45
162.339472503598	53.0176486665474	170	55
162.186357532497	58.823052338065	170	65
158.030593863637	59.0194633411644	160	65
153.594285947907	59.2139239813122	160	55
153.594285947907	59.2139239813122	150	55
153.594285947907	59.2139239813122	150	65
148.943387582996	59.4097831597891	140	55
148.847606197505	65.9213161062985	140	65
148.753899391183	73.7597065653769	140	75
148.662115947651	80.0032123268161	140	85
154.486144074613	80.0032120812053	160	75
154.486144074613	80.0032120812053	150	75

Solution x	Solution y	Original x	Original y
154.486144074613	80.0032120812053	150	85
161.341594059809	80.0032127913222	170	75
161.341368300879	84.1184454510673	170	85
161.341144196799	87.9227225478393	160	85
161.340920047621	92.0094614977523	160	95
161.340695907044	95.8353477037052	170	95
161.340471529185	99.9988361918309	170	105
153.288968552756	99.9992242373998	160	105
153.288968552756	99.9992242373998	150	105
153.288968552756	99.9992242373998	150	95
137.401841409984	99.9996120358314	140	105
137.401841409984	99.9996120358314	140	95

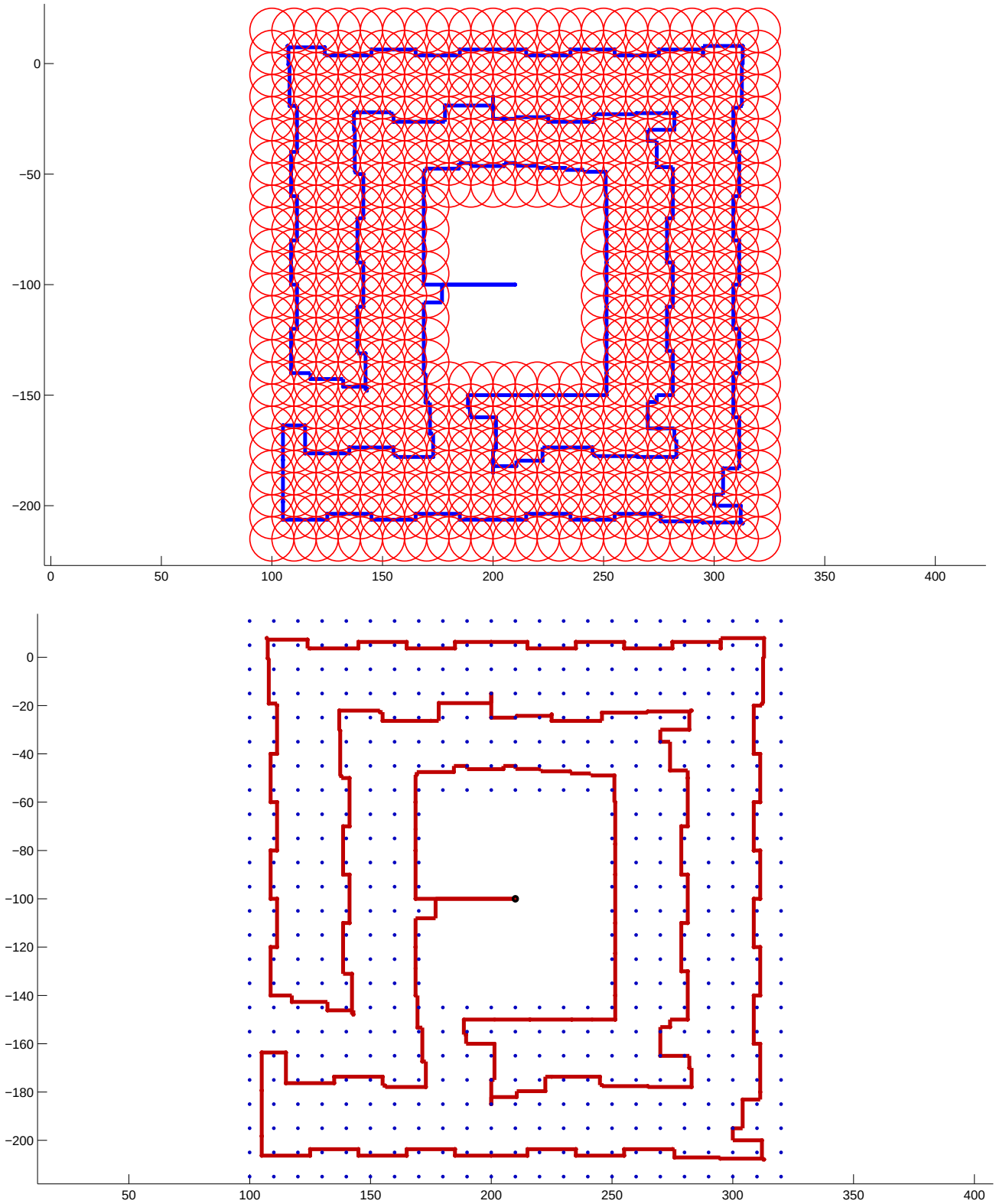


Figure N.145: *bubbles*8, Equal Radius, 2D, Manhattan, Length = 2225.7367958

Table N-148: Solution for *bubbles*8, Equal Radius, 2D, Manhattan

Total distance: 2225.73679576763 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
66.9393061195083	108.069691393607	60	105
58.6602677803031	119.999999687177	50	125
58.6602677803031	119.999999687177	50	115
58.6602677803031	119.999999687177	60	115
58.6602683394365	128.801829055985	60	125
58.660268900614	140.00000016621	50	145
58.660268900614	140.00000016621	50	135
58.660268900614	140.00000016621	60	135
59.4566732476068	153.310839869702	50	155
59.4566732476068	153.310839869702	60	155
59.4566732476068	153.310839869702	60	145
61.4750696846313	167.370766909575	60	175
61.4750696846313	167.370766909575	60	165
61.4750696846313	167.370766909575	70	165
62.9289209494246	177.928919407666	60	185
62.9289209494246	177.928919407666	70	185
62.9289209494246	177.928919407666	70	175
46.0938580670318	177.326020280457	40	185
46.0938580670318	177.326020280457	50	185
46.0938580670318	177.326020280457	50	175
44.9999996709252	173.660269574413	40	175
44.9999996709252	173.660269574413	40	165
44.9999996709252	173.660269574413	50	165
25.0000051312674	173.66026846112	20	175
25.0000051312674	173.66026846112	20	165
25.0000051312674	173.66026846112	30	165
24.9999960882957	176.339729929394	20	185
24.9999960882957	176.339729929394	30	185
24.9999960882957	176.339729929394	30	175
5.00000058736242	176.339729378321	0	185
5.00000058736242	176.339729378321	10	185
5.00000058736242	176.339729378321	10	175
4.99997351258574	163.660251011906	0	165
4.99997351258574	163.660251011906	10	165
4.99997351258574	163.660251011906	10	155
-4.99993995053381	163.660236232793	-10	165
-4.99993995053381	163.660236232793	-10	155
-4.99993995053381	163.660236232793	0	155
-4.99993985410124	179.312286775487	-10	185
-4.99993985410124	179.312286775487	-10	175
-4.99993985410124	179.312286775487	0	175
-4.99993974736449	198.257496838187	-10	205
-4.99993974736449	198.257496838187	-10	195
-4.99993974736449	198.257496838187	0	195
-4.9999396257849	206.339760571013	-10	215
-4.9999396257849	206.339760571013	0	215
-4.9999396257849	206.339760571013	0	205
14.9999695789899	206.33974760961	10	215
14.9999695789899	206.33974760961	20	215
14.9999695789899	206.33974760961	20	205
15.0000009699073	203.660270316789	10	205
15.0000009699073	203.660270316789	10	195
15.0000009699073	203.660270316789	20	195
34.9999962404351	203.660269928004	30	205
34.9999962404351	203.660269928004	30	195
34.9999962404351	203.660269928004	40	195
35.0000054933867	206.339729034154	30	215
35.0000054933867	206.339729034154	40	215
35.0000054933867	206.339729034154	40	205
54.9999961435523	206.339728432472	50	215
54.9999961435523	206.339728432472	60	215
54.9999961435523	206.339728432472	60	205
55.0000064362165	203.660270019719	50	205
55.0000064362165	203.660270019719	50	195
55.0000064362165	203.660270019719	60	195
74.9999953667539	203.660270387283	70	205
74.9999953667539	203.660270387283	70	195
74.9999953667539	203.660270387283	80	195
75.0000049217006	206.339727831569	70	215
75.0000049217006	206.339727831569	80	215
75.0000049217006	206.339727831569	80	205
89.9802706363612	206.339727197344	90	215
89.9802706363612	206.339727197344	90	205
104.999994611869	206.339726679331	110	215
104.999994611869	206.339726679331	100	215
104.999994611869	206.339726679331	100	205
105.000005029465	203.660272531177	110	205
105.000005029465	203.660272531177	110	195
105.000005029465	203.660272531177	100	195
124.999994622211	203.660273174926	130	205
124.999994622211	203.660273174926	130	195
124.999994622211	203.660273174926	120	195
125.000004392151	206.339724877731	130	215
125.000004392151	206.339724877731	120	215
125.000004392151	206.339724877731	120	205
144.999995160448	206.339724472329	150	215
144.999995160448	206.339724472329	140	215
144.999995160448	206.339724472329	140	205
145.00000529232	203.660277787979	150	205
145.00000529232	203.660277787979	150	195
145.00000529232	203.660277787979	140	195
165.000002819002	203.660279262528	170	205
165.000002819002	203.660279262528	170	195
165.000002819002	203.660279262528	160	195
165.839057785036	207.095349457898	170	215
165.839057785036	207.095349457898	160	215
165.839057785036	207.095349457898	160	205
184.800580773232	207.547831039632	190	215
184.800580773232	207.547831039632	180	215
184.800580773232	207.547831039632	180	205
202.928916023158	207.928912177027	210	215
202.928916023158	207.928912177027	200	215
202.928916023158	207.928912177027	200	205
202.026614554702	199.991908557345	210	205
202.026614554702	199.991908557345	210	195
202.026614554702	199.991908557345	200	195
190.000022107101	195.002384916446	190	205
190.000022107101	195.002384916446	190	195
190.000022107101	195.002384916446	180	195
194.055167385496	183.085952536847	200	185
194.055167385496	183.085952536847	190	185
194.055167385496	183.085952536847	190	175
201.339722874034	179.999996559107	210	185
201.339722874034	179.999996559107	210	175
201.339722874034	179.999996559107	200	175
201.339723148245	160.000002585573	210	165
201.339723148245	160.000002585573	210	155
201.339723148245	160.000002585573	200	155
198.660268626236	159.9999935824	200	165
198.660268626236	159.9999935824	190	165
198.660268626236	159.9999935824	190	155
198.660268072358	140.000000305357	200	145
198.660268072358	140.000000305357	190	145
198.660268072358	140.000000305357	190	135
201.33972858611	139.999988972132	210	145
201.33972858611	139.999988972132	210	135
201.33972858611	139.999988972132	200	135
201.339728682572	119.999997341369	210	125
201.339728682572	119.999997341369	210	115
201.339728682572	119.999997341369	200	115
198.660275456433	119.999986707855	200	125
198.660275456433	119.999986707855	190	125
198.660275456433	119.999986707855	190	115
198.660275201694	100.000000431694	200	105
198.660275201694	100.000000431694	190	105
198.660275201694	100.000000431694	190	95
201.339729613221	99.9999909048246	210	105
201.339729613221	99.9999909048246	210	95
201.339729613221	99.9999909048246	200	95
201.33972995278	80.0000078450904	210	75
201.33972995278	80.0000078450904	210	85
201.33972995278	80.0000078450904	200	85
198.660270943305	79.9999977071756	200	75
198.660270943305	79.9999977071756	190	75
198.660270943305	79.9999977071756	190	85
198.660270550401	60.0000066427288	200	55
198.660270550401	60.0000066427288	190	55
198.660270550401	60.0000066427288	190	65
201.339729358067	59.9999966258192	210	55
201.339729358067	59.9999966258192	210	65
201.339729358067	59.9999966258192	200	65
201.339729879772	40.0000057348547	210	35
201.339729879772	40.0000057348547	210	45
201.339729879772	40.0000057348547	200	45

Solution x	Solution y	Original x	Original y
198.66027077692	39.9999964979499	200	35
198.66027077692	39.9999964979499	190	35
198.66027077692	39.9999964979499	190	45
198.66027135845	19.9999992871623	200	15
198.66027135845	19.9999992871623	190	15
198.66027135845	19.9999992871623	190	25
202.085962735331	19.1498582590459	210	15
202.085962735331	19.1498582590459	210	25
202.085962735331	19.1498582590459	200	25
202.545624118999	0.436878625196801	210	-5
202.545624118999	0.436878625196801	210	5
202.545624118999	0.436878625196801	200	5
202.928915504732	-7.92892475171948	210	-15
202.928915504732	-7.92892475171948	200	-15
202.928915504732	-7.92892475171948	200	-5
185.000004748814	-3.66027106977675	190	-5
185.000004748814	-3.66027106977675	190	5
185.000004748814	-3.66027106977675	180	5
184.999996637607	-6.33973022167771	190	-15
184.999996637607	-6.33973022167771	180	-15
184.999996637607	-6.33973022167771	180	-5
165.000007904948	-6.33972970179537	170	-15
165.000007904948	-6.33972970179537	160	-15
165.000007904948	-6.33972970179537	160	-5
164.999996864912	-3.66026676425282	170	-5
164.999996864912	-3.66026676425282	170	5
164.999996864912	-3.66026676425282	160	5
145.000005573929	-3.66026615517726	150	-5
145.000005573929	-3.66026615517726	150	5
145.000005573929	-3.66026615517726	140	5
144.999996498659	-6.33973275468252	150	-15
144.999996498659	-6.33973275468252	140	-15
144.999996498659	-6.33973275468252	140	-5
125.000003818863	-6.33973337844647	130	-15
125.000003818863	-6.33973337844647	120	-15
125.000003818863	-6.33973337844647	120	-5
124.999995086503	-3.66026502703542	130	-5
124.999995086503	-3.66026502703542	130	5
124.999995086503	-3.66026502703542	120	5
105.000002941295	-3.660264510164	110	-5
105.000002941295	-3.660264510164	110	5
105.000002941295	-3.660264510164	100	5
104.999994241743	-6.33973619816793	110	-15
104.999994241743	-6.33973619816793	100	-15
104.999994241743	-6.33973619816793	100	-5
89.9812655789469	-6.33973670026818	90	-15
89.9812655789469	-6.33973670026818	90	-5
75.0000042369745	-6.33973719559427	70	-15
75.0000042369745	-6.33973719559427	80	-15
75.0000042369745	-6.33973719559427	80	-5
74.9999956197909	-3.6602631137295	70	-5
74.9999956197909	-3.6602631137295	70	5
74.9999956197909	-3.6602631137295	80	5
55.0000034257733	-3.66026287525126	50	-5
55.0000034257733	-3.66026287525126	50	5
55.0000034257733	-3.66026287525126	60	5
54.9999931955013	-6.33973739280765	50	-15
54.9999931955013	-6.33973739280765	60	-15
54.9999931955013	-6.33973739280765	60	-5
35.0000041487068	-6.33973755675284	30	-15
35.0000041487068	-6.33973755675284	40	-15
35.0000041487068	-6.33973755675284	40	-5
34.9999957825732	-3.66026254914443	30	-5
34.9999957825732	-3.66026254914443	30	5
34.9999957825732	-3.66026254914443	40	5
15.0000002571663	-3.66026348969349	10	-5
15.0000002571663	-3.66026348969349	10	5
15.0000002571663	-3.66026348969349	20	5
13.9327688108652	-7.30548007792537	10	-15
13.9327688108652	-7.30548007792537	20	-15
13.9327688108652	-7.30548007792537	20	-5
-2.92892571030262	-7.92892569270415	-10	-15
-2.92892571030262	-7.92892569270415	0	-15
-2.92892571030262	-7.92892569270415	0	-5
-2.53823701643542	0.444538280736889	-10	-5
-2.53823701643542	0.444538280736889	-10	5
-2.53823701643542	0.444538280736889	0	5
-2.07123686616291	19.1504671966937	-10	15
-2.07123686616291	19.1504671966937	-10	25
-2.07123686616291	19.1504671966937	0	25

Solution x	Solution y	Original x	Original y
1.33973685826778	19.9999988535829	0	15
1.33973685826778	19.9999988535829	10	15
1.33973685826778	19.9999988535829	10	25
1.33973762985534	39.999996373863	0	35
1.33973762985534	39.999996373863	10	35
1.33973762985534	39.999996373863	10	45
-1.33973761385931	40.0000041516753	-10	35
-1.33973761385931	40.0000041516753	-10	45
-1.33973761385931	40.0000041516753	0	45
-1.33973686323529	59.999993416129	-10	55
-1.33973686323529	59.999993416129	-10	65
-1.33973686323529	59.999993416129	0	65
1.33973688997173	60.0000029461697	0	55
1.33973688997173	60.0000029461697	10	55
1.33973688997173	60.0000029461697	10	65
1.33973658547518	79.9999951317724	0	75
1.33973658547518	79.9999951317724	10	75
1.33973658547518	79.9999951317724	10	85
-1.33973633050553	80.0000036063938	-10	75
-1.33973633050553	80.0000036063938	-10	85
-1.33973633050553	80.0000036063938	0	85
-1.33973617816193	99.9999958674883	-10	105
-1.33973617816193	99.9999958674883	-10	95
-1.33973617816193	99.9999958674883	0	95
1.33973488832814	100.000005307161	0	105
1.33973488832814	100.000005307161	10	105
1.33973488832814	100.000005307161	10	95
1.33973446128253	119.999994157547	0	125
1.33973446128253	119.999994157547	10	125
1.33973446128253	119.999994157547	10	115
-1.33973332622799	120.000003160545	-10	125
-1.33973332622799	120.000003160545	-10	115
-1.33973332622799	120.000003160545	0	115
-1.33973232179437	140.000000154657	-10	145
-1.33973232179437	140.000000154657	-10	135
-1.33973232179437	140.000000154657	0	135
7.44902499122634	142.691936236129	0	145
7.44902499122634	142.691936236129	10	145
7.44902499122634	142.691936236129	10	135
22.2113054346507	146.164989790437	20	155
22.2113054346507	146.164989790437	20	145
22.2113054346507	146.164989790437	30	145
32.9289203507802	147.928923554139	30	155
32.9289203507802	147.928923554139	40	155
32.9289203507802	147.928923554139	40	145
32.3276635307485	131.088554127655	30	135
32.3276635307485	131.088554127655	40	135
32.3276635307485	131.088554127655	40	125
28.6602678405583	130.000000749189	20	135
28.6602678405583	130.000000749189	20	125
28.6602678405583	130.000000749189	30	125
28.6602664666222	110.000004850234	20	115
28.6602664666222	110.000004850234	20	105
28.6602664666222	110.000004850234	30	105
31.3397353616145	109.999994823584	30	115
31.3397353616145	109.999994823584	40	115
31.3397353616145	109.999994823584	40	105
31.3397346689839	90.0000035364429	30	85
31.3397346689839	90.0000035364429	40	85
31.3397346689839	90.0000035364429	40	95
28.6602647110379	89.9999940808328	20	85
28.6602647110379	89.9999940808328	20	95
28.6602647110379	89.9999940808328	30	95
28.6602641421591	70.0000040767963	20	65
28.6602641421591	70.0000040767963	20	75
28.6602641421591	70.0000040767963	30	75
31.3397360149725	69.999995780116	30	65
31.3397360149725	69.999995780116	40	65
31.3397360149725	69.999995780116	40	75
31.339735503273	49.9999999398256	30	45
31.339735503273	49.9999999398256	40	45
31.339735503273	49.9999999398256	40	55
27.9253746329407	49.1496809352007	20	45
27.9253746329407	49.1496809352007	20	55
27.9253746329407	49.1496809352007	30	55
27.4605275109027	30.4389729376533	20	25
27.4605275109027	30.4389729376533	20	35
27.4605275109027	30.4389729376533	30	35
27.0710749695333	22.0710744535789	20	15
27.0710749695333	22.0710744535789	30	15

Solution x	Solution y	Original x	Original y
27.0710749695333	22.0710744535789	30	25
43.93507290036	22.6954004544966	40	15
43.93507290036	22.6954004544966	50	15
43.93507290036	22.6954004544966	50	25
44.9999999434046	26.3397355121155	40	25
44.9999999434046	26.3397355121155	40	35
44.9999999434046	26.3397355121155	50	35
65.0000001214239	26.3397352527961	60	25
65.0000001214239	26.3397352527961	60	35
65.0000001214239	26.3397352527961	70	35
68.2596642085989	18.9881914921009	60	15
68.2596642085989	18.9881914921009	70	15
68.2596642085989	18.9881914921009	70	25
89.9951734564215	15.0000096999276	90	5
89.9951734564215	15.0000096999276	80	15
89.9951734564215	15.0000096999276	90	15
89.9991244939729	24.9999885165543	80	25
89.9991244939729	24.9999885165543	90	25
89.9991244939729	24.9999885165543	90	35
100.548417230192	24.2547513076441	100	15
100.548417230192	24.2547513076441	100	25
114.999998283863	23.6602666990134	120	15
114.999998283863	23.6602666990134	110	15
114.999998283863	23.6602666990134	110	25
115.000004239541	26.3397345070701	120	25
115.000004239541	26.3397345070701	120	35
115.000004239541	26.3397345070701	110	35
134.999999466608	26.339732765169	140	25
134.999999466608	26.339732765169	140	35
134.999999466608	26.339732765169	130	35
135.844966509444	22.9191830882021	140	15
135.844966509444	22.9191830882021	130	15
135.844966509444	22.9191830882021	130	25
154.810136619211	22.4595017326612	160	15
154.810136619211	22.4595017326612	150	15
154.810136619211	22.4595017326612	150	25
172.928922590084	22.0710799824328	180	15
172.928922590084	22.0710799824328	170	15
172.928922590084	22.0710799824328	170	25
172.016542172493	29.9801433184686	180	25
172.016542172493	29.9801433184686	180	35
172.016542172493	29.9801433184686	170	35
160.000013835409	34.9977956565335	160	25
160.000013835409	34.9977956565335	160	35
160.000013835409	34.9977956565335	150	35
164.025201324419	46.8569944206482	170	45
164.025201324419	46.8569944206482	160	45
164.025201324419	46.8569944206482	160	55
171.339730840098	50.0000025837415	180	45
171.339730840098	50.0000025837415	180	55
171.339730840098	50.0000025837415	170	55
171.339730735302	69.9999963376026	180	65
171.339730735302	69.9999963376026	180	75
171.339730735302	69.9999963376026	170	75
168.660251924674	70.0000046635666	170	65
168.660251924674	70.0000046635666	160	65
168.660251924674	70.0000046635666	160	75
168.66025252552	89.9999789562501	170	85
168.66025252552	89.9999789562501	160	85
168.66025252552	89.9999789562501	160	95
171.339719504649	89.9999880450022	180	85
171.339719504649	89.9999880450022	180	95
171.339719504649	89.9999880450022	170	95
171.339720891314	110.000008042069	180	115
171.339720891314	110.000008042069	180	105
171.339720891314	110.000008042069	170	105
168.660265714983	110.000016732125	170	115
168.660265714983	110.000016732125	160	115
168.660265714983	110.000016732125	160	105
168.660265372702	129.999986536139	170	135
168.660265372702	129.999986536139	160	135
168.660265372702	129.999986536139	160	125
171.339723528597	129.999999753761	180	135
171.339723528597	129.999999753761	180	125
171.339723528597	129.999999753761	170	125
171.339720833331	150.000009764266	180	155
171.339720833331	150.000009764266	180	145
171.339720833331	150.000009764266	170	145
164.041149166215	153.101898917685	170	155
164.041149166215	153.101898917685	160	155

Solution x	Solution y	Original x	Original y
164.041149166215	153.101898917685	160	145
160.00001875817	165.002325387326	160	175
160.00001875817	165.002325387326	160	165
160.00001875817	165.002325387326	150	165
171.999730818093	170.006491809815	180	175
171.999730818093	170.006491809815	180	165
171.999730818093	170.006491809815	170	165
172.928920913674	177.928912921189	180	185
172.928920913674	177.928912921189	170	185
172.928920913674	177.928912921189	170	175
154.805971560109	177.547842326513	160	185
154.805971560109	177.547842326513	150	185
154.805971560109	177.547842326513	150	175
135.843004536923	177.094941247328	140	185
135.843004536923	177.094941247328	130	185
135.843004536923	177.094941247328	130	175
134.999999576745	173.660273558806	140	175
134.999999576745	173.660273558806	140	165
134.999999576745	173.660273558806	130	165
114.999999603545	173.660272826502	120	175
114.999999603545	173.660272826502	120	165
114.999999603545	173.660272826502	110	165
112.374598207795	179.628168093335	120	185
112.374598207795	179.628168093335	110	185
112.374598207795	179.628168093335	110	175
100.569010984629	182.09123860813	100	185
100.569010984629	182.09123860813	100	175
90.0000139847615	184.999981955881	90	195
90.0000139847615	184.999981955881	80	185
90.0000139847615	184.999981955881	90	185
90.0000152566143	174.996596099493	80	175
90.0000152566143	174.996596099493	90	175
90.0000152566143	174.996596099493	90	165
91.3397277176124	159.999999637612	100	165
91.3397277176124	159.999999637612	90	155
91.3397277176124	159.999999637612	100	155
79.5753326854201	156.183703008419	80	165
79.5753326854201	156.183703008419	70	155
79.5753326854201	156.183703008419	80	155
78.6637607271021	149.993952107948	70	145
78.6637607271021	149.993952107948	80	145
91.3862702697963	149.993953264036	90	145
105.990401477381	149.993954423818	110	155
105.990401477381	149.993954423818	110	145
105.990401477381	149.993954423818	100	145
123.342590991262	149.993955588607	130	155
123.342590991262	149.993955588607	120	155
123.342590991262	149.993955588607	120	145
131.771628264777	149.993956740655	130	145
141.343219036018	149.993958648325	150	155
141.343219036018	149.993958648325	140	155
141.343219036018	149.993958648325	140	145
141.342791185961	139.999933663492	150	145
141.342791185961	139.999933663492	150	135
141.342791185961	139.999933663492	140	135
141.342331926088	122.609376593207	150	125
141.342331926088	122.609376593207	140	125
141.342331926088	122.609376593207	140	115
141.341872800299	109.999976136941	150	115
141.341872800299	109.999976136941	150	105
141.341872800299	109.999976136941	140	105
141.341355465569	90.0000141616405	150	85
141.341355465569	90.0000141616405	150	95
141.341355465569	90.0000141616405	140	95
141.340730962544	77.3556687384063	150	75
141.340730962544	77.3556687384063	140	75
141.340730962544	77.3556687384063	140	85
141.340106394303	60.0000183889929	150	55
141.340106394303	60.0000183889929	150	65
141.340106394303	60.0000183889929	140	65
140.954889100701	48.9498595448988	150	45
140.954889100701	48.9498595448988	140	45
140.954889100701	48.9498595448988	140	55
131.222926368896	48.106721285424	130	55
122.637034210063	47.2092160722377	130	45
122.637034210063	47.2092160722377	120	45
122.637034210063	47.2092160722377	120	55
110.50144623201	46.2323958555697	110	55
100.002079424172	45.000011644477	100	35
100.002079424172	45.000011644477	110	45

Solution x	Solution y	Original x	Original y
100.002079424172	45.000011644477	100	45
94.9999994120115	46.3397331039462	90	45
94.9999994120115	46.3397331039462	90	55
94.9999994120115	46.3397331039462	100	55
79.99794318354	45.0000109933095	80	35
79.99794318354	45.0000109933095	70	45
79.99794318354	45.0000109933095	80	45
74.517228416231	47.527282365512	70	55
74.517228416231	47.527282365512	80	55
59.1464668107382	48.6651465663724	50	45
59.1464668107382	48.6651465663724	60	45
59.1464668107382	48.6651465663724	60	55
58.6602648034606	59.9999990700458	50	55
58.6602648034606	59.9999990700458	50	65
58.6602648034606	59.9999990700458	60	65
58.6602633728466	71.1782490318514	60	75
58.6602619884854	79.9999998473306	50	75
58.6602619884854	79.9999998473306	50	85
58.6602619884854	79.9999998473306	60	85
58.6602632753226	99.9999915559505	50	105
58.6602632753226	99.9999915559505	50	95
58.6602632753226	99.9999915559505	60	95

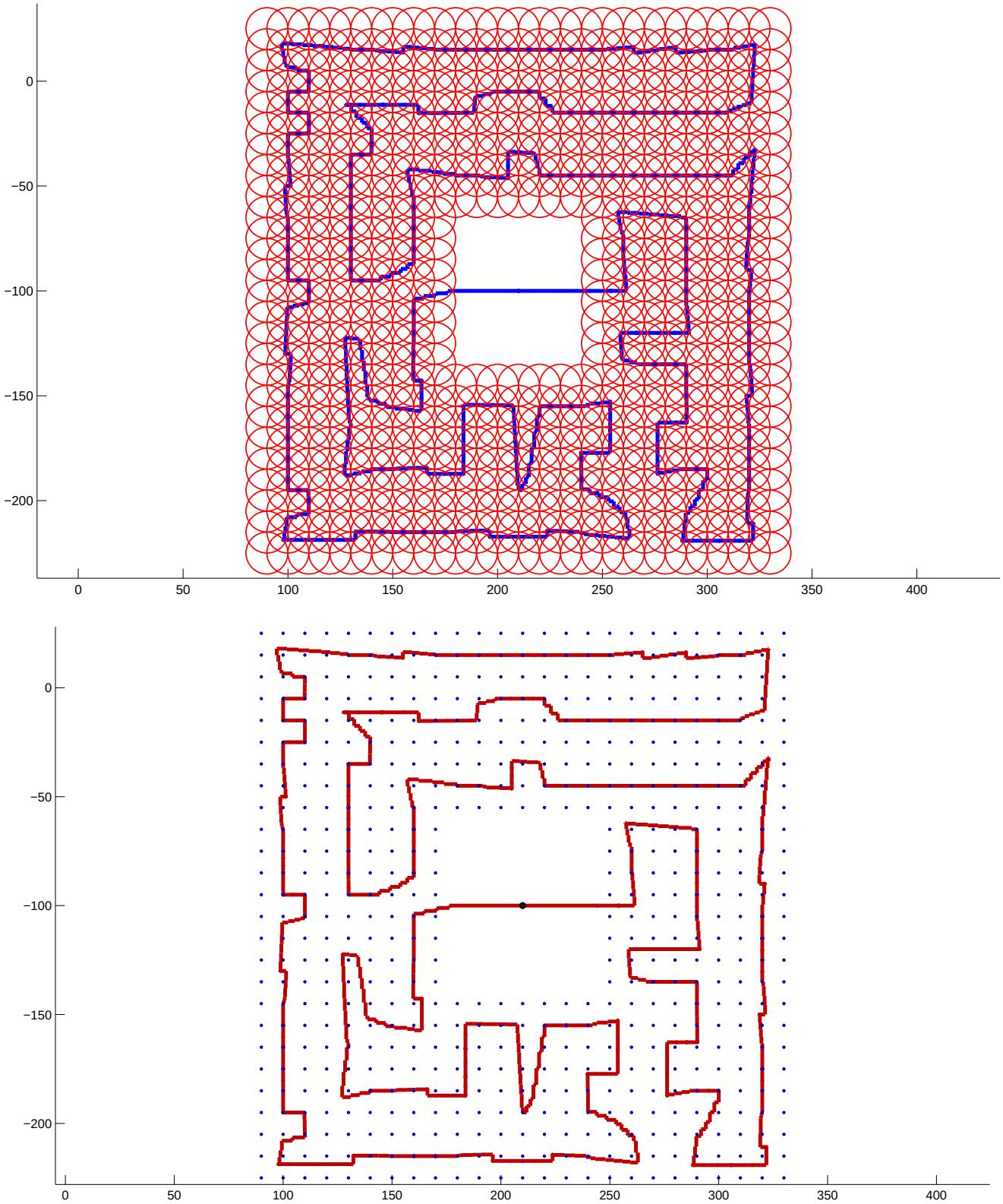


Figure N.146: *bubbles*9, Equal Radius, 2D, Manhattan, Length = 2658.7776654

Table N-149: Solution for *bubbles*9, Equal Radius, 2D, Manhattan

Total distance: 2658.77766539585			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
66.2971583818276	101.112951669127	60	95
60.4954131908271	102.427813391455	60	105
54.7968806945841	103.720331918386	50	105
50.0000046764858	105.000025614849	40	105
50.0000016082201	114.994059723563	40	115
49.9999999397311	115.000032342154	50	115
49.9999982267129	115.006004955787	60	115
49.9999952215436	124.99995844782	60	125
49.9349621246006	125.700489633533	50	125
49.8699459289869	126.403163477157	40	125
49.8277818901312	131.232921799952	50	135
49.7856229580079	135.609807168741	40	135
49.7456808835303	142.759058609262	40	145
51.1079201309153	142.759059780958	50	145
52.4817522010789	142.759060950231	60	145
53.6915083594364	142.75906211793	60	135
53.691509898099	151.133459589516	60	155
53.691511436527	157.240934423511	60	165
50.3423987330186	156.678132788347	50	155
47.0186572881499	156.11840701877	50	165
41.0242743882325	155.402556434152	40	165
37.0175956449113	153.839172375554	40	155
32.7218934814057	152.262577616453	30	155
28.7171670432361	150.64688100025	20	155
27.8547510933077	144.491271302944	30	145
26.984049288167	138.271339933898	20	135
26.1752021044907	133.34707305591	30	135
25.3510112573059	128.193718416496	30	125
24.5029274003762	123.637079356291	20	115
23.8981088916871	122.764982718256	30	115
20.4678907994197	122.418784614147	20	125
17.0710707046377	122.071072195673	10	115
17.36747739533	127.765934087943	10	125
17.6728861316616	135.110251078799	10	135
17.9874482118694	142.583151595881	10	145
18.3159279845379	148.325160467714	20	145
18.6434055290121	154.843829248672	10	155
18.9908608148814	161.271961355656	10	165
19.4957014518243	163.150967673581	20	165
19.9999938698388	165.00000203318	30	165
19.2131975567327	171.068682025669	20	175
18.4237645990491	176.4089689174	10	175
17.721294780506	182.723037594161	10	185
17.0710719974727	187.92892689775	10	195
20.9671839173583	187.025062742343	20	195
25.1121834402125	186.00851830161	20	185
29.9963881378569	185.000000866624	30	175
30.0021619187935	185.000002248945	30	185
30.0079349478011	185.000000124407	30	195
39.9999617767611	184.999995159206	40	195
41.1347243346108	184.815927557106	40	185
42.2774610091267	184.631864090363	40	175
46.7858992730459	184.511532119127	50	185
50.9489881490463	184.391173688029	50	175
56.2681917562992	184.277593441477	60	175
56.2681920943717	187.208343866268	50	195
60.3274246087338	187.208343862474	60	195
64.464051595363	187.208343859326	60	185
69.2139332009558	187.208343856477	70	195
73.7318074933794	187.208343853164	80	195
73.7318078193834	183.004046375518	80	185
73.7318081452463	178.466047848625	70	185
73.7318081452463	178.466047848625	70	175
73.731808471268	172.521357982495	80	175
73.7318087971577	165.690461683291	70	165
73.7318087971577	165.690461683291	80	165
73.7318091230065	159.404225981105	70	155
73.7318094487806	154.277592435181	70	145
77.8042170693923	154.344651251803	80	155
81.6991175663185	154.411700630406	80	145
88.6326798113498	154.481463143597	90	145
92.8450751942505	154.554311999817	90	155
97.3770325160808	154.627158633853	100	145
97.6304322064999	158.660829208788	100	155
97.8829152339089	163.157498328952	100	165
98.134701845438	167.481198465614	90	165
98.3963494516778	172.923459745255	90	175
98.6701980074742	177.363232052073	100	175
98.9435594608567	182.10982599865	100	185
99.2165373097378	186.534522216625	90	185
99.5208867644589	192.755802202134	90	195
100.000004694708	194.999992299589	100	205
101.755136042821	191.983882611472	100	195
103.546126673561	188.806551113525	110	195
104.924552472042	182.261157468933	110	185
106.234220331796	174.71697544795	110	175
107.507959066713	167.158991253237	110	165
108.76033812647	160.330594708453	110	155
110.000031961406	155.000005706809	110	145
119.993261000339	155.000002817881	120	145
119.99997078766	154.999999842455	120	155
120.006680579582	154.999996782313	120	165
129.999983952906	154.999992671065	130	165
132.031017817745	154.340993986225	130	155
134.111489541464	153.681099178917	130	145
139.089030439889	153.205563530942	140	145
143.69151237395	152.759067580081	150	145
143.691510839199	156.608755619307	150	155
143.691509306218	160.732487269644	140	155
143.691507773388	166.111224954204	150	165
143.691507773388	166.111224954204	140	165
143.69150624028	172.128909149135	150	175
143.691504705916	177.240937991122	150	185
140.228484880322	177.240939146745	140	185
136.801059460545	177.240940301075	140	175
133.144300798268	177.240941455178	130	175
129.745682356847	177.240942606829	120	175
129.814046195385	181.520246392964	130	185
129.882413361543	185.4783905596	120	185
129.966800791651	194.647554685559	120	195
133.993808793255	196.491452479038	130	195
138.532257140682	198.372668718143	140	195
142.92031356027	200.332586667208	150	195
145.417551341645	202.969508694124	140	205
148.223468832069	205.509443568026	150	205
150.960527508873	208.076701193263	160	205
152.008908039308	213.353764384089	160	215
152.928924134582	217.928927176833	160	225
149.421253636028	217.555948402524	150	225
145.825891766315	217.170295060327	150	215
141.834284333571	216.786951620747	140	215
138.017092895169	216.40526359377	140	225
133.370441786501	215.99149759211	130	225
131.221822239157	215.423798543199	130	215
129.106659383833	214.857293560012	130	205
123.907851141112	214.657448895042	120	215
119.312373981247	214.457582886566	120	205
113.73180324041	214.277596936046	110	205
113.73180290397	217.208345859916	120	225
109.47546135999	217.208345858312	110	225
105.107079046811	217.208345856634	110	215
99.954992190273	217.20834585487	100	225
99.954992190273	217.20834585487	100	215
94.8224538070752	217.208345853057	90	215
90.4812947961082	217.208345851179	90	225
86.2681962775557	217.208345845459	80	225
86.2681959440171	214.277596269595	90	205
80.9716058561419	214.391009985969	80	205
76.8036376231937	214.510697709332	80	215
72.3000070697768	214.630366794019	70	205
71.1458303001797	214.815153240973	70	215
69.9999922682589	214.999992333968	70	225
60.0009219622187	214.999992503521	60	225
59.9883109047417	214.999992698192	60	215
59.9883109047417	214.999992698192	60	205
50.0126599066496	214.999992824032	50	205
50.005463612422	214.999992719697	50	215
49.9982675612138	214.999993025426	50	225
40.0000137665156	214.999992618959	40	225
39.260451222089	214.927076484744	40	215
38.5191842015112	214.854223506397	40	205
33.7097156023739	214.817511719101	30	215
29.370913796756	214.780799603321	30	205
22.2409430072242	214.745681920687	20	205

Solution x	Solution y	Original x	Original y
22.2409418293529	216.699922754795	20	215
22.2409406527816	218.691502239136	30	225
17.6148598527527	218.691503763008	20	225
12.4402598516572	218.691505289518	10	215
7.6615775074648	218.691506815712	10	225
2.30006697246947	218.691508341468	0	225
-2.47627303516893	218.691509866675	0	215
-7.64412356219334	218.691511391965	-10	225
-12.240931867576	218.69151291503	-20	225
-11.726284366369	215.493109205185	-10	215
-11.2140596577579	212.336149137019	-20	215
-10.6133300489602	207.911551316787	-20	205
-5.74637617695382	206.444394252378	-10	205
-6.95091189584218E-6	204.999998560868	10	205
-0.0668735391389959	201.722458145156	0	205
-0.133724508047777	198.244674189041	0	195
-0.200552284265314	194.997546735998	0	185
-5.42558127846223	194.996328916939	-10	195
-9.99999541998071	194.995111204715	-20	195
-9.99999557289287	185.000008293478	-20	185
-9.99999582327359	180.353967979394	-10	185
-9.99999595574569	175.010440363819	0	175
-9.99999615537611	175.003254948753	-10	175
-9.99999639561538	174.996069428386	-20	175
-9.99999629521567	165.002927321553	-20	165
-9.99999596156175	164.990607307298	0	165
-9.99999582256595	160.350893558342	-10	165
-9.99999561125907	155.010610170791	0	155
-9.99999552139369	155.004042626256	-10	155
-9.99999541344192	154.997475300381	-20	155
-9.99999481102189	145.000005955332	-20	145
-9.6705372735	143.518260382109	-10	145
-9.34085693084739	142.022040324639	0	145
-9.1104226139676	137.947442526069	-10	135
-8.87970822845786	134.146368490013	0	135
-8.66026154105785	129.9999975466	0	125
-11.3397410402773	129.99999782877	-20	135
-11.1701677951808	125.711130231771	-20	125
-10.9941649424722	121.771027196153	-10	125
-10.8183280909981	117.538639997661	-10	115
-10.6426191358495	113.555938310386	-20	115
-10.4502416824877	107.760691463822	-20	105
-7.66185469256538	107.118351897136	-10	105
-4.76557127837047	106.481258333925	0	105
-2.11397002888661	105.848515726883	0	115
-4.82550962033201E-6	104.999992978764	10	105
-4.72225713110674E-6	99.6170133064092	0	95
-4.61840639331967E-6	95.0012038415801	10	95
-0.183863477146247	94.9974286152787	0	85
-5.42774976625319	94.9957233285447	-10	95
-9.99999793099845	94.994018039173	-20	95
-9.99999899711558	85.0000289700041	-20	85
-9.99999992649887	81.7299898788648	-10	85
-10.0000008475809	78.2581295764195	-10	75
-10.0000017667538	75.0040462568472	0	75
-10.0000030481968	74.9923210970916	-20	75
-10.0000041195134	65.0000080380726	0	65
-10.328951981816	63.5081284279906	-10	65
-10.6580387536603	62.0008811943006	-20	65
-10.8889324313585	57.9416502652766	-10	55
-11.1200694830367	54.1463083495122	-20	55
-11.3397416128479	50.0000009196847	-20	45
-8.6602596293471	50.0000011663468	0	55
-8.8949778603094	46.3244174506563	0	45
-9.14353936415591	43.0978802222843	-10	45
-9.39180296131296	39.7678090245465	-10	35
-9.63980217581597	36.7569832764382	0	35
-9.99999613800708	34.9999962273396	-20	35
-9.99999649071373	25.0024120630129	-20	25
-6.73734875127458	25.0007479512763	-10	25
-3.26546993502541	24.9990838631082	0	25
-3.60277226718608E-6	24.9974197777332	10	25
-3.80980674208331E-6	15.0014421008857	10	15
-9.99999655592485	14.9976298679126	-20	15
-9.99999746672925	5.00461100923608	-20	5
-9.88942267593569	5.00389721956025	-10	5
-9.77888659470537	5.00318343591979	-10	15
-0.187292894123232	5.00213405050918	0	15
-0.124884419950959	1.73653601108889	0	5
-0.0624520270560538	-1.73777105135541	0	-5

Solution x	Solution y	Original x	Original y
-3.89402708833586E-6	-4.99999884591866	10	-5
-5.79427085187925	-6.57984708634944	-10	-5
-10.7671707012379	-8.18460913867957	-20	-5
-11.5642515796383	-12.028353279126	-20	-15
-12.2438698833268	-14.9794637230776	-10	-15
-12.9289280125312	-17.9289309071696	-20	-25
-8.23141376975838	-17.5518330512467	-10	-25
-2.97713494705481	-17.1612592973011	0	-15
1.83812673052651	-16.7725562931369	0	-25
7.55107529088998	-16.3607529572563	10	-25
11.7220542447871	-15.9063772514991	10	-15
16.0605142064532	-15.452934441679	20	-15
19.9978094867333	-15.0000035578899	20	-5
20.0063963890025	-15.0000011998617	20	-25
29.9999778456374	-14.9999973852929	30	-25
31.4896380602245	-14.6708683593998	30	-15
32.9970770215853	-14.3415435319976	30	-5
37.0452020272016	-14.1108186290711	40	-15
40.8435108796769	-13.8798229102231	40	-5
44.9999986470359	-13.6602580838513	50	-5
44.999998405071	-16.3397403310468	40	-25
49.0159148946273	-16.0243140080974	50	-25
52.6309187469632	-15.6825380412062	50	-15
56.4513516054704	-15.3411670765436	60	-15
59.999358144588	-15.0000034397167	60	-5
60.0079192913797	-15.0000033988676	60	-25
69.99079241257	-15.0000028413203	70	-25
69.9972131000383	-15.0000023449009	70	-15
70.0036339401645	-15.0000018006783	70	-5
75.3629940943401	-15.0000016850265	80	-15
79.9966936839849	-15.0000015446577	80	-5
80.0073162066066	-15.0000016407167	80	-25
89.9999671724438	-15.0000015783526	90	-25
94.6214081316969	-15.0000014979108	90	-15
99.9956014284963	-15.000001376941	100	-5
100.002414205478	-15.0000016056571	100	-15
100.009227597659	-15.0000017454483	100	-25
105.35901767188	-15.0000018453211	110	-15
110.000031477785	-15.0000019500901	110	-25
119.991558559586	-15.0000019393047	120	-25
120.003011781443	-15.0000018794371	120	-5
124.618656009752	-15.0000020079562	120	-15
129.99658633369	-15.0000023195407	130	-5
130.003293480226	-15.0000027156451	130	-15
130.009998920431	-15.0000033225089	130	-25
135.357182557187	-15.0000036788242	140	-15
139.999998154296	-15.0000040249419	140	-5
142.097052825778	-15.4517892444638	140	-25
146.522192330753	-15.7541381771312	150	-15
150.601172251124	-16.0568601513538	150	-25
154.999999900031	-16.3397394434031	160	-25
154.999999691864	-13.660260691237	150	-5
159.182020783494	-14.1457614403382	160	-5
162.941685395905	-14.7163520830524	160	-15
166.968505700266	-15.2863922480236	170	-15
170.753659665194	-15.8568647695276	170	-25
175.000001184629	-16.3397381773874	180	-25
175.00000097881	-13.6602604228898	170	-5
178.648357712229	-13.8934834567294	180	-5
181.862086114869	-14.1410868998078	180	-15
185.197855999507	-14.3884058314641	190	-15
188.224391841081	-14.6354707899521	190	-5
190.000016696155	-14.9999951212999	190	-25
195.357936766244	-15.0000001094297	200	-15
199.999990465123	-15.0000053751678	200	-5
202.542483637892	-15.9343970903901	200	-25
206.206729313732	-16.6110032481634	210	-15
209.59238868346	-17.2919099314915	210	-25
212.928928632245	-17.928925687406	220	-25
212.594162195	-12.7998599393773	220	-15
212.248380314405	-6.67044507118028	220	-5
211.889176056247	-1.34522694836645	210	-5
211.531642134857	4.72839679007839	220	5
211.152699279536	10.5920653524827	220	15
208.880130319071	11.3764882657625	210	15
206.579015488986	12.147903353965	210	5
204.001623621716	12.9836922518508	200	5
201.976544143038	13.9944558391252	200	15
199.999986547097	14.9999928758273	200	25
190.002394165699	14.9999945400715	190	25

Solution x	Solution y	Original x	Original y
189.995920271372	14.9999959850259	190	15
189.989441611736	14.9999963754762	190	5
180.0094730975	14.9999967710028	180	5
179.998289022928	14.9999990662764	180	25
175.360023627045	14.9999972428078	180	15
170.004959818815	14.9999976801915	170	25
169.997621822488	14.9999971077784	170	15
169.9902830502	14.9999968802351	170	5
160.009330652428	14.999996793838	160	5
160.002209334404	14.9999970798805	160	15
159.995087603877	14.9999971211674	160	25
154.620080108216	14.999997020516	150	15
150.01373415907	14.9999969101083	150	25
149.996853837812	14.9999980069343	150	5
140.010177481744	14.9999968347453	140	5
140.003057968322	14.9999967965221	140	15
139.995938820074	14.9999968032618	140	25
134.616308689461	14.9999965924795	130	15
130.00265336743	14.999996389995	130	25
129.991111326082	14.9999958761132	130	5
120.009420837153	14.9999954470085	120	5
120.004167454098	14.9999951789503	120	15
119.998913830737	14.9999949181948	120	25
116.113580456579	11.8308462352185	110	15
112.965265627742	8.27393678903081	110	5
109.999998906537	5.00000478769999	110	-5
104.617146145681	5.00000475227677	100	5
99.9999886674282	5.00000469612049	100	15
94.6195412300101	5.00000462479871	90	5
90.0000009478961	5.00000456057007	90	-5
87.1810899372996	6.15859924375039	90	15
83.1936954829684	6.99948958119833	80	5
79.4960369920014	7.84905790794259	70	5
79.1877863186338	11.5857651477252	80	15
78.8791285147111	15.0744359462853	80	25
74.0434519614382	15.1121480143754	70	15
69.7334708295168	15.1498598297813	70	25
64.248339479775	15.1851755600041	60	15
59.4706295196842	15.220491903275	60	25
52.2409427559591	15.2543207646027	50	25
52.2409415881339	13.2980030551682	50	15
52.2409404223233	11.3084924664934	60	5
45.6357222353518	11.3084909271573	50	5
35.3956100453568	11.3084893884234	30	5
35.3956100453568	11.3084893884234	40	5
35.3956100453568	11.3084893884234	40	15
24.4822915047413	11.3084878503451	20	5
17.7590644419109	11.3084863126302	10	5
20.186916275976	14.4190035379951	20	15
22.622857675208	17.503624046189	20	25
25.2905174600855	19.847086772747	30	15
27.6812083503568	22.4707372311443	30	25
29.9999957231877	25.0000008349113	40	25
29.9152992497329	30.3704660435097	30	35
29.8306272119775	35.0018534034201	30	45
24.5801706840314	35.0031516363986	20	35
20.0000021648293	35.0044499075235	10	35
20.0000019019104	44.9999927317406	10	45
20.0000018171189	49.6229623030874	20	45
20.0000017298376	54.9958968017563	10	55
20.0000019439566	55.0022688598502	20	55
20.0000021571774	55.00864098377	30	55
20.0000022256096	60.357435481463	20	65
20.0000022839639	64.9921757109057	30	65
20.0000022799147	65.0029766328736	10	65
20.000002477277	74.9964542561786	10	75
20.0000030816942	75.0029905841411	20	75
20.0000036861219	75.0095271487442	30	75
20.000004123696	84.9999500783307	10	85
20.001486471218	85.1384066530194	30	85
20.0023101710892	88.3426600618031	20	85
20.0031338725887	91.7677271641915	20	95
20.0039575695815	94.9999962094032	20	105
29.9999982859894	94.9999952569473	30	105
34.2584908436048	93.2129331582788	30	95
39.0935925011229	91.3908713941402	40	95
43.8117788727302	89.4979164394811	50	95
46.988974469669	87.2139125199399	50	85
50.0000034760673	85.0005813073114	60	85
50.0000051956671	84.9917387743014	40	85

Solution x	Solution y	Original x	Original y
50.0000057748633	75.0080188720991	40	75
50.0000049092902	74.998054274617	60	75
50.0000054196367	70.363415394722	50	75
50.0000053667824	65.0031030080875	60	65
50.0000048015883	64.9975111345583	50	65
50.000005395875	64.9919218514059	40	65
50.0000041414603	55.0082745075281	40	55
50.0000034547904	54.9994083394642	60	55
49.258569943776	51.7936423002009	50	55
48.5152169385054	48.393866064653	50	45
47.7675834826621	45.2153194374384	40	45
47.071071148276	42.0710706862133	40	35
52.2521500393896	42.7224773579712	50	35
58.5322578145401	43.4246759135211	60	35
63.8769168937865	44.2135800001428	60	45
69.9968729688552	44.9999977734447	70	55
70.001873185821	44.9999996216661	70	45
70.0068737587372	45.0000016580816	70	35
79.9999796612832	45.0000055318149	80	35
81.6673011138594	45.4025775462197	80	45
83.3607742193058	45.8055571287902	80	55
89.4306409830862	46.0809138073292	90	55
95.0000001528399	46.3397400056553	100	55
94.9999999077441	43.4230976382293	100	45
94.9999996627556	40.4111411815929	90	45
94.999999417891	36.9537028886516	90	35
94.9999991733403	33.6602600544643	90	25
98.5347296419724	33.9299776970633	100	35
101.984765149941	34.1993316048164	100	25
107.197444605686	34.5049665117465	110	25
108.138677148923	37.9376289253633	110	35
109.071271516614	41.5904465291039	110	45
110.000007803227	44.9999943229598	110	55
115.362897075232	44.9999947651767	120	45
119.998136829992	44.9999951319263	120	55
120.009165201536	44.9999948080822	120	35
125.358402107596	44.9999952177181	130	45
129.997765739554	44.9999953046353	130	55
130.008962214874	44.9999953386562	130	35
135.358269524577	44.9999949482607	140	45
140.000014423263	44.9999948286334	140	35
145.359103447777	44.9999946748725	150	45
150.000010861624	44.9999945318762	150	35
155.359308223644	44.9999944615358	160	45
160.00001279374	44.9999943675089	160	35
165.35835257231	44.9999942975462	170	45
170.000052650453	44.9999942327019	170	35
179.999945382893	44.9999941551153	180	35
184.608815490005	44.9999941570856	180	45
189.997346390746	44.9999942403291	190	55
190.004615887157	44.9999938943666	190	45
190.011885903847	44.9999936112434	190	35
199.999997090449	44.9999930803561	200	55
202.365566562594	42.1361525459685	200	45
204.821583758761	39.1243543910635	200	35
207.568407962511	36.4049014634735	210	35
210.225779881535	33.7504903381575	210	25
212.928928939778	32.0710749013559	220	25
212.495502379094	36.8172217778211	220	35
212.043220573722	42.2171194689477	210	45
211.593597385681	47.18960650608	220	45
211.105272735269	53.6872139218728	220	55
210.551925982258	58.9505330811379	210	55
210.000003157298	64.996221742163	200	65
210.000002421597	65.0023982196361	210	65
209.999999469864	65.0085739511533	220	65
209.999992042662	74.9999678224438	220	75
209.669016875233	76.4828369521697	210	75
209.338011031973	77.9841119344868	200	75
209.108155082285	82.0302573051491	210	85
208.878101308491	85.8215615333886	200	85
208.660259584175	89.9999944485854	200	95
211.339733542738	89.9999942179484	220	85
210.929214313361	94.8209484423825	220	95
210.464053447442	99.52169704982	210	95
210.000008488253	104.999250040064	200	105
210.000007465472	105.006196194144	210	105
210.000007435101	105.013143101379	220	105
210.00000732342	114.987048883697	220	115
210.000006931992	114.994831896608	210	115

Solution x	Solution y	Original x	Original y
210.000006801308	115.002614939076	200	115
210.000006817073	120.36724223764	210	125
210.000007233264	124.998433539929	200	125
210.000007739277	125.011987008372	220	125
210.000007817606	130.363877403169	210	135
210.000008026224	134.99999683176	200	135
210.444836363345	137.077836410623	220	135
210.749407836391	141.512441259949	210	145
211.054477553834	145.592226608994	220	145
211.339731052612	150.000007877758	220	155
208.660259337412	150.000007709754	200	145
208.895761340043	153.675794804111	200	155
209.14574341856	156.889793644124	210	155
209.395551150321	160.227586984439	210	165
209.645189239402	163.253277236862	200	165
209.999991079828	165.000003695202	220	165
209.999990500047	174.98606339605	200	175
209.999991199037	174.994291353669	210	175
209.999991318141	175.002518899146	220	175
209.999991114478	180.359162186593	210	185
209.999990792589	185.000002969499	220	185
209.999990237221	194.999992317966	220	195
209.731728862541	196.36736491717	210	195
209.463475702618	197.750851976875	200	195
209.281067801955	204.626199627412	200	205
209.110311020004	210.876599330727	200	215
210.504770886291	210.876599527636	210	205
211.908907426352	210.876599741783	220	205
211.908907012771	213.711964625625	220	215
211.908906599932	216.384539332907	210	215
211.908906185058	219.123401335578	220	225
205.530202389963	219.123402198364	210	225
195.840034310845	219.123403059787	200	225
195.840034310845	219.123403059787	190	225
189.571934385056	219.123403921135	190	215
183.265066319942	219.123404782029	180	225
178.091095725753	219.123405650122	170	225
178.60277919456	214.889466621709	170	215
179.168652592085	210.631391806888	180	215
179.733362835356	205.799053098336	170	205
181.894124762108	202.650494974435	180	205
184.116867544654	199.379056214075	190	205
185.972625620109	194.829674490605	180	195
188.013670242959	190.291983105801	190	195
189.999990990175	185.001558114887	200	185
189.997857183845	185.000008295795	190	175
185.384865612322	185.000008417404	190	185
180.00000105462	185.000008505746	180	175
176.631515340618	185.56787396287	180	185
173.039696670365	186.13721388215	170	185
169.68961629903	186.709107479336	170	195
166.308487899457	187.240931029143	160	195
166.308489428315	182.627592841954	160	185
166.308490958785	177.458777080485	170	175
166.308492489541	172.717869839019	160	175
166.308494021104	167.405696416931	160	165
166.308495553859	162.759061417579	160	155
170.677880701185	162.759060258726	170	155
175.329567842238	162.759059100576	180	165
175.329567842238	162.759059100576	170	165
180.25431647732	162.759057943978	190	165
180.177009222079	155.382621042711	190	155
180.08850662837	150.553822908851	180	155
180.000006786621	145.001707775386	180	145
180.000006786621	145.001707775386	170	145
180.000003921873	144.98960331887	190	145
180.000004492039	135.009055476255	190	135
174.544057346071	135.006283651091	180	135
167.581857454452	135.003516539581	170	135
160.004516717533	135.00074969721	160	145
156.589497415471	134.107091063585	160	135
152.941336296681	133.210091300815	150	135
149.532811920097	132.305475089756	140	135
149.234991033813	128.117124479211	150	125
148.93693674661	124.23944555934	140	125
148.660262272665	119.999999006931	140	115
156.278038411375	119.999999256987	160	125
156.278038411375	119.999999256987	160	115
156.278038411375	119.999999256987	150	115
166.474806104624	119.999999507132	170	115

Solution x	Solution y	Original x	Original y
174.481676534304	119.999999757206	180	125
174.481676534304	119.999999757206	170	125
181.339737089582	120.000000007247	190	125
181.05778402505	115.608410140685	190	115
180.754906952727	111.532065363531	180	115
180.452455164464	107.100074173068	190	105
180.000006950617	104.999996323941	170	105
180.000005442889	100.365441428558	180	105
180.000004969702	95.0108471818344	190	95
180.000003154695	95.0021599145387	180	95
180.000001898023	94.9934731494031	170	95
180.000000896567	89.6209739024535	180	85
179.999999878378	85.0069942659129	170	85
179.999998735775	84.9934208496318	190	85
179.999998214992	75.0066488920566	190	75
179.999996938531	74.9980657180881	180	75
179.999995714262	74.9894822191277	170	75
179.99999457425	69.6168845194006	180	65
179.999992470076	65.0000227633392	190	65
177.499404525642	64.3500993415214	180	55
171.597881150272	63.9281044718398	170	55
167.047274481096	63.5491600345536	170	65
162.143749582677	63.1691082091095	160	65
157.539218123007	62.7876809215047	160	55
151.924722275134	62.4233154159709	150	55
147.071072910002	62.0710710448175	140	55
147.570321156125	64.8957495033118	150	65
148.06672490603	67.7211991436545	140	65
148.604132531229	71.0510484585907	140	75
149.302643811178	73.0446190142453	150	75
149.999995201739	75.0000246655524	160	75
150.000000645874	84.9921019817926	160	85
150.000005056466	85.002672153922	140	85
150.341201151878	88.5240733354544	150	85
150.682742415663	92.3338114618535	150	95
151.024829780556	95.9508134353528	160	95
151.339737833857	100.00000062803	160	105
144.103388947447	100.000000386902	150	105
144.103388947447	100.000000386902	140	105
134.183519866485	100.000000143374	140	95

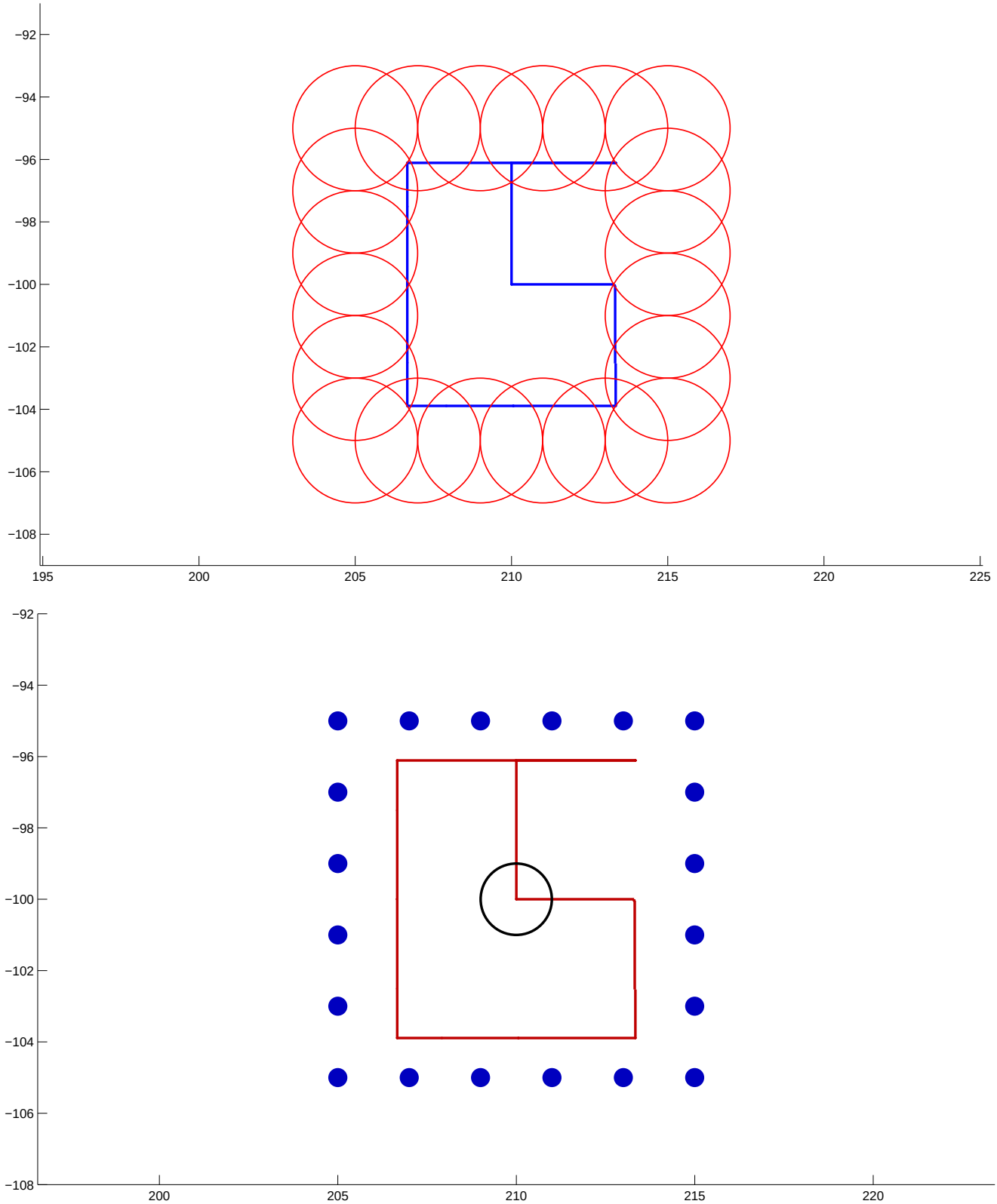


Figure N.147: $rotatingDiamonds1$, Equal Radius, 2D, Manhattan, Length = 35.5777872

Table N-150: Solution for *rotatingDiamonds*1, Equal Radius, 2D, Manhattan

Total distance: 35.5777871569768 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
103.299279395789	100.038992151524	105	101
103.299279395789	100.038992151524	105	99
103.317561697809	102.531450658828	105	103
103.335901105299	103.890594260443	105	105
103.335901105299	103.890594260443	103	105
100.058152799325	103.890594020188	99	105
100.058152799325	103.890594020188	101	105
97.9145685134015	103.890593778618	97	105
96.6640978105434	103.890593536115	95	105
96.6640978063771	102.506165253679	95	103
96.6640978031094	99.9983715073138	95	99
96.6640978031094	99.9983715073138	95	101
96.6640978020598	97.5099244300806	95	97
96.6640978015514	96.1094058425798	95	95
96.6640978015514	96.1094058425798	97	95
99.9888185614767	96.1094055957674	99	95
99.9888185614767	96.1094055957674	101	95
103.335901364767	96.1094053504692	105	95
103.335901364767	96.1094053504692	105	97
103.335901364767	96.1094053504692	103	95

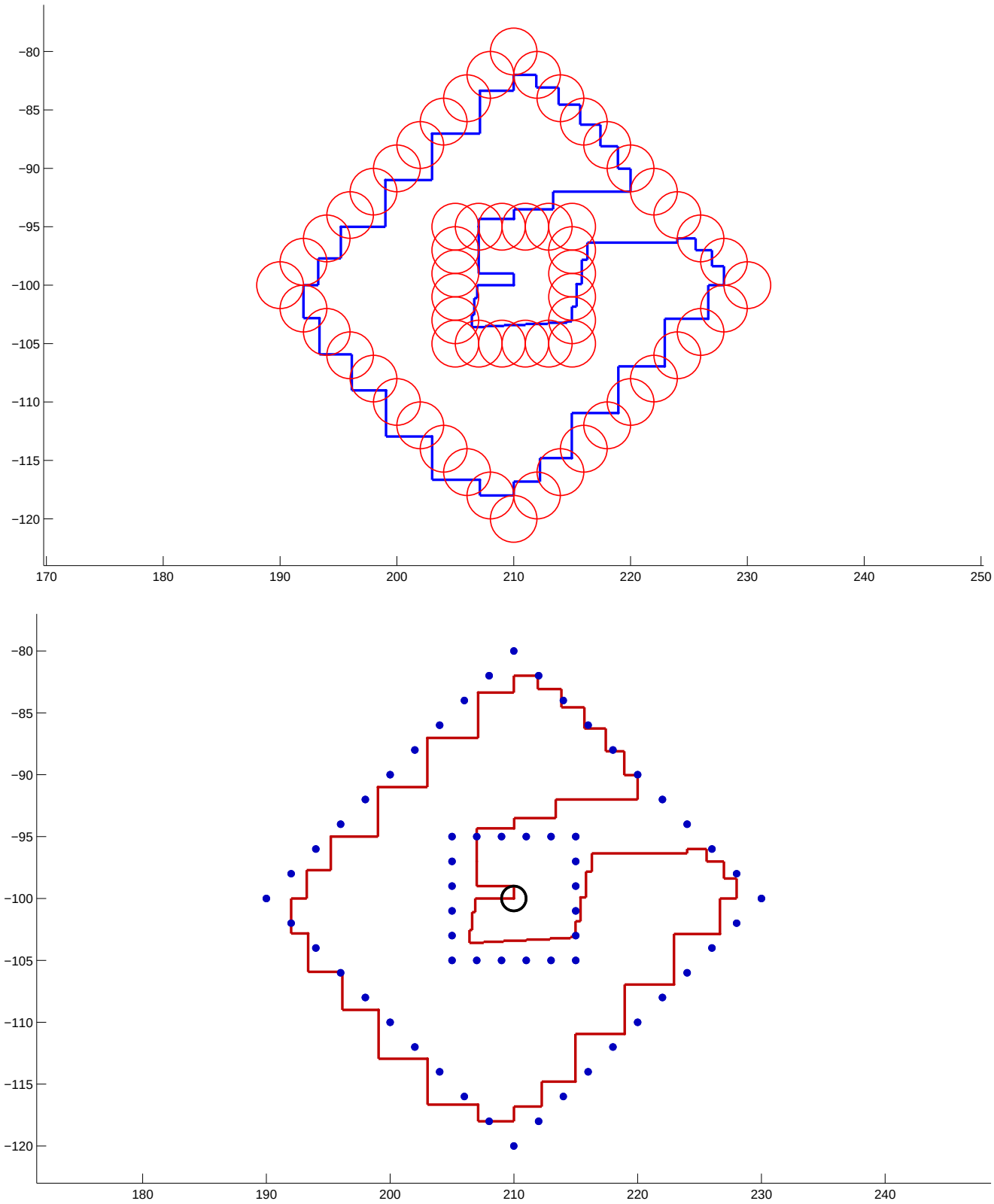


Figure N.148: $rotatingDiamonds2$, Equal Radius, 2D, Manhattan, Length = 192.3430627

Table N-151: Solution for *rotatingDiamonds*2, Equal Radius, 2D, Manhattan

Total distance: 192.343062701765 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
96.8803895264371	101.107415982095	95	101
96.6226346311995	102.550204314199	95	103
96.4142072906646	103.585773556951	95	105
97.5568516386211	103.5014697157	97	105
99.1687694589258	103.412697791271	99	105
101.016815176589	103.31869634721	101	105
102.914996098697	103.216513249255	103	105
104.570902809095	103.097033393101	105	105
104.980543866131	101.840736924514	105	103
105.390038606462	99.9134305099026	105	101
105.390038606462	99.9134305099026	105	99
105.829372132474	97.8303183945294	105	97
106.305548486615	96.3555292832916	105	95
113.999999294121	96.0000055273586	114	94
115.575119901897	97.0117993128517	116	96
116.969104837102	98.3807027187206	118	98
117.99999351824	100.000000074134	120	100
116.651349012238	102.871111283653	116	104
116.651349012238	102.871111283653	118	102
112.933594497982	106.950699808522	112	108
112.933594497982	106.950699808522	114	106
108.955101554783	110.943029084631	108	112
108.955101554783	110.943029084631	110	110
104.973545691173	114.79775531468	104	116
104.973545691173	114.79775531468	106	114
102.247555205507	116.811154496449	102	118
100.000000068453	117.999993526824	100	120
97.1064282530376	116.657283960712	96	116
97.1064282530376	116.657283960712	98	118
93.0214503762143	112.952995899198	92	112
93.0214503762143	112.952995899198	94	114
89.0704936661663	109.005543930599	88	108
89.0704936661663	109.005543930599	90	110
86.1388058215524	105.924223388647	86	106
83.3735944026093	102.822447499053	82	102
83.3735944026093	102.822447499053	84	104
82.0000037612326	99.9996253376345	80	100
83.263181236981	97.7082546027244	82	98
85.2034080158916	95.0018805269244	86	94
85.2034080158916	95.0018805269244	84	96
89.0140857620483	91.0028749558366	90	90
89.0140857620483	91.0028749558366	88	92
93.0112334743838	87.0272368767124	94	86
93.0112334743838	87.0272368767124	92	88
97.1108113447393	83.3601879624421	98	82
97.1108113447393	83.3601879624421	96	84
99.9999999417596	82.0000038346248	100	80
101.93230582439	83.0812706482479	102	82
103.842133917448	84.5532295019796	104	84
105.693317789736	86.2619514756433	106	86
107.421400704708	88.1085295789776	108	88
108.915918513023	90.0314560675317	110	90
109.999994886752	91.9999998757834	112	92
103.380198247372	93.5061193826295	103	95
100.02496544388	94.332756648944	99	95
100.02496544388	94.332756648944	101	95
97.0000039098692	95.0000020628983	95	95
97.0000039098692	95.0000020628983	97	95
97.0000037240036	96.9999998393348	95	97
97.0000041194312	98.9999973327859	95	99

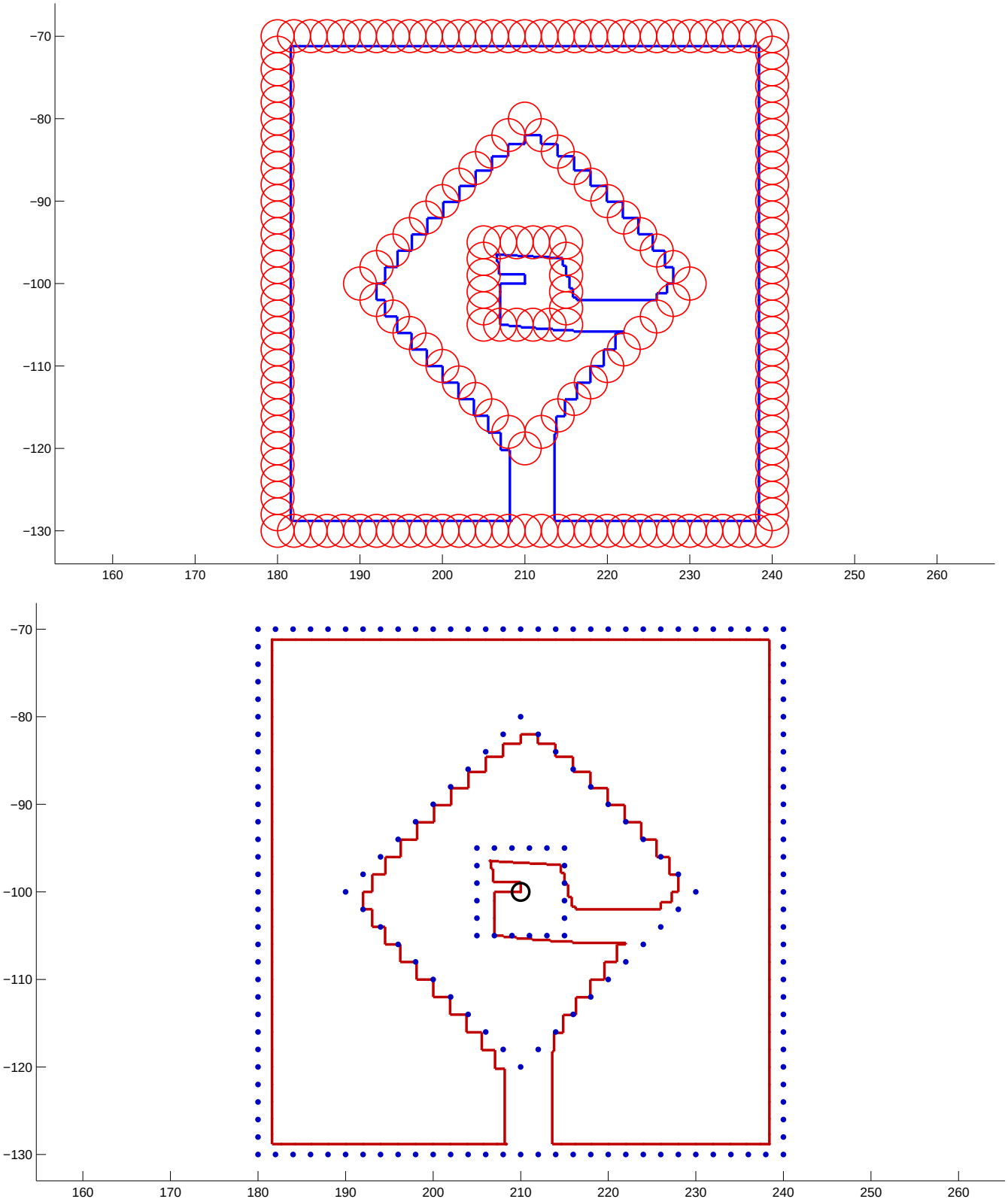


Figure N.149: $rotatingDiamonds3$, Equal Radius, 2D, Manhattan, Length = 432.3426801

Table N-152: Solution for *rotatingDiamonds*3, Equal Radius, 2D, Manhattan

Total distance: 432.342680128384			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
97.00000119	101.0000017	95Orig	101
97.00000095	102.9999995	95Orig	103
97.00000129	105.0000019	95Orig	105
98.04622194	105.1614052	97Orig	105
99.52528482	105.3237052	99Orig	105
101.3219241	105.4875116	101Orig	105
103.3942676	105.6537093	103Orig	105
105.9135331	105.8235046	105Orig	105
111.9999983	105.9999943	114Orig	106
110.9904889	108.01218	112Orig	108
109.5654056	110.0230967	110Orig	110
107.9476724	112.0344762	108Orig	112
106.3110095	114.0532568	106Orig	114
104.8538986	116.0975652	104Orig	116
103.8077046	118.2245345	102Orig	118
103.5999368	128.7999123	102Orig	130
104.6528358	128.7999115	104Orig	130
106.240896	128.7999107	106Orig	130
108.0899444	128.7999099	108Orig	130
110.0421665	128.7999091	110Orig	130
112.0289924	128.7999082	112Orig	130
114.0253452	128.7999074	114Orig	130
116.022795	128.7999066	116Orig	130
118.0185775	128.7999058	118Orig	130
120.0102283	128.799905	120Orig	130
121.9903997	128.7999042	122Orig	130
123.9356895	128.7999033	124Orig	130
125.7780447	128.7999025	126Orig	130
127.3546669	128.7999017	128Orig	130
128.4000712	128.7999009	130Orig	130
128.4000717	127.6591257	130Orig	128
128.4000722	125.9231034	130Orig	126
128.4000727	123.9831687	130Orig	124
128.4000731	121.9956191	130Orig	122
128.4000736	119.999368	130Orig	120
128.4000741	118.001666	130Orig	118
128.4000746	116.0034863	130Orig	116
128.4000751	114.0048921	130Orig	114
128.4000755	112.005906	130Orig	112
128.400076	110.0065925	130Orig	110
128.4000765	108.0070345	130Orig	108
128.400077	106.00731	130Orig	106
128.4000775	104.0074818	130Orig	104
128.4000779	102.0075971	130Orig	102
128.4000784	100.0076914	130Orig	100
128.4000789	98.00779306	130Orig	98
128.4000794	96.00792932	130Orig	96
128.4000798	94.00813132	130Orig	94
128.4000803	92.00844085	130Orig	92
128.4000808	90.00891865	130Orig	90
128.4000813	88.00965306	130Orig	88
128.4000817	86.01076194	130Orig	86
128.4000822	84.01237092	130Orig	84
128.4000827	82.0145518	130Orig	82
128.4000831	80.01730269	130Orig	80
128.4000836	78.02124559	130Orig	78
128.4000841	76.0326209	130Orig	76
128.4000845	74.08883836	130Orig	74
128.400085	72.34990915	130Orig	72
128.4000855	71.20011687	130Orig	70
127.3417023	71.20011686	128Orig	70
125.7479571	71.20011685	126Orig	70
123.8978618	71.20011685	124Orig	70
121.9526809	71.20011684	122Orig	70
119.974688	71.20011684	120Orig	70
117.9846795	71.20011683	118Orig	70
115.9896501	71.20011683	116Orig	70
113.99218	71.20011683	114Orig	70
111.9933776	71.20011683	112Orig	70
109.9938043	71.20011683	110Orig	70
107.9937818	71.20011683	108Orig	70
105.9935089	71.20011684	106Orig	70
103.9931164	71.20011684	104Orig	70
101.9926978	71.20011684	102Orig	70
99.99232736	71.20011685	100Orig	70
97.99207373	71.20011685	98Orig	70
95.99200951	71.20011686	96Orig	70
93.99222218	71.20011687	94Orig	70
91.99282905	71.20011688	92Orig	70
89.99400276	71.20011689	90Orig	70
87.99601932	71.20011689	88Orig	70
85.99935429	71.20011691	86Orig	70
84.00488936	71.20011692	84Orig	70
82.01439342	71.20011693	82Orig	70
80.03173051	71.20011694	80Orig	70
78.06603433	71.20011696	78Orig	70
76.14006814	71.20011697	76Orig	70
74.31095115	71.20011699	74Orig	70
72.71190146	71.20011701	72Orig	70
71.59991329	71.20011703	70Orig	70
71.59991372	72.40153931	70Orig	72
71.59991415	74.12899081	70Orig	74
71.59991458	76.04653987	70Orig	76
71.59991502	78.01973252	70Orig	78
71.59991545	80.00872166	70Orig	80
71.59991589	82.00283527	70Orig	82
71.59991633	83.99915725	70Orig	84
71.59991677	85.99674022	70Orig	86
71.59991721	87.99516059	70Orig	88
71.59991765	89.99417036	70Orig	90
71.59991809	91.99360545	70Orig	92
71.59991853	93.99335181	70Orig	94
71.59991897	95.99332707	70Orig	96
71.59991942	97.99346884	70Orig	98
71.59991986	99.99372711	70Orig	100
71.5999203	101.9940589	70Orig	102
71.59992075	103.9944237	70Orig	104
71.5999212	105.9947792	70Orig	106
71.59992164	107.9950748	70Orig	108
71.59992209	109.9952439	70Orig	110
71.59992254	111.9951939	70Orig	112
71.59992299	113.994796	70Orig	114
71.59992344	115.9938811	70Orig	116
71.59992389	117.9922357	70Orig	118
71.59992434	119.9895058	70Orig	120
71.59992479	121.9843695	70Orig	122
71.59992524	123.9696254	70Orig	124
71.5999257	125.9083197	70Orig	126
71.59992615	127.6474778	70Orig	128
71.59992661	128.7998994	70Orig	130
72.66020004	128.7999002	72Orig	130
74.24988262	128.799901	74Orig	130
76.10079155	128.7999018	76Orig	130
78.04900823	128.7999026	78Orig	130
80.02902753	128.7999033	80Orig	130
82.01925944	128.7999041	82Orig	130
84.01297669	128.7999049	84Orig	130
86.0079464	128.7999057	86Orig	130
88.00278892	128.7999065	88Orig	130
89.99463243	128.7999073	90Orig	130
91.97468632	128.7999081	92Orig	130
93.91678916	128.7999088	94Orig	130
95.75086265	128.7999096	96Orig	130
97.32442935	128.7999104	98Orig	130
98.39983529	128.7999112	100Orig	130
98.17626965	120.2006633	100Orig	120
97.06557588	118.0760154	98Orig	118
95.55471369	116.0366295	96Orig	116
93.80716962	114.0213047	94Orig	114
91.93688957	112.0141228	92Orig	112
90.02027729	110.0096916	90Orig	110
88.10810329	108.0059783	88Orig	108
86.24924128	106.0017087	86Orig	106
84.51760056	103.9957755	84Orig	104
83.03464909	101.9889964	82Orig	102
82.00000114	99.99999999	80Orig	100
83.04802568	97.99922958	82Orig	98
84.55103254	96.01701328	84Orig	96
86.2971727	94.03562556	86Orig	94
88.16822989	92.05955643	88Orig	92
90.10022496	90.09807855	90Orig	90
92.06109242	88.16828579	92Orig	88
94.0341727	86.30412154	94Orig	86
96.00912469	84.57073435	96Orig	84

Solution x	Solution y	Original x	Original y
97.98099574	83.07851384	98Orig	82
100	82.00000112	100Orig	80
101.9469018	83.08512182	102Orig	82
103.9591084	84.56373421	104Orig	84
105.9668752	86.28644554	106Orig	86
107.9616416	88.14640041	108Orig	88
109.9385095	90.07670257	110Orig	90
111.8838562	92.04165401	112Orig	92
113.7639711	94.02469174	114Orig	94
115.5072975	96.02001233	116Orig	96
116.9850065	98.02586459	118Orig	98
117.9999983	99.9999988	120Orig	100
117.2474611	101.1718485	118Orig	102
116.0000036	101.9999983	116Orig	104
106.2822294	101.6867863	105Orig	103
105.8271884	100.5873504	105Orig	101
105.4055697	99.14623006	105Orig	99
104.9960396	97.83943349	105Orig	97
104.5858967	96.89356178	105Orig	95
102.9609677	96.77410872	103Orig	95
101.0291564	96.67337049	101Orig	95
99.13058078	96.58171127	99Orig	95
97.5120742	96.49562466	97Orig	95
96.41421374	96.41421513	95Orig	95
96.60537517	97.36903676	95Orig	97
96.85004969	98.87800914	95Orig	99

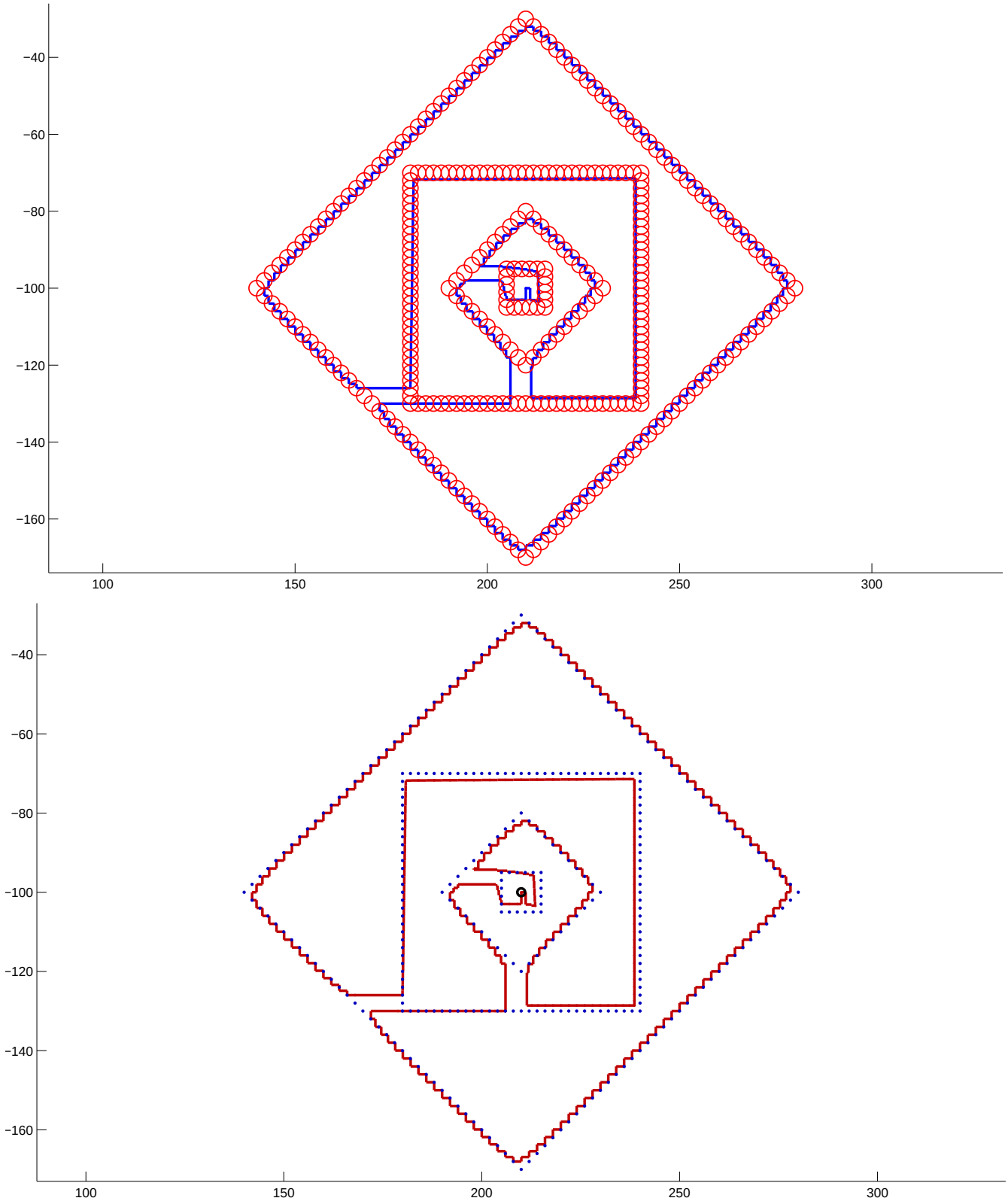


Figure N.150: $rotatingDiamonds4$, Equal Radius, 2D, Manhattan, Length = 989.0239841

Table N-153: Solution for *rotatingDiamonds*4, Equal Radius, 2D, Manhattan

Total distance: 989.023984102151			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
101.1226602	103.0877842	101	105
102.5574374	103.3621576	103	105
103.5857875	103.585768	105	105
103.5057623	102.417337	105	103
103.422003	100.8090108	105	101
103.3340932	98.98997789	105	99
103.2402536	97.16260794	105	97
103.1358497	95.6354096	105	95
101.9454072	95.3620484	103	95
100.3711777	95.09397015	101	95
98.53118548	94.82701315	99	95
96.44386742	94.55848472	97	95
93.9307963	94.28531903	95	95
88.00000719	93.99998969	86	94
89.12638747	92.02248016	88	92
90.60760486	90.06495484	90	90
92.31183213	88.14882444	92	88
94.15089337	86.30824141	94	86
96.06595691	84.60172668	96	84
98.02209046	83.11855108	98	82
100	82.00000707	100	80
101.9917104	83.11993349	102	82
103.9823672	84.60405969	104	84
105.9696892	86.3119043	106	86
107.9481301	88.15455213	108	88
109.9074351	90.07300492	110	90
111.8283506	92.03183292	112	92
113.6757329	94.01157575	114	94
115.3899783	96.00227318	116	96
116.8794992	97.99914772	118	98
117.9999916	100.0000002	120	100
116.8833523	101.9952778	118	102
115.4003622	103.9930292	116	104
113.6959094	105.9926929	114	106
111.8659722	107.9942686	112	108
109.9796054	109.9985357	110	110
108.0897057	112.0075819	108	112
106.2478465	114.0259931	106	114
104.5196942	116.063737	104	116
102.9962801	118.1446805	102	118
101.8080467	120.3498673	100	120
101.4170861	128.5888453	100	130
102.6210359	128.5886992	102	130
104.2489257	128.5885537	104	130
106.0932409	128.5884081	106	130
108.0325833	128.5882623	108	130
110.0094414	128.5881164	110	130
112.0003069	128.5879706	112	130
113.996087	128.5878248	114	130
115.9930425	128.587679	116	130
117.9887697	128.587533	118	130
119.9795478	128.5873871	120	130
121.9563699	128.5872414	122	130
123.8960426	128.5870956	124	130
125.7419622	128.5869495	126	130
127.3743077	128.5868036	128	130
128.5849448	128.5866547	130	130
128.585092	127.3770128	130	128
128.5852378	125.741515	130	126
128.585383	123.893591	130	124
128.5855287	121.9535496	130	122
128.5856743	119.9769021	130	120
128.5858197	117.9861793	130	118
128.5859655	115.9900526	130	116
128.5861112	113.9918162	130	114
128.5862565	111.9927283	130	112
128.5864022	109.9932792	130	110
128.5865475	107.9936668	130	108
128.586693	105.9939759	130	106
128.5868384	103.9942458	130	104
128.586984	101.9944972	130	102
128.5871294	99.99474281	130	100
128.587275	97.99499269	130	98
128.5874204	95.99525662	130	96
128.5875657	93.99554772	130	94
128.587711	91.99588743	130	92
128.5878564	89.9963171	130	90
128.5880019	87.99692499	130	88
128.5881472	85.99791609	130	86
128.5882928	83.99979318	130	84
128.5884382	82.00384113	130	82
128.5885833	80.01342266	130	80
128.5887289	78.03739936	130	78
128.588874	76.09880234	130	76
128.5890192	74.25431638	130	74
128.5891646	72.62536599	130	72
128.5893124	71.42057012	130	70
127.3832739	71.43211446	128	70
125.7486088	71.44372073	126	70
123.8988776	71.45538032	124	70
121.9568104	71.4670939	122	70
119.9787983	71.47886329	120	70
117.9873301	71.49069058	118	70
115.9908506	71.50257799	116	70
113.9924742	71.51452788	114	70
111.9933539	71.52654276	112	70
109.9939247	71.53862533	110	70
107.994357	71.55077848	108	70
105.9947215	71.56300532	106	70
103.9950497	71.5753092	104	70
101.9953577	71.58769374	102	70
99.99565458	71.60016286	100	70
97.99594643	71.61272084	98	70
95.99623819	71.62537234	96	70
93.99653453	71.63812246	94	70
91.99684063	71.65097681	92	70
89.9971633	71.66394158	90	70
87.99751322	71.67702362	88	70
85.99791091	71.69023059	86	70
83.99840446	71.70357108	84	70
81.99912893	71.71705477	82	70
80.00052393	71.73069273	80	70
78.0041786	71.74449763	78	70
76.01625361	71.75848423	76	70
74.06163864	71.77266998	74	70
72.2384208	71.78707684	72	70
70.85750257	71.80175017	70	70
70.82685554	72.95664937	70	72
70.79638053	74.48766506	70	74
70.76602978	76.23876478	70	76
70.73578854	78.11294124	70	78
70.7056483	80.05111308	70	80
70.67560236	82.02100707	70	82
70.6456447	84.00624994	70	84
70.61576976	85.99885175	70	86
70.58597235	87.99498195	70	88
70.5562475	89.99281514	70	90
70.52659054	91.99148023	70	92
70.49699696	93.99055762	70	94
70.46746243	95.98983983	70	96
70.43798279	97.98921641	70	98
70.40855399	99.98861576	70	100
70.37917211	101.9879704	70	102
70.34983333	103.987186	70	104
70.32053391	105.9860979	70	106
70.29127019	107.9843929	70	108
70.26203856	109.9814545	70	110
70.23283546	111.9760548	70	112
70.20365733	113.9657342	70	114
70.17450062	115.9455744	70	116
70.14536173	117.9058284	70	118
70.116237	119.827609	70	120
70.0871226	121.6759064	70	122
70.05801433	123.3907111	70	124
70.02890702	124.8796883	70	126
69.99979147	125.999999	70	128
58.00000334	125.999998	58	128
56.00019434	124.8786355	56	126
53.99976514	123.3890356	54	124
52.00012723	121.6742839	52	122
50.00152651	119.8262718	50	120
48.00442714	117.904762	48	118
46.00997757	115.9447204	46	116
44.02063908	113.96505	44	114

Solution x	Solution y	Original x	Original y
42.04141765	111.9755208	42	112
40.08224888	109.9810841	40	110
38.16230564	107.9842701	38	108
36.31684285	105.9864869	36	106
34.60563555	103.9887941	34	104
33.11978626	101.9925218	32	102
32.00000671	100.0000001	30	100
33.1196198	97.99367291	32	98
34.60580839	95.99138212	34	96
36.31733734	93.99037926	36	94
38.16287514	91.98995001	38	92
40.08270392	89.98981419	40	90
42.04166411	87.9898387	42	88
44.02063679	85.98995773	44	86
46.00970082	83.99013847	46	84
48.00383394	81.99036425	48	82
50.00052321	79.99062625	50	80
51.99851574	77.99091947	52	78
53.99718563	75.99124086	54	76
55.99621809	73.99158846	56	74
57.99545293	71.9919611	58	72
59.99480725	69.99235835	60	70
61.99423715	67.99278073	62	68
63.99371883	65.99323013	64	66
65.99323915	63.99371049	66	64
67.99279081	61.99422916	68	62
69.99236993	59.99479932	70	60
71.99197472	57.99544475	72	58
73.99160471	55.9962092	74	56
75.99126044	53.9971753	76	54
77.99094314	51.99850261	78	52
79.99065488	50.00050483	80	50
81.99039882	48.00380605	82	48
83.99018023	46.00965661	84	46
85.99000872	44.02056641	86	44
87.98990314	42.04155564	88	42
89.98990182	40.08254793	90	40
91.99008321	38.16267616	92	38
93.9906053	36.3171322	94	36
95.99178033	34.60566929	96	34
97.99426799	33.11958142	98	32
100.0000002	32.00000682	100	30
101.9935011	33.11974874	102	32
103.990286	34.60555619	104	34
105.9886986	36.31664218	106	36
107.9878626	38.16199046	108	38
109.9873608	40.08186977	110	40
111.9870083	42.04101516	112	42
113.9867272	44.02022641	114	44
115.9864854	46.00953887	116	46
117.9862689	48.003912	118	48
119.986071	50.0008277	120	50
121.9858875	51.9990334	122	52
123.9857154	53.99790496	124	54
125.9855517	55.99712916	126	56
127.9853938	57.99654671	128	58
129.9852387	59.99607499	130	60
131.9850829	61.99567004	132	62
133.9849222	63.99530775	134	64
135.9847511	65.99497454	136	66
137.9845615	67.99466264	138	68
139.984341	69.99436764	140	70
141.9840689	71.99408715	142	72
143.9837075	73.99382003	144	74
145.983186	75.99356587	146	76
147.9823647	77.99332462	148	78
149.9809622	79.99309628	150	80
151.9784029	81.99288066	152	82
153.9735044	83.99267749	154	84
155.9638428	85.99248767	156	86
157.9444914	87.99231759	158	88
159.9055989	89.99219048	160	90
161.8280254	91.9921717	162	92
163.6764191	93.99241838	164	94
165.3907292	95.9932667	166	96
166.8794222	97.99537906	168	98
167.9999901	100.0000002	170	100
166.8792808	101.9948268	168	102
165.3902933	103.9921973	166	104
163.675856	105.990882	164	106

Solution x	Solution y	Original x	Original y
161.827619	107.9902074	162	108
159.9055114	109.9898217	160	110
157.9447466	111.989549	158	112
155.9643901	113.9893084	156	114
153.9742745	115.9890689	154	116
151.9793378	117.9888233	152	118
149.9820245	119.9885733	150	120
147.9835361	121.9883223	148	122
145.9844608	123.9880724	146	124
143.9850868	125.9878235	144	126
141.9855558	127.9875745	142	128
139.9859384	129.9873233	140	130
137.9862707	131.987067	138	132
135.986572	133.9868021	136	134
133.9868532	135.9865239	134	136
131.9871211	137.9862258	132	138
129.9873805	139.9858968	130	140
127.9876348	141.985518	128	142
125.9878872	143.9850535	126	144
123.9881397	145.9844332	124	146
121.9883939	147.9835158	122	148
119.9886497	149.9820139	120	150
117.9889057	151.9793393	118	152
115.9891593	153.97429	116	154
113.9894102	155.9644173	114	156
111.9896681	157.9447732	112	158
109.9899687	159.9055034	110	160
107.9903984	161.8275078	108	162
105.9911354	163.6755466	106	164
103.9925162	165.3897601	104	166
101.9951413	166.8787911	102	168
100.0000002	167.9999907	100	170
97.9957391	166.8788284	98	168
95.99365022	165.3899318	96	166
93.99277305	163.6759298	94	164
91.99253939	161.8279341	92	162
89.99264091	159.905784	90	160
87.99293375	157.944817	88	158
85.99338085	155.9642216	86	156
83.9940303	153.9738974	84	154
81.99503445	151.9788053	82	152
79.99672286	149.9813946	80	150
77.99976027	147.9828713	78	148
76.00545938	145.9838361	76	146
74.01639956	143.9845913	74	144
72.03765826	141.985282	72	142
70.07921526	139.9859653	70	140
68.16036408	137.9866874	68	138
66.31677409	135.9876644	66	136
64.60885832	133.9897114	64	134
63.12698388	131.9950378	62	132
61.99999594	130.0038246	60	130
68.83109089	130.0031877	70	130
71.50306501	130.0025508	72	130
73.76402891	130.001914	74	130
75.88075651	130.001277	76	130
77.93481862	130.0006401	78	130
79.9589005	130.0000033	80	130
81.96676437	129.9993664	82	130
83.96297894	129.9987295	84	130
85.94597002	129.9980926	86	130
87.90756349	129.9974557	88	130
89.82956889	129.9968188	90	130
91.67731183	129.9961819	92	130
93.39121657	129.995545	94	130
94.87968871	129.9949081	96	130
96.00000472	129.9942712	98	130
96.00000184	118.0000044	98	118
94.88546868	115.9952435	96	116
93.41151319	113.9921043	94	114
91.72088302	111.9906812	92	112
89.91305888	109.9905973	90	110
88.07028247	107.9914097	88	108
86.26635504	105.9927291	86	106
84.5797595	103.9942729	84	104
83.10983771	101.9960564	82	102
82.00000735	100.0000017	80	100
82.89692161	98.89652655	82	98
84.00000328	98.00001023	84	96
93.59184798	98.3064672	95	97

Solution x	Solution y	Original x	Original y
93.97073367	99.46257306	95	99
94.32386381	100.7537571	95	101
94.66523618	101.9902443	95	103
95.00001926	102.9999993	95	105
97.00000051	103.0000001	97	105
98.9999953	102.9999996	99	105

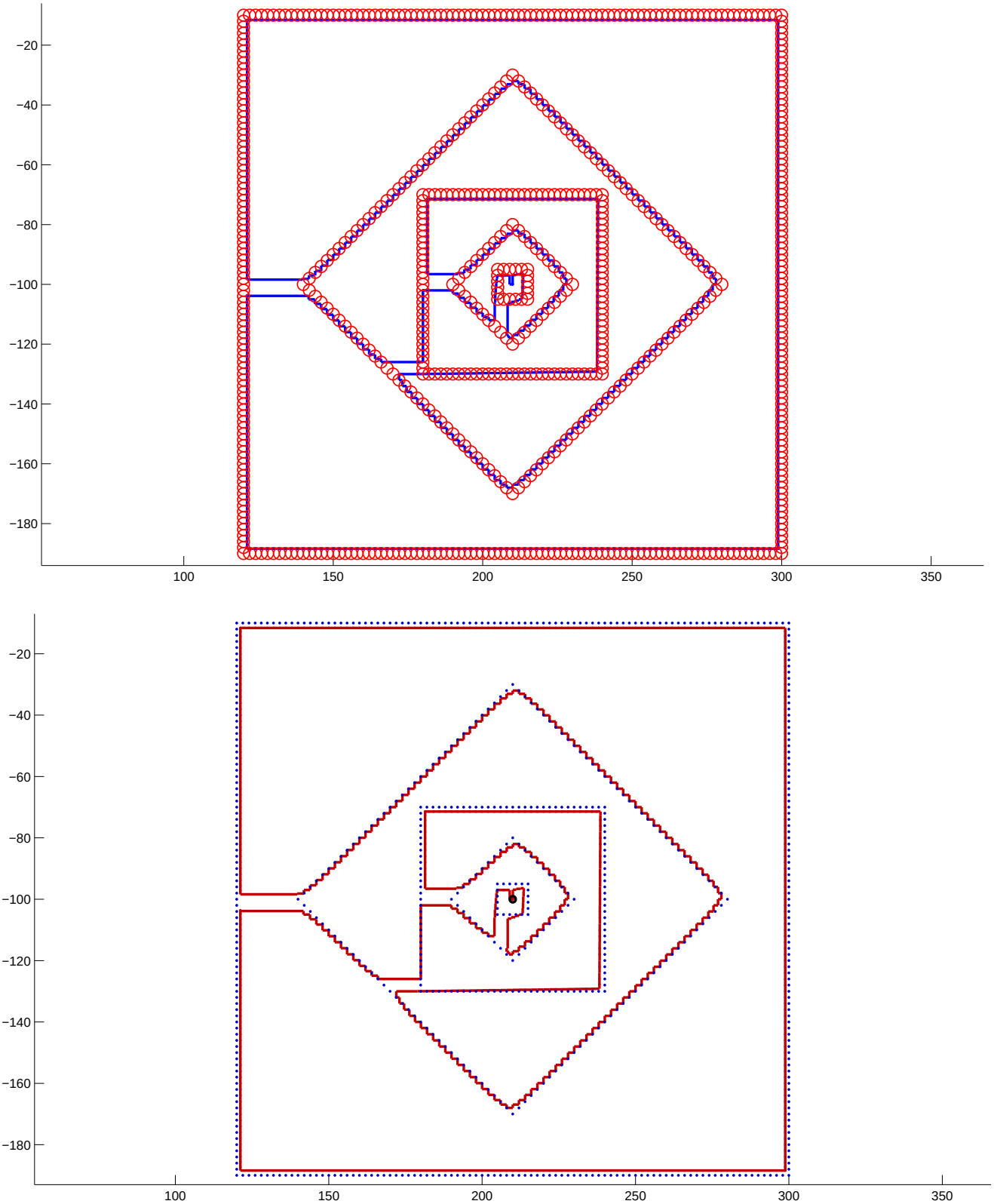


Figure N.151: $rotatingDiamonds5$, Equal Radius, 2D, Manhattan, Length = 1729.0214296

Table N-154: Solution for *rotatingDiamonds*5, Equal Radius, 2D, Manhattan

Total distance: 1729.02142956083			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
98.99999495	96.99999832	99	95
97.00000243	96.99999368	97	95
95.00002659	96.99999091	95	95
94.83762919	98.0766328	95	97
94.67459151	99.58365027	95	99
94.51034199	101.3905685	95	101
94.34415256	103.4668367	95	103
94.17499914	105.992377	95	105
93.9999901	111.9999916	94	114
91.99555994	110.9415802	92	112
89.99300807	109.4905145	90	110
87.99200693	107.8487595	88	108
85.99145334	106.1516028	86	106
83.99159955	104.5171271	84	104
81.99455832	103.0718778	82	102
79.9999953	101.9999995	80	100
70.00399371	101.9999961	70	100
70.00338624	103.0830118	70	102
70.00277957	104.5608989	70	104
70.00217327	106.2763176	70	106
70.00156716	108.1299275	70	108
70.00096121	110.0566881	70	110
70.00035533	112.0186641	70	112
69.99974954	113.9946551	70	114
69.99914378	115.9710721	70	116
69.99853805	117.9346217	70	118
69.99793232	119.8648241	70	120
69.99732655	121.7241155	70	122
69.99672074	123.4453867	70	124
69.99611481	124.9228093	70	126
69.99550858	126.0000023	70	128
58.00000332	126.0000003	58	128
55.9943873	124.9090236	56	126
53.9962574	123.4338722	54	124
51.99795474	121.7194816	52	122
49.99861577	119.8656139	50	120
47.99832424	117.9390634	48	118
45.99712914	115.979307	46	116
43.99477271	114.009691	44	114
41.99048023	112.0481799	42	112
39.98258409	110.1170302	40	110
37.96778336	108.2531066	38	108
35.93962821	106.5186673	36	106
33.88447563	105.0076167	34	104
31.7580759	103.8534169	32	102
11.19792629	103.6015518	10	102
11.19792971	104.7372238	10	104
11.19793306	106.3114509	10	106
11.19793648	108.1266368	10	108
11.19793983	110.0534049	10	110
11.19794325	112.025179	10	112
11.19794661	114.0138483	10	114
11.19795003	116.0086728	10	116
11.1979534	118.005786	10	118
11.19795682	120.0038547	10	120
11.19796018	122.0024274	10	122
11.19796361	124.0013394	10	124
11.19796698	126.0005091	10	126
11.1979704	127.9998782	10	128
11.19797377	129.999398	10	130
11.19797719	131.9990296	10	132
11.19798057	133.9987435	10	134
11.197984	135.9985189	10	136
11.19798737	137.9983407	10	138
11.1979908	139.9981978	10	140
11.19799418	141.9980816	10	142
11.19799761	143.9979844	10	144
11.19800099	145.9978994	10	146
11.19800442	147.9978202	10	148
11.1980078	149.9977403	10	150
11.19801123	151.9976531	10	152
11.19801462	153.9975516	10	154
11.19801805	155.9974278	10	156
11.19802144	157.9972722	10	158
11.19802488	159.9970733	10	160
11.19802827	161.9968157	10	162
11.19803171	163.9964791	10	164
11.19803511	165.9960343	10	166
11.19803854	167.9954387	10	168
11.19804194	169.9946267	10	170
11.19804538	171.9934878	10	172
11.19804878	173.9918064	10	174
11.19805222	175.9890837	10	176
11.19805563	177.9840084	10	178
11.19805907	179.9729376	10	180
11.19806248	181.9457901	10	182
11.19806592	183.8758261	10	184
11.19806935	185.6977928	10	186
11.19807278	187.2776631	10	188
11.19807623	188.3982123	10	190
12.40410345	188.3982136	12	190
14.1243999	188.3982155	14	190
16.04188937	188.3982175	16	190
18.01830287	188.3982194	18	190
20.010797	188.3982214	20	190
22.0075985	188.3982233	22	190
24.00570338	188.3982252	24	190
26.00437678	188.3982272	26	190
28.00340046	188.3982291	28	190
30.00266737	188.398231	30	190
32.00210574	188.398233	32	190
34.00166588	188.3982349	34	190
36.00131457	188.3982368	36	190
38.00102987	188.3982388	38	190
40.00079698	188.3982407	40	190
42.00060541	188.3982426	42	190
44.00044735	188.3982445	44	190
46.00031673	188.3982465	46	190
48.00020865	188.3982484	48	190
50.00011916	188.3982503	50	190
52.00004501	188.3982522	52	190
53.99998355	188.3982542	54	190
55.99993259	188.3982561	56	190
57.99989036	188.398258	58	190
59.9998554	188.3982599	60	190
61.99982653	188.3982619	62	190
63.99980278	188.3982638	64	190
65.99978336	188.3982657	66	190
67.99976764	188.3982676	68	190
69.99975509	188.3982695	70	190
71.99974527	188.3982714	72	190
73.99973786	188.3982734	74	190
75.99973255	188.3982753	76	190
77.99972913	188.3982772	78	190
79.9997274	188.3982791	80	190
81.99972722	188.398281	82	190
83.99972846	188.3982829	84	190
85.99973103	188.3982849	86	190
87.99973484	188.3982867	88	190
89.99973985	188.3982887	90	190
91.999746	188.3982906	92	190
93.99975326	188.3982925	94	190
95.9997616	188.3982944	96	190
97.999771	188.3982963	98	190
99.99978145	188.3982982	100	190
101.9997929	188.3983001	102	190
103.9998055	188.398302	104	190
105.999819	188.3983039	106	190
107.9998336	188.3983058	108	190
109.9998491	188.3983077	110	190
111.9998657	188.3983096	112	190
113.9998832	188.3983115	114	190
115.9999016	188.3983134	116	190
117.9999209	188.3983153	118	190
119.9999409	188.3983172	120	190
121.9999616	188.3983191	122	190
123.9999827	188.398321	124	190
126.0000042	188.3983229	126	190
128.0000256	188.3983248	128	190
130.0000467	188.3983267	130	190
132.0000672	188.3983286	132	190
134.0000863	188.3983305	134	190
136.0001037	188.3983324	136	190
138.0001184	188.3983343	138	190

Solution x	Solution y	Original x	Original y
140.0001296	188.3983362	140	190
142.0001361	188.3983381	142	190
144.0001369	188.39834	144	190
146.0001303	188.3983419	146	190
148.0001145	188.3983438	148	190
150.0000877	188.3983457	150	190
152.0000473	188.3983475	152	190
153.9999906	188.3983494	154	190
155.9999142	188.3983513	156	190
157.9998141	188.3983532	158	190
159.9996854	188.3983551	160	190
161.999522	188.398357	162	190
163.9993165	188.3983588	164	190
165.9990604	188.3983607	166	190
167.9987448	188.3983626	168	190
169.9983625	188.3983645	170	190
171.9979122	188.3983664	172	190
173.9973983	188.3983683	174	190
175.9968065	188.3983701	176	190
177.9959714	188.398372	178	190
179.994054	188.3983739	180	190
181.9876689	188.3983758	182	190
183.9642838	188.3983776	184	190
185.88002	188.3983795	186	190
187.5989777	188.3983813	188	190
188.7972186	188.3983833	190	190
188.7972187	187.2938668	190	188
188.7972187	185.7058867	190	186
188.7972188	183.878591	190	184
188.7972188	181.9473781	190	182
188.7972188	179.9746287	190	180
188.7972189	177.9857895	190	178
188.7972189	175.990776	190	176
188.7972189	173.9933583	190	174
188.7972189	171.9949414	190	172
188.797219	169.9960476	190	170
188.797219	167.9968799	190	168
188.797219	165.9975276	190	166
188.797219	163.9980388	190	164
188.7972191	161.9984442	190	162
188.797219	159.9987658	190	160
188.7972191	157.9990202	190	158
188.7972191	155.9992201	190	156
188.7972191	153.9993753	190	154
188.7972191	151.9994938	190	152
188.7972191	149.999582	190	150
188.7972191	147.9996453	190	148
188.7972191	145.9996881	190	146
188.7972191	143.9997142	190	144
188.7972191	141.9997268	190	142
188.7972192	139.9997286	190	140
188.7972192	137.9997219	190	138
188.7972192	135.9997085	190	136
188.7972192	133.9996902	190	134
188.7972192	131.9996683	190	132
188.7972192	129.9996439	190	130
188.7972192	127.9996179	190	128
188.7972192	125.999591	190	126
188.7972192	123.9995639	190	124
188.7972192	121.9995371	190	122
188.7972192	119.9995109	190	120
188.7972191	117.9994856	190	118
188.7972192	115.9994615	190	116
188.7972191	113.9994386	190	114
188.7972191	111.9994173	190	112
188.7972191	109.9993974	190	110
188.7972191	107.9993791	190	108
188.7972191	105.9993624	190	106
188.7972191	103.9993475	190	104
188.7972191	101.9993342	190	102
188.7972191	99.99932257	190	100
188.7972191	97.99931271	190	98
188.7972191	95.99930459	190	96
188.7972191	93.99929824	190	94
188.797219	91.9992937	190	92
188.797219	89.99929102	190	90
188.797219	87.99929025	190	88
188.797219	85.99929149	190	86
188.797219	83.99929482	190	84
188.7972189	81.99930039	190	82

Solution x	Solution y	Original x	Original y
188.797219	79.99930836	190	80
188.7972189	77.99931894	190	78
188.7972189	75.99933239	190	76
188.7972189	73.99934902	190	74
188.7972189	71.99936923	190	72
188.7972188	69.99939351	190	70
188.7972188	67.99942244	190	68
188.7972188	65.99945677	190	66
188.7972187	63.99949738	190	64
188.7972187	61.99954538	190	62
188.7972187	59.99960213	190	60
188.7972187	57.99966929	190	58
188.7972186	55.99974891	190	56
188.7972186	53.99984351	190	54
188.7972186	51.9999562	190	52
188.7972185	50.00009079	190	50
188.7972185	48.00025201	190	48
188.7972185	46.00044572	190	46
188.7972184	44.00067927	190	44
188.7972184	42.00096202	190	42
188.7972184	40.00130622	190	40
188.7972183	38.00172855	190	38
188.7972183	36.00225276	190	36
188.7972182	34.0029145	190	34
188.7972182	32.00376974	190	32
188.7972181	30.00491009	190	30
188.7972181	28.00649234	190	28
188.797218	26.00880316	190	26
188.797218	24.01242485	190	24
188.7972179	22.01870423	190	22
188.7972179	20.03111187	190	20
188.7972178	18.05903109	190	18
188.7972178	16.12749238	190	16
188.7972177	14.29944775	190	14
188.7972176	12.71300678	190	12
188.7972175	11.60029872	190	10
187.5888239	11.60030059	188	10
185.8779269	11.60030251	186	10
183.9637378	11.60030439	184	10
181.986352	11.60030631	182	10
179.9921338	11.6003082	180	10
177.9939342	11.60031012	178	10
175.9948972	11.60031201	176	10
173.9956504	11.60031393	174	10
171.996275	11.60031583	172	10
169.9967768	11.60031775	170	10
167.9971686	11.60031965	168	10
165.9974699	11.60032157	166	10
163.9977001	11.60032347	164	10
161.9978752	11.60032539	162	10
159.9980074	11.6003273	160	10
157.9981058	11.60032922	158	10
155.9981773	11.60033113	156	10
153.9982273	11.60033305	154	10
151.9982598	11.60033496	152	10
149.9982783	11.60033689	150	10
147.9982853	11.6003388	148	10
145.998283	11.60034073	146	10
143.9982732	11.60034264	144	10
141.9982573	11.60034457	142	10
139.9982364	11.60034648	140	10
137.9982116	11.60034841	138	10
135.9981835	11.60035033	136	10
133.9981528	11.60035226	134	10
131.9981201	11.60035418	132	10
129.9980857	11.60035611	130	10
127.9980501	11.60035803	128	10
125.9980136	11.60035996	126	10
123.9979764	11.60036189	124	10
121.9979387	11.60036382	122	10
119.9979008	11.60036574	120	10
117.9978628	11.60036768	118	10
115.9978249	11.60036961	116	10
113.9977873	11.60037155	114	10
111.9977501	11.60037347	112	10
109.9977135	11.60037541	110	10
107.9976775	11.60037734	108	10
105.9976425	11.60037928	106	10
103.9976084	11.60038121	104	10
101.9975756	11.60038316	102	10

Solution x	Solution y	Original x	Original y
99.99754403	11.60038508	100	10
97.99751399	11.60038703	98	10
95.99748563	11.60038896	96	10
93.99745913	11.60039091	94	10
91.99743469	11.60039284	92	10
89.99741252	11.60039479	90	10
87.99739282	11.60039673	88	10
85.99737583	11.60039867	86	10
83.99736178	11.60040061	84	10
81.99735093	11.60040256	82	10
79.99734355	11.6004045	80	10
77.99733992	11.60040645	78	10
75.99734034	11.60040839	76	10
73.99734515	11.60041034	74	10
71.99735469	11.60041229	72	10
69.99736936	11.60041424	70	10
67.99738957	11.60041619	68	10
65.9974158	11.60041814	66	10
63.99744858	11.60042009	64	10
61.99748853	11.60042204	62	10
59.99753636	11.60042399	60	10
57.99759292	11.60042595	58	10
55.99765922	11.6004279	56	10
53.9977365	11.60042986	54	10
51.99782627	11.60043182	52	10
49.99793043	11.60043377	50	10
47.9980514	11.60043573	48	10
45.99819221	11.60043769	46	10
43.99835681	11.60043965	44	10
41.9985503	11.60044162	42	10
39.99877934	11.60044358	40	10
37.99905277	11.60044554	38	10
35.99938245	11.60044751	36	10
33.99978456	11.60044948	34	10
32.00028187	11.60045145	32	10
30.00090775	11.60045342	30	10
28.00171434	11.60045539	28	10
26.0027914	11.60045736	26	10
24.00431716	11.60045934	24	10
22.00671459	11.60046131	22	10
20.01117698	11.6004633	20	10
18.02150264	11.60046527	18	10
16.05047243	11.60046727	16	10
14.14093463	11.60046924	14	10
12.42429588	11.60047124	12	10
11.19937	11.60047323	10	10
11.19936655	12.73876205	10	12
11.1993631	14.32534393	10	14
11.19935966	16.14367794	10	16
11.19935622	18.06634334	10	18
11.19935279	20.03280094	10	20
11.19934936	22.0174557	10	22
11.19934593	24.00986395	10	24
11.1993425	26.00573972	10	26
11.19933907	28.00327104	10	28
11.19933564	30.00165588	10	30
11.19933223	32.00051817	10	32
11.19932879	33.99966961	10	34
11.19932538	35.99900899	10	36
11.19932195	37.99847793	10	38
11.19931854	39.99804035	10	40
11.19931511	41.99767255	10	42
11.19931171	43.99735809	10	44
11.19930828	45.99708506	10	46
11.19930488	47.99684442	10	48
11.19930144	49.99662905	10	50
11.19929805	51.99643307	10	52
11.19929462	53.99625135	10	54
11.19929123	55.9960792	10	56
11.1992878	57.995912	10	58
11.19928441	59.99574496	10	60
11.19928098	61.99557284	10	62
11.1992776	63.99538964	10	64
11.19927417	65.99518824	10	66
11.19927079	67.99495996	10	68
11.19926736	69.99469388	10	70
11.19926398	71.99437593	10	72
11.19926055	73.99398731	10	74
11.19925718	75.99350177	10	76
11.19925375	77.99288007	10	78

Solution x	Solution y	Original x	Original y
11.19925038	79.99205752	10	80
11.19924694	81.99091256	10	82
11.19924358	83.9891828	10	84
11.19924014	85.98623605	10	86
11.19923678	87.98045008	10	88
11.19923334	89.96757397	10	90
11.19922999	91.9365783	10	92
11.19922655	93.8599003	10	94
11.1992232	95.67395743	10	96
11.19921976	97.25380166	10	98
11.19921642	98.39940461	10	100
29.74841219	98.14926213	30	100
31.88892946	96.99891176	32	98
33.94421032	95.47616845	34	96
35.9700367	93.73096167	36	94
37.98273036	91.86061648	38	92
39.98912594	89.92497916	40	90
41.99240483	87.95685857	42	88
43.99410797	85.97294397	44	86
45.99499784	83.98138574	46	84
47.9954581	81.98609011	48	82
49.99568518	79.98892315	50	80
51.99578178	77.99078559	52	78
53.99580311	75.9921231	54	76
55.99578001	73.99316548	56	74
57.99573073	71.99403857	58	72
59.99566686	69.9948172	60	70
61.99559652	67.99555075	62	68
63.99552607	65.99627618	64	66
65.99546107	63.99702529	66	64
67.99540689	61.99782941	68	62
69.99536917	59.99872334	70	60
71.99535409	57.99974946	72	58
73.99536862	56.0009635	74	56
75.99542046	54.00244469	76	54
77.99551771	52.00431687	78	52
79.99566795	50.00679623	80	50
81.99587623	48.01030154	82	48
83.99614164	46.01570473	84	46
85.99645141	44.02488522	86	44
87.99677208	42.04191769	88	42
89.99703813	40.0755206	90	40
91.99714408	38.14383172	92	38
93.99696406	36.28284316	94	36
95.99647807	34.55848295	96	34
97.99628138	33.07742013	98	32
99.99999996	32.0000003	100	30
101.9960018	33.078151	102	32
103.9963795	34.55878887	104	34
105.9970053	36.28189976	106	36
107.9973146	38.14197306	108	38
109.9973513	40.07338458	110	40
111.9972365	42.0399874	112	42
113.9970637	44.02342675	114	44
115.9968887	46.01482935	116	46
117.9967384	48.01003479	118	48
119.9966214	50.00712516	120	50
121.9965352	52.00521628	122	52
123.996472	54.00388952	124	54
125.9964213	56.00293391	126	56
127.996372	58.0022328	128	58
129.9963133	60.00171511	130	60
131.9962345	62.0013343	132	62
133.9961251	64.00105865	134	64
135.9959741	66.00086612	136	66
137.9957694	68.00074128	138	68
139.9954977	70.00067315	140	70
141.9951432	72.00065368	142	72
143.9946868	74.00067646	144	74
145.9941012	76.00073551	146	76
147.9933349	78.0008239	148	78
149.9922697	80.00093172	150	80
151.9906087	82.00104326	152	82
153.9876095	84.00113308	154	84
155.9814815	86.00116121	156	86
157.9680861	88.00106866	158	88
159.9382657	90.00077731	160	90
161.8726902	92.00020495	162	92
163.7330933	93.99932353	164	94
165.4513279	95.99832766	166	96

Solution x	Solution y	Original x	Original y
166.9238859	97.99801981	168	98
167.9999165	100	170	100
166.9232548	101.9978736	168	102
165.4498332	103.9982007	166	104
163.7315638	105.9992686	164	106
161.8718715	108.000255	162	108
159.9383655	110.0009374	160	110
157.96898	112.0013206	158	112
155.982949	114.0014741	156	114
153.9894549	116.0014717	154	116
151.9926985	118.0013719	152	118
149.99453	120.0012158	150	120
147.9957338	122.0010284	148	122
145.9966317	124.0008235	146	124
143.9973539	126.0006066	144	126
141.997956	128.0003783	142	128
139.998466	130.0001354	140	130
137.9989023	131.9998725	138	132
135.9992795	133.9995822	136	134
133.9996098	135.9992555	134	136
131.9999039	137.9988817	132	138
130.0001705	139.9984483	130	140
128.0004167	141.9979406	128	142
126.0006477	143.9973398	126	144
124.0008657	145.9966172	124	146
122.0010699	147.9957162	122	148
120.0012538	149.9945047	120	150
118.0014033	151.9926591	118	152
116.0014936	153.9893926	116	154
114.0014866	155.9828549	114	156
112.0013304	157.9688513	112	158
110.0009661	159.9382218	110	160
108.0003506	161.871785	108	162
105.9995154	163.7316864	106	164
103.9987003	165.4503225	104	166
101.9985862	166.9239028	102	168
100	167.9999165	100	170
97.99899603	166.9248061	98	168
95.99933971	165.4524384	96	166
94.00036756	163.7339271	94	164
92.00147805	161.8732628	92	162
90.00249057	159.9387337	90	160
88.00340726	157.9686041	88	158
86.00429068	155.982175	86	156
84.00522128	153.9885776	84	154
82.00629849	151.9919281	82	152
80.00768436	149.9939955	80	150
78.0097219	147.995495	78	148
76.01320433	145.9966784	76	146
74.01995344	143.9975737	74	144
72.03403779	141.9980412	72	142
70.06431564	139.9977279	70	140
68.12956174	137.9959969	68	138
66.26770237	135.9920386	66	136
64.54790953	133.9858067	64	134
63.07571909	131.9817559	62	132
62.00001041	130.0000722	60	130
68.88499693	129.9726005	70	130
71.55050013	129.9451282	72	130
73.79935339	129.9176534	74	130
75.90711194	129.8901734	76	130
77.95618378	129.8626851	78	130
79.97906116	129.8351853	80	130
81.98987475	129.8076711	82	130
83.9950205	129.7801392	84	130
85.99745208	129.7525868	86	130
87.99855551	129.7250106	88	130
89.99899316	129.6974077	90	130
91.99908796	129.6697749	92	130
93.99899951	129.6421089	94	130
95.99880591	129.6144066	96	130
97.99854242	129.5866645	98	130
99.99822016	129.5588793	100	130
101.9978348	129.5310472	102	130
103.99737	129.5031646	104	130
105.9967954	129.4752276	106	130
107.9960577	129.4472324	108	130
109.9950548	129.4191746	110	130
111.9935693	129.3910501	112	130
113.9911033	129.3628541	114	130

Solution x	Solution y	Original x	Original y
115.9864785	129.3345818	116	130
117.9768928	129.3062279	118	130
119.9557712	129.2777868	120	130
121.9080905	129.2492519	122	130
123.8010617	129.2206156	124	130
125.5689405	129.1918676	126	130
127.0979486	129.1629887	128	130
128.2098935	129.133914	130	130
128.2244249	127.7946254	130	128
128.2386313	125.9489642	130	126
128.2525863	123.9818766	130	124
128.266322	121.9900934	130	122
128.2798612	119.9931297	130	120
128.2932223	117.994804	130	118
128.3064205	115.9959095	130	116
128.3194684	113.9966965	130	114
128.3323771	111.9972915	130	112
128.3451562	109.9977679	130	110
128.3578143	107.9981695	130	108
128.3703588	105.998525	130	106
128.3827965	103.9988555	130	104
128.3951335	101.9991796	130	102
128.4073753	99.9995149	130	100
128.419527	97.99988047	130	98
128.4315932	96.00029838	130	96
128.4435779	94.00079707	130	94
128.4554852	92.0014172	130	92
128.4673186	90.00222188	130	90
128.4790814	88.00331435	130	88
128.4907766	86.00487023	130	86
128.5024071	84.00720948	130	84
128.5139753	82.01101353	130	82
128.5254836	80.01810358	130	80
128.5369342	78.03423015	130	78
128.548329	76.07808636	130	76
128.5596698	74.20600724	130	74
128.5709582	72.56216389	130	72
128.5821933	71.41041133	130	70
127.4231808	71.41058056	128	70
125.787521	71.41075022	126	70
123.9213844	71.41091944	124	70
121.9664851	71.41108891	122	70
119.9819247	71.41125831	120	70
117.988026	71.41142768	118	70
115.9911074	71.41159716	116	70
113.9930391	71.41176654	114	70
111.9944018	71.41193597	112	70
109.9954195	71.41210535	110	70
107.9962112	71.41227476	108	70
105.9968548	71.41244414	106	70
103.9974061	71.41261363	104	70
101.9979077	71.41278305	102	70
99.99839506	71.41295246	100	70
97.99890109	71.4131219	98	70
95.99946135	71.41329144	96	70
94.00011931	71.41346083	94	70
92.000934	71.41363033	92	70
90.00199103	71.41379978	90	70
88.00342082	71.41396937	88	70
86.00543403	71.41413884	86	70
84.00840935	71.41430839	84	70
82.01315393	71.41447799	82	70
80.02174608	71.41464758	80	70
78.04031043	71.41481722	78	70
76.08774564	71.41498684	76	70
74.21976455	71.41515661	74	70
72.57672873	71.41532633	72	70
71.41282201	71.41549691	70	70
71.41265146	72.5871907	70	72
71.41248121	74.2176862	70	74
71.41231123	76.07654682	70	76
71.41214123	78.02760433	70	78
71.4119715	80.01051825	70	80
71.41180171	82.00353185	70	82
71.41163198	83.9995137	70	84
71.41146226	85.99572354	70	86
71.41129254	87.98919995	70	88
71.4111229	89.97204778	70	90
71.41095331	91.92110485	70	92
71.4107836	93.7749201	70	94

Solution x	Solution y	Original x	Original y
71.41061405	95.40102337	70	96
71.41044512	96.5820372	70	98
81.65966078	96.23203467	82	98
83.84343866	95.03742443	84	96
85.92227373	93.50164185	86	94
87.95995175	91.76643402	88	92
89.97867165	89.92871843	90	90
91.98866902	88.06346601	92	88
93.99550968	86.24083005	94	86
96.00293765	84.54448885	96	84
98.01203073	83.08389555	98	82
100.0000003	82.000012	100	80
101.9971301	83.1006925	102	82
103.9900821	84.56804972	104	84
105.9807991	86.27634925	106	86
107.9652009	88.12962802	108	88
109.9341353	90.05951963	110	90
111.8687646	92.02609571	112	92
113.7313239	94.00923742	114	94
115.452813	96.00015579	116	96
116.9262176	97.99652711	118	98
117.9999903	99.99999997	120	100
116.9259344	101.9949622	118	102
115.453763	103.990548	116	104
113.7344685	105.9827761	114	106
111.8734595	107.9671632	112	108
109.9387197	109.9349901	110	110
107.9673107	111.8678593	108	112
105.976958	113.7287353	106	114
103.9758468	115.4498982	104	116
101.9726876	116.9247467	102	118
100.0000032	117.9999881	100	120
98.75098605	117.1211788	98	118
98.00001682	115.999997	96	116
98.33167526	106.3172549	97	105
99.49227282	105.8549112	99	105
100.7903395	105.4246021	101	105
102.0503165	105.0051271	103	105
103.0954156	104.5848679	105	105
103.2191212	102.9371131	105	103
103.3222913	101.0273708	105	101
103.4159072	99.14946883	105	99
103.5034966	97.51309778	105	97
103.5857788	96.41423113	105	95
102.5957266	96.62885138	103	95
101.1354898	96.88897314	101	95

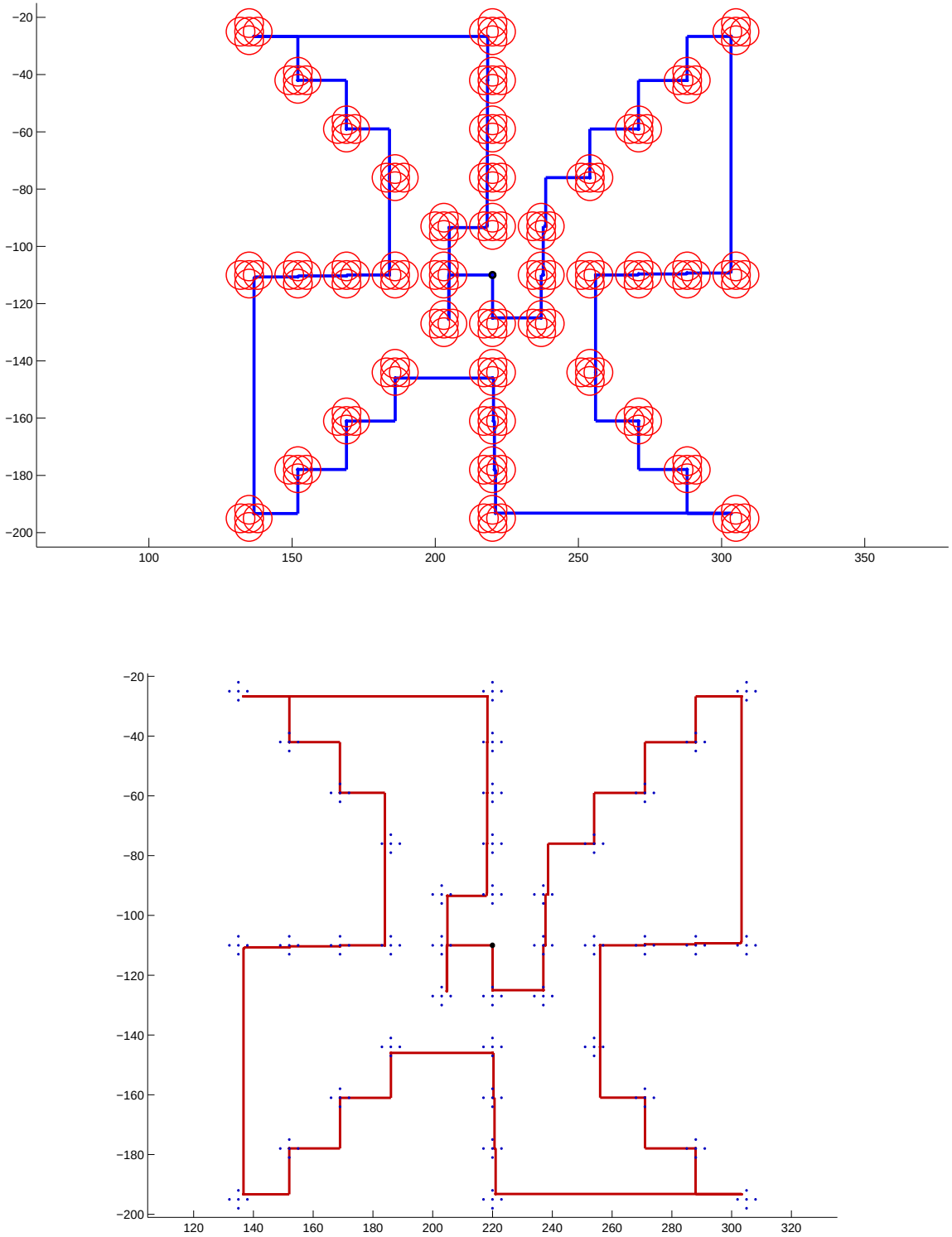


Figure N.152: *chaoSingleDep*, Equal Radius, 2D, Manhattan, Length = 1204.5642499

Table N-155: Solution for *chaoSingleDep*, Equal Radius, 2D, Manhattan

Total distance: 1204.56424992228 Depot: x 110 y 110			
Solution x	Solution y	Original x	Original y
94.7015981490887	125.298403095134	93	130
94.7015981490887	125.298403095134	90	127
94.7015981490887	125.298403095134	93	127
94.7015981490887	125.298403095134	96	127
94.7015981490887	125.298403095134	93	124
94.7922479947173	109.985547318941	93	107
94.7922479947173	109.985547318941	93	113
94.7922479947173	109.985547318941	90	110
94.7922479947173	109.985547318941	93	110
94.7922479947173	109.985547318941	96	110
94.904370623686	93.461374815975	93	90
94.904370623686	93.461374815975	90	93
94.904370623686	93.461374815975	93	93
94.904370623686	93.461374815975	96	93
94.904370623686	93.461374815975	93	96
108.058622578173	92.6843889348195	113	93
108.058622578173	92.6843889348195	110	90
108.058622578173	92.6843889348195	107	93
108.058622578173	92.6843889348195	110	93
108.058622578173	92.6843889348195	110	96
108.133774987203	75.9948126660784	113	76
108.133774987203	75.9948126660784	110	73
108.133774987203	75.9948126660784	107	76
108.133774987203	75.9948126660784	110	76
108.133774987203	75.9948126660784	110	79
108.194246514271	58.9975115509512	113	59
108.194246514271	58.9975115509512	110	56
108.194246514271	58.9975115509512	107	59
108.194246514271	58.9975115509512	110	59
108.194246514271	58.9975115509512	110	62
108.248015639673	42.0077479439172	113	42
108.248015639673	42.0077479439172	110	39
108.248015639673	42.0077479439172	107	42
108.248015639673	42.0077479439172	110	42
108.248015639673	42.0077479439172	110	45
108.298403120116	26.7016010078022	113	25
108.298403120116	26.7016010078022	110	22
108.298403120116	26.7016010078022	107	25
108.298403120116	26.7016010078022	110	25
108.298403120116	26.7016010078022	110	28
26.7015883158179	26.7015972732552	25	22
26.7015883158179	26.7015972732552	22	25
26.7015883158179	26.7015972732552	25	25
26.7015883158179	26.7015972732552	28	25
26.7015883158179	26.7015972732552	25	28
42.0242799625439	42.0024961488048	42	39
42.0242799625439	42.0024961488048	39	42
42.0242799625439	42.0024961488048	42	42
42.0242799625439	42.0024961488048	45	42
42.0242799625439	42.0024961488048	42	45
58.9649848453718	58.9870236303468	59	56
58.9649848453718	58.9870236303468	56	59
58.9649848453718	58.9870236303468	59	59
58.9649848453718	58.9870236303468	62	59
58.9649848453718	58.9870236303468	59	62
73.999963514027	76.0000046692938	76	73
73.999963514027	76.0000046692938	73	76
73.999963514027	76.0000046692938	76	76
73.999963514027	76.0000046692938	79	76
73.999963514027	76.0000046692938	76	79
73.9999599551651	110.000018997763	76	107
73.9999599551651	110.000018997763	76	113
73.9999599551651	110.000018997763	73	110
73.9999599551651	110.000018997763	76	110
73.9999599551651	110.000018997763	79	110
58.9634562560061	110.333068233923	59	107
58.9634562560061	110.333068233923	59	113
58.9634562560061	110.333068233923	56	110
58.9634562560061	110.333068233923	59	110
58.9634562560061	110.333068233923	62	110
42.0139282653116	110.675271867521	42	113
42.0139282653116	110.675271867521	42	107
42.0139282653116	110.675271867521	39	110
42.0139282653116	110.675271867521	42	110
42.0139282653116	110.675271867521	45	110
26.8164133240849	111.047037309923	25	107
26.8164133240849	111.047037309923	25	113
26.8164133240849	111.047037309923	22	110
26.8164133240849	111.047037309923	25	110
26.8164133240849	111.047037309923	28	110
26.7016091887067	193.298394286359	25	198
26.7016091887067	193.298394286359	22	195
26.7016091887067	193.298394286359	25	195
26.7016091887067	193.298394286359	28	195
26.7016091887067	193.298394286359	25	192
42.0126302207059	177.947274158101	42	181
42.0126302207059	177.947274158101	39	178
42.0126302207059	177.947274158101	42	178
42.0126302207059	177.947274158101	45	178
42.0126302207059	177.947274158101	42	175
58.9878375733588	161.020066949494	59	164
58.9878375733588	161.020066949494	56	161
58.9878375733588	161.020066949494	59	161
58.9878375733588	161.020066949494	62	161
58.9878375733588	161.020066949494	59	158
75.9999995390402	146.000049623047	76	147
75.9999995390402	146.000049623047	73	144
75.9999995390402	146.000049623047	76	144
75.9999995390402	146.000049623047	79	144
75.9999995390402	146.000049623047	76	141
110.000133583988	146.000053325659	113	144
110.000133583988	146.000053325659	110	147
110.000133583988	146.000053325659	107	144
110.000133583988	146.000053325659	110	144
110.000133583988	146.000053325659	110	141
110.329717288363	161.011128637793	113	161
110.329717288363	161.011128637793	110	164
110.329717288363	161.011128637793	107	161
110.329717288363	161.011128637793	110	161
110.329717288363	161.011128637793	110	158
110.669173767202	177.956747958578	113	178
110.669173767202	177.956747958578	110	181
110.669173767202	177.956747958578	107	178
110.669173767202	177.956747958578	110	178
110.669173767202	177.956747958578	110	175
111.037367738264	193.188939276903	113	195
111.037367738264	193.188939276903	110	198
111.037367738264	193.188939276903	107	195
111.037367738264	193.188939276903	110	195
111.037367738264	193.188939276903	110	192
193.298369176623	193.298371989837	198	195
193.298369176623	193.298371989837	195	198
193.298369176623	193.298371989837	195	195
193.298369176623	193.298371989837	195	192
193.298369176623	193.298371989837	192	195
177.945813532497	177.938385485448	181	178
177.945813532497	177.938385485448	178	181
177.945813532497	177.938385485448	178	178
177.945813532497	177.938385485448	178	175
177.945813532497	177.938385485448	175	178
161.008679553929	160.970976024703	164	161
161.008679553929	160.970976024703	161	164
161.008679553929	160.970976024703	161	161
161.008679553929	160.970976024703	161	158
161.008679553929	160.970976024703	158	161
146.000056976658	144.000006877488	147	144
146.000056976658	144.000006877488	144	147
146.000056976658	144.000006877488	144	144
146.000056976658	144.000006877488	144	141
146.000056976658	144.000006877488	141	144
146.000051990612	109.999385999435	147	110
146.000051990612	109.999385999435	144	107
146.000051990612	109.999385999435	144	113
146.000051990612	109.999385999435	144	110
146.000051990612	109.999385999435	141	110
161.008614950807	109.658485184815	164	110
161.008614950807	109.658485184815	161	107
161.008614950807	109.658485184815	161	113
161.008614950807	109.658485184815	161	110
161.008614950807	109.658485184815	158	110
177.96238742375	109.308963890332	181	110
177.96238742375	109.308963890332	178	107
177.96238742375	109.308963890332	178	113
177.96238742375	109.308963890332	178	110

Solution x	Solution y	Original x	Original y
177.96238742375	109.308963890332	175	110
193.188678104734	108.931031772483	198	110
193.188678104734	108.931031772483	195	113
193.188678104734	108.931031772483	195	107
193.188678104734	108.931031772483	195	110
193.188678104734	108.931031772483	192	110
193.298389805592	26.7016319454642	198	25
193.298389805592	26.7016319454642	195	22
193.298389805592	26.7016319454642	195	25
193.298389805592	26.7016319454642	195	28
193.298389805592	26.7016319454642	192	25
177.965211343863	42.0488328459928	181	42
177.965211343863	42.0488328459928	178	39
177.965211343863	42.0488328459928	178	42
177.965211343863	42.0488328459928	178	45
177.965211343863	42.0488328459928	175	42
160.976523129341	58.9989410060093	164	59
160.976523129341	58.9989410060093	161	56
160.976523129341	58.9989410060093	161	59
160.976523129341	58.9989410060093	161	62
160.976523129341	58.9989410060093	158	59
143.995875228351	75.9900405168365	147	76
143.995875228351	75.9900405168365	144	73
143.995875228351	75.9900405168365	144	76
143.995875228351	75.9900405168365	144	79
143.995875228351	75.9900405168365	141	76
128.574690108057	92.9878873222001	130	93
128.574690108057	92.9878873222001	127	90
128.574690108057	92.9878873222001	127	93
128.574690108057	92.9878873222001	127	96
128.574690108057	92.9878873222001	124	93
127.71574977148	109.965344454124	130	110
127.71574977148	109.965344454124	127	107
127.71574977148	109.965344454124	127	113
127.71574977148	109.965344454124	127	110
127.71574977148	109.965344454124	124	110
127.000165010856	124.999951508311	130	127
127.000165010856	124.999951508311	127	130
127.000165010856	124.999951508311	127	127
127.000165010856	124.999951508311	127	124
127.000165010856	124.999951508311	124	127
110.007337744886	124.999956459444	113	127
110.007337744886	124.999956459444	110	130
110.007337744886	124.999956459444	107	127
110.007337744886	124.999956459444	110	127
110.007337744886	124.999956459444	110	124

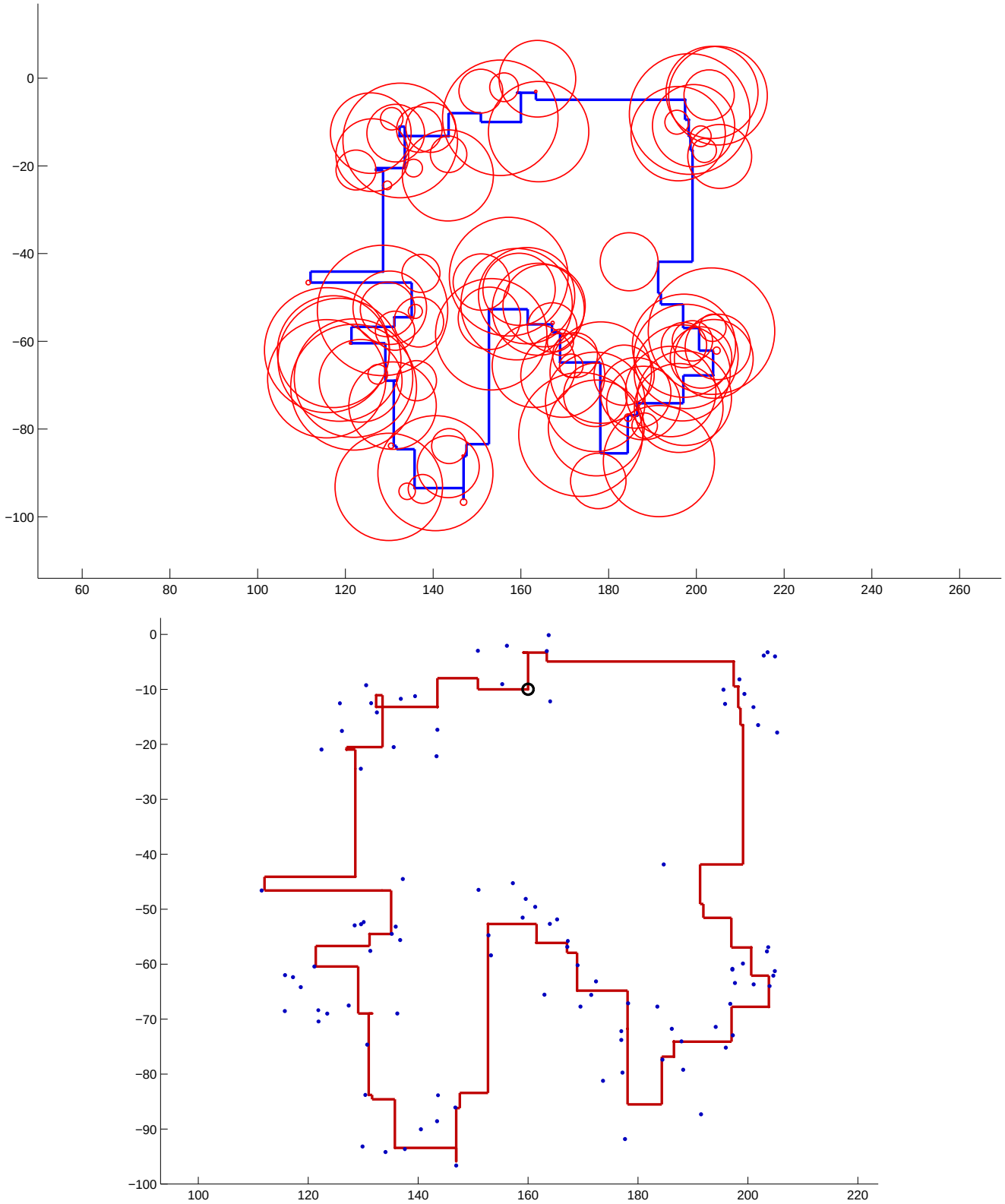


Figure N.153: *team*1_100, arbitrary radius, 2D, Manhattan, Length = 494.1144919

Table N-156: Solution for *team*1_100, arbitrary radius, 2D, Manhattan

Total distance: 494.114491902807 Depot: x 50 y 10				
Solution x	Solution y	Original x	Original y	Radius
40.8679999999996	7.98200000000825	40.868	2.981	5.001
33.5	13.192	45.293	9.057	13.174
33.5	13.192	29.447	11.243	5.69
33.5	13.192	33.5	17.352	4.16
33.5	13.192	33.341	22.178	10.381
33.5	13.192	22.494	14.202	13.068
22.348364932731	13.192	21.459	12.53	6.577
22.3483649327317	11.0673649327317	26.839	11.732	5.19
22.3483649327317	11.0673649327317	20.541	9.26	2.556
23.5189999999462	20.506	25.542	20.506	2.023
16.979	20.962	15.772	12.549	9.192
16.979	20.962	16.123	17.568	8.298
16.979	20.962	12.414	20.962	4.565
18.5719999999829	24.4489999800969	19.569	24.449	0.997
18.5719999999829	44.1029558467977	20.103	52.347	8.385
18.5719999999829	44.1029558467977	18.45	52.954	14.862
2.04800000000212	46.599	1.527	46.599	0.521
23.4182569147596	46.599	27.219	44.51	4.337
25.0849999999996	54.507	25.923	53.185	1.603
25.0849999999996	54.507	25.201	54.507	0.116
21.1645992598713	54.507	26.732	55.612	5.676
21.1645992598713	54.507	21.299	57.593	4.473
21.1645992598713	56.7013927077423	19.619	52.734	6.234
11.363000000144	60.4419999999972	11.123	60.442	0.24
11.363000000144	60.4419999999972	7.235	62.367	12.76
11.363000000144	60.4419999999972	8.641	64.188	14.025
11.363000000144	60.4419999999972	13.454	69.007	9.443
11.363000000144	60.4419999999972	5.777	62.003	14.244
11.363000000144	60.4419999999972	11.844	68.394	13.519
11.363000000144	60.4419999999972	11.878	70.444	14.354
11.363000000144	60.4419999999972	5.739	68.535	13.479
19.0922272841294	68.9770000000122	17.374	67.529	2.247
21.6389999999999	68.9770000000122	26.213	68.977	4.574
21.0080000000017	83.7929999999973	20.393	83.793	0.615
21.0080000000017	83.7929999999973	19.881	93.181	12.244
21.6142483027431	84.590154133439	20.735	74.659	9.97
25.76083371594	93.4346837541862	27.59	93.644	3.286
25.76083371594	93.4346837541862	24.053	94.189	1.867
36.924	95.8989999999719	36.924	96.636	0.737
36.924	86.198733312513	36.762	86.092	0.194
36.924	86.198733312513	33.443	88.578	7.057
36.924	86.198733312513	30.503	90.056	13.109
37.5849075230915	83.4407766662008	33.626	83.869	3.982
42.7093832544304	52.6897807240481	49.571	48.14	8.233
42.7093832544304	52.6897807240481	40.978	46.49	6.437
42.7093832544304	52.6897807240481	42.804	54.74	7.11
51.536281592143	56.1351792938596	47.232	45.27	13.543
51.536281592143	56.1351792938596	51.29	49.58	10.97
51.536281592143	56.1351792938596	49.02	51.541	12.697
51.536281592143	56.1351792938596	53.958	52.681	10.486
51.536281592143	56.1351792938596	55.281	51.871	9.377
51.536281592143	56.1351792938596	57.142	56.857	5.652
51.536281592143	56.1351792938596	43.243	58.404	12.71
51.536281592143	56.1351792938596	52.975	65.56	9.534
57.0798192036599	56.1351792938596	57.243	55.792	0.38
57.0798192036599	57.930864338331	59.007	60.213	2.987
58.9159334512264	64.8172684315246	62.352	63.144	5.122
58.9159334512264	64.8172684315246	61.493	65.592	2.691
68.1029999999999	71.7630000000001	59.534	67.732	9.572
68.1029999999999	71.7630000000001	66.971	72.201	7.244
68.1029999999999	71.7630000000001	73.523	67.727	6.866
68.1029999999999	71.7630000000001	76.154	71.763	8.051
68.1029999999999	85.5207494501248	67.643	91.829	6.325
74.3335465406915	76.8439101744411	74.447	77.382	0.86
76.5450777429195	76.8439101744411	63.631	81.224	14.134
76.5450777429195	76.8439101744411	77.919	74.057	8.389
76.5450777429195	76.8439101744411	78.214	79.218	2.902
76.5450777429195	76.8439101744411	81.476	87.316	12.684
76.5450777429195	74.1159225836951	68.193	67.124	11.572
76.5450777429195	74.1159225836951	66.957	73.797	11.351
76.5450777429195	74.1159225836951	67.179	79.746	10.928
76.5450777429195	74.1159225836951	84.146	71.427	10.315
76.5450777429195	74.1159225836951	87.252	72.952	10.77
76.5450777429195	74.1159225836951	85.968	75.194	10.133
87.0237301093412	67.7612379762659	91.043	63.691	7.01
93.8029999999986	67.7612379762658	87.173	60.998	11.762
93.8029999999986	67.7612379762658	86.785	67.217	10.959
93.8029999999986	67.7612379762658	94.894	61.262	7.46
93.8029999999986	67.7612379762658	93.946	64.003	8.979
93.8029999999999	62.103	94.619	62.103	0.816
90.5952287151875	56.9626500255988	87.18	60.86	5.182
90.5952287151875	56.9626500255988	89.091	59.886	4.603
90.5952287151875	56.9626500255988	93.694	56.925	3.099
86.9747105535016	51.5662462942875	87.633	63.432	11.884
81.8891566241995	49.0675604774687	93.456	57.69	14.427
81.2940000000001	41.865	74.679	41.865	6.615
89.114	16.502	91.857	16.502	2.743
89.114	16.502	95.317	17.864	7.295
88.6370713286446	13.3696942114926	91.007	13.249	2.373
88.2375177883612	9.48328269928157	85.554	10.061	2.745
88.2375177883612	9.48328269928157	85.841	12.653	10.749
88.2375177883612	9.48328269928157	89.359	10.839	9.385
88.2375177883612	9.48328269928157	88.457	8.185	13.747
87.3977796147418	4.93349333889602	92.889	3.855	5.733
87.3977796147418	4.93349333889602	93.574	3.255	10.497
87.3977796147418	4.93349333889602	94.926	4.006	11.26
53.405	3.32100000000018	53.405	3.041	0.28
49.1859929089548	3.3209999999999	54.032	12.197	11.442
49.1859929089548	3.3209999999999	46.154	2.083	3.275
49.1859929089548	3.3209999999999	53.754	0.148	8.742

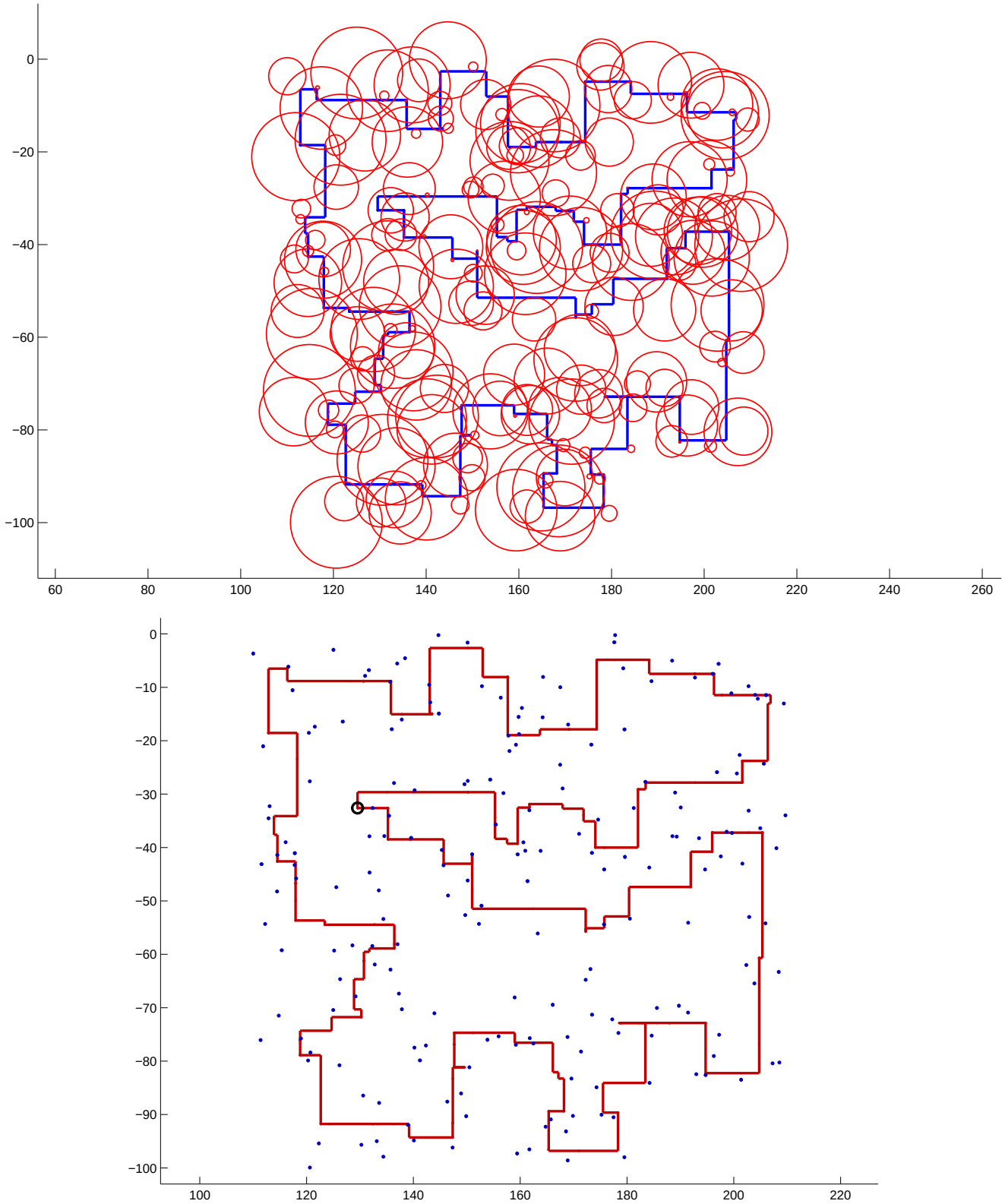


Figure N.154: *team*2_200, arbitrary radius, 2D, Manhattan, Length = 780.7125045

Table N-157: Solution for *team*2_200, arbitrary radius, 2D, Manhattan

Total distance: 780.712504456912 Depot: x 19.5535 y 32.6157				
Solution x	Solution y	Original x	Original y	Radius
25.2355727687046	32.6157	22.373755	32.6144	4.900414
25.2355727687046	34.5237312331077	24.567885	37.86062	3.403033
25.2355727687057	38.4790663910904	25.46019	34.06066	5.200669
25.2365727686977	38.4790663910902	21.779985	37.899125	3.504901
29.4566151759455	38.4790663910869	35.347265	40.483415	6.900943
29.4566151759481	38.4800663910815	29.577285	38.20107	0.303974
35.6576300000011	43.0402229999966	36.49954	48.989475	8.009904
35.65863	43.0402229999966	35.65863	43.345715	0.305492
41.0073200059751	41.3842630015101	41.00732	41.27668	0.107583
41.0073200059752	44.8449740642312	42.753335	50.906813	6.308285
41.0073200059751	47.9077342564567	40.184205	46.1874365	1.907077
41.0073200059751	48.028730911647	39.724355	52.657318	4.803105
41.0073200059751	51.4694818632543	42.291825	54.317701	4.104253
52.4900067725184	51.4694818632535	53.302235	56.10093	4.70213
62.2696827612146	55.7735279999656	62.26967	64.78212	9.008592
62.2696827612155	55.1108156106189	63.17424	62.764205	7.706659
65.7389274354014	52.8981502251165	65.705495	54.4013975	1.503619
70.37739642633	47.4001067545276	70.55475	53.342402	6.30295
81.9224369477461	47.4001067545276	81.466395	54.091358	6.706774
81.9224369477461	40.7798793184489	74.17807	43.76639	8.300269
85.9592832331091	40.7798793184489	84.61874	44.121625	3.6006
85.9592832331091	37.2108040000002	79.319755	37.96047	9.501655
85.960283233109	37.2108040000002	87.57797	41.66484	6.902275
85.961283233109	37.2108040000002	83.48933	38.25693	8.302552
85.962283233109	37.2108040000002	88.660005	37.051535	7.30023
85.963283233109	37.2108040000002	89.661665	37.28143	7.609892
85.964283233109	37.2108040000002	91.6164	43.026115	8.109517
92.788305	37.2108040000002	92.788305	33.10169	4.109114
95.3409402141845	37.2108040000002	97.982935	40.137435	10.003975
95.3419402141844	37.2108040000002	94.955665	36.40187	7.002314
95.3429402141844	37.2108040000002	99.67714	33.98061	5.405501
95.3429402141844	54.1201632563788	95.92709	54.202926	6.608684
95.3429402141844	60.695287945029	92.878595	53.021252	10.006179
94.7511190982623	60.6952879450289	92.344515	62.02096	3.309346
94.7511190982709	60.6962879449288	98.425325	63.29758	4.501834
94.7511190982669	65.5427324104292	93.854515	65.44994	0.901393
94.7511190982734	76.6814519478757	98.53739	80.25874	5.208919
94.7511190982752	82.2532404370425	97.272905	80.426715	7.307128
91.3717536525235	82.253240437047	91.37176	83.481715	1.3041
84.7245500001251	82.4141159999561	84.72455	82.62255	0.208434
84.7235500001245	82.4141159999561	82.980165	82.460215	3.407507
84.723550000126	72.854297999959	86.26193	79.048	6.603528
84.7235500001241	72.8532979999589	87.254685	75.06877	5.900928
77.9479328598796	72.8532979999414	81.449	70.90379	4.00725
77.9469328598796	72.8532979999414	79.72973	69.6285	6.503827
75.6092418749834	72.8532979999414	75.60926	70.05143	2.801868
72.8026821256761	72.8532979999414	74.635475	75.231085	3.002518
72.4089989141565	72.8532979999414	67.24276	72.18951	5.208708
68.5319142990858	72.8532979999589	63.457115	71.302795	5.306378
68.8811472996939	72.8532979999589	68.40623	74.741575	3.705743
68.8821472995167	72.8532979999589	61.393495	78.21387	9.209541
73.4309239996031	84.088711521968	74.234205	84.088705	0.803281
65.5082260001181	84.9100000717737	64.30468	84.91	1.203546
65.5082260000103	89.6336569485956	65.23767	90.033385	0.507723
68.3042845959459	89.6336569485956	67.48261	90.51293	1.203441
68.3042845959461	96.7930625768548	69.51155	98.000325	1.707329
60.9736106175082	96.7930625768549	58.9163	98.60932	7.507171
55.3295639999964	96.5374389860411	49.437672	97.29667	8.8097
55.3295639999965	96.536438986041	51.725585	96.536445	3.603979
55.3295639999965	89.3692361835506	54.766852	92.295455	9.502154
55.3305640000732	89.3692361836029	55.7501	90.920415	1.606912
58.2039089999782	89.3692361835438	58.59379	93.155945	9.907152
58.2039089999969	84.3905811380909	59.88564	90.256965	6.102678
58.2039089999996	83.27302	59.609455	83.27302	1.405546
57.1481152187718	82.0718249902835	58.86286	75.490835	6.800719
56.1040147244041	76.5561959999989	56.10401	69.44853	7.107666
52.5465186920439	76.5561960000023	52.486843	76.711165	6.306844
49.2006239994909	76.6435729999976	49.200624	76.95068	0.307107
49.1996239994954	76.6435729999978	51.801592	75.702955	5.507245
48.9830439456984	74.683737	48.983044	68.08194	6.601797
41.2239595553671	74.683737	45.96408	75.36881	5.908922
41.2229595553674	74.683737	43.88264	75.9979	8.106066
37.6643202579307	74.6837369999999	33.93752	71.055425	5.201316
37.6643202579307	76.8659852578733	32.35548	77.08328	8.907943
37.6643202579307	76.8669852578678	31.22881	79.877355	7.509507
37.6643202579307	81.1571336952353	30.1948	77.47401	8.506801
39.5802539999983	81.1571336952365	40.48646	81.157135	0.906206
37.3764455004373	83.2704342790435	38.950185	86.058925	3.201927
37.3764455004373	91.5545119305242	36.34587	87.597465	6.900084
37.3764455004374	91.5555119305272	39.89323	90.309885	2.808165
37.3536151817832	94.2855239999999	37.353615	96.195315	1.909791
37.3526151817832	94.2855239999896	30.09705	94.85711	8.906507
29.1972868176639	91.7537706097841	28.966505	91.93771	1.002586
26.2786371975341	91.7537706097843	23.159665	94.99055	6.103619
23.8367757971644	91.7537706097841	20.26183	95.676245	5.307169
23.2249916017315	91.7537706097841	20.60172	86.45345	9.802386
22.3832683594924	91.7537706097841	23.602775	87.83846	8.306271
22.3822683594924	91.7537706097842	24.384515	97.907795	6.707286
14.3661599193254	91.7537706097838	12.30828	95.415795	4.20063
12.652948821895	91.753770609784	10.636965	99.941455	9.901623
12.652948821895	78.8776718722575	16.17437	80.77798	4.001447
8.80285700000192	78.877671872316	10.302265	79.88844	1.80828
8.80285700001289	78.8766718722568	10.737535	78.399525	6.808137
8.80285699999911	76.0733556480943	8.96414	75.77293	2.204212
8.80285699999911	76.0723556474022	1.401765	76.07236	7.401092
8.80285699999911	74.3019344337981	4.81189	71.48163	9.90886
14.6785831583324	71.7499228824559	14.99811	70.439575	3.802058
20.2507379999947	71.749922882456	19.19225	67.891335	4.001137
20.250738	70.2970145174515	27.85894	70.297015	7.608202
18.890567	64.6587146739651	16.28216	64.658715	2.608407
20.7444461679694	61.2521736151644	15.17562	59.299125	5.903506
20.7444461679694	61.2511736151644	22.77816	61.91876	9.100277
20.7444461679694	59.5281756275681	25.726765	62.875185	6.002164
21.7610248618912	58.907176061693	18.601355	58.3359	9.106551
23.373605190389	58.9071760616911	22.32618	58.45293	1.401145
26.4279709999998	58.9071760616956	27.294235	67.36467	8.501742
26.4279709999998	58.1176400430863	27.03592	58.11764	0.607949
26.4279709999887	54.4621928470036	24.393135	53.387308	8.804674
22.7012659498672	54.4621928470041	23.528225	48.047471	7.005381
22.7002659499007	54.462192847007	21.800035	44.699325	9.804285
13.4107922963641	54.462192847007	15.566305	47.445917	8.70734
13.4107922963641	53.6678705712576	5.35045	59.245825	9.802178
7.93337512115551	53.6678705712576	2.26292	54.336059	5.709688
7.93337512115551	49.9248728910669	4.493385	48.2428075	7.3014
7.93337512115551	46.6890893268528	8.071465	45.7971455	0.90257
7.93337512115551	46.6880893268527	7.79806	41.063165	5.901659
7.93337512115551	42.6045554707712	7.76847	43.27595	8.308131
4.53102180969465	42.6045554707712	4.535275	41.40327	1.201293
4.53002180969466	42.6045554707712	1.56824	43.114435	3.00535
4.53002180969466	37.6212431317377	6.091625	39.029145	2.102568
3.89234200004159	34.5391651323244	2.888575	34.539165	1.003767
3.89234200004606	34.115239326986	3.09506	32.271765	2.008496
8.23332399999997	23.4354027547879	10.613375	27.61233	4.807428
8.23332399983445	18.540250121034	10.44323	18.54025	2.209906
2.85595219057427	18.5402501210336	1.875835	21.036865	9.501742
2.85595219057427	18.5392501210336	11.54701	17.37734	9.803906
2.85595219057427	6.51123592615391	0.024125	3.6794065	4.00481
6.39551335770656	6.51123592615391	6.5851	6.152225	0.405995
6.39551335770658	8.83170160284406	7.39533	10.545265	8.903739
18.1179012940823	8.83170160284407	16.776285	16.423415	7.709348
20.6628917055467	8.83170160284407	21.673354	6.8005655	8.80316
20.6638917055467	8.83170160284406	26.97316	5.55935	8.204253
20.6648917055467	8.83170160284405	20.9699	7.87089	1.008062
20.6648917055467	8.83270160284458	15.031135	2.9821155	9.903269
25.7980175828378	8.83270160284435	25.662895	8.989655	0.207105
25.7980175828378	15.0426959999831	25.954135	17.869355	7.603419
27.8279949329579	15.0426959999831	27.827995	16.04415	1.001454
33.6721589999326	14.9245748044062	34.77264	14.924575	1.100481
33.052453	14.9245748044069	33.169445	12.82499	2.709158
33.052453	6.94057753554632	32.973595	9.54291	2.603527
33.052453	4.56492	28.448025	4.56492	4.604428
33.052453	2.638353	34.695715	0.250565	8.309293
40.1604599512757	2.63835300006188	40.16046	1.62977	1.008583
42.9639646767344	8.06913460886439	42.845635	9.79738	5.407265
47.686858	8.06913460886381	50.337118	13.87323	8.600173
47.687858	8.06913460886452	54.294115	8.069135	6.606257
47.6616350000103	8.06913460886565	49.707097	15.54357	9.000518
47.6616350000002	11.9544055734065	46.358401	11.954405	1.303234
47.6616350000046	14.3580558255762	47.801417	19.06334	4.70736
47.6616350000265	18.959532	47.997827	21.94091	8.509285
49.2165632862002	18.9595319998958	49.216563	20.76273	1.803198
53.6983096741157	17.8806536263865	49.796921	18.777515	4.003148
59.1327032019689	17.8806536264038	54.207021	15.63022	7.700153
59.133703201958	17.8806536264065	58.979255	16.987345	4.304944

Solution x	Solution y	Original x	Original y	Radius
64.321721784188	17.8806536263907	69.52818	17.90893	5.206535
64.3217217841895	17.7136133353035	63.31789	20.756115	3.203825
64.3217217841903	4.85145630004789	57.51838	10.00522	10.000856
64.3227217841931	4.8514563000479	67.61759	1.570395	5.100981
67.7947726345546	4.8514563000479	67.794775	0.2453923	4.606064
74.147254603621	4.8514563000479	69.299455	6.449115	5.10428
74.147254603621	7.4830949767512	74.60069	8.85595	4.00271
82.6903933812341	7.4830949767512	78.44886	5.02628	8.808511
82.691393381234	7.48309497675119	82.741185	8.18936	0.708018
86.2920185356982	7.48309497675119	86.016245	7.495035	0.503562
86.2930185356982	7.48309497675119	87.144585	5.62369	7.10022
86.2940185356982	7.4830949767512	94.4971	12.154995	9.50306
86.2940185356982	11.4625305870968	93.997115	11.43328	7.703152
87.7715868596736	11.4625305870942	89.544625	11.14329	1.801549
87.7725868596736	11.4625305870942	92.761655	9.792985	7.707934
96.7446179713574	11.4625305870936	96.04228	11.46233	0.702338
96.871992999993	13.0420444464812	99.37313	13.042045	2.501137
96.3568961369545	23.7914692653938	95.62369	24.314785	0.900802
91.5783097756885	23.7914692653938	91.09643	22.6866	1.205359
91.5783097756885	27.838686764491	90.572985	26.136825	8.602133
91.5783097756885	27.8396867644911	86.845365	25.906095	8.100197
82.7684735010966	27.8396867644911	80.066985	32.520545	5.404485
73.4772130050843	27.8180342076716	73.44882	27.71684	0.105102
73.483288265418	29.098882515189	79.01289	29.7258	7.100822
72.0576462735181	29.098882515189	71.273045	32.62062	3.608079
72.0576462734955	40.0089449999992	78.52122	37.890255	6.801958
65.7877128936185	40.0089449999992	69.610075	41.75992	4.204327
65.7256421551432	40.0089450000006	65.72564	44.111465	4.10252
64.0705158814461	40.0089449999992	61.04328	37.44322	7.908259
64.0705158814461	35.0830994131065	64.595135	34.78327	0.604254
61.8647281332347	33.8899244251932	63.437195	41.00367	9.004095
61.8647281332347	32.7237444195791	57.48649	24.517395	9.301244
57.951864811531	31.862787999996	57.95186	28.956245	2.906543
51.7289984254049	31.862787999996	50.608737	39.047145	7.509385
51.7289984254048	32.5222304670102	53.824634	40.64213	9.902994
51.7279984254048	32.5222304670171	51.719243	33.03008	0.507925
49.5221300615272	39.287067	50.972003	40.60627	8.001002
49.5211300615271	39.287067	49.52113	41.29678	2.009713
47.5240416755835	38.3823182061084	51.37375	46.298003	8.802177
45.2810487168765	37.4597843650713	46.870011	29.816545	7.806658
45.2810487168766	34.2996270313551	45.420784	35.70231	1.409626
45.2810487168765	29.6306350000002	44.38625	27.294685	2.501465
40.1982595273282	29.6306350000002	40.19826	27.52955	2.101085
40.194576766785	29.6306350000002	39.58443	28.150345	1.800561
30.0289714827283	29.6306350000002	30.249755	29.28668	0.408718
25.0782250920152	29.6306350000002	26.379295	27.934205	5.600223

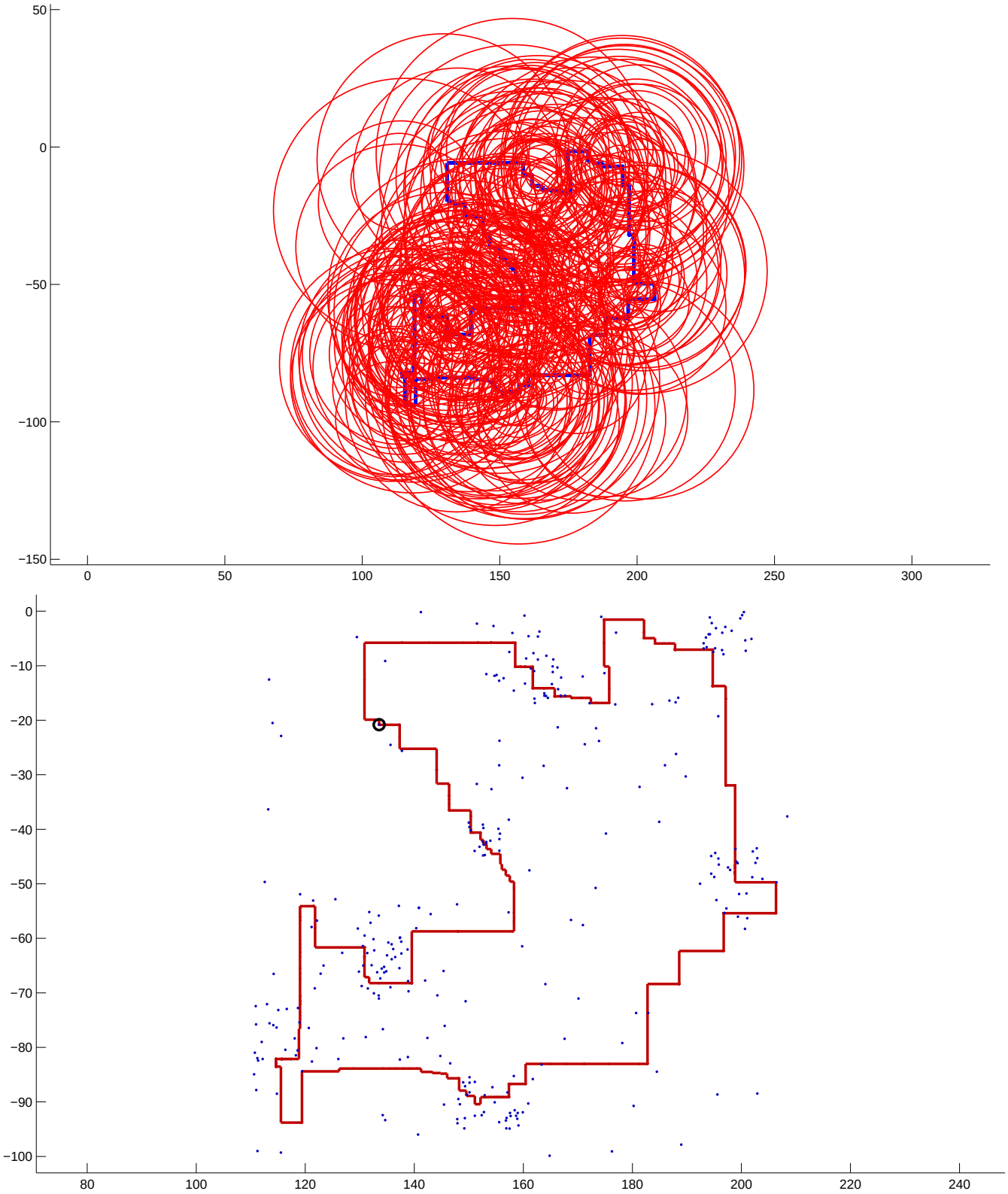


Figure N.155: *team*3_300, arbitrary radius, 2D, Manhattan, Length = 487.9948018

Table N-158: Solution for *team*3_300, arbitrary radius, 2D, Manhattan

Total distance: 487.994801797785				
Depot: x 23.55 y 20.83				
Solution x	Solution y	Original x	Original y	Radius
24.570825823062	20.83	4.01	20.5	30.01
27.3098801441465	20.83	3.21	36.35	37.4
27.3098801441486	23.1457528869689	27.74	25.63	7.06
27.3098801441466	25.2435657612151	25.65	24.53	2.83
34.0932072174867	26.0844439828799	23.55	20.83	11.78
34.0932072174867	29.1159529780696	71.33	32.23	42.89
34.0932072174867	29.1169529780696	45.63	23.76	13.71
34.0932072174867	31.6208586625479	49.85	30.56	44.85
36.3782070005933	31.9534304988119	47.34	38.25	14.49
36.3782070005933	33.8259969911664	42.69	39.78	10.22
36.3782070005933	33.8269969911664	40	38.77	18.88
36.3782070005933	33.8279969911664	40.11	39.6	36.03
36.3782070005933	34.4834533502194	40.4	40.19	32.32
36.3782070005933	35.3494778326956	42.59	39.16	36.88
36.3782070005933	36.5414787517779	41.47	31.69	27.11
36.3782070005933	36.5424787517779	44.15	32.64	10.23
40.3415680969018	37.5928678339277	45.6	41.81	23.25
40.342568096905	37.5928678339222	43.21	42.35	16.43
40.3425680969019	40.5951678735408	45.42	39.91	7.33
40.3435680969017	40.5951678735422	43.96	42.1	13.34
40.8064509835857	40.5951678735422	43.21	42.61	13.5
42.1482435237398	40.5951678735401	41.97	43.22	4.65
42.1482435237462	41.9592546945582	41.07	43.98	16.59
42.6986762619495	42.7776815946073	42.95	44.74	47.83
43.260810029395	43.6226948615951	42.56	42.28	38.94
44.1088259701223	44.4980094111721	45.6	43.93	19.94
45.7741674178824	45.4060938684208	42.62	44.81	3.21
45.7741674178824	46.3912222433584	58.75	56.63	26.43
46.067056620978	47.4149358193806	45.71	40.8	34.61
46.7799465780948	48.480822071799	65.16	40.78	37.77
47.5209590476938	49.5956838071052	51.12	47.54	20.96
48.2899999999997	50.77	63.26	50.77	14.97
48.2899999999994	55.2880548876912	54.05	68.39	14.97
48.2899999999896	56.9264657326381	60.94	57.56	37.6
48.2899999999935	58.7144229808327	47.3	55.25	13.14
47.9431593016667	58.7144229808327	49.78	61.48	3.32
38.0192792431376	58.7144229808327	30.83	54.42	13.2
38.0182792431376	58.7144229808328	37.85	53.76	19.4
38.0172792431376	58.7144229808327	30.36	58.14	13.13
38.0172792431376	58.7154229808327	27.64	62.78	15.95
29.53633228302	68.22	28.86	67.84	0.99
29.53533228302	68.22	27.28	65.47	12.73
29.5343322830199	68.22	24.03	65.56	12.46
29.5333322830199	68.2199999999999	24.86	66.05	20.4
23.52	68.2199999999999	23.52	71.05	2.83
21.7241335993883	67.115882366883	22.6	70.1	3.11
20.8593516232104	66.7436448659489	20.35	68.75	2.07
20.8593516232104	63.3872635022035	20.64	65	4.42
20.8583516232104	63.3872635022035	19.86	66.11	2.9
20.8583516232104	61.6735066913178	22.17	64.94	3.52
20.8573516232104	61.6735066913178	23.19	66.22	5.11
20.8563516232104	61.6735066913178	22.65	62.2	11.7
20.8553516232104	61.6735066913178	25.84	61.09	17.04
20.8543516232104	61.6735066913178	16.79	62.67	4.76
11.7967200044803	58.0159924554743	21.99	57.15	10.23
11.7967200044803	54.11	11.18	57.92	14
11.46	54.11	11.46	53.07	1.04
11.459	54.11	12.14	56.76	5.34
9.03098235343364	54.3896918073428	9.07	51.92	2.47
9.02998235343365	54.3896918073428	27.36	59.94	22.06
9.02998235343365	54.3906918073429	23.5	55.84	18.38
9.02998235343365	54.9364659407322	15.54	52.83	26.09
9.02998235343365	55.4951895950947	22.51	60.15	23.44
9.02998235343365	56.0659464720663	21.75	55.19	18.06
9.02998235343365	56.0669464720663	2.57	49.67	15.72
9.02998235343365	56.0679464720663	13.36	65	29.08
9.02998235343365	56.6923367717016	20.88	59.51	36.31
9.02998235343365	56.6933367717016	21.39	62.71	35.55
9.02998235343365	56.6943367717016	25.86	63.85	38.15
9.02998235343365	60.3117728492098	26.15	61.96	39.04
9.02998235343365	61.0180749782352	27.62	60.61	40.48
9.02998235343365	61.7511276599925	25.24	60.77	37.65
9.02998235343365	62.5171268194081	21.49	69.2	28.99
9.02998235343365	62.5181268194127	23.47	70.49	29.96
9.02998235343365	63.33398176093	35.37	65.99	42.77
9.02998235343365	65.4961835686777	39.42	71.54	47.2
9.02998235343365	65.4971835686755	21.1	78.12	28.48
9.02998235343365	66.442750660976	16.07	82.14	24.27
9.02998235343365	67.4252829912339	12.82	66.49	17.6
9.02998235343365	70.569287007622	37.93	93.92	38.41
9.02998235343365	70.5702870076219	39.7	88.73	41.5
9.02998235343365	70.5712870076219	19.65	58.2	41.68
9.02998235343365	71.0455387187193	46.89	94.85	49.64
9.02998235343365	71.529448214619	27.18	54.04	49.76
9.02998235343365	71.5304482146189	27.4	59.84	47.68
9.02998235343365	71.531448214619	38.36	90.43	47.27
9.02998235343365	71.532448214619	24.2	92.42	40.35
9.02998235343365	72.0753996503457	2.99	72.09	6.04
9.02998235343365	72.0763996503457	28.82	81.78	43.64
9.02998235343365	72.0773996503456	32.42	78.27	49.72
9.02998235343365	73.5960482257221	36.6	82.94	44.77
9.02998235343365	74.1453449717899	6.62	72.96	3.81
9.02998235343365	74.7203947785491	5.07	73.15	4.26
9.02998235343365	76.6076117979609	8.06	78.36	4.56
8.84440297027844	78.5480695699986	11.23	82.6	5.9
8.84440297027844	80.2190883596078	12.07	80.14	6.18
8.84440297027844	82.13	9.41	84.38	2.32
7.40848002718018	82.13	49.91	91.9	43.61
7.40748002718017	82.13	8.67	72.77	28.82
7.03349418070968	82.13	34.24	70.46	46.56
6.76039363509146	82.131	31.99	67.74	46.93
6.48916251037947	82.13	25.62	68.98	43.08
6.21936353364872	82.13	8.95	75.43	30.95
5.94990026707642	82.13	3.44	75.58	32.57
5.68094146839863	82.13	4.15	75.92	36
5.67994146839862	82.13	6.36	80.44	34.29
5.67894146839862	82.1299999999999	10.66	76.44	43.81
5.67794146839863	82.1299999999999	8.2	81.45	44.4
5.67694146839862	82.1300000000001	8.6	80.56	41.43
5.67594146839863	82.13	2.01	79.01	42.13
4.63199999999439	82.1299999999999	1.36	82.41	36.76
4.63099999999439	82.1300000000001	1.21	81.97	14.68
4.6299999999944	82.13	2.19	82.13	2.44
4.6299999999944	82.131	11.74	69.17	18.09
4.62999999999434	82.132	0.62	84.95	36.73
4.62999999999434	82.1329999999999	24.47	65.24	32.36
4.62999999999434	82.8204056498807	38.08	89.48	35.64
4.62999999999434	82.8214056498806	0.76	80.97	8.89
4.62999999999434	83.0460577149117	35.46	90.5	36.39
4.62999999999434	83.3093610392714	48.25	85.26	49.96
4.62999999999435	83.5219109083562	20.56	61.44	30.47
4.62999999999431	83.5229109083561	4.21	66.53	21.01
4.62999999999434	83.5239109083561	24.49	66.27	27.9
4.62999999999434	83.5249109083561	0.91	72.43	18.26
4.62999999999434	83.5259109083562	25.01	63.12	28.84
4.62999999999434	83.5269109083561	4.8	88.51	18.34
4.62999999999434	83.5279109083562	0.97	75.78	17.69
4.62999999999434	83.5289109083561	1.24	99.01	20.96
5.54000000000001	93.7999999999991	5.54	99.29	5.49
9.39201503629366	93.7999999999991	4.75	76.37	18.12
9.39201503629032	84.3892993870803	1.01	87.83	21.8
16.2103318758261	83.8900000000027	16.99	78.36	10.94
18.8096701759716	83.8900000000035	24.67	93.34	18.16
24.25	83.89	24.25	76.66	7.23
25.5109374948214	83.890000000001	27.35	82.24	4.58
26.7141144370384	83.890000000004	30.85	54.39	33.55
27.9403596295332	83.8900000000029	28.95	69.72	21.24
29.1978930966392	83.890000000003	33.01	55.55	36.48
30.4909440308798	83.8900000000029	28.77	62.05	31.17
31.224849632505	84.4902269691812	26.5	63.44	28.82
33.3342198229074	84.5942858116749	23.78	67.37	23.49
33.3342198229074	84.7023997467563	30.69	95.98	13.17
34.8371384148357	84.8085173981259	35.58	76.06	8.78
36.0280460134018	85.6813263812571	34.79	81.57	35.28
38.2101605216086	85.6813263812571	39.31	87.14	5.32
38.2101605216086	87.9259420414504	41.11	86.33	3.31
39.5241473089045	88.9038943298097	40.13	86.48	6.39
41.11	90.4	41.11	92.55	2.15
41.4456029516088	90.4	46.8	93.43	39.27
41.7860224569465	90.399999999996	37.88	93.16	38.09
42.1310669803784	89.1263740506457	39.18	94.86	14.97
42.4803715618911	89.1263740506457	40.14	85.47	26.51
42.6593268722845	89.1263740506456	42.78	91.87	35.26
43.1584793156255	89.1263740506457	38.99	86.42	12.82

Solution x	Solution y	Original x	Original y	Radius
43.6622752782715	89.1263740506456	42.93	88.78	12.51
43.6622752782715	89.1253740506455	48.68	92.55	20.63
44.1729256531642	89.1253740506455	44.33	87.3	27.93
44.6897943888148	89.1253740506455	47.56	92.03	9.48
45.072687993201	89.1253740506455	44.75	90.08	11.27
45.4615701922191	89.1253740506455	47.67	92.59	35.3
45.8571547584705	89.1253740506455	42.37	92.45	18.71
46.2598906109021	89.1253740506455	45.57	93.71	20.17
46.3932065059969	89.1253740506455	48.42	91.53	30.91
46.9392343491531	89.1253740506456	50.91	90.3	4.38
47.3475247371473	89.1253740506455	48.89	93.1	36.74
47.3485247371473	89.1253740506456	47.48	94.9	26.29
47.3485247371473	86.7099944596582	47.08	88.26	25.21
47.3495247371473	86.7099944596582	46.92	92.94	12.72
47.3505247371473	86.7099944596582	39.28	92.99	15.28
47.7252477174919	86.7099944596582	40.14	88.25	7.74
50.4263303749677	86.7099944596582	53.35	83.14	7.08
50.4263303749677	83.0235719927938	49.11	94.31	17.31
53.0883467203196	83.0235719927938	51.75	85.81	36.53
54.9714692549755	83.0235719927938	54.83	99.88	28.66
57.9317198807764	83.0235719927938	66.26	99.07	34.13
61.1557538641989	83.0235719927938	57.57	78.44	7.54
61.1567538641989	83.0235719927938	60.12	71.05	24.74
65.6303988229091	83.0235719927938	68.17	79.21	25.07
71.2585355914652	83.0235719927938	74.49	84.46	5.64
72.785026801264	83.0235719927938	85.6	88.65	40.1
72.785026801264	68.3726850585801	72.93	73.7	16.22
78.5792608367297	68.3726850585801	70.7	73.7	18.06
78.5802608367297	68.3726850585801	70.23	90.73	37.84
78.5812608367297	68.3726850585801	48.98	92.03	41.59
78.5822608367296	68.3726850585801	78.98	97.83	29.46
78.5822608367297	62.3176267732304	92.92	88.46	39.57
86.7452685333346	62.3176267732304	85.43	53	9.41
86.7452685333346	55.4046157821246	89.36	56.03	3.45
86.7452685333346	55.4036157821246	86.88	55.34	10.88
86.7462685333346	55.4036157821246	90.65	58.26	31.68
86.7472685333346	55.4036157821246	87.26	54.53	10.31
86.7482685333345	55.4036157821246	85.02	48.75	30.39
86.7492685333345	55.4036157821245	84.47	44.91	21.75
86.7502685333346	55.4036157821246	87.56	46.99	41.58
86.7512685333345	55.4036157821246	92	48.8	13.39
86.7522685333345	55.4036157821246	92.09	44.08	37.36
86.7532685333345	55.4036157821246	92.82	43.5	36.84
86.7542685333345	55.4036157821246	91.08	56.32	17.84
96.3499999914565	55.4036157821246	98.41	37.64	22.32
96.3499999914565	49.7299999996198	96.43	49.73	0.08
88.842906899399	48.1203385906422	82.42	49.99	11.64
88.8419068993989	48.1203385906422	92.59	46.16	30.13
88.8409068993989	48.1203385906422	93.86	49.11	7.68
88.8409068993989	47.8595573434969	89.33	46.23	10.42
88.8399068993989	47.8595573434969	89.11	45.94	8.83
88.838906899399	47.8595573434969	89.59	51.88	4.09
88.8389068993989	47.0800259789186	84.47	48.16	27.36
88.8389068993989	47.0790259789186	87.92	47.46	19.28
88.837906899399	47.0790259789186	88.92	43.62	3.46
88.837906899399	47.0780259789186	85.85	46.49	8.76
88.837906899399	46.6192308001794	92.92	45.3	44.4
88.837906899399	46.6182308001794	85.78	45.37	33.83
88.836906899399	46.6182308001794	90.93	51.78	5.57
88.8359068993991	46.6182308001794	85.21	44.35	35.25
88.835906899399	31.9365068603705	74.93	38.63	25.85
88.8359068993991	31.9355068603705	79.79	30.32	35.55
88.834906899399	31.9355068603705	76.81	16.4	34.4
87.1080328838015	31.9355068603705	75.98	28.26	25
87.1080328838015	31.9345068603705	78.01	26.19	23.38
87.1070328838015	31.9345068603705	78.41	15.88	33.29
87.1070328838015	16.0693276119837	67	3.94	32.81
87.1070328838015	16.0683276119837	64.87	11.36	35.55
87.1070328838015	16.0673276119837	53.87	15.51	48.76
87.1070328838015	13.734203563311	85.76	19.27	9.99
84.7389741153459	13.734203563311	83.63	6.61	7.21
84.7379741153458	13.734203563311	90.79	7.27	30.18
84.7369741153457	13.734203563311	85.18	6.81	43.66
84.7359741153458	13.734203563311	86.71	7.9	17.03
84.7349741153458	13.734203563311	90.45	0.18	30.09
84.7339741153458	13.734203563311	88.21	3.61	26.68
84.7339741153458	7.0577367774807	91.86	5.09	8.07
84.7329741153458	7.0577367774807	84.85	7.49	13.74
77.8359220778375	7.0577367774807	83.98	4.24	15.73
77.8359220778375	7.0567367774807	83.5	4.83	37.8

Solution x	Solution y	Original x	Original y	Radius
77.8359220778375	7.0557367774807	85.34	3.13	40.46
77.8359220778375	7.0547367774807	86.46	7.15	18.46
77.8359220778375	7.0537367774807	83.08	5.9	14.32
77.8359220778376	7.0527367774807	90.14	0.74	21.22
77.8359220778375	6.94893549661604	87.06	2.89	20.41
77.8359220778375	5.93071345015487	90.71	5.35	17.99
76.8220320955739	5.93071345015487	84.57	2.19	42.77
75.8493020707602	5.93071345015487	84.21	1.15	11.63
74.1535260656767	5.93071345015487	84.22	4.25	43.87
74.1535260656767	4.95891510177205	89.81	1.33	26.05
72.139695886648	4.95891510177205	83.08	6.85	42.38
72.139695886648	4.95791510177205	86.49	3.97	35.89
72.139695886648	3.87828913363513	77.94	16.73	14.1
72.139695886648	3.87728913363513	44.53	2.72	49.48
72.139695886648	1.5461879502691	45.09	11.7	48.9
64.8171879502692	1.5461879502691	45.57	28.26	48.56
64.8161879502691	1.5461879502691	64.3	1.03	0.73
64.816187950269	5.83800404801921	42.72	42.84	48.6
64.8161879502691	10.1499355356641	53.73	28.37	48.55
65.7497768079535	14.1798372449663	63.88	23.81	9.81
65.7497768079535	16.8399999999852	66.87	17.1	1.15
65.7487768079534	16.8399999999984	73.63	17.07	49.78
63.35	16.84	63.35	21.49	4.65
63.3490000000002	16.839999999998	60.89	11.99	21.62
62.3758693222839	16.8399999999851	62.16	16.88	21
62.3758693222839	15.9005536150429	56.26	10.34	24.93
61.4704667838762	15.9005536150426	56.38	14.32	21.79
60.5925832764196	15.9005536150426	55.4	11.17	24.33
58.8332764568501	15.9005536150426	61.27	24.41	39.95
58.8332764568501	15.6151991907421	58.02	32.46	35.22
56.9344581810926	15.6151991907421	56.85	15.49	20.36
56.9344581810926	15.6141991907421	56.31	21.31	24.49
55.7602754812826	15.6141991907421	57.66	15.51	35.11
55.7602754812826	15.6131991907421	54.5	15.91	18.5
55.7602754812826	15.6121991907421	54.15	15.54	39.45
55.7602754812826	15.6111991907421	52.03	16.04	40.73
55.7602754812826	14.1310579645978	55.24	13.37	7.67
53.8051779803373	14.1310579645978	53.85	15.08	0.95
53.8041779803374	14.1310579645978	52.12	16.84	26.81
51.7310878768549	14.1310579645978	48.26	14.58	3.5
51.7310878768549	14.1300579645977	50.3	13.28	17.44
51.7310878768549	10.2005651806279	51.98	10.99	14.06
51.7300878768549	10.2005651806279	50.52	8.68	38.38
50.3111641553911	10.2005651806279	52.67	8.88	8.37
50.3111641553911	10.1995651806279	51.38	10.51	13.35
50.3111641553911	10.1985651806279	52.67	4.65	26.24
49.5411637988207	10.1985651806279	55.38	10.13	5.89
49.5411637988207	10.1975651806279	50.21	0.82	29.59
49.5401637988207	10.1975651806279	56.94	12.18	13.04
48.5123401509003	10.1975651806279	55.5	8.86	30.33
48.5123401509003	10.1965651806279	52.96	3.75	34.45
48.5123401509003	5.79100000000347	51.86	7.7	17.94
48.5123401509003	5.79000000000348	50.97	4.59	36.43
48	5.79000000000347	48	4	1.79
44.0898344368044	5.79000000000348	47.45	7.49	16.55
44.0888344368043	5.79000000000348	46.38	12.31	40.75
44.0878344368039	5.79000000000347	45.57	12.76	29.32
44.0878344368039	5.79100000000347	54.22	8.18	10.41
41.6858360542732	5.79100000000347	44.72	11.87	20.59
41.6848360542731	5.79100000000348	43.23	11.54	40.96
39.0803098351217	5.79100000000348	41.49	2.29	8.71
32.7032908805205	5.79100000000347	31.22	0.18	17.31
27.7237855541233	5.79100000000347	24.66	9.13	37.86
27.7227855541263	5.79100000000347	19.48	4.75	45.94
20.8700000000039	12.54	3.36	12.54	17.51
20.8700000000039	19.9033277045912	5.58	22.9	47.89

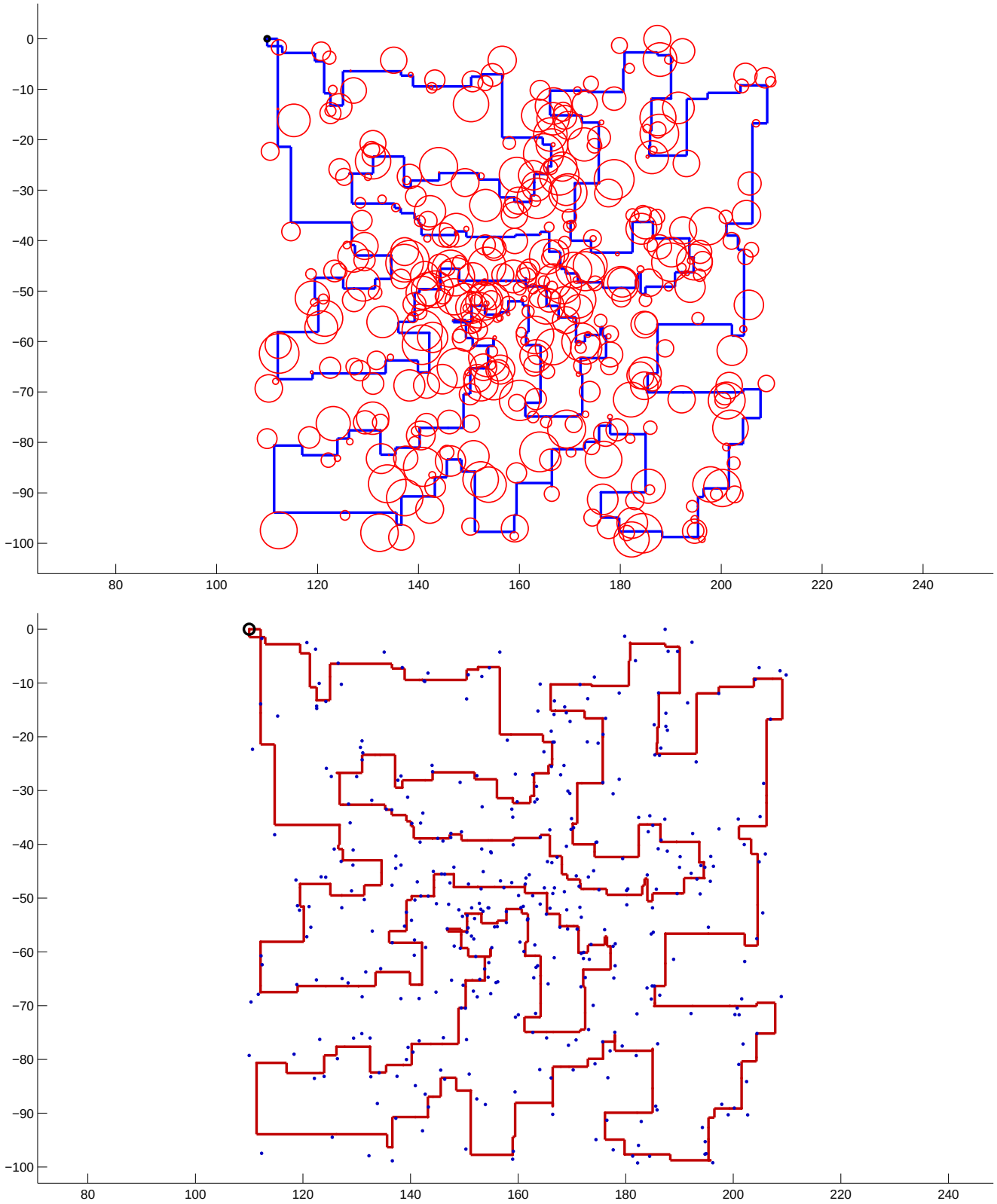


Figure N.156: *team*4_400, arbitrary radius, 2D, Manhattan, Length = 1231.65447143851

Table N-159: Solution for *team4_400*, arbitrary radius, 2D, Manhattan

Total distance: 1231.65447143851				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
2.11756021989824	14.0398795273413	2.125025	13.8908	0.1492663
2.11756021989824	15.5557824086245	5.2982	16.16745	3.2389206
2.11756021989824	21.4089408294796	0.610975	22.331075	1.7663891
4.72912500015134	36.3912829999999	4.729125	38.22055	1.829267
16.7988848531694	36.3912829999999	18.77905	36.01655	2.0153111
16.7988848531694	40.1164640811977	17.095675	43.177	3.0748926
16.5495742	40.8769500000862	15.806625	40.87695	0.7429492
17.4118971098807	42.9436775549666	19.322625	41.061025	2.6823985
17.4118971098807	42.9446775544561	19.292975	43.870425	2.0965358
24.6087161999965	42.9446775544561	27.2689	42.18555	2.7742388
24.6087161999965	45.2856054386911	28.231575	43.86655	3.8908642
24.6087161999711	47.1002265201827	27.251975	44.47235	3.7272714
24.6087161999018	47.5983000677953	26.549225	47.5983	1.9405088
21.4057714888729	49.5064779999924	21.4066	50.274675	1.3469706
17.2192749993792	49.5064779999995	17.219275	51.795125	2.288647
17.2182749993757	49.5064779999924	19.028925	48.6519	3.3340627
15.0839520420178	47.3691762527957	14.24105	46.110125	1.6004334
15.0829520420179	47.3691762527956	13.3837	46.032275	2.1621199
9.44820125415374	47.3691762527957	8.7059	46.626875	1.0497725
9.44820125415367	48.0582053457498	8.9679	51.422725	3.3986294
9.44820125415366	51.5806750132541	9.352575	52.2461	0.7596151
10.1519760998058	51.5806750132543	11.134375	51.580675	0.9823989
10.1519760999303	52.0932484655629	11.458875	55.406825	3.5619902
10.1519760999885	58.1219676123541	10.71515	57.182775	3.2469865
2.11444132834609	58.1219676123532	2.206275	60.72485	2.6045019
2.11444132834706	66.3000792663279	2.404275	62.37445	3.9363141
2.11444132834829	67.4819836723183	1.692025	67.9044	0.5973869
2.11444132834701	67.4809836723186	0.331025	69.303175	2.7183647
8.99489941744174	66.3384911606124	8.8531	66.09375	0.2828521
14.2568861945586	66.3384911606124	12.50315	65.202575	2.0894727
18.2070705891466	66.3384911606124	17.272875	64.973225	1.6542893
20.3132498893703	66.3384911606124	18.3822	65.772725	2.0122239
20.3142498893703	66.3384911606124	21.0091	68.35155	2.1296062
23.4932995966426	63.7533843000051	21.668825	63.73225	1.824597
24.4446499999383	63.7533843000729	24.44465	63.1281	0.6252843
29.894478647447	66.1078792999625	28.20205	68.6988	3.0947027
31.583524999505	66.1078792998087	31.583525	68.6781	2.5702207
32.1265918128129	66.1078792999626	34.7277	67.482525	2.9420086
32.1265918128129	58.2942068449763	32.800625	59.186225	2.9956219
32.1265918128129	58.2932068449764	30.688625	60.637275	3.9031621
26.7738409313864	58.2932068449767	30.732825	57.781	3.9919808
26.6553828378631	58.2932068449764	26.5978	58.30075	0.0580748
26.0086384000005	56.1225249249122	22.891175	56.122525	3.1174634
29.2321959633188	54.2189146271162	28.87265	55.2137	1.0577671
29.2321959633188	52.9536839739573	30.1798	54.1346	1.5141057
29.2321959633188	50.3559248708954	29.2116	52.625	2.2691686
30.2100075256302	49.6350200850294	31.24645	46.9846	2.8458636
30.2110075256301	49.6350200850294	30.804475	50.3614	3.2757758
34.3407167147843	49.6350200850304	31.916925	49.63125	3.3038515
34.3407167147843	49.63402008503	34.822	51.041775	1.4877525
34.3407167147843	48.0207816969935	36.34605	45.558575	3.6813731
34.3407167147843	48.0207816969935	33.276075	49.648225	3.6486347
34.3407167147842	46.6547379019642	34.241775	45.041325	2.3579528
34.3407167147849	45.5684071000019	35.77655	45.5234	1.4365385
38.0513999996594	45.5684071	38.0514	44.25295	1.3154571
38.0513999996602	47.946062399992	37.32375	47.164775	3.8061293
38.0513999996602	47.946062399992	40.7628	47.39015	2.9963842
42.5017797335703	47.9460623999992	43.5222	45.0811	3.7775081
42.5027797335703	47.9460623999921	43.10885	48.272275	0.6882847
45.648307199166	47.9460623999921	48.801425	47.111675	3.261649
47.3591500000001	47.9460623999919	47.35915	48.071	0.1249376
48.588767679731	47.9460623999978	46.718325	46.79505	2.1962207
51.2535592832458	47.5020358872422	51.332325	47.3944	2.0193416
51.2535592832457	47.5010358872422	52.0729	45.66175	2.0135272
51.2535592832458	47.5020358872418	51.464375	46.273425	1.9665818
51.2535592832458	49.0842974119951	50.075475	49.526025	1.2581756
51.8396219654341	49.0842974119951	52.703075	49.56845	0.9899267
55.3638981766147	49.0842974119952	56.4549	49.1402	1.0924331
55.3648981766147	49.0842974119952	54.870925	48.098925	1.102256
55.3648981766147	52.9394530734158	54.099275	51.121125	2.2154275
55.3658981766147	52.9394530734158	55.9361	51.897075	2.2731123
57.7669749993584	55.2232421999997	55.262125	52.9866	3.5612885
57.7679749993597	55.2232421999997	57.767975	55.4125	0.1892578
59.0369000246983	55.2232421999997	59.205025	55.76	2.6513752
59.0369000246984	55.2072214000164	59.0369	52.162425	3.0447964
60.3519701747364	55.2072214000163	61.491825	51.7088	3.6794322
61.2278424059939	56.0486142092685	61.751375	53.5726	2.857714
61.2288424059885	56.0486142092685	60.964225	55.767775	0.3858666
61.2288424059884	60.1103952	63.23165	61.378	3.0992482
61.2298424059883	60.1103952	62.1796	60.091575	3.7726122
61.2308424059891	60.1103951999761	61.732525	60.28975	0.5327791
62.1382250014625	60.1103951999496	62.138225	61.218175	1.1077798
62.9806083585414	58.7133431446307	63.564825	58.6141	0.5925861
66.0957249495401	57.1308745000005	66.095725	55.876775	1.2540995
66.5138912703723	58.9604000011843	68.048425	58.486425	1.6060654
67.1806812999664	58.960400001184	67.662425	58.9604	0.4817437
67.1806812999577	60.2558163921095	68.033375	62.578975	2.4747025
67.1806812999554	63.2994878118545	67.8084	64.88	1.7006027
62.1142611000578	63.2994878118545	62.481725	64.778425	1.7172899
62.1142611000578	66.4790750000529	61.692525	66.479075	0.4217361
62.455039499986	71.3351441744133	63.9561	69.944325	2.046353
62.4550394999859	74.4484500084369	63.106325	74.44845	0.6512855
61.554355154839	74.8900794999879	60.77085	76.3761	1.6799218
56.5292245050593	74.8900794999879	59.360575	77.3659	3.7611478
55.289875	74.8900794999879	55.289875	75.9977	1.1076205
51.5794656639232	74.8900795	52.726325	74.9715	1.1497459
51.1698468000068	72.1453999993225	49.5023	72.1454	1.6675468
54.0087344073514	72.1453999993225	50.03295	71.692275	4.0015227
54.1817979999961	69.538935192438	53.249925	71.4317	2.1097265
54.181798	65.9389000053386	55.5813	65.9389	1.399502
54.1817979999962	64.4375577529823	52.902425	64.80215	2.0317535
54.1817979999961	64.4365577529837	53.6353	62.58645	1.9291342
54.181797999964	60.7072583788108	53.3194	62.871025	3.2245451
53.1757604797088	60.7072583788109	56.708375	61.084725	3.5527238
51.3122130000302	60.7072583788107	53.1029	58.71345	3.7092457
51.3122129999999	60.7062583788356	51.0767	59.931625	0.8096439
51.3122129999999	58.1772003519518	50.342	58.1772	0.970213
51.8034483999973	53.8509999965428	51.8225	53.851	0.0190516
51.8034483999973	52.8654820271655	51.731775	54.063975	1.2006342
50.6840113636495	52.0243815	50.9611	51.5263	0.5699678
50.5203999994505	52.0243815	50.5204	51.7746	0.2497815
47.8252505852183	52.0243815000118	47.81055	52.508825	1.4515793
47.8252505852183	54.2044850305437	47.802925	54.5327	0.3289734
46.1191250005033	54.6706050999582	46.119125	55.3112	0.6405949
46.1191250005039	54.6696050999582	45.616825	55.349625	0.8547389
43.1750102197791	52.8950716000089	43.47965	52.4779	0.5165632
43.1740102197693	52.895071600009	44.413025	51.821425	1.9013123
43.1740102197693	52.895071600009	44.549375	51.8385	3.4753711
43.1740102197691	52.8940716000106	42.80595	50.969325	2.8313705
43.1740102197691	52.8940716000106	41.89655	53.797625	3.5360134
42.5834224965285	52.8940716000022	38.966475	52.166125	3.6894736
42.5834224965285	52.8940716000022	43.054225	52.07985	3.6716308
41.3638	52.8940716000022	41.3638	51.811825	1.0822466
40.2180353492056	52.8940716000022	39.658325	53.39295	0.8383044
40.2170353492081	52.8940716000106	37.074525	51.14655	3.5957201
40.2170353492081	52.8940716000106	40.529725	53.231175	3.1574837
40.5139672327796	54.315331443541	40.468775	56.35765	2.0428185
40.5139672327796	55.7075892714131	40.703325	55.537825	0.2543153
40.5139672328507	56.2552425844358	41.323875	57.06515	1.1453823
40.5139672327796	56.1874334378001	41.765825	57.606275	1.8921573
36.8719625709603	55.7327875695246	36.8297	55.690525	0.0597683
39.4113250326392	56.8092077918685	39.243575	59.34405	2.5403868
39.4113250326496	59.3038515394016	38.122975	58.912025	1.3466157
40.720382913344	60.8627557999874	43.7645	63.186425	3.8299193
42.1145250000007	60.8627557999876	42.114525	60.87195	0.0091942
44.865545025591	59.4638049807407	45.110025	59.219325	0.3457469
44.8655450255911	60.8974164506778	44.541975	62.0002	1.1492733
43.8137340275389	65.3145231028536	45.884675	65.715725	2.1094453
43.8127340275389	65.3145231028536	44.4217	64.703925	0.8623628
43.3675906004706	65.3145231028536	46.228875	65.56925	2.8726006
42.853164839895	65.3145231028536	44.898775	67.784675	3.8144474
41.461524623137	65.1098113397227	42.3891	68.379025	3.3982575
41.5196075784182	65.3145231028536	41.683175	67.299925	2.7312469
40.2553894685681	65.3145231028536	37.615325	65.262725	3.9137176
40.2553894685681	65.3145231028536	42.88515	65.09985	2.6385081
40.2553894685682	66.4582949085179	39.7753	66.19835	0.5459462
40.2553894685682	70.412679290436	40.205375	70.4585	2.1049867
39.2148923788847	70.4126792904348	39.430175	70.428325	0.2158504
38.9189279924529	77.1192089038004	40.4153	76.30845	1.7018987
35.8788292991762	77.1192089038004	36.110325	75.95995	2.3419359
33.7774414612297	77.1192089038004	31.60195	76.5275	2.2545249
30.2224834503886	77.1192089038004	29.5312	77.759375	0.9421706
30.2224834503886	81.0372558208289	30.46345	78.65395	2.8521408
28.6608886067302	81.0372558208298	29.23795	80.022375	1.1674686

Solution x	Solution y	Original x	Original y	Radius
28.6353535548022	81.0372558208 29	27.4824	83.15295	2.409453
25.4486619995721	82.4355620999989	22.609375	83.218325	2.9452111
24.1584000003143	82.4355620999988	24.1584	82.49565	0.0600879
22.4676749884613	77.6279674000233	22.467675	76.02705	1.6009174
22.466674988461	77.6279674000235	20.9401	75.2051	3.2102784
17.753826650946	77.6279674000234	19.41455	76.0326	2.3028676
16.2198905476687	77.6279674000233	13.11545	76.27845	3.3850773
16.2198905477777	79.2405067797648	16.4015	79.860725	0.6462605
13.9285499994255	82.5412503	13.92855	83.165725	0.6244747
13.1458311900558	82.5412502999985	12.1212	83.525275	1.4206244
6.94362918862851	80.6342196350472	8.347775	79.0334	2.1293776
1.37939439506508	80.6342196351324	0.00155	79.256375	1.9485664
1.37939439506505	93.9175644643081	2.307925	97.449675	3.6521191
16.222334422236	93.9175644643084	15.45105	94.471525	0.9496062
25.6386945230899	96.316974199989	22.27635	97.920025	3.7249339
26.6212000002831	96.316974199989	26.6212	98.85125	2.5342758
26.621200000283	90.7045973160516	23.831575	88.204275	3.750467
30.8851151939871	90.7045973160516	27.27955	90.9405	3.6132742
33.229646382458	90.7045973160519	32.22375	93.28635	2.7707895
33.2306463824586	90.7045973160516	33.324025	88.862275	2.0476207
33.2306463824572	86.9326063234431	32.733925	86.47665	0.6742613
34.1689405711341	86.9326063234462	30.896	84.86835	3.8695341
35.60905	83.3984699000108	35.60905	81.995775	1.4026949
38.4917149928664	85.7950498307502	36.3513	83.686975	3.004223
41.1845259196489	85.7950498307475	40.913925	82.729825	3.0771461
41.1845259196486	85.7960498307495	42.31835	87.347525	3.5183382
41.1845259196487	86.1761712012345	43.9034	88.387225	3.5077797
41.1845259196487	97.7314511001197	40.290225	96.689525	1.7024114
48.9904500016881	97.7314511001198	48.99045	98.5583	0.8268489
48.9904500016834	94.3919166614936	49.100125	97.070175	2.680503
49.4346999999784	88.0596997000229	49.4347	86.0537	2.0059997
56.4280749999865	88.7103565999678	56.428075	90.20545	1.4950934
56.4280749999865	81.3548803075767	56.13655	83.451075	2.1163693
57.9369935352388	81.3548803075766	54.01775	81.8894	3.9555254
59.485431788825	81.3548803075693	60.2356	81.956375	0.9615343
62.9533107902465	79.8867364787537	64.2971	80.8087	1.6296583
65.7903311996966	79.8867364787534	66.686275	83.4025	3.6281274
65.7903311996971	76.7025022433659	65.721375	76.70655	0.0690749
67.9701500018816	76.7025022433594	67.096325	78.407125	2.3790582
67.9701500018814	75.4213475998846	67.97015	74.943825	0.4775226
67.9701500018815	78.3807965999998	69.349625	77.516575	2.180516
71.9668499983675	78.3807965999809	71.96685	79.285825	0.9050284
74.9983616500024	78.035488349793	75.94035	77.0935	1.3321727
74.9983616500024	85.3717707173896	75.589675	88.707575	3.3878078
74.9983616500024	89.9028698964396	75.8385	89.39705	0.982971
72.139717229814	89.9028698964398	72.88955	91.55335	1.8128248
66.1510597000168	89.9028698964396	66.508125	91.303225	3.030605
66.1510597000202	94.91155	64.46975	94.91155	1.6813097
69.7867557101156	97.6498510469716	67.679475	96.828325	2.2617553
69.8254041897292	97.6498510469716	72.222075	99.2555	3.494791
69.8264041897292	97.6498510469716	71.306475	97.9771	1.5158171
69.8264041897292	97.6508510470042	72.374675	95.981125	3.0465832
78.2844020286542	98.7547967579973	74.44305	98.0205	3.9109049
85.7445467602457	98.7547967579974	86.192975	99.203225	0.6341733
85.3942106000061	98.7547967579975	84.9479	97.513325	1.6436369
85.3942106000039	95.3012260847616	84.730325	97.611875	2.4041303
85.3942106000044	94.8141183762858	84.77555	95.283075	0.7763126
85.3942106	92.664475	84.25115	92.664475	1.1430606
85.3942106000039	90.8121137833835	87.858275	88.334025	3.4946441
86.4943013536931	89.1144824168061	90.195175	89.03695	3.7016857
89.3047722156974	89.1144824168061	89.0595	90.291	1.201812
91.5429919392281	89.1144824168061	92.685275	90.310575	1.653919
91.5429919392281	83.4553452268862	92.480625	84.1266	1.2780059
91.5429919392281	80.354174497982	91.03755	80.9252	0.7625888
94.3054398748051	79.6253447474187	91.825175	77.123475	3.5229343
94.3054398748068	75.1738913683146	94.404	75.185075	0.0991926
97.7924322549167	69.4674929333383	98.93765	68.322275	1.6195826
94.3605522162037	70.0926515999965	91.08095	71.69145	3.6485541
90.3144749587437	70.0926515999997	90.314475	71.662575	1.5699234
89.3462001924773	70.0926515999965	91.5733	68.725	2.6135119
89.3462001924773	70.0926515999965	90.725625	70.444425	2.1020018
82.457011265545	70.0926515999965	82.150425	71.4598	2.6881218
75.2792620167115	70.0926515999965	72.106325	71.513625	3.4765924
75.4157958319891	69.5504576973378	74.758025	68.76505	2.7316723
75.4167958319891	69.5504576973377	76.3481	68.05155	1.7646676
75.416795831989	66.3406569415681	73.97555	66.71955	2.6718873
75.416795831989	66.3396569415628	74.919425	66.332825	3.2122786
75.416795831989	66.338656941565	75.320425	66.338125	0.0963723
77.3679056229964	62.1492432942179	78.897475	61.3791	1.7125137
77.3679056229964	56.607374100018	74.7548	56.66355	2.6437784

Solution x	Solution y	Original x	Original y	Radius
77.3689056229973	56.6073741000045	75.12385	56.355025	2.2591934
85.3769000005597	56.6073741000004	85.3769	55.416	1.1913741
92.1247750160484	58.845807699985	92.124775	61.791725	2.9459173
94.5240440999998	56.8591946739731	94.377175	57.5521	0.7082996
94.5240440999964	51.2502354414912	95.486225	52.746525	2.9208705
94.5240441	41.8090000460192	94.807975	43.25145	1.5111964
94.5240440999997	41.8080000460265	95.9689	41.808	1.4448559
93.3189593634767	38.9935178292578	92.049975	40.056175	1.6551621
91.0449395999999	37.143199191074	87.349525	37.1432	3.6954146
91.0449395999999	36.6321434894322	90.921925	35.308625	1.329223
96.1882534259378	32.2896692578955	94.997925	34.851	2.8244109
96.1882534259385	30.9147649530883	95.640625	28.68455	2.2964659
96.1882534259273	16.7649207084179	96.9141	16.74635	0.7260841
99.1079967142815	9.21930362770027	99.82775	8.49955	1.0178851
97.3201159582467	9.21930362770023	98.6909	7.723575	2.0288551
93.8303261870014	9.21930362770024	94.81355	7.137025	2.3027404
93.8303261868947	10.6998420950269	94.09005	9.358875	1.3658877
87.3024457080126	11.9104923948774	87.3023	11.937375	0.026883
83.1674177366202	23.148929422219	83.1155	24.690275	2.6366931
75.6366461082351	23.1489294222191	75.41995	23.365625	0.3064542
75.7707516932776	22.1479187713525	76.538875	22.08605	0.7706109
75.7707516932776	21.0665376520752	76.27055	23.463675	3.2776576
75.90228064195	21.0665376520752	77.750225	18.79385	3.8375488
75.90228064195	18.3372986535839	77.472675	18.057475	1.59513
75.9022806419501	18.3362986535839	75.3053	17.780525	0.815641
76.1642378937228	12.3061692892136	77.464	15.628175	3.5672263
76.1642378937227	11.8404317403578	76.1173	11.832075	0.047676
80.0425580806363	11.840431740326	81.52085	13.687775	3.1351213
80.0425580806278	3.2704121	82.33615	2.420325	2.4460605
79.6523000555921	3.2704121	79.6523	4.144625	0.8742129
79.65130005592	3.27041209999239	77.882675	4.11235	3.3455297
77.3467704759836	2.6809277517503	77.335225	0.00945	2.6715027
70.8428509999874	2.49929786769977	69.817575	1.306825	1.5726355
70.8428509999874	5.85574993791187	71.829525	5.85575	0.986674
70.5885741694667	10.5426921742461	68.784175	11.8632	2.318307
63.7163809293911	10.5426921742463	62.944875	12.9098	2.4896628
63.7163809293912	10.2688810160662	64.181275	8.885925	1.4590044
62.266482936955	10.2688810161349	61.5062	10.2838	0.7604293
56.0629469228773	10.2688810161262	54.0981	10.209075	1.9657569
56.0629469228768	15.1732174060464	56.7601	13.3255	3.6207209
56.9355869407035	15.1732174060464	53.686425	15.19815	3.2492576
56.9355869407035	15.1732174060464	56.680125	15.845675	3.207153
56.9365869407035	15.1732174060464	58.962525	15.549225	2.3682429
56.9375869407035	15.1732174060464	58.66755	14.455925	1.8727735
62.3731819528886	16.581399836573	59.666825	17.15215	2.7658857
65.7970235999672	16.581399836573	66.273425	16.5814	0.4764014
65.7210589842987	20.0123515396548	62.8697	20.929125	3.2881032
65.7210589842987	20.0123515396548	65.789175	19.559925	2.251298
65.7210589842987	20.0133515396548	64.881075	21.1972	1.4515751
65.7210589842987	28.6434794098778	65.757275	28.49595	0.1519096
65.7210589842987	28.6444794098778	68.792375	27.90175	3.9463741
65.7210589842987	28.6454794098778	67.6691	30.587025	2.7503569
61.8321015324985	28.6454794098778	59.25755	30.092125	2.9531507
60.9860343554538	28.6454794098778	59.6161	30.5374	3.7763801
60.9860343554535	36.1709215321766	59.92645	35.207	1.4324328
60.158457519486	36.1709215321763	59.82755	37.21565	1.095882
60.1574575193707	36.1709215321766	60.313175	36.907775	0.9152904
60.1574575193999	40.0134869622801	58.980725	40.369175	1.2293142
64.2054222603965	40.0134869623428	64.627025	39.598675	0.591454
64.2054222603962	41.3759915762694	64.48255	39.62755	1.7702677
64.2054222603964	42.3651819690539	63.06625	46.073225	3.8790845
69.6418848124974	42.3651819690538	69.4258	42.661825	0.367001
72.419975003703	40.1696725845794	74.186175	37.664625	3.0650817
72.4199750037035	36.3003880000576	72.419975	34.998125	1.302263
74.0101277704519	36.3003880000577	74.4851	34.7013	1.668137
76.4659271923529	36.3003880000575	75.0516	36.4713	3.1806421
76.4659271923529	36.3013880000575	77.267275	35.3236	1.527158
76.4659271923529	39.4963956754595	76.5757	39.19325	0.3224087
76.4659271923529	39.5584284118599	76.046775	40.829925	1.3388025
79.4542909892172	39.5584284118599	77.736325	41.257125	2.4159837
79.4552909892171	39.5584284118599	80.128375	42.2928	2.9296913
83.6847232543358	39.5584284118599	82.455325	37.974875	2.6754574
83.6847232543358	43.3536445693128	80.003925	44.278875	3.7953033
83.6847232543358	43.3536445693128	83.98185	43.958725	0.6740969
84.5230547957483	43.3536445693128	85.82305	42.253575	2.2900333
84.5230547957483	43.3546445693128	86.306375	44.08645	1.9276333
84.5230547957483	46.2799230000126	84.710775	44.260425	3.5456061
84.6684426340753	46.2799230000126	85.726975	46.8848	1.2191665
83.6873986339941	46.2799230000006	83.247325	46.458225	0.4748225
82.1659999858836	46.2799230000009	82.166	45.384	0.895923

Solution x	Solution y	Original x	Original y	Radius
80.8308411170378	49.1297284823713	83.835575	49.221375	3.0061312
80.3847927942627	49.1297284823713	79.556325	49.1563	0.8288938
74.9757502223975	50.5824412	74.97575	51.8098	1.2273588
74.0183749347971	46.3785165000016	74.018375	45.692475	0.6860415
73.838645347953	46.3785165000107	75.70595	48.354275	2.7185379
73.5065466430587	47.6882457718909	70.163125	48.595475	3.4643229
73.0739641158006	49.382114999987	70.38585	48.289775	2.9015796
70.2027500020923	49.382114999991	70.20275	51.264575	1.88246
66.460338351203	48.2788462964576	65.024675	48.473875	1.4488497
64.1044196223014	48.2788462964576	64.04505	44.910675	3.3686945
62.1356719257723	48.2788462964576	60.81405	45.86495	3.5607331
61.5839713664158	47.19494674651	61.33205	47.81805	0.6721027
61.5168914927835	46.5089926949015	58.59885	48.807625	3.714657
59.1472356397863	45.5833299434214	56.7604	48.090675	3.4617573
58.1162603967971	43.7465286220963	56.281125	43.406775	1.8663211
58.1162603967971	42.1899493489214	57.24125	42.40615	2.5354041
55.8945249999999	42.1899493489331	55.460475	43.213925	3.4716194
55.894525	38.2523614000328	55.894525	37.29925	0.9531114
54.1142925155859	38.8395174402213	54.125425	38.6935	0.1464412
49.1934702865892	39.2733015	49.0937	40.0849	2.5088011
45.1627540059946	39.2733015	45.015525	41.584025	2.3336041
44.8985499454478	39.2733015	44.89855	41.381	2.1076985
44.446019082152	39.2733015	43.242475	40.8624	1.9934273
40.5632331667074	39.2733015	37.4986	37.94785	3.3389816
39.4736499999572	38.1629563000151	39.47365	37.672175	0.4907813
37.2531288278493	38.8914196	37.4906	38.735475	0.2840973
34.1002935357055	38.8914195999977	35.05695	38.887125	2.3714259
34.1002935357055	38.8914195999977	36.0198	39.389875	1.9831699
31.7652	38.8914196	31.7652	39.5927	0.7012804
30.5947317593335	36.6502594904523	30.2641	36.115	1.0777196
30.067578424139	35.7035286154938	31.8731	36.0461	1.8377332
29.2153077584397	34.5609326389306	32.29465	34.1886	3.1017705
26.495388684785	33.5629508431308	26.51415	33.575825	0.0227537
25.2726628185069	32.6485654211189	25.49855	33.45475	0.8372327
22.7904953469081	32.6485654211189	22.793175	31.8095	0.8390697
17.4490854760565	32.6485654211189	18.476575	32.50015	1.0381531
16.8148037674936	26.714523	15.2685	27.387025	1.686213
16.3052730917966	26.7145230000001	14.358825	25.883825	2.1162985
19.9844999985094	26.7145229999999	19.9845	27.40155	0.687027
20.9892000035334	23.568455786397	20.686175	21.9667	1.6301674
20.9892000035334	23.3384609999998	20.9892	20.7572	2.581261
23.4001795456541	23.3384609999998	21.1268	22.989225	2.3000479
24.3720673807806	23.3384609999998	20.995625	24.282225	3.5058599
27.139067478125	29.4530770783625	28.216025	27.287675	2.41843
28.4714582000301	29.4530770783642	29.46595	31.229925	2.0362226
28.4714582000677	28.0812750018193	27.65685	28.081275	0.8146082
32.7133445913887	28.0812750018194	33.989075	25.3104	3.7659631
34.098725005296	26.6026952000319	34.098725	26.483975	0.1187202
41.9110710404431	27.9037178693352	39.217825	28.48755	2.7558001
42.348141615918	27.9037178693361	42.344525	27.231625	0.6721026
46.0549647296996	31.4245215949549	43.312375	33.022625	3.1742295
49.0146749992568	31.4245215949549	48.825175	33.4678	2.052047
49.0146749992568	32.3307015999936	49.014675	34.9475	2.6167984
52.2743918938538	30.9925358850962	49.821325	32.088775	2.6868713
52.940756905974	30.9925358850962	53.08505	32.116125	1.1328164
52.940756905974	28.4600824140562	53.51985	31.610925	3.9899375
52.940756905974	28.4590824140562	53.429725	29.230175	2.9604889
52.940756905974	26.7866492387672	49.48335	26.949275	3.4612295
55.6331908471811	26.7866492387672	52.727475	27.05645	2.9182147
55.6331908471811	26.7856492387672	56.18475	25.5187	1.3818024
55.6331908471811	25.2634167814968	58.5251	25.335175	2.8927993
56.3149870999904	25.2634167814968	57.8987	27.066925	3.9092312
56.3149870999975	24.1297833301908	54.7913	22.79115	3.9863921
56.3149870999975	24.1297833301908	56.46315	20.9863	3.1469731
56.314987099999	20.9848000023344	56.707375	20.9848	0.3923879
54.6289509400108	19.5829570665714	56.145325	18.970525	3.3151033
48.6877732085121	19.5829570665714	47.99765	20.639375	1.2618593
46.5920497573128	7.04339629999999	46.59205	4.24755	2.7958463
42.5559874168266	7.04339629999999	44.6523	7.1683	2.2507146
42.5559874168266	7.50771520577307	43.2503	8.7931	1.4609189
42.5559874168266	7.50871520577307	40.718225	8.45085	2.0651849
40.423700002595	9.43446709998646	40.4237	12.94705	3.5125829
32.1930164137447	9.43446709998463	32.5307	9.603625	0.3776832
32.1930164137429	9.43346709998375	33.240325	8.160175	1.9941137
31.6314728217212	9.43346709998516	32.636425	9.71905	1.0447423
28.9025691607718	7.29917991896785	28.471925	7.124375	0.46477
26.5321870811893	6.42043500000169	25.090375	4.2535	2.6027734
16.5338250000011	6.4204350000016	16.533825	6.314025	0.10641
15.0268476680963	8.84033853211842	17.13825	10.254625	2.541304
15.0268476680978	13.2199631999942	14.259	13.428825	2.5476741

Solution x	Solution y	Original x	Original y	Radius
12.5489499898646	13.2199631999994	12.5519	14.734025	2.0899186
12.5479499898644	13.2199631999982	12.54795	14.295525	1.0755618
12.5479499901797	10.7868539451238	13.011825	10.0758	0.8489863
11.2890636584719	4.46889237427959	12.34295	3.720825	1.2923936
9.47878907249333	2.79031286416269	10.7326	2.49095	1.8617797
2.99186070255706	1.46082596266701	2.34935	1.70725	1.5141472

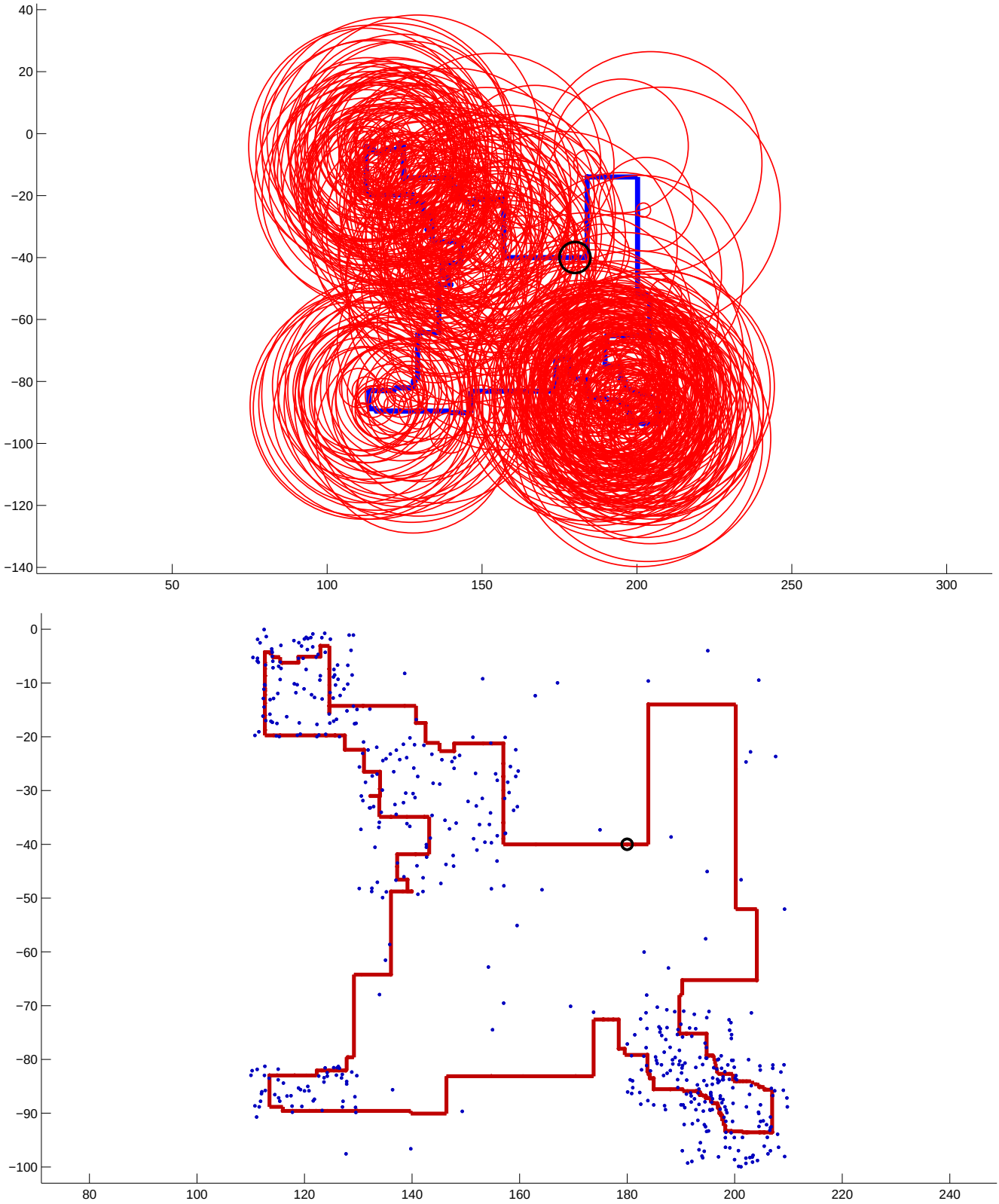


Figure N.157: *team*5_499, arbitrary radius, 2D, Manhattan, Length = 563.110301116539

Table N-160: Solution for *team*5_499, arbitrary radius, 2D, Manhattan

Total distance: 563.110301116539				
Depot: x 70 y 40				
Solution x	Solution y	Original x	Original y	Radius
53.025088251771	40	44.7486	39.7162	12.5268
46.9682	38.9567999993687	41.4412	38.9568	5.527
46.9682	35.977221248419	47.3754	37.9401	18.8601
46.9682000000067	35.976221248419	44.5785	34.1629	2.9998
46.9682000000067	35.975221248419	40.4113	32.0356	16.7439
46.9682000000067	31.484075869541	47.2249	31.4694	0.8229
46.9682000000067	29.9512582905066	49.5874	32.9921	32.9977
46.9682000000067	27.3798657911181	45.8434	28.1097	15.1991
46.9682000000067	27.3788657911181	49.2766	27.3707	19.0778
46.9682000000067	27.3778657911181	45.5527	26.8832	29.6166
46.9682000000067	24.9704930554979	49.2796	22.4102	3.4493
46.9682000000067	24.969493055498	57.0413	9.9678	25.5663
46.9682000000067	21.2394271780406	44.6412	21.1681	2.8359
46.9682000000067	21.2384271780405	49.7446	26.3767	17.8751
46.9682000000067	21.2374271780405	47.312	20.115	1.1739
44.8919635771841	21.2374271780405	43.5486	39.6053	27.6035
43.2285956348635	21.2374271780405	48.0614	30.3792	10.3406
37.8168999999936	21.2374271780405	52.9148	12.3625	18.1234
37.8168999999938	22.6748999999988	38.8284	23.4703	29.4494
37.8158999999936	22.6748999999983	37.9243	23.9119	11.4323
37.8148999999938	22.6749	37.8149	25.869	3.1941
35.1209104795526	21.9097599377971	33.6715	23.2449	5.013
35.1209104795526	21.1298354763053	35.5448	24.2684	19.4434
32.5010065807362	17.4323035924387	33.916	28.6484	11.305
32.5000065807363	17.4323035924387	32.1965	21.571	23.9954
32.4990065807363	17.4323035924387	29.6006	20.2054	12.7079
30.731578587043	17.4323035924387	30.1704	30.5441	13.1238
30.730578587043	17.4323035924387	30.3241	25.8121	12.6672
30.730578587043	14.2461000000016	28.392	21.3903	19.1959
28.6149000000048	14.2461000000017	28.6149	8.2266	6.0195
20.8725157691377	14.2461000000017	47.7847	28.4345	34.5556
20.8718405042546	14.2464247351186	20.4824	37.2243	26.8839
20.8708405042546	14.2464247351186	29.0396	36.1372	26.8002
20.8698405042546	14.2464247351186	23.8226	36.8408	22.7865
14.6622128232335	14.2464247351186	38.1953	36.049	32.0805
14.6274463690399	14.2464247351186	35.3466	47.2689	39.4146
14.6264463690399	14.2464247351186	41.9344	32.8635	35.1115
14.6254463690399	14.2464247351186	43.0635	31.4686	35.4855
14.6244463690399	14.2464247351186	19.5822	17.4941	10.5093
14.6234463690399	14.2464247351186	17.3372	11.1211	21.5037
14.6224463690399	14.2464247351186	32.6566	40.0511	38.6421
14.6214463690399	14.2464247351186	37.4163	24.6203	31.2894
14.6214463690399	15.5154922297036	19.0819	14.2893	6.4132
14.6204463690399	15.5154922297036	14.5843	15.7568	0.244
14.6204463690399	13.5870657421232	15.3264	12.7877	21.1927
14.6204463690399	12.2828596122479	35.1494	28.8106	32.8637
14.6204463690399	10.3881666946899	15.4595	7.4752	3.0314
14.6204463690399	7.38302625017596	43.1416	9.2079	35.1675
14.6204463690399	7.38202625017599	15.5961	8.5134	9.1422
14.6204463690399	7.38102625017598	12.8565	9.4609	9.659
14.6204463690399	7.38002625017599	11.3126	12.1774	11.447
14.6204463690399	7.37902625017598	41.315	20.08	34.9881
14.6204463690399	3.10499669030594	14.8098	1.8409	1.2782
12.9661667829765	3.10499669030594	11.5459	0.8736	30.4629
12.9651667829765	3.10499669030594	17.8934	15.1905	13.0517
12.9641667829765	3.10499669030594	19.7672	14.9362	14.1421
12.9641667829765	5.10393990053256	12.5256	4.7007	23.5883
12.9641667829765	5.10493990053248	8.0267	2.1019	25.3395
8.85909642633018	5.10493990053248	9.4253	3.1222	2.062
8.85909642633017	6.23499999999985	8.8668	5.4121	1.245
8.85809642633032	6.23499999999982	10.2894	7.4847	1.9001
8.40090000089349	6.23499999999982	8.4009	11.7989	5.5639
5.84240938029005	6.23499999999983	4.1027	5.9391	6.8207
5.84140938029005	6.23499999999988	5.4981	6.1028	36.5373
5.84040938029005	6.23499999999989	8.098	10.1576	7.8091
5.83940938029005	6.23499999999988	5.4781	9.3534	25.1036
5.83840938029005	6.23499999999988	5.2006	6.8919	22.5304
5.83740938029005	6.2349999999999	4.1301	7.1548	37.1524
5.83640938029005	6.2349999999999	15.7685	10.3669	18.5804
5.47046317984156	5.18726499960273	4.0211	5.0495	26.717
5.10545989513648	5.18726499960274	3.9756	4.3104	39.2995
4.74107563187356	5.18726499960273	3.8933	3.6617	1.7453
4.48100636984076	5.18726499960273	2.4773	0.052	34.0937
4.12818835827582	5.18726499960273	18.047	6.7045	18.9999
4.12818835827582	4.82829501392273	22.2385	33.2025	37.3358
3.69591337231546	4.27282470739747	28.8128	30.4765	39.1387
3.33299052248019	4.27282470739747	15.3812	8.8682	15.4856
2.96443541921101	4.27282470739747	2.8757	1.3778	25.9254
2.89016466395078	4.27282470739747	2.7247	6.6491	8.9474
2.63010000002595	4.27282470739747	1.2646	1.8964	2.7408
2.63010000002595	4.27382470739747	1.729	2.5191	7.1357
2.63010000002595	4.27482470739747	1.2522	5.4022	7.2247
2.63010000002595	4.27582470739747	1.2192	5.9144	28.8322
2.63010000002595	4.43712043746893	18.6523	3.9117	19.4015
2.63010000002595	4.43812043746893	18.2952	1.0836	19.3439
2.63010000002595	6.2132440143496	9.7281	5.4172	13.7083
2.63010000002595	6.2142440143496	12.1595	5.1953	17.8764
2.63010000002595	6.21524401434965	9.9074	11.0867	12.9373
2.63010000002595	6.21624401434964	12.9432	8.6486	15.3773
2.63010000002595	6.21724401434965	3.9473	4.1638	2.4396
2.63010000002595	6.21824401434964	18.8587	8.5087	16.8623
2.63010000002595	6.39815006978669	1.4037	6.1535	1.4597
2.63010000002595	6.58101111504418	0.4211	5.2548	12.1971
2.63010000002595	6.62037016839275	5.6246	7.277	11.7089
2.63010000002595	6.62137016839275	30.7692	16.7931	37.8932
2.63010000002595	7.35173295036401	21.333	28.4534	38.4741
2.63010000002595	7.35273295036401	19.3111	17.5672	32.0992
2.63010000002595	7.35373295036401	20.821	23.0825	38.9893
2.63010000002595	7.35473295036401	12.3192	17.7013	29.1964
2.63010000002595	8.63980209457326	12.6858	19.6571	29.725
2.63010000002595	8.64080209457326	12.295	19.9912	28.6871
2.63010000002595	8.64180209457326	9.2095	19.5087	29.1422
2.63010000002595	8.64280209457326	8.65	19.7295	27.9816
2.63010000002595	8.64380209457326	4.753	19.8404	29.0972
2.63010000002595	8.64480209457326	5.3173	19.9696	36.3373
2.63010000002595	8.64580209457326	3.6086	13.0876	29.6311
2.63010000002595	8.64680209457326	4.024	17.3232	37.3677
2.63010000002595	8.64780209457326	6.693	16.2603	35.4947
2.63010000002595	8.64880209457326	11.8636	12.6991	36.7112
2.63010000002595	8.64980209457326	8.6382	10.3371	27.1817
2.63010000002595	8.65080209457326	15.9493	16.7531	36.5644
2.63010000002595	11.0741139203447	13.2666	12.9678	29.5528
2.63010000002595	11.0751139203447	2.6723	10.4123	24.6134
2.63010000002595	11.0761139203447	2.5621	10.2967	12.6169
2.63010000002595	11.0771139203447	14.7479	11.7757	30.4615
2.63010000002595	11.2653128457694	18.0288	10.2093	31.7011
2.63010000002595	11.4538607720932	16.2452	9.322	31.0488
2.63010000002595	11.4548607720932	16.1355	6.6685	36.4875
2.63010000002595	11.4558607720932	2.4532	11.1564	29.4831
2.63010000002595	11.4568607720932	13.8628	4.3052	36.3913
2.63010000002595	11.4578607720932	11.169	1.5527	37.2188
2.63010000002595	12.2142401136583	5.0355	11.9367	6.6489
2.63010000002595	12.2152401136583	4.243	12.8676	6.736
2.63010000002595	12.2162401136583	2.3396	12.8751	24.3453
2.63010000002595	12.2172401136583	19.0824	1.094	39.3681
2.63010000002593	12.2182401136583	9.9632	1.8111	39.4027
2.63010000002593	12.2192401136583	11.5168	3.287	27.8697
2.63010000002595	12.2202401136583	8.9599	2.5066	22.9145
2.63010000002595	13.7406181145736	10.6256	1.7583	24.4015
2.63010000002595	13.7416181145736	10.526	3.779	20.82
2.63010000002595	13.7426181145736	13.2084	1.5682	22.8241
2.63010000002595	13.7436181145736	13.7484	0.7577	20.4003
2.63010000002595	13.7446181145736	10.31	1.5005	14.7461
2.63010000002585	14.2354787674476	5.6082	3.0104	11.8319
2.63010000002591	16.0074385262154	22.0871	33.226	33.6947
2.63010000002583	16.0084385262154	25.1657	24.0751	31.1219
2.63010000002583	16.0094385262154	2.4914	14.471	5.3662
2.63010000002578	16.0104385262154	3.5607	15.7968	5.1124
2.63010000002578	16.0114385262154	2.2625	16.1551	18.392
2.63010000002578	18.7315130269607	21.8127	22.4456	26.3083
2.63010000002578	18.7325130269607	25.9644	23.203	29.8543
2.63010000002578	18.7335130269607	24.4655	29.9184	29.8304
2.63009999999933	18.7345130269607	29.0027	23.8765	31.6897
2.63009999999933	18.7355130269607	30.4469	21.4825	31.6307
2.63010000002578	18.7365130269607	1.5116	19.0597	16.8413
2.63009999999933	19.7396984418597	0.7828	19.7397	1.8473
4.28095010440082	19.7396984418597	3.7626	17.1174	21.877
5.44221687096714	19.7396984418596	2.785	16.9995	3.817
5.44321687096713	19.7396984418597	4.8686	17.5054	8.1304
11.8841458521219	19.7396984418597	9.0075	17.4052	24.0927
14.0328153593052	19.7396984418597	22.1476	14.8515	12.414
14.0338153593052	19.7396984418596	27.0476	34.4285	22.5144
14.0348153593052	19.7396984418597	42.5333	36.3249	34.2929
14.0358153593053	19.7396984418597	13.9396	19.5452	16.1224

Solution x	Solution y	Original x	Original y	Radius
14.0368153593053	19.7396984418596	48.2875	25.5427	34.7388
15.6779205252596	19.7396984418596	14.7151	17.4542	14.2143
15.6789205252596	19.7396984418596	15.42	17.0914	16.8786
15.6799205252596	19.7396984418597	16.5052	19.9903	2.3082
15.6809205252596	19.7396984418596	16.6256	12.3206	7.479
17.485436538802	19.7396984418597	27.0169	46.6583	30.8141
17.485436538802	22.404331456552	25.2216	48.8368	29.4028
17.485436538802	22.405331456552	20.8616	31.8567	16.439
21.0572267242121	22.405331456552	20.9805	20.9752	15.7265
21.0582267242121	22.405331456552	27.0718	22.4926	16.8129
21.0582267242121	26.5067044151268	23.4201	21.9457	16.8924
21.0592267242121	26.5067044151268	24.5672	24.4137	9.9276
24.048406873179	26.5067044151269	24.5323	49.8988	23.3971
24.049406873179	26.5067044151269	26.5855	26.5008	2.5361
24.049406873179	29.7000709657924	20.1974	25.6106	21.4356
24.049406873179	29.7010709657924	28.4876	46.0461	21.3519
24.049406873179	29.7020709657924	22.5985	27.2784	18.0514
24.049406873179	29.703070965792	30.9136	43.9894	22.4068
24.048406873179	29.7030709657916	23.4789	26.9268	12.6384
24.047406873179	29.7030709657919	37.7223	44.0563	29.1657
24.047406873179	29.7040709657924	29.5705	36.67	21.5656
24.047406873179	29.7050709657939	42.0622	41.0674	34.7982
24.047406873179	29.7060709657939	48.8851	33.6728	37.4425
24.047406873179	29.7070709657939	36.302	43.7274	22.8064
24.047406873179	29.7080709657939	37.6461	42.0792	22.0605
24.0474068731791	31.0115000296414	27.7157	24.2487	7.9151
24.0464068731791	31.0115000296414	41.7938	26.8087	25.8964
24.045406873179	31.0115000296414	31.0534	27.3935	17.9341
23.9129619242267	31.0115000296415	44.3864	36.3116	25.6737
23.9119619242267	31.0115000296415	44.7377	48.2657	29.7234
22.2568000000059	31.0115000296415	22.8416	32.9746	3.8923
22.2558000000058	31.0115000296414	20.5677	31.0115	1.6881
23.9129619242267	34.891246663682	47.2998	37.9687	27.2808
26.0659937023016	34.8912466636819	24.2607	34.0424	1.9949
26.0669937023015	34.891246663682	23.8984	35.8981	7.2024
26.0679937023016	34.8912466636819	26.8183	32.6012	9.1398
29.0334094989408	34.8912466636819	28.4031	32.2444	13.356
32.3096060934388	34.891246663682	30.555	31.3009	18.8032
32.3096060934388	34.8922466636819	33.7228	34.609	1.4413
32.7850473340401	34.8922466636819	36.1356	35.5262	3.41
33.1715999331926	41.8473749798698	54.1532	48.4548	21.9974
32.7850473340401	41.8473749798697	32.6554	40.5505	13.7264
30.6609494145551	41.8473749798698	32.7117	42.3778	10.9453
30.6599494145551	41.8473749798694	22.5313	48.1754	10.3014
27.2226999021127	41.8473749798698	23.1185	40.5549	4.3029
27.2226999021127	44.1532014236734	20.1897	48.2132	9.8947
27.2226999021127	44.1542014236734	23.5397	47.0618	4.6924
27.2226999021127	46.550099058817	33.3877	38.8388	13.1359
29.1407019395003	46.5500990588171	36.9556	37.1182	17.3813
29.1407019395002	46.551099058817	27.2789	43.4795	3.5918
29.1407019395002	48.7582	47.084	47.7144	24.8395
29.1407019395002	48.7592	32.0569	46.2162	8.3019
29.9276000000003	48.7592	45.8348	38.3992	22.4696
29.9286000000002	48.7592000000001	45.8095	43.1051	19.6777
29.9296	48.7592000000001	64.954	37.309	38.0588
29.9296	48.7602	32.0319	48.7602	2.1023
28.2587704091478	48.7614715598726	31.0932	49.2942	14.8063
26.0647893386386	48.7614715598726	25.8602	58.6207	28.7536
26.0647893386356	64.2413633600873	22.4944	48.7727	18.9786
26.0637893386356	64.2413633600873	25.0595	61.5431	18.8768
26.0627893386356	64.2413633600873	23.9463	67.9458	30.7026
20.5978020811072	64.2413633600873	1.8225	87.776	36.7171
19.1792940307466	79.5952062539961	2.0599	86.005	20.2991
18.1134116027275	79.5952062539961	1.983	86.3665	17.6822
18.1134116027275	79.5962062539961	0.029	82.9455	21.0457
17.9692849012287	79.5962062539961	1.1933	81.8445	20.336
17.8264466692007	82.0576112244982	2.696	85.7661	16.7328
17.6889933336623	82.0576112244982	3.3964	83.4982	22.6969
17.6879933336623	82.0576112244982	13.617	84.1913	7.3733
17.3109683271627	82.0576112244982	18.7876	82.3448	1.5043
16.3836507100444	82.0576112244982	17.8246	84.0918	15.5287
15.4607569802125	82.0576112244982	19.7188	83.0222	29.297
14.5862362465541	82.0576112244982	16.887	83.4344	34.5743
14.5852362465541	82.0576112244982	17.0206	82.7787	29.1615
13.8925870972056	82.0576112244982	14.2245	83.0966	3.3966
13.1974844508473	82.0576112244982	16.4864	81.6235	21.8233
12.2795672437235	82.0576112244982	13.8296	81.5783	24.0124
12.2795672437235	82.9763669345549	16.072	81.5553	6.7432
11.318740591267	82.9763669345549	10.6041	85.0219	25.6845
10.357302233813	82.9763669345549	16.2773	81.3093	7.8184

Solution x	Solution y	Original x	Original y	Radius
8.1563996237303	82.9763669345549	9.2565	85.6186	2.8621
8.1553996237303	82.9763669345549	4.4842	86.5445	5.1195
8.1543996237303	82.9763669345549	9.9966	85.8576	5.4423
8.15339962373031	82.9763669345549	6.7503	86.812	32.5272
4.90119057305456	82.9763669345549	5.1015	81.8103	31.1473
4.90119057305456	82.9773669345549	10.8331	85.8288	11.4013
4.90119057305456	82.978366934555	15.9151	82.9337	11.014
3.48180000000551	82.9783669345549	5.091	83.7862	25.4049
3.48180000000551	82.9793669345549	0.2473	82.0871	6.3206
3.48180000000551	82.9803669345549	2.5389	82.9669	4.4555
3.48180000000551	82.9813669345549	0.7751	88.6342	34.6112
3.48180000000551	82.9823669345549	1.0919	90.7016	28.434
3.48180000000551	88.8122000122633	1.5647	88.8122	1.9171
5.96145549701524	89.5769584673896	9.522	88.7288	27.8783
5.96145549701524	89.5779584673897	14.2132	82.4414	14.4019
5.96245549701523	89.5779584673897	7.7403	89.8119	8.6997
5.96345549701523	89.5779584673897	7.6764	88.6806	9.6476
5.96445549701524	89.5779584673897	5.387	87.7604	6.3922
7.79382745693182	89.5779584673897	13.6279	83.3943	17.0874
7.79482745693183	89.5779584673897	8.8756	85.3213	16.0341
7.79582745693183	89.5779584673897	11.8372	87.4011	35.7247
8.45289229361033	89.5779584673897	13.2856	89.4879	21.8166
9.11259500294868	89.5779584673897	17.1642	87.7833	37.7116
10.8856780539357	89.5779584673897	7.4797	86.7529	25.8983
10.8866780539358	89.5779584673896	12.6448	83.0865	35.3802
12.1439944240062	89.5779584673896	15.4215	81.5375	38.9838
12.1449944240062	89.5779584673896	5.1953	87.1361	37.283
12.892704781318	89.5779584673896	6.0677	84.3942	37.1993
13.5724688134312	89.5779584673896	2.625	81.2761	30.3022
14.258518314696	89.5779584673896	11.6247	87.7046	3.2321
19.8311457591009	89.5779584673896	17.0519	88.8308	13.9972
19.8321457591009	89.5779584673896	19.3715	86.9483	2.6697
19.8331457591009	89.5779584673896	19.4915	88.9148	6.4477
19.8341457591009	89.5779584673896	26.3736	85.6358	33.6814
19.8351457591009	89.5779584673896	17.7167	97.5636	31.3797
19.8361457591009	89.5779584673896	19.5543	89.8549	33.619
29.7504999256674	90.0653999999999	29.7505	96.621	6.5556
36.3780186456583	83.1274068277853	17.8311	84.5721	18.6031
44.7425591563619	83.1274068277853	47.0351	69.5204	24.0774
44.7435591562215	83.1274068277853	39.3354	89.658	8.4792
44.7445591562216	83.1274068277853	44.9743	74.4953	27.6089
44.7455591563619	83.1274068277853	49.5234	55.0957	33.4236
50.6334192748305	83.1274068277853	44.1821	62.8241	34.6478
60.4287880200678	83.1274068277853	59.4827	70.1321	13.0297
60.4287880200678	83.126406827823	71.008	83.9726	10.613
63.7544000000002	72.5699000000051	63.7544	71.2264	1.3435
65.5699633050492	72.5699000000052	76.8895	78.6378	24.9962
65.5699633050493	72.5709000000052	78.4301	80.0876	24.8331
65.5699633050493	72.5719000000052	79.7775	80.296	29.6152
65.5699633050492	72.5729000000052	76.3867	80.9989	33.1367
65.5699633050493	72.5739000000052	73.5126	71.3248	18.5601
66.4834253343041	72.5739000000052	73.1545	60.0435	34.4744
67.418088766642	72.5739000000052	75.6074	70.2776	26.094
67.418088766642	72.5749000000052	75.9291	73.9471	36.4707
68.4387815798252	72.5749000000052	75.2812	79.5319	38.4796
68.4387815798252	78.0000441089835	73.6161	81.1388	38.2238
68.4387815798252	78.0010441089835	72.5026	72.4828	37.2859
68.4387815798252	78.0020441089836	70.0314	77.1275	35.8588
69.5494768679331	78.0020441089835	70.8021	79.2974	26.617
69.5494768679331	79.1588969958749	73.1002	79.4037	12.7865
73.7651760826596	79.1588969958749	78.9268	79.6337	28.7763
73.7651760826596	79.1598969958749	78.4966	80.8407	27.0644
73.7651760826596	79.1608969958749	80.2014	81.5949	32.3848
73.7651760826596	82.2651621883495	80.7551	80.6861	19.901
73.7651760826596	82.2661621883495	76.7822	82.9894	3.1025
73.9943239318872	82.2661621883495	82.0065	75.6791	28.4662
73.9943239318872	82.7774904400204	79.3483	75.3688	27.2443
73.9953239318872	82.7774904400204	77.9819	77.7483	19.944
74.2141930752746	82.7774904400204	77.1908	76.3248	8.3165
74.2151930752746	82.7774904400204	74.9451	88.4605	8.2599
74.2151930752746	83.4992580263993	75.5773	80.7384	16.9072
74.2151930752745	83.5002580263993	76.4126	75.548	18.6216
74.2161930752746	83.5002580263994	71.4242	75.4202	25.4968
74.4649185885382	83.5002580263994	71.0504	85.2637	27.4246
74.4649185885382	83.5012580263993	80.1131	82.5047	19.9521
74.9318613029077	83.5012580263993	77.4302	82.5606	33.5083
74.9318613029077	83.5022580263994	70.5598	83.7819	31.7327
74.9318613029077	85.5307310498865	72.6803	81.9225	4.2531
74.9318613029076	85.5317310498865	70.0787	86.0551	4.8813
74.9318613029076	85.5327310498865	70.8501	86.3243	34.4665

Solution x	Solution y	Original x	Original y	Radius
74.9318613029332	85.5337310498865	79.6279	80.9538	23.4026
74.9318613029332	85.5347310498865	72.5273	88.3137	14.2003
78.0362431335811	85.5347310498865	73.8575	87.669	25.5244
78.0362431335811	85.5357310498865	74.3211	82.1244	8.5161
78.0362431335811	85.5367310498865	79.3747	83.7664	2.2827
80.2856460931709	85.5367310498865	83.3441	85.5151	31.408
80.2856460931708	85.899388231749	79.4655	74.4467	12.4177
81.2071276827691	85.899388231749	76.9521	88.589	36.7425
82.8485308474197	85.899388231749	78.0272	82.0721	8.7342
82.8495308474197	85.899388231749	83.1803	86.2205	0.461
82.8495308474197	86.0849096815553	84.2824	83.9445	9.6857
83.53115780795	86.0849096815553	85.6153	86.7737	37.7006
83.53115780795	86.0859096815553	84.7929	84.8117	17.1593
83.53115780795	86.5879001092296	84.1657	89.6201	13.6552
83.53115780795	86.5889001092295	80.5965	92.0964	36.4049
83.53115780795	86.5899001092295	87.8356	87.4643	27.6715
83.53115780795	86.5909001092295	79.7296	78.3022	15.676
83.53115780795	86.5919001092295	88.3919	89.421	7.2563
83.7213627153762	86.5919001092295	87.3294	86.7915	10.1629
83.9128839388396	86.5919001092295	86.7862	83.711	21.1375
83.9128839388396	86.7385964384326	82.1226	91.9552	29.2899
84.6074818604634	86.7385964384326	84.3608	92.148	27.0972
84.6084818604635	86.7385964384326	83.3686	96.8014	13.9298
84.6084818604635	87.1867682897748	83.1514	91.319	39.4372
84.6084818604635	87.1877682897748	81.9044	86.793	18.7468
84.6084818604635	87.1887682897748	81.7913	86.2239	19.3521
84.8081557036309	87.1887682897748	81.0772	83.8409	24.7807
85.0092868601556	87.1887682897748	79.415	85.235	23.8334
85.0092868601555	87.1897682897748	82.5335	87.3296	23.2737
85.2123972118321	87.1897682897748	84.5964	57.5663	31.6899
85.2123972118321	87.5726798126005	81.9035	87.9149	16.8426
85.6202322150457	87.5726798126005	82.7904	89.3622	32.2308
85.6212322150457	87.5726798126005	77.364	70.7565	18.9213
85.6212322150457	88.1315785227227	85.7193	87.9646	30.5682
86.0815694829137	88.1315785227226	85.8291	89.3215	27.9965
86.0815694829137	88.1325785227226	72.3356	86.155	38.7669
86.0815694829137	88.1335785227226	83.3685	88.3604	8.2767
86.3415110685391	88.1335785227226	80.2922	75.8098	14.5911
86.7778399312353	88.1335785227226	77.1151	89.3423	37.2077
86.7778399311957	88.4934715363292	87.6085	88.0524	0.9405
86.7788399311958	88.4934715363292	87.7484	83.7546	5.1562
86.887612955356	88.4934715363292	86.0867	81.533	7.8826
86.887612955356	89.0322643007419	88.5666	89.9178	22.668
86.888612955356	89.0322643007419	89.6546	85.279	10.469
87.1430172334941	89.0322643007419	81.0134	86.425	31.9429
87.1430172334941	89.9888672988613	80.026	88.4312	31.2606
87.1430172334941	89.9898672988613	88.176	88.8141	24.7619
87.1440172334941	89.9898672988612	87.2864	89.2526	24.3141
87.4117097144676	89.9898672988613	89.697	88.1654	35.3374
87.4117097144676	90.3896384020585	80.4141	88.4668	26.3631
87.4127097144676	90.3896384020585	88.7272	81.0174	30.12
87.6733191647302	90.3896384020585	92.1839	88.8237	30.3052
87.6733191647302	91.4389344864244	85.8774	87.324	11.0712
87.9477489003012	91.4389344864244	93.255	98.1789	39.9406
87.9487489003012	91.4389344864244	88.0059	90.774	31.4291
87.9487489003012	91.4399344864244	80.252	96.9762	27.7656
87.9497489003012	91.4399344864244	90.7381	99.8897	39.8736
87.9507489003012	91.4399344864244	90.6972	96.9626	12.1171
87.9507489003012	92.3349007876027	85.5265	86.4226	27.3567
88.2464165728231	92.3349007876027	86.994	98.105	12.5626
88.2474165728231	92.3349007876026	84.0572	98.2927	11.5023
88.2474165728231	93.2975177409783	84.5701	92.5098	11.4862
88.2474165728231	93.2985177409783	83.6163	95.496	6.5288
88.2474165728231	93.2995177409783	88.3602	93.5594	0.2833
88.2474165728231	93.3005177409783	80.3025	81.1115	15.7523
88.5115849584313	93.3005177409783	88.2817	96.351	29.8948
89.4034873164196	93.3005177409783	89.983	98.6224	7.2459
89.4034873164196	93.3697158985399	83.9295	97.9734	22.5699
89.4034873164196	93.3707158985399	85.1326	93.3031	30.9423
89.4034873164196	93.3717158985399	89.3359	93.6392	11.0562
90.7408920146108	93.3717158985399	84.785	93.3953	25.851
91.0295742046315	93.3717158985399	89.0976	96.4455	23.7594
91.3233246587175	93.3717158985399	91.162	99.965	25.8943
91.3233246587175	93.5484999999891	92.093	98.3621	32.0505
91.6299303672118	93.5484999999892	94.2258	98.7848	33.585
91.9499535328076	93.5484999999892	96.1791	97.5552	14.7422
92.2647586458905	93.5484999999892	96.0605	94.495	12.9494
92.2647586458905	93.5494999999891	91.4519	94.5103	21.3367
92.2647586458905	93.550499999989	84.3334	97.0716	13.2701
92.2647586458905	93.5514999999913	80.7173	88.9602	17.7309

Solution x	Solution y	Original x	Original y	Radius
92.6113858602126	93.5514999999913	81.2522	99.2612	19.7395
94.6564912304609	93.5514999999913	92.8113	98.2407	11.443
94.657491230461	93.5514999999913	93.4254	97.8126	10.7468
94.657491230461	93.5524999999913	96.8293	85.3988	25.2212
94.6574912304609	93.553499999991	85.4655	89.4614	13.9477
95.0570692974579	93.5534999999906	85.3838	89.3565	14.2439
95.4796000015083	93.5534999999906	95.4796	96.129	2.5755
95.4796000015083	93.5524999999909	83.0689	84.7397	17.7189
95.4796000015083	93.5514999999914	85.8335	84.6274	15.0275
95.4796000015083	93.5504999999915	92.0809	99.3222	13.6093
95.4796000015085	93.5494999999915	98.1513	96.345	8.7509
95.4796000015082	93.5484999999914	93.3103	99.0843	24.3725
95.4796000015073	93.5474999999915	96.6476	96.9796	23.7398
96.6246241785617	93.5474999999916	99.292	98.0492	20.4892
96.6246241785618	93.5464999999914	97.9735	93.9042	16.4454
96.6246241785618	93.5454999999892	88.2673	94.5543	14.161
96.6246241785617	93.5444999999892	99.7949	88.8243	10.9809
96.6246241785617	93.5434999999891	89.931	94.5372	17.4038
96.6246241785616	93.5424999999891	93.0738	84.8753	27.0049
96.6246241785618	93.5414999999884	89.5983	91.5249	17.2739
96.6246241785618	93.5404999999885	96.671	90.7145	32.754
96.6246241785618	93.5394999999884	84.4799	87.8799	17.7516
96.6246241785617	93.5384999999885	95.9324	92.1458	31.1565
96.6246241785617	93.5374999999885	96.5452	93.172	16.1374
96.6246241785617	93.5364999999885	95.3031	91.4204	25.4609
96.6246241785618	93.5354999999884	82.0258	98.9707	16.4132
96.6246241785616	93.5344999999886	94.509	92.4532	10.0411
96.6246241785617	93.5334999999885	94.8083	91.5304	29.5468
96.9562999999995	93.5334999999886	96.6676	92.6743	10.3882
96.9562999999995	93.5324999999886	96.809	92.5136	11.7087
96.9562999999995	93.5314999999885	94.4375	89.8165	6.7853
96.9562999999995	93.5304999999886	88.3323	91.5035	13.825
96.9562999999995	93.5294999999885	99.0472	85.7396	19.7408
96.9562999999995	93.5284999999886	94.7976	88.4491	36.0251
96.9562999999995	86.7219	97.0785	86.7219	0.1222
96.9562999999995	86.7209000000001	94.4683	90.0421	36.408
96.9562999999995	85.6308751344641	92.7639	86.5161	5.447
96.029208719639	85.6308751344641	99.7041	87.1751	20.8453
95.5309743436012	85.6308751344641	97.4362	85.8361	6.7092
95.5309743436012	85.1323551966387	90.256	83.0105	8.936
95.0478062872402	85.1323551966387	89.9071	81.4441	15.7904
94.57589847519	85.1323551966387	90.3741	83.7882	6.0655
94.57589847519	85.1313551966387	90.1019	83.486	37.2389
94.57589847519	84.6841293080598	94.7529	81.9671	38.2984
94.2066611987766	84.6090950141124	98.6006	82.3388	4.9458
93.6064745897533	84.3145481036026	99.1691	80.9928	24.2662
93.0159887522589	84.0561784010118	97.0965	81.0307	20.0164
92.1968849314994	84.0561784010118	94.6937	81.204	23.1601
91.5283754464134	84.0561784010117	92.5909	80.0433	19.5797
90.9189107300568	84.0561784010117	97.0848	81.6578	37.2835
90.3359953591154	84.0561784010117	87.1273	84.0324	22.6844
90.3349953591154	84.0561784010118	89.4354	80.1567	4.0019
89.664472518589	82.6849561322323	89	83.7031	2.6411
89.0036753404628	82.6849561322323	87.8874	83.7559	28.0801
88.3711456278594	82.6849561322323	87.314	87.2617	16.5203
87.7530285619173	82.6849561322323	85.5459	86.1581	23.0206
87.2900168603778	82.6849561322323	87.5661	81.6563	27.3837
86.8393766103597	82.5481561560284	85.9222	83.4369	1.3228
86.7112842571578	81.940832015175	86.8895	84.3247	31.0852
86.5863272276522	81.3626953371872	86.8222	80.0693	26.0963
86.462948312373	80.8055055905019	86.675	81.8002	31.4898
86.3411193610855	80.2673315406821	87.485	79.3312	14.9303
86.2193380528499	79.7438855166937	89.7033	80.1502	26.8819
86.0989710034517	79.2560525483446	84.0326	80.947	25.7062
85.9797899443931	79.2560525483447	83.5177	79.6473	24.9276
85.7411248900939	79.2560525483447	87.8518	83.2273	10.2812
85.740124890094	79.2560525483447	88.1669	82.2879	36.2685
85.739124890094	79.2560525483447	91.1956	46.5873	33.1213
85.739124890094	79.2550525483447	87.0156	79.966	12.6359
85.739124890094	79.2540525483447	84.4928	76.9707	35.8799
85.2107082910541	79.2540525483447	84.7658	77.8153	28.1634
85.2097082910541	79.2540525483447	84.6626	79.7388	28.8542
85.2087082910541	79.2540525483446	82.7718	81.5009	13.2622
84.9289739824176	79.2540525483446	89.0638	74.5581	18.603
84.9289739824176	79.2530525483446	89.4099	75.3847	13.3372
84.7768157702379	79.2530525483446	84.7887	79.7551	24.4915
84.7758157702378	79.2530525483446	88.9513	72.6403	19.8606
84.775815770238	79.2520525483446	89.379	76.0987	38.3025
84.7758157702378	75.1991236836741	89.2994	73.1482	4.9668
84.7758157702378	75.1981236836742	82.4808	71.6064	18.1512

Solution x	Solution y	Original x	Original y	Radius
81.0274693034783	75.1981236836743	78.8402	71.1237	4.6244
81.0264693034785	75.1981236836742	75.4182	80.175	23.5169
81.0254693034785	75.1981236836742	77.4087	74.0915	5.5705
81.0244693034785	75.1981236836742	73.5352	77.8165	36.1475
81.0234693034784	75.1981236836741	73.6863	74.2382	25.5224
81.0224693034784	75.1981236836741	82.7574	74.2926	14.8137
81.0214693034788	75.1981236836742	81.6179	74.1421	15.9576
79.6949000000007	75.1981236836741	79.9937	73.4457	4.0141
79.6949000000007	75.1971236836741	76.1087	74.9228	26.6713
79.6949000000007	75.1961236836741	76.1847	74.2911	17.8739
79.6949000000007	68.0431001929345	73.6361	68.0431	6.0588
80.2397320705416	65.243380786372	77.6803	63.0066	3.3991
80.2407320705417	65.243380786372	80.5183	71.0301	20.9716
94.1158999999998	65.243380786372	84.8025	72.2361	24.0623
94.1158999999998	65.242380786372	85.22	71.0885	39.2361
94.1158999999998	65.241380786372	93.093	71.3467	21.4346
94.1158999999998	52.0430999999864	99.2739	52.0431	5.158
90.1878856507445	25.9864559634247	92.0943	24.688	2.3066
90.1878856507445	13.9954000000115	92.9329	22.8145	15.1532
73.9235000024034	13.9954	84.9979	3.9891	21.6131
73.9225000024032	13.9954	73.9225	9.6395	4.3559
73.9215000024031	13.9954	94.4757	9.4701	35.9228
73.9215000024034	39.999	97.6128	23.6668	38.6763
71.5266660883204	39.999	84.8772	45.0654	32.4975
70	39.999	78.1743	38.6355	9.4129

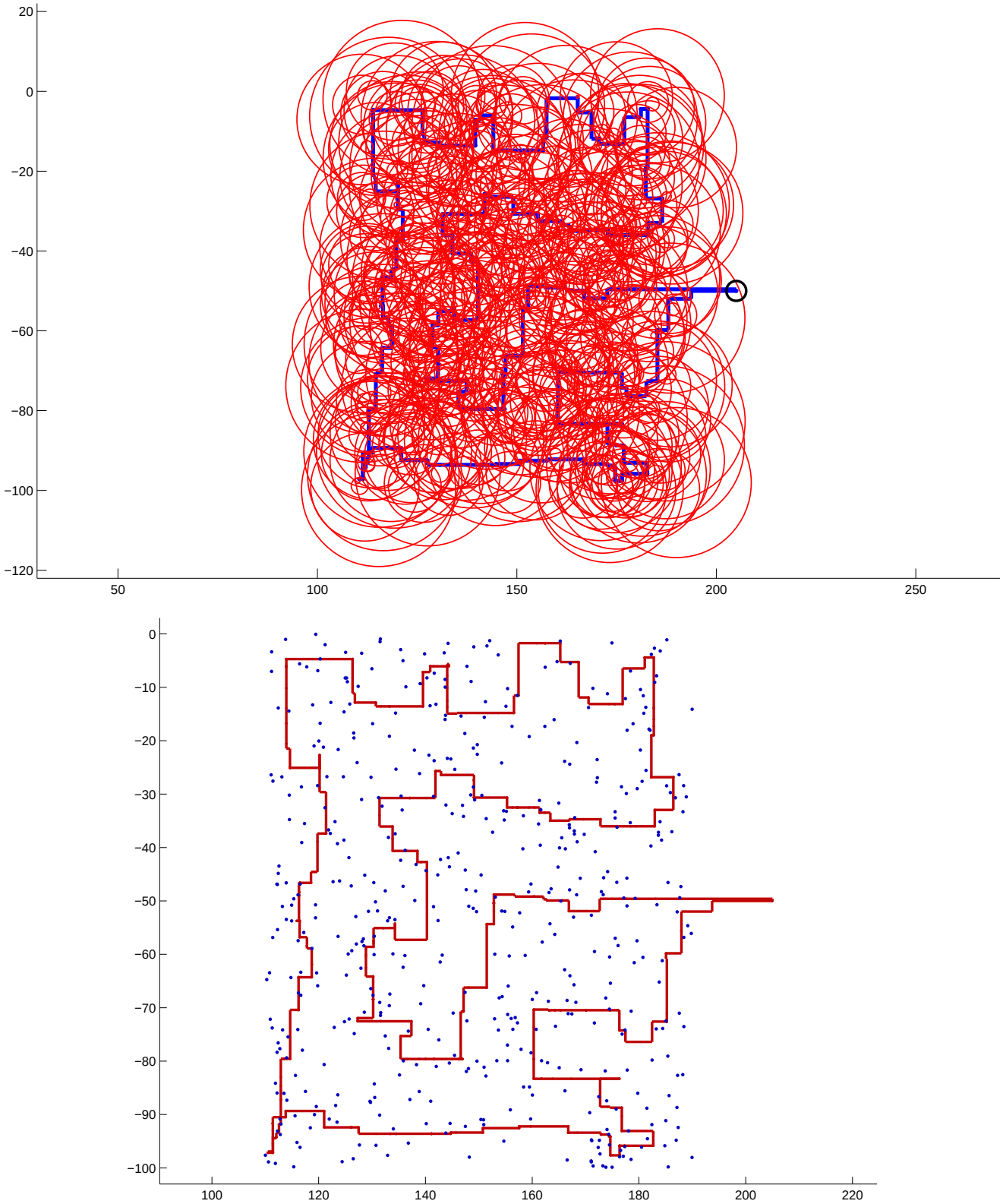


Figure N.158: *team*6_500, arbitrary radius, 2D, Manhattan, Length = 781.134182103051

Table N-161: Solution for *team*6_500, arbitrary radius, 2D, Manhattan

Total distance: 781.134182103051 Depot: x 95 y 50				
Solution x	Solution y	Original x	Original y	Radius
83.7100294542087	51.9826392379281	77.1618533	52.0527053	6.548551
77.9535740395575	55.6966180111063	79.155929	54.6404138	1.6003827
77.9535740395575	55.6976180111063	79.80288	56.0883078	5.2865846
77.9535740395575	59.8130314204689	69.6306367	57.4599551	8.6491765
75.0763170000004	59.8130314204689	73.7932186	65.1929118	5.5307734
75.0763170000004	60.5657779998876	70.748982	60.565778	4.327335
75.0763170000004	60.8345921638614	74.3685871	61.179785	0.787426
75.2339027999996	71.0148630873399	77.5651358	71.0148631	2.331233
75.2339027999997	72.5989251455184	74.4567732	73.8913977	9.1604579
75.2329027999997	72.5989251455184	78.4065879	56.8222853	18.7893207
75.2319027999997	72.5989251455184	78.2121151	82.5216358	10.3605913
72.456688400001	76.4042596999855	72.4566884	79.8068651	3.4026054
67.4666900195729	74.5755623888622	69.1126526	61.5737532	13.1055803
67.4666900195729	74.2542764611384	67.3900644	74.174693	0.1104763
66.3239995345855	74.2542764611384	66.8428254	74.9418962	11.9134957
66.3239995345855	70.4671979753402	68.5426632	70.6500378	3.2232857
66.0934300509911	70.4671979753405	75.4040099	79.0607348	12.6702712
64.5696637930137	70.4671979753405	64.6626599	65.39963	5.0684212
64.5686637930032	70.4671979753405	64.4543682	70.2655389	6.7382235
60.0998242307773	70.4671979753404	57.43771	71.1535593	13.3451357
60.0988242307773	70.4671979753405	61.6425082	72.8564323	8.9988257
60.0978242307773	70.4671979753405	58.1838222	68.9986011	5.0984315
55.3408148042916	70.4671979753404	57.8283627	65.6998258	5.6799674
55.3398148042916	70.4671979753405	56.7397866	71.0931061	12.7871715
54.2499992022571	70.4671979753404	56.0822206	62.8731122	7.9532835
54.2489992022571	70.4671979753404	54.3749565	73.471727	4.4215583
53.2007952211638	70.4671979753404	50.0180258	68.4527432	3.7667027
53.2007952211638	70.4661979753404	63.772212	68.1836695	14.1434905
53.2007952211638	70.4651979753404	56.5346421	68.6367247	7.6638079
53.2007952211638	70.4641979753404	64.4880133	60.4854675	17.3914578
53.2007952211638	70.4631979753404	57.0800315	64.0172849	9.5428133
53.2007952211638	70.4621979753404	61.6781701	59.473286	14.5751959
53.0250996	70.3356998000002	53.0250996	68.7918887	1.5438111
50.2914394999543	70.3356998000002	50.7478618	74.0551131	4.9191824
50.2914394999543	73.6815582759352	46.8228713	71.844353	6.908088
50.2914394999542	79.5779221749251	47.2434466	72.8348775	7.3999265
50.2914394999543	79.5789221749251	49.7783583	78.4397036	1.598943
50.2914394999543	83.3001966428247	48.3895216	84.8378656	2.445755
50.2924394999541	83.3001966428246	47.9098314	77.7959758	9.5350991
51.7475053069332	83.3001966428246	45.3945603	79.9114427	10.2225307
51.7485053069333	83.3001966428246	55.0653569	81.234009	5.9096312
53.8420428465583	83.3001966428248	56.1389342	85.561632	4.4417673
57.2948263014127	83.3001966428246	59.1397084	81.6064397	2.5044765
62.7201693000002	83.3001966428246	65.7364961	88.9695394	13.1578882
66.3198819826023	83.3001966428247	75.0689318	72.4744486	14.9698309
66.3208819826023	83.3001966428247	78.4106856	73.5257917	15.5467792
62.7201693	85.4362196108853	63.9530194	87.4245185	11.3124411
62.7201693000001	86.6470185999925	62.4719528	86.6470186	0.2482165
62.7201693	88.5416068744478	60.774398	89.648206	12.5083419
64.5674939597761	88.7267919284707	67.7945884	81.6777909	7.7525837
66.7935110033098	88.7267919284679	71.4909917	88.8238404	8.4049975
66.7935110033101	90.3256001439972	73.2290706	73.9762718	18.8679238
66.7935110033103	93.074347096646	68.0410206	93.0677269	2.2249974
66.7935110033104	93.075347096646	72.4289329	91.88372	10.9387068
72.681478899984	95.8469299010384	76.9820609	94.8106777	5.1618551
72.6814789	95.8479299010385	74.8496365	95.8479299	2.1681576
72.6804788999841	95.8479299010397	75.4923392	99.8090463	10.3077719
72.6794788999845	95.8479299010404	75.6464183	86.4517504	11.7494177
72.6784788999844	95.8479299010395	69.765468	86.0199863	10.8561261
67.3033079407789	95.8479299010402	68.523768	98.3881808	8.1618794
67.3023079407789	95.8479299010399	64.9776601	99.8572829	14.8646935
66.3729212000146	95.8479299010399	63.7965883	99.8649883	5.4396338
66.3729212000146	95.8489299010398	62.3573907	96.159986	5.0891887
66.3729212000146	95.8499299010395	67.3268965	96.007007	10.9024154
66.3729212000146	95.8509299010396	67.0620012	97.8077872	8.2792999
66.3729212000147	97.633796599992	66.3729212	97.9005203	0.2667237
66.3729212000145	97.6327965999923	66.5761879	96.7049476	4.0776062
66.3729212000146	97.6317965999924	62.6982725	97.3778678	9.4559017
66.3729212000147	97.6307965999925	77.1265753	88.6843079	19.9105474
66.3719212000148	97.6307965999925	77.2293497	82.6694496	19.9727905
64.6313620475314	97.6307965999924	62.5782193	94.8345715	11.8936571
64.6313620475314	94.1094573179633	61.0630253	98.699805	11.0127062
64.6313620475314	94.1084573179633	61.1689993	94.8861498	3.5486281
64.6303620475314	94.1084573179633	64.4754864	95.6952093	6.985863
64.4168409968139	94.1084573179633	75.0360354	91.1497098	11.023678
64.4168409968139	93.741576646905	79.9522127	98.0359405	18.7966063

Solution x	Solution y	Original x	Original y	Radius
62.8800890627278	93.741576646905	64.0121883	92.7907393	9.0477095
62.8800890627278	93.740576646905	77.3466754	92.4222135	14.6923437
62.8800890627278	93.3890841147317	61.0701287	98.8683739	7.9054547
58.4940664567298	93.3890841147317	56.5514993	98.5201232	8.4190197
56.745729548526	93.3890841147317	71.5874534	94.5399994	16.9233519
56.7457295485261	93.3880841147317	70.4834315	96.1070737	17.0458905
56.7457295484705	92.2233357000547	50.0446513	86.3510967	11.408718
56.7447295484704	92.2233357	49.4827685	84.8462228	10.3517087
56.7437295484705	92.2233357	51.7496653	79.9144917	15.0357032
49.7030603996654	92.2233357000547	49.7030604	90.8227548	1.4005809
47.7612119921046	92.2233357000547	63.6802314	81.8267454	19.0132656
47.5327911454097	92.2233357000547	64.3381393	93.722702	16.872102
47.5327911454096	92.5489336589238	61.4066356	99.633296	16.0904388
47.5317911454097	92.5489336589237	63.2522018	99.6147456	18.4401179
47.5307911454097	92.5489336589238	61.0866811	94.7582572	17.8354325
40.7522345840453	92.5489336589238	40.8799687	90.9919823	1.5621823
40.7522345840453	93.3796411083924	52.878421	80.2956919	17.8391178
40.7512345840453	93.3796411083924	40.9379615	91.8870672	1.5042087
40.7502345840453	93.3796411083924	37.489488	92.2138591	7.9102312
40.7492345840453	93.3796411083924	38.2308224	97.9753907	7.7014595
35.7570537813797	93.3796411083924	44.680977	94.9895485	12.4233676
34.7349936016124	93.3796411083924	45.8972803	89.1189208	14.0274616
34.7349936016124	93.5973867998558	33.8269693	93.4852631	7.8640695
34.7339936016124	93.5973867998558	45.3765455	76.9954785	19.7202249
31.1363843322204	93.5973867999473	19.6070156	87.5155962	13.0351264
31.1353843322204	93.5973867999473	30.1525293	91.7059859	6.8413479
31.1343843322204	93.5973867999473	19.6994488	87.7215703	12.92719
31.1333843322204	93.5973867999473	21.4283979	90.119601	12.23519
24.4855055236576	93.5973867999473	25.1363027	82.596723	16.9876139
24.4845055236576	93.5973867999474	23.9936704	92.6751712	7.0508341
23.4102735708374	93.5973867999986	26.8042407	95.3391438	3.8148041
23.4092735708373	93.5973867999986	22.9057445	97.6296948	8.6251096
20.7475397989808	93.5973867998558	20.7475398	95.759314	2.1619272
17.4755023466782	92.4072126682201	34.617789	91.6565199	17.1587159
17.4755023466782	92.4062126682201	20.5127244	86.7993916	6.7971193
16.0378543379841	92.4062126682201	31.00496	87.5127119	15.7467648
16.0368543379841	92.4062126682201	27.0999394	87.1794445	15.3093219
16.0358543379841	92.4062126682201	28.8394854	85.6978668	18.7042447
16.0358543379841	92.4052126682201	14.3875276	98.8261078	6.6290931
16.0358543379841	92.4042126680998	13.4475731	91.4293541	11.6363893
16.0358543379841	92.4032126680998	16.4819632	98.2716229	9.7324435
11.0272565001864	92.4032126680998	13.1891897	88.2938542	7.7896989
11.0272565001839	89.3355990000001	13.5790401	86.3111074	4.776713
11.0262565001873	89.3355990000001	11.0262565	80.6460603	8.6895387
3.81502807807	89.3355990000002	9.5621792	88.5032381	5.8071138
3.81502807807006	90.4954537419659	1.295681	73.7881021	19.2219951
3.81402807806894	90.4954537419663	3.2443278	74.1558976	17.4562068
2.56300463367054	90.4954537419665	2.4095765	76.567725	13.9285738
1.40773129879537	91.6892482301656	1.8947773	99.155621	13.566985
1.40773129879534	91.6902482301656	5.3401207	99.7769332	19.3172668
1.40773129879534	91.6912482301656	6.5131248	96.1438685	18.9754882
1.40773129879534	92.8612388263968	8.4509457	92.4898096	15.3075709
1.40773129879534	94.1122107142734	5.5712407	90.2337915	18.9787731
1.40773129879526	95.4785087900973	17.6447354	95.7025091	18.1912178
1.40773129879534	96.9081305956462	11.9839899	90.8471274	12.6071325
1.4077312987952	96.9091305956462	7.5281123	85.6801168	14.3445898
1.40773129879537	96.9101305956463	0.6045586	98.8714353	2.1193873
0.483220698442125	97.1507124015983	0.0137858	97.6201473	0.6638812
0.483220698442125	97.149712401599	3.4980922	86.0326352	13.3409157
1.42383308592441	97.1497124015991	4.0389978	87.3302987	15.0585227
1.42383308592441	94.4280760833475	2.8109458	93.7321232	1.5519124
1.42383308592441	94.4270760833475	2.2885744	93.0945686	2.1740904
2.07217112894224	94.2260135482825	2.7731053	90.8551563	11.768651
2.07217112894224	94.2250135482825	9.2263989	90.0124515	19.4614621
2.07217112894224	93.4158050772385	5.9392628	95.2323551	4.2724995
2.5630046336705	91.8406844572175	5.6520223	82.6769432	11.1746738
2.56300463366854	91.8396844572175	2.9296139	91.7761922	1.1614786
2.90073941206425	87.2133108967055	12.9149435	73.6813943	16.8344008
2.90173941206604	87.2133108967047	2.2068367	85.97283	4.2948267
2.90173941206604	86.0847853348043	6.6484375	67.6725429	18.7895827
2.90173941206604	85.6710408958895	2.7334234	77.6753662	7.9974461
2.90173941206604	85.4285029689422	0.9335658	72.1659561	13.4077909
2.90173941206604	84.689233697056	1.9077799	84.1438746	1.1337425
2.90173941206604	82.9895509540413	6.6502494	63.3598676	19.9843888
2.90173941206604	79.5639144711218	4.0094679	79.3774545	4.1542009
3.51783071476432	79.5639144711218	4.2645198	75.4568775	4.1743619
3.51883071476429	79.5639144711218	6.0949397	74.0865476	7.6811646
4.65251158837143	79.5639144711219	2.2118306	78.338365	2.7310978
4.65251158837143	70.3997874251252	6.9413921	77.9428724	8.4884288
6.22126100402817	70.3997874251252	9.8142501	65.891213	15.3270767

Solution x	Solution y	Original x	Original y	Radius
6.22226100402817	70.3997874251252	9.6122245	63.4753738	15.5818673
6.22326100402816	70.3997874251252	9.4153722	53.1681384	17.5248196
6.22326100402816	64.3003090860601	9.4077401	50.7341371	15.2153276
6.22326100402816	64.2993090860601	0.2763329	64.7359652	5.9629374
6.22426100402817	64.2993090860601	0.7950307	63.4582891	17.1080484
6.4548675672574	64.2993090860601	4.8021518	64.3437535	13.9826688
6.79179836101585	64.2993090860601	6.1363219	48.8674613	18.2256529
8.69909499974627	64.2993090860601	6.2196931	67.2192158	9.1371587
8.69909499974627	61.8784954761089	3.2029124	51.042154	12.1504864
8.69909499974627	61.8774954761089	19.3270801	51.9549025	14.5767542
8.69909499974627	61.3814936816772	20.6501388	50.1791373	16.3804834
8.69909499974627	58.9082961999789	16.1987878	59.3187745	8.6880066
8.69909499974627	58.907296199976	8.7488745	58.9072962	0.0497795
7.80657301445807	58.3957495642783	18.3784185	57.1026507	10.6506348
7.80557301442728	58.3957495642783	18.5593029	70.8497614	16.4543343
7.80557301442728	56.7846062024066	7.2093662	55.909681	8.5307974
6.42295911393694	56.7846062024066	4.944301	50.787374	6.1768296
6.42195911393695	56.7846062024066	2.2999767	55.3764405	4.3558776
6.42195911393695	53.7509899010724	3.9504558	53.4738105	13.2039761
6.42195911393695	53.7499899010722	20.3908302	60.0437447	17.1200275
6.42195911393695	53.7489899010723	18.1200543	57.6122523	15.16683
6.42195911393695	53.7479899010722	6.1457761	57.4553139	10.5969023
6.31979600000273	53.7479899010722	16.0956015	47.1989931	14.2319044
5.85062400003572	53.7479899010722	4.9451086	53.7479899	0.9055154
6.31979600000273	48.9467248959322	1.389212	56.8496436	9.3148689
6.31979600000273	48.9457248959322	13.6466825	56.641223	16.9874359
6.31979600000273	48.9447248959322	16.954408	52.9270638	16.3581023
6.31979600000273	48.3885162777101	15.6671545	41.9038059	18.2677056
6.31979600000273	48.3875162777101	17.0586402	58.0717087	18.9407433
6.31979600000273	48.3865162777101	13.919931	46.2670929	15.1163989
6.31979600000274	48.3855162777101	18.6253841	45.1799856	17.6321283
6.31979600000274	48.3845162777101	12.7057803	46.3942459	11.1678278
6.31979600000273	48.3835162777101	5.3360715	49.6056788	1.5688834
6.31979600000274	46.6238899199551	3.9184302	46.6238898	2.4013658
6.48779353906843	46.6238899199539	6.5220454	46.8393292	1.8896117
6.48879353907009	46.623889919955	2.1729785	46.8604253	11.1913394
6.48979353907008	46.623889919955	2.27936	46.9159446	4.2205505
8.55391118984605	46.6238899199549	2.5746679	43.4683609	9.7340669
8.55391118984605	46.6228899199549	2.4253981	44.8523436	11.7215543
8.55391118984605	44.569551359657	23.0786229	38.1227731	15.8911359
9.16073242997348	44.569551359657	7.3492035	35.5012058	9.3339917
9.77893377294045	38.8940462582456	13.5198617	39.2703319	5.6665967
9.77893377294045	37.3712852000157	14.7299938	38.6202015	5.5606508
11.3787538999943	37.3712852000157	22.4746551	48.1041051	15.816336
11.3787538999996	37.3702852000156	12.1928408	37.3702852	0.8140869
11.3787538999943	36.2462153120564	25.3533813	42.3962835	16.55549
11.3787538999947	35.812488410531	24.3319298	37.4283803	13.053577
11.3787538999945	29.6218994936951	11.1949114	32.5347928	2.918689
10.1686808420612	28.8697559031921	9.7861225	28.4044715	0.6023624
10.1686808420612	25.4018937278355	11.5512784	26.7283657	1.9160125
10.1686808420612	22.6926563804367	14.7546051	14.610274	12.5838102
10.1676808420612	22.6926563804367	10.0346396	20.0550826	2.640927
10.1676808420612	25.075183928331	13.0553452	35.1491327	12.3752896
10.1676808420612	25.076183928331	18.0420031	31.0087706	9.8590332
10.1666808420612	25.076183928331	19.7989907	26.8559855	13.3335104
10.1656808420612	25.076183928331	21.8832831	32.2702186	16.0376904
4.61231831255238	25.076183928331	3.1062568	26.7803784	2.2743131
4.61231831255238	25.075183928331	13.6477983	21.6503409	10.1300266
4.61231831255238	25.074183928331	17.2034005	24.1027648	19.2446407
4.61231831255238	25.073183928331	14.6392528	26.7492086	14.0759419
4.61231831255238	25.072183928331	11.8541821	36.7134083	16.0938551
4.61231831255238	25.071183928331	6.820668	39.0713932	16.2462105
4.61231831255238	25.070183928331	24.4888337	25.329984	19.8782132
4.61231831255236	21.469817322497	1.0903939	26.3844516	6.0462866
3.95106879999864	20.532307320915	4.4919615	30.1971308	9.6799472
3.95006879999863	20.532307320915	1.4410502	27.5670412	9.0702473
3.95006879999863	16.7374470708301	4.5207011	34.7763494	18.0479256
3.94906880000011	16.7374470708301	4.4183327	14.4467589	11.646626
3.94906880000011	13.8762399000038	2.4227502	13.8762399	1.5263186
3.94906880000011	10.1952408854177	6.7702019	28.6398243	18.6590849
3.94906880000011	10.1942408854175	10.881307	21.222109	15.2562401
3.94906880000011	6.11003892035955	16.5565287	18.5575743	18.4350632
3.94906880000011	6.10903892035955	12.2844966	12.8434228	16.9324181
3.94906880000011	6.10803892035955	8.8711802	13.2955279	15.7653907
3.94906880000011	6.10703892035955	10.2638739	16.7343669	18.8298176
3.94906880000011	6.10603892035954	11.2137447	2.0282324	19.8233424
3.94906880000011	6.10503892035955	7.7653349	6.167634	19.726704
3.94906880000011	6.10403892035954	10.2956976	4.6843351	13.6376992
3.94906880000009	6.10303892035963	9.1420339	20.9818632	15.7590069
3.94906880000009	6.10203892035964	9.4518233	0.0818322	12.2091392

Solution x	Solution y	Original x	Original y	Radius
3.94906880000011	4.71760254092444	1.1696301	7.0254341	16.3262783
3.94906880000011	4.71660254092443	1.1893308	3.3623299	7.3969025
3.94906880000009	4.71560254092443	19.95828	6.5164086	19.0088103
3.94906880000009	4.71460254087924	3.796854	1.0310825	3.6866637
16.3322246708371	4.71460254092442	15.3634563	8.946465	13.8278483
16.3332246708372	4.71460254092444	14.9649191	8.2569823	11.1052011
16.3342246708371	4.71460254092444	6.4321646	5.6038094	10.5758755
16.3352246708371	4.71460254092444	15.2275578	8.2482088	10.0059049
16.3362246708372	4.71460254092444	26.3324067	9.9110212	19.0585155
16.3372246708371	4.71460254092444	21.5694811	0.9567502	13.3401903
16.3382246708371	4.71460254092444	18.0605132	3.6100683	8.5868999
16.3392246708371	4.71460254092444	15.0419936	3.4632806	4.5348945
16.340224670837	4.71460254092444	9.8269964	6.8843491	6.8651251
16.3402246708375	11.121026497785	15.820225	13.1438067	7.149623
16.7861753920034	12.8553364937179	16.5956207	19.4929376	6.6403358
16.7871753920037	12.8553364937179	27.922577	21.764341	14.2606988
20.7023304658178	12.8553364937179	33.6893922	8.5224136	19.9918892
20.7023304658178	13.5788379999942	33.6742877	16.0147514	19.9827348
21.6531877608513	13.5788379999941	17.3929381	9.8303298	5.6745961
23.2581629999999	13.5788379999941	20.1050057	16.8211128	7.104643
23.2591629999979	13.5788379999941	24.4057133	14.819481	14.1480218
23.2601629999999	13.578837999994	23.260163	19.1726271	5.5937891
29.5461012616371	13.5788379999947	46.2315326	17.3070005	18.9782971
29.5461012616371	13.5778379999942	42.0438698	1.2746098	18.5219549
29.5461012616371	9.4110627157368	43.6411268	3.9331303	18.3321607
29.5461012616371	9.4100627157368	41.2499501	12.693222	15.4469364
29.5461012616371	9.40906271573762	28.9980611	9.3107142	0.5567948
29.5461012616371	7.13836816899424	45.3795945	10.2393952	17.2768189
29.5461012616371	7.13736816899459	30.2787157	8.2280249	8.4927039
29.5461012616371	7.13636816899523	34.0986738	23.3047286	16.797077
30.8930991277573	6.06111379964352	25.7941467	5.022901	13.154074
30.8930991277574	6.06011379964342	21.5004558	1.4444458	10.4654737
30.8940991277573	6.0601137996434	29.8399494	3.731908	5.1894117
30.8950991277573	6.0601137996434	33.5301093	3.5426558	3.7368294
31.5037698244105	6.06011379964343	25.3620642	2.9418291	9.3612642
32.1474358080508	6.0601137996456	39.7157151	22.5518047	19.2813071
33.3828127849013	6.0601137996434	36.6688954	15.3802855	16.9765386
33.8783285886335	6.06011379964343	31.6461166	7.3585956	12.8469017
34.3869678999998	6.06011379964359	37.7928549	6.0601138	3.405887
34.3869678999993	5.66531840000061	39.0651937	2.4238303	9.0370307
34.2377990000479	5.66531840000032	34.237799	1.769458	3.8958604
34.0882101112423	7.81734358343202	38.5584867	8.9239146	8.3130054
34.0882101112425	10.1112280170986	33.7088519	9.9711832	13.226048
34.0882101112425	12.5156488250105	30.8819888	13.4626957	3.5848945
34.0882101112424	13.7097568396122	31.9710737	13.1659452	6.1525799
34.0882101112423	14.9349064887516	33.7699504	15.2531662	0.4500872
35.9148181844547	14.8135828214152	54.100404	16.0525172	18.9251989
36.8474853407697	14.8135828214152	52.4413086	6.2567644	17.7872557
37.6511174014757	14.8135828214152	37.3849664	18.6565566	3.8521791
39.9395784691786	14.8135828214152	41.0252369	15.6288565	2.3078897
41.6961342809132	14.8135828214152	40.565033	30.2350611	16.7047972
43.6313980942052	14.8135828214152	45.092729	13.545129	9.6124868
45.6980337837212	14.8135828214152	62.1748486	23.5386262	19.2663276
46.5801789281868	14.8135828214152	49.4509792	19.23293	5.5356339
46.5801789281868	11.5455798849652	56.0727891	23.8686819	15.5553362
47.3386684337161	11.5455798849652	47.2237184	11.5265695	0.1165005
47.435860613744	11.5455798849652	52.3761166	17.3066951	10.3802999
47.4358606137441	1.72743130000364	41.5241877	2.2495139	5.9346817
50.8490074499039	1.72743130000279	64.943613	1.686391	14.0946653
52.4279982821458	1.72743130000279	68.4102584	6.9403941	16.8109375
52.4279982821455	1.72643130000279	57.1362338	5.5136309	10.1201436
52.4279982821455	1.72543130000279	54.6678163	5.1970784	9.6677205
55.2537104000215	1.72543130000363	55.2537104	1.3428502	0.3825811
55.2537104000214	5.26998596756668	67.7860652	18.0440513	17.8951575
58.7089198181603	5.26998596756659	68.9038468	16.8104734	18.4978064
58.7089198181602	11.8931168799728	58.3586123	20.3359236	10.6167883
60.5482992000008	11.8931168799727	61.3811866	10.1841347	1.9011369
60.5482992000007	13.1357100000001	60.5482992	13.7850738	0.6493638
64.4359405515332	13.1357100000006	64.1033853	11.196525	1.9674937
65.4586965434287	13.1357100000002	67.4654721	12.1137109	14.0781794
65.4596965434292	13.1357100000023	70.8086056	11.5809577	15.5821047
66.9387695923191	13.1357100000027	70.2907843	10.4186099	7.1185577
66.9387695923191	6.46600230529342	79.9570853	14.106802	15.0949781
71.0818477114841	4.42484524213055	72.8917692	2.6849909	5.1292918
71.0828477114894	4.42484524213054	72.320279	3.8462993	12.1872623
71.083847711484	4.42484524213054	72.9487249	9.0752285	6.7256814
72.774528957397	4.42484524213046	73.9903157	3.2090585	1.7193821
72.7745289573968	4.42584524213054	75.2339764	1.1053279	16.7841753
72.7745289573967	4.42684524213054	73.292725	7.8305571	14.0833606
72.7745289573968	4.42784524213054	71.2868972	13.7571779	15.5198317

Solution x	Solution y	Original x	Original y	Radius
72.7745289573967	13.9013456440772	70.9135058	14.8761766	6.3074316
72.7745289573967	13.9023456440771	72.0757838	18.033427	4.1897587
72.7745289573969	15.9924411577703	75.1791401	28.4357222	18.0653964
72.7745289573967	17.2854140700034	71.8742878	17.8343061	6.5081686
72.7745289573969	18.9898536930452	70.2766166	21.7580017	9.1846004
72.7745289573969	18.9908536930452	69.6772126	28.9703915	10.4491408
72.3227914355448	18.9908536930452	73.9542296	35.1681427	17.0431609
72.3227914355447	26.8276787972258	76.8303918	30.6898889	15.6982902
72.3227914355446	26.8286787972258	75.8801773	29.7113355	15.8480612
72.322791435545	26.8296787972258	78.8734057	30.5074156	17.7741551
72.3227914355449	26.8306787972258	78.3681704	28.4149174	15.9637623
72.322791435545	26.8316787972258	66.7264937	28.6241638	9.8453178
72.322791435545	26.8326787972258	70.5957341	27.6007009	1.8901283
76.4304439989504	26.832678797226	71.3343578	25.5495623	6.1682291
76.4314439989505	26.8326787972258	77.5184606	26.3492827	1.1896541
76.4314439989505	30.463811001982	74.2228108	38.6099587	8.4402478
76.4314439989502	32.9651355730611	73.6483802	37.1698351	9.29445
72.9541613896027	32.965135573061	78.2442809	33.2914556	5.9254971
72.9541613896027	36.0243277682817	72.24704	39.7077335	3.7506664
72.9541613896027	36.0233277682817	76.1612584	37.0439506	3.365582
69.4227431456509	36.0233277682817	73.6393721	37.6930766	4.535198
68.4290791288975	36.0233277682817	65.884583	36.2103636	2.551361
62.7818028030441	34.7123759000034	68.3855742	35.3493495	5.6398572
62.7818028030442	34.7113759000035	65.5247054	34.4819771	3.6959394
62.7818028030441	34.7103759000037	65.5339196	33.299582	4.4914809
59.6085867795128	34.7103759000037	62.0390375	27.7696953	7.3539199
57.0336698995539	34.7103759000036	57.0336699	24.3925592	10.3178167
57.0336698995539	34.9688215999997	56.9481598	35.7189477	0.7997132
55.1300701003947	34.9688215999997	55.1300701	40.0588307	5.0900091
53.4063571968824	34.9688215999997	62.1996928	26.9322785	11.912547
53.4063571968824	34.9678215999997	57.9145816	37.4787407	9.8427718
53.4063571968824	34.9668215999997	61.8021468	40.7857588	13.1222565
53.4063571968824	34.9658215999997	59.7400431	37.5401839	7.0381524
53.4063571968824	33.4792989910201	67.6344777	29.9025036	17.8609779
52.3710540983301	33.4792989910201	51.358437	31.183912	5.9744983
51.3739728310987	33.4792989910201	51.2078647	35.5791539	4.4951633
51.3739728310987	32.5044859581899	51.6262531	32.9510025	3.6157759
50.4091320760145	32.5044859581899	57.8811625	36.8910334	11.1609103
49.4307109663537	32.5044859581899	57.9600279	34.4089577	11.7355261
47.2556831937299	32.5044859581899	55.5353048	38.1752447	10.1702798
47.2556831937299	32.5034859581899	48.3601763	34.0464698	2.951746
47.2556831937299	32.5024859581899	42.5831476	37.1399223	8.4151487
47.2556831937299	32.5014859581899	45.1705924	33.2150554	5.0012449
46.2592965191427	32.5014859581899	54.9748886	31.6899499	11.8489378
45.283773705784	32.5014859581899	56.98499	36.3050676	14.2729457
45.283773705784	30.6555541320258	58.429274	38.9397266	18.6397178
45.282773705784	30.6555541320258	44.272376	24.1529526	13.4087757
39.0950697905115	30.6555541320258	39.7052051	20.7340789	9.9402181
39.0940697905115	30.6555541320258	41.3950957	34.602479	10.330203
39.0930697905116	30.6555541320258	51.5218465	39.5765057	17.6859637
39.0920697905115	30.6555541320258	56.2067364	40.2417677	19.6165059
39.0920697905115	27.3970387302992	39.21475	31.0795566	8.3251067
39.0910697905115	27.3970387302992	44.6441662	33.1239716	11.3823841
39.0900697905115	27.3970387302992	38.4714341	30.1541626	8.9883187
39.0890697905115	27.3970387302992	38.9767874	28.6595996	1.2675438
39.0890697905115	26.4134985870751	38.9701661	21.3778805	5.0370217
32.9135049074541	26.4134985870751	34.7673517	23.4200763	8.3957645
32.9125049074541	26.4134985870751	28.9097869	26.1468646	4.1835746
32.9125049074541	25.6834415128362	31.6418617	23.7354033	2.3258089
31.8790123504288	25.6834415128361	30.6527015	22.708305	3.2179614
31.8790123504288	26.2965191633166	31.5115819	30.4349931	4.1547529
31.8790123504288	30.7249462027293	33.8398153	32.0377234	2.359689
30.1354412774769	30.7249462027293	37.130172	34.1670861	7.7958056
27.0657667911047	30.7249462027293	25.434095	30.36432	1.6710488
27.0647667911047	30.7249462027293	25.6408756	32.9849766	2.7008855
21.399459630316	30.724946203574	21.2205961	30.6755865	0.1855493
21.399459630316	33.9870504211614	35.0133629	33.6653342	15.142596
21.399459630316	36.070512413445	36.9545772	32.1019086	17.1509479
23.8384915719031	36.070512413444	35.4889656	25.3753347	17.6050983
23.8384915719033	38.3576657136855	36.1244237	41.0242921	15.4858909
23.8384915719033	40.6339790758368	30.0937988	44.3308943	9.1718387
23.8384915719038	40.6349790758366	32.8302989	42.2309887	9.1323516
26.4794026656813	40.6349790758367	26.2175773	40.5220972	0.2851225
28.5075088458922	40.6349790758361	38.128444	50.990683	14.1351688
28.5075088458919	42.7167189300791	34.4981613	43.6098189	7.4849006
28.5075088458921	42.7177189300791	44.7688336	34.8472485	19.5683767
29.0376900200041	42.7177189300791	28.2512087	43.1796715	0.9121146
29.2394126996521	42.7177189300791	37.4597811	44.2188485	8.3563058
30.2685161361535	42.7177189300801	34.2887402	41.9043439	4.1016802
30.2685161361536	42.7187189300791	48.2549784	40.2375649	18.4484604

Solution x	Solution y	Original x	Original y	Radius
30.2685161361535	57.277257636115	33.1471098	60.1558513	4.0709462
24.2844590000403	54.9244090961247	25.824676	62.4300357	7.6620297
24.2844590000403	54.2109863000565	24.284459	53.5118781	0.6991082
24.2844590000403	55.0775256402287	28.018456	49.9258106	6.3626175
24.2834590000403	55.0775256402288	32.3078962	45.114069	14.2581658
22.070851639969	55.0775256402289	39.4220046	48.156385	18.6805968
22.069851639969	55.0775256402288	21.0216738	51.8703093	6.5542883
21.0424082905528	55.0775256402289	39.5709227	52.0192185	18.7792196
20.2890897791146	56.6178678466968	20.4303529	56.6155569	0.1377486
20.2890897791146	57.5668251806638	20.3277951	46.570702	10.9961913
20.2880897791145	57.5668251806638	31.5095969	51.0684653	15.7915136
20.2880897791146	57.9327870793862	32.3710377	53.6854	15.9945905
20.288089779114	58.5938471843239	20.1950128	67.681815	11.7719782
20.2870897791103	58.5938471843239	23.2409835	69.6045703	11.4000663
18.8583947999997	58.5938471843239	22.9209187	53.7233909	7.2787759
18.8583947999999	59.1292036797122	18.474215	58.4012448	5.4896057
18.8583948	60.0763066505191	15.5276897	59.9411898	6.7609848
18.8583947999999	60.4532299937539	25.8175111	47.2716024	14.9058581
18.8583948	62.4901399356988	17.9198509	62.5969087	1.1752301
18.8583948	63.8863652000986	15.1928212	63.8863652	3.6655736
18.8583948	64.1593627714281	23.9069485	59.9121563	8.0586758
20.2129010000004	64.1593627714281	23.2467308	53.1536864	11.4161743
20.2129010000004	64.1603627714282	29.6716712	65.8677857	16.7115843
20.2129010000004	65.2575225815264	32.7632095	61.4478694	19.7763438
20.2129010000004	68.4338348115316	26.1534967	60.2417469	15.8350837
20.2129010000004	68.4348348115316	32.5068688	76.0167984	18.6744309
20.2129010000004	68.4358348115315	19.7736057	66.4248411	8.3807699
20.212901	68.4368348115315	23.3330747	67.4297538	6.4618896
20.212901	68.4378348115315	21.4467307	69.0185063	4.517097
20.212901	68.4388348115315	29.1113171	69.2428114	9.8595935
20.212901	70.9164832001439	21.6218153	70.9164832	1.4089143
20.212901	71.9409547561657	23.1076735	77.6165558	6.3711973
17.2994081428714	71.9409547561657	15.7168362	72.1075902	1.9558061
17.2994081428714	72.5325796	14.8230271	72.6203252	2.4779351
17.3004081428714	72.5325796	16.6661596	74.8364156	8.962299
21.6853829926399	72.5325796	21.5799527	71.4486566	10.0338577
21.6863829926399	72.5325796	35.4564008	78.9241199	15.1810796
26.7897314117379	72.5325796	26.7897314	74.395765	1.8631854
27.3663212884679	72.5325796	44.3710695	67.9205927	17.6190773
27.366321288468	75.2954374921049	22.4809106	75.2843669	6.1954617
25.3457808199758	75.2954374921049	30.51178	74.0433946	12.6878142
25.3457808199758	79.6010392000355	20.4274735	84.2677658	6.7799767
26.4950164741106	79.6010392000356	25.8819635	79.9487476	9.3875474
28.8185889894795	79.6010392000357	28.3264783	80.6515072	7.0901709
30.0274799560123	79.6010392000355	40.9923031	81.1407106	14.9699296
30.0284799560123	79.6010392000355	34.482979	80.365325	8.2940253
31.6191491375699	79.6010392000354	40.3910959	90.932739	16.8734606
31.620149137568	79.6010392000358	45.412979	71.2677197	19.9703759
31.6211491375701	79.6010392000355	32.0336769	81.0046037	2.6979108
34.9056018445423	79.6010392000356	38.0621359	81.3957333	6.4246672
36.2925189217677	79.6010392000355	41.3355343	82.7796974	5.9611972
36.2935189217678	79.6010392000357	39.6568849	80.0063838	8.4281529
36.9484158637992	79.6010392000358	43.3709663	79.9295648	6.4309473
36.9484158637991	79.6000392000357	37.6570142	81.9317057	6.23332
36.6047554000021	79.6000392000358	45.5118999	65.9532613	17.6961201
36.6047554000021	71.0013316000003	46.0567355	72.019762	17.1499692
36.6047554000021	71.0003316000004	42.9598051	72.0704928	12.5037762
36.6047554000029	70.9993316000003	43.6827488	74.1878852	13.0248043
36.6047554000029	70.9983316000003	50.8238583	67.1806384	19.5280512
36.6047554000029	70.9973316000004	45.6990417	60.3070344	16.3509992
36.6047554000022	70.9963316000001	35.1926471	70.9963316	1.4121083
36.6047554000029	70.6931290783309	46.3729602	74.0499355	10.9997053
37.1393083530552	70.6931290783307	37.7594155	72.4638416	1.8761545
37.1393083530559	66.2180191396693	51.8847181	57.7017397	17.2459771
38.1402074427676	66.2180191396693	37.415218	67.1119326	1.1509522
41.4892721960297	66.2180191398118	43.8195847	68.1613988	3.0343172
41.4892721960297	66.2170191396693	47.6524078	52.2249928	17.0127082
41.4892721960297	54.3424671356159	43.0002757	59.9692573	5.8261393
41.4902721960297	54.3424671356159	48.6878693	60.2173135	11.2892676
42.8249769999369	54.3424671356159	46.3458684	54.8708712	8.2955698
42.824977	51.9811136019509	44.8729194	51.9811136	2.0479424
42.8249769999369	50.3924506718462	44.2906965	51.8898251	3.7343282
42.8249769999369	50.3914506718463	38.9617732	51.3997809	12.7914782
42.824977	50.3904506718416	43.0965371	49.287121	2.8888775
42.824977	50.3894506718469	58.3317264	48.8464518	16.6689028
42.824977	50.3884506718469	53.1446811	48.4277704	14.7395753
42.824977	50.3874506718469	37.6481264	47.8813096	7.0802754
42.8249769999368	48.8119644842314	40.4352515	45.1450838	4.3768484
42.824977	48.8129644842314	54.2235528	56.265496	13.6774223
46.7570780875359	49.1865114182414	49.3212736	48.3119567	3.8293124

Solution x	Solution y	Original x	Original y	Radius
50.3461840276476	49.1865114182414	49.7681271	46.8278362	2.4284766
50.3471840276476	49.1865114182414	65.5436157	56.992435	17.084027
52.1139269671663	49.7071121377876	67.1669184	49.4371849	15.5982026
52.7785090907498	49.9236551203914	66.0988248	58.3515559	17.5072809
52.7785090907498	49.9246551203913	63.3830619	45.6708392	11.4259131
54.893299120576	49.9246551203913	53.5581269	47.7413894	13.1857928
55.685733439256	49.9246551203913	54.8328865	43.6672378	6.4152555
55.686733439256	49.9246551203913	63.3053921	48.8331121	9.0739339
56.3552540974246	49.9246551203913	57.0032853	47.929495	2.0977627
56.6154130524851	49.9246551203913	55.3536754	50.0230289	10.7398558
56.8802378059796	51.9056678	53.3341085	54.2742297	4.845343
56.8812378059795	51.9056678	73.3690079	50.7128517	17.0196572
57.7424661999997	51.9056678	57.7424662	53.0431767	1.1375089
58.714838364243	51.9056678	67.7686962	50.942416	9.9071922
60.1495200297902	51.9056678000006	61.0935569	52.6920317	2.1590612
61.4594720798191	51.9056678000006	58.9987357	45.7674431	9.2369593
62.6436942844126	49.6011284000022	75.4422908	46.5496079	15.4085245
63.7611002549622	49.6011284000022	62.9728444	48.2610974	5.9042331
64.9743936860552	49.6011284000022	67.7343836	45.7338412	10.9613064
66.256659636652	49.6011284000022	65.8501112	46.5185477	5.7590293
67.6674745188884	49.6011284000022	64.136723	44.5156078	8.3082067
69.4104751320654	49.6011284000022	69.2934493	49.5142976	0.775327
73.0518106582038	49.6011284000022	77.8566059	47.3210428	13.3824609
77.6409989110028	49.6011284000022	77.6409989	49.4044045	0.1967239

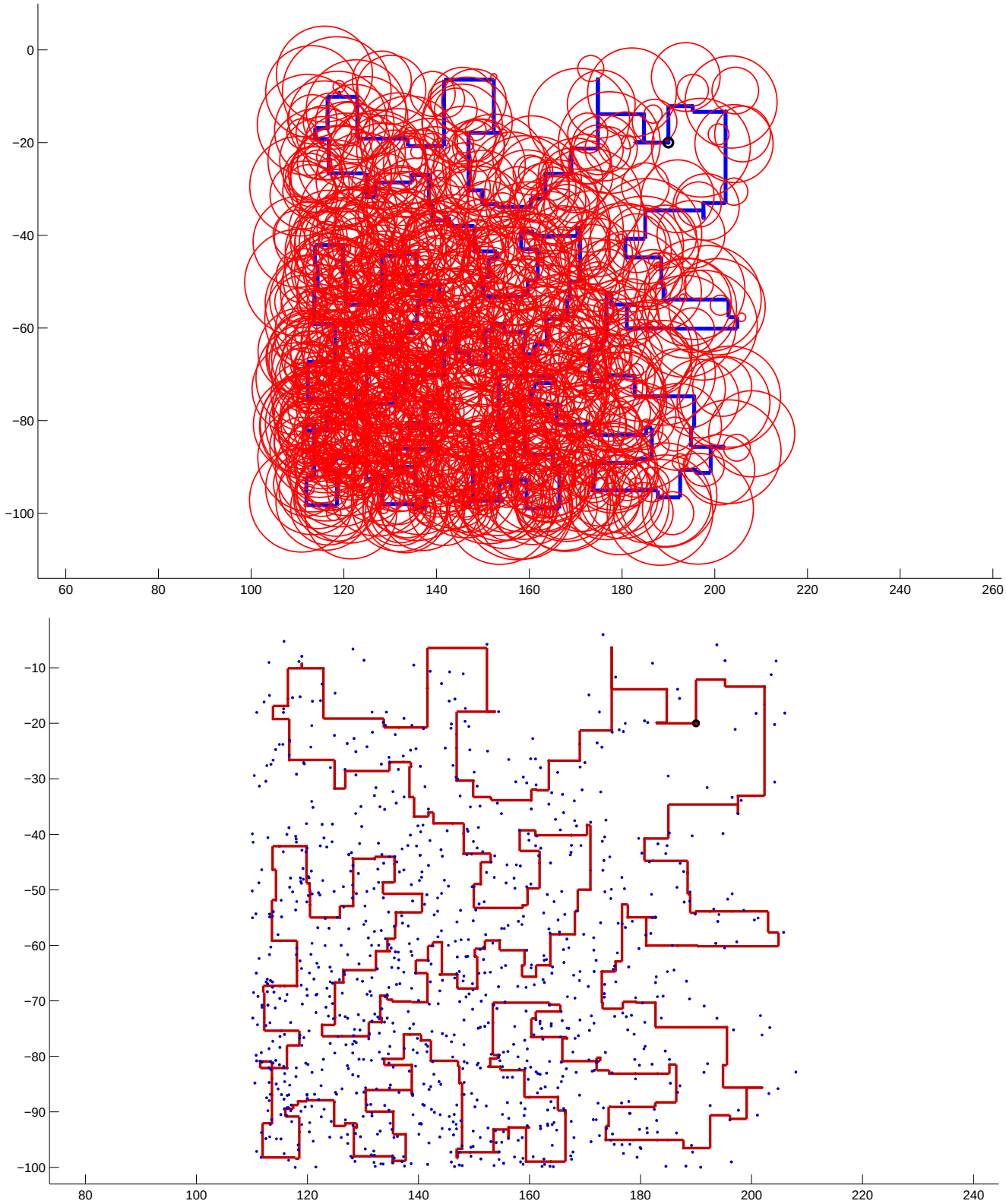


Figure N.159: *bonus*1000, arbitrary radius, 2D, Manhattan, Length = 1226.3949981

Table N-162: Solution for *bonus*1000, arbitrary radius, 2D, Manhattan

Total distance: 1226.39499807866 Depot: x 80 y 20				
Solution x	Solution y	Original x	Original y	Radius
72.7558189760159	19.86081824	71.29498477	19.86081824	1.460834206
74.7231443478645	13.8695615799837	77.03036191	15.51069798	4.834719524
74.7241443478645	13.8695615799825	76.68650337	13.86956158	1.962359022
74.7241443478645	13.8695615799825	72.1570689	9.179080442	9.589007965
64.7996343360323	6.35996559885694	65.51501196	11.68636529	7.30737771
64.7996343360323	6.35996559885694	63.24920239	4.015695007	2.810594924
64.7996343360323	21.2811830174984	62.83458953	32.37480154	11.26631142
64.7996343360323	21.2811830174984	64.88897514	21.58345165	5.371825022
64.7996343360323	21.2811830174984	62.61153544	17.95816147	4.324411312
64.7996343360323	21.2811830174984	66.17419814	21.15751135	7.122166774
64.7996343360323	21.2811830174984	66.92261807	21.4897109	4.897969721
64.7996343360323	21.2811830174984	60.71671796	14.8721563	10.90485749
64.7996343360323	21.2811830174984	67.26622281	20.02005982	10.98398776
64.7996343360323	21.2811830174984	70.71952594	19.54937922	6.168002999
59.0634957048562	23.7594322894143	50.59311922	22.75724468	8.529458236
59.0634957048562	23.7594322894143	59.11600598	27.89604561	6.714910247
59.0634957048562	23.7594322894143	59.97712424	27.07719444	8.051501149
59.0634957048562	23.7594322894143	62.17589976	23.53474989	5.377142852
59.0634957048562	26.7292278311565	59.48412304	31.97998889	5.267581898
59.0634957048562	26.7292278311565	63.04507341	24.29862677	4.664845393
53.4808912799815	26.7292278311565	50.20668952	26.40233109	3.704996422
53.4808912799815	26.7292278311565	51.08696185	26.42044109	3.4213392
53.4808912799815	26.7292278311565	55.07321291	28.85442279	3.578504928
53.4808912799807	32.0644482369701	53.48089128	34.57431179	2.509863553
51.1985870400604	31.9145494370007	51.19858704	31.0981292	0.816420237
51.1985870400604	31.9145494370007	46.26887105	26.53209753	8.81744986
50.3298269701247	33.8547122519473	50.32982697	35.43640834	1.581696088
50.3298269701247	33.8547122519473	54.69460289	37.32086801	6.733868048
50.3298269701247	33.8547122519473	54.00076983	32.50218762	8.205190824
50.3298269701247	33.8547122519473	55.9549233	32.80200534	9.08801586
50.3298269701247	33.8547122519473	51.99282443	27.99909333	9.260790549
43.0767577968695	33.505597246105	40.81010844	38.77304558	5.734432078
43.0767577968695	33.505597246105	44.21687698	34.39769027	3.557457265
43.0767577968695	33.505597246105	47.52772375	30.54529654	5.345510096
43.0767577968695	33.2889464543923	44.94410764	36.28576006	3.530989553
39.8418864092225	30.3142010045818	40.57036155	31.31828969	1.240512039
39.8418864092225	30.3142010045818	40.05041388	28.81118981	7.168813073
39.8418864092225	30.3142010045818	42.45831495	25.01806118	11.16727795
39.8418864092225	30.3142010045818	39.25918273	24.78783876	9.890531084
39.8418864092225	30.3142010045818	36.2315122	27.60710766	7.544747892
36.8869757660043	30.3142010045826	37.07046765	30.04479215	0.347521723
36.8869757660043	30.3142010045826	36.77121212	29.70512597	4.799880351
36.8869757660001	24.4508572200536	39.07927218	20.57348801	5.646872091
36.8869757660001	24.4508572200536	34.82834577	24.45085722	2.058629996
36.8869757660237	21.9897519160306	38.38951699	19.65672727	4.440566438
36.8869757660237	21.9897519160306	35.94447387	20.12395641	2.090335546
36.8869757660643	17.9136318099997	38.46066343	17.33665094	2.23318621
43.7275354857617	17.9136318100005	44.45005227	17.91363181	0.722516784
43.7275354857617	17.9136318100005	36.57027062	15.62107689	9.745800746
42.343466059995	6.422476724236	42.34346606	5.769949569	0.652527155
31.607256857349	13.7042993093631	35.85991513	20.90404301	8.748151694
31.607256857349	13.7042993093631	35.53984032	15.99196501	8.611862088
31.607256857349	13.7042993093631	38.07401644	11.09458783	6.973490769
31.607256857349	13.7042993093631	34.15723352	12.84614068	4.597761329
31.607256857349	13.7042993093631	35.62470684	10.73896033	6.976212454
31.607256857349	13.7042993093631	32.11403346	10.63014558	3.943215754
31.607256857349	13.7042993093631	29.15811552	9.518746656	4.849447835
31.607256857349	20.7428947317892	30.90434674	20.96780911	1.948898626
26.4664072463099	20.7428947317892	28.82263126	20.36706254	2.386009522
26.4664072463099	20.7428947317892	25.83818458	22.03803134	1.439459118
26.4664072463099	20.7428947317892	27.39065822	19.10906735	2.166651987
23.7548005912359	19.9657038470221	23.64941173	19.80991504	0.188087651
23.7548005912359	19.9657038470221	21.65865806	17.99154884	8.718780186
23.7548005912368	19.1429558863685	24.23492671	17.98856994	1.250251176
12.8731692585995	10.0970088131779	20.19850768	8.627828216	7.471216408
12.8731692585995	10.0970088131779	18.20950886	6.619599382	6.369371766
8.98802722970578	9.24044023855427	8.988027099	7.925934732	1.314505506
8.98802722970609	10.0970088131779	8.465864182	8.874062551	11.71772619
6.48024782309724	15.565053807095	4.953508892	23.81507206	11.32693583
6.48024782309724	15.565053807095	2.197761157	16.16441336	10.88783855
6.48024782309724	15.565053807095	5.801300438	5.23076571	10.356567
6.48024782309724	16.8615533159962	9.442374955	27.32019574	10.87002293
6.48024782309724	16.8615533159962	9.320660383	27.08555662	10.8588123
6.48024782309724	16.8615533159962	10.62327399	24.29073933	10.64782213
6.48024782309724	16.8615533159962	14.9958336	14.5728326	8.817791313
6.48024782309724	16.8615533159962	12.36712067	15.90584574	8.460729812

Solution x	Solution y	Original x	Original y	Radius
6.48024782309724	16.8615533159962	10.89890727	16.02503912	4.675459945
6.48024782309724	16.8615533159962	12.63680518	12.91935497	10.77386908
6.48024782309724	16.8615533159962	8.679954371	15.22687294	10.6053774
6.48024782309724	16.8615533159962	5.722550995	17.38650207	10.68361364
6.48024782309724	16.8615533159962	7.319977879	15.37807435	6.081166637
6.48024782309724	16.8615533159962	3.177857831	14.97802426	5.317837399
6.48024782309724	16.8615533159962	3.082410661	9.043855976	9.949435792
3.79990769949515	19.225727031582	0.438114408	29.42535326	10.7393682
3.79990769949515	19.225727031582	0.867278095	18.04823486	3.160190534
6.73661799427572	23.3927643634951	14.86812736	22.17705421	8.397529002
6.73661799427572	23.3927643634951	6.719406227	25.73868862	2.345987396
6.73661799427572	23.3927643634951	6.772905892	23.04434695	2.6690689
6.73661799427572	23.3927643634951	5.677247541	18.04924585	6.000363709
6.73661799427572	26.6062812554829	14.14878683	27.98719075	10.13344558
6.73661799427572	26.6062812554829	8.026602483	29.17059173	9.758103666
6.73661799427572	26.6062812554829	2.518275748	30.45426362	5.70976178
6.73661799427572	26.6062812554829	1.354188569	31.31594018	7.295671947
6.73661799427572	26.6062812554829	10.79914705	20.42039499	9.255684285
6.73661799427572	26.6062812554829	3.430192849	27.39779729	6.526989384
6.73661799427572	26.6062812554829	3.815111582	26.65111472	5.810017463
6.73661799427572	26.6062812554829	2.694391803	27.62826968	5.298497076
6.73661799427572	26.6062812554829	5.584406208	23.81184943	9.409363681
6.73661799427572	26.6062812554829	4.281409798	24.72152663	3.095213609
14.8864582928353	31.7563951536555	23.06731773	35.0375678	8.814338039
14.8864582928353	31.7563951536555	22.07359754	33.01769228	8.049766298
14.8864582928353	31.7563951536555	18.69463352	36.26547074	6.160741982
14.8864582928353	31.7563951536555	19.64225061	34.99214308	6.554722745
14.8864582928353	31.7563951536555	14.50630809	38.16565664	6.420525444
14.8864582928353	31.7563951536555	12.65054039	38.20990532	8.455350331
14.8864582928353	31.7563951536555	18.74305811	29.30240259	6.990859055
14.8864582928353	31.7563951536555	10.78091353	34.08373955	6.747292093
16.8168374220055	28.596922000995	22.33900559	31.60235215	6.287046338
16.8168374220055	28.596922000995	16.76117492	28.31246812	0.289848796
24.7814944226449	26.9941991480028	24.87958822	27.09583401	0.141251684
24.7814944226449	26.9941991480028	20.73212412	24.23741148	6.929326091
24.7814944226449	26.9941991480028	18.71921477	25.10440199	9.380442313
24.7814944226449	26.9941991480028	18.39694528	22.72524013	8.568057279
24.7814944226449	26.9941991480028	17.16840861	23.65521269	10.62185038
27.2661951400681	26.9941991480001	27.26619514	25.90196542	1.092233728
27.2661951400681	26.9941991480001	24.09498187	20.3828805	10.45340098
27.2661951400681	26.9941991480001	21.70527032	21.60018691	8.932392927
28.6208871279995	27.7443236799268	30.34406593	27.74432368	1.723178802
28.6208871279995	27.7443236799268	29.56587444	24.57869021	7.997446269
28.6208871279995	27.7443236799268	28.59013959	24.83311171	10.05513054
28.6208871279995	27.7443236799268	24.70443529	26.12365999	8.158816457
28.6208871279995	27.7443236799268	23.31975826	27.34182644	8.782240679
28.3718407640007	33.2762276798911	31.17947294	31.40633137	3.870118229
28.3718407640007	33.2762276798911	27.42853428	33.27622768	0.943306484
29.2067311579832	36.8174001824814	30.28185343	43.77834378	7.043480934
29.2067311579832	36.8174001824814	29.65914735	42.12761495	5.483604448
29.2067311579832	36.8174001824814	30.83636789	38.35208021	5.711258926
29.2067311579832	36.8174001824814	28.54401437	40.13690379	5.278992328
29.2067311579832	36.8174001824814	29.90863496	38.4851443	2.311172422
29.2067311579832	36.8174001824814	23.91492832	35.50451908	5.452232026
31.80606468	36.0695228250009	31.80606468	35.45021175	0.619311075
31.80606468	36.0695228250009	25.40396983	32.32053998	11.43146897
31.80606468	36.0695228250009	26.37919279	28.3108891	11.05276225
32.7061536246876	38.0162170806697	30.41452332	39.55317391	2.75931255
32.7061536246876	38.0162170806697	25.99458773	34.37910238	11.0175516
36.1482050521324	38.0162170806697	35.17250587	39.36136713	1.66175135
36.1482050521324	38.0162170806697	28.08331623	42.02257662	9.317039589
38.1629026171506	39.8673089333511	38.90241804	39.45548462	0.84645279
38.1629026171506	39.8673089333511	38.78467609	39.06908374	2.608214338
38.1629026171506	39.8673089333511	41.09480481	34.92509896	6.686212606
38.1629026171506	39.8673089333511	32.06711817	41.12824267	9.236365321
38.1629026171506	39.8673089333511	37.51752459	33.09106605	9.30247437
38.1629026171506	43.482506778692	42.25980634	46.86827481	6.991437475
38.1629026171506	43.482506778692	35.40868681	49.33377596	6.467074744
38.1629026171506	43.482506778692	41.57443341	43.13832473	5.186489261
38.1629026171506	43.482506778692	39.58652985	43.55288071	5.227108341
38.1629026171506	43.482506778692	38.72818734	43.64397508	6.801536894
38.1629026171506	43.482506778692	34.31056081	43.95356429	3.881034988
43.0157981869999	45.00092033	43.11381093	45.00092033	0.098012743
43.0157981869999	45.00092033	40.57741767	42.47262	3.80870253
41.2179071141779	48.9448323799105	41.84687745	52.15158968	3.267858024
41.2179071141779	48.9448323799105	43.66555329	47.77139353	2.714393217
41.2179071141779	48.9448323799105	39.96945525	49.46230999	2.614076519
39.959807718004	49.44131071	39.67150404	49.44131071	0.288303678
39.959807718004	49.44131071	37.58124673	53.7047325	6.278048118
39.959807718004	49.44131071	43.74535734	43.87626012	7.961235625

Solution x	Solution y	Original x	Original y	Radius
39.959807718004	49.44131071	33.45977848	51.47641849	7.198818879
39.959807718004	49.44131071	34.17044541	50.63731129	11.2605766
39.959807718004	49.44131071	31.52001616	50.89228775	10.98721573
39.959807718004	49.44131071	39.91233765	41.2977364	9.100834641
39.959807718004	49.44131071	30.55507662	47.73107042	10.01719534
39.959807718004	49.44131071	31.80593192	45.60640645	10.76621751
39.959807718004	49.44131071	34.06373355	42.77086753	11.54083384
39.9598077180039	53.2688062374988	39.86159624	55.58185516	2.315133001
48.8072393315554	52.7822028751225	47.38308024	49.71863955	4.361961303
48.8072393315554	52.7822028751225	48.01348394	55.67625048	3.794373864
48.8072393315554	52.7822028751225	48.91348948	54.77748717	1.998111236
48.8072393315554	52.7822028751225	52.57887869	54.16196226	4.016092555
49.6576229018276	49.7323296892675	50.26037041	48.95030273	0.987355419
49.6576229018276	49.7323296892675	53.22205568	50.84724902	8.874987766
49.6576229018276	49.7323296892675	54.43373891	52.12894009	7.548403707
49.6576229018276	49.7323296892675	48.35826716	45.69665672	9.422444764
49.6576229018276	49.7323296892675	47.65008175	45.51867646	10.88958897
49.6576229018276	49.7323296892675	45.94832838	45.50704308	7.19052718
49.6576229018276	49.7323296892675	55.80484172	50.30189669	7.040116877
49.6576229018276	49.7323296892675	49.81718199	39.89953162	11.40867509
49.6576229018276	49.7323296892675	57.35658457	43.71456461	10.0633535
51.8127919449028	45.1618071746969	49.48945411	49.44119699	4.953096168
51.8127919449028	45.1618071746969	51.65508094	43.85648581	1.762166358
51.8127919449028	45.1618071746969	53.79810347	45.16180718	1.985311525
51.8127919449029	43.006522966894	51.12261026	42.05252276	1.177483398
48.2314324970898	39.2731794571902	48.20619517	39.24794213	0.03569097
48.2314324970898	39.2731794571902	49.49892788	30.73465222	9.148611436
48.2314324970898	39.2731794571902	48.88810081	29.6929228	11.17097838
48.2314324970898	39.2731794571902	39.35568633	35.06788426	9.948736286
51.0639085808363	40.1535471269995	49.90577559	41.072269	2.801182703
51.0639085808363	40.1535471269995	52.03099226	42.50134863	7.192186477
51.0639085808363	40.1535471269995	51.33580352	40.30660727	4.986289138
51.0639085808363	40.1535471269995	55.55130491	39.21526309	11.86807905
51.0639085808363	40.1535471269995	58.48548965	38.49282405	11.79894595
57.5616622183551	40.1535471269995	57.56166222	41.97700689	1.823459763
57.5616622183551	40.1535471269995	59.28037529	42.02965748	8.171091803
57.5616622183551	40.1535471269995	58.14893689	37.55022655	9.288752836
57.5616622183551	40.1535471269995	63.54041364	40.47906672	10.09103037
57.5616622183551	40.1535471269995	63.76560063	37.45231942	11.55334525
60.364601227227	38.3650457166825	63.41360315	44.69674786	7.070238855
60.364601227227	38.3650457166825	56.1557774	36.1071959	6.201998603
60.364601227227	38.3650457166825	63.12520069	41.24941139	6.279661735
60.364601227227	38.3650457166825	61.01859213	37.82208646	0.850005209
60.364601227227	38.3650457166825	58.09138733	33.97784367	4.941158085
60.9667190949999	46.4808444999763	57.48443808	43.25173204	5.068521277
60.9667190949999	46.4808444999763	63.21772914	46.4808445	2.251010045
60.9667190949978	49.9655521513537	64.75792457	49.92103542	4.153788299
60.9667190949978	49.9655521513537	67.10787364	49.80646667	8.845260172
60.9667190949978	49.9655521513537	71.99750065	50.82091856	11.82057255
58.7005594890664	53.7992615827213	58.50503897	53.8647284	0.206189664
58.7005594890664	53.7992615827213	63.59211348	50.34808715	9.725987624
58.7005594890664	53.7992615827213	59.77266019	58.01872841	6.553588622
58.7005594890664	53.7992615827213	62.81703196	55.94894639	5.494902887
58.7005594890664	53.7992615827213	61.56325619	58.635877	7.786489382
58.1876779473754	58.0158613752269	56.36080227	54.43871329	4.01664825
58.1876779473754	58.0158613752269	57.09480153	60.45993374	2.677287543
55.4150567246035	58.0158613752269	55.16481024	55.42346911	2.604442543
55.4150567246035	58.0158613752269	55.40337389	57.61168804	1.863254992
53.7622566771722	63.5872176705317	54.15102156	63.89433124	0.495436049
53.7622566771722	63.5872176705317	54.03625818	65.02303827	5.354401863
53.7622566771722	63.5872176705317	56.20333441	63.09635143	7.090992634
53.7622566771722	63.5872176705317	57.97334153	65.39941546	9.414607276
53.7622566771722	63.5872176705317	59.10597324	64.72617137	7.277653794
53.7622566771722	63.5872176705317	59.0134746	66.34233581	8.63026105
53.7622566771722	63.5872176705317	56.84900895	69.27095699	9.651018813
53.7622566771722	63.5872176705317	58.20433528	69.50520456	8.582697416
53.7622566771722	63.5872176705317	53.90080059	74.55382457	11.74270355
51.196259201672	65.6529121841114	47.89205446	67.3947139	3.735189713
51.196259201672	65.6529121841114	52.45383187	66.17944394	1.363350544
48.667661118175	63.6499192000771	45.68320409	63.6499192	2.984457028
48.667661118175	63.6499192000771	50.29671492	64.07582579	2.617903286
49.1073645379949	60.88674535998	49.52719402	60.88674536	0.419829482
49.1073645379949	60.88674535998	53.50308144	57.04941766	6.080321585
49.1073645379949	60.88674535998	50.37372436	63.54183807	3.991959404
49.1073645379949	60.88674535998	52.64945222	62.68533593	7.539647236
49.1073645379949	60.88674535998	56.73611746	58.87824868	10.42122905
49.1073645379949	60.88674535998	56.12304172	60.76926662	8.549372537
49.1073645379949	60.88674535998	49.39322363	67.57061768	11.53351655
44.6177208557388	59.1179384737382	47.22851165	47.89903616	11.51868038
44.6177208557388	59.1179384737382	48.65047008	56.26343732	11.1175127

Solution x	Solution y	Original x	Original y	Radius
44.6177208557388	59.1179384737382	45.78512338	48.76667443	10.70444172
44.6177208557388	59.1179384737382	46.15723029	56.4070148	5.286178878
44.6177208557388	59.1179384737382	45.47068469	56.96814934	4.238980951
44.6177208557388	59.1179384737382	40.92420024	52.54921675	7.535927257
44.6177208557388	59.1179384737382	44.98764045	56.96391467	10.72794423
44.6177208557388	59.1179384737382	40.32660467	53.626561	11.22803277
44.6177208557388	59.1179384737382	53.70737401	57.8077763	11.42963583
44.6177208557388	59.1179384737382	42.10911161	58.06602885	5.369736734
44.6177208557388	59.1179384737382	43.40294282	59.60424206	9.536160415
44.6177208557388	59.1179384737382	52.59359138	61.87082203	8.855134315
44.6177208557388	59.1179384737382	36.93641703	55.80482127	9.247821291
44.6177208557388	59.1179384737382	44.96838238	64.05706864	9.942108139
44.6177208557388	59.1179384737382	53.04622082	62.56220406	11.46013038
44.6177208557388	59.1179384737382	41.72708173	62.5487287	8.265204335
44.6177208557388	59.1179384737382	37.67648628	59.01822185	8.663388767
44.6177208557388	59.1179384737382	42.95157888	64.84132436	9.17378456
44.6177208557388	59.1179384737382	52.68458788	66.68600654	11.1378938
44.6177208557388	59.1179384737382	38.55825219	62.0328479	8.230604564
44.6177208557388	59.1179384737382	33.50828257	58.48410354	11.3670918
41.9812032203945	60.6109820105482	41.72170476	60.36141703	0.360615737
41.9812032203945	60.6109820105482	41.10546356	60.73573959	2.160394708
41.9812032203945	60.6109820105482	39.00311055	58.98114927	3.475306118
41.9812032203945	60.6109820105482	35.39691212	60.01558524	7.016255469
41.9812032203945	60.6109820105482	37.36735143	64.72519961	8.210035462
41.9812032203945	60.6109820105482	39.83687168	68.05987049	8.931405029
41.9812032203945	60.6109820105482	38.57181853	69.29967661	10.842735
40.1532462070007	61.974181689956	38.87334077	61.97418169	1.279905437
40.1532462070007	61.974181689956	36.53251416	65.89826385	7.253690252
40.1532462070007	61.974181689956	34.32584869	66.311045	8.8122254
40.1532462070007	61.974181689956	33.57300136	70.51852673	11.82127081
40.5679234442054	67.5223692285407	41.95981534	64.94436816	2.929752986
40.5679234442054	67.5223692285407	39.73860453	66.92518954	1.039178085
40.5679234442054	67.7879924200247	44.42598809	67.45202223	3.872665591
40.5679234442054	67.7879924200247	40.91327599	65.05437313	3.322312195
40.5679234442054	67.7879924200247	41.30767537	70.05965636	2.389077221
36.9911720900008	67.5223692285407	38.18944723	65.54612606	4.457511574
36.9911720900008	67.5223692285407	39.12047899	68.75765335	3.957947734
36.9911720900008	67.5223692285407	37.43465738	70.14594443	3.15595335
36.99117209	65.2614901010234	36.99117209	62.09652931	3.164960791
36.99117209	65.2614901010234	36.88863481	65.11756178	1.700574542
33.8738306432236	65.2614901010463	38.05290287	66.43336709	5.771110944
33.8738306432236	65.2614901010463	32.14669335	66.5741861	2.169371802
34.223938901271	59.4453021647751	32.83493269	54.50530143	5.131563652
34.223938901271	59.4453021647751	36.65639834	59.2724504	2.438593171
34.223938901271	59.4453021647751	34.15128455	57.37934974	3.806785854
32.5749033388432	60.1058092812881	32.47933058	60.09950546	0.095780428
32.5749033388432	60.1058092812881	26.97467166	54.66512134	11.66012717
32.5749033388432	60.1058092812881	32.28903103	63.37386507	5.529867185
32.5749033388432	60.1058092812881	28.86030824	61.83789689	5.323228343
32.5749033388432	60.1058092812881	26.36749261	61.24478927	10.05967123
32.5749033388432	60.1058092812881	22.84438078	60.01413405	9.832099483
32.5749033388432	60.1058092812881	21.56136042	60.00845368	11.66584778
32.5749033388432	60.1058092812881	30.01509861	69.93828769	10.72586107
31.7348765784172	62.6906982450551	31.78300706	62.74548174	0.072923073
31.7348765784172	62.6906982450551	33.85806756	68.2147305	8.272925857
31.7348765784172	62.6906982450551	27.36103425	64.84526011	5.82414556
31.7348765784172	62.6906982450551	26.6523776	66.91672378	7.970867369
29.517675711006	65.01108227	29.47881008	65.01108227	0.038865631
29.517675711006	65.01108227	24.37529212	73.10827156	9.946110191
29.517675711006	65.01108227	22.14002238	72.37729838	10.56803504
31.6133502290883	70.2611189391858	31.96159565	70.60936436	0.492493397
31.6133502290883	70.2611189391858	31.67974116	78.20082263	10.5302733
31.6133502290883	70.2611189391858	24.84752889	78.21896812	11.0945574
28.7445473357182	70.1162755676256	28.77703399	67.75671878	2.359780417
25.2188183049535	69.7862997674541	26.03259253	67.05188068	2.852941681
25.2188183049535	69.7862997674541	23.39691794	71.43920824	2.45996491
24.3449444700639	69.0643265040729	24.34494447	68.89894191	0.165384594
24.3449444700639	69.0643265040729	24.00842436	69.26671548	3.536360214
24.3449444700639	69.0643265040729	22.95220857	73.2582761	8.329429805
24.3449444700639	69.0643265040729	21.60880813	73.64895737	8.789616797
24.3449444700639	69.0643265040729	22.95922483	75.83051285	9.548150341
24.3449444700639	69.0643265040729	20.16006997	73.55306832	7.784192094
24.3449444700639	69.0643265040729	18.49430275	75.1491321	9.770365975
24.3449444700639	69.0643265040729	18.79013692	77.54174683	11.83768723
23.1248556581043	69.064326504073	21.2618816	68.31108552	3.123606085
23.1248556580003	70.1683697460421	21.52581462	69.05739134	1.947101759
23.1248556580003	70.1683697460421	14.01917911	69.22007201	9.959122763
23.1248556580003	70.1683697460421	15.83973733	72.60736968	9.12349234
23.1248556580003	72.9080834128156	22.68191696	72.90808337	0.442938698
23.1248556580003	72.9080834128156	17.24413003	73.14298035	6.329084859

Solution x	Solution y	Original x	Original y	Radius
23.3679478069969	73.8368918963765	23.86908483	73.83689183	0.501137023
23.3679478069969	73.8368918963765	18.31523717	76.27495825	7.153261702
23.3679478069969	73.8368918963765	21.51917751	80.74471553	9.9567065
23.3679478069969	73.8368918963765	18.15807888	79.40011164	9.804701845
23.3679478069969	73.8368918963765	14.09860615	77.68853822	11.70742841
23.3679478069969	73.8368918963765	19.16596982	83.58117432	11.91490763
21.0474950800352	76.2568214834297	21.16552744	75.92926841	0.348170438
21.0474950800352	76.2568214834297	19.47269695	75.25893863	3.538510883
21.0474950800352	76.2568214834297	22.96398221	79.24584246	5.253467184
21.0474950800352	76.2568214834297	18.46683587	77.29301103	4.716670657
21.0474950800352	76.2568214834297	18.15532249	77.80652015	5.054973135
21.0474950800352	76.2568214834297	20.11668251	80.56671914	7.222669816
21.0474950800352	76.2568214834297	14.92906226	79.42060964	9.914113666
21.0474950800352	76.2568214834297	12.87616068	80.54131267	11.25097601
21.047495080035	76.3834967839874	21.04749508	76.84597788	0.462481096
21.047495080035	76.3834967839874	19.29153506	80.52426775	5.162100755
21.047495080035	76.3834967839874	17.20155001	81.69531761	7.066943728
16.2365550636696	76.3834967839875	15.50686687	76.44859369	0.73258615
16.2365550636696	76.3834967839875	16.93400358	77.9224885	2.955652193
16.2365550636696	76.3834967839875	9.360499311	76.63383999	9.675555003
16.2365550636696	76.3834967839875	8.595205897	76.73972439	10.65699304
16.2365550636696	76.3834967839875	10.82142722	82.89323555	9.472743412
12.6353767392707	74.3487219363816	16.80968797	72.84815948	5.35823493
12.6353767392707	74.3487219363816	11.56644578	72.10851879	2.482161061
12.6353767392707	74.3487219363816	10.28504553	75.43578797	2.70670664
12.6353767392707	74.3487219363816	8.675234817	76.17385221	4.360484441
14.9546427145948	72.9759561231833	13.34199807	71.15108407	2.435319437
14.9546427145948	72.9759561231833	14.67447984	73.22055772	0.560824618
14.9546427145948	67.7468377630111	16.29427026	68.63097998	1.605088602
14.9546427145948	66.6824217946541	14.11476256	66.58488992	0.845524181
14.9546427145948	66.6824217946541	8.880939202	67.16779099	7.575125342
16.4659474235762	66.6824217946541	15.77830732	66.19409337	0.843394073
16.4659474235762	66.6824217946541	9.088863996	70.57778186	9.588159879
16.4659474235762	66.6824217946541	6.041792217	70.01715429	11.62482668
16.4659474235762	64.4698452956136	16.63383213	64.77854357	0.351715097
16.4659474235762	64.4698452956136	14.06057656	63.93249207	5.381459732
16.4659474235762	64.4698452956136	10.63863267	61.64507704	8.169031835
16.4659474235762	64.4698452956136	12.00297966	63.9466553	5.950994709
16.4659474235762	64.4698452956136	13.50520564	67.72241024	9.360297306
16.4659474235762	64.4698452956136	8.933612257	64.19415642	8.119454693
16.4659474235762	64.4698452956136	14.51945543	70.49107423	7.364687094
16.4659474235762	64.4698452956136	11.73654707	68.82383733	7.948897757
16.4659474235762	64.4698452956136	11.54525803	68.93314303	9.632544021
16.4659474235762	64.4698452956136	13.78543979	72.75062985	9.733830208
16.4659474235762	64.4698452956136	9.964092428	69.02740379	10.49120227
22.336562016	64.2387596092848	22.58317288	64.23875961	0.246610864
22.336562016	64.2387596092848	21.61039636	65.83676525	4.44331993
22.336562016	64.2387596092848	17.25601024	61.69443137	6.772109512
22.336562016	64.2387596092848	19.92687299	66.4828608	7.674542398
22.336562016	64.2387596092848	20.75020952	68.82081849	6.986664743
22.336562016	64.2387596092848	16.73656026	65.26611785	7.348251841
22.336562016	64.2387596092848	14.35540419	64.70998039	9.721773775
22.336562016	64.2387596092848	14.52745655	66.82146945	9.209129847
22.336562016	64.2387596092848	19.17901123	72.48982593	10.20159412
22.336562016	61.055389402906	20.97945435	58.66863495	2.745603401
22.336562016	61.055389402906	21.30645349	61.8915326	1.625246019
24.8185928154126	61.055389402906	25.84588775	61.17671521	1.034434548
24.8185928154126	61.055389402906	26.46280572	62.61127777	3.79783788
24.8185928154126	61.055389402906	26.36495426	64.10386589	5.012038977
24.8185928154126	61.055389402906	25.20403775	63.98638021	4.126692706
24.8185928154126	61.055389402906	24.66562586	67.58605744	8.251747258
24.4000108650918	58.82740751	24.05460087	58.82740751	0.345409995
24.4000108650918	58.82740751	18.97844246	66.0992932	9.320379407
25.7780806503136	56.5625807623341	25.6524776	56.5792119	0.126699333
25.7780806503136	56.5625807623341	19.29354577	63.34226321	9.732805781
25.956829732961	54.0629844264186	30.18073163	48.32029982	9.58620967
25.956829732961	54.0629844264186	27.13020332	56.00735022	9.113612959
25.956829732961	54.0629844264186	29.89833465	58.88393924	9.428399067
25.956829732961	54.0629844264186	24.61643689	54.01115924	7.411713322
25.956829732961	54.0629844264186	28.38294287	59.7022254	6.876187581
25.956829732961	54.0629844264186	28.66025221	61.13181458	8.682831908
25.956829732961	54.0629844264186	18.10483235	51.48322234	8.264928029
25.956829732961	54.0629844264186	20.53092136	55.63617906	5.894866268
25.956829732961	54.0629844264186	24.68488711	59.85199485	7.587909595
25.956829732961	54.0629844264186	24.58618772	59.92581691	6.813403422
25.956829732961	54.0629844264186	25.08011935	60.4806985	8.52356797
25.956829732961	54.0629844264186	20.16713628	56.2637712	7.589009856
25.956829732961	54.0629844264186	25.66105506	62.27941228	9.39136023
26.9161562750253	54.0629844264186	33.45872958	53.85918585	6.545746658
26.9161562750253	54.0629844264186	28.94274384	52.01860718	4.898024634

Solution x	Solution y	Original x	Original y	Radius
26.9161562750253	54.0629844264186	28.17203359	56.51587977	4.557563307
26.9161562750253	54.0629844264186	23.68432498	51.4412716	4.840858032
26.9161562750253	54.0629844264186	22.00300591	49.77440842	6.521574248
26.9161562750253	54.0629844264186	23.29263587	57.34435722	5.760491154
26.9161562750253	54.0629844264186	22.06521443	57.50548607	6.030659205
30.6547660710398	50.7224507794003	34.68773061	48.27076221	4.719701242
30.6547660710398	50.7224507794003	31.12121771	52.61678334	1.950915934
30.6547660710398	50.7224507794003	28.72359173	49.06807614	3.019170961
23.6039313221067	48.6759142499048	22.81585575	48.67591425	0.788075572
23.6039313221067	48.6759142499048	20.72246404	50.29048837	3.507005939
23.6039313221067	48.6759142499048	16.47526591	49.4455512	9.818184126
23.6039313221067	48.6759142499048	17.44262234	43.68368222	10.91295355
23.6039313221067	48.6759142499048	19.77510428	38.58926296	11.91376449
25.7003216599963	45.3412119236754	26.12441872	44.96485891	2.839436564
25.7003216599962	45.3402119236754	27.37711129	46.43616017	2.003178979
25.7003216599962	45.3402119236754	18.80954314	50.67936902	11.57690137
25.7003216599962	45.3402119236754	22.68802089	46.28526246	10.38254064
25.7003216599962	45.3402119236754	24.77779172	44.04083387	11.013687
25.7003216599962	45.3402119236754	19.40209516	41.66020767	11.97444555
25.7003216599963	44.7372689246269	25.73174612	44.02606181	0.711901016
25.7003216599963	44.0416276396133	25.71821347	44.02373583	0.02530284
25.7003216599963	44.0416276396133	14.44281578	41.35822358	11.77700274
22.1142722646892	44.4042915431194	30.62796082	46.77730777	8.83821808
22.1142722646892	44.4042915431194	30.33187934	43.75504148	8.637269115
22.1142722646892	44.4042915431194	26.567735	46.7768569	5.167125033
22.1142722646892	44.4042915431194	27.06311365	42.64274924	7.281813729
22.1142722646892	44.4042915431194	23.73647568	45.21539639	5.188751838
22.1142722646892	44.4042915431194	23.40792676	43.64379836	8.702120093
22.1142722646892	44.4042915431194	19.18169919	47.05766373	3.954790614
22.1142722646892	44.4042915431194	22.79879511	41.59634367	7.012240784
22.1142722646892	44.4042915431194	18.21468575	45.65080463	4.897381571
22.1142722646892	44.4042915431194	18.21138052	45.58660191	4.414503197
22.1142722646892	44.4042915431194	17.93093151	43.30092715	5.511425972
18.1621892077247	44.2921781177341	17.80089583	46.64512233	2.679415185
18.1621892077247	44.2921781177341	17.47416259	43.6041515	0.973016574
18.248121787973	50.4047229676028	18.13426387	49.15791018	1.2520007
18.248121787973	50.4047229676028	11.99216143	50.52822644	8.464820885
18.248121787973	50.4047229676028	8.078510661	52.12465727	11.74516273
18.248121787973	50.4047229676028	9.196765131	46.15569372	11.9809647
18.248121787973	50.4047229676028	12.31993183	42.07287161	11.95610617
18.24812178791	52.9258079101142	20.37447933	52.92580791	2.126357542
18.24812178791	52.9258079101142	16.54761864	53.09785344	6.228334506
15.83763760051	54.991720671	15.36448886	54.97389236	0.473484508
15.83763760051	54.991720671	9.891024822	52.16610985	9.993987041
15.83763760051	54.991720671	13.89109091	56.92730438	9.141496171
15.83763760051	54.991720671	16.07158763	60.00636388	7.250262131
15.83763760051	54.991720671	9.265122262	48.10149258	9.899762573
15.83763760051	54.991720671	13.17908278	60.05355856	7.781969298
15.83763760051	54.991720671	10.83705181	59.65376627	8.510330825
15.83763760051	54.991720671	11.71156616	63.23151575	10.95254356
15.83763760051	54.991720671	4.692804385	58.08052349	11.75765381
15.83763760051	54.991720671	8.011277516	61.69215045	10.57580758
15.83763760051	54.991720671	10.36857839	64.9958121	11.82219863
13.2177104300492	54.9917206709072	17.45311026	57.02027397	4.698442012
13.2177104300492	54.9917206709072	13.21771043	55.16074821	0.169027539
13.2177104300492	54.9917206709072	11.86612062	56.83051802	3.1512409
10.4558439694725	52.7142411454397	7.880864255	53.63419396	2.73437995
10.4558439694725	52.7142411454397	6.810990128	49.52757429	9.894324521
10.4558439694725	52.7142411454397	3.857750749	53.93522034	9.829595519
10.4558439694725	52.7142411454397	3.684518627	54.75346427	10.66155854
10.4558439694725	52.7142411454397	0.073554416	50.20291794	11.48330524
10.4558439694725	50.2715886123859	14.81228179	50.29125842	4.356482226
10.4558439694725	50.2715886123859	12.24975114	50.92735248	3.387131358
10.4558439694725	50.2715886123859	10.84189087	50.74783931	3.28397178
10.4558439694725	50.2715886123859	10.16802995	51.02082052	0.802611588
10.4558439694725	50.2715886123859	7.342191074	50.36568708	3.656790591
10.3913959530815	48.8203806195512	12.77181014	48.33401693	2.429592834
10.3913959530815	48.8203806195512	10.30388261	47.84277995	0.981509885
10.222281001617	48.8203806195512	8.811692105	48.50504439	1.445405816
10.222281001617	48.8203806195512	8.736047039	47.86465463	7.075947311
10.222281001617	48.8203806195512	9.954481978	42.50823893	10.6166074
10.222281001617	48.8203806195512	8.013859219	41.41457221	9.523443187
9.83317711143224	42.1305733890095	9.755265232	43.18329059	1.339232837
9.83317711143224	42.1305733890095	11.00474377	35.14184161	10.56540176
9.832177112	42.1305733890003	10.71615729	46.62293177	5.678630364
9.832177112	42.1305733890003	12.97854061	40.66549102	4.434042673
9.832177112	42.1305733890003	9.020444459	42.86210706	2.418478506
9.832177112	42.1305733890003	9.832177112	38.08691559	4.043657799
4.96011657389133	42.1305733890095	10.20301226	47.6234059	9.015245558
4.96011657389133	42.1305733890095	13.48749824	42.29987548	9.005353542

Solution x	Solution y	Original x	Original y	Radius
4.96011657389133	42.1305733890095	6.962926975	47.87740863	8.307462013
4.96011657389133	42.1305733890095	5.668356774	43.14782971	8.305775856
4.96011657389133	42.1305733890095	7.974625907	40.8370263	8.509762243
4.96011657389133	42.1305733890095	7.871697725	40.35198819	6.3641027
4.96011657389133	42.1305733890095	6.302525489	40.0085763	3.025946417
4.96011657389133	42.1305733890095	6.668915236	38.80565327	8.512380576
4.96011657389133	42.1305733890095	2.885836634	40.60849192	7.864786769
4.96011657389133	42.1305733890095	0.094225631	39.91558536	5.346313369
3.72567426361348	46.3839736199663	1.775610616	46.38397362	1.950063647
3.72567426361348	46.3839736199663	0.224660494	41.43611847	9.809410917
4.32761718008145	51.831180975415	8.915897502	48.83105962	5.482065711
4.32761718008145	51.831180975415	5.283007933	51.8957834	3.483971696
4.32761718008145	51.831180975415	5.351054934	54.87903352	3.370669882
4.32761718008145	51.831180975415	3.166581108	54.38581172	2.806090341
4.32761718008145	51.831180975415	3.200690229	54.90401263	3.339909369
3.60871175767529	54.0969567083034	1.250751092	48.74029716	5.852672895
3.60871175767529	54.0969567083034	0.102323447	55.05645207	3.635297833
3.60871175767529	59.1589487538669	0.715064701	54.34039001	5.620649576
3.60871175767529	59.1589487538669	3.164572856	61.67055704	3.732266773
8.1100353096236	64.5452265113737	8.077114598	60.52651503	4.01884632
8.1100353096236	64.5452265113737	11.17807544	66.07771318	3.944211846
8.1100353096236	64.5452265113737	9.897889543	67.94003152	3.836811672
8.1100353096236	67.3077240102338	3.336609071	66.34370608	10.13002568
8.1100353096236	67.3077240102338	3.702577787	67.55965669	9.862533299
8.1100353096236	67.3077240102338	0.793870075	65.00803843	9.318627115
8.1100353096236	67.3077240102338	0.155166122	73.1143838	9.943054863
5.89381543075365	67.3077240102338	3.390983182	60.32064994	8.156128877
5.89381543075365	67.3077240102338	6.334374787	68.85467086	1.608457989
5.89381543075365	67.3077240102338	6.979895184	73.91637244	7.031194882
5.89381543075365	67.3077240102338	2.881941531	70.78732912	7.680996283
5.07677458132009	67.3077240102337	8.689838933	62.80875147	6.672826006
5.07677458132009	67.3077240102337	1.282619347	62.39268391	6.209124989
5.07677458132009	67.3077240102337	2.559418382	66.60707534	5.994415632
5.07677458132009	67.3077240102337	2.82031094	66.9400554	6.180554629
5.07677458132009	67.3077240102337	3.972668798	68.43095677	4.819982765
5.07677458132009	67.3077240102337	5.020361565	69.58798476	2.661868193
5.07677458132009	67.3077240102337	2.781332517	68.35625636	5.523577876
5.07677458132009	67.3077240102337	4.203561784	71.28689241	5.184520227
5.07677458132009	67.3077240102337	1.096851862	69.20060768	4.924336954
2.02654393910811	68.5195852699784	0.299902086	68.51958527	1.726641853
2.21854139783846	71.0328226047144	1.834626902	71.15202574	0.401994686
2.21854139783733	73.0783644764792	1.825477279	70.78130479	2.330446868
2.21854139783285	75.3935208072632	2.766374061	66.09545945	9.314186257
5.32987178658938	75.393520807263	3.705228073	66.5975084	9.299418871
5.32987178658938	75.393520807263	5.863440787	76.06172049	5.891195528
5.32987178658938	75.393520807263	3.252339284	73.9521337	4.320781181
5.32987178658938	75.393520807263	5.065657714	76.41830653	1.058298093
5.32987178658938	75.393520807263	9.701793671	81.23141394	8.243525166
5.32987178658938	75.393520807263	2.544714587	74.45838234	3.751572119
5.32987178658938	75.393520807263	1.009741561	74.32200243	6.745106086
5.32987178658938	75.393520807263	3.765987951	77.28123402	9.204063574
5.32987178658938	75.393520807263	3.100034102	78.61964126	6.829391359
5.32987178658938	75.393520807263	5.724809855	81.80721271	6.479054365
5.32987178658938	75.393520807263	4.961462551	81.51420623	9.226598726
5.32987178658938	75.393520807263	1.696022601	79.3379408	6.739019376
5.32987178658938	75.393520807263	3.059490558	82.05603574	7.23908529
5.32987178658938	75.393520807263	0.773453591	79.81662315	6.785233233
8.54508069899977	78.0382404100042	9.018582074	78.03824041	0.473501375
8.54508069899977	78.0382404100042	3.795442881	81.20966501	11.97973034
6.31235578630202	82.1196345119672	2.885089549	70.78781924	11.83875801
6.31235578630202	82.1196345119672	12.63857375	82.42671014	6.575237335
6.31235578630202	82.1196345119672	10.08146406	81.46406963	5.184740001
6.31235578630202	82.1196345119672	12.45480817	85.29988604	8.467366828
6.31235578630202	82.1196345119672	5.042739397	78.40053531	10.26257011
6.31235578630202	82.1196345119672	7.992357197	82.08091397	4.51998708
6.31235578630202	82.1196345119672	11.28159713	86.83718755	7.508047868
6.31235578630202	82.1196345119672	7.936374341	83.63932008	7.056138248
6.31235578630202	82.1196345119672	12.03430063	87.78817585	9.339380238
6.31235578630202	82.1196345119672	5.779054124	82.01317499	10.01915756
6.31235578630202	82.1196345119672	4.297539438	80.73294711	11.22405457
6.31235578630202	82.1196345119672	5.912402555	83.10767778	4.777473299
6.31235578630202	82.1196345119672	3.380314451	80.99890539	11.39696855
6.31235578630202	82.1196345119672	10.77763243	89.00986935	11.5413795
6.31235578630202	82.1196345119672	6.810206318	85.20186256	3.122176307
6.31235578630202	82.1196345119672	5.902742913	84.57417463	10.96205759
6.31235578630202	82.1196345119672	1.837820965	81.06813079	5.360711684
6.31235578630202	82.1196345119672	0.848777488	80.80421078	10.36784038
6.31235578630202	82.1196345119672	6.359309777	87.06467249	5.433004527
6.31235578630202	82.1196345119672	8.842438164	89.89183088	9.248878075
6.31235578630202	82.1196345119672	4.724328509	85.88211036	10.66842937

Solution x	Solution y	Original x	Original y	Radius
6.31235578630202	82.1196345119672	5.333729823	86.89695613	7.779774892
6.31235578630202	82.1196345119672	3.105512661	84.71082736	5.063715926
6.31235578630202	82.1196345119672	7.009024866	89.80852716	9.591229282
6.31235578630202	82.1196345119672	8.980893435	92.30918249	10.59560796
6.31235578630202	82.1196345119672	6.256438132	90.66257931	10.99795307
6.31235578630202	82.1196345119672	3.115821998	88.00026043	11.67905671
1.50286430089396	80.923347727074	1.451959255	80.87244268	0.071990607
1.50286430089396	80.923347727074	0.539457489	84.81338557	5.520424731
3.61063488557139	83.9714514577592	3.437419026	82.39656928	1.58437925
3.61063488557139	83.9714514577592	4.377655918	84.98459142	1.270737521
3.61063488557139	87.0604375663892	6.291693293	89.27097954	4.843225065
3.61063488557139	87.0604375663892	3.319354366	86.8534104	1.444683466
3.61063488557139	87.0604375663892	2.643010323	87.48230483	1.581592217
3.61063488557139	87.0604375663892	2.887848626	89.80188387	3.077223153
3.61063488557139	92.0534488060736	3.553988961	91.38716753	0.836905203
3.61063488557139	92.0534488060736	3.298576907	92.26869515	0.379092562
1.9165239020126	95.7417225957716	2.510162792	94.82470236	1.092397933
1.91652390222157	98.2148330800047	1.662890125	98.21483308	0.253633777
7.81008667546651	98.4404888729053	7.810086676	100	1.559511127
8.52468491796083	93.6185688799821	10.35439985	93.61856888	1.829714932
8.52468491796083	93.6185688799821	8.327911253	95.97957355	8.978439052
8.52468491796083	93.6185688799821	11.51332542	99.95442641	9.875636287
8.52468491796083	93.6185688799821	8.376403562	96.83801393	9.194583524
8.52468491796083	93.6185688799821	4.440109707	94.87692744	8.411496493
8.52468491796083	93.6185688799821	3.212591442	94.51392157	10.08518593
8.52468491796083	93.6185688799821	5.819691822	97.53170939	10.47278678
8.52468491799547	90.8432392106866	6.625140742	98.72893978	8.11126017
6.02426591899975	90.6468941582493	7.178182114	91.76838261	1.609117439
6.02426591911546	89.46110654	5.838459994	89.46110654	0.185805925
6.02426591911546	89.46110654	5.231683223	94.88567828	5.753061171
6.02426591911546	89.46110654	1.725004249	93.73701725	6.881927737
6.02426591911546	89.46110654	0.846436708	97.15575264	11.19775474
7.4459092561487	88.7927680964257	6.663988874	86.9326968	2.017737523
7.4459092561487	88.7927680964257	7.085383584	88.77850283	1.129697938
7.4459092561487	88.7927680964257	6.579193932	89.24907689	0.979496385
8.30887420170194	88.1044796224086	10.40564453	91.96900158	4.396700555
8.30887420170194	88.1044796224086	5.793118726	87.72031575	2.544917974
9.94009568812902	87.9157784990002	9.940095688	86.998178	0.917600499
9.94009568812902	87.9157784990002	9.577914639	89.11916471	4.320583214
9.94009568812902	87.9157784990002	5.209294544	90.50333801	7.245222646
14.8083419265003	88.2858883054802	20.16675465	86.45561332	5.662375247
14.8083419265003	88.2858883054802	15.06397637	86.4956065	2.769631739
14.8083419265003	88.2858883054802	9.921883095	86.8721598	5.099750684
14.8083419265003	88.2858883054802	9.984816242	87.60870523	5.654212003
14.8083419265003	88.2858883054802	12.48771043	90.90107319	3.496358466
14.8083419265003	92.5563369679982	14.30638295	91.72702037	2.704929464
14.8083419265003	92.5563369679982	14.02380259	94.55773265	2.149671288
16.8508056799532	92.0701612580562	16.85080568	91.45389056	0.616270698
16.8508056799532	92.0701612580562	13.01348985	89.5505908	6.625491116
16.8508056799532	92.0701612580562	16.10416337	94.62212285	7.114799892
16.8508056799532	92.0701612580562	11.04946885	95.30278919	11.15137795
18.8749495257949	92.709536012683	17.25875189	95.69940805	3.398739413
18.8749495257949	92.7729800667458	20.03955091	90.83830295	2.258156755
18.8749495257949	92.7729800667458	18.21730526	92.48725442	1.5701409
18.8749495257949	92.7729800667458	18.65944439	93.90622028	1.153549238
18.3635032930017	98.0176515199591	20.42707279	96.69258649	2.602601065
18.3635032930017	98.0176515199591	18.10270516	98.29192556	0.6619415
18.3635032930017	98.0176515199591	17.81960057	98.01765152	0.543902723
18.3635032930017	98.0176515199591	18.56973911	98.93410982	1.127429706
25.3455320400147	99.1419545459979	25.34553204	99.20543489	0.063480344
25.3455320400147	99.1419545459979	23.65267964	99.40598609	5.864138835
25.3455320400147	99.1419545459979	22.19955839	99.83998701	6.495340695
25.4455899820475	99.1419545459979	27.50072899	99.76767751	2.315046026
25.4455899820475	98.8298154221621	28.69202489	99.34571575	3.476487599
25.4455899820475	98.8298154221621	27.32463884	98.08040747	2.022977234
25.4455899820475	98.8298154221621	25.35918107	97.93925835	0.894739291
25.4455899820475	98.8298154221621	25.64004891	98.33585155	1.834844509
27.7030936899908	94.0460061100177	30.08845088	94.04600611	2.38535719
27.7030936899908	94.0460061100177	27.03699297	98.99807723	9.045435578
25.4178630652971	93.1818159799825	25.24294214	93.18181598	0.174920924
25.4178630652971	93.1818159799825	23.10855555	93.46528062	6.046811031
25.4178630652971	93.1818159799825	22.62104276	94.03699994	3.483508579
25.4178630652971	93.1818159799825	19.55892343	94.48515334	8.137719702
25.4178630652971	93.1818159799825	21.95406549	97.08230078	5.310921574
25.4178630652971	93.1818159799825	22.06521104	97.80973943	10.44097889
25.4178630652971	93.1818159799825	23.23282295	99.37897746	9.140009252
25.4178630652971	93.1818159799825	21.53298817	97.76613815	6.447332374
25.4178630652971	93.1818159799825	17.22630202	94.08640458	10.84424377
25.4178630652971	93.1818159799825	22.00240146	99.12603644	7.885601786
25.4533739233629	89.959009055581	31.03913924	88.81924735	5.700862296

Solution x	Solution y	Original x	Original y	Radius
25.4533739233629	89.959009055581	29.03165996	90.53300961	3.624031953
25.4533739233629	89.959009055581	22.46431132	85.87828698	5.64815455
25.4533739233629	89.959009055581	23.92476676	88.85275247	4.755388035
25.4533739233629	89.959009055581	24.92385591	92.07997464	3.317074037
22.2588641317655	89.959009055581	21.63379999	90.72848541	0.991362215
20.5129874295912	87.7904188643098	20.75129811	88.7330358	0.972274996
20.5129874295912	87.7904188643098	15.25088212	86.85170355	8.312417494
20.5129874295912	86.0673035275945	17.38954679	82.23173111	4.9464631
20.5129874295912	86.0673035275945	18.16441332	83.32201509	4.389263708
20.5129874295912	86.0673035275945	20.47481611	85.68176763	4.269604774
20.5129874295912	86.0673035275945	21.4032788	88.65695382	2.971051139
20.5129874295912	86.0673035275945	18.85500198	86.61471751	1.746017703
28.8030734344709	86.6511427657218	28.95022635	86.79829568	0.208105648
28.8030734344709	86.6511427657218	30.46512782	92.10545477	8.699579279
28.8030734344709	86.6511427657218	30.51609732	92.20951413	7.873323153
28.8030734344709	86.6511427657218	30.18341718	92.15484297	6.43104448
28.8030734344709	86.6511427657218	24.68088332	89.71453351	5.772547732
28.8030734344709	86.6511427657218	26.20322759	94.45704722	10.10698797
28.8030734344709	86.6511427657218	21.61123904	90.19731465	9.443600344
28.8030734344709	86.6511427657218	25.58817455	94.62259734	11.27075496
28.8030734344707	84.6246665707228	28.34961296	82.66841267	2.008122438
28.8030734344709	81.5691389754773	29.49613778	81.77737157	0.723751207
28.8030734344709	81.5691389754773	30.96168192	84.99460949	5.800733164
28.8030734344709	81.5691389754773	31.92346769	85.96439053	5.672562244
28.8030734344709	81.5691389754773	25.47356848	81.94258519	6.220239291
28.8030734344709	81.5691389754773	24.67927032	81.21698222	7.738446369
28.8030734344709	81.5691389754773	28.94608169	87.05476962	8.550013673
28.8030734344709	81.5691389754773	26.49994117	86.49656314	11.41565502
28.8030734344709	81.5691389754773	24.93956922	85.18138774	10.96633056
28.8030734344709	81.5691389754773	24.79158589	85.73273425	9.89839469
23.8252631211918	80.4714379999672	23.53960858	80.471438	0.285654541
23.8252631211918	80.4714379999672	16.23739593	85.87006787	9.998633909
27.3572246966766	76.0523129690045	28.17365085	71.94302821	4.360337135
27.3572246966766	76.0523129690045	29.09610379	74.18683092	3.584248474
27.3572246966766	76.0523129690045	25.63863856	75.55318582	1.789599458
28.44331265	76.0523129690002	28.44331265	74.98671685	1.065596119
28.44331265	76.0523129690002	25.39416892	74.01493111	4.846769394
28.44331265	76.0523129690002	27.46499326	78.56518576	6.680683032
28.44331265	76.0523129690002	24.57644237	79.57543571	7.621327433
30.4748757054883	77.1272828315918	35.03662295	76.31902131	4.632798788
30.4748757054883	77.1272828315918	32.43971284	75.52883521	2.656140818
30.4748757054883	77.1272828315918	31.34183617	77.86791685	1.166905359
30.4748757054883	77.1272828315918	29.81370195	76.77877617	0.987897175
30.4748757054883	77.1272828315918	31.54519137	79.16359507	3.505835342
30.4748757054883	77.1272828315918	29.7776223	79.3796747	3.220365403
30.4748757054883	77.1272828315918	29.05539546	78.84402949	4.430792212
32.2517778934998	80.8132814783712	35.96077646	77.38727187	5.108866084
32.2517778934998	80.8132814783712	32.56942546	80.98884638	0.362936649
32.2517778934998	80.8132814783712	32.77989789	83.25231939	4.247864371
37.1018121016174	81.6857395224642	38.78697828	81.20736169	1.751750667
37.1018121016174	81.6857395224642	32.21271953	85.45061531	9.951664756
37.3771789409485	84.8011742173654	38.25086273	84.70191635	0.879303979
37.3771789409485	84.8011742173654	36.90788531	88.78292268	8.871911482
37.3771789409485	84.8011742173654	36.43143728	90.48214242	6.954373264
37.3771789409485	84.8011742173654	32.87814817	90.10176773	9.598818493
37.3771789409485	84.8011742173654	36.31961338	94.1541845	11.14531248
37.8472307089994	86.8894024199285	38.21932161	86.88940242	0.372090901
37.8472307089994	86.8894024199285	37.64776281	91.60925844	7.287109974
37.8472307089994	86.8894024199285	33.91919319	90.52236574	7.193036058
37.8472307089994	86.8894024199285	32.33676606	89.56266763	6.977995049
37.8472307089994	86.8894024199285	35.60188133	93.1465045	7.692381008
37.8472307089994	86.8894024199285	30.78074407	88.67743671	9.308222123
37.8472307089942	92.7101879108476	35.55901251	90.85604615	4.28990011
37.8472307089942	92.7101879108476	36.26720319	91.81523904	3.763004237
37.8472307089942	92.7101879108476	36.86677729	93.06343809	3.595056547
37.8472307089942	92.7101879108476	39.84944538	96.227912	4.047622309
37.8472307089641	96.6528967048391	37.83606476	96.13365876	0.51935799
37.8472307089641	96.6528967048391	34.28587406	93.01320732	5.515074689
37.8472307089641	96.6528967048391	33.84742868	94.52834747	8.71001742
37.8472307089641	96.6528967048391	31.89808649	95.62749105	8.151929048
36.8709366300005	97.2623379199522	35.84999591	97.26233792	1.02094072
36.870936630009	98.3991241148211	36.49499514	99.8776323	1.525555131
37.0706904879326	97.2733204392676	37.35558564	97.30806318	0.287005759
37.0706904879326	97.2733204392676	31.65500689	99.46882276	7.475813284
39.3322895806035	97.2733204393536	36.79414467	92.2553405	5.623371076
39.3322895806035	97.2733204393536	39.44288188	96.38027853	1.997947716
39.3322895806035	97.2733204393536	41.23951851	98.4925435	2.263631388
39.3322895806035	97.2733204393536	39.47053756	98.01039691	1.338634383
39.3322895806035	97.2733204393536	37.87107476	99.67477247	5.142647072
39.3322895806035	97.2733204393536	37.35140359	99.57591236	4.551929256

Solution x	Solution y	Original x	Original y	Radius
39.3322895806035	97.2733204393536	35.92075185	99.04269187	5.09129157
44.5308113186609	97.2285614299999	44.56970667	97.22856143	0.038895351
43.5288082718887	93.1842796409184	48.45592928	88.4082341	6.862006444
43.5288082718887	93.1842796409184	45.13861135	90.47060332	6.162353189
43.5288082718887	93.1842796409184	42.23200248	88.95299773	4.651433464
43.5288082718887	93.1842796409184	45.33430047	93.58613905	5.098588574
43.5288082718887	93.1842796409184	43.91518159	93.39792889	1.222268104
43.5288082718887	93.1842796409184	42.53215273	92.92397176	1.03008857
43.5288082718887	93.1842796409184	39.86881125	93.47781189	5.895861926
43.5288082718887	93.1842796409184	45.34071838	99.2752365	6.545950484
46.2073210600502	94.4891684979931	46.20732106	94.82215894	0.332990442
46.2073210600502	94.4891684979931	48.82360524	98.37839062	7.220914682
46.2073210600502	94.4891684979931	50.67630959	98.08417141	8.634086059
46.2073210600502	94.4891684979931	44.53236455	98.59505273	8.99567986
46.2582185400242	92.8139785900044	46.25821854	91.17761288	1.63636571
46.2582185400242	92.8139785900044	47.96746082	95.14523251	8.805162658
46.2582185400242	92.8139785900044	45.01212749	95.47966426	8.619068903
46.2582185400242	92.8139785900044	47.31578899	98.13704672	11.87713881
46.2582185400242	92.8139785900044	44.01236363	95.54242778	10.44212715
46.2582185400242	92.8139785900044	48.86252985	99.44183304	10.4064769
46.2582185400242	92.8139785900044	43.04035221	95.37042711	9.4350131
46.2582185400242	92.8139785900044	41.14116704	94.61634345	11.9580341
46.2582185400242	92.8139785900044	43.63164404	99.67485887	11.34349589
49.9008759730894	92.8139785900044	48.69087386	94.64188777	2.380405111
49.9008759730894	92.8139785900044	51.95218378	92.57992082	2.064617824
49.3873711996068	98.9619931270898	52.2623599	99.83573023	3.745784047
49.3863711996068	98.9619931270898	48.39934621	99.02729511	0.989182834
49.3863711996068	98.9619931270898	52.71570498	99.46690315	5.481309266
53.8235172181962	98.9619931270898	52.60387814	98.51053443	2.070061212
53.8235172181962	98.9619931270898	53.69991452	99.81161169	0.858562362
53.8235172181962	98.9619931270898	54.29998953	99.89190946	1.044878103
56.4772202491747	90.268832409143	49.03663551	90.65504513	8.507710049
56.4772202491747	90.268832409143	53.26472651	92.17526811	6.470026475
56.4772202491747	90.268832409143	53.29556121	92.47449182	6.766260463
56.4772202491747	90.268832409143	59.01602486	86.99268685	4.144714535
56.4772202491747	90.268832409143	54.90972966	93.30800556	7.380299806
56.4772202491747	90.268832409143	57.53422575	91.73216299	2.263638208
56.4772202491747	90.268832409143	54.09260921	96.04789718	7.918650854
56.4772202491747	90.268832409143	63.32241418	89.29380754	7.42798409
56.4772202491747	90.268832409143	61.4906739	91.40517217	5.140621126
56.4772202491747	89.7720084349622	56.30399813	89.72916428	0.18367023
56.4772202491747	89.7720084349622	61.09603132	95.38804721	8.526033691
56.4762202491748	89.7720084349632	56.15571936	89.41500769	1.432185748
56.4762202491748	89.7720084349632	57.84005051	97.24933499	10.98084378
56.4762202491748	89.7720084349632	57.43254842	97.94119843	10.09429194
55.1100159401188	87.3631436071731	55.11001594	85.68607737	1.677066237
55.1100159401188	87.3631436071731	51.98537923	93.03310405	10.9895755
55.1100159401188	87.3631436071731	54.43632749	91.92787857	10.0796961
55.1100159401188	87.3631436071731	54.10050901	92.28618361	9.480891031
55.1100159401188	87.3631436071731	58.00620671	94.64720593	11.42342539
49.9534590736458	87.3766613364208	50.20394782	81.95454381	5.63710621
49.9534590736458	87.3766613364208	52.05342714	85.82620662	2.610320997
49.9534590736458	87.3766613364208	49.19512952	89.44346883	4.342724929
49.9534590736458	87.3766613364208	49.59427698	92.51123595	5.147122326
49.0816243439277	82.4949622845946	45.32225765	79.26748614	4.954739166
49.0816243439277	82.4949622845946	49.77274656	84.13753559	4.242971999
49.0816243439277	82.4949622845946	53.61605765	80.93460352	4.795394132
49.0816243439277	82.4949622845946	51.91564321	83.24154723	4.641150631
49.0816243439277	82.4949622845946	51.44475874	86.59474587	4.908082369
44.7485388537343	81.8907763888247	46.11608956	79.13405595	3.077288175
44.7485388537343	81.8907763888247	44.66930475	80.79724102	1.096402137
44.7485388537343	81.8907763888247	45.13867401	81.86371268	0.563248674
42.6485048970966	81.8907763888247	41.14833132	82.10595877	1.515527703
42.6485048970966	81.8907763888247	40.55838899	87.88304878	7.94496914
42.6485048970966	81.8907763888247	40.16683897	89.097423	10.1742901
42.6485048970966	81.8907763888247	34.03327785	85.06694553	9.82794583
42.9257867110618	80.4010733346377	43.12816365	79.63219046	0.795070626
42.9257867110618	80.4010733346377	36.17809574	80.13104248	8.234427368
42.9257867110618	80.4010733346377	33.71990859	84.56649705	11.87467854
44.2888594519669	79.7731809299985	44.56064253	79.77318093	0.271783078
44.2888594519669	79.7731809299985	44.47086767	80.17305261	4.558123438
44.2888594519669	79.7731809299985	46.93472918	83.75304242	7.122281837
44.2888594519669	79.7731809299985	46.03038143	83.79986665	6.928032766
44.2888594519669	79.7731809299985	45.3176187	83.7901857	4.538711056
44.2888594519669	79.7731809299985	40.58416037	81.54961967	7.064640642
44.2888594519669	79.7731809299985	46.02083433	88.3362158	9.025977842
44.2888594519669	79.7731809299985	38.00030199	82.20200968	9.151482372
44.2888594519669	79.7731809299985	39.57638463	86.69599702	10.21132869
43.389163866259	73.94634335997	42.58773685	73.94634336	0.801427016
43.389163866259	73.94634335997	40.77647626	81.23711291	8.680043042

Solution x	Solution y	Original x	Original y	Radius
43.389163866259	73.94634335997	34.30971303	75.90183293	10.30780315
43.389163866259	73.94634335997	38.24583972	80.95791524	10.77332683
43.3891638660121	70.3281064120011	43.59103477	70.75648589	1.830314492
45.590845730016	70.3281064120012	45.59084573	70.21452412	0.113582292
45.590845730016	70.3281064120012	49.38151416	71.84627519	5.560857427
45.590845730016	70.3281064120012	42.13585343	68.94604524	4.750703238
45.590845730016	70.3281064120012	44.13660931	71.38940487	5.060740493
45.590845730016	70.3281064120012	47.34853229	74.63427391	8.300992216
45.590845730016	70.3281064120012	50.78444002	76.12504454	8.918500215
45.590845730016	70.3281064120012	39.75179858	71.51477588	9.864345808
45.590845730016	70.3281064120012	41.95376322	74.60739468	10.5272795
45.590845730016	70.3281064120012	41.14789047	74.75727523	7.341258219
45.590845730016	70.3281064120012	40.76978451	74.94346594	8.186468819
45.590845730016	70.3281064120012	38.19879917	73.45302115	11.60064907
45.590845730016	70.3281064120012	38.20769452	77.89743741	10.9290231
45.590845730016	70.3281064120012	36.44207057	76.13900165	11.50367704
53.6105565401311	70.6930679744321	50.86986196	67.11854893	4.50428609
53.6105565401311	70.6930679744321	53.60239056	70.80290226	0.11567415
53.6105565401311	70.6930679744321	51.90516717	74.10528304	4.497348507
55.5560240309785	71.9192181599816	55.72002047	71.91921816	0.163996439
55.5560240309785	71.9192181599816	60.79681015	75.33369853	8.472276725
51.1248835909619	73.1860436088702	51.17754367	73.39508539	0.21557261
51.1248835909619	73.1860436088702	51.91696279	73.69595809	5.533020939
51.1248835909619	73.1860436088702	53.92763119	74.12654413	8.444710151
51.1248835909619	73.1860436088702	55.90538334	73.56581582	5.910476566
51.1248835909619	73.1860436088702	49.21219028	82.18677234	11.80432558
51.1248835909619	73.1860436088702	56.76810138	74.93595817	10.01955077
51.1248835909619	73.1860436088702	57.06276587	74.98770524	9.477514768
51.1248835909619	73.1860436088702	59.09181099	73.44789922	8.247004523
51.1248835909619	73.1860436088702	53.08761619	83.0335557	11.99564131
51.1248835909619	73.1860436088702	57.82109764	79.24611201	11.76834886
50.3177190274015	76.5301202710005	49.13669956	77.10708156	1.314416719
50.3177190274015	76.5301202710005	47.14165764	77.84331314	3.855818645
50.3177190274015	76.5301202710005	47.92908542	80.11129273	4.896396861
50.3177190274015	76.5301202710005	49.62844822	78.65994225	3.895592856
50.3177190274015	76.5301202710005	49.55654528	80.81624315	5.359214828
50.3177190274015	76.5301202710005	48.20934555	82.30314786	7.596162818
50.3177190274015	76.5301202710005	51.18829335	82.80979047	7.761910446
50.3177190274015	76.5301202710005	51.49657531	83.11057243	7.887384084
50.3177190274015	76.5301202710005	55.99099974	83.60147673	11.10984141
52.2457576708696	76.5301202710008	52.24575767	74.98560476	1.544515511
52.2457576708696	76.5301202710008	52.40986372	76.90026657	0.582033584
56.7830630269994	76.77458472	55.58088554	76.52999392	3.50422197
56.7830630269994	76.77458472	58.21523833	76.77458472	1.432175303
55.9184017672504	80.871131862768	55.73082902	81.05870461	0.265267923
55.9184017672504	80.871131862768	52.83415121	85.50123146	6.270496768
55.9184017672504	80.871131862768	56.64479831	82.24679775	3.64219376
55.9184017672504	80.871131862768	55.75342338	84.56592915	5.992730061
55.9184017672504	80.871131862768	58.40265516	82.89286098	3.789211097
55.9184017672504	80.871131862768	53.87450626	88.16447802	7.742268204
55.9184017672504	80.871131862768	53.27314218	89.6748569	11.35118685
55.9184017672504	80.871131862768	62.20174968	80.96664236	8.789809443
55.9184017672504	80.871131862768	62.03157877	81.16617953	8.754951123
55.9184017672504	80.871131862768	54.48965648	89.30641789	9.13140765
62.733749793423	80.2465292165396	60.70093329	80.64454551	3.209176581
62.733749793423	80.2465292165396	63.68037897	79.29990004	1.33873582
62.0778858380016	82.5196734100182	61.67834468	82.51967341	0.399541158
64.3586678240617	83.1197163049542	61.30013954	82.69641043	3.087682485
64.3586678240617	83.1197163049542	64.88497046	82.96772641	9.339812785
69.09548968	83.1197163049542	69.09548968	84.07624055	0.956524245
69.09548968	83.1197163049542	67.89989075	88.12316705	7.944934507
69.09548968	83.1197163049542	68.01446808	90.26524455	9.658401998
69.09548968	83.1197163049542	68.11557125	90.29313921	9.036263761
69.09548968	83.1197163049542	75.38279951	84.8495864	9.738201242
73.0766930834118	83.119716304999	68.96890483	80.55619731	4.842060922
73.0766930834118	83.119716304999	69.80433177	81.60817435	4.561618689
75.2099828300011	81.4713909171605	75.20998283	80.5662569	0.905134017
75.2099828300011	81.4713909171605	82.09017124	81.333147	9.364452955
76.4347547479998	86.4930313700306	76.68533256	86.49303137	0.250577812
76.4347547479998	88.3026911599566	77.11333094	85.3156461	3.063152598
72.6603292586313	88.8531099984437	72.48804708	89.57044348	0.737731979
72.6603292586313	88.8531099984437	72.91384846	91.54886288	4.973733961
72.6603292586313	88.8531099984437	69.92952441	96.42807986	9.02685985
72.6603292586313	88.8531099984437	69.38304877	98.18671586	10.74668541
72.6603292586313	88.8531099984437	79.19703593	96.06011661	11.2419465
72.66032925863	89.1135704288765	71.22771139	93.77569631	4.877275027
64.5515195021962	89.113570428876	66.59307852	88.41880362	2.156539854
64.5515195021962	89.113570428876	64.64609008	95.09261932	9.659748021
64.5515195021962	89.113570428876	66.67195124	95.92017704	9.763847817
64.2468610814831	92.5322204222738	62.35255518	88.46202983	4.962229956

Solution x	Solution y	Original x	Original y	Radius
64.2468610814831	92.5322204222738	62.03675317	91.42777069	2.470705606
64.2468610814831	92.5322204222738	63.88368354	92.98872817	4.684052733
64.2468610814831	92.5322204222738	64.96530116	93.98228963	1.618288248
63.7521381217438	95.0509163990364	57.58318464	98.55697919	7.09566511
63.7521381217438	95.0509163990364	62.61309781	94.29391595	5.245785935
63.7521381217438	95.0509163990364	65.26732099	95.86741863	6.903660169
63.7521381217438	95.0509163990364	66.92699784	97.50570073	6.78636185
68.6864652517943	95.0509163990043	69.82339194	93.15949799	3.201208435
68.6864652517943	95.0509163990043	68.09186985	95.85522589	2.454162297
73.0497226900223	95.0509163990002	73.04972269	93.68364053	1.367275869
73.0497226900223	95.0509163990002	79.39161289	97.26593015	9.87516425
73.0497226900223	95.0509163990002	78.18108034	99.79242924	11.42083614
74.8887264707262	95.0509163990001	71.17046416	92.96230041	4.264714687
74.8887264707262	95.0509163990001	76.48394754	93.81500316	3.73579719
77.7321668322925	96.5437633820566	70.07355989	96.61021246	7.658895206
77.7321668322925	96.5437633820566	74.57969734	99.83821951	6.450291742
77.7321668322925	96.5437633820566	80.84419352	99.98848979	4.64228932
82.53992082	90.6177680068072	82.53992082	88.87907996	1.738688046
86.10921689	91.269607106605	86.10921689	91.46882481	0.199217703
86.10921689	91.269607106605	93.12739448	86.70709298	11.17874385
86.10921689	91.269607106605	86.37403118	99.02923308	11.96387757
89.1209615630671	85.6455426449114	91.90328388	76.16243153	10.02897755
89.1209615630671	85.6455426449114	87.63411723	89.72076827	4.425243646
89.1209615630671	85.6455426449114	97.99058573	82.84537681	9.301137649
89.1209615630671	85.6455426449114	91.04765146	90.60180149	7.6089096
91.8770527484251	85.6455426449113	93.29522257	74.82458329	10.91349472
91.8770527484251	85.6455426449113	94.75890926	85.83537613	2.888102094
84.8524448531331	81.6072899569158	83.77232341	73.14211564	8.533805631
84.8524448531331	81.6072899569158	86.75397464	75.23932777	8.469131771
84.8524448531331	81.6072899569158	81.4352048	82.89764497	3.652744946
85.5614063552393	74.7538586617292	81.47694776	70.94126153	6.403879885
85.5614063552393	74.7538586617292	91.59995025	72.67875795	6.385143329
72.8414372885653	74.7538586617292	65.34735437	72.80394877	7.821760947
72.8414372885653	74.7538586617292	70.36283848	70.39401036	6.760808749
72.8414372885653	74.7538586617292	73.75840634	73.11670598	1.876459737
72.8414372885653	74.7538586617292	70.83372488	78.21085961	5.320597925
72.8414372885653	74.7538586617292	70.61748839	78.65460339	7.660924967
72.8414372885653	74.7538586617292	72.09010058	81.417498	6.705862814
72.8414372885653	74.7538586617292	74.46580568	79.0435318	7.178734541
72.6949696441894	70.3272081954468	72.70378804	66.70645397	3.620764964
72.6949696441894	70.3272081954468	73.05372772	69.26625594	1.566755571
69.1263440600858	70.1873896192298	69.12634406	69.4594231	0.727966519
69.1263440600858	70.1873896192298	67.69295238	75.24403656	11.35995088
69.1263440600858	70.1873896192298	70.77169737	73.88064127	8.726232409
69.1263440600858	70.1873896192298	68.84275879	76.03221479	10.79538264
66.8108789299881	71.4187804859872	66.81087893	72.19337817	0.774597684
63.1652048610203	70.3743213087532	62.01287875	62.70691628	7.75530817
63.1652048610203	70.3743213087532	60.59756518	67.42291916	6.033901052
63.1652048610203	70.3743213087532	65.09617026	64.32634731	6.924546531
63.1652048610203	70.3743213087532	63.53725064	67.03413314	7.164195385
63.1652048610203	70.3743213087532	65.55566867	66.58332744	6.556838353
63.1652048610203	70.3743213087532	63.47892732	68.70647259	6.807486056
63.1652048610203	70.3743213087532	63.48323083	69.36201841	5.452872617
63.1652048610203	70.3743213087532	61.14896118	72.70410502	3.400508534
63.1652048610203	70.3743213087532	58.81674593	76.2826012	7.335997979
63.1652048610203	70.3743213087532	61.63608438	74.03409399	7.121975094
63.1652048610203	70.3743213087532	68.36889636	72.61479797	6.100291297
63.0186663194916	64.724620940001	61.64088805	64.72462094	1.377778269
63.0186663194916	64.724620940001	65.84999623	61.37790202	9.405960407
63.0186663194916	64.724620940001	67.45457311	72.85375456	11.61655168
65.5079821053005	62.8995790055635	61.59665848	60.86573745	4.870665397
65.5079821053005	62.8995790055635	65.33791464	63.72798066	0.84567857
65.5079821053005	62.8995790055635	67.87575086	63.89107621	2.566981804
66.6570320500264	52.6358171530002	66.65703205	47.7722791	4.863538053
66.6570320500264	52.6358171530002	71.61626861	44.97765672	11.56039904
67.7115908671892	54.9502142811644	64.66140077	51.58253517	4.820243123
67.7115908671892	54.9502142811644	65.98277732	56.02257659	2.034393571
67.7115908671892	54.9502142811644	66.67873973	56.13517049	1.600074425
67.7115908671892	54.9502142811644	67.27809665	56.79217526	1.980408171
72.6585097209418	54.9502142811643	72.73426073	54.95021428	0.075751006
72.6585097209418	54.9502142811643	71.85259834	57.85616299	6.145303146
72.6585097209418	54.9502142811643	78.85550393	52.04144231	8.272925398
72.6585097209418	54.9502142811643	74.55729645	43.48740037	11.94062462
72.6585097209418	54.9502142811643	74.85083054	64.74645556	10.29426937
72.6585097209418	54.9502142811643	76.04244622	64.45001766	10.41499903
71.0256059300441	58.1456075288991	70.94365949	58.14560753	0.08194644
71.0256059300451	60.046844571589	68.52022941	55.69012612	6.004927032
71.0256059300451	60.046844571589	72.13050555	55.03070373	5.622701454
71.0256059300451	60.046844571589	69.70404765	60.5822767	3.495543351
71.0256059300451	60.046844571589	72.84290598	65.67053988	5.910036243

Solution x	Solution y	Original x	Original y	Radius
76.7034491526344	60.0468445715745	75.75634139	60.02200009	0.947433566
76.7034491526344	60.0468445715745	74.07680751	69.16329968	10.96743145
76.7034491526344	60.0468445715745	78.83068399	69.67274441	11.30182844
80.378346781223	60.1560609903975	78.29263567	66.45988674	6.639910385
80.378346781223	60.1560609903975	85.16088414	60.47696067	4.793291165
94.8648814343844	57.6821517304505	95.77662579	57.68215173	0.911744354
92.9763861807989	53.8703292719996	91.19333201	55.09349477	2.162271031
86.5184818100296	53.8703292719996	86.51848331	50.71555717	3.154772102
82.4745459389903	53.8703292719996	83.19197135	53.48639501	0.813698186
82.4745459389903	53.8703292719996	90.50689197	55.43830225	10.39640446
79.867508750456	54.1515057240001	79.86750899	54.35421653	0.202710806
79.867508750456	54.1515057240001	85.71414415	51.67250379	10.80797757
79.867508750456	54.1515057240001	83.91646182	55.69492785	10.80258547
79.867508750456	54.1515057240001	88.60564442	53.67349247	11.4446079
79.867508750456	54.1515057240001	83.55927983	59.64747077	10.99948591
79.867508750456	54.1515057240001	87.34079917	59.37931572	11.8500657
78.945297941196	50.7877997622561	77.87000631	52.21112855	1.783848909
78.945297941196	50.7877997622561	78.92131522	50.41345477	0.375112442
78.4910710039067	46.918312839729	70.24663893	43.40548551	10.39433718
78.4910710039067	46.918312839729	74.78372311	42.05088328	8.48875153
78.4910710039067	46.918312839729	84.14082278	54.46253046	9.425227564
78.4910710039067	46.918312839729	79.30599483	40.28434635	6.78710395
78.4910710039067	46.7926291466633	77.77449926	46.72256252	0.900649502
78.4910710038588	44.7826073884065	77.14427045	45.25079579	1.425858377
72.2180074129684	44.7826073884065	64.47235297	44.07915445	7.777532307
72.2180074129684	44.7826073884065	76.57028534	49.55513485	6.459051132
72.2180074129684	44.7826073884065	73.13866372	41.71405139	6.333819835
70.6994931990834	40.7467591799837	69.67922342	40.74675918	1.020269779
70.6994931990834	40.7467591799837	75.19376171	39.75388964	11.99616742
75.0076793799447	34.6259503450001	75.00767938	29.50135545	5.124594895
87.5674828300011	36.2010492429804	87.56748283	36.27406643	0.073017187
87.5684828299451	36.2010492429804	82.01891737	31.58538586	7.858683337
87.5684828299459	33.0549861643713	84.85983095	39.85329756	7.318048431
87.5684828299459	33.0549861643713	86.50661976	33.33916758	4.865256989
87.5684828299459	33.0549861643713	88.13068149	33.9074779	7.167241247
92.3351348243679	32.8972580256167	94.17807015	30.5898166	2.95308255
92.3351348243679	16.5766853827926	90.81819821	18.2159484	2.233445753
92.3351348243679	13.3741379371847	87.03899122	21.09553754	10.64878101
92.3351348243679	13.3741379371847	94.15587216	20.2227246	8.426061551
92.3351348243679	13.3741379371847	95.99475962	18.1472698	6.014618976
92.3351348243679	13.3741379371847	93.53556787	11.2495411	9.93311926
92.3351348243679	13.3741379371847	94.43184685	8.796264511	5.035188817
85.2297941799427	12.1228646580087	85.22979418	8.715884504	3.406980154
85.2297941799427	12.1228646580087	83.75499038	5.857780347	7.422722871

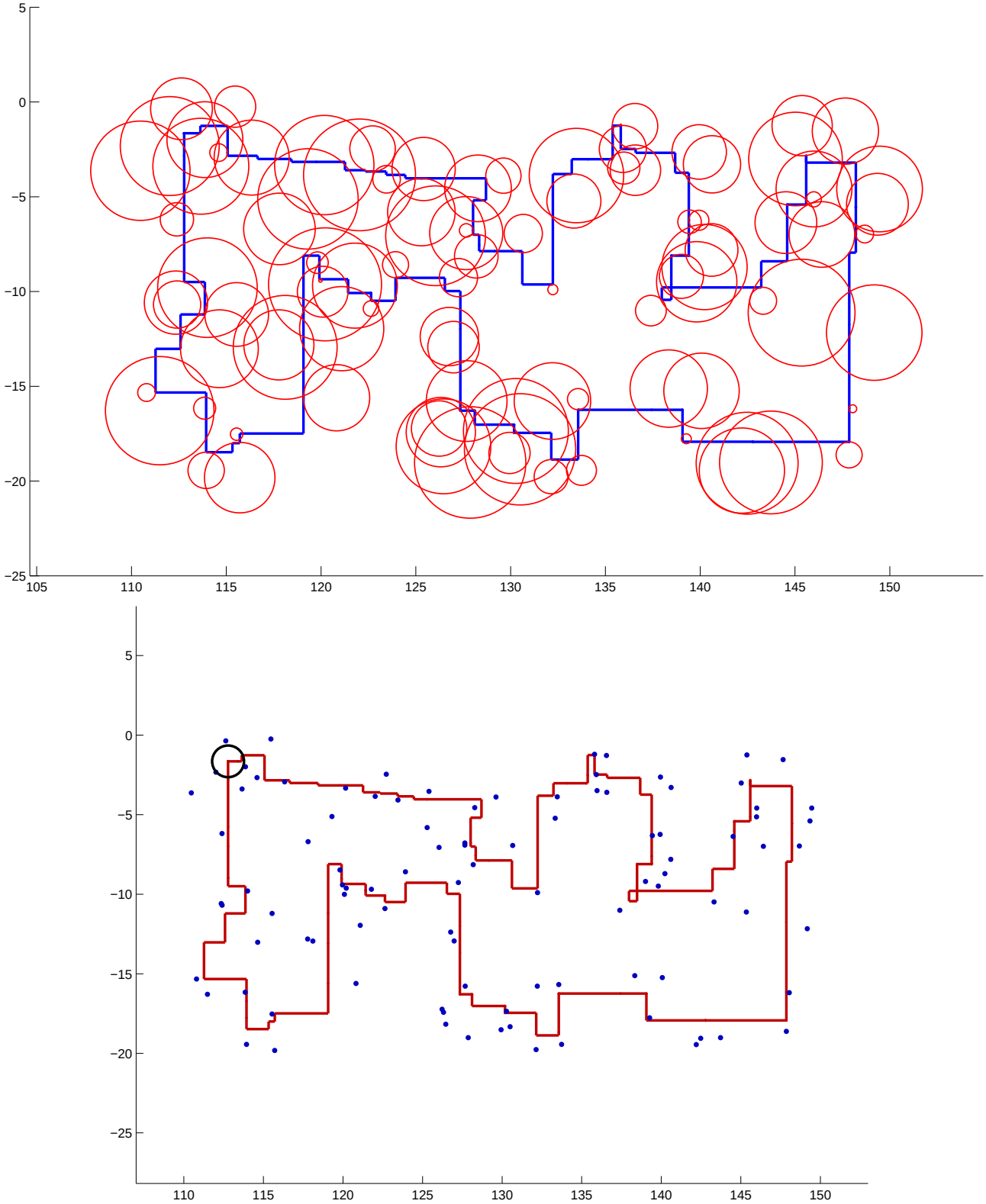


Figure N.160: $kroD100$, arbitrary radius, 2D, Manhattan, Length = 174.0126770

Table N-163: Solution for *kroD*100, arbitrary radius, 2D, Manhattan

Total distance: 174.012676966135 Depot: 2.78 y 1.65				
Solution x	Solution y	Original x	Original y	Radius
2.78	1.651	2.02	2.33	2.61
2.78	2.82200640079323	0.47	3.63	2.62
2.78	5.7620244518136	3.66	3.39	2.53
2.78	6.9837253933199	2.4	6.19	0.88
2.78	8.97530857968446	4.01	9.8	2.63
2.78	8.97630857968445	2.35	10.59	1.67
2.78	9.49601507547204	2.41	10.69	1.25
3.86999999999743	11.2100000136878	5.55	11.21	1.68
2.59000220144806	13.0233831388419	4.64	13.02	2.05
1.27000000000662	15.330000011221	0.8	15.33	0.47
3.93999999958675	16.7287319310635	3.86	16.16	0.58
3.93999999958673	17.7654999159631	1.49	16.29	2.86
3.93999999958675	18.4799999999941	3.94	19.44	0.96
5.32780548030723	17.9996903126315	5.71	19.82	1.86
5.71491654026747	17.4913491293877	5.55	17.53	0.33
9.06999999999999	15.6100008317957	10.82	15.61	1.75
9.06999999999991	13.0865410980708	7.78	12.82	1.85
9.07000000000077	11.1993790592511	8.11	12.95	2.74
9.07000000000077	8.1087228258197	7.81	6.7	1.89
9.91050433344225	9.04106993277815	9.81	8.48	0.57
9.91050433344225	9.35246275326099	9.97	9.42	0.09
11.4281300238073	9.76490153206873	10.21	9.62	2.98
11.4281300238073	9.76590153206873	11.09	11.96	2.22
11.428130023811	10.0807675023247	10.09	10.01	1.34
12.6395405426599	10.0807675023265	11.79	9.69	2.24
12.6400000000297	10.49	12.64	10.9	0.41
13.9299999710817	9.2800000000002	13.93	8.59	0.69
16.5286800209951	9.97696362056536	17.25	9.27	1.01
17.3465766209523	11.7164855091622	16.77	12.38	1.54
17.3465766209523	11.9807275478147	16.99	12.94	1.36
17.3465766209523	13.6762583640478	17.68	15.78	2.13
17.3465766209523	16.2893317819445	16.23	17.23	1.46
17.3475766209523	16.2893317819445	17.87	19.02	2.94
18.1071451413608	16.2893317819445	16.46	18.17	2.5
18.1071451413608	17.026283368652	16.32	17.42	1.83
20.1805036882483	17.026283368652	20.28	17.36	2.77
20.1805036882489	17.4568639559507	19.94	18.52	1.09
20.1815036882483	17.4568639559507	20.5	18.33	2.94
22.1399999726403	18.8699999999993	22.14	19.77	0.9
23.5599999991065	18.6707796156635	23.74	19.44	0.79
23.5599999991065	16.2410000000017	22.21	15.78	2.02
23.5599999991065	16.2400000000017	23.56	15.68	0.56
27.442078958022	16.2399999999998	28.34	15.12	2.04
29.0642841765914	16.2400000000003	30.07	15.24	1.99
29.0642841765914	17.9289999999978	29.27	17.77	0.26
32.7783043279114	17.9289999999978	32.2	19.45	2.25
32.7783043279114	17.9299999999978	32.48	19.06	2.69
32.7793043279114	17.9299999999978	33.73	19.02	2.71
37.8599999996964	17.9299999999978	37.86	18.62	0.69
37.8599999996964	16.1541624392259	38.05	16.19	0.21
37.8599999996965	11.745731615456	39.18	12.17	2.52
37.8599999996966	7.94880133546145	36.42	6.99	1.73
38.21	6.97000000034536	38.68	6.97	0.47
38.2099999999996	5.55554541389536	39.35	5.4	1.63
38.2099999999996	5.55454541389538	39.46	4.59	2.26
38.2099999999948	3.20132477258526	37.66	1.54	1.75
35.5899999999998	2.82607106438768	35.38	1.25	1.59
35.5899999999998	5.13999998648258	35.99	5.14	0.4
35.5899999999998	5.4156807768281	35.03	3.01	2.47
34.5874271603888	5.4156807768281	36	4.59	2
34.5874271603887	6.01618266494143	34.52	6.37	1.63
34.5874271603886	8.405063045983	35.35	11.12	2.82
33.2214455385234	9.78687339822537	33.32	10.49	0.71
27.972756491977	10.4372435064464	27.4	11.01	0.81
28.4762528290744	8.10752574400691	29.82	9.49	2.12
28.4772528290742	8.10752574401085	30.23	8.71	2.25
29.3999999999993	8.10752574401027	29.01	9.2	1.16
29.3999999999999	7.60099270138566	30.6	7.81	1.39
29.3999999999999	6.24000000024253	29.93	6.24	0.53
29.3999999999996	6.23900000024253	29.44	6.32	0.62
29.3999999999966	3.73708256405013	30.62	3.29	1.51
28.6797497414276	2.68175537913346	29.95	2.64	1.44
26.5953643731811	2.47947881736226	26.56	1.28	1.2
25.8099999852177	1.25000000000392	25.81	1.21	0.04
25.3824516456324	2.51045462132929	25.92	2.48	1.24
25.3824516456324	3.02140001818917	26.58	3.6	1.33
25.2608356628772	3.02140001818918	25.97	3.49	0.85
24.0757813452403	3.02140001818917	23.47	3.88	2.49
23.2266254187482	3.80450141903706	23.34	5.23	1.43
22.2299999998016	9.62999999999454	22.23	9.9	0.27
20.6181153588008	7.87260871386828	20.67	6.94	1.01
19.1591023064745	7.87260871386839	18.19	8.14	1.15
18.3423908913447	7.56124882472707	16.04	7.06	2.63
18.3423908913447	7.00103145374117	17.66	6.92	1.93
18.02	6.77999998566093	17.66	6.78	0.36
18.02	5.19115600998352	18.28	4.56	1.76
18.7005980204497	4.02999999999978	19.62	3.89	0.93
15.289999993852	4.03	15.29	5.81	1.78
14.4492134479422	3.84780815874707	15.41	3.54	1.67
13.4382305459529	3.66900510206798	13.46	4.08	0.73
12.3408903715647	3.59854112338041	12.72	2.46	1.2
11.2646041597281	3.16187966562595	12.03	3.85	2.95
9.75358022013984	3.16187966562595	10.17	3.33	2.62
8.4349486879395	3.00770280353731	9.31	5.12	2.65
6.64785173744053	2.83858607984376	6.34	2.94	1.98
5.07000000000001	2.6700000034527	4.6	2.67	0.47
5.07000000000053	1.26395266162172	5.47	0.25	1.09
3.63639349656648	1.65	2.64	0.36	1.63
3.40228302644334	1.65	3.87	1.99	2

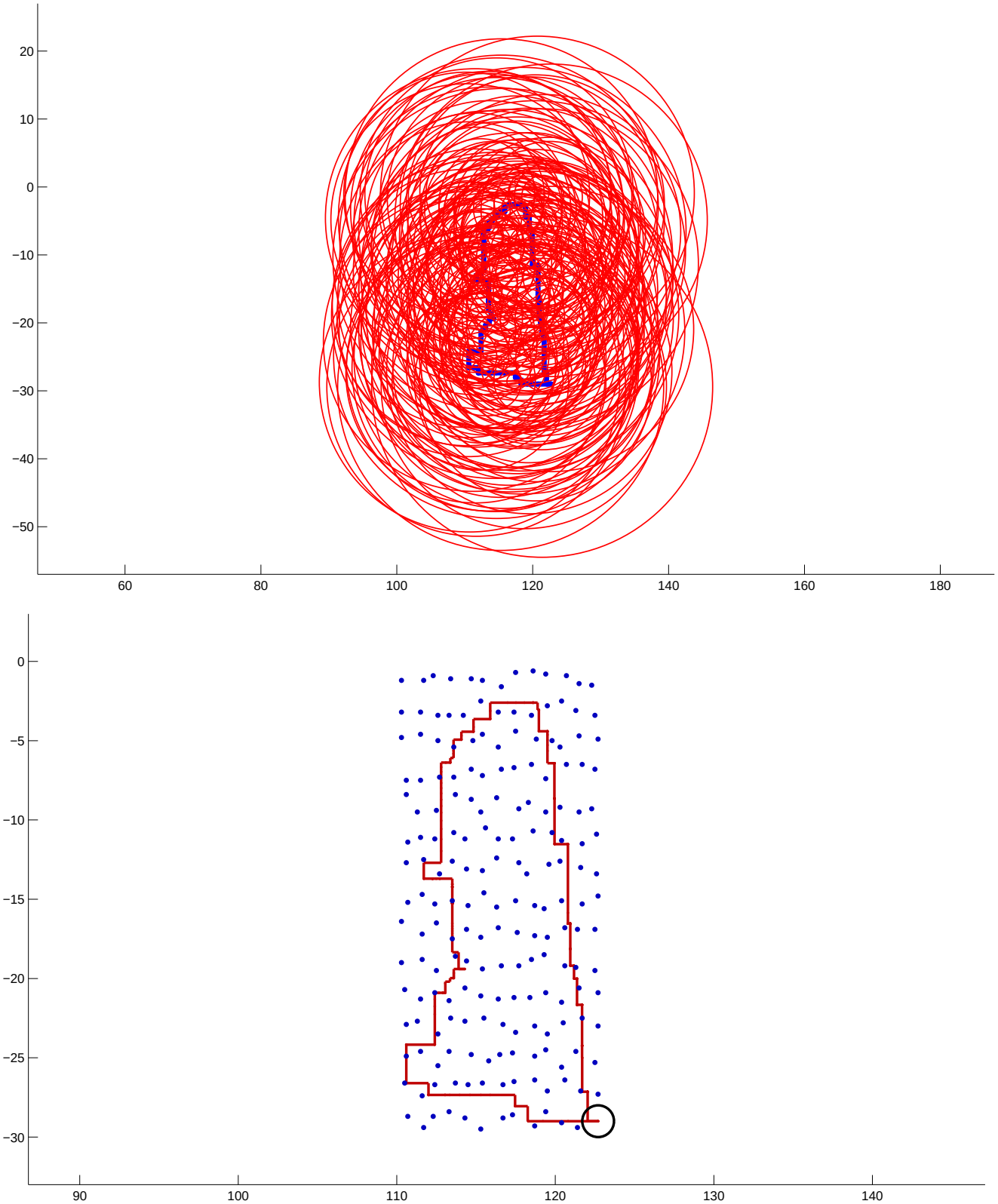


Figure N.161: $rat195$, arbitrary radius, 2D, Manhattan, Length = 82.1999999

Table N-164: Solution for *rat*195, arbitrary radius, 2D, Manhattan

Total distance: 82.1999998866636 Depot: x 12.7 y 29				
Solution x	Solution y	Original x	Original y	Radius
10.8062063298667	29	11.4	16.9	15
9.21858599581489	29	12.5	25.3	5
8.2949968710878	29	4.3	28.8	4
8.2949968710878	28.999	10.6	19.2	11
8.25597906207359	28.0558455799344	7.3	28.6	1.1
7.46435259752272	28.0558455799344	5.3	29.5	24
7.46435259752272	27.3447985008204	6.7	26.7	1
5.88883468825465	27.3447985008204	0.7	28.7	22.1
5.29553564932513	27.3447985008204	1.7	29.4	22
4.61713459214951	27.3447985008204	6.5	24.8	19.1
3.9643876802588	27.3447985008204	5.8	25.2	22.1
3.33430126128229	27.3447985008204	4.7	24.8	24
3.04381285148075	27.3447985008204	3.7	26.6	21.1
3.04281285148076	27.3447985008204	1.6	18.8	10
1.99917491176669	27.3447985008204	4.5	26.7	21.1
1.99917491176669	27.3437985008204	5.4	26.6	19.1
1.99917491176669	26.5999998718715	3.3	28.4	7.1
0.600000056677203	26.5999998718715	0.5	26.6	0.1
0.600000056677203	24.1719613691483	0.6	22.9	14
0.601000056677208	24.1719613691482	1.3	22.7	22.1
0.602000056677213	24.1719613691482	1.6	27.4	19.1
2.4	24.1719613691483	0.6	24.9	4.1
2.4	22.2556275596509	2.6	23.5	8
2.4	21.7555712285231	3.4	22.5	5
2.4	21.306240605323	1.5	21.3	6
2.4	20.9	2.4	20.9	0
2.65682562984865	20.9	5.5	14.6	9.1
2.90931884190172	20.9	0.5	20.7	19
2.90931884190171	20.899	4.3	11.2	10
3.05734880546223	20.899	1.5	24.6	5
3.05734880546223	20.3073495001412	0.3	19	19.1
3.05734880546223	20.1973564588492	3.3	21.4	7
3.35628597544277	19.9785748486944	6.7	22.9	22
3.59565051733703	19.9785748486944	7.4	21.2	20.1
3.59565051733703	19.8771142260131	8.4	21.2	24
3.59565051733703	19.7782358625346	6.4	21.3	20
3.59565051733703	19.6799235027375	5.3	21.1	15.1
3.59565051733703	19.6368631438168	4.3	22.7	8
3.59565051733703	19.4020800796967	4.3	20.6	21.1
4.30000000000001	19.3999999985108	5.4	19.4	1.1
3.89672993489653	18.3465845387822	3.7	18.6	17
3.5	17.5	3.5	17.5	0
3.5	17.3209891602556	1.6	17.2	21.1
3.5	17.1514781678837	0.3	16.4	19
3.5	17.002324725577	4.4	18.9	24
3.5	16.858532982214	2.5	16.5	10
3.5	16.7028747706346	4.4	16.9	1
3.5	16.5271369890467	7.5	4.4	14.1
3.5	15.2665713714177	2.5	19.5	6
3.5	15.2655713714177	7.7	9.3	10.1
3.5	15.2645713714177	9.8	5	13
3.5	15.2635713714177	10.7	6.5	12
3.5	15.2625713714177	8.5	18.8	23
3.5	15.2615713714177	8.2	13.4	18
3.5	15.2605713714177	7.5	15.1	23.1
3.5	15.2595713714177	6.6	19.2	8.1
3.5	15.2585713714177	9.5	17.4	17
3.5	15.2575713714177	4.4	13.1	16
3.5	15.2565713714177	6.3	12.4	4
3.5	15.0961196735521	0.7	15.2	7.1
3.5	15.0951196735521	3.5	15.1	0.1
3.5	14.2237248326417	8.8	4.9	12
3.5	14.2227248326417	2.4	15.3	3.1
3.5	14.2217248326417	2.7	13.4	5.1
3.5	14.2207248326417	7.5	0.7	14.1
3.5	14.0563851381374	5.4	13.2	3.1
3.5	14.0553851381374	2.6	5	9.1
3.5	13.7000000000001	3.5	12.6	1.1
2.71313514720302	13.7000000000001	3.6	10.8	22
2.71213514720301	13.7000000000001	2.4	11.2	8
2.48356157179518	13.7000000000001	2.5	9.4	11.1
2.25680380070376	13.7000000000001	6.3	8.6	20
2.25580380070376	13.7000000000001	5.6	10.5	25
2.25480380070377	13.7	0.7	11.4	12.1
1.69999999999999	13.7	1.6	14.7	11
1.69999999999999	12.7000000000852	0.6	12.7	1.1
2.79870793550542	11.9592141877768	1.7	12.5	18.1
2.79870793550541	11.2113185015803	1.5	11.1	2
2.79870793550541	10.5675451030416	1.5	7.5	4
2.79870793550541	10.0378323775358	1.3	9.5	7
2.79870793550542	9.53876612651997	2.7	7.3	3
2.79870793550541	9.11975709588873	4.7	8.7	4.1
2.79870793550542	8.7192089027141	0.3	1.2	18.1
2.79870793550541	8.32321495543628	4.7	6.8	3
2.79870793550541	7.98993602017214	6.6	6.8	7.1
2.79870793550542	7.66676018324601	3.6	7.3	22
2.79870793550541	7.35325837826942	2.6	3.4	4.1
2.79870793550541	6.96442037433386	1.7	1.2	10
2.79870793550541	6.67005121091985	3.6	5.4	18.1
2.79870793550541	6.37797550697189	3.3	3.4	20.1
3.08957428174686	6.37797550697189	4.8	5	21.1
3.37930121081601	6.37797550697189	5.3	2.5	9.1
3.37930121081601	6.08968097046435	7.4	6.7	8
3.57844708009004	6.00226663870484	5.4	7.2	3.1
3.57844708009004	5.8133551390539	0.6	8.4	8.1
3.57844708009004	5.62707540212764	5.3	9.5	19.1
3.57844708009004	5.44401354865086	3.7	8.4	3.1
3.57844708009004	4.93090908777881	0.6	7.5	17.1
4.07144949647797	4.93090908777881	0.3	4.8	20
4.07144949647797	4.6820700360343	3.4	1.1	18.1
4.07144949647797	4.43442444695085	0.3	3.2	4.1
4.84154146266059	4.43442444695085	6.4	5.4	8
4.84154146266059	4.13452187677372	2.3	0.9	8
4.84154146266059	3.63421928341477	5.4	1.2	23
5.89581544437739	3.63421928341477	6.4	3.2	5.1
5.89581544437739	3.12155429898172	7.4	3.2	9
5.89581544437739	2.6	5.4	4.6	24
6.98503913468221	2.6	1.5	4.6	22
7.51545743528435	2.6	1.5	3.2	14.1
8.04993385623597	2.6	4.7	1.1	20.1
8.59335782171692	2.6	6.6	1.6	18
8.59435782171694	2.6	9.4	0.8	3
8.60000000002192	2.6	8.6	0.6	2
8.8840965338027	3.06344493613013	11.5	1.4	3.1
8.96371008552497	3.06344493613013	10.4	2.5	19
8.96471008552497	3.06344493613013	8.5	3.4	3.1
8.96471008552497	4.40628155303223	10.7	0.9	23.1
8.96571008552498	4.40628155303223	10.3	5.4	2
8.96571008552498	4.40728155303223	11.3	3.1	7
9.50134757038171	4.40728155303223	12.5	3.4	10.1
9.50134757038171	4.40828155303223	9.5	2.8	19
9.50134757038171	4.62659383145019	11.5	4.7	2
9.50134757038171	4.96161087563018	12.7	4.9	23
9.50134757038171	5.28054158120473	10.3	9.2	4
9.50134757038171	5.64337357453948	12.3	1.5	5
9.50134757038171	6.42008408676107	4.2	3.4	10.1
9.94190222844149	6.42008408676107	9.8	10.8	8.1
9.94290222844148	6.42008408676107	7.7	12.7	23
9.94390222844149	6.42008408676107	7.3	11.2	18.1
9.94490222844148	6.42008408676107	11.5	9.5	21
9.94490222844149	8.6428411140417	9.4	7.4	19
9.94590222844148	8.6428411140417	10.4	11.3	24
9.94690222844149	8.6428411140417	8.5	6.5	24.1
9.94790222844148	8.6428411140417	11.7	6.5	20.1
9.94790222844148	11.5244732158608	12.7	14.8	9
9.94890222844148	11.5244732158608	8.7	15.4	17
10.7883385754141	11.5244732158608	8.3	8.9	9
10.7893385754141	11.5244732158608	10.4	15.1	18
10.7903385754141	11.5244732158608	12.6	13.4	4
10.7903385754141	11.5254732158608	9.6	12.8	5
10.7913385754141	11.5254732158608	9.3	15.6	5.1
10.7913385754141	15.860540459597	12.5	16.9	2
10.7913385754141	16.5329910168594	12.6	10.9	9
10.7913385754141	16.5339910168594	4.5	15.4	20.1
10.7913385754141	16.5349910168594	6.4	11.2	12
10.7923385754141	16.5349910168594	6.3	15.5	11
10.7933385754141	16.5349910168594	10.6	16.8	19.1
10.9381576617277	16.5349910168594	7.6	17.1	19.1
10.9391576617277	16.5349910168594	10.3	12.6	10
10.9401576617277	16.5349910168594	7.7	19.2	23
10.9401576617277	16.5359910168594	5.3	17.4	8
10.9401576617277	16.5369910168594	6.4	16.8	6
10.9401576617277	16.5379910168593	8.6	10.7	14
10.9401576617277	18.1397614772021	12.5	6.8	14.1

Solution x	Solution y	Original x	Original y	Radius
10.9411576617277	18.1397614772021	9.4	9.5	13
10.9421576617277	18.1397614772021	7.4	26.5	18
10.9431576617277	18.1397614772021	7.5	23.4	15.1
10.9441576617277	18.1397614772021	11.3	19.3	6.1
10.9451576617277	18.1397614772021	10.4	29.1	17.1
10.9451576617277	19.1938992274844	10.6	26.4	17
10.9461576617277	19.1938992274844	9.5	27.1	21
10.9471576617277	19.1938992274844	8.7	29.3	21
11.1756650927513	19.1938992274844	12.7	23	4.1
11.1766650927513	19.1938992274844	11.7	11.5	9.1
11.1766650927513	20.0089485267401	12.3	9.3	13.1
11.1776650927513	20.0089485267401	12.5	19.5	5.1
11.3666087076472	20.0089485267401	5.5	22.5	14.1
11.3676087076472	20.0089485267401	10.4	25.6	8.1
11.3676087076472	21.6540301723728	9.4	24.5	16.1
11.3676087076472	21.6550301723728	8.7	23	11
11.3676087076472	21.6560301723728	12.7	20.9	21
11.3686087076472	21.6560301723728	6.7	28.8	14.1
11.3696087076472	21.6560301723728	10.5	22.8	15.1
11.3706087076472	21.6560301723728	8.7	24.9	12.1
11.3716087076472	21.6560301723728	8.7	26.4	9.1
11.3726087076472	21.6560301723728	11.7	22.5	14.1
11.3726087076472	21.6570301723728	9.5	23.5	3.1
11.6859253807044	21.6570301723728	11.7	15.3	18
11.6869253807044	21.6570301723728	11.5	20.6	14
11.6879253807044	21.6570301723728	10.4	21.5	16
11.6879253807044	24.2432027629138	11.3	24.6	14.1
11.6889253807044	24.2432027629138	9.4	28.4	5.1
11.6899253807044	24.2432027629138	2.4	26.7	11
11.6899253807044	24.2442027629137	7.3	24.7	8
11.6899253807044	24.2452027629137	2.3	28.7	13
11.6899253807044	24.9996555190286	2.6	25.5	11
11.6909253807044	24.9996555190199	11.6	13	12
11.6909253807044	27.1416248853671	11.6	27.1	0.1
11.6919253807044	27.1416248853671	9.3	18.5	9.1
12.0365659512715	27.1416248853671	9.4	20.9	9.1
12.0375659512714	27.1416248853671	8.7	17.3	13.1
12.0375659512714	27.1426248853671	3.3	24.6	9.1
12.0375659512714	28.999	12.7	27.3	3.1
12.0375659512714	29	11.4	29.4	25.1

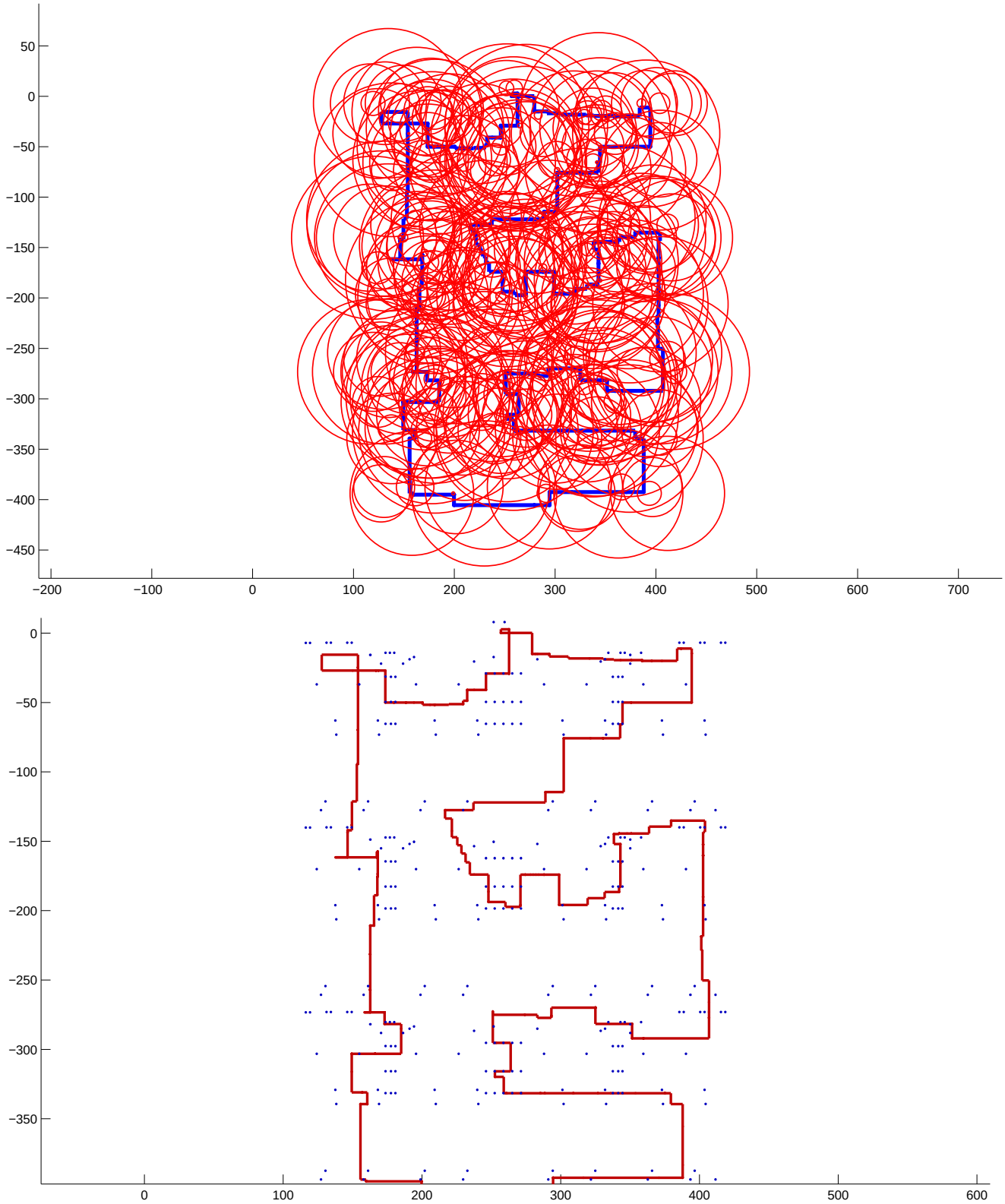


Figure N.162: *lin*318, arbitrary radius, 2D, Manhattan, Length = 2505.4064740

Table N-165: Solution for *lin*318, arbitrary radius, 2D, Manhattan

Total distance: 2505.40647403602 Depot: x 169.3 y 405.5				
Solution x	Solution y	Original x	Original y	Radius
184.499188959689	405.5	215	387.5	42
184.499188959689	400.221124566811	184.3	387.5	61.5
184.499188959689	392.482975684109	211.8	393.8	37.7
184.499188959688	392.481975684109	181.1	393.8	9
184.499188959688	392.481975684109	122.8	387.5	61.9
206.353139257917	392.481975684108	231.5	315.8	80.7
260.842587029665	392.481975684108	255.9	387.5	12.9
277.899999999994	392.481975684109	286.6	387.5	29.3
277.899999999995	383.300000000061	283.5	393.8	11.9
277.899999999995	355.536971447357	301.6	393.8	56.6
277.899999999996	339.399998799807	294.5	339.4	16.6
269.437022427831	331.600998884459	263	329.2	67.9
265.099999985152	331.600998884459	293.7	329.2	38.2
265.099999985152	331.600998884459	248	280.4	61.5
265.099999985152	331.600998884459	231.5	331.6	33.6
265.099999985152	331.600998884459	305.5	273.1	77.3
265.099999985152	331.599998884459	252.8	393.8	64.1
243.918317530849	331.599998884459	263.8	339.4	73.1
234.681278593828	331.599998884459	234.6	331.6	0.7
226.138764159923	331.599998884459	222	329.2	53.4
216.867042676914	331.599998884459	222.8	339.4	9.8
216.867042676914	331.599998884459	148.8	331.6	79
199.084740308896	331.599998884459	227.6	315.8	32.6
199.084740308896	331.599998884459	142.5	315.8	63.6
199.084740308896	331.599998884459	142.5	331.6	70.4
178.549501573721	331.599998884459	161.4	315.8	25.4
178.549501573721	331.599998884459	155.1	315.8	37.1
178.549501573721	331.599998884459	161.4	295.3	52.8
175.422047385587	331.599998884459	178	303.2	29.3
175.422047385587	331.599998884459	224.4	280.4	71.8
175.422047385587	331.599998884459	234.6	297.7	68.2
161.7	331.599998884459	161.4	331.6	0.3
161.7	331.599998884459	227.6	331.6	65.9
150.900000476722	331.599998884459	130.7	339.4	25.3
150.900000476722	331.599998884459	192.1	339.4	44.1
150.900000476722	331.598998884459	136.2	331.6	42.4
150.900000476722	331.597998884459	155.1	331.6	4.2
148.991887786538	319.80530659936	129.9	329.2	48.2
142.600000000026	319.80530659936	136.2	295.3	62.2
142.600000000026	315.799999957248	136.2	315.8	6.4
142.600000000026	315.799999957248	99.2	329.2	46.6
153.9	295.299999941661	155.1	295.3	1.2
143.570832995648	295.299999941661	116.5	303.2	28.2
141.04335319264	272.643356716585	122.8	254.4	25.8
141.04335319264	275.025401781067	141.7	283.5	8.5
141.04335319264	275.026401781182	142.5	295.3	23
164.141552768502	275.026401781182	148.8	315.8	45
164.141552768502	275.026401781182	191.3	329.2	60.6
173.199994962935	277.299999999926	173.2	285.1	7.8
183.309043467593	275.877150768919	184.3	254.4	21.5
183.309043467593	275.876150768919	148.8	295.3	39.6
183.309043467593	269.9	181.1	260.7	21.4
214.99799913245	269.9	211.8	260.7	12.9
214.99899913245	269.9	222	285.1	76.7
214.99999913245	269.900000000076	215	254.4	15.5
214.99999913245	269.900000000076	227.6	297.7	31.3
214.99999913245	269.900000000076	278.7	273.1	72.9
214.99999913245	281.636201762831	218.9	286.7	9.4
241.473160275727	281.63620176283	236.2	280.4	68.9
241.473160275728	281.637201762831	240.2	281.9	1.3
241.473160275727	281.638201762831	240.2	288.2	74.7
241.473160275727	292.1	208.7	303.2	47.1
241.473160275727	292.1	231.5	297.7	23.7
249.599999767974	292.1	249.6	303.2	11.1
249.599999767974	292.1	234.6	315.8	30.3
249.600999767975	292.1	252.8	260.7	64.9
249.601999767975	292.1	280.3	303.2	54.2
296.900000000002	277.168710726819	283.5	260.7	62.8
296.900000000002	277.168710726819	286.6	254.4	68.8
296.900000000002	273.100007705136	308.7	273.1	11.8
296.9	265.984144352438	275.6	273.1	24
296.899999999999	250.341830747681	301.6	260.7	17.7
292.007746927209	228.771448474455	233.1	280.4	78.4
292.007746927209	228.771448474455	234.6	198.5	64.9
291.331676501181	218.604911693827	293.7	273.1	71.8
291.331676501181	218.604911693827	290.6	273.1	54.5
291.331676501181	218.604911693827	231.5	164.6	80.6
292.646213573923	207.256170177206	263.8	206.3	78
292.646213573923	192.553236099172	293.7	196.1	3.7
292.646213573923	190.054082529311	308.7	140	57.3
292.646213573923	190.053082529311	255.9	254.4	74.1
292.646213573923	160.265721804206	294.5	206.3	67.1
292.646213573923	160.265721804206	280.3	170.1	29.1
292.646213573923	160.265721804206	240.2	155.1	52.7
292.646213573923	160.265721804206	227.6	182.7	69
292.646213573923	152.306251662894	278.7	140	31.7
292.646213573923	152.306251662894	283.5	127.6	48.7
292.646213573923	152.306251662894	227.6	164.6	68.2
292.646213573923	143.382118531073	293.7	140	60.8
294.03395606083	135.166041178278	301.6	127.6	10.7
269.528013228038	135.166041178278	252.8	127.6	21.2
269.528013228038	139.453862293142	305.5	140	43.2
253.685013416037	144.400644245923	248	147.3	33
240.841825677769	144.400644245923	286.6	121.3	53.2
240.841825677769	144.400644245923	231.5	198.5	54.9
237.827897914222	144.400644245923	236.2	147.3	14.3
232.165469709932	144.400644245923	240.2	148.8	12
232.165469709932	144.400644245923	290.6	140	58.6
232.165469709932	144.400644245923	191.3	196.1	65.9
232.165469709932	144.835120046011	233.1	147.3	53.4
228.300000000007	144.835120046011	224.4	147.3	27.7
228.300000000007	152.000000864525	222	152	6.3
232.999999999992	152.000000864525	218.9	153.6	44.9
232.999999999992	165.819800853837	227.6	198.5	71.7
232.999999999992	165.819800853837	208.7	170.1	55.8
232.999999999992	182.699	249.6	170.1	30.4
232.999999999992	182.7	234.6	182.7	1.6
232.11901194146	186.552053418223	234.6	164.6	25.4
232.11901194146	186.552053418223	275.6	140	63.7
221.657768651825	191.011495533614	222	196.1	5.1
209.435126879849	195.9	222.8	206.3	36.2
192.099999990838	195.9	192.1	206.3	10.4
188.900269906017	195.899999999995	263	196.1	74.1
188.900269906016	174.1	173.2	152	43.5
188.900269906016	174.1	231.5	182.7	62.1
178.000000755776	174.1	178	170.1	4
177.999000755756	174.1	155.1	198.5	57.2
174.000373738481	174.100000000022	155.1	162.2	51.3
172.071522773438	174.100000000023	155.1	182.7	57.9
170.149666660667	174.100000000023	148.8	182.7	49.8
168.259565833704	174.100000000023	142.5	182.7	52.7
164.400904155381	174.100000000023	161.4	162.2	60.1
164.399904155361	174.100000000023	161.4	182.7	56.9
162.759138765545	174.100000000023	142.5	198.5	69.8
161.000000000008	196.1	129.9	196.1	31.1
161.000000000008	196.101	148.8	198.5	59.7
161.000000000009	197.263068312307	161.4	198.5	1.3
150.202452977247	193.798243765679	130.7	206.3	42
137.90102566501	193.798243765678	136.2	198.5	5
137.90102566501	186.2484166672	136.2	182.7	73.4
137.90102566501	174.010112936179	100	206.3	53.6
127.572537485057	174.010112936177	116.5	170.1	39
124.483638975051	165.161740616349	148.8	162.2	66
121.436545838927	158.829823811236	141.7	150.4	56
118.427530264276	152.863685830634	142.5	162.2	56.6
115.446614119916	147.134650029895	136.2	162.2	53.2
111.597803329069	142.502443729579	127.6	153.6	25.7
111.597803329069	133.605864639488	70.9	198.5	76.6
106.7	127.599999999238	89	127.6	17.7
106.7	127.598999999238	119.7	127.6	64
127.120975827228	122.0620635975	122.8	121.3	4.4
179.022805600937	114.564302212104	215	121.3	69.7
179.023805600937	114.564302212104	181.1	127.6	13.2
192.16894701019	75.799085668046	192.1	73.2	2.6
192.169947010188	75.7990856680463	191.3	63	18.3
211.453051281519	75.7990856680464	184.3	121.3	57.9
220.490953913104	75.7990856680463	234.6	65.4	24.2
220.490953913104	75.7990856680463	222	63	20.4
220.490953913104	75.7990856680463	211.8	127.6	53.8
220.491953913106	75.7990856680463	161.4	65.4	60
232.830619893927	65.8321903031056	227.6	65.4	8.3
232.831619893927	65.8321903031056	231.5	65.4	1.4
234.542181213848	49.9957991763159	234.6	49.6	0.4
240.73026220082	49.9957991763159	248	14.2	37.6

Solution x	Solution y	Original x	Original y	Radius
240.73026220082	49.9957991763159	255.9	121.3	72.9
284.421435585676	49.9957991763159	293.7	63	37
284.421435585676	14.6612731659944	294.5	73.2	59.4
284.422435585676	14.6612731659944	290.6	6.9	35.4
284.422435585676	11.1387260513121	293.7	6.9	10.2
276.781339553657	11.1387260513121	305.5	6.9	29.6
276.780339553657	11.1387260513122	275.6	6.9	4.4
276.780339553657	11.1397260513121	308.7	6.9	32.2
273.923163448264	19.9999999999998	280.3	37	73
263.000005765711	20.0000000000004	263	63	43
255.611359446852	19.9999999999955	240.2	15.7	16
255.611359446852	19.9999999999955	231.5	49.6	41.1
248.73869161735	19.999999999982	227.6	31.5	39.6
248.73869161735	19.999999999982	278.7	6.9	32.7
248.738691617348	19.4710786465734	263.8	73.2	55.8
248.738691617348	19.4710786465734	222.8	73.2	62.4
240.81222703503	19.4710786465734	249.6	37	20.7
240.811227035024	19.4710786465734	240.2	22	3.2
240.811227035024	19.4710786465734	236.2	14.2	10.1
233.134789076989	19.4710786465504	222	18.9	14.4
228.313561533457	18.9082937923328	227.6	49.6	30.7
220.686370046068	18.2367657373457	218.9	20.5	7.4
210.785870487549	18.2367657373457	224.4	14.2	14.2
195.524139821396	16.8276909707783	231.5	31.5	56.7
181.819761577969	15.0007982415833	178	37	22.7
181.819761577969	15.0007982415833	141.7	17.3	52.8
173.278902770292	15.0007982415833	173.2	18.9	3.9
171.738146356012	15.0007982415833	208.7	37	62.2
169.378638860167	15.0007982415833	234.6	31.5	69.7
169.378638860167	-0.170660163217415	233.1	14.2	77.3
146.861879168556	-0.170660163217415	149.6	-7.9	8.2
146.861879168556	-2.73812016321385	141.7	-7.9	7.3
152.799999999999	-2.73812016321385	142.5	29.1	81.1
152.799999999999	29.1000000497162	155.1	29.1	2.3
152.799999999999	29.1010000497162	161.4	49.6	79.4
152.799999999999	29.1020000497162	161.4	29.1	80.6
152.799999999999	29.1030000497162	148.8	49.6	66.7
136.194350632915	29.1030000497162	148.8	65.4	68.2
136.193350632915	29.1030000497161	136.2	65.4	54.2
136.193350632915	40.899983159297	136.2	29.1	21.8
136.192350632915	40.899983159297	136.2	49.6	8.7
127.632227965059	40.899983159297	127.6	20.5	20.4
122.612490391906	40.899983159297	116.5	37	49.6
122.612490391906	48.7559765616613	142.5	49.6	28.5
122.612490391906	48.7559765616613	129.9	63	16
119.721718140512	51.1855200512521	130.7	73.2	24.6
119.721718140512	51.1855200512521	63.8	65.4	57.7
109.312181566951	51.5999999999948	100	73.2	54.1
99.199999999789	51.6	99.2	63	11.4
99.199999999789	51.6	66.9	14.2	52
99.199999999789	51.6	52.8	15.7	64.3
98.8384380152154	51.5999999999953	155.1	49.6	57
95.8790024713296	51.5999999999579	155.1	65.4	62
90.5337862890373	50.025431399684	142.5	65.4	66.7
90.5337862890373	50.025431399684	148.8	29.1	68.3
84.178533047354	50.025431399684	63.8	49.6	33.5
78.4457748804802	50.025431399684	63.8	31.4	27.9
78.4457748804802	50.025431399684	24.4	6.9	74.1
78.4457748804802	50.025431399684	76.4	22	28.1
69.7789446875653	50.0254313996841	85.8	37	59.3
69.7779446875653	50.0254313996841	70.9	49.6	1.2
63.6273232376217	50.0254313996841	67.7	65.4	19.9
63.6273232376217	26.9542305519632	67.7	31.5	48.5
63.6263232376217	26.9542305519631	70.9	65.4	71.5
58.6581485117285	26.9542305519631	81.1	18.9	25.4
58.6571485117286	26.9542305519631	84.3	17.3	27.4
56.8376622336992	26.9542305519624	70.1	14.2	18.4
56.8366622337014	26.9542305519622	60.6	22	36.4
56.8366622337006	26.9532305519623	63.8	14.2	23.68
40.1007283449726	26.9532305519623	6.3	7.1	39.2
17.8145691352818	15.5145722569585	9.4	7.1	11.9
43.899	24.706459502102	21.3	6.9	41
43.9	24.706459502102	36.2	6.9	19.4
43.9	24.707459502102	39.4	6.9	37.7
43.9	36.999999999036	44.9	37	1
43.9	69.6821048942871	14.2	37	44.6
43.9	69.6821048942871	24.4	140	73
43.9	69.6821048942871	9.4	140.2	80.8
43.9	69.6831048942794	58.3	63	68.9
43.9	69.6841048942877	28.3	73.2	20.4

Solution x	Solution y	Original x	Original y	Radius
43.9	94.1277893590377	59.1	73.2	29.3
43.9	94.1277893590377	70.9	31.5	68.2
43.9	94.1277893590377	92.1	121.3	64.6
43.9	94.1287893590377	67.7	49.6	74
43.0465674707323	121.299924295998	51.2	121.3	8.2
39.5667603993892	138.355733992469	39.4	140	4.5
39.5667603993892	138.355733992469	27.6	63	76.3
39.5667603993892	138.356733992469	20.5	121.3	76.9
39.5667603993892	142.086372597315	81.1	152	42.7
36.438850133166	142.086372597315	36.2	140	2.1
36.438850133166	143.652374703502	85.8	170.1	56
36.438850133166	143.653374703502	6.3	140.2	53.1
36.4388501331659	161.61471722135	27.6	196.1	35.6
36.4388501331659	161.61471722135	70.9	182.7	40.4
27.6465600123935	161.61471722135	14.2	170.1	15.9
57.4499130259342	161.61471722135	52.8	148.8	54.4
57.4509130259342	161.61471722135	66.9	147.3	43.6
57.4509130259342	161.61471722135	63.8	147.3	52
57.4519130259342	161.61471722135	70.9	164.6	21.9
57.4519130259342	157.504163061015	76.4	155.1	19.1
58.1958369489449	157.504163061015	60.6	155.1	3.4
58.1958369489448	157.505163061015	70.1	147.3	74.2
58.1958369489449	157.506163061015	84.3	150.4	61.5
58.1958369489449	157.507163061015	48	127.6	40.8
58.1958369489447	173.614007213228	67.7	164.6	53.4
58.1958369489449	173.615007213227	63.8	164.5	10.7
58.1958369489449	175.700265931665	58.3	196.1	20.4
57.860921930504	175.700265931665	21.3	140	51.1
57.860921930504	175.701265931665	63.8	198.5	60.1
57.860921930504	175.702265931665	67.7	182.7	29.6
57.860921930504	188.774926335449	17.3	127.6	73.4
57.860921930504	188.966766406807	67.7	198.5	13.7
55.4875907081193	210.743608636504	44.9	170.1	42
55.4875907081193	210.743608636504	99.2	196.1	46.1
52.6955997812375	210.743608636504	28.3	206.3	25.7
52.6955997812403	231.498882075163	59.1	206.3	26
52.6955997812403	231.498882075163	89	260.7	48.3
52.6955997812403	231.498882075163	6.3	273.3	71.7
52.6955997812403	231.498882075163	39.4	273.1	61.9
52.6955997812403	231.498882075163	21.3	273.1	71.9
52.6955997812629	257.119448181179	17.3	260.7	36.9
52.6955997812629	257.119448181179	70.9	315.8	68
52.6955997812629	257.119448181179	119.7	260.7	67.1
52.6955997812629	257.119448181179	52.8	281.9	48.7
52.6955997812426	257.120448181169	92.1	254.4	70.4
52.6955997812391	257.121448181174	63.8	182.7	81.7
52.6955997812391	257.121448181174	51.2	254.4	9.5
52.6955997812392	273.300000015532	76.4	288.2	37.9
52.6945997812392	273.300000015532	36.2	273.1	28.7
48.5999999999998	273.300000015532	9.4	273.3	39.2
63.0579832277565	273.300000015532	63.8	280.4	22
63.0579832277565	273.300000015532	127.6	286.7	75.6
63.0579832277565	273.300000015532	70.1	280.4	10
63.0579832277565	273.300000015532	20.5	254.4	56.1
63.0579832277564	281.710506410446	48	260.7	54.8
63.0579832277564	281.710506410446	84.3	283.5	54.6
74.9999999999726	285.099999936537	81.1	285.1	6.1
74.9999999999727	303.198000000016	63.8	315.8	50.8
56.1536910961663	303.198000000017	70.9	297.7	30.8
56.1536910961664	303.199000000017	63.8	297.6	81.2
56.1536910961664	303.199000000017	60.6	288.2	62.7
56.1536910961659	303.200000000016	67.7	297.7	81
56.1526910961632	303.200000000016	44.9	303.2	67.2
39.400000000054	303.200000000016	14.2	303.2	25.2
39.400000000054	303.200000000016	66.9	280.4	41.3
39.4	316.056373217487	24.4	273.1	45.5
39.4	330.956359971177	27.6	329.2	13.2
47.0123340659484	330.956359971177	63.8	331.6	16.8
47.0123340659484	330.957359971176	85.8	303.2	50.8
47.0123340659484	330.958359971176	67.7	315.8	26.1
47.0123340659484	330.958359971176	100	339.4	61.5
50.6	339.4	59.1	339.4	8.5
50.6	339.4	48	393.8	61.4
50.6	339.401	58.3	329.2	56.8
45.7	339.401	28.3	339.4	44.9
45.7	393.800000921343	17.3	393.8	28.4
49.7215544780466	395.125008451588	51.2	387.5	18.6
49.7215544780466	395.125008451588	20.5	387.5	30.2
89.7031021285885	395.125008451587	92.1	387.5	46.4
89.7031021285885	395.125008451587	67.7	331.6	72.5

Solution x	Solution y	Original x	Original y	Radius
89.7031021285885	395.125008451587	89	393.8	1.5
89.7031021285885	405.5	70.9	331.6	81.8
89.7031021285885	405.5	119.7	393.8	72

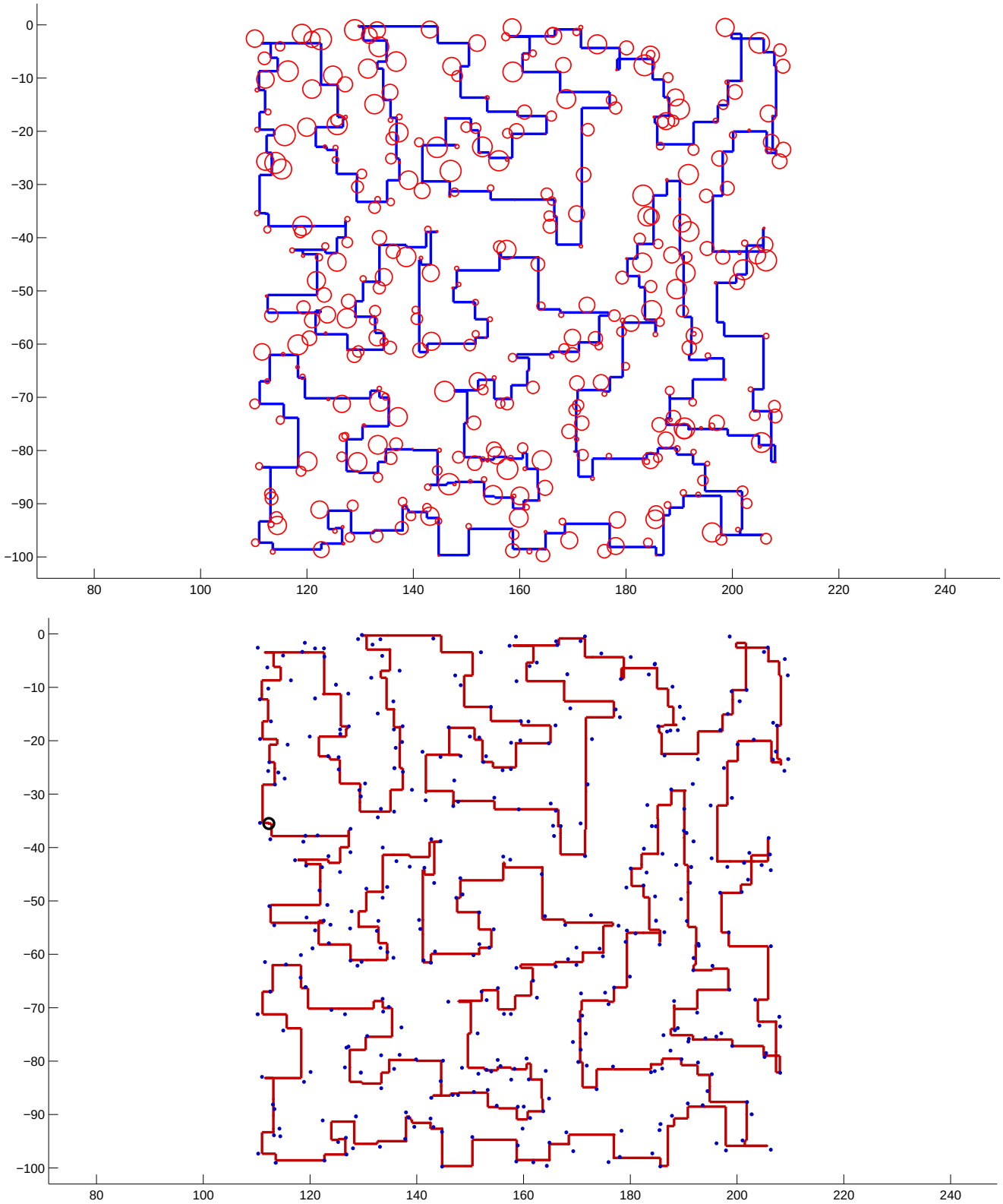


Figure N.163: $rd400$, arbitrary radius, 2D, Manhattan, Length = 1544.5409324

Table N-166: Solution for $rd400$, arbitrary radius, 2D, Manhattan

Total distance: 1544.54093240802 Depot: x 2.28315 y 35.5085				
Solution x	Solution y	Original x	Original y	Radius
2.78343832533557	37.8530000000113	2.57158	38.4711	0.6534
8.75416493622197	37.8530000000113	8.75416	38.928	1.075
10.9802900773524	37.8530000000113	9.16001	37.8018	1.821
11.4160122996064	37.8307668358709	11.4258	37.7412	0.0901
17.2539084971118	36.8679915192936	17.6023	36.5196	0.4927
17.2539084971118	39.9551232887383	17.5856	40.8861	0.9883
15.6371995277515	42.8770999999999	15.6372	44.5891	1.712
13.4598001389658	42.2806000000052	13.4598	41.6191	0.6615
7.67215000000961	42.3799000274254	7.21925	42.3799	0.4529
9.2381346170488	43.1134285116715	9.27453	43.3967	0.2856
11.915699999994	43.1134285116712	12.2621	43.6923	0.6746
11.9157	46.3661224207152	11.7937	48.0467	1.685
11.9157	50.7625999792215	13.2524	50.7626	1.3367
2.62213000000042	50.980800001925	2.40393	50.9808	0.2182
2.62213000000047	54.1020999999967	3.30116	54.5758	1.2586
10.1098380351703	54.1020999999994	9.35555	53.1101	1.2462
10.9637999985025	54.102099999994	10.9638	55.5178	1.4157
12.5810481709198	53.7048518289126	12.5872	53.6987	0.0087
12.4924144188918	53.7048518289125	13.8308	54.4775	1.5454
11.6210521320405	58.1525000000001	10.4725	58.878	1.3585
13.5317999989387	58.1525000000097	13.5318	57.9262	0.2263
17.6010999998135	61.0628999999993	17.6011	61.1721	0.1092
18.1308833701523	61.0628999999996	18.9042	62.1271	1.3155
20.6831757465598	61.0628999999988	19.6656	61.3862	1.0677
24.4511	60.6643000250444	25.6513	60.6643	1.2002
24.4511	58.829923073201	24.5176	59.5849	0.7579
24.4511000000019	57.9118406723538	23.2085	58.8069	1.5314
22.8192976653292	54.7818999999974	22.8193	53.7552	1.0267
22.544699948545	54.8375	22.5447	55.6169	0.7794
19.125	54.8374999999968	17.5187	55.1629	1.8177
19.125	51.9552999949123	17.8085	51.9553	1.3165
20.5403615635013	48.2787985141293	20.5641	47.7219	0.5609
23.63389987057	48.2787985141294	23.6126	49.4214	1.1428
23.63389987057	48.2777985141294	24.4594	47.3987	1.6009
23.63389987057	41.3619000000001	23.6339	40.0124	1.3495
25.64808454386	41.3619	26.2003	42.5604	1.3196
28.6888999619418	41.7876	28.6889	43.6077	1.8201
32.4111946565459	38.9312835317479	32.7353	38.4372	0.5909
34.35281646854	38.9312835317478	34.4656	38.8185	0.1595
33.2771000638401	45.0704	33.2771	46.652	1.5816
31.433899985782	44.135	31.4339	43.8079	0.3271
31.1199	53.568799971591	30.4468	53.5688	0.6731
31.1199000000074	56.2301462521153	30.6696	55.2626	1.0672
31.1199000000211	61.4989999999996	31.2678	61.1344	1.3636
32.6409999999925	61.4989999999996	32.641	61.5676	0.0686
32.6409999999926	59.9174299427857	33.4192	59.483	1.6934
41.6794882689427	59.9174299427858	40.6271	60.1839	1.0856
41.6794882689427	58.7798544911077	41.7302	58.1199	0.6619
43.6754038286258	58.7798544911078	43.5841	58.7522	0.0954
43.9698	55.3301000395102	44.4217	55.3301	0.4519
41.5972997159917	52.1085980376627	41.6783	52.1535	0.5487
37.5527	49.4355999999365	37.4105	49.4356	0.1422
38.1818597622919	48.8643361383809	38.5534	48.7846	0.38
38.1818597622945	46.1398460016941	38.1612	45.7549	0.3855
46.2037075140903	42.8153999999746	46.2037	41.7062	1.1092
46.448617788348	43.7208376526927	47.522	42.292	1.7871
53.5146915126399	43.7208376526927	53.4254	44.9898	1.2721
53.5146915126399	53.4781504759127	54.0007	52.8659	0.7817
57.6500365688956	54.065640984782	57.8122	54.5104	0.4734
63.1317684358565	54.065640984782	62.6521	52.6724	1.4735
66.7374000000001	54.6502004584469	67.8108	54.6502	1.0734
64.9478875373306	59.6776437320104	64.8783	60.379	0.7048
64.9468875373118	59.6776437320104	64.2573	58.953	1.3119
61.1224013915672	59.6776437320103	59.9164	58.75	1.5215
61.1224013915672	61.4407147050118	59.9164	61.9972	1.3282
59.1707067858576	61.4407147050118	58.3448	60.9201	0.9763
55.8855006873736	61.9321785652766	56.0439	62.2937	0.3947
49.4526000000044	62.5481000029872	48.6743	62.5481	0.7783
51.7382999999519	64.9464000000001	51.793	64.9464	0.0547
51.42281955355	67.7276930419689	52.5118	68.1256	1.1594
48.4338699193012	70.3016999999997	47.6475	71.1843	1.1821
46.3399003964725	70.3017000000001	46.3399	71.17	0.8683
45.2183998052091	66.7199000000057	45.2184	66.3382	0.3817
42.1778766359867	68.6069314845839	42.1545	66.9856	1.6215
42.1778766359865	68.6872664783054	43.1006	68.5786	0.9291
37.7944	68.88250011246	35.9094	68.8825	1.885
40.1260999999999	74.8199000180471	41.4131	74.8199	1.287
39.5782000000003	81.2568000413268	38.4806	81.2568	1.0976
42.7250761468164	81.7054999999927	41.546	82.3742	1.3555
43.2754473908454	81.7054999999929	43.0779	81.6476	0.4575
43.9629000055059	81.705499999994	43.9629	81.9344	0.2289
45.1635999986726	81.1935	45.1636	79.7971	1.3964
45.1645999986727	81.1935000000065	45.6946	80.9262	1.6109
47.708699671078	81.5259	47.7087	83.4773	1.9514
48.8102014705918	81.5259	48.3206	81.4332	0.4983
50.5772005002775	80.466	50.5772	79.5094	0.9566
51.3491522940513	83.4472843929513	50.9984	83.4341	0.351
53.3826001219411	83.4472843929506	54.169	81.8375	1.7916
53.3826001219412	87.0159144245803	54.7886	87.0165	1.406
53.5891000000014	89.3848999999989	53.7144	89.3849	0.1253
50.7659746058227	90.9080000000076	51.2472	90.6526	0.5448
49.8327948342326	90.9080000000076	49.8328	92.6571	1.7491
48.7496419806001	88.8410128236797	50.0418	88.5256	1.6597
48.7496419806001	88.8400128236797	48.934	88.5471	0.3461
45.295856296366	88.5906571243067	44.9959	88.3516	1.7636
43.306800001058	85.9027	43.3068	85.4106	0.4921
40.4051076116981	85.9026999999998	40.7053	85.7824	0.3234
37.7809566269052	86.0762078838924	37.7453	86.3505	0.2766
36.320598020658	86.4571501450271	36.723	86.3354	1.9971
33.1436498553264	86.4571501450269	32.7208	86.88	0.598
34.5631999999999	84.6404874239834	34.4937	83.7515	0.8917
34.5631999999999	79.9328000000845	34.9224	79.9328	0.3592
29.8827000000007	79.7819	29.8827	79.684	0.0979
26.786884461464	79.7818999999999	26.7929	78.8352	1.2073
24.8446983139742	79.7819000000022	23.3293	78.9181	1.7443
24.8446983139746	82.1549146064815	25.7615	81.4539	1.1541
23.3569002393737	84.1982	23.3569	85.0798	0.8816
19.7211350948569	83.8893052811823	19.5225	82.1483	1.7523
17.4497	81.1813001038752	16.5471	81.1813	0.9026
17.449700000001	77.9465628162986	16.8354	77.4785	0.7723
17.4497000000016	77.8955749874198	17.2306	77.2747	0.6584
20.4387450287232	75.4346035129469	20.7262	75.308	0.3141
25.3810000000004	73.6903987885151	27.1361	73.6904	1.7551
25.3809999999998	70.042491918163	24.7619	69.8637	0.6444
23.6205999891476	68.761200000006	23.6206	68.344	0.4172
21.9362932459133	70.1707999999997	23.7167	70.7298	1.8661
15.3823540558442	70.1708	16.576	71.2313	1.5967
14.0141000265388	70.1707999999999	14.0141	70.4084	0.2376
9.62107818844129	66.3214099023588	9.17265	66.1356	0.4854
8.30742015237277	64.4429603135562	8.25408	64.3565	0.3367
8.30742015237278	62.0294000000001	8.30742	60.1487	1.8807
5.21556501969977	62.0294	5.5259	61.9092	0.3328
3.02059194663165	62.0294000000085	1.5771	61.4642	1.5502
3.00528063389427	66.9885996371892	2.55217	66.9796	0.4532
1.11326500001468	71.2334998554741	0.194865	71.2335	0.9184
5.63812759544524	73.8453623551613	4.99968	74.2733	0.7686
8.35819999999998	82.0450000997893	10.1219	82.045	1.7637
8.35819999999893	83.1552061832141	8.89064	83.8954	0.9118
1.65324498292135	83.1552061832158	1.02508	82.9527	0.66
3.14383999999971	87.1239334079105	3.06059	88.1315	1.011
3.1438400000004	90.171391058516	3.35356	88.986	1.2038
3.1438400000004	92.6488990406275	4.28894	92.6489	1.1451
3.1438399999999	93.318732843609	4.45069	94.0863	1.713
3.14383999999698	93.3197328436049	3.24988	93.8751	0.5654
1.01031800000001	97.3272000660544	0.299018	97.3272	0.7113
3.57800988988758	98.5794999999726	3.57801	99.0366	0.4571
12.692945313795	97.480599999671	12.7313	98.6134	1.4759
16.6085000000008	97.4805999996709	16.854	97.4806	0.2455
16.608500000001	94.5831176936704	16.7243	94.3593	0.252
15.2733000133985	94.7555999999992	15.2733	95.1553	0.3997
13.9990335756512	91.3217797260727	12.3803	91.1149	1.6319
18.298376406732	91.3217797260723	18.6101	90.3489	1.0216
18.298376406732	95.4889341905328	18.064	96.3276	0.8708
22.6051295747289	94.9964766846482	23.1083	96.0553	1.1723
27.9893015707091	94.9964766846506	27.8353	94.5623	1.2194
27.9893015707091	90.3919999999987	27.9893	89.6021	0.7899
28.7238621815566	90.9231253000196	28.4623	90.5817	0.4301
29.0899093631272	91.5626852635272	29.5533	92.3189	0.8869
32.5556978291361	91.5626852635272	32.5896	90.759	0.8044
32.5556978291363	92.6635716360288	33.1283	92.3481	1.7117
34.7578999999993	92.6635716360287	34.7487	93.2543	0.5908
34.7578999999996	99.6478000000005	34.7579	99.7518	0.104
40.4170999835645	94.7202	40.4171	94.2218	0.4984
48.7219274296111	96.6862919943514	48.9418	95.7946	0.9184

Solution x	Solution y	Original x	Original y	Radius
48.7219274296112	98.503699999998	48.6626	98.7924	1.3028
51.83630001519	98.5036999999991	51.8363	98.9629	0.4592
54.8665000000009	98.5036999999981	54.3707	99.6057	1.2802
54.8665000000006	95.5265000000004	54.8665	95.2849	0.2416
58.4876068935176	95.5265000000012	59.3326	96.8644	1.5824
58.4876068935175	93.7669116778742	58.0371	93.3465	0.6162
67.0075130113065	93.7669116778744	68.3546	93.0491	1.5264
66.9136137697988	98.1195999999999	65.9332	98.9174	1.264
66.9146137697962	98.1196	68.0526	97.9535	1.5961
74.1313998475664	98.1196	74.1314	97.2935	0.8261
75.6359000119288	99.6311999999977	75.6359	99.7073	0.0761
77.0286117195712	92.1597649186906	75.4786	92.9344	1.7328
77.0286117195712	92.1587649186906	75.6586	91.7899	1.4188
78.2083956241389	90.7319933013096	77.8131	90.2453	0.627
80.7776999966328	88.5158	80.7777	87.9354	0.5804
83.9338229346875	88.5158	83.5669	88.2708	0.4412
87.8794350701787	95.8731011140908	86.1563	95.4019	1.7864
88.5140729709722	95.8731011140909	87.9339	96.7331	1.0374
95.6134012614927	95.8731011140908	96.3227	96.5824	1.0031
91.4525	94.8618000040116	91.0373	94.8618	0.4152
91.7974	89.9533999875789	92.7385	89.9534	0.9411
91.7974	87.64050374898	91.8947	87.6684	1.0085
84.8665919608002	84.740321337515	84.4594	85.6238	0.9728
84.8665919607995	82.5702475663498	85.2864	82.465	0.4328
82.5978464694946	80.7606200532621	82.6909	80.2719	0.4975
79.5498099563487	79.5454000000017	79.6042	79.6519	0.547
77.5352000260258	79.5454	77.5352	78.0347	1.5107
75.9745683904229	80.5948765800211	75.9957	81.402	0.8074
73.8930997453349	80.5948765800212	74.5996	81.8744	1.5343
73.8930997453349	81.5399	73.8931	82.0767	0.5368
66.7645001503329	81.515	66.7645	81.0279	0.4871
63.6977001664026	84.902	63.6977	85.2552	0.3532
61.0505684218281	80.1703999935871	61.8453	80.8454	1.0427
60.3485000000032	80.1703999935871	60.2539	80.1704	0.0946
60.6139963530834	77.5033862587663	60.7208	77.8844	0.3957
60.6139963530833	76.4135704399548	59.2712	76.4167	1.3428
60.6139963530833	75.6691728662478	61.6789	74.8507	1.3431
60.6139963530833	72.4674420400031	60.356	72.3736	1.0968
60.6139963530834	70.5129011397726	60.9907	71.4945	1.0514
60.8923824911722	68.6439	60.771	67.3196	1.3646
65.3010999753866	68.6439	65.3011	67.1869	1.457
65.929700004883	68.8938999999999	65.9297	69.3415	0.4476
66.9461327239424	66.2040406871421	66.9764	66.2314	0.0408
69.3672000218552	63.7484559085868	69.9395	64.1832	0.7187
69.3672000218556	56.7984251588997	69.1414	57.6653	0.8958
69.3672000218553	55.9681000000026	69.3672	55.5594	0.4087
72.4646379719763	55.9681000000025	70.983	56.1077	1.4882
75.5116999812356	57.7464000000041	75.5117	58.1702	0.4238
75.5841999999977	55.8636000356987	76.3859	55.8636	0.8017
75.5841999999943	55.4216744092113	74.8357	53.7031	1.8745
73.5475189990241	49.3184534009223	74.6616	49.1772	1.123
72.4680896510111	47.2224181026362	72.4782	47.1166	0.1063
70.432483117731	47.2224181026361	69.2786	47.5055	1.1881
70.2537000000046	43.9308000005654	70.0979	43.9308	0.1558
72.1205408921819	43.1737339229387	73.064	44.6995	1.7939
72.1205408921822	41.1841000373297	72.565	40.2263	1.0559
75.1719999999999	41.1841000373141	76.05	41.1841	0.878
75.1720000000001	34.6322872866681	74.7866	36.0265	1.4465
75.1271	34.5186416547769	74.0572	35.987	1.8168
75.1271	32.0501000589386	73.2088	32.0501	1.9183
77.6794000906334	29.3578	77.6794	29.1288	0.229
80.3209748527045	29.3578000000016	81.7106	28.112	1.8663
80.1213999999994	32.9480986516181	80.1207	32.7664	0.1817
80.1214000000058	37.0041493305738	80.0506	36.8529	0.167
80.1214000000058	38.1793958797303	80.5435	37.2793	1.6755
80.1214000000056	38.1803958797303	81.8496	38.8539	1.8548
80.1214000000006	43.2582002954122	78.6058	43.2582	1.5156
80.815806573552	44.4290633905675	81.4209	43.6493	0.987
80.8158065735519	48.3785627548202	81.1997	46.621	1.799
80.8158065735519	48.3795627548202	79.5061	49.6701	1.8387
80.8158065735519	54.881533362449	80.6139	53.7748	1.125
82.3440999999982	58.0478999882181	82.7455	58.0479	0.4014
82.2682030161743	58.4559631916152	82.834	58.4111	1.5249
82.2682030161743	61.9747685238823	81.8774	60.6902	1.3427
81.854841125506	62.9551588745117	81.8209	62.9891	0.048
85.3959001463314	62.6731000000022	85.3959	62.1638	0.5093
88.3543	66.6381999739922	88.5712	66.6382	0.2169
82.541299991626	70.2338999999999	82.5413	70.9361	0.7022
78.2185999466304	69.577000000001	78.2186	68.7569	0.8201
78.2185999466301	73.9426166718628	78.9206	73.8168	1.3456

Solution x	Solution y	Original x	Original y	Radius
78.2185999466297	73.9436166718627	78.3667	74.2083	0.3033
77.5604	75.1456005729428	76.2214	75.1456	1.339
81.7543827025337	75.9620683495424	80.9911	75.8316	1.9298
81.7543827025411	75.9630683495452	80.8889	76.3527	1.4712
84.2003641301884	75.9630683495452	84.0931	75.7357	0.2514
86.2421500069786	75.9630683495452	86.1254	75.412	0.5633
86.2421500069786	75.9640683495458	87.0562	74.7862	1.4318
89.1222633176747	77.1653495202695	89.1084	77.1611	0.0145
94.9810265884013	78.983272928964	95.1537	79.2325	0.3032
98.0032593183429	82.1130593182264	98.0879	82.1977	0.1197
97.2953307117051	78.2419573660922	95.4573	78.5053	1.8568
97.2953307117048	72.6102757705709	98.0725	73.509	1.2703
97.2953307117048	72.6092757705709	97.9153	71.697	1.103
94.8544758441454	72.609275770571	94.2046	73.3577	0.9912
93.8857000000001	68.5015008497097	93.4248	68.5015	0.4609
95.8315999999999	58.4969008403116	96.3481	58.4969	0.5165
88.4430860933018	55.9088563340223	88.4474	55.9131	0.0043
87.0835999999996	48.4796999998882	86.8559	48.4797	0.2277
90.7245819111297	46.9261749760722	90.8764	48.3318	1.4138
92.6733781878266	44.250972888016	92.0634	46.0336	1.8841
92.6733781878266	41.4537278355576	92.3029	41.017	0.5727
95.8035748378398	38.3700251621595	95.9404	38.2332	0.1935
95.8035748378399	42.6043999999999	96.1419	41.3034	1.4714
95.2603547841526	42.6043999999998	96.3235	44.2629	1.97
93.1651029275418	42.6043999999998	94.61	43.2995	1.6034
91.3249000030933	42.6044	91.3249	42.8902	0.2858
88.6641312410416	42.6043999999998	88.1955	43.6361	1.3319
86.3080000000016	42.6043999999928	85.2354	42.0312	1.3087
86.308	32.1301003569385	85.0689	32.1301	1.2391
88.173060605785	31.6868578912487	89.036	30.7257	1.2917
88.173060605786	23.8250044889446	87.5589	25.1226	1.4356
90.1249698654651	20.0544695352602	90.11	20.7153	0.661
93.146399999724	20.0238000000005	93.1464	19.8146	0.2092
96.4455796629086	23.2293865826481	97.2905	22.0419	1.4574
96.4455796629087	24.0497513584217	96.7473	23.5618	0.5737
98.2076	24.444589533102	98.8743	25.646	1.374
98.2076	23.4576999810096	99.5853	23.4577	1.3777
97.5636999999998	17.1802000002654	97.4766	17.1802	0.0871
97.5636999999999	17.1792000002654	96.7716	16.6523	1.5563
98.2077999999999	7.77477995812308	99.5164	7.77478	1.3086
97.8780826721071	5.13605671478291	98.9579	4.73211	1.1529
95.8761033099527	5.13605671478291	95.0473	3.39817	1.9254
95.8761033099527	2.57787104963403	95.7659	2.55349	0.1129
89.8254213472412	1.6855633985872	88.6343	0.494442	1.6845
91.6601	10.5225000000113	91.7898	10.5225	0.1297
89.166213902244	10.5225000000113	88.9914	10.7701	0.3849
89.1662139022441	12.3018619976908	90.4883	12.6216	1.3602
89.1662139022441	15.0931219604134	88.2698	14.9994	0.9013
87.2621054043489	18.257180772011	86.8707	18.0065	0.4648
82.6839000668127	22.4624	82.6839	23.4883	1.0259
75.8591959438248	22.4624	76.419	22.7841	0.7107
75.8591959438248	18.5104963853626	76.9072	18.2917	1.0706
75.4067	17.3084000057336	75.2455	17.3084	0.1612
76.3166767048619	17.0592090594447	77.5205	18.1054	1.5949
78.5888317795584	17.0592090594447	80.035	15.8589	1.8794
78.5878317795584	17.0592090594447	78.906	18.0381	1.0293
78.0615486688831	13.6247335147033	79.2919	13.6517	1.5872
77.0696052397778	10.2702308830387	77.911	9.90186	0.9185
75.0008097667541	6.40994000000155	73.4709	7.6166	1.9485
74.9998097667516	6.40994000000009	74.5771	5.70821	1.6887
74.6319999956797	6.40994000000009	74.632	5.60444	0.8055
68.3399455594463	8.37000444138305	68.2389	8.47105	0.1429
68.7936	4.34542979807239	70.1018	4.34543	1.3082
62.9420973797336	4.3454297980724	64.5769	3.66176	1.772
61.5068999792354	0.857606000000004	61.5069	0.482106	0.3755
60.2474478444572	0.857606000000008	60.7013	1.36116	0.6779
57.3019623160988	0.857605999999267	56.3237	2.07366	1.5607
56.614685947962	2.15771983461112	56.1254	1.40532	0.8975
48.1460000000003	2.15771983461122	48.5894	0.54797	1.6697
48.1459999999999	2.23052961505968	47.3917	2.23053	0.7543
51.8575000000002	5.37248057002536	52.4925	5.37248	0.635
50.5497999999994	6.17219177036277	51.1528	6.04103	0.6171
50.5498	8.85907007054221	48.6979	8.85907	1.8519
57.5985648862797	8.85907007054221	58.2097	7.56071	1.435
57.5985648862797	12.6179363914798	58.7637	13.9566	1.7747
66.9158	13.2576096141468	67.267	14.1516	0.9605
66.9158	15.6194000380245	68.0574	15.6194	1.1416
61.6813505569901	19.5888052761769	62.8285	19.7058	1.1531
61.6813505569902	29.501164863333	62.0154	28.1819	1.3609
61.6813505569901	36.61598572245	60.6972	35.5066	1.483

Solution x	Solution y	Original x	Original y	Radius
61.525800000141	41.2921999999999	61.5258	41.6034	0.3112
56.9260348827277	37.379655472672	55.717	37.8511	1.2977
56.9260348827277	35.9926810420732	56.9788	35.9946	0.0528
56.5160662369174	35.9926810420732	55.5492	35.9315	0.9688
56.5160662369173	32.8503148151859	56.0389	33.1015	0.7741
55.2818869041794	32.8503148151858	55.099	31.771	1.0947
49.1051455353199	32.8503148151859	49.1148	32.8614	0.0147
44.5403996356999	31.2797	44.5404	30.686	0.5937
38.5176676718893	31.2797000000023	37.7688	31.4408	0.766
36.8624253392095	32.0849704764132	36.8488	32.2474	0.163
36.8624253392096	29.4224010846513	37.0272	27.4581	1.9712
31.7085900322378	29.694337319064	31.6686	31.1822	1.4884
31.7085900322377	22.6246553655719	31.0765	22.0815	0.8334
37.9191139116494	22.624655365572	38.2173	22.874	0.3887
36.094870327195	22.6246553655719	34.4638	23.0393	1.9126
36.0948703271948	17.5953703291331	36.0033	17.5038	0.1295
40.8295529138748	18.8001963231229	39.9475	19.2268	0.9798
40.8295529138748	19.8300942738781	41.7205	19.4188	0.9813
42.2939860612319	23.9818934115274	42.987	22.9253	1.8509
42.2949860612319	23.9818934115282	42.4972	23.9973	0.2028
44.2670272511595	25.0031999999998	46.0829	25.5503	1.8965
47.6331000024987	25.0032	47.6331	25.3181	0.3149
48.5864573771638	20.4871375218275	47.6864	20.3976	0.9045
48.5864573771722	20.4861375218276	49.4045	19.961	1.3777
54.6929095964762	20.4861375218276	54.7387	20.4852	0.0458
55.0486	17.1432000177643	55.9929	17.1432	0.9443
49.6032770134595	16.3123065263283	50.9211	16.4053	1.3211
49.5675386480014	16.3123065263283	49.4944	16.327	0.0746
43.8936596290768	13.6777261257991	43.8962	13.6901	0.3615
38.8726000000004	8.84903242241808	38.2491	9.61738	0.9895
38.8726	7.79248968357689	37.2177	7.79249	1.6549
40.473	3.44287038573464	42.0178	3.44287	1.5448
34.5760687153906	0.299559459562672	33.1085	0.882753	1.5792
24.6032809156484	0.299559459562672	23.1984	1.0131	1.5757
19.8285434954512	0.299559459562673	19.0116	0.977048	1.9383
19.8285434954513	0.298559459562684	19.7287	0.198716	0.1412
20.6030510329637	2.94221493088112	21.7245	2.01127	1.4575
24.9694999999998	2.94221493088102	23.5387	4.13129	1.8604
24.9695	6.90196025945979	26.7979	6.90196	1.8284
23.2532000000002	8.21886025944805	21.4744	8.21886	1.7788
24.3313101539911	14.1303640189369	22.6997	14.9199	1.8126
25.7178004690123	14.1303640189369	25.6231	12.6549	1.4785
25.7178004690123	17.4771999999899	25.7178	17.895	0.4178
26.8547816230768	17.4771999999999	27.3595	17.3028	0.534
26.8547816230767	20.4385563285386	27.2482	20.2425	1.7718
26.8547816230768	20.4395563285386	26.0672	21.3383	1.195
26.8171000000001	25.1372001323609	25.8125	25.1372	1.0046
27.3772999999996	25.6883512138742	27.4222	25.8428	0.1631
27.3773000000006	29.2048986097352	29.1053	29.2049	1.728
25.0747672990736	33.273400000001	25.7714	33.2927	0.6969
23.1820379115821	33.2734	23.2874	32.7742	0.5102
22.7183000546958	33.2734	22.7183	34.3604	1.087
19.3435000000002	31.5536021306412	19.5262	30.4483	1.1203
19.3435000000002	29.2712000943987	19.247	29.2712	0.0965
19.4321	28.021999999743	20.3288	28.022	0.8967
15.5899880232134	25.9760351155804	15.3897	25.3897	0.6196
15.5899880232093	23.5169608568535	15.3759	23.0999	0.4688
13.7071645537648	22.9181510473071	13.4	22.8874	0.3087
11.6596699999999	19.2346995893998	9.96077	19.2347	1.6989
16.7771400211735	17.8709300816964	15.6993	18.7479	1.8907
16.7781400211734	17.870930081696	15.6444	17.8995	1.1341
16.9705999999965	17.3231999987136	17.2907	17.3232	0.3201
15.7825667891014	11.2605200000001	17.1854	11.1942	1.4044
14.8736997184291	11.2605200000001	14.8737	9.51072	1.7498
12.4824568700542	11.2605200000001	10.9524	12.0779	1.7347
12.6515999999923	4.29147000001196	12.7116	4.29147	0.06
12.6515999999923	3.45902000004702	12.6307	2.70835	1.996
9.6118746083294	3.45902000004695	10.9477	2.73525	1.5193
9.13506071079156	3.45902000004696	9.0496	1.67955	1.784
8.5705199979683	3.45902000004696	8.57052	3.36732	0.0917
5.10400229645658	3.45902000004695	4.96047	4.06059	0.8823
1.57978745618686	3.45902000004679	0.219756	2.58493	1.6167
3.18236002354047	6.18677764475611	2.00806	6.28968	1.1788
4.51056999999997	8.70233002025537	6.43447	8.70233	1.9239
0.965562000000318	11.3512521481341	2.19732	10.251	1.6516
0.965562000000062	12.2624000027823	0.613562	12.2624	0.352
2.13562999998425	16.3883000224872	2.68873	16.3883	0.5531
1.10505000000208	19.6998999864446	0.65945	19.6999	0.4456
3.84752999999979	20.7451998516443	5.81823	20.7452	1.9707
2.40936000000023	24.0294999984895	2.38826	24.0295	0.0211

Solution x	Solution y	Original x	Original y	Radius
3.38604999999338	25.1716737624905	2.1823	25.6845	1.6403
3.38604999999484	25.1726737624864	4.056	25.9589	1.9713
3.38604999999455	27.1001000365812	5.25835	27.1001	1.8723
3.3860499999944	28.2217013453855	3.44571	28.2052	0.0619
1.105806	35.3949999995146	0.642906	35.395	0.4629

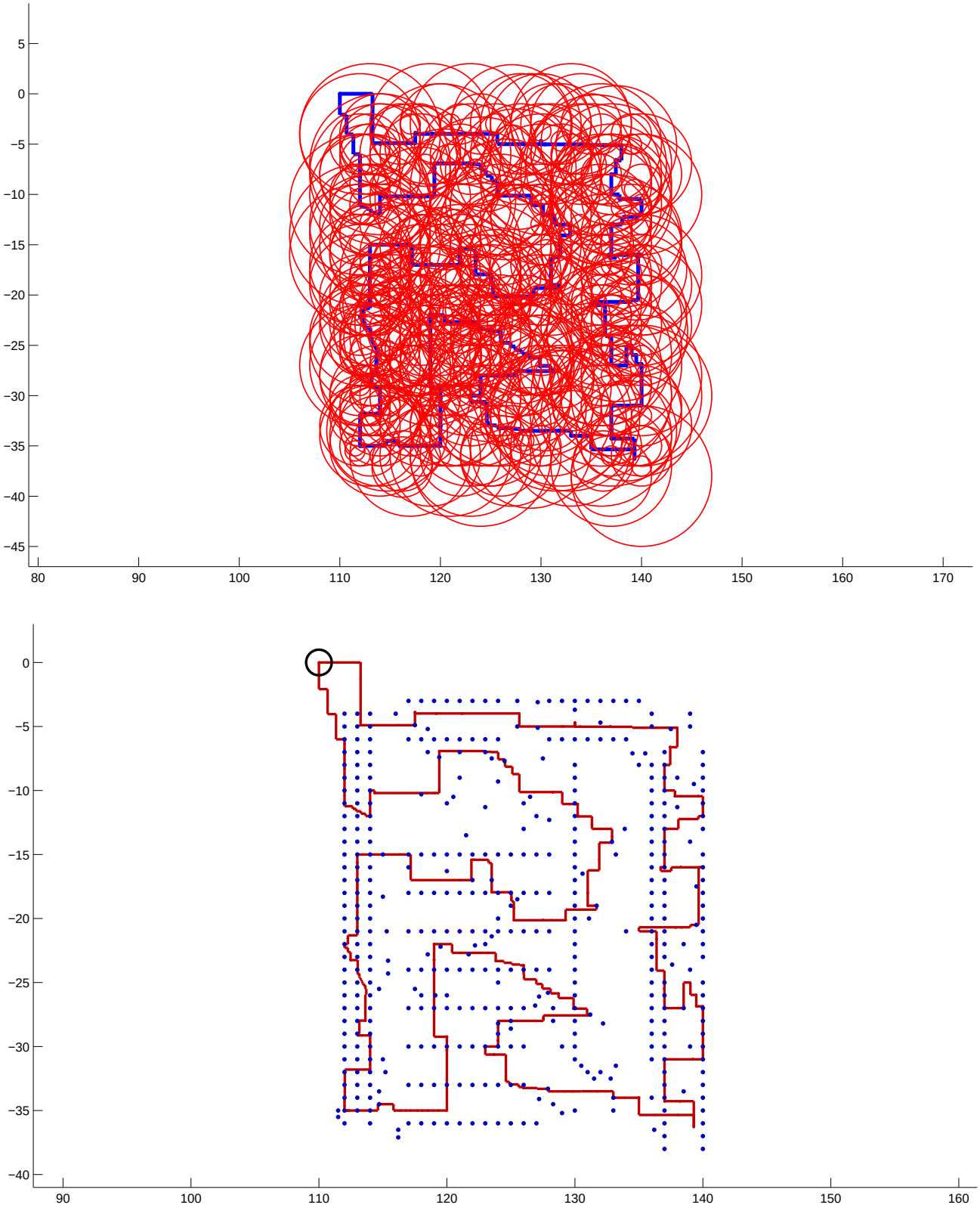


Figure N.164: *pcb*442, arbitrary radius, 2D, Manhattan, Length = 281.2537974

Table N-167: Solution for *pcb*442, arbitrary radius, 2D, Manhattan

Total distance: 281.25379737016				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
3.25312952090339	0.070345500243815	4	4	4
3.25312952090339	1.2756219392138	9	3	6
3.25312952090339	4.90249362627883	4	7	7
3.25412952090338	4.90249362627794	4	5	4
3.25412952090338	4.90349362627675	3	5	3
3.99999836475112	4.99999999999896	4	6	1
3.99999836475112	4.90000000000001	3	6	3
6.16069612586075	4.9	3	10	6
7.49899999999999	4.9	7	6	5
7.5	4.9	7.5	4.9	0
7.5	3.86602540378444	7	3	1
7.5	3.98495766019304	6	4	3
9.15893548191282	3.98495766019304	10	3	4
9.15893548191282	3.98595766019304	8	3	2
9.15993548191283	3.98595766019304	8.5	5.2	4
9.15993548191283	3.98595766019304	8	6	4
11.1659954858871	3.98595766019304	12	3	2
11.1669954858871	3.98595766019304	11	3	1
11.1669954858871	3.98695766019409	14	3	3
15.6609800515115	3.98695766019409	15.5	3	1
15.6609800515115	5.00000000000002	15.5	5	4
18.9999995369533	4.99999999999365	19	6	1
19.0974984355435	5.00000000000002	17.1	5.1	2
20.0000017938021	4.7000000016045	20	3.7	1
20.0010017938021	4.7000000016045	19	3	5
20.0020017938021	4.7000000016045	20	6	5
20.0020017938021	5.01967760231966	18	3	5
20.0020017938021	5.01967760231966	18	6	5
20.4161244863265	5.01967760231966	21	3	4
20.4171244863265	5.01967760231966	20	3	5
22.7826001651724	5.01967760231966	21	6	5
22.7826001651724	5.02067760231966	25	3	3
22.7826001651724	5.02067760231966	22	4.7	1
22.7836001651724	5.02067760231965	23	3	6
22.7836001651724	5.02167760231965	23	6	2
22.7836001651724	5.02167760231965	22	6	3
22.7836001651724	5.02267760231962	17.1	3.1	6
22.7836001651724	5.02367760231962	24	6	5
24.4999601216597	5.09999999992609	24.5	7.1	2
25.4044089061554	5.09999999992609	22	3	4
26.2034072202763	5.09999999992609	25	8	7
26.4134935075866	5.09999999992609	26	4	2
27.3296706911023	5.09999999992609	29	4	2
28.005012562886	5.09999999992609	29	5	1
28.005012562886	6.6214327184755	30	7	5
27.4474954772349	6.6214327184755	24	3	5
27.447495477235	6.6224327184755	27	7	6
27.4474954772349	6.6234327184755	26	5	6
27.4474954772349	6.62443271847549	27.5	5.2	6
27.4474954772349	6.6254327184755	27	9	6
27.4474954772349	8.01431837271019	27	15	7
27.0000000000009	8.01431837271019	27	8	4
27.0000000000009	8.01431837271019	26	8	2
27.0000000000009	8.0153183727102	25.5	7.1	7
27.0000000000009	8.0163183727102	26	9	5
27.0000000000009	10.0000002963333	26	10	1
27.8193886745171	10.4477067080246	27	10	6
27.8203886745169	10.4477067080246	26	11	6
27.821388674517	10.4477067080246	28	9	4
28.2756469537361	10.4477067080247	30	8	4
29.6181425944902	10.4477067080247	30	10	6
29.6191425944117	10.4477067080247	29.3	9.5	1
29.9999999999996	11	30	9	2
30	11.1669797809312	30	11	1
30	12	30	12	0
29.6453992120064	12.2336722598768	30	13	1
28.3581286237325	12.2336722598768	28	11.3	1
28.0823711212869	13	26	12	5
27.6499007926188	13	27	11	6
27.2178868659089	13	26	13	5
27.2168868659089	13	27	12	4
27	13	27	13	0
27	13.9990006516634	27	14	2
27	14.0000006516634	26	14	1
27	14.0010006516634	26	15	5
27	16	27	16	0
26.999	16	27	17	1
26.7071068597367	16	26	18	5
26.7071068597367	16.2928932973628	26	17	1
27.534916524792	16.001	26	16	3
28.2673722269313	16.001	30	17	2
28.2673722269313	16	29.5	17.5	5
28.2673722269313	16	30	18	6
28.2683722269313	16	30	15	4
28.2683722269313	16	29	14	5
30	16	30	16	0
29.8322478560963	16	30	19	5
29.6697219260489	20.5	30	20	1
29.5	20.5	29.5	20.5	0
29.0157492908108	20.6822678437113	30	21	6
28.3446663330575	20.6822678437113	27	20	2
28.3436663330575	20.6822678437113	27	18	3
27.8826662080673	20.6822678437113	27	19	5
27.8816662080673	20.6822678437113	26	19	5
27.8806662080673	20.6822678437113	27	22	2
27.8796662080673	20.6822678437113	27	21	4
27.8796662080673	20.6832678437113	26	20	2
25.0000000000013	20.9999994369871	24	21	1
26.3790505835451	21.5984925263023	26	21	4
26.3800505835451	21.5984925263023	26	24	3
26.3800505835451	24.0750342957993	26	25	1
26.9980419580145	24.8291186348477	26	22	3
26.9980419580145	25.4884111930671	27	25	2
26.9980419580144	25.4894111930673	30	25	4
26.9980419580145	25.4904111930673	27	26	3
26.9980419580145	25.9999993610119	27	23	3
26.9980419580145	26.1911327125971	26	28	3
26.9990419580145	26.1911327125971	27	29	3
26.9999999199132	26.9999999999999	27	28	1
28.5001969892341	26.9999999999999	27	27	7
28.5001969892341	25.0000000093423	28.5	27	2
29.0000003961324	25.0000000000001	29	24	1
29.0280493959104	25.966237140458	30	23	5
29.481383623811	25.966237140458	30	22	4
29.481383623811	26.8550070492976	30	26	1
29.482383623811	26.8550070492976	28.5	22	6
30	26.8550070492976	26	23	6
30	27	30	27	0
30	27.001	30	28	6
30	28	30	29	1
30	30.1757128891094	27.6	23.6	7
30	30.9990610350605	29	30	7
29.9878611564689	30.9990610350605	27	30	6
29.9878611564689	30.9990610350605	26	30	7
29.9878611564689	31.0000610350605	30	32	1
29.986861156469	31.0000610350605	30	31	4
29.986861156469	31.0000610350605	30	30	7
29.2056498225338	31.0000610350605	26	29	5
29.2056498225338	31.0000610350605	26	27	6
29.2046498225338	31.0000610350605	27	31	3
27	31.0000610350605	26	31	1
27	32.999	27	32	7
27	33	27	33	0
27.0121991049098	34.270269886035	30	34	3
27.0131991049098	34.270269886035	28.5	33.5	5
27.0141991049098	34.270269886035	30	33	5
27.0151991049098	34.270269886035	30	38	7
28.2060634317026	34.270269886035	27	37	6
28.2070634317026	34.270269886035	26.2	36.5	3
29.292893243584	36.2928931940429	30	37	1
29.2928932435839	35.3447513981718	27	38	4
29.292893243584	35.3437513981717	30	36	3
28.0297627106729	35.3437513981717	30	35	2
26.2454552547407	35.3437513981717	27	36	1
25.00000025	34.001	27	34	2
24.99900025	34.001	27	35	3
24.99900025	34	26	34	7
23.8865871170133	34	23	35	6
23	34	23	34	0
23	33.4899748742132	23.2	31.5	2
22.402076837344	33.4899748742132	20	31	6
21.7645214273358	33.4899748742132	22	32	7
21.7645214273358	33.4899748742132	21	32	6
21.1320145983761	33.4899748742132	22.8	32.5	7

Solution x	Solution y	Original x	Original y	Radius
20.5034589601507	33.5	21.5	32.5	7
19.8618632482291	33.5	19	35.2	6
19.2271339051368	33.5	20	35	2
18.3000002216453	33.5	18.3	34.5	1
17.9	33.3	17.9	33.3	0
17.0539078968615	33.2361120649874	17.2	34.1	1
15.8800466230864	33.1620081094579	15	36	3
15.6000513929711	32.9545735453046	16	33	2
14.8883471070412	32.746966630987	14	33	4
14.6079842135434	32.5390489172961	17	36	5
14.6079842135434	32.2500277267351	16	36	4
14.6079842135433	31.9219726409779	15	30	7
14.6079842135434	30.6242158272241	12	33	4
13.6627414368253	30.6242158272241	16	30	7
13.6627414368253	30.6232158272241	11	36	6
12.99999990002	30.00099990002	8	30	5
13	30	12	30	1
14	30	14	30	0
14	29.5160763835798	15	33	6
14	29.5160763835798	15	27	6
14	29.0290214156713	15	28.6	6
14	28.4786497449428	14	28.2	3
14	27.9999995000006	14	29	1
14.001	27.9999995000006	14	27	1
17.5443552881211	27.8033940906607	15	28	3
17.5443552881211	27.8023940906608	16	27	7
17.5443552881211	27.564726266497	16.9	26.8	1
21.199	27.564726266497	20	30	3
21.199	27.563726266497	18.3	28	7
21.199	27.5627262664969	19	30	4
21.199	27.561726266497	18.3	27	5
21.2	27.561726266497	20.5	31.5	4
21.2	27.5409663907518	20	28	2
21.2	27.5	21.2	27.5	0
20.9498070695793	27.0422523845677	20	27	3
19.894037386155	27.0422523845678	26	26	7
19.894037386155	27.0422523845678	20	29	7
19.8940373861545	27.0412523845734	22.2	28.2	3
19.894037386155	26.2126722078613	20	25	5
18.719549514507	25.846552076317	17.9	25.8	5
18.719549514507	25.846552076317	17.2	26.1	6
18.1032699779138	25.4810299468614	20	26	4
17.4564744297423	25.1130998574787	20	23	7
16.9895048273243	24.7492792641108	14	25	3
16.0171673273907	24.3701944110811	20	24	4
16	24	16	24	0
16	23.6514573084465	18	24	6
16	23.6504573084465	15	24	4
15.7065531541449	23.5944871803306	13	21	4
15.0728263319791	23.465208775981	17	24	2
14.4494865081222	23.3194960615153	12.2	22.1	5
13.8111555015375	23.3194960615153	13	24	5
13.8111555015375	22.687014934047	12	24	5
13.1878066869449	22.687014934047	11.7	22.8	3
12.5892375070735	22.687014934047	13	22	1
12.1934640005528	22.687014934047	13.5	21.4	3
11.6171678277447	22.687014934047	12	21	4
11.0367954481443	22.687014934047	14	20	5
10.4057697281529	22	11	21	2
9.00099999999988	22	10	21	4
8.99999999999989	22	9	21	1
8.99999999999989	23.2360679774999	7	21	3
8.99999999999989	23.2370679774999	8	21	6
8.99999999999989	23.2380679774999	9.1	26	5
8.99999999999989	23.2390679774999	11	24	5
8.99999999999989	26.9949992881488	8	26	2
8.99999999999989	26.9959992881488	8	24	6
8.99999999999989	26.9969992881488	8	27	3
8.99999999999989	26.9969992881488	7.5	25.5	3
8.99999999999989	26.9979992881488	10	26	4
8.99999999999989	26.9979992881488	10	24	4
8.99999999999989	26.9989992881488	9	24	5
8.99999999999989	26.9999992881488	7	27	2
8.99999999999989	29.2360675307326	13	30	5
9.99999950049926	29.2360675307326	12	27	3
9.99999950049926	29.2370675307326	11	27	5
9.99999950049926	29.2380675307327	13	27	7
9.99999950049926	29.2390675307327	9	30	2
9.99999950049926	30.2714118488735	9	27	6
9.99999950049926	30.2724118488715	10	27	5

Solution x	Solution y	Original x	Original y	Radius
9.99999950049926	30.2734118488735	10	30	1
9.99999950049926	32.9990004995008	9	33	1
10	33	10	33	0
10	33.001	8	33	4
10	33.001	11	33	4
9.99999999999999	35	10	36	1
9.99899999999999	35	12	36	4
9.35464039048037	35	13	36	6
8.94334582159055	35	9	36	5
8.53210927100048	35	14	36	7
8.09781973224922	35	8	36	2
7.66776583534205	35	13	33	6
7.13611482217895	35	6.2	37.1	3
6.80575797905374	35	6.2	36.5	3
6.3748344457012	35	7	33	3
5.93377944502447	35	3	35	3
5.82260443869119	34.5	3	34	5
5.71259168822694	34.5	11	30	7
4.7	34.5	4.7	34.5	0
4.60882382875494	35.0000000064415	4	35	5
3.99988649693957	35.0000000064415	4	36	1
2.32646326129715	35.0000000064415	1.5	35.5	1
2.32646326129715	35.0000000064415	1.5	35	1
2.22120364480293	35.0000000064415	4.7	33.5	6
2.11546802423236	35.0000000064415	7	36	6
2	35	2	35	0
2	34.9999999999999	2	36	1
2	34.6534481283022	4	34	5
2	34.3090938746837	2	32	3
2	34	2	34	0
2.02026347852939	33.5438530739514	2	33	4
2.02026347852939	33.0921350021466	3	33	1
2.02026347852939	32.6539810799191	4	33	4
2.02026347852939	31.7997093399665	3	32	1
4	31.7997093399665	7	30	5
4	31.4022472077449	4	32	4
4	31	4	31	0
4	30.999	5.2	32	3
4	30.999	5	31	1
4	30.3992166088118	2	30	3
4	29.716229582983	4	30	5
4	29.134380858326	5.4	23.3	6
3.999	29.1343808583259	2	27	6
3.999	29.1343808583259	3	27	6
3.99799999999999	29.1343808583259	2	28	4
3.997	29.1343808583259	2	31	3
3.997	29.1343808583259	3	31	3
3.0485429245135	29.1343808583259	3	30	2
3	28.9999999994719	2	29	1
3.15842047941845	28.6086978839544	3	29	2
3.15842047941845	27.9774799508922	3	28	1
3.62631746745312	27.9774799508947	4	28	6
3.62631746745312	27.9764799508921	4	29	3
3.62631746745312	27.3329560154256	7	24	6
3.62631746745312	26.8857758575951	8.5	22.8	7
3.62631746745312	26.4713175639676	4	27	1
3.62631746745312	25.9484560077973	4	26	3
3.70000000000002	25.500001397694	4.7	25.5	1
3.62609024150647	25.210516152111	5.4	24.3	5
3.55195435689423	25.210516152111	4	24	4
3.4777441300126	25.0668438561347	4	25	4
3.40344573338866	24.9232168857511	3	24	3
3.32931816578696	24.7807875921387	9.5	22.2	7
3.25094711938628	24.6442915556963	2	25	3
3.17314809654322	24.5074565795028	3	25	6
3.15951777285916	24.3704238175446	2	26	2
3.15951777285916	24.3704238175446	3	26	2
3.03056242521555	23.2453381107697	4	23	1
2.4720648854553	23.2453381107697	7	18	7
2.4720648854553	22.6249688563381	2	23	3
2.25959782772712	22.2901867727527	2	24	5
2	22	2	22	0
2.2670312637301	21.9072307867698	2	20	4
2.2670312637301	21.5510464682206	3	23	5
2.2670312637301	21.5510464682206	3	22	5
2.2670312637301	21.3129573335098	5.3	21	5
3.00000000359442	21.0842972360186	3	21	3
3.00000000359444	20.8559883357852	2	21	3
3.00000000359444	20.6273715599549	4	22	2
3.00000000359442	20.3207200127755	4	21	2

Solution x	Solution y	Original x	Original y	Radius
3.00000000359455	19.9999152114572	4	20	1
3.00000000359442	19.5014514536886	3	20	4
3.00000292300898	18.9975821477707	4	19	1
3.00000292300898	18.4930470341292	3	18	2
3.00000292300898	18.0059225078432	5	18.3	4
3.00000292300898	18.0059225078432	9	18	6
3.00000292300898	17.8437613058014	4	18	3
3.00000292300898	17.6837690620859	2	17	5
3.00000292298192	17.5216572551107	3	19	2
3.00000292298192	17.348137171006	2	18	5
3.00000292298192	17.348137171006	2	19	5
3.00000292298192	17.1730108591654	3	16	4
3.00000000000013	16.9999914963738	3	17	1
3.00000000000013	16.9999914963738	4	17	1
3.00000000000013	15.6550156117587	4	16	5
3.00000000000013	15.6540156117587	3	15	4
3.00000000000013	15	2	15	1
4.999	15	4	15	6
5	15	5	15	0
5.001	15	8	18	5
6.35312797539007	15	7	16	5
7	15	7	15	0
7	15.001	8	15	3
7	15.002	9	15	5
7	15.003	10	16.3	5
7.17157287525501	16.9999999999966	10	18	3
10.999998859587	16.9999999999966	11	18	1
11.9114378277662	16.9999999999966	12	17	6
11.9114378277662	15.4124378277662	10	15	2
11.9114378277662	15.4114378277662	11	15	1
12.0885621722339	15.4114378277662	11.5	13.5	2
12.0885621722339	15.4114378277662	13	15	1
13.2603952431537	15.6730414576014	14	15	1
13.5	17	13.5	17	0
13.5	17.9455663718704	12	18	6
13.5	17.9465663718705	14	18	2
13.5	17.9475663718705	13	18	5
15.039969377197	17.9475663718705	15	19	3
15.039969377197	18.4027393933047	15	18	7
15.040969377197	18.4027393933053	17	18	2
15.040969377197	18.655684439705	16	18	4
15.2303035618194	19.1507279125317	16	15	5
15.2303035618194	19.1517279125317	15.5	18.5	5
15.2303035618194	19.1527279125317	18	18	3
15.2303035618194	19.1537279125317	14	24	5
15.2303035618194	20.1342634638642	14	21	7
15.2313035618194	20.1342634638642	16	21	3
17.4995	20.1342634638642	18	21	1
17.5005	20.1342634638642	17	21	1
17.5015	20.1342634638642	15	21	6
18.1970856232198	20.1342634638642	20	21	2
19.2795645915634	20.1342634638642	20	22	2
19.2795645915634	19.3064779583382	20	20	1
21.698	19	20	19	2
21.699	19	21.1	20	4
21.7	19	21.7	19	0
21	19	20	17	3
21	18.0000000718391	20	18	1
21	17.999000071839	17	15	6
21	16.2387178362906	20.6	16.5	2
21.9026058237237	15.3602475286784	20	15	2
21.9026058237237	14.0766821674679	16	13	6
22.9	14.0766821674679	23.2	15	6
22.9	13.5851054506358	22.9	14	1
22.9	12.9999999127663	23.9	13	1
21.3356981174866	12.6712769089704	16.5	10.5	6
21.3356981174866	12.6702769089704	20	14	6
21.3356981174867	12.0236046357925	15	15	7
20.2159909552597	12.0236046357925	20	13	1
20.2159909552608	11.9181670732276	20	9	6
20.2159909552608	11.9181670732276	20	12	5
20.2159909552607	11.0556409784608	18	15	6
20.2149909552609	11.0556409784615	18	12.3	3
19.5419658228408	11.0556409784608	20	11	1
19.0079614902515	10.1259348846681	20	10	1
18.2685311781176	10.125934884668	17.5	7.5	6
18.2675311781177	10.1259348846681	20	8	6
18.2665311781176	10.1259348846681	17	12	3
18.2655311781176	10.1259348846681	20	16	7
16.8238163011526	10.1259348846681	13	11.3	4

Solution x	Solution y	Original x	Original y	Radius
15.6589159125728	8.72221281052715	16	11	5
15.1124645320015	8.14597278544776	14.5	7.7	4
14.5377567505315	7.57481647441939	14	9.3	7
14.0031541020743	6.99999502580769	14	6	1
13.4597988136606	6.9890684378346	13	7	3
12.9253691314633	6.9165151389993	11	7	2
12.7098598142	6.91651513899117	13.5	7.5	1
11.1859884322191	6.91651513899117	11	6	1
10.8938385484093	6.91651513899117	10	6	7
10.6027164393715	6.91651513899117	13	6	5
10.3063362476727	6.91651513899117	13	3	6
10.0421858561138	6.91651513899117	12	6	3
9.72398936897949	6.91651513899117	11	9	5
9.40000000000001	6.91651513899117	9	6	1
9.40000000000001	7.399	8.5	7	1
9.40000000000001	7.4	9.4	7.4	0
9.40000000000001	10.1999999999996	10	11	1
9.00718333709848	10.1999999999996	10.5	10.5	7
8.40000000000035	10.1999999999996	12	15	6
4.35323661997928	10.1999999999996	3	11	2
4.35323661997928	10.1999999999996	3	12	4
4.35323661997928	10	8	10.3	5
4	10	4	10	0
4	10.0000000000001	4	9	1
4	10.0000000000001	4	11	5
4	10.0010000000001	3	13	6
4	10.0010000000001	3	14	6
4	10.0020000000001	2	10	3
4	12	4	12	0
3.64917231118487	11.8146494974349	4	13	2
3.2867672782741	11.6237917806891	4	14	4
2.91960722241942	11.4285561365724	2	13	4
2.63936250372245	11.2310945514345	2	12	1
2.001	10.3905931577718	3	9	2
2.001	9	2	16	7
2	9	2	9	0
2	8.64504292432143	2	11	7
2	8.286786959622	3	8	5
2	8.286786959622	4	8	7
2	7.92982744414854	3	7	3
2	7.58095585218524	2	14	7
2	7.1743505730966	2	7	1
2	6.78217939446249	2	8	4
2	6.38324810672401	2	5	3
2	6	2	6	0
1.34080607181728	4.0388284721053	3	4	7
0.675221555377561	2.08212892467817	2	4	6

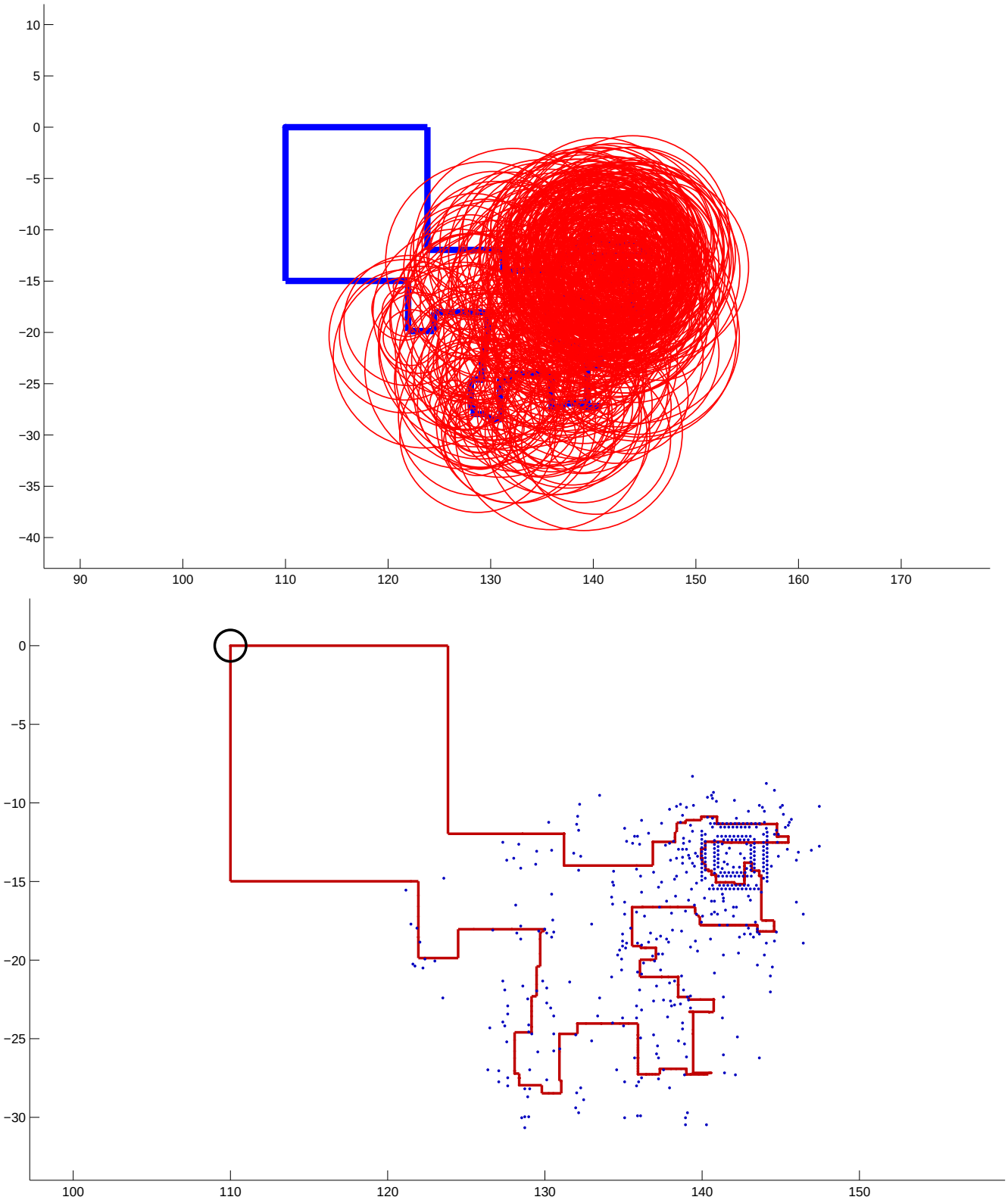


Figure N.165: $d493$, arbitrary radius, 2D, Manhattan, Length = 179.5632101

Table N-168: Solution for $d493$, arbitrary radius, 2D, Manhattan

Total distance: 179.563210066766				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
13.8318527863422	11.9618006523447	17.323	12.504	3.533
18.5768720949731	11.9618006523447	18.466	14.155	2.196
18.5778720949731	11.9618006523447	22.022	11.361	6.97
21.2156081934134	11.9618006523447	22.085	10.853	1.409
21.2166081934134	11.9618006523447	22.212	10.091	4.948
21.2176081934134	11.961800652336	23.482	9.52	3.464
21.2176081934134	13.984	25.578	12.568	5.855
21.2186081934134	13.984	22.276	13.393	3.052
21.2196081934134	13.984	22.149	14.282	1.97
25.8320000000031	13.984	25.832	14.219	0.235
26.8630338109939	12.4753933329107	26.022	12.631	1.625
26.8630338109939	12.4743933329107	25.895	12.123	4.686
26.8640338109939	12.4743933329107	26.594	11.933	0.605
28.2749087765031	12.4743933329107	27.673	12.695	3.999
28.2759087765031	12.4743933329107	29.975	13.621	8.631
28.2769087765031	12.4743933329107	28.499	12.949	0.524
28.2769087765031	12.4733933329107	28.816	12.568	3.752
28.2769087765031	12.4723933329107	28.372	13.52	4.868
28.2769087765031	12.4713933329107	27.927	12.568	0.363
28.2769087765031	12.1879690311555	28.181	12.441	9.321
28.2769087765031	11.8504362549191	27.991	13.647	2.618
28.384119934077	11.6079899548074	28.372	10.218	4.687
28.384119934077	11.2613289252094	29.007	10.282	4.077
28.9425073725772	11.2613289252094	28.753	10.79	0.508
28.9425073725772	11.0947900452661	27.419	11.298	1.537
29.4708663237359	11.0947900452661	29.451	10.155	0.94
29.9481620232966	10.875	30.34	9.647	1.289
29.9491620232966	10.875	29.388	11.804	6.15
30.0372746897891	10.875	29.388	8.313	3.288
30.1270298143713	10.875	28.626	11.234	4.284
30.1280298143712	10.875	30.527	11.313	2.614
30.7252743451134	10.875	30.787	11.313	9.249
30.7262743451134	10.875	31.047	11.313	6.138
30.8188314160531	10.875	31.015	12.776	4.762
30.9119999999992	10.875	30.912	9.901	0.974
30.9407736531172	10.875	31.437	11.541	2.677
30.9407736531172	11.3399999999736	31.697	11.541	4.577
30.9417736531172	11.3399999999736	30.34	10.917	4.723
30.9427736531172	11.3399999999736	31.015	12.516	8.72
30.9437736531173	11.3399999999736	31.177	11.541	1.55
31.1703994752061	11.3399999999736	31.502	12.126	9.301
31.1703994752061	11.3409999999737	31.827	11.313	3.091
32.2169986538489	11.3409999999737	32.217	11.541	0.2
32.2179986538489	11.3409999999737	32.477	11.541	3.772
32.2189986538489	11.3409999999737	32.347	11.313	0.438
32.612426578298	11.3409999999737	32.737	11.541	5.142
32.613426578298	11.3409999999737	26.149	11.107	6.643
32.7327261205425	11.3409999999737	33.387	11.313	9.319
32.8534756918241	11.3409999999737	32.944	10.536	3.833
32.8544756918241	11.3409999999737	30.721	9.329	3.502
32.8554756918241	11.3409999999737	33.127	11.313	2.902
32.9858141515393	11.3409999999737	32.997	11.541	0.865
33.1209479936147	11.3409999999737	34.087	11.615	4.861
33.6470000104486	11.3409999999737	32.867	11.313	1.814
33.6470000104749	11.34	33.647	11.313	0.027
33.6470000104749	11.341	33.452	11.541	4.46
33.6470000104749	11.342	34.135	11.866	1.771
33.6470000104749	11.343	33.642	10.155	3.353
33.6470000104749	11.344	34.976	10.282	4.446
33.7523156021657	11.344	35.484	11.425	2.932
33.7523156021657	11.345	35.166	10.726	5.004
34.7561657175196	11.345	35.547	11.234	6.26
34.7561657175196	11.346	35.293	11.552	5.688
34.7561657175196	11.347	34.087	8.758	5.137
34.7561657175196	11.348	30.657	11.541	6.88
34.7561657175196	11.349	27.927	10.409	7.95
34.7561657175196	11.35	33.907	12.516	2.372
34.7561657175196	11.351	28.626	10.091	7.98
34.7561657175196	11.352	34.595	11.996	4.778
34.7561657175196	11.9676607692713	30.658	9.71	8.685
34.7561657175196	12.1326983626925	35.42	12.949	1.498
34.7561657175196	12.1336983626925	32.055	9.837	5.02
34.7561657175196	12.1346983626925	30.594	9.52	7.585
34.7571657175196	12.1346983626925	34.595	9.202	3.337
34.8696496290943	12.1346983626925	34.722	11.742	0.519
34.8706496290943	12.1346983626925	35.103	10.155	3.418
35.4804333640477	12.1346983626925	37.452	10.218	4.761
35.4804333640477	12.5179999999979	35.674	11.044	6.002
35.4804333640477	12.5189999999979	37.452	12.758	1.986
35.2773582148907	12.5189999999979	36.944	13.012	3.218
35.0737830913671	12.5189999999979	36.119	13.139	3.085
34.8715670139941	12.5189999999979	34.135	13.166	1.621
34.6814637365699	12.5189999999979	33.907	13.036	3.305
34.4960456180433	12.5189999999981	34.785	12.504	9.071
34.1380963433285	12.518999999998	34.135	12.646	4.083
34.1349999998293	12.518999999998	34.135	12.906	0.387
34.1339999998294	12.518999999998	34.135	12.386	5.584
33.7539191716095	12.518999999998	34.135	13.686	4.602
33.5679907814701	12.518999999998	33.907	12.776	9.552
33.3831838560789	12.518999999998	33.322	12.841	4.98
33.2013267476695	12.518999999998	33.322	12.321	0.752
33.0185024250677	12.518999999998	32.932	12.353	3.826
32.8387766122302	12.518999999998	33.095	12.971	2.042
32.6604577621654	12.518999999998	32.672	12.353	8.34
32.4851980978528	12.518999999998	33.062	12.126	4.87
32.3270346797995	12.518999999998	32.282	12.126	3.133
31.8846374376057	12.518999999998	32.835	12.613	0.955
31.8836374376057	12.518999999998	31.762	12.126	6.006
31.7797223481667	12.518999999998	31.242	12.126	5.83
31.3423426114838	12.518999999998	32.542	12.126	1.441
31.3423426114848	12.4700000000044	31.892	12.353	3.015
31.3413426114838	12.4700000000044	31.632	12.353	8.922
30.9253512269895	12.47	31.372	12.353	3.954
30.73333436854	12.47	30.787	12.646	0.184
30.73233436854	12.47	31.697	14.433	8.117
30.6099014098217	12.47	31.567	14.661	2.638
30.6089014098217	12.47	30.787	13.166	1.867
30.6079014098217	12.47	30.202	12.971	8.778
30.202	12.47	30.202	12.451	0.019
30.201	12.47	30.202	12.711	9.036
30.2	12.4700000000044	29.975	12.581	3.034
30.2	12.9210638542067	29.975	13.101	5.333
30.199	12.9210638542067	30.202	11.996	1.233
30.198	12.9210638542067	29.975	12.841	8.339
29.94	12.9210638542067	29.705	13.393	8.359
29.94	12.9220638542067	30.202	13.231	0.532
29.94	13.203	29.578	13.203	0.362
29.94	13.522502475451	29.197	13.52	8.532
29.94	13.5235024754502	29.388	13.838	7.053
29.94	13.5245024754502	29.975	13.361	8.8
29.94	13.5255024754498	31.827	14.661	8.515
29.94	13.5265024754494	30.982	12.126	5.546
30.0088434620734	13.5265024754494	29.975	13.881	2.974
30.0098434620736	13.5265024754494	29.515	14.028	5.055
30.0098434620737	13.5275024754502	29.007	12.949	8.697
30.0098434620737	13.5285024754509	29.134	13.33	6.084
30.0098434620737	13.5295024754511	28.753	13.457	9.22
30.0098434620737	13.530502475451	30.202	13.751	8.941
30.0098434620737	13.531502475451	30.202	14.011	8.617
30.0098434620737	13.857837132921	28.753	13.838	1.257
30.2146895724653	14.2396986180409	29.975	14.141	0.982
30.2146895724653	14.2406986180413	29.975	14.401	4.095
30.2156895724653	14.2406986180417	29.975	14.921	2.292
30.2166895724653	14.2406986180414	29.975	14.661	0.642
30.2176895724653	14.2406986180412	30.202	14.271	0.592
30.2176895724653	14.2416986180411	31.047	14.661	2.465
30.2176895724653	14.2426986180394	30.787	14.206	3.808
30.4036038834033	14.2426986180394	31.015	14.076	6.371
30.4036038834033	14.3297023904478	31.015	13.556	2.877
30.4036038834033	14.3307023904478	31.547	13.203	3.992
30.5914767577314	14.3307023904478	30.787	14.466	9.289
30.5914767577314	14.3317023904478	31.437	14.433	8.72
30.5914767577314	14.569689961239	31.61	13.901	7.404
30.5914767577314	14.570689961239	28.245	14.854	5.84
30.5914767577314	14.571689961239	29.007	14.409	6.619
30.8804049390645	14.571689961239	30.975	17.076	3.584
30.8814049390645	14.571689961239	29.324	15.489	9.524
30.8814049390647	14.572689961239	31.015	13.816	1.481
30.8814049390645	14.6943147824654	31.275	14.173	1.24
30.8824049390647	14.6943147824654	31.307	14.661	1.899
30.8824049390645	14.6953147824654	30.15	16.06	8.901
30.8824049390646	14.6963147824654	30.462	15.473	6.788
30.8824049390646	15.0551325306803	31.356	16.251	5.882
30.8824049390645	15.0561325306803	30.785	16.251	3.205

Solution x	Solution y	Original x	Original y	Radius
30.8834049390645	15.0561325306803	31.483	16.822	9.589
30.8844049390645	15.0561325306803	30.722	15.473	0.772
30.8854049390645	15.0561325306803	31.502	15.473	5.299
31.1542645281371	15.0561325306803	31.242	15.473	0.426
31.4852221134427	15.0561325306803	31.632	15.246	4.737
31.486222113442	15.0561325306803	31.112	15.246	8.972
31.8885526577025	15.0561325306803	31.762	15.473	7.919
32.0382724357211	15.0561325306803	31.892	15.246	6.832
32.0819163415093	15.164	31.372	15.246	6.866
32.0829163415093	15.164	32.022	15.473	6.4
32.282	15.164	32.282	15.473	0.309
32.6889999999999	15.164	32.412	15.246	8.256
32.689	15.163	32.932	15.246	6.384
32.689	15.162	32.152	15.246	4.552
32.689	15.161	32.087	14.661	1.421
32.689	14.9532513653834	32.944	15.933	2.412
32.689	14.9111585353926	33.071	16.187	6.12
32.689	14.8691286355502	32.477	14.433	7.82
32.689	14.8272189498712	32.347	14.661	7.755
32.689	14.7661676988093	32.607	14.661	4.485
32.689	14.707813033921	30.787	13.426	9.125
32.69	14.7078130339209	32.372	14.092	6.932
32.69	14.6496099484038	32.867	14.661	8.465
32.69	14.6486099484028	32.737	14.433	4.264
32.69	14.6476099484028	31.957	14.433	4.494
32.69	14.6466099484028	31.991	14.092	3.28
32.69	14.5885888398076	30.787	13.946	7.399
32.69	14.4536122870012	31.015	13.036	5.03
32.69	14.4526122870012	34.135	14.986	7.609
32.69	14.4516122870012	25.705	12.123	8.029
32.69	14.4506122870013	34.135	14.726	3.323
32.69	14.4496122870012	35.992	13.647	9.144
32.6900000000001	14.4486122870012	34.135	14.206	1.632
32.69	14.4476122870012	33.322	14.141	3.297
32.6899999999999	14.2277722557511	32.835	14.173	0.155
32.69	14.0208958968975	25.07	11.615	8.154
32.6899999999999	14.0198958968975	32.217	14.433	0.628
32.69	13.807	32.69	13.52	0.287
32.691	13.807	33.095	13.491	0.844
32.6909999999999	13.808	34.135	13.426	8.117
33.0131505045233	13.808	33.907	13.816	8.76
33.1524971330124	13.808	33.095	13.751	7.425
33.1524971330124	14.3109211184865	33.322	13.621	7.179
33.1534971330126	14.3109211184865	33.095	14.011	2.901
33.1544971330126	14.3109211184865	33.322	13.881	0.777
33.6275020485529	14.3109211184865	33.907	13.556	0.805
33.6275020485529	14.3363937309861	33.907	14.076	0.382
33.6285020485529	14.3363937309861	33.062	15.473	7.07
33.6295020485529	14.3363937309861	33.907	14.336	1.948
33.6295020485529	14.6312545931441	33.127	14.661	2.812
33.6295020485529	14.6322545931432	32.182	16.632	9.605
33.6305020485529	14.6322545931432	32.542	15.473	5.858
33.7572890233833	14.6322545931432	32.672	15.246	2.909
33.7572890233833	14.6332545931437	32.802	15.473	3.005
33.7582890233833	14.6332545931438	33.322	15.473	2.231
33.7592890233833	14.6332545931442	33.452	15.246	2.23
33.7602890233833	14.6332545931442	33.907	14.791	0.855
33.7612890233833	14.6332545931442	34.135	13.946	7.157
33.7612890233833	14.6342545931433	34.135	14.466	7.813
33.7612890233833	15.2127857688476	33.582	15.473	0.316
33.7612890233833	17.4793536535195	33.769	15.679	3.318
34.0650987627162	17.4793536535195	31.293	15.806	3.238
34.0650987627162	17.4803536535195	35.992	16.314	6.3
34.5772872030127	17.8331233309809	36.436	17.076	2.007
34.5772872030126	18.171	27.292	16.632	9.708
34.5772872030128	18.172	26.149	15.679	9.977
34.6523796007078	18.172	34.722	18.219	0.084
34.6513796007078	18.172	36.436	18.918	5.753
34.4535601686563	18.172	34.595	18.791	4.79
34.0596141222393	18.172	33.642	18.346	5.973
33.8693794048761	18.172	30.202	14.791	5.659
33.690848159291	18.172	34.341	21.013	9.585
33.5150000000013	18.172	33.515	20.315	2.143
33.5150000000012	17.7841619155173	33.515	18.219	4.061
33.5150000000012	17.7831619155144	33.515	18.029	3.593
33.473119063151	17.7831619155144	30.657	15.246	4.816
33.4315011995527	17.7831619155145	31.356	16.06	3.559
33.4315011995527	17.7821619155147	31.991	16.632	2.73
33.3903559605389	17.7821619155147	29.197	12.441	7.211
33.3893559605389	17.7821619155147	31.015	13.296	5.495

Solution x	Solution y	Original x	Original y	Radius
33.3496382325441	17.7821619155147	31.275	12.613	5.931
33.3486382325441	17.7821619155147	32.182	10.98	7.118
33.3162416177634	17.7821619155147	33.388	17.584	0.393
33.2291483755801	17.7821619155147	29.642	15.108	5.237
33.1414717288648	17.7821619155147	33.96	10.536	7.536
33.0583462771493	17.7821619155147	33.071	18.346	7.578
32.9724632727666	17.7821619155147	32.817	17.775	7.615
32.8872410290844	17.7821619155147	31.991	17.203	2.464
32.8033286586951	17.7821619155147	32.69	18.346	1.033
32.7202019177571	17.7821619155147	32.944	17.965	2.152
32.6337895646758	17.7821619155147	25.197	12.441	9.295
32.5716847903018	17.7821619155147	33.095	12.711	5.532
32.5096349322788	17.7821619155147	32.802	12.126	6.243
32.4478400872374	17.7821619155147	32.372	18.537	3.113
32.4034753392241	17.7821619155147	33.261	18.537	7.388
32.3456678161568	17.7821619155147	33.322	12.581	6.265
32.2880178674513	17.7821619155147	31.102	17.775	2.111
32.231173977565	17.7787394779027	34.849	11.996	7.912
32.1744660412331	17.7787394779027	33.907	11.996	7.29
32.1144906002056	17.7787394779027	33.833	10.282	9.452
32.0547639720061	17.7787394779026	33.322	14.401	5.546
31.9951135227176	17.7787394779027	33.322	13.101	6.817
31.9356644667136	17.7787394779027	33.095	13.231	6.668
31.8933968455357	17.7787394779027	32.412	12.353	7.931
31.8411982871752	17.7787394779027	31.957	11.541	8.595
31.782494207327	17.7787394779027	31.61	17.775	4.415
31.7273516558356	17.7787394779027	33.96	19.68	7.146
31.6790793851652	17.7787394779027	32.022	12.126	7.596
31.6209863777688	17.7787394779026	32.152	12.353	7.264
31.5631653127125	17.7787394779027	32.436	13.231	5.906
31.5088134303607	17.7787394779027	32.607	11.313	7.65
31.4546361491958	17.7787394779027	31.567	11.313	7.667
31.4007256273209	17.7787394779027	31.737	12.885	5.959
31.346989200599	17.7787394779027	31.307	11.313	7.443
31.3303353438528	17.7787394779026	29.975	12.061	7.414
31.2737920445374	17.7787394779027	34.849	13.393	6.061
31.2160429715624	17.7787394779027	30.787	12.906	6.569
31.1587023837379	17.7787394779026	29.261	11.425	8.741
31.1017877366658	17.7787394779026	29.975	12.321	7.85
31.0451801393174	17.7787394779027	30.787	13.686	6.343
30.9885138844278	17.7787394779026	29.975	11.801	8.467
30.9322036865222	17.7787394779026	30.787	12.386	7.465
30.8760325488438	17.7787394779027	31.399	13.754	6.233
30.8200306314845	17.7787394779027	30.658	10.98	9.268
30.7643630364926	17.7787394779027	28.816	12.25	9.823
30.7090279189465	17.7787394779027	28.753	12.949	9.829
30.657318178127	17.7787394779027	30.202	13.491	9.735
30.6058563601601	17.7787394779027	30.982	15.473	9.722
30.557933755365	17.7787394779027	31.177	14.433	9.897
30.503436317406	17.7787394779027	34.341	22.029	7.918
30.4522831358139	17.7787394779027	32.087	11.313	9.723
30.4047491925764	17.7787394779027	33.96	11.234	9.284
30.3506286170395	17.7787394779027	29.261	19.172	3.212
30.3002477202616	17.7787394779027	24.371	14.346	7.57
30.2640707286696	17.7787394779027	29.705	19.426	2.488
30.2116051637526	17.7787394779027	30.785	20.823	6.267
30.1593468834742	17.7787394779027	34.135	12.126	8.535
30.1071323674133	17.7787394779027	31.356	19.68	4.172
30.0548039012492	17.7787394779027	30.531	18.664	6.676
30.0061202159176	17.7754038385522	30.594	17.076	5.185
29.9576339926574	17.772069913863	30.785	16.949	7.677
29.9093660599423	17.7687373150752	29.959	17.584	6.004
29.8650201961196	17.7654053398055	29.578	18.791	1.065
29.8482122530659	17.2116164680526	30.023	17.203	0.175
29.7074960040704	17.0914193526378	29.642	17.076	3.024
29.5677126663293	16.9501723034468	28.943	16.886	0.628
29.5526007187246	16.8753815266103	28.054	17.013	8.339
29.5526007187246	16.7858893134477	27.737	16.251	9.503
29.5526007187246	16.626000000001	24.308	15.044	9.423
29.5149999996114	16.626000000001	29.515	16.505	0.121
28.4503085830989	16.626000000001	30.594	16.251	2.691
28.4493085830989	16.626000000001	28.372	14.663	8.657
27.9651641396953	16.626000000001	27.419	15.044	7.778
27.4147667198789	16.626000000001	29.134	16.187	3.747
26.8601492333132	16.6278317534394	28.308	15.933	3.661
26.1976251794004	16.6278317534394	26.086	14.663	1.968
26.1966251794005	16.6278317534394	26.911	14.409	5.204
26.1966251794005	16.6288317534394	27.229	15.362	4.245
26.1966251794004	16.6298317534395	25.07	16.314	2.3
26.1966251794005	16.6308317534395	25.895	18.918	7.438

Solution x	Solution y	Original x	Original y	Radius
25.5430000000004	16.6308317534395	25.07	17.076	5.925
25.5430000000004	19.1080000000029	24.943	19.108	0.6
26.1090665748158	19.2162005393417	24.625	19.68	9.202
26.1100665748158	19.2162005393417	26.022	21.902	6.288
26.1110665748158	19.2162005393418	18.212	18.283	7.954
26.3813112307755	19.2162005393418	24.308	16.441	3.717
26.3823112307755	19.2162005393417	21.831	13.203	7.88
26.3833112307755	19.2162005393417	19.482	13.076	9.717
26.3843112307756	19.2162005393417	26.149	19.045	0.291
26.3853112307755	19.2162005393417	26.594	18.854	6.988
26.3863112307755	19.2162005393417	26.721	18.283	8.04
26.3873112307755	19.2162005393418	27.102	18.664	5.391
26.3873112307755	19.2172005393418	27.864	18.854	5.87
26.3873112307755	19.2182005393417	20.434	15.806	8.615
26.3883112307755	19.2182005393418	27.356	20.632	8.262
26.3893112307755	19.2182005393419	26.34	17.203	3.101
26.3903112307756	19.2182005393418	25.832	16.949	3.416
26.3913112307756	19.2182005393418	22.974	17.711	5.019
26.3923112307756	19.2182005393418	22.149	11.742	9.67
26.3933112307756	19.2182005393418	27.356	18.473	1.404
27.0579999999975	19.2182005393417	27.483	19.616	4.477
27.0579999999976	19.616	27.229	19.616	0.171
27.0579999999976	19.9771646946114	28.689	18.156	4.491
26.7159202590298	19.9771646946114	27.737	18.664	7.927
26.7159202590298	19.9781646946113	26.975	20.061	0.272
26.0470000000022	20.7590000000007	25.895	20.759	0.152
26.0470000000022	21.072813735316	26.149	20.886	5.887
26.4035463078064	21.072813735316	18.466	18.664	8.295
27.4236236324011	21.072813735316	27.102	21.648	0.659
27.4246236324012	21.072813735316	24.943	18.346	3.687
27.4256236324011	21.072813735316	25.197	18.918	4.006
27.8464307043472	21.072813735316	27.927	21.458	1.027
27.8474307043466	21.072813735316	28.245	21.331	3.596
28.4766323786971	21.072813735316	28.689	21.013	0.24
28.4766323786971	21.073813735316	24.879	19.934	4.656
28.4766323786971	21.074813735316	24.943	18.791	4.875
28.4766323786971	21.5761785079639	24.244	21.077	4.835
28.4766323786971	21.5771785079639	24.371	15.235	7.737
28.476632378694	21.5781785079639	20.561	18.219	9.121
28.4766323786971	22.3376882777054	24.879	20.632	4.555
28.4766323786971	22.3386882777054	26.276	20.188	3.614
28.4766323786971	22.3396882777054	25.451	17.965	5.492
28.476632378697	22.3406882777054	27.991	22.601	0.551
28.4776323786972	22.3406882777111	27.8	23.617	6.658
29.1309999999999	22.3406882777111	24.244	15.997	8.356
29.1319999999999	22.3406882777111	28.816	21.902	4.368
29.1329999999999	22.3406882777111	28.626	22.791	9.57
29.1339999999999	22.3406882777054	29.07	22.347	8.48
29.1339999999999	22.5129999999971	29.134	22.537	0.024
29.8865602160954	22.512999999997	28.054	22.918	3.972
30.7336082813408	22.512999999997	33.907	13.296	9.748
30.733608281349	22.513999999997	27.546	22.537	5.492
30.733608281349	22.514999999997	31.356	22.347	9.352
30.7336082813468	22.515999999997	34.404	14.028	9.888
30.7336082813468	22.516999999997	33.322	13.361	9.946
30.7336082813468	22.517999999997	33.095	14.271	9.731
30.7336082813468	22.518999999997	26.149	27.49	8.339
30.7336082813468	22.519999999997	31.293	23.68	6.085
30.7336082813468	23.3049004226129	32.245	24.887	2.188
30.4469280519778	23.3049004226129	25.895	29.903	9.341
30.4459280519778	23.3049004226129	31.356	26.03	3.642
30.4449280519777	23.3049004226129	33.642	26.22	5.615
30.4449280519781	23.2923787104355	29.261	23.045	3.259
29.1903787104613	23.2923787104355	25.133	19.235	5.738
29.4248025484544	23.2923787104355	29.261	22.283	1.411
29.4248025484544	24.4356345933037	28.753	23.998	1.239
29.4248025484544	24.6872923394076	28.499	25.141	1.031
29.4248025484544	24.6882923394076	28.245	22.855	6.887
29.4248025484544	24.6892923394076	28.753	24.379	0.74
29.4248025484544	27.172000000983	28.88	25.331	8.431
29.4248025484544	27.173000000983	24.562	26.982	7.031
30.58	27.173000000983	31.42	27.173	0.84
30.3899074027867	27.2714176220999	32.118	27.3	5.473
30.1052860693835	27.2714176220999	26.848	19.743	9.863
29.7805287840816	27.2714176221	34.087	18.918	9.955
29.2700717402999	27.2714176221	32.309	19.553	9.666
29.2690717402998	27.2714176220999	30.277	30.475	7.266
28.9947295660943	27.2714176221	28.943	30.475	3.204
28.9947295660943	27.2704176220999	34.468	20.442	9.777
28.9947295660943	27.0236201752376	20.942	25.649	8.469

Solution x	Solution y	Original x	Original y	Radius
28.9947295660943	26.916900938578	29.007	26.157	0.76
28.9937295660943	26.916900938578	22.466	28.887	7.763
28.6606570202052	26.916900938578	24.752	19.362	9.904
28.3402634487828	26.916900938578	27.546	26.982	8.192
28.0269777888676	26.916900938578	28.118	18.092	9.723
27.3053546624843	26.916900938578	21.958	24.76	6.761
27.3053546624843	27.2647960720236	19.164	24.696	8.537
27.0279897281623	27.2647960720236	27.229	27.554	5.774
26.8312399386197	27.2647960720236	27.927	28.125	6.761
26.6362495800697	27.2647960720236	29.07	29.713	9.61
26.4430386533303	27.2647960720236	28.943	30.03	6.569
26.4420386533284	27.2647960720236	26.086	29.903	5.939
26.4410386533276	27.2647960720236	25.07	30.03	3.224
26.4400386533275	27.2647960720236	19.863	21.331	9.178
25.916	27.2647960720236	25.832	27.998	0.738
25.916	27.0809637460952	20.561	23.553	7.372
25.916	26.9038735359991	27.229	26.22	2.987
25.916	26.7304046792951	28.88	27.3	4.959
25.916	26.558462132909	25.07	27.744	6.389
25.916	26.2210000000035	25.959	27.744	5.865
25.916	26.2200000000034	25.705	26.22	0.211
25.916	26.2190000000034	20.117	22.728	7.823
25.916	26.2180000000034	18.593	21.648	9.517
25.916	25.8817412657169	17.64	23.426	9.913
25.916	25.772685367189	18.974	24.125	8.219
25.916	25.6649213423058	27.102	25.966	2.428
25.916	25.5575970317166	27.165	25.458	2.59
25.916	25.4043563962331	18.72	28.189	7.716
25.916	24.9986600113706	25.006	24.188	1.627
25.916	24.9976600113706	26.086	24.95	5.746
25.916	24.766176473337	22.149	29.713	6.925
25.916	24.7651764733375	20.434	18.537	8.447
25.916	24.7641764733374	26.911	24.76	7.931
25.916	24.0319953488246	26.149	23.172	0.891
25.3304208858196	24.0319953488246	25.832	22.918	6.514
24.7668811132572	24.0319953488246	24.308	23.998	2.157
24.2386848825856	24.0319953488246	24.943	23.68	9.291
23.5829555065049	24.0319953488246	25.832	23.68	9.355
23.5819555065068	24.0319953488246	26.911	22.601	7.439
22.6095975411226	24.0319953488246	23.482	22.41	8.804
22.0678014940785	24.0319953488246	23.355	23.553	6.4
22.0668014940731	24.0319953488246	22.974	25.141	2.625
22.0668014940731	24.6960000000001	13.513	22.41	8.854
20.9220000000107	24.6960000000001	20.561	24.696	0.361
20.9220000000003	25.8319339904339	20.561	25.776	5.596
20.9220000000003	27.6805074037255	20.117	27.617	1.231
21.0373469708988	27.6805074037255	22.022	28.443	5.071
21.0373469708988	28.4743469708914	21.958	29.395	1.302
20.5348901986853	28.4743469708914	17.323	21.331	8.168
20.2405137012334	28.4743469708914	22.276	28.125	2.538
19.8030320427818	27.9576707302442	19.037	28.189	3.611
18.3625896706363	27.9576707302443	18.529	30.03	2.079
18.362589670636	27.5020632793893	18.91	28.697	3.011
18.3625896706359	27.5010632793892	18.974	29.967	3.376
18.3625896706364	27.5000632793894	18.72	29.967	7.58
18.3625896706363	27.4990632793894	18.72	30.665	3.298
18.3625896706363	27.4980632793896	17.64	27.49	0.99
18.3625896706363	27.2119869144131	17.069	27.744	2.549
18.071	27.2119869144121	17.64	27.998	1.574
18.071	27.0459999999999	17.069	27.046	1.002
18.071	27.0449999999999	19.037	26.982	6.169
18.071	26.2320533214906	16.37	26.982	2.311
18.071	25.7927374956066	17.577	25.204	4.26
18.071	25.0934576554086	19.545	25.839	4.367
18.071	24.5967643597744	16.497	24.315	2.342
19.1510653053332	24.5967643597744	18.974	24.569	2.27
19.1510653053332	24.2453988208363	16.688	18.092	8.156
19.1510653053332	24.2443988208363	17.45	24.188	1.702
19.1510653053332	23.5773661801812	17.323	23.934	5.56
19.1510653053332	23.2470579902752	17.45	21.902	6.347
19.1510653053332	22.9253381135353	17.64	22.918	3.23
19.1510653053332	22.609872775707	18.91	22.474	4.101
19.1510653053332	22.300795722512	18.148	16.505	6.09
19.4674029974212	22.163597304045	18.466	17.838	4.44
19.4674029974212	21.8934539627842	19.482	21.966	0.074
19.4674029974212	21.5450810600657	21.577	21.394	2.115
19.4674029974212	20.9608486230199	20.498	17.457	7.365
19.4674029974212	20.4005471941052	20.371	23.045	6.483
19.6973010879394	19.5950337564047	20.117	21.775	2.22
19.6973010879394	18.6856233187163	17.577	13.647	6.049

Solution x	Solution y	Original x	Original y	Radius
19.6973010879394	18.6455302521895	18.339	12.631	6.166
19.6973010879394	18.2227602853995	20.117	18.283	0.424
19.8351424513299	18.1469198248566	20.244	11.234	6.925
19.9815147185365	18.0374852814732	19.99	18.029	0.012
17.8973940361774	18.0374852814731	18.021	13.52	4.982
17.8963940361773	18.0374852814732	19.609	18.156	3.821
16.7008365800794	18.0374852814731	19.418	13.901	6.882
15.4783153144001	18.0374852814732	20.434	13.012	7.723
14.4803705845253	19.8729999999997	13.005	20.061	3.941
12.3699999999977	19.8729999999997	12.37	19.934	0.061
11.9506591992173	18.5384103244853	12.243	20.505	2.717
11.9506591992173	18.5374103244853	11.735	20.378	7.485
11.9506591992173	17.8756456913471	11.608	20.251	6.345
11.9506591992173	17.2233653840038	12.052	18.854	6.347
11.9506591992173	16.5841773572309	11.862	17.965	2.45
11.9506591992172	15.8919310570762	11.481	17.711	3.058
11.9506591992172	14.985028924293	13.576	14.79	1.637
11.4829137372974	14.985028924293	11.163	15.552	0.651

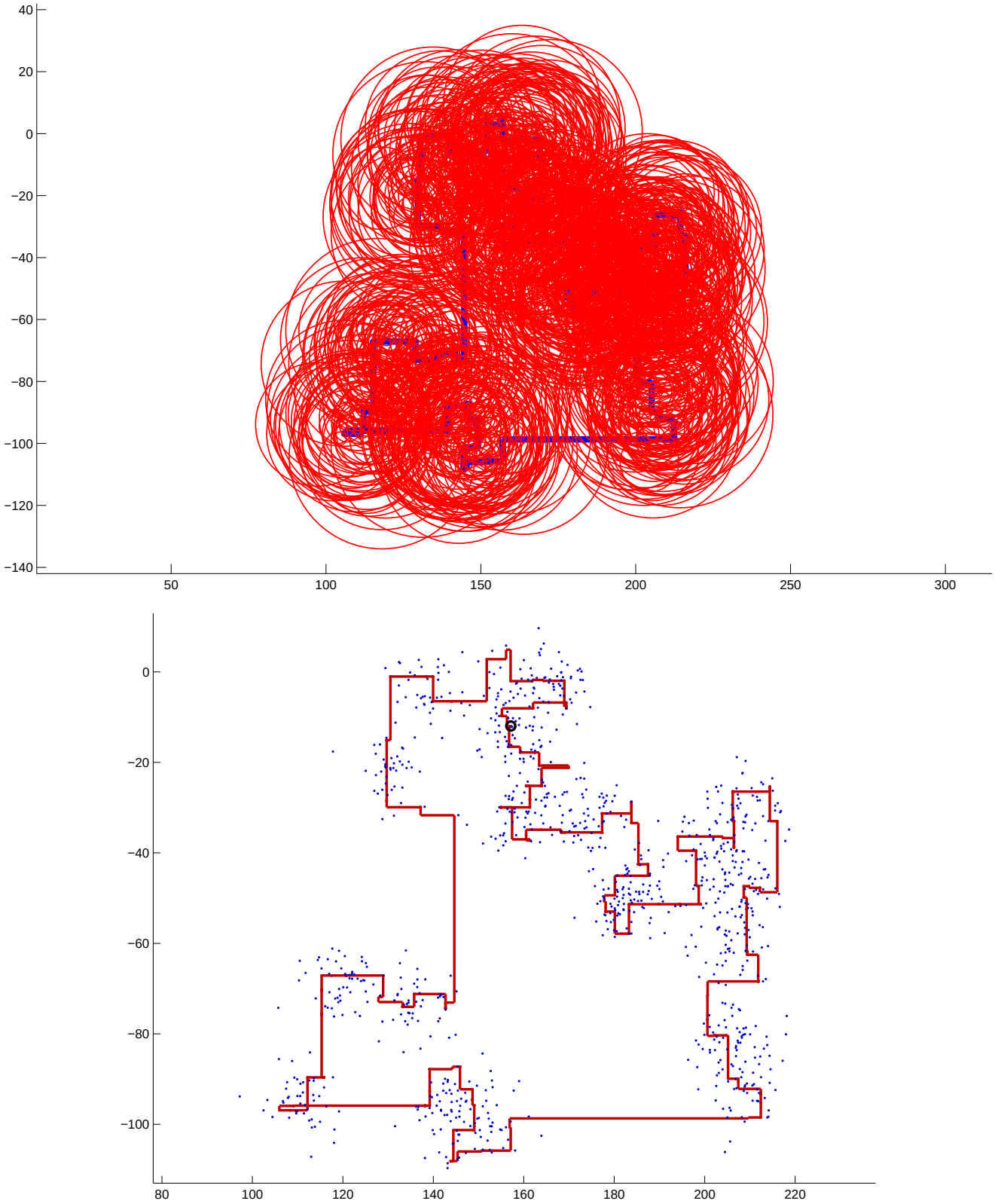


Figure N.166: $dsj1000$, arbitrary radius, 2D, Manhattan, Length = 758.1192149

Table N-169: Solution for $dsj1000$, arbitrary radius, 2D, Manhattan

Total distance: 758.119214942377 Depot: x 47.1287 y 11.9659				
Solution x	Solution y	Original x	Original y	Radius
46.7572000000047	16.5426000442205	46.503	16.5426	0.2542
46.7572000000047	16.5426000442205	54.0368	23.8586	14.1498
46.7572000000047	16.5426000442205	55.1607	27.7715	18.2237
46.7572000000047	16.5426000442205	59.5552	26.5288	17.0515
46.7572000000047	16.5426000442205	54.8257	29.6059	17.9639
46.7572000000047	16.5426000442205	54.7376	29.7596	17.0277
46.7572000000047	16.5426000442205	51.7623	34.8081	20.8873
46.7572000000047	16.5426000442205	55.9275	34.3566	23.3784
46.7572000000047	16.5426000442205	23.1689	25.59	25.7524
46.7572000000047	16.5426000442205	64.9829	35.6055	27.8112
46.7572000000047	16.5426000442205	64.2784	38.8059	29.0239
49.1801082063814	17.7971564937391	46.213	15.3079	3.873
49.1801082063814	17.7971564937391	47.2642	16.1804	3.1622
49.1801082063814	17.7971564937391	51.539	18.7116	3.3237
52.3847863008465	17.7971564937396	52.4859	17.4578	0.3541
52.3847863008465	17.7971564937396	49.9971	19.9155	3.9588
52.3847863008465	17.7971564937396	55.3647	9.0137	9.4748
52.3847863008465	17.7971564937396	55.4854	26.8201	10.8698
52.3847863008465	17.7971564937396	58.5931	27.1316	12.8934
52.3847863008465	17.7971564937396	62.5649	23.4331	17.3284
52.3847863008465	17.7971564937396	57.9508	29.6187	14.7612
52.3847863008465	17.7971564937396	66.7482	27.6121	22.4893
52.3847863008465	17.7971564937396	66.9624	36.7077	25.6742
52.3847863008465	17.7971564937396	66.7168	38.698	29.069
53.4139396021141	20.6896731310199	51.6732	17.1776	3.9198
53.4139396021141	20.6896731310199	53.2794	21.4994	2.9791
53.4139396021141	20.6896731310199	55.9782	19.9329	2.6736
59.8986936571612	21.2125624771589	63.3795	20.1125	3.6505
59.8986936571612	21.2125624771589	61.643	23.6955	3.0344
53.9292587900183	25.1859998938757	54.2786	24.4277	0.8349
53.9292587900183	25.1859998938757	56.8778	27.618	8.9898
53.9292587900183	25.1859998938757	58.9981	26.6128	10.0374
53.9292587900183	25.1859998938757	63.132	27.7543	11.7407
53.9292587900183	25.1859998938757	67.242	26.9141	16.4624
53.9292587900183	25.1859998938757	67.5765	27.7962	15.1317
53.9292587900183	25.1859998938757	64.2717	31.7627	14.3523
53.9292587900183	25.1859998938757	63.5739	32.9982	17.0906
53.9292587900183	25.1859998938757	70.1037	27.3839	17.3373
53.9292587900183	25.1859998938757	58.8785	37.4935	17.2077
53.9292587900183	25.1859998938757	66.5887	34.1226	18.4197
53.9292587900183	25.1859998938757	65.211	38.9167	22.6036
53.9292587900183	25.1859998938757	72.6191	32.6684	20.9501
53.9292587900183	25.1859998938757	75.4748	37.8532	28.9661
53.9292587900183	25.1859998938757	75.9853	41.4015	28.8962
53.9292587900183	25.1859998938757	72.9198	44.5581	29.4271
50.5512000000165	25.1859998938759	48.493	25.186	2.0582
50.5512000000165	25.1859998938759	50.1386	26.6573	9.4164
50.5512000000165	25.1859998938759	49.5432	29.0024	8.1871
50.5512000000165	25.1859998938759	47.9812	30.2306	11.8841
50.5512000000165	25.1859998938759	47.4903	33.2139	11.8665
50.5512000000165	25.1859998938759	48.325	36.101	13.1633
50.5512000000165	25.1859998938759	42.8212	36.4305	19.4237
50.5512000000165	25.1859998938759	43.7884	36.8808	16.446
50.5512000000165	25.1859998938759	64.4232	44.0581	28.7966
51.3436999999434	28.2488948792329	47.4152	28.2569	4.917
51.3436999999434	28.2488948792329	52.7074	28.2489	1.3637
51.3436999999434	28.2488948792329	54.5895	27.7676	3.8179
51.3436999999435	29.9318999146938	51.0819	30.8837	1.7131
51.3436999999435	29.9318999146938	56.2795	36.0371	11.477
51.3436999999435	29.9318999146938	65.3289	43.5846	21.6754
51.3436999999435	29.9318999146938	71.8327	48.0379	28.84
44.8842000000094	29.9318999146934	44.6028	29.9319	0.2814
44.8842000000094	29.9318999146934	47.9603	31.0225	3.9403
44.8842000000094	29.9318999146934	44.1303	30.8739	4.2334
44.8842000000094	29.9318999146934	50.3723	32.2399	6.6627
44.8842000000094	29.9318999146934	45.9581	33.5048	9.009
44.8842000000094	29.9318999146934	37.4272	33.8061	15.7441
44.8842000000094	29.9318999146934	45.4526	36.121	8.6374
44.8842000000094	29.9318999146934	40.9959	37.9409	12.8365
44.8842000000094	29.9318999146934	44.3651	39.5082	12.4052
44.8842000000094	29.9318999146934	50.3352	41.2014	12.9522
44.8842000000094	29.9318999146934	18.7531	32.536	27.0946
47.4074231176291	37.0118085311217	45.4903	38.3462	2.3358
51.4445741920179	37.2682746466644	51.6292	37.4529	0.2611
50.5160999999999	36.1398000013115	44.7872	36.1398	5.7289
50.5160999999999	36.1398000013115	53.589	37.6567	4.7875
50.5161000000022	34.8690999999868	50.1654	34.298	3.7703
53.8795999832884	34.8691000000021	53.8796	31.7093	3.1598
53.8795999832884	34.8691000000021	51.473	33.7115	2.7502
58.3172284743415	35.4768354504738	58.126	35.24	0.3044
58.3172284743415	35.4768354504738	61.5106	34.0654	10.912
58.3172284743415	35.4768354504738	66.7818	30.0369	10.9633
58.3172284743415	35.4768354504738	63.453	34.6286	7.4277
58.3172284743415	35.4768354504738	63.8645	34.3723	14.5693
58.3172284743415	35.4768354504738	69.1853	30.9522	13.139
58.3172284743415	35.4768354504738	60.9493	37.7343	9.1697
58.3172284743415	35.4768354504738	67.7055	32.9993	14.8259
58.3172284743415	35.4768354504738	67.4673	33.2544	16.5328
58.3172284743415	35.4768354504738	62.6603	37.129	12.7997
58.3172284743415	35.4768354504738	64.8516	39.5774	16.3435
58.3172284743415	35.4768354504738	72.4926	42.7909	23.9047
58.3172284743415	35.4768354504738	75.9022	40.5634	19.0711
58.3172284743415	35.4768354504738	72.9378	43.4347	22.409
58.3172284743415	35.4768354504738	72.7013	43.6681	23.6645
58.3172284743415	35.4768354504738	72.4429	44.8985	21.9495
58.3172284743415	35.4768354504738	70.4096	46.4113	21.9243
58.3172284743415	35.4768354504738	73.6428	45.1426	25.8084
58.3172284743415	35.4768354504738	72.0385	47.603	19.8624
58.3172284743415	35.4768354504738	73.6395	46.5004	26.6417
58.3172284743415	35.4768354504738	70.7664	48.6137	19.7705
58.3172284743415	35.4768354504738	73.2561	47.9132	27.6156
58.3172284743415	35.4768354504738	70.6462	49.6735	27.2687
58.3172284743415	35.4768354504738	61.2083	54.3519	20.9342
58.3172284743415	35.4768354504738	67.8488	53.6384	21.5605
58.3172284743415	35.4768354504738	72.1444	51.2772	22.7706
58.3172284743415	35.4768354504738	68.022	53.7678	25.621
58.3172284743415	35.4768354504738	70.916	53.3608	25.4746
58.3172284743415	35.4768354504738	77.4079	49.147	24.2468
58.3172284743415	35.4768354504738	76.0043	50.5809	29.1787
58.3172284743415	35.4768354504738	69.8977	54.8286	26.5823
58.3172284743415	35.4768354504738	69.2681	55.3133	27.1365
58.3172284743415	35.4768354504738	76.5498	52.218	29.3359
58.9806408328097	35.4768354504741	60.463	30.4795	7.3122
58.9806408328097	35.4768354504741	60.8351	33.4935	6.3537
58.9806408328097	35.4768354504741	62.464	33.4003	5.2338
58.9806408328097	35.4768354504741	60.137	35.2014	3.3879
58.9806408328097	35.4768354504741	62.0243	36.102	3.1072
67.315500000002	35.4768354504739	68.0366	38.8903	3.4888
67.315500000002	35.4768354504739	65.7303	47.3671	12.9967
67.315500000002	35.4768354504739	70.5497	45.0925	13.3393
67.315500000002	35.4768354504739	73.2401	49.0047	19.489
67.315500000002	35.4768354504739	71.8965	50.0142	19.3441
67.315500000002	35.4768354504739	73.5268	49.2611	16.8647
67.315500000002	35.4768354504739	70.8564	51.5507	19.1375
67.315500000002	35.4768354504739	73.6611	50.4924	19.7557
67.315500000002	35.4768354504739	73.911	51.0144	19.7234
67.315500000002	35.4768354504739	72.0304	52.5053	20.8079
67.315500000002	35.4768354504739	73.8072	55.2741	22.0263
67.315500000002	35.4768354504739	72.7757	56.7077	24.2193
67.315500000002	31.2899003142038	63.2951	31.2899	4.0204
67.315500000002	31.2899003142038	68.2062	28.5319	2.9167
67.315500000002	31.2899003142038	67.6588	29.7348	2.8615
67.3165000002239	31.2899003142038	68.3676	27.331	4.5622
67.3165000002239	31.2899003142038	67.8857	28.9512	7.9175
67.3165000002239	31.2899003142038	70.5469	25.0661	16.1699
67.3165000002239	31.2899003142038	69.5886	28.6002	10.8714
73.7989000036572	28.8180000000542	73.7989	28.6287	0.1893
73.7989000036572	28.8180000000542	71.5231	31.8286	7.639
73.7989000036572	28.8180000000542	77.5882	39.4219	18.0454
73.7989000036572	28.8180000000542	80.8076	41.6004	22.8911
73.7989000036572	28.8180000000542	87.5726	32.8781	19.8465
73.7989000036572	28.8180000000542	90.6179	26.4649	21.9514
73.7989000036572	28.8180000000542	90.72	30.049	25.9851
73.7989000036572	28.8180000000542	79.9479	46.2913	20.0233
73.7989000036572	28.8180000000542	93.6487	25.1273	25.1293
73.7989000036572	28.8180000000542	87.2346	40.5435	24.2659
73.7989000036572	28.8180000000542	92.4351	33.0022	23.0347
73.7989000036572	28.8180000000542	93.4265	31.4744	21.1215
73.7989000036572	28.8180000000542	88.4465	41.4478	21.203
73.7989000036572	28.8180000000542	89.0134	41.3658	27.9234
73.7989000036572	28.8180000000542	90.014	39.915	25.9424
73.7989000036572	28.8180000000542	80.7698	50.729	24.0359
73.7989000036572	28.8180000000542	95.0864	33.2234	27.2565
73.7989000036572	28.8180000000542	97.4429	30.1528	27.9419

Solution x	Solution y	Original x	Original y	Radius
73.7989000036572	28.8180000000542	92.1801	41.0349	29.4376
73.7989000036572	28.8180000000542	92.2396	41.0703	23.428
73.7989000036572	28.8180000000542	89.3464	46.1786	28.4968
73.7989000036572	28.8180000000542	93.2846	41.9379	28.0563
73.7989000036572	28.8180000000542	93.3823	48.5086	29.5211
73.7989000036572	33.4242616592664	68.3701	31.308	5.8267
73.7989000036572	33.4242616592664	72.2401	34.2889	2.9732
75.3327823373578	42.5327151202842	75.73	42.7229	0.4404
75.3327823373578	42.5327151202842	67.5609	49.631	13.5732
75.3327823373578	42.5327151202842	69.1689	51.2673	13.4858
75.3327823373578	42.5327151202842	71.0505	50.768	14.6692
75.3327823373578	42.5327151202842	80.8872	43.1227	14.1296
75.3327823373578	42.5327151202842	86.5983	36.2039	13.6175
75.3327823373578	42.5327151202842	69.1565	53.343	16.8114
75.3327823373578	42.5327151202842	66.0257	55.1875	16.5761
75.3327823373578	42.5327151202842	77.6289	48.4559	16.6228
75.3327823373578	42.5327151202842	88.2545	36.066	15.726
75.3327823373578	42.5327151202842	73.3859	52.8201	15.2561
75.3327823373578	42.5327151202842	87.5583	39.2312	14.1099
75.3327823373578	42.5327151202842	89.1249	38.0318	15.9201
75.3327823373578	42.5327151202842	68.5789	56.8701	16.6688
75.3327823373578	42.5327151202842	67.4683	58.2291	22.4924
75.3327823373578	42.5327151202842	69.9782	57.1009	18.2604
75.3327823373578	42.5327151202842	70.5527	57.3223	18.2025
75.3327823373578	42.5327151202842	89.3668	41.343	15.2017
75.3327823373578	42.5327151202842	90.1236	40.724	15.0486
75.3327823373578	42.5327151202842	90.4784	41.2284	19.2596
75.3327823373578	42.5327151202842	73.2116	57.797	20.4365
75.3327823373578	42.5327151202842	90.0385	42.8005	21.625
75.3327823373578	42.5327151202842	77.8264	55.5164	14.0686
75.3327823373578	42.5327151202842	92.634	40.1716	17.8594
75.3327823373578	42.5327151202842	87.8413	47.1867	18.3729
75.3327823373578	42.5327151202842	82.0477	53.0979	18.2605
75.3327823373578	42.5327151202842	84.6532	51.7406	13.6619
75.3327823373578	42.5327151202842	91.1842	48.1207	17.5671
75.3327823373578	42.5327151202842	81.1686	57.7423	24.938
75.3327823373578	42.5327151202842	91.9756	47.4725	19.7423
75.3327823373578	42.5327151202842	95.1396	47.3596	26.132
75.3327823373578	42.5327151202842	93.0102	50.1223	27.268
75.3327823373578	42.5327151202842	98.0763	43.3554	27.4576
75.3327823373578	42.5327151202842	95.7654	46.8722	22.8599
75.3327823373578	42.5327151202842	98.0879	44.5657	26.354
75.3327823373578	42.5327151202842	93.3932	53.1876	28.8804
75.3327823373578	42.5327151202842	88.0225	60.7529	27.571
75.3327823373578	42.5327151202842	103.0838	43.6629	28.7382
75.3327823373578	42.5327151202842	98.2152	53.7701	29.4627
75.3327823373578	42.5327151202842	97.9579	54.2407	26.2321
75.3327823373578	42.5327151202842	90.2672	64.2791	29.5547
75.3327823373578	42.5327151202842	95.1558	61.2395	27.409
77.4743999997496	42.5327151202843	77.9223	44.6051	3.0325
77.4743999997496	42.5327151202843	87.5129	47.9594	13.3149
77.4743999997496	42.5327151202843	95.0304	53.2116	22.3786
77.4743999997495	45.0467999924093	77.8794	45.0468	0.405
77.4743999997495	45.0467999924093	89.6611	52.1615	14.4321
77.4743999997495	45.0467999924093	98.3613	42.0392	22.2209
77.4743999997495	45.0467999924093	85.8477	60.7859	18.5843
77.4743999997495	45.0467999924093	99.0651	51.1078	22.694
77.4743999997495	45.0467999924093	102.6402	60.9181	29.8857
70.7583233763445	45.046799992408	74.5598	39.2546	7.8873
70.7583233763445	45.046799992408	67.4955	46.0347	3.4091
70.7583233763445	45.046799992408	67.7991	50.1342	7.0884
70.7583233763445	45.046799992408	66.2863	51.2705	7.8797
70.1419732606321	49.3937349457719	68.7356	47.889	2.3048
70.1419732606321	49.3937349457719	70.0624	50.1219	0.7325
67.7933000000621	50.685500013743	66.949	50.6855	0.8443
67.7933000000621	50.685500013743	77.9705	58.8491	15.3336
68.1052619949443	52.9820284941231	73.2283	44.0709	10.2788
68.1052619949443	52.9820284941231	70.6191	48.182	10.2546
68.1052619949443	52.9820284941231	69.4154	51.8752	4.1739
68.1052619949443	52.9820284941231	70.1179	52.2878	5.6226
68.1052619949443	52.9820284941231	72.0955	52.6394	7.0709
68.1052619949443	52.9820284941231	75.2757	50.6388	7.5436
68.1052619949443	52.9820284941231	68.2826	55.0673	4.1147
68.1052619949443	52.9820284941231	70.694	53.8562	5.7549
70.1344008516083	57.8528999996555	70.1344	58.5671	0.7142
73.2536034641377	57.8528999996554	73.7963	57.8273	0.5433
73.2536034641377	57.8528999996554	86.2321	62.729	16.3953
73.2536034641377	57.8528999996554	94.5987	62.0376	22.0196
73.2536034641377	57.8528999996554	92.749	64.7326	21.2415
73.2536034641377	57.8528999996554	93.9444	64.9	23.8239

Solution x	Solution y	Original x	Original y	Radius
73.2536034641377	51.3584332445661	74.4488	50.3129	5.5377
73.2536034641377	51.3584332445661	74.3979	53.0985	4.2274
73.2536034641377	51.3584332445661	76.2244	51.9684	3.4858
76.7484545903244	51.3584332445661	78.0993	54.3894	5.6239
79.875651405541	51.3584332445661	67.6648	48.1141	12.6345
79.875651405541	51.3584332445661	72.0723	49.2863	10.8405
79.875651405541	51.3584332445661	76.4125	46.981	12.1404
79.875651405541	51.3584332445661	74.8417	48.5823	11.9548
79.875651405541	51.3584332445661	75.5201	48.6107	10.8007
79.875651405541	51.3584332445661	75.5587	49.1352	7.8556
79.875651405541	51.3584332445661	70.2011	52.705	12.1835
79.875651405541	51.3584332445661	77.9078	47.2474	6.5423
79.875651405541	51.3584332445661	76.379	48.6237	7.5959
79.875651405541	51.3584332445661	79.533	47.2684	8.9398
79.875651405541	51.3584332445661	71.2619	53.5794	11.3066
79.875651405541	51.3584332445661	80.0004	48.0282	9.8035
79.875651405541	51.3584332445661	78.2967	50.1808	11.8299
79.875651405541	51.3584332445661	80.3964	49.7264	1.7131
79.875651405541	51.3584332445661	89.2688	56.3248	12.5008
84.4368673751289	51.3584332445661	83.5076	51.7826	1.0852
84.4368673751289	51.3584332445661	87.1149	58.1702	8.6573
84.4368673751289	51.3584332445661	92.9131	56.6287	15.0729
84.4368673751289	51.3584332445661	92.8209	56.9207	12.3836
84.4368673751289	51.3584332445661	94.6877	57.1733	13.9646
84.4368673751289	51.3584332445661	95.4289	57.3916	14.9929
84.4368673751289	51.3584332445661	95.9041	59.3009	16.7412
84.4368673751289	51.3584332445661	97.3108	57.82	22.7988
84.4368673751289	51.3584332445661	96.4356	62.0951	20.9554
84.4368673751289	51.3584332445661	93.0933	68.7697	21.8016
84.4368673751289	51.3584332445661	103.9916	60.6173	27.4308
84.4368673751289	51.3584332445661	95.9481	74.251	27.2231
84.4378673751289	51.3584332445661	85.9154	51.5363	1.4882
84.4378673751289	51.3584332445661	94.6788	63.8911	17.5158
84.4378673751289	51.3584332445661	98.4258	65.8894	20.8311
84.4378673751289	51.3584332445661	101.778	67.1686	23.9527
89.1207174059473	51.3584332445661	92.1982	53.9806	4.0431
89.1207174059473	51.3584332445661	93.2379	56.4517	7.5848
89.1207174059473	51.3584332445661	94.4551	58.0456	10.0481
89.1207174059473	51.3584332445661	94.8477	58.3247	10.8435
89.1207174059473	51.3584332445661	95.479	61.1306	12.7416
89.1207174059473	51.3584332445661	102.1595	55.9791	15.0641
89.1207174059473	51.3584332445661	98.4228	65.0226	19.713
89.1207174059473	51.3584332445661	97.5653	74.5618	26.0912
88.6834170572245	47.3185854565003	89.352	47.1855	0.6817
88.6834170572245	47.3185854565003	90.4865	46.0315	3.9724
88.6834170572245	47.3185854565003	94.4684	44.7163	7.0613
88.6834170572245	47.3185854565003	90.3356	51.1932	6.8103
88.6834170572245	47.3185854565003	94.5726	47.3613	6.423
88.6834170572245	47.3185854565003	92.412	50.9961	8.4715
88.6834170572245	47.3185854565003	96.0562	52.3857	12.0834
88.6834170572245	47.3185854565003	97.7133	51.9341	11.5332
88.6834170572245	47.3185854565003	96.8097	54.0588	13.9289
88.6834170572245	47.3185854565003	100.5945	52.9653	16.0066
88.6834170572245	47.3185854565003	103.8062	50.1176	16.2282
88.6834170572245	47.3185854565003	98.8606	57.9963	15.8873
88.6834170572245	47.3185854565003	99.3413	60.508	18.4113
88.6834170572245	47.3185854565003	106.6231	51.946	20.5204
88.0938928183535	42.0189859737465	89.5287	45.4109	3.6829
88.0938928183535	39.5161045196317	81.9079	40.1742	6.2209
88.0938928183535	39.5161045196317	85.9182	41.843	3.5933
88.0938928183535	39.5161045196317	92.8093	39.7693	4.7222
84.0515098784599	36.3835000000022	79.7169	32.9378	5.5373
84.0515098784599	36.3835000000022	85.065	35.2948	4.702
88.2951090000733	36.3835000000022	85.525	32.0217	5.5598
88.2951090000733	36.3835000000022	91.9372	36.8319	3.8859
88.2951090000733	36.3835000000022	91.8795	37.1845	3.6728
91.1654998594424	36.3835000000022	91.1655	36.0648	0.3187
91.1654998594424	36.3835000000022	96.5473	37.5774	13.5522
91.1654998594424	36.3835000000022	91.9732	45.8332	12.7139
91.1654998594424	36.3835000000022	93.9129	43.6355	15.3805
91.1654998594424	36.3835000000022	96.2133	40.5576	17.1844
91.1654998594424	36.3835000000022	94.5355	44.3621	13.4241
91.1654998594424	36.3835000000022	95.46	44.379	10.525
91.1654998594424	36.3835000000022	94.5838	45.9916	12.3529
91.1654998594424	36.3835000000022	98.7317	39.6579	13.6077
91.1654998594424	36.3835000000022	95.0864	47.4256	15.4813
91.1654998594424	36.3835000000022	96.2485	47.1277	17.9146
91.1654998594424	36.3835000000022	100.0845	45.3198	20.4175
91.1654998594424	36.3835000000022	102.0152	42.2262	18.485
91.1654998594424	36.3835000000022	101.161	45.7653	23.4902

Solution x	Solution y	Original x	Original y	Radius
91.1654998594424	36.3835000000022	98.2004	50.3921	18.7026
91.1654998594424	36.3835000000022	102.543	45.6081	21.8293
91.1654998594424	36.3835000000022	101.377	48.1816	20.458
91.1654998594424	36.3835000000022	104.1102	44.8822	24.3902
91.1654998594424	36.3835000000022	103.8959	45.4099	16.5891
91.1654998594424	36.3835000000022	99.5817	52.1789	22.5087
94.0288098350184	36.7240572021058	86.512	33.4131	8.2137
94.0288098350184	36.7240572021058	94.1971	38.0204	3.1512
94.0288098350184	36.7240572021058	94.3087	39.6383	5.7437
94.0288098350184	36.7240572021058	97.0063	39.6578	6.2182
94.0288098350184	36.7240572021058	96.2085	41.8253	7.8844
94.0288098350184	36.7240572021058	96.8865	41.9997	5.9999
96.4575680126367	38.7763684173973	97.0806	39.3994	0.8811
96.4575680126367	38.7763684173973	98.4033	39.6451	2.523
96.4575680126367	38.7763684173973	96.6284	43.246	6.0243
96.4575680126367	38.7763684173973	103.3956	43.6231	9.5596
96.4575680126367	38.7763684173973	100.8862	48.4618	10.9264
96.4575680126367	38.7763684173973	102.9297	48.0592	14.2478
96.4575680126366	32.9941396675652	85.1876	33.113	12.2337
96.4575680126366	32.9941396675652	90.6435	28.0536	9.6928
96.4575680126366	32.9941396675652	93.6941	39.0671	9.1173
96.4575680126366	32.9941396675652	95.1298	37.6897	8.2516
96.4575680126366	32.9941396675652	99.272	31.5703	3.1541
96.4575680126366	32.9941396675652	95.8598	39.2349	9.5298
96.4575680126366	32.9941396675652	98.9301	33.2654	6.2044
96.4575680126366	32.9941396675652	98.5859	34.5756	9.3554
96.4575680126366	32.9941396675652	101.5683	27.6266	8.8382
96.2022	32.9941396675657	96.3928	32.1668	2.1401
96.2022	30.1567013648211	96.0238	29.4057	0.7719
96.2022	30.1567013648211	105.6149	29.5786	12.2754
96.2022000001402	26.451099997595	92.942	26.4511	3.2602
96.2022000001402	26.451099997595	91.0332	34.8187	16.4532
96.2022000001402	26.451099997595	93.9312	28.9768	14.5805
96.2022000001402	26.451099997595	92.7124	33.4453	14.4155
96.2022000001402	26.451099997595	97.1071	18.8552	18.2973
96.2022000001402	26.451099997595	97.0499	25.7334	22.9168
96.2022000001402	26.451099997595	98.3241	22.4412	19.863
96.2022000001402	26.451099997595	96.156	30.1327	15.6026
96.2022000001402	26.451099997595	98.3827	22.3334	15.4136
96.2022000001402	26.451099997595	97.3283	27.0933	16.7318
96.2022000001402	26.451099997595	99.0428	19.6959	17.7192
96.2022000001402	26.451099997595	95.8908	32.6754	17.855
96.2022000001402	26.451099997595	97.1838	29.5842	15.6415
96.2022000001402	26.451099997595	96.2582	32.5713	16.7348
96.2022000001402	26.451099997595	93.6083	38.4774	16.8124
96.2022000001402	26.451099997595	97.9141	29.0493	23.1555
96.2022000001402	26.451099997595	100.384	25.6874	21.4485
96.2022000001402	26.451099997595	96.6051	36.0943	18.2734
96.2022000001402	26.451099997595	99.0228	31.9463	24.3368
96.2022000001402	26.451099997595	98.5493	33.1624	15.8362
96.2022000001402	26.451099997595	100.6297	27.3107	20.9684
96.2022000001402	26.451099997595	102.4997	24.4075	22.2451
96.2022000001402	26.451099997595	101.7295	28.4449	24.6989
96.2022000001402	26.451099997595	100.5275	34.9543	18.18
96.2022000001402	26.451099997595	101.1976	33.4905	15.926
96.2022000001402	26.451099997595	102.9211	31.879	24.191
96.2022000001402	26.451099997595	105.0575	26.2706	21.5332
96.2022000001402	26.451099997595	99.6903	41.4772	20.1453
96.2022000001402	26.451099997595	105.5782	30.6326	17.6401
96.2022000001402	26.451099997595	103.4615	37.3033	18.992
96.2022000001402	26.451099997595	106.6895	31.0233	23.9388
96.2022000001402	26.451099997595	106.8535	30.7643	22.1596
96.2022000001402	26.451099997595	107.8221	37.3636	23.6325
101.31149204314	26.4510999975952	92.5592	25.4331	8.84
101.31149204314	26.4510999975952	97.5011	28.0267	4.1233
101.31149204314	26.4510999975952	102.211	28.3893	3.0468
104.39690000001	25.3242131321646	102.9016	24.8202	1.7694
104.39790000001	25.3242131321646	104.9423	23.521	1.8836
104.39790000001	27.727619396651	106.1692	29.0085	2.1859
104.39790000001	32.9987989937479	104.0844	32.9988	0.3135
106.048078777008	32.9987989937485	108.656	34.8419	3.7915
106.048078777008	48.6933787853537	106.4442	49.0895	0.5602
102.198191452543	47.7229532952	101.7941	49.0832	1.419
102.198191452543	47.7229532952	98.7715	55.3698	10.7015
102.198191452543	47.7229532952	100.6388	53.8259	11.1764
102.198191452543	47.7229532952	98.9521	56.5952	9.6017
102.198191452543	47.7229532952	105.6501	47.8555	11.3295
102.198191452543	47.7229532952	102.8738	56.4102	11.5644
102.198191452543	47.7229532952	103.5291	67.906	21.3267
99.7789000507181	47.3796000000011	97.5519	44.8528	3.8542

Solution x	Solution y	Original x	Original y	Radius
99.7789000507181	47.3796000000011	99.7789	45.6905	1.6891
99.7789000507181	47.3796000000011	100.6036	46.802	2.256
98.653857988221	47.3796000000247	98.9198	48.0008	5.0724
98.653857988221	47.3796000000247	97.7455	51.8526	5.024
98.653857988221	49.8562276153094	94.3452	48.7818	4.4406
98.653857988221	49.8562276153094	98.1036	50.8139	1.1045
98.653857988221	49.8562276153094	99.5987	51.3246	2.5606
99.2774142771437	52.4567051728448	100.3439	52.2486	1.0866
99.2774142771437	52.4567051728448	99.9754	58.6633	10.7282
99.2774142771437	52.4567051728448	99.4285	63.8276	13.2796
99.2774142771437	52.4567051728448	96.1169	76.0362	25.7488
99.2774142771437	52.4567051728448	100.0565	80.1054	29.4827
99.2774142771536	61.786331015935	99.0429	61.6589	0.2669
99.2774142771536	61.786331015935	94.6798	69.1984	14.7127
99.2774142771536	61.786331015935	97.9014	66.9835	12.1626
99.2774142771536	61.786331015935	93.9524	73.145	21.3513
99.2774142771536	61.786331015935	96.2521	73.5638	18.6663
99.2774142771536	61.786331015935	91.1291	78.4897	23.993
99.2774142771536	61.786331015935	94.4072	76.9857	17.5737
99.2774142771536	61.786331015935	89.95	80.2132	25.9539
99.2774142771536	61.786331015935	97.816	74.8015	15.0437
99.2774142771536	61.786331015935	92.1151	81.2598	24.5532
99.2774142771536	61.786331015935	89.5631	83.3752	25.9016
99.2774142771536	61.786331015935	94.0795	80.8773	27.9293
99.2774142771536	61.786331015935	97.7624	79.6432	23.8114
99.2774142771536	61.786331015935	99.1261	78.6323	23.8719
99.2774142771536	61.786331015935	98.567	80.2017	23.8946
99.2774142771536	61.786331015935	98.2007	80.5294	24.0186
99.2774142771536	61.786331015935	98.2345	80.86	27.4352
99.2774142771536	61.786331015935	97.8831	81.9659	26.0286
99.2774142771536	61.786331015935	93.0994	86.3608	27.9466
99.2774142771536	61.786331015935	108.1531	76.0691	21.0274
99.2774142771536	61.786331015935	93.1284	88.6615	29.2956
99.2774142771536	61.786331015935	97.7943	87.7833	29.1465
99.2774142771536	61.786331015935	107.981	80.0957	26.4329
99.2774142771536	61.786331015935	104.3693	90.8389	29.9766
99.4296798819792	61.7863310159335	93.5538	62.1822	5.8892
99.4296798819792	61.7863310159335	95.4724	61.7777	4.4248
99.4296798819774	62.5191606146837	94.6583	60.3511	8.4724
99.4296798819774	62.5191606146837	99.7259	57.0659	5.4613
99.4296798819774	62.5191606146837	100.6854	61.817	3.0255
101.837699999882	68.416404856363	102.9023	68.4164	1.0646
101.837699999882	68.416404856363	97.1852	78.7831	16.1734
101.837699999882	68.416404856363	98.9119	80.0767	14.6996
101.837699999882	68.416404856363	88.3633	87.3681	27.6489
101.837699999882	68.416404856363	101.0606	82.9382	16.7992
101.837699999882	68.416404856363	96.2545	87.1498	21.7369
101.837699999882	68.416404856363	103.8313	82.5056	18.7916
101.837699999882	68.416404856363	101.1477	85.2681	21.9848
101.837699999882	68.416404856363	102.2936	85.0217	21.6835
101.837699999882	68.416404856363	92.5654	91.5305	28.4592
101.837699999882	68.416404856363	104.3617	84.8664	23.8168
101.837699999882	68.416404856363	100.7126	88.5952	21.6123
101.837699999882	68.416404856363	107.2392	85.9448	25.7344
90.6470480686949	71.5747130548152	88.7937	67.447	7.6628
90.6470480686949	71.5747130548152	94.549	73.3405	4.2829
90.6470480686949	71.5747130548152	93.1133	78.1389	7.0122
90.6001496832283	76.8218430849337	91.0116	75.887	1.8515
90.6001496832283	76.8218430849337	89.835	77.746	1.1998
90.6001496840555	80.4415503159445	88.6759	82.3658	2.7213
92.1266881324837	80.3352000000701	91.86	79.7087	0.6809
92.1266881324837	80.3352000000701	97.3132	81.5365	6.4549
92.1266881324837	80.3352000000701	95.9325	86.7596	20.5114
92.1266881324837	80.3352000000701	88.6062	92.2681	22.8388
92.1266881324837	80.3352000000701	98.656	92.6213	22.9191
92.1266881324837	80.3352000000701	100.5649	91.4192	20.5542
92.1266881324837	80.3352000000701	99.3782	93.0601	23.8531
92.1266881324837	80.3352000000701	101.602	92.3175	24.3611
92.1266881324837	80.3352000000701	95.504	96.351	27.717
92.1266881324837	80.3352000000701	105.6506	92.4297	20.7058
92.1266881324837	80.3352000000701	98.2349	98.4363	21.6189
92.1266881324837	80.3342000000001	92.0851	66.8651	14.1856
92.1266881324837	80.3342000000001	92.6699	80.64	12.8577
92.1266881324837	80.3342000000001	86.3374	85.7586	11.3801
92.1266881324837	80.3342000000001	93.2494	81.8793	4.3234
92.1266881324837	80.3342000000001	91.14	83.5499	11.1932
92.1266881324837	80.3342000000001	98.5933	78.8152	8.4088
92.1266881324837	80.3342000000001	101.2985	78.2917	13.0659
92.1266881324837	80.3342000000001	94.9909	83.4209	6.6825
92.1266881324837	80.3342000000001	97.4314	81.946	7.1176

Solution x	Solution y	Original x	Original y	Radius
92.1266881324837	80.3342000000001	97.0865	83.6094	9.8674
92.1266881324837	80.3342000000001	93.9684	87.8762	12.1102
92.1266881324837	80.3342000000001	99.0152	86.155	11.2918
92.1266881324837	80.3342000000001	98.3726	88.4744	13.4661
92.1266881324837	80.3342000000001	95.2026	90.5293	13.6073
92.1266881324837	80.3342000000001	96.8345	90.0197	11.1201
94.6945000029976	80.3342	94.6945	78.572	1.7622
95.1601455160258	82.2826860324105	96.8706	83.0827	1.8883
95.1601455160257	89.9194453997212	92.7178	89.1801	2.5518
95.1601455160257	89.9194453997212	92.4623	94.734	13.3072
97.4421981969936	89.9194453997212	98.1138	89.594	0.7463
97.4421981969937	90.5776553349148	96.5235	92.1962	1.8611
97.4421981969937	90.5776553349148	95.6122	103.8055	14.657
97.4421981969937	92.1633908043767	97.0347	92.0258	0.4301
102.410700000019	93.3315772683828	88.0687	81.4777	18.8265
102.410700000019	93.3315772683828	91.1677	84.1211	16.3324
102.410700000019	93.3315772683828	92.288	83.6157	16.0638
102.410700000019	93.3315772683828	96.9541	82.6989	14.592
102.410700000019	93.3315772683828	93.4941	85.8189	18.0194
102.410700000019	93.3315772683828	96.9343	84.943	15.8069
102.410700000019	93.3315772683828	103.6911	80.62	12.7759
102.410700000019	93.3315772683828	103.1106	83.2736	15.1682
102.410700000019	93.3315772683828	102.0461	86.7072	14.3206
102.410700000019	93.3315772683828	99.3434	90.9979	16.5588
102.410700000019	93.3315772683828	98.9319	91.3958	11.9055
102.410700000019	93.3315772683828	98.853	91.6792	14.5242
102.410700000019	93.3315772683828	104.5599	87.8351	14.6615
102.410700000019	93.3315772683828	102.4507	89.6037	13.3753
102.410700000019	93.3315772683828	100.8882	91.1406	9.708
102.410700000019	93.3315772683828	95.7576	96.9635	15.3189
102.410700000019	93.3315772683828	102.0076	93.075	14.2567
102.410700000019	93.3315772683828	100.6204	94.7646	15.4911
102.410700000019	93.3315772683828	98.8373	99.4165	17.0801
102.410700000019	93.3315772683828	104.1034	98.3317	13.8815
102.410700000019	95.2662434431285	103.2876	94.1817	1.3947
102.410700000015	95.2672434431303	101.8123	94.891	1.3025
102.411700000015	98.4842999813351	103.8628	98.4843	1.4511
102.410700000015	98.4842999813351	101.583	94.8217	5.6707
102.410700000015	98.4842999813351	104.1728	96.9352	2.9606
99.6512183360983	98.7013829868058	95.0373	98.5247	4.6173
96.8113751716397	98.7013829868057	94.0924	96.5838	3.4463
96.8103751718149	98.7013829868057	94.4828	106.1237	9.4889
46.8814000000619	100.678000016834	46.0729	100.678	0.8085
46.8814000000619	100.678000016834	42.9285	106.2179	10.4101
47.1110999995041	105.808399542297	48.0764	105.8084	0.9653
40.5097137522175	105.998106973764	40.5226	102.8002	3.2203
40.5097137522175	105.998106973764	42.4716	105.6496	1.9926
35.3555699934677	108.118023471944	35.3466	107.7036	0.412
33.5657818785779	108.220018120593	33.1686	108.6172	0.5617
34.4148983329539	104.215881551532	35.4006	103.6799	1.122
34.4148983329539	104.215881551532	37.1983	106.347	4.5493
34.4148983329539	104.215881551532	35.7224	107.36	11.5177
34.4148983329539	104.215881551532	33.1638	109.6815	13.4189
34.4148983329539	101.283896280419	35.7859	98.3251	3.261
34.4148983329539	101.283896280419	31.6341	101.1443	2.7843
39.0294999999973	101.397437415715	39.1965	105.4524	4.0584
39.0295000000011	100.427102758258	35.9551	95.9225	5.5858
39.0295000000011	100.427102758258	42.5793	100.4271	3.5498
39.0295000000011	100.427102758258	42.9226	100.4615	4.0129
39.0294999999973	95.8160091783263	35.4152	92.5489	4.9112
39.0294999999973	95.8160091783263	37.1788	95.0118	2.6206
39.0294999999973	95.8160091783263	38.2186	96.6747	1.6837
39.0294999999973	95.8160091783263	39.196	99.7694	4.3434
38.659774816162	94.5388628107615	31.4455	71.7336	27.0146
38.659774816162	94.5388628107615	34.7819	91.1147	26.8877
38.659774816162	94.5388628107615	42.0978	97.503	9.3352
38.659774816162	94.5388628107615	47.126	99.3914	14.4896
38.659774816162	94.5388628107615	43.0828	99.6317	26.6664
38.659774816162	94.5388628107615	38.189	100.3805	26.8425
38.659774816162	94.5388628107615	44.7902	101.1589	13.5802
38.659774816162	94.5388628107615	45.0704	101.2748	15.9718
38.659774816162	94.5388628107615	40.2693	101.3043	10.0221
38.659774816162	94.5388628107615	35.2228	101.4244	27.011
38.659774816162	94.5388628107615	53.9006	102.5381	26.8445
38.659774816162	94.5388628107615	45.465	105.2608	13.9094
38.659774816162	92.2715472677351	37.9917	90.5379	3.3721
38.659774816162	92.2715472677351	41.599	92.4813	2.9467
35.9043589010525	87.2734010645719	33.839	67.1668	20.2124
35.9043589010525	87.2734010645719	35.1535	70.6086	16.7445
35.9043589010525	87.2734010645719	42.9721	90.3177	7.6955

Solution x	Solution y	Original x	Original y	Radius
35.9043589010525	87.2734010645719	48.9533	90.4759	19.0092
35.9043589010525	87.2734010645719	39.6285	91.4521	19.1143
35.9043589010525	87.2734010645719	33.1881	90.5996	12.9818
35.9043589010525	87.2734010645719	47.7789	92.5461	17.3786
35.9043589010525	87.2734010645719	33.6244	92.4492	13.8672
35.9043589010525	87.2734010645719	34.0163	93.2553	18.0121
35.9043589010525	87.2734010645719	32.8593	93.0881	18.3654
35.9043589010525	87.2734010645719	44.0393	95.7757	16.7138
35.9043589010525	87.2734010645719	40.9431	96.0349	13.182
35.9043589010525	87.2734010645719	39.7333	98.7582	18.7088
34.223193433143	87.8117276717742	35.4073	87.2216	1.8355
29.1853657723059	87.8117276717733	22.6268	64.3936	24.3192
29.1853657723059	87.8117276717733	23.527	73.6169	21.6834
29.1853657723059	87.8117276717733	31.105	77.2121	19.85
29.1853657723059	87.8117276717733	24.4797	75.354	15.2855
29.1853657723059	87.8117276717733	26.6151	77.1467	15.3985
29.1853657723059	87.8117276717733	29.376	80.5861	14.4218
29.1853657723059	87.8117276717733	40.8939	84.3555	20.2802
29.1853657723059	87.8117276717733	27.1736	83.2653	16.1862
29.1853657723059	87.8117276717733	17.9606	81.6588	21.1617
29.1853657723059	87.8117276717733	23.4089	84.0628	9.7975
29.1853657723059	87.8117276717733	32.6009	89.9531	11.1863
29.1853657723059	87.8117276717733	43.1057	91.7939	21.808
29.1853657723059	87.8117276717733	30.8807	93.5109	15.6566
29.1853657723059	87.8117276717733	29.3468	93.7461	24.255
29.1853657723059	87.8117276717733	34.0458	95.0903	23.4922
29.1853657723059	87.8117276717733	33.9629	96.8355	13.8521
29.1853657723059	87.8117276717733	35.7481	97.1257	23.4808
29.1853657723059	87.8117276717733	34.0464	97.1856	23.2445
29.1853657723059	87.8117276717733	26.1674	96.1159	22.0166
29.1853657723059	87.8117276717733	42.2565	98.7398	24.1013
29.1853657723059	87.8117276717733	40.065	98.6098	21.6771
29.1853657723059	87.8117276717733	26.55	96.735	21.6617
29.1853657723059	87.8117276717733	35.0473	98.5367	21.3919
29.1853657723059	87.8117276717733	28.2891	98.27	21.2566
29.1853657723059	87.8117276717733	26.9511	99.1097	22.0884
29.1853657723059	87.8117276717733	29.8552	101.3038	17.7782
29.1853657723059	87.8117276717733	35.7306	102.2767	20.2694
29.1853657723059	87.8117276717733	35.5571	102.295	22.4132
29.1853657723059	87.8117276717733	34.3074	104.3145	24.0514
29.1853657723062	92.6313902697697	29.5221	90.7635	1.898
29.1853657723062	92.6313902697697	8.0611	104.093	29.9646
29.1853657723062	95.8916179631404	29.1897	96.4145	0.5229
29.1853657723062	95.8916179631404	29.7849	97.5299	6.777
29.1853657723062	95.8916179631404	30.1816	102.1772	8.5674
28.1814671072089	95.8916179631405	31.4906	71.3219	26.6563
28.1814671072089	95.8916179631405	31.4187	76.5703	26.413
28.1814671072089	95.8916179631405	34.9317	80.2335	24.9565
28.1814671072089	95.8916179631405	42.6808	88.2098	26.1251
28.1814671072089	95.8916179631405	33.2241	90.2072	24.6184
28.1814671072089	95.8916179631405	32.1756	91.0244	9.1133
28.1814671072089	95.8916179631405	41.6896	94.8028	26.2925
28.1814671072089	95.8916179631405	37.3296	94.7968	26.3816
28.1814671072089	95.8916179631405	35.2297	94.8683	10.0169
28.1814671072089	95.8916179631405	29.7064	94.0211	26.0785
28.1814671072089	95.8916179631405	31.4281	94.9219	25.0918
28.1814671072089	95.8916179631405	51.1106	98.2963	24.3822
28.1814671072089	95.8916179631405	26.6904	96.1713	25.5008
28.1814671072089	95.8916179631405	33.0573	97.9271	8.5196
28.1814671072089	95.8916179631405	32.4952	97.9758	7.8091
28.1814671072089	95.8916179631405	36.8108	99.4487	12.3219
28.1814671072089	95.8916179631405	33.8351	99.3235	26.1581
28.1814671072089	95.8916179631405	42.8352	101.6931	21.2677
28.1814671072089	95.8916179631405	39.3246	101.8921	13.7336
28.1814671072089	95.8916179631405	46.5537	103.4177	24.5733
28.1814671072089	95.8916179631405	42.0156	103.5929	23.2765
28.1814671072089	95.8916179631405	40.9527	105.6227	16.0561
28.1814671072089	95.8916179631405	31.3011	106.2109	16.9428
28.1814671072089	95.8916179631405	32.8361	107.2479	24.978
28.1814671072089	95.8916179631405	28.1717	107.4546	16.9459
7.78374134887919	95.8916179631405	3.0162	107.1796	15.3823
-0.916543436462561	95.9211327742751	-1.2335	86.0108	9.9154
-0.916543436462561	95.9211327742751	3.5924	94.7451	6.9732
-0.916543436462561	95.9211327742751	0.5802	93.7511	6.2472
-0.916543436462561	95.9211327742751	1.6453	95.7178	2.5699
-0.916543436462561	95.9211327742751	1.4019	97.5847	8.9245
-0.916543436462561	95.9211327742751	4.9579	99.4405	7.1688
-4.04974489372088	96.9054448937209	-3.1358	95.2162	4.3309
-4.04974489372088	96.9054448937209	-5.5457	98.4014	2.1156
-1.66509803792951	96.9054448937185	3.1184	98.924	10.2515

Solution x	Solution y	Original x	Original y	Radius
-1.66509803792951	96.9054448937185	-6.686	94.6391	5.5087
2.17219523890728	89.625799958576	-0.1009	90.0487	2.3121
2.17219523890728	89.625799958576	-0.171	97.1566	11.053
2.17219523890728	89.625799958576	-12.8049	93.8535	19.948
5.80869999996207	89.6257999585769	7.8142	89.6258	2.0055
5.80869999996207	89.6257999585769	3.5503	90.3653	9.6646
5.80869999996207	89.6257999585769	0.6193	91.0377	11.2677
5.80869999996207	89.6257999585769	4.7737	93.7785	12.9549
5.80869999996207	89.6257999585769	6.3198	96.0864	13.0595
5.80869999996207	89.6257999585769	0.6138	95.4238	17.1272
5.80869999996207	89.6257999585769	2.1469	96.6722	20.9499
5.80869999996207	89.6257999585769	-0.3116	97.6012	20.2615
5.80869999996207	89.6257999585769	2.5533	99.1767	13.4676
5.80869999996207	89.6257999585769	3.811	100.5395	22.995
5.80869999996207	89.6257999585769	3.1448	100.72	20.6463
5.80869999996207	89.6257999585769	-1.8619	98.5581	15.9681
5.80869999996207	89.6257999585769	-7.5489	96.9207	21.6
5.29198888839485	75.6002600757486	31.7515	71.3679	28.4179
5.29198888839485	75.6002600757486	26.9783	71.0141	24.9531
5.29198888839485	75.6002600757486	16.7224	69.1113	26.0784
5.29198888839485	75.6002600757486	12.5389	66.9051	25.9958
5.29198888839485	75.6002600757486	14.5018	68.1646	28.3495
5.29198888839485	75.6002600757486	21.3934	72.6127	27.5896
5.29198888839485	75.6002600757486	15.0856	70.6386	28.271
5.29198888839485	75.6002600757486	4.4426	63.6871	23.1902
5.29198888839485	75.6002600757486	24.7401	75.4523	27.8452
5.29198888839485	75.6002600757486	9.3844	71.5303	26.9324
5.29198888839485	75.6002600757486	1.7661	66.5446	26.4568
5.29198888839485	75.6002600757486	7.0214	70.8048	24.0693
5.29198888839485	75.6002600757486	18.7356	77.2891	27.8207
5.29198888839485	75.6002600757486	9.0002	73.0359	24.3533
5.29198888839485	75.6002600757486	-4.2807	74.2616	26.6495
5.29198888839485	75.6002600757486	3.5998	89.8159	20.0402
5.29198888839485	75.6002600757486	-4.1255	85.596	25.3799
5.29198888839485	75.6002600757486	5.8502	91.8647	18.0105
5.29198888839485	75.6002600757486	2.5704	90.3092	25.529
5.29198888839485	75.6002600757486	1.2023	90.7259	19.1166
5.29198888839485	75.6002600757486	-0.7351	89.6931	28.3044
5.29198888839485	75.6002600757486	3.4538	93.5151	19.9908
5.29198888839485	75.6002600757486	-2.3037	90.7079	19.8948
5.29198888839485	75.6002600757486	1.1743	92.9818	22.3694
5.29198888839485	75.6002600757486	9.17	97.1621	26.9226
5.29198888839485	75.6002600757486	-2.5612	92.1356	25.3912
5.29198888839485	75.6002600757486	-0.0468	93.7668	20.328
5.29198888839485	75.6002600757486	-1.9602	93.9224	23.076
5.29198888839485	75.6002600757486	-2.1508	94.1499	24.1365
5.29198888839485	75.6002600757486	-3.2639	94.8889	23.5193
5.29198888839485	75.6002600757486	8.1477	101.1634	26.7278
5.29198888839485	75.6002600757486	-0.339	97.1979	24.9263
5.29198888839485	75.5992600757485	6.0914	73.9114	1.8676
5.29198888839484	70.2984002901892	8.8648	72.0358	5.5515
5.29198888839484	70.2984002901892	4.0089	72.186	2.2824
5.29198888839483	70.2974002899924	23.9369	61.5866	22.0202
5.29198888839483	70.2974002899924	14.2239	63.9607	12.6801
5.29198888839483	70.2974002899924	15.3124	65.205	17.4654
5.29198888839483	70.2974002899924	7.6803	61.1857	15.0459
5.29198888839483	70.2974002899924	12.0444	66.3239	13.9456
5.29198888839483	70.2974002899924	8.4928	63.9998	9.7983
5.29198888839483	70.2974002899924	14.0233	68.3418	20.9704
5.29198888839483	70.2974002899924	11.4442	66.9869	21.9247
5.29198888839483	70.2974002899924	10.5042	66.7806	12.8873
5.29198888839483	70.2974002899924	12.0587	67.8257	15.0634
5.29198888839483	70.2974002899924	11.4886	67.7219	21.8599
5.29198888839483	70.2974002899924	5.2812	65.5492	11.3895
5.29198888839483	70.2974002899924	10.9416	69.7746	20.3266
5.29198888839483	70.2974002899924	10.0835	69.723	14.2892
5.29198888839483	70.2974002899924	11.6475	70.8021	20.1612
5.29198888839483	70.2974002899924	9.4578	72.6847	17.4171
5.29198888839483	70.2974002899924	8.3117	72.2049	15.4861
5.29198888839483	70.2974002899924	12.73	75.2001	18.6111
5.29198888839483	70.2974002899924	0.3096	68.1954	12.3905
5.29198888839483	70.2974002899924	9.9143	75.8382	21.3192
5.29198888839483	70.2974002899924	8.0472	76.1743	21.0495
5.29198888839487	67.1050065296501	0.4838	63.8626	5.7993
5.29298888839484	67.1050065296499	4.7342	63.0935	4.7706
7.50663331347619	67.1050065296499	9.6606	65.5604	2.866
7.50663331347619	67.1050065296499	6.9842	66.7632	0.6443
7.65964491502885	67.1050065296499	10.7344	66.9849	3.0771
10.6897759761195	67.1050065296506	26.4833	65.6457	15.8608
10.6897759761195	67.1050065296506	15.1112	64.361	9.0815

Solution x	Solution y	Original x	Original y	Radius
10.6897759761195	67.1050065296506	9.1569	61.6426	9.3858
10.6897759761195	67.1050065296506	10.4334	62.822	8.2889
10.6897759761195	67.1050065296506	12.0877	66.3858	4.791
10.6897759761195	67.1050065296506	14.7433	68.1941	9.3958
10.6897759761195	67.1050065296506	12.0097	66.7734	5.0159
10.6897759761195	67.1050065296506	13.2613	67.7948	9.5466
10.6897759761195	67.1050065296506	9.1707	70.0865	9.3679
10.6897759761195	67.1050065296506	6.6564	74.2265	11.3789
18.8975516483407	67.10500652965	18.9682	67.082	0.0743
18.8975516483407	67.10500652965	22.9431	70.0987	5.5998
18.8975516483407	67.10500652965	22.1344	71.2137	6.3651
18.8975516483407	67.10500652965	24.5076	73.115	8.9241
18.8975516483407	67.10500652965	6.6701	63.5082	29.6501
18.8975516483407	67.10500652965	7.5677	74.3816	29.6105
18.8975516483407	71.8285725702025	18.2654	71.5277	0.7001
17.873300000138	72.9688972446473	15.4332	72.9689	2.4401
23.217529049167	74.0295999999542	22.8228	67.5784	16.2582
23.217529049167	74.0295999999542	21.1184	76.9048	8.7289
23.217529049167	74.0295999999542	13.7649	76.0563	11.1171
23.2185290491666	74.029599999997	14.2076	63.0144	24.0324
23.2185290491666	74.029599999997	31.0449	71.9995	23.5272
23.2185290491666	74.029599999997	22.0857	71.4539	17.4147
23.2185290491666	74.029599999997	27.2709	73.9256	19.9916
23.2185290491666	74.029599999997	25.3366	76.538	21.2393
23.2185290491666	74.029599999997	22.8762	75.7017	22.7687
23.2185290491666	74.029599999997	23.796	77.2181	18.2059
23.2185290491666	74.029599999997	2.7376	84.0979	22.8219
24.3217999927434	74.0296	26.2205	72.9044	6.2191
24.3217999927434	74.0296	24.5354	72.6275	5.9717
24.3217999927434	74.0296	24.3218	77.9732	3.9436
25.7736997032431	73.5413060895175	25.4767	75.481	1.9623
25.7736997032426	71.1996000000002	28.241	67.9653	4.4101
25.7736997032426	71.1996000000002	25.7737	68.9159	2.2837
25.7746997032317	71.1996000000002	26.4587	69.6793	4.4461
25.7746997032317	71.1996000000002	27.6433	72.5657	2.8004
32.697000042027	74.3922999999838	32.697	74.6737	0.2814
32.697000042027	74.3922999999838	37.0706	93.0168	27.7874
32.697000042027	74.3922999999838	32.2034	92.5655	28.0393
32.697000042027	74.3922999999838	36.1694	94.3523	28.0801
32.697000042027	74.3922999999838	30.7482	95.8761	28.9897
32.697000042027	74.3922999999838	31.6916	96.8159	27.5118
32.697000042027	74.3922999999838	31.7064	96.988	27.9597
32.697000042027	74.3922999999838	21.5395	100.4343	29.9057
32.6970000420271	73.100452218534	26.4747	67.9787	12.3016
32.6970000420271	73.100452218534	32.2488	71.8762	10.0488
32.6970000420271	73.100452218534	24.1578	73.3792	11.3579
32.6970000420271	73.100452218534	33.517	80.8699	7.8126
34.6313	31.6782998622509	35.5392	31.6783	0.9079
27.1896615940053	29.9003786046384	28.099	29.8348	0.9117
27.1896615940053	29.9003786046384	20.5046	21.2685	15.1676
27.1896615940053	29.9003786046384	19.4476	21.0876	13.323
27.1896615940053	29.9003786046384	20.8129	26.0745	16.1762
27.1896615940053	29.9003786046384	18.7218	26.0511	18.3773
27.1896615940053	29.9003786046384	15.0509	21.8739	20.7664
22.4703862041526	29.9003786046384	21.3113	31.7798	2.2081
19.6862999999993	28.4786682739996	23.3217	16.9506	12.0877
19.6862999999993	28.4786682739996	22.8581	29.0039	5.9592
19.6862999999993	28.4786682739996	19.8821	27.2321	8.0149
19.6862999999993	25.0667909388993	19.5225	24.6717	0.4277
19.6862999999993	20.4264	19.4151	20.4264	0.2712
19.6862999999993	20.4264	19.6457	23.2311	5.0904
19.6862999999993	20.4264	7.8039	17.6061	13.3149
19.6862999999993	15.096662359633	21.2889	20.2133	12.2867
19.6862999999993	15.095662359633	27.0312	22.0371	12.0381
19.6862999999993	15.095662359633	24.5729	19.8583	11.2071
19.6862999999993	15.095662359633	19.6468	14.5775	7.1553
19.6862999999993	15.095662359633	21.4132	25.3225	11.064
19.6862999999993	15.095662359633	18.4916	22.031	8.3539
19.6862999999993	15.095662359633	17.2669	18.1061	10.6475
20.5148851846735	1.01315635056426	24.8641	0.1355	6.251
20.5148851846735	1.01315635056426	19.4163	-0.8394	2.1538
20.5158851846735	1.01315635056426	22.4229	-2.1641	7.0873
28.4272655530615	1.01315635056426	31.1391	0.2266	2.8236
28.4272655530615	1.01315635056426	27.3755	-1.0984	2.359
29.9497032489348	1.01315635056426	31.0707	1.7474	2.3995
29.9497032489346	6.4941999999043	29.9497	8.0977	1.6035
29.9497032489346	6.4941999999043	29.2451	9.0499	5.6713
29.9497032489346	6.4941999999043	29.6205	6.6839	7.8815
29.9497032489346	6.4941999999043	27.6562	5.4902	8.29
29.9497032489346	6.4941999999043	26.246	7.8923	7.1855

Solution x	Solution y	Original x	Original y	Radius
29.9497032489346	6.4941999999043	26.4488	5.1021	9.3497
29.9497032489346	6.4941999999043	25.2224	21.1268	20.0558
29.9497032489346	6.4941999999043	23.1228	16.7524	13.0518
29.9497032489346	6.4941999999043	24.0847	21.2619	18.4856
29.9497032489346	6.4941999999043	23.1615	20.5337	18.9562
29.9497032489346	6.4941999999043	22.0389	18.6688	16.6692
29.9497032489346	6.4941999999043	21.1889	21.267	20.9082
29.9497032489346	6.4941999999043	22.6294	-1.9579	16.8768
29.9497032489346	6.4941999999043	19.3676	20.9011	22.1053
29.9497032489346	6.4941999999043	18.1963	16.0602	17.912
29.9497032489346	6.4941999999043	17.3215	22.815	26.1071
29.9497032489346	6.4941999999043	17.7323	26.9057	28.6742
29.9497032489346	6.4941999999043	16.9754	26.2994	25.4942
34.0048636622736	6.49419999990406	36.2059	6.8965	2.2375
34.0048636622736	6.49419999990406	31.7997	5.4917	9.7028
34.0048636622736	6.49419999990406	29.4417	11.4808	11.6626
34.0048636622736	6.49419999990406	33.4349	0.0139	13.2105
34.0048636622736	6.49419999990406	29.2732	5.6917	15.7976
34.0048636622736	6.49419999990406	28.1449	5.3771	15.5333
34.0048636622736	6.49419999990406	25.9081	14.4892	15.0463
34.0048636622736	6.49419999990406	31.1128	-2.8096	18.9309
34.0048636622736	6.49419999990406	23.9142	5.5856	20.6816
34.0048636622736	6.49419999990406	21.6596	11.213	23.4533
34.0048636622736	6.49419999990406	22.4003	2.9895	21.9707
34.0048636622736	6.49419999990406	21.7951	21.835	24.0928
34.0048636622736	6.49419999990406	19.0397	19.3917	27.4702
34.0048636622736	6.49419999990406	16.9397	16.157	23.6795
41.8203005351438	-2.8167117629552	42.4155	0.0668	2.9443
41.8203005351438	-2.8167117629552	54.4331	-6.2551	16.56
46.0937000254435	-4.90129999999967	46.0937	-5.8176	0.9163
47.0947459177366	2.02893737067079	44.2937	4.7268	3.889
47.0947459177366	2.02893737067079	48.302	2.6164	1.3426
52.1136984961757	1.76635233008823	51.8363	2.0767	1.2126
52.1136984961757	1.76635233008823	52.8937	1.339	0.8894
52.1136984961757	1.76635233008823	51.7765	0.7553	1.0658
54.3865822861946	1.96827503284814	49.5265	1.5006	5.684
54.3865822861946	1.96827503284814	54.7597	1.1902	4.007
54.3865822861946	1.96827503284814	57.3839	0.9502	3.1655
56.9865633930068	1.96827503284814	58.2864	0.0731	2.2981
56.9865633930068	1.96827503284814	53.8048	-5.0553	14.1877
58.9748072519228	1.96827503284814	58.6318	9.4344	7.474
58.9748072519228	1.96827503284814	58.2741	0.1622	6.0785
58.9748072519228	1.96827503284814	62.5325	1.766	5.6387
58.9748072519228	1.96827503284814	62.7821	-0.0838	4.3251
58.9748072519228	7.46097356231715	56.6752	3.9284	9.6519
58.9748072519228	7.46097356231715	61.7542	11.527	4.9252
59.4111219733488	8.06302197341797	59.4358	8.0877	0.0349
59.4111219733488	8.06302197341797	58.0726	3.0503	10.1594
59.4111219733488	8.06302197341797	60.2628	6.0605	10.0471
59.4111219733488	8.06302197341797	60.4719	1.0667	17.5347
59.4111219733489	6.76469647287117	58.0725	5.2013	2.9904
59.4111219733489	6.76469647287117	60.5785	6.8128	2.6428
55.4684095151094	6.76469647287117	51.2901	7.6487	4.2708
55.4684095151094	6.76469647287117	55.5508	6.709	3.2447
55.4684095151094	6.76469647287117	56.6229	3.2945	3.6572
52.0510496111707	8.04533881759906	53.4554	15.0784	7.1719
52.0510496111707	8.04533881759906	50.2911	5.2466	6.9728
52.0510496111707	8.04533881759906	57.2331	12.7874	7.0243
45.1636000000326	9.45404080326796	46.0043	6.8606	2.7263
45.1636000000326	9.45404080326796	53.412	-4.2453	16.6165
45.1636000000115	9.75000015765252	44.5689	9.75	0.5947
45.1636000000115	9.75000015765252	42.7704	10.2739	5.5443
45.1636000000115	9.75000015765252	45.5397	7.2979	4.7628
45.1636000000115	9.75000015765252	48.4975	2.4432	10.4173
45.1636000000115	9.75000015765252	33.6792	4.7017	13.2435
45.1636000000115	9.75000015765252	31.9656	14.6164	14.4873
45.1636000000115	9.75000015765252	36.4279	-4.3699	20.2708
45.1636000000115	9.75000015765252	27.2842	5.8331	18.4271
45.1636000000115	9.75000015765252	28.6989	1.5656	19.8786
45.1636000000115	9.75000015765252	25.8989	0.7413	22.2466
45.1636000000115	9.75000015765252	26.7943	-2.6353	24.1177
45.1636000000115	9.75000015765252	20.7311	19.0512	27.1888
45.1636000000115	9.75000015765252	20.5322	21.5891	28.8292
46.2836818967521	11.9659	47.1015	12.1757	0.8443
46.2836818967521	11.9659	47.4524	12.1509	13.8821
46.2836818967521	11.9659	48.2378	10.888	5.8133
46.2836818967521	11.9659	47.6091	10.2274	11.8474
46.2836818967521	11.9659	48.9393	11.7496	17.8826
46.2836818967521	11.9659	46.5714	10.174	27.098
46.2836818967521	11.9659	47.5448	13.9665	6.8471

Solution x	Solution y	Original x	Original y	Radius
46.2836818967521	11.9659	49.0558	10.279	25.3924
46.2836818967521	11.9659	44.5228	11.8645	25.0082
46.2836818967521	11.9659	45.8725	14.3747	19.0119
46.2836818967521	11.9659	44.7075	13.3055	12.6011
46.2836818967521	11.9659	48.0446	14.6778	8.8581
46.2836818967521	11.9659	46.3909	8.819	24.8054
46.2836818967521	11.9659	50.5069	12.3029	19.1593
46.2836818967521	11.9659	43.7231	10.6871	24.1762
46.2836818967521	11.9659	43.7175	13.3612	11.2776
46.2836818967521	11.9659	46.6598	16.011	13.039
46.2836818967521	11.9659	43.984	9.2005	7.1984
46.2836818967521	11.9659	51.32	11.9016	29.8963
46.2836818967521	11.9659	44.2621	15.3855	17.5289
46.2836818967521	11.9659	52.0306	12.0787	25.2448
46.2836818967521	11.9659	51.9742	12.9315	19.8738
46.2836818967521	11.9659	43.7681	7.8375	19.4193
46.2836818967521	11.9659	41.9974	13.5778	24.1613
46.2836818967521	11.9659	44.3034	16.6265	9.4533
46.2836818967521	11.9659	46.8369	6.4403	14.1993
46.2836818967521	11.9659	52.3173	10.0275	24.0147
46.2836818967521	11.9659	49.3862	17.5735	29.4535
46.2836818967521	11.9659	47.2412	18.0641	26.9311
46.2836818967521	11.9659	47.7278	5.7114	28.1097
46.2836818967521	11.9659	52.0827	15.9727	11.4211
46.2836818967521	11.9659	44.0031	6.0986	17.8329
46.2836818967521	11.9659	45.9074	18.6439	15.0199
46.2836818967521	11.9659	53.965	12.2967	9.8572
46.2836818967521	11.9659	40.2323	12.6508	15.4062
46.2836818967521	11.9659	44.3097	5.4051	11.9467
46.2836818967521	11.9659	53.1154	7.9184	19.9574
46.2836818967521	11.9659	48.7027	4.8736	25.6148
46.2836818967521	11.9659	49.1677	19.2175	29.9217
46.2836818967521	11.9659	47.0712	4.3382	28.9099
46.2836818967521	11.9659	49.9475	19.2284	17.8419
46.2836818967521	11.9659	45.9242	19.9	25.1738
46.2836818967521	11.9659	53.7123	16.59	19.1512
46.2836818967521	11.9659	53.9046	16.3668	12.2702
46.2836818967521	11.9659	45.0418	3.8658	10.1722
46.2836818967521	11.9659	49.309	3.6922	20.878
46.2836818967521	11.9659	40.2335	17.1357	11.2782
46.2836818967521	11.9659	52.1655	19.1446	15.5087
46.2836818967521	11.9659	52.0607	4.6851	25.9984
46.2836818967521	11.9659	53.4617	5.8056	21.7012
46.2836818967521	11.9659	41.1669	5.3004	27.2131
46.2836818967521	11.9659	54.3108	6.5803	23.4136
46.2836818967521	11.9659	39.7266	17.3977	17.8866
46.2836818967521	11.9659	55.8132	15.4408	11.5975
46.2836818967521	11.9659	40.715	18.8306	23.0792
46.2836818967521	11.9659	42.4139	3.5597	13.287
46.2836818967521	11.9659	52.3291	3.6705	19.2214
46.2836818967521	11.9659	52.2056	3.4977	20.8953
46.2836818967521	11.9659	38.0686	7.3443	25.6467
46.2836818967521	11.9659	36.7928	9.6586	12.2244
46.2836818967521	11.9659	49.1449	22.3659	23.3416
46.2836818967521	11.9659	50.9668	1.717	23.9816
46.2836818967521	11.9659	46.7163	23.0055	28.4765
46.2836818967521	11.9659	43.4311	0.4843	25.8563
46.2836818967521	11.9659	49.2438	-0.5725	17.8927
46.2836818967521	11.9659	55.5686	2.3786	17.8085
46.2836818967521	11.9659	50.8742	24.2729	23.767
46.2836818967521	11.9659	54.5841	1.3	17.8466
46.2836818967521	11.9659	54.6465	1.327	23.7327
46.2836818967521	11.9659	36.4235	4.5159	16.6099
46.2836818967521	11.9659	44.8479	-0.9391	19.1888
46.2836818967521	11.9659	56.514	2.6652	22.7885
46.2836818967521	11.9659	55.7669	1.6852	24.4965
46.2836818967521	11.9659	51.545	-0.7619	25.0267
46.2836818967521	11.9659	58.8992	5.3006	25.2792
46.2836818967521	11.9659	33.7832	8.5886	17.2676
46.2836818967521	11.9659	58.5415	3.6684	22.039
46.2836818967521	11.9659	57.7618	2.6586	24.3155
46.2836818967521	11.9659	47.7428	26.438	28.0445
46.2836818967521	11.9659	50.0191	-2.6033	29.6269
46.2836818967521	11.9659	58.2987	1.8222	22.9315
46.2836818967521	11.9659	54.6523	25.2022	28.2307
46.2836818967521	11.9659	46.7677	27.4481	29.3514
46.2836818967521	11.9659	45.985	27.4123	25.7471
46.2836818967521	11.9659	56.047	-0.6998	25.6513
46.2836818967521	11.9659	58.6741	1.1796	18.8015
46.2836818967521	11.9659	47.5893	27.8934	19.7112

Solution x	Solution y	Original x	Original y	Radius
46.2836818967521	11.9659	39.9467	-2.3317	24.6235
46.2836818967521	11.9659	46.684	28.1154	27.5206
46.2836818967521	11.9659	61.565	4.5717	20.8967
46.2836818967521	11.9659	53.5826	-3.7128	20.6553
46.2836818967521	11.9659	60.4167	1.4088	18.4179
46.2836818967521	11.9659	55.089	27.0379	20.8338
46.2836818967521	11.9659	43.0131	-4.6452	20.9992
46.2836818967521	11.9659	30.7839	5.7178	20.1469
46.2836818967521	11.9659	53.915	28.4629	20.5718
46.2836818967521	11.9659	63.4243	4.3429	22.7299
46.2836818967521	11.9659	64.6914	7.7788	22.2178
46.2836818967521	11.9659	58.3955	-2.2935	20.2689
46.2836818967521	11.9659	46.4115	30.3033	28.1751
46.2836818967521	11.9659	59.6709	-1.5476	26.9171
46.2836818967521	11.9659	63.0749	1.8033	22.3131
46.2836818967521	11.9659	46.9054	30.8841	23.9447
46.2836818967521	11.9659	47.3356	31.1656	22.3253
46.2836818967521	11.9659	50.5738	30.8854	21.7078
46.2836818967521	11.9659	61.9524	-0.333	23.4378
46.2836818967521	11.9659	57.7878	-4.3732	27.1183
46.2836818967521	11.9659	28.0443	7.2557	23.7219
46.2836818967521	11.9659	50.8592	31.2824	23.4486
46.2836818967521	11.9659	27.9452	7.0873	24.5101
46.2836818967521	11.9659	62.4332	-0.684	29.6949
46.2836818967521	11.9659	52.5136	31.162	28.7958
46.2836818967521	11.9659	32.3564	-1.4633	25.6089
46.2836818967521	11.9659	63.3607	23.5913	24.1094
46.2836818967521	11.9659	48.6326	32.1618	29.9479
46.2836818967521	11.9659	31.0065	-1.0714	23.9753
46.2836818967521	11.9659	63.8119	26.0212	22.8759
46.2836818967521	11.9659	62.9268	27.0211	28.5574
46.2836818967521	11.9659	53.289	-9.6645	25.3042
46.2836818967521	11.9659	54.3132	33.4794	25.0485
46.2836818967521	11.9659	60.1802	30.671	27.7411
46.2836818967521	11.9659	58.6228	31.6703	25.6598
46.2836818967521	11.9659	45.6407	35.658	25.0567
46.2836818967521	11.9659	58.4334	33.3219	26.7455
46.2836818967521	11.9659	24.5208	1.7631	29.7307
46.2836818967521	11.9659	64.1748	30.2745	28.016
46.2836818967521	11.9659	46.003	37.4534	29.0578
46.2836818967521	11.9659	22.0744	6.6433	29.8611
46.2836818967521	11.9659	22.5923	19.795	27.7634
46.2836818967521	11.9659	61.1622	34.1592	28.1161
46.2836818967521	11.9659	65.4552	32.6167	29.012
46.2836818967521	11.9659	61.1452	36.2851	29.605

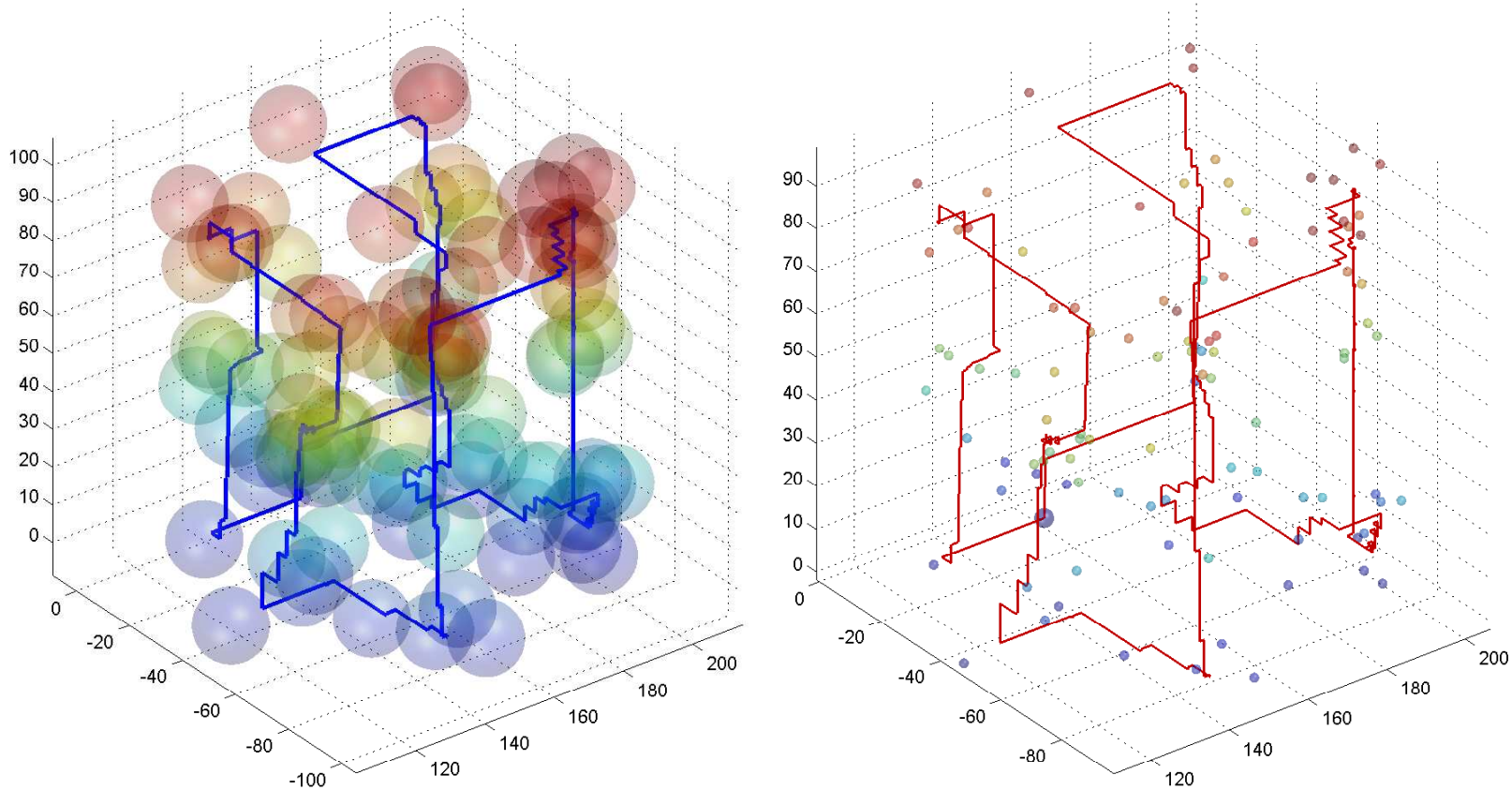


Figure N.167: *team*1_100, Equal Radius, 3D, Manhattan, Length = 1089.1559309

Table N-170: Solution for *team*1_100, Equal Radius, 3D, Manhattan

Total distance: 1089.15593085414 Depot: x 50 y 10 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
23.9797108676794	13.1779997313978	4.44299956693876	16.123	17.568	4.443
25.6968167807456	13.1779996953071	15.5002095127649	33.5	17.352	15.52
26.096188819039	13.1779996582669	26.2235867582192	29.447	11.243	26.345
26.4920610265042	13.1779996212612	37.1277118688818	20.541	9.26	39.729
26.9127959878962	13.1779995844048	43.683630832534	21.459	12.53	50.646
27.9058653732367	13.1779995476948	44.2127319287925	22.494	14.202	49.345
29.0448135868568	13.1779995109553	44.7123854343853	25.542	20.506	48.088
33.341001679467	13.1779994729135	45.1029526262883	33.341	22.178	45.103
36.4700213190496	10.8332484343307	63.2809986949515	45.293	9.057	63.281
36.4700213185827	10.8332478329166	76.0250008615654	40.868	2.981	76.025
28.4481403985061	11.6906818445975	79.792028988413	26.839	11.732	76.118
21.41400031017	12.5489936125054	84.25202127803	15.772	12.549	91.264
21.414000584006	20.9620010840275	80.1469278011325	12.414	20.962	80.147
21.7061724507477	28.3996002189342	79.4574397237263	19.569	24.449	84.923
22.0019532564372	47.1192603746144	78.7182152368001	19.619	52.734	79.19
22.300757576876	54.5715333135834	77.978818403859	21.299	57.593	80.779
22.6005466531125	60.7338091246423	77.2270071601676	26.213	68.977	77.227
22.6005466851728	60.2822305112565	70.7354384753131	26.732	55.612	72.392
22.6005467171386	59.8464266195391	63.2501727357229	20.103	52.347	63.856
22.6005467491878	59.4551578630538	54.7742349863022	25.201	54.507	48.664
22.6005467810288	59.0994468843715	52.5854428763148	25.923	53.185	46.671
18.4635677544641	59.1567887401138	52.6377510905947	18.45	52.954	46.14
14.8583684498767	60.6257374235565	54.3617852140715	11.123	60.442	50.101
11.7883652699813	62.1118474789141	56.2731744024052	7.235	62.367	51.584
9.27537168685821	63.6031585366306	58.4878711659333	5.739	68.535	65.134
9.27537170453749	63.6031583513024	56.0629973932842	17.374	67.529	56.063
8.9498798653924	63.2272236270673	51.4290062031018	11.844	68.394	54.009
8.61978132509428	62.8405662453511	45.7903499197182	13.454	69.007	48.213
8.26261504269948	62.4051800087804	29.1225582164262	11.878	70.444	28.798
7.74942770399173	59.7016280899269	22.0487259779932	5.777	62.003	23.29
7.2402755072054	56.8899840945366	14.5160004630652	8.641	64.188	15.551
6.72315337885703	51.7951543404685	5.24615043256446	1.527	46.599	0.05
24.6903389493425	52.5371215795684	5.68988511721543	27.219	44.51	3.327
26.7634274768819	72.3426448384105	6.22337357422913	20.735	74.659	7.978
29.3830352107624	84.4939487567244	6.74977300148914	36.762	86.092	10.176
30.5600626296636	90.272014197966	7.22599300157242	36.924	96.636	7.226
29.1719836246048	90.1593995423861	15.6696295309533	24.053	94.189	12.551
28.0714819339784	90.0457409190486	37.0511010842262	27.59	93.644	36.826
26.9744619335189	89.9317599418215	60.4469993360289	20.393	83.793	60.447
26.9744617755699	89.9317597795551	72.9578928064157	33.626	83.869	72.958
26.6095027957824	89.9317598041757	81.2049604871268	33.443	88.578	84.328
26.2153222931551	89.9317598288857	85.8357275735996	30.503	90.056	84.685
25.8157355847401	89.9317598536227	90.927240413783	19.881	93.181	96.862
64.0406367638105	87.9636507368264	90.704515571227	67.643	91.829	97.188
67.1102970977078	82.2768985754352	90.4532214313602	63.631	81.224	94.784
70.8548578996908	77.3049037487551	90.198765995829	74.447	77.382	91.404
74.1989948810465	72.4598652039274	89.9439181734458	76.154	71.763	97.979
76.592994200455	68.6310198420742	89.6527666542931	73.523	67.727	97.567
85.2269913856415	65.8493254422977	89.2862896941998	87.633	63.432	97.407
86.4933859153185	64.8953864878403	87.648618188336	93.946	64.003	91.762
87.0920367333998	64.0539603129563	77.108042250338	93.456	57.69	77.108
85.7463964946861	65.6031009505859	77.0170363538052	89.091	59.886	77.014
84.282958482382	67.693034918855	76.9259097418598	77.919	74.057	76.926
85.0621013355778	66.7600937864125	67.3443254019062	86.785	67.217	67.68
85.8363864358604	65.8265339856827	57.9236699089298	91.043	63.691	55.511
86.571357654155	64.9234798802179	51.162654819083	94.619	62.103	50.624
87.0601442106732	64.1888652720574	46.1982810475176	87.173	60.998	48.592
87.5501311475165	63.4723289454468	40.7139123527824	87.18	60.86	47.333
88.0435635274581	62.7856550840239	15.7167771956342	94.894	61.262	13.169
88.4978399060108	62.1211512425456	6.80814740929969	93.694	56.925	1.612
86.9580955943855	69.9866859443101	8.17716071963759	85.968	75.194	1.985
85.5381992227202	72.3846908446711	10.7529134037279	84.146	71.427	3.869
84.1914226714199	74.9666402822026	15.2747506625624	87.252	72.952	19.479
82.7807558551859	77.8139148769987	18.784699721638	78.214	79.218	18.292
81.4760016882759	80.5918063512877	22.3799236927161	81.476	87.316	28.362
70.8234900071076	79.7459845338103	22.379923170896	67.179	79.746	30.609
70.8234887604682	74.7553448094751	20.8211467033799	66.957	73.797	28.023
70.823487518774	70.9614642846614	16.8471491856122	66.971	72.201	17.644
70.8234862780072	67.1239963675373	12.7790061938148	68.193	67.124	4.172
70.8234861406021	49.7107247823788	12.7790065238369	74.679	41.865	10.639
57.2300307077697	49.7107248568251	15.9918743107356	51.29	49.58	11.489
52.995055878356	49.7107249313611	21.1506757420302	49.02	51.541	23.534
49.3819836682567	49.7107250059055	25.7430018310373	40.978	46.49	25.743
50.5622304183408	53.9163070231603	27.732996130851	42.804	54.74	25.734
52.4640132877527	57.595022599913	30.1092768932085	59.007	60.213	31.626
53.9617927335411	60.6644315979485	32.3249952257578	61.493	65.592	32.325

Solution x	Solution y	Solution z	Original x	Original y	Original z
53.9617927774763	60.6644317570111	45.2349980381	59.534	67.732	45.235
53.6077915418098	59.7374577323487	48.2938633944211	57.243	55.792	50.963
53.2484262074571	58.8592470901363	51.0815251064282	57.142	56.857	57.493
52.8743557396455	58.0302316845533	52.9271437273498	53.958	52.681	59.332
52.4908476769954	57.3863665894479	54.0125157380118	55.281	51.871	55.993
52.1013375840081	56.7769789281063	55.0729925621622	49.571	48.14	55.073
52.1013373523477	56.8134420152174	75.0539965932413	43.243	58.404	75.054
53.7058029463291	56.8134421176418	80.2914770799611	52.975	65.56	80.551
55.9548087582678	56.8134422187984	84.3289996686864	62.352	63.144	84.329
55.9548085812013	45.270040108667	87.6175562913721	47.232	45.27	89.834
55.9548087096953	6.76343143940454	87.617557242615	53.754	0.148	93.309
84.598655472905	7.8164604867207	87.2611792386469	88.457	8.185	95.157
85.5030654071081	8.78100956298713	85.9658354557065	85.841	12.653	93.498
86.3795886865083	9.48827980491103	72.8560724202456	85.554	10.061	65.642
87.2758203297054	10.1899186819926	68.8157399454551	91.007	13.249	70.645
88.1420908263982	10.8737594603124	64.481919092415	91.857	16.502	66.492
88.9530200684551	11.5000566330823	59.2089991350129	95.317	17.864	59.209
88.8442179855786	10.582816755306	36.862575571934	94.926	4.006	36.794
88.5516138542583	10.4452414996448	28.4256443839848	89.359	10.839	25.32
88.2586904783193	10.3076430032078	21.6754083090165	92.889	3.855	22.202
87.9500404707638	10.1741972802903	13.7598378840304	93.574	3.255	13.429
50.2430431872934	10.084762257244	10.7059588629127	46.154	2.083	10.72
50.162537482693	10.0564359323906	7.06213443607124	53.405	3.041	5.972
50.081508397179	10.0282366242514	3.79546574829139	54.032	12.197	7.44

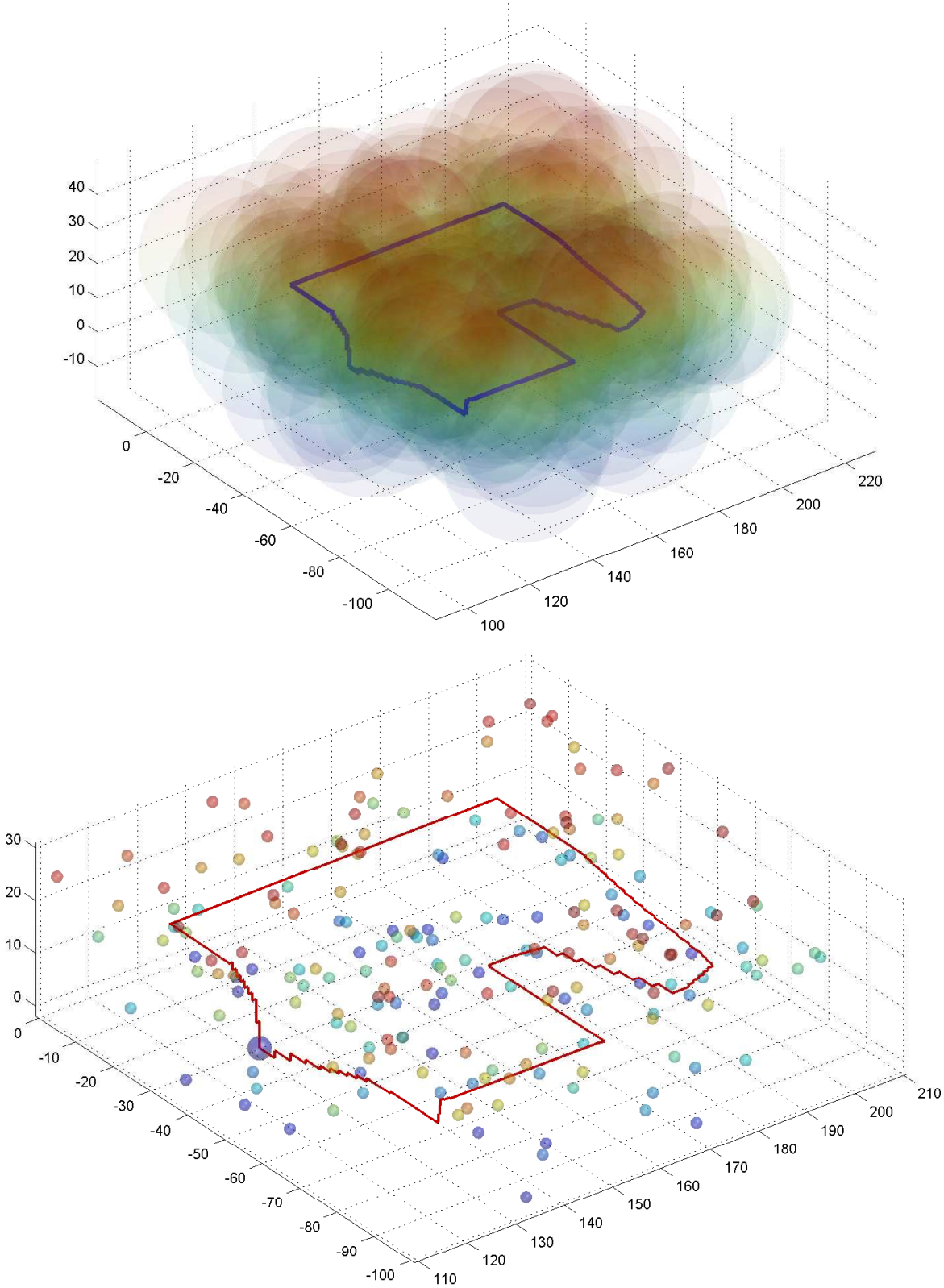


Figure N.168: *team*2_200, Equal Radius, 3D, Manhattan, Length = 359.4025228

Table N-171: Solution for *team*2_200, Equal Radius, 3D, Manhattan

Total distance: 359.402522787148 Depot: x 19.5535 y 32.6157 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
19.5534999790637	36.707637144723	1.39753338536739	2.888575	34.539165	0.815621
19.5534999728477	40.9445990875285	2.79657087062201	4.535275	41.40327	15.496926
19.553499967136	44.983332840154	3.51034170418039	4.493385	48.2428075	1.749018
19.5534999616027	48.9728067133409	4.23126649630448	5.35044999999999	59.245825	2.02242
19.5534999616027	48.9728067133409	4.23126649630448	2.26291999999999	54.336059	8.412226
19.553499956537	51.6142346164801	4.94187895734152	18.601355	58.3359	16.263038
19.553499956537	51.6142346164801	4.94187895734152	15.17562	59.299125	20.231796
19.5534999514981	53.8661841823393	5.58651228757833	24.393135	53.387308	3.209069
19.5534999464095	56.1828300610039	6.2358957006399	23.528225	48.047471	10.497692
19.5534999412975	58.6943127169731	6.88403157869812	22.32618	58.45293	10.978007
19.5534999361897	61.295250718851	7.53146729323383	27.03592	58.11764	25.51317
19.5534999307843	67.7485899416712	7.89235313050861	25.726765	62.875185	13.655865
19.5534999307843	67.7485899416712	7.89235313050861	22.77816	61.91876	23.535116
19.5534999253618	80.4861300007965	8.24130568295587	30.09705	94.85711	4.685105
19.5534999253618	80.4861300007965	8.24130568295587	24.384515	97.907795	0.111537
19.5534999189419	80.690916724567	9.74414874403546	30.1948	77.47401	0.923346
19.5534999189419	80.690916724567	9.74414874403546	16.28216	64.658715	7.376906
19.5534999124644	80.9011510309117	11.40064789691	4.81189000000001	71.48163	19.467897
19.5534999124644	80.9011510309117	11.40064789691	1.401765	76.07236	14.516115
19.5534999066501	81.1251878699484	12.556103811691	14.99811	70.439575	28.594361
19.5534999066501	81.1251878699484	12.556103811691	10.737535	78.399525	25.651463
19.5534999016757	81.5335262850954	12.7960482765762	16.17437	80.77798	18.674423
19.5534999016757	81.5335262850954	12.7960482765762	8.96414	75.77293	21.604208
19.5534998969603	81.9496639812495	13.0354702656086	23.602775	87.83846	18.275699
19.5534998969603	81.9496639812495	13.0354702656086	20.60172	86.45345	23.44328
19.5534998921879	82.3641912485103	13.2740844009506	28.966505	91.93771	20.861988
19.5534998921879	82.3641912485103	13.2740844009506	23.159665	94.99055	21.634541
19.5534998871933	82.7646885193918	13.5105491781046	20.26183	95.676245	17.846167
19.5534998871933	82.7646885193918	13.5105491781046	12.30828	95.415795	18.734286
19.5534998823533	83.152020611781	13.7463792023605	10.302265	79.88844	24.724981
19.5534998777399	83.544218404121	13.9808896889321	19.19225	67.891335	25.986874
19.5534998733131	84.1464488827786	14.179163649787	10.636965	99.941455	22.606097
27.2941777044796	84.1464484903426	14.1791636474335	27.294235	67.36467	25.05905
29.8877829004789	84.1464485980351	14.1488956503188	33.93752	71.055425	5.905417
29.8877829004789	84.1464485980351	14.1488956503188	27.85894	70.297015	5.978866
32.4790868666683	84.1464487060304	14.1187677104765	31.22881	79.877355	13.445056
35.1337724198431	84.1464488139961	14.0886544741539	32.35548	77.08328	26.131092
37.930365694311	84.1464489219735	14.0584842359208	43.88264	75.9979	6.534575
40.6460284369398	84.1464490299991	14.0283569890182	39.89323	90.309885	11.775799
40.6460284369398	84.1464490299991	14.0283569890182	37.353615	96.195315	18.415189
43.6274825708395	84.1464491380653	13.9982187723326	36.34587	87.597465	1.344209
43.6274825708395	84.1464491380653	13.9982187723326	54.766852	92.295455	6.553331
46.4994022194713	84.1464492460625	13.968206275858	49.437672	97.29667	7.39626
49.3508007279202	84.1464493539654	13.9382435630584	65.23767	90.033385	6.608827
49.3508007279202	84.1464493539654	13.9382435630584	67.48261	90.51293	17.817861
49.853249639651	84.1464494616217	13.9080917266899	64.30468	84.91	26.009678
49.853249639651	84.1464494616217	13.9080917266899	59.88564	90.256965	29.954013
50.1233183481535	84.1464495686644	13.875563195943	55.7501	90.920415	19.617278
50.3931125645153	84.1464496758465	13.8430245788884	49.200624	76.95068	27.905495
50.3931125645153	84.1464496758465	13.8430245788884	59.609455	83.27302	29.920795
50.6563174905236	84.1464497827973	13.8100995957176	51.725585	96.536445	28.40681
50.9177149614529	84.146449889632	13.7766913333457	58.59379	93.155945	12.405414
51.1779861480686	84.1464499962937	13.743303580688	58.9163	98.60932	2.300231
51.1779861681173	82.1973576715982	13.7433036163263	38.950185	86.058925	28.399966
51.1779861884284	79.5677455602207	13.7433036517252	40.48646	81.157135	14.786912
51.1779862093265	77.0235528814365	13.7433036871666	52.486843	76.711165	9.36826
51.1779862302965	74.5757851554105	13.7433037227033	51.801592	75.702955	19.859805
51.1779862302965	74.5757851554105	13.7433037227033	58.86286	75.490835	22.793064
51.1779862512024	72.2626886319429	13.7433037581926	61.393495	78.21387	27.829379
51.1779862713833	69.4436421279458	13.7433037934911	56.10401	69.44853	29.951816
51.1779862713833	69.4436421279458	13.7433037934911	63.457115	71.302795	28.410692
51.1779862910905	66.348997792455	13.7433038281535	48.983044	68.08194	24.712405
51.1779862910905	66.348997792455	13.7433038281535	45.96408	75.36881	19.356846
51.1779863108873	63.1611703332374	13.7433038626969	53.302235	56.10093	10.554691
51.1779863306371	60.2387127587777	13.7433038973006	42.753335	50.906813	15.568394
51.1779863306371	60.2387127587777	13.7433038973006	42.291825	54.317701	14.78098
51.1779863505699	57.7907242769766	13.7433039318748	39.724355	52.657318	1.123019
51.177986370689	55.6513308621919	13.7433039666321	36.49954	48.989475	3.669737
51.1779863912383	54.0176128059311	13.7433040015651	41.00732	41.27668	4.938398
51.1779863912383	54.0176128059311	13.7433040015651	35.65863	43.345715	7.513468
51.1779864136642	53.5250029111808	13.743304036912	50.972003	40.60627	2.976184
51.1779864136642	53.5250029111808	13.743304036912	50.608737	39.047145	0.30438
51.1779864360797	53.2321338921846	13.7433040730116	51.37375	46.298003	11.79476
51.1779864360797	53.2321338921846	13.7433040730116	49.52113	41.29678	9.327678
51.1779864584034	52.9442791659304	13.7433041091116	40.184205	46.1874365	21.269314
51.1779864811602	52.659219592512	13.7433041450344	35.347265	40.483415	12.676508

Solution x	Solution y	Solution z	Original x	Original y	Original z
51.4483278795404	52.6592195458154	13.7433041893694	53.824634	40.64213	16.603226
51.7192311025772	52.6592194991785	13.7433042336805	51.719243	33.03008	9.909651
56.7373508595631	52.8514252916664	13.7433043404768	69.610075	41.75992	4.719164
58.3136565846299	53.0511705326982	13.7433044474248	65.72564	44.111465	7.622314
59.8622082046132	53.2503057937965	13.7433045543972	64.595135	34.78327	9.989898
61.0111116779956	53.4940171056305	13.7433046614712	61.04328	37.44322	1.978623
62.2051048022523	56.8978947668855	13.7433047704204	65.705495	54.4013975	3.082521
63.3988790395322	60.4091037182003	13.7433048794407	62.26967	64.78212	6.975531
64.6098735952992	63.8342210444946	13.7433049884991	63.17424	62.764205	21.920947
65.8406625189838	67.385907373273	13.7433050974757	68.40623	74.741575	8.582781
65.8406625189838	67.385907373273	13.7433050974757	75.60926	70.05143	9.458663
67.0551925075387	70.8872923620069	13.7433052065204	67.24276	72.18951	20.816233
68.2872610839881	74.5087318389633	13.7433053155167	74.635475	75.231085	23.616275
69.5115487310414	78.3256991927121	13.743305424455	69.51155	98.000325	10.150379
73.1192175469232	77.9567090034433	13.9226031111318	91.37176	83.481715	13.123111
74.3939122474501	77.5673613096562	14.1025804465609	74.234205	84.088705	29.630347
75.6983029423315	77.1727776792392	14.2793855792226	82.980165	82.460215	28.432538
76.9382390407736	76.7736617404809	14.4531532332372	86.26193	79.048	11.651774
78.1649513657865	76.3754651511118	14.6275063592441	84.72455	82.62255	16.621981
79.3885155827251	75.9764466725892	14.8018686861202	98.53739	80.25874	11.354076
79.5077828802516	74.4861268560061	15.0258665626605	87.254685	75.06877	11.123991
79.6270859111247	73.0211276620574	15.2507069823633	97.272905	80.426715	12.650593
79.7375843777859	69.5240220346254	15.4802476704268	81.449	70.90379	9.10693
79.8485082049406	66.2018986499087	15.7109342086676	79.72973	69.6285	5.76607
79.9600028767581	62.9570754238414	15.9434368046248	93.854515	65.44994	7.938496
79.9600028767581	62.9570754238414	15.9434368046248	98.425325	63.29758	13.439936
80.0679628076882	59.8503479448648	16.1801489002838	92.344515	62.02096	28.826016
80.1746470055539	56.5981641390172	16.4106006154116	95.92709	54.202926	8.883113
80.2800484742141	53.7087580071358	16.6442351116649	92.878595	53.021252	1.55944
80.3789417584443	51.2138969818396	16.9286609800955	70.55475	53.342402	18.770686
80.4786392400913	48.752711580505	17.2129437784212	81.466395	54.091358	0.343064
80.4786392400913	48.752711580505	17.2129437784212	87.57797	41.66484	5.551613
80.5782472684826	46.3318345332698	17.5131772664894	83.48933	38.25693	16.203282
80.5782472684826	46.3318345332698	17.5131772664894	84.61874	44.121625	19.170305
80.6780719407857	44.1360978904487	17.8139054177584	74.17807	43.76639	28.605582
80.7784879945438	41.9925062188339	18.1121261136368	63.437195	41.00367	26.99622
80.8875600692588	40.1373907785919	18.372878152244	97.982935	40.137435	28.75306
80.8875598724268	38.8078163155793	18.3728781411995	99.67714	33.98061	22.565216
80.887559675558	38.144621255381	18.3728781301371	89.661665	37.28143	20.914346
80.8875594787164	37.4859512457409	18.3728781190559	88.660005	37.051535	6.873362
80.8875592819249	36.8315509245509	18.3728781080876	91.6164	43.026115	2.808093
80.8875590851014	34.3192866424122	18.372878097345	79.01289	29.7258	2.755744
80.8875588884431	31.9956508223475	18.372878086769	94.955665	36.40187	7.771411
80.8875588884431	31.9956508223475	18.372878086769	95.62369	24.314785	12.804988
80.8875586914771	29.7984858089514	18.3728780763345	79.319755	37.96047	22.926601
80.8875586914771	29.7984858089514	18.3728780763345	78.52122	37.890255	25.630233
80.8875584947159	27.4372380397404	18.3728780657838	80.066985	32.520545	19.480329
80.8875582980849	25.0529647975629	18.3728780552535	92.788305	33.10169	27.022649
80.8875581013788	22.206333242145	18.3728780446389	90.572985	26.136825	24.857885
80.8875581013788	22.206333242145	18.3728780446389	94.4971	12.154995	26.111766
80.8875579042336	20.3324211143279	18.3728780338441	96.04228	11.46233	26.220597
80.8875577051034	19.2229412024731	18.3728780225761	99.37313	13.042045	19.983146
80.8875574922435	18.4736632600264	18.3728780107202	92.761655	9.792985	28.945088
80.8875572810701	17.7720058298734	18.3728779989603	86.016245	7.495035	26.90563
80.8875572810701	17.7720058298734	18.3728779989603	87.144585	5.62369	21.911356
80.8875570694847	17.1058309826438	18.3728779869678	74.60069	8.85595	6.459838
80.8875568583341	16.4543741761884	18.3728779751808	93.997115	11.43328	4.127594
78.2272367304766	16.4543736746542	18.3728779925174	67.61759	1.570395	20.822479
78.2272367304766	16.4543736746542	18.3728779925174	67.794775	0.2453923	14.617193
77.6076376164775	16.4543731822009	18.3728780101309	78.44886	5.02628	2.732259
76.9816156360237	16.4543726914854	18.3728780280131	82.741185	8.18936	9.780027
76.9816156360237	16.4543726914854	18.3728780280131	89.544625	11.14329	6.653118
76.3050218025898	16.4543722012969	18.3728780461049	86.845365	25.906095	9.026374
76.3050218025898	16.4543722012969	18.3728780461049	91.09643	22.6866	6.913126
69.8424564349281	16.4543717105597	18.3728780646603	63.31789	20.756115	1.726904
69.8424564349281	16.4543717105597	18.3728780646603	73.44882	27.71684	3.250298
64.4498118533681	16.4543712200548	18.3728780834445	58.979255	16.987345	1.276103
64.4498118533681	16.4543712200548	18.3728780834445	50.337118	13.87323	4.749218
63.6706763539027	16.4543707297404	18.3728781026054	57.95186	28.956245	5.320699
62.9504959002327	16.4543702395397	18.3728781218825	71.273045	32.62062	26.349189
59.9067281481478	16.4543697532951	18.3728781409779	69.52818	17.90893	23.466902
59.9067281481478	16.4543697532951	18.3728781409779	69.299455	6.449115	15.081267
56.4469273905998	16.4543692673237	18.3728781600305	57.51838	10.00522	23.910843
53.0823894444828	16.4543687815879	18.3728781790337	47.997827	21.94091	22.00424
49.9395933301487	16.4543682959004	18.372878198023	39.58443	28.150345	20.548662
49.9395933301487	16.4543682959004	18.372878198023	44.38625	27.294685	26.050788
47.4845567588172	16.4543678099819	18.3728782168389	45.420784	35.70231	13.427579
46.8176818590469	16.4543673322325	18.3728782358357	40.19826	27.52955	29.10549
46.8176818590469	16.4543673322325	18.3728782358357	49.796921	18.777515	27.389734
46.1756649376415	16.4543668544348	18.3728782544974	46.870011	29.816545	8.525673

Solution x	Solution y	Solution z	Original x	Original y	Original z
46.1756649376415	16.4543668544348	18.3728782544974	47.801417	19.06334	7.814097
45.5393007627927	16.4543663766242	18.3728782733674	57.48649	24.517395	4.703245
45.5393007627927	16.4543663766242	18.3728782733674	54.207021	15.63022	20.585643
42.7774797125511	16.4543658998513	18.3728782923379	49.216563	20.76273	2.277188
39.6722738093083	16.4543654230343	18.3728783114815	54.294115	8.069135	15.776464
35.5170595854223	16.4543649463036	18.3728783306258	27.827995	16.04415	0.143676
34.3725144911014	16.4543644695132	18.3728783502163	49.707097	15.54357	19.872896
34.3725144911014	16.4543644695132	18.3728783502163	46.358401	11.954405	18.491997
33.1055586271146	16.4543639925933	18.3728783697726	34.77264	14.924575	26.641448
33.1055586271146	16.4543639925933	18.3728783697726	32.973595	9.54291	20.606347
31.8574045413726	16.4543635156191	18.3728783892336	40.16046	1.62977	24.917947
31.8574045413726	16.4543635156191	18.3728783892336	34.695715	0.250565	26.535311
30.4394746278604	16.454363039195	18.3728784083485	42.845635	9.79738	11.955362
30.4394746278604	16.454363039195	18.3728784083485	28.448025	4.56492	10.374303
28.9582420380509	16.4543625632325	18.3728784276328	30.249755	29.28668	9.627144
27.4786588274425	16.4543620866885	18.3728784469998	26.379295	27.934205	23.031473
26.0172442393396	16.4543616095126	18.3728784662756	33.169445	12.82499	1.129185
24.2697774864936	16.4543611323181	18.3728784857738	25.954135	17.869355	4.361083
22.522047367184	16.4543606549976	18.3728785054152	26.97316	5.55935	2.320922
22.522047367184	16.4543606549976	18.3728785054152	6.5851	6.152225	13.546134
20.2482573462379	16.4543601735357	18.3728785253086	20.9699	7.87089	11.180156
17.9838890009629	16.4543596924096	18.3728785452773	25.662895	8.989655	21.265898
17.9838890009629	16.4543596924096	18.3728785452773	21.673354	6.8005655	13.961641
15.6061869832835	16.4543592119851	18.3728785652675	7.39533	10.545265	21.25087
15.6061869832835	16.4543592119851	18.3728785652675	15.031135	2.9821155	24.523433
13.3536089831863	16.4543587328895	18.3728785852787	0.024124999999998	3.6794065	26.062187
13.4695856843393	18.9386476759292	18.2213897036212	16.776285	16.423415	15.502152
13.4695856843393	18.9386476759292	18.2213897036212	10.44323	18.54025	17.132759
13.5859077299456	21.4948750664014	18.0707203621237	11.54701	17.37734	26.244082
13.7025196001256	24.1335236307171	17.9198297014331	10.613375	27.61233	15.443404
13.8194785010178	26.7614822593765	17.7694155586827	3.09506	32.271765	28.722779
13.8194785010178	26.7614822593765	17.7694155586827	1.87583499999999	21.036865	8.472142
13.9392096629123	29.4832009585268	17.6199582999389	7.76846999999999	43.27595	27.165517
14.0592549007811	31.49881340337	17.4708522608939	1.56824	43.114435	27.74491
14.7276837919062	31.6398150086118	16.0739669164528	7.79806000000001	41.063165	21.758433
14.7276837919062	31.6398150086118	16.0739669164528	6.09162499999999	39.029145	21.745986
15.4162891636145	31.7813357294972	14.634301680709	8.071465	45.7971455	5.631658
16.1387833888782	31.9210108603364	13.3673183056227	21.800035	44.699325	19.798588
16.1387833888782	31.9210108603364	13.3673183056227	15.566305	47.445917	16.822861
16.8529830389105	32.0596578567237	12.0518751668704	21.779985	37.899125	15.006029
17.5643670804681	32.1983948310093	10.7350452447614	25.46019	34.06066	24.177315
18.2620117600112	32.3373408187908	9.31965980804945	22.373755	32.6144	28.047693
18.9161632696278	32.4764398524823	5.02594234816351	29.577285	38.20107	12.365171
18.9161632696278	32.4764398524823	5.02594234816351	24.567885	37.86062	12.401465

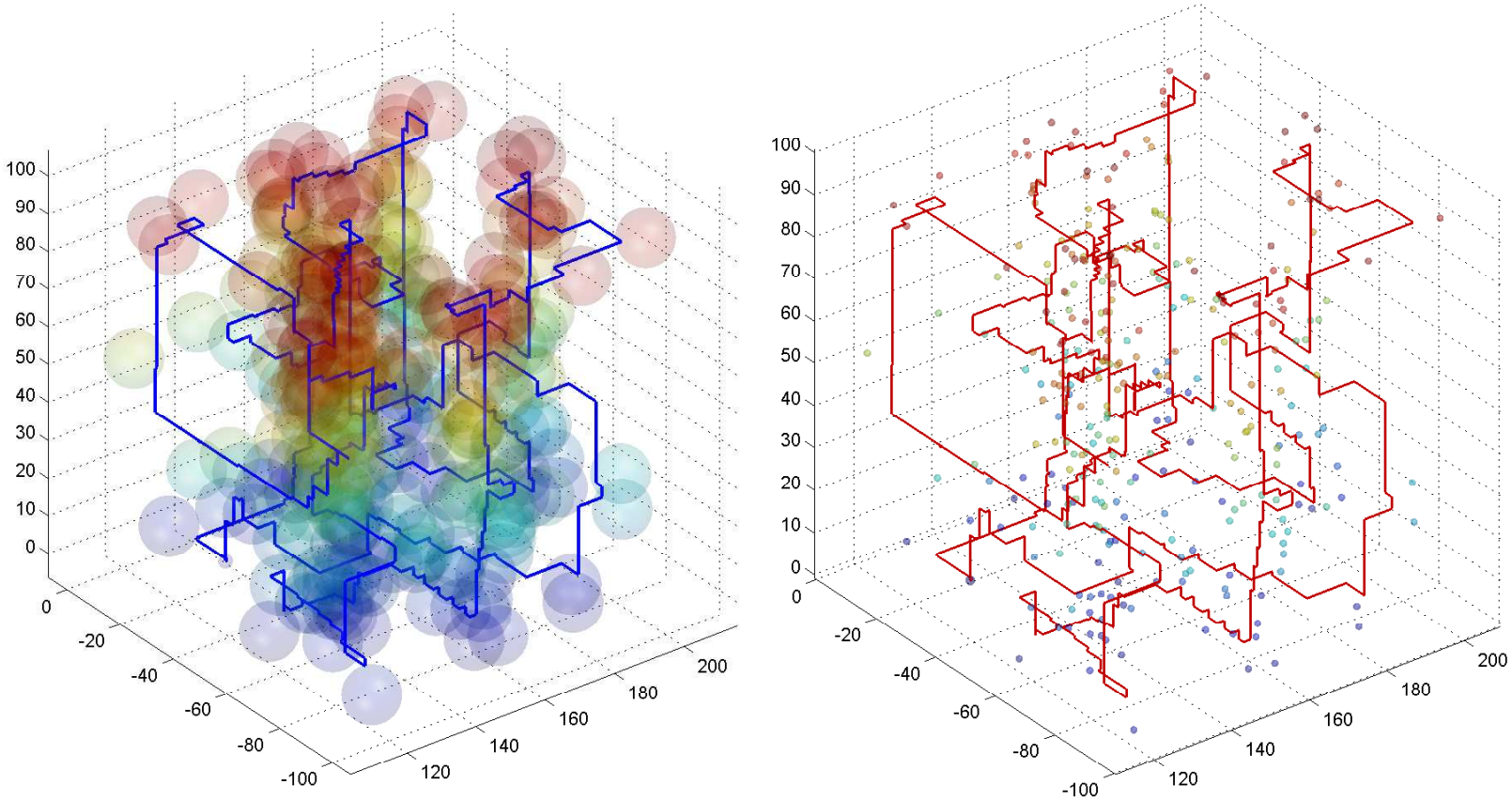


Figure N.169: *team*3_300, Equal Radius, 3D, Manhattan, Length = 2001.1057597

Table N-172: Solution for *team*3_300, Equal Radius, 3D, Manhattan

Total distance: 2001.10575971971 Depot: x 23.55 y 20.83 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
24.2913391084809	8.68165370729149	0.4351824626705	19.48	4.75	3.34
50.2099998379629	7.82000385854206	0.759994069040186	50.21	0.82	0.76
52.2236268041704	8.81027913725726	5.27000186114278	54.15	15.54	5.27
52.2236292448584	8.81027781160485	6.52999734979854	48.26	14.58	6.53
53.1224452243004	7.91971585550007	8.78631649186174	54.22	8.18	8.6
53.1224452243004	7.91971585550007	8.78631649186174	56.26	10.34	5.55
53.9618571927039	6.98360751856787	11.5134013810843	47.45	7.49	9.86
59.3502487598427	5.97975009510132	20.5999998462074	64.3	1.03	20.6
59.1028912783427	6.85515254575323	24.7817999218814	55.5	8.86	22.02
58.8600043374974	7.69999947125252	30.4199996091128	51.86	7.7	30.42
59.152942824949	12.4417113812344	33.685411131205	53.85	15.08	32.9
59.467831098465	15.5644269137825	37.3808296430119	55.4	11.17	38.22
59.467831098465	15.5644269137825	37.3808296430119	56.31	21.31	38.26
59.8782588895838	16.7599617920278	39.8299987055803	66.87	17.1	39.83
54.1975652582407	16.7599729634356	40.9240121820553	56.38	14.32	39.64
47.3736176662962	16.7599841366562	42.041537992548	44.72	11.87	38.22
45.6299999080881	16.759995350248	45.5899998984585	45.63	23.76	45.59
41.1534284459707	7.34788116025866	47.4170699718135	41.49	2.29	43.49
36.169750966068	5.12975013245845	50.9999990544004	31.22	0.18	51
43.3272928106323	6.47168708130156	51.4420248154798	44.53	2.72	56.05
48.5605761339986	8.18425693514745	51.8495115773505	52.67	8.88	54.93
52.0366553236083	9.85021189605742	52.2458222245741	51.98	10.99	46.43
52.0366553236083	9.85021189605742	52.2458222245741	52.12	16.84	52.03
52.9182653020421	9.86726205511926	57.070341500775	51.38	10.51	60.31
52.9182653020421	9.86726205511926	57.070341500775	52.03	16.04	55.64
53.8700025818114	9.88414748271685	63.6546837073109	53.87	15.51	67.82
53.8700025818114	9.88414748271685	63.6546837073109	56.85	15.49	62.45
57.7763324203278	9.40748454406391	63.6546821567008	55.38	10.13	64.28
62.2637736112921	8.92902660136366	63.6546806052689	67	3.94	64.95
62.2637736112921	8.92902660136366	63.6546806052689	60.89	11.99	66.92
62.263762948282	12.0713066911859	58.7137657270433	56.94	12.18	54.17
64.8699979146674	12.0713358516482	58.7137681657447	64.87	11.36	51.75
70.3767078074805	15.3286436379791	59.2907895678678	73.63	17.07	53.58
71.4127769977183	16.7300007852078	61.8510780833164	77.94	16.73	64.38
68.6140634519458	28.4001371935483	61.8510787414217	71.33	32.23	64.13
65.1599995208694	33.8624228687625	61.8510793983899	65.16	40.78	60.78
55.9458208085944	30.560001598585	61.851081376503	49.85	30.56	58.41
55.945820207627	29.6602391629042	62.4996355609372	53.73	28.37	56.21
55.9458196239376	28.9545772668085	67.0799977102253	61.27	24.41	67.08
53.5170392630045	28.954576353112	69.7089634612402	58.02	32.46	71.61
49.12310327815	28.9545754366838	71.8970734509226	44.15	32.64	73.77
47.5022251588099	28.9545745122129	73.565096727016	41.47	31.69	75.83
47.502227152082	24.5439847850075	73.5650980750548	45.57	28.26	77.82
47.5022291485938	11.5400030534951	73.5650994181075	43.23	11.54	68.02
49.4347060018799	8.67755517018687	76.5326362542292	52.67	4.65	71.84
49.4347060018799	8.67755517018687	76.5326362542292	46.38	12.31	81.64
49.4347060018799	8.67755517018687	76.5326362542292	45.57	12.76	80.46
50.4489552542585	7.98736043157143	79.4938827626585	50.97	4.59	83.57
50.4489552542585	7.98736043157143	79.4938827626585	48	4	84.7
50.4489552542585	7.98736043157143	79.4938827626585	52.96	3.75	74.52
50.4489552542585	7.98736043157143	79.4938827626585	50.52	8.68	79.3
50.4489816950826	11.2131275470518	87.8708738755954	55.24	13.37	88.36
50.4489816950826	11.2131275470518	87.8708738755954	45.09	11.7	92.12
50.4490085073093	13.2799968085936	88.6015796690769	50.3	13.28	95.6
54.308989302461	13.9119872098078	87.8961682223105	54.5	15.91	93.18
58.0986526602215	14.5187189649879	87.0882846945929	57.66	15.51	81.33
62.1600015692103	15.110633095509	86.4226973567402	62.16	16.88	79.65
65.1957214618102	15.1106346855449	88.3148361174384	63.35	21.49	87.32
85.7599988454103	15.1106362602862	91.0297420905046	85.76	19.27	96.66
86.1715439908923	7.51758181697853	85.743710480111	88.21	3.61	89.96
86.1715439908923	7.51758181697853	85.743710480111	87.06	2.89	85.23
86.1715439908923	7.51758181697853	85.743710480111	86.49	3.97	82.84
86.5646046857919	5.51489206821087	69.3169151153145	90.45	0.18	67.28
86.5646046857919	5.51489206821087	69.3169151153145	84.21	1.15	74
86.5646046857919	5.51489206821087	69.3169151153145	90.14	0.74	66.47
86.5646046857919	5.51489206821087	69.3169151153145	84.57	2.19	72.59
86.7528730300207	5.39420707359735	55.7690849416015	83.98	4.24	58.09
86.7528730300207	5.39420707359735	55.7690849416015	83.5	4.83	59.12
86.7528730300207	5.39420707359735	55.7690849416015	83.63	6.61	58.86
86.7528730300207	5.39420707359735	55.7690849416015	83.08	5.9	51.4
86.9509589485661	5.27456637233405	41.0495465636135	86.71	7.9	46.76
86.9509589485661	5.27456637233405	41.0495465636135	90.71	5.35	36.18
86.9509589485661	5.27456637233405	41.0495465636135	83.08	6.85	43.86
86.9509589485661	5.27456637233405	41.0495465636135	85.18	6.81	41.52
86.9509589485661	5.27456637233405	41.0495465636135	86.46	7.15	36.07
87.1473382088999	5.15296322071967	17.7844869313913	84.85	7.49	23.97

Solution x	Solution y	Solution z	Original x	Original y	Original z
87.1473382088999	5.15296322071967	17.7844869313913	89.81	1.33	12.56
87.1473382088999	5.15296322071967	17.7844869313913	84.22	4.25	20.41
87.1473382088999	5.15296322071967	17.7844869313913	91.86	5.09	13.18
87.1473387999013	6.16199266444167	12.1460590403821	85.34	3.13	7.91
87.1473393916799	7.27000229580669	8.81754969251572	90.79	7.27	2.84
80.7916352463686	13.2293952302635	9.09620067234855	76.81	16.4	5.21
78.4099986534508	15.8800015033442	9.39999510685469	78.41	15.88	16.4
70.5219832441014	23.8100001179741	9.39999450650988	63.88	23.81	11.61
75.2400052687759	30.3022397818304	9.39998061842096	75.98	28.26	8.37
79.8087849135418	38.0882936955088	9.39996673085003	74.93	38.63	8.7
88.7332929368884	45.2999999583855	9.3999528438755	92.92	45.3	3.79
88.7332916338029	51.5275175860555	13.0899598446472	90.65	58.26	13.09
88.7332916338029	51.5275175860555	13.0899598446472	89.33	46.23	11.31
88.7332916338029	51.5275175860555	13.0899598446472	87.92	47.46	7.48
88.0044371602813	51.1504907637337	22.8132367800699	86.88	55.34	28.08
88.0044371602813	51.1504907637337	22.8132367800699	90.93	51.78	26.41
88.0044371602813	51.1504907637337	22.8132367800699	91.08	56.32	19.58
86.6545727259681	48.0868180337191	24.5497434755949	85.21	44.35	20.93
85.3737046663064	45.7559323229466	26.6387585487278	89.11	45.94	22.79
83.9139391146494	43.4085158880753	29.2988760241145	85.02	48.75	32.58
82.3029850623942	31.719046681248	31.0100008390278	78.01	26.19	31.01
82.302985688963	31.7190487930026	44.578178088194	79.79	30.32	50.96
91.4099932004667	37.6400002470807	42.840014142096	98.41	37.64	42.84
90.59101450284	43.8764011836104	42.7649557427749	87.56	46.99	46.13
90.59101450284	43.8764011836104	42.7649557427749	92.82	43.5	36.14
90.59101450284	43.8764011836104	42.7649557427749	84.47	44.91	39.53
90.2164819887752	48.091231749987	50.4003550438353	93.86	49.11	54.34
90.2164819887752	48.091231749987	50.4003550438353	92	48.8	50.4
90.2164819887752	48.091231749987	50.4003550438353	85.43	53	49.96
89.9855865047155	48.5723492968182	64.8807780574274	92.59	46.16	69.75
89.9855865047155	48.5723492968182	64.8807780574274	84.47	48.16	64.66
89.9855865047155	48.5723492968182	64.8807780574274	85.85	46.49	60.83
89.7676832089076	49.1084170071984	80.6877860031877	96.43	49.73	81.64
89.7676832089076	49.1084170071984	80.6877860031877	89.36	56.03	81.08
89.7676832089076	49.1084170071984	80.6877860031877	89.59	51.88	82.73
89.7676832089076	49.1084170071984	80.6877860031877	88.92	43.62	77.06
89.5101574205613	49.2512367931737	87.4061302333395	85.78	45.37	88.36
89.2594813300843	49.3962399878575	93.1685529081154	92.09	44.08	96.66
86.6607694946839	52.7248345252216	93.3871038863997	87.26	54.53	99.96
82.1147490526903	53.9867323425278	93.5459802547969	82.42	49.99	99.02
76.2183159792976	73.6999981839603	93.6832247373149	70.7	73.7	97.99
77.7767724496327	76.4531224356378	93.6832226438171	72.93	73.7	97.12
86.0580146655151	88.4599980523718	93.6832205411775	92.92	88.46	92.3
66.2600003066006	92.6187022692407	93.6832200953667	66.26	99.07	96.4
55.980007968602	92.0300022786904	89.7900029033099	48.98	92.03	89.79
55.9800058984973	85.2570398641328	87.7400251280294	57.57	78.44	87.74
51.7500006298649	85.8099909316417	87.6400080204127	51.75	85.81	80.64
49.9762172659225	86.2170992344609	92.3095256292832	53.35	83.14	97.2
37.3485039862155	86.713468221848	93.3850725887448	34.79	81.57	97.09
36.2958857654211	90.0041504564114	93.8485049565558	35.46	90.5	93.34
35.2562697759086	93.2784237556702	94.3137336754134	30.69	95.98	98.88
42.6745001247648	93.2784233130864	84.7352954529806	47.48	94.9	89.56
42.6745001247648	93.2784233130864	84.7352954529806	42.37	92.45	91.48
42.6745001247648	93.2784233130864	84.7352954529806	46.92	92.94	79.18
42.6745001247648	93.2784233130864	84.7352954529806	44.75	90.08	82.93
42.6745001247648	93.2784233130864	84.7352954529806	40.14	88.25	82.87
42.6745011006102	93.2784225378985	67.6123627993473	48.68	92.55	68.87
42.6745011006102	93.2784225378985	67.6123627993473	41.11	92.55	72.93
42.6745011006102	93.2784225378985	67.6123627993473	37.88	93.16	68.12
42.6745011006102	93.2784225378985	67.6123627993473	39.18	94.86	64.79
42.6745011006102	93.2784225378985	67.6123627993473	38.08	89.48	68.3
42.6745011006102	93.2784225378985	67.6123627993473	39.28	92.99	62.54
42.6745020788233	93.2784217660874	57.0799979392972	47.67	92.59	55.65
42.6745020788233	93.2784217660874	57.0799979392972	42.93	88.78	59.49
42.6745020788233	93.2784217660874	57.0799979392972	39.31	87.14	57.08
42.6745020788233	93.2784217660874	57.0799979392972	39.7	88.73	54.48
43.3464069452999	93.6917980414508	46.6549474805154	37.93	93.92	46.64
43.3464069452999	93.6917980414508	46.6549474805154	38.36	90.43	43.39
47.1444565078082	94.270052439296	45.3961473860186	48.42	91.53	51.1
49.8802464011654	94.9302482531947	42.569999883802	54.83	99.88	42.57
49.8802464011654	94.9302482531947	42.569999883802	46.8	93.43	44.07
45.9791939930423	90.0958432721186	37.7539228718338	49.11	94.31	36.24
45.9791939930423	90.0958432721186	37.7539228718338	47.08	88.26	42.71
45.9791939930423	90.0958432721186	37.7539228718338	50.91	90.3	36.65
45.9791939930423	90.0958432721186	37.7539228718338	45.57	93.71	36.64
45.9791939930423	90.0958432721186	37.7539228718338	48.89	93.1	33.02
45.9791939930423	90.0958432721186	37.7539228718338	40.13	86.48	38.33
45.6348630536395	89.5427992204947	31.5425391751297	49.91	91.9	29.51
45.2778517769938	88.9724522615695	26.8589637200859	46.89	94.85	27.74
44.9109796731732	88.29392251334	21.0247552622042	38.99	86.42	22.62

Solution x	Solution y	Solution z	Original x	Original y	Original z
44.9109796731732	88.29392251334	21.0247552622042	40.14	85.47	20.22
44.6057523976465	87.7038114639986	9.25290627714054	48.25	85.26	10.69
44.6057523976465	87.7038114639986	9.25290627714054	47.56	92.03	4.61
44.6057523976465	87.7038114639986	9.25290627714054	44.33	87.3	2.27
42.803548278312	86.0667943552456	11.2760605386644	42.78	91.87	12.41
41.0096807915261	83.5245326971001	13.1362505501448	41.11	86.33	11.14
39.2159771227722	80.7158804845244	15.1048073326775	36.6	82.94	12.12
37.5696865354187	77.5611052252256	17.3281729884177	39.42	71.54	17.38
35.5799991445108	76.0599995498026	19.5299945310809	35.58	76.06	26.53
31.9615665741838	72.0902557547369	19.4981236539911	31.99	67.74	24.97
24.3117398746291	72.0432118247554	19.2922689240023	21.1	78.12	20.54
24.2237033195121	69.8647595097546	15.9453363977549	19.86	66.11	18.19
24.1376216051575	68.3205715612378	10.448739073197	25.62	68.98	3.75
24.0473684122402	65.7851534041152	10.0805055395157	20.64	65	8.49
23.9576118460746	63.3348498895898	9.71556653866102	22.65	62.2	11.71
23.8680005102401	60.9757171791874	9.34749285697962	24.47	65.24	5.9
23.8680005102401	60.9757171791874	9.34749285697962	27.4	59.84	3.43
23.1167272653321	60.6966878526223	9.29522319708451	27.64	62.78	13.86
23.1167272653321	60.6966878526223	9.29522319708451	27.36	59.94	13.4
20.5202252817202	60.3902803750186	9.24024042980184	20.56	61.44	16.14
16.9914882454126	58.3832636116696	7.93407475695775	16.79	62.67	10.23
13.5183061614051	55.9429678241707	6.54230827064997	11.46	53.07	0.5
13.5183051917717	55.9429677109178	17.0751670027495	15.54	52.83	23.01
9.39351091438579	66.4744259017742	16.8667076294206	4.20999999999999	66.53	21.42
8.96851301169097	75.0492146312753	16.5297858198844	4.15000000000001	75.92	20.91
8.61171100603123	80.1069509575205	16.1380397038517	12.07	80.14	22.08
7.97630003885075	84.9580516340542	13.8117035457658	8.59999999999999	80.56	11.38
7.33549259831878	94.5058442165936	11.7441553748764	5.54000000000001	99.29	6.96
7.33549193154802	86.9254099726083	30.6599983910516	0.620000000000005	84.95	30.66
21.8854867300757	86.9254072638994	34.7544690865512	24.67	93.34	35.07
21.8854937222183	86.1118004320284	34.7545318902613	24.2	92.42	34.13
21.8855006595793	81.7799991951616	34.7545946766451	28.82	81.78	35.71
21.3558420272972	68.3312638337947	34.7545985032455	24.49	66.27	29.11
20.5741706549947	66.2174246799085	34.7546023834191	23.19	66.22	32.78
19.770208864248	64.1122508396339	34.7546062663254	25.01	63.12	37.19
19.770208864248	64.1122508396339	34.7546062663254	25.24	60.77	36.77
15.8265756917548	63.1077668490307	34.7546101304741	11.18	57.92	34.05
15.8265756917548	63.1077668490307	34.7546101304741	22.17	64.94	33.7
15.8265805108893	63.5499887090473	45.0958153343292	11.74	69.17	44.25
15.8265805108893	63.5499887090473	45.0958153343292	20.35	68.75	46.32
18.7210554673961	62.8583651020171	45.8795175472448	21.39	62.71	50.33
21.1644620042637	62.1694407263135	46.6054300546309	22.51	60.15	43.07
23.4827060199577	61.4969858537156	47.3645812885303	19.65	58.2	51.17
23.4827060199577	61.4969858537156	47.3645812885303	23.5	55.84	45.92
28.6247578438904	60.9674970195533	48.0360518395124	30.36	58.14	54.2
28.624773675633	60.9674877212632	48.0360559366807	30.85	54.39	47.15
28.6247745331899	65.4031265300091	48.2768702312093	35.37	65.99	46.58
28.6247745331899	65.4031265300091	48.2768702312093	28.77	62.05	46.68
28.624775328554	66.1595108701556	49.5862687936789	23.78	67.37	54.34
28.624775328554	66.1595108701556	49.5862687936789	28.86	67.84	42.89
28.6247761288728	66.5405596105173	65.5244597373309	27.28	65.47	69.94
28.6247761288728	66.5405596105173	65.5244597373309	26.15	61.96	69.66
28.6247761288728	66.5405596105173	65.5244597373309	27.62	60.61	68.71
28.6247761288728	66.5405596105173	65.5244597373309	25.84	61.09	65.42
28.6247761288728	66.5405596105173	65.5244597373309	25.86	63.85	60.16
28.62477693427	69.2039437309218	67.0041695878441	34.24	70.46	67.21
28.6247777345091	71.5863596264673	68.4710161520894	23.47	70.49	67.86
28.6247785361047	74.1536464953846	69.9774660724459	28.95	69.72	73.23
28.6247793369041	78.0570747115984	71.3019850592717	32.42	78.27	77.18
21.9351152554044	78.0570901672933	66.9551155556935	16.99	78.36	62.01
22.1016495934313	78.0570957089454	77.9359528694573	24.25	76.66	84.45
22.1016528363654	78.5546809801282	77.9359532143596	27.35	82.24	75.13
15.1234703977278	78.5546804592628	79.5200421116115	16.07	82.14	77.28
7.20250559055665	78.5546799368764	81.2184854936489	1.36	82.41	81.26
7.20250559055665	78.5546799368764	81.2184854936489	8.28999999999999	81.45	86.91
7.20250559055665	78.5546799368764	81.2184854936489	11.23	82.6	85.27
7.20250559055665	78.5546799368764	81.2184854936489	8.06	78.36	80.59
7.20250559055665	78.5546799368764	81.2184854936489	6.36	80.44	74.53
3.82251546886417	77.8193793863595	90.5516016838987	0.760000000000005	80.97	91.36
3.82251546886417	77.8193793863595	90.5516016838987	0.969999999999999	75.78	96.61
3.82251546886417	77.8193793863595	90.5516016838987	4.75	76.37	88.59
3.82251546886417	77.8193793863595	90.5516016838987	10.66	76.44	91.14
3.82251231900469	77.8193788740573	75.7166374138725	1.20999999999999	81.97	77.86
3.82251231900469	77.8193788740573	75.7166374138725	5.06999999999999	73.15	76.92
3.82251231900469	77.8193788740573	75.7166374138725	2.98999999999999	72.09	73.38
3.82251231900469	77.8193788740573	75.7166374138725	6.62000000000001	72.96	75.87
3.82250916879698	77.8193783708591	67.1670302144733	0.909999999999997	72.43	63.78
3.82250908530678	80.4649181773517	67.167029453798	3.44	75.58	64.88
3.82250900193979	84.6113154358835	67.1670286988061	2.19	82.13	61.84
3.82250891957614	92.9364517129844	67.1670279539736	1.23999999999999	99.01	69.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.82251493727492	88.6046374948565	63.3527331183795	1.01000000000001	87.83	68.27
3.82252095883861	84.7323245472445	53.6583383021648	4.8	88.51	50.28
3.82252095883861	84.7323245472445	53.6583383021648	9.41	84.38	51.54
3.82252696862604	79.3898276305676	50.0178260804757	8.95	75.43	49.37
3.82253296267426	77.4825819747509	46.9740483091939	2.01000000000001	79.01	40.57
3.82253898086636	71.2892492852787	46.4379033883382	8.67	72.77	42.39
3.82254498535973	51.0400004859845	45.9780660955969	2.56999999999999	49.67	48.06
3.82255099114703	36.3500000150666	45.5131512757977	3.20999999999999	36.35	38.54
4.33625105178413	19.3678554932443	57.0702384631011	3.36	12.54	56.95
4.97194211550922	18.9904095801974	88.8580196735178	4.01000000000001	20.5	95.59
8.38879011982515	17.5156450777359	88.9730444384013	5.58	22.9	91.06
19.7677518841472	14.0222487239251	89.0860963474344	24.66	9.13	90.15
14.5827437010735	51.9199992260725	89.0860983751632	9.06999999999999	51.92	93.4
15.4173492684302	57.0299221845921	80.0149372443243	12.14	56.76	74.37
15.4173492684302	57.0299221845921	80.0149372443243	21.99	57.15	79.17
16.0372332667025	62.6829385252091	78.6752635284611	13.36	65	72.75
20.2606187004638	63.4399966959841	78.4033584281677	26.5	63.44	75.23
20.2606199054153	66.3394646666971	78.4033554231643	24.03	65.56	79.56
20.2606199054153	66.3394646666971	78.4033554231643	23.52	71.05	74.38
20.0399344835557	66.3394383529043	85.8475634528261	21.49	69.2	86.43
19.818386792477	66.3394120300792	92.8899380706081	12.82	66.49	92.89
21.5845938203448	64.7974705414175	92.9320255902466	22.6	70.1	92.91
23.2683263436923	62.7771481476394	92.9740107511163	24.86	66.05	97.16
24.8186813781103	60.139357091905	93.0155751587343	20.88	59.51	94.7
26.5614871145725	57.5994204869259	93.0570700355335	21.75	55.19	94.83
28.960851000189	55.4931302059165	93.0984481589132	27.18	54.04	89.82
31.5423952829022	53.4915295549503	93.139915910937	30.83	54.42	86.59
34.8051914399699	50.9670747118748	93.1826572851815	33.01	55.55	89.21
39.9999996097135	42.0496892859628	93.2258482398008	40	38.77	99.41
43.1016335066046	42.0496880407855	93.2258477767669	47.34	38.25	97.3
43.1016338750075	42.0496892471954	86.6893062884081	43.96	42.1	91.03
43.1016342428247	42.049690454065	73.4791584703899	42.62	44.81	79.79
43.1016342428247	42.049690454065	73.4791584703899	43.21	42.61	80.16
43.1016342428247	42.049690454065	73.4791584703899	41.97	43.22	75.7
43.1016342428247	42.049690454065	73.4791584703899	45.42	39.91	67.31
43.1016346058942	42.0496916645222	57.5208503676521	42.69	39.78	60.49
43.1016346058942	42.0496916645222	57.5208503676521	42.72	42.84	54.45
43.1016349692615	42.0496928762488	41.5040744471533	40.11	39.6	39.05
43.1016349692615	42.0496928762488	41.5040744471533	40.4	40.19	35.32
44.9367419660091	44.2705057650253	42.5526817048886	42.56	42.28	42.23
46.8884932523051	46.6369307655474	43.6072145600543	41.07	43.98	42.76
57.8744363424816	51.0152431711663	44.7392055881379	63.26	50.77	40.6
58.7500006117663	56.630000179527	61.1299935402474	58.75	56.63	68.13
63.2065018650525	61.9996517268727	57.9258600109806	60.94	57.56	60.13
69.4891147711715	78.2356361923385	53.9663819150136	68.17	79.21	59.57
78.5999922882738	88.6499993862927	32.3900000252093	85.6	88.65	32.39
78.5999821663559	90.8403150839977	29.6099996829622	78.98	97.83	29.61
71.7060854154529	90.7299792113997	11.5526067678119	70.23	90.73	4.71
71.7060817348988	84.459999174217	11.5526077393268	74.49	84.46	5.13
61.638623628454	72.7498598440273	12.4456510532901	60.12	71.05	6.63
56.2141873825958	67.2150105755937	13.6941561438537	54.05	68.39	12.29
51.5323363679974	61.2504961236168	14.9716410437587	49.78	61.48	16.59
47.2999847735319	55.2500026576247	16.2199983015601	47.3	55.25	23.22
46.4263354760298	48.9274583987647	16.2200080441467	45.6	43.93	17.79
45.570485756337	45.4685929135266	16.2200177806912	42.95	44.74	22.67
45.5704850531983	45.468587933367	11.4765122617354	43.21	42.35	12.25
45.5704843514565	45.4685829595306	6.46440633044153	45.71	40.8	10.89
45.5704843514565	45.4685829595306	6.46440633044153	42.59	39.16	5.9
45.5704867408697	46.1298142784237	6.46439940014618	45.6	41.81	1.51
45.5704891298792	47.1062650227762	6.46439256823447	51.12	47.54	2.22
37.8500000714352	47.1062736322805	6.4643937840685	37.85	53.76	4.29
30.473909788641	30.1728868775631	12.3318638784302	27.74	25.63	13.28
25.650001288004	24.5300007501293	17.4699961994754	25.65	24.53	24.47
24.5906403680492	22.6305115899044	10.7193283822458	23.55	20.83	14.19

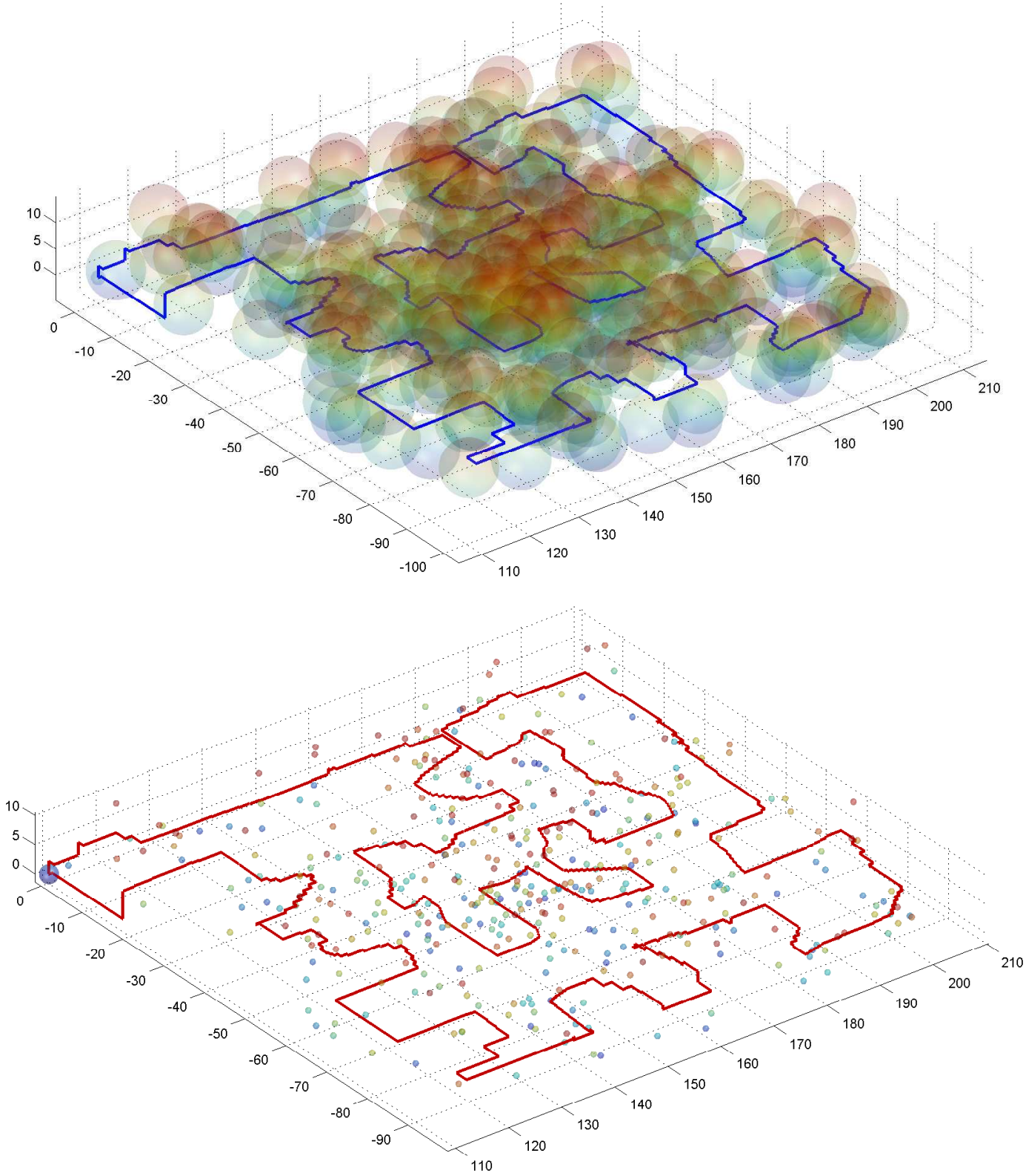


Figure N.170: *team*4_400, Equal Radius, 3D, Manhattan, Length = 961.4325736

Table N-173: Solution for *team*4_400, Equal Radius, 3D, Manhattan

Total distance: 961.432573580038 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
0.610975300653877	17.3310744517733	4.8295491225392	0.610974999999996	22.331075	4.829551
2.77023579501748	17.3310744081295	4.95208624495501	2.12502499999999	13.8908	8.215003
6.15387096126578	17.3310743645231	5.06321791425746	5.29819999999999	16.16745	9.485319
12.5518998349818	17.3310743208989	5.16633412003499	12.5519	14.734025	9.438961
13.5862719980875	17.4733517119857	5.16111944026048	12.54795	14.295525	6.980367
14.6792930268072	17.6188395088423	5.15590346214802	14.259	13.428825	7.786985
18.8838632811483	20.7456369701304	5.1505839762219	20.9892	20.7572	9.683969
18.8964505995752	22.0224953134095	5.08473650168203	21.1268	22.989225	6.335554
18.9090178972184	23.2569770075067	5.01873426425961	20.686175	21.9667	1.804567
18.9215653912371	24.6044565199892	4.95343898687515	20.995625	24.282225	3.380339
18.9340996300519	25.9715320327028	4.88832965394738	14.358825	25.883825	4.414924
18.9468222573748	27.3687640925656	4.82351134219309	15.2685	27.387025	1.441223
19.9798509148998	28.2619589301826	4.81228819774253	19.9845	27.40155	0.660019
21.0150341813988	29.2094270497767	4.80110277216236	18.476575	32.50015	2.42942
24.2341369054413	29.7402344328626	4.78999142787823	28.216025	27.287675	5.4487
25.1192954560983	30.4573936229648	4.77886197804944	27.65685	28.081275	4.203862
25.9304086198515	31.2299251025104	4.76773532647116	29.46595	31.229925	1.232208
25.109767961757	32.7823934483883	4.88246993349967	26.51415	33.575825	9.461971
23.5108840390689	33.8170595267602	4.97789294867467	25.49855	33.45475	4.180424
21.7754916346878	34.8637781371912	5.07350061359254	22.793175	31.8095	6.267813
19.9171800199051	36.0618465437762	5.16870178297765	18.77905	36.01655	4.45503
18.1456283572048	37.2643596646342	5.26404738235806	19.322625	41.061025	7.646061
15.5807263764227	37.9845540625931	5.35635599962052	15.806625	40.87695	9.361797
9.71141979819596	38.2205507641119	5.42393185603316	4.729125	38.22055	5.844342
10.2080692346954	44.0873525699318	5.42393233851257	8.7059	46.626875	9.397095
13.3437410606777	44.4240755128396	5.42393282059508	17.095675	43.177	5.934841
15.2221657620067	44.7690511473657	5.42393330267529	19.292975	43.870425	8.142944
15.2993186137926	48.3750302439173	5.42393378406496	19.028925	48.6519	8.742576
14.2410503269828	48.3750308015132	5.42393211808995	14.24105	46.110125	0.966331
13.5276356901106	49.7058232911561	5.42393190513569	13.3837	46.032275	5.26473
12.8189261669436	51.422724782129	5.4239316921815	8.9679	51.422725	2.23495
13.0418380691977	52.0678996316008	5.45311219672886	11.134375	51.580675	9.341968
13.2731732310933	52.7325246928363	5.4820207512839	9.352575	52.2461	8.408063
13.8492549450039	53.5848969223098	5.50944611737336	10.71515	57.182775	5.281599
14.8882559133105	54.0739871632394	5.53691232603154	11.458875	55.406825	8.437123
17.5300927332328	54.515444189735	5.56402054791852	17.219275	51.795125	6.528901
20.2526411789655	54.9742516915577	5.59110796205945	21.4066	50.274675	5.660638
21.5722614696463	56.6169358342273	5.61817915177869	22.891175	56.122525	6.014662
22.8434916247298	58.3007500310012	5.64524439033083	26.5978	58.30075	8.947543
22.2272126727528	60.5430595980818	5.64524406534896	24.44465	63.1281	8.275156
21.5307410243633	62.0502960584711	5.64524374035098	21.668825	63.73225	4.392072
20.8330713616195	63.4743013392731	5.64524341535677	21.0091	68.35155	4.610936
18.2729411118352	63.5094477584526	5.64524309060472	17.272875	64.973225	8.378801
15.9353896723094	63.5445249522283	5.64524276584687	18.3822	65.772725	3.391578
12.4443600268581	63.5794247681119	5.64524244109922	12.50315	65.202575	6.796126
8.94909057718191	63.6142766928253	5.64524211634987	8.8531	66.09375	2.882202
5.51445260721222	63.6489868668895	5.64524179160915	2.20627500000001	60.72485	3.544594
5.03072363824911	63.68634083304	5.64524146695362	2.404275	62.37445	1.602613
5.01266090784314	66.6955136690767	5.64524114442933	1.692025	67.9044	4.763979
4.99466425300061	69.3031750762113	5.64524082188765	0.331024999999997	69.303175	3.842333
4.99472650521882	79.0322969689623	5.64524082332433	0.00154999999999461	79.256375	5.511897
8.34777494634757	79.03367394654	5.64524082486421	8.347775	79.0334	0.64524
10.7559017313006	79.053125799297	5.67709081012689	12.1212	83.525275	6.555356
12.13955815079	79.0721913749092	5.7087483832135	16.4015	79.860725	3.65876
12.6962478595574	79.091185132093	5.7409316262729	13.92855	83.165725	6.067072
13.2263854128612	79.1100675212319	5.7730904416841	13.11545	76.27845	9.886291
17.7796441506828	79.1973070191061	5.78400496561233	19.41455	76.0326	9.16761
18.5978595332361	79.3021288389644	5.79468002530393	20.9401	75.2051	6.209147
19.1799553172832	79.4170927320685	5.80534562157796	22.467675	76.02705	4.2329
19.2808888782292	82.4956499993914	5.81646707839782	24.1584	82.49565	6.916419
19.1005952789661	84.950881759724	5.81646722493902	22.609375	83.218325	5.878629
18.9140298371561	88.2408567668534	5.8164673714804	23.831575	88.204275	5.345531
14.0109234894971	92.0368132623558	5.81646751803981	15.45105	94.471525	3.135131
5.97471579322806	94.6211092577322	5.81646766460367	2.307925	97.449675	7.701639
22.2763498516746	94.6211091122931	5.81646754575298	22.27635	97.920025	9.573749
26.4892893386891	94.1296280128066	5.24777952091949	26.6212	98.85125	4.844028
30.3003326448405	93.0892972798239	4.70936337547411	32.22375	93.28635	0.1273
30.5182638446938	91.0364141542367	4.62664786617898	27.27955	90.9405	3.131217
30.7427969114841	89.022663514241	4.54435590418833	33.324025	88.862275	2.512368
30.9627602087503	87.0541444742276	4.46255644532668	32.733925	86.47665	2.244896
31.1801816359688	85.1740976110598	4.38120834969863	30.896	84.86835	8.084952
31.3982821785766	83.3595987325425	4.29873409768597	27.4824	83.15295	4.645899
31.6269075359579	81.5961065195985	4.21613644078311	29.23795	80.022375	0.178216
32.1799670341862	81.1574374666303	4.15524351667092	29.5312	77.759375	2.944562
32.838744052759	80.7822352277742	4.09482884543639	30.46345	78.65395	2.876347
33.5412279321832	80.4189772464839	4.03458425119197	31.60195	76.5275	2.478681

Solution x	Solution y	Solution z	Original x	Original y	Original z
34.4331768976955	80.1222305739131	3.97517108016748	35.60905	81.995775	1.580638
35.2935053740382	79.8198817033749	3.91605288065923	36.3513	83.686975	3.385766
36.1103251032628	79.4954851822225	3.85704389648542	36.110325	75.95995	0.32151
39.6395756249111	79.9014039192464	4.23637760544123	40.4153	76.30845	7.455735
40.9885827216107	82.8203383514265	4.46221390045489	40.913925	82.729825	6.876661
42.3452099486133	85.8119355539623	4.68489347206154	42.31835	87.347525	7.738111
43.7065759466275	88.3872250538961	4.90197245521186	43.9034	88.387225	9.898098
43.7065770283933	93.5653922273536	4.169137554911	40.290225	96.689525	2.280132
49.0999095940986	93.5653934142196	4.16913556559194	49.100125	97.070175	0.603113
49.1004892808683	93.5653797812968	4.16940989007356	48.99045	98.5583	3.927321
52.8925407475309	90.2054499779101	6.02684789875125	56.428075	90.20545	9.562383
52.8067322304015	86.7085631909642	5.59593902119607	49.4347	86.0537	7.963635
52.7225878284468	83.7510494125376	5.13145021445484	56.13655	83.451075	6.561985
52.6374231379151	80.9557732292966	4.65222998850456	54.01775	81.8894	8.14471
52.551792433464	77.7563980493369	4.12704280848286	52.726325	74.9715	6.042198
52.4661481457889	75.4165504267047	3.58104582690872	50.03295	71.692275	1.548117
52.3890515321699	75.0321521905544	3.2488569253331	49.5023	72.1454	0.362105
54.053027349961	75.4867249761239	3.56325567010566	53.249925	71.4317	1.507319
56.1930310080685	76.1524932107685	3.91529132569033	55.289875	75.9977	8.05121
58.7138939768166	76.8248594086789	4.23308745903151	60.77085	76.3761	8.633151
59.4781981834917	77.6019888442475	4.42848809048729	59.360575	77.3659	4.085186
60.2459087163907	78.3845202254338	4.62417240943764	60.2356	81.956375	8.121308
62.4703573500317	78.3890234532563	4.62859119248886	63.106325	74.44845	6.994666
64.3111938336354	78.393547214909	4.63300147035121	65.721375	76.70655	7.829144
65.9382438821573	78.3980763740153	4.63740640271997	69.349625	77.516575	1.446757
66.6510626034824	78.4026193371559	4.64183756387696	67.97015	74.943825	1.28227
66.6625866379528	79.1864262590151	4.76932208396019	67.096325	78.407125	5.545343
66.6741090277292	79.9838322942661	4.89654568640999	64.2971	80.8087	0.617407
66.6862579224813	80.3728476597678	5.81239258620198	66.686275	83.4025	9.789982
70.1268419291708	80.3728476648774	5.8123925277736	71.96685	79.285825	7.324255
73.0537558481412	80.3728476700349	5.81239246934334	75.94035	77.0935	8.244154
73.0537558757654	88.7075748890178	5.26739988453197	75.589675	88.707575	0.958209
72.4060297179692	89.7141775130235	5.26740136540928	75.8385	89.39705	2.129044
71.1254229698428	90.8053899890137	5.26740284652228	72.88955	91.55335	2.086078
69.7218026866521	91.8620234026083	5.26740432769549	66.508125	91.303225	8.984758
69.4676787139308	94.9115482493128	5.26740580780003	64.46975	94.91155	5.12346
70.0654306239193	95.0152713182575	5.49427755378618	67.679475	96.828325	2.179153
70.7974672739203	95.1162530942165	5.74427090085472	71.306475	97.9771	2.882666
71.5136827234251	95.2151943250588	6.00743097007974	72.374675	95.981125	5.386278
72.2220752395634	95.313974391162	6.27161637842973	72.222075	99.2555	9.348041
75.9788109108829	95.138301796164	6.27161622591331	74.44305	98.0205	8.628544
82.2704425721702	94.9570468769853	6.27161607339267	84.730325	97.611875	9.216212
83.9471335782517	94.7589386292168	6.27161592085926	84.9479	97.513325	6.355392
85.5477278407783	94.5573105345008	6.27161576832578	86.192975	99.203225	7.750239
86.4125421242162	93.6518204329258	6.27161561575794	84.77555	95.283075	3.666391
87.3380788923789	92.6885567616937	6.27161546319372	84.25115	92.664475	5.874601
88.3740910893887	91.7311476192379	6.27161531062974	89.0595	90.291	3.16566
89.384990501671	90.8311419992459	6.27161515806955	87.858275	88.334025	4.100051
90.4819020989714	90.0185519339347	6.27161500551174	90.195175	89.03695	6.180904
91.5934708332975	89.222729949871	6.27161485295389	92.685275	90.310575	1.584168
92.100773824623	84.1266002133669	6.27161470047795	92.480625	84.1266	1.286063
92.1007753876641	80.9251999557767	6.2716147334605	91.03755	80.9252	1.385966
93.0848334036389	77.3542272589538	6.27161482957081	91.825175	77.123475	9.251483
94.1224266373442	73.9443471321238	6.27161492567803	94.404	75.185075	7.131673
95.1577571797144	70.2049687129906	6.27161502178456	98.93765	68.322275	8.948906
92.3634312883722	70.204968712274	5.98506755557372	91.5733	68.725	1.37953
91.1541270898376	70.2049687115241	5.82580875734407	90.314475	71.662575	4.957094
89.9814348151823	70.2049687107634	5.66708941713949	90.725625	70.444425	7.760216
88.7874929814477	70.2049687099974	5.50703222539702	91.08095	71.69145	1.548548
82.1504251099321	70.2049687092246	5.3723773227631	82.150425	71.4598	0.532397
76.8891402731686	70.2049686007878	5.37237760833655	72.106325	71.513625	4.730422
77.1139375164219	68.8926961602035	5.41780486576491	74.758025	68.76505	2.771423
77.3441186450643	67.5966266516745	5.46346274034214	73.97555	66.71955	2.504
77.6012010757466	66.4810854142263	5.50995072202318	74.919425	66.332825	2.561604
77.869345233877	65.3811235249065	5.55681109764739	75.320425	66.338125	2.101527
78.1564541953648	64.1644073362809	5.60439795209326	76.3481	68.05155	4.299693
78.4611399518497	61.6742460541412	5.65230125588188	78.897475	61.3791	6.581026
78.765321037058	59.2499393487834	5.70015925028769	74.7548	56.66355	6.610021
79.348066535514	58.5466615758759	5.74723673860391	75.12385	56.355025	6.655597
84.749253638314	58.0927216444823	5.79361857350771	85.3769	55.416	3.88436
89.6904837294619	57.6588874456028	5.84015515144565	92.124775	61.791725	6.696503
90.472919171578	55.6780708246659	5.88590940894735	94.377175	57.5521	6.223661
91.0874955224904	52.7161568221957	5.93159900727317	95.486225	52.746525	3.57388
91.1167792624294	45.1643706077645	6.18788929517464	94.807975	43.25145	7.382414
91.1456487152993	41.8080000741614	6.43871271245031	95.9689	41.808	7.756384
91.1456483749781	39.5019387503964	6.43871284471838	92.049975	40.056175	5.962344
91.1456480346566	37.143199966541	6.43871297698627	87.349525	37.1432	9.692858
92.0420611805309	34.5567301833547	6.09759472551048	90.921925	35.308625	2.502062
92.9903279390685	31.7125320451635	5.77571237398029	94.997925	34.851	5.629957
93.8628831814177	26.8302764541474	5.45451235429979	95.640625	28.68455	2.397586

Solution x	Solution y	Solution z	Original x	Original y	Original z
94.6656009122362	16.7513620005303	5.15035017056559	96.9141	16.74635	0.695888
94.7368913252132	8.84337008037648	5.11534805223026	94.81355	7.137025	0.426722
94.8059374913526	8.74615466357485	5.09768706571812	94.09005	9.358875	9.999877
94.9485959853666	8.49954962604408	4.92118878854105	99.82775	8.49955	3.828547
94.9485958129861	7.72357563989685	4.92118858665026	98.6909	7.723575	8.237085
87.5055171014371	7.21936048421528	4.7918132046697	87.3023	11.937375	5.783418
82.566994308525	5.27966425462843	4.6571095401357	82.33615	2.420325	8.700274
80.6154866783244	5.04554028537881	4.19333561918159	79.6523	4.144625	8.31435
78.9381267718253	4.8154003834371	3.64308737419211	77.882675	4.11235	4.515775
77.3352249533249	4.58612038406474	3.08702368642798	77.335225	0.00945	1.073545
73.7592338510443	5.14726111022193	3.08702366236694	71.829525	5.85575	2.05089
70.7525827160235	5.70207159466885	3.08702363830686	69.817575	1.306825	4.894499
69.4205203265545	16.7891538199148	3.08702361422724	65.789175	19.559925	1.053267
70.6059854546012	16.7891536834706	3.41170541317265	66.273425	16.5814	2.463993
73.3103933745215	16.7891535470285	3.74717594119055	75.3053	17.780525	0.662947
75.4745646091162	16.7891534105834	4.10061926285922	77.750225	18.79385	0.265085
76.1173001885594	16.7891532741276	5.13987744898384	76.1173	11.832075	5.793623
77.5995316865818	16.7892295953968	5.13987784754728	81.52085	13.687775	5.204149
77.5995922649162	18.0574764040064	5.13987824586808	77.472675	18.057475	0.141489
77.7747092974692	19.5329104017103	5.13987879883563	77.464	15.628175	3.533669
77.9505199953905	22.1028822667973	5.1398793518211	76.538875	22.08605	1.37194
78.1289054970316	24.6902747817042	5.139879904837	83.1155	24.690275	4.773978
77.4871714597564	25.4609857952202	5.14092118920818	76.27055	23.463675	8.429053
76.8742882123544	26.3096126075173	5.14196201067769	75.41995	23.365625	8.701179
76.4047488427734	32.6445722412331	5.14300051912238	75.0516	36.4713	6.125794
75.9555709157463	34.9981247720063	5.14403888645744	72.419975	34.998125	8.679512
76.4216022267714	35.5138007530331	5.07399716675679	74.4851	34.7013	1.961771
76.910391196925	36.0409452229754	5.00467824344408	74.186175	37.664625	1.593253
77.5466872480746	36.5048625011796	4.93794202727091	77.267275	35.3236	0.141297
78.351272457651	37.7024307921214	4.88857062980841	82.455325	37.974875	2.274181
78.6827976731065	38.7535761657918	4.84174344288368	76.5757	39.19325	8.28894
79.0298340380783	39.7789346458574	4.79446055326823	77.736325	41.257125	4.306668
79.3812923507011	40.7697655379161	4.74720452465147	76.046775	40.829925	8.304908
80.1197919450966	41.7399370505356	4.69624201812345	80.128375	42.2928	0.877447
80.8612410239904	42.6866187450777	4.64577205112193	83.98185	43.958725	1.112514
81.214319490829	43.2902442206732	4.59912032130048	85.82305	42.253575	5.699647
81.4303038921654	44.0986709507978	4.55153773717914	86.306375	44.08645	5.63357
81.4463919508124	45.0259010489872	4.42600213995588	83.247325	46.458225	8.799584
81.4620144823786	45.4195144850035	4.14804985178509	80.003925	44.278875	7.256115
81.4776530518758	45.8213898882593	3.85931116388603	79.556325	49.1563	6.397826
81.4933574124986	46.1591465230171	3.53663696062045	82.166	45.384	5.835084
81.509057880942	46.499614217335	3.20725225045527	84.710775	44.260425	5.70064
81.5246466326756	46.8847971186179	2.8302637888491	85.726975	46.8848	0.120938
80.0243158599501	46.922234626376	2.83026384996658	83.835575	49.221375	2.182226
74.9757504577667	46.9592996287103	2.83026391108775	74.97575	51.8098	4.043794
73.9029989282228	46.9592997330489	2.83026394105854	74.018375	45.692475	4.261669
72.8323625890365	46.9592998373789	2.83026397102877	75.70595	48.354275	5.510084
71.4865335105012	46.9592999416948	2.83026400099606	70.38585	48.289775	4.820236
70.2027499906029	46.9593000459987	2.83026403096215	70.20275	51.264575	0.287703
68.6008731885461	46.7640915208085	3.42857292495822	70.163125	48.595475	2.681471
66.8896146221796	46.5672621556989	4.03473822507514	64.04505	44.910675	0.523975
66.1810757010502	46.3875320152751	5.58591332632419	65.024675	48.473875	9.912197
65.7995987326744	46.073224076774	5.77631945458427	63.06625	46.073225	9.963062
65.7995986327644	42.6618259270376	5.77631947904972	69.4258	42.661825	9.2188
64.3646758452761	42.2116877697037	5.77631938064811	64.48255	39.62755	9.929967
62.7849721218167	41.9544526142206	5.77631928215765	64.627025	39.598675	9.161247
60.3131754684408	41.7130991512831	5.77631918365567	60.313175	36.907775	7.157937
59.9866318526315	42.6042582218395	5.74220703699591	58.980725	40.369175	5.096252
59.6633391264806	43.5507526455988	5.7081151625659	57.24125	42.40615	5.476964
59.3474642010098	44.5309712759421	5.6740303399431	60.81405	45.86495	6.053591
59.0282830297017	45.4826334459627	5.63993455820191	61.33205	47.81805	9.220678
58.571509811137	45.9869049872478	5.60417461644413	58.59885	48.807625	9.719414
58.0947774755317	46.039691302243	5.27373985227675	56.7604	48.090675	9.498427
57.7463677444332	46.0896064424943	3.82040916246717	55.460475	43.213925	0.442759
57.6894372934501	46.6136184029112	3.77540905613166	56.281125	43.406775	0.357518
57.6348100276478	51.1211248161708	3.73370895013979	54.099275	51.121125	0.198175
58.1058192445988	51.7441990870336	3.85613807187776	55.262125	52.9866	2.328913
58.6052726210067	52.3498459611865	3.97946912641587	55.9361	51.897075	1.720125
59.1355384907224	52.9637455349242	4.10420751774046	59.0369	52.162425	0.980631
59.6677246249332	53.5898007784382	4.230656420836	57.767975	55.4125	2.368927
60.2208469309024	54.1927656964139	4.35814851171562	59.205025	55.76	1.820366
60.7859507999099	54.7779889538599	4.48704315772978	61.491825	51.7088	3.765748
61.3442601978112	55.4040540522135	4.61636093710006	61.751375	53.5726	3.689653
61.9004945400262	56.0498524271583	4.74606440639769	60.964225	55.767775	5.605242
62.4642658222158	56.6996394576194	4.87546476327774	62.1796	60.091575	6.795975
63.0340301408818	57.2819637071129	5.00320827831484	66.095725	55.876775	6.205798
63.5640683222755	57.8870560205901	5.13014442913031	63.564825	58.6141	2.885043
64.095107145899	58.4864251815451	5.25803417733872	68.048425	58.486425	8.31929
64.0951071447505	59.3251452885762	5.25803422268614	63.23165	61.378	8.16167
64.0951071436005	60.1057990249253	5.25803426803054	61.732525	60.28975	3.358698

Solution x	Solution y	Solution z	Original x	Original y	Original z
64.09510714245	60.8849715476317	5.2580343133763	62.138225	61.218175	0.933898
64.0951071412993	61.6227733986238	5.25803435873115	67.662425	58.9604	5.24713
64.0951071401997	62.5789750639419	5.25803440408563	68.033375	62.578975	2.177441
64.0262222991765	63.8295851192968	5.2912629184525	67.8084	64.88	6.618444
63.9560806439399	64.9443240823676	5.32438394962107	63.9561	69.944325	5.325084
61.6972003458793	64.5659236220866	5.32512296062114	62.481725	64.778425	2.883198
59.3368147064991	64.1871645292228	5.32586198870624	61.692525	66.479075	4.622593
56.3287107249724	63.7959330234345	5.32660102221854	55.5813	65.9389	1.049446
54.6876000173369	63.2422321738186	5.32734036605849	52.902425	64.80215	1.303032
53.638670641666	62.5853199348799	5.3280800205456	53.6353	62.58645	0.328338
53.3700260713421	61.3039338168217	5.42638420487265	53.3194	62.871025	8.033264
53.1017776510318	59.9355118299592	5.52389056978847	56.708375	61.084725	7.280884
52.8151490471887	58.4142389789587	5.62034048691665	51.0767	59.931625	7.815468
52.533681340188	56.7652300045319	5.71610886973513	53.1029	58.71345	6.825055
52.2512720366635	54.9750266417985	5.81162830561404	50.342	58.1772	6.133715
51.9760525592327	52.5289735557927	5.90702161635803	51.8225	53.851	9.626807
51.7016993502219	49.5565735125707	6.00065550675676	51.464375	46.273425	9.764247
51.7016986902626	49.5565738151287	5.85232625672336	52.0729	45.66175	8.843258
51.7016980302843	49.5565741177501	5.62775077500961	50.9611	51.5263	9.096967
51.7016973703193	49.5565744203645	5.39146809575291	51.731775	54.063975	3.386729
51.7016967103658	49.5565747229305	5.24549503665765	50.5204	51.7746	0.922891
51.7016961104785	49.5565749972765	5.24549305482113	50.075475	49.526025	6.785114
51.7016955106036	49.5565752716238	5.24549107296081	56.4549	49.1402	6.740043
50.932749308691	49.5565755606974	5.00372203643684	54.870925	48.098925	4.394617
49.9377768912385	49.5565758497788	4.76449892259983	51.332325	47.3944	1.206534
48.8014263606007	49.5565761388668	4.54192219319305	48.801425	47.111675	0.180447
48.4855251471458	49.5649810314626	4.5419220558519	52.703075	49.56845	2.111726
47.8029255206608	49.5733861214691	4.5419219185313	47.802925	54.5327	5.178486
47.1094808002348	49.4462374123755	4.54192155204293	47.81055	52.508825	5.320082
46.4051071082405	49.3174287704761	4.54192118555255	47.35915	48.071	7.780887
45.6813088795998	49.1895636792654	4.54192081905085	46.718325	46.79505	7.837302
44.9182357882372	49.064447017018	4.5419204525307	44.413025	51.821425	3.225875
44.1662081738891	48.937987137284	4.54192008601452	40.7628	47.39015	6.093812
43.5222008478945	48.8131876810743	4.5419197194865	43.5222	45.0811	1.214529
43.4264898459221	49.3817450274238	4.61100982058204	42.80595	50.969325	5.199786
43.3309322438631	49.9392657576158	4.68003731593118	43.10885	48.272275	1.575949
43.2354793467327	50.520275253736	4.74966654553465	44.549375	51.8385	4.639375
43.1397685188225	51.0917237698465	4.81931065834082	41.3638	51.811825	0.610596
43.0463156872292	51.6319762615613	4.89197083237816	43.054225	52.07985	5.94327
42.9528819035307	52.1701466279862	4.9645167259169	41.89655	53.797625	8.251962
42.8599121721556	52.6864676567661	5.03624331652733	45.616825	55.349625	8.112205
42.7488829845065	52.962085450894	5.09916778430345	43.47965	52.4779	9.729662
42.6361721960517	53.2449917177839	5.15888211452193	40.529725	53.231175	6.058478
42.5241642611621	53.5281315708665	5.21851757265573	46.119125	55.3112	3.945632
42.4089485940829	53.8017916331565	5.27847090218387	40.703325	55.537825	6.299364
42.2943873669386	54.0720285977294	5.33832496817868	39.658325	53.39295	5.48876
42.1808351765495	54.3439480998979	5.3981659018468	38.966475	52.166125	2.317575
42.1024907283835	55.3618052522915	5.47535122871834	40.468775	56.35765	3.688499
42.0244348446295	56.3549507062214	5.55283431665203	41.323875	57.06515	2.903463
41.946517234541	57.3308714167188	5.63079162336587	41.765825	57.606275	4.678763
41.8686351479039	58.3045210215023	5.70887298943753	38.122975	58.912025	4.096565
41.7921710709278	59.2458650278356	5.78758299317597	39.243575	59.34405	2.988695
41.7164143390365	60.1864190652378	5.86712081985779	45.110025	59.219325	7.835164
41.6395176614258	61.1869481982326	5.94594728809508	42.114525	60.87195	6.966651
41.5625734910691	62.1986079313756	6.02464411638379	44.541975	62.0002	4.336081
41.4849661791077	63.2228498635285	6.10374456393946	43.7645	63.186425	9.005722
41.4067545467623	64.2538366112724	6.18205045957036	42.88515	65.09985	8.113938
41.3283057192602	65.2627246557104	6.26003637339954	37.615325	65.262725	9.608735
41.3283058361382	65.7157245154753	6.26003630111508	45.884675	65.715725	8.319043
41.2932094132504	65.9184763642233	5.98595387443268	46.228875	65.56925	6.129679
41.2498540292343	66.1397560390639	5.69790139797918	42.3891	68.379025	5.906332
41.2064375860216	66.358146880176	5.40937271577141	44.4217	64.703925	2.042243
41.1565105089868	66.6918059722346	5.25690537071438	44.898775	67.784675	2.145396
40.6021507133263	66.810886936858	5.21110292228056	41.683175	67.299925	9.367966
40.0179143245913	66.929423102164	5.164579150639	40.205375	70.4585	3.559151
39.4301748116565	67.0453464812787	5.11823569305983	39.430175	70.428325	1.436461
37.7540024651801	67.0453463846942	5.11823583747445	39.7753	66.19835	5.821872
35.9177107723	67.0453462880984	5.11823598188815	34.7277	67.482525	7.589491
34.2053583012502	67.0453461914829	5.11823612629907	31.583525	68.6781	7.867205
32.9171956036129	67.0453460947992	5.11823627070164	28.20205	68.6988	5.301267
32.9171958187778	60.9187446103606	5.11823638819058	30.688625	60.637275	0.70091
32.9171960340109	58.9700425692631	5.11823650573169	32.800625	59.186225	6.71386
32.9171962492451	57.020216012936	5.11823662327162	36.8297	55.690525	7.310631
32.9171964644477	55.6628436236404	5.11823674080434	30.732825	57.781	6.904491
32.917196679658	54.134600503516	5.11823685833501	30.1798	54.1346	0.93414
33.147654244381	53.5207745225915	5.14128786867085	28.87265	55.2137	3.915468
33.441720005734	52.7300588826398	5.16447786647471	29.2116	52.625	7.111098
33.8074355429763	51.951830968757	5.18751073866206	30.804475	50.3614	3.667235
34.1925199771142	51.2167381081486	5.21058022890151	34.822	51.041775	1.965488
34.5746383409327	50.4864043309144	5.23371214992463	37.074525	51.14655	9.462196

Solution x	Solution y	Solution z	Original x	Original y	Original z
34.7361563349988	48.2637051400194	5.25422119230915	35.77655	45.5234	7.314779
34.8966223975991	46.5101153964398	5.27469444718154	38.0514	44.25295	8.429467
34.5606543781861	46.5101155004854	5.01872184568354	37.32375	47.164775	1.301487
34.1414717308958	46.5101156044583	4.80209807276074	36.34605	45.558575	2.970524
33.7097527307226	46.5101157083343	4.58818516242164	34.241775	45.041325	3.482667
33.2760746862981	46.5101158121219	4.37546969351537	33.276075	49.648225	0.482877
32.5475799789974	46.5101154618228	4.37546981667925	31.24645	46.9846	0.258005
31.8778344073642	46.5101151115152	4.37546993985268	31.916925	49.63125	4.365548
31.208257718179	46.5101147611823	4.37547006302542	26.549225	47.5983	5.827804
31.2082577114007	45.0226848628118	4.37547010202182	27.251975	44.47235	3.840979
31.2082577045533	43.6103029137194	4.37547014101867	28.231575	43.86655	5.176578
31.2082576976683	42.1855500413233	4.37547018001543	27.2689	42.18555	1.296271
32.4424661799707	40.9614257307376	4.48447293188582	36.0198	39.389875	2.90819
33.3792706790043	39.88851929309	4.59480069472579	37.4906	38.735475	3.373994
34.0504874203808	38.9375068077208	4.70660202301041	31.7652	39.5927	8.134315
34.7986703080391	37.9478682569605	4.81564415937496	37.4986	37.94785	9.024015
34.7986713702349	37.810229343639	4.81564482594914	35.05695	38.887125	3.774047
34.7986724324261	37.6721680223666	4.81564549252667	39.47365	37.672175	3.042346
34.7986726022879	36.1939723221076	4.85178970107978	31.8731	36.0461	3.846108
34.7986727721549	34.7297522627394	4.88798171194572	30.2641	36.115	4.866777
34.7986729420694	32.2432047086841	4.92418498009541	32.29465	34.1886	4.533526
34.798673111989	29.2793409717542	4.96040957874025	33.989075	25.3104	7.891632
36.3377988902074	29.83858185701	4.96040946135137	34.098725	26.483975	3.010898
38.8847906836855	30.5509357715274	4.96040934398005	39.217825	28.48755	6.718496
41.3775707587391	31.2955270284854	4.96040922660646	42.344525	27.231625	2.735005
43.0338473377516	33.438195298208	4.96040910925779	43.312375	33.022625	9.818329
44.4088028041096	36.9548384731353	4.96040899187475	44.89855	41.381	7.163397
45.0155248742115	37.0732504517514	4.96040887432259	45.015525	41.584025	2.803346
45.4351754729776	36.8692143625491	4.96040899155682	43.242475	40.8624	6.853519
47.2708912532833	36.2243012689675	4.96040910875573	49.0937	40.0849	6.606023
48.5490490449013	35.2723311126439	4.9604092259497	48.825175	33.4678	4.421401
49.8213249753029	34.3595340590806	4.96040934314404	49.821325	32.088775	0.505787
51.0865409351441	34.3595337670956	4.98662383538696	53.08505	32.116125	1.177184
51.740064902452	34.3595334753141	5.01378935213723	49.014675	34.9475	8.94848
53.1568901779424	34.3595331835117	5.04014727560068	53.51985	31.610925	8.734185
54.4809363278065	34.3595328917955	5.0661619790933	54.125425	38.6935	6.380106
55.8945256628412	34.359532599935	5.09207403958094	55.894525	37.29925	9.136585
59.6161054152413	33.9518215158787	5.09207423528464	59.6161	30.5374	8.744708
59.662618265202	33.9518216530654	4.93850844131766	59.25755	30.092125	1.789844
59.8275501532228	33.951821791403	4.93089258602377	59.82755	37.21565	1.143092
61.6277593991397	32.4098911319884	4.93089293457325	59.92645	35.207	4.720771
63.677833288567	30.5835292535408	4.93089328312398	67.6691	30.587025	1.957775
63.760102592343	28.8042456190715	4.93089363227717	65.757275	28.49595	9.473031
63.8241185093181	27.90175018988	4.93089398117066	68.792375	27.90175	4.368368
59.6679667388253	27.4252793276278	5.14269279126655	57.8987	27.066925	9.346556
57.528497157487	26.9591500727045	5.33357409653391	53.429725	29.230175	5.838259
56.7162348850273	26.3810938215631	5.52120426653261	58.5251	25.335175	8.213376
55.8572344422447	25.8165604146782	5.70535863838539	56.18475	25.5187	0.990177
54.946273513398	25.2718061034824	5.92944143988704	54.7913	22.79115	2.590985
54.0458744106598	24.7729508388419	6.16543124155881	52.727475	27.05645	3.021539
53.2105660615642	24.2362199837397	6.41288484646923	49.48335	26.949275	8.082485
52.9160191437715	20.6393753311519	6.61279843721513	47.99765	20.639375	7.512605
53.8911818458849	20.1207033906069	6.61279863323725	56.46315	20.9863	9.377425
54.7561765818032	19.5900320925007	6.61279882925344	53.686425	15.19815	7.953267
55.8088115291042	19.2211437507961	6.61279902526006	56.145325	18.970525	8.712859
56.855169176614	18.8532565762934	6.6127992212642	56.707375	20.9848	8.081779
57.9094363297807	18.4773818256445	6.61279941726646	56.680125	15.845675	6.62366
59.0118151734939	18.1126639342333	6.61279961326884	58.962525	15.549225	6.884037
60.1200173928582	17.7572257790044	6.61279980927102	58.66755	14.455925	4.659081
61.3592200696564	17.4260827964974	6.61280000527825	59.666825	17.15215	3.601254
62.7192271364497	17.0962111816627	6.61280020129115	62.8697	20.929125	3.670375
63.9994772506261	16.5441157752613	6.61280039734375	64.881075	21.1972	7.607995
64.9122440824701	11.8632004120549	6.61280059338291	68.784175	11.8632	9.776368
63.1048528345438	11.5946917821358	6.48164762693156	61.5062	10.2838	8.047741
61.4446362117038	11.3288282034484	6.34975753220668	62.944875	12.9098	8.420704
59.6506153171636	11.0593678889659	6.21672351758297	56.7601	13.3255	9.545614
59.419499544121	9.68916705960377	5.90025421560157	64.181275	8.885925	4.857898
53.6955308743165	8.9948174243302	5.65517886867701	54.0981	10.209075	9.589747
47.1425895874872	8.26015358208214	5.39380072575317	44.6523	7.1683	9.495828
46.5920496311366	7.78308251049075	4.44964221842418	46.59205	4.24755	0.914106
43.2503018588121	8.00131814434733	4.49535130052923	43.2503	8.7931	9.432262
41.8052373035601	8.00132000070501	4.49535155932092	40.718225	8.45085	2.325605
40.4236997924082	8.00132185705203	4.49535181811233	40.4237	12.94705	3.760655
33.4991536313622	7.86701791877817	4.50003416388045	33.240325	8.160175	9.454403
31.7829690808099	7.72342267099249	4.50465978866431	32.636425	9.71905	0.854223
29.870644599225	7.57679564542661	4.50928826686057	32.5307	9.603625	5.102178
27.5148892575929	7.42853299340755	4.51391660816654	28.471925	7.124375	1.494169
24.9727716020246	7.28049875780604	4.51854590653278	25.090375	4.2535	0.574579
18.3206577895923	7.204904490802	4.52333614722885	17.13825	10.254625	1.09375
15.7752624180457	7.12563219106206	4.52813741197005	16.533825	6.314025	5.413684

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.1242389953183	7.04646919624305	4.53293862047563	13.011825	10.0758	8.49229
11.9342318500717	4.7100311130674	4.53758081453471	12.34295	3.720825	3.558355
10.7325998681952	2.49095007089482	4.54222345839791	10.7326	2.49095	9.542224
4.54887478380076	1.25439258287595	2.21622149282939	2.34935	1.70725	1.418964

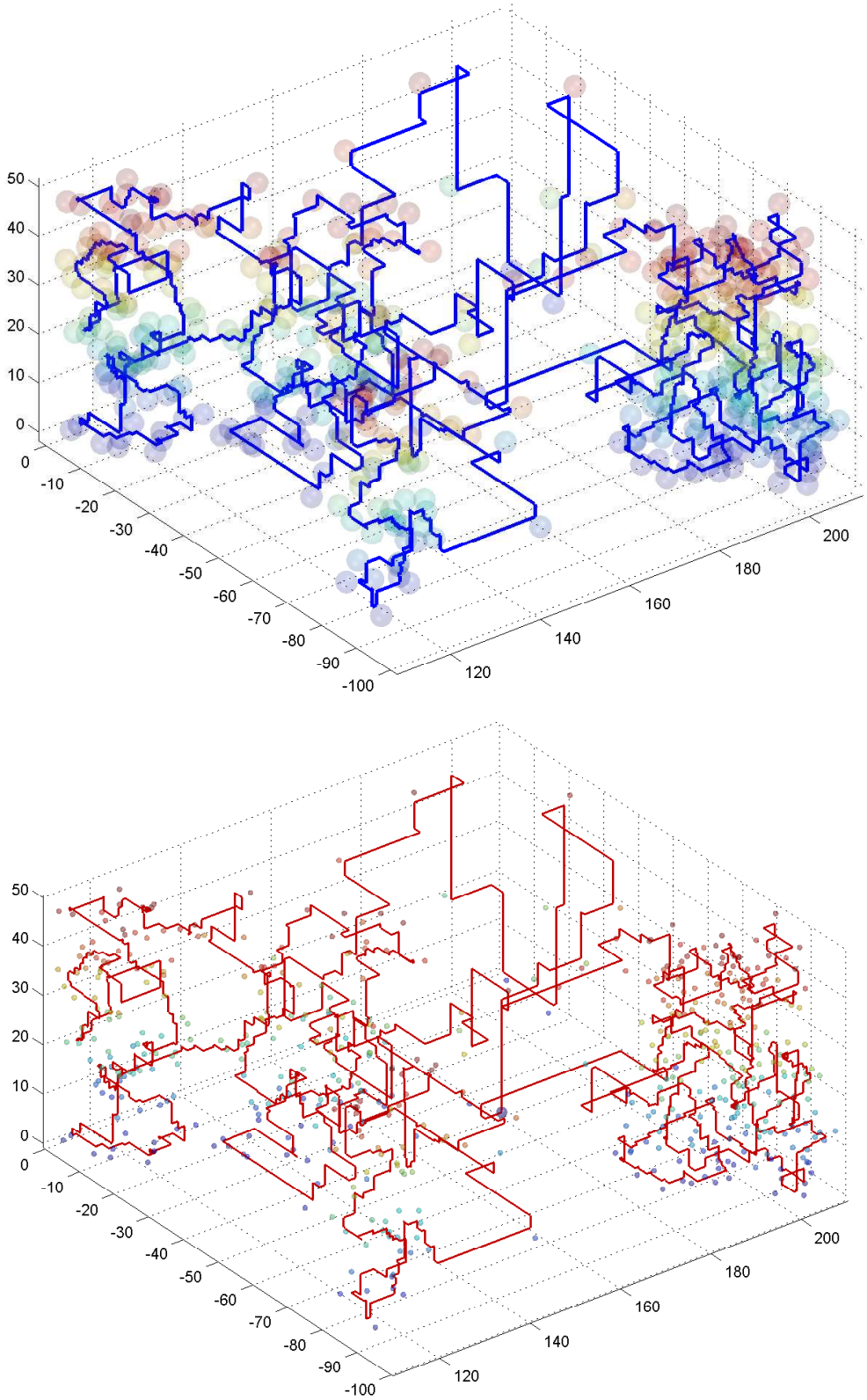


Figure N.171: *team*5_499, Equal Radius, 3D, Manhattan, Length = 2705.2350210

Table N-174: Solution for *team*5_499, Equal Radius, 3D, Manhattan

Total distance: 2705.23502097583 Depot: x 70 y 40 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
66.3682200353961	38.7232186387294	2.25570045551514	64.954	37.309	2.2557
97.2738885179162	52.0430998426913	4.34079989226592	99.2739	52.0431	4.3408
84.6894517496358	56.9537126600633	7.56935497753739	84.5964	57.5663	6.5683
74.5687206473479	60.0435002643856	16.4771793341857	73.1545	60.0435	17.8914
75.4030078187516	69.9297134245401	15.4095711018427	75.6074	70.2776	13.8577
76.1847005671995	74.2910949983242	14.7823110468358	76.1847	74.2911	12.7823
77.0323550387854	74.6123645617091	14.9435936532072	77.4087	74.0915	13.1093
77.4645707533498	75.2487431755237	17.4536134840205	77.1908	76.3248	19.088
79.3483004632532	75.3688116043921	17.5442885284694	79.3483	75.3688	19.5443
82.7657879981835	77.8152998993085	16.2747990488531	84.7658	77.8153	16.2748
82.287806947747	79.81152456151	13.770945499608	83.5177	79.6473	12.5117
80.7889248801995	82.3521806482142	12.9302989216299	79.3747	83.7664	12.9303
81.6167309110473	82.1740051404935	9.72371239916276	80.3025	81.1115	9.6723
83.4863232748046	82.0104580583862	6.755606349894	82.7718	81.5009	6.6283
85.9099113762269	81.849125447885	3.95890205586347	86.8222	80.0693	3.9589
85.9099112814128	82.6716292863583	3.28722865799225	86.0867	81.533	3.6186
85.9099111864223	83.7109960463243	2.58322312724402	86.7862	83.711	0.7854
85.8743570365525	83.9570571033286	2.78815355040037	87.7484	83.7546	3.1863
85.8328429768908	84.2276540824668	2.95464861266779	85.8335	84.6274	4.9143
83.9375737068419	84.2277220463904	2.95466216594443	84.2824	83.9445	3.7257
81.7912999444168	84.2277900184283	2.95467571818662	81.7913	86.2239	2.8298
79.4302115917409	82.5605994924966	3.023727766182	77.4302	82.5606	3.0237
79.4302129438389	80.2269239163402	3.26162687047454	78.9268	79.6337	5.1041
79.4302246088011	80.2269222764198	1.90595150364734	80.7551	80.6861	0.4798
76.2337104269928	79.0119451244715	2.14098834720465	75.2812	79.5319	0.6498
75.4145436218819	76.0266445128647	2.50039637403824	76.4126	75.548	2.1999
74.4361655394712	73.711718610199	2.86807379399087	73.6863	74.2382	1.6716
73.6361004998246	70.0431103402863	3.2936033687504	73.6361	68.0431	3.2936
72.9896928545538	71.5617570904289	8.55246748611921	73.5126	71.3248	10.3828
71.4456213962119	75.7132789791702	8.85239430234846	70.0314	77.1275	8.8524
72.6508679028494	74.9936137249108	8.96109732900574	71.4242	75.4202	7.9198
76.0585230645356	74.159144186194	9.07535122821089	75.9291	73.9471	7.416
80.2636369474516	73.3856548350647	9.20017836888023	79.9937	73.4457	8.9779
85.2302659182145	72.6085774523337	9.32548263937533	85.22	71.0885	8.0711
91.9382886637184	72.5014047794288	10.09959318782	93.093	71.3467	11.2543
90.1129661206247	75.149630079907	9.91125954856538	89.4099	75.3847	11.7139
89.7166593100133	76.0987013708116	5.64520284289773	89.379	76.0987	3.6739
89.7166549045864	80.1475352530676	6.50749470617357	89.4354	80.1567	8.4369
89.7166505005799	83.7881997372029	6.62713504063252	90.3741	83.7882	8.516
89.0972058286453	87.2616987326273	6.62713510209362	87.314	87.2617	7.5328
91.9392072854355	88.0992754256036	4.52179897514695	92.1839	88.8237	5.0595
94.5126470133835	88.8604282173496	1.91095852593139	94.7976	88.4491	0.0367
95.3975787631047	92.5135996414859	1.71372046554959	96.809	92.5136	0.2967
95.3973707805495	94.1306802443428	4.49014329006166	95.4796	96.129	4.4906
94.6739737359259	94.130688805032	4.52835290552058	96.0605	94.495	5.5816
90.4650775777895	94.1306973625917	4.56546923265485	89.931	94.5372	6.4495
90.4650754779434	94.1306990996809	2.82079536976599	89.3359	93.6392	1.2449
90.7145493151878	97.5243730443304	3.13811099341279	92.093	98.3621	2.0725
90.8418910246573	97.8921796516392	8.6155821074182	92.8113	98.2407	8.6156
90.8419088506595	97.8922809858542	10.1812030357816	90.6972	96.9626	11.6096
90.8419266782624	97.8923824840776	10.9243971617485	90.7381	99.8897	10.9244
92.3625301697839	97.8923710421743	11.2867059391665	92.0809	99.3222	11.7562
94.2168558807645	97.8923595968581	11.629195142024	94.2258	98.7848	13.3192
96.0021611270229	97.8923481421167	11.8041346256681	96.6476	96.9796	12.6166
97.3686643871967	97.892336688761	11.9731204918938	99.292	98.0492	12.4987
97.3686564822842	96.3449997024607	11.9731231800588	98.1513	96.345	10.1326
96.5438862238615	94.7425428940326	14.1139009010689	97.9735	93.9042	14.8216
89.0320490807235	93.9453736611167	15.1236916527094	88.3602	93.5594	13.9637
85.7803146011506	93.2079393360905	16.5674032150693	84.3608	92.148	16.0712
85.1430065187972	92.7706954393855	20.5213597201058	84.785	93.3953	20.8615
84.5287577100755	92.3143645729263	23.7962324960068	83.1514	91.319	24.221
84.1226132814596	91.9551968713906	25.5943991207417	82.1226	91.9552	25.5944
85.4860635782849	90.6717123245756	26.5183824094514	85.3838	89.3565	26.2565
86.9076213961074	89.7664688031615	27.5021942484834	88.0059	90.774	26.7084
87.7256991750577	88.1837586144521	29.0920577024596	88.3919	89.421	29.806
88.4037580405645	83.0105002087715	30.2250115603557	90.256	83.0105	30.9795
87.4849973719807	79.3312252288646	30.225012348469	87.485	79.3312	28.225
85.6997854335896	79.2234099023743	30.8173916617068	84.6626	79.7388	29.6454
84.7215335238396	79.1133026550019	31.6702339487143	84.0326	80.947	31.8699
84.4927945715492	76.9707001872155	32.1361875777021	84.4928	76.9707	34.1362
80.815044823909	75.2156410040317	31.2962477730571	80.2922	75.8098	32.7263
78.7782234878592	72.1707197429884	29.6109996578293	77.364	70.7565	29.611
82.619961445813	72.4010456473438	26.3339790983154	82.4808	71.6064	25.4475
86.9512886534396	72.6403338405665	24.2874195239402	88.9513	72.6403	24.2874
86.9512916783104	80.6583232037439	23.9381434484908	88.7272	81.0174	24.4065
86.9512947005414	82.5121850936537	23.5041760791612	88.1669	82.2879	22.5207

Solution x	Solution y	Solution z	Original x	Original y	Original z
86.9512977220899	84.7184561469022	23.1288520635321	86.8895	84.3247	23.0154
86.951300743598	87.2329089288086	22.755699378586	88.176	88.8141	22.7557
86.4353268682502	87.0934632417603	22.3091432058816	87.8356	87.4643	21.4217
85.642344155826	86.9511034147322	21.934791483951	85.5265	86.4226	22.7788
84.8681280719294	86.8102972084651	21.5384895370284	84.7929	84.8117	21.5385
84.8680799848186	86.8102970860436	19.0157067657049	83.3441	85.5151	19.0157
84.8680810547245	87.7474780701301	18.7605966762814	84.1657	89.6201	18.7606
85.5063572635894	87.4802153857428	17.9730772352874	85.8291	89.3215	18.2752
86.0052825982687	86.633707180854	16.7824623515658	85.8774	87.324	15.9329
86.5109874247499	85.6759610030971	15.7923183186109	85.6153	86.7737	15.008
87.1272993877848	84.0324031698795	15.0404127021689	87.1273	84.0324	13.0404
87.5661037852241	83.6563126229128	15.3738050044091	87.5661	81.6563	15.3738
90.2474985989205	83.7632988167315	16.8919191248934	90.1019	83.486	18.038
93.1772758339191	83.8708299986839	18.0163620836478	93.0738	84.8753	19.4127
96.7092861174832	83.9728631471615	18.6294033640848	97.4362	85.8361	18.6294
96.7092870868614	83.6474025702336	22.343374675878	96.8293	85.3988	23.0282
96.7092880543728	82.3825495074825	23.1962983908176	94.7529	81.9671	23.1963
97.096500698229	82.3825392807872	23.9326307465356	97.0965	81.0307	25.4066
97.6691514909856	83.2631267012933	14.0389929921094	97.0848	81.6578	13.6354
98.3806737605264	88.8242986636078	11.113121051827	99.7949	88.8243	9.6989
96.9036008426932	89.4789364711175	11.2358041399954	96.671	90.7145	10.1968
95.6058391429299	89.971801402251	11.3651282376241	94.4375	89.8165	9.7901
95.4415716694641	90.7385492995346	13.1170086992774	94.8083	91.5304	12.0006
95.2823747861774	91.3848517073403	17.6391798423096	95.3031	91.4204	17.8619
95.1231340881878	92.0301325513244	21.621526903238	94.509	92.4532	22.8398
94.9679175525147	92.6317651037071	23.3451002050751	96.5452	93.172	22.7505
94.7851085928884	93.1322689790712	28.2683588441423	96.6676	92.6743	28.4611
91.451901049478	94.5102683414172	29.5982855770325	91.4519	94.5103	31.5983
90.2588520576959	94.5543582626465	28.9546832658615	88.2673	94.5543	28.7709
90.2588531012997	96.3509918173787	28.9546682800554	88.2817	96.351	29.2562
90.7766681765506	96.7727560041223	27.9281410724895	89.0976	96.4455	27.3307
92.8627774828426	97.2480401508072	27.2592100338825	93.3103	99.0843	27.6346
93.5099570286744	97.403608092076	25.6513314316802	93.255	98.1789	24.6576
94.1790853220924	97.5549948060494	24.4973993302144	96.1791	97.5552	24.4974
92.5938355407357	97.5623928582859	22.3760785084237	93.4254	97.8126	20.9017
87.5574350897551	97.5697855294889	21.5601498828942	86.994	98.105	22.6387
84.5720292227803	97.577172769775	20.5246691753853	83.9295	97.9734	19.8967
82.3425781788692	97.5845574298516	19.5951989182648	81.2522	99.2612	19.5952
82.3425794672784	97.2631393162532	17.1577016654462	84.3334	97.0716	17.1577
82.3425703364163	97.2631234265265	15.5180525100188	83.3686	96.8014	16.23
82.3425612044011	97.2631075377586	13.2280001514938	84.0572	98.2927	13.228
82.2929541209927	95.4408349056638	10.924576354516	83.6163	95.496	9.4544
82.1994919155741	89.4435333588696	10.8357317768049	83.3685	88.3604	12.0152
77.1151004693881	89.3422875956744	9.08941226295451	77.1151	89.3423	7.0894
74.9180986062678	87.5322718265425	12.6124094058757	74.9451	88.4605	13.7746
72.680302560246	83.920305353084	14.1919888049196	72.6803	81.9225	14.2859
72.07879739717	83.9731703989201	14.1920067748997	71.008	83.9726	12.5028
72.0787688397006	85.0494472937927	19.5617103803276	70.8501	86.3243	19.985
72.0787403143783	85.5638873830256	21.4655026199021	72.3356	86.155	20.9164
72.0787117878496	86.0551006280305	23.751200262924	70.0787	86.0551	23.7512
73.2950101409486	86.7321265209521	27.3040438997142	72.5273	88.3137	27.5858
76.7508331509809	87.1222696796097	29.4510706113812	76.9521	88.589	30.1519
79.4232952028374	87.4352070563827	30.7690971099884	80.7173	88.9602	30.7691
79.423290166179	87.3220635904708	31.1879641777455	80.4141	88.4668	31.9981
79.4232851286478	87.2002200607774	31.5376533703341	80.026	88.4312	32.9439
79.4232800816793	85.2350896186901	31.6242045254209	79.415	85.235	33.6242
79.4232752025824	85.2171936417689	30.463549102632	81.0134	86.425	30.4534
79.4232702513717	83.5197717178332	29.7493422017085	81.0772	83.8409	29.4446
79.4232652982778	81.1537693246748	29.1084833244431	79.7775	80.296	30.6811
79.4232603441577	80.2716097210391	25.6068198221575	79.7296	78.3022	25.4406
76.3867005067842	80.9295751892812	25.606809905619	76.3867	80.9989	23.608
74.6169059413108	80.9296019518663	26.2317287776353	75.4182	80.175	27.0139
71.9578911136782	80.9296287197813	26.791390982047	70.8021	79.2974	26.7913
71.9578530563636	82.3516919656646	30.4467986891793	70.5598	83.7819	30.4468
73.1066310984718	81.1849470872043	31.12927742255	73.1002	79.4037	30.5501
74.2704876655084	80.8393568387813	32.3790888396531	75.5773	80.7384	32.0605
75.123876397896	80.4971004432602	33.763005429002	73.6161	81.1388	33.9424
76.9662766795634	80.1213820744825	35.016547710246	78.4301	80.0876	35.2889
77.9818950713652	79.7483120961739	36.1544965168813	77.9819	77.7483	36.1545
78.2352072734286	81.3360463205031	36.4355864198394	80.2014	81.5949	36.2605
78.2605553752256	81.51622709255	39.523401218192	78.0272	82.0721	40.7931
78.2859346310751	81.6913626255063	41.0389007958027	80.1131	82.5047	41.0389
78.276006629852	81.691363089727	45.6127052269554	79.6279	80.9538	46.8845
77.2618078055129	81.6913635697341	45.6233335445273	78.4966	80.8407	46.208
75.2606387099296	81.6913640499044	45.6339349266029	74.3211	82.1244	47.3456
75.2606390932763	81.6913622300249	44.8430960504186	76.7822	82.9894	44.8431
75.2606352189538	79.7922864648324	42.8344491446026	76.8895	78.6378	42.7161
73.5352028441808	79.7922805525522	42.8343855419427	73.5352	77.8165	42.524
73.0284143096596	85.2636988490023	42.8343803441796	71.0504	85.2637	43.1302
73.9178272155875	86.4311205037407	41.7304245090702	73.8575	87.669	40.179

Solution x	Solution y	Solution z	Original x	Original y	Original z
80.8307132070107	86.4779080291533	41.69285278628	81.9035	87.9149	41.5399
81.9043996513652	86.5224736899024	41.6554327877547	81.9044	86.793	39.6738
82.830015339132	86.5224794095445	45.1116886368944	83.1803	86.2205	46.5816
83.6688006361591	86.5224851293484	46.4174953904406	84.4799	87.8799	46.3607
84.3335233397335	86.5224908480514	47.7547958257798	85.7193	87.9646	47.7548
84.3335218248691	86.5224862373059	48.1727422060798	82.5335	87.3296	48.5022
84.3335237152234	84.7397009135774	48.1727548199592	83.0689	84.7397	49.7222
86.674996363743	83.5423969658508	48.172755353061	86.675	81.8002	49.155
87.0072165192778	83.9112554261975	46.651842063653	87.8518	83.2273	45.632
87.3132716440116	84.3112150894801	45.6138881368075	87.8874	83.7559	45.2883
87.6107760822666	84.7266193450347	44.631261131766	89	83.7031	44.7227
87.8511845044181	85.279005233615	43.59792374057	89.6546	85.279	42.7332
87.8511847860184	88.1653979351761	43.5979206486595	89.697	88.1654	44.368
87.3794423241558	89.3256970743832	43.1019806938665	87.2864	89.2526	43.6381
86.9099767889135	90.5014780672906	42.5866992617013	88.3323	91.5035	43.0727
85.9647352476227	91.1151633722186	41.9582192401095	84.5701	92.5098	41.6265
86.3659036456208	89.3510520662744	41.9582164492912	85.4655	89.4614	40.2893
87.3294022010863	86.7915035357509	41.9582136615994	87.3294	86.7915	39.9582
92.7000078662257	86.3192268799591	42.1208046871612	92.7639	86.5161	40.1878
95.5249051929603	85.6865196875892	43.3196334393278	97.0785	86.7219	43.0832
95.9734614349472	82.5946057190625	45.1987765269711	94.6937	81.204	45.1011
98.0143875516083	82.1475116043143	47.7200968184367	99.1691	80.9928	48.8748
95.5844487377081	90.5806612906126	47.6483916489617	95.9324	92.1458	48.2362
91.3687230541264	91.7073773907066	47.5751597944927	89.5983	91.5249	48.4013
91.2237318868664	97.8102568503429	47.480114949936	89.983	98.6224	48.7896
91.1619767647404	97.9649845822073	45.098500538853	91.162	99.965	45.0985
82.8622642944314	97.5985047377508	43.8185414332277	82.0258	98.9707	44.6731
81.6309183583558	96.9761982803006	32.3434681485796	80.252	96.9762	30.8948
81.6309361055806	92.0964626922586	36.5247794321245	80.5965	92.0964	38.2365
83.9738957510099	91.7860338360407	36.5247898359275	85.1326	93.3031	36.2953
84.3596730539241	89.3821360427068	36.5248002417639	82.7904	89.3622	35.5781
85.1622069251212	87.0755659376094	36.524810651672	85.5459	86.1581	36.8243
85.9222011337945	85.4305972363566	36.5248210611526	85.9222	83.4369	36.366
87.3721856501833	87.3694584294681	36.5787463887735	87.6085	88.0524	34.9791
88.566600862897	88.5035697825802	36.6355832614709	88.5666	89.9178	38.0498
94.4262029181495	88.3212315834113	36.2802670701891	94.4683	90.0421	37.16
98.2898757827353	87.1750996212087	33.813523611666	99.7041	87.1751	32.3993
97.9811572219277	85.6131383753177	34.0767618283272	99.0472	85.7396	32.4859
97.0547516294913	83.0242832695138	35.7332136547388	98.6006	82.3388	36.0882
92.9865244160818	81.7017491192381	37.0003566697025	92.5909	80.0433	37.2966
90.8181608564571	81.0926671658776	38.0568212184694	89.9071	81.4441	38.6007
89.2507032872724	80.4585649402578	39.0089622634688	89.7033	80.1502	39.6028
87.4891504808667	79.8437052243405	39.8834715844334	87.0156	79.966	38.2934
86.2062675034695	79.2096010964616	42.1450715390112	84.7887	79.7551	43.3502
85.9810079190893	73.3416707301243	42.4204912234293	84.8025	72.2361	43.599
87.4722425725528	73.341684355211	41.3796960026463	89.2994	73.1482	41.8171
87.7671493862662	73.3416979827445	38.1341319135863	89.0638	74.5581	37.2181
83.5142669687452	73.0919737921851	38.134133874934	82.7574	74.2926	38.276
81.2366003292864	72.8211036357204	38.1341358363758	80.5183	71.0301	37.6084
81.2365994864991	73.6368889768978	40.9898991937337	79.4655	74.4467	41.2824
81.2365986468903	73.8332124174349	41.5159034992194	82.0065	75.6791	41.5159
81.2365929834009	73.8332113260815	47.6830233010946	81.6179	74.1421	49.6219
77.2560571331154	73.8332088887539	47.6830213168748	76.1087	74.9228	48.9063
77.2560548951041	70.7297859959678	45.9690616959532	78.8402	71.1237	45.9036
77.2560526562977	64.5584028550133	44.3273624005992	77.6803	63.0066	43.1391
72.5025990238265	71.4925672411457	44.3273652638467	72.5026	72.4828	42.5897
64.1225217500099	71.4925774161023	44.3273746356316	63.7544	71.2264	45.6612
59.4826978472773	71.4925875913128	44.3273840054996	59.4827	70.1321	42.8614
45.9134074867866	73.2466771771699	47.9689768635872	44.9743	74.4953	49.2176
45.9134101258552	62.8241002340605	32.2851982278532	44.1821	62.8241	31.2839
49.5233987623773	55.0957002871193	32.2851927252827	49.5234	55.0957	34.2852
52.1531917443335	48.4547999753485	25.9540012852642	54.1532	48.4548	25.954
46.5632470173297	39.8204376459209	24.848385556692	45.8348	38.3992	25.1619
44.3863998033927	38.3111851328815	23.5769854062121	44.3864	36.3116	23.5359
41.4412000437661	38.3111979558098	23.5769412471201	41.4412	38.9568	21.684
38.5608357845448	38.3111987948865	29.5203985921749	36.9556	37.1182	29.5204
38.5608360981466	42.2405667956835	30.8827009059012	37.7223	44.0563	30.8827
39.021971723593	41.3535229983708	38.3128917774653	37.6461	42.0792	39.3984
41.9343994698582	34.8635075001098	38.9519011638589	41.9344	32.8635	38.9519
43.3948462036232	35.4289831518823	40.1921620095027	44.5785	34.1629	40.8334
43.9619028414932	37.0845949823159	40.9139375591799	42.5333	36.3249	41.241
44.8121464152879	40.5045277341303	41.5725252685374	44.7486	39.7162	41.5468
45.6697814576559	46.3001794061141	42.2332013966349	47.084	47.7144	42.2332
44.8561652960684	43.1204923579389	46.8759069987931	45.8095	43.1051	48.3862
43.1694630417369	40.0275184459812	47.6919668711885	43.5486	39.6053	49.4906
35.3877077866493	38.8387992407957	47.9843835860797	33.3877	38.8388	47.9844
37.1256919341687	36.0489996838445	48.0562383738813	38.1953	36.049	49.7462
37.1256907870224	27.7465037505656	45.9363996604108	37.8149	25.869	45.9364
31.5591494352339	28.700132310731	42.1478947475145	31.0534	27.3935	41.3669
28.8127997308657	30.4765003615146	40.3516069190536	28.8128	30.4765	38.3516

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.0814232922313	33.0248638725039	41.2647874819773	24.2607	34.0424	42.9391
24.0814232922313	33.0248638725039	41.2647874819773	22.8416	32.9746	42.6888
22.9927533502741	33.2260023893707	41.3602950039262	22.0871	33.226	43.1435
22.9927534098063	33.658117688114	33.6056818886927	22.2385	33.2025	32.4261
22.9927534696521	34.1148919024495	31.4349002988258	23.8984	35.8981	31.4349
22.707601896991	30.2033864213448	29.9238227875877	24.4655	29.9184	30.3851
22.2141485497552	28.1988919654375	26.206522133705	23.4789	26.9268	25.8998
21.2852155833248	27.5120424693196	24.2038795776836	21.333	28.4534	22.585
20.3105687646351	25.3441871308637	23.7525787549905	20.1974	25.6106	23.6453
19.3501039100143	23.0012027855378	23.3041727959804	20.821	23.0825	24.0822
16.9866186616621	20.4536451535622	22.7791110845278	16.5052	19.9903	24.3242
15.4200001001207	18.7799581203504	21.9590180990391	15.42	17.0914	20.8872
13.9395994810986	18.7799596788016	21.9590174862166	13.9396	19.5452	20.1112
11.9589153155519	18.7799591460715	22.0003923617721	12.6858	19.6571	22.2672
9.20949981115621	18.7799586129835	22.0416858822938	9.20950000000001	19.5087	23.9042
5.86057033035739	18.779939877728	21.9897888976896	5.3173	19.9696	21.9865
3.4838288627486	18.7799211368774	21.9378456806036	1.5116	19.0597	21.7588
3.48382729044026	14.5125060540137	21.9378170247704	3.6086	13.0876	23.3357
3.48382568773582	14.5124780048336	20.5487069470504	2.3396	12.8751	20.4499
3.69536355417847	15.3891746542031	20.5486922770125	2.785	16.9995	21.2146
4.83695578451699	15.5150212123257	20.5486775695595	4.8686	17.5054	20.7421
4.83704194526706	15.5150203456614	19.0941989127025	6.693	16.2603	19.0942
4.10027546350129	15.0933956933146	11.4260908974019	3.5607	15.7968	11.1608
3.40788831089037	14.650619366271	5.66228292837958	2.2625	16.1551	5.423
3.0831301312186	5.75146464843873	3.71807591864496	1.2522	5.4022	3.551
2.8837021498577	3.6738068372789	2.27070161204874	1.729	2.5191	1.116
3.7105982742066	9.51127192836661	2.43545630802428	2.5621	10.2967	1.629
4.97161004370179	11.7053849632756	2.60849085306042	4.24299999999999	12.8676	1.4876
7.77406959759163	12.5781915232004	2.80408912712903	8.40090000000001	11.7989	4.4087
8.65000041340886	18.3152785140107	2.94478666134346	8.65000000000001	19.7295	4.359
9.98555760099444	16.7557134042277	2.22849464481208	9.00749999999999	17.4052	0.9316
14.747899835374	13.1899184390865	1.75471630627391	14.7479	11.7757	0.3405
17.8010316864892	16.5844508443538	4.87229952309566	19.5822	17.4941	4.8723
16.3010999737089	16.5844507536141	6.37254024324962	15.9493	16.7531	4.9236
15.0047495444264	16.5844506627091	10.5092563711892	14.7151	17.4542	12.2868
15.0047448428129	14.9308940112955	10.3468481790013	14.5843	15.7568	10.6354
15.0047401414123	12.7877012977624	10.1832697402009	15.3264	12.7877	8.2093
11.4562584519878	12.0345343287762	10.2681318666974	11.3126	12.1774	8.305
10.5423527207655	10.139888489982	11.3190689821413	8.6382	10.3371	11.0732
10.3299183142994	3.54092030783783	13.4232549108778	11.5168	3.287	14.9558
9.41740011240186	2.46513011396849	13.6173028833876	8.02670000000001	2.1019	15.008
10.0742115251929	2.46512769449646	10.8982477979594	8.95990000000001	2.5066	9.8186
10.9362136081076	2.46512527502117	9.50602450017475	10.31	1.5005	9.6337
11.8979725816025	2.46512285586433	8.06539871097097	11.169	1.5527	6.9406
13.2083966575903	2.46512043728121	7.17511145857491	13.2084	1.5682	5.3875
13.540638771103	2.46512324700413	8.45160719498651	14.8098	1.8409	8.2695
13.8403741316877	2.46512605693157	9.81034442780276	13.8628	4.3052	10.5937
13.8404676064345	2.31241326506754	9.81034603005127	13.7484	0.7577	11.0651
17.6369157273818	2.31240838508321	9.81034643701001	19.0824	1.094	9.1576
17.4468950726175	2.71166135962188	13.2475535677142	18.2952	1.0836	13.7585
17.1998861981349	7.84559302225147	14.2304309363837	16.2452	9.322	13.5564
17.0053531245457	8.3742215838269	18.4243092635959	18.8587	8.5087	18.9878
15.5941630913193	8.82661287820157	19.0586704224264	15.4595	7.4752	20.3496
14.41755786885	10.1086436765787	19.3987725362271	12.8565	9.4609	19.9198
13.863605532209	12.6990985649999	19.7066049274148	11.8636	12.6991	19.7066
18.3529825700962	13.5219820222094	24.0244996309239	19.7672	14.9362	24.0245
18.0482817908112	12.9761991367116	25.7708245505544	19.0819	14.2893	25.2658
17.6794044944036	12.069866970847	29.1809411890003	16.6256	12.3206	29.6782
17.3372142696259	11.1210983351305	31.7281941424705	17.3372	11.1211	33.7282
17.2264730130666	8.62197729494007	31.7281926253869	15.5961	8.5134	30.9972
17.1274841743921	6.50905976337885	31.7281911085785	18.047	6.7045	32.7171
17.0262087097762	4.16737623195528	31.7281895912468	18.6523	3.9117	30.6336
10.6256160433235	3.65675078126835	31.7281880777844	10.6256	1.7583	32.3574
10.5352302363971	3.69480864658181	31.4232338933169	9.42529999999999	3.1222	32.8197
10.453843971871	3.73383810307227	30.8482921877134	9.9632	1.8111	30.9688
10.3989040796795	4.26882725269097	26.3868971177556	10.526	3.779	24.6321
10.3435186383579	4.94132971557686	25.757819530758	9.7281	5.4172	24.1163
10.2893735405903	5.48469444876731	25.4007965465454	10.2894	7.4847	25.4008
5.78886036721622	5.48451147078353	23.2903838674843	5.20059999999999	6.8919	22.4547
3.94730112491587	5.48432849421651	22.2311740155302	3.9473	4.1638	20.7291
3.21615986635122	5.4843355990842	22.4833641821302	4.0211	5.0495	22.5141
2.40788935544025	5.48434270433941	22.7354062607675	0.421099999999996	5.2548	22.7354
3.00929638782088	6.39404550218011	25.6266649185473	2.7247	6.6491	25.454
3.62463955422297	7.27718277778739	28.7238180572945	5.6246	7.277	28.7239
3.6248173069518	10.5189562306522	30.2056999739847	5.0355	11.9367	30.2057
3.50336108323833	9.8508953436163	31.6194749889287	2.67230000000001	10.4123	33.2768
3.40370543170334	6.15350002957244	31.8542084973583	1.4037	6.1535	31.8542
3.40370524360185	2.64662284913404	32.5563687988456	2.87569999999999	1.3778	31.3806
3.40370505608752	1.8245114240518	34.3257995318385	2.4773	0.052	34.3258
3.81996689056736	3.01964432806271	35.4300904134733	3.8933	3.6617	34.8265

Solution x	Solution y	Solution z	Original x	Original y	Original z
4.23427442046047	4.08319896774796	36.6671842636783	4.1027	5.9391	36.7092
4.67274827663941	4.44348493159448	37.847331638348	3.9756	4.3104	38.409
5.13400732695841	4.80651457103352	38.9140831147827	5.6082	3.0104	39.1925
5.50520386862067	6.10438884696274	39.716175452022	5.49809999999999	6.1028	41.7036
5.88774757898054	7.42515653005699	39.7607198337856	4.1301	7.1548	40.2018
6.73693312019554	9.28569644371493	39.8045714782455	5.4781	9.3534	39.1694
7.90739390888899	11.0866962204463	39.8487276317433	9.9074	11.0867	39.8487
7.01882829764767	11.4424653629649	40.02227410483	8.098	10.1576	40.7441
3.17198954145168	11.9966533996744	40.1803345608622	2.4532	11.1564	41.7483
2.49140136448538	14.4710003086158	40.2926938282337	2.4914	14.471	42.2927
2.04186791810182	18.8289217710989	36.4377692574118	0.782799999999995	19.7397	35.1787
10.6673836518569	18.8289195840155	37.8038022201096	12.3192	17.7013	37.8038
10.6673853764792	18.8289195073167	41.8653991700849	12.295	19.9912	41.8654
5.70300726936823	18.4187806404144	43.3195455563998	4.753	19.8404	42.7266
4.569345658347	17.7150624847368	47.1612177822104	4.024	17.3232	48.8138
3.76260051470497	17.1173951336736	47.9095936219611	3.76260000000001	17.1174	49.9096
3.02949673536473	5.91440032501752	47.9095933727554	1.2192	5.9144	48.7598
3.12987809068898	2.49043002365022	47.2869368534135	1.2646	1.8964	47.5137
10.8668059004911	2.20380879749251	44.5306882782645	11.5459	0.8736	43.2005
10.8668058235775	5.41194793102995	44.5737748731541	8.8668	5.4121	44.5737
11.7170094924391	5.43239250234079	46.1415074117038	12.1595	5.1953	46.5778
12.5239034325142	5.45285203673764	47.5765657943187	12.5256	4.7007	49.4275
13.266600541558	11.5535127355515	47.5848508362937	13.2666	12.9678	48.999
14.3430108053104	10.093703700783	46.7463889477235	15.7685	10.3669	47.703
14.9375743478411	8.2700616920572	45.2937995320652	16.1355	6.6685	45.2938
14.9375717984644	8.64859708112185	42.3179190475447	12.9432	8.6486	42.1679
15.381245526114	8.86829340128769	42.3179037277825	15.3812	8.8682	40.3179
18.0153956037153	11.0833027215953	42.3178982804866	18.0288	10.2093	41.4498
20.6287441169524	14.8514967542239	42.3178928338145	22.1476	14.8515	41.0167
19.8934064973401	15.1905037249775	44.1135001227854	17.8934	15.1905	44.1135
20.9658503652248	17.2890265980571	45.9291903886884	19.3111	17.5672	45.5963
28.769195105779	18.919166496722	48.5065659293539	29.6006	20.2054	49.7928
28.7691938223611	16.793098417699	38.67650133939	30.7692	16.7931	38.6765
28.6148921633015	10.2266063235106	35.9223021175295	28.6149	8.2266	35.9223
27.9644065046748	23.2029986827033	35.3118980386419	25.9644	23.203	35.3119
29.4738837357931	24.4215614266848	33.0203576859274	29.0027	23.8765	31.3376
33.1580471616802	27.0972673946247	32.4656127685418	33.916	28.6484	33.3227
33.7351964027351	27.3963670059924	26.7830005752499	35.1494	28.8106	26.783
33.6999541378969	24.3326501876502	25.1978105277301	35.5448	24.2684	24.4525
32.1964996597527	23.5710063245352	25.1133818197148	32.1965	21.571	25.1134
30.1713706355773	24.0099760618588	22.8076035148336	30.3241	25.8121	22.3846
27.2772123587449	24.2574386584469	21.6290401475793	27.0718	22.4926	21.0532
25.479586054989	24.7025524756145	20.9315414171507	24.5672	24.4137	22.4773
24.6712064680958	25.1947106704821	17.3648428575239	25.1657	24.0751	15.8892
22.2758155937283	31.8566999595507	17.0023202392789	20.8616	31.8567	15.5881
22.4017190957865	36.8795835308368	17.9061904218494	20.4824	37.2243	17.8497
22.7939605905427	37.7334311607228	18.9703517171376	23.8226	36.8408	17.9115
23.1185031934038	39.140681523394	21.4816819488494	23.1185	40.5549	22.8959
27.4444444043125	36.1976425284448	20.5272945276285	29.0396	36.1372	21.3542
28.2080833225222	33.5698790465566	18.4700380576861	26.8183	32.6012	18.9499
30.170400389089	32.5090523059792	13.6821102882106	30.1704	30.5441	13.3093
33.722798260657	34.608998733833	13.682106436264	33.7228	34.609	11.6821
34.7213821471491	35.5262010360346	15.7865812000448	36.1356	35.5262	17.2008
34.2349344691381	39.6579169123278	15.282220536289	32.6554	40.5505	15.9859
34.0708151429243	40.0511020822582	8.3676214308339	32.6566	40.0511	6.9534
36.3020012362526	42.0817964124135	10.6235313484001	36.302	43.7274	11.7602
42.062199380131	42.0817971016058	10.6235333756361	42.0622	41.0674	12.3472
44.7376985972883	48.2657002445344	9.75820746659083	44.7377	48.2657	7.7582
45.620880264275	69.5204000319215	11.9262799675217	47.0351	69.5204	13.3405
39.3353998871443	88.2437794393821	9.46782087168874	39.3354	89.658	8.0536
18.8956832612244	87.2239773279339	12.5254397889983	17.1642	87.7833	12.5892
18.1703191184639	85.3967416367187	15.2015024313209	17.8311	84.5721	16.3475
17.4908987115024	84.1136657848015	16.6413255046285	17.8246	84.0918	18.5648
15.4215106254854	82.9517200051023	16.7989802316135	15.4215	81.5375	18.2132
15.3297378259554	83.1377343796238	14.3734411489247	13.6279	83.3943	14.3913
15.244521677268	83.319400446623	11.9015968877904	13.617	84.1913	11.8486
15.1686227540853	83.4781758226195	9.69788350023416	17.0206	82.7787	9.6966
13.263257099329	84.1860725692932	7.52066423572845	12.6448	83.0865	6.5696
11.915586589487	85.1683400168353	6.25576089923889	10.8331	85.8288	6.1261
10.8942820049226	86.0286576730755	5.0333565861244	11.6247	87.7046	5.4339
5.38700106430544	86.3619093159587	2.37917623690644	5.387	87.7604	0.9494
4.48420739310717	86.3618689647756	6.18484771853604	4.4842	86.5445	8.1765
4.01950786354175	82.6706104374449	6.18485052208385	2.625	81.2761	5.8521
4.86834290362559	84.1787487918286	10.3173264393148	3.3964	83.4982	10.9781
7.78381996851581	87.8823221542836	11.9441546282158	7.74030000000001	89.8119	11.7653
11.8956740166509	88.0979781740991	16.8566644290463	13.2856	89.4879	17.2258
10.6041005978072	86.9549004944374	16.8566667878463	10.6041	85.0219	16.3433
9.83568039130653	87.0450622198127	17.7338435721565	9.9966	85.8576	17.8499
9.04774094860886	87.1372483888944	18.5927903504713	8.87560000000001	85.3213	18.2881
8.36898207564542	87.2500204723162	19.7951898930392	9.2565	85.6186	20.1316

Solution x	Solution y	Solution z	Original x	Original y	Original z
5.19366776875256	87.4036152808283	20.5690813936041	5.1953	87.1361	22.5444
1.64498530292249	88.7795868666181	20.5918604392966	1.0919	90.7016	20.5918
1.64498326591722	83.8169387879197	20.756503203361	2.5389	82.9669	19.2333
1.64498122638669	83.5176672684889	22.6092005217396	0.247299999999996	82.0871	22.6092
4.05990351453096	83.5176695472036	26.7595961022128	5.1015	81.8103	26.7596
4.05990813961058	86.0049655407991	27.7830062310589	2.0599	86.005	27.783
6.22134113519593	86.2530577000404	30.6264208580033	6.0677	84.3942	30.725
9.52199494031854	86.728790405494	32.82629998667	9.52200000000001	88.7288	32.8263
9.95357659191123	86.7287891609891	35.0447950794433	11.8372	87.4011	35.0448
7.9374445228982	86.0878635002893	35.3009479838661	7.47969999999999	86.7529	34.8532
6.18186403805311	85.3968670987133	35.562001089801	6.7503	86.812	36.4409
1.87023241372199	83.7264668548835	35.7922094193442	1.19329999999999	81.8445	35.7922
1.87022971928141	83.7264684828132	44.9094911332317	0.0289999999999964	82.9455	44.9095
3.09099021377777	83.7862219216434	45.0917025361823	5.09099999999999	83.7862	45.0917
2.70816393336929	85.2862087819786	45.4376455417222	2.696	85.7661	44.4643
2.32522557274454	86.6138774398603	45.8068538903783	1.983	86.3665	46.2259
1.94921472249003	88.0121177725331	46.168072365956	0.775099999999995	88.6342	47.6629
1.94921798478582	88.012118474774	43.1863209007872	1.5647	88.8122	41.3941
2.83820023618364	88.0121127234056	43.6501408366968	1.82250000000001	87.776	42.1327
7.973627717611	88.0121069723828	44.9879090774999	7.6764	88.6806	43.7076
17.051893106667	88.0121012204669	47.7420335185579	17.0519	88.8308	49.5668
17.7281733656469	86.9482989952355	47.7420353251273	19.3715	86.9483	48.882
17.2642332142353	83.2916914070677	47.6314567347009	18.7876	82.3448	48.1119
15.6070942724372	82.4951171412722	47.5141900441238	13.8296	81.5783	47.5142
15.7180071901288	82.4951172669194	45.2799989013514	16.072	81.5553	45.6344
15.8281601383689	82.49511739281	42.6718095523686	15.9151	82.9337	42.2853
15.9381743583532	82.495117518678	40.3996912387385	14.2245	83.0966	40.7659
16.0728165178511	82.4951176442376	29.0749968446577	14.2132	82.4414	28.7174
16.2792221692478	82.4951177700333	27.3452459094708	16.2773	81.3093	25.7994
16.4864043631216	82.495117899735	27.1496885158864	16.4864	81.6235	25.3496
17.0817129467393	82.7754843369303	28.0999153888511	16.887	83.4344	26.4901
17.7189901920562	83.0297552200658	34.7847696685525	19.7188	83.0222	34.7895
17.7197938423078	88.6602399151422	35.1794833490309	19.4915	88.9148	34.46
17.720606007621	90.1689081003053	36.037072576066	19.5543	89.8549	35.5989
17.7214249817627	95.5635947705714	38.0165000372689	17.7167	97.5636	38.0165
28.0528719412326	95.5635958243062	38.995800305287	29.7505	96.621	38.9958
26.5449776230917	85.2401092016081	40.3125667797486	26.3736	85.6358	40.2837
25.08630845869	62.9571928521128	41.6368077982028	25.0595	61.5431	43.0509
25.0862630107283	66.7837932136669	30.7817060997942	23.9463	67.9458	29.6197
25.151759271018	50.8135435735149	31.9111775914708	24.5323	49.8988	32.6923
25.2179059006527	47.2297373005321	32.8507045619303	23.5397	47.0618	33.8948
27.0169002267884	46.658298819715	32.948592664158	27.0169	46.6583	34.9486
29.1901975638835	45.591383881922	29.2620682285805	28.4876	46.0461	28.1502
32.7116979172774	44.3760858249989	27.4438592063084	32.7117	42.3778	27.3609
33.3483141147771	47.2687709844416	27.4438382093836	35.3466	47.2689	27.5268
32.1910439038037	47.2814537384879	25.033002897383	32.0569	46.2162	23.8838
31.0932079540287	47.2941927665806	23.7875995859398	31.0932	49.2942	23.7876
30.928218881508	47.1592125803557	21.9021237877296	32.0319	48.7602	21.6234
30.2986627539003	45.716699584485	21.3140486142113	30.9136	43.9894	21.9238
27.2789000889503	45.4795067895334	19.1307003935948	27.2789	43.4795	19.1307
24.5313068118462	48.1753997608829	17.6769990669989	22.5313	48.1754	17.677
24.5313140763699	50.0381087333083	12.79627340786	25.2216	48.8368	12.0716
24.5313213401957	57.1260057327925	10.5469997542438	25.8602	58.6207	10.547
23.0851817990613	50.1183192715162	6.38596144530564	22.4944	48.7727	6.2361
21.9253003727748	48.2131983014766	2.84853935040221	20.1897	48.2132	1.8547
21.9252995440831	31.0892925273428	2.84853639776445	20.5677	31.0115	4.2467
21.9252987173171	27.3566610783304	2.84853344153282	22.5985	27.2784	2.308
21.925297890475	23.781526218513	2.8485304855127	21.8127	22.4456	3.4445
21.9252970637436	22.252245928679	2.84852752912838	20.9805	20.9752	1.6334
23.8361191156352	22.2522497567363	2.91653645329835	23.4201	21.9457	1.1934
28.0593391326503	22.2522535854307	2.99035564948556	28.392	21.3903	1.2616
28.7644386016972	22.2522574214851	3.12381350425809	30.4469	21.4825	3.8833
28.7644393035389	31.3008942821588	3.12381740599194	30.555	31.3009	2.2328
28.7644388446197	32.897815959204	3.1238242384206	28.4031	32.2444	2.4033
28.7644383857717	34.8522240897884	3.12383107144458	29.5705	36.67	2.9094
28.6571889038024	33.6537853763021	6.88110397303803	27.0476	34.4285	7.3345
28.5638008002566	26.5008010459274	8.35514660401195	26.5855	26.5008	8.649
29.2587310099215	25.1927075314086	8.35515184548618	27.7157	24.2487	8.5851
33.6714999486639	24.5306587038917	8.35515708541803	33.6715	23.2449	9.8871
37.3152274151759	24.5306607721188	6.06402442620813	38.8284	23.4703	6.171
37.924302358494	24.5306628416975	3.10448257779295	37.9243	23.9119	1.2026
41.200419042166	30.8692502275185	3.10448913786469	43.0635	31.4686	2.6925
41.20041858953	30.8692543992836	7.35600407312473	40.4113	32.0356	8.7762
45.3871728503368	29.4946374404221	7.22222629326419	45.8434	28.1097	8.3609
46.902250615666	28.9973862192737	7.06675271760583	47.7847	28.4345	6.8217
48.1218953945273	28.5254072599778	6.91230175725646	49.2766	27.3707	5.7576
47.8951111022564	33.5024653182509	7.36551357738188	48.8851	33.6728	5.7706
47.5874103141405	35.9894807442549	10.4015002641749	47.2998	37.9687	10.4015
47.587404930406	35.9628649172767	15.9706720746768	47.3754	37.9401	16.076
47.5873995544627	33.2258166631424	16.4206360910917	47.2249	31.4694	15.6819

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.5873941800442	32.9920541405544	18.1971025089315	49.5874	32.9921	18.1971
47.3774285123699	30.1924543287014	20.9999851340916	48.0614	30.3792	22.0976
47.1603642531203	27.0109141991958	22.6378751569324	48.2875	25.5427	23.29
43.2078217566485	26.8420900310808	22.9562791148083	41.7938	26.8087	24.3703
43.8106983292759	26.8420532520795	18.5469150302454	45.5527	26.8832	17.5652
39.2493305304623	24.6202997989101	18.5469155523592	37.4163	24.6203	17.7469
41.9065919200676	21.4419653478725	19.3893952058126	41.315	20.08	19.8292
47.3119999236269	20.1149989165434	20.1432931883993	47.312	20.115	22.1433
51.5005816821177	12.362500558284	14.812718486062	52.9148	12.3625	13.3985
44.5558180161421	10.6221185163846	26.5196988283358	43.1416	9.2079	26.5197
45.5569976685266	20.5335904587803	27.3842246019163	44.6412	21.1681	25.9788
48.1411261185432	22.4422077846158	31.8089133395616	49.2796	22.4102	31.3443
49.744600823328	24.3766923513819	39.5088996728373	49.7446	26.3767	39.5089
57.264461201189	11.4374800638046	42.4333392946234	57.0413	9.9678	41.9779
73.922499994516	9.63949962537308	47.6475907379135	73.9225	9.6395	49.6476
84.9979000067463	5.98910909702303	22.3271000509084	84.9979	3.9891	22.3271
93.7855387774275	9.4701003965283	5.99875640374802	94.4757	9.4701	4.1216
93.7855404343237	23.8809468168211	5.99876244830473	92.0943	24.688	5.2999
94.3951393987869	23.8809519173138	25.6004175750494	92.9329	22.8145	25.5988
96.2067095655889	23.8809570200604	45.7532088620228	97.6128	23.6668	47.1593
91.195599972891	44.5872887790792	37.0514999966445	91.1956	46.5873	37.0515
84.8428428745983	43.4814576575394	27.491457912826	84.8772	45.0654	27.1944
77.9829184871522	40.05834214111	22.8985874230474	78.1743	38.6355	23.4376

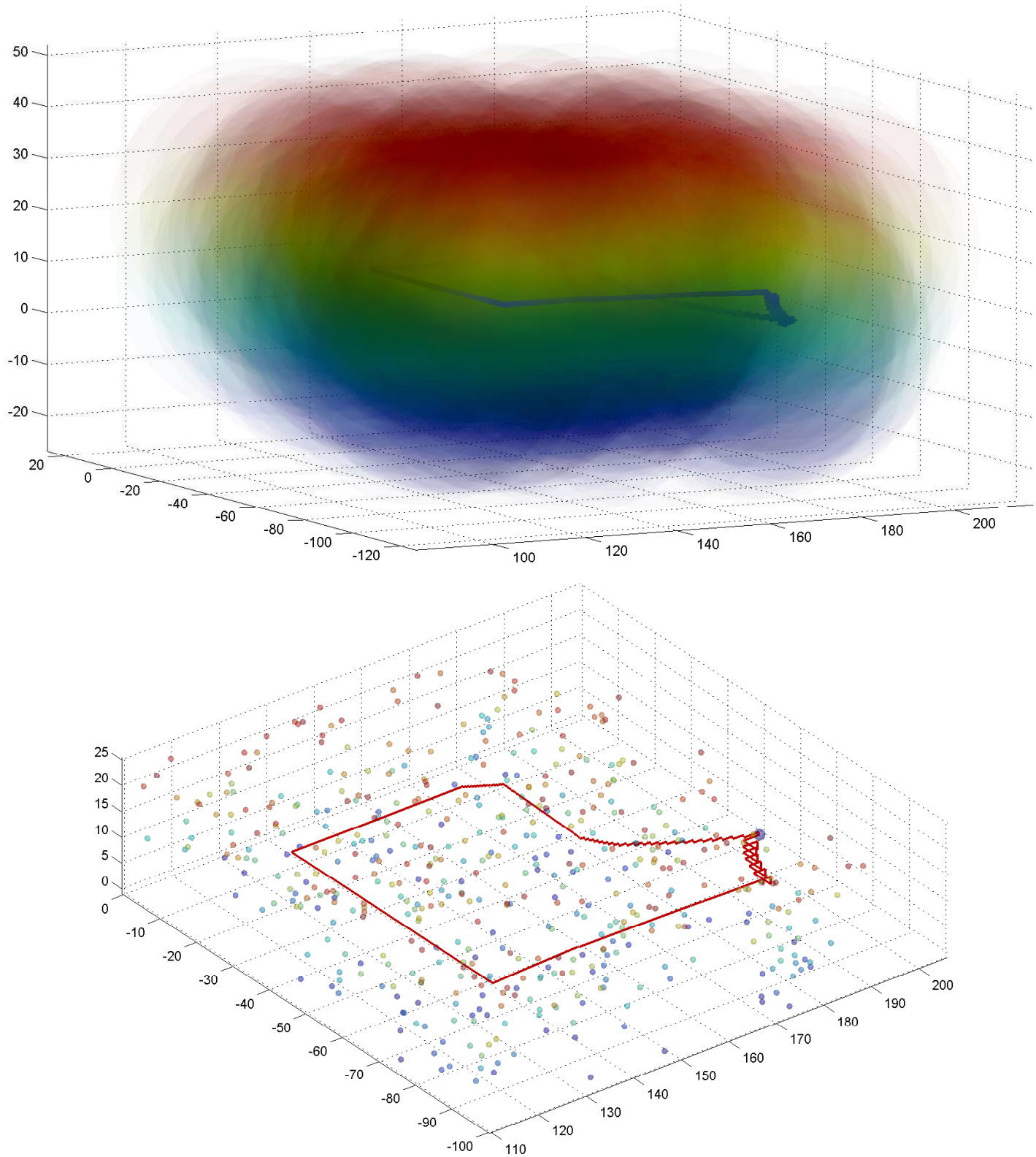


Figure N.172: *team*6_500, Equal Radius, 3D, Manhattan, Length = 289.8068752

Table N-175: Solution for *team*6_500, Equal Radius, 3D, Manhattan

Total distance: 289.806875223691 Depot: x 95 y 50 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
91.6058037047934	53.7921407562402	1.62645965006751	78.4065879	56.8222853	10.2773712
88.5908521407447	57.5397887848628	3.21981949599118	79.80288	56.0883078	18.4129389
85.7821812115365	61.4548546041147	4.77034534437913	79.155929	54.6404138	23.5670664
83.1612587233339	65.8165236163352	6.23834477161163	77.5651358	71.0148631	15.8380209
80.6555017209866	70.2455781899256	7.69199936873082	78.4106856	73.5257917	13.7197973
78.2305686690714	74.8512964204026	9.14180105011912	79.9522127	98.0359405	21.2412381
75.6527414339554	76.3401923520451	10.2210464648435	75.4923392	99.8090463	23.5616918
74.8033719155629	76.3504881740933	10.2386205532064	72.4566884	79.8068651	12.2176684
73.9625396287599	76.360791252763	10.2561971710201	67.7945884	81.6777909	13.5506647
73.1326746742169	76.3710997103075	10.2737758723126	66.8428254	74.9418962	18.8280244
73.1326746742169	76.3710997103075	10.2737758723126	73.2290706	73.9762718	17.115174
72.3185477959061	76.3814245788511	10.2913517666717	67.3900644	74.174693	20.6721334
71.5130823870139	76.3917562563965	10.3089233911455	73.7932186	65.1929118	21.2635249
71.5130823870139	76.3917562563965	10.3089233911455	74.3685871	61.179785	20.6768635
70.7113406982627	76.4021106974665	10.3264839754346	70.748982	60.565778	20.2126548
69.9142148532295	76.4124769351036	10.3440400750508	69.1126526	61.5737532	13.3447692
69.9142148532295	76.4124769351036	10.3440400750508	75.0689318	72.4744486	0.4051745
69.1206283731456	76.422853735865	10.3616115023044	65.5436157	56.992435	13.1266946
69.1206283731456	76.422853735865	10.3616115023044	69.6306367	57.4599551	14.1507992
68.3387997873176	76.433253074777	10.3791861446343	64.4880133	60.4854675	12.6069191
68.3387997873176	76.433253074777	10.3791861446343	66.0988248	58.3515559	13.6719306
67.5692469756295	76.4436695487106	10.3967654640242	61.6781701	59.473286	10.2741841
66.8085580894299	76.4540945340907	10.4143514328871	45.6990417	60.3070344	11.94067
66.8085580894299	76.4540945340907	10.4143514328871	48.6878693	60.2173135	5.6974781
66.3219274013094	76.4645863947896	10.4319445425445	43.8195847	68.1613988	20.4285954
66.3219274013094	76.4645863947896	10.4319445425445	50.8238583	67.1806384	20.6239323
65.8975385645952	76.4750817002382	10.4494871478251	51.8847181	57.7017397	23.1071854
65.8975385645952	76.4750817002382	10.4494871478251	56.0822206	62.8731122	23.9833277
65.5423303821627	76.485649572435	10.4669057724459	50.7478618	74.0551131	24.8207298
65.5423303821627	76.485649572435	10.4669057724459	56.5346421	68.6367247	22.9662555
65.1939809227499	76.4962077966669	10.4843008744013	57.43771	71.1535593	20.5447257
64.8475841320635	76.5067638394899	10.5016914219995	56.7397866	71.0931061	18.3430984
64.8475841320635	76.5067638394899	10.5016914219995	58.1838222	68.9986011	16.3418061
64.5051331917827	76.5173204446031	10.5190791115386	57.8283627	65.6998258	15.4827548
64.5051331917827	76.5173204446031	10.5190791115386	63.772212	68.1836695	14.3458559
64.1657665158443	76.5278836582388	10.5364666018079	57.0800315	64.0172849	6.0370203
64.1657665158443	76.5278836582388	10.5364666018079	64.6626599	65.39963	6.8345581
63.8296489395758	76.5384633241756	10.5538600787783	54.3749565	73.471727	7.5546522
63.8296489395758	76.5384633241756	10.5538600787783	61.6425082	72.8564323	6.6704147
63.4973414605734	76.5490495223852	10.571259106274	64.4543682	70.2655389	2.1929672
63.4973414605734	76.5490495223852	10.571259106274	68.5426632	70.6500378	2.313903
63.1664031820898	76.5596509673402	10.5886703330527	74.4567732	73.8913977	2.9219836
62.8346217176973	76.5702594583508	10.6060873386535	77.2293497	82.6694496	0.4080071
62.8346217176973	76.5702594583508	10.6060873386535	75.4040099	79.0607348	6.3376777
62.499340584506	76.5808847757988	10.623513685228	71.4909917	88.8238404	7.979611
62.499340584506	76.5808847757988	10.623513685228	77.1265753	88.6843079	7.3792466
62.1607545156012	76.5915273196428	10.6409405723739	71.5874534	94.5399994	3.1033191
62.1607545156012	76.5915273196428	10.6409405723739	72.4289329	91.88372	3.0217722
61.8189577051712	76.6021646089912	10.6583795612968	74.8496365	95.8479299	7.1137605
61.4725229791276	76.6127853305542	10.675823252307	76.9820609	94.8106777	15.132467
61.4725229791276	76.6127853305542	10.675823252307	75.0360354	91.1497098	19.4705099
61.1153682149399	76.6233810684615	10.6932554488475	77.3466754	92.4222135	24.9773835
60.6144320753658	76.6338816380901	10.7104892575211	75.6464183	86.4517504	17.8073467
60.6144320753658	76.6338816380901	10.7104892575211	78.2121151	82.5216358	9.4131561
60.1043567388695	76.6443889884529	10.7277259309985	69.765468	86.0199863	16.8900143
59.593974221597	76.6549015581178	10.7449627241369	70.4834315	96.1070737	18.6164445
59.593974221597	76.6549015581178	10.7449627241369	68.0410206	93.0677269	14.2384361
59.0747514045917	76.6653982982916	10.762192646782	62.6982725	97.3778678	18.7400798
59.0747514045917	76.6653982982916	10.762192646782	64.3381393	93.722702	21.2607142
58.5555296150873	76.6758828880051	10.7794100162047	64.9776601	99.8572829	20.7305349
58.0183378169472	76.6863349382085	10.7965952007289	61.0630253	98.699805	24.8594975
57.4700616346809	76.696750018884	10.8137203012288	56.5514993	98.5201232	15.0548231
57.4700616346809	76.696750018884	10.8137203012288	61.4066356	99.633296	10.2157007
56.9247069857008	76.7071503531569	10.8308454394227	66.3729212	97.9005203	11.9390694
56.3730048187988	76.717542615356	10.847970504559	66.5761879	96.7049476	8.0800553
55.8153630285396	76.7279296073572	10.8650995281005	68.523768	98.3881808	6.8534875
55.8153630285396	76.7279296073572	10.8650995281005	67.3268965	96.007007	6.0328841
55.2218273943982	76.7382945857439	10.8822440689381	67.0620012	97.8077872	5.6584534
54.6096717520965	76.7486482147982	10.8993975290601	63.7965883	99.8649883	6.5257645
53.977691594592	76.7589851836584	10.9165594270488	61.0701287	98.8683739	3.7920781
53.977691594592	76.7589851836584	10.9165594270488	63.2522018	99.6147456	0.7669575
53.1804181267923	76.7692375850526	10.9338291968714	61.1689993	94.8861498	0.1686343
52.3748068721789	76.7794865302827	10.9511125515024	61.0866811	94.7582572	1.1597592
52.3748068721789	76.7794865302827	10.9511125515024	65.7364961	88.9695394	1.2659879
51.5480031994568	76.7897322867686	10.9684207563096	62.3573907	96.159986	6.7572642
51.5480031994568	76.7897322867686	10.9684207563096	64.4754864	95.6952093	9.6236824

Solution x	Solution y	Solution z	Original x	Original y	Original z
50.6837210201033	76.7999620844022	10.9857369677642	62.5782193	94.8345715	12.3846974
49.8043283947475	76.8101847298823	11.0030532374272	64.0121883	92.7907393	13.624016
49.8043283947475	76.8101847298823	11.0030532374272	63.9530194	87.4245185	17.4311618
48.8925472696683	76.8203994960984	11.0203664403464	60.774398	89.648206	21.5223541
48.8925472696683	76.8203994960984	11.0203664403464	62.4719528	86.6470186	17.4140053
47.9561217256251	76.8306087004715	11.037668387143	59.1397084	81.6064397	24.1713239
47.9561217256251	76.8306087004715	11.037668387143	63.6802314	81.8267454	23.9676687
46.9866554317479	76.8408188652226	11.054946509069	56.1389342	85.561632	20.0765614
46.9866554317479	76.8408188652226	11.054946509069	55.0653569	81.234009	22.9552522
46.0097620509445	76.8510314039012	11.0722105160596	51.7496653	79.9144917	22.4057667
46.0097620509445	76.8510314039012	11.0722105160596	52.878421	80.2956919	22.1921533
45.0318405319499	76.861248987456	11.0894611396523	45.3765455	76.9954785	11.855076
45.0318405319499	76.861248987456	11.0894611396523	47.2434466	72.8348775	10.3871125
44.0659757678709	76.8714766818144	11.106714612753	46.8228713	71.844353	9.3127449
43.1042392745665	76.8817105390653	11.1239703129417	44.3710695	67.9205927	10.1383529
43.1042392745665	76.8817105390653	11.1239703129417	45.412979	71.2677197	7.8505587
42.1515875999974	76.8919595360756	11.1412309038977	50.0180258	68.4527432	3.6702061
42.1515875999974	76.8919595360756	11.1412309038977	53.0250996	68.7918887	2.0307378
41.1869282321917	76.9022240656602	11.1585053335898	42.9598051	72.0704928	1.9046969
41.1869282321917	76.9022240656602	11.1585053335898	45.5118999	65.9532613	1.4856264
40.2274738415591	76.912507472308	11.1757968130675	43.6827488	74.1878852	3.8851851
39.2706180749331	76.9227955889295	11.1930947304044	49.4827685	84.8462228	4.1362821
39.2706180749331	76.9227955889295	11.1930947304044	46.0567355	72.019762	4.0391076
38.3055463466787	76.93307847823	11.2104024412768	48.3895216	84.8378656	6.8593636
37.3343431380223	76.9433540875687	11.2277106926893	33.8269693	93.4852631	8.3635932
37.3343431380223	76.9433540875687	11.2277106926893	34.617789	91.6565199	3.2534463
36.3826392795224	76.9536128535674	11.2450228442012	22.9057445	97.6296948	0.3244356
36.3826392795224	76.9536128535674	11.2450228442012	38.2308224	97.9753907	0.1604725
36.3236077011903	76.9619727723826	11.2670420052842	37.6570142	81.9317057	5.2409906
36.3236077011903	76.9619727723826	11.2670420052842	39.6568849	80.0063838	5.1586736
36.2646100737134	76.9703393773139	11.2890767902913	38.0621359	81.3957333	12.1235509
36.2056298085218	76.9787083052238	11.3111118042486	40.9923031	81.1407106	10.4646561
36.2056298085218	76.9787083052238	11.3111118042486	43.3709663	79.9295648	12.3122786
36.1466513388121	76.9870814110611	11.3331535595234	49.7783583	78.4397036	19.1457188
36.1466513388121	76.9870814110611	11.3331535595234	46.3729602	74.0499355	16.6434815
36.0876048533272	76.9954615117168	11.3551863835229	41.3355343	82.7796974	17.0555529
36.0876048533272	76.9954615117168	11.3551863835229	45.3945603	79.9114427	16.0984045
36.0285442873525	77.0038452960652	11.3772200475006	44.680977	94.9895485	20.4805113
35.9694191736213	77.0122195528172	11.3992415615353	39.5709227	52.0192185	20.9490324
35.095412818513	77.0724297963331	11.411140625057	37.7594155	72.4638416	24.7804303
34.2244690663389	77.1328214753768	11.4230364819859	40.9379615	91.8870672	23.915222
34.2244690663389	77.1328214753768	11.4230364819859	40.3910959	90.932739	23.935083
33.3444279229822	77.1930046825591	11.4349205600118	45.8972803	89.1189208	23.3584238
33.3444279229822	77.1930046825591	11.4349205600118	50.0446513	86.3510967	14.724494
32.428953538603	77.2530769578157	11.4467974561987	49.7030604	90.8227548	10.5216088
32.428953538603	77.2530769578157	11.4467974561987	47.9098314	77.7959758	13.7573709
31.4669717079935	77.3131336424331	11.4586770140105	37.489488	92.2138591	10.0537289
31.4669717079935	77.3131336424331	11.4586770140105	40.8799687	90.9919823	19.2349904
30.4938488643479	77.3731009057074	11.4705549839013	30.1525293	91.7059859	19.8161573
29.526754959997	77.4330284405348	11.4824293145592	27.0999394	87.1794445	14.318048
29.526754959997	77.4330284405348	11.4824293145592	31.00496	87.5127119	14.2496673
28.5709673870226	77.4930310793368	11.4943038546422	26.8042407	95.3391438	15.0909578
27.6219827584332	77.5529111634982	11.5061767513068	23.9936704	92.6751712	13.4234383
26.6810592169454	77.6127227017169	11.5180494309128	20.7475398	95.759314	10.8106372
26.6810592169454	77.6127227017169	11.5180494309128	21.4283979	90.119601	10.9146393
25.7608762552199	77.6723611065399	11.5299243097511	11.9839899	90.8471274	5.5312557
25.7608762552199	77.6723611065399	11.5299243097511	19.6994488	87.7215703	8.9292535
24.8735110808623	77.7319264464624	11.541805731246	9.22639889999999	90.0124515	4.4717238
24.8735110808623	77.7319264464624	11.541805731246	9.5621792	88.5032381	1.7950294
24.0418344579334	77.7913594625026	11.5536993013548	7.5281123	85.6801168	11.1420674
24.0418344579334	77.7913594625026	11.5536993013548	13.5790401	86.3111074	8.8070912
23.2390049277915	77.8507632574175	11.5655949770611	5.6520223	82.6769432	10.5413091
22.4552090263729	77.9101659766213	11.5774912711175	2.4095765	76.567725	8.2487866
21.6964205137542	77.9696266072859	11.5893896700028	1.295681	73.7881021	0.4861457
21.6964205137542	77.9696266072859	11.5893896700028	6.0949397	74.0865476	5.2825592
20.9900504886654	78.0292991565688	11.6013015339193	6.2196931	67.2192158	1.3051514
20.9900504886654	78.0292991565688	11.6013015339193	6.6484375	67.6725429	4.7357573
20.3117900457487	78.089416235385	11.6132251675069	6.9413921	77.9428724	3.7844258
19.6419636813925	78.1496180755175	11.6251530766806	1.90777989999999	84.1438746	3.0185488
19.6419636813925	78.1496180755175	11.6251530766806	4.0094679	79.3774545	3.2513282
18.9991955307649	78.2098652185308	11.637092630701	2.2068367	85.97283	4.4333903
18.3696581266386	78.2700850818504	11.6490376146333	2.2885744	93.0945686	4.7870646
18.3696581266386	78.2700850818504	11.6490376146333	2.8109458	93.7321232	7.4419786
17.7755105902578	78.3299176634366	11.660992566627	0.0137857999999937	97.6201473	12.5524591
17.7755105902578	78.3299176634366	11.660992566627	2.7731053	90.8551563	10.3958831
17.2871413906886	78.3889822471063	11.6729446018038	0.604558600000004	98.8714353	15.0611354
17.2871413906886	78.3889822471063	11.6729446018038	1.8947773	99.155621	15.7943163
17.1086460751069	78.4389238679159	11.684778479015	5.3401207	99.7769332	23.3119522
17.1086460753815	78.1019325307728	11.684778478773	6.5131248	96.1438685	22.6159881
17.1086460756552	77.7588812003288	11.6847784785283	2.92961390000001	91.7761922	24.0474062

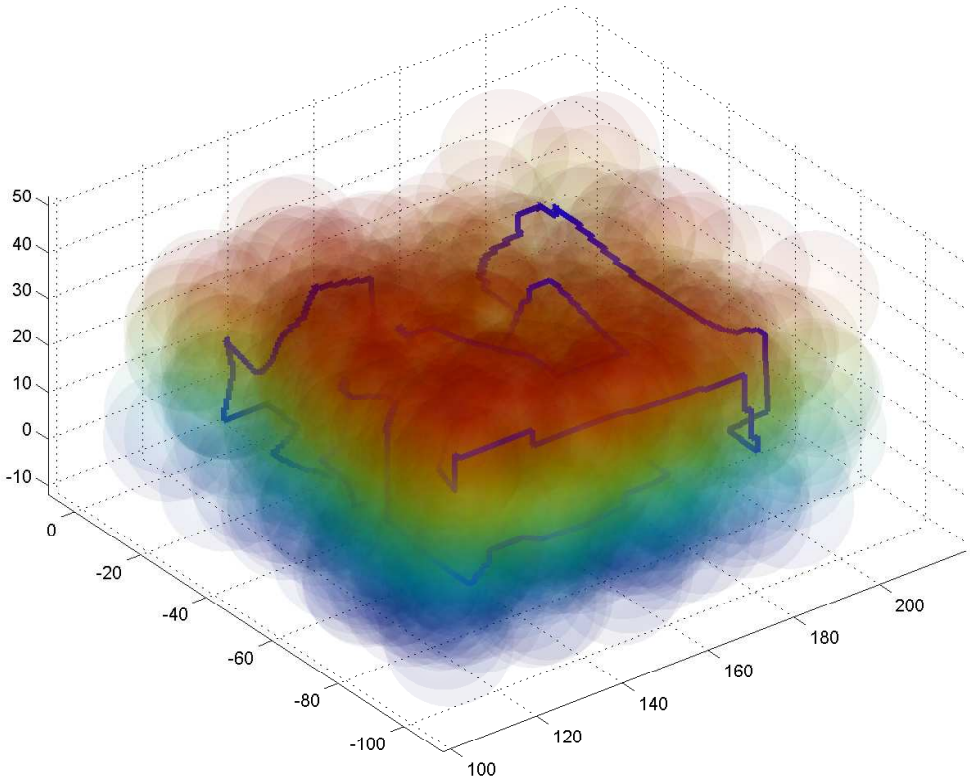
Solution x	Solution y	Solution z	Original x	Original y	Original z
17.1086460756552	77.7588812003288	11.6847784785283	4.0389978	87.3302987	23.4710958
17.1086460759291	77.4109808019093	11.6847784782814	5.5712407	90.2337915	20.7281907
17.1086460759291	77.4109808019093	11.6847784782814	3.4980922	86.0326352	18.0570339
17.1086460761995	77.061790245006	11.6847784780347	5.93926279999999	95.2323551	18.983803
17.1086460761995	77.061790245006	11.6847784780347	8.45094570000001	92.4898096	19.3229772
17.1086460764666	76.7063327711328	11.6847784777886	14.3875276	98.8261078	17.7695633
17.1086460764666	76.7063327711328	11.6847784777886	16.4819632	98.2716229	22.9610856
17.1086460767312	76.3318920086526	11.6847784775418	17.6447354	95.7025091	24.4008135
17.1086460769948	75.9500434081738	11.6847784772944	19.6070156	87.5155962	19.7643343
17.1086460769948	75.9500434081738	11.6847784772944	20.5127244	86.7993916	9.2772764
17.1086460772588	75.5679948971996	11.6847784770488	13.4475731	91.4293541	19.9118277
17.1086460772588	75.5679948971996	11.6847784770488	13.1891897	88.2938542	23.4034575
17.1086460775254	75.1826420663228	11.6847784768021	11.0262565	80.6460603	18.6716382
17.1086460775254	75.1826420663228	11.6847784768021	16.6661596	74.8364156	22.1285239
17.1086460777956	74.7993192142318	11.6847784765558	2.2118306	78.338365	17.5236695
17.1086460777956	74.7993192142318	11.6847784765558	4.2645198	75.4568775	14.9212902
17.1086460780655	74.4177477500511	11.6847784763101	2.73342340000001	77.6753662	22.8134911
17.1086460780655	74.4177477500511	11.6847784763101	3.24432779999999	74.1558976	22.7592184
17.1086460783357	74.0374360885859	11.6847784760626	0.2763329	64.7359652	24.1588067
17.1086460786061	73.6617288784211	11.6847784758134	0.933565799999997	72.1659561	13.9038289
17.1086460786061	73.6617288784211	11.6847784758134	0.795030699999998	63.4582891	12.408302
17.1086460788753	73.2902538388633	11.6847784755639	4.8021518	64.3437535	14.9149548
17.1086460788753	73.2902538388633	11.6847784755639	6.65024940000001	63.3598676	12.1766222
17.1086460791446	72.9233570421241	11.6847784753153	9.81425009999999	65.891213	10.4751695
17.1086460791446	72.9233570421241	11.6847784753153	9.6122245	63.4753738	1.8891309
17.1086460794127	72.5599211596959	11.6847784750686	8.7488745	58.9072962	5.1240813
17.1086460796808	72.199593380757	11.6847784748243	1.389212	56.8496436	7.9005554
17.1086460796808	72.199593380757	11.6847784748243	4.9451086	53.7479899	10.2966488
17.1086460799481	71.8508702789728	11.6847784745839	6.14577610000001	57.4553139	19.7085867
17.1086460802146	71.5056063122471	11.6847784743424	7.20936620000001	55.909681	20.1638147
17.1086460802146	71.5056063122471	11.6847784743424	9.41537220000001	53.1681384	17.4096726
17.1086460804797	71.1689138302488	11.6847784740993	3.2029124	51.042154	21.6188315
17.1086460807458	70.8682415796094	11.6847784738546	4.944301	50.787374	18.9241415
17.1086460807458	70.8682415796094	11.6847784738546	6.1363219	48.8674613	19.7646406
17.1086460810123	70.593618408907	11.6847784736081	9.4077401	50.7341371	22.0830838
17.1086460812785	70.3245710911956	11.6847784733606	16.954408	52.9270638	19.3144339
17.1086460815442	70.0580125812165	11.6847784731131	23.2467308	53.1536864	15.3512789
17.1086460818085	69.7937700486724	11.6847784728658	22.9209187	53.7233909	24.603033
17.1086460820725	69.5324426701277	11.6847784726175	19.3270801	51.9549025	21.8491926
17.1086460823362	69.2740014832892	11.6847784723685	18.474215	58.4012448	21.6380189
17.1086460823362	69.2740014832892	11.6847784723685	20.4303529	56.6155569	23.1754411
17.1086460826002	69.0187949399053	11.6847784721185	18.1200543	57.6122523	16.2352309
17.1086460826002	69.0187949399053	11.6847784721185	20.3908302	60.0437447	17.3381089
17.1086460828646	68.7662854095328	11.6847784718689	16.1987878	59.3187745	15.8426137
17.1086460828646	68.7662854095328	11.6847784718689	17.0586402	58.0717087	14.4615884
17.1086460831299	68.5164711901526	11.6847784716207	15.1928212	63.8863652	20.6093336
17.1086460831299	68.5164711901526	11.6847784716207	19.7736057	66.4248411	22.4431961
17.1086460833968	68.2681139151104	11.6847784713709	25.824676	62.4300357	22.6279041
17.1086460833968	68.2681139151104	11.6847784713709	26.1534967	60.2417469	15.9637624
17.108646083665	68.0219834455847	11.6847784711202	29.6716712	65.8677857	16.615982
17.1086460839345	67.7765000005321	11.6847784708695	32.0336769	81.0046037	12.2328895
17.1086460839345	67.7765000005321	11.6847784708695	35.1926471	70.9963316	12.3857242
17.1086460842102	67.5287351781355	11.6847784706199	32.5068688	76.0167984	20.6942387
17.1086460842102	67.5287351781355	11.6847784706199	35.4564008	78.9241199	21.2236154
17.1086460844864	67.2774411273861	11.684778470367	22.4809106	75.2843669	23.7038192
17.1086460844864	67.2774411273861	11.684778470367	26.7897314	74.395765	23.1412606
17.1086460847622	67.025519674895	11.6847784701111	23.1076735	77.6165558	13.9842376
17.108646085037	66.7732537436877	11.6847784698546	20.4274735	84.2677658	10.0950289
17.108646085037	66.7732537436877	11.6847784698546	25.8819635	79.9487476	10.2285525
17.1086460853105	66.5187157061402	11.6847784695992	25.1363027	82.596723	1.6788626
17.1086460853105	66.5187157061402	11.6847784695992	28.3264783	80.6515072	10.7169993
17.1086460855817	66.2613398691406	11.6847784693455	30.51178	74.0433946	6.2558417
17.1086460855817	66.2613398691406	11.6847784693455	32.7632095	61.4478694	17.2734289
17.1086460858537	66.0050938797946	11.6847784690921	21.5799527	71.4486566	7.5717836
17.1086460858537	66.0050938797946	11.6847784690921	23.2409835	69.6045703	6.9223743
17.1086460861233	65.7495859938256	11.6847784688395	21.4467307	69.0185063	0.8942161
17.1086460861233	65.7495859938256	11.6847784688395	23.3330747	67.4297538	2.1722534
17.108646086391	65.4950198902471	11.6847784685903	18.5593029	70.8497614	1.5511613
17.108646086391	65.4950198902471	11.6847784685903	21.6218153	70.9164832	0.5487705
17.1086460866561	65.2407951674371	11.6847784683448	12.9149435	73.6813943	7.0579
17.1086460866561	65.2407951674371	11.6847784683448	14.8230271	72.6203252	11.2037362
17.1086460869195	64.9865393647651	11.6847784680995	15.7168362	72.1075902	13.3837018
17.1086460869195	64.9865393647651	11.6847784680995	20.1950128	67.681815	12.2807597
17.1086460871828	64.7326843722552	11.6847784678521	17.9198509	62.5969087	8.2401641
17.1086460871828	64.7326843722552	11.6847784678521	23.9069485	59.9121563	8.8002389
17.1086460874471	64.480322842507	11.6847784676056	13.919931	46.2670929	1.9535236
17.1086460874471	64.480322842507	11.6847784676056	20.3277951	46.570702	14.9318681
17.1086460877109	64.2330032827075	11.6847784673586	28.8394854	85.6978668	0.4508897
17.1086460879809	63.0625439564307	11.6847784671164	34.482979	80.365325	2.7097027
17.1086460879809	63.0625439564307	11.6847784671164	37.415218	67.1119326	2.4786359

Solution x	Solution y	Solution z	Original x	Original y	Original z
17.1086460882505	61.5029473616939	11.6847784668755	33.1471098	60.1558513	4.4414558
17.1086460882505	61.5029473616939	11.6847784668755	43.0002757	59.9692573	5.0791111
17.1086460885163	60.1231466940043	11.6847784666354	29.1113171	69.2428114	2.3178943
17.1086460887803	58.7295735912941	11.6847784663961	32.3710377	53.6854	0.0060466
17.1086460887803	58.7295735912941	11.6847784663961	38.128444	50.990683	1.5244057
17.1086460890424	57.4510529924414	11.6847784661589	34.4981613	43.6098189	6.3838863
17.1086460890424	57.4510529924414	11.6847784661589	37.6481264	47.8813096	6.5793036
17.1086460893054	56.3001222575169	11.6847784659219	34.2887402	41.9043439	6.835982
17.1086460895693	55.2115267943555	11.6847784656848	2.4253981	44.8523436	2.2881323
17.1086460895693	55.2115267943555	11.6847784656848	6.5220454	46.8393292	9.3610404
17.108646089827	54.1718799021051	11.6847784654485	18.3784185	57.1026507	1.60641
17.108646089827	54.1718799021051	11.6847784654485	24.284459	53.5118781	4.6981631
17.108646090084	53.1416774078773	11.684778465214	30.0937988	44.3308943	14.5383671
17.108646090084	53.1416774078773	11.684778465214	32.8302989	42.2309887	13.616708
17.1086460903446	52.1540817374093	11.6847784649769	31.5095969	51.0684653	11.523883
17.1086460906095	51.1732113439919	11.6847784647393	2.57466789999999	43.4683609	15.573931
17.1086460906095	51.1732113439919	11.6847784647393	6.820668	39.0713932	12.1631417
17.1086460908705	50.2288756192397	11.6847784644998	20.6501388	50.1791373	13.3126618
17.1086460908705	50.2288756192397	11.6847784644998	21.0216738	51.8703093	12.3795264
17.1086460911352	49.2935482550119	11.68477846426	4.5207011	34.7763494	11.5308277
17.1086460913986	48.3845464021103	11.6847784640194	15.5276897	59.9411898	0.034091
17.1086460916643	47.4677468073149	11.6847784637806	5.3360715	49.6056788	2.051856
17.1086460916643	47.4677468073149	11.6847784637806	13.6466825	56.641223	0.3772494
17.1086460919305	46.5497179956711	11.6847784635441	2.2999767	55.3764405	4.437231
17.1086460921969	45.6251323289924	11.6847784633092	2.27936	46.9159446	7.984275
17.1086460921969	45.6251323289924	11.6847784633092	3.9504558	53.4738105	7.1081084
17.1086460924644	44.7014222533212	11.6847784630765	2.1729785	46.8604253	18.9044886
17.1086460924644	44.7014222533212	11.6847784630765	3.9184302	46.6238898	20.1933306
17.1086460927325	43.7841082093034	11.68477846284	12.7057803	46.3942459	23.5548248
17.1086460927325	43.7841082093034	11.68477846284	16.0956015	47.1989931	18.8482809
17.1086460930006	42.871865771736	11.6847784626003	25.8175111	47.2716024	20.9185995
17.1086460930006	42.871865771736	11.6847784626003	28.018456	49.9258106	18.7011667
17.1086460932671	41.9572021123621	11.6847784623594	22.4746551	48.1041051	9.2672876
17.1086460932671	41.9572021123621	11.6847784623594	32.3078962	45.114069	10.6720814
17.1086460935352	41.0432845117153	11.684778462119	7.3492035	35.5012058	13.5793477
17.1086460935352	41.0432845117153	11.684778462119	11.1949114	32.5347928	13.765914
17.1086460937994	40.1514643630959	11.6847784618785	13.0553452	35.1491327	19.4677587
17.1086460940628	39.2681735228286	11.6847784616373	11.8541821	36.7134083	15.5034658
17.1086460940628	39.2681735228286	11.6847784616373	12.1928408	37.3702852	11.5867049
17.1086460943249	38.3964793019175	11.6847784613958	14.7299938	38.6202015	11.4606651
17.1086460943249	38.3964793019175	11.6847784613958	15.6671545	41.9038059	9.4975475
17.1086460945868	37.5301501755827	11.6847784611555	13.5198617	39.2703319	6.7423337
17.1086460948479	36.6667660630675	11.6847784609158	24.3319298	37.4283803	9.9719727
17.1086460951088	35.8068925270731	11.6847784606772	25.3533813	42.3962835	8.9845466
17.1086460951088	35.8068925270731	11.6847784606772	28.2512087	43.1796715	6.8189779
17.1086460953691	34.943179186298	11.6847784604412	18.6253841	45.1799856	19.5247549
17.1086460953691	34.943179186298	11.6847784604412	26.2175773	40.5220972	21.9150058
17.1086460956283	34.0727424605537	11.6847784602011	23.0786229	38.1227731	23.1605385
17.1086460956283	34.0727424605537	11.6847784602011	25.6408756	32.9849766	23.8146293
17.1086460958877	33.2068656100444	11.6847784599571	21.8832831	32.2702186	24.0783885
17.108646096147	32.345056217179	11.6847784597113	21.2205961	30.6755865	15.8621351
17.108646096147	32.345056217179	11.6847784597113	25.434095	30.36432	15.4263508
17.1086460964069	31.4918400786006	11.6847784594651	18.0420031	31.0087706	14.9562459
17.1086460966677	30.6416552310248	11.6847784592191	16.5956207	19.4929376	15.3111277
17.1086460966677	30.6416552310248	11.6847784592191	20.1050057	16.8211128	11.4177964
17.1086460969294	29.8167422525793	11.6847784589733	24.4057133	14.819481	14.2616378
17.1086460969294	29.8167422525793	11.6847784589733	33.7699504	15.2531662	14.0155756
17.1086460971925	29.0336275287409	11.6847784587274	30.8819888	13.4626957	23.5805357
17.108646097456	28.2862319633749	11.684778458479	33.7088519	9.9711832	22.3346661
17.108646097456	28.2862319633749	11.684778458479	33.6742877	16.0147514	17.7329183
17.1086460977176	28.0001957987697	11.6847784582275	38.9701661	21.3778805	18.3750053
17.1086460979785	27.7163004773266	11.684778457974	28.9097869	26.1468646	19.859402
17.1086460979785	27.7163004773266	11.684778457974	31.5115819	30.4349931	13.1711147
17.1086460982374	27.4329111331414	11.6847784577201	35.0133629	33.6653342	20.0549291
17.1086460982374	27.4329111331414	11.6847784577201	36.9545772	32.1019086	19.1323386
17.1086460984903	27.1482163658804	11.684778457462	33.8398153	32.0377234	11.3609992
17.1086460984903	27.1482163658804	11.684778457462	38.9767874	28.6595996	7.54261
17.1086460987362	26.8633014436469	11.684778457205	35.4889656	25.3753347	12.2670294
17.1086460987362	26.8633014436469	11.684778457205	39.7157151	22.5518047	13.0027284
17.1086460989746	26.5802348007609	11.6847784569478	39.7052051	20.7340789	2.9027737
17.1086460989746	26.5802348007609	11.6847784569478	38.4714341	30.1541626	2.0837059
17.1086460992017	26.2992744831264	11.6847784566952	34.7673517	23.4200763	4.8203284
17.1086460992017	26.2992744831264	11.6847784566952	37.3849664	18.6565566	4.7787046
17.1086460994224	26.0209469016135	11.6847784564446	34.0986738	23.3047286	4.238405
17.1086460996412	25.743262919567	11.6847784561953	30.6527015	22.708305	8.3283902
17.1086460996412	25.743262919567	11.6847784561953	31.6418617	23.7354033	9.0609597
17.108646099858	25.466629722856	11.6847784559458	23.260163	19.1726271	1.8635456
17.108646099858	25.466629722856	11.6847784559458	27.922577	21.764341	5.4511195
17.1086461000754	25.1914582912044	11.6847784556983	19.7989907	26.8559855	1.6393695
17.1086461000754	25.1914582912044	11.6847784556983	24.4888337	25.329984	1.2423959

Solution x	Solution y	Solution z	Original x	Original y	Original z
17.108646100295	24.9167528389265	11.6847784554538	14.6392528	26.7492086	4.8139494
17.108646100295	24.9167528389265	11.6847784554538	17.2034005	24.1027648	4.0750954
17.1086461005176	24.642509396134	11.6847784552108	6.7702019	28.6398243	6.655852
17.1086461005176	24.642509396134	11.6847784552108	11.5512784	26.7283657	10.5788887
17.1086461007452	24.3682071419346	11.6847784549682	10.0346396	20.0550826	11.5771729
17.1086461007452	24.3682071419346	11.6847784549682	10.881307	21.222109	11.4410052
17.1086461009766	24.0947476500154	11.6847784547255	10.2638739	16.7343669	2.745395
17.1086461012097	23.8220452275355	11.684778454484	7.7653349	6.167634	7.7136991
17.1086461012097	23.8220452275355	11.684778454484	10.2956976	4.6843351	8.4372721
17.1086461014474	23.5547326796032	11.6847784542444	3.796854	1.0310825	8.8837938
17.1086461014474	23.5547326796032	11.6847784542444	11.2137447	2.0282324	10.133715
17.1086461016735	23.3201010112402	11.6847784540061	9.4518233	0.0818322	21.8708164
17.1086461018954	23.1116186599784	11.6847784537669	1.18933079999999	3.3623299	20.9336159
17.1086461018954	23.1116186599784	11.6847784537669	1.16963010000001	7.0254341	24.7260216
17.6923978085966	23.1116186602722	11.6847784514076	6.43216459999999	5.6038094	17.9548593
17.6923978085966	23.1116186602722	11.6847784514076	9.8269964	6.8843491	16.4620329
18.2904724112144	23.1116186605661	11.6847784490459	8.8711802	13.2955279	17.3948906
18.2904724112144	23.1116186605661	11.6847784490459	12.2844966	12.8434228	15.9512599
18.8956604221357	23.1116186608603	11.6847784466853	2.4227502	13.8762399	13.6085461
18.8956604221357	23.1116186608603	11.6847784466853	4.41833269999999	14.4467589	21.446539
19.5212580182951	23.1116186611545	11.684778444325	1.0903939	26.3844516	18.4073439
20.1604849930244	23.1116186614478	11.6847784419648	1.44105020000001	27.5670412	20.5926225
20.1604849930244	23.1116186614478	11.6847784419648	3.1062568	26.7803784	17.2167375
20.8289249156081	23.111618661741	11.6847784396049	4.4919615	30.1971308	23.0431363
21.5136377496135	23.111618662036	11.6847784372432	9.78612250000001	28.4044715	22.2738758
22.2066056877518	23.1116186623334	11.6847784348803	9.1420339	20.9818632	21.7425538
22.2066056877518	23.1116186623334	11.6847784348803	13.6477983	21.6503409	20.9429038
22.9147769677853	23.1116186626373	11.6847784325166	14.7546051	14.610274	24.9337615
22.9147769677853	23.1116186626373	11.6847784325166	16.5565287	18.5575743	19.3585299
23.6347071696161	23.1116186629408	11.6847784301514	15.2275578	8.2482088	20.735321
23.6347071696161	23.1116186629408	11.6847784301514	14.9649191	8.2569823	17.1672819
24.3722618839924	23.1116186632428	11.6847784277864	19.95828	6.5164086	22.2907726
24.3722618839924	23.1116186632428	11.6847784277864	25.7941467	5.022901	22.6635913
25.1160455595148	23.1116186635416	11.6847784254184	25.3620642	2.9418291	18.8013171
25.1160455595148	23.1116186635416	11.6847784254184	29.8399494	3.731908	9.1569031
25.8584016943494	23.1116186638343	11.6847784230506	21.5694811	0.9567502	13.1824134
25.8584016943494	23.1116186638343	11.6847784230506	21.5004558	1.4444458	11.8706015
26.6175295088654	23.1116186641234	11.6847784206842	15.0419936	3.4632806	14.5409941
27.3993788790855	23.1116186644108	11.6847784183165	15.3634563	8.946465	9.6121679
27.3993788790855	23.1116186644108	11.6847784183165	15.820225	13.1438067	8.0447276
28.2074255118991	23.1116186646948	11.6847784159503	17.3929381	9.8303298	1.4719335
29.0313919797979	23.1116186649772	11.6847784135866	18.0605132	3.6100683	1.3230623
29.8978529529354	23.1116186652605	11.6847784112263	26.3324067	9.9110212	1.9657306
29.8978529529354	23.1116186652605	11.6847784112263	30.2787157	8.2280249	1.312123
30.7740557628152	23.1116186655421	11.6847784088709	28.9980611	9.3107142	10.3932004
31.6553450846905	23.1116186658242	11.6847784065156	33.6893922	8.5224136	7.0176775
32.5384307101207	23.1116186661067	11.6847784041615	31.9710737	13.1659452	6.9350237
32.5384307101207	23.1116186661067	11.6847784041615	36.6688954	15.3802855	11.2906359
33.4270182658426	23.11161866639	11.6847784018087	41.0252369	15.6288565	6.5265879
34.3134676481204	23.1116186666736	11.6847783994579	44.272376	24.1529526	16.7575015
35.1959570561678	23.1116186669568	11.6847783971048	44.6441662	33.1239716	16.5654644
35.1959570561678	23.1116186669568	11.6847783971048	44.7688336	34.8472485	18.3927145
36.0680786159861	23.1116186672867	11.684778394749	39.21475	31.0795566	21.1487172
36.0680786159861	23.1116186672867	11.684778394749	40.565033	30.2350611	14.624538
36.9435115632042	23.111618667575	11.6847783923896	37.130172	34.1670861	22.6509329
37.8234399232771	23.1116186678658	11.6847783900276	36.1244237	41.0242921	19.6707957
38.7104052922821	23.1116186681599	11.6847783876629	40.4352515	45.1450838	11.9573703
39.598861887197	23.1116186684572	11.6847783852976	41.3950957	34.602479	9.5059407
39.598861887197	23.1116186684572	11.6847783852976	42.5831476	37.1399223	7.4293369
40.493418623086	23.1116186687683	11.6847783829353	45.1705924	33.2150554	0.7183829
40.493418623086	23.1116186687683	11.6847783829353	51.6262531	32.9510025	3.9807244
41.3818235129734	23.1116186690732	11.68477838058	48.3601763	34.0464698	9.5017871
41.3818235129734	23.1116186690732	11.68477838058	51.2078647	35.5791539	12.2358489
42.265008453363	23.1116186693789	11.684778378225	51.5218465	39.5765057	8.1668107
42.265008453363	23.1116186693789	11.684778378225	55.1300701	40.0588307	9.3430467
43.1258704008548	23.111618669685	11.6847783758736	48.2549784	40.2375649	15.7273532
43.1258704008548	23.111618669685	11.6847783758736	56.2067364	40.2417677	14.7422616
43.970048207544	23.1116186699888	11.6847783735207	56.98499	36.3050676	16.2652139
43.970048207544	23.1116186699888	11.6847783735207	56.9481598	35.7189477	11.6860928
44.7966291952101	23.1116186702891	11.6847783711683	58.429274	38.9397266	17.4146787
44.7966291952101	23.1116186702891	11.6847783711683	61.8021468	40.7857588	11.6604123
45.5655508673858	23.111618670585	11.684778368816	54.8328865	43.6672378	22.5503676
45.5655508673858	23.111618670585	11.684778368816	55.5353048	38.1752447	17.6684542
46.3044965003413	23.1116186708808	11.6847783664601	65.5247054	34.4819771	22.2818751
46.3044965003413	23.1116186708808	11.6847783664601	68.3855742	35.3493495	17.8360025
46.9028329846532	23.1116186711779	11.6847783640995	71.3343578	25.5495623	21.1336705
47.3895029853609	23.1116186714746	11.6847783617354	68.9038468	16.8104734	21.7337542
47.3895029853609	23.1116186714746	11.6847783617354	70.2766166	21.7580017	19.3250026
47.8393982333274	23.1116186717708	11.6847783593705	67.4654721	12.1137109	23.8276929
47.8393982333274	23.1116186717708	11.6847783593705	71.2868972	13.7571779	21.261272

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.8393982365926	23.1116186724378	11.6847783554298	70.8086056	11.5809577	17.5154997
47.8393982365926	23.1116186724378	11.6847783554298	71.8742878	17.8343061	13.6189325
47.839398239852	23.1116186731086	11.6847783514947	70.2907843	10.4186099	14.6666305
47.8393982430963	23.1116186737723	11.684778347556	67.7860652	18.0440513	10.7235759
47.8393982430963	23.1116186737723	11.684778347556	72.0757838	18.033427	9.5185824
47.839398246324	23.111618674439	11.6847783436184	70.9135058	14.8761766	3.8438809
47.839398246324	23.111618674439	11.6847783436184	69.6772126	28.9703915	6.8785128
47.8393982495436	23.1116186751165	11.684778339684	55.2537104	1.3428502	19.4907476
47.8393982495436	23.1116186751165	11.684778339684	52.4413086	6.2567644	20.6204114
47.839398252721	23.1116186757731	11.6847783357564	34.237799	1.769458	21.0926833
47.839398252721	23.1116186757731	11.6847783357564	33.5301093	3.5426558	21.7233363
48.4518920862297	23.1116186795906	11.6847782921352	31.6461166	7.3585956	24.5416178
48.4518920862297	23.1116186795906	11.6847782921352	38.5584867	8.9239146	23.1054293
49.2378434337073	23.1116186833791	11.6847782484996	60.5482992	13.7850738	16.8556106
50.01980008838	23.1116186871725	11.6847782048635	54.6678163	5.1970784	7.0182008
50.01980008838	23.1116186871725	11.6847782048635	61.3811866	10.1841347	3.2294003
50.7942071982786	23.1116186909578	11.6847781612326	57.1362338	5.5136309	23.5708492
50.7942071982786	23.1116186909578	11.6847781612326	64.943613	1.686391	19.5930668
51.1716595604171	23.1116186947397	11.6847781176003	51.358437	31.183912	20.2786449
51.5499145632756	23.111618698543	11.6847780739676	41.2499501	12.693222	14.1376671
51.9310599893041	23.11161870234	11.6847780303334	45.092729	13.545129	18.3076608
51.9310599893041	23.11161870234	11.6847780303334	46.2315326	17.3070005	18.3576471
52.3162741334003	23.1116187065947	11.684777986701	57.0336699	24.3925592	19.6603049
52.3162741334003	23.1116187065947	11.684777986701	62.1996928	26.9322785	20.2466983
52.7006342491165	23.1116187104174	11.6847779430585	68.4102584	6.9403941	4.658299
52.7006342491165	23.1116187104174	11.6847779430585	72.9487249	9.0752285	0.6396625
52.7006342581402	23.1116187160734	11.6847779299227	52.3761166	17.3066951	24.8659343
52.7006342581402	23.1116187160734	11.6847779299227	49.4509792	19.23293	17.9552005
52.7006342670703	23.11161872167	11.6847779167326	64.1033853	11.196525	7.8712992
52.700634276052	23.1116187272972	11.6847779035719	39.0651937	2.4238303	22.4127866
53.2185957678312	23.17075907026	11.5323063834657	41.5241877	2.2495139	17.9679654
53.2185957678312	23.17075907026	11.5323063834657	43.6411268	3.9331303	13.8180098
53.7637649233665	23.2304292075838	11.3789913542083	42.0438698	1.2746098	8.4709115
53.7637649233665	23.2304292075838	11.3789913542083	37.7928549	6.0601138	4.720283
54.3580809972293	23.2908207866227	11.2269350482258	45.3795945	10.2393952	3.6711995
54.3580809972293	23.2908207866227	11.2269350482258	47.2237184	11.5265695	11.522225
54.9646284606112	23.3513794721456	11.0752507919436	54.100404	16.0525172	0.8678853
54.9646284606112	23.3513794721456	11.0752507919436	58.3586123	20.3359236	6.4801103
55.5738837126448	23.4119931446528	10.9240592590473	56.0727891	23.8686819	7.47443
56.1848837294182	23.4726064719555	10.7729483637754	54.9748886	31.6899499	9.1125802
56.7985051803707	23.533176875632	10.6218506011171	57.9600279	34.4089577	5.7051211
56.7985051803707	23.533176875632	10.6218506011171	57.8811625	36.8910334	2.4827855
57.4161474904707	23.5936047599366	10.4711647151089	57.9145816	37.4787407	0.4915272
57.4161474904707	23.5936047599366	10.4711647151089	59.7400431	37.5401839	2.8523374
58.0380738853267	23.6538554486443	10.3211494131237	65.5339196	33.299582	2.2513726
58.0380738853267	23.6538554486443	10.3211494131237	65.884583	36.2103636	0.6036001
58.6577865522447	23.7139781260706	10.1718386631156	66.7264937	28.6241638	4.754423
59.2774207842716	23.7740923223452	10.0227416231168	62.0390375	27.7696953	8.7011853
59.8996238431482	23.8342072890447	9.87375173655364	62.1748486	23.5386262	9.8971034
60.5248200552653	23.8943322047688	9.72484713336985	75.1791401	28.4357222	11.5456464
61.1460081762795	23.9544274417615	9.57594111079662	75.2339764	1.1053279	6.9329867
61.1460081762795	23.9544274417615	9.57594111079662	73.9903157	3.2090585	6.7443046
61.2338468096169	24.8310047712385	9.4562833178328	72.8917692	2.6849909	9.1068195
61.2338468096169	24.8310047712385	9.4562833178328	72.320279	3.8462993	6.5608426
61.3211401909568	25.912490125462	9.33694564820254	73.292725	7.8305571	19.3842603
61.4082120001835	27.091055486793	9.21715236482842	79.9570853	14.106802	16.0131314
61.4082120001835	27.091055486793	9.21715236482842	77.5184606	26.3492827	20.0048231
61.4947374946532	28.3585707783683	9.09685426771821	78.2442809	33.2914556	24.7068001
61.5808803477327	29.6061362551549	8.97583190198156	75.8801773	29.7113355	20.1473913
61.5808803477327	29.6061362551549	8.97583190198156	76.8303918	30.6898889	19.4810071
61.6666790918946	30.8670954651304	8.85439591997026	70.5957341	27.6007009	14.8208364
61.752460581353	32.1426714701277	8.73296622489213	67.6344777	29.9025036	14.033884
61.8382618724979	33.4316395484641	8.61157288840228	72.24704	39.7077335	13.756154
61.8382618724979	33.4316395484641	8.61157288840228	73.6393721	37.6930766	12.5724621
61.9238197825088	34.7204440367492	8.49023537708391	74.2228108	38.6099587	15.750928
61.9238197825088	34.7204440367492	8.49023537708391	76.1612584	37.0439506	15.0269683
62.0089636104241	36.0176119378474	8.36881257998777	73.9542296	35.1681427	22.8323041
62.0938765876988	37.3294181648522	8.24709688669323	63.3830619	45.6708392	19.4411223
62.1788378092253	38.635867748875	8.12526103888094	58.3317264	48.8464518	15.1551224
62.1788378092253	38.635867748875	8.12526103888094	62.9728444	48.2610974	18.088966
62.2640010489611	39.926561260171	8.00332962771569	57.7424662	53.0431767	19.7584506
62.349314017594	41.1941870310761	7.88119810503503	46.3458684	54.8708712	24.5219613
62.349314017594	41.1941870310761	7.88119810503503	57.0032853	47.929495	24.4820709
62.4469240479384	41.6657178314678	7.73104395346983	44.8729194	51.9811136	24.4648411
62.4469240479384	41.6657178314678	7.73104395346983	47.6524078	52.2249928	24.4877735
62.5485699565209	42.0899914834882	7.57195789815778	53.3341085	54.2742297	9.8426206
62.5485699565209	42.0899914834882	7.57195789815778	54.2235528	56.265496	3.5115961
62.6506818719633	42.5099096114378	7.41335041930491	38.9617732	51.3997809	16.210445
62.7682622308378	42.8583907845478	7.24175092724313	37.4597811	44.2188485	16.422469
62.7682622308378	42.8583907845478	7.24175092724313	39.4220046	48.156385	14.5273965

Solution x	Solution y	Solution z	Original x	Original y	Original z
63.4959935647075	43.1666695555725	6.93465590533214	58.9987357	45.7674431	3.4982849
64.2287072853661	43.4752705170776	6.62841305527795	53.1446811	48.4277704	1.8438372
64.9711543042482	43.7839081144579	6.32321353382299	53.5581269	47.7413894	5.6200486
65.723507736977	44.0927203986796	6.01853267400752	61.0935569	52.6920317	4.4207174
66.4807481590864	44.4010891728768	5.7143704618617	49.7681271	46.8278362	16.9025729
66.4807481590864	44.4010891728768	5.7143704618617	55.3536754	50.0230289	15.6187386
67.2722362171089	44.7094362528078	5.40762886071837	44.2906965	51.8898251	11.3116798
67.2722362171089	44.7094362528078	5.40762886071837	49.3212736	48.3119567	9.5488066
68.1773961434137	45.0150915676004	5.09833669724986	67.7343836	45.7338412	11.9249335
69.086818166045	45.3211769721106	4.78875859816219	43.0965371	49.287121	4.5164689
70.5026319524831	45.6224848212289	4.48005382738386	65.8501112	46.5185477	18.4012114
71.9443097420026	45.9241940574335	4.17001388437001	67.7686962	50.942416	23.8888342
73.4194033291094	46.2253830269813	3.8561282873739	78.3681704	28.4149174	19.0447715
74.8683230525987	46.533335455264	3.53657797734898	78.8734057	30.5074156	10.2492504
76.3203801948569	46.8441413173374	3.21640951493997	73.6483802	37.1698351	8.0638871
77.7952844678537	47.1565590640382	2.89620626184001	63.3053921	48.8331121	7.8682203
79.3322829953497	47.469322033519	2.57583350665101	64.136723	44.5156078	8.6797357
80.9450707160427	47.7831220610634	2.25505980721761	77.8566059	47.3210428	1.4302369
82.5868119148518	48.0975263321795	1.9348678518394	69.2934493	49.5142976	7.1641629
84.3019030573357	48.4124057685429	1.61441904565626	75.4422908	46.5496079	10.6773392
86.079505855069	48.7282902610881	1.29322663508114	73.3690079	50.7128517	12.3210863
87.9553474496529	49.0447362370608	0.970685301330839	77.1618533	52.0527053	6.1051205
89.9168364869565	49.3618274570934	0.648021426901479	77.6409989	49.4044045	6.2831565
91.985425671508	49.6799426927169	0.325434630005542	67.1669184	49.4371849	3.0262948



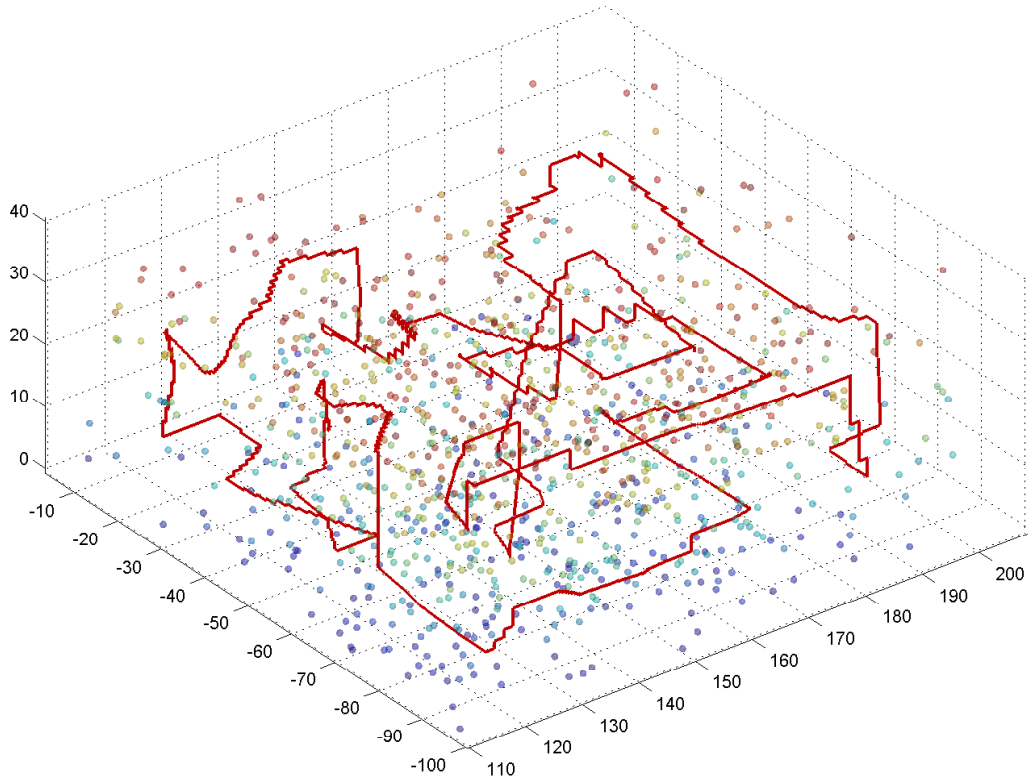


Figure N.173: *bonus*1000, Equal Radius, 3D, Manhattan, Length = 1183.1870282

Table N-176: Solution for *bonus*1000, Equal Radius, 3D, Manhattan

Total distance: 1183.18702816547 Depot: x 80 y 20 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
74.9753176635994	18.8618345723077	0.419909522749352	72.1570689	9.179080442	1.515121588
74.9753176635994	18.8618345723077	0.419909522749352	76.68650337	13.86956158	1.8774276
70.9125377309601	17.9123277131557	0.836498330244053	70.71952594	19.54937922	9.466423791
66.9825257107646	16.9509712726377	1.24200229528989	65.51501196	11.68636529	3.24100338
63.2491996052198	16.0156952075384	1.64623801487998	63.24920239	4.015695007	1.646238652
62.8028116335477	23.724653085244	3.15590822381009	62.17589976	23.53474989	9.188656209
62.8028116335477	23.724653085244	3.15590822381009	64.88897514	21.58345165	8.959362969
62.3577208870231	32.5021808239818	4.54259012901002	54.00076983	32.50218762	13.15428984
62.3577208870231	32.5021808239818	4.54259012901002	58.09138733	33.97784367	3.040604697
62.3577204441177	33.2762860766814	4.5425905616997	51.19858704	31.0981292	6.058142298
62.3577204441177	33.2762860766814	4.5425905616997	55.07321291	28.85442279	12.55016086
62.3577200020689	34.4595075926017	4.54259099388936	63.76560063	37.45231942	9.842542758
62.3577200020689	34.4595075926017	4.54259099388936	59.11600598	27.89604561	4.171146498
62.3577195601061	35.6822802489121	4.54259142605489	69.67922342	40.74675918	12.58912096
62.3396773873198	35.6822809878698	4.54259163844764	70.24663893	43.40548551	1.656037041
62.3215348904004	35.6822817178195	4.54259185099322	57.35658457	43.71456461	3.914439364
62.3034089964947	35.6822824458511	4.54259206356436	50.32982697	35.43640834	3.785700884
62.3034089964947	35.6822824458511	4.54259206356436	54.69460289	37.32086801	4.721267047
62.4025778793407	37.7532608884203	4.70414990501574	51.33580352	40.30660727	1.042528676
62.9684320527321	38.1176439939446	4.99856201054241	64.75792457	49.92103542	3.951957012
63.1208039223907	38.1518020820196	6.83539683924197	63.41360315	44.69674786	5.219771375
63.2731972355052	38.185928108582	8.70832294093696	55.55130491	39.21526309	7.425393497
63.2731972355052	38.185928108582	8.70832294093696	57.56166222	41.97700689	5.193477838
63.4277869049469	38.2200457822855	10.7186471742235	59.28037529	42.02965748	18.78086606
63.4277869049469	38.2200457822855	10.7186471742235	56.1557774	36.1071959	13.13084437
63.5848505837755	38.2541587246112	12.3679843771553	63.21772914	46.4808445	18.00555738
63.5848505837755	38.2541587246112	12.3679843771553	64.47235297	44.07915445	14.05919317
63.7421349475458	38.2881417623785	13.8252585890064	67.10787364	49.80646667	13.82525922
63.7421350151231	38.2881417447355	17.1794000838698	73.13866372	41.71405139	17.04301109
63.7421350825822	38.2881417270095	20.5850856604386	74.55729645	43.48740037	20.58508364
63.3392208166728	36.5964201907635	21.1682239828682	63.12520069	41.24941139	24.07122315
62.9376308363878	34.8506890425643	21.747298602604	58.48548965	38.49282405	23.12403661
62.9376308363878	34.8506890425643	21.747298602604	58.14893689	37.55022655	17.10511358
62.5465047577787	33.0225923501426	22.3349115931857	59.48412304	31.97998889	33.72997467
62.5465047577787	33.0225923501426	22.3349115931857	59.97712424	27.07719444	29.13491814
62.2284211103439	31.7949743723672	22.6057310245644	55.9549233	32.80200534	27.96563646
62.2284211103439	31.7949743723672	22.6057310245644	62.83458953	32.37480154	31.54745986
61.9158443939826	30.5577477966778	22.8688310387582	53.48089128	34.57431179	29.79987824
61.666261538639	27.9990934143408	23.096675400485	51.99282443	27.99909333	30.19770488
63.3793292848725	24.1006273424123	23.0966753620699	60.71671796	14.8721563	28.06290831
65.3200265404959	22.0482335778622	23.0966753236474	66.17419814	21.15751135	18.97034229
67.2662227364059	20.0200590622846	23.0966752852862	67.26622281	20.02005982	35.0966755
69.5340059922703	18.6132535726885	22.7967708295761	66.92261807	21.4897109	27.4812889
69.5340059922703	18.6132535726885	22.7967708295761	63.04507341	24.29862677	23.57575014
72.2724726750799	17.0846982512311	22.4950704979609	62.61153544	17.95816147	22.4620849
76.3922304532925	15.537763971082	22.1940371449892	77.03036191	15.51069798	15.03164451
80.6080274295144	13.9940057476163	21.897614252974	85.22979418	8.715884504	12.16207554
80.6080274349335	13.9940057520281	25.3926995798142	83.75499038	5.857780347	33.63275215
80.6080274349335	13.9940057520281	25.3926995798142	71.29498477	19.86081824	30.17263192
85.0219829912079	13.9940057793188	25.3926993607049	93.53556787	11.2495411	17.39352488
84.9315327655922	14.9539970163376	26.4514378031275	95.99475962	18.1472698	27.39786086
84.9315327655922	14.9539970163376	26.4514378031275	94.43184685	8.796264511	23.29859307
84.816268062497	20.2936873640611	28.6528822701809	94.15587216	20.2227246	36.0994515
84.816268062497	20.2936873640611	28.6528822701809	90.81819821	18.2159484	35.33294835
84.1493516705215	28.6151516616443	28.8115101468859	94.17807015	30.5898166	23.81736257
83.1847759788404	33.4542140835481	28.9750392860324	82.01891737	31.58538586	22.96295297
82.2329146014488	38.6293166919508	29.1394889746293	84.85983095	39.85329756	21.28837281
81.2689374323149	43.6570737371456	29.3055518391043	79.30599483	40.28434635	35.54252376
80.3212846733145	49.4919325836154	29.470622485397	71.99750065	50.82091856	33.04720741
79.4507171131909	54.9502185022077	29.6348415468365	72.73426073	54.95021428	39.57914747
79.4507171366508	55.2324609945471	29.6348400243992	83.91646182	55.69492785	39.74024442
79.4507171366508	55.2324609945471	29.6348400243992	77.87000631	52.21112855	39.93820594
79.4507171601607	55.520021653763	29.6348385018488	86.51848331	50.71555717	36.90102142
79.4507171601607	55.520021653763	29.6348385018488	83.19197135	53.48639501	32.18766969
79.450717183653	55.822171857028	29.634836979196	88.60564442	53.67349247	30.97358927
79.450717183653	55.822171857028	29.634836979196	78.85550393	52.04144231	24.20403351
79.4507172071288	56.1290434092675	29.6348354566401	91.19333201	55.09349477	31.72721103
79.450717230505	56.705055467573	29.6348339312189	83.55927983	59.64747077	24.27812457
79.450717253884	57.276708824138	29.6348324058493	76.57028534	49.55513485	21.13053287
79.4507172773098	60.8915426901241	29.6348308807156	69.70404765	60.5822767	24.01827102
79.4507172773098	60.8915426901241	29.6348308807156	72.13050555	55.03070373	28.54528132
79.4507173007824	66.4188684832901	29.6348293554997	73.05372772	69.26625594	20.0928079
79.4507173242856	67.978792901358	29.6348278306252	78.83068399	69.67274441	24.24069079
79.4507173242856	67.978792901358	29.6348278306252	74.85083054	64.74645556	30.78568814
79.4507173477776	69.588261788858	29.6348263057086	81.47694776	70.94126153	23.66230135
79.4507173713099	71.1924593024899	29.6348247808362	70.77169737	73.88064127	33.24954023

Solution x	Solution y	Solution z	Original x	Original y	Original z
79.4507173713099	71.1924593024899	29.6348247808362	72.84290598	65.67053988	28.7186167
79.4507173948602	72.8537544454282	29.6348232559215	67.45457311	72.85375456	29.93900874
79.8416166525761	74.8911431972643	29.5627270978851	68.84275879	76.03221479	29.69910657
80.2900995122535	76.8137460855747	29.4906107398545	72.09010058	81.417498	36.30236671
80.9467804078593	77.8897970499403	29.4157396439999	75.20998283	80.5662569	34.55930276
81.6240193292487	78.9500754956256	29.3406162971726	81.4352048	82.89764497	33.18556014
81.6240193292487	78.9500754956256	29.3406162971726	70.61748839	78.65460339	33.23222305
84.305631415607	80.0390339549679	29.2633745713101	86.75397464	75.23932777	39.5614605
85.7449955596426	82.2377228209607	29.1813439197693	94.75890926	85.83537613	36.18471901
85.7449955596426	82.2377228209607	29.1813439197693	87.63411723	89.72076827	28.65831969
85.8076718949345	82.3834843664581	23.5503556130336	91.04765146	90.60180149	20.03455373
85.8076718949345	82.3834843664581	23.5503556130336	93.12739448	86.70709298	18.39915073
85.8696393997509	82.525580579804	20.6068175885844	93.29522257	74.82458329	19.9847248
85.8696393997509	82.525580579804	20.6068175885844	91.59995025	72.67875795	22.12004218
85.9301664463421	82.6821998944042	16.351588721296	91.90328388	76.16243153	11.12653143
85.9301664463421	82.6821998944042	16.351588721296	83.77232341	73.14211564	19.82850896
85.9905853931653	82.8453761958272	12.8373463295978	97.99058573	82.84537681	12.83735391
82.8093350217651	83.0023791422495	12.6611135869612	82.09017124	81.333147	13.10533341
79.7348101305694	83.1597281534065	12.4849569635911	82.53992082	88.87907996	14.07314191
79.7348101305694	83.1597281534065	12.4849569635911	75.38279951	84.8495864	16.86303573
76.8587051665806	83.316461044881	12.3080783707962	74.46580568	79.0435318	1.384862598
76.6033830699161	87.4555559836784	12.2590077713365	77.11333094	85.3156461	2.683835286
76.3481420198499	92.4351781433413	12.2101904549338	73.04972269	93.68364053	0.740152131
76.3481420198499	92.4351781433413	12.2101904549338	86.10921689	91.46882481	10.98097302
76.3481419844068	92.4351782682016	12.4141810043971	78.18108034	99.79242924	3.657350909
76.3481419844068	92.4351782682016	12.4141810043971	79.39161289	97.26593015	10.2457076
76.3481419483842	92.4351783906017	12.6787564610054	70.07355989	96.61021246	6.954740599
76.3481419483842	92.4351783906017	12.6787564610054	71.17046416	92.96230041	3.31475723
76.3481419127349	92.43517851295	12.9633400545097	69.38304877	98.18671586	10.95698255
76.3481418771922	92.4351786354322	13.2496074839042	69.92952441	96.42807986	14.30332435
76.3481418771922	92.4351786354322	13.2496074839042	64.64609008	95.09261932	13.24961232
76.3481418812314	92.4351787096462	14.3077888477054	79.19703593	96.06011661	13.22486099
76.348141885286	92.4351787839257	15.374655865524	86.37403118	99.02923308	15.37465632
74.9561286722285	92.4351787805549	21.7474677820988	80.84419352	99.98848979	20.3915349
73.3932971864849	92.4351787772139	29.6503605636329	74.57969734	99.83821951	39.01985633
73.3932971864849	92.4351787772139	29.6503605636329	66.67195124	95.92017704	38.76714707
73.3932971864849	92.4351787772139	29.6503605636329	64.96530116	93.98228963	34.40488013
73.3932971864849	92.4351787772139	29.6503605636329	66.92699784	97.50570073	24.16462464
73.3932971864849	92.4351787772139	29.6503605636329	65.26732099	95.86741863	25.98441419
73.3932971864849	92.4351787772139	29.6503605636329	76.48394754	93.81500316	33.05082675
73.3932971864849	92.4351787772139	29.6503605636329	68.01446808	90.26524455	37.65674979
73.3932971864849	92.4351787772139	29.6503605636329	68.09186985	95.85522589	22.47153407
73.3932971864849	92.4351787772139	29.6503605636329	69.82339194	93.15949799	27.73705762
73.3932971864849	92.4351787772139	29.6503605636329	71.22771139	93.77569631	25.9346523
73.3932971864849	92.4351787772139	29.6503605636329	66.59307852	88.41880362	32.58136924
73.3932971864849	92.4351787772139	29.6503605636329	72.91384846	91.54886288	27.04740893
73.3932971864849	92.4351787772139	29.6503605636329	63.32241418	89.29380754	27.27800065
73.3932971864849	92.4351787772139	29.6503605636329	72.48804708	89.57044348	25.63543235
73.3932971864849	92.4351787772139	29.6503605636329	68.11557125	90.29313921	19.6765572
73.3932971864849	92.4351787772139	29.6503605636329	76.68533256	86.49303137	21.67959601
73.3932971864849	92.4351787772139	29.6503605636329	69.80433177	81.60817435	25.92271927
63.9638690787644	91.3742974051331	29.5420658966516	63.88368354	92.98872817	38.82161587
63.9638690787644	91.3742974051331	29.5420658966516	62.03675317	91.42777069	38.34727303
63.9638690787644	91.3742974051331	29.5420658966516	62.61309781	94.29391595	17.98130243
63.9638690787644	91.3742974051331	29.5420658966516	59.01602486	86.99268685	19.95901958
63.9638690787644	91.3742974051331	29.5420658966516	64.88497046	82.96772641	30.52764719
63.9638690787644	91.3742974051331	29.5420658966516	61.30013954	82.69641043	22.92622968
63.9638690787644	91.3742974051331	29.5420658966516	68.96890483	80.55619731	30.92710539
61.0826694461109	91.3159765482864	29.5826348180422	61.4906739	91.40517217	33.71736683
61.0826694461109	91.3159765482864	29.5826348180422	56.64479831	82.24679775	31.938846
58.7603771159002	91.258131351308	29.62310256382	57.84005051	97.24933499	35.2604133
58.7603771159002	91.258131351308	29.62310256382	57.58318464	98.55697919	27.3972425
56.5726114172071	91.2000288733581	29.6635186947003	52.71570498	99.46690315	35.19170787
54.7192442119247	91.1414678036068	29.7037517965802	53.69991452	99.81161169	33.42740223
54.7192442119247	91.1414678036068	29.7037517965802	54.29998953	99.89190946	28.80232628
52.9486117543937	91.082444792778	29.7439336285643	48.39934621	99.02729511	30.05026749
52.9486117543937	91.082444792778	29.7439336285643	48.69087386	94.64188777	30.6210566
51.3853371261961	91.0231972685786	29.7841119136146	47.31578899	98.13704672	24.13193979
51.3853371261961	91.0231972685786	29.7841119136146	52.60387814	98.51053443	27.61605738
49.9449318292699	90.9635592995039	29.8244528549489	45.34071838	99.2752365	24.31073394
48.7306022658694	90.9032853271062	29.865017416196	43.63164404	99.67485887	36.08960829
48.7306022658694	90.9032853271062	29.865017416196	48.82360524	98.37839062	35.9745595
48.2701697758278	90.8334807325088	29.9031588414269	43.04035221	95.37042711	39.63020675
48.2701697758278	90.8334807325088	29.9031588414269	49.19512952	89.44346883	37.79505672
48.0373266173121	90.7535680967056	29.9364939755557	45.3176187	83.7901857	37.67961833
48.0373266173121	90.7535680967056	29.9364939755557	49.21219028	82.18677234	33.0110742
47.8073057458962	90.6749855842122	29.9696489127978	51.44475874	86.59474587	38.70943792
47.8073057458962	90.6749855842122	29.9696489127978	56.15571936	89.41500769	36.83882342
47.5650027673771	90.5969309519114	30.0025154918037	54.48965648	89.30641789	34.42411824
47.3199823945449	90.5189383999155	30.0353466612593	53.61605765	80.93460352	33.38542247

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.3199823945449	90.5189383999155	30.0353466612593	50.20394782	81.95454381	24.2461412
46.4119586971358	90.4614968764687	30.0668173589283	52.83415121	85.50123146	31.48102764
45.4681045973355	90.4041758138061	30.09828146336	55.11001594	85.68607737	27.25029831
45.4681045973355	90.4041758138061	30.09828146336	51.91564321	83.24154723	26.19545671
44.016189587569	90.3476138418509	30.129930228277	53.29556121	92.47449182	25.90682802
44.016189587569	90.3476138418509	30.129930228277	53.27314218	89.6748569	31.66096453
41.7570786013456	90.2909776606287	30.1616621679302	51.95218378	92.57992082	30.72068519
37.9761109626812	90.2342243839032	30.193391697603	36.49499514	99.8776323	35.60714208
37.9761109626812	90.2342243839032	30.193391697603	35.92075185	99.04269187	36.73360907
37.9761109626812	90.2342243839032	30.193391697603	31.65500689	99.46882276	25.89517482
37.9761109626812	90.2342243839032	30.193391697603	39.44288188	96.38027853	38.94704805
37.9761109626812	90.2342243839032	30.193391697603	37.83606476	96.13365876	36.97541326
37.9761109626812	90.2342243839032	30.193391697603	35.84999591	97.26233792	26.33021041
37.9761109626812	90.2342243839032	30.193391697603	37.35558564	97.30806318	23.47070651
37.9761109626812	90.2342243839032	30.193391697603	44.56970667	97.22856143	30.36827838
37.9761109626812	90.2342243839032	30.193391697603	45.01212749	95.47966426	34.75016178
37.9761109626812	90.2342243839032	30.193391697603	42.53215273	92.92397176	36.17653823
37.9761109626812	90.2342243839032	30.193391697603	36.31961338	94.1541845	22.11569666
37.9761109626812	90.2342243839032	30.193391697603	39.86881125	93.47781189	29.627917
37.9761109626812	90.2342243839032	30.193391697603	36.86677729	93.06343809	25.83290646
37.9761109626812	90.2342243839032	30.193391697603	39.84944538	96.227912	20.60442108
37.9761109626812	90.2342243839032	30.193391697603	41.14116704	94.61634345	23.98672915
37.9761109626812	90.2342243839032	30.193391697603	33.91919319	90.52236574	22.93790886
37.9761109626812	90.2342243839032	30.193391697603	36.26720319	91.81523904	18.88940672
37.9761109626812	90.2342243839032	30.193391697603	36.43143728	90.48214242	22.55722277
37.9761109626812	90.2342243839032	30.193391697603	39.57638463	86.69599702	34.69521123
37.9761109626812	90.2342243839032	30.193391697603	45.13861135	90.47060332	31.83589749
37.9761109626812	90.2342243839032	30.193391697603	40.16683897	89.097423	24.82067356
37.9761109626812	90.2342243839032	30.193391697603	40.55838899	87.88304878	23.6255072
37.9761109626812	90.2342243839032	30.193391697603	32.77989789	83.25231939	22.10896744
37.9761109626812	90.2342243839032	30.193391697603	48.45592928	88.4082341	31.5542414
37.9761109626812	90.2342243839032	30.193391697603	40.77647626	81.23711291	32.65865455
37.9761109626812	90.2342243839032	30.193391697603	41.14833132	82.10595877	30.01446557
37.9761109626812	90.2342243839032	30.193391697603	46.03038143	83.79986665	30.96050312
37.9761109626812	90.2342243839032	30.193391697603	38.78697828	81.20736169	22.75217398
37.9761109626812	90.2342243839032	30.193391697603	46.93472918	83.75304242	25.57195373
25.8363541969887	89.8986916007225	33.3443282483237	22.00240146	99.12603644	39.9893956
25.8363541969887	89.8986916007225	33.3443282483237	16.10416337	94.62212285	35.78598723
25.8363541969887	89.8986916007225	33.3443282483237	16.85080568	91.45389056	39.93862668
25.8363541969887	89.8986916007225	33.3443282483237	18.65944439	93.90622028	36.26618878
25.8363541969887	89.8986916007225	33.3443282483237	18.21730526	92.48725442	38.15120003
25.8363541969887	89.8986916007225	33.3443282483237	25.64004891	98.33585155	37.39052093
25.8363541969887	89.8986916007225	33.3443282483237	23.65267964	99.40598609	29.7230242
25.8363541969887	89.8986916007225	33.3443282483237	25.35918107	97.93925835	33.70510702
25.8363541969887	89.8986916007225	33.3443282483237	25.34553204	99.20543489	30.35671629
25.8363541969887	89.8986916007225	33.3443282483237	27.50072899	99.76767751	31.96071673
25.8363541969887	89.8986916007225	33.3443282483237	28.69202489	99.34571575	27.8214658
25.8363541969887	89.8986916007225	33.3443282483237	22.46431132	85.87828698	39.40664672
25.8363541969887	89.8986916007225	33.3443282483237	21.63379999	90.72848541	25.0330528
25.8363541969887	89.8986916007225	33.3443282483237	31.89808649	95.62749105	29.09944527
25.8363541969887	89.8986916007225	33.3443282483237	35.60188133	93.1465045	36.33325574
25.8363541969887	89.8986916007225	33.3443282483237	30.08845088	94.04600611	25.46859145
25.8363541969887	89.8986916007225	33.3443282483237	30.18341718	92.15484297	29.45540328
25.8363541969887	89.8986916007225	33.3443282483237	34.28587406	93.01320732	33.5082721
25.8363541969887	89.8986916007225	33.3443282483237	32.33676606	89.56266763	36.70990188
25.8363541969887	89.8986916007225	33.3443282483237	30.78074407	88.67743671	34.14412331
25.8363541969887	89.8986916007225	33.3443282483237	36.79414467	92.2553405	34.07762876
25.8363541969887	89.8986916007225	33.3443282483237	25.47356848	81.94258519	37.44485814
25.8363541969887	89.8986916007225	33.3443282483237	24.67927032	81.21698222	36.79859251
25.8363541969887	89.8986916007225	33.3443282483237	28.94608169	87.05476962	32.15968695
25.8363541969887	89.8986916007225	33.3443282483237	37.64776281	91.60925844	32.09349115
25.8363541969887	89.8986916007225	33.3443282483237	29.49613778	81.77737157	38.35679407
25.8363541969887	89.8986916007225	33.3443282483237	31.92346769	85.96439053	34.03343791
25.8363541969887	89.8986916007225	33.3443282483237	22.96398221	79.24584246	32.40861489
25.8363541969887	89.8986916007225	33.3443282483237	24.84752889	78.21896812	35.91459865
25.8363541969887	89.8986916007225	33.3443282483237	30.96168192	84.99460949	29.50639116
25.8363541969887	89.8986916007225	33.3443282483237	32.21271953	85.45061531	28.67707968
25.8363541969887	89.8986916007225	33.3443282483237	27.46499326	78.56518576	33.59652638
25.8363541969887	89.8986916007225	33.3443282483237	34.03327785	85.06694553	30.01520061
23.5118993144519	89.8986915741473	33.3443283000796	20.75129811	88.7330358	32.51930493
23.5118993144519	89.8986915741473	33.3443283000796	20.16675465	86.45561332	33.59426088
21.3504951568222	89.8986915476292	33.3443283518191	18.85500198	86.61471751	28.9549492
21.3504951568222	89.8986915476292	33.3443283518191	19.16596982	83.58117432	33.35557023
19.3188250646674	89.8986915211833	33.3443284035009	16.23739593	85.87006787	34.99641701
17.3550781253384	89.8986914947413	33.3443284551982	14.92906226	79.42060964	37.22040132
17.3550781253384	89.8986914947413	33.3443284551982	17.38954679	82.23173111	30.2609052
15.7737950752818	89.8986914685327	33.3443285068238	10.82142722	82.89323555	36.78865334
15.7737950752818	89.8986914685327	33.3443285068238	10.08146406	81.46406963	37.62633094
14.591783842215	89.8986914424904	33.3443285583996	9.940095688	86.998178	38.16021851
13.4510658869556	89.898691416455	33.3443286099851	12.48771043	90.90107319	36.2773466

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.4510658869556	89.898691416455	33.3443286099851	14.30638295	91.72702037	37.41288443
12.3144575326422	89.8986913903828	33.3443286616005	12.03430063	87.78817585	32.36153594
11.1811984468416	89.8986913643617	33.3443287131668	10.35439985	93.61856888	31.55963283
11.1811984468416	89.8986913643617	33.3443287131668	11.04946885	95.30278919	26.87229799
10.0570894954184	89.8986913383033	33.3443287646383	5.231683223	94.88567828	37.04813984
8.97589005257822	89.8986913122079	33.344328816107	1.662890125	98.21483308	37.96621421
8.97589001828774	88.1935025797558	33.3443288289795	1.83782096500001	81.06813079	39.8464095
8.9758902596175	88.1935026015942	32.8324126876266	2.643010323	87.48230483	39.26134045
8.97589050102984	88.1935026234824	32.3059490905122	1.696022601	79.3379408	35.04130759
8.97589050102984	88.1935026234824	32.3059490905122	7.992357197	82.08091397	36.27596397
8.97589074310881	88.1935026456559	31.6108042437436	5.779054124	82.01317499	31.17715184
8.97589074310881	88.1935026456559	31.6108042437436	5.912402555	83.10767778	28.97692543
8.9758909852448	88.1935026678179	30.9272161460804	7.936374341	83.63932008	31.96057141
8.9758909852448	88.1935026678179	30.9272161460804	9.701793671	81.23141394	32.23008983
8.97589122738496	88.1935026899592	30.2412928334391	5.333729823	86.89695613	31.50319232
8.97589146955595	88.1935027120935	29.5544230924408	5.838459994	89.46110654	32.98505569
8.97589146955595	88.1935027120935	29.5544230924408	6.256438132	90.66257931	27.09179537
8.97589171177729	88.1935027342354	28.8683018997846	5.209294544	90.50333801	29.97691556
8.97589195403262	88.1935027563892	28.1812753771628	9.577914639	89.11916471	27.81169318
8.97589219628549	88.1935027785434	27.4961701628172	6.57919393199999	89.24907689	23.95110219
8.97589243856223	88.1935028007079	26.8193639413919	7.17818211399999	91.76838261	25.47562666
8.97589243856223	88.1935028007079	26.8193639413919	8.980893435	92.30918249	24.9496481
8.97589268086057	88.1935028222932	26.1508634920021	7.810086676	100	26.21604958
8.97589268086057	88.1935028222932	26.1508634920021	5.819691822	97.53170939	24.16806715
8.97589292344423	88.1935028437925	25.5004795619333	8.327911253	95.97957355	16.39239366
8.97589292344423	88.1935028437925	25.5004795619333	2.88784862599999	89.80188387	16.96831616
9.25655732543271	87.3490842819998	25.5004796099918	1.72500424899999	93.73701725	20.97210735
9.25655732543271	87.3490842819998	25.5004796099918	3.553988961	91.38716753	22.96960314
9.55610762491773	86.3224361706067	25.5004796582392	3.212591442	94.51392157	23.83849287
9.86567256113864	85.0805441474061	25.500479706554	3.115821998	88.00026043	26.66042774
10.1790871801192	83.8202071588624	25.5004797549025	0.539457489	84.81338557	26.32883597
10.1790871801192	83.8202071588624	25.5004797549025	3.795442881	81.20966501	27.41200193
10.5070362674414	82.5900882089597	25.5004798033325	9.921883095	86.8721598	22.00737941
10.5070362674414	82.5900882089597	25.5004798033325	9.01858207399999	78.03824041	22.65782791
10.8360283705018	81.3811050729694	25.5004798517509	3.05949055799999	82.05603574	19.35294441
10.8360283705018	81.3811050729694	25.5004798517509	4.961462551	81.51420623	19.50536364
11.1804449489308	80.1706600532793	25.5004799001855	3.765987951	77.28123402	18.22137656
11.1804449489308	80.1706600532793	25.5004799001855	5.065657714	76.41830653	16.15003851
11.7673059288383	79.5275592389817	25.5004799489528	5.863440787	76.06172049	20.11271942
11.7673059288383	79.5275592389817	25.5004799489528	10.28504553	75.43578797	21.16629174
12.374156583789	78.9080781179663	25.5004799976978	6.979895184	73.91637244	25.14533012
12.374156583789	78.9080781179663	25.5004799976978	11.56644578	72.10851879	29.32762892
12.995803813	78.3194490139014	25.5004800465112	8.675234817	76.17385221	29.29611493
13.6264197992586	77.73631318841	25.5004800953775	18.46683587	77.29301103	30.42019724
14.2471317029448	77.1557030511666	25.5004801443144	18.15807888	79.40011164	23.44302335
14.2471317029448	77.1557030511666	25.5004801443144	18.31523717	76.27495825	29.81755027
14.8551214652842	76.5766949445838	25.5004801932865	17.24413003	73.14298035	27.78293034
14.8551214652842	76.5766949445838	25.5004801932865	22.95220857	73.2582761	29.61659281
15.4307763402825	76.0173906503582	25.5004802423544	18.49430275	75.1491321	23.37172362
15.4307763402825	76.0173906503582	25.5004802423544	20.16006997	73.55306832	21.43875646
15.9955243260287	75.4666046379679	25.500480291397	20.11668251	80.56671914	21.763779
15.9955243260287	75.4666046379679	25.500480291397	19.47269695	75.25893863	20.7798111
16.5482544280918	74.9096284445416	25.5004803404526	15.50686687	76.44859369	16.39940441
16.5482544280918	74.9096284445416	25.5004803404526	18.15532249	77.80652015	16.99185344
17.1007126749898	74.3429064308767	25.5004803894579	16.80968797	72.84815948	15.34934359
17.6550544106118	73.784848827268	25.5004804384391	19.17901123	72.48982593	17.20855307
18.2063118080341	73.2313228264649	25.5004804873919	14.67447984	73.22055772	21.75092301
18.2063118080341	73.2313228264649	25.5004804873919	14.51945543	70.49107423	24.26034768
18.7684294570335	72.6841441764124	25.5004805363842	14.01917911	69.22007201	23.43359605
18.7684294570335	72.6841441764124	25.5004805363842	14.11476256	66.58488992	23.55512122
19.3493875030256	72.1560625815457	25.5004805854366	11.73654707	68.82383733	18.16264782
20.0145766753997	71.6535028571769	25.5004806344907	13.50520564	67.72241024	17.09707449
20.8357523839667	71.1880998586189	25.5004806835513	16.63383213	64.77854357	18.98571058
20.8357523839667	71.1880998586189	25.5004806835513	21.61039636	65.83676525	18.75923326
21.699092510752	70.7492903748006	25.5004807325923	26.36495426	64.10386589	19.00754119
21.699092510752	70.7492903748006	25.5004807325923	26.36749261	61.24478927	19.91950535
21.7780346712446	70.7076552183259	25.5004807809298	24.58618772	59.92581691	21.04332426
21.7780347601674	70.7076552234374	25.7834510906071	26.46280572	62.61127777	22.19141047
21.7780347601674	70.7076552234374	25.7834510906071	24.68488711	59.85199485	22.75052505
21.7780348491916	70.7076552289138	26.0894719021114	26.03259253	67.05188068	24.42560707
21.7780349382662	70.7076552343948	26.3964352046205	21.30645349	61.8915326	27.89064267
21.7780349382662	70.7076552343948	26.3964352046205	25.66105506	62.27941228	31.77717439
21.7780350273686	70.7076552400261	26.6940169681599	25.20403775	63.98638021	32.83153178
21.7780351165619	70.7076552457066	26.9862814020486	14.35540419	64.70998039	34.26175056
21.9757423951996	70.7076552688779	26.9862814932867	14.52745655	66.82146945	34.730647
22.1873416537424	70.7076552922045	26.9862815845067	21.52581462	69.05739134	31.57893426
22.1873416537424	70.7076552922045	26.9862815845067	18.97844246	66.0992932	30.20753751
22.400045648296	70.7076553171194	26.986281675676	21.16552744	75.92926841	33.87335876
22.400045648296	70.7076553171194	26.986281675676	25.39416892	74.01493111	32.17996221
22.6126998910604	70.7076553404967	26.9862817669474	22.14002238	72.37729838	30.29531679

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.8255815228022	70.7076553638781	26.9862818582042	24.37529212	73.10827156	29.72637521
22.8255815228022	70.7076553638781	26.9862818582042	24.00842436	69.26671548	26.32388978
23.0382870591187	70.7076553872459	26.9862819493473	21.51917751	80.74471553	21.88319617
23.0382870591187	70.7076553872459	26.9862819493473	22.68191696	72.90808337	38.77088424
23.0382870591187	70.7076553872459	26.9862819493473	23.86908483	73.83689183	36.6939804
23.0382870591187	70.7076553872459	26.9862819493473	21.2618816	68.31108552	38.60957073
23.0382870591187	70.7076553872459	26.9862819493473	25.63863856	75.55318582	34.2564448
23.0382870591187	70.7076553872459	26.9862819493473	19.92687299	66.4828608	36.85195291
23.0382870591187	70.7076553872459	26.9862819493473	29.81370195	76.77877617	33.99746475
23.0382870591187	70.7076553872459	26.9862819493473	29.7776223	79.3796747	28.90759999
23.0382870591187	70.7076553872459	26.9862819493473	31.54519137	79.16359507	27.34637643
23.0382870591187	70.7076553872459	26.9862819493473	32.43971284	75.52883521	28.48064207
23.0382870591187	70.7076553872459	26.9862819493473	31.96159565	70.60936436	21.8177247
23.0382870591187	70.7076553872459	26.9862819493473	32.14669335	66.5741861	28.83764483
23.0382870591187	70.7076553872459	26.9862819493473	31.78300706	62.74548174	25.97934086
28.7802631318805	70.7076554189246	26.9649908213095	32.56942546	80.98884638	22.4278796
28.7802631318805	70.7076554189246	26.9649908213095	31.67974116	78.20082263	20.94127433
29.9235904648865	70.707655450491	26.9440683715783	29.09610379	74.18683092	25.64666307
29.9235904648865	70.707655450491	26.9440683715783	28.77703399	67.75671878	24.26797752
31.0879687566958	70.7076554819952	26.9231659854601	33.57300136	70.51852673	38.6296637
31.3285627754551	70.707655513541	26.8941435268468	35.96077646	77.38727187	28.20511129
31.3285627754551	70.707655513541	26.8941435268468	40.76978451	74.94346594	30.5932008
31.5537302778289	70.7076555450009	26.8649219050584	42.58773685	73.94634336	30.2774743
31.5631213294274	70.7076555755886	25.0578077436178	38.57181853	69.29967661	29.47346952
31.5631213294274	70.7076555755886	25.0578077436178	42.13585343	68.94604524	25.50967647
31.5724681574147	70.7076556062261	23.1059156525903	38.05290287	66.43336709	23.58284008
31.5724681574147	70.7076556062261	23.1059156525903	39.73860453	66.92518954	24.34934694
31.5817943307987	70.707655636866	21.1188452019876	28.17365085	71.94302821	19.49378883
31.5817943307987	70.707655636866	21.1188452019876	30.01509861	69.93828769	21.72402497
31.591133881125	70.7076556675034	19.1706754840721	43.59103477	70.75648589	19.17067552
31.591133881125	70.7076556675034	19.1706754840721	38.18944723	65.54612606	17.9243242
31.4198745523387	70.7076556971436	17.4564412159939	40.91327599	65.05437313	16.01674823
31.2406430889801	70.7076557268454	15.8852818465378	37.43465738	70.14594443	13.87115315
31.2406430889801	70.7076557268454	15.8852818465378	36.88863481	65.11756178	9.028914476
31.0575862491968	70.7076557566058	14.58947372581	29.47881008	65.01108227	16.71360152
31.0575862491968	70.7076557566058	14.58947372581	28.86030824	61.83789689	13.23528428
30.8757381280251	70.7076557863397	13.3013711964489	27.36103425	64.84526011	12.45761345
30.6946319636778	70.7076558160596	12.0233377874877	22.58317288	64.23875961	11.9213097
30.5173535943057	70.7076558457784	10.7480028511178	24.66562586	67.58605744	10.297776
30.5173535943057	70.7076558457784	10.7480028511178	26.6523776	66.91672378	14.68008016
30.3417405976597	70.7076558754742	9.44273990052478	20.75020952	68.82081849	3.659175109
30.3417405976597	70.7076558754742	9.44273990052478	24.34494447	68.89894191	6.614252607
30.1771983364426	70.7076559051748	8.46672232422934	21.60880813	73.64895737	1.318444959
30.1771983364426	70.7076559051748	8.46672232422934	23.39691794	71.43920824	1.906907845
30.0255081685279	70.7076559348448	7.80146156787269	24.57644237	79.57543571	13.43961074
30.0255081685279	70.7076559348448	7.80146156787269	29.05539546	78.84402949	14.28609887
29.8906902033518	70.7076559645088	5.94663522675835	23.53960858	80.471438	3.12432842
29.8906902033518	70.7076559645088	5.94663522675835	22.95922483	75.83051285	0.740171728
29.8386773182834	70.7076559933274	5.77961273591665	21.04749508	76.84597788	0.391094884
30.1757781604438	69.9561340860778	5.77961275067631	28.44331265	74.98671685	9.740464776
30.514179798765	69.1930034704329	5.77961276543894	31.34183617	77.86791685	6.462154326
30.514179798765	69.1930034704329	5.77961276543894	34.30971303	75.90183293	2.096267325
30.8492500985944	68.360180460955	5.7796127802537	35.03662295	76.31902131	1.401481412
30.8492500985944	68.360180460955	5.7796127802537	36.44207057	76.13900165	9.824805701
31.17059428989	67.3493075102621	5.77961279513221	33.85806756	68.2147305	3.068667124
31.17059428989	67.3493075102621	5.77961279513221	34.32584869	66.311045	4.144300462
31.4901635410015	66.3508655401774	5.77961281002511	32.28903103	63.37386507	1.032108002
31.4901635410015	66.3508655401774	5.77961281002511	36.53251416	65.89826385	3.47943245
31.8075994752451	65.3788976122746	5.77961282494253	33.50828257	58.48410354	3.557102036
31.8075994752451	65.3788976122746	5.77961282494253	34.15128455	57.37934974	2.952751483
32.1227892120357	64.5084528406208	5.77961283989421	32.47933058	60.09950546	10.14811096
32.1227892120357	64.5084528406208	5.77961283989421	37.36735143	64.72519961	6.841621681
32.435966241983	63.659550098035	5.77961285485303	31.12121771	52.61678334	1.82071962
32.773185469787	63.309639057889	5.77961287007517	28.66025221	61.13181458	11.59083816
33.1134973652846	62.9617064979762	5.77961288529923	25.84588775	61.17671521	8.212138725
33.4597819276906	62.6155389904082	5.77961290053315	33.45977848	51.47641849	1.316430254
35.8515777328492	62.6155393667585	5.84832261788976	37.58124673	53.7047325	1.291628295
35.8515777328492	62.6155393667585	5.84832261788976	40.92420024	52.54921675	3.399585878
37.2772537545748	62.6155397431658	5.91789062688854	38.55825219	62.0328479	1.356643655
37.2772537545748	62.6155397431658	5.91789062688854	38.87334077	61.97418169	4.472466865
38.6928966052183	62.615540119552	5.9876360161924	43.40294282	59.60424206	0.51389979
40.0554313271256	62.6155404960032	6.05760786413145	38.19879917	73.45302115	2.159211899
40.0554313271256	62.6155404960032	6.05760786413145	39.75179858	71.51477588	1.359571846
41.9421414936168	62.6155408726912	6.12951830923887	39.83687168	68.05987049	1.771904532
41.9421414936168	62.6155408726912	6.12951830923887	52.45383187	66.17944394	1.57361944
41.9538237310904	62.6155412495276	6.48462397556146	41.95376322	74.60739468	6.926728294
41.9538237310904	62.6155412495276	6.48462397556146	41.30767537	70.05965636	6.684179381
42.2137425281495	62.1321656614036	6.48462431983687	44.13660931	71.38940487	9.812814914
42.4723185008463	61.6221909676627	6.48462466407067	47.89205446	67.3947139	7.919602812
42.7287553597126	61.1036070917714	6.48462500829106	50.29671492	64.07582579	3.765527546

Solution x	Solution y	Solution z	Original x	Original y	Original z
42.9817572480042	60.5804578082301	6.48462535252676	44.96838238	64.05706864	11.93558957
43.234297221958	60.0537503265247	6.48462569673049	39.12047899	68.75765335	13.33882614
43.234297221958	60.0537503265247	6.48462569673049	36.99117209	62.09652931	16.1628835
43.6052293554243	57.5186925892986	6.48462604001703	36.65639834	59.2724504	14.55953297
43.9967123541732	54.7797738249263	6.48462638322269	42.10911161	58.06602885	13.19335194
43.9967123541732	54.7797738249263	6.48462638322269	44.98764045	56.96391467	9.231659535
44.3902374177947	51.8813771208627	6.48462672638685	45.47068469	56.96814934	6.687113785
44.7833970629526	48.8016511763437	6.48462706955167	35.40868681	49.33377596	1.880059691
44.7833970629526	48.8016511763437	6.48462706955167	48.20619517	39.24794213	0.08063613
44.7833977099406	48.8016509517727	7.66899879390998	34.68773061	48.27076221	5.003934468
44.7833977099406	48.8016509517727	7.66899879390998	43.74535734	43.87626012	1.779657186
44.7833983571747	48.8016507271235	8.9845506654867	34.17044541	50.63731129	14.2756352
44.7833983571747	48.8016507271235	8.9845506654867	34.31056081	43.95356429	5.695822859
45.5046215465108	48.80165051951	10.4545047553956	39.58652985	43.55288071	14.45846769
45.5046215465108	48.80165051951	10.4545047553956	41.57443341	43.13832473	6.475589725
46.2710121015762	48.8016503124887	11.9147211313421	53.79810347	45.16180718	4.496135918
46.929632359343	48.8016501049456	14.0789391850157	53.22205568	50.84724902	15.61737169
47.5753343359699	48.8016498973291	16.2101006084286	45.78512338	48.76667443	13.05604142
48.22552688819	48.8016496897129	18.4132869342594	43.11381093	45.00092033	20.21315796
48.22552688819	48.8016496897129	18.4132869342594	47.22851165	47.89903616	20.36250944
48.8921055604752	48.8016494821893	20.5533314335272	39.96945525	49.46230999	23.88525166
49.6037155021435	48.8016492746476	22.549688860678	42.25980634	46.86827481	24.73500352
49.6037155021435	48.8016492746476	22.549688860678	40.57741767	42.47262	24.8981708
50.5804340142817	48.8016490673908	24.2188112683336	51.65508094	43.85648581	22.32830057
51.555609678938	48.801648860204	25.9208443446165	49.81718199	39.89953162	25.94554765
51.555609678938	48.801648860204	25.9208443446165	52.03099226	42.50134863	22.51431543
52.5514165124873	48.8016486532928	27.6994264427755	48.35826716	45.69665672	26.59304148
52.5514165124873	48.8016486532928	27.6994264427755	50.26037041	48.95030273	24.30726963
53.5854104142137	48.8016484464265	29.5610944574528	47.65008175	45.51867646	25.16647853
54.6705477793891	48.8016482396483	31.5464137458075	43.66555329	47.77139353	28.778171
56.7170550114315	48.8016480328976	34.0517183396079	48.65047008	56.26343732	32.64491993
56.7170550114315	48.8016480328976	34.0517183396079	57.09480153	60.45993374	34.61199265
56.7170550114315	48.8016480328976	34.0517183396079	45.94832838	45.50704308	38.19660802
56.7170550114315	48.8016480328976	34.0517183396079	48.91348948	54.77748717	32.9330217
56.7170550114315	48.8016480328976	34.0517183396079	52.57887869	54.16196226	35.47497689
56.7170550114315	48.8016480328976	34.0517183396079	47.38308024	49.71863955	31.58389373
56.7170550114315	48.8016480328976	34.0517183396079	58.50503897	53.8647284	36.33438611
56.7170550114315	48.8016480328976	34.0517183396079	55.16481024	55.42346911	31.47512835
56.7170550114315	48.8016480328976	34.0517183396079	65.98277732	56.02257659	36.50214422
56.7170550114315	48.8016480328976	34.0517183396079	57.48443808	43.25173204	37.88033317
56.7170550114315	48.8016480328976	34.0517183396079	55.80484172	50.30189669	30.08035465
56.7170550114315	48.8016480328976	34.0517183396079	51.12261026	42.05252276	30.83772297
56.7170550114315	48.8016480328976	34.0517183396079	63.54041364	40.47906672	32.95919177
56.7170550114315	48.8016480328976	34.0517183396079	61.01859213	37.82208646	31.82775528
61.4312153027291	48.8016480511781	34.0517183402447	71.61626861	44.97765672	39.11549021
61.4015823781285	51.9868974218151	33.3417886597575	66.67873973	56.13517049	35.54640769
61.3719171155437	54.97394745753	32.6271810285642	67.27809665	56.79217526	31.19414535
61.3422239688938	57.9210911494158	31.9177873229596	67.87575086	63.89107621	33.2359079
61.3422239688938	57.9210911494158	31.9177873229596	62.01287875	62.70691628	29.4740589
61.3124793965798	60.3696472636422	31.210982712944	56.73611746	58.87824868	26.03485933
61.2827663761117	62.9083937675781	30.5196183011813	56.12304172	60.76926662	25.75259057
61.2827663761117	62.9083937675781	30.5196183011813	61.59665848	60.86573745	25.73038778
61.2530884925974	65.6915719893785	29.8529139403487	59.10597324	64.72617137	21.25191915
61.2530884925974	65.6915719893785	29.8529139403487	65.84999623	61.37790202	25.6974767
61.2234036982084	68.9223824207106	29.2280632065673	60.59756518	67.42291916	21.31629348
61.1937262168352	72.361878139917	28.6242884299663	60.70093329	80.64454551	19.95511414
61.1937259825303	72.3618779519292	28.6242890257297	58.81674593	76.2826012	22.48412381
61.1937259825303	72.3618779519292	28.6242890257297	57.06276587	74.98770524	20.67544591
61.1937257497506	72.3618777637703	28.6242896216593	67.69295238	75.24403656	20.54681948
61.1937255167346	72.3618775754637	28.6242902177712	70.83372488	78.21085961	24.5182183
61.1937222578405	72.3618772032993	29.4704629422558	62.20174968	80.96664236	37.77358899
61.1937222578405	72.3618772032993	29.4704629422558	65.34735437	72.80394877	34.67473005
59.7822025349205	72.3211885732238	29.47046332943	63.48323083	69.36201841	31.45080353
59.7822025349205	72.3211885732238	29.47046332943	63.47892732	68.70647259	29.32775126
58.3219677851347	72.2805642481272	29.4704637166051	54.03625818	65.02303827	30.15017844
58.3219677851347	72.2805642481272	29.4704637166051	63.53725064	67.03413314	29.14142524
56.8865687663565	72.2400946337148	29.4704641037948	59.09181099	73.44789922	33.41304482
56.8865687663565	72.2400946337148	29.4704641037948	55.90538334	73.56581582	30.52666899
55.460334373959	72.1996119521418	29.4704644909484	60.79681015	75.33369853	28.93747546
55.460334373959	72.1996119521418	29.4704644909484	58.20433528	69.50520456	29.55764241
53.9697831446408	72.159133942655	29.4704648781063	56.76810138	74.93595817	28.17323894
52.4630655144624	72.1186433955483	29.4704652652719	52.40986372	76.90026657	30.53428803
52.4630655144624	72.1186433955483	29.4704652652719	55.58088554	76.52999392	28.31600672
50.9445164640318	72.0780959093969	29.4704656524222	49.13669956	77.10708156	27.62901252
49.4581730180605	72.0375182430953	29.470466039576	50.78444002	76.12504454	23.00978791
49.4581730180605	72.0375182430953	29.470466039576	51.90516717	74.10528304	22.83711571
47.9388911204585	71.9969032979065	29.4704664268091	49.62844822	78.65994225	20.1083463
46.1227083924361	71.9556489524127	29.4704668141921	44.56064253	79.77318093	20.51948675
45.9033853293665	71.7876592526418	29.4704672057101	43.12816365	79.63219046	23.15451647
45.6864106545861	71.6160824245758	29.4704675973669	44.66930475	80.79724102	25.59577081

Solution x	Solution y	Solution z	Original x	Original y	Original z
45.4702291317784	71.4409664051279	29.4704679890935	44.42598809	67.45202223	18.20113405
45.470224966541	71.4409653002182	30.195398147623	47.34853229	74.63427391	38.87043339
45.470224966541	71.4409653002182	30.195398147623	53.92763119	74.12654413	38.27376011
45.2569443727633	71.4409640923533	30.1954025263311	38.20769452	77.89743741	37.44950686
45.2569432666668	68.808430494212	30.195403378855	41.14789047	74.75727523	32.931636
45.2569421606949	65.9285113420323	30.1954042313712	49.38151416	71.84627519	34.52041136
45.2569421606949	65.9285113420323	30.1954042313712	52.68458788	66.68600654	36.07142386
45.2569410543134	62.6853373368858	30.1954050837749	49.39322363	67.57061768	37.48715692
45.2569410543134	62.6853373368858	30.1954050837749	52.64945222	62.68533593	20.742851
44.6521066122826	61.8306733122795	30.2299456420538	45.59084573	70.21452412	23.93560611
44.0433023014245	60.8700190877181	30.2646067618932	45.68320409	63.6499192	24.04332627
43.4326562310723	59.8997027816353	30.2993164609502	41.72708173	62.5487287	34.68501321
42.8262388676616	58.9223898855124	30.3339963421591	42.95157888	64.84132436	26.30910849
42.8262388676616	58.9223898855124	30.3339963421591	41.95981534	64.94436816	23.77879253
42.2247424859278	57.867673322067	30.3687742772214	41.72170476	60.36141703	24.46424235
41.625463380091	56.8040005807827	30.4035969304219	37.67648628	59.01822185	34.10509713
41.625463380091	56.8040005807827	30.4035969304219	39.00311055	58.98114927	34.60197054
41.0393103993189	55.7273294896605	30.4383743342598	41.10546356	60.73573959	25.88754111
40.4541630205278	54.6235707153193	30.473191202636	35.39691212	60.01558524	36.77171252
39.8879626185695	53.4486773146045	30.5079328549139	39.86159624	55.58185516	39.85963663
39.8879626185695	53.4486773146045	30.5079328549139	41.84687745	52.15158968	38.57062516
39.3192317522441	52.2690457250161	30.5424951776336	36.93641703	55.80482127	27.58013236
39.3192317522441	52.2690457250161	30.5424951776336	40.32660467	53.626561	31.93108458
38.7545600573333	51.0711567826575	30.5770761376034	32.83493269	54.50530143	23.93617923
38.2090590771098	49.8261766109689	30.611738667109	28.72359173	49.06807614	23.44175989
38.2090590771098	49.8261766109689	30.611738667109	33.45872958	53.85918585	23.94292918
38.0077425734055	48.8699680454127	30.6493047100906	28.94274384	52.01860718	30.54475385
38.0077425734055	48.8699680454127	30.6493047100906	30.18073163	48.32029982	32.22769732
37.8120967246071	47.8933801569554	30.6868554265603	30.55507662	47.73107042	32.65818922
37.6181447737607	46.921109327882	30.7243904083775	30.28185343	43.77834378	32.70178342
37.6181447737607	46.921109327882	30.7243904083775	34.06373355	42.77086753	33.9464291
37.4268384819473	45.9944163411859	30.761889369378	30.83636789	38.35208021	33.99399048
37.2395238225538	45.1755003569612	30.7993246574832	39.35568633	35.06788426	34.69629234
37.2395238225538	45.1755003569612	30.7993246574832	44.94410764	36.28576006	32.88778098
35.7715730704172	45.0265791594207	30.8351753655807	38.72818734	43.64397508	34.64285831
35.7715730704172	45.0265791594207	30.8351753655807	39.67150404	49.44131071	30.57444188
34.2449686078653	44.877398486899	30.871016976542	31.80593192	45.60640645	39.41102857
34.2449686078653	44.877398486899	30.871016976542	30.62796082	46.77730777	34.94066727
32.8129930304748	44.7279658040468	30.9067559436226	31.52001616	50.89228775	38.01036066
31.4086563219927	44.5771879308256	30.9424056606903	23.68432498	51.4412716	36.97532542
31.2840698143627	41.5963432811551	30.9726715005811	22.79879511	41.59634367	39.45795983
32.4956557341686	40.871920622637	29.4938203901229	30.41452332	39.55317391	35.96788826
33.7270461821789	40.1533657056346	27.9375334771791	31.80606468	35.45021175	24.23960074
33.7270461821789	40.1533657056346	27.9375334771791	38.90241804	39.45548462	22.15074575
34.9322192565884	39.4525168490183	26.5241050949804	29.65914735	42.12761495	24.52937867
34.9322192565884	39.4525168490183	26.5241050949804	32.06711817	41.12824267	27.14001544
36.2049765356556	38.7450952719445	25.1381251186835	39.91233765	41.2977364	28.26450372
37.4550252613809	38.0333522785718	23.7285808124968	41.09480481	34.92509896	27.7383049
38.6823360170869	37.3308914536976	22.2822399293686	40.57036155	31.31828969	15.51939441
38.6823360170869	37.3308914536976	22.2822399293686	49.90577559	41.072269	23.3893886
38.960788255648	35.480263265013	20.1818950743833	37.07046765	30.04479215	18.0646406
38.960788255648	35.480263265013	20.1818950743833	37.51752459	33.09106605	16.01141602
39.2411057451348	33.7746764638576	18.2238348693421	35.17250587	39.36136713	13.28284014
39.2411057451348	33.7746764638576	18.2238348693421	38.78467609	39.06908374	12.83761672
39.5245709417966	31.8526945351357	16.5167690966438	44.21687698	34.39769027	11.89272829
39.8062207311179	29.8915399289833	14.8884844624941	40.81010844	38.77304558	7.861958026
40.0851510731821	23.9756052217615	13.761674205201	50.20668952	26.40233109	10.32749181
40.3476499347995	14.1370485292235	12.7331994213707	42.34346606	5.769949569	4.366098536
40.3476499799931	16.3072705356768	13.2421300307512	35.62470684	10.73896033	9.362523366
40.3476499799931	16.3072705356768	13.2421300307512	38.07401644	11.09458783	4.920078282
40.3476500251283	19.1441099128798	13.7869477431892	28.82263126	20.36706254	14.69297653
40.347650070238	21.5123225805984	14.3164331538573	29.56587444	24.57869021	18.08116751
40.347650070238	21.5123225805984	14.3164331538573	30.34406593	27.74432368	15.48974465
40.3476501156001	21.9870450593247	14.6916145678299	36.57027062	15.62107689	13.23399254
40.3476501156001	21.9870450593247	14.6916145678299	36.77121212	29.70512597	6.399428168
40.3476501612395	22.2238709722475	17.4708891098897	35.85991513	20.90404301	13.98769394
40.3476502068914	22.4611992886449	20.3917628564458	28.59013959	24.83311171	20.75915805
40.424009452949	22.4611995726031	20.3917646683074	36.2315122	27.60710766	22.87055815
40.500506567405	22.4611998564816	20.3917664794651	35.94447387	20.12395641	25.28688733
40.500506567405	22.4611998564816	20.3917664794651	38.38951699	19.65672727	24.71703453
40.5772336923138	22.4612001404244	20.3917682891186	38.46066343	17.33665094	24.22591115
40.654046516664	22.4612004244349	20.3917700982453	35.53984032	15.99196501	21.54085765
40.7311124668195	22.4612007085486	20.391771907237	46.26887105	26.53209753	18.29584073
40.7311124668195	22.4612007085486	20.391771907237	47.52772375	30.54529654	17.6892221
40.8072183193447	22.4612009922553	20.3917737186944	49.49892788	30.73465222	20.32700892
40.6782712197887	22.2952294021968	23.3893222222492	39.07927218	20.57348801	18.57850652
40.6782712197887	22.2952294021968	23.3893222222492	42.45831495	25.01806118	18.69304905
40.54948357662	22.1295622282456	26.9537167085011	48.88810081	29.6929228	28.59078684
40.4153569288751	21.9553743575524	29.7229738769097	51.08696185	26.42044109	32.70824117
40.4153569288751	21.9553743575524	29.7229738769097	50.59311922	22.75724468	32.75181399

Solution x	Solution y	Solution z	Original x	Original y	Original z
38.005215534736	21.6181489110999	30.1216750854622	44.45005227	17.91363181	31.37577496
35.3583594747987	21.2840605250103	30.5195917928321	39.25918273	24.78783876	35.71196052
35.3583594747987	21.2840605250103	30.5195917928321	40.05041388	28.81118981	27.86495236
32.2053457731981	20.9402483626265	30.9173688896288	32.11403346	10.63014558	35.85165647
29.1581151984276	20.6470315592658	31.2812424817256	29.15811552	9.518746656	35.77137383
27.7129029519762	21.9158912823098	31.2812424949865	27.39065822	19.10906735	34.23380192
27.7129029519762	21.9158912823098	31.2812424949865	34.82834577	24.45085722	36.05632865
26.1461819059975	23.1735024869154	31.2812425082402	25.83818458	22.03803134	36.60516078
26.1461819059975	23.1735024869154	31.2812425082402	27.26619514	25.90196542	35.39277783
24.583954128997	24.4257623899332	31.2812425214858	21.70527032	21.60018691	37.91508039
23.0733943974543	25.7116411196679	31.2812425347263	17.16840861	23.65521269	38.43535721
23.0733943974543	25.7116411196679	31.2812425347263	20.73212412	24.23741148	36.78766314
21.7248658178497	27.0583002125912	31.2812425479481	24.87958822	27.09583401	32.67332021
20.3574331554513	28.409628419009	31.2812425611619	27.42853428	33.27622768	38.61257115
20.3574331554513	28.409628419009	31.2812425611619	26.37919279	28.3108891	38.48025156
17.9327993052151	29.5052741783506	31.2812425742996	18.69463352	36.26547074	33.27071747
17.9327993052151	29.5052741783506	31.2812425742996	22.07359754	33.01769228	30.23180819
15.3792075590645	30.5462734967804	31.2812425874259	12.97854061	40.66549102	35.96453487
15.3792075590645	30.5462734967804	31.2812425874259	14.50630809	38.16565664	31.09752118
13.4829175619485	31.2249294417659	31.2812426004447	6.302525489	40.0085763	32.06550398
12.3199307932263	31.767129177412	31.2812426134083	12.31993183	42.07287161	37.42873621
11.7905252037853	31.646077091547	30.4137864257952	9.832177112	38.08691559	39.13126485
11.2765585572742	31.5227493741255	29.2811448543021	2.51827574799999	30.45426362	34.97941135
10.7974863212364	31.3997682449859	28.0111893099236	3.815111582	26.65111472	27.4138472
10.3298230121617	31.2773902653516	26.7541116774154	2.885836634	40.60849192	26.29324057
10.3298230121617	31.2773902653516	26.7541116774154	8.013859219	41.41457221	25.49555223
10.1801240729265	30.8761282425501	25.8759911266101	14.44281578	41.35822358	23.25943932
10.0244852355652	30.3294275452799	25.1186184085974	10.78091353	34.08373955	26.71276523
10.0244852355652	30.3294275452799	25.1186184085974	14.14878683	27.98719075	26.90047422
9.86836429364419	29.7827874943522	24.355392257647	6.71940622700001	25.73868862	24.12156356
9.86836429364419	29.7827874943522	24.355392257647	9.44237495500001	27.32019574	23.59921997
9.71269530065661	29.2455250653262	23.5965658524753	5.584406208	23.81184943	17.55438576
9.71269530065661	29.2455250653262	23.5965658524753	11.00474377	35.14184161	13.52979102
9.55476652728427	28.4415910899316	23.1934374464688	1.354188569	31.31594018	20.59719751
9.55476652728427	28.4415910899316	23.1934374464688	3.43019284899999	27.39779729	20.1502757
9.39938336245503	27.6282696011329	22.7967862471529	2.694391803	27.62826968	12.84474665
9.39938336245503	27.6282696011329	22.7967862471529	8.02660248300001	29.17059173	11.48261049
9.39938338839394	26.21680474882	23.2178008121769	18.71921477	25.10440199	21.46380598
9.39938341435183	24.8338515219898	23.6421158161743	10.62327399	24.29073933	35.14972626
9.39938344032078	23.5118010804011	23.980187888103	14.86812736	22.17705421	27.08627601
9.39938346632115	22.2057532792796	24.3167951390415	4.281409798	24.72152663	26.34546352
9.39938346632115	22.2057532792796	24.3167951390415	4.953508892	23.81507206	25.41914679
9.39938349229854	20.8729638095978	24.6529130848631	6.772905892	23.04434695	34.36872103
9.39938351830645	19.4846672652894	24.9749525027903	10.79914705	20.42039499	35.93251466
9.39938354434605	18.0492431035075	25.2708319829624	5.677247541	18.04924585	36.67897415
9.39938354434605	18.0492431035075	25.2708319829624	7.31997787899999	15.37807435	33.05725748
10.0404771882878	17.6854678716063	23.4785592988782	2.197761157	16.16441336	29.99258788
10.0404771882878	17.6854678716063	23.4785592988782	3.177857831	14.97802426	24.78576733
10.7507991693776	17.3270513831221	21.2750999506725	5.72255099500001	17.38650207	24.6119319
10.7507991693776	17.3270513831221	21.2750999506725	12.36712067	15.90584574	24.47249551
11.4711747214099	16.9697089939258	18.9466599685769	8.465864182	8.874062551	25.43796737
11.4711747214099	16.9697089939258	18.9466599685769	18.39694528	22.72524013	21.81072027
12.18908181705	16.6253432425197	15.2400369876996	8.98802709899999	7.925934732	19.26951737
12.18908181705	16.6253432425197	15.2400369876996	20.19850768	8.627828216	19.22611956
12.18908181705	16.6253432425197	15.2400369876996	21.65865806	17.99154884	8.745957007
12.18908181705	16.6253432425197	15.2400369876996	23.64941173	19.80991504	13.65279264
12.1890817942104	15.9853439231274	12.7873019221428	10.89890727	16.02503912	12.34011368
12.1890817942104	15.9853439231274	12.7873019221428	12.63680518	12.91935497	10.56277797
12.1890817719218	15.3513556347669	10.4200551026058	8.67995437099999	15.22687294	13.91463376
12.1890817496659	14.7180090575278	7.96944826994454	0.867278095000003	18.04823486	8.201101929
12.1890817496659	14.7180090575278	7.96944826994454	3.082410661	9.043855976	8.462200359
12.1890817276517	13.9626623365653	5.31937119202704	5.801300438	5.23076571	0.128009607
14.9467706286779	13.9626624747892	5.31937119596807	18.20950886	6.619599382	5.445678785
17.5388642179941	13.9626626131155	5.3193711999119	14.9958336	14.5728326	1.422152891
20.2242103766384	13.9626627514548	5.31937120387266	24.09498187	20.3828805	2.129534364
20.2242103766384	13.9626627514548	5.31937120387266	24.23492671	17.98856994	0.400117348
22.6139219724159	13.9626628897465	5.31937120787589	34.15723352	12.84614068	2.236297964
22.1272908215803	19.3796148030206	5.31937126781994	30.90434674	20.96780911	4.645040707
21.6240710548924	24.4903428062377	5.31937132776908	31.17947294	31.40633137	5.155453447
20.3678874864764	25.4275205601363	5.31937138772961	25.99458773	34.37910238	4.84512326
18.945577213733	26.2506831038691	5.31937144769748	24.70443529	26.12365999	11.74081492
18.945577213733	26.2506831038691	5.31937144769748	25.40396983	32.32053998	7.877867709
17.296189037817	27.0428198361926	5.31937150834636	23.31975826	27.34182644	2.882941415
15.5629931099616	27.8356650681256	5.31937156896814	16.76117492	28.31246812	1.562447455
15.5629931099616	27.8356650681256	5.31937156896814	18.74305811	29.30240259	6.154559295
13.7862080646472	28.626953188126	5.31937162890713	9.320660383	27.08555662	0.10230943
12.0911862511546	29.4253526453418	5.31937168887239	0.438114408000004	29.42535326	2.454773911
12.0911863069319	32.8242912914583	5.67236210659395	6.668915236	38.80565327	2.074648475
12.0911863627373	35.7469319010873	6.02873310688551	5.668356774	43.14782971	2.118277692
12.091186418607	37.8787121582842	6.3926348234018	9.020444459	42.86210706	4.331128313

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.091186474501	39.9155852111334	6.7578727868794	0.0942256310000005	39.91558536	7.02793547
12.6363220643084	41.6220270644569	6.75787558245547	7.871697725	40.35198819	7.19843067
13.1878310654809	43.3570230174943	6.75787837798429	8.91589750200001	48.83105962	4.105846181
13.1878310654809	43.3570230174943	6.75787837798429	8.81169210500001	48.50504439	3.044600386
13.7558879372552	44.9327160202892	6.75788117355437	10.20301226	47.6234059	3.00365475
14.3299291649457	46.4863979962496	6.75788396916985	17.80089583	46.64512233	2.63462135
14.3299291649457	46.4863979962496	6.75788396916985	23.73647568	45.21539639	11.53681715
14.8515996759922	48.1187450619364	6.75788676458188	16.54761864	53.09785344	0.161381972
15.3705797597586	49.6677937172979	6.75788956009046	16.47526591	49.4455512	6.794569926
15.3705797597586	49.6677937172979	6.75788956009046	18.13426387	49.15791018	7.430088572
15.887085095552	51.2457369649361	6.75789235558843	18.80954314	50.67936902	11.76647286
15.887085095552	51.2457369649361	6.75789235558843	24.61643689	54.01115924	6.209992422
16.3816951656498	52.7908319168169	6.75789515100439	13.89109091	56.92730438	11.2581209
16.3816951656498	52.7908319168169	6.75789515100439	20.16713628	56.2637712	6.937664837
16.8768828534153	54.2719518880384	6.7578979463999	16.07158763	60.00636388	16.82852088
17.3851593188427	55.2439880802524	6.75790074015547	21.56136042	60.00845368	9.387366518
17.3851593188427	55.2439880802524	6.75790074015547	22.84438078	60.01413405	11.39370551
17.8793799755407	56.1681295502782	6.75790353389298	28.38294287	59.7022254	11.36065683
17.3872657961504	56.1681295743931	6.7579035411251	28.17203359	56.51587977	9.985576368
16.7926253939725	56.1681295984972	6.75790354834158	25.6524776	56.5792119	5.011755882
16.1715117599679	56.1681296225648	6.75790355557744	25.08011935	60.4806985	0.592321921
14.7162583228666	56.1681296465711	6.75790356307139	15.77830732	66.19409337	0.808180704
14.7162583228666	56.1681296465711	6.75790356307139	17.45311026	57.02027397	2.53786626
12.668017925071	56.1681296699422	6.75790357096506	10.83705181	59.65376627	0.709551762
12.668017925071	56.1681296699422	6.75790357096506	13.17908278	60.05355856	0.206865651
10.6635479155246	56.1681296933496	6.7579035789183	1.28261934699999	62.39268391	2.604217434
10.6933121060176	55.4265748014695	8.07442363182951	5.28300793299999	51.8957834	3.767703534
10.7231142748857	54.6996948597426	9.44114839880331	3.200690229	54.90401263	9.791910202
10.7231142748857	54.6996948597426	9.44114839880331	9.89102482200001	52.16610985	9.967821485
10.7529656262213	53.9817567829074	10.8055291294312	0.715064701000003	54.34039001	17.34040242
10.7529656262213	53.9817567829074	10.8055291294312	3.857750749	53.93522034	16.19502855
10.8145167857422	52.4331124729723	10.885049285956	8.078510661	52.12465727	17.30721805
10.8145167857422	52.4331124729723	10.885049285956	7.342191074	50.36568708	15.52547031
10.8762000637838	50.9352134916146	10.9642126422092	10.84189087	50.74783931	12.90312929
10.8762000637838	50.9352134916146	10.9642126422092	11.99216143	50.52822644	12.13005328
10.9378667650414	49.4606891717901	11.0433230558	6.810990128	49.52757429	10.46442277
10.9378667650414	49.4606891717901	11.0433230558	6.962926975	47.87740863	12.6680673
10.9996890936996	48.01729636676	11.122426390395	0.0735544159999932	50.20291794	9.32702938
11.0628273787312	46.3630588822179	11.2019014692335	1.77561061599999	46.38397362	3.634697851
11.3772030223845	44.6388573707195	11.6723108936987	0.224660494000005	41.43611847	14.21171956
11.3772030223845	44.6388573707195	11.6723108936987	7.974625907	40.8370263	13.38849506
14.574528453998	43.9549283584348	12.033385228993	9.954481978	42.50823893	15.05115407
18.0720221787025	43.2754793318084	12.3928617963922	28.54401437	40.13690379	8.087159098
18.7174691051729	42.7356581464086	12.8276838042292	23.91492832	35.50451908	14.65205958
18.7174691051729	42.7356581464086	12.8276838042292	29.90863496	38.4851443	12.83287597
18.792287528907	42.5828554619806	13.262496405014	23.06731773	35.0375678	21.55663613
18.792287528907	42.5828554619806	13.262496405014	22.33900559	31.60235215	9.968662506
18.7922877248245	42.582855397172	18.9204061608889	12.65054039	38.20990532	17.83269917
18.7922877248245	42.582855397172	18.9204061608889	19.64225061	34.99214308	28.17560222
18.7922878023354	43.2810926577696	18.5839925136528	19.77510428	38.58926296	16.64922472
18.7922878798181	43.9913293108354	18.2490144538906	25.73174612	44.02606181	8.459085063
18.7922878046389	43.9913332816861	18.2490147581659	26.567735	46.7768569	17.70634543
18.7922878046389	43.9913332816861	18.2490147581659	30.33187934	43.75504148	14.96541955
18.1147800789721	44.5541148933581	20.0727141890727	20.53092136	55.63617906	20.16527215
18.1147800789721	44.5541148933581	20.0727141890727	20.72246404	50.29048837	10.84675569
17.3642691419819	44.9868453894105	23.800013870061	19.18169919	47.05766373	27.00382561
16.6113874145521	45.4186187163613	27.3800587854524	9.19676513100001	46.15569372	17.99642834
16.6113874145521	45.4186187163613	27.3800587854524	18.21468575	45.65080463	39.25800482
16.6113874145521	45.4186187163613	27.3800587854524	10.30388261	47.84277995	17.55376223
16.6113874145521	45.4186187163613	27.3800587854524	17.44262234	43.68368222	35.8944745
16.6113874145521	45.4186187163613	27.3800587854524	19.40209516	41.66020767	37.5577128
16.6113874145521	45.4186187163613	27.3800587854524	23.40792676	43.64379836	35.72280889
16.6113874145521	45.4186187163613	27.3800587854524	22.81585575	48.67591425	26.59144604
16.6113874145521	45.4186187163613	27.3800587854524	17.93093151	43.30092715	17.11460176
16.6113874145521	45.4186187163613	27.3800587854524	22.68802089	46.28526246	22.76975049
16.6113874145521	45.4186187163613	27.3800587854524	25.71821347	44.02373583	30.1225615
16.6113874145521	45.4186187163613	27.3800587854524	24.77779172	44.04083387	26.11612996
16.6113874145521	45.4186187163613	27.3800587854524	26.12441872	44.96485891	27.03242338
16.6113874145521	45.4186187163613	27.3800587854524	27.37711129	46.43616017	27.11673494
16.6113874145521	45.4186187163613	27.3800587854524	28.08331623	42.02257662	27.79667825
16.6113874145521	45.4186187163613	27.3800587854524	27.06311365	42.64274924	23.39166283
15.69177411899	46.2295817749702	27.5245592931677	17.47416259	43.6041515	31.53434731
15.69177411899	46.2295817749702	27.5245592931677	18.21138052	45.58660191	25.83715904
14.7603034400843	47.0545296888272	27.6689212732258	9.755265232	43.18329059	30.87649008
14.7603034400843	47.0545296888272	27.6689212732258	13.48749824	42.29987548	28.42807605
13.8608957181649	47.9152762647273	27.812950547165	12.77181014	48.33401693	34.40572033
12.9669346894899	48.7767955754812	27.9562918244779	1.250751092	48.74029716	30.02493246
12.9669346894899	48.7767955754812	27.9562918244779	10.71615729	46.62293177	28.86994808
12.7624142079287	49.6737775432907	28.0875635711454	8.736047039	47.86465463	22.63362148
12.5588551273076	50.5825472922942	28.2194158554461	13.21771043	55.16074821	22.9111302

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.5588551273076	50.5825472922942	28.2194158554461	14.81228179	50.29125842	28.12065032
12.3548568225348	51.4778825654895	28.3518793255631	11.86612062	56.83051802	27.8782456
12.3548568225348	51.4778825654895	28.3518793255631	12.24975114	50.92735248	27.57127396
12.1510110368137	52.3620830549067	28.4845244932316	4.692804385	58.08052349	25.21182896
11.9506344135027	53.1968778355795	28.6178898379056	3.390983182	60.32064994	30.61068338
11.7619558544911	53.8670875779498	28.750099249669	0.102323447000003	55.05645207	30.68754948
11.7619558544911	53.8670875779498	28.750099249669	5.351054934	54.87903352	31.2051026
11.6518606235909	54.3858153223504	28.8723814863572	3.166581108	54.38581172	37.35766501
11.6518606235909	54.3858153223504	28.8723814863572	3.684518627	54.75346427	34.67646632
12.5153870836705	54.5924874827785	28.721616841105	7.88086425500001	53.63419396	36.66849242
12.5153870836705	54.5924874827785	28.721616841105	9.26512226200001	48.10149258	36.29819804
13.4661117584394	54.8043208476429	28.5667005449804	10.16802995	51.02082052	39.350114
13.4661117584394	54.8043208476429	28.5667005449804	18.10483235	51.48322234	38.87016683
14.9405168531471	55.1000855236342	28.1812193143389	15.36448886	54.97389236	39.50883453
16.3918796126287	55.3966182528282	27.7267573776064	20.37447933	52.92580791	35.47903396
16.3918796126287	55.3966182528282	27.7267573776064	22.00300591	49.77440842	32.73357505
17.6863995887246	55.7005329545062	27.2501921168264	26.97467166	54.66512134	21.38913798
18.6449153787526	56.007347512753	26.8060304093901	27.13020332	56.00735022	18.32075531
18.5627517791964	58.2950787028651	27.3973708088981	29.89833465	58.88393924	31.18403904
17.6662664998202	59.2298342272972	27.5887430252034	24.05460087	58.82740751	33.73414623
16.7269208255589	60.1720049328156	27.7784338073533	22.06521443	57.50548607	32.39286042
15.7605158503555	61.1337541206972	27.96728295443	19.29354577	63.34226321	29.80733532
15.7605158503555	61.1337541206972	27.96728295443	23.29263587	57.34435722	30.94445508
14.7187035779093	62.1275272132834	28.1553867604367	17.25601024	61.69443137	35.19020429
14.7187035779093	62.1275272132834	28.1553867604367	20.97945435	58.66863495	34.56781671
13.5813194160878	63.1756598239575	28.3400611873901	8.07711459799999	60.52651503	33.72017469
13.5813194160878	63.1756598239575	28.3400611873901	14.06057656	63.93249207	34.35643485
12.4947073938911	64.2533449227006	28.5228196539852	8.88093920200001	67.16779099	33.76570468
12.4947073938911	64.2533449227006	28.5228196539852	11.17807544	66.07771318	32.92555185
11.4427441204366	65.3155418987686	28.7042132030684	9.964092428	69.02740379	34.44916177
10.4016296032926	66.3604335242147	28.8845880279879	5.020361565	69.58798476	32.44258164
10.4016296032926	66.3604335242147	28.8845880279879	3.972668798	68.43095677	28.84137669
9.4306685750484	67.385847541073	29.0646205186813	3.702577787	67.55965669	35.63856131
8.5034656491334	68.4174021545634	29.242876556635	1.09685186199999	69.20060768	38.65184391
8.50346570142233	68.4174023211945	27.6535117123345	2.559418382	66.60707534	29.94444397
8.50346575369787	68.4174024877772	26.0403196447968	2.76637406099999	66.09545945	29.36453565
8.50346575369787	68.4174024877772	26.0403196447968	9.89788954300001	67.94003152	30.38024953
8.50346580600092	68.4174026543471	24.3374706194693	11.54525803	68.93314303	25.95468917
8.50346580600092	68.4174026543471	24.3374706194693	8.689838933	62.80875147	27.12937634
8.5034658584093	68.4174028208343	22.5877545420971	4.203561784	71.28689241	26.51244139
8.5034658584093	68.4174028208343	22.5877545420971	3.705228073	66.5975084	22.49684982
8.50346591080951	68.417402987331	20.7888403413092	0.299902086000003	68.51958527	21.52036301
8.50346596318187	68.4174031537621	18.9804435729238	0.155166121999997	73.1143838	18.2350269
8.50346601555017	68.4174033202183	17.2048507140686	1.009741561	74.32200243	17.21598932
8.50346601555017	68.4174033202183	17.2048507140686	2.544714587	74.45838234	20.47608884
8.50346606792633	68.4174034868259	15.3445168989414	6.04179221699999	70.01715429	8.958731963
8.50346606792633	68.4174034868259	15.3445168989414	6.334374787	68.85467086	8.438723386
8.50346612037214	68.4174036532806	13.7311101352921	2.885089549	70.78781924	5.964704064
8.5034661728438	68.4174038197308	12.3345623099363	2.881941531	70.78732912	3.789169139
8.5034661728438	68.4174038197308	12.3345623099363	2.781332517	68.35625636	3.710000307
8.50346622540553	68.417403986188	11.3377972398765	0.793870075000001	65.00803843	8.045595465
8.5034662779525	68.4174041525665	10.3701268358965	1.834626902	71.15202574	0.775939504
8.5034662779525	68.4174041525665	10.3701268358965	1.825477279	70.78130479	1.056192161
8.50346640300162	68.4174042565304	10.3701267569472	2.82031094	66.9400554	1.18723785
8.50346640300162	68.4174042565304	10.3701267569472	11.71156616	63.23151575	10.39694521
8.50346652814218	68.4174043605373	10.3701266783422	3.16457285600001	61.67055704	18.73530868
8.50346652814218	68.4174043605373	10.3701266783422	8.01127751600001	61.69215045	17.84993877
8.53227652958999	69.0464074882701	10.2354164916538	10.36857839	64.9958121	20.62230905
8.56103733062906	69.7369344371288	10.0943791095544	8.93361225699999	64.19415642	15.31500377
8.56103733062906	69.7369344371288	10.0943791095544	12.00297966	63.9466553	16.56981835
8.58976857194027	70.4769631905079	9.95164080246115	10.63863267	61.64507704	12.52958841
8.58976857194027	70.4769631905079	9.95164080246115	16.73656026	65.26611785	12.28815231
8.61839717639859	71.3194017596172	9.80796205713143	9.088863996	70.57778186	13.84286783
8.61839717639859	71.3194017596172	9.80796205713143	13.34199807	71.15108407	14.18117491
8.6470049388021	72.1714390131578	9.66356222202969	13.78543979	72.75062985	12.01531817
8.6470049388021	72.1714390131578	9.66356222202969	15.83973733	72.60736968	8.73861151
8.67554686173392	73.027263792625	9.51912643822961	9.360499311	76.63383999	11.96842635
8.67554686173392	73.027263792625	9.51912643822961	14.09860615	77.68853822	13.45994873
8.70404967814079	73.8575661048883	9.37399165208718	3.380314451	80.99890539	17.02151813
8.70404967814079	73.8575661048883	9.37399165208718	3.336609071	66.34370608	12.08281041
8.73296498127962	74.4301128456658	9.21236196154	1.45195925500001	80.87244268	12.37991353
8.73296498127962	74.4301128456658	9.21236196154	3.437419026	82.39656928	11.4164042
8.76201161063221	74.9528367427216	9.04903184039565	0.848777487999996	80.80421078	5.669295757
8.76201161063221	74.9528367427216	9.04903184039565	0.773453591000006	79.81662315	5.077053724
8.79124634910764	75.438651452603	8.88826370577866	3.10003410199999	78.61964126	7.805263196
8.79124634910764	75.438651452603	8.88826370577866	5.04273939700001	78.40053531	10.86923314
8.82052771198883	75.9201974181455	8.72740732327597	5.724809855	81.80721271	6.405774196
8.82052771198883	75.9201974181455	8.72740732327597	3.252339284	73.9521337	6.052632886
8.84985757339474	76.3991472940608	8.56719956334226	4.297539438	80.73294711	0.059971047
8.87925310828933	76.8609839929054	8.41049498815463	8.595205897	76.73972439	1.498449057

Solution x	Solution y	Solution z	Original x	Original y	Original z
8.90865416880099	77.3242010610992	8.25467832796393	16.93400358	77.9224885	0.924123088
8.90865416880099	77.3242010610992	8.25467832796393	16.29427026	68.63097998	5.127480774
8.93695134645424	78.9384850560563	8.11372688058099	17.20155001	81.69531761	4.530646889
8.96518537500592	80.4889728859332	7.97339406308005	19.29153506	80.52426775	7.949521468
8.96518537500592	80.4889728859332	7.97339406308005	18.79013692	77.54174683	13.67079469
8.99270648362028	83.0146947539152	7.82296711190892	12.45480817	85.29988604	5.441763796
8.99270648362028	83.0146947539152	7.82296711190892	12.87616068	80.54131267	1.790579055
9.0202042712796	85.6817662249865	7.67356486326293	15.25088212	86.85170355	0.622562014
9.0202042712796	85.6817662249865	7.67356486326293	20.47481611	85.68176763	4.096992025
9.02020420490491	86.5917007476992	7.67356482255801	4.724328509	85.88211036	2.778795893
9.02020420490491	86.5917007476992	7.67356482255801	6.810206318	85.20186256	2.844617135
9.02020413863077	87.5227873883797	7.67356478190702	3.10551266100001	84.71082736	3.992777578
9.02020407242721	88.4764331517377	7.67356474127368	4.377655918	84.98459142	5.210127271
9.02020407242721	88.4764331517377	7.67356474127368	6.35930977699999	87.06467249	1.39262333
9.02020400628952	89.4699442473344	7.6735647006946	7.009024866	89.80852716	6.686928303
9.02020400628952	89.4699442473344	7.6735647006946	7.085383584	88.77850283	10.21283209
9.02020394016732	90.4796871839429	7.6735646600804	2.510162792	94.82470236	6.564520873
9.02020394016732	90.4796871839429	7.6735646600804	4.44010970700001	94.87692744	8.233710837
9.02020387406121	91.4508094129089	7.67356461943681	3.298576907	92.26869515	0.703140302
9.02020380752407	92.4230252115432	7.67356457883033	0.846436707999999	97.15575264	0.271481864
10.5816501240308	92.4230252154668	8.86963406300699	8.37640356200001	96.83801393	4.582503625
12.1766043567546	92.4230252193663	10.1009367915268	10.40564453	91.96900158	9.717112894
12.1766043567546	92.4230252193663	10.1009367915268	8.842438164	89.89183088	2.824200169
13.8694894230922	92.4230252233093	11.4303098975692	3.319354366	86.8534104	10.89284525
13.8694894230922	92.4230252233093	11.4303098975692	5.793118726	87.72031575	18.95737877
13.8694894230922	92.4230252233093	11.4303098975692	6.29169329299999	89.27097954	11.1353809
13.8694894230922	92.4230252233093	11.4303098975692	18.10270516	98.29192556	19.61359774
13.8694894230922	92.4230252233093	11.4303098975692	18.56973911	98.93410982	17.86986814
13.8694894230922	92.4230252233093	11.4303098975692	14.02380259	94.55773265	18.6627295
13.8694894230922	92.4230252233093	11.4303098975692	17.81960057	98.01765152	13.9964983
13.8694894230922	92.4230252233093	11.4303098975692	6.663988874	86.9326968	14.76370285
13.8694894230922	92.4230252233093	11.4303098975692	22.19955839	99.83998701	15.37683497
13.8694894230922	92.4230252233093	11.4303098975692	10.77763243	89.00986935	18.62168793
13.8694894230922	92.4230252233093	11.4303098975692	9.98481624199999	87.60870523	18.9809529
13.8694894230922	92.4230252233093	11.4303098975692	5.902742913	84.57417463	9.395938461
13.8694894230922	92.4230252233093	11.4303098975692	17.25875189	95.69940805	8.290437664
13.8694894230922	92.4230252233093	11.4303098975692	23.23282295	99.37897746	14.24859303
13.8694894230922	92.4230252233093	11.4303098975692	13.01348985	89.5505908	15.47048063
13.8694894230922	92.4230252233093	11.4303098975692	11.28159713	86.83718755	19.13922705
13.8694894230922	92.4230252233093	11.4303098975692	21.95406549	97.08230078	10.07565883
13.8694894230922	92.4230252233093	11.4303098975692	19.55892343	94.48515334	9.227774263
13.8694894230922	92.4230252233093	11.4303098975692	22.62104276	94.03699994	18.3046068
13.8694894230922	92.4230252233093	11.4303098975692	20.03955091	90.83830295	21.35984013
13.8694894230922	92.4230252233093	11.4303098975692	23.10855555	93.46528062	15.33870171
13.8694894230922	92.4230252233093	11.4303098975692	15.06397637	86.4956065	14.41870487
13.8694894230922	92.4230252233093	11.4303098975692	21.61123904	90.19731465	15.12916055
13.8694894230922	92.4230252233093	11.4303098975692	25.24294214	93.18181598	14.28875041
13.8694894230922	92.4230252233093	11.4303098975692	12.63857375	82.42671014	11.06948651
13.8694894230922	92.4230252233093	11.4303098975692	24.92385591	92.07997464	15.00916266
13.8694894230922	92.4230252233093	11.4303098975692	21.4032788	88.65695382	8.541884
13.8694894230922	92.4230252233093	11.4303098975692	24.68088332	89.71453351	6.983081462
13.8694894230922	92.4230252233093	11.4303098975692	18.16441332	83.32201509	7.61422766
13.8441861333498	92.4230253128946	12.985207777686	6.625140742	98.72893978	20.20468371
14.775275499343	92.4121797121382	12.9790271847468	11.51332542	99.95442641	21.54207323
21.4082463404596	92.401042258578	12.9728129548031	21.53298817	97.76613815	23.69582939
21.4082463404596	92.401042258578	12.9728129548031	17.22630202	94.08640458	22.99978352
22.104388385492	92.28479499673	12.6711725770453	27.32463884	98.08040747	18.9687539
22.104388385492	92.28479499673	12.6711725770453	25.58817455	94.62259734	16.80660453
22.7625453090344	92.1676137177981	12.360943818269	27.03699297	98.99807723	18.13725322
23.398832565335	92.0493937911181	12.0442841798855	30.46512782	92.10545477	16.97866967
23.398832565335	92.0493937911181	12.0442841798855	30.51609732	92.20951413	14.80192542
23.9988407532404	91.9312976532252	11.722769308142	26.49994117	86.49656314	20.04082186
23.9988407532404	91.9312976532252	11.722769308142	24.93956922	85.18138774	19.5490822
24.5835144561667	91.8156457542367	11.3761514029543	24.79158589	85.73273425	15.36547182
24.5835144561667	91.8156457542367	11.3761514029543	28.34961296	82.66841267	14.80317352
25.1498948237565	91.7024362775791	11.0205822640405	26.20322759	94.45704722	0.043122659
25.7044079144488	91.5879712592198	10.7118276002825	22.06521104	97.80973943	1.986453498
25.7044079144488	91.5879712592198	10.7118276002825	29.03165996	90.53300961	6.710005169
26.3007458902154	91.4708556950385	10.4318347993793	20.42707279	96.69258649	1.544902576
28.5951521337996	91.3379317240292	10.2444544501398	23.92476676	88.85275247	0.073261016
28.5951521337996	91.3379317240292	10.2444544501398	33.71990859	84.56649705	17.88810749
31.0032573835347	91.2119076857551	10.0621697512082	33.84742868	94.52834747	10.85109907
33.3562308777841	91.0857472243854	9.87979387674693	37.35140359	99.57591236	15.11952707
33.3562308777841	91.0857472243854	9.87979387674693	41.23951851	98.4925435	12.0504117
34.7344901561321	90.9539778038631	9.69220338625768	31.03913924	88.81924735	11.29281098
34.7344901561321	90.9539778038631	9.69220338625768	28.95022635	86.79829568	12.40202554
36.240735204616	90.8231164030749	9.5038994957991	32.87814817	90.10176773	12.94837243
37.7922583351164	90.6924314319911	9.31507576187944	39.47053756	98.01039691	0.046804559
38.4183123711387	90.401309779248	9.21729472183622	38.21932161	86.88940242	6.390388464
39.0460276829463	90.1123870238085	9.11965051768988	37.87107476	99.67477247	15.46291348

Solution x	Solution y	Solution z	Original x	Original y	Original z
39.0460276829463	90.1123870238085	9.11965051768988	38.25086273	84.70191635	10.62939488
39.7027170861317	89.7654115343723	9.01884802387276	38.00030199	82.20200968	0.019607641
40.7156623366037	89.5841106794479	8.93793220458428	38.24583972	80.95791524	3.839199962
41.7741400650833	89.4068519792295	8.85746931809991	35.55901251	90.85604615	4.893665446
41.7741400650833	89.4068519792295	8.85746931809991	36.90788531	88.78292268	9.064555312
42.9145023695266	89.2296724487502	8.7771314171666	36.17809574	80.13104248	5.688631409
42.9145023695266	89.2296724487502	8.7771314171666	44.47086767	80.17305261	3.885836986
47.8331653478894	89.0791952138415	8.69895125896303	49.55654528	80.81624315	0.169379697
47.8331654070558	89.0791956331134	8.96525727381129	44.01236363	95.54242778	0.007676566
47.8331654070558	89.0791956331134	8.96525727381129	46.25821854	91.17761288	0.218810451
47.8331654666081	89.0791960520344	9.37873645577353	47.96746082	95.14523251	6.669541987
47.8331654666081	89.0791960520344	9.37873645577353	42.23200248	88.95299773	4.136491045
47.8331655261824	89.0791964709297	9.80013941632336	46.20732106	94.82215894	11.38854737
47.8331655857719	89.0791968897921	10.2200358945904	45.33430047	93.58613905	11.44191552
47.8331655857719	89.0791968897921	10.2200358945904	43.91518159	93.39792889	6.973666169
47.8331656454235	89.079197308619	10.6421213772911	48.86252985	99.44183304	4.964951227
47.8331657049631	89.0791977265894	11.4370842260323	44.53236455	98.59505273	17.96036731
47.8331657049631	89.0791977265894	11.4370842260323	52.2623599	99.83573023	14.38314162
47.8331657049631	89.0791977265894	11.4370842260323	50.67630959	98.08417141	16.59101162
47.8331657049631	89.0791977265894	11.4370842260323	54.09260921	96.04789718	12.52208915
47.8331657049631	89.0791977265894	11.4370842260323	49.59427698	92.51123595	3.551090207
47.8331657049631	89.0791977265894	11.4370842260323	54.90972966	93.30800556	12.19693664
47.8331657049631	89.0791977265894	11.4370842260323	51.98537923	93.03310405	5.658677856
47.8331657049631	89.0791977265894	11.4370842260323	49.03663551	90.65504513	13.8830876
47.8331657049631	89.0791977265894	11.4370842260323	53.26472651	92.17526811	13.38443287
47.8331657049631	89.0791977265894	11.4370842260323	54.43632749	91.92787857	15.4166252
47.8331657049631	89.0791977265894	11.4370842260323	54.10050901	92.28618361	12.05829408
47.8331657049631	89.0791977265894	11.4370842260323	46.02083433	88.3362158	14.03418258
47.8331657049631	89.0791977265894	11.4370842260323	57.53422575	91.73216299	13.63995038
47.8331657049631	89.0791977265894	11.4370842260323	45.13867401	81.86371268	20.6390675
47.8331657049631	89.0791977265894	11.4370842260323	56.30399813	89.72916428	6.343295144
47.8331657049631	89.0791977265894	11.4370842260323	40.58416037	81.54961967	6.0287924
47.8331657049631	89.0791977265894	11.4370842260323	53.87450626	88.16447802	6.291517338
47.8331657049631	89.0791977265894	11.4370842260323	49.77274656	84.13753559	18.23448828
47.8331657049631	89.0791977265894	11.4370842260323	52.05342714	85.82620662	0.803032132
47.8331657049631	89.0791977265894	11.4370842260323	51.49657531	83.11057243	16.78262105
47.8331657049631	89.0791977265894	11.4370842260323	55.99099974	83.60147673	17.9737132
47.8331657049631	89.0791977265894	11.4370842260323	48.20934555	82.30314786	4.491594241
47.8331657049631	89.0791977265894	11.4370842260323	53.08761619	83.0335557	12.88369987
47.8331657049631	89.0791977265894	11.4370842260323	51.18829335	82.80979047	5.597845952
47.8331657049631	89.0791977265894	11.4370842260323	46.11608956	79.13405595	12.05021293
47.8331657049631	89.0791977265894	11.4370842260323	45.32225765	79.26748614	7.718311017
47.8331657049631	89.0791977265894	11.4370842260323	47.92908542	80.11129273	4.265931676
47.8331657049631	89.0791977265894	11.4370842260323	47.14165764	77.84331314	10.33249494
47.8331657049631	89.0791977265894	11.4370842260323	55.73082902	81.05870461	7.770192012
55.5479067409534	88.9057278643827	11.4370841219671	58.00620671	94.64720593	1.304858734
56.819714828546	88.671893199213	11.4370840184195	57.43254842	97.94119843	9.821238574
58.0826646626742	88.4329216650517	11.4370839148684	61.09603132	95.38804721	2.385400865
58.0826646626742	88.4329216650517	11.4370839148684	62.35255518	88.46202983	5.064300638
58.8749509563591	88.1231670135943	11.4370838116573	67.89989075	88.12316705	3.528198384
58.7627703658985	83.6167509745202	11.4962741548183	55.75342338	84.56592915	0.703415223
58.7627703658985	83.6167509745202	11.4962741548183	57.82109764	79.24611201	0.587934441
58.6534257586517	82.2644469329904	11.5614588388413	63.68037897	79.29990004	5.705664659
58.5437352591973	80.9688891184994	11.6268061159423	69.09548968	84.07624055	12.89569188
58.5437352591973	80.9688891184994	11.6268061159423	62.03157877	81.16617953	8.458189727
58.4299823715796	79.3849840713698	11.6923167611937	58.40265516	82.89286098	16.95320583
58.4299823715796	79.3849840713698	11.6923167611937	61.67834468	82.51967341	13.24261796
58.3161202108828	77.7485719544964	11.7576974185056	55.72002047	71.91921816	21.5952445
58.2052352773005	76.9244103704589	11.8195996438989	53.90080059	74.55382457	8.588853077
58.0947015185466	76.112348944636	11.8815737816564	52.24575767	74.98560476	14.55357765
57.984610069871	75.308144857493	11.9434948821674	51.91696279	73.69595809	14.416915
57.8749839773181	74.5133505195152	12.0053621270853	51.17754367	73.39508539	6.606709632
57.8749839773181	74.5133505195152	12.0053621270853	53.60239056	70.80290226	5.406808424
57.7665340200125	73.7488846413536	12.0675872089335	61.63608438	74.03409399	0.746346368
57.595975527136	72.796555226967	12.2327199233666	61.14896118	72.70410502	7.635652533
57.4248988105578	71.8497301544503	12.3984544689777	58.21523833	76.77458472	1.682398914
57.4248988105578	71.8497301544503	12.3984544689777	50.86986196	67.11854893	6.466301231
57.2532288008472	69.13119881238	12.625349554227	56.84900895	69.27095699	14.65228976
57.2532288008472	69.13119881238	12.625349554227	57.97334153	65.39941546	18.27090119
57.0818168713545	66.640362554824	12.8504372597684	61.64088805	64.72462094	13.53456764
57.0818168713545	66.640362554824	12.8504372597684	65.09617026	64.32634731	13.59892336
56.9080911704003	64.369834173239	13.0753109967901	50.37372436	63.54183807	17.2232387
56.7359190699195	62.1538391158605	13.2990186697013	52.59359138	61.87082203	17.23711721
56.5645774558802	59.9678144538079	13.5219526044765	55.40337389	57.61168804	14.09596446
56.3935441847794	57.8464660976788	13.7449656536516	56.36080227	54.43871329	23.33898219
56.3935441847794	57.8464660976788	13.7449656536516	64.66140077	51.58253517	18.71344865
56.2086332418189	56.8113300063771	13.9495359284088	46.15723029	56.4070148	19.959172
56.2086332418189	56.8113300063771	13.9495359284088	49.48945411	49.44119699	20.62289914
56.2086333781306	56.8113309929925	13.9495358032177	48.01348394	55.67625048	22.64155069
56.2086333781306	56.8113309929925	13.9495358032177	53.50308144	57.04941766	21.52167719

Solution x	Solution y	Solution z	Original x	Original y	Original z
56.5650907497986	57.2051499512556	13.4248363826173	49.52719402	60.88674536	13.02441036
56.9279909180442	57.5957309427895	12.901524885368	53.70737401	57.8077763	9.994366281
56.9279909180442	57.5957309427895	12.901524885368	54.43373891	52.12894009	7.9067999
57.2959659305651	57.9937430338401	12.3909938845767	56.20333441	63.09635143	9.893720293
57.6651977552285	58.3884012222223	11.8837550855521	54.15102156	63.89433124	1.875052021
59.0134775759681	58.5681881734351	11.7513332317433	59.0134746	66.34233581	2.610073656
59.0134775759681	58.5681881734351	11.7513332317433	53.04622082	62.56220406	2.597564218
60.873732395773	58.568189792789	11.7513318734166	59.77266019	58.01872841	1.019723189
60.873732395773	58.568189792789	11.7513318734166	61.56325619	58.635877	0.997422198
62.8170293931452	58.5681914125609	11.7513305187317	62.81703196	55.94894639	0.04067048
62.8170293931452	58.5681914125609	11.7513305187317	70.94365949	58.14560753	5.076539278
64.887300227626	59.0200930083046	11.7513302272471	63.59211348	50.34808715	9.20862338
64.887300227626	59.0200930083046	11.7513302272471	66.65703205	47.7722791	14.44067044
66.3662731003412	60.9475981037862	11.7513299347441	69.12634406	69.4594231	3.844630021
66.3662731003412	60.9475981037862	11.7513299347441	65.33791464	63.72798066	4.706052333
66.9025290692253	61.1885576203177	11.75132964533	66.81087893	72.19337817	6.977880898
66.9025290692253	61.1885576203177	11.75132964533	65.55566867	66.58332744	7.127202217
68.0434908690913	61.1991748244221	11.7513293669355	75.75634139	60.02200009	5.726434896
69.0851511128523	61.209794883096	11.7513290886086	72.70378804	66.70645397	9.083647724
70.1101465620683	61.2204098881305	11.7513288102951	68.52022941	55.69012612	11.12241046
71.1501052255419	61.231032398903	11.7513285319819	71.85259834	57.85616299	9.805797889
72.1935736864306	61.2416605919739	11.7513282536827	68.36889636	72.61479797	11.90493723
72.1935736864306	61.2416605919739	11.7513282536827	73.75840634	73.11670598	12.48249331
74.5427763945151	60.6901899205132	11.3469478704493	74.07680751	69.16329968	17.32839223
74.5427763945151	60.6901899205132	11.3469478704493	70.36283848	70.39401036	9.239076068
77.8407418248275	60.0166531505612	10.9334208831061	78.29263567	66.45988674	19.86750284
77.8407418248275	60.0166531505612	10.9334208831061	76.04244622	64.45001766	13.22117777
81.217108657456	59.2235388020215	10.4632700034752	85.16088414	60.47696067	19.97453885
81.217108657456	59.2235388020215	10.4632700034752	87.34079917	59.37931572	10.08579475
83.7117052827678	58.4218766286255	9.95466335941997	90.50689197	55.43830225	17.11301088
83.7117052827678	58.4218766286255	9.95466335941997	85.71414415	51.67250379	7.296357424
85.5933188275435	57.6821520032277	9.41760981904308	95.77662579	57.68215173	3.069360741
85.4377522318077	54.5529148702279	9.41760983592337	84.14082278	54.46253046	0.380513445
85.2828695616963	51.4935398783262	9.41760985283121	79.86750899	54.35421653	8.27403967
85.1291251317029	48.3327725987258	9.4176098697452	78.92131522	50.41345477	7.556720976
85.1291251317029	48.3327725987258	9.4176098697452	77.77449926	46.72256252	10.92269156
84.9780311994266	45.2507943159637	9.41760988667352	77.14427045	45.25079579	0.327384457
84.9780311312116	41.722141605922	9.41760996088999	74.78372311	42.05088328	3.322634156
84.9780311312116	41.722141605922	9.41760996088999	75.19376171	39.75388964	3.378695446
84.9780310640427	38.767132965715	9.41761003450193	88.13068149	33.9074779	16.96093724
84.9780309967678	36.2740664845365	9.41761010884614	87.56748283	36.27406643	21.13489416
84.9780309967678	36.2740664845365	9.41761010884614	86.50661976	33.33916758	0.489048022
83.0706740379129	30.2497898371894	6.92089076141537	75.00767938	29.50135545	13.77877729
81.5918911811511	24.8093251873049	3.37656433107641	87.03899122	21.09553754	1.216015821

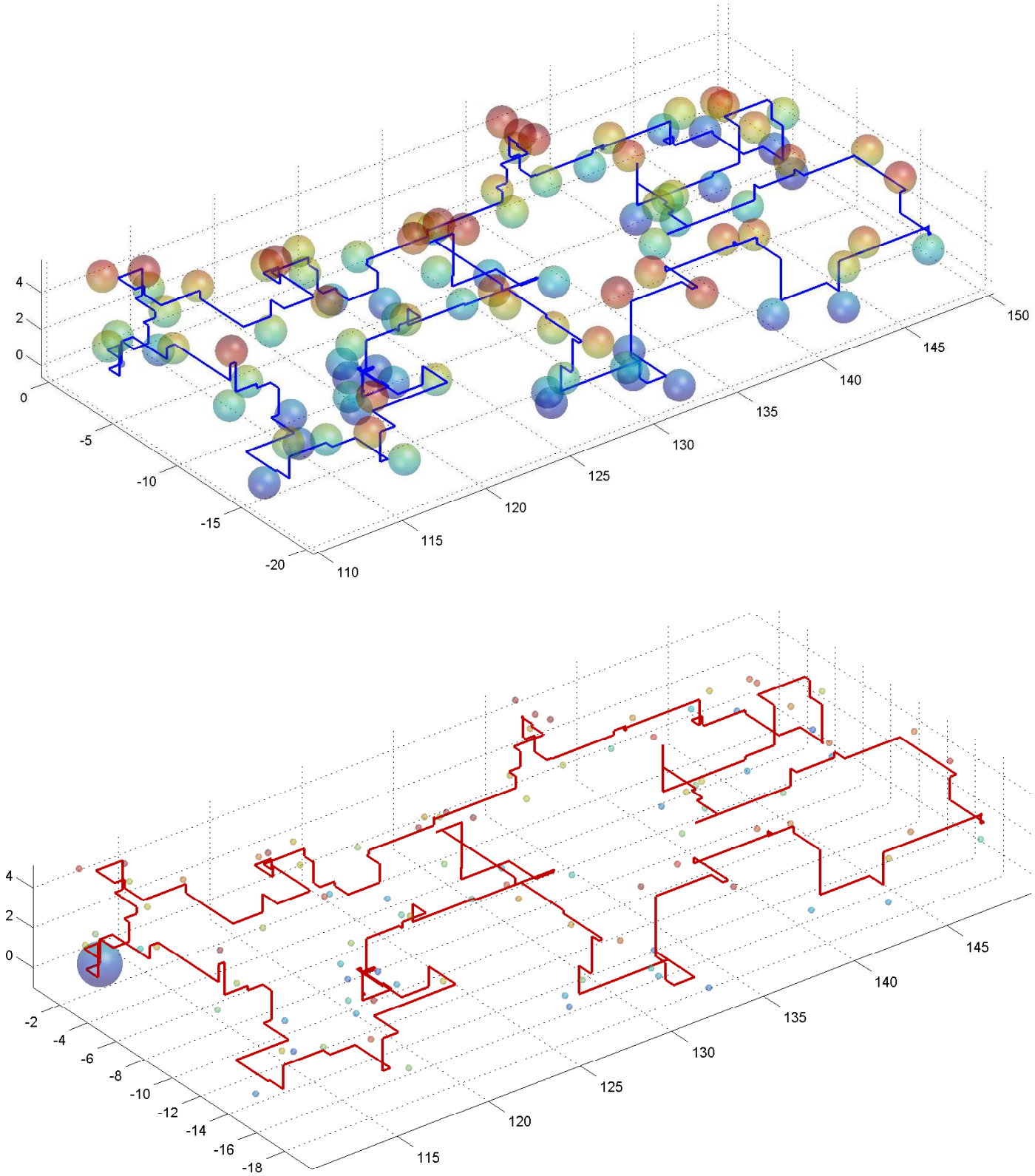


Figure N.174: $kroD100$, $r = 0.7798$, Equal Radius, 3D, Manhattan, Length = 276.9349054

Table N-177: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 3D, Manhattan

Total distance: 276.934905445295 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
2.01594185459805	2.52627869327299	1.70404205929738	2.02	2.33	2.08
1.24980303354859	3.63000022358049	2.66999978940928	0.47	3.63	2.67
1.94613733358771	6.28280980594641	3.31997654144985	2.4	6.19	3.07
2.40999966370912	10.5797955035295	4.19802322460798	2.41	10.69	4.97
2.73221313247213	10.5797989480583	2.58239619331807	2.35	10.59	1.97
4.00999865298562	10.5798023928722	2.3499898035407	4.01	9.8	2.35
4.82632809274826	11.2100004149633	0.870503362028878	5.55	11.21	0.58
4.37741030530964	13.0356770717373	0.870502842840523	4.64	13.02	0.19
1.46909740306376	15.3299997996152	0.870502326397526	0.8	15.33	0.47
1.57056916420301	16.2820559872127	2.05771147895011	1.49	16.29	2.83
3.75220834658542	16.7846479943086	2.06888085636961	3.86	16.16	2.13
5.11123374201038	19.3204271749307	2.08002965545237	5.71	19.82	2.08
4.66180417438362	19.3204243108791	3.7201956967571	3.94	19.44	3.99
5.55000062786365	17.5299999768597	3.72019637227256	5.55	17.53	4.5
10.0401962503025	15.6099999266843	2.71999990640971	10.82	15.61	2.72
8.55980348486767	12.8200017509233	1.55000083025451	7.78	12.82	1.55
8.70345804327107	12.6191648082992	1.13478301734695	8.11	12.95	0.83
10.3295983225004	11.9581729805413	0.959501515021299	11.09	11.96	0.79
10.3323263693114	10.1052005425241	0.948115577169921	9.97	9.42	1.03
10.5635672278358	10.1037102805529	0.721717751399164	10.21	9.62	0.29
11.3219488855439	10.1022510047717	0.598050199482894	11.79	9.69	0.13
10.8643270223711	10.1022553346462	2.30999887354223	10.09	10.01	2.31
12.6399999597093	10.3485957772385	2.62859532602106	12.64	10.9	3.18
13.9300002305617	9.36980357915495	1.72000375284266	13.93	8.59	1.72
17.3228103623261	9.36981397750313	1.62793688774303	17.25	9.27	1.67
21.6721169178698	9.36982437597661	1.53559802980222	22.23	9.9	1.41
20.6699997325725	7.45494798885176	1.53559613665706	20.67	6.94	0.95
18.0505603250508	7.45494901529566	2.14000142793034	17.66	6.78	2.14
18.0505577923682	7.52922183216745	4.44567254456277	18.19	8.14	4.91
17.5247608627986	7.52921946989308	4.4456719541913	17.66	6.92	4.8
16.6210385978534	7.52921711158328	4.44567136107906	16.04	7.06	4.67
16.9427049488048	12.746724749973	4.07496723011825	16.99	12.94	3.45
16.9427049488048	12.746724749973	4.07496723011825	16.77	12.38	3.99
17.2702496573664	15.7780448884865	3.86097687891841	17.68	15.78	3.21
17.3185978433967	18.4685921824524	3.82999301393102	17.87	19.02	3.83
17.1304530087776	17.9927627144562	2.03553808743149	16.46	18.17	1.97
17.0098039594545	17.2302757462141	0.85000208583521	16.23	17.23	0.85
17.0101141260027	17.2291656903438	0.648693186734888	16.32	17.42	0.34
21.8576887992288	16.4037796629922	0.648010949778182	22.21	15.78	0.34
21.8576884661891	19.1213056400085	0.648010937417442	22.14	19.77	0.32
20.7198034193807	18.5199949276952	1.48998751081342	19.94	18.52	1.49
20.7198034193807	18.5199949276952	1.48998751081342	20.5	18.33	0.82
20.7197990913572	17.8579866512618	4.53173391057502	20.28	17.36	4.94
23.7399989644781	18.6725513312252	4.53173133808183	23.74	19.44	4.67
24.0563438315077	16.1890923387273	4.23283463426664	23.56	15.68	4.13
28.3399998177214	15.8998050937442	3.97999954747752	28.34	15.12	3.98
29.7081261778468	15.92189789619	3.64153804857211	30.07	15.24	3.68
29.7498446081898	17.7597975354208	1.37422486843902	29.27	17.77	0.77
32.4536083395566	18.7208703605129	1.34170620886609	32.48	19.06	0.64
32.4536227949041	18.7208704420577	2.99981474421272	32.2	19.45	3.11
33.7300003931323	18.7208699411706	2.99984825539441	33.73	19.02	3.72
37.8599985209201	18.6199973467123	2.49980642750173	37.86	18.62	1.72
38.0500002382796	16.1899999223663	3.66019365139187	38.05	16.19	4.44
38.4004458730618	12.1700004752592	3.66017276239225	39.18	12.17	3.68
35.3886575521012	11.427206842167	3.36804218403056	35.35	11.12	3.97
33.3173131307335	11.0251793418664	2.4824619976263	33.32	10.49	1.92
28.12857295419	11.0099746242233	2.46798728474301	27.4	11.01	2.19
29.3573923280845	9.48140613160895	2.46798666182867	29.82	9.49	1.92
29.3573923280845	9.48140613160895	2.46798666182867	29.01	9.2	2.88
29.705747480046	8.67383856367357	2.46798604070864	30.23	8.71	2.76
29.9548143077644	7.80999978967378	2.46798541955741	30.6	7.81	2.03
29.9548085029801	6.32197799836641	3.55428347723836	29.44	6.32	4.14
29.954825649436	6.32185460964627	1.24509942330295	29.93	6.24	0.47
34.4612050311322	6.32185004086355	1.41365987167192	34.52	6.37	0.69
36.03491269458	6.32184547054928	3.41436006070972	36.42	6.99	3.53
36.0349210427688	5.4874485114053	3.41438848610241	35.99	5.14	4.02
36.0349293903783	5.14607170488009	3.41441681977889	36	4.59	3.96
38.6004162945935	5.49526573194971	2.49467573527825	39.35	5.4	2.53
38.680000144974	6.26755756340225	0.558632535258395	38.68	6.97	0.22
38.7675549030666	4.58999993967616	0.558632444283837	39.46	4.59	0.2
37.6145623131561	2.18329109887818	0.729078128095767	37.66	1.54	0.37
35.3800005127559	2.0298054414604	1.14000084973538	35.38	1.25	1.14
34.7898803545594	2.59731563312754	2.4336329600355	35.03	3.01	2.97
30.620000513591	2.82019744708083	2.67760037722722	30.62	3.29	3.3
29.9499984463653	2.82019579020176	2.45869954009157	29.95	2.64	1.7
26.5800029678809	2.82019571295735	2.50002063282137	26.58	3.6	2.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.3020897222583	1.9502987345399	3.31295564081062	26.56	1.28	3.27
25.8100020784789	1.76140680756325	4.36859680872323	25.81	1.21	4.92
25.7151840612457	2.56432213164743	4.32010507739654	25.92	2.48	4.76
25.6177015901194	3.45764947911784	4.27008543304561	25.97	3.49	4.95
23.9772195991802	3.95062204983633	3.48165935174912	23.47	3.88	3.22
23.339999256572	4.47758997618791	2.91487486906581	23.34	5.23	2.71
18.9693372691978	4.47758098054995	2.914873276837	18.28	4.56	3.27
18.9693372159754	4.31980438544723	2.49000122451269	19.62	3.89	2.49
15.410004152963	4.31980346821628	2.2799979777293	15.41	3.54	2.28
15.2899980448051	5.25859509255608	1.34140393506141	15.29	5.81	0.79
13.5779701483282	4.28309947178548	1.54884588284154	13.46	4.08	0.87
12.7854684991672	3.82509624426326	2.64236808003851	12.03	3.85	2.73
12.7199943140566	3.23980339207326	3.03000026091794	12.72	2.46	3.03
10.4905113362408	3.81770775992591	3.57417900373626	10.17	3.33	3.55
9.56000105060268	5.1200001844815	4.13135753432636	9.31	5.12	4.87
9.56000014076248	7.74135704736313	4.04999600089519	9.81	8.48	4.05
7.81000003113179	6.6999995806919	3.13980325709346	7.81	6.7	2.36
6.18471816025733	3.32532987282096	3.58369935330151	6.34	2.94	3.58
3.87000088122399	1.9900000144376	4.03019697093836	3.87	1.99	4.81
3.33460964768108	0.645643942478211	4.0301958169657	2.64	0.36	4.24
4.79801852061716	0.645643479130442	2.56000077189291	5.47	0.25	2.56
4.37256707388084	2.21523109415356	2.22047809081923	4.6	2.67	2.69
3.65999985683344	2.61019694447994	1.24999989233957	3.66	3.39	1.25

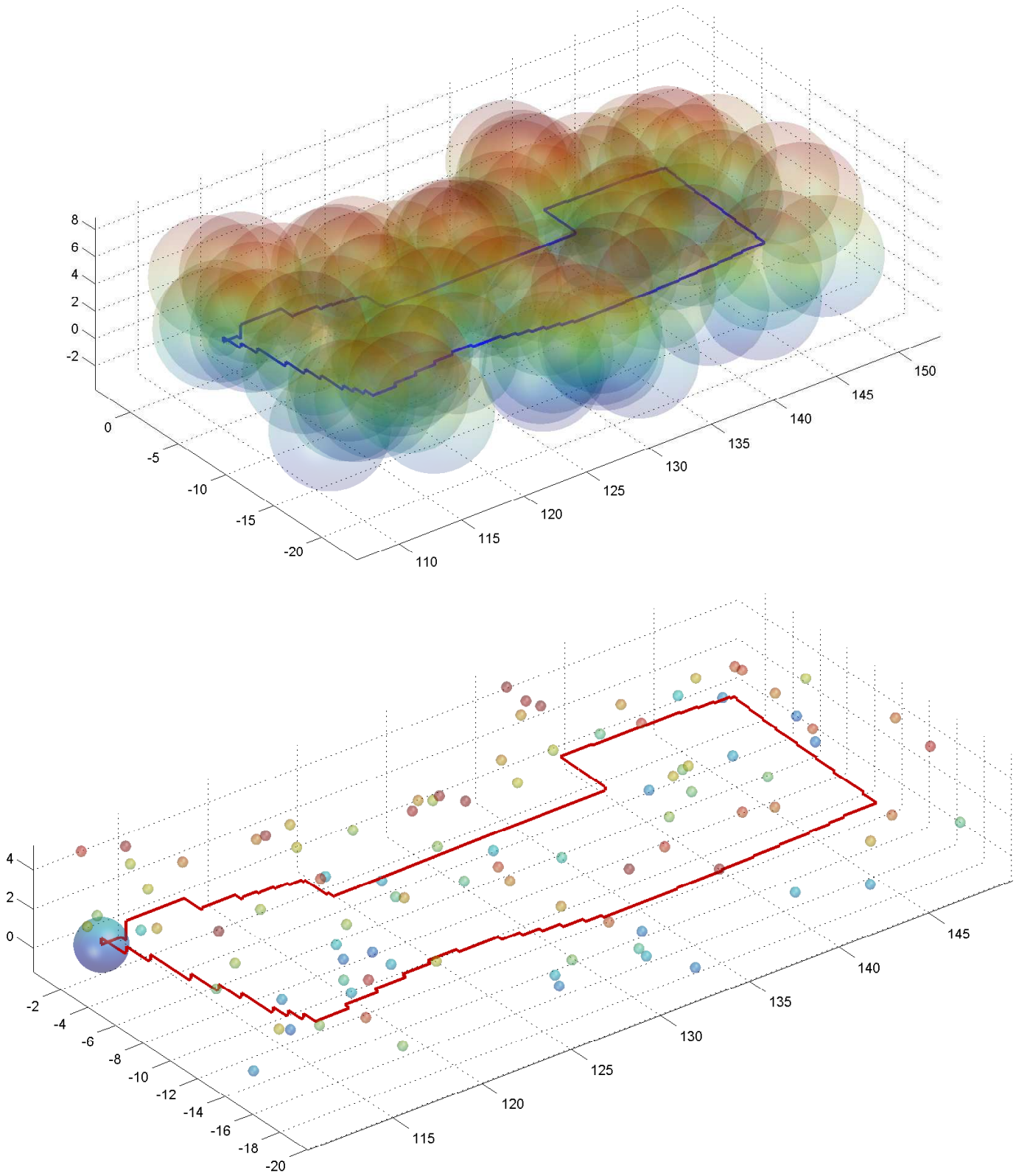
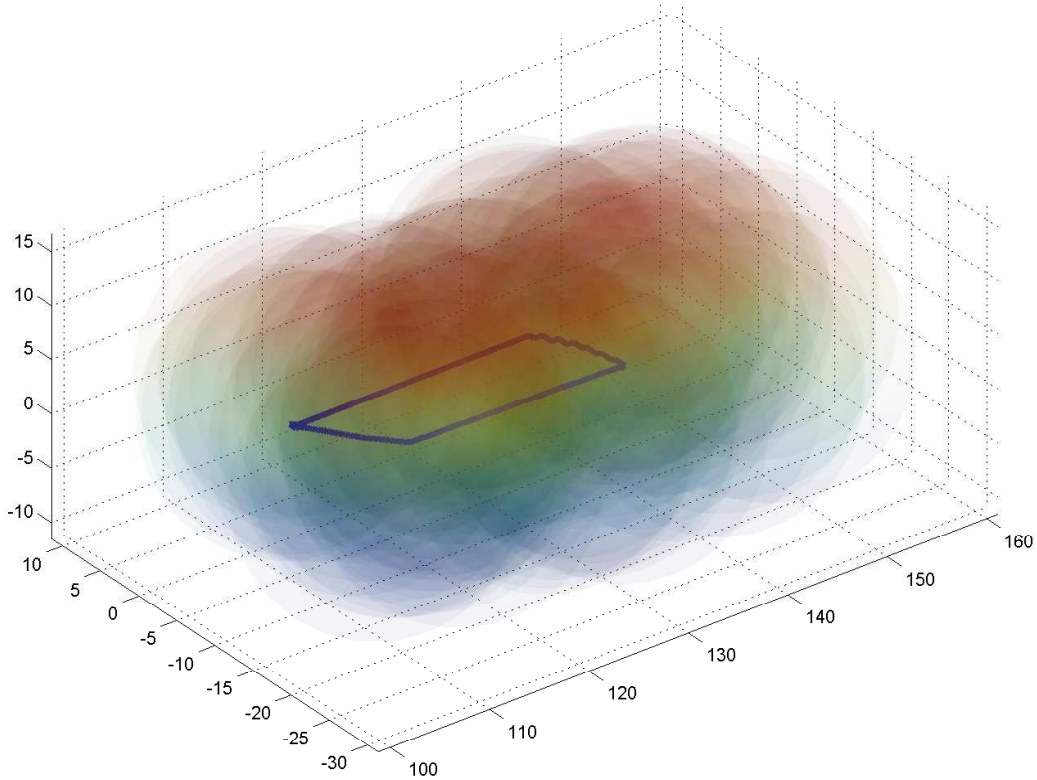


Figure N.175: $kroD100$, $r = 3.899$, Equal Radius, 3D, Manhattan, Length = 109.7704722

Table N-178: Solution for $kroD100$, $r = 3.899$, Equal Radius, 3D, Manhattan

Total distance: 109.770472159589 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
3.8792927330919	2.02325987298174	1.0252347694784	6.34	2.94	3.58
3.8792927330919	2.02325987298174	1.0252347694784	4.6	2.67	2.69
3.8792927330919	2.02325987298174	1.0252347694784	5.47	0.25	2.56
3.8792927330919	2.02325987298174	1.0252347694784	3.87	1.99	4.81
3.8792927330919	2.02325987298174	1.0252347694784	2.64	0.36	4.24
7.12646986962966	3.31905441610254	1.14227877931659	7.81	6.7	2.36
8.98588018820945	3.82287907086379	1.25407516101172	9.31	5.12	4.87
9.78572757343858	4.02984413308222	1.31452342200915	10.17	3.33	3.55
10.580130450846	4.23879045605561	1.37453598541734	12.03	3.85	2.73
10.580130450846	4.23879045605561	1.37453598541734	12.72	2.46	3.03
11.2147509003036	4.45906674721955	1.43369723033265	13.46	4.08	0.87
11.8043984502674	4.6806685531817	1.4929952879797	15.41	3.54	2.28
11.8793353128112	6.26303543388633	1.54486401160827	9.97	9.42	1.03
11.9597757857914	6.69684571272453	1.5974390073674	10.09	10.01	2.31
12.1921279564778	6.75522321105203	1.64293062883589	10.21	9.62	0.29
12.1921279564778	6.75522321105203	1.64293062883589	9.81	8.48	4.05
13.1115362208465	6.80516694402936	1.68636006393227	11.79	9.69	0.13
14.4479585983466	6.85369110647325	1.7304517135305	13.93	8.59	1.72
15.8570670877578	6.90204967486792	1.77455933631587	16.04	7.06	4.67
15.8570670877578	6.90204967486792	1.77455933631587	15.29	5.81	0.79
17.3451757395274	6.950542441225	1.81834242827686	18.28	4.56	3.27
18.7003132444551	6.99953131818248	1.8619136808591	19.62	3.89	2.49
19.8916697002608	7.0494982126907	1.90535569738638	17.25	9.27	1.67
19.8916697002608	7.0494982126907	1.90535569738638	17.66	6.78	2.14
19.8916697002608	7.0494982126907	1.90535569738638	20.67	6.94	0.95
19.8916697002608	7.0494982126907	1.90535569738638	18.19	8.14	4.91
19.8916697002608	7.0494982126907	1.90535569738638	22.23	9.9	1.41
19.8916697002608	7.0494982126907	1.90535569738638	17.66	6.92	4.8
23.2517576081009	7.09498323517755	1.94649357228982	23.34	5.23	2.71
23.2517576081009	7.09498323517755	1.94649357228982	23.47	3.88	3.22
26.7211560359007	7.14191631007865	1.9872438671922	29.82	9.49	1.92
26.7547601130265	7.16475883545068	2.02993323335554	30.23	8.71	2.76
26.7547601130265	7.16475883545068	2.02993323335554	30.6	7.81	2.03
26.7547602617398	7.1647598295459	2.18998867530457	27.4	11.01	2.19
26.7547603126703	6.6650674596982	2.20210554842381	29.01	9.2	2.88
26.7547603635255	5.96803031316393	2.21420912102729	29.93	6.24	0.47
26.7547604143019	5.23946224603093	2.22638406184327	26.58	3.6	2.5
26.7547604143019	5.23946224603093	2.22638406184327	29.44	6.32	4.14
26.7547604650578	4.45937613629559	2.23851516630209	25.97	3.49	4.95
26.7547604650578	4.45937613629559	2.23851516630209	25.92	2.48	4.76
26.7547605152228	3.89026073932931	2.25057384171236	25.81	1.21	4.92
28.5251679499055	3.97644095110178	2.25056703962118	26.56	1.28	3.27
28.5251679499055	3.97644095110178	2.25056703962118	29.95	2.64	1.7
28.5251679499055	3.97644095110178	2.25056703962118	30.62	3.29	3.3
33.3672970730076	4.06764868532937	2.2505602406486	35.38	1.25	1.14
34.2772387932081	4.16887898032442	2.250553441052	35.03	3.01	2.97
34.2772387932081	4.16887898032442	2.250553441052	36	4.59	3.96
35.1139286129739	4.27057158700502	2.25054664031977	35.99	5.14	4.02
35.9359836394788	4.37191014477207	2.25053983882923	37.66	1.54	0.37
36.143748837826	4.59000069513773	2.25053300923253	39.46	4.59	0.2
36.066899929091	5.59858275769244	2.25053305099427	39.35	5.4	2.53
35.9868610813147	6.68072412107361	2.25053309273731	36.42	6.99	3.53
35.9068809062875	7.75218020289345	2.25053313446341	34.52	6.37	0.69
35.9068809062875	7.75218020289345	2.25053313446341	38.68	6.97	0.22
35.8234166975288	9.4171080426357	2.25053317626158	33.32	10.49	1.92
35.7415368037977	10.8868486878261	2.25053321806913	35.35	11.12	3.97
35.6599903791936	12.3547301035044	2.25053325985822	39.18	12.17	3.68
35.5371074033928	14.658070757759	2.25053330155268	38.05	16.19	4.44
35.402038867094	15.7373749614285	2.25053334316156	37.86	18.62	1.72
33.5040022634842	15.8551096888659	2.25053338485328	32.48	19.06	0.64
32.6134131463814	15.9544552821992	2.25053342659499	33.73	19.02	3.72
31.4044125015815	16.0463117744759	2.25053346830241	32.2	19.45	3.11
29.6966836106842	16.1302838189495	2.25053350999323	29.27	17.77	0.77
28.1621445302251	16.2137227197611	2.25053355171387	30.07	15.24	3.68
26.3188436937858	16.2977080389077	2.25053359342058	28.34	15.12	3.98
23.740000153642	16.3824864817633	2.25053363510925	23.74	19.44	4.67
23.1052690303135	16.3824865376371	2.25053359039574	22.21	15.78	0.34
23.1052690303135	16.3824865376371	2.25053359039574	23.56	15.68	4.13
22.4984902001276	16.3824865935337	2.25053354569604	20.28	17.36	4.94
22.4984902001276	16.3824865935337	2.25053354569604	19.94	18.52	1.49
22.1400009449667	16.3824866493601	2.25053350097409	22.14	19.77	0.32
19.6233115891332	16.1908666502493	2.25053359370388	17.87	19.02	3.83
18.7589194989288	15.9488881159688	2.25053368639676	20.5	18.33	0.82
17.6813597604516	15.6880714957736	2.25053377910824	16.99	12.94	3.45
17.6813597604516	15.6880714957736	2.25053377910824	17.68	15.78	3.21
16.7180167075599	15.4458262397389	2.25053387179225	16.23	17.23	0.85

Solution x	Solution y	Solution z	Original x	Original y	Original z
15.7970645911085	15.1984878050343	2.25053396449731	16.32	17.42	0.34
15.7970645911085	15.1984878050343	2.25053396449731	16.46	18.17	1.97
14.8153565449586	14.9205186895262	2.25053405723282	16.77	12.38	3.99
12.6399989599237	14.6865945836388	2.25053414993784	12.64	10.9	3.18
11.0202652786778	14.9574533591714	2.25053414939436	11.09	11.96	0.79
9.40532593038404	15.2652033383968	2.25053414887139	10.82	15.61	2.72
7.63130211269954	15.572492666679	2.25053414834205	8.11	12.95	0.83
7.63130211269954	15.572492666679	2.25053414834205	7.78	12.82	1.55
5.72431222291935	15.9342151781724	2.25053414784512	5.71	19.82	2.08
4.85625738234889	15.9423620810884	2.25053414731902	5.55	17.53	4.5
3.93999991357175	15.9505209694779	2.2505341467435	3.94	19.44	3.99
3.79636245746906	15.0907462751783	2.04256265143483	1.49	16.29	2.83
3.65630535593451	14.1686005406494	1.83199561071039	4.64	13.02	0.19
3.65630535593451	14.1686005406494	1.83199561071039	3.86	16.16	2.13
3.51532072871331	13.2382334286514	1.6244621016221	0.8	15.33	0.47
3.38796352624679	11.107416830632	1.42917588369912	2.41	10.69	4.97
3.26594091439145	9.58366304397767	1.16724504120492	5.55	11.21	0.58
3.26594091439145	9.58366304397767	1.16724504120492	4.01	9.8	2.35
3.14089169365755	7.72798979101436	0.905520518386195	2.35	10.59	1.97
3.14089169365755	7.72798979101436	0.905520518386195	2.4	6.19	3.07
3.01807321390807	4.91449406027104	0.624232542355095	2.02	2.33	2.08
2.89679761090926	3.33540489232822	0.330992945308495	3.66	3.39	1.25
2.89679761090926	3.33540489232822	0.330992945308495	0.47	3.63	2.67



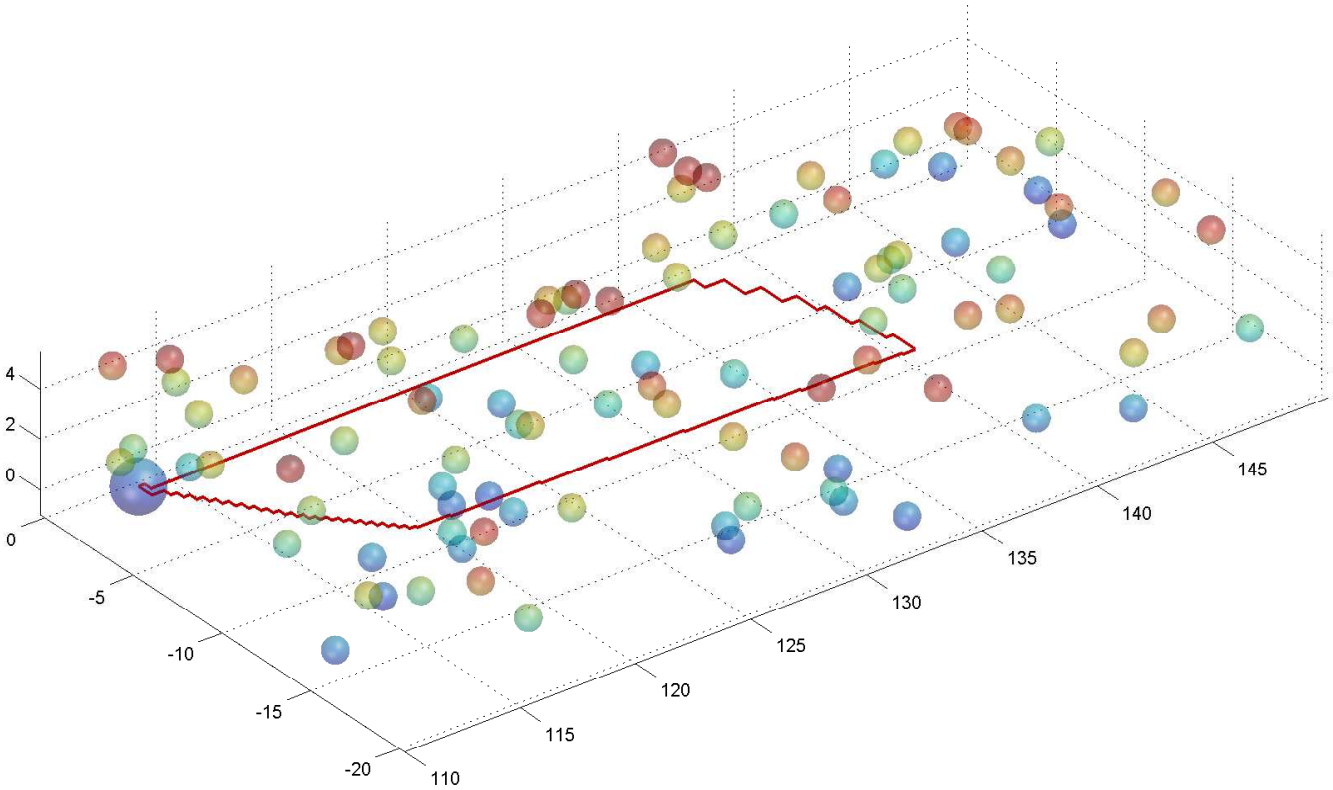
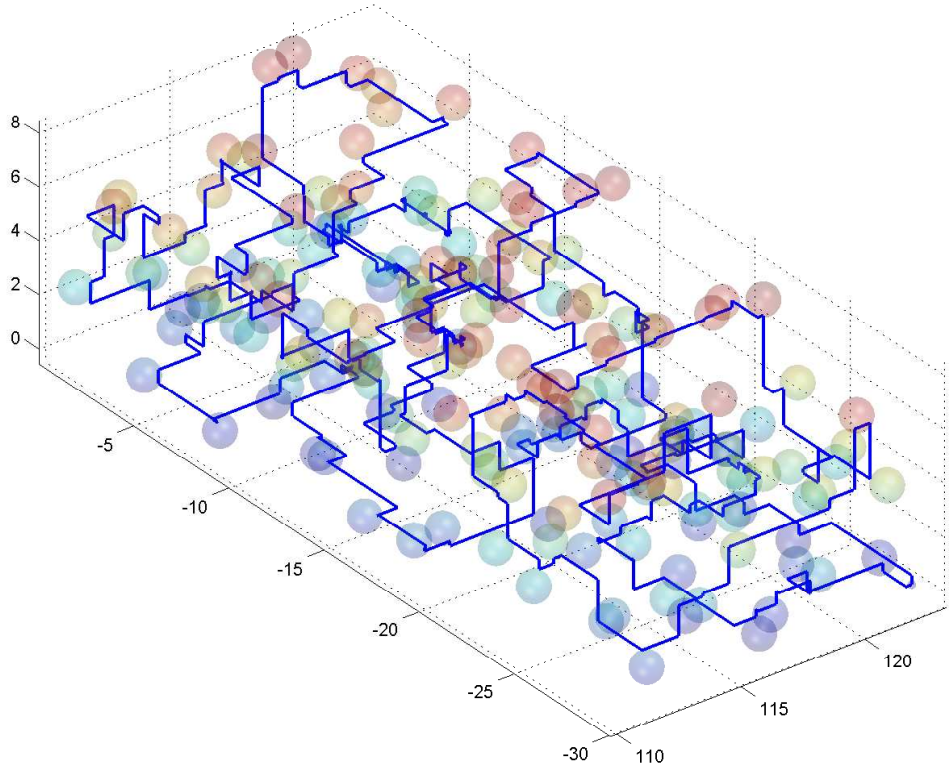


Figure N.176: $kroD100$, $r = 11.697$, Equal Radius, 3D, Manhattan, Length = 71.3755246

Table N-179: Solution for $kroD100$, $r = 11.697$, Equal Radius, 3D, Manhattan

Total distance: 71.3755246326367 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
3.04070648619552	2.03089656733099	7.93225041206824E-10	3.66	3.39	1.25
3.04070648619552	2.03089656733099	7.93225041206824E-10	2.02	2.33	2.08
26.5280537865826	2.65396267491023	2.24514860036606E-8	35.38	1.25	1.14
26.5280537865826	2.65396267491023	2.24514860036606E-8	37.66	1.54	0.37
27.3596764958558	3.8329450858392	4.97785741515599E-8	35.03	3.01	2.97
27.3596764958558	3.8329450858392	4.97785741515599E-8	36	4.59	3.96
28.0603169825961	5.03469326840472	7.69649961540608E-8	36.42	6.99	3.53
28.0603169825961	5.03469326840472	7.69649961540608E-8	35.99	5.14	4.02
28.6635688453683	6.21233638037326	1.04070499773456E-7	39.35	5.4	2.53
28.6635688453683	6.21233638037326	1.04070499773456E-7	39.46	4.59	0.2
29.0279966041887	7.66148869487998	1.31105755585281E-7	38.68	6.97	0.22
29.3734381203971	9.16936550863649	1.58197432043039E-7	39.18	12.17	3.68
29.6788754875865	10.438886643618	1.85113879780374E-7	32.48	19.06	0.64
29.6788754875865	10.438886643618	1.85113879780374E-7	37.86	18.62	1.72
29.1362767143515	10.3590856874446	1.77690141711651E-7	38.05	16.19	4.44
27.9736228415703	10.2723819718034	1.70059292869951E-7	32.2	19.45	3.11
27.9736228415703	10.2723819718034	1.70059292869951E-7	33.73	19.02	3.72
24.8683048421868	10.1759681089582	1.62419857119289E-7	17.25	9.27	1.67
24.8683048421868	10.1759681089582	1.62419857119289E-7	17.66	6.78	2.14
24.8683048421868	10.1759681089582	1.62419857119289E-7	18.19	8.14	4.91
24.8683048421868	10.1759681089582	1.62419857119289E-7	22.23	9.9	1.41
24.8683048421868	10.1759681089582	1.62419857119289E-7	20.67	6.94	0.95
24.8683048421868	10.1759681089582	1.62419857119289E-7	17.66	6.92	4.8
24.8683048421868	10.1759681089582	1.62419857119289E-7	19.62	3.89	2.49
24.8683048421868	10.1759681089582	1.62419857119289E-7	18.28	4.56	3.27
24.8683048421868	10.1759681089582	1.62419857119289E-7	16.99	12.94	3.45
24.8683048421868	10.1759681089582	1.62419857119289E-7	16.04	7.06	4.67
24.8683048421868	10.1759681089582	1.62419857119289E-7	16.77	12.38	3.99
24.8683048421868	10.1759681089582	1.62419857119289E-7	23.34	5.23	2.71
24.8683048421868	10.1759681089582	1.62419857119289E-7	17.68	15.78	3.21
24.8683048421868	10.1759681089582	1.62419857119289E-7	27.4	11.01	2.19
24.8683048421868	10.1759681089582	1.62419857119289E-7	23.47	3.88	3.22
24.8683048421868	10.1759681089582	1.62419857119289E-7	29.01	9.2	2.88
24.8683048421868	10.1759681089582	1.62419857119289E-7	29.82	9.49	1.92
24.8683048421868	10.1759681089582	1.62419857119289E-7	22.21	15.78	0.34
24.8683048421868	10.1759681089582	1.62419857119289E-7	30.23	8.71	2.76
24.8683048421868	10.1759681089582	1.62419857119289E-7	20.28	17.36	4.94
24.8683048421868	10.1759681089582	1.62419857119289E-7	30.6	7.81	2.03
24.8683048421868	10.1759681089582	1.62419857119289E-7	23.56	15.68	4.13
24.8683048421868	10.1759681089582	1.62419857119289E-7	26.58	3.6	2.5
24.8683048421868	10.1759681089582	1.62419857119289E-7	29.93	6.24	0.47
24.8683048421868	10.1759681089582	1.62419857119289E-7	29.44	6.32	4.14
24.8683048421868	10.1759681089582	1.62419857119289E-7	25.97	3.49	4.95
24.8683048421868	10.1759681089582	1.62419857119289E-7	33.32	10.49	1.92
24.8683048421868	10.1759681089582	1.62419857119289E-7	25.92	2.48	4.76
24.8683048421868	10.1759681089582	1.62419857119289E-7	26.56	1.28	3.27
24.8683048421868	10.1759681089582	1.62419857119289E-7	28.34	15.12	3.98
24.8683048421868	10.1759681089582	1.62419857119289E-7	25.81	1.21	4.92
24.8683048421868	10.1759681089582	1.62419857119289E-7	29.95	2.64	1.7
24.8683048421868	10.1759681089582	1.62419857119289E-7	23.74	19.44	4.67
24.8683048421868	10.1759681089582	1.62419857119289E-7	30.62	3.29	3.3
24.8683048421868	10.1759681089582	1.62419857119289E-7	30.07	15.24	3.68
24.8683048421868	10.1759681089582	1.62419857119289E-7	29.27	17.77	0.77
24.8683048421868	10.1759681089582	1.62419857119289E-7	35.35	11.12	3.97
23.7370570594693	10.0901952500588	1.5462416946832E-7	17.87	19.02	3.83
23.7370570594693	10.0901952500588	1.5462416946832E-7	22.14	19.77	0.32
23.7370570594693	10.0901952500588	1.5462416946832E-7	34.52	6.37	0.69
19.9592147986744	9.99696218773381	1.48014763112769E-7	19.94	18.52	1.49
19.9592147986744	9.99696218773381	1.48014763112769E-7	20.5	18.33	0.82
16.7400763129573	9.90103647860106	1.41483171844925E-7	16.23	17.23	0.85
16.7400763129573	9.90103647860106	1.41483171844925E-7	16.32	17.42	0.34
13.8826557621255	9.80333690282477	1.35058593642157E-7	16.46	18.17	1.97
10.0575655152526	9.70437889365979	1.28659872089543E-7	5.71	19.82	2.08
8.67556667146235	9.59661347789675	1.22251611500701E-7	3.94	19.44	3.99
8.41715272451479	9.32545555548003	1.16692042695377E-7	5.55	17.53	4.5
8.16319567015171	9.0403573966174	1.11048340301068E-7	10.82	15.61	2.72
8.16319567015171	9.0403573966174	1.11048340301068E-7	3.86	16.16	2.13
7.9139423864782	8.74128642198719	1.0540886918875E-7	12.64	10.9	3.18
7.9139423864782	8.74128642198719	1.0540886918875E-7	11.09	11.96	0.79
7.66220079927221	8.43987755641543	9.98189939593885E-8	10.21	9.62	0.29
7.66220079927221	8.43987755641543	9.98189939593885E-8	9.81	8.48	4.05
7.41100465261147	8.13948432281291	9.42576754425772E-8	10.09	10.01	2.31
7.41100465261147	8.13948432281291	9.42576754425772E-8	9.97	9.42	1.03
7.15984083144481	7.8388812992951	8.87432349827577E-8	13.93	8.59	1.72
7.15984083144481	7.8388812992951	8.87432349827577E-8	11.79	9.69	0.13
6.90226203054874	7.53813211857986	8.33020230572856E-8	15.29	5.81	0.79

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.90226203054874	7.53813211857986	8.33020230572856E-8	13.46	4.08	0.87
6.6315111117366	7.245515676666	7.79352244961729E-8	15.41	3.54	2.28
6.34605768961596	6.9614785873372	7.25724724759402E-8	1.49	16.29	2.83
6.34605768961596	6.9614785873372	7.25724724759402E-8	0.8	15.33	0.47
6.09188257379076	6.61174808835321	6.71762343529281E-8	2.41	10.69	4.97
5.84181273844396	6.25773124373797	6.16890378779544E-8	4.01	9.8	2.35
5.84181273844396	6.25773124373797	6.16890378779544E-8	2.35	10.59	1.97
5.59710221144786	5.89799913324874	5.62057334008159E-8	5.55	11.21	0.58
5.35333920696161	5.53359865331911	5.07636777058451E-8	8.11	12.95	0.83
5.35333920696161	5.53359865331911	5.07636777058451E-8	4.64	13.02	0.19
5.10952020876778	5.14595817477469	4.53944704048581E-8	7.78	12.82	1.55
4.86415854266525	4.74327787365452	4.00293860280954E-8	12.03	3.85	2.73
4.6138906495068	4.34400134726005	3.46375035320534E-8	12.72	2.46	3.03
4.6138906495068	4.34400134726005	3.46375035320534E-8	10.17	3.33	3.55
4.35276920522605	3.95412515337283	2.91639192795401E-8	6.34	2.94	3.58
4.35276920522605	3.95412515337283	2.91639192795401E-8	4.6	2.67	2.69
4.09227798730126	3.57034374774061	2.36505997008862E-8	7.81	6.7	2.36
4.09227798730126	3.57034374774061	2.36505997008862E-8	9.31	5.12	4.87
3.82663299652228	3.18229637541502	1.80376282798989E-8	3.87	1.99	4.81
3.5617388255252	2.79743327089584	1.23489201087068E-8	2.4	6.19	3.07
3.5617388255252	2.79743327089584	1.23489201087068E-8	0.47	3.63	2.67
3.30096033661793	2.41001202298375	6.6144885124686E-9	5.47	0.25	2.56
3.30096033661793	2.41001202298375	6.6144885124686E-9	2.64	0.36	4.24



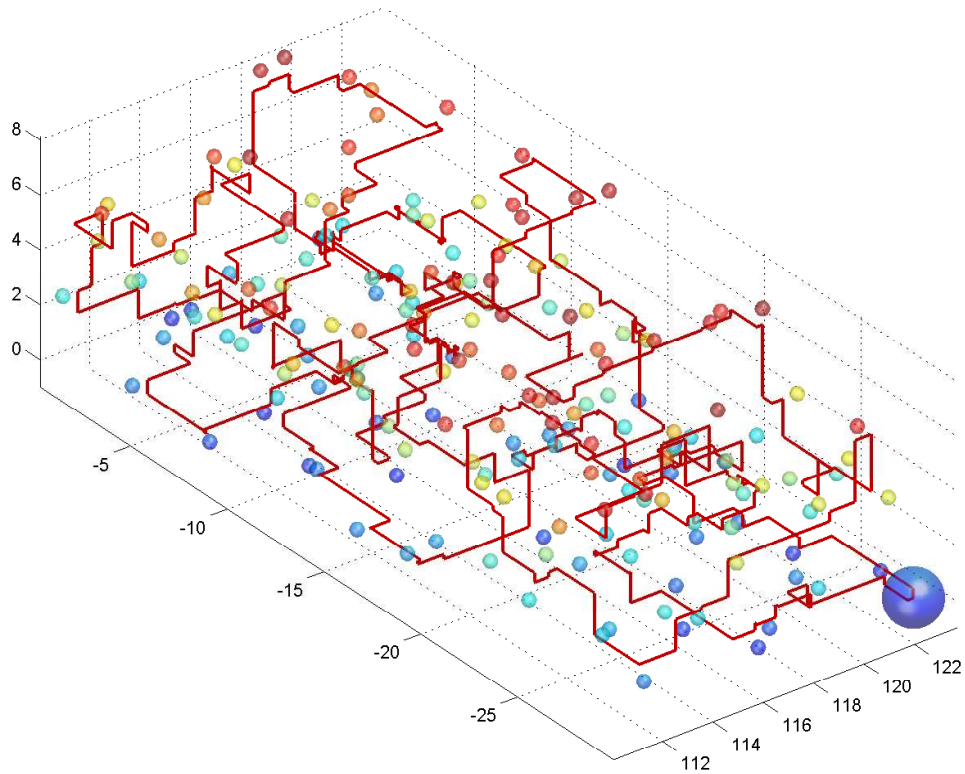


Figure N.177: $rat195$, $r = 0.578$, Equal Radius, 3D, Manhattan, Length = 412.1314243

Table N-180: Solution for $rat195$, $r = 0.578$, Equal Radius, 3D, Manhattan

Total distance: 412.131424309341 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
12.469661598988	27.7838811318212	0.303505000453686	12.7	27.3	0.2
9.50000036838637	27.6780035851416	1.00000095986638	9.5	27.1	1
8.69999984640954	28.8912901847593	1.49128974962207	8.7	29.3	1.9
7.42956866377612	28.7597706217111	1.00690856490256	7.3	28.6	0.6
6.69659353900442	28.6394410100294	0.739286210843005	6.7	28.8	0.2
5.81102285221347	26.6000000272756	0.706430508302656	5.4	26.6	0.3
5.92203307557617	24.8003478554072	0.706465544198048	6.5	24.8	0.7
4.70000314864387	24.799648990735	1.8219975188787	4.7	24.8	2.4
4.63371026341088	23.03370948492	1.63371163696893	4.3	22.7	1.3
5.50430288283452	23.0656802922734	1.93719464460363	5.5	22.5	1.9
6.56200198414948	23.3195082103499	2.64791274826458	6.7	22.9	2.9
7.06398634206991	24.6780091477816	2.95127452779677	7.3	24.7	2.7
7.45111216720811	25.9405423804918	3.32679334614736	7.4	26.5	3.3
8.69999923995496	25.9912900630824	3.89128992187226	8.7	26.4	4.3
8.92294550184482	25.1147597602749	3.66401899998507	8.7	24.9	3.7
9.17502590060403	24.5000002569405	3.43242375317071	9.4	24.5	2.9
9.17502619723828	23.9780002874466	3.60000188538916	9.5	23.5	3.6
7.50000035928888	23.9780026046856	5.29999848171489	7.5	23.4	5.3
6.37801744071835	25.200000109928	5.80000201280921	5.8	25.2	5.8
6.37801806171792	26.6924315780925	7.42004354036768	6.7	26.7	7.9
4.50000019763615	26.6924552893095	5.97795449802885	4.5	26.7	5.4
3.54951513013732	26.692468921824	5.97796142960461	3.7	26.6	6.4
1.04208994039472	26.6924825583264	5.97796844906595	0.5	26.6	5.8
1.04208790793251	28.2903885003244	7.07800369797649	0.7	28.7	7.3
2.22175942879844	28.2020854697286	7.07800357104147	2.3	28.7	7.3
2.59999853477174	25.5000005902441	7.07800344331388	2.6	25.5	6.5
2.80765590381392	24.5873863217715	7.11363495568844	3.3	24.6	6.9
2.89591302375072	23.516664645071	7.15299494128256	2.6	23.5	7.4
2.99128908375097	22.5000000540287	7.19129137430476	3.4	22.5	7.6
2.83985677318354	21.5290814837358	7.01033723966384	3.3	21.4	7.2
2.39999709751886	21.0964604469577	6.74359002178263	2.4	20.9	6.2
0.91680964095444	21.0964525106186	6.7435873525764	0.5	20.7	6.8
0.921997294862322	21.3000018996029	4.60000196865231	1.5	21.3	4.6
0.921996334739134	22.6112511924849	4.42505542330051	1.3	22.7	4.8
0.92199537194071	23.1133974767072	3.1141172633293	0.6	22.9	2.8
0.921994390381144	24.7638948514582	2.76030768200928	0.6	24.9	2.3
1.49999970269869	24.7638958375999	2.94572094336268	1.5	24.6	3.5
1.82200325140654	26.6999994583645	1.40102267029341	2.4	26.7	1.4
1.82200409004363	27.5140841368743	1.40021217451764	1.6	27.4	1.8
1.82200492933092	29.0003971317338	1.39940129478501	1.7	29.4	1
3.29999977111794	28.9780235961646	2.50000128915874	3.3	28.4	2.5
4.30289509758865	28.9780233870859	2.61621306719825	4.3	28.8	2.1
5.34751063062514	28.9780231785062	3.95419175698516	5.3	29.5	4.1
9.39999894279651	28.9780229679406	4.30000537729036	9.4	28.4	4.3
10.3999997822842	28.9780234860349	6.5350133055505	10.4	29.1	7.1
11.0390815942437	28.9780231610162	4.4605056443163	11.4	29.4	4.3
11.0390821717766	27.1000006700753	4.46050335817749	11.6	27.1	4.6
10.9148355688203	26.4000000141643	3.18473422344469	10.6	26.4	2.7
10.9148362519604	25.6000011518551	3.33726209575215	10.4	25.6	3.6
12.1219944095429	25.2999963114106	3.33726414341646	12.5	25.3	2.9
12.1219966536089	23.0000005358803	4.70000051464074	12.7	23	4.7
11.700000043265	22.4999997866483	7.32199687839905	11.7	22.5	7.9
11.4699420257313	21.1670218223677	7.07674212412084	11.5	20.6	7
10.3648105900632	21.1511561620925	6.99685746976325	10.4	21.5	7.4
8.40020997890778	21.1342969420761	6.87177544969479	8.4	21.2	7.3
6.44285414165589	21.1173741946358	6.71522386863086	6.4	21.3	7.2
5.30000069780276	21.0999882836918	6.2780031834734	5.3	21.1	5.7
4.87801000842838	20.5999996139994	6.30000250973729	4.3	20.6	6.3
4.87801259348633	19.1757797523529	6.32813979430916	4.4	18.9	6.5
7.12319142812308	19.1757749386534	6.32814759754738	7.7	19.2	6.3
6.59999975708186	19.1757642447425	7.32250570822627	6.6	19.2	7.9
5.80444310755014	17.3998938797	7.32250318347839	5.3	17.4	7.6
5.79595679550569	15.5103469460895	7.32250061543751	6.3	15.5	7.6
5.49999937647783	15.1727829275843	7.32249801142887	5.5	14.6	7.4
3.67607108988841	15.4724476519239	7.07478305346297	3.5	15.1	6.8
3.07800252698793	16.499999440217	6.89999948022957	2.5	16.5	6.9
3.50000019554017	16.9219974091524	6.59999977182751	3.5	17.5	6.6
3.9532932824587	16.6719509884879	6.22947214749953	4.4	16.9	6.4
4.0838366705495	15.8011170994976	4.90000032775877	4.5	15.4	4.9
2.4000185873973	15.8011273280887	3.88802033772341	2.4	15.3	3.6
2.17787794138152	17.2000000563407	3.88800229963774	1.6	17.2	3.9
2.51528222753821	19.0336430352092	3.86584016219489	2.5	19.5	4.2
3.71980643521476	19.0497140876315	2.79848397256336	3.7	18.6	2.9
5.0662867540956	19.0662955895395	0.733712407149491	5.4	19.4	0.4
1.71635661836793	19.0324107153228	0.882335221301575	1.6	18.8	1.3
0.708710945047898	18.9999970946002	0.991292581981767	0.3	19	1.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
0.819848239769016	16.391100112986	0.955457670665204	0.3	16.4	1.1
1.64278328526275	12.7097039908794	0.916839391669386	1.7	12.5	1
2.39999882098024	11.2000001054921	0.87800210578814	2.4	11.2	0.3
2.60317568423686	9.60514980496381	1.38350122153628	2.5	9.4	1.9
5.2779892022006	9.49999869312883	1.42241766493577	5.3	9.5	2
5.27799935993826	8.70004003816373	1.20000752851919	4.7	8.7	1.2
5.73615757982714	8.59999854153617	1.02715478209992	6.3	8.6	0.9
5.39999857920422	7.64166832963768	1.02715321723007	5.4	7.2	1.4
3.59999993085998	7.64166726612841	0.466207870810851	3.6	7.3	0
0.878001544527393	7.89324423746311	0.500003572725649	0.6	8.4	0.5
0.878001722409678	4.80000048056857	1.00000008185087	0.3	4.8	1
2.59969309994079	3.97800177915874	1.30000116097407	2.6	3.4	1.3
2.60048237005523	4.92344699169767	2.22709068680581	2.6	5	2.8
3.60000014170612	4.92345145893995	2.22709027700831	3.6	5.4	1.9
5.39999988233225	4.83566386831393	2.27222315365226	5.4	4.6	2.8
6.27505747852437	4.83566365966067	1.30000146995548	6.4	5.4	1.3
6.27506122800136	3.20000000895735	0.864337255332933	6.4	3.2	0.3
6.2750619566684	1.60000059678026	0.921982302325168	6.6	1.6	1.4
5.41414490183828	1.37165497815455	0.817919532694682	5.4	1.2	0.3
4.69999982907353	1.23322493125028	0.76243868884113	4.7	1.1	0.2
3.25942442247649	1.23322365788023	1.82445405188066	3.4	1.1	2
0.877046245363843	1.23322238335397	2.60000050884794	0.3	1.2	2.6
1.41884965589441	1.23322150972606	4.00585031368949	1.7	1.2	4.1
1.82771808925702	1.23322063698664	5.10000015395033	2.3	0.9	5.1
0.708709256218668	3.1999998585739	6.09129125709669	0.3	3.2	6.5
1.49965214852672	4.02199816400491	5.79999952869358	1.5	4.6	5.8
1.50034805464139	3.20000255533063	4.17800207715884	1.5	3.2	3.6
3.2314359805202	3.11858729396152	4.42288230785705	3.3	3.4	4
4.13230295270424	3.02014241320115	5.67044421513601	4.2	3.4	5.8
4.89129094535882	2.90870925928758	6.50000012851369	5.3	2.5	6.5
4.79999835483004	5.00000003868248	7.22199810824025	4.8	5	7.8
3.64165750600466	8.24418123305015	7.02162901769468	3.7	8.4	7.5
1.30000121854147	8.92199790806063	6.30000014303687	1.3	9.5	6.3
1.17800200316059	7.5000017761871	5.50000017277107	0.6	7.5	5.5
1.77416924997905	7.40101734486241	4.4161324762381	1.5	7.5	4.4
2.70000017867272	7.29999871602499	3.37800236401005	2.7	7.3	2.8
4.67857888446069	6.96968678921338	4.22759758500392	4.7	6.8	4
6.49615460475137	6.67421561875687	5.66021432828482	6.6	6.8	6.1
7.46223681651826	6.316698423924	6.02315685746261	7.4	6.7	6.3
8.84796475851545	5.18869727109305	6.26548581662903	8.8	4.9	6.7
12.2912886101845	4.89999965987167	6.39129281793606	12.7	4.9	6.8
11.8533794603879	3.09999950500828	6.36690654490576	11.3	3.1	6.2
11.853382596425	1.50000082922755	6.3669055696062	12.3	1.5	6
11.172560167976	1.27232228233962	6.82380762525772	11.5	1.4	6.7
9.40000015769611	1.02497029650478	7.36757657954463	9.4	0.8	7.9
8.612856983078	1.02497000860209	7.24701902517028	8.6	0.6	7.6
7.97799686508362	1.02496973271595	4.60000068465771	7.5	0.7	4.6
7.97799913799426	3.16284519216513	4.18803546433628	8.5	3.4	4.2
7.97800139247882	3.2000374778963	3.20000331124036	7.4	3.2	3.2
8.0532339914175	4.41194462278668	2.88367441966473	7.5	4.4	2.9
8.62688801893029	6.19902710494158	2.52963547557801	8.5	6.5	2.8
9.39999983126592	6.82199783394957	2.00000094883196	9.4	7.4	2
9.85201226036151	5.5100451238611	1.75058595328859	10.3	5.4	1.9
10.0654374428408	4.78589002019659	1.43618425316887	9.8	5	1.1
10.3662908022743	1.23371016154354	1.23371050895049	10.7	0.9	0.9
10.2280130243759	2.25454153261263	1.9026308845711	10.4	2.5	2.2
10.078002082852	2.80000008133386	2.3000005675	9.5	2.8	2.3
11.921997766868	3.40000028414543	2.79999928525243	12.5	3.4	2.8
11.7269408248887	4.73706739039224	2.93776008739475	11.5	4.7	3.2
11.5513772678131	6.26071056997056	3.06428496091513	11.7	6.5	2.6
11.2709555051347	6.50000013517877	4.01002034376072	10.7	6.5	4.1
12.0000004452212	6.80000105519833	4.01002250805453	12.5	6.8	4.3
11.9999994126248	9.49999977190503	4.01002216728507	11.5	9.5	4.3
12.0219975664561	10.8999968115896	3.99999035698301	12.6	10.9	4
11.6999994111415	10.9428183634723	3.05373874643774	11.7	11.5	2.9
10.1821147677607	10.635546402266	3.05373768325777	9.8	10.8	3.4
10.0097612253202	9.59810071126925	3.05373668130907	10.3	9.2	3.3
8.23010205999083	9.47800277992752	3.05373566865589	7.7	9.3	3.2
8.30000342409053	9.47800212822589	1.90000063571202	8.3	8.9	1.9
8.82199777834506	9.50000850754744	1.00000160538494	9.4	9.5	1
7.29447117686536	10.7920055335865	0.741715657963805	7.3	11.2	0.4
5.62252835830951	10.9823910808638	0.611387894065167	5.6	10.5	0.4
4.40000023964734	12.6912903738981	0.508709007541226	4.4	13.1	0.1
3.98091922058082	12.4141788266448	3.03970666985729	3.5	12.6	3.2
3.86679936548629	11.4845750430728	3.43311385398974	4.3	11.2	3.3
3.59999927801799	11.2633332901881	4.4544445335244	3.6	10.8	4.8
1.50000043440122	11.2633351492143	4.45444419254666	1.5	11.1	3.9
0.831330999386637	11.400001025709	6.13711594305704	0.7	11.4	6.7
0.831329690824631	12.7000002324533	5.82969182718197	0.6	12.7	5.3
0.831330384904305	14.8019785172686	5.90198262994199	0.7	15.2	6.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
1.60000019285083	14.6999968896897	5.87800253293033	1.6	14.7	5.3
2.84165301499745	13.6723581050648	5.89270383083962	2.7	13.4	6.1
5.18947340525563	13.0870907893556	5.90731016384394	5.4	13.2	5.7
6.29999971326851	12.3999999367824	5.92199787617374	6.3	12.4	6.5
6.7484798103726	11.495777973275	5.25246207185516	6.4	11.2	5.2
8.2109073693204	11.0891300059508	4.6768376327213	8.6	10.7	4.5
8.20739327204589	12.69999903497	4.67683748806698	7.7	12.7	4.4
8.38827140773691	12.8900923250321	6.77649902198988	8.2	13.4	6.9
9.64546817350718	12.9457753172352	7.05149551887593	9.6	12.8	7.5
11.4229462507289	13.0037248623279	7.22208026892351	11.6	13	7.6
12.2758087018807	13.061631127487	7.36163103037964	12.6	13.4	7.7
12.2757994772751	9.87749564425089	7.19999959077974	12.3	9.3	7.2
10.9464152666183	11.2985229052544	6.89777817591657	10.4	11.3	7
10.8780025098006	12.6000001048927	5.40000056850816	10.3	12.6	5.4
10.9509854475898	15.079528637458	4.88752115540524	10.4	15.1	4.9
11.400000237551	16.3219972176184	4.30000016026238	11.4	16.9	4.3
11.8272927627261	15.6452709672707	3.4727900431627	11.7	15.3	3.7
12.3695434223866	15.2742210119031	0.700001981754689	12.7	14.8	0.7
12.3695425758963	16.4944136659234	0.490607323507848	12.5	16.9	0.1
10.6000003913747	16.4944073447057	0.490611134979901	10.6	16.8	0
9.34824457487639	15.9738287173486	0.826900666480633	9.3	15.6	1.2
8.59672881425982	15.8073686243753	0.968403193177868	8.7	15.4	1.1
7.50000043666837	15.6780024651533	1.10000192901465	7.5	15.1	1.1
6.97800253750489	16.7999993451201	1.70000046851196	6.4	16.8	1.7
7.70879922224576	17.0125331184418	2.11561495680123	7.6	17.1	1.9
8.58580425179136	17.2175614281059	2.61893088265089	8.7	17.3	3.1
9.09129883940425	17.4000006330415	2.7912823177841	9.5	17.4	3.2
9.08445786898559	18.2800054756951	2.30747210413598	9.3	18.5	2.6
9.07758316096776	18.7999995787843	1.32202055080851	8.5	18.8	1.3
10.546571302507	19.0915865868723	1.32201076726811	10.6	19.2	0.8
11.3000000302217	19.2999981282873	1.32200040831776	11.3	19.3	1.9
12.1220015056716	19.500000670564	1.13727063739788	12.5	19.5	0.7
12.1219988858144	20.8987514066851	2.19998871113245	12.7	20.9	2.2
9.40000017669352	20.9001697314411	2.32199753328993	9.4	20.9	2.9
7.97800291344122	21.20000046439	2.19999937890868	7.4	21.2	2.2
8.8276903901636	22.6891863362948	1.1982767784232	8.7	23	0.9
10.394530695522	23.1994004465325	0.752103644272993	10.5	22.8	0.7
11.4003726550434	24.7779366166829	0.33843263700464	11.3	24.6	0.1

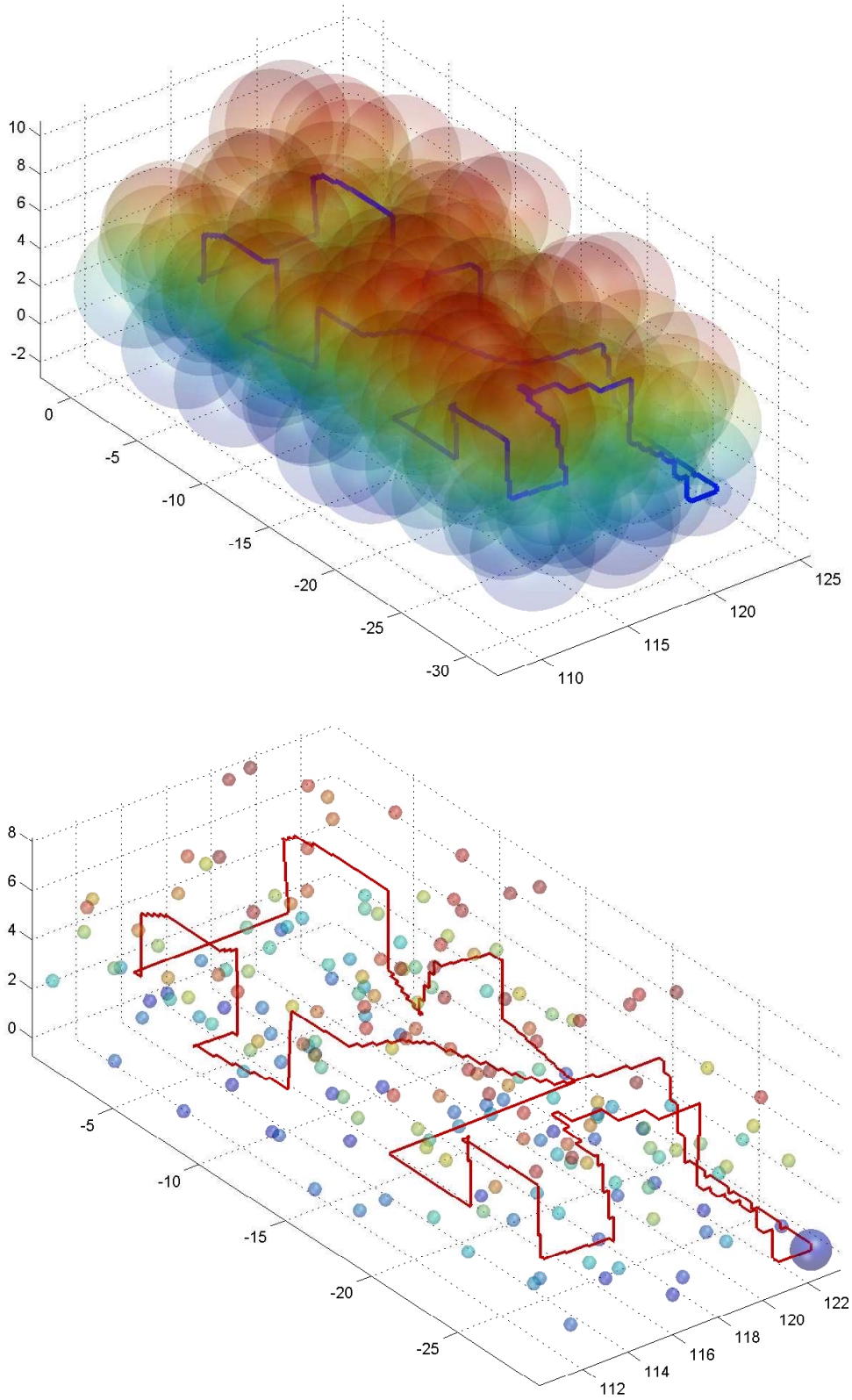


Figure N.178: $rat195$, $r = 2.89$, Equal Radius, 3D, Manhattan, Length = 149.6043831

Table N-181: Solution for $rat195$, $r = 2.89$, Equal Radius, 3D, Manhattan

Total distance: 149.604383138837 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
11.2648822184017	28.6442210467317	1.19327901401041	8.7	29.3	1.9
10.8668592436577	28.2291862768404	1.9525794444071	11.4	29.4	4.3
10.8668592436577	28.2291862768404	1.9525794444071	9.4	28.4	4.3
10.5872331203777	27.6525237203326	2.17359178343457	10.6	26.4	2.7
10.5872331203777	27.6525237203326	2.17359178343457	11.6	27.1	4.6
10.2635184504777	27.196541722652	2.34691530479186	9.5	27.1	1
9.94881758857991	26.7483594025423	2.52445362928084	9.4	24.5	2.9
9.64704900095256	26.3862565078337	2.69999941509453	7.4	26.5	3.3
9.64704900095256	26.3862565078337	2.69999941509453	7.3	24.7	2.7
9.64704900021999	26.3862565066792	3.15281924118151	10.4	25.6	3.6
9.64704899949859	26.3862565055458	3.59999997302123	9.5	23.5	3.6
9.64704899892737	26.4698076915215	4.6503772799145	8.7	26.4	4.3
9.64704899892737	26.4698076915215	4.6503772799145	8.7	24.9	3.7
9.64704899837231	26.5557763163886	5.95453473878496	10.4	29.1	7.1
7.80221542551814	25.7609389386422	5.95453473891513	6.7	26.7	7.9
6.62274902014816	24.7948010355064	5.95453473905097	7.5	23.4	5.3
5.29999977876932	23.9787691968069	5.95453473919206	5.3	21.1	5.7
5.00337021143375	25.0481830463518	5.95453473952983	5.8	25.2	5.8
4.70214713209899	26.1513061592979	5.95453473987602	3.7	26.6	6.4
4.40823404930912	27.2518382500444	5.95453474022454	2.3	28.7	7.3
4.55223290127968	27.2518382495454	5.51293852653324	2.6	25.5	6.5
4.79467510881973	27.251838249057	4.35797941848251	5.3	29.5	4.1
4.79467510881973	27.251838249057	4.35797941848251	4.5	26.7	5.4
5.03386716358449	27.2518382485676	3.16723035427233	4.3	28.8	2.1
5.27879949698567	27.2518382480821	2.16502665882453	7.3	28.6	0.6
5.27879949698567	27.2518382480821	2.16502665882453	6.7	28.8	0.2
5.27879949702529	26.9712821661679	2.16502665849291	6.5	24.8	0.7
5.27879949702529	26.9712821661679	2.16502665849291	5.4	26.6	0.3
4.33797528189896	26.9712821704673	2.24173516608104	4.7	24.8	2.4
3.34209351634412	26.9712821747819	2.31831313191509	3.3	28.4	2.5
2.35866781978602	26.9712821791034	2.39482099236777	1.7	29.4	1
2.35866781978602	26.9712821791034	2.39482099236777	0.6	24.9	2.3
2.23704085347755	26.971282183341	3.38541536094328	2.4	26.7	1.4
2.23704085347755	26.971282183341	3.38541536094328	1.6	27.4	1.8
2.1162841384197	26.9712821876977	5.46757701651638	0.7	28.7	7.3
2.11628413925573	25.2773630271881	5.36423346238596	0.5	26.6	5.8
2.11628414009805	22.8999995569062	5.26028096511999	0.6	22.9	2.8
2.11628414460198	22.5354811019745	5.26028096452356	3.3	24.6	6.9
2.11628414460198	22.5354811019745	5.26028096452356	1.5	24.6	3.5
2.11628414460198	22.5354811019745	5.26028096452356	3.4	22.5	7.6
2.11628414460198	22.5354811019745	5.26028096452356	2.6	23.5	7.4
2.11628414460198	22.5354811019745	5.26028096452356	1.3	22.7	4.8
2.11628414460198	22.5354811019745	5.26028096452356	3.3	21.4	7.2
2.11628414460198	22.5354811019745	5.26028096452356	1.5	21.3	4.6
2.11628414460198	22.5354811019745	5.26028096452356	2.4	20.9	6.2
2.11628414460198	22.5354811019745	5.26028096452356	0.5	20.7	6.8
2.50000818895755	22.3900000016786	4.19999967606544	2.5	19.5	4.2
2.63637150933354	22.3899999947781	2.27367350446079	5.5	22.5	1.9
2.63637150933354	22.3899999947781	2.27367350446079	4.3	22.7	1.3
2.63637150596681	19.9092515770043	2.27367350257833	0.3	19	1.4
2.63637150260311	18.7600642843895	2.27367350070023	1.6	18.8	1.3
2.63637149924152	17.631242768039	2.27367349882407	0.3	16.4	1.1
3.14062662540985	17.6312427679997	2.27367349902134	1.6	17.2	3.9
3.14062662540985	17.6312427679997	2.27367349902134	2.4	15.3	3.6
4.13381180325763	17.6312427679655	2.27367349921971	3.7	18.6	2.9
5.1709066741129	17.631242767932	2.27367349941812	5.4	19.4	0.4
6.13344788621447	17.6312427678986	2.27367349961757	6.4	16.8	1.7
7.08683796150328	17.6312427678664	2.27367349981718	7.5	15.1	1.1
7.6385453376282	17.6312427678338	2.27367350001713	7.6	17.1	1.9
8.19454244156054	17.6312427678024	2.27367350021721	8.7	17.3	3.1
8.74242649537005	17.6312427677718	2.27367350041733	8.7	15.4	1.1
9.30074680800524	17.6312427677425	2.27367350061779	9.3	18.5	2.6
9.30074680800524	17.6312427677425	2.27367350061779	9.5	17.4	3.2
9.86355142740574	17.6312427677127	2.27367350081829	11.3	19.3	1.9
9.86355142740574	17.6312427677127	2.27367350081829	8.5	18.8	1.3
10.4118256595359	17.6312427676802	2.27367350101893	10.6	19.2	0.8
10.9561741875573	17.6312427676513	2.27367350122093	12.5	19.5	0.7
10.9561741875742	17.011375481318	2.35632036555242	12.5	16.9	0.1
10.9561741877967	16.4438566123671	2.45415970040817	10.6	16.8	0
10.9561741877967	16.4438566123671	2.45415970040817	9.3	15.6	1.2
10.9561741880193	15.902227018105	2.56146774851298	11.4	16.9	4.3
10.9561741882425	15.3232143494933	2.66632148904258	11.7	15.3	3.7
10.9561741884661	14.7511811207876	2.77036177260183	10.4	15.1	4.9
10.9561741886905	14.1660022250756	2.87098557307898	12.7	14.8	0.7
10.9561741886905	14.1660022250756	2.87098557307898	11.7	11.5	2.9
10.9561741889214	13.4000000104959	5.32304044560938	12.6	13.4	7.7

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.9561741889214	13.4000000104959	5.32304044560938	11.6	13	7.6
10.8628944039222	12.7598558633275	5.32304044403614	10.3	12.6	5.4
10.8628944039222	12.7598558633275	5.32304044403614	12.6	10.9	4
10.3591509228604	12.6688138091069	5.32304044246682	10.4	11.3	7
9.85795731442292	12.5796681099384	5.32304044089761	9.6	12.8	7.5
9.37398102986084	12.4903586066319	5.32304043932877	8.2	13.4	6.9
8.93948218526614	12.399999442912	5.32304043776171	6.3	12.4	6.5
8.93948218478241	12.0525266750906	4.76678344471475	6.4	11.2	5.2
8.93948218430339	11.7615368449008	4.11082195444177	8.6	10.7	4.5
8.93948218382505	11.4783153134744	3.44360568792604	9.8	10.8	3.4
8.93948218334698	11.2000000208393	2.77995760209738	7.7	12.7	4.4
8.93948218334698	11.2000000208393	2.77995760209738	7.3	11.2	0.4
9.0932723217723	10.5782292288136	2.78911840963882	7.7	9.3	3.2
9.25133593668409	10.0191970568739	2.7982761705824	9.4	9.5	1
9.40929157292663	9.48484668865934	2.80744726943217	8.3	8.9	1.9
9.57013817068652	8.96968234651123	2.8166236727634	9.4	7.4	2
9.73179301358171	8.49909996610766	2.82580178817515	8.5	6.5	2.8
9.90039487729155	8.10362570371089	2.83497331502713	11.7	6.5	2.6
9.90039487729155	8.10362570371089	2.83497331502713	10.3	5.4	1.9
9.91899137577629	8.10019017809363	4.29999960597646	12.5	6.8	4.3
9.91899137577629	8.10019017809363	4.29999960597646	10.7	6.5	4.1
9.91899137521895	8.10019017718703	5.05406094489676	11.5	9.5	4.3
9.91899137521895	8.10019017718703	5.05406094489676	10.3	9.2	3.3
9.91899137474402	8.10019017629433	6.08494200496624	12.3	9.3	7.2
9.91899137474402	8.10019017629433	6.08494200496624	7.4	6.7	6.3
9.91425689405796	6.2794564050993	6.07053033534099	8.8	4.9	6.7
9.90952686626602	4.90374363935259	6.05610797013881	12.7	4.9	6.8
9.85219414699648	3.82807325341714	5.94499225519566	11.3	3.1	6.2
9.79444743365694	2.83900249239328	5.8336655813884	12.3	1.5	6
9.70282912470631	2.61968867090178	5.71305883387891	11.5	1.4	6.7
9.60785500645444	2.41283304131422	5.58754759895085	7.5	0.7	4.6
9.60785500645444	2.41283304131422	5.58754759895085	9.4	0.8	7.9
9.60785500645444	2.41283304131422	5.58754759895085	8.6	0.6	7.6
9.63815519239546	2.45671184627006	4.74527988830761	8.5	3.4	4.2
9.66855400259092	2.50045227743623	3.94271914957594	7.4	3.2	3.2
9.66855400259092	2.50045227743623	3.94271914957594	10.4	2.5	2.2
9.69936167539529	2.5438970791772	3.33888178552008	11.5	4.7	3.2
9.72819916335858	2.58194123754617	2.79999873736887	12.5	3.4	2.8
9.72819914938157	2.5819412381026	2.73730592861876	10.7	0.9	0.9
9.72819913530981	2.58194123867486	2.6811187427418	9.8	5	1.1
9.72819913530981	2.58194123867486	2.6811187427418	9.5	2.8	2.3
8.48099870057219	2.58194123669019	2.68111874246848	7.5	4.4	2.9
7.42216068019604	2.58194123470709	2.68111874219691	6.6	1.6	1.4
6.46658664540361	2.58194123272381	2.68111874192547	6.4	3.2	0.3
5.53207685689812	2.58194123074034	2.68111874165538	5.4	1.2	0.3
4.70000004660689	2.58194122875425	2.6811187413821	4.7	1.1	0.2
4.13658068759284	2.58194122867186	2.68111874797589	3.4	1.1	2
3.59975132170105	2.58194122858614	2.68111875456564	2.6	5	2.8
3.59975132170105	2.58194122858614	2.68111875456564	2.6	3.4	1.3
3.17775061060986	2.58194122850079	2.68111876115397	1.5	3.2	3.6
3.17775061060986	2.58194122850079	2.68111876115397	1.7	1.2	4.1
2.83687961885052	2.5819412284198	2.68111876774475	0.3	1.2	2.6
2.86462063327899	2.9776245457161	5.23498892391452	0.3	3.2	6.5
2.91440162121083	3.23351294392067	5.33993239446379	2.3	0.9	5.1
2.96452766268054	3.52956919778991	5.44572080828781	3.3	3.4	4
3.01460019894853	3.82690670577441	5.55296144108943	4.2	3.4	5.8
3.06446639218052	4.12761681747382	5.66014703898609	4.8	5	7.8
3.06446639223611	4.12761681824616	5.66014703878538	5.3	2.5	6.5
3.06446639121594	5.56328212143847	5.66014703823028	1.5	4.6	5.8
3.06446639019907	7.30242257003251	5.660147037678	1.3	9.5	6.3
3.27593913239679	7.27087373383122	5.54613439397355	0.6	7.5	5.5
3.57360139302793	7.23921053382272	5.43248306039622	3.7	8.4	7.5
3.86881532663743	7.20730034357533	5.31276286595068	6.6	6.8	6.1
3.90711344043831	7.17828393556477	4.44511497023934	1.5	7.5	4.4
3.94617602354496	7.14920990131566	3.5953655779354	2.7	7.3	2.8
3.98541443273388	7.12012850623706	2.80000003469238	4.7	6.8	4
3.98541443273388	7.12012850623706	2.80000003469238	5.4	4.6	2.8
3.98541443340244	7.12012850616823	1.79709198666307	6.3	8.6	0.9
3.98541443340244	7.12012850616823	1.79709198666307	4.7	8.7	1.2
3.96385591230103	6.85874815790643	1.79709198607588	5.4	7.2	1.4
3.96385591230103	6.85874815790643	1.79709198607588	6.4	5.4	1.3
3.40970404126527	6.82718187629047	1.7970919854948	3.6	5.4	1.9
2.85256085271499	6.79575108348194	1.79709198491393	3.6	7.3	0
2.26427394230369	6.76427397852936	1.79709198433502	0.3	4.8	1
2.41352747275727	7.75976412772263	1.79709198482743	0.6	8.4	0.5
2.57082228112979	8.6440470947792	1.7970919853202	2.5	9.4	1.9
2.72836776258883	9.49532306759406	1.79709198581281	2.4	11.2	0.3
2.88749459233102	10.1677906889254	1.7970919863046	1.7	12.5	1
3.07013162465049	10.4999998921094	1.79709198679598	5.6	10.5	0.4
3.07013162451646	11.2176871036923	1.83092205384491	4.4	13.1	0.1

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.07013162438164	11.2501299931657	2.31919237332753	5.3	9.5	2
3.07013162424478	11.2889345305763	3.29507590791128	4.3	11.2	3.3
3.07013162410814	11.3277690793515	4.27414992351705	3.5	12.6	3.2
3.07013162410814	11.3277690793515	4.27414992351705	2.7	13.4	6.1
3.07013162397188	11.3638188508545	4.65395700838234	3.6	10.8	4.8
3.07013162397188	11.3638188508545	4.65395700838234	1.5	11.1	3.9
3.07013162383602	11.399999481241	5.04634462407536	0.6	12.7	5.3
3.07013162383602	11.399999481241	5.04634462407536	0.7	11.4	6.7
3.13737804607007	13.2467181383244	5.04634462433087	1.6	14.7	5.3
3.20561803305631	14.608191535989	5.04634462458683	0.7	15.2	6.3
3.56726258114338	14.8853232829868	5.04634462484338	2.5	16.5	6.9
4.03650978683169	15.1066419154769	5.04634462510082	3.5	15.1	6.8
4.52127579036517	15.328752345024	5.04634462535846	4.5	15.4	4.9
5.00807428662708	15.551332570987	5.04634462561622	6.3	15.5	7.6
5.13179056457017	15.790019514361	5.04634462587246	3.5	17.5	6.6
5.32980605395399	15.9264678373546	5.04634462612902	5.4	13.2	5.7
5.52535832592095	16.1688096430086	5.04634462638546	5.5	14.6	7.4
5.72318220117884	16.9473871598495	5.04634462664076	5.3	17.4	7.6
5.92888498195086	17.6326136263667	5.04634462689561	4.4	16.9	6.4
6.14556243657736	18.3900690411877	5.04634462715028	4.4	18.9	6.5
6.3807810851648	19.1052120362007	5.04634462740475	6.6	19.2	7.9
6.55920189578723	19.6514301255749	5.04634462766078	7.7	19.2	6.3
6.73418963016053	20.2210614762677	5.04634462791679	4.3	20.6	6.3
7.01336847699888	20.7058021503938	5.04634462817239	6.4	21.3	7.2
7.30459234532623	21.167500746616	5.04634462842755	6.7	22.9	2.9
7.71657007207293	21.3720480955905	5.04634462868327	7.4	21.2	2.2
8.84502669373943	21.6235411733765	5.04634462893821	8.4	21.2	7.3
10.1614625526697	21.8826685246384	5.04634462919293	10.4	21.5	7.4
11.4058832852777	22.1503624614354	5.04634462945022	11.7	22.5	7.9
11.4058832890901	22.1503624646198	4.56286678845264	9.4	20.9	2.9
11.4058832890901	22.1503624646198	4.56286678845264	11.5	20.6	7
11.4487963345105	22.4888628541697	3.5551064057678	12.7	23	4.7
11.4914828920504	22.8239030700375	2.40777510908023	12.7	20.9	2.2
11.5337887014063	23.2089883565364	1.32712746264254	8.7	23	0.9
11.7595926061975	24.0943511182292	1.07009559423818	10.5	22.8	0.7
11.9937727679038	25.1426585702972	0.816513188417468	12.5	25.3	2.9
12.2247659186191	26.1942029139191	0.541483887847156	11.3	24.6	0.1
12.462275966433	27.5426835394906	0.270660133379028	12.7	27.3	0.2

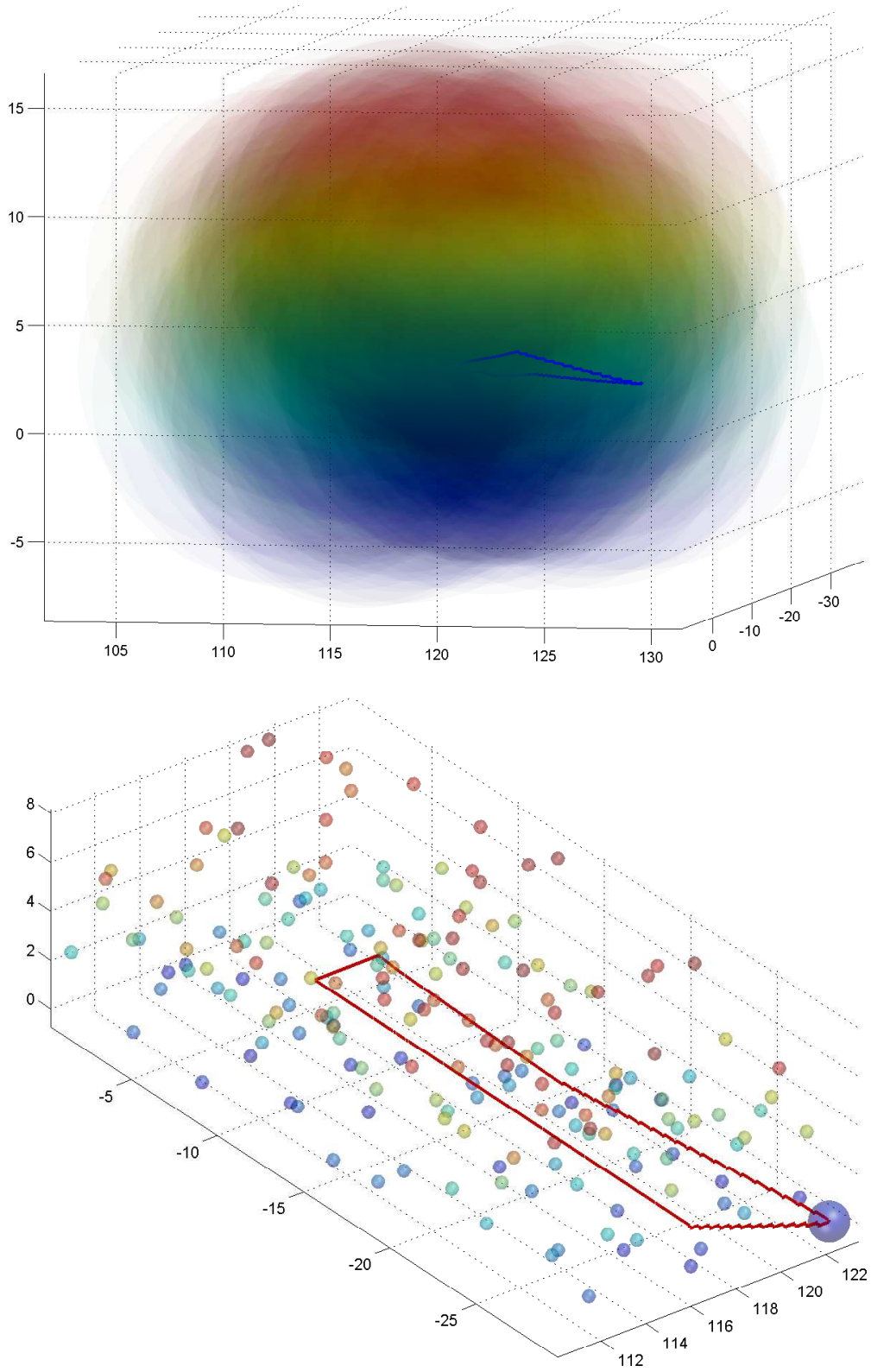


Figure N.179: $rat195$, $r = 8.67$, Equal Radius, 3D, Manhattan, Length = 59.9565101

Table N-182: Solution for $rat195$, $r = 8.67$, Equal Radius, 3D, Manhattan

Total distance: 59.9565101071076 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
12.2250667356707	28.9367372192083	0.115389614587963	11.4	29.4	4.3
11.7597972316012	28.874583955285	0.229295979226993	11.6	27.1	4.6
11.3011204481063	28.812716759449	0.342819583666634	9.5	27.1	1
10.8520139021532	28.7511355569873	0.456431418319989	10.6	26.4	2.7
10.4091220923023	28.6899072643307	0.569865495770882	10.4	25.6	3.6
9.97119795692735	28.6290570990614	0.682968821785881	9.4	24.5	2.9
9.53922194150934	28.568627404649	0.795868241483248	8.7	24.9	3.7
9.11330814456394	28.5085259154558	0.908478697053006	8.7	29.3	1.9
8.69138864278553	28.4484537256924	1.02114597556736	7.4	26.5	3.3
8.27529023232586	28.388576051058	1.13372060330382	7.3	28.6	0.6
7.86392902856126	28.3288309916743	1.24658114428776	6.7	28.8	0.2
7.45759680329908	28.2692141918952	1.35978226927877	2.3	28.7	7.3
7.0944187540632	28.209651513708	1.46928018119601	0.7	28.7	7.3
7.08797816323076	27.858730508056	1.47594838061507	0.5	26.6	5.8
7.08156165220939	27.5258450274212	1.4826062285236	7.5	23.4	5.3
7.07515094982453	27.2059974835187	1.48926087512267	6.7	26.7	7.9
7.06874403141177	26.8920344204174	1.49590508369609	10.4	29.1	7.1
7.06232584342369	26.5728080286373	1.50253132605337	6.5	24.8	0.7
7.05591306021078	26.259880897001	1.5091629815256	7.3	24.7	2.7
7.04950511767109	25.9528625610162	1.51579923516452	4.7	24.8	2.4
7.04950511767109	25.9528625610162	1.51579923516452	5.4	26.6	0.3
7.04311402945297	25.6540946446749	1.52244764102097	2.4	26.7	1.4
7.03673640882252	25.3576414467574	1.52910187517653	1.6	27.4	1.8
7.03673640882252	25.3576414467574	1.52910187517653	1.7	29.4	1
7.03038873770532	25.05511722135	1.53576720877716	3.3	28.4	2.5
7.03038873770532	25.05511722135	1.53576720877716	4.3	28.8	2.1
7.02406032297299	24.7494138323036	1.54243729389133	4.5	26.7	5.4
7.02406032297299	24.7494138323036	1.54243729389133	5.3	29.5	4.1
7.01774363311334	24.4391904341005	1.54910359433169	3.7	26.6	6.4
7.0114341922914	24.1283849439351	1.5557658500563	2.6	25.5	6.5
7.00513349091187	23.8181741893338	1.56242366573137	2.6	23.5	7.4
6.99884142377161	23.5130453486226	1.56907468642031	3.4	22.5	7.6
6.9925559290179	23.214570059491	1.57571960184855	4.4	16.9	6.4
6.98628208714688	22.9726655792075	1.58234353911192	3.3	24.6	6.9
6.98001336877471	22.7308517033975	1.58896277409625	3.5	17.5	6.6
6.97375289302386	22.5082293739048	1.5955720037766	5.3	17.4	7.6
6.96749522168274	22.3021887886648	1.60216797721098	7.7	19.2	6.3
6.96123373699882	22.099858112041	1.60876087652354	10.4	21.5	7.4
6.96123373699882	22.099858112041	1.60876087652354	11.7	22.5	7.9
6.95491681322811	21.8994856135886	1.6153242038893	1.5	21.3	4.6
6.94860997257422	21.7011112895183	1.62188723532611	2.4	20.9	6.2
6.94231175481656	21.5048006233383	1.62844860238586	1.5	24.6	3.5
6.93602310196189	21.307132372988	1.63501166997029	0.3	19	1.4
6.93602310196189	21.307132372988	1.63501166997029	0.6	22.9	2.8
6.92975672340512	21.1129156591761	1.64158239503003	4.3	22.7	1.3
6.92975672340512	21.1129156591761	1.64158239503003	1.3	22.7	4.8
6.92350141232433	20.9190823689338	1.64815750488309	5.5	22.5	1.9
6.91724699671245	20.7257007636103	1.65473595202103	6.7	22.9	2.9
6.91099172184423	20.5324610861821	1.6613162548362	0.6	24.9	2.3
6.90474615308619	20.3322414637079	1.66789796059694	4.3	20.6	6.3
6.89850217882238	20.1331310385301	1.67447747512134	11.5	20.6	7
6.89223471711691	19.9346253263144	1.68104475498114	8.4	21.2	7.3
6.88596345735078	19.7363596476848	1.68760827496473	5.4	19.4	0.4
6.87969448659158	19.539443493639	1.69417464227175	1.6	18.8	1.3
6.87343160219409	19.3441675405466	1.70074394079597	8.5	18.8	1.3
6.86716674084121	19.1501515563373	1.70731510368429	7.6	17.1	1.9
6.86090033276005	18.9578638673381	1.71388719797337	2.5	19.5	4.2
6.85463835116369	18.7663378808606	1.72045831044003	3.7	18.6	2.9
6.84837963968089	18.5758807019194	1.72702954954841	2.5	16.5	6.9
6.84212641252697	18.3883663715679	1.73359665040866	3.5	15.1	6.8
6.83587716162161	18.2044926587129	1.74016083732939	6.4	16.8	1.7
6.8296285511488	18.0220143758951	1.74672684894621	4.5	15.4	4.9
6.82338294623125	17.841405327861	1.75329355509107	3.3	21.4	7.2
6.81714120748782	17.6576970622499	1.75985474243994	0.5	20.7	6.8
6.811138268012	16.9148844578849	1.76620363362329	5.4	13.2	5.7
6.80513896891813	16.231474417881	1.77255251059763	6.3	15.5	7.6
6.79914067630233	15.5728218152624	1.77889882690764	5.5	14.6	7.4
6.79314363002689	14.9366076841752	1.78524230538274	9.6	12.8	7.5
6.78713980285005	14.3320752001729	1.79158019449468	8.2	13.4	6.9
6.78113278155846	13.7432495504318	1.79791494090628	11.6	13	7.6
6.77510659062514	13.1721805256873	1.8042397428053	12.3	9.3	7.2
6.76884159116862	13.013354030071	1.81033907054483	10.6	19.2	0.8
6.76884159116862	13.013354030071	1.81033907054483	12.5	16.9	0.1
6.76250861525213	12.848884950634	1.81644827175995	10.6	16.8	0
6.75613780645048	12.6833787443769	1.82256403574863	9.3	15.6	1.2
6.74975041997676	12.5175853478784	1.82868440683749	7.5	15.1	1.1

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.74975041997676	12.5175853478784	1.82868440683749	8.7	15.4	1.1
6.74334560963619	12.3514711630188	1.83481434547731	2.7	13.4	6.1
6.74334560963619	12.3514711630188	1.83481434547731	0.6	12.7	5.3
6.73697178414531	12.1860405186458	1.84094011162081	0.7	15.2	6.3
6.73062206822345	12.0156850466964	1.84705600229836	6.3	12.4	6.5
6.72427187084524	11.8458136894162	1.8531684627608	6.4	11.2	5.2
6.71792223941125	11.6767976919584	1.85927933324361	1.5	11.1	3.9
6.71792223941125	11.6767976919584	1.85927933324361	0.7	11.4	6.7
6.71160369625578	11.5096921085744	1.86538249405535	2.4	15.3	3.6
6.71160369625578	11.5096921085744	1.86538249405535	1.6	14.7	5.3
6.70530849649633	11.3396431369886	1.87148139291144	7.3	11.2	0.4
6.69901334499627	11.1701586293944	1.87758551664125	5.6	10.5	0.4
6.69272143675516	11.0014435236133	1.88369504248618	3.6	10.8	4.8
6.6864382357039	10.8333561725259	1.88980423563704	0.3	16.4	1.1
6.6864382357039	10.8333561725259	1.88980423563704	0.6	8.4	0.5
6.68022059461026	10.6185386337196	1.89592620389006	3.5	12.6	3.2
6.67401201610899	10.4032761624907	1.90204945143998	4.3	11.2	3.3
6.66781058757012	10.1883080852055	1.9081738042651	5.3	9.5	2
6.66161542665208	9.97446257320664	1.91430136311167	3.6	7.3	0
6.66161542665208	9.97446257320664	1.91430136311167	3.6	5.4	1.9
6.65543302810585	9.76701998513707	1.92043825629076	4.7	8.7	1.2
6.65543302810585	9.76701998513707	1.92043825629076	6.3	8.6	0.9
6.6492620211495	9.5618306077907	1.92658465344074	1.7	12.5	1
6.6431001391465	9.35482800033539	1.9327361018421	2.4	11.2	0.3
6.6431001391465	9.35482800033539	1.9327361018421	2.5	9.4	1.9
6.63695083965126	9.14764845078545	1.93889735946451	5.4	7.2	1.4
6.63695083965126	9.14764845078545	1.93889735946451	6.4	5.4	1.3
6.63080492539397	8.94444330083575	1.94506756091412	2.7	7.3	2.8
6.62466201771221	8.74276000793923	1.95124118014172	0.3	4.8	1
6.62466201771221	8.74276000793923	1.95124118014172	2.6	3.4	1.3
6.61853069126414	8.55220234273877	1.95742589755941	1.5	7.5	4.4
6.61853069126414	8.55220234273877	1.95742589755941	1.5	4.6	5.8
6.61240606795194	8.36815115886835	1.96360804827378	2.6	5	2.8
6.60628196317664	8.186140385427	1.96979366327388	3.7	8.4	7.5
6.60628196317664	8.186140385427	1.96979366327388	5.4	4.6	2.8
6.60015225339676	8.0063223142638	1.97598333883052	1.3	9.5	6.3
6.60015225339676	8.0063223142638	1.97598333883052	0.6	7.5	5.5
6.59401998996238	7.82679535200143	1.98216619375161	4.7	1.1	0.2
6.58788447494941	7.65326391374864	1.98835963266294	5.4	1.2	0.3
6.58174293838816	7.48414247451155	1.99456514871362	12.7	4.9	6.8
6.57556018364249	7.31916158820109	2.00069472094457	7.5	0.7	4.6
6.56937277037052	7.15919503369502	2.00682188516826	1.7	1.2	4.1
6.56937277037052	7.15919503369502	2.00682188516826	0.3	1.2	2.6
6.56937270739547	7.15919495754433	2.00682271849359	0.3	3.2	6.5
6.80552786509513	7.15919496455823	2.00682270951349	1.5	3.2	3.6
7.04950614743386	7.1591949716188	2.00682270053497	7.5	4.4	2.9
7.29451422347189	7.15919497870433	2.00682269153894	2.3	0.9	5.1
7.90680624810555	7.15919498585448	2.00682268253196	8.6	0.6	7.6
8.15327853999284	7.15919499305031	2.00682267330797	7.4	3.2	3.2
8.40119754854038	7.1591950002691	2.00682266407705	11.5	4.7	3.2
8.64818572847506	7.15919500752489	2.00682265483901	8.5	3.4	4.2
8.89616111187571	7.15919501480033	2.00682264559588	9.5	2.8	2.3
9.14473911058769	7.15919502209718	2.00682263634081	6.4	3.2	0.3
9.14473911058769	7.15919502209718	2.00682263634081	6.6	1.6	1.4
9.39999538346059	7.1591950294307	2.00682262707936	9.4	0.8	7.9
9.41209533059587	7.22348231421955	1.98601810657782	11.7	6.5	2.6
9.42418698313784	7.28794242047104	1.96521428591307	3.3	3.4	4
9.42418698313784	7.28794242047104	1.96521428591307	3.4	1.1	2
9.43686452202782	7.37177054374833	1.94438509011415	10.4	2.5	2.2
9.43686452202782	7.37177054374833	1.94438509011415	10.7	0.9	0.9
9.44953152167386	7.45712572970779	1.9235738885527	10.3	5.4	1.9
9.44953152167386	7.45712572970779	1.9235738885527	9.8	5	1.1
9.462194462108	7.54309679808691	1.90278183017927	4.8	5	7.8
9.462194462108	7.54309679808691	1.90278183017927	4.2	3.4	5.8
9.47493380338904	7.63143743034105	1.88181698137392	8.3	8.9	1.9
9.47493380338904	7.63143743034105	1.88181698137392	9.4	9.5	1
9.48767702381753	7.7196047785325	1.86087108676735	6.6	6.8	6.1
9.5004297144819	7.8078961442259	1.83990782025219	7.7	9.3	3.2
9.51318956634823	7.89608372810567	1.81894570345931	4.7	6.8	4
9.52596579670227	7.98444839463637	1.79797930175524	9.4	7.4	2
9.52596579670227	7.98444839463637	1.79797930175524	8.5	6.5	2.8
9.5387509655492	8.07318033625342	1.77702674994358	5.3	2.5	6.5
9.55164203031927	8.16893591776161	1.75577874570681	11.5	1.4	6.7
9.55164203031927	8.16893591776161	1.75577874570681	12.3	1.5	6
9.56406527616849	8.48221314673622	1.73221179955626	12.5	3.4	2.8
9.56406527616849	8.48221314673622	1.73221179955626	11.3	3.1	6.2
9.576469659038	8.82277752289035	1.70859247686258	10.7	6.5	4.1
9.58887403039917	9.16790192327528	1.68496882512424	7.4	6.7	6.3
9.601287375469	9.51932522012957	1.66131836220568	8.8	4.9	6.7
9.61370658981574	9.88613737419108	1.63761801395689	12.5	6.8	4.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.62611919786764	10.2604221769102	1.61390722041022	11.5	9.5	4.3
9.63852845608424	10.6379142278057	1.59019030303861	10.3	9.2	3.3
9.65093875317258	11.0196475477501	1.56647420188106	9.8	10.8	3.4
9.66335264924406	11.4041377718789	1.5427582011125	8.6	10.7	4.5
9.67577386658604	11.7923328680881	1.51903552008054	7.7	12.7	4.4
9.68820427577282	12.181956489679	1.49530558791141	11.7	11.5	2.9
9.70063325351312	12.575488040631	1.47157674486312	12.6	10.9	4
9.71305520247491	12.9750148071401	1.44783885356713	12.6	13.4	7.7
9.72545932804427	13.3761235995733	1.42402598714084	12.7	14.8	0.7
9.73784987943718	13.7780719905208	1.40022329046661	10.3	12.6	5.4
9.75024314400233	14.1860494821966	1.3764076686089	4.4	13.1	0.1
9.76265971857092	14.6011234537075	1.35260914248196	10.4	11.3	7
9.77507607610656	15.0328937512227	1.32876055688541	10.4	15.1	4.9
9.78749020870656	15.4692190670469	1.3048983427871	12.5	19.5	0.7
9.79987647816091	15.9008408262104	1.28104910687346	11.7	15.3	3.7
9.81225072054215	16.3383573252301	1.25719626526556	11.4	16.9	4.3
9.82461547396419	16.7798222587959	1.23333430816721	7.4	21.2	2.2
9.83699664037194	17.2155378233378	1.20947523862639	1.6	17.2	3.9
9.9526469155869	17.667637293717	1.15507298270397	9.5	17.4	3.2
10.0687466162073	18.1256174582111	1.10066788635046	8.7	17.3	3.1
10.1853773026032	18.5907333387747	1.04626011760237	9.3	18.5	2.6
10.3024559477422	19.0617993330112	0.991864324434131	11.3	19.3	1.9
10.4197788695222	19.5381958191946	0.937487571074902	4.4	18.9	6.5
10.544899445053	20.035734864485	0.881831489445801	6.6	19.2	7.9
10.674830656774	20.5567664296644	0.824809855291736	6.4	21.3	7.2
10.8083451107971	21.0775343223241	0.766991412240014	5.3	21.1	5.7
10.9454671090197	21.6072096492608	0.708719243574244	8.7	23	0.9
11.0834749372165	22.142009264126	0.65051015536724	9.4	20.9	2.9
11.22226768313	22.6896817531733	0.592284712887775	9.5	23.5	3.6
11.3618251042748	23.2451157894256	0.5340016529781	12.7	20.9	2.2
11.501476069348	23.8187210529161	0.475707107314081	12.7	23	4.7
11.6411213931917	24.4077435384529	0.417279299084107	10.5	22.8	0.7
11.7814574317323	25.0157214803783	0.358884101697832	5.8	25.2	5.8
11.9308416466404	25.6342946892601	0.299373596276345	8.7	26.4	4.3
12.0820472067148	26.2649491004747	0.239685445700674	9.4	28.4	4.3
12.2349998877389	26.901979380025	0.179808388946483	11.3	24.6	0.1
12.3890403668565	27.5658586151892	0.12000196883287	12.5	25.3	2.9
12.5438179433445	28.2604833505202	0.0602207046873957	12.7	27.3	0.2

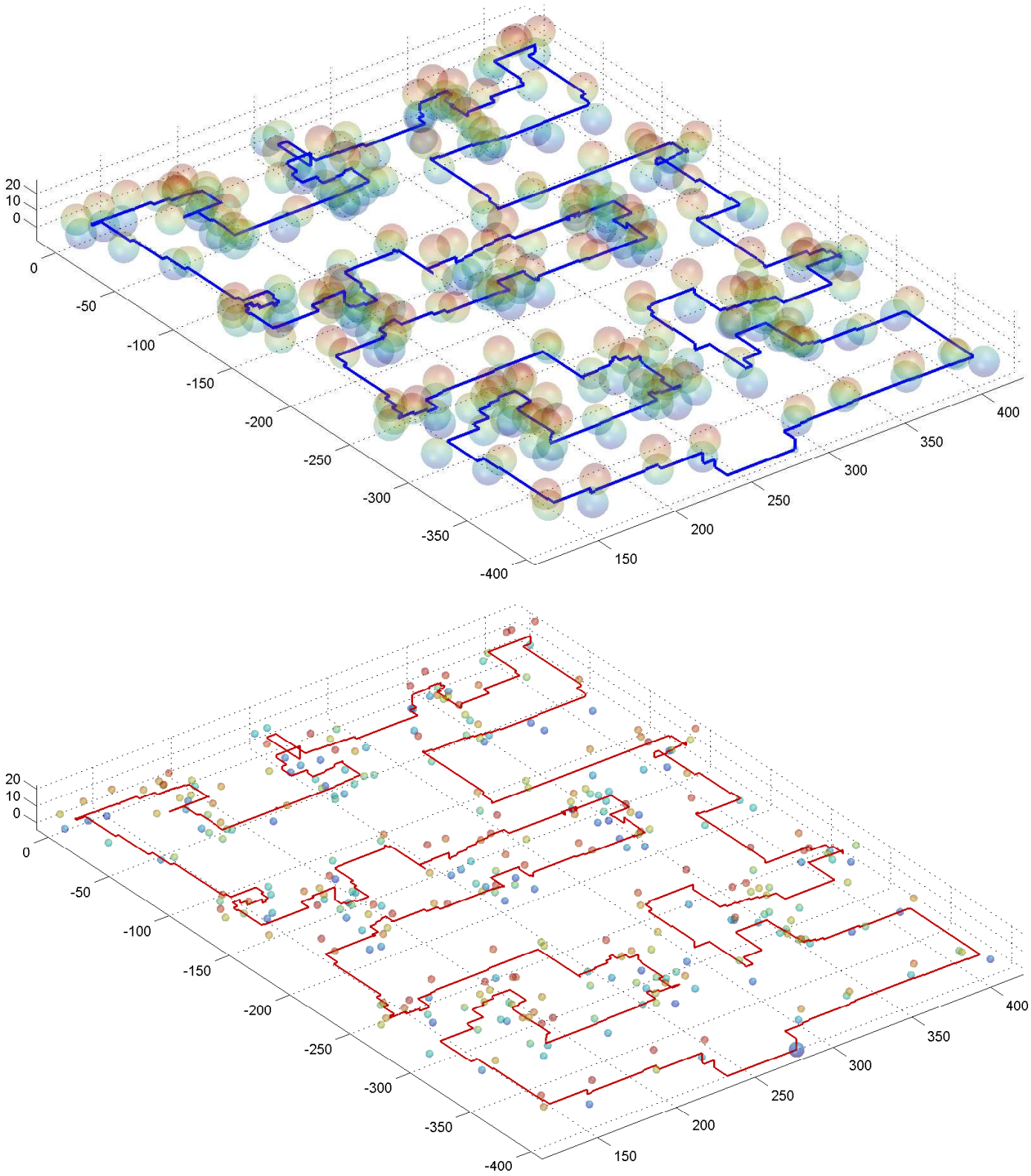


Figure N.180: $lin318$, $r = 8.268$, Equal Radius, 3D, Manhattan, Length = 3700.2413634

Table N-183: Solution for *lin*318, $r = 8.268$, Equal Radius, 3D, Manhattan

Total distance: 3700.24136337711 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
125.223354124149	394.73500127611	4.42167983735669	122.8	387.5	3.6
118.772872420164	392.692336827734	9.92236683314647	119.7	393.8	17.8
92.1000002979807	389.835758279435	10.7687840466421	92.1	387.5	18.7
84.033065841962	389.835757332856	10.0560805093806	89	393.8	11
51.2000059725842	389.835756384377	9.33121635574785	51.2	387.5	1.4
47.9999990901391	389.835756774148	12.1443313264541	48	393.8	19.4
24.1274668060992	389.835750309778	12.1443206990795	17.3	393.8	14.6
24.1274632311137	384.257963647853	11.6007673373637	20.5	387.5	17.4
24.1274596567687	342.806558679532	10.9579548384945	28.3	339.4	12.9
24.1274560824754	329.199999013997	10.3034236917184	27.6	329.2	2.8
20.7822254567324	303.200000430578	10.3034223492815	14.2	303.2	5.3
42.0182916749444	298.198390713289	10.8786712371471	44.9	303.2	8.5
52.3271311714503	289.344463814024	11.4678477715582	52.8	281.9	9
59.7768858480123	287.913234202415	12.1321019122195	60.6	288.2	12.5
66.8999988205445	286.478277200034	12.7951386755432	66.9	280.4	18.4
68.523241023327	286.63970414226	12.7951334328043	63.8	280.4	12.2
72.5117347262124	286.814455194148	12.7951281900572	70.1	280.4	12.5
77.7206147733378	286.994000996016	12.7951229473641	84.3	283.5	16.3
77.8256048463851	289.036428490867	12.7951176886138	81.1	285.1	18.2
77.929234836408	292.118581598325	12.7951124289165	76.4	288.2	6.4
78.0337014950631	300.428963803282	12.795107170373	85.8	303.2	13.4
73.4239211686974	300.428964412401	11.671933807182	70.9	297.7	11.7
69.2538695613956	300.428965021747	10.5484094375845	67.7	297.7	2.9
69.2538678462442	300.601792801802	10.6139679810503	63.8	297.6	5.2
69.2538661372995	313.098310475782	10.8125131166423	63.8	315.8	14.7
69.2538644290306	319.193268048806	11.0065031641741	70.9	315.8	15.2
69.2538644290306	319.193268048806	11.0065031641741	67.7	315.8	13.4
69.2538627206473	331.599993899851	11.1975208716145	70.9	331.6	19.3
66.7918984442138	332.109837607437	10.8485112022194	63.8	331.6	18.4
65.9578552653998	332.653548792121	9.68898468028513	67.7	331.6	4.4
65.1064513472141	333.201517815697	8.62214063007506	58.3	329.2	7.6
64.5833012791153	333.916702054385	7.66823781835359	59.1	339.4	4.8
97.4770884271917	333.432369870437	7.66823791058338	100	339.4	3.8
104.385396039329	332.874977239617	7.66823800288041	99.2	329.2	7.7
124.572998440912	332.33789060813	7.6682380951828	129.9	329.2	5.1
130.632665581444	331.819867840089	7.66823818750901	130.7	339.4	10.6
136.199999219567	323.81447952132	7.66823827963845	136.2	315.8	9.7
138.93782583923	325.771068681892	7.66823717116782	136.2	331.6	10.8
142.500002362889	327.250950307814	7.66823606248411	142.5	331.6	14.7
153.66635369137	327.250952517844	7.50377747896673	155.1	331.6	14.3
154.820324876948	327.250954719796	7.0806499148219	161.4	331.6	4.6
150.249961611864	327.250952576305	7.08064940357432	148.8	331.6	0.2
150.249954296224	315.801858790459	7.08065003526422	142.5	315.8	4.2
151.206235254279	315.800064711181	7.08626707316672	148.8	315.8	8.4
152.183584921249	315.798270547384	7.0918836264907	155.1	315.8	5.4
153.131994527355	315.796476425212	7.09750084994206	161.4	315.8	7.1
153.131993980599	298.016838053992	7.93385801624534	155.1	295.3	0.7
153.131993434296	295.299999833392	10.7999863771807	161.4	295.3	10.8
147.61399233576	292.452104250835	11.3312985442839	148.8	295.3	14.4
141.700000414858	289.346366996618	11.8536401068601	141.7	283.5	17.7
138.92132967173	291.024850162859	11.3122997927094	142.5	295.3	13.4
135.63950171074	292.55081182882	10.7614483185965	136.2	295.3	3.1
127.402445057667	293.207924560373	10.5342350761385	127.6	286.7	5.8
116.555695589268	295.025701220203	10.3400275164947	116.5	303.2	9.1
116.555636464083	266.34633363903	10.340025038967	119.7	260.7	11.7
116.555577329829	259.801231578683	10.3400225610111	122.8	254.4	9.9
92.1000017952626	259.801163220765	10.3400200944815	92.1	254.4	16.6
85.1078171106752	259.801160443346	9.60862054433022	89	260.7	3.7
51.2000007743077	259.801157667438	8.95998512226865	51.2	254.4	2.7
47.9999986887764	260.700005268756	9.13199430828899	48	260.7	17.4
39.4000000770027	270.552663555366	8.6658119356837	39.4	273.1	0.8
33.009665442556	270.552664330587	10.0105792035156	36.2	273.1	6.7
24.4000003646687	270.552665105421	11.4341875854017	24.4	273.1	19.3
19.5595191963396	270.552664478516	11.3175296825329	21.3	273.1	15.8
14.0982090093977	270.552663851188	11.20008288159	6.3	273.3	11.2
15.2267166251418	268.74150443107	11.1706820193892	9.4	273.3	14
18.3506576197827	259.504906265748	11.1410501088044	17.3	260.7	14.5
21.5734185412559	249.24470291345	11.1113914369659	20.5	254.4	9
24.9623631239715	209.615165705989	11.0817579108936	28.3	206.3	15.8
27.6908912097615	199.212260915687	11.0520383767861	27.6	196.1	18.7
58.5401356583605	199.121829862888	10.8901829533376	59.1	206.3	14.9
59.792938004605	198.499931279193	9.73210428425809	67.7	198.5	11.8
59.792938004605	198.499931279193	9.73210428425809	63.8	198.5	2.5
59.7929529113389	196.099994279487	9.73209617370648	58.3	196.1	1.6
63.7999999384202	189.18240022333	9.73209453110438	63.8	182.7	4.6
67.3847891130055	189.250522490139	10.8738248800567	67.7	182.7	12.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
70.8809771519003	189.319315345844	11.9723610618335	70.9	182.7	16.9
73.8782442500293	195.579888467277	12.0584900592663	70.9	198.5	18.8
93.4477604480316	197.906807326382	12.1401662157066	99.2	196.1	13.9
100.037011813617	200.404129483067	12.2216372711042	100	206.3	18
130.699999264606	200.453624747004	12.2536499201251	130.7	206.3	18.1
133.73279011363	199.835980298241	11.490133556754	129.9	196.1	10
137.335883291224	199.23712908413	10.7381859875566	136.2	198.5	8.4
141.068862280118	198.640448858855	9.99704188440936	148.8	198.5	8.3
142.085698217591	198.045058911249	9.33415407803156	142.5	198.5	1.1
142.499970189115	186.764470167114	9.2999992919463	142.5	182.7	2.1
142.65671026037	186.764468594085	9.29999880977049	136.2	182.7	6.2
148.86280870756	186.764467027534	9.2999983284338	148.8	182.7	9.2
155.099999857422	186.764465461497	9.2999978471742	155.1	182.7	16.5
160.68249253126	186.764465190233	7.8641621724218	161.4	182.7	0.7
160.682496536935	195.769639140855	8.79575427332575	161.4	198.5	1.4
160.682500542191	198.499978266119	11.5011810314687	155.1	198.5	17.6
187.079771302674	199.273267515844	11.501184656519	191.3	196.1	16.7
192.100000836037	200.125618264187	11.501188281116	192.1	206.3	17
222.79999552506	200.125618126521	11.5011879335091	222.8	206.3	17
223.891103351833	199.341425575739	10.4455100362574	222	196.1	3.2
227.688548644709	198.920552036586	10.1568333336173	227.6	198.5	10.4
231.497471614285	198.499992199504	9.86800576690028	231.5	198.5	1.6
231.499078626761	193.882331200861	10.2264275520358	234.6	198.5	10.6
231.500684085091	187.162640740432	10.5831474293472	234.6	182.7	13.3
231.502288981003	182.700002039681	10.9319941798045	231.5	182.7	19.2
231.5156177875	181.365948177271	7.37674191149231	227.6	182.7	0.3
231.529401460753	171.985666306217	7.10445576441488	231.5	164.6	6.5
231.543192673249	169.422046591793	6.83393169833435	227.6	164.6	1.4
234.600006878476	169.41066466569	6.82438957667486	234.6	164.6	0.1
244.088499243695	169.410658995937	6.82438561046613	249.6	170.1	0.7
244.088498903089	154.203427029623	6.82438686746746	248	147.3	4.5
241.379432670822	154.203428174956	6.8307879109101	240.2	155.1	5.1
238.740005218451	154.203429316174	6.83718989041721	240.2	148.8	5.8
235.945308085979	154.203430457728	6.84359300915901	236.2	147.3	7.3
233.099994108247	154.203431610259	6.84999561435472	233.1	147.3	11.4
224.400002593214	154.203434446058	6.85000017680716	224.4	147.3	2.3
220.340165281384	156.220714815494	9.402172993389	222	152	14.6
215.480915750184	158.78836468972	11.3261457896738	218.9	153.6	11.5
208.699999572239	162.119954679046	13.2369477167642	208.7	170.1	15.4
178.13497482042	162.022738990174	13.2369488169641	178	170.1	11.6
173.199999629558	157.727298229226	13.2369499178834	173.2	152	19.2
163.010868182209	157.727299141041	12.2780648297588	161.4	162.2	17.4
155.884919848104	157.727300052682	11.1776492477958	155.1	162.2	15.7
149.431817974611	157.727300964315	9.9669053603463	148.8	162.2	5.3
143.456480462411	157.727301875888	8.87364603447508	142.5	162.2	2.7
138.946433646226	157.727302787801	8.08842621918528	136.2	162.2	1.7
138.946433362084	156.80501730413	11.3555054505119	141.7	150.4	15.8
127.691111686406	157.392896560879	11.3555045760424	127.6	153.6	18.6
119.590719659092	162.7672245748	11.3555037004898	116.5	170.1	13.6
119.590719341107	132.761175348521	10.0279588029638	119.7	127.6	15.5
119.590719023235	128.914052208739	8.09432398286863	122.8	121.3	7.8
93.3220618349689	129.178196152586	8.09431305407767	92.1	121.3	6.9
89.1721580954057	129.582970064526	8.09430212770882	89	127.6	0.1
86.9436187349419	145.218597128574	8.09429127470647	84.3	150.4	4.3
85.005165178606	150.361526052401	8.0942804223692	81.1	152	7.1
83.2061540204845	155.100000648361	8.0942695700292	76.4	155.1	3.4
83.2061534245529	162.884920899549	8.09426857894184	85.8	170.1	5
75.2327116864855	161.500880202931	8.09426959184699	70.9	164.6	8.4
69.7057849547493	160.036434114759	8.09427060477918	63.8	164.5	8.3
69.7057849547493	160.036434114759	8.09427060477918	67.7	164.6	2.1
67.8617642158382	154.906601934724	8.09427161825146	66.9	147.3	5
67.8617596214596	154.906602836644	15.45697397902	70.1	147.3	17.8
63.5269607743409	155.097914485519	15.4569783406574	60.6	155.1	13.8
63.5269607743409	155.097914485519	15.4569783406574	63.8	147.3	12.9
53.1615984753335	156.572197142855	15.4569827054891	52.8	148.8	15.5
44.899999750997	163.127228753624	15.4569870702474	44.9	170.1	19.9
16.6966203960503	162.616104584673	15.4569859640107	14.2	170.1	13.5
15.2265097927205	143.596463564861	15.4569848580365	9.4	140.2	11.5
14.3116154966945	140.199999814201	15.4569837522337	6.3	140.2	17.5
17.300003542752	135.814045972151	15.4569553440853	17.3	127.6	16.4
22.2327785142571	135.814043062812	13.2003270773456	24.4	140	15.5
26.591377642611	135.814040153406	10.78804786439	21.3	140	9.6
36.1999966522591	135.814037244154	8.53004970104254	36.2	140	1.4
38.9806854635872	134.050613519677	8.53004823317795	39.4	140	3.5
41.5469141253878	127.642171610114	8.53004676569298	48	127.6	5.5
43.2671073488799	121.30000035401	8.53004529831202	51.2	121.3	6.2
27.3220400365955	117.56545854538	8.53004537681419	20.5	121.3	8.4
25.3514263855676	76.9336978416337	8.53004545533412	28.3	73.2	9.3
23.2446458352688	61.8721281708321	8.53004553384762	27.6	63	3.4
20.5634012146801	36.993233114892	8.53004561241252	14.2	37	6.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.6165688011569	11.9984865830053	8.5300456910099	21.3	6.9	14.1
12.9785445867509	10.5229152922257	8.53004576932162	6.3	7.1	12
13.9194261795403	10.5229153421438	8.19505803770532	9.4	7.1	2.4
24.6114738379617	10.5229153926453	7.9576405266939	24.4	6.9	1.6
36.1999995720911	10.5229154431563	7.73198311926531	36.2	6.9	0.3
40.6411491807211	11.7337118550149	8.58611436239409	39.4	6.9	14.8
51.4014310702578	14.9431859260301	9.1334249687154	52.8	15.7	13.8
60.5859873623822	18.0638096845483	9.66521165017128	60.6	22	16.9
68.8907159739678	18.282722734409	9.76846123155644	70.1	14.2	16.8
68.8907159739678	18.282722734409	9.76846123155644	63.8	14.2	14.4
71.699533308461	19.117454704176	9.83442826352034	66.9	14.2	11.4
76.1449015125994	20.056838285103	9.90021236453604	76.4	22	1.9
78.0893955458324	20.3631698643793	10.0603623279225	84.3	17.3	5.6
78.0893955458324	20.3631698643793	10.0603623279225	81.1	18.9	10.9
78.2318834309762	36.7594062502904	10.6795151777802	85.8	37	14
72.6420453002219	36.75941967757	10.6795154229505	70.9	31.5	11.6
67.6999968552452	36.759433106087	10.6795156681263	67.7	31.5	4.3
61.406243521473	36.8790452892691	10.6795160746563	63.8	31.4	12.4
52.9650933341064	37.0000281869949	10.6795164811417	44.9	37	12.5
62.1595185479901	47.9317356353093	10.6795159546129	63.8	49.6	2.8
62.9929682695718	48.7691436304701	10.6795154295863	67.7	49.6	9.5
63.7903306828726	49.6000050089381	10.6795149046824	70.9	49.6	14.9
63.7903301417639	59.1786371864072	10.3728928223938	63.8	65.4	13.7
63.7903296011826	62.8094319451119	10.0575715801819	58.3	63	8.5
63.7903290609206	66.4056481879586	9.74439889473627	59.1	73.2	9.3
72.6216861956813	66.4056435524863	9.74439193878395	70.9	65.4	6.9
72.6216861956813	66.4056435524863	9.74439193878395	67.7	65.4	8.4
99.2776522333561	66.4056389173783	9.74438498308156	100	73.2	14.4
99.2776989394996	65.0700029061419	8.70430793970964	99.2	63	0.7
123.940967633214	65.0700016209571	8.70431716144245	129.9	63	9.4
130.699999713336	65.0700003357913	8.70432638310964	130.7	73.2	7.2
136.66889946306	64.764193325917	8.88540295748417	136.2	65.4	3.7
142.867195329925	64.4576461805764	9.06858852597886	142.5	65.4	2.7
149.373324426374	64.149400551365	9.25590479050014	155.1	65.4	8.7
149.373324426374	64.149400551365	9.25590479050014	148.8	65.4	6.2
153.618637991042	63.8382308082135	9.44445811379785	161.4	65.4	7.2
153.683080781977	49.6021840565894	10.6319950719421	161.4	49.6	13.6
148.800005965554	49.6004598651964	10.6319955493145	148.8	49.6	18.9
148.083130977915	49.5989197248612	9.11741554064	155.1	49.6	5.1
142.49999982732	49.5973793117503	8.36800411751923	142.5	49.6	0.1
134.656438759003	44.857432300746	10.1204345867584	136.2	49.6	6.3
124.768004313956	36.9999999498817	12.0999992793027	116.5	37	12.1
127.600003928128	28.2175607721622	13.5336644429407	127.6	20.5	16.5
142.844004174141	28.2175594994944	13.5336686619548	148.8	29.1	19.2
142.843995667044	28.2175557946018	5.64133349744933	136.2	29.1	0.8
142.843998382957	15.7303758331904	5.64133386133305	141.7	17.3	2
142.844001098335	0.221993690749244	5.6413342253079	141.7	-7.9	4.6
148.53264036311	0.272547612911467	5.64133525047059	149.6	-7.9	5.2
148.891328801667	24.9049202080473	5.6413362760837	142.5	29.1	2.7
155.715577214347	25.4652916412574	5.64133730239366	155.1	29.1	1.4
162.963864937891	26.0099876489453	5.64133832871998	161.4	29.1	11.5
172.775304880066	26.5344690739789	5.64133935498316	173.2	18.9	8.3
178.200724757562	28.8890242586592	5.64134038107159	178	37	4.3
208.699999702098	29.0415896460004	5.64134140777277	208.7	37	3.4
217.071324289091	22.7492040387706	5.99005107553257	222	18.9	3.1
221.24652188804	18.7303386129564	6.34754367842534	224.4	14.2	0.3
221.889206007324	18.2720576680754	11.198972136454	218.9	20.5	18.5
233.09999969907	17.3640333181803	11.4613611840183	233.1	14.2	19.1
239.146721607477	17.3640329706271	11.1425855661186	240.2	22	17.8
240.864527073377	17.3640326226311	9.25332484660045	240.2	15.7	7.9
242.598665296783	17.3640322746193	7.40133281832829	248	14.2	2
238.881596322816	19.5222283203633	8.24101890441783	236.2	14.2	3.3
236.564347401885	26.9050573059916	9.37033766814154	234.6	31.5	11.8
234.384559549928	31.9618008529378	10.4591595337167	227.6	31.5	14.9
234.384559549928	31.9618008529378	10.4591595337167	231.5	31.5	11.2
233.888125185934	43.2067092157182	10.9792079256405	234.6	49.6	6
233.346404321424	43.8147556387431	12.3815923024139	231.5	49.6	10.4
232.814955671152	44.3850443732276	13.8625695115596	227.6	49.6	17.6
250.9023747642	39.4381637392096	13.8625684955234	249.6	37	15.8
273.955059153731	34.9646738768517	13.8625674795034	280.3	37	9.6
275.600002605761	11.0300796731152	13.8625664636727	275.6	6.9	6.7
281.315219680189	11.0300786005543	13.8625678118164	278.7	6.9	10.2
288.99046979942	11.0300775282088	13.8625691600124	290.6	6.9	18.4
295.244918836258	11.0300764560213	13.8625705081397	293.7	6.9	18.6
303.000077174613	11.0300753839671	13.8625718562309	308.7	6.9	18.2
301.658410007511	12.321510885445	10.1893618589663	305.5	6.9	5.7
296.874440109524	60.4205115134873	9.07883334506853	293.7	63	15.4
294.042370066048	67.7805186204748	7.45784411809526	294.5	73.2	1.3
263.800003259153	68.0361880623004	7.25716381843666	263.8	73.2	0.8
262.999824349485	68.0361865042345	7.25718482509322	263	63	0.7

Solution x	Solution y	Solution z	Original x	Original y	Original z
239.712491360068	68.0361850986918	7.82130195121401	234.6	65.4	4.6
232.924725855315	68.0361836930258	8.40693217598829	231.5	65.4	1.8
227.762660823489	68.0361822874304	9.07630692824842	227.6	65.4	13.5
222.657648281438	68.0361808818234	9.72288686779589	222	63	7.9
217.766759659406	68.0361794762466	10.379242505708	222.8	73.2	10.5
196.26685239235	68.0361780705867	11.0337134926374	192.1	73.2	7.8
191.300002281844	68.0361766647476	11.7428031175136	191.3	63	18.3
190.137020192115	118.821143202145	10.4498425020829	184.3	121.3	14.5
189.239765768125	126.659688144352	8.80450726040945	181.1	127.6	7.7
207.775283088632	126.659691558356	8.80450443438524	211.8	127.6	10.4
218.24230508782	126.659694972374	8.80450160834573	215	121.3	10.5
248.86485228921	126.6596983867	8.80449878227252	252.8	127.6	3.3
256.8726189983	126.659701800914	8.80449595637251	255.9	121.3	14.5
279.973351237762	126.659705216 32	8.804493129999	283.5	127.6	15
286.600001645112	126.659708631617	8.80449030339511	286.6	121.3	15.1
301.599997705205	127.600003035222	8.66800648147862	301.6	127.6	0.4
302.85363566546	139.997204171398	10.7536377582027	308.7	140	16.6
299.647394902029	139.998224612196	10.0638652725114	305.5	140	11.2
295.015759843897	139.99924508943	9.36578044875641	293.7	140	9.3
290.599999390785	140.000265606508	8.66800636456582	290.6	140	0.4
282.556783410546	140.001336207108	8.66800725458282	275.6	140	4.2
282.556783301298	140.002673030018	11.9866461648234	278.7	140	19.3
285.17444926492	169.637189660896	11.4617656690571	280.3	170.1	14.3
288.238989490291	194.618112813105	10.925925941775	293.7	196.1	5.6
289.621535486235	201.743557049869	10.4784579582775	294.5	206.3	5.6
267.428944610628	201.743550794778	11.1113796753014	263.8	206.3	6.2
263.000001124606	201.743544538731	11.8576214968788	263	196.1	17.9
261.133009351514	254.276847449173	11.7440272906968	255.9	254.4	18.1
260.997765394508	259.974859691726	9.59420169438779	252.8	260.7	8.8
286.599987903075	259.974864295303	9.59419753421059	286.6	254.4	15.7
288.505811020422	262.065569944602	8.51845285388322	283.5	260.7	2.6
297.578685799702	264.815026519056	7.81434588400766	301.6	260.7	2.7
300.431993906801	273.098144620077	7.23263091545477	305.5	273.1	0.7
300.431992422944	273.099863447739	9.39996072527253	308.7	273.1	9.4
290.995521852482	273.101561091992	9.76391009247026	290.6	273.1	10.7
290.995521852482	273.101561091992	9.76391009247026	293.7	273.1	6.2
278.700010025431	273.103258979466	10.1319930133608	278.7	273.1	18.4
278.218041513671	273.888025787001	10.1319919318318	275.6	273.1	17.9
278.044448539574	295.383249453539	10.1319908428072	280.3	303.2	11.5
249.600000917025	295.432131297988	10.1319897524273	249.6	303.2	7.3
246.4054839962	288.018908772655	10.1319903296829	248	280.4	9.5
241.325217365489	286.575582631276	10.1319909071844	240.2	281.9	12.5
241.325217365489	286.575582631276	10.1319909071844	240.2	288.2	11.3
236.801170533736	285.226447971168	10.1319914846532	236.2	280.4	11.1
232.420892002556	283.973182361995	10.1319920621088	233.1	280.4	17.3
224.400001930711	283.231607640545	10.1319926389686	224.4	280.4	17.9
221.99999968129	283.231606211884	9.9541322322386	222	285.1	1.9
218.809839168427	281.908671617527	10.163355002008	218.9	286.7	3.7
215.485328888794	261.861998839664	10.4246611383682	211.8	260.7	3.2
214.999995638967	260.246364886043	13.5536376735161	215	254.4	19.4
186.518017466265	261.104294622032	13.1468909932649	184.3	254.4	16.9
183.810134034814	266.674433104013	12.6256538579489	181.1	260.7	13.4
181.468006686293	285.100000032536	12.099994588885	173.2	285.1	12.1
182.576156927485	303.322905096027	8.15659443382206	178	303.2	1.5
192.099999820341	333.553630137986	7.44635865528394	192.1	339.4	1.6
196.813068317599	325.578005984557	7.69378173484625	191.3	329.2	9.3
208.700002510846	303.539507122748	7.93896936010559	208.7	303.2	16.2
226.421783421887	303.539260079677	7.93897966806906	227.6	297.7	4.1
226.421783421887	303.539260079677	7.93897966806906	231.5	297.7	7.4
228.751175739467	303.539014103267	7.93898997750611	234.6	297.7	7.7
228.546667085738	313.246623784246	8.58094379900017	234.6	315.8	11.2
228.335026160186	318.964767697726	9.19492426000144	227.6	315.8	6.5
228.335026160186	318.964767697726	9.19492426000144	231.5	315.8	7.2
228.122090808484	328.412903685959	9.82734159710586	222	329.2	14.2
227.921290174931	335.411933187218	10.3787047019646	222.8	339.4	15.5
231.270153905986	335.411931684155	9.34200814053908	227.6	331.6	9.8
235.252210791297	335.411930180846	8.29798960554584	231.5	331.6	8.7
240.199378766945	335.411928677426	7.24761297004416	234.6	331.6	5.2
262.999999451377	335.411927170215	6.25636516732073	263	329.2	0.8
269.132330400383	335.722872454083	6.25636597707385	263.8	339.4	8.3
294.235369575281	336.026050296868	6.25636678697628	294.5	339.4	13.8
294.235387567453	336.026051172763	6.03447397242697	293.7	329.2	1.4
295.119477264908	393.797637294569	6.03447231658016	301.6	393.8	0.9
286.94482775239	393.798976891391	6.31340868723688	286.6	387.5	8.3
279.266754171541	393.800316698585	6.58910826493527	283.5	393.8	11.4
259.045809407628	393.801656494882	6.85806696938471	255.9	387.5	4.9
252.799999546132	393.80299667166	7.13199129343333	252.8	393.8	15.4
215.54744712159	394.158942788453	6.93905001397695	211.8	393.8	13.7
211.693545754756	394.517873158737	6.7291642150547	215	387.5	7.3
185.575505675333	394.948741149866	6.51752886773198	184.3	387.5	3.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
180.89149519803	395.717663824662	6.3212817120375	181.1	393.8	14.3

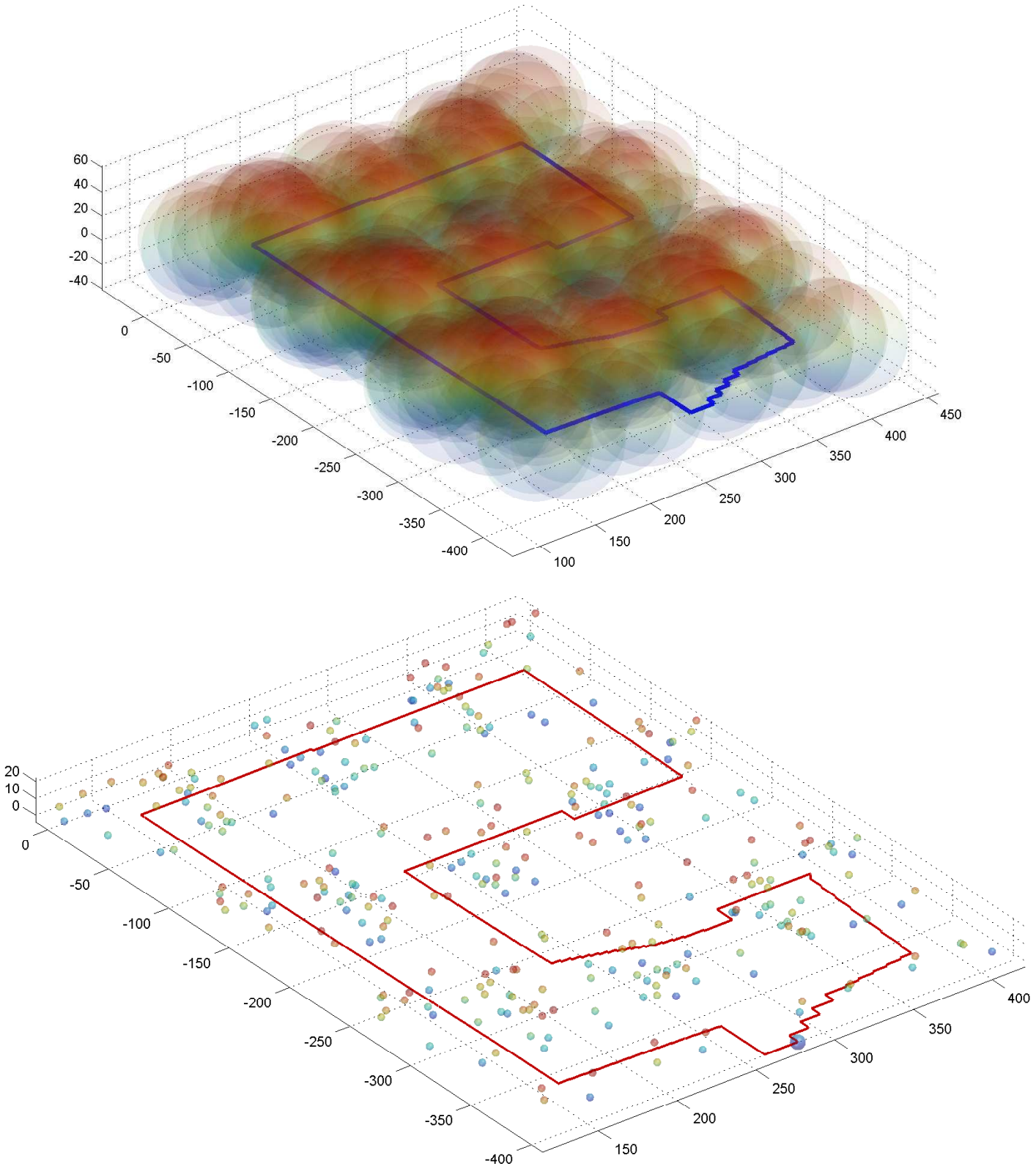


Figure N.181: *lin*318, $r = 41.34$, Equal Radius, 3D, Manhattan, Length = 1612.4919172

Table N-184: Solution for *lin*318, $r = 41.34$, Equal Radius, 3D, Manhattan

Total distance: 1612.49191724847 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
148.356519079074	369.700085337629	0.195706779873738	142.5	331.6	14.7
146.771837347658	369.435473221007	0.351309394159316	155.1	331.6	14.3
139.243598892	369.260493057657	0.491103568521524	136.2	331.6	10.8
132.389529046342	369.088928749274	0.630303037996882	130.7	339.4	10.6
125.683169430578	368.91846083871	0.769363484263955	129.9	329.2	5.1
117.262000093973	368.754954063556	0.907974131070844	122.8	387.5	3.6
108.746626481127	368.591295894516	1.04658752936511	119.7	393.8	17.8
99.4618511575451	368.427094108858	1.18495706541326	99.2	329.2	7.7
90.4656219422978	368.267435415898	1.3228472748298	92.1	387.5	18.7
90.4656219422978	368.267435415898	1.3228472748298	100	339.4	3.8
80.8510406856551	368.108243329046	1.46056401017269	89	393.8	11
70.6998403678603	367.948684899711	1.59818795912245	59.1	339.4	4.8
70.6998403678603	367.948684899711	1.59818795912245	67.7	331.6	4.4
62.1426717838455	367.791327550034	1.73577046349594	51.2	387.5	1.4
54.0866732797533	367.633829474537	1.87339395602573	48	393.8	19.4
46.4897811157436	367.475937413834	2.01075422529892	17.3	393.8	14.6
46.3469015188169	363.129290404885	2.11162930594526	20.5	387.5	17.4
46.2061187365916	354.320885227375	2.21203394835496	28.3	339.4	12.9
46.0656168809425	346.751005435873	2.3123949251777	27.6	329.2	2.8
45.9254048091722	340.044814941626	2.41277613156971	63.8	331.6	18.4
45.785059294271	333.729164117084	2.51308615254487	58.3	329.2	7.6
45.6446610241442	327.632621175979	2.61339333924237	63.8	315.8	14.7
45.5041178872584	321.903408445619	2.71365125186743	70.9	331.6	19.3
45.5041178872584	321.903408445619	2.71365125186743	70.9	315.8	15.2
45.3629453406266	316.26788104241	2.81373496423461	67.7	297.7	2.9
45.221516328595	311.117717067882	2.91383990863508	76.4	288.2	6.4
45.0784838492449	307.30580645779	3.01388346327159	70.9	297.7	11.7
44.9351415800124	303.634531177847	3.11388837074752	67.7	315.8	13.4
44.7915511583859	299.901916109176	3.21384627322671	66.9	280.4	18.4
44.6475837257139	296.457722191716	3.31368527323932	63.8	297.6	5.2
44.5034643125258	293.045198915504	3.41353323553221	60.6	288.2	12.5
44.3592187411655	289.692673071087	3.51335439710569	63.8	280.4	12.2
44.2147825598429	286.425239930054	3.61314639906318	52.8	281.9	9
44.0702953448275	283.205843552598	3.71293242375047	44.9	303.2	8.5
43.9258163903752	279.92031469417	3.81271036513753	14.2	303.2	5.3
43.782693247097	275.810390711386	3.91248625268965	9.4	273.3	14
43.6405514245261	271.853265788403	4.01215901060672	36.2	273.1	6.7
43.4984916375718	267.93652673296	4.11183817135367	6.3	273.3	11.2
43.3580667142257	263.820007345021	4.21141037171972	21.3	273.1	15.8
43.2179157938907	259.660307708719	4.31092484667788	48	260.7	17.4
43.0777359315495	255.544015558954	4.41039365262044	17.3	260.7	14.5
42.9378971140092	251.42396168063	4.50981138990351	51.2	254.4	2.7
42.7980061357039	247.332344688149	4.60925439665522	20.5	254.4	9
42.6583695714076	243.226084294641	4.70868890417869	24.4	273.1	19.3
42.5195208568722	237.345179507356	4.80783152166757	39.4	273.1	0.8
42.3807674800311	228.196912080773	4.90705206092045	28.3	206.3	15.8
42.242200718966	220.490892159517	5.00621776858434	63.8	198.5	2.5
42.1033338472482	213.857660500043	5.1054221756662	58.3	196.1	1.6
41.9643055429194	207.726348402811	5.20466575626464	59.1	206.3	14.9
41.8251330480095	201.711069626741	5.30387370254524	27.6	196.1	18.7
41.6861187605894	195.874004209827	5.40302496086829	63.8	182.7	4.6
41.5468749450634	190.351690267254	5.50219749797553	67.7	182.7	12.4
41.4073161822568	185.039096506914	5.60133914604039	67.7	198.5	11.8
41.2674024162471	179.490356855715	5.70044955628734	44.9	170.1	19.9
41.12749090999	174.121101847117	5.7995025762316	14.2	170.1	13.5
40.987967093476	168.889649145426	5.89851795992447	67.7	164.6	2.1
40.8481449213452	163.782163344286	5.99757426715704	70.9	164.6	8.4
40.7079063598476	158.711662631591	6.0966284649677	63.8	164.5	8.3
40.5674273626327	153.613443089295	6.19568426138203	60.6	155.1	13.8
40.4267505917821	148.544427559041	6.29471218411037	66.9	147.3	5
40.2857390647551	143.53943826027	6.39376274897923	52.8	148.8	15.5
40.2857390647551	143.53943826027	6.39376274897923	63.8	147.3	12.9
40.1443092781499	138.517508245938	6.49275279227039	6.3	140.2	17.5
40.1443092781499	138.517508245938	6.49275279227039	9.4	140.2	11.5
40.0042425431806	133.49428914919	6.59160665412357	36.2	140	1.4
39.8642177577651	128.451844831021	6.69049779294431	21.3	140	9.6
39.7243976700187	123.306324815234	6.7893848283949	17.3	127.6	16.4
39.7243976700187	123.306324815234	6.7893848283949	20.5	121.3	8.4
39.5850342688184	118.207048314206	6.88822655139847	24.4	140	15.5
39.4458620580434	112.76504976906	6.98701757806853	48	127.6	5.5
39.3065980714549	107.181825688012	7.08582558750346	51.2	121.3	6.2
39.1671988646339	101.45331309126	7.18464767475689	39.4	140	3.5
39.0277511879469	85.8197163885967	7.28358935986522	27.6	63	3.4
38.8884378369069	73.2894614763086	7.3825652517855	59.1	73.2	9.3
38.7488895006988	60.9005643226847	7.48153841323783	28.3	73.2	9.3
38.6094551185989	47.6796171240916	7.58051022601149	14.2	37	6.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
38.4703577248235	35.6030310493196	7.67949931509651	9.4	7.1	2.4
38.3488137623888	34.785495216253	7.78056420939961	24.4	6.9	1.6
38.227384289353	33.984976734013	7.88170834398596	21.3	6.9	14.1
38.1061398269336	33.2003295350571	7.98279239523297	6.3	7.1	12
41.7203872856844	33.2003297967657	7.98279280707697	36.2	6.9	0.3
45.3866625028865	33.2003300588242	7.98279321903396	44.9	37	12.5
49.0617800351116	33.2003303209026	7.98279363098134	39.4	6.9	14.8
49.0617800351116	33.2003303209026	7.98279363098134	52.8	15.7	13.8
52.8167308711466	33.200330583354	7.98279404284874	63.8	14.2	14.4
56.5045210663127	33.2003308460363	7.98279445473221	70.1	14.2	16.8
56.5045210663127	33.2003308460363	7.98279445473221	66.9	14.2	11.4
60.0484194388428	33.2003311089378	7.98279486652201	60.6	22	16.9
60.0484194388428	33.2003311089378	7.98279486652201	63.8	31.4	12.4
63.5882363298858	33.2003313719264	7.98279527824916	76.4	22	1.9
63.5882363298858	33.2003313719264	7.98279527824916	81.1	18.9	10.9
66.9790055671421	33.2003316351435	7.98279569003144	67.7	31.5	4.3
66.9790055671421	33.2003316351435	7.98279569003144	70.9	31.5	11.6
70.3671283767461	33.2003318984531	7.98279610185467	63.8	49.6	2.8
73.7950338979057	33.2003321617004	7.98279651372508	70.9	49.6	14.9
73.7950338979057	33.2003321617004	7.98279651372508	67.7	49.6	9.5
77.2846609694158	33.2003324248089	7.9827969255666	63.8	65.4	13.7
81.0093446315817	33.2003326876411	7.98279733737215	67.7	65.4	8.4
81.0093446315817	33.2003326876411	7.98279733737215	70.9	65.4	6.9
85.1683096366708	33.2003329499577	7.98279774921885	58.3	63	8.5
97.7368026616961	33.2003332113318	7.98279816100291	99.2	63	0.7
97.7368026616961	33.2003332113318	7.98279816100291	100	73.2	14.4
106.496095794955	33.2003334723887	7.98279857293662	84.3	17.3	5.6
106.496095794955	33.2003334723887	7.98279857293662	85.8	37	14
117.82032504808	33.2003337334151	7.98279898477708	116.5	37	12.1
129.375061616937	33.2003339946228	7.98279939669897	127.6	20.5	16.5
129.375061616937	33.2003339946228	7.98279939669897	141.7	17.3	2
140.572421179868	33.2003342559435	7.98279980856718	141.7	-7.9	4.6
146.133845899823	33.2003345203622	7.98280022075755	149.6	-7.9	5.2
146.133849969387	33.6158628765735	7.98280068666605	136.2	29.1	0.8
146.133849969387	33.6158628765735	7.98280068666605	142.5	29.1	2.7
146.133854041975	34.0329562369837	7.98280115267089	136.2	49.6	6.3
146.133854041975	34.0329562369837	7.98280115267089	142.5	49.6	0.1
146.133858119335	34.4476401567125	7.98280161875853	129.9	63	9.4
146.133862205475	34.8570894329853	7.98280208486776	130.7	73.2	7.2
150.64643554683	34.8570909941533	7.98280255479716	136.2	65.4	3.7
150.64643554683	34.8570909941533	7.98280255479716	142.5	65.4	2.7
155.758391426098	34.8570925548365	7.9828030248752	148.8	65.4	6.2
161.069027067663	34.8570941152963	7.9828034949909	161.4	65.4	7.2
166.414757565515	34.8570956755438	7.98280396512821	155.1	49.6	5.1
166.414757565515	34.8570956755438	7.98280396512821	155.1	65.4	8.7
172.356544152424	34.8570972355559	7.98280443532173	148.8	49.6	18.9
172.356544152424	34.8570972355559	7.98280443532173	161.4	49.6	13.6
179.364438783906	34.8570987954952	7.98280490541964	148.8	29.1	19.2
179.364438783906	34.8570987954952	7.98280490541964	161.4	29.1	11.5
189.250228606401	34.8571003557453	7.98280537541842	155.1	29.1	1.4
207.552652202652	34.8571019161546	7.98280584554978	233.1	14.2	19.1
207.552652202652	34.8571019161546	7.98280584554978	236.2	14.2	3.3
207.552652202652	34.8571019161546	7.98280584554978	224.4	14.2	0.3
207.552652202652	34.8571019161546	7.98280584554978	222	18.9	3.1
207.552652202652	34.8571019161546	7.98280584554978	218.9	20.5	18.5
207.552652202652	34.8571019161546	7.98280584554978	231.5	31.5	11.2
207.552652202652	34.8571019161546	7.98280584554978	227.6	31.5	14.9
207.552652202652	34.8571019161546	7.98280584554978	234.6	49.6	6
207.552652202652	34.8571019161546	7.98280584554978	227.6	49.6	17.6
207.552652202652	34.8571019161546	7.98280584554978	231.5	49.6	10.4
207.552652202652	34.8571019161546	7.98280584554978	208.7	37	3.4
207.552652202652	34.8571019161546	7.98280584554978	234.6	65.4	4.6
207.552652202652	34.8571019161546	7.98280584554978	231.5	65.4	1.8
207.552652202652	34.8571019161546	7.98280584554978	227.6	65.4	13.5
207.552652202652	34.8571019161546	7.98280584554978	222	63	7.9
207.552652202652	34.8571019161546	7.98280584554978	173.2	18.9	8.3
207.552652202652	34.8571019161546	7.98280584554978	222.8	73.2	10.5
207.552652202652	34.8571019161546	7.98280584554978	178	37	4.3
207.552652202652	34.8571019161546	7.98280584554978	191.3	63	18.3
207.552652202652	34.8571019161546	7.98280584554978	192.1	73.2	7.8
236.837554964636	34.857099294342	7.98280619647797	249.6	37	15.8
236.837554964636	34.857099294342	7.98280619647797	263	63	0.7
244.156957030758	34.8570966727229	7.98280654764964	240.2	22	17.8
244.156957030758	34.8570966727229	7.98280654764964	234.6	31.5	11.8
252.084699518991	34.8570940520099	7.98280689877819	248	14.2	2
252.084699518991	34.8570940520099	7.98280689877819	240.2	15.7	7.9
261.027798940108	34.8570914330059	7.98280724999506	275.6	6.9	6.7
261.027798940108	34.8570914330059	7.98280724999506	280.3	37	9.6
268.811732543565	34.8570888159348	7.98280760127418	278.7	6.9	10.2
276.344356677443	34.8570862010336	7.98280795257226	305.5	6.9	5.7

Solution x	Solution y	Solution z	Original x	Original y	Original z
276.344356677443	34.8570862010336	7.98280795257226	290.6	6.9	18.4
278.200640201152	34.8570835817388	7.98280830443714	293.7	6.9	18.6
280.011912608582	34.8570809659523	7.98280865627382	308.7	6.9	18.2
279.843019758413	54.7491620623726	7.9828086498533	293.7	63	15.4
279.673968763946	73.4876039752968	7.98280864346214	294.5	73.2	1.3
279.673968763946	73.4876039752968	7.98280864346214	263.8	73.2	0.8
279.505075727534	93.2769919685895	7.98280863720132	286.6	121.3	15.1
279.336014478514	107.244776533951	7.98280863091696	255.9	121.3	14.5
279.336014478514	107.244776533951	7.98280863091696	252.8	127.6	3.3
279.168381883663	117.400277017228	7.98280862469301	283.5	127.6	15
279.168381883663	117.400277017228	7.98280862469301	278.7	140	19.3
279.000785409156	126.280934256763	7.98280861839263	308.7	140	16.6
278.831937516362	134.026338454806	7.98280861201934	301.6	127.6	0.4
278.831937516362	134.026338454806	7.98280861201934	290.6	140	0.4
278.662522210033	142.100374788617	7.98280860579471	305.5	140	11.2
278.662522210033	142.100374788617	7.98280860579471	293.7	140	9.3
278.492366195375	150.631857885962	7.9828085995819	275.6	140	4.2
278.322336352506	159.646242452717	7.98280859341512	280.3	170.1	14.3
278.152370535518	168.477524926529	7.98280858727632	294.5	206.3	5.6
272.714739025867	168.560184630602	7.98280858495463	293.7	196.1	5.6
266.050645503012	168.64370559101	7.98280858275655	263	196.1	17.9
259.672175026086	168.72734209818	7.98280858050855	263.8	206.3	6.2
252.953458310946	168.810680415264	7.98280857832446	234.6	198.5	10.6
247.33725257278	168.893823437213	7.98280857614524	249.6	170.1	0.7
241.783977081578	168.977021963515	7.98280857402149	240.2	155.1	5.1
236.332295500644	169.060337825352	7.98280857193505	234.6	182.7	13.3
230.97945465937	169.143659755932	7.98280856984252	231.5	182.7	19.2
225.692903614318	169.226976912197	7.98280856770268	231.5	198.5	1.6
220.348752814158	169.310136698747	7.9828085656416	227.6	198.5	10.4
214.912304339514	169.393135341586	7.98280856358331	222.8	206.3	17
208.581553550455	169.47549209862	7.98280856147814	192.1	206.3	17
208.581553486558	165.295420187851	7.98280838379229	222	196.1	3.2
208.581553423109	159.260428240079	7.98280820628146	248	147.3	4.5
207.569544036914	159.26042781868	7.982808068176	240.2	148.8	5.8
207.569544036914	159.26042781868	7.982808068176	236.2	147.3	7.3
206.50096107945	159.260427397698	7.98280793012606	233.1	147.3	11.4
205.413342804463	159.260426977183	7.9828077921432	224.4	147.3	2.3
205.413342804463	159.260426977183	7.9828077921432	222	152	14.6
204.309310185308	159.260426556871	7.98280765416544	231.5	164.6	6.5
203.186046650008	159.260426136707	7.98280751624785	234.6	164.6	0.1
203.186046650008	159.260426136707	7.98280751624785	227.6	164.6	1.4
202.008163628984	159.260425716441	7.98280737843282	227.6	182.7	0.3
202.008163628984	159.260425716441	7.98280737843282	191.3	196.1	16.7
200.834879454688	159.260425295645	7.98280724070068	218.9	153.6	11.5
200.834879454688	159.260425295645	7.98280724070068	208.7	170.1	15.4
199.649328113803	159.260424874847	7.98280710290661	215	121.3	10.5
193.373065233549	159.260424467516	7.9828069649482	211.8	127.6	10.4
185.181505260404	159.260424060936	7.98280682703395	181.1	127.6	7.7
177.511020073774	159.260423654744	7.98280668910053	173.2	152	19.2
177.511020073774	159.260423654744	7.98280668910053	161.4	162.2	17.4
170.593476453	159.260423248983	7.98280655111967	184.3	121.3	14.5
170.593476453	159.260423248983	7.98280655111967	136.2	162.2	1.7
170.593476453	159.260423248983	7.98280655111967	142.5	162.2	2.7
170.593476453	159.260423248983	7.98280655111967	148.8	162.2	5.3
170.593476453	159.260423248983	7.98280655111967	155.1	162.2	15.7
170.593476453	159.260423248983	7.98280655111967	142.5	182.7	2.1
170.593476453	159.260423248983	7.98280655111967	161.4	182.7	0.7
170.593476453	159.260423248983	7.98280655111967	155.1	182.7	16.5
170.593476453	159.260423248983	7.98280655111967	161.4	198.5	1.4
170.593476453	159.260423248983	7.98280655111967	148.8	182.7	9.2
163.074666350962	159.260422844638	7.98280641332012	178	170.1	11.6
155.299012106464	159.260422440127	7.98280627547619	155.1	198.5	17.6
147.863379856598	159.260422034976	7.98280613760955	142.5	198.5	1.1
141.912929851935	159.260421628758	7.98280599984892	136.2	198.5	8.4
141.912929851935	159.260421628758	7.98280599984892	148.8	198.5	8.3
135.848749446356	159.260421220979	7.98280586214328	116.5	170.1	13.6
135.848749446356	159.260421220979	7.98280586214328	136.2	182.7	6.2
130.218822845232	159.260420813084	7.98280572444418	127.6	153.6	18.6
130.218822845232	159.260420813084	7.98280572444418	141.7	150.4	15.8
124.552169579869	159.260420405626	7.98280558667	122.8	121.3	7.8
119.035278542344	159.260419999365	7.98280544897597	119.7	127.6	15.5
113.520436087568	159.260419593686	7.9828053112013	89	127.6	0.1
112.149396883444	159.260419193481	7.98280517487488	76.4	155.1	3.4
110.868283793323	159.260418793543	7.98280503866259	84.3	150.4	4.3
110.868283793323	159.260418793543	7.98280503866259	85.8	170.1	5
109.6373365192	159.260418394097	7.98280490255003	81.1	152	7.1
108.434929073265	159.260417995302	7.9828047664794	70.1	147.3	17.8
108.43492922236	159.260417917715	7.98280423894744	92.1	121.3	6.9
108.589773498679	187.180545664804	7.98280379934884	70.9	198.5	18.8
108.761693251625	190.664434563004	7.98280335889835	99.2	196.1	13.9

Solution x	Solution y	Solution z	Original x	Original y	Original z
108.933753482528	194.160574130007	7.98280291844058	70.9	182.7	16.9
109.119471167271	202.77974336261	7.98280247767715	129.9	196.1	10
109.304850355322	211.864225244361	7.98280203691191	130.7	206.3	18.1
109.489869995197	221.477261071187	7.98280159610574	100	206.3	18
109.675072315958	232.383089589189	7.98280115526786	89	260.7	3.7
109.861099089096	240.070682443918	7.9828007145199	92.1	254.4	16.6
110.04749671626	247.496977306966	7.9828002737466	122.8	254.4	9.9
110.233752583464	254.940800661547	7.98279983297536	119.7	260.7	11.7
110.419930073888	262.448002495663	7.98279939220411	84.3	283.5	16.3
110.607146619669	268.808124782184	7.982798951343	81.1	285.1	18.2
110.795473562204	274.463159171503	7.98279851033929	85.8	303.2	13.4
110.983064468559	278.064143559463	7.98279806914765	70.1	280.4	12.5
116.292348032382	279.600038661206	7.98279762573696	116.5	303.2	9.1
116.292348032382	279.600038661206	7.98279762573696	127.6	286.7	5.8
121.550397317314	281.113698020344	7.98279718239762	141.7	283.5	17.7
126.567946258609	282.631174856792	7.98279673901165	136.2	315.8	9.7
131.306408508105	284.064381088992	7.98279629561956	142.5	315.8	4.2
135.783137634911	285.43369600218	7.98279585230171	136.2	295.3	3.1
140.287335138273	286.801636233536	7.98279540904058	142.5	295.3	13.4
144.805668587834	288.16934661406	7.98279496575181	178	303.2	1.5
148.314789470031	289.49404323001	7.98279452258586	155.1	295.3	0.7
148.314789470031	289.49404323001	7.98279452258586	161.4	295.3	10.8
151.763756203981	290.82179874763	7.9827940794664	148.8	295.3	14.4
155.243205403779	292.152260724374	7.9827936363251	148.8	315.8	8.4
158.785653191075	293.466520317761	7.98279319318266	155.1	315.8	5.4
162.370756985862	294.767482766598	7.98279275008161	148.8	331.6	0.2
168.149495796653	295.740458984899	7.98279230753564	161.4	315.8	7.1
174.119021928197	296.708189088442	7.98279186502067	173.2	285.1	12.1
180.174515128016	297.683048640191	7.98279142248408	161.4	331.6	4.6
192.099996937784	298.555713511582	7.98279098007374	192.1	339.4	1.6
200.400982406982	298.555713680355	7.9827906637673	191.3	329.2	9.3
209.915450213882	298.555713849777	7.98279034739148	234.6	331.6	5.2
209.915450201217	297.771937888294	7.98279014483732	208.7	303.2	16.2
209.915450201217	297.771937888294	7.98279014483732	218.9	286.7	3.7
209.915450188156	296.994131145288	7.98278994223993	231.5	331.6	8.7
209.915450188156	296.994131145288	7.98278994223993	227.6	331.6	9.8
209.915450170134	294.542445888373	7.98278973951759	222	329.2	14.2
209.915450151637	290.955420329694	7.98278953672304	222	285.1	1.9
209.915450132851	287.500537477262	7.98278933395906	211.8	260.7	3.2
209.915450132851	287.500537477262	7.98278933395906	181.1	260.7	13.4
209.915450120351	285.598202039508	7.98278913113005	184.3	254.4	16.9
214.908188124312	285.598202148176	7.98278749764239	224.4	280.4	17.9
214.908188124312	285.598202148176	7.98278749764239	215	254.4	19.4
219.870133219121	285.598202256954	7.98278586403112	233.1	280.4	17.3
224.728563877566	285.598202365697	7.98278423037028	240.2	288.2	11.3
224.728563877566	285.598202365697	7.98278423037028	240.2	281.9	12.5
229.367663990777	285.598202474371	7.98278259666596	231.5	297.7	7.4
229.367663990777	285.598202474371	7.98278259666596	227.6	297.7	4.1
234.109900899212	285.598202583006	7.98278096298205	227.6	315.8	6.5
239.050083485503	285.598202691728	7.98277932928202	234.6	315.8	11.2
239.050083485503	285.598202691728	7.98277932928202	231.5	315.8	7.2
244.438182194348	285.598202800858	7.98277769551724	249.6	303.2	7.3
244.438182194348	285.598202800858	7.98277769551724	234.6	297.7	7.7
250.072046544169	285.598202910331	7.98277606173914	248	280.4	9.5
250.072046544169	285.598202910331	7.98277606173914	236.2	280.4	11.1
256.205190231852	285.598203019817	7.98277442792671	255.9	254.4	18.1
256.205190231852	285.598203019817	7.98277442792671	252.8	260.7	8.8
262.886646469559	285.598203129172	7.98277279397168	286.6	254.4	15.7
265.515920608585	285.598203239705	7.98277115890807	293.7	273.1	6.2
267.996838320169	285.598203349992	7.98276952381489	305.5	273.1	0.7
269.320028759726	285.598203459676	7.9827678881498	308.7	273.1	9.4
269.255879372415	285.688953781849	7.40788921404009	275.6	273.1	17.9
269.191729569364	285.779888651683	6.83181422770545	290.6	273.1	10.7
269.127559903014	285.871060494774	6.25528967848138	283.5	260.7	2.6
269.063377749122	285.962729185878	5.67984110189946	301.6	260.7	2.7
268.596160755368	295.733794382733	5.33115094171941	278.7	273.1	18.4
268.128021051881	308.070077758806	4.98156496143337	280.3	303.2	11.5
267.659372615716	321.409928143882	4.63176239409283	293.7	329.2	1.4
267.659372615716	321.409928143882	4.63176239409283	263	329.2	0.8
267.188581414193	334.317243833257	4.28259613539787	263.8	339.4	8.3
266.718604844616	347.563958087999	3.93336173031811	294.5	339.4	13.8
266.244190940284	364.535370773787	3.58329938422124	283.5	393.8	11.4
265.765305789419	373.729803494103	3.23205670636011	301.6	393.8	0.9
258.508558330522	374.574675444535	2.89448194854702	286.6	387.5	8.3
249.151813306618	375.412798796061	2.55646854304106	255.9	387.5	4.9
239.812842919421	376.249785142276	2.21844685022186	252.8	393.8	15.4
229.894046949535	377.082034612707	1.8796968698235	211.8	393.8	13.7
221.375613500743	377.910654463865	1.54024940024473	222.8	339.4	15.5
207.811586316517	384.480831114373	1.15566607102438	215	387.5	7.3
194.231124163805	391.169327990709	0.770857056050289	184.3	387.5	3.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
181.881997238229	398.081702215764	0.386024893221283	181.1	393.8	14.3

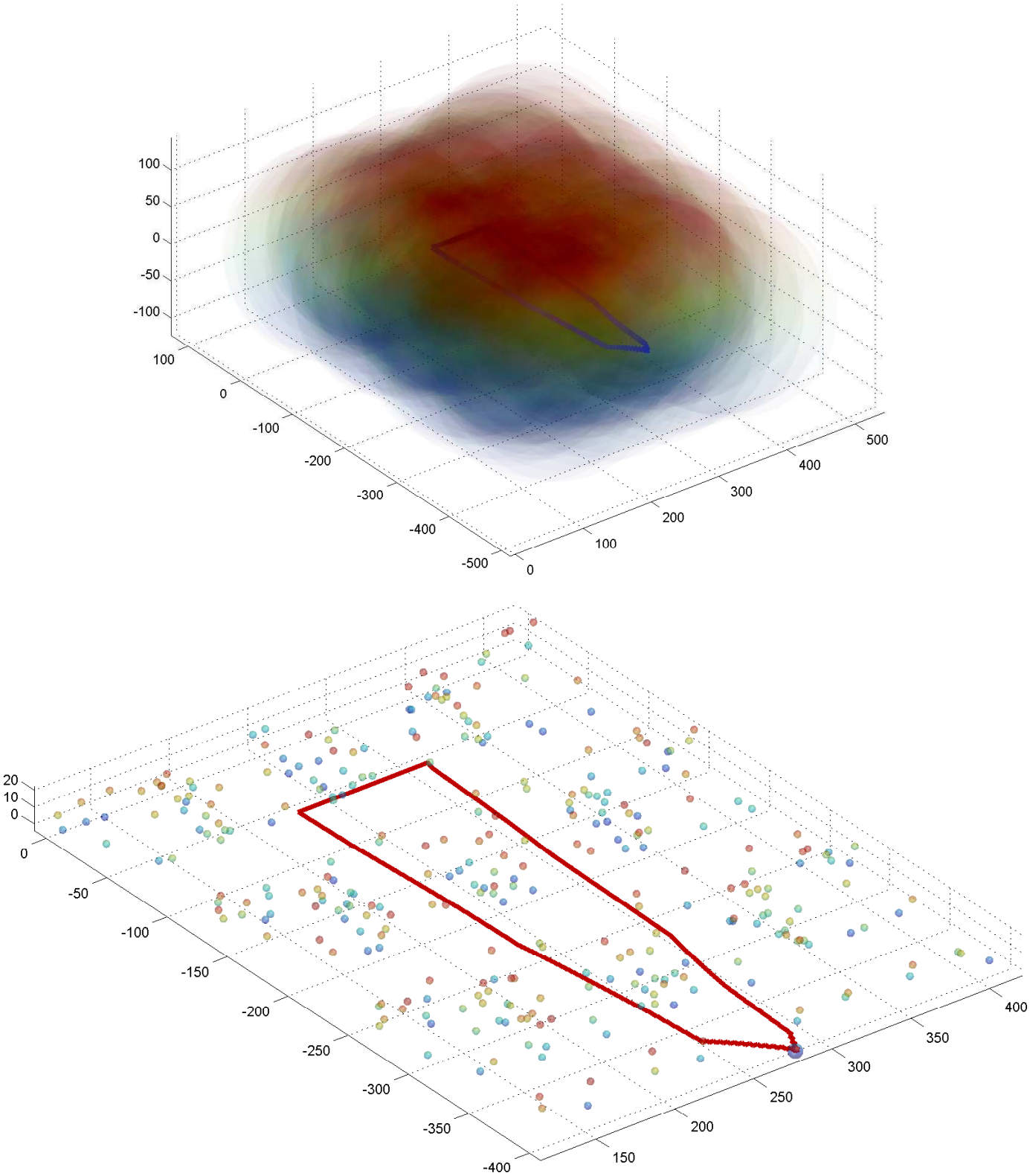


Figure N.182: $lin318$, $r = 124.02$, Equal Radius, 3D, Manhattan, Length = 851.4709259

Table N-185: Solution for $lin318$, $r = 124.02$, Equal Radius, 3D, Manhattan

Total distance: 851.470925912844 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
171.610252962368	400.424866471051	8.93066953722155E-10	215	387.5	7.3
171.610252962368	400.424866471051	8.93066953722155E-10	211.8	393.8	13.7
173.7830889125	395.951962300074	2.64945754224755E-9	181.1	393.8	14.3
175.975242680335	391.600925316475	4.40103065102448E-9	184.3	387.5	3.8
178.167425889791	387.403675240291	6.15447959262383E-9	301.6	393.8	0.9
178.558112077036	379.621843165961	7.9018747101145E-9	283.5	393.8	11.4
178.945916101425	371.998985185723	9.65077617820498E-9	286.6	387.5	8.3
179.332835691781	364.456830999834	1.1400899779801E-8	255.9	387.5	4.9
179.719520325342	357.012120387677	1.31509381162687E-8	252.8	393.8	15.4
180.105162886703	349.485132643179	1.48998822169233E-8	89	393.8	11
180.491293732741	341.669394798755	1.66495510711684E-8	81.1	285.1	18.2
180.881870579886	335.442239383119	1.83988362323362E-8	84.3	283.5	16.3
180.881870579886	335.442239383119	1.83988362323362E-8	85.8	303.2	13.4
181.278619497413	330.263418291521	2.0145776602476E-8	92.1	254.4	16.6
181.278619497413	330.263418291521	2.0145776602476E-8	89	260.7	3.7
181.694565082897	326.830775376442	2.18907842963745E-8	122.8	254.4	9.9
181.694565082897	326.830775376442	2.18907842963745E-8	119.7	260.7	11.7
182.118432890667	323.70293680875	2.36357777794183E-8	116.5	303.2	9.1
182.544829581733	320.61804440887	2.53805865213508E-8	127.6	286.7	5.8
182.544829581733	320.61804440887	2.53805865213508E-8	136.2	295.3	3.1
182.972601280644	317.645500833656	2.7129800628245E-8	141.7	283.5	17.7
183.400447234537	314.733313564428	2.88762578293245E-8	142.5	295.3	13.4
183.828753315687	311.869289198945	3.06242355918585E-8	148.8	295.3	14.4
183.828753315687	311.869289198945	3.06242355918585E-8	161.4	295.3	10.8
184.258498218742	309.091403175819	3.23712470162718E-8	155.1	295.3	0.7
184.689830881813	306.351942342729	3.41206458642773E-8	249.6	303.2	7.3
185.121509653373	303.632545783478	3.5869987868864E-8	280.3	303.2	11.5
185.551202272747	300.922196587743	3.76143560743003E-8	178	303.2	1.5
185.551202272747	300.922196587743	3.76143560743003E-8	161.4	315.8	7.1
185.987053932399	298.247863704156	3.93629591144418E-8	173.2	285.1	12.1
186.426032369692	295.607605386284	4.11106384490267E-8	305.5	273.1	0.7
186.835228210262	293.161431866501	4.28616431236151E-8	308.7	273.1	9.4
187.027098205629	292.023431559266	4.46034533752027E-8	184.3	254.4	16.9
187.027098205629	292.023431559266	4.46034533752027E-8	181.1	260.7	13.4
187.22008662965	290.908903502631	4.63429472574717E-8	215	254.4	19.4
187.413384068146	289.806197398718	4.80842885508537E-8	211.8	260.7	3.2
187.607001519149	288.713194078848	4.98256440550904E-8	218.9	286.7	3.7
187.80084449871	287.625582432722	5.1568250114542E-8	224.4	280.4	17.9
187.80084449871	287.625582432722	5.1568250114542E-8	222	285.1	1.9
187.995046987203	286.54969057274	5.33099751010013E-8	233.1	280.4	17.3
188.189263881185	285.4797537333	5.5050435321391E-8	248	280.4	9.5
188.189263881185	285.4797537333	5.5050435321391E-8	240.2	281.9	12.5
188.383127238169	284.420604232248	5.6793922453835E-8	236.2	280.4	11.1
188.383127238169	284.420604232248	5.6793922453835E-8	240.2	288.2	11.3
188.576987459679	283.370487115661	5.85369122063639E-8	234.6	297.7	7.7
188.576987459679	283.370487115661	5.85369122063639E-8	231.5	297.7	7.4
188.771053482869	282.324838295526	6.02801151217136E-8	227.6	297.7	4.1
188.771053482869	282.324838295526	6.02801151217136E-8	227.6	315.8	6.5
188.965526110206	281.280243279821	6.2021584312788E-8	234.6	315.8	11.2
188.965526110206	281.280243279821	6.2021584312788E-8	231.5	315.8	7.2
189.160111009075	280.233144034147	6.37656967228395E-8	208.7	303.2	16.2
189.160111009075	280.233144034147	6.37656967228395E-8	222	329.2	14.2
189.355771882838	279.183274034014	6.55103775670796E-8	222.8	339.4	15.5
189.355771882838	279.183274034014	6.55103775670796E-8	192.1	339.4	1.6
189.552880762919	278.122740130803	6.72529125722576E-8	231.5	331.6	8.7
189.552880762919	278.122740130803	6.72529125722576E-8	227.6	331.6	9.8
189.750740114618	277.053982341001	6.89945522935886E-8	263	329.2	0.8
189.750740114618	277.053982341001	6.89945522935886E-8	234.6	331.6	5.2
189.948243515667	275.974711349296	7.07380820585968E-8	293.7	329.2	1.4
190.143098910525	274.866219388755	7.24843118860008E-8	294.5	339.4	13.8
190.306161400011	265.410870487519	7.42124797170618E-8	278.7	273.1	18.4
190.306161400011	265.410870487519	7.42124797170618E-8	275.6	273.1	17.9
190.468659791758	256.473281704622	7.59394822580361E-8	290.6	273.1	10.7
190.630411943527	247.639962955217	7.76680337821745E-8	301.6	260.7	2.7
190.630411943527	247.639962955217	7.76680337821745E-8	293.7	273.1	6.2
190.790075591098	238.779968776158	7.93968411016977E-8	286.6	254.4	15.7
190.790075591098	238.779968776158	7.93968411016977E-8	283.5	260.7	2.6
190.948843366079	230.063843953913	8.11263589639566E-8	255.9	254.4	18.1
190.948843366079	230.063843953913	8.11263589639566E-8	252.8	260.7	8.8
191.107736107697	221.451777675038	8.28543988973252E-8	263.8	206.3	6.2
191.266674301089	213.170699983604	8.45827798912069E-8	293.7	196.1	5.6
191.266674301089	213.170699983604	8.45827798912069E-8	294.5	206.3	5.6
191.424521042597	205.586720082558	8.63126246031243E-8	191.3	196.1	16.7
191.583010977189	198.196453575226	8.8040607693074E-8	222	196.1	3.2
191.74212219625	190.957661481672	8.97703102964442E-8	280.3	170.1	14.3
191.74212219625	190.957661481672	8.97703102964442E-8	263	196.1	17.9

Solution x	Solution y	Solution z	Original x	Original y	Original z
191.900989261719	184.081575864526	9.14985776034882E-8	208.7	170.1	15.4
192.060471502541	177.365841409884	9.32226811301007E-8	308.7	140	16.6
192.204860011585	174.613949613859	9.49472678257735E-8	305.5	140	11.2
192.204860011585	174.613949613859	9.49472678257735E-8	293.7	140	9.3
192.346937764062	172.122958376359	9.66660138601583E-8	301.6	127.6	0.4
192.487944369345	169.798215817518	9.8387658908905E-8	224.4	147.3	2.3
192.487944369345	169.798215817518	9.8387658908905E-8	227.6	164.6	1.4
192.629387362594	167.518900713492	1.00108053402437E-7	222	152	14.6
192.629387362594	167.518900713492	1.00108053402437E-7	218.9	153.6	11.5
192.771449181563	165.285951448997	1.01828064202891E-7	233.1	147.3	11.4
192.913747114647	163.077961206541	1.03549126606595E-7	236.2	147.3	7.3
192.913747114647	163.077961206541	1.03549126606595E-7	240.2	155.1	5.1
193.056323807187	160.914388136089	1.05269123196194E-7	248	147.3	4.5
193.056323807187	160.914388136089	1.05269123196194E-7	240.2	148.8	5.8
193.198879000865	158.793597655783	1.06990725612377E-7	249.6	170.1	0.7
193.341258821423	156.681355222326	1.08713010149586E-7	231.5	164.6	6.5
193.341258821423	156.681355222326	1.08713010149586E-7	234.6	164.6	0.1
193.483359725793	154.586820094829	1.10435422584487E-7	231.5	182.7	19.2
193.483359725793	154.586820094829	1.10435422584487E-7	234.6	182.7	13.3
193.624876887681	152.485931709845	1.12158375031868E-7	227.6	182.7	0.3
193.624876887681	152.485931709845	1.12158375031868E-7	231.5	198.5	1.6
193.765684876892	150.366656399417	1.13881299057539E-7	234.6	198.5	10.6
193.765684876892	150.366656399417	1.13881299057539E-7	227.6	198.5	10.4
193.905729884717	148.214754613139	1.15605203632185E-7	222.8	206.3	17
194.045452522338	146.040429812163	1.17329079785122E-7	192.1	206.3	17
194.045452522338	146.040429812163	1.17329079785122E-7	155.1	198.5	17.6
194.184860614707	143.832159685131	1.19049332170107E-7	161.4	198.5	1.4
194.324327966863	141.609799398508	1.20772583045436E-7	142.5	198.5	1.1
194.464008780036	139.36889637067	1.22493716503413E-7	129.9	196.1	10
194.604061660953	137.104162603373	1.24217436336949E-7	130.7	206.3	18.1
194.604061660953	137.104162603373	1.24217436336949E-7	136.2	198.5	8.4
194.745089176427	134.766032849293	1.25940275097491E-7	99.2	196.1	13.9
194.745089176427	134.766032849293	1.25940275097491E-7	100	206.3	18
194.887172349159	131.850483619763	1.27658182691448E-7	116.5	170.1	13.6
195.02987945606	128.916490944429	1.29375024471301E-7	127.6	153.6	18.6
195.173088194306	125.985313105759	1.31093955246797E-7	141.7	150.4	15.8
195.173088194306	125.985313105759	1.31093955246797E-7	155.1	162.2	15.7
195.316705502767	123.053745756385	1.32810896502633E-7	142.5	162.2	2.7
195.316705502767	123.053745756385	1.32810896502633E-7	148.8	162.2	5.3
195.460886004909	120.103615702853	1.34528363560094E-7	136.2	162.2	1.7
195.605600699596	117.138002352011	1.3624575956328E-7	136.2	182.7	6.2
195.605600699596	117.138002352011	1.3624575956328E-7	142.5	182.7	2.1
195.751537841976	114.065152690912	1.37965159296982E-7	148.8	182.7	9.2
195.751537841976	114.065152690912	1.37965159296982E-7	148.8	198.5	8.3
195.898723057431	110.820041616934	1.39683123734358E-7	155.1	182.7	16.5
196.046656996284	107.505699829281	1.41401130804297E-7	178	170.1	11.6
196.046656996284	107.505699829281	1.41401130804297E-7	161.4	182.7	0.7
196.195967033778	104.074611754144	1.43120175266631E-7	173.2	152	19.2
196.195967033778	104.074611754144	1.43120175266631E-7	161.4	162.2	17.4
196.347561802091	100.582555638522	1.44837400739561E-7	184.3	121.3	14.5
196.347561802091	100.582555638522	1.44837400739561E-7	181.1	127.6	7.7
196.501454435386	97.1097069691089	1.4655395830232E-7	215	121.3	10.5
196.501454435386	97.1097069691089	1.4655395830232E-7	211.8	127.6	10.4
196.656427553043	93.6473867245705	1.48271567468328E-7	290.6	140	0.4
196.656427553043	93.6473867245705	1.48271567468328E-7	275.6	140	4.2
196.805538006075	90.0488140597045	1.49989489273139E-7	278.7	140	19.3
196.952713067928	86.3764733311947	1.5170816425325E-7	286.6	121.3	15.1
196.952713067928	86.3764733311947	1.5170816425325E-7	283.5	127.6	15
197.096871047335	82.60141393332	1.53424110749256E-7	252.8	127.6	3.3
197.240855691235	78.7905058147871	1.55141862023811E-7	263.8	73.2	0.8
197.240855691235	78.7905058147871	1.55141862023811E-7	234.6	65.4	4.6
197.384916841005	75.0478767241335	1.56860181732554E-7	263	63	0.7
197.528646125878	71.3392355697179	1.58579680942239E-7	293.7	63	15.4
197.528646125878	71.3392355697179	1.58579680942239E-7	294.5	73.2	1.3
197.670042058383	67.6727183492934	1.60273344818052E-7	305.5	6.9	5.7
197.670042058383	67.6727183492934	1.60273344818052E-7	290.6	6.9	18.4
197.760756488565	67.3178590664889	1.62000986847488E-7	278.7	6.9	10.2
197.851008686758	66.9636045613186	1.63704243050233E-7	275.6	6.9	6.7
197.851008686758	66.9636045613186	1.63704243050233E-7	280.3	37	9.6
197.940545843121	66.6109779597203	1.65405310781352E-7	248	14.2	2
198.029983429767	66.259591320024	1.67108069604183E-7	236.2	14.2	3.3
198.029983429767	66.259591320024	1.67108069604183E-7	234.6	49.6	6
198.119387584123	65.9098932584114	1.6881196529539E-7	249.6	37	15.8
198.119387584123	65.9098932584114	1.6881196529539E-7	234.6	31.5	11.8
198.208738664448	65.5615696960932	1.70515207287281E-7	231.5	49.6	10.4
198.208738664448	65.5615696960932	1.70515207287281E-7	227.6	65.4	13.5
198.298163479134	65.213480248251	1.72217966110111E-7	231.5	65.4	1.8
198.298163479134	65.213480248251	1.72217966110111E-7	222	63	7.9
198.387653569746	64.864879174918	1.73922728663456E-7	222.8	73.2	10.5
198.387653569746	64.864879174918	1.73922728663456E-7	255.9	121.3	14.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
198.476740538836	64.5117015402914	1.75626908571758E-7	148.8	65.4	6.2
198.476740538836	64.5117015402914	1.75626908571758E-7	155.1	65.4	8.7
198.56645410411	64.1575891245411	1.77330974793222E-7	161.4	65.4	7.2
198.656536451665	63.8030329338075	1.7903607840708E-7	191.3	63	18.3
198.656536451665	63.8030329338075	1.7903607840708E-7	192.1	73.2	7.8
198.74709876704	63.4473033307101	1.80740897803844E-7	227.6	49.6	17.6
198.74709876704	63.4473033307101	1.80740897803844E-7	208.7	37	3.4
198.83770337371	63.0919345985461	1.82445560881206E-7	231.5	31.5	11.2
198.83770337371	63.0919345985461	1.82445560881206E-7	227.6	31.5	14.9
198.928148825729	62.7376410989114	1.84151389248655E-7	224.4	14.2	0.3
199.018590399504	62.3842871210834	1.85858780810122E-7	240.2	15.7	7.9
199.108890378387	62.0317431678915	1.87521422390091E-7	308.7	6.9	18.2
195.924243583102	62.0317431684503	1.86960591008756E-7	293.7	6.9	18.6
192.408100912724	62.0317431689713	1.86347449471214E-7	233.1	14.2	19.1
192.408100912724	62.0317431689713	1.86347449471214E-7	240.2	22	17.8
188.831780542913	62.0317431694228	1.85732815793926E-7	218.9	20.5	18.5
188.831780542913	62.0317431694228	1.85732815793926E-7	222	18.9	3.1
185.241049750302	62.0317431699597	1.85118508966298E-7	173.2	18.9	8.3
181.703737307311	62.0317431705004	1.84504870048841E-7	178	37	4.3
178.203922814012	62.0317431710443	1.83893618554976E-7	155.1	29.1	1.4
178.203922814012	62.0317431710443	1.83893618554976E-7	155.1	49.6	5.1
174.814553284062	62.0317431715064	1.83284925014959E-7	148.8	29.1	19.2
174.814553284062	62.0317431715064	1.83284925014959E-7	161.4	29.1	11.5
171.515043451987	62.0317431720573	1.82676345161781E-7	148.8	49.6	18.9
171.515043451987	62.0317431720573	1.82676345161781E-7	161.4	49.6	13.6
168.280911590742	62.0317431726047	1.82064283649197E-7	142.5	49.6	0.1
168.280911590742	62.0317431726047	1.82064283649197E-7	142.5	65.4	2.7
165.12420464189	62.0317431731471	1.81456456971318E-7	136.2	29.1	0.8
165.12420464189	62.0317431731471	1.81456456971318E-7	142.5	29.1	2.7
162.04329202928	62.0317431736991	1.80852083531136E-7	141.7	17.3	2
158.994601660693	62.0317431742575	1.80249287495826E-7	81.1	18.9	10.9
158.994601660693	62.0317431742575	1.80249287495826E-7	127.6	20.5	16.5
156.100537027443	62.0317431748306	1.7964532617043E-7	116.5	37	12.1
156.100537027443	62.0317431748306	1.7964532617043E-7	136.2	49.6	6.3
153.26823006152	62.0317431754102	1.79041890646658E-7	129.9	63	9.4
150.458712970914	62.0317431759904	1.7844006094947E-7	130.7	73.2	7.2
150.458712970914	62.0317431759904	1.7844006094947E-7	136.2	65.4	3.7
147.683520366555	62.0317431765671	1.77838685999632E-7	119.7	127.6	15.5
144.934992926528	62.0317431771239	1.77235790488339E-7	122.8	121.3	7.8
144.934992926528	62.0317431771239	1.77235790488339E-7	85.8	170.1	5
142.825368134421	62.0317431776008	1.76629285419949E-7	89	127.6	0.1
142.825368134421	62.0317431776008	1.76629285419949E-7	84.3	150.4	4.3
140.802730040137	62.0317431780249	1.78104869519302E-7	39.4	6.9	14.8
140.802730040137	62.0317431780249	1.78104869519302E-7	63.8	14.2	14.4
140.802730040137	62.0317431780249	1.78104869519302E-7	70.1	14.2	16.8
140.802730040137	62.0317431780249	1.78104869519302E-7	84.3	17.3	5.6
140.802730040137	62.0317431780249	1.78104869519302E-7	141.7	-7.9	4.6
140.802730040137	62.0317431780249	1.78104869519302E-7	149.6	-7.9	5.2
139.082529829549	62.0317431784542	1.77495806497063E-7	100	73.2	14.4
139.082529829549	62.0317431784542	1.77495806497063E-7	92.1	121.3	6.9
137.384393541671	62.0317431788968	1.76886715053115E-7	70.9	65.4	6.9
137.384393541671	62.0317431788968	1.76886715053115E-7	99.2	63	0.7
135.714832486772	62.0317431793392	1.76279996821904E-7	58.3	63	8.5
135.714832486772	62.0317431793392	1.76279996821904E-7	59.1	73.2	9.3
134.095791564682	62.0317431797829	1.75674841784712E-7	63.8	65.4	13.7
134.095791564682	62.0317431797829	1.75674841784712E-7	67.7	65.4	8.4
132.513539483351	62.0317431802295	1.75069018837348E-7	70.9	49.6	14.9
132.513539483351	62.0317431802295	1.75069018837348E-7	67.7	49.6	9.5
130.961224473398	62.0317431806839	1.74462243762719E-7	63.8	49.6	2.8
129.42438587712	62.0317431811402	1.73856619767321E-7	76.4	22	1.9
129.42438587712	62.0317431811402	1.73856619767321E-7	85.8	37	14
127.90453244165	62.0317431816056	1.73251549995257E-7	67.7	31.5	4.3
126.396516783918	62.0317431820723	1.72647148133365E-7	63.8	31.4	12.4
126.396516783918	62.0317431820723	1.72647148133365E-7	70.9	31.5	11.6
124.909860776751	62.0317431825381	1.72041552559676E-7	66.9	14.2	11.4
123.433741623573	62.031743183002	1.71435644347184E-7	52.8	15.7	13.8
123.433741623573	62.031743183002	1.71435644347184E-7	60.6	22	16.9
121.984611943482	62.0317431834547	1.70826737644347E-7	36.2	6.9	0.3
120.565632721864	62.0317431838864	1.70219166761854E-7	21.3	6.9	14.1
120.565632721864	62.0317431838864	1.70219166761854E-7	24.4	6.9	1.6
119.265203738268	62.0317431842099	1.69611539035941E-7	14.2	37	6.3
118.001832430499	62.0317431844935	1.69001097560795E-7	9.4	7.1	2.4
116.84168444307	62.0317431847494	1.68356166341255E-7	6.3	7.1	12
117.108957965493	72.5145223565453	1.65847623634363E-7	44.9	37	12.5
117.376645525828	83.3604214598922	1.63296931532386E-7	27.6	63	3.4
117.645366264984	94.4828681837389	1.60747916311266E-7	28.3	73.2	9.3
117.915167942589	105.782090932763	1.58207328126991E-7	14.2	170.1	13.5
118.203884277593	111.46362289883	1.5564664579415E-7	44.9	170.1	19.9
118.493251878931	116.908952422787	1.53089715126953E-7	70.9	164.6	8.4
118.782267332556	122.257043721214	1.50532230236422E-7	67.7	164.6	2.1

Solution x	Solution y	Solution z	Original x	Original y	Original z
119.07103167263	127.535290197517	1.47976351172474E-7	20.5	121.3	8.4
119.361505965828	132.898614400931	1.454212963381E-7	17.3	127.6	16.4
119.654179799758	138.350813639656	1.42865303587314E-7	6.3	140.2	17.5
119.654179799758	138.350813639656	1.42865303587314E-7	9.4	140.2	11.5
119.954000911956	143.887929457559	1.40307790275074E-7	70.1	147.3	17.8
120.253380198241	149.466070048783	1.37747122153087E-7	63.8	147.3	12.9
120.552472775076	155.104325706352	1.35185800331783E-7	52.8	148.8	15.5
120.851689187189	160.823306030314	1.32623355852957E-7	66.9	147.3	5
121.150677939705	166.644961596505	1.30061508230028E-7	24.4	140	15.5
121.150677939705	166.644961596505	1.30061508230028E-7	21.3	140	9.6
121.453443969297	173.003225920898	1.27500499047528E-7	81.1	152	7.1
121.755220979389	179.507659472116	1.24939731449558E-7	76.4	155.1	3.4
122.056230324473	186.181864850112	1.22379574918341E-7	36.2	140	1.4
122.358318740263	193.313146300617	1.19822246347212E-7	48	127.6	5.5
122.358318740263	193.313146300617	1.19822246347212E-7	39.4	140	3.5
122.662386860736	201.933023659596	1.17269152610788E-7	51.2	121.3	6.2
122.967548159756	212.308703208824	1.14717394694708E-7	60.6	155.1	13.8
123.272827158614	223.663301425308	1.1216549467008E-7	63.8	164.5	8.3
123.57821023952	236.04423451375	1.09613679910581E-7	6.3	273.3	11.2
123.963537711503	238.954347773538	1.07054120235262E-7	9.4	273.3	14
124.368716460118	241.485116646529	1.04486659324721E-7	27.6	196.1	18.7
124.368716460118	241.485116646529	1.04486659324721E-7	28.3	206.3	15.8
124.780689195422	244.181076202401	1.01917706274435E-7	59.1	206.3	14.9
124.780689195422	244.181076202401	1.01917706274435E-7	67.7	198.5	11.8
125.192956917289	246.987802743177	9.93478437294471E-8	70.9	198.5	18.8
125.192956917289	246.987802743177	9.93478437294471E-8	63.8	198.5	2.5
125.605143614386	249.929923329764	9.67783932992461E-8	70.9	182.7	16.9
125.605143614386	249.929923329764	9.67783932992461E-8	67.7	182.7	12.4
126.017751182361	253.106877467485	9.42076354704113E-8	63.8	182.7	4.6
126.431136292408	256.436307061127	9.16391940108952E-8	58.3	196.1	1.6
126.845569957117	259.906634959246	8.90729836555693E-8	24.4	273.1	19.3
127.263401291526	263.371013122115	8.65036042796419E-8	21.3	273.1	15.8
127.263401291526	263.371013122115	8.65036042796419E-8	36.2	273.1	6.7
127.687565202023	266.851660607506	8.39328890833713E-8	17.3	260.7	14.5
127.687565202023	266.851660607506	8.39328890833713E-8	20.5	254.4	9
128.123199703753	270.496524284584	8.13613638683819E-8	48	260.7	17.4
128.123199703753	270.496524284584	8.13613638683819E-8	51.2	254.4	2.7
128.561582341803	274.280644231426	7.8790364455017E-8	39.4	273.1	0.8
129.002045094735	278.11944420337	7.62223493211422E-8	52.8	281.9	9
129.002045094735	278.11944420337	7.62223493211422E-8	63.8	280.4	12.2
129.443983953711	282.048086452485	7.36545757717977E-8	60.6	288.2	12.5
129.886525674351	286.018712094451	7.10862337882645E-8	63.8	297.6	5.2
129.886525674351	286.018712094451	7.10862337882645E-8	67.7	297.7	2.9
130.329668319453	290.059516013279	6.85219418983252E-8	70.1	280.4	12.5
130.773096662685	294.181165198811	6.59578347494971E-8	76.4	288.2	6.4
131.216525420271	298.381441992845	6.33953476381066E-8	70.9	297.7	11.7
131.660304841891	302.655194273583	6.08334005391953E-8	63.8	315.8	14.7
131.660304841891	302.655194273583	6.08334005391953E-8	67.7	315.8	13.4
132.105421309687	307.024334170286	5.82709134278048E-8	58.3	329.2	7.6
132.105421309687	307.024334170286	5.82709134278048E-8	59.1	339.4	4.8
132.552705453832	311.414805926981	5.57121353494949E-8	100	339.4	3.8
132.552705453832	311.414805926981	5.57121353494949E-8	92.1	387.5	18.7
132.995649321444	315.628080775764	5.31454560359634E-8	67.7	331.6	4.4
133.439504499489	319.881529255817	5.05814625739731E-8	63.8	331.6	18.4
133.884857837649	324.186444266378	4.80157495985623E-8	70.9	315.8	15.2
133.884857837649	324.186444266378	4.80157495985623E-8	70.9	331.6	19.3
134.332993585697	328.652318099593	4.544885712221E-8	14.2	303.2	5.3
134.332993585697	328.652318099593	4.544885712221E-8	44.9	303.2	8.5
134.855833457862	335.227053954615	4.28859010526139E-8	27.6	329.2	2.8
135.387242278728	342.087350743658	4.03255455694307E-8	28.3	339.4	12.9
135.927464450165	349.204362585046	3.77665685391548E-8	48	393.8	19.4
135.927464450165	349.204362585046	3.77665685391548E-8	51.2	387.5	1.4
136.473979512132	355.908946616768	3.52025892880192E-8	66.9	280.4	18.4
137.02555463755	363.629464212094	3.26413100992795E-8	20.5	387.5	17.4
137.623219963475	369.974572959785	3.00739486647217E-8	17.3	393.8	14.6
140.138374859656	372.28341611157	2.74814198064632E-8	99.2	329.2	7.7
140.138374859656	372.28341611157	2.74814198064632E-8	129.9	329.2	5.1
142.692435663792	374.694504927775	2.48967353400076E-8	130.7	339.4	10.6
145.254792189488	377.1512277946	2.23111271679954E-8	136.2	331.6	10.8
145.254792189488	377.1512277946	2.23111271679954E-8	142.5	331.6	14.7
147.8308416013	379.706522499151	1.972593111077E-8	136.2	315.8	9.7
147.8308416013	379.706522499151	1.972593111077E-8	142.5	315.8	4.2
150.437065404089	382.415887094196	1.71462914977383E-8	148.8	315.8	8.4
150.437065404089	382.415887094196	1.71462914977383E-8	155.1	315.8	5.4
153.061856498589	385.323214587568	1.4574112583432E-8	148.8	331.6	0.2
155.704858655289	388.322142825323	1.20076890652854E-8	122.8	387.5	3.6
158.388760204865	391.353092826288	9.44488931509113E-9	119.7	393.8	17.8
161.12594786168	394.434983255782	6.88001478010847E-9	155.1	331.6	14.3
163.901003781435	397.665763899854	4.31494129315979E-9	191.3	329.2	9.3
163.901003781435	397.665763899854	4.31494129315979E-9	161.4	331.6	4.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
166.709466936383	401.196510008434	1.74550507381355E-9	263.8	339.4	8.3

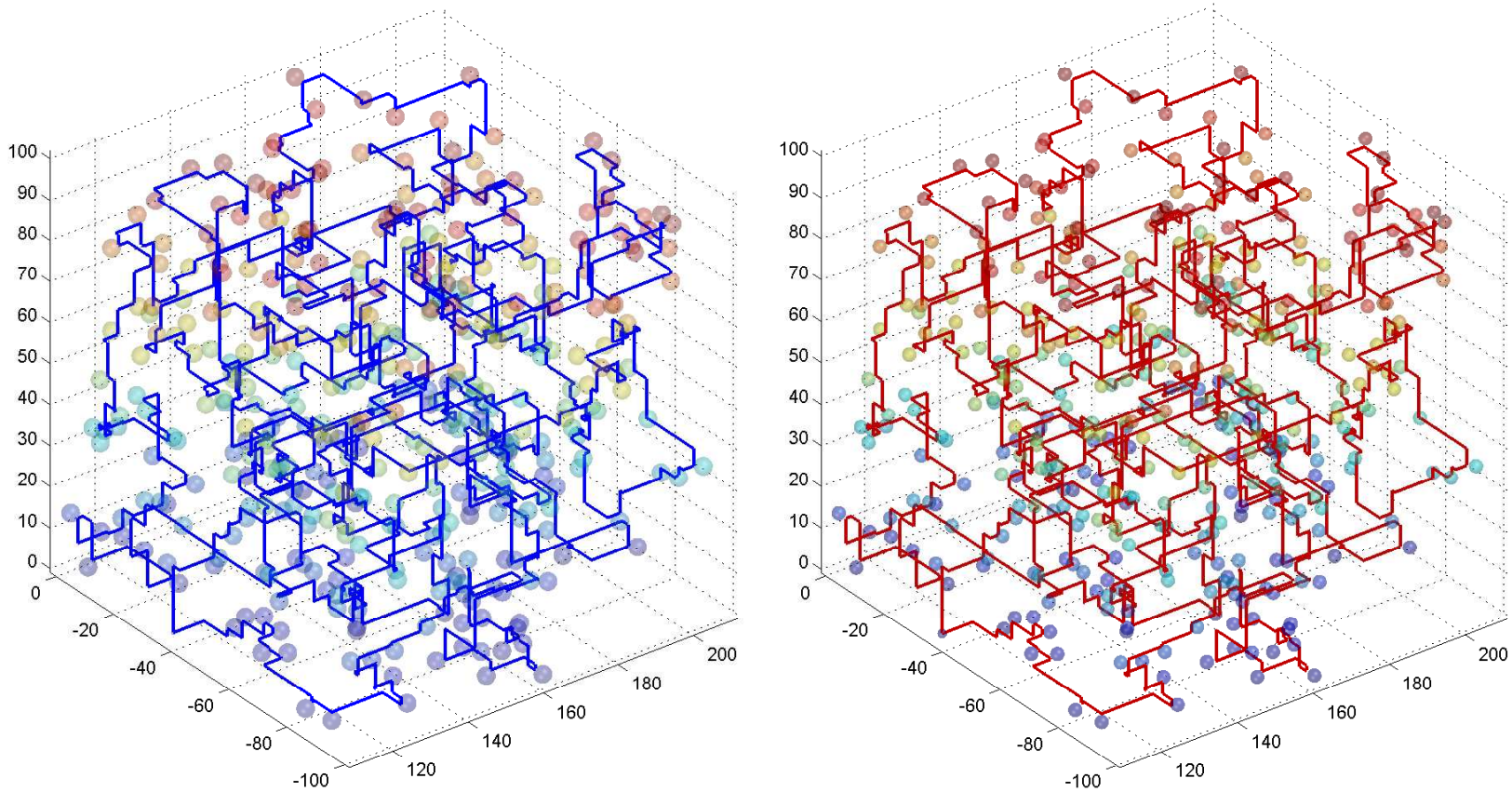


Figure N.183: $rd400$, $r = 1.9910618$, Equal Radius, 3D, Manhattan, Length = 4560.3678377

Table N-186: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 3D, Manhattan

Total distance: 4560.36783774256 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
10.3707535973819	43.6381423900382	1.64697146809824	12.2621	43.6923	1.4336
10.6787330538729	48.3518972578781	5.64439588875702	11.7937	48.0467	6.2423
10.963798900347	55.5177994763708	8.18183337072828	10.9638	55.5178	10.1729
11.5407320163221	57.9262004306031	6.72290253476349	13.5318	57.9262	6.7229
7.46446037398626	61.9153168488481	6.3581019171874	5.5259	61.9092	6.1438
7.33337416059726	66.1807828033821	6.0808037040062	9.17265	66.1356	6.7326
2.69742367242141	82.9526998087327	4.78776978523376	1.02508	82.9527	3.7072
3.35356362300712	88.9859999273383	4.78776911557558	3.35356	88.986	2.7967
16.8539967472078	95.4895292364749	6.09070334034278	16.854	97.4806	6.0907
17.2022008315644	91.7567996697346	8.92680213162679	18.6101	90.3489	8.9268
12.2826798582299	92.602180664881	15.1061554403535	12.3803	91.1149	15.3598
6.4416351331099	94.063965317085	19.1779969645613	4.45069	94.0863	19.178
15.2582404515396	94.0640971663379	19.8127027704499	15.2733	95.1553	18.4059
23.1082992239274	94.0642289551035	21.9675036125291	23.1083	96.0553	21.9675
29.4440970075518	93.8921917271729	25.6397961667788	29.5533	92.3189	26.5937
33.1282998281323	93.7559933891486	26.4081940424447	33.1283	92.3481	27.8161
35.3070966718407	94.5834685180259	25.9827195451888	34.7487	93.2543	26.9859
46.9596532840497	97.7607308628336	25.3829980937519	48.6626	98.7924	25.383
34.7579141189716	97.7607292079996	13.4448016463335	34.7579	99.7518	13.4448
34.5001461927401	87.7734697710169	6.03022007787161	32.7208	86.88	6.0296
40.7052957407361	87.7734698324072	6.02513116883617	40.7053	85.7824	6.0265
41.8854184293884	94.0161279574437	3.88593721037365	40.4171	94.2218	3.0792
50.686756092888	97.813352583495	2.74584695967415	51.8363	98.9629	1.5963
50.4073610599027	95.6319352393177	7.60600632126162	48.9418	95.7946	8.5835
50.1929048833595	92.6570990519282	8.6232650359413	49.8328	92.6571	10.5815
50.1928978952716	88.5471014311971	5.05457950323882	48.934	88.5471	3.512
52.8197917835364	87.0164988954614	7.19788624428531	54.7886	87.0165	7.4948
50.5771984672963	81.4584717075559	7.19789557124256	50.5772	79.5094	6.7911
46.053692517853	81.4584754178483	7.99146168511215	45.1636	79.7971	7.5816
45.6946018905442	81.4584792253255	21.3105968033333	45.6946	80.9262	23.2292
45.1239532190902	82.4740165511419	17.348179220456	43.9629	81.9344	16.1851
44.7147020518582	84.0027026385569	16.2891022794515	43.3068	85.4106	16.2891
50.437484482524	83.7243035641677	15.2322775394709	50.9984	83.4341	15.7476
54.1690003224888	83.4493412088934	14.0748032337734	54.169	81.8375	12.9059
62.3156503720454	83.8731533189204	14.0748071116029	63.6977	85.2552	13.695
62.1286961926592	79.2923037312996	16.405302767072	60.7208	77.8844	16.4053
65.0301823145757	80.0498872706888	23.2022003509948	66.7645	81.0279	23.2022
61.9065123221081	80.0498862448493	27.6914812761951	61.8453	80.8454	29.5157
61.9064682673944	79.455254671447	27.4145052423127	60.2539	80.1704	27.9583
61.906424235036	72.373600365644	26.9403197519484	60.356	72.3736	25.6911
65.3010994868092	68.2224707026239	26.9403253373179	65.3011	67.1869	28.6409
66.9764051574037	68.2224702289185	9.09440379569788	66.9764	66.2314	9.0944
96.5073977773575	70.2890994309433	3.84760575013225	97.9153	71.697	3.8476
86.803800075625	62.16380010861	3.11650056796026	85.3959	62.1638	1.7086
88.1423546799496	55.8992635304752	12.6736317996034	88.4474	55.9131	14.5629
88.8853286470004	48.3318003160617	12.9357089981473	90.8764	48.3318	12.9357
85.634317352153	42.6794465621814	18.2291765896489	85.2354	42.0312	17.7315
82.9755952217593	39.1980066001195	27.8833795573155	81.8496	38.8539	28.9342
81.7324086985441	36.8002784467989	29.877622157517	80.5435	37.2793	30.7227
80.9156506138135	32.7663999615009	31.1216101981355	80.1207	32.7664	32.9471
80.9156496164378	28.1120005298193	21.0621908777486	81.7106	28.112	19.2367
76.4189992272082	24.7751697458338	27.7957982418506	76.419	22.7841	27.7958
62.0154000430394	26.7740022456278	29.6322013102886	62.0154	28.1819	31.0401
49.4045007031159	21.9520680440298	26.5255000954586	49.4045	19.961	26.5255
47.6330985659792	25.3181000992239	20.5810686388442	47.6331	25.3181	18.59
37.07606383814	27.4703743226654	23.0276462985367	37.0272	27.4581	25.0096
36.2408740460171	32.3131396520683	23.0524832396131	36.8488	32.2474	21.2512
27.6082391582315	42.5603988921206	23.0792445216964	26.2003	42.5604	24.4871
29.4521179071325	44.35106402521	13.7252198163778	28.6889	43.6077	12.417
35.4194317833978	49.4356002466841	12.3771059460681	37.4105	49.4356	12.3771
32.6606683127126	55.26260001915	12.0173947706662	30.6696	55.2626	12.0174
32.9510488928686	61.088716609144	2.95584360595122	31.2678	61.1344	2.0752
50.5251376526669	64.9463997491647	2.43651445717082	51.793	64.9464	0.9013
50.5251301168148	67.9933461567161	10.9937010445416	52.5118	68.1256	10.9937
46.3248824106106	67.9934726341356	18.5412561866228	45.2184	66.3382	18.5431
46.3246946845019	70.7465663105537	18.6985030704423	47.6475	71.1843	17.3202
46.3245057037143	71.1700038827678	29.2251899033646	46.3399	71.17	31.2162
41.4131000198148	73.4120027695202	29.1372017176867	41.4131	74.8199	27.7293
36.4353233096437	68.6131056897171	30.4740784545504	35.9094	68.8825	29.2317
33.4868184525335	61.3915776398082	32.8439784103713	33.4192	59.483	33.0004
31.3970297846527	61.1363427975678	34.1888971395123	32.641	61.5676	34.0062
25.6439008014958	60.8746943539107	35.6206307621685	25.6513	60.6643	37.4717
19.5010760810169	60.6286997764116	35.9664643158337	18.9042	62.1271	34.907
18.9265982885692	55.1628999171554	42.864201927949	17.5187	55.1629	44.2721
20.5641022321112	47.7219004325519	40.8736687500284	20.5641	47.7219	38.8826
23.6339006940841	42.0034681890452	41.5074028583448	23.6339	40.0124	41.5074

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.8692015712634	45.2441017064336	45.1215995122041	33.2771	46.652	45.1216
31.0442446770674	38.5703826198563	46.0072179095961	32.7353	38.4372	45.6112
25.8218504643594	34.2028208369031	47.1281128746821	25.7714	33.2927	46.3113
20.9340970254311	31.8561986479961	48.5255011835382	19.5262	30.4483	48.5255
21.7263649934833	32.6760129799249	52.0863564230415	22.7183	34.3604	52.0641
21.8795048848631	32.7742089836662	58.0537988312035	23.2874	32.7742	59.4617
17.2921826736076	35.2426883754095	56.6946581515213	17.6023	36.5196	56.7286
10.3095545072412	36.6522557754591	55.3209435203595	9.16001	37.8018	54.1714
13.7457163996562	25.5824275962903	58.2700370885658	15.3897	25.3897	58.7078
14.5694377538284	20.3873403173276	59.9926005888854	15.6993	18.7479	59.9926
14.5694345054115	23.0998983216257	63.2235697412553	15.3759	23.0999	65.044
4.01817100112879	24.029501408677	63.2235664755234	2.38826	24.0295	62.08
4.40938026181401	26.5764083212774	68.893612205681	3.44571	28.2052	68.896
5.50569667898273	26.8960433542918	74.4285103324284	4.056	25.9589	74.3875
19.2469955791907	27.280130402327	80.8170007564227	19.247	29.2712	80.817
20.328802186883	27.2801291350338	92.8350012279625	20.3288	28.022	94.6827
27.4221936970574	27.2506692550769	89.657330074738	27.4222	25.8428	88.2494
27.7665832199556	27.8661817826741	96.687828711991	29.1053	29.2049	97.3043
27.2481974732968	20.2425009997146	96.6878292767971	27.2482	20.2425	98.6789
22.6996995827234	16.910970934696	96.5596933084676	22.6997	14.9199	96.5597
11.3632837443176	19.8371723254634	95.8397904938694	9.96077	19.2347	95.1963
10.0451826694049	38.6874719015112	95.2473838224569	8.75416	38.928	96.5496
9.60876486451232	41.6794928594169	88.6801732834148	9.27453	43.3967	88.7547
9.21032011844136	42.3799009234569	79.4030006600007	7.21925	42.3799	79.403
13.3001323839135	49.0583467808921	76.2450383458095	13.2524	50.7626	76.4367
17.80850183735	49.9642298660084	71.4677019436744	17.8085	51.9553	71.4677
24.4593997860367	49.3897699257138	68.2545969753491	24.4594	47.3987	68.2546
30.4468035038718	53.5687397402457	60.3034648246592	30.4468	53.5688	58.3124
43.2439002766919	54.1523022808019	60.3034450086238	44.4217	55.3301	59.2126
41.6782992462288	52.1534993412741	68.8466295088259	41.6783	52.1535	70.8377
39.3680716204493	48.7967908603476	65.7760740262033	38.5534	48.7846	64.7262
37.8087740780672	45.5065245364781	64.0960441013712	38.1612	45.7549	62.3997
35.3632506536242	38.7307739677528	63.5055872619086	34.4656	38.8185	62.9703
33.6596691669415	31.1822001733847	62.9486967330678	31.6686	31.1822	62.9487
34.8762891155039	24.5348789539148	60.7612415042209	34.4638	23.0393	61.4662
36.5248530842107	23.4515709418746	49.9524367404123	38.2173	22.874	49.077
31.0765004374398	23.4515683927859	49.9524370474139	31.0765	22.0815	48.5077
26.8722257862342	23.4515745719109	50.1121071207088	25.8125	25.1372	50.1121
26.872225784315	19.5172366883714	52.7372020316358	25.7178	17.895	52.7372
26.872232552356	19.5172355624165	63.9830002536451	26.0672	21.3383	63.983
27.3595040882714	17.5892461893565	75.2188432956782	27.3595	17.3028	77.1892
36.0033004279644	17.5892367204859	70.4199352475	36.0033	17.5038	68.4307
49.5016375560639	17.5892286704827	70.4199349038666	50.9211	16.4053	69.6798
47.6541835363029	20.9174312362013	73.7532410107972	47.6864	20.3976	74.364
45.7843780809804	25.5526780352777	76.2592529067582	46.0829	25.5503	78.1024
39.3916182625257	30.2871874791925	76.6336021703464	37.7688	31.4408	76.6336
43.1610332092181	30.2871838755114	93.5896305933731	44.5404	30.686	94.969
42.5500792176629	24.566938834091	89.1930616776015	42.4972	23.9973	88.7768
41.9416838965291	20.7844730657063	85.7780729108208	41.7205	19.4188	86.0496
41.3553984227387	19.2267999077072	81.2197005700329	39.9475	19.2268	79.8118
43.8962032697503	15.6811706452873	83.4665010353808	43.8962	13.6901	83.4665
54.5850046419626	15.7352950761997	85.8883995298875	55.9929	17.1432	85.8884
53.1438712101419	6.04104133053321	87.327000754791	51.1528	6.04103	87.327
54.0910430191694	5.00417546971601	88.7418463250831	52.4925	5.37248	88.2454
62.5858278659189	3.66175922891616	91.1441022117146	64.5769	3.66176	91.1441
62.5858116575185	1.66539011239378	97.3771172613393	61.5069	0.482106	98.5604
68.1564568755671	14.799995757363	96.3249446461448	68.0574	15.6194	97.6814
75.2455002598074	17.3084000635348	93.8699734391076	75.2455	17.3084	91.8789
93.1463955992506	19.8145969846015	94.7871253123927	93.1464	19.8146	96.7782
95.8690767571768	21.7748752286461	82.3480004660914	96.7473	23.5618	82.348
95.8690768835302	16.6522999935913	74.9860750256359	96.7716	16.6523	73.2113
90.4882993614586	12.6216003872604	81.5315268244255	90.4883	12.6216	83.5226
74.8788004016432	9.02450056850451	79.1312997332208	73.4709	7.6166	79.1313
76.829943191974	17.9137216973348	78.8347084135215	76.9072	18.2917	80.6948
78.3563900444434	19.1975584483847	73.6080207810118	77.5205	18.1054	72.6356
82.683900586066	23.4883005972408	72.1826724567225	82.6839	23.4883	70.1916
89.0359993709342	30.7257000697545	75.9477269756396	89.036	30.7257	77.9388
93.9493261292199	38.2331999550217	74.7443987583312	95.9404	38.2332	74.7444
86.8558999367846	46.4886266937035	70.9689003384564	86.8559	48.4797	70.9689
79.2393029510394	42.9078115062276	67.0088002063058	78.6058	43.2582	65.7281
76.228403809304	36.9486580028035	65.4708945647041	74.7866	36.0265	64.8468
75.6466698863186	35.9869984136835	64.6657464439336	74.0572	35.987	63.4666
77.6794011973842	30.7182677110948	64.6657511095083	77.6794	29.1288	65.8649
85.0142828100203	33.1736539324912	62.8998136453171	85.0689	32.1301	62.1612
91.7441966210172	39.9422299820052	61.5588935575176	92.3029	41.017	61.4442
95.3869338300225	42.5058523708479	60.2643983617055	96.3235	44.2629	60.2644
95.3869344777583	42.5058426360425	53.4853488011655	94.61	43.2995	53.8065
95.3869351257289	42.5058328984255	41.2101059487841	96.1419	41.3034	39.8142
92.1202732351401	44.288041300382	41.3498159045363	92.0634	46.0336	40.4672
90.772937605492	44.3665133664401	42.4927293106952	91.3249	42.8902	41.6597

Solution x	Solution y	Solution z	Original x	Original y	Original z
87.6494423125702	44.4521149371983	46.8353218886281	88.1955	43.6361	47.6404
82.4363093334405	44.5390352445068	49.2096625413111	81.4209	43.6493	50.298
81.1996992560643	44.629928342643	50.1349989691133	81.1997	46.621	50.135
77.1243282332826	40.6416425629894	50.8572900237394	76.05	41.1841	50.3284
75.199870660319	32.0500999076769	51.6558013888628	73.2088	32.0501	51.6558
78.1846399819552	19.2402642874971	53.8074171576531	78.906	18.0381	53.555
80.0350007196384	16.867582395167	56.3534396424119	80.035	15.8589	58.0701
87.5811411908498	16.8675837111089	45.4757288655141	88.2698	14.9994	45.4757
87.5811503081131	18.0065065955631	45.2979061541109	86.8707	18.0065	43.4379
87.5812748504937	23.2533866871437	45.2979039278177	87.5589	25.1226	45.9834
97.2904977012699	22.0418988383174	34.8851720482141	97.2905	22.0419	32.8941
98.0752444661546	9.14862028525302	36.5945011726788	99.5164	7.77478	36.5945
93.2309474786296	9.14865195917903	38.6828015683937	91.7898	10.5225	38.6828
93.6394016239479	3.39817064597835	48.4234981840614	95.0473	3.39817	49.8314
88.8128599498762	2.47748950933449	25.7719011186659	88.6343	0.494442	25.7719
88.8128434255076	10.7700982446433	19.2921486543623	88.9914	10.7701	17.3091
79.2919007433026	11.6606303700756	22.4660017199316	79.2919	13.6517	22.466
76.7666022885706	10.031992082346	31.8249920165029	77.911	9.90186	32.1435
70.2299692989962	8.47104734894995	37.5341010509942	68.2389	8.47105	37.5341
72.8037482810833	5.60444013323209	47.7123221598402	74.632	5.60444	48.5009
60.701300884351	2.87378937372871	47.7123234057774	60.7013	1.36116	46.4176
56.3236995865848	2.87378928473971	64.8995743967364	56.3237	2.07366	66.7228
33.1085027615142	2.8738148149113	62.2839949940711	33.1085	0.882753	62.284
26.7979005682681	4.91089164111801	59.4640017328535	26.7979	6.90196	59.464
22.2441510763103	2.6185181537895	57.318613261784	21.7245	2.01127	55.495
22.2441472051667	2.61851540200096	73.0479989031663	23.5387	4.13129	73.048
19.728699674342	1.60661381471778	78.1584005041418	19.7287	0.198716	79.5663
12.9387690430838	2.7352536468071	75.6447996780174	10.9477	2.73525	75.6448
15.2583443849682	10.6933880018128	73.5431980285206	17.1854	11.1942	73.5432
10.9258791496179	10.6933924368649	65.7657244702182	10.9524	12.0779	65.6188
6.43447079647279	10.6933968578596	59.8477997316022	6.43447	8.70233	59.8478
2.60462961467091	12.262400316858	51.496700319596	0.613562	12.2624	51.4967
2.68875290654051	14.3972327353058	43.9305003236226	2.68873	16.3883	43.9305
3.47358780117135	10.2204158370376	35.8512959932566	2.19732	10.251	34.6682
5.40399190415015	5.67263211719464	34.628696820395	4.96047	4.06059	34.5353
8.65723719769655	4.65572975023665	33.4703734864545	8.57052	3.36732	32.2638
12.6306999244415	4.11624813614483	32.8716961938057	12.6307	2.70835	31.4638
15.876167460303	15.9219699867215	33.1257041387704	17.2907	17.3232	33.1257
15.8761659872735	15.9219685805705	34.8068992036818	15.6444	17.8995	34.8069
15.8761652514538	9.5107199672491	36.0252062157529	14.8737	9.51072	37.7455
19.0116002302134	2.96605597318602	36.0251733223207	19.0116	0.977048	36.1157
23.1606561827788	2.99405159031576	19.9869014445931	23.1984	1.0131	19.9686
24.2152034198949	11.2470026727787	17.4990004947997	25.6231	12.6549	17.499
20.587819408849	7.99867941265477	12.2201179474802	21.4744	8.21886	12.0685
12.7116003175097	4.2914719591127	7.56036801674852	12.7116	4.29147	5.5693
9.04959863585245	3.50882938033773	7.56038067288632	9.0496	1.67955	6.7742
1.46690519094928	3.50882507116577	13.5360509446236	0.219756	2.58493	14.7832
2.81931015113297	6.61834489353764	4.2324206751079	2.00806	6.28968	2.6575
12.2504563758063	21.737857960263	3.48264316989792	13.4	22.8874	2.3331
6.26767926248617	21.4177819850734	12.1103519210369	5.81823	20.7452	12.0688
2.06734733974768	21.1077963693777	21.2280003137847	0.65945	19.6999	21.228
2.6196794593282	25.2255031180356	26.0298996418399	2.1823	25.6845	27.6693
3.26728299301996	27.1001033475092	26.8401944228673	5.25835	27.1001	26.8402
2.76313563604133	38.5270490476396	26.9848711859581	2.57158	38.4711	27.3546
2.26542361852327	50.9884898887938	27.1285436011424	2.40393	50.9808	25.185
1.60276244237959	69.8256003758362	31.0366007353775	0.194865	71.2335	31.0366
2.83719022090091	66.2811323908363	43.9580168048389	2.55217	66.9796	45.1209
4.20037126992186	56.0147868344492	46.5700770653469	3.30116	54.5758	46.8676
8.55243430987284	54.9113001329513	48.3977688764202	9.35555	53.1101	48.6717
8.55243507967164	58.8779980095197	48.3977780927618	10.4725	58.878	47.8708
6.94065735136307	60.167776845718	54.7452168350355	8.30742	60.1487	54.798
2.98499994890651	61.4642007586729	60.6206020833775	1.5771	61.4642	62.0285
13.7101569575249	68.6301935355371	60.072301865284	14.0141	70.4084	60.1608
16.5760012301326	69.2402314130546	59.4971367305052	16.576	71.2313	59.4946
22.3957046375882	69.2402294474555	59.4952582835498	23.7167	70.7298	59.5174
22.3957361862874	69.2402263117359	51.5167391222835	23.6206	68.344	50.228
21.7222121419271	78.6389282560834	53.3424439953271	23.3293	78.9181	52.7226
19.5225321051289	82.1483013682421	60.6759292726509	19.5225	82.1483	62.667
19.4053788546261	94.9862111036216	60.6759286913829	18.064	96.3276	61.2807
28.0616061638155	93.3706782436832	59.3420722431597	27.8353	94.5623	59.9313
44.9958996606167	90.1222877534992	57.6729135493132	44.9959	88.3516	56.7624
53.7143995960076	90.1222925861931	57.6729119011907	53.7144	89.3849	55.8234
59.3384557676717	94.8921681390575	60.3007746610178	59.3326	96.8644	60.2925
67.8430116964851	94.9500774815059	63.4846603862005	68.3546	93.0491	63.4728
68.0526014618945	96.5455983488494	68.5513963178109	68.0526	97.9535	69.9593
73.9550400292003	96.0235914801411	63.5147657376248	74.1314	97.2935	62.187
76.405196982664	90.2452998349782	63.0478024889321	77.8131	90.2453	61.6399
75.301003957494	83.4846001015599	63.5442087912571	73.8931	82.0767	63.5442
84.4594035078646	84.2159024064245	67.9925921544701	84.4594	85.6238	69.4005
84.623268004787	80.306528789034	62.3065725079785	82.6909	80.2719	62.172

Solution x	Solution y	Solution z	Original x	Original y	Original z
89.1631334424156	77.4715696358155	60.77025540505	89.1084	77.1611	62.2997
94.2045968919008	75.3487741556967	49.4797004999866	94.2046	73.3577	49.4797
94.5735278643901	79.2685164346608	39.5691058510659	95.4573	78.5053	38.9919
94.9147987351159	95.1744951072276	35.4748010915136	96.3227	96.5824	35.4748
92.0798564856201	93.7081886970063	33.4884540939122	91.0373	94.8618	33.7328
90.7844586964163	88.94282211125	31.0075295066295	91.8947	87.6684	31.3605
80.7777008588237	87.9353992419311	25.5660741426779	80.7777	87.9354	23.575
77.535208076418	80.0257724263077	33.1993004760236	77.5352	78.0347	33.1993
77.4349342078057	80.0258060569746	37.5418103683407	75.9957	81.402	37.5418
78.9206067591144	73.8168051407669	38.4362278956507	78.9206	73.8168	40.4273
82.1020241094247	72.3093110199702	37.3479079081096	82.5413	70.9361	35.9747
82.102026961865	75.7356976428337	43.6345997626852	84.0931	75.7357	43.6346
79.6042011697793	77.7509505343201	47.4993469933142	79.6042	79.6519	48.0916
78.1223500998874	75.1455990872141	47.4993502102325	76.2214	75.1456	46.9071
79.0735360012706	72.9730962587535	50.4511652678677	78.3667	74.2083	50.3369
80.257429952896	63.235220184636	53.7317609067772	81.8209	62.9891	53.3907
80.9145523275032	58.4111025296666	60.1176633930283	82.834	58.4111	60.6469
69.3672007063901	57.1719445212429	60.1176673036871	69.3672	55.5594	61.2856
67.9841524112127	58.1401695891781	58.2100284827953	69.1414	57.6653	59.1832
64.2883193681673	59.3259717875235	51.1817588986416	64.2573	58.953	49.3124
61.2396229860867	67.3119457238547	50.9057317759866	60.771	67.3196	52.7577
60.445248425161	74.2801841817544	43.0542482210184	61.6789	74.8507	42.3385
59.246620254237	77.1983539668199	40.3995895323835	59.2712	76.4167	39.0582
58.0370984509121	93.2937716179861	39.2441747491347	58.0371	93.3465	37.2538
54.8664999046055	93.2938272316222	41.941899445579	54.8665	95.2849	41.9419
50.946353722071	88.5204160981511	42.8718933632114	50.0418	88.5256	42.3177
48.6219398431305	83.7791168720151	43.9048877318539	47.7087	83.4773	42.5429
47.4710717321434	81.0227036986383	47.2065786785844	48.3206	81.4332	48.7053
43.4786417114468	67.2201479235843	47.9227566356601	42.1545	66.9856	47.2528
42.0179316459429	60.4929921670581	48.7687697592059	40.6271	60.1839	50.1596
55.6947172935712	60.4929864580956	45.6090025555975	56.0439	62.2937	45.4781
58.0480338406232	60.4929806441599	43.4230423695106	58.3448	60.9201	41.5011
58.0480432618492	55.76573106505	43.7625224682632	57.8122	54.5104	45.2899
67.5911056806309	55.7657381239347	42.9395193454702	67.8108	54.6502	44.2592
71.7261677516329	55.7657451905519	40.2758987958662	70.983	56.1077	39.9244
80.6137016793292	55.7657522572977	37.997484544695	80.6139	53.7748	37.9975
80.754607344432	59.5275086126497	26.6396923043711	81.8774	60.6902	25.477
80.7545636731001	58.0478840275731	28.4957141875314	82.7455	58.0479	28.4959
77.3807058998907	55.7633854942794	28.8436723741838	76.3859	55.8636	29.5918
75.5108715397641	53.3589940811894	29.1695896794503	74.8357	53.7031	27.6754
74.3386982009207	49.4016645425908	29.5926340923551	74.6616	49.1772	30.6996
73.064000543715	46.1073990813144	29.9755008342936	73.064	44.6995	31.3834
71.2696697546086	47.5054767135456	16.1011017749972	69.2786	47.5055	16.1011
73.2189218427101	47.591286688895	12.8254224013132	72.4782	47.1166	11.4083
79.5060964644017	47.6790294657359	11.7964990568847	79.5061	49.6701	11.7965
80.0506021005538	36.8528999419162	3.82386998569377	80.0506	36.8529	1.8328
90.1099997356594	22.7045271845374	5.70754863316471	90.11	20.7153	5.7932
98.0267082250264	23.8460140083732	5.70758393160006	98.8743	25.646	5.6301
98.0267087121069	22.6353877584932	7.14336975519965	99.5853	23.4577	6.8435
98.0267091548746	16.7085606726935	9.34403259933009	97.4766	17.1802	10.0021
98.0267095981862	4.73211320995599	11.0652013097247	98.9579	4.73211	12.8251
95.7658988068937	4.48834786395259	8.02167566304372	95.7659	2.55349	7.5519
74.5771010063914	5.70820929133603	8.02167090310121	74.5771	5.70821	6.0306
70.1985354048353	6.15749054700403	9.47634224513468	70.1018	4.34543	9.0382
67.2669996031187	14.1515982549292	15.4196321269581	67.267	14.1516	17.4107
58.8779686372373	14.672319237166	15.2013439055039	58.7637	13.9566	16.9818
56.3387621160949	19.3002301621395	11.8363006542685	54.7387	20.4852	11.8363
61.2651306582009	19.3002258059612	4.220062233443	62.8285	19.7058	3.0557
58.2096981875192	7.56071107466838	4.22006674375125	58.2097	7.56071	2.229
49.3774106043835	2.37648373318011	7.04100248999561	47.3917	2.23053	7.041
49.3774189496308	2.37645944946303	14.4263999680359	48.5894	0.54797	14.4264
54.3872280897241	2.376458601205	17.9030002113848	56.1254	1.40532	17.903
48.6978982613583	7.88786675047871	19.56486807428	48.6979	8.85907	21.303
39.2087667509498	7.88788867972226	19.5648797412485	38.2491	9.61738	19.3363
39.2087669629865	7.79242871620815	31.023799874257	37.2177	7.79249	31.0238
42.0177992657935	5.43393783335328	36.9379987031847	42.0178	3.44287	36.938
42.9870033704097	20.9342318369738	37.9860022993842	42.987	22.9253	37.986
49.4943971893674	18.318068446935	40.7381997702827	49.4944	16.327	40.7382
50.5746083312837	32.0563974705748	42.6105221701909	49.1148	32.8614	42.5439
54.8368912199271	34.2787138559741	44.6045040474356	55.5492	35.9315	44.2535
55.9429466021128	34.7822510547081	50.574819814776	56.0389	33.1015	51.1098
56.9788007379871	35.9945985558219	52.4215304306343	56.9788	35.9946	54.4126
59.2703761377645	36.5620867531765	51.8063436326105	60.6972	35.5066	52.4287
59.6621665536196	40.9025215139589	50.3406023285094	61.5258	41.6034	50.3406
47.4918121798496	40.9025234528367	50.0135108519548	46.2037	41.7062	48.7254
48.2554851487858	40.552534920944	65.5264075650217	47.522	42.292	65.6102
55.0989996896184	33.7620706133929	70.6981004517058	55.099	31.771	70.6981
57.0764739976609	37.5262646018329	80.4822111486903	55.717	37.8511	81.0117
70.5739271497374	40.2263004366867	84.1996007818624	72.565	40.2263	84.1996
70.0978965186959	43.9308006994126	95.3424273475202	70.0979	43.9308	97.3335

Solution x	Solution y	Solution z	Original x	Original y	Original z
64.3234118104715	52.672399790613	95.3424301915727	62.6521	52.6724	96.4246
64.8783352479369	58.4126447255226	95.3423536593602	64.8783	60.379	95.6551
73.5354426138307	58.4126565296632	94.9267975674031	75.5117	58.1702	94.9268
69.9394985578477	62.1921256188706	90.604801858264	69.9395	64.1832	90.6048
61.2249970338653	60.2506489815006	88.560798839759	59.9164	58.75	88.5608
61.2250079269037	62.7595526311055	76.4849950962004	59.9164	61.9972	76.3491
61.2250188481387	70.7479701602486	68.7874902173602	60.9907	71.4945	66.9566
66.0919761477924	70.747971674504	70.717017297324	65.9297	69.3415	71.7927
78.2185966869482	70.747973212986	71.4148032350263	78.2186	68.7569	71.4148
80.2957935345273	74.0762684779644	78.9737429325457	80.9911	75.8316	78.9882
80.888903573198	74.3616245349635	85.0129003845274	80.8889	76.3527	85.0129
85.5700178871089	73.898718303638	91.83130779913	86.1254	75.412	92.2501
87.5436497953978	73.1548195038962	94.578999084868	87.0562	74.7862	94.9506
93.4087384325026	68.4964344477234	96.1781245252299	93.4248	68.5015	98.1606
95.1985282287856	59.6464730493604	96.201198964762	96.3481	58.4969	97.3507
90.5622756081252	66.638200191029	86.5414032360024	88.5712	66.6382	86.5414
96.0844069892803	73.5084231844199	85.0655138431982	98.0725	73.509	85.0617
96.0906102235972	78.9817041471081	84.138750058627	95.1537	79.2325	85.4918
96.0968229905925	82.1977006365876	81.4504048410654	98.0879	82.1977	81.4504
92.7384979737887	89.9533898503791	80.6558773917374	92.7385	89.9534	78.6648
76.7184049527117	90.6161149720466	80.6558945857809	75.6586	91.7899	79.8395
75.8516956265882	90.9853060597899	80.6559118931563	75.4786	92.9344	80.494
75.8516889445969	83.4227088435641	91.6011230905655	74.5996	81.8744	91.5993
84.6253992647856	83.4376574636807	91.6069751548278	85.2864	82.465	90.0038
84.647433336424	88.2724812663372	91.6223138520143	83.5669	88.2708	89.9554
85.9426347722292	95.4018977681235	98.0039193626478	86.1563	95.4019	99.9835
85.9426478909559	96.7330972895637	97.5761953141215	87.9339	96.7331	97.5762
75.6359000708685	97.7162235882027	96.3468927230173	75.6359	99.7073	96.3469
65.9331999970797	97.7162287038758	87.3883479375153	65.9332	98.9174	85.8003
54.3858525750536	97.6731852813735	89.9005535346069	54.3707	99.6057	90.3024
50.7959524967545	91.0969586658121	90.0691176932603	51.2472	90.6526	88.5593
37.745301039029	88.3415743290212	90.2585200075894	37.7453	86.3505	90.2585
32.5896001528747	89.351100396865	98.0898942267638	32.5896	90.759	99.4978
28.7786449225404	88.8233329744467	95.2851858375486	28.4623	90.5817	94.8789
27.1360960956326	75.0982844332429	94.085118844458	27.1361	73.6904	92.6772
16.8354000858147	75.8923632587811	95.7449452680504	16.8354	77.4785	96.9485
6.93524558890373	74.2732989960193	95.7449403859492	4.99968	74.2733	96.2118
13.8307994435867	56.3789833005363	91.4001319894859	13.8308	54.4775	90.8096
17.6011004944	59.219204268076	91.4001287664044	17.6011	61.1721	91.0121
23.2085003256135	58.8068959684428	91.4001287948119	23.2085	58.8069	93.3912
31.4339008230482	45.7646317623793	91.4001091992104	31.4339	43.8079	91.7683
52.12847852763	45.7646302708623	89.6933205016304	53.4254	44.9898	88.3964
52.0393261275466	52.8576959833144	92.5209974030322	54.0007	52.8659	92.5002
43.7212730800197	58.1198970510169	97.2118929427776	41.7302	58.1199	97.2119
43.7212943493761	58.7522034848377	97.5155592098881	43.5841	58.7522	99.5019
46.6832272153529	62.5481006330471	86.8455033701323	48.6743	62.5481	86.8455
43.9608473349995	68.7083897343615	85.9040480857549	43.1006	68.5786	87.3861
42.8202139239054	80.1225817614185	81.1192102738155	43.0779	81.6476	81.3569
41.5459977899965	81.6750695735041	72.9133929413716	41.546	82.3742	71.0491
29.8827027683047	81.6750716843253	74.8634027894859	29.8827	79.684	74.8634
27.79804978439	89.5947223054947	78.0221280138308	27.9893	89.6021	79.9213
12.7822537245668	96.9979660513699	78.2426517563451	12.7313	98.6134	79.0339
3.57801221480382	97.6286991761974	78.4321974562232	3.57801	99.0366	79.8401
2.29009049072666	97.3271974462387	63.0477004524072	0.299018	97.3272	63.0477
2.6853360887764	93.8107897790989	53.7271378466395	3.24988	93.8751	52.5027
3.06059513799549	90.122571160166	51.3598003870208	3.06059	88.1315	51.3598
5.30563592122547	91.8068377728706	48.5973116972915	4.28894	92.6489	49.3954
16.724299259127	92.9514002121762	36.1914007159981	16.7243	94.3593	34.7835
17.8570112287461	82.2261524167749	36.9219576018354	16.5471	81.1813	37.3426
26.7928994423462	80.8262698018564	37.5421041817914	26.7929	78.8352	37.5421
27.4566520545191	80.826269729634	44.2757580690764	25.7615	81.4539	44.2448
34.9223984087268	80.8262696534606	52.3174530371834	34.9224	79.9328	54.0968
35.6765568270175	82.946156951945	45.9890760194061	34.4937	83.7515	46.1073
36.7229959473295	84.344328953058	38.0239006487404	36.723	86.3354	38.0239
37.0726955663616	82.664694860596	32.7466011284643	38.4806	81.2568	32.7466
23.3569001264664	83.0887299345936	30.5318029362298	23.3569	85.0798	30.5318
10.7109811670779	83.0887291174058	29.0610998989284	8.89064	83.8954	29.0611
11.6362688376293	81.4428508734902	25.0853852086263	10.1219	82.045	24.5182
16.9327278184782	77.5319239085543	23.3594173713824	17.2306	77.2747	24.7644
20.528822726278	74.5433786244613	17.2834168131369	20.7262	75.308	17.3361
23.7555761793933	69.8636998745213	10.8835433989658	24.7619	69.8637	9.1655
23.755574879045	61.4243757967904	13.4915016943996	24.5176	59.5849	13.4915
19.6267854005695	61.81956500752	18.689557948354	19.6656	61.3862	20.5906
9.66197908975573	62.948602952614	18.8287995105951	8.25408	64.3565	18.8288
12.9431714609441	55.3640033011106	19.0838417338531	12.5872	53.6987	19.2898
21.6683614882221	54.3781088944568	19.3323187230515	22.8193	53.7552	17.9075
21.9690462318	54.0100031472711	27.5848140446906	22.5447	55.6169	28.4034
22.2046620213127	49.4213999927593	28.2908427568594	23.6126	49.4214	29.6987
15.8722147094143	44.5933745036808	28.2656367592125	15.6372	44.5891	30.235
15.67307957443	41.1586716222157	25.0685045103941	17.5856	40.8861	25.0628

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.5059159043761	40.1174448177475	22.0896304202156	13.4598	41.6191	22.5554
11.4257978830105	37.7412005152203	16.2165676028344	11.4258	37.7412	14.2255
2.22589485467057	35.5085243002875	16.21656708347	0.642906	35.395	17.4189

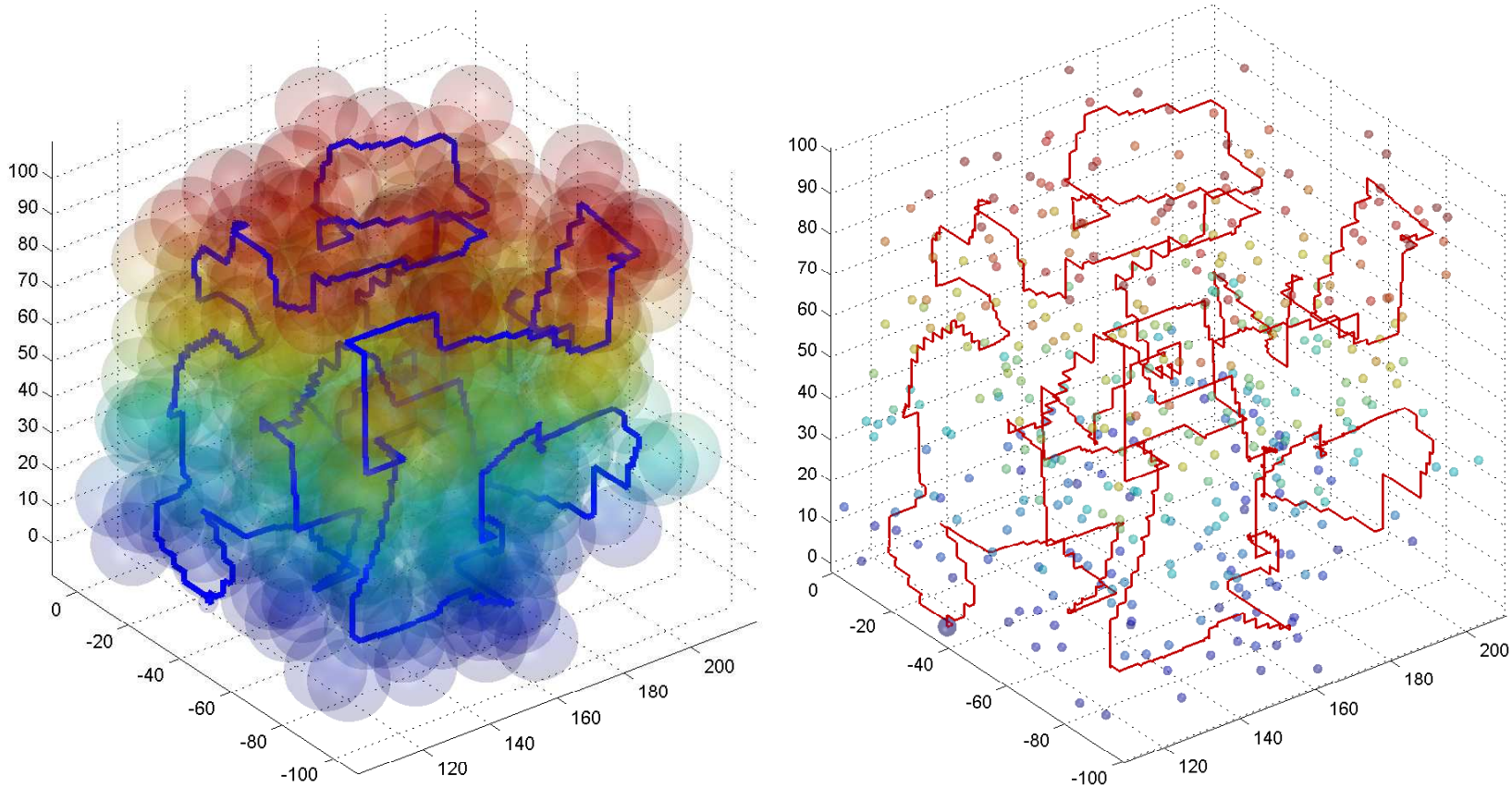


Figure N.184: $rd400$, $r = 9.955309$, Equal Radius, 3D, Manhattan, Length = 2132.7786309

Table N-187: Solution for $rd400$, $r = 9.955309$, Equal Radius, 3D, Manhattan

Total distance: 2132.77863089705 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
3.79187494709977	24.0944527638994	2.00578076161888	13.4	22.8874	2.3331
4.40632289308572	19.3107073378165	3.88987646542526	5.81823	20.7452	12.0688
5.01154093707721	13.8663580405121	5.36206010909741	2.00806	6.28968	2.6575
5.64032049782367	10.9351071095855	6.96763330789144	9.0496	1.67955	6.7742
6.02508952602228	10.6080725392742	8.73780680214153	12.7116	4.29147	5.5693
6.3209719713492	10.3442717921653	13.9786485263689	0.219756	2.58493	14.7832
13.3937093182063	10.2168871952535	15.5900251088079	21.4744	8.21886	12.0685
16.0152578160813	10.0904682440684	17.5348999159165	25.6231	12.6549	17.499
16.0525250689971	7.94452523415749	19.9686001074998	23.1984	1.0131	19.9686
15.8530148145959	7.94452655215498	31.2183797927625	17.2907	17.3232	33.1257
15.6444031034936	7.94452786939674	34.7249582872818	15.6444	17.8995	34.8069
11.8815932290014	7.94452776018227	34.7249655428229	2.19732	10.251	34.6682
11.8912332271292	7.9445259648171	35.4233552624335	14.8737	9.51072	37.7455
11.9008714463277	7.94452416945109	36.1157002313855	19.0116	0.977048	36.1157
11.6061365003647	8.54910403177762	37.0921042798994	12.6307	2.70835	31.4638
11.3100678975397	9.19004449463435	38.1648827021804	8.57052	3.36732	32.2638
11.0193640897239	9.89098286549697	39.4224099561912	4.96047	4.06059	34.5353
10.7797969527586	11.32000253552	44.5873226165345	2.68873	16.3883	43.9305
10.5688713340532	12.2624002547307	51.4966998387201	0.613562	12.2624	51.4967
10.5688710608628	14.2797437186854	55.6820092804089	6.43447	8.70233	59.8478
10.5688707876876	16.7537462165167	58.9840739458702	10.9524	12.0779	65.6188
10.5688705145114	19.8188540482371	61.4469428672749	15.6993	18.7479	59.9926
10.5688702413277	22.9773195804108	64.0011874300674	2.38826	24.0295	62.08
10.5688699681722	25.9588988332912	66.8581765380937	4.056	25.9589	74.3875
11.7123915758341	26.1238939693134	65.1237601895214	3.44571	28.2052	68.896
13.697017007496	26.2864968340439	62.6751705409862	15.3759	23.0999	65.044
15.6443915704259	26.4496637626516	60.1581262923654	15.3897	25.3897	58.7078
17.6022999930981	26.6130184499199	57.7123826722654	17.6023	36.5196	56.7286
19.5262000479431	26.6130184039473	57.7123820136755	19.5262	30.4483	48.5255
21.9472774730318	26.348984214874	57.7137886023668	22.7183	34.3604	52.0641
23.5471608234385	25.7699929819122	57.7151994440119	25.8125	25.1372	50.1121
25.0692754922136	25.1946282944019	57.7166112395411	23.2874	32.7742	59.4617
26.6607100470187	24.5807399251889	57.7180229500476	31.6686	31.1822	62.9487
27.3023349163756	22.0859986878469	57.7194310506313	31.0765	22.0815	48.5077
27.3056605630339	20.940829591797	59.0824139557375	25.7178	17.895	52.7372
27.3089864778459	19.8401849697724	60.5981476573796	34.4638	23.0393	61.4662
27.3123089713832	18.6817584282539	62.0923730343924	26.0672	21.3383	63.983
27.3156316093684	17.5038000528923	63.5693622181325	36.0033	17.5038	68.4307
26.9468521629267	12.2585387594732	63.5693621965165	26.7979	6.90196	59.464
26.5784683176859	8.16342763012564	63.5693621749091	33.1085	0.882753	62.284
21.7245002657377	7.83474503812468	63.5693621533337	21.7245	2.01127	55.495
20.6240672297227	7.83474499982752	69.9697389561502	23.5387	4.13129	73.048
19.4977490039746	7.83474496153716	75.6447999343383	10.9477	2.73525	75.6448
19.7758911097467	8.83864703945817	77.4041904876363	17.1854	11.1942	73.5432
20.0555927593701	9.82716634627277	79.268965277201	19.7287	0.198716	79.5663
20.3379470859331	19.5669284849393	81.0556580417428	19.247	29.2712	80.817
20.6338973519657	20.2058214500381	82.994372190786	27.3595	17.3028	77.1892
20.9057185239856	20.9036723500622	87.1192649009049	27.4222	25.8428	88.2494
21.1697756946421	21.563605730158	91.020783459008	27.2482	20.2425	98.6789
21.3384442784684	22.5175910444471	91.350883297571	22.6997	14.9199	96.5597
21.5055334637239	23.9298225294277	91.6584859967939	20.3288	28.022	94.6827
21.6729097073285	25.2865207370622	91.9644434455532	29.1053	29.2049	97.3043
17.1745593761301	25.2865207269027	91.9644433466598	9.96077	19.2347	95.1963
17.1745594274836	38.011400474684	91.4934582295814	8.75416	38.928	96.5496
17.1745594790443	40.3654750604233	86.4233858189033	9.27453	43.3967	88.7547
17.1745595306198	42.3798999626602	79.4030010813889	7.21925	42.3799	79.403
18.7358056574337	44.6073126377104	78.9659704123627	13.2524	50.7626	76.4367
20.6664396355762	46.3225683791835	78.5399561191302	17.8085	51.9553	71.4677
23.7059890145168	47.3986999897173	78.181359797377	24.4594	47.3987	68.2546
23.7059895340516	48.500831781951	88.1234547329176	31.4339	43.8079	91.7683
23.7059900527929	54.477495005519	89.5491205272423	13.8308	54.4775	90.8096
25.228344038518	55.8270984691386	89.5491247765709	17.6011	61.1721	91.0121
29.7728022481933	56.7780528430776	89.5491290246895	23.2085	58.8069	93.3912
38.2169768450318	57.7057279565106	89.5491332721479	41.7302	58.1199	97.2119
43.3964660155302	58.6276845286373	89.54913751782	43.5841	58.7522	99.5019
43.3964682364783	58.6276878249415	87.3861003292026	43.1006	68.5786	87.3861
48.7362197360971	58.6276877681491	86.8401231211938	48.6743	62.5481	86.8455
54.1995174128957	58.6276877113555	86.2961991912951	54.0007	52.8659	92.5002
59.9163995791325	58.6276876545679	85.7168413374456	59.9164	61.9972	76.3491
61.273343909447	58.3169287906328	86.8706663374696	59.9164	58.75	88.5608
62.6520971801114	58.0061873256941	88.0187151417399	62.6521	52.6724	96.4246
65.442269428985	58.0061855385302	88.01871626979	64.8783	60.379	95.6551
68.3451327210246	58.0061837512789	88.0187173976548	75.5117	58.1702	94.9268
67.9078685733149	55.7112753754192	87.9050738211473	69.9395	64.1832	90.6048
67.4531559833409	44.2674683045485	87.7900784871656	70.0979	43.9308	97.3335
64.5731315802684	41.2897487118519	87.3302044812179	72.565	40.2263	84.1996

Solution x	Solution y	Solution z	Original x	Original y	Original z
57.8348972927119	38.5535423685681	86.8861311028067	53.4254	44.9898	88.3964
53.2852051805569	34.886240968119	86.4387033958071	55.717	37.8511	81.0117
48.2768880097441	30.8225907796343	86.0021511763343	44.5404	30.686	94.969
46.784096578591	27.0432732322792	85.1790144519449	41.7205	19.4188	86.0496
45.6549496534632	25.3151344752099	84.334115563309	42.4972	23.9973	88.7768
44.5606233787736	23.6232128227699	83.4664997089074	43.8962	13.6901	83.4665
44.5606227846614	23.8910295616978	79.9955289918308	39.9475	19.2268	79.8118
44.5606221905886	24.1621091981825	76.6335998391858	37.7688	31.4408	76.6336
47.5110593934889	23.9955229251933	76.5112228967168	46.0829	25.5503	78.1024
50.5656714675473	23.8287386271115	76.3887809485329	47.6864	20.3976	74.364
53.8618192078416	23.6626955364172	76.2666092387479	55.099	31.771	70.6981
54.6763316218607	19.6032613137545	76.1844054831665	50.9211	16.4053	69.6798
55.5350752759212	16.2697432278535	76.1029218927657	55.9929	17.1432	85.8884
56.3237000870842	5.67704505624053	76.0030911750297	56.3237	2.07366	66.7228
57.7543123834061	5.67704501194936	82.2442136298082	51.1528	6.04103	87.327
59.48349469072	5.67704496765915	86.2913098288422	52.4925	5.37248	88.2454
61.5069000841611	5.67704492337042	90.0680033877992	61.5069	0.482106	98.5604
67.4044973644163	9.67910543045123	89.8310078101482	68.0574	15.6194	97.6814
69.9490993652425	10.1296809754467	89.2056856278687	64.5769	3.66176	91.1441
73.6393300321383	10.6110998483527	88.5654918955649	73.4709	7.6166	79.1313
79.7317102841773	14.7681091117406	88.428870302639	75.2455	17.3084	91.8789
88.1582976002319	18.5929113298902	88.2917796013142	93.1464	19.8146	96.7782
88.3892873849604	19.3640441675477	82.8974553433247	90.4883	12.6216	83.5226
88.6193030016838	20.1824504201406	77.4689246663786	96.7716	16.6523	73.2113
88.7719533175204	24.2243892108992	76.7346060876548	96.7473	23.5618	82.348
88.9009340419711	31.193731896282	74.7444146943556	95.9404	38.2332	74.7444
84.0133360766311	28.7320086618997	74.7253408796602	89.036	30.7257	77.9388
77.959409332604	26.1701068377655	74.7062544816442	76.9072	18.2917	80.6948
77.854668934468	26.1556476162422	72.1623843872271	77.5205	18.1054	72.6356
77.7500697132135	26.1412209253266	69.6048475940426	82.6839	23.4883	70.1916
77.6451092635984	26.1267999261551	67.0465509316965	77.6794	29.1288	65.8649
77.5402009374446	26.1123740240416	64.5609662976165	85.0689	32.1301	62.1612
74.9399209096545	26.0962930957424	64.2607722439224	74.7866	36.0265	64.8468
73.9568457634085	26.0497148138446	63.1563936460282	74.0572	35.987	63.4666
72.7513089634326	20.0939111611966	58.5631756469713	80.035	15.8589	58.0701
71.3176097033918	16.0856790232013	54.2255759462728	78.906	18.0381	53.555
69.6391625351322	11.6046476646713	50.1157134641826	74.632	5.60444	48.5009
67.7407668336787	8.40062687900054	46.4175999848455	60.7013	1.36116	46.4176
69.2914938279525	10.1041665779579	40.0606396996263	68.2389	8.47105	37.5341
70.8666201819351	11.8373576743527	34.3498968094519	77.911	9.90186	32.1435
72.2524331904788	13.6517000729123	29.5054669258522	79.2919	13.6517	22.466
70.7170201676545	20.5456613205948	32.4800188522811	76.419	22.7841	27.7958
68.9907398617733	26.228662911393	36.1945945783135	62.0154	28.1819	31.0401
67.685044177215	30.6757518802248	43.8193754889282	73.2088	32.0501	51.6558
61.525800113315	33.3160816883947	44.8243926607149	61.5258	41.6034	50.3406
60.0002081408829	33.3160813589592	44.8243926260364	60.6972	35.5066	52.4287
58.4583954982389	33.3160810295146	44.8243925913497	56.0389	33.1015	51.1098
56.9787995709818	33.3160807000705	44.8243925566594	56.9788	35.9946	54.4126
52.8576063088995	32.9617198173605	40.5069800416466	55.5492	35.9315	44.2535
48.4138739368733	32.6046812164512	35.6356120662304	49.1148	32.8614	42.5439
43.8882688313569	32.24739918452	28.2906647742772	36.8488	32.2474	21.2512
44.8382026349911	28.6325351504553	28.3387096253855	37.0272	27.4581	25.0096
45.9459122758086	25.3376373436841	28.3869115724484	47.6331	25.3181	18.59
46.1801343652445	22.4945260686911	29.3652400207816	49.4045	19.961	26.5255
46.4133282305229	19.8004839532613	30.3649797421861	42.987	22.9253	37.986
46.6517367925218	16.3269998199788	31.197369217446	49.4944	16.327	40.7382
46.651736941261	10.1271778025304	31.1973691105059	42.0178	3.44287	36.938
46.7494629503391	10.1271777225437	29.7889669893723	37.2177	7.79249	31.0238
46.9085147414474	10.127177642602	24.6047258909125	48.6979	8.85907	21.303
47.067355385218	10.1271775626615	19.9489094306234	38.2491	9.61738	19.3363
47.2318614418125	10.1271774827231	15.623809673089	48.5894	0.54797	14.4264
47.3917068067609	10.1271774028549	13.1032722179501	47.3917	2.23053	7.041
56.1254001537238	10.1271774423903	13.103272071032	56.1254	1.40532	17.903
56.8004661867884	10.8831908574639	12.4814590907688	54.7387	20.4852	11.8363
57.8737170059722	11.138538580563	11.9216111962141	58.7637	13.9566	16.9818
58.9425390131782	11.3925441032122	11.3495421562775	58.2097	7.56071	2.229
62.8284999877656	14.0519846987113	11.2497563040847	62.8285	19.7058	3.0557
66.4834909660234	14.0519846615714	11.2497565751485	67.267	14.1516	17.4107
70.1018000106546	14.0519846244313	11.2497568462042	70.1018	4.34543	9.0382
74.6203924865933	14.1130652740545	11.3286737537695	74.5771	5.70821	6.0306
81.7105999706153	21.215711774665	12.056909149929	81.7106	28.112	19.2367
87.0638269109501	21.215711742716	12.0569091080584	90.11	20.7153	5.7932
91.745374047026	21.2157117107665	12.0569090661935	99.5853	23.4577	6.8435
92.6955573914214	21.2157116787937	12.0569090243659	98.8743	25.646	5.6301
92.6955573593928	15.9215507317783	12.4222804645397	97.4766	17.1802	10.0021
92.6955573273625	10.3567614976923	12.7902805975747	95.7659	2.55349	7.5519
92.695557295253	10.0929329845871	16.0350155802253	98.9579	4.73211	12.8251
92.6955572631306	9.83847017509593	20.6086630086839	88.9914	10.7701	17.3091
92.6955572310125	9.58368719047636	25.7719001042137	88.6343	0.494442	25.7719
92.6955575029425	13.2104395892192	32.894099766822	97.2905	22.0419	32.8941

Solution x	Solution y	Solution z	Original x	Original y	Original z
92.6955574384402	12.1707214191179	36.2594667068138	99.5164	7.77478	36.5945
92.6955573739312	11.2022414550086	39.582677653804	91.7898	10.5225	38.6828
92.6955573094244	10.2384001408696	42.9911699051403	95.0473	3.39817	49.8314
91.8475454039252	15.4685217357187	42.3705672520844	88.2698	14.9994	45.4757
91.0203175880202	20.8269734966132	41.7428513865442	86.8707	18.0065	43.4379
90.2167402452526	26.9289425112331	41.1113458339409	87.5589	25.1226	45.9834
89.4298628753693	33.7432666712678	40.4649756902882	91.3249	42.8902	41.6597
88.5803998388409	35.3465004937098	39.7933053079125	96.1419	41.3034	39.8142
86.697136047789	36.2364177616927	39.1229313456371	80.1207	32.7664	32.9471
85.8723925923426	37.5251005933272	38.6519480383695	80.5435	37.2793	30.7227
85.256140723681	38.8539003514919	38.2885395967445	81.8496	38.8539	28.9342
85.2561406672406	44.972920419206	38.2885441526509	80.6139	53.7748	37.9975
85.2561406693839	44.9729205228673	41.4614048454921	92.0634	46.0336	40.4672
85.2561406715236	44.9729206265268	44.7920108576686	81.1997	46.621	50.135
85.2561406736671	44.9729207301848	47.6211277100995	81.4209	43.6493	50.298
85.2561406758142	44.9729208338454	50.3284000623959	76.05	41.1841	50.3284
85.6485537228747	44.972921393314	53.0171972814101	88.1955	43.6361	47.6404
86.0385254092042	44.9729219527954	56.1228653666974	94.61	43.2995	53.8065
86.3935423177162	44.9729225123211	60.2643986779146	96.3235	44.2629	60.2644
86.3935375914203	46.5641082609686	60.6454544022912	92.3029	41.017	61.4442
86.3935328626206	48.4797000552168	61.0243332770599	86.8559	48.4797	70.9689
81.9851437395703	50.459519977638	61.0243334597464	78.6058	43.2582	65.7281
79.2039131805883	55.0680977961795	61.0243336423863	69.3672	55.5594	61.2856
78.9249789314258	57.6653000602318	61.0243338250195	69.1414	57.6653	59.1832
78.9822026009528	61.463901741634	61.319512712934	82.834	58.4111	60.6469
79.0393661707976	65.6738461341988	61.6154674799963	81.8209	62.9891	53.3907
79.0962935070061	73.2167754303081	61.9560108939742	82.6909	80.2719	62.172
79.1530902335568	77.1611369928305	62.2996912332885	89.1084	77.1611	62.2997
79.1530902882172	77.2753465598002	68.2804124416671	84.4594	85.6238	69.4005
74.7203159959619	75.0248335871176	68.2804127179321	73.8931	82.0767	63.5442
70.8575997386671	71.4945002230852	68.2804129942307	60.9907	71.4945	66.9566
72.7961519318311	70.5032917212705	71.361423378499	78.2186	68.7569	71.4148
74.6022875241914	69.5304272254046	74.4815800466696	65.9297	69.3415	71.7927
78.6483716004013	68.5706975625609	78.970028499752	80.9911	75.8316	78.9882
82.3066602885036	67.5183243874589	83.5412642901935	80.8889	76.3527	85.0129
86.8280804635139	66.028114612429	87.349026111097	88.5712	66.6382	86.5414
91.2474098901796	64.5421940047644	91.3054062824856	96.3481	58.4969	97.3507
91.2474096605143	67.7039601462358	90.8498218344034	93.4248	68.5015	98.1606
91.2474094308438	70.8112637754682	90.3726649957339	87.0562	74.7862	94.9506
91.2474092011829	73.5280585777439	89.8834650770048	86.1254	75.412	92.2501
91.247408971528	76.1587692250438	89.3906173541289	98.0725	73.509	85.0617
91.2474087418441	79.345542076711	88.920357618045	95.1537	79.2325	85.4918
91.2474085121533	82.5917752092285	88.4567058434194	98.0879	82.1977	81.4504
91.2474082820756	87.5405742383993	88.2074994757957	92.7385	89.9534	78.6648
86.819634575068	87.5405743576134	89.565988093605	85.2864	82.465	90.0038
82.7574572907363	87.5405744768453	90.9269712385117	74.5996	81.8744	91.5993
82.757457235484	90.2291867300592	90.9269726028416	83.5669	88.2708	89.9554
82.7574571802413	93.0491567279361	90.9269739671958	86.1563	95.4019	99.9835
82.0826287474058	93.0491568475533	90.6448198022929	87.9339	96.7331	97.5762
79.5325230332058	93.0491569670916	90.2029691768326	75.6359	99.7073	96.3469
78.9512057875581	93.0491570864001	83.2652249951594	75.4786	92.9344	80.494
78.3788370721115	93.0491572057184	77.3927415196172	75.6586	91.7899	79.8395
77.8130997007825	93.0491573250349	71.1922074545766	77.8131	90.2453	61.6399
74.1313998417914	93.0491591535957	71.1922076027267	74.1314	97.2935	62.187
69.5725541751812	93.0491594514197	72.5988671908381	68.3546	93.0491	63.4728
65.9683888619902	93.0491597492429	75.7106113444453	68.0526	97.9535	69.9593
61.975359473793	93.0491600470549	80.2884495646282	65.9332	98.9174	85.8003
54.3707000536863	93.0491603448482	82.8110728642465	54.3707	99.6057	90.3024
49.021734629134	90.4106840164187	82.4860221146939	51.2472	90.6526	88.5593
43.0793764491478	87.8026382221457	82.1556564050945	37.7453	86.3505	90.2585
42.3133663320646	86.4155968462761	81.3876429651815	43.0779	81.6476	81.3569
41.5459988116771	85.1013873302753	80.6235786111399	41.546	82.3742	71.0491
34.7059997531647	85.1013872333025	81.3939667444852	29.8827	79.684	74.8634
33.5738240255129	85.1013871364093	84.92416772112	27.9893	89.6021	79.9213
32.5895998696844	85.1013870395102	91.3063649096889	32.5896	90.759	99.4978
29.2504445378207	84.2381112380761	91.3063649439095	28.4623	90.5817	94.8789
26.0333028812999	83.3173357705719	91.3063649781284	27.1361	73.6904	92.6772
16.6944139285556	82.9643316089367	91.3063650123269	16.8354	77.4785	96.9485
7.31263527765832	82.6216613581448	91.3063650465176	4.99968	74.2733	96.2118
7.31263517580956	89.9764069578165	80.9719007505611	3.57801	99.0366	79.8401
7.31263507408764	90.2619772786924	79.0338997263577	12.7313	98.6134	79.0339
7.31263486813847	90.2619774953303	63.0477000829348	0.299018	97.3272	63.0477
7.52203088275159	90.1753965346247	58.4512793967448	4.28894	92.6489	49.3954
8.48731620746472	90.0608199554031	58.3560305227598	3.24988	93.8751	52.5027
9.5965890109411	89.9449581281061	58.2622668230198	3.06059	88.1315	51.3598
13.8536887612419	89.8313962006714	58.1741940508282	18.064	96.3276	61.2807
16.9944380316146	89.7162954345593	58.0857125857954	19.5225	82.1483	62.667
19.4444427625039	89.6046731147662	57.9959791768249	27.8353	94.5623	59.9313
19.5105618385528	79.4081314411761	57.8669724272255	23.7167	70.7298	59.5174
19.5736640397976	78.7772423113157	57.7330831593637	16.576	71.2313	59.4946

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.6369959951209	78.1973900354364	57.5986182541426	14.0141	70.4084	60.1608
21.6444884556918	78.1534742790634	54.8221046026513	23.3293	78.9181	52.7226
23.6205998515424	78.1095662759006	52.1624000790928	23.6206	68.344	50.228
25.1568336708394	79.9327999272169	52.1623999087481	34.9224	79.9328	54.0968
23.257896399385	81.0163545546379	46.8335816169636	25.7615	81.4539	44.2448
21.3083011715504	82.1018905849752	42.0171462780921	26.7929	78.8352	37.5421
19.0266788573157	83.2498110132847	38.3506336882919	16.5471	81.1813	37.3426
16.8283942387596	84.4206754173591	34.7950695805425	16.7243	94.3593	34.7835
15.388707728651	84.4689769063447	31.5087551514061	23.3569	85.0798	30.5318
13.6455063791997	84.5172640036409	28.3985711196187	8.89064	83.8954	29.0611
12.0015352828479	84.5655732918345	25.2617310939093	17.2306	77.2747	24.7644
9.83311252424507	84.6143765606519	22.2755188356962	10.1219	82.045	24.5182
7.66223808722052	84.6632353954175	19.1779998003877	4.45069	94.0863	19.178
7.66223759599896	84.663235527007	10.9273381326882	1.02508	82.9527	3.7072
8.30074104869315	87.4141269558415	11.1582583431689	3.35356	88.986	2.7967
13.0520296979494	88.655953509819	11.6327826641739	15.2733	95.1553	18.4059
15.442870856013	89.3689476548467	11.9992667106283	12.3803	91.1149	15.3598
17.968997671841	90.0783830967633	12.3628938485688	16.854	97.4806	6.0907
22.5135199126794	90.4672504495913	12.9317541865799	18.6101	90.3489	8.9268
27.824165149981	90.8569715611422	13.5109817917882	32.7208	86.88	6.0296
28.8040705856747	91.3833731512646	15.7890511144044	23.1083	96.0553	21.9675
30.6218490065299	91.8222210637103	16.8186019733442	29.5533	92.3189	26.5937
34.7486999825641	92.2315031509659	17.0832702497871	34.7487	93.2543	26.9859
37.4811574231789	92.2315035206068	14.564513925564	34.7579	99.7518	13.4448
40.6504488188775	92.2315038902248	12.1746102909009	40.4171	94.2218	3.0792
43.9754745449854	92.2315042598168	10.9570731384734	48.9418	95.7946	8.5835
46.8516155098298	92.2315046294017	9.77415204137392	49.8328	92.6571	10.5815
49.6129474992209	92.2315049989909	8.58580750376768	51.8363	98.9629	1.5963
49.6129475896161	89.8864707767528	8.58580807285302	48.934	88.5471	3.512
49.6129476800138	87.6239742137004	8.58580864195195	54.7886	87.0165	7.4948
49.6129477704082	85.4106005798105	8.5858092110546	43.3068	85.4106	16.2891
49.6179700887675	83.9891965680034	8.58580923895951	40.7053	85.7824	6.0265
49.6230040213031	82.3226073269912	8.58580926687248	45.1636	79.7971	7.5816
49.6280398968313	80.7197636613381	8.58580929478641	43.9629	81.9344	16.1851
49.6330853823292	78.8641239477172	8.58580932267677	50.9984	83.4341	15.7476
49.6381303105732	76.632885997754	8.58580935055971	54.169	81.8375	12.9059
49.6431730438748	73.9367747620192	8.58580937843954	50.5772	79.5094	6.7911
49.6482161135575	70.90092807245	8.58580940632363	51.793	64.9464	0.9013
49.6482164233045	70.90092800193	9.37199822048086	52.5118	68.1256	10.9937
49.648216733061	70.9009279314278	10.1522688318425	47.6475	71.1843	17.3202
49.6482170428382	70.9009278609412	10.8836990978079	45.2184	66.3382	18.5431
58.368141967547	70.9009278444366	10.8836992554322	66.9764	66.2314	9.0944
58.158550817322	74.2686237946185	13.0101312491732	60.7208	77.8844	16.4053
57.9482410283971	77.3870660932852	15.0292688305403	63.6977	85.2552	13.695
57.6526814566122	77.8385339358794	21.2350209987367	66.7645	81.0279	23.2022
56.4093557320069	78.1604062737243	22.6057322990178	60.356	72.3736	25.6911
55.0859971691155	78.490632914959	23.9064802022572	60.2539	80.1704	27.9583
53.6720731631528	78.8195724858454	25.1448838597069	61.8453	80.8454	29.5157
49.0774373684528	79.1367479659167	26.0824911257773	46.3399	71.17	31.2162
48.1637998666121	80.7063940700254	26.4557424602065	45.6946	80.9262	23.2292
47.2653649749545	82.2844307358722	26.8320438056751	41.4131	74.8199	27.7293
46.595596188766	89.2798081300436	27.200789479167	48.6626	98.7924	25.383
42.6537437787877	89.4542945198242	27.8161006072594	33.1283	92.3481	27.8161
42.6537438651659	89.454294674157	32.5372597140258	36.723	86.3354	38.0239
42.6537439515545	89.4542948284895	35.525292564148	38.4806	81.2568	32.7466
42.6537440379747	89.4542949828799	46.1072997221351	34.4937	83.7515	46.1073
45.0997335546738	89.5153479602504	47.2223247437015	47.7087	83.4773	42.5429
47.3345186028379	89.5767524576121	48.4427508366045	48.3206	81.4332	48.7053
49.4987955088692	89.6386661812665	49.661149729727	50.0418	88.5256	42.3177
51.6443983275889	89.700645670595	51.0369788280877	44.9959	88.3516	56.7624
55.3748755119134	89.7627777236393	52.1578846848858	53.7144	89.3849	55.8234
59.3325997876316	89.8249342220423	53.2530317012115	59.3326	96.8644	60.2925
60.0769818233178	89.0900816359917	46.9459180140739	54.8665	95.2849	41.9419
61.0674040608999	88.0575841416033	44.8661303316588	58.0371	93.3465	37.2538
62.7906819272351	83.6686407736897	44.2255216171251	59.2712	76.4167	39.0582
66.0974212602796	82.4344448213289	43.7174770398177	61.6789	74.8507	42.3385
71.8983753078137	81.4621779828951	43.2198253627867	75.9957	81.402	37.5418
76.5114013769043	80.4954050472426	42.7372265989852	77.5352	78.0347	33.1993
77.6481487293174	80.115151723316	42.6124370437241	76.2214	75.1456	46.9071
78.8090126235114	79.7424030062003	42.4870348588562	78.3667	74.2083	50.3369
80.0317358993736	79.4273380952612	42.3505195571047	79.6042	79.6519	48.0916
81.2662691828252	79.1125070901477	42.2132087289537	78.9206	73.8168	40.4273
82.5413004875446	78.8024637606282	42.0762172137075	82.5413	70.9361	35.9747
86.2949237203472	78.8024638158829	42.0762172113814	84.0931	75.7357	43.6346
90.3769138200318	78.8024638711428	42.076217209056	94.2046	73.3577	49.4797
90.3769139371475	82.9497536122934	38.7708520802489	95.4573	78.5053	38.9919
90.3769140542621	88.5976756231911	35.4747999958752	96.3227	96.5824	35.4748
90.2582308727433	87.5732093044766	32.5335765496145	91.8947	87.6684	31.3605
90.1394968827174	86.55259904576	29.6706275755008	91.0373	94.8618	33.7328
90.0201812126429	84.8121249818153	23.0782566771734	80.7777	87.9354	23.575

Solution x	Solution y	Solution z	Original x	Original y	Original z
89.9183822949158	71.7342582094418	9.73224503208899	97.9153	71.697	3.8476
87.8951387673795	63.8638872867608	9.58891721516235	85.3959	62.1638	1.7086
86.0788496176843	57.8175640390865	9.44868303819946	88.4474	55.9131	14.5629
84.2133078773074	52.4019325879707	9.30769220638427	90.8764	48.3318	12.9357
81.7028155148209	48.7613225042994	9.16525590444231	72.4782	47.1166	11.4083
80.8722214969882	46.381635156709	9.01893278193567	79.5061	49.6701	11.7965
80.0505999846791	43.8923673160967	8.87226646064611	80.0506	36.8529	1.8328
79.0127638516176	45.0998535413845	13.9814187387795	85.2354	42.0312	17.7315
77.8743728796582	46.3811889685293	17.994369468869	69.2786	47.5055	16.1011
76.9716569777296	47.6210707995266	23.054683965164	73.064	44.6995	31.3834
76.2911247903632	49.5004578292042	24.0958766126736	74.6616	49.1772	30.6996
75.6197511195525	51.4042553396243	25.0724005849032	76.3859	55.8636	29.5918
74.9471349460798	53.1809332699015	26.0134631927568	74.8357	53.7031	27.6754
74.2765528627564	54.9594074766325	26.9482205597619	82.7455	58.0479	28.4959
73.4452720782797	56.4548436539978	27.8400741905648	81.8774	60.6902	25.477
65.8886421414974	57.2815149962219	29.0650223944581	65.3011	67.1869	28.6409
64.9299763165682	57.3459167828295	35.2336924001459	70.983	56.1077	39.9244
63.8955140151757	57.4103932493979	39.7075256593002	67.8108	54.6502	44.2592
62.8248644987956	57.4749855085534	43.4904509141467	57.8122	54.5104	45.2899
61.8039238861514	57.5396917779867	47.1056332194617	64.2573	58.953	49.3124
60.7709997691595	57.6043696903404	50.5845710128526	60.771	67.3196	52.7577
57.3396583157902	57.6043696450579	50.584571282281	58.3448	60.9201	41.5011
51.6697559001318	57.6043695997616	50.5845715519059	56.0439	62.2937	45.4781
42.1545004776206	57.6043695544608	50.5845718215647	42.1545	66.9856	47.2528
41.5705679114624	56.2874108642989	53.0951416749356	40.6271	60.1839	50.1596
40.9898555380025	54.9275625661135	55.773666418955	44.4217	55.3301	59.2126
40.402109466861	53.5687998918496	58.3123999880409	30.4468	53.5688	58.3124
40.4021091790987	52.1534999064017	60.9645279737106	41.6783	52.1535	70.8377
40.2075992078765	49.3962804271171	60.6408961829863	38.5534	48.7846	64.7262
40.0136001168638	46.6977458410571	60.3148256266062	38.1612	45.7549	62.3997
39.8200939470743	44.0609932214076	59.9878425749655	34.4656	38.8185	62.9703
39.6296559477252	41.9129577746109	59.6562836966184	47.522	42.292	65.6102
38.9729910350241	38.3127036395017	52.8159977577614	46.2037	41.7062	48.7254
38.2172995645321	32.8293094590937	49.0770084907991	38.2173	22.874	49.077
34.6756407851785	36.0458776830625	49.02892058614	32.7353	38.4372	45.6112
31.322750918868	39.1203325474787	48.9808905166912	33.2771	46.652	45.1216
27.4067881043483	41.1339018650844	48.9330559077543	25.7714	33.2927	46.3113
23.9409596385719	44.004844724153	48.8853334779073	23.6339	40.0124	41.5074
20.5640982910961	47.7221498965771	48.8379094147574	20.5641	47.7219	38.8826
16.2749771837841	47.725163708994	50.1721053433413	17.5187	55.1629	44.2721
9.2121848209156	47.7281680967778	53.4251249841862	9.16001	37.8018	54.1714
8.61429103171351	51.248620629368	53.4672577558015	9.35555	53.1101	48.6717
8.0146984457667	54.6459506563207	53.5094428983736	3.30116	54.5758	46.8676
7.44093231815748	58.1002981741055	53.5517932664423	8.30742	60.1487	54.798
6.8657485664356	61.4641996858774	53.5941426366981	1.5771	61.4642	62.0285
6.86574861761085	62.25483879038	47.1560411447259	10.4725	58.878	47.8708
6.86574866878546	63.0623534669805	40.6478576329376	2.55217	66.9796	45.1209
6.86574871996615	63.8438114355213	31.0366012511624	0.194865	71.2335	31.0366
14.8106274011932	63.8438114697209	30.705142829311	18.9042	62.1271	34.907
21.1194033792679	63.8438115039257	30.3700899308233	25.6513	60.6643	37.4717
24.5910722346652	63.8438115381359	30.0108749398717	32.641	61.5676	34.0062
26.1826934216211	63.8438115723537	29.6295117388481	33.4192	59.483	33.0004
27.323376078618	63.8438116065884	29.2316993820102	35.9094	68.8825	29.2317
25.6340705890677	63.7990375257451	26.0437924330715	22.5447	55.6169	28.4034
24.1924558022489	63.7547527183501	21.882202284559	19.6656	61.3862	20.5906
22.8192999371221	63.7105094434989	17.9074999677791	22.8193	53.7552	17.9075
20.7262000371982	65.3526905087052	17.3360999352793	20.7262	75.308	17.3361
19.3693225541894	64.687829645514	15.1620154274863	24.7619	69.8637	9.1655
16.3782577804294	63.8010749069291	14.0570851266143	8.25408	64.3565	18.8288
15.1067747527616	62.8936684627347	12.5084435289338	9.17265	66.1356	6.7326
14.0590551123857	61.90920099437	11.2715138907795	5.52590	61.9092	6.1438
15.9717263693737	61.7096998145779	11.2715139304057	13.5318	57.9262	6.7229
17.9735160996703	61.5116271572237	11.2715139700352	10.9638	55.5178	10.1729
22.8073014422361	61.3227821444349	11.2715140096674	24.5176	59.5849	13.4915
27.4551901355469	61.1343954882087	11.2715140492995	31.2678	61.1344	2.0752
27.4551903499904	55.2244066202472	11.8243290726936	30.6696	55.2626	12.0174
27.4551905644305	49.435600415113	12.3771004342186	37.4105	49.4356	12.3771
25.5472295128592	48.8036568243799	15.8567232879474	28.6889	43.6077	12.417
23.5220819920928	48.1932078009076	19.8635505333888	23.6126	49.4214	29.6987
21.1965994031804	46.8977801216939	20.0034568253504	26.2003	42.5604	24.4871
18.3763923072602	45.7087707939293	20.1420471160961	17.5856	40.8861	25.0628
15.6372000018067	44.5891002429929	20.27969058632	15.6372	44.5891	30.235
13.3321197123582	44.3750568776742	20.2796902601886	13.4598	41.6191	22.5554
11.0295377542172	44.1618959852156	20.2796899340543	12.5872	53.6987	19.2898
7.26787208535264	43.8889993208835	20.2796896079339	2.40393	50.9808	25.185
6.89654080388243	37.3589780128127	20.2796892813458	2.57158	38.4711	27.3546
6.53555413598572	29.9452802488248	20.2796889547247	2.1823	25.6845	27.6693
6.21388805584792	27.907037609189	20.2796886279214	0.65945	19.6999	21.228
6.21388813074961	30.322628996838	18.431920206318	5.25835	27.1001	26.8402
6.21388820565352	33.6033943725349	14.7620367322384	0.642906	35.395	17.4189

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.21388828056141	36.7347923753501	10.7668689449057	11.4258	37.7412	14.2255
6.21388835546527	39.802072231076	6.24230001900191	11.7937	48.0467	6.2423
4.83802553984225	38.1950252431824	2.81721365693216	12.2621	43.6923	1.4336

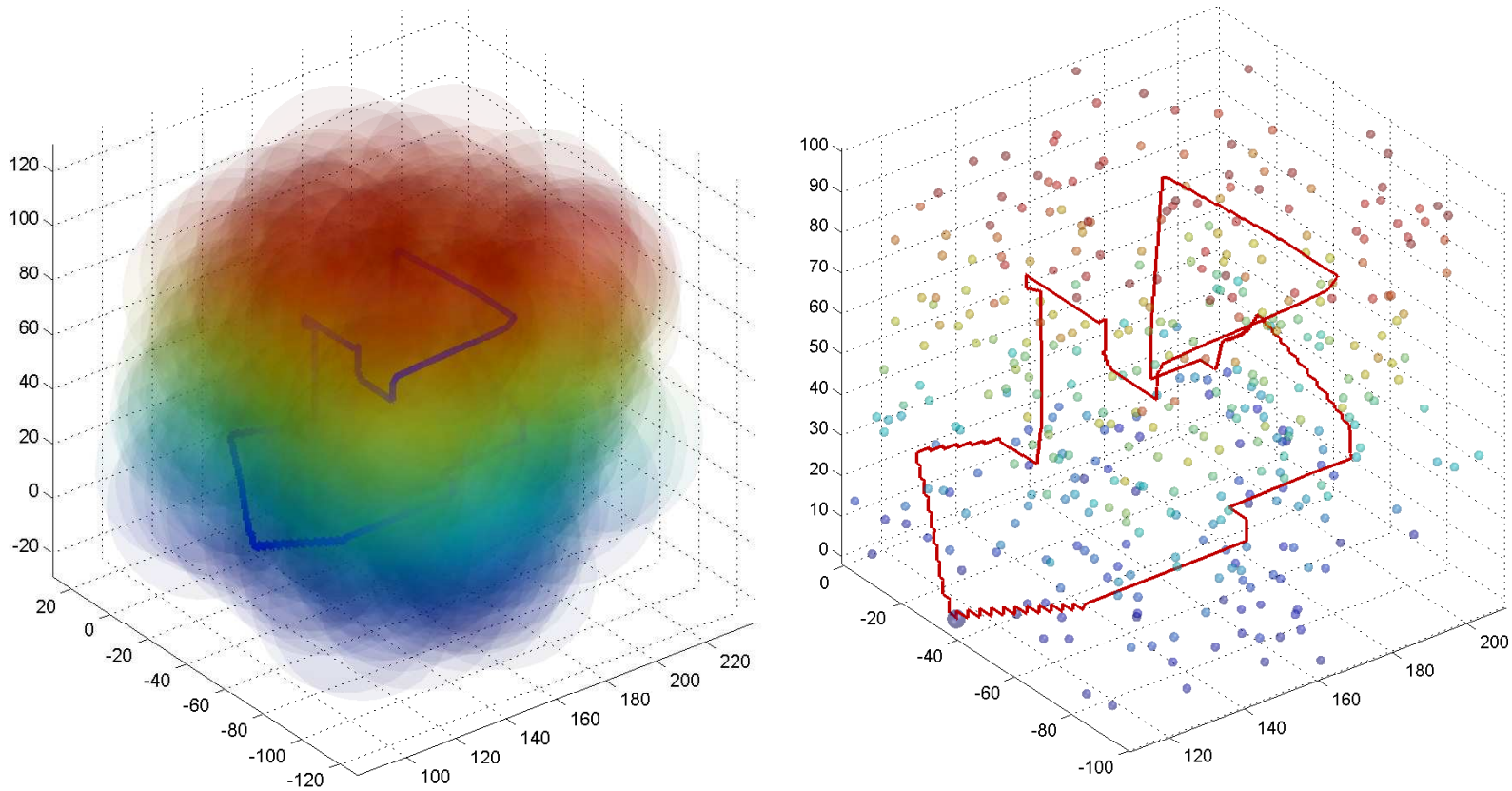


Figure N.185: $rd400$, $r = 29.865927$, Equal Radius, 3D, Manhattan, Length = 656.4960397

Table N-188: Solution for $rd400$, $r = 29.865927$, Equal Radius, 3D, Manhattan

Total distance: 656.496039666644 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
2.70124439867212	32.5722458810445	3.25060579159292	13.4	22.8874	2.3331
2.70124439867212	32.5722458810445	3.25060579159292	12.2621	43.6923	1.4336
3.11689827755859	29.694099975005	6.56105166234462	9.0496	1.67955	6.7742
3.11689827755859	29.694099975005	6.56105166234462	0.65945	19.6999	21.228
3.52639998896309	27.9564772948204	9.75831784864585	0.219756	2.58493	14.7832
3.52639998896309	27.9564772948204	9.75831784864585	2.00806	6.28968	2.6575
3.93844023174512	26.4790067665944	12.9799133297362	5.81823	20.7452	12.0688
4.35060059880263	25.0165891271374	16.2343340952283	0.642906	35.395	17.4189
4.76352498260421	23.5440215463229	19.5092073371792	2.40393	50.9808	25.185
5.17874570498081	21.6897071858472	22.5220467858748	2.1823	25.6845	27.6693
5.17874570498081	21.6897071858472	22.5220467858748	2.57158	38.4711	27.3546
5.59540289034837	19.7937335338785	25.5237124689964	2.68873	16.3883	43.9305
5.59540289034837	19.7937335338785	25.5237124689964	2.19732	10.251	34.6682
6.01381519993522	17.9526585874946	28.3700666575588	0.613562	12.2624	51.4967
6.4344700700762	16.1538874213409	30.9263911710251	6.43447	8.70233	59.8478
10.0040506028455	16.1538874159613	30.0596864180266	4.96047	4.06059	34.5353
10.0040506028455	16.1538874159613	30.0596864180266	8.57052	3.36732	32.2638
13.6895432184422	16.1538874105929	29.194763067332	12.6307	2.70835	31.4638
17.4159528156405	16.1538874052249	28.3311018229625	19.0116	0.977048	36.1157
21.1556953917628	16.1538873998569	27.4646890194518	37.2177	7.79249	31.0238
21.1556953917628	16.1538873998569	27.4646890194518	38.2491	9.61738	19.3363
24.534510625951	16.1538873944897	26.6062509242734	12.7116	4.29147	5.5693
28.7815901490981	16.153887389158	25.7967331760851	47.3917	2.23053	7.041
28.7815899139251	19.9618904384997	26.0364647111474	23.1984	1.0131	19.9686
28.7815899139251	19.9618904384997	26.0364647111474	25.6231	12.6549	17.499
28.781589678802	24.3277702782505	26.277161663697	21.4744	8.21886	12.0685
28.781589678802	24.3277702782505	26.277161663697	5.25835	27.1001	26.8402
28.7815894436927	29.286973521669	26.519180566749	30.6696	55.2626	12.0174
28.7815894436927	29.286973521669	26.519180566749	28.6889	43.6077	12.417
28.7815892084994	29.4546606755151	27.6914136872015	36.8488	32.2474	21.2512
28.7815892084994	29.4546606755151	27.6914136872015	26.2003	42.5604	24.4871
28.7815889733091	29.6220040253717	28.8809284652189	37.0272	27.4581	25.0096
28.7815887381192	29.7895245183705	30.0785187401757	49.4045	19.961	26.5255
28.7815885029225	29.9576431885496	31.2883791637723	49.4944	16.327	40.7382
28.7815882677131	30.1270237629671	32.4658054487544	49.1148	32.8614	42.5439
28.7815882677131	30.1270237629671	32.4658054487544	42.987	22.9253	37.986
28.7815880324964	30.2967080303894	33.6273564115908	55.5492	35.9315	44.2535
28.7815877971978	30.4636929123024	34.5946076713006	32.7353	38.4372	45.6112
28.7815877971978	30.4636929123024	34.5946076713006	25.7714	33.2927	46.3113
28.7815875619034	30.6306948973866	35.5536164021148	33.2771	46.652	45.1216
28.7815875619034	30.6306948973866	35.5536164021148	23.6339	40.0124	41.5074
28.78158732661	30.7972146045579	36.5067411547553	20.5641	47.7219	38.8826
28.78158732661	30.7972146045579	36.5067411547553	23.6126	49.4214	29.6987
28.7815870913367	30.9628707491409	37.4717003495448	25.6513	60.6643	37.4717
28.7815870759531	30.9465704179429	38.8842313266138	22.5447	55.6169	28.4034
28.7815870605996	30.9302571721119	40.3989774789111	17.5856	40.8861	25.0628
28.7815870605996	30.9302571721119	40.3989774789111	13.4598	41.6191	22.5554
28.7815870452449	30.9139402415883	42.0931029030452	17.2907	17.3232	33.1257
28.7815870452449	30.9139402415883	42.0931029030452	15.6372	44.5891	30.235
28.7815870298808	30.8976251277416	43.8886397914849	14.8737	9.51072	37.7455
28.7815870298808	30.8976251277416	43.8886397914849	15.6444	17.8995	34.8069
28.7815870145328	30.8813346315978	45.8042519970343	25.7178	17.895	52.7372
28.7815870145328	30.8813346315978	45.8042519970343	25.8125	25.1372	50.1121
28.7815869991589	30.8650507400503	47.7194024910063	31.0765	22.0815	48.5077
28.7815869838013	30.8487696359071	49.6488177247371	38.2173	22.874	49.077
28.7815869684385	30.8324904083046	51.5970809430234	34.4638	23.0393	61.4662
28.7815869684385	30.8324904083046	51.5970809430234	31.6686	31.1822	62.9487
28.7815869530993	30.816209075813	53.5206163898434	26.0672	21.3383	63.983
28.7815869530993	30.816209075813	53.5206163898434	15.3759	23.0999	65.044
28.7815869377383	30.7999334603934	55.4048471270031	15.6993	18.7479	59.9926
28.7815869377383	30.7999334603934	55.4048471270031	15.3897	25.3897	58.7078
28.7815869223742	30.7836669506724	57.3002142619875	17.6023	36.5196	56.7286
28.7815869223742	30.7836669506724	57.3002142619875	19.5262	30.4483	48.5255
28.7815869070101	30.7673998313323	59.2607239045057	23.2874	32.7742	59.4617
28.7815869070101	30.7673998313323	59.2607239045057	22.7183	34.3604	52.0641
28.7815868916588	30.7511364796652	61.2826379324306	24.4594	47.3987	68.2546
28.7815868916588	30.7511364796652	61.2826379324306	34.4656	38.8185	62.9703
28.7815868763007	30.734867174404	63.3147906483299	38.5534	48.7846	64.7262
28.7815868763007	30.734867174404	63.3147906483299	38.1612	45.7549	62.3997
28.7815868609409	30.7185911480443	65.3925332441216	47.522	42.292	65.6102
28.7815868455887	30.7023141281147	67.4963450431935	37.7688	31.4408	76.6336
28.7815868302985	30.6860406846052	69.5990689329095	44.5404	30.686	94.969
28.4041706132621	30.1085064412446	69.5990689417802	29.1053	29.2049	97.3043
28.0266887668507	29.5327085824833	69.5990689507679	20.3288	28.022	94.6827
27.6526994671546	28.9586621059476	69.5990689597551	27.4222	25.8428	88.2494
27.6526994671546	28.9586621059476	69.5990689597551	19.247	29.2712	80.817

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.2808448887424	28.3867115578234	69.5990689687429	27.3595	17.3028	77.1892
27.2808448887424	28.3867115578234	69.5990689687429	36.0033	17.5038	68.4307
26.9086938772517	27.8215967862771	69.5990689777406	21.7245	2.01127	55.495
26.9086938499863	27.821596783132	70.4876348015556	33.1085	0.882753	62.284
26.9086938499863	27.821596783132	70.4876348015556	26.7979	6.90196	59.464
26.9086938227251	27.821596779993	71.4721737009592	27.2482	20.2425	98.6789
26.9086938227251	27.821596779993	71.4721737009592	22.6997	14.9199	96.5597
26.9086937954649	27.8215967768546	72.2095561363293	19.7287	0.198716	79.5663
26.9086937954649	27.8215967768546	72.2095561363293	23.5387	4.13129	73.048
26.908693768216	27.8215967737275	72.8349102710576	10.9477	2.73525	75.6448
26.9086937680152	28.0742430922488	72.8349102960603	17.1854	11.1942	73.5432
26.9086937678293	28.3281928480715	72.83491032109	10.9524	12.0779	65.6188
26.9086937676266	28.5840247291481	72.8349103460897	3.44571	28.2052	68.896
26.9086937676266	28.5840247291481	72.8349103460897	2.38826	24.0295	62.08
26.9086937674416	28.8413003665468	72.8349103711225	4.056	25.9589	74.3875
26.9086937672564	29.0991284260943	72.8349103961545	13.2524	50.7626	76.4367
26.9086937670598	29.3538299515973	72.8349104211658	9.96077	19.2347	95.1963
26.9086937668937	38.9280115295991	72.8349104459042	8.75416	38.928	96.5496
26.9086937696255	41.8344630365407	72.8349104507442	31.4339	43.8079	91.7683
26.9086937696255	41.8344630365407	72.8349104507442	9.27453	43.3967	88.7547
26.9086937723611	44.7715913080273	72.8349104555913	7.21925	42.3799	79.403
26.9086937750975	47.7767093595836	72.8349104604394	9.16001	37.8018	54.1714
26.9086937778338	51.3115404945294	72.8349104652865	1.5771	61.4642	62.0285
26.9086937778338	51.3115404945294	72.8349104652865	8.30742	60.1487	54.798
26.9086937805727	53.1101024476738	72.8349104701339	30.4468	53.5688	58.3124
26.9086937805727	53.1101024476738	72.8349104701339	9.35555	53.1101	48.6717
26.9086937912818	53.7791190269338	73.3590129467543	41.6783	52.1535	70.8377
26.9086937912818	53.7791190269338	73.3590129467543	17.8085	51.9553	71.4677
26.9086938019918	54.4533623809622	73.8887291710466	23.2085	58.8069	93.3912
26.9086938019918	54.4533623809622	73.8887291710466	13.8308	54.4775	90.8096
26.9086938127026	55.1297071607839	74.4075308754593	41.7302	58.1199	97.2119
26.9086938234324	55.8036578658187	74.9008730830978	43.5841	58.7522	99.5019
26.9086938133791	55.803657880401	70.607496867083	44.4217	55.3301	59.2126
26.9086938033578	55.8036578950308	66.6401429115502	46.2037	41.7062	48.7254
25.8546903087872	57.895522452562	66.6401429005506	23.6206	68.344	50.228
25.8546903087872	57.895522452562	66.6401429005506	10.4725	58.878	47.8708
24.8477566458618	59.9674856910783	66.640142889572	17.5187	55.1629	44.2721
23.8584700553528	62.0928478097829	66.6401428785943	3.30116	54.5758	46.8676
23.2619692097765	66.9795999466334	66.6401428676533	2.55217	66.9796	45.1209
23.2619692166691	74.2100661206221	66.6401429234251	3.06059	88.1315	51.3598
23.2619692235844	77.4721277620033	66.6401429792505	3.24988	93.8751	52.5027
23.2619692305246	78.5716455992721	66.6401430351612	0.299018	97.3272	63.0477
23.3343611492826	78.5716456083605	69.7980550967033	14.0141	70.4084	60.1608
23.4068261474033	78.5716456174888	73.1220161097437	4.99968	74.2733	96.2118
23.4068261474033	78.5716456174888	73.1220161097437	17.6011	61.1721	91.0121
23.5699786473299	78.5716456266173	73.2205785124264	16.8354	77.4785	96.9485
23.7334562851032	78.5716456357489	73.3187052748684	16.576	71.2313	59.4946
23.8972215262153	78.5716456448807	73.4170137834852	23.7167	70.7298	59.5174
24.0610962494019	78.5716456540131	73.5155032411821	23.3293	78.9181	52.7226
24.0610962494019	78.5716456540131	73.5155032411821	25.7615	81.4539	44.2448
24.2242132688626	78.5716456631196	73.621032965425	34.9224	79.9328	54.0968
24.2242132688626	78.5716456631196	73.621032965425	34.4937	83.7515	46.1073
24.3431252954585	78.571645672247	73.9191278640909	41.546	82.3742	71.0491
24.3431252954585	78.571645672247	73.9191278640909	29.8827	79.684	74.8634
24.4618002124129	78.5716456813754	74.2186121734808	37.7453	86.3505	90.2585
24.4618002124129	78.5716456813754	74.2186121734808	27.1361	73.6904	92.6772
24.5802254026565	78.5716456905024	74.5149419476669	27.9893	89.6021	79.9213
24.6986632435363	78.5716456996341	74.8115142341031	3.57801	99.0366	79.8401
27.2787057525995	78.5716457087203	75.0000832358867	12.7313	98.6134	79.0339
30.1232905072285	78.5716457178092	75.1886264321878	32.5896	90.759	99.4978
30.1232905072285	78.5716457178092	75.1886264321878	28.4623	90.5817	94.8789
32.9398573275114	78.5716457268696	75.3733605345794	18.064	96.3276	61.2807
32.9398573275114	78.5716457268696	75.3733605345794	19.5225	82.1483	62.667
36.5280775484748	78.5716457359571	75.5606619496082	27.8353	94.5623	59.9313
40.401838639521	78.5716457450429	75.7490881537929	43.0779	81.6476	81.3569
40.401838639521	78.5716457450429	75.7490881537929	43.1006	68.5786	87.3861
44.3511138883747	78.571645754131	75.937520410623	51.2472	90.6526	88.5593
48.2408051734594	78.5716457632186	76.1254853773355	53.7144	89.3849	55.8234
52.0704580978169	78.5716457723056	76.3148549906392	59.3326	96.8644	60.2925
55.7316944715539	78.571645781392	76.5056855429434	68.3546	93.0491	63.4728
59.1975585096079	78.5716457904794	76.6974837435722	74.1314	97.2935	62.187
61.917471056801	78.571645799565	76.8922347717751	65.9332	98.9174	85.8003
61.917471056801	78.571645799565	76.8922347717751	68.0526	97.9535	69.9593
64.618647219159	78.5716458086225	77.087047170982	75.4786	92.9344	80.494
64.618647219159	78.5716458086225	77.087047170982	77.8131	90.2453	61.6399
67.1803794077348	78.5716458177107	77.2831834124901	92.7385	89.9534	78.6648
67.1803794077348	78.5716458177107	77.2831834124901	75.6586	91.7899	79.8395
69.0426966903528	78.5716458267984	77.4792816588524	98.0879	82.1977	81.4504
69.6596300450865	78.5716458358864	77.6702469518506	98.0725	73.509	85.0617
69.6596300450865	78.5716458358864	77.6702469518506	95.1537	79.2325	85.4918

Solution x	Solution y	Solution z	Original x	Original y	Original z
69.8229091557405	78.5716458449776	77.826579672515	88.5712	66.6382	86.5414
69.9855840022147	78.5716458540693	77.9827551635039	80.8889	76.3527	85.0129
70.1481998489467	78.5716458631622	78.1389266621011	84.4594	85.6238	69.4005
70.1481998489467	78.5716458631622	78.1389266621011	82.6909	80.2719	62.172
70.3102944038079	78.5716458722237	78.2959187312533	78.2186	68.7569	71.4148
70.3102944038079	78.5716458722237	78.2959187312533	65.9297	69.3415	71.7927
70.4727073679672	78.5716458813155	78.4535569662636	59.9164	61.9972	76.3491
70.4727073679672	78.5716458813155	78.4535569662636	60.9907	71.4945	66.9566
70.6362526504097	78.5716458904055	78.6119745496281	80.9911	75.8316	78.9882
70.7999700675395	78.5716458994973	78.770699785281	87.0562	74.7862	94.9506
70.7999700675395	78.5716458994973	78.770699785281	86.1254	75.412	92.2501
70.9623684786958	78.5716459085886	78.928136114167	89.1084	77.1611	62.2997
70.9623684786958	78.5716459085886	78.928136114167	73.8931	82.0767	63.5442
71.1243443270528	78.5716459176679	79.0873427857295	83.5669	88.2708	89.9554
71.2859431923025	78.5716459267704	79.2462470488439	85.2864	82.465	90.0038
71.2859431923025	78.5716459267704	79.2462470488439	74.5996	81.8744	91.5993
71.4473903560779	78.5716459358638	79.4050055335142	48.6743	62.5481	86.8455
71.6148420573091	78.5716459449552	79.5625674615932	54.3707	99.6057	90.3024
71.7907605629547	78.5716459540456	79.7163297371019	75.6359	99.7073	96.3469
71.9664244916462	78.5716459631374	79.868895668914	86.1563	95.4019	99.9835
72.071655988019	78.5716459722217	79.954497464557	87.9339	96.7331	97.5762
72.0716559834235	68.2322293820825	79.9544974568907	93.4248	68.5015	98.1606
72.0716559788366	58.4968998549742	79.9544974492337	96.3481	58.4969	97.3507
71.7783664979514	54.3349306303551	79.8867832034735	54.0007	52.8659	92.5002
71.7783664979514	54.3349306303551	79.8867832034735	53.4254	44.9898	88.3964
71.4906586140616	50.5902031377813	79.8191332271675	69.9395	64.1832	90.6048
71.4906586140616	50.5902031377813	79.8191332271675	59.9164	58.75	88.5608
71.2050405449241	46.6956825606861	79.7515019774263	75.5117	58.1702	94.9268
71.2050405449241	46.6956825606861	79.7515019774263	64.8783	60.379	95.6551
70.9200521532358	42.4176944422677	79.6837125055109	72.565	40.2263	84.1996
70.635275918589	38.2470009173654	79.6159650733213	70.0979	43.9308	97.3335
70.635275918589	38.2470009173654	79.6159650733213	62.6521	52.6724	96.4246
70.3509435239753	33.605990324023	79.5479329687885	55.717	37.8511	81.0117
70.3509435239753	33.605990324023	79.5479329687885	55.099	31.771	70.6981
70.0697935274797	29.0927775648721	79.480083540876	46.0829	25.5503	78.1024
70.0697935274797	29.0927775648721	79.480083540876	47.6864	20.3976	74.364
69.7959409927375	25.1606472320257	79.4124093851595	42.4972	23.9973	88.7768
69.7959409927375	25.1606472320257	79.4124093851595	41.7205	19.4188	86.0496
69.5768897108475	22.775123823058	79.3437382144172	43.8962	13.6901	83.4665
69.5768897108475	22.775123823058	79.3437382144172	39.9475	19.2268	79.8118
69.5374494876625	22.4532366946165	79.2734925283057	52.4925	5.37248	88.2454
69.5374494876625	22.4532366946165	79.2734925283057	55.9929	17.1432	85.8884
69.498073165399	22.1368921200568	79.2031478712553	56.3237	2.07366	66.7228
69.458773528659	21.8278907202086	79.1330579192982	73.4709	7.6166	79.1313
69.458773528659	21.8278907202086	79.1330579192982	51.1528	6.04103	87.327
69.4195210623835	21.523728419895	79.0629297471603	64.5769	3.66176	91.1441
69.3802825514558	21.2219134487305	78.9927342474981	61.5069	0.482106	98.5604
69.3415229033467	20.9863018457042	78.9178089662093	68.0574	15.6194	97.6814
69.3415229033467	20.9863018457042	78.9178089662093	75.2455	17.3084	91.8789
69.3028020994913	20.7514383009511	78.8427355691027	93.1464	19.8146	96.7782
69.3028020994913	20.7514383009511	78.8427355691027	96.7473	23.5618	82.348
69.1882404909252	20.5494753124009	75.2745659692887	90.4883	12.6216	83.5226
69.1882404909252	20.5494753124009	75.2745659692887	96.7716	16.6523	73.2113
69.0715342417159	20.3490285651337	71.8279517414688	76.9072	18.2917	80.6948
69.0715342417159	20.3490285651337	71.8279517414688	77.5205	18.1054	72.6356
68.9550517552307	20.1490378013673	68.4528165239393	89.036	30.7257	77.9388
68.9550517552307	20.1490378013673	68.4528165239393	82.6839	23.4883	70.1916
68.8379769621495	19.9483635608122	64.9776145004104	77.6794	29.1288	65.8649
68.8379769621495	19.9483635608122	64.9776145004104	74.7866	36.0265	64.8468
68.7209762879724	19.7470632651648	61.6343685204143	74.0572	35.987	63.4666
68.6039870867951	19.5452544238973	58.3340815937987	80.035	15.8589	58.0701
68.4869032208504	19.3437220773954	55.0924465606093	56.9788	35.9946	54.4126
68.3701396440812	19.1415135687247	51.9138658762801	56.0389	33.1015	51.1098
68.2536864484967	18.938797287661	48.7930992504966	78.906	18.0381	53.555
68.2536864484967	18.938797287661	48.7930992504966	50.9211	16.4053	69.6798
68.1377900031186	18.7365367049147	44.7332617320103	74.632	5.60444	48.5009
68.1377900031186	18.7365367049147	44.7332617320103	68.2389	8.47105	37.5341
68.0218268443444	18.5352685827937	40.8508866388337	60.7013	1.36116	46.4176
67.9060768451127	18.3348382624245	36.9379998725085	42.0178	3.44287	36.938
67.9060768518831	18.3348382614708	28.6278626326394	56.1254	1.40532	17.903
67.9060768518831	18.3348382614708	28.6278626326394	48.5894	0.54797	14.4264
67.9060768587763	18.3348382605615	28.5559309028578	58.7637	13.9566	16.9818
67.9060768656721	18.3348382596531	28.4842260735562	48.6979	8.85907	21.303
67.9060768725681	18.3348382587444	28.4127158683486	54.7387	20.4852	11.8363
67.9060768725681	18.3348382587444	28.4127158683486	47.6331	25.3181	18.59
67.9060768794701	18.3348382578373	28.341679533143	58.2097	7.56071	2.229
72.6703070151821	18.334838261765	28.3416795348678	62.8285	19.7058	3.0557
78.6950766633517	18.3348382656938	28.3416795365946	98.9579	4.73211	12.8251
81.2501254614409	18.3348382696256	28.3416795383254	95.7659	2.55349	7.5519
81.2501254660573	20.7112153597518	28.390736728824	97.4766	17.1802	10.0021

Solution x	Solution y	Solution z	Original x	Original y	Original z
81.2501254706787	23.1532974981373	28.4398830011515	69.2786	47.5055	16.1011
81.2501254753095	23.344794330584	28.4954007994686	99.5853	23.4577	6.8435
81.2501254753095	23.344794330584	28.4954007994686	98.8743	25.646	5.6301
81.2501254799397	23.5355243851263	28.551969418669	70.1018	4.34543	9.0382
81.2501254799397	23.5355243851263	28.551969418669	67.267	14.1516	17.4107
81.2501254845697	23.7502604453907	28.6103846023822	90.11	20.7153	5.7932
81.2501254845697	23.7502604453907	28.6103846023822	80.0506	36.8529	1.8328
81.2501254892028	23.8578321710002	28.7390328247843	74.5771	5.70821	6.0306
81.2501254938379	24.1086757469644	29.7126607588489	76.419	22.7841	27.7958
81.2501254938379	24.1086757469644	29.7126607588489	62.0154	28.1819	31.0401
81.2501254984764	24.3595778196694	30.6906225223782	81.7106	28.112	19.2367
81.2501255031157	24.6104100262916	31.6793075735769	88.9914	10.7701	17.3091
81.2501255031157	24.6104100262916	31.6793075735769	79.2919	13.6517	22.466
81.2501255077532	24.8632316578839	32.7001053599235	97.2905	22.0419	32.8941
81.2501255123916	25.116273596562	33.7243061768399	88.2698	14.9994	45.4757
81.2501255123916	25.116273596562	33.7243061768399	86.8707	18.0065	43.4379
81.2501255170294	25.3704894558198	34.7376258348521	87.5589	25.1226	45.9834
81.2501255216702	25.6247726168819	35.7459463005176	95.0473	3.39817	49.8314
81.250125526302	26.0269970176805	36.2663227794564	91.7898	10.5225	38.6828
81.2501255309367	26.4320778728538	36.7870205190925	99.5164	7.77478	36.5945
81.2501255309367	26.4320778728538	36.7870205190925	77.911	9.90186	32.1435
81.2501255355707	26.848272725219	37.310971836065	88.6343	0.494442	25.7719
81.2501255401987	28.0286374672143	38.1237946096762	80.1207	32.7664	32.9471
81.2501255401987	28.0286374672143	38.1237946096762	80.5435	37.2793	30.7227
81.2501255448314	29.2043942323633	38.9464313995326	85.2354	42.0312	17.7315
81.2501255448314	29.2043942323633	38.9464313995326	81.8496	38.8539	28.9342
81.2501255494615	30.3433120455664	39.8102347563686	73.064	44.6995	31.3834
81.250125554093	31.4689252426342	40.6828409386314	74.6616	49.1772	30.6996
81.2501255587251	32.5720269649926	41.5677362998943	76.3859	55.8636	29.5918
81.2501255587251	32.5720269649926	41.5677362998943	74.8357	53.7031	27.6754
81.2501255633558	33.5497324650714	42.5192767969836	80.6139	53.7748	37.9975
81.2501255633558	33.5497324650714	42.5192767969836	70.983	56.1077	39.9244
81.2501255679883	34.4727453468164	43.4875918724135	67.8108	54.6502	44.2592
81.2501255679883	34.4727453468164	43.4875918724135	61.5258	41.6034	50.3406
81.2501255726218	35.3659457922579	44.4541456158117	64.2573	58.953	49.3124
81.2501255772546	35.9380278059054	45.3118964842753	81.1997	46.621	50.135
81.2501255772546	35.9380278059054	45.3118964842753	81.4209	43.6493	50.298
81.25012558189	36.5085464664247	46.170918010949	76.05	41.1841	50.3284
81.2501255865259	37.0794320876978	47.0315944435988	73.2088	32.0501	51.6558
81.2501255865259	37.0794320876978	47.0315944435988	60.6972	35.5066	52.4287
81.2501255911623	37.6551534943831	47.8935152332234	85.0689	32.1301	62.1612
81.2501255911623	37.6551534943831	47.8935152332234	78.6058	43.2582	65.7281
81.2501255958227	38.2331998367895	48.7411418344932	95.9404	38.2332	74.7444
81.2501255849012	40.9348480913869	47.6741211489575	92.3029	41.017	61.4442
81.250125574004	43.6669423444505	46.5984376568995	96.3235	44.2629	60.2644
81.250125574004	43.6669423444505	46.5984376568995	94.61	43.2995	53.8065
81.2501255631058	46.4608510872811	45.5089316568439	96.1419	41.3034	39.8142
81.2501255631058	46.4608510872811	45.5089316568439	91.3249	42.8902	41.6597
81.2501255522073	49.3888110204012	44.4403801348147	92.0634	46.0336	40.4672
81.2501255522073	49.3888110204012	44.4403801348147	88.1955	43.6361	47.6404
81.2501255413116	52.461385765442	43.3844522296057	86.8559	48.4797	70.9689
81.2501255413116	52.461385765442	43.3844522296057	82.834	58.4111	60.6469
81.2501255304121	55.9123444833107	42.0305471464385	69.3672	55.5594	61.2856
81.2501255195128	59.4423562336508	40.6320077824781	81.8209	62.9891	53.3907
81.2501255195128	59.4423562336508	40.6320077824781	69.1414	57.6653	59.1832
81.2501255086173	63.1346907923517	39.1796710587779	91.8947	87.6684	31.3605
81.2501254977168	65.6344014713771	37.8157862614469	82.5413	70.9361	35.9747
81.2501254977168	65.6344014713771	37.8157862614469	82.7455	58.0479	28.4959
81.2501254868205	68.2280558731684	36.4837658930544	94.2046	73.3577	49.4797
81.2501254759264	70.8262773162296	35.1339362597038	96.3227	96.5824	35.4748
81.2501254649495	70.8924067998618	33.3342943642992	91.0373	94.8618	33.7328
81.2501254539733	70.9582381205917	31.542698357927	95.4573	78.5053	38.9919
81.2501254539733	70.9582381205917	31.542698357927	84.0931	75.7357	43.6346
81.2501254430009	71.0240650683203	29.719304656847	90.8764	48.3318	12.9357
81.2501254320065	71.1219362041819	29.4946155172121	81.8774	60.6902	25.477
81.2501254210158	71.2199681972469	29.2702478629501	78.9206	73.8168	40.4273
81.2501254210158	71.2199681972469	29.2702478629501	77.5352	78.0347	33.1993
81.250125410028	71.3180077783694	29.0454959151022	85.3959	62.1638	1.7086
81.2501253990348	71.4171908791986	28.83814678303	65.3011	67.1869	28.6409
81.250125388089	71.5164930867208	28.6309203894792	97.9153	71.697	3.8476
78.4165423112306	71.5164941024009	28.6309203829776	88.4474	55.9131	14.5629
75.5017316886176	71.5164951182075	28.6309203764995	79.5061	49.6701	11.7965
72.4782020763998	71.5164961343218	28.6309203700221	72.4782	47.1166	11.4083
70.1020156294945	71.6039450078492	28.6309203636002	66.9764	66.2314	9.0944
70.1020156294945	71.6039450078492	28.6309203636002	52.5118	68.1256	10.9937
68.0128198378261	71.6916213966828	28.6309203571802	63.6977	85.2552	13.695
68.0128198378261	71.6916213966828	28.6309203571802	60.7208	77.8844	16.4053
66.0204053849633	71.7792206295744	28.6309203507606	80.7777	87.9354	23.575
66.0204053849633	71.7792206295744	28.6309203507606	66.7645	81.0279	23.2022
63.9841592912196	71.8665888263251	28.6309203443407	75.9957	81.402	37.5418

Solution x	Solution y	Solution z	Original x	Original y	Original z
63.9841592912196	71.8665888263251	28.6309203443407	61.8453	80.8454	29.5157
61.9558701152266	71.9539273933161	28.6309203379218	79.6042	79.6519	48.0916
61.9558701152266	71.9539273933161	28.6309203379218	78.3667	74.2083	50.3369
59.2655204595446	72.0409966504809	28.6309203315008	76.2214	75.1456	46.9071
56.3329043820609	72.1280414144109	28.6309203250801	51.793	64.9464	0.9013
53.8750666806558	72.2157084092391	28.6309203186598	61.6789	74.8507	42.3385
53.8750666806558	72.2157084092391	28.6309203186598	59.2712	76.4167	39.0582
51.4128620628927	72.303419075246	28.6309203122401	60.2539	80.1704	27.9583
51.4128620628927	72.303419075246	28.6309203122401	60.356	72.3736	25.6911
48.9339903698927	72.3911896389281	28.6309203058298	48.934	88.5471	3.512
48.561540077164	72.3911896507365	28.630920304971	47.6475	71.1843	17.3202
48.561540077164	72.3911896507365	28.630920304971	45.2184	66.3382	18.5431
48.1909475230156	72.3911896625605	28.6309203041216	46.3399	71.17	31.2162
48.1909475230156	72.3911896625605	28.6309203041216	35.9094	68.8825	29.2317
47.8230981098421	72.3911896743871	28.6309203032735	57.8122	54.5104	45.2899
47.4518059119447	72.3911896862164	28.6309203024261	37.4105	49.4356	12.3771
47.451805882353	72.8786209658153	28.6309203034079	42.1545	66.9856	47.2528
47.4518058527656	73.3684583356137	28.6309203043922	32.641	61.5676	34.0062
47.4518058231799	73.8625816058675	28.6309203053769	56.0439	62.2937	45.4781
47.4518058231799	73.8625816058675	28.6309203053769	58.3448	60.9201	41.5011
47.4518057935936	74.36654135918	28.6309203063614	40.6271	60.1839	50.1596
47.4518057935936	74.36654135918	28.6309203063614	33.4192	59.483	33.0004
47.4518057640095	74.8889165682452	28.6309203073451	60.771	67.3196	52.7577
47.45180573442	75.4279309426357	28.6309203083271	50.5772	79.5094	6.7911
47.45180573442	75.4279309426357	28.6309203083271	45.1636	79.7971	7.5816
47.4518057048315	75.9671521548478	28.6309203093099	54.169	81.8375	12.9059
47.4518057048315	75.9671521548478	28.6309203093099	50.9984	83.4341	15.7476
47.4518056752437	76.5064700694074	28.6309203102936	49.8328	92.6571	10.5815
47.4518056752437	76.5064700694074	28.6309203102936	54.7886	87.0165	7.4948
47.4518056456542	77.035081086797	28.6309203112767	43.3068	85.4106	16.2891
47.4518056160656	77.5636916592375	28.6309203122604	45.6946	80.9262	23.2292
47.4518056160656	77.5636916592375	28.6309203122604	43.9629	81.9344	16.1851
47.4518055864788	78.09512269189	28.630920313245	48.3206	81.4332	48.7053
47.451805556894	78.6273017870893	28.6309203142309	44.9959	88.3516	56.7624
47.4518055409569	78.6273017953842	23.0255615618609	51.8363	98.9629	1.5963
46.1011529631029	78.6273017910141	23.0255615626677	48.9418	95.7946	8.5835
44.7514058071796	78.6273017866493	23.0255615634776	40.4171	94.2218	3.0792
44.7514058071796	78.6273017866493	23.0255615634776	40.7053	85.7824	6.0265
43.443306783671	78.6273017822838	23.0255615642874	33.1283	92.3481	27.8161
43.443306783671	78.6273017822838	23.0255615642874	41.4131	74.8199	27.7293
42.1678468575633	78.6273017779185	23.0255615650976	34.7487	93.2543	26.9859
40.9100215498026	78.6273017735539	23.0255615659083	48.6626	98.7924	25.383
39.6433611258295	78.6273017691898	23.0255615667193	54.8665	95.2849	41.9419
39.6433611258295	78.6273017691898	23.0255615667193	58.0371	93.3465	37.2538
36.8577977348895	78.627301764823	23.0255615675278	50.0418	88.5256	42.3177
36.8577977348895	78.627301764823	23.0255615675278	47.7087	83.4773	42.5429
33.753347028174	78.6273017604545	23.0255615683356	36.723	86.3354	38.0239
33.753347028174	78.6273017604545	23.0255615683356	38.4806	81.2568	32.7466
30.672287781409	78.6273017560874	23.025561569144	32.7208	86.88	6.0296
30.672287781409	78.6273017560874	23.025561569144	31.2678	61.1344	2.0752
27.6347714613823	78.6273017517204	23.025561569953	26.7929	78.8352	37.5421
24.6367393231022	78.6273017473553	23.0255615707626	34.7579	99.7518	13.4448
21.4466555069631	78.627301742987	23.0255615715713	23.1083	96.0553	21.9675
18.2728872717687	78.6273017386201	23.0255615723808	9.17265	66.1356	6.7326
18.2728872717687	78.6273017386201	23.0255615723808	13.5318	57.9262	6.7229
15.4254149654848	78.6273017342542	23.0255615731909	10.9638	55.5178	10.1729
12.7183076620664	78.6273017298869	23.0255615740004	19.6656	61.3862	20.5906
9.98134765233566	78.6273017255217	23.0255615748107	18.9042	62.1271	34.907
7.17488415015805	78.6273017211563	23.0255615756207	16.7243	94.3593	34.7835
4.2889400080588	78.6273017168778	23.0255615764731	4.28894	92.6489	49.3954
4.24991077865383	78.5368630803406	22.7946784780367	0.194865	71.2335	31.0366
4.21089709310276	78.4465334083541	22.5637011234461	8.25408	64.3565	18.8288
4.17188603446738	78.3563765978481	22.3330561121024	8.89064	83.8954	29.0611
4.13287455951459	78.266240448406	22.1023183687127	4.45069	94.0863	19.178
4.13287455951459	78.266240448406	22.1023183687127	3.35356	88.986	2.7967
4.09387848159052	78.1760079349637	21.8731751079572	15.2733	95.1553	18.4059
4.09387848159052	78.1760079349637	21.8731751079572	12.3803	91.1149	15.3598
4.05485891179492	78.0856475253597	21.6447332759859	16.854	97.4806	6.0907
4.05485891179492	78.0856475253597	21.6447332759859	18.6101	90.3489	8.9268
4.01572518481876	77.9945464130137	21.4212479983141	1.02508	82.9527	3.7072
3.97660758823471	77.9034809894925	21.1987629879987	29.5533	92.3189	26.5937
3.82520154236985	74.5182048021155	19.4705616753154	23.3569	85.0798	30.5318
3.67303283969875	70.958320672217	17.6846025102055	16.5471	81.1813	37.3426
3.67303283969875	70.958320672217	17.6846025102055	17.2306	77.2747	24.7644
3.52011327564249	67.1338477725678	15.729097672096	10.1219	82.045	24.5182
3.52011327564249	67.1338477725678	15.729097672096	20.7262	75.308	17.3361
3.36679545394671	63.1441832844272	13.7568381561119	24.7619	69.8637	9.1655
3.21283497993127	59.0936432567137	11.8199090246598	24.5176	59.5849	13.4915
3.05833948580458	55.1236598490293	9.88550488986795	5.52590	61.9092	6.1438
2.90389783683179	51.1693366541324	7.96979410165741	22.8193	53.7552	17.9075

Solution x	Solution y	Solution z	Original x	Original y	Original z
2.74889680315022	47.2404676340224	6.01297435455627	12.5872	53.6987	19.2898
2.59376116905875	43.2963310597888	4.01803738167065	11.7937	48.0467	6.2423
2.43854449453067	39.3749414532868	2.02611147358441	11.4258	37.7412	14.2255

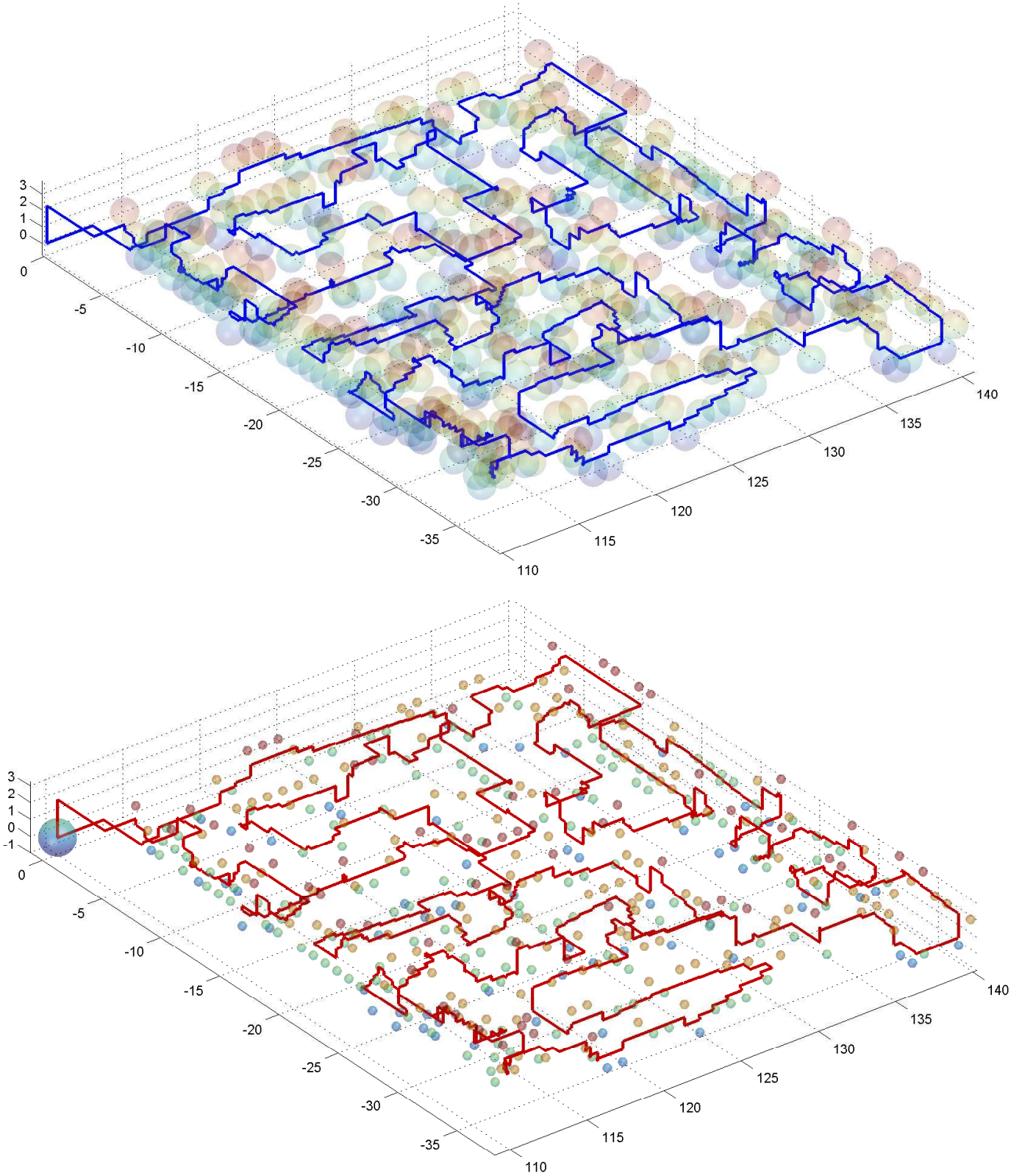


Figure N.186: *pcb*442, $r = 0.76$, Equal Radius, 3D, Manhattan, Length = 532.9168269

Table N-189: Solution for $pcb442$, $r = 0.76$, Equal Radius, 3D, Manhattan

Total distance: 532.916826948658 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
2.98152851851113	3.26477938342491	0.143863263895631	3	4	0
4.00000008539627	3.3030215447826	0.696977886998916	4	4	1
5.99999959311498	3.30302159823152	0.696978343711357	6	4	1
7.00000000097908	3.30302155813589	0.696978693101043	7	3	0
7.99966534050944	3.30302162056135	1.38535773910751	8	3	2
8.99970801050365	3.30302168300249	1.61390116956649	9	3	1
10.0000000025084	3.30302174539323	2.30302129391381	10	3	3
11.0000000024579	3.30302198273302	2.3030214795159	11	3	3
12.0000000040352	3.30302237066851	2.30302147480642	12	3	3
13.0040242950654	3.30543992245698	1.99024476826046	13	3	2
14.0140286234856	3.30785946756427	1.67667014142709	14	3	1
15.4954385473272	3.31031969112414	1.62301870502438	15.5	3	1
16.9283388295515	3.31279053311518	1.57790365807206	17.1	3.1	2
17.9662697629858	3.31526362270276	1.53141267239048	18	3	1
18.9209650307255	3.31774211058189	1.48776319186144	19	3	1
19.7426071295955	3.32022529719111	1.4460612631034	20	3	2
20.139784178741	3.32271929933593	1.39885587025522	20	3.7	2
20.9997194328961	3.32519150603294	1.334118355055	21	3	2
21.8619386151698	3.32770529649889	0.95632862844564	22	3	1
22.6237491318469	3.33022240369337	0.571393079728081	23	3	0
22.6259808746946	4.69930553564347	0.569936468912279	22	4.7	1
22.6609928884438	5.62491286977489	0.567437976952511	23	6	0
22.6609927919592	5.62491269631787	1.0000000541695	22	6	1
23.7598894614379	5.49195463656516	1.52852038201037	24	6	2
24.0000003878646	3.67429108109162	1.64938113879885	24	3	2
24.9999999303238	3.67429119433138	1.64938134343217	25	3	2
25.7197211484107	4.07366672110554	1.64938132449968	26	4	1
26.0000004062333	4.60515058108881	1.6493813058465	26	5	1
27.4218721602709	4.60515078761031	1.93520108171712	27.5	5.2	2
28.5497728488997	4.60515099436321	2.20938969840267	29	5	2
28.999999932454	4.605151201253	2.54022364069713	29	4	3
29.3948485918275	6.99999990421541	2.5402239842838	30	7	3
29.3948485965002	8.00000016758979	2.54022397178154	30	8	3
29.3948488019634	9.99999974136366	2.54022387999671	30	10	3
29.3948485687407	10.9999956634021	2.54022364015598	30	11	3
27.9952859997026	11.0371473540874	2.53206829829632	28	11.3	2
26.5859385733594	11.0735038796835	2.52399106008662	26	11	3
26.5793311512191	11.1913787443852	1.58953195054348	27	11	1
26.5720418366499	11.774136631528	1.54356544146275	27	12	1
26.56449770514	12.0065577379581	1.50765439643353	26	12	1
26.5619436441988	12.9473117696901	1.50383042612247	27	13	2
26.559379269053	13.7408835576797	1.49997967134198	27	14	1
26.5567928153203	14.0419491676348	1.49618586684399	26	14	2
26.5543576637176	14.7580797878635	1.49205021103072	27	15	1
26.5519055811436	15.0900629971554	1.48796848679482	26	15	1
26.5495146561269	15.8877661013921	1.48403529126854	26	16	1
26.5471777910039	16.1905740692644	1.48023002176951	27	16	2
26.5448214174018	16.7849184062861	1.47636370407329	27	17	2
26.5424373016423	17.023267995335	1.47240818796098	26	17	2
26.5403744347387	17.9961335782688	1.46709973280383	26	18	2
26.5388800911592	18.3853465695003	1.00173759371217	27	18	1
26.5373832118167	18.9998587194677	0.537421379342699	26	19	0
26.7091598393975	19.0001854560669	2.29785007158411	27	19	3
26.7091599259222	19.9200581939602	1.64474157523527	27	20	1
26.7091600120527	20.5035048255622	1.49649499570594	27	21	1
26.0952101195153	20.4189392267563	1.58653489366143	26	20	1
25.7338221969232	20.3591502554555	1.82330685251406	26	21	2
23.9895805004877	20.2716897379931	1.99976275725311	24	21	2
21.8080312623521	19.9464850090071	2.17607389563279	21.1	20	2
21.699998947935	19.5347066278787	2.45991564748997	21.7	19	3
20.2634638917844	19.5347065882196	2.45991568212803	20	20	3
20.2634635969006	18.8299607038488	1.72101349258119	20	19	2
20.2634633022204	17.9999999723389	0.712873924556676	20	18	0
20.2634632472018	17.0000001591399	0.712873923654015	20	17	0
20.2634633838709	16.4997511823224	1.34778212218808	20.6	16.5	1
20.2634635206944	15.9999999069423	2.28712616323598	20	16	3
20.3467374075957	14.6466630420612	1.92604708630422	20	14	2
20.4999249743448	14.5553423094836	1.29362365703941	20	15	1
22.893338707977	14.3759229233374	1.10075206383054	23.2	15	1
23.3222812653597	13.785346560722	0.929194784486838	22.9	14	1
23.9071773897806	13.0612332580159	0.754567917700189	23.9	13	0
25.2873738846067	12.9572199022249	0.744864384631642	26	13	1
25.2940855132243	10.003913243298	0.724859950032609	26	10	1
25.2978515202238	8.99999998221285	0.290842991458239	26	9	0
24.996494524603	7.59649342929596	0.290842903554415	24.5	7.1	0
25.2337339800644	7.63114863144473	1.45084696050079	25	8	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.6014013156779	7.66321733203485	1.68088730521586	26	8	2
25.8685492374904	7.69442506876667	1.87418657986504	25.5	7.1	2
26.8407123239001	7.7305352344659	2.03736023036403	27	7	2
26.9999998666599	8.00000021095365	2.23999850370996	27	8	3
27.1239875636214	8.73760981554165	1.76979345279387	27	9	2
27.2503010757502	9.33678016731285	1.23316511326874	27	10	1
28.0432267546857	9.38927294974157	1.10947637537659	28	9	1
28.8789591701648	9.44311750098119	0.987980102057534	29.3	9.5	1
29.4541800134498	9.49676338411882	0.866338600127593	30	9	1
29.500133389749	11.9999999587865	0.572482221714747	30	12	0
29.500132623622	12.9999973581004	1.42756535222613	30	13	2
29.5001318950576	14.0000000094829	1.42774960969831	29	14	2
29.541458596093	14.9796011468945	1.29674792905189	30	15	1
29.5814093953736	15.9267900259003	1.17442304162307	30	16	1
29.6204595839676	16.792082287173	1.05566534292066	30	17	1
29.6587685353038	17.4913165204105	0.937953687871464	29.5	17.5	1
29.6972998965772	18.1877416735598	0.819413904040062	30	18	1
29.7352969042833	19.019649963121	0.697647013409273	30	19	0
29.7635661589451	20.7222891638727	0.666767221361655	30	21	0
29.7635663141289	20.7222892564223	1.25643067072908	29.5	20.5	1
29.763566469429	20.7222893492498	1.99999955829424	30	20	2
29.7635664778196	21.9999997814199	2.27771055491666	30	22	3
29.7635659798354	22.2777107235176	1.00000067195216	30	23	1
28.4752925054996	22.2777106738069	0.811643835762701	28.5	22	1
27.1450292132656	22.2777106240782	0.615854289262599	27	22	0
26.5002384796321	22.2777105744347	0.500240881792475	26	22	0
26.5188265020677	22.7375338424224	1.75764529554341	27	23	2
26.5370345390302	23.0934590346176	2.49216472741049	26	23	3
26.5612145242287	25.5612118340116	2.56121175351542	27	26	3
26.5333068992711	25.5000169243247	1.14705950170177	26	26	1
26.5133473627355	25.1276106322719	0.937632850076708	27	25	1
26.4930753586481	24.7809183080652	0.723728212231122	26	25	1
26.4732861891364	24.3600014078543	0.473288391269005	26	24	0
27.6000000565005	24.3600017456461	0.999999806589072	27.6	23.6	1
28.9468858747512	24.4420168239566	1.40373739918116	29	24	2
29.4475415952139	25.0571085668036	1.46379835872024	30	25	1
29.5809556692531	26.0086943866782	1.54670934566642	30	26	1
29.684485695288	27.0007783286399	1.65519396062686	30	27	1
29.7596659570553	28.000000012207	2.27899882636419	30	28	3
29.7596661390929	29.0764554304822	1.71247993082671	30	29	2
29.7596663201044	30.2789986021063	1.00000017641537	30	31	1
29.7596661391529	30.0000002790968	0.721001302125553	30	30	0
29.0044738822829	29.874618679185	0.741831840103364	29	30	0
28.4011317417492	27.7104277796318	0.994380501050992	28.5	27	1
27.1740777368215	27.5588717739187	1.24806314522201	27	27	1
26.4387865447088	27.4387875595707	1.56121219123977	26	27	2
26.4689970697162	27.7380883677895	1.05455257746662	26	28	1
26.4999998406674	28.0000002473699	0.572365958626246	27	28	0
26.4999997352066	28.7228682784548	0.572366172604152	27	29	1
26.4999996281426	29.0000005998381	0.572366386448165	26	29	0
26.4999998136497	30.4276336602438	1.00000021616387	26	31	1
26.5923111327595	30.4276337905294	1.92093401311088	26	30	2
26.9999994953703	30.4276339173687	2.37172275157457	27	30	3
27.150946921431	31.0832620228622	2.37172269159624	27	31	3
27.3154322784363	31.9026900452072	2.37172263117664	27	32	2
27.4945234736521	32.6304610369759	2.37172257073613	27	33	2
28.5000000204616	32.8371080363419	2.37172251015183	28.5	33.5	2
29.7600043423036	32.5099049565363	2.49009567710747	30	32	3
29.7600043700957	33.1810009895677	2.41235290753125	30	33	2
29.7600044002136	34.0262964758047	2.33851741472085	30	34	3
29.7600044303107	35.0354812772277	2.22299788540629	30	35	2
29.7600044605621	36.0928488747826	2.11076872739632	30	36	2
29.7600044983145	37.2788856382334	1.99999877541645	30	38	2
29.7600043444526	37.2788856150201	0.66500269172563	30	37	0
27.0001759403375	37.2788867620895	0.760001512298008	27	38	1
26.9997894804118	36.9999952568323	0.760001738047872	27	37	0
26.9993775481319	36.0000048187123	0.760002037066856	27	36	0
26.6262719364952	35.936213408123	1.76306909554053	26.2	36.5	2
26.552853558956	35.1643684924481	1.90213189269599	27	35	2
26.4756107031258	34.525916178566	2.03740807159048	27	34	2
25.6514652962863	34.4510144188877	2.18552344510174	26	34	2
23.0268593724922	34.3816740655359	2.34333674691704	23	34	3
23.0268567726145	34.3816741582842	1.44108392839819	23	35	1
23.0268551961968	32.7904563467738	1.44108384032076	22.8	32.5	1
23.0268536195379	31.9850111731991	1.44108375222685	23.2	31.5	2
22.1602791610738	31.9850106861684	1.44108331634079	22	32	2
21.5000000100684	31.9850101997488	1.44108288039678	21.5	32.5	2
20.8463002627271	31.5925759098242	1.08799804355585	21	32	1
20.0911687963194	31.0911686746487	0.748985531957535	20	31	0
20.091167990576	31.0911678687034	2.5067299067914	20.5	31.5	3

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.7183721732375	30.4061832491911	2.506730552147	20	30	3
18.72704957614	30.1492244385271	2.50673119713643	19	30	3
16.298743088423	29.9121668614692	2.50673184203628	16	30	2
15.390554601756	29.6632416191807	2.50673248700839	15	30	2
15.1864653230659	28.2812665622616	2.50673313230899	15	28	2
14.9999998678071	27.5781789141527	2.50673377767254	15	27	3
14.6739487280431	28.0077226407353	2.09975013514411	15	28.6	2
14.0005352244985	28.2000010808731	1.76000151473259	14	28.2	1
14.0001648837901	29.0000002486033	1.7600012904292	14	29	1
13.9998218298373	29.9994442981846	1.76000105510812	14	30	1
12.9987678399591	29.9995762864793	1.88071987862924	13	30	2
11.998650112289	29.9997068627442	2.00000212264671	12	30	2
10.9991890799127	29.9998374354031	2.11928542128189	11	30	2
9.99999999705652	29.9999680053038	2.2399983983114	10	30	3
8.92380760727882	30.0000894509743	2.11922276152315	9	30	2
7.76000151224559	30.0002108853877	1.99999906893558	7	30	2
7.76000171401796	30.0003764281803	0.721112363039289	8	30	0
7.76000155253337	32.9996091291816	0.999999927280756	7	33	1
8.00000062564767	32.9998664196597	1.23999835059813	8	33	2
9.00000004543118	33.0000685729111	1.23999832884013	9	33	2
10.0000000029745	33.0002925620956	0.760001648228689	10	33	0
10.9998109136955	33.0548407188199	0.931300463252742	11	33	1
11.9995428443986	33.1095490235202	1.10090371421994	12	33	1
12.9998770252103	33.1645757733523	1.27314418883963	13	33	2
13.9991749662138	33.2374516841586	1.31246038982308	14	33	1
15.0000134861269	33.3119086458993	1.3523645195037	15	33	2
16.0068319758217	33.4062947117652	1.3846390831737	16	33	2
17.162595962773	33.6684837827356	1.40894384610795	17.2	34.1	2
17.8873577551437	33.76976790618	1.42922923878876	17.9	33.3	2
18.5156404065406	34.4203719226033	1.44609656392481	18.3	34.5	2
19.4625957460454	34.999999864397	1.46259909180668	20	35	2
18.6337985253756	35.2327124881616	1.31002137469518	19	35.2	1
17.1232967751168	35.4686083739658	1.16751053062372	17	36	1
16.0404831539887	35.6556371599716	1.03177706924287	16	36	1
15.0125060913194	35.8299747042451	0.896767085635038	15	36	1
14.0000000042781	35.9996022896234	0.760001786672643	14	36	0
12.9999999942813	35.9997663437425	1.2399981746	13	36	2
11.9990976257433	35.999894806138	1.23999819389954	12	36	1
10.999181500876	36.0000232345783	1.23999821127043	11	36	1
9.99999994045234	36.0001514453689	1.2399982150165	10	36	2
9.00000000249223	36.0003033063693	0.760001715708814	9	36	0
8.00000004575367	36.000510764348	0.760001592690128	8	36	0
7.24729687350386	36.1841600522176	1.27095907802227	7	36	1
6.63894812384919	36.3764352320323	1.89398680728214	6.2	36.5	2
6.19999990505683	36.5625957618767	2.46259929055522	6.2	37.1	3
4.46022350995788	36.0166153061955	2.4485070406414	4	36	2
3.96917287739335	35.4870742971291	2.43468693371369	4	35	3
3.06736354414865	35.4238844302921	2.4169538997135	3	35	2
2.27818339374366	35.3644601084457	2.39952168326069	2	35	3
2.24082443696588	35.3442489555574	2.02075569571922	1.5	35.5	2
2.23374278383965	35.3043078493097	1.85604166941301	2	36	2
2.22701177092065	34.9999998818351	1.22148707314296	1.5	35	1
2.43637330640078	34.4016541654961	1.22148685102382	2	34	1
2.73039871741494	34.0599888887827	1.2214866289597	3	34	1
3.00000042095206	33.7270118727806	1.22148640689302	3	33	1
3.99999947772243	33.727011892975	1.2214863698942	4	33	1
4.2448391303317	33.9331005843232	1.22148648250836	4.7	34.5	1
4.24483868485088	33.8032030121144	2.32737265613539	4	34	3
4.24483823945938	33.4999996580047	2.39137018060916	4.7	33.5	3
2.45516217949786	32.9999999202801	2.39137046948984	2	33	3
2.45516223026593	32.0003261425085	1.60862931244547	2	32	1
3.28535282561899	32.00005820905	1.60862941517111	3	32	2
4.54851587575264	31.9997902781278	1.60862951777243	5.2	32	2
4.41522260007378	31.6223334225242	1.22753903380499	4	32	1
4.29781144495347	31.0386578323436	0.9140979418277	5	31	1
4.00000000803043	30.537370203923	0.537434330618542	4	30	0
3.71807999046595	30.5381708341781	1.57521492913251	4	31	2
3.24338836070646	30.5389700584337	1.89437459566349	3	31	2
2.84931460618715	30.539768828068	2.19488510776285	3	30	2
2.39420479727552	30.5405683243935	2.5405138590435	2	31	3
2.39420545827957	29.9368244241185	2.4020943510756	2	30	3
2.39420612009229	29.0000006386524	1.64977192451833	2	29	1
2.39420770431461	28.547304314729	1.64977117206362	2	28	2
2.95921626508814	28.5473031993473	1.64976970595463	3	29	2
3.49999561027761	28.5473020814229	1.64976823987399	4	29	2
3.49999660603507	28.1941789299287	1.50647522650756	4	28	2
3.49999760373471	27.9999955274521	0.572366908088704	3	28	0
3.49999961478534	27.0001593459035	0.572365022072404	4	27	0
3.49999971310559	26.9993863563978	0.572364980179399	3	27	0
3.49999992152469	25.9999999965764	0.572365044633896	4	26	0

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.50000001287094	25.0000000803079	0.572365237987092	3	25	0
3.50000078155047	24.2613962155038	0.864795999784145	3	24	1
3.5000015501893	23.7387800895655	1.1358763246511	4	24	1
3.50000231885114	23.0000000755101	1.42763271225826	4	23	2
3.48678363066499	22.5568881885634	1.01507934260899	4	22	1
3.23053742797117	22.5444180228374	0.789720842368453	3	23	1
2.99999984339917	22.5318148825942	0.542931723958427	3	22	0
2.40765182303822	22.5318198302958	0.64140719057764	2	22	1
2.40764533736129	23.1724666217626	0.641414557598473	2	23	1
2.40763885157732	24.0000139809612	0.64142192356002	2	24	0
2.40763310858942	25.9999865178469	0.64143148467039	2	26	0
2.40762898204859	26.3585634980246	1.00000012829612	2	27	1
2.40762915815773	25.6414362425796	1.99999972520878	2	25	2
3.00000004135175	25.6414362821148	2.32989985716271	3	26	3
3.86823324170012	25.2750553950862	2.30620425512425	4	25	2
4.62296568081263	24.9520028069872	2.28272456849128	4.7	25.5	2
5.27569444966399	24.3358060245054	2.25964891188034	5.4	24.3	3
5.40000056758805	24.0600013268163	1.99999996162505	5.4	23.3	2
6.53006539422515	24.4066890344856	1.71571290134203	7	24	2
6.85453222837225	25.4480023864755	1.26576987484424	7.5	25.5	1
7.00000260932652	26.2399987933616	1.00038864003452	7	27	1
7.99936728550865	26.2399992785265	0.999492592692582	8	27	1
8.00008632238381	26.2399994609332	0.721111941034831	8	26	0
8.77887781977375	26.4572982039863	0.863242433467364	9.1	26	1
9.28853825798493	26.7327465632603	1.00000113928083	10	27	1
9.28853831555354	26.732747118697	2.34967408611213	9	27	3
10.0154981773528	26.7327470401563	2.14596513579654	10	26	2
11.0924676842129	26.7327469618835	2.03650259419918	11	27	2
12.2961660389741	26.7327468836992	1.9274485452443	13	27	2
12.309041290594	26.7327468058989	0.638890041835107	12	27	0
13.6746785188668	26.7327467231294	0.632727436914326	14	27	0
13.6746785072689	25.0279570004882	0.672937492947641	14	25	0
13.6746784945868	24.3498729359091	0.999999277885129	13	24	1
14.2829708302634	24.3498726516134	1.12216351667587	14	24	1
15.0931947568152	24.3498723671699	1.24702558076081	15	24	1
15.9965367038878	24.3498720828083	1.37739970286643	16	24	2
16.8827508118856	24.3498717985154	1.45548995407862	17	24	2
17.5229290931036	24.349871514556	1.52293014679429	18	24	2
17.4171823201021	25.6871731027716	1.46704358064799	17.9	25.8	2
17.1448527626215	26.1648566018056	1.38121561813389	17.2	26.1	2
16.8603021925555	26.6891037151172	1.28042813576072	16.9	26.8	2
16.5374028727822	26.9999999786715	0.537401715063982	16	27	0
17.9058953141277	27.2739880852283	0.580237419250226	18.3	27	1
18.4210969294012	27.631843715698	0.620855025687519	18.3	28	0
21.0797881427757	27.7644318241098	0.680981559891437	21.2	27.5	0
21.4399982343044	28.1999981274191	0.999819050061036	22.2	28.2	1
20.0004534314704	28.2399984361509	1.00018110876716	20	29	1
20.0003085888303	27.7767600404717	1.36125484826983	20	28	2
20.0001637559715	26.9239605848923	1.54012004186698	20	27	2
20.0000189240566	25.9889827620196	1.70011446166643	20	26	1
19.9998740928542	25.0000000051649	2.23999837712227	20	25	3
19.9996735675106	24.0000000075295	0.760001513365623	20	24	0
19.8847502222564	23.0067424212112	1.2789204892932	20	23	2
19.7467025384707	22.0829886947743	1.36949311110851	20	22	2
19.5805330696005	21.4070275992447	1.44034978983259	20	21	1
18.0917409879449	21.2571448556478	1.55772196144571	18	21	1
17.0088952429354	21.121336737108	1.70038263509935	17	21	1
16.0000000059619	21.0000000573489	2.23999857834292	16	21	3
14.9993714696302	20.8807575937378	2.11923383862067	15	21	2
14.0000002515652	20.7600013512552	2.00000002174133	14	20	2
13.7528011389374	20.9420344999913	1.88385094378249	14	21	2
13.4893728396495	21.1222382674755	1.76615664863082	13	21	2
13.2783107748402	21.3107484773304	1.64214396330162	13.5	21.4	1
12.9999998432021	21.4830511851033	1.55710503250199	13	22	1
12.1710390672441	21.4830497710474	2.09850116145483	12	21	2
11.5027750172667	21.4830483562371	2.69753749357735	11	21	3
11.5027780632144	22.1000000226743	2.69753741150598	12.2	22.1	3
11.4774299531831	22.7922622217556	2.32104194669615	11.7	22.8	2
11.4519106768127	23.4815224130138	1.99062886257731	12	24	2
10.9730513420354	23.5087880649244	1.5663397544646	11	24	1
10.0130382125076	23.5268435850738	1.52497615988106	10	24	2
9.09956868814413	23.5443019127657	1.48005050143692	9	24	1
8.43878824963544	23.5612142374468	1.43878698092611	8	24	1
8.72418199597013	22.7995366885517	1.55427910293581	8.5	22.8	2
9.03972394183204	22.0411535308954	1.66121852935864	9.5	22.2	2
9.27888833840589	21.000204730455	1.76000023569049	10	21	2
8.99999224206377	20.999900819643	1.76000041972974	9	21	1
7.99939989462173	20.9995920765399	1.7600006343179	8	21	2
6.9999998967302	20.9992833330336	1.76000084816839	7	21	1
5.45314027589679	20.8512703367565	1.93578001440618	5.3	21	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
4.19499088704271	20.7001341658539	2.10984878713451	4	20	2
3.91995142359855	20.6404720456346	2.34886217224758	4	21	3
3.00000017679163	20.4512612096665	2.3884730751351	3	20	3
2.72206412688215	20.4512615011275	1.91169450171932	3	21	2
2.37181303810522	20.4512617929192	1.37181087349114	2	21	1
2.37181303848129	19.8554593900977	1.37181087289426	2	20	1
2.37181303893159	19.1439087150732	1.3718108723505	2	19	1
2.3718130394863	18.5487381173714	1.37181087183324	2	18	1
2.99999958504399	18.5487384059903	1.38847350102274	3	19	2
3.1314788877438	18.373554905583	1.36079865466365	3	18	2
3.90534372401881	18.3314932026876	1.16800165270785	4	19	1
4.44706395735918	18.2815478018435	1.0051901851924	4	18	1
5.36750664599786	18.2327646249529	0.842592321807627	5	18.3	1
6.94164719920684	18.1837856130115	0.674693561548969	7	18	0
7.94919904512852	18.1373410102311	0.575785663128254	8	18	1
8.89315494257049	18.0912886611679	0.470923821936912	9	18	1
9.69123403926983	18.0455818675168	0.354129838308138	10	18	0
10.2802166728064	17.9999962265678	0.24395445145916	11	18	0
10.2802167517163	16.9629984354799	0.243953784432032	10	16.3	0
11.9895194085484	17.0511878551804	0.243953795212945	12	17	1
12.3874201611572	17.6118776409027	0.243953804627683	12	18	0
13.0115159329956	17.9915335814974	0.243953814069428	13	18	1
14.9999998114212	18.2802163121378	0.243953822850096	15	19	0
15.3466301399762	15.4945742980248	0.243954443894391	15	15	0
15.9225782801871	14.9999995875092	0.243955063536471	16	15	1
15.9225823551391	12.9999998604799	0.24395516911402	16	13	1
15.9225863433386	10.9297454247946	0.243955251496053	16.5	10.5	0
15.6736685464333	10.9297456919199	1.36164698545311	16	11	2
13.4233575227399	10.9297459588489	1.48884241850886	13	11.3	2
13.4233580527384	9.70419285678699	1.28585656535767	14	9.3	1
11.0000003239437	9.70419293741802	1.28585647353598	11	9	1
10.5000000037641	10.2399984987921	1.28585655491521	10.5	10.5	2
9.99999985345137	10.2399989033604	1.00000041190853	10	11	1
8.58965742828936	9.92331460356968	0.864429239560912	8	10.3	1
8.39350985619946	7.04737802768804	0.707557825677497	8.5	7	0
8.15535244654235	5.6872492825086	0.626423627900781	8.5	5.2	1
7.65550458959754	5.42603239076224	0.526032095463875	7.5	4.9	0
7.65550435471789	5.99999970960843	1.61540204083899	7	6	2
8.20347257476185	6.21354703552354	1.61540212934041	8	6	2
8.8611377995592	6.44263908094504	1.61540221781613	9	6	2
9.40000002063354	6.74449545877355	1.61540230627087	9.4	7.4	2
10.0143295276871	6.63055028020749	1.59464964373121	10	6	2
10.9141045547283	6.59812700273661	1.56526241957657	11	6	2
11.2350313604006	6.57577259363176	1.52359310812535	11	7	1
12.0053258383192	6.55166590389097	1.48789022668971	12	6	2
12.9999997414705	6.53740005322202	0.537403812280461	13	6	0
13.1799045867448	6.62303402344936	0.612958114055073	13	7	0
13.690277786658	6.67493449257575	1.96107351259707	14	6	2
13.7989488143209	6.97252735676079	2.565089557699	13.5	7.5	3
14.5000000357658	7.03008732487921	2.64108670935336	14.5	7.7	3
15.5000000362674	5.66991265452854	2.64108667350707	15.5	5	3
17.0999991123609	5.66991337597638	1.50279251878805	17.1	5.1	1
17.5000000473403	6.93008566536246	1.50279168446502	17.5	7.5	1
18.0461364411902	6.46425148511603	1.57639187609527	18	6	1
19.1413349489335	6.37576679872847	2.03541687884542	19	6	2
20.5035054738838	6.29084077964992	2.50350550882624	21	6	3
20.0001861465946	6.29084086723884	1.70214915103597	20	6	1
19.9998698817321	7.95352019906653	1.71121604721268	20	8	1
19.9995535517284	8.99560851244937	1.72073460095017	20	9	1
19.9992370354179	9.9993083349759	1.73087396347122	20	10	1
19.9989201100861	10.9982551364292	1.74201762569766	20	11	1
19.998602215872	11.9713166509596	1.75539557957448	20	12	1
19.9982765617446	12.240002031682	1.99908141272166	20	13	2
18.4707478362111	12.2400027745383	1.99967034090542	18	12.3	2
17.7211103482663	12.2400035176222	2.00025918743355	17	12	2
17.7211102401386	14.831255128698	2.11113433344003	17	15	2
17.7211101258399	15.0000004284414	2.29301877802412	18	15	3
17.5458661079129	17.5267809987089	2.28925037067698	18	18	2
16.9945764254796	17.7499502620551	2.28551449629674	17	18	3
16.0106453929359	17.7734259146231	2.27945504318639	16	18	3
15.5000000095078	17.7894771990089	2.26973945131728	15.5	18.5	2
14.9999982936856	17.7894761669871	2.2697392819717	15	18	3
14.0000004598322	17.7894749835884	2.26973905135781	14	18	3
13.6255999439478	16.9792837035109	2.26352297546999	13.5	17	3
13.4690736583226	15.4165873339956	2.25638817728411	14	15	2
12.798328481956	15.1945738843689	2.24936884015859	13	15	2
12.0037685012649	14.9832890527941	2.24236336274614	12	15	3
11.5000000036073	14.2600011678202	1.99999999995282	11.5	13.5	2
10.9999998836731	14.9995159396068	1.76000117585589	11	15	1
9.99929004347004	14.9997129600571	1.76000128258574	10	15	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
8.99999999341907	14.9999099795443	1.76000139044902	9	15	1
8.00000000083352	15.0001013738558	1.76000165235969	8	15	1
7.00018117095362	15.0003111957183	2.23999897250895	7	15	3
6.9998187949126	15.2399988736189	1.99999995564988	7	16	2
5.34129065984797	15.022561281226	1.7243632523048	5	15	2
4.39124203760591	14.8065720466902	1.41808653224613	4	15	1
3.88976696079718	14.5662899529455	1.18460881932032	4	14	1
3.30807737879223	14.386340402405	0.973474764971044	3	15	1
2.99794602403018	13.9931954948935	0.756956785105422	3	14	0
2.65247699449915	13.3953556887678	0.747158232336136	3	13	1
2.18432776367086	13.0000001095393	0.73730930417491	2	13	0
2.18432744732166	12.737309282083	1.00000024004868	2	12	1
2.1843274470522	13.9999999875388	2.26269067433761	2	14	3
2.18432776211797	15.0000000002685	1.73730914296456	2	15	1
2.18432837959739	15.9999997300714	1.73730902964886	2	16	1
2.32371832337962	16.3403222848321	1.98197347028863	2	17	2
2.73187686434241	16.4202340185714	2.21286767376022	3	16	2
3.07198231848118	16.5053700460233	2.46691708962752	3	17	3
3.56121391191053	16.561211357882	2.56121401585332	4	17	3
3.54772430232643	15.7873246231778	2.54641354732829	4	16	3
3.53387488402521	13.1310557218508	2.53117394231746	4	13	3
3.51964211951403	12.0546055747438	2.51546325919208	4	12	2
3.50473712926286	11.2802075494126	2.50054286688783	4	11	3
3.08068805303397	11.2534912447139	2.00384404120298	3	12	2
2.90388035628249	11.1247409969887	1.54589146987978	3	11	1
2.72111139553002	10.9999989726693	1.2399997302972	2	11	1
2.72111142866487	10.0003877370322	1.23999921787862	2	10	1
3.00000035941468	10.0000435949063	1.23999903493896	3	10	2
3.46259803056056	9.99972386652803	0.537401710429312	4	10	0
3.46259800497576	9.00000021140611	0.537401736270361	4	9	0
3.28596375067103	8.63188920544559	0.628281689924245	3	9	1
3.12780074052442	8.09457722380591	0.712559561240338	3	8	0
2.99999955394838	7.76000100163127	1.00000006554365	3	7	1
2.5807601626301	8.04192643959477	1.33933424040528	2	8	1
2.37356338807442	8.33814509516745	1.99999998388289	2	9	2
2.37356345305932	7.51441661075678	2.58355380678036	2	7	3
3.58965505668188	7.51441671245998	2.58355382127664	4	8	3
3.58965505001996	6.87621225986332	2.47856237939483	4	7	2
3.58965504334773	6.02806908693232	2.38783920843455	4	6	3
3.58965503645707	5.41580881530883	1.48612914413891	4	5	1
3.2442299809404	5.41580881462318	1.48612922947193	3	5	1
2.99999765652379	5.41580881401927	1.48612931480993	3	6	1
2.00039523081009	5.41580873072753	1.48612947733499	2	6	1
2.00009012569059	4.76588157418929	1.87177140461138	2	5	2
1.99978502127534	3.99999991252176	2.23999906507931	2	4	3

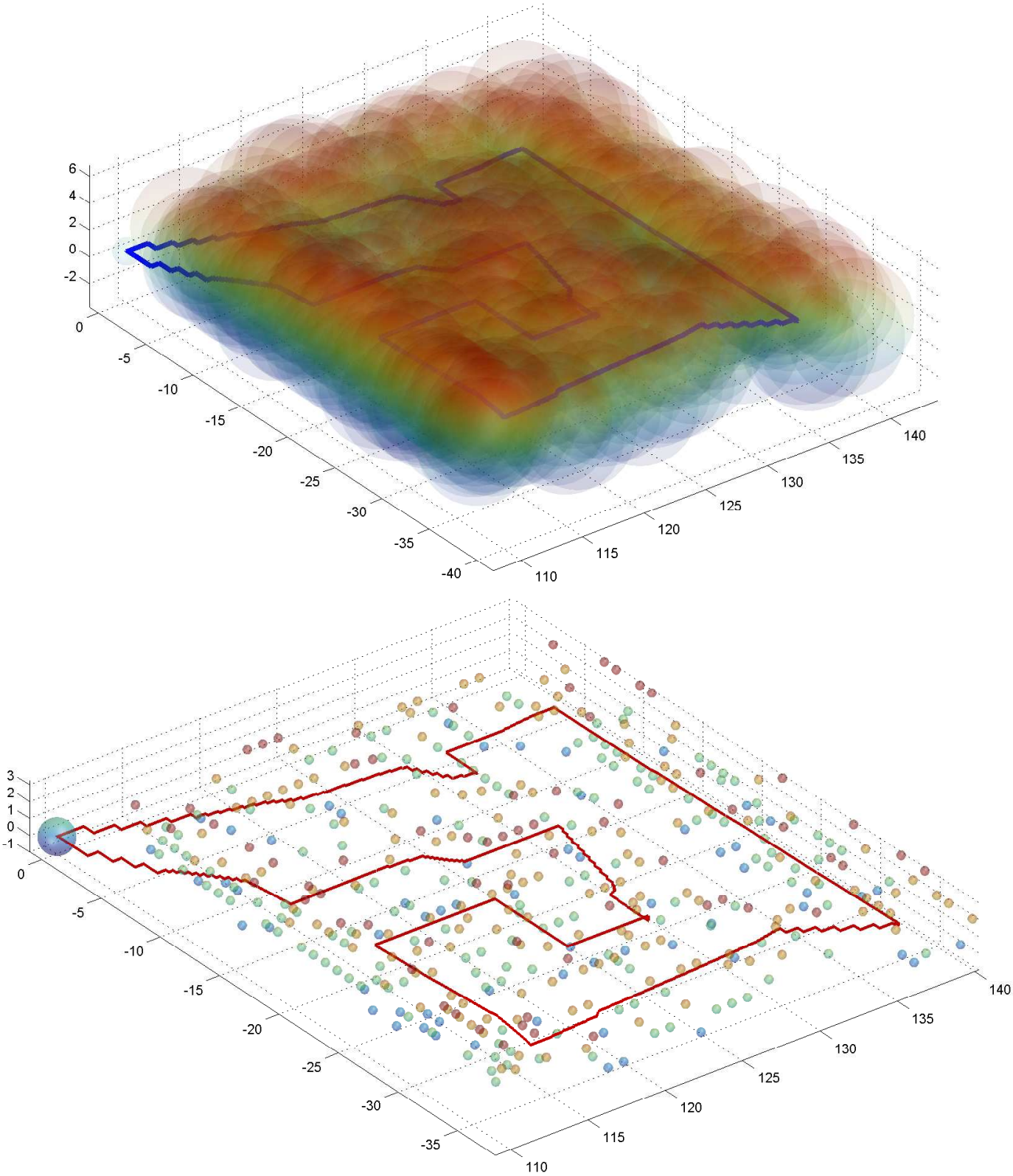


Figure N.187: *pcb*442, $r = 3.8$, Equal Radius, 3D, Manhattan, Length = 180.5786677

Table N-190: Solution for $pcb442$, $r = 3.8$, Equal Radius, 3D, Manhattan

Total distance: 180.57866773468 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
1.73601383704212	0.909202385538539	0.0414779981381521	3	4	0
3.03353631745773	1.54009449883174	0.0829706691688399	4	4	1
4.22371189252908	2.10382620267213	0.124349041054709	4	5	1
5.45667850403518	2.5903711987335	0.165590685910941	6	4	1
6.66485724362619	3.06324000310398	0.206776955839718	8	6	2
7.25884292676362	3.31312843704475	0.246136232249749	7.5	4.9	0
7.25884292676362	3.31312843704475	0.246136232249749	7	6	2
7.8674032768244	3.54040671032208	0.28519400634743	9	3	1
7.8674032768244	3.54040671032208	0.28519400634743	8.5	5.2	1
8.45492875622529	3.76523403727828	0.32417039788383	7	3	0
8.45492875622529	3.76523403727828	0.32417039788383	8	3	2
9.08126600649183	3.99404507459581	0.363065225179695	10	3	3
9.6800442045476	4.22788096255541	0.40161557983841	11	3	3
10.2316218911563	4.46997510408834	0.439740417260611	13	3	2
10.2316218911563	4.46997510408834	0.439740417260611	13	6	0
10.5905926797084	4.72252867949413	0.47743710561305	11	6	2
10.5905926797084	4.72252867949413	0.47743710561305	12	6	2
10.9391267512485	4.96704002231081	0.514915038828423	9	6	2
10.9391267512485	4.96704002231081	0.514915038828423	10	6	2
11.3141714565759	5.20503730584738	0.552164224787873	8.5	7	0
11.3141714565759	5.20503730584738	0.552164224787873	11	7	1
11.7807715842613	5.42329957893027	0.589529070170557	9.4	7.4	2
11.7807715842613	5.42329957893027	0.589529070170557	11	9	1
12.6081874088261	5.56466805318173	0.626237867489552	13.5	7.5	3
12.6081874088261	5.56466805318173	0.626237867489552	14.5	7.7	3
12.9687714589462	5.67645267127788	0.660336753246402	15.5	5	3
12.9687714589462	5.67645267127788	0.660336753246402	14	9.3	1
13.1024996649115	5.71959008772131	0.692371138350579	14	6	2
13.2357622212026	5.76271360460564	0.724353446194289	12	3	3
13.2357622212026	5.76271360460564	0.724353446194289	14	3	1
14.1863508230711	5.87942054347672	0.747584540242428	13	7	0
15.2048814218529	5.99548913759873	0.770837431229919	15.5	3	1
16.2109844282228	6.11560172690413	0.794081235738201	18	3	1
16.831331236691	6.25376534404127	0.817289120789737	17.1	3.1	2
16.831331236691	6.25376534404127	0.817289120789737	17.1	5.1	1
17.4428503293774	6.40415738847469	0.840392388544014	19	3	1
17.4428503293774	6.40415738847469	0.840392388544014	19	6	2
17.7068916545279	6.89708475840321	0.863358968123798	20	6	1
17.962603609096	7.40558947953652	0.886323215371267	18	6	1
18.2192817714718	7.93138275105114	0.909287426665291	17.5	7.5	1
18.2192817714718	7.93138275105114	0.909287426665291	20	8	1
18.4745748260508	8.46487203790731	0.932252229648792	16.5	10.5	0
18.4745748260508	8.46487203790731	0.932252229648792	20	10	1
18.7391736438973	8.93351734178742	0.955264049937124	16	11	2
18.7391736438973	8.93351734178742	0.955264049937124	17	12	2
19.2877742882626	9.15179676765679	0.977800671142528	18	12.3	2
19.9999968209062	9.33388611862912	1.00019521322913	20	13	2
20.0047047119508	8.86562696259003	1.00019522302523	20	9	1
20.0047047119508	8.86562696259003	1.00019522302523	20	11	1
20.009412312085	8.37405787664618	1.00019523281652	21	6	3
20.009412312085	8.37405787664618	1.00019523281652	20	12	1
20.0141169104015	7.15531171818104	1.00019524261197	20	3.7	2
20.0188196789829	6.66606245205463	1.00019525238573	20	3	2
20.9997483546594	6.66604330314594	1.00019526216691	21	3	2
21.9895795482244	6.66602533214999	1.00019527194296	22	3	1
22.9999999813068	6.66600736201247	1.00019528148369	23	3	0
23.8161970571625	6.66785332149279	1.0540966516389	24	3	2
24.1658198114263	6.66981491175291	1.09278592230115	22	4.7	1
24.5435296388782	6.67177732632423	1.13149706975831	22	6	1
24.5435296388782	6.67177732632423	1.13149706975831	23	6	0
24.9691752692678	6.67374022960541	1.17032818927947	24	6	2
25.4067931138864	6.67570335854886	1.20911679265728	25	3	2
25.4067931138864	6.67570335854886	1.20911679265728	26	4	1
26.9547224452889	6.67772345678191	1.2440053592447	29	4	3
26.9573667294709	7.24685095933817	1.24684808643169	26	5	1
26.9600113165116	7.86722389560431	1.24969109230143	24.5	7.1	0
26.9600113165116	7.86722389560431	1.24969109230143	25	8	2
26.9600113165116	7.86722389560431	1.24969109230143	25.5	7.1	2
26.9600113165116	7.86722389560431	1.24969109230143	26	8	2
26.9600113165116	7.86722389560431	1.24969109230143	26	9	0
26.9600113165116	7.86722389560431	1.24969109230143	26	10	1
26.9600113165116	7.86722389560431	1.24969109230143	27	7	2
26.9600113165116	7.86722389560431	1.24969109230143	27.5	5.2	2
26.9600113165116	7.86722389560431	1.24969109230143	27	8	3
26.9600113165116	7.86722389560431	1.24969109230143	27	9	2
26.9600113165116	7.86722389560431	1.24969109230143	27	10	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.9600113165116	7.86722389560431	1.24969109230143	27	11	1
26.9600113165116	7.86722389560431	1.24969109230143	28	9	1
26.9600113165116	7.86722389560431	1.24969109230143	29	5	2
26.9600113165116	7.86722389560431	1.24969109230143	29.3	9.5	1
26.9600113165116	7.86722389560431	1.24969109230143	30	7	3
26.9600113165116	7.86722389560431	1.24969109230143	30	8	3
26.9600113165116	7.86722389560431	1.24969109230143	30	9	1
26.9626375616674	9.04414776937441	1.25252546115626	30	10	3
26.9652547667792	9.8306440973317	1.25535422845506	26	11	3
26.9652547667792	9.8306440973317	1.25535422845506	26	12	1
26.9678733327915	10.5198948104002	1.25818250016244	28	11.3	2
26.9704917095248	11.1979092789743	1.26101057836896	30	11	3
26.9704917095248	11.1979092789743	1.26101057836896	30	12	0
26.9731011628408	11.841893606293	1.2638371969528	27	12	1
26.9731011628408	11.841893606293	1.2638371969528	27	13	2
26.9757110031197	12.4723232180648	1.26666378827585	26	13	1
26.9783214239697	13.098701760189	1.26949058937347	23.9	13	0
26.9809353629726	13.7359515118355	1.27231907155568	26	16	1
26.9809353629726	13.7359515118355	1.27231907155568	27	15	1
26.9835498823852	14.3088389495013	1.2751479004581	27	16	2
26.9861644409725	14.8598879109375	1.27797640109902	23.2	15	1
26.9956938978773	14.9390604183386	1.28098001805994	26	15	1
27.0052288390585	15.018292473803	1.28398387480457	27	17	2
27.0052288390585	15.018292473803	1.28398387480457	27	18	1
27.0147673173761	15.0953024881541	1.28698767654007	26	17	2
27.0147673173761	15.0953024881541	1.28698767654007	26	18	2
27.0243250057955	15.1699178937437	1.28999039549033	26	14	2
27.0243250057955	15.1699178937437	1.28999039549033	27	14	1
27.0338912419955	15.2452190104574	1.29299310957368	29	14	2
27.0338912419955	15.2452190104574	1.29299310957368	30	13	2
27.0422503961674	15.8828146061134	1.29596355225871	30	15	1
27.0505896386527	16.569430696708	1.29893432636915	30	16	1
27.05891125692	17.2918110955822	1.30190539916521	29.5	17.5	1
27.05891125692	17.2918110955822	1.30190539916521	30	17	1
27.0672080835192	18.0387029418508	1.30487696718108	30	18	1
27.0754890837061	18.7972401885665	1.30784879946426	30	19	0
27.0837476601667	19.5510463125007	1.31082211930628	30	20	2
27.0837476601667	19.5510463125007	1.31082211930628	30	21	0
27.0919435553211	20.1348508860157	1.31379750793138	29.5	20.5	1
27.1001314979021	20.7169457161128	1.31677314698723	28.5	22	1
27.1001314979021	20.7169457161128	1.31677314698723	30	23	1
27.1081792006253	21.0056110923774	1.31975100236656	30	22	3
27.1081792006253	21.0056110923774	1.31975100236656	29	24	2
27.116144450701	21.2147384375745	1.32272333938981	27	23	2
27.116144450701	21.2147384375745	1.32272333938981	27.6	23.6	1
27.124111403218	21.4155817262085	1.32569570482743	26	23	3
27.1320845475371	21.6129704823169	1.32866693822296	24	21	2
27.1320845475371	21.6129704823169	1.32866693822296	26	21	2
27.1400904380014	21.8160888850386	1.33163714425146	27	19	3
27.148098860344	22.0377635906532	1.33460515527107	27	20	1
27.148098860344	22.0377635906532	1.33460515527107	27	21	1
27.1561109516115	22.2684384287966	1.33757355816053	26	19	0
27.1561109516115	22.2684384287966	1.33757355816053	26	20	1
27.1641938211017	23.0056733153059	1.34055187251319	26	22	0
27.1641938211017	23.0056733153059	1.34055187251319	27	22	0
27.1722836949545	23.8255795353006	1.34353164806803	26	24	0
27.1722836949545	23.8255795353006	1.34353164806803	26	25	1
27.180382813783	24.6286548548672	1.34651223288897	27	25	1
27.1884835427019	25.4355754709278	1.34949293351667	30	26	1
27.1965708765971	26.2232825187023	1.35247381145737	30	25	1
27.2046412533106	27.1223555879744	1.35545497808193	28.5	27	1
27.2046412533106	27.1223555879744	1.35545497808193	30	27	1
27.2126977341999	28.0793260452205	1.35843656795203	29	30	0
27.2126977341999	28.0793260452205	1.35843656795203	30	30	0
27.2206652959749	28.5477102959336	1.36142474616995	30	29	2
27.2206652959749	28.5477102959336	1.36142474616995	30	31	1
27.2284620734217	28.7700789125437	1.36441523948995	30	28	3
27.2362359051795	28.9993441460014	1.36740348910821	27	26	3
27.2362359051795	28.9993441460014	1.36740348910821	27	27	1
27.2440161734097	29.2738238392438	1.37038925016612	26	26	1
27.2440161734097	29.2738238392438	1.37038925016612	26	27	2
27.2518234225187	29.6609486499255	1.37337548515726	26	28	1
27.259636061865	30.0655538627836	1.3763620084515	27	28	0
27.259636061865	30.0655538627836	1.3763620084515	27	29	1
27.2674532542882	30.5108401923567	1.37934978842389	26	29	0
27.2674532542882	30.5108401923567	1.37934978842389	27	33	2
27.2752778359303	30.9482736279504	1.38233806990407	27	30	3
27.2752778359303	30.9482736279504	1.38233806990407	27	31	3
27.2831062707149	31.404009387194	1.38532469872484	26	30	2
27.2909398838125	31.8811877917097	1.38831111031256	26	31	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.2909398838125	31.8811877917097	1.38831111031256	27	32	2
27.2987801319251	32.3792965227177	1.39129770635469	30	32	3
27.2987801319251	32.3792965227177	1.39129770635469	30	33	2
27.3065915770039	32.8870712976726	1.39428199840978	28.5	33.5	2
27.314401351657	33.394303984523	1.39726606221283	27	34	2
27.3222133985633	33.9021898376591	1.40024995935454	27	35	2
27.3300277780032	34.4046422476789	1.40323365021308	26.2	36.5	2
27.3378476889679	34.8783104442263	1.40621700116693	27	36	0
27.3456704232582	35.3456653632897	1.4092012530401	30	38	2
27.2309731912295	35.1951201150495	1.40920126655196	30	34	3
27.2309731912295	35.1951201150495	1.40920126655196	30	35	2
27.2309731912295	35.1951201150495	1.40920126655196	27	38	1
27.2309731912295	35.1951201150495	1.40920126655196	30	36	2
27.1035950165285	35.0455939653368	1.40920128008354	30	37	0
26.2643641979745	34.5683261985091	1.40920129359865	27	37	0
25.3888240204362	34.0305837852716	1.40920130710539	26	34	2
24.5138828538672	33.5021822295471	1.40920132061374	23	34	3
23.7182574704173	32.9735629707495	1.40920133412894	23.2	31.5	2
22.951268608964	32.4722872802374	1.4092013476452	22.8	32.5	1
22.2000000226789	31.9779035251964	1.40920136115806	22.2	28.2	1
21.8498509414553	32.0327677869415	1.40920139209748	20	29	1
21.5652194915949	32.0908876873151	1.40920142275589	20	31	0
21.2894206318638	32.1493357754631	1.40920145368755	22	32	2
21.0129336772063	32.2078976220023	1.40920148462391	21.5	32.5	2
20.7364451984897	32.2664932786151	1.40920151556591	21	32	1
20.4606301084826	32.325197826405	1.40920154622117	23	35	1
19.8324980399743	32.3774792871128	1.40920157716151	20.5	31.5	3
19.1988030134697	32.4299445218529	1.40920160810883	20	30	3
18.5394589912302	32.4831274650969	1.40920163876764	19	35.2	1
18.5394589912302	32.4831274650969	1.40920163876764	20	35	2
17.8119808617647	32.5352291825429	1.40920166972019	17.9	33.3	2
17.8119808617647	32.5352291825429	1.40920166972019	18.3	34.5	2
17.0878512855743	32.5871214640838	1.40920170067578	16	33	2
16.3953465820927	32.6390465101659	1.40920173163207	17.2	34.1	2
16.3953465820927	32.6390465101659	1.40920173163207	17	36	1
15.6335568145297	32.6892036820086	1.40920176258798	16	36	1
14.8436656480137	32.7381051151487	1.40920179324858	15	36	1
14.048736189364	32.7859743929148	1.40920182390624	13	36	2
14.048736189364	32.7859743929148	1.40920182390624	14	36	0
13.3872991430515	32.8308916697453	1.40920185486539	13	30	2
13.3872991430515	32.8308916697453	1.40920185486539	14	30	1
12.7291711811786	32.8769560507484	1.40920188582431	14	33	1
12.7291711811786	32.8769560507484	1.40920188582431	15	33	2
11.9918774909415	32.9230909288706	1.40920191678419	12	33	1
11.9918774909415	32.9230909288706	1.40920191678419	13	33	2
11.2457162929087	32.9693075802807	1.40920194774185	12	30	2
10.4567814969822	33.0162761547336	1.40920197840173	10	30	3
10.4567814969822	33.0162761547336	1.40920197840173	11	30	2
9.7021462513970 8	33.0654786180491	1.40920200905858	8	30	0
9.57028425009842	33.1745410613945	1.4092020397197	8	33	2
9.57028425009842	33.1745410613945	1.4092020397197	9	33	2
9.44028814437007	33.2844013491165	1.40920207070234	10	33	0
9.44028814437007	33.2844013491165	1.40920207070234	11	33	1
9.30905016491093	33.3952352729088	1.40920210166984	11	36	1
9.30905016491093	33.3952352729088	1.40920210166984	12	36	1
8.57401319454959	33.4608071818407	1.40920213233727	9	36	0
8.57401319454959	33.4608071818407	1.40920213233727	10	36	2
7.74107370579345	33.5247139066587	1.40920216330892	7	36	1
7.74107370579345	33.5247139066587	1.40920216330892	8	36	0
6.9431181083289	33.5873780471827	1.40920219426981	6.2	36.5	2
6.20000002738975	33.6490054761445	1.409202224935	6.2	37.1	3
5.73835235120335	33.6490054784953	1.40920223238535	4	36	2
5.31180603220517	33.6490054808402	1.40920223983834	7	33	1
5.31180603220517	33.6490054808402	1.40920223983834	4.7	34.5	1
4.87752587447608	33.6490054831887	1.40920224728497	2	36	2
4.76569717968859	33.6490054852459	1.40920225473068	1.5	35	1
4.76569717968859	33.6490054852459	1.40920225473068	1.5	35.5	2
4.79522059574293	33.5275599914179	1.40920225490496	4	34	3
4.82477850418842	33.4061846203036	1.40920225507989	4	35	3
4.85437683101132	33.2837980641922	1.40920225525552	3	35	2
4.88408072673526	33.1600719490822	1.40920225543138	2	35	3
4.92235398928898	32.8410563000468	1.40920225560725	2	33	3
4.96128861796923	32.5223418710557	1.40920225578302	2	34	1
4.96128861796923	32.5223418710557	1.40920225578302	3	34	1
5.00111476455123	32.1716480962561	1.40920225595913	3	33	1
5.00111476455123	32.1716480962561	1.40920225595913	4	33	1
5.04118129352103	31.8175626118905	1.40920225613546	2	32	1
5.04118129352103	31.8175626118905	1.40920225613546	3	32	2
5.0819338075536	31.4665337505039	1.40920225631177	4	32	1
5.12276800998333	31.115980856949	1.40920225648785	5.2	32	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
5.12276800998333	31.115980856949	1.40920225648785	4.7	33.5	3
5.1636847099923	30.7396511328431	1.4092022566641	4	31	2
5.1636847099923	30.7396511328431	1.4092022566641	5	31	1
5.20471798809702	30.3675139795808	1.40920225684098	3	30	2
5.20471798809702	30.3675139795808	1.40920225684098	3	31	2
5.24620742308245	30.0000000626586	1.40920225701886	9	30	2
5.21208935951631	29.8546505029991	1.40920225123243	7	30	2
5.17786844003173	29.7096601297223	1.4092022454477	2	30	3
5.17786844003173	29.7096601297223	1.4092022454477	2	31	3
5.15359144906061	29.2703173286323	1.40920223965575	2	28	2
5.15359144906061	29.2703173286323	1.40920223965575	2	29	1
5.12990178031585	28.8886831655495	1.40920223386446	3	28	0
5.12990178031585	28.8886831655495	1.40920223386446	3	29	2
5.1063681537716	28.5219111462266	1.40920222807606	4	30	0
5.08287039414527	28.1463002071409	1.40920222229155	4	28	2
5.05940080448721	27.7746448311846	1.40920221650356	4	29	2
5.03596228645596	27.398283078942	1.40920221071533	7	27	1
5.01246891270439	27.0278028303049	1.4092022049272	8	27	1
4.98881548005406	26.6606508767048	1.40920219913996	7.5	25.5	1
4.98881548005406	26.6606508767048	1.40920219913996	8	26	0
4.9647612706446	26.3248449341701	1.40920219335326	4.7	25.5	2
4.9647612706446	26.3248449341701	1.40920219335326	4	26	0
4.94075207209805	25.9986176809456	1.40920218756954	3	26	3
4.91681862278267	25.6745415424507	1.40920218178075	2	25	2
4.91681862278267	25.6745415424507	1.40920218178075	4	25	2
4.89307909826803	25.3641707410141	1.40920217599026	3	25	0
4.86940575301875	25.0577860452362	1.40920217020195	3	27	0
4.86940575301875	25.0577860452362	1.40920217020195	4	27	0
4.8458723378879	24.7223173075031	1.4092021644144	2	26	0
4.8458723378879	24.7223173075031	1.4092021644144	2	27	1
4.82340888760146	24.051754064223	1.40920215862643	2	23	1
4.82340888760146	24.051754064223	1.40920215862643	2	24	0
4.80124507853081	23.4463189235992	1.40920215283882	4	23	2
4.80124507853081	23.4463189235992	1.40920215283882	5.4	23.3	2
4.77908896016194	22.8629742272495	1.40920214705037	2	21	1
4.77908896016194	22.8629742272495	1.40920214705037	2	22	1
4.77908896016194	22.8629742272495	1.40920214705037	3	23	1
4.77908896016194	22.8629742272495	1.40920214705037	3	24	1
4.77908896016194	22.8629742272495	1.40920214705037	4	24	1
4.77908896016194	22.8629742272495	1.40920214705037	5.4	24.3	3
4.75736339961315	22.3715400632421	1.40920214125992	3	22	0
4.73568580204726	21.8892770302597	1.40920213547179	2	20	1
4.71421037561399	21.4734688241986	1.40920212968414	4	21	3
4.6927514348267	21.0640947079199	1.40920212389427	3	20	3
4.6927514348267	21.0640947079199	1.40920212389427	3	21	2
4.6713923331983	20.6713699005054	1.40920211810417	2	18	1
4.6713923331983	20.6713699005054	1.40920211810417	2	19	1
4.96706668325666	20.671739999435	1.40920211816893	3	18	2
4.96706668325666	20.671739999435	1.40920211816893	3	19	2
5.31455665543849	20.6721101909004	1.40920211823578	4	18	1
5.67951393171417	20.6724804331487	1.40920211830205	5	18.3	1
5.67951393171417	20.6724804331487	1.40920211830205	4	19	1
6.06697201446617	20.6728507344044	1.40920211836805	4	20	2
6.06697201446617	20.6728507344044	1.40920211836805	5.3	21	2
6.47980170692736	20.6732210414573	1.40920211843153	7	21	1
6.47980170692736	20.6732210414573	1.40920211843153	4	22	1
6.92957157845072	20.6735913268111	1.40920211849482	8	21	2
6.92957157845072	20.6735913268111	1.40920211849482	10	21	2
7.31479105819115	20.6739616146547	1.40920211856075	7	18	0
7.70653761219859	20.674331954712	1.40920211862551	8	18	1
8.09641564489807	20.6747023391547	1.40920211868998	9.5	22.2	2
8.47685471025197	20.6750727213045	1.40920211875124	8.5	22.8	2
8.47685471025197	20.6750727213045	1.40920211875124	7	24	2
9.05574710803738	20.6754427078837	1.40920211881213	8	24	1
9.7405224574382	20.6758125354107	1.40920211887634	9	18	1
9.7405224574382	20.6758125354107	1.40920211887634	9	21	1
10.4821788010283	20.6761824203742	1.40920211894059	10	18	0
11.2633923571062	20.6765523623149	1.40920211899933	11	18	0
12.0736831852519	20.6769223579186	1.40920211906002	15	19	0
12.4422320988117	20.6772924983967	1.40920211911736	15.5	18.5	2
12.4424955764381	21.1663717284032	1.40920211915781	13.5	21.4	1
12.4424955764381	21.1663717284032	1.40920211915781	13	22	1
12.4427590354917	21.6537210559226	1.40920211919314	13	21	2
12.4427590354917	21.6537210559226	1.40920211919314	14	21	2
12.4430224751004	22.163165786098	1.4092021192287	11	21	3
12.4430224751004	22.163165786098	1.4092021192287	12	21	2
12.4432859304966	22.7161714546079	1.40920211926478	12.2	22.1	3
12.4435493870146	23.2836608939379	1.40920211930121	11.7	22.8	2
12.4435493870146	23.2836608939379	1.40920211930121	12	24	2
12.4438128498472	23.8606147888399	1.40920211933755	13	24	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.4440763073173	24.4422588636369	1.40920211937361	11	24	1
12.4443397731815	25.0373992210242	1.40920211941391	9	24	1
12.4443397731815	25.0373992210242	1.40920211941391	10	24	2
12.4446033800916	25.9159211856577	1.40920211945343	9.1	26	1
12.4446033800916	25.9159211856577	1.40920211945343	10	26	2
12.4448670672254	26.795745979189	1.40920211949215	9	27	3
12.8782616985059	26.8003017401941	1.40920211947678	10	27	1
13.368851888197	26.8048577128716	1.40920211946078	11	27	2
13.9007952669668	26.8094139221871	1.40920211943883	14	27	0
13.9007952669668	26.8094139221871	1.40920211943883	15	27	3
14.4240243587419	26.8139706213271	1.40920211942276	12	27	0
14.4240243587419	26.8139706213271	1.40920211942276	13	27	2
15.0378287732468	26.8185279837987	1.40920211940548	14	28.2	1
15.0378287732468	26.8185279837987	1.40920211940548	14	29	1
15.7109194239717	26.8230832893548	1.40920211937933	15	28	2
15.7109194239717	26.8230832893548	1.40920211937933	15	28.6	2
16.4308850734035	26.8276373464182	1.40920211936237	15	30	2
16.4308850734035	26.8276373464182	1.40920211936237	16	30	2
17.6309724229337	26.8321732440842	1.40920211934642	19	30	3
17.6309724253185	26.8321717436745	1.26591635730001	20	27	2
17.6309724253185	26.8321717436745	1.26591635730001	20	28	2
17.6309724278156	26.8321702432636	1.12073451500872	21.2	27.5	0
17.6309724296295	26.2445631194822	1.12073362172743	18.3	28	0
17.6309724314419	25.6316617927407	1.12073272844902	16	27	0
17.6309724332377	25.0000000036714	1.12073183517335	14	25	0
17.6617179626526	24.2078196492715	1.1207318112705	14	24	1
17.6617179626526	24.2078196492715	1.1207318112705	15	24	1
17.6946541126898	23.5152219229905	1.12073178745721	15	21	2
17.6946541126898	23.5152219229905	1.12073178745721	16	21	3
17.7880999629923	23.465630837547	1.12073176363814	16	24	2
17.7880999629923	23.465630837547	1.12073176363814	17	24	2
17.8828855785811	23.4160071244393	1.12073173982047	18	24	2
17.9777765298456	23.3663719955189	1.12073171600091	17.9	25.8	2
17.9777765298456	23.3663719955189	1.12073171600091	18.3	27	1
18.0716505150361	23.3118360385265	1.12073169218565	17.2	26.1	2
18.0716505150361	23.3118360385265	1.12073169218565	16.9	26.8	2
18.2504662928178	23.0180456953481	1.12073166836437	20	25	3
18.4226454120347	22.7015385724698	1.12073164454248	20	24	0
18.4226454120347	22.7015385724698	1.12073164454248	20	26	1
18.5728058398914	22.0004507597657	1.1207316207231	20	22	2
18.5728058398914	22.0004507597657	1.1207316207231	20	23	2
18.72083876737	21.2936672477091	1.12073159690172	17	21	1
18.72083876737	21.2936672477091	1.12073159690172	18	21	1
18.8720035718757	20.6164442163059	1.12073157308533	20	21	1
19.022574094975	19.9398420004627	1.12073154926807	20	20	3
19.1724289637912	19.2691586336883	1.12073152544957	21.7	19	3
19.1724289637912	19.2691586336883	1.12073152544957	21.1	20	2
19.3145845857871	18.6074881484158	1.120731501625	20	18	0
19.3145845857871	18.6074881484158	1.120731501625	20	19	2
19.4563528552008	17.9627798613802	1.12073147780339	20	17	0
19.5980050477251	17.3406852802566	1.12073145398595	20	15	1
19.5980050477251	17.3406852802566	1.12073145398595	20.6	16.5	1
19.7390199092761	16.7872573654882	1.12073143016929	20	14	2
19.8798937662971	16.3031245963525	1.12073140625893	22.9	14	1
19.0568526010364	16.3031246085776	1.12073138871346	20	16	3
18.2113730692049	16.3031246208056	1.12073137116447	18	15	3
17.3871409302794	16.3031246330489	1.1207313536162	18	18	2
16.5538369992267	16.3031246452856	1.12073133606723	17	18	3
15.7116020474069	16.3031246575229	1.12073131851873	17	15	2
15.7116020474069	16.3031246575229	1.12073131851873	15	18	3
14.8816923734682	16.3031246697681	1.12073130096995	16	18	3
14.0000000824692	16.3031246819999	1.12073128341869	14	20	2
13.8182910715256	16.1147343065408	1.11482711350711	13.5	17	3
13.6375060635373	15.9252529647849	1.10891967228939	14	18	3
13.4561731317808	15.730174263104	1.10300714168094	12	18	0
13.4561731317808	15.730174263104	1.10300714168094	13	18	1
13.2803958604484	15.5231123908615	1.09709873610646	10	16.3	0
13.2803958604484	15.5231123908615	1.09709873610646	12	17	1
13.1307775953266	15.3041998478495	1.0912015083015	11.5	13.5	2
13.1307775953266	15.3041998478495	1.0912015083015	11	15	1
12.9863913958683	15.0927339076456	1.08530277133767	12	15	3
12.8433110864285	14.8820235095529	1.07940046121158	13	15	2
12.7003563886115	14.6716338730669	1.07349702968198	15	15	0
12.7003563886115	14.6716338730669	1.07349702968198	16	15	1
12.5436295889491	14.4590229242785	1.06759704715301	16	13	1
11.7109202618398	14.3140229444815	1.061700835005	13	11.3	2
11.7109202618398	14.3140229444815	1.061700835005	14	15	2
10.507826986246	14.1793627133	1.05579694633537	10.5	10.5	2
9.74580552609595	14.1747437081847	1.0471664092703	10	11	1
8.97255458653922	14.1701350550111	1.03853693400571	9	15	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
8.97255458653922	14.1701350550111	1.03853693400571	10	15	2
8.18361852490172	14.1655252206944	1.02990534463975	8	15	1
7.40470813955402	14.1609148759625	1.02127448325699	7	15	3
7.40470813955402	14.1609148759625	1.02127448325699	7	16	2
6.66048439457424	14.1563015441814	1.01263250682799	5	15	2
5.96456361218596	14.1516874486144	1.00398712651667	4	15	1
5.31780767380694	14.1470725486841	0.995342462753874	3	15	1
4.72782878452557	14.1424566217739	0.986698516394224	2	16	1
4.72782878452557	14.1424566217739	0.986698516394224	3	16	2
4.27945283881142	14.1378310273681	0.978050196195132	2	17	2
4.27945283881142	14.1378310273681	0.978050196195132	3	17	3
4.2735654440777	13.9390387754539	0.952307717912738	4	17	3
4.26768464123916	13.6084128218112	0.925676883520757	4	16	3
4.26180532368063	13.2450086197942	0.898879896277538	2	14	3
4.26180532368063	13.2450086197942	0.898879896277538	2	15	1
4.25594421210519	12.8512986133412	0.871911820252791	4	13	3
4.25594421210519	12.8512986133412	0.871911820252791	4	14	1
4.25008451759871	12.4527153080878	0.844869239151781	4	11	3
4.25008451759871	12.4527153080878	0.844869239151781	4	12	2
4.24422627829857	12.0748235888539	0.817696586008031	3	12	2
4.23837050967887	11.6988068625758	0.790489291582694	3	10	2
4.23837050967887	11.6988068625758	0.790489291582694	3	11	1
4.23251994525073	11.3428678141457	0.763230608844385	2	9	2
4.23251994525073	11.3428678141457	0.763230608844385	2	10	1
4.22669130913495	11.050371582685	0.735776585132003	2	11	1
4.22669130913495	11.050371582685	0.735776585132003	2	12	1
4.22087274634735	10.7547650905436	0.708306811954751	2	13	0
4.22087274634735	10.7547650905436	0.708306811954751	3	14	0
4.21507543823371	10.307481085853	0.681050217986268	8	10.3	1
4.21507543823371	10.307481085853	0.681050217986268	3	13	1
3.99675634028161	9.88575620500311	0.635755244650061	4	10	0
3.77869970826089	9.46480821576997	0.590517101327788	4	9	0
3.56051767489251	9.04829736621446	0.545333460054613	3	8	0
3.34365185784358	8.64025742199416	0.500205243860366	2	8	1
3.12968536872944	8.23789892040387	0.455043609423283	2	7	3
2.9210040899717	7.85580345989478	0.409377533386372	3	7	1
2.71241433823927	7.47933209681245	0.363676230230817	4	7	2
2.5011200167135	7.1072090262941	0.317809662405085	4	6	3
2.28051478327708	6.75588283010004	0.271188552270337	2	6	1
2.28051478327708	6.75588283010004	0.271188552270337	3	6	1
2.05954998794893	6.41291335289259	0.22446916170236	4	8	3
2.05954998794893	6.41291335289259	0.22446916170236	3	9	1
1.58826637924088	5.16297939514939	0.169209738778826	3	5	1
1.1039506212983	3.93315297239012	0.113855353414309	2	5	2
0.608254583955073	2.61185452763476	0.0581810856931835	2	4	3

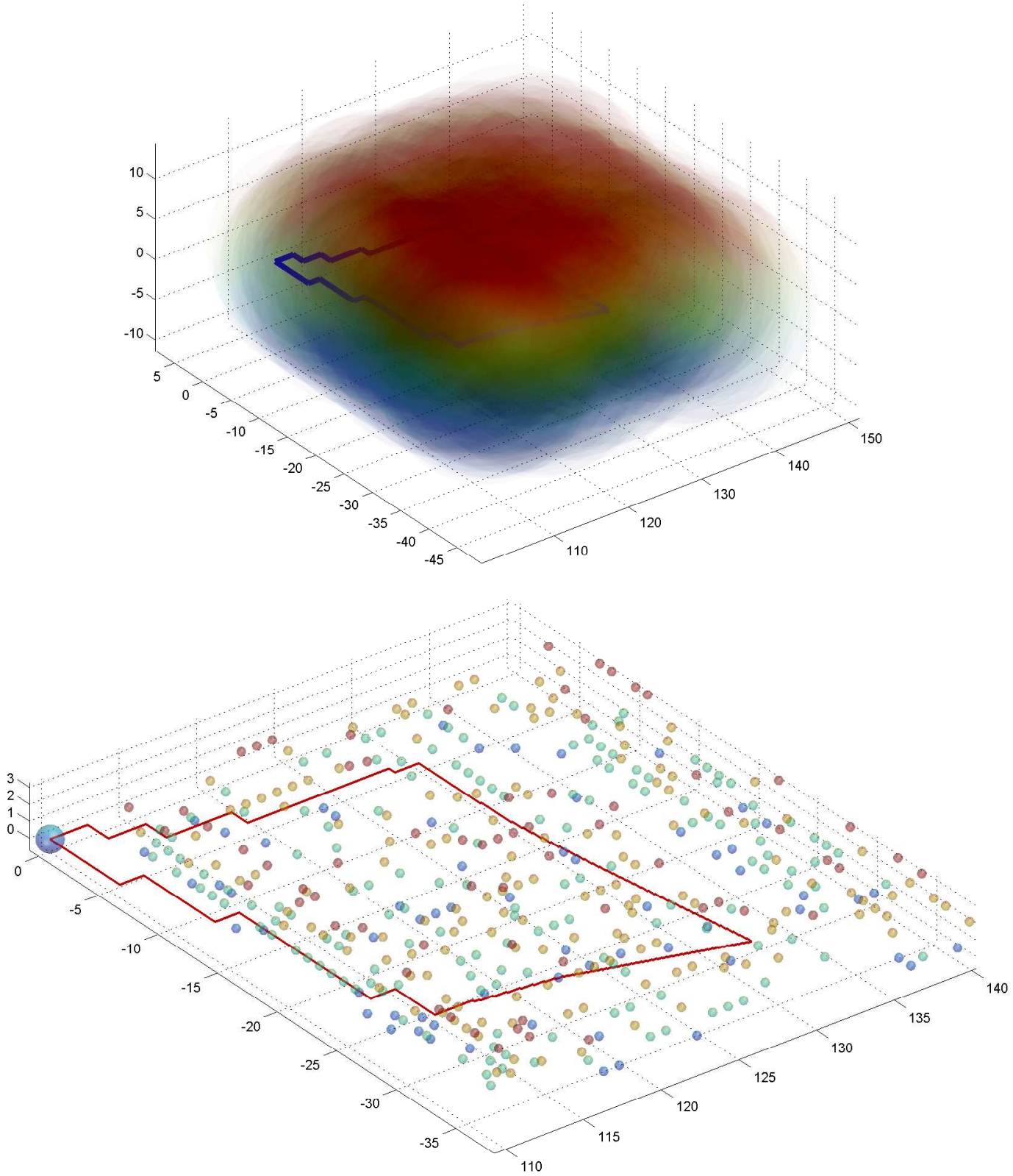


Figure N.188: *pcb*442, $r = 11.4$, Equal Radius, 3D, Manhattan, Length = 104.2560242

Table N-191: Solution for $pcb442$, $r = 11.4$, Equal Radius, 3D, Manhattan

Total distance: 104.256024181597 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
2.41460299566347	1.75308066764486	3.5198510772716E-11	4	4	1
2.41460299566347	1.75308066764486	3.5198510772716E-11	3	4	0
4.82404076711646	3.4713611956644	3.43970185667786E-10	4	10	0
4.82404076711646	3.4713611956644	3.43970185667786E-10	4	9	0
4.82404076711646	3.4713611956644	3.43970185667786E-10	4	7	2
4.82404076711646	3.4713611956644	3.43970185667786E-10	4	6	3
4.82404076711646	3.4713611956644	3.43970185667786E-10	3	9	1
4.82404076711646	3.4713611956644	3.43970185667786E-10	2	7	3
4.82404076711646	3.4713611956644	3.43970185667786E-10	6	4	1
4.82404076711646	3.4713611956644	3.43970185667786E-10	3	7	1
4.82404076711646	3.4713611956644	3.43970185667786E-10	2	8	1
4.82404076711646	3.4713611956644	3.43970185667786E-10	4	5	1
4.82404076711646	3.4713611956644	3.43970185667786E-10	3	6	1
4.82404076711646	3.4713611956644	3.43970185667786E-10	2	5	2
4.82404076711646	3.4713611956644	3.43970185667786E-10	2	4	3
9.01689322125682	4.81831053083259	6.82449652344985E-10	13	15	2
9.01689322125682	4.81831053083259	6.82449652344985E-10	8	10.3	1
9.01689322125682	4.81831053083259	6.82449652344985E-10	4	11	3
9.01689322125682	4.81831053083259	6.82449652344985E-10	4	8	3
9.01689322125682	4.81831053083259	6.82449652344985E-10	3	11	1
9.01689322125682	4.81831053083259	6.82449652344985E-10	3	10	2
9.01689322125682	4.81831053083259	6.82449652344985E-10	2	11	1
9.01689322125682	4.81831053083259	6.82449652344985E-10	2	10	1
9.01689322125682	4.81831053083259	6.82449652344985E-10	2	9	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	29	4	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	14	15	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	25	3	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	21	6	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	20	9	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	15	15	0
18.1075601456802	5.32003908751171	1.01900177185144E-9	24	3	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	20	8	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	16	11	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	16.5	10.5	0
18.1075601456802	5.32003908751171	1.01900177185144E-9	11.5	13.5	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	20	6	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	19	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	13	11.3	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	17.5	7.5	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	22	3	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	21	3	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	20	3.7	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	14.5	7.7	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	20	3	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	18	6	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	14	9.3	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	13.5	7.5	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	15.5	5	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	17.1	5.1	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	10.5	10.5	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	19	3	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	17.1	3.1	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	18	3	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	14	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	10	11	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	11	9	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	13	7	0
18.1075601456802	5.32003908751171	1.01900177185144E-9	12	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	15.5	3	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	13	6	0
18.1075601456802	5.32003908751171	1.01900177185144E-9	11	7	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	11	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	9.4	7.4	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	14	3	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	13	3	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	12	3	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	10	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	11	3	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	9	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	10	3	3
18.1075601456802	5.32003908751171	1.01900177185144E-9	8	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	8.5	7	0
18.1075601456802	5.32003908751171	1.01900177185144E-9	7	6	2
18.1075601456802	5.32003908751171	1.01900177185144E-9	8.5	5.2	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	9	3	1
18.1075601456802	5.32003908751171	1.01900177185144E-9	8	3	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.1075601456802	5.32003908751171	1.01900177185144E-9	7.5	4.9	0
18.1075601456802	5.32003908751171	1.01900177185144E-9	7	3	0
19.6458206221187	10.4616514845818	1.32959421250689E-9	30	15	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	30	10	3
19.6458206221187	10.4616514845818	1.32959421250689E-9	30	12	0
19.6458206221187	10.4616514845818	1.32959421250689E-9	30	8	3
19.6458206221187	10.4616514845818	1.32959421250689E-9	30	9	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	30	7	3
19.6458206221187	10.4616514845818	1.32959421250689E-9	29.3	9.5	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	28	9	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	27	10	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	27	9	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	27	8	3
19.6458206221187	10.4616514845818	1.32959421250689E-9	29	5	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	27	7	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	26	8	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	26	9	0
19.6458206221187	10.4616514845818	1.32959421250689E-9	25	8	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	27.5	5.2	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	25.5	7.1	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	26	5	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	24	6	2
19.6458206221187	10.4616514845818	1.32959421250689E-9	24.5	7.1	0
19.6458206221187	10.4616514845818	1.32959421250689E-9	26	4	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	23	6	0
19.6458206221187	10.4616514845818	1.32959421250689E-9	22	6	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	22	4.7	1
19.6458206221187	10.4616514845818	1.32959421250689E-9	23	3	0
19.7283862441555	12.9490375711813	1.60518176528512E-9	30	17	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	30	16	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	27	17	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	18	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	30	13	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	29	14	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	27	16	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	17	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	30	11	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	21.7	19	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	21.1	20	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	27	15	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	16	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	20	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	27	14	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	27	13	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	15	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	14	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	28	11.3	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	19	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	27	12	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	13	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	11	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	18	21	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	16	21	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	23.2	15	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	27	11	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	12	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	16	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	17	21	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	20.6	16.5	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	18	0
19.7283862441555	12.9490375711813	1.60518176528512E-9	18	18	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	17	18	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	22.9	14	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	26	10	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	17	0
19.7283862441555	12.9490375711813	1.60518176528512E-9	16	18	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	23.9	13	0
19.7283862441555	12.9490375711813	1.60518176528512E-9	15.5	18.5	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	15	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	14	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	18	15	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	15	18	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	13	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	14	18	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	17	15	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	13.5	17	3
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	12	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	18	12.3	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	11	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	16	15	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.7283862441555	12.9490375711813	1.60518176528512E-9	20	10	1
19.7283862441555	12.9490375711813	1.60518176528512E-9	17	12	2
19.7283862441555	12.9490375711813	1.60518176528512E-9	16	13	1
19.8043520461309	13.7340134134761	1.8671961754535E-9	27	18	1
19.8043520461309	13.7340134134761	1.8671961754535E-9	20	21	1
19.8800975830693	14.4754529999264	2.12447837100171E-9	24	21	2
19.8800975830693	14.4754529999264	2.12447837100171E-9	20	22	2
19.9562849554201	15.1686227529928	2.38654784823211E-9	26	21	2
19.9562849554201	15.1686227529928	2.38654784823211E-9	26	20	1
20.0321469649724	15.8282846547187	2.64426525120598E-9	26	23	3
20.107752631231	16.443198247372	2.90443047390454E-9	27	19	3
20.183341814636	17.0545274736295	3.15793435845535E-9	30	18	1
20.183341814636	17.0545274736295	3.15793435845535E-9	29.5	17.5	1
20.257938136371	17.6656740426323	3.42753203597113E-9	30	21	0
20.257938136371	17.6656740426323	3.42753203597113E-9	30	19	0
20.3312521006773	18.247295063255	3.68969388375717E-9	30	20	2
20.3312521006773	18.247295063255	3.68969388375717E-9	29.5	20.5	1
20.4037634368883	18.814902858508	3.95236021688561E-9	30	22	3
20.4037634368883	18.814902858508	3.95236021688561E-9	30	23	1
20.4743200160259	19.3261089448459	4.21443502318652E-9	29	24	2
20.5444307756995	19.8191964775761	4.47947812176608E-9	27.6	23.6	1
20.5444307756995	19.8191964775761	4.47947812176608E-9	27	23	2
20.6146394096413	20.3039441923088	4.74047290310864E-9	28.5	22	1
20.6146394096413	20.3039441923088	4.74047290310864E-9	27	22	0
20.6846103223876	20.7869646434323	5.00744334885894E-9	27	21	1
20.6846103223876	20.7869646434323	5.00744334885894E-9	27	20	1
20.7544608741997	21.2751663331547	5.26727639282854E-9	26	22	0
20.7544608741997	21.2751663331547	5.26727639282854E-9	26	19	0
20.8244788034061	21.7704892492466	5.53792922630691E-9	26	24	0
20.8944678987449	22.264506127498	5.80673642502916E-9	27	25	1
20.8944678987449	22.264506127498	5.80673642502916E-9	26	25	1
20.9643070207327	22.7551196859686	6.07531980278964E-9	26	26	1
21.0341916855098	23.244040421659	6.34173957791972E-9	26	28	1
21.0341916855098	23.244040421659	6.34173957791972E-9	26	27	2
21.1041072677294	23.7258187954125	6.61154153647203E-9	27	29	1
21.1041072677294	23.7258187954125	6.61154153647203E-9	27	28	0
21.1737447763541	24.1969594027422	6.8808816422461E-9	26	29	0
21.2434978769867	24.6648534789207	7.15333037248911E-9	26	31	1
21.3132516481644	25.1245085282061	7.42395478425806E-9	27	31	3
21.3827337099185	25.5742759266166	7.69492913832437E-9	27	30	3
21.3827337099185	25.5742759266166	7.69492913832437E-9	26	30	2
21.4520582356993	26.0157945131785	7.96707233519101E-9	27	26	3
21.4520582356993	26.0157945131785	7.96707233519101E-9	27	27	1
21.5215122222876	26.4619703818373	8.2342364038368E-9	28.5	27	1
21.5907722443254	26.9090355108975	8.5049531861614E-9	30	27	1
21.659590895482	27.3569723747479	8.77607853055906E-9	30	26	1
21.659590895482	27.3569723747479	8.77607853055906E-9	30	25	1
21.7280710553723	27.8164854398588	9.04987551564318E-9	30	29	2
21.7280710553723	27.8164854398588	9.04987551564318E-9	30	28	3
21.7958641303371	28.2760878727384	9.31889054811563E-9	30	30	0
21.7958641303371	28.2760878727384	9.31889054811563E-9	29	30	0
21.863468266499	28.73438484562	9.59694368418695E-9	30	31	1
21.9308783646614	29.1908552801825	9.87152937170777E-9	30	33	2
21.9308783646614	29.1908552801825	9.87152937170777E-9	30	32	3
21.9978044463139	29.6378696018294	1.01461345991538E-8	30	35	2
21.9978044463139	29.6378696018294	1.01461345991538E-8	30	34	3
22.064010933969	30.0640011463353	1.04205977180527E-8	30	38	2
22.064010933969	30.0640011463353	1.04205977180527E-8	30	36	2
21.8334065677527	29.986803363443	1.01986632472517E-8	30	37	0
21.8334065677527	29.986803363443	1.01986632472517E-8	27	37	0
21.5891827995165	29.9082689787173	9.97659199697409E-9	27	36	0
21.3439755276317	29.8298053531875	9.75900071864544E-9	27	38	1
21.0941001808586	29.7500254445643	9.5424788071341E-9	26.2	36.5	2
21.0941001808586	29.7500254445643	9.5424788071341E-9	27	35	2
20.8405068085865	29.6695633875035	9.32143429110965E-9	28.5	33.5	2
20.8405068085865	29.6695633875035	9.32143429110965E-9	27	34	2
20.5809345581082	29.5888006740478	9.10456776637147E-9	27	33	2
20.5809345581082	29.5888006740478	9.10456776637147E-9	27	32	2
20.3173967398564	29.5081949870544	8.88804585486014E-9	26	34	2
20.3173967398564	29.5081949870544	8.88804585486014E-9	23	34	3
20.0518968824348	29.4271062084605	8.66465477145084E-9	23	35	1
20.0518968824348	29.4271062084605	8.66465477145084E-9	22.8	32.5	1
19.7861786860691	29.3457324530376	8.4478077866379E-9	23.2	31.5	2
19.7861786860691	29.3457324530376	8.4478077866379E-9	22	32	2
19.5201637399418	29.2645415744971	8.2279605351232E-9	21.5	32.5	2
19.2541051063011	29.1831922933575	8.01204969036462E-9	21	32	1
19.2541051063011	29.1831922933575	8.01204969036462E-9	20	31	0
18.9889220587275	29.1019344756317	7.79434472519824E-9	20.5	31.5	3
18.9889220587275	29.1019344756317	7.79434472519824E-9	20	30	3
18.7241689440378	29.0206551033815	7.57522222727402E-9	19	30	3

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.7241689440378	29.0206551033815	7.57522222727402E-9	20	29	1
18.4607443899355	28.939625453747	7.357911613326E-9	20	28	2
18.1977605941591	28.8588286137661	7.13698611320979E-9	22.2	28.2	1
17.9336042601922	28.7779975741401	6.91595936075373E-9	21.2	27.5	0
17.9336042601922	28.7779975741401	6.91595936075373E-9	18.3	28	0
17.6699973559903	28.6971742826534	6.70194566509963E-9	20	24	0
17.4065902065333	28.6168466834224	6.4871734650751E-9	20	23	2
17.143065774688	28.5370831826329	6.27450624790526E-9	20	25	3
16.8791851668822	28.4574991915772	6.05906436135228E-9	20	27	2
16.8791851668822	28.4574991915772	6.05906436135228E-9	20	26	1
16.6144702920831	28.3779659480311	5.84001647041532E-9	18.3	27	1
16.6144702920831	28.3779659480311	5.84001647041532E-9	17.9	25.8	2
16.3504539641587	28.2986889754552	5.62350521704502E-9	16.9	26.8	2
16.0869910475665	28.2194799745145	5.41069056225751E-9	17.2	26.1	2
16.0869910475665	28.2194799745145	5.41069056225751E-9	15	27	3
15.8249091997039	28.140555172901	5.19436937906903E-9	16	27	0
15.5635219863423	28.0618603362009	4.97877294947102E-9	16	30	2
15.30236377968	27.9829285668237	4.76479833366739E-9	15	30	2
15.0418268233543	27.9038288140646	4.54941506689011E-9	15	28.6	2
15.0418268233543	27.9038288140646	4.54941506689011E-9	15	28	2
14.7823155687174	27.8248453086825	4.3364067892071E-9	14	28.2	1
14.7823155687174	27.8248453086825	4.3364067892071E-9	14	27	0
14.5245763153217	27.7462207400442	4.11758804830242E-9	14	29	1
14.2674186261207	27.6675897127335	3.90881282896771E-9	14	30	1
14.010582207301	27.5888686109901	3.6957050753017E-9	13	30	2
14.010582207301	27.5888686109901	3.6957050753017E-9	12	30	2
13.7553780043917	27.5101708089155	3.48492079638163E-9	11	30	2
13.7553780043917	27.5101708089155	3.48492079638163E-9	10	30	3
13.503351390198	27.4317719139067	3.26730642541406E-9	9	33	2
13.503351390198	27.4317719139067	3.26730642541406E-9	10	33	0
13.2557400726676	27.3530032197216	3.05615799334191E-9	12	33	1
13.2557400726676	27.3530032197216	3.05615799334191E-9	11	33	1
13.0102039177707	27.2740688916434	2.84542522877018E-9	14	33	1
13.0102039177707	27.2740688916434	2.84542522877018E-9	13	33	2
12.7652835775479	27.1950178705771	2.63456279014918E-9	16	33	2
12.7652835775479	27.1950178705771	2.63456279014918E-9	15	33	2
12.5195692166811	27.1159159212956	2.42464004429621E-9	17.2	34.1	2
12.5195692166811	27.1159159212956	2.42464004429621E-9	17.9	33.3	2
12.2698602933721	27.0365610740308	2.21092477659113E-9	20	35	2
12.2698602933721	27.0365610740308	2.21092477659113E-9	18.3	34.5	2
11.8116331453866	26.9449681786319	1.99689154101179E-9	19	35.2	1
11.8116331453866	26.9449681786319	1.99689154101179E-9	17	36	1
11.1879741527229	26.847728930715	1.7831531806678E-9	16	36	1
10.5208251995955	26.7490220444041	1.57497304087428E-9	15	36	1
10.5208251995955	26.7490220444041	1.57497304087428E-9	14	36	0
9.78517593063893	26.6481006148989	1.36758693258798E-9	13	36	2
9.78517593063893	26.6481006148989	1.36758693258798E-9	12	36	1
9.00552107620808	26.5453268257623	1.15991838356422E-9	11	36	1
9.00552107620808	26.5453268257623	1.15991838356422E-9	10	36	2
8.2055559947609	26.4409734253332	9.51839496110551E-10	9	36	0
8.2055559947609	26.4409734253332	9.51839496110551E-10	8	36	0
7.40452728503696	26.3353099543801	7.49382778053587E-10	4	36	2
7.40452728503696	26.3353099543801	7.49382778053587E-10	3	35	2
7.40452728503696	26.3353099543801	7.49382778053587E-10	2	36	2
7.40452728503696	26.3353099543801	7.49382778053587E-10	2	35	3
7.40452728503696	26.3353099543801	7.49382778053587E-10	1.5	35.5	2
7.40452728503696	26.3353099543801	7.49382778053587E-10	1.5	35	1
7.40452728503696	26.3353099543801	7.49382778053587E-10	2	34	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	6.2	37.1	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	6.2	36.5	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	18	24	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	7	36	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	17	24	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	8	33	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	16	24	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	13	27	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	35	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	4.7	33.5	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	9	30	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	7	33	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	34	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	4.7	34.5	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	15	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	11	27	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	5.2	32	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	14	25	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	14	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	12	27	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	9	27	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	7	30	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.09594821158259	26.1840390329639	5.44524425549753E-10	15	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	13	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	12	24	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	10	27	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	10	26	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	8	30	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	33	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	33	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	12.2	22.1	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	14	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	5	31	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	32	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	31	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	33	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	32	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	11.7	22.8	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	9.1	26	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	14	20	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	13	22	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	13	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	11	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	10	24	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	8	27	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	31	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	31	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	13.5	21.4	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	12	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	11	21	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	7	27	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	29	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	30	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	32	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	30	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	7.5	25.5	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	9	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	8	26	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	30	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	28	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	29	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	9.5	22.2	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	8.5	22.8	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	10	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	8	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	7	24	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	5.4	24.3	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	4.7	25.5	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	26	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	29	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	28	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	9	21	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	8	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	27	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	25	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	28	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	5.4	23.3	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	26	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	27	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	27	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	7	21	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	23	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	25	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	5.3	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	21	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	25	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	24	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	26	0
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	22	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	23	1
7.09594821158259	26.1840390329639	5.44524425549753E-10	4	20	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	21	2
7.09594821158259	26.1840390329639	5.44524425549753E-10	3	20	3
7.09594821158259	26.1840390329639	5.44524425549753E-10	2	23	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	34	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	15	19	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	13	18	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	12	18	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	12	17	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	12	15	3
4.66509955193229	22.8706074527749	3.27464277916079E-10	11	18	0

Solution x	Solution y	Solution z	Original x	Original y	Original z
4.66509955193229	22.8706074527749	3.27464277916079E-10	10	18	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	9	18	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	11	15	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	10	15	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	8	18	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	10	16.3	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	24	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	9	15	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	7	18	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	7	16	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	7	15	3
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	22	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	22	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	5	18.3	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	8	15	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	19	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	17	3
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	19	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	21	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	18	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	16	3
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	18	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	17	3
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	20	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	5	15	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	19	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	16	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	18	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	17	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	15	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	13	3
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	14	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	15	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	16	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	14	3
4.66509955193229	22.8706074527749	3.27464277916079E-10	4	12	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	15	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	14	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	13	1
4.66509955193229	22.8706074527749	3.27464277916079E-10	3	12	2
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	13	0
4.66509955193229	22.8706074527749	3.27464277916079E-10	2	12	1
3.08643539106956	11.8310103258587	1.21195498081761E-10	3	8	0
3.08643539106956	11.8310103258587	1.21195498081761E-10	3	5	1
1.53883747727809	5.8539585525616	-7.3450578952361E-11	2	6	1

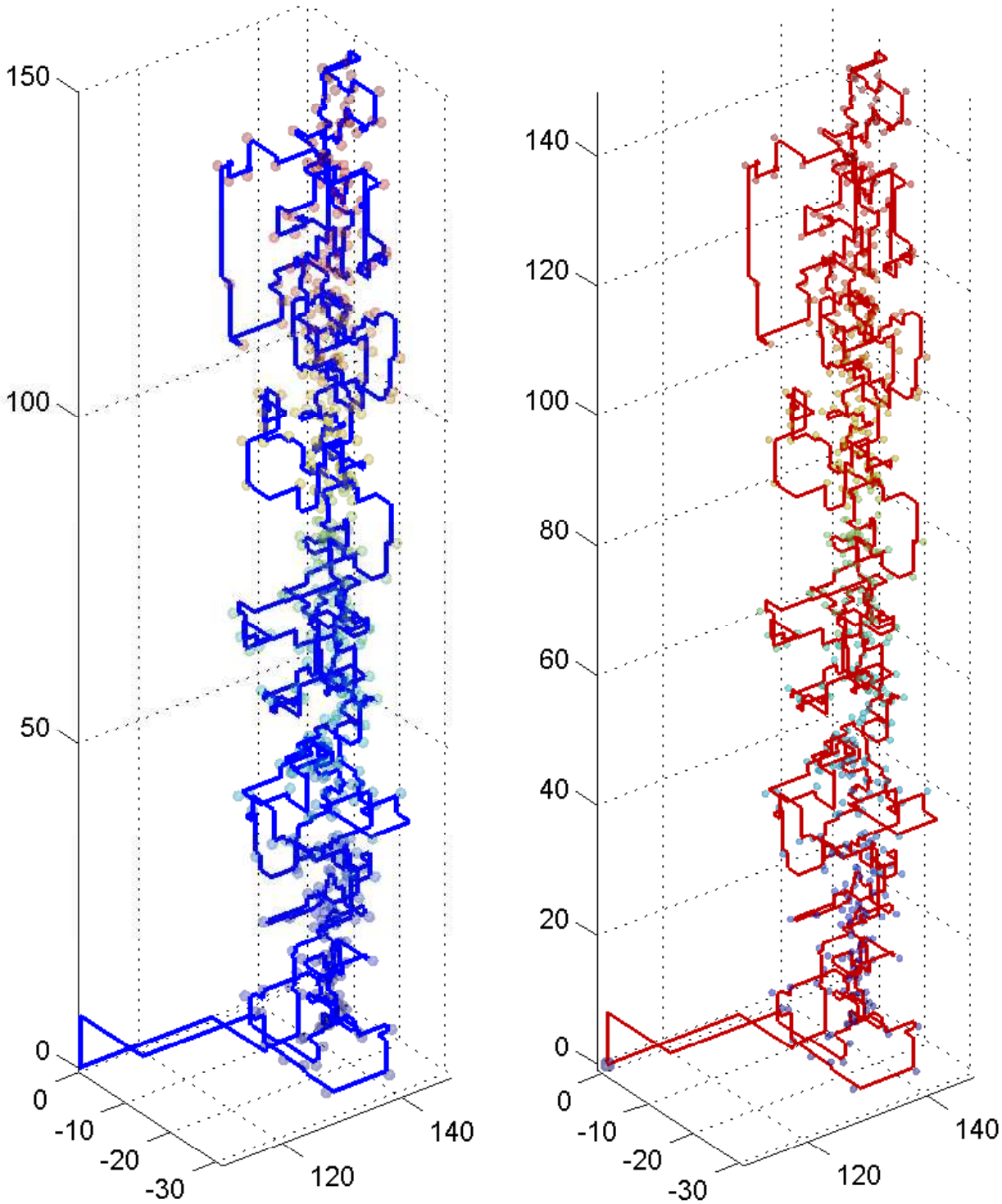


Figure N.189: $d493$, $r = 0.74904$, Equal Radius, 3D, Manhattan, Length = 1912.7275896

Table N-192: Solution for $d493$, $r = 0.74904$, Equal Radius, 3D, Manhattan

Total distance: 1912.72758958798 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
22.1489755442458	11.7419952424276	0.610980013232074	22.149	11.742	1.36
24.9429862060913	18.4251611319772	0.611002400196011	24.943	19.108	0.303
25.7714120043755	18.405882829875	2.76346257932019	26.149	19.045	2.783
25.8041368943748	16.3826662199157	3.25560354950637	25.07	16.314	3.298
28.3959664798972	16.0971868703752	3.51375119725738	28.308	15.933	3.524
31.769931569407	15.82527393085	3.77121896650373	31.892	15.246	4.139
32.5612163709878	15.7062430236182	3.91574682887831	32.932	15.246	4.376
32.5611036288951	17.6832041503413	2.68400659337469	32.69	18.346	2.359
31.8555985128771	14.0982812440622	2.68400159803939	31.399	13.754	2.704
31.4598951976305	13.1659975219561	2.68399631344534	30.787	13.166	3.014
31.7150347457667	11.9216252866226	0.764444995099476	31.567	11.313	0.396
33.1269911047201	11.8430106004626	0.640078221051769	33.127	11.313	0.11
33.6052845626679	12.3763269147533	3.42598497032146	34.135	12.906	3.426
33.1354586659597	12.1945154805893	4.10574943208075	33.322	12.841	4.069
32.2262778902783	11.6804995974823	4.89286013036036	32.542	12.126	4.969
29.9809408476533	10.6849738868804	5.59198661842949	29.451	10.155	5.592
30.3263764802731	13.0089106445852	5.94464494301855	31.015	13.036	5.79
30.4273908641184	14.4330072770324	6.69302907326244	31.177	14.433	6.693
29.9590030902586	16.8349023621715	8.66400035778648	29.959	17.584	8.664
29.543210593428	15.8702572874635	10.539835937953	29.134	16.187	10.819
29.2551717933788	11.2920944674025	11.3385014428888	28.753	10.79	11.577
30.7111159525824	11.3833557089371	11.33851164263	30.787	11.313	10.711
31.7619857370713	11.4766510934684	11.3384955204583	31.762	12.126	11.712
32.2012626562007	11.4763761793354	9.11142154720045	32.022	12.126	9.107
32.9969739086166	11.4761007144234	7.00626073918887	32.997	11.541	6.26
33.3675314581743	11.1574391364242	7.32787660449189	33.452	11.541	6.941
33.7150745399322	10.723097762085	7.77267631749731	33.647	11.313	7.765
34.087009446482	9.38004909207442	8.22091248198243	34.087	8.758	8.639
34.5442892153956	10.726004617261	8.22089024387407	35.166	10.726	7.803
34.129314941052	12.3094228751695	8.4929422732568	34.135	12.386	7.828
33.7056127774394	13.3098229998708	10.4860250910924	34.135	13.686	10.417
32.9589387671933	13.8404946832521	13.3932452806885	33.095	13.751	14.049
31.3718624951128	14.543420474687	13.6621016907936	31.112	15.246	13.662
31.3717402497435	14.5434172549476	15.1789552875728	31.632	15.246	15.179
31.3068709774411	12.9185564118743	15.684809135839	31.372	12.353	15.396
31.2409604123438	12.5452074121174	16.7342215139764	31.242	12.126	17.355
30.5353616715723	12.5450357876327	16.7343323493086	29.975	12.061	16.621
30.5866336461142	13.7338447376498	17.8979925413688	29.975	14.141	17.903
31.0332560297522	13.8148849459004	18.926741147653	30.787	13.426	19.207
31.609963645947	13.9011704527816	19.576535284215	31.61	13.901	20.326
31.8139256153085	15.335699777525	19.343613301721	31.242	15.473	19.727
35.5593155590182	15.8813075775552	18.4896931552963	35.992	16.314	18.057
34.9946624580779	11.9623865158569	21.0304768520584	35.293	11.552	21.184
34.1586027199705	10.9973254344615	22.4938340393229	33.96	10.536	22.989
33.8329791624649	10.811822125244	22.6804584944777	33.833	10.282	23.21
33.0692015798744	11.4139007594117	22.6509708983923	33.062	12.126	22.872
32.6652576716147	11.4231932631099	21.3338334947794	32.867	11.313	21.273
32.2244958259467	11.432555809562	20.1137994010542	31.827	11.313	19.849
31.8837460881223	11.4419360112242	19.3247642359578	32.182	10.98	18.901
30.6569878054113	11.4516299769187	19.0947359953887	30.657	11.541	18.351
26.1934147884943	11.4518195184012	19.4648690146073	26.149	11.107	19.141
22.76554927144	11.4520048821482	19.9289753172265	22.022	11.361	19.929
25.8860161638755	11.9251196841727	20.1953399841467	25.895	12.123	19.556
28.6358216735878	12.253175254674	21.5956425894023	28.816	12.25	22.231
29.5124015889208	12.5830780403126	21.8858351945914	30.202	12.451	21.726
29.6099199366047	13.3930365667616	22.6932745866932	29.705	13.393	23.437
29.6101178636432	16.5049767464714	22.4341007574385	29.515	16.505	21.691
31.1059026422996	17.3689613881868	23.158882064051	31.102	17.775	23.735
32.6957937209701	17.5795345472958	23.3152982635683	32.944	17.965	22.768
32.9849848948912	17.6889834645573	27.2399837286455	33.515	18.219	27.24
32.6788078736927	15.699320320741	27.8494815332114	32.152	15.246	27.742
32.5519598669444	15.4729712599021	29.3239651577185	32.022	15.473	29.854
33.1197393005573	14.6180248788192	28.8268412908458	33.322	14.401	29.372
33.53678826729	14.0759773137089	25.0544366552808	33.907	14.076	24.403
33.5367731484457	11.6150113602831	26.3957170833619	34.087	11.615	26.904
30.5940132739672	10.162285088537	26.3957480093681	30.594	9.52	26.782
28.433969814092	10.2181634329964	26.051538483071	28.372	10.218	25.305
28.4336725348513	10.4090693528306	29.0065505493622	27.927	10.409	29.559
28.6392642550501	12.4243085673277	28.786926546314	28.181	12.441	28.249
30.2569364959713	13.9459208826261	28.6779940286057	30.787	13.946	28.148
30.0337397216903	14.0998053258017	29.1291850344142	30.202	13.491	28.883
29.7566257493846	14.4090640188747	30.2930064367547	29.007	14.409	30.293
29.9686771738711	15.8915509034399	31.6463252179808	30.15	16.06	32.059
30.1686553359056	16.9471877243283	32.3621599388663	30.023	17.203	33.037
31.614945587863	17.0639937215939	32.4090411251606	31.61	17.775	32.188
35.6866486621366	17.0773063889442	35.4130012422148	36.436	17.076	35.413

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.9599984296739	18.9569018831538	39.2143267882102	33.96	19.68	39.41
32.3496557762117	18.506984446185	39.2143959006161	32.372	18.537	39.944
26.5283594782861	17.9028520332675	39.2144682751508	26.34	17.203	39.025
26.528289055807	20.9730890000329	39.4120023620843	26.149	20.886	38.979
26.5282191989525	29.2979574692317	39.6610507127883	26.086	29.903	39.661
32.9083981194108	26.2200007162159	42.1829138943969	33.642	26.22	42.336
28.5333075683735	23.6170145248753	42.1830206623254	27.8	23.617	42.03
29.3161797231768	22.7178659487936	43.4952277398893	29.261	23.045	43.901
30.1750939562424	20.7547569888006	44.1563322115594	30.785	20.823	44.268
30.4951502214816	17.3695552164065	44.6924412310156	30.785	16.949	44.302
30.7340245443082	16.8219208079711	46.9549939748132	31.483	16.822	46.955
30.7342802905678	15.9917746525256	48.9798733290411	30.657	15.246	48.98
31.0342983395559	16.0250704178496	49.1001023237356	30.982	15.473	49.591
33.0313937420949	17.2057771704625	49.1299855470005	33.388	17.584	48.735
33.5354503055776	17.6189712350996	49.1613329580174	33.642	18.346	49.307
33.5356087835798	14.2226651072204	49.1614385541481	33.322	13.881	49.4
33.5357752105625	13.0086662639953	49.1615389685877	33.095	12.971	48.557
34.2647333653169	13.006699975895	49.9698357084677	33.907	13.036	49.61
35.6304056636647	13.0047361859495	51.6194811873157	36.119	13.139	51.404
36.1946275817144	13.0027713902302	57.9359117349859	36.944	13.012	57.936
33.7676342625633	11.9581510601785	58.1282401800342	33.387	11.313	58.128
33.7675074765609	11.9580992748656	59.8289489850347	33.96	11.234	59.829
33.0950926523062	14.0108997636111	60.2620752270864	33.095	14.011	61.011
32.6719965238558	14.6558560655483	60.2621799374559	32.672	15.246	60.724
31.9685368045125	14.5783840579299	58.5908690315534	31.827	14.661	58.532
31.3315304052399	14.5004047182945	57.0685441823356	31.275	14.173	56.999
30.7237345879786	14.4246474360852	55.7170085939993	29.975	14.401	55.717
32.8233841319288	14.4238938176031	54.8653866955438	33.322	14.141	54.817
33.4180674070343	14.4231532907911	54.0880266697898	34.135	14.206	54.088
32.6070900345819	14.4231091243815	53.6736599464051	32.607	14.661	52.963
32.4606117312193	13.254077940978	54.0614638279292	32.69	13.52	54.423
32.3052428049456	10.7064147527995	54.3750493999955	32.944	10.536	54.126
30.6579973974042	10.1972773479407	55.4790288475588	30.658	9.71	56.048
28.6259956670251	10.1974395529092	53.6135064366086	28.626	10.091	52.872
22.7432709762558	10.8530451986983	54.8244284166538	22.085	10.853	55.182
22.7433255163019	13.3930038719552	54.8244646574491	22.276	13.393	54.239
23.5588830366842	16.4409945979236	56.0350119574215	24.308	16.441	56.035
19.0992414991685	17.9644950883218	58.2351287203359	18.466	17.838	58.207
18.7180441699807	23.5812611298061	61.0837953671086	18.974	24.125	61.119
18.1991094780626	24.1880234126575	63.3218744302908	17.45	24.188	63.322
21.5683785882354	28.3295307795975	63.4390906453252	22.022	28.443	62.892
21.716895530684	28.8870115486737	64.3690142064121	22.466	28.887	64.369
18.7200543289903	29.9158864543364	66.9860038440091	18.72	30.665	66.986
18.3891222518223	27.4900012960267	72.7329868875465	17.64	27.49	72.733
19.1640196773944	25.4018544140606	74.0551120903333	19.164	24.696	74.306
21.9580020394654	28.7653464483713	74.0551504587449	21.958	29.395	74.461
24.5569910383598	27.6716531921116	72.245663195617	24.562	26.982	72.259
26.9945593055795	27.4895611264868	70.0945026063715	27.546	26.982	70.094
25.8320002370273	27.4898544062314	70.0733593651359	25.832	27.998	69.522
24.7823059012485	23.6009683290603	70.2003775755334	24.943	23.68	69.938
23.5037669516323	17.7110033557481	70.3323485241898	22.974	17.711	70.862
25.0700094341902	12.062008257617	69.78014014375	25.07	11.615	69.179
28.8010472162492	12.0620843572409	71.2695890746889	28.816	12.568	71.763
31.306790855364	12.0621575966014	71.461077254544	31.307	11.313	71.461
31.5703780428639	12.5070643614105	71.8075954213272	31.015	12.776	72.117
36.7026176285219	12.7564195536422	72.0100897179449	37.452	12.758	72.01
32.3328850707123	12.7671940653142	74.3154466460046	32.282	12.126	74.654
31.4249325822765	12.7794196327916	74.4750757583468	31.502	12.126	74.715
29.3751212598754	12.7924492706852	74.5980967398959	29.197	13.52	74.598
29.3750505610278	11.2343247521142	75.3448906688422	28.626	11.234	75.345
29.3750294260963	10.867931556239	75.8200093799724	29.007	10.282	76.107
29.9796164085921	12.4100635340987	75.8200274873128	29.975	12.581	76.539
30.6620230863831	12.5356275425907	75.8200270921347	30.787	12.906	76.252
31.2248707122411	12.6484723610837	75.8200293717928	30.787	12.646	75.914
32.1086472055274	12.7613642657054	75.8200482565292	32.835	12.613	75.794
32.1335755971361	14.1166399392794	75.8200371245097	32.477	14.433	75.823
32.1581238893515	14.933022311036	75.8200426198012	32.087	14.661	75.705
32.1827216571541	16.0232208389382	75.8200468129783	32.182	16.632	75.383
32.554194357717	16.0231718347305	80.0140459673419	33.071	16.187	80.531
32.4688635072188	15.4206630682834	78.4768298326453	33.062	15.473	78.089
32.2934567122218	14.5093763826582	78.262125616648	32.835	14.173	77.958
30.8631887975729	14.2709738171479	78.1282727465461	30.202	14.271	77.775
30.9528454212891	13.8646155334657	78.12828074863	30.787	14.466	78.121
31.0471572104115	12.0472857234907	78.128290029106	31.047	11.313	78.28
31.5624760659046	12.0857886732969	78.1282449231992	31.437	11.541	78.241
32.1799248182507	12.1262589087624	78.1282001899856	32.802	12.126	77.71
32.019714681222	12.4089920817693	81.2267707438829	32.672	12.353	81.337
31.6822163546718	12.7216812643608	82.4040240492142	32.152	12.353	82.503
31.0539263175723	13.1917245499907	83.2934161237109	31.015	13.556	83.741
30.4613903707471	13.525241196018	83.7511064839365	29.975	13.621	83.535

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.0930018664306	13.8380131362737	84.322656380686	29.388	13.838	84.576
34.1302735486839	14.3548889284566	84.3226918741148	34.135	14.986	84.727
34.1336374771152	14.0552036867057	83.9693305592278	34.135	14.466	84.176
34.137016540542	13.6785695463485	83.5702649849277	33.907	13.296	83.348
34.1403952762753	13.3794099876001	83.2270310384991	34.135	13.166	82.509
34.8061871739349	13.3793488876627	84.3670081812451	35.42	12.949	84.367
34.1308083744244	13.3910597479911	86.4737844210997	34.135	12.646	86.486
33.1256472845258	14.1423246911448	86.9803318388459	32.737	14.433	86.615
32.6530156503175	14.6052970978805	88.0507630965599	32.412	15.246	88.024
32.3747980886401	14.7668285826339	89.3633913851724	32.542	15.473	89.387
30.7221138406219	14.8206299340672	90.2047921653475	30.722	15.473	90.573
30.6061565971778	14.6735461136764	90.2047748601489	29.975	14.921	90.476
30.5645030303729	12.8410094114237	90.204756807763	29.975	12.841	90.667
30.5645174590368	11.422599106787	89.0897321572927	30.34	10.917	88.584
31.4722457179645	11.4821844337482	90.9397663612317	31.957	11.541	90.999
31.9879005869414	11.5415232341269	92.507851831891	32.737	11.541	92.508
31.9879276736938	12.929934640414	92.7555385717891	31.547	13.203	92.722
31.9879523191615	13.742082008099	93.0069285582771	31.697	14.433	93.007
34.0998775040547	13.3929656954806	93.1211170415155	34.849	13.393	93.121
33.2599827516821	12.6441750375202	94.5008344037976	33.322	12.321	95.076
32.1486752365861	12.2905473508155	94.7992156930397	32.412	12.353	94.929
30.4955691095394	11.9286881680462	95.085353830685	30.527	11.313	94.769
27.9102656970213	11.7891768870201	95.8856467499542	27.419	11.298	96.166
29.0783783896195	12.026325466101	95.8856325608711	29.261	11.425	96.137
29.6019448249312	13.2240068313168	95.8856206104281	30.202	13.231	95.497
29.7104936011133	14.2993021681589	95.8856033447377	30.202	14.791	95.605
29.6016020683056	13.740825179433	97.6452720284264	29.515	14.028	97.711
29.4936880444376	13.0611809785025	99.1958760082786	28.753	12.949	99.196
31.6237808554525	13.0610288944912	99.3324397131464	31.737	12.885	98.954
33.2126611906822	13.0608779817898	99.4795353955627	33.322	12.581	100.045
33.2127723536267	15.4901107854013	98.3230012592441	32.802	15.473	97.861
33.21289113811	18.2982166652348	97.8904425217656	33.071	18.346	97.156
33.3133026211289	18.2985976632131	101.590044416654	32.817	17.775	101.585
34.0302371544127	18.2989824687039	106.413929897365	34.595	18.791	106.414
34.0307081425277	18.2991981798809	108.773060497926	34.722	18.219	109.051
32.3090256497444	18.8525591699849	108.773096386411	32.309	19.553	108.506
31.3991266176348	17.0549235217062	110.548370364839	30.975	17.076	111.068
31.0948448461282	14.8338548168679	110.86319951853	31.047	14.661	110.232
30.8101607956946	14.0006789600545	112.928377946236	31.015	14.076	113.16
30.5050752335062	13.1010051000748	114.246892195684	29.975	13.101	114.777
31.0563995453612	12.4035574352498	111.938352577132	30.982	12.126	111.418
31.6852316063473	11.9442837337693	111.399100880102	31.632	12.353	111.341
32.3470368722199	11.3130063753886	110.887101058777	32.347	11.313	110.138
34.5886520862821	10.6693680512221	111.452920360338	35.103	10.155	111.634
33.9335648917919	14.7643904219173	111.452957794475	33.452	15.246	111.765
34.3138399826695	13.4603641197777	109.710535597881	34.135	13.426	109.486
34.7287028412446	12.2090594696581	108.50266018784	34.722	11.742	108.413
35.1438861370231	11.5740978033704	107.474001728782	35.674	11.044	107.474
34.13499693333	11.9615493901204	106.344859880249	34.135	12.126	105.614
33.096107617442	11.9616372346456	107.49665053439	33.095	12.711	107.498
32.9319626378972	11.9616899504103	107.639165405585	32.932	12.353	108.278
32.2611304674049	11.9613837561481	107.592270642199	32.477	11.541	107.287
31.2751079648969	11.9610833259997	107.546733048989	31.275	12.613	107.178
30.6942825922435	10.0782114022474	107.546228029034	30.34	9.647	108.046
30.6935546203329	10.0776284705193	106.333030087179	30.721	9.329	106.333
30.0313473796928	11.8039436835975	105.877750804489	29.388	11.804	105.494
30.0312818813911	12.6168878852559	105.877610015678	29.578	13.203	105.988
30.0347290181126	12.6166109615332	103.951350993388	29.975	13.361	103.951
30.6472948530598	12.0707035148058	103.360082291927	31.177	11.541	103.36
29.7211312883813	12.623662050431	103.179769413102	29.197	12.441	103.553
29.4653917893427	13.8379279004022	102.900707076185	28.753	13.838	102.669
30.2020281440541	14.0110732379571	102.900662488005	30.202	14.011	102.151
31.2079223216869	14.4330183250595	102.967221572341	31.957	14.433	102.967
30.9671696481353	15.1726234059306	104.475528847881	31.372	15.246	104.804
30.6688545638402	15.839393088049	105.233518329819	31.293	15.806	105.367
29.6420091177516	16.5457981800461	105.775878238827	29.642	17.076	106.306
27.311413751283	16.3824553151282	105.712866487235	27.292	16.632	106.393
26.0861001630359	14.6630029935789	104.864138248155	26.086	14.663	104.115
25.9131639050514	13.2707154761761	109.195615897113	26.022	12.631	109.182
25.7270982765258	12.9711133565208	114.728990223116	25.197	12.441	114.729
27.2472935201007	15.432834557663	115.807522051068	27.229	15.362	116.263
28.8288662764924	18.7909938793377	116.421016991688	29.578	18.791	116.421
27.9269911864748	20.7088602689431	117.969996025365	27.927	21.458	117.97
26.6411668400426	20.0348007495926	119.122381266433	26.276	20.188	119.025
25.8821436676419	19.2350077521444	120.495952380618	25.133	19.235	120.496
27.1019375188133	18.6639755485514	120.873855428031	27.102	18.664	121.623
27.3649711377777	17.0040836765423	120.800136042936	28.054	17.013	121.063
27.3969769023406	13.0982839082588	120.416969645946	27.927	12.568	120.417
22.3650431705129	14.5167598142012	119.560749626986	22.149	14.282	119.226
20.487357412262	17.4693777698411	118.965032510078	19.99	18.029	118.966

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.4857971827662	17.4707269726393	115.796907904559	20.498	17.457	115.048
11.7356626791159	19.628911297862	116.222048385371	11.735	20.378	116.222
11.7140191120653	17.673513860729	124.556808399691	11.481	17.711	124.498
11.69249528768	15.5520091916475	141.302074743814	11.163	15.552	141.832
13.7191267791539	14.6832266672171	138.766482132567	13.576	14.79	138.325
17.5769857186999	13.647026465675	137.905151323414	17.577	13.647	137.156
18.3389987908178	13.1607351065148	141.66925867218	18.339	12.631	142.199
18.9829032076514	18.3787937761534	140.728991767856	18.466	18.664	140.644
24.878996198807	19.4042677760228	139.949734758019	24.879	19.934	139.42
27.1269798918756	18.2196735027304	143.300373876592	27.356	18.473	143.695
28.268739737057	15.4045925027459	144.260572172596	28.245	14.854	144.187
29.488258703013	14.7661347540676	145.401362410705	29.975	14.661	145.197
30.0379867707242	14.2062461844152	147.61985692034	30.787	14.206	147.62
30.0382913391281	13.8809747243252	148.6445112108	29.975	13.881	149.391
33.8789217709364	13.171389833514	148.130557626476	33.907	13.556	148.567
36.9218570799689	10.748150451583	146.804068199503	37.452	10.218	146.804
32.6411186433149	12.3530054231405	146.678890515558	31.892	12.353	146.679
32.7026311183478	14.0899000945138	145.590847947568	31.991	14.092	145.487
32.9440514072087	15.7029755208793	145.252970169971	32.944	15.933	144.54
33.3054345487142	15.7030303025661	146.011154159971	33.769	15.679	145.826
33.5819739521255	15.7030854921929	147.035053164938	33.582	15.473	147.748
33.793780122267	20.3557220442098	146.992211328752	34.468	20.442	147.277
33.8114220228106	20.4831455299381	142.761035867393	34.341	21.013	142.761
33.2480170714404	20.1338011521016	142.433353851541	33.515	20.315	142.968
32.1051621289524	19.6799555161289	141.631050483955	31.356	19.68	141.631
33.2589116782737	15.5179363012629	141.377049055831	33.322	15.473	140.664
33.8339434276301	14.3294997750416	141.303981881176	33.907	14.336	141.111
34.3747249793519	13.1320349051707	141.231875270499	34.785	12.504	141.232
34.3746908566255	13.2793712247193	139.514009885452	34.404	14.028	139.514
34.3746450076243	12.6863014522031	138.674051031683	33.907	12.776	139.011
34.3745975538271	11.9960512028504	135.796984702197	34.595	11.996	135.081
33.6529149473803	11.7729360499602	136.76368620147	34.135	11.866	136.659
31.6969934864434	11.5409247738167	137.923892543284	31.697	11.541	138.673
29.3880503165944	9.06215405263818	137.407007767599	29.388	8.313	137.407
29.1026809708947	12.8830387931197	137.134570858043	29.007	12.949	137.787
28.8489138436277	14.6629910304812	135.662639331964	28.372	14.663	135.085
28.8490526707783	15.4888839474495	136.343692056764	29.324	15.489	136.921
26.1716924761235	15.7479720992558	136.311736446394	26.149	15.679	137.044
25.4508038815915	17.9619401737635	132.344039052857	25.451	17.965	131.595
20.9618503950839	18.0092960534723	132.343829103912	20.434	18.537	132.408
21.1153750866031	15.8838092917584	127.774515702918	20.434	15.806	127.618
24.336982259546	15.0372361226441	127.169539119638	24.371	15.235	126.557
26.5939915239526	12.6821480549065	126.916962567396	26.594	11.933	126.917
27.694915062921	13.1057492887928	126.120842273659	27.673	12.695	125.598
28.9430025000568	16.1368617229408	125.853941487913	28.943	16.886	125.854
30.4794258356067	16.0485305729949	121.747853132473	30.594	16.251	121.669
31.7746912965096	15.958359367076	118.672086206968	31.991	16.632	118.575
32.0564565983628	15.4843984368569	118.029176899124	31.502	15.473	118.128
32.4964553435341	15.013862918209	117.266448266355	32.217	14.433	117.304
33.3768974221609	14.7909583321877	116.395171971738	33.907	14.791	115.865
33.240727197053	12.6148743540183	116.901934074042	33.907	12.516	116.73
32.6170983055727	11.8431012281973	118.865991501409	32.087	11.313	118.866
33.2939611939772	12.676473284106	119.663760058078	33.322	13.101	119.477
33.9533767837348	13.2192383827802	120.705039414043	34.135	13.946	120.705
33.9538439729296	13.2193361076336	122.387488315649	33.907	13.816	122.673
33.9543081632243	13.2194290216018	122.895405828634	33.322	13.621	122.895
35.4195078059415	13.2195034485688	125.163806105207	35.992	13.647	125.389
34.603612037147	11.9959879694525	125.163845139483	33.907	11.996	124.886
34.6053834986183	9.95101044965023	128.930993123993	34.595	9.202	128.931
34.8289064360851	10.329010708191	130.596738800999	34.976	10.282	131.121
35.0388744799451	10.7259386017202	131.157086757136	35.547	11.234	131.369
31.1937870762139	10.5013131392778	131.157112304626	30.912	9.901	131.507
31.1937772467265	12.4741119087288	131.103592963832	30.787	12.386	130.829
31.1937695750136	15.3106259318565	131.051425989018	30.462	15.473	131.052
31.3561901020442	15.3108310860471	129.884986726257	31.356	16.06	129.885
32.2819647478671	15.3107478759755	128.331737249195	32.282	15.473	127.6
32.5339490381207	15.2676592496746	129.859743559977	32.347	14.661	129.857
32.8350126661983	15.2278589389194	131.437025135318	32.867	14.661	131.697
33.1270557714722	15.1905224950772	132.094131689362	33.127	14.661	132.624
35.7670908124884	18.5792775643932	131.639952810034	36.436	18.918	131.64
34.0233577087516	18.5792832651507	124.645027564838	33.515	18.029	124.645
34.0233415315574	22.0289987017824	123.406111702196	34.341	22.029	122.727
32.0907670912613	24.7533348294868	124.954850210165	32.245	24.887	125.449
27.4399639273979	26.3376259909017	125.563981287849	27.229	26.22	125.044
26.0220832131723	29.1641345033064	127.854008742806	25.895	29.903	127.854
26.0219419738877	28.2288290332956	136.668997992198	26.149	27.49	136.669
25.0699843753551	29.5630960540365	142.853302050964	25.07	30.03	143.44
22.1490037886145	29.5629964267653	142.5520039478	22.149	29.713	141.818
19.0371575402014	28.9386570671163	146.542120997409	19.037	28.189	146.557
18.964680541298	29.5941843582584	146.54340445017	18.529	30.03	146.971

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.0097685909885	29.4546386905067	135.175085315067	18.72	29.967	135.012
19.0566633145716	29.2773109685487	133.417104053008	18.974	29.967	133.455
19.105048959951	26.9645263147934	129.788687509177	19.037	26.982	129.54
19.153617907283	24.5492548375069	127.936181637929	18.974	24.569	127.812
19.2026417263646	22.00628603022	126.435645760696	18.593	21.648	126.239
21.0472177844406	21.9236616860162	126.293936536056	21.577	21.394	126.294
20.3638242251397	22.3496016723662	124.737131842937	20.371	23.045	124.747
19.6591771756987	22.4741111192043	122.978990451589	18.91	22.474	122.979
19.9074076248085	23.5530193237468	119.685160002158	20.561	23.553	119.319
18.1325721522073	27.505568365718	119.68516738527	17.64	27.998	119.961
18.767554497749	27.4578298752314	115.78014227852	18.72	28.189	115.769
24.307999381742	24.5277114358455	113.987730120302	24.308	23.998	113.458
26.6757085593597	24.9146081135514	115.368313911286	26.911	24.76	115.286
28.1308825961078	25.331152770208	116.965990229663	28.88	25.331	116.966
28.1309581493031	28.1249982149867	118.388168041152	27.927	28.125	119.109
29.7468906967997	29.9449267226381	112.299000813762	30.277	30.475	112.299
29.0712869203486	29.8064143123289	107.639518310196	28.943	30.475	107.548
28.6452623123944	29.4473442284737	106.40918167482	28.943	30.03	106.391
27.6946876055982	25.4580080107346	105.313769190361	27.165	25.458	104.784
28.0033149868241	23.9980546213648	106.929002786014	28.753	23.998	106.929
25.8320865098148	23.6799587564728	108.73487049955	25.832	23.68	109.484
25.628142289156	20.6320736058034	106.0769970588	24.879	20.632	106.077
27.2289848109249	20.3651362601278	102.004093841259	27.229	19.616	102.004
27.9664533254322	21.8835166646542	101.834838732656	27.991	22.601	101.939
28.5126267577979	21.9569988776989	101.589590316552	29.07	22.347	101.831
28.6038355351684	22.0069014384918	96.334342418618	29.134	22.537	96.334
25.1964505846177	19.9650404884441	96.30760454491	24.752	19.362	96.308
25.1965227256628	24.1879989846119	95.2594940888818	25.006	24.188	94.535
26.4794336277346	27.5539807639753	96.4470157667255	27.229	27.554	96.447
22.2760047437543	28.1246939671155	101.540877957684	22.276	28.125	102.29
19.4397990453531	28.1673816821566	98.0279997864073	18.91	28.697	98.028
19.7196635903758	26.3644700784248	93.8078572853703	19.545	25.839	93.739
20.0313070275483	25.7759971875648	91.1757453303764	20.561	25.776	90.646
17.5189833673104	24.927067004392	94.4867066803422	17.577	25.204	95.05
12.5583824352933	21.0385521895351	94.9460946016542	12.243	20.505	94.648
12.1378940873818	20.7804862243914	101.423999845759	11.608	20.251	101.424
17.3228988542575	20.8015077523396	106.480107970957	17.323	21.331	107.01
17.4101660845892	18.1066982568496	103.093261080119	16.688	18.092	103.09
18.3325733439009	16.4104077094848	100.21701016794	18.148	16.505	99.59
22.1267393862765	10.4763397508551	99.8950006458443	22.212	10.091	100.44
23.4820035266921	10.0498271999611	92.68056447427	23.482	9.52	92.151
25.7049738430716	12.1230023188643	92.7228555436993	25.705	12.123	93.472
26.3813071558977	14.4090046509778	89.7287316145161	26.911	14.409	89.199
25.9013972899945	16.9085982281279	90.793361974585	25.832	16.949	91.413
25.47277845585	18.7910028187886	91.1343668615554	24.943	18.791	91.664
25.8627428663486	20.7647092566754	91.0697410293924	25.895	20.759	90.426
26.235029433541	22.8396392507371	91.013833536675	26.149	23.172	91.657
27.4165771929102	22.9766459161432	90.8051767489858	27.546	22.537	91.326
27.9784377195381	23.2119028781551	89.8942824497365	28.245	22.855	90.204
28.4100382383589	23.4948834087125	87.7654144559546	28.054	22.918	87.821
31.5879909029144	26.7699683247991	81.725000721806	32.118	27.3	81.725
31.3559296481348	26.0299770957345	76.7831173573183	31.356	26.03	76.034
28.995145439345	22.3624711389304	78.7185830648903	28.816	21.902	78.963
27.7439262616956	21.5460963912058	79.7002033614921	27.102	21.648	79.965
27.5769825582522	18.9061379880658	80.0118609250801	27.737	18.664	80.683
27.0532489086649	18.7582266947021	80.0608646829029	26.721	18.283	80.536
27.0532986537454	19.2705107654832	76.7618657506205	26.848	19.743	76.594
27.053348375017	19.6160454928556	75.2014767393524	27.483	19.616	74.587
26.9108727637988	21.9077223879765	75.2805436792735	26.911	22.601	75.564
23.4819979729936	21.9076717019189	75.2805916527575	23.482	22.41	74.725
19.9172976561354	21.902847889005	75.5046364834832	19.863	21.331	75.529
17.4499979176806	21.8980471681554	75.7259161620864	17.45	21.902	76.475
12.3917154701257	18.49471119386	73.9089952743014	11.862	17.965	73.909
13.0050390976215	19.3118776257062	68.6460035976546	13.005	20.061	68.646
17.3229942726046	13.2531469658917	65.716013767327	17.323	12.504	65.716
19.43090258502	13.3343999482444	64.5863294066344	19.418	13.901	64.222
21.8717332558818	13.4006016766267	64.2312245327838	21.831	13.203	64.85
25.8319985435359	13.4698474014548	61.70111600566	25.832	14.219	61.701
28.3719921201692	13.46942728975	61.5043840801431	28.372	13.52	60.757
29.7060455698541	13.0932273551955	61.5045514584696	30.202	12.971	61.507
30.308551752416	12.7456280279848	61.5047190016319	31.015	12.516	61.408
30.2018692867788	12.7455820460934	64.1419850724555	30.202	11.996	64.142
29.2827542273911	12.9273439399315	65.4909822663783	28.753	13.457	65.491
30.294626003482	12.3986097299708	66.0293257462168	30.202	12.711	66.602
32.0549929203601	10.4553141804295	66.2581669412031	32.055	9.837	66.681
34.7693620190132	11.4249984033244	66.2581094503347	35.484	11.425	66.484
34.5533855163498	12.1473537913983	64.7873296395367	34.849	11.996	64.173
34.086984106624	18.3879714446843	64.6119540210943	34.087	18.918	64.082
31.3431146875821	17.0760848638455	65.1030311261724	30.594	17.076	65.103
31.3868241551097	16.9461144115422	66.862408755995	31.991	17.203	67.188

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.4127215178733	15.6422395924328	66.9696013494447	31.762	15.473	67.554
31.4369221374127	15.1821041526675	67.041177285923	31.437	14.433	67.041
31.4562504218241	15.3284475613165	68.7526665527222	31.307	14.661	68.868
31.4760489985198	15.8925618467816	69.4521966676042	31.356	16.251	69.04
31.4960080648915	16.2807869579509	71.4000834036133	30.785	16.251	71.611
32.7308638346414	18.5369582578805	71.4650509074727	33.261	18.537	71.995
30.609073648728	18.7948282391638	71.3166903361472	30.531	18.664	72.004
29.7441326955303	19.1622192043213	70.0660373679983	29.705	19.426	70.279
28.9126363481135	19.4900860146864	68.2387284501926	29.261	19.172	68.315
27.3560003806804	19.8828876292614	65.916001882262	27.356	20.632	65.916
25.4727063093709	18.8757116567269	64.0079964760897	24.943	18.346	64.008
25.6948714683572	19.2199054563664	59.7444699365971	25.197	18.918	59.354
30.6151164511316	22.3470002796997	59.4637020960571	31.356	22.347	59.353
26.7504677738079	24.8512517110713	59.4635486214141	26.086	24.95	59.469
26.4668685894112	25.9830697168961	59.4633933123262	27.102	25.966	59.543
25.5970993756807	27.217001894067	59.4632383360833	25.07	27.744	59.542
28.1651348130546	27.1132437776507	58.962790893474	28.88	27.3	58.991
28.1943265387097	25.3902751570392	57.3355148703195	28.499	25.141	57.61
28.2231211326007	24.3790062387048	51.5652042075652	28.753	24.379	51.035
26.5940097385351	19.3840036406955	52.3530461420967	26.594	18.854	52.883
24.1727096632198	20.965917719257	52.0303429148467	24.244	21.077	52.586
20.2023232041412	22.0837249232934	51.4751326498304	20.117	21.775	51.546
17.3231758365207	23.9340095392524	50.8951227663419	17.323	23.934	50.146
17.2260232215161	27.0458895269891	51.7055179540988	17.069	27.046	52.438
17.2259203755578	27.225807120135	45.7362530681541	17.069	27.744	45.218
17.2259180690958	22.9180004467682	46.584734504143	17.64	22.918	47.209
12.6427130063568	18.8540222955543	46.5846462140883	12.052	18.854	46.124
19.573286760303	18.2170660087101	47.8035197417076	19.609	18.156	48.051
25.0699874735776	17.6056914161853	48.7192764514077	25.07	17.076	49.249
25.8950118756858	18.309472267823	46.91684307436	25.895	18.918	46.48
27.7367809084587	16.2509972356371	46.9169009497192	27.737	16.251	47.666
27.7920190852665	13.1976132924489	46.8497727302798	28.499	12.949	46.85
27.4985539792995	13.1975750780605	44.4502659978925	27.991	13.647	44.302
25.5780427186504	13.1975375521166	43.6790041151496	25.578	12.568	43.273
25.040012513902	14.3451381924126	43.6789803105536	24.371	14.346	43.342
29.6419817551075	14.3612345736601	43.6792932269406	29.642	15.108	43.621
30.6726354343702	13.815638210058	44.0178330771551	31.015	13.816	44.684
30.6735253468598	11.5149572979451	44.0182810004409	30.658	10.98	44.543
31.8859045844189	11.5156288139561	43.7414532013387	32.607	11.313	43.742
31.8860731384718	13.5344891703549	41.9661076933945	32.372	14.092	41.845
30.8370202712954	13.433874049081	41.9660052873526	30.787	13.686	41.698
29.8664394653869	13.3298561995415	41.9659052068992	29.134	13.33	42.125
29.9750759110961	12.5500804390544	40.7940343621997	29.975	11.801	40.794
30.1493744862234	12.6819619083607	40.3622955634719	29.975	12.321	39.763
30.4657261268133	13.1071883270203	40.2695446502052	30.202	13.751	40.213
31.3636383962419	13.2447024835585	40.1802681595367	31.015	13.296	40.037
32.8736422299904	13.3809625693959	40.0923471876912	33.095	13.231	40.765
33.1127851037277	13.5813742955389	39.0435535078332	33.095	13.491	38.538
33.3536479201886	13.7887505062932	38.5106848248539	33.322	13.361	37.986
33.6050342050696	14.1959911947433	38.3009577745368	34.135	14.726	38.301
33.2609345470834	13.7175419516523	36.9272067077834	33.095	14.271	36.737
32.9667411869627	11.5410342910506	36.1449989641684	32.217	11.541	36.145
33.1125466419691	10.6845773591225	35.2382095585027	33.642	10.155	35.22
32.2738084431728	12.9840995804978	35.2374830383124	32.436	13.231	35.38
31.2826807343575	14.372519740763	35.236745584264	31.567	14.661	34.796
27.4190508864136	15.0420410427239	35.2360157887493	27.419	15.044	35.984
24.8420414019477	15.2439436597068	33.41725702819	24.308	15.044	33.546
24.243985848068	15.4673286788083	29.2257224816034	24.244	15.997	28.696
20.2306976953174	13.0764737454624	31.5282239621317	19.482	13.076	31.528
20.2293515687409	11.9829471253537	37.6459969940553	20.244	11.234	37.646
18.5506738643102	13.5200098419861	41.2542774999684	18.021	13.52	41.784
18.7869190844918	18.0639455579614	36.5624188753773	18.212	18.283	36.255
20.2495309653608	18.7028735723679	36.0882645300859	20.561	18.219	35.874
20.8776325558459	24.5061619237516	35.7209003502143	20.561	24.696	36.269
25.7049984430915	25.4997840067356	32.7020096261721	25.705	26.22	32.496
29.2609907712311	23.0032252322698	32.7019405708473	29.261	22.283	32.908
30.7629613843091	23.1500790616329	29.1800493385598	31.293	23.68	29.18
28.6891865441773	21.7621255863385	29.0148940057361	28.689	21.013	29.015
28.625831511285	22.0418693608013	23.223085574143	28.626	22.791	23.223
26.9750125179717	20.5907280792945	22.9466694148341	26.975	20.061	22.417
26.3222074748488	21.8331762458367	23.3131277378003	26.022	21.902	22.93
25.8319658023851	22.9180010522388	23.7858965852034	25.832	22.918	24.535
21.9564504921761	24.0535563235607	23.4829563610097	21.958	24.76	23.638
17.7087543587982	24.1415237240172	22.401959147949	17.64	23.426	22.454
16.8637306437305	24.7583781866047	17.8480479562865	16.497	24.315	17.876
16.3699825891661	26.4523073417259	11.497699597112	16.37	26.982	10.968
12.8996919382679	20.4637002675265	15.8419928652317	12.37	19.934	15.842
13.7968592442327	22.0000843589321	17.0792674716156	13.513	22.41	17.465
19.3351732425366	22.5014761377852	17.5601356961418	19.482	21.966	17.833
20.956141418134	24.9753793807991	17.9067330842845	20.942	25.649	17.701

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.9740061619337	25.141048729402	18.7878956597737	22.974	25.141	19.537
28.5266754697438	25.6765870750471	18.5115134890146	29.007	26.157	18.195
28.3891773324933	21.3310229493249	18.5115514388953	28.245	21.331	19.247
28.3889881801967	19.0651020746166	16.8310024308572	27.864	18.854	16.375
28.3888160526582	18.842303689043	16.7214744386461	28.689	18.156	16.722
28.1179444010904	18.8422495762183	12.9310139483718	28.118	18.092	12.931
25.021352910222	19.9899291606003	11.565967301267	24.625	19.68	11.726
24.1041002943552	23.5529999348772	9.24701239318119	23.355	23.553	9.247
25.9914286137376	27.0337695113852	8.29246140643303	25.959	27.744	8.296
30.6709014613832	27.1730986062122	7.30498588807289	31.42	27.173	7.305
29.0699890921981	29.0000623287312	2.51490921955324	29.07	29.713	2.284
20.2736263670751	27.6169936527896	2.51486224788333	20.117	27.617	1.782
20.273456030946	22.7318550859458	2.98961989495027	20.117	22.728	3.645
20.2732863467762	18.2825063208337	3.16897994381789	20.117	18.283	2.485
20.2731160994145	13.7436147505738	7.23997325159956	20.434	13.012	7.24
18.46599343119	13.7436534166234	8.0449575947163	18.466	14.155	8.671

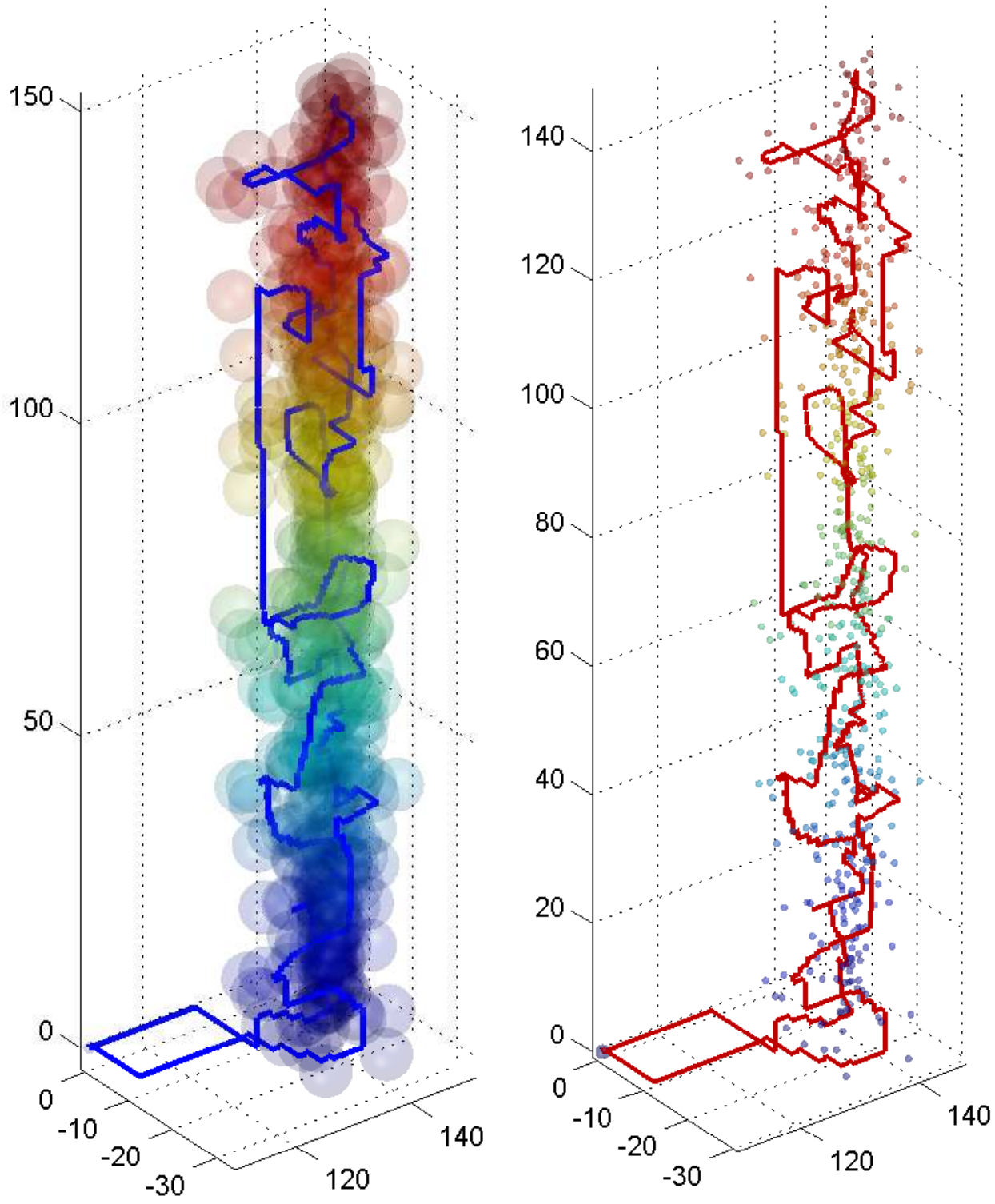


Figure N.190: $d493$, $r = 3.7452$, Equal Radius, 3D, Manhattan, Length = 938.4333440

Table N-193: Solution for $d493$, $r = 3.7452$, Equal Radius, 3D, Manhattan

Total distance: 938.433343957503 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
18.4659998488128	14.1549994488452	4.92579840062186	18.466	14.155	8.671
20.6464853187463	14.8054500201024	4.40270621124203	20.434	13.012	7.24
23.0453869011527	15.6451435436908	3.67166663852468	25.07	16.314	3.298
24.9430000185521	16.459740940778	2.95125587515841	24.943	19.108	0.303
27.140055444542	16.2032751680381	3.00599964509998	26.149	19.045	2.783
30.0126948170698	15.9252545901861	3.06081308152356	32.69	18.346	2.359
30.3221292955933	14.9119535266575	3.11800081800796	28.308	15.933	3.524
30.3221292955933	14.9119535266575	3.11800081800796	31.177	14.433	6.693
30.5357521089804	14.3574050253324	3.15961148766962	32.932	15.246	4.376
30.740575685399	13.779160457579	3.20104735026055	31.399	13.754	2.704
30.9443799060209	13.2015638033377	3.24251654416532	30.787	13.166	3.014
30.9443799060209	13.2015638033377	3.24251654416532	31.892	15.246	4.139
31.1460499836448	12.579445986132	3.28390741918328	34.135	12.906	3.426
31.1460499836448	12.579445986132	3.28390741918328	33.322	12.841	4.069
31.3315745189597	11.9392760718522	3.32519939405554	33.127	11.313	0.11
31.3315745189597	11.9392760718522	3.32519939405554	31.567	11.313	0.396
31.3857379685389	11.7805308481885	4.89971849007599	32.542	12.126	4.969
31.3857379685389	11.7805308481885	4.89971849007599	31.015	13.036	5.79
31.4398140701429	11.6200639511981	6.37726719850387	32.997	11.541	6.26
31.4398140701429	11.6200639511981	6.37726719850387	33.452	11.541	6.941
31.493392401403	11.4598152591624	7.8029960348275	35.166	10.726	7.803
31.493392401403	11.4598152591624	7.8029960348275	33.647	11.313	7.765
31.4933945419131	11.4598042349846	8.63899621294243	34.087	8.758	8.639
30.902886893734	11.6086771518555	8.70200680843863	29.451	10.155	5.592
30.7694749709117	12.6917958768649	8.97616159326249	34.135	12.386	7.828
30.7694749709117	12.6917958768649	8.97616159326249	32.022	12.126	9.107
30.6061053435394	13.9699985019324	9.28861112499111	29.959	17.584	8.664
30.4860366527138	14.0465555451779	10.226529646802	34.135	13.686	10.417
30.2811309482913	14.1251593349109	11.027950142986	29.134	16.187	10.819
30.2811309482913	14.1251593349109	11.027950142986	31.112	15.246	13.662
30.0757476833342	14.2023494771099	11.6966347900245	28.753	10.79	11.577
29.9089953956203	14.301741901875	12.4140987727854	30.787	11.313	10.711
29.9089953956203	14.301741901875	12.4140987727854	31.762	12.126	11.712
29.7274568577656	14.4156318362233	13.8230069442847	31.372	12.353	15.396
29.7274568577656	14.4156318362233	13.8230069442847	29.975	12.061	16.621
29.5318003738037	14.5699834236216	14.1222034529186	33.095	13.751	14.049
29.1030606545531	14.7412919106971	14.4264901142179	31.632	15.246	15.179
28.6368721094941	14.9115174527347	14.7257224375677	28.118	18.092	12.931
28.2799284330327	15.0131602406414	15.6215877512124	28.689	18.156	16.722
27.9131948952938	15.1091214633881	16.3750002922455	27.864	18.854	16.375
27.9131866898382	14.5031353367401	18.0406012906887	29.975	14.141	17.903
27.9131784838832	13.9039913601284	19.7259818952064	31.61	13.901	20.326
24.7693076404394	13.8982504875192	19.7260319764852	22.022	11.361	19.929
26.5881342353044	13.8982518520048	19.7260333457543	26.149	11.107	19.141
26.5881342353044	13.8982518520048	19.7260333457543	25.895	12.123	19.556
28.6872902732525	13.8982532166699	19.726034715045	30.657	11.541	18.351
28.6872902732525	13.8982532166699	19.726034715045	30.202	12.451	21.726
29.7049994964877	13.8982545816421	19.7260360843402	28.816	12.25	22.231
29.7049994964877	13.8982545816421	19.7260360843402	29.705	13.393	23.437
30.3815496923693	13.9621217732577	19.7260359381794	29.515	16.505	21.691
31.1346134536602	14.0242685548045	19.72603579199	31.242	12.126	17.355
31.1346134536602	14.0242685548045	19.72603579199	30.787	13.426	19.207
31.8890844052158	14.0872808933447	19.7260356458214	32.182	10.98	18.901
32.6207023316776	14.1520594720687	19.7260354996612	31.827	11.313	19.849
32.6207023316776	14.1520594720687	19.7260354996612	32.867	11.313	21.273
33.3737593814441	14.219800210139	19.7260353534778	35.992	16.314	18.057
33.2680058851749	14.2197997658218	20.4696902862838	31.242	15.473	19.727
33.1637052699338	14.2197993214882	21.241055357397	35.293	11.552	21.184
33.0538453712069	14.2197988773293	22.0186996751647	33.062	12.126	22.872
32.9439896976317	14.2197984331968	22.7679995905551	32.944	17.965	22.768
32.0560786542451	14.1801956769829	23.4157079094489	31.102	17.775	23.735
31.9202214624977	13.7359981516514	23.689414643401	33.907	14.076	24.403
31.7823922039378	13.2883150880714	23.9602776242643	33.96	10.536	22.989
31.6095801129552	13.0465823053027	24.2890541750855	33.833	10.282	23.21
30.9434968445902	12.9408550471565	25.3049999313904	28.372	10.218	25.305
30.9434987465091	13.1099668705915	26.1569528117572	30.594	9.52	26.782
30.9435006486589	13.5166136100179	26.7249855369858	34.087	11.615	26.904
30.9435025492946	15.4961454798656	27.2400004129687	33.515	18.219	27.24
30.8357738314651	15.4555984038272	29.3616830678471	31.61	17.775	32.188
30.4154825519518	15.1871835833731	29.4009719555921	32.152	15.246	27.742
30.4154825519518	15.1871835833731	29.4009719555921	32.022	15.473	29.854
29.9612218609289	14.9174365474965	29.4403926544453	33.322	14.401	29.372
29.9612218609289	14.9174365474965	29.4403926544453	29.007	14.409	30.293
29.3137936397866	14.657357936495	29.4797861581581	30.787	13.946	28.148
28.6320930371953	14.4000891977321	29.5192996347718	28.181	12.441	28.249
28.6320930371953	14.4000891977321	29.5192996347718	30.202	13.491	28.883

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.9269996515073	14.1542016836722	29.559007295986	27.927	10.409	29.559
25.6103109730432	14.313852314198	30.6539185234716	24.244	15.997	28.696
23.8194597708883	14.4696730375035	32.0207126031213	24.308	15.044	33.546
21.9551001505581	14.624875302833	33.2698736397486	19.482	13.076	31.528
21.0018123504043	14.788212089234	35.5502629588104	20.561	18.219	35.874
20.1426633605397	14.9306361763287	37.4592047886505	20.244	11.234	37.646
19.1389620578245	16.0394508292493	38.660135864861	18.212	18.283	36.255
18.3035809589112	16.7587700972046	41.878903343615	18.021	13.52	41.784
17.496221576445	17.857338966246	45.2567684763365	19.609	18.156	48.051
15.7972017514193	18.8540002561678	46.1239993799601	12.052	18.854	46.124
16.3750409873936	21.8264935066145	46.4689010664104	17.64	22.918	47.209
16.9335225670402	24.4048049824524	46.8098096051427	17.069	27.744	45.218
17.4337955770237	24.5809540944429	49.298504488598	17.323	23.934	50.146
17.9351226265125	24.7579059882162	51.6004503988296	20.117	21.775	51.546
18.1287470836879	25.5008590810418	54.4134266035563	17.069	27.046	52.438
18.3254469819274	26.1838788763406	59.3552739612758	18.974	24.125	61.119
18.5201215212288	26.956442603642	62.2493194616913	17.45	24.188	63.322
18.7200010130676	28.0167423920251	64.3377422011184	18.72	30.665	66.986
21.027366841262	27.5178115155867	63.672432682316	22.466	28.887	64.369
22.9886821338348	27.0002441091706	62.9906095139848	22.022	28.443	62.892
25.1431392978308	26.464377959297	62.3113127705943	25.07	27.744	59.542
27.3432876073749	25.885129436677	61.7504886235328	28.88	27.3	58.991
28.4989982971481	25.1410001455556	61.3552019012168	28.499	25.141	57.61
28.6733413819559	24.6172784081756	61.5477192126167	27.102	25.966	59.543
28.85203873249	24.0580927231762	61.7471623129313	26.086	24.95	59.469
29.3869709336828	22.3387754022836	62.2659665194791	31.356	22.347	59.353
29.7896476961138	20.6119603778501	63.2651692532083	27.356	20.632	65.916
30.5592923665493	18.8579386133172	63.7010516726145	34.087	18.918	64.082
30.9495306832032	17.0366120627041	64.1125951648278	30.594	17.076	65.103
31.3419989576093	15.2113102598117	64.517808835134	28.753	13.457	65.491
31.8088441348818	13.9944563248053	64.899650435138	34.849	11.996	64.173
31.9311976300694	13.7862760461056	65.7526459085968	30.202	12.711	66.602
32.0550014111843	13.5806397960368	66.5728400446093	32.055	9.837	66.681
32.2271318556412	13.5806398874484	66.5728464924502	30.202	11.996	64.142
32.4226507745791	13.5806399789067	66.5728529463004	35.484	11.425	66.484
32.4226506873081	14.0939744673292	67.6988236949723	31.437	14.433	67.041
32.4226506873081	14.0939744673292	67.6988236949723	31.762	15.473	67.554
32.4226506000439	14.5910056492503	68.8715692731279	31.991	17.203	67.188
32.4226506000439	14.5910056492503	68.8715692731279	31.307	14.661	68.868
32.4226505127889	15.0232547763012	70.4306550673139	31.356	16.251	69.04
32.4226505127889	15.0232547763012	70.4306550673139	30.785	16.251	71.611
32.4226504255502	15.4316329486792	72.0038882300241	30.531	18.664	72.004
33.0851748633858	14.962253417167	72.0070084023803	33.261	18.537	71.995
33.7098986192727	12.9103659564243	72.0101285915144	37.452	12.758	72.01
32.9253433057407	12.9103633213467	72.5067647562178	31.307	11.313	71.461
32.9253433057407	12.9103633213467	72.5067647562178	31.015	12.776	72.117
32.2500408393717	12.9103606864258	73.0268182000102	28.816	12.568	71.763
32.2500408393717	12.9103606864258	73.0268182000102	29.197	13.52	74.598
32.0787888334504	12.9103580518893	73.9804544692971	32.282	12.126	74.654
31.9073244372733	12.9103554173927	74.911733598814	28.626	11.234	75.345
31.8275438715243	12.910352786271	75.4232179783173	32.182	16.632	75.383
31.8275438715243	12.910352786271	75.4232179783173	30.202	14.271	77.775
31.6750166204398	12.910349995526	76.1069929912848	29.007	10.282	76.107
31.6750151711177	12.9103490960552	76.4486164725434	31.047	11.313	78.28
31.6750137218089	12.9103481966052	76.7768492898191	30.787	12.646	75.914
31.6750137218089	12.9103481966052	76.7768492898191	30.787	12.906	76.252
31.6750122725218	12.9103472971586	77.1114188334989	29.975	12.581	76.539
31.6750108232583	12.9103463977157	77.4491708892227	31.437	11.541	78.241
31.6750108232583	12.9103463977157	77.4491708892227	30.787	14.466	78.121
31.6750093740107	12.9103454982717	77.779655615832	31.502	12.126	74.715
31.6750079247692	12.9103445988453	78.1589886773428	32.477	14.433	75.823
31.6750079247692	12.9103445988453	78.1589886773428	32.087	14.661	75.705
31.6750064754966	12.9103436993646	78.6214101262632	32.835	14.173	77.958
31.6750050262083	12.9103427998736	79.0909217222251	32.802	12.126	77.71
31.6750050262083	12.9103427998736	79.0909217222251	32.835	12.613	75.794
31.6750035768135	12.9103419004053	80.0109624945068	33.071	16.187	80.531
31.6750035768135	12.9103419004053	80.0109624945068	33.062	15.473	78.089
31.6750021271618	12.9103410005963	81.2198401968479	32.152	12.353	82.503
31.6750021271618	12.9103410005963	81.2198401968479	32.672	12.353	81.337
31.6750006774908	12.9103401007966	82.3500913383156	31.015	13.556	83.741
31.6749992278276	12.9103392009915	83.4065431989563	29.388	13.838	84.576
31.6749992278276	12.9103392009915	83.4065431989563	29.975	13.621	83.535
31.6749977782325	12.9103383011678	84.3669947132911	35.42	12.949	84.367
31.6749977782325	12.9103383011678	84.3669947132911	33.907	13.296	83.348
31.6052448345349	12.9103373940629	84.9044941648151	34.135	14.466	84.176
31.6052448345349	12.9103373940629	84.9044941648151	34.135	13.166	82.509
31.5304149070988	12.9103364869113	85.8035203545028	34.135	14.986	84.727
31.4510991872467	12.9103355796398	87.062726759534	32.412	15.246	88.024
31.4510991872467	12.9103355796398	87.062726759534	32.737	14.433	86.615
31.3709117992518	12.9103346723172	88.2497039265228	34.135	12.646	86.486

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.2878074090712	12.9103337650009	90.036761545123	32.542	15.473	89.387
31.2878074090712	12.9103337650009	90.036761545123	30.34	10.917	88.584
31.2043688158693	12.9103328576598	92.5946828297928	34.849	13.393	93.121
30.9209169958048	12.9103319500925	93.2178867927345	33.322	12.321	95.076
30.9209169958048	12.9103319500925	93.2178867927345	29.261	11.425	96.137
30.9209169958048	12.9103319500925	93.2178867927345	32.412	12.353	94.929
30.9209169958048	12.9103319500925	93.2178867927345	30.202	13.231	95.497
30.9209169958048	12.9103319500925	93.2178867927345	30.527	11.313	94.769
30.9209169958048	12.9103319500925	93.2178867927345	32.737	11.541	92.508
30.9209169958048	12.9103319500925	93.2178867927345	31.697	14.433	93.007
30.9209169958048	12.9103319500925	93.2178867927345	31.547	13.203	92.722
30.9209169958048	12.9103319500925	93.2178867927345	31.957	11.541	90.999
30.9209169958048	12.9103319500925	93.2178867927345	29.975	12.841	90.667
30.9209169958048	12.9103319500925	93.2178867927345	30.722	15.473	90.573
30.9209169958048	12.9103319500925	93.2178867927345	29.975	14.921	90.476
30.7401408858902	12.9103310421623	96.3572697215369	32.802	15.473	97.861
30.7401408858902	12.9103310421623	96.3572697215369	30.202	14.791	95.605
30.5124165821147	12.9103301338731	97.2430272435646	31.737	12.885	98.954
30.2812626601614	12.9103292255834	98.0621177863178	33.322	12.581	100.045
29.8153528635545	12.9103283173263	98.4379273215814	29.515	14.028	97.711
29.3523092651383	12.9103274090581	98.8183434654209	30.202	14.011	102.151
28.7529992041618	12.910326500631	99.040506916567	28.753	13.838	102.669
26.8979915565569	12.7290182397445	99.040506987181	28.753	12.949	99.196
24.6684164067395	12.5474157270541	99.0405070578149	22.212	10.091	100.44
24.7363023378257	12.6675816558349	96.6864671456686	27.419	11.298	96.166
24.8028878865569	12.7899164512821	94.6091029730795	25.705	12.123	93.472
24.869302067117	12.9126974494771	92.7436335421467	23.482	9.52	92.151
24.9527163992493	14.5659891209048	92.2181827657269	26.911	14.409	89.199
25.0300275540208	16.4754246200431	91.9233403773068	25.832	16.949	91.413
25.1071561798298	18.3200692822638	91.630333948256	24.943	18.791	91.664
25.1843230257444	20.1087008416685	91.3373309493674	27.546	22.537	91.326
25.2588010929286	21.0639943565915	91.0447272311679	25.895	20.759	90.426
25.3331473237508	22.0308175319291	90.754282501101	28.245	22.855	90.204
25.4057430142939	22.9179998501418	90.4692587534471	28.054	22.918	87.821
24.367938702061	23.4418353997557	91.2382357644917	26.149	23.172	91.657
23.2269810990978	23.9696055721116	91.9962944258068	20.561	25.776	90.646
22.6220278535103	24.3832747149009	93.0907194691292	25.006	24.188	94.535
21.9349570746674	24.7999612280598	94.057910820106	19.545	25.839	93.739
21.3222021019877	25.2040022112927	95.0500017053566	17.577	25.204	95.05
21.3222015097519	25.832069950217	98.0279999041569	18.91	28.697	98.028
22.2828239377481	25.8282743983155	99.3325776902697	22.276	28.125	102.29
26.2375383881476	25.4864951272589	99.3355879801199	27.229	27.554	96.447
26.9008797235152	22.5506853998971	99.3386636770969	29.134	22.537	96.334
26.9092621461483	21.6300078564788	99.3444901308667	29.07	22.347	101.831
26.9092621461483	21.6300078564788	99.3444901308667	27.991	22.601	101.939
26.9175648681937	20.460162301641	99.3502738498664	27.229	19.616	102.004
26.9258636344771	19.3799003817428	99.3560446451794	24.752	19.362	96.308
30.6630807480922	18.8727408655891	99.8314707017826	33.071	18.346	97.156
31.1985279296347	18.4428427926812	102.891527325536	32.817	17.775	101.585
31.7096885421248	18.0196934361624	106.861162867091	34.722	18.219	109.051
31.7743590663777	17.3430611212103	106.960320846037	32.309	19.553	108.506
31.7743590663777	17.3430611212103	106.960320846037	34.595	18.791	106.414
31.8372734680893	16.4259410299273	107.059058586746	31.293	15.806	105.367
31.9002923906194	15.5337901852928	107.158607707216	31.372	15.246	104.804
31.9634428540548	14.6556598165321	107.25964023304	32.932	12.353	108.278
32.0263035687047	13.8987492754033	107.35990790006	32.477	11.541	107.287
32.0890556016164	13.2188545619445	107.460234266369	31.275	12.613	107.178
32.0890556016164	13.2188545619445	107.460234266369	29.578	13.203	105.988
32.1528521494489	12.5504655520237	107.56207611811	30.721	9.329	106.333
32.296031369147	12.5028804892614	107.995661766965	30.34	9.647	108.046
32.4502562518333	12.4568676033325	108.427337054173	31.047	14.661	110.232
32.6089883003417	12.410252462036	108.8191033366	31.632	12.353	111.341
32.6089883003417	12.410252462036	108.8191033366	30.982	12.126	111.418
32.7745868315092	12.3637220979769	109.147609870259	32.347	11.313	110.138
32.9407060637407	12.3172919485282	109.47170486846	35.103	10.155	111.634
32.7850675555759	12.4955362452632	108.865092785402	34.135	13.426	109.486
32.6279138660027	12.6724186345059	108.248075529477	33.095	12.711	107.498
32.4703302571026	12.8492566259781	107.642490732397	34.722	11.742	108.413
32.4703302571026	12.8492566259781	107.642490732397	35.674	11.044	107.474
32.096533563844	13.12811469048	107.084616370058	34.135	12.126	105.614
31.6990599153378	13.4131331220883	106.561423358342	31.177	11.541	103.36
31.6990599153378	13.4131331220883	106.561423358342	31.957	14.433	102.967
30.5476872194747	13.4131391854174	106.564882338586	29.388	11.804	105.494
30.5476872194747	13.4131391854174	106.564882338586	29.975	13.361	103.951
29.5346649808819	13.4131452499295	106.568344570348	29.197	12.441	103.553
28.5913775781849	13.4131513171113	106.571812838464	26.022	12.631	109.182
28.5913757838189	14.9441173093931	106.571814559391	26.086	14.663	104.115
28.5913739981501	16.7391292752328	106.571816287003	27.292	16.632	106.393
28.5913722125407	18.5510227133481	106.571818014653	29.642	17.076	106.306
28.5913704268854	20.6320003138256	106.571819742353	24.879	20.632	106.077

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.5913704456065	26.5136855069139	107.180486479859	28.943	30.03	106.391
28.5913704456065	26.5136855069139	107.180486479859	28.753	23.998	106.929
28.5913704456065	26.5136855069139	107.180486479859	27.165	25.458	104.784
28.5913704643422	26.987549458429	108.382907521428	28.943	30.475	107.548
28.5913704830715	27.229365899631	111.492120542895	30.277	30.475	112.299
26.9748717349837	26.6275135388914	111.492120870755	25.832	23.68	109.484
26.9748710444029	26.6275133914547	113.458000098464	24.308	23.998	113.458
26.9748712749906	26.6275145864237	115.959299520521	26.911	24.76	115.286
26.9748715055822	26.6275157814154	118.70878923987	27.927	28.125	119.109
26.9748715055822	26.6275157814154	118.70878923987	28.88	25.331	116.966
26.9748717361589	26.627516976411	123.194877393464	27.229	26.22	125.044
26.9748719667379	26.6275181714103	126.393986628833	25.895	29.903	127.854
30.6871737413443	24.3933153765094	126.393986731548	32.245	24.887	125.449
33.5795864411725	22.0289999331288	126.393986834304	34.341	22.029	122.727
33.5795876791099	19.1900403685267	127.605327198337	33.515	18.029	124.645
33.5795889170475	17.2124444580208	129.919959216055	33.127	14.661	132.624
33.5795889170475	17.2124444580208	129.919959216055	36.436	18.918	131.64
33.5795889170475	17.2124444580208	129.919959216055	32.867	14.661	131.697
33.5795889170475	17.2124444580208	129.919959216055	30.462	15.473	131.052
33.5795889170475	17.2124444580208	129.919959216055	32.347	14.661	129.857
33.5795889170475	17.2124444580208	129.919959216055	31.356	16.06	129.885
33.5795889170475	17.2124444580208	129.919959216055	32.282	15.473	127.6
33.5795897672957	13.6470004954385	128.253754867277	35.992	13.647	125.389
33.579587128645	13.0746770524999	128.380695398058	33.907	11.996	124.886
33.5795844850579	12.8069235691629	128.931003723898	34.595	9.202	128.931
32.9140718358751	12.8069229038136	131.266047614956	35.547	11.234	131.369
32.9140718358751	12.8069229038136	131.266047614956	34.976	10.282	131.121
32.9140718358751	12.8069229038136	131.266047614956	30.912	9.901	131.507
32.9140718358751	12.8069229038136	131.266047614956	30.787	12.386	130.829
32.3091256021954	12.8069222389774	133.44660026836	34.595	11.996	135.081
31.6249243586472	12.8069215741696	135.084999451295	28.372	14.663	135.085
31.6249240489579	12.0888282294749	136.369783692323	29.007	12.949	137.787
31.6249240489579	12.0888282294749	136.369783692323	34.135	11.866	136.659
31.6249237392951	11.3167837841871	137.407000022178	29.388	8.313	137.407
32.2077717972677	11.4559715439114	138.482619563621	31.697	11.541	138.673
32.7975468897809	11.5952697331753	139.552912190925	34.404	14.028	139.514
32.7975468897809	11.5952697331753	139.552912190925	33.907	12.776	139.011
33.3219965526925	11.7277970494071	140.664000487982	33.322	15.473	140.664
33.5883983329708	11.7277970990501	142.075612260287	33.907	14.336	141.111
33.8528564555318	11.7277971486726	143.679609402896	34.785	12.504	141.232
34.1122635153337	11.7277971982897	146.033792919444	37.452	10.218	146.804
33.615728139213	12.2203626616994	146.033793282606	31.892	12.353	146.679
33.1391308377426	12.7112952904823	146.033793645771	33.582	15.473	147.748
32.6446654193869	13.110601083664	146.033794008985	33.907	13.556	148.567
32.1188407467641	13.5036460748048	146.033794372223	31.991	14.092	145.487
32.1188407467641	13.5036460748048	146.033794372223	29.975	14.661	145.197
31.6350358989998	13.881000287286	146.033794735302	29.975	13.881	149.391
31.6350357725514	14.3664163049295	145.907028756956	30.787	14.206	147.62
31.6350356461094	14.8540016224257	145.778918360969	28.245	14.854	144.187
31.753510572889	16.4389368087746	145.778918112074	33.769	15.679	145.826
31.753510572889	16.4389368087746	145.778918112074	32.944	15.933	144.54
31.8700301892774	18.1985987748753	145.778917863229	34.468	20.442	147.277
31.8700301835985	18.1985988411152	142.761000626773	34.341	21.013	142.761
31.2386111180662	17.9098947680073	142.257786195833	33.515	20.315	142.968
30.3361228025564	17.5672061548099	141.716569249674	31.356	19.68	141.631
29.3801672205672	17.2080369002501	141.17928644979	27.356	18.473	143.695
28.7498731720505	16.7988494258392	140.342463885677	29.324	15.489	136.921
26.423031780198	16.600558617369	140.22133198081	26.149	15.679	137.044
24.3461484982302	16.4091924320919	140.108176782019	24.879	19.934	139.42
17.5770001353146	16.0835075677967	140.000288236023	17.577	13.647	137.156
15.7481933097176	16.0835082429959	140.652201330965	13.576	14.79	138.325
14.8702959678434	16.0835089183214	141.831999720796	11.163	15.552	141.832
17.4980330815918	16.2337903551164	142.376770462819	18.339	12.631	142.199
18.0187911785214	20.1437027311393	143.039602280901	18.466	18.664	140.644
18.5290003403528	28.0124147972991	143.815703485731	18.529	30.03	146.971
20.0390742050465	28.0124146466292	143.633846875158	19.037	28.189	146.557
21.9147037927442	28.0124144959468	143.439995950099	25.07	30.03	143.44
21.9147040459416	28.0124139698965	140.141214020932	22.149	29.713	141.818
21.9147042991327	28.0124134437868	135.012001257133	18.72	29.967	135.012
21.9760747279719	27.9282823874411	134.32046339496	18.974	29.967	133.455
23.457387494338	27.0481416043449	134.15272459162	26.149	27.49	136.669
23.6129105475661	20.4782128240376	132.531239190626	25.451	17.965	131.595
23.7620985478132	18.5793704334892	131.211125074299	20.434	18.537	132.408
23.9414836027973	16.7344459072185	128.303094121178	20.434	15.806	127.618
25.0877222103746	16.1796429171394	127.51957641583	24.371	15.235	126.557
26.2783190767465	15.6375402579669	126.762229665208	26.594	11.933	126.917
26.840429144291	15.5595236780446	125.609955409495	28.943	16.886	125.854
27.362232817709	15.480986664387	124.438908044552	27.673	12.695	125.598
27.8752552126165	15.4042289827796	123.067154525512	27.102	18.664	121.623
27.8752552126165	15.4042289827796	123.067154525512	28.054	17.013	121.063

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.591264195457	15.3093238609332	122.548056534658	27.927	12.568	120.417
29.4570443121949	15.2222153107075	122.173450171753	30.594	16.251	121.669
30.2866162050208	15.1347671164964	121.802215254312	33.322	13.621	122.895
30.6997757168417	15.0516756912975	121.361127641012	33.907	13.816	122.673
30.8711787372719	14.9768157748314	120.212308218307	34.135	13.946	120.705
31.0213647882296	14.9033987873586	118.866000569999	33.322	13.101	119.477
31.0213647882296	14.9033987873586	118.866000569999	32.087	11.313	118.866
31.0213663266262	14.9033984280033	117.820230801704	31.991	16.632	118.575
31.0213678650026	14.9033980686417	116.730000191103	33.907	12.516	116.73
31.0089653368458	15.3932426519476	116.053780458972	29.578	18.791	116.421
30.996966538076	15.4990232400717	114.570625570424	33.907	14.791	115.865
30.996966538076	15.4990232400717	114.570625570424	33.452	15.246	111.765
30.9749840302851	15.6936699526225	114.548762186663	30.975	17.076	111.068
30.5285545954162	15.6936700653801	114.599761807589	31.502	15.473	118.128
30.5285545954162	15.6936700653801	114.599761807589	32.217	14.433	117.304
29.5421675088858	15.693670178217	114.642674750342	31.015	14.076	113.16
28.4284890724429	15.6936702911297	114.685836747371	29.975	13.101	114.777
27.0535227583768	15.6936704041817	114.729008888707	25.197	12.441	114.729
27.0535223729157	16.5990194502416	116.255207566996	27.229	15.362	116.263
27.0535219873818	17.5488187545466	117.787774386364	25.133	19.235	120.496
27.0535216055505	17.6844135673939	117.879307407905	26.276	20.188	119.025
27.0535212236931	17.8160805651125	117.969993479651	27.927	21.458	117.97
22.1490003957553	17.8160786618726	117.986310394115	22.149	14.282	119.226
21.110626466193	18.6522556443579	117.986310586346	19.99	18.029	118.966
20.1249399442559	19.5092017778625	117.986310778561	20.498	17.457	115.048
18.9326887168523	25.17821313421	117.986310971155	18.72	28.189	115.769
18.9326853009156	25.178213186411	120.046936512399	17.64	27.998	119.961
18.9326818857868	25.1782132385441	122.159202999869	20.371	23.045	124.747
18.9326818857868	25.1782132385441	122.159202999869	18.91	22.474	122.979
18.9326818857868	25.1782132385441	122.159202999869	20.561	23.553	119.319
18.9326784675604	25.178213290758	126.259449101306	19.037	26.982	129.54
18.6588843789266	23.8415845499921	125.898505487211	18.974	24.569	127.812
18.3838254304646	22.4173507827399	125.523898509771	18.593	21.648	126.239
18.1081243411109	21.0547208380335	125.145493685428	21.577	21.394	126.294
15.0896977093781	18.7129200017472	124.497999664479	11.481	17.711	124.498
15.0897039418516	18.7129197248143	116.221999457379	11.735	20.378	116.222
15.1190510151704	18.7129194322703	105.969327111192	17.323	21.331	107.01
15.1190510151704	18.7129194322703	105.969327111192	16.688	18.092	103.09
15.1474166856237	18.7129191396923	99.9748805257171	18.148	16.505	99.59
15.0470297192654	19.9353024762429	99.974879748317	11.608	20.251	101.424
15.0470294934618	19.9353063822675	93.6316022690395	12.243	20.505	94.648
15.0470292676979	19.9353102879893	73.9090031889749	11.862	17.965	73.909
15.0470291039055	20.0610019511075	71.7855309765711	13.005	20.061	68.646
17.5127289494438	23.7469611373423	72.7329992153321	17.64	27.49	72.733
17.5127346718619	23.7469610717563	73.2163620704836	17.45	21.902	76.475
19.2806201798579	24.0152342709011	73.1692783033156	19.863	21.331	75.529
20.3766855075798	24.4786639262805	73.1191737507624	19.164	24.696	74.306
21.5440535098006	24.9401242206856	73.0689674516017	23.482	22.41	74.725
22.115931964852	25.955387377152	73.0169540215974	21.958	29.395	74.461
23.5477872319849	25.9980845531001	72.9227474926058	24.562	26.982	72.259
24.8939192937987	26.0406990254044	72.8288006705688	24.943	23.68	69.938
25.832000099145	26.178111872339	72.7953080024057	25.832	27.998	69.522
27.2848138426599	26.1781118156712	73.5030015799508	27.546	26.982	70.094
28.5863014377737	26.1781117589726	76.266343444855	31.356	26.03	76.034
29.5913514523722	26.1781117022732	79.1983514635867	32.118	27.3	81.725
29.1560738289756	24.1354384947538	78.8659908961845	28.816	21.902	78.963
28.7245478182847	22.5159860727014	78.5331468679464	27.102	21.648	79.965
28.3103227964972	21.0224194091316	78.1908233910063	27.737	18.664	80.683
27.9207018697172	20.2541591218954	77.7476257752929	26.721	18.283	80.536
27.6111610494335	19.8368796160143	76.327171120512	26.848	19.743	76.594
27.3044014584793	19.420273271143	74.8889877331344	26.911	22.601	75.564
27.0033174184108	18.8962491898309	73.2000818026014	27.483	19.616	74.587
26.7003097749766	18.3633240461701	71.3170907724696	29.705	19.426	70.279
26.3365332001173	17.7686202765423	69.934773844806	29.261	19.172	68.315
25.3727596363053	16.6088410780835	69.3348085720635	22.974	17.711	70.862
24.6008907107848	15.2637669284749	68.6699448059336	25.07	11.615	69.179
19.9712590715739	15.1522562609067	65.7160002962498	17.323	12.504	65.716
20.7425655880671	15.309450044273	65.1375211008104	19.418	13.901	64.222
21.5583750270543	15.4685367391392	64.5751793419735	21.831	13.203	64.85
22.3631797693176	15.63102976939	64.0079961354362	24.943	18.346	64.008
22.3631810310351	15.631030958556	61.7009999269371	25.832	14.219	61.701
22.3631812688972	16.4693251634781	59.3540002451965	25.197	18.918	59.354
21.9521534367725	16.4693250508542	58.2070001575517	18.466	17.838	58.207
22.8178969284732	15.4206366678942	57.4214922561264	24.308	16.441	56.035
23.6238956731661	14.3021529184364	56.6827603310447	22.276	13.393	54.239
24.5217460075978	13.2798526288059	56.0521667805601	22.085	10.853	55.182
28.625999902418	12.7340071396539	55.5254977013649	28.626	10.091	52.872
30.2539049703928	12.7340168546446	55.5255130690038	32.944	10.536	54.126
30.2539129434605	12.7826009777548	55.9125996186632	30.658	9.71	56.048
30.2539209163904	12.8320331440579	56.2980202003118	33.322	14.141	54.817

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.2539288843494	12.8792658449151	56.9497324807132	29.975	14.401	55.717
30.2539288843494	12.8792658449151	56.9497324807132	31.275	14.173	56.999
30.253936852238	12.9262038361074	57.6283686952816	28.372	13.52	60.757
30.2539448396394	12.9709651741368	57.7621583751986	30.202	12.971	61.507
31.0703352743792	12.9813744366488	57.7621560858922	31.015	12.516	61.408
31.9929068582135	12.9918213961214	57.7621537925127	33.095	14.011	61.011
32.6152365019364	13.0022250960412	57.7621514978325	31.827	14.661	58.532
32.6152365019364	13.0022250960412	57.7621514978325	32.672	15.246	60.724
33.2028353345701	13.0120386658419	57.7621491993969	36.944	13.012	57.936
33.0864938966223	13.2494047370508	57.1108276453257	33.387	11.313	58.128
33.0864938966223	13.2494047370508	57.1108276453257	33.96	11.234	59.829
32.9661152841265	13.537163284884	55.4865086467029	32.69	13.52	54.423
32.8458989589099	13.8249889801337	53.969414460515	34.135	14.206	54.088
32.7249162896912	14.1115279148439	52.4432579254949	36.119	13.139	51.404
32.5034133949494	14.5286055195645	51.8931650553231	33.322	13.881	49.4
32.5034133949494	14.5286055195645	51.8931650553231	30.982	15.473	49.591
32.2856767901923	14.9392618380386	51.4426146500323	33.095	12.971	48.557
32.2856767901923	14.9392618380386	51.4426146500323	33.907	13.036	49.61
32.0379727548794	15.6932931414866	51.1736682152891	33.388	17.584	48.735
31.7732259142631	16.2838910181521	50.9348016011959	33.642	18.346	49.307
31.7732259142631	16.2838910181521	50.9348016011959	32.607	14.661	52.963
31.4829986461914	16.8220006756582	50.7002017961872	31.483	16.822	46.955
31.4829986461914	16.8220006756582	50.7002017961872	30.657	15.246	48.98
28.7530001775895	20.6487926255105	50.7002019779961	28.753	24.379	51.035
27.4513261004042	20.6487918896151	50.7002020676859	24.244	21.077	52.586
27.5443640775799	19.3003807132107	49.7614343876836	26.594	18.854	52.883
27.6387308011753	18.0675328065777	47.9965977646849	25.895	18.918	46.48
27.6387308011753	18.0675328065777	47.9965977646849	25.07	17.076	49.249
27.7365909650213	16.90715907626	46.12990664169	30.785	16.949	44.302
27.7365909650213	16.90715907626	46.12990664169	27.737	16.251	47.666
27.8248470136388	15.764947745905	45.2517034818425	29.642	15.108	43.621
27.8248470136388	15.764947745905	45.2517034818425	28.499	12.949	46.85
27.9113680253833	15.0400386557712	44.2374022384517	24.371	14.346	43.342
28.3849660121544	14.7353351977763	43.9397061284108	25.578	12.568	43.273
29.976341093876	14.5087828135067	43.669758517772	30.658	10.98	44.543
29.976341093876	14.5087828135067	43.669758517772	27.991	13.647	44.302
30.6317328762891	14.4056097074321	43.2475190337823	32.607	11.313	43.742
30.8365336353085	14.3383663145958	42.5914675591869	32.372	14.092	41.845
30.8365336353085	14.3383663145958	42.5914675591869	31.015	13.816	44.684
31.0380779623169	14.2713040310426	41.8998558295036	30.787	13.686	41.698
31.2400188887892	14.2043406084825	41.2120980429127	33.095	13.231	40.765
31.4380052090289	14.1376106959356	40.5357985490178	29.975	11.801	40.794
31.4380052090289	14.1376106959356	40.5357985490178	29.134	13.33	42.125
31.6497043993053	14.0720109573605	39.7745667012342	31.015	13.296	40.037
31.862536989791	14.0065417692645	39.0076764380557	29.975	12.321	39.763
31.862536989791	14.0065417692645	39.0076764380557	30.202	13.751	40.213
32.0859152371055	13.9416404195041	38.1660353168975	33.322	13.361	37.986
32.0859152371055	13.9416404195041	38.1660353168975	33.095	13.491	38.538
32.304866814329	13.8769184376785	37.3199051003082	32.217	11.541	36.145
32.5241368131963	13.8128770276232	36.5307898079869	32.436	13.231	35.38
32.7436070819574	13.7489345884983	35.7705091944161	33.642	10.155	35.22
32.7436074025736	14.6520124519776	35.7705085702701	33.095	14.271	36.737
32.7436077231865	15.5675625787138	35.770507946116	34.135	14.726	38.301
32.7436080437794	16.5612512531025	35.7705073219016	36.436	17.076	35.413
31.4508670281015	16.5612522272125	35.770506948046	31.567	14.661	34.796
30.1500227190244	16.5612532013998	35.7705065742006	30.15	16.06	32.059
30.1282428199619	16.7658486318799	36.3582203593877	30.023	17.203	33.037
30.1064750494507	16.9672595679533	37.2785365975574	27.419	15.044	35.984
30.0852017205303	17.2030000548926	39.0250006772335	26.34	17.203	39.025
30.1532848921808	18.4456065721185	39.1099387291501	32.372	18.537	39.944
30.2210034188852	19.6799997788452	39.1944986179624	33.96	19.68	39.41
29.887939214413	20.8652820435506	39.1945004642414	26.149	20.886	38.979
30.3516437894221	20.8653018120544	40.5481950115778	30.785	20.823	44.268
30.3516456593257	23.2594414687853	40.5481950240264	29.261	23.045	43.901
30.3516475295034	26.1577860520875	40.5481950363503	33.642	26.22	42.336
28.1211850739185	26.1577921380106	40.1291851114487	27.8	23.617	42.03
26.0860000469941	26.1577982250912	39.6609993402285	26.086	29.903	39.661
24.3062017295164	24.6960008772322	36.269000048839	20.561	24.696	36.269
25.5285780876652	24.3570168265725	33.8877598351833	25.705	26.22	32.496
26.7603234026146	24.0051393929758	31.8990172901236	29.261	22.283	32.908
27.5477982815847	23.6800108028058	29.1800000508041	31.293	23.68	29.18
27.483773542827	23.6487988129964	27.0816533811513	25.832	22.918	24.535
27.483773542827	23.6487988129964	27.0816533811513	28.689	21.013	29.015
27.4191941495991	23.6183539122581	23.1084504924215	26.975	20.061	22.417
27.3559389242378	23.5901760344441	21.827152184737	28.626	22.791	23.223
27.3559389242378	23.5901760344441	21.827152184737	26.022	21.902	22.93
27.2927431295036	23.5621133922311	20.2672803600779	29.007	26.157	18.195
25.8720490869306	23.4840661783199	20.2141115161568	28.245	21.331	19.247
22.0497210074265	23.408326619156	20.161449090332	21.958	24.76	23.638
20.6848019236236	23.2536482564775	19.5911851036276	20.942	25.649	17.701

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.6848019236236	23.2536482564775	19.5911851036276	22.974	25.141	19.537
18.6178472981806	23.087616840028	19.0822701822718	19.482	21.966	17.833
18.6178472981806	23.087616840028	19.0822701822718	17.64	23.426	22.454
17.3009601201331	22.9200926489909	18.0115924458566	16.497	24.315	17.876
16.043412688403	22.7508324729373	16.9482461890387	13.513	22.41	17.465
15.0182581173494	22.5822568187601	15.8419998456929	12.37	19.934	15.842
16.5020150662473	23.3087168721381	11.5899258801221	16.37	26.982	10.968
24.4232026231582	23.3698950984058	11.2325936856029	24.625	19.68	11.726
25.4381496255402	24.3258592995048	9.87036527306242	23.355	23.553	9.247
26.5936347048769	25.3250853619688	8.57247956112923	25.959	27.744	8.296
27.8068564530808	26.1872367520521	7.30499969160292	31.42	27.173	7.305
27.8068562023842	26.1872372150785	2.2840009035282	29.07	29.713	2.284
22.4827683608474	25.0958474027271	1.85853232319472	20.117	27.617	1.782
21.1865771820649	21.7111432720282	1.4364966104455	20.117	22.728	3.645
20.0091910447499	17.2122377551426	0.983890455160498	20.117	18.283	2.485
18.8250331744447	11.3891794912441	0.516189152977909	22.149	11.742	1.36

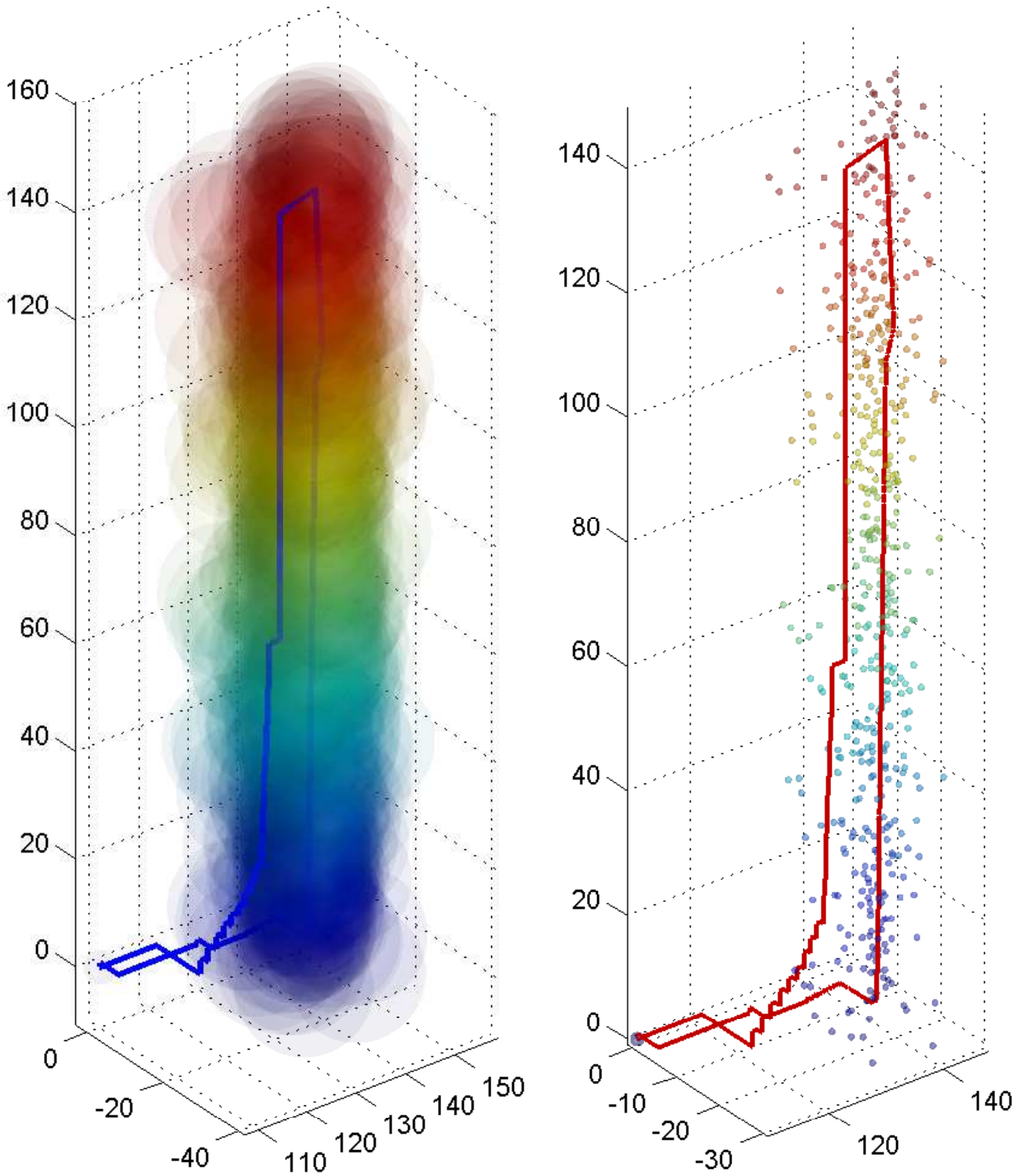


Figure N.191: $d493$, $r = 11.2356$, Equal Radius, 3D, Manhattan, Length = 388.7310227

Table N-194: Solution for $d493$, $r = 11.2356$, Equal Radius, 3D, Manhattan

Total distance: 388.73102271821 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
11.3766640702385	11.5307056787409	2.48827193566643	20.117	18.283	2.485
12.2032294834713	12.577260730955	4.9822940055678	20.434	13.012	7.24
12.9799097502811	13.6202071830672	7.35383157154795	18.466	14.155	8.671
13.7396481108229	14.6610291649756	9.69175204097215	12.37	19.934	15.842
14.5067688048048	15.6558810794968	11.7762514261995	13.513	22.41	17.465
15.2808343484809	16.5847881690871	13.6292609860661	16.37	26.982	10.968
16.0228437070359	17.2010093769109	16.1413001826892	20.942	25.649	17.701
16.7193811707276	17.7645790713357	18.4939009093968	16.497	24.315	17.876
17.4171407793286	18.3161517071031	20.8768360674602	17.64	23.426	22.454
18.1149109283238	18.8602015698401	23.2236662320189	28.626	22.791	23.223
18.1661081358919	18.9760919117064	25.5685498053116	26.975	20.061	22.417
18.2170083157598	19.091810140429	28.1876738042312	26.022	21.902	22.93
18.2170083157598	19.091810140429	28.1876738042312	25.832	22.918	24.535
18.2673423323705	19.2063065276067	32.3270071142327	19.482	13.076	31.528
18.2673423323705	19.2063065276067	32.3270071142327	20.244	11.234	37.646
18.3175839897302	19.3230772124224	35.4456759957121	20.561	18.219	35.874
18.3175839897302	19.3230772124224	35.4456759957121	18.212	18.283	36.255
18.3678095188258	19.4400026174377	38.5631553196865	20.561	24.696	36.269
18.4180068801368	19.5565399320956	41.8422704490099	18.021	13.52	41.784
18.4180068801368	19.5565399320956	41.8422704490099	19.609	18.156	48.051
18.4681974517304	19.6736913090857	44.8156565452308	12.052	18.854	46.124
18.5184881380421	19.7909311453458	47.7455243595605	17.64	22.918	47.209
18.5184881380421	19.7909311453458	47.7455243595605	17.323	23.934	50.146
18.568808647264	19.9077445308414	50.6474993853944	17.069	27.744	45.218
18.6191892872691	20.0229692340631	54.5267193448809	17.069	27.046	52.438
18.6696007081766	20.1375493944408	58.7124484970802	18.974	24.125	61.119
18.7200113284997	20.2518985560409	62.7662804589016	18.72	30.665	66.986
19.3027225824605	20.2518986045382	62.7662805976	22.466	28.887	64.369
19.8724349059308	20.2518986533835	62.7662807375122	22.022	28.443	62.892
20.4362818508198	20.2518987022476	62.7662808774726	26.086	24.95	59.469
20.9863166750662	20.2518987510951	62.7662810174541	28.88	27.3	58.991
20.9863167354351	20.2518987694138	64.7678666812487	25.832	27.998	69.522
20.9863167958331	20.2518987877585	66.3900758039798	27.356	20.632	65.916
20.9863168562432	20.2518988060925	68.0307631406994	17.323	12.504	65.716
20.9863169166431	20.2518988244198	69.7533616587898	17.45	24.188	63.322
20.986316977043	20.2518988427566	71.6801420306222	13.005	20.061	68.646
20.9863170374174	20.251898861069	73.7389581427976	11.862	17.965	73.909
20.9863170977836	20.2518988793833	75.8074877057559	21.958	29.395	74.461
20.9863171581543	20.2518988976983	77.9738663823146	17.64	27.49	72.733
20.9863171581543	20.2518988976983	77.9738663823146	19.164	24.696	74.306
20.9863172185196	20.2518989160131	80.7850286141677	17.45	21.902	76.475
20.9863172788827	20.2518989343358	83.8420637422076	19.863	21.331	75.529
20.9863173392494	20.2518989526583	87.9258455168611	20.561	25.776	90.646
20.9863173996117	20.2518989709748	91.8445729514907	17.577	25.204	95.05
20.9863173996117	20.2518989709748	91.8445729514907	19.545	25.839	93.739
20.9863174599707	20.251898989214	95.4841348387675	22.276	28.125	102.29
20.9863174599707	20.251898989214	95.4841348387675	18.91	28.697	98.028
20.9863175203304	20.2518990075488	97.4437488274304	12.243	20.505	94.648
20.9863175806832	20.2518990258854	99.5698799953198	11.608	20.251	101.424
20.9863176410134	20.2518990442188	101.605513523936	18.148	16.505	99.59
20.9863176410134	20.2518990442188	101.605513523936	24.752	19.362	96.308
20.9863177013588	20.2518990625506	103.898866252929	16.688	18.092	103.09
20.9863177616825	20.2518990808736	106.249606681929	17.323	21.331	107.01
20.986317821995	20.2518990991828	108.619300686596	26.911	24.76	115.286
20.986317821995	20.2518990991828	108.619300686596	24.308	23.998	113.458
20.9863178823379	20.2518991175026	110.365612305866	25.832	23.68	109.484
20.986317942688	20.2518991358134	112.149383075915	26.276	20.188	119.025
20.9863180030405	20.2518991541142	113.753193084404	27.102	18.664	121.623
20.9863180030405	20.2518991541142	113.753193084404	25.133	19.235	120.496
20.9863180634196	20.2518991724351	114.952746713359	28.88	25.331	116.966
20.9863181237827	20.2518991907077	116.119954756267	27.927	28.125	119.109
20.9863181842109	20.2518992090583	117.059921810772	20.498	17.457	115.048
20.9863182446088	20.2518992273702	118.014043039487	20.561	23.553	119.319
20.9863183050001	20.2518992456849	118.969151130059	18.91	22.474	122.979
20.9863183653852	20.2518992640003	119.912308706519	20.371	23.045	124.747
20.9863184257829	20.2518992823095	120.838834531259	11.735	20.378	116.222
20.9863184861633	20.251899300613	121.891873184144	18.72	28.189	115.769
20.986318546542	20.2518993189306	123.156438033496	17.64	27.998	119.961
20.9863186069141	20.2518993372486	124.495385112427	11.481	17.711	124.498
20.9863186672834	20.2518993555611	125.847488786978	18.593	21.648	126.239
20.9863187276379	20.2518993738624	127.210129657978	21.577	21.394	126.294
20.9863187880014	20.251899392167	128.594122519654	20.434	15.806	127.618
20.9863188483675	20.2518994104644	130.002519225753	25.895	29.903	127.854
20.9863188483675	20.2518994104644	130.002519225753	18.974	24.569	127.812
20.9863189087356	20.2518994287699	132.309632478657	19.037	26.982	129.54
20.9863189691047	20.2518994470685	134.781977332158	18.72	29.967	135.012

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.9863189691047	20.2518994470685	134.781977332158	18.974	29.967	133.455
20.9863190294445	20.2518994653812	137.52169077137	18.466	18.664	140.644
20.9863190897944	20.2518994836976	140.211501047736	11.163	15.552	141.832
20.9863191503634	20.2518995022907	142.012265111227	18.529	30.03	146.971
21.3685997189265	20.1273243578604	142.012265128575	19.037	28.189	146.557
21.7564011112275	20.0008786652915	142.012265147812	13.576	14.79	138.325
22.1824045057318	19.8767269466044	142.012265167585	20.434	18.537	132.408
22.6143112338247	19.7529578554508	142.012265187018	18.339	12.631	142.199
23.05383207489	19.6301727939644	142.012265206871	22.149	29.713	141.818
23.4975025936335	19.5040159167482	142.012265226735	26.149	27.49	136.669
23.9316045876641	19.375417346624	142.01226524582	26.149	15.679	137.044
24.3633940265015	19.2472127735311	142.012265265903	24.879	19.934	139.42
24.7950223881738	19.1189809640466	142.012265285518	31.356	19.68	141.631
25.2194520699224	18.9907107338801	142.012265306175	25.07	30.03	143.44
25.6504772818167	18.8022345583409	142.012265325458	28.245	14.854	144.187
25.6504772818167	18.8022345583409	142.012265325458	27.356	18.473	143.695
26.0782408712469	18.6146094712374	142.012265344294	17.577	13.647	137.156
26.7192202511424	18.441640257846	142.012265362926	29.975	14.661	145.197
27.3531236045634	18.2693347758855	142.012265382474	34.468	20.442	147.277
27.9529301083523	18.0962771184069	142.012265401031	34.341	21.013	142.761
28.5381116607793	17.9226658374247	142.012265420616	29.975	13.881	149.391
29.1188328359657	17.7502685267215	142.012265439638	30.787	14.206	147.62
29.6964805989333	17.5785788244725	142.012265459234	33.515	20.315	142.968
30.268465977181	17.4065212142564	142.012265477412	37.452	10.218	146.804
30.2684542704141	17.4455512700032	141.388281612667	33.907	13.556	148.567
30.2684425631798	17.4846480310635	140.732037028221	33.582	15.473	147.748
30.2684308558348	17.5237702622426	140.052100564237	31.892	12.353	146.679
30.2684308558348	17.5237702622426	140.052100564237	31.991	14.092	145.487
30.2684191483144	17.563005350183	139.330126014357	33.769	15.679	145.826
30.2684191483144	17.563005350183	139.330126014357	32.944	15.933	144.54
30.2684074404432	17.6022762447251	138.572066677344	33.322	15.473	140.664
30.2684074404432	17.6022762447251	138.572066677344	34.404	14.028	139.514
30.2683957330043	17.6415940634643	137.815648118733	34.785	12.504	141.232
30.2683957330043	17.6415940634643	137.815648118733	33.907	14.336	141.111
30.2683840252197	17.6810023004678	137.042417466709	33.907	12.776	139.011
30.2683840252197	17.6810023004678	137.042417466709	34.135	11.866	136.659
30.2683723171951	17.7205190065521	136.273878150576	31.697	11.541	138.673
30.2683606090823	17.760098648438	135.500966658467	34.595	11.996	135.081
30.2683606090823	17.760098648438	135.500966658467	35.547	11.234	131.369
30.2683489006458	17.7998788593101	134.770634278605	30.912	9.901	131.507
30.2683489006458	17.7998788593101	134.770634278605	30.787	12.386	130.829
30.268337192408	17.8398384949539	134.077449365556	29.388	8.313	137.407
30.268337192408	17.8398384949539	134.077449365556	29.007	12.949	137.787
30.2683254839508	17.8801828373709	133.341484345685	36.436	18.918	131.64
30.2683254839508	17.8801828373709	133.341484345685	25.451	17.965	131.595
30.2683137757006	17.9205131013462	132.62447727879	29.324	15.489	136.921
30.2683020675587	17.9608629874011	131.899975221518	34.976	10.282	131.121
30.2682903588908	18.0013585608944	131.184398957687	34.595	9.202	128.931
30.2682786504058	18.042152679708	130.495833171329	28.372	14.663	135.085
30.2682786504058	18.042152679708	130.495833171329	30.462	15.473	131.052
30.2682669413427	18.0829982333735	129.80076911457	33.127	14.661	132.624
30.2682552328642	18.1238742168506	129.102178355987	32.867	14.661	131.697
30.2682435240493	18.1647803894936	128.400773540963	32.245	24.887	125.449
30.2682435240493	18.1647803894936	128.400773540963	27.229	26.22	125.044
30.2682318157375	18.2054317316961	127.736787212235	32.347	14.661	129.857
30.2682318157375	18.2054317316961	127.736787212235	31.356	16.06	129.885
30.2682201068003	18.2461293835768	127.070576354518	24.371	15.235	126.557
30.2682201068003	18.2461293835768	127.070576354518	28.943	16.886	125.854
30.2682083982226	18.2868697934939	126.414585162397	35.992	13.647	125.389
30.2681966898816	18.3276669809375	125.764961352805	33.907	11.996	124.886
30.2681849809791	18.3685403443662	125.121068007307	32.282	15.473	127.6
30.2681849809791	18.3685403443662	125.121068007307	33.515	18.029	124.645
30.2681732721782	18.4094397535929	124.479185809713	27.673	12.695	125.598
30.2681732721782	18.4094397535929	124.479185809713	27.927	12.568	120.417
30.2681615635755	18.4504707183305	123.852413323268	26.594	11.933	126.917
30.2681498546814	18.4915951427898	123.218167725346	28.054	17.013	121.063
30.2681381457497	18.5327313671331	122.590617794635	30.594	16.251	121.669
30.2681264375854	18.5738846112017	121.967409157436	34.341	22.029	122.727
30.2681147288915	18.6150063070604	121.345414053291	33.322	13.621	122.895
30.2681030199654	18.6561770517163	120.722743468222	33.907	13.816	122.673
30.2680913114371	18.6973975808091	120.098287585821	34.135	13.946	120.705
30.2680796023382	18.7386657373508	119.475208708867	31.015	14.076	113.16
30.2680678934584	18.7799983535216	118.873622240361	29.975	13.101	114.777
30.2680561846199	18.8213965647749	118.284116716424	22.149	14.282	119.226
30.2680444759908	18.8628973381147	117.692746672158	19.99	18.029	118.966
30.2680327685017	18.9044378077385	117.091201650635	33.322	13.101	119.477
30.2680210607118	18.9460449618001	116.486441201101	32.087	11.313	118.866
30.2680093528062	18.9877675192566	115.876613651823	32.217	14.433	117.304
30.2679976452554	19.0295317294117	115.266611531413	25.197	12.441	114.729
30.2679859378441	19.0714003526879	114.66092912738	27.229	15.362	116.263

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.2679742302983	19.1133030077353	114.054755675501	31.632	12.353	111.341
30.2679625225319	19.1552922466867	113.458034917187	32.309	19.553	108.506
30.267950814907	19.1972782897454	112.872673597347	32.347	11.313	110.138
30.2679391009443	19.2394016164784	112.298535735085	30.277	30.475	112.299
30.199601866196	19.2394015070304	112.06304879673	27.927	21.458	117.97
30.1313426316179	19.2394014164922	111.82587003207	29.578	18.791	116.421
30.0631069860241	19.2394013204832	111.587804720108	31.991	16.632	118.575
29.9948106248276	19.2394012301549	111.347077656797	31.502	15.473	118.128
29.9264667206899	19.2394011326205	111.103572639806	30.982	12.126	111.418
29.858100539488	19.2394010357383	110.860330765007	30.975	17.076	111.068
29.7897236400625	19.2394009437144	110.6174224692	35.103	10.155	111.634
29.7204684654152	19.2394008456818	110.372787770598	33.452	15.246	111.765
29.6511251450911	19.2394007500613	110.128094109391	33.907	14.791	115.865
29.5816020585576	19.2394006559572	109.880604933181	33.907	12.516	116.73
29.5113902737189	19.2394005617267	109.618722941187	34.135	13.426	109.486
29.4410245412304	19.2394004659202	109.357354507152	32.932	12.353	108.278
29.3705363948294	19.2394003697135	109.097002209679	31.047	14.661	110.232
29.3000198295683	19.239400273942	108.83670039557	34.722	11.742	108.413
29.2291740358112	19.2394001806756	108.577202869164	34.722	18.219	109.051
29.1581864811971	19.2394000860635	108.317961858767	34.595	18.791	106.414
29.0870555962366	19.2393999921114	108.059840347096	33.095	12.711	107.498
29.0870555962366	19.2393999921114	108.059840347096	32.477	11.541	107.287
29.0156334784608	19.239399875411	107.803324055269	35.674	11.044	107.474
28.9430405717139	19.2393997625945	107.547998919702	28.943	30.475	107.548
28.9305219417244	19.2382578809104	107.099995688266	34.135	12.126	105.614
28.9305219417244	19.2382578809104	107.099995688266	29.578	13.203	105.988
28.9179944096859	19.237116165916	106.659115541743	31.293	15.806	105.367
28.9179944096859	19.237116165916	106.659115541743	31.372	15.246	104.804
28.9054637308892	19.235974519208	106.223666357746	29.642	17.076	106.306
28.8929328796677	19.234832889511	105.789349483848	28.943	30.03	106.391
28.8929328796677	19.234832889511	105.789349483848	28.753	23.998	106.929
28.8804020124542	19.2336900983931	105.348845443436	27.165	25.458	104.784
28.8678730522078	19.2325472310718	104.910265675185	29.07	22.347	101.831
28.8678730522078	19.2325472310718	104.910265675185	27.991	22.601	101.939
28.855345172925	19.2314042801785	104.479566443633	24.879	20.632	106.077
28.855345172925	19.2314042801785	104.479566443633	27.229	19.616	102.004
28.8428220668223	19.2302612877408	104.051743965112	27.292	16.632	106.393
28.8428220668223	19.2302612877408	104.051743965112	26.086	14.663	104.115
28.8303029207379	19.2291183505554	103.624210521613	30.34	9.647	108.046
28.8303029207379	19.2291183505554	103.624210521613	30.721	9.329	106.333
28.8177659080416	19.2279764244315	103.145926144581	26.022	12.631	109.182
28.8177659080416	19.2279764244315	103.145926144581	31.275	12.613	107.178
28.8052316743904	19.2268347177281	102.64267318988	29.975	13.361	103.951
28.8052316743904	19.2268347177281	102.64267318988	30.202	14.011	102.151
28.7926956645199	19.2256931073283	102.141382892129	29.388	11.804	105.494
28.7801590452635	19.2245515986475	101.634328650747	31.177	11.541	103.36
28.7801590452635	19.2245515986475	101.634328650747	29.197	12.441	103.553
28.7676190606878	19.2234102664789	101.123231331566	31.957	14.433	102.967
28.7550763055012	19.2222689749252	100.61095069317	28.753	13.838	102.669
28.7550763055012	19.2222689749252	100.61095069317	32.817	17.775	101.585
28.7425306801057	19.2211277298388	100.097547678302	22.212	10.091	100.44
28.7337876324498	19.2200447938445	94.2149344470273	23.482	9.52	92.151
28.7337876324498	19.2200447938445	94.2149344470273	25.832	16.949	91.413
28.7257068055373	19.2189817358347	93.9595734177351	25.705	12.123	93.472
28.7176276824591	19.2179187531915	93.7048123339319	24.943	18.791	91.664
28.7176276824591	19.2179187531915	93.7048123339319	25.895	20.759	90.426
28.7095510150256	19.2168557507377	93.4523968733523	28.245	22.855	90.204
28.7014746148668	19.2157927113124	93.2013528531057	25.006	24.188	94.535
28.7014746148668	19.2157927113124	93.2013528531057	26.149	23.172	91.657
28.6934008159433	19.2147295710516	92.9509940402281	27.229	27.554	96.447
28.6853282090049	19.2136663567327	92.6983135339651	29.134	22.537	96.334
28.6853282090049	19.2136663567327	92.6983135339651	27.546	22.537	91.326
28.6772560836752	19.21260305293	92.4455753454896	33.322	12.581	100.045
28.6772560836752	19.21260305293	92.4455753454896	33.322	12.321	95.076
28.6772560836752	19.21260305293	92.4455753454896	32.412	12.353	94.929
28.6772560836752	19.21260305293	92.4455753454896	34.849	13.393	93.121
28.6772560836752	19.21260305293	92.4455753454896	31.697	14.433	93.007
28.6772560836752	19.21260305293	92.4455753454896	31.547	13.203	92.722
28.6772560836752	19.21260305293	92.4455753454896	30.722	15.473	90.573
28.6772560836752	19.21260305293	92.4455753454896	32.542	15.473	89.387
28.6772560836752	19.21260305293	92.4455753454896	28.054	22.918	87.821
28.6691189749168	19.21154136468	92.0716709821462	33.071	18.346	97.156
28.6691189749168	19.21154136468	92.0716709821462	30.202	14.791	95.605
28.6609796176296	19.2104797017706	91.692039102287	32.802	15.473	97.861
28.6528378737312	19.2094180730355	91.305184649079	31.737	12.885	98.954
28.6528378737312	19.2094180730355	91.305184649079	28.753	12.949	99.196
28.6446905791008	19.2083567858106	90.8546202567427	29.515	14.028	97.711
28.6446905791008	19.2083567858106	90.8546202567427	30.202	13.231	95.497
28.6365422336432	19.2072956130984	90.3846133141475	29.261	11.425	96.137
28.6365422336432	19.2072956130984	90.3846133141475	27.419	11.298	96.166

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.6283950430434	19.2062347563843	89.8704611846312	30.527	11.313	94.769
28.6202462493889	19.2051740345661	89.3390148802549	32.412	15.246	88.024
28.6202462493889	19.2051740345661	89.3390148802549	34.135	14.986	84.727
28.6120930116773	19.2041133742347	88.8239247536204	34.135	12.646	86.486
28.6120930116773	19.2041133742347	88.8239247536204	32.737	14.433	86.615
28.6039343079665	19.2030528365505	88.3217867168141	35.42	12.949	84.367
28.5957664917195	19.2019924484045	87.8404416109933	34.135	14.466	84.176
28.5957664917195	19.2019924484045	87.8404416109933	33.907	13.296	83.348
28.587591488557	19.2009321916721	87.3801562225479	34.135	13.166	82.509
28.579411239494	19.1998720390681	86.9353049470848	32.152	12.353	82.503
28.579411239494	19.1998720390681	86.9353049470848	32.672	12.353	81.337
28.5712242331191	19.1988121142212	86.5181430996809	31.015	13.556	83.741
28.5630363666206	19.1977522349044	86.1048781059057	29.388	13.838	84.576
28.5630363666206	19.1977522349044	86.1048781059057	29.975	13.621	83.535
28.5548480806882	19.1966924344309	85.6972673723014	32.737	11.541	92.508
28.5548480806882	19.1966924344309	85.6972673723014	31.957	11.541	90.999
28.5466177179038	19.1956339617947	84.9981243447391	29.975	12.841	90.667
28.5466177179038	19.1956339617947	84.9981243447391	30.34	10.917	88.584
28.5383852146336	19.1945756965665	84.2522470711057	29.975	14.921	90.476
28.5383852146336	19.1945756965665	84.2522470711057	26.911	14.409	89.199
28.5301530819981	19.1935175122348	83.4648011208179	27.737	18.664	80.683
28.5301530819981	19.1935175122348	83.4648011208179	26.721	18.283	80.536
28.5219222750075	19.1924593226949	82.6992134375729	28.816	21.902	78.963
28.5219222750075	19.1924593226949	82.6992134375729	27.102	21.648	79.965
28.5136922548416	19.1914010600027	81.957198604852	32.118	27.3	81.725
28.5136922548416	19.1914010600027	81.957198604852	31.356	26.03	76.034
28.5054571972507	19.1903425290294	81.2648785976562	33.071	16.187	80.531
28.4972205506517	19.1892840140873	80.5768205232549	33.062	15.473	78.089
28.488982127585	19.1882255262526	79.8980157486591	30.787	14.466	78.121
28.488982127585	19.1882255262526	79.8980157486591	30.202	14.271	77.775
28.4807425623225	19.18716711087	79.2330638083783	32.182	16.632	75.383
28.4807425623225	19.18716711087	79.2330638083783	29.197	13.52	74.598
28.4725015640757	19.186108757948	78.5951696715756	32.477	14.433	75.823
28.4725015640757	19.186108757948	78.5951696715756	32.087	14.661	75.705
28.4642575541112	19.1850504745087	77.9749318181309	32.835	12.613	75.794
28.4642575541112	19.1850504745087	77.9749318181309	32.282	12.126	74.654
28.4560085885113	19.1839923605899	77.377498707387	32.802	12.126	77.71
28.4560085885113	19.1839923605899	77.377498707387	32.835	14.173	77.958
28.4477552891035	19.1829343663046	76.7811445807999	31.437	11.541	78.241
28.4477552891035	19.1829343663046	76.7811445807999	31.047	11.313	78.28
28.4394987840188	19.1818765608639	76.1785824951943	29.007	10.282	76.107
28.4394987840188	19.1818765608639	76.1785824951943	28.626	11.234	75.345
28.431242170301	19.1808189751255	75.5821658755223	29.975	12.581	76.539
28.4229850381975	19.1797614464657	74.9852432075718	30.787	12.906	76.252
28.414726993971	19.1787039715465	74.3871027198975	31.502	12.126	74.715
28.414726993971	19.1787039715465	74.3871027198975	30.787	12.646	75.914
28.4064664686661	19.1776466279389	73.7877194918757	31.307	11.313	71.461
28.4064664686661	19.1776466279389	73.7877194918757	28.816	12.568	71.763
28.3982040864709	19.176589447149	73.2042836592112	31.015	12.776	72.117
28.3899406140964	19.1755323244545	72.6247932997041	37.452	12.758	72.01
28.3815520970196	19.1744766135497	72.0852474060369	33.261	18.537	71.995
28.3815520970196	19.1744766135497	72.0852474060369	30.531	18.664	72.004
28.3731612949555	19.1734209023796	71.5485163709866	27.546	26.982	70.094
28.3731612949555	19.1734209023796	71.5485163709866	24.562	26.982	72.259
28.3647738773036	19.1723649826919	71.0156951990492	27.483	19.616	74.587
28.3563869192131	19.1713090514735	70.4795557233711	26.911	22.601	75.564
28.3563869192131	19.1713090514735	70.4795557233711	26.848	19.743	76.594
28.3480014555211	19.1702530567712	69.9264981550298	24.943	23.68	69.938
28.3480014555211	19.1702530567712	69.9264981550298	23.482	22.41	74.725
28.3396201875524	19.1691969461389	69.365138372033	25.07	11.615	69.179
28.3396201875524	19.1691969461389	69.365138372033	22.974	17.711	70.862
28.3312434606821	19.1681409455945	68.8044979912641	31.307	14.661	68.868
28.3228656982363	19.1670849852812	68.2451139881728	31.437	14.433	67.041
28.3144868013343	19.1660290681757	67.6891127694322	31.762	15.473	67.554
28.3144868013343	19.1660290681757	67.6891127694322	31.991	17.203	67.188
28.306105618573	19.1649731874902	67.1366548062783	31.356	16.251	69.04
28.306105618573	19.1649731874902	67.1366548062783	30.785	16.251	71.611
28.2977226300496	19.1639173394376	66.5763110450056	29.705	19.426	70.279
28.2893393295839	19.1628614706014	66.0119259162313	29.261	19.172	68.315
28.280955901636	19.1618055811863	65.4457626541158	32.055	9.837	66.681
28.280955901636	19.1618055811863	65.4457626541158	30.202	12.711	66.602
28.2725661617375	19.1607500060835	64.8712747546696	34.849	11.996	64.173
28.2725661617375	19.1607500060835	64.8712747546696	35.484	11.425	66.484
28.2641471377874	19.1596949535119	64.279792099905	25.197	18.918	59.354
28.2557296289206	19.1586398861101	63.6989532040046	31.827	14.661	58.532
28.2557296289206	19.1586398861101	63.6989532040046	28.372	13.52	60.757
28.2473104887065	19.157584910393	63.1391410927165	34.087	18.918	64.082
28.2473104887065	19.157584910393	63.1391410927165	30.594	17.076	65.103
28.2388884133563	19.1565299185244	62.5773966011498	32.672	15.246	60.724
28.2304645730883	19.1554749513321	62.020213313592	31.356	22.347	59.353

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.2220396943309	19.1544199249789	61.4684044477045	30.658	9.71	56.048
28.2220396943309	19.1544199249789	61.4684044477045	29.975	14.401	55.717
28.2135633883728	19.1533679888775	61.1787304001281	36.944	13.012	57.936
28.2049014514398	19.1523179786758	60.9513042199957	30.202	11.996	64.142
28.2049014514398	19.1523179786758	60.9513042199957	28.753	13.457	65.491
28.1962382912422	19.1512681019721	60.7212455090579	30.202	12.971	61.507
28.1875743313542	19.1502182792011	60.4911340760803	33.095	14.011	61.011
28.1875743313542	19.1502182792011	60.4911340760803	31.015	12.516	61.408
28.1789064050149	19.149168564523	60.2609052517856	33.387	11.313	58.128
28.1789064050149	19.149168564523	60.2609052517856	33.96	11.234	59.829
28.1702249287178	19.1481191612128	60.0331678417925	25.832	14.219	61.701
28.1615446318122	19.1470697951162	59.8051597488433	21.831	13.203	64.85
28.1615446318122	19.1470697951162	59.8051597488433	24.943	18.346	64.008
28.1528754921896	19.1460205692474	59.5709968447364	19.418	13.901	64.222
28.1446072402526	19.144974956317	58.781143000988	25.07	27.744	59.542
28.1446072402526	19.144974956317	58.781143000988	27.102	25.966	59.543
28.1363417779311	19.1439290681839	57.9873781050795	28.499	25.141	57.61
28.1280761288197	19.1428830942809	57.1974860660307	22.085	10.853	55.182
28.1280761288197	19.1428830942809	57.1974860660307	18.466	17.838	58.207
28.1198342151555	19.1418374274241	56.4387219781747	22.276	13.393	54.239
28.111596260073	19.1407918402426	55.6938208324864	26.594	18.854	52.883
28.111596260073	19.1407918402426	55.6938208324864	24.308	16.441	56.035
28.1033603068082	19.1397462641954	54.958749434652	25.07	17.076	49.249
28.0951258272447	19.1387007011521	54.2445219084629	28.753	24.379	51.035
28.0951258272447	19.1387007011521	54.2445219084629	24.244	21.077	52.586
28.0868926208901	19.1376550181418	53.5470468983642	20.117	21.775	51.546
28.0786649320577	19.1366092669686	52.8607087029729	36.119	13.139	51.404
28.0704254730706	19.1355636720024	52.1906068999945	28.626	10.091	52.872
28.0621857034848	19.1345182272182	51.5185448246646	32.944	10.536	54.126
28.0621857034848	19.1345182272182	51.5185448246646	32.69	13.52	54.423
28.0539358362776	19.1334730846715	50.8098149892615	34.135	14.206	54.088
28.0539358362776	19.1334730846715	50.8098149892615	31.275	14.173	56.999
28.0456800644471	19.1324280553617	50.0566041654485	32.607	14.661	52.963
28.0456800644471	19.1324280553617	50.0566041654485	33.322	14.141	54.817
28.0374186902592	19.1313831243252	49.2676989629316	33.322	13.881	49.4
28.0374186902592	19.1313831243252	49.2676989629316	30.982	15.473	49.591
28.0291538508882	19.1303382704907	48.4813663429431	27.737	16.251	47.666
28.0208893397578	19.1292934316057	47.699188560836	33.642	18.346	49.307
28.0208893397578	19.1292934316057	47.699188560836	30.657	15.246	48.98
28.0126219205571	19.1282486145031	46.9115714662507	25.895	18.918	46.48
28.0043554433982	19.1272037866406	46.1269881745183	33.388	17.584	48.735
27.9960868544875	19.1261589617437	45.3349965752818	33.095	12.971	48.557
27.9960868544875	19.1261589617437	45.3349965752818	33.907	13.036	49.61
27.9878091659715	19.1251143224452	44.4850071146016	32.607	11.313	43.742
27.9878091659715	19.1251143224452	44.4850071146016	30.658	10.98	44.543
27.9795261742821	19.1240699185604	43.6451511005006	28.499	12.949	46.85
27.9712431697457	19.1230255797163	42.7923721628829	26.34	17.203	39.025
27.9629610261666	19.1219812562697	41.9545191138746	26.086	29.903	39.661
27.9629610261666	19.1219812562697	41.9545191138746	26.149	20.886	38.979
27.9547345516032	19.1209319095694	41.503801506568	33.642	26.22	42.336
27.9547345516032	19.1209319095694	41.503801506568	27.8	23.617	42.03
27.9465037231641	19.1198823633976	41.0516836486127	29.261	23.045	43.901
27.9382725777263	19.1188327598167	40.5972103615858	30.785	20.823	44.268
27.9382725777263	19.1188327598167	40.5972103615858	31.483	16.822	46.955
27.9300387892106	19.1177831364399	40.1300259911588	29.642	15.108	43.621
27.9300387892106	19.1177831364399	40.1300259911588	30.785	16.949	44.302
27.9218035696948	19.1167335542995	39.6550956882889	31.015	13.816	44.684
27.9218035696948	19.1167335542995	39.6550956882889	27.991	13.647	44.302
27.9135669150936	19.1156840849598	39.1647881787066	25.578	12.568	43.273
27.9135669150936	19.1156840849598	39.1647881787066	24.371	14.346	43.342
27.9053338889567	19.1146347344833	38.6603183240232	29.134	13.33	42.125
27.8971004917369	19.1135854361388	38.1508681858169	29.975	11.801	40.794
27.8971004917369	19.1135854361388	38.1508681858169	30.787	13.686	41.698
27.8888648472253	19.1125362677309	37.6308137535363	29.975	12.321	39.763
27.8806283430571	19.1114871657895	37.1073589632083	31.015	13.296	40.037
27.8806283430571	19.1114871657895	37.1073589632083	30.202	13.751	40.213
27.87238968416	19.1104381571241	36.5744699675243	33.095	13.231	40.765
27.87238968416	19.1104381571241	36.5744699675243	32.372	14.092	41.845
27.8641443915384	19.1093892828082	36.0145796639418	33.642	10.155	35.22
27.8641443915384	19.1093892828082	36.0145796639418	32.217	11.541	36.145
27.8558796770547	19.1083409422811	35.4663341943014	25.705	26.22	32.496
27.8476164708091	19.1072924894749	34.9260083185669	31.293	23.68	29.18
27.8393514389851	19.1062439544055	34.4000855563551	28.689	21.013	29.015
27.8393514389851	19.1062439544055	34.4000855563551	29.261	22.283	32.908
27.8310861041529	19.1051953363105	33.8852163143932	33.96	19.68	39.41
27.8310861041529	19.1051953363105	33.8852163143932	32.372	18.537	39.944
27.8228149389337	19.1041466782388	33.3458681720258	34.135	14.726	38.301
27.8145386905652	19.1030980834498	32.7896098336997	33.322	13.361	37.986
27.8145386905652	19.1030980834498	32.7896098336997	33.095	13.491	38.538
27.8062518842382	19.1020496972327	32.181049227379	31.61	17.775	32.188

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.8062518842382	19.1020496972327	32.181049227379	30.023	17.203	33.037
27.7979635767765	19.1010013052931	31.5728574631983	30.15	16.06	32.059
27.7979635767765	19.1010013052931	31.5728574631983	31.567	14.661	34.796
27.7896732845475	19.0999529596053	30.9581612372321	36.436	17.076	35.413
27.7896732845475	19.0999529596053	30.9581612372321	33.095	14.271	36.737
27.7813675921575	19.0989047062974	30.2817745034344	32.436	13.231	35.38
27.7813675921575	19.0989047062974	30.2817745034344	27.419	15.044	35.984
27.7730587989086	19.0978565663668	29.5608744663033	33.322	14.401	29.372
27.7730587989086	19.0978565663668	29.5608744663033	30.202	13.491	28.883
27.7647466292629	19.0968085098815	28.8449495518884	32.152	15.246	27.742
27.7647466292629	19.0968085098815	28.8449495518884	32.022	15.473	29.854
27.7564313325491	19.095760490997	28.1316087724072	30.787	13.946	28.148
27.7481149855049	19.0947125078524	27.4193015561082	29.007	14.409	30.293
27.7397983668657	19.0936645524974	26.7001924050146	24.244	15.997	28.696
27.7397983668657	19.0936645524974	26.7001924050146	24.308	15.044	33.546
27.7314860444952	19.0926166416593	25.94092047286	28.181	12.441	28.249
27.7314860444952	19.0926166416593	25.94092047286	27.927	10.409	29.559
27.7231737433916	19.091568943358	25.1455344299101	28.372	10.218	25.305
27.714861151902	19.0905213726071	24.3503134317345	34.087	11.615	26.904
27.714861151902	19.0905213726071	24.3503134317345	30.594	9.52	26.782
27.7065341774328	19.0894742789602	23.4767121095856	33.96	10.536	22.989
27.6981912361335	19.0884275449989	22.6185300015025	33.833	10.282	23.21
27.6981912361335	19.0884275449989	22.6185300015025	33.907	14.076	24.403
27.6898244457821	19.087381326798	21.7292659626482	21.958	24.76	23.638
27.6814615677473	19.0863349987009	20.8277848062566	22.974	25.141	19.537
27.6731015534547	19.0852885574519	19.9355288623673	32.867	11.313	21.273
27.6731015534547	19.0852885574519	19.9355288623673	33.062	12.126	22.872
27.6647319920386	19.0842423713637	18.998694538548	28.753	10.79	11.577
27.6563292543448	19.0832001255654	18.7682622886956	35.992	16.314	18.057
27.6563292543448	19.0832001255654	18.7682622886956	35.293	11.552	21.184
27.6478873396944	19.0821587896236	18.5231638411726	28.245	21.331	19.247
27.6394454492266	19.0811174166935	18.2779697692338	29.007	26.157	18.195
27.6310030894722	19.0800759373397	18.0328855935715	32.944	17.965	22.768
27.6310030894722	19.0800759373397	18.0328855935715	33.515	18.219	27.24
27.6225229301344	19.0790345076605	17.7269514484851	29.515	16.505	21.691
27.6225229301344	19.0790345076605	17.7269514484851	31.102	17.775	23.735
27.6140407366153	19.0779930833142	17.4156220235199	31.242	15.473	19.727
27.6055572777852	19.0769516783323	17.1032392767725	30.787	13.426	19.207
27.6055572777852	19.0769516783323	17.1032392767725	31.61	13.901	20.326
27.597070624066	19.0759103681087	16.7876369222526	29.975	14.141	17.903
27.5885832008104	19.0748690928762	16.4715911532834	29.975	12.061	16.621
27.5885832008104	19.0748690928762	16.4715911532834	31.242	12.126	17.355
27.5800927233419	19.0738279598882	16.1550337176056	30.202	12.451	21.726
27.5716002190777	19.0727869180244	15.8321526768153	28.816	12.25	22.231
27.5716002190777	19.0727869180244	15.8321526768153	29.705	13.393	23.437
27.5631042957719	19.0717460862555	15.4862833580992	25.895	12.123	19.556
27.5631042957719	19.0717460862555	15.4862833580992	22.022	11.361	19.929
27.5546220962172	19.0707055978122	15.1188658748454	26.149	11.107	19.141
27.5461412019552	19.0696652234279	14.745396743643	30.657	11.541	18.351
27.5376579887062	19.0686249506504	14.3666223116003	27.864	18.854	16.375
27.5291748061475	19.0675846664197	13.9868624555709	28.689	18.156	16.722
27.5291748061475	19.0675846664197	13.9868624555709	19.482	21.966	17.833
27.5206991942171	19.0665443109396	13.5982793054879	28.118	18.092	12.931
27.5206991942171	19.0665443109396	13.5982793054879	31.632	15.246	15.179
27.5122220059339	19.0655039807152	13.2092296830915	32.182	10.98	18.901
27.5122220059339	19.0655039807152	13.2092296830915	31.827	11.313	19.849
27.5036729236197	19.0644655154982	12.3419263459586	31.112	15.246	13.662
27.4951225539011	19.0634270752208	11.470431436095	30.787	11.313	10.711
27.4865700796934	19.0623887250937	10.6052614258302	29.134	16.187	10.819
27.4780171952305	19.0613503926547	9.74029257947403	29.959	17.584	8.664
27.4694636161836	19.0603120674588	8.87962880476683	31.42	27.173	7.305
27.4609067273695	19.0592736121771	8.03343563531106	25.959	27.744	8.296
27.452351117925	19.0582350266885	7.18589427944216	24.625	19.68	11.726
27.4437967761079	19.0571964371926	6.32178207176894	23.355	23.553	9.247
27.4352444890415	19.0561577981099	5.44442799029143	29.07	29.713	2.284
26.3997779008594	19.0517425071801	5.43989806419601	20.117	27.617	1.782
26.393741378574	18.6194581581498	5.43673711178124	20.117	22.728	3.645
26.3877066899173	18.1815565446546	5.43357631268692	24.943	19.108	0.303
26.3816723520076	17.7429882968601	5.43041583017353	26.149	19.045	2.783
26.375638116687	17.3035899179521	5.42725549623247	32.69	18.346	2.359
26.3696023636242	16.863098079613	5.42409541263528	32.932	15.246	4.376
26.3635651057968	16.4248269060921	5.42093543123546	31.177	14.433	6.693
26.3575269767118	15.9887479003971	5.41777540183001	33.095	13.751	14.049
26.3513952947853	15.6701736946244	5.41458277885469	32.022	12.126	9.107
26.3513952947853	15.6701736946244	5.41458277885469	31.762	12.126	11.712
26.3452597816441	15.3583948559347	5.41138914225968	25.07	16.314	3.298
26.3391245817767	15.0463221826922	5.40819563796729	28.308	15.933	3.524
26.3329891402069	14.733978075397	5.40500225243321	35.166	10.726	7.803
26.3268472399247	14.4290299045645	5.40180839827855	33.647	11.313	7.765
26.3207028937446	14.1266992711398	5.39861433497	33.322	12.841	4.069

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.3145567297535	13.8252575992621	5.39542039565137	31.399	13.754	2.704
26.3084095535682	13.5239367796406	5.39222664216006	30.787	13.166	3.014
26.3022615684196	13.2228626973066	5.38903304180769	33.452	11.541	6.941
26.2961116020718	12.9229680455211	5.38583932535234	32.997	11.541	6.26
26.2899599774271	12.6239492344137	5.3826455525415	32.542	12.126	4.969
26.2838069444825	12.3252687662072	5.37945181362095	31.372	12.353	15.396
26.0701375636476	11.9205279055437	5.04223312102172	31.015	13.036	5.79
25.8554092595083	11.5150066695152	4.70469677703337	29.451	10.155	5.592
25.6400109957555	11.1106327243305	4.36680939945443	34.135	13.686	10.417
25.4044980028748	10.6856473217184	3.99318118490652	34.087	8.758	8.639
25.1591462314703	10.267575568601	3.60638922978245	33.127	11.313	0.11
24.908874895479	9.84777178168894	3.22500451372989	31.567	11.313	0.396
24.6556969476873	9.42627599746106	2.84661818029206	34.135	12.386	7.828
24.2030450023863	8.87910730534277	2.2679527965059	34.135	12.906	3.426
23.6205977567973	8.26405386652996	1.66951760595071	31.892	15.246	4.139
16.1157882015119	4.82356218236859	0.836788087350779	22.149	11.742	1.36

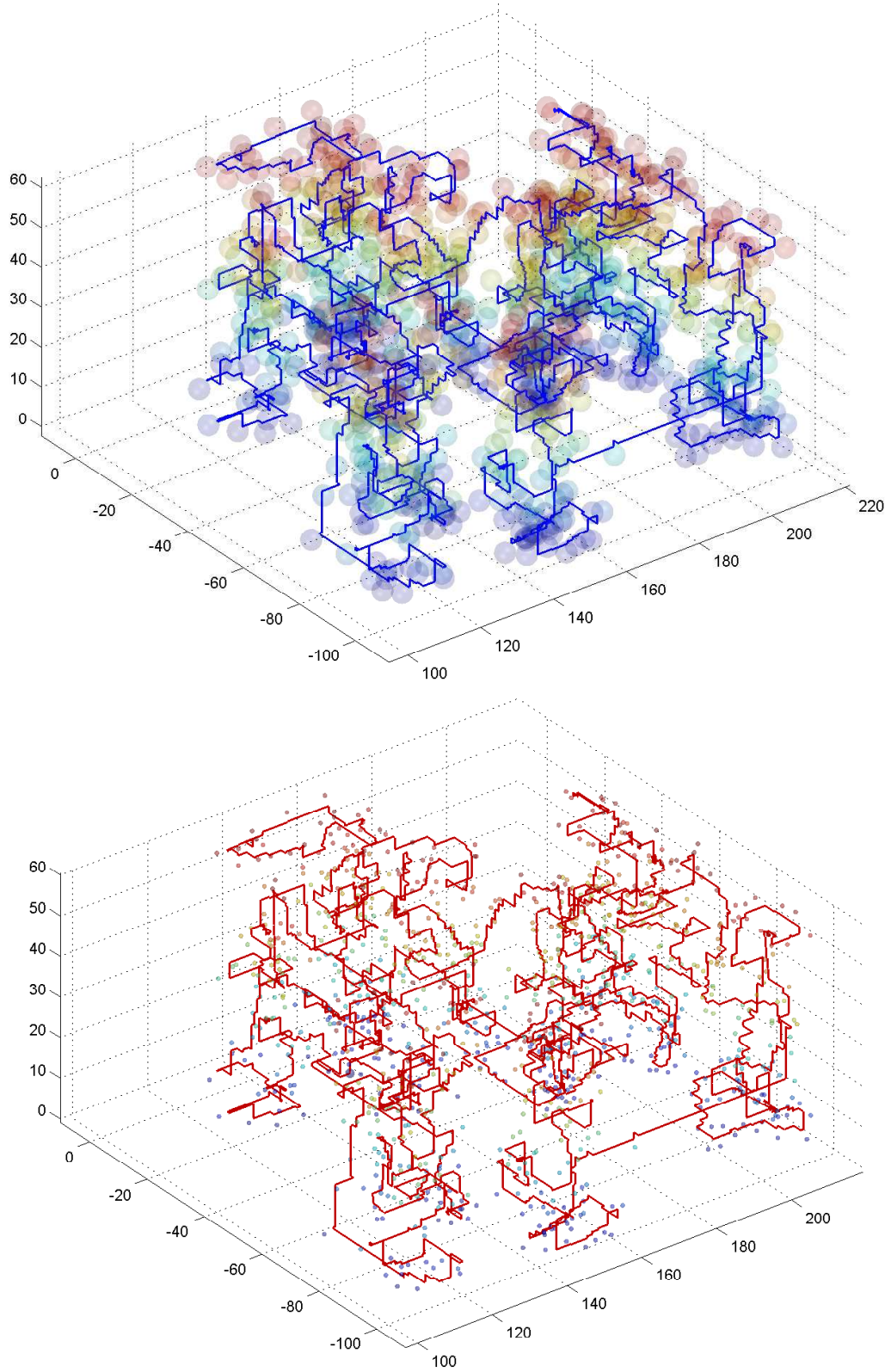


Figure N.192: $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Manhattan, Length = 4412.9731379

Table N-195: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Manhattan

Total distance: 4412.97313791776 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
44.5395151306751	9.59244554502174	0.933740632162234	42.7704	10.2739	1.2183
43.2771742888812	5.83035473183638	1.81400065265201	42.4139	3.5597	1.814
43.277173839977	13.5777996246304	5.27182526550399	41.9974	13.5778	7.3366
44.8064315943249	15.0851063210339	4.87244252570515	44.2621	15.3855	4.7212
46.463300386672	16.5324403778562	4.47526052420223	46.503	16.5426	2.0548
47.2668213859425	17.6945832698233	4.45004961188375	49.3862	17.5735	5.4967
47.4691564213326	19.234933607736	4.4235589365734	49.1677	19.2175	6.1526
47.4934054741551	22.9979712941627	2.62212358558512	46.7163	23.0055	0.3229
51.8390367428209	24.4442877208294	2.61391430852459	54.0368	23.8586	2.2143
52.286027533136	31.1262461733178	2.60573337414311	50.8592	31.2824	4.4654
56.7234670291674	33.8374658165176	2.59736844346959	58.126	35.24	1.1949
56.344646238251	31.1255678775927	6.91726340515079	57.9508	29.6187	7.6435
55.3612882025453	30.597679999814	7.9514812507131	54.8257	29.6059	7.5612
54.4348750841005	30.0998462990001	9.03636755736606	53.915	28.4629	8.3577
53.5943432286084	29.6743168689727	10.3207170326709	54.5895	27.7676	11.1642
49.5432003524832	29.433406385649	10.9510200046898	49.5432	29.0024	13.3417
48.010477142792	29.4334045822606	8.65011418540191	46.7677	27.4481	8.8301
47.5892988060873	29.4334027806409	3.21159860936561	47.5893	27.8934	1.3329
43.8957911507961	31.4719397474048	3.2563891730637	44.1303	30.8739	2.5661
39.8564213557589	33.8060999384567	3.30131510128104	37.4272	33.8061	3.3013
42.3255193850857	35.8126719613756	3.52944253876735	42.8212	36.4305	1.5446
43.9804757248674	37.1523322514492	3.80698406123726	44.3651	39.5082	4.2576
43.9805494508192	37.1523440688788	3.80704670204826	45.6407	35.658	2.8521
43.980573505654	37.1523611169317	8.76086410275505	45.4526	36.121	9.3446
43.9805975554104	37.1523781676855	11.7992116144672	45.4903	38.3462	11.2293
43.9806215995059	37.1523952153973	17.4550745961534	43.7884	36.8808	19.8614
50.0843715271396	38.8324676513887	17.4550761667705	50.3352	41.2014	16.9793
50.0843749218533	33.6695765038284	19.9354704545863	50.3723	32.2399	19.4829
50.0843783164086	31.1620003374141	22.8964996446409	52.5136	31.162	22.8965
49.2139991013753	29.8417853207098	24.3100522767856	50.5738	30.8854	25.5173
47.744428383841	27.351011326007	25.2029626622957	47.7428	26.438	23.4687
46.2791956003109	25.7660325732182	26.6678544458349	45.985	27.4123	27.7797
44.9699661644648	20.2513529715803	27.6804186108436	45.9242	19.9	29.6168
41.8600938941931	17.3491484816352	28.2108228651166	40.2335	17.1357	30.0024
41.8600978607984	17.3491455089763	23.4641296981122	40.715	18.8306	21.9165
44.0162183144938	17.1055561293114	23.4641268721456	44.3034	16.6265	25.3299
45.9014531630673	16.8686308759138	23.464124045783	47.2412	18.0641	21.8927
46.1523156681603	16.010999791099	23.4641212252207	46.6598	16.011	21.0885
46.1523173956069	14.9336598072533	23.5134768381121	48.0446	14.6778	22.9405
46.1523191220778	13.9313989945604	23.5632224987676	45.8725	14.3747	21.2711
46.1523208492632	10.6871099252646	23.6231787057077	43.7231	10.6871	23.6231
46.8540591091704	10.2789985168154	27.653920947365	49.0558	10.279	28.6803
45.9496743992321	7.0064069430364	27.6539210749492	46.0043	6.8606	27.4465
45.0417998222593	3.86580986563088	27.6539212025889	45.0418	3.8658	25.2247
44.0614845848185	3.71562736325255	31.1801877450968	44.0031	6.0986	31.1209
43.2100448629421	2.23905529421206	38.4927399170727	42.4155	0.0668	38.5675
42.6951842827831	1.87664812460055	43.3154409881512	43.4311	0.4843	45.1031
33.434900201513	1.71599981178733	43.5296027717823	33.4349	0.0139	45.2628
31.123379722847	1.7160215392564	37.4674318992109	28.6989	1.5656	37.4478
31.1233788313064	5.49169886027174	37.4672749459601	31.7997	5.4917	35.1341
29.9246285431817	6.08890178978888	37.9771341402723	29.6205	6.6839	35.8272
28.9510865007987	6.57672125902388	39.694094024489	29.2732	5.6917	40.0529
27.9451993307654	7.08729991501655	41.3099787481384	27.9452	7.0873	43.7392
24.2726025330285	7.54652567077283	39.9827171793471	22.0744	6.6433	40.1203
24.0795387191712	14.2293200819553	37.7058959609576	25.9081	14.4892	36.1934
21.3346692127829	15.4114814846236	37.482437111271	19.6468	14.5775	38.07
20.0727621870402	16.9853094793253	37.251417228772	18.1963	16.0602	36.4885
19.5225069911863	24.6716941866004	37.040820738878	19.5225	24.6717	34.6116
19.2193113074487	25.4186858270362	37.0408189556987	17.7323	26.9057	35.8248
19.4236316882303	23.4166805903839	38.1167386834929	17.3215	22.815	38.4524
19.6861504301694	22.1794293221025	39.0225653708635	21.1889	21.267	39.0474
19.9310976792544	21.1546702088807	39.9245394546012	20.7311	19.0512	39.2565
20.1249625651014	20.8932295713698	44.8093853236081	21.7951	21.835	45.5134
20.1249625651014	20.8932295713698	44.8093853236081	19.3676	20.9011	45.1036
20.3040218019662	20.6109679832367	47.0635967591013	19.4151	20.4264	46.5071
20.4861534715823	20.3302897810933	49.6661029752096	22.5923	19.795	49.1879
20.6363895343196	20.0713122076538	57.9682874728887	22.0389	18.6688	59.3708
20.1414885986403	21.9950498198295	57.6774438563902	19.4476	21.0876	59.2618
19.6860703801025	25.4362086802103	57.3488210679785	18.7218	26.0511	59.401
19.4046214148895	26.2993980289336	50.4148015027802	16.9754	26.2994	50.4148
20.4589390769502	26.5514707143727	49.9180810528652	21.4132	25.3225	51.4824
21.1564480858403	26.8494845534846	49.0965348403065	23.1689	25.59	48.8728
21.311305218404	31.7290406961822	48.536491094792	21.3113	31.7798	46.1078
35.5391999094242	31.7290592884322	56.3182084974823	35.5392	31.6783	58.7469
40.9958999339475	35.5116780708023	51.1587000281698	40.9959	37.9409	51.1587
44.7879995663239	35.4192200126256	46.5719401942171	46.003	37.4534	46.4333

Solution x	Solution y	Solution z	Original x	Original y	Original z
45.1628267807798	35.2710982406449	44.5484525847139	44.7872	36.1398	42.3342
46.7069322962962	34.8233690919158	44.4661482266225	45.9581	33.5048	45.1742
48.6325999938057	34.4139867485298	44.3830701663741	48.6326	32.1618	43.4727
51.4729800975991	34.4139900412186	44.3830696294341	51.473	33.7115	46.7085
51.5738648871904	34.7948343204603	42.691962275229	50.1654	34.298	41.7388
51.6774156503517	35.189594203821	41.3930378600329	51.7623	34.8081	42.2217
51.7808485074048	35.5903189821683	39.934880106197	51.6292	37.4529	39.3047
51.8846543071344	35.9257104227535	38.7590142467468	53.589	37.6567	38.7584
51.8846299694994	33.479419428788	38.7580295664674	54.3132	33.4794	38.814
50.7066885355913	32.0881801435764	38.1447796049407	51.0819	30.8837	36.7669
49.4090220906187	31.0619493928298	37.6232403635019	47.9812	30.2306	39.2099
48.891884142019	30.4593723688742	36.0272365721268	47.9603	31.0225	36.0363
48.4005313606849	29.8343061018597	34.4272006516373	46.684	28.1154	34.4272
48.4007918584464	30.6122560765412	33.8420685601722	46.4115	30.3033	33.5708
48.4010526376658	31.4498908989469	33.2836914114334	46.9054	30.8841	31.5685
48.4013145504725	34.4324333176563	33.0581494319361	48.325	36.101	31.2943
55.9274997099572	34.4324459136952	33.0581375705114	55.9275	34.3566	30.6301
58.4334999159784	34.8454447594342	33.7681398606051	58.4334	33.3219	33.0094
60.9492990321604	35.307005060334	34.5492563339912	60.9493	37.7343	34.646
62.2969860996284	35.173342928895	34.5492659153077	62.464	33.4003	33.7046
63.5739019864297	35.045928114323	34.5492755003414	63.5739	32.9982	33.2424
65.4551831388067	35.0459221733476	36.7678996007525	65.4552	32.6167	36.7679
65.4859323392442	35.3625699096383	37.648723263156	63.8645	34.3723	36.4179
65.517686985834	35.7644493301689	40.9882613313635	63.453	34.6286	41.047
65.5530203867778	37.4068283943717	43.5063965428371	65.211	38.9167	43.4098
65.5884058281852	38.6125503010119	46.1196282192266	64.2784	38.8059	47.0778
65.6240554110303	39.7749682262568	47.9907007940661	66.7168	38.698	48.2341
65.6594785794989	41.1985419795433	49.7466766791951	64.8516	39.5774	48.8657
65.6952187509455	45.2064596040198	52.8474833450715	67.4955	46.0347	52.8305
65.730369854264	47.3671003060958	55.997277406271	65.7303	47.3671	58.4265
66.8138007216423	50.2786342113209	55.9972778553526	66.2863	51.2705	54.2569
68.1563401492721	51.7763874856028	55.9972783046805	69.4154	51.8752	55.6067
69.2681002844848	53.2478711108001	55.9972787540046	69.2681	55.3133	57.276
71.3480145585949	52.5899865699167	55.8091100458491	72.0304	52.5053	58.0692
71.9492983162375	51.9835567450039	55.1206913188308	73.3859	52.8201	55.9097
72.4581520849407	51.3046308014054	54.3427991537002	73.2401	49.0047	54.3428
72.4581527078423	51.5502740916245	52.3052098139336	74.4488	50.3129	52.3971
72.4581533233726	52.1326616037619	49.4654789038727	74.3979	53.0985	48.6112
72.4581539212287	52.4845584614575	48.7222705221796	72.0955	52.6394	50.8408
72.4581545193311	52.8294478825177	46.5774719977021	70.1179	52.2878	46.5219
72.4581551339263	55.7998649992456	45.2127997710819	73.7963	57.8273	45.2128
70.5537962912433	55.7761698285482	42.6621047813667	68.5789	56.8701	42.2821
70.0827692057846	55.7521066149873	41.2432609320945	69.8977	54.8286	42.1718
69.6175221933503	55.7280747450242	39.5509999178526	69.1565	53.343	39.551
69.6175205340152	57.0968571029168	37.5545996823955	67.4683	58.2291	37.5546
69.6175220375871	57.0968578482921	33.7791002211853	68.2826	55.0673	33.7791
72.361006489116	57.3250823256203	30.9299987156101	73.2116	57.797	29.252
74.1188195046208	57.5476861158312	29.6052959804337	73.8072	55.2741	29.1095
81.0849579493556	58.2568139145812	28.9057711785196	81.1686	57.7423	31.0101
86.6804752808844	59.0999945806165	26.9795444276807	87.1149	58.1702	24.9275
88.5394612792891	61.5318919608209	26.5277467439493	88.0225	60.7529	26.1198
90.6140429223909	64.5894008206693	26.0844448868052	92.749	64.7326	27.0986
90.8431337574768	66.2802328814199	23.5741353604281	88.7937	67.447	23.6857
91.9374323910256	66.6683509373152	18.7677483589421	92.0851	66.8651	17.5763
93.0120708522245	67.0529404756946	15.8978602562341	93.0933	68.7697	14.1811
93.0120788719707	63.2795575296673	16.912292440491	93.5538	62.1822	15.7085
93.012086891298	61.1014196232275	18.2072150556627	94.5987	62.0376	18.5629
93.0120949093486	57.1733002446423	19.3715725830779	94.6877	57.1733	21.1304
92.7134805832816	55.5872260935475	16.9610650523294	92.8209	56.9207	15.4027
92.4119988073785	50.9961007075812	15.7967231333223	92.412	50.9961	13.3675
91.8343268219275	50.033174078265	19.2274382390844	93.0102	50.1223	20.798
91.1383303827702	49.0485936237091	20.6803114452985	91.9756	47.4725	20.0446
90.3418855680486	48.3169204386382	22.5088810418017	89.3464	46.1786	22.3858
90.0027827603859	48.1142572959801	25.5054069464573	87.8413	47.1867	25.6907
89.8512939756932	47.9593962706602	27.0255436911411	87.5129	47.9594	27.6836
92.7479743938177	47.4255984530669	27.0255446195061	95.0864	47.4256	26.3676
92.4898215027658	43.9783780718874	27.0324620861189	93.9129	43.6355	26.629
92.2184552961046	41.0349004143583	27.0393797755009	92.1801	41.0349	29.4683
92.218430748802	39.067268799524	27.039361035378	93.6941	39.0671	28.969
92.0800582440793	38.8067817025372	26.0506431675569	93.6083	38.4774	26.0941
91.9371968651384	38.5496189145191	25.0548211487055	91.9372	36.8319	23.3371
88.9564813875398	38.7977907493213	25.4942124873324	87.5583	39.2312	23.679
88.4464977449133	39.0185771624919	32.5801988102728	88.4465	41.4478	32.5802
86.6710109831092	39.0185773116677	33.9280730127845	87.2346	40.5435	32.6709
84.0446405156708	39.0185774605685	36.8216001012387	81.9079	40.1742	36.8216
86.9540335253995	38.1178065202897	42.1211979008811	88.2545	36.066	42.1212
86.954035929621	38.1178051985105	43.2897850032726	86.5983	36.2039	44.7429
90.0384988539736	40.6327825974307	43.28978468465	90.0385	42.8005	44.3862
90.6428487957166	40.6327808343138	42.7419944910051	90.4784	41.2284	44.1276
91.2561359657292	40.6327790710606	42.127555335376	90.014	39.915	40.6629

Solution x	Solution y	Solution z	Original x	Original y	Original z
92.0610309132589	40.6327773078797	41.6486160376543	92.2396	41.0703	39.2658
92.0610359090337	39.606930564199	41.8015019659717	91.8795	37.1845	41.8015
93.5314617887185	39.6656928913405	41.9396881286037	93.2846	41.9379	42.3812
95.9866441986721	39.7171220159071	42.0691598897072	96.5473	37.5774	41.1201
96.2084950133728	39.9360220180678	43.6349914394698	96.2085	41.8253	45.162
96.2734820208134	34.575601338745	43.6349897727937	98.5859	34.5756	44.3792
96.2734816576314	33.7244204572793	41.1131509262441	95.0864	33.2234	41.4865
96.2734812946002	32.9165784488946	38.245530246018	98.5493	33.1624	37.7737
96.2734809261289	31.8364087758264	37.1942002650553	97.1838	29.5842	37.1942
95.062173633934	31.8548433993671	36.1675851945291	95.8908	32.6754	36.0409
93.6913736607148	31.8732534155432	35.1576701932649	92.7124	33.4453	33.5856
93.6913741202501	27.5561469204765	36.6495074467928	92.942	26.4511	38.6789
93.6914222128373	27.5561470809224	31.9089072412118	93.6487	25.1273	31.9089
94.8675784735006	27.8954389269797	31.6580627796622	93.9312	28.9768	31.8553
96.254404526912	28.2188162664608	31.4055795444028	97.3283	27.0933	33.194
96.6170526352891	29.2706526960085	29.6737885217963	97.5011	28.0267	29.587
96.9637437485075	30.5720479140424	27.9836438323984	97.4429	30.1528	28.42
97.3051055918472	31.9463001883361	26.1689458792541	99.0228	31.9463	24.4512
97.2930149228482	33.8153096360384	27.8668400515057	98.9301	33.2654	27.8083
97.2808824696007	36.0972856129189	29.5966048452164	96.6051	36.0943	31.9245
97.2709917286402	38.9893949239264	29.6117180121601	98.4033	39.6451	29.8224
97.2610864218662	41.3259942056642	29.6268222718184	96.8865	41.9997	31.9305
97.2610836216128	41.3259955586016	29.6268209956008	97.0063	39.6578	31.3742
97.2610815193695	41.374117183497	27.4397347697488	98.7317	39.6579	27.3708
97.2610794167651	41.4255369423325	25.4894302953895	96.2133	40.5576	25.5914
97.2610773142527	41.4772829088468	23.4888000770441	99.6903	41.4772	23.4888
97.1777176398778	42.6612772500092	21.4845013733823	95.46	44.379	21.4845
99.179303526002	41.054557719875	21.1838861263179	98.3613	42.0392	20.5386
101.743778261737	39.0210188748655	20.8907986197057	103.4615	37.3033	20.8908
96.0837409613469	39.1865246040968	18.6685899817994	94.3087	39.6383	18.4042
94.2479697852141	39.3495513920985	16.6898116551063	94.1971	38.0204	14.8005
92.5687191717295	39.5540804233915	16.2504553510643	92.8093	39.7693	16.6418
90.8342677926887	39.7578311081987	15.8042986346786	89.0134	41.3658	15.8043
90.8342679083173	39.7578312132045	14.5898219744379	89.3668	41.343	14.5671
90.8342680243573	39.7578313178123	13.3915280330387	89.1249	38.0318	13.3915
96.038798602922	41.0372579513933	13.3451715275301	97.0806	39.3994	12.7921
98.1071912913005	44.1673735078424	13.2991515257793	98.0879	44.5657	15.6818
101.428299852459	44.4301379639125	12.4402850900367	102.0152	42.2262	11.91
102.391597309407	45.406395762617	11.893649830012	102.543	45.6081	13.7083
103.326059839076	46.3448699900701	11.2085216590225	104.1102	44.8822	12.643
104.01497642966	49.0894994217785	9.90610081709798	106.4442	49.0895	9.9061
102.632668435348	49.9893678794869	9.37901075502818	103.8062	50.1176	9.3383
100.927103788179	50.8779634985094	8.85303209934417	99.5987	51.3246	10.6347
100.271798606693	51.5713624308966	7.28780382792173	100.6388	53.8259	6.8403
99.3793695962142	51.8254274676512	6.41135903813017	100.3439	52.2486	6.1962
98.395841760103	52.0766301680604	5.55306457568409	98.2004	50.3921	3.9008
97.6701328116478	53.1813441210355	5.31549541805879	98.2152	53.7701	7.2972
96.8096998468897	54.0588006528328	5.0233232994421	96.8097	54.0588	2.5941
95.6650049486541	56.4516985690656	5.02332591915054	93.2379	56.4517	4.9219
95.9041025452813	56.8816527966229	5.02332994038537	95.9041	59.3009	4.8034
97.5333961018872	56.792626050096	6.03659717283149	98.8606	57.9963	4.7298
98.2755898543485	56.6978939000605	9.83261118929111	97.3108	57.82	10.7791
99.1338482136617	56.6012410339439	12.1040972253806	98.9521	56.5952	10.596
100.012045309159	56.5045398615502	16.5650052319102	102.1595	55.9791	16.6639
100.44457639897	56.4101919469256	20.1677963102271	102.8738	56.4102	20.1678
100.44457499483	49.4945731414662	20.3577606056126	101.377	48.1816	18.5975
100.444573589352	49.2260125791566	22.0951003112795	100.6036	46.802	22.0951
100.444571356821	49.2260367481159	27.2436809642786	101.7941	49.0832	29.2585
98.4251257170973	52.3857002153198	27.2436822851287	96.0562	52.3857	26.7058
98.9840314016026	55.5697657166677	27.4166094079931	98.7715	55.3698	27.9452
99.549695648697	58.9612860370607	27.5881152259362	99.9754	58.6633	29.714
100.060279801695	65.4508787507528	27.7348028889716	101.778	67.1686	27.7348
98.6333788982457	63.8837103591016	31.7293356611176	98.4228	65.0226	33.0945
97.288429032719	61.4970468554425	33.6835577209919	95.479	61.1306	33.7151
96.4044619840761	59.4951223831664	35.6169001218751	94.4551	58.0456	35.6169
99.7258907513593	59.4951234802369	38.9487983763378	99.7259	57.0659	38.9488
100.031293353189	60.3774452660417	40.213334032395	99.0429	61.6589	39.3422
100.356969265319	61.0936743262127	41.8557963083159	99.3413	60.508	43.9191
101.363857898798	66.877957639402	42.0624810051845	102.9023	68.4164	43.143
94.8898366474245	64.799996245073	42.0624801654303	93.9444	64.9	44.2206
94.2938507669824	61.6875623954928	42.0624793236684	95.4724	61.7777	41.2303
93.6367150909517	58.4614630551926	42.0624784819632	95.4289	57.3916	42.7453
92.0948144228515	57.264653321038	42.0624776398959	92.9131	56.6287	40.2251
89.2688016649505	56.3247977547342	42.062476798094	89.2688	56.3248	44.4917
88.1881600072125	51.7615359572851	39.4390206834177	85.9154	51.5363	38.6114
90.6256210051335	51.7615322974742	39.4390201650648	90.3356	51.1932	37.7625
93.4621266874219	51.7615286379817	39.4390196469291	93.3932	53.1876	39.0419
96.3856161134492	51.7615249780932	39.4390191288313	97.7455	51.8526	39.6885
98.3240409542399	51.7615213181736	39.4390186107144	98.1036	50.8139	41.2796
100.59450386787	51.7615176586694	39.4390180923493	100.5945	52.9653	41.549

Solution x	Solution y	Solution z	Original x	Original y	Original z
104.323634366088	51.7615130496627	39.4390174242622	106.6231	51.946	40.2003
103.693115365931	46.0118467883337	38.4324749966352	103.3956	43.6231	38.3961
103.390687754658	45.9387790673444	37.6057985038486	103.8959	45.4099	37.4639
103.083798121246	45.8660425323287	36.7906720096379	103.0838	43.6629	35.7673
99.7789010924782	45.8660520518683	36.7906718116377	99.7789	45.6905	34.3678
98.7799620914197	46.0573472632052	37.2803025725605	100.0845	45.3198	38.3951
97.3945046389354	46.2546382541944	37.7184139918573	97.5519	44.8528	38.2336
95.968036295333	46.4599494806508	38.1430506191055	95.1396	47.3596	38.3213
94.7174461042153	46.6609801009205	38.5640510541193	94.3452	48.7818	37.6589
93.9234184767566	46.7925414180225	39.3626107743092	94.4684	44.7163	40.2539
92.4065757263839	46.9801702594441	39.8113283849607	90.4865	46.0315	39.3528
91.7812232287805	47.1855019222408	40.3099013666136	89.352	47.1855	40.3099
92.5513075863194	47.6073147604438	44.7818355189749	91.9732	45.8332	46.1527
93.9545324139711	49.2182887788058	45.416197242026	93.3823	48.5086	44.2946
95.5307126638094	51.1198774786271	46.117806214135	95.0304	53.2116	46.2852
97.957899140285	51.8114762647888	46.7850972645579	97.9579	54.2407	46.7851
98.5799234252671	50.7443834672043	46.9788913372397	97.7133	51.9341	48.5236
99.3694592378645	48.6871581588127	47.152755259868	98.9198	48.0008	44.9228
103.244650273889	48.1945286349912	48.280100166784	105.6501	47.8555	48.2801
102.473314071688	48.1945261934838	49.6941089933312	102.9297	48.0592	51.9744
101.161000054802	48.1945237522443	49.9947021179503	101.161	45.7653	49.9947
100.214124876654	49.3280402048802	51.3480431681954	100.8862	48.4618	50.2894
99.1731539151699	50.6619100807821	53.0596259387778	99.5817	52.1789	51.8005
97.9941153979734	51.5163497573437	57.4230103438057	99.0651	51.1078	59.3413
93.6007136149963	52.5780860353315	58.1673885210923	92.1982	53.9806	59.5699
94.1871503026712	47.8951747276306	58.0213678661137	94.5838	45.9916	57.9488
94.7448560785425	46.422161588026	57.875654126405	94.5355	44.3621	59.1041
96.1322026807117	46.3353057260561	54.732762256121	96.2485	47.1277	52.4491
96.5586228960729	44.8730768104989	54.7007350522035	98.0763	43.3554	53.563
91.8094087531787	45.7823166118821	54.7007361901762	91.1842	48.1207	54.4953
91.8094077218182	40.6716538577046	54.7007382569096	90.1236	40.724	54.2833
91.8094066910045	35.318457989475	54.7007403238016	92.4351	33.0022	54.3205
90.7092750162925	35.3184947108321	54.9240259103459	91.0332	34.8187	52.6374
87.3831755548507	35.3185314381449	57.5606112960044	85.065	35.2948	58.2863
95.129799858606	35.6874113139848	57.560612047073	95.1298	37.6897	58.9361
98.3188726187421	34.700433216444	57.2520141305004	100.5275	34.9543	58.1047
98.5000066654535	32.2203378366867	56.4121898502334	96.2582	32.5713	56.693
98.7679824808861	24.0081353903938	55.3733177018901	98.3827	22.3334	54.4737
99.0428021174911	22.1251233875274	54.5280024489624	99.0428	19.6959	54.528
100.380559507227	27.5738500629043	54.31320821933	102.211	28.3893	55.4005
100.852470694987	28.8317227701056	54.0535196548391	101.7295	28.4449	56.1482
101.197601711902	31.0612763951812	53.5495987062389	101.1976	33.4905	53.5496
103.190413329781	31.0424013210413	51.2589450992134	104.0844	32.9988	51.1923
104.260276326415	31.0232566983476	49.1369999831753	106.6895	31.0233	49.137
104.086975543478	30.0340243222027	46.9072311298765	105.5782	30.6326	47.1426
103.906028349434	28.9110413887913	44.4721429891577	106.1692	29.0085	43.7624
102.078885511926	27.4276555288771	43.9588993260262	100.384	25.6874	43.9589
102.078900412919	27.626636225248	42.2011546732182	101.5683	27.6266	39.8262
106.226780040509	35.5449629537508	42.201151745183	107.8221	37.3636	42.4217
106.226777163957	34.8418904679949	30.8419156077011	108.656	34.8419	30.8419
105.614899137969	29.5786000769466	30.3648233816877	105.6149	29.5786	27.9356
104.942299102639	24.8704221441589	31.0738529916242	104.9423	23.521	33.0938
98.3241001954179	24.8704228002364	26.6570025252253	98.3241	22.4412	26.657
92.7087532169706	26.9817364846946	25.4888276288091	90.6435	28.0536	25.8632
92.419531402142	27.4477401304462	21.6799811288127	92.5592	25.4331	20.672
92.1225130307114	28.6464876777368	20.594611971041	90.72	30.049	19.1921
95.9788098760082	28.4360832952405	20.7775615059586	96.156	30.1327	19.1399
97.6440445967178	27.7423181586016	21.2111246481561	97.0499	25.7334	20.6225
100.629699808134	27.3107001482998	21.6958768909957	100.6297	27.3107	24.1251
102.499699046762	26.8367231253938	19.7902006837465	102.4997	24.4075	19.7902
103.157342108799	27.0471729197575	19.1615727621119	102.9016	24.8202	19.8795
104.069881069578	27.9557056648623	16.9130845137542	105.0575	26.2706	17.0665
104.810669444508	29.4497775569673	14.4546007712234	106.8535	30.7643	14.4546
102.921099339328	29.4497770039254	13.8488984828899	102.9211	31.879	13.8489
99.305168373581	29.3956554068329	12.7966422642171	99.272	31.5703	11.7517
97.4165993251673	28.9921845040645	12.6813702324798	96.0238	29.4057	14.5945
97.2641690507699	27.4551102665276	10.492411720992	97.9141	29.0493	9.3885
97.1070955403775	21.284422800568	9.23019952454175	97.1071	18.8552	9.2302
92.9251356393461	26.4649000121324	3.4735226419474	90.6179	26.4649	2.7134
93.4265051768736	31.4743896271795	3.47352196518671	93.4265	31.4744	1.0443
94.1838719140295	32.166801167362	3.47352174365328	96.3928	32.1668	2.4627
92.9732749399425	36.0647998335253	3.47352525706396	91.1655	36.0648	5.0962
93.5912487082076	38.9804336041791	3.25641372962174	92.634	40.1716	1.8791
94.3475041899256	40.3844818473863	3.05776561161306	95.8598	39.2349	3.852
94.9106803801691	43.2459999922039	2.84872064182028	96.6284	43.246	1.131
94.7503319412838	45.8535345058573	3.53730920025139	95.7654	46.8722	1.8076
94.5724841271526	46.8216024601559	6.58068967327591	94.5726	47.3613	8.9492
89.5287414336186	46.8216402168361	6.5806980668532	89.5287	45.4109	8.5583
88.4939086127657	50.2172230728959	6.58070434023383	89.6611	52.1615	6.6683
82.4047399028033	50.8277742973364	6.58071061394231	82.0477	53.0979	5.7932

Solution x	Solution y	Solution z	Original x	Original y	Original z
82.4047256776591	50.8277761974221	11.2859470238827	84.6532	51.7406	11.3965
77.5856878644712	50.8277779509925	11.2862296332116	76.5498	52.218	12.9878
77.5856883058568	50.202514624731	6.99744743009718	76.2244	51.9684	6.7104
77.5856887447859	48.2786993568755	4.54969008575387	77.6289	48.4559	5.3003
77.5856891840188	46.2913001605009	1.58434100574678	79.9479	46.2913	1.0177
75.7300005735611	44.5700227281251	1.58433863907413	75.73	42.7229	0.0066
75.0657333328197	46.6572657670826	1.81214407184645	73.6395	46.5004	2.2066
74.4789206777866	48.8536062110441	2.0371240174751	75.2757	50.6388	0.889
73.6162561537071	49.4468785926161	2.3107596662719	73.5268	49.2611	4.4383
72.7806434531701	50.0678041962309	2.53329222822045	73.6611	50.4924	3.9757
71.8192810774237	50.6607679240536	2.74373658284724	73.911	51.0144	2.5794
67.8488013310423	51.2091776355177	2.95700242054592	67.8488	53.6384	2.957
67.3466271698344	47.21282380599	3.66470590646652	68.7356	47.889	4.3235
66.7784902137867	39.979483080069	4.32125965367934	68.0366	38.8903	2.9918
65.9997633723275	38.16189589941	5.30153039596761	66.9624	36.7077	4.2616
65.0063184758505	37.1289985220473	6.68716988176745	62.6603	37.129	7.3175
65.0063181959147	32.0156209062736	6.68717302584539	63.2951	31.2899	8.2512
67.5332069081497	32.0156197238019	6.68717248604636	67.6588	29.7348	5.9837
68.8490471237095	32.0156185428392	6.68717194641836	68.3701	31.308	4.6701
70.716363732504	32.0156173620729	6.68717140704123	71.5231	31.8286	8.0149
72.2401000651905	32.015616181335	6.68717086749157	72.2401	34.2889	7.5435
73.7989004095938	30.9758698861713	6.68716984390871	73.7989	28.6287	7.3132
79.429886671718	31.690434900374	5.26185565841325	79.7169	32.9378	5.3155
84.1757331686553	32.3361199819906	3.82229800333174	85.1876	33.113	2.1197
85.8548805426905	32.8780997336439	3.08132012189793	87.5726	32.8781	1.3636
85.4331323013089	33.276686973585	6.46986452907837	86.512	33.4131	7.017
84.9879979747495	33.6728600370583	9.25780833545398	85.525	32.0217	10.845
84.3088401319652	40.267061455726	9.63665442983265	85.9182	41.843	9.5066
81.9471633209905	41.1139261576157	10.0271903186701	80.8076	41.6004	10.0065
80.159427453564	41.9220619811443	10.4181639203151	80.8872	43.1227	9.5119
77.8794023941193	42.6175774867153	10.8339010762109	77.8794	45.0468	10.8339
77.5881981271486	40.1845288121477	11.9045917614267	77.5882	39.4219	14.211
76.4617984291751	40.1845281452204	10.0222379147879	75.9022	40.5634	8.2476
75.4747993223057	40.1845274782924	8.98856617828667	75.4748	37.8532	8.3059
73.1061448596621	44.5580987346398	8.98856455848235	72.9198	44.5581	6.5665
73.106138778065	45.23593816569	9.76056996730467	73.6428	45.1426	7.6389
73.1061326959244	45.9352774669647	13.4638367364794	73.2283	44.0709	14.6285
73.1061266137983	47.9131987769199	14.6359114174779	73.2561	47.9132	17.0605
72.8878901469525	48.4006415402821	14.0540288101758	71.8327	48.0379	13.6369
72.6752245688704	48.8982262855406	13.487520946609	72.0723	49.2863	13.9841
72.4652461152516	49.386658311862	12.9044354970209	71.8965	50.0142	14.8598
72.2643885138224	49.824376731319	11.8629171160549	70.7664	48.6137	12.8047
72.0847538112889	50.377708620116	10.1717275787973	71.0505	50.768	8.8572
71.9107109708407	50.9112385056111	8.95020458350082	72.1444	51.2772	8.2689
71.7360069059013	51.435071881623	7.82166850105194	70.6462	49.6735	6.8503
71.5839245424543	53.3608000891423	7.21979381010326	70.916	53.3608	4.8842
71.5839229766995	55.5349002903017	7.21979464778953	72.7757	56.7077	5.4576
70.9196300667706	55.5349018925584	9.25519564336972	70.5527	57.3223	8.5137
70.294555917831	55.534903494254	12.5904104043244	69.9782	57.1009	12.9468
69.6888713227059	55.5349050956759	15.3935006261311	68.022	53.7678	15.3935
69.6888695812085	56.1790830026103	20.7069995368892	70.1344	58.5671	20.707
66.4726744657584	55.2626437053091	22.1080333827452	66.0257	55.1875	22.0287
63.6375223371891	54.3519001419982	23.5229697578335	61.2083	54.3519	23.523
69.1247311812857	53.5779107565731	23.5518605437656	70.694	53.8562	23.1583
71.4483158156605	52.7764833593898	23.5808007781406	71.2619	53.5794	21.4252
75.3200534271622	50.8677567085418	23.6114515503252	75.5201	48.6107	22.753
75.5587040149586	50.8451478850616	23.6743433682167	75.5587	49.1352	25.3998
79.2535891673978	50.8451477417003	23.6743434966199	80.3964	49.7264	23.6683
81.4759756404078	50.8451475985638	23.6743436250098	83.5076	51.7826	22.7284
79.6854374045638	50.7130381010398	26.30145758064	80.7698	50.729	27.0276
77.3165537781651	50.5808816960032	28.4153123199189	76.0043	50.5809	30.4596
77.3165520067785	47.9468279525885	28.4153132238535	76.379	48.6237	27.9163
77.3165502355872	44.6051000261532	28.4153141277806	77.9223	44.6051	30.7678
74.5597999451862	41.0588359967393	27.6414082088023	74.5598	39.2546	26.0148
70.4096001910295	44.0701865857766	27.6414119046801	70.4096	46.4113	26.9931
66.8303325762346	44.0701876368786	27.6414271963451	64.4232	44.0581	27.3148
66.8303308509451	44.0701886929937	31.9793025185201	65.3289	43.5846	33.8262
67.1991329478353	47.2346683170527	31.2256820344919	67.6648	48.1141	30.5928
67.560901025244	49.6309978756127	30.5075224444477	67.5609	49.631	28.0783
68.2842305568197	49.9220038794754	31.6094700864246	67.7991	50.1342	31.512
69.0324182571106	50.2112210700808	32.7233967198285	70.8564	51.5507	32.2844
69.364088818479	50.4245413390966	34.7683309578592	70.2011	52.705	34.7749
69.3640893889847	50.4245312728989	34.768465599646	66.949	50.6855	34.7495
69.715521894331	50.0096047504332	35.6539771414495	70.0624	50.1219	34.6274
70.0624203343451	49.5922994786399	36.6380748412443	69.1689	51.2673	37.9561
70.5563590892513	48.2828669747382	37.0793696655748	70.6191	48.182	36.9413
71.0490622694149	46.9866447620683	37.5231010866175	72.0385	47.603	37.589
71.5161634110118	45.5645436936155	37.9655112713787	72.4429	44.8985	35.9587
71.8501850021502	44.8072254253992	40.4235030471239	72.4926	42.7909	40.5929
72.1596217628825	44.3269630981596	42.5518328533988	70.5497	45.0925	44.08

Solution x	Solution y	Solution z	Original x	Original y	Original z
72.1596217628825	44.3269630981596	42.5518328533988	72.9378	43.4347	40.5471
72.7013014021265	43.8291539381671	45.258921984669	72.7013	43.6681	47.6828
75.985298003753	43.8291483059331	43.6905455869622	75.9853	41.4015	43.6031
76.3852566544041	46.834632858188	43.6905342024923	74.8417	48.5823	43.578
77.9076783254226	47.2473994618188	43.6905228191234	77.9078	47.2474	41.2613
77.9158289181245	47.5908435565163	43.8476277189733	79.533	47.2684	42.1428
77.9236829766487	48.0397567715181	44.2082493374889	80.0004	48.0282	43.1849
77.931407756069	48.4906957396327	44.7815503862997	78.2967	50.1808	43.2865
77.9391150513323	48.7731942454716	46.581145882921	76.4125	46.981	46.4216
77.9469768386215	50.2639484228672	49.9344208289233	77.4079	49.147	51.5989
77.954855451428	53.5218104748027	51.1254825341112	78.0993	54.3894	50.2798
77.9627345356358	55.9744108191523	52.4763023954193	77.8264	55.5164	53.7679
77.9706191373636	58.8490995579253	53.5782767174305	77.9705	58.8491	56.0075
84.8925910141382	60.1494645491495	53.0107293341326	85.8477	60.7859	54.7762
86.9451531221761	61.1450153565748	52.1021609535732	86.2321	62.729	51.1705
90.2671999642754	61.8498762341836	51.35389984777	90.2672	64.2791	51.3539
93.1513921025766	60.9120268615464	50.379234667855	94.6583	60.3511	50.0221
94.8477002679404	60.0424202703383	49.4590209614576	94.8477	58.3247	47.7413
101.562375846416	60.6172995744401	50.4601004815506	103.9916	60.6173	50.4601
101.397117705976	61.0165415466216	52.5118527056863	100.6854	61.817	51.0639
101.235530952574	61.3924893202174	57.4426247525906	102.6402	60.9181	59.3218
99.4071676228054	62.6866403836743	57.5730138332859	99.4285	63.8276	59.6975
96.9159655981308	62.8044216389148	57.6184220022237	95.1558	61.2395	57.4763
96.6228113403244	62.9744296812305	57.6643108210667	96.4356	62.0951	55.4366
96.3965209008979	63.8911006569613	57.7659792059722	94.6788	63.8911	59.4837
96.4694974751344	67.6222237346803	57.6564705435148	97.9014	66.9835	57.8832
96.5414035706916	73.5010410329146	57.5465244290496	96.2521	73.5638	59.9232
96.6189534700741	76.0568174072344	55.8811926050777	96.1169	76.0362	57.1147
96.6968757516466	78.6322977732272	53.6332026527429	99.1261	78.6323	53.6332
96.6968765739459	79.6304855621183	52.8697992495616	97.4314	81.946	52.8698
96.6968761238831	78.9810170992977	48.8112631004536	98.567	80.2017	48.301
96.6968756738543	76.9211835421955	47.3698786226792	97.816	74.8015	47.4482
96.6968752261519	76.8304931620139	43.9951014780337	97.5653	74.5618	43.9951
96.4663249084184	78.4285415065388	43.4223893022494	97.7624	79.6432	41.8331
95.421337512637	78.6911169336232	43.2508026294317	94.6945	78.572	44.5388
94.4770774062488	78.954771992582	43.0739392478599	94.0795	80.8773	41.7611
93.9119077789366	79.0933696929496	42.9469840787908	92.6699	80.64	42.9825
93.4408231816489	79.2242194508197	42.8197956810838	92.1151	81.2598	42.8198
93.4408237619932	75.8870089705612	40.312500593486	91.0116	75.887	40.3125
94.0042025603738	75.7078432519919	38.8024998837962	95.9481	74.251	38.8025
94.0041972048555	75.7078440547217	36.7472021085827	94.549	73.3405	36.7472
93.0753367516052	77.1034068858114	35.6583686457114	94.4072	76.9857	34.4342
91.8281285991391	78.550999571146	34.8038426577754	93.1133	78.1389	33.5399
89.9500035658305	80.2131999186654	34.1094239191042	89.95	80.2132	31.6802
89.786422217416	81.4777001604534	34.4381807190424	88.0687	81.4777	36.1559
90.858255233487	83.5661049767935	34.3441862888222	89.5631	83.3752	32.5568
95.3277196438104	86.2272638220485	34.2579604621459	96.2545	87.1498	32.8659
97.6281365263361	87.9323426010789	34.1740061107535	97.7943	87.7833	36.2243
99.6827943314951	89.8079573788776	34.0852770395249	100.5649	91.4192	35.2273
100.829058118777	90.6210622936516	33.9924541314376	101.602	92.3175	35.5214
100.991590906301	90.6995481150942	31.4219919534663	98.853	91.6792	31.3431
101.371153627177	90.7694535935743	29.5232757267959	99.3434	90.9979	30.2293
101.940075314885	90.8389083074745	25.0156004521923	104.3693	90.8389	25.0156
101.58299921082	92.3924752981411	23.7005999370741	101.583	94.8217	23.7006
101.046125615555	90.4465388051721	22.2040464068575	100.7126	88.5952	23.1233
100.543024418366	89.5940008723472	19.2781019441731	98.1138	89.594	19.2781
100.5544938683	89.1857398930265	17.0779199313972	102.4507	89.6037	15.6617
100.565187870216	86.9950123166547	16.9381301627721	102.0461	86.7072	16.2393
100.575906394704	85.0217002720498	16.8006484554867	102.2936	85.0217	15.0829
98.5634653733712	83.6018082959078	17.4231323286045	97.8831	81.9659	16.6355
97.0724207852624	82.6989056152815	18.1048590955619	96.9541	82.6989	20.5312
97.0724129721599	81.8220110670301	17.6801415998171	98.2007	80.5294	17.4055
97.0724051493633	81.0962531977689	17.2636000507428	97.1852	78.7831	16.5303
92.2880006818976	81.3000521374683	17.2635992756019	92.288	83.6157	17.9977
91.1291018574898	80.9189237786788	13.705400045065	91.1291	78.4897	13.7054
90.8261936377082	81.2355940323867	11.1300021935154	88.6759	82.3658	11.13
91.6354067590398	81.2355939353066	10.9104994317217	91.14	83.5499	11.0268
96.3050076350662	81.2355938377093	10.6789023881703	97.3132	81.5365	12.7479
97.0943214251383	81.2355937400465	10.2213938312274	96.8706	83.0827	11.4782
97.9839266999	81.2355936422697	9.51003763651776	98.9119	80.0767	11.0692
98.6471734433465	81.2355935443434	8.18616214800571	98.5933	78.8152	8.2256
100.056500446133	81.2355934474247	2.20250057319948	100.0565	80.1054	0.0522
107.051802741147	83.5228144443373	2.43260092686743	107.2392	85.9448	2.4326
107.051807540437	78.2343449396106	2.76100196301783	108.1531	76.0691	2.761
107.05180722252	80.0763318160901	10.399994307085	107.981	80.0957	12.6444
103.831301381381	80.076375701761	7.22360460922525	103.8313	82.5056	7.2236
103.338359715312	79.4880820995665	7.08200619930045	103.6911	80.62	5.0557
102.689660558723	68.9163745126266	6.98091016950129	103.5291	67.906	8.9335
98.4258001192524	68.3186236716958	6.83619569936893	98.4258	65.8894	6.8362
95.6279758890633	70.2853769593896	5.5879853125928	94.6798	69.1984	4.5089

Solution x	Solution y	Solution z	Original x	Original y	Original z
93.7841663472431	73.6616735724884	4.59791517900832	93.9524	73.145	3.1932
91.8575388272067	78.156426984547	3.771249906213	91.86	79.7087	2.2114
89.9232112462187	79.1655396263865	3.26823306841354	89.835	77.746	1.5427
88.1687234601304	85.0458954621337	2.93358786962197	86.3374	85.7586	1.5055
88.363301630486	85.0458958629998	2.93358924929637	88.3633	87.3681	2.2205
93.2493996028696	84.3072324653826	2.9336010403916	93.2494	81.8793	2.8544
94.6841590762197	85.2716517307198	3.21612185573156	93.0994	86.3608	2.8092
98.1136967464626	86.0333584459638	3.50721688582278	99.0152	86.155	1.7016
99.9319168061818	86.7767540740615	3.85033095355807	101.1477	85.2681	2.6541
100.627219404576	91.0270403131454	4.3393169790715	100.8882	91.1406	6.6906
101.130025370554	93.1429861413349	4.48001265119215	99.3782	93.0601	2.9898
103.540802648624	95.6660407071042	4.65261824392757	104.1728	96.9352	2.733
103.979980329984	95.9100752443104	9.05411366040899	104.1034	98.3317	9.2012
103.979987776856	94.1900283165829	9.05411988364567	105.6506	92.4297	8.9472
102.322127362872	94.5677877843812	9.99384513585863	102.0076	93.075	9.5996
100.790420099377	94.9832060128133	10.9924770583067	101.8123	94.891	12.8509
97.0135155780554	95.4053447974158	11.5780734116075	95.504	96.351	10.2996
96.0053345003371	95.7614376702872	12.491429455881	95.7576	96.9635	11.4638
95.0373008625607	96.095475479368	13.5607918202683	95.0373	98.5247	13.5608
94.5012976180148	94.4753281768419	13.6360092960075	92.4623	94.734	14.7003
94.2458684790062	91.6622843528089	13.7059105710192	95.2026	90.5293	12.2607
93.9683984491719	90.3054241692323	13.7783076060125	93.9684	87.8762	13.7783
92.9726025288126	90.3848039127836	17.8604496314419	92.7178	89.1801	18.823
92.0156587272882	90.465247461996	20.4105253604038	93.1284	88.6615	20.1351
90.3239234446883	90.550381643214	23.9862996513083	88.6062	92.2681	23.9863
92.5113470166226	89.5767299508689	24.8803347974721	92.5654	91.5305	24.0262
94.6176490718861	85.9210996685088	26.1529833087411	93.4941	85.8189	27.3685
98.0878568410997	82.500273087813	27.1682131632202	98.2345	80.86	27.262
101.298498157298	80.7209242541103	28.1682006091811	101.2985	78.2917	28.1682
101.642168773183	82.7467886807058	35.4895256486777	103.1106	83.2736	35.5168
101.96122914474	84.4937442397853	42.6245990520562	104.3617	84.8664	42.6246
97.2009500850942	84.4937464215137	43.299089304548	97.0865	83.6094	41.2641
93.5681715617417	84.493748603617	45.9790001679934	91.1677	84.1211	45.979
94.7656150044754	84.5896670098677	52.0510842524224	94.9909	83.4209	53.4521
95.9069105306837	84.6878647067202	54.253671607374	95.9325	86.7596	55.1395
97.0298969518401	84.7747583131728	55.2195620414753	96.9343	84.943	57.6208
100.979176235126	84.854415732111	55.2794389668039	101.0606	82.9382	56.7378
102.270286449185	87.9496106790735	55.3178509548173	104.5599	87.8351	55.8078
102.516961138539	94.1816997817153	55.3551528402664	103.2876	94.1817	57.6589
102.516961788015	96.4619609648312	53.5771007674717	103.8628	98.4843	53.5771
100.620399065017	95.808782278114	53.0128576607544	100.6204	94.7646	50.8195
95.720356056048	95.8087821837983	54.7202440546003	94.0924	96.5838	56.3482
96.7657674584453	92.9793585909728	53.378062330056	98.656	92.6213	53.0887
97.4667351671935	90.7284057623306	52.1575996446566	98.3726	88.4744	52.1576
97.4667355446296	91.1157611028926	49.6885496596073	98.9319	91.3958	49.6094
97.4667359235581	91.4972208903177	47.2960326471226	96.5235	92.1962	47.4754
97.4667363023803	91.867498941811	44.7839303693059	97.0347	92.0258	44.3343
97.4667366814776	92.2359132936976	42.5183359623157	96.8345	90.0197	42.1774
97.4667370621341	97.4902294761146	41.3074770761803	98.2349	98.4363	43.0129
97.4667374454223	99.4165002432869	37.0118649558703	98.8373	99.4165	35.0062
94.4828004138488	104.295763708272	37.0118677676107	94.4828	106.1237	38.6118
93.6418820674281	103.267561143893	24.1412787066443	95.6122	103.8055	23.229
54.266508031771	101.711648791203	22.5269818239334	53.9006	102.5381	21.0284
43.3063144705418	99.6857841695175	21.4026950214424	42.2565	98.7398	22.9258
41.009165407643	98.4460750985302	18.8368906985459	40.9431	96.0349	18.7884
39.9363230720146	98.3924170951837	17.5327996421041	38.2186	96.6747	17.5328
40.7105150604521	98.8750793520631	14.8387992137381	42.5793	100.4271	14.8388
40.269295879215	98.8750773912202	8.68640292272434	40.2693	101.3043	8.6864
39.5216682473467	98.4891301823411	7.36028126342561	40.065	98.6098	6.7408
38.7429521446495	98.1015049471374	6.13297592835102	39.7333	98.7582	4.2197
37.2036578993347	97.6389308116628	5.63840750691847	35.7859	98.3251	5.4495
36.0485186455242	97.15320877108	5.15072543225965	35.7481	97.1257	4.802
34.9282872141482	96.6682446550141	4.6703400415274	33.9629	96.8355	4.449
33.9223658625642	96.1792897249801	4.19520769894141	33.0573	97.9271	5.3628
33.3054231857188	94.8923266099632	3.40233500049951	34.0458	95.0903	5.2592
32.5984200623294	93.5109036152283	2.05411965304045	30.8807	93.5109	0.3364
36.1321081219734	93.3874334136558	2.63193325379566	37.0706	93.0168	1.0492
38.1857377851422	93.2651943516225	3.35532958387238	37.3296	94.7968	3.7833
41.3159600879039	93.1383659655615	4.0374022310547	41.6896	94.8028	3.024
43.7154426409847	93.0041480857074	4.87102586593231	43.1057	91.7939	5.1823
46.6892811708553	92.8726937704705	5.67731781699582	47.7789	92.5461	5.4276
48.8560267893373	92.741889491118	6.50276914431608	48.9533	90.4759	7.3728
48.8560356826206	98.2963000321901	6.50276958276419	51.1106	98.2963	5.5983
48.0763994609026	104.090681559777	8.62117766403764	48.0764	105.8084	10.3389
45.4866769187098	103.993745162457	5.66014258883914	45.465	105.2608	3.7217
43.0534055638716	103.883477997697	5.21606895488321	42.9285	106.2179	5.6354
41.5996387020894	103.620532186141	4.44800311669917	40.9527	105.6227	4.1926
40.5225994758931	103.294654081434	3.73326928374358	40.5226	102.8002	1.3549
36.0892900903124	103.294652587592	3.88761385304685	35.7306	102.2767	4.1846
32.3385486411898	103.294651093856	4.04120436020222	30.1816	102.1772	4.0412

Solution x	Solution y	Solution z	Original x	Original y	Original z
32.3385519677322	103.294651760727	11.2493380843586	31.6341	101.1443	12.133
35.7326670305248	104.881355694364	11.2493406547302	37.1983	106.347	12.5162
35.6973958861882	101.933967628477	10.8715931635729	35.5571	102.295	9.2843
35.6621496514418	98.4010214172356	10.5267831540164	35.0473	98.5367	9.9491
35.6269764588196	94.7096410777456	10.1886046312624	35.2297	94.8683	9.4168
35.591848950655	90.8087058788107	9.85896453256442	37.9917	90.5379	9.9912
34.8683997423333	90.5113186106517	9.20187287010979	34.7819	91.1147	8.0437
34.1501643189528	90.2071978290308	8.60017992803762	33.2241	90.2072	6.3544
34.1501639795482	82.1916976447639	8.64537183739906	33.517	80.8699	6.7304
34.1501636504965	82.1287806334956	15.6176369961603	34.9317	80.2335	16.9208
32.7225356719226	89.4925159493818	15.617636248284	32.6009	89.9531	17.4409
31.3485052023707	93.7460988027382	15.6176355004181	29.3468	93.7461	14.2413
31.5870683209816	94.3889272352063	17.5787005407475	31.6916	96.8159	17.5787
31.5870771986317	93.2553001267129	22.3960846736226	34.0163	93.2553	22.3961
29.5222349530616	93.1927226412181	22.4343237829889	29.5221	90.7635	22.4343
29.5155271919623	94.8399727417394	23.7000654211104	29.1897	96.4145	23.036
29.5088288775821	95.9571961056798	25.1981458213513	31.7064	96.988	25.1942
29.4058154253962	95.9718410783408	27.9390826619429	29.7064	94.0211	29.3487
26.1674001697752	96.115905162569	27.9612771255043	26.1674	96.1159	30.3905
23.9687229475547	100.434294005438	27.1148991862359	21.5395	100.4343	27.1149
27.7428370328742	100.550180440671	22.1351565752956	28.2891	98.27	21.6276
28.1717014321934	107.252267756551	21.6658823401316	28.1717	107.4546	19.2451
32.8030601730918	107.252272176383	21.7408041550443	33.1686	108.6172	19.7963
33.1637981699273	107.252276566851	28.6323997833985	33.1638	109.6815	28.6324
33.3647514156774	105.833953657434	31.4759177908971	31.3011	106.2109	32.3658
33.6543837220295	103.476080099038	32.462930423987	34.3074	104.3145	33.9426
33.9336534208002	99.6122052408392	33.2284005971882	34.0464	97.1856	33.2284
33.9336628051884	99.6122081844557	35.0412086610612	33.8351	99.3235	37.4512
36.1907035817083	99.7298707992571	34.6351554650161	36.8108	99.4487	34.5912
38.1890019599783	99.8478905390933	34.2295166059393	38.189	100.3805	31.8594
44.4585820173754	99.8478918691433	34.9134813944498	46.0729	100.678	36.5278
44.2074766034798	99.8478908035452	28.7237287472658	45.0704	101.2748	27.009
42.9226008975402	99.8478897304084	28.5671485005951	42.9226	100.4615	26.2167
42.4834494480698	92.6482749137743	29.0663807293151	42.9721	90.3177	28.7365
34.6326809858265	92.5526084216894	30.8927550685127	33.1881	90.5996	30.8927
34.6325883144367	92.5525402735477	35.5695997954029	32.2034	92.5655	35.5696
34.9252652021369	91.9926170057101	37.8926728598895	32.8593	93.0881	38.0081
36.4197792297336	88.9441912575474	39.6135979599503	35.4073	87.2216	40.4202
40.4527373972535	87.9827391013003	40.7119909515167	42.6808	88.2098	40.1619
40.8939010883651	86.7847229200635	43.1765000873968	40.8939	84.3555	43.1765
42.3181885608842	92.0258177618361	46.5593455925593	41.599	92.4813	48.0171
44.039291923796	95.7757001285257	48.399676564202	44.0393	95.7757	50.8289
44.1244763192381	103.417696476029	45.8992006714605	46.5537	103.4177	45.8992
42.6787094885561	103.595934885296	45.1388004026777	42.8352	101.6931	44.9574
41.1514244393127	103.789451883705	44.4043235728262	42.0156	103.5929	44.0945
39.3826025825383	103.983768639517	43.6883171706488	39.3246	101.8921	42.5744
37.934132134176	105.034843333026	43.4143839579858	39.1965	105.4524	44.823
35.346600014344	105.985878752896	43.1127197153278	35.3466	107.7036	41.395
32.8678586907581	105.7183622063	43.3192522278839	32.8361	107.2479	41.504
30.7679248884481	101.164335527367	44.7621890311843	29.8552	101.3038	43.5974
29.1196231177217	96.1713001873488	46.6575992248082	26.6904	96.1713	46.6576
32.1755996857885	93.4536230487923	47.282300075103	32.1756	91.0244	47.2823
33.443600539857	96.2303858929655	47.9321414774592	32.4952	97.9758	48.1403
35.3362832013574	97.4288922551377	48.558877503427	35.9551	95.9225	47.402
36.7667766345659	99.7693999494397	49.3378011683252	39.196	99.7694	49.3378
36.7667766472446	101.964109719081	50.8453278210498	35.4006	103.6799	50.1937
36.7667766601866	102.518276377119	57.6302262883238	35.2228	101.4244	59.0123
36.766776673681	105.263558192924	58.1388330335186	35.7224	107.36	58.7833
41.6540043861983	104.244546691207	58.1388338191553	42.4716	105.6496	56.7244
43.4612194499677	101.623318523531	58.1388346051371	44.7902	101.1589	57.6534
44.8093604273259	99.3914003471558	58.1388353911425	47.126	99.3914	58.8698
43.127424539019	98.3450496374597	58.1388349268044	43.0828	99.6317	56.4863
41.4898554205953	96.384702284267	58.1388344626709	42.0978	97.503	57.9578
39.6284998837135	93.7251077431896	58.1388339985289	39.6285	91.4521	58.9959
37.1580436259721	93.9049181987228	57.2990952550405	35.4152	92.5489	58.019
36.7119672530604	94.146313087339	54.9194631588845	37.1788	95.0118	52.8478
36.1693985479426	94.3521386024813	54.4710232509395	36.1694	94.3523	52.0418
33.6266541930429	94.3572244834353	54.8442167847228	33.6244	92.4492	56.3457
32.1161344225368	95.1111075124433	54.8514459851277	31.4281	94.9219	54.3744
30.7482003552085	95.876097440707	54.8586766797535	30.7482	95.8761	57.2879
29.5005326189467	96.1628788701	54.858672696594	29.7849	97.5299	53.9895
28.1761071408421	96.4318811353718	54.8586687136733	26.55	96.735	54.3574
27.2215442447035	96.6969115326076	54.8586647308411	26.9511	99.1097	54.9389
27.2215410582147	80.586101872069	54.8586582263721	29.376	80.5861	55.9809
27.1340175465928	77.2247893142801	53.4071962961916	25.3366	76.538	54.326
27.0514802111431	75.4523001239469	50.2549245362426	24.7401	75.4523	49.5075
28.3410555500877	73.9045347066173	50.2549238324769	27.6433	72.5657	51.9251
31.309579690521	73.2379276584663	50.2549231284509	32.697	74.6737	51.2201
32.2487989909103	71.876200566463	50.254922424303	32.2488	71.8762	47.8257
32.7887560136003	71.0285915284963	57.572198425515	35.1535	70.6086	57.9365

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.6772271295045	71.028589686151	57.572200620995	26.9783	71.0141	56.5271
24.0874514378329	71.0285878438253	57.5722028165404	24.1578	73.3792	57.4094
18.2654002461163	71.0285860003739	57.5722050120429	18.2654	71.5277	59.9496
15.682795552877	70.9736167700603	55.2267836506289	15.4332	72.9689	53.8868
15.3123988063041	65.4190200471436	55.1483759628094	15.3124	65.205	52.7286
14.2075989100228	65.4190155652345	55.1483819594772	14.2076	63.0144	54.8035
11.4441999852808	65.4190156276952	55.6818057013527	11.4442	66.9869	57.5373
8.80026297045116	65.0778408820419	55.6818052684096	8.4928	63.9998	55.0759
6.39181214099874	64.7511125131368	55.6818048354892	4.7342	63.0935	56.3188
6.4983400400483	64.9235379721873	51.0204086809197	4.4426	63.6871	51.0243
7.07186538869027	65.7678763356721	45.9917821434472	5.2812	65.5492	44.5709
11.5940740908756	66.7733999101301	45.2814023170786	12.0097	66.7734	42.888
11.5940759862452	67.630561318445	45.4378900372755	11.4886	67.7219	43.0579
11.5940778809006	68.3418007168737	48.6514992443937	14.0233	68.3418	48.6515
10.9415986377475	69.7746002092694	49.5739777993912	10.9416	69.7746	52.0032
9.38439936562329	71.5302998313102	48.8628221648324	9.3844	71.5303	46.4336
3.94038094562673	72.7989650440252	51.1473542272017	4.0089	72.186	49.5614
-1.85147767041185	74.2616004929815	57.1386963440353	-4.2807	74.2616	57.1387
-1.17197241551622	85.0415247671439	57.3397564417405	-1.23350	86.0108	56.7294
-0.488731704738768	90.0517146695967	57.5436007683251	-2.30370	90.7079	58.2529
0.633959220645664	92.5391919866083	57.7387000945497	-0.0468000000000046	93.7668	57.0052
1.90386965502283	94.2457225977162	57.9381161730144	1.1743	92.9818	59.2535
3.55538654207918	98.0379867400892	58.1251886400105	4.9579	99.4405	59.5277
-5.11967697722204	96.9207001482936	56.8304995087502	-7.5489	96.9207	56.8305
-2.99164348838738	96.0353046472096	50.2436258064252	-3.26390	94.8889	48.3647
0.0813960654329264	95.4611277100624	49.3679805618774	0.580200000000005	93.7511	50.7296
1.66363077026274	95.101436836292	46.2153556985697	2.1469	96.6722	44.5395
2.41646542917282	93.5150998012616	45.8322019465128	3.4538	93.5151	43.6356
2.41646552892958	90.365300386332	45.864018690445	3.55029999999999	90.3653	48.0124
0.466385016458673	89.2076434410342	44.6059639630869	1.20229999999999	90.7259	43.7677
-2.40778026873339	87.3137196448537	43.5866995621368	-4.1255	85.596	43.5867
1.17062038608108	89.8159000686469	36.4919348946056	3.5998	89.8159	36.4775
0.137209924133202	92.2592831622444	36.491871143916	0.619299999999996	91.0377	37.0534
-0.962595348946195	96.3017008235679	36.4918073861941	-1.86190	98.5581	36.524
-0.962597355585359	96.3017011427109	31.8855024681318	-3.1358	95.2162	31.8855
0.454245041166331	97.2863118309231	31.5236340195263	1.64530	95.7178	31.8751
1.42707906394502	99.0022810675123	31.1490990059886	3.1448	100.72	31.1491
0.953509286836123	98.8480759254221	29.4974832973666	3.11839999999999	98.924	29.022
-0.143004844453898	98.692854137861	28.343752482771	-0.311599999999999	97.6012	28.6474
-1.21854120085932	98.5405202924882	27.1427497394772	-0.339	97.1979	25.6607
-3.11647735776974	98.401394912541	26.4862016309401	-5.5457	98.4014	26.4862
-2.56119885790844	92.1356075840984	26.2192224129962	-2.5612	92.1356	23.79
-0.735099577712063	92.0899761873875	26.2349974919201	-0.735100000000003	89.6931	26.6301
3.59239941228977	92.4229006551174	26.2349995024639	3.5924	94.7451	26.9481
6.90294445764161	91.6170513717841	26.23499959891	7.8142	89.6258	27.2865
6.90294461274075	101.957631165267	26.1409929965234	8.0611	104.093	26.141
6.79651919949997	97.4829926585328	20.5210441571097	9.17	97.1621	20.3835
4.98186344282144	96.7892898806509	19.0866002169843	6.3198	96.0864	20.0555
1.59560766341612	96.1556670276984	17.1308631820557	1.4019	97.5847	15.4849
-0.983063541185743	95.061504897653	16.3492690888026	0.613799999999998	95.4238	16.9249
-10.3759225105944	93.8879921991425	15.5007991412172	-12.8049	93.8535	15.5008
-6.7597965880278	93.8879652371203	9.5236486390059	-6.68600	94.6391	7.4364
-3.59072119998508	93.8879382685388	8.74781276280072	-2.1508	94.1499	7.6254
-1.9601995935341	93.8879112990555	8.09037753726421	-1.9602	93.9224	5.6614
3.93088975786257	93.6199422187391	8.35376944416946	4.77370	93.7785	6.1602
4.59411704784904	93.334968483619	11.7179320513134	5.8502	91.8647	13.1882
4.59411469910177	100.243683099833	11.5088963088059	3.81100	100.5395	9.9764
4.59411235045222	105.332625032459	11.3111976131161	3.0162	107.1796	11.3112
5.71847733454301	101.163400259278	5.56463680192708	8.1477	101.1634	5.5645
2.5757275411397	99.1758630571967	5.5583226823891	2.55330	99.1767	7.9857
2.03598843327254	96.9609186042049	3.64108682942579	-0.171000000000006	97.1566	2.8672
1.83333804466625	91.4867425703067	3.01534912238182	2.57040	90.3092	4.6781
1.61681838399834	90.0486997327903	1.86842071070023	-0.100899999999996	90.0487	0.1507
1.80329921016454	83.5244185119521	2.09421592801146	2.7376	84.0979	3.4333
1.98426148216794	64.8590891973189	2.30864005103536	0.483800000000002	63.8626	0.7436
2.83292594771028	64.5202700693672	12.3345535080611	1.76609999999999	66.5446	12.6159
7.73785211381117	63.6142513068562	15.1483067492731	9.15690	61.6426	15.1483
7.73786884614906	63.6142393749911	24.6435996560679	7.6803	61.1857	24.6436
8.25554281629809	64.8343104651924	27.0734130196783	6.9842	66.7632	27.251
9.89556245135502	65.1909323367403	28.7604001936486	12.0444	66.3239	28.7604
9.89555908519783	65.1909324461774	31.6477375055069	10.7344	66.9849	31.9545
9.89555571814201	65.1909325530964	33.9681995738413	10.4334	62.822	33.9682
6.58197381547753	65.7133964888461	35.4311384789148	6.67010	63.5082	34.9077
2.40210007492564	68.1954001546087	38.5317783871652	0.309600000000003	68.1954	39.7657
9.45779887662725	72.6846982935841	38.531778054739	9.45780	72.6847	40.961
10.8992589827058	73.6033822280448	37.6747997581807	12.73	75.2001	37.6748
8.50101472874198	73.6033794806815	36.5076999781421	6.09139999999999	73.9114	36.5077
8.7193876379423	72.8201798437121	35.4170074649027	8.8648	72.0358	37.3381
8.93556783271617	72.1707690125283	31.9144090699798	8.3117	72.2049	29.6247
9.23522057741297	71.4815038616036	31.7128931903862	7.0214	70.8048	31.3366

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.0113644518561	71.0578427530287	31.5304775617887	11.6475	70.8021	30.9107
15.0855942868612	70.6385985416444	31.3500219566502	15.0856	70.6386	28.9208
15.187613924645	68.4833262714907	31.3692983946787	14.7433	68.1941	29.0053
19.3766675097496	68.3413601691594	33.0025795479044	18.9682	67.082	33.9115
25.0805370241114	68.2032157969948	34.3308982120759	26.4747	67.9787	32.7219
26.4715086512619	68.0668113416385	42.4820074169966	26.4833	65.6457	42.68
26.4715864249024	69.6793000836311	42.4820119322545	26.4587	69.6793	44.9112
29.444291550963	71.3679004730703	40.6656039877237	31.7515	71.3679	39.9054
29.4442902991382	77.212099745587	40.6656028594038	31.105	77.2121	42.4385
27.1736003956734	80.8360774207056	40.5955891997385	27.1736	83.2653	40.5956
26.1386363728956	78.5008601887114	38.5773949082272	24.3218	77.9732	38.2426
25.4216742899476	76.6859235228019	36.8378565699876	24.4797	75.354	37.647
24.7900557938477	75.4654106050362	34.4239258721214	22.8762	75.7017	33.805
24.3221391468303	74.1381394278142	32.744969245664	26.2205	72.9044	33.175
22.0856998833763	73.6052040173021	28.0359778258962	22.0857	71.4539	26.9077
18.7356015430982	77.2890995787934	28.0359779064718	18.7356	77.2891	30.4652
17.9605991509653	79.2295777908538	21.6946001335388	17.9606	81.6588	21.6946
13.6918649158136	77.4908612412932	18.3130683811328	13.7649	76.0563	18.1156
9.23909604375318	76.1889575770734	15.2085368686825	8.0472	76.1743	13.1381
8.97208710581505	74.9604667556965	15.0523133662229	7.5677	74.3816	13.1566
8.97208818292026	74.960465955937	20.3803996729626	6.65640	74.2265	20.3804
9.9142985486711	74.9604655337451	23.9258947496202	9.9143	75.8382	26.191
10.2279503042165	70.7908649598128	23.4150822602708	9.1707	70.0865	21.5855
10.6123326976855	69.1978281975113	23.0785295777364	10.5042	66.7806	23.1982
12.0441687198479	69.1749106114088	21.9180777847405	12.5389	66.9051	22.2814
12.7690898525868	69.1535794057255	19.0779603873161	12.0587	67.8257	18.5408
13.5552974806371	69.1323476851905	16.7730473457778	14.5018	68.1646	16.8217
13.5552974806371	69.1323476851905	16.7730473457778	13.2613	67.7948	17.1077
14.293178205568	69.1112569247576	14.1767998674389	16.7224	69.1113	14.1768
14.2238971773214	66.3899216551821	10.3191001594843	14.2239	63.9607	10.3191
14.1310574774314	66.4258822543058	8.05827330044367	15.1112	64.361	7.2726
11.1289457558047	66.5794525271231	7.94219789904215	9.6606	65.5604	9.552
10.9986562598632	67.2928784859153	6.3753427376709	12.0877	66.3858	4.5331
10.8455063745236	69.6305136710023	5.9922553857495	10.0835	69.723	3.7551
10.7179175948948	71.3181791382496	5.83719994932287	9.00020	73.0359	5.8372
21.3954429059652	69.9043531709135	5.67396191875708	22.9431	70.0987	4.2047
22.8228004128274	68.3149793958326	5.52465840439917	22.8228	67.5784	3.2098
28.240999878253	68.3149786638208	7.18567738906249	28.241	67.9653	9.5896
31.6982511943751	68.3149785300716	7.1331870104363	33.839	67.1668	7.1332
31.5325590977483	70.5788658376041	3.4412826093099	31.4906	71.3219	1.4719
31.3674767790775	71.9995279346608	2.410598736429	31.0449	71.9995	0.0029
31.3671704660758	74.1720227959122	2.41055701414336	31.4187	76.5703	2.7936
25.0311962364417	74.1720295490702	2.38902268387872	23.527	73.6169	0.5641
25.0311939919762	75.4809785110441	2.38902094550907	25.4767	75.481	0.001
24.6608753995796	75.5232733569721	4.15653510746372	24.5076	73.115	4.3052
24.4203493679784	77.3599207625354	4.64694392882898	26.6151	77.1467	3.8306
23.4089060662519	81.6335777420224	5.79600035140889	23.4089	84.0628	5.796
23.2975741662264	78.5166245326588	8.04391149593303	23.796	77.2181	9.3562
23.1848300987405	76.9047995396206	9.38299926466165	21.1184	76.9048	10.6601
23.1848304590497	72.612702945752	9.38299976734368	21.3934	72.6127	7.7423
23.8301353336858	72.1621836059859	11.3384007245693	22.1344	71.2137	11.8857
24.7883092633296	71.7612770213034	12.8326473548776	24.5354	72.6275	12.2334
25.7737004266722	71.345121940069	14.4865001350144	25.7737	68.9159	14.4865
27.2709002129257	71.4963779369981	16.4296006803404	27.2709	73.9256	16.4296
29.0278887936288	71.4963742290966	19.6873974598118	31.4455	71.7336	19.6874
24.6436431882332	64.8228847300726	19.9829605811395	22.6268	64.3936	19.9605
23.4726988556468	61.3054945501275	20.2791631531946	23.9369	61.5866	18.0383
21.1823211533401	32.5360003331682	21.0115010140635	18.7531	32.536	21.0115
26.381281007029	29.8348001548449	25.3455812860302	28.099	29.8348	27.0633
23.9397803904422	28.2338061188451	24.0962514774619	22.8581	29.0039	22.5241
22.5954295748937	25.6505948540626	23.3181006882831	20.8129	26.0745	22.3222
21.8462309971307	21.5891006012171	22.7026439993659	20.5322	21.5891	20.6595
21.8462315554931	20.5363892657788	26.6296541829889	23.1615	20.5337	28.672
19.6967029540899	20.536153920698	26.6294185299907	18.4916	22.031	28.1174
19.6964119730845	19.3266574526573	25.8588377699104	19.0397	19.3917	26.8913
19.6961209965789	18.106099815828	25.0093995172031	17.2669	18.1061	25.0094
21.1097407442321	16.3721814367765	23.4701006361263	23.1228	16.7524	24.3445
21.6596013943607	13.6422209285143	17.5630008878994	21.6596	11.213	17.563
29.5363789212321	14.6164006829763	16.7618994880778	31.9656	14.6164	16.7619
26.2656393696348	18.9878903566878	15.1129037475277	24.5729	19.8583	16.0395
25.1763478497918	20.8254655210984	11.4251438786788	25.2224	21.1268	9.0297
23.3969071466146	21.174047586351	11.3711381104715	24.0847	21.2619	9.4135
20.4654629338407	21.5192423108197	11.3189307111866	20.5046	21.2685	13.3595
17.430004425192	21.8739021207673	11.2649934701131	15.0509	21.8739	10.7741
19.8820987745928	24.8529984754649	11.26499195897	19.8821	27.2321	11.7559
20.411855369273	22.5658066244824	7.40192860922919	19.6457	23.2311	5.559
21.0267380649342	17.7470069811841	6.28560089889734	23.3217	16.9506	6.2856
10.2290307222808	17.7470063882723	5.77869859993303	7.8039	17.6061	5.7787
16.9396999363252	17.7470060403664	2.17887144505957	16.9397	16.157	0.3423
21.3517029986354	19.1060139758379	2.17887219901795	21.2889	20.2133	0.1771

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.0311993263076	19.7187064026112	2.1788729542988	27.0312	22.0371	1.4535
28.025843863899	7.45164462040755	2.7378185983394	28.0443	7.2557	0.5495
29.0109541489774	1.74740021575347	4.11204852031501	31.0707	1.7474	5.3999
26.7942997081118	-0.450641053194024	4.11204804989353	26.7943	-2.6353	5.1743
21.1118813798601	-0.450639755727483	3.98987746965398	19.4163	-0.8394	2.2943
22.4868654808897	2.7281308687968	9.9274576276921	22.4003	2.9895	12.1851
23.990579343809	4.7333867290268	10.4986569617623	23.9142	5.5856	8.3806
25.6341969752166	5.60989089332229	16.5489509642443	26.246	7.8923	16.6585
26.2426174335703	5.8106548400938	19.4053003058461	26.4488	5.1021	19.0029
26.8437714211604	6.01425639038721	22.6264231856384	28.1449	5.3771	22.529
27.3879917208026	6.22151973889472	25.9972616292906	27.2842	5.8331	28.3822
28.9478307930518	8.79613833481271	26.0354339595068	29.2451	9.0499	23.6495
29.1975827541576	9.1019763758514	27.6509678838647	29.9497	8.0977	27.1858
29.4417025573387	9.41983378903031	29.434701992936	29.4417	11.4808	30.7206
33.8740721484772	6.90772673312188	29.434701524858	36.2059	6.8965	29.7476
34.1217264065881	4.51590020550403	29.4347010554497	36.4235	4.5159	28.6582
32.8568793569611	3.07374681148665	29.4347019506902	33.6792	4.7017	30.2163
31.1127996893252	-0.660251816193124	29.4347028457268	31.1128	-2.8096	30.5667
24.6266271862968	-0.575039496809895	29.4347011035196	24.5208	1.7631	30.0851
24.6266144921211	-0.575040175673394	27.7748877233627	24.8641	0.1355	28.7608
24.6266017990745	-0.57504085459243	25.7183998091665	22.6294	-1.9579	25.7184
32.3068133271477	-0.301395347620753	21.4824662267163	32.3564	-1.4633	20.5286
39.6237664895735	-0.0150978454778397	18.7748851659648	39.9467	-2.3317	18.5214
41.3072161871424	4.58342309543171	17.4030123215736	41.1669	5.3004	18.6447
43.0477872212981	7.78905169445707	15.6308631204026	43.984	9.2005	15.6271
44.4160431434907	9.60889883308223	13.860603385775	44.5228	11.8645	13.3212
45.6048794935609	9.95677603495441	12.9670639861182	44.5689	9.75	12.1988
47.0046494445287	10.3077371916372	12.1422842558345	47.1015	12.1757	10.5923
47.0046567621628	4.73436960288895	12.1422862011802	47.0712	4.3382	9.7807
47.004664078404	4.11401075376043	12.1422881555653	48.4975	2.4432	11.2037
47.0046647890807	4.11400993494541	13.832089057687	48.7027	4.8736	15.3944
46.9699610660541	2.30809651742519	13.8320885929498	48.302	2.6164	11.9932
46.9339390602159	-0.939099887382808	13.8320881284183	44.8479	-0.9391	15.0769
46.9339395614133	-3.53832091102528	9.11790047438328	46.0937	-5.8176	9.1179
50.3987796374692	-0.953194701806041	7.87094797467356	51.545	-0.7619	6.4521
52.3318779107919	1.39678404432354	6.95009789551485	52.3291	3.6705	6.1162
54.493473876992	1.42471848904788	6.87946203833253	54.5841	1.3	6.274
56.6215942428612	1.45265637320212	6.8091073644118	58.2741	0.1622	8.0145
56.6752103966332	1.49917858524321	4.27154489141803	56.6752	3.9284	4.2715
58.2781355235701	1.46469356628336	4.25582560840623	58.5415	3.6684	5.0311
59.2663618369419	1.42611110947686	4.2398602835366	58.2864	0.0731	4.559
60.4494464851201	1.38783579294263	4.22389089063881	58.6741	1.1796	4.0744
62.4331991720431	1.34960837966574	4.20794168411507	62.4332	-0.684	2.8792
63.0230521569693	6.11045671268299	4.20794227585341	64.6914	7.7788	3.6297
60.6189170174264	6.01895190946321	8.07394060489183	59.4358	8.0877	8.3998
60.4507769079508	5.26794698881436	8.63216293897299	58.8992	5.3006	6.9433
60.3119303824664	4.49984354003353	11.0137712936546	58.0725	5.2013	11.1785
60.216040165874	0.789591318428242	12.5186282606186	61.9524	-0.333	11.9086
60.1132164330569	-0.575778374302832	14.9348000312707	58.3955	-2.2935	14.9348
60.6456784680096	1.80330057866662	17.7212991715995	63.0749	1.8033	17.7213
60.6456785156012	9.36545006399968	18.9197983056342	61.7542	11.527	18.9198
55.1040722008089	7.21699394231127	19.2326497385318	53.1154	7.9184	18.71
54.1588967619116	0.755300151517902	19.5694398329414	51.7765	0.7553	20.0441
54.1588990428637	-2.68580748350827	19.5694417940981	53.8048	-5.0553	19.1679
55.7467409031407	-2.39258940467442	20.7732033615322	56.047	-0.6998	19.4659
57.0755305796395	-2.14955958517235	24.3186236692264	57.7878	-4.3732	24.6962
57.5811741136625	1.50864579624776	25.387504927467	57.7618	2.6586	23.6599
58.0726012607617	3.05029983398431	28.1251783572206	58.0726	3.0503	30.5544
60.2773680918025	4.40231651145554	27.980613207966	60.5785	6.8128	27.9807
60.2774153302885	4.40232214840729	27.7158044056285	60.2628	6.0605	25.9406
60.3528782962995	-0.0837994652512375	27.7653158310786	62.7821	-0.0838	27.7653
59.2006541695041	-1.33645333655913	30.8502666675939	59.6709	-1.5476	33.1451
53.9782948574953	-2.24598814460849	31.1296972100601	53.5826	-3.7128	29.3577
52.4483212998882	-2.60330585754979	31.782602647045	50.0191	-2.6033	31.7826
52.4483208010823	-7.38538267243875	34.2743000356368	53.289	-9.6645	34.2743
52.2325797408999	-4.1775349737026	37.0022742611493	53.412	-4.2453	38.3008
52.0064229053311	-0.837449946890137	38.6665565459032	52.8937	1.339	38.4463
51.6730216057188	-0.572497810601076	42.7885992273233	49.2438	-0.5725	42.7886
51.7770185230228	1.0527413163427	43.6278989378605	49.5265	1.5006	43.2383
51.9184447432677	1.93865937983526	44.9731926732613	50.9668	1.717	44.4164
52.0619963236851	2.84413987467222	46.4440336156959	52.0607	4.6851	47.5572
52.205605693715	3.37940079803803	47.316260439461	52.2056	3.4977	49.7426
54.7219299704939	3.37940856297195	46.7025120538002	54.6465	1.327	47.163
57.3815295952272	3.37941632952175	46.021475540493	57.3839	0.9502	46.0215
57.3891395374575	3.38396504675011	43.075723670275	55.7669	1.6852	42.4618
60.3715644049291	3.39629556076421	43.0556505892108	60.4167	1.4088	44.4464
60.9397889305949	3.47978845259098	39.9697394088766	62.5325	1.766	39.3982
61.0319112870875	3.92147957208404	39.6924990401936	63.4243	4.3429	39.6925
61.0319060234331	3.92148162622223	39.2330665855427	61.565	4.5717	36.954
55.5686196538369	3.92148276952475	39.2330657796303	55.5686	2.3786	41.1094

Solution x	Solution y	Solution z	Original x	Original y	Original z
55.4667411266001	5.54157770038996	39.0316008176226	55.5508	6.709	40.6861
55.3646916855351	6.58447834022154	38.808495816464	55.3647	9.0137	38.8085
54.3107996315252	6.58447771430598	36.6017180385631	54.3108	6.5803	34.1725
52.5406316028557	6.58447709584097	37.3036018546093	53.4617	5.8056	38.0578
50.2910998650191	6.58447647739876	37.9601895441754	50.2911	5.2466	39.9878
47.3833004927675	7.78336492321207	37.3682718173102	46.3909	8.819	37.7186
45.3045856199017	8.80584946985534	36.7586850032693	43.7681	7.8375	35.3656
44.7074993006009	13.3054986950228	36.3897214705158	44.7075	13.3055	33.9605
43.2819405287927	13.8282571322564	38.632459648495	43.7175	13.3612	37.2361
41.7165036195199	14.3700429650736	42.7237444431402	40.2323	12.6508	42.5989
41.1291117064415	15.9951885086318	49.1426878199122	39.7266	17.3977	50.5452
45.4092295070712	15.4112469476962	47.4641141338355	47.2642	16.1804	48.1934
46.4627144529962	14.7043695776842	44.2765320949669	46.213	15.3079	43.6977
47.5447996837052	13.966499549331	41.5855216002604	47.5448	13.9665	39.1563
48.300469581179	12.704897813107	41.6236754121022	48.2378	10.888	40.0435
49.3367520994836	12.6132496757198	41.6808122424929	48.9393	11.7496	40.9103
50.4261807877359	12.5224444289189	41.738249690223	51.32	11.9016	40.4537
51.3613877791379	12.4324892260596	41.796415583878	51.9742	12.9315	39.5168
51.5357781874682	12.2966954331417	46.7770996707275	53.965	12.2967	46.7771
50.0383217248179	10.2274045011038	48.8780000837677	47.6091	10.2274	48.878
50.8075853835858	10.0705585686888	51.911452646554	50.5069	12.3029	52.6774
52.4403656077438	9.34188080980076	52.3959510716098	51.2901	7.6487	52.6277
56.4054127443471	8.81490102603124	52.8639822336524	58.6318	9.4344	53.4701
56.5661021354716	4.77070497546857	53.1302283992089	56.6229	3.2945	52.4352
56.7266223163709	2.70034056800775	53.4045150296187	56.514	2.6652	55.8183
57.7671328414791	1.94401239544454	53.4215365018474	58.2987	1.8222	52.9601
58.7565412311026	1.19459539956799	53.4385846198746	60.4719	1.0667	55.1539
54.7597010651269	1.19459039257446	53.39361789549	54.7597	1.1902	50.9644
54.0997025218269	1.19458550268472	53.9783043732367	51.8363	2.0767	53.9783
54.0997008920527	-4.55363613111391	55.6749344398536	54.4331	-6.2551	57.3764
43.0398748698077	-4.46359555887219	55.5384852456167	43.0131	-4.6452	57.9101
36.4279000756521	-4.3698931221136	54.8612214970949	36.4279	-4.3699	52.432
31.6451239567689	-1.78884712426783	56.5556474591221	31.1391	0.2266	57.7289
31.0064990214758	-1.61775010841239	56.8181148314186	31.0065	-1.0714	59.1851
27.7338693726422	-1.61774881880902	56.6037274681098	27.3755	-1.0984	56.1861
24.7898844633444	-1.61774752926881	56.3910980156402	22.4229	-2.1641	56.3911
25.89890075182	0.741300110230839	55.8998213753975	25.8989	0.7413	53.4706
28.1393996771916	3.81133222599985	56.2006433910079	27.6562	5.4902	56.4427
30.9309677523482	5.3920148487425	56.4976427235795	30.7839	5.7178	56.2846
33.8277299633463	6.9044374515354	56.7963415059049	33.7832	8.5886	57.2507
36.7927997648778	7.94088051352054	57.0879812156998	36.7928	9.6586	58.8057
38.0686005447203	7.34429904286229	54.2090215677489	38.0686	7.3443	51.7798
44.245175424434	5.58384477216277	54.2274928932602	44.2937	4.7268	51.9613
44.9958344649814	5.53701844735615	55.0536897514632	46.8369	6.4403	54.1626
45.4132120307658	5.4890593350509	56.4922669056597	45.5397	7.2979	57.1732
45.8255247263216	5.44011499228646	57.6656750912801	44.3097	5.4051	59.4302
47.1006387234696	5.39129962647971	58.023937151199	47.7278	5.7114	59.7593
48.187360070557	5.34232234259222	58.3394090994515	49.309	3.6922	59.7251
48.187359357778	17.8215648430652	58.3394070013243	45.9074	18.6439	58.1761
52.0826994898756	17.8215660279469	58.3394055102126	52.0827	15.9727	59.9151
54.2189835649881	18.4263598029872	55.5373659826999	53.7123	16.59	54.3027
62.867937079792	21.0290271263525	54.7152574864798	63.3795	20.1125	53.5518
68.1176775309295	25.0660997014824	53.995899681917	70.5469	25.0661	53.9959
68.1176740612846	26.7802162732998	53.0355790222009	67.8857	28.9512	53.8343
68.1176705915714	27.1260128560359	47.6996205390082	68.3676	27.331	45.292
61.3724899565472	27.1260172007298	49.6222957709604	58.9981	26.6128	49.6223
61.3724895568684	32.7429295462984	49.992411197723	60.8351	33.4935	47.8851
61.3724891625201	33.9638358343188	51.0937966854966	61.1452	36.2851	50.8184
61.3724887678921	34.2130463920777	52.9836683062952	60.137	35.2014	51.7925
61.3724883695929	34.4472704512305	57.5792692561107	62.0243	36.102	59.234
57.1194402009602	29.8523733850604	56.9899834148802	56.8778	27.618	56.4108
55.08900136456	29.467122184402	56.5553987082846	55.089	27.0379	56.5554
54.6517165179038	29.5472961778672	55.1058871470393	54.7376	29.7596	56.3053
54.2127215546035	29.6273089097477	53.290418869897	52.7074	28.2489	52.4902
53.8785455224482	29.7117860627662	52.2319474462841	55.1607	27.7715	51.8295
52.7194525978092	29.8285476621932	51.6196980868628	53.8796	31.7093	51.2249
46.7723562291164	29.9319057734213	51.085469324758	44.6028	29.9319	49.9927
47.3355924497056	30.7846732690355	51.0854693396854	47.3356	31.1656	48.6863
47.4903043908798	30.7846779636046	54.5513996199055	47.4903	33.2139	54.5514
48.7211931795486	28.5837249862746	56.0029159452523	47.4152	28.2569	57.2588
50.5628056793152	26.6621703773611	57.0581374677499	50.1386	26.6573	56.0437
52.5754426455766	24.7433406741321	58.2537421978463	54.2786	24.4277	59.9569
51.698684690715	24.7433389243244	53.0330093460993	50.8742	24.2729	53.2264
50.8815494481198	24.7433371746082	47.2334001130869	48.493	25.186	47.2334
51.2988354927545	22.82796756234	43.6213750357013	49.1449	22.3659	43.2644
52.165500882947	21.5738217772756	41.5432014175082	52.1655	19.1446	41.5432
59.52415709578	23.72938307055	41.1077817148479	61.643	23.6955	42.1255
59.8497281976578	26.1420511554355	39.975700532823	59.5552	26.5288	41.5263
60.180201735249	28.2417779575368	38.4138000103353	60.1802	30.671	38.4138
61.6219056552969	28.1570843902338	36.9190004642286	62.9268	27.0211	37.7555

Solution x	Solution y	Solution z	Original x	Original y	Original z
62.6257721655851	28.0742199139386	34.8101443970559	63.132	27.7543	33.1939
63.5489959058987	27.9917306956997	33.4883629664187	63.8119	26.0212	34.0563
64.4062855463913	27.9132691398047	31.7454955906988	64.1748	30.2745	31.4674
66.4360667643602	27.7470188766093	31.0209139863417	67.5765	27.7962	32.158
67.9279458912029	27.5805668677382	30.1916274419944	69.5886	28.6002	31.4169
68.385977678346	27.3838980873896	21.4819165096768	70.1037	27.3839	19.7642
67.1386799539883	26.7098562786059	21.5497183892596	67.242	26.9141	23.9429
63.9674152371635	24.8356149289148	21.5881944005819	62.5649	23.4331	22.9907
64.434928729208	25.2262873237733	13.1758413593075	63.3607	23.5913	11.9128
65.6887358767416	26.9908544616168	12.5729659351632	66.7482	27.6121	12.1372
66.7681526212111	28.5487094832904	11.9887222542324	68.2062	28.5319	10.0866
66.9895344867546	30.2203440825411	11.8339199176414	66.7818	30.0369	13.8618
67.2140914132078	32.0674546059645	11.6628550327929	66.5887	34.1226	10.8677
67.4673022773986	32.5235936462423	11.5086876666033	67.4673	33.2544	9.192
68.8969513586441	32.5235943924382	13.2734364930685	69.1853	30.9522	12.1629
70.1941975393764	32.5235951389455	16.6888947853696	72.6191	32.6684	16.6889
67.4081388788761	32.5235956116372	16.8299494304378	67.7055	32.9993	17.0949
64.396557756433	32.5235960842955	16.9705316058076	64.2717	31.7627	18.8904
61.7160267819368	32.5235965570727	17.100220561728	61.5106	34.0654	15.2705
60.8972236784343	32.5235970280591	20.5869997933746	58.6228	31.6703	20.587
61.6990068108631	33.874215652611	22.5715874933668	61.1622	34.1592	24.5106
62.608718803539	35.0913176569322	23.5089973476742	64.9829	35.6055	23.509
58.517046379457	35.0913190666051	23.736933888171	56.2795	36.0371	23.7369
58.5170431416662	35.0913201083786	28.0132996405853	58.8785	37.4935	28.0133
58.2333318857359	30.5930776557132	29.8756424168778	60.463	30.4795	30.5011
57.4543378238056	27.6378987433621	30.7298498005466	58.5931	27.1316	32.5338
56.088364481435	25.924866375758	31.2171283549378	55.4854	26.8201	32.387
54.8768677467754	23.6901804044762	31.6651832247974	54.6523	25.2022	31.3259
53.7126642780783	19.2310582504871	32.1234280749462	51.539	18.7116	33.0294
53.6486656123038	18.9659599693378	32.2425396338253	52.4859	17.4578	33.7507
53.6486669091524	19.244137791004	26.5423012073669	55.9782	19.9329	26.5423
52.3766701522326	19.244139093368	25.6638969704029	49.9475	19.2284	25.6639
52.3766685292205	19.2441404058649	23.4845965342671	51.6732	17.1776	23.9169
52.3766669064217	19.2441417186389	19.0176027811636	53.2794	21.4994	19.0176
52.3317078760883	19.2441408053504	18.5507988283276	49.9971	19.9155	18.5508
52.3317679676524	16.5413371290305	16.5979632300126	53.4554	15.0784	17.1477
52.3318280511141	15.1285288752318	14.0008945989262	53.9046	16.3668	14.1276
52.3318881216875	12.4566775575428	11.1526000074101	52.3173	10.0275	11.1526
53.4198239703989	12.6210238177025	8.35169470278163	52.0306	12.0787	8.641
54.8038785784689	12.7874061083836	5.1838005744137	57.2331	12.7874	5.1838
54.8038784190763	13.2311875786063	3.61740479602457	55.8132	15.4408	3.6174
48.0786958649106	12.5359515075143	3.502088843635	47.4524	12.1509	5.76
47.3771835443341	12.0848347917751	3.26210469155416	46.5714	10.174	4.4604

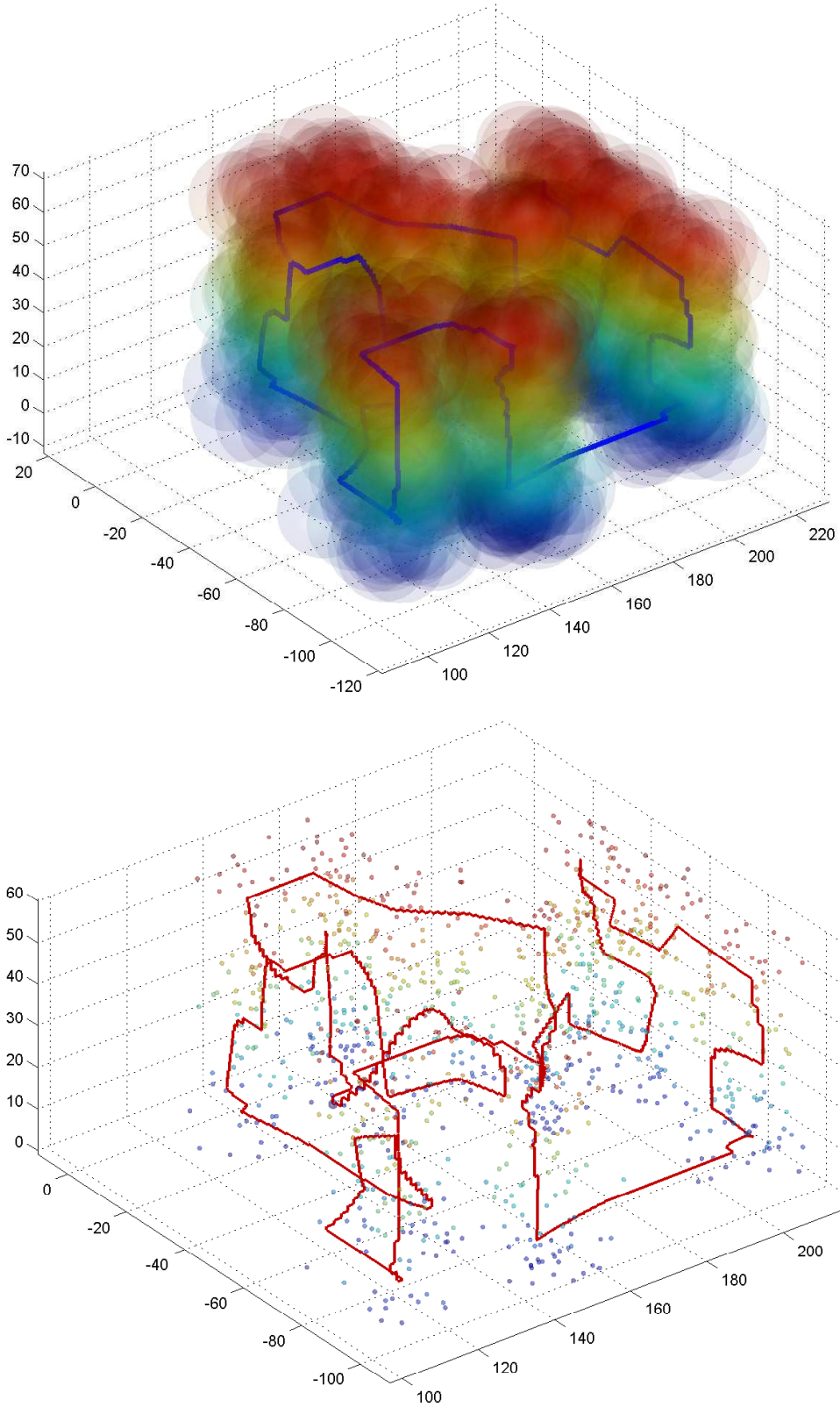


Figure N.193: $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Manhattan, Length = 1248.0843202

Table N-196: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Manhattan

Total distance: 1248.08432019708 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
47.8954370359805	13.7437630791016	1.79852890289068	46.7163	23.0055	0.3229
47.8954370359805	13.7437630791016	1.79852890289068	41.9974	13.5778	7.3366
48.6928938554753	15.2955269755873	3.53124648965082	44.2621	15.3855	4.7212
48.6928938554753	15.2955269755873	3.53124648965082	46.503	16.5426	2.0548
49.5132792846889	16.8460195440913	5.27131467984811	49.3862	17.5735	5.4967
50.3363671385492	18.39571583001	7.01164264292733	46.7677	27.4481	8.8301
50.3363671385492	18.39571583001	7.01164264292733	47.5893	27.8934	1.3329
51.2568239436488	19.3689220508856	9.40088860078261	49.1677	19.2175	6.1526
52.1873754614296	20.3448433992418	11.8759846058779	49.5432	29.0024	13.3417
52.1873754614296	20.3448433992418	11.8759846058779	54.5895	27.7676	11.1642
53.130334125264	21.2235814688698	14.3186357691807	53.2794	21.4994	19.0176
54.0756806603311	22.1029036919388	16.6533702950923	49.9971	19.9155	18.5508
54.0756806603311	22.1029036919388	16.6533702950923	53.4554	15.0784	17.1477
55.0468607286695	23.0234850863822	18.9479784975588	49.9475	19.2284	25.6639
55.0468607286695	23.0234850863822	18.9479784975588	51.6732	17.1776	23.9169
56.0945890080681	24.0134663936663	20.8503800545487	55.9782	19.9329	26.5423
57.1471955117991	25.0274788073316	22.6529127643594	55.4854	26.8201	32.387
57.1471955117991	25.0274788073316	22.6529127643594	54.6523	25.2022	31.3259
58.2585249420192	26.0230279093714	24.0075508253181	60.463	30.4795	30.5011
58.2585249420192	26.0230279093714	24.0075508253181	58.5931	27.1316	32.5338
59.3596681474554	26.9864382315222	25.1978586954851	69.5886	28.6002	31.4169
59.5833708367225	27.6099209956871	25.5293034994374	67.5765	27.7962	32.158
59.5833708367225	27.6099209956871	25.5293034994374	64.1748	30.2745	31.4674
59.8009307960041	28.2278076161229	25.8480582148735	63.8119	26.0212	34.0563
60.0170207354558	28.8543385928185	26.1598454444487	62.9268	27.0211	37.7555
60.0170207354558	28.8543385928185	26.1598454444487	63.132	27.7543	33.1939
60.1801833641475	30.6710026566283	26.2677093272026	60.1802	30.671	38.4138
60.6786664314346	31.3284985235883	25.6243678831443	63.8645	34.3723	36.4179
61.1415166491582	31.9275288486147	24.6306288128377	64.9829	35.6055	23.509
61.6015676236806	32.5215869575598	23.6440834108841	61.1622	34.1592	24.5106
61.6015676236806	32.5215869575598	23.6440834108841	67.242	26.9141	23.9429
62.0562808746765	33.1277483592937	22.6563201479607	64.4232	44.0581	27.3148
62.0562808746765	33.1277483592937	22.6563201479607	72.6191	32.6684	16.6889
62.0562808746765	33.1277483592937	22.6563201479607	67.7055	32.9993	17.0949
62.0562808746765	33.1277483592937	22.6563201479607	70.1037	27.3839	19.7642
62.0562808746765	33.1277483592937	22.6563201479607	64.2717	31.7627	18.8904
62.0562808746765	33.1277483592937	22.6563201479607	50.5738	30.8854	25.5173
62.0562808746765	33.1277483592937	22.6563201479607	58.6228	31.6703	20.587
62.0562808746765	33.1277483592937	22.6563201479607	61.5106	34.0654	15.2705
62.0562808746765	33.1277483592937	22.6563201479607	52.5136	31.162	22.8965
62.0562808746765	33.1277483592937	22.6563201479607	66.7818	30.0369	13.8618
62.0562808746765	33.1277483592937	22.6563201479607	62.5649	23.4331	22.9907
62.0562808746765	33.1277483592937	22.6563201479607	50.3723	32.2399	19.4829
62.1524388139487	34.1966785581909	22.6420845823206	58.8785	37.4935	28.0133
62.1524388139487	34.1966785581909	22.6420845823206	56.2795	36.0371	23.7369
62.2490498960656	35.240877433889	22.6278294251646	58.4334	33.3219	33.0094
62.2490498960656	35.240877433889	22.6278294251646	55.9275	34.3566	30.6301
62.3473161666739	36.362418439863	22.6133614969294	62.464	33.4003	33.7046
62.3473161666739	36.362418439863	22.6133614969294	63.5739	32.9982	33.2424
62.4452883010273	37.8068215852128	22.5984523094819	60.9493	37.7343	34.646
63.6495457649066	41.8083859742613	22.1043213675764	65.3289	43.5846	33.8262
64.6437767568588	43.9498100353574	20.18682026971	66.0257	55.1875	22.0287
64.6437767568588	43.9498100353574	20.18682026971	61.2083	54.3519	23.523
65.715723642698	44.7704719121469	17.2529128350833	71.2619	53.5794	21.4252
65.715723642698	44.7704719121469	17.2529128350833	68.022	53.7678	15.3935
66.6325979000297	45.4246649035314	12.9468045460671	69.9782	57.1009	12.9468
66.6325979000297	45.4246649035314	12.9468045460671	71.0505	50.768	8.8572
66.6325983346329	45.4246649888494	12.2027770716273	70.916	53.3608	4.8842
66.6325987687516	45.4246650735888	11.6267124262264	72.1444	51.2772	8.2689
66.6325987687516	45.4246650735888	11.6267124262264	70.6462	49.6735	6.8503
66.632599202774	45.4246651582385	11.0681348469925	73.5268	49.2611	4.4383
66.6325996366331	45.4246652427554	10.5359867956216	73.911	51.0144	2.5794
66.6325996366331	45.4246652427554	10.5359867956216	73.6611	50.4924	3.9757
66.1600582422062	44.0834004560966	10.6421402334691	73.6395	46.5004	2.2066
66.1600582422062	44.0834004560966	10.6421402334691	68.7356	47.889	4.3235
65.6012217241492	42.4258248254293	10.7524111428942	68.0366	38.8903	2.9918
65.0380247730917	40.8556257105703	10.8633889893265	66.9624	36.7077	4.2616
65.0380247730917	40.8556257105703	10.8633889893265	62.6603	37.129	7.3175
64.4773248045	39.4038201684244	10.9750771016083	72.2401	34.2889	7.5435
63.890327293245	38.0716475141938	11.0872114268015	66.5887	34.1226	10.8677
63.3008810999066	36.7730874203245	11.1993582800139	66.7482	27.6121	12.1372
62.700284514787	35.6267626346672	11.3113870908491	63.3607	23.5913	11.9128
62.0127678217338	35.4124770905101	11.4212524639875	69.1853	30.9522	12.1629
62.0127678217338	35.4124770905101	11.4212524639875	68.2062	28.5319	10.0866
61.2767042850197	35.2023779079732	11.5311977902711	71.5231	31.8286	8.0149
61.2767042850197	35.2023779079732	11.5311977902711	67.4673	33.2544	9.192

Solution x	Solution y	Solution z	Original x	Original y	Original z
60.3088328733201	34.9970636309974	11.6425148064535	68.3701	31.308	4.6701
59.0821618450758	34.7958729187873	11.7561347016452	67.6588	29.7348	5.9837
59.0821618450758	34.7958729187873	11.7561347016452	63.2951	31.2899	8.2512
56.9929857605377	34.6026064504293	11.8727132412303	58.126	35.24	1.1949
54.8376689527973	34.4090183327326	11.9916705854874	54.8257	29.6059	7.5612
52.7044656753328	34.2163886573312	12.1109374948582	53.915	28.4629	8.3577
50.5601991224784	34.0249404167436	12.2304804057004	57.9508	29.6187	7.6435
48.0096868177458	33.8351242451297	12.3506577737784	50.8592	31.2824	4.4654
45.330923078425	33.6460453117606	12.4716604746669	37.4272	33.8061	3.3013
45.330923078425	33.6460453117606	12.4716604746669	44.1303	30.8739	2.5661
45.1468458126828	33.4549782837078	12.8897659318573	42.8212	36.4305	1.5446
45.1468458126828	33.4549782837078	12.8897659318573	45.6407	35.658	2.8521
44.972023570035	33.2487858017636	14.0549648514155	44.3651	39.5082	4.2576
44.7981852911722	33.0301864766581	16.5277479248738	50.3352	41.2014	16.9793
44.7981852911722	33.0301864766581	16.5277479248738	45.4903	38.3462	11.2293
44.6227134704838	32.8062440543443	19.189906811849	43.7884	36.8808	19.8614
44.6227134704838	32.8062440543443	19.189906811849	45.4526	36.121	9.3446
44.4472442282723	32.5795004909913	23.4319733856336	48.325	36.101	31.2943
44.4472442282723	32.5795004909913	23.4319733856336	46.9054	30.8841	31.5685
44.2703891566447	32.351999372534	26.1607872934077	45.985	27.4123	27.7797
44.2703891566447	32.351999372534	26.1607872934077	47.7428	26.438	23.4687
44.0929302627343	32.1275091422444	28.9863120880306	46.684	28.1154	34.4272
43.9151403499482	31.9042136796841	31.6001680587832	47.9603	31.0225	36.0363
43.9151403499482	31.9042136796841	31.6001680587832	46.4115	30.3033	33.5708
43.7366717871188	31.6816342735242	34.0553282176432	47.9812	30.2306	39.2099
43.5576240735526	31.4595336102385	36.3679616604488	54.3132	33.4794	38.814
43.5576240735526	31.4595336102385	36.3679616604488	51.0819	30.8837	36.7669
43.3687348415812	31.2354268295527	38.4026911450661	51.6292	37.4529	39.3047
43.3687348415812	31.2354268295527	38.4026911450661	53.589	37.6567	38.7584
42.8377749781273	30.7992369611623	40.0390012158153	51.7623	34.8081	42.2217
42.2782639315639	30.35489226896	41.61704349728	51.473	33.7115	46.7085
41.6530271859439	29.8968876254995	42.9669395691061	45.9581	33.5048	45.1742
41.6530271859439	29.8968876254995	42.9669395691061	48.6326	32.1618	43.4727
41.006701394535	29.4338119173896	44.3026675353624	44.7872	36.1398	42.3342
41.006701394535	29.4338119173896	44.3026675353624	50.1654	34.298	41.7388
40.2847204539731	28.9452332222478	45.7556480312734	40.9959	37.9409	51.1587
40.2847204539731	28.9452332222478	45.7556480312734	46.003	37.4534	46.4333
39.5201420780621	28.3938850861152	47.0501495780235	47.4903	33.2139	54.5514
39.5201420780621	28.3938850861152	47.0501495780235	44.6028	29.9319	49.9927
34.5084587071824	27.5291981536078	47.6063302742388	35.5392	31.6783	58.7469
22.7350898446986	26.0511004231077	47.9370991969731	18.7218	26.0511	59.401
22.7350897828068	23.2127136565891	47.8497618933052	19.4476	21.0876	59.2618
22.7350897220213	22.3063566150936	47.7239050461315	22.5923	19.795	49.1879
22.7350896612688	21.4095767152688	47.5980042569179	22.0389	18.6688	59.3708
22.7350896009658	21.0616256347946	45.6305044417101	16.9754	26.2994	50.4148
22.7350896009658	21.0616256347946	45.6305044417101	21.4132	25.3225	51.4824
22.7350895408637	20.7060504164359	43.3567621141067	21.3113	31.7798	46.1078
22.7350895408637	20.7060504164359	43.3567621141067	23.1689	25.59	48.8728
22.7350894808304	20.2913090639191	40.1893252212524	19.4151	20.4264	46.5071
22.7350894208806	19.8767889865709	36.6568066914783	19.3676	20.9011	45.1036
22.7350894208806	19.8767889865709	36.6568066914783	21.7951	21.835	45.5134
22.7350893611131	19.4586992619668	29.6527000534568	17.3215	22.815	38.4524
22.7350893611131	19.4586992619668	29.6527000534568	17.7323	26.9057	35.8248
22.7350893611131	19.4586992619668	29.6527000534568	20.7311	19.0512	39.2565
22.7350893611131	19.4586992619668	29.6527000534568	21.1889	21.267	39.0474
22.7350893611131	19.4586992619668	29.6527000534568	19.6468	14.5775	38.07
22.7350893611131	19.4586992619668	29.6527000534568	18.1963	16.0602	36.4885
22.7350893611131	19.4586992619668	29.6527000534568	19.5225	24.6717	34.6116
22.7350893611131	19.4586992619668	29.6527000534568	25.9081	14.4892	36.1934
22.7350893611131	19.4586992619668	29.6527000534568	18.4916	22.031	28.1174
22.7350893611131	19.4586992619668	29.6527000534568	19.0397	19.3917	26.8913
22.7350893611131	19.4586992619668	29.6527000534568	17.2669	18.1061	25.0094
22.7350893611131	19.4586992619668	29.6527000534568	23.1615	20.5337	28.672
22.7350893611131	19.4586992619668	29.6527000534568	28.099	29.8348	27.0633
22.7350893611131	19.4586992619668	29.6527000534568	20.8129	26.0745	22.3222
22.7350893611131	19.4586992619668	29.6527000534568	22.8581	29.0039	22.5241
22.7350893611131	19.4586992619668	29.6527000534568	29.4417	11.4808	30.7206
22.7350893611131	19.4586992619668	29.6527000534568	20.5322	21.5891	20.6595
22.7350893611131	19.4586992619668	29.6527000534568	23.1228	16.7524	24.3445
22.7350893015876	12.9615978691953	28.2753682676267	24.5208	1.7631	30.0851
22.7350892422276	11.1401664690029	26.777513277244	24.8641	0.1355	28.7608
22.7350891828222	10.0101681012813	25.1358019670513	22.6294	-1.9579	25.7184
22.7350891828222	10.0101681012813	25.1358019670513	27.2842	5.8331	28.3822
22.7350891234956	9.65434691243458	23.152428283278	28.1449	5.3771	22.529
22.7350891234956	9.65434691243458	23.152428283278	26.4488	5.1021	19.0029
22.7350890641152	9.30460693525615	21.2799012039736	29.9497	8.0977	27.1858
22.7350890046405	8.95624476828425	19.2057126557698	29.2451	9.0499	23.6495
22.7350889451031	8.60793778592747	17.010513335513	31.9656	14.6164	16.7619
22.7350888854079	8.24499814783921	14.8447642491229	21.6596	11.213	17.563
22.7350888854079	8.24499814783921	14.8447642491229	26.246	7.8923	16.6585

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.7350888257566	7.88102487606602	12.5982675142128	22.4003	2.9895	12.1851
22.7350888257566	7.88102487606602	12.5982675142128	23.9142	5.5856	8.3806
22.7350887661679	7.52113248765646	10.4560797676955	19.4163	-0.8394	2.2943
22.7350887661679	7.52113248765646	10.4560797676955	26.7943	-2.6353	5.1743
22.4867036760579	8.33143272416321	10.4560797833434	31.0707	1.7474	5.3999
22.162349131747	10.3814826978759	10.4560797991199	28.0443	7.2557	0.5495
21.7585120622298	15.9825999283219	10.4560798150375	27.0312	22.0371	1.4535
20.8380606925472	16.5351361043196	10.4560798312072	21.2889	20.2133	0.1771
19.9126620147113	17.0681876586069	10.4560798474619	16.9397	16.157	0.3423
19.9126620147113	17.0681876586069	10.4560798474619	23.3217	16.9506	6.2856
19.0132546537385	17.6061001422628	10.4560798637619	7.8039	17.6061	5.7787
19.0132546537385	17.6061001422628	10.4560798637619	15.0509	21.8739	10.7741
19.3853445483989	19.9554447099718	10.4560809586016	24.5729	19.8583	16.0395
19.7534195978518	22.3168777005796	10.45608205337	25.2224	21.1268	9.0297
20.1183029309438	24.7195898227843	10.4560831481479	24.0847	21.2619	9.4135
20.4810832833902	27.2257864625839	10.4560842429328	19.6457	23.2311	5.559
20.8447639719816	29.8745481444399	10.4560853377634	20.5046	21.2685	13.3595
21.2090988103466	33.136573050136	10.4560864325466	19.8821	27.2321	11.7559
21.5746575523999	36.7402787666941	10.4560875273184	18.7531	32.536	21.0115
21.9611396025871	55.3410557168878	10.4560886213287	23.9369	61.5866	18.0383
22.344755341239	63.5012036215363	10.4560897152125	24.5076	73.115	4.3052
22.7142547980882	65.2150710538898	10.4560908095368	22.8228	67.5784	3.2098
23.0840915750733	66.8999481106247	10.4560919039335	22.9431	70.0987	4.2047
23.4544679125627	68.5476139860737	10.456092998389	23.527	73.6169	0.5641
23.8251941335651	69.9297404717792	10.456094093195	25.4767	75.481	0.001
24.1682608289562	70.6203953376296	10.4560951904747	21.3934	72.6127	7.7423
24.5131366138498	71.3088858807808	10.4560962877812	22.1344	71.2137	11.8857
24.8595813627272	71.9993345426743	10.4560973850779	31.0449	71.9995	0.0029
24.8595868219832	72.2316397911372	10.4560990869009	31.4906	71.3219	1.4719
24.8595868219832	72.2316397911372	10.4560990869009	33.839	67.1668	7.1332
24.8595922809346	72.470860310832	10.4561007904416	31.4187	76.5703	2.7936
24.8595977403704	72.7062714392012	10.4561024953431	26.6151	77.1467	3.8306
24.8596031998989	72.9404619759914	10.4561042007002	23.4089	84.0628	5.796
24.8596031998989	72.9404619759914	10.4561042007002	23.796	77.2181	9.3562
26.3094769059991	72.9404626753665	12.4490671199078	34.9317	80.2335	16.9208
26.3094769059991	72.9404626753665	12.4490671199078	33.517	80.8699	6.7304
25.1397920850892	72.7637132791395	14.0909647722544	31.4455	71.7336	19.6874
25.1397920850892	72.7637132791395	14.0909647722544	28.241	67.9653	9.5896
23.8835578424606	72.5883620533388	15.6958592072065	25.7737	68.9159	14.4865
22.6189133017445	72.4136512721854	17.3164983347965	16.7224	69.1113	14.1768
21.410593824602	72.239696392165	18.9895698639726	27.2709	73.9256	16.4296
21.410593824602	72.239696392165	18.9895698639726	24.5354	72.6275	12.2334
20.1344072198869	72.0656735837171	20.8312125832838	21.1184	76.9048	10.6601
18.8193349210768	71.8878574045647	24.5326217862965	17.9606	81.6588	21.6946
18.8193349210768	71.8878574045647	24.5326217862965	13.7649	76.0563	18.1156
17.597302197785	71.7053799768337	30.3395410715471	24.3218	77.9732	38.2426
17.597302197785	71.7053799768337	30.3395410715471	9.9143	75.8382	26.191
17.597302197785	71.7053799768337	30.3395410715471	8.3117	72.2049	29.6247
17.597302197785	71.7053799768337	30.3395410715471	18.7356	77.2891	30.4652
17.597302197785	71.7053799768337	30.3395410715471	24.4797	75.354	37.647
17.597302197785	71.7053799768337	30.3395410715471	22.8762	75.7017	33.805
17.597302197785	71.7053799768337	30.3395410715471	6.9842	66.7632	27.251
17.597302197785	71.7053799768337	30.3395410715471	15.0856	70.6386	28.9208
17.597302197785	71.7053799768337	30.3395410715471	26.2205	72.9044	33.175
17.597302197785	71.7053799768337	30.3395410715471	22.0857	71.4539	26.9077
17.597302197785	71.7053799768337	30.3395410715471	26.4747	67.9787	32.7219
16.3727137082179	71.2415119383553	30.4870347692901	14.7433	68.1941	29.0053
15.1613613846556	70.781247713065	30.6346898168448	10.7344	66.9849	31.9545
15.1613613846556	70.781247713065	30.6346898168448	12.0444	66.3239	28.7604
14.0069334339474	70.3306896048453	30.7824683087771	10.4334	62.822	33.9682
14.0069334339474	70.3306896048453	30.7824683087771	18.9682	67.082	33.9115
12.8619451610291	69.8963451172419	30.9294470607774	6.67010	63.5082	34.9077
11.8010623971853	69.4748772903647	31.0756200214495	11.4886	67.7219	43.0579
11.8010623971853	69.4748772903647	31.0756200214495	12.0097	66.7734	42.888
10.8315388588471	69.3024925727856	31.1151592251074	12.73	75.2001	37.6748
9.84944304914674	69.1287755707762	31.1546236390011	9.45780	72.6847	40.961
9.84944304914674	69.1287755707762	31.1546236390011	8.8648	72.0358	37.3381
8.88143993708289	68.953302315234	31.1938470883521	0.309600000000003	68.1954	39.7657
8.88143993708289	68.953302315234	31.1938470883521	6.09139999999999	73.9114	36.5077
9.17484557056294	68.9533018999593	29.3653846346511	7.0214	70.8048	31.3366
9.17484557056294	68.9533018999593	29.3653846346511	11.6475	70.8021	30.9107
9.46835269430409	68.9533014846557	27.5058924916585	7.6803	61.1857	24.6436
9.76314861727546	68.9533010694353	25.7271218068102	12.5389	66.9051	22.2814
9.76314861727546	68.9533010694353	25.7271218068102	12.0587	67.8257	18.5408
10.0559085390874	68.9533006542589	24.1267650648621	9.1707	70.0865	21.5855
10.0559085390874	68.9533006542589	24.1267650648621	10.5042	66.7806	23.1982
10.3490767476902	68.9533002391101	22.5675920849926	6.65640	74.2265	20.3804
10.6440835527716	68.9532998239388	21.0393201487146	8.0472	76.1743	13.1381
10.6440835527716	68.9532998239388	21.0393201487146	7.5677	74.3816	13.1566
10.9468564111423	68.9532994086133	19.9374549098306	9.15690	61.6426	15.1483

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.2511170299244	68.9532989933751	18.8807240000366	14.2239	63.9607	10.3191
11.5520557343397	68.9532985782129	17.9389396769231	15.1112	64.361	7.2726
11.5520557343397	68.9532985782129	17.9389396769231	22.6268	64.3936	19.9605
10.1868605424615	68.9532985985023	16.73052841869	13.2613	67.7948	17.1077
8.80257033546198	68.9532986187524	15.521309705127	14.5018	68.1646	16.8217
7.36856551254002	68.9532986389758	14.3042711850427	12.0877	66.3858	4.5331
5.66171179102589	68.9532986591638	13.3564788373664	10.0835	69.723	3.7551
3.73187843067784	68.9532986793463	12.5238165453304	1.76609999999999	66.5446	12.6159
3.73187843067784	68.9532986793463	12.5238165453304	9.6606	65.5604	9.552
1.70982370251342	68.9532986993977	11.7030328928475	0.483800000000002	63.8626	0.7436
1.70982336390995	74.791937554267	11.7030340636851	9.00020	73.0359	5.8372
1.70982302520612	81.5383885901165	11.7030352346169	2.7376	84.0979	3.4333
1.70982268650323	87.6741605999221	11.703036405682	-0.100899999999996	90.0487	0.1507
1.70982234831325	89.7914851252592	11.7030375801861	-0.171000000000006	97.1566	2.8672
1.70982234831325	89.7914851252592	11.7030375801861	-1.9602	93.9224	5.6614
1.70982201045723	90.9098107965822	11.7030387565421	-2.1508	94.1499	7.6254
1.70982201045723	90.9098107965822	11.7030387565421	2.57040	90.3092	4.6781
1.70982167264644	92.0231302268598	11.7030399331589	5.8502	91.8647	13.1882
1.70982133480832	93.1435030340803	11.7030411097689	2.55330	99.1767	7.9857
1.70982133480832	93.1435030340803	11.7030411097689	4.77370	93.7785	6.1602
1.7098209969362	94.2313574062517	11.7030422866382	8.1477	101.1634	5.5645
1.70982065841287	95.1103269300057	11.703043464907	3.0162	107.1796	11.3112
1.70982065841287	95.1103269300057	11.703043464907	3.81100	100.5395	9.9764
0.527174685741187	94.4832363297925	13.6114687999689	1.4019	97.5847	15.4849
-0.658809294358093	93.8535344369082	15.5008012553173	-12.8049	93.8535	15.5008
-0.658809294358093	93.8535344369082	15.5008012553173	-6.68600	94.6391	7.4364
0.499073225905036	93.8220349331495	20.7169988802623	0.613799999999998	95.4238	16.9249
1.65755301503761	93.7905340024879	26.4888984014025	-1.86190	98.5581	36.524
1.65755301503761	93.7905340024879	26.4888984014025	-5.5457	98.4014	26.4862
1.65755301503761	93.7905340024879	26.4888984014025	3.1448	100.72	31.1491
1.65755301503761	93.7905340024879	26.4888984014025	8.0611	104.093	26.141
1.65755301503761	93.7905340024879	26.4888984014025	-3.1358	95.2162	31.8855
1.65755301503761	93.7905340024879	26.4888984014025	-0.311599999999999	97.6012	28.6474
1.65755301503761	93.7905340024879	26.4888984014025	3.11839999999999	98.924	29.022
1.65755301503761	93.7905340024879	26.4888984014025	-0.338999999999999	97.1979	25.6607
1.65755301503761	93.7905340024879	26.4888984014025	1.64530	95.7178	31.8751
1.65755301503761	93.7905340024879	26.4888984014025	0.619299999999996	91.0377	37.0534
1.65755301503761	93.7905340024879	26.4888984014025	3.5924	94.7451	26.9481
1.65755301503761	93.7905340024879	26.4888984014025	-2.5612	92.1356	23.79
1.65755301503761	93.7905340024879	26.4888984014025	3.5998	89.8159	36.4775
1.65755301503761	93.7905340024879	26.4888984014025	6.3198	96.0864	20.0555
1.65755301503761	93.7905340024879	26.4888984014025	9.17	97.1621	20.3835
1.65755301503761	93.7905340024879	26.4888984014025	-0.735100000000003	89.6931	26.6301
1.65755301503761	93.7905340024879	26.4888984014025	7.8142	89.6258	27.2865
1.72033985054912	93.6399253574607	36.6410913057547	2.1469	96.6722	44.5395
1.72033985054912	93.6399253574607	36.6410913057547	3.4538	93.5151	43.6356
1.78309245307288	93.4890572131642	41.86933718136	3.55029999999999	90.3653	48.0124
1.78309245307288	93.4890572131642	41.86933718136	1.20229999999999	90.7259	43.7677
1.84582786026135	93.3390313087838	46.2556367966946	-3.26390	94.8889	48.3647
1.84582786026135	93.3390313087838	46.2556367966946	0.580200000000005	93.7511	50.7296
1.90867088730674	93.1890374052655	50.2152830606165	-7.5489	96.9207	56.8305
1.90867088730674	93.1890374052655	50.2152830606165	-0.0468000000000046	93.7668	57.0052
2.27623944233696	92.5897251561226	50.3215175916994	1.1743	92.9818	59.2535
2.6451084389345	91.990624290338	50.4271681838839	4.95789999999999	99.4405	59.5277
2.96785395705643	88.9105126131476	50.5200705188037	-2.30370	90.7079	58.2529
3.29590323297785	85.7048219353886	50.6124407197008	-1.23350	86.0108	56.7294
3.62690416261847	82.5466651302116	50.704559191387	-4.1255	85.596	43.5867
3.97486058388063	78.7185910228773	50.7978595874651	-4.2807	74.2616	57.1387
4.35434137293883	76.3025809642891	50.8897689862433	4.0089	72.186	49.5614
4.73419322989035	74.0042053552961	50.9817570318147	4.7342	63.0935	56.3188
6.46400752051616	74.0370914243408	50.9817570352586	8.4928	63.9998	55.0759
8.05444895852044	74.0702069921756	50.9817570386148	4.4426	63.6871	51.0243
8.05444895852044	74.0702069921756	50.9817570386148	5.2812	65.5492	44.5709
10.1572265443084	74.1037795163006	50.9817570420034	9.3844	71.5303	46.4336
12.2808986760731	74.1373747645071	50.9817570454053	10.9416	69.7746	52.0032
12.2808986760731	74.1373747645071	50.9817570454053	14.0233	68.3418	48.6515
14.3991762828205	74.1710463555367	50.9817570488096	14.2076	63.0144	54.8035
14.3991762828205	74.1710463555367	50.9817570488096	15.3124	65.205	52.7286
16.5056416905147	74.2059142205328	50.9817570518955	11.4442	66.9869	57.5373
19.3132817444817	74.2410218790493	50.9817570548082	15.4332	72.9689	53.8868
22.2888152278215	74.2761465726223	50.9817570577075	18.2654	71.5277	59.9496
26.0090585700276	74.3113355176633	50.9817570604716	35.1535	70.6086	57.9365
26.3282057986249	74.3481723902502	50.9817570624196	24.1578	73.3792	57.4094
26.3282057986249	74.3481723902502	50.9817570624196	26.9783	71.0141	56.5271
26.6485594866864	74.3850779334464	50.9817570642395	25.3366	76.538	54.326
26.6485594866864	74.3850779334464	50.9817570642395	24.7401	75.4523	49.5075
26.9706227411187	74.4219886347059	50.9817570660308	27.6433	72.5657	51.9251
26.9706227411187	74.4219886347059	50.9817570660308	32.2488	71.8762	47.8257
27.2901289122963	74.4589656516649	50.9817570678082	26.4587	69.6793	44.9112
27.2901289122963	74.4589656516649	50.9817570678082	26.4833	65.6457	42.68

Solution x	Solution y	Solution z	Original x	Original y	Original z
29.365988953009	75.2443592826488	50.9817570711072	32.697	74.6737	51.2201
31.3943612772089	76.0339618244295	50.9817570743956	31.7515	71.3679	39.9054
33.166269676114	79.3940335363172	50.9817570781115	29.376	80.5861	55.9809
35.0102006180963	82.7576100916303	50.9817570817842	31.105	77.2121	42.4385
37.1619038772481	88.2098003955125	50.981757085517	42.6808	88.2098	40.1619
37.1619039978506	90.5950403709745	51.1190284931894	32.4952	97.9758	48.1403
37.1619039978506	90.5950403709745	51.1190284931894	35.9551	95.9225	47.402
37.161904118645	92.570018563252	51.2572079896329	26.55	96.735	54.3574
37.161904118645	92.570018563252	51.2572079896329	29.7849	97.5299	53.9895
37.1619042393438	93.7724738117347	51.3910028732311	26.9511	99.1097	54.9389
37.1619043605486	94.176857015051	51.5079164703315	30.7482	95.8761	57.2879
37.1619043605486	94.176857015051	51.5079164703315	31.4281	94.9219	54.3744
37.1619044816871	94.5801815470422	51.6241508964185	35.4152	92.5489	58.019
37.1619046028616	94.9860763032138	51.7399743246192	39.6285	91.4521	58.9959
37.1619046028616	94.9860763032138	51.7399743246192	33.6244	92.4492	56.3457
37.1619047241132	95.3998203375017	51.8549159766303	36.1694	94.3523	52.0418
37.1619047241132	95.3998203375017	51.8549159766303	32.1756	91.0244	47.2823
37.1619048452051	95.8208692184156	51.9703548545657	37.1788	95.0118	52.8478
37.1619049662619	96.2433297711006	52.0857958601396	44.0393	95.7757	50.8289
37.1619049662619	96.2433297711006	52.0857958601396	41.599	92.4813	48.0171
37.1619050873081	96.6719291942238	52.201731940222	44.7902	101.1589	57.6534
37.1619052085678	97.0889128620968	52.3167173454498	47.126	99.3914	58.8698
37.1619052085678	97.0889128620968	52.3167173454498	42.0978	97.503	57.9578
36.6939933599654	97.0889130576644	52.316717346484	42.4716	105.6496	56.7244
36.6939933599654	97.0889130576644	52.316717346484	43.0828	99.6317	56.4863
36.1867385962229	97.0889132544259	52.3167173471332	35.7224	107.36	58.7833
36.1867385962229	97.0889132544259	52.3167173471332	35.2228	101.4244	59.0123
36.1867375389905	97.0889115094829	49.1130538121193	35.4006	103.6799	50.1937
36.1867375389905	97.0889115094829	49.1130538121193	39.196	99.7694	49.3378
36.1867364817367	97.088909764372	45.8991868232189	35.3466	107.7036	41.395
36.1867364817367	97.088909764372	45.8991868232189	32.8361	107.2479	41.504
36.1867364817367	97.088909764372	45.8991868232189	39.1965	105.4524	44.823
36.1867364817367	97.088909764372	45.8991868232189	46.5537	103.4177	45.8992
36.1867364817367	97.088909764372	45.8991868232189	42.0156	103.5929	44.0945
36.1867364817367	97.088909764372	45.8991868232189	29.8552	101.3038	43.5974
36.1867364817367	97.088909764372	45.8991868232189	42.8352	101.6931	44.9574
36.1867364817367	97.088909764372	45.8991868232189	39.3246	101.8921	42.5744
36.1867364817367	97.088909764372	45.8991868232189	26.6904	96.1713	46.6576
36.1867364817367	97.088909764372	45.8991868232189	33.8351	99.3235	37.4512
36.1867364817367	97.088909764372	45.8991868232189	32.8593	93.0881	38.0081
35.7237892931024	94.815025091365	44.0183750653421	40.8939	84.3555	43.1765
35.1849768914901	93.8077384747745	42.2884844361219	35.4073	87.2216	40.4202
34.6466164642736	92.8403480951431	40.5955983952328	27.1736	83.2653	40.5956
34.6466166046981	95.0751963384586	37.2739437283169	32.2034	92.5655	35.5696
34.6466167449645	97.3858746946606	34.0520203228289	46.0729	100.678	36.5278
34.6466167449645	97.3858746946606	34.0520203228289	42.9721	90.3177	28.7365
33.5557066848904	98.6627755977222	27.1148999960124	21.5395	100.4343	27.1149
34.4460932551776	98.6627758349183	23.685586402781	33.1638	109.6815	28.6324
34.4460932551776	98.6627758349183	23.685586402781	31.3011	106.2109	32.3658
34.4460932551776	98.6627758349183	23.685586402781	33.1686	108.6172	19.7963
34.4460932551776	98.6627758349183	23.685586402781	28.1717	107.4546	19.2451
34.4460932551776	98.6627758349183	23.685586402781	34.3074	104.3145	33.9426
34.4460932551776	98.6627758349183	23.685586402781	36.8108	99.4487	34.5912
34.4460932551776	98.6627758349183	23.685586402781	38.189	100.3805	31.8594
34.4460932551776	98.6627758349183	23.685586402781	45.0704	101.2748	27.009
34.4460932551776	98.6627758349183	23.685586402781	34.0464	97.1856	33.2284
34.4460932551776	98.6627758349183	23.685586402781	42.9226	100.4615	26.2167
34.4460932551776	98.6627758349183	23.685586402781	26.1674	96.1159	30.3905
34.4460932551776	98.6627758349183	23.685586402781	31.6341	101.1443	12.133
34.4460932551776	98.6627758349183	23.685586402781	28.2891	98.27	21.6276
34.4460932551776	98.6627758349183	23.685586402781	31.7064	96.988	25.1942
34.4460932551776	98.6627758349183	23.685586402781	42.2565	98.7398	22.9258
34.4460932551776	98.6627758349183	23.685586402781	42.5793	100.4271	14.8388
34.4460932551776	98.6627758349183	23.685586402781	29.1897	96.4145	23.036
34.4460932551776	98.6627758349183	23.685586402781	29.7064	94.0211	29.3487
34.4460932551776	98.6627758349183	23.685586402781	31.6916	96.8159	17.5787
34.4460932551776	98.6627758349183	23.685586402781	38.2186	96.6747	17.5328
34.4460932551776	98.6627758349183	23.685586402781	40.9431	96.0349	18.7884
34.4460932551776	98.6627758349183	23.685586402781	33.1881	90.5996	30.8927
34.4460932551776	98.6627758349183	23.685586402781	34.0163	93.2553	22.3961
34.4460932551776	98.6627758349183	23.685586402781	29.3468	93.7461	14.2413
34.4460932551776	98.6627758349183	23.685586402781	29.5221	90.7635	22.4343
34.4460932551776	98.6627758349183	23.685586402781	32.6009	89.9531	17.4409
34.4937677077498	98.2958152601801	13.6130967882884	30.1816	102.1772	4.0412
34.5418339037478	97.9135695834891	11.0480814694848	40.9527	105.6227	4.1926
34.5418339037478	97.9135695834891	11.0480814694848	30.8807	93.5109	0.3364
35.187297497047	97.7798722075546	11.0866696237771	35.0473	98.5367	9.9491
35.8340643053803	97.6462092068295	11.1252569713141	35.2297	94.8683	9.4168
36.4829220877088	97.5128200348129	11.1638462625211	37.9917	90.5379	9.9912
36.4829220877088	97.5128200348129	11.1638462625211	33.2241	90.2072	6.3544

Solution x	Solution y	Solution z	Original x	Original y	Original z
37.1429278751309	97.3813477244516	11.202470526343	37.0706	93.0168	1.0492
37.1429278751309	97.3813477244516	11.202470526343	34.7819	91.1147	8.0437
37.8121762222385	97.2521430827208	11.2413197707073	37.1983	106.347	12.5162
37.8121762222385	97.2521430827208	11.2413197707073	35.5571	102.295	9.2843
38.4908090999513	97.1213879093756	11.2801495542561	34.0458	95.0903	5.2592
38.4908090999513	97.1213879093756	11.2801495542561	37.3296	94.7968	3.7833
39.1883427126023	96.9912614866319	11.3190669502754	33.9629	96.8355	4.449
39.906554761245	96.8612396731334	11.3580376471381	33.0573	97.9271	5.3628
40.6578249439365	96.7311557463277	11.397061024257	35.7859	98.3251	5.4495
40.6578249439365	96.7311557463277	11.397061024257	35.7481	97.1257	4.802
41.4503417519091	96.6010457928231	11.4361752106074	35.7306	102.2767	4.1846
42.3206426688133	96.4692906199584	11.4754386587291	40.5226	102.8002	1.3549
42.3206426688133	96.4692906199584	11.4754386587291	39.7333	98.7582	4.2197
44.0738004915641	96.2930078980432	11.519496414044	42.9285	106.2179	5.6354
44.0738004915641	96.2930078980432	11.519496414044	45.465	105.2608	3.7217
45.4967508868943	96.0487591172445	11.5658253533983	48.0764	105.8084	10.3389
45.4967508868943	96.0487591172445	11.5658253533983	40.2693	101.3043	8.6864
46.9365341932339	95.7959037656964	11.6122164634923	40.065	98.6098	6.7408
46.9365341932339	95.7959037656964	11.6122164634923	41.6896	94.8028	3.024
48.6915894667931	95.5430527066557	11.6589269917415	43.1057	91.7939	5.1823
50.6292291333874	95.2925715956701	11.7057764436526	48.9533	90.4759	7.3728
52.6156993453461	95.0439337899114	11.7526876666411	51.1106	98.2963	5.5983
52.6156993453461	95.0439337899114	11.7526876666411	47.7789	92.5461	5.4276
54.8236514585686	94.7958312917716	11.7998235635331	53.9006	102.5381	21.0284
88.6062077361684	92.2680888571443	11.8402090265455	88.6062	92.2681	23.9863
89.0674697111112	91.9758323746702	11.7664538846183	92.4623	94.734	14.7003
89.0674697111112	91.9758323746702	11.7664538846183	93.9684	87.8762	13.7783
89.5189587225224	91.6853021412394	11.6925798235577	95.0373	98.5247	13.5608
89.5189587225224	91.6853021412394	11.6925798235577	95.7576	96.9635	11.4638
89.952895397584	91.3875901669209	11.6186470728877	95.504	96.351	10.2996
90.3811200479566	91.0876235179719	11.544767788841	86.3374	85.7586	1.5055
91.6657462140156	90.899944098319	11.4864788598273	95.2026	90.5293	12.2607
91.6657462140156	90.899944098319	11.4864788598273	96.8706	83.0827	11.4782
92.8644210777622	90.7151909312188	11.4281945701093	98.1138	89.594	19.2781
92.8644210777622	90.7151909312188	11.4281945701093	92.7178	89.1801	18.823
94.0042332656303	90.5314103021434	11.3695266188149	93.1284	88.6615	20.1351
94.0042332656303	90.5314103021434	11.3695266188149	92.288	83.6157	17.9977
95.198452637325	90.3507793447081	11.3104178893854	96.9541	82.6989	20.5312
95.198452637325	90.3507793447081	11.3104178893854	98.2007	80.5294	17.4055
95.5135198156542	90.2828741734066	11.153575373346	97.8831	81.9659	16.6355
95.8260069825151	90.2154956855539	10.9951088434647	97.3132	81.5365	12.7479
95.8260069825151	90.2154956855539	10.9951088434647	98.9119	80.0767	11.0692
96.1336680191782	90.1492003694521	10.8364074906595	102.2936	85.0217	15.0829
96.4369883591962	90.0831212941744	10.6768817045569	102.4507	89.6037	15.6617
96.4369883591962	90.0831212941744	10.6768817045569	102.0461	86.7072	16.2393
96.7341421408139	90.0172064204662	10.5156169674449	101.8123	94.891	12.8509
97.0291168414992	89.9511723738912	10.3540361708291	102.0076	93.075	9.5996
97.0291168414992	89.9511723738912	10.3540361708291	100.8882	91.1406	6.6906
97.3215071024068	89.8850832629398	10.1930600477334	104.1034	98.3317	9.2012
97.3215071024068	89.8850832629398	10.1930600477334	105.6506	92.4297	8.9472
97.5983089124899	89.8181167716273	10.0328530753502	104.1728	96.9352	2.733
97.5983089124899	89.8181167716273	10.0328530753502	99.3782	93.0601	2.9898
97.6575010667484	87.997436687729	9.98510915117577	103.8313	82.5056	7.2236
97.6575010667484	87.997436687729	9.98510915117577	103.6911	80.62	5.0557
97.7162230381451	86.6630171192353	9.93757168863976	107.2392	85.9448	2.4326
97.7162232450353	86.6630138703934	9.93757142079785	93.0994	86.3608	2.8092
97.7162232450353	86.6630138703934	9.93757142079785	93.2494	81.8793	2.8544
97.7162234512558	86.6630106240688	9.93757115303529	101.1477	85.2681	2.6541
97.7162234512558	86.6630106240688	9.93757115303529	99.0152	86.155	1.7016
97.7162236575911	86.6630073782004	9.93757088535907	100.0565	80.1054	0.0522
97.7162238640115	86.663004140558	9.9375706177665	88.3633	87.3681	2.2205
97.7162238640115	86.663004140558	9.9375706177665	91.86	79.7087	2.2114
97.878288769986	84.0956938665372	9.93757051538711	88.6759	82.3658	11.13
98.0426732366376	81.6478681137095	9.93757041299706	91.14	83.5499	11.0268
98.2082770109596	79.1627314073882	9.93757031060904	107.981	80.0957	12.6444
98.3707715794645	76.6439185697844	9.93757020819396	108.1531	76.0691	2.761
98.0645185379756	76.6439179257632	10.2248909191842	98.5933	78.8152	8.2256
97.7585885316286	76.6439172817143	10.5130640420344	103.5291	67.906	8.9335
97.4425708497281	76.6439166385371	10.8037341944479	98.4258	65.8894	6.8362
97.4425708497281	76.6439166385371	10.8037341944479	94.6798	69.1984	4.5089
97.1079299982607	76.6439160024349	11.1176521384854	89.835	77.746	1.5427
97.1079299982607	76.6439160024349	11.1176521384854	93.9524	73.145	3.1932
96.9163653056263	76.6439153663016	16.4161996587405	91.1291	78.4897	13.7054
96.9163653056263	76.6439153663016	16.4161996587405	93.0933	68.7697	14.1811
96.7274433418803	76.6439147302673	23.6856997699362	97.1852	78.7831	16.5303
96.7274433418803	76.6439147302673	23.6856997699362	88.7937	67.447	23.6857
96.7274435204355	77.8207980821388	26.1245731251274	93.1133	78.1389	33.5399
96.7274435204355	77.8207980821388	26.1245731251274	94.549	73.3405	36.7472
96.727443698987	79.6628917005807	27.0228238570353	94.4072	76.9857	34.4342
96.7274438775271	81.5949057535748	27.8842297891853	88.0687	81.4777	36.1559

Solution x	Solution y	Solution z	Original x	Original y	Original z
96.7274438775271	81.5949057535748	27.8842297891853	89.95	80.2132	31.6802
96.7274440553961	83.6867199665057	28.3184154507386	89.5631	83.3752	32.5568
96.7274442329255	85.8174015104528	28.7476862983003	96.2545	87.1498	32.8659
96.7274442329255	85.8174015104528	28.7476862983003	93.4941	85.8189	27.3685
96.7274444101718	87.9751111922937	29.1756402099077	101.602	92.3175	35.5214
96.7274444101718	87.9751111922937	29.1756402099077	100.5649	91.4192	35.2273
96.7274444101718	87.9751111922937	29.1756402099077	101.583	94.8217	23.7006
96.7274444101718	87.9751111922937	29.1756402099077	104.3693	90.8389	25.0156
96.7274444101718	87.9751111922937	29.1756402099077	98.853	91.6792	31.3431
96.7274444101718	87.9751111922937	29.1756402099077	99.3434	90.9979	30.2293
96.7274444101718	87.9751111922937	29.1756402099077	103.1106	83.2736	35.5168
96.7274444101718	87.9751111922937	29.1756402099077	100.7126	88.5952	23.1233
96.7274444101718	87.9751111922937	29.1756402099077	101.2985	78.2917	28.1682
96.7274444101718	87.9751111922937	29.1756402099077	98.2345	80.86	27.262
96.7274445883145	90.9303927032948	29.6038428713463	92.5654	91.5305	24.0262
96.7274447660193	93.9072641691203	30.0380681821524	95.6122	103.8055	23.229
96.7274449439062	94.18682027459	38.6118001789896	94.4828	106.1237	38.6118
96.963504453123	92.2655859109704	42.2200652921448	98.8373	99.4165	35.0062
97.1979027191815	89.8884759826496	48.1716876263797	103.8628	98.4843	53.5771
97.1979027191815	89.8884759826496	48.1716876263797	103.2876	94.1817	57.6589
97.1979027191815	89.8884759826496	48.1716876263797	94.0924	96.5838	56.3482
97.1979027191815	89.8884759826496	48.1716876263797	100.6204	94.7646	50.8195
97.1979027191815	89.8884759826496	48.1716876263797	104.5599	87.8351	55.8078
97.1979027191815	89.8884759826496	48.1716876263797	98.656	92.6213	53.0887
97.1979027191815	89.8884759826496	48.1716876263797	98.2349	98.4363	43.0129
97.1979027191815	89.8884759826496	48.1716876263797	98.9319	91.3958	49.6094
97.1979027191815	89.8884759826496	48.1716876263797	98.3726	88.4744	52.1576
97.1979027191815	89.8884759826496	48.1716876263797	101.0606	82.9382	56.7378
97.1979027191815	89.8884759826496	48.1716876263797	96.5235	92.1962	47.4754
97.1979027191815	89.8884759826496	48.1716876263797	96.9343	84.943	57.6208
97.1979027191815	89.8884759826496	48.1716876263797	95.9325	86.7596	55.1395
97.1979027191815	89.8884759826496	48.1716876263797	97.0347	92.0258	44.3343
97.1979027191815	89.8884759826496	48.1716876263797	104.3617	84.8664	42.6246
97.1979027191815	89.8884759826496	48.1716876263797	96.8345	90.0197	42.1774
97.1979027191815	89.8884759826496	48.1716876263797	94.9909	83.4209	53.4521
97.1979027191815	89.8884759826496	48.1716876263797	97.4314	81.946	52.8698
97.1979027191815	89.8884759826496	48.1716876263797	98.567	80.2017	48.301
97.1979027191815	89.8884759826496	48.1716876263797	97.7943	87.7833	36.2243
97.1979027191815	89.8884759826496	48.1716876263797	97.0865	83.6094	41.2641
97.1979027191815	89.8884759826496	48.1716876263797	91.1677	84.1211	45.979
97.1979027191815	89.8884759826496	48.1716876263797	97.7624	79.6432	41.8331
97.1979027191815	89.8884759826496	48.1716876263797	94.0795	80.8773	41.7611
97.1979027191815	89.8884759826496	48.1716876263797	94.6945	78.572	44.5388
97.1979027191815	89.8884759826496	48.1716876263797	92.1151	81.2598	42.8198
97.1979027191815	89.8884759826496	48.1716876263797	92.6699	80.64	42.9825
97.1979027317732	84.4875925975633	48.2875280539784	97.816	74.8015	47.4482
97.1979027442878	81.1242107346947	48.4035062210201	99.1261	78.6323	53.6332
97.1979027567945	77.9528561559554	48.5191338705822	96.1169	76.0362	57.1147
97.1979027693403	74.982518465259	48.6338687356159	97.5653	74.5618	43.9951
97.1979027818875	72.0705437390825	48.7489062537575	96.2521	73.5638	59.9232
97.1979027944485	68.7543227359465	48.8599186093978	94.6788	63.8911	59.4837
97.1979028072197	67.6300570376068	48.9573065878005	99.4285	63.8276	59.6975
97.1979028197484	66.7111743095127	49.0503230441209	97.9014	66.9835	57.8832
97.1979028322568	65.7940057015973	49.1427748126719	95.1558	61.2395	57.4763
97.1979028322568	65.7940057015973	49.1427748126719	96.4356	62.0951	55.4366
97.1979028448061	64.9369068497304	49.234277046476	102.6402	60.9181	59.3218
96.4664670908501	64.9369068071695	48.5566335856202	103.9916	60.6173	50.4601
96.4664670908501	64.9369068071695	48.5566335856202	100.6854	61.817	51.0639
95.6951776626536	64.9369067649635	47.8647664792498	102.9023	68.4164	43.143
94.8858709479546	64.9369067226874	47.2034052171881	99.3413	60.508	43.9191
94.8858709479546	64.9369067226874	47.2034052171881	99.0429	61.6589	39.3422
94.0405664698812	64.9369066806709	46.5913955688594	95.4724	61.7777	41.2303
93.1945633515239	64.9369066387582	45.9914352282545	93.9444	64.9	44.2206
92.3505337704936	64.9369065968232	45.394845505827	95.9481	74.251	38.8025
92.3505337704936	64.9369065968232	45.394845505827	91.0116	75.887	40.3125
92.3505337704936	64.9369065968232	45.394845505827	85.8477	60.7859	54.7762
92.3505337704936	64.9369065968232	45.394845505827	86.2321	62.729	51.1705
92.3505337704936	64.9369065968232	45.394845505827	95.4289	57.3916	42.7453
92.3505337704936	64.9369065968232	45.394845505827	95.0304	53.2116	46.2852
92.3505337704936	64.9369065968232	45.394845505827	89.2688	56.3248	44.4917
92.3505337704936	64.9369065968232	45.394845505827	92.9131	56.6287	40.2251
92.3505337704936	64.9369065968232	45.394845505827	94.4551	58.0456	35.6169
92.0629434295758	62.4779057460099	45.3948456927462	90.2672	64.2791	51.3539
91.7765211176369	59.9802197689489	45.3948458796466	94.6583	60.3511	50.0221
91.7765211176369	59.9802197689489	45.3948458796466	94.8477	58.3247	47.7413
91.4888772740518	57.5643932732375	45.3948460665083	97.9579	54.2407	46.7851
91.4888772740518	57.5643932732375	45.3948460665083	97.7133	51.9341	48.5236
91.1949160387754	55.5174276581702	45.3948462533955	100.5945	52.9653	41.549
90.8894317534457	53.632051848505	45.3948464403076	98.1036	50.8139	41.2796
90.8894317534457	53.632051848505	45.3948464403076	97.7455	51.8526	39.6885

Solution x	Solution y	Solution z	Original x	Original y	Original z
90.5740902162758	51.8979379708791	45.3948466272531	93.3932	53.1876	39.0419
90.5740902162758	51.8979379708791	45.3948466272531	90.3356	51.1932	37.7625
90.2584053947864	50.1807914135899	45.3948468142655	85.9154	51.5363	38.6114
90.2584053947864	50.1807914135899	45.3948468142655	78.2967	50.1808	43.2865
90.5673527118767	49.9534237222057	45.6276915679651	89.352	47.1855	40.3099
90.8774094776392	49.7269607471727	45.8619714696897	94.3452	48.7818	37.6589
90.8774094776392	49.7269607471727	45.8619714696897	94.4684	44.7163	40.2539
91.1834155004746	49.5030436179335	46.1020520892462	97.5519	44.8528	38.2336
91.1834155004746	49.5030436179335	46.1020520892462	95.1396	47.3596	38.3213
91.4726371747606	49.2855348263937	46.3586861674684	92.2396	41.0703	39.2658
91.7610706789445	49.075162473946	46.6257203526012	90.4784	41.2284	44.1276
91.7610706789445	49.075162473946	46.6257203526012	90.4865	46.0315	39.3528
92.0518728423003	48.8682159845274	46.8975475203019	90.0385	42.8005	44.3862
92.3440836652226	48.6627527574739	47.1704640884088	91.9732	45.8332	46.1527
92.6368884779373	48.4578592139942	47.4437613535717	96.2085	41.8253	45.162
92.6368884779373	48.4578592139942	47.4437613535717	93.2846	41.9379	42.3812
92.9284552789408	48.2566295581125	47.7211355668941	98.9198	48.0008	44.9228
92.9284552789408	48.2566295581125	47.7211355668941	93.3823	48.5086	44.2946
93.2183218754395	48.0556165048114	48.0010665318922	101.161	45.7653	49.9947
93.5040090996504	47.8553281797027	48.2800606342394	105.6501	47.8555	48.2801
93.5040090996504	47.8553281797027	48.2800606342394	100.8862	48.4618	50.2894
93.5040090940089	47.7808391588741	48.7380999674666	102.9297	48.0592	51.9744
93.5040090881131	47.7063427835981	49.1898758315913	99.0651	51.1078	59.3413
93.5040090881131	47.7063427835981	49.1898758315913	99.5817	52.1789	51.8005
93.5040090818552	47.6225701601652	49.3191078000415	92.1982	53.9806	59.5699
93.5040090818552	47.6225701601652	49.3191078000415	91.1842	48.1207	54.4953
93.5040090760042	45.7139658884699	49.3578779669558	96.2485	47.1277	52.4491
93.50400907014	43.7970677527223	49.3966349108287	94.5838	45.9916	57.9488
93.5040090642691	41.8230533405119	49.4352935757053	94.5355	44.3621	59.1041
93.5040090583941	39.7265039624295	49.4737926388893	98.0763	43.3554	53.563
93.5040090525272	37.5464123838702	49.5122632192577	90.1236	40.724	54.2833
93.5040090466716	35.2947981216565	49.5507033411666	85.065	35.2948	58.2863
94.0435287524415	34.6939209764946	49.5507033231689	92.4351	33.0022	54.3205
94.0435287524415	34.6939209764946	49.5507033231689	91.0332	34.8187	52.6374
94.5924000002053	34.0977477090599	49.5507033051241	95.1298	37.6897	58.9361
94.5924000002053	34.0977477090599	49.5507033051241	96.2582	32.5713	56.693
95.1395820827925	33.4913258964033	49.5507032868574	100.5275	34.9543	58.1047
95.1395820827925	33.4913258964033	49.5507032868574	101.1976	33.4905	53.5496
95.6595074046559	32.8798345160409	49.5507032683922	102.211	28.3893	55.4005
95.6595074046559	32.8798345160409	49.5507032683922	104.0844	32.9988	51.1923
96.1478006080935	32.2879752702423	49.5507032497692	101.7295	28.4449	56.1482
96.6248139691599	31.7095789496335	49.5507032309722	98.3827	22.3334	54.4737
97.095599175045	31.1855464991124	49.5507032119425	105.5782	30.6326	47.1426
97.095599175045	31.1855464991124	49.5507032119425	100.384	25.6874	43.9589
97.5496896689197	30.6742724328718	49.5507031929218	99.0428	19.6959	54.528
97.5496899292606	30.8127719001229	47.0101688371473	98.5859	34.5756	44.3792
97.5496899292606	30.8127719001229	47.0101688371473	95.0864	33.2234	41.4865
97.5496901895832	30.9508462581084	44.7428968436855	86.5983	36.2039	44.7429
97.5496901895832	30.9508462581084	44.7428968436855	92.942	26.4511	38.6789
97.7715540184037	30.9508468354306	43.1486506092754	91.8795	37.1845	41.8015
97.7715540184037	30.9508468354306	43.1486506092754	88.2545	36.066	42.1212
98.006006137416	30.9508474125657	41.6449932121392	90.014	39.915	40.6629
98.7708943473857	30.9508479885868	40.6854953932482	96.5473	37.5774	41.1201
99.5451328744688	30.9508485645614	39.7259775922362	98.5493	33.1624	37.7737
99.5451328744688	30.9508485645614	39.7259775922362	97.1838	29.5842	37.1942
100.333521913125	30.9508491405361	38.7869363604794	106.6895	31.0233	49.137
100.333521913125	30.9508491405361	38.7869363604794	107.8221	37.3636	42.4217
100.333521913125	30.9508491405361	38.7869363604794	106.1692	29.0085	43.7624
100.333521913125	30.9508491405361	38.7869363604794	108.656	34.8419	30.8419
100.333521913125	30.9508491405361	38.7869363604794	101.5683	27.6266	39.8262
100.333521913125	30.9508491405361	38.7869363604794	104.9423	23.521	33.0938
100.333521913125	30.9508491405361	38.7869363604794	105.6149	29.5786	27.9356
100.333521913125	30.9508491405361	38.7869363604794	95.8908	32.6754	36.0409
100.333521913125	30.9508491405361	38.7869363604794	97.3283	27.0933	33.194
100.333521913125	30.9508491405361	38.7869363604794	97.5011	28.0267	29.587
100.333521913125	30.9508491405361	38.7869363604794	97.4429	30.1528	28.42
100.333521913125	30.9508491405361	38.7869363604794	93.9312	28.9768	31.8553
100.333521913125	30.9508491405361	38.7869363604794	93.6487	25.1273	31.9089
99.7553462015325	32.6109820086056	35.8782831032566	98.9301	33.2654	27.8083
99.7553462015325	32.6109820086056	35.8782831032566	99.0228	31.9463	24.4512
99.1892794335336	34.3596456292471	34.6241333790255	98.7317	39.6579	27.3708
99.1892794335336	34.3596456292471	34.6241333790255	96.2133	40.5576	25.5914
98.650559001017	35.634806194012	33.7283531412746	98.4033	39.6451	29.8224
98.1132390016536	36.8840210508306	32.8480424200001	92.1801	41.0349	29.4683
98.1132390016536	36.8840210508306	32.8480424200001	93.6941	39.0671	28.969
97.5951916242024	38.0838595099486	32.0009384556558	93.9129	43.6355	26.629
97.5951916242024	38.0838595099486	32.0009384556558	93.6083	38.4774	26.0941
97.091963783227	39.2312036828786	31.2047409394719	91.9372	36.8319	23.3371
97.091963783227	39.2312036828786	31.2047409394719	87.5583	39.2312	23.679
97.2609352438492	40.5530695188216	31.2047410841128	92.7124	33.4453	33.5856

Solution x	Solution y	Solution z	Original x	Original y	Original z
97.2609352438492	40.5530695188216	31.2047410841128	88.4465	41.4478	32.5802
97.4332559637913	41.9779687949676	31.2047412287523	96.6051	36.0943	31.9245
97.6058511680191	43.4716951414847	31.2047413733838	96.8865	41.9997	31.9305
97.6058511680191	43.4716951414847	31.2047413733838	97.0063	39.6578	31.3742
97.7790431740108	45.0306509475475	31.2047415180191	103.0838	43.6629	35.7673
97.7790431740108	45.0306509475475	31.2047415180191	100.0845	45.3198	38.3951
97.9510709223699	46.6200241464524	31.2047416626158	101.7941	49.0832	29.2585
97.9510709223699	46.6200241464524	31.2047416626158	99.7789	45.6905	34.3678
98.1227181266897	48.2076434808028	31.2047418072076	103.8959	45.4099	37.4639
98.1227181266897	48.2076434808028	31.2047418072076	103.3956	43.6231	38.3961
98.291507099671	50.0567348995825	31.2047419517146	96.0562	52.3857	26.7058
98.291507099671	50.0567348995825	31.2047419517146	95.0864	47.4256	26.3676
98.4617604809967	51.9459957935451	31.2047420962139	106.6231	51.946	40.2003
98.4617604809967	51.9459957935451	31.2047420962139	99.7259	57.0659	38.9488
98.4617603863034	53.3831900656595	30.0132024676479	95.479	61.1306	33.7151
98.4617602915874	54.6972040699274	28.7761887563794	92.749	64.7326	27.0986
98.4617602915874	54.6972040699274	28.7761887563794	94.6877	57.1733	21.1304
98.4617601970823	55.4839913917431	27.7347997693808	101.778	67.1686	27.7348
98.4617601970823	55.4839913917431	27.7347997693808	98.4228	65.0226	33.0945
98.0340954845257	55.4672492844675	26.1935750968138	99.9754	58.6633	29.714
98.0340954845257	55.4672492844675	26.1935750968138	98.7715	55.3698	27.9452
97.6063039878652	55.4505041595142	24.6043520787977	102.8738	56.4102	20.1678
97.1741232414562	55.4337580236853	23.0828060412774	88.0225	60.7529	26.1198
96.7749628251659	55.416982822478	21.3882437555553	87.1149	58.1702	24.9275
96.3993017744862	55.4001958874502	19.4961191451164	94.5987	62.0376	18.5629
96.0255257381542	55.3833986424831	17.6303496965215	92.0851	66.8651	17.5763
96.0255257381542	55.3833986424831	17.6303496965215	93.5538	62.1822	15.7085
95.9831148217295	54.8938359932586	16.5025526211003	92.8209	56.9207	15.4027
95.9831148217295	54.8938359932586	16.5025526211003	92.412	50.9961	13.3675
95.940779473179	54.408751733038	15.4023061644968	93.2379	56.4517	4.9219
95.940779473179	54.408751733038	15.4023061644968	89.6611	52.1615	6.6683
95.8987857322999	53.9258233428633	14.6586038489753	96.8097	54.0588	2.5941
95.8559907724613	53.4202558039152	14.5277953734735	98.2004	50.3921	3.9008
95.8559907724613	53.4202558039152	14.5277953734735	94.5726	47.3613	8.9492
95.8131227026433	52.9471721099475	14.4022048209042	100.3439	52.2486	6.1962
95.8131227026433	52.9471721099475	14.4022048209042	99.5987	51.3246	10.6347
95.7701683077215	52.4785667249422	14.2779938029509	100.6388	53.8259	6.8403
95.7271520276883	52.0083132726602	14.154664228669	98.8606	57.9963	4.7298
95.7271520276883	52.0083132726602	14.154664228669	95.9041	59.3009	4.8034
95.6838836875968	51.154492256111	14.0474453230653	97.3108	57.82	10.7791
95.6838836875968	51.154492256111	14.0474453230653	98.2152	53.7701	7.2972
95.6405919547015	50.2631307018173	13.9409117036377	102.1595	55.9791	16.6639
95.6405919547015	50.2631307018173	13.9409117036377	98.9521	56.5952	10.596
95.5971817744921	49.301047389902	13.834378664639	101.377	48.1816	18.5975
95.5537199531452	48.3491703373034	13.7275420304395	106.4442	49.0895	9.9061
95.5537199531452	48.3491703373034	13.7275420304395	103.8062	50.1176	9.3383
95.5093571754264	47.3611561131614	13.6228003621693	104.1102	44.8822	12.643
95.5093571754264	47.3611561131614	13.6228003621693	102.543	45.6081	13.7083
95.4648022890782	46.4096489498122	13.5181750683285	100.6036	46.802	22.0951
95.4648022890782	46.4096489498122	13.5181750683285	99.6903	41.4772	23.4888
95.4193622022452	45.7766366227383	13.3998970483269	89.3464	46.1786	22.3858
95.3741479023782	45.1421840992494	13.2793899365629	89.0134	41.3658	15.8043
95.3290295124359	44.5184294789111	13.1586990708553	95.46	44.379	21.4845
95.2839181370928	43.8962029447244	13.0372183322662	93.0102	50.1223	20.798
95.2388686851568	43.2439074482926	12.9143726416054	91.9756	47.4725	20.0446
95.2388686851568	43.2439074482926	12.9143726416054	89.5287	45.4109	8.5583
95.1939604571597	42.5741871174395	12.7911214615358	94.3087	39.6383	18.4042
95.1490716913932	41.9123666423231	12.6674520973557	95.7654	46.8722	1.8076
95.1490716913932	41.9123666423231	12.6674520973557	96.6284	43.246	1.131
95.1038807377846	40.6337311699801	12.567837208229	95.8598	39.2349	3.852
95.0586871950424	39.3801893055929	12.4688619757101	92.634	40.1716	1.8791
95.0586871950424	39.3801893055929	12.4688619757101	91.1655	36.0648	5.0962
95.0136686619717	38.1543569285284	12.3722344982903	96.3928	32.1668	2.4627
94.9685328352355	37.2660652439781	12.2796332306768	103.4615	37.3033	20.8908
94.9685328352355	37.2660652439781	12.2796332306768	98.3613	42.0392	20.5386
94.9037534630082	36.3077403646181	12.010977224907	102.0152	42.2262	11.91
94.9037534630082	36.3077403646181	12.010977224907	97.0806	39.3994	12.7921
94.8387384341267	35.2915713114558	11.7424795406248	98.0879	44.5657	15.6818
94.8387384341267	35.2915713114558	11.7424795406248	92.8093	39.7693	16.6418
94.7736183266237	34.0772164898223	11.4684057622775	94.1971	38.0204	14.8005
94.7736183266237	34.0772164898223	11.4684057622775	96.0238	29.4057	14.5945
94.7085296690071	32.8780993524269	11.1924365789264	93.4265	31.4744	1.0443
94.7085296690071	32.8780993524269	11.1924365789264	87.5726	32.8781	1.3636
94.7085297700918	30.5993017520327	11.192453407082	97.1071	18.8552	9.2302
94.7085298684848	30.5992989545148	12.2656154161173	99.272	31.5703	11.7517
94.7085298684848	30.5992989545148	12.2656154161173	97.9141	29.0493	9.3885
94.7085299668762	30.5992961571333	13.3607586217733	102.9211	31.879	13.8489
94.7085300653436	30.599293359732	14.4545976252019	106.8535	30.7643	14.4546
94.708530041748	30.5992894951024	16.562254161595	105.0575	26.2706	17.0665
94.708530041748	30.5992894951024	16.562254161595	102.9016	24.8202	19.8795

Solution x	Solution y	Solution z	Original x	Original y	Original z
94.7085300177155	30.5992856316233	18.41680496664	98.3241	22.4412	26.657
94.7085300177155	30.5992856316233	18.41680496664	92.5592	25.4331	20.672
93.9038056589453	30.6492611258459	17.5128194525525	102.4997	24.4075	19.7902
92.9828896769144	30.6995399750715	16.57278084694	100.6297	27.3107	24.1251
92.9828896769144	30.6995399750715	16.57278084694	97.0499	25.7334	20.6225
91.7901925673672	30.7501641656312	15.3362012328651	96.156	30.1327	19.1399
91.7901925673672	30.7501641656312	15.3362012328651	90.72	30.049	19.1921
90.5906436920488	30.8008175761843	14.0498021453027	90.6435	28.0536	25.8632
90.5906436920488	30.8008175761843	14.0498021453027	90.6179	26.4649	2.7134
90.5906436920488	30.8008175761843	14.0498021453027	86.512	33.4131	7.017
90.5906436920488	30.8008175761843	14.0498021453027	85.525	32.0217	10.845
89.1428932347936	31.641731439028	13.8086207512377	89.3668	41.343	14.5671
87.7021466682665	32.4202952856498	13.567049653484	89.1249	38.0318	13.3915
86.2584362643182	33.1848362307913	13.3255570190245	85.9182	41.843	9.5066
84.8327040496858	33.9067847979858	13.0860714071921	85.1876	33.113	2.1197
83.4024907134865	34.6393007884104	12.8585933503816	79.7169	32.9378	5.3155
82.0364930296826	35.3800409961827	12.6338233172102	73.7989	28.6287	7.3132
81.4126075399001	36.9743584522282	12.4335517388964	75.4748	37.8532	8.3059
80.8029365708128	38.5632485792865	12.2341959300922	77.5882	39.4219	14.211
80.1994811597011	40.1508505123821	12.0345129432055	80.8076	41.6004	10.0065
80.1994811597011	40.1508505123821	12.0345129432055	75.9022	40.5634	8.2476
79.6054771817621	41.736247094781	11.8358409589586	77.8794	45.0468	10.8339
79.0155066745214	43.2962114634746	11.6373258896848	84.6532	51.7406	11.3965
79.0155066745214	43.2962114634746	11.6373258896848	82.0477	53.0979	5.7932
78.3210538992689	44.0120348086703	11.4528441945194	79.9479	46.2913	1.0177
78.3210538992689	44.0120348086703	11.4528441945194	80.8872	43.1227	9.5119
77.613282006657	44.7123763499581	11.2743992895826	76.2244	51.9684	6.7104
77.613282006657	44.7123763499581	11.2743992895826	77.6289	48.4559	5.3003
76.9150430091659	45.3805848274889	11.0979498678719	73.6428	45.1426	7.6389
76.9150430091659	45.3805848274889	11.0979498678719	72.9198	44.5581	6.5665
76.2368195796332	46.0541043446497	10.9225953389704	75.2757	50.6388	0.889
76.2368195796332	46.0541043446497	10.9225953389704	75.73	42.7229	0.0066
75.5821182608755	46.7317064739994	10.7623675554912	70.7664	48.6137	12.8047
75.5821182608755	46.7317064739994	10.7623675554912	73.2283	44.0709	14.6285
74.9443638860092	47.4139958934041	10.6014284691918	67.8488	53.6384	2.957
74.9443644090924	47.41399571839	11.9523116358892	72.7757	56.7077	5.4576
74.9443644090924	47.41399571839	11.9523116358892	70.5527	57.3223	8.5137
74.9443649325214	47.4139955441127	14.7699868631079	72.0723	49.2863	13.9841
74.9443649325214	47.4139955441127	14.7699868631079	71.8327	48.0379	13.6369
74.9443654561012	47.4139953699825	17.6739706415995	71.8965	50.0142	14.8598
74.944365979526	47.4139951945111	20.7070015259501	70.1344	58.5671	20.707
76.6913114703298	47.4139931421927	23.0074210366313	83.5076	51.7826	22.7284
76.6913114703298	47.4139931421927	23.0074210366313	76.5498	52.218	12.9878
78.3300661228286	47.4139910893218	28.0847087484847	87.5129	47.9594	27.6836
78.3300661228286	47.4139910893218	28.0847087484847	87.8413	47.1867	25.6907
78.3300661228286	47.4139910893218	28.0847087484847	87.2346	40.5435	32.6709
78.3300661228286	47.4139910893218	28.0847087484847	80.3964	49.7264	23.6683
78.3300661228286	47.4139910893218	28.0847087484847	76.379	48.6237	27.9163
78.3300661228286	47.4139910893218	28.0847087484847	75.5587	49.1352	25.3998
78.3300661228286	47.4139910893218	28.0847087484847	75.5201	48.6107	22.753
78.3300661228286	47.4139910893218	28.0847087484847	67.6648	48.1141	30.5928
78.3300661228286	47.4139910893218	28.0847087484847	67.5609	49.631	28.0783
78.3300661228286	47.4139910893218	28.0847087484847	70.4096	46.4113	26.9931
78.3300661228286	47.4139910893218	28.0847087484847	73.2561	47.9132	17.0605
78.3300661228286	47.4139910893218	28.0847087484847	74.5598	39.2546	26.0148
77.8521917888773	47.5775487835869	28.9328873454205	80.7698	50.729	27.0276
77.3723070171466	47.7408419720329	29.7882922948355	81.1686	57.7423	31.0101
77.3723070171466	47.7408419720329	29.7882922948355	73.2116	57.797	29.252
76.8961770423715	47.8956225263118	30.640909226478	73.8072	55.2741	29.1095
76.8961770423715	47.8956225263118	30.640909226478	76.0043	50.5809	30.4596
76.4269527633214	48.0492345288613	31.5045503629634	70.8564	51.5507	32.2844
76.4269527633214	48.0492345288613	31.5045503629634	70.694	53.8562	23.1583
76.0205502688302	48.1963922699514	32.8844477555158	67.7991	50.1342	31.512
75.6241727118716	48.3433617898097	34.2893584204236	66.949	50.6855	34.7495
75.238875444333	48.4900371792917	35.6926518325359	68.2826	55.0673	33.7791
75.238875444333	48.4900371792917	35.6926518325359	70.2011	52.705	34.7749
74.8683630900534	48.6350282086027	37.1618724312773	67.4683	58.2291	37.5546
74.7953829138005	48.6831219041095	37.9523838799853	72.0385	47.603	37.589
74.722482273266	48.7312318400599	38.745131418073	72.9378	43.4347	40.5471
74.722482273266	48.7312318400599	38.745131418073	72.4429	44.8985	35.9587
74.6497269633412	48.7794529657606	39.543206368958	75.9853	41.4015	43.6031
74.6497269633412	48.7794529657606	39.543206368958	72.4926	42.7909	40.5929
74.5770244056155	48.8278766564326	40.3230201209107	81.9079	40.1742	36.8216
74.5770244056155	48.8278766564326	40.3230201209107	77.9223	44.6051	30.7678
74.5008560825976	48.8781214445236	41.5609039125531	77.9078	47.2474	41.2613
74.4246281059095	48.9283884933147	42.8042378846438	80.0004	48.0282	43.1849
74.4246281059095	48.9283884933147	42.8042378846438	79.533	47.2684	42.1428
74.3481415561991	48.9786957219321	44.0566398425086	69.8977	54.8286	42.1718
74.3481415561991	48.9786957219321	44.0566398425086	69.1565	53.343	39.551
74.3481415561991	48.9786957219321	44.0566398425086	69.1689	51.2673	37.9561

Solution x	Solution y	Solution z	Original x	Original y	Original z
74.3481415561991	48.9786957219321	44.0566398425086	70.6191	48.182	36.9413
74.3481415561991	48.9786957219321	44.0566398425086	70.0624	50.1219	34.6274
74.2727972299402	49.0288106907906	45.9758773689244	76.4125	46.981	46.4216
74.2727972299402	49.0288106907906	45.9758773689244	74.8417	48.5823	43.578
74.1974324726379	49.0789700843272	47.9464103215557	78.0993	54.3894	50.2798
74.1974324726379	49.0789700843272	47.9464103215557	77.4079	49.147	51.5989
74.1218874767134	49.1290627071598	49.8239266335467	77.9705	58.8491	56.0075
74.1218874767134	49.1290627071598	49.8239266335467	77.8264	55.5164	53.7679
74.1218874767134	49.1290627071598	49.8239266335467	69.2681	55.3133	57.276
74.1218874767134	49.1290627071598	49.8239266335467	72.0304	52.5053	58.0692
74.1218874767134	49.1290627071598	49.8239266335467	73.3859	52.8201	55.9097
74.1218874767134	49.1290627071598	49.8239266335467	69.4154	51.8752	55.6067
74.1218874767134	49.1290627071598	49.8239266335467	65.7303	47.3671	58.4265
74.1218874767134	49.1290627071598	49.8239266335467	73.2401	49.0047	54.3428
74.1218874767134	49.1290627071598	49.8239266335467	74.4488	50.3129	52.3971
74.1218874767134	49.1290627071598	49.8239266335467	72.0955	52.6394	50.8408
74.1218874767134	49.1290627071598	49.8239266335467	73.7963	57.8273	45.2128
74.1218874767134	49.1290627071598	49.8239266335467	66.2863	51.2705	54.2569
74.1218874767134	49.1290627071598	49.8239266335467	74.3979	53.0985	48.6112
74.1218874767134	49.1290627071598	49.8239266335467	70.1179	52.2878	46.5219
74.1218874767134	49.1290627071598	49.8239266335467	68.5789	56.8701	42.2821
73.2337036460452	47.4382988913928	49.7409314701197	72.7013	43.6681	47.6828
72.3511641922535	45.8021339275033	49.6580309470595	67.4955	46.0347	52.8305
71.4899437130885	44.1714743815234	49.5750216613527	70.5497	45.0925	44.08
70.6351712866381	42.5370051240449	49.4922195969564	65.211	38.9167	43.4098
69.8140266359631	40.9843790989559	49.4097648218632	66.7168	38.698	48.2341
69.0039779842575	39.460788122474	49.32735228032	64.8516	39.5774	48.8657
68.2074821063667	37.9421532610444	49.2449577940991	64.2784	38.8059	47.0778
68.2074821063667	37.9421532610444	49.2449577940991	63.453	34.6286	41.047
67.4586199746111	36.5117106061764	49.1632749207686	60.137	35.2014	51.7925
67.4586199746111	36.5117106061764	49.1632749207686	60.8351	33.4935	47.8851
66.7576435436953	35.1419448219647	49.0815746322895	62.0243	36.102	59.234
66.7576435436953	35.1419448219647	49.0815746322895	61.1452	36.2851	50.8184
66.124965611859	33.7226810351046	48.9982046078702	70.5469	25.0661	53.9959
66.124965611859	33.7226810351046	48.9982046078702	67.8857	28.9512	53.8343
65.4551937595445	32.6166997489807	48.9139907113437	68.3676	27.331	45.292
65.4551937595445	32.6166997489807	48.9139907113437	65.4552	32.6167	36.7679
64.0750869941186	31.4552588044626	48.9748657583111	58.9981	26.6128	49.6223
62.7558456516917	30.3316353508118	49.035736482035	61.643	23.6955	42.1255
61.4646268878244	29.2894756056516	49.0968665508586	59.5552	26.5288	41.5263
60.2028376108803	28.2698853964421	49.1582057561259	56.8778	27.618	56.4108
58.9804725993608	27.2567856916548	49.2193766313921	54.7376	29.7596	56.3053
58.9804725993608	27.2567856916548	49.2193766313921	55.089	27.0379	56.5554
57.849596238874	26.2309994633096	49.2801912797572	63.3795	20.1125	53.5518
56.6573111997512	25.2606043827795	49.3408827184569	55.1607	27.7715	51.8295
55.4787566048475	24.2828655250541	49.4015508266385	53.8796	31.7093	51.2249
55.4787566048475	24.2828655250541	49.4015508266385	47.3356	31.1656	48.6863
54.4816114561412	23.1311483484187	49.462251141412	47.4152	28.2569	57.2588
54.4816114561412	23.1311483484187	49.462251141412	52.7074	28.2489	52.4902
53.7539135857314	21.436520006911	49.5215758399565	45.9074	18.6439	58.1761
53.7539135857314	21.436520006911	49.5215758399565	53.7123	16.59	54.3027
53.3820916477106	20.5191369820541	49.5764108788918	52.0827	15.9727	59.9151
53.0158418163624	19.7042220884578	49.6304206532069	54.2786	24.4277	59.9569
53.0158418163624	19.7042220884578	49.6304206532069	50.1386	26.6573	56.0437
52.6491901173067	18.7156621383163	49.6833926903114	50.8742	24.2729	53.2264
52.2841611714321	17.6999501350771	49.7363213262118	48.493	25.186	47.2334
51.9232106473675	16.6247293601836	49.7893110354149	49.1449	22.3659	43.2644
51.9232106473675	16.6247293601836	49.7893110354149	52.1655	19.1446	41.5432
51.565710957878	15.4714423532962	49.8426369742326	46.213	15.3079	43.6977
51.2129428534552	14.3223795508855	49.8960879307105	39.7266	17.3977	50.5452
51.2129428534552	14.3223795508855	49.8960879307105	47.2642	16.1804	48.1934
50.9606867264244	12.5410760402243	49.949412791587	47.6091	10.2274	48.878
50.9606867264244	12.5410760402243	49.949412791587	53.965	12.2967	46.7771
50.7088650804214	10.8045645542039	50.0028092651068	50.5069	12.3029	52.6774
50.4572707577163	9.0550482223717	50.0561831770453	58.6318	9.4344	53.4701
50.4572707577163	9.0550482223717	50.0561831770453	51.2901	7.6487	52.6277
50.2018818387176	7.3227150585608	50.1094695817106	46.8369	6.4403	54.1626
50.2018818387176	7.3227150585608	50.1094695817106	44.2937	4.7268	51.9613
49.94974710553	5.65097042671864	50.1627006030395	44.3097	5.4051	59.4302
49.94974710553	5.65097042671864	50.1627006030395	45.5397	7.2979	57.1732
49.7057931281552	3.96854681888195	50.2153784217992	49.309	3.6922	59.7251
49.7057931281552	3.96854681888195	50.2153784217992	47.7278	5.7114	59.7593
49.4635715496343	2.24758919636795	50.267561776697	54.4331	-6.2551	57.3764
49.4635715496343	2.24758919636795	50.267561776697	43.0131	-4.6452	57.9101
49.4635715496343	2.24758919636795	50.267561776697	60.4719	1.0667	55.1539
49.4635715496343	2.24758919636795	50.267561776697	56.514	2.6652	55.8183
49.4635715496343	2.24758919636795	50.267561776697	51.8363	2.0767	53.9783
49.4635715496343	2.24758919636795	50.267561776697	58.2987	1.8222	52.9601
49.4635715496343	2.24758919636795	50.267561776697	56.6229	3.2945	52.4352
49.4635715496343	2.24758919636795	50.267561776697	54.7597	1.1902	50.9644

Solution x	Solution y	Solution z	Original x	Original y	Original z
49.4635715496343	2.24758919636795	50.267561776697	52.2056	3.4977	49.7426
49.4635715496343	2.24758919636795	50.267561776697	54.6465	1.327	47.163
49.4635715496343	2.24758919636795	50.267561776697	57.3839	0.9502	46.0215
49.4635715496343	2.24758919636795	50.267561776697	52.0607	4.6851	47.5572
49.4635715496343	2.24758919636795	50.267561776697	43.4311	0.4843	45.1031
49.4635715496343	2.24758919636795	50.267561776697	50.9668	1.717	44.4164
49.4635715496343	2.24758919636795	50.267561776697	49.2438	-0.5725	42.7886
49.4635715496343	2.24758919636795	50.267561776697	49.5265	1.5006	43.2383
49.4635715496343	2.24758919636795	50.267561776697	55.7669	1.6852	42.4618
49.4635715496343	2.24758919636795	50.267561776697	55.5686	2.3786	41.1094
49.4635715496343	2.24758919636795	50.267561776697	50.2911	5.2466	39.9878
44.4006491674424	2.24758914700555	50.2675618323763	36.4279	-4.3699	52.432
41.4301952234676	2.24758909776028	50.2675618880498	38.0686	7.3443	51.7798
38.62051614717	2.24758904849509	50.2675619437119	36.7928	9.6586	58.8057
36.212445714438	2.24758899915802	50.2675619994044	33.7832	8.5886	57.2507
33.9498223208141	2.24758894977835	50.2675620551177	31.0065	-1.0714	59.1851
33.9498223208141	2.24758894977835	50.2675620551177	31.1391	0.2266	57.7289
31.9395591333425	2.24758890045278	50.267562110885	22.4229	-2.1641	56.3911
32.1978440005343	2.24758911562034	49.0343335694477	27.3755	-1.0984	56.1861
32.4590400011779	2.24758933081086	47.7069909912916	27.6562	5.4902	56.4427
32.7249832927081	2.24758954597613	46.13115634787	30.7839	5.7178	56.2846
32.7249832927081	2.24758954597613	46.13115634787	25.8989	0.7413	53.4706
32.9996017873471	2.24758976113707	43.3773245199924	33.4349	0.0139	45.2628
32.9996017873471	2.24758976113707	43.3773245199924	27.9452	7.0873	43.7392
33.2764164255724	2.24758997629287	40.5970861604978	22.0744	6.6433	40.1203
33.2764164255724	2.24758997629287	40.5970861604978	29.6205	6.6839	35.8272
34.2406773208879	2.24759019104478	38.6279873842842	29.2732	5.6917	40.0529
35.2299427610952	2.24759040578562	36.6398859998828	28.6989	1.5656	37.4478
35.2299427610952	2.24759040578562	36.6398859998828	31.7997	5.4917	35.1341
36.2739175623089	2.24759062053148	34.6766824970854	42.4155	0.0668	38.5675
37.2819712287721	2.24759083529213	32.6262403052771	36.2059	6.8965	29.7476
37.2819712287721	2.24759083529213	32.6262403052771	36.4235	4.5159	28.6582
38.3034780572938	2.24759105003772	30.7072780842461	31.1128	-2.8096	30.5667
38.3034780572938	2.24759105003772	30.7072780842461	33.6792	4.7017	30.2163
39.4177686590111	2.24759126482348	28.8101162320824	32.3564	-1.4633	20.5286
41.0543439288959	2.24759147975323	27.6355859250861	39.9467	-2.3317	18.5214
42.7462031982067	2.24759169474427	26.6075279978466	44.8479	-0.9391	15.0769
42.7462035504816	3.56042247303169	26.6075280270449	45.0418	3.8658	25.2247
42.7462035504816	3.56042247303169	26.6075280270449	41.1669	5.3004	18.6447
42.7462039027579	4.85675472720904	26.6075280559429	43.7231	10.6871	23.6231
42.7462042550183	6.10850497309502	26.6075280849469	48.0446	14.6778	22.9405
42.7462042550183	6.10850497309502	26.6075280849469	45.8725	14.3747	21.2711
42.7462046071149	7.07213050826034	26.6075281143471	44.3034	16.6265	25.3299
42.7462046071149	7.07213050826034	26.6075281143471	46.6598	16.011	21.0885
42.7462049590775	7.8126157260278	26.6075281440052	40.715	18.8306	21.9165
42.7462049590775	7.8126157260278	26.6075281440052	47.2412	18.0641	21.8927
45.1321526087601	7.79425471377679	29.4983922013668	40.2335	17.1357	30.0024
45.1321526087601	7.79425471377679	29.4983922013668	45.9242	19.9	29.6168
45.3757765543199	7.68799390774701	30.7237172338129	49.0558	10.279	28.6803
45.6186058297279	7.58163801407969	31.96571894694	50.0191	-2.6033	31.7826
45.6186058297279	7.58163801407969	31.96571894694	44.0031	6.0986	31.1209
45.8565288282546	7.47778753433553	33.2269262307475	40.2323	12.6508	42.5989
46.7356219298471	7.33080085354698	33.3913932158362	47.5448	13.9665	39.1563
46.7356219298471	7.33080085354698	33.3913932158362	43.7175	13.3612	37.2361
47.6294722741378	7.1820413085517	33.5541808941944	44.7075	13.3055	33.9605
48.539616857464	7.03263564156971	33.7169762586708	52.4859	17.4578	33.7507
48.539616857464	7.03263564156971	33.7169762586708	51.539	18.7116	33.0294
48.9675528287171	6.56804148691531	33.8860633838878	54.3108	6.5803	34.1725
49.3918072736502	6.10386745472668	34.0551791932782	52.8937	1.339	38.4463
49.3918072736502	6.10386745472668	34.0551791932782	53.4617	5.8056	38.0578
49.8104026068882	5.64630834381865	34.223187817311	53.412	-4.2453	38.3008
50.2129065699987	5.24008595025742	34.3882668726072	46.3909	8.819	37.7186
50.2129065699987	5.24008595025742	34.3882668726072	43.7681	7.8375	35.3656
50.6251828796956	4.82920751640431	34.5529161139812	48.2378	10.888	40.0435
51.0408431928809	4.41132118582826	34.7166019854801	48.9393	11.7496	40.9103
51.4608729935055	3.97996042282168	34.8786845250947	51.32	11.9016	40.4537
51.4608729935055	3.97996042282168	34.8786845250947	51.9742	12.9315	39.5168
51.8813895748533	3.51266503450865	35.0381375938636	55.5508	6.709	40.6861
51.8813895748533	3.51266503450865	35.0381375938636	55.3647	9.0137	38.8085
52.2961649364801	3.03489637190928	35.1962811142044	63.4243	4.3429	39.6925
52.2961649364801	3.03489637190928	35.1962811142044	61.565	4.5717	36.954
52.4633680844125	2.45349748576695	35.3260581025954	60.4167	1.4088	44.4464
52.4633680844125	2.45349748576695	35.3260581025954	62.5325	1.766	39.3982
52.4633678114378	2.45349717013172	34.7953901717202	59.6709	-1.5476	33.1451
52.4633678114378	2.45349717013172	34.7953901717202	58.0726	3.0503	30.5544
52.4633675383691	2.4534968545229	34.2743035197546	53.289	-9.6645	34.2743
52.4633669892605	2.64197695080515	31.8555928223938	53.5826	-3.7128	29.3577
52.4633664401215	2.83169790645026	29.5294943476757	62.7821	-0.0838	27.7653
52.4633664401215	2.83169790645026	29.5294943476757	60.2628	6.0605	25.9406
52.4633658908489	3.02234388086232	27.5165901090017	60.5785	6.8128	27.9807

Solution x	Solution y	Solution z	Original x	Original y	Original z
52.4633658908489	3.02234388086232	27.5165901090017	46.0043	6.8606	27.4465
52.4633653415704	3.21119224280796	25.5050218506591	51.7765	0.7553	20.0441
52.4633647923084	3.40049654191985	23.6018726395522	57.7878	-4.3732	24.6962
52.4633647923084	3.40049654191985	23.6018726395522	57.7618	2.6586	23.6599
52.4633642429962	3.5925071339746	21.6689172909394	53.8048	-5.0553	19.1679
52.4633636936954	3.78714674726413	19.8174139150284	56.047	-0.6998	19.4659
52.4633636936954	3.78714674726413	19.8174139150284	58.3955	-2.2935	14.9348
52.4633631443227	3.98503495427151	18.1390145734423	61.7542	11.527	18.9198
52.4633625947186	4.14367410359077	15.983324014161	63.0749	1.8033	17.7213
52.4633625947186	4.14367410359077	15.983324014161	61.9524	-0.333	11.9086
52.4633620447952	4.30652016492044	14.1276021780314	53.9046	16.3668	14.1276
52.4633620447952	4.30652016492044	14.1276021780314	59.4358	8.0877	8.3998
52.4056274408923	4.30652014425389	12.9787259545176	53.1154	7.9184	18.71
52.4056274408923	4.30652014425389	12.9787259545176	52.3173	10.0275	11.1526
52.3479118542268	4.30652012356456	11.8046752002254	48.7027	4.8736	15.3944
52.3479118542268	4.30652012356456	11.8046752002254	48.302	2.6164	11.9932
52.2903590107391	4.306520102886	10.6111269017878	43.984	9.2005	15.6271
52.2903590107391	4.306520102886	10.6111269017878	44.5228	11.8645	13.3212
52.2339226953758	4.30652008207896	9.14013573834428	58.0725	5.2013	11.1785
52.1773848023344	4.30652006132108	7.64954952384458	58.2741	0.1622	8.0145
52.1773848023344	4.30652006132108	7.64954952384458	58.8992	5.3006	6.9433
52.1205818693735	4.30652004054183	6.16723837542926	62.4332	-0.684	2.8792
52.1205818693735	4.30652004054183	6.16723837542926	46.0937	-5.8176	9.1179
52.1205818693735	4.30652004054183	6.16723837542926	58.2864	0.0731	4.559
52.1205818693735	4.30652004054183	6.16723837542926	58.6741	1.1796	4.0744
52.1205818693735	4.30652004054183	6.16723837542926	58.5415	3.6684	5.0311
52.1205818693735	4.30652004054183	6.16723837542926	51.545	-0.7619	6.4521
52.1205818693735	4.30652004054183	6.16723837542926	48.4975	2.4432	11.2037
52.1205818693735	4.30652004054183	6.16723837542926	54.5841	1.3	6.274
52.1205818693735	4.30652004054183	6.16723837542926	56.6752	3.9284	4.2715
52.1205818693735	4.30652004054183	6.16723837542926	44.5689	9.75	12.1988
52.1205818693735	4.30652004054183	6.16723837542926	47.0712	4.3382	9.7807
52.1205818693735	4.30652004054183	6.16723837542926	52.3291	3.6705	6.1162
52.1205818693735	4.30652004054183	6.16723837542926	57.2331	12.7874	5.1838
52.1205818693735	4.30652004054183	6.16723837542926	47.1015	12.1757	10.5923
52.1205818693735	4.30652004054183	6.16723837542926	52.0306	12.0787	8.641
52.1205818693735	4.30652004054183	6.16723837542926	42.4139	3.5597	1.814
52.1205818693735	4.30652004054183	6.16723837542926	47.4524	12.1509	5.76
52.1205818693735	4.30652004054183	6.16723837542926	46.5714	10.174	4.4604
52.1205818693735	4.30652004054183	6.16723837542926	42.7704	10.2739	1.2183
52.5453094006456	7.77880050485601	3.62969763423848	64.6914	7.7788	3.6297
52.2624581240596	9.90436047392799	2.74567322608573	55.8132	15.4408	3.6174
51.9783052223373	11.9121694159306	1.85881815472099	54.0368	23.8586	2.2143

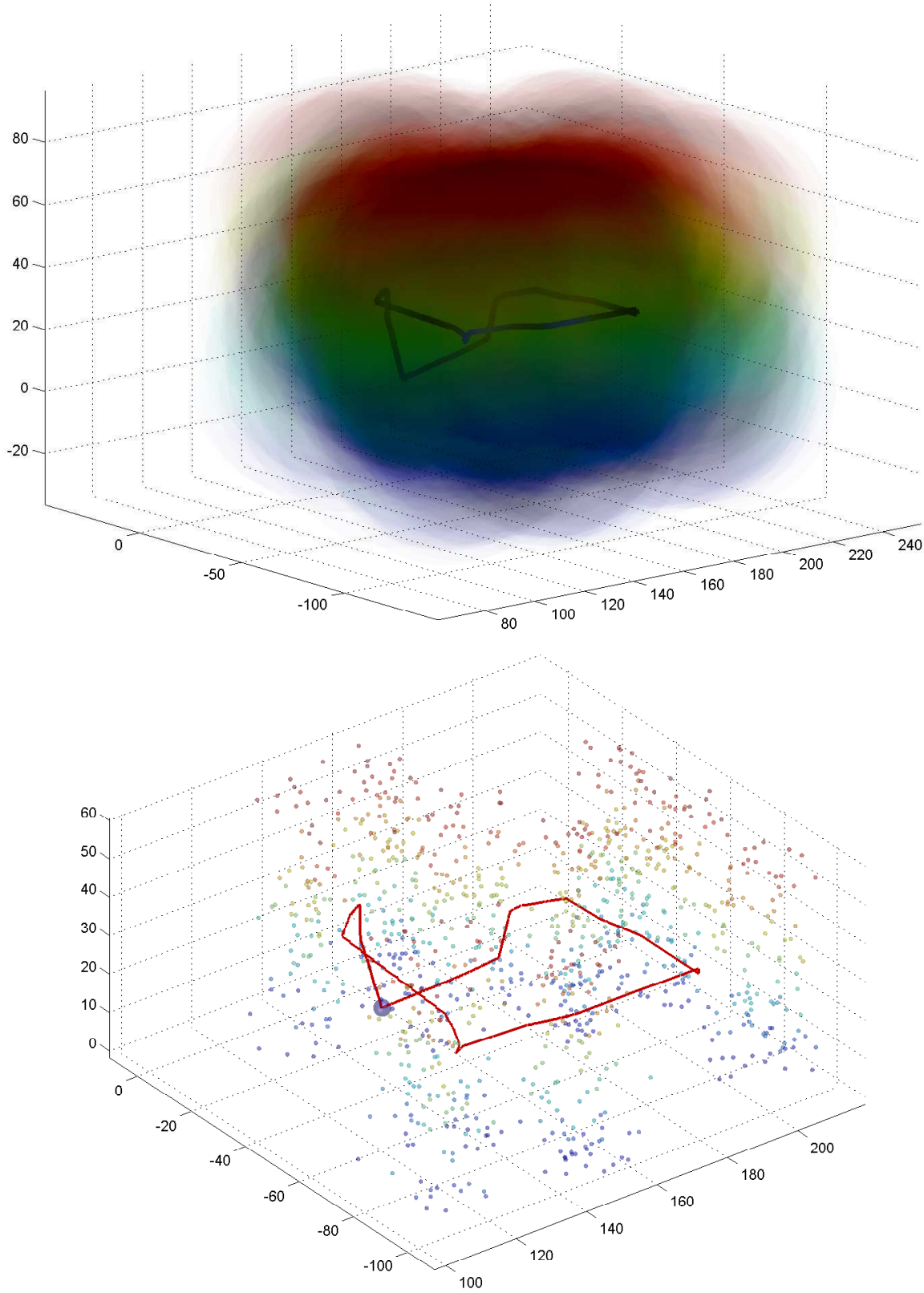


Figure N.194: $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Manhattan, Length = 341.1658446

Table N-197: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Manhattan

Total distance: 341.165844609089 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
46.9163556669074	11.9723276961966	0.693400164527809	42.7704	10.2739	1.2183
46.9163556669074	11.9723276961966	0.693400164527809	46.5714	10.174	4.4604
46.705695374478	11.9787419214676	1.3866994612555	41.9974	13.5778	7.3366
46.4955108454682	11.9851585385471	2.08040193924813	44.5689	9.75	12.1988
46.4955108454682	11.9851585385471	2.08040193924813	44.5228	11.8645	13.3212
46.2859643871238	11.9915762679498	2.77132256479174	48.7027	4.8736	15.3944
46.2859643871238	11.9915762679498	2.77132256479174	43.984	9.2005	15.6271
46.0768780746128	11.997993287614	3.4572188196385	48.302	2.6164	11.9932
46.0768780746128	11.997993287614	3.4572188196385	48.4975	2.4432	11.2037
45.8681129446817	12.0044111344082	4.14115711109703	52.3291	3.6705	6.1162
45.8681129446817	12.0044111344082	4.14115711109703	47.0712	4.3382	9.7807
45.6596368028391	12.0108285102398	4.82576648249191	54.5841	1.3	6.274
45.4511333600757	12.0172464336208	5.51121699500308	58.2864	0.0731	4.559
45.4511333600757	12.0172464336208	5.51121699500308	58.6741	1.1796	4.0744
45.2422938758012	12.0236657462406	6.19982195620662	58.2741	0.1622	8.0145
45.0333405376903	12.0300861447887	6.88876133586502	58.0725	5.2013	11.1785
45.0333405376903	12.0300861447887	6.88876133586502	58.8992	5.3006	6.9433
44.824204396274	12.0365060543253	7.57792422681838	58.5415	3.6684	5.0311
44.824204396274	12.0365060543253	7.57792422681838	56.6752	3.9284	4.2715
44.6150227599583	12.042927767533	8.27096425950904	64.6914	7.7788	3.6297
44.6150227599583	12.042927767533	8.27096425950904	59.4358	8.0877	8.3998
44.4051902117835	12.0493495538852	8.96728745862842	57.2331	12.7874	5.1838
44.4051902117835	12.0493495538852	8.96728745862842	55.8132	15.4408	3.6174
44.1952269574009	12.0557694067881	9.66829923981805	52.0306	12.0787	8.641
44.1952269574009	12.0557694067881	9.66829923981805	47.1015	12.1757	10.5923
43.9857062345402	12.0621896355885	10.3714829555534	53.9046	16.3668	14.1276
43.9857062345402	12.0621896355885	10.3714829555534	52.3173	10.0275	11.1526
43.776236678286	12.0686075705126	11.0755894169019	53.1154	7.9184	18.71
43.5668141680075	12.0750258632043	11.7786153105233	56.047	-0.6998	19.4659
43.5668141680075	12.0750258632043	11.7786153105233	51.7765	0.7553	20.0441
43.3574818915748	12.0814513447594	12.4792199785413	63.0749	1.8033	17.7213
43.3574818915748	12.0814513447594	12.4792199785413	61.9524	-0.333	11.9086
43.1472136124521	12.087882245518	13.1813501747385	61.7542	11.527	18.9198
42.936563967584	12.0943103526269	13.8832137920732	60.2628	6.0605	25.9406
42.936563967584	12.0943103526269	13.8832137920732	57.7618	2.6586	23.6599
42.7255040439448	12.100740666802	14.5810377635331	62.7821	-0.0838	27.7653
42.7255040439448	12.100740666802	14.5810377635331	60.5785	6.8128	27.9807
42.5134289137448	12.1071739761861	15.2713364529209	59.6709	-1.5476	33.1451
42.5134289137448	12.1071739761861	15.2713364529209	58.0726	3.0503	30.5544
42.3005966430684	12.1136138386807	15.9506482034319	61.565	4.5717	36.954
42.3005966430684	12.1136138386807	15.9506482034319	53.4617	5.8056	38.0578
42.0868580594257	12.1200551392816	16.6129127971069	62.5325	1.766	39.3982
42.0868580594257	12.1200551392816	16.6129127971069	63.4243	4.3429	39.6925
41.8697644866883	12.1265011411371	17.2404922940367	55.5686	2.3786	41.1094
41.8697644866883	12.1265011411371	17.2404922940367	55.5508	6.709	40.6861
41.6516920164316	12.1329508344544	17.8504535712343	55.3647	9.0137	38.8085
41.4331157781593	12.1393998979128	18.454727176763	54.3108	6.5803	34.1725
41.2141347340599	12.1458504244144	19.055972127017	46.0043	6.8606	27.4465
41.2141347340599	12.1458504244144	19.055972127017	49.0558	10.279	28.6803
40.9951350130252	12.1523034520279	19.6561242552914	43.7231	10.6871	23.6231
40.9951350130252	12.1523034520279	19.6561242552914	45.8725	14.3747	21.2711
40.7761125804615	12.1587544708657	20.2575256932473	36.4279	-4.3699	52.432
40.7761125804615	12.1587544708657	20.2575256932473	19.5225	24.6717	34.6116
40.7761125804615	12.1587544708657	20.2575256932473	22.0744	6.6433	40.1203
40.7761125804615	12.1587544708657	20.2575256932473	18.1963	16.0602	36.4885
40.7761125804615	12.1587544708657	20.2575256932473	19.6468	14.5775	38.07
40.7761125804615	12.1587544708657	20.2575256932473	18.4916	22.031	28.1174
40.7761125804615	12.1587544708657	20.2575256932473	28.6989	1.5656	37.4478
40.7761125804615	12.1587544708657	20.2575256932473	22.6294	-1.9579	25.7184
40.7761125804615	12.1587544708657	20.2575256932473	22.8581	29.0039	22.5241
40.7761125804615	12.1587544708657	20.2575256932473	24.5208	1.7631	30.0851
40.7761125804615	12.1587544708657	20.2575256932473	24.8641	0.1355	28.7608
40.7761125804615	12.1587544708657	20.2575256932473	20.8129	26.0745	22.3222
40.7761125804615	12.1587544708657	20.2575256932473	19.0397	19.3917	26.8913
40.7761125804615	12.1587544708657	20.2575256932473	53.289	-9.6645	34.2743
40.7761125804615	12.1587544708657	20.2575256932473	31.1128	-2.8096	30.5667
40.7761125804615	12.1587544708657	20.2575256932473	23.1615	20.5337	28.672
40.7761125804615	12.1587544708657	20.2575256932473	17.2669	18.1061	25.0094
40.7761125804615	12.1587544708657	20.2575256932473	20.5322	21.5891	20.6595
40.7761125804615	12.1587544708657	20.2575256932473	27.2842	5.8331	28.3822
40.7761125804615	12.1587544708657	20.2575256932473	19.8821	27.2321	11.7559
40.7761125804615	12.1587544708657	20.2575256932473	23.1228	16.7524	24.3445
40.7761125804615	12.1587544708657	20.2575256932473	15.0509	21.8739	10.7741
40.7761125804615	12.1587544708657	20.2575256932473	57.7878	-4.3732	24.6962
40.7761125804615	12.1587544708657	20.2575256932473	53.5826	-3.7128	29.3577
40.7761125804615	12.1587544708657	20.2575256932473	7.8039	17.6061	5.7787

Solution x	Solution y	Solution z	Original x	Original y	Original z
40.7761125804615	12.1587544708657	20.2575256932473	20.5046	21.2685	13.3595
40.7761125804615	12.1587544708657	20.2575256932473	32.3564	-1.4633	20.5286
40.7761125804615	12.1587544708657	20.2575256932473	29.9497	8.0977	27.1858
40.7761125804615	12.1587544708657	20.2575256932473	28.1449	5.3771	22.529
40.7761125804615	12.1587544708657	20.2575256932473	26.4488	5.1021	19.0029
40.7761125804615	12.1587544708657	20.2575256932473	24.5729	19.8583	16.0395
40.7761125804615	12.1587544708657	20.2575256932473	22.4003	2.9895	12.1851
40.7761125804615	12.1587544708657	20.2575256932473	29.2451	9.0499	23.6495
40.7761125804615	12.1587544708657	20.2575256932473	19.6457	23.2311	5.559
40.7761125804615	12.1587544708657	20.2575256932473	21.6596	11.213	17.563
40.7761125804615	12.1587544708657	20.2575256932473	53.8048	-5.0553	19.1679
40.7761125804615	12.1587544708657	20.2575256932473	19.4163	-0.8394	2.2943
40.7761125804615	12.1587544708657	20.2575256932473	24.0847	21.2619	9.4135
40.7761125804615	12.1587544708657	20.2575256932473	26.246	7.8923	16.6585
40.7761125804615	12.1587544708657	20.2575256932473	58.3955	-2.2935	14.9348
40.7761125804615	12.1587544708657	20.2575256932473	26.7943	-2.6353	5.1743
40.7761125804615	12.1587544708657	20.2575256932473	25.2224	21.1268	9.0297
40.7761125804615	12.1587544708657	20.2575256932473	39.9467	-2.3317	18.5214
40.7761125804615	12.1587544708657	20.2575256932473	23.9142	5.5856	8.3806
40.7761125804615	12.1587544708657	20.2575256932473	23.3217	16.9506	6.2856
40.7761125804615	12.1587544708657	20.2575256932473	16.9397	16.157	0.3423
40.7761125804615	12.1587544708657	20.2575256932473	31.9656	14.6164	16.7619
40.7761125804615	12.1587544708657	20.2575256932473	21.2889	20.2133	0.1771
40.7761125804615	12.1587544708657	20.2575256932473	31.0707	1.7474	5.3999
40.7761125804615	12.1587544708657	20.2575256932473	27.0312	22.0371	1.4535
40.7761125804615	12.1587544708657	20.2575256932473	41.1669	5.3004	18.6447
40.7761125804615	12.1587544708657	20.2575256932473	62.4332	-0.684	2.8792
40.7761125804615	12.1587544708657	20.2575256932473	44.8479	-0.9391	15.0769
40.7761125804615	12.1587544708657	20.2575256932473	46.0937	-5.8176	9.1179
40.7761125804615	12.1587544708657	20.2575256932473	28.0443	7.2557	0.5495
40.7761125804615	12.1587544708657	20.2575256932473	51.545	-0.7619	6.4521
40.7761125804615	12.1587544708657	20.2575256932473	42.4139	3.5597	1.814
40.7678066867728	12.165493492782	20.6938753937447	33.6792	4.7017	30.2163
40.7678066867728	12.165493492782	20.6938753937447	36.4235	4.5159	28.6582
40.7595000526446	12.1722376269456	21.1292759364786	36.2059	6.8965	29.7476
40.7595000526446	12.1722376269456	21.1292759364786	44.0031	6.0986	31.1209
40.7511926569096	12.178983617974	21.5639677263222	43.7681	7.8375	35.3656
40.7511926569096	12.178983617974	21.5639677263222	45.0418	3.8658	25.2247
40.7428854332597	12.1857313230164	21.9983581514149	29.6205	6.6839	35.8272
40.7428854332597	12.1857313230164	21.9983581514149	31.7997	5.4917	35.1341
40.7345767963752	12.1924812680622	22.4313826935904	27.9452	7.0873	43.7392
40.7345767963752	12.1924812680622	22.4313826935904	29.2732	5.6917	40.0529
40.7262668078518	12.1992315493032	22.860101365179	33.4349	0.0139	45.2628
40.7262668078518	12.1992315493032	22.860101365179	43.4311	0.4843	45.1031
40.7179561969517	12.2059887468692	23.2826836326731	49.5265	1.5006	43.2383
40.7179561969517	12.2059887468692	23.2826836326731	42.4155	0.0668	38.5675
40.7096446766257	12.2127510129468	23.7022308752585	49.2438	-0.5725	42.7886
40.7013326339872	12.2195166359013	24.1197109911093	50.0191	-2.6033	31.7826
40.6930205312625	12.2262871240859	24.5377336626838	53.412	-4.2453	38.3008
40.6930205312625	12.2262871240859	24.5377336626838	52.8937	1.339	38.4463
40.6847074835418	12.2330661963322	24.953982929545	55.7669	1.6852	42.4618
40.6763933978778	12.2398476482993	25.3684051253614	60.4167	1.4088	44.4464
40.6680759902495	12.2466324696868	25.7795435292102	57.3839	0.9502	46.0215
40.6597558324659	12.2534214682906	26.1877030241165	54.6465	1.327	47.163
40.6514334775306	12.2602147791241	26.5932664685478	52.0607	4.6851	47.5572
40.6514334775306	12.2602147791241	26.5932664685478	50.9668	1.717	44.4164
40.6431085542287	12.2670149738193	26.9959343609763	51.8363	2.0767	53.9783
40.6431085542287	12.2670149738193	26.9959343609763	52.2056	3.4977	49.7426
40.6347783252895	12.2738248640808	27.390487081834	49.309	3.6922	59.7251
40.6264424351891	12.2806408215136	27.7657699231702	47.7278	5.7114	59.7593
40.6264424351891	12.2806408215136	27.7657699231702	45.5397	7.2979	57.1732
40.6181017820766	12.2874663197079	28.1260083387203	52.0827	15.9727	59.9151
40.6181017820766	12.2874663197079	28.1260083387203	50.5069	12.3029	52.6774
40.6097523814282	12.2942915558525	28.4725725864226	54.2786	24.4277	59.9569
40.6011645658608	12.3009906539274	28.5634102224429	50.1386	26.6573	56.0437
40.6011645658608	12.3009906539274	28.5634102224429	45.9074	18.6439	58.1761
40.5925691579911	12.3076833111197	28.6535749661394	35.5392	31.6783	58.7469
40.5925691579911	12.3076833111197	28.6535749661394	47.4152	28.2569	57.2588
40.5839753683901	12.3143406152476	28.737443759925	40.9959	37.9409	51.1587
40.5839753683901	12.3143406152476	28.737443759925	47.4903	33.2139	54.5514
40.5753707460948	12.3209563688429	28.8203609757271	39.7266	17.3977	50.5452
40.5753707460948	12.3209563688429	28.8203609757271	40.2323	12.6508	42.5989
40.5667704577851	12.3275779040862	28.903279804613	38.0686	7.3443	51.7798
40.5667704577851	12.3275779040862	28.903279804613	44.2937	4.7268	51.9613
40.5581739164826	12.3342157167403	28.9860403681186	46.8369	6.4403	54.1626
40.5581739164826	12.3342157167403	28.9860403681186	47.6091	10.2274	48.878
40.5495754230799	12.3408596952436	29.0686350111874	58.6318	9.4344	53.4701
40.5495754230799	12.3408596952436	29.0686350111874	51.2901	7.6487	52.6277
40.5409609321455	12.3475062858616	29.1509240877445	56.6229	3.2945	52.4352
40.5409609321455	12.3475062858616	29.1509240877445	54.7597	1.1902	50.9644

Solution x	Solution y	Solution z	Original x	Original y	Original z
40.532330818414	12.3541708084881	29.2329636113186	60.4719	1.0667	55.1539
40.532330818414	12.3541708084881	29.2329636113186	58.2987	1.8222	52.9601
40.5236623456224	12.3608615438687	29.314165785478	54.4331	-6.2551	57.3764
40.5236623456224	12.3608615438687	29.314165785478	56.514	2.6652	55.8183
39.5590960830341	12.8592259742589	29.3186202864513	43.0131	-4.6452	57.9101
39.5590960830341	12.8592259742589	29.3186202864513	44.3097	5.4051	59.4302
38.5870143116269	13.3749051796918	29.3230644206022	31.0065	-1.0714	59.1851
37.6436220199036	13.9045168856515	29.3275039848372	31.1391	0.2266	57.7289
36.714946217927	14.4427698711521	29.3319398134092	29.4417	11.4808	30.7206
35.7925908151599	14.9825616955856	29.3363884920526	18.7218	26.0511	59.401
35.7925908151599	14.9825616955856	29.3363884920526	19.4476	21.0876	59.2618
35.3339453558956	15.3761821233833	29.3407982679364	16.9754	26.2994	50.4148
35.3339453558956	15.3761821233833	29.3407982679364	21.4132	25.3225	51.4824
34.8847685867168	15.766821971474	29.3452066112966	23.1689	25.59	48.8728
34.4378877890246	16.1566993846031	29.349614557947	21.3113	31.7798	46.1078
33.9937839007457	16.5445045042882	29.3540221494076	19.4151	20.4264	46.5071
33.5523509097798	16.9325978845147	29.3584295917491	19.3676	20.9011	45.1036
33.5523509097798	16.9325978845147	29.3584295917491	21.7951	21.835	45.5134
33.1152816723697	17.3209136530882	29.3628362012866	21.1889	21.267	39.0474
32.6801091502818	17.7093717070801	29.3672459690779	20.7311	19.0512	39.2565
32.2470274204765	18.0982222539843	29.3716593116479	25.9081	14.4892	36.1934
31.8152516818996	18.4880175271625	29.376078950216	33.7832	8.5886	57.2507
31.3831428041086	18.880407552428	29.3804920440322	36.7928	9.6586	58.8057
30.9494479834236	19.2755699206234	29.3848987322557	22.0389	18.6688	59.3708
30.5193032951301	19.670768285693	29.3893013675839	22.5923	19.795	49.1879
30.0910372376273	20.0657075523807	29.393707001049	27.3755	-1.0984	56.1861
29.6651129350171	20.473654316957	29.3981091692686	27.6562	5.4902	56.4427
29.2402241903694	20.8857269346342	29.4025092554753	30.7839	5.7178	56.2846
28.8151793765663	21.3017573421974	29.4069060373129	22.4229	-2.1641	56.3911
28.472437987856	24.6422600825081	29.4113053633888	25.8989	0.7413	53.4706
28.1308089258474	29.2749078798251	29.4157053192121	28.099	29.8348	27.0633
27.7893702809428	33.9756374308174	29.4201107945048	17.3215	22.815	38.4524
27.44921225105	38.9260044031422	29.4245150224471	17.7323	26.9057	35.8248
27.1103468235476	44.1775119367266	29.4289171314165	18.7531	32.536	21.0115
26.772842334474	49.7979100040602	29.4333221012774	31.4455	71.7336	19.6874
26.4349810940509	55.014709099216	29.4377242057312	34.9317	80.2335	16.9208
26.0958960750104	59.5535512060622	29.4421216090584	33.517	80.8699	6.7304
25.7554229012599	63.423532467712	29.4465169316291	33.2241	90.2072	6.3544
25.3871553308254	64.3446891005218	29.4509027799389	22.6268	64.3936	19.9605
25.0199398960217	65.2729300046009	29.4552874901549	23.9369	61.5866	18.0383
24.6536025620851	66.2108576285836	29.4596720459112	24.5354	72.6275	12.2334
24.2879935262124	67.1518423191268	29.4640585409177	27.2709	73.9256	16.4296
23.9228495992434	68.0963204150297	29.4684455548867	34.7819	91.1147	8.0437
23.5542181048273	68.9947414240877	29.4728360065782	31.6916	96.8159	17.5787
23.5542181048273	68.9947414240877	29.4728360065782	38.2186	96.6747	17.5328
23.178605918606	69.8094785793896	29.477224748415	29.3468	93.7461	14.2413
23.178605918606	69.8094785793896	29.477224748415	32.6009	89.9531	17.4409
22.802152600356	70.6044131174636	29.4816184196143	29.5221	90.7635	22.4343
22.4257267421054	71.3953725052099	29.4860129932631	34.0163	93.2553	22.3961
22.0483043755607	72.1789911662094	29.490409228972	31.7064	96.988	25.1942
22.0483043755607	72.1789911662094	29.490409228972	29.1897	96.4145	23.036
21.6697928244892	72.9434483022886	29.4948097821099	29.7064	94.0211	29.3487
21.2911823027462	73.703832157318	29.4992121377569	34.0464	97.1856	33.2284
21.2911823027462	73.703832157318	29.4992121377569	33.1881	90.5996	30.8927
20.9108650314413	74.4543914973131	29.503617062319	36.8108	99.4487	34.5912
20.9108650314413	74.4543914973131	29.503617062319	38.189	100.3805	31.8594
20.524069267565	75.1718752992024	29.5080209427442	33.8351	99.3235	37.4512
20.1356213085337	75.8795668004661	29.5124232054636	32.8361	107.2479	41.504
20.1356213085337	75.8795668004661	29.5124232054636	29.8552	101.3038	43.5974
19.7177495347039	76.412463783849	29.5168087537142	31.3011	106.2109	32.3658
19.7177495347039	76.412463783849	29.5168087537142	34.3074	104.3145	33.9426
19.2926790203242	76.9210665931625	29.5211929994863	33.1638	109.6815	28.6324
18.8447024317591	77.3657680204816	29.5255757861806	28.1717	107.4546	19.2451
18.8447024317591	77.3657680204816	29.5255757861806	33.1686	108.6172	19.7963
18.3586659309481	77.7445078486782	29.5299647591711	28.2891	98.27	21.6276
17.8714138668048	78.1223254439815	29.5343562430538	21.5395	100.4343	27.1149
17.8714138668048	78.1223254439815	29.5343562430538	26.1674	96.1159	30.3905
17.3831764760368	78.4984553337341	29.5387411931553	8.0611	104.093	26.141
17.3831764760368	78.4984553337341	29.5387411931553	9.17	97.1621	20.3835
16.9002677613826	78.8714271341427	29.5431221643545	3.0162	107.1796	11.3112
16.9002677613826	78.8714271341427	29.5431221643545	3.81100	100.5395	9.9764
16.8486959580965	78.8992027743201	29.5478363212436	8.1477	101.1634	5.5645
16.7971759238545	78.926925073257	29.5525581344625	2.55330	99.1767	7.9857
16.7971759238545	78.926925073257	29.5525581344625	4.77370	93.7785	6.1602
16.7457812241418	78.9546032872381	29.5572884677488	2.57040	90.3092	4.6781
16.7457812241418	78.9546032872381	29.5572884677488	2.7376	84.0979	3.4333
16.6945033900435	78.9823026814223	29.5620311463849	-0.171000000000006	97.1566	2.8672
16.6945033900435	78.9823026814223	29.5620311463849	-0.100899999999996	90.0487	0.1507
16.6797732875397	78.9937880920965	29.569003256679	-2.1508	94.1499	7.6254
16.6797732875397	78.9937880920965	29.569003256679	-1.9602	93.9224	5.6614

Solution x	Solution y	Solution z	Original x	Original y	Original z
16.6650663687157	79.0052619227584	29.5759972859492	-6.68600	94.6391	7.4364
16.6504203181567	79.0167164021667	29.5830059759805	-12.8049	93.8535	15.5008
16.6359066039285	79.0281421863585	29.590018259509	0.613799999999998	95.4238	16.9249
16.6359066039285	79.0281421863585	29.590018259509	1.4019	97.5847	15.4849
16.6214006617867	79.0395583324943	29.5970382592221	6.3198	96.0864	20.0555
16.6214006617867	79.0395583324943	29.5970382592221	5.8502	91.8647	13.1882
16.6068935984189	79.0509705945453	29.6040682325874	-2.5612	92.1356	23.79
16.6068935984189	79.0509705945453	29.6040682325874	-0.735100000000003	89.6931	26.6301
16.5924032104377	79.0623867120098	29.6111013793073	-5.5457	98.4014	26.4862
16.5924032104377	79.0623867120098	29.6111013793073	-0.338999999999999	97.1979	25.6607
16.5779299770858	79.0737953124824	29.618139037804	-0.311599999999999	97.6012	28.6474
16.5779299770858	79.0737953124824	29.618139037804	3.11839999999999	98.924	29.022
16.5634631804565	79.08520025869	29.6251800448652	3.1448	100.72	31.1491
16.5489968743694	79.0966010078406	29.6322211006756	1.64530	95.7178	31.8751
16.5489968743694	79.0966010078406	29.6322211006756	3.5924	94.7451	26.9481
16.534534586441	79.1080040142968	29.6392683252266	-1.86190	98.5581	36.524
16.534534586441	79.1080040142968	29.6392683252266	-3.1358	95.2162	31.8855
16.5200825316236	79.1194023476186	29.6463126214114	3.5998	89.8159	36.4775
16.5200825316236	79.1194023476186	29.6463126214114	7.8142	89.6258	27.2865
16.5056296477263	79.1308089472334	29.6533633737235	3.4538	93.5151	43.6356
16.4911768524187	79.1422143060758	29.6604059592368	2.1469	96.6722	44.5395
16.4767249840448	79.1536157931345	29.6674392767809	3.55029999999999	90.3653	48.0124
16.4767249840448	79.1536157931345	29.6674392767809	1.20229999999999	90.7259	43.7677
16.4622760002606	79.1650222429667	29.6744599535502	-3.26390	94.8889	48.3647
16.4622760002606	79.1650222429667	29.6744599535502	0.580200000000005	93.7511	50.7296
16.4478324488538	79.176420277613	29.6814541079689	-4.1255	85.596	43.5867
16.4478324488538	79.176420277613	29.6814541079689	0.619299999999996	91.0377	37.0534
16.433392985137	79.1878190412849	29.6884483684289	-1.23350	86.0108	56.7294
16.433392985137	79.1878190412849	29.6884483684289	-4.2807	74.2616	57.1387
16.4189658011923	79.1992159508511	29.6953908785238	0.483800000000002	63.8626	0.7436
16.4189658011923	79.1992159508511	29.6953908785238	12.0877	66.3858	4.5331
16.4118060344318	79.2666562374382	29.7721175919877	-2.30370	90.7079	58.2529
16.4046743365317	79.3328531958477	29.8444338150006	1.76609999999999	66.5446	12.6159
16.397550177303	79.39909591925	29.9169040918942	9.6606	65.5604	9.552
16.397550177303	79.39909591925	29.9169040918942	14.2239	63.9607	10.3191
16.3904307716214	79.4654427527625	29.9896011937663	15.1112	64.361	7.2726
16.3904307716214	79.4654427527625	29.9896011937663	22.8228	67.5784	3.2098
16.3833112255893	79.5319388999543	30.0625804024648	24.5076	73.115	4.3052
16.3833112255893	79.5319388999543	30.0625804024648	23.527	73.6169	0.5641
16.3761885312887	79.5985538675753	30.1359162087226	25.4767	75.481	0.001
16.3761885312887	79.5985538675753	30.1359162087226	28.241	67.9653	9.5896
16.3690628417553	79.6652972690456	30.2096434310934	26.6151	77.1467	3.8306
16.3690628417553	79.6652972690456	30.2096434310934	31.4187	76.5703	2.7936
16.3619294628996	79.732107588412	30.283803089703	23.4089	84.0628	5.796
16.3547951820109	79.7989050903562	30.3581023262458	21.1184	76.9048	10.6601
16.3547951820109	79.7989050903562	30.3581023262458	23.796	77.2181	9.3562
16.3476612664661	79.8657297360207	30.4325914316705	22.1344	71.2137	11.8857
16.3476612664661	79.8657297360207	30.4325914316705	21.3934	72.6127	7.7423
16.3405269391814	79.9326270516896	30.5073111520426	16.7224	69.1113	14.1768
16.3405269391814	79.9326270516896	30.5073111520426	25.7737	68.9159	14.4865
16.3333898663835	79.9995970012298	30.5821833747795	13.2613	67.7948	17.1077
16.3333898663835	79.9995970012298	30.5821833747795	14.5018	68.1646	16.8217
16.3262565272299	80.0666455933752	30.6571870179467	12.0587	67.8257	18.5408
16.3191246013614	80.1337319137733	30.7322585461153	9.1707	70.0865	21.5855
16.3191246013614	80.1337319137733	30.7322585461153	12.5389	66.9051	22.2814
16.3119936779359	80.2008715874704	30.807435065513	6.9842	66.7632	27.251
16.3119936779359	80.2008715874704	30.807435065513	10.5042	66.7806	23.1982
16.3048644157171	80.2680813113264	30.8827045400875	7.6803	61.1857	24.6436
16.3048644157171	80.2680813113264	30.8827045400875	9.15690	61.6426	15.1483
16.2977380877907	80.3354830715691	30.9582437483614	6.67010	63.5082	34.9077
16.2977380877907	80.3354830715691	30.9582437483614	10.4334	62.822	33.9682
16.2906121200255	80.4030255283057	31.0338303984177	0.309600000000003	68.1954	39.7657
16.2906121200255	80.4030255283057	31.0338303984177	5.2812	65.5492	44.5709
16.2834927331047	80.4706975736339	31.1093722478057	12.0097	66.7734	42.888
16.2763717036258	80.5384395162128	31.1849037287862	14.0233	68.3418	48.6515
16.2763717036258	80.5384395162128	31.1849037287862	11.4886	67.7219	43.0579
16.2692472376487	80.6063255354488	31.2603615698025	4.0089	72.186	49.5614
16.2692472376487	80.6063255354488	31.2603615698025	9.3844	71.5303	46.4336
16.2621261059596	80.6743019341706	31.3356862853107	8.4928	63.9998	55.0759
16.2621261059596	80.6743019341706	31.3356862853107	4.4426	63.6871	51.0243
16.2550125175607	80.7425790279575	31.4106650401245	10.9416	69.7746	52.0032
16.2479014338519	80.8109276999219	31.4855397861042	15.4332	72.9689	53.8868
16.2479014338519	80.8109276999219	31.4855397861042	15.3124	65.205	52.7286
16.2407949185498	80.8794509530824	31.5601707380143	25.3366	76.538	54.326
16.2407949185498	80.8794509530824	31.5601707380143	24.7401	75.4523	49.5075
16.2336808286654	80.9479352107061	31.6345282576089	27.6433	72.5657	51.9251
16.2336808286654	80.9479352107061	31.6345282576089	32.2488	71.8762	47.8257
16.2265574808508	81.0164683774407	31.7086555231204	26.4587	69.6793	44.9112
16.2265574808508	81.0164683774407	31.7086555231204	26.4833	65.6457	42.68
16.2194348396869	81.0851973355902	31.7827381358145	31.7515	71.3679	39.9054

Solution x	Solution y	Solution z	Original x	Original y	Original z
16.2123074123758	81.1539576551453	31.8567952281355	26.2205	72.9044	33.175
16.2123074123758	81.1539576551453	31.8567952281355	22.0857	71.4539	26.9077
16.2051792442778	81.2227928245897	31.9309987436482	18.9682	67.082	33.9115
16.2051792442778	81.2227928245897	31.9309987436482	26.4747	67.9787	32.7219
16.1980484296087	81.2917819824041	32.0052447525543	14.7433	68.1941	29.0053
16.1909195328358	81.360848769706	32.0795509163767	10.7344	66.9849	31.9545
16.1909195328358	81.360848769706	32.0795509163767	12.0444	66.3239	28.7604
16.1837953738618	81.4301078357181	32.153948781349	11.6475	70.8021	30.9107
16.1837953738618	81.4301078357181	32.153948781349	15.0856	70.6386	28.9208
16.1766705740269	81.4994628380413	32.2284413563479	7.0214	70.8048	31.3366
16.1766705740269	81.4994628380413	32.2284413563479	8.3117	72.2049	29.6247
16.169550818824	81.5689374085642	32.3030419734707	6.09139999999999	73.9114	36.5077
16.169550818824	81.5689374085642	32.3030419734707	8.8648	72.0358	37.3381
16.1624366401511	81.638509995598	32.3776505121185	9.45780	72.6847	40.961
16.1553261187908	81.7081520426091	32.4522317919634	12.73	75.2001	37.6748
16.1553261187908	81.7081520426091	32.4522317919634	24.4797	75.354	37.647
16.1482149528861	81.7779044431087	32.5268280989393	24.3218	77.9732	38.2426
16.1482149528861	81.7779044431087	32.5268280989393	22.8762	75.7017	33.805
16.1411031871594	81.8477910855619	32.6014889927565	27.1736	83.2653	40.5956
16.1339904294624	81.9176824131576	32.6761398632438	35.4073	87.2216	40.4202
16.1339904294624	81.9176824131576	32.6761398632438	31.105	77.2121	42.4385
16.1268726673141	81.9876406819048	32.7507739750582	32.8593	93.0881	38.0081
16.1268726673141	81.9876406819048	32.7507739750582	32.2034	92.5655	35.5696
16.1197514203473	82.0574371862431	32.8254918912367	32.1756	91.0244	47.2823
16.1126296714395	82.1272043200373	32.9001615623865	32.4952	97.9758	48.1403
16.1055022313502	82.1968419079858	32.974753075641	26.6904	96.1713	46.6576
16.0983769378425	82.2664363851056	33.0493415188937	26.55	96.735	54.3574
16.0912516693113	82.3359122504936	33.1237976908764	4.95789999999999	99.4405	59.5277
16.0912516693113	82.3359122504936	33.1237976908764	1.1743	92.9818	59.2535
16.0841304971571	82.4049294336816	33.1974765639261	-7.5489	96.9207	56.8305
16.0841304971571	82.4049294336816	33.1974765639261	-0.0468000000000046	93.7668	57.0052
16.7519189865525	82.4049294317434	33.1615541861827	10.0835	69.723	3.7551
16.7519189865525	82.4049294317434	33.1615541861827	22.9431	70.0987	4.2047
17.4226039756433	82.4049294298274	33.126033330762	6.65640	74.2265	20.3804
18.0979449544715	82.4049294279239	33.0905550508031	9.9143	75.8382	26.191
18.7767057817848	82.4049294260238	33.0550982661044	17.9606	81.6588	21.6946
18.7767057817848	82.4049294260238	33.0550982661044	13.7649	76.0563	18.1156
19.4590918017947	82.4049294241173	33.0196979464032	18.7356	77.2891	30.4652
20.1420677180367	82.4049294222092	32.9842771579633	9.00020	73.0359	5.8372
20.8349653211069	82.4049294203072	32.9489887593858	8.0472	76.1743	13.1381
20.8349653211069	82.4049294203072	32.9489887593858	7.5677	74.3816	13.1566
21.5424109954791	82.4049294184393	32.9138774290841	4.7342	63.0935	56.3188
21.5424109954791	82.4049294184393	32.9138774290841	14.2076	63.0144	54.8035
22.3071667105293	82.4049294165481	32.8785288843239	18.2654	71.5277	59.9496
22.3071667105293	82.4049294165481	32.8785288843239	11.4442	66.9869	57.5373
23.0899731990951	82.4049294146654	32.8430481861696	24.1578	73.3792	57.4094
23.8738696468758	82.4049294127799	32.8075375805054	35.1535	70.6086	57.9365
23.8738696468758	82.4049294127799	32.8075375805054	32.697	74.6737	51.2201
24.646964832618	82.4049294108946	32.7719781291415	29.376	80.5861	55.9809
24.646964832618	82.4049294108946	32.7719781291415	26.9783	71.0141	56.5271
25.4220194139202	82.4049294090159	32.7363752451921	26.9511	99.1097	54.9389
25.4220194139202	82.4049294090159	32.7363752451921	29.7849	97.5299	53.9895
26.1987872081589	82.4049294071402	32.700693985573	30.7482	95.8761	57.2879
26.9750830187636	82.4049294052647	32.6649614794214	31.4281	94.9219	54.3744
27.752014168151	82.4049294033916	32.6292009720777	33.6244	92.4492	56.3457
27.752014168151	82.4049294033916	32.6292009720777	35.4152	92.5489	58.019
28.5258005516537	82.4049294014951	32.5933419259113	36.1694	94.3523	52.0418
28.5258005516537	82.4049294014951	32.5933419259113	35.9551	95.9225	47.402
29.2984100499216	82.4049293996252	32.5574517946402	37.1788	95.0118	52.8478
30.069497397618	82.4049293977572	32.5215233320219	35.4006	103.6799	50.1937
30.069497397618	82.4049293977572	32.5215233320219	39.196	99.7694	49.3378
30.8363743064045	82.4049293958901	32.4854907384418	31.6341	101.1443	12.133
31.6066490915287	82.4049293940185	32.4495662735841	35.5571	102.295	9.2843
32.3767126664409	82.4049293921442	32.4137942687965	34.0458	95.0903	5.2592
33.1497355208451	82.4049293902723	32.3781982165404	42.4716	105.6496	56.7244
33.1497355208451	82.4049293902723	32.3781982165404	43.0828	99.6317	56.4863
33.8838605653971	82.4049293883851	32.342246706354	35.7224	107.36	58.7833
33.8838605653971	82.4049293883851	32.342246706354	35.2228	101.4244	59.0123
34.3181791111074	82.404929386475	32.2744564086757	33.9629	96.8355	4.449
34.7539538125073	82.4049293845757	32.2072101886357	44.7902	101.1589	57.6534
34.7539538125073	82.4049293845757	32.2072101886357	47.126	99.3914	58.8698
35.1768801346128	82.4049293826548	32.1389007031221	35.0473	98.5367	9.9491
35.6010190770769	82.4049293807418	32.0709903828789	35.2297	94.8683	9.4168
36.0264588507126	82.4049293788373	32.0034454995374	42.0978	97.503	57.9578
36.0264588507126	82.4049293788373	32.0034454995374	39.6285	91.4521	58.9959
36.4503548383523	82.4049293769177	31.9350333456103	42.9721	90.3177	28.7365
36.4503548383523	82.4049293769177	31.9350333456103	40.9431	96.0349	18.7884
36.8749355857273	82.404929375013	31.8668992780084	44.0393	95.7757	50.8289
37.2985220995785	82.4049293730999	31.7984420621999	30.8807	93.5109	0.3364
37.7271240603447	82.4049293711919	31.7306699159096	30.1816	102.1772	4.0412

Solution x	Solution y	Solution z	Original x	Original y	Original z
38.1638720707737	82.4049293692791	31.6636700860127	33.0573	97.9271	5.3628
38.6030825687988	82.404929367363	31.5970760989305	37.9917	90.5379	9.9912
39.0433669740188	82.4049293654547	31.5307739308423	41.599	92.4813	48.0171
39.0433669740188	82.4049293654547	31.5307739308423	42.6808	88.2098	40.1619
39.4841907982159	82.4049293635488	31.4640778900624	40.8939	84.3555	43.1765
39.9258444978583	82.4049293616515	31.3972785530847	39.3246	101.8921	42.5744
39.9258444978583	82.4049293616515	31.3972785530847	42.8352	101.6931	44.9574
40.3684167871816	82.4049293597492	31.3302621031677	35.3466	107.7036	41.395
40.8128829978483	82.4049293578408	31.2631625759303	42.5793	100.4271	14.8388
41.2580896690745	82.4049293559355	31.1961957766164	37.1983	106.347	12.5162
41.2580896690745	82.4049293559355	31.1961957766164	40.2693	101.3043	8.6864
41.7070858277683	82.4049293539976	31.1295681348187	48.0764	105.8084	10.3389
41.7070858277683	82.4049293539976	31.1295681348187	45.465	105.2608	3.7217
42.1438551284347	82.4049293520846	31.0647373515809	42.9285	106.2179	5.6354
42.580742664603	82.4049293501713	31.0004072907352	40.9527	105.6227	4.1926
42.580742664603	82.4049293501713	31.0004072907352	40.5226	102.8002	1.3549
43.0315792914486	82.4049293482474	30.9391879770878	35.7306	102.2767	4.1846
43.0315792914486	82.4049293482474	30.9391879770878	39.7333	98.7582	4.2197
43.4913184735763	82.4049293463227	30.8784974557875	40.065	98.6098	6.7408
43.4913184735763	82.4049293463227	30.8784974557875	41.6896	94.8028	3.024
43.9545560285827	82.4049293444007	30.8181243554662	43.1057	91.7939	5.1823
44.4191093690845	82.4049293424833	30.7579371787202	48.9533	90.4759	7.3728
44.4191093690845	82.4049293424833	30.7579371787202	47.7789	92.5461	5.4276
44.8841263238311	82.4049293405839	30.6981966563192	39.1965	105.4524	44.823
44.8841263238311	82.4049293405839	30.6981966563192	42.0156	103.5929	44.0945
45.352859432352	82.4049293386687	30.6379772429118	46.5537	103.4177	45.8992
45.352859432352	82.4049293386687	30.6379772429118	46.0729	100.678	36.5278
45.8229943075002	82.4049293367533	30.5776471139574	42.9226	100.4615	26.2167
45.8229943075002	82.4049293367533	30.5776471139574	45.0704	101.2748	27.009
46.2955516303617	82.4049293348345	30.5173063758625	53.9006	102.5381	21.0284
46.2955516303617	82.4049293348345	30.5173063758625	42.2565	98.7398	22.9258
46.7677254199276	82.4049293329002	30.4569627046474	35.7859	98.3251	5.4495
47.2454705841178	82.4049293309635	30.396823478097	35.7481	97.1257	4.802
47.2454705841178	82.4049293309635	30.396823478097	37.3296	94.7968	3.7833
47.7336619110789	82.4049293290232	30.3370909010417	37.0706	93.0168	1.0492
47.7336619110789	82.4049293290232	30.3370909010417	31.4906	71.3219	1.4719
48.2538058633201	82.4049293270969	30.2781187989926	31.0449	71.9995	0.0029
53.8750248483641	82.4049293251847	30.2273415133184	33.839	67.1668	7.1332
65.261457108398	82.404929323293	30.1767565058896	86.3374	85.7586	1.5055
68.2915706415067	82.4049293214006	30.1268899195999	88.3633	87.3681	2.2205
70.6485782208984	82.4049293195167	30.0772833055865	93.0994	86.3608	2.8092
72.2612644811338	82.4049293176449	30.0281717237338	51.1106	98.2963	5.5983
77.8736030044486	82.4049293157805	29.9800108270549	94.0924	96.5838	56.3482
81.8253608801665	82.404929313889	29.9317189057019	103.8628	98.4843	53.5771
82.8889930519408	82.4049293119558	29.8816508288531	103.2876	94.1817	57.6589
82.9597378244017	82.4049293099484	29.2338138341863	89.835	77.746	1.5427
83.0305465314347	82.404929307961	28.6100916971045	104.1728	96.9352	2.733
83.0305465303877	82.2389225450261	28.610091700819	105.6506	92.4297	8.9472
83.0305465293197	82.0724696177858	28.6100917045052	104.1034	98.3317	9.2012
83.0305465282543	81.9047423783388	28.6100917081765	95.9041	59.3009	4.8034
83.0305465271767	81.7416604811208	28.6100917118328	96.9541	82.6989	20.5312
83.0305465271767	81.7416604811208	28.6100917118328	98.2007	80.5294	17.4055
83.0305465261132	81.5789224410566	28.610091715465	92.288	83.6157	17.9977
83.0305465250368	81.4163106319794	28.6100917190813	98.5933	78.8152	8.2256
83.0305465250368	81.4163106319794	28.6100917190813	91.1291	78.4897	13.7054
83.030546523978	81.2544578060077	28.6100917226905	101.8123	94.891	12.8509
83.030546523978	81.2544578060077	28.6100917226905	102.0076	93.075	9.5996
83.0305465229032	81.0918069326012	28.6100917262899	96.8706	83.0827	11.4782
83.0305465229032	81.0918069326012	28.6100917262899	98.9119	80.0767	11.0692
83.0305465218153	80.9298806919738	28.6100917298677	95.0373	98.5247	13.5608
83.0305465218153	80.9298806919738	28.6100917298677	95.7576	96.9635	11.4638
83.0305465207667	80.7672021422878	28.6100917334498	95.504	96.351	10.2996
83.0305465196818	80.6041003768334	28.6100917370083	93.9524	73.145	3.1932
83.0305465196818	80.6041003768334	28.6100917370083	94.6798	69.1984	4.5089
83.0305465186153	80.4423452664808	28.6100917405516	108.1531	76.0691	2.761
83.0305465186153	80.4423452664808	28.6100917405516	100.0565	80.1054	0.0522
83.0305465175252	80.2967000604346	28.6100917441099	91.14	83.5499	11.0268
83.0305465175252	80.2967000604346	28.6100917441099	88.6759	82.3658	11.13
83.0305465164358	80.1513546154727	28.6100917476544	100.8882	91.1406	6.6906
83.0305465164358	80.1513546154727	28.6100917476544	99.3782	93.0601	2.9898
83.0305465153474	80.0050386834271	28.610091751178	97.1852	78.7831	16.5303
83.0305465153474	80.0050386834271	28.610091751178	97.3132	81.5365	12.7479
83.0305465142665	79.8591611513207	28.6100917546969	93.1284	88.6615	20.1351
83.0305465142665	79.8591611513207	28.6100917546969	93.9684	87.8762	13.7783
83.0305465131665	79.7133372059514	28.6100917581998	92.5654	91.5305	24.0262
83.0305465131665	79.7133372059514	28.6100917581998	88.6062	92.2681	23.9863
83.0305465121073	79.5674059948311	28.6100917617415	98.1138	89.594	19.2781
83.0305465121073	79.5674059948311	28.6100917617415	92.7178	89.1801	18.823
83.0305465110289	79.4214551402036	28.610091765287	101.1477	85.2681	2.6541
83.0305465110289	79.4214551402036	28.610091765287	99.0152	86.155	1.7016

Solution x	Solution y	Solution z	Original x	Original y	Original z
83.0305465099452	79.2753110377447	28.6100917687909	92.4623	94.734	14.7003
83.0305465099452	79.2753110377447	28.6100917687909	95.2026	90.5293	12.2607
83.0305465088798	79.1289755804123	28.6100917723066	107.2392	85.9448	2.4326
83.0305465077522	78.9613086678104	28.6100917758364	107.981	80.0957	12.6444
83.0305465066193	78.7937706188444	28.6100917793667	103.8313	82.5056	7.2236
83.0305465066193	78.7937706188444	28.6100917793667	103.6911	80.62	5.0557
83.0305465054932	78.6264200649061	28.6100917828668	102.2936	85.0217	15.0829
83.0305465054932	78.6264200649061	28.6100917828668	97.8831	81.9659	16.6355
83.0305465043668	78.4592797369051	28.6100917863661	102.0461	86.7072	16.2393
83.0305465032486	78.2921553897262	28.6100917898652	104.3693	90.8389	25.0156
83.0305465032486	78.2921553897262	28.6100917898652	100.7126	88.5952	23.1233
83.0305465021103	78.1249087422317	28.6100917933755	102.4507	89.6037	15.6617
83.0305465009939	77.9576550078365	28.6100917968673	95.6122	103.8055	23.229
83.0305465009939	77.9576550078365	28.6100917968673	101.583	94.8217	23.7006
83.0305464998577	77.7895766339257	28.6100918003142	98.2349	98.4363	43.0129
83.0305464987374	77.6209576291993	28.6100918038033	94.4828	106.1237	38.6118
83.0305464987374	77.6209576291993	28.6100918038033	98.8373	99.4165	35.0062
83.0305464975955	77.4504328223342	28.6100918072834	97.0347	92.0258	44.3343
83.0305464975955	77.4504328223342	28.6100918072834	96.8345	90.0197	42.1774
83.0305464964781	77.2798658814174	28.6100918107775	96.5235	92.1962	47.4754
83.0305464953597	77.1091119022339	28.6100918142751	100.6204	94.7646	50.8195
83.0305464953597	77.1091119022339	28.6100918142751	98.9319	91.3958	49.6094
83.0305464942195	76.9368651211597	28.6100918177787	98.656	92.6213	53.0887
83.0305464942195	76.9368651211597	28.6100918177787	98.3726	88.4744	52.1576
83.0305464930994	76.7635071575204	28.6100918213022	104.5599	87.8351	55.8078
83.0305464930994	76.7635071575204	28.6100918213022	101.0606	82.9382	56.7378
83.030546491925	76.3783877236027	28.6100918248226	96.9343	84.943	57.6208
83.030546491925	76.3783877236027	28.6100918248226	95.9325	86.7596	55.1395
83.0305464907497	75.989530210786	28.6100918283568	97.4314	81.946	52.8698
83.0305464907497	75.989530210786	28.6100918283568	94.9909	83.4209	53.4521
83.030546489599	75.6004635124788	28.6100918319026	99.1261	78.6323	53.6332
83.030546489599	75.6004635124788	28.6100918319026	98.567	80.2017	48.301
83.0305464884175	75.2121870904407	28.6100918354301	96.2521	73.5638	59.9232
83.0305464884175	75.2121870904407	28.6100918354301	96.1169	76.0362	57.1147
83.0305464872651	74.8265415200405	28.610091838995	97.816	74.8015	47.4482
83.0305464872651	74.8265415200405	28.610091838995	97.5653	74.5618	43.9951
83.0305464860846	74.4429211029838	28.6100918425709	93.2494	81.8793	2.8544
83.0305464849244	74.0587347879773	28.6100918461292	91.86	79.7087	2.2114
83.0305464837579	73.674378330117	28.6100918496662	95.9481	74.251	38.8025
83.0305464826003	73.2908183231407	28.6100918532134	94.549	73.3405	36.7472
83.0305464826003	73.2908183231407	28.6100918532134	98.4228	65.0226	33.0945
83.0305464814336	72.9104471164631	28.6100918567547	94.4072	76.9857	34.4342
83.0305464814336	72.9104471164631	28.6100918567547	93.1133	78.1389	33.5399
83.0305464802651	72.5311388019023	28.6100918602918	89.95	80.2132	31.6802
83.0305464790849	72.1522790238962	28.6100918638164	88.0687	81.4777	36.1559
83.0305464790849	72.1522790238962	28.6100918638164	89.5631	83.3752	32.5568
83.0305464779405	71.773840095722	28.6100918673472	91.1677	84.1211	45.979
83.0305464779405	71.773840095722	28.6100918673472	92.1151	81.2598	42.8198
83.0305464767808	71.3947851392696	28.6100918708885	94.6945	78.572	44.5388
83.0305464767808	71.3947851392696	28.6100918708885	92.6699	80.64	42.9825
83.0305464755985	71.016086610339	28.6100918744251	94.0795	80.8773	41.7611
83.0305464755985	71.016086610339	28.6100918744251	91.0116	75.887	40.3125
83.0305464744553	70.63832923018	28.6100918779755	97.7624	79.6432	41.8331
83.0305464732752	70.2606393684301	28.6100918815072	97.0865	83.6094	41.2641
83.0305464721342	69.8824173368082	28.6100918850579	104.3617	84.8664	42.6246
83.0305464709544	69.5020218344513	28.6100918885994	103.1106	83.2736	35.5168
83.0305464709544	69.5020218344513	28.6100918885994	97.7943	87.7833	36.2243
83.0305464698076	69.1200728039033	28.6100918921481	101.602	92.3175	35.5214
83.0305464686336	68.7340734418811	28.6100918956886	100.5649	91.4192	35.2273
83.0305464686336	68.7340734418811	28.6100918956886	98.853	91.6792	31.3431
83.0305464674623	68.3422472003087	28.6100918992318	99.3434	90.9979	30.2293
83.0305464663147	67.9476882340922	28.6100919027851	96.2545	87.1498	32.8659
83.0305464651241	67.5518534319166	28.6100919063147	93.4941	85.8189	27.3685
83.0305464639814	67.1550389005489	28.610091909858	101.2985	78.2917	28.1682
83.0305464639814	67.1550389005489	28.610091909858	98.2345	80.86	27.262
83.0305464628091	66.7573518291162	28.6100919133643	101.778	67.1686	27.7348
83.0305464616449	66.3608216058493	28.6100919168581	102.9023	68.4164	43.143
83.0305464616449	66.3608216058493	28.6100919168581	99.3413	60.508	43.9191
83.0305464604718	65.9664495053484	28.6100919203679	93.9444	64.9	44.2206
83.0305464593085	65.5728317072896	28.6100919238892	95.4289	57.3916	42.7453
83.0305464593085	65.5728317072896	28.6100919238892	92.9131	56.6287	40.2251
83.0305464581414	65.1824496029365	28.6100919274037	89.2688	56.3248	44.4917
83.0305464581414	65.1824496029365	28.6100919274037	93.3932	53.1876	39.0419
83.0305464569869	64.7955569357144	28.6100919309128	95.0304	53.2116	46.2852
83.0305464569869	64.7955569357144	28.6100919309128	93.3823	48.5086	44.2946
83.0305464558116	64.4135721317089	28.6100919344124	97.9579	54.2407	46.7851
83.030546454655	64.0333497408127	28.6100919379265	98.9198	48.0008	44.9228
83.0305464534997	63.656390809052	28.6100919414348	105.6501	47.8555	48.2801
83.0305464534997	63.656390809052	28.6100919414348	101.161	45.7653	49.9947
83.0305464523415	63.2943197223047	28.610091944951	102.9297	48.0592	51.9744

Solution x	Solution y	Solution z	Original x	Original y	Original z
83.0305464523415	63.2943197223047	28.610091944951	100.8862	48.4618	50.2894
83.0305464511667	62.9441806679878	28.6100919484716	99.5817	52.1789	51.8005
83.0305464511667	62.9441806679878	28.6100919484716	97.7133	51.9341	48.5236
83.030546450011	62.5983255679263	28.6100919520023	96.2485	47.1277	52.4491
83.030546450011	62.5983255679263	28.6100919520023	91.1842	48.1207	54.4953
83.0305464488415	62.2597642678714	28.6100919555238	92.1982	53.9806	59.5699
83.0305464476869	61.9243652262442	28.6100919590628	95.1558	61.2395	57.4763
83.0305464465324	61.589520205233	28.6100919626107	97.9014	66.9835	57.8832
83.0305464465324	61.589520205233	28.6100919626107	96.4356	62.0951	55.4366
83.0305464453762	61.2540041647336	28.6100919661747	99.4285	63.8276	59.6975
83.0305464453762	61.2540041647336	28.6100919661747	94.6788	63.8911	59.4837
83.0305464442162	60.9179745818549	28.6100919697635	102.6402	60.9181	59.3218
83.0133572931348	60.7810503382672	28.6013220417105	103.9916	60.6173	50.4601
83.0133572931348	60.7810503382672	28.6013220417105	100.6854	61.817	51.0639
82.9960968870547	60.6440863787415	28.5925347199988	94.6583	60.3511	50.0221
82.9960968870547	60.6440863787415	28.5925347199988	94.8477	58.3247	47.7413
82.9788511290518	60.5073160589003	28.5837477165359	90.2672	64.2791	51.3539
82.9788511290518	60.5073160589003	28.5837477165359	86.2321	62.729	51.1705
82.96162860706	60.3704655716627	28.5749487590167	85.8477	60.7859	54.7762
82.96162860706	60.3704655716627	28.5749487590167	77.9705	58.8491	56.0075
82.9444337400261	60.2336658194525	28.5661218064995	77.8264	55.5164	53.7679
82.9444337400261	60.2336658194525	28.5661218064995	78.0993	54.3894	50.2798
82.9272690161271	60.0971342539651	28.557282061417	77.4079	49.147	51.5989
82.9272690161271	60.0971342539651	28.557282061417	74.4488	50.3129	52.3971
82.9101298149128	59.9611075589301	28.5484256907468	72.0955	52.6394	50.8408
82.9101298149128	59.9611075589301	28.5484256907468	70.1179	52.2878	46.5219
82.8930285215243	59.8254234702131	28.5395593100708	73.7963	57.8273	45.2128
82.8930285215243	59.8254234702131	28.5395593100708	74.3979	53.0985	48.6112
82.8759384408085	59.6898598643994	28.5306795983896	69.8977	54.8286	42.1718
82.8759384408085	59.6898598643994	28.5306795983896	69.1565	53.343	39.551
82.8588824595848	59.554554661516	28.5218041641213	68.5789	56.8701	42.2821
82.8418423746331	59.4193038406327	28.5129241146585	67.4683	58.2291	37.5546
82.8248223308011	59.2840900443667	28.5040443286393	73.2116	57.797	29.252
82.8248223308011	59.2840900443667	28.5040443286393	73.8072	55.2741	29.1095
82.8078252553645	59.1490227015886	28.4951855961538	81.1686	57.7423	31.0101
82.790822720994	59.0139698714059	28.4863313434954	80.7698	50.729	27.0276
82.790822720994	59.0139698714059	28.4863313434954	80.3964	49.7264	23.6683
82.7738281578543	58.8792061281713	28.4775019057165	76.0043	50.5809	30.4596
82.756845772837	58.7445609042661	28.4686774385422	77.9223	44.6051	30.7678
82.7398754743285	58.6101203832867	28.4598574332245	81.9079	40.1742	36.8216
82.7229096283419	58.4759459064288	28.4510333392142	88.4465	41.4478	32.5802
82.7229096283419	58.4759459064288	28.4510333392142	87.2346	40.5435	32.6709
82.7059328849382	58.3421943943327	28.4422101831642	87.5583	39.2312	23.679
82.7059328849382	58.3421943943327	28.4422101831642	89.0134	41.3658	15.8043
82.6889576071258	58.2089273221454	28.4334127490419	89.3668	41.343	14.5671
82.6719854671841	58.0758956848433	28.4246331700024	94.3087	39.6383	18.4042
82.6550106258152	57.9431321237936	28.4158663342482	99.6903	41.4772	23.4888
82.6550106258152	57.9431321237936	28.4158663342482	98.3613	42.0392	20.5386
82.63801538958	57.8107781933846	28.4071149105445	98.7317	39.6579	27.3708
82.63801538958	57.8107781933846	28.4071149105445	96.2133	40.5576	25.5914
82.6210144019116	57.6789041030049	28.39837047871	97.0063	39.6578	31.3742
82.6210144019116	57.6789041030049	28.39837047871	98.4033	39.6451	29.8224
82.6040062653262	57.5475082926774	28.3896247143719	96.8865	41.9997	31.9305
82.5869941173245	57.4162788593594	28.380876740953	93.6941	39.0671	28.969
82.5699846584973	57.2852951659161	28.3721302499161	93.6083	38.4774	26.0941
82.5529780206829	57.1545802053484	28.3633871026656	93.9129	43.6355	26.629
82.5359718216781	57.0240172752369	28.354645281166	95.46	44.379	21.4845
82.5359718216781	57.0240172752369	28.354645281166	89.3464	46.1786	22.3858
82.5189719197945	56.8937517966704	28.3459127781527	93.0102	50.1223	20.798
82.5189719197945	56.8937517966704	28.3459127781527	91.9756	47.4725	20.0446
82.5019797680749	56.7636979438054	28.3371908948831	95.0864	47.4256	26.3676
82.4849900207967	56.6337862040426	28.3284700202257	101.7941	49.0832	29.2585
82.4849900207967	56.6337862040426	28.3284700202257	100.6036	46.802	22.0951
82.4679880221466	56.5041763903446	28.3197517837185	98.7715	55.3698	27.9452
82.4679880221466	56.5041763903446	28.3197517837185	96.0562	52.3857	26.7058
82.4509879220141	56.3747373769419	28.3110374695393	99.9754	58.6633	29.714
82.4339806057347	56.2453105406069	28.3023235690934	95.479	61.1306	33.7151
82.4339806057347	56.2453105406069	28.3023235690934	94.4551	58.0456	35.6169
82.4169791283316	56.1159612074439	28.2936095582392	99.0429	61.6589	39.3422
82.4169791283316	56.1159612074439	28.2936095582392	95.4724	61.7777	41.2303
82.3999667680066	55.9865305193717	28.2848883201836	99.7259	57.0659	38.9488
82.3999667680066	55.9865305193717	28.2848883201836	97.7455	51.8526	39.6885
82.3829508482943	55.8572684207124	28.2761653729815	98.1036	50.8139	41.2796
82.3659382427584	55.7281440653722	28.2674409761673	106.6231	51.946	40.2003
82.3659382427584	55.7281440653722	28.2674409761673	100.5945	52.9653	41.549
82.3488968107729	55.5991209041477	28.2587100459735	103.8959	45.4099	37.4639
82.3318434885203	55.4702964286157	28.2499791678191	103.3956	43.6231	38.3961
82.314776307309	55.341693180091	28.2412467851631	103.0838	43.6629	35.7673
82.314776307309	55.341693180091	28.2412467851631	99.7789	45.6905	34.3678
82.2976902174531	55.2134346718445	28.2325180844626	100.0845	45.3198	38.3951

Solution x	Solution y	Solution z	Original x	Original y	Original z
82.2805916108792	55.0853152075536	28.2237878217484	97.5519	44.8528	38.2336
82.2634854055124	54.9573412149838	28.2150568546218	95.1396	47.3596	38.3213
82.2634854055124	54.9573412149838	28.2150568546218	94.3452	48.7818	37.6589
82.2463686747661	54.8295111019104	28.2063248279878	94.4684	44.7163	40.2539
82.2463686747661	54.8295111019104	28.2063248279878	90.4865	46.0315	39.3528
82.2292473214966	54.7019154822809	28.1975883815836	92.2396	41.0703	39.2658
82.2292473214966	54.7019154822809	28.1975883815836	92.1801	41.0349	29.4683
82.2121294104582	54.5747179603436	28.188861560379	90.4784	41.2284	44.1276
82.1950111084754	54.4477203980663	28.1801292224841	96.2085	41.8253	45.162
82.1950111084754	54.4477203980663	28.1801292224841	93.2846	41.9379	42.3812
82.1778457222446	54.3210819577177	28.1713835132638	91.9732	45.8332	46.1527
82.1778457222446	54.3210819577177	28.1713835132638	90.0385	42.8005	44.3862
82.1606521780094	54.1947132213489	28.162620908896	89.352	47.1855	40.3099
82.1606521780094	54.1947132213489	28.162620908896	90.014	39.915	40.6629
82.1434483285538	54.0686940204224	28.1538543480235	90.3356	51.1932	37.7625
82.1262268295699	53.9426864501305	28.1450857005594	85.9154	51.5363	38.6114
82.1262268295699	53.9426864501305	28.1450857005594	78.2967	50.1808	43.2865
82.1090222166135	53.8167907103328	28.1363086155411	80.0004	48.0282	43.1849
82.1090222166135	53.8167907103328	28.1363086155411	79.533	47.2684	42.1428
82.0918390384614	53.691122251847	28.1275182293578	76.4125	46.981	46.4216
82.0918390384614	53.691122251847	28.1275182293578	74.8417	48.5823	43.578
82.0746836294895	53.5656611957151	28.1187033601117	77.9078	47.2474	41.2613
82.0746836294895	53.5656611957151	28.1187033601117	72.0385	47.603	37.589
82.0575557529939	53.4404163264978	28.1098788870566	70.6191	48.182	36.9413
82.0575557529939	53.4404163264978	28.1098788870566	72.4429	44.8985	35.9587
82.0404651826304	53.3154513774699	28.101052305552	69.1689	51.2673	37.9561
82.0404651826304	53.3154513774699	28.101052305552	70.0624	50.1219	34.6274
82.0234088406097	53.1906262063887	28.0922183077961	70.2011	52.705	34.7749
82.0234088406097	53.1906262063887	28.0922183077961	70.8564	51.5507	32.2844
82.0063774580949	53.0659073485352	28.0833817308153	68.2826	55.0673	33.7791
82.0063774580949	53.0659073485352	28.0833817308153	66.949	50.6855	34.7495
81.9893760493093	52.9412758856036	28.0745368899043	67.7991	50.1342	31.512
81.9893760493093	52.9412758856036	28.0745368899043	67.6648	48.1141	30.5928
81.9724043443861	52.8168475250413	28.0656920846526	67.5609	49.631	28.0783
81.9724043443861	52.8168475250413	28.0656920846526	70.4096	46.4113	26.9931
81.9554582975419	52.6926474943125	28.0568540644815	76.379	48.6237	27.9163
81.9554582975419	52.6926474943125	28.0568540644815	75.5587	49.1352	25.3998
81.9385122271599	52.5685987461127	28.0480215814792	75.5201	48.6107	22.753
81.9385122271599	52.5685987461127	28.0480215814792	73.2561	47.9132	17.0605
81.9215710463594	52.444769125271	28.0392079017221	70.694	53.8562	23.1583
81.9046318721444	52.3209693331054	28.0303974927023	61.2083	54.3519	23.523
81.9046318721444	52.3209693331054	28.0303974927023	68.022	53.7678	15.3935
81.8877094906108	52.1972845909199	28.0216006441467	71.2619	53.5794	21.4252
81.8877094906108	52.1972845909199	28.0216006441467	66.0257	55.1875	22.0287
81.8707892183901	52.0736966657934	28.0128086481898	70.1344	58.5671	20.707
81.8538660878484	51.9500880658392	28.0040184426167	69.9782	57.1009	12.9468
81.8369439605763	51.8264853939579	27.9952373681887	70.5527	57.3223	8.5137
81.8200232916537	51.7028686543952	27.9864689726876	72.7757	56.7077	5.4576
81.8200232916537	51.7028686543952	27.9864689726876	71.8327	48.0379	13.6369
81.8031043061626	51.5793507889487	27.9777199912861	71.8965	50.0142	14.8598
81.8031043061626	51.5793507889487	27.9777199912861	72.0723	49.2863	13.9841
81.7861899445127	51.4560134479445	27.9689768799561	76.5498	52.218	12.9878
81.7861899445127	51.4560134479445	27.9689768799561	76.2244	51.9684	6.7104
81.7692784413356	51.3327739462842	27.9602476165378	84.6532	51.7406	11.3965
81.7692784413356	51.3327739462842	27.9602476165378	82.0477	53.0979	5.7932
81.7523645757895	51.2096041583379	27.951532616304	89.6611	52.1615	6.6683
81.7523645757895	51.2096041583379	27.951532616304	89.5287	45.4109	8.5583
81.7354517977436	51.0866096926905	27.942832897576	98.2004	50.3921	3.9008
81.7354517977436	51.0866096926905	27.942832897576	94.5726	47.3613	8.9492
81.7185421554815	50.9637826309601	27.9341508398607	92.8209	56.9207	15.4027
81.7185421554815	50.9637826309601	27.9341508398607	92.412	50.9961	13.3675
81.7016453097296	50.841028293847	27.925472847247	102.8738	56.4102	20.1678
81.7016453097296	50.841028293847	27.925472847247	102.1595	55.9791	16.6639
81.6847535169455	50.7181595346618	27.9167908663786	104.1102	44.8822	12.643
81.6847535169455	50.7181595346618	27.9167908663786	98.0879	44.5657	15.6818
81.6678710238746	50.5956298248877	27.9081141097427	103.8062	50.1176	9.3383
81.6678710238746	50.5956298248877	27.9081141097427	99.5987	51.3246	10.6347
81.6509888535395	50.4732512516697	27.8994433015817	98.2152	53.7701	7.2972
81.6509888535395	50.4732512516697	27.8994433015817	100.3439	52.2486	6.1962
81.6341123500504	50.3510429743081	27.890779160674	103.5291	67.906	8.9335
81.6341123500504	50.3510429743081	27.890779160674	98.4258	65.8894	6.8362
81.6172227029928	50.2291707586725	27.8820940879092	98.9521	56.5952	10.596
81.600332968605	50.1073493716486	27.8734103209192	93.0933	68.7697	14.1811
81.600332968605	50.1073493716486	27.8734103209192	93.5538	62.1822	15.7085
81.5834456227875	49.9852309890629	27.8647293276864	88.7937	67.447	23.6857
81.5665611685544	49.8629664966556	27.8560487065359	92.749	64.7326	27.0986
81.5665611685544	49.8629664966556	27.8560487065359	88.0225	60.7529	26.1198
81.549677205893	49.740566604443	27.8473738433425	73.3859	52.8201	55.9097
81.549677205893	49.740566604443	27.8473738433425	69.4154	51.8752	55.6067
81.5328072713529	49.6181647156005	27.8386849086969	87.1149	58.1702	24.9275

Solution x	Solution y	Solution z	Original x	Original y	Original z
81.5328072713529	49.6181647156005	27.8386849086969	83.5076	51.7826	22.7284
81.5159350430799	49.4958203348931	27.830019332884	65.7303	47.3671	58.4265
81.5159350430799	49.4958203348931	27.830019332884	67.4955	46.0347	52.8305
81.4990986908088	49.3738264938567	27.8213315283342	87.5129	47.9594	27.6836
81.4990986908088	49.3738264938567	27.8213315283342	87.8413	47.1867	25.6907
81.4822579294309	49.2520672399872	27.8126636127033	69.2681	55.3133	57.276
81.4822579294309	49.2520672399872	27.8126636127033	66.2863	51.2705	54.2569
81.4654322810414	49.1300658544924	27.8039691327464	72.0304	52.5053	58.0692
81.4486036088031	49.0079288108411	27.795246981866	70.916	53.3608	4.8842
81.4486036088031	49.0079288108411	27.795246981866	67.8488	53.6384	2.957
81.4318064612134	48.8858462671549	27.7865668704905	73.2401	49.0047	54.3428
81.4150127223378	48.7638203129992	27.7778680123138	92.0851	66.8651	17.5763
81.3982082882935	48.6413942051623	27.7691686583562	97.3108	57.82	10.7791
81.3982082882935	48.6413942051623	27.7691686583562	98.8606	57.9963	4.7298
81.3813906279055	48.5183156886035	27.7604794798039	100.6388	53.8259	6.8403
81.3645678382868	48.3950822038778	27.7517951189138	106.4442	49.0895	9.9061
81.3477308780933	48.271773381547	27.7431120598514	101.377	48.1816	18.5975
81.3477308780933	48.271773381547	27.7431120598514	102.543	45.6081	13.7083
81.3308931524556	48.148725753685	27.7344272118679	94.5987	62.0376	18.5629
81.3308931524556	48.148725753685	27.7344272118679	94.6877	57.1733	21.1304
81.3140588918382	48.0253013563209	27.7257371396543	93.2379	56.4517	4.9219
81.3140588918382	48.0253013563209	27.7257371396543	96.8097	54.0588	2.5941
81.29721867922	47.9012946155108	27.7170850100092	99.0651	51.1078	59.3413
81.2542165559945	45.971064392785	27.6995775113084	94.5838	45.9916	57.9488
81.2111705890779	44.2251458496143	27.6820266996713	98.0763	43.3554	53.563
81.1680856194207	42.5821272092566	27.6644592027125	94.5355	44.3621	59.1041
81.1248996701752	40.960951736523	27.6468358536587	77.5882	39.4219	14.211
81.0817848038603	39.3680422359999	27.6292677343626	74.5598	39.2546	26.0148
81.0387483372636	37.7920621162077	27.6117380087441	95.1298	37.6897	58.9361
80.9956098858002	36.1896654165041	27.594152774789	99.0428	19.6959	54.528
80.9344247664048	36.0558197602189	27.5732002219864	98.3827	22.3334	54.4737
80.8729594687279	35.9227119577914	27.5521978715075	101.7295	28.4449	56.1482
80.8729594687279	35.9227119577914	27.5521978715075	102.211	28.3893	55.4005
80.8074429022814	35.7953320578879	27.530658881595	100.5275	34.9543	58.1047
80.8074429022814	35.7953320578879	27.530658881595	101.1976	33.4905	53.5496
80.6380863782045	35.672548223121	27.5008271198298	96.2582	32.5713	56.693
80.6380863782045	35.672548223121	27.5008271198298	92.4351	33.0022	54.3205
80.4677476856264	35.5500171237341	27.4708874258741	91.0332	34.8187	52.6374
80.4677476856264	35.5500171237341	27.4708874258741	91.8795	37.1845	41.8015
80.29749340455	35.4275715659902	27.4409239496462	88.2545	36.066	42.1212
80.127502141862	35.3051884508677	27.4109666878146	96.5473	37.5774	41.1201
80.127502141862	35.3051884508677	27.4109666878146	95.0864	33.2234	41.4865
79.9573411633343	35.1828867447121	27.381001815175	98.5859	34.5756	44.3792
79.7868688373499	35.0606126403719	27.3510113751365	98.5493	33.1624	37.7737
79.7868688373499	35.0606126403719	27.3510113751365	95.8908	32.6754	36.0409
79.6162328121561	34.9384717445444	27.3210315411087	92.942	26.4511	38.6789
79.4457685728073	34.8165163970526	27.2910599545552	101.5683	27.6266	39.8262
79.4457685728073	34.8165163970526	27.2910599545552	97.1838	29.5842	37.1942
79.2749486008931	34.6948251174757	27.2610942947827	106.1692	29.0085	43.7624
79.2749486008931	34.6948251174757	27.2610942947827	100.384	25.6874	43.9589
79.1025373141661	34.5735230287296	27.2310738849761	105.5782	30.6326	47.1426
78.9283847551224	34.4523738437258	27.2009907905259	104.0844	32.9988	51.1923
78.9283847551224	34.4523738437258	27.2009907905259	106.6895	31.0233	49.137
78.7428471210169	34.3317357145882	27.1706078037924	107.8221	37.3636	42.4217
78.5551523644153	34.2109473930095	27.1401702902981	108.656	34.8419	30.8419
78.3661220339125	34.0901361214307	27.1097406126273	105.6149	29.5786	27.9356
78.3661220339125	34.0901361214307	27.1097406126273	97.4429	30.1528	28.42
78.1763570691715	33.9695724818402	27.0793550644047	98.9301	33.2654	27.8083
78.1763570691715	33.9695724818402	27.0793550644047	99.0228	31.9463	24.4512
77.9862123847221	33.8491062714729	27.0490207407035	96.6051	36.0943	31.9245
77.9862123847221	33.8491062714729	27.0490207407035	92.7124	33.4453	33.5856
77.7959815127679	33.7286256716477	27.0186762044389	97.5011	28.0267	29.587
77.7959815127679	33.7286256716477	27.0186762044389	93.9312	28.9768	31.8553
77.605574107198	33.6083345193376	26.9883388025598	93.6487	25.1273	31.9089
77.605574107198	33.6083345193376	26.9883388025598	98.3241	22.4412	26.657
77.414970018686	33.488387653135	26.9580180977087	104.9423	23.521	33.0938
77.414970018686	33.488387653135	26.9580180977087	97.3283	27.0933	33.194
77.2227184263427	33.3687214665863	26.927661794208	100.6297	27.3107	24.1251
77.2227184263427	33.3687214665863	26.927661794208	97.0499	25.7334	20.6225
77.0298489571198	33.2492588205963	26.8973468842771	102.4997	24.4075	19.7902
77.0298489571198	33.2492588205963	26.8973468842771	92.5592	25.4331	20.672
76.8364600488035	33.1301031483961	26.8670766444985	105.0575	26.2706	17.0665
76.8364600488035	33.1301031483961	26.8670766444985	102.9016	24.8202	19.8795
76.640719731142	33.0112788821333	26.8368497628244	106.8535	30.7643	14.4546
76.4423666318323	32.8924843917823	26.8066594361665	102.9211	31.879	13.8489
76.2427196412031	32.7736959488542	26.7765078719455	103.4615	37.3033	20.8908
76.0415406364524	32.6546505950106	26.7463601292421	96.156	30.1327	19.1399
75.8396581887222	32.5356601139867	26.7162401625466	91.9372	36.8319	23.3371
75.8396581887222	32.5356601139867	26.7162401625466	90.6435	28.0536	25.8632
75.6364765089107	32.416646245073	26.68614377193	69.5886	28.6002	31.4169

Solution x	Solution y	Solution z	Original x	Original y	Original z
75.6364765089107	32.416646245073	26.68614377193	67.5765	27.7962	32.158
75.4347381355827	32.2978757552205	26.6560512755389	64.1748	30.2745	31.4674
75.4347381355827	32.2978757552205	26.6560512755389	60.463	30.4795	30.5011
75.2346481195958	32.1792291168853	26.6259722337813	63.132	27.7543	33.1939
75.0351750379856	32.0606719447105	26.5958947250105	63.8119	26.0212	34.0563
75.0351750379856	32.0606719447105	26.5958947250105	58.5931	27.1316	32.5338
74.8368545478131	31.9423093572451	26.5658212205651	55.4854	26.8201	32.387
74.6393653609109	31.8240287592111	26.5357497654413	54.6523	25.2022	31.3259
74.6393653609109	31.8240287592111	26.5357497654413	51.539	18.7116	33.0294
74.4438759545349	31.7060956103691	26.5056760114254	52.4859	17.4578	33.7507
74.2494174571998	31.5884193231463	26.4755926801529	55.9782	19.9329	26.5423
74.2494174571998	31.5884193231463	26.4755926801529	49.9475	19.2284	25.6639
74.0566327775715	31.4710878544657	26.4455140067433	53.2794	21.4994	19.0176
73.8645589057882	31.353868050849	26.4154468382309	49.9971	19.9155	18.5508
73.8645589057882	31.353868050849	26.4154468382309	53.4554	15.0784	17.1477
73.6743473341315	31.2370835141011	26.3854067087	51.6732	17.1776	23.9169
73.6743473341315	31.2370835141011	26.3854067087	48.0446	14.6778	22.9405
73.4863669377286	31.120841868878	26.3553682024463	46.6598	16.011	21.0885
73.3000003222695	31.0049413214584	26.325340225462	40.715	18.8306	21.9165
73.3000003222695	31.0049413214584	26.325340225462	47.2412	18.0641	21.8927
73.1216216784726	30.8902253397932	26.2953484159617	40.2335	17.1357	30.0024
73.1216216784726	30.8902253397932	26.2953484159617	45.9242	19.9	29.6168
72.9596352627113	30.7784004108848	26.2653026484798	44.7075	13.3055	33.9605
72.9596352627113	30.7784004108848	26.2653026484798	44.3034	16.6265	25.3299
72.8015640296806	30.6676117309986	26.235247252095	43.7175	13.3612	37.2361
72.6508627638647	30.5589605055443	26.2051028617666	46.3909	8.819	37.7186
72.6508627638647	30.5589605055443	26.2051028617666	47.5448	13.9665	39.1563
72.5141087907104	30.4562444369096	26.1747340738833	50.2911	5.2466	39.9878
72.5141087907104	30.4562444369096	26.1747340738833	48.2378	10.888	40.0435
72.4170230029341	30.3797104938619	26.1427342044864	51.9742	12.9315	39.5168
72.4170230029341	30.3797104938619	26.1427342044864	48.9393	11.7496	40.9103
72.320772021163	30.3035499368295	26.110700071491	53.965	12.2967	46.7771
72.320772021163	30.3035499368295	26.110700071491	51.32	11.9016	40.4537
72.2251800405486	30.227760197562	26.0786151460909	53.7123	16.59	54.3027
72.1649774633354	30.1713093677397	26.0331443004446	47.2642	16.1804	48.1934
72.1649774633354	30.1713093677397	26.0331443004446	46.213	15.3079	43.6977
72.1079791698574	30.1164782132337	25.9860550451336	49.1449	22.3659	43.2644
72.1079791698574	30.1164782132337	25.9860550451336	52.1655	19.1446	41.5432
72.0511322460489	30.0617034840833	25.9389392395433	50.8742	24.2729	53.2264
72.0511322460489	30.0617034840833	25.9389392395433	48.493	25.186	47.2334
71.9947465787898	30.007030936073	25.8914795261847	55.1607	27.7715	51.8295
71.9947465787898	30.007030936073	25.8914795261847	52.7074	28.2489	52.4902
71.938524610964	29.9523727440633	25.8438612335358	54.7376	29.7596	56.3053
71.938524610964	29.9523727440633	25.8438612335358	55.089	27.0379	56.5554
71.8828196261802	29.897770787623	25.7955717044135	56.8778	27.618	56.4108
71.827247172039	29.8431979322448	25.7470857848715	58.9981	26.6128	49.6223
71.7717107629406	29.7886526616862	25.6985759229404	60.137	35.2014	51.7925
71.7717107629406	29.7886526616862	25.6985759229404	53.8796	31.7093	51.2249
71.7163044150857	29.7341144030251	25.649955227815	62.0243	36.102	59.234
71.7163044150857	29.7341144030251	25.649955227815	61.1452	36.2851	50.8184
71.6611677048637	29.6794477624584	25.6006831782344	64.2784	38.8059	47.0778
71.6611677048637	29.6794477624584	25.6006831782344	60.8351	33.4935	47.8851
71.6061142358681	29.6248080071059	25.5513647945341	66.7168	38.698	48.2341
71.6061142358681	29.6248080071059	25.5513647945341	64.8516	39.5774	48.8657
71.5511435395227	29.5701796552948	25.501971699048	72.7013	43.6681	47.6828
71.4962106501331	29.5155417529396	25.4525240209369	70.5497	45.0925	44.08
71.4962106501331	29.5155417529396	25.4525240209369	72.9378	43.4347	40.5471
71.4413767172442	29.4608994601091	25.403032710361	72.4926	42.7909	40.5929
71.4413767172442	29.4608994601091	25.403032710361	65.211	38.9167	43.4098
71.3866955574074	29.4062832683736	25.3535375679869	86.5983	36.2039	44.7429
71.3866955574074	29.4062832683736	25.3535375679869	75.9853	41.4015	43.6031
71.3321305943559	29.3516697539757	25.3039961095788	90.1236	40.724	54.2833
71.3321305943559	29.3516697539757	25.3039961095788	85.065	35.2948	58.2863
71.2671123324898	29.2917844609446	25.2409483243187	67.8857	28.9512	53.8343
71.2022016117978	29.2319402039187	25.1778120255539	70.5469	25.0661	53.9959
71.2022016117978	29.2319402039187	25.1778120255539	63.3795	20.1125	53.5518
71.137416509896	29.172241569727	25.1144668594937	68.3676	27.331	45.292
71.137416509896	29.172241569727	25.1144668594937	62.9268	27.0211	37.7555
71.0727377039981	29.1125920303312	25.0511168728257	59.5552	26.5288	41.5263
71.0727377039981	29.1125920303312	25.0511168728257	61.643	23.6955	42.1255
71.0082221542577	29.0530271072174	24.9877436918736	60.1802	30.671	38.4138
70.9437571433355	28.9934654830812	24.9243709008787	54.3132	33.4794	38.814
70.9437571433355	28.9934654830812	24.9243709008787	51.0819	30.8837	36.7669
70.8795210329801	28.9339191067708	24.8610008505399	53.589	37.6567	38.7584
70.8795210329801	28.9339191067708	24.8610008505399	51.6292	37.4529	39.3047
70.815457996189	28.8743063740981	24.7976084880478	44.7872	36.1398	42.3342
70.7516473922637	28.8146585597068	24.7341705304267	46.003	37.4534	46.4333
70.7516473922637	28.8146585597068	24.7341705304267	45.9581	33.5048	45.1742
70.6883745491889	28.7549135939483	24.6706360784718	44.6028	29.9319	49.9927
70.6883745491889	28.7549135939483	24.6706360784718	47.3356	31.1656	48.6863

Solution x	Solution y	Solution z	Original x	Original y	Original z
70.6522969868388	28.6933020541543	24.3562101666402	51.473	33.7115	46.7085
70.6522969868388	28.6933020541543	24.3562101666402	51.7623	34.8081	42.2217
70.6162662217265	28.6316545826098	24.037969781406	50.1654	34.298	41.7388
70.6162662217265	28.6316545826098	24.037969781406	48.6326	32.1618	43.4727
70.5803078539257	28.5699848303287	23.716153668413	47.9812	30.2306	39.2099
70.5803078539257	28.5699848303287	23.716153668413	47.9603	31.0225	36.0363
70.5444275740809	28.508334009303	23.3924424052004	46.4115	30.3033	33.5708
70.5444275740809	28.508334009303	23.3924424052004	46.684	28.1154	34.4272
70.5086289797076	28.4467142654243	23.0674815375387	45.985	27.4123	27.7797
70.5086289797076	28.4467142654243	23.0674815375387	47.7428	26.438	23.4687
70.4729109128983	28.3851692948481	22.7432617825316	50.5738	30.8854	25.5173
70.4729109128983	28.3851692948481	22.7432617825316	52.5136	31.162	22.8965
70.4372239067626	28.3236362734971	22.4200339210076	48.325	36.101	31.2943
70.4372239067626	28.3236362734971	22.4200339210076	46.9054	30.8841	31.5685
70.4016274743514	28.262089937353	22.0958972286666	58.4334	33.3219	33.0094
70.4016274743514	28.262089937353	22.0958972286666	55.9275	34.3566	30.6301
70.3660461370055	28.2005394471433	21.7712693998198	63.5739	32.9982	33.2424
70.3304568400106	28.1389957976844	21.446332305363	65.4552	32.6167	36.7679
70.3304568400106	28.1389957976844	21.446332305363	63.8645	34.3723	36.4179
70.2948702581492	28.0774666103446	21.1200217721173	63.453	34.6286	41.047
70.2592931569587	28.0159365641061	20.7922451241349	60.9493	37.7343	34.646
70.2592931569587	28.0159365641061	20.7922451241349	62.464	33.4003	33.7046
70.2237530509112	27.9544272161483	20.4635144559469	65.3289	43.5846	33.8262
70.1882203625019	27.8928620235224	20.1339473151914	64.4232	44.0581	27.3148
70.1882203625019	27.8928620235224	20.1339473151914	58.8785	37.4935	28.0133
70.1527182556361	27.831260045038	19.8041419156255	64.9829	35.6055	23.509
70.1527182556361	27.831260045038	19.8041419156255	61.1622	34.1592	24.5106
70.1172346746944	27.7696822968671	19.4746690162517	56.2795	36.0371	23.7369
70.0817718488007	27.7080992222051	19.1452606717602	58.6228	31.6703	20.587
70.0463253153037	27.6465239454468	18.8161265597861	62.5649	23.4331	22.9907
70.0463253153037	27.6465239454468	18.8161265597861	63.3607	23.5913	11.9128
70.0108976641304	27.5850345492992	18.487916394149	67.242	26.9141	23.9429
69.9754655093492	27.5235603032321	18.1594304339773	70.1037	27.3839	19.7642
69.9754655093492	27.5235603032321	18.1594304339773	64.2717	31.7627	18.8904
69.9400335598268	27.4620915625206	17.8310743772728	66.7482	27.6121	12.1372
69.9400335598268	27.4620915625206	17.8310743772728	67.6588	29.7348	5.9837
69.9046138357519	27.4006544888838	17.5045209333945	69.1853	30.9522	12.1629
69.8691937648288	27.3392189140401	17.1784746996244	67.4673	33.2544	9.192
69.8691937648288	27.3392189140401	17.1784746996244	68.2062	28.5319	10.0866
69.8337805703641	27.277798625439	16.8538424118659	66.5887	34.1226	10.8677
69.7983699338766	27.2163707920273	16.5297917105241	61.5106	34.0654	15.2705
69.7983699338766	27.2163707920273	16.5297917105241	66.7818	30.0369	13.8618
69.7629720037871	27.154958965886	16.2062642388364	67.7055	32.9993	17.0949
69.7275731999793	27.0935466399599	15.882730386636	72.6191	32.6684	16.6889
69.6921656006151	27.0321320775702	15.559165730872	71.5231	31.8286	8.0149
69.6921656006151	27.0321320775702	15.559165730872	73.7989	28.6287	7.3132
69.6567676967119	26.9707488858237	15.2369991018265	79.7169	32.9378	5.3155
69.6567676967119	26.9707488858237	15.2369991018265	72.2401	34.2889	7.5435
69.621386045112	26.9093631610398	14.9163858169266	86.512	33.4131	7.017
69.621386045112	26.9093631610398	14.9163858169266	85.1876	33.113	2.1197
69.5859918221728	26.8479637402495	14.5978373941548	90.72	30.049	19.1921
69.5859918221728	26.8479637402495	14.5978373941548	85.525	32.0217	10.845
69.5506012218371	26.7865672961639	14.279233329775	96.0238	29.4057	14.5945
69.5151855884231	26.725166417845	13.9606256386648	99.272	31.5703	11.7517
69.5151855884231	26.725166417845	13.9606256386648	97.9141	29.0493	9.3885
69.4796946492542	26.6637303780337	13.6430945827617	97.1071	18.8552	9.2302
69.4441750465878	26.6023591489895	13.326203087857	96.3928	32.1668	2.4627
69.4441750465878	26.6023591489895	13.326203087857	93.4265	31.4744	1.0443
69.4085933656438	26.5409516700781	13.012270571356	87.5726	32.8781	1.3636
69.4085933656438	26.5409516700781	13.012270571356	90.6179	26.4649	2.7134
69.3730230736714	26.4795773383736	12.700321849592	91.1655	36.0648	5.0962
69.3374473820162	26.4181879111746	12.3890741696266	95.8598	39.2349	3.852
69.3374473820162	26.4181879111746	12.3890741696266	92.634	40.1716	1.8791
69.3018085232236	26.3567058470753	12.0805023404351	95.7654	46.8722	1.8076
69.3018085232236	26.3567058470753	12.0805023404351	96.6284	43.246	1.131
69.2658736014834	26.2946786382628	11.7810408788053	102.0152	42.2262	11.91
68.7227698191157	25.9668928496258	11.4650375755035	97.0806	39.3994	12.7921
68.1673993644806	25.6372929668899	11.1489363577519	92.8093	39.7693	16.6418
68.1673993644806	25.6372929668899	11.1489363577519	94.1971	38.0204	14.8005
67.5974127385649	25.3054708896461	10.8319851374966	89.1249	38.0318	13.3915
67.5974127385649	25.3054708896461	10.8319851374966	85.9182	41.843	9.5066
67.0212023887803	24.9722424228783	10.5154393230213	80.8872	43.1227	9.5119
67.0212023887803	24.9722424228783	10.5154393230213	80.8076	41.6004	10.0065
66.4431893471859	24.6375360077396	10.1995776517962	77.8794	45.0468	10.8339
65.8644639551083	24.3017097444682	9.8838917104902	73.2283	44.0709	14.6285
65.2863112362943	23.9650913811092	9.5680021215799	70.7664	48.6137	12.8047
65.2863112362943	23.9650913811092	9.5680021215799	71.0505	50.768	8.8572
64.7091358064621	23.6243130395967	9.25225804448479	72.1444	51.2772	8.2689
64.7091358064621	23.6243130395967	9.25225804448479	70.6462	49.6735	6.8503
64.1317037893723	23.2784029678301	8.9372251507669	73.6611	50.4924	3.9757

Solution x	Solution y	Solution z	Original x	Original y	Original z
64.1317037893723	23.2784029678301	8.9372251507669	73.5268	49.2611	4.4383
63.5513800022936	22.9267456395901	8.62362946035852	73.911	51.0144	2.5794
63.5513800022936	22.9267456395901	8.62362946035852	75.2757	50.6388	0.889
62.9642289525406	22.5660954121081	8.31243487728025	77.6289	48.4559	5.3003
62.3723817161068	22.2017436557669	8.00170750048967	79.9479	46.2913	1.0177
61.7734191903883	21.8334593381547	7.69213702589568	75.73	42.7229	0.0066
61.1725402256112	21.4634599432763	7.38351073057221	75.9022	40.5634	8.2476
61.1725402256112	21.4634599432763	7.38351073057221	75.4748	37.8532	8.3059
60.5689641395468	21.0916370942267	7.07492873614993	73.6428	45.1426	7.6389
59.9630974135004	20.7171358015497	6.76638342534211	72.9198	44.5581	6.5665
59.9630974135004	20.7171358015497	6.76638342534211	73.6395	46.5004	2.2066
59.3509972911576	20.3359641205241	6.45869734145927	68.7356	47.889	4.3235
59.3509972911576	20.3359641205241	6.45869734145927	68.0366	38.8903	2.9918
58.7376131177093	19.9494347978658	6.15180762883012	66.9624	36.7077	4.2616
58.7376131177093	19.9494347978658	6.15180762883012	68.3701	31.308	4.6701
58.1251137389041	19.5621580420105	5.84543440444524	58.126	35.24	1.1949
57.5153718096761	19.174359463998	5.53962702408706	62.6603	37.129	7.3175
56.9063897689942	18.7853792909495	5.23383265746968	63.2951	31.2899	8.2512
56.297764009887	18.3959768920121	4.92801143517134	57.9508	29.6187	7.6435
56.297764009887	18.3959768920121	4.92801143517134	54.8257	29.6059	7.5612
55.6928616813974	18.0062003263937	4.62239485441529	54.5895	27.7676	11.1642
55.6928616813974	18.0062003263937	4.62239485441529	53.915	28.4629	8.3577
55.0918873361255	17.6163233716179	4.31672448800804	46.7677	27.4481	8.8301
54.4946159180803	17.2266341233793	4.01118516321193	49.5432	29.0024	13.3417
53.8999835158873	16.8368476374909	3.705393819017	50.3352	41.2014	16.9793
53.3078144401726	16.443267193958	3.39840412407604	43.7884	36.8808	19.8614
53.3078144401726	16.443267193958	3.39840412407604	50.3723	32.2399	19.4829
52.7226210008774	16.0460115034743	3.08886771758892	45.4526	36.121	9.3446
52.7226210008774	16.0460115034743	3.08886771758892	45.6407	35.658	2.8521
52.1438694797048	15.645950213031	2.77963865059285	45.4903	38.3462	11.2293
51.5682540234661	15.243315271672	2.469850673087	44.3651	39.5082	4.2576
51.5682540234661	15.243315271672	2.469850673087	42.8212	36.4305	1.5446
50.9995113214265	14.8356986192304	2.16047495757451	37.4272	33.8061	3.3013
50.9995113214265	14.8356986192304	2.16047495757451	44.2621	15.3855	4.7212
50.4386544119761	14.4278234479618	1.85132611700891	50.8592	31.2824	4.4654
50.4386544119761	14.4278234479618	1.85132611700891	44.1303	30.8739	2.5661
49.8812757768101	14.0176691023087	1.54227275237164	47.5893	27.8934	1.3329
49.3257034443079	13.6068148080731	1.2334451524578	54.0368	23.8586	2.2143
49.3257034443079	13.6068148080731	1.2334451524578	46.7163	23.0055	0.3229
48.7726797592356	13.1956516912771	0.925107786833493	49.1677	19.2175	6.1526
48.2220778041321	12.7850222598682	0.616732209881974	49.3862	17.5735	5.4967
48.2220778041321	12.7850222598682	0.616732209881974	46.503	16.5426	2.0548
47.6787032248324	12.3762249625917	0.308835681832186	47.4524	12.1509	5.76

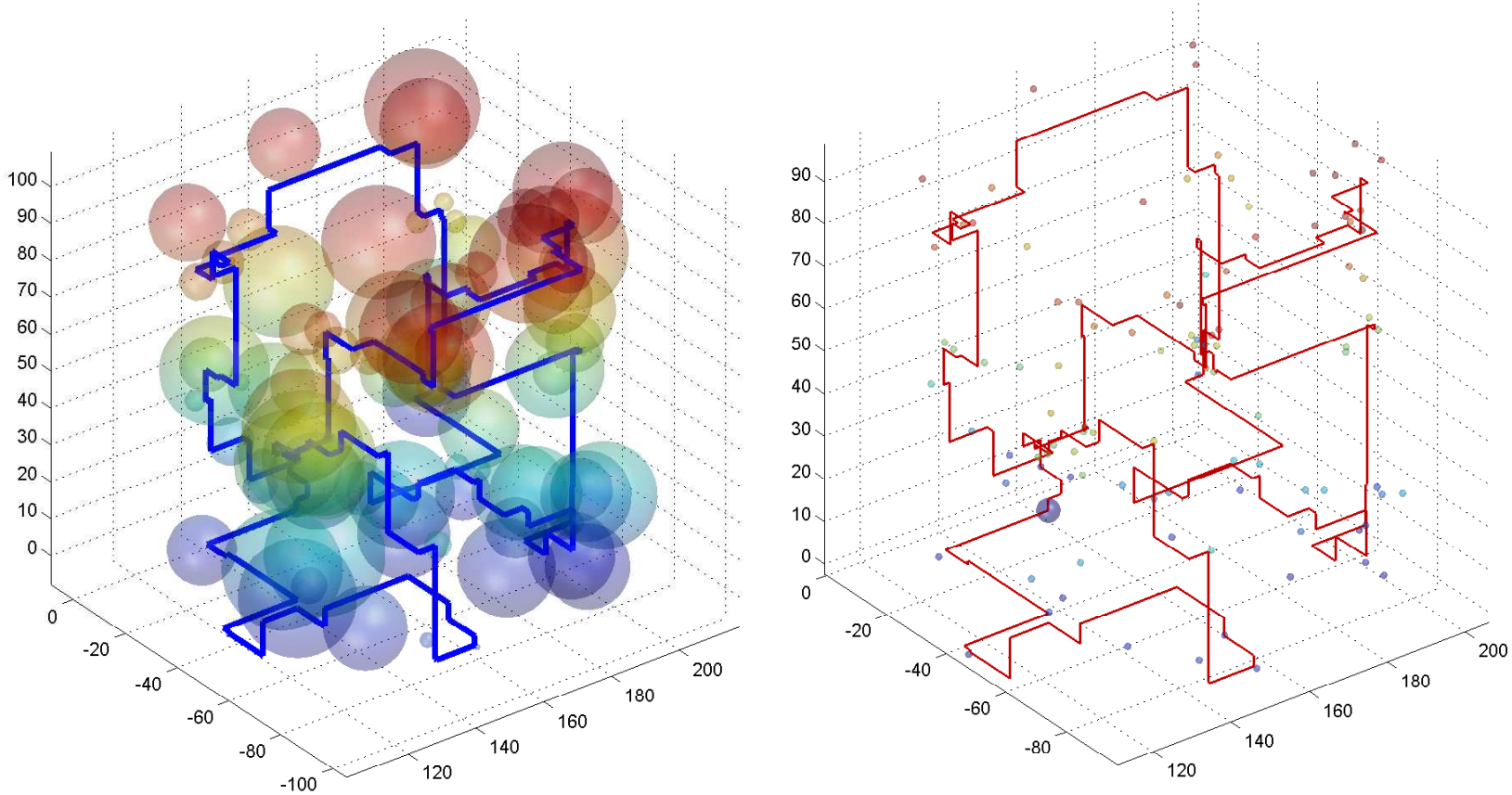


Figure N.195: *team*1_100, arbitrary radius, 3D, Manhattan, Length = 1264.3627211

Table N-198: Solution for *team*1_100, arbitrary radius, 3D, Manhattan

Total distance: 1264.36272114116 Depot: x 50 y 10 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
23.6258017799352	17.5680000007733	0.898318145305415	16.123	17.568	4.443	8.298
23.6258017799352	44.5100003051755	0.898318145305272	27.219	44.51	3.327	4.337
1.89540263292524	46.5990000078855	0.41840263307125	1.527	46.599	0.05	0.521
1.89540263292524	59.7984535021166	9.76355506355836	5.777	62.003	23.29	14.244
1.89540263292524	59.7994535021165	9.76355506355835	8.64100	64.188	15.551	14.025
11.8780000955095	70.443997531809	9.76355506355835	20.735	74.659	7.978	9.97
11.8780000955095	70.443997531809	14.4440000000002	11.878	70.444	28.798	14.354
36.5679999999997	86.0920000111635	10.1760000170972	36.762	86.092	10.176	0.194
36.5679999999997	96.1796925424664	7.6823074667361	36.924	96.636	7.226	0.737
25.2971320778827	95.579650559068	12.4884268799941	24.053	94.189	12.551	1.867
25.2971320778827	95.579650559068	38.1653317755154	27.59	93.644	36.826	3.286
20.3929999773903	83.792999988031	59.8319999999999	20.393	83.793	60.447	0.615
17.4986650340457	69.291199340342	54.6744319915162	17.374	67.529	56.063	2.247
17.4976650340456	69.291199340342	54.6744319915162	7.235	62.367	51.584	12.76
14.2071190729446	69.291199340342	54.6744319915161	5.739	68.535	65.134	13.479
14.2071190729446	60.974463135137	53.1202815464964	13.454	69.007	48.213	9.443
11.3630000000004	60.4419999976277	50.100999999745	11.123	60.442	50.101	0.24
11.363	55.8173004813921	49.0735537974112	11.844	68.394	54.009	13.519
25.0849999999999	54.1512724989285	47.6372724552706	25.923	53.185	46.671	1.603
25.0849999999999	54.5070000190102	48.6640000081375	25.201	54.507	48.664	0.116
25.0849999999999	54.5070000190102	48.6650000081373	18.45	52.954	46.14	14.862
25.0849999999999	54.5070000190102	70.2452332026525	20.103	52.347	63.856	8.385
24.4618886438339	54.5070000190102	77.4755563803914	26.732	55.612	72.392	5.676
24.4618886438339	54.5070000190101	77.616111379339	19.619	52.734	79.19	6.234
24.4618886438339	57.5930000629497	77.616111379339	21.299	57.593	80.779	4.473
24.4618886438339	64.7694261916426	77.616111379339	26.213	68.977	77.227	4.574
30.8103003405874	83.8689999795393	75.7736987459581	33.626	83.869	72.958	3.982
30.8103003405874	87.7665811610756	90.8251811433	30.503	90.056	84.685	13.109
30.8103003405873	87.7675811610756	90.8251811432997	33.443	88.578	84.328	7.057
29.888749392055	87.7675811610756	92.3392370634531	19.881	93.181	96.862	12.244
67.6430000162102	87.7675811610756	92.3392370634531	67.643	91.829	97.188	6.325
74.5970117694148	76.9427222373439	91.8471330662397	74.447	77.382	91.404	0.86
76.7769282415648	76.9427222373439	91.8471330662397	63.631	81.224	94.784	14.134
76.7779282415649	76.9427222373439	91.8471330662397	76.154	71.763	97.979	8.051
76.7779282415649	69.6841715311488	91.8471330662397	73.523	67.727	97.567	6.866
79.1933503139069	69.6841715311488	91.8471330662397	87.633	63.432	97.407	11.884
86.0673709212952	68.3090883875303	91.8471330662397	93.946	64.003	91.762	8.979
86.0673709212952	67.2170000185344	78.6154784762898	86.785	67.217	67.68	10.959
86.0673709212952	62.9660490227332	78.6154784762898	93.456	57.69	77.108	14.427
86.0673709212952	62.965049022733	78.6154784762898	89.091	59.886	77.014	4.603
77.9189999767394	65.839884722839	78.6154784762898	77.919	74.057	76.926	8.389
61.2332739743387	61.2066307994825	78.6154784762898	52.975	65.56	80.551	9.534
61.2332739743387	61.2066307994825	79.7214044599819	62.352	63.144	84.329	5.122
55.0510544662283	58.9778338867011	79.7214044599819	43.243	58.404	75.054	12.71
55.0510544662283	53.089054898602	82.014945277925	47.232	45.27	89.834	13.543
55.0510544662283	54.2838926633977	59.3298292241136	53.958	52.681	59.332	10.486
55.0510544662283	54.2838926633977	57.9627784503165	55.281	51.871	55.993	9.377
55.0510544662283	54.2838926633977	55.0107505998467	49.571	48.14	55.073	8.233
57.2366372527457	55.7920000178637	51.342946727118	57.243	55.792	50.963	0.38
57.2366372527457	56.8569999902009	51.8417923600001	57.142	56.857	57.493	5.652
57.2366372527457	61.5260008680901	51.8417923600001	59.534	67.732	45.235	9.572
86.977107387715	61.5260008680903	51.8417923600001	87.18	60.86	47.333	5.182
94.0420008650133	61.5260008680903	51.8417923600001	91.043	63.691	55.511	7.01
94.0420008650132	61.5260008680903	51.8407923600002	87.173	60.998	48.592	11.762
94.0420008650131	61.5260008680901	50.6240000468303	94.619	62.103	50.624	0.816
94.0420008650132	59.1163239235231	13.1806642548832	94.894	61.262	13.169	7.46
93.6940000001383	59.1163239235231	3.80332390627114	93.694	56.925	1.612	3.099
79.7650000000361	67.1240000000308	4.17199968251435	68.193	67.124	4.172	11.572
79.7650000000361	67.1240000000309	9.67581010668932	84.146	71.427	3.869	10.315
79.7650000000361	77.4416476377364	9.67581010668932	85.968	75.194	1.985	10.133
79.7650000000361	77.4416476377364	13.171798156892	87.252	72.952	19.479	10.77
79.7650000000361	77.4416476377364	20.5868150873397	81.476	87.316	28.362	12.684
78.2140004207186	77.4416476377364	20.5868150873397	78.214	79.218	18.292	2.902
66.8385242340454	77.4416476377364	24.3211273601896	66.957	73.797	28.023	11.351
66.8385242340454	75.0080570890917	24.3211273601896	67.179	79.746	30.609	10.928
66.8385242340454	75.0070570890916	24.3211273601896	66.971	72.201	17.644	7.244
61.4929999770172	65.5920000076557	29.634	61.493	65.592	32.325	2.691
59.7214825523887	58.105010511807	29.634	59.007	60.213	31.626	2.987
49.0672837437094	58.105010511807	25.7430000674505	42.804	54.74	25.734	7.11
47.415	46.4900000555968	25.7430000674505	40.978	46.49	25.743	6.437
47.415	41.8650001160204	17.2550000000002	49.02	51.541	23.534	12.697
47.415	41.8650001160206	17.2540000000002	51.29	49.58	11.489	10.97
74.6789999933502	41.8650001160205	17.2540000000002	74.679	41.865	10.639	6.615
85.7257526067925	9.08264076235065	17.2540000000002	93.574	3.255	13.429	10.497
90.5354790079947	9.08264076235065	22.2020003136664	92.889	3.855	22.202	5.733
90.5354790079946	9.08264076235065	27.753618940151	89.359	10.839	25.32	9.385

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
90.5354790079947	9.08364076235069	27.753618940151	94.926	4.006	36.794	11.26
90.5354790079947	14.0983296258245	63.1441256123393	95.317	17.864	59.209	7.295
90.5354790079947	14.0983296258245	66.492000001043	91.857	16.502	66.492	2.743
90.5354790079947	12.707378441244	68.3832654795071	91.007	13.249	70.645	2.373
85.5496060882039	10.2040708370059	68.3832654795071	85.554	10.061	65.642	2.745
85.5496060882039	10.2040708370059	87.0030431248683	85.841	12.653	93.498	10.749
77.5683428613035	6.20254142681176	87.0030431248683	88.457	8.185	95.157	13.747
53.7539999350182	6.20254142681176	87.0030431248683	53.754	0.148	93.309	8.742
44.6705267298717	6.20254142681176	76.4402858099509	40.868	2.981	76.025	5.001
44.6705267298717	9.05699999354883	76.4402858099509	45.293	9.057	63.281	13.174
26.1487512214677	10.9026713902904	76.4402858099509	26.839	11.732	76.118	5.19
19.5690000219137	17.068927413298	84.2180145464169	15.772	12.549	91.264	9.192
19.5690000219137	23.7440145318971	84.2180145464169	19.569	24.449	84.923	0.997
16.979	20.9619999928818	80.1470000291789	12.414	20.962	80.147	4.565
23.5189999999999	20.9619999928818	48.0880000299641	33.341	22.178	45.103	10.381
23.5189999999999	20.5059999920486	48.0880000299641	25.542	20.506	48.088	2.023
23.5189999999999	15.4400733719026	48.0880000299641	21.459	12.53	50.646	6.577
22.3483658209341	15.4400733719026	48.0880000299641	22.494	14.202	49.345	13.068
22.3483658209341	11.0673640444911	39.7290000000007	20.541	9.26	39.729	2.556
23.7894121397784	11.0673640444911	25.7645246646016	29.447	11.243	26.345	5.69
33.4999999987137	13.192	15.5199999984232	33.5	17.352	15.52	4.16
48.7265874536562	3.23898989624208	12.3846639760255	46.154	2.083	10.72	3.275
53.2070100987775	3.23898989624208	5.97200000081699	53.405	3.041	5.972	0.28
53.2070100987775	10	2.67757057349477	54.032	12.197	7.44	11.442

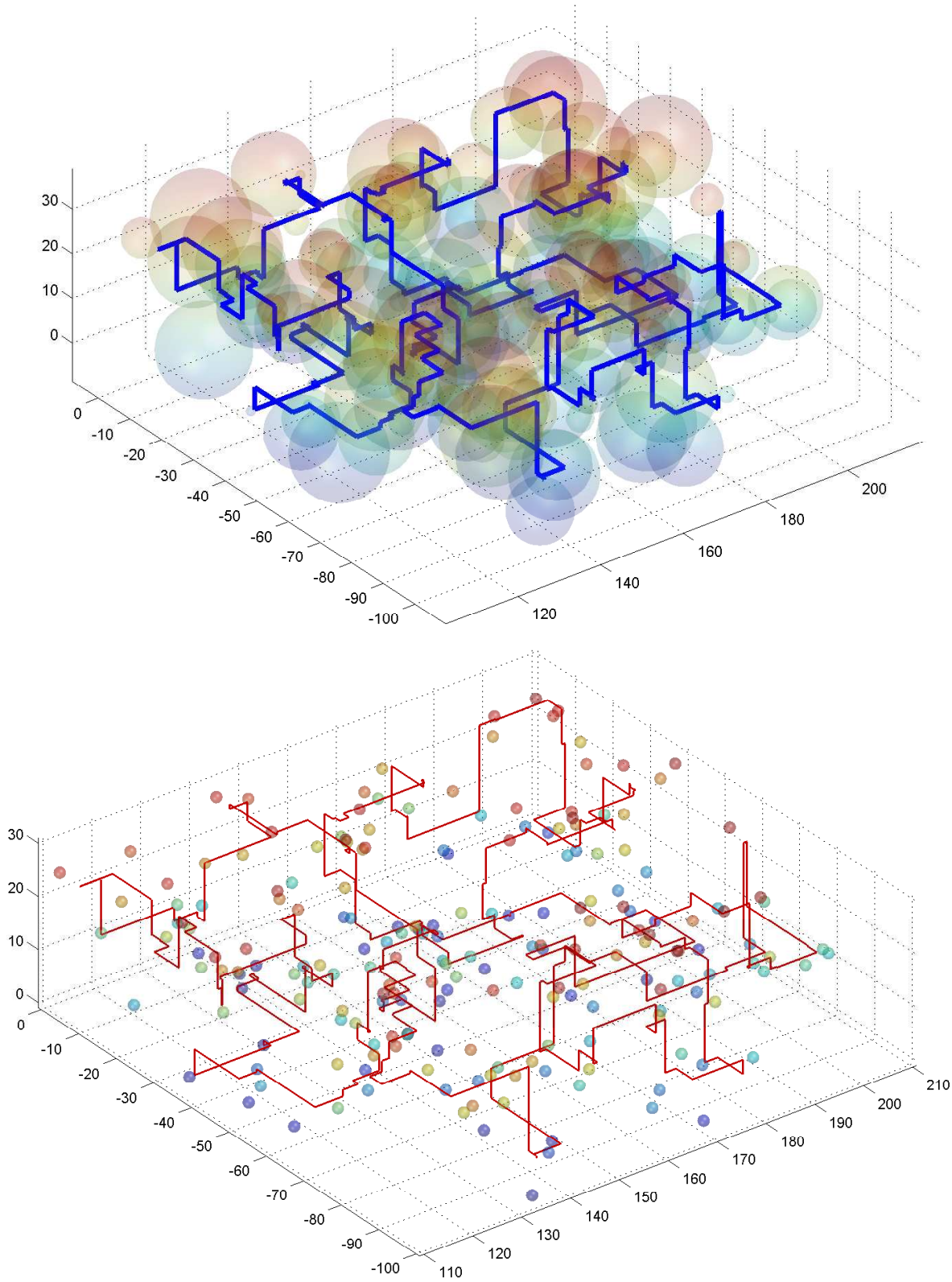


Figure N.196: *team*2_200, arbitrary radius, 3D, Manhattan, Length = 1450.3564139

Table N-199: Solution for *team*2_200, arbitrary radius, 3D, Manhattan

Total distance: 1450.35641387472 Depot: x 19.5535 y 32.6157 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
26.8285072041845	16.1068736807899	0.143675979124529	27.827995	16.04415	0.143676	1.001454
26.8285072041845	16.1068736807898	0.813303500787903	25.954135	17.869355	4.361083	7.603419
31.2537810541442	14.7406540403558	1.129185	33.169445	12.82499	1.129185	2.709158
30.3017559167705	29.640244198101	9.82548377412566	30.249755	29.28668	9.627144	0.408718
29.5772849817382	37.8970960000002	12.3651710528238	29.577285	38.20107	12.365171	0.303974
25.305588749665	37.897096	14.7032174711121	24.567885	37.86062	12.401465	3.403033
25.2848854127022	37.897096	15.0060290443367	21.779985	37.899125	15.006029	3.504901
25.2848854127022	33.4264509253897	23.0314729970243	26.379295	27.934205	23.031473	5.600223
22.3737549835339	33.4264509253897	23.2150301040419	22.373755	32.6144	28.047693	4.900414
22.3737549835339	38.1343419605492	23.2150301040418	25.46019	34.06066	24.177315	5.200669
22.3737549835339	40.2998164042523	21.6010565617872	21.800035	44.699325	19.798588	9.804285
13.9869151639556	40.2998164042523	21.540545166713	15.566305	47.445917	16.822861	8.70734
4.53527501187801	40.2998164042523	21.540545166713	7.79806	41.063165	21.758433	5.901659
4.53527501187801	40.2998164042523	21.539545166713	6.09162499999999	39.029145	21.745986	2.102568
4.53527501187801	41.152595897509	16.6717738055431	4.535275	41.40327	15.496926	1.201293
4.4599603286516	41.152595897509	20.0095897625791	7.76846999999999	43.27595	27.165517	8.308131
3.63404475216923	41.1525958975091	26.7879530080965	1.56824	43.114435	27.74491	3.00535
3.63404475216923	32.2717650000074	26.7879530080965	3.09506	32.271765	28.722779	2.008496
6.0651036400612	27.61232988315	17.000514019088	10.613375	27.61233	15.443404	4.807428
6.0651036400612	21.0368650281623	17.000514019088	1.87583499999999	21.036865	8.472142	9.501742
9.04323282165792	18.5578131657144	17.000514019088	10.44323	18.54025	17.132759	2.209906
9.21394687975845	16.4234147464813	17.000514019088	16.776285	16.423415	15.502152	7.709348
9.03442112941214	16.4234147464813	23.7500088852422	11.54701	17.37734	26.244082	9.803906
9.03442112941214	6.03034921729769	23.7500088852422	7.39533	10.545265	21.25087	8.903739
5.64045753616378	6.03034921729769	23.7500088852422	15.031135	2.9821155	24.523433	9.903269
2.33630311475785	5.99158466514425	23.7500088852422	0.024124999999998	3.6794065	26.062187	4.00481
6.36571604076191	6.48186960174698	13.4564843765033	6.5851	6.152225	13.546134	0.405995
20.9698976983613	6.6354598959205	13.3521955252518	21.673354	6.8005655	13.961641	8.80316
20.9698976983613	6.86282800000159	11.1801565277466	20.9699	7.87089	11.180156	1.008062
25.6955612559512	6.86282800000159	11.1678895350281	28.448025	4.56492	10.374303	4.604428
25.6955612559512	6.86282800000159	10.3195752516872	26.97316	5.55935	2.320922	8.204253
25.6955612559512	8.78514241665306	21.265898000938	25.662895	8.989655	21.265898	0.207105
30.5770484245927	8.78514241665306	21.2851000046057	32.973595	9.54291	20.606347	2.603527
39.447284121326	2.34294587870495	24.9179469843499	40.16046	1.62977	24.917947	1.008583
35.8168384190179	2.37188389459417	25.7726378422924	34.695715	0.250565	26.535311	8.309293
35.8168384190179	14.9245749885858	26.2940172974394	34.77264	14.924575	26.641448	1.100481
42.0959308912547	26.3186701255187	26.2940172974394	44.38625	27.294685	26.050788	2.501465
42.0959308912547	26.3186701255187	26.2950172974394	47.997827	21.94091	22.00424	8.509285
41.0010794942079	27.5295499999999	27.1638311636065	40.19826	27.52955	29.10549	2.101085
41.0010794942079	29.2081933052434	20.207955251644	39.58443	28.150345	20.548662	1.800561
41.0010794942079	45.595922740597	19.650743576114	40.184205	46.1874365	21.269314	1.907077
41.0010794942079	45.5959227405969	15.1640590069696	42.753335	50.906813	15.568394	6.308285
41.0010794942078	50.421694233157	14.7809800393802	42.291825	54.317701	14.78098	4.104253
41.0010794942078	50.421694233157	5.17786530782003	39.724355	52.657318	1.123019	4.803105
41.0010794942078	41.3526245801007	5.01434257669773	41.00732	41.27668	4.938398	0.107583
36.3833209604484	42.6218431203462	7.23941391592253	36.49954	48.989475	3.669737	8.009904
35.8746455433535	43.1296996137564	7.51346800002763	35.65863	43.345715	7.513468	0.305492
41.3498701895093	35.3366858099177	8.52567324016565	46.870011	29.816545	8.525673	7.806658
41.0016803609072	36.5454862952935	12.2979333940991	35.347265	40.483415	12.676508	6.900943
45.4207839617321	36.5454862952935	12.2979333940991	45.420784	35.70231	13.427579	1.409626
51.3603593146943	37.4958361855811	11.7947552808402	51.37375	46.298003	11.79476	8.802177
51.3603593146943	33.3895105302092	9.90965100003468	51.719243	33.03008	9.909651	0.507925
51.3114093335199	40.3836281778254	9.32767796143147	49.52113	41.29678	9.327678	2.009713
51.3114093335199	40.3836281778254	7.66039300877862	50.608737	39.047145	0.30438	7.509385
55.9267031471511	40.3836281778254	7.66039300877869	50.972003	40.60627	2.976184	8.001002
56.2374558641893	40.3836281778254	7.52827294702525	61.04328	37.44322	1.978623	7.908259
66.800966019044	40.3836281778254	7.52827294702522	69.610075	41.75992	4.719164	4.204327
66.6763970574634	40.12174224667	7.52827294702522	65.72564	44.111465	7.622314	4.10252
64.5951355328538	35.3875240000049	9.98989741541858	64.595135	34.78327	9.989898	0.604254
62.2185845567305	35.3875240000049	16.6032218350126	53.824634	40.64213	16.603226	9.902994
63.1040785203949	35.1719171321684	22.9872867297137	63.437195	41.00367	26.99622	9.004095
71.2730449999999	35.1719171321684	23.7978918762548	71.273045	32.62062	26.349189	3.608079
71.273045	40.7757065510453	23.3161547090935	74.17807	43.76639	28.605582	8.300269
72.8128188539794	40.7757065510453	23.3161547090935	78.52122	37.890255	25.630233	6.801958
84.6187384035442	40.8656571354266	21.7163132471639	83.48933	38.25693	16.203282	8.302552
84.6187384035442	41.5756158944839	21.7163132471639	84.61874	44.121625	19.170305	3.6006
84.6187384035442	40.8656739182952	21.7163132471638	79.319755	37.96047	22.926601	9.501655
84.6187384035442	34.3887991355458	21.7163132471638	80.066985	32.520545	19.480329	5.404485
93.9103600321092	34.3887991355458	22.5652159891318	89.661665	37.28143	20.914346	7.609892
93.9113600321091	34.3887991355458	22.5652159891318	97.982935	40.137435	28.75306	10.003975
94.271639	33.9806099808718	22.5652159891318	99.67714	33.98061	22.565216	5.405501
94.1456238964234	33.1016900237064	23.1441823856783	92.788305	33.10169	27.022649	4.109114
94.1456238964234	32.9577485170705	21.0227910194402	90.572985	26.136825	24.857885	8.602133
94.1456238964234	25.9061036784466	12.5362759194175	86.845365	25.906095	9.026374	8.100197
94.7639004554293	24.3147849946985	12.5362759194175	95.62369	24.314785	12.804988	0.900802
91.8557043964061	22.8432383376118	7.83608707232828	91.09643	22.6866	6.913126	1.205359

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
90.7275940267645	11.8116815432077	7.83608707232828	89.544625	11.14329	6.653118	1.801549
97.1955414123739	11.8116815432077	7.83608707232829	93.997115	11.43328	4.127594	7.703152
97.1955414123739	11.8116815432077	19.983146	99.37313	13.042045	19.983146	2.501137
96.6019967835739	11.5903202415682	26.4458692225962	96.04228	11.46233	26.220597	0.702338
96.6019967835739	7.95276230541901	26.4458692225962	94.4971	12.154995	26.111766	9.50306
96.6019967835739	7.95176230541913	26.4458692225962	92.761655	9.792985	28.945088	7.707934
86.0162450029228	7.70044852293609	26.4458692225962	86.016245	7.495035	26.90563	0.503562
86.0152450029228	7.70044852293609	26.4458692225962	87.144585	5.62369	21.911356	7.10022
82.7411849993893	7.70044852293609	10.2921354415622	82.741185	8.18936	9.780027	0.708018
81.3910695895999	7.70044852293609	10.2921354415622	78.44886	5.02628	2.732259	8.808511
74.6006899807023	7.70044852293609	10.2921354415621	74.60069	8.85595	6.459838	4.00271
68.1140357158829	7.70044852293609	14.5483940127443	69.299455	6.449115	15.081267	5.10428
67.7947742982994	4.85145630028471	14.6171931647296	67.794775	0.2453923	14.617193	4.606064
66.8868296980716	5.02797664914866	23.1600980273771	67.61759	1.570395	20.822479	5.100981
66.8868296980716	13.5571007351331	24.5590820850522	69.52818	17.90893	23.466902	5.206535
66.434745363782	14.4173560831654	24.5590820850523	57.51838	10.00522	23.910843	10.000856
49.7969210003316	15.9468607211585	24.5590820850522	49.796921	18.777515	27.389734	4.003148
47.9115062573577	14.7907258284918	24.5590820850522	54.207021	15.63022	20.585643	7.700153
47.3756470440092	12.6934121047856	24.5590820850522	49.707097	15.54357	19.872896	9.000518
47.3084174212591	12.6934121047856	17.9922409023178	46.358401	11.954405	18.491997	1.303234
47.3084174212591	12.6934121047856	12.9223603913001	42.845635	9.79738	11.955362	5.407265
50.5374162632085	12.6934121047856	12.9223603913001	54.294115	8.069135	15.776464	6.606257
50.5374162632085	16.5420499053547	12.9223603913001	50.337118	13.87323	4.749218	8.600173
50.5374162632085	16.737120175364	4.77070291957048	47.801417	19.06334	7.814097	4.70736
50.5374162632085	20.6725218701213	3.50141517564158	49.216563	20.76273	2.277188	1.803198
58.9792546660444	20.6725218701213	3.50141517564158	58.979255	16.987345	1.276103	4.304944
60.6503809150768	20.7561150009368	3.50141517564158	63.31789	20.756115	1.726904	3.203825
60.5800805528543	21.6112886302562	3.50141517564158	57.48649	24.517395	4.703245	9.301244
59.8845253026063	27.7717605529182	3.50141517564158	57.95186	28.956245	5.320699	2.906543
73.4488200320655	27.7717605529182	3.33990917827244	73.44882	27.71684	3.250298	0.105102
73.4488200320655	28.0760462134683	3.98987747691481	79.01289	29.7258	2.755744	7.100822
83.895255922795	41.1599091163301	4.2375675848545	88.660005	37.051535	6.873362	7.30023
83.895255922795	41.1599091163301	4.23856758485451	87.57797	41.66484	5.551613	6.902275
91.2257209620643	41.1599091163301	4.23856758485451	94.955665	36.40187	7.771411	7.002314
91.2257209620643	43.6910314630647	4.23856758485451	91.6164	43.026115	2.808093	8.109517
91.2257209620643	54.1973342519269	4.23856758485451	95.92709	54.202926	8.883113	6.608684
91.2247209620646	54.1973342519269	4.23856758485451	92.878595	53.021252	1.55944	10.006179
86.9248415135686	54.1973342519269	4.23856758485451	81.466395	54.091358	0.343064	6.706774
66.6450611666924	54.197334251927	4.23856758485451	65.705495	54.4013975	3.082521	1.503619
66.6450611666924	54.197334251927	13.9013325753834	70.55475	53.342402	18.770686	6.30295
56.6271429926977	56.1009299350173	13.8795990253437	53.302235	56.10093	10.554691	4.70213
63.1742400000477	62.7642050022187	14.214288	63.17424	62.764205	21.920947	7.706659
63.1752400000479	62.7642050022187	14.2142880000001	62.26967	64.78212	6.975531	9.008592
68.4062299849408	71.0391221636302	8.7389033126466	68.40623	74.741575	8.582781	3.705743
78.1305442901562	71.0391221636302	8.7389033126466	75.60926	70.05143	9.458663	2.801868
85.0946468714625	71.0391221636299	8.7389033126466	79.72973	69.6285	5.76607	6.503827
85.0946468714624	70.0891227886313	8.7389033126466	81.449	70.90379	9.10693	4.00725
85.1725174670844	70.0891227886313	8.7389033126466	87.254685	75.06877	11.123991	5.900928
93.4399580385207	65.449939927132	8.7389033126466	93.854515	65.44994	7.938496	0.901393
93.4399580385207	64.229101263993	26.6178747782201	92.344515	62.02096	28.826016	3.309346
94.1461560914187	64.2882929267447	14.4267038106666	98.425325	63.29758	13.439936	4.501834
94.2098506352305	80.2587399982454	14.2532552278042	98.53739	80.25874	11.354076	5.208919
94.2098506352305	82.8309840000001	14.2532552278042	97.272905	80.426715	12.650593	7.307128
91.3717599657709	82.8309840000001	14.2532552278042	91.37176	83.481715	13.123111	1.3041
85.9607856530966	82.8309840000001	14.4292692490751	86.26193	79.048	11.651774	6.603528
84.7245499959283	82.8309840000001	16.6219810024269	84.72455	82.62255	16.621981	0.208434
79.8504313137666	83.5206995581219	28.9112724829424	82.980165	82.460215	28.432538	3.407507
74.2342046003007	83.5206995581221	29.0623415572808	74.234205	84.088705	29.630347	0.803281
74.2342046003006	75.2755171411509	26.59152661818	74.635475	75.231085	23.616275	3.002518
67.2427600008954	74.9453291600108	25.2361990390755	67.24276	72.18951	20.816233	5.208708
60.4609975753092	74.9453291600108	26.9084795898224	58.86286	75.490835	22.793064	6.800719
60.4609975753092	74.9453291600108	26.9094795898224	63.457115	71.302795	28.410692	5.306378
60.4609975753092	74.9453291600109	28.8025665794384	56.10401	69.44853	29.951816	7.107666
60.4609975753092	83.2619971197189	28.8025665794384	61.393495	78.21387	27.829379	9.209541
60.4609975753092	83.2730200105208	28.8025665794384	59.609455	83.27302	29.920795	1.405546
60.4609975753092	85.1243242325609	28.193655204748	59.88564	90.256965	29.954013	6.102678
65.4889013517371	85.1243242325608	26.0240963058438	64.30468	84.91	26.009678	1.203546
66.3365967975943	90.1456100027319	17.8178609959182	67.48261	90.51293	17.817861	1.203441
65.5878044105934	90.1456100027319	6.95896138564255	65.23767	90.033385	6.608827	0.507723
68.3050222869524	96.9177674093634	9.61434518124927	69.51155	98.000325	10.150379	1.707329
58.9162995013166	96.9177674093634	9.61434518124927	58.9163	98.60932	2.300231	7.507171
57.9551449260228	96.9177674093634	9.61434518124927	49.437672	97.29667	7.39626	8.8097
57.9551449260228	92.527327	9.61434518124927	54.766852	92.295455	6.553331	9.502154
55.7709995579208	92.527327	18.164610733539	58.59379	93.155945	12.405414	9.907152
55.7501000585255	92.527327	19.6172780035922	55.7501	90.920415	19.617278	1.606912
51.7255849957602	95.2083975450121	25.0564436633524	51.725585	96.536445	28.40681	3.603979
38.9886365902931	95.2083975450121	18.4151885148331	37.353615	96.195315	18.415189	1.909791
39.777761134782	90.309885	14.5815890150208	39.89323	90.309885	11.775799	2.808165
39.777761134782	81.7078370610893	14.6616823198609	40.48646	81.157135	14.786912	0.906206
38.4094681317385	81.7078370610891	14.6616823198609	31.22881	79.877355	13.445056	7.509507

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
38.4518313898285	81.7078370610893	27.7159845097037	32.35548	77.08328	26.131092	8.907943
38.9501849998247	82.9309055252747	27.7159845097037	38.950185	86.058925	28.399966	3.201927
48.958962080127	76.9506800001526	27.7159845097035	49.200624	76.95068	27.905495	0.307107
48.958962080127	74.6836930770504	24.7124050117232	48.983044	68.08194	24.712405	6.601797
46.6833317183274	74.6836930770504	18.670563682024	51.801592	75.702955	19.859805	5.507245
46.6823317183275	74.6836930770504	18.670563682024	45.96408	75.36881	19.356846	5.908922
46.6823317183275	74.6836930770504	10.0048435011946	52.486843	76.711165	9.36826	6.306844
36.756713250847	74.6836930770504	10.0048435011946	43.88264	75.9979	6.534575	8.106066
33.8142509443423	74.6836930770504	9.6302208381679	33.93752	71.055425	5.905417	5.201316
33.8142509443423	74.6870742377648	4.3114364006268	27.85894	70.297015	5.978866	7.608202
33.8103397937554	74.6870742377648	4.31143640062681	30.1948	77.47401	0.923346	8.506801
33.8103397937554	93.2876150273057	4.31143640062681	36.34587	87.597465	1.344209	6.900084
28.2569682746428	94.0353415295239	3.98399038777658	24.384515	97.907795	0.111537	6.707286
28.2569682746428	93.9652053576683	4.31245902183745	30.09705	94.85711	4.685105	8.906507
28.2575694471455	91.9377100032395	20.1530528342092	28.966505	91.93771	20.861988	1.002586
23.2707233784682	91.9377100032394	20.1105185592598	20.60172	86.45345	23.44328	9.802386
23.2697233784681	91.9377100032394	20.1105185592598	23.602775	87.83846	18.275699	8.306271
23.2687233784682	91.9377100032394	20.1105185592598	23.159665	94.99055	21.634541	6.103619
22.1168032049289	91.9377100032395	20.1105185592598	20.26183	95.676245	17.846167	5.307169
12.2937833336731	91.9377100032396	20.1105185592598	12.30828	95.415795	18.734286	4.20063
12.2937833336731	90.5038080851464	20.1105185592598	10.636965	99.941455	22.606097	9.901623
12.2937833336731	81.1585680398987	19.5731876871238	16.17437	80.77798	18.674423	4.001447
6.94057281873215	81.1585680398988	19.5731876871237	4.81189	71.48163	19.467897	9.90886
6.45883768704803	77.9771420000002	19.5731876871237	1.401765	76.07236	14.516115	7.401092
8.96413997943236	77.977142	21.6042079735832	8.96414	75.77293	21.604208	2.204212
10.3022650030304	78.0801599999999	24.7249810246933	10.302265	79.88844	24.724981	1.80828
16.0245908490894	78.08016	24.7249810246933	10.737535	78.399525	25.651463	6.808137
16.0245908490894	71.6923654636702	25.154521155479	14.99811	70.439575	28.594361	3.802058
20.0196303385915	64.179034751442	25.154521155479	19.19225	67.891335	25.986874	4.001137
26.4327482249458	61.5732779627643	25.154521155479	27.294235	67.36467	25.05905	8.501742
26.6772712452816	58.4528176598521	25.154521155479	27.03592	58.11764	25.51317	0.607949
21.0764037032304	58.4528176598521	20.2680867846555	22.77816	61.91876	23.535116	9.100277
21.0181491593665	58.4528176598521	20.2317962100885	15.17562	59.299125	20.231796	5.903506
21.0754163730149	58.4528176598521	13.6558650253632	18.601355	58.3359	16.263038	9.106551
21.6686078084056	58.4528176598521	13.6558650253632	25.726765	62.875185	13.655865	6.002164
21.6686078084056	54.8015206634159	10.4976920138715	23.528225	48.047471	10.497692	7.005381
21.6268373885449	57.9181243973725	10.4976920138715	22.32618	58.45293	10.978007	1.401145
21.6268373885447	60.6329284851454	7.37690603572664	24.393135	53.387308	3.209069	8.804674
16.2821600019186	62.050308	7.37690603572664	16.28216	64.658715	7.376906	2.608407
13.1726231799064	62.050308	6.13800011616994	5.35044999999999	59.245825	2.02242	9.802178
7.49214584835389	54.0468692464318	6.13800011616994	2.26291999999999	54.336059	8.412226	5.709688
7.49214584835389	46.4890579358599	5.64836448192877	8.071465	45.7971455	5.631658	0.90257
3.89234200000034	46.4890579358599	5.64836448192877	4.493385	48.2428075	1.749018	7.3014
3.89234200000034	34.5391650986309	0.815620790242358	2.888575	34.539165	0.815621	1.003767

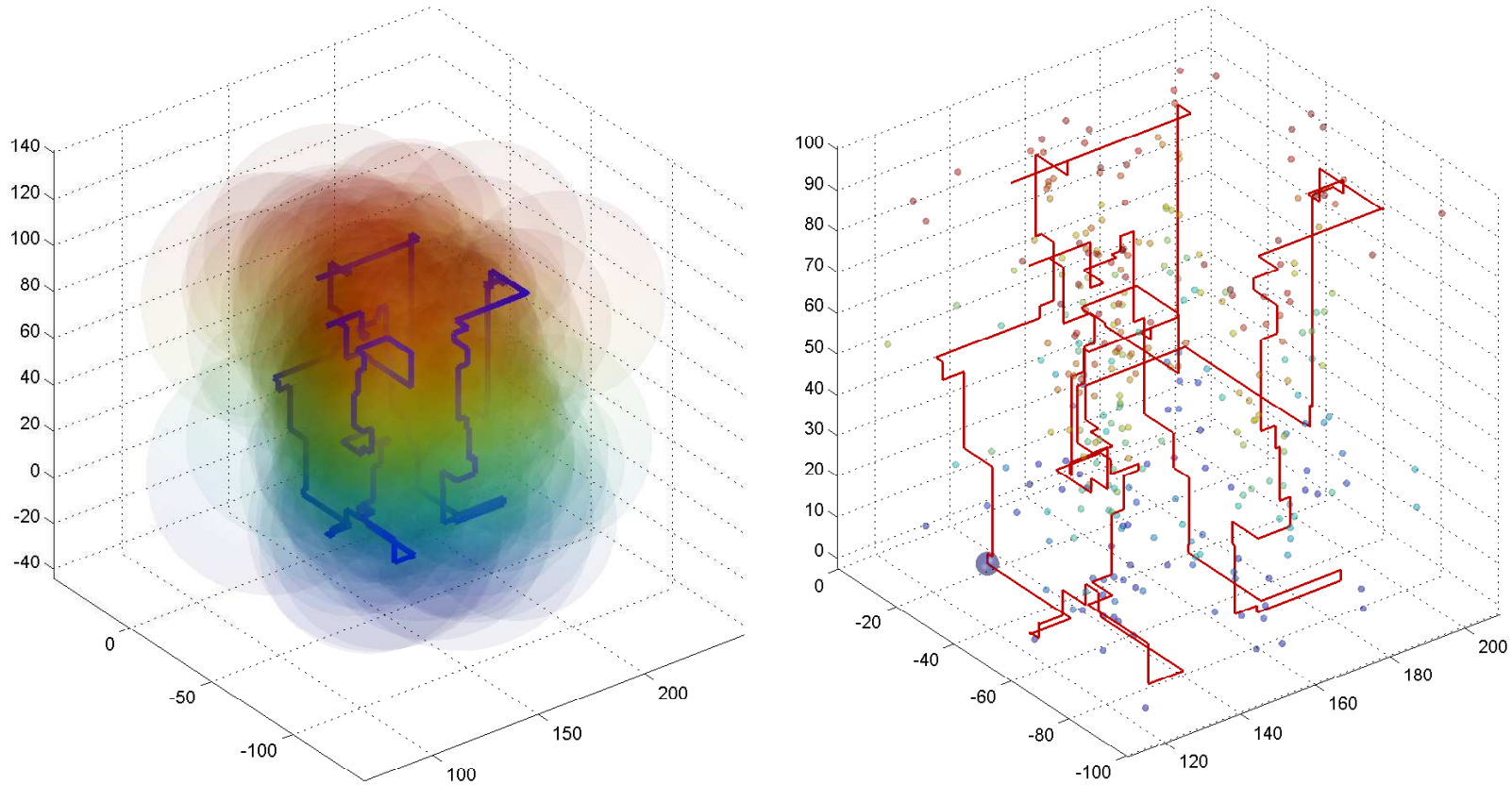


Figure N.197: *team*3_300, arbitrary radius, 3D, Manhattan, Length = 1382.5977637

Table N-200: Solution for *team*3_300, arbitrary radius, 3D, Manhattan

Total distance: 1382.59776365685 Depot: x 23.55 y 20.83 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
23.55	20.83	2.41	23.55	20.83	14.19	11.78
23.6488900262207	22.5288855922454	18.1265976326064	27.74	25.63	13.28	7.06
23.6488900262208	22.5288855922455	24.4700000101104	25.65	24.53	24.47	2.83
23.6488900262207	12.5399980956982	43.1929418810731	40.11	39.6	39.05	36.03
23.6488900262207	12.5399980956982	43.1929418810731	42.56	42.28	42.23	38.94
18.0658990841445	12.5399980956983	47.4454415080431	3.36	12.54	56.95	17.51
18.0658990841445	10.0500633036371	47.4454415080431	31.22	0.18	51	17.31
41.4899995847829	10.0500633036368	47.4454415080429	41.49	2.29	43.49	8.71
41.4899995847829	10.1761332158235	47.4454415080429	51.98	10.99	46.43	14.06
45.6300039219318	10.1761332158236	47.4454415080431	45.63	23.76	45.59	13.71
45.7795755837788	10.1761332158234	50.3584586788281	52.67	8.88	54.93	8.37
45.7805755837788	10.1761332158234	50.3584586788261	64.87	11.36	51.75	35.55
45.7805755837788	10.1761332158234	50.3584586788261	83.08	6.85	43.86	42.38
49.4899999999971	10.1761332158235	50.3584586788243	52.03	16.04	55.64	40.73
49.4899999999971	10.1761332158235	50.3584586788243	49.85	30.56	58.41	44.85
49.49	10.1761332158235	50.3594586788241	67	3.94	64.95	32.81
49.49	10.1300000003025	64.2800001284251	55.38	10.13	64.28	5.89
49.49	10.1300000003025	64.6724130755666	51.38	10.51	60.31	13.35
49.4899999999971	10.1300000003026	64.6734130755602	56.94	12.18	54.17	13.04
49.4899999999971	10.1290000003026	64.6734130755602	44.53	2.72	56.05	49.48
49.4899999999971	10.1280000003053	64.6734130755602	43.23	11.54	68.02	40.96
49.4899999999971	10.1270000003053	64.6734130755602	45.57	12.76	80.46	29.32
49.4899999999975	5.7920000085341	64.6734130755602	46.38	12.31	81.64	40.75
49.4899999999975	5.79100000853409	64.6734130755602	52.12	16.84	52.03	26.81
49.4899999999975	5.79100000853409	64.6744130755602	56.85	15.49	62.45	20.36
48.0000065574682	5.79100000853409	74.52	52.96	3.75	74.52	34.45
48.0000065574683	5.7910000085341	79.3	50.52	8.68	79.3	38.38
48.0000065574685	5.7910000085341	84.6989998981196	50.97	4.59	83.57	36.43
48.0000065574675	5.79000000852462	84.6989998981146	52.67	4.65	71.84	26.24
48.0000065574674	5.79000000852462	84.6999998981146	48	4	84.7	1.79
48.0000065574674	16.9302409651568	88.2366330031626	45.09	11.7	92.12	48.9
48.0000065574677	16.9312409651568	88.2366330031758	24.66	9.13	90.15	37.86
32.8854576199521	16.9312409651568	88.2366330031756	4.01000	20.5	95.59	30.01
55.9981032725482	16.9312409651568	88.2366330031756	54.5	15.91	93.18	18.5
55.9991032725482	16.9312409651568	88.2366330031755	50.3	13.28	95.6	17.44
56.0001032725482	16.9312409651611	88.2366330031756	55.24	13.37	88.36	7.67
63.3490005622608	16.9312409651611	88.2366330031757	62.16	16.88	79.65	21
63.3500005622607	16.9312409651612	88.2366330031757	63.35	21.49	87.32	4.65
80.9250031422133	16.9312409651611	88.2366330031755	85.76	19.27	96.66	9.99
80.9250031422133	16.9302409651538	88.2366330031755	87.06	2.89	85.23	20.41
80.9250031422132	12.3064194814148	74.000000005841	84.21	1.15	74	11.63
80.9250031422132	12.3064194814148	71.8318585905761	86.49	3.97	82.84	35.89
80.9250031422132	12.3064194814148	71.8318585905761	88.21	3.61	89.96	26.68
80.9250031422132	12.3064194814148	71.8308585905745	83.5	4.83	59.12	37.8
80.9250031422132	12.3064194814148	71.8308585905745	90.45	0.18	67.28	30.09
80.9250031422131	12.3064194814148	71.8298585905745	84.57	2.19	72.59	42.77
80.9250031422131	12.3064194814148	58.800706446443	60.89	11.99	66.92	21.62
80.9250031422131	12.3064194814148	58.800706446443	86.71	7.9	46.76	17.03
80.9250031422131	12.3064194814148	58.800706446443	83.08	5.9	51.4	14.32
80.9250031422131	12.3064194814148	58.800706446443	77.94	16.73	64.38	14.1
80.9250031422131	12.3064194814148	58.800706446443	83.63	6.61	58.86	7.21
80.9250031422131	12.3064194814148	58.800706446443	83.98	4.24	58.09	15.73
80.9250031422131	12.3064194814148	58.800706446443	90.14	0.74	66.47	21.22
80.9250031422131	12.3064194814148	50.1622269991512	85.18	6.81	41.52	43.66
80.9250031422132	12.3064194814148	36.2249623845333	84.85	7.49	23.97	13.74
70.6927490565153	16.2868268637212	39.0168275395171	86.46	7.15	36.07	18.46
66.8700000091927	16.2868268637212	39.0168275395173	66.87	17.1	39.83	1.15
54.1052116476073	16.2868268637212	39.0168275395173	56.31	21.31	38.26	24.49
54.1052116476073	16.2868268637212	39.0168275395173	56.38	14.32	39.64	21.79
54.1052116476114	14.5820005281971	33.434225124857	53.85	15.08	32.9	0.95
54.1052116476113	14.5810005281957	33.4342251248559	44.72	11.87	38.22	20.59
50.7348881186736	14.5810005281958	33.4342251248588	51.86	7.7	30.42	17.94
50.7348881186736	14.5810005281958	33.4342251248588	55.4	11.17	38.22	24.33
50.7348881186736	14.5810005281958	9.00485934978011	19.48	4.75	3.34	45.94
50.7348881186736	14.5810005281958	9.00485934978011	50.21	0.82	0.76	29.59
50.7348881186735	14.580000528256	9.00485934977959	48.26	14.58	6.53	3.5
50.7348881186735	14.1812835278298	9.00485934978011	47.45	7.49	9.86	16.55
50.7348881186733	14.1812835278298	9.00585934978049	54.22	8.18	8.6	10.41
50.7348881186734	14.1812835278298	12.1631618665162	54.15	15.54	5.27	39.45
50.735888118674	14.1812835278298	12.163161866516	56.26	10.34	5.55	24.93
50.735888118674	14.1812835278298	12.163161866516	55.5	8.86	22.02	30.33
62.0969093735616	14.1812835278298	12.1631618665169	76.81	16.4	5.21	34.4
62.0969093735616	14.1802835278297	12.1631618665176	78.41	15.88	16.4	33.29
62.0969093735616	14.1802835278297	12.1631618665176	84.22	4.25	20.41	43.87
62.0969093735617	14.1792835278294	12.163161866518	63.88	23.81	11.61	9.81
62.0969093735617	6.48412271051558	12.1631618665183	90.79	7.27	2.84	30.18

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
64.2999704054486	6.48412271051558	12.1631618665217	75.98	28.26	8.37	25
64.2999704054484	1.76000000026028	20.6000001572815	64.3	1.03	20.6	0.73
90.8172625739725	1.76000000026028	20.7428769621462	89.81	1.33	12.56	26.05
90.8172625739724	7.70343317937685	20.7428769621464	90.71	5.35	36.18	17.99
90.8172625739725	7.70443317937919	20.7428769621464	73.63	17.07	53.58	49.78
90.8172625739724	7.70543317937918	20.7428769621464	91.86	5.09	13.18	8.07
90.8172625739725	25.7180298517134	20.7428769621464	85.34	3.13	7.91	40.46
90.8172625739725	43.0659290968959	20.7428769621464	87.92	47.46	7.48	19.28
90.8182625739725	43.0659290968959	20.7428769621462	90.65	58.26	13.09	31.68
90.8182625739725	43.0659290968959	20.7438769621462	91.08	56.32	19.58	17.84
90.8182625739725	43.0659290968959	21.126132485498	85.21	44.35	20.93	35.25
90.8182625739725	43.0669290968958	21.126132485498	89.33	46.23	11.31	10.42
90.8192625739726	43.0669290968958	21.126132485498	89.11	45.94	22.79	8.83
90.8202625739727	43.0669290968958	21.126132485498	78.01	26.19	31.01	23.38
90.8202625739727	43.0679290968958	21.126132485498	92.92	45.3	3.79	44.4
90.8202625739726	45.314787285226	21.126132485498	74.93	38.63	8.7	25.85
90.8202625739725	45.314787285226	26.5490392324802	86.88	55.34	28.08	10.88
90.8212625739724	45.314787285226	26.5490392324801	84.47	44.91	39.53	21.75
90.8212625739724	46.2127974471902	26.5490392324801	90.93	51.78	26.41	5.57
90.8222625739724	46.2127974471902	26.5490392324801	85.02	48.75	32.58	30.39
90.8222625739724	46.2127974471902	46.13	87.56	46.99	46.13	41.58
90.8222625739724	46.2127974471902	53.6232034130763	79.79	30.32	50.96	35.55
90.8222625739724	46.2127974471902	53.6232034130763	92.82	43.5	36.14	36.84
90.8222625739724	46.2137974471902	53.6232034130763	85.43	53	49.96	9.41
90.8222625739724	46.2137974471902	53.6232034130763	85.85	46.49	60.83	8.76
90.8222625739724	46.2137974471902	53.6232034130763	93.86	49.11	54.34	7.68
90.8232625739724	46.2137974471902	53.6232034130763	98.41	37.64	42.84	22.32
90.8232625739724	46.2137974471902	53.6232034130763	92	48.8	50.4	13.39
90.8232625739724	46.2137974471902	78.3298071733234	84.47	48.16	64.66	27.36
90.8242625739724	46.2137974471902	78.3298071733234	92.59	46.16	69.75	30.13
90.8242625739724	46.2137974471902	78.3298071733234	85.78	45.37	88.36	33.83
90.8242625739724	46.2147974471902	78.3298071733234	88.92	43.62	77.06	3.46
96.3500000000034	49.7299999999906	81.6399992619439	96.43	49.73	81.64	0.08
86.7825050926639	49.7300007455323	81.639999261944	89.59	51.88	82.73	4.09
86.7825050926639	53.806169784071	81.6399992619438	89.36	56.03	81.08	3.45
86.7825050926639	53.806169784071	89.6996483272138	92.09	44.08	96.66	37.36
86.7825050926639	53.806169784071	89.7006483272138	92.92	88.46	92.3	39.57
86.7825050926542	55.4321096760135	89.7006483272138	87.26	54.53	99.96	10.31
86.7815050926461	55.4321096760135	89.7006483272138	82.42	49.99	99.02	11.64
86.7815050926461	75.7298477986269	89.7006483272138	72.93	73.7	97.12	16.22
86.7815050926461	76.0689438416282	90.1200000616001	70.7	73.7	97.99	18.06
53.3515365957258	76.0689438416282	90.1200000616026	57.57	78.44	87.74	7.54
53.3500000001214	83.1390660307419	90.120000061603	53.35	83.14	97.2	7.08
53.3490000001216	83.1390660307419	90.120000061603	42.37	92.45	91.48	18.71
53.3480000001214	83.1390660307419	90.120000061603	48.98	92.03	89.79	41.59
46.8296954024888	83.139066030742	87.2708044549706	51.75	85.81	80.64	36.53
46.8296954024888	91.3270084800672	80.4869795129891	66.26	99.07	96.4	34.13
46.8296954024923	91.3280084800671	80.4869795129891	47.48	94.9	89.56	26.29
42.4104176258006	91.3280084800671	80.4869795129891	37.88	93.16	68.12	38.09
42.4104176258006	91.3290084800616	80.4869795129891	38.08	89.48	68.3	35.64
42.4104176258007	91.3300084800618	80.4869795129891	40.14	88.25	82.87	7.74
42.4104176258007	91.3310084800618	80.4869795129891	44.75	90.08	82.93	11.27
42.4104176258007	91.3310084800617	71.725697031929	46.92	92.94	79.18	12.72
42.4104176258007	91.3320084800615	71.725697031929	48.68	92.55	68.87	20.63
42.4104176258007	91.3330084800614	71.725697031929	42.93	88.78	59.49	12.51
42.4104176258007	91.3330084800614	71.725697031929	41.11	92.55	72.93	2.15
42.4104176258007	91.3330084800614	71.724697031929	39.18	94.86	64.79	14.97
42.4104176258007	91.3330084800613	71.7236970319289	39.28	92.99	62.54	15.28
42.4104176258007	91.3330084800614	58.1328487221631	39.31	87.14	57.08	5.32
42.4114176258007	91.3330084800613	58.1328487221631	47.67	92.59	55.65	35.3
42.4124176258007	91.3330084800614	58.1328487221631	38.36	90.43	43.39	47.27
46.2731472216445	91.3330084800608	58.1328487221631	68.17	79.21	59.57	25.07
46.2731472216445	91.3330084800593	52.5245681407799	39.7	88.73	54.48	41.5
46.2731472216445	91.3330084800598	52.5235681407805	54.83	99.88	42.57	28.66
46.2731472216445	91.3330084800597	52.5225681407785	49.11	94.31	36.24	17.31
46.2731472216445	91.3330084800598	52.5215681407806	48.89	93.1	33.02	36.74
47.5162874637964	91.3330084800599	39.2190482093061	50.91	90.3	36.65	4.38
50.3569505840025	91.3330084800602	32.1401666583839	78.98	97.83	29.61	29.46
41.7168406356806	87.8086496014509	32.140166658384	45.57	93.71	36.64	20.17
41.7168406356807	87.8076496014508	32.1401666583839	24.67	93.34	35.07	18.16
41.7168406356809	86.4810001536019	32.1401666583839	46.89	94.85	27.74	49.64
41.7168406356811	86.4800001536019	32.1401666583839	40.13	86.48	38.33	6.39
41.7168406356816	86.4800001535856	32.1391666583839	48.42	91.53	51.1	30.91
41.716840635684	82.3391390343318	32.139166658384	37.93	93.92	46.64	38.41
41.7168406356838	82.3391390343318	32.1381666583787	46.8	93.43	44.07	39.27
41.7168406356839	82.3391390343161	26.532999986028	49.91	91.9	29.51	43.61
41.7168406356842	82.3391390343161	26.531999986028	47.08	88.26	42.71	25.21
41.7168406356841	82.3391390343133	26.5309999860287	35.37	65.99	46.58	42.77
41.7168406356839	82.3391390343133	26.5299999859517	35.58	76.06	26.53	8.78
41.7168406356841	82.3391390343133	26.5289999859059	40.14	85.47	20.22	26.51

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
41.716840635684	82.339139034316	26.527999985906	38.99	86.42	22.62	12.82
41.7168406356836	83.2826623091087	26.5279999859062	36.6	82.94	12.12	44.77
41.7168406356839	83.282662309109	9.99913303110741	41.11	86.33	11.14	3.31
47.5579999210243	83.2826623091089	8.26437865055899	42.78	91.87	12.41	35.26
47.5589999210236	83.2826623091088	8.26437865055745	44.33	87.3	2.27	27.93
47.5599999209749	83.2826623091087	8.26437865055745	47.56	92.03	4.61	9.48
47.5609999209757	83.2826623091089	8.26437865055898	70.23	90.73	4.71	37.84
52.6263825128298	83.2826623091088	8.26437865055898	48.25	85.26	10.69	49.96
69.9513717450402	83.2826623091089	8.26437865055898	74.49	84.46	5.13	5.64
69.9513717450402	83.2826623091087	10.7940369485667	85.6	88.65	32.39	40.1
54.3175891609299	83.282662309109	10.7940369485668	54.05	68.39	12.29	14.97
48.6765747307732	57.8442696782502	10.7940369485667	42.59	39.16	5.9	36.88
48.6765747307732	57.8442696782502	10.7940369485667	45.71	40.8	10.89	34.61
48.6755747307731	57.8442696782502	10.7940369485667	42.95	44.74	22.67	47.83
48.6755747307732	57.8442696782499	12.2500001954501	43.21	42.35	12.25	16.43
48.6755747307732	57.8442696782499	12.2500001954501	45.6	43.93	17.79	19.94
48.6755747307731	57.8442696782502	12.2510001954493	27.4	59.84	3.43	47.68
48.6755747307732	57.8442696782502	12.772383702494	60.12	71.05	6.63	24.74
48.6755747307731	57.8442696782502	12.7733837024888	45.6	41.81	1.51	23.25
48.6755747307731	58.3490824308675	12.7733837024951	51.12	47.54	2.22	20.96
48.6755747307732	58.349082430869	16.5900004127498	40.4	40.19	35.32	32.32
48.6755747307732	58.349082430869	16.5900004127498	49.78	61.48	16.59	3.32
48.6755747307731	58.349082430869	29.2960360594555	47.3	55.25	23.22	13.14
48.6755747307734	52.7009477306909	37.8310867785926	63.26	50.77	40.6	14.97
48.6755747307733	42.7351274509649	37.8310867785926	41.07	43.98	42.76	16.59
48.6755747307733	42.7351274509649	37.8320867785926	42.72	42.84	54.45	48.6
48.6755747307732	42.7351274509649	48.0306623904955	58.75	56.63	68.13	26.43
48.6755747307733	42.7341274509649	48.0306623904955	53.73	28.37	56.21	48.55
48.6755747307731	42.7341274509649	48.0316623904955	58.02	32.46	71.61	35.22
48.6755747307732	42.7341274509649	61.3758822483387	57.66	15.51	81.33	35.11
48.6755747307733	42.7341274509649	61.3768822483387	53.87	15.51	67.82	48.76
48.6755747307732	42.7341274509649	61.3778822483387	61.27	24.41	67.08	39.95
48.6755747307732	42.7341274509649	61.3788822483387	65.16	40.78	60.78	37.77
48.6755747307732	42.7341274509649	61.3798822483387	60.94	57.56	60.13	37.6
48.6755747307733	42.7341274509649	61.3808822483387	45.42	39.91	67.31	7.33
48.6755747307732	42.7331274509649	61.3808822483387	42.69	39.78	60.49	10.22
48.6755747307733	42.7331274509649	61.3818822483387	71.33	32.23	64.13	42.89
45.8178364004299	42.7331274509649	61.3818822483387	41.47	31.69	75.83	27.11
45.8178364004246	42.7331274509649	73.7700005239001	44.15	32.64	73.77	10.23
45.81783640043	42.7331274509649	83.605304449001	47.34	38.25	97.3	14.49
45.8168364004302	42.7331274509649	83.605304449001	43.96	42.1	91.03	13.34
45.8158364004355	42.7331274509825	83.605304449001	40	38.77	99.41	18.88
41.9700017869752	43.2200017698834	80.35	41.97	43.22	75.7	4.65
41.9700017867609	43.2210017699484	80.3500	43.21	42.61	80.16	13.5
39.4608266388666	44.910616471331	80.3500000000023	42.62	44.81	79.79	3.21
39.4608266388667	44.9116164713278	80.3500000000021	45.57	28.26	77.82	48.56
30.7018966378739	51.9190003851084	80.3500000000022	21.99	57.15	79.17	10.23
27.18	51.9190003851084	80.3500000000022	33.01	55.55	89.21	36.48
27.18	51.9190003851084	80.3510000000022	30.83	54.42	86.59	13.2
27.18	51.9190003851085	80.3520000000023	27.18	54.04	89.82	49.76
27.18	51.9190003851085	91.6534387726446	5.58	22.9	91.06	47.89
10.8165462849995	51.9190003851085	91.6534387726446	20.88	59.51	94.7	36.31
10.8165462849994	51.9200003856934	91.6534387726446	9.06999999999999	51.92	93.4	2.47
16.1087384052431	56.9398820394286	77.9382429741369	12.14	56.76	74.37	5.34
16.1087384052431	56.9408820394304	77.9382429741371	13.36	65	72.75	29.08
23.3049450093614	56.9408820394302	77.9382429741372	28.95	69.72	73.23	21.24
23.3059450093614	56.9408820394303	77.9382429741374	23.47	70.49	67.86	29.96
23.3069450093614	56.9408820394303	77.9382429741372	27.62	60.61	68.71	40.48
23.3069450093614	62.0534322868454	77.9382429741373	26.15	61.96	69.66	39.04
23.3069450093614	62.0534322868453	77.2019687402528	27.28	65.47	69.94	12.73
23.3069450093614	71.0500000058193	77.2019687402528	23.52	71.05	74.38	2.83
23.3069450093614	73.0574455058139	77.2019687402528	34.24	70.46	67.21	46.56
23.3069450093614	73.0584455058139	77.2019687402529	26.5	63.44	75.23	28.82
23.3069450093614	73.0584455058139	77.2807681898058	24.03	65.56	79.56	12.46
23.3069450093614	73.0584455058139	77.281768189809	25.84	61.09	65.42	17.04
23.3069450093614	76.6600000446697	77.281768189809	24.25	76.66	84.45	7.23
23.3069450093614	76.6610000446699	77.281768189809	16.07	82.14	77.28	24.27
23.3069450093614	76.6620000446698	77.281768189809	32.42	78.27	77.18	49.72
23.3069450093614	82.2400002002554	77.281768189809	27.35	82.24	75.13	4.58
23.3069450093614	87.6087163068142	91.8899350264762	30.69	95.98	98.88	13.17
23.3069450093614	73.0110801657673	91.8899350264761	35.46	90.5	93.34	36.39
23.3069450093614	73.0100801657673	91.8899350264762	34.79	81.57	97.09	35.28
23.01087715929	73.0100801657673	91.8899350264762	24.86	66.05	97.16	20.4
23.01087715929	73.0090801657673	91.8899350264762	22.6	70.1	92.91	3.11
21.7499988044671	73.0090801657673	91.8899350264762	21.75	55.19	94.83	18.06
21.7489988044671	73.0090801657672	91.8899350264761	21.49	69.2	86.43	28.99
8.81825016422131	73.0090801657672	91.3600180467392	12.82	66.49	92.89	17.6
8.81825016422131	77.2144421974099	91.3600180467392	0.969999999999999	75.78	96.61	17.69
8.8182501642213	77.2154421974099	91.3600180467392	0.760000000000005	80.97	91.36	8.89
8.8182501642213	77.2154421974099	85.2700166122064	11.23	82.6	85.27	5.9

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
8.81825016422131	77.2154421974099	84.7961945020287	4.75	76.37	88.59	18.12
8.81825016422131	76.7700000000347	84.7961945020287	1.23999999999999	99.01	69.5	41.19
8.81825016422131	76.7700000000347	84.7961945020287	10.66	76.44	91.14	43.81
8.81725016422131	76.7700000000347	84.7961945020288	8.06	78.36	80.59	4.56
8.81725016422131	76.7700000000347	84.7951945020288	8.28999999999999	81.45	86.91	44.4
8.81725016422131	76.7700000000347	84.7941945020287	1.36	82.41	81.26	36.76
8.81725016422131	76.7700000000347	84.7931945020287	1.20999999999999	81.97	77.86	14.68
8.81725016422131	76.7700000000347	84.7921945020377	6.36	80.44	74.53	34.29
6.62000131358903	76.7700000000347	75.8700097957818	6.62000	72.96	75.87	3.81
6.61900131358904	76.7700000000347	75.8700097957818	5.06999999999999	73.15	76.92	4.26
4.63523	76.7700000000347	75.8700097957818	2.98999999999999	72.09	73.38	6.04
4.63523	76.7700000000347	64.6020663833762	3.44	75.58	64.88	32.57
4.63000000000888	76.7700000000347	61.8400057623214	0.909999999999997	72.43	63.78	18.26
4.63000000000888	82.1290003497498	61.840005762321	1.01000	87.83	68.27	21.8
4.63000000000888	82.1300003497497	61.840005762321	2.19	82.13	61.84	2.44
8.53035460041929	82.2332294088564	61.8400057623212	16.99	78.36	62.01	10.94
8.5303546004193	82.2332294088564	59.7522990315209	4.8	88.51	50.28	18.34
8.53035460041927	82.2332294088564	51.5409998326186	25.86	63.85	60.16	38.15
8.5303546004193	82.2332294088564	51.5399998326186	9.41	84.38	51.54	2.32
8.53035460041926	76.4961328603731	48.0609999687215	8.95	75.43	49.37	30.95
8.5303546004193	76.4951328603737	48.0609999687217	2.01000	79.01	40.57	42.13
8.5303546004193	64.2162219506393	48.0609999687218	3.20999999999999	36.35	38.54	37.4
8.53035460041932	64.2162219506393	48.0599999687219	2.56999999999999	49.67	48.06	15.72
16.8991274908437	64.2162219506393	48.0599999687217	19.65	58.2	51.17	41.68
20.4717834559231	64.2162219506393	48.0599999687219	30.36	58.14	54.2	13.13
20.4717834559231	67.8390000707418	48.0599999687223	23.78	67.37	54.34	23.49
20.4717834559231	67.8400000707417	48.0599999687218	21.39	62.71	50.33	35.55
20.4717834559231	67.8400000707417	44.4647455919433	20.35	68.75	46.32	2.07
20.4727834559231	67.8400000707414	44.4647455919357	30.85	54.39	47.15	33.55
20.4737834559234	67.8400000707418	44.4647455919356	28.77	62.05	46.68	31.17
27.8699999999961	67.8400000707417	44.4647455919356	23.5	55.84	45.92	18.38
27.8700000000041	67.8400000707416	42.8900000612159	28.86	67.84	42.89	0.99
23.9071573449967	67.8400000707415	34.6811645878242	22.17	64.94	33.7	3.52
20.4322173776593	67.8400000707415	34.6811645878242	25.01	63.12	37.19	28.84
20.4322173776593	67.8400000707415	34.6811645878242	22.51	60.15	43.07	23.44
20.4312173776589	67.8400000707415	34.6811645878242	4.15000	75.92	20.91	36
20.4302173776589	67.8400000707416	34.6811645878242	15.54	52.83	23.01	26.09
20.429217377656	67.8400000707414	34.6811645878242	11.18	57.92	34.05	14
20.4292173776569	67.8400000707415	34.6801645878235	39.42	71.54	17.38	47.2
20.4292173776572	68.1190634852492	34.6801645878242	4.20999999999999	66.53	21.42	21.01
20.4292173776572	68.1190634852492	34.6801645878242	23.19	66.22	32.78	5.11
20.429217377656	68.120063485257	34.6801645878232	0.620000000000005	84.95	30.66	36.73
20.429217377656	68.1210634852571	34.6801645878236	11.74	69.17	44.25	18.09
20.429217377656	68.121063485257	20.178309714381	8.67	72.77	42.39	28.82
20.428217377656	68.121063485257	20.178309714381	25.24	60.77	36.77	37.65
15.2115619017352	68.121063485257	20.178309714381	24.2	92.42	34.13	40.35
15.2115619017352	75.1687984350969	20.1783097143809	28.82	81.78	35.71	43.64
15.2105619017352	75.1687984350908	20.1783097143818	12.07	80.14	22.08	6.18
15.2095619017356	75.1687984350908	20.1783097143805	8.6	80.56	11.38	41.43
8.7096528066978	96.1203470428857	10.1296531697412	5.54000	99.29	6.96	5.49
18.1888793042262	67.1948950513989	10.705459215952	16.79	62.67	10.23	4.76
18.4499999999999	66.1100000026992	15.6558532007795	19.86	66.11	18.19	2.9
18.4499999999999	61.7244593745023	10.4927814685366	20.64	65	8.49	4.42
18.4499999999999	53.7629999778954	8.39266757759376	22.65	62.2	11.71	11.7
18.4499999999998	53.7619999778953	8.39266757759377	24.49	66.27	29.11	27.9
18.4499999999998	53.7609999779009	8.39266757759377	21.1	78.12	20.54	28.48
18.4499999999998	53.7609999779009	8.39166757758725	31.99	67.74	24.97	46.93
18.4499999999998	53.7599999779007	8.39166757759412	27.36	59.94	13.4	22.06
18.4499999999998	53.7599999779007	8.39166757759412	27.64	62.78	13.86	15.95
18.4499999999998	53.7599999779004	8.39066757759412	25.62	68.98	3.75	43.08
18.4499999999998	53.7599999779009	8.38966757761579	20.56	61.44	16.14	30.47
18.4499999999998	53.7599999779018	4.2899999993848	37.85	53.76	4.29	19.4
12.5	53.0699999923034	0.499999996585314	11.46	53.07	0.5	1.04
12.5	49.9657587448606	0	24.47	65.24	5.9	32.36

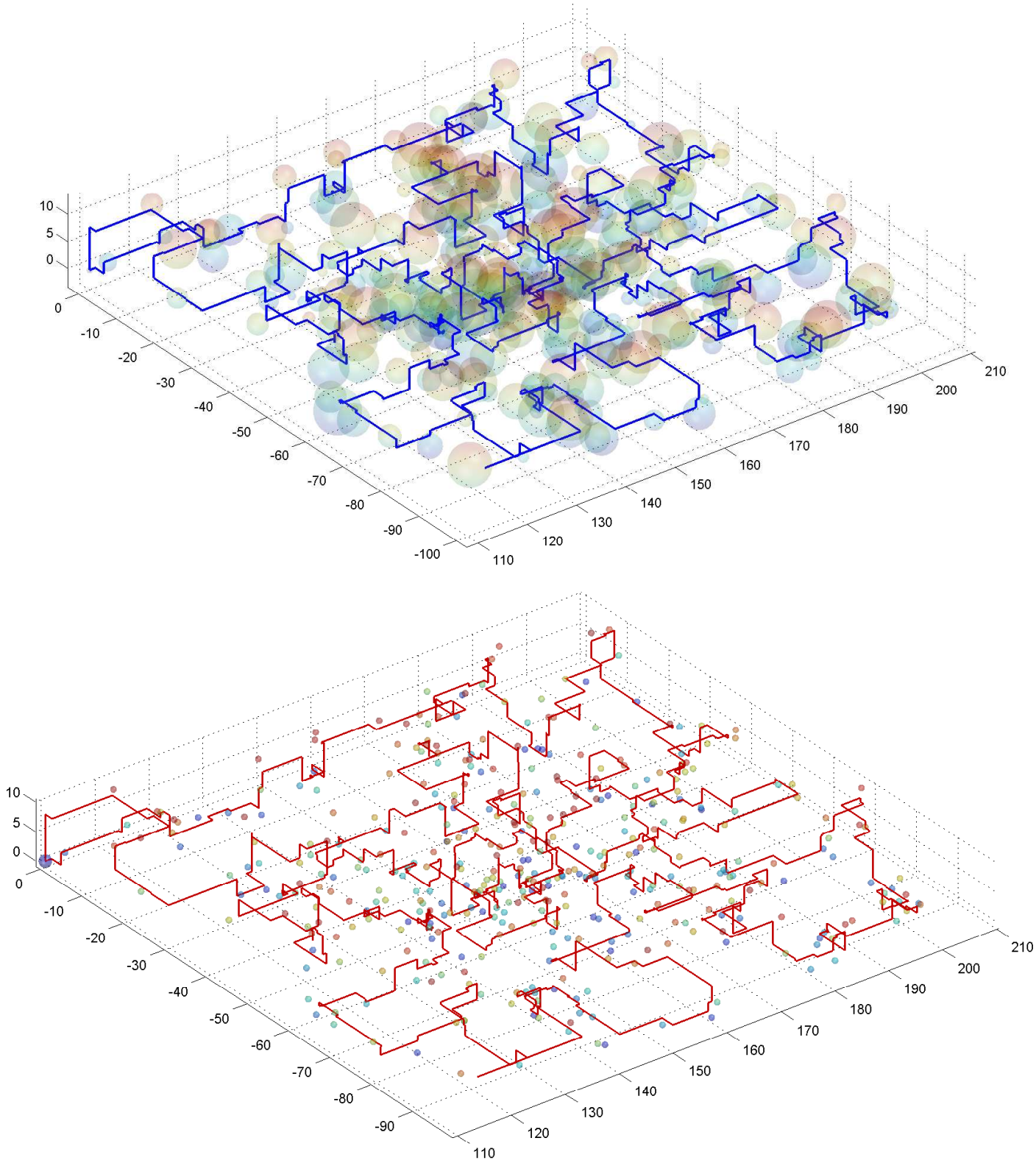


Figure N.198: *team*4_400, arbitrary radius, 3D, Manhattan, Length = 1780.7982675

Table N-201: Solution for *team*4_400, arbitrary radius, 3D, Manhattan

Total distance: 1780.79826746153 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
1.13432854012349	2.30390221529501	2.09747024852757	2.34935	1.70725	1.418964	1.5141472
11.8455335503595	3.0144458362051	4.51954518404501	12.34295	3.720825	3.558355	1.2923936
16.5338249957512	6.3140249959906	5.30727400000121	16.533825	6.314025	5.413684	0.10641
17.1382500007589	7.80520497429915	1.77092616475452	17.13825	10.254625	1.09375	2.541304
25.090375	6.56503257237085	1.77092616475452	25.090375	4.2535	0.574579	2.6027734
28.8078893711832	7.28730003169415	1.77092616475452	28.471925	7.124375	1.494169	0.46477
32.5454785218567	9.22623104820165	1.77092616475452	32.636425	9.71905	0.854223	1.0447423
32.5454785218567	9.22623104820146	5.10217799875371	32.5307	9.603625	5.102178	0.3776832
33.2403250001159	9.22623104820146	7.76916890628459	33.240325	8.160175	9.454403	1.9941137
40.4236999556129	9.43446709999997	3.76065498067885	40.4237	12.94705	3.760655	3.5125829
42.5027657475785	8.65221353776436	3.34533815974287	40.718225	8.45085	2.325605	2.0651849
44.9778671869931	5.86173221574203	2.5282888130045	46.59205	4.24755	0.914106	2.7958463
44.9778671869932	8.7930996382926	8.41051338132805	44.6523	7.1683	9.495828	2.2507146
44.4463222494342	8.79309963829259	8.59332528532154	43.2503	8.7931	9.432262	1.4609189
53.2145551017299	10.673851145368	8.59332528532154	54.0981	10.209075	9.589747	1.9657569
59.0341985887427	10.673851145368	8.59332528532154	56.7601	13.3255	9.545614	3.6207209
61.8636000724133	10.673851145368	8.59332528532154	62.944875	12.9098	8.420704	2.4896628
61.8646000724133	10.673851145368	8.59332528532154	61.5062	10.2838	8.047741	0.7604293
67.1840479477067	10.673851145368	8.59332528532154	68.784175	11.8632	9.776368	2.318307
65.6402794000001	8.88592500885917	4.85789800218911	64.181275	8.885925	4.857898	1.4590044
71.1318411603773	5.8557500128303	2.74857391281834	71.829525	5.85575	2.05089	0.986674
70.9108488662594	1.59437739666712	3.80122488597778	69.817575	1.306825	4.894499	1.5726355
77.3352250005373	1.59437739666712	3.22411046596506	77.335225	0.00945	1.073545	2.6715027
80.2396608006673	2.42032500091331	7.44013709999999	82.33615	2.420325	8.700274	2.4460605
79.6523000002717	4.1446250001503	7.44013709999999	79.6523	4.144625	8.31435	0.8742129
77.8803363509263	7.20422127681245	5.79362300032118	77.882675	4.11235	4.515775	3.3455297
76.1649760000003	11.8320750049185	5.79362300032118	76.1173	11.832075	5.793623	0.047676
76.2985123911163	12.2676687462815	3.2621182171445	77.464	15.628175	3.533669	3.5672263
76.2985123911163	17.9434908468898	3.26211821714451	77.750225	18.79385	0.265085	3.8375488
76.3447476470803	18.057474895956	1.26941612682847	77.472675	18.057475	0.141489	1.59513
75.7751555035485	18.057474895956	1.26941612682847	75.3053	17.780525	0.662947	0.815641
75.7751555035485	22.1189242999484	1.46937187538787	76.538875	22.08605	1.37194	0.7706109
75.7751555035485	22.3545962002313	5.3847849678407	76.27055	23.463675	8.429053	3.2776576
75.5968814141678	23.1886935848584	8.52424758471716	75.41995	23.365625	8.701179	0.3064542
81.5575083118157	22.8521250400822	5.84449989514761	83.1155	24.690275	4.773978	2.6366931
81.5575083118157	16.7565846169316	5.84449989514761	81.52085	13.687775	5.204149	3.1351213
87.3023000037067	11.9373749996064	5.81030100000114	87.3023	11.937375	5.783418	0.026883
94.0900499934347	9.3588750289118	8.63398929999996	94.09005	9.358875	9.999877	1.3658877
96.9207500974441	8.69667119520809	8.42657413992301	98.6909	7.723575	8.237085	2.0288551
98.8291343025459	8.69667119520809	3.82854684563529	99.82775	8.49955	3.828547	1.0178851
96.3462837801031	8.69667119520809	1.14841740312788	94.81355	7.137025	0.426722	2.3027404
96.346283780103	16.7463503114634	1.14841740312788	96.9141	16.74635	0.695888	0.7260841
95.9669025663289	26.5517165169132	1.61125279263995	95.640625	28.68455	2.397586	2.2964659
92.251148	35.3086249988376	2.50206198559827	90.921925	35.308625	2.502062	1.329223
93.269592442008	36.7633927968212	6.78447737300772	94.997925	34.851	5.629957	2.8244109
94.5682429180728	41.7593899850314	7.38241411015107	94.807975	43.25145	7.382414	1.5111964
94.5682429180728	41.7593899850314	7.40509298523171	95.9689	41.808	7.756384	1.4448559
92.6739288729547	40.5745556587282	7.40509298523171	92.049975	40.056175	5.962344	1.6551621
87.3495239961596	40.0453061839799	7.40509298523171	87.349525	37.1432	9.692858	3.6954146
84.7333625872524	44.1151736130666	6.74738194223587	86.306375	44.08645	5.63357	1.9276333
84.7333625872524	44.1151736130666	6.46859723339661	85.82305	42.253575	5.699647	2.2900333
82.7995132240496	44.1656724175066	6.46859723339661	84.710775	44.260425	5.70064	3.5456061
82.7995132240496	45.3839999467975	6.46859723339661	82.166	45.384	5.835084	0.895923
82.7995132240496	45.3839999467975	8.46383377534375	80.003925	44.278875	7.256115	3.7953033
82.9115748054362	46.4582250501739	8.46383377534375	83.247325	46.458225	8.799584	0.4748225
79.5563249907393	48.3274061999999	6.39782599980109	79.556325	49.1563	6.397826	0.8288938
74.0183751719183	48.3274061999999	6.39782599980109	75.70595	48.354275	5.510084	2.7185379
74.0183751719183	46.3785165	4.26166903636279	74.018375	45.692475	4.261669	0.6860415
72.9243314573018	47.2656775794369	3.8576870198089	70.38585	48.289775	4.820236	2.9015796
72.4211075109823	51.2166976130472	2.5019155812225	70.163125	48.595475	2.681471	3.4643229
71.5338501589721	51.2645749950751	1.6188033036527	70.20275	51.264575	0.287703	1.88246
73.869531082713	51.8108862472081	3.51210974121389	74.97575	51.8098	4.043794	1.2273588
73.8695310827129	56.3221259078261	4.32066028910268	74.7548	56.66355	6.610021	2.6437784
74.203328277592	56.3221259078261	4.59270770900238	75.12385	56.355025	6.655597	2.2591934
78.8974749943569	59.8160920701991	5.88123361359276	78.897475	61.3791	6.581026	1.7125137
93.6725156501863	59.8160920701991	5.88123361359276	92.124775	61.791725	6.696503	2.9459173
93.7571493485907	57.5521000043287	5.88123361359276	94.377175	57.5521	6.223661	0.7082996
93.7571493485907	54.2778104201572	5.36188079180375	95.486225	52.746525	3.57388	2.9208705
85.726974841554	54.2778104201572	3.84769486943582	85.3769	55.416	3.88436	1.1913741
85.726974841554	47.0317017948735	1.36689619818101	83.835575	49.221375	2.182226	3.0061312
85.726974841554	46.8847994471716	1.34010449999991	85.726975	46.8848	0.120938	1.2191665
84.0419286237868	44.5903892730623	1.34010449999991	83.98185	43.958725	1.112514	0.6740969
82.4553178241786	40.6332825983097	1.97261618041266	82.455325	37.974875	2.274181	2.6754574
77.9767017968725	40.6332825983097	1.97261618041266	80.128375	42.2928	0.877447	2.9296913
77.736325	40.6332825983097	1.97261618041266	77.736325	41.257125	4.306668	2.4159837
77.2672749966792	35.7374863569204	1.61130027908458	77.267275	35.3236	0.141297	1.527158

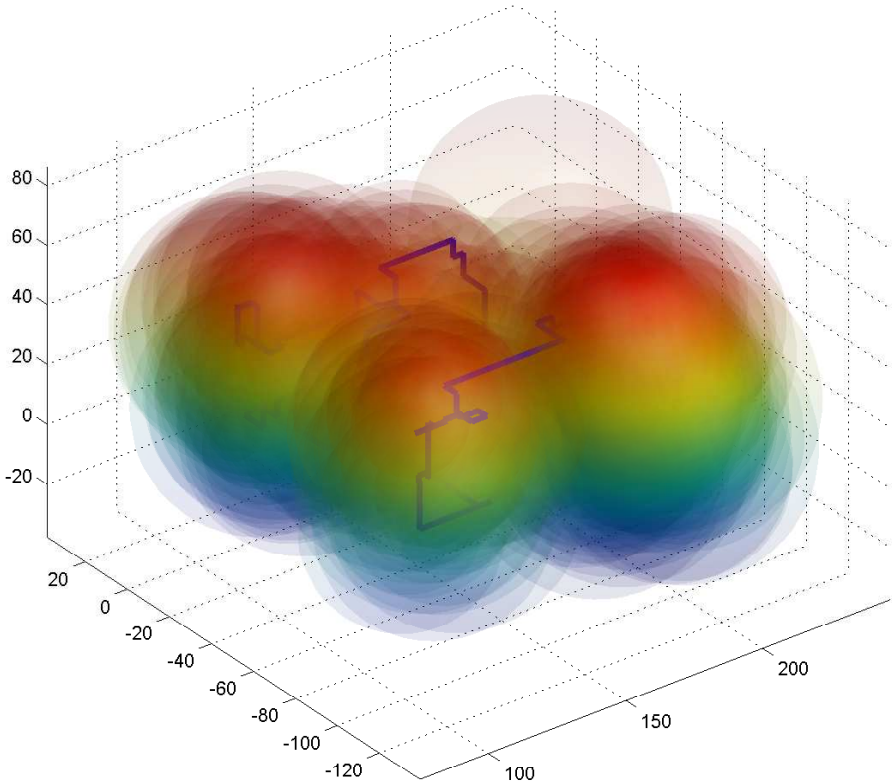
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
75.6511690842808	35.7374863569204	1.65559370234879	74.186175	37.664625	1.593253	3.0650817
75.4837740758095	35.7374863569204	2.80536389637082	74.4851	34.7013	1.961771	1.668137
73.4490878631156	35.7374863569204	8.37924475231563	72.419975	34.998125	8.679512	1.302263
75.9913110049283	35.7374863569204	8.37924475231563	75.0516	36.4713	6.125794	3.1806421
76.2661964918694	39.1932498529314	8.37924475231561	76.5757	39.19325	8.28894	0.3224087
75.9845928617848	42.1652150669699	8.37924475231561	76.046775	40.829925	8.304908	1.3388025
69.4257998327191	42.3644951803561	9.00366117888322	69.4258	42.661825	9.2188	0.367001
65.8828376538834	40.1687491557894	9.00366117888322	64.48255	39.62755	9.929967	1.7702677
64.6270252163884	40.1687491557894	9.00366117888322	64.627025	39.598675	9.161247	0.591454
64.6270252163884	42.804357672433	8.69222073425803	63.06625	46.073225	9.963062	3.8790845
64.6270252163884	47.9578734075452	8.69222073425803	65.024675	48.473875	9.912197	1.4488497
61.7230798867533	47.9578734075452	8.69222073425803	61.33205	47.81805	9.220678	0.6721027
58.8190074203691	47.9578734075452	8.55306017742425	58.59885	48.807625	9.719414	3.714657
58.8190074203691	48.2461466412882	7.63928533953538	60.81405	45.86495	6.053591	3.5607331
56.432000108803	48.2461466412882	7.63928533953538	56.7604	48.090675	9.498427	3.4617573
56.432000108803	48.2461466412882	7.36738203492042	56.4549	49.1402	6.740043	1.0924331
55.956185891284	48.2461466412882	4.27010645537891	54.870925	48.098925	4.394617	1.102256
55.9360989195969	49.6239627000002	1.72012527993144	55.9361	51.897075	1.720125	2.2731123
53.5110171018751	49.4940228468898	1.58186941582818	54.099275	51.121125	0.198175	2.2154275
52.3387433364221	49.4940228468898	1.58186941582818	52.703075	49.56845	2.111726	0.9899267
51.332324999955	49.4137416	1.20653399987949	51.332325	47.3944	1.206534	2.0193416
50.5776767101023	49.4137416	1.20653399987949	48.801425	47.111675	0.180447	3.261649
50.545012648229	51.7746000678277	1.17145691739303	50.5204	51.7746	0.922891	0.2497815
50.5450126482289	53.8819925760458	3.38672899389599	51.731775	54.063975	3.386729	1.2006342
47.8029530798804	53.8819925760458	4.84951260119565	47.81055	52.508825	5.320082	1.4515793
47.8029530798804	54.5327002404725	4.84951260119565	47.802925	54.5327	5.178486	0.3289734
46.1191249837078	54.8582312747976	4.3986012703904	46.119125	55.3112	3.945632	0.6405949
45.8285291864196	54.7760844426081	7.51486828285281	45.616825	55.349625	8.112205	0.8547389
45.4155965719351	54.1207749809711	8.37555843736632	41.89655	53.797625	8.251962	3.5360134
43.6847462722508	52.6713708692538	9.29683168514885	43.47965	52.4779	9.729662	0.5165632
43.6847462722508	52.6713708692538	4.76381695602137	43.054225	52.07985	5.94327	3.6716308
43.6847462722508	52.6713708692538	4.76281695602137	44.413025	51.821425	3.225875	1.9013123
41.2499034353766	52.8496076778328	4.89598908975317	44.549375	51.8385	4.639375	3.4753711
41.2499034353766	53.3151906044877	4.89598908975317	42.80595	50.969325	5.199786	2.8313705
40.2510955416293	53.3256234182351	4.89598908975317	40.529725	53.231175	6.058478	3.1574837
40.2510955416294	53.3929510641841	4.89598908975317	39.658325	53.39295	5.48876	0.8383044
40.6625882653786	56.2875043444002	3.96807086200198	40.468775	56.35765	3.688499	2.0428185
40.6625882653786	56.4038631682848	3.56474977135368	41.323875	57.06515	2.903463	1.1453823
40.5674105801843	56.4038631682848	4.47235324537751	41.765825	57.606275	4.678763	1.8921573
40.5674105801844	55.7250322451343	6.19373734773137	40.703325	55.537825	6.299364	0.2543153
36.8642072494847	55.7250322451343	7.27612376233606	36.8297	55.690525	7.310631	0.0597683
36.9918056946913	59.1261979046324	4.79510620360608	38.122975	58.912025	4.096565	1.3466157
37.2829317590176	59.3440500018311	4.60407209999994	39.243575	59.34405	2.988695	2.5403868
31.1897563884405	59.3440500018311	4.60407209999994	32.800625	59.186225	6.71386	2.9956219
30.6886248774599	60.6372742441182	4.60407209999994	30.688625	60.637275	0.70091	3.9031621
30.5925583323549	66.7334362386751	5.30126699909377	28.20205	68.6988	5.301267	3.0947027
31.5835245881063	66.7334362386751	6.18663447125145	31.583525	68.6781	7.867205	2.5702207
32.29529717115	66.6045588045094	6.18663447125145	34.7277	67.482525	7.589491	2.9420086
38.9591611004097	66.6045588045094	6.18663447125145	37.615325	65.262725	9.608735	3.9137176
39.7753000000004	66.6045588045094	6.18663447125145	39.7753	66.19835	5.821872	0.5459462
41.6831750028853	66.6045588045094	6.7267209369798	41.683175	67.299925	9.367966	2.7312469
44.4049378387087	65.9758181662009	6.7267209369798	42.3891	68.379025	5.906332	3.3982575
44.5011035629896	65.7157250022391	6.7267209369798	45.884675	65.715725	8.319043	2.1094453
44.5011035629896	65.7157250022391	2.90094240783033	44.898775	67.784675	2.145396	3.8144474
44.5011035629896	64.7039249964322	2.90094240783033	44.4217	64.703925	2.042243	0.8623628
44.5011035629896	63.1487463176248	4.33608127042271	44.541975	62.0002	4.336081	1.1492733
44.5011035629896	63.2743338645887	6.12967900001787	46.228875	65.56925	6.129679	2.8726006
44.405988073766	63.2743338645887	6.96665103219189	42.88515	65.09985	8.113938	2.6385081
42.1237192000036	60.8719500008152	6.96665103219189	42.114525	60.87195	6.966651	0.0091942
45.1100246929966	60.2368428714104	6.96665103219189	43.7645	63.186425	9.005722	3.8299193
45.1100246929966	59.3499970699539	7.51506131491704	45.110025	59.219325	7.835164	0.3457469
50.6002674031356	59.3499970699539	7.51506131491704	51.0767	59.931625	7.815468	0.8096439
50.6002674031356	58.1772000130033	7.0689215086635	50.342	58.1772	6.133715	0.970213
51.5379386052011	56.3819441331346	9.2485813333683	53.1029	58.71345	6.825055	3.7092457
51.8090284864124	53.8509999992224	9.61333548247184	51.8225	53.851	9.626807	0.0190516
51.5310678	51.5263	9.09696700198758	50.9611	51.5263	9.096967	0.5699678
51.5310678	47.6010049219179	8.84325800133703	52.0729	45.66175	8.843258	2.0135272
50.343324246754	47.601004921918	8.84325800133703	51.464375	46.273425	9.764247	1.9665818
50.0754750107964	48.6363604763553	7.6747784737223	50.075475	49.526025	6.785114	1.2581756
47.4414324658289	48.0709999987734	7.6868710454446	47.35915	48.071	7.780887	0.1249376
47.4414324658289	44.8006908294073	7.26894255858657	46.718325	46.79505	7.837302	2.1962207
47.4414324658288	41.9727810754084	6.60602299999924	49.0937	40.0849	6.606023	2.5088011
46.7098934282971	42.3033677009687	6.60602299999924	44.89855	41.381	7.163397	2.1076985
43.4784034354331	42.3033677009687	5.49642568762082	43.242475	40.8624	6.853519	1.9934273
43.4784034354331	42.3863969491884	1.37585995133906	45.015525	41.584025	2.803346	2.3336041
42.9357003755737	48.8093110938431	1.37585995133906	43.5222	45.0811	1.214529	3.7775081
42.9357003755737	48.8499248893242	1.37585995133906	43.10885	48.272275	1.575949	0.6882847
41.3638000021032	51.0465611317853	1.37585995133906	41.3638	51.811825	0.610596	1.0822466
36.3097524999999	51.0417750023858	1.37585995133906	38.966475	52.166125	2.317575	3.6894736
36.3097525000001	51.0417750023858	1.96548801482765	34.822	51.041775	1.965488	1.4877525

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
36.3097525	50.8488183439836	7.49929833709985	37.074525	51.14655	9.462196	3.5957201
36.3097525	45.5588394465346	7.49929833709985	35.77655	45.5234	7.314779	1.4365385
38.0513999270949	45.1831186086399	7.49929833709983	38.0514	44.25295	8.429467	1.3154571
38.6440363923936	45.271386433886	6.09381200005079	40.7628	47.39015	6.093812	2.9963842
38.3541795888598	45.271386433886	4.43835085557764	37.32375	47.164775	1.301487	3.8061293
36.5997277999997	45.271386433886	3.48266699907555	36.34605	45.558575	2.970524	3.6813731
36.5997278	45.0413250029379	3.48266699907559	34.241775	45.041325	3.482667	2.3579528
36.5997277999999	39.558699828884	3.35849237061574	35.05695	38.887125	3.774047	2.3714259
37.0397954205085	38.708432679789	3.35849237061574	36.0198	39.389875	2.90819	1.9831699
37.2082178329439	38.708432679789	3.35849237061574	37.4906	38.735475	3.373994	0.2840973
39.1902974476317	37.9555277114741	3.32569888316231	39.47365	37.672175	3.042346	0.4907813
34.6564201161392	39.0206870795478	7.63843489272966	37.4986	37.94785	9.024015	3.3389816
31.7651999361416	39.0968198545637	7.63843489272975	31.7652	39.5927	8.134315	0.7012804
31.3729416251815	36.1492549144188	5.61145895040971	31.8731	36.0461	3.846108	1.8377332
31.1891240306115	36.1492549144188	5.41871601823808	30.2641	36.115	4.866777	1.0777196
31.1891240306115	31.3082097715016	4.21392515949945	32.29465	34.1886	4.533526	3.1017705
29.4659500000005	31.2299249999993	3.2684306	29.46595	31.229925	1.232208	2.0362226
28.4714582000005	28.6016316944798	4.20386184428173	28.216025	27.287675	5.4487	2.41843
28.4714582000005	28.081275115965	4.20386184428173	27.65685	28.081275	4.203862	0.8146082
33.9890750011484	26.5488015188713	4.33511126357529	33.989075	25.3104	7.891632	3.7659631
34.0987250043664	26.5488015188713	3.11035657599696	34.098725	26.483975	3.010898	0.1187202
41.7914146816584	27.3016398203417	3.11035657599696	42.344525	27.231625	2.735005	0.6721026
41.7914146816584	28.6873227574289	7.09812403806715	39.217825	28.48755	6.718496	2.7558001
42.6325023749228	31.5346763794432	7.09812403806715	43.312375	33.022625	9.818329	3.1742295
49.0146749961648	33.0971441746566	7.09812403806715	49.014675	34.9475	8.94848	2.6167984
49.0146749961648	32.7586483687508	5.54199652746002	48.825175	33.4678	4.421401	2.052047
49.0146749961648	32.7586483687508	1.96725916960111	49.821325	32.088775	0.505787	2.6868713
53.581253529913	32.7586483687508	1.96725916960111	53.08505	32.116125	1.177184	1.1328164
55.3126288777112	26.614777933261	1.96725916960111	52.727475	27.05645	3.021539	2.9182147
55.5416822084923	26.614777933261	1.96725916960111	54.7913	22.79115	2.590985	3.9863921
56.1847499515987	26.4957815249985	1.96725916960111	56.18475	25.5187	0.990177	1.3818024
57.049480585739	26.6147746372035	7.23429491377352	57.8987	27.066925	9.346556	3.9092312
57.049480585739	27.622583000539	7.23429491377352	58.5251	25.335175	8.213376	2.8927993
57.049480585739	27.9707703969935	7.70263126434893	59.6161	30.5374	8.744708	3.7763801
55.3539159034386	27.9707703969935	7.70263126434893	53.429725	29.230175	5.838259	2.9604889
52.2530538006919	27.9707703969935	7.70263126434893	53.51985	31.610925	8.734185	3.9899375
49.3760825467099	27.9707703969935	7.70263126434893	49.48335	26.949275	8.082485	3.4612295
49.220952832811	20.8837294374302	7.70263126434893	47.99765	20.639375	7.512605	1.2618593
56.5345111420851	20.8837294374302	7.70263126434893	56.46315	20.9863	9.377425	3.1469731
56.707375022861	20.8837294374302	7.70263126434893	56.707375	20.9848	8.081779	0.3923879
56.707375022861	20.7762826366992	7.70263126434893	56.145325	18.970525	8.712859	3.3151033
56.707375022861	16.36807206516	7.70263126434893	53.686425	15.19815	7.953267	3.2492576
56.707375022861	16.36807206516	7.35283658552428	56.680125	15.845675	6.62366	3.207153
57.1466116533695	16.36807206516	7.35283658552428	58.962525	15.549225	6.884037	2.3682429
58.6675499994181	16.3286985	4.65908100021234	58.66755	14.455925	4.659081	1.8727735
58.6675499994181	16.5814002482297	4.65908100021233	59.666825	17.15215	3.601254	2.7658857
65.9365583439517	16.5814002482297	2.80085966496562	66.273425	16.5814	2.463993	0.4764014
65.8420302578639	18.8266605181088	3.18114674427998	65.789175	19.559925	1.053267	2.251298
65.7922416038963	19.4860533611155	4.10386948946079	62.8697	20.929125	3.670375	3.2881032
65.7922416038963	21.2909233100462	8.72168921992663	64.881075	21.1972	7.607995	1.4515751
65.7572750035437	28.4959500107142	9.32112139999986	65.757275	28.49595	9.473031	0.1519096
65.7572750035437	28.4959500107142	6.81968660351301	68.792375	27.90175	4.368368	3.9463741
65.7527689925302	28.6328039750707	2.22825371064447	67.6691	30.587025	1.957775	2.7503569
61.787229451773	28.6328039750706	2.22825371064433	59.25755	30.092125	1.789844	2.9531507
59.8560074124992	36.6376996779144	2.07374819796009	59.82755	37.21565	1.143092	1.095882
59.8560074124992	36.6376996779144	4.7207709981412	59.92645	35.207	4.720771	1.4324328
59.5462340487547	37.0866577073039	7.62436927875306	60.313175	36.907775	7.157937	0.9152904
55.8945250098983	37.2992499059178	8.1834736	55.894525	37.29925	9.136585	0.9531114
54.2718662000001	38.6935000074718	6.38010596903849	54.125425	38.6935	6.380106	0.1464412
57.7514108	40.3691749992301	5.09625217589449	58.980725	40.369175	5.096252	1.2293142
57.7514108	43.4067749999988	5.09625217589449	57.24125	42.40615	5.476964	2.5354041
57.7514108	43.4067749999988	1.50704577896999	56.281125	43.406775	0.357518	1.8663211
57.8380185503321	44.7619652807629	1.50704577896999	55.460475	43.213925	0.442759	3.4716194
60.8229894049978	44.910675014659	1.50704577896999	64.04505	44.910675	0.523975	3.3686945
60.6496404819347	54.6649297422156	1.50704577896999	59.0369	52.162425	0.980631	3.0447964
57.9552971524311	54.6649297422156	1.50704577896999	55.262125	52.9866	2.328913	3.5612885
57.9552971524311	55.3855013691193	2.36892699541317	57.767975	55.4125	2.368927	0.1892578
57.9562971524311	55.3855013691193	2.36892699541317	59.205025	55.76	1.820366	2.6513752
61.3500915998897	55.3855013691193	2.36892699541317	61.751375	53.5726	3.689653	2.857714
61.3500915998897	55.3855013691193	3.76574524844171	61.491825	51.7088	3.765748	3.6794322
61.3500915998897	55.767768438074	5.60524848853233	60.964225	55.767775	5.605242	0.3858666
67.3038305343489	55.767768438074	6.3231407300131	66.095725	55.876775	6.205798	1.2540995
67.9571096233359	58.486425000279	6.71582264109871	68.048425	58.486425	8.31929	1.6060654
67.9571096233359	58.7335780123516	5.55338112437072	67.662425	58.9604	5.24713	0.4817437
67.9571096233359	62.5789750053638	4.65096804772528	68.033375	62.578975	2.177441	2.4747025
67.9571096233358	64.8800000000648	4.92435575224706	67.8084	64.88	6.618444	1.7006027
72.2300811034318	66.5881875735696	4.29969294077077	74.919425	66.332825	2.561604	3.2122786
75.3618839245877	66.5881875735696	4.29969294077077	76.3481	68.05155	4.299693	1.7646676
75.3618839245877	66.3996423856084	2.16304438817093	75.320425	66.338125	2.101527	0.0963723
75.3618839245877	66.846918671163	2.16304438817093	73.97555	66.71955	2.504	2.6718873

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
75.3618839245877	66.8479186711627	2.16304438817093	74.758025	68.76505	2.771423	2.7316723
83.7002243701126	69.9883687853368	2.16304438817092	82.150425	71.4598	0.532397	2.6881218
90.0936298433784	69.9883687853368	2.16304438817091	91.5733	68.725	1.37953	2.6135119
90.0936298433784	69.9883687853368	4.62046276203638	91.08095	71.69145	1.548548	3.6485541
90.3144749518885	70.0926516	4.95709410493198	90.314475	71.662575	4.957094	1.5699234
92.4638174138724	70.0926516	7.37911204145034	90.725625	70.444425	7.760216	2.1020018
98.0025835596122	69.2573414527898	8.01383954292307	98.93765	68.322275	8.948906	1.6195826
94.4950238691628	75.1458254934642	7.12802562093184	94.404	75.185075	7.131673	0.0991926
94.2653716117452	76.3448767784016	6.83274543931517	91.825175	77.123475	9.251483	3.5229343
91.4428500612131	80.9252000298896	2.03193313404506	91.03755	80.9252	1.385966	0.7625888
91.4428500612131	84.1266000013738	2.03193313404506	92.480625	84.1266	1.286063	1.2780059
91.336670517513	89.540321282789	2.15287110312133	92.685275	90.310575	1.584168	1.653919
88.6013903340948	89.5717109276343	2.31883602317629	89.0595	90.291	3.16566	1.201812
86.5451494870809	89.5717109276343	2.31883602317629	87.858275	88.334025	4.100051	3.4946441
86.545149487081	89.5717109276343	5.87460100148261	90.195175	89.03695	6.180904	3.7016857
85.3942106	92.6644750077874	5.87460100148261	84.25115	92.664475	5.874601	1.1430606
85.8268348618566	96.1513083134381	6.29187853223042	84.9479	97.513325	6.355392	1.6436369
85.8268348618566	98.8370848745577	7.38409888718008	86.192975	99.203225	7.750239	0.6341733
84.2180643394879	98.5672204519091	7.22942489729605	84.730325	97.611875	9.216212	2.4041303
84.2180643394879	94.9239935352886	4.07003873372707	84.77555	95.283075	3.666391	0.7763126
75.8384998780492	90.0921153450232	2.82410957459629	75.8385	89.39705	2.129044	0.982971
75.6919170964479	90.607930515181	3.147968461608	75.589675	88.707575	0.958209	3.3878078
74.0142296880738	90.607930515181	3.147968461608	72.88955	91.55335	2.086078	1.8128248
74.0142296880738	96.8306560899224	6.3681252243824	72.374675	95.981125	5.386278	3.0465832
74.0142296880738	96.8316560899224	6.3681252243824	74.44305	98.0205	8.628544	3.9109049
72.222075013195	97.4296670109489	6.3681252243824	72.222075	99.2555	9.348041	3.494791
71.3064750160826	97.4296670109489	4.29617885920989	71.306475	97.9771	2.882666	1.5158171
68.4246524951205	96.5482374256924	4.29617885920989	67.679475	96.828325	2.179153	2.2617553
65.2470627714536	96.2772232428141	4.52552709698277	64.46975	94.91155	5.12346	1.6813097
65.2470627714536	90.7632073505435	8.42364627262647	66.508125	91.30325	8.984758	3.030605
57.4852649198179	90.2054500001787	8.50519155652381	56.428075	90.20545	9.562383	1.4950934
57.4852649198179	83.7936554671307	8.15654628843777	56.13655	83.451075	6.561985	2.1163693
57.485264919818	83.7926554671304	8.15654628843777	54.01775	81.8894	8.14471	3.9555254
60.1989592992972	82.9078493210878	7.98750857758305	60.2356	81.956375	8.121308	0.9615343
65.3510425392407	82.9078493210878	6.45294987366123	66.686275	83.4025	9.789982	3.6281274
65.3510425392407	81.0180242883665	1.84263132274161	64.2971	80.8087	0.617407	1.6296583
67.9701499677556	79.1582150891378	1.84263132274162	69.349625	77.516575	1.446757	2.180516
67.9701499677556	74.9902174	1.75753369389323	67.97015	74.943825	1.28227	0.4775226
72.1063241695996	74.9902174	4.73042100265206	72.106325	71.513625	4.730422	3.4765924
74.7260042047921	77.0934996223844	7.69638726836499	75.94035	77.0935	8.244154	1.3321727
71.9668499991814	78.4608438004274	7.69638726836499	71.96685	79.285825	7.324255	0.9050284
66.1802009305731	77.9670759528035	7.69638726836489	67.096325	78.407125	5.545343	2.3790582
65.7213749974873	76.7065499988208	7.76006909999849	65.721375	76.70655	7.829144	0.0690749
61.0400960658466	76.7065499988208	7.68919795919697	60.77085	76.3761	8.633151	1.6799218
61.0400960658466	76.7065499988208	7.38529195871817	59.360575	77.3659	4.085186	3.7611478
54.9114145757183	75.5337086802092	7.11938226139614	55.289875	75.9977	8.05121	1.1076205
53.7021350023123	74.9715000077898	6.65023621751489	52.726325	74.9715	6.042198	1.1497459
62.5535674333817	74.448449977215	6.65023621751489	63.106325	74.44845	6.994666	0.6512855
62.5371836326929	69.5999133119348	6.65023621751489	63.9561	69.944325	5.325084	2.046353
62.1142611000002	66.4790746772644	4.62259288673698	61.692525	66.479075	4.622593	0.4217361
62.1382252056354	63.6605004800617	2.04167779999999	62.481725	64.778425	2.883198	1.7172899
62.1382252056354	61.2181750343615	2.04167780000008	62.138225	61.218175	0.933898	1.1077798
63.1458033487053	59.0331216481991	2.88504308594896	63.564825	58.6141	2.885043	0.5925861
62.2653041	60.2897499999948	3.35869799998851	61.732525	60.28975	3.358698	0.5327791
62.2653041	60.3603441146977	5.2169263767356	62.1796	60.091575	6.795975	3.7726122
62.2653041	61.3779999969594	5.21692637673559	63.23165	61.378	8.16167	3.0992482
59.585164026782	61.3779999969594	5.21692637673556	56.708375	61.084725	7.280884	3.5527238
54.5321454751349	62.3592779600141	5.08961753998828	53.3194	62.871025	8.033264	3.2245451
54.5321454751347	62.3592779600141	2.02115217160559	53.6353	62.58645	0.328338	1.9291342
54.5321454751347	65.8171252950178	1.96775646035374	52.902425	64.80215	1.303032	2.0317535
54.5321454751347	65.8181252950178	1.96775646035374	55.5813	65.9389	1.049446	1.399502
53.9533847826556	70.8870393650623	1.50556731900378	53.249925	71.4317	1.507319	2.1097265
53.9523847826554	70.8870393650623	1.50556731900359	50.03295	71.692275	1.548117	4.0015227
49.5022999886548	70.8870393650623	1.45629001297989	49.5023	72.1454	0.362105	1.6675468
39.5821588916218	70.5803088876721	1.45629001297989	39.430175	70.428325	1.436461	0.2158504
40.6674712762649	70.8838824730905	1.55005025831818	40.205375	70.4585	3.559151	2.1049867
40.6674712762649	75.2451033485771	6.60490145091694	40.4153	76.30845	7.455735	1.7018987
40.6674712762649	85.1504831135304	6.60490145091694	40.913925	82.729825	6.876661	3.0771461
43.9033866041438	85.1504831135304	6.60490145091694	42.31835	87.347525	7.738111	3.5183382
43.9033866041438	87.179179093313	6.60490145091694	43.9034	88.387225	9.898098	3.5077797
48.4801452611235	87.179179093313	6.60490145091694	49.4347	86.0537	7.963635	2.0059997
48.4801452611235	97.9077093630304	3.92732047695677	48.99045	98.5583	3.927321	0.8268489
47.7907674981012	97.9077093630304	2.48691968759102	49.100125	97.070175	0.603113	2.680503
41.2568642198812	95.3406669481728	2.48691968759102	40.290225	96.689525	2.280132	1.7024114
33.4081863000001	92.8143701355794	2.48691968759102	32.22375	93.28635	0.1273	2.7707895
33.4081863	90.9034852160333	2.48691968759102	33.324025	88.862275	2.512368	2.0476207
33.4081863	86.4766500026328	2.24489598860946	32.733925	86.47665	2.244896	0.6742613
33.6656266991804	84.3206093282546	2.19790140626417	36.3513	83.686975	3.385766	3.004223
34.4306036556686	81.3923840209958	2.04403472255469	35.60905	81.995775	1.580638	1.4026949
34.7582075311128	77.3120675152187	1.67362698276418	36.110325	75.95995	0.32151	2.3419359

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
33.6611936853649	77.3120675152187	2.00239139999992	31.60195	76.5275	2.478681	2.2545249
29.5312002779141	77.7593751245402	2.00239139999992	29.5312	77.759375	2.944562	0.9421706
29.2379506137697	80.0223733134606	2.00239139999992	30.46345	78.65395	2.876347	2.8521408
29.2379506137697	80.0223733134605	1.34568459999934	29.23795	80.022375	0.178216	1.1674686
28.4971519036682	81.8715271213435	2.87567366426832	27.4824	83.15295	4.645899	2.409453
28.4971519036682	82.4956500003121	6.19045558319969	30.896	84.86835	8.084952	3.8695341
25.4474682772549	82.4956500003121	6.19045558319969	22.609375	83.218325	5.878629	2.9452111
24.2008885489064	82.4956500003121	6.8739304257901	24.1584	82.49565	6.916419	0.0600879
24.9690756255131	86.1064387659774	5.90924842697206	23.831575	88.204275	5.345531	3.750467
24.9690756255131	90.9405049243521	5.90924842697206	27.27955	90.9405	3.131217	3.6132742
24.9690756255131	97.251767482537	5.90924842697206	26.6212	98.85125	4.844028	2.5342758
22.2763529879317	97.251767482537	5.90924842697206	22.27635	97.920025	9.573749	3.7249339
5.48379378961405	97.251767482537	5.90924842697206	2.307925	97.449675	7.701639	3.6521191
14.7795766886887	94.4715249742893	3.80660365564232	15.45105	94.471525	3.135131	0.9496062
13.7295196759654	83.5252753072944	5.59688144545857	13.92855	83.165725	6.067072	0.6244747
13.5418244000002	83.5252753072945	6.55535586196651	12.1212	83.525275	6.555356	1.4206244
13.5418244000002	78.0280417685517	7.0199550389836	13.11545	76.27845	9.886291	3.3850773
18.7239836802084	77.1704028824103	7.0199550389836	20.9401	75.2051	6.209147	3.2102784
19.4145500003276	76.8637301652278	7.0199550389836	19.41455	76.0326	9.16761	2.3028676
21.1027930187513	76.8637301652278	4.23289999672084	22.467675	76.02705	4.2329	1.6009174
16.4015000216577	79.2144644999999	3.65875994065757	16.4015	79.860725	3.65876	0.6462605
8.347775	79.1675612033226	2.77038699136434	8.347775	79.0334	0.64524	2.1293776
1.40838255960523	79.1675612033226	4.16659210000028	0.00154999999999461	79.256375	5.511897	1.9485664
1.69202518768162	71.3290063359998	4.16659210000028	0.331024999999997	69.303175	3.842333	2.7183647
1.69202518768162	67.9043994562609	4.16659210000028	1.692025	67.9044	4.763979	0.5973869
2.20627504584286	63.3293519	3.54459407004141	2.20627500000001	60.72485	3.544594	2.6045019
2.57282784212411	63.5227051962801	3.54459407004141	2.404275	62.37445	1.602613	3.9363141
8.85309945475579	65.924307273635	3.10868483158582	8.8531	66.09375	2.882202	0.2828521
14.2144188026477	65.924307273635	7.02524435291357	12.50315	65.202575	6.796126	2.0894727
17.272874917462	65.924307273635	7.02524435291357	17.272875	64.973225	8.378801	1.6542893
18.3821999572492	65.924307273635	5.39808437627965	18.3822	65.772725	3.391578	2.0122239
21.0091	66.372757438664	5.39808437627965	21.0091	68.35155	4.610936	2.1296062
21.8261932218529	65.1738570195731	5.49939248489925	21.668825	63.73225	4.392072	1.824597
24.9366554208848	63.4939235340206	8.39797401009246	24.44465	63.1281	8.275156	0.6252843
26.59779999938	58.3007499995327	8.8894681999979	26.5978	58.30075	8.947543	0.0580748
26.7408442000001	57.7810006860523	6.90449066769251	30.732825	57.781	6.904491	3.9919808
26.0086383999968	56.122526079828	6.01465739781835	22.891175	56.122525	6.014662	3.1174634
28.8379580855254	54.5430404385229	6.01465739781837	29.2116	52.625	7.111098	2.2691686
28.8379580855254	54.5430404385229	3.0982266271414	28.87265	55.2137	3.915468	1.0577671
30.1371923808022	54.1345978542993	2.44764608243053	30.1798	54.1346	0.93414	1.5141057
30.1371923808022	53.3275496708906	2.44764608243067	30.804475	50.3614	3.667235	3.2757758
30.1371923808022	51.6485845713588	2.44764608243067	31.916925	49.63125	4.365548	3.3038515
30.1371923808022	49.6482250001029	2.342971373128	33.276075	49.648225	0.482877	3.6486347
30.1371923808022	46.4796591034139	2.342971373128	31.24645	46.9846	0.258005	2.8458636
27.2689	44.7547559567733	2.342971373128	27.2689	42.18555	1.296271	2.7742388
24.821391780786	44.7547559567734	3.03077187214933	27.251975	44.47235	3.840979	3.7272714
24.821391780786	44.7547559567734	3.52716452467444	28.231575	43.86655	5.176578	3.8908642
24.8018971519464	48.4400226081776	5.76517137929531	26.549225	47.5983	5.827804	1.9405088
21.9516756173042	49.5064780002473	6.52890099999998	21.4066	50.274675	5.660638	1.3469706
17.2193086480995	49.5064780002473	6.52890100000003	17.219275	51.795125	6.528901	2.288647
17.2193086480995	49.5064780002473	6.75319420317153	19.028925	48.6519	8.742576	3.3340627
17.2193086480995	43.7428006719411	7.86172833086753	19.292975	43.870425	8.142944	2.0965358
17.1384811661797	42.4358930722677	7.86172833086753	19.322625	41.061025	7.646061	2.6823985
15.8066243502127	41.4022943419309	8.83645250713687	15.806625	40.87695	9.361797	0.7429492
15.8066243502127	45.44042090225	4.30075448360136	17.095675	43.177	5.934841	3.0748926
14.2410499996478	46.1101249997794	2.56676440000001	14.24105	46.110125	0.966331	1.6004334
14.2410499996478	46.1101249997795	3.47814940714322	13.3837	46.032275	5.26473	2.1621199
10.7151499774025	53.9357885	3.47814940714322	8.9679	51.422725	2.23495	3.3986294
10.7151499774025	53.9357885	5.28159900753157	10.71515	57.182775	5.281599	3.2469865
10.1121901000001	53.9357885	8.40806300731762	11.458875	55.406825	8.437123	3.5619902
10.1121901000001	52.2460999850481	8.40806300731762	9.352575	52.2461	8.408063	0.7596151
10.439714014136	51.5806745870608	8.64730713782312	11.134375	51.580675	9.341968	0.9823989
8.8156740250417	45.9003833435337	8.64730713782312	8.7059	46.626875	9.397095	1.0497725
6.558392	38.2205500001497	5.84434200041677	4.729125	38.22055	5.844342	1.829267
17.526196921481	34.5833559794816	3.79337080299672	18.77905	36.01655	4.45503	2.0153111
18.4765749887338	33.2342351827108	3.16350501112994	18.476575	32.50015	2.42942	1.0381531
26.1858575711275	33.3473426688018	3.71455860975844	25.49855	33.45475	4.180424	0.8372327
26.5010131457032	33.5626881439652	9.44883414586997	26.51415	33.575825	9.461971	0.0227537
22.7931750012608	31.8094999988405	7.10688270000015	22.793175	31.8095	6.267813	0.8390697
20.9892000001825	22.5824266658317	7.85874135160692	20.9892	20.7572	9.683969	2.581261
20.9892000001825	22.5824266658317	7.55074120292076	21.1268	22.989225	6.335554	2.3000479
20.9892000001825	22.5824266658318	6.0617645017788	20.995625	24.282225	3.380339	3.5058599
20.9892000001825	22.5824266658318	1.21145372255088	20.686175	21.9667	1.804567	1.6301674
19.9845001757558	26.9157485737642	1.14582047488064	19.9845	27.40155	0.660019	0.687027
14.8848637717971	26.9157485737642	1.2114518860603	15.2685	27.387025	1.441223	1.686213
14.8848637717971	26.9157485737642	4.04533113380197	14.358825	25.883825	4.414924	2.1162985
2.22883579855757	22.6352139280769	4.18911645883444	0.610974999999996	22.331075	4.829551	1.7663891
2.2288357985575	13.917763762839	8.1111921050407	2.12502499999999	13.8908	8.215003	0.1492663
4.29099541293883	13.917763762839	7.96675473340837	5.29819999999999	16.16745	9.485319	3.2389206
12.0857510527866	13.917763762839	7.96675473340837	12.5519	14.734025	9.438961	2.0899186

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
12.3450488597878	13.917763762839	7.96675473340837	12.54795	14.295525	6.980367	1.0755618
12.3450488597878	13.916763762839	7.96675473340837	14.259	13.428825	7.786985	2.5476741
12.3450488597878	10.0757999987716	7.96675473340837	13.011825	10.0758	8.49229	0.8489863
11.1812834057199	1.60618819997198	7.96675473340837	10.7326	2.49095	9.542224	1.8617797



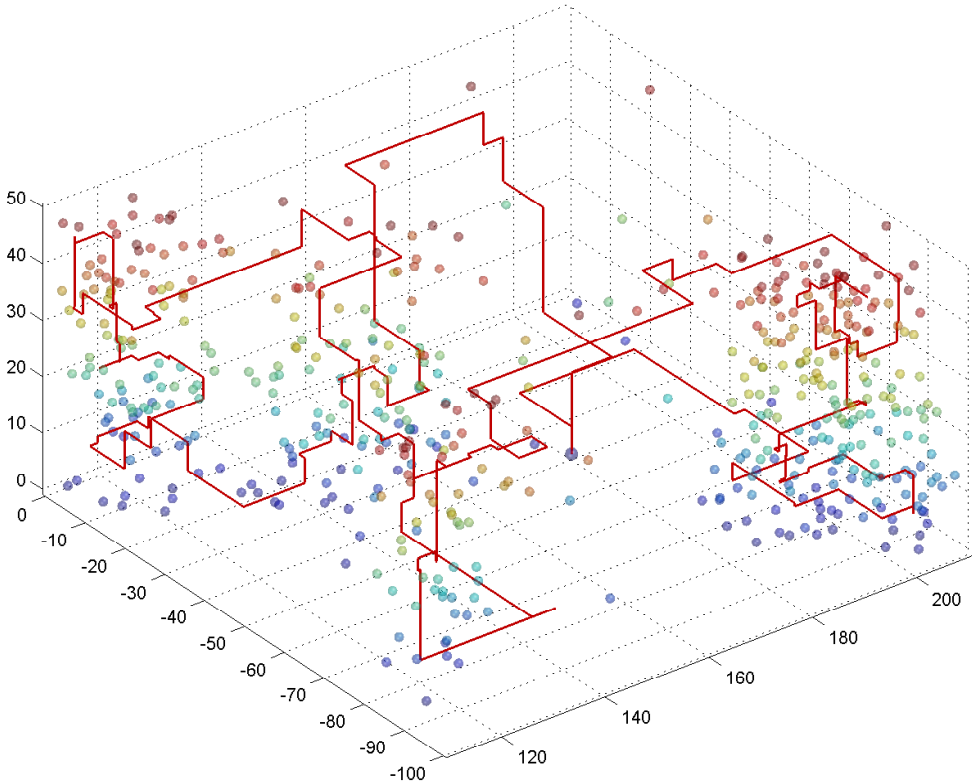


Figure N.199: *team*5_499, arbitrary radius, 3D, Manhattan, Length = 1156.8842941

Table N-202: Solution for *team*5_499, arbitrary radius, 3D, Manhattan

Total distance: 1156.88429407185 Depot: x 70 y 40 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
70	40	14.4671749591796	64.954	37.309	2.2557	38.0588
75.6692992521899	40	14.4671749591725	84.8772	45.0654	27.1944	32.4975
75.6692992521899	39.999000000125	14.4671749591724	78.1743	38.6355	23.4376	9.4129
77.7797000000038	22.814499998998	25.5987892632789	92.9329	22.8145	25.5988	15.1532
77.7797000000033	22.814499998998	32.9945080680639	91.1956	46.5873	37.0515	33.1213
77.7796999999978	22.8134999989992	32.9945080680638	94.4757	9.4701	4.1216	35.9228
77.7796999999992	12.7205860553005	40.7332085413557	84.9979	3.9891	22.3271	21.6131
73.922499956231	12.7205860553005	46.5675131989593	97.6128	23.6668	47.1593	38.6763
73.9224999560798	12.7195860553005	46.5675131989596	73.9225	9.6395	49.6476	4.3559
58.8648203053968	12.7195860553005	46.5675131989593	57.0413	9.9678	41.9779	25.5663
58.8648203053968	12.7195860553005	46.5675131989593	49.7446	26.3767	39.5089	17.8751
47.2292263524891	20.2868672332122	33.1289838255215	49.2796	22.4102	31.3443	3.4493
47.2292263524891	20.2868672332122	25.2252237135042	44.6412	21.1681	25.9788	2.8359
47.2292263524891	20.2868672332122	22.4764398116189	41.315	20.08	19.8292	34.9881
47.2292263524891	20.2868672332122	22.4764398116189	41.9344	32.8635	38.9519	35.1115
47.2292263524891	20.2868672332122	22.4754398116192	47.312	20.115	22.1433	1.1739
47.2282263524891	20.2868672332122	22.4754398116192	52.9148	12.3625	13.3985	18.1234
47.2282263524891	31.4694572130739	22.4754398116192	45.5527	26.8832	17.5652	29.6166
47.2282263524891	31.4694572130738	16.5047999980137	48.0614	30.3792	22.0976	10.3406
47.2272263524891	31.4694572130744	16.5047999980137	49.2766	27.3707	5.7576	19.0778
47.2262263524891	31.469457213074	16.5047999979898	45.8434	28.1097	8.3609	15.1991
47.2248940728632	31.4694572130739	16.5047999979898	47.2249	31.4694	15.6819	0.8229
47.2238940728632	31.4694572130739	16.5047999979898	47.2998	37.9687	10.4015	27.2808
47.2228940728632	31.4694572130745	16.5047999980137	45.8348	38.3992	25.1619	22.4696
47.2228940728632	33.9280318066421	16.5047999980137	54.1532	48.4548	25.954	21.9974
40.6043538507254	33.9280318066422	16.5047999980137	49.5234	55.0957	34.2852	33.4236
39.1479011844334	33.9280318066419	17.2007999169581	36.1356	35.5262	17.2008	3.41
39.1479011844347	33.9280318066419	17.2017999169799	49.5874	32.9921	18.1971	32.9977
39.1479011844347	33.9280318066419	17.2017999169799	44.3864	36.3116	23.5359	25.6737
39.1479011844298	33.9280318066294	21.683999979664	41.4412	38.9568	21.684	5.527
39.14790118443	30.7107766691284	22.2074119931157	41.7938	26.8087	24.3703	25.8964
39.14690118443	30.7107766691284	22.2074119931756	35.5448	24.2684	24.4525	19.4434
39.14590118443	30.7107766691258	22.2074119931755	35.1494	28.8106	26.783	32.8637
33.9160000062272	30.7107766691257	22.207411993176	33.916	28.6484	33.3227	11.305
33.9150000063571	30.7107766691258	22.2074119931755	27.0476	34.4285	7.3345	22.5144
33.9140000062974	30.7107766691284	22.2074119931756	32.6554	40.5505	15.9859	13.7264
33.9130000062972	30.7107766691284	22.2074119931757	29.0396	36.1372	21.3542	26.8002
33.9120000062969	30.7107766691284	22.2074119931757	36.9556	37.1182	29.5204	17.3813
33.9110000062946	30.7107766691285	22.2074119931758	43.0635	31.4686	2.6925	35.4855
33.9100000062946	30.7107766691285	22.2074119931758	47.7847	28.4345	6.8217	34.5556
33.9100000062946	30.7107766691285	22.2074119931758	48.8851	33.6728	5.7706	37.4425
33.9090000062946	30.7107766691285	22.2074119931758	26.8183	32.6012	18.9499	9.1398
33.9080000062946	30.7107766691285	22.2074119931758	20.1974	25.6106	23.6453	21.4356
33.9080000062946	30.7107766691285	22.2074119931758	32.1965	21.571	25.1134	23.9954
33.9070000062946	30.7107766691285	22.2074119931758	20.4824	37.2243	17.8497	26.8839
33.9060000062946	30.7107766691285	22.2074119931758	23.8226	36.8408	17.9115	22.7865
33.9050000062946	30.7107766691284	22.2074119931758	25.1657	24.0751	15.8892	31.1219
33.9040000062946	30.7107766691284	22.2074119931758	20.8616	31.8567	15.5881	16.439
32.2393517355845	30.7107766691284	22.2074119931757	21.333	28.4534	22.585	38.4741
32.2393517355845	30.7107766691284	22.2074119931757	48.2875	25.5427	23.29	34.7388
32.2383517355846	30.7107766691284	22.2074119931757	23.4789	26.9268	25.8998	12.6384
32.2383517355846	30.7107766691284	22.2074119931757	30.3241	25.8121	22.3846	12.6672
32.2373517355846	30.7107766691284	22.2074119931757	24.5672	24.4137	22.4773	9.9276
32.2373517355846	30.7107766691284	22.2064119931756	27.0718	22.4926	21.0532	16.8129
32.805796794728	30.7107766691284	19.4211467540605	37.4163	24.6203	17.7469	31.2894
32.805796794728	33.497041902084	11.6841000057796	38.8284	23.4703	6.171	29.4494
32.805796794728	33.497041902084	11.6831000057797	40.4113	32.0356	8.7762	16.7439
32.8057967947281	33.497041902084	11.6821000057797	33.7228	34.609	11.6821	1.4413
32.8057967947281	33.497041902084	11.6811000057797	30.555	31.3009	2.2328	18.8032
32.8057967947281	28.1825842710306	9.88909999966254	47.3754	37.9401	16.076	18.8601
32.8057967947281	28.1825842710306	9.88809999969357	33.6715	23.2449	9.8871	5.013
32.8057967947281	28.1825842710306	9.88709999966254	27.7157	24.2487	8.5851	7.9151
32.8057967947281	28.1825842710306	9.88609999966254	37.9243	23.9119	1.2026	11.4323
32.8047967947279	28.1825842710305	9.88609999966255	30.1704	30.5441	13.3093	13.1238
26.4820343816375	28.1825842710305	9.88609999966256	26.5855	26.5008	8.649	2.5361
26.4810343816375	28.1825842710305	9.88609999966254	29.5705	36.67	2.9094	21.5656
26.4800343816375	28.1825842710306	9.88609999966254	28.4031	32.2444	2.4033	13.356
26.4800343816375	29.817833036515	5.44036695116226	22.5985	27.2784	2.308	18.0514
26.4790343816342	29.8178330365151	5.44036695116226	28.392	21.3903	1.2616	19.1959
20.5686999999299	29.8178330365152	5.44036695116228	20.9805	20.9752	1.6334	15.7265
20.5676999999299	29.8178330365152	5.44036695116227	20.5677	31.0115	4.2467	1.6881
20.5666999999299	29.8178330365151	5.44036695116227	21.8127	22.4456	3.4445	26.3083
14.6195224350233	29.8178330365151	5.44036695116227	23.4201	21.9457	1.1934	16.8924
14.6195224350233	15.7578000360529	5.44036695116227	19.5822	17.4941	4.8723	10.5093
14.6195224350233	15.7578000360529	10.3936723230345	14.7479	11.7757	0.3405	30.4615
14.6185224350233	15.7578000360529	10.3936723230345	15.3264	12.7877	8.2093	21.1927

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
14.6175224350233	15.7578000360529	10.3936723230345	15.9493	16.7531	4.9236	36.5644
14.6175224350233	15.7578000360529	10.3936723230345	11.8636	12.6991	19.7066	36.7112
14.6175224350233	15.7568000360529	10.3936723230345	14.5843	15.7568	10.6354	0.244
14.6175224350233	5.90946965894554	10.3936723230345	9.00749999999999	17.4052	0.9316	24.0927
14.6175224350233	5.90946965894554	8.26945053484122	15.42	17.0914	20.8872	16.8786
14.6175224350233	3.10555524395231	8.26945053484121	13.8628	4.3052	10.5937	36.3913
14.6175224350233	3.10455524394902	8.26945053484116	14.8098	1.8409	8.2695	1.2782
14.6165224350233	3.10455524394902	8.26945053484122	19.0824	1.094	9.1576	39.3681
14.6155224350231	3.10455524394901	8.26945053484129	13.2084	1.5682	5.3875	22.8241
14.6145224350232	3.10455524394893	8.26945053484337	13.7484	0.7577	11.0651	20.4003
14.6135224350232	3.10455524394893	8.26945053484435	18.2952	1.0836	13.7585	19.3439
14.6125224350231	3.10455524394895	8.26945053484434	11.5168	3.287	14.9558	27.8697
14.6125224350231	3.10455524394895	8.26945053484434	8.6382	10.3371	11.0732	27.1817
14.6115224350231	3.10455524394893	8.26945053484435	8.02670	2.1019	15.008	25.3395
14.6105224350231	3.10455524394899	8.26945053484433	8.95990	2.5066	9.8186	22.9145
14.6095224350231	3.10455524394898	8.26945053484434	11.169	1.5527	6.9406	37.2188
7.06948837404114	3.10455524394893	7.16711319493494	1.2522	5.4022	3.551	7.2247
5.46523951985196	3.10455524394946	7.16711319493494	1.729	2.5191	1.116	7.1357
5.46523951985196	9.45835427334991	7.16711319493494	4.24299999999999	12.8676	1.4876	6.736
5.46523951985196	9.45935427334991	7.16711319493494	8.40090	11.7989	4.4087	5.5639
5.46523951985196	9.46035427334991	7.16711319493495	8.65000	19.7295	4.359	27.9816
5.46523951985196	11.8592583365405	7.16711319493494	2.2625	16.1551	5.423	18.392
5.46523951985196	11.8592583365405	13.8075203527843	2.5621	10.2967	1.629	12.6169
5.46523951985196	11.8592583365405	13.8075203527843	0.421099999999996	5.2548	22.7354	12.1971
5.46523951985196	11.8592583365405	13.8075203527843	3.5607	15.7968	11.1608	5.1124
5.46523951985196	11.8592583365405	13.8075203527843	11.3126	12.1774	8.305	11.447
5.46523951985196	12.1583712743989	13.8075203527843	9.7281	5.4172	24.1163	13.7083
5.46523951985196	12.1583712743989	13.8075203527843	1.5116	19.0597	21.7588	16.8413
5.46523951985196	12.1583712743989	13.8085203527843	5.3173	19.9696	21.9865	36.3373
5.46523951985196	12.1583712743989	13.8095203527843	2.3396	12.8751	20.4499	24.3453
5.46523951985196	12.1583712743989	13.8095203527843	6.693	16.2603	19.0942	35.4947
5.46523951985196	18.4933127000465	18.9442853227668	2.785	16.9995	21.2146	3.817
5.46623951985222	18.4933127000465	18.9442853227668	3.6086	13.0876	23.3357	29.6311
5.46723951985223	18.4933127000464	18.9442853227668	9.20950	19.5087	23.9042	29.1422
5.46823951985222	18.4933127000464	18.9442853227668	4.8686	17.5054	20.7421	8.1304
15.5812529577422	18.4933127000464	18.9442853226763	12.6858	19.6571	22.2672	29.725
15.5812529577422	18.4933127000464	22.8252127020713	19.7672	14.9362	24.0245	14.1421
15.5812529577422	18.4933127000464	22.8262127020713	20.821	23.0825	24.0822	38.9893
15.5812529577422	18.4933127000464	22.8272127020712	30.4469	21.4825	3.8833	31.6307
15.5812529577422	18.4943127000464	22.8272127020713	24.4655	29.9184	30.3851	29.8304
15.5822529577422	18.4943127000464	22.8272127020713	18.8587	8.5087	18.9878	16.8623
15.5822529577422	18.4943127000464	22.8282127020709	16.5052	19.9903	24.3242	2.3082
15.5822529577422	15.1356562991922	22.8282127020709	16.6256	12.3206	29.6782	7.479
15.5822529577422	9.92418085701045	22.1333341155935	18.047	6.7045	32.7171	18.9999
15.5822529577422	9.92318085701042	22.1333341155935	15.4595	7.4752	20.3496	3.0314
15.5822529577422	9.92318085701046	22.1323341155776	19.0819	14.2893	25.2658	6.4132
15.5812529577423	9.92318085701078	22.1323341155776	12.8565	9.4609	19.9198	9.659
15.5812529577423	7.23827996631611	22.1323341155776	16.2452	9.322	13.5564	31.0488
15.5802529577422	7.23827996631612	22.1323341155776	13.9396	19.5452	20.1112	16.1224
15.5792529577423	7.23827996631612	22.1323341155776	14.7151	17.4542	12.2868	14.2143
11.6671575372631	5.57693114640916	22.1323341155776	10.31	1.5005	9.6337	14.7461
5.35843112945497	5.57693114640916	22.1323341155775	5.20059999999999	6.8919	22.4547	22.5304
5.35843112945494	5.57593114640916	22.1323341155776	4.0211	5.0495	22.5141	26.717
5.35843112945498	5.57493114640917	22.1323341155776	3.9473	4.1638	20.7291	2.4396
9.08271030413644	6.01695343188558	25.4007999716335	10.2894	7.4847	25.4008	1.9001
9.08271030413638	5.04834976986513	32.1672221687947	10.526	3.779	24.6321	20.82
9.0827103041366	5.04834976986514	32.1682221687948	9.42529999999999	3.1222	32.8197	2.062
9.08171030413659	5.04834976980996	32.1682221687948	2.87569999999999	1.3778	31.3806	25.9254
9.08171030413659	5.04834976980996	32.1682221687948	10.6256	1.7583	32.3574	24.4015
7.62179999998536	5.04834976980996	32.1682221687949	9.9632	1.8111	30.9688	39.4027
7.62179999998536	6.13333580448283	32.1682221687941	15.5961	8.5134	30.9972	9.1422
7.62179999998536	6.13433580448283	32.168222168794	15.3812	8.8682	40.3179	15.4856
7.62179999998536	6.13433580448283	32.168222168794	5.0355	11.9367	30.2057	6.6489
7.62179999998536	6.13433580448282	44.5737000106235	9.9074	11.0867	39.8487	12.9373
7.62179999998537	5.41810000027075	44.5737000106235	12.1595	5.1953	46.5778	17.8764
7.62179999998537	5.41810000027075	44.5737000106235	12.9432	8.6486	42.1679	15.3773
7.62179999998536	5.41710000027075	44.5737000106236	5.4781	9.3534	39.1694	25.1036
7.62179999998537	5.41610000026562	44.5737000106235	5.49809999999999	6.1028	41.7036	36.5373
7.62179999998537	5.41610000026562	44.5737000106235	16.1355	6.6685	45.2938	36.4875
7.62179999998536	5.41510000026563	44.5737000106235	11.5459	0.8736	43.2005	30.4629
7.62179999998536	5.41510000026563	44.5737000106235	18.0288	10.2093	41.4498	31.7011
7.62179999998455	5.41410000026562	44.5737000106235	1.2192	5.9144	48.7598	28.8322
7.62179999998455	5.41410000026562	44.5737000106235	12.5256	4.7007	49.4275	23.5883
7.62179999998375	5.41310000026239	44.5737000106235	4.1301	7.1548	40.2018	37.1524
7.62179999991544	5.41210000026239	44.5737000106236	8.8668	5.4121	44.5737	1.245
7.62180	3.71678581384689	44.5737000106236	3.9756	4.3104	38.409	39.2995
2.14886953618776	3.71678581384791	45.6653906329826	1.2646	1.8964	47.5137	2.7408
2.14886953617629	3.71678581385746	45.6643906331032	5.6082	3.0104	39.1925	11.8319
2.14886953617759	3.71678581385746	34.8265000234785	3.8933	3.6617	34.8265	1.7453
2.14886953617629	3.71678581385747	33.2664382908305	2.4773	0.052	34.3258	34.0937

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
1.77289791428485	6.15350000468607	33.2664382908305	1.4037	6.1535	31.8542	1.4597
1.77289791428484	6.15450000468607	33.2664382908305	2.7247	6.6491	25.454	8.9474
1.77289791428484	6.15550000468606	33.2664382908305	4.1027	5.9391	36.7092	6.8207
1.77289791428485	6.15550000468614	36.9748191069353	2.67230	10.4123	33.2768	24.6134
1.77289791428485	14.4699999990554	36.9748191069353	2.4532	11.1564	41.7483	29.4831
1.77289791428485	14.4709999990554	36.9748191069353	2.4914	14.471	42.2927	5.3662
1.77289791428484	14.6370504782747	36.9748191069353	3.76260	17.1174	49.9096	21.877
1.77289791428484	14.6380504782747	36.9748191069353	5.6246	7.277	28.7239	11.7089
1.77289791428484	18.606454332433	36.2501371969788	0.782799999999995	19.7397	35.1787	1.8473
7.2946733864982	18.606454332433	36.2501371969787	4.753	19.8404	42.7266	29.0972
7.2946733864982	18.6054543324331	36.2501371969788	12.3192	17.7013	37.8038	29.1964
7.2946733864982	18.604454332433	36.2501371969787	18.6523	3.9117	30.6336	19.4015
7.2946733864982	18.603454332433	36.2501371969787	4.024	17.3232	48.8138	37.3677
7.2946733864982	16.5214432624773	36.2501371969787	17.3372	11.1211	33.7282	21.5037
7.5614927160924	16.5214432624773	36.2501371969791	8.098	10.1576	40.7441	7.8091
7.5614927160924	16.5204432624814	36.2501371969802	15.7685	10.3669	47.703	18.5804
7.5614927160924	16.5194432624814	36.2501371969827	17.8934	15.1905	44.1135	13.0517
7.5614927160924	14.2371659485836	36.2501371969835	12.295	19.9912	41.8654	28.6871
18.9616357101945	14.2371659485836	36.2501371969849	13.2666	12.9678	48.999	29.5528
26.1777973949104	14.2371659485836	36.2501371969849	19.3111	17.5672	45.5963	32.0992
26.1787973949104	14.2371659485836	36.250137196985	31.0534	27.3935	41.3669	17.9341
26.1797973949104	14.2371659485836	36.2501371969843	22.1476	14.8515	41.0167	12.414
26.1807973949104	14.2371659485836	36.2501371969846	25.9644	23.203	35.3119	29.8543
26.1807973949104	14.2371659485836	36.2501371969846	29.0027	23.8765	31.3376	31.6897
26.1817973949102	14.2371659485836	36.2501371969849	30.7692	16.7931	38.6765	37.8932
26.1817973949102	14.2371659485836	36.2501371969849	28.8128	30.4765	38.3516	39.1387
28.6149000084526	14.2371659485836	36.2501371969849	28.6149	8.2266	35.9223	6.0195
37.814899987205	14.2371659485836	42.7423	29.6006	20.2054	49.7928	12.7079
37.8148999872054	25.8690000001896	42.7423	37.8149	25.869	45.9364	3.1941
37.8158999872053	25.8690000001897	42.7423	43.1416	9.2079	26.5197	35.1675
41.8592802344624	25.8690000001897	42.7423	45.8095	43.1051	48.3862	19.6777
41.8592802344624	27.5396387470906	42.0980763251031	44.7486	39.7162	41.5468	12.5268
41.8592802344624	27.5406387471364	42.0980763251031	38.1953	36.049	49.7462	32.0805
41.8592802344624	34.0905280480223	42.0980763251032	44.5785	34.1629	40.8334	2.9998
26.3184883331697	34.0905280480222	42.0980763251032	42.5333	36.3249	41.241	34.2929
26.3174883331696	34.0905280480223	42.0980763251031	37.6461	42.0792	39.3984	22.0605
26.3164883331697	34.0905280480223	42.0980763251031	43.5486	39.6053	49.4906	27.6035
26.3154883331698	34.0905280480223	42.0980763251031	33.3877	38.8388	47.9844	13.1359
26.3144883331697	34.0905280480223	42.0980763251032	47.084	47.7144	42.2332	24.8395
26.3134883331697	34.0905280480223	42.0980763251031	22.0871	33.226	43.1435	33.6947
26.0690110571073	34.0905280480223	42.0980763251032	24.2607	34.0424	42.9391	1.9949
26.0690110571073	34.0905280480223	40.8210415171927	22.8416	32.9746	42.6888	3.8923
26.0690110571073	34.0905280480223	33.4578863695319	22.2385	33.2025	32.4261	37.3358
26.0690110571073	42.4609149103454	33.4578863695319	23.8984	35.8981	31.4349	7.2024
26.0690110571073	43.1337680514735	33.4578863695319	24.5323	49.8988	32.6923	23.3971
26.0690110571073	43.1337680514735	33.4568863695318	23.5397	47.0618	33.8948	4.6924
26.0700110571073	43.1337680514735	33.4568863695318	27.0169	46.6583	34.9486	30.8141
26.5527162263604	43.1337680514735	22.6322933478013	28.4876	46.0461	28.1502	21.3519
26.5527162263604	43.1337680514735	22.6312933478013	27.2789	43.4795	19.1307	3.5918
26.5527162263604	43.1337680514735	22.6302933478013	23.1185	40.5549	22.8959	4.3029
26.5527162263604	43.1337680514735	22.6292933478013	32.7117	42.3778	27.3609	10.9453
26.5527162263604	43.1337680514735	22.6282933478013	37.7223	44.0563	30.8827	29.1657
26.5527162263604	48.7602010332381	21.6264970410994	35.3466	47.2689	27.5268	39.4146
29.9296000022399	48.7602010332379	21.6264970410994	32.0569	46.2162	23.8838	8.3019
29.9296000022399	48.7602010332381	21.6254970410994	30.9136	43.9894	21.9238	22.4068
29.9296000022399	48.7602010332385	21.6244970411421	31.0932	49.2942	23.7876	14.8063
29.9296000022399	48.7602010332385	21.6234970411421	32.0319	48.7602	21.6234	2.1023
29.9296000022399	48.7602010332386	21.6224970410994	36.302	43.7274	11.7602	22.8064
29.9296000022399	48.7602010332377	21.6214970411421	32.6566	40.0511	6.9534	38.6421
29.9296000022399	48.7602010332377	21.6214970411421	42.0622	41.0674	12.3472	34.7982
29.9296000022399	52.5756940335423	21.6214970411421	44.7377	48.2657	7.7582	29.7234
29.9296000022399	52.5756940335423	13.3399550921679	25.8602	58.6207	10.547	28.7536
29.9296000022399	52.5756940335423	13.3399550921679	47.0351	69.5204	13.3405	24.0774
29.9296000022399	52.5756940335423	12.0192535437736	25.2216	48.8368	12.0716	29.4028
29.9296000022399	52.5756940335423	12.0182535437736	22.5313	48.1754	17.677	10.3014
27.6328164576265	52.5756940335423	6.69967175384091	20.1897	48.2132	1.8547	9.8947
27.7894358112849	52.5756940335424	6.69967175384091	22.4944	48.7727	6.2361	18.9786
27.7894358112849	85.1169954408341	6.69967175384091	16.887	83.4344	26.4901	34.5743
27.7894358112849	85.1179954408432	6.69967175384091	17.8311	84.5721	16.3475	18.6031
27.7894358112849	85.1189954408433	6.69967175384091	23.9463	67.9458	29.6197	30.7026
27.7894358112849	85.1199954408433	6.69967175384091	10.6041	85.0219	16.3433	25.6845
27.7894358112849	85.1209954408422	6.69967175384091	13.6279	83.3943	14.3913	17.0874
27.7894358112849	85.1219954408422	6.69967175384091	17.8246	84.0918	18.5648	15.5287
27.7894358112849	85.1229954408418	6.69967175384091	17.0206	82.7787	9.6966	29.1615
32.2999579675	85.1229954408418	6.69967175384091	39.3354	89.658	8.0536	8.4792
32.2989579675	85.1229954408418	6.69967175384091	15.4215	81.5375	18.2132	38.9838
11.9525575578309	85.1229954408418	6.69967175384091	17.1642	87.7833	12.5892	37.7116
11.9515575578309	85.1229954408419	6.69967175384091	10.8331	85.8288	6.1261	11.4013
11.9505575578308	85.1229954408412	6.69967175384091	12.6448	83.0865	6.5696	35.3802
11.9495575578308	85.1229954408409	6.69967175384091	11.6247	87.7046	5.4339	3.2321

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
6.30280171888154	85.1229954408411	6.69967175390518	5.387	87.7604	0.9494	6.3922
6.30280171888154	85.122995440841	11.8485999994848	13.617	84.1913	11.8486	7.3733
6.30280171888154	85.122995440841	12.7451053250924	2.625	81.2761	5.8521	30.3022
6.30280171888154	85.1229954408411	12.7461053250113	4.4842	86.5445	8.1765	5.1195
6.30280171888154	85.1229954408419	13.9211801461455	9.9966	85.8576	17.8499	5.4423
6.30280171888154	85.1229954408426	13.9221801461543	8.87560	85.3213	18.2881	16.0341
6.30280171888154	85.1229954408426	13.9231801461629	3.3964	83.4982	10.9781	22.6969
6.30280171888154	85.1229954408425	18.9506793790612	13.2856	89.4879	17.2258	21.8166
6.30180171884311	85.1229954408425	18.9506793790044	7.74030	89.8119	11.7653	8.6997
6.30180171884311	85.1229954408425	18.9516793790612	2.5389	82.9669	19.2333	4.4555
6.30180171884311	85.1229954408427	22.6092000046605	6.0677	84.3942	30.725	37.1993
5.79106435576696	85.1229954408424	22.6092000046605	0.247299999999996	82.0871	22.6092	6.3206
5.79106435583186	85.1229954408426	22.6102000046605	1.19329999999999	81.8445	35.7922	20.336
5.79106435583186	85.1229954408424	24.7854194879596	0.0289999999999964	82.9455	44.9095	21.0457
9.25650003283926	85.1229954408426	22.9504636949917	9.2565	85.6186	20.1316	2.8621
9.45211827022101	85.1229954408426	22.9504636949917	16.4864	81.6235	25.3496	21.8233
9.45211827022101	85.1229954408424	25.7993999963673	16.2773	81.3093	25.7994	7.8184
9.45211827022101	85.1229954408424	25.8003999963673	19.7188	83.0222	34.7895	29.297
9.45211827022101	85.1229954408424	25.8013999963672	14.2132	82.4414	28.7174	14.4019
9.45111827016778	85.1229954408425	25.8013999963673	9.52200	88.7288	32.8263	27.8783
9.45011827016781	85.1229954408423	25.8013999963672	7.47969999999999	86.7529	34.8532	25.8983
9.45011827016781	85.123995440843	25.8013999963674	2.0599	86.005	27.783	20.2991
9.45011827016781	85.1249954408429	25.8013999963673	1.82250	87.776	42.1327	36.7171
9.45011827016781	85.1249954408429	25.8013999963673	11.8372	87.4011	35.0448	35.7247
9.44911827016782	85.1249954408429	25.8013999963673	6.7503	86.812	36.4409	32.5272
9.4491182701678	85.1259954408428	25.8013999963673	5.1953	87.1361	22.5444	37.283
9.44911827016782	85.1269954408428	25.8013999963673	5.1015	81.8103	26.7596	31.1473
9.4491182701678	85.1269954408427	29.1680230918574	1.0919	90.7016	20.5918	28.434
9.4491182701678	85.1279954408428	29.1680230918574	0.775099999999995	88.6342	47.6629	34.6112
9.4491182701678	85.1289954408427	29.1680230918819	2.696	85.7661	44.4643	16.7328
9.44911827016782	85.1289954408414	40.8331692815145	7.6764	88.6806	43.7076	9.6476
9.44911827016782	87.5159305192911	40.8331692815145	5.09099999999999	83.7862	45.0917	25.4049
2.86096948311624	87.5159305192883	40.8331692815145	1.5647	88.8122	41.3941	1.9171
14.2244999926558	86.4925338043849	40.8331692815145	14.2245	83.0966	40.7659	3.3966
18.822322068253	86.492533804385	40.8331692815145	1.983	86.3665	46.2259	17.6822
18.823322068276	86.4925338043851	40.8331692815145	15.9151	82.9337	42.2853	11.014
18.823322068276	88.1994290735169	40.8331692815145	17.0519	88.8308	49.5668	13.9972
18.824322068276	88.1994290735169	40.8331692815145	13.8296	81.5783	47.5142	24.0124
18.8253220682759	88.1994290735169	40.8331692815145	19.4915	88.9148	34.46	6.4477
25.2997828452104	88.1994290735169	40.8331692815145	17.7167	97.5636	38.0165	31.3797
25.3007828452103	88.1994290735169	40.8331692815145	19.5543	89.8549	35.5989	33.619
25.3007828452103	88.2004290735168	40.8331692815145	26.3736	85.6358	40.2837	33.6814
25.3007828452103	92.1712828487611	40.8331692815145	29.7505	96.621	38.9958	6.5556
19.8512929331609	85.068341726127	47.0481914713402	19.3715	86.9483	48.882	2.6697
19.8512929331608	82.344800048078	47.0481914713402	18.7876	82.3448	48.1119	1.5043
19.8512929331609	79.2423998698202	47.0481914713402	16.072	81.5553	45.6344	6.7432
19.8512929331609	79.2413998698202	47.0481914713402	25.0595	61.5431	43.0509	18.8768
63.3549012640129	79.2413998698202	46.9223757059074	44.1821	62.8241	31.2839	34.6478
63.3549012640129	71.463253442302	46.9223757059074	44.9743	74.4953	49.2176	27.6089
63.3549012640129	71.462253442302	46.9223757059074	59.4827	70.1321	42.8614	13.0297
63.3559012640129	71.462253442302	46.9223757059074	63.7544	71.2264	45.6612	1.3435
63.3559012640129	66.4056999993656	46.9223757059074	76.1087	74.9228	48.9063	26.6713
69.2580632095188	66.4056999993656	43.1390343294148	81.6179	74.1421	49.6219	15.9576
69.2590632095904	66.4056999993656	43.1390343294151	72.5026	72.4828	42.5897	37.2859
77.6803004236515	66.4056999993656	43.1390343294148	77.6803	63.0066	43.1391	3.3991
77.6803004236516	70.1775200379374	43.139034329415	78.8402	71.1237	45.9036	4.6244
85.5448491038583	70.1775200379374	43.1390343294132	89.2994	73.1482	41.8171	4.9668
85.5458491037393	70.1775200379374	43.1390343294134	77.364	70.7565	29.611	18.9213
85.5468491037393	70.1775200379374	43.1390343294135	84.7887	79.7551	43.3502	24.4915
85.5468491037393	70.1775200379374	43.1390343294135	84.8025	72.2361	43.599	24.0623
85.5468491037393	70.1775200379374	43.1380343293585	84.4928	76.9707	34.1362	35.8799
85.5468491037393	70.1775200379374	43.1380343293585	80.2922	75.8098	32.7263	14.5911
85.547849103683	70.1775200379374	43.1380343294148	82.0065	75.6791	41.5159	28.4662
96.9562999999789	70.1775200379374	43.1380343294148	96.8293	85.3988	23.0282	25.2212
96.9563000000088	86.7208985372611	43.1380343294148	99.7041	87.1751	32.3993	20.8453
96.9563000000088	86.7218985372612	43.138034329415	92.7639	86.5161	40.1878	5.447
96.9563000000088	86.7218985372611	43.0832000005303	97.0785	86.7219	43.0832	0.1222
96.9563	86.9793568652896	35.6165569887619	98.6006	82.3388	36.0882	4.9458
96.956299999998	87.111899999998	35.6165569887619	99.1691	80.9928	48.8748	24.2662
96.9552999999974	87.111899999998	35.6165569887619	94.6937	81.204	45.1011	23.1601
96.5652379624883	87.1118999999979	32.0836237745267	89.7033	80.1502	39.6028	26.8819
94.4939377644652	87.1118999999981	32.0836237745267	91.4519	94.5103	31.5983	21.3367
94.4939377644652	87.1118999999981	32.0836237745267	88.3919	89.421	29.806	7.2563
92.0930000029563	87.111899999998	32.0836237745266	92.093	98.3621	2.0725	32.0505
92.0930000029563	87.111899999998	32.0836237745266	95.9324	92.1458	48.2362	31.1565
92.0930000029563	87.111899999998	32.0836237745266	91.162	99.965	45.0985	25.8943
92.0930000029563	87.111899999998	32.0836237745266	96.6476	96.9796	12.6166	23.7398
92.0930000029563	87.111899999998	32.0836237745266	94.8083	91.5304	12.0006	29.5468
92.0930000029563	87.111899999998	32.0836237745266	93.3103	99.0843	27.6346	24.3725
92.0930000029563	87.111899999998	32.0836237745266	85.1326	93.3031	36.2953	30.9423

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
92.0930000029563	87.111899999998	32.0836237745266	88.2817	96.351	29.2562	29.8948
92.0930000029563	87.111899999998	32.0836237745266	89.0976	96.4455	27.3307	23.7594
92.0930000029563	87.111899999998	32.0836237745266	88.0059	90.774	26.7084	31.4291
89.0473056959069	87.1118999999981	32.0836237745267	99.0472	85.7396	32.4859	19.7408
89.0473056959069	87.1118999999981	32.0836237745267	97.0965	81.0307	25.4066	20.0164
89.0463056958536	87.1118999999981	32.0836237745267	90.256	83.0105	30.9795	8.936
89.0453056958536	87.1118999999982	32.0836237745267	88.1669	82.2879	22.5207	36.2685
89.0443056958536	87.1118999999983	32.0836237745267	88.7272	81.0174	24.4065	30.12
89.0433056958536	87.1118999999812	32.0836237745268	87.485	79.3312	28.225	14.9303
89.0423056958536	87.1118999999996	32.0836237745714	84.6626	79.7388	29.6454	28.8542
89.0413056958536	87.111899999998	32.0836237745714	84.0326	80.947	31.8699	25.7062
89.0403056958536	87.111899999998	32.0836237745714	78.4301	80.0876	35.2889	24.8331
89.0403056958536	87.1118999999979	32.0846237745191	77.9819	77.7483	36.1545	19.944
89.0403056958536	87.1118999999999	34.8790568331009	87.0156	79.966	38.2934	12.6359
87.6084999903617	87.1119	34.9790999917974	87.6085	88.0524	34.9791	0.9405
87.4148379538707	87.1119	36.3660000141793	85.5459	86.1581	36.8243	23.0206
87.4138379538704	87.1118999999898	36.3660000141798	89.9071	81.4441	38.6007	15.7904
87.4138379538842	84.684614305982	36.3660000141798	92.5909	80.0433	37.2966	19.5797
87.4138379538842	84.684614305982	36.3660000141798	81.9044	86.793	39.6738	18.7468
86.3635277257751	84.6846143059789	36.3660000141796	86.675	81.8002	49.155	31.4898
86.3625277257751	84.6846143059788	36.3660000141797	87.3294	86.7915	39.9582	10.1629
86.3615277257727	84.6846143059788	36.3660000141796	85.9222	83.4369	36.366	1.3228
86.3615277257726	84.6846143059788	40.7931000438465	78.0272	82.0721	40.7931	8.7342
86.5480540631668	84.6846143059788	44.7206999992796	87.8518	83.2273	45.632	10.2812
86.5480540631656	84.6846143059789	44.7216999992796	87.8874	83.7559	45.2883	28.0801
86.5480540631656	84.6846143059789	44.7226999992794	89	83.7031	44.7227	2.6411
86.5480540631656	84.6846143059789	46.1205999999668	87.2864	89.2526	43.6381	24.3141
86.5480540631657	84.6856143059789	46.120599999967	85.4655	89.4614	40.2893	13.9477
86.5480540631657	84.6856143059789	46.120599999967	81.9035	87.9149	41.5399	16.8426
86.5480540632012	92.8245184463306	46.1205999999664	84.5701	92.5098	41.6265	11.4862
86.5480540632012	92.8255184463304	46.1205999999664	85.7193	87.9646	47.7548	30.5682
86.5480540631669	92.8265184463305	46.1205999999658	89.5983	91.5249	48.4013	17.2739
86.5480540631669	92.8265184463305	46.1205999999658	88.3323	91.5035	43.0727	13.825
86.5480540631671	92.8275184463307	46.1205999999668	89.983	98.6224	48.7896	7.2459
86.5480540631671	92.8265184463306	46.1205999999668	80.5965	92.0964	38.2365	36.4049
86.548054063167	92.8255184463284	46.1205999999668	88.5666	89.9178	38.0498	22.668
86.548054063167	92.8245184463285	46.1205999999662	94.4683	90.0421	37.16	36.408
86.548054063167	86.2224999998196	46.1205999999662	84.4799	87.8799	46.3607	17.7516
86.548054063167	86.2224999998196	46.1205999999662	82.5335	87.3296	48.5022	23.2737
86.548054063167	86.2214999998195	46.1205999999662	89.6546	85.279	42.7332	10.469
86.548054063167	86.2204999998195	46.1205999999672	89.697	88.1654	44.368	35.3374
86.5470540631983	86.2204999998195	46.1205999999672	89.0638	74.5581	37.2181	18.603
83.1803000018383	86.2204999998195	46.1205999999672	83.1803	86.2205	46.5816	0.461
82.2576377958992	83.9392544994266	46.1205999999672	83.0689	84.7397	49.7222	17.7189
82.256637795783	83.9392544994259	46.1205999999673	79.6279	80.9538	46.8845	23.4026
82.2566377957829	83.9392544994258	44.8441000004696	74.3211	82.1244	47.3456	8.5161
82.2556377957829	83.9392544994257	44.8441000004692	79.4655	74.4467	41.2824	12.4177
79.7367203875979	83.9392544994254	44.8441000004694	80.1131	82.5047	41.0389	19.9521
79.7367203875979	83.9392544994254	44.8441000004694	80.2014	81.5949	36.2605	32.3848
79.7357203875981	83.9392544994257	44.8441000004696	82.0258	98.9707	44.6731	16.4132
79.7357203875981	83.9392544994255	44.84310000047	76.7822	82.9894	44.8431	3.1025
79.735720387598	83.9392544994258	42.7161000724719	78.4966	80.8407	46.208	27.0644
83.3093289612439	83.9392544994259	42.7161000724719	76.8895	78.6378	42.7161	24.9962
83.3093289612269	83.9392544994267	42.7151000724737	71.0504	85.2637	43.1302	27.4246
83.3093289612261	83.9392544994262	39.0337749171973	73.8575	87.669	40.179	25.5244
83.3093289612262	83.9392544994263	33.9442997033823	73.6161	81.1388	33.9424	38.2238
83.3093289612261	83.9392544994265	33.9432997033679	80.5183	71.0301	37.6084	20.9716
83.3093289612261	83.9392544994265	33.9432997033679	75.5773	80.7384	32.0605	16.9072
83.3093289612414	83.9392544994266	33.9422997033823	81.0134	86.425	30.4534	31.9429
83.3093289612404	83.9392544994277	33.9412997033909	80.7173	88.9602	30.7691	17.7309
83.3093289612412	83.9392544994276	33.9402997033968	82.7904	89.3622	35.5781	32.2308
83.3093289612436	83.9392544994275	33.9392997034014	82.7574	74.2926	38.276	14.8137
89.4099000069318	83.9392544994276	30.3859710457019	82.4808	71.6064	25.4475	18.1512
89.4099000069314	83.9392544994275	30.3849710457019	88.9513	72.6403	24.2874	19.8606
89.4099000069315	83.9392544994272	30.3839710457019	94.7529	81.9671	23.1963	38.2984
89.4099000069314	83.9392544994275	21.9472262827745	97.0848	81.6578	13.6354	37.2835
89.4099000069315	83.9392544994276	21.9462262827361	89.4099	75.3847	11.7139	13.3372
91.6055950585284	85.7093164574498	21.9462262827361	97.4362	85.8361	18.6294	6.7092
91.6055950585283	85.70931645745	21.9472262827361	93.255	98.1789	24.6576	39.9406
91.6055950585491	85.7093164574499	21.9482262827366	82.1226	91.9552	25.5944	29.2899
91.6055950585493	85.7093164574501	22.6490599567128	96.6676	92.6743	28.4611	10.3882
91.6045950585492	85.7093164574499	22.6490599567321	96.5452	93.172	22.7505	16.1374
84.9539608175627	85.70931645745	22.6490599567321	81.2522	99.2612	19.5952	19.7395
84.9529608175628	85.7093164574497	22.6490599567321	86.994	98.105	22.6387	12.5626
84.9519608175185	85.7093164574499	22.6490599567322	88.2673	94.5543	28.7709	14.161
84.9519608175185	85.7093164574499	22.6490599567322	85.3838	89.3565	26.2565	14.2439
84.9509608174654	85.7093164574499	22.6490599567322	80.252	96.9762	30.8948	27.7656
84.9499608174655	85.7093164574498	22.6490599567322	80.4141	88.4668	31.9981	26.3631
84.9489608174655	85.7093164574495	22.6490599567321	73.5352	77.8165	42.524	36.1475
84.9479608174655	85.7093164574494	22.6490599567321	84.7929	84.8117	21.5385	17.1593

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
84.9469608174654	85.7093164574499	22.6490599567321	72.3356	86.155	20.9164	38.7669
84.9459608174656	85.7093164574495	22.6490599567321	76.3867	80.9989	23.608	33.1367
74.8213586169308	85.7093164574496	22.6490599567321	70.0787	86.0551	23.7512	4.8813
74.821358616931	85.7093164574494	19.6301557971878	70.8501	86.3243	19.985	34.4665
74.821358616931	85.7093164574494	19.6301557971878	70.8021	79.2974	26.7913	26.617
74.821358616931	85.7093164574497	19.6291557971878	72.5273	88.3137	27.5858	14.2003
74.821358616931	85.7093164574497	19.6291557971878	70.5598	83.7819	30.4468	31.7327
74.821358616931	84.6236202733725	19.6291557971878	76.9521	88.589	30.1519	36.7425
77.2198786223623	84.6236202733734	19.6291557971878	80.026	88.4312	32.9439	31.2606
77.2198786223623	84.6236202733734	19.6291557971878	79.415	85.235	33.6242	23.8334
77.2208786223624	84.6236202733735	19.6291557971878	73.1002	79.4037	30.5501	12.7865
77.2208786223624	84.6236202733735	19.6291557971878	77.1908	76.3248	19.088	8.3165
77.2208786223626	84.6236202733727	19.6281557971878	86.8895	84.3247	23.0154	31.0852
77.2208786223626	84.6236202733732	17.4816219985768	81.0772	83.8409	29.4446	24.7807
77.2208786223626	84.3116288434709	13.4542258263152	79.3747	83.7664	12.9303	2.2827
76.0992532094066	84.3116288434733	13.4542258263152	72.6803	81.9225	14.2859	4.2531
76.0992532094066	84.311628843473	13.0260603506458	83.5177	79.6473	12.5117	24.9276
81.6026055581773	84.3116288434742	13.0260603506459	84.2824	83.9445	3.7257	9.6857
81.6026055581773	84.3126288434191	13.0260603506458	82.7718	81.5009	6.6283	13.2622
81.6026055581772	84.3136288434739	13.0260603506459	71.008	83.9726	12.5028	10.613
81.6026055581772	84.313628843474	13.7633766482125	74.9451	88.4605	13.7746	8.2599
81.6036055581934	84.3136288434739	13.7633766482125	88.176	88.8141	22.7557	24.7619
81.6036055581934	84.3136288434739	13.7633766482125	87.8356	87.4643	21.4217	27.6715
88.2836549600419	84.3136288434739	13.7633766482125	83.1514	91.319	24.221	39.4372
88.2846549600418	84.3136288434739	13.7633766482125	90.3741	83.7882	8.516	6.0655
88.2846549600418	84.314628843474	13.7633766482125	87.1273	84.0324	13.0404	22.6844
88.2846549600419	84.3156288434741	13.7633766482125	87.5661	81.6563	15.3738	27.3837
88.2846549600418	84.316628843474	13.7633766482125	75.4182	80.175	27.0139	23.5169
88.2856549600419	84.3166288434741	13.7633766482125	79.7296	78.3022	25.4406	15.676
88.3592000046918	84.316628843474	13.7633766482125	79.7775	80.296	30.6811	29.6152
88.3592000047397	84.317628843474	13.7633766482125	85.5265	86.4226	22.7788	27.3567
88.3592000047397	84.3186288434739	13.7633766482125	83.3441	85.5151	19.0157	31.408
88.3592000047397	84.319628843474	13.7633766482125	84.1657	89.6201	18.7606	13.6552
88.3592000047396	93.3520766495528	13.7633766482125	85.8291	89.3215	18.2752	27.9965
88.3592000047397	93.353076649548	13.7633766482126	84.785	93.3953	20.8615	25.851
88.3592000047397	93.3540766495432	13.7633766482125	80.3025	81.1115	9.6723	15.7523
88.3602000047109	93.3540766495433	13.7633766482125	84.0572	98.2927	13.228	11.5023
88.3602000047109	93.3540766495433	13.7633766482125	85.8774	87.324	15.9329	11.0712
88.3602000047107	93.3550766495434	13.7633766482125	84.3608	92.148	16.0712	27.0972
88.3602000047106	93.3560766495434	13.7633766482125	83.9295	97.9734	19.8967	22.5699
88.3602000047107	93.3570766495552	13.7633766482125	84.3334	97.0716	17.1577	13.2701
88.360200004711	93.3580766495602	13.7633766482125	85.6153	86.7737	15.008	37.7006
88.360200004711	93.3580766495602	13.7633766482125	90.1019	83.486	18.038	37.2389
88.3602000047106	93.3590766495602	13.7633766482125	88.3602	93.5594	13.9637	0.2833
89.018923088856	92.5611676168622	12.8143552836976	94.4375	89.8165	9.7901	6.7853
90.4552381617219	92.5611676168625	12.8143552836976	77.1151	89.3423	7.0894	37.2077
90.4552381617217	92.561167616853	12.8133552836977	93.093	71.3467	11.2543	21.4346
90.4552381617214	92.5611676168532	12.8123552838107	83.3685	88.3604	12.0152	8.2767
90.4562381617197	92.5611676168694	12.8123552838107	99.7949	88.8243	9.6989	10.9809
93.995765026939	92.5611676168763	12.8123552838088	98.1513	96.345	10.1326	8.7509
93.995765026939	92.5611676168763	12.8123552838088	92.8113	98.2407	8.6156	11.443
93.99676502705	92.5611676168764	12.8123552838109	93.4254	97.8126	20.9017	10.7468
93.99676502705	92.5611676168764	12.8123552838109	94.509	92.4532	22.8398	10.0411
93.9967650270495	92.5621676168765	12.812355283811	95.3031	91.4204	17.8619	25.4609
93.9967650270495	92.5621676168765	12.812355283811	93.0738	84.8753	19.4127	27.0049
93.9967650270499	92.5621676168767	12.811355283811	92.0809	99.3222	11.7562	13.6093
93.9967650270498	92.5621676168765	12.810355283811	92.1839	88.8237	5.0595	30.3052
93.9967650270498	92.5621676168764	12.809355283811	94.2258	98.7848	13.3192	33.585
93.9967650270499	92.5621676168765	12.808355283811	96.0605	94.495	5.5816	12.9494
93.9967650270499	92.5621676168765	12.808355283811	90.6972	96.9626	11.6096	12.1171
93.9967650270502	92.5621676168764	12.8073552838111	97.9735	93.9042	14.8216	16.4454
93.9967650270502	92.5621676168764	12.8073552838111	83.3686	96.8014	16.23	13.9298
93.9967650270502	94.6389733646517	12.807355283811	99.292	98.0492	12.4987	20.4892
93.9967650270502	94.6389733646517	12.807355283811	96.1791	97.5552	24.4974	14.7422
93.9967650270503	94.6389733646519	12.806355283811	90.7381	99.8897	10.9244	39.8736
93.9967650270508	94.6389733646519	5.97962665265108	94.7976	88.4491	0.0367	36.0251
93.9967650270508	94.6399733646505	5.97962665265108	95.4796	96.129	4.4906	2.5755
93.9957650270508	94.6399733646504	5.97962665265108	96.671	90.7145	10.1968	32.754
93.9957650270509	94.6399733646504	7.38706641690029	96.809	92.5136	0.2967	11.7087
93.9957650270506	94.6389733646504	7.38706641690029	89.3359	93.6392	1.2449	11.0562
89.749419238138	94.6389733646501	7.38706641690029	89.931	94.5372	6.4495	17.4038
89.749419238138	94.6379733646503	7.38706641690029	83.6163	95.496	9.4544	6.5288
87.8993413883193	90.4424603754708	7.38706641690029	87.314	87.2617	7.5328	16.5203
87.8993413883193	83.7008027362013	7.38706641690028	87.7484	83.7546	3.1863	5.1562
87.8993413883193	83.6998027362014	7.38706641690028	89.4354	80.1567	8.4369	4.0019
79.5110624242903	83.6998027362013	7.38706641690028	86.0867	81.533	3.6186	7.8826
79.5110624242904	83.6988027362013	7.38706641690028	86.8222	80.0693	3.9589	26.0963
79.5110624242732	83.6988027362013	7.950759267687	85.8335	84.6274	4.9143	15.0275
79.5110624242731	83.6978027362014	7.950759267687	86.7862	83.711	0.7854	21.1375
79.511062424273	83.6968027362014	7.95075926768699	81.7913	86.2239	2.8298	19.3521

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
79.5110624242728	83.6958027362013	7.95075926768699	80.7551	80.6861	0.4798	19.901
79.5110624242728	83.6948027362014	7.95075926768699	75.2812	79.5319	0.6498	38.4796
79.5110624242729	77.2980300763086	7.95075926768699	76.4126	75.548	2.1999	18.6216
79.511062424273	77.2970300763085	7.95075926768699	73.6863	74.2382	1.6716	25.5224
79.5110624242795	77.2960300763086	7.95075926768699	79.9937	73.4457	8.9779	4.0141
79.5110624242905	77.295030076342	7.95075926768699	77.4302	82.5606	3.0237	33.5083
79.5110624242902	74.0914997530153	7.950759267687	77.4087	74.0915	13.1093	5.5705
79.5110624242903	68.0471000019292	7.95075926768699	75.9291	73.9471	7.416	36.4707
79.5110624242923	68.0461000017889	7.95075926768699	76.1847	74.2911	12.7823	17.8739
79.5110624242676	68.0451000017872	7.95075926768699	75.6074	70.2776	13.8577	26.094
79.5110624242647	68.0451000017616	5.7021230835523	73.5126	71.3248	10.3828	18.5601
79.5110624242902	68.0441000017616	5.7021230835523	85.22	71.0885	8.0711	39.2361
79.5110624242784	68.0441000017607	5.70112308355229	89.379	76.0987	3.6739	38.3025
79.5110624242902	68.0441000017606	4.77477316785671	78.9268	79.6337	5.1041	28.7763
79.5110624242902	68.0431000012308	4.77477316785665	73.6361	68.0431	3.2936	6.0588
94.1341887931733	64.2643931946164	4.77477316785671	71.4242	75.4202	7.9198	25.4968
94.1341887931732	57.8915148369609	4.77477316785671	70.0314	77.1275	8.8524	35.8588
94.1341887931733	57.8905148369609	4.77477316785671	84.7658	77.8153	16.2748	28.1634
94.1341887931733	57.8905148369609	4.77477316785671	79.3483	75.3688	19.5443	27.2443
94.1341887931733	57.8895148369609	4.77477316785671	73.1545	60.0435	17.8914	34.4744
94.1341887931733	57.8885148369609	4.77477316785671	84.5964	57.5663	6.5683	31.6899
94.1341887931733	52.0430999992663	4.77477316785671	99.2739	52.0431	4.3408	5.158
92.0943000116203	26.9340287999407	4.77477316785671	92.0943	24.688	5.2999	2.3066

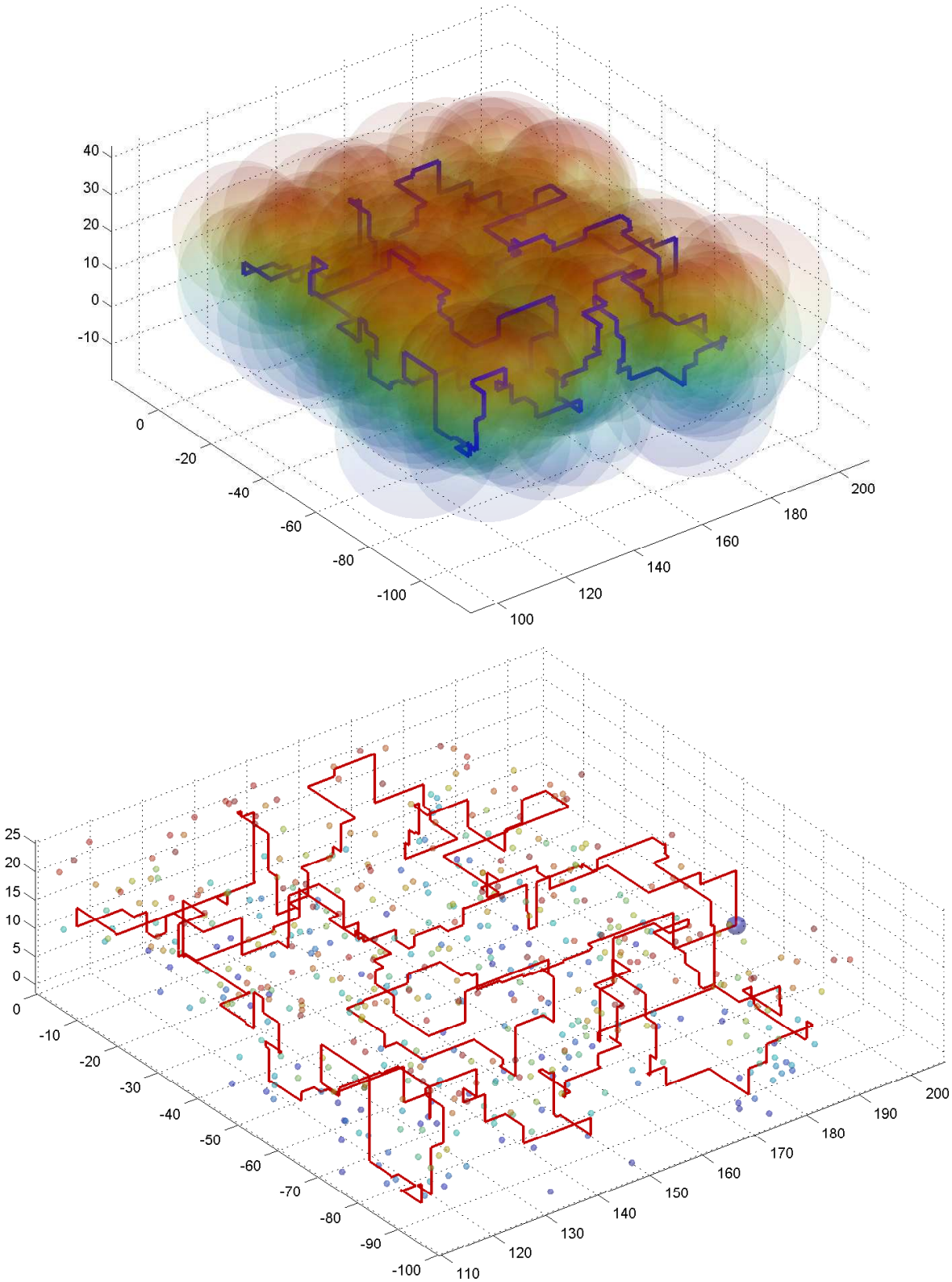


Figure N.200: *team*6_500, arbitrary radius, 3D, Manhattan, Length = 1471.9799079

Table N-203: Solution for *team*6_500, arbitrary radius, 3D, Manhattan

Total distance: 1471.97990792047 Depot: x 95 y 50 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
83.2409438687785	49.6203192459505	6.21317669026693	77.1618533	52.0527053	6.1051205	6.548551
77.6409988990187	49.6011284	6.28315648740454	77.6409989	49.4044045	6.2831565	0.1967239
69.2946692116048	49.6011284	6.3928124401767	78.4065879	56.8222853	10.2773712	18.7893207
69.2946692116048	49.6011284	6.3928124401767	73.3690079	50.7128517	12.3210863	17.0196572
69.2934503402618	49.6011284	6.39371344085202	69.2934493	49.5142976	7.1641629	0.775327
69.2934503402618	49.6200434617538	6.39321300036041	67.1669184	49.4371849	3.0262948	15.5982026
69.2886261490144	49.6200434617538	6.39321300036041	64.4880133	60.4854675	12.6069191	17.3914578
69.2886261490144	49.6200434617538	6.39321300036041	61.6781701	59.473286	10.2741841	14.5751959
66.8789818164747	49.6200434617538	6.39321300036041	58.9987357	45.7674431	3.4982849	9.2369593
66.8571963978222	49.6200434617539	6.39321300036041	64.136723	44.5156078	8.6797357	8.3082067
66.8571963978222	50.809280594161	6.39321300036041	53.1446811	48.4277704	1.8438372	14.7395753
66.5140700687557	50.809280594161	6.01055177868665	54.2235528	56.265496	3.5115961	13.6774223
66.5140700687557	50.810280594161	6.01055177868665	63.3053921	48.8331121	7.8682203	9.0739339
61.0935569061979	51.165344883329	5.94740421436258	61.0935569	52.6920317	4.4207174	2.1590612
54.847624582681	50.9652819476348	5.94740421436258	48.6878693	60.2173135	5.6974781	11.2892676
53.4110092518014	50.9652819476348	6.30393442655393	53.3341085	54.2742297	9.8426206	4.845343
49.4138897901248	50.4809713543339	6.30393442655393	53.5581269	47.7413894	5.6200486	13.1857928
49.3212735425774	50.345288457188	6.30393442655393	49.3212736	48.3119567	9.5488066	3.8293124
45.1042377335447	50.345288457188	6.30393442655393	43.0965371	49.287121	4.5164689	2.8888775
45.1042377335446	50.345288457188	9.05771455126816	44.2906965	51.8898251	11.3116798	3.7343282
45.1042377335446	50.345288457188	9.05871455126816	47.6524078	52.2249928	24.4877735	17.0127082
45.1042377335446	50.3452884571881	9.05971455126824	51.8847181	57.7017397	23.1071854	17.2459771
44.1770809924883	49.2802200100922	9.05971455126816	45.6990417	60.3070344	11.94067	16.3509992
42.8959437471438	49.2802200100922	9.05971455126816	39.5709227	52.0192185	20.9490324	18.7792196
42.8959437471439	44.0494438231295	9.05971455126816	39.4220046	48.156385	14.5273965	18.6805968
42.8959437471438	44.0484438231293	9.05971455126816	37.6481264	47.8813096	6.5793036	7.0802754
38.5030989747859	44.0484438231293	9.05971455126816	38.9617732	51.3997809	16.210445	12.7914782
38.5020989747857	44.0484438231293	9.05971455126816	37.4597811	44.2188485	16.422469	8.3563058
38.5010989747858	44.0484438231293	9.05971455126816	40.4352515	45.1450838	11.9573703	4.3768484
36.6637796952722	44.0484438231293	9.05971455126816	34.2887402	41.9043439	6.835982	4.1016802
36.6637796952722	44.0484438231293	7.46377075903977	34.4981613	43.6098189	6.3838863	7.4849006
36.6637796952722	44.0484438231293	7.46377075903977	32.8302989	42.2309887	13.616708	9.1323516
28.2512088060385	44.0268098403921	7.15707503954858	28.2512087	43.1796715	6.8189779	0.9121146
26.0471548847404	44.0268098403921	7.15707503954858	31.5095969	51.0684653	11.523883	15.7915136
26.0461548847404	44.0268098403921	7.15707503954858	30.0937988	44.3308943	14.5383671	9.1718387
26.0451548847404	44.0268098403921	7.15707503954858	20.3277951	46.570702	14.9318681	10.9961913
26.0441548847404	44.0268098403921	7.15707503954858	25.3533813	42.3962835	8.9845466	16.55549
26.0441548847404	44.0268098403921	7.15707503954858	22.4746551	48.1041051	9.2672876	15.816336
24.9820648043395	51.8703107766026	7.15707503954858	21.0216738	51.8703093	12.3795264	6.5542883
24.9820648043395	51.8703107766026	7.15707503954858	20.6501388	50.1791373	13.3126618	16.3804834
24.9820648043395	53.5118781123742	4.74397158239282	24.284459	53.5118781	4.6981631	0.6991082
25.1422578996869	53.5761580657749	4.74397158239282	32.3710377	53.6854	0.0060466	15.9945905
25.1422578996868	53.5771580657749	4.74397158239282	18.3784185	57.1026507	1.60641	10.6506348
27.3000637839746	53.5771580657749	4.74397158239282	23.2467308	53.1536864	15.3512789	11.4161743
27.3000637839746	59.9692572851321	4.74397158239282	23.9069485	59.9121563	8.8002389	8.0586758
37.1827835744364	59.9692572851321	4.74397158239282	38.128444	50.990683	1.5244057	14.1351688
37.1837835744365	59.9692572851322	4.74397158239282	43.0002757	59.9692573	5.0791111	5.8261393
37.1837835744364	60.4320971119385	4.67246519756553	33.1471098	60.1558513	4.4414558	4.0709462
37.1837835744364	67.1119326476463	3.60607950096165	37.415218	67.1119326	2.4786359	1.1509522
36.604690929583	70.9963320350074	12.3722307101242	35.1926471	70.9963316	12.3857242	1.4121083
41.9605490451444	73.655474261358	12.3722307101243	43.3709663	79.9295648	12.3122786	6.4309473
41.9605490451445	73.6554742613577	20.2427731338313	40.9923031	81.1407106	10.4646561	14.9699296
41.9605490451445	73.6554742613577	20.2437731338313	46.3729602	74.0499355	16.6434815	10.9997053
41.9605490451445	70.5595370996385	20.4285954000013	43.8195847	68.1613988	20.4285954	3.0343172
41.8801299628976	72.4638415999999	22.9042758	50.8238583	67.1806384	20.6239323	19.5280512
37.7594155	72.4638416	22.9042758	37.7594155	72.4638416	24.7804303	1.8761545
26.789731405692	72.5477125009237	22.9042758	26.7897314	74.395765	23.1412606	1.8631854
26.7805103687054	72.5477125009238	22.9042758	32.5068688	76.0167984	20.6942387	18.6744309
25.88576318419	72.5477125009238	22.9042758	17.0586402	58.0717087	14.4615884	18.9407433
25.88576318419	72.5477125009238	22.9042758	22.4809106	75.2843669	23.7038192	6.1954617
25.88576318419	72.4902638269999	17.5480952177601	32.7632095	61.4478694	17.2734289	19.7763438
25.88576318419	72.4902638269999	17.5480952177601	30.51178	74.0433946	6.2558417	12.6878142
21.8379473392015	72.4902638269999	17.54809521776	23.2409835	69.6045703	6.9223743	11.4000663
21.8379473392015	72.4902638269999	17.54809521776	21.5799527	71.4486566	7.5717836	10.0338577
21.8379473392015	72.4902638269999	17.54809521776	23.1076735	77.6165558	13.9842376	6.3711973
21.8379473392015	72.4902638269999	17.54809521776	19.7736057	66.4248411	22.4431961	8.3807699
21.8379473392015	72.4902638269999	17.54809521776	16.6661596	74.8364156	22.1285239	8.962299
18.8583948	63.8863652745027	17.5480952177601	26.1534967	60.2417469	15.9637624	15.8350837
18.8583948	63.8863652745028	20.6093335953486	15.1928212	63.8863652	20.6093336	3.6655736
18.8583948	59.2663236266997	23.0217362607578	18.1200543	57.6122523	16.2352309	15.16683
18.8583948	59.2663236266997	23.0217362607578	16.1987878	59.3187745	15.8426137	8.6880066
18.8583948	59.2663236266997	23.022736260758	16.954408	52.9270638	19.3144339	16.3581023
18.8583948	59.2663236266997	23.022736260758	16.0956015	47.1989931	18.8482809	14.2319044
18.8583948	59.2653236266997	23.022736260758	19.3270801	51.9549025	21.8491926	14.5767542
18.8583948	59.2643236266996	23.0227362607579	25.824676	62.4300357	22.6279041	7.6620297
18.8583948	59.2643236266996	23.0227362607579	18.474215	58.4012448	21.6380189	5.4896057

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
20.4303529054049	59.2643236266996	23.022736260758	29.6716712	65.8677857	16.615982	16.7115843
20.4303529054049	56.6155569144741	23.0376925000008	20.4303529	56.6155569	23.1754411	0.1377486
20.4303529054049	56.6155569144741	23.0226694874563	22.9209187	53.7233909	24.603033	7.2787759
23.9050013481687	47.7151532460347	23.0226694874563	28.018456	49.9258106	18.7011667	6.3626175
23.9292913574386	47.700751299087	21.9150057329344	32.3078962	45.114069	10.6720814	14.2581658
23.9292913574386	40.8663252368736	21.9150057329344	25.8175111	47.2716024	20.9185995	14.9058581
25.9268579684318	40.8663252368736	21.9150057329344	24.3319298	37.4283803	9.9719727	13.053577
25.9268579684318	40.5309347683607	21.9150057329344	36.1244237	41.0242921	19.6707957	15.4858909
25.9324547999998	40.5220971942018	21.9150057329344	26.2175773	40.5220972	21.9150058	0.2851225
25.9324547999998	40.4030020629443	21.8922615220502	23.0786229	38.1227731	23.1605385	15.8911359
25.9268133106945	40.4030020629443	21.8922615220502	21.8832831	32.2702186	24.0783885	16.0376904
25.9268133106945	31.1094702054458	21.8922615220503	25.6408756	32.9849766	23.8146293	2.7008855
25.9268133106944	30.9354733146678	16.9174633542466	25.434095	30.36432	15.4263508	1.6710488
21.2205960975861	30.6755865124292	16.0476843999995	21.2205961	30.6755865	15.8621351	0.1855493
6.39768909002149	28.0643939976358	16.0476844	1.0903939	26.3844516	18.4073439	6.0462866
4.98343660541545	28.0643939976358	17.2167374759008	3.1062568	26.7803784	17.2167375	2.2743131
5.05267607870977	28.0643939976358	21.7766960002096	4.4919615	30.1971308	23.0431363	9.6799472
9.78612242909651	28.0643939976358	21.7766960002096	9.78612250000001	28.4044715	22.2738758	0.6023624
10.0021000090115	28.0047130712904	21.7766960002096	1.44105020000001	27.5670412	20.5926225	9.0702473
10.0021000090115	22.6897299803655	21.7766960002096	14.7546051	14.610274	24.9337615	12.5838102
10.0031000090115	22.6897299803655	21.7766960002096	4.41833269999999	14.4467589	21.446539	11.646626
10.0116749141668	22.6897299803655	21.7766960002096	9.1420339	20.9818632	21.7425538	15.7590069
10.0116749141668	22.6897299803655	12.5767866567982	13.6477983	21.6503409	20.9429038	10.1300266
10.0346395999718	22.6897299803655	11.7591855381947	10.0346396	20.0550826	11.5771729	2.640927
10.6929671966951	25.4868725859694	11.7591855381947	11.5512784	26.7283657	10.5788887	1.9160125
10.8696134761275	34.6290629879238	11.7591855381947	14.7299938	38.6202015	11.4606651	5.5606508
10.8696134761275	34.6290629879238	11.7591855381947	11.1949114	32.5347928	13.765914	2.918689
10.8696134761275	34.865216998714	11.7591855381947	11.8541821	36.7134083	15.5034658	16.0938551
10.8696134761275	34.865216998714	11.7591855381947	4.5207011	34.7763494	11.5308277	18.0479256
10.8696134761275	34.866216998714	11.7591855381947	18.6253841	45.1799856	19.5247549	17.6321283
10.8696134761275	34.866216998714	11.7591855381947	13.0553452	35.1491327	19.4677587	12.3752896
10.8696134761275	37.4258736746367	11.7591855381947	15.6671545	41.9038059	9.4975475	18.2677056
11.4463562658203	37.6448808830575	11.7591855381948	13.5198617	39.2703319	6.7423337	5.6665967
11.4463562658203	37.6448808830575	11.7601855381948	12.1928408	37.3702852	11.5867049	0.8140869
10.0305608010243	37.6448808830575	11.7601855381948	6.820668	39.0713932	12.1631417	16.2462105
5.54048222240476	37.6448808830575	11.7601855381948	7.3492035	35.5012058	13.5793477	9.3339917
5.53948222240474	37.6448808830575	11.7601855381948	2.57466789999999	43.4683609	15.573931	9.7340669
5.53948222240476	44.1851121664934	11.7601855381948	2.1729785	46.8604253	18.9044886	11.1913394
5.45286568262293	44.436496999995	11.7601855381948	3.2029124	51.042154	21.6188315	12.1504864
5.23822976786798	46.6238897999999	18.1871683916865	3.9184302	46.6238898	20.1933306	2.4013658
5.23822976786798	48.9325619294898	15.6652772267788	9.4077401	50.7341371	22.0830838	15.2153276
5.23822976786798	48.9335619294898	15.6652772267788	9.41537220000001	53.1681384	17.4096726	17.5248196
5.23822976786798	48.93456192949	15.6652772267787	7.20936620000001	55.909681	20.1638147	8.5307974
5.23822976786798	48.9440184998747	15.6652772267788	4.944301	50.787374	18.9241415	6.1768296
5.23822976786798	48.9440184998746	15.6519945152579	12.7057803	46.3942459	23.5548248	11.1678278
5.23822976786798	52.8912296531493	10.2966499255724	4.9451086	53.7479899	10.2966488	0.9055154
5.83712988700077	48.7082280578122	9.37820468296586	2.27936	46.9159446	7.984275	4.2205505
5.87406707168471	48.6143662313914	9.36104040004727	6.5220454	46.8393292	9.3610404	1.8896117
5.87406707168471	48.7082447821278	9.36104040004727	2.4253981	44.8523436	2.2881323	11.7215543
5.87406707168471	49.6056785629901	3.52561170826521	5.3360715	49.6056788	2.051856	1.5688834
6.27217224325327	57.0626128377982	5.03065755786952	2.2999767	55.3764405	4.437231	4.3558776
8.75462304365996	58.8665938859334	5.09600507347753	8.7488745	58.9072962	5.1240813	0.0497795
10.0378299914653	58.8665938859334	5.09600507347753	6.65024940000001	63.3598676	12.1766222	19.9843888
10.0388299914653	58.8665938859334	5.09600507347753	6.6484375	67.6725429	4.7357573	18.7895827
10.0398299914653	58.8665938859334	5.09600507347753	20.3908302	60.0437447	17.3381089	17.1200275
10.0398299914653	58.8665938859334	5.09600507347753	18.5593029	70.8497614	1.5511613	16.4543343
10.0398299914653	58.8665938859334	5.09600507347753	13.919931	46.2670929	1.9535236	15.1163989
10.0398299914653	58.8665938859334	5.09600507347753	13.6466825	56.641223	0.3772494	16.9874359
10.0398299914653	58.8665938859334	5.09600507347753	12.9149435	73.6813943	7.0579	16.8344008
10.0398299914653	58.8665938859334	5.09600507347753	3.9504558	53.4738105	7.1081084	13.2039761
10.0398299914653	58.8665938859334	5.09600507347753	4.8021518	64.3437535	14.9149548	13.9826688
10.0398299914653	58.8665938859334	5.09600507347753	1.389212	56.8496436	7.9005554	9.3148689
10.0398299914653	58.8665938859334	5.09600507347753	0.795030699999998	63.4582891	12.408302	17.1080484
10.0398299914655	61.6139957755803	6.5446813243623	6.2196931	67.2192158	1.3051514	9.1371587
10.0408299914655	61.6139957755803	6.5446813243623	9.6122245	63.4753738	1.8891309	15.5818673
16.2521545108872	61.6139957755803	6.5446813243623	15.5276897	59.9411898	0.034091	6.7609848
17.9198511954956	62.596908631504	7.06493400000003	17.9198509	62.5969087	8.2401641	1.1752301
20.612738924622	70.4344677043529	7.06493400000003	29.1113171	69.2428114	2.3178943	9.8595935
20.6856794761908	70.4344677043529	1.48490632672689	21.6218153	70.9164832	0.5487705	1.4089143
20.6123314079049	70.4344677043529	4.30978910060391	21.4467307	69.0185063	0.8942161	4.517097
20.6123314079049	70.4344677043529	6.01554249943657	23.3330747	67.4297538	2.1722534	6.4618896
15.7168360567484	70.4344677043529	11.4438039488619	20.1950128	67.681815	12.2807597	11.7719782
15.7168360567484	70.4344677043529	12.3708648855083	15.7168362	72.1075902	13.3837018	1.9558061
14.8230266857338	70.4344677043529	12.3708648855083	14.8230271	72.6203252	11.2037362	2.4779351
14.8220266857336	70.4344677043529	12.3708648855083	9.81425009999999	65.891213	10.4751695	15.3270767
2.71815123666254	66.7576407325682	19.1083637800105	0.2763329	64.7359652	24.1588067	5.9629374
2.71815123666254	66.7576407325681	19.1073637800103	6.1363219	48.8674613	19.7646406	18.2256529
2.71815123666254	66.7576407325681	19.1073637800103	6.14577610000001	57.4553139	19.7085867	10.5969023
2.71815123666254	78.7009380254252	19.1073637800103	0.933565799999997	72.1659561	13.9038289	13.4077909
2.71815123666254	78.7009380254252	17.044992826516	4.2645198	75.4568775	14.9212902	4.1743619

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.71815123666254	78.7595308530484	15.5810706262769	7.5281123	85.6801168	11.1420674	14.3445898
2.71815123666254	78.7595308530484	15.5810706262769	5.6520223	82.6769432	10.5413091	11.1746738
2.71815123666246	78.7595308530484	15.5800706262766	3.24432779999999	74.1558976	22.7592184	17.4562068
2.71815123666246	78.7595308530484	14.928250114379	2.73342340000001	77.6753662	22.8134911	7.9974461
2.71815123666246	78.7605308530483	14.928250114379	2.2118306	78.338365	17.5236695	2.7310978
2.71815123666249	78.7605308530483	4.12623240446724	6.0949397	74.0865476	5.2825592	7.6811646
2.71815123666249	81.7577862002602	4.12623240446724	6.9413921	77.9428724	3.7844258	8.4884288
2.71815123666249	81.7577862002602	4.12623240446724	2.2068367	85.97283	4.4333903	4.2948267
2.71815123666251	81.7577862002602	4.12523240446723	1.295681	73.7881021	0.4861457	19.2219951
2.71815123666251	83.2352069797785	4.12523240446723	2.4095765	76.567725	8.2487866	13.9285738
2.71815123666251	83.2352069797785	4.09253697153687	4.0094679	79.3774545	3.2513282	4.1542009
2.71815123666251	84.1438746007779	3.81143615203819	1.90777989999999	84.1438746	3.0185488	1.1337425
4.11638499745385	88.5032380948257	3.81143615203819	9.5621792	88.5032381	1.7950294	5.8071138
1.26459509715959	88.5032380948257	4.09107389222095	2.7731053	90.8551563	10.3958831	11.768651
1.26459509715959	91.3074669270637	4.09107389222095	2.2885744	93.0945686	4.7870646	2.1740904
1.26459509715959	93.601914557317	7.45863124151354	2.8109458	93.7321232	7.4419786	1.5519124
0.48322071101444	97.1507124141697	12.5524590794845	0.0137857999999937	97.6201473	12.5524591	0.6638812
0.48322071101444	96.9416447358825	15.6085401413058	0.604558600000004	98.8714353	15.0611354	2.1193873
2.92961437740075	96.9416447358825	21.9104251408741	1.8947773	99.155621	15.7943163	13.566985
2.92961437740075	96.9406447358825	21.9104251408741	6.5131248	96.1438685	22.6159881	18.9754882
2.92961437740075	96.9406447358825	21.9104251408741	5.3401207	99.7769332	23.3119522	19.3172668
2.92961437740075	96.9396447358826	21.9104251408741	8.45094570000001	92.4898096	19.3229772	15.3075709
2.92961437740075	96.9396447358826	21.9104251408741	5.5712407	90.2337915	20.7281907	18.9787731
2.92961437740075	95.9882693789099	21.9104251408741	13.4475731	91.4293541	19.9118277	11.6363893
2.92961437740075	95.9882693789098	21.9196145283198	17.6447354	95.7025091	24.4008135	18.1912178
2.92961437740075	95.9882693789098	21.9206145283198	5.93926279999999	95.2323551	18.983803	4.2724995
2.92961437740075	92.4454524677506	23.0964268566348	3.4980922	86.0326352	18.0570339	13.3409157
2.92961437740075	92.4444524677506	23.0964268566348	4.0389978	87.3302987	23.4710958	15.0585227
2.92961437740075	92.4444524677506	23.0974268566348	2.92961390000001	91.7761922	24.0474062	1.1614786
12.6545942227642	92.4444524677506	23.0974268566348	16.4819632	98.2716229	22.9610856	9.7324435
12.6545942227641	92.4444524677507	18.2346358308006	14.3875276	98.8261078	17.7695633	6.6290931
12.6545942227642	89.1704739460367	18.2346358308007	11.0262565	80.6460603	18.6716382	8.6895387
12.6545942227642	89.1704739460368	15.6816557257899	19.6070156	87.5155962	19.7643343	13.0351264
12.6555942227641	89.1704739460368	15.6816557257899	11.9839899	90.8471274	5.5312557	12.6071325
12.6555942227641	89.1704739460368	15.6816557257899	13.1891897	88.2938542	23.4034575	7.7896989
12.6565942227642	89.1704739460368	15.6816557257899	9.22639889999999	90.0124515	4.4717238	19.4614621
12.6575942227642	89.1704739460368	15.6816557257899	19.6994488	87.7215703	8.9292535	12.92719
16.8173060805746	89.170473946037	10.8453854571736	13.5790401	86.3111074	8.8070912	4.776713
16.8183060805745	89.170473946037	10.8453854571736	20.4274735	84.2677658	10.0950289	6.7799767
16.8193060805745	89.170473946037	10.8453854571736	20.5127244	86.7993916	9.2772764	6.7971193
20.7475893123557	93.5973868002383	10.8453854571736	21.4283979	90.119601	10.9146393	12.23519
20.7475893123557	93.5973868002383	10.81062211058	20.7475398	95.759314	10.8106372	2.1619272
20.8332939416474	93.5973868002383	7.66187088014081	22.9057445	97.6296948	0.3244356	8.6251096
33.7505567676612	93.5973868002383	7.66187088014081	33.8269693	93.4852631	8.3635932	7.8640695
33.750556767661	93.5973868002383	4.64073813358625	38.2308224	97.9753907	0.1604725	7.7014595
33.750556767661	85.9964415753098	4.64073813358625	39.6568849	80.0063838	5.1586736	8.4281529
32.96946719033	85.9964415753098	4.64073813358625	34.482979	80.365325	2.7097027	8.2940253
32.96946719033	85.9964415753098	4.64173813358625	37.6570142	81.9317057	5.2409906	6.23332
32.96946719033	85.3109751975451	12.2328894934202	38.0621359	81.3957333	12.1235509	6.4246672
32.96846719033	85.3109751975451	12.2328894934203	34.617789	91.6565199	3.2534463	17.1587159
32.96846719033	85.3109751975451	12.2328894934203	28.8394854	85.6978668	0.4508897	18.7042447
32.0336769	85.3109751975451	12.2328894934203	25.1363027	82.596723	1.6788626	16.9876139
32.0336769	85.3099751975451	12.2328894934203	25.8819635	79.9487476	10.2285525	9.3875474
32.0336769	83.7025145	12.2328894934202	32.0336769	81.0046037	12.2328895	2.6979108
31.2051605871721	86.9511729532142	12.2328894934202	28.3264783	80.6515072	10.7169993	7.0901709
31.2051605871721	91.8308785867871	12.2328894934202	27.0999394	87.1794445	14.318048	15.3093219
29.5017146657567	91.8308785867871	12.2328894934202	31.00496	87.5127119	14.2496673	15.7467648
29.5017146657567	91.8318785867873	12.2328894934203	23.9936704	92.6751712	13.4234383	7.0508341
29.5017146657568	92.6416700697403	15.090957802211	26.8042407	95.3391438	15.0909578	3.8148041
36.4110384138285	91.8312639419356	17.0555528931569	37.489488	92.2138591	10.0537289	7.9102312
36.4110384138285	91.8250156016628	17.0555528931569	30.1525293	91.7059859	19.8161573	6.8413479
41.0082561324456	88.7319038025311	17.0555528931569	41.3355343	82.7796974	17.0555529	5.9611972
41.0082561324455	90.5360611796843	17.7496525139987	40.8799687	90.9919823	19.2349904	1.5621823
41.0082561324455	90.6085909139299	23.12579127868	40.9379615	91.8870672	23.915222	1.5042087
42.3321811056971	90.4438668663922	23.12579127868	40.3910959	90.932739	23.935083	16.8734606
42.3321811056971	83.0804883269204	23.12579127868	45.8972803	89.1189208	23.3584238	14.0274616
42.3321811056971	83.0804883269204	23.12579127868	44.680977	94.9895485	20.4805113	12.4233676
49.4470210934845	78.4860669871092	23.12579127868	50.7478618	74.0551131	24.8207298	4.9191824
49.4470210934844	78.4860669871093	23.0407152959188	51.7496653	79.9144917	22.4057667	15.0357032
49.4470210934845	78.4860669871093	20.709267586947	49.7783583	78.4397036	19.1457188	1.598943
49.4470210934845	78.4870669871095	20.7092675869471	35.4564008	78.9241199	21.2236154	15.1810796
49.4470210934845	86.7522309270472	16.607156980787	47.9098314	77.7959758	13.7573709	9.5350991
49.4470210934845	86.7522309270472	16.607156980787	45.3945603	79.9114427	16.0984045	10.2225307
49.4470210934845	89.4457759581272	10.521609135721	49.7030604	90.8227548	10.5216088	1.4005809
49.4470210934845	89.4334948880771	10.5216091357209	50.0446513	86.3510967	14.724494	11.408718
49.4470210934845	87.8722324671196	6.93434944262533	49.4827685	84.8462228	4.1362821	10.3517087
49.4470210934845	87.8722324671196	6.93434944262533	45.3765455	76.9954785	11.855076	19.7202249
49.4470210934845	87.0431801674269	6.8593636	48.3895216	84.8378656	6.8593636	2.445755
52.9154943581485	87.3132817072511	3.71726239999995	65.7364961	88.9695394	1.2659879	13.1578882
61.168999275227	87.3132817072513	3.71726239999995	67.3268965	96.007007	6.0328841	10.9024154

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
61.1689992752271	94.88614981942	3.71726240000004	61.1689993	94.8861498	0.1686343	3.5486281
61.1689992752271	97.2668242222881	8.35055787763883	68.523768	98.3881808	6.8534875	8.1618794
61.1699992752271	97.2668242222881	8.35055787763883	63.2522018	99.6147456	0.7669575	18.4401179
64.2526344441167	97.2668242222882	8.35055787763872	61.4066356	99.633296	10.2157007	16.0904388
64.2526344441167	97.5895353942105	10.914749177519	79.9522127	98.0359405	21.2412381	18.7966063
64.2526344441167	97.5895353942105	10.914749177519	66.5761879	96.7049476	8.0800553	4.0776062
64.2526344441167	97.5895353942105	10.914749177519	70.4834315	96.1070737	18.6164445	17.0458905
64.2526344441167	97.5895353942105	10.914749177519	67.0620012	97.8077872	5.6584534	8.2792999
64.2526344441167	97.5895353942105	10.914749177519	62.3573907	96.159986	6.7572642	5.0891887
64.2526344441167	97.5895353942105	10.914749177519	64.3381393	93.722702	21.2607142	16.872102
64.2526344441167	97.5895353942105	10.914749177519	63.7965883	99.8649883	6.5257645	5.4396338
64.2526344441167	97.5895353942105	10.914749177519	61.0701287	98.8683739	3.7920781	7.9054547
64.2526344441167	97.5895353942105	10.914749177519	64.9776601	99.8572829	20.7305349	14.8646935
64.2526634878288	97.5895353942105	11.7031233917403	64.4754864	95.6952093	9.6236824	6.985863
64.2526634878288	97.5895353942105	11.7031233917403	62.5782193	94.8345715	12.3846974	11.8936571
64.2526634878288	97.7119181594139	11.7504672666398	56.5514993	98.5201232	15.0548231	8.4190197
66.3729212001018	97.7119181594139	11.7504672666398	66.3729212	97.9005203	11.9390694	0.2667237
66.3729212001018	97.5099647291547	11.7504672666398	64.0121883	92.7907393	13.624016	9.0477095
73.3165175728488	96.1413234055599	11.7504672666398	75.0360354	91.1497098	19.4705099	11.023678
73.3165175728488	96.1413234055599	11.7504672666398	76.9820609	94.8106777	15.132467	5.1618551
73.3165175728488	95.8479299191699	8.64687945613116	74.8496365	95.8479299	7.1137605	2.1681576
72.932515346159	83.9676350726182	8.99183029126577	71.5874534	94.5399994	3.1033191	16.9233519
72.932515346159	83.9676350726182	8.99183029126577	61.0866811	94.7582572	1.1597592	17.8354325
72.932515346159	83.2094705000001	8.99183029126577	77.2293497	82.6694496	0.4080071	19.9727905
72.932515346159	83.2094705000001	8.99183029126577	77.1265753	88.6843079	7.3792466	19.9105474
72.931515346159	83.2094705000001	8.99183029126577	72.4289329	91.88372	3.0217722	10.9387068
72.931515346159	83.2094705000001	10.0113756564283	71.4909917	88.8238404	7.979611	8.4049975
72.4566883998312	83.2094705	12.2176684652938	72.4566884	79.8068651	12.2176684	3.4026054
70.7072896085619	83.2094705000001	12.2176684652938	67.7945884	81.6777909	13.5506647	7.7525837
70.7062896085619	83.2094705000001	12.2176684652938	69.765468	86.0199863	16.8900143	10.8561261
70.7052896085619	83.2094705000001	12.2176684652938	78.4106856	73.5257917	13.7197973	15.5467792
70.7052896085619	83.2094705000001	12.2176684652938	78.2121151	82.5216358	9.4131561	10.3605913
70.7052896085619	92.8337349591311	14.2384360349395	75.6464183	86.4517504	17.8073467	11.7494177
70.266018	93.0677265543169	14.2384360349395	77.3466754	92.4222135	24.9773835	14.6923437
70.266018	93.0677265543169	14.2384360349395	68.0410206	93.0677269	14.2384361	2.2249974
70.266018	93.1658556527311	17.6622218000001	75.4923392	99.8090463	23.5616918	10.3077719
62.4729528362869	90.4843413159951	17.6622218000001	62.6982725	97.3778678	18.7400798	9.4559017
62.4719528362869	90.4843413159953	17.6622218000001	61.0630253	98.699805	24.8594975	11.0127062
62.4719528362869	86.6562423406371	17.6622218000001	63.9530194	87.4245185	17.4311618	11.3124411
62.4719528362869	86.647018585867	17.6622218000002	62.4719528	86.6470186	17.4140053	0.2482165
60.5807015	86.6257605982563	17.6664227304701	60.774398	89.648206	21.5223541	12.5083419
60.5807015	85.5616319626478	20.0765613329593	56.1389342	85.561632	20.0765614	4.4417673
60.5807015	82.0618734171237	21.8803646278755	55.0653569	81.234009	22.9552522	5.9096312
60.5807015	81.6064397	22.1229241770932	59.1397084	81.6064397	24.1713239	2.5044765
60.5807015	81.601208716235	21.8803751318297	63.6802314	81.8267454	23.9676687	19.0132656
60.5807015	81.601208716235	21.8803751318297	52.878421	80.2956919	22.1921533	17.8391178
60.5807015	74.1746929999943	21.8803751318297	63.772212	68.1836695	14.3458559	14.1434905
67.2798599803509	74.1746929999943	20.6798792861133	67.3900644	74.174693	20.6721334	0.1104763
67.2798599803517	74.1736929999943	20.6798792861133	66.8428254	74.9418962	18.8280244	11.9134957
63.64872717789	70.3385557260475	20.6798792861133	56.5346421	68.6367247	22.9662555	7.6638079
56.28863454674	70.2173202600522	20.6798792861133	58.1838222	68.9986011	16.3418061	5.0984315
56.2886345467401	70.1350104457703	20.6798792861133	56.7397866	71.0931061	18.3430984	12.7871715
56.0822034591199	70.1078856594743	20.6798792861134	56.0822206	62.8731122	23.9833277	7.9532835
56.0464834271349	70.1078856594743	12.4514781449437	57.43771	71.1535593	20.5447257	13.3451357
55.9763679607124	70.1078856594743	12.4514781449439	57.8283627	65.6998258	15.4827548	5.6799674
53.5550569530423	70.1078856594743	12.4514781449439	57.0800315	64.0172849	6.0370203	9.5428133
53.5378549201621	70.1078856594743	10.2994673451604	54.3749565	73.471727	7.5546522	4.4215583
53.5091528519089	70.1078856594743	9.31273651591004	46.8228713	71.844353	9.3127449	6.908088
53.5091528519089	70.1004155579081	7.55470093784253	47.2434466	72.8348775	10.3871125	7.3999265
53.5091528519089	70.1004155579081	3.23095678660081	43.6827488	74.1878852	3.8851851	13.0248043
53.5091528519089	70.0994155579081	3.23095678660081	45.5118999	65.9532613	1.4856264	17.6961201
53.5091528519089	70.0994155579081	3.23095678660081	46.0567355	72.019762	4.0391076	17.1499692
53.5091528519089	70.0984155579081	3.23095678660081	45.412979	71.2677197	7.8505587	19.9703759
53.5091528519089	70.0974155579081	3.23095678660081	42.9598051	72.0704928	1.9046969	12.5037762
53.5091528519089	69.7970427121236	3.2309567866008	50.0180258	68.4527432	3.6702061	3.7667027
53.5091528519089	69.6500999973114	3.21923202841129	53.0250996	68.7918887	2.0307378	1.5438111
53.5091528519089	69.6500999973114	4.74694594859291	44.3710695	67.9205927	10.1383529	17.6190773
58.2493634905138	69.6500999973114	4.7469459485929	64.4543682	70.2655389	2.1929672	6.7382235
66.469390031443	69.6500999973113	4.7469459485929	64.6626599	65.39963	6.8345581	5.0684212
67.0532080853654	69.6500999973114	4.7469459485929	74.4567732	73.8913977	2.9219836	9.1604579
67.0532080853654	69.6500999973114	4.7469459485929	68.5426632	70.6500378	2.313903	3.2232857
67.0706253902679	69.6500999973114	4.7469459485929	75.0689318	72.4744486	0.4051745	14.9698309
67.0706253902679	69.6500999973114	4.7469459485929	75.4040099	79.0607348	6.3376777	12.6702712
69.8277733213066	69.6500999973114	4.7469459485929	61.6425082	72.8564323	6.6704147	8.9988257
75.6751440079996	69.6500999973114	15.8370209003782	73.2290706	73.9762718	17.115174	18.8679238
75.6751440079996	69.6500999973114	15.8380209003777	77.5651358	71.0148631	15.8380209	2.331233
75.0747658751744	69.6500999973114	20.3285084469309	73.7932186	65.1929118	21.2635249	5.5307734
75.0747658751744	61.1797833136103	20.3285084469309	74.3685871	61.179785	20.6768635	0.787426
75.0747658751744	60.5667778200623	20.3285084469309	69.1126526	61.5737532	13.3447692	13.1055803
75.0747658751744	60.5657778200623	20.3285084469309	70.748982	60.565778	20.2126548	4.327335

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
75.0747658751744	55.5257846689757	20.5873119511657	69.6306367	57.4599551	14.1507992	8.6491765
77.9331273954092	54.6404136772226	22.4354249458877	79.80288	56.0883078	18.4129389	5.2865846
78.0242875347848	54.6404136772226	22.4354249458877	79.155929	54.6404138	23.5670664	1.6003827
77.5187197832344	51.9308991582651	22.4354249458877	67.7686962	50.942416	23.8888342	9.9071922
67.077766611286	51.9308991582651	22.4354249458877	63.3830619	45.6708392	19.4411223	11.4259131
66.9969197852912	51.9308991582651	20.3691723169072	62.9728444	48.2610974	18.088966	5.9042331
66.9969197852912	51.9308991582651	20.3691723169072	58.3317264	48.8464518	15.1551224	16.6689028
66.9959197852911	51.9308991582651	20.3691723169072	65.5436157	56.992435	13.1266946	17.084027
66.9959197852911	51.9308991582651	20.3691723169072	66.0988248	58.3515559	13.6719306	17.5072809
65.8501111941926	51.9308991582651	20.3691723169071	65.8501112	46.5185477	18.4012114	5.7590293
57.7424662951168	52.0835176552986	20.3691723169072	57.7424662	53.0431767	19.7584506	1.1375089
57.7424662951168	52.0835176552986	22.6830662132657	55.3536754	50.0230289	15.6187386	10.7398558
57.0032853008777	49.8680248481272	23.6803787063044	57.0032853	47.929495	24.4820709	2.0977627
53.637554741158	49.8680248481272	23.6803787063044	54.8328865	43.6672378	22.5503676	6.4152555
46.2105828367369	50.643450205639	23.6803787063044	44.8729194	51.9811136	24.4648411	2.0479424
46.2105828367369	49.8680248481272	23.6803787063044	46.3458684	54.8708712	24.5219613	8.2955698
49.7681270811336	46.8278362000095	19.3310495	49.7681271	46.8278362	16.9025729	2.4284766
52.132383054844	46.8278362000095	19.3310495	48.2549784	40.2375649	15.7273532	18.4484604
52.132383054844	46.8268362000095	19.3310495	55.5353048	38.1752447	17.6684542	10.1702798
52.132383054844	32.7380518023228	19.3310495	58.429274	38.9397266	17.4146787	18.6397178
56.3923092213215	32.7380518023228	19.3310495	57.0336699	24.3925592	19.6603049	10.3178167
56.3933092213215	32.7380518023228	19.3310495	51.358437	31.183912	20.2786449	5.9744983
60.5572625632748	32.7380518023228	19.3310495	75.1791401	28.4357222	11.5456464	18.0653964
60.5572625632748	32.7380518023228	19.3310495	75.8801773	29.7113355	20.1473913	15.8480612
64.5909854633954	32.7380518023228	19.3310495	65.5247054	34.4819771	22.2818751	3.6959394
64.5909854633954	32.7370518023229	19.3310495	68.3855742	35.3493495	17.8360025	5.6398572
64.5909854633954	32.4233845003053	19.3310495	73.9542296	35.1681427	22.8323041	17.0431609
76.3844964533688	32.4233845003053	19.3310495	78.2442809	33.2914556	24.7068001	5.9254971
76.4368066096176	28.2483886579493	19.3310495	71.3343578	25.5495623	21.1336705	6.1682291
76.496909471148	28.2483886579493	19.3310495	70.2766166	21.7580017	19.3250026	9.1846004
76.496909471148	28.2483886579493	19.3310495	71.2868972	13.7571779	21.261272	15.5198317
76.4969094711481	28.2063959171837	19.3310495	76.8303918	30.6898889	19.4810071	15.6982902
76.4969094711481	28.2063959171837	19.3310495	78.3681704	28.4149174	19.0447715	15.9637623
76.550062543967	26.5026163840405	19.3310495	77.5184606	26.3492827	20.0048231	1.1896541
72.0719911790716	26.5026163840405	15.2538033996223	70.5957341	27.6007009	14.8208364	1.8901283
68.732117394917	26.5026163840405	11.4719849023899	62.0390375	27.7696953	8.7011853	7.3539199
68.732117394917	26.5016163840405	11.4719849023899	62.1748486	23.5386262	9.8971034	19.2663276
68.732117394917	26.5016163840405	11.4719849023899	68.9038468	16.8104734	21.7337542	18.4978064
68.732117394917	19.633861774976	11.4719849023899	67.7860652	18.0440513	10.7235759	17.8951575
68.732117394917	19.6328617749758	11.4719849023899	72.0757838	18.033427	9.5185824	4.1897587
68.731117394917	19.6328617749758	11.4719849023899	78.8734057	30.5074156	10.2492504	17.7741551
68.731117394917	19.6328617749758	11.4719849023899	69.6772126	28.9703915	6.8785128	10.4491408
68.731117394917	19.631861774976	11.4719849023899	71.8742878	17.8343061	13.6189325	6.5081686
68.7311173949173	17.2080284446881	11.4719849023899	79.9570853	14.106802	16.0131314	15.0949781
68.7311173949173	17.2080284446881	16.2641396808171	73.292725	7.8305571	19.3842603	14.0833606
68.7311173949173	17.1779935472436	16.2641396808171	70.2907843	10.4186099	14.6666305	7.1185577
61.0074687823756	17.1779935472436	16.2641396808171	58.3586123	20.3359236	6.4801103	10.6167883
61.0074687823756	15.7223321427683	16.3964410895014	62.1996928	26.9322785	20.2466983	11.912547
61.0074687823755	13.7850737507403	16.3964410895014	60.5482992	13.7850738	16.8556106	0.6493638
62.1358915999863	13.7054564805682	10.8949030648871	67.4654721	12.1137109	23.8276929	14.0781794
62.1358915999863	12.6792580377869	10.5411505362482	70.8086056	11.5809577	17.5154997	15.5821047
62.1358915999863	11.1965242152176	7.87130064939446	64.1033853	11.196525	7.8712992	1.9674937
62.1358915999863	10.1841347008803	4.97431917362633	61.3811866	10.1841347	3.2294003	1.9011369
62.1358915999863	10.176891059687	4.97431917362633	68.4102584	6.9403941	4.658299	16.8109375
72.2699335999998	10.176891059687	4.97431917362633	70.9135058	14.8761766	3.8438809	6.3074316
72.2709336	10.176891059687	4.97431917362633	72.9487249	9.0752285	0.6396625	6.7256814
72.2709336	10.176891059687	4.97431917362633	72.320279	3.8462993	6.5608426	12.1872623
72.2709336	5.65932083795936	4.97431917362633	72.8917692	2.6849909	9.1068195	5.1292918
72.2709336000001	3.20905850144764	6.7443046022525	73.9903157	3.2090585	6.7443046	1.7193821
72.2709336	1.61337591523915	10.5975181294124	75.2339764	1.1053279	6.9329867	16.7841753
62.9025223434606	1.61337591523915	10.5975181294124	54.6678163	5.1970784	7.0182008	9.6677205
62.9025223434606	1.61337591523915	19.2202219349115	64.943613	1.686391	19.5930668	14.0946653
55.2537103976396	1.61337591523915	19.2202219349112	55.2537104	1.3428502	19.4907476	0.3825811
55.2447063307345	1.61337591523915	19.2202219349112	52.4413086	6.2567644	20.6204114	17.7872557
55.2447063307345	1.61337591523915	17.9552024149284	57.1362338	5.5136309	23.5708492	10.1201436
50.0328825381754	13.6202677277896	17.9552024149284	52.3761166	17.3066951	24.8659343	10.3802999
49.4509787691344	13.6972961000003	17.9552024149284	49.4509792	19.23293	17.9552005	5.5356339
47.3034324186307	13.6206868835218	13.1121212131348	45.092729	13.545129	18.3076608	9.6124868
47.3024324186305	13.6206868835218	13.1121212131349	46.2315326	17.3070005	18.3576471	18.9782971
47.3014324186306	13.6206868835218	13.1121212131349	41.2499501	12.693222	14.1376671	15.4469364
47.223718400105	11.64307	11.522225000622	47.2237184	11.5265695	11.522225	0.1165005
41.0407620453578	13.5375646938763	7.50260655702842	41.0252369	15.6288565	6.5265879	2.3078897
37.3849664000008	13.5375646938763	7.5026065570284	54.100404	16.0525172	0.8678853	18.9251989
37.3849664000008	13.5375646938763	7.5026065570284	39.7052051	20.7340789	2.9027737	9.9402181
37.3849664000008	15.9326546291182	7.50260655702843	37.3849664	18.6565566	4.7787046	3.8521791
37.3849664000008	15.2298684638035	7.50260655702843	39.7157151	22.5518047	13.0027284	19.2813071
33.7706466096833	15.2298684638036	14.4650588793153	33.7699504	15.2531662	14.0155756	0.4500872
33.4239478464619	14.8020789999997	14.4650588793153	33.6742877	16.0147514	17.7329183	19.9827348
33.4239478464619	14.8020789999997	14.4650588793153	16.5565287	18.5575743	19.3585299	18.4350632
33.4239478464619	13.4626957	21.0527080195121	30.8819888	13.4626957	23.5805357	3.5848945

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
33.4239478464619	5.67552813871196	21.0527080195121	31.6461166	7.3585956	24.5416178	12.8469017
33.4239478464619	5.67552813871196	21.0527080195121	19.95828	6.5164086	22.2907726	19.0088103
33.4239478464619	5.67452813871196	21.0527080195121	38.5584867	8.9239146	23.1054293	8.3130054
33.4239478464619	5.67452813871196	21.0527080195121	33.7088519	9.9711832	22.3346661	13.226048
33.4249478464619	5.67452813871196	21.0527080195121	39.0651937	2.4238303	22.4127866	9.0370307
33.4249478464619	5.67352813871197	21.0527080195121	33.5301093	3.5426558	21.7233363	3.7368294
34.237796258676	5.66511330215804	21.0527080195121	34.237799	1.769458	21.0926833	3.8958604
34.237796258676	5.66511330215804	20.0006381575766	25.3620642	2.9418291	18.8013171	9.3612642
36.6709282175189	5.66511330215804	17.9679653966989	43.6411268	3.9331303	13.8180098	18.3321607
36.6709282175189	5.66511330215804	17.9679653966989	41.5241877	2.2495139	17.9679654	5.9346817
36.6709282175189	5.67329748148014	7.93607944503597	45.3795945	10.2393952	3.6711995	17.2768189
36.6709282175189	5.67329748148014	7.93607944503597	42.0438698	1.2746098	8.4709115	18.5219549
36.6709282175189	6.06011394831217	7.93607944503597	37.7928549	6.0601138	4.720283	3.405887
29.1566249114257	8.78983706263703	9.71160506076928	30.2787157	8.2280249	1.312123	8.4927039
29.006300529686	8.79193668227228	10.0558261107409	31.9710737	13.1659452	6.9350237	6.1525799
29.006300529686	8.86784723345992	10.0558261107409	28.9980611	9.3107142	10.3932004	0.5567948
29.0063005296859	8.77442332212659	10.0558261107409	29.8399494	3.731908	9.1569031	5.1894117
25.7941738559165	8.77442332212659	10.0558261107409	26.3324067	9.9110212	1.9657306	19.0585155
25.7941738559165	8.77442332212659	10.0558261107409	25.7941467	5.022901	22.6635913	13.154074
17.3929381001425	8.77442332212659	7.04742472572354	17.3929381	9.8303298	1.4719335	5.6745961
15.1254877273364	8.77442332212659	7.11782808057412	33.6893922	8.5224136	7.0176775	19.9918892
15.1254877273364	8.77442332212659	7.11782808057412	24.4057133	14.819481	14.2616378	14.1480218
15.1254877273363	7.05044762442018	7.11782808057412	15.3634563	8.946465	9.6121679	13.8278483
15.1254877273363	7.05044762442018	7.11882808057412	15.820225	13.1438067	8.0447276	7.149623
15.1254877273364	7.05044762442018	7.11982808057412	21.5694811	0.9567502	13.1824134	13.3401903
15.1254877273364	7.05044762442018	7.11982808057412	14.9649191	8.2569823	17.1672819	11.1052011
15.1254877273364	7.05044762442018	7.12082808057412	21.5004558	1.4444458	11.8706015	10.4654737
15.1254877273364	7.05044762442018	7.12082808057412	18.0605132	3.6100683	1.3230623	8.5868999
15.1254877273364	7.05044762442018	10.7998884243801	11.2137447	2.0282324	10.133715	19.8233424
15.1254877273364	7.05044762442018	10.7998884243801	7.7653349	6.167634	7.7136991	19.726704
15.1254877273364	7.05044762442018	10.8008884243801	10.2956976	4.6843351	8.4372721	13.6376992
15.1254877273363	7.05044762442018	10.8018884243801	15.2275578	8.2482088	20.735321	10.0059049
12.5789812643726	4.17607163381144	10.8018884243801	9.4518233	0.0818322	21.8708164	12.2091392
12.5779812643726	4.17607163381144	10.8018884243801	9.8269964	6.8843491	16.4620329	6.8651251
12.5769812643726	4.17607163381144	10.8018884243801	15.0419936	3.4632806	14.5409941	4.5348945
3.94329715289537	4.17607163381144	10.8018884243801	3.796854	1.0310825	8.8837938	3.6866637
3.94329715289537	4.17607163381144	14.1168967248924	1.18933079999999	3.3623299	20.9336159	7.3969025
3.94329715289537	13.8366373078453	14.1168967248924	1.16963010000001	7.0254341	24.7260216	16.3262783
3.94329715289537	13.8762399061372	13.7411561778474	2.4227502	13.8762399	13.6085461	1.5263186
11.494187718872	13.8784556482614	13.7411561778474	6.43216459999999	5.6038094	17.9548593	10.5758755
11.495187718872	13.8784556482613	13.7411561778474	8.8711802	13.2955279	17.3948906	15.7653907
15.0361397238568	21.2239015998435	13.7411561778475	20.1050057	16.8211128	11.4177964	7.104643
18.0420159090162	21.2239015998435	13.7411561778475	16.5956207	19.4929376	15.3111277	6.6403358
18.0420159090162	21.2249015998435	13.7411561778475	18.0420031	31.0087706	14.9562459	9.8590332
22.3917359445657	21.2249015998435	7.06826022251448	10.881307	21.222109	11.4410052	15.2562401
22.3917359445657	21.2249015998435	7.06726022251448	6.7702019	28.6398243	6.655852	18.6590849
22.3917359445657	21.2249015998435	7.06726022251448	12.2844966	12.8434228	15.9512599	16.9324181
22.3927359445656	21.2249015998435	7.06726022251448	14.6392528	26.7492086	4.8139494	14.0759419
22.3937359445656	21.2249015998435	7.06726022251448	10.2638739	16.7343669	2.745395	18.8298176
23.2601629948321	21.2249015998435	7.06726022251448	23.260163	19.1726271	1.8635456	5.5937891
23.2864227228033	21.2427052260779	7.06726022251448	24.4888337	25.329984	1.2423959	19.8782132
23.2864227228033	21.2427052260779	7.06726022251448	17.2034005	24.1027648	4.0750954	19.2446407
23.2874227228033	21.2427052260779	7.06726022251448	19.7989907	26.8559855	1.6393695	13.3335104
29.3160527999999	21.2427052260779	7.06726022251448	27.922577	21.764341	5.4511195	14.2606988
29.3160527999999	23.7354033751134	9.06095926056783	31.6418617	23.7354033	9.0609597	2.3258089
29.3160527999999	23.9088583183105	10.998093845458	34.7673517	23.4200763	4.8203284	8.3957645
29.3160527999999	23.9088583183105	10.998093845458	30.6527015	22.708305	8.3283902	3.2179614
29.3160527999999	23.9088583183105	16.3481953220357	28.9097869	26.1468646	19.859402	4.1835746
35.1145869786541	23.9088583183105	16.3481953220357	36.6688954	15.3802855	11.2906359	16.9765386
35.1155869786541	23.9088583183105	16.3481953220357	38.9701661	21.3778805	18.3750053	5.0370217
35.1155869786541	24.3469863039065	16.3481953220357	44.272376	24.1529526	16.7575015	13.4087757
35.1155869786541	24.3469863039065	16.3481953220357	40.565033	30.2350611	14.624538	16.7047972
35.1155869786541	29.8940185524409	16.3481953220357	44.6441662	33.1239716	16.5654644	11.3823841
35.1155869786541	30.0450075990399	16.3481953220357	39.21475	31.0795566	21.1487172	8.3251067
35.1155869786541	30.0450075990399	16.3481953220357	37.130172	34.1670861	22.6509329	7.7958056
35.1155869786541	30.0450075990399	14.5913458094732	35.0133629	33.6653342	20.0549291	15.142596
35.1155869786541	30.0450075990399	14.5913458094732	35.4889656	25.3753347	12.2670294	17.6050983
35.1155869786541	30.0450075990399	14.5797562321925	31.5115819	30.4349931	13.1711147	4.1547529
35.1155869786541	30.052644358585	11.3609992	33.8398153	32.0377234	11.3609992	2.359689
38.0306824864489	29.927143400002	8.37637154974263	36.9545772	32.1019086	19.1323386	17.1509479
38.9767877463662	29.927143400002	7.54260985014478	38.9767874	28.6595996	7.54261	1.2675438
38.9767877463662	29.928143400002	7.54260985014477	38.4714341	30.1541626	2.0837059	8.9883187
38.9767877463662	29.928143400002	7.54260985014477	34.0986738	23.3047286	4.238405	16.797077
45.170592361781	29.928143400002	7.54260985014477	41.3950957	34.602479	9.5059407	10.330203
45.170592361781	29.928143400002	5.72062779999984	42.5831476	37.1399223	7.4293369	8.4151487
45.1705923617809	29.928143400002	5.7196278	51.5218465	39.5765057	8.1668107	17.6859637
45.170592361781	33.215055422328	5.7196278	45.1705924	33.2150554	0.7183829	5.0012449
46.2920664775339	33.2394472798118	7.55642315907683	48.3601763	34.0464698	9.5017871	2.951746
51.1734690981219	33.2394472798118	7.55642315907683	51.6262531	32.9510025	3.9807244	3.6157759
51.173469098122	35.3725795553473	7.74556638367993	51.2078647	35.5791539	12.2358489	4.4951633

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
53.9488421430441	35.3725795553473	7.74556638367993	55.1300701	40.0588307	9.3430467	5.0900091
53.948842143044	35.3725795553473	10.8863796	54.9748886	31.6899499	9.1125802	11.8489378
53.9488421430442	35.7189477026276	10.8863796	56.2067364	40.2417677	14.7422616	19.6165059
53.9488421430442	35.7189477026276	10.8863796	44.7688336	34.8472485	18.3927145	19.5683767
56.9481600062065	35.7189477026276	10.8863796	56.9481598	35.7189477	11.6860928	0.7997132
56.9491600062065	35.7189477026277	10.8863796	56.98499	36.3050676	16.2652139	14.2729457
56.9501600062065	35.7189477026277	10.8863796	56.0727891	23.8686819	7.47443	15.5553362
65.8812401779159	35.7189477026277	6.13078150315326	57.9600279	34.4089577	5.7051211	11.7355261
65.8812401779159	36.2093634061417	6.13078150315319	57.9145816	37.4787407	0.4915272	9.8427718
65.8812401779159	36.2093634061417	3.15496110000014	61.8021468	40.7857588	11.6604123	13.1222565
65.8835829915143	36.2093634061417	3.15496110000014	59.7400431	37.5401839	2.8523374	7.0381524
65.8845829915143	36.2093634061417	3.15496110000014	57.8811625	36.8910334	2.4827855	11.1609103
65.8845829915144	36.2103634061417	3.15496109999999	65.884583	36.2103636	0.6036001	2.551361
65.8855829915144	36.2103634061418	3.1549611000002	65.5339196	33.299582	2.2513726	4.4914809
67.3007302596627	36.2103634061417	11.0034317607811	66.7264937	28.6241638	4.754423	9.8453178
75.4132684182051	37.0439506401824	11.6604960916077	73.6483802	37.1698351	8.0638871	9.29445
75.4132684182051	37.0439506401824	11.7455580565439	76.1612584	37.0439506	15.0269683	3.365582
75.413268418205	39.7077324450759	11.7455580565438	73.6393721	37.6930766	12.5724621	4.535198
75.413268418205	39.7077324450759	11.7455580565438	72.24704	39.7077335	13.756154	3.7506664
75.4132684182051	39.7077324450759	11.6646613658427	67.6344777	29.9025036	14.033884	17.8609779
75.4132684182051	39.7087324450759	11.6646613658426	74.2228108	38.6099587	15.750928	8.4402478
75.4132684182051	39.7087324450759	11.6646613658426	67.7343836	45.7338412	11.9249335	10.9613064
78.2667273253921	50	11.6646613658427	75.4422908	46.5496079	10.6773392	15.4085245
88.097010595262	50	9.61849432987192	77.8566059	47.3210428	1.4302369	13.3824609

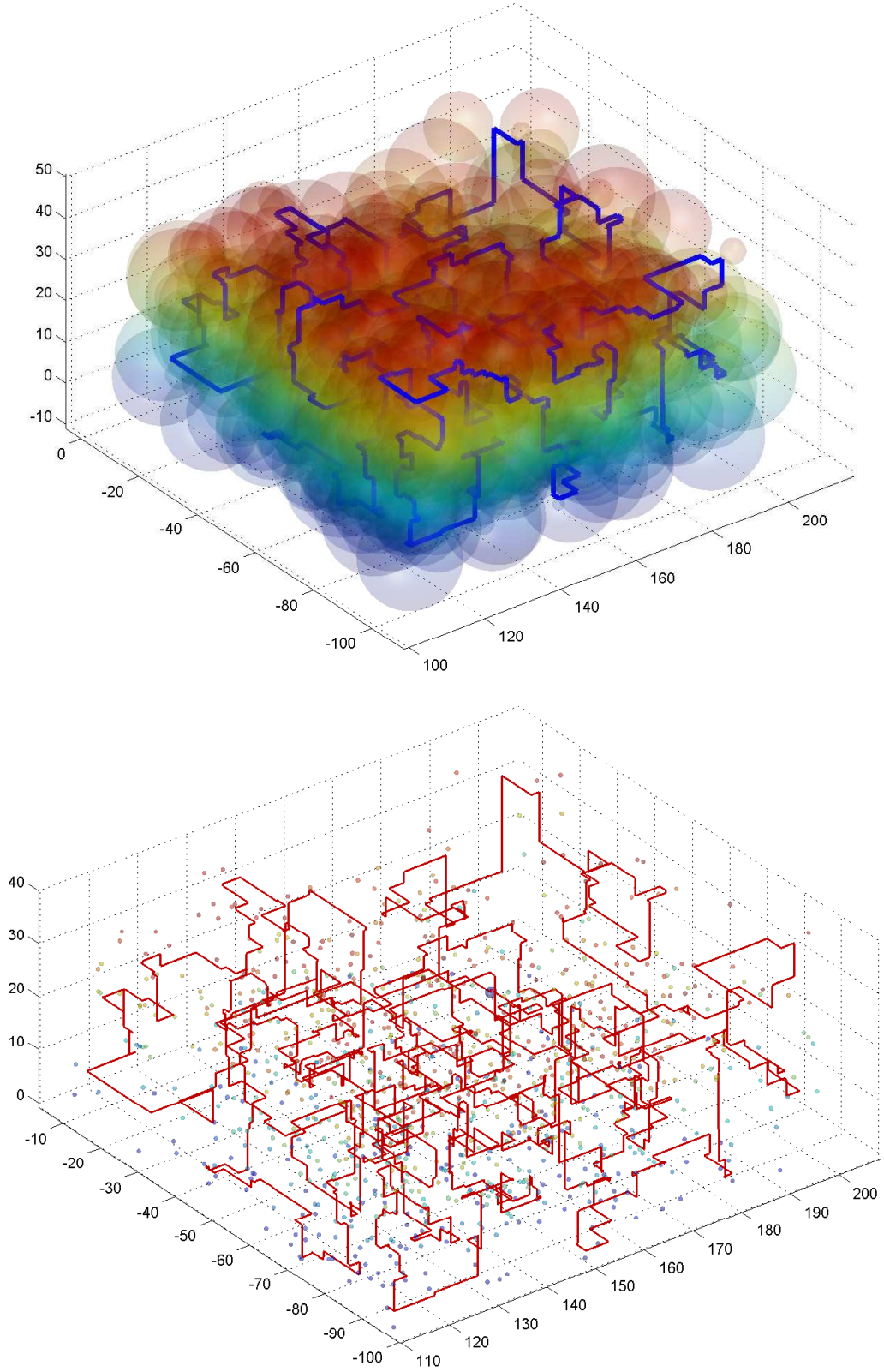


Figure N.201: *bonus*1000, arbitrary radius, 3D, Manhattan, Length = 3218.9380346

Table N-204: Solution for *bonus*1000, arbitrary radius, 3D, Manhattan

Total distance: 3218.93803460693 Depot: x 80 y 20 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
79.9693289271788	13.2254855968756	0	87.03899122	21.09553754	1.216015821	10.64878101
76.4444233657695	13.2254855968756	0.039652768651262	76.68650337	13.86956158	1.8774276	1.962359022
76.4444233657695	13.2254855968756	2.18729984113829	72.1570689	9.179080442	1.515121588	9.589007965
61.7274633042144	13.2254855968756	2.18729984113814	65.51501196	11.68636529	3.24100338	7.30737771
61.7274633042144	6.3159138598954	2.18729984113828	63.24920239	4.015695007	1.646238652	2.810594924
42.3434659297564	6.3159138598954	4.00872662733837	42.34346606	5.769949569	4.366098536	0.652527155
34.8039078104107	6.3159138598954	4.00872662733837	38.07401644	11.09458783	4.920078282	6.973490769
34.8039078104107	6.34229231461992	4.00872662733837	35.62470684	10.73896033	9.362523366	6.976212454
34.8039078104107	13.0745710137614	4.00872662733837	36.57027062	15.62107689	13.23399254	9.745800746
30.9043467400002	13.0745710137614	4.00872662733837	34.15723352	12.84614068	2.236297964	4.597761329
30.90434674	19.1257151258479	4.00872662733837	30.90434674	20.96780911	4.645040707	1.948898626
24.2349265476201	18.9086253754096	1.28417841976642	21.65865806	17.99154884	8.745957007	8.718780186
24.2349265476201	18.8726310377068	1.28417841976648	24.23492671	17.98856994	0.400117348	1.250251176
24.2349265476201	18.9086194515742	1.28417841976642	24.09498187	20.3828805	2.129534364	10.45340098
16.7611749275975	28.022619324	1.28417841976642	23.31975826	27.34182644	2.882941415	8.782240679
16.7611749275975	28.0226193240003	1.56244747456288	16.76117492	28.31246812	1.562447455	0.289848796
16.7611749275975	28.022619324	1.56344747456289	9.320660383	27.08555662	0.10230943	10.8588123
16.7611749275975	28.022619324	7.70673153068229	18.74305811	29.30240259	6.154559295	6.990859055
3.98856022266011	28.0226193239998	7.70673153068229	8.02660248300001	29.17059173	11.48261049	9.758103666
3.98856022266011	28.0216193239998	7.70673153068229	0.438114408000004	29.42535326	2.454773911	10.7393682
3.98856022266011	27.6282699583412	7.70673153068229	2.694391803	27.62826968	12.84474665	5.298497076
3.98856022266011	18.0482349383722	7.70673153068229	0.867278095000003	18.04823486	8.201101929	3.160190534
3.98902827739717	10.8300944346474	7.70673153068229	3.082410661	9.043855976	8.462200359	9.949435792
10.0988546101222	10.8300944346474	7.70673153068229	5.801300438	5.23076571	0.128009607	10.356567
12.4352052768212	10.8300944346474	7.70673153068229	14.9958336	14.5728326	1.422152891	8.817791313
13.9990138075872	10.8300944346474	7.70673153068229	18.20950886	6.619599382	5.445678785	6.369371766
12.7534495868997	10.8300944346474	12.340114982554	8.67995437099999	15.22687294	13.91463376	10.6053774
12.7534495868999	11.7326846871821	12.340114982554	12.63680518	12.91935497	10.56277797	10.77386908
12.7524495868997	11.7326846871821	12.340114982554	10.89890727	16.02503912	12.34011368	4.675459945
12.7524495868997	9.24044023799995	19.2261115765352	20.19850768	8.627828216	19.22611956	7.471216408
8.9880269375377	9.24044023799995	19.2695177010781	8.98802709899999	7.925934732	19.26951737	1.314505506
8.35809583166605	14.9780243256375	23.5292640124242	8.465864182	8.874062551	25.43796737	11.71772619
8.35809583166602	14.9780243256375	23.5838817869225	3.177857831	14.97802426	24.78576733	5.317837399
8.35809583166605	20.0028507220073	23.5838817869225	2.197761157	16.16441336	29.99258788	10.88783855
9.58149204709541	23.8452781994444	23.5838817869225	12.36712067	15.90584574	24.47249551	8.460729812
9.58149204709551	25.1044058762604	23.5838817869225	18.71921477	25.10440199	21.46380598	9.380442313
9.58149204709541	26.7830667370063	23.665461187871	5.584406208	23.81184943	17.55438576	9.409363681
6.17963604058113	26.7830667370063	23.665461187871	4.953508892	23.81507206	25.41914679	11.32693583
6.17863604058113	26.7830667370063	23.665461187871	6.71940622700001	25.73868862	24.12156356	2.345987396
6.17763604058112	26.7830667370063	23.665461187871	1.354188569	31.31594018	20.59719751	7.295671947
6.17763604058112	26.7830667370063	26.0378453629232	4.281409798	24.72152663	26.34546352	3.095213609
6.17763604058112	26.7830667370063	26.0388453629232	3.43019284899999	27.39779729	20.1502757	6.526989384
5.99374170997379	26.978797752217	32.0736149129797	2.51827574799999	30.45426362	34.97941135	5.70976178
6.17771102150752	25.4368228549143	32.0736149129797	3.815111582	26.65111472	27.4138472	5.810017463
6.77620224961359	21.6818471009614	32.0736149129797	6.772905892	23.04434695	34.36872103	2.6690689
7.31997788183716	21.3791604989666	32.0736149129797	7.31997787899999	15.37807435	33.05725748	6.081166637
7.32097788183715	21.3791604989666	32.0736149129797	5.72255099500001	17.38650207	24.6119319	10.68361364
7.60252657764181	21.3791604989665	32.0736149129797	5.677247541	18.04924585	36.67897415	6.000363709
11.0323786842597	21.4675636775862	32.0736149129797	10.62327399	24.29073933	35.14972626	10.64782213
11.0333786842595	21.4675636775862	32.0736149129797	14.86812736	22.17705421	27.08627601	8.397529002
11.0333786842595	21.4675636775862	29.8606009929175	10.79914705	20.42039499	35.93251466	9.255684285
18.2866731759129	21.4675636775862	29.8606009929175	17.16840861	23.65521269	38.43535721	10.62185038
18.2866731759129	25.9240228113868	29.8606009929175	22.07359754	33.01769228	30.23180819	8.049766298
18.2866731759128	28.1751198092207	29.8606009929175	9.44237495500001	27.32019574	23.59921997	10.87002293
19.3035706426559	28.6667604608372	29.8606009929175	19.64225061	34.99214308	28.17560222	6.554722745
19.3035706426559	30.7678227353274	29.8606009929175	14.14878683	27.98719075	26.90047422	10.13344558
21.4373583328448	30.7678227353274	29.0935495905682	23.06731773	35.0375678	21.55663613	8.814338039
21.4373583328448	30.7678227353274	32.8145718940002	18.69463352	36.26547074	33.27071747	6.160741982
24.8795882200979	27.0958340897375	32.8145718940002	24.87958822	27.09583401	32.67332021	0.141251684
25.0054326090477	26.785373489536	35.1293160823908	20.73212412	24.23741148	36.78766314	6.929326091
26.4664414040699	21.4234226692462	35.4651642461293	25.83818458	22.03803134	36.60516078	1.439459118
29.1361847021062	19.9257983506663	35.4651642461293	21.70527032	21.60018691	37.91508039	8.932392927
29.1361847021062	19.4713724076883	35.4651642461293	27.39065822	19.10906735	34.23380192	2.166651987
29.1581155157687	14.368194491	35.7713738182861	29.15811552	9.518746656	35.77137383	4.849447835
32.769715774	14.3681944909998	35.7713738182861	32.11403346	10.63014558	35.85165647	3.943215754
32.769715774	24.45085722	36.0563286482334	34.82834577	24.45085722	36.05632865	2.058629996
32.7198475902802	26.6774276485016	36.0563286482334	39.25918273	24.78783876	35.71196052	9.890531084
27.6552107699816	26.6774276485016	36.0563286482334	27.26619514	25.90196542	35.39277783	1.092233728
27.6552107699816	33.2762272077497	36.0563286482334	26.37919279	28.3108891	38.48025156	11.05276225
27.6552107699816	33.2762272077497	37.6969047851887	27.42853428	33.27622768	38.61257115	0.943306484
27.6552107699816	39.5531781009241	35.9678863832078	30.41452332	39.55317391	35.96788826	2.75931255
26.2236563273192	40.7166493872388	35.9678863832078	34.06373355	42.77086753	33.9464291	11.54083384
26.2236563273192	40.7176493872389	35.9678863832078	30.83636789	38.35208021	33.99399048	5.711258926
26.1392320460477	40.762310657631	35.9678863832078	30.55507662	47.73107042	32.65818922	10.01719534
26.1105871795085	40.762310657631	35.9678863832078	30.18073163	48.32029982	32.22769732	9.58620967
26.1105871795085	43.9896280289055	35.9678863832078	24.77779172	44.04083387	26.11612996	11.013687

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
25.7182134697335	44.0076690109739	30.1421086491146	25.71821347	44.02373583	30.1225615	0.02530284
25.7182134697335	44.0076690109739	32.7281945645387	30.28185343	43.77834378	32.70178342	7.043480934
25.7172134697333	44.0076690109739	32.7281945645387	23.40792676	43.64379836	35.72280889	8.702120093
22.7987951152975	44.0076690109739	32.8733542296037	22.79879511	41.59634367	39.45795983	7.012240784
17.4741623438624	44.007669010974	32.4197482765789	17.47416259	43.6041515	31.53434731	0.973016574
14.6517133218373	44.007669010974	32.5104629394999	17.44262234	43.68368222	35.8944745	10.91295355
14.6517133218373	44.007669010974	32.5853372106771	12.31993183	42.07287161	37.42873621	11.95610617
14.6517133218373	46.2107018829237	32.5853372106771	10.71615729	46.62293177	28.86994808	5.678630364
13.9526803910792	46.2107018829237	34.40572033	12.77181014	48.33401693	34.40572033	2.429592834
13.9526803910792	46.2107018829237	36.5881885357189	9.26512226200001	48.10149258	36.29819804	9.899762573
13.9526803910792	45.6508045830303	36.8456083823263	18.21468575	45.65080463	39.25800482	4.897381571
13.9526803910792	41.8033363162181	36.8456083823263	12.97854061	40.66549102	35.96453487	4.434042673
9.83217711207975	41.4226228474186	36.8456083823263	9.832177112	38.08691559	39.13126485	4.043657799
9.75526498378211	41.8968653616392	31.2488537779311	9.755265232	43.18329059	30.87649008	1.339232837
9.22714370033377	41.8968653616392	31.2488537779311	19.40209516	41.66020767	37.5577128	11.97444555
9.2105759188707	40.7362488401715	31.248853777931	13.48749824	42.29987548	28.42807605	9.005353542
9.1238597195188	40.7362488401715	31.248853777931	6.302525489	40.0085763	32.06550398	3.025946417
9.12385971951886	40.7362488401715	30.2971551627725	8.013859219	41.41457221	25.49555223	9.523443187
9.5899187545705	40.7362488401715	30.2971551627725	2.885836634	40.60849192	26.29324057	7.864786769
9.58991875457048	40.7362488401715	27.8657540751573	14.50630809	38.16565664	31.09752118	6.420525444
9.65393938103225	40.7362488401715	26.7127652363262	10.78091353	34.08373955	26.71276523	6.747292093
9.65393938103225	40.7362488401715	22.4563713750129	19.77510428	38.58926296	16.64922472	11.91376449
9.65393938103225	40.7362488401715	22.3538629376972	14.44281578	41.35822358	23.25943932	11.77700274
9.65393938103225	40.7932836068947	22.3538629376972	11.00474377	35.14184161	13.52979102	10.56540176
9.65393938103225	40.7932836068947	22.3528629376972	12.65054039	38.20990532	17.83269917	8.455350331
9.65393938103222	41.4361175434805	16.9160202476319	0.224660494000005	41.43611847	14.21171956	9.809410917
12.4230842329068	41.4361175434806	16.9160202476319	9.954481978	42.50823893	15.05115407	10.6166074
12.4230842329069	43.3009271500075	16.9160202476319	17.93093151	43.30092715	17.11460176	5.511425972
12.4206499400579	43.3009271500075	16.9160202476319	7.974625907	40.8370263	13.38849506	8.509762243
12.4206499400579	47.6402187067038	16.9160202476319	9.19676513100001	46.15569372	17.99642834	11.9809647
12.4206499400579	47.6402187067038	16.6229261442733	8.736047039	47.86465463	22.63362148	7.075947311
10.0675041452957	47.6402187067038	16.6229261442733	10.30388261	47.84277995	17.55376223	0.981509885
9.78021067435137	47.6402187067038	15.5254286737847	7.342191074	50.36568708	15.52547031	3.656790591
9.78021067435137	47.6402187067038	12.9061373875762	8.078510661	52.12465727	17.30721805	11.74516273
9.78021067435137	47.6402187067038	12.9051373875762	3.857750749	53.93522034	16.19502855	9.829595519
9.78021067435137	47.6402187067038	12.9041373875762	6.962926975	47.87740863	12.6680673	8.307462013
9.78021067435137	47.6402187067038	12.9031373875762	10.84189087	50.74783931	12.90312929	3.28397178
9.15659320939976	47.6402187067038	12.9031373875761	11.99216143	50.52822644	12.13005328	8.464820885
9.15659320939976	47.6402187067038	11.9108765564591	6.810990128	49.52757429	10.46442277	9.894324521
8.81169292529977	47.6402187067038	11.9108765564591	10.20301226	47.6234059	3.00365475	9.015245558
8.81169292529978	47.6402187067038	4.20273445010403	8.81169210500001	48.50504439	3.044600386	1.445405816
8.81169292529978	47.6402187067038	4.34604313567047	9.89102482200001	52.16610985	9.967821485	9.993987041
6.92593498954336	47.6402187067038	4.34604313567047	8.91589750200001	48.83105962	4.105846181	5.482065711
6.92593498954336	44.0711752608912	4.34604313567047	9.020444459	42.86210706	4.331128313	2.418478506
3.60796437923257	44.0711752608912	4.39117950460638	7.871697725	40.35198819	7.19843067	6.3641027
3.59064287926968	44.0711752608912	5.06499331438832	6.668915236	38.80565327	2.074648475	8.512380576
2.92452522797784	44.071175260891	5.21037022866495	0.0942256310000005	39.91558536	7.02793547	5.346313369
2.92452522797784	44.1581155143846	5.21037022866495	5.668356774	43.14782971	2.118277692	8.305775856
2.92452522797784	46.383973620069	5.21037022866482	1.77561061599999	46.38397362	3.634697851	1.950063647
4.83899521294292	53.7352222937408	6.39459699072494	0.0735544159999932	50.20291794	9.32702938	11.48330524
4.83899521294292	53.7352222937411	6.53678517419324	5.28300793299999	51.8957834	3.767703534	3.483971696
4.83899521294292	54.8939063787675	6.88143786294439	3.200690229	54.90401263	9.791910202	3.339909369
5.64871153136217	54.8939063787675	6.88143786294439	11.71156616	63.23151575	10.39694521	10.95254356
5.82541621103464	56.9273048500053	6.95558166195952	13.89109091	56.92730438	11.2581209	9.141496171
5.82541621103464	58.2506921511085	6.95558166195952	0.793870075000001	65.00803843	8.045595465	9.318627115
5.71193785944175	62.3926838885583	6.95558166195947	1.28261934699999	62.39268391	2.604217434	6.209124989
5.71193785944175	68.8526708599942	6.95558166195952	2.781332517	68.35625636	3.710000307	5.523577876
5.71193785944175	68.8536708599942	6.95558166195952	3.336609071	66.34370608	12.08281041	10.13002568
5.71193785944175	68.8546708599942	6.95558166195952	6.334374787	68.85467086	8.438723386	1.608457989
5.36970677740455	68.8975777289225	6.93017873090062	6.04179221699999	70.01715429	8.958731963	11.62482668
5.36970677740467	68.929670093085	6.93017873090062	5.04273939700001	78.40053531	10.86923314	10.26257011
2.11888007991988	69.1139643928196	6.93017873090056	2.82031094	66.9400554	1.18723785	6.180554629
2.11888007991988	71.01115111364	6.93017873090062	2.885089549	70.78781924	5.964704064	11.83875801
2.11888007991988	71.0111511136401	1.15056077870982	1.825477279	70.78130479	1.056192161	2.330446868
2.11888007991988	71.152025824313	1.06019266302325	1.834626902	71.15202574	0.775939504	0.401994686
3.96055080691997	71.152025824313	1.31291198669515	4.297539438	80.73294711	0.059971047	11.22405457
3.96055080691997	74.1773029629074	1.31291198669515	2.881941531	70.78732912	3.789169139	7.680996283
3.96055080691997	74.1773029629074	1.79623942957131	3.252339284	73.9521337	6.052632886	4.320781181
4.00489773862599	74.1773029629074	1.79623942957131	8.595205897	76.73972439	1.498449057	10.65699304
4.00489773862599	74.1773029629074	2.84461713510553	12.87616068	80.54131267	1.790579055	11.25097601
4.04134143146801	74.1808875334795	2.84461713510553	3.10003410199999	78.61964126	7.805263196	6.829391359
4.04134143146801	74.3935127344945	2.84461713510553	0.773453591000006	79.81662315	5.077053724	6.785233233
4.04134143146801	82.9061358162448	2.84461713510553	4.724328509	85.88211036	2.778795893	10.66842937
4.04134143146801	82.9071358162448	2.84461713510553	5.902742913	84.57417463	9.395938461	10.96205759
4.04134143146801	82.9387173958002	2.84461713510553	6.35930977699999	87.06467249	1.39262333	5.433004527
4.04134143146801	82.9397173958002	2.84461713510553	3.10551266100001	84.71082736	3.992777578	5.063715926
4.04134143146801	83.7591664270176	2.84461713510553	6.810206318	85.20186256	2.844617135	3.122176307
4.04134143146801	83.7591664270176	5.210127271	4.377655918	84.98459142	5.210127271	1.270737521
2.24136665859317	83.0159180859615	5.210127271	5.724809855	81.80721271	6.405774196	6.479054365
2.24136665859317	83.0159180859615	12.379913530198	0.848777487999996	80.80421078	5.669295757	10.36784038

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.24136665859317	82.1833820616818	12.379913530198	3.437419026	82.39656928	11.4164042	1.58437925
1.5239498620014	80.8724426776179	12.379913530198	1.45195925500001	80.87244268	12.37991353	0.071990607
1.5718947485715	80.8724426776179	17.457757486765	3.380314451	80.99890539	17.02151813	11.39696855
1.5718947485715	79.8436218189126	17.457757486765	3.765987951	77.28123402	18.22137656	9.204063574
2.54471458617128	76.6863790200104	17.457757486765	2.544714587	74.45838234	20.47608884	3.751572119
4.00320055921424	76.6863790200104	17.2068811124928	0.155166121999997	73.1143838	18.2350269	9.943054863
5.06565807683862	76.6863790200104	17.1738216871174	5.065657714	76.41830653	16.15003851	1.058298093
7.10747546861523	76.8626541529552	17.2077858313502	1.009741561	74.32200243	17.21598932	6.745106086
8.43705443853862	76.8626541529552	22.5346867366459	5.863440787	76.06172049	20.11271942	5.891195528
8.43705443853862	76.8626541529552	22.5356867366457	10.28504553	75.43578797	21.16629174	2.70670664
8.54508069899909	78.0382398840081	22.6578279106357	9.01858207399999	78.03824041	22.65782791	0.473501375
8.54508069899909	78.0382398840081	25.3564521186951	8.675234817	76.17385221	29.29611493	4.360484441
8.54508069899909	78.9087869185669	33.1038369386107	7.992357197	82.08091397	36.27596397	4.51998708
9.28597632947825	77.2763332572612	33.1038369386107	5.779054124	82.01317499	31.17715184	10.01915756
9.28597632947825	77.2753332572612	33.1038369386107	10.82142722	82.89323555	36.78865334	9.472743412
9.28597632947825	72.3850479241885	33.1038369386107	14.92906226	79.42060964	37.22040132	9.914113666
9.28597632947825	72.1378684149135	33.1038369386107	14.52745655	66.82146945	34.730647	9.209129847
9.28597632947825	72.1378684149135	31.2012376435815	14.35540419	64.70998039	34.26175056	9.721773775
9.81129285068789	72.1378684149135	31.2012376435815	9.964092428	69.02740379	34.44916177	10.49120227
9.81129285068789	72.1085187906057	31.0827818271486	11.56644578	72.10851879	29.32762892	2.482161061
9.81129285068789	72.1085187906057	35.1373288114357	8.88093920200001	67.16779099	33.76570468	7.575125342
4.48089308055523	69.8680978219593	35.1373288114357	1.09685186199999	69.20060768	38.65184391	4.924336954
4.48089308055523	69.8680978219593	31.4913327578719	4.203561784	71.28689241	26.51244139	5.184520227
5.39720971886602	69.8680978219593	31.4913327578719	3.972668798	68.43095677	28.84137669	4.819982765
5.39820971886603	69.8680978219593	31.4913327578719	2.76637406099999	66.09545945	29.36453565	9.314186257
5.39920971886603	69.8680978219593	31.4913327578719	5.020361565	69.58798476	32.44258164	2.661868193
5.39920971886603	66.7094811817417	31.4913327578719	3.702577787	67.55965669	35.63856131	9.862533299
8.07711459900052	66.7094811817417	31.4913327578719	2.559418382	66.60707534	29.94444397	5.994415632
8.07711459900054	66.7084811817417	31.4913327578719	3.390983182	60.32064994	30.61068338	8.156128877
8.07711459900058	63.8706725300836	31.4913327578719	8.07711459799999	60.52651503	33.72017469	4.01884632
9.50799391743411	64.0915207825953	31.4913327578721	14.06057656	63.93249207	34.35643485	5.381459732
9.89788954110077	64.103219848	30.3802495315752	9.89788954300001	67.94003152	30.38024953	3.836811672
13.4529531335142	64.103219848	30.3802495315752	8.689838933	62.80875147	27.12937634	6.672826006
13.4539531335142	64.103219848	30.3802495315752	11.17807544	66.07771318	32.92555185	3.944211846
19.681207471	64.103219848	29.5597955878464	19.92687299	66.4828608	36.85195291	7.674542398
19.681207471	61.8915325088958	29.5417544216769	18.97844246	66.0992932	30.20753751	9.320379407
19.681207471	61.8915325088958	29.1078753249591	19.29354577	63.34226321	29.80733532	9.732805781
19.681207471	61.8915325088958	29.0381473938037	17.25601024	61.69443137	35.1920429	6.772109512
19.681207471	61.8915325088958	27.8906427401405	21.30645349	61.8915326	27.89064267	1.625246019
19.681207471	60.7441080044884	23.0875649549518	24.68488711	59.85199485	22.75052505	7.587909595
19.681207471	60.6847074977303	23.0875649549518	20.53092136	55.63617906	20.16527215	5.894866268
19.681207471	56.2177957305429	23.0875649549518	22.68802089	46.28526246	22.76975049	10.38254064
19.4399440292625	55.9559652695015	23.0875649549518	24.58618772	59.92581691	21.04332426	6.813403422
13.3372309338551	55.1607482233505	23.0306507342135	13.21771043	55.16074821	22.9111302	0.169027539
13.3372309338551	54.5967360415094	26.2120008019969	11.86612062	56.83051802	27.8782456	3.1512409
13.3372309338551	53.832937277633	26.2120008019969	12.24975114	50.92735248	27.57127396	3.387131358
13.3372309338551	49.7744088184016	26.2120008019969	14.81228179	50.29125842	28.12065032	4.356482226
21.9444294335566	49.7744088184016	26.2120008019969	19.18169919	47.05766373	27.00382561	3.954790614
22.0030038127827	49.7744088184016	26.2120008019969	22.00300591	49.77440842	32.73357505	6.521574248
22.125142771593	48.6759142639588	26.2120008019969	22.81585575	48.67591425	26.59144604	0.788075572
21.792914578332	48.1673871132534	25.8371591903756	18.21138052	45.58660191	25.83715904	4.414503197
26.5677345660974	48.1673871132534	25.8371591903756	26.97467166	54.66512134	21.38913798	11.66012717
26.5677345660974	48.1673871132534	22.6838509140405	27.13020332	56.00735022	18.32075531	9.113612959
26.5677345660974	48.1673871132534	22.6828509140405	26.567735	46.7768569	17.70634543	5.167125033
28.1587022416625	48.1673871132534	23.7413693171805	27.06311365	42.64274924	23.39166283	7.281813729
28.1587022416624	48.1673871132534	23.7423693171805	28.72359173	49.06807614	23.44175989	3.019170961
29.2063692335804	50.8767379735804	23.9361792249824	32.83493269	54.50530143	23.93617923	5.131563652
28.4769969926337	50.8767379735804	23.9361792249825	34.17044541	50.63731129	14.2756352	11.2605766
28.4769969926337	50.1739953275719	25.2640346380332	33.45872958	53.85918585	23.94292918	6.545746658
28.4769969926337	46.4361601681395	25.44252543607	27.37711129	46.43616017	27.11673494	2.003178979
28.4769969926337	44.964858713363	25.4425254360702	26.12441872	44.96485891	27.03242338	2.839436564
28.4769969926337	44.964858713363	25.2564458861669	28.08331623	42.02257662	27.79667825	9.317039589
28.4769969926337	44.964858713363	25.2554458861669	29.65914735	42.12761495	24.52937867	5.483604448
28.4769969926337	44.964858713363	24.1623774234051	32.06711817	41.12824267	27.14001544	9.236365321
31.3089283141511	35.811374041418	24.1623774234052	31.80606468	35.45021175	24.23960074	0.619311075
37.0704675659807	30.3923138730004	24.1623774234051	36.2315122	27.60710766	22.87055815	7.544747892
37.0704675659808	30.3923138730004	18.0646405521596	37.07046765	30.04479215	18.0646406	0.347521723
39.5030370881027	30.3923138730004	16.8053043377665	37.51752459	33.09106605	16.01141602	9.30247437
40.5703615017213	31.3182896042641	16.759906449	40.57036155	31.31828969	15.51939441	1.240512039
42.981129778094	32.9901045241428	16.8031007458958	47.52772375	30.54529654	17.6892221	5.345510096
42.981129778094	33.3446122742313	16.8031007458958	49.49892788	30.73465222	20.32700892	9.148611436
42.981129778094	33.3446122742313	22.9401851076784	48.88810081	29.6929228	28.59078684	11.17097838
42.981129778094	33.3446122742313	23.1932501608473	40.05041388	28.81118981	27.86495236	7.168813073
43.6569426627987	33.3446122742313	23.2470925912351	46.26887105	26.53209753	18.29584073	8.81744986
43.6717419021149	33.3446122742313	25.8620435266784	42.45831495	25.01806118	18.69304905	11.16727795
43.6717419021149	33.3446122742313	30.5968603548511	39.91233765	41.2977364	28.26450372	9.100834641
44.0576401365117	33.3446122742313	31.146599688195	44.94410764	36.28576006	32.88778098	3.530989553
44.0576401365117	29.9945236915975	31.146599688195	41.09480481	34.92509896	27.7383049	6.686212606
44.0576401365117	27.1252277472976	31.146599688195	39.35568633	35.06788426	34.69629234	9.948736286
44.0576401365117	18.4753451848242	31.146599688195	44.45005227	17.91363181	31.37577496	0.722516784

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
43.7782953902716	18.4753451848242	30.4479724838346	50.59311922	22.75724468	32.75181399	8.529458236
39.4724419044686	18.4753451848242	25.8589452537312	38.46066343	17.33665094	24.22591115	2.23318621
39.4724419044686	19.0032443256237	25.8589452537312	38.38951699	19.65672727	24.71703453	4.440566438
37.9794245740977	19.6471095424067	25.3199840311905	35.94447387	20.12395641	25.28688733	2.090335546
37.9794245740977	19.6471095424067	14.7529210613554	35.53984032	15.99196501	21.54085765	8.611862088
37.9794245740977	19.6471095424067	14.4979124685347	39.07927218	20.57348801	18.57850652	5.646872091
27.2999005422204	19.6471095424067	14.4979124685347	35.85991513	20.90404301	13.98769394	8.748151694
27.0309520374549	19.6471095424067	13.8713397877421	28.82263126	20.36706254	14.69297653	2.386009522
23.6888885421439	19.8099150331725	13.8366908340144	23.64941173	19.80991504	13.65279264	0.188087651
23.6888885421439	22.7252401984206	15.0722529333963	18.39694528	22.72524013	21.81072027	8.568057279
24.2663615388605	24.7055332374498	14.9168238328634	28.59013959	24.83311171	20.75915805	10.05513054
27.6622373006223	24.7055332374498	14.9168238328634	24.70443529	26.12365999	11.74081492	8.158816457
27.6622373006223	25.5754751548714	14.9168238328634	29.56587444	24.57869021	18.08116751	7.997446269
31.6746174452357	26.8111893990642	14.9168238328634	30.34406593	27.74432368	15.48974465	1.723178802
32.7534737439408	29.7051259514101	9.02557167616119	36.77121212	29.70512597	6.399428168	4.799880351
31.1794738057043	31.4063157364	9.02557167616119	31.17947294	31.40633137	5.155453447	3.870118229
28.6392538667608	31.6023520970696	9.02557167616119	25.40396983	32.32053998	7.877867709	11.43146897
28.6392538667608	31.6023520970697	9.02657167616117	25.99458773	34.37910238	4.84512326	11.0175516
28.626051928	31.6023520970697	9.96866258769922	22.33900559	31.60235215	9.968662506	6.287046338
28.626051928	35.8562544806193	11.9302163399444	23.91492832	35.50451908	14.65205958	5.452232026
28.6260519280003	36.1745134316761	12.6218469641652	30.33187934	43.75504148	14.96541955	8.637269115
31.1951582146867	36.5767830558798	12.6218469641652	29.90863496	38.4851443	12.83287597	2.311172422
33.5833566456944	39.4554853560275	12.8667119974388	35.17250587	39.36136713	13.28284014	1.66175135
38.9024170271964	39.4554853560275	12.8667119974387	39.58652985	43.55288071	14.45846769	5.227108341
38.9024170271964	39.4554853560275	21.3042929600002	38.90241804	39.45548462	22.15074575	0.84645279
40.6539127358025	42.4489859698287	21.0903098650978	40.57741767	42.47262	24.8981708	3.80870253
40.6539127358025	44.9403024114327	20.3468357893477	47.22851165	47.89903616	20.36250944	11.51868038
43.0445054544254	45.0009203362535	20.2824634348625	43.11381093	45.00092033	20.21315796	0.098012743
39.8845472852483	45.0009203362535	20.4591656566553	45.78512338	48.76667443	13.05604142	10.70444172
39.8845472852483	45.0009203362535	20.4601656566553	47.65008175	45.51867646	25.16647853	10.88958897
39.8845472852483	48.7513507350365	21.3897476855571	39.96945525	49.46230999	23.88525166	2.614076519
39.8845472852483	48.7513507350365	30.3025300141439	38.72818734	43.64397508	34.64285831	6.801536894
39.8753655280078	49.4413113492401	30.3705803964983	39.67150404	49.44131071	30.57444188	0.288303678
39.8753655280078	49.4413113492401	30.2741174469453	42.25980634	46.86827481	24.73500352	6.991437475
39.8753655280078	49.4413113492401	30.2731174469453	40.32660467	53.626561	31.93108458	11.22803277
39.8753655280078	49.4413113492401	30.2721174469453	36.93641703	55.80482127	27.58013236	9.247821291
44.6036866316211	49.4413113492401	30.2721174469453	43.66555329	47.77139353	28.778171	2.714393217
44.6036866316212	55.676250478394	24.3060492137541	48.01348394	55.67625048	22.64155069	3.794373864
44.58427344232	58.971025793365	24.3060492137541	46.15723029	56.4070148	19.959172	5.286178878
42.0457705579748	60.3614165029101	24.3060492137541	41.72170476	60.36141703	24.46424235	0.360615737
42.4977059921607	61.0250376578148	24.2611116057164	41.10546356	60.73573959	25.88754111	2.160394708
43.2818385713047	65.4209840068612	24.1046193976517	45.68320409	63.6499192	24.04332627	2.984457028
45.4956345781983	70.1525904972356	23.9356061152649	45.59084573	70.21452412	23.93560611	0.113582292
44.1046257764821	70.1525904972356	20.9132872276205	44.42598809	67.45202223	18.20113405	3.872665591
43.5910347702317	70.1525904972356	20.8984953874119	43.59103477	70.75648589	19.17067552	1.830314492
43.2087986669946	69.4703999469407	20.9115222843225	42.13585343	68.94604524	25.50967647	4.750703238
39.5738021310777	67.2882418990507	23.3896989596231	39.73860453	66.92518954	24.34934694	1.039178085
39.5565358650073	66.5741861	23.3896989596231	41.95981534	64.94436816	23.77879253	2.929752986
37.3114870222966	66.5741861	26.6682730279999	42.95157888	64.84132436	26.30910849	9.17378456
33.1778649155042	66.5741861	26.6682730280001	38.05290287	66.43336709	23.58284008	5.771110944
32.14669335	66.5741861	26.668273028	32.14669335	66.5741861	28.83764483	2.169371802
31.7830070518631	62.8184048130002	25.9793408557005	31.78300706	62.74548174	25.97934086	0.072923073
30.2549912311296	62.8184048130002	22.1914104701823	26.46280572	62.61127777	22.19141047	3.79783788
30.2549912311294	63.4619438380212	22.1020658949259	26.36495426	64.10386589	19.00754119	5.012038977
31.6772544552012	70.3250231637284	22.102065894926	31.96159565	70.60936436	21.8177247	0.492493397
30.5488358162828	70.3027660609838	22.761903942616	28.17365085	71.94302821	19.49378883	4.360337135
30.5488358162828	69.9157789319925	22.8159382155252	30.01509861	69.93828769	21.72402497	10.72586107
29.2416053638952	69.9157789319925	23.4365953484976	28.77703399	67.75671878	24.26797752	2.359780417
26.0325925302182	69.904822361	24.4256070673292	26.03259253	67.05188068	24.42560707	2.852941681
23.6002252582197	69.9184489031912	29.7756227652645	24.00842436	69.26671548	26.32388978	3.536360214
23.6002252582197	69.9184489031912	29.8876597807806	24.37529212	73.10827156	29.72637521	9.946110191
22.2957564566299	69.9184489031912	30.0114602726627	21.52581462	69.05739134	31.57893426	1.947101759
22.2957564566299	69.9194489031913	30.0114602726627	22.14002238	72.37729838	30.29531679	10.56803504
22.2957564566299	69.9204489031912	30.0114602726627	22.95220857	73.2582761	29.61659281	8.329429805
22.2957564566299	74.6655318021747	30.0114602726627	18.46683587	77.29301103	30.42019724	4.716670657
22.2957564566299	74.6665318021747	30.0114602726627	22.96398221	79.24584246	32.40861489	5.253467184
22.2947564566299	74.6665318021747	30.0114602726627	17.24413003	73.14298035	27.78293034	6.329084859
22.2947564566299	75.591508701215	33.8733583668683	18.31523717	76.27495825	29.81755027	7.153261702
21.4117211133213	75.6830747278749	33.8733583668683	21.16552744	75.92926841	33.87335876	0.348170438
23.849039102	75.5531858199999	34.2564448	25.63863856	75.55318582	34.2564448	1.789599458
23.8287541772451	75.55318582	34.2564448	25.39416892	74.01493111	32.17996221	4.846769394
23.8287541772451	73.4139277203149	36.4282491143221	23.86908483	73.83689183	36.6939804	0.501137023
22.8609512589009	72.9080833311648	38.3657405494307	22.68191696	72.90808337	38.77088424	0.442938698
22.8609512589009	70.9832453287087	38.3657405494307	21.2618816	68.31108552	38.60957073	3.123606085
23.58914545489	80.5185384958894	38.3657405494307	24.84752889	78.21896812	35.91459865	11.0945574
23.59014545489	80.5185384958894	38.3657405494307	25.47356848	81.94258519	37.44485814	6.220239291
23.59114545489	80.5185384958894	38.3657405494307	22.46431132	85.87828698	39.40664672	5.64815455
29.2796355107576	80.5185384958894	38.3657405494307	30.78074407	88.67743671	34.14412331	9.308222123
29.4961377467487	81.0536203629999	38.3567941418696	29.49613778	81.77737157	38.35679407	0.723751207
29.4961377467487	80.558067499635	37.7908202575317	24.67927032	81.21698222	36.79859251	7.738446369

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
29.4961377467487	77.4417347750105	34.7183959501315	27.46499326	78.56518576	33.59652638	6.680683032
29.4961377467487	77.4417347750104	34.6574493659032	29.81370195	76.77877617	33.99746475	0.987897175
29.9787756776682	77.4417347750104	31.2860998137255	29.7776223	79.3796747	28.90759999	3.220365403
30.5969162426435	77.4417347750104	28.4806417847896	32.43971284	75.52883521	28.48064207	2.656140818
30.5969162426435	77.4417347750104	25.6466630630104	29.09610379	74.18683092	25.64666307	3.584248474
30.61911906928	77.4685635461257	25.6466630630104	31.67974116	78.20082263	20.94127433	10.5302733
30.62011906928	77.4685635461257	25.6466630630104	31.54519137	79.16359507	27.34637643	3.505835342
30.8881768216764	79.5901660491945	22.7608753508617	32.77989789	83.25231939	22.10896744	4.247864371
32.569425513976	80.7322114241291	22.6845145754273	32.56942546	80.98884638	22.4278796	0.362936649
32.5694255139759	80.4358528208633	22.7601412259594	32.21271953	85.45061531	28.67707968	9.951664756
39.3786183077675	80.4358528208633	23.1545165303724	40.55838899	87.88304878	23.6255072	7.94496914
39.3796183077674	80.4358528208633	23.1545165303724	38.78697828	81.20736169	22.75217398	1.751750667
43.1281637139205	80.427261086	23.1545165303724	43.12816365	79.63219046	23.15451647	0.795070626
44.6693054692392	80.427261086	24.5636794892064	44.66930475	80.79724102	25.59577081	1.096402137
44.7776807878874	80.427261086	24.2461412000078	50.20394782	81.95454381	24.2461412	5.63710621
44.7776807878874	80.1774292855181	21.9648424914955	46.93472918	83.75304242	25.57195373	7.122281837
44.7516031207813	79.9641415130503	20.5500506171751	44.56064253	79.77318093	20.51948675	0.271783078
45.1386738126688	81.3075426850031	20.5500506171751	45.13867401	81.86371268	20.6390675	0.563248674
46.9130587761777	81.2964139856273	20.3115040923615	49.62844822	78.65994225	20.1083463	3.895592856
47.0282823231086	81.2964139856273	19.7832798947399	49.77274656	84.13753559	18.23448828	4.242971999
47.0282823231086	81.2964139856273	10.5413059153073	51.49657531	83.11057243	16.78262105	7.887384084
47.0282823231086	81.2964139856273	10.3177539999633	46.11608956	79.13405595	12.05021293	3.077288175
47.0282823231086	81.2964139856273	8.89165274774966	45.32225765	79.26748614	7.718311017	4.954739166
47.0282823231086	81.2964139856273	8.89065274774948	47.14165764	77.84331314	10.33249494	3.855818645
47.0282823231086	81.2964139856273	8.88965274774966	47.92908542	80.11129273	4.265931676	4.896396861
47.0282823231086	81.2964139856273	7.544486865461	48.20934555	82.30314786	4.491594241	7.596162818
47.0282823231086	81.1635804004805	7.52657513428754	44.47086767	80.17305261	3.885836986	4.558123438
50.168398101593	81.1635804004805	7.52657513428754	41.95376322	74.60739468	6.926728294	10.5272795
55.7351829191105	81.1635804004805	7.52657513428754	55.73082902	81.05870461	7.770192012	0.265267923
55.8039834895987	81.1635804004805	2.69509974842344	53.90080059	74.55382457	8.588853077	11.74270355
56.269913218337	81.1635804004805	2.69509974842344	62.03157877	81.16617953	8.458189727	8.754951123
56.269913218337	78.1989643251564	2.69509974842344	57.82109764	79.24611201	0.587934441	11.76834886
58.215238145974	77.7872856227752	2.69509974842344	58.21523833	76.77458472	1.682398914	1.432175303
62.7289727628611	77.96116422	5.70566493306241	61.63608438	74.03409399	0.746346368	7.121975094
63.680379024057	77.96116422	5.70566493306241	63.68037897	79.29990004	5.705664659	1.33873582
63.680379024057	74.465837157013	6.20328321399995	61.14896118	72.70410502	7.635652533	3.400508534
66.8108788556623	72.1933781420411	6.20328321399995	66.81087893	72.19337817	6.977880898	0.774597684
66.8108788556625	72.1933781420411	6.2022832140001	70.36283848	70.39401036	9.239076068	6.760808749
69.1263442629522	69.9741732234211	4.35938002170259	69.12634406	69.4594231	3.844630021	0.727966519
71.1605754037593	69.9796051969732	9.20577359857479	72.70378804	66.70645397	9.083647724	3.620764964
71.1605754037593	69.9796051969731	9.36384328729324	68.36889636	72.61479797	11.90493723	6.100291297
72.8000818030722	71.503412694046	12.4824933449061	73.75840634	73.11670598	12.48249331	1.876459737
72.8000818030722	70.269631391164	21.147507075325	74.07680751	69.16329968	17.32839223	10.96743145
72.8000818030722	70.268631391164	21.147507075325	67.69295238	75.24403656	20.54681948	11.35995088
72.8000818030722	69.964433942889	21.147507075325	78.29263567	66.45988674	19.86750284	6.639910385
72.8000818030722	69.963433942889	21.147507075325	73.05372772	69.26625594	20.0928079	1.566755571
72.8000818030722	61.7842534569327	23.4641787177056	83.55927983	59.64747077	24.27812457	10.99948591
72.5686632866904	61.7842534569327	23.4641787177056	69.70404765	60.5822767	24.01827102	3.495543351
72.5676632866904	61.7842534569327	23.4641787177056	65.84999623	61.37790202	25.6974767	9.405960407
62.8249236714442	61.7842534569327	23.4641787177056	62.01287875	62.70691628	29.4740589	7.75530817
60.597570308361	61.7842534569327	23.4641787177056	60.59756518	67.42291916	21.31629348	6.033901052
60.597570308361	61.5174203797071	23.4641787177055	59.10597324	64.72617137	21.25191915	7.277653794
59.5831834783885	61.5174203797071	23.4641787177055	52.64945222	62.68533593	20.742851	7.539647236
59.5831834783886	61.304233553819	25.0393906568976	61.59665848	60.86573745	25.73038778	4.870665397
59.5831834783886	61.303233553819	25.0393906568976	56.73611746	58.87824868	26.03485933	10.42122905
59.5093875029029	57.2332136639646	25.0393906568976	56.12304172	60.76926662	25.75259057	8.549372537
58.5501660767501	57.2332136639646	25.0393906568976	56.36080227	54.43871329	23.33898219	4.01664825
58.1474915592433	57.2332136639646	25.0393906568976	53.50308144	57.04941766	21.52167719	6.080321585
57.0377612829223	57.2332136639646	30.0803425961842	55.80484172	50.30189669	30.08035465	7.040116877
57.0377612829223	57.2332136639646	31.47512835	55.16481024	55.42346911	31.47512835	2.604442543
57.0948020583656	57.7826461969998	34.611992649998	57.09480153	60.45993374	34.61199265	2.677287543
58.3666417448408	53.9295866628914	36.1959888869662	58.50503897	53.8647284	36.33438611	0.206189664
48.9134903617937	53.9295866628914	34.7423069847131	48.91348948	54.77748717	32.9330217	1.998111236
48.9134903617937	52.6932476438466	34.7423069847131	52.57887869	54.16196226	35.47497689	4.016092555
47.976835810806	52.6679761607414	34.742306984713	47.38308024	49.71863955	31.58389373	4.361961303
45.9483283410987	52.6679761607413	37.544903685609	45.94832838	45.50704308	38.19660802	7.19052718
44.906311470289	52.6679761607414	37.544903685609	41.84687745	52.15158968	38.57062516	3.267858024
39.86159624	55.5388178683823	37.5449036856089	39.86159624	55.58185516	39.85963663	2.315133001
39.0031105544261	55.5388178683823	37.544903685609	48.65047008	56.26343732	32.64491993	11.1175127
39.0031105544261	55.5388178683823	35.0795761673175	39.00311055	58.98114927	34.60197054	3.475306118
38.7526831750616	55.5388178683823	35.0795761673175	37.67648628	59.01822185	34.10509713	8.663388767
38.7526831750616	55.4898568144469	35.0795761673175	35.39691212	60.01558524	36.77171252	7.016255469
38.7516831750616	55.4898568144469	35.0795761673175	31.52001616	50.89228775	38.01036066	10.98721573
31.8059252173625	55.4628743546766	35.0795761673175	31.80593192	45.60640645	39.41102857	10.76621751
29.1952721927598	55.4628743546767	35.0795761673175	30.62796082	46.77730777	34.94066727	8.83821808
28.9427438386891	55.4628743546767	34.0272341363356	28.94274384	52.01860718	30.54475385	4.898024634
28.9427438386891	60.0278510894766	34.0272341363355	29.89833465	58.88393924	31.18403904	9.428399067
25.2040377500026	60.0367107852497	34.0272341363355	25.20403775	63.98638021	32.83153178	4.126692706
25.048351510786	58.7511163861931	34.0272341363355	25.66105506	62.27941228	31.77717439	9.39136023
24.2206948441051	58.7511163861931	34.0272341363355	24.05460087	58.82740751	33.73414623	0.345409995

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
20.9708167418295	57.7174332952268	34.0272341363355	20.97945435	58.66863495	34.56781671	2.745603401
20.9708167418295	54.9738919558866	34.0272341363355	23.29263587	57.34435722	30.94445508	5.760491154
20.9708167418295	54.9738919558866	34.0282341363355	22.06521443	57.50548607	32.39286042	6.030659205
20.9708167418295	54.9738919558866	35.0802336152219	23.68432498	51.4412716	36.97532542	4.840858032
20.3926742952806	54.9738919558866	36.0503631826449	20.37447933	52.92580791	35.47903396	2.126357542
15.3644898874554	54.9738919558866	39.0353500219992	15.36448886	54.97389236	39.50883453	0.473484508
10.1680300063438	51.7591354929926	39.0353500219992	10.16802995	51.02082052	39.350114	0.802611588
10.1235112548993	52.9462929333162	39.0353500219992	18.10483235	51.48322234	38.87016683	8.264928029
9.96671075447327	52.9462929333162	38.2972558371618	7.88086425500001	53.63419396	36.66849242	2.73437995
5.42975858290518	52.9462929333162	38.1822596872322	3.166581108	54.38581172	37.35766501	2.806090341
5.42975858290518	52.9462929333162	30.5786341416001	3.684518627	54.75346427	34.67646632	10.66155854
3.09823599675725	52.9462929333162	28.7580632826933	1.250751092	48.74029716	30.02493246	5.852672895
3.09823599675725	54.3374379230416	28.7580632826933	0.102323447000003	55.05645207	30.68754948	3.635297833
3.09823599675725	54.3374379230416	28.7570632826932	5.351054934	54.87903352	31.2051026	3.370669882
3.09823599675725	54.3374379230416	22.4749731855622	4.692804385	58.08052349	25.21182896	11.75765381
3.02395127812423	54.3374379230418	22.4649253944462	0.715064701000003	54.34039001	17.34040242	5.620649576
3.02395127812423	61.6705580879753	22.4649253944462	3.16457285600001	61.67055704	18.73530868	3.732266773
1.82927782854222	61.6705580879753	22.4649253944462	3.705228073	66.5975084	22.49684982	9.299418871
1.32193422977522	67.4975557755256	22.4649253944462	0.299902086000003	68.51958527	21.52036301	1.726641853
8.49768912761201	67.4975557755258	22.7078731011075	10.36857839	64.9958121	20.62230905	11.82219863
8.49768912761201	67.4975557755258	22.7095970389999	6.979895184	73.91637244	25.14533012	7.031194882
13.9574056787402	67.4975557755258	22.7095970389999	14.51945543	70.49107423	24.26034768	7.364687094
13.9584056787401	67.4975557755256	22.7095970389999	11.54525803	68.93314303	25.95468917	9.632544021
14.1147620901773	66.5848903650486	22.7095970389999	14.11476256	66.58488992	23.55512122	0.845524181
14.1147620901773	65.1345940091795	22.7095970389999	14.01917911	69.22007201	23.43359605	9.959122763
16.6338323361235	65.1302586670003	18.9857106469477	16.63383213	64.77854357	18.98571058	0.351715097
17.1670764299997	65.8367652709267	18.7592332600274	21.61039636	65.83676525	18.75923326	4.44331993
16.8220259339483	65.8367652709267	14.319792394075	10.63863267	61.64507704	12.52958841	8.169031835
16.8220259339483	65.8377652709267	14.3197923940747	16.07158763	60.00636388	16.82852088	7.250262131
16.8220259339483	65.8387652709267	14.3197923940747	8.01127751600001	61.69215045	17.84993877	10.57580758
16.8220259339482	65.8397652709267	14.3197923940747	8.93361225699999	64.19415642	15.31500377	8.119454693
16.820581518162	66.0688750568628	14.1811749101816	12.00297966	63.9466553	16.56981835	5.950994709
16.818980974371	66.0688750568627	14.1811749101816	13.50520564	67.72241024	17.09707449	9.360297306
15.2524110125228	66.0688750568627	14.1811749101816	11.73654707	68.82383733	18.16264782	7.948897757
15.2524110125228	69.4290526233564	14.1811749101816	9.360499311	76.63383999	11.96842635	9.675555003
15.0640283998725	69.4290526233564	14.1811749101816	13.34199807	71.15108407	14.18117491	2.435319437
15.2472322307898	69.4290526233565	11.5310819526925	16.80968797	72.84815948	15.34934359	5.35823493
15.2472322307897	69.4290526233563	6.58423629982311	9.088863996	70.57778186	13.84286783	9.588159879
15.2472322307898	69.4290526233564	4.29224711258697	15.83973733	72.60736968	8.73861151	9.12349234
15.3818355587884	69.4290526233564	4.29224711258697	16.29427026	68.63097998	5.127480774	1.605088602
15.3818355587884	66.2998842530676	4.29224711258697	13.17908278	60.05355856	0.206865651	7.781969298
15.7783073466545	66.1940932647143	1.65157477700006	15.77830732	66.19409337	0.808180704	0.843394073
17.133082055024	54.0059059190442	1.65157477700003	10.83705181	59.65376627	0.709551762	8.510330825
17.133082055024	54.0049059190441	1.65157477700006	20.16713628	56.2637712	6.937664837	7.589009856
17.133082055024	52.7174819521624	1.65157477700006	16.54761864	53.09785344	0.161381972	6.228334506
17.133082055024	52.7174819521623	4.39768349278901	17.45311026	57.02027397	2.53786626	4.698442012
17.133082055024	48.5490399690342	4.39768349278893	17.80089583	46.64512233	2.63462135	2.679415185
17.133082055024	48.5490399690342	7.87328058003916	16.47526591	49.4455512	6.794569926	9.818184126
17.1340820550238	48.5490399690342	7.87328058003916	18.13426387	49.15791018	7.430088572	1.2520007
20.0660801251924	48.5490399690342	7.87328058003916	18.80954314	50.67936902	11.76647286	11.57690137
20.0660801251924	48.5490399690342	7.87428058003916	20.72246404	50.29048837	10.84675569	3.507005939
20.0660801251924	44.5294518077217	7.93392634709745	23.73647568	45.21539639	11.53681715	5.188751838
25.7317462847783	44.5294518077217	7.955694988827	25.73174612	44.02606181	8.459085063	0.711901016
31.4681885925019	44.5294518077217	7.93720234574052	28.54401437	40.13690379	8.087159098	5.278992328
31.4970328876699	44.5294518077217	3.79800155929976	34.31056081	43.95356429	5.695822859	3.881034988
31.728605120478	44.5294518077217	3.79800155929976	35.40868681	49.33377596	1.880059691	6.467074744
31.963494258976	52.4506039554598	3.79800155929976	37.58124673	53.7047325	1.291628295	6.278048118
33.3974626558016	52.5492145607893	3.77163555399995	40.92420024	52.54921675	3.399585878	7.535927257
33.3333310881484	52.5492145607893	3.77163555399995	34.68773061	48.27076221	5.003934468	4.719701242
31.12121771	52.61678334	3.77163555399995	31.12121771	52.61678334	1.82071962	1.950915934
30.5282679262781	52.61678334	3.80004215565603	24.61643689	54.01115924	6.209992422	7.411713322
30.5272679262782	52.6167833400001	3.80004215565603	33.45977848	51.47641849	1.316430254	7.198818879
30.5272679262782	56.579211898605	3.80004215565603	34.15128455	57.37934974	2.952751483	3.806785854
25.779176933	56.579211898605	5.01175587580934	25.6524776	56.5792119	5.011755882	0.126699333
25.779176933	59.6123447229322	5.01175587580934	28.38294287	59.7022254	11.36065683	6.876187581
32.4116035895413	59.6123447229322	5.01175587580935	32.28903103	63.37386507	1.032108002	5.529867185
32.4116035895413	59.6123447229321	10.0068038630235	21.56136042	60.00845368	9.387366518	11.66584778
32.4116035895413	60.0995054597617	10.0803839701708	32.47933058	60.09950546	10.14811096	0.095780428
26.7916591533079	60.8593155037486	10.0082862476888	28.17203359	56.51587977	9.985576368	4.557563307
26.7426815971635	60.8593155037486	8.9435940922351	25.08011935	60.4806985	0.592321921	8.52356797
26.5773437499367	61.1767152426444	8.9435940922351	25.84588775	61.17671521	8.212138725	1.034434548
26.8202924258769	62.2698723072967	8.9435940922351	28.86030824	61.83789689	13.23528428	5.323228343
29.4563710002655	62.2698723072967	8.9435940922351	28.66025221	61.13181458	11.59083816	8.682831908
29.4563710002655	62.2708723072967	8.9435940922351	24.66562586	67.58605744	10.297776	8.251747258
29.4563710002655	62.4904731179349	16.6679111250878	22.84438078	60.01413405	11.39370551	9.832099483
29.4563710002655	64.9544582574826	16.6679111250878	26.36749261	61.24478927	19.91950535	10.05967123
29.4563710002655	64.9886431852295	16.6911624369438	29.47881008	65.01108227	16.71360152	0.038865631
22.7575530817386	64.4707894987647	16.6911624369438	26.6523776	66.91672378	14.68008016	7.970867369
22.7575530817386	64.4707894987647	15.9037521778145	27.36103425	64.84526011	12.45761345	5.82414556
22.7575530817386	64.413139836759	11.9213096963657	22.58317288	64.23875961	11.9213097	0.246610864

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
22.7575530817386	68.8270337172117	10.0377459586998	16.73656026	65.26611785	12.28815231	7.348251841
24.1795598759995	68.8989419231549	6.61425260366611	24.34494447	68.89894191	6.614252607	0.165384594
24.1655429845676	68.9199016664016	6.26391704000183	20.75020952	68.82081849	3.659175109	6.986664743
24.1655429845676	69.3532708292729	0.853575980000249	23.39691794	71.43920824	1.906907845	2.45996491
24.1655429845676	76.8459779195738	0.853575980000062	22.95922483	75.83051285	0.740171728	9.548150341
24.1645429845673	76.8459779195738	0.853575980000062	21.60880813	73.64895737	1.318444959	8.789616797
21.0474951137639	76.8459779195738	0.85357598000023	21.04749508	76.84597788	0.391094884	0.462481096
19.889655773	77.9224885088327	0.924122972699606	16.93400358	77.9224885	0.924123088	2.955652193
23.1544314319452	80.4714378478782	0.924122972699606	17.20155001	81.69531761	4.530646889	7.066943728
23.2539540389997	80.4714378478782	3.12432819064464	23.53960858	80.471438	3.12432842	0.285654541
23.2539540390001	82.4858217280517	3.55676328680082	20.47481611	85.68176763	4.096992025	4.269604774
23.2539540390001	85.6859026809997	3.55676328680097	23.92476676	88.85275247	0.073261016	4.755388035
21.4032787958814	85.6859026809998	8.54188402465126	21.4032788	88.65695382	8.541884	2.971051139
16.7893436600665	85.6859026809997	8.54188402465126	15.25088212	86.85170355	0.622562014	8.312417494
16.7893436600665	85.6859026809997	11.9459369822485	12.45480817	85.29988604	5.441763796	8.467366828
16.2307895862467	85.6859026809997	12.0409356184609	15.06397637	86.4956065	14.41870487	2.769631739
16.2307895862466	85.6859026809997	11.6773449222725	12.63857375	82.42671014	11.06948651	6.575237335
16.2307895862467	83.3220150900452	11.5546255021768	18.16441332	83.32201509	7.61422766	4.389263708
16.2307895862467	80.6784920211151	11.677753037841	19.29153506	80.52426775	7.949521468	5.162100755
16.2307895862466	80.6774920211149	11.677753037841	14.09860615	77.68853822	13.45994873	11.70742841
16.2307895862466	80.6764920211146	11.677753037841	18.79013692	77.54174683	13.67079469	11.83768723
16.2307895862466	80.5822338211399	11.7410631292741	19.17901123	72.48982593	17.20855307	10.20159412
16.1414034120259	76.4485949206913	16.0332816928625	15.50686687	76.44859369	16.39940441	0.73258615
16.1414034120259	74.7462113264446	16.0332816928625	18.15532249	77.80652015	16.99185344	5.054973135
16.1414034120259	74.7452113264446	16.0332816928625	21.51917751	80.74471553	21.88319617	9.9567065
16.1414034120259	74.1777753542432	16.0332816928625	18.49430275	75.1491321	23.37172362	9.770365975
16.1414034120259	74.1777753542432	21.2844184762007	19.47269695	75.25893863	20.7798111	3.538510883
16.1414034120259	74.1309252661525	21.4144398732054	18.15807888	79.40011164	23.44302335	9.804701845
16.1414034120259	73.6744248154538	21.4144398732054	13.78543979	72.75062985	12.01531817	9.733830208
15.0710427421587	73.6171205987304	21.7509231294422	14.67447984	73.22055772	21.75092301	0.560824618
15.0710427421588	79.3856236391646	21.7509231294422	20.16006997	73.55306832	21.43875646	7.784192094
20.5534650092063	79.3856236391646	28.0056948954885	20.11668251	80.56671914	21.763779	7.222669816
20.5534650092063	79.3866236391646	28.0056948954885	19.16596982	83.58117432	33.35557023	11.91490763
20.5534650092063	79.8740224623556	28.2590831738902	16.23739593	85.87006787	34.99641701	9.998633909
20.5534650092063	85.5812758360538	28.2590831738902	20.16675465	86.45561332	33.59426088	5.662375247
20.5534650092063	85.5812758360538	28.4615528637408	17.38954679	82.23173111	30.2609052	4.9464631
20.5534650092063	86.4050869895909	28.6087466544839	18.85500198	86.61471751	28.9549492	1.746017703
20.7512978307636	88.7330357583263	31.5470299339999	20.75129811	88.7330358	32.51930493	0.972274996
21.6337997719848	89.7371231949999	25.0330530594391	21.63379999	90.72848541	25.0330528	0.991362215
21.6337997719849	89.4792079607397	21.3714162556625	20.03955091	90.83830295	21.35984013	2.258156755
28.4433127333339	89.4792079607397	21.3450018493901	24.93956922	85.18138774	19.5490822	10.96633056
28.4433127333339	82.6685021532711	21.3450018493901	33.71990859	84.56649705	17.88810749	11.87467854
28.4433127333339	82.6685021532712	16.8091087309351	28.34961296	82.66841267	14.80317352	2.008122438
28.4433127333339	82.5952919054946	16.7970982284477	24.57644237	79.57543571	13.43961074	7.621327433
28.4433127333339	82.4429399617278	16.7970982284477	29.05539546	78.84402949	14.28609887	4.430792212
28.4433127333339	76.0523129690004	16.7970982284477	36.44207057	76.13900165	9.824805701	11.50367704
28.443312733334	76.0523129690002	9.74046534829733	28.44331265	74.98671685	9.740464776	1.065596119
29.0426298398087	76.094635249238	6.46215395781754	36.17809574	80.13104248	5.688631409	8.234427368
31.3418367589226	76.7010114909956	6.46215395781754	31.34183617	77.86791685	6.462154326	1.166905359
35.0366230583552	76.7010114909956	6.01850514073674	35.03662295	76.31902131	1.401481412	4.632798788
35.0366230583552	81.1043716923919	6.1187575955896	40.58416037	81.54961967	6.0287924	7.064640642
35.0366230583552	81.1043716923919	6.1197575955896	36.90788531	88.78292268	9.064555312	8.871911482
35.0366230583552	84.7019163584458	6.24679017359425	34.30971303	75.90183293	2.096267325	10.30780315
38.2394707606486	84.7019163584458	9.75016469937565	38.25086273	84.70191635	10.62939488	0.879303979
38.2394707606486	85.3799340968831	8.5860135211238	38.00030199	82.20200968	0.019607641	9.151482372
38.2394707606486	85.3799340968831	8.25658215310835	38.24583972	80.95791524	3.839199962	10.77332683
38.2394707606486	86.8894024886048	6.76193341462689	38.21932161	86.88940242	6.390388464	0.372090901
38.7824165141124	87.2668060748973	6.76193341462689	42.23200248	88.95299773	4.136491045	4.651433464
34.2042739569669	87.2668060748973	6.81266821120762	31.03913924	88.81924735	11.29281098	5.700862296
34.2032739569669	87.2668060748973	6.81266821120762	35.55901251	90.85604615	4.893665446	4.28990011
30.5486952226283	87.2477173094847	6.90765665136867	29.03165996	90.53300961	6.710005169	3.624031953
30.5486952226283	87.2477173094848	11.59039573996	32.87814817	90.10176773	12.94837243	9.598818493
30.5486952226283	87.2477173094848	11.59139573996	26.49994117	86.49656314	20.04082186	11.41565502
28.9502263338617	87.006401328	12.4020255504792	28.95022635	86.79829568	12.40202554	0.208105648
28.9502263338617	92.3490606279855	12.4020255504792	24.79158589	85.73273425	15.36547182	9.89839469
25.8827520862127	92.3490606279855	14.288750780044	24.92385591	92.07997464	15.00916266	3.317074037
25.4178630640031	93.1818160618523	14.288750780044	25.24294214	93.18181598	14.28875041	0.174920924
25.8980300836383	93.1818160618523	18.5755762565649	30.51609732	92.20951413	14.80192542	7.873323153
25.8980300836383	95.1866406562542	18.5755762565649	30.46512782	92.10545477	16.97866967	8.699579279
25.8980300836383	95.1866406562542	18.5765762565649	25.58817455	94.62259734	16.80660453	11.27075496
25.8980300836382	95.1866406562542	18.5775762565649	22.62104276	94.03699994	18.3046068	3.483508579
25.8980300836383	96.256395518572	18.8203872930898	27.03699297	98.99807723	18.13725322	9.045435578
25.8980300836383	96.6537990109231	18.8203872930898	27.32463884	98.08040747	18.9687539	2.022977234
25.8980300836383	96.2553874516716	18.8203872930898	22.19955839	99.83998701	15.37683497	6.495340695
25.8980300836383	96.2543874516716	18.8203872930898	23.23282295	99.37897746	14.24859303	9.140009252
19.2364493018913	96.1993878865224	18.8203872930898	23.10855555	93.46528062	15.33870171	6.046811031
15.5397562656265	96.1993878865224	18.8203872930898	21.61123904	90.19731465	15.12916055	9.443600344
15.5397562656265	96.0736861849358	18.8203872930898	14.02380259	94.55773265	18.6627295	2.149671288
15.5397562656265	96.169543691876	19.1000432717816	11.51332542	99.95442641	21.54207323	9.875636287
18.0518132436765	96.169543691876	19.1000432717816	17.22630202	94.08640458	22.99978352	10.84424377

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
18.0518132436765	96.207328324448	19.1000432717816	21.53298817	97.76613815	23.69582939	6.447332374
18.1027047108142	97.8322616693671	19.1372830781734	18.10270516	98.29192556	19.61359774	0.6619415
18.3309329231399	97.8322616693671	17.8698784611621	18.56973911	98.93410982	17.86986814	1.127429706
18.3309329231399	97.8322616693671	13.9964995280137	17.81960057	98.01765152	13.9964983	0.543902723
18.3309329231399	97.8322616693671	8.97060504687451	19.55892343	94.48515334	9.227774263	8.137719702
18.3309329231399	94.0208588614421	8.97060504687451	17.25875189	95.69940805	8.290437664	3.398739413
20.5990756739804	94.0208588614421	8.97060504687451	21.95406549	97.08230078	10.07565883	5.310921574
20.5990756739804	93.7963411560208	6.98308146479658	24.68088332	89.71453351	6.983081462	5.772547732
20.5990756739804	94.088985425	6.98308146479658	22.06521104	97.80973943	1.986453498	10.44097889
20.5990756739804	94.089985425	6.98308146479658	26.20322759	94.45704722	0.043122659	10.10698797
20.42707279	94.089985425	1.54490258088447	20.42707279	96.69258649	1.544902576	2.602601065
11.593584153678	94.089985425	0.971199222281807	0.846436707999999	97.15575264	0.271481864	11.19775474
3.29857705781016	92.5367540722939	0.971199222281807	3.298576907	92.26869515	0.703140302	0.379092562
3.29857705781016	92.6685151257796	0.971199222281807	8.37640356200001	96.83801393	4.582503625	9.194583524
3.29857705781016	93.7269669348569	0.971199222281807	4.44010970700001	94.87692744	8.233710837	8.411496493
3.28260477503865	94.0522603706816	6.56452101584938	2.510162792	94.82470236	6.564520873	1.092397933
6.00894397499997	91.9690015958505	9.71711289666052	10.40564453	91.96900158	9.717112894	4.396700555
6.00288382737091	89.1006216010565	10.1873133644734	7.085383584	88.77850283	10.21283209	1.129697938
6.00288382737091	89.1006216010565	10.1883133644734	7.009024866	89.80852716	6.686928303	9.591229282
4.36577132699416	89.1006216010565	10.1883133644734	8.842438164	89.89183088	2.824200169	9.248878075
4.34526900336898	87.8705679461881	10.8928448161271	3.319354366	86.8534104	10.89284525	1.444683466
4.34526900336898	87.8705679461881	15.0669358773051	2.88784862599999	89.80188387	16.96831616	3.077223153
4.37005651441969	87.8705679461881	15.0669358773051	6.29169329299999	89.27097954	11.1353809	4.843225065
4.90338893192839	87.8705679461881	15.0669358773051	6.663988874	86.9326968	14.76370285	2.017737523
4.90338893192839	87.8705679461881	15.454789738143	3.05949055799999	82.05603574	19.35294441	7.23908529
4.90338893192815	87.8705679461881	15.455789738143	4.961462551	81.51420623	19.50536364	9.226598726
5.79311262038266	87.8705679461881	16.4169001197768	5.793118726	87.72031575	18.95737877	2.544917974
5.79311262038266	89.5505942637981	16.4169001197768	10.77763243	89.00986935	18.62168793	11.5413795
6.45594284843625	89.5505942637981	16.4169001197768	13.01348985	89.5505908	15.47048063	6.625491116
6.45594284843615	90.5730910073672	20.5982492795964	11.28159713	86.83718755	19.13922705	7.508047868
6.45594284843615	90.5730910073672	20.5992492795964	9.98481624199999	87.60870523	18.9809529	5.654212003
4.01319407453222	90.5730910073672	20.5992492795964	1.72500424899999	93.73701725	20.97210735	6.881927737
3.75406266070864	90.5745293365214	22.9696039442316	3.553988961	91.38716753	22.96960314	0.836905203
3.75406266070864	90.5745293365214	24.4155215734629	3.212591442	94.51392157	23.83849287	10.08518593
3.75406266070864	89.0779295066823	24.9305985750001	0.539457489	84.81338557	26.32883597	5.520424731
6.57919391663123	89.2490768951013	24.9305985750001	6.57919393199999	89.24907689	23.95110219	0.979496385
6.57919391663124	89.3750893974134	24.9347040462792	9.921883095	86.8721598	22.00737941	5.099750684
6.57919391663126	91.6086820792514	24.9347040462792	5.819691822	97.53170939	24.16806715	10.47278678
6.57919391663127	91.6096820792514	24.9347040462792	7.17818211399999	91.76838261	25.47562666	1.609117439
6.57919391663127	92.1397563667801	24.9347040462792	6.625140742	98.72893978	20.20468371	8.11126017
7.15289801218253	93.4774454639802	24.9347040462792	8.327911253	95.97957355	16.39239366	8.978439052
7.1528980121825	98.4313637061538	24.9347040462792	3.115821998	88.00026043	26.66042774	11.67905671
7.1528980121825	98.4323637061539	24.9347040462795	8.980893435	92.30918249	24.9496481	10.59560796
7.81008670008218	98.440488873	26.2160495403196	7.810086676	100	26.21604958	1.559511127
8.52468491799999	98.440488873	31.55963283	11.04946885	95.30278919	26.87229799	11.15137795
8.52468491799999	93.9919908318685	31.55963283	5.333729823	86.89695613	31.50319232	7.779774892
8.52468491799999	93.9201091135157	31.55963283	12.03430063	87.78817585	32.36153594	9.339380238
8.52468491799999	93.61856888	31.55963283	10.35439985	93.61856888	31.55963283	1.829714932
8.52468491799999	90.6663112445929	31.7058534315046	9.577914639	89.11916471	27.81169318	4.320583214
8.52468491799999	90.6663112445929	31.7068534315045	7.936374341	83.63932008	31.96057141	7.056138248
5.9687622186386	89.4611065519382	32.8525975002971	5.838459994	89.46110654	32.98505569	0.185805925
5.9687622186386	86.3987783513088	32.8525975002971	5.209294544	90.50333801	29.97691556	7.245222646
5.9687622186386	86.3987783513088	32.4395446323531	5.912402555	83.10767778	28.97692543	4.777473299
9.30945767440119	86.3987783513088	33.1104239261156	6.256438132	90.66257931	27.09179537	10.99795307
9.30945767440119	86.3987783513088	37.8011507664078	10.08146406	81.46406963	37.62633094	5.184740001
9.30945767440097	86.3987783513088	37.8686598834439	9.940095688	86.998178	38.16021851	0.917600499
5.41968309277897	85.4534707741471	37.8686598834439	9.701793671	81.23141394	32.23008983	8.243525166
4.20309672833641	85.4534707741471	37.8686598834439	1.83782096500001	81.06813079	39.8464095	5.360711684
1.8400861084211	85.453470774147	37.8686598834439	1.696022601	79.3379408	35.04130759	6.739019376
1.8400861084211	85.4534707741471	37.9662142025639	3.795442881	81.20966501	27.41200193	11.97973034
1.8400861084211	87.9058548857431	37.9662142025639	2.643010323	87.48230483	39.26134045	1.581592217
1.8400861084211	98.0333622110021	37.9662142025639	1.662890125	98.21483308	37.96621421	0.253633777
9.90357807928612	98.0333622110024	38.1180439170114	5.231683223	94.88567828	37.04813984	5.753061171
9.90357807928612	92.0617098923668	38.1180439170114	12.48771043	90.90107319	36.2773466	3.496358466
16.8508058937637	92.0617098923669	38.1180439170114	14.30638295	91.72702037	37.41288443	2.704929464
16.8508058937638	91.8896597731635	39.5028575139584	16.85080568	91.45389056	39.93862668	0.616270698
17.5574990027143	93.4873747600798	37.1364303743351	18.21730526	92.48725442	38.15120003	1.5701409
19.7604515317735	94.2490884432505	36.2361797666334	18.65944439	93.90622028	36.26618878	1.153549238
22.4838438244323	94.9902438961241	35.5794748896186	16.10416337	94.62212285	35.78598723	7.114799892
23.8636283872494	98.3409921456952	35.5794748896186	22.00240146	99.12603644	39.9893956	7.885601786
25.3455320410397	98.3409921456952	35.5794748896186	25.64004891	98.33585155	37.39052093	1.834844509
25.3455320410397	98.3967817134839	33.5459127580563	25.35918107	97.93925835	33.70510702	0.894739291
25.3455320410397	98.3967817134839	31.1510232375747	23.65267964	99.40598609	29.7230242	5.864138835
25.3455320410396	99.1567103765826	30.3974062871341	25.34553204	99.20543489	30.35671629	0.063480344
28.3062537391197	98.4647026760228	30.3974062871341	28.69202489	99.34571575	27.8214658	3.476487599
28.3062537391198	98.2621448998317	30.3974062871341	27.50072899	99.76767751	31.96071673	2.315046026
29.5195473486592	90.5156067814627	30.3974062871342	32.33676606	89.56266763	36.70990188	6.977995049
30.477914728614	90.5156067814627	30.3974062871341	34.28587406	93.01320732	33.5082721	5.515074689
30.4779147286142	90.5146067814627	30.3974062871341	30.96168192	84.99460949	29.50639116	5.800733164
31.9234676955511	90.3183813946635	30.3974062871341	31.92346769	85.96439053	34.03343791	5.672562244

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
31.9234676955511	93.8678158767541	30.3974062871341	28.94608169	87.05476962	32.15968695	8.550013673
31.9234676955511	93.8688158767541	30.3974062871341	34.03327785	85.06694553	30.01520061	9.82794583
31.9234676955511	93.8688158767542	26.6190690483263	30.08845088	94.04600611	25.46859145	2.38535719
33.4624898019821	93.8688158767543	26.6190690483263	31.89808649	95.62749105	29.09944527	8.151929048
33.4631200325742	93.8688158767543	26.6186992789183	30.18341718	92.15484297	29.45540328	6.43104448
33.4631200325742	96.6507586965153	26.6186992789183	31.65500689	99.46882276	25.89517482	7.475813284
33.4631200325742	96.6517586965155	26.6186992789183	33.91919319	90.52236574	22.93790886	7.193036058
33.4631200325742	96.6517586965155	26.0488199809569	40.16683897	89.097423	24.82067356	10.1742901
35.8015294837004	96.6517586965155	26.0488199809569	35.84999591	97.26233792	26.33021041	1.02094072
36.9088266948938	96.6517586965155	26.0488199809569	36.86677729	93.06343809	25.83290646	3.595056547
36.9088266948938	97.0316152799531	26.0488199809569	39.86881125	93.47781189	29.627917	5.895861926
37.0783095114978	97.0316152799531	26.0488199809569	36.31961338	94.1541845	22.11569666	11.14531248
37.2784567591486	97.0316152799531	23.4707068287926	37.35558564	97.30806318	23.47070651	0.287005759
37.2784567591486	97.0316152799531	23.4697068287926	41.14116704	94.61634345	23.98672915	11.9580341
37.2784567591486	95.4408172370549	23.4697068287926	36.43143728	90.48214242	22.55722277	6.954373264
37.2784567591486	95.4408172370549	18.8894067185565	39.84944538	96.227912	20.60442108	4.047622309
37.2784567591486	95.4398172370548	18.8894067185566	36.26720319	91.81523904	18.88940672	3.763004237
37.2784567591486	95.439817237055	12.7571867732828	37.87107476	99.67477247	15.46291348	5.142647072
37.2784567591486	95.6873685428085	12.7543704804101	37.35140359	99.57591236	15.11952707	4.551929256
37.2784567591486	96.0346277843975	12.7105609261465	33.84742868	94.52834747	10.85109907	8.71001742
41.23951851	96.228912112	12.0504117000006	41.23951851	98.4925435	12.0504117	2.263631388
42.1631045141329	96.2289121119999	12.0504117000006	46.02083433	88.3362158	14.03418258	9.025977842
45.8666424573438	96.228912112	11.3885471465553	45.33430047	93.58613905	11.44191552	5.098588574
45.8743306179999	94.8221587335579	11.3885471465552	46.20732106	94.82215894	11.38854737	0.332990442
43.9151814649971	94.620196994	6.97366594296642	43.91518159	93.39792889	6.973666169	1.222268104
40.6867316748894	94.620196994	0.759362894617933	48.86252985	99.44183304	4.964951227	10.4064769
40.2718498572149	97.2090847161431	0.759362894617933	39.47053756	98.01039691	0.046804559	1.338634383
44.986717666195	96.3426775079636	0.759362894617933	47.96746082	95.14523251	6.669541987	8.805162658
44.9867176661949	92.0544146366563	0.759362894617933	46.25821854	91.17761288	0.218810451	1.63636571
49.556545331737	92.0389066410436	0.759362894617934	44.01236363	95.54242778	0.007676566	10.44212715
49.556545331737	92.0379066410437	0.759362894617934	51.98537923	93.03310405	5.658677856	10.9895755
49.556545331737	92.0369066410437	0.759362894617934	49.59427698	92.51123595	3.551090207	5.147122326
49.556545331737	86.1428840614172	0.759362894617934	49.55654528	80.81624315	0.169379697	5.359214828
53.9393734548573	86.1428840614173	0.764675968828779	52.05342714	85.82620662	0.803032132	2.610320997
57.390325224	86.1428840614173	0.764675968828779	55.75342338	84.56592915	0.703415223	5.992730061
57.390325224	86.1428840614173	0.765675968828779	58.00620671	94.64720593	1.304858734	11.42342539
57.390325224	88.4620297280195	5.06430073275225	62.35255518	88.46202983	5.064300638	4.962229956
56.5035287958781	88.4620297280195	5.81628884318436	51.18829335	82.80979047	5.597845952	7.761910446
56.5035287958781	89.6023503591147	5.81628884318435	53.87450626	88.16447802	6.291517338	7.742268204
56.4100401803105	89.6231222164506	6.23725308766117	56.30399813	89.72916428	6.343295144	0.18367023
62.3274572783678	89.4713798074303	5.74385852023178	64.64609008	95.09261932	13.24961232	9.659748021
62.3274572783678	87.6486930517294	5.74385852023178	61.09603132	95.38804721	2.385400865	8.526033691
62.3274572783679	86.1798712022848	5.74385852023178	67.89989075	88.12316705	3.528198384	7.944934507
74.1746205406556	86.1798712022848	2.68383528503411	77.11333094	85.3156461	2.683835286	3.063152598
74.1746205406556	86.1798712022849	2.10742800000004	74.46580568	79.0435318	1.384862598	7.178734541
73.0497228091286	93.6836405024368	2.10742800000004	73.04972269	93.68364053	0.740152131	1.367275869
71.3099173750644	94.1198715176159	2.15774348467572	71.17046416	92.96230041	3.31475723	4.264714687
71.3089173750644	94.1198715176159	2.15774348467572	69.38304877	98.18671586	10.95698255	10.74668541
71.2589786099458	94.1198715176159	2.15774348467572	70.07355989	96.61021246	6.954740599	7.658895206
71.2579786099457	94.1198715176159	2.15774348467563	78.18108034	99.79242924	3.657350909	11.42083614
71.257978609946	94.1198715176159	5.61265488667907	79.39161289	97.26593015	10.2457076	9.87516425
71.1551998006758	94.1198715176159	5.61265488667907	79.19703593	96.06011661	13.22486099	11.2419465
69.9790889498024	94.1198715176159	5.61265488667907	69.92952441	96.42807986	14.30332435	9.02685985
69.9790889498024	94.1198715176159	11.7055168421337	68.11557125	90.29313921	19.6765572	9.036263761
69.827225082298	94.1198715176159	22.4715340687398	68.09186985	95.85522589	22.47153407	2.454162297
69.9790124364428	94.1198715176159	24.7835111436142	66.92699784	97.50570073	24.16462464	6.78636185
69.9790124364428	94.1188715176159	24.7835111436142	65.26732099	95.86741863	25.98441419	6.903660169
69.9790124364428	91.9347200847327	24.7835111436142	69.82339194	93.15949799	27.73705762	3.201208435
70.2716177122611	90.1068512110502	24.7835111436142	63.32241418	89.29380754	27.27800065	7.42798409
72.4880470257612	89.570443517974	24.8977003709999	72.48804708	89.57044348	25.63543235	0.737731979
73.3701821343711	89.5477745433842	24.7847356361118	71.22771139	93.77569631	25.9346523	4.877275027
73.715423538337	87.1927388604479	24.7847356361118	72.91384846	91.54886288	27.04740893	4.973733961
76.6853327621954	86.7436091820015	21.6795960554809	76.68533256	86.49303137	21.67959601	0.250577812
76.6853327621954	93.489673554821	20.3915345661475	75.38279951	84.8495864	16.86303573	9.738201242
80.8441935116405	95.3462004699994	20.3915345661475	80.84419352	99.98848979	20.3915349	4.64228932
81.0408030426456	95.3462004699994	18.8378150090782	86.37403118	99.02923308	15.37465632	11.96387757
82.539920827073	90.617768006	14.0731419112756	82.53992082	88.87907996	14.07314191	1.738688046
86.1092169276297	91.3279566199956	11.1218412074432	86.10921689	91.46882481	10.98097302	0.199217703
88.6894480809991	84.4258474004563	11.2087234775247	82.09017124	81.333147	13.10533341	9.364452955
88.6894480809991	84.3492990848329	11.2087234775247	91.90328388	76.16243153	11.12653143	10.02897755
88.6894480809991	82.8453771164162	12.8373533338297	97.99058573	82.84537681	12.83735391	9.301137649
88.6894480809991	76.4952701308528	13.8619707618113	83.77232341	73.14211564	19.82850896	8.533805631
86.0051746525943	75.4694884225814	23.6623012655012	81.47694776	70.94126153	23.66230135	6.403879885
86.0051746525941	76.5300881004296	24.2874013071938	93.29522257	74.82458329	19.9847248	10.91349472
87.6341168391879	76.5300881004296	24.2874013071938	78.83068399	69.67274441	24.24069079	11.30182844
87.6341168391879	76.5310881004296	24.2874013071938	91.59995025	72.67875795	22.12004218	6.385143329
87.6341168391879	85.2888966016097	24.2874013071938	93.12739448	86.70709298	18.39915073	11.17874385
87.6341168391879	85.2955246239999	24.2874013071938	91.04765146	90.60180149	20.03455373	7.6089096
87.6341168391879	85.2955246239998	28.6583195897968	87.63411723	89.72076827	28.65831969	4.425243646
92.24522918965	85.2955246239998	34.8690037821631	94.75890926	85.83537613	36.18471901	2.888102094

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
89.5650450778723	81.5037514748794	34.8690037821631	86.75397464	75.23932777	39.5614605	8.469131771
84.3053459421591	81.5037514748794	34.8690037821631	81.4352048	82.89764497	33.18556014	3.652744946
75.2099827990739	81.4167584376834	34.8690037821631	75.20998283	80.5662569	34.55930276	0.905134017
75.2099827990739	81.5047603786514	34.8690037821631	72.09010058	81.417498	36.30236671	6.705862814
74.5796973400099	94.9009442813916	34.8690037821631	74.57969734	99.83821951	39.01985633	6.450291742
73.4780789622856	94.9009442813916	34.1062728919212	76.48394754	93.81500316	33.05082675	3.73579719
66.5930785193435	90.0486076737637	34.1062728919211	68.01446808	90.26524455	37.65674979	9.658401998
66.5930785193435	89.9437078774038	34.1062728919212	66.59307852	88.41880362	32.58136924	2.156539854
66.3164789696055	90.0476058031977	34.1062728919212	66.67195124	95.92017704	38.76714707	9.763847817
65.3128501465465	92.3640013819999	34.4048807345615	63.88368354	92.98872817	38.82161587	4.684052733
64.9653010659823	92.3640013819999	34.4048807345615	64.96530116	93.98228963	34.40488013	1.618288248
64.9653010659823	92.3266452210721	35.876567423957	61.4906739	91.40517217	33.71736683	5.140621126
62.0367611332308	91.4277722244067	35.876567423957	62.03675317	91.42777069	38.34727303	2.470705606
62.0367611332309	89.5477167683665	35.876567423957	62.20174968	80.96664236	37.77358899	8.789809443
57.2081487948662	89.5477167683666	35.876567423957	56.15571936	89.41500769	36.83882342	1.432185748
57.2081487948662	86.5947458700042	35.876567423957	54.48965648	89.30641789	34.42411824	9.13140765
55.4527653883899	86.5947458700042	35.876567423957	51.44475874	86.59474587	38.70943792	4.908082369
55.4527653883899	85.3025151269262	32.6480909576954	53.61605765	80.93460352	33.38542247	4.795394132
55.4527653883899	85.3025151269262	32.5272097516389	56.64479831	82.24679775	31.938846	3.64219376
55.4527653883899	85.3025151269262	28.3666772447968	52.83415121	85.50123146	31.48102764	6.270496768
55.4622601750454	85.3025151269262	28.3666772447968	51.91564321	83.24154723	26.19545671	4.641150631
55.4622601750454	85.3015151269262	28.3666772447968	55.11001594	85.68607737	27.25029831	1.677066237
55.4622601750454	81.8908502643439	28.3666772447968	60.79681015	75.33369853	28.93747546	8.472276725
67.1241522753101	78.7769866624138	28.2901320756017	70.83372488	78.21085961	24.5182183	5.320597925
67.1241522753101	78.7769866624138	28.2911320756016	69.80433177	81.60817435	25.92271927	4.561618689
67.1241522753101	78.5713020946592	28.3587843300902	64.88497046	82.96772641	30.52764719	9.339812785
67.1241522753101	78.5713020946592	30.8196365304792	68.96890483	80.55619731	30.92710539	4.842060922
66.921432646859	78.5713020946592	30.8196365304792	70.77169737	73.88064127	33.24954023	8.726232409
66.921432646859	78.5703020946593	30.8196365304792	70.61748839	78.65460339	33.23222305	7.660924967
66.920432646859	78.5703020946593	30.8196365304792	68.84275879	76.03221479	29.69910657	10.79538264
66.920432646859	78.5693020946593	30.8196365304792	67.45457311	72.85375456	29.93900874	11.61655168
66.9204326468589	73.4479029765964	30.8196365304792	59.09181099	73.44789922	33.41304482	8.247004523
67.1120431661042	73.3828602404234	30.8196365304792	63.48323083	69.36201841	31.45080353	5.452872617
67.1120431661043	73.3818602404233	30.8196365304792	63.47892732	68.70647259	29.32775126	6.807486056
67.3189360248404	66.2900356568199	30.8196365304792	65.34735437	72.80394877	34.67473005	7.821760947
67.3189360248404	65.6705398806809	30.8196365304792	72.84290598	65.67053988	28.7186167	5.910036243
67.3189360248404	64.5936008565416	30.8302445836345	74.85083054	64.74645556	30.78568814	10.29426937
67.3189360248404	64.5926008565417	30.8302445836343	67.87575086	63.89107621	33.2359079	2.566981804
67.3189360248404	56.0225765891846	30.8302445836341	67.27809665	56.79217526	31.19414535	1.980408171
67.3189360248404	56.0225765891846	34.968052593921	65.98277732	56.02257659	36.50214422	2.034393571
67.3189360248404	55.8389898379781	34.167982774	66.67873973	56.13517049	35.54640769	1.600074425
72.1305055536205	55.0307037723382	34.167982774	72.13050555	55.03070373	28.54528132	5.622701454
72.719882732349	55.0307037723382	34.167982774	71.99750065	50.82091856	33.04720741	11.82057255
72.719882732349	55.0307037723382	39.4744347968878	71.61626861	44.97765672	39.11549021	11.56039904
72.7342607277693	54.9502142880207	39.5033964639998	72.73426073	54.95021428	39.57914747	0.075751006
73.6734813005271	52.2733476268929	39.4756849915242	83.91646182	55.69492785	39.74024442	10.80258547
76.1481925934174	52.2707005883203	39.4756849915242	77.87000631	52.21112855	39.93820594	1.783848909
79.3059948309399	47.0714503	35.5425241073661	79.30599483	40.28434635	35.54252376	6.78710395
84.0056694761004	52.0545264389854	35.5425241073661	86.51848331	50.71555717	36.90102142	3.154772102
84.0056694761004	53.4867072109959	32.1876663924442	83.19197135	53.48639501	32.18766969	0.813698186
89.0310609790001	53.6412438704914	32.1750563468142	88.60564442	53.67349247	30.97358927	11.4446079
89.031060979	55.09349477	31.72721103	91.19333201	55.09349477	31.72721103	2.162271031
85.1608841852104	55.8450677010173	21.207911347	85.16088414	60.47696067	19.97453885	4.793291165
83.0288729640155	55.8450677010173	21.207911347	90.50689197	55.43830225	17.11301088	10.39640446
83.0288729640155	51.8792412485155	21.207911347	74.55729645	43.48740037	20.58508364	11.94062462
83.0288729640156	49.5551348498833	21.207911347	76.57028534	49.55513485	21.13053287	6.459051132
83.0288729640155	49.5541348498835	21.207911347	78.85550393	52.04144231	24.20403351	8.272925398
87.5674828331801	36.274066413555	21.207911347	87.56748283	36.27406643	21.13489416	0.073017187
89.1762465503261	34.3151059367168	21.207911347	82.01891737	31.58538586	22.96295297	7.858683337
89.1762465503261	34.3151059367168	23.3501251587358	84.85983095	39.85329756	21.28837281	7.318048431
91.2249876	34.3151059367168	23.3501251587358	88.13068149	33.9074779	16.96093724	7.167241247
91.2249876	30.5898166097552	23.8173625860536	94.17807015	30.5898166	23.81736257	2.95308255
91.2249876	18.2159483999999	23.8173625860537	95.99475962	18.1472698	27.39786086	6.014618976
91.2249876	18.2159483999999	33.099502597	94.15587216	20.2227246	36.0994515	8.426061551
90.81819821	18.2159484	33.099502597	90.81819821	18.2159484	35.33294835	2.233445753
89.6416442855555	10.3477431007541	33.099502597	83.75499038	5.857780347	33.63275215	7.422722871
89.6416442855555	10.3477431007541	23.2985910713944	94.43184685	8.796264511	23.29859307	5.035188817
89.6416442855555	10.3477431007541	15.152819810236	93.53556787	11.2495411	17.39352488	9.93311926
85.2297941796814	10.3477431007541	15.152819810236	85.22979418	8.715884504	12.16207554	3.406980154
74.7099884101269	11.2950415329995	15.1610139620331	77.03036191	15.51069798	15.03164451	4.834719524
73.0832818205065	19.3803765069356	15.1610139620331	70.71952594	19.54937922	9.466423791	6.168002999
71.5305513699885	19.3803765069356	15.1610139620331	66.17419814	21.15751135	18.97034229	7.122166774
71.2949850763905	19.3803765069356	28.7930623064766	71.29498477	19.86081824	30.17263192	1.460834206
71.1602622129017	19.3803765069356	28.7395368581573	66.92261807	21.4897109	27.4812889	4.897969721
62.6115354399995	19.3803765069357	26.5469357278432	67.26622281	20.02005982	35.0966755	10.98398776
62.6115354399995	19.3803765069356	26.5459357278432	62.61153544	17.95816147	22.4620849	4.324411312
59.5247585391331	25.0376554056543	26.5459357278432	63.04507341	24.29862677	23.57575014	4.664845393
57.4710285576398	25.1006183607472	26.5459357278432	60.71671796	14.8721563	28.06290831	10.90485749
57.4700285576399	25.1006183607472	26.5459357278432	55.9549233	32.80200534	27.96563646	9.08801586
53.5062140190989	25.1006183607472	26.5459357278432	59.97712424	27.07719444	29.13491814	8.051501149

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
53.5062140190989	26.42044109	30.2889890409801	51.08696185	26.42044109	32.70824117	3.4213392
53.5062140190989	26.42044109	30.275641156247	51.99282443	27.99909333	30.19770488	9.260790549
53.5062140190989	35.9241039010251	30.275641156247	53.48089128	34.57431179	29.79987824	2.509863553
53.5062140190989	35.925103901025	30.275641156247	62.83458953	32.37480154	31.54745986	11.26631142
59.9851884825185	35.9251039010249	30.275641156247	59.48412304	31.97998889	33.72997467	5.267581898
60.1942593044947	36.4147162506619	30.275641156247	58.48548965	38.49282405	23.12403661	11.79894595
60.4735974326841	38.474382125496	29.041370456968	63.12520069	41.24941139	24.07122315	6.279661735
60.4735974326841	38.474382125496	31.8277552695762	61.01859213	37.82208646	31.82775528	0.850005209
60.1942217847227	38.474382125496	32.8131691292255	63.54041364	40.47906672	32.95919177	10.09103037
57.4844381503414	43.1344438509811	32.8131691292255	57.48443808	43.25173204	37.88033317	5.068521277
51.5872756293312	43.1344438509811	30.8377225756412	51.12261026	42.05252276	30.83772297	1.177483398
51.5872756293313	43.2074413991318	24.1146402691372	52.03099226	42.50134863	22.51431543	7.192186477
51.5872756293313	43.2084413991318	24.1146402691372	49.81718199	39.89953162	25.94554765	11.40867509
51.5872756293313	43.4620577830891	24.0444180615195	51.65508094	43.85648581	22.32830057	1.762166358
51.2120950426415	43.4620577830891	24.0444180615195	49.90577559	41.072269	23.3893886	2.801182703
51.2120950426415	48.9493019739228	24.0444180615195	48.35826716	45.69665672	26.59304148	9.422444764
51.2120950426415	48.9503019739227	24.0444180615195	50.26037041	48.95030273	24.30726963	0.987355419
51.3136240579851	49.118867193221	21.4202762743133	49.48945411	49.44119699	20.62289914	4.953096168
53.562975278793	57.5536250949874	21.4202762743134	53.22205568	50.84724902	15.61737169	8.874987766
53.563975278793	57.5536250949874	21.4202762743134	53.70737401	57.8077763	9.994366281	11.42963583
53.563975278793	57.61168804	14.3931713144005	55.40337389	57.61168804	14.09596446	1.863254992
53.5478802535706	60.7264413881529	14.3931713144005	52.59359138	61.87082203	17.23711721	8.855134315
50.3737252737193	60.7264413881529	14.3931713144005	50.37372436	63.54183807	17.2232387	3.991959404
49.5271940252289	60.7264413881529	13.4124302442416	49.52719402	60.88674536	13.02441036	0.419829482
49.5261940252289	60.7264413881529	13.4124302442412	44.98764045	56.96391467	9.231659535	10.72794423
38.4346757972667	60.7264413881529	13.4124302442412	42.10911161	58.06602885	13.19335194	5.369736734
38.3863730729001	60.7264413881529	13.6431082412058	36.65639834	59.2724504	14.55953297	2.438593171
38.3863730729001	63.4084453404878	13.6431082412058	36.99117209	62.09652931	16.1628835	3.164960791
38.3863730729001	64.8460037103649	13.6431082412058	38.18944723	65.54612606	17.9243242	4.457511574
38.3863730729001	65.0351286018083	13.6431082412058	39.12047899	68.75765335	13.33882614	3.957947734
38.3863730729001	67.1455654028041	13.6431082412058	37.43465738	70.14594443	13.87115315	3.15595335
38.5889997915854	65.0908652952718	13.6431082412059	40.91327599	65.05437313	16.01674823	3.322312195
38.5889997915854	65.0908652952719	9.02891447602215	36.88863481	65.11756178	9.028914476	1.700574542
38.5889997915854	63.977186377027	5.77664719666667	33.85806756	68.2147305	3.068667124	8.272925857
38.5889997915854	63.8527816334618	5.77664719666667	39.83687168	68.05987049	1.771904532	8.931405029
38.5889997915854	63.8527816334618	5.77564719666667	39.75179858	71.51477588	1.359571846	9.864345808
38.5889997915854	63.8527816334618	5.75237230200003	37.36735143	64.72519961	6.841621681	8.210035462
38.5889997915854	63.8517816334618	5.75237230200003	36.53251416	65.89826385	3.47943245	7.253690252
38.5889997915854	63.8507816334618	5.75237230200003	38.55825219	62.0328479	1.356643655	8.230604564
38.5889997915854	63.8497816334618	5.75237230200003	44.96838238	64.05706864	11.93558957	9.942108139
38.8733407330974	61.9741816665412	5.75237230200003	38.87334077	61.97418169	4.472466865	1.279905437
41.8245845128846	61.9741816665412	5.75237230200003	43.40294282	59.60424206	0.51389979	9.536160415
41.8255845128846	61.9741816665412	5.75237230200003	33.50828257	58.48410354	3.557102036	11.3670918
41.8265845128846	61.9741816665412	5.75237230200003	34.32584869	66.311045	4.144300462	8.8122254
42.7534198626453	60.0845077470066	5.75237230200003	45.47068469	56.96814934	6.687113785	4.238980951
42.7534198626453	68.4005705970153	5.75237230200003	38.19879917	73.45302115	2.159211899	11.60064907
42.7534198626453	68.4015705970153	5.75237230200003	41.30767537	70.05965636	6.684179381	2.389077221
47.805780160942	68.4015705970153	5.63536449929779	47.89205446	67.3947139	7.919602812	3.735189713
47.805780160942	65.2518593804665	5.63536449929779	50.86986196	67.11854893	6.466301231	4.50428609
47.828779230619	64.9491590871606	3.76552754602972	50.29671492	64.07582579	3.765527546	2.617903286
47.828779230619	64.9491590871606	2.1610918961196	53.04622082	62.56220406	2.597564218	11.46013038
52.4538318829084	64.9491590871606	2.16109189611959	52.45383187	66.17944394	1.57361944	1.363350544
52.4538318829084	64.8490015011007	2.16109189611959	59.0134746	66.34233581	2.610073656	8.63026105
53.8649814153021	64.1803716289515	2.16109189611959	54.15102156	63.89433124	1.875052021	0.495436049
53.603895953932	70.8975794483335	5.47324992290384	53.60239056	70.80290226	5.406808424	0.11567415
51.1775436218765	73.17951277993	6.60670961341396	51.17754367	73.39508539	6.606709632	0.21557261
48.8701711832933	73.17951277993	9.81281488808348	44.13660931	71.38940487	9.812814914	5.060740493
48.8701711832933	73.4410892489999	9.81281488808348	53.08761619	83.0335557	12.88369987	11.99564131
52.245757718267	73.4410892489999	14.5535776582321	52.24575767	74.98560476	14.55357765	1.544515511
52.245757718267	73.4410892489999	14.6410080797227	51.91696279	73.69595809	14.416915	5.533020939
52.245757718267	73.4410892489999	14.6420080797227	56.84900895	69.27095699	14.65228976	9.651018813
52.245757718267	73.4410892489999	21.4785015931051	51.90516717	74.10528304	22.83711571	4.497348507
55.3758271536096	73.4410892489999	21.4785015931051	57.06276587	74.98770524	20.67544591	9.477514768
55.5560240309978	71.9192178694748	21.5952450480128	55.72002047	71.91921816	21.5952445	0.163996439
55.5560240309978	70.1655227331322	21.7030016409202	58.81674593	76.2826012	22.48412381	7.335997979
55.5560240309978	70.1211476658768	29.5425505470332	54.03625818	65.02303827	30.15017844	5.354401863
57.0847212662166	70.1211476658768	29.5425505470332	63.53725064	67.03413314	29.14142524	7.164195385
56.8776101547798	70.1681517731822	30.0323876179867	55.90538334	73.56581582	30.52666899	5.910476566
53.651921788061	72.3053101230777	30.0323876179866	53.92763119	74.12654413	38.27376011	8.444710151
52.8289187498936	72.3053101230777	30.0323876179867	58.20433528	69.50520456	29.55764241	8.582697416
52.8289187498936	76.3206667274339	30.0323876179867	55.58088554	76.52999392	28.31600672	3.50422197
52.4098637526319	76.6055479426193	30.0323876179867	52.40986372	76.90026657	30.53428803	0.582033584
49.1366995888999	76.6055479426193	28.8439838537459	49.13669956	77.10708156	27.62901252	1.314416719
49.1366995888999	73.6854619743579	28.8439838537459	50.78444002	76.12504454	23.00978791	8.918500215
49.1356995888999	73.6854619743579	28.8439838537457	56.76810138	74.93595817	28.17323894	10.01955077
49.1356995888999	73.6854619743579	31.5522324646948	49.39322363	67.57061768	37.48715692	11.53351655
49.1356995888999	73.6844619743578	31.552232464695	49.38151416	71.84627519	34.52041136	5.560857427
43.5474450410844	73.6844619743578	31.552232464695	47.34853229	74.63427391	38.87043339	8.300992216
43.0949736202612	70.5185262269784	31.6243451606205	33.57300136	70.51852673	38.6296637	11.82127081
43.0949736202612	70.1963466048865	31.6243451606205	38.20769452	77.89743741	37.44950686	10.9290231

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
43.0949736202612	70.1953466048865	31.6243451606205	52.68458788	66.68600654	36.07142386	11.1378938
42.4163918252976	70.1953466048865	31.6243451606205	41.72708173	62.5487287	34.68501321	8.265204335
42.4163918252976	73.9463433600002	31.6243451606205	38.57181853	69.29967661	29.47346952	10.842735
42.4163918252976	73.9463433600002	31.061370298511	41.14789047	74.75727523	32.931636	7.341258219
42.4163918252976	73.9463433599999	31.0603702985109	42.58773685	73.94634336	30.2774743	0.801427016
40.1972854778781	77.3872718691669	31.060370298511	35.96077646	77.38727187	28.20511129	5.108866084
40.3148147074058	77.3872718691669	31.060370298511	49.21219028	82.18677234	33.0110742	11.80432558
40.4097155523411	82.9167326381066	31.060370298511	41.14833132	82.10595877	30.01446557	1.515527703
40.4097155523411	83.0951946050456	31.060370298511	40.76978451	74.94346594	30.5932008	8.186468819
44.9355969632581	83.0951946050456	31.060370298511	40.77647626	81.23711291	32.65865455	8.680043042
44.9355969632581	83.0961946050456	31.060370298511	39.57638463	86.69599702	34.69521123	10.21132869
44.9355969632581	83.0971946050456	31.060370298511	46.03038143	83.79986665	30.96050312	6.928032766
44.9355969632581	88.2534021298893	36.949100334	45.3176187	83.7901857	37.67961833	4.538711056
44.9355969632581	89.4434687982569	36.949100334	49.19512952	89.44346883	37.79505672	4.342724929
44.9345969632581	89.4434687982569	36.949100334	45.13861135	90.47060332	31.83589749	6.162353189
41.9299073242272	89.4434687982569	36.949100334	37.64776281	91.60925844	32.09349115	7.287109974
41.9299073242272	92.8662901261915	36.949100334	42.53215273	92.92397176	36.17653823	1.03008857
41.5903612844118	92.8662901261915	36.949100334	36.79414467	92.2553405	34.07762876	5.623371076
41.5880054699261	96.3802785299997	36.949100334	43.04035221	95.37042711	39.63020675	9.4350131
39.44288188	96.3802785299997	36.949100334	39.44288188	96.38027853	38.94704805	1.997947716
37.6684939319926	96.5212793253309	36.9489263615211	37.83606476	96.13365876	36.97541326	0.51935799
37.5737256797068	96.6928482141169	36.9489263615211	45.01212749	95.47966426	34.75016178	8.619068903
37.5737256797068	98.7979020832919	36.9489263615211	35.60188133	93.1465045	36.33325574	7.692381008
37.5737256797068	98.7979020832919	35.6071419237402	35.92075185	99.04269187	36.73360907	5.09129157
37.5737256797068	98.7989020832919	35.6071419237401	36.49499514	99.8776323	35.60714208	1.525555131
37.5737256797068	98.7989020832919	30.3891369026023	43.63164404	99.67485887	36.08960829	11.34349589
44.4102499441545	97.2613908430977	30.3891369026023	48.82360524	98.37839062	35.9745595	7.220914682
44.5697066696807	97.2613908430977	30.3891369026023	44.56970667	97.22856143	30.36827838	0.038895351
48.3993466510173	98.0979672882475	30.3891369026023	48.39934621	99.02729511	30.05026749	0.989182834
51.0489292251188	94.5825529267816	30.3891369026023	48.69087386	94.64188777	30.6210566	2.380405111
51.4500768152346	94.5825529267816	30.7206851897319	51.95218378	92.57992082	30.72068519	2.064617824
51.4500768152346	94.5825529267816	30.7216851897318	53.27314218	89.6748569	31.66096453	11.35118685
51.4500768152346	94.5825529267816	31.5542417104589	48.45592928	88.4082341	31.5542414	6.862006444
51.4500768152346	94.5825529267816	31.9934083143773	57.84005051	97.24933499	35.2604133	10.98084378
53.3999226002378	94.6019650696984	32.7608695387808	52.71570498	99.46690315	35.19170787	5.481309266
53.3999226002378	99.3612025992209	32.7608695387808	53.69991452	99.81161169	33.42740223	0.858562362
53.3999226002378	99.3612025992209	28.8023259923465	54.29998953	99.89190946	28.80232628	1.044878103
53.3999226002378	99.2407522666893	28.8023259923465	52.60387814	98.51053443	27.61605738	2.070061212
53.295561174133	99.2407522666893	25.9073270128492	53.29556121	92.47449182	25.90682802	6.766260463
51.8865780314616	99.2407522666893	25.9073270128492	57.58318464	98.55697919	27.3972425	7.09566511
51.8865780314616	99.2407522666893	24.310733948585	45.34071838	99.2752365	24.31073394	6.545950484
51.8865780314616	99.072788759966	24.310733948585	47.31578899	98.13704672	24.13193979	11.87713881
51.8865780314616	99.0433568062006	23.1214547601369	44.53236455	98.59505273	17.96036731	8.99567986
51.8865780314616	99.0433568062006	17.9102569702304	50.67630959	98.08417141	16.59101162	8.634086059
51.8865780314616	99.0433568062006	17.9092569702303	52.2623599	99.83573023	14.38314162	3.745784047
51.8865780314616	99.0433568062006	17.9082569702303	54.09260921	96.04789718	12.52208915	7.918650854
51.8865780314616	97.7578347740896	15.9635186961946	53.26472651	92.17526811	13.38443287	6.470026475
51.8865780314616	96.1587984576022	15.9635186961946	54.43632749	91.92787857	15.4166252	10.0796961
51.8865780314616	92.8434039996063	15.9635186961944	57.43254842	97.94119843	9.821238574	10.09429194
56.9905038889498	92.8434039996063	15.9635186961946	49.03663551	90.65504513	13.8830876	8.507710049
56.9905038889498	92.8434039996063	15.903588588	54.10050901	92.28618361	12.05829408	9.480891031
57.1126286482726	92.8434039996063	15.903588588	54.90972966	93.30800556	12.19693664	7.380299806
57.534225525373	91.73216299	15.903588588	57.53422575	91.73216299	13.63995038	2.263638208
61.2600206948222	91.73216299	15.903588588	62.61309781	94.29391595	17.98130243	5.245785935
61.2600206948222	84.5006289292029	19.8225005867466	59.01602486	86.99268685	19.95901958	4.144714535
61.300139286043	82.9192145680006	19.8465963504839	61.30013954	82.69641043	22.92622968	3.087682485
61.300139286043	82.9192145680006	19.8225080272527	55.99099974	83.60147673	17.9737132	11.10984141
61.300139286043	82.9192145680006	18.194573216402	60.70093329	80.64454551	19.95511414	3.209176581
61.300139286043	82.9192145680006	16.5039601319424	58.40265516	82.89286098	16.95320583	3.789211097
61.6783450558127	82.9192145680006	13.2426180500669	61.67834468	82.51967341	13.24261796	0.399541158
68.4362396932864	83.4169903889748	13.1095079492861	69.09548968	84.07624055	12.89569188	0.956524245
62.9514593826105	69.836106872576	13.1095079492861	65.09617026	64.32634731	13.59892336	6.924546531
62.9514593826105	64.7246209486404	13.1095079492861	61.64088805	64.72462094	13.53456764	1.377778269
62.9514593826105	63.7279813969533	12.2078243250751	57.97334153	65.39941546	18.27090119	9.414607276
62.9514593826105	63.7279813969533	11.9784335764815	56.20333441	63.09635143	9.893720293	7.090992634
62.9514593826105	63.7279813969533	4.99389769463028	65.55566867	66.58332744	7.127202217	6.556838353
64.4958724297461	63.7279813969533	4.78439236052431	65.33791464	63.72798066	4.706052333	0.84567857
64.4958724297461	58.158332884237	4.78439236052431	59.77266019	58.01872841	1.019723189	6.553588622
64.4958724297461	58.157332884237	4.78439236052431	61.56325619	58.635877	0.997422198	7.786489382
64.4958724297461	58.156332884237	4.78439236052417	62.81703196	55.94894639	0.04067048	5.494902887
68.5202293738655	58.156332884237	5.6472873695411	68.52022941	55.69012612	11.12241046	6.004927032
68.5202293738655	58.156332884237	5.19173971862198	71.85259834	57.85616299	9.805797889	6.145303146
70.943659486895	58.1563328842371	5.15778080559041	70.94365949	58.14560753	5.076539278	0.08194644
75.7563411969947	58.1563328842371	5.15778080559041	76.04244622	64.45001766	13.22117777	10.41499903
75.7563411969946	59.2641987390879	5.15778080559041	75.75634139	60.02200009	5.726434896	0.947433566
76.6346724410311	58.1474122654718	5.15778080559041	87.34079917	59.37931572	10.08579475	11.8500657
77.4340342182346	57.682152379558	3.81264065859982	85.71414415	51.67250379	7.296357424	10.80797757
95.1319248801548	57.682152379558	3.71406106199962	95.77662579	57.68215173	3.069360741	0.911744354
92.4275528869372	54.3542165287345	3.71406106199962	84.14082278	54.46253046	0.380513445	9.425227564
79.8675090810723	54.3542165287346	8.07132886399993	79.86750899	54.35421653	8.27403967	0.202710806

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
78.9213152210086	50.4134546938579	7.93183341800136	78.92131522	50.41345477	7.556720976	0.375112442
77.7744988220557	46.7225624486564	10.0220420579993	77.77449926	46.72256252	10.92269156	0.900649502
77.1442707101414	45.2507960194417	1.75324283399997	77.14427045	45.25079579	0.327384457	1.425858377
77.1442707101414	45.2507960194417	1.75424283400014	70.24663893	43.40548551	1.656037041	10.39433718
76.6731131475371	43.3720511000655	11.492311225221	74.78372311	42.05088328	3.322634156	8.48875153
76.6731131475371	41.7670289590001	11.7873346993149	73.13866372	41.71405139	17.04301109	6.333819835
69.679223322336	41.7670289590001	12.5891209091924	69.67922342	40.74675918	12.58912096	1.020269779
66.5460274179941	41.7670289590001	12.5891209091924	63.76560063	37.45231942	9.842542758	11.55334525
64.6614007759574	41.7670289590001	12.5891209091924	58.14893689	37.55022655	17.10511358	9.288752836
64.6614007759574	41.7670289590002	12.6373872220379	59.28037529	42.02965748	18.78086606	8.171091803
64.6614007759574	47.7523114182704	12.6373872220378	64.47235297	44.07915445	14.05919317	7.777532307
64.6614007759574	47.7523114182704	15.7833705364418	67.10787364	49.80646667	13.82525922	8.845260172
64.6614007759574	47.7523114182704	15.7843705364418	66.65703205	47.7722791	14.44067044	4.863538053
64.6614007759574	47.7523114182704	15.7869952031611	64.66140077	51.58253517	18.71344865	4.820243123
63.3733454002528	46.8284242314815	15.7869952031611	63.21772914	46.4808445	18.00555738	2.251010045
63.3733454002528	46.8284242314815	6.35459177247922	64.75792457	49.92103542	3.951957012	4.153788299
62.3606058566729	43.3830011781954	6.35459177247922	63.59211348	50.34808715	9.20862338	9.725987624
57.5616622215609	43.3830011781954	6.35459177247922	57.56166222	41.97700689	5.193477838	1.823459763
57.4189303737562	43.3830011781954	6.35459177247922	63.41360315	44.69674786	5.219771375	7.070238855
57.4189303737562	44.5844449037194	6.35459177247922	57.35658457	43.71456461	3.914439364	10.0633535
54.1908584701947	44.5844449037194	6.35459177247922	53.79810347	45.16180718	4.496135918	1.985311525
54.1908584701947	44.5844449037194	7.90679965683079	54.43373891	52.12894009	7.9067999	7.548403707
53.9305289785376	40.4701299358379	7.90679965683079	55.55130491	39.21526309	7.425393497	11.86807905
53.9305289785376	37.8879821443817	7.90679965683079	54.00076983	32.50218762	13.15428984	8.205190824
53.9295289785376	37.8879821443817	7.90679965683079	56.1557774	36.1071959	13.13084437	6.201998603
44.216876830336	37.8879821443817	11.2047131564964	44.21687698	34.39769027	11.89272829	3.557457265
40.8184922039226	39.06908374	11.2047131564964	38.78467609	39.06908374	12.83761672	2.608214338
41.3888315842962	39.2022708456652	11.2047131564964	40.81010844	38.77304558	7.861958026	5.734432078
41.3888315842962	39.2022708456652	9.84793351476653	41.57443341	43.13832473	6.475589725	5.186489261
41.3888315842962	39.2022708456652	0.105873455506867	43.74535734	43.87626012	1.779657186	7.961235625
48.2061951693118	39.2227048016731	0.105873455506867	48.20619517	39.24794213	0.08063613	0.03569097
51.7129816876354	39.2227048016731	3.04060464891331	51.33580352	40.30660727	1.042528676	4.986289138
51.7129816876354	35.6193759391458	3.04060464891331	50.32982697	35.43640834	3.785700884	1.581696088
53.150229245	33.9778437293598	3.04060464891331	58.09138733	33.97784367	3.040604697	4.941158085
53.1502292449999	30.978175972885	4.17115236773718	59.11600598	27.89604561	4.171146498	6.714910247
52.0061470852523	30.978175972885	6.05814215698223	51.19858704	31.0981292	6.058142298	0.816420237
53.7060309128626	30.9318342121736	6.60486771171802	54.69460289	37.32086801	4.721267047	6.733868048
53.7060309128626	28.8544227808708	9.24312126144302	55.07321291	28.85442279	12.55016086	3.578504928
53.7060309128627	26.9552766719998	9.24312126144311	50.20668952	26.40233109	10.32749181	3.704996422
64.8889752889219	26.9552766719998	9.24312126144311	62.17589976	23.53474989	9.188656209	5.377142852
64.8889752889219	26.9552766719998	8.95936483883241	64.88897514	21.58345165	8.959362969	5.371825022
74.4446722080053	27.8527926250864	8.95936483883248	75.00767938	29.50135545	13.77877729	5.124594895
74.4446722080053	28.2532070010798	0.489048023564518	75.19376171	39.75388964	3.378695446	11.99616742
83.0663635500439	29.8989113716818	0.489048023564523	86.50661976	33.33916758	0.489048022	4.865256989

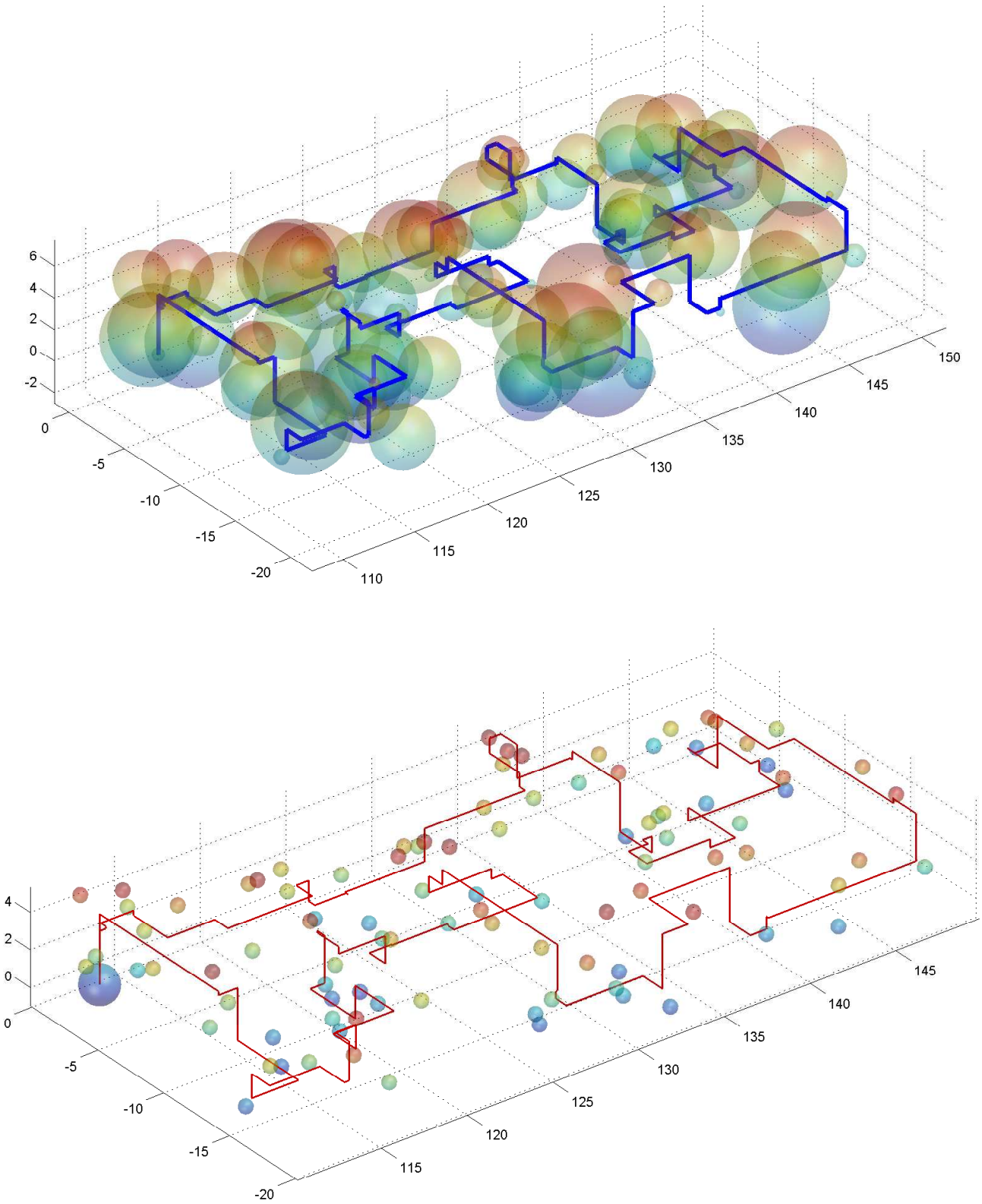
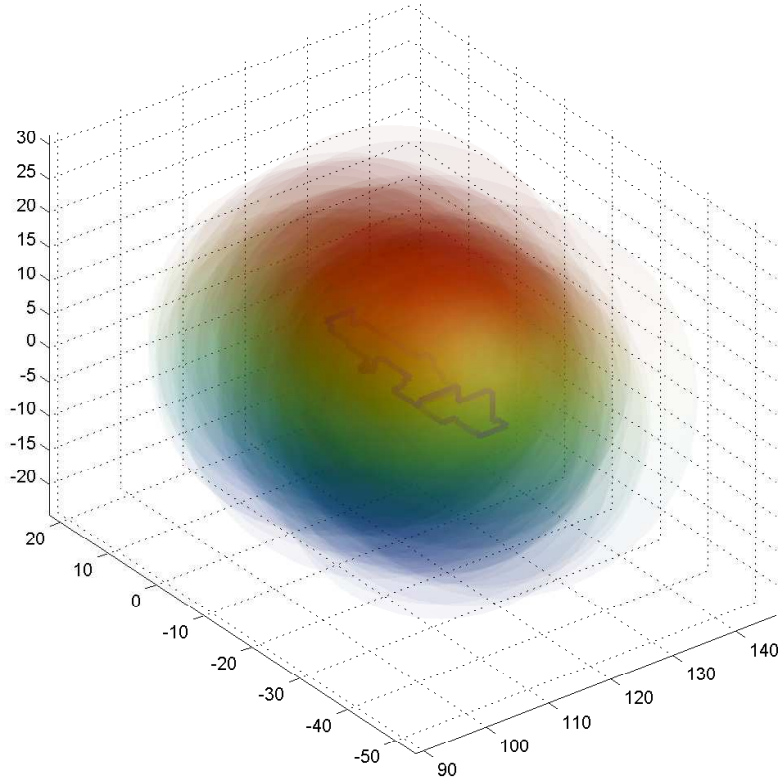


Figure N.202: $kroD100$, arbitrary radius, 3D, Manhattan, Length = 233.1348582

Table N-205: Solution for $kroD100$, arbitrary radius, 3D, Manhattan

Total distance: 233.134858225544 Depot: x 2.78 y 1.65 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.78	1.65	2.86211041805455	3.66	3.39	1.25	2.53
3.14829336425957	1.65	2.97561128841248	2.02	2.33	2.08	2.61
3.14929336425958	1.65	2.97561128841248	3.87	1.99	4.81	2
3.14929336425958	1.25377931008231	2.97561128841248	2.64	0.36	4.24	1.63
5.06982604521515	1.25377931008231	2.70278621278889	5.47	0.25	2.56	1.09
5.06982604521515	2.67000000064379	2.70278621278889	4.6	2.67	2.69	0.47
5.06982604521515	3.83204774896619	2.70278621278875	6.34	2.94	3.58	1.98
7.81084099983111	4.84034540458933	2.7027862127888	9.31	5.12	4.87	2.65
7.81084099983111	4.84134540458933	2.7027862127888	7.81	6.7	2.36	1.89
12.1353152079974	4.84134540458933	2.7027862127888	10.17	3.33	3.55	2.62
12.7200000001884	3.61452636932158	2.70278621278875	12.72	2.46	3.03	1.2
13.4599999998322	3.61452636932158	1.60000000000005	12.03	3.85	2.73	2.95
13.4599999998322	4.08000000004303	1.60000000000006	13.46	4.08	0.87	0.73
15.290000000022	4.22497634087062	1.60000000000005	15.29	5.81	0.79	1.78
15.290000000022	3.97191713517629	1.60000000000005	15.41	3.54	2.28	1.67
19.9363818065917	3.97191713517629	3.36032084417704	18.28	4.56	3.27	1.76
19.9373818065916	3.97191713517629	3.36032084417708	19.62	3.89	2.49	0.93
23.5380159207381	3.97191713517629	3.36032084417708	23.34	5.23	2.71	1.43
25.810000000152	3.97191713517629	3.36032084417708	23.47	3.88	3.22	2.49
25.810000000152	3.53518337401496	4.11641829269036	25.97	3.49	4.95	0.85
25.810000000152	3.53418337401496	4.11641829269036	25.92	2.48	4.76	1.24
25.810000000152	1.23828426588614	4.89171572339121	25.81	1.21	4.92	0.04
26.487553230072	2.46397537016253	3.08946821662365	26.58	3.6	2.5	1.33
26.487553230072	2.46397537016253	3.08846821662366	26.56	1.28	3.27	1.2
29.5682199436509	2.63999999972868	3.08846821662365	29.95	2.64	1.7	1.44
29.5682199436509	2.63999999972875	3.53537137050676	30.62	3.29	3.3	1.51
29.5682199436509	6.27117514518933	3.53537137050676	29.44	6.32	4.14	0.62
29.5682199436509	6.27117514518931	0.856061266058204	29.93	6.24	0.47	0.53
29.5682199436509	8.68813543644223	1.72234629904426	30.23	8.71	2.76	2.25
29.5682199436509	8.68913543644223	1.72234629904426	30.6	7.81	2.03	1.39
29.0191620332304	9.12682920110757	1.72234629904426	29.01	9.2	2.88	1.16
27.8676537262435	10.5423462730684	1.72234629904426	27.4	11.01	2.19	0.81
31.5467948877692	10.5423462730684	1.28348861979244	29.82	9.49	1.92	2.12
33.0098175850159	10.5423462730684	1.28348861979244	33.32	10.49	1.92	0.71
33.0098175850159	6.97000022023928	0.562529182929165	34.52	6.37	0.69	1.63
38.358171227423	6.97000022023929	0.562529182929165	38.68	6.97	0.22	0.47
38.3581712274229	5.40000000267251	1.23648707548459	39.35	5.4	2.53	1.63
38.358171227423	5.39900000267251	1.23648707548459	39.46	4.59	0.2	2.26
37.8573838278877	3.04756086859091	1.23648707548459	37.66	1.54	0.37	1.75
36.39	2.47421004907835	1.23648707548459	35.38	1.25	1.14	1.59
36.39	4.78448584101837	4.02207	35.03	3.01	2.97	2.47
36.39	4.87335834437513	4.02207	36	4.59	3.96	2
36.39	5.14000000256486	4.02207	35.99	5.14	4.02	0.4
36.39	8.64888516781246	4.02207	36.42	6.99	3.53	1.73
36.39	8.64988516781246	4.02207	35.35	11.12	3.97	2.82
37.8931270028508	14.3098032360944	4.02207	39.18	12.17	3.68	2.52
37.901507575935	16.1899999999377	4.29150757596669	38.05	16.19	4.44	0.21
37.8599999999438	17.9299999999999	1.71999999986658	37.86	18.62	1.72	0.69
35.1983323872564	17.9299999999999	1.71999999986658	33.73	19.02	3.72	2.71
33.1055385136089	17.9299999999999	1.71999999986658	32.2	19.45	3.11	2.25
33.1045385136089	17.9299999999999	1.71999999986658	32.48	19.06	0.64	2.69
29.269999999917	17.770000000032	1.03000000000003	29.27	17.77	0.77	0.26
28.3465849040129	16.2018510747262	3.93452488477927	30.07	15.24	3.68	1.99
26.6110898617889	16.2018510747262	3.93452488477927	28.34	15.12	3.98	2.04
23.6153257185815	16.2018510747262	3.93452488477927	23.56	15.68	4.13	0.56
23.6153257185815	19.1799371644317	3.93452488477927	23.74	19.44	4.67	0.79
22.1399999997347	19.1799371644317	0.999577699811479	22.14	19.77	0.32	0.9
22.1399999997347	17.6879982331947	0.999577699811479	22.21	15.78	0.34	2.02
19.4346693879146	17.6879982331947	0.999577699811479	19.94	18.52	1.49	1.09
19.4336693879146	17.6879982331947	0.999577699811479	20.5	18.33	0.82	2.94
17.6823176345824	17.6879982331947	0.999577699811479	16.46	18.17	1.97	2.5
17.6823176345824	17.2299999996629	0.999577699811479	16.23	17.23	0.85	1.46
17.6823176345824	17.2289999996629	0.999577699811479	16.32	17.42	0.34	1.83
17.6823176345824	16.8808708353552	1.38654777072875	17.68	15.78	3.21	2.13
17.7863576158763	16.8808708353552	3.83316536750579	20.28	17.36	4.94	2.77
17.7863576158763	16.0811917497008	3.83316536750579	17.87	19.02	3.83	2.94
17.7863576158763	12.94	3.83316536750579	16.99	12.94	3.45	1.36
17.7863576158763	12.38	3.83316536750579	16.77	12.38	3.99	1.54
17.7863576158763	8.14000000009254	3.83316536750579	18.19	8.14	4.91	1.15
17.7863576158763	8.14000000009255	3.02660866581604	16.04	7.06	4.67	2.63
17.7863576158763	7.11709605887648	2.95208359182767	17.66	6.92	4.8	1.93
17.7863576158763	7.11709605887669	2.14000000000049	17.66	6.78	2.14	0.36
21.4239116874776	7.11709605887669	1.59834724755729	20.67	6.94	0.95	1.01
22.074115427363	9.74411542725694	1.56588457266364	22.23	9.9	1.41	0.27
17.2220630267255	9.27999999999994	1.67412083398379	17.25	9.27	1.67	1.01
13.9299999999067	9.27999999999994	1.71999999999514	13.93	8.59	1.72	0.69

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
12.6400000000645	10.49	3.17999999999286	12.64	10.9	3.18	0.41
9.94140717302859	10.49	3.55222388150154	10.09	10.01	2.31	1.34
9.94140717302859	8.87219367416469	3.65780581745399	9.81	8.48	4.05	0.57
9.94140717302859	9.42000034077445	2.31496056377867	10.21	9.62	0.29	2.98
9.94140717302859	9.42000034077458	1.3658821724131	11.79	9.69	0.13	2.24
9.94140717302859	9.42000034077455	1.11533727348562	9.97	9.42	1.03	0.09
9.08417134764858	10.4049709577727	1.11533727348562	8.11	12.95	0.83	2.74
9.08417134764858	12.8539838230567	1.11533727348562	11.09	11.96	0.79	2.22
9.08417134764858	12.8539838230567	2.86167152738136	7.78	12.82	1.55	1.85
9.08417134764858	15.7812543955792	2.86167152738136	10.82	15.61	2.72	1.75
5.54999999999504	17.5300000000058	4.17000	5.55	17.53	4.5	0.33
4.33653924710514	18.5657250858539	3.99000029464929	3.94	19.44	3.99	0.96
4.33653924710514	18.5657250858538	2.07999898572033	5.70999999999999	19.82	2.08	1.86
4.06992421824704	16.6983602150646	2.07999898572033	3.86	16.16	2.13	0.58
4.06992421824704	16.6973602150645	2.07999898572033	1.48999999999999	16.29	2.83	2.86
1.15286679149104	15.3299999995497	0.780459381341296	0.799999999999997	15.33	0.47	0.47
3.88200238716226	11.209999999937	0.780459381341296	5.55	11.21	0.58	1.68
3.88200238716226	11.2091735798096	0.78063296121392	4.64	13.02	0.19	2.05
3.88200238716226	10.6900000012755	3.58058995394388	4.01000	9.8	2.35	2.63
2.78000000000023	10.6900000012755	3.5805899539438	2.34999999999999	10.59	1.97	1.67
2.78003	10.6900000012755	3.77601507547214	2.41	10.69	4.97	1.25
2.78	6.55268817627043	3.77601507547203	2.4	6.19	3.07	0.88
2.78	3.07763781120635	3.77598192227139	0.469999999999999	3.63	2.67	2.62



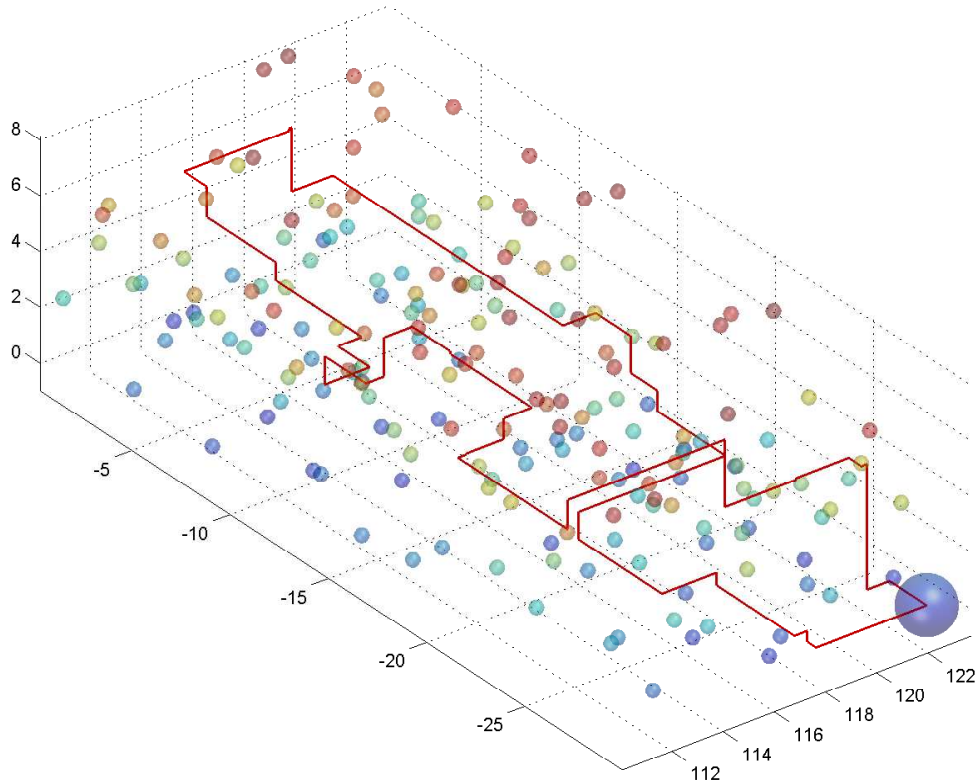


Figure N.203: *rat*195, arbitrary radius, 3D, Manhattan, Length = 112.7771027

Table N-206: Solution for $rat195$, arbitrary radius, 3D, Manhattan

Total distance: 112.777102692755 Depot: x 12.7 y 29 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
12.7	28.999	0	6.7	28.8	0.2	14.1
12.7	27.1130221086105	0	8.7	26.4	4.3	9.1
12.7	27.1120221086132	0	9.5	27.1	1	21
11.8209735544791	27.1120221086199	0	9.4	28.4	4.3	5.1
11.8209735544791	27.1120221086199	4.49999999999987	11.4	29.4	4.3	25.1
11.6000001205478	27.0999999996322	4.49999999999987	11.6	27.1	4.6	0.1
11.6000001205478	26.4664793948383	4.49999999999987	9.3	18.5	2.6	9.1
11.5990001205478	26.4664793948383	4.49999999999987	10.4	25.6	3.6	8.1
9.49999998922762	26.4664793948383	4.49999999999987	9.5	23.5	3.6	3.1
9.49899998922761	26.4664793948383	4.49999999999987	8.7	24.9	3.7	12.1
9.49899998922761	26.4664793948383	4.49999999999987	8.7	23	0.9	11
9.49799998922762	26.4664793948383	4.49999999999987	12.5	25.3	2.9	5
9.49799998922762	26.5486248481274	4.49999999999987	10.4	29.1	7.1	17.1
6.70100000098347	26.5486248481274	4.49999999999987	5.8	25.2	5.8	22.1
6.70100000098347	26.5486248481274	6.91152361515445	1.7	29.4	1	22
6.70000000098346	26.5486248481274	6.91152361515445	6.7	26.7	7.9	1
2.41334768020359	26.5486248481274	6.91152361515445	2.3	28.7	7.3	13
2.41234768020358	26.5486248481274	6.91152361515445	0.7	28.7	7.3	22.1
2.41134768020359	26.5486248481274	6.91152361515445	2.6	25.5	6.5	11
2.41034768020359	26.5486248481274	6.91152361515445	3.7	26.6	6.4	21.1
2.40434768020421	26.5486248481274	6.91052361515382	4.5	26.7	5.4	21.1
2.40334768020421	26.5486248481274	6.91052361515382	3.3	24.6	6.9	9.1
2.4023476802042	26.5486248481274	6.91052361515382	5.5	22.5	1.9	14.1
0.560665451537702	26.5486248481274	6.05372999873899	0.6	24.9	2.3	4.1
0.560665451414224	26.5486248481274	5.86066544959676	0.5	26.6	5.8	0.1
0.560665451414224	26.5476248482511	5.86066544959676	1.3	22.7	4.8	22.1
0.560665451414224	20.9533153963997	5.86066544959676	1.5	21.3	4.6	6
0.561665451414228	20.9533153963997	5.86066544959676	2.5	19.5	4.2	6
0.561665451414228	20.9523153963997	5.86066544959677	0.3	19	1.4	19.1
0.561665451414228	20.9523153963997	5.86066544959677	0.3	16.4	1.1	19
0.903000001817475	20.9523153963997	5.86066544959677	0.5	20.7	6.8	19
0.903000001817475	20.9059999998921	5.86066544959677	6.4	21.3	7.2	20
2.399	20.901	6.2	2.6	23.5	7.4	8
2.4	20.901	6.2	7.6	17.1	1.9	19.1
2.4	20.901	6.2	3.7	18.6	2.9	17
2.4	20.9	6.2	2.4	20.9	6.2	0
2.4	20.899	6.2	1.6	18.8	1.3	10
2.4	20.899	6.59800	3.3	21.4	7.2	7
2.4	20.898	6.59800	5.3	21.1	5.7	15.1
2.40100	20.898	6.59800	3.4	22.5	7.6	5
3.5	20.898	6.59800	10.4	21.5	7.4	16
3.5	19.2000000041345	6.598	6.6	19.2	7.9	8.1
3.5	17.503	6.59800	5.3	17.4	7.6	8
3.5	17.502	6.59800	5.5	14.6	7.4	9.1
3.5	17.501	6.598	2.5	16.5	6.9	10
3.5	17.501	6.599	7.7	19.2	6.3	23
3.5	17.501	6.6	4.4	18.9	6.5	24
3.5	17.5	6.6	3.5	17.5	6.6	0
3.5	16.7271545194894	6.6	3.6	10.8	4.8	22
3.5	16.7271545194901	6.7	4.4	16.9	6.4	1
3.50000	16.72615451949	6.7	3.6	7.3	0	22
3.49999999999761	15.0999999999957	6.7	3.5	15.1	6.8	0.1
3.49999999999761	14.8000003746049	6.7	4.3	20.6	6.3	21.1
2.4	14.8000003746049	6.7	6.3	15.5	7.6	11
2.4	14.8000003746049	5.30000000000684	2.4	15.3	3.6	3.1
1.70000000000007	14.8000003746049	5.30000000000684	1.6	14.7	5.3	11
1.70000000000007	12.7009999999995	5.30000000000684	7.7	9.3	3.2	10.1
1.70000000000007	12.6999999999994	5.30000000000684	0.6	12.7	5.3	1.1
1.70000000000007	12.6999999999994	4.29926307109135	0.7	15.2	6.3	7.1
2.97332644076127	12.6999999999994	4.29926307109135	6.3	12.4	6.5	4
3.45974207488197	12.6000000000002	4.29926307109135	3.5	12.6	3.2	1.1
3.45974207488197	11.7983774301146	4.29926307109135	1.3	9.5	6.3	7
3.45974207488197	11.7973774301147	4.29926307109135	5.4	13.2	5.7	3.1
3.45974207488197	11.0999999999998	4.29926307109135	1.5	11.1	3.9	2
3.45974207488197	11.0999999999998	4.32518885596717	1.6	17.2	3.9	21.1
3.45974207488197	11.0999999999998	4.32618885596717	0.7	11.4	6.7	12.1
3.45974207488197	11.0999999999998	4.32718885596893	2.7	13.4	6.1	5.1
3.46074207488198	11.0999999999998	4.32718885596893	1.7	12.5	1	18.1
3.46174207488197	11.0999999999998	4.32718885596893	4.3	11.2	3.3	10
3.46174207488197	11.0989999999998	4.32718885596893	2.4	11.2	0.3	8
4.37948117569128	9.39999923995175	4.32718885596893	2.5	9.4	1.9	11.1
4.37948117569128	7.19366894346185	4.32718885596893	0.6	7.5	5.5	17.1
4.37948117569128	7.19266894346186	4.32718885596893	1.5	7.5	4.4	4
4.37948117569128	7.19166894346186	4.32718885596887	2.7	7.3	2.8	3
4.37948117569128	7.19066894346185	4.32718885596819	0.6	8.4	0.5	8.1
4.37948117569128	7.18966894346173	4.32718885596785	5.4	7.2	1.4	3.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
4.37948117569128	7.18866894346406	4.32718885596887	4.7	8.7	1.2	4.1
4.37948117569128	6.71532383801438	4.32718885596887	7.5	4.4	2.9	14.1
4.37948117569128	6.71532383801438	4.32818885596887	1.5	4.6	5.8	22
4.37948117569128	6.71432383801437	4.32818885596887	2.6	5	2.8	9.1
4.37948117569128	6.71332383801435	4.32818885596887	5.4	4.6	2.8	24
4.37948117569128	6.71332383801436	4.9907032296015	8.5	6.5	2.8	24.1
4.3794811756913	6.71232383801435	4.9907032296015	1.5	3.2	3.6	14.1
4.37948117569128	6.71132383801438	4.9907032296015	0.3	1.2	2.6	18.1
4.3794811756913	6.71132383801437	4.9917032296015	3.3	3.4	4	20.1
4.37948117569128	6.71132383801438	4.99270322960148	7.4	3.2	3.2	9
4.37948117569128	6.71032383801439	4.99270322960149	9.5	2.8	2.3	19
4.37948117569128	6.71032383801439	4.99270322960149	10.4	2.5	2.2	19
4.37948117569128	6.70932383801439	4.99270322960149	3.6	5.4	1.9	18.1
4.37948117569128	6.70832383801439	4.99270322960149	3.7	8.4	7.5	3.1
4.37948117569128	6.70832383801439	4.99370322960146	1.7	1.2	4.1	10
4.37948117568928	6.68932393375745	4.99370322960147	8.3	8.9	1.9	9
4.37948117569127	6.68832393375745	4.99370322960147	6.3	8.6	0.9	20
4.37948117569127	6.68832393375745	4.99370322960147	0.3	4.8	1	20
4.37948117569088	6.68732393375745	4.99370322960147	4.7	6.8	4	3
4.37948117568911	3.39921198466694	4.99370322960145	6.4	5.4	1.3	8
4.37948117568914	3.39821198467184	4.99370322960158	2.6	3.4	1.3	4.1
4.37948117568928	3.3972119846723	4.99370322960158	2.3	0.9	5.1	8
4.37948117568928	3.20087939420517	6.09032627145176	0.3	3.2	6.5	4.1
4.37948117568963	2.02839023953298	6.09032627145175	4.2	3.4	5.8	10.1
4.37948117569114	2.02739023953298	6.09032627145266	5.3	2.5	6.5	9.1
5.39106581916694	2.02739023953298	6.09032627145266	5.4	1.2	0.3	23
5.39206581918371	2.02739023953298	6.09032627145266	6.6	6.8	6.1	7.1
5.39206581918471	2.01421356237306	6.09032627145266	6.6	1.6	1.4	18
8.50528363412016	2.01421356237306	6.09032627145266	8.8	4.9	6.7	12
8.50528363412016	2.01421356237306	6.18578643762685	11.5	1.4	6.7	3.1
8.6	2.01421356237306	6.18578643762687	8.6	0.6	7.6	2
8.60099999999998	2.01421356237306	6.18578643762687	9.4	0.8	7.9	3
8.60199999999999	2.01421356237306	6.18578643762687	4.8	5	7.8	21.1
8.60199999999999	2.01421356237306	6.18478643762687	8.5	3.4	4.2	3.1
8.60199999999999	2.02439023953298	4.83193407727642	12.3	1.5	6	5
8.60199999999998	2.02439023953298	4.83093407727635	9.4	7.4	2	19
8.60199999999999	2.02439023953298	4.17609765264522	10.7	0.9	0.9	23.1
8.602	2.02439023953298	4.17509765208314	4.7	1.1	0.2	20.1
8.602	2.02439023953298	3.89696732113104	6.4	3.2	0.3	5.1
10.2043157107699	5.34553868217836	3.89696732112901	10.3	5.4	1.9	2
10.2043157107682	5.34653868217998	3.89696732112856	7.4	6.7	6.3	8
10.2043157107683	5.34753868217676	3.89696732112856	7.5	0.7	4.6	14.1
10.2043157107683	5.34753868217676	3.89696732112856	3.4	1.1	2	18.1
10.2043157107668	5.34853868217522	3.89696732112856	10.7	6.5	4.1	12
10.2043157107668	5.34953868217522	3.89696732112856	11.7	6.5	2.6	20.1
10.2043157107668	5.35053868217522	3.89696732112856	12.5	3.4	2.8	10.1
10.2043157107668	5.35153868217524	3.89696732112856	9.8	5	1.1	13
10.2043157107668	5.35253868217524	3.89696732112856	11.5	4.7	3.2	2
10.2043157107668	5.35353868217524	3.89696732112856	11.3	3.1	6.2	7
10.2043157107668	5.35453868217524	3.89696732112856	12.7	4.9	6.8	23
10.2043157107668	9.3	3.89696732112856	12.3	9.3	7.2	13.1
10.2043157107668	12.2176589782878	3.89696732112856	12.6	10.9	4	9
10.2043157107668	12.2186589782878	3.89696732112856	10.3	9.2	3.3	4
10.2043157107668	12.2196589782878	3.89696732112856	5.6	10.5	0.4	25
10.2043157107668	12.2206589782878	3.89696732112856	7.3	11.2	0.4	18.1
10.2043157107668	12.2216589782878	3.89696732112856	11.5	9.5	4.3	21
10.2043157107668	12.2216589782878	3.89696732112856	5.3	9.5	2	19.1
10.2043157107668	12.2226589782878	3.89696732112856	11.7	11.5	2.9	9.1
10.2043157107668	12.2236589782878	3.89696732112856	6.4	11.2	5.2	12
10.2043157107668	12.2246589782878	3.89696732112856	4.4	13.1	0.1	16
10.2043157107668	12.2246589782878	3.89696732112856	9.4	9.5	1	13
10.2043157107668	12.2256589782906	3.89696732113105	8.6	10.7	4.5	14
10.2043157107668	12.2256589782906	3.89696732113105	12.5	6.8	4.3	14.1
10.2043157107668	13.7314495289659	3.89696732113105	10.4	11.3	7	24
10.2053157107668	13.7314495289659	3.89696732113105	10.3	12.6	5.4	10
10.2063157107668	13.7314495289659	3.89696732113105	9.6	12.8	7.5	5
10.2063157107668	13.7314495289659	3.8955204553554	7.7	12.7	4.4	23
10.2073157107668	13.7314495289659	3.8955204553554	11.6	13	7.6	12
11.4100098302385	13.7314495289659	3.8955204553554	12.6	13.4	7.7	4
11.4805212137958	15.5115243739717	3.1678446771575	4.5	15.4	4.9	20.1
11.4805212137958	15.5115243739717	3.1678446771575	8.2	13.4	6.9	18
11.4805212137958	15.5115243739717	3.1668446771575	8.4	21.2	7.3	24
11.4805212137958	15.5115243739717	3.16584467715682	11.4	16.9	4.3	15
11.4805212137958	15.5115243739717	3.16484467715686	10.4	15.1	4.9	18
11.4805212137958	15.5115243739717	2.56395522829526	12.7	14.8	0.7	9
11.4805212137958	15.5115243739717	2.5629552282953	9.3	15.6	1.2	5.1
11.4805212137958	15.511524373972	2.5619552282953	6.4	16.8	1.7	6
11.4805212137958	16.9	1.82065772438322	12.5	16.9	0.1	2
11.4805212137958	17.6876680188592	1.82065772438322	10.6	19.2	0.8	11
11.4805212137958	17.6876680188592	1.82065772438322	9.5	17.4	3.2	17

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
11.4805212137958	17.6886680188583	1.82065772438322	9.8	10.8	3.4	8.1
11.4805212137958	17.6896680188583	1.82065772438322	11.3	19.3	1.9	6.1
11.4805212137958	17.690668018857	1.82065772438322	11.7	15.3	3.7	18
11.4805212137958	17.691668018857	1.82065772438322	10.6	16.8	0	19.1
11.4805212137958	20.3461592148389	1.82065772438322	10.5	22.8	0.7	15.1
11.4805212137958	20.3471592148389	1.82065772438322	4.3	22.7	1.3	8
11.4805212137958	20.3481592148389	1.82065772438321	12.7	23	4.7	4.1
8.96813281943086	20.3481592148389	1.82065772438322	12.5	19.5	0.7	5.1
8.96713281943086	20.3481592148389	1.82065772438322	12.7	20.9	2.2	21
8.96713281943086	20.3481592148389	1.82065772438322	7.4	21.2	2.2	20.1
8.96613281943084	20.3481592148389	1.82065772438322	11.3	24.6	0.1	14.1
8.9651328194257	20.3481592148389	1.82065772438324	8.5	18.8	1.3	23
8.9651328194257	20.3481592148389	1.82065772438324	7.5	15.1	1.1	23.1
8.9641328194257	20.3481592148389	1.82065772438324	10.6	26.4	2.7	17
8.9641328194257	20.3481592148389	1.82065772438324	9.4	24.5	2.9	16.1
8.96313281942569	20.3481592148389	1.82065772438324	11.5	20.6	7	14
8.96213281943649	20.3481592148389	1.82065772438324	7.5	23.4	5.3	15.1
8.96213281943649	20.3481592148389	1.82065772438324	11.7	22.5	7.9	14.1
8.96213281943626	20.3481592148389	1.81965772438318	9.4	20.9	2.9	9.1
8.9621328194365	20.3481592148389	1.81865772438324	8.7	15.4	1.1	17
8.96213281943649	20.3481592148389	1.81765772438324	8.7	17.3	3.1	13.1
5.73661783903252	20.3481592148389	0.844615039962871	5.4	19.4	0.4	1.1
5.73661783903252	20.3491592148389	0.844615039962871	0.6	22.9	2.8	14
5.73661783903252	24.6000000000004	0.844615039962871	1.5	24.6	3.5	5
7.87307996220073	24.6000000000004	0.389784205601696	1.6	27.4	1.8	19.1
7.87307996220045	28.2447869595262	0.389784205601696	4.3	28.8	2.1	4
7.87307996220156	28.5522504509864	0.389784205601686	3.3	28.4	2.5	7.1
8.37679877532769	28.5522504509863	0.389784205601696	5.3	29.5	4.1	24
8.37679877532769	28.5532504509864	0.389784205601696	2.4	26.7	1.4	11
8.37679877532769	28.5542504509864	0.389784205601697	4.7	24.8	2.4	24
8.3777987753277	28.5542504509863	0.389784205601697	7.4	26.5	3.3	18
8.37879877532771	28.5542504509864	0.389784205601697	8.7	29.3	1.9	21
8.37879877532771	28.5552504509863	0.389784205601696	7.3	28.6	0.6	1.1
8.37879877532814	28.5552504509863	0.002999999999974	5.4	26.6	0.3	19.1
8.37879877532814	28.5552504509864	0.001999999999974	6.5	24.8	0.7	19.1
8.37879877532814	28.5552504509864	0.000999999999974	7.3	24.7	2.7	8
8.37879877532814	29	0	6.7	22.9	2.9	22
12.699	29	0	12.7	27.3	0.2	3.1

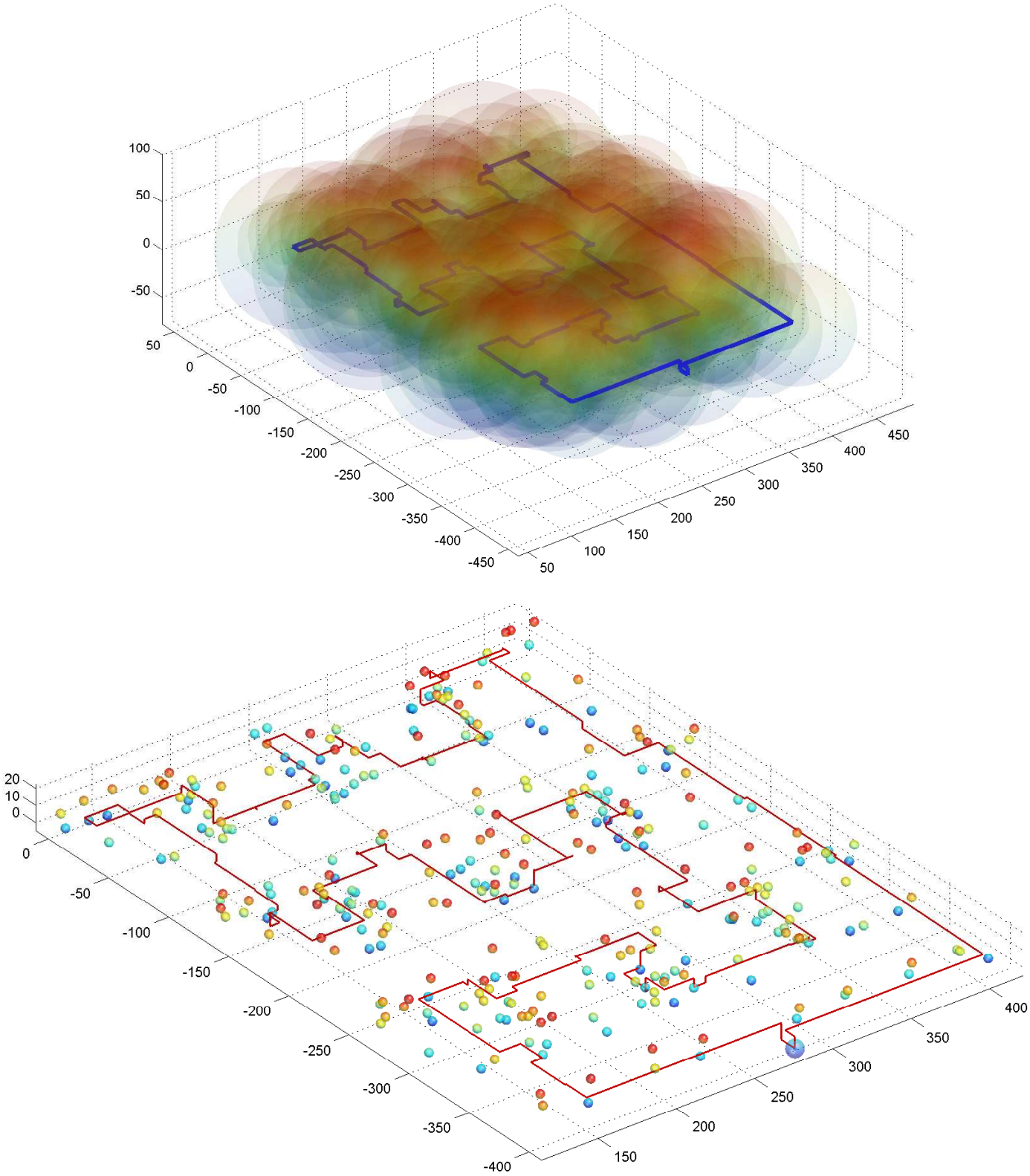


Figure N.204: *lin*318, arbitrary radius, 3D, Manhattan, Length = 2736.7897884

Table N-207: Solution for *lin*318, arbitrary radius, 3D, Manhattan

Total distance: 2736.78978842239 Depot: x 169.3 y 405.5 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
169.3	393.941303366167	0	119.7	393.8	17.8	72
169.3	393.941303366162	9.49999999999809	122.8	387.5	3.6	61.9
89.0010003308858	393.799999970222	9.49999999999974	92.1	387.5	18.7	46.4
89.0000003308465	393.799999970222	9.49999999999974	89	393.8	11	1.5
45.2383249318924	393.799999970224	9.49999999999974	17.3	393.8	14.6	28.4
45.2383249318921	376.533972949624	9.49999999999974	48	393.8	19.4	61.4
45.2383249318912	376.532972949624	9.49999999999809	63.8	297.6	5.2	81.2
45.2383249318912	376.532972949624	9.49999999999809	28.3	339.4	12.9	44.9
45.2383249318912	376.532972949624	9.49999999999809	51.2	387.5	1.4	18.6
45.2383249318912	376.532972949623	8.79507631094753	20.5	387.5	17.4	30.2
45.2383249318912	347.471770618478	8.79507631094752	70.9	331.6	19.3	81.8
52.6128686451041	343.169150045306	8.79507631094751	59.1	339.4	4.8	8.5
52.6128686451041	335.104446168904	8.79507631094751	67.7	331.6	4.4	72.5
52.6128686451041	329.199997211191	8.79507631094749	99.2	329.2	7.7	46.6
52.612868645104	329.198997211191	8.79507631094754	63.8	331.6	18.4	16.8
39.5579719503361	329.198997211222	8.79507631094752	100	339.4	3.8	61.5
39.5579719503361	329.198997211222	8.79507631094752	58.3	329.2	7.6	56.8
39.3600620332861	329.198997211191	8.79507631094753	27.6	329.2	2.8	13.2
39.3600620332861	307.234326591607	8.79507631094749	20.5	254.4	9	56.1
39.1564509012331	307.234326591607	8.79507631094751	39.4	273.1	0.8	61.9
39.1564509012331	303.200003092759	8.7950763109475	14.2	303.2	5.3	25.2
39.3496499592155	303.200003092759	8.79507631094749	44.9	303.2	8.5	67.2
39.3496499592154	281.24117701308	8.7950763109475	36.2	273.1	6.7	28.7
39.3496499592156	281.240177013068	8.79507631094751	6.3	273.3	11.2	71.7
39.3496499592155	273.300075905497	8.79507631094749	24.4	273.1	19.3	45.5
39.3496499592154	273.299075905488	8.79507631094753	21.3	273.1	15.8	71.9
39.3496499592154	273.298075905493	8.79507631094752	9.4	273.3	14	39.2
39.3496499592155	261.686977752954	8.7950763109475	17.3	260.7	14.5	36.9
51.1990000168065	261.686977752954	8.79507631094822	52.8	281.9	9	48.7
51.2000000168064	261.686977752954	8.79507631094822	51.2	254.4	2.7	9.5
67.6970000107488	261.686977752954	8.79507631094823	48	260.7	17.4	54.8
67.6970000107487	265.495077108221	8.79507631094821	63.8	315.8	14.7	50.8
67.6980000107486	265.495077108221	8.7950763109482	63.8	280.4	12.2	22
67.6980000107486	265.495077108221	12.0999999998984	60.6	288.2	12.5	62.7
67.6980000107485	289.732395583777	12.0999999998984	70.1	280.4	12.5	10
67.6990000107447	289.732395583777	12.0999999998984	66.9	280.4	18.4	41.3
67.7000000107448	289.732395583777	12.0999999998984	67.7	315.8	13.4	26.1
67.7010000107447	289.732395583777	12.0999999998984	67.7	297.7	2.9	81
67.7020000107447	289.732395583777	12.0999999998984	70.9	297.7	11.7	30.8
81.1000033426422	289.732395583777	12.0999999998984	70.9	315.8	15.2	68
81.1000033426423	285.10099999141	12.0999999998984	76.4	288.2	6.4	37.9
81.1000033426424	285.09999999141	12.0999999998984	81.1	285.1	18.2	6.1
125.410866364258	280.010072223462	12.0999999998984	116.5	303.2	9.1	28.2
125.410866364258	280.010072223462	11.6178510527121	119.7	260.7	11.7	67.1
125.410866364258	280.010072223462	11.6178510527121	89	260.7	3.7	48.3
125.410866364258	280.010072223463	11.6168510527122	122.8	254.4	9.9	25.8
125.410866364258	280.010072223463	11.6168510527122	142.5	295.3	13.4	23
125.410866364258	280.011072223463	11.6168510527122	84.3	283.5	16.3	54.6
125.410866364258	280.012072223462	11.6168510527156	92.1	254.4	16.6	70.4
125.410866364258	280.013072223462	11.6168510527156	85.8	303.2	13.4	50.8
125.410866364258	280.014072223462	11.6168510527156	127.6	286.7	5.8	75.6
141.69846386384	280.014072223462	11.6168510527155	141.7	283.5	17.7	8.5
165.414978028616	280.014072223462	11.6168510527156	148.8	315.8	8.4	45
165.414978028616	280.015072223462	11.6168510527155	136.2	295.3	3.1	62.2
165.414978028616	285.099999908372	11.6168510527155	173.2	285.1	12.1	7.8
165.414978028616	295.300000554389	11.6168510527156	161.4	295.3	10.8	52.8
165.413978028616	295.300000554388	11.6168510527156	148.8	295.3	14.4	39.6
155.099996530799	295.300000554388	1.9000000000698	155.1	295.3	0.7	1.2
149.787945683462	295.300000554389	1.9000000000698	178	303.2	1.5	29.3
144.606880727674	315.796002823483	1.90000000006979	161.4	315.8	7.1	25.4
144.606880727674	315.797002823492	1.90000000006979	155.1	315.8	5.4	37.1
144.606880727674	315.798002823494	1.90000000006979	129.9	329.2	5.1	48.2
144.606880727674	315.799002823498	1.90000000006978	136.2	331.6	10.8	42.4
144.606880727674	315.799002823498	1.90000000006978	191.3	329.2	9.3	60.6
144.606880727674	315.800002823498	1.90000000006978	142.5	315.8	4.2	63.6
142.600000000002	315.800002823498	9.69999864102594	136.2	315.8	9.7	6.4
142.600000000002	317.078933717227	10.0999999999996	130.7	339.4	10.6	25.3
142.600000000002	331.60000014125	10.0999999999996	142.5	331.6	14.7	70.4
155.099997569762	331.600000141249	10.0999999999996	155.1	331.6	14.3	4.2
161.399997694161	331.60000014125	10.0999999999996	148.8	331.6	0.2	79
161.399997694161	331.600000141249	4.90414	161.4	331.6	4.6	0.3
168.951841967611	331.600000141249	8.57035270263597	222	329.2	14.2	53.4
168.951841967611	331.600000141249	8.57035270263597	227.6	331.6	9.8	65.9
168.952841967611	331.600000141249	8.57035270263597	192.1	339.4	1.6	44.1
222.800003999516	332.470354386105	8.57035270263597	222.8	339.4	15.5	9.8
234.600002704072	331.600005025296	5.93256	234.6	331.6	5.2	0.7

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
239.241648030294	302.215185471013	5.93256	208.7	303.2	16.2	47.1
239.241648030294	302.215185471013	5.93256	227.6	297.7	4.1	31.3
239.241648030294	302.215185471013	5.93256	227.6	315.8	6.5	32.6
239.241648030294	302.215185471013	5.93256	249.6	303.2	7.3	11.1
239.241648030294	302.215185471013	5.93256	234.6	315.8	11.2	30.3
239.241648030294	302.215185471013	5.93256	231.5	331.6	8.7	33.6
239.241648030294	281.900993134324	11.6206142288521	252.8	260.7	8.8	64.9
239.241648030294	281.900993134324	11.6216142288474	248	280.4	9.5	61.5
239.241648030294	281.899993134325	11.6216142288474	240.2	281.9	12.5	1.3
239.241648030294	281.898368785234	11.6216142288494	234.6	297.7	7.7	68.2
239.241648030294	281.898368785234	11.6216142288494	278.7	273.1	18.4	72.9
239.240648030294	281.898368785234	11.6216142288494	222	285.1	1.9	76.7
239.240648030294	281.898368785234	11.6216142288494	236.2	280.4	11.1	68.9
239.239648030294	281.898368785234	11.6216142288474	233.1	280.4	17.3	78.4
239.239648030294	281.898368785234	11.6216142288474	240.2	288.2	11.3	74.7
239.238648030294	281.898368785234	11.6216142288473	224.4	280.4	17.9	71.8
220.497612533533	281.898368785234	11.6216142288473	218.9	286.7	3.7	9.4
214.348427932672	281.898368785234	11.6216142288473	231.5	297.7	7.4	23.7
202.425978150659	260.700999714392	11.6216142288474	211.8	260.7	3.2	12.9
202.425978150659	260.699999714392	11.6216142288473	181.1	260.7	13.4	21.4
202.425978150659	251.348199188403	11.6216142288473	215	254.4	19.4	15.5
202.425978150659	249.11106218739	8.22292882347549	184.3	254.4	16.9	21.5
221.116718589411	205.873227380167	8.22292882347549	222.8	206.3	17	36.2
221.116718589411	196.099998889889	8.22292882347548	222	196.1	3.2	5.1
221.116718589411	192.706474343719	8.22292882347548	234.6	198.5	10.6	64.9
221.116718589411	180.588156507419	8.22292882347549	231.5	182.7	19.2	62.1
221.116718589411	180.587156507427	8.22292882347549	234.6	164.6	0.1	25.4
221.116718589411	180.587156507427	8.22392882347549	231.5	198.5	1.6	54.9
221.116718589411	180.587156507427	10.3999854837622	227.6	198.5	10.4	71.7
221.116718589411	180.587156507427	10.3999854837622	211.8	127.6	10.4	53.8
223.594392150791	180.587156507427	12.4425682362276	249.6	170.1	0.7	30.4
233.64480077439	181.744800957977	12.4425682362276	234.6	182.7	13.3	1.6
230.736649005905	152.014674149308	12.4425682362276	240.2	155.1	5.1	52.7
230.736649005905	152.013674149308	12.4425682362276	233.1	147.3	11.4	53.4
230.736649005905	152.012674149308	12.4425682362276	224.4	147.3	2.3	27.7
230.736649005905	152.012674149308	12.4425682362276	240.2	148.8	5.8	12
230.735649005905	152.012674149308	12.4425682362276	227.6	164.6	1.4	68.2
230.734649005905	152.012674149308	12.4425682362275	231.5	164.6	6.5	80.6
230.733649005905	152.012674149308	12.4425682362276	227.6	182.7	0.3	69
225.334778523049	152.012674149308	12.4425682362276	236.2	147.3	7.3	14.3
225.334778523049	152.011674149308	12.4425682362275	248	147.3	4.5	33
225.333778523048	152.011674149308	12.4425682362264	218.9	153.6	11.5	44.9
217.502034508428	152.011674149308	12.4425682362264	222	152	14.6	6.3
181.91025303111	139.891929732565	12.4425682362275	181.1	127.6	7.7	13.2
181.91025303111	139.892929732565	12.4425682362264	184.3	121.3	14.5	57.9
181.91025303111	139.893929732565	12.4425682362282	215	121.3	10.5	69.7
181.91025303111	152.026065065911	12.4425682362282	173.2	152	19.2	43.5
181.91025303111	170.100000071355	12.4425682362281	178	170.1	11.6	4
181.91025303111	199.688784199369	12.4425682362266	161.4	162.2	17.4	60.1
181.91025303111	199.688784199369	12.4425682362266	208.7	170.1	15.4	55.8
181.91025303111	199.689784199369	12.4425682362257	191.3	196.1	16.7	65.9
185.48979101785	199.689784199369	12.442568236227	192.1	206.3	17	10.4
161.400000265856	198.500003949432	2.70826	161.4	198.5	1.4	1.3
144.699525214322	198.500003949432	2.70826	148.8	198.5	8.3	59.7
144.698525214323	198.500003949431	2.70826	155.1	198.5	17.6	57.2
144.698525214324	197.451245950728	3.63787902931622	129.9	196.1	10	31.1
137.305585276995	197.451245950728	3.63787902931622	136.2	198.5	8.4	5
135.024693467657	197.451245950728	3.63787902931622	142.5	198.5	1.1	69.8
130.550184582677	197.451245950729	3.63787902931623	130.7	206.3	18.1	42
130.549184582677	197.451245950728	3.63787902931622	148.8	182.7	9.2	49.8
130.548184582677	197.451245950728	3.63787902931936	142.5	182.7	2.1	52.7
130.548184582677	162.2	3.63787902932019	155.1	162.2	15.7	51.3
130.548184582677	150.4	3.63787902931659	141.7	150.4	15.8	56
130.548184582677	136.691477001963	3.63787902822191	161.4	182.7	0.7	56.9
130.548184582677	136.691477001963	3.63787902822191	142.5	162.2	2.7	56.6
130.548184582677	136.691477001963	3.63887902822191	116.5	170.1	13.6	39
130.548184582673	136.691477001963	3.63987902822194	155.1	182.7	16.5	57.9
130.548184582673	136.691477001963	3.64087902822194	127.6	153.6	18.6	25.7
122.799998277733	125.700000000002	7.80000010395801	122.8	121.3	7.8	4.4
104.324285478047	125.700000000002	7.80000010395802	136.2	162.2	1.7	53.2
104.324285478047	125.700000000002	9.26473950253207	148.8	162.2	5.3	66
104.324285478047	136.602389111061	9.26473950253207	119.7	127.6	15.5	64
104.324285478047	142.717418237397	9.26473950254044	70.1	147.3	17.8	74.2
89.872476754041	142.717418237397	9.26473950254044	89	127.6	0.1	17.7
63.092614852659	142.717418237397	9.26473950254044	76.4	155.1	3.4	19.1
63.0926148526591	155.099998668297	11.4876697475242	63.8	164.5	8.3	10.7
63.0926148526591	155.099998668297	11.4876697475242	60.6	155.1	13.8	3.4
63.0926148526526	178.837551365166	11.4876697475242	63.8	182.7	4.6	81.7
63.0926148526591	178.838551365163	11.4876697475242	136.2	182.7	6.2	73.4
63.0926148526591	178.838551365163	11.4876697475242	99.2	196.1	13.9	46.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
63.0926148526591	178.838551365163	11.4876697475242	100	206.3	18	53.6
63.0926148526591	178.838551365163	11.4876697475242	85.8	170.1	5	56
63.0926148526591	178.838551365163	11.4876697475242	84.3	150.4	4.3	61.5
63.0926148526591	178.838551365163	11.4876697475242	81.1	152	7.1	42.7
63.0926148526591	178.838551365163	11.4876697475242	70.9	182.7	16.9	40.4
63.0926148526591	178.838551365163	11.4876697475242	67.7	182.7	12.4	29.6
63.0926148526591	178.838551365163	11.4876697475242	70.9	164.6	8.4	21.9
63.0926148526591	178.838551365163	11.4876697475242	63.8	198.5	2.5	60.1
63.0926148526591	178.838551365163	11.4876697475242	67.7	164.6	2.1	53.4
63.0926148526591	178.838551365163	11.4876697475242	92.1	121.3	6.9	64.6
63.0926148526591	178.838551365163	11.4876697475242	66.9	147.3	5	43.6
63.0926148526591	178.838551365163	11.4876697475242	63.8	147.3	12.9	52
63.0926148526591	178.838551365163	11.4876697475242	52.8	148.8	15.5	54.4
63.0926148526591	178.838551365163	11.4876697475242	44.9	170.1	19.9	42
63.0926148526591	178.838551365163	11.4876697475242	24.4	140	15.5	73
63.0926148526591	178.838551365163	11.4876697475242	17.3	127.6	16.4	73.4
63.092614852654	185.600765550382	11.4876697475242	70.9	198.5	18.8	76.6
63.092614852654	185.601765550378	11.4876697475242	67.7	198.5	11.8	13.7
58.5105329101557	185.601765550378	11.4876697475242	59.1	206.3	14.9	26
48.7617588373687	185.60176555038	11.4876697475242	58.3	196.1	1.6	20.4
29.9731440189886	185.60176555038	11.4876697475242	27.6	196.1	18.7	35.6
29.9721440189886	185.60176555038	11.4876697475242	28.3	206.3	15.8	25.7
29.9721440189886	170.100005522477	11.4876697475242	14.2	170.1	13.5	15.9
29.9721440189886	163.701368351875	11.4876697475242	48	127.6	5.5	40.8
29.9721440189886	163.700368351873	11.4876697475242	21.3	140	9.6	51.1
29.9721440189886	150.421504710033	3.49999999998287	6.3	140.2	17.5	53.1
29.9721440189886	150.420504710033	3.49999999998287	9.4	140.2	11.5	80.8
36.1999899262007	140.000002925258	3.49999999998287	36.2	140	1.4	2.1
36.1999899262009	139.999002925258	3.49999999998287	20.5	121.3	8.4	76.9
43.0316593801753	139.999002925258	6.15726347061487	39.4	140	3.5	4.5
43.0316593801754	121.29285400235	6.91983362886518	51.2	121.3	6.2	8.2
43.0316593801753	87.1094579316465	6.91983362886518	28.3	73.2	9.3	20.4
44.1928929496435	87.1094579316465	11.7928934879835	27.6	63	3.4	76.3
44.1928929496435	36.9999999475688	11.7928934879835	44.9	37	12.5	1
36.8212254070164	36.9999999475689	9.27037444565972	52.8	15.7	13.8	64.3
36.8212254070164	36.9989999475689	9.27037444565973	14.2	37	6.3	44.6
36.8212254070164	24.0903013740919	9.27037444565973	36.2	6.9	0.3	19.4
36.8212254070164	24.0893013740919	9.27037444565975	60.6	22	16.9	36.4
36.8212254070164	24.0883013740919	9.27037444565974	21.3	6.9	14.1	41
36.8202254070164	24.0883013740919	9.27037444565975	6.3	7.1	12	39.2
36.8192254070164	24.0883013740919	9.27037444565979	24.4	6.9	1.6	74.1
16.2705151547449	13.9705150116032	9.27037444565971	9.4	7.1	2.4	11.9
37.5668674203433	23.6030391693071	9.27037444565971	66.9	14.2	11.4	52
49.3312385579392	23.603039169307	9.27037444565972	76.4	22	1.9	28.1
49.3322385579392	23.603039169307	9.27037444565976	67.7	31.5	4.3	48.5
56.1914560990681	23.603039169307	9.27037444565974	58.3	63	8.5	68.9
56.1914560990681	23.603039169307	9.27037444565974	70.1	14.2	16.8	18.4
56.1914560990681	23.603039169307	9.27037444565974	63.8	14.2	14.4	23.68
56.1914560990681	23.603039169307	9.27037444565974	39.4	6.9	14.8	37.7
56.192456099068	23.603039169307	9.27037444565975	81.1	18.9	10.9	25.4
70.8999997968581	23.603039169307	13.699999999989	85.8	37	14	59.3
70.8999997968581	39.7853284289106	13.699999999989	84.3	17.3	5.6	27.4
70.8999997968583	49.5999970208401	13.699999999989	70.9	49.6	14.9	1.2
70.8999997968581	49.5999970208401	3.05891578698731	116.5	37	12.1	49.6
70.8999997968581	49.5999970208401	3.05891578698731	59.1	73.2	9.3	29.3
70.8999997968581	49.5999970208401	3.05891578698731	67.7	65.4	8.4	19.9
70.8999997968581	49.5999970208401	3.05891578698731	63.8	31.4	12.4	27.9
70.9009997968581	49.5999970208403	3.05891578698732	100	73.2	14.4	54.1
85.6805535387066	49.5999970208405	3.05891578698734	63.8	65.4	13.7	57.7
85.6805535387066	49.6009970208403	3.05891578698569	161.4	49.6	13.6	79.4
85.6805535387066	49.6009970208403	3.05891578698569	70.9	65.4	6.9	71.5
85.6805535387066	49.6009970208403	3.05891578698569	148.8	29.1	19.2	68.3
85.6805535387066	49.6009970208403	3.05891578698569	67.7	49.6	9.5	74
85.6805535387066	49.6009970208403	3.05891578698569	70.9	31.5	11.6	68.2
97.2989994319408	52.0099266085102	3.05891578698567	99.2	63	0.7	11.4
97.2989994319408	49.5993807438956	3.05891578698914	142.5	29.1	2.7	81.1
97.2989994319408	49.5993807438956	3.05891578698914	63.8	49.6	2.8	33.5
133.784864296142	49.5993807438956	3.05891578698964	129.9	63	9.4	16
136.269758129895	49.5993807438956	3.05891578698961	130.7	73.2	7.2	24.6
136.269758129895	43.6913165447066	3.05891578698964	136.2	65.4	3.7	54.2
136.270758129895	43.6913165447066	3.05891578698967	142.5	65.4	2.7	66.7
141.69992674853	43.6913165447066	3.05891578698968	148.8	49.6	18.9	66.7
141.69992674853	43.6903165447066	3.05891578698969	136.2	29.1	0.8	21.8
141.699926748531	43.6893165447066	3.05891578698969	136.2	49.6	6.3	8.7
141.699926748531	20.5083146224788	3.05891578698968	127.6	20.5	16.5	20.4
141.699926748531	3.15941597507378	3.0589157869895	141.7	17.3	2	52.8
141.699926748531	-0.764521077388815	3.05891578698952	141.7	-7.9	4.6	7.3
146.173529667725	-0.764521077388815	3.05891578698965	149.6	-7.9	5.2	8.2
155.100000142978	27.4736540926267	3.02634528609037	155.1	29.1	1.4	2.3
170.727239027784	27.4736540926267	6.57246991947553	148.8	65.4	6.2	68.2

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
170.727239027784	27.4736540926267	6.57346991947551	161.4	29.1	11.5	80.6
170.727239027783	21.3727610186451	6.5734699194755	173.2	18.9	8.3	3.9
170.255074981013	21.3727610186451	6.5734699194755	178	37	4.3	22.7
170.255074981013	49.5989968824891	6.57346991947552	155.1	65.4	8.7	62
170.255074981013	49.5989968824891	6.57346991947552	161.4	65.4	7.2	60
170.255074981013	49.5999968824891	6.57346991947551	142.5	49.6	0.1	28.5
177.703922881809	49.5999968824891	6.57346991947552	155.1	49.6	5.1	57
177.703922881809	66.5390930005851	6.57346991947552	191.3	63	18.3	18.3
192.10000071493	70.9074852319822	6.57346991947552	192.1	73.2	7.8	2.6
192.10000071493	65.3999992888123	5.20172255914854	222.8	73.2	10.5	62.4
227.768090256085	65.3999992888123	5.20172255914854	222	63	7.9	20.4
227.769090256083	65.3999992888123	5.20172255914854	227.6	65.4	13.5	8.3
231.500000595472	65.3999992888124	3.20000000003278	231.5	65.4	1.8	1.4
234.199999999981	62.0166959559509	3.20000000003278	263	63	0.7	43
234.199999999981	62.0166959559509	3.20000000003278	280.3	37	9.6	73
234.199999999981	49.5999995425055	5.99999756756343	234.6	49.6	6	0.4
234.199999999981	49.5999995425057	6.00099756756664	234.6	65.4	4.6	24.2
234.199999999981	49.5989995425056	6.00099756756665	227.6	49.6	17.6	30.7
234.199999999981	29.1181273436858	6.00099756756665	231.5	31.5	11.2	56.7
234.199999999981	29.1181273436858	6.00099756756665	234.6	31.5	11.8	69.7
234.199999999981	29.1171273436858	6.0009975675675	231.5	49.6	10.4	41.1
234.199999999981	29.1161273436858	6.0009975675675	240.2	15.7	7.9	16
233.45355994045	29.1161273436858	6.00099756756748	249.6	37	15.8	20.7
233.45355994045	23.5365774853216	6.0009975675675	222	18.9	3.1	14.4
233.45355994045	23.5365774853216	6.0009975675675	224.4	14.2	0.3	14.2
233.45355994045	23.5365774853216	6.0009975675675	236.2	14.2	3.3	10.1
225.218835113318	23.5365774853304	6.0009975675675	208.7	37	3.4	62.2
225.218835113318	23.5365774853304	6.0009975675675	227.6	31.5	14.9	39.6
225.218835113318	21.1746352196191	14.7082734630296	218.9	20.5	18.5	7.4
240.200000374095	21.1746352196191	14.7082734630296	240.2	22	17.8	3.2
240.200000374095	9.3127137603893	10.3795125098905	233.1	14.2	19.1	77.3
275.599999983426	9.3127137603893	10.3795125098905	275.6	6.9	6.7	4.4
279.451450895712	9.3127137603893	10.3795125098906	248	14.2	2	37.6
279.452450895714	9.3127137603893	10.3795125098906	278.7	6.9	10.2	32.7
279.452450895714	9.3127137603893	10.3795125098906	305.5	6.9	5.7	29.6
286.692189760271	9.3127137603893	11.5921895035335	293.7	6.9	18.6	10.2
286.692189760271	9.3127137603893	11.5911895035411	308.7	6.9	18.2	32.2
286.692189760271	14.3910166632696	11.5911895035411	290.6	6.9	18.4	35.4
286.692189760271	15.221646126657	11.5911895035411	294.5	73.2	1.3	59.4
273.631569053254	92.5870997355484	7.23619132694853	293.7	63	15.4	37
273.631569053255	92.5870997355516	7.23519132694853	263.8	73.2	0.8	55.8
273.631569053255	92.5880997355482	7.23519132694853	255.9	121.3	14.5	72.9
273.631569053255	127.600000935883	7.23519132694853	252.8	127.6	3.3	21.2
295.235915241362	132.821933043317	7.23519132694853	301.6	127.6	0.4	10.7
295.236915241362	132.821933043317	7.23519132694853	278.7	140	19.3	31.7
295.236915241362	136.350863358294	7.23519132694852	308.7	140	16.6	57.3
295.236915241362	173.200719428645	7.23519132694853	305.5	140	11.2	43.2
295.236915241362	173.201719428645	7.23519132694853	283.5	127.6	15	48.7
295.236915241362	173.201719428645	7.23519132694853	286.6	121.3	15.1	53.2
295.236915241362	173.202719428646	7.23519132694854	293.7	140	9.3	60.8
295.236915241362	173.203719428646	7.23519132694854	275.6	140	4.2	63.7
295.236915241362	173.203719428646	7.23519132694854	290.6	140	0.4	58.6
295.236915241362	173.204719428646	7.2351913269489	280.3	170.1	14.3	29.1
295.236915241362	193.157747539796	7.23519132694909	263	196.1	17.9	74.1
295.236915241362	193.158747539796	7.23519132694928	255.9	254.4	18.1	74.1
295.237915241362	193.158747539796	7.23519132694928	293.7	196.1	5.6	3.7
295.238915241362	193.158747539796	7.23519132694928	286.6	254.4	15.7	68.8
295.238915241362	199.181280326077	7.23519132694928	283.5	260.7	2.6	62.8
297.100275718401	199.181280326077	7.23519132695277	263.8	206.3	6.2	78
297.100275718402	273.100000364223	7.23519132695276	294.5	206.3	5.6	67.1
297.100275718402	273.100000364223	7.23519132695276	275.6	273.1	17.9	24
297.100275718402	273.100000364223	7.23519132695276	290.6	273.1	10.7	54.5
297.100275718402	273.100000364223	7.23519132695276	301.6	260.7	2.7	17.7
297.100275718402	273.100000364223	7.23519132695276	280.3	303.2	11.5	54.2
297.100275718402	273.100000364223	7.23519132695276	308.7	273.1	9.4	11.8
295.551264302195	344.868664467162	7.23519132694927	231.5	315.8	7.2	80.7
295.551264302195	344.868664467162	7.23519132694927	293.7	273.1	6.2	71.8
295.551264302195	344.868664467162	7.23519132694927	305.5	273.1	0.7	77.3
295.551264302195	344.868664467162	7.23519132694927	263	329.2	0.8	67.9
295.551264302195	344.868664467162	7.23519132694927	263.8	339.4	8.3	73.1
295.551264302195	344.868664467162	7.23519132694927	293.7	329.2	1.4	38.2
295.551264302195	344.868664467162	7.23519132694927	294.5	339.4	13.8	16.6
295.551264302195	344.868664467162	7.23519132694927	301.6	393.8	0.9	56.6
295.551264302196	397.246181992614	6.91491586065931	286.6	387.5	8.3	29.3
273.030145658281	397.246181992614	6.91491586065931	283.5	393.8	11.4	11.9
264.107438738198	397.246181992615	6.9149158606593	255.9	387.5	4.9	12.9
248.723834707839	397.246181992615	6.91491586065931	252.8	393.8	15.4	64.1
248.723834707839	397.247181992608	6.9149158606593	211.8	393.8	13.7	37.7
248.723834707839	397.247181992606	6.91391586062785	215	387.5	7.3	42
184.916110244211	397.247181992606	6.91391586062781	181.1	393.8	14.3	9

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
184.916110244209	397.247181992609	6.91291586063007	184.3	387.5	3.8	61.5

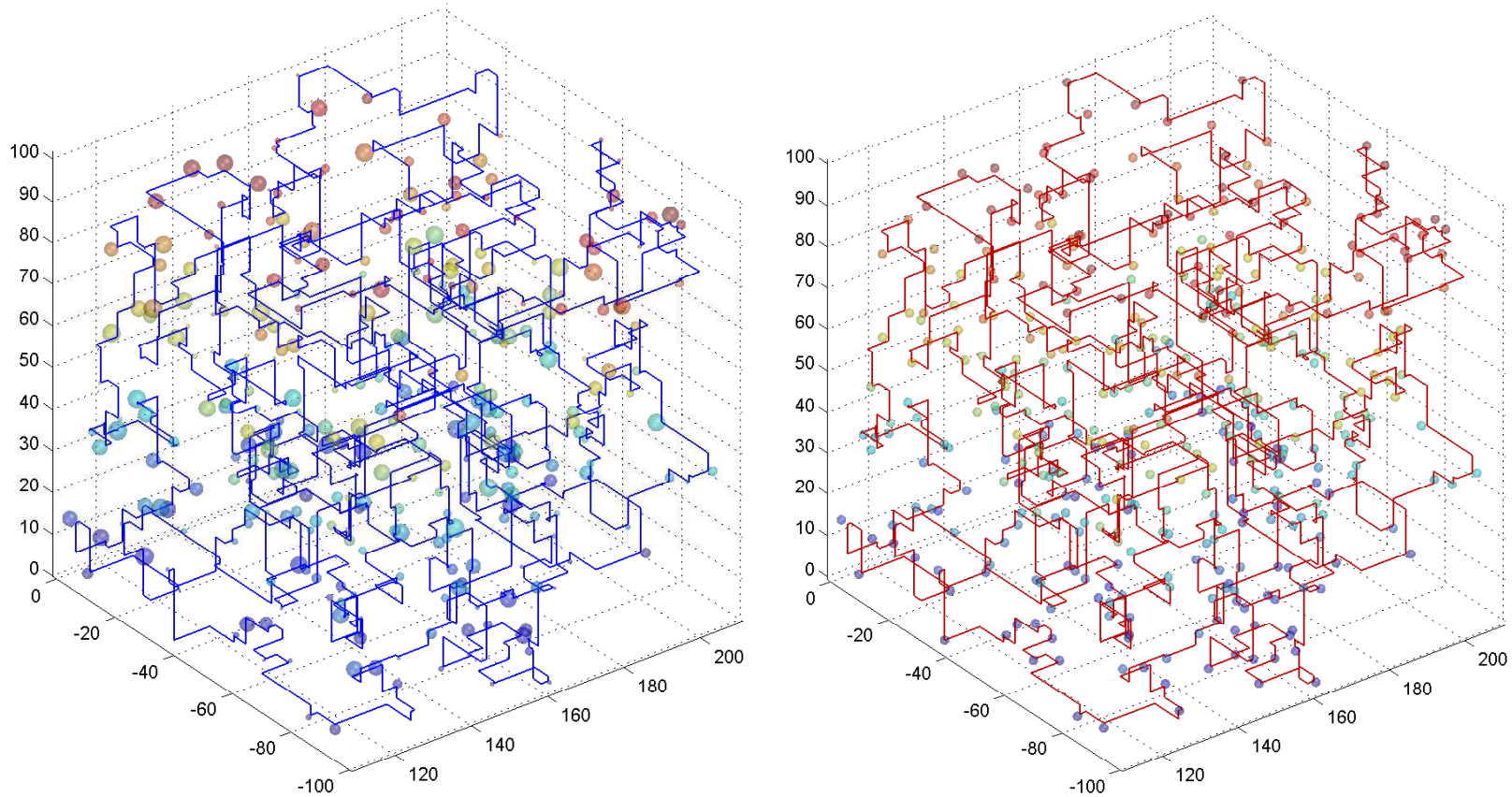


Figure N.205: $rd400$, arbitrary radius, 3D, Manhattan, Length = 5163.8340072

Table N-208: Solution for $rd400$, arbitrary radius, 3D, Manhattan

Total distance: 5163.83400723664 Depot: x 2.28315 y 35.5085 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
11.5875	43.6923000000041	1.4336000000184	12.2621	43.6923	1.4336	0.6746
11.5875	47.7316606649408	7.78155492470445	11.7937	48.0467	6.2423	1.685
11.5875	55.5177999726982	8.90199292235822	10.9638	55.5178	10.1729	1.4157
13.3054999999967	57.9261997945274	6.72290004511853	13.5318	57.9262	6.7229	0.2263
5.76122537213759	61.9091996395387	6.37912490146257	5.52590	61.9092	6.1438	0.3328
8.82942051698514	66.1355982659276	6.38937021983466	9.17265	66.1356	6.7326	0.4854
1.61632877166888	82.9526999912576	4.00051	1.02508	82.9527	3.7072	0.66
3.3535599984229	88.9860000029377	4.0005	3.35356	88.986	2.7967	1.2038
16.8540001402534	97.2350999999839	6.0906998488305	16.854	97.4806	6.0907	0.2455
17.8877192903877	91.071279865708	8.92680029505338	18.6101	90.3489	8.9268	1.0216
14.0051470800507	91.1346832585106	15.5100604376854	12.3803	91.1149	15.3598	1.6319
6.09520985029332	94.0863000023428	18.6984966506986	4.45068999999999	94.0863	19.178	1.713
15.2732999847016	94.883	18.6984966506985	15.2733	95.1553	18.4059	0.3997
23.1082999999755	94.883	21.9674999999854	23.1083	96.0553	21.9675	1.1723
29.553302700031	93.1840020343878	26.3982771761244	29.5533	92.3189	26.5937	0.8869
33.4949020295593	93.2342705716286	26.3982771761244	33.1283	92.3481	27.8161	1.7117
34.6875113012376	93.2543020680516	26.3982771761244	34.7487	93.2543	26.9859	0.5908
34.6875113012375	99.6752400164149	13.4448000068498	34.7579	99.7518	13.4448	0.104
33.2257870394382	86.8799990872899	6.34989999999858	32.7208	86.88	6.0296	0.598
40.7052993788957	85.7823990670076	6.34989999999858	40.7053	85.7824	6.0265	0.3234
44.4000623351617	80.4488882076349	6.61097374506897	45.1636	79.7971	7.5816	1.3964
50.5771983478086	80.4488882076349	6.61097374506898	50.5772	79.5094	6.7911	0.9566
53.6951251941199	87.0164998709297	6.61097374506898	54.7886	87.0165	7.4948	1.406
48.8930149782763	88.887458959784	3.55955225009447	48.934	88.5471	3.512	0.3461
40.9155000000009	94.2217999088575	3.0791999126095	40.4171	94.2218	3.0792	0.4984
51.5711804882901	98.6997810537495	1.86141927291344	51.8363	98.9629	1.5963	0.4592
49.8327999999998	95.870568519555	8.75798151321663	48.9418	95.7946	8.5835	0.9184
49.8327999999998	94.4062	10.5814999999975	49.8328	92.6571	10.5815	1.7491
49.5838182849075	97.8711808558457	25.3830011549813	48.6626	98.7924	25.383	1.3028
57.6013808181138	93.7822192152469	37.2538010583392	58.0371	93.3465	37.2538	0.6162
54.8665002094305	95.0432999999797	41.9419000920004	54.8665	95.2849	41.9419	0.2416
49.7583459963583	86.8932562398276	42.2191517050087	50.0418	88.5256	42.3177	1.6597
49.6318572383173	83.5565063889044	42.2217231878475	47.7087	83.4773	42.5429	1.9514
48.3205998248157	81.9315000000016	48.7053000759398	48.3206	81.4332	48.7053	0.4983
46.5605652261756	88.3515999980106	55.9487000000019	44.9959	88.3516	56.7624	1.7636
53.7144000640442	89.3849000609413	55.9487000000019	53.7144	89.3849	55.8234	0.1253
59.3326000234313	95.2819999999998	60.2925000299071	59.3326	96.8644	60.2925	1.5824
68.181215173484	94.5656205774847	63.4727999998624	68.3546	93.0491	63.4728	1.5264
68.1812151734842	96.8285563796532	68.8343576911696	68.0526	97.9535	69.9593	1.5961
74.704295190422	96.6998767062781	62.2299382806144	74.1314	97.2935	62.187	0.8261
77.3697442237267	90.2453013428992	62.0832561273345	77.8131	90.2453	61.6399	0.627
74.2726750179433	82.4562748224459	63.5442014366944	73.8931	82.0767	63.5442	0.5368
83.8977534126035	85.0621541432326	68.838853418561	84.4594	85.6238	69.4005	0.9728
83.175350214159	80.2718996149555	62.2852000000091	82.6909	80.2719	62.172	0.4975
89.1084000012619	77.1611000013929	62.2852000000091	89.1084	77.1611	62.2997	0.0145
94.2046002636895	74.3489	49.4796999512715	94.2046	73.3577	49.4797	0.9912
95.6134007726492	80.1764973330258	39.7859014249773	95.4573	78.5053	38.9919	1.8568
95.6134007726491	95.8731016029224	35.4747965296808	96.3227	96.5824	35.4748	1.0031
91.4524999999775	94.8618017613307	33.7327960535996	91.0373	94.8618	33.7328	0.4152
91.4524999999775	87.9354000245742	30.6859192412618	91.8947	87.6684	31.3605	1.0085
80.7777000214063	87.9354000245741	24.1554	80.7777	87.9354	23.575	0.5804
77.5352003954636	79.5453999999973	33.1993028246446	77.5352	78.0347	33.1993	1.5107
76.5666180144422	80.8310819841793	37.5418000638657	75.9957	81.402	37.5418	0.8074
78.9205999836848	73.8167999570412	39.0817	78.9206	73.8168	40.4273	1.3456
82.5412992096899	71.4326303751618	36.4712303883442	82.5413	70.9361	35.9747	0.7022
83.8416999999986	75.7356997223687	43.6345994028994	84.0931	75.7357	43.6346	0.2514
79.6042000444389	79.2262388258151	47.7480573319199	79.6042	79.6519	48.0916	0.547
77.2633749353335	75.1455931840095	47.7480573319199	76.2214	75.1456	46.9071	1.339
78.3601181910047	74.144745072314	50.040406592051	78.3667	74.2083	50.3369	0.3033
81.7729	62.9891000012843	53.3907000007099	81.8209	62.9891	53.3907	0.048
81.3418666408075	58.2665687530247	60.9261288792958	82.834	58.4111	60.6469	1.5249
69.3671999669988	55.8483945199981	60.9966054370561	69.3672	55.5594	61.2856	0.4087
69.1653398750221	58.306747152558	59.8080440388282	69.1414	57.6653	59.1832	0.8958
64.2573000014333	58.9529998826627	50.6243	64.2573	58.953	49.3124	1.3119
60.7709987961566	67.3196009853603	51.3931000000007	60.771	67.3196	52.7577	1.3646
60.3689488078739	74.9489003317358	42.6183252652898	61.6789	74.8507	42.3385	1.3431
59.2712001626459	75.4671977066412	40.0077036781953	59.2712	76.4167	39.0582	1.3428
58.3448000305373	61.8964	41.5010999551843	58.3448	60.9201	41.5011	0.9763
56.2717801515162	62.065819738292	45.2502199594751	56.0439	62.2937	45.4781	0.3947
57.9398266987773	54.964541475912	45.2502199594752	57.8122	54.5104	45.2899	0.4734
67.7417328049972	54.964541475912	45.1745617568705	67.8108	54.6502	44.2592	1.0734
70.1164504573861	54.964541475912	40.3206571374758	70.983	56.1077	39.9244	1.4882
80.6138999731901	54.8998	37.9974999643329	80.6139	53.7748	37.9975	1.125
82.3441000000024	58.0479012379195	28.4959007156629	82.7455	58.0479	28.4959	0.4014
81.8773969479902	59.7407678963139	26.4264324465082	81.8774	60.6902	25.477	1.3427
76.0168368571669	55.2271490258616	29.2732949857216	76.3859	55.8636	29.5918	0.8017

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
74.9872071753411	54.671360006623	29.2732949857216	74.8357	53.7031	27.6754	1.8745
74.9208324690192	50.1002807933717	30.1149211343698	74.6616	49.1772	30.6996	1.123
73.0640000418035	45.9679788439109	30.1149211343698	73.064	44.6995	31.3834	1.7939
70.4118076233167	47.1485376876238	16.1011000060093	69.2786	47.5055	16.1011	1.1881
72.4781999950995	47.1485376876239	11.5096887277232	72.4782	47.1166	11.4083	0.1063
79.6296206576339	47.914923961964	12.3302765568493	79.5061	49.6701	11.7965	1.8387
89.4626	48.3317999999839	12.9356999999862	90.8764	48.3318	12.9357	1.4138
88.450440559381	55.9131000031405	14.5598594410606	88.4474	55.9131	14.5629	0.0043
97.1353580307302	70.9170644099792	3.84760028271053	97.9153	71.697	3.8476	1.103
85.4649317080236	62.1418194508114	2.21272098621729	85.3959	62.1638	1.7086	0.5093
80.1686868279229	36.8528999904186	1.95088683699396	80.0506	36.8529	1.8328	0.167
81.7106000072892	29.6995834258646	18.2555503906538	81.7106	28.112	19.2367	1.8663
84.387441261022	41.183241949713	18.2555503906538	85.2354	42.0312	17.7315	1.3087
80.9664126400151	37.7023375759671	30.0892615181532	81.8496	38.8539	28.9342	1.8548
80.120699858717	36.9115614965665	31.0125001074158	80.5435	37.2793	30.7227	1.6755
80.120699858717	32.7663999800874	32.7653999999994	80.1207	32.7664	32.9471	0.1817
63.3763	28.1819000069574	31.0400999884307	62.0154	28.1819	31.0401	1.3609
76.4029410808627	23.4893907155478	27.8818325966028	76.419	22.7841	27.7958	0.7107
78.1695802350991	13.6517013368094	23.5883200012977	79.2919	13.6517	22.466	1.5872
77.9439790163559	10.0333933579576	31.2350652966643	77.911	9.90186	32.1435	0.9185
68.3818000000054	8.47104936373749	37.5341004273178	68.2389	8.47105	37.5341	0.1429
74.0624257006654	5.60444003479896	47.9313252748414	74.632	5.60444	48.5009	0.8055
60.7013006209104	1.8405073313545	46.8969480425777	60.7013	1.36116	46.4176	0.6779
56.3236999975542	2.07365999745647	65.1621	56.3237	2.07366	66.7228	1.5607
33.0864856800795	2.34452965439506	61.6868425480796	33.1085	0.882753	62.284	1.5792
26.7978999999897	5.07356	59.4640000000027	26.7979	6.90196	59.464	1.8284
22.3291058262682	2.71779429966192	56.6173107674927	21.7245	2.01127	55.495	1.4575
22.3291058262682	2.71779429966192	73.0479999997177	23.5387	4.13129	73.048	1.8604
19.7286999972661	0.298559478187011	79.4664565231787	19.7287	0.198716	79.5663	0.1412
12.467	2.73524999999541	75.6448000001456	10.9477	2.73525	75.6448	1.5193
15.9009742766109	10.6262299998272	73.5432000510405	17.1854	11.1942	73.5432	1.4044
10.8906023479965	10.6262299998272	65.6129649470435	10.9524	12.0779	65.6188	1.7347
6.43448111583058	10.6262299998272	59.8477766146303	6.43447	8.70233	59.8478	1.9239
0.965562000000148	12.2624000729848	51.4966999920535	0.613562000000002	12.2624	51.4967	0.352
2.68872959858288	15.8351999999987	43.93049998201	2.68873	16.3883	43.9305	0.5531
2.68872959858288	11.5795604101629	35.5174504948309	2.19732	10.251	34.6682	1.6516
4.34920927717533	4.03960887152897	35.1712036176813	4.96047	4.06059	34.5353	0.8823
8.57051999863422	3.43216169135742	32.3286416923143	8.57052	3.36732	32.2638	0.0917
11.6407462617834	3.81899499390156	32.7943920838906	12.6307	2.70835	31.4638	1.996
17.0643551144087	17.0968551242754	33.1257000149117	17.2907	17.3232	33.1257	0.3201
16.1109954417874	17.0968551242756	35.0553586095694	15.6444	17.8995	34.8069	1.1341
16.1109954417874	9.51071916960974	36.5082045503473	14.8737	9.51072	37.7455	1.7498
17.9387905213066	2.5888	36.0243643392662	19.0116	0.977048	36.1157	1.9383
23.1984	2.5888	19.9686	23.1984	1.0131	19.9686	1.5757
24.5776444403731	11.6094408076607	17.4989999694602	25.6231	12.6549	17.499	1.4785
22.2726235479207	8.9697702587415	13.4696075586341	21.4744	8.21886	12.0685	1.7788
12.7115999995325	4.29147000566037	5.62930000000114	12.7116	4.29147	5.5693	0.06
9.04955322900094	3.46354999925628	6.77422179108357	9.0496	1.67955	6.7742	1.784
1.17937297048122	3.46354999925628	13.8235745225884	0.219756000000004	2.58493	14.7832	1.6167
2.01407506556565	7.20777814298575	3.39684366760821	2.00806	6.28968	2.6575	1.1788
13.2217721375721	22.7091719727872	2.51132819465572	13.4	22.8874	2.3331	0.3087
5.96182895130489	20.0149865481496	13.5833902159823	5.81823	20.7452	12.0688	1.9707
0.974537015243712	20.0149865481496	21.2279998939291	0.659450000000007	19.6999	21.228	0.4456
2.49404051739515	24.3975717464433	26.7011999999939	2.1823	25.6845	27.6693	1.6403
3.39121682585353	27.1000999966783	26.7011999999939	5.25835	27.1001	26.8402	1.8723
2.57158163765453	38.4711014494286	26.7011999999939	2.57158	38.4711	27.3546	0.6534
2.40392975920761	50.980799800868	25.4032000000039	2.40393	50.9808	25.185	0.2182
0.844271950288146	70.5840932146047	31.0365999808054	0.194864999999993	71.2335	31.0366	0.9184
2.09897	66.9796000058295	45.1209000072298	2.55217	66.9796	45.1209	0.4532
2.09897	61.4642000027883	60.5687836771825	1.5771	61.4642	62.0285	1.5502
8.58938662348989	60.2784276949575	52.9430881319053	8.30742	60.1487	54.798	1.8807
9.13437604628559	58.8779999979538	48.1052067714459	10.4725	58.878	47.8708	1.3585
9.13437604628559	54.1978416716325	48.1052067714459	9.35554999999999	53.1101	48.6717	1.2462
4.50166883462759	54.1978416716325	46.8676000019987	3.30116	54.5758	46.8676	1.2586
17.8350007854758	54.1978416716325	42.7645690630181	17.5187	55.1629	44.2721	1.8177
20.5640999958478	47.721900011595	39.4435	20.5641	47.7219	38.8826	0.5609
23.633899999924	41.3619	41.5073999999804	23.6339	40.0124	41.5074	1.3495
32.1587397658345	45.5336400639156	45.1215999655301	33.2771	46.652	45.1216	1.5816
32.1444008596251	38.4363291890286	45.6106924643208	32.7353	38.4372	45.6112	0.5909
25.4026147006791	33.1922738186841	46.8940362998056	25.7714	33.2927	46.3113	0.6969
20.3183717006806	31.2404717532467	48.5255001873621	19.5262	30.4483	48.5255	1.1203
22.7182993524071	33.2734000000003	52.0641007115307	22.7183	34.3604	52.0641	1.087
22.9928362493015	33.0687640937113	59.1671355223833	23.2874	32.7742	59.4617	0.5102
17.2884007934381	36.5081734925048	56.3490080967061	17.6023	36.5196	56.7286	0.4927
10.2113648855425	36.7504451601628	55.2227547952033	9.16001	37.8018	54.1714	1.821
15.1138003364112	24.8350971771776	58.7219154035927	15.3897	25.3897	58.7078	0.6196
15.1138003364112	20.5456587808155	59.9926000004674	15.6993	18.7479	59.9926	1.8907
15.1138003364112	23.0999001592492	64.6553134856625	15.3759	23.0999	65.044	0.4688
2.40317993633604	24.0295000023778	62.0949199698307	2.38826	24.0295	62.08	0.0211
3.44570999516218	28.1433000000017	68.8959999977855	3.44571	28.2052	68.896	0.0619

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
4.05600000442314	27.9302	74.3874999216318	4.056	25.9589	74.3875	1.9713
19.2470000039659	29.1747	80.8170000134081	19.247	29.2712	80.817	0.0965
20.328800361094	28.0219999713202	93.7860	20.3288	28.022	94.6827	0.8967
27.4221998860219	25.9581291196933	88.3647291123301	27.4222	25.8428	88.2494	0.1631
27.9161372465595	28.0157372248385	96.9071	29.1053	29.2049	97.3043	1.728
27.2481999777016	20.242499662131	96.9071	27.2482	20.2425	98.6789	1.7718
22.6997	16.7325	96.5597	22.6997	14.9199	96.5597	1.8126
9.2745300138176	19.5430051372355	96.5597	9.96077	19.2347	95.1963	1.6989
9.2745300138176	39.868605144957	96.5597	8.75416	38.928	96.5496	1.075
9.27453001381758	43.1110999999999	88.7547000007951	9.27453	43.3967	88.7547	0.2856
7.53949902689884	42.7001482955158	79.4029999634415	7.21925	42.3799	79.403	0.4529
13.3362396192259	49.9919983868378	77.5256953911931	13.2524	50.7626	76.4367	1.3367
17.8084999978965	50.6388	71.4677000137231	17.8085	51.9553	71.4677	1.3165
24.4593977450979	48.999599999996	68.2546027886505	24.4594	47.3987	68.2546	1.6009
30.4467999977315	53.5688000009198	58.9855	30.4468	53.5688	58.3124	0.6731
44.0310093295202	55.3301002333348	58.9855	44.4217	55.3301	59.2126	0.4519
41.7126999999996	60.1839019166095	50.1596004747481	40.6271	60.1839	50.1596	1.0856
41.7126999999996	66.9855999952615	48.8129522393663	42.1545	66.9856	47.2528	1.6215
23.2428543914739	68.2639760770922	50.3859881862725	23.6206	68.344	50.228	0.4172
22.7526650647732	70.408399996406	57.9522585075616	23.7167	70.7298	59.5174	1.8661
16.9218699285903	70.408399996406	58.1707191645083	16.576	71.2313	59.4946	1.5967
14.2517000000115	70.408399996406	60.1607999791353	14.0141	70.4084	60.1608	0.2376
19.5224999994733	82.1483000002754	60.9147	19.5225	82.1483	62.667	1.7523
26.904057642664	94.5623000195252	60.7185255279813	27.8353	94.5623	59.9313	1.2194
18.0639999999387	95.6625793213645	60.7185255279814	18.064	96.3276	61.2807	0.8708
4.28893995755575	92.6489000133344	50.5405	4.28894	92.6489	49.3954	1.1451
3.06058984853634	89.1425	51.3598005810134	3.06059	88.1315	51.3598	1.011
2.82304902619927	93.505323710816	52.5302313596054	3.24988	93.8751	52.5027	0.5654
1.01031800000794	97.3272029081849	63.047699538706	0.299018000000004	97.3272	63.0477	0.7113
3.57801017036817	98.7133812837484	79.5168816968845	3.57801	99.0366	79.8401	0.4571
12.2041602747916	97.5547468075743	79.5168816968845	12.7313	98.6134	79.0339	1.4759
27.31390020789	89.5371156409152	79.5168816968844	27.9893	89.6021	79.9213	0.7899
29.8826999856549	79.781900000001	74.8633999891548	29.8827	79.684	74.8634	0.0979
41.5459998364032	81.4157160724115	72.0075825562079	41.546	82.3742	71.0491	1.3555
43.2586126076433	81.4157160724115	81.6719543563183	43.0779	81.6476	81.3569	0.4575
43.8505380295744	68.6711791338127	86.8454995322043	43.1006	68.5786	87.3861	0.9291
47.896	62.5480999596883	86.8454995322043	48.6743	62.5481	86.8455	0.7783
43.5841000152353	58.7521999747574	99.4065000000005	43.5841	58.7522	99.5019	0.0954
42.3920999999999	58.1199000092181	97.2118999949769	41.7302	58.1199	97.2119	0.6619
53.2189999999997	52.8658999842477	92.5001998733256	54.0007	52.8659	92.5002	0.7817
53.2189999999997	44.9898000000778	89.6516439802684	53.4254	44.9898	88.3964	1.2721
31.4338996752182	44.1349999999999	91.7682993055757	31.4339	43.8079	91.7683	0.3271
23.2085000000345	58.8068999999942	91.8598	23.2085	58.8069	93.3912	1.5314
17.6010999755644	61.0877143220752	91.0814087105723	17.6011	61.1721	91.0121	0.1092
13.8308000001512	55.9988090366053	91.0814087105723	13.8308	54.4775	90.8096	1.5454
5.76828000000431	74.2733005252953	96.2118042688405	4.99968	74.2733	96.2118	0.7686
16.8353990313841	76.9324017261437	96.4024011396298	16.8354	77.4785	96.9485	0.7723
27.1360999806594	74.931443367432	93.918242855889	27.1361	73.6904	92.6772	1.7551
28.3323750458749	90.1902036825337	94.9745207096609	28.4623	90.5817	94.8789	0.4301
32.5896000166952	90.1902036825337	98.9290029278891	32.5896	90.759	99.4978	0.8044
37.745300070817	86.6271000000018	90.2584996268713	37.7453	86.3505	90.2585	0.2766
51.2472000736792	90.6525999009689	89.1040999999999	51.2472	90.6526	88.5593	0.5448
54.3706975348207	99.1551568278228	89.1041	54.3707	99.6057	90.3024	1.2802
65.9331988536166	99.1551568278228	87.0417377514891	65.9332	98.9174	85.8003	1.264
75.6358998663959	99.6311999999991	96.3468999190893	75.6359	99.7073	96.3469	0.0761
86.8965	96.7330999996201	97.5761999994189	87.9339	96.7331	97.5762	1.0374
86.1562999999983	95.4018999999967	98.1971	86.1563	95.4019	99.9835	1.7864
83.9514808894075	88.2708000750328	90.1716289978304	83.5669	88.2708	89.9554	0.4412
84.9030120402698	82.5752857190476	90.1716289978303	85.2864	82.465	90.0038	0.4328
75.5455041164414	82.5752857190476	90.6153787118151	74.5996	81.8744	91.5993	1.5343
75.5455041164414	91.2028920793702	80.4939999997441	75.4786	92.9344	80.494	1.7328
75.5455041164414	90.8651675523025	79.8185733221546	75.6586	91.7899	79.8395	1.4188
92.7384988056961	89.953401186642	79.6058999999996	92.7385	89.9534	78.6648	0.9411
97.9682000000006	82.1977000379104	81.4504000120531	98.0879	82.1977	81.4504	0.1197
95.445353286046	79.2325002625792	85.408922978165	95.1537	79.2325	85.4918	0.3032
96.8505759870421	73.5090000920137	85.408922978165	98.0725	73.509	85.0617	1.2703
88.788100000004	66.6381999135149	86.5414001011936	88.5712	66.6382	86.5414	0.2169
95.9828794777919	58.8621207827585	97.350700088096	96.3481	58.4969	97.3507	0.5165
93.4247999093082	68.5014997317199	97.699699999999	93.4248	68.5015	98.1606	0.4609
87.353949171326	74.8815	96.3478525115292	87.0562	74.7862	94.9506	1.4318
86.2298009338365	74.8815	92.4081414028484	86.1254	75.412	92.2501	0.5633
80.8889000084988	74.8815	85.0129000098821	80.8889	76.3527	85.0129	1.4712
80.2358614470019	74.8815	80.4885508783166	80.9911	75.8316	78.9882	1.9298
78.2186000360146	69.577	71.4147989777016	78.2186	68.7569	71.4148	0.8201
65.8841332641344	69.577	71.4147989777016	65.9297	69.3415	71.7927	0.4476
60.9916063849025	70.7510497657308	67.7000533526955	60.9907	71.4945	66.9566	1.0514
60.9916063849026	61.4215875383091	76.8751387474427	59.9164	61.9972	76.3491	1.3282
60.9916063849026	59.82651914979	88.5608005876097	59.9164	58.75	88.5608	1.5215
69.9394973952927	63.4644999999954	90.6047994160614	69.9395	64.1832	90.6048	0.7187
75.2120280926068	58.469871800341	94.9267998716756	75.5117	58.1702	94.9268	0.4238

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
64.8782990521219	59.6741999999988	95.6551002980948	64.8783	60.379	95.6551	0.7048
64.1256	52.6724	96.4246	62.6521	52.6724	96.4246	1.4735
70.0978999713054	43.930800072881	97.1776999999993	70.0979	43.9308	97.3335	0.1558
71.5091	40.2263005096051	84.1996002227188	72.565	40.2263	84.1996	1.0559
54.9914662205304	38.6378604711531	81.7295617796066	55.717	37.8511	81.0117	1.2977
54.9914662205304	30.6816502466504	70.7091313711847	55.099	31.771	70.6981	1.0947
50.9211	17.3394602549806	70.6139572822716	50.9211	16.4053	69.6798	1.3211
46.9533027893871	20.3985072549553	74.893799874179	47.6864	20.3976	74.364	0.9045
46.012090483729	24.4115094834476	76.5875223079681	46.0829	25.5503	78.1024	1.8965
38.3104433528418	30.8991557640624	76.6335996717007	37.7688	31.4408	76.6336	0.766
44.1205898917989	30.6859999522854	94.5491915161274	44.5404	30.686	94.969	0.5937
42.5632413629714	23.8056623703833	88.7832340727188	42.4972	23.9973	88.7768	0.2028
41.9038803349297	19.2268006517704	85.1506171784883	41.7205	19.4188	86.0496	0.9813
40.6403237807054	19.2268006517703	80.504622667709	39.9475	19.2268	79.8118	0.9798
43.8962010989409	14.0515999999981	83.4664988743309	43.8962	13.6901	83.4665	0.3615
55.3251775329088	16.4754806001428	85.8884000002394	55.9929	17.1432	85.8884	0.9443
51.7699	6.04102999733359	87.3270000014474	51.1528	6.04103	87.327	0.6171
52.4573939720105	4.88919661446182	87.8349980798513	52.4925	5.37248	88.2454	0.635
62.8048999999997	3.66175999657985	91.144099971608	64.5769	3.66176	91.1441	1.772
61.7236950324068	0.698901021191369	98.3436049753557	61.5069	0.482106	98.5604	0.3755
69.1947408575741	15.6752300176345	97.6002252328401	68.0574	15.6194	97.6814	1.1416
75.2454989030804	17.3083995268091	92.0401000001701	75.2455	17.3084	91.8789	0.1612
93.1464014172664	19.8145984770073	96.5689999997665	93.1464	19.8146	96.7782	0.2092
96.4015560612777	23.1039869171315	82.3479999809827	96.7473	23.5618	82.348	0.5737
96.4015560612777	16.6523000009016	74.722967018037	96.7716	16.6523	73.2113	1.5563
90.4882999999961	12.6215999999958	82.1624	90.4883	12.6216	83.5226	1.3602
74.8038862391625	8.94958519353644	79.6242000000164	73.4709	7.6166	79.1313	1.9485
76.9072059154244	18.2917017270796	79.6242000000164	76.9072	18.2917	80.6948	1.0706
76.9072059154244	18.2917017270796	71.7573465144221	77.5205	18.1054	72.6356	1.5949
82.6838909074637	23.4882955732866	71.2174999999776	82.6839	23.4883	70.1916	1.0259
89.0360000000126	30.7257000000456	76.6471	89.036	30.7257	77.9388	1.2917
95.7468999999643	38.2331997902446	74.7443997849482	95.9404	38.2332	74.7444	0.1935
86.8559004905415	48.2519999999795	70.9689002736001	86.8559	48.4797	70.9689	0.2277
78.871688040204	44.2235492927871	64.7512663223152	78.6058	43.2582	65.7281	1.5156
75.4998826482407	35.9869975743874	64.7512663223151	74.7866	36.0265	64.8468	1.4465
75.341876877792	35.9869975743874	64.7512663223151	74.0572	35.987	63.4666	1.8168
77.6793999782351	29.2907274585394	65.7029725527459	77.6794	29.1288	65.8649	0.229
86.0081382211902	31.3272306758824	62.0684572253677	85.0689	32.1301	62.1612	1.2391
92.4614838809731	40.7138044934704	61.9034482199375	92.3029	41.017	61.4442	0.5727
95.5557698951524	42.4486534660056	60.2644000028187	96.3235	44.2629	60.2644	1.97
95.5557698951524	42.4486534660056	53.722300846653	94.61	43.2995	53.8065	1.6034
95.5557698951524	42.3195139621357	40.702446517666	96.1419	41.3034	39.8142	1.4714
92.0633999944689	44.1642439916573	40.702446517666	92.0634	46.0336	40.4672	1.8841
91.3249001193513	43.1760000000025	41.6597002318699	91.3249	42.8902	41.6597	0.2858
89.4615676882785	43.3717070957143	47.3223958949001	88.1955	43.6361	47.6404	1.3319
82.3942462711004	43.6352628956126	50.1350000115482	81.4209	43.6493	50.298	0.987
81.1997000325375	44.822	50.1350000115482	81.1997	46.621	50.135	1.799
75.4686647831917	40.6313249826013	50.685293745866	76.05	41.1841	50.3284	0.878
75.1271	32.050099900009	51.6557999780057	73.2088	32.0501	51.6558	1.9183
79.0797415092343	17.1958141511331	52.9894675723112	78.906	18.0381	53.555	1.0293
80.0349999999999	15.8589	56.1907	80.035	15.8589	58.0701	1.8794
87.632484392872	15.636715076639	45.4757000011431	88.2698	14.9994	45.4757	0.9013
87.1993630988229	18.0065001922843	43.7665633649682	86.8707	18.0065	43.4379	0.4648
87.558899869216	24.1074789774862	44.9682760323727	87.5589	25.1226	45.9834	1.4356
97.2905001014976	22.041899928369	34.3515	97.2905	22.0419	32.8941	1.4574
98.5910806174785	8.7001004852015	36.5945003397517	99.5164	7.77478	36.5945	1.3086
91.8815117476774	10.4307882486373	38.6827999810215	91.7898	10.5225	38.6828	0.1297
93.6858366533681	3.39816995033002	48.4699365536387	95.0473	3.39817	49.8314	1.9254
89.3762999999972	2.00671718990565	25.7719	88.6343	0.494442	25.7719	1.6845
89.3762999999972	10.7701012166962	17.3090983587179	88.9914	10.7701	17.3091	0.3849
90.1100150015422	20.7153049295839	6.45419999981393	90.11	20.7153	5.7932	0.661
98.2076	24.7717881833865	6.45419999981393	98.8743	25.646	5.6301	1.374
98.2076	23.457700000842	6.84350000293376	99.5853	23.4577	6.8435	1.3777
97.5637000000009	17.1801999813392	10.0021000031206	97.4766	17.1802	10.0021	0.0871
98.1426749974764	4.73210906906574	12.009878186467	98.9579	4.73211	12.8251	1.1529
95.7658999960639	2.63332164693026	7.63173306426134	95.7659	2.55349	7.5519	0.1129
74.586182584308	5.17155544891885	7.63173306426134	74.5771	5.70821	6.0306	1.6887
71.0933099952265	5.17155544891885	8.82416282560776	70.1018	4.34543	9.0382	1.3082
67.2669994263955	14.1516032165841	16.4502000000055	67.267	14.1516	17.4107	0.9605
57.0817561021462	14.1516032165841	16.4502000000055	58.7637	13.9566	16.9818	1.7747
54.7710855164672	20.4528145353103	11.8362999958338	54.7387	20.4852	11.8363	0.0458
61.8489027766473	19.7057999926766	3.664	62.8285	19.7058	3.0557	1.1531
58.2097000014079	7.56071000008644	3.664	58.2097	7.56071	2.229	1.435
48.1459999999969	2.23052791626826	7.04099727434812	47.3917	2.23053	7.041	0.7543
49.2026142893397	2.03994833246661	14.8575229300325	48.5894	0.54797	14.4264	1.6697
55.4907716602366	2.03994833246661	17.9029999970835	56.1254	1.40532	17.903	0.8975
48.6979338522347	8.85765713196655	19.4511005391991	48.6979	8.85907	21.303	1.8519
38.8725999999991	8.85765713196655	19.4511005391991	38.2491	9.61738	19.3363	0.9895
38.8725999999991	7.79248822337894	31.0237999344464	37.2177	7.79249	31.0238	1.6549
41.1363485101839	4.71151112778242	36.9379999711364	42.0178	3.44287	36.938	1.5448

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
41.1363485101839	22.8949705868614	37.985999989577	42.987	22.9253	37.986	1.8509
38.2171456511847	22.8949705868614	48.6888661288099	38.2173	22.874	49.077	0.3887
31.0765492618477	22.8949705868614	48.6888661288099	31.0765	22.0815	48.5077	0.8334
25.9840137242178	24.1473494039375	50.1121000000759	25.8125	25.1372	50.1121	1.0046
25.9840137242178	18.217004803124	52.7372002251881	25.7178	17.895	52.7372	0.4178
26.0672001738553	20.1433000000002	63.9830007213959	26.0672	21.3383	63.983	1.195
27.3594972594879	17.5576252450792	76.7199238611773	27.3595	17.3028	77.1892	0.534
35.8855159051831	17.5576252450793	68.4307006595682	36.0033	17.5038	68.4307	0.1295
33.2724392928167	22.8370837665528	62.9487002598011	34.4638	23.0393	61.4662	1.9126
33.1569999999977	31.1822026289097	62.9487002598011	31.6686	31.1822	62.9487	1.4884
34.4654419246557	38.818377943361	62.9487002598011	34.4656	38.8185	62.9703	0.1595
38.1612000197383	45.7548999585662	62.7852000000002	38.1612	45.7549	62.3997	0.3855
38.6835963242049	48.4909408334738	64.5231896281499	38.5534	48.7846	64.7262	0.38
41.6782999040131	51.7655106618909	70.449710356435	41.6783	52.1535	70.8377	0.5487
46.2037019886302	43.4652574079579	65.3286261768348	47.522	42.292	65.6102	1.7871
46.2037019886302	41.7062004258376	49.8345999999985	46.2037	41.7062	48.7254	1.1092
61.2145999999963	41.6034009706815	50.3406001321859	61.5258	41.6034	50.3406	0.3112
60.9289967291297	36.1136131190172	51.0956229768293	60.6972	35.5066	52.4287	1.483
56.9787999966641	35.9945999985778	54.3598000000014	56.9788	35.9946	54.4126	0.0528
56.0388991612812	33.8756	51.1097997017993	56.0389	33.1015	51.1098	0.7741
55.549199829231	34.9627	44.2534996784051	55.5492	35.9315	44.2535	0.9688
49.1294999999917	32.8613999998706	42.5439000013813	49.1148	32.8614	42.5439	0.0147
49.4416498290301	16.3797501607841	40.7381999984868	49.4944	16.327	40.7382	0.0746
49.1780572277963	18.7775650411931	25.8574710641069	49.4045	19.961	26.5255	1.3777
47.6331001287115	25.3180998323797	18.9049000000002	47.6331	25.3181	18.59	0.3149
37.0272	27.4581	23.0384	37.0272	27.4581	25.0096	1.9712
36.8488000079496	32.2474002930099	21.4142000000051	36.8488	32.2474	21.2512	0.163
27.133396566224	42.5603999933684	23.5540003493147	26.2003	42.5604	24.4871	1.3196
27.9962659229382	45.1759626895759	12.3771001821505	28.6889	43.6077	12.417	1.8201
37.2682999999616	49.4355994991758	12.3771001821505	37.4105	49.4356	12.3771	0.1422
31.5500158400619	54.7662282991381	11.674764737437	30.6696	55.2626	12.0174	1.0672
31.2678016201307	60.1701892356218	3.03941084927245	31.2678	61.1344	2.0752	1.3636
24.6291727111033	60.114976494864	12.9614218456362	24.5176	59.5849	13.4915	0.7579
24.6291727111033	69.8636999522463	9.79608292617623	24.7619	69.8637	9.1655	0.6444
20.7409557720932	75.593356754739	17.2056676431449	20.7262	75.308	17.3361	0.3141
17.3963397248903	77.8895910784983	24.9315223060415	17.2306	77.2747	24.7644	0.6584
11.3123339371286	83.2300876043075	25.0558542582824	10.1219	82.045	24.5182	1.7637
9.80243999999924	83.8953987885865	29.0611001848796	8.89064	83.8954	29.0611	0.9118
22.4753000000161	85.0798008179001	30.5317937004278	23.3569	85.0798	30.5318	0.8816
16.9024909370575	94.1811091193327	34.783500448412	16.7243	94.3593	34.7835	0.252
16.9024909370575	81.7102852248187	36.7034140538303	16.5471	81.1813	37.3426	0.9026
25.9392103623642	79.6888903962188	37.5421021382553	26.7929	78.8352	37.5421	1.2073
25.7615000419119	80.2998	44.2447999817227	25.7615	81.4539	44.2448	1.1541
24.693929475856	80.0045478283034	52.7225999994025	23.3293	78.9181	52.7226	1.7443
34.9223999977442	80.0045478283034	53.7448385118597	34.9224	79.9328	54.0968	0.3592
35.1194922216929	83.6652737334017	46.7366472938031	34.4937	83.7515	46.1073	0.8917
36.723	84.3383	38.0239	36.723	86.3354	38.0239	1.9971
38.0133489404737	82.0652784657228	33.3234576755644	38.4806	81.2568	32.7466	1.0976
44.555521838089	82.0652784657228	23.2292000604615	45.6946	80.9262	23.2292	1.6109
43.9126198729603	82.0652784657228	16.3309936183969	43.9629	81.9344	16.1851	0.2289
43.6547652096342	85.0626307155722	16.2890983905526	43.3068	85.4106	16.2891	0.4921
51.1079555039415	83.3917652091122	15.9665020357382	50.9984	83.4341	15.7476	0.351
54.1689999985653	83.3917652091122	13.7970173995291	54.169	81.8375	12.9059	1.7916
63.4585947164515	85.0160946810032	13.7970173995291	63.6977	85.2552	13.695	0.3532
61.0006021895215	78.1642021171203	16.4053004478284	60.7208	77.8844	16.4053	0.3957
66.3965944403898	80.708663552804	23.2022020808225	66.7645	81.0279	23.2022	0.4871
61.845301575449	80.708663552804	28.4820044771245	61.8453	80.8454	29.5157	1.0427
60.3485000000013	80.170399989241	27.958299976985	60.2539	80.1704	27.9583	0.0946
60.3559999743853	72.3736000463445	26.7879	60.356	72.3736	25.6911	1.0968
65.3011000022992	67.1868999982667	27.1839	65.3011	67.1869	28.6409	1.457
66.9355999999988	66.2314000024394	9.0944000000201	66.9764	66.2314	9.0944	0.0408
51.8185221147547	64.9806104701824	0.935510457295452	51.793	64.9464	0.9013	0.0547
51.8185221147547	67.1963131046721	10.993701441556	52.5118	68.1256	10.9937	1.1594
45.4387745563987	66.558574633996	18.322725397145	45.2184	66.3382	18.5431	0.3817
46.811643945308	71.1772859716319	18.1560563687877	47.6475	71.1843	17.3202	1.1821
46.3398999975491	71.1772859716319	30.3479305691095	46.3399	71.17	31.2162	0.8683
41.4130971148886	73.9098534880844	28.6393463428543	41.4131	74.8199	27.7293	1.287
34.8691904495533	70.0043188776045	28.6393463428543	35.9094	68.8825	29.2317	1.885
33.4192000027671	61.1764	33.0004000009092	33.4192	59.483	33.0004	1.6934
32.6409999966536	61.499	34.0062000011864	32.641	61.5676	34.0062	0.0686
25.6513016336728	61.499	36.6092871348375	25.6513	60.6643	37.4717	1.2002
19.7667720855468	61.499	35.6156859184118	18.9042	62.1271	34.907	1.3155
19.7667720855467	61.499	19.5784905310898	19.6656	61.3862	20.5906	1.0677
8.44847384443625	64.162106159285	19.023193821784	8.25408	64.3565	18.8288	0.3367
12.5871999958362	53.7048518274857	19.2836481694771	12.5872	53.6987	19.2898	0.0087
22.6632000741741	53.7552005472604	18.9222638657132	22.8193	53.7552	17.9075	1.0267
22.6632000741741	54.8465610535479	28.4034007847489	22.5447	55.6169	28.4034	0.7794
22.8045189854743	49.4213987593811	28.8906177554464	23.6126	49.4214	29.6987	1.1428
16.6093047583798	44.1664976818986	28.8906177554464	15.6372	44.5891	30.235	1.712
16.6093047583798	40.9631551776319	25.1956419767619	17.5856	40.8861	25.0628	0.9883

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
13.3791394325415	40.9631551776319	22.5839046113074	13.4598	41.6191	22.5554	0.6615
11.4258000135137	37.7412000003958	14.3156000000012	11.4258	37.7412	14.2255	0.0901
0.960233882668263	35.5085	17.1015718183308	0.642905999999996	35.395	17.4189	0.4629

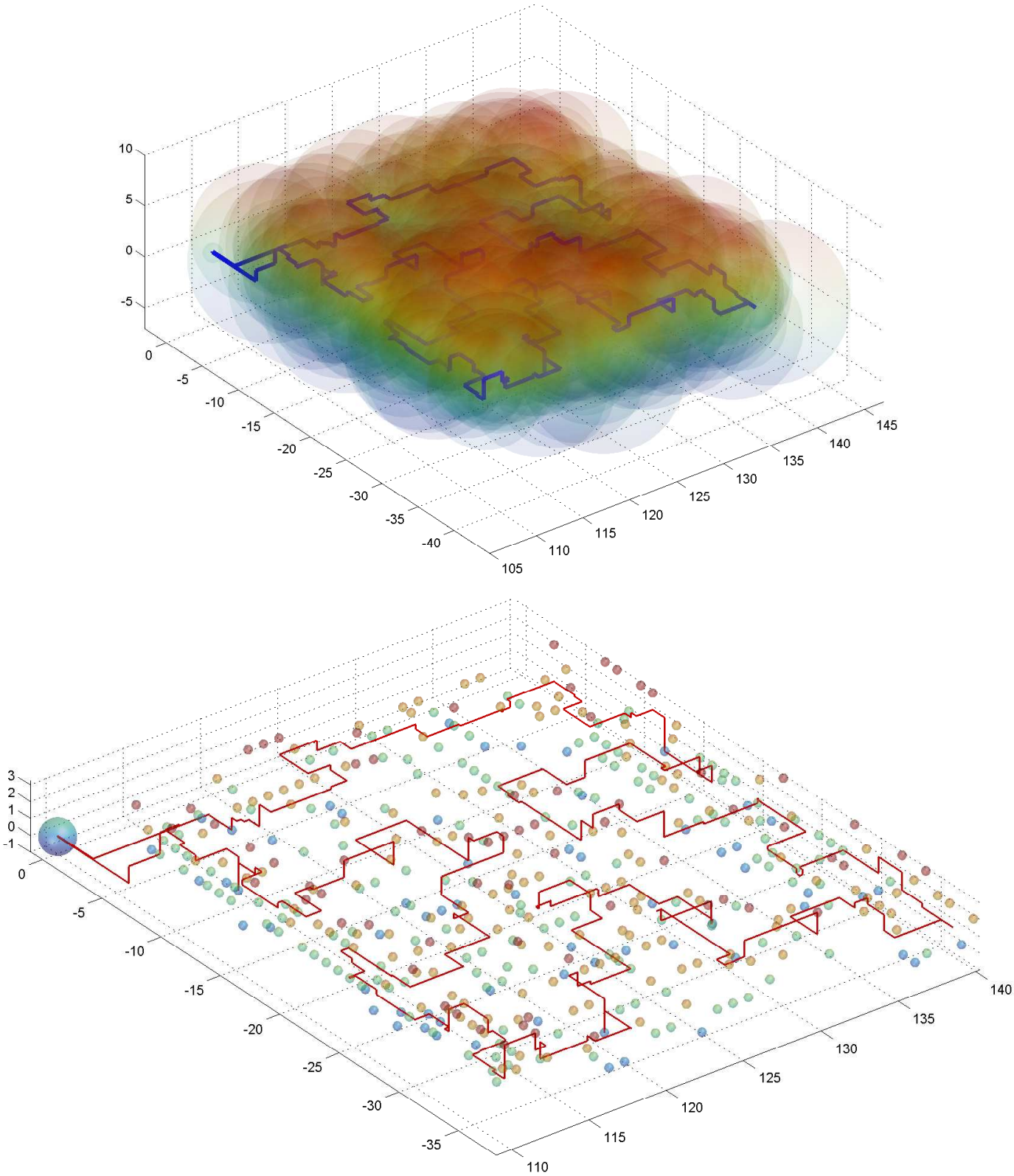


Figure N.206: *pcb*442, arbitrary radius, 3D, Manhattan, Length = 337.1969964

Table N-209: Solution for *pcb*442, arbitrary radius, 3D, Manhattan

Total distance: 337.196996375827 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
0	6	1	2	4	3	6
2	6	1	2	6	1	0
2	6	1.001	3	7	1	3
2	6	2.29203876561646	3	6	1	3
2.00000000000006	6	2.29303876561646	2	5	2	3
3.25464472878669	6	2.33333252691038	4	6	3	1
3.25464472878669	6	2.33333252691038	3	5	1	3
2.33333301075174	7.66666602153451	2.33333252691038	3	9	1	2
2.33333301075174	7.66666602153451	2.33333252691038	2	7	3	1
2	9	2	2	9	2	0
3.99900049950071	9.99999950049926	0	4	9	0	1
4	10	0	4	10	0	0
4	10	0.001000	3	11	1	2
4	10	1.62941358202845	3	14	0	6
4	10	1.62941358202845	3	13	1	6
4	10	1.62941358202845	3	10	2	6
4	10	1.62941358202845	3	8	0	5
4	11.406440744055	1.62941358202845	4	14	1	4
4	11.406440744055	1.62941358202845	3	15	1	4
4	11.406440744055	1.62941358202845	3	12	2	4
4	11.406440744055	1.62941358202845	2	13	0	4
4	11.406440744055	1.62941358202845	2	10	1	3
4	11.406440744055	1.62941358202845	2	8	1	4
3.99999999999996	11.406440744055	2	4	11	3	5
3.99999999999996	11.406440744055	2	4	8	3	7
4	12	2	4	12	2	0
2.70710755882935	12	1.70710600354303	2	12	1	1
2.70710755882935	12.001	1.70710600354303	2	11	1	7
2.70710755882935	12.002	1.70710600354303	2	16	1	7
2.70710755882935	12.002	1.70710600354303	2	14	3	7
2.70710755882936	14.9999999967538	1.70710600354303	2	15	1	1
2.70710755882936	14.9999999967538	2.0000001234989	4	16	3	5
2.70710755882936	14.9999999967538	2.0000001234989	3	16	2	4
2.99964859552135	16.9996485562827	2.0000001234989	3	17	3	1
3.00029712973259	17.0000000220715	2.0000001234989	4	15	1	6
3.00029712973259	17.0000000220715	2.0000001234989	3	19	2	2
3.99999999925414	17.0000000220715	2.0000001234989	4	17	3	1
3.99999999925414	14.732050878871	2.0000001234989	4	13	3	2
5	15	2	5	15	2	0
7	15	3	7	15	3	0
10.2062994813266	15	3	12	15	3	6
10.2062994813266	15	3	10	16.3	0	5
10.2062994813266	15.0000	2.99900000000006	8	15	1	3
10.2062994813266	15	2.99800000000006	10	15	2	2
10.2062994813267	15	1.60930870999648	9	15	1	5
10.2062994813267	15	1.60930870999648	7	16	2	5
10.2062994813266	15	1.60830870999648	11	15	1	1
10.2062994813266	12.0259182853995	1.60830870999648	11.5	13.5	2	2
10.2062994813266	11.7664209270021	1.60830870999648	10	11	1	1
10.2062994813266	11.7664209270021	1.60930870999648	13	11.3	2	4
13.498	11.7664209270021	1.60930870999648	16	13	1	6
13.498	14.2277569580013	1.60930870999648	16	15	1	5
13.498	14.2277569580013	1.60930870999648	17	15	2	6
13.499	14.2277569580013	1.60930870999648	14	15	2	1
13.5	14.2277569580013	1.60930870999648	13	15	2	1
13.5	17	3	13.5	17	3	0
13.5	17.4292857857286	2.99999999999999	13	21	2	4
13.5	17.4292857857286	2.99999999999999	14	18	3	2
13.5	17.4292857857286	2.99999999999999	12	21	2	4
13.501	17.4292857857286	3	16	18	3	4
15	18.0000000129224	3	17	18	3	2
15	18.0000000129224	2.02361555877841	15.5	18.5	2	5
11.0009999103928	18.0000000129225	1.00000000000009	13	18	1	5
10.9999999103928	18.0000000129225	1.00002	11	18	0	1
10.9122349147977	18.0000000129224	1.00002	12	18	0	6
10.9122349147977	20.3936972557253	1.00002	12.2	22.1	3	5
10.9122349147977	20.3936972557253	1.00002	12	24	2	5
10.9122349147977	20.3936972557254	1.00100000000027	15	15	0	7
10.9122349147977	20.3936972557254	1.00100000000027	10	18	0	3
10.9122349147977	20.3936972557254	1.00100000000027	9.5	22.2	2	7
10.9122349147977	20.3936972557254	1.00100000000027	9	18	1	6
10.9122349147977	20.3936972557254	1.00100000000027	8	21	2	6
10.9122349147977	20.3936972557254	1.00100000000027	8.5	22.8	2	7
10.9122349147977	20.3936972557254	1.00100000000027	8	18	1	5
10.9122349147977	20.3936972557254	1.00100000000027	13	27	2	7
10.9122349147977	20.3936972557254	1.00100000000027	8	24	1	6

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
10.9122349147977	20.3936972557254	1.00100000000027	7	18	0	7
10.9122349147977	20.3936972557254	1.00100000000027	7	24	2	6
10.9122349147977	20.3936972557253	1.00200000000027	12	17	1	6
10.9122349147977	20.3936972557253	1.00300000000027	10	21	2	4
9.93809138426377	20.3936972557253	1.00300000000027	9	24	1	5
9.93809138426377	20.3936972557253	1.00400000000027	7	21	1	3
9.93809138426377	20.3936972557253	1.31190861573623	5.3	21	2	5
9.93809138426377	20.8493428720585	1.31190861573623	11	21	3	2
9.93809138426377	20.8493428720585	1.31190861573623	9	21	1	1
9.93809138426377	23.4452925086423	1.31190861573623	11	24	1	5
8.85217138416088	23.4452925086423	1.31190861573623	11.7	22.8	2	3
8.85217138416088	23.4452925086423	1.31190861573623	10	24	2	4
7.00000001991614	23.4452925086423	1.31190861573623	10	26	2	4
7.00000001991617	25.0448907160462	1.33150019889679	9	27	3	6
7.00000001991617	25.0448907160462	1.33150019889679	7	30	2	5
6.99900001991632	25.0448907160462	1.33150019889679	7.5	25.5	1	3
6.9980000199163	25.0448907160462	1.33150019889679	9.09999999999999	26	1	5
6.9970000199163	25.0448907160462	1.33150019889679	8	26	0	2
6.9970000199163	25.0448907160462	1.33150019889679	7	27	1	2
5.74885466796808	25.0448907160462	1.33150019889679	8	27	1	3
4.74678034225845	25.0448907160462	1.33150019889679	5.4	23.3	2	6
4.74678034225845	25.0448907160462	1.33150019889679	5.4	24.3	3	5
4.74578034225846	25.0448907160462	1.33150019889679	4.7	25.5	2	1
3.55124828292145	25.0448907160462	1.33150019889679	3	26	3	2
3.55124828292145	23.4961689059186	1.33150019889679	4	22	1	2
3.55124828292145	23.4961689059186	1.2560714745149	2	24	0	5
3.55124828292145	23.4951689059186	1.2560714745149	4	23	2	1
3.55124828292145	19.8571829806524	1.2560714745149	4	20	2	1
3.55124828292145	19.8561829806524	1.2560714745149	4	19	1	1
3.03398663422534	19.8561829806524	1.2560714745149	3	18	2	2
3.03398663422534	19.8571829806524	1.2560714745149	3	20	3	4
3.03398663422534	20.8402142836668	1.2560714745149	4	21	3	2
3.03398663422534	20.8402142836668	1.00205	5	18.3	1	4
3.03398663422534	20.8402142836668	1.001	4	18	1	3
3.03398663422534	20.8402142836668	1.001	2	18	1	5
3.03398663422534	21.8991835034014	1.001	3	22	0	5
3.03398663422534	21.8991835034014	1.001	2	20	1	4
2	21.8991835034014	1.001	2	19	1	5
2	21.8991835034014	1.001	2	17	2	5
2	22	1.001	3	23	1	5
2	22	1.001	2	21	1	3
2	22	1	2	22	1	0
2.36478608999712	23.7561754821743	0.999999999999974	4	24	1	4
2.36478608999712	23.7561754821743	0.999999999999974	3	21	2	3
2.36478608999712	23.7561754821743	0.999999999999974	4	25	2	4
2.36478608999712	23.7561754821743	0.999999999999974	2	23	1	3
2.36478608999712	23.7561754821743	0.999999999999974	2	25	2	3
2.36478608999714	23.7561754821744	0.708106819033455	3	24	1	3
2.36478608999712	23.7561754821744	0.707106819033455	3	25	0	6
2.36478608999712	26.9990000236608	0.707106819033457	2	26	0	2
3.29289325666034	26.9990000236608	0.707106819033456	3	27	0	6
3.29289325666034	26.9990000236608	0.707106819033456	2	27	1	6
3.29289325666034	27.0000000236608	0.70710681903345	4	27	0	1
3.29289325666034	28.6676346643221	0.70710681903345	4	28	2	6
3.29289325666034	28.6676346643221	0.70710681903345	4	29	2	3
3.23294613427113	28.6676346643221	0.70710681903345	8	30	0	5
3.23294613427113	28.6676346643221	0.70710681903345	4	26	0	3
3.23294613427113	28.6676346643221	0.70710681903345	3	28	0	1
3.00000	28.9999999998455	0.999999985469433	2	29	1	1
3.00000	28.9999999998455	1.9993037279255	3	29	2	2
3.00000	28.9999999998455	1.9993037279255	3	30	2	2
3.15252002215679	28.9999999998455	1.99930372792545	2	28	2	4
3.15252002215679	28.9999999998455	1.99930372792545	2	30	3	3
3.15282375008204	28.9999999998455	1.99999999999997	3	31	2	3
3.15282375008204	28.9999999998455	1.99999999999997	2	31	3	3
4	31	2	4	31	2	0
4	31	1.1947129433614	4	30	0	5
4	31	1.1937129433614	4	32	1	4
4.3062870566386	31.6937129433614	1.1937129433614	8	33	2	4
4.3062870566386	31.6937129433614	1.1937129433614	5	31	1	1
4.3062870566386	31.6937129433614	1.1937129433614	7	33	1	3
4.3062870566386	31.6937129433614	1.1937129433614	4	33	1	4
4.3062870566386	31.6937129433614	1.1937129433614	2	32	1	3
4.3062870566386	31.6937129433614	1.1937129433614	2	33	3	4
4.30628705663861	32.0556294889759	1.05726937991357	5.2	32	2	3
2.67111652837534	32.0556294889758	1.05726937991367	3	32	2	1
2.67111652837535	32.0556294889757	1	3	33	1	1
2.18865777841692	33.999	1	3	34	1	5
2.18865777841692	33.999	1	4	35	3	5
2	33.999	1	4	34	3	5

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2	34	1	2	34	1	0
2	35	1.86602540378448	1.5	35	1	1
2	35	1.86602540378448	1.5	35.5	2	1
2	35	1.99999966707143	2	36	2	1
2	35	3	2	35	3	0
2.01316584461699	34.9999999999999	3	3	35	2	3
4.0000012870977	34.9999999999999	1.9999995823859	4	36	2	1
4.699	34.4999999999998	1	4.7	33.5	3	6
4.7	34.5	1	4.7	34.5	1	0
7.75006924909029	34.5	1	11	36	1	6
7.75006924909029	34.5	1	9	36	0	5
7.75006924909023	34.5	1.00108	7	36	1	6
7.75006924909023	34.5	1.00108	6.2	36.5	2	3
7.75006924909023	34.5	1.29289328818599	8	36	0	2
7.75006924909015	35.180866863007	1.29289328818599	6.2	37.1	3	3
10	35.2928931494409	1.29289328818599	10	36	2	1
10	33.001	0	12	33	1	4
10	33.001	0	11	33	1	4
10	33	0	10	33	0	0
10	32.9999995298953	0.000999529895283	12	36	1	4
10	32.9999995298953	2.00000000000003	9	33	2	1
10	31.7320508075689	2.00000	9	30	2	2
10	30	2	10	30	3	1
10.578939817078	30	1.18814338500394	11	30	2	7
10.5799398170782	30	1.18814338500408	11	27	2	5
10.5799398170782	30	1.18814338500408	10	27	1	5
11.4161431368157	30	1.18814338500408	12	30	2	1
11.4161431368157	29.9999997501197	1.00050217297128	13	30	2	5
13.9995024228514	29.9999997501197	1.00050217297128	14	29	1	1
14	30	1	14	30	1	0
14.0000000000853	29.9990000000853	1	14	28.2	1	3
14.0000000000854	26.9999995890918	1	14	27	0	1
14.0000000000853	25.0000000000853	1	12	27	0	3
16	24.6875	1.01086178530717	15	24	1	4
16	24.6875	1.01086178530717	14	25	0	3
16	24	2	16	24	2	0
16	22.2679491924311	2	17	24	2	2
14.001	22.2679491924311	1.00000000512924	18	24	2	6
14.001	22.2669491924311	1.00000000512924	13	24	1	5
14	22.2669491924311	1.00000000512924	14	24	1	5
14	22.0000000061926	1.00000000512924	13	22	1	1
14	21.9990000061929	1.00000000512924	15	21	2	6
14	21.9990000061929	1.00000000512924	14	20	2	5
14.2553058288387	21.9990000061929	1.00000000512926	13.5	21.4	1	3
14.9999999819498	21.9316624790355	0.636675041929116	15	19	0	3
17.0000002777334	21.9316624790356	0.636675041929116	17	21	1	1
17.0000002777334	21.9316624790356	0.636675041929116	16	21	3	3
17.999999891133	21.9316624790357	0.636675041929116	18	21	1	1
17.999999891133	22.0759823441715	0.24653493723809	14	21	2	7
17.999999891133	22.0759823441715	0.24653493723809	15	18	3	7
19.998777880649	22.0759823441715	0.246534937238097	20	21	1	2
19.9997778806491	22.0759823441714	0.246534937238077	20	23	2	7
20.0007778806491	22.0759823441714	0.246534937238098	20	22	2	2
20.0007778806491	22.0759823441714	0.245534937238153	20	24	0	4
20.0007778806491	24.5665144877255	0.245534937238168	20	27	2	3
20.0017778806491	24.5665144877255	0.245534937238168	20	26	1	4
21.2	24.5665144877255	0.245534937238168	20	25	3	5
21.2	27.5	0	21.2	27.5	0	0
21.1367590438003	27.5	0	20	31	0	6
21.1367590438002	27.5	1.34381268414167	20	29	1	7
21.1357590438002	27.5	1.3438126841417	17.9	25.8	2	5
21.1357590438002	27.5	1.3438126841417	18.3	27	1	5
19.9160739921695	27.5	1.3438126841417	22.2	28.2	1	3
19.9160739921695	27.5	1.3438126841417	20	30	3	3
19.9150739921695	27.5	1.34381268414173	17.2	26.1	2	6
18.3575382449448	27.5	1.34381268414173	20	28	2	2
17.8853401683065	27.5000	1.34381268414173	15	30	2	7
17.8843401683066	27.5000	1.34381268414178	15	28	2	3
17.8843401683065	27.5000	2.00000	16	27	0	7
17.8843401683065	27.5000	2.00000	18.3	28	0	7
17.6141428428542	27.5000	2	16.9	26.8	2	1
17.9	27.5000	1.99999999999999	15	27	3	6
17.9	30.0157783170092	1.99999999999999	15	28.6	2	6
17.8999999999999	30.0167783170093	2	16	30	2	7
17.9	30.0177783170092	2	19	30	3	4
17.9	33.3	2	17.9	33.3	2	0
17.2012308523186	33.3	2	13	33	2	6
17.2012308523186	33.301	2	15	33	2	6
17	34	2	15	36	1	3
17.7316624790355	34	2.03367504192886	19	35.2	1	6

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
17.7316624790355	34	2.03367504192886	17	36	1	5
17.7316624790355	34	2.03467504192891	13	36	2	6
17.7316624790355	34	2.03567504192891	14	36	0	7
17.7316624790355	34	2.03667504192891	14	33	1	4
17.7316624790355	34	2.03667504192891	16	33	2	2
17.7316624790355	34	2.03667504192891	17.2	34.1	2	1
17.7316624790355	34	2.03667504192891	18.3	34.5	2	1
17.7316624790355	34	2.03667504192891	16	36	1	4
18.2683375209645	34	2.03667504192891	20	35	2	2
18.2683375209645	34	3	21.5	32.5	2	7
18.2683375209645	34	3	22.8	32.5	1	7
23	34	3	23	34	3	0
23	34	1.70710649078003	20.5	31.5	3	4
23	34	1.70710649078003	21	32	1	6
23	31.707107071593	1.7071064907799	22	32	2	7
25.1675670390492	31.707107071593	1.7071064907799	23.2	31.5	2	2
25.1675670390492	31.707107071593	1.7071064907799	27	31	3	3
25.9999999956906	31.7071070715931	1.70710649078003	26	31	1	1
26.1643858727022	33	2.00000	26	30	2	7
26.1643858727022	33	2.00000	27	30	3	6
27	33	2	27	33	2	0
27	33	1.99899999999998	27	32	2	7
27	33	1.99899999999998	26	34	2	7
27	33	1.99799999999974	28.5	33.5	2	5
27	33.0000	1.63633183144342	27	34	2	2
27	34.4181065713249	1.59880793454829	26.2	36.5	2	3
27	34.418106571325	0.708106570248407	23	35	1	6
27	34.418106571325	0.708106570248407	27	35	2	3
27	34.4181065713248	0.707106570248407	27	37	0	6
27	35.2928930078753	0.707106570248408	27	36	0	1
27.0010000000002	35.2928930078753	0.707106570248405	27	38	1	4
30	36.2928930078753	0.707106570248405	30	37	0	1
30	33.691141646417	0.707106570248404	30	36	2	3
30	33.691141646417	0.759539808206417	30	35	2	2
30	33.6911416464169	0.945967371725553	30	34	3	3
30	33.6911416464169	0.945967371725553	30	38	2	7
30	32.0000000089283	1.99999999999997	30	32	3	1
30	30	1.99999999999997	30	31	1	4
30	30	1.99999999999997	30	33	2	5
30	30	1.03894044402172	29	30	0	7
30	30	1.03894044402172	30	30	0	7
30.0000	29.2763413285372	1.03894044401913	30	29	2	1
30.0000	27.0010	1	30	28	3	6
30	27	1	30	27	1	0
29.999500051873	26.9999997501249	0.999500198002152	30	26	1	1
27.1888777380824	26.9999997501249	0.999500198002152	26	27	2	6
27.1888777380825	27.0009997501249	0.999500198002152	27	27	1	7
27.1888777380824	27.0009997501249	0.998500198002152	26	28	1	3
27.1888777380824	27.0009997501249	0.998500198002152	27	29	1	3
27.1888777380825	27.0009997501249	0.997500198002152	28.5	27	1	2
27.1888777380825	27.2928929190491	0.70710648142208	26	29	0	5
27.0000	27.2928929190491	0.707106481422192	27	28	0	1
27.0000	27.0369168810876	1.00000009559417	26	26	1	7
27.0000	25.8735198951626	1.00000009559417	27.6	23.6	1	7
27.0000	25.0000001123685	1.00000009559417	26	25	1	1
27.0000	24.5697074415275	1.18177987161648	26	22	0	3
27.0000	24.5697074415275	1.18177987161648	26	24	0	3
27.0010	24.5697074415274	1.18177987161648	26	23	3	6
27.0010	24.5687074415274	1.18177987161648	27	23	2	3
27.0010	24.5687074415274	1.18177987161648	27	25	1	2
28.9093132736149	24.5687074415274	1.18177987161648	27	26	3	3
28.9093132736149	24.5687074415274	1.18177987161648	30	25	1	4
28.9093132736149	24.5677074415274	1.18177987161648	29	24	2	1
29.5	24.5677074415274	1.18177987161648	30	23	1	5
29.5	20.501	1.29289321881345	28.5	22	1	6
29.5	20.5	1.29289321881345	30	20	2	1
29.5	20.5	1	29.5	20.5	1	0
29.5	20.5	1.001	30	22	3	4
26.1352894003198	20.5	1.001	27	22	0	2
25.999	20.5	1.001	27	20	1	2
25.999	20.5	1.13828940031978	30	21	0	6
25.999	20.5	1.13828940031978	30	19	0	5
25.999	20.499	1.13828940031978	26	21	2	4
25.999	20.499	1.13828940031978	27	21	1	4
25.998	20.499	1.13828940031978	26	20	1	2
23.4350431555958	20.499	1.13828940031978	26	19	0	5
23.4350431555958	20.499	1.13828940031978	26	18	2	5
23.4350431555958	20.498	1.13828940031978	21.1	20	2	4
23.4350431555958	20.498	2.65484331252662	24	21	2	1
21.7	19	3	21.7	19	3	0

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
19.9999999962711	19	3	18	18	2	3
19.9999999962711	19	3	20	20	3	1
19.9999999962711	19	2.18264896763348	20	19	2	2
19.9999999962711	18.0009999905671	1.00000	20	17	0	3
19.9999999962711	18.0009999905671	1.00000	20.6	16.5	1	2
19.999999996271	17.9999999905673	1.00000	20	18	0	1
19.999999996271	13.900472546462	1.0000	20	15	1	2
19.999999996271	13.899472546462	1.0000	20	16	3	7
19.999999996271	13.898472546462	1.0000	18	15	3	6
19.999999996271	13.897472546462	1.0000	20	14	2	6
19.999999996271	12.9998312013885	1.0000	20	13	2	1
19.8284271247462	11.9999999532557	1.00000000000003	17	12	2	3
19.8284271247462	11.9999999532557	1.00000000000003	18	12.3	2	3
19.9603473907888	11.9999999532557	1.00000000000003	20	12	1	5
20.0000000271332	11.0000	1.00000000000003	20	10	1	1
20.0000000271332	11.0000	1.00000000000003	20	9	1	6
20.8989793835043	11.0000	1.00000000000003	23.2	15	1	6
20.8989793835043	11.0000	1.00000000000003	20	11	1	1
20.8989793835043	11.0010	1.00000000000003	16	11	2	5
22.3948281569525	11.0010	1.00000000000003	16.5	10.5	0	6
22.8999995744834	13	1.00000000000003	22.9	14	1	1
22.9009995744834	13	1.00000000000003	26	15	1	5
22.9009995744834	13	1.00000000000003	26	13	1	5
23.9000000285388	12.9999999999999	1.00000000000003	23.9	13	0	1
23.9000000285388	12.9999999999999	1.00100000000003	26	12	1	5
24.1010205144336	13	2	27	12	1	4
24.1010205144336	13	2	29	14	2	5
27	13	2	27	13	2	0
26.9958840716162	14.1010231856768	2	27	15	1	7
26.9948840716162	14.1010231856767	2	27	19	3	5
26.9948840716162	14.1010231856767	2	26	14	2	1
26.9948840716162	14.1010231856767	2	29.5	17.5	1	5
26.9948840716162	14.1010231856767	2	30	15	1	4
27	15.7320508075689	2	27	18	1	3
27	15.7320508075689	2	27	14	1	2
27	16	2	27	16	2	0
26.7071062075139	16.0438550181467	2	27	17	2	1
26.7071062075139	16.2928926451412	2	26	17	2	1
28.9856679156256	16.2928926451412	1.00099801122114	26	16	1	3
28.9856679156256	16	1	30	18	1	6
30	16	1	30	16	1	0
30	16	0	30	17	1	2
30	12	0	30	12	0	0
30	12	1.99999999999998	25	8	2	7
30	12	1.99999999999998	30	13	2	1
30	12	1.99999999999998	30	10	3	6
30	10.9999999880491	1.99999999999998	30	11	3	1
30	10.9976467737337	1.99999999999998	25.5	7.1	2	7
30	10.9976467737337	1.99999999999998	28	9	1	4
30	10.9976467737337	1.99999999999998	30	8	3	4
30	10.9976467737337	1.99999999999998	30	7	3	5
28.9531959539184	10.9976467737337	1.99999999999998	28	11.3	2	1
28.9531959539184	10.5505486924312	1.70710681053642	30	9	1	2
28.9531959539184	9.99999991506139	1.70710681053642	29.3	9.5	1	1
26.7071067518368	9.99999991506139	1.70710681053642	26	10	1	1
26.7071067518368	7.73426012385613	1.70710681053638	26	11	3	6
26.7071067518368	7.73426012385613	1.70710681053638	27	11	1	6
27.9603732853824	7.73426012385613	1.70710681053635	27	9	2	6
27.9603732853824	7.73426012385613	1.70710681053635	27	8	3	4
27.9603732853823	7.73326012385628	1.70710681053642	26	8	2	2
27.9603732853824	7	1.70710681053642	27	7	2	6
28.065256120376	5.25125079114879	1.74874928964728	29	5	2	1
28.065256120376	5.25025079114869	1.74874928964743	27.5	5.2	2	6
28.065256120376	5.25025079114869	1.74974928964721	29	4	3	2
24.9999999995013	5.50953217752385	1.38028415097165	26	4	1	2
24.9999999995013	5.5095321775238	1.37928415097165	25	3	2	3
24.9989999995012	5.50953217752376	1.37928415097165	24	3	2	5
24.4370981747642	5.50953217752374	1.37928415097165	26	5	1	6
24.4370981747641	5.50953217752383	1.37828415097165	26	9	0	5
24.4370981747641	5.50953217752383	1.37828415097165	27	10	1	6
24.4072742556287	5.65371692414273	1.37828415097165	24.5	7.1	0	2
24.4072742556287	5.65371692414273	1.37828415097165	23	6	0	2
24.4072742556287	5.65271692414273	1.37828415097165	24	6	2	5
24.4072742556287	5.65271692414273	1.53663868438822	22	3	1	4
24.4072742556287	5.65271692414273	1.53663868438822	23	3	0	6
21.6977010440614	5.65271692414273	1.53663868438822	17.1	3.1	2	6
21.6977010440614	5.65271692414273	1.53663868438822	18	3	1	5
21.6977010440614	5.65271692414273	1.53663868438822	19	3	1	5
21.6977010440614	5.65271692414273	1.53663868438822	20	3	2	5
21.6977010440614	5.65271692414273	1.53663868438822	21	3	2	4

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
21.6977010440613	5.48780344227255	1.53663868438822	22	4.7	1	1
20.4744992938116	5.48780344227255	1.53663868438822	20	6	1	5
20.4734992938116	5.48780344227255	1.53663868438822	22	6	1	3
20.4724992938116	5.48780344227255	1.53663868438822	20	8	1	6
19.6629744944191	5.41277484018968	1.53663868438822	19	6	2	1
19.6619744944191	5.41277484018968	1.53663868438822	17.5	7.5	1	6
19.6619744944191	4.51916728985679	1.53663868438822	20	3.7	2	1
19.6619744944191	4.5191672898568	1.81578864627288	18	6	1	5
19.6619744944191	4.5191672898568	1.81578864627288	21	6	3	5
16.5312421856518	4.51916728985679	1.81578864627284	17.1	5.1	1	2
15.5	4.51916728985679	1.81578864627284	15.5	5	3	4
15.5	3.57835014015079	1.81578864627284	15.5	3	1	1
14	3.57835014015079	2.42264992697651	14	3	1	3
11.5773505943947	3.57835014015079	2.42264992697652	12	3	3	2
11.5773505943947	3.57735014015061	2.42264992697651	11	3	3	1
11.5773505943947	5.99999998698559	2.42264992697652	11	6	2	1
13.0090926986421	5.99999998698559	2.13454634932109	14	6	2	1
13.0090926986421	6.00099998698559	2.13454634932109	14.5	7.7	3	4
13.0090926986421	6.00099998698559	2.13454634932109	13	7	0	3
13.0090926986421	7.4	2.13454634932109	13.5	7.5	3	1
11.9725401629176	7.4	2	12	6	2	3
11	7.4	2	11	7	1	2
9.4	7.4	2	9.4	7.4	2	0
8.10063946662412	6.43720776640615	2.05832	9	6	2	1
8.10063946670097	6.43720776640615	0.723723749955432	8.5	7	0	1
8.06955425644711	5.59143090715074	0.723723749955432	10.5	10.5	2	7
8.06955425644711	5.59143090715074	0.723723749955432	14	9.3	1	7
8.06955425644711	5.59143090715074	0.723723749955432	13	6	0	5
8.06955425644711	5.59143090715074	0.723723749955432	10	6	2	7
8.06955425644711	5.59143090715074	0.723723749955432	8	6	2	4
8.06955425644711	5.59143090715074	0.723723749955432	7	6	2	5
8.06955425644711	5.59143090715074	0.723723749955432	8.5	5.2	1	4
8.06955425644711	5.59143090715074	0.723723749955432	4	7	2	7
8.06955425644711	5.59143090715074	0.723723749955432	13	3	2	6
8.06955425644711	5.59143090715074	0.723723749955432	10	3	3	4
8.06955425644711	5.59143090715074	0.723723749955432	9	3	1	6
8.06955425644711	5.59143090715074	0.723723749955432	3	4	0	7
7.76824193895305	5.31302099114092	0.723723749955432	11	9	1	5
7.76824193895305	5.31302099114092	0.723723749955432	8	10.3	1	5
7.76824193895305	5.31302099114092	0.723723749955432	6	4	1	3
7.76824193895305	5.31302099114092	0.723723749955432	4	5	1	4
7.76824193895305	5.31302099114092	0.723723749955432	4	4	1	4
7.5	4.9	0	7.5	4.9	0	0
7.50000000000003	3.07666	0	7	3	0	1
7.50000000000003	3.07666	0.063508326896284	8	3	2	2

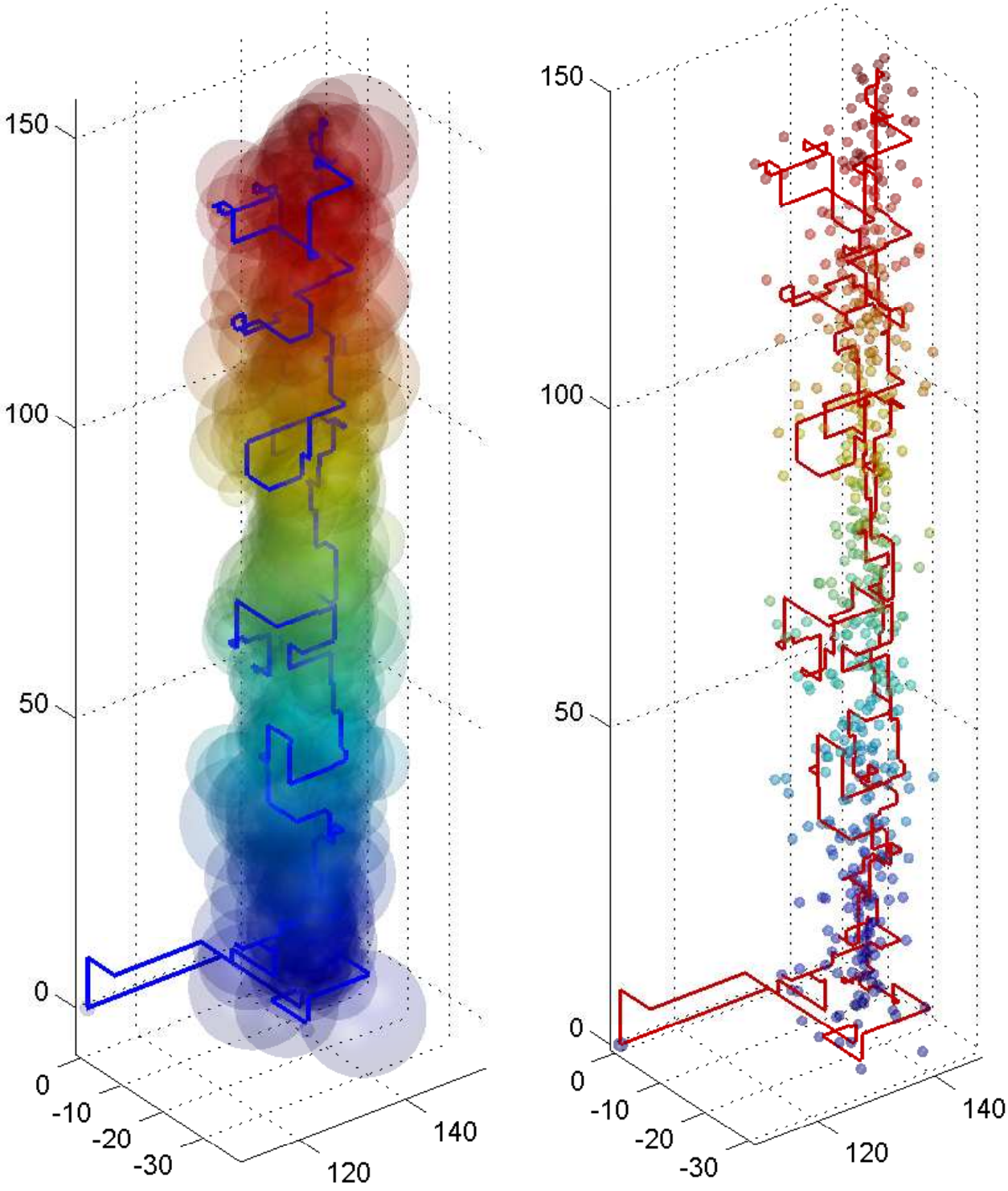


Figure N.207: $d493$, arbitrary radius, 3D, Manhattan, Length = 1065.5848949

Table N-210: Solution for $d493$, arbitrary radius, 3D, Manhattan

Total distance: 1065.58489487762 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
25.401359344449	18.8655652817278	0	22.149	11.742	1.36	9.67
25.401359344449	18.8655652817278	0.001119032178894	24.943	19.108	0.303	0.6
25.9695652816357	18.8655652817278	2.6405662830502	26.149	19.045	2.783	0.291
25.0700000019296	18.5180374107119	2.6405662830502	25.07	16.314	3.298	2.3
20.4337531328081	18.5180374107119	2.6405662830502	20.117	18.283	2.485	0.424
20.4337531328081	26.7926577926126	2.6405662830502	20.117	22.728	3.645	7.823
20.4337531328081	26.7936577926126	2.6405662830502	20.117	27.617	1.782	1.231
20.9716335271386	26.7936577926126	6.55553386354383	29.07	29.713	2.284	9.61
20.9726335271387	26.7936577926126	6.55553386354393	23.355	23.553	9.247	6.4
31.4189999994976	26.7936577926126	6.55553386354388	25.959	27.744	8.296	5.865
31.4199999994975	26.7936577926126	6.55553386354383	31.42	27.173	7.305	0.84
32.6899999976865	18.3460943981969	6.55553386354381	29.959	17.584	8.664	6.004
32.6899999976866	18.3460943981723	3.3919999956869	32.69	18.346	2.359	1.033
33.7476005280037	18.3460943981723	3.39199999568689	31.892	15.246	4.139	6.832
33.7486005280037	18.3460943981723	3.39199999568678	32.932	15.246	4.376	6.384
33.7486005280037	12.9149580517802	3.39199999568678	33.322	12.841	4.069	4.98
33.7496005280037	12.9149580517802	3.39199999568678	34.135	12.906	3.426	0.387
32.637045118432	12.9149580517803	3.01399999943806	30.787	13.166	3.014	1.867
32.637045118432	12.9149580517803	2.9703405765796	31.399	13.754	2.704	6.233
32.637045118432	11.3130000033311	2.9703405765796	33.127	11.313	0.11	2.902
32.637045118432	11.3120000033311	2.9703405765796	31.567	11.313	0.396	7.667
32.637045118432	10.9097613845723	4.20205081276217	32.542	12.126	4.969	1.441
29.8143822727142	10.9097613845723	5.16551603050558	29.451	10.155	5.592	0.94
29.8143822727142	13.0279770104101	5.16551603050558	28.308	15.933	3.524	3.661
29.8143822727142	13.0279770104101	5.16651603050558	31.015	13.036	5.79	5.03
29.8143822727142	13.0279770104101	5.82974267550809	31.177	14.433	6.693	9.897
33.6343893512242	11.9370283445247	5.82974267550808	32.997	11.541	6.26	0.865
33.6353893512243	11.9370283445247	5.82974267550808	32.022	12.126	9.107	7.596
33.6353893512243	11.3373760709511	5.82974267550809	34.135	12.386	7.828	5.584
33.6353893512243	11.3373760709511	5.82974267550809	33.452	11.541	6.941	4.46
33.6353893512243	11.3373760709511	7.76500000001205	33.647	11.313	7.765	0.027
33.6353893512243	11.3373760709511	12.5277715650307	35.166	10.726	7.803	5.004
33.6353893512243	11.3373760709511	12.5287715650306	34.087	8.758	8.639	5.137
33.6353893512243	11.3373760709511	12.5297715650306	34.135	13.686	10.417	4.602
33.6353893512244	11.3373760709511	13.5569602062293	31.632	15.246	15.179	4.737
33.6353893512244	11.3373760709511	13.5569602062293	31.372	12.353	15.396	3.954
33.6353893512245	12.5876038717606	13.5569602062293	35.992	16.314	18.057	6.3
33.6343893512245	12.5876038717606	13.5569602062293	33.095	13.751	14.049	7.425
33.6333893512245	12.5876038717606	13.5569602062293	31.112	15.246	13.662	8.972
33.6323893512244	12.5876038717606	13.5569602062293	28.118	18.092	12.931	9.723
29.1339999103551	12.5876038717606	11.8603244028721	29.134	16.187	10.819	3.747
29.0645322444634	11.0881537235647	11.8603244028721	30.787	11.313	10.711	9.249
29.0511537185106	11.0881537235647	11.8603244028721	28.753	10.79	11.577	0.508
29.0645322444634	14.0038871337142	11.8603244028721	31.762	12.126	11.712	6.006
30.1835450317609	14.0038871337139	15.8881085840104	28.689	18.156	16.722	4.491
30.1835450317609	14.0038871337139	18.7479883035736	29.975	12.061	16.621	7.414
30.1835450317609	14.0038871337139	18.7489883035737	30.657	11.541	18.351	6.88
30.1835450317609	14.0038871337139	18.7499883035737	26.149	11.107	19.141	6.643
30.1835450317609	14.0038871337139	18.7509883035737	32.182	10.98	18.901	7.118
30.1835450317609	14.0038871337139	18.7519883035737	31.61	13.901	20.326	7.404
30.1835450317609	14.0038871337139	18.852754195372	29.975	14.141	17.903	0.982
30.1835450317609	14.0038871337139	19.7270002947199	25.895	12.123	19.556	4.686
30.8159999999932	14.0038871337142	19.7270002947199	30.787	13.426	19.207	9.125
30.8159999999932	15.473000068339	19.7270002947199	31.242	15.473	19.727	0.426
29.5150000002476	16.387893509974	21.6605521758771	29.515	16.505	21.691	0.121
29.5150000002475	12.4827971817391	21.6605521758771	30.594	9.52	26.782	7.585
29.5140000002474	12.4827971817391	21.6605521758771	28.181	12.441	28.249	9.321
28.6817857369587	12.4700000000077	21.6605521758771	22.022	11.361	19.929	6.97
29.6506011333737	12.4700000000077	21.6724889024449	31.242	12.126	17.355	5.83
30.2019999990485	12.4700000000077	21.7260000007894	30.202	12.451	21.726	0.019
32.1200481055725	12.4826145601819	22.4424633194758	29.705	13.393	23.437	8.359
32.1210481055725	12.4826145601819	22.4424633194758	31.827	11.313	19.849	3.091
32.1220481055725	12.4826145601819	22.4424633194758	32.867	11.313	21.273	1.814
32.1220481055725	12.4826145601819	22.4575336271833	33.833	10.282	23.21	9.452
32.1220481055725	12.4826145601819	23.626449866078	28.816	12.25	22.231	9.823
32.1220481055725	12.4826145601819	23.6386779723882	28.372	10.218	25.305	4.687
32.1230481055725	12.4826145601819	23.6386779723882	34.087	11.615	26.904	4.861
33.524999999998	12.5283225362501	24.0860711867769	33.062	12.126	22.872	4.87
33.524999999998	12.5293225362501	24.0860711867769	33.96	10.536	22.989	7.536
33.524999999998	12.5293225362501	24.0860711867769	35.293	11.552	21.184	5.688
33.524999999998	12.734907691171	24.0860711867769	33.322	14.401	29.372	5.546
33.524999999998	14.0760000005646	24.4029999812648	33.907	14.076	24.403	0.382
32.7127165902533	14.1123877091901	24.4029999812648	27.927	10.409	29.559	7.95
32.7127165902533	16.5851726634016	24.4029999812648	31.102	17.775	23.735	2.111
32.7117165902538	16.5851726634016	24.4029999812647	32.944	17.965	22.768	2.152
32.7117165902538	16.5851726634016	25.6207733666567	32.152	15.246	27.742	4.552

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
32.7117165902538	17.079256313317	25.6217733666568	29.007	14.409	30.293	6.619
32.7117165902538	17.079256313317	25.6217733666568	32.022	15.473	29.854	6.4
32.7117165902538	17.079256313317	27.9013553572777	30.202	13.491	28.883	9.735
32.7117165902538	17.079256313317	27.9023553572776	30.787	13.946	28.148	7.399
32.7117165902538	17.079256313317	27.9033553572776	33.095	14.271	36.737	9.731
32.7117165902538	17.079256313317	27.9033553572776	33.515	18.219	27.24	4.061
30.1467436867328	17.079256313317	31.528887838665	32.436	13.231	35.38	5.906
30.1467436867326	17.079256313317	31.529887838665	31.61	17.775	32.188	4.415
30.1467436867335	17.079256313317	33.0370000048545	30.023	17.203	33.037	0.175
30.1467436867335	17.0760003235821	33.0431911221564	30.15	16.06	32.059	8.901
31.29810686403	17.0760003235821	33.0431911221564	24.244	15.997	28.696	8.356
31.3073812815101	17.076000323582	33.7667208551084	31.567	14.661	34.796	2.638
34.429	17.0760003235821	35.413	36.436	17.076	35.413	2.007
34.429	13.4086119928473	35.4130	33.642	10.155	35.22	3.353
32.251	11.7380888124679	36.1450000004894	32.217	11.541	36.145	0.2
32.251	13.4910001411901	38.5379999446273	33.095	13.491	38.538	0.844
32.251	13.4910001411901	38.9770000015703	33.095	13.231	40.765	6.668
32.2499999999998	13.49100014119	38.9770000015703	32.372	14.092	41.845	6.932
32.2499999999998	13.49100014119	38.9780000015703	29.975	11.801	40.794	8.467
32.25	13.49100014119	38.9790000015703	33.322	13.361	37.986	9.946
32.2499999999998	15.7932103541007	38.9790000015703	30.787	13.686	41.698	6.343
32.2499999999998	15.7932103541007	38.9790000015703	34.135	14.726	38.301	3.323
31.2634224307934	15.7932103541007	38.9790000015703	33.96	19.68	39.41	7.146
31.2634224307934	15.7932103541007	38.9790000015703	30.202	13.751	40.213	8.941
31.2624224307934	15.7932103541007	38.9790000015703	32.372	18.537	39.944	3.113
29.1020090793326	15.7932103541007	38.9790000015703	26.149	20.886	38.979	5.887
29.1020090793324	15.7932103541006	39.0250001475702	26.34	17.203	39.025	3.101
29.1020090793324	15.7932103541006	39.0250001475702	31.015	13.296	40.037	5.495
29.1020090793326	14.2868946595911	39.275360056323	27.419	15.044	35.984	7.778
29.1020090793326	14.286894659591	41.6228609149918	25.895	18.918	46.48	7.438
29.1020090793326	14.2858946595917	41.6228609149918	24.308	15.044	33.546	9.423
29.534	13.8159999999922	42.8199123808194	24.371	14.346	43.342	7.57
29.534	13.8159999999922	44.6610295115927	25.578	12.568	43.273	5.855
29.534	13.8159999999922	44.6840000004047	31.015	13.816	44.684	1.481
29.534	13.8159999999923	44.6850000004046	29.642	15.108	43.621	5.237
29.534	13.8159999999922	44.6860000004046	29.975	12.321	39.763	7.85
28.8695239536671	13.3195239530166	44.6860000004046	29.134	13.33	42.125	6.084
28.8695239536671	13.3195239530166	46.7463565823106	27.991	13.647	44.302	2.618
28.8695239536672	13.3195239530166	46.8500000054987	28.499	12.949	46.85	0.524
28.8695239536671	13.3195239530166	48.7320000002316	27.737	16.251	47.666	9.503
28.8695239536671	13.3195239530166	48.7320000002316	30.658	10.98	44.543	9.268
28.8695239536671	13.3195239530166	48.7330000002319	25.07	17.076	49.249	5.925
28.8695239536671	17.3464365804642	48.7330000002321	30.657	15.246	48.98	4.816
33.0749303245308	17.3464365804642	48.733000000232	30.785	16.949	44.302	7.677
33.0749303245308	17.346436580464	48.7340000002321	31.483	16.822	46.955	9.589
33.0749303245308	17.346436580464	48.7350000002321	33.388	17.584	48.735	0.393
33.0749303245308	17.346436580464	50.1467165159627	33.642	18.346	49.307	5.973
32.8447718908197	17.346436580464	50.1467165159627	26.594	18.854	52.883	6.988
33.1071897470126	17.346436580464	50.1467165159627	30.982	15.473	49.591	9.722
33.1071897470126	13.8809999999931	50.1467165159627	33.322	13.881	49.4	0.777
33.1071897470126	13.8080	50.1467165159627	33.095	12.971	48.557	2.042
33.1071897470126	13.8070	50.1467165159629	33.907	13.036	49.61	3.305
33.1071897470126	13.8070	50.1467165159629	32.607	11.313	43.742	7.65
33.1071897470126	13.8070	51.4040000004883	36.119	13.139	51.404	3.085
33.1071897470126	13.8070	53.8932623778418	32.944	10.536	54.126	3.833
33.1071897470127	13.8070	53.8942623778418	34.135	14.206	54.088	1.632
32.6900000000005	13.8070	54.4230000000002	32.69	13.52	54.423	0.287
32.6900000000005	13.8070	54.4240000000002	33.322	14.141	54.817	3.297
32.4597548269579	13.8070	54.4240000000002	31.827	14.661	58.532	8.515
32.4597548269579	13.8070	56.9989999521881	31.275	14.173	56.999	1.24
33.8073724120763	13.8070	57.031956537364	29.975	14.401	55.717	4.095
33.8073724120763	13.8070	57.031956537364	32.607	14.661	52.963	4.485
33.8073724120763	13.8070	57.2011553618941	30.658	9.71	56.048	8.685
33.8073724120763	13.8070	57.2021553618941	33.387	11.313	58.128	9.319
33.8307155525406	13.8070	57.7600484464188	36.944	13.012	57.936	3.218
33.8307155525406	13.8070	59.2161181090122	33.96	11.234	59.829	9.284
34.6051338258528	13.8070	59.2171181090122	33.095	14.011	61.011	2.901
34.6051338258528	13.8070	59.8368054032387	32.672	15.246	60.724	2.909
34.6051338258528	13.8070	64.7733495319291	30.594	17.076	65.103	5.185
34.6051338258528	13.8070	64.7743495319293	34.849	11.996	64.173	7.912
34.6051338258528	13.0129405115513	68.044151305259	30.202	12.971	61.507	8.778
34.6051338258528	13.0129405115513	68.044151305259	31.015	12.516	61.408	8.72
34.6051338258528	13.0129405115513	68.7867512196786	35.484	11.425	66.484	2.932
36.0593039010793	13.0129405115513	70.6173051620556	37.452	12.758	72.01	1.986
32.0784351420002	13.0129405115513	70.6173051620556	31.307	11.313	71.461	7.443
32.0784351420002	13.0129405115513	70.5685767080826	32.055	9.837	66.681	5.02
32.0784351420002	13.0129405115515	70.5695767080828	30.202	12.711	66.602	9.036
32.0784351420002	13.2400258119136	70.5695767080828	31.015	12.776	72.117	4.762
32.0784351420002	13.2400258119136	75.7010000003999	32.282	12.126	74.654	3.133
32.0784351420002	13.2400258119136	75.7020000003999	28.626	11.234	75.345	4.284

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
32.0784351420002	13.2400258119136	75.7020000003999	29.975	12.581	76.539	3.034
32.0784351420002	13.2400258119136	75.7030000003999	31.502	12.126	74.715	9.301
32.0784351420002	13.2400258119136	75.7040000003999	32.477	14.433	75.823	7.82
32.0784351420002	13.2400258119136	75.7050000003999	32.087	14.661	75.705	1.421
32.0784351420002	13.1889458444266	75.7050000003999	32.835	12.613	75.794	0.955
31.984127946276	13.1889458444266	75.7050000003999	30.787	12.906	76.252	6.569
30.7869999994829	12.8300000000004	75.9140000029216	30.787	12.646	75.914	0.184
30.737214910106	12.8300	75.9140000029216	29.007	10.282	76.107	4.077
30.737214910106	13.9016410203062	77.1902841482068	31.437	11.541	78.241	2.677
30.737214910106	14.0179999999989	77.7750000104902	30.202	14.271	77.775	0.592
30.737214910106	14.0179999999989	77.8069616307015	32.802	12.126	77.71	6.243
32.8349999861535	14.0179999999989	77.9580000051481	32.835	14.173	77.958	0.155
32.8349999861535	14.0179999999989	78.8574633279508	33.062	15.473	78.089	7.07
33.0814867359956	14.0179999999989	80.8168222946112	32.672	12.353	81.337	8.34
33.0814867359956	14.0179999999989	80.8178222946112	32.152	12.353	82.503	7.264
33.0814867359956	14.0179999999989	83.3498271528995	33.907	13.296	83.348	9.748
33.0824867359956	14.0179999999989	83.3498271528995	33.071	16.187	80.531	6.12
33.0824867359956	14.0179999999989	83.3498271528995	31.015	13.556	83.741	2.877
33.0824867359956	14.0179999999989	83.4000403072234	31.047	11.313	78.28	6.138
33.0824867359956	14.0179999999989	83.4000403072234	34.135	13.166	82.509	1.621
33.0824867359956	14.0179999999989	84.2761983512578	29.388	13.838	84.576	7.053
34.3607540368238	14.008245953259	84.3670005027836	35.42	12.949	84.367	1.498
34.3607540368238	14.0131107840187	84.9506050365868	34.135	14.466	84.176	7.813
34.3607540368238	14.0131107840187	84.9516050365868	34.135	14.986	84.727	7.609
33.3937139955953	14.0131107840187	86.7412689164753	30.34	10.917	88.584	4.723
33.3937139955953	14.0131107840187	86.7412689164753	31.957	11.541	90.999	8.595
30.9291130797032	14.0131107840187	86.7412689164753	32.737	14.433	86.615	4.264
30.9291130797031	14.0131107840187	88.6130134363678	34.135	12.646	86.486	4.083
30.929113079703	14.701	90.5699998479942	32.412	15.246	88.024	8.256
30.9281130797031	14.701	90.5699998479942	32.542	15.473	89.387	5.858
30.9281130797031	14.701	90.5709998479942	31.697	14.433	93.007	8.117
30.9281130797031	14.701	90.5719998479942	29.975	12.841	90.667	8.339
30.9281130797031	14.701	90.5729998479942	31.547	13.203	92.722	3.992
30.9281130797031	14.701	90.5729998479942	32.737	11.541	92.508	5.142
30.721999986042	14.701	90.5729998479942	30.722	15.473	90.573	0.772
30.721999986042	14.701	91.6972466900573	29.975	14.921	90.476	2.292
30.721999986042	11.895703642225	91.6972466900573	26.911	14.409	89.199	5.204
26.0029776286827	11.895703642225	92.1509999826031	23.482	9.52	92.151	3.464
26.0029776286827	11.895703642225	95.8864215570808	25.705	12.123	93.472	8.029
26.0029776286827	11.895703642225	96.1660000051231	27.419	11.298	96.166	1.537
26.0029776286827	11.895703642225	97.1109976735706	29.197	12.441	103.553	7.211
25.4697406865021	11.895703642225	97.1822593130746	22.212	10.091	100.44	4.948
25.4697406865021	11.895703642225	97.1807902532842	28.753	12.949	99.196	9.829
30.5128651410056	11.895703642225	97.1807902532842	29.261	11.425	96.137	8.741
30.5128651410056	12.3209999900421	97.1807902532842	30.527	11.313	94.769	2.614
32.7532449068055	12.3209999900421	95.5679569533666	33.322	12.321	95.076	0.752
32.7532449068055	13.188071185523	95.5679569533666	34.849	13.393	93.121	6.061
30.8503019411869	13.188071185523	95.5679569533665	30.202	14.791	95.605	5.659
30.7274961728284	13.188071185523	95.5679569533665	30.202	13.231	95.497	0.532
30.8503019411869	13.188071185523	97.8610000000009	32.802	15.473	97.861	3.005
30.8503019411869	13.188071185523	97.8620000000009	33.071	18.346	97.156	7.578
30.8503019411869	13.188071185523	97.8620000000009	32.412	12.353	94.929	7.931
30.8503019411869	13.188071185523	97.8630000000009	32.817	17.775	101.585	7.615
30.8503019411869	13.188071185523	98.7931040198028	31.737	12.885	98.954	5.959
30.8503019411869	13.188071185523	98.7931040198028	31.957	14.433	102.967	4.494
30.8503019411869	13.188071185523	100.045	33.322	12.581	100.045	6.265
30.8503019411869	13.0561793221864	102.488610102974	29.515	14.028	97.711	5.055
30.8503019411869	13.0561793221864	103.360000730899	31.177	11.541	103.36	1.55
29.7713382461642	13.0561793221867	103.360000730899	29.975	13.361	103.951	8.8
29.7713382461642	13.0561793221867	103.360000730899	29.388	11.804	105.494	6.15
29.7703382461642	13.0561793221867	103.360000730899	31.372	15.246	104.804	6.866
29.7703382461642	14.1018627660367	103.360000730899	30.202	14.011	102.151	8.617
29.7693382461642	14.1018627660368	103.360000730899	28.753	13.838	102.669	1.257
29.6420000000033	14.1018627660368	105.759114533422	29.642	17.076	106.306	3.024
29.5779999890195	13.4909842432566	105.759114533422	31.293	15.806	105.367	3.238
29.5779999890195	13.4834557776008	105.759114533422	29.578	13.203	105.988	0.362
27.207000671267	13.5192383278206	105.258761658858	26.086	14.663	104.115	1.968
27.207000671267	12.6309990747208	105.258761658858	27.292	16.632	106.393	9.708
27.207000671267	12.6309990747209	108.070065465462	26.022	12.631	109.182	1.625
30.3399999994631	10.9357753308366	108.070065465462	30.34	9.647	108.046	1.289
30.4613456116072	10.9357753308366	108.225159700977	31.275	12.613	107.178	5.931
30.4613456116071	10.9357753308366	109.433866805198	33.095	12.711	107.498	5.532
30.462345611607	10.9357753308366	109.433866805198	30.721	9.329	106.333	3.502
30.462345611607	10.9357753308366	109.433866805198	32.477	11.541	107.287	3.772
30.7402199498492	11.1017012110679	109.699999999999	30.982	12.126	111.418	5.546
32.3470000140984	11.3130000077962	109.699999999999	32.347	11.313	110.138	0.438
34.6660965928282	11.7420000277031	109.699999999999	35.103	10.155	111.634	3.418
34.6660965928282	11.7420000277031	108.928980434773	34.722	11.742	108.413	0.519
34.6660965928282	11.7430000277032	108.928980434773	32.932	12.353	108.278	3.826
34.6660965928282	16.7790820967305	108.928980434773	35.674	11.044	107.474	6.002

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
34.6660965928282	18.1563038353106	109.049999999946	34.595	18.791	106.414	4.79
34.6660965928282	18.1563038353106	109.050999999946	34.722	18.219	109.051	0.084
34.6660965928282	18.1563038353106	111.534655185266	32.309	19.553	108.506	9.666
34.6660965928282	17.0685587474498	111.534655185266	34.135	12.126	105.614	8.535
33.1300357892737	14.4405356898255	111.534655185266	30.975	17.076	111.068	3.584
33.1290357892737	14.4405356898255	111.534655185266	33.452	15.246	111.765	2.23
33.1280357892739	14.4405356898255	111.534655185266	31.047	14.661	110.232	2.465
33.1280357892739	14.4405356898255	113.326421587211	34.135	13.426	109.486	8.117
33.1280357892739	14.4395356898254	113.326421587211	31.015	14.076	113.16	6.371
33.1280357892739	14.4395356898254	113.326421587211	31.632	12.353	111.341	8.922
33.1280357892739	14.4395356898254	115.838305485934	33.907	14.791	115.865	0.855
32.8433857167407	14.4395356898254	115.838305485934	33.907	12.516	116.73	2.372
32.8433857167406	14.4395356898254	117.258477886151	29.975	13.101	114.777	5.333
32.8433857167406	14.4395356898254	117.259477886152	32.217	14.433	117.304	0.628
32.8433857167406	14.4395356898254	119.960438139545	31.991	16.632	118.575	2.73
32.8433857167406	12.8246797613764	119.960438139545	31.502	15.473	118.128	5.299
32.8423857167406	12.8246797613764	119.960438139545	32.087	11.313	118.866	9.723
32.8413857167406	12.8246797613764	119.960438139545	33.322	13.101	119.477	6.817
28.183679761765	12.8246797613764	120.415999998898	28.054	17.013	121.063	8.339
28.183679761765	12.8246797613764	120.415999998898	34.135	13.946	120.705	7.157
28.183679761765	12.8246797613764	120.416999998897	27.927	12.568	120.417	0.363
28.4989369394272	12.8246797613764	121.68740516391	33.322	13.621	122.895	7.179
28.4989369394272	12.8256797613764	121.68740516391	27.673	12.695	125.598	3.999
28.4989369394272	14.6361265832682	122.163343625585	30.594	16.251	121.669	2.691
28.4989369394273	16.4419369433948	125.85399994061	28.943	16.886	125.854	0.628
28.4989369394272	16.4419369433948	125.85499994061	24.371	15.235	126.557	7.737
27.1990000000041	11.9330000477047	126.917000075913	26.594	11.933	126.917	0.605
27.1990000000041	11.9330000477047	135.837203792711	30.462	15.473	131.052	6.788
27.1990000000041	10.7664104833923	135.837203792711	28.372	14.663	135.085	8.657
27.1990000000041	10.7664104833923	135.838203792712	29.007	12.949	137.787	8.697
27.1990000000041	10.766410483392	137.407	29.388	8.313	137.407	3.288
23.3329408169344	10.766410483392	139.125548918364	29.324	15.489	136.921	9.524
23.3329408169344	10.7664104833923	139.126548918364	26.149	15.679	137.044	9.977
23.3329408169344	15.5520000610286	139.126548918364	24.879	19.934	139.42	4.656
13.6849176038662	15.5520000610285	139.76973591447	13.576	14.79	138.325	1.637
12.97217174847	15.5520000610285	141.370673485224	18.466	18.664	140.644	8.295
11.6233265143292	15.5520000610285	141.371673485224	11.163	15.552	141.832	0.651
12.97217174847	15.5520000610285	141.371673485224	18.339	12.631	142.199	6.166
13.6849176038663	17.9630000000817	135.478430442277	17.577	13.647	137.156	6.049
21.5675695577235	17.9630000000816	135.478430442277	20.434	15.806	127.618	8.615
21.5675695577235	17.9640000000814	135.478430442277	20.434	18.537	132.408	8.447
21.5675695577235	17.9650000000814	135.478430442277	25.451	17.965	131.595	5.492
21.5675695577235	28.828688801095	135.478430442277	26.149	27.49	136.669	8.339
21.5675695577235	28.829688801095	135.478430442277	18.72	29.967	135.012	7.58
21.4254543606019	28.829688801095	135.478430442277	18.974	29.967	133.455	3.376
19.7293111107262	28.829688801095	145.770688680695	18.529	30.03	146.971	2.079
19.7293111107262	28.8286888010948	145.770688680695	19.037	28.189	146.557	3.611
19.7303111107261	28.8286888010948	145.770688680695	22.149	29.713	141.818	6.925
26.9458778417227	28.8286888010948	145.770688680695	25.07	30.03	143.44	3.224
28.0079517611122	19.6799998445595	144.120208105017	31.356	19.68	141.631	4.172
28.0079517611122	19.6414917494852	144.120208105017	27.356	18.473	143.695	1.404
31.8373211043177	19.6414917494852	144.120208105017	34.341	21.013	142.761	9.585
31.8383211043177	19.6414917494852	144.120208105017	33.515	20.315	142.968	2.143
30.7638812344264	15.1356286468869	144.120208105017	34.468	20.442	147.277	9.777
30.7638812344264	15.1356286468869	145.195000071177	32.944	15.933	144.54	2.412
30.7638812344262	15.1356286468869	145.196000071177	28.245	14.854	144.187	5.84
30.7638812344262	15.1356286468869	145.197000071177	31.991	14.092	145.487	3.28
30.4289625525906	15.1149625544664	145.197000071177	29.975	14.661	145.197	0.642
30.4289625525906	15.1559999999999	146.742798912309	29.975	13.881	149.391	2.974
30.4289625525906	15.1569999999999	146.742798912309	30.787	14.206	147.62	3.808
32.5787229530066	15.1569999999999	147.74800000673	33.769	15.679	145.826	3.318
33.5820000026584	15.1569999999996	147.74800000673	33.582	15.473	147.748	0.316
33.8013474154395	13.5560005349095	147.768963327048	33.907	13.556	148.567	0.805
33.8013474154395	13.2741179144205	146.804000003514	37.452	10.218	146.804	4.761
33.8013474154395	13.2741179144205	144.535134511009	31.892	12.353	146.679	3.015
33.8013474154395	13.2741179144205	144.534134511009	34.404	14.028	139.514	9.888
33.6991983214668	13.2741179144205	144.534134511009	33.907	12.776	139.011	9.552
33.6991983214668	13.2741179144205	142.406153248426	31.697	11.541	138.673	4.577
33.6991983214668	13.2741179144205	142.406153248426	33.907	14.336	141.111	1.948
33.6991983214668	13.2741179144205	140.664000000116	33.322	15.473	140.664	2.231
33.6991983214668	13.2741179144205	137.640693351345	34.135	11.866	136.659	1.771
33.6991983214668	13.2741179144205	137.639693351345	34.595	11.996	135.081	4.778
33.6991983214668	13.2741179144205	131.883119101001	35.547	11.234	131.369	6.26
33.6991983214668	13.2731179144204	131.883119101001	34.976	10.282	131.121	4.446
33.6991983214668	10.4740460550796	131.883119101001	34.595	9.202	128.931	3.337
31.6039744508455	10.4740460550796	131.883119101001	30.912	9.901	131.507	0.974
31.6039744508455	10.4750460550796	131.883119101001	30.787	12.386	130.829	7.465
31.6039744508455	13.1252922240974	131.883119101001	31.356	16.06	129.885	3.559
31.9729999999999	13.1252922240974	132.630273837637	34.785	12.504	141.232	9.071
31.9729999999999	13.1262922240977	132.630273837637	32.867	14.661	131.697	8.465

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
31.9729999999999	13.1272922240977	132.630273837637	32.347	14.661	129.857	7.755
31.9729999999999	15.4254367970658	132.630273837637	36.436	18.918	131.64	5.753
31.973	15.4254367970659	130.176294057022	33.127	14.661	132.624	2.812
31.973	15.4730000011842	127.6	32.282	15.473	127.6	0.309
31.973	16.6874113894342	127.6	33.515	18.029	124.645	3.593
31.973	18.65256184357	127.6	35.992	13.647	125.389	9.144
31.973	18.65256184357	127.142973287996	33.907	11.996	124.886	7.29
31.973	21.0972487119038	127.142973287996	34.341	22.029	122.727	7.918
31.973	21.0972487119038	127.142973287996	33.907	13.816	122.673	8.76
31.973	23.5291286881463	127.142973287996	32.245	24.887	125.449	2.188
27.2289999994974	23.8549343993538	126.868454358059	27.229	26.22	125.044	2.987
27.2279999994975	23.8549343993537	126.868454358059	25.895	29.903	127.854	9.341
20.9121969284378	23.8549343993537	126.868454358059	19.037	26.982	129.54	6.169
20.9111969284376	23.8549343993537	126.868454358059	18.974	24.569	127.812	2.27
20.9111969284376	23.5089873003293	126.294	18.593	21.648	126.239	9.517
21.5696706448751	23.5089873003291	126.294	21.577	21.394	126.294	2.115
21.5696706448751	23.5099873003293	126.294	20.371	23.045	124.747	6.483
21.5696706448751	26.8187463812961	121.003514701477	27.927	28.125	119.109	6.761
17.6409999998907	26.8187463812961	121.003514701477	18.72	28.189	115.769	7.716
17.6399999998905	26.8187463812961	121.003514701477	17.64	27.998	119.961	1.574
17.6399999998905	19.112042410283	121.003514701477	18.91	22.474	122.979	4.101
13.6330432994011	18.0230732989066	122.346956769327	11.735	20.378	116.222	7.485
13.6320432994008	18.0230732989066	122.346956769327	11.481	17.711	124.498	3.058
15.6979820678401	18.0230732989066	118.97643428072	20.561	23.553	119.319	7.372
19.9899999985393	18.0230732989066	118.97643428072	19.99	18.029	118.966	0.012
22.4492820999593	18.0230732989066	118.97643428072	27.102	18.664	121.623	5.391
22.4492820999593	16.2139188517917	118.97643428072	25.133	19.235	120.496	5.738
22.4492820999593	16.2129188517917	118.97643428072	22.149	14.282	119.226	1.97
27.5056350689065	16.2129188517917	116.943	25.197	12.441	114.729	9.295
27.5056350689065	16.2139188517917	116.943	20.498	17.457	115.048	7.365
28.6496999407501	18.7909992957717	116.943	29.578	18.791	116.421	1.065
28.6496999407501	19.0339101771321	116.943	27.229	15.362	116.263	4.245
27.927	19.033910177132	116.943	26.276	20.188	119.025	3.614
27.9270000000002	21.458	116.943	27.927	21.458	117.97	1.027
27.9270000000002	21.459	116.943	26.911	24.76	115.286	7.931
27.9270	23.6982549110948	113.458	28.88	25.331	116.966	8.431
27.9260000000002	23.6982549110948	113.458	30.277	30.475	112.299	7.266
26.4650	23.9980003312642	113.458	24.308	23.998	113.458	2.157
27.545935567031	23.9980003312642	107.208493210403	28.753	23.998	106.929	1.239
27.5459355670309	24.6304610181512	107.208493210403	27.165	25.458	104.784	2.59
27.5459355670308	27.6116868648451	107.208493210403	28.943	30.475	107.548	3.204
20.786618693726	27.6116868648451	100.300101271471	22.276	28.125	102.29	2.538
20.5609912812742	27.6116868648451	100.300101271471	18.91	28.697	98.028	3.011
20.5609912812743	25.7759999984093	96.2419999999934	20.561	25.776	90.646	5.596
20.5599912812742	25.7759999984093	96.2419999999934	19.545	25.839	93.739	4.367
14.4432847543036	25.7759999984093	96.2419999999934	17.577	25.204	95.05	4.26
14.4432847543036	20.5049999999999	96.2419999999934	12.243	20.505	94.648	2.717
14.4432847543036	20.5049999999998	101.987549899956	18.148	16.505	99.59	6.09
17.9228175357852	20.5049999999998	101.987549899956	11.608	20.251	101.424	6.345
23.7111877706097	20.5049999999999	101.987549899956	17.323	21.331	107.01	8.168
24.4004814928085	20.505	101.987549899956	16.688	18.092	103.09	8.156
24.4014814928087	20.505	101.987549899956	24.879	20.632	106.077	4.555
27.2290000028222	19.7862069158665	101.987549899956	27.229	19.616	102.004	0.171
27.693612083214	23.0619503328253	101.987549899956	25.832	23.68	109.484	9.355
27.693612083214	23.0629503328255	101.987549899956	29.07	22.347	101.831	8.48
27.6946120832141	23.0629503328256	101.987549899956	27.991	22.601	101.939	0.551
28.94300013682	25.1554345612742	101.987549899956	28.943	30.03	106.391	6.569
29.1170294379001	25.1554345612742	101.3481534028	27.229	27.554	96.447	5.774
29.1170294379001	22.5539705633971	96.3340000005942	29.134	22.537	96.334	0.024
26.0470000000023	22.9376208574994	94.5350002733931	25.006	24.188	94.535	1.627
26.0470000000023	22.9336291908334	91.4139999973617	26.149	23.172	91.657	0.891
26.0470000000021	20.3582273318157	91.4139999973617	24.943	18.791	91.664	4.875
26.0470000000021	20.3582273318157	91.4129999973617	25.832	16.949	91.413	3.416
26.0470000000021	20.3582273318157	90.5623225296404	24.752	19.362	96.308	9.904
26.0470000000023	20.7589999956679	90.4259999803037	25.895	20.759	90.426	0.152
26.0950458556888	20.7877382538399	90.4259999803037	28.054	22.918	87.821	3.972
26.0950458556888	20.7877382538399	86.1470814662749	28.245	22.855	90.204	6.887
27.0159526771502	20.7877382538399	86.1470814662749	27.546	22.537	91.326	5.492
27.0159526771502	20.7877382538399	79.7311130933518	27.737	18.664	80.683	7.927
27.0169526771502	20.7877382538399	79.7311130933518	26.721	18.283	80.536	8.04
27.0317928713088	20.7877382538399	79.7311130933518	32.182	16.632	75.383	9.605
27.0317928713088	20.7877382538399	79.7311130933518	28.816	21.902	78.963	4.368
27.0317928713088	20.7877382538399	79.7311130933518	30.787	14.466	78.121	9.289
27.0317928713088	20.7877382538399	79.7311130933518	29.975	13.621	83.535	8.631
27.0317928713088	21.0359143246412	79.7311130933518	27.102	21.648	79.965	0.659
28.7807171500558	23.4547170557742	79.7174962619403	32.118	27.3	81.725	5.473
28.7807171500558	23.4547170557742	76.0340000978202	31.356	26.03	76.034	3.642
28.7797171500557	23.4547170557742	76.0340000978202	26.911	22.601	75.564	7.439
28.7797171500557	23.4547170557742	70.9264431200664	23.482	22.41	74.725	8.804
27.7714569633012	19.1875529734744	70.9264431200665	26.848	19.743	76.594	9.863

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
27.7704569633011	19.1875529734744	70.9264431200665	22.974	17.711	70.862	5.019
27.7724569633012	19.1875529734744	70.9264431200665	27.483	19.616	74.587	4.477
29.6966927174529	19.1875529734744	70.9264431200665	30.531	18.664	72.004	6.676
29.6976927174529	19.1875529734744	70.9264431200665	33.261	18.537	71.995	7.388
29.6986927174532	19.1875529734744	70.9264431200664	30.785	16.251	71.611	3.205
29.6986927174532	19.1875529734744	67.9997169449203	29.705	19.426	70.279	2.488
29.6986927174532	19.1875529734744	67.9987169449203	31.762	15.473	67.554	7.919
29.6986927174532	19.1875529734744	67.9977169449205	34.087	18.918	64.082	9.955
29.6986927174532	19.1875529734744	67.9977169449205	31.356	22.347	59.353	9.352
29.6986927174532	17.604225362473	67.9977169449205	31.991	17.203	67.188	2.464
29.6986927174532	16.0058192489929	67.9977169449205	29.261	19.172	68.315	3.212
29.6986927174532	16.0048192489928	67.9977169449205	31.356	16.251	69.04	5.882
29.6986927174532	13.8044330097297	67.9977169449205	25.07	11.615	69.179	8.154
29.6986927174532	13.8044330097297	68.331956012374	29.197	13.52	74.598	8.532
29.6986927174532	13.8034330097297	68.3319560123739	28.816	12.568	71.763	3.752
29.6996927174529	13.8034330097297	68.3319560123739	31.307	14.661	68.868	1.899
29.6996927174529	13.8034330097297	68.330956012374	31.437	14.433	67.041	8.72
29.6996927174529	13.122044579003	68.330956012374	27.356	20.632	65.916	8.262
29.6996927174529	13.122044579003	64.1420006474761	30.202	11.996	64.142	1.233
25.7577119662296	14.0905402879283	61.5187792810451	25.832	14.219	61.701	0.235
25.1970000208246	14.911999999999	59.9318730652938	28.372	13.52	60.757	4.868
25.1970000208247	14.9119999999991	59.3540000000052	25.197	18.918	59.354	4.006
25.1970000208247	12.8347236327313	56.1783133834125	24.308	16.441	56.035	3.717
22.0850013828158	11.8493135260005	56.1783133834125	22.085	10.853	55.182	1.409
22.0850013828158	11.8493135260005	56.1807001880382	28.626	10.091	52.872	7.98
22.0850013828158	11.8493135260005	56.8648818705877	22.276	13.393	54.239	3.052
22.0850013828158	15.8393539152184	56.9605681353544	18.466	17.838	58.207	4.44
22.0850013828158	16.0168020099278	64.0334877890231	24.943	18.346	64.008	3.687
19.9674185821479	16.0168020099278	64.3643355333737	21.831	13.203	64.85	7.88
19.9674185821479	16.0168020099278	64.3643355333737	28.753	13.457	65.491	9.22
19.9042540364242	16.0168020099278	64.3643355333736	19.418	13.901	64.222	6.882
17.2408927557825	16.0168020099278	65.3478024091704	17.323	12.504	65.716	3.533
14.2929295219915	17.9650000000002	71.7248800798965	13.005	20.061	68.646	3.941
14.2929295219913	17.9650000000002	73.6039071303493	11.862	17.965	73.909	2.45
14.2929295219913	22.0038367916842	73.6039071303493	17.45	21.902	76.475	6.347
14.2929295219913	27.9595140133024	73.6039071303493	19.863	21.331	75.529	9.178
14.2939295219913	27.9595140133024	73.6039071303493	19.164	24.696	74.306	8.537
17.605687296511	27.9595140133024	73.6039071303493	17.64	27.49	72.733	0.99
21.9580008353051	28.4149001006009	73.6039071303493	21.958	29.395	74.461	1.302
25.0939999999999	28.4149001006007	73.6039071303493	24.562	26.982	72.259	7.031
25.0939999999999	28.4149001006007	73.6039071303493	27.546	26.982	70.094	8.192
25.0939999999999	27.9980000146381	73.6039071303493	24.943	23.68	69.938	9.291
25.0939999999999	27.9980000146381	69.5219999947579	25.832	27.998	69.522	0.738
25.0939999999999	27.9980000146382	67.4226644760361	22.466	28.887	64.369	7.763
19.7891478521145	27.9980000146382	67.4226644760361	18.72	30.665	66.986	3.298
19.7881478521145	27.9980000146381	67.4226644760361	22.022	28.443	62.892	5.071
19.0503798118863	24.7672999721307	63.3220000001498	17.45	24.188	63.322	1.702
26.8661608413124	24.7672999721307	63.3220000001497	18.974	24.125	61.119	8.219
26.8661608413124	24.7672999721308	57.6099997853221	27.102	25.966	59.543	2.428
27.5381101576277	24.7672999721308	57.6099997853221	28.499	25.141	57.61	1.031
27.5381101576277	24.7662999721308	57.6099997853221	26.086	24.95	59.469	5.746
27.5381101576277	24.6162178895082	57.6099997853221	25.07	27.744	59.542	6.389
27.5381101576277	24.6162178895082	57.6099997853221	28.88	27.3	58.991	4.959
27.5381101576277	24.6162178895082	52.5859999965391	24.244	21.077	52.586	4.835
28.5127528222307	25.0690948646305	51.1518348038258	28.753	24.379	51.035	0.74
28.5127528222307	25.0690948646305	46.3415218213486	30.785	20.823	44.268	6.267
28.5127528222307	25.0700948646307	46.3415218213486	27.8	23.617	42.03	6.658
28.5127528222307	25.0710948646305	46.3415218213486	29.261	23.045	43.901	3.259
28.5127528222307	26.2199999229497	44.6205236679334	33.642	26.22	42.336	5.615
26.0859999965899	26.6357617186353	44.6205236679334	26.086	29.903	39.661	5.939
17.7154164371311	26.6357617186352	47.4205791022195	17.069	27.744	45.218	2.549
17.7154164371311	26.6357617186352	51.791583460665	17.069	27.046	52.438	1.002
18.3022912915558	20.5200414081119	51.791583460665	20.117	21.775	51.546	2.22
18.3022912915558	20.4230066687716	45.9474866447333	17.323	23.934	50.146	5.56
18.3022912915558	20.4230066687716	45.2675370149665	17.64	22.918	47.209	3.23
18.3022912915558	20.4230066687715	45.2665370149666	19.609	18.156	48.051	3.821
18.3022912915557	18.1589999999998	45.2665370149666	12.052	18.854	46.124	6.347
19.8356761432841	18.1589999999998	41.8673876189684	18.021	13.52	41.784	4.982
20.2439983520442	18.1589999999998	41.8673876189682	20.561	18.219	35.874	9.121
20.2439983520442	18.1589999999998	37.6459999684371	20.244	11.234	37.646	6.925
20.2439983520442	18.1589999999998	36.5052923442417	18.212	18.283	36.255	7.954
20.2439983520442	21.3865961537928	36.5052923442417	19.482	13.076	31.528	9.717
20.3637520455197	24.9393949497451	36.4483687344325	20.561	24.696	36.269	0.361
25.7049999998201	26.0089999999999	32.4959999999443	25.705	26.22	32.496	0.211
28.4489999999998	23.3608835743965	32.4959999999442	29.261	22.283	32.908	1.411
28.4489999999998	23.3608835743965	29.0149999997406	31.293	23.68	29.18	6.085
28.4489999999995	21.0129999982572	29.0149999997406	28.689	21.013	29.015	0.24
28.4489999999998	20.2533330444893	29.0149999997406	25.832	22.918	24.535	6.514
28.4489999999998	20.2533330444893	28.491520679617	26.022	21.902	22.93	6.288
27.1673330444762	20.2533330444893	22.418	28.626	22.791	23.223	9.57

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
27.1673330444762	20.2533330444893	22.4170	26.975	20.061	22.417	0.272
28.4695988498337	20.2533330444893	22.0435110093992	27.864	18.854	16.375	5.87
28.4695988498337	20.2533330444893	18.1950000229531	28.245	21.331	19.247	3.596
28.4695988498337	25.6195988427621	18.1950000229531	29.007	26.157	18.195	0.76
25.3163977873657	25.6195988427621	17.8334005193003	21.958	24.76	23.638	6.761
25.3163977873657	23.1604622466053	17.8334005193003	20.942	25.649	17.701	8.469
22.7173991100213	23.1604622466053	17.8334005193003	22.974	25.141	19.537	2.625
19.5559716821433	21.9639925575481	17.8334005193003	19.482	21.966	17.833	0.074
19.5559716821433	21.963992557548	15.8419999997478	17.64	23.426	22.454	9.913
12.4131335134407	19.9771335138673	15.8419999997478	12.37	19.934	15.842	0.061
12.4131335134407	21.9639925575482	15.8419999997478	13.513	22.41	17.465	8.854
15.3926784285691	24.6731645792738	15.8419999997478	16.497	24.315	17.876	2.342
16.27	24.6731645792738	10.968	16.37	26.982	10.968	2.311
16.27	15.8989664111516	10.9680	24.625	19.68	11.726	9.202
16.27	14.155	8.671	18.466	14.155	8.671	2.196
16.27	6.66707509894719	8.67100	20.434	13.012	7.24	7.723

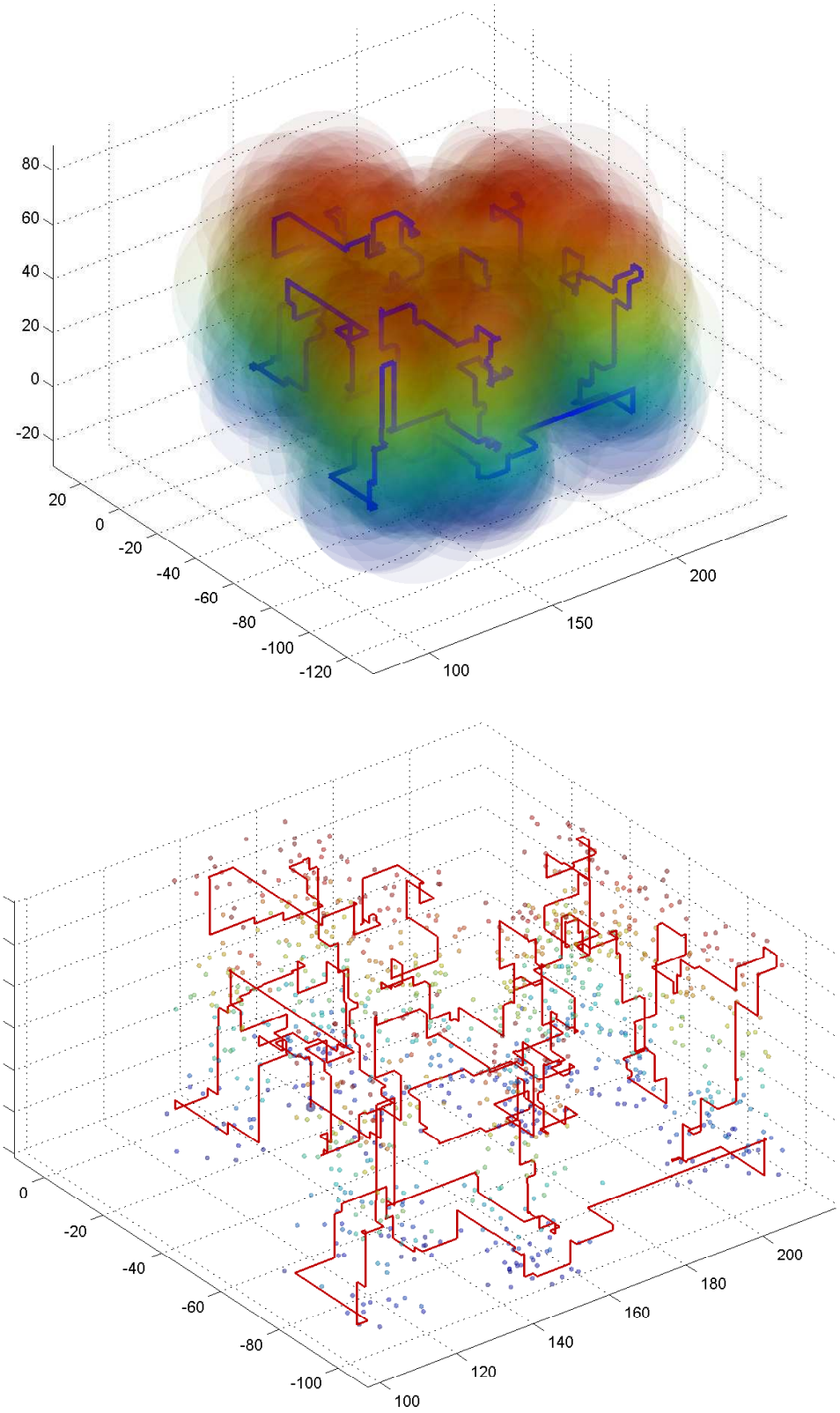


Figure N.208: $dsj1000$, arbitrary radius, 3D, Manhattan, Length = 2303.0686450

Table N-211: Solution for $dsj1000$, arbitrary radius, 3D, Manhattan

Total distance: 2303.06864501282 Depot: x 47.1287 y 11.9659 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
47.1287	11.9659	2.05479999996967	42.7704	10.2739	1.2183	5.5443
47.1287	11.9669	2.05479999996971	58.6741	1.1796	4.0744	18.8015
47.1287	11.9669	2.05479999996971	54.5841	1.3	6.274	17.8466
47.1287	11.9669	2.05479999996971	42.4139	3.5597	1.814	13.287
47.1287	11.9669	2.05479999996971	47.4524	12.1509	5.76	13.8821
47.1287	11.9669	2.05479999996971	55.8132	15.4408	3.6174	11.5975
47.1287	11.9669	2.05479999996971	44.2621	15.3855	4.7212	17.5289
47.1287	11.9669	2.05479999996971	54.0368	23.8586	2.2143	14.1498
46.7572	16.5425999999854	2.0547999999697	46.503	16.5426	2.0548	0.2542
46.7572	32.7247271045247	2.05479999996984	42.8212	36.4305	1.5446	19.4237
46.7572	32.7247271045247	2.05479999996984	54.8257	29.6059	7.5612	17.9639
46.7572	32.7247271045247	3.78257429454752	44.1303	30.8739	2.5661	4.2334
46.7572	35.1120415389091	3.78257429454752	45.6407	35.658	2.8521	25.0567
46.7572	35.1120415389091	3.78257429454752	43.7884	36.8808	19.8614	16.446
46.7572	36.3838223528586	11.2292999996064	45.4903	38.3462	11.2293	2.3358
49.8777385438989	32.4506370329863	12.8419234032134	37.4272	33.8061	3.3013	15.7441
49.8777385438989	32.4506370329863	12.8419234032134	57.9508	29.6187	7.6435	14.7612
49.8777385438989	32.4506370329863	12.8419234032134	44.3651	39.5082	4.2576	12.4052
49.8777385438989	32.4506370329863	12.8419234032134	49.5432	29.0024	13.3417	8.1871
49.8777385438989	32.4506370329863	12.8419234032134	45.4526	36.121	9.3446	8.6374
49.8777385438989	32.4506370329863	12.8419234032134	50.3723	32.2399	19.4829	6.6627
49.8777385438989	32.4506370329863	12.8419234032134	50.3352	41.2014	16.9793	12.9522
51.1732862464531	27.465791811928	12.8419234032134	54.5895	27.7676	11.1642	3.8179
51.1732862464531	23.5529991397142	18.5463758065572	53.2794	21.4994	19.0176	2.9791
51.1732862464531	21.7321066672663	18.5463758065572	53.4554	15.0784	17.1477	7.1719
51.1732862464531	21.7321066672663	21.343815211269	49.9971	19.9155	18.5508	3.9588
51.1732862464531	20.0920730139452	21.3438152112689	51.6732	17.1776	23.9169	3.9198
51.1732862464531	20.0920730139452	25.495100789147	53.9046	16.3668	14.1276	12.2702
51.1732862464531	20.0920730139452	25.495100789147	48.0446	14.6778	22.9405	8.8581
51.1732862464531	20.0920730139452	25.495100789147	44.3034	16.6265	25.3299	9.4533
51.1732862464531	20.0920730139452	25.495100789147	55.4854	26.8201	32.387	10.8698
53.3046	19.9328999999947	26.5423000002712	55.9782	19.9329	26.5423	2.6736
52.7928093803202	17.4862865518387	33.5763957870967	52.4859	17.4578	33.7507	0.3541
50.1009558839184	17.4862865518387	33.5763957870967	54.3108	6.5803	34.1725	23.4136
50.1009558839184	17.4862865518387	33.5773957870967	44.7075	13.3055	33.9605	12.6011
50.1009558839184	17.4862865518387	33.5783957870968	46.6598	16.011	21.0885	13.039
50.1009558839184	17.4862865518387	33.5783957870968	51.539	18.7116	33.0294	3.3237
50.1009558839184	17.4862865518387	33.5783957870968	58.5931	27.1316	32.5338	12.8934
50.1009558839184	17.4862865518387	40.7339127630347	40.715	18.8306	21.9165	23.0792
50.1009558839184	17.4862865518387	40.7339127630347	49.1449	22.3659	43.2644	23.3416
50.1009558839184	17.4852865518388	40.7339127630347	52.1655	19.1446	41.5432	15.5087
47.9865099449558	13.5525034705386	40.7339127630347	43.7681	7.8375	35.3656	19.4193
47.9865099449558	13.5525034705386	40.7339127630347	43.7175	13.3612	37.2361	11.2776
47.9855099449558	13.5525034705386	40.7339127630347	48.2378	10.888	40.0435	5.8133
47.9855099449558	13.5525034705386	40.7339127630347	48.9393	11.7496	40.9103	17.8826
47.9855099449558	13.5515034705386	40.7339127630347	55.3647	9.0137	38.8085	9.4748
47.9855099449558	13.5515034705386	40.7339127630347	51.9742	12.9315	39.5168	19.8738
47.9845099449558	13.5515034705386	40.7339127630347	49.2438	-0.5725	42.7886	17.8927
47.9835099449558	13.5515034705386	40.7339127630347	47.5448	13.9665	39.1563	6.8471
47.9825099449558	13.5515034705385	40.7339127630347	46.213	15.3079	43.6977	3.873
47.9825099449558	13.5515034705386	49.7972836305553	47.2642	16.1804	48.1934	3.1622
47.9825099449558	9.60154993612409	49.7972836305553	53.289	-9.6645	34.2743	25.3042
47.9825099449558	9.60154993612409	49.7972836305553	60.4719	1.0667	55.1539	17.5347
47.9825099449558	9.60154993612409	49.7972836305553	33.7832	8.5886	57.2507	17.2676
47.9825099449558	9.60154993612409	49.7972836305553	55.7669	1.6852	42.4618	24.4965
47.9825099449558	9.60154993612409	49.7972836305553	50.9668	1.717	44.4164	23.9816
47.9825099449558	9.60154993612409	49.7972836305553	27.9452	7.0873	43.7392	24.5101
47.9825099449558	9.60154993612409	49.7972836305553	46.3909	8.819	37.7186	24.8054
47.9825099449558	9.60154993612409	49.7972836305553	55.089	27.0379	56.5554	20.8338
47.9825099449558	9.60154993612409	49.7972836305553	45.9242	19.9	29.6168	25.1738
47.9825099449558	9.60154993612409	49.7972836305553	47.3356	31.1656	48.6863	22.3253
47.9825099449558	9.60054993612409	49.7972836305553	50.5069	12.3029	52.6774	19.1593
47.9825099449558	9.60054993612409	49.7972836305553	53.7123	16.59	54.3027	19.1512
47.9825099449558	9.60054993612409	53.1206301513437	53.965	12.2967	46.7771	9.8572
47.9825099449558	6.75603190296211	53.1206301513437	45.5397	7.2979	57.1732	4.7628
47.9825099449558	5.14267953806439	53.1206301513437	44.2937	4.7268	51.9613	3.889
47.9825099449558	5.14267953806439	53.1206301513437	47.6091	10.2274	48.878	11.8474
47.9825099449557	3.40655648629687	53.1216140098706	25.8989	0.7413	53.4706	22.2466
47.9835099449558	3.40655648629687	53.1216140098706	44.3097	5.4051	59.4302	11.9467
47.9845099449558	3.40655648629687	53.1216140098706	43.0131	-4.6452	57.9101	20.9992
47.9845099449558	3.40655648629687	53.1216140098706	36.4279	-4.3699	52.432	20.2708
47.9855099449558	3.40655648629687	53.1216140098706	31.0065	-1.0714	59.1851	23.9753
47.9855099449558	3.40655648629687	53.1216140098706	30.7839	5.7178	56.2846	20.1469
47.9865099449558	3.40655648629687	53.1216140098706	54.4331	-6.2551	57.3764	16.56
47.9865099449558	3.40655648629687	53.1216140098706	46.8369	6.4403	54.1626	14.1993
51.2900999981285	3.40655648629687	53.1216140098706	51.2901	7.6487	52.6277	4.2708

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
51.8362999999147	2.93588871719223	53.1216140098706	49.309	3.6922	59.7251	20.878
51.8362999999147	2.93588871719223	53.1216140098706	52.2056	3.4977	49.7426	20.8953
51.8362999999147	2.93488871719223	53.1216140098706	51.8363	2.0767	53.9783	1.2126
53.6660785368666	2.93488871719223	50.3131730443674	54.7597	1.1902	50.9644	4.007
53.6660785368666	2.93488871719223	50.3131730443674	56.6229	3.2945	52.4352	3.6572
55.5508000001613	3.40099903555264	50.3131730443674	58.6318	9.4344	53.4701	7.474
55.5508000001613	3.40099903555267	45.212971257205	57.3839	0.9502	46.0215	3.1655
55.5508000001613	3.40099903555267	45.211971257205	56.514	2.6652	55.8183	22.7885
55.5508000001613	3.4643	45.211971257205	58.2987	1.8222	52.9601	22.9315
55.5508000001613	3.4643	45.211971257205	54.6465	1.327	47.163	23.7327
55.5508000001611	3.4643	45.210971257205	60.4167	1.4088	44.4464	18.4179
55.5508000001611	3.4643	45.210971257205	61.565	4.5717	36.954	20.8967
55.5508000001611	3.4643	40.686100000408	55.5508	6.709	40.6861	3.2447
55.5508000001611	3.4643	40.6851000004077	63.4243	4.3429	39.6925	22.7299
56.8938	1.76600000000713	39.3982000006645	47.7278	5.7114	59.7593	28.1097
56.8938	1.76600000000713	39.3982000006645	62.5325	1.766	39.3982	5.6387
56.8938	1.76600000000725	39.3357	53.4617	5.8056	38.0578	21.7012
52.8937000000024	1.33899999925195	39.3357	52.8937	1.339	38.4463	0.8894
52.8927000000023	1.33899999925195	39.3357	53.412	-4.2453	38.3008	16.6165
48.2153001088537	1.33899999925195	39.3357	51.32	11.9016	40.4537	29.8963
48.2153001088537	1.33899999925195	41.2184123097974	28.6989	1.5656	37.4478	19.8786
48.2143001088537	1.33899999925195	41.2184123097974	49.5265	1.5006	43.2383	5.684
48.2143001088537	1.33899999925195	41.2184123097974	50.2911	5.2466	39.9878	6.9728
42.2636001064259	1.33899999925195	41.2184123097974	42.4155	0.0668	38.5675	2.9443
42.2626001064259	1.33899999925195	41.2184123097974	33.4349	0.0139	45.2628	13.2105
42.2626001064259	1.33899999925195	41.2184123097974	40.2323	12.6508	42.5989	15.4062
40.7016645415488	1.33899999925195	42.7286877991659	39.7266	17.3977	50.5452	17.8866
28.9033886930825	1.33899999925195	56.2003083283141	27.6562	5.4902	56.4427	8.29
28.9033886930825	0.698885526831267	56.2003083283141	22.4229	-2.1641	56.3911	7.0873
28.9033886930825	0.698885526831267	56.2003083283141	27.3755	-1.0984	56.1861	2.359
28.9033886930825	0.698885526831267	56.2003083283141	31.1391	0.2266	57.7289	2.8236
35.5382000000574	7.95870769282615	56.2003083283142	36.7928	9.6586	58.8057	12.2244
35.5382000000574	7.95870769282615	56.2003083283142	45.9074	18.6439	58.1761	15.0199
35.5382000000574	31.036317753336	58.1049177533855	40.9959	37.9409	51.1587	12.8365
35.5392000000575	31.036317753336	58.1049177533855	35.5392	31.6783	58.7469	0.9079
44.6027999999766	29.9318999999807	50.2741	44.6028	29.9319	49.9927	0.2814
51.7431184823994	29.9318999999807	50.2741	53.8796	31.7093	51.2249	3.1598
51.7431184823996	28.2489000001888	51.5259184825923	52.7074	28.2489	52.4902	1.3637
51.7431184823996	27.3366564218869	51.5259184825923	46.003	37.4534	46.4333	29.0578
51.7431184823995	27.3356564218874	51.5259184825923	55.1607	27.7715	51.8295	18.2237
50.6830206588601	27.3356564218874	49.732584942072	45.9581	33.5048	45.1742	9.009
50.6830206588602	25.1860000001017	48.6887671769692	50.8742	24.2729	53.2264	23.767
49.9483671771071	25.1860000001018	48.6887671769692	50.1386	26.6573	56.0437	9.4164
49.9483671771071	25.1860000001018	48.6887671769692	48.493	25.186	47.2334	2.0582
50.7019907339858	25.0180634517359	58.9569853504886	47.4152	28.2569	57.2588	4.917
50.7019907339858	25.0180634517359	59.3665365485106	52.0827	15.9727	59.9151	11.4211
54.2786000000003	25.0180634517359	59.3665365485106	54.2786	24.4277	59.9569	0.8349
59.8261778097228	25.0180634517359	59.3665365485106	54.7376	29.7596	56.3053	17.0277
59.8271778097228	25.0180634517359	59.3665365485106	56.8778	27.618	56.4108	8.9898
59.8271778097227	33.9048778092716	59.2340000002333	62.0243	36.102	59.234	3.1072
59.3464581959573	33.2346563262048	59.2340000002333	61.1452	36.2851	50.8184	29.605
59.3464581959572	33.2346563262049	54.0565219772911	47.4903	33.2139	54.5514	11.8665
59.3464581959572	33.2346563262049	54.0565219772911	60.137	35.2014	51.7925	3.3879
59.3464581959572	33.2346563262049	54.0565219772911	60.8351	33.4935	47.8851	6.3537
63.1387845784922	23.7550549187141	54.0565219772912	67.8857	28.9512	53.8343	7.9175
63.1387845784923	23.7550549187141	53.5517999999603	63.3795	20.1125	53.5518	3.6505
63.1387845784922	23.7550549187141	44.7649440828329	58.9981	26.6128	49.6223	10.0374
63.1387845784922	23.7550549187141	44.7649440828329	61.643	23.6955	42.1255	3.0344
63.1387845784922	23.7560549187141	44.7649440828329	59.5552	26.5288	41.5263	17.0515
63.1387845784922	23.7570549187141	44.7649440828329	62.9268	27.0211	37.7555	28.5574
63.1387845784922	23.7570549187141	44.7649440828329	64.1748	30.2745	31.4674	28.016
63.8359467806793	27.3310000010983	44.7649440828329	68.3676	27.331	45.292	4.5622
63.8359467806793	33.3992999999261	44.7649440828329	70.5469	25.0661	53.9959	16.1699
63.8359467806793	33.3992999999261	44.7649440828329	72.7013	43.6681	47.6828	23.6645
63.8359467806793	33.4002999999262	44.7649440828329	60.1802	30.671	38.4138	27.7411
63.8359467806793	33.4002999999262	38.9384	66.7168	38.698	48.2341	29.069
63.8349467806793	33.4002999999263	38.9384	64.8516	39.5774	48.8657	16.3435
63.8349467806793	33.4002999999263	38.9384	64.2784	38.8059	47.0778	29.0239
63.8339467806793	33.4002999999262	38.9384	63.453	34.6286	41.047	7.4277
62.4639999999825	33.4002999999263	38.9384	62.464	33.4003	33.7046	5.2338
51.6173718075015	33.7115000001359	43.9620920147948	51.473	33.7115	46.7085	2.7502
51.6173718075015	37.2278904029186	43.9620920147948	51.7623	34.8081	42.2217	20.8873
51.6173718075015	37.2278904029186	43.9620920147948	54.3132	33.4794	38.814	25.0485
51.6173718075015	37.2278904029186	39.436624164138	51.6292	37.4529	39.3047	0.2611
49.7292997041165	36.1398000000971	39.436624164138	44.7872	36.1398	42.3342	5.7289
49.7292997041165	36.1398000000971	39.436624164138	53.589	37.6567	38.7584	4.7875
49.7292997041165	36.1398000000971	38.4025000761427	48.325	36.101	31.2943	13.1633
49.7292997041165	32.5968	38.4025000761427	50.1654	34.298	41.7388	3.7703
49.7292997041165	32.5968	36.7668999998415	47.9812	30.2306	39.2099	11.8841
49.7302997041165	32.5968	36.7668999998415	47.9603	31.0225	36.0363	3.9403

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
51.0819000000414	32.5968	36.7668999998415	51.0819	30.8837	36.7669	1.7131
51.0819000000414	32.5968	36.7658999998415	58.4334	33.3219	33.0094	26.7455
51.0819000000414	32.5968	36.7658999998415	46.9054	30.8841	31.5685	23.9447
58.0793051740988	32.5968	34.5372039885592	56.2795	36.0371	23.7369	11.477
58.0803051740986	32.5968	34.5372039885592	55.9275	34.3566	30.6301	23.3784
61.192651629669	34.2269647069739	26.1767135199771	61.1622	34.1592	24.5106	28.1161
61.193651629669	34.2269647069739	26.1767135199771	50.5738	30.8854	25.5173	21.7078
61.193651629669	34.2279647069739	26.1767135199771	58.6228	31.6703	20.587	25.6598
61.194651629669	34.2279647069739	26.1767135199771	61.5106	34.0654	15.2705	10.912
61.194651629669	34.2279647069739	26.1767135199771	60.463	30.4795	30.5011	7.3122
61.194651629669	34.2279647069739	26.1767135199771	60.9493	37.7343	34.646	9.1697
66.4761084051286	34.2279647069739	26.1767135199771	64.9829	35.6055	23.509	27.8112
66.4761084051286	34.2279647069739	23.9877802567842	49.1677	19.2175	6.1526	29.9217
66.4761084051286	34.2279647069739	23.9877802567842	73.6395	46.5004	2.2066	26.6417
66.4761084051286	34.2279647069739	23.9877802567842	75.4748	37.8532	8.3059	28.9661
66.4761084051286	34.2279647069739	23.9877802567842	77.5882	39.4219	14.211	18.0454
66.4761084051286	34.2279647069739	23.9877802567842	73.6428	45.1426	7.6389	25.8084
66.4761084051286	34.2279647069739	23.9877802567842	66.9624	36.7077	4.2616	25.6742
66.4761084051286	34.2279647069739	23.9877802567842	69.1853	30.9522	12.1629	13.139
66.4761084051286	34.2279647069739	23.9877802567842	67.4673	33.2544	9.192	16.5328
66.4761084051286	34.2279647069739	23.9877802567842	66.7818	30.0369	13.8618	10.9633
66.4761084051286	34.2279647069739	23.9877802567842	62.5649	23.4331	22.9907	17.3284
66.4761084051286	34.2279647069739	23.9877802567842	69.5886	28.6002	31.4169	10.8714
66.4761084051286	34.2279647069739	23.9877802567842	67.242	26.9141	23.9429	16.4624
66.4761084051286	34.2279647069739	23.9877802567842	66.5887	34.1226	10.8677	18.4197
66.4761084051286	34.2279647069739	23.9877802567842	67.5765	27.7962	32.158	15.1317
66.4761084051286	34.2279647069739	23.9877802567842	67.7055	32.9993	17.0949	14.8259
66.4761084051286	34.2279647069739	23.9877802567842	63.132	27.7543	33.1939	11.7407
66.4761084051286	34.2279647069739	23.9877802567842	64.2717	31.7627	18.8904	14.3523
66.4761084051286	34.2279647069739	23.9877802567842	72.4429	44.8985	35.9587	21.9495
66.4761084051286	34.2279647069739	23.9877802567842	63.8645	34.3723	36.4179	14.5693
66.4761084051286	34.2279647069739	23.9877802567842	63.5739	32.9982	33.2424	17.0906
66.4761084051286	34.2279647069739	23.9877802567842	70.4096	46.4113	26.9931	21.9243
66.4761084051286	34.2279647069739	23.9877802567842	65.3289	43.5846	33.8262	21.6754
66.4761084051286	34.2279647069739	23.9877802567842	64.4232	44.0581	27.3148	28.7966
66.4761084051286	34.2279647069739	23.9877802567842	58.8785	37.4935	28.0133	17.2077
67.7623819395512	35.5138249131332	27.432971622534	74.5598	39.2546	26.0148	7.8873
67.7623819395512	50.7486465571597	27.432971622534	70.6191	48.182	36.9413	10.2546
67.7623819395512	50.7496465571596	27.432971622534	65.4552	32.6167	36.7679	29.012
67.7623819395512	50.7496465571596	27.432971622534	65.211	38.9167	43.4098	22.6036
67.7623819395512	50.7496465571598	34.9656117905978	67.5609	49.631	28.0783	13.5732
67.7623819395512	50.7496465571597	34.9666117905978	66.949	50.6855	34.7495	0.8443
67.7633819395511	50.7496465571596	34.9666117905978	70.8564	51.5507	32.2844	19.1375
67.7643819395511	50.7496465571597	34.966611790598	67.6648	48.1141	30.5928	12.6345
69.896792418369	50.7496465571597	34.966611790598	70.0624	50.1219	34.6274	0.7325
69.896792418369	51.6101819115307	35.3197081425393	48.6326	32.1618	43.4727	29.9479
69.896792418369	51.6101819115307	35.3197081425393	68.2826	55.0673	33.7791	4.1147
69.896792418369	51.6101819115307	35.3197081425393	67.7991	50.1342	31.512	7.0884
69.896792418369	51.6101819115307	40.6192939324155	68.5789	56.8701	42.2821	16.6688
71.7865325417384	51.6101819115307	40.6192939324155	72.0385	47.603	37.589	19.8624
71.7865325417383	51.6111819115307	40.6192939324155	61.2083	54.3519	23.523	20.9342
71.7865325417383	56.1975740695271	40.6192939324155	69.1689	51.2673	37.9561	13.4858
71.7865325417384	56.1985740695271	40.6192939324155	75.9853	41.4015	43.6031	28.8962
71.7865325417384	56.1985740695271	40.6192939324155	69.8977	54.8286	42.1718	26.5823
71.7865325417382	56.1995740695271	40.6192939324155	71.8327	48.0379	13.6369	28.84
71.7865325417382	56.2005740695271	40.6192939324155	67.4683	58.2291	37.5546	22.4924
71.7865325417384	56.2015740695273	40.6192939324155	68.022	53.7678	15.3935	25.621
71.7865325417382	56.202574069527	40.6192939324155	70.2011	52.705	34.7749	12.1835
73.4121291913103	56.202574069527	45.2128000000074	76.4125	46.981	46.4216	12.1404
73.4121291913103	56.202574069527	45.2128000000074	74.8417	48.5823	43.578	11.9548
73.4121291913103	57.4431285802527	45.2128000000075	73.7963	57.8273	45.2128	0.5433
72.64084213959	55.4030921447332	45.2128000000075	72.0955	52.6394	50.8408	7.0709
72.64084213959	55.4030921447331	51.177528930042	78.0993	54.3894	50.2798	5.6239
72.64084213959	55.4030921447331	51.177528930042	74.4488	50.3129	52.3971	5.5377
72.64084213959	55.4030921447331	51.177528930042	74.3979	53.0985	48.6112	4.2274
72.2043211925365	55.4030921447332	51.1775289300419	73.2401	49.0047	54.3428	19.489
72.2043211925365	55.4030921447332	51.1775289300419	72.9378	43.4347	40.5471	22.409
70.6866452616812	55.4030921447332	51.1775289300419	73.3859	52.8201	55.9097	15.2561
70.6866452616812	55.4020921447328	51.1775289300419	69.2681	55.3133	57.276	27.1365
70.6866452616812	55.4010921447328	51.1775289300416	72.0304	52.5053	58.0692	20.8079
70.6866452616812	55.4010921447328	51.6311023474887	77.8264	55.5164	53.7679	14.0686
70.6866452616812	55.4010921447328	51.6311023474887	66.2863	51.2705	54.2569	7.8797
70.6866452616812	54.565125396102	51.6311023474887	65.7303	47.3671	58.4265	12.9967
70.6866452616812	54.565125396102	51.6311023474887	70.1179	52.2878	46.5219	5.6226
70.6866452616812	51.8752000004314	51.6311023474887	69.4154	51.8752	55.6067	4.1739
70.6866452616812	46.0346999993861	51.6311023474887	67.4955	46.0347	52.8305	3.4091
70.6866452616812	45.5304341909374	40.0456520897293	70.5497	45.0925	44.08	13.3393
71.7129700702308	45.5304341909374	40.0456520897293	77.9078	47.2474	41.2613	6.5423
71.7129700702308	45.5294341909374	40.0456520897293	80.0004	48.0282	43.1849	9.8035
71.7129700702308	45.5294341909374	40.0456520897293	79.533	47.2684	42.1428	8.9398

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
74.5922854898497	45.5294341909374	33.6559936488858	72.4926	42.7909	40.5929	23.9047
77.9222999992294	45.5294341909374	33.6559936488858	77.9223	44.6051	30.7678	3.0325
81.9059000001129	45.5294341909374	33.6559936488858	78.2967	50.1808	43.2865	11.8299
81.9069000001129	45.5294341909374	33.6559936488858	92.1801	41.0349	29.4683	29.4376
81.9069000001129	45.5294341909374	33.6559936488858	73.8072	55.2741	29.1095	22.0263
81.9079000001127	45.5294341909374	33.6559936488858	87.5129	47.9594	27.6836	13.3149
81.9079000001127	45.5294341909374	33.6559936488858	81.9079	40.1742	36.8216	6.2209
81.948462503074	45.5294341909374	22.5926948283855	75.5587	49.1352	25.3998	7.8556
85.056922071105	45.5294341909374	22.5926948283855	95.46	44.379	21.4845	10.525
85.056922071105	45.5304341909373	22.5926948283855	89.3464	46.1786	22.3858	28.4968
85.056922071105	45.5314341909372	22.5926948283855	87.8413	47.1867	25.6907	18.3729
83.5075999998845	50.7059184563683	22.5926948283855	83.5076	51.7826	22.7284	1.0852
83.5075999998847	50.7059184563683	22.5916948283856	87.1149	58.1702	24.9275	8.6573
79.6475295378104	50.7059184563683	22.4789942216176	80.3964	49.7264	23.6683	1.7131
79.6465295378104	50.7059184563683	22.4789942216176	81.1686	57.7423	31.0101	24.938
79.6455295378104	50.7059184563683	22.4789942216176	76.0043	50.5809	30.4596	29.1787
73.2282999999836	50.7059184563683	22.4789942216176	73.2283	44.0709	14.6285	10.2788
71.1932954087102	50.7059184563683	22.4789942216176	66.0257	55.1875	22.0287	16.5761
71.1932954087102	50.7059184563683	22.7713480078202	76.379	48.6237	27.9163	7.5959
71.1932954087102	50.7059184563683	22.7713480078202	75.5201	48.6107	22.753	10.8007
70.1901901671534	53.3430000001006	22.7713480078202	70.916	53.3608	4.8842	25.4746
70.1891901671534	53.3430000001007	22.7713480078202	69.1565	53.343	39.551	16.8114
70.1891901671534	53.3430000001007	22.7713480078202	70.694	53.8562	23.1583	5.7549
70.1891901671534	55.3488580456185	22.7713480078203	72.0723	49.2863	13.9841	10.8405
70.1891901671534	57.8540047271725	20.7322771717926	69.9782	57.1009	12.9468	18.2604
70.1891901671534	57.8550047271725	20.7322771717926	73.6611	50.4924	3.9757	19.7557
70.1891901671534	57.8550047271725	20.7312771717927	71.8965	50.0142	14.8598	19.3441
70.1891901671534	57.8550047271725	20.7312771717927	71.2619	53.5794	21.4252	11.3066
70.1891901671534	57.8550047271725	20.7070000000496	70.1344	58.5671	20.707	0.7142
70.1891901671534	57.8550047271725	6.01175152421196	72.9198	44.5581	6.5665	29.4271
70.1891901671534	57.8550047271725	6.01175152421196	70.6462	49.6735	6.8503	27.2687
70.1891901671534	57.8550047271725	6.01075152421187	73.5268	49.2611	4.4383	16.8647
70.1891901671534	57.8540047271725	6.01075152421187	67.8488	53.6384	2.957	21.5605
70.1891901671534	48.4876	6.01075152421187	70.7664	48.6137	12.8047	19.7705
70.1891901671534	48.4866	6.01075152421187	71.0505	50.768	8.8572	14.6692
70.1891901671534	48.4856	6.01075152421187	73.911	51.0144	2.5794	19.7234
70.1891901671534	48.4846	6.01075152421187	70.5527	57.3223	8.5137	18.2025
70.1891901671534	48.4836	6.01075152421187	73.2561	47.9132	17.0605	27.6156
70.1891901671534	48.4826	6.01075152421178	68.7356	47.889	4.3235	2.3048
76.224399999919	48.4826	6.71039999999586	75.2757	50.6388	0.889	7.5436
76.224399999919	48.4826	6.71039999999586	76.2244	51.9684	6.7104	3.4858
77.5930217538828	48.4826	6.7103999999959	72.1444	51.2772	8.2689	22.7706
77.5930217538828	45.0468000000812	6.71039999999591	82.0477	53.0979	5.7932	18.2605
77.5930217538828	45.0468000000811	10.5475217533561	77.8794	45.0468	10.8339	0.405
77.5930217538828	42.7228999998775	10.5475217533561	79.9479	46.2913	1.0177	20.0233
77.5930217538828	42.7228999998775	10.5475217533561	77.6289	48.4559	5.3003	16.6228
77.5930217538828	42.7228999998775	0.447	80.8076	41.6004	10.0065	22.8911
77.5930217538828	42.7228999998775	0.447	75.9022	40.5634	8.2476	19.0711
75.7300000004598	42.7228999998775	0.447	75.73	42.7229	0.0066	0.4404
69.348890928692	40.8836918125829	0.447	68.0366	38.8903	2.9918	3.4888
58.4304	40.8836918125829	1.19490000008382	72.7757	56.7077	5.4576	24.2193
58.4304	35.248	1.19490000008381	58.126	35.24	1.1949	0.3044
59.937735164798	32.4314146916573	6.35682365616552	63.2951	31.2899	8.2512	4.0204
59.937735164798	28.8149694230845	6.35682365616552	62.6603	37.129	7.3175	12.7997
59.937735164798	28.8149694230845	7.27946289840901	70.1037	27.3839	19.7642	17.3373
63.7945555749265	28.8149694230845	7.27946289840901	72.6191	32.6684	16.6889	20.9501
63.7955555749265	28.8149694230845	7.27946289840901	68.3701	31.308	4.6701	5.8267
68.9457889970693	28.8149694230845	7.27946289840901	68.2062	28.5319	10.0866	2.9167
70.0385252931542	28.8149694230845	7.27946289840901	71.5231	31.8286	8.0149	7.639
70.0385252931542	28.8149694230845	7.27946289840901	67.6588	29.7348	5.9837	2.8615
70.0395252931542	28.8149694230845	7.27946289840901	63.3607	23.5913	11.9128	24.1094
70.0395252931542	28.8149694230845	7.27946289840901	66.7482	27.6121	12.1372	22.4893
73.798900000023	28.8149694230845	7.27946289840901	73.7989	28.6287	7.3132	0.1893
74.2812479963372	32.1432258621049	7.27946289840901	72.2401	34.2889	7.5435	2.9732
83.9119658400988	35.9709330921548	7.27946289840901	85.525	32.0217	10.845	5.5598
83.9119658400988	35.9719330921548	7.27946289840901	79.7169	32.9378	5.3155	5.5373
83.9119658400988	41.8633153558326	7.27946289840901	85.9182	41.843	9.5066	3.5933
89.5286993707771	41.9571588288069	7.27946289840901	89.5287	45.4109	8.5583	3.6829
89.5286993707771	41.9561588288069	7.27946289840901	84.6532	51.7406	11.3965	13.6619
89.5286993707771	41.9561588288069	7.27946289840901	80.8872	43.1227	9.5119	14.1296
93.0644558204239	40.197400821253	7.27946289840901	95.7654	46.8722	1.8076	22.8599
93.0644558204239	40.197400821253	7.27946289840901	89.6611	52.1615	6.6683	14.4321
93.0654558204239	40.1974008212531	7.27946289840901	102.4997	24.4075	19.7902	22.2451
93.0654558204239	40.1974008212531	4.91301828532979	96.6284	43.246	1.131	6.0243
91.4262952250531	36.0648000000206	4.91301828532979	91.1655	36.0648	5.0962	0.3187
94.2388824783336	34.7672019650296	4.58254672989514	86.512	33.4131	7.017	8.2137
96.0990690827425	32.1667999999976	4.58254672989514	96.3928	32.1668	2.4627	2.1401
96.0990690827425	29.9489145871413	4.58254672989514	93.4265	31.4744	1.0443	21.1215
96.0990690827425	29.9489145871413	4.58254672989514	87.5726	32.8781	1.3636	19.8465
96.0990690827425	29.9489145871413	6.65752124443971	85.1876	33.113	2.1197	12.2337

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
96.0990690827425	29.9489145871413	14.0512854130272	96.0238	29.4057	14.5945	0.7719
96.0990690827425	31.5702999997315	14.0512854130272	102.9211	31.879	13.8489	24.191
96.0990690827425	31.5702999997315	14.0512854130272	97.9141	29.0493	9.3885	23.1555
96.3936281538523	31.5702999997315	13.0413985404753	99.272	31.5703	11.7517	3.1541
95.9103398766676	36.7111154954956	13.0413985404753	97.1071	18.8552	9.2302	18.2973
95.9103398766676	36.7111154954956	13.0413985404753	103.8062	50.1176	9.3383	16.2282
95.9103398766676	36.7111154954956	13.0413985404753	95.8598	39.2349	3.852	9.5298
95.9103398766676	36.7111154954956	13.0413985404753	92.634	40.1716	1.8791	17.8594
95.9103398766676	36.7111154954956	13.0413985404753	94.1971	38.0204	14.8005	3.1512
95.9103398766676	36.7111154954956	13.0413985404753	96.2133	40.5576	25.5914	17.1844
95.9103398766676	36.7111154954956	13.0413985404753	93.9129	43.6355	26.629	15.3805
95.9103398766676	36.7111154954956	13.0413985404753	89.1249	38.0318	13.3915	15.9201
95.9103398766676	36.7111154954956	13.0413985404753	89.3668	41.343	14.5671	15.2017
95.9103398766676	36.7111154954956	13.0413985404753	87.5583	39.2312	23.679	14.1099
96.4830268046132	38.8018268045904	13.0413985404753	97.0806	39.3994	12.7921	0.8811
95.4371252581054	38.8018268045904	20.4441286113942	92.8093	39.7693	16.6418	4.7222
95.4371252581054	38.8018268045904	21.6486859519432	94.3087	39.6383	18.4042	5.7437
95.4371252581054	36.8319000002407	21.6486859519432	91.9372	36.8319	23.3371	3.8859
95.4371252581054	24.8487213997985	21.6486859519432	90.6179	26.4649	2.7134	21.9514
95.4371252581054	24.8487213997985	21.6486859519432	92.5592	25.4331	20.672	8.84
95.4371252581054	24.8477213997986	21.6486859519432	89.0134	41.3658	15.8043	27.9234
95.4381252581054	24.8477213997986	21.6486859519432	90.6435	28.0536	25.8632	9.6928
102.901599999193	24.8477213997986	21.6486859519432	102.9016	24.8202	19.8795	1.7694
102.901599999193	24.8477213997985	31.7407800437624	101.7295	28.4449	56.1482	24.6989
104.913131227247	24.8477213997986	31.7570470422652	104.9423	23.521	33.0938	1.8836
104.913131227247	34.8419000010615	31.44721446369	108.656	34.8419	30.8419	3.7915
98.4032999996976	37.7149427632486	31.44721446369	98.4033	39.6451	29.8224	2.523
98.4032999996977	37.7149427632486	31.44821446369	97.0063	39.6578	31.3742	6.2182
98.4032999996977	37.7149427632486	35.8470001203912	96.8865	41.9997	31.9305	5.9999
97.2604182920381	37.7149427632486	38.7074249727836	103.9916	60.6173	50.4601	27.4308
97.2604182920381	37.7149427632486	38.7074249727836	101.1976	33.4905	53.5496	15.926
97.2604182920381	37.7149427632486	38.7074249727836	103.8959	45.4099	37.4639	16.5891
97.2604182920381	37.7149427632486	38.7074249727836	103.3956	43.6231	38.3961	9.5596
97.2604182920381	37.7149427632486	38.7074249727836	97.0499	25.7334	20.6225	22.9168
97.2604182920381	37.7149427632486	38.7074249727836	99.0228	31.9463	24.4512	24.3368
97.2604182920381	37.7149427632486	38.7074249727836	98.0879	44.5657	15.6818	26.354
97.2604182920381	37.7149427632486	38.7074249727836	93.6487	25.1273	31.9089	25.1293
97.2604182920381	37.7149427632486	38.7074249727836	98.7317	39.6579	27.3708	13.6077
97.2604182920381	37.7149427632486	38.7074249727836	98.3613	42.0392	20.5386	22.2209
97.2604182920381	37.7149427632486	38.7074249727836	95.0864	33.2234	41.4865	27.2565
97.2604182920381	37.7149427632486	38.7074249727836	95.1396	47.3596	38.3213	26.132
97.2604182920381	37.7149427632486	38.7074249727836	90.72	30.049	19.1921	25.9851
97.2604182920381	37.7149427632486	38.7074249727836	93.0102	50.1223	20.798	27.268
97.2604182920381	37.7149427632486	38.7074249727836	90.014	39.915	40.6629	25.9424
97.2604182920381	37.7149427632486	38.7074249727836	88.2545	36.066	42.1212	15.726
97.2604182920381	37.7149427632486	38.7074249727836	87.2346	40.5435	32.6709	24.2659
97.2604182920381	37.7149427632486	38.7074249727836	80.7698	50.729	27.0276	24.0359
97.2604182920381	37.7149427632486	39.2044382144856	96.5473	37.5774	41.1201	13.5522
94.4765617863695	37.1844999994581	39.2044382144856	91.8795	37.1845	41.8015	3.6728
94.4765617863695	37.055641648547	33.0293707378851	93.6941	39.0671	28.969	9.1173
95.5782348908406	33.2653999994932	33.0293707378851	98.9301	33.2654	27.8083	6.2044
95.5782348908406	28.7381812130405	33.0293707378851	97.4429	30.1528	28.42	27.9419
95.5782348908407	28.7381812130405	33.1644274479671	97.5011	28.0267	29.587	4.1233
95.5782348908407	28.7381812130405	33.4232876599122	106.8535	30.7643	14.4546	22.1596
95.5782348908407	28.7381812130405	33.4232876599122	105.5782	30.6326	47.1426	17.6401
95.5782348908407	28.7381812130405	33.4232876599122	105.0575	26.2706	17.0665	21.5332
95.5782348908407	28.7381812130405	33.4232876599122	105.6149	29.5786	27.9356	12.2754
95.5782348908407	28.7381812130405	33.4232876599122	101.5683	27.6266	39.8262	8.8382
95.5782348908407	28.7381812130405	33.4232876599122	103.4615	37.3033	20.8908	18.992
95.5782348908407	28.7381812130405	33.4232876599122	100.6297	27.3107	24.1251	20.9684
95.5782348908407	28.7381812130405	33.4232876599122	98.3241	22.4412	26.657	19.863
95.5782348908407	28.7381812130405	33.4232876599122	97.3283	27.0933	33.194	16.7318
95.5782348908407	28.7381812130405	33.4232876599122	98.5493	33.1624	37.7737	15.8362
95.5782348908407	28.7381812130405	33.4232876599122	97.1838	29.5842	37.1942	15.6415
95.5782348908407	28.7381812130405	33.4232876599122	96.156	30.1327	19.1399	15.6026
95.5782348908407	28.7381812130405	33.4232876599122	99.6903	41.4772	23.4888	20.1453
95.5782348908407	28.7381812130405	33.4232876599122	95.8908	32.6754	36.0409	17.855
95.5782348908407	28.7381812130405	33.4232876599122	96.6051	36.0943	31.9245	18.2734
95.5782348908407	28.7381812130405	33.4232876599122	93.9312	28.9768	31.8553	14.5805
95.5782348908407	28.7381812130405	33.4232876599122	92.7124	33.4453	33.5856	14.4155
95.5782348908407	28.7381812130405	33.4232876599122	93.6083	38.4774	26.0941	16.8124
95.5782348908407	28.7381812130405	33.4232876599122	88.4465	41.4478	32.5802	21.203
95.2653948362165	28.7381812130405	38.6789000001987	92.942	26.4511	38.6789	3.2602
103.9833	29.0085000008133	43.7623999999797	106.1692	29.0085	43.7624	2.1859
103.9833	32.7020491954518	51.1922999999841	104.0844	32.9988	51.1923	0.3135
103.9833	32.7020491954518	53.2460870591079	100.5275	34.9543	58.1047	18.18
103.9833	30.5437129409463	53.2460870591079	106.6895	31.0233	49.137	23.9388
103.9833	30.5437129409463	53.2460870591079	100.384	25.6874	43.9589	21.4485
102.210999999878	30.5437129409463	53.2460870591079	102.211	28.3893	55.4005	3.0468
102.209999999878	30.5437129409463	53.2460870591079	99.0428	19.6959	54.528	17.7192

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
102.209999999878	37.1477075621066	52.6116766042693	98.3827	22.3334	54.4737	15.4136
102.209999999878	37.1477075621066	52.6116766042693	98.5859	34.5756	44.3792	9.3554
102.208999999878	37.1477075621067	52.6116766042693	96.2582	32.5713	56.693	16.7348
96.2085000057911	37.715250019976	51.8903915255955	95.1298	37.6897	58.9361	8.2516
96.2085000057911	37.715250019976	51.8903915255955	96.2085	41.8253	45.162	7.8844
89.0274178501379	37.715250019976	57.5450372384192	85.065	35.2948	58.2863	4.702
89.0274178501379	42.818910808483	57.5450372384192	92.4351	33.0022	54.3205	23.0347
89.0274178501379	42.818910808483	57.5450372384192	91.0332	34.8187	52.6374	16.4532
89.7073691864787	42.818910808483	57.5450372384192	85.8477	60.7859	54.7762	18.5843
89.7073691864787	51.5194807463476	57.5450372384192	93.3823	48.5086	44.2946	29.5211
89.7073691864787	51.5194807463476	57.5450372384192	77.4079	49.147	51.5989	24.2468
89.7073691864787	51.5204807463476	57.5450372384192	102.6402	60.9181	59.3218	29.8857
89.7073691864787	51.5214807463476	57.5450372384192	90.1236	40.724	54.2833	15.0486
89.7073691864787	51.5224807463476	57.5450372384192	92.1982	53.9806	59.5699	4.0431
89.7073691864787	51.5224807463476	56.5868598999271	90.2672	64.2791	51.3539	29.5547
89.7073691864787	51.5224807463476	56.5868598999271	77.9705	58.8491	56.0075	15.3336
89.7073691864787	51.5224807463477	56.5858598999271	90.4784	41.2284	44.1276	19.2596
89.7073691864787	51.5224807463476	56.5848598999272	94.5355	44.3621	59.1041	13.4241
89.7073691864787	51.5224807463476	50.8003769832452	99.0651	51.1078	59.3413	22.694
89.7073691864787	51.5224807463476	50.8003769832452	99.5817	52.1789	51.8005	22.5087
89.7073691864787	51.5224807463475	50.7993769832452	94.5838	45.9916	57.9488	12.3529
89.7073691864787	51.5224807463475	50.7993769832452	96.2485	47.1277	52.4491	17.9146
89.7073691864787	51.5224807463475	39.6646709414427	96.4356	62.0951	55.4366	20.9554
86.9676709413569	51.5224807463476	39.6646709414427	93.3932	53.1876	39.0419	28.8804
86.9676709413569	51.5224807463476	39.6636709414426	85.9154	51.5363	38.6114	1.4882
89.3520000000077	48.5349532693141	39.6636709414425	90.0385	42.8005	44.3862	21.625
89.3520000000077	48.5349532693141	39.6636709414425	86.5983	36.2039	44.7429	13.6175
89.3520000000077	47.8663280855448	39.6636709414426	92.2396	41.0703	39.2658	23.428
89.3520000000076	47.8663280855448	40.2754325090359	89.352	47.1855	40.3099	0.6817
90.7583932850004	48.8684231977712	40.2754325090359	95.0864	47.4256	26.3676	15.4813
90.7583932850004	48.8684231977712	40.2754325090359	94.3452	48.7818	37.6589	4.4406
90.7583932850004	48.8684231977712	40.2754325090359	90.4865	46.0315	39.3528	3.9724
90.7583932850004	48.8684231977712	40.2754325090359	90.3356	51.1932	37.7625	6.8103
90.7583932850004	50.4607115172155	40.2754325090359	100.0845	45.3198	38.3951	20.4175
90.7583932850004	50.4607115172155	40.2754325090359	91.9732	45.8332	46.1527	12.7139
90.7593932850004	50.4607115172156	40.2754325090359	94.4684	44.7163	40.2539	7.0613
90.7603932850004	50.4607115172156	40.2754325090359	93.9444	64.9	44.2206	23.8239
90.7603932850004	50.4607115172156	40.2754325090359	92.9131	56.6287	40.2251	15.0729
90.7613932850004	50.4607115172157	40.2754325090359	95.1558	61.2395	57.4763	27.409
94.8476999957616	50.4607115172156	40.2754325090359	97.7133	51.9341	48.5236	11.5332
94.8476999957616	50.4607115172156	40.2754325090359	94.8477	58.3247	47.7413	10.8435
97.9473592146867	50.4607115172156	40.2754325090359	99.3413	60.508	43.9191	18.4113
97.9473592146867	50.4607115172156	40.2754325090359	95.4289	57.3916	42.7453	14.9929
97.9483592146867	50.4607115172156	40.2754325090359	102.9297	48.0592	51.9744	14.2478
97.9493592146867	50.4607115172156	40.2754325090359	91.1842	48.1207	54.4953	17.5671
97.9493592146867	50.4607115172156	40.2754325090359	89.2688	56.3248	44.4917	12.5008
97.9503592146867	50.4607115172157	40.2754325090359	100.5945	52.9653	41.549	16.0066
97.9503592146867	50.4607115172156	40.2443727750175	98.1036	50.8139	41.2796	1.1045
97.9503592146867	50.4607115172156	40.2443727750175	97.7455	51.8526	39.6885	5.024
97.9503592146867	50.4607115172156	39.9828063882864	107.8221	37.3636	42.4217	23.6325
97.9503592146867	50.4607115172156	39.9828063882864	106.6231	51.946	40.2003	20.5204
97.9503592146867	50.4597115172157	39.9828063882864	101.161	45.7653	49.9947	23.4902
97.9503592146867	50.4597115172157	39.9828063882864	100.8862	48.4618	50.2894	10.9264
97.9503592146867	47.3796	39.9828063882864	105.6501	47.8555	48.2801	11.3295
97.9503592146867	47.3796	39.9828063882864	98.9198	48.0008	44.9228	5.0724
97.9513592146867	47.3796	39.9828063882864	97.5519	44.8528	38.2336	3.8542
99.7778999996916	47.3796	34.3678000002611	103.0838	43.6629	35.7673	28.7382
99.7778999996916	47.3796	34.3678000002611	93.2846	41.9379	42.3812	28.0563
99.7788999996918	47.3796	34.3678000002611	99.7789	45.6905	34.3678	1.6891
100.407272929591	47.9472071630183	29.4436015497896	99.9754	58.6633	29.714	10.7282
100.964148983017	47.9472071630181	29.4436015497898	101.7941	49.0832	29.2585	1.419
100.964148983017	47.947207163018	22.5293185020601	100.6036	46.802	22.0951	2.256
105.534437896845	47.947207163018	22.5293185020601	102.0152	42.2262	11.91	18.485
105.534437896845	47.9472071630178	22.5283185020603	101.377	48.1816	18.5975	20.458
105.534437896845	49.0894999999447	22.5283185020603	102.8738	56.4102	20.1678	11.5644
105.534437896845	49.0894999999447	22.5283185020603	98.7715	55.3698	27.9452	10.7015
105.885382432716	49.0894999999448	22.5283185020601	102.1595	55.9791	16.6639	15.0641
105.885382432716	49.0894999999447	12.643	104.1102	44.8822	12.643	24.3902
105.885382432716	49.0894999999447	12.6419999999982	97.3108	57.82	10.7791	22.7988
105.885382432716	49.0894999999448	9.94643149494749	98.2004	50.3921	3.9008	18.7026
105.885382432716	49.0894999999448	9.9454314949475	106.4442	49.0895	9.9061	0.5602
100.139139346829	50.4069676622184	9.9454314949475	98.9521	56.5952	10.596	9.6017
100.139139346829	50.4069676622184	9.9454314949475	94.5726	47.3613	8.9492	6.423
100.139139346829	50.4069676622184	9.9454314949475	92.412	50.9961	13.3675	8.4715
100.139139346829	50.4069676622184	8.30858270442893	102.543	45.6081	13.7083	21.8293
100.139139346829	52.2485999998075	8.30858270442893	99.5987	51.3246	10.6347	2.5606
100.139139346829	52.2485999998074	7.26333290405312	100.3439	52.2486	6.1962	1.0866
98.8622805609541	52.2485999998072	7.26333290405312	100.6388	53.8259	6.8403	11.1764
98.8622805609538	52.2485999998071	7.26433290405334	98.2152	53.7701	7.2972	29.4627
98.862280560954	52.2485999998071	7.26533290405312	96.8097	54.0588	2.5941	13.9289

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
98.861280560954	52.2485999998072	7.26533290405312	98.8606	57.9963	4.7298	15.8873
98.860280560954	52.2485999998074	7.26533290405312	93.2379	56.4517	4.9219	7.5848
98.860280560954	65.5621528248963	7.26533290405312	103.5291	67.906	8.9335	21.3267
98.860280560954	65.5621528248963	13.3937420829062	108.1531	76.0691	2.761	21.0274
98.860280560954	65.5621528248963	13.3937420829062	103.8313	82.5056	7.2236	18.7916
98.860280560954	65.5621528248963	13.3937420829062	98.9119	80.0767	11.0692	14.6996
98.860280560954	65.5621528248963	13.3937420829062	98.4258	65.8894	6.8362	20.8311
98.860280560954	65.5621528248963	13.3937420829062	94.6798	69.1984	4.5089	14.7127
98.860280560954	65.5621528248963	13.3937420829062	95.9041	59.3009	4.8034	16.7412
98.860280560954	65.5621528248963	13.3937420829062	98.4228	65.0226	33.0945	19.713
98.860280560954	65.5621528248963	13.3937420829062	92.0851	66.8651	17.5763	14.1856
98.860280560954	65.5621528248963	13.3937420829062	94.6877	57.1733	21.1304	13.9646
95.9681064401282	65.5621528248962	19.8845475548526	92.8209	56.9207	15.4027	12.3836
95.9671064401282	65.5621528248961	19.8845475548529	93.0933	68.7697	14.1811	21.8016
95.9671064401282	65.5621528248961	19.8845475548529	76.5498	52.218	12.9878	29.3359
95.9661064401282	65.5621528248962	19.884547554853	93.5538	62.1822	15.7085	5.8892
95.9661064401282	62.6440702185653	20.3209523769692	96.0562	52.3857	26.7058	12.0834
93.0813095337679	62.6440702185654	26.8596691765332	94.5987	62.0376	18.5629	22.0196
93.0813095337679	62.6440702185654	26.8596691765332	91.9756	47.4725	20.0446	19.7423
93.0803095337678	62.6440702185653	26.8596691765332	95.479	61.1306	33.7151	12.7416
93.0803095337678	62.6440702185653	26.8596691765332	92.749	64.7326	27.0986	21.2415
93.0803095337678	61.9444574576387	26.8596691765332	94.4551	58.0456	35.6169	10.0481
93.0793095337678	61.9444574576387	26.8596691765332	88.7937	67.447	23.6857	7.6628
93.0793095337678	61.9444574576387	26.8596691765332	73.2116	57.797	29.252	20.4365
93.079309533768	61.9258	26.8596691765332	95.0304	53.2116	46.2852	22.3786
99.0429000000734	61.9258	39.3411999999532	98.0763	43.3554	53.563	27.4576
99.0429000000734	61.9258	39.3421999999532	99.0429	61.6589	39.3422	0.2669
99.471399852441	61.9258	39.342199999953	99.7259	57.0659	38.9488	5.4613
99.471399852441	61.9258	39.342199999953	95.4724	61.7777	41.2303	4.4248
99.471399852441	61.9258	48.0403569111719	97.9579	54.2407	46.7851	26.2321
100.685400000708	61.9258	48.0403569111719	100.6854	61.817	51.0639	3.0255
100.685400000708	65.9651086083055	48.0403569111719	94.6788	63.8911	59.4837	17.5158
100.685400000708	65.9661086083055	48.0403569111719	94.6583	60.3511	50.0221	8.4724
100.685400000708	68.4163999999238	48.0403569111719	97.9014	66.9835	57.8832	12.1626
101.8377	68.4163999999239	48.0403569111719	99.1261	78.6323	53.6332	23.8719
101.8377	68.4163999999239	48.0403569111719	99.4285	63.8276	59.6975	13.2796
101.8377	68.4163999999238	47.1088736841927	95.9481	74.251	38.8025	27.2231
101.8377	68.4163999999239	43.1430000000813	102.9023	68.4164	43.143	1.0646
92.8628866178706	75.8588911314123	43.1430000000813	96.1169	76.0362	57.1147	25.7488
92.8628866178706	75.8588911314123	43.1430000000813	97.5653	74.5618	43.9951	26.0912
92.8628866178706	75.8588911314123	40.3124999999516	91.0116	75.887	40.3125	1.8515
93.8182871096582	75.8588911314123	40.1334954967209	93.1133	78.1389	33.5399	7.0122
93.8182871096582	75.8588911314123	40.1334954967209	94.549	73.3405	36.7472	4.2829
93.8182871096582	75.8588911314123	44.5409053873741	89.95	80.2132	31.6802	25.9539
93.8182871096582	75.8588911314123	44.5409053873741	88.0225	60.7529	26.1198	27.571
93.8182871096582	75.8598911314124	44.5409053873742	89.5631	83.3752	32.5568	25.9016
93.8182871096583	77.0415076646405	44.5409053873743	97.0865	83.6094	41.2641	9.8674
93.8182871096583	77.0425076646405	44.5409053873745	96.2521	73.5638	59.9232	18.6663
93.8192871096582	77.0425076646405	44.5409053873745	94.6945	78.572	44.5388	1.7622
93.8192871096583	77.0425076646405	44.5419053873745	98.567	80.2017	48.301	23.8946
93.8192871096582	77.0425076646405	48.6478125070047	91.1677	84.1211	45.979	16.3324
93.8192871096582	77.0425076646405	48.6478125070047	86.2321	62.729	51.1705	16.3953
93.8192871096583	77.0435076646405	48.6478125070047	97.816	74.8015	47.4482	15.0437
93.8192871096583	77.0435076646405	48.6478125070047	92.6699	80.64	42.9825	12.8577
93.8192871096583	81.7588818279677	48.6478125070047	97.4314	81.946	52.8698	7.1176
93.8192871096583	81.7588818279677	48.6478125070047	94.9909	83.4209	53.4521	6.6825
95.1593530722834	81.7588818279677	48.6478125070047	100.6204	94.7646	50.8195	15.4911
95.1593530722834	81.7588818279677	48.6478125070047	96.8345	90.0197	42.1774	11.1201
95.1603530722834	81.7588818279678	48.6478125070047	98.9319	91.3958	49.6094	11.9055
95.1613530722834	81.7588818279678	48.6478125070047	98.3726	88.4744	52.1576	13.4661
95.1613530722834	92.6786230763328	48.6478125070047	104.5599	87.8351	55.8078	14.6615
95.1613530722834	92.6796230763328	48.6478125070047	96.5235	92.1962	47.4754	1.8611
95.1613530722834	92.6806230763325	48.6478125070047	95.9325	86.7596	55.1395	20.5114
95.1613530722834	94.1817000000558	48.6478125070047	98.656	92.6213	53.0887	22.9191
95.1613530722834	94.1817000000558	54.1201428621501	94.0924	96.5838	56.3482	3.4463
102.4117	94.1817000000558	54.1201428621501	97.7943	87.7833	36.2243	29.1465
102.4117	94.1817000000558	54.1201428621501	94.0795	80.8773	41.7611	27.9293
102.4117	94.1817000000558	56.5735487757413	103.2876	94.1817	57.6589	1.3947
102.4117	98.4842999999874	53.5780999995784	101.0606	82.9382	56.7378	16.7992
102.4117	98.4842999999874	53.5780999995784	96.9343	84.943	57.6208	15.8069
102.4117	98.4842999999874	53.5770999995784	103.8628	98.4843	53.5771	1.4511
97.3086353935498	98.8441491249999	44.0027198284566	94.4828	106.1237	38.6118	9.4889
97.3086353935497	92.025800000139	44.0027198284566	97.0347	92.0258	44.3343	0.4301
97.3086353935497	91.2696296403852	24.864181555813	105.6506	92.4297	8.9472	20.7058
97.3086353935497	91.2696296403852	24.864181555813	95.6122	103.8055	23.229	14.657
97.3086353935497	91.2696296403852	24.864181555813	98.8373	99.4165	35.0062	17.0801
97.3086353935497	91.2696296403852	24.864181555813	95.7576	96.9635	11.4638	15.3189
97.3086353935497	91.2696296403852	24.864181555813	100.5649	91.4192	35.2273	20.5542
97.3086353935497	91.2696296403852	24.864181555813	102.0461	86.7072	16.2393	14.3206
97.3086353935497	91.2696296403852	24.864181555813	98.853	91.6792	31.3431	14.5242

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
97.3086353935497	91.2696296403852	24.864181555813	99.3434	90.9979	30.2293	16.5588
97.3086353935497	91.2696296403852	24.864181555813	92.4623	94.734	14.7003	13.3072
97.3086353935497	91.2696296403852	24.864181555813	95.2026	90.5293	12.2607	13.6073
97.3086353935497	91.2696296403852	24.864181555813	93.9684	87.8762	13.7783	12.1102
97.3086353935497	91.2696296403852	24.864181555813	96.9541	82.6989	20.5312	14.592
97.3086353935497	91.2696296403852	24.864181555813	97.1852	78.7831	16.5303	16.1734
97.3086353935497	91.2696296403852	24.864181555813	93.4941	85.8189	27.3685	18.0194
97.3086353935497	91.2696296403852	24.864181555813	92.288	83.6157	17.9977	16.0638
97.3086353935497	91.2696296403852	24.864181555813	94.4072	76.9857	34.4342	17.5737
97.3086353935497	91.2696296403852	24.864181555813	88.0687	81.4777	36.1559	18.8265
97.3086353935497	91.2686296403853	24.864181555813	104.3693	90.8389	25.0156	29.9766
97.3086353935497	91.2686296403853	24.864181555813	92.5654	91.5305	24.0262	28.4592
98.0804305294879	90.5164794995833	24.864181555813	107.2392	85.9448	2.4326	25.7344
98.0804305294879	90.5164794995833	24.864181555813	99.3782	93.0601	2.9898	23.8531
98.0804305294879	90.5164794995833	24.864181555813	98.2349	98.4363	43.0129	21.6189
98.0804305294879	90.5164794995833	24.864181555813	101.583	94.8217	23.7006	5.6707
98.0804305294879	90.5164794995833	24.864181555813	101.602	92.3175	35.5214	24.3611
98.0804305294879	90.5164794995833	24.864181555813	104.3617	84.8664	42.6246	23.8168
98.0804305294879	90.5164794995833	24.864181555813	102.2936	85.0217	15.0829	21.6835
98.0804305294879	90.5164794995833	24.864181555813	100.7126	88.5952	23.1233	21.6123
98.0804305294879	90.5164794995833	24.864181555813	103.1106	83.2736	35.5168	15.1682
98.0804305294879	90.5164794995833	24.864181555813	96.2545	87.1498	32.8659	21.7369
98.0804305294879	90.5164794995833	24.864181555813	101.2985	78.2917	28.1682	13.0659
98.0804305294879	90.5164794995833	24.864181555813	98.2007	80.5294	17.4055	24.0186
98.0804305294879	90.5164794995833	24.864181555813	97.7624	79.6432	41.8331	23.8114
98.0804305294879	90.5164794995833	24.864181555813	88.6062	92.2681	23.9863	22.8388
98.0804305294879	90.5164794995833	24.864181555813	101.778	67.1686	27.7348	23.9527
98.0804305294879	90.5164794995833	24.864181555813	92.1151	81.2598	42.8198	24.5532
98.0804305294879	90.5164794995833	24.864181555813	91.1291	78.4897	13.7054	23.993
98.080430529488	90.3362250200285	19.2077282153048	98.1138	89.594	19.2781	0.7463
93.3310611279899	87.044890240836	19.2077282153048	93.1284	88.6615	20.1351	29.2956
93.3310611279899	87.044890240836	19.2077282153048	98.2345	80.86	27.262	27.4352
93.3310611279899	87.044890240836	19.2067282153048	92.7178	89.1801	18.823	2.5518
93.3310611279899	84.6751176434303	11.3365627017616	102.4507	89.6037	15.6617	13.3753
93.3310611279899	84.6751176434303	11.3365627017616	103.6911	80.62	5.0557	12.7759
93.3310611279899	84.6751176434303	11.3355627017616	97.3132	81.5365	12.7479	6.4549
91.3562163881616	84.6751176434303	11.3355627017616	95.504	96.351	10.2996	27.717
91.3562163881616	84.6751176434303	11.3355627017616	91.14	83.5499	11.0268	11.1932
91.3562163881616	82.7890277460153	11.3355627017616	88.6759	82.3658	11.13	2.7213
95.0107376130501	82.7890277460153	11.3355627017616	96.8706	83.0827	11.4782	1.8883
95.0107376130501	82.7890277460153	11.3345627017616	107.981	80.0957	12.6444	26.4329
95.0107376130501	82.7890277460153	11.3345627017616	97.8831	81.9659	16.6355	26.0286
92.1839257729359	80.2135528018074	11.3345627017616	101.1477	85.2681	2.6541	21.9848
92.1839257729359	80.2125528018074	11.3345627017616	100.0565	80.1054	0.0522	29.4827
92.1839257729359	80.2125528018074	11.3345627017616	93.0994	86.3608	2.8092	27.9466
92.1839257729359	79.889066909614	2.78250829230928	91.86	79.7087	2.2114	0.6809
92.1839257729361	78.8395334978136	2.78250829230917	98.5933	78.8152	8.2256	8.4088
92.1839257729361	78.8395334978136	2.78250829230917	93.2494	81.8793	2.8544	4.3234
90.5277048528748	78.4387048529857	2.23540485306059	89.835	77.746	1.5427	1.1998
92.6850735975077	80.5871177517085	2.7310000000555	86.3374	85.7586	1.5055	11.3801
92.6850735975077	80.5871177517085	2.7310000000555	93.9524	73.145	3.1932	21.3513
92.6850735975077	80.5871177517084	2.7320000000555	88.3633	87.3681	2.2205	27.6489
92.6850735975076	80.5871177517084	2.7330000000555	99.0152	86.155	1.7016	11.2918
101.61250977794	80.5871177517084	2.7330000000555	102.0076	93.075	9.5996	14.2567
101.61250977794	95.4485708132743	2.7330000000555	104.1728	96.9352	2.733	2.9606
101.61250977794	95.4485708132743	11.6908547830563	101.8123	94.891	12.8509	1.3025
101.61250977794	96.1566708769608	11.6908547830563	104.1034	98.3317	9.2012	13.8815
101.61250977794	96.1566708769608	11.6908547830563	100.8882	91.1406	6.6906	9.708
96.8320225895883	96.1566708769608	11.6908547830563	95.0373	98.5247	13.5608	4.6173
54.8054483811618	104.8431	10.3389000000516	34.0458	95.0903	5.2592	23.4922
48.0764000000719	104.8431	10.3389000000516	48.0764	105.8084	10.3389	0.9653
48.0754000000722	104.8431	10.3389000000517	42.9285	106.2179	5.6354	10.4101
48.0754000000722	104.8431	10.3389000000517	40.2693	101.3043	8.6864	10.0221
45.2981740159211	104.8431	10.3389000000516	37.3296	94.7968	3.7833	26.3816
45.2981740159211	104.8431	10.3389000000516	41.6896	94.8028	3.024	26.2925
45.2981740159212	102.80019999963	4.5752	37.0706	93.0168	1.0492	27.7874
45.2981740159212	102.80019999963	4.5752	47.7789	92.5461	5.4276	17.3786
40.522599999998	102.80019999963	4.5752	40.5226	102.8002	1.3549	3.2203
36.6822331950971	101.336130938627	4.5752	45.465	105.2608	3.7217	13.9094
36.6822331950971	101.336130938627	4.5752	35.7859	98.3251	5.4495	3.261
34.4015976035291	101.336130938627	4.5752	35.7481	97.1257	4.802	23.4808
34.401597603529	101.336130938627	10.1632025892157	39.7333	98.7582	4.2197	18.7088
34.401597603529	101.336130938627	10.1632025892157	43.1057	91.7939	5.1823	21.808
34.401597603529	101.336130938627	10.1642025892157	35.0473	98.5367	9.9491	21.3919
34.401597603529	101.335130938627	10.1642025892157	40.065	98.6098	6.7408	21.6771
33.6028974109311	101.335130938627	10.1642025892157	48.9533	90.4759	7.3728	19.0092
33.6028974109311	101.144300000039	10.1642025892157	31.6341	101.1443	12.133	2.7843
33.6028974109311	98.2078469846039	10.1642025892157	34.7819	91.1147	8.0437	26.8877
33.6028974109311	98.2068469846037	10.1642025892157	35.7306	102.2767	4.1846	20.2694
33.6028974109311	98.2058469846037	10.1642025892157	35.5571	102.295	9.2843	22.4132

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
34.6196	98.2058469846037	10.1642025892157	28.1717	107.4546	19.2451	16.9459
34.6196	98.2058469846037	10.1642025892157	40.9527	105.6227	4.1926	16.0561
34.6196	98.2058469846037	10.1642025892157	30.1816	102.1772	4.0412	8.5674
34.6196	98.2058469846037	10.1642025892157	33.0573	97.9271	5.3628	8.5196
34.6196	98.2058469846037	10.1642025892157	30.8807	93.5109	0.3364	15.6566
34.6196	98.2058469846037	10.1642025892157	33.9629	96.8355	4.449	13.8521
34.6196	98.2058469846037	10.1642025892157	35.2297	94.8683	9.4168	10.0169
34.6196	98.2058469846037	10.1642025892157	32.6009	89.9531	17.4409	11.1863
34.6196	90.5378999995287	9.99120000019196	37.9917	90.5379	9.9912	3.3721
34.6196	90.5378999995286	9.99020000019196	34.9317	80.2335	16.9208	24.9565
34.6196	78.0835445557476	9.99020000019204	33.2241	90.2072	6.3544	24.6184
34.6186	78.0835445557476	9.99020000019214	31.4187	76.5703	2.7936	26.413
34.6186	78.0835445557475	3.16778586157056	33.517	80.8699	6.7304	7.8126
26.7268575293052	78.0835445557476	3.16778586157054	23.4089	84.0628	5.796	9.7975
26.7268575293052	78.0835445557476	3.16778586157054	24.5076	73.115	4.3052	8.9241
25.5768896458731	77.3299989401658	3.16778586156961	21.1184	76.9048	10.6601	8.7289
25.4767000000239	75.48099872127	1.96329999999958	25.4767	75.481	0.001	1.9623
25.4757000000239	75.48099872127	1.96329999999958	31.4906	71.3219	1.4719	26.6563
25.4757000000239	68.1911600183379	7.27260000000003	23.796	77.2181	9.3562	18.2059
23.3474890697331	68.1911600183379	7.27259999999989	21.3934	72.6127	7.7423	27.5896
23.3464890697331	68.1911600183379	7.27259999999977	23.527	73.6169	0.5641	21.6834
23.3454890697331	68.1911600183379	7.27259999999999	15.1112	64.361	7.2726	9.0815
23.3454890697331	68.1911600183379	7.27259999999999	22.9431	70.0987	4.2047	5.5998
23.8346874245671	68.1911600183379	9.5895999996417	26.6151	77.1467	3.8306	15.3985
23.8346874245671	68.1911600183379	9.5895999996417	31.0449	71.9995	0.0029	23.5272
23.8356874245671	68.1911600183379	9.5895999996417	22.8228	67.5784	3.2098	16.2582
23.8366874245671	68.1911600183379	9.58959999964179	28.241	67.9653	9.5896	4.4101
23.8366874245671	68.1911600183379	14.9373746966979	31.4455	71.7336	19.6874	27.0146
23.8366874245671	68.1911600183379	14.9383746966979	14.5018	68.1646	16.8217	28.3495
23.8366874245671	68.1911600183379	14.9383746966979	33.839	67.1668	7.1332	20.2124
23.8366874245671	68.1911600183379	14.9393746966979	22.6268	64.3936	19.9605	24.3192
23.8366874245671	68.1911600183379	14.9403746966979	25.7737	68.9159	14.4865	2.2837
23.835687424567	68.1911600183379	14.9403746966979	24.5354	72.6275	12.2334	5.9717
23.834687424567	68.1911600183379	14.9403746966977	22.1344	71.2137	11.8857	6.3651
23.833687424567	68.1911600183379	14.9403746966977	27.2709	73.9256	16.4296	19.9916
12.0443999996492	68.1911600183379	14.9403746966977	10.0835	69.723	3.7551	14.2892
12.0443999996492	68.1911600183379	14.9403746966977	6.65640	74.2265	20.3804	11.3789
12.0443999996492	68.1911600183379	14.9403746966977	9.1707	70.0865	21.5855	9.3679
12.0443999996492	68.1911600183379	14.9403746966977	9.15690	61.6426	15.1483	9.3858
12.0443999996492	68.1911600183379	14.9403746966977	10.5042	66.7806	23.1982	12.8873
12.0443999996492	68.1911600183379	14.9403746966977	14.2239	63.9607	10.3191	12.6801
12.0443999996492	68.1911600183379	14.9403746966977	13.2613	67.7948	17.1077	9.5466
12.0443999996492	68.1911600183379	14.9403746966977	12.0444	66.3239	28.7604	13.9456
12.0443999996491	68.1911600183379	14.9393746966979	13.7649	76.0563	18.1156	11.1171
12.0443999996491	68.1911600183379	14.9393746966979	16.7224	69.1113	14.1768	26.0784
12.0443999996493	68.1911600183379	13.0585629075664	22.0857	71.4539	26.9077	17.4147
12.0443999996492	68.1911600183379	13.0575629075664	1.76609999999999	66.5446	12.6159	26.4568
12.0443999996492	68.1911600183379	13.0575629075664	12.0587	67.8257	18.5408	15.0634
10.1556566775064	68.1911600183379	13.0575629075664	7.5677	74.3816	13.1566	29.6105
10.1556566775063	68.1911600183379	8.52829271177182	12.0877	66.3858	4.5331	4.791
10.1556566775063	68.1911600183379	8.52829271177182	9.6606	65.5604	9.552	2.866
10.1556566775064	68.1911600183379	2.4628	9.00020	73.0359	5.8372	24.3533
-0.10090000021043	69.3702635481621	2.4628	0.483800000000002	63.8626	0.7436	5.7993
-0.100900000210501	90.0486999999985	2.4628	-0.100899999999996	90.0487	0.1507	2.3121
-0.100900000210558	92.5739382905908	2.4628	8.1477	101.1634	5.5645	26.7278
-0.100900000210686	93.0782406101436	2.4628	2.57040	90.3092	4.6781	25.529
-2.95721109721786	93.0782406101436	2.4628	2.7376	84.0979	3.4333	22.8219
-2.95721109721804	93.0782406101436	11.1788092472079	-6.68600	94.6391	7.4364	5.5087
-2.95721109721811	93.0782406101436	12.7552140275441	-12.8049	93.8535	15.5008	19.948
-2.95721109721811	93.0782406101436	12.7552140275441	3.0162	107.1796	11.3112	15.3823
-2.95721109721811	93.0782406101436	12.7552140275441	-0.171000000000006	97.1566	2.8672	11.053
-2.95721109721811	93.0782406101436	12.7552140275441	2.55330	99.1767	7.9857	13.4676
-2.95721109721811	93.0782406101436	12.7552140275441	0.613799999999998	95.4238	16.9249	17.1272
-2.95721109721811	93.0782406101436	12.7552140275441	4.77370	93.7785	6.1602	12.9549
-2.95721109721811	93.0782406101436	12.7552140275441	6.3198	96.0864	20.0555	13.0595
-2.95721109721811	93.0782406101436	12.7552140275441	5.8502	91.8647	13.1882	18.0105
-2.9582110972183	93.0782406101436	12.755214027544	-2.5612	92.1356	23.79	25.3912
-2.9592110972183	93.0782406101436	12.755214027544	1.4019	97.5847	15.4849	8.9245
-2.9592110972183	95.8248950322983	26.4861999999993	-0.338999999999999	97.1979	25.6607	24.9263
-4.04974489385842	96.9054448935851	26.4861999999992	-5.5457	98.4014	26.4862	2.1156
1.04012238078629	94.1181002964325	31.5500240386061	-2.1508	94.1499	7.6254	24.1365
1.04012238078629	94.1181002964325	31.5500240386061	-3.1358	95.2162	31.8855	4.3309
1.04012238078629	94.1181002964325	31.5500240386061	1.64530	95.7178	31.8751	2.5699
1.04012238078629	94.1181002964325	31.5500240386061	7.0214	70.8048	31.3366	24.0693
1.12071294229081	94.3713929052953	31.5500240386062	0.619299999999996	91.0377	37.0534	11.2677
1.12071294229081	94.3713929052953	31.5500240386062	3.5998	89.8159	36.4775	20.0402
1.121712942291	94.3713929052953	31.5500240386062	1.20229999999999	90.7259	43.7677	19.1166
1.1217129422909	94.3713929052954	44.5359020189121	2.1469	96.6722	44.5395	20.9499
1.1217129422909	94.3713929052954	44.5359020189121	3.4538	93.5151	43.6356	19.9908
1.121712942291	94.3713929052954	44.536902018912	0.580200000000005	93.7511	50.7296	6.2472

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
1.12271294229096	94.3713929052954	44.5369020189118	-4.2807	74.2616	57.1387	26.6495
1.12271294229097	94.3713929052954	54.4585929087644	-4.1255	85.596	43.5867	25.3799
1.12371294229116	94.3713929052954	54.4585929087644	-1.23350	86.0108	56.7294	9.9154
4.95789999938216	94.3713929052954	54.4585929087644	4.95789999999999	99.4405	59.5277	7.1688
5.01787589699806	94.3713929052953	54.4585929087644	1.1743	92.9818	59.2535	22.3694
5.01787589699806	94.3713929052953	54.4585929087644	26.55	96.735	54.3574	21.6617
5.84482848535474	94.3713929052954	54.4585929087644	-2.30370	90.7079	58.2529	19.8948
5.84482848535474	94.3713929052954	54.4585929087644	3.55029999999999	90.3653	48.0124	9.6646
5.84482848535474	94.3703929052952	54.4585929087644	-7.5489	96.9207	56.8305	21.6
5.84482848535474	94.3703929052952	54.4585929087644	-0.0468000000000046	93.7668	57.0052	20.328
5.84482848535474	94.3703929052953	36.524	-1.86190	98.5581	36.524	15.9681
5.84482848535474	94.3703929052953	30.231269685172	-0.735100000000003	89.6931	26.6301	28.3044
5.84482848535474	94.3703929052953	28.6473999999995	-0.311599999999999	97.6012	28.6474	20.2615
5.84482848535474	94.3703929052953	28.6473999999995	3.1448	100.72	31.1491	20.6463
5.84482848535474	91.6310702981513	27.2561473831075	-3.26390	94.8889	48.3647	23.5193
5.84482848535474	91.6310702981513	27.2561473831075	-1.9602	93.9224	5.6614	23.076
5.84482848535474	91.6310702981513	27.2561473831075	3.81100	100.5395	9.9764	22.995
5.84482848535474	91.6310702981513	27.2561473831075	3.11839999999999	98.924	29.022	10.2515
5.84482848535474	91.6310702981513	27.2561473831075	3.5924	94.7451	26.9481	6.9732
5.84482848535474	91.6310702981513	27.2561473831075	26.1674	96.1159	30.3905	22.0166
5.84482848535474	91.6310702981513	27.2561473831075	8.0472	76.1743	13.1381	21.0495
5.84482848535474	91.6310702981513	27.2561473831075	17.9606	81.6588	21.6946	21.1617
7.81419999893738	91.6310702981513	27.2561473831075	7.8142	89.6258	27.2865	2.0055
29.2130725844988	91.6310702981513	26.5035266940941	9.17	97.1621	20.3835	26.9226
29.2130725844988	92.2870419603296	26.5035266940942	33.1881	90.5996	30.8927	12.9818
29.2130725844985	92.2870419603296	22.7691854034878	29.5221	90.7635	22.4343	1.898
29.2130725844985	95.9665972817721	22.7691854034878	29.3468	93.7461	14.2413	24.255
29.2130725844985	95.9665972817724	22.7681854034878	28.2891	98.27	21.6276	21.2566
29.2130725844985	95.9665972817722	22.7671854034878	29.1897	96.4145	23.036	0.5229
29.2130725844985	95.9665972817724	22.7661854034875	31.6916	96.8159	17.5787	27.5118
29.2130725844985	108.0555	22.7661854034878	34.0163	93.2553	22.3961	18.0121
33.1685999999731	108.0555	19.796300000053	33.1686	108.6172	19.7963	0.5617
37.1972999991706	108.0555	17.0655	31.7064	96.988	25.1942	27.9597
37.1982999991708	108.0555	17.0655	51.1106	98.2963	5.5983	24.3822
37.1982999991708	106.34699999993	17.0655	37.1983	106.347	12.5162	4.5493
39.8147227900094	100.427099215244	17.0655	42.5793	100.4271	14.8388	3.5498
38.218600000087	98.3584	17.5328000003454	38.2186	96.6747	17.5328	1.6837
37.475839807084	98.3584	17.5328000003454	53.9006	102.5381	21.0284	26.8445
37.475839807084	98.3584	17.5328000003454	45.0704	101.2748	27.009	15.9718
37.474839807084	98.3584	17.5328000003452	40.9431	96.0349	18.7884	13.182
37.474839807084	98.3584	24.7919998433821	31.3011	106.2109	32.3658	16.9428
37.473839807084	98.3584	24.791999843382	42.2565	98.7398	22.9258	24.1013
37.472839807084	98.3584	24.7919998433821	32.8593	93.0881	38.0081	18.3654
37.4718398070841	98.3584	24.7919998433822	21.5395	100.4343	27.1149	29.9057
37.4718398070841	98.3584	26.1410000010117	8.0611	104.093	26.141	29.9646
39.5049492279052	98.3584	26.2166999998421	42.9226	100.4615	26.2167	4.0129
39.5049492279052	98.3584	28.959389413908	29.8552	101.3038	43.5974	17.7782
39.5049492279052	97.184278921321	28.959389413908	42.9721	90.3177	28.7365	7.6955
36.467026419035	97.184278921321	28.959389413908	38.189	100.3805	31.8594	26.8425
36.467026419035	97.184278921321	39.3604735807781	33.8351	99.3235	37.4512	26.1581
36.467026419035	88.2813264190357	39.360473580778	35.4073	87.2216	40.4202	1.8355
42.2912942405112	88.2813264190357	39.3604735807781	40.8939	84.3555	43.1765	20.2802
42.2922942405112	88.2813264190357	39.360473580778	42.6808	88.2098	40.1619	26.1251
45.5012041673431	88.2813264190357	37.0994958325218	29.7064	94.0211	29.3487	26.0785
45.5012041673431	100.678000000068	37.0994958325218	46.0729	100.678	36.5278	0.8085
45.5012041673431	100.678000000068	41.3950000000926	34.3074	104.3145	33.9426	24.0514
45.5012041673431	100.678000000068	41.3950000000926	34.0464	97.1856	33.2284	23.2445
45.5012041673431	104.92724000414	41.3950000000926	36.8108	99.4487	34.5912	12.3219
35.6379279940916	107.411272006394	41.3950000000926	32.8361	107.2479	41.504	24.978
35.6379279940918	107.412272006394	41.3950000000926	33.1638	109.6815	28.6324	13.4189
35.6379279940918	107.412272006394	41.3950000000926	35.3466	107.7036	41.395	0.412
36.0615330271759	105.803334764976	41.3950000000926	42.0156	103.5929	44.0945	23.2765
36.0615330271759	105.802334764976	41.3950000000926	39.3246	101.8921	42.5744	13.7336
36.0615330271759	105.802334764976	47.3765929920592	44.0393	95.7757	50.8289	16.7138
36.061533027176	105.801334764976	47.3765929920592	35.7224	107.36	58.7833	11.5177
36.061533027176	105.801334764976	47.3765929920592	39.1965	105.4524	44.823	4.0584
36.0615330271759	103.79707596197	49.2946330795071	35.4006	103.6799	50.1937	1.122
37.5708579993287	103.79707596197	49.2946330795071	39.196	99.7694	49.3378	4.3434
37.5708579993287	103.79707596197	49.2946330795071	32.4952	97.9758	48.1403	7.8091
37.5708579993287	103.79707596197	55.7897770614932	35.2228	101.4244	59.0123	27.011
37.5708579993287	103.79707596197	55.7897770614932	43.0828	99.6317	56.4863	26.6664
37.5718579993286	103.79707596197	55.7897770614932	39.6285	91.4521	58.9959	19.1143
37.5718579993286	104.405225714913	55.7897770614932	47.126	99.3914	58.8698	14.4896
37.5718579993286	104.405225714913	55.7897770614932	42.0978	97.503	57.9578	9.3352
41.2272257148948	104.405225714913	55.7897770614932	42.4716	105.6496	56.7244	1.9926
39.566832055037	104.405225714913	55.7897770614932	44.7902	101.1589	57.6534	13.5802
39.566832055037	93.9325190986051	55.7897770614932	35.4152	92.5489	58.019	4.9112
39.566832055037	93.932519098605	52.8477999998866	33.6244	92.4492	56.3457	13.8672
39.566832055037	93.932519098605	52.8477999998866	37.1788	95.0118	52.8478	2.6206
39.566832055037	93.932519098605	50.1434230343691	36.1694	94.3523	52.0418	28.0801

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
39.566832055037	93.932519098605	50.1434230343691	32.2034	92.5655	35.5696	28.0393
39.566832055037	92.660421989092	50.1434230343691	35.9551	95.9225	47.402	5.5858
39.566832055037	92.660421989092	50.1434230343691	41.599	92.4813	48.0171	2.9467
39.566832055037	91.9699424355244	50.1434230343691	31.4281	94.9219	54.3744	25.0918
32.4984945659205	91.9699424355244	50.1434230343691	46.5537	103.4177	45.8992	24.5733
32.4984945659205	91.9699424355244	50.1434230343691	42.8352	101.6931	44.9574	21.2677
32.4984945659205	91.9699424355244	51.2224742317481	26.6904	96.1713	46.6576	25.5008
32.4974945659206	91.9699424355245	51.2224742317481	29.7849	97.5299	53.9895	6.777
32.4974945659206	91.9699424355245	51.2224742317481	32.1756	91.0244	47.2823	9.1133
32.4964945659206	91.9699424355245	51.222474231748	30.7482	95.8761	57.2879	28.9897
32.4954945659206	91.9699424355245	51.2224742317479	26.9511	99.1097	54.9389	22.0884
32.4954945659206	91.9699424355245	51.2224742317479	29.376	80.5861	55.9809	14.4218
32.4954945659206	74.5476942637348	51.2224742317479	25.3366	76.538	54.326	21.2393
32.4954945659206	74.5476942637348	51.2224742317479	31.105	77.2121	42.4385	19.85
32.4954945659206	74.477292558542	51.2224742317479	32.697	74.6737	51.2201	0.2814
32.4954945659206	74.4772925585421	51.2234742317476	24.7401	75.4523	49.5075	27.8452
29.5657399422222	74.477292558542	51.2234742317476	27.6433	72.5657	51.9251	2.8004
29.5657399422223	74.477292558542	57.1538234805429	35.1535	70.6086	57.9365	16.7445
29.5657399422223	74.477292558542	57.1538234805429	32.2488	71.8762	47.8257	10.0488
29.5657399422223	72.0227454576044	57.1538234805429	24.1578	73.3792	57.4094	11.3579
18.2653999999404	72.0227454576044	57.1538234805429	26.9783	71.0141	56.5271	24.9531
18.2653999999405	72.0227454576044	59.4545545425871	18.2654	71.5277	59.9496	0.7001
17.7214686810659	72.1216016739938	53.8868000000598	15.4332	72.9689	53.8868	2.4401
17.7214686810659	72.1216016739938	44.91320000016	15.3124	65.205	52.7286	17.4654
17.7214686810659	72.1216016739938	44.91320000016	27.1736	83.2653	40.5956	16.1862
22.7434654524637	72.1216016739938	44.9132000001601	31.7515	71.3679	39.9054	28.4179
22.7434654524637	72.1216016739938	44.9122000001599	26.4833	65.6457	42.68	15.8608
22.7434654524637	72.1216016739938	44.9112000001599	26.4587	69.6793	44.9112	4.4461
22.7434654524637	74.3592214422256	38.2425999999081	24.3218	77.9732	38.2426	3.9436
22.7434654524637	74.3592214422256	38.241599999908	22.8762	75.7017	33.805	22.7687
22.7434654524637	74.3592214422256	33.9076642946118	24.4797	75.354	37.647	15.2855
22.7434654524637	67.8004173788854	33.9076642946118	26.2205	72.9044	33.175	6.2191
18.9666514295711	67.1561847645666	33.9076642946118	18.9682	67.082	33.9115	0.0743
17.4995992940734	67.1561847645666	33.9076642946117	23.9369	61.5866	18.0383	22.0202
17.4985992940732	67.1561847645666	33.9076642946117	7.6803	61.1857	24.6436	15.0459
17.4985992940732	67.1561847645666	33.9076642946117	10.4334	62.822	33.9682	8.2889
17.4985992940732	67.1561847645666	33.9076642946117	14.7433	68.1941	29.0053	9.3958
17.4985992940732	67.1561847645666	33.9076642946117	26.4747	67.9787	32.7219	12.3016
17.4985992940732	67.1351867784336	27.6229867785309	9.9143	75.8382	26.191	21.3192
17.4985992940732	67.1351867784336	27.6229867785309	12.73	75.2001	37.6748	18.6111
7.35618677835221	67.1351867784337	27.6229867785307	6.9842	66.7632	27.251	0.6443
8.28287027677823	67.1351867784338	28.7330344985886	8.3117	72.2049	29.6247	15.4861
8.28387027677846	67.1351867784338	28.7330344985884	15.0856	70.6386	28.9208	28.271
8.28387027677846	68.2582442900885	33.3117187754768	8.8648	72.0358	37.3381	5.5515
8.28387027677846	68.2582442900885	33.3117187754768	10.7344	66.9849	31.9545	3.0771
6.28748686155537	72.0541225024985	36.5066999999922	12.5389	66.9051	22.2814	25.9958
6.28748686155537	72.0541225024985	36.5076999999921	6.09139999999999	73.9114	36.5077	1.8676
6.28748686155537	72.0541225024985	36.5086999999923	18.7356	77.2891	30.4652	27.8207
6.28748686155537	72.0541225024985	36.5096999999923	11.6475	70.8021	30.9107	20.1612
6.28748686155537	72.0541225024985	36.5106999999923	9.45780	72.6847	40.961	17.4171
6.28748686155537	72.0541225024985	36.5106999999923	11.4886	67.7219	43.0579	21.8599
6.28748686155537	72.0541225024985	49.5583999983581	4.4426	63.6871	51.0243	23.1902
6.28748686155537	72.0541225024985	49.5583999983581	9.3844	71.5303	46.4336	26.9324
6.28748686155537	72.0541225024985	49.5593999983581	6.67010	63.5082	34.9077	29.6501
6.28748686155537	72.0541225024985	49.5603999983581	0.309600000000003	68.1954	39.7657	12.3905
6.28748686155537	72.0541225024985	49.5603999983581	5.2812	65.5492	44.5709	11.3895
6.28748686155537	72.0541225024985	49.5613999983581	4.0089	72.186	49.5614	2.2824
6.28748686155537	69.969211162678	51.812345088406	10.9416	69.7746	52.0032	20.3266
6.28748686155537	69.969211162678	51.812345088406	14.0233	68.3418	48.6515	20.9704
6.28748686155537	63.2888924265236	51.812345088406	11.4442	66.9869	57.5373	21.9247
6.28748686155537	63.2878924265236	51.812345088406	4.7342	63.0935	56.3188	4.7706
12.009700001332	63.2878924265235	46.4950056508465	8.4928	63.9998	55.0759	9.7983
12.009700001332	63.2878924265235	46.4950056508465	12.0097	66.7734	42.888	5.0159
19.1529030861922	41.0128284925876	46.4950056508466	14.2076	63.0144	54.8035	24.0324
19.1529030861922	32.0398369788609	46.4950056508466	16.9754	26.2994	50.4148	25.4942
19.1529030861922	32.0388369788614	46.4950056508466	21.3113	31.7798	46.1078	2.2081
19.1539030861922	32.0388369788614	46.4950056508468	18.7218	26.0511	59.401	18.3773
19.1539030861922	20.6993301879061	46.4950056508469	21.4132	25.3225	51.4824	11.064
19.1539030861922	20.6983301879058	46.4950056508469	22.5923	19.795	49.1879	27.7634
19.1539030861922	20.6983301879058	46.4950056508469	23.1689	25.59	48.8728	25.7524
19.1539030861922	20.6973301879056	46.4950056508468	22.0389	18.6688	59.3708	16.6692
19.1549030861922	20.6973301879056	46.4950056508469	18.1963	16.0602	36.4885	17.912
19.1549030861922	20.6973301879056	46.4950056508469	25.9081	14.4892	36.1934	15.0463
19.4151000000496	20.6973301879056	46.4950056508469	19.4151	20.4264	46.5071	0.2712
19.521499999839	20.6973301879056	45.9447223452068	19.4476	21.0876	59.2618	13.323
19.521499999839	20.6973301879056	39.2565	20.7311	19.0512	39.2565	27.1888
19.521499999839	20.6973301879056	39.2565	17.3215	22.815	38.4524	26.1071
19.521499999839	20.6973301879056	38.3426114812818	19.3676	20.9011	45.1036	22.1053
19.5224999998391	20.6973301879056	38.3426114812818	19.6468	14.5775	38.07	7.1553
19.5224999998391	24.244	38.3426114812818	21.1889	21.267	39.0474	20.9082

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
19.5224999998391	24.244	38.3426114812818	20.8129	26.0745	22.3222	16.1762
19.5224999998391	24.244	34.6115999999311	19.5225	24.6717	34.6116	0.4277
19.5382821285135	24.244	33.4109869684293	17.7323	26.9057	35.8248	28.6742
19.5382821285133	24.244	33.4099869684293	18.4916	22.031	28.1174	8.3539
19.5382821285133	24.244	33.4089869684293	23.1615	20.5337	28.672	18.9562
19.5382821285132	24.244	33.4079869684293	17.2669	18.1061	25.0094	10.6475
31.4773669294032	24.244	30.0023992771827	40.2335	17.1357	30.0024	11.2782
28.0989999999275	28.5065173142593	27.0633000000015	23.1228	16.7524	24.3445	13.0518
28.0989999999274	28.9231	27.0633000000015	28.099	29.8348	27.0633	0.9117
28.0979999999274	28.9231	27.0633000000015	19.0397	19.3917	26.8913	27.4702
28.0979999999274	28.9231	27.0633000000015	21.7951	21.835	45.5134	24.0928
20.6252428102652	28.9231	27.0633000000015	22.8581	29.0039	22.5241	5.9592
20.6252428102652	28.9231	21.0115	18.7531	32.536	21.0115	27.0946
20.6252428102652	28.9231	8.50552209814323	15.0509	21.8739	10.7741	20.7664
20.6252428102652	28.9231	8.50552209814323	20.5046	21.2685	13.3595	15.1676
20.6252428102652	19.9436568007515	8.50552209814323	7.8039	17.6061	5.7787	13.3149
20.6252428102652	19.9436568007515	8.50552209814323	21.2889	20.2133	0.1771	12.2867
20.6252428102652	19.9436568007515	8.50552209814323	23.3217	16.9506	6.2856	12.0877
20.6252428102652	19.9436568007515	8.50552209814323	19.8821	27.2321	11.7559	8.0149
20.6252428102652	19.9426568007514	8.50552209814323	28.0443	7.2557	0.5495	23.7219
20.6252428102652	19.9426568007514	8.50552209814323	16.9397	16.157	0.3423	23.6795
20.6252428102652	18.2372264306593	8.50552209814323	31.9656	14.6164	16.7619	14.4873
20.6252428102652	18.2372264306593	8.50452209814324	24.0847	21.2619	9.4135	18.4856
20.6252428102652	18.2372264306593	8.50452209814324	25.2224	21.1268	9.0297	20.0558
20.6252428102652	18.2372264306593	5.92955987094042	27.0312	22.0371	1.4535	12.0381
20.6252428102652	18.2372264306593	5.67687627538367	19.6457	23.2311	5.559	5.0904
20.6252428102652	18.2362264306593	5.67687627538367	24.5729	19.8583	16.0395	11.2071
20.6252428102652	0.421018369992958	5.67687627538367	26.7943	-2.6353	5.1743	24.1177
20.6252428102652	0.421018369992958	3.55471947544952	19.4163	-0.8394	2.2943	2.1538
29.0762428027006	0.421018369992958	3.55471947544952	21.6596	11.213	17.563	23.4533
29.0762428027006	0.421018369992958	5.54291227122457	31.0707	1.7474	5.3999	2.3995
29.0762428027006	3.86705654592441	21.8936911227736	23.9142	5.5856	8.3806	20.6816
29.0772428027007	3.86705654592416	21.8936911227738	28.1449	5.3771	22.529	15.5333
29.0772428027007	3.86705654592416	21.8936911227738	29.4417	11.4808	30.7206	11.6626
29.0782428027007	3.86705654592416	21.8936911227738	26.4488	5.1021	19.0029	9.3497
29.0782428027007	3.86705654592416	21.8936911227738	26.246	7.8923	16.6585	7.1855
29.0782428027007	3.86705654592416	21.8946911227736	22.4003	2.9895	12.1851	21.9707
29.0782428027007	3.86705654592416	21.8956911227738	22.6294	-1.9579	25.7184	16.8768
29.0782428027007	3.86705654592416	21.8956911227738	27.2842	5.8331	28.3822	18.4271
29.0782428027007	4.02392124447303	26.2715869388144	24.8641	0.1355	28.7608	6.251
29.0782428027007	4.02392124447303	26.2715869388144	29.2451	9.0499	23.6495	5.6713
29.6205005033852	6.68390050382322	27.9457	31.7997	5.4917	35.1341	9.7028
29.6205005033852	6.68390050382322	27.9457	29.6205	6.6839	35.8272	7.8815
29.9496999851198	6.68569283287939	27.9457	29.9497	8.0977	27.1858	1.6035
33.6227558344906	5.11904555690126	27.9457	31.1128	-2.8096	30.5667	18.9309
33.6227558344906	5.11904555690126	27.9457	33.6792	4.7017	30.2163	13.2435
36.5755861615415	5.11904555690126	28.4397796397543	36.2059	6.8965	29.7476	2.2375
36.5765861615415	5.11904555690126	28.4397796397543	22.0744	6.6433	40.1203	29.8611
39.9448915915694	4.80105110751171	28.4397796397543	44.0031	6.0986	31.1209	17.8329
39.9458915915694	4.80105110751171	28.4397796397543	29.2732	5.6917	40.0529	15.7976
39.9458915915694	4.80105110751171	28.4397796397543	36.4235	4.5159	28.6582	16.6099
44.5195893862107	4.80105110751171	28.4397796397548	46.0043	6.8606	27.4465	2.7263
48.1912607121088	4.09954876440906	28.4397796397548	62.4332	-0.684	2.8792	29.6949
48.1912607121088	4.09954876440906	28.4397796397548	53.8048	-5.0553	19.1679	14.1877
48.1912607121088	4.09954876440906	28.4397796397548	51.545	-0.7619	6.4521	25.0267
48.1912607121088	4.09954876440906	28.4397796397548	57.7878	-4.3732	24.6962	27.1183
48.1912607121088	4.09954876440906	28.4397796397548	58.3955	-2.2935	14.9348	20.2689
48.1912607121088	4.09954876440906	28.4397796397548	61.9524	-0.333	11.9086	23.4378
48.1912607121088	4.09954876440906	28.4397796397548	32.3564	-1.4633	20.5286	25.6089
48.1912607121088	4.09954876440906	28.4397796397548	39.9467	-2.3317	18.5214	24.6235
48.1912607121088	4.09954876440906	28.4397796397548	59.6709	-1.5476	33.1451	26.9171
48.1912607121088	4.09954876440906	28.4397796397548	44.8479	-0.9391	15.0769	19.1888
48.1912607121088	4.09954876440906	28.4397796397548	50.0191	-2.6033	31.7826	29.6269
48.1912607121088	4.09954876440906	28.4397796397548	56.047	-0.6998	19.4659	25.6513
48.1912607121088	4.09954876440906	28.4397796397548	43.4311	0.4843	45.1031	25.8563
48.1912607121088	4.09954876440906	28.4397796397548	63.0749	1.8033	17.7213	22.3131
48.1912607121088	4.09954876440906	28.4397796397548	58.8992	5.3006	6.9433	25.2792
48.1912607121088	4.09954876440906	28.4397796397548	47.0712	4.3382	9.7807	28.9099
48.1912607121088	4.09954876440906	28.4397796397548	52.0607	4.6851	47.5572	25.9984
48.1912607121088	4.09954876440906	28.4397796397548	38.0686	7.3443	51.7798	25.6467
48.1912607121088	4.09954876440906	28.4397796397548	57.7618	2.6586	23.6599	24.3155
48.1912607121088	4.09954876440906	28.4397796397548	58.0726	3.0503	30.5544	10.1594
48.1912607121088	4.09954876440906	28.4397796397548	48.7027	4.8736	15.3944	25.6148
48.1912607121088	4.09954876440906	28.4397796397548	46.5714	10.174	4.4604	27.098
48.1912607121088	4.09954876440906	28.4397796397548	45.0418	3.8658	25.2247	10.1722
48.1912607121088	4.09954876440906	28.4397796397548	41.1669	5.3004	18.6447	27.2131
48.1912607121088	4.09954876440906	28.4397796397548	52.3173	10.0275	11.1526	24.0147
48.1912607121088	4.09954876440906	28.4397796397548	53.1154	7.9184	18.71	19.9574
48.1912607121088	4.09954876440906	28.4397796397548	52.0306	12.0787	8.641	25.2448
48.1912607121088	4.09954876440906	28.4397796397548	41.9974	13.5778	7.3366	24.1613

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
48.1912607121088	4.09954876440906	28.4397796397548	44.5228	11.8645	13.3212	25.0082
48.1912607121088	4.09954876440906	28.4397796397548	49.3862	17.5735	5.4967	29.4535
48.1912607121088	4.09954876440906	28.4397796397548	43.7231	10.6871	23.6231	24.1762
48.1912607121088	4.09954876440906	28.4397796397548	49.0558	10.279	28.6803	25.3924
48.1912607121088	4.09954876440906	28.4397796397548	45.8725	14.3747	21.2711	19.0119
48.1912607121088	4.09954876440906	28.4397796397548	47.2412	18.0641	21.8927	26.9311
48.1912607121088	4.09954876440906	28.4397796397548	49.9475	19.2284	25.6639	17.8419
48.1912607121088	4.09954876440906	28.4397796397548	54.6523	25.2022	31.3259	28.2307
48.1912607121088	4.09954876440906	28.4397796397548	47.7428	26.438	23.4687	28.0445
48.1912607121088	4.09954876440906	28.4397796397548	45.985	27.4123	27.7797	25.7471
48.1912607121088	4.09954876440906	28.4397796397548	46.684	28.1154	34.4272	27.5206
48.1912607121088	4.09954876440906	28.4397796397548	52.5136	31.162	22.8965	28.7958
48.1912607121088	4.09954876440906	28.4397796397548	46.4115	30.3033	33.5708	28.1751
51.7764998940847	1.50893440618897	20.7977344085883	51.7765	0.7553	20.0441	1.0658
59.4198892260444	1.50893440618897	23.7440919030414	53.5826	-3.7128	29.3577	20.6553
59.4198892260444	1.50893440618897	23.7440919030414	55.5686	2.3786	41.1094	17.8085
59.4198892260444	1.50893440618897	25.605407825451	62.7821	-0.0838	27.7653	4.3251
59.4198892260444	6.81279961412068	25.605407825451	60.5785	6.8128	27.9807	2.6428
59.4198892260444	7.19021383657806	25.605407825451	60.2628	6.0605	25.9406	10.0471
59.4198892260444	7.19021383657806	25.605407825451	63.8119	26.0212	34.0563	22.8759
59.4198892260444	7.19021383657818	18.8902361141286	61.7542	11.527	18.9198	4.9252
59.4198892260444	8.05663784823745	8.39980013991812	59.4358	8.0877	8.3998	0.0349
58.70699494763	8.05663784823744	8.39980013991812	56.6752	3.9284	4.2715	9.6519
58.70699494763	8.05663784823744	8.39980013991812	57.2331	12.7874	5.1838	7.0243
58.70699494763	6.10613999083429	8.39980013991812	58.0725	5.2013	11.1785	2.9904
58.70699494763	6.10613999083429	6.8571	58.5415	3.6684	5.0311	22.039
58.2863999971414	0.073099996966114	6.8571	58.2864	0.0731	4.559	2.2981
55.594610547524	-5.16967807100554	6.8571	58.2741	0.1622	8.0145	6.0785
46.741621958208	-5.16967807100554	9.11789995376173	46.0937	-5.8176	9.1179	0.9163
46.9719062474208	2.61640261712308	11.8103739369158	48.302	2.6164	11.9932	1.3426
45.019225752669	9.75000008360145	11.8103739369158	44.5689	9.75	12.1988	0.5947
45.8816546582015	11.4410542301266	11.8103739369158	24.5208	1.7631	30.0851	29.7307
45.8816546582015	11.4410542301266	11.8103739369158	64.6914	7.7788	3.6297	22.2178
45.8816546582015	11.4410542301266	11.8103739369158	52.3291	3.6705	6.1162	19.2214
45.8816546582015	11.4410542301266	11.8103739369158	48.4975	2.4432	11.2037	10.4173
45.8816546582015	11.4410542301266	11.8103739369158	43.984	9.2005	15.6271	7.1984
45.8816546582015	11.4410542301266	11.8103739369158	20.5322	21.5891	20.6595	28.8292
45.8816546582015	11.4410542301266	11.8103739369158	46.7163	23.0055	0.3229	28.4765
45.8816546582015	11.4410542301266	11.8103739369158	47.5893	27.8934	1.3329	19.7112
45.8816546582015	11.4410542301266	11.8103739369158	50.8592	31.2824	4.4654	23.4486
45.8816546582015	11.4410542301266	11.8103739369158	53.915	28.4629	8.3577	20.5718
45.8816546582015	11.4410542301266	11.8103739369158	46.7677	27.4481	8.8301	29.3514
47.1287	11.4410542301266	11.00750867381	47.1015	12.1757	10.5923	0.8443

Appendix O

CEVRP Best Known Solutions

In this appendix, we present the best known solution for each benchmark CEVRP problem generated in this dissertation. Solution distances are given in Tables O, O, and O. Some of the solutions do not appear anywhere else in the dissertation. This is because they were found by methods that were still in development and do not, in their current form, produce these results. The solutions are still valuable since they provide a measuring stick for new heuristics for the CEVRP.

For each problem, we show two figures and give the values of each node and its representative point. Solution correctness and feasibility may thus be verified by any interested reader. The x, y, and z values for the representative points are referred to in the tables as Solution x, Solution y, and Solution z. The x, y, and z values for $orig(i)$ are referred to as Original x, Original y, and Original z.

One figure overlays the solution tour on the graph of disks or spheres surrounding the original nodes. The other figure overlays the solution tour on the original nodes. The perspective is the same for the two figures except for a few problems where the tour cannot be seen without changing the perspective. Feasibility for each solution is guaranteed to at least 1e-5. That is, the representative point for node i, (x_i, y_i) or (x_i, y_i, z_i), is no more than 1e-5 units outside the disk or sphere surrounding (a_i, b_i) or (a_i, b_i, c_i). For many problems, representative points are feasible to 1e-10.

We note three things regarding solutions and figures. (1) Coordinate values

are shown as they are represented internally by the computer. For example, the number 21.6 may be represented as 21.59999999999999. Similarly, the number 4.01 may be represented as 4.01000000000001. (2) In solution figures, the x values have been shifted to the right by 110. That is, an x-coordinate in the solution of 50 is set to 160 in the figure. (3) In solution figures, the y values are multiplied by -1. That is, a y-coordinate equal to 10 in the solution is set to -10 in the figure.

Table O-1: Best Known Solutions for 2D, Equal Radius Problems

Name	Euclidean Equal	Manhattan Equal
Overlap ratio: 0.02		
kroD100	376.283837200746	453.318441962213
rat195	294.350814937603	353.601836843240
lin318	5029.09317052352	5906.18397015052
rd400	1199.48701221812	1490.88532530283
pcb442	524.207465527437	647.718458614654
d493	830.138714892407	1101.65713121852
dsj1000	1431.60743473052	1803.03788589256
Overlap ratio: 0.1		
kroD100	302.967151191244	363.995264669544
rat195	231.286699983597	286.787608789850
lin318	3923.49278692995	4783.58226199434
rd400	792.969082591494	944.847609040612
pcb442	406.132158154241	516.098912326682
d493	732.967061485933	984.437534245903
dsj1000	973.087872185032	1248.28888366572
Overlap ratio: 0.3		
kroD100	168.211547217279	210.086809238435
rat195	133.348265765829	175.884585530221
lin318	2406.19518118537	2800.85660569294
rd400	469.114955729596	566.493220235225
pcb442	270.172256516162	360.878900727224
d493	535.918908662567	714.531508580154
dsj1000	491.586674583231	644.727307052363
Varied overlap ratios		
team1_100	1289.15926098968	1628.06155498709
team2_200	525.301901357434	640.198080814187
team3_300	1009.34205704164	1223.21219773295
team4_400	1332.06370986519	1674.59973315034
team5_499	1070.60713233399	1300.85429540812
team6_500	611.803701689917	754.307344949657
bonus1000	1358.41416570140	1752.09281652829
rotatingDiamonds1	43.5540318496497	56.2779116912506
rotatingDiamonds2	199.215279694603	273.071636122489
rotatingDiamonds3	632.534294081259	727.483761305393
rotatingDiamonds4	870.036933360009	1119.99889035316
rotatingDiamonds5	1788.72273651424	2029.81391629613
bubbles1	525.561937957425	606.862779166624
bubbles2	493.126945564769	530.557242072316
bubbles3	997.962502781319	1152.93967977946
bubbles4	1517.61533500695	1778.85845872170
bubbles5	1873.66469945897	2143.88374837429
bubbles6	1840.30331670224	2066.69317253711
bubbles7	1983.55044130888	2160.64618751550
bubbles8	2935.02593667690	3461.29634610208
bubbles9	3286.47115704795	3817.21753576749
concentricCircles1	82.7198592195314	102.536844608964
concentricCircles2	206.589605528986	257.053486227215
concentricCircles3	394.243139204668	483.974501022847
concentricCircles4	613.043795713390	774.960392695861
concentricCircles5	814.937191068533	1023.26801823671
chaoSingleDep	1130.81935610958	1332.77452350258

Table O-2: Best Known Solutions for 3D, Equal Radius Problems

Name	Euclidean Equal	Manhattan Equal
Overlap ratio: 0.02		
kroD100	413.162272324453	545.150805573889
rat195	405.397566194992	549.488386921308
lin318	5152.43832524597	6358.54011234675
rd400	3434.97468740324	4860.12873077882
pcb442	583.403416371046	770.764982629419
d493	2697.55627302711	3784.38656086244
dsj1000	3580.93381220446	4976.37234302661
Overlap ratio: 0.1		
kroD100	312.132821218024	400.094637689879
rat195	267.673370968309	369.715954279881
lin318	4009.19433636304	4748.96978909543
rd400	1888.01843268973	2611.14341560369
pcb442	410.265613168860	528.161211805445
d493	2198.70011786895	3054.15217180303
dsj1000	1587.81339643093	2252.50174869065
Overlap ratio: 0.3		
kroD100	172.559571209228	216.361250863620
rat195	144.628827724444	208.393806403075
lin318	2367.95673608988	2848.79838322875
rd400	962.697580890450	1310.09434977427
pcb442	274.959156856103	360.626034832628
d493	1835.30610073134	2596.32132815398
dsj1000	740.663985288729	1190.15318043963
Varied overlap ratios		
team1_100	2290.78036875582	3271.69883659779
team2_200	642.608797184271	855.241002003161
team3_300	2164.80845098577	2955.19443309386
team4_400	1401.12214800013	1828.97141215696
team5_499	2227.28518395090	3155.41765775118
team6_500	655.506281257898	913.629600895872
bonus1000	1776.63076394511	2495.81642974937

Table O-3: Best Known Solutions for Arbitrary Radius Problems

Name	2D Euclidean Arbitrary	2D Manhattan Arbitrary	3D Euclidean Arbitrary	3D Manhattan Arbitrary
team1_100	1419.20410585227	1755.06296727634	2371.73106505555	3441.41573285092
team2_200	911.187985749524	1121.19114027856	1304.93782055717	1797.40847154213
team3_300	864.107933162231	1095.80864294969	1745.48906965270	2459.09150938096
team4_400	1558.60123610070	1942.80534479826	1788.58265370804	2459.24189438406
team5_499	825.985037931262	1001.31316501947	1309.00391640462	1822.33504980110
team6_500	1068.29057159335	1311.12383183882	1441.88478571873	2004.42248850435
bonus1000	1768.69125790916	2230.89797138153	2912.15092896269	4098.69131471320
kroD100	362.608367276927	433.119968803099	386.293931208620	515.133166233284
rat195	171.352161842645	201.996569467903	194.938256167597	265.091235868124
lin318	4433.37990903867	5272.30967748824	4501.27663380246	5617.06224432374
rd400	1395.42455859158	1714.32819504423	3802.00074025300	5448.00899755598
pcb442	451.143149821312	560.656108632743	463.461188827136	627.637463771702
d493	801.457196205245	1072.81808840153	2359.34517215251	3296.76351006562
dsj1000	1147.27168012950	1429.93654641569	2216.35509362291	3102.36625110613

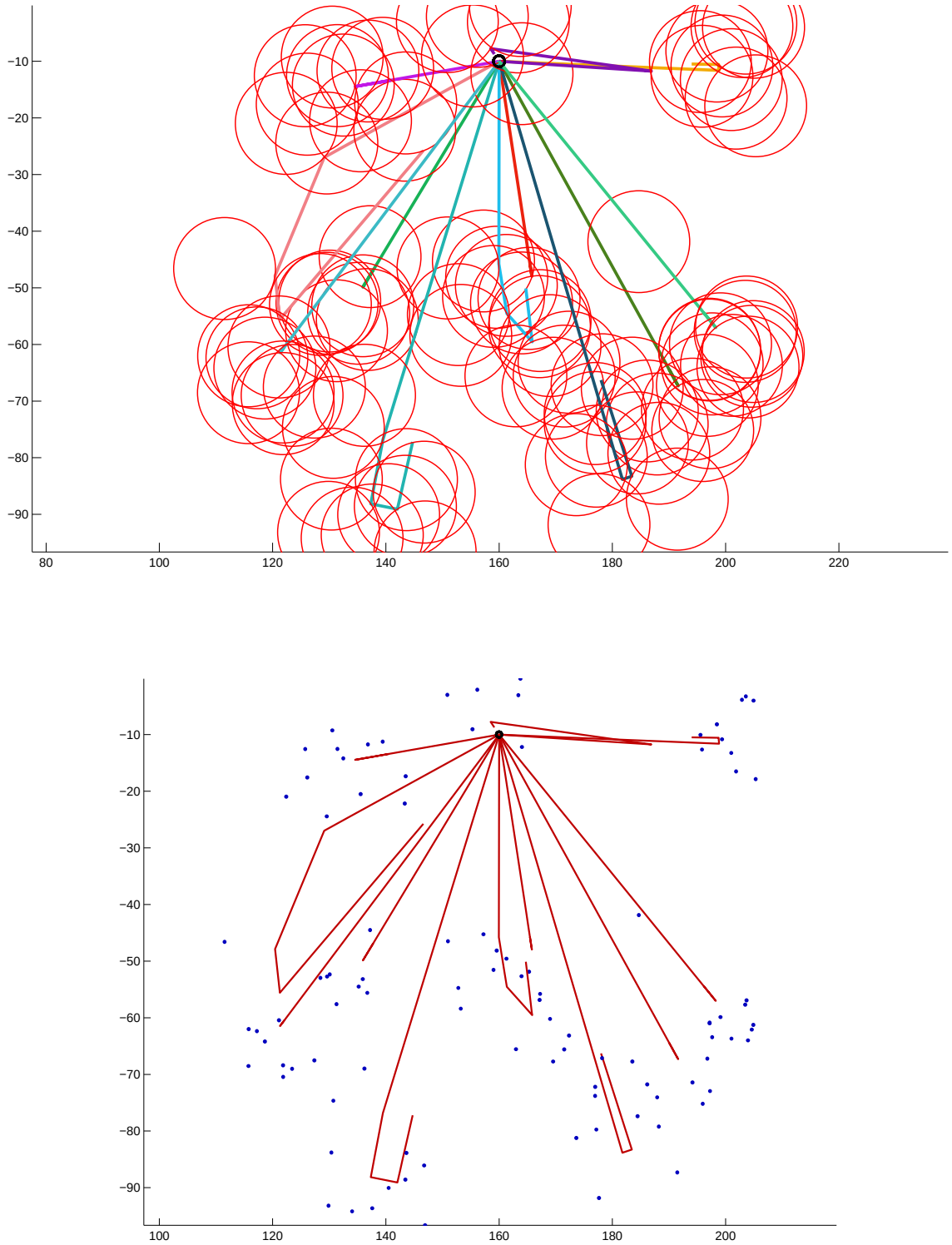


Figure O.1: *team*1_100, Equal Radius, 2D, Euclidean, Length = 1289.1592610

Table O-4: Solution for *team*1_100, Equal Radius, 2D, Euclidean

Total distance: 1289.15926098968			
Total demand met: 543			
Depot: x 50 y 10			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 76.7963333843959 Demand Met: 40			
54.7277523550812	41.0314339100057	47.232	45.27
55.1388116054388	43.7298798893254	49.571	48.14
55.4113051606952	45.5173157292602	51.29	49.58
55.624478845898	46.9154735918364	53.958	52.681
55.7837447669598	47.9600777250669	57.142	56.857
55.70032291856	47.4124755537713	57.243	55.792
55.4442412719107	45.7312770408335	55.281	51.871
Route: 2 Length: 101.217498453897 Demand Met: 44			
49.9496156179925	45.7757684726393	40.978	46.49
50.9752026546096	52.1133817680914	42.804	54.74
51.3664322230019	54.5297411669934	43.243	58.404
54.5334118353353	58.0717894575126	52.975	65.56
55.8347033561259	59.5274136867847	59.534	67.732
55.7952315123138	59.1921396783345	61.493	65.592
55.6878229215497	58.2798094262559	62.352	63.144
55.3700483558813	55.5833309298597	59.007	60.213
54.7262288055157	50.1202576572459	49.02	51.541
Route: 3 Length: 93.1546855567379 Demand Met: 46			
30.908253985212	41.658566358274	27.219	44.51
27.0300581314308	48.0893607606574	20.103	52.347
26.3492403099976	49.2184005783975	19.619	52.734
25.946714674659	49.8859414484311	21.299	57.593
26.3879844945612	49.1542372305849	26.732	55.612
26.9672861135887	48.1936516413	25.201	54.507
27.781842878983	46.8430118235156	25.923	53.185
Route: 4 Length: 130.915472900909 Demand Met: 46			
68.8508970565049	44.1705438177176	74.679	41.865
78.7373720017291	62.0915526576987	87.18	60.86
80.0493124482397	64.4697878196344	87.633	63.432
80.9237497743263	66.0549503504685	86.785	67.217
81.6186802119244	67.3146955209167	85.968	75.194
81.4411559053107	66.9929223723827	87.252	72.952
81.1798503940147	66.5193227899087	84.146	71.427
80.8801082806566	65.9760548000603	77.919	74.057
79.9952040024549	64.3720223258957	76.154	71.763
Route: 5 Length: 155.659290987325 Demand Met: 46			
65.9134843160275	63.9557353621204	68.193	67.124
67.3811559530579	68.9334057716928	66.971	72.201
68.5506454223964	72.8989180481024	66.957	73.797
69.6865077294556	76.7499740441807	67.179	79.746
70.6291294649914	79.9457978501021	63.631	81.224
71.7764262112779	83.8343031930139	67.643	91.829
73.4365252663417	83.2703527495941	81.476	87.316
72.2234557944287	79.4773557151235	78.214	79.218
70.6698836532634	74.6200169251261	74.447	77.382
68.0091470044491	66.3006794653162	73.523	67.727
Route: 6 Length: 125.438598432662 Demand Met: 46			
34.7286470477063	18.3910072361202	33.5	17.352
23.479610080985	24.5717951758818	19.569	24.449
19.1153154184153	26.969695575646	12.414	20.962
10.4361280075464	47.8747239722793	1.527	46.599
11.229142328349	55.1214235645074	5.777	62.003
11.2585526366222	55.390249436912	7.235	62.367
11.2796946303281	55.5835053369368	8.64100000000001	64.188
17.6125763711574	48.1280477196794	18.45	52.954
36.6088729050371	25.7644480803093	33.341	22.178
Route: 7 Length: 167.307726560256 Demand Met: 46			
32.3125720749065	67.5725866760075	26.213	68.977
29.4726120592784	76.8163447478027	20.735	74.659
28.1081646944623	84.0646391752887	20.393	83.793
27.3400835852829	88.1449199047563	19.881	93.181
28.5087967774695	88.378416359691	24.053	94.189
30.1457659865339	88.7054960696258	27.59	93.644
32.0311161832718	89.0822117953243	36.924	96.636
32.4594644762638	87.1969618720571	30.503	90.056
32.9789700480333	84.9105477230088	33.443	88.578
33.6616084736206	81.9062610527876	36.762	86.092
34.724547260102	77.2286366108743	33.626	83.869
Route: 8 Length: 51.6392764733921 Demand Met: 46			
34.8925466639683	12.646776864163	29.447	11.243
29.2227042077275	13.6401118997254	25.542	20.506
27.5155914754961	13.9391909464749	21.459	12.53
26.5487631120658	14.1085758279337	22.494	14.202
25.7665275687395	14.2456227885579	20.541	9.26
24.5677195521355	14.4556514132786	15.772	12.549
24.5677195447159	14.4556514112799	16.123	17.568
30.5096214215325	13.4146447371526	26.839	11.732
Route: 9 Length: 78.6938426993806 Demand Met: 45			
58.4780265154037	10.3524306300576	54.032	12.197
86.2332668900564	11.5056586807539	91.857	16.502
88.8411226020231	11.6139570764753	95.317	17.864
88.8165040468714	11.2910906611959	91.007	13.249
88.7888770540607	10.9295725435707	89.359	10.839
88.7607623363632	10.5626677498076	94.926	4.006
88.4527170282641	10.5580539642904	93.574	3.255
87.444687811517	10.5433452165646	92.889	3.855
83.9996169847067	10.4932303444711	88.457	8.185
Route: 10 Length: 128.774144936126 Demand Met: 46			
15.4086013125891	56.0042622192282	11.123	60.442
11.9832775665563	60.5598831153535	13.454	69.007
11.5884047347015	61.0849835110141	11.844	68.394
11.3046694197501	61.4622804865943	11.878	70.444
11.304668519062	61.4622815395146	5.739	68.535
12.0600384802858	60.4580112787486	17.374	67.529
Route: 11 Length: 58.3133410957448 Demand Met: 46			
76.8877227931278	11.7371224069852	85.841	12.653
76.7790772633313	11.7218906598157	85.554	10.061
54.1800327512428	8.55459916643774	53.754	0.148
52.1962422507999	8.27660590395063	53.405	3.041
49.9644698649994	7.9638707361273	46.154	2.083
48.4955765527634	7.75803681848172	40.868	2.981
49.1496071526454	8.73271110502307	45.293	9.057
Route: 12 Length: 121.249049508854 Demand Met: 46			
85.3744663502185	53.4781505714193	87.173	60.998
86.5886743071889	54.9698803739569	89.091	59.886
87.583168649928	56.1912130670353	91.043	63.691
88.2621249620727	57.024916191123	93.946	64.003
88.0070410094582	56.7109824420179	94.619	62.103
87.6679534959626	56.2935758674604	94.894	61.262
87.0109792034405	55.4852089242657	93.456	57.69
86.0989096408458	54.363212899006	93.694	56.925

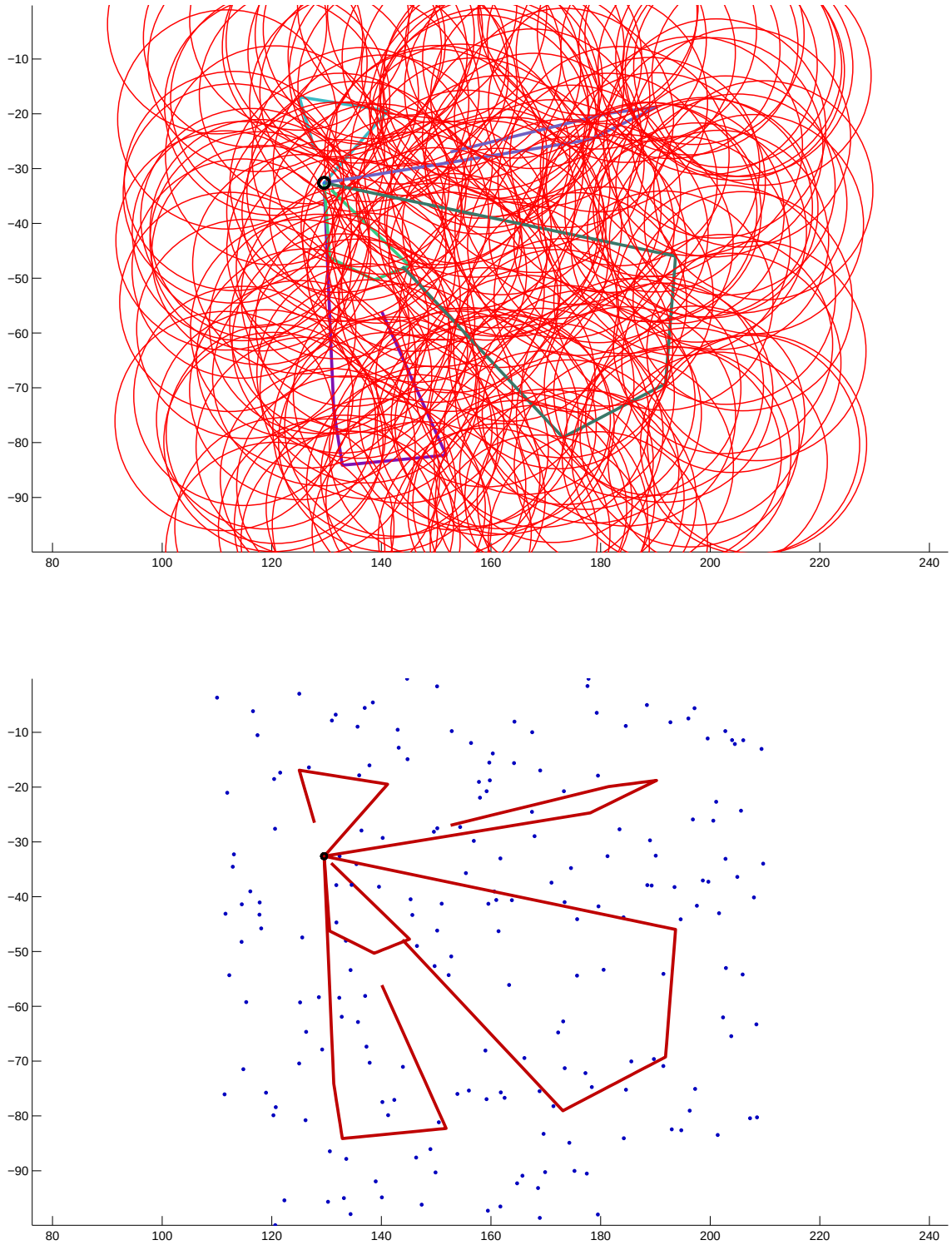


Figure O.2: *team*2_200, Equal Radius, 2D, Euclidean, Length = 525.3019014

Table O-5: Solution for *team*2_200, Equal Radius, 2D, Euclidean

Total distance: 525.301901357434			
Total demand met: 617			
Depot: x 19.5535 y 32.6157			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 50.1813994038853 Demand Met: 120			
20.311026521522	31.756850575598	25.46019	34.06066
21.1373337412219	30.8200274369667	23.528225	48.047471
22.6104278393221	29.1499404720326	35.65863	43.345715
25.2757106992441	26.1280476586016	40.19826	27.52955
26.9673696283442	24.2100003708645	10.613375	27.61233
26.9673696283442	24.2100003708645	44.38625	27.294685
29.0408839136219	21.8591078264846	46.870011	29.816545
29.5927010055479	21.2329656315544	47.997827	21.94091
29.9414125733296	20.8373207568264	46.358401	11.954405
30.1908791164791	20.5543937033787	32.973595	9.54291
30.1908791164791	20.5543937033787	33.169445	12.82499
30.4795355368879	20.227101976492	34.77264	14.924575
30.7737209961314	19.8935700258198	49.796921	18.777515
30.9833732042369	19.6558320677533	49.707097	15.54357
31.138939139718	19.4794816316055	40.16046	1.62977
31.1389402991966	19.4794808930774	50.337118	13.87323
30.7662801557751	19.4203485455297	49.216563	20.76273
30.2087149207407	19.3317774713632	47.801417	19.06334
29.5621039097018	19.2288790520327	34.695715	0.250565
28.3373885294059	19.0344086083547	28.448025	4.56492
27.2829679233886	18.867008866358	27.827995	16.04415
27.2829679233886	18.867008866358	25.954135	17.869355
26.3590487032549	18.720313411257	42.845635	9.79738
22.9953313960262	18.1861361787564	15.031135	2.9821155
21.3900228313566	17.9312336685656	26.97316	5.55935
19.7248147849198	17.6668121853698	20.9699	7.87089
19.7248147849198	17.6668121853698	25.662895	8.989655
18.0544326207809	17.4015666012178	21.673354	6.8005655
16.3740051445494	17.1347237731455	6.5851	6.152225
15.0146888555824	16.9188571850753	0.024125	3.6794065
15.5213183059388	18.6712313029691	11.54701	17.37734
16.0471242475941	20.4898868928085	10.44323	18.54025
16.0471242475941	20.4898868928085	16.776285	16.423415
16.6756064743202	22.6637100869858	7.39533	10.545265
17.7846534507558	26.4987799726829	1.87583499999999	21.036865
Route: 2 Length: 125.113513430454 Demand Met: 120			
20.922718394377	65.0660636057725	4.81189000000001	71.48163
21.1120813886711	69.5512925148408	14.99811	70.439575
21.3042230708285	74.0995346492023	1.401765	76.07236
21.5432552961551	75.6215482831841	8.96414	75.77293
21.7845014876436	77.157586209307	10.737535	78.399525
22.0203613867612	78.6591913190791	10.302265	79.88844
22.2507697477165	80.126014080107	16.17437	80.77798
22.4824158574815	81.6007448183721	20.60172	86.45345
22.7031420056508	83.006001238208	20.26183	95.676245
22.8790434341203	84.1259073281355	10.636965	99.941455
23.7073365311899	84.0450371605986	23.602775	87.83846
24.5546637867408	83.9623106803138	12.30828	95.415795
25.7499779391102	83.8456270179315	23.159665	94.99055
27.0384118129672	83.7198467832874	24.384515	97.907795
28.424504966133	83.5845096514489	31.22881	79.877355
29.778245003067	83.4523404706899	30.1948	77.47401
31.1183354440141	83.3215142505719	32.35548	77.08328
32.4100483573686	83.1954178337612	28.966505	91.93771
33.8083491134305	83.0589089032259	30.09705	94.85711
35.3479617800978	82.90859842775	36.34587	87.597465
36.9026417453167	82.7568334323574	37.353615	96.195315
38.5087704841152	82.6000395312885	51.725585	96.536445
39.1599430549702	82.5364924090095	38.950185	86.058925
39.8545901659132	82.4687177861712	39.89323	90.309885
40.5750688715994	82.3984134795571	58.86286	75.490835
40.8684654613099	82.3698027831357	59.609455	83.27302
41.0921777227055	82.3479911857848	49.437672	97.29667
41.2953890805286	82.3281745024783	40.48646	81.157135
41.5244573338667	82.3058590813927	54.766852	92.295455
41.727376686449	82.2860754345277	59.88564	90.256965
41.8107703678488	82.2779709891379	61.393495	78.21387
41.8107712261968	82.2779709538264	58.59379	93.155945
41.3521628399976	81.2547575665573	55.7501	90.920415
40.6276792444286	79.6380787794015	49.200624	76.95068
39.938826463821	78.1009373510012	52.486843	76.711165
39.2248076687463	76.5076283481372	51.801592	75.702955
Route: 3 Length: 51.4146657070446 Demand Met: 120			
19.6559319331989	34.0063031112056	2.888575	34.539165
19.7837113125592	35.7410273249224	7.79806000000001	41.063165
19.9088973724905	37.4405194560474	4.535275	41.40327
20.0303224799816	39.0888951500325	7.76846999999999	43.27595
20.1455408605379	40.6529908261872	8.071465	45.7971455
20.2521971343351	42.1008516189559	1.56824	43.114435
20.3608908332218	43.5763170810068	4.493385	48.2428075
20.4574896754365	44.887634256393	15.566305	47.445917
20.5583329506646	46.2565853050529	2.26291999999999	54.336059
20.5583338694451	46.2565870342332	5.35044999999999	59.245825
22.5109897853077	47.2307356273824	15.17562	59.299125
24.582348523579	48.2641160015366	18.601355	58.3359
26.6909761584483	49.3160981482598	22.77816	61.91876
28.6919468843496	50.3143689700775	27.85894	70.297015
28.6973982626046	50.3121935715706	27.294235	67.36467
28.7028870236467	50.310002564682	25.726765	62.875185
28.7083350304003	50.3078277593186	19.19225	67.891335
29.0051548791424	50.1895178592786	22.32618	58.45293
29.3141326375639	50.066362839289	16.28216	64.658715
30.266190497434	49.6869322270999	24.393135	53.387308
31.2420755287862	49.2980119285583	27.03592	58.11764
32.2814144242653	48.8838129700799	39.724355	52.657318
33.2996817072444	48.478005284185	51.37375	46.298003
34.0197100999267	48.1910347278339	49.52113	41.29678
34.5802589200249	47.9676166466809	42.753335	50.906813
35.1297655544728	47.7486007413784	53.824634	40.64213
35.1297656895772	47.7486006813805	53.302235	56.10093
34.6141836256169	47.2476956138109	36.49954	48.989475
34.116908626796	46.7645772880209	42.291825	54.317701
33.5913946341912	46.2540227219184	41.00732	41.27668
33.072259475528	45.7496664169181	50.972003	40.60627
32.3432598717244	45.0414168623146	50.608737	39.047145
30.6617080007905	43.4077085854384	39.58443	28.150345
29.3890720620915	42.1712979785568	35.347265	40.483415
28.0473242995872	40.8677400775496	45.420784	35.70231
25.6679498137451	38.5560925500895	30.249755	29.28668
23.7036002412214	36.647665064254	26.379295	27.934205
22.1150499207521	35.1043403958214	6.09162499999999	39.029145
20.8477290142279	33.8730898433616	22.373755	32.6144
Route: 4 Length: 124.939944484645 Demand Met: 120			
37.7946899868546	29.6455757686053	51.719243	33.03008
45.2930754026028	28.4244949151729	57.48649	24.517395
50.0176228791938	27.6551821586146	57.95186	28.956245
53.8937706621351	27.0240508539306	64.595135	34.78327
56.8579483538847	26.5414321871926	61.04328	37.44322
59.7288353694934	26.0740202255833	63.437195	41.00367
62.7116882472544	25.5883155378737	65.72564	44.111465
65.5794465077016	25.1212575125192	69.610075	41.75992
68.1100108878547	24.7091426790608	74.17807	43.76639
69.5246430492017	24.0170397425366	71.273045	32.62062
71.0256316817426	23.2826671833524	73.44882	27.71684
72.553295902854	22.5352304065174	79.01289	29.7258
74.0767268821859	21.7898290487217	80.066985	32.520545
75.6402757576232	21.0247758824919	86.845365	25.906095
77.0567266888326	20.3316687341492	90.572985	26.136825
78.2678334388027	19.739013127915	91.09643	22.6866
79.357408162612	19.205818971892	95.62369	24.314785
80.2156458717859	18.7858085241106	99.37313	13.042045
79.874998208213	18.8294921347114	96.04228	11.46233
79.4713370778484	18.8812367874675	94.4971	12.154995
79.0062022756069	18.9408493149153	93.997115	11.43328
78.4560283366135	19.0113462796335	92.761655	9.792985
77.7870785640879	19.0970449558182	89.544625	11.14329
77.0459361246874	19.1919803250598	87.144585	5.62369
76.1545014333679	19.3061490635293	86.016245	7.495035
75.1210544181002	19.4384808336338	82.741185	8.18936
73.9814825797274	19.5843764984076	78.44886	5.02628
72.7310481814067	19.7444435336423	74.60069	8.85595
71.4522947752801	19.9081118609235	67.794775	0.2453923
69.5405905236491	20.3761541227932	67.61759	1.570395
67.0657008024812	20.9821171479611	69.299455	6.449115
64.2618563593527	21.6686633372018	69.52818	17.90893
61.0579827925832	22.4531099804134	63.31789	20.756115
57.7699831780521	23.2581211062046	58.979255	16.987345

Solution x	Solution y	Original x	Original y
54.3774547970336	24.0887601098174	57.51838	10.00522
50.2244989840065	25.10563258032	54.294115	8.069135
42.6382868426257	26.9631546030265	54.207021	15.63022
Route: 5 Length: 173.652378315768 Demand Met: 120			
55.7923439326544	40.1682605709514	65.705495	54.4013975
62.9253790169759	41.6547462363515	70.55475	53.342402
68.129630206351	42.739253178056	81.466395	54.091358
70.3787208774024	43.207922456471	84.61874	44.121625
72.1057739824003	43.5678048030096	78.52122	37.890255
73.84130009482	43.9294543012199	79.319755	37.96047
75.5997677193389	44.2958987361502	83.48933	38.25693
77.2842695042871	44.6469441250627	87.57797	41.66484
78.8068585372605	44.9642553580106	88.660005	37.051535
80.210256843234	45.2567345920624	89.661665	37.28143
81.5180822496331	45.5293006295577	92.788305	33.10169
82.6682708942156	45.7690221887345	94.955665	36.40187
83.6759656574839	45.9790475450029	99.67714	33.98061
83.5330382971446	47.7959995730781	97.982935	40.137435
83.3459512056405	50.1739841701433	91.6164	43.026115
83.1272494571465	52.9536834688264	92.878595	53.021252
82.9051810687048	55.7761563208911	95.92709	54.202926
82.6660093099716	58.815919027366	98.425325	63.29758
82.4585006364596	61.4533099828732	92.344515	62.02096
82.2476407635834	64.133250121402	93.854515	65.44994
82.0358740854952	66.8246893377156	87.254685	75.06877
81.8457636089999	69.2410406245333	98.53739	80.25874
81.3439738249512	69.5038490675616	97.272905	80.426715
80.1915659451541	70.1073502719872	81.449	70.90379
79.095827862086	70.6811681179066	79.72973	69.6285
78.0380871218936	71.2350772872842	91.37176	83.481715
76.6403846407931	71.9669981195957	75.60926	70.05143
75.2952492015843	72.671391655783	68.40623	74.741575
74.0978785397886	73.298391140939	82.980165	82.460215
72.8424922377948	73.9557683941664	74.635475	75.231085
71.6299438996194	74.5907131195854	86.26193	79.048
70.1623683508388	75.3592083182252	84.72455	82.62255
68.2459749811119	76.362726543327	65.23767	90.033385
66.7451097273646	77.1486234342796	64.30468	84.91
65.420408289241	77.8422646074107	67.48261	90.51293
64.2754026500778	78.4417977725418	74.234205	84.088705
63.1073902668232	79.0533785337131	58.9163	98.60932
63.1073895334485	79.0533777893012	69.51155	98.000325
59.4025322055922	75.1028920542592	67.24276	72.18951
55.5264589217799	70.9699708875463	63.457115	71.302795
51.3092556267646	66.4733677787544	62.26967	64.78212
46.4083498319955	61.2478168845525	63.17424	62.764205
33.8541865369871	47.8627179137472	40.184205	46.1874365
Route: 6 Length: 1.5636927397544E-8 Demand Met: 17			
19.5534999967425	32.6156999967665	21.800035	44.699325
19.5534999953518	32.6156999966316	24.567885	37.86062
19.5534999939497	32.6156999960207	21.779985	37.899125
19.5534999935945	32.6156999958286	3.09506	32.271765
19.5534999958613	32.6156999967201	29.577285	38.20107

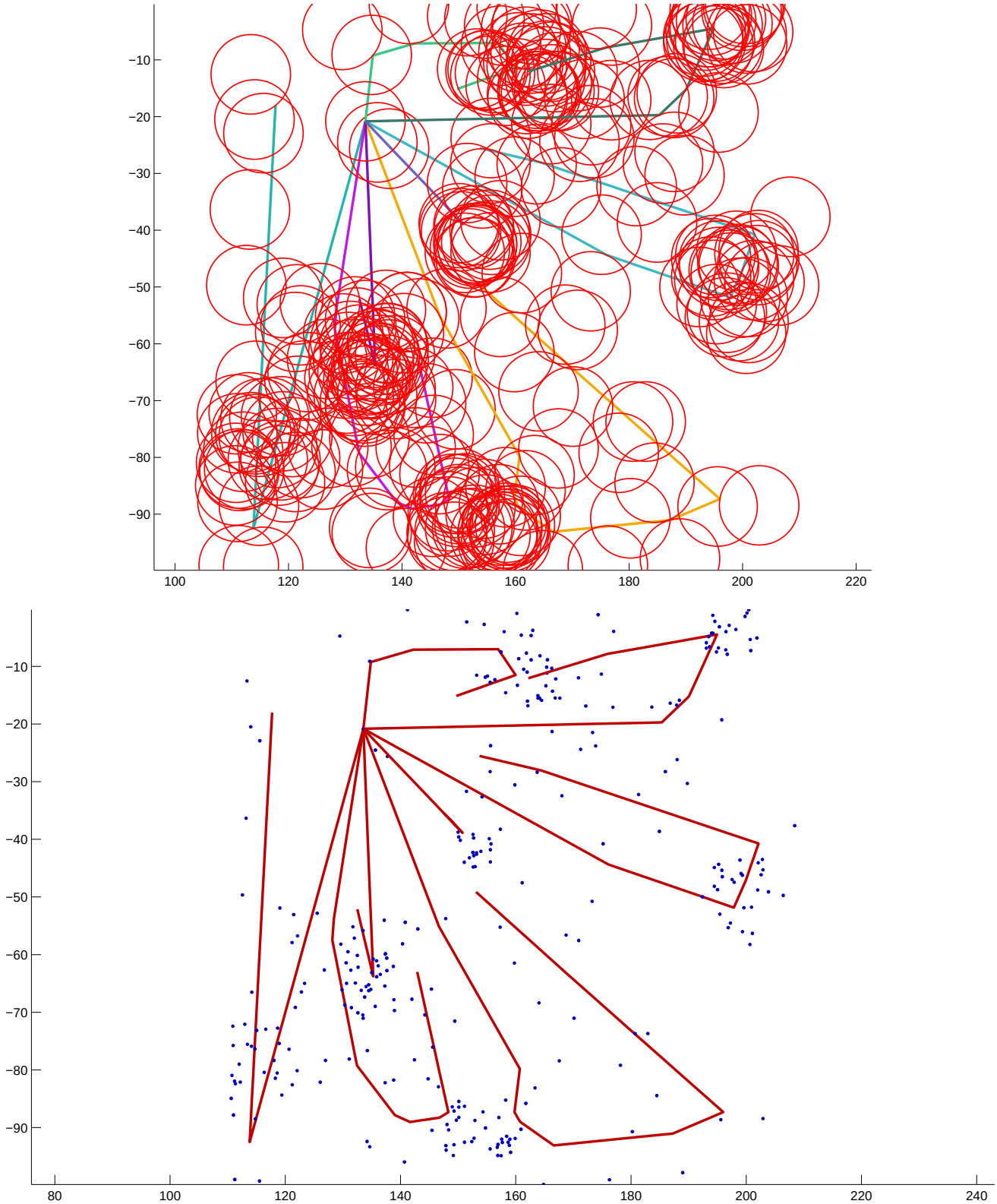


Figure O.3: *team*3_300, Equal Radius, 2D, Euclidean, Length = 1009.3420570

Table O-6: Solution for *team*3_300, Equal Radius, 2D, Euclidean

Total distance: 1009.34205704164 Total demand met: 9490 Depot: x 23.55 y 20.83			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 165.006679919067 Demand Met: 1259			
10.6541126911223	67.6830322735881	4.20999999999999	66.53
8.80935985545553	74.3867364219109	8.59999999999999	80.56
8.80935985545553	74.3867364219109	8.06	78.36
8.80935985545553	74.3867364219109	11.74	69.17
8.25979778805228	76.3834529443393	8.95	75.43
7.67035980052455	78.5251315596486	12.07	80.14
7.67035980052455	78.5251315596486	10.66	76.44
6.8426338610313	81.5324854765278	11.23	82.6
5.98281521792573	84.6563070462512	9.41	84.38
4.90678323759353	88.5655805674833	4.8	88.51
3.82276895735761	92.5038934955672	5.54000000000001	99.29
3.8227683941754	92.5038936678052	1.23999999999999	99.01
4.02185578735094	88.6907474476658	1.01000000000001	87.83
4.20464025654798	85.1908014450483	0.620000000000005	84.95
4.20464025654798	85.1908014450483	1.36	82.41
4.32408660154854	82.9044607198259	1.20999999999999	81.97
4.43413918555031	80.7981717448309	0.760000000000005	80.97
4.43413918555031	80.7981717448309	2.01000000000001	79.01
4.53196798250102	78.9262930631575	0.969999999999999	75.78
4.60155487637734	77.5952392885515	4.75	76.37
4.60155487637734	77.5952392885515	4.15000000000001	75.92
4.66222766737697	76.4349367106659	2.19	82.13
4.66222766737697	76.4349367106659	8.28999999999999	81.45
4.66222766737697	76.4349367106659	6.36	80.44
4.66222766737697	76.4349367106659	0.909999999999997	72.43
4.66222766737697	76.4349367106659	5.06999999999999	73.15
4.66222766737697	76.4349367106659	2.98999999999999	72.09
4.66222766737697	76.4349367106659	6.62000000000001	72.96
4.66222766737697	76.4349367106659	8.67	72.77
4.90218867334494	71.8433449900448	3.44	75.58
5.99319587196916	50.9619607035295	2.56999999999999	49.67
5.99319587196916	50.9619607035295	9.06999999999999	51.92
6.7269282104015	36.9203039442438	3.20999999999999	36.35
7.30235800349828	25.9115258592257	5.58	22.9
7.53628623873171	21.4375925132397	4.01000000000001	20.5
7.71492025916569	18.0203980337478	3.36	12.54
Route: 2 Length: 148.069138249636 Demand Met: 1296			
18.416510430707	53.8490826551481	11.46	53.07
18.2705691360342	55.9671565031734	12.14	56.76
18.1662430265009	57.4813186055613	11.18	57.92
18.8178791344356	60.7907621404625	16.79	62.67
19.2853264439693	63.1679304416324	13.36	65
19.6758286518415	65.153763064231	12.82	66.49
20.233571937536	67.9887948199224	22.6	70.1
20.6636457232355	70.1749624904935	23.47	70.49
21.0698200890257	72.2396717728232	23.52	71.05
21.5130862966242	74.4929049663959	24.25	76.66
21.8599942009282	76.2564052392527	16.99	78.36
22.1556057824308	77.7591082517581	21.1	78.12
22.4514592600061	79.2630178230225	16.07	82.14
24.6798281102085	82.1775148897051	27.35	82.24
26.4618162900698	84.5081829644682	28.82	81.78
28.5546758673072	87.2454380333309	24.2	92.42
29.0232036512413	87.8582420591521	24.67	93.34
31.6544056439935	89.0467484333045	30.69	95.98
33.730971217839	88.7374915182295	37.88	93.16
34.6877424538424	88.5950033625613	35.46	90.5
35.6356153962734	88.4538408370258	41.11	86.33
36.2233690417384	88.3663100540727	37.93	93.92
36.784026127744	88.2828150780251	39.18	94.86
37.1140379049665	88.0800923171449	39.28	92.99
37.4489443146245	87.8743637595091	41.11	92.55
37.7711540725794	87.6764352985911	42.37	92.45
38.0514783304033	87.5042363420327	42.78	91.87
38.3049001823298	87.3485626678466	44.75	90.08
38.196224986098	86.8586353678346	38.08	89.48
38.0837096984816	86.3513934858571	38.36	90.43
37.9580327362534	85.784814679538	39.7	88.73
37.8215874999899	85.1696900926514	40.14	88.25
37.6693690640168	84.4834565942398	40.13	86.48
37.506566548234	83.7495076935949	40.14	85.47
37.3331161354671	82.9675555955169	39.31	87.14
37.110476265928	81.9638463506801	38.99	86.42
36.782263317295	80.4841927477941	36.6	82.94
36.4044807778003	78.7810692916298	34.79	81.57
35.945233037678	76.7106838807436	32.42	78.27
35.4571769304124	74.5104188449197	35.58	76.06
34.9051358556518	72.0216934058373	39.42	71.54
34.3098159008889	69.3378572818117	34.24	70.46
33.6452082052011	66.341630881476	31.99	67.74
32.9069327195593	63.0132152328395	35.37	65.99
Route: 3 Length: 203.889798467824 Demand Met: 1294			
34.5904638759353	49.6682479459257	30.85	54.39
35.6727418052564	52.4949900837293	30.83	54.42
36.6896254612986	55.1507097562943	30.36	58.14
36.6896254612986	55.1507097562943	33.01	55.55
50.7061379638784	79.8138520378612	57.57	78.44
50.3681033419488	82.577914890818	53.35	83.14
49.9621157797008	85.8974570990979	47.08	88.26
49.9621157797008	85.8974570990979	44.33	87.3
49.7836989361443	87.3563140002559	51.75	85.81
49.7836989361443	87.3563140002559	42.93	88.78
49.7836989361443	87.3563140002559	48.25	85.26
49.9542965187501	87.6465652582395	50.91	90.3
50.1167687303329	87.9229977404926	49.91	91.9
50.1167687303329	87.9229977404926	48.98	92.03
50.2604523015829	88.1674670361666	48.89	93.1
50.392974273979	88.3929459090987	48.68	92.55
50.519798459438	88.6087303521083	47.56	92.03
50.519798459438	88.6087303521083	48.42	91.53
50.6419198341367	88.8165113178073	46.8	93.43
50.6419198341367	88.8165113178073	46.92	92.94
50.7522453579656	89.0042179427427	45.57	93.71
50.7522453579656	89.0042179427427	47.67	92.59
50.8557498136186	89.0792430890856	49.11	94.31
50.9620175711387	89.1562700883403	46.89	94.85
51.9925326645524	89.8783558560869	47.48	94.9
56.6017398148207	93.1079237496634	54.83	99.88
65.5241617074534	92.2177481272653	66.26	99.07
70.979597938687	91.6733550735112	70.23	90.73
77.2467770266702	91.04796381165	78.98	97.83
82.6424313957365	88.7605959008651	85.6	88.65
86.0114146539697	87.3323715709471	92.92	88.46
78.3077871050332	80.5135542605436	74.49	84.46
72.7687310055781	75.6106449291643	68.17	79.21
69.9392924559639	73.1061209230781	72.93	73.7
69.9392924559639	73.1061209230781	70.7	73.7
63.6963308969204	67.5802423088006	60.12	71.05
58.7101241333665	63.1667020682572	54.05	68.39
55.9294879459329	60.6665686263601	49.78	61.48
55.1705424655972	59.9841518385204	60.94	57.56
53.4710182396181	58.4560191346357	58.75	56.63
49.5107124522289	54.8951615866952	47.3	55.25
46.6085848814014	52.2857184941256	51.12	47.54
43.1056746428526	49.1363746185487	37.85	53.76
Route: 4 Length: 155.033178794272 Demand Met: 1298			
30.572057872101	24.7148549305259	27.74	25.63
43.754723667378	32.0079988732088	45.57	28.26
61.0204599832375	41.5612564808179	65.16	40.78
66.1022776602826	44.373007976355	63.26	50.77
82.585719734139	50.0364295458413	85.85	46.49
82.585719734139	50.0364295458413	85.78	45.37
82.585719734139	50.0364295458413	84.47	48.16
82.585719734139	50.0364295458413	85.21	44.35
82.585719734139	50.0364295458413	82.42	49.99
82.585719734139	50.0364295458413	84.47	44.91
84.6713702647895	50.7531283069902	87.26	54.53
84.6713702647895	50.7531283069902	85.43	53
85.9361850796859	51.1877046007494	86.88	55.34
87.0146746619715	51.5582533449975	89.36	56.03
87.8488868181951	51.8448700243607	90.65	58.26
87.8488868181951	51.8448700243607	91.08	56.32
88.7666265354732	49.7684185641937	90.93	51.78
88.7666265354732	49.7684185641937	89.59	51.88
89.9137755344091	47.1728764466853	96.43	49.73
89.9137755344091	47.1728764466853	93.86	49.11
90.0586634019849	46.7517095684526	92	48.8
90.0586634019849	46.7517095684526	92.59	46.16
90.221291978813	46.278994624895	87.92	47.46
90.3910819032008	45.7854766229706	87.56	46.99
90.3910819032008	45.7854766229706	85.02	48.75
90.7580137516923	44.7189411000461	89.33	46.23

Solution x	Solution y	Original x	Original y
90.7580137516923	44.7189411000461	89.11	45.94
91.2135867855364	43.3947668228602	92.92	45.3
91.2135867855364	43.3947668228602	92.09	44.08
91.6874373734741	42.0175037944582	92.82	43.5
92.1297967275621	40.7317937061437	98.41	37.64
87.370995633177	39.1309401887852	88.92	43.62
75.0468665070559	34.9889682199821	79.79	30.32
75.0468665070559	34.9889682199821	74.93	38.63
75.0468665070559	34.9889682199821	75.98	28.26
75.0468665070559	34.9889682199821	71.33	32.23
54.3949374156679	28.0429468038843	58.02	32.46
54.3949374156679	28.0429468038843	56.31	21.31
54.3949374156679	28.0429468038843	53.73	28.37
54.3949374156679	28.0429468038843	49.85	30.56
43.7235978304024	25.547218037228	45.63	23.76
Route: 5 Length: 86.2497911003347 Demand Met: 1227			
24.7806290519285	51.6033399311715	27.18	54.04
24.91618549672	54.9968493459352	27.4	59.84
24.9785739405795	56.5582404874417	27.36	59.94
25.0278413616276	57.7910117426328	20.56	61.44
25.0278413616276	57.7910117426328	20.88	59.51
25.0588176710505	58.565429402107	28.77	62.05
25.0588176710505	58.565429402107	27.62	60.61
25.0828356988602	59.1664177322239	25.84	61.09
25.0828356988602	59.1664177322239	25.24	60.77
25.1049400251609	59.7196468672782	22.65	62.2
25.1049400251609	59.7196468672782	22.51	60.15
25.1256468001102	60.2377927315929	26.15	61.96
25.1456304666451	60.7378007129562	25.01	63.12
25.1646449771717	61.213469642662	22.17	64.94
25.1646449771717	61.213469642662	21.39	62.71
25.1807471515024	61.6162226041891	26.5	63.44
25.1807471515024	61.6162226041891	27.64	62.78
25.1962563308403	62.0043266088712	27.28	65.47
25.1962563308403	62.0043266088712	25.86	63.85
25.2101088164926	62.351092887277	20.64	65
25.2231703310107	62.6779250458031	23.78	67.37
25.2231703310107	62.6779250458031	23.19	66.22
25.2339445801022	62.9475996705921	19.86	66.11
25.2432369145307	63.1801506362826	24.03	65.56
25.2432369145307	63.1801506362826	24.47	65.24
25.2520333843313	63.4003629366993	25.62	68.98
25.2596175409742	63.5902223139658	24.49	66.27
25.2596175409742	63.5902223139658	24.86	66.05
25.2666939384859	63.7674107650808	28.95	69.72
25.2666939384859	63.7674107650808	28.86	67.84
25.2666934812951	63.7674105732477	21.49	69.2
25.2666930285201	63.7674103281629	20.35	68.75
24.2450561572085	59.4633244431324	19.65	58.2
23.6542699835541	56.9742203708287	21.99	57.15
23.0896199127954	54.5951618445826	23.5	55.84
23.0896199127954	54.5951618445826	21.75	55.19
22.5051575962635	52.1324189616816	15.54	52.83
Route: 6 Length: 67.4959101579867 Demand Met: 1171			
24.5246360701049	12.070694129004	24.66	9.13
24.8383198728276	9.25427011883178	19.48	4.75
32.2292546208261	7.10686514410557	31.22	0.18
39.3249432140141	7.06068762915593	41.49	2.29
42.5018847795282	7.04001265332969	44.53	2.72
44.69111475951	7.02581408466433	48	4
46.1408730114721	7.01639961562494	50.97	4.59
46.9435809474719	7.01116840550731	50.21	0.82
47.2564795747099	7.47449855182874	47.45	7.49
47.5768179582445	7.94881471180294	52.96	3.75
48.1124931626353	8.74270475404988	52.67	4.65
48.850943308758	9.83720475470401	52.67	8.88
48.850943308758	9.83720475470401	51.86	7.7
49.5066815545305	10.8091729239978	55.24	13.37
49.7398798424442	11.1546650471612	51.98	10.99
49.9730898399282	11.5001536573391	56.38	14.32
49.9730894096921	11.5001538946808	56.94	12.18
49.9730894096921	11.5001538946808	55.4	11.17
49.7611774402268	11.5749880374684	54.5	15.91
49.7611774402268	11.5749880374684	54.15	15.54
49.4689951152154	11.6781138668357	50.3	13.28
49.1812815696483	11.7796652117947	51.38	10.51
49.1812815696483	11.7796652117947	50.52	8.68
48.8822444688334	11.8852276130015	53.85	15.08
48.5121340645696	12.0158893298537	53.87	15.51
48.5121340645696	12.0158893298537	52.03	16.04

Solution x	Solution y	Original x	Original y
47.7698291743855	12.2779313272028	52.12	16.84
47.7698291743855	12.2779313272028	48.26	14.58
46.4017724191073	12.7608495340312	46.38	12.31
45.0262692593062	13.2463708228101	45.57	12.76
43.6208098998744	13.7424117538072	45.09	11.7
42.011126871762	14.3104943548394	44.72	11.87
39.6980266180306	15.1270158492045	43.23	11.54
Route: 7 Length: 49.8689972026987 Demand Met: 663			
25.5531980084616	22.9285102705814	23.55	20.83
28.5561108516421	26.0743566975436	25.65	24.53
36.0042933265367	33.8769835463451	41.47	31.69
37.9945265025201	35.9619990432214	40.4	40.19
38.9948703985323	37.0099610119893	44.15	32.64
39.6483844719985	37.6945983413569	41.07	43.98
39.9482890217045	38.0087861236017	43.21	42.35
40.1889719004079	38.2609291154553	45.6	41.81
40.3390120813079	38.4181132781746	42.95	44.74
40.412668014169	38.4952758965888	43.96	42.1
40.4832373377295	38.569204020561	42.72	42.84
40.4832373377295	38.569204020561	42.56	42.28
40.5469406094001	38.6359381506243	47.34	38.25
40.5958225390275	38.6871559444361	42.62	44.81
40.5958225390275	38.6871559444361	41.97	43.22
40.6356199415907	38.7288569698667	42.69	39.78
40.6739781859161	38.7690481913949	42.59	39.16
40.7100170480561	38.8068063256522	43.21	42.61
40.7424096203417	38.8407431682694	45.71	40.8
40.7424096203417	38.8407431682694	45.42	39.91
40.7668429215229	38.866339436711	45.6	43.93
39.2771926471002	37.3058046747708	40.11	39.6
37.5524681603761	35.4989891157682	40	38.77
Route: 8 Length: 133.728563149818 Demand Met: 1282			
54.2401086940856	20.1721727425075	56.85	15.49
57.3626613762606	20.1053328644306	57.66	15.51
60.277968141392	20.042998207304	61.27	24.41
62.9682843187319	19.9853942947299	62.16	16.88
65.8363254119988	19.9239959384286	63.88	23.81
65.8363254119988	19.9239959384286	63.35	21.49
72.3126581317181	19.7852763818566	77.94	16.73
72.3126581317181	19.7852763818566	66.87	17.1
73.8382756778263	19.7525795020617	73.63	17.07
75.3369788154714	19.7204577653459	78.01	26.19
77.0191745863231	18.1142458941612	76.81	16.4
78.5546196035907	16.6481964939947	78.41	15.88
80.0508588899255	15.2196017457368	85.76	19.27
81.6876969485201	11.6092433289968	83.08	6.85
82.3104513196351	10.2352345297955	84.85	7.49
82.8093279248244	9.13453330887936	83.63	6.61
83.2574264754849	8.14586087777805	83.08	5.9
83.6775274663186	7.21895668238915	85.18	6.81
84.0861688306143	6.31733350676356	86.46	7.15
84.4931541081823	5.41936637411185	90.79	7.27
84.4931541081823	5.41936637411185	86.71	7.9
84.8202250870228	4.69769474352899	90.14	0.74
84.9216595097405	4.47388933842551	90.45	0.18
84.9053001324774	4.47678823539779	91.86	5.09
84.9053001324774	4.47678823539779	90.71	5.35
84.5427885879096	4.54098585908775	89.81	1.33
84.0190053447209	4.63375064859942	88.21	3.61
84.0190053447209	4.63375064859942	87.06	2.89
83.3327650925119	4.75527886554378	86.49	3.97
82.5762802187628	4.88925374250864	85.34	3.13
82.5762802187628	4.88925374250864	84.57	2.19
81.6321431822575	5.05644944250151	84.21	1.15
80.456796198234	5.26459748090386	84.22	4.25
80.456796198234	5.26459748090386	83.98	4.24
78.3985972299345	5.62906812756327	83.5	4.83
70.0208441729029	7.11261148229443	67	3.94
65.9391889793928	7.83537177834172	64.3	1.03
63.4631997170152	8.59438514231156	64.87	11.36
60.8328778079475	9.40069544708554	60.89	11.99
58.385435152201	10.15092375901	55.5	8.86
56.384538480918	10.7642653858265	56.26	10.34
54.3578826639186	11.3855049417786	55.38	10.13
52.1840993140212	12.0518661645068	54.22	8.18

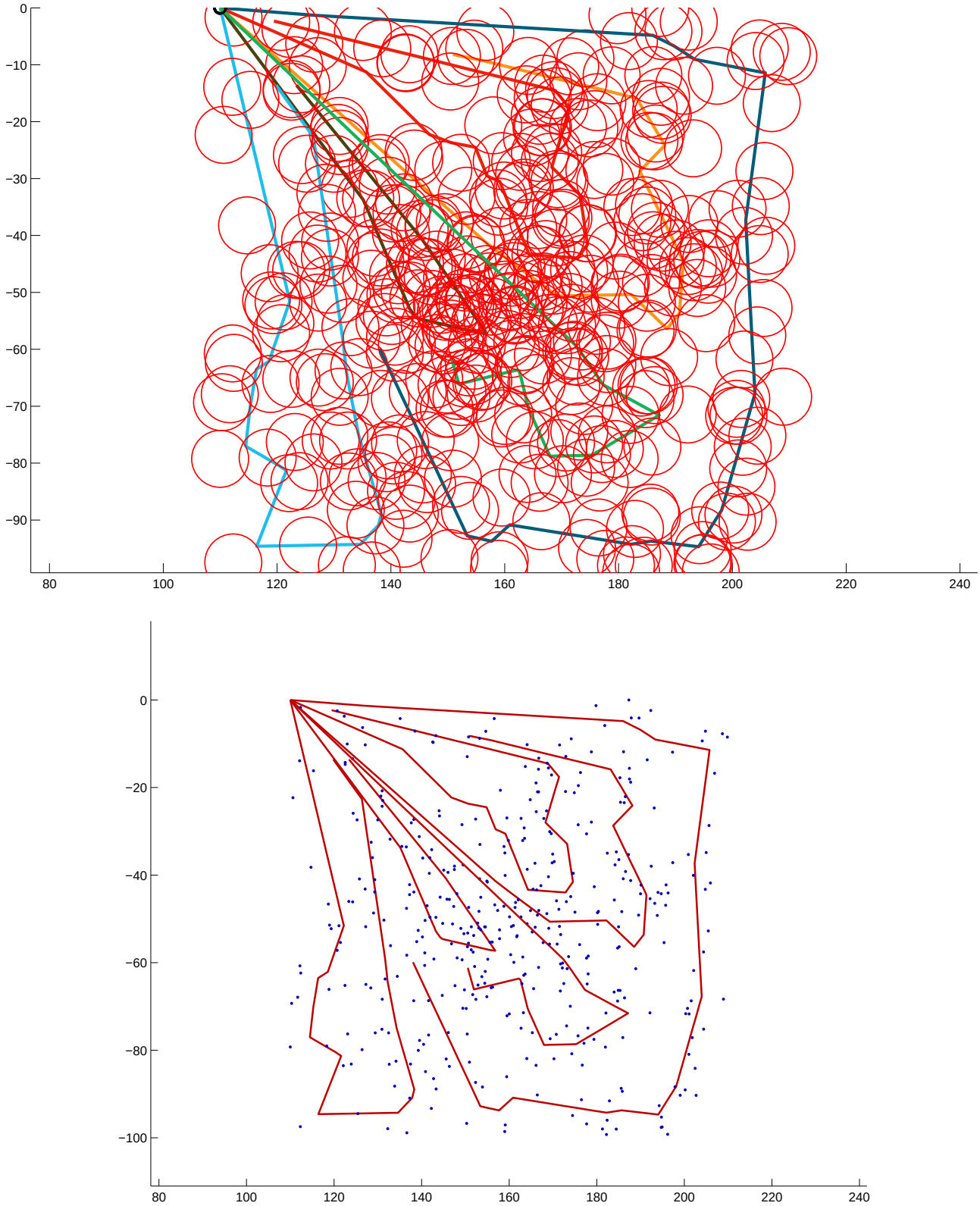


Figure O.4: *team*4_400, Equal Radius, 2D, Euclidean, Length = 1332.0637099

Table O-7: Solution for *team*4_400, Equal Radius, 2D, Euclidean

Total distance: 1332.06370986519			
Total demand met: 2245			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 220.770161887587 Demand Met: 375			
27.7389932870396	24.4840213719157	28.216025	27.287675
31.5507165610613	27.8484596992576	33.989075	25.3104
35.2294942575339	31.0955627443579	32.29465	34.1886
40.0077854142609	35.3131444809045	37.4906	38.735475
43.173206225259	38.1071077959681	43.242475	40.8624
44.9596906529615	39.6839547877821	49.0937	40.0849
45.5465116883281	40.2019179398536	44.89855	41.381
46.1225256946894	40.7103425216662	45.015525	41.584025
46.7139412140377	41.2323616694441	43.5222	45.0811
48.953649480214	42.9761923471676	46.718325	46.79505
50.3787853562299	44.0858036426229	47.35915	48.071
51.4934230242692	44.9075632297756	48.801425	47.111675
52.867967600677	45.9209358207115	52.703075	49.56845
53.7147462450527	46.5452236202236	52.0729	45.66175
54.7578014012462	47.3142141117809	56.7604	48.090675
55.5810843812946	47.9211809005049	54.870925	48.098925
56.44310519927	48.556707119095	56.4549	49.1402
57.2822309387442	49.1753545135251	55.262125	52.9866
57.9544981468039	49.6709887205306	54.099275	51.121125
59.2761573381844	50.6453838293042	57.767975	55.4125
61.3394022481211	50.5989867499423	58.59885	48.807625
67.1390823149242	50.4685942150798	70.20275	51.264575
69.0266369205081	50.4261457197481	70.163125	48.595475
70.5855587441664	50.3910856916668	70.38585	48.289775
72.2113621524258	50.3545256084319	74.018375	45.692475
73.3076924152104	51.4007331587571	75.70595	48.354275
74.6273265356456	52.6600464499484	74.97575	51.8098
76.0289329818953	53.9975787791272	75.12385	56.355025
77.1896871607752	55.1052770777667	74.7548	56.66355
78.5381199092252	56.392028951881	78.897475	61.3791
80.7103229674247	53.6207084491197	85.3769	55.416
80.9184927146372	50.6407477471478	83.835575	49.221375
81.0329054409202	49.0028057043746	79.556325	49.1563
81.1522595035138	47.2941352502757	85.726975	46.8848
81.2131132029166	46.4230179959463	83.247325	46.458225
81.2753266806898	45.5324420285736	82.166	45.384
81.3374550823124	44.6430884662779	86.306375	44.08645
81.2817286726518	44.4583114471725	84.710775	44.260425
81.2237340584124	44.2660125319368	83.98185	43.958725
81.1644856060445	44.0695558223137	85.82305	42.253575
80.6541062451717	43.0141718704546	80.003925	44.278875
80.0938798317293	41.8557115021781	80.128375	42.2928
79.5102060852432	40.648765340034	82.455325	37.974875
79.0842806254249	39.7680161557143	77.736325	41.257125
78.6249721332631	38.8182361370819	76.046775	40.829925
78.1078059651202	37.7488162840874	76.5757	39.19325
77.5483301943773	36.5919068664238	74.186175	37.664625
77.046289205288	35.5537664085894	77.267275	35.3236
76.5520994997133	34.5318612402774	75.0516	36.4713
75.9780184845753	33.34475331044	74.4851	34.7013
75.3567581450608	32.0600854798125	72.419975	34.998125
73.7291643814233	28.6942912269691	68.792375	27.90175
75.4987179394388	26.8648919622559	75.41995	23.365625
76.9460437069063	25.3685440196761	76.538875	22.08605
78.1473189220953	24.127080362647	83.1155	24.690275
77.2130930859707	22.5794767723119	76.27055	23.463675
76.2453425621451	20.976338905706	77.750225	18.79385
75.448775484557	19.6567776495403	77.472675	18.057475
74.6927048144935	18.4043023907471	75.3053	17.780525
73.9635713592556	17.1964509153987	77.464	15.628175
73.1583326247825	15.8625243922001	76.1173	11.832075
68.098184320839	14.630159003216	68.784175	11.8632
63.0516274618412	13.4011194590759	64.181275	8.885925
57.4725222507782	12.0424052587885	56.7601	13.3255
52.8296189521995	10.9116870575804	54.0981	10.209075
45.5085845099518	9.12874836595835	46.59205	4.24755
43.3786866819439	8.70149967620867	44.6523	7.1683
40.8844174541198	8.20117495764232	40.4237	12.94705
Route: 2 Length: 151.683703192661 Demand Met: 372			
17.353323215338	23.2849851134428	20.686175	21.9667
25.1303780237206	33.7204711418292	29.46595	31.229925
25.5715243595399	34.7570373414236	22.793175	31.8095
27.6779424395291	39.7064793878023	31.7652	39.5927
28.5645010744948	41.7896393059189	27.2689	42.18555
29.4769920213509	43.9337210486084	31.24645	46.9846
29.4769920213509	43.9337210486084	28.231575	43.86655
29.9315564776406	45.0018152283582	27.251975	44.47235
30.4887531128134	46.3110616239015	26.549225	47.5983
31.1098685716193	47.7704945993686	31.916925	49.63125
31.5954508018046	48.9114748693085	30.804475	50.3614
32.0334769472209	49.9407164313878	33.276075	49.648225
32.4685356522713	50.9629893779638	34.822	51.041775
32.8627237933206	51.8892307588611	30.1798	54.1346
32.8627237933206	51.8892307588611	29.2116	52.625
33.2464882995361	52.7909855351014	28.87265	55.2137
34.2482198551795	54.2254401837129	30.732825	57.781
34.8088915477314	54.6072651904705	32.800625	59.186225
36.0121070432009	54.8871415202839	36.8297	55.690525
37.0904002351949	55.1379588936469	37.074525	51.14655
38.5170237923992	55.4698017559378	38.122975	58.912025
39.7890765697874	55.7656891024773	39.243575	59.34405
40.9526587748333	56.0363452933035	40.468775	56.35765
42.1762342350951	56.3209564149089	41.323875	57.06515
43.5376257545096	56.6376254087945	41.765825	57.606275
45.4690830487088	57.0869040986463	44.541975	62.0002
46.834322502918	57.2854500724056	51.0767	59.931625
46.4502769768277	56.7238632527137	50.342	58.1772
45.8426303192964	55.8353105685808	47.802925	54.5327
45.8426303192964	55.8353105685808	46.119125	55.3112
45.2792211650837	55.0114432445233	47.81055	52.508825
44.7876333087706	54.2925968368984	45.616825	55.349625
44.7876333087706	54.2925968368984	43.47965	52.4779
44.3518246874305	53.6553154860734	40.703325	55.537825
43.9612412231388	53.0841678769847	41.89655	53.797625
43.588659798156	52.5393446608457	44.549375	51.8385
43.2173535734261	51.9963863060192	44.413025	51.821425
43.2173535734261	51.9963863060192	43.054225	52.07985
42.8352295099184	51.4376095466251	40.529725	53.231175
42.4473328200138	50.8703919911761	39.658325	53.39295
42.030810423587	50.2613165224623	41.3638	51.811825
41.5863137323027	49.6113347847898	38.966475	52.166125
41.0994555939199	48.8994094874788	42.80595	50.969325
40.4154391197121	47.8991827121339	43.10885	48.272275
39.4747679203952	46.5236540255753	40.7628	47.39015
39.4747679203952	46.5236540255753	37.32375	47.164775
38.4522896745703	45.0285000456226	38.0514	44.25295
37.5574855626192	43.7200424748344	36.34605	45.558575
37.5574855626192	43.7200424748344	35.77655	45.5234
36.4391114536648	42.0846547454563	34.241775	45.041325
36.4391114536648	42.0846547454563	36.0198	39.389875
35.4682181717918	40.6649193175227	39.47365	37.672175
34.5730575461869	39.5659878609974	35.05695	38.887125
33.6959959611898	38.4892770112232	37.4986	37.94785
32.0274249069643	36.4409092003756	31.8731	36.0461
30.49584128846	34.5607079659729	30.2641	36.115
28.6802435799289	32.3318372799025	26.51415	33.575825
27.0565729754342	30.3385717088252	25.49855	33.45475
24.6551408398872	27.3904921427446	27.65685	28.081275
13.4163958652329	13.5934576938435	17.13825	10.254625
Route: 3 Length: 327.48311142495 Demand Met: 374			
16.8776864394331	1.32588557975601	16.533825	6.314025
26.1108760105923	1.87405267185874	25.090375	4.2535
69.1933122753154	4.431432641031	69.817575	1.306825
72.3407072912551	4.61828971351871	71.829525	5.85575
76.0358512267103	4.83766754743063	77.335225	0.00945
77.2843738530576	5.46637609592149	77.882675	4.11235
78.5647926034649	6.1111522858689	79.6523	4.144625
79.8488863968617	6.75778522968416	82.33615	2.420325
83.3856257951567	9.04852091055095	81.52085	13.687775
87.9836236949703	9.93060229643306	87.3023	11.937375
93.2642107165881	10.9436795876566	94.81355	7.137025
95.5318293002424	11.3786521989542	98.6909	7.723575
95.7728019733721	11.4248667972061	99.82775	8.49955
95.5275765275917	13.2793367437794	96.9141	16.74635
95.5275765275917	13.2793367437794	94.09005	9.358875
93.1301303936248	31.4080569437578	94.997925	34.851
93.1301303936248	31.4080569437578	95.640625	28.68455
92.3457078559826	37.3386422181128	87.349525	37.1432
92.4172532745847	38.6795385230605	92.049975	40.056175
92.4172532745847	38.6795385230605	90.921925	35.308625
92.6470765017348	42.9862147253195	95.9689	41.808
92.6470765017348	42.9862147253195	94.807975	43.25145

Solution x	Solution y	Original x	Original y
93.1557047463875	52.5185055035553	95.486225	52.746525
93.5425617955595	59.7686633961231	92.124775	61.791725
93.5425617955595	59.7686633961231	94.377175	57.5521
93.9690833161165	67.7624187258723	98.93765	68.322275
93.4960172563975	69.4215316920365	91.5733	68.725
93.0231605988425	71.0799039931188	90.725625	70.444425
92.5581153829468	72.7108738645822	90.314475	71.662575
92.0645098855818	74.4419988881582	94.404	75.185075
92.0645098855818	74.4419988881582	91.08095	71.69145
91.0953764280983	77.8408126986489	91.825175	77.123475
89.7923686957573	82.4105384986237	92.480625	84.1266
89.7923686957573	82.4105384986237	91.03755	80.9252
88.1232698767311	88.2640647377715	92.685275	90.310575
87.6250662303916	89.0488126986983	90.195175	89.03695
87.0555556751503	89.9458822212403	89.0595	90.291
86.4426718344146	90.9112724964382	87.858275	88.334025
85.4164283801065	92.5277793781702	84.25115	92.664475
84.4938394263797	93.9810125217075	84.730325	97.611875
84.4938394263797	93.9810125217075	84.77555	95.283075
84.0449134726946	94.6881470355651	86.192975	99.203225
82.616597126984	94.5202669721592	84.9479	97.513325
76.7513606733694	93.8313254312601	75.8385	89.39705
75.6902187452875	93.7065706266888	75.589675	88.707575
74.4138291787099	93.9087365824917	72.88955	91.55335
73.3392938464428	94.0789684163762	71.306475	97.9771
73.3392938464428	94.0789684163762	72.374675	95.981125
72.8283763520029	94.1599390489304	74.44305	98.0205
72.2253298312824	94.2554945947827	72.222075	99.2555
68.7712452752922	93.7037171158289	67.679475	96.828325
65.9999497581073	93.2610246782527	66.508125	91.303225
63.0353353105201	92.7874563560616	64.46975	94.91155
56.474512921672	91.739464928366	56.428075	90.20545
50.8679184557292	90.8438951908391	49.4347	86.0537
48.2352340326787	93.2406776459886	49.100125	97.070175
47.7004498685883	93.7275661769898	48.99045	98.5583
43.4142404912601	92.7856020915771	40.290225	96.689525
41.7687054046705	89.2687437981258	43.9034	88.387225
40.0635827798286	85.6245361542065	42.31835	87.347525
40.0635827798286	85.6245361542065	40.913925	82.729825
38.3044739452153	81.8649620878799	36.3513	83.686975
38.3044739452153	81.8649620878799	35.60905	81.995775
36.7410372485625	78.5235685682698	40.4153	76.30845
35.6986199461419	76.2957054065828	36.110325	75.95995
34.6842686212446	74.1278249851084	31.60195	76.5275
32.9393078807445	70.3984830080186	31.583525	68.6781
31.9601370912273	68.3057730599995	34.7277	67.482525
30.8485070663892	65.9299691734383	28.20205	68.6988
28.0253283914673	59.8961842468127	30.688625	60.637275
Route: 4 Length: 176.478798217982 Demand Met: 375			
4.01374047395213	1.76115029571496	2.34935	1.70725
14.6208808640766	6.4154034404577	13.011825	10.0758
25.6619521532983	11.260079943016	28.471925	7.124375
36.7879874457113	22.2687797913752	34.098725	26.483975
40.5722044663784	23.6744783669356	39.217825	28.48755
44.827476870399	24.5058987093567	47.99765	20.639375
45.8234761150707	26.9275356873796	42.344525	27.231625
46.8964912420342	29.5363497818143	43.312375	33.022625
47.3867714390838	29.7541054330752	49.48335	26.949275
49.1287940059707	30.5276888987991	52.727475	27.05645
49.5923782388604	31.6824327098331	49.014675	34.9475
49.8930586108682	32.4313933216754	48.825175	33.4678
50.1898851215797	33.1707574581496	49.821325	32.088775
50.5373017394968	34.0361421838482	53.51985	31.610925
51.0314565324121	35.2670511354004	53.08505	32.116125
52.1578999096929	38.0730001873896	55.894525	37.29925
53.0688632012912	40.3422490554603	54.125425	38.6935
54.2779480260499	43.3541883764549	51.332325	47.3944
54.6814665276773	43.382823995632	51.464375	46.273425
55.7019383218249	43.4552311698943	55.460475	43.213925
56.7519152455024	43.5297304578891	56.281125	43.406775
57.8458362949118	43.6073467827545	57.24125	42.40615
59.0149608973572	43.6902981170122	58.980725	40.369175
60.2244236297838	43.7761110030119	60.81405	45.86495
61.276618711881	43.8507669043364	61.33205	47.81805
62.1332705368489	43.9115525565024	63.06625	46.073225
62.8665934334134	43.9635879683945	65.024675	48.473875
63.5889436356838	42.9243185514613	64.04505	44.910675
64.5543417508601	41.535370467905	69.4258	42.661825
64.339868429809	40.1442796399264	64.627025	39.598675
64.1335644648692	38.8061813731699	64.48255	39.62755

Solution x	Solution y	Original x	Original y
63.8887091659947	37.2180291094399	59.82755	37.21565
63.6911669370967	35.9367758082661	60.313175	36.907775
63.4645687978256	34.467062751224	59.92645	35.207
63.2173066044306	32.8633246410955	67.6691	30.587025
62.2033677112717	31.8632539204579	65.757275	28.49595
60.4947767464847	30.1781154716387	59.6161	30.5374
58.2724614100596	27.9860252309201	53.429725	29.230175
58.4589644621165	27.3600159977389	59.25755	30.092125
58.6913902046772	26.579856399427	57.8987	27.066925
58.9356753827935	25.7598861949181	58.5251	25.335175
59.1731246084108	24.9628609636547	56.18475	25.5187
59.4583368717375	24.005503242965	54.7913	22.79115
59.8614717250575	22.6522837376093	56.46315	20.9863
60.2099541802239	21.4825181808555	56.707375	20.9848
60.595660181827	20.187816605915	62.8697	20.929125
60.9666096733787	18.9426314723701	65.789175	19.559925
61.0666061483842	18.6069865703864	59.666825	17.15215
61.160592005135	18.2915165148683	64.881075	21.1972
61.3735178391108	17.576846921734	66.273425	16.5814
60.2724817104169	16.2440341969363	62.944875	12.9098
59.5379270336683	15.3549002193568	58.962525	15.549225
58.8460457361512	14.5174253508997	61.5062	10.2838
58.2596362425492	14.372747725191	56.680125	15.845675
57.7452463779039	14.2458441147705	58.66755	14.455925
57.2154209922585	14.1151313950687	56.145325	18.970525
52.5565638557252	12.9657593793208	53.686425	15.19815
44.279300408302	10.9236652502846	43.2503	8.7931
39.9314522463043	9.85104336293185	40.718225	8.45085
35.205993460172	8.68528320661585	33.240325	8.160175
32.6228699168126	8.04803556665645	32.636425	9.71905
30.0074660516018	7.40282465220911	32.5307	9.603625
13.9496057943949	3.44131819650264	12.34295	3.720825
9.43690456946203	2.32805246898769	10.7326	2.49095
Route: 5 Length: 223.319266601576 Demand Met: 375			
3.04569505160795	12.8424561591172	2.12502499999999	13.8908
4.78460010514269	20.1743966086553	0.610974999999996	22.331075
4.78460010514269	20.1743966086553	5.29819999999999	16.16745
8.74872649145632	36.8881949150698	4.729125	38.22055
10.6788082496475	45.0254925160263	13.3837	46.032275
10.6788082496475	45.0254925160263	8.7059	46.626875
11.2989415344584	47.6402607070011	14.24105	46.110125
12.2254496865615	51.5466229838344	17.219275	51.795125
11.8389995355367	52.6662827568595	11.134375	51.580675
11.4218617431764	53.8748319780315	9.352575	52.2461
11.4218617431764	53.8748319780315	8.9679	51.422725
10.7053205037711	55.9506626688112	11.458875	55.406825
9.85752331678938	58.4066418729698	10.71515	57.182775
8.58263588647395	62.0994122610205	12.50315	65.202575
6.36922630440236	63.4943052941141	2.20627500000001	60.72485
6.204987289209	64.4776710316451	2.404275	62.37445
5.78829127006529	66.9713062660508	1.692025	67.9044
5.61924159346592	67.9832564700671	8.8531	66.09375
5.2820287434633	70.001406231354	0.331024999999997	69.303175
4.47315900218079	77.0192405395042	0.00154999999999461	79.256375
7.10556045883611	78.5557517939865	8.347775	79.0334
10.4310246174097	80.496724878	13.11545	76.27845
11.6187646538205	81.3186351575844	16.4015	79.860725
10.6592700801729	83.7659080627704	12.1212	83.525275
10.6592700801729	83.7659080627704	13.92855	83.165725
6.41351739320263	94.5958751413168	2.307925	97.449675
15.3101690046382	94.4381620252826	15.45105	94.471525
21.6149524372838	94.3264846357022	22.27635	97.920025
24.6102460180936	94.2734626385652	26.6212	98.85125
26.4248332827379	92.3666110517216	27.27955	90.9405
27.842721433628	90.8766505845171	32.22375	93.28635
28.3247789462378	88.9494741604933	33.324025	88.862275
27.9629315527958	87.6905837623402	32.733925	86.47665
27.9629315527958	87.6905837623402	30.896	84.86835
27.0260643962511	84.4314371209585	23.831575	88.204275
27.0260643962511	84.4314371209585	27.4824	83.15295
27.0260643962511	84.4314371209585	22.609375	83.218325
27.0260643962511	84.4314371209585	24.1584	82.49565
27.0260643962511	84.4314371209585	29.23795	80.022375
25.7817096221616	80.1019001277276	30.46345	78.65395
25.2454125800314	78.2361470967574	29.5312	77.759375
24.2764194142205	74.8654524282557	19.41455	76.0326
24.0803323582729	73.8524703004203	22.467675	76.02705
23.8234588555868	72.5254946395272	20.9401	75.2051
23.0896846997739	68.7352223706721	21.0091	68.35155
22.5301283758637	65.844812727086	18.3822	65.772725

Solution x	Solution y	Original x	Original y
22.2166730006365	64.2256534728237	17.272875	64.973225
22.0103972969173	62.3393589195515	24.44465	63.1281
22.0103972969173	62.3393589195515	21.668825	63.73225
21.6379001520081	58.9326891855397	26.5978	58.30075
21.1291461505949	55.4369727483881	22.891175	56.122525
20.4282135797371	50.6209523619495	21.4066	50.274675
19.7846020413116	46.1988045219098	19.028925	48.6519
19.7846020413116	46.1988045219098	19.292975	43.870425
19.1482912658734	41.8267688296905	17.095675	43.177
19.1482912658734	41.8267688296905	15.806625	40.87695
18.7193643208601	38.8794658696957	19.322625	41.061025
17.631741690797	31.4056927637875	18.77905	36.01655
17.631741690797	31.4056927637875	18.476575	32.50015
17.631741690797	31.4056927637875	19.9845	27.40155
17.631741690797	31.4056927637875	15.2685	27.387025
16.8057457403734	25.7307891253757	20.995625	24.282225
16.5421088650825	23.9192902420749	21.1268	22.989225
16.3552616217537	22.6351371371873	20.9892	20.7572
15.7285632927364	21.7677817160175	14.358825	25.883825
11.6269651649377	16.0911281927037	14.259	13.428825
11.6269651649377	16.0911281927037	12.54795	14.295525
9.81525728406123	13.5837890148801	12.5519	14.734025
Route: 6 Length: 232.328668540433 Demand Met: 374			
49.2508733823543	46.7541624166513	50.075475	49.526025
52.1241023785533	49.4817380173727	50.9611	51.5263
52.1241023785533	49.4817380173727	50.5204	51.7746
54.1653306716528	51.4195150966124	51.731775	54.063975
54.1653306716528	51.4195150966124	51.8225	53.851
56.2226709369251	53.3725904449773	59.0369	52.162425
56.2226709369251	53.3725904449773	55.9361	51.897075
58.0256970290953	55.0842364946591	61.491825	51.7088
59.0731671715224	56.0784956374051	61.751375	53.5726
60.0692980926401	57.0239989054905	60.964225	55.767775
60.0692980926401	57.0239989054905	59.205025	55.76
61.3832423346494	58.2711952987268	63.564825	58.6141
62.3499089142073	59.188708326693	66.095725	55.876775
63.9785684827231	61.3909500613654	68.048425	58.486425
64.1577894989605	61.6519448900778	67.662425	58.9604
64.337429682473	61.9135263899654	61.732525	60.28975
64.544989421139	62.2157577032745	62.138225	61.218175
64.7761533251133	62.5523561864731	62.1796	60.091575
65.0941385894961	63.0153587079826	62.481725	64.778425
65.0941385894961	63.0153587079826	63.23165	61.378
65.476717517107	63.572409464065	68.033375	62.578975
65.8326188608294	64.0906202513712	61.692525	66.479075
66.5834188711863	65.183708970142	67.8084	64.88
67.2999908051973	66.2270048596164	63.9561	69.944325
70.6862096443934	68.0603267395486	73.97555	66.71955
72.1424127868033	68.8484599612739	72.106325	71.513625
73.2736310100797	69.4606784467081	75.320425	66.338125
73.2736310100797	69.4606784467081	74.919425	66.332825
74.4288906488093	70.0859150617518	74.758025	68.76505
75.6665415828361	70.7557636588808	76.3481	68.05155
77.1514113631458	71.5595053544268	82.150425	71.4598
73.826433617282	73.5342542868404	75.94035	77.0935
70.7002686316663	75.3909442091357	71.96685	79.285825
69.3572494245844	76.1887235733011	67.97015	74.943825
68.1299716629709	76.9177472485835	69.349625	77.516575
68.1299716629709	76.9177472485835	67.096325	78.407125
67.0103630906507	77.5828062784243	65.721375	76.70655
65.9670037270489	78.2025689412198	63.106325	74.44845
65.3007788716243	78.5982853721744	66.686275	83.4025
63.7157779391477	78.6389803847322	64.2971	80.8087
61.9703474644442	78.6838112057971	60.77085	76.3761
60.5572625694759	78.7200862159928	59.360575	77.3659
59.3418852880876	78.7512758918482	60.2356	81.956375
57.9391043423612	78.7872917737575	56.13655	83.451075
57.9390910075699	78.787278310159	54.01775	81.8894
56.7583655979157	76.154504244702	55.289875	75.9977
55.7673998984876	73.9447940431109	52.726325	74.9715
54.9030163786601	72.0173305176766	53.249925	71.4317
54.2281084217918	70.5123722295824	49.5023	72.1454
53.9708247701429	69.4784038694563	50.03295	71.692275
53.4089099312	67.221623564325	52.902425	64.80215
53.0492248552745	65.7763602332836	55.5813	65.9389
53.0492248552745	65.7763602332836	53.3194	62.871025
52.794181918852	64.7513022944805	53.6353	62.58645
52.5859054166168	63.9140896988985	56.708375	61.084725
52.1756973295557	63.6267334372252	53.1029	58.71345
47.0871712123168	64.85902649837	43.7645	63.186425

Solution x	Solution y	Original x	Original y
46.0017240400675	65.1222193576674	44.4217	64.703925
45.0436945220295	65.354518399368	46.228875	65.56925
45.0436945220295	65.354518399368	45.884675	65.715725
43.8473487705665	65.6446113060163	42.3891	68.379025
43.8473487705665	65.6446113060163	42.88515	65.09985
43.0332310337324	65.8420223101149	44.898775	67.784675
42.0689027020227	66.0758620791731	40.205375	70.4585
41.9439548946463	66.1061758957255	39.430175	70.428325
41.6666960888096	65.1389987313107	39.7753	66.19835
41.3793147294357	64.1365058930081	41.683175	67.299925
40.5693893662204	61.3128118500189	45.110025	59.219325
40.5693893662204	61.3128118500189	42.114525	60.87195
40.504787847419	61.2152620829762	37.615325	65.262725

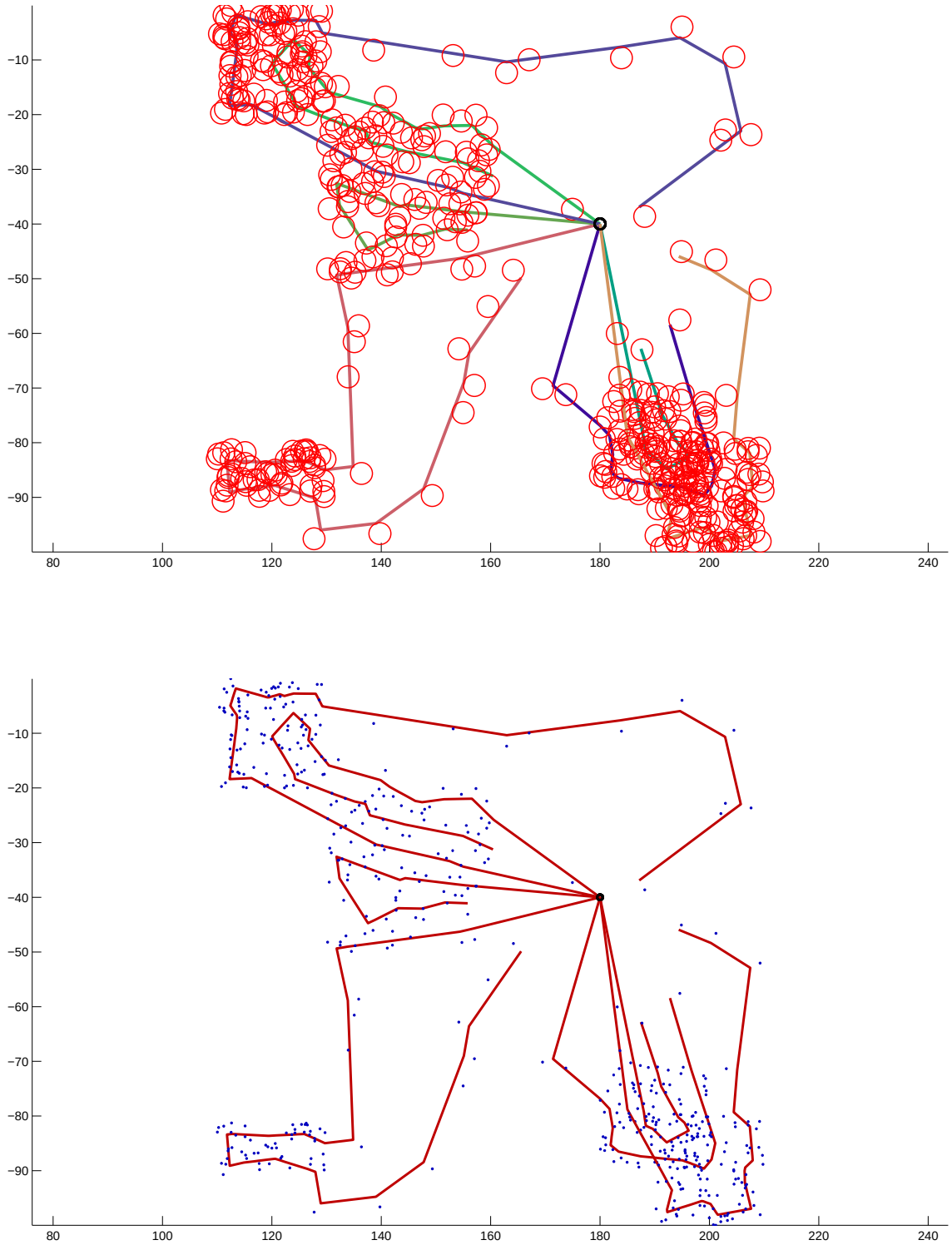


Figure O.5: *team*5_499, Equal Radius, 2D, Euclidean, Length = 1070.6071323

Table O-8: Solution for *team*5_499, Equal Radius, 2D, Euclidean

Total distance: 1070.60713233399			
Total demand met: 9744			
Depot: x 70 y 40			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 98.0519714384164 Demand Met: 1266			
75.9534026867948	69.2020256172273	75.6074	70.2776
76.3709317915896	71.2500419264073	77.364	70.7565
76.9739137851846	74.2077544531963	76.1087	74.9228
76.9739137851846	74.2077544531963	77.4087	74.0915
76.9739137851846	74.2077544531963	76.1847	74.2911
76.9739137851846	74.2077544531963	75.9291	73.9471
77.5311385815861	76.9409881425551	76.8895	78.6378
77.5311385815861	76.9409881425551	77.1908	76.3248
77.5311385815861	76.9409881425551	76.4126	75.548
78.0203793999317	79.3407406460806	79.7775	80.296
78.0203793999317	79.3407406460806	78.9268	79.6337
78.0203793999317	79.3407406460806	79.7296	78.3022
78.0203793999317	79.3407406460806	77.9819	77.7483
78.1217187702769	80.0352049094848	78.4301	80.0876
78.2192687041883	80.7037016251138	79.6279	80.9538
78.2192687041883	80.7037016251138	76.3867	80.9989
78.2842387931793	81.1489451537719	78.0272	82.0721
78.2842387931793	81.1489451537719	78.4966	80.8407
78.337841195342	81.5162855967185	77.4302	82.5606
78.3766106993241	81.7819763772925	76.7822	82.9894
79.1997822290918	82.1490798690556	80.2014	81.5949
79.1997822290918	82.1490798690556	80.3025	81.1115
79.6356826169122	82.3434845921995	80.7551	80.6861
80.6099905786541	83.2873890827333	81.0772	83.8409
80.6099905786541	83.2873890827333	80.1131	82.5047
81.862435779373	84.500781395786	81.7913	86.2239
82.1843588866498	84.8126863947597	81.9044	86.793
82.7279103359389	84.5236560925773	83.1803	86.2205
82.7279103359389	84.5236560925773	83.0689	84.7397
84.1440869176715	83.7706186339717	83.3441	85.5151
84.1440869176715	83.7706186339717	85.8335	84.6274
84.1440869176715	83.7706186339717	84.7929	84.8117
84.1440869176715	83.7706186339717	85.9222	83.4369
85.6388589434828	82.9757958383056	87.1273	84.0324
85.6388589434828	82.9757958383056	86.7862	83.711
85.6388589434828	82.9757958383056	84.2824	83.9445
86.1172460460713	82.7214231041636	86.8895	84.3247
86.1172460460713	82.7214231041636	87.7484	83.7546
86.2046877214202	82.6749286409704	87.8874	83.7559
86.2046877214202	82.6749286409704	87.8518	83.2273
86.2046912714322	82.6748830357874	88.1669	82.2879
85.9367043383452	82.1559142694153	87.5661	81.6563
85.9367043383452	82.1559142694153	86.675	81.8002
85.4457885078019	81.2052370242466	86.0867	81.533
85.4457885078019	81.2052370242466	86.8222	80.0693
85.4457885078019	81.2052370242466	87.0156	79.966
84.7940645655373	80.643968181525	84.7887	79.7551
84.7940645655373	80.643968181525	84.6626	79.7388
84.322575284709	80.2379223285357	82.7718	81.5009
84.322575284709	80.2379223285357	84.0326	80.947
83.6757721253771	79.0734000902024	83.5177	79.6473
82.8008924889738	77.4982316480161	84.7658	77.8153
82.8008924889738	77.4982316480161	84.4928	76.9707
82.8008924889738	77.4982316480161	82.0065	75.6791
81.5484417683798	75.2433690384578	80.2922	75.8098
81.5484417683798	75.2433690384578	82.7574	74.2926
81.5484417683798	75.2433690384578	81.6179	74.1421
81.2045020920006	74.6241331067165	79.3483	75.3688
81.2045020920006	74.6241331067165	79.4655	74.4467
80.8693087204862	73.3439826985056	79.9937	73.4457
80.5624108288636	72.1718989040848	82.4808	71.6064
80.5624108288636	72.1718989040848	80.5183	71.0301
79.9421498007002	70.2826594883285	78.8402	71.1237
77.4927920253377	62.8221855522036	77.6803	63.0066
Route: 2 Length: 124.654622440556 Demand Met: 1458			
61.3976060163309	69.5548764923876	59.4827	70.1321
63.895883409697	71.6677052730369	63.7544	71.2264
70.0423943679061	76.8661091161841	71.4242	75.4202
70.6800814166886	77.5543609657216	70.0314	77.1275
71.7401429216911	78.698448359356	73.5352	77.8165
71.8990931775208	79.6470172741406	70.8021	79.2974
72.1473554789825	81.1286534799112	73.6161	81.1388
72.32156819811	82.1683136583945	74.3211	82.1244
72.2415207540136	82.8205221226492	72.6803	81.9225
72.1250290095303	83.7698677945056	70.5598	83.7819
72.0342104032758	84.5100108068552	71.008	83.9726
71.9357686111008	85.3125624965798	70.0787	86.0551
72.190068466473	85.5215505452754	70.8501	86.3243
72.190068466473	85.5215505452754	71.0504	85.2637
72.7677603230801	85.9963096857814	72.3356	86.155
73.3947701046313	86.5116014973604	72.5273	88.3137
75.7378607788488	87.0092707534876	76.9521	88.589
75.7378607788488	87.0092707534876	74.9451	88.4605
75.7378607788488	87.0092707534876	73.8575	87.669
77.4191070096746	87.3655265309027	77.1151	89.3423
79.6512824217427	87.5813746513483	80.026	88.4312
81.0163088002088	87.7133379982662	80.4141	88.4668
83.3989369953286	87.9437239503339	84.1657	89.6201
83.3989369953286	87.9437239503339	82.7904	89.3622
83.3989369953286	87.9437239503339	83.3685	88.3604
83.3989369953286	87.9437239503339	81.9035	87.9149
83.3989369953286	87.9437239503339	82.5335	87.3296
84.5071470374858	88.0508749921172	84.4799	87.8799
84.5071470374858	88.0508749921172	85.8774	87.324
84.8837610947122	88.0872816015636	85.6153	86.7737
84.8837610947122	88.0872816015636	85.5265	86.4226
85.1030775086182	88.1084787010608	85.5459	86.1581
86.6136041078541	88.6590081854589	87.314	87.2617
86.6136041078541	88.6590081854589	87.3294	86.7915
86.7821535833796	88.7268873047111	87.6085	88.0524
86.7821535833796	88.7268873047111	87.8356	87.4643
86.923731200596	88.7838973193111	88.176	88.8141
86.923731200596	88.7838973193111	85.4655	89.4614
86.923731200596	88.7838973193111	85.8291	89.3215
86.923731200596	88.7838973193111	85.3838	89.3565
86.923731200596	88.7838973193111	85.7193	87.9646
87.4781451214736	89.0070927215432	87.2864	89.2526
88.0345638624163	89.2310932910998	88.3919	89.421
88.5285600568235	89.4299661689862	88.0059	90.774
88.5285600568235	89.4299661689862	88.5666	89.9178
88.9730120821818	89.6088895355645	88.3323	91.5035
89.0000813978071	89.6164423741523	89.5983	91.5249
89.7659984140038	88.6918166319745	89.697	88.1654
90.3910529743337	87.9372616560905	92.1839	88.8237
90.8224652375554	86.0655627199587	92.7639	86.5161
91.0758268805622	84.9657315304795	93.0738	84.8753
90.704933603687	83.8332834989047	89.6546	85.279
90.704933603687	83.8332834989047	90.3741	83.7882
90.704933603687	83.8332834989047	90.1019	83.486
90.704933603687	83.8332834989047	89	83.7031
90.704933603687	83.8332834989047	90.256	83.0105
89.3564952530353	79.7157389970359	89.9071	81.4441
89.3564952530353	79.7157389970359	88.7272	81.0174
89.3564952530353	79.7157389970359	89.7033	80.1502
89.3564952530353	79.7157389970359	89.4354	80.1567
89.3564952530353	79.7157389970359	87.485	79.3312
88.1969370689941	76.1748088398978	89.379	76.0987
88.1969370689941	76.1748088398978	89.4099	75.3847
87.4244746117387	73.8161530551338	89.0638	74.5581
87.4244746117387	73.8161530551338	89.2994	73.1482
87.1699722991518	73.0392685513861	88.9513	72.6403
86.7117316076398	71.6404712473246	84.8025	72.2361
86.2653589760458	70.1357911311818	85.22	71.0885
82.7933274183732	58.4317399347019	84.5964	57.5663
Route: 3 Length: 217.023322461631 Demand Met: 1605			
46.6146050328178	45.7703265822567	47.084	47.7144
44.3752564917511	46.2988117533302	44.7377	48.2657
35.7046438767926	47.4559132656304	35.3466	47.2689
32.4520422905826	47.8899883415343	32.0569	46.2162
31.125054337473	48.0670869964752	31.0932	49.2942
31.125054337473	48.0670869964752	32.0319	48.7602
25.089051688422	48.8726258259928	24.5323	49.8988
25.089051688422	48.8726258259928	25.2216	48.8368
23.8243401669037	49.0414115433416	23.5397	47.0618
23.0573199620586	49.1597291395291	22.4944	48.7727
22.4788999465484	49.2489496657805	22.5313	48.1754
21.8365805371409	49.3480244201361	20.1897	48.2132
23.8757039706952	58.8693006020195	25.8602	58.6207
23.9872103394926	61.7824464494072	25.0595	61.5431
24.2283571782223	68.0823060354916	23.9463	67.9458
24.8506478363485	84.3393925403042	26.3736	85.6358
19.6858410283979	84.9731435763067	19.3715	86.9483

Solution x	Solution y	Original x	Original y
19.0317296236099	84.6670188813422	17.8311	84.5721
18.6759437096499	84.5005067471488	19.7188	83.0222
17.9643395921765	84.1674890101782	18.7876	82.3448
17.4196881798949	83.9302937270506	17.8246	84.0918
16.7916009200271	83.6567707167718	16.887	83.4344
16.7916009200271	83.6567707167718	17.0206	82.7787
16.2050319655607	83.401328745858	16.4864	81.6235
15.9197697468022	83.277095858771	16.2773	81.3093
15.6602108316738	83.2903974100152	16.072	81.5553
15.2134206321672	83.3132892793177	15.9151	82.9337
14.6768993829833	83.3407634487365	13.8296	81.5783
14.6768993829833	83.3407634487365	15.4215	81.5375
14.1389833981294	83.3683393022192	14.2132	82.4414
13.5673112090952	83.3976451490484	13.617	84.1913
13.5673112090952	83.3976451490484	14.2245	83.0966
12.7397940949682	83.4400665783469	12.6448	83.0865
12.7397940949682	83.4400665783469	13.6279	83.3943
10.7609738895445	83.5415075471183	10.6041	85.0219
9.53068549712256	83.6045756399546	8.87560000000001	85.3213
9.25725749826924	83.6185943884425	9.2565	85.6186
6.73053228404443	83.4869550819431	6.0677	84.3942
5.64473323446158	83.4303800391999	5.09099999999999	83.7862
4.88605724920811	83.3908487181846	5.1015	81.8103
3.90134617663796	83.3395407545974	3.3964	83.4982
3.17979794028982	83.3019426199371	2.5389	82.9669
2.67298256232228	83.275532398471	2.625	81.2761
2.00643967321194	83.3424576962882	1.19329999999999	81.8445
1.78617206416608	83.3645695716812	0.247299999999996	82.0871
1.79743575229574	83.4966837912248	0.0289999999999964	82.9455
1.94527381877192	85.2311949731531	2.696	85.7661
2.03530685064888	86.2874905883851	1.983	86.3665
2.03530685064888	86.2874905883851	2.0599	86.005
2.13719066982999	87.4828424197797	1.82250000000001	87.776
2.21723888044725	88.4219914297213	0.775099999999995	88.6342
2.27403513151587	89.0883381161108	1.0919	90.7016
2.79103491052483	88.9721992515014	1.5647	88.8122
4.8270880344748	88.5148948061144	4.4842	86.5445
5.45126908449133	88.4373214937092	5.1953	87.1361
6.10301296504515	88.3563245000863	5.387	87.7604
7.04191537555141	88.2396417943922	6.7503	86.812
7.04191537555141	88.2396417943922	7.47969999999999	86.7529
7.54733969920686	88.1768274822214	7.6764	88.6806
8.03475898818013	88.1162504728672	7.74030000000001	89.8119
9.21628301108744	87.9694188514761	9.52200000000001	88.7288
10.1974241004473	87.8474882410886	9.9966	85.8576
10.6059495869872	87.8158720752424	10.8331	85.8288
11.4677157673326	88.0870463053582	11.6247	87.7046
12.3156174009964	88.3538572490673	11.8372	87.4011
15.1827147720503	89.2560102587892	13.2856	89.4879
15.1827147720503	89.2560102587892	17.0519	88.8308
16.5242243132429	89.6781341179119	17.1642	87.7833
17.9549488920377	90.1950607883438	19.4915	88.9148
18.0474586583343	90.7499989751036	19.5543	89.8549
18.9166644759466	95.963555649626	17.7167	97.5636
29.022349542308	94.7582453045691	29.7505	96.621
37.7468317971943	88.4428832365763	39.3354	89.658
43.2575610357561	73.8785686008631	44.9743	74.4953
45.1052849066702	68.9951839725069	47.0351	69.5204
46.0330144473911	63.5818360247353	44.1821	62.8241
51.1475444940891	56.2243664352762	49.5234	55.0957
55.56198573457	49.874436672879	54.1532	48.4548
Route: 4 Length: 106.139720310134 Demand Met: 716			
45.3791785641091	37.8182142897643	44.7486	39.7162
45.3791785641091	37.8182142897643	45.8348	38.3992
45.3791785641091	37.8182142897643	47.2998	37.9687
45.3791785641091	37.8182142897643	47.3754	37.9401
43.7381037006687	37.6207206191836	42.5333	36.3249
43.7381037006687	37.6207206191836	43.5486	39.6053
37.6855470296407	36.8926463569959	36.9556	37.1182
37.6855470296407	36.8926463569959	38.1953	36.049
34.3863134171357	36.495743239859	33.7228	34.609
34.3863134171357	36.495743239859	36.1356	35.5262
33.4045806347434	36.8388562207046	33.3877	38.8388
29.6967618816065	35.4728584333967	29.0396	36.1372
29.6967618816065	35.4728584333967	29.5705	36.67
25.8574564926887	34.0584256872358	24.2607	34.0424
25.8574564926887	34.0584256872358	26.8183	32.6012
25.8574564926887	34.0584256872358	27.0476	34.4285
23.3371200132546	33.1299147315216	22.8416	32.9746
21.8199477349623	32.5709646906418	20.5677	31.0115

Solution x	Solution y	Original x	Original y
21.8810824708578	33.0195214394444	20.8616	31.8567
21.9980114943293	33.8773353400881	22.0871	33.226
21.9980114943293	33.8773353400881	22.2385	33.2025
22.3606836672761	36.5372037203331	20.4824	37.2243
22.3606836672761	36.5372037203331	23.8226	36.8408
22.3606836672761	36.5372037203331	23.8984	35.8981
24.4103417374535	39.7639239409758	23.1185	40.5549
26.6292498320353	43.257041660026	27.2789	43.4795
27.5686723912528	44.7359042760069	27.0169	46.6583
28.9163767650054	44.0926623035022	28.4876	46.0461
28.9163767650054	44.0926623035022	30.9136	43.9894
32.6473272378118	42.227327544726	32.7117	42.3778
32.6473272378118	42.227327544726	32.6554	40.5505
33.0989459159609	42.0015846046692	32.6566	40.0511
37.432109812995	42.0774507053189	36.302	43.7274
37.432109812995	42.0774507053189	37.7223	44.0563
37.432109812995	42.0774507053189	37.6461	42.0792
41.6635824819252	40.9444121601939	41.4412	38.9568
41.6635824819252	40.9444121601939	42.0622	41.0674
45.8026885080234	41.1051079734556	45.8095	43.1051
Route: 5 Length: 144.998438630869 Demand Met: 1549			
65.304782031524	36.5794020244253	64.954	37.309
50.5647337253018	25.8407601630697	49.2766	27.3707
49.9197525264764	25.2153443148259	49.7446	26.3767
48.6279550804845	23.9627430747132	49.2796	22.4102
48.6279550804845	23.9627430747132	48.2875	25.5427
46.5787565172093	21.9757423634877	47.312	20.115
44.2712337881738	22.0201093267255	44.6412	21.1681
41.4699068427248	22.0739932482591	41.315	20.08
39.2817931562469	22.3729254794261	38.8284	23.4703
38.179882768274	22.523482316354	37.9243	23.9119
37.466693238878	22.6209334283425	37.4163	24.6203
36.2212164590201	22.386255796784	35.5448	24.2684
34.6324697148015	21.5106580867357	33.6715	23.2449
32.9100306044999	20.5613713338015	32.1965	21.571
31.5261230570083	19.7986703838445	30.4469	21.4825
30.6097889410176	19.1217980488194	29.6006	20.2054
29.887621876637	18.5883234393135	30.7692	16.7931
22.0841135200663	16.37272332118	22.1476	14.8515
20.4134144531448	15.8983954753575	19.3111	17.5672
20.2683320092191	15.7189443958104	19.0819	14.2893
20.2683320092191	15.7189443958104	19.7672	14.9362
20.2683320092191	15.7189443958104	19.5822	17.4941
18.995200964668	14.1444229132015	17.8934	15.1905
16.8991043686452	11.5521625589654	15.3264	12.7877
16.8991043686452	11.5521625589654	16.6256	12.3206
16.6824006764274	11.2680456591822	14.7479	11.7757
16.7725888174612	10.6153287735955	17.3372	11.1211
16.8718360211329	9.89696950507106	18.0288	10.2093
16.9719605430103	9.17219153414621	18.8587	8.5087
16.3999991761949	8.63182080486149	15.4595	7.4752
16.3999991761949	8.63182080486149	15.3812	8.8682
16.3999991761949	8.63182080486149	15.5961	8.5134
16.3999991761949	8.63182080486149	16.2452	9.322
16.3999991761949	8.63182080486149	15.7685	10.3669
15.3587049322257	7.64805225368817	16.1355	6.6685
13.9359476646591	6.3038637698386	13.8628	4.3052
11.7980268117817	8.64229379893647	10.2894	7.4847
11.7980268117817	8.64229379893647	12.9432	8.6486
11.7980268117817	8.64229379893647	12.8565	9.4609
10.0605598553036	10.5427812474049	8.098	10.1576
10.1023984754701	10.6563204379146	8.6382	10.3371
10.1542701433772	10.7970873057981	9.9074	11.0867
10.2064201506136	10.9386091317456	8.40090000000001	11.7989
11.198261702621	12.6075394518697	11.3126	12.1774
11.198261702621	12.6075394518697	11.8636	12.6991
12.0311168980506	14.0089548060202	13.2666	12.9678
14.0722912901563	17.4436379208671	14.5843	15.7568
14.0722912901563	17.4436379208671	15.9493	16.7531
14.1042259331696	17.6307073252756	15.42	17.0914
14.1382250924809	17.8298432349908	14.7151	17.4542
14.173325108722	18.0354176946971	12.3192	17.7013
14.173325108722	18.0354176946971	13.9396	19.5452
14.2339653922337	18.3909286054993	12.6858	19.6571
16.9579028841299	19.4443489349104	16.5052	19.9903
21.5175583783207	21.207720975935	20.9805	20.9752
21.5175583783207	21.207720975935	20.821	23.0825
21.5175583783207	21.207720975935	21.8127	22.4456
25.1135916942972	22.489782097741	23.4201	21.9457
25.1135916942972	22.489782097741	24.5672	24.4137

Solution x	Solution y	Original x	Original y
25.7125450304586	22.6179536530335	25.1657	24.0751
26.4323044882714	22.7719796160443	25.9644	23.203
26.4323044882714	22.7719796160443	27.0718	22.4926
27.0966653328838	22.9141489077486	28.392	21.3903
27.3983183071244	23.6852853931088	29.0027	23.8765
27.6213230089649	24.2553926960166	27.7157	24.2487
27.9153344394414	25.0069636989778	26.5855	26.5008
30.04203887589	25.5650522583267	30.3241	25.8121
31.6057179577257	25.9753924042673	31.0534	27.3935
34.3638158528865	26.6991790145422	33.916	28.6484
35.5501401816731	26.9334591983437	35.1494	28.8106
37.680004498204	27.3540743605691	37.8149	25.869
41.5177383509996	28.1119803247571	41.7938	26.8087
44.9466998965129	28.7891830264568	45.5527	26.8832
45.8170848393627	29.1786529701073	45.8434	28.1097
47.0785281008275	29.7431240029012	47.7847	28.4345
48.1511407097385	30.2230973086711	47.2249	31.4694
48.1511407097385	30.2230973086711	48.0614	30.3792
50.4325978240722	31.2440175980166	49.5874	32.9921
Route: 6 Length: 226.018824455624 Demand Met: 1607			
48.6701914427771	35.2277027869445	48.8851	33.6728
44.9840628800678	34.4029817563713	44.3864	36.3116
44.0094201042154	34.0060021026643	44.5785	34.1629
42.464667731788	33.3768521622932	43.0635	31.4686
40.8171592569104	33.0061483053733	40.4113	32.0356
40.8171592569104	33.0061483053733	41.9344	32.8635
30.7557167444672	30.742127898864	30.1704	30.5441
30.7557167444672	30.742127898864	30.555	31.3009
29.0988941057602	30.3693277028445	28.4031	32.2444
28.1737378721119	29.8766865549646	28.8128	30.4765
25.3307540713737	28.3628886063604	24.4655	29.9184
23.2823781315196	27.2721672494298	22.5985	27.2784
23.2823781315196	27.2721672494298	23.4789	26.9268
22.2352566700027	26.7145833971802	21.333	28.4534
19.8145604678282	25.4255995882726	20.1974	25.6106
10.4206220098916	20.4233565464631	8.65000000000001	19.7295
10.4206220098916	20.4233565464631	9.20950000000001	19.5087
10.4206220098916	20.4233565464631	12.295	19.9912
8.07027468977178	19.1718207367798	9.00749999999999	17.4052
6.25456867008917	18.2116609397817	6.693	16.2603
5.22722026480845	18.2572782050243	4.8686	17.5054
5.22722026480845	18.2572782050243	5.3173	19.9696
4.30516145617551	18.2982238457924	4.753	19.8404
2.25786985506943	18.3890721127764	0.782799999999995	19.7397
2.30851782659549	18.0087966399055	1.5116	19.0597
2.54770882972318	16.2131494976363	2.4914	14.471
2.54770882972318	16.2131494976363	2.2625	16.1551
2.54770882972318	16.2131494976363	2.785	16.9995
2.54770882972318	16.2131494976363	3.5607	15.7968
2.54770882972318	16.2131494976363	3.76260000000001	17.1174
2.54770882972318	16.2131494976363	4.024	17.3232
2.95802531553177	13.132518203839	4.24299999999999	12.8676
3.13638558450592	11.7934543460669	2.5621	10.2967
3.13638558450592	11.7934543460669	2.67230000000001	10.4123
3.13638558450592	11.7934543460669	2.4532	11.1564
3.13638558450592	11.7934543460669	2.3396	12.8751
3.13638558450592	11.7934543460669	3.6086	13.0876
3.18404374431051	11.4356526505493	5.0355	11.9367
3.4885073581103	9.14963842640611	5.4781	9.3534
3.62475272957599	7.25209163664337	5.6246	7.277
3.60046819519124	6.73448244313627	5.49809999999999	6.1028
3.49609450496783	6.58054615540441	4.1301	7.1548
3.49609450496783	6.58054615540441	5.20059999999999	6.8919
3.17990693558376	6.11416147607526	2.7247	6.6491
3.17990693558376	6.11416147607526	4.1027	5.9391
2.77632330656441	5.51882943526629	1.2192	5.9144
2.77632330656441	5.51882943526629	1.4037	6.1535
2.56954350176335	5.21383045763107	1.2522	5.4022
2.39976688277318	4.96341742656564	0.421099999999996	5.2548
2.61262330588309	4.28366193943978	3.9756	4.3104
2.61262330588309	4.28366193943978	4.0211	5.0495
2.85156382089376	3.52058595550975	3.9473	4.1638
3.16440312775825	2.52143672448896	1.2646	1.8964
3.16440312775825	2.52143672448896	1.729	2.5191
3.40540977302328	1.8236207804369	2.4773	0.052
4.03388307832036	1.99964745417745	2.87569999999999	1.3778
4.03388307832036	1.99964745417745	3.8933	3.6617
7.52108173297421	2.97624179514492	5.6082	3.0104
7.52108173297421	2.97624179514492	8.02670000000001	2.1019
7.52108173297421	2.97624179514492	8.95990000000001	2.5066

Solution x	Solution y	Original x	Original y
7.52108173297421	2.97624179514492	9.42529999999999	3.1222
9.1485746669189	3.43204578179074	8.8668	5.4121
9.46155249255895	3.43503807199806	9.7281	5.4172
10.0360307156389	3.2718526450253	10.526	3.779
10.5381396824442	3.12921319132889	9.9632	1.8111
10.5381396824442	3.12921319132889	10.31	1.5005
11.0389517980418	2.98694557604113	10.6256	1.7583
11.0389517980418	2.98694557604113	11.169	1.5527
11.4465865632053	2.87113952751941	11.5459	0.8736
11.7657364148248	2.99720502240249	11.5168	3.287
12.0808191278331	3.12159107043696	12.5256	4.7007
12.2761424114029	3.1987000849279	12.1595	5.1953
13.2472056721434	2.9408751540107	13.2084	1.5682
13.9941282258611	2.7425527287993	13.7484	0.7577
15.2439925735961	2.75905048340613	14.8098	1.8409
17.685875758031	2.79128760064929	18.2952	1.0836
18.0318165325349	2.79585297255145	19.0824	1.094
18.6010766803072	3.89494440258777	18.6523	3.9117
19.2157811167638	5.08154843173995	18.047	6.7045
28.8928036829741	6.59694898872555	28.6149	8.2266
43.1518784142431	8.82983570361527	43.1416	9.2079
52.9402814764017	10.3626558023874	52.9148	12.3625
57.2794213201049	9.7960088984454	57.0413	9.9678
73.6398543067321	7.65958294355601	73.9225	9.6395
84.6343742391267	5.95580051123781	84.9979	3.9891
92.8713884016705	10.6643533719856	94.4757	9.4701
95.7336744128508	22.9820077099813	97.6128	23.6668
93.6390442167824	24.5531229596566	92.9329	22.8145
93.6390442167824	24.5531229596566	92.0943	24.688
77.1710623068146	36.9053102840021	78.1743	38.6355
Route: 7 Length: 153.720232596757 Demand Met: 1543			
72.5725117459639	59.949009943567	73.1545	60.0435
73.5686958672174	67.6741597458195	73.6361	68.0431
73.9849380718297	70.9020061356001	73.5126	71.3248
74.2396913984088	72.8775436228915	73.6863	74.2382
74.2396913984088	72.8775436228915	72.5026	72.4828
75.0011182658048	78.7819696581851	73.1002	79.4037
75.4928400476777	79.6736540866483	75.2812	79.5319
76.0538026396698	80.6908986934288	75.5773	80.7384
76.0538026396698	80.6908986934288	75.4182	80.175
78.0638485256099	84.3358956835134	79.3747	83.7664
79.3429561510271	86.6554218221272	81.0134	86.425
79.3429561510271	86.6554218221272	79.415	85.235
81.4558030412742	90.4868737490338	80.5965	92.0964
81.4558030412742	90.4868737490338	80.7173	88.9602
82.5749478395166	92.5163187490435	84.3608	92.148
82.5749478395166	92.5163187490435	82.1226	91.9552
82.5749478395166	92.5163187490435	83.1514	91.319
82.9175296620434	93.1375543287296	84.5701	92.5098
83.1487490739484	93.556846555772	85.1326	93.3031
83.0461756428641	93.9593514995828	83.6163	95.496
83.0461756428641	93.9593514995828	84.785	93.3953
82.5259952136552	96.0006959779927	83.3686	96.8014
82.2488782548614	97.0881100627883	80.252	96.9762
82.3151766604601	97.5670529982058	81.2522	99.2612
82.6292490597718	97.4655732746594	82.0258	98.9707
83.6687085103027	97.1297249670431	84.0572	98.2927
83.6687085103027	97.1297249670431	83.9295	97.9734
84.770726613059	96.7736611670229	84.3334	97.0716
86.3895718999326	96.2506216353058	86.994	98.105
87.871217164417	95.7718700349616	88.2817	96.351
87.871217164417	95.7718700349616	88.2673	94.5543
88.5595695840272	95.5494510582087	88.3602	93.5594
88.8734343660983	95.5850087536552	89.3359	93.6392
89.3037477328143	95.7439661289199	89.0976	96.4455
89.7277967069232	95.9006094707351	89.931	94.5372
90.2117002210604	96.079362807775	91.4519	94.5103
90.6913801420825	96.8005509918084	90.6972	96.9626
91.1520429566214	97.4931483775025	89.983	98.6224
91.5223155924702	98.0498458465548	90.7381	99.8897
91.564817047771	98.0422000205799	91.162	99.965
91.564817047771	98.0422000205799	92.0809	99.3222
92.2362635595146	97.9213973454928	92.8113	98.2407
92.2362635595146	97.9213973454928	92.093	98.3621
92.8358543969209	97.8135225530376	93.255	98.1789
93.3661149308571	97.7181211542934	93.4254	97.8126
93.8870677223477	97.6243942780348	94.2258	98.7848
93.8870677223477	97.6243942780348	93.3103	99.0843
95.5337493747488	97.3281333088321	96.1791	97.5552
96.5881179896047	97.1384377878679	96.6476	96.9796

Solution x	Solution y	Original x	Original y
97.6192018261335	96.9529315992694	99.292	98.0492
97.3306233128684	95.7343696700577	98.1513	96.345
97.3306233128684	95.7343696700577	95.4796	96.129
96.9620901636214	94.1781075484707	97.9735	93.9042
96.9620901636214	94.1781075484707	96.5452	93.172
96.8018026810655	93.5012667080936	96.0605	94.495
96.8018026810655	93.5012667080936	96.6676	92.6743
96.6199687188731	92.7334364930523	96.809	92.5136
96.6199687188731	92.7334364930523	95.9324	92.1458
96.492047656492	92.1932694625091	94.509	92.4532
96.4764300160398	91.6384201360889	94.8083	91.5304
96.4631551952293	91.1667909689234	95.3031	91.4204
96.4487105601938	90.6536012642711	96.671	90.7145
96.4340445242532	90.1325394766168	94.4683	90.0421
96.4300173130113	89.9894785735951	94.4375	89.8165
96.5463716110707	89.4195897327183	94.7976	88.4491
97.9252252965218	88.1141041591209	99.7949	88.8243
97.8535808186143	87.291996130086	99.7041	87.1751
97.7644800959732	86.269460310716	99.0472	85.7396
97.7033624889825	85.5680780840058	97.0785	86.7219
97.7033624889825	85.5680780840058	97.4362	85.8361
97.7033624889825	85.5680780840058	96.8293	85.3988
97.4800789105761	83.0054273158379	98.6006	82.3388
97.3831503898137	81.8930429470099	99.1691	80.9928
96.7524335566781	81.3354779315607	97.0848	81.6578
96.7524335566781	81.3354779315607	97.0965	81.0307
95.9766421917149	80.6496642392377	94.7529	81.9671
95.2999428089559	80.0514504077104	94.6937	81.204
94.4464038061762	79.2968731370798	92.5909	80.0433
95.0820950886846	71.5552576393995	93.093	71.3467
97.464901152221	52.8960767147684	99.2739	52.0431
90.277545813247	48.3641531792473	91.1956	46.5873
84.3912334968633	45.9361447500627	84.8772	45.0654

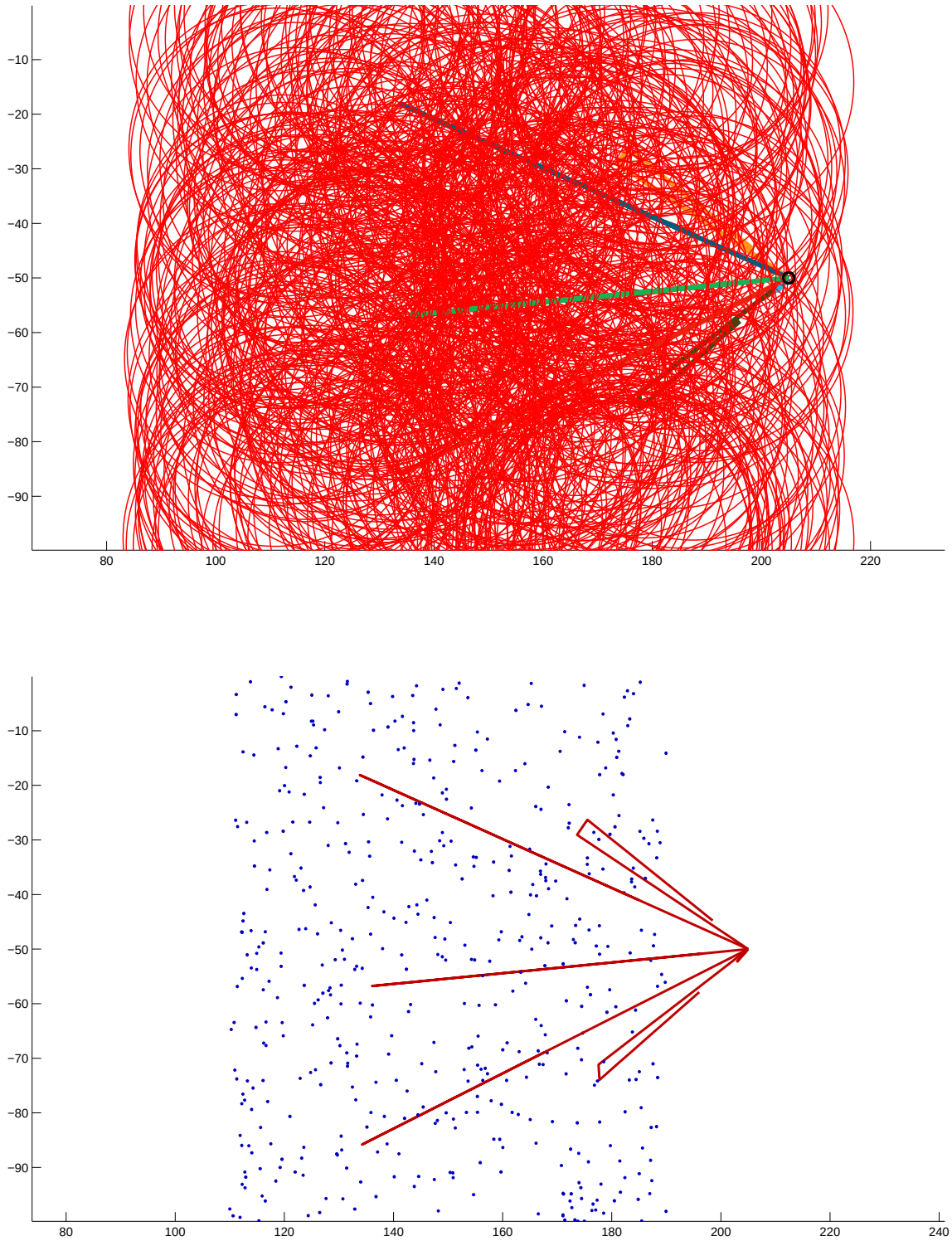


Figure O.6: *team*6_500, Equal Radius, 2D, Euclidean, Length = 611.8037017

Table O-9: Solution for *team*6_500, Equal Radius, 2D, Euclidean

Total distance: 611.803701689917			
Total demand met: 25539			
Depot: x 95 y 50			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 78.8563267610109 Demand Met: 4606			
90.6951039344577	47.1257826888729	76.1612584	37.0439506
87.7771412024574	45.177597453223	73.9542296	35.1681427
85.6660429600789	43.768191331539	73.6483802	37.1698351
83.9468135575086	42.6204212469893	73.6393721	37.6930766
82.4355627309963	41.6114895235519	74.2228108	38.6099587
81.026740093013	40.6709450061524	72.24704	39.7077335
79.6829349249165	39.7738093135493	68.3855742	35.3493495
78.4652357523341	38.9608672994933	65.5339196	33.299582
77.3893976491828	38.2426383726546	65.5247054	34.4819771
76.399109170756	37.5815272132613	65.884583	36.2103636
75.4530575774689	36.949953948682	61.8021468	40.7857588
74.5513522368307	36.3479900264959	59.7400431	37.5401839
73.7188939206997	35.7922611590433	58.429274	38.9397266
72.9437585888618	35.2748049037932	56.2067364	40.2417677
72.2242611058215	34.7944942775251	54.8328865	43.6672378
71.5484270198264	34.3433324825155	55.1300701	40.0588307
70.9137309994004	33.9196347219023	55.5353048	38.1752447
70.3138568047312	33.5191842053099	57.9145816	37.4787407
69.7309615251149	33.1300674501826	57.8811625	36.8910334
69.1629174509753	32.7508635070332	56.98499	36.3050676
68.6113628766605	32.3826662181698	56.9481598	35.7189477
68.0719544776745	32.0225755050291	57.9600279	34.4089577
67.5373392263776	31.6656818020791	54.9748886	31.6899499
67.0192242433016	31.3198031324148	51.358437	31.183912
66.5285555646528	30.992248153528	51.6262531	32.9510025
66.0528044005103	30.6746511613324	51.2078647	35.5791539
65.5829451781879	30.3609850826126	48.3601763	34.0464698
65.1307314387092	30.0590978210911	45.1705924	33.2150554
64.7126832415721	29.7800188708204	44.6441662	33.1239716
64.3247171801634	29.5210217991882	44.7688336	34.8472485
63.9580970851274	29.276273203006	41.3950957	34.602479
63.644039481326	29.0666133901379	37.130172	34.1670861
63.6850667003707	29.0069281089814	39.21475	31.0795566
63.7290097494095	28.9430068112929	38.4714341	30.1541626
63.7809124474463	28.8675147933191	38.9767874	28.6595996
63.8397233116463	28.7819755231825	40.565033	30.2350611
63.9015426148296	28.6920597716839	44.272376	24.1529526
63.9638202758653	28.6014760657505	52.3761166	17.3066951
64.0239891136896	28.5139571487644	54.100404	16.0525172
64.0820620252317	28.4294841883872	58.3586123	20.3359236
64.1389583740438	28.3467215328213	56.0727891	23.8686819
64.1961407730351	28.2635425069026	57.0336699	24.3925592
64.2538677593665	28.1795710467509	62.1748486	23.5386262
64.3115926743572	28.0956022026219	62.1996928	26.9322785
64.370015009882	28.0106191039068	62.0390375	27.7696953
64.4294451406991	27.9241703036484	66.7264937	28.6241638
64.4896237308497	27.8366332478773	67.6344777	29.9025036
64.5505673815427	27.7479839105491	69.6772126	28.9703915
64.6117930015689	27.658924787974	70.5957341	27.6007009
64.672784546357	27.5702063496167	71.3343578	25.5495623
64.7329372043354	27.4827081664357	70.2766166	21.7580017
64.7919977636479	27.3967981686548	67.7860652	18.0440513
64.850157966203	27.3121970241984	68.9038468	16.8104734
64.9070499047274	27.229440021325	71.8742878	17.8343061
64.962489534246	27.1487954072253	72.0757838	18.033427
65.0168734797204	27.0696865284497	70.9135058	14.8761766
65.0703592605529	26.9918841010635	71.2868972	13.7571779
65.1229936624834	26.9153202505649	70.8086056	11.5809577
65.1747250435345	26.8400701211708	70.2907843	10.4186099
65.2256234937346	26.7660319861631	67.4654721	12.1137109
65.276572884239	26.6919210078549	64.1033853	11.196525
65.3279121207676	26.6172446348102	60.5482992	13.7850738
65.3802251493998	26.541154626235	61.3811866	10.1841347
65.431937970217	26.4659393309063	57.1362338	5.5136309
65.4802827888372	26.3956240735932	54.6678163	5.1970784
65.5212841323715	26.3359900491199	52.4413086	6.2567644
65.5420109457043	26.3058404658712	55.2537104	1.3428502
65.5420112990048	26.3058405427804	64.943613	1.686391
65.542011649333	26.305840619237	68.4102584	6.9403941
65.5420119987356	26.3058406947325	72.320279	3.8462993
65.5420123502757	26.3058407742827	72.8917692	2.6849909
65.5420127113152	26.3058408694747	75.2339764	1.1053279
66.5885968820585	27.1476370681301	73.9903157	3.2090585
68.0142168557066	28.2943192206367	73.292725	7.8305571
69.6103958058066	29.5781859279507	72.9487249	9.0752285
71.4649859310167	31.0699045207898	79.9570853	14.106802
73.3110954462867	32.5548240864035	77.5184606	26.3492827
75.0208896467204	33.9301159516346	78.3681704	28.4149174
76.7184117329955	35.2955396873096	75.1791401	28.4357222
78.8139452910341	36.981069434828	75.8801773	29.7113355
81.2965720249556	38.9779536150652	76.8303918	30.6898889
84.3476913227612	41.4320850237134	78.8734057	30.5074156
88.4979195421284	44.7701514899545	78.2442809	33.2914556
Route: 2 Length: 73.7194750130783 Demand Met: 4993			
88.4534867960608	55.0481340571301	67.1669184	49.4371849
85.9159234720748	57.0049001282629	62.9728444	48.2610974
84.1107073598534	58.3969223590348	63.3053921	48.8331121
82.600422849244	59.5615136206596	61.6781701	59.473286
81.4050930000774	60.4832369366043	64.4880133	60.4854675
80.3137803915021	61.3247517483644	64.6626599	65.39963
79.295017319384	62.1103257153252	63.772212	68.1836695
78.3544537319588	62.8356025741721	64.4543682	70.2655389
77.4804002543764	63.5095954830701	68.5426632	70.6500378
76.6353725106361	64.161208177812	67.3900644	74.174693
75.8342874568584	64.7789370999621	66.8428254	74.9418962
75.0747153057937	65.3646553917544	61.6425082	72.8564323
74.362157828155	65.9141204532535	57.43771	71.1535593
73.7025834607516	66.4227297966819	56.7397866	71.0931061
73.0891205654914	66.8957820392537	54.3749565	73.471727
72.5342402338542	67.3236604969905	50.7478618	74.0551131
72.0568219464643	67.6918068341191	50.0180258	68.4527432
71.6254173193587	68.024471293123	50.8238583	67.1806384
71.223918684504	68.3340747197537	53.0250996	68.7918887
70.8413919291057	68.6290485442998	56.5346421	68.6367247
70.4680430241905	68.916944961994	58.1838222	68.9986011
70.1006578617357	69.2002423441209	57.8283627	65.6998258
69.7358420437309	69.4815581520161	57.0800315	64.0172849
69.3719642688472	69.7621503033519	56.0822206	62.8731122
69.0081073261097	70.0427260591607	54.2235528	56.265496
68.6407958676852	70.3259654200895	51.8847181	57.7017397
68.2743814044729	70.6085130093188	48.6878693	60.2173135
67.9168153124444	70.8842375293418	45.6990417	60.3070344
67.5788457029778	71.144851121707	43.0002757	59.9692573
67.582939580893	71.2125617546845	45.5118999	65.9532613
67.5872492401641	71.2838501620357	44.3710695	67.9205927
67.5917522350003	71.3583442517809	43.8195847	68.1613988
67.5964211172967	71.435587392799	42.9598051	72.0704928
67.6011635444652	71.5140493122165	45.412979	71.2677197
67.6059271740472	71.5928613275102	46.0567355	72.019762
67.6107012065237	71.6718447079837	46.8228713	71.844353
67.6154932473985	71.7511255198406	47.2434466	72.8348775
67.6202883999422	71.8304570861282	46.3729602	74.0499355
67.6250804734179	71.9097363374418	43.6827488	74.1878852
67.6298960835354	71.9894022323205	45.3765455	76.9954785
67.6346841087251	72.0686088429671	49.7783583	78.4397036
67.6394396961347	72.1472770997635	51.7496653	79.9144917
67.6441631248118	72.2254116457825	52.878421	80.2956919
67.6488678823775	72.3032354863203	55.0653569	81.234009
67.653538806519	72.3804981475848	49.4827685	84.8462228
67.6581293328439	72.4564283865206	48.3895216	84.8378656
67.6626388053738	72.5310148937578	50.0446513	86.3510967
67.6670509394143	72.6039894097511	56.1389342	85.561632
67.6714175647809	72.6762110782151	59.1397084	81.6064397
67.6757993554464	72.7486827912552	63.6802314	81.8267454
67.6801984053261	72.8214399031416	67.7945884	81.6777909
67.6846149095401	72.8944854919088	69.765468	86.0199863
67.6890160105717	72.9672768149079	71.4909917	88.8238404
67.6933797567551	73.0394511703022	72.4289329	91.88372
67.6976589805645	73.1102291264916	68.0410206	93.0677269
67.7018470860418	73.1795000096996	65.7364961	88.9695394
67.7060027544167	73.2482337916432	63.9530194	87.4245185
67.7101273155275	73.3164524753734	62.4719528	86.6470186
67.7142254731903	73.3842335298186	60.774398	89.648206
67.7182698690309	73.4511239480808	64.0121883	92.7907393
67.7222423285658	73.5168241589313	64.3381393	93.722702
67.7261670082193	73.5817335679833	64.4754864	95.6952093
67.7300290150913	73.6456058332273	62.6982725	97.3778678
67.7337822694623	73.7076783121116	62.3573907	96.159986
67.7374813771666	73.7688543811349	62.5782193	94.8345715
67.7411668572796	73.82980471087	61.1689993	94.8861498
67.7448398404133	73.890547795955	61.0866811	94.7582572
67.748513656653	73.9513041109836	56.5514993	98.5201232

Solution x	Solution y	Original x	Original y
67.7485137457049	73.9513040485754	61.0630253	98.699805
67.7485138353061	73.9513039857374	61.0701287	98.8683739
67.7485139255153	73.9513039224712	61.4066356	99.633296
67.7485140169449	73.9513038583284	63.2522018	99.6147456
67.748514108462	73.9513037940947	63.7965883	99.8649883
67.7485141996065	73.9513037300678	64.9776601	99.8572829
67.7485142907191	73.9513036658975	66.3729212	97.9005203
67.7485143825369	73.9513036011561	67.0620012	97.8077872
67.7485144752574	73.95130353563	66.5761879	96.7049476
67.7485145688458	73.9513034694273	67.3268965	96.007007
67.7485146632023	73.951303402643	68.523768	98.3881808
67.7485147594548	73.9513033342135	70.4834315	96.1070737
67.7485148562549	73.9513032652984	71.5874534	94.5399994
67.748514953294	73.9513031962918	74.8496365	95.8479299
67.7485150505011	73.9513031271694	75.4923392	99.8090463
67.748515252503	73.951302969571	79.9522127	98.0359405
68.8156144713751	73.0134335103953	76.9820609	94.8106777
70.0188238091247	71.9559366702625	77.3466754	92.4222135
71.3133558788374	70.8181752344843	75.0360354	91.1497098
72.7355255244229	69.5682312582746	77.1265753	88.6843079
74.204908751358	68.276790446199	75.6464183	86.4517504
75.7246106152042	66.9411254433258	77.2293497	82.6694496
77.1982690421992	65.6459312804262	78.2121151	82.5216358
78.6496706129508	64.3703032466442	75.4040099	79.0607348
80.240975112749	62.971716808212	72.4566884	79.8068651
82.3867111866462	61.0858429198463	73.2290706	73.9762718
86.0404448613436	57.8745732927668	74.4567732	73.8913977
Route: 3 Length: 156.01375924781 Demand Met: 5000			
63.1611810316333	35.728510489165	49.4509792	19.23293
57.115656490806	33.0185698447675	46.2315326	17.3070005
52.6995989466847	31.0390889988038	47.2237184	11.5265695
49.653828420913	29.6738279775267	45.3795945	10.2393952
47.3245384226348	28.6297281440349	45.092729	13.545129
45.3042420237897	27.7241272687797	41.0252369	15.6288565
43.539470201478	26.9330532377326	41.2499501	12.693222
41.8988374750388	26.1976265842789	38.5584867	8.9239146
40.407842286405	25.5292813134287	37.7928549	6.0601138
39.0743547861447	24.9315440662423	43.6411268	3.9331303
37.7999621403258	24.3602983863865	42.0438698	1.2746098
36.642318938336	23.8413841553197	41.5241877	2.2495139
35.5463773625087	23.3501260189715	39.0651937	2.4238303
34.5119260148808	22.8864295853437	34.237799	1.769458
33.5667780405708	22.462762380241	33.5301093	3.5426558
32.6730938463564	22.0621634393631	29.8399494	3.731908
31.8361808593919	21.687011995192	25.7941467	5.022901
31.0567255718598	21.3376158813716	25.3620642	2.9418291
30.3347198293584	21.0139715312552	21.5694811	0.9567502
29.6962180347269	20.7277577900783	21.5004558	1.4444458
29.1140162833474	20.4667806161242	18.0605132	3.6100683
28.5792812109545	20.2270804955372	19.95828	6.5164086
28.0667024674485	19.997312178605	17.3929381	9.8303298
27.5730772104778	19.7760399632978	15.3634563	8.946465
27.1019087973139	19.5648341212611	15.2275578	8.2482088
26.6508430885011	19.3626394380026	14.9649191	8.2569823
26.2168822968647	19.1681122333815	15.0419936	3.4632806
25.8058636963949	18.9838691616047	11.2137447	2.0282324
25.4327116885105	18.8166000231872	9.4518233	0.0818322
25.1157693675771	18.6745271703206	10.2956976	4.6843351
24.8159550994614	18.5401321211452	9.8269964	6.8843491
24.5282836781314	18.4111802171241	7.7653349	6.167634
24.256128959896	18.2891837497115	6.43216459999999	5.6038094
24.0019203091039	18.1752316737397	3.796854	1.0310825
23.8172643288347	18.0924570774185	1.18933079999999	3.3623299
23.8172648497916	18.0924575192319	1.16963010000001	7.0254341
23.817265368692	18.0924579606151	2.4227502	13.8762399
23.817265887735	18.092458402079	4.41833269999999	14.4467589
23.8172664066103	18.0924588432876	8.8711802	13.2955279
23.8172669250063	18.0924592843082	12.2844966	12.8434228
23.8172674428652	18.0924597252215	15.820225	13.1438067
23.817267960372	18.092460166041	14.7546051	14.610274
23.8172684778384	18.0924606067668	10.2638739	16.7343669
23.8172689955069	18.0924610473461	10.0346396	20.0550826
23.8172695137348	18.0924614877059	9.1420339	20.9818632
23.8172700324953	18.092461927834	10.881307	21.222109
23.8172705516687	18.09246236783	13.6477983	21.6503409
23.8172710711414	18.092462807795	16.5956207	19.4929376
23.8172715908279	18.0924632478775	16.5565287	18.5575743
23.8172721105919	18.092463688219	20.1050057	16.8211128
23.8172726306672	18.0924641287539	23.260163	19.1726271
23.8172731513576	18.0924645692926	24.4057133	14.819481

Solution x	Solution y	Original x	Original y
23.8172736726906	18.0924650099267	26.3324067	9.9110212
23.8172741946117	18.0924654508653	28.9980611	9.3107142
23.8172747170103	18.09246589219	30.2787157	8.2280249
23.8172752396094	18.0924663340577	31.6461166	7.3585956
23.8172757621066	18.0924667766435	33.6893922	8.5224136
23.8172762843444	18.092467220039	33.7088519	9.9711832
23.8172768064225	18.092467664214	31.9710737	13.1659452
23.8172773287849	18.0924681090778	30.8819888	13.4626957
23.817277851589	18.0924685546532	33.7699504	15.2531662
23.8172783748574	18.0924690010002	33.6742877	16.0147514
23.8172788986063	18.0924694481831	36.6688954	15.3802855
23.8172794226863	18.0924698964471	37.3849664	18.6565566
23.81727994737	18.0924703458494	39.7052051	20.7340789
23.8172804730646	18.0924707967375	38.9701661	21.3778805
23.8172809997374	18.0924712491264	39.7157151	22.5518047
23.8172815277609	18.0924717033544	35.4889656	25.3753347
23.8172820570513	18.0924721591404	34.7673517	23.4200763
23.8172825872732	18.0924726165307	34.0986738	23.3047286
23.8172831182882	18.0924730756382	31.6418617	23.7354033
23.8172836498702	18.0924735363123	30.6527015	22.708305
23.8172841818673	18.0924739985963	27.922577	21.764341
23.8172847139555	18.0924744621221	28.9097869	26.1468646
23.8172852465873	18.0924749272475	24.4888337	25.329984
23.8172857795814	18.0924753929686	19.7989907	26.8559855
23.8172863130074	18.0924758583047	17.2034005	24.1027648
23.8172868465988	18.0924763228215	14.6392528	26.7492086
23.8172873804559	18.0924767861112	11.5512784	26.7283657
23.8172879145168	18.0924772480743	9.78612250000001	28.4044715
23.8172884489754	18.0924777086636	6.7702019	28.6398243
23.8172889841557	18.0924781668203	3.1062568	26.7803784
23.8172895208734	18.0924786275196	1.0903939	26.3844516
23.8172900818339	18.0924790946715	1.44105020000001	27.5670412
23.8172906615275	18.0924795712084	4.4919615	30.1971308
23.8172912494878	18.0924800500332	4.5207011	34.7763494
23.8172918200413	18.092480519166	7.3492035	35.5012058
23.8172924061456	18.0924809884975	6.820668	39.0713932
24.9820046958554	18.6145755227249	12.1928408	37.3702852
26.2040049136413	19.1623499035639	11.8541821	36.7134083
27.5309258226987	19.7571557760236	13.0553452	35.1491327
28.9845987166226	20.4087779649993	11.1949114	32.5347928
30.7291962094088	21.1908049837247	18.0420031	31.0087706
32.6385642556394	22.0466830941405	21.2205961	30.6755865
34.6964998953383	22.969142747497	21.8832831	32.2702186
36.9479328123577	23.9783187943512	25.434095	30.36432
39.3976022501311	25.0763352846473	31.5115819	30.4349931
41.9354552359538	26.2138691230126	33.8398153	32.0377234
44.7908203689692	27.4937255263675	35.0133629	33.6653342
48.2750156855709	29.0554824872811	36.9545772	32.1019086
52.6622758581925	31.0220815272343	42.5831476	37.1399223
58.0513296392095	33.437771642506	48.2549784	40.2375649
64.8721626812354	36.4952599166567	51.5218465	39.5765057
74.951295529121	41.0131173973316	64.136723	44.5156078
Route: 4 Length: 158.619703662094 Demand Met: 4992			
66.9719315094711	64.1821121924338	47.9098314	77.7959758
61.7707341968726	66.8138746355513	45.3945603	79.9114427
58.2536686648506	68.5935348212133	43.3709663	79.9295648
55.6187451646992	69.9268339307344	41.3355343	82.7796974
53.5904103195257	70.953189644165	40.9923031	81.1407106
51.8581813183521	71.8297068368502	39.6568849	80.0063838
50.3146736442872	72.6107263434652	38.0621359	81.3957333
48.929846377109	73.3114531801891	37.6570142	81.9317057
47.6578060802615	73.9551115909583	35.4564008	78.9241199
46.4592135992428	74.5616078498822	34.482979	80.365325
45.3349617116462	75.1304886809455	32.0336769	81.0046037
44.294903784532	75.6567671433934	28.3264783	80.6515072
43.3544758796745	76.132631896399	25.8819635	79.9487476
42.5122106555558	76.5588250753086	23.1076735	77.6165558
41.7658166100561	76.9365061577016	22.4809106	75.2843669
41.0929638831524	77.2769743081431	26.7897314	74.395765
40.4508588705289	77.6018835758889	30.51178	74.0433946
39.8215704164998	77.9203073748125	32.5068688	76.0167984
39.2011250950088	78.2342562495549	37.7594155	72.4638416
38.5701037762086	78.5535566373414	35.1926471	70.9963316
37.9335879981267	78.8756372001309	37.415218	67.1119326
37.2766421914773	79.2080554940415	33.1471098	60.1558513
36.587476858708	79.5567772059893	32.7632095	61.4478694
35.8678167209889	79.9209295554854	29.6716712	65.8677857
35.1352979543126	80.291588349617	29.1113171	69.2428114
34.3940497649251	80.6666639559844	23.2409835	69.6045703
33.6651732269609	81.0354791459588	23.3330747	67.4297538

Solution x	Solution y	Original x	Original y
32.9394695516283	81.4026886664029	19.7736057	66.4248411
32.2292298428121	81.7620731712614	20.1950128	67.681815
31.528408615723	82.1166916809884	21.4467307	69.0185063
30.8277103484817	82.4712477401016	21.6218153	70.9164832
30.1246049093622	82.8270215169084	21.5799527	71.4486566
29.4156366744442	83.1857615610121	18.5593029	70.8497614
28.7082410337517	83.543705663025	16.6661596	74.8364156
28.0115097326426	83.8962530807951	15.7168362	72.1075902
27.3186916195897	84.2468201515561	14.8230271	72.6203252
26.6273090565324	84.5966605227981	12.9149435	73.6813943
25.942118321037	84.9433674365189	6.0949397	74.0865476
25.3105508316361	85.2629404328847	4.2645198	75.4568775
24.739692080854	85.5517941954756	3.24432779999999	74.1558976
24.2337965646365	85.807759874627	0.933565799999997	72.1659561
24.2337965119391	85.807776022929	1.295681	73.7881021
24.2337964577608	85.807776060012	2.4095765	76.567725
24.2337964029503	85.807776097511	2.73342340000001	77.6753662
24.2337963476833	85.8077761352896	2.2118306	78.338365
24.2337962919174	85.8077761734543	4.0094679	79.3774545
24.2337962359131	85.8077762117797	6.9413921	77.9428724
24.2337961793374	85.8077762506684	11.0262565	80.6460603
24.2337961216266	85.8077762901822	7.5281123	85.6801168
24.2337960633724	85.8077763296265	5.6520223	82.6769432
24.2337960046324	85.8077763694634	1.90777989999999	84.1438746
24.2337959454651	85.8077764097175	2.2068367	85.97283
24.2337958859108	85.8077764502088	3.4980922	86.0326352
24.2337958258793	85.8077764910415	4.0389978	87.3302987
24.2337957652967	85.8077765322336	5.5712407	90.2337915
24.2337957040391	85.8077765735992	2.7731053	90.8551563
24.2337956424034	85.8077766151197	2.92961390000001	91.7761922
24.2337955804162	85.8077766567742	2.2885744	93.0945686
24.2337955181086	85.8077766985402	2.8109458	93.7321232
24.2337954556225	85.8077767403686	0.0137857999999937	97.6201473
24.2337953728207	85.8077767941632	0.604558600000004	98.8714353
24.4534950080808	85.6966053480093	1.8947773	99.155621
24.7775662758658	85.532620489032	5.3401207	99.7769332
25.1304325406004	85.3540647260982	6.5131248	96.1438685
25.5003846624398	85.1668632149101	5.93926279999999	95.2323551
25.8929093108562	84.9682396526438	8.45094570000001	92.4898096
26.2976108411987	84.7634544038235	9.22639889999999	90.0124515
26.7119034612801	84.5538159884464	9.5621792	88.5032381
27.1358447670399	84.3392952977318	13.5790401	86.3111074
27.5590091695511	84.125167769995	13.1891897	88.2938542
27.987010074893	83.90859288669	11.9839899	90.8471274
28.4288156738105	83.68503265633	13.4475731	91.4293541
28.8821900407535	83.4556185731761	14.3875276	98.8261078
29.3718212756665	83.2078577641729	16.4819632	98.2716229
29.8908505188549	82.9452209554452	17.6447354	95.7025091
30.430136483385	82.6723340351347	20.7475398	95.759314
30.9849971549197	82.3915660367542	22.9057445	97.6296948
31.5593834740873	82.1009174442227	26.8042407	95.3391438
32.138633077375	81.8078075653249	23.9936704	92.6751712
32.7289228626244	81.5091111317669	21.4283979	90.119601
33.338801856281	81.2005024262869	19.6994488	87.7215703
33.9756001397104	80.8782725235347	19.6070156	87.5155962
34.6465085400562	80.5387828060583	20.5127244	86.7993916
35.3542349775395	80.1806631511653	20.4274735	84.2677658
36.101041704712	79.8027693425228	25.1363027	82.596723
36.8643529200584	79.4165251357405	27.0999394	87.1794445
37.6578720816876	79.0149963669089	28.8394854	85.6978668
38.4712824110308	78.603404226937	31.00496	87.5127119
39.3054409257882	78.181315772515	30.1525293	91.7059859
40.1992235751389	77.7290605191248	33.8269693	93.4852631
41.1570591331569	77.2443980337539	34.617789	91.6565199
42.1716182238438	76.7310376160221	37.489488	92.2138591
43.2466600679012	76.1870746962151	40.3910959	90.932739
44.369223984519	75.6190628820749	40.8799687	90.9919823
45.558524923738	75.017275630651	40.9379615	91.8870672
46.8611568489555	74.3581363119593	38.2308224	97.9753907
49.4823773163583	73.0317961932552	44.680977	94.9895485
53.2075963851884	71.1468590570698	45.8972803	89.1189208
57.7686714822825	68.8390937965556	49.7030604	90.8227548
Route: 5 Length: 6.07821878523325 Demand Met: 952			
94.54589496221	50.5118558377086	79.155929	54.6404138
94.2360729284609	50.8611730093674	79.80288	56.0883078
93.9127214022699	51.225599362236	78.4065879	56.8222853
93.6067099998369	51.5704640341295	74.3685871	61.179785
93.3429436180525	51.8677040252801	77.5651358	71.0148631
93.1471178933836	52.0883560693535	78.4106856	73.5257917
92.9829935698019	52.2732951328802	75.0689318	72.4744486

Solution x	Solution y	Original x	Original y
93.0815605819468	52.162100211963	73.7932186	65.1929118
93.2083768464796	52.0190677005706	70.748982	60.565778
93.3666686075276	51.8406232226653	69.6306367	57.4599551
93.5490446391984	51.6351299188197	67.7686962	50.942416
93.7647545283593	51.3921061337332	69.2934493	49.5142976
94.0070364294991	51.119111879045	73.3690079	50.7128517
94.2766239231202	50.815346349341	77.1618533	52.0527053
94.5593684254376	50.4967425232779	77.6409989	49.4044045
94.7614499184701	50.2689171995175	77.8566059	47.3210428
Route: 6 Length: 138.516218220691 Demand Met: 4996			
83.2759947845092	51.1510463955304	69.1126526	61.5737532
77.4074945520499	51.7270506859144	66.0988248	58.3515559
72.6514056946478	52.1939265348376	65.5436157	56.992435
68.628060133668	52.5888654367618	61.0935569	52.6920317
65.0895122186861	52.9362203615551	57.7424662	53.0431767
61.8965266348182	53.2496549745023	53.3341085	54.2742297
59.0462413375731	53.5294354549084	47.6524078	52.2249928
56.5804218121265	53.7714671291052	46.3458684	54.8708712
54.4026572701833	53.9852136804335	44.8729194	51.9811136
52.3481689840077	54.1868705555385	44.2906965	51.8898251
50.3731543573114	54.3807355034229	39.5709227	52.0192185
48.5517863476115	54.5595200257637	38.9617732	51.3997809
46.8367300747713	54.7278672842529	38.128444	50.990683
45.1976433685616	54.8887542706867	32.3710377	53.6854
43.7031798991124	55.0354418187715	31.5095969	51.0684653
42.3177692581046	55.1714229002569	28.018456	49.9258106
41.0597248563194	55.2949008725636	25.8175111	47.2716024
39.9332082591078	55.4054678108331	24.284459	53.5118781
38.9054003573466	55.5063451874874	23.2467308	53.1536864
37.9621360683393	55.5989237802841	22.9209187	53.7233909
37.0879724585593	55.6847196431254	20.4303529	56.6155569
36.2929637145638	55.7627461843446	23.9069485	59.9121563
35.5275322240454	55.8378696271895	26.1534967	60.2417469
34.7681301078194	55.9124014047393	25.824676	62.4300357
34.0132311294126	55.9864912064308	20.3908302	60.0437447
33.2923478112032	56.0572424048115	18.474215	58.4012448
32.6085539119838	56.1243534343598	18.3784185	57.1026507
31.9521933278257	56.1887721355644	18.1200543	57.6122523
31.3172258859431	56.2510913369632	17.0586402	58.0717087
30.704389154816	56.3112386422553	16.1987878	59.3187745
30.1140226873605	56.3691806977881	15.5276897	59.9411898
29.5442842821503	56.4250983720679	17.9198509	62.5969087
28.9797693996493	56.4805033740832	15.1928212	63.8863652
28.4301390298995	56.534447424413	9.6122245	63.4753738
27.9235509743034	56.5841673188251	9.81425009999999	65.891213
27.4533999348065	56.6303109939936	6.6484375	67.6725429
27.0485359281092	56.670045985513	6.2196931	67.2192158
26.6963074162604	56.704614259069	6.65024940000001	63.3598676
26.3679137256705	56.7368433488717	4.8021518	64.3437535
26.0731546128587	56.7657711389818	0.2763329	64.7359652
26.073154630525	56.7657711274188	0.795030699999998	63.4582891
26.0731546475366	56.7657711154161	1.389212	56.8496436
26.0731546646312	56.7657711034618	2.2999767	55.3764405
26.0731546816335	56.7657710916668	4.9451086	53.7479899
26.0731546984357	56.765771080051	3.9504558	53.4738105
26.0731547151118	56.7657710685368	3.2029124	51.042154
26.0731547316499	56.7657710571965	4.944301	50.787374
26.0731547480598	56.7657710459858	5.3360715	49.6056788
26.0731547643307	56.7657710349155	2.27936	46.9159446
26.0731547796238	56.7657710241802	2.1729785	46.8604253
26.073154979309	56.7657710138306	2.4253981	44.8523436
26.0731547989917	56.7657710044268	2.57466789999999	43.4683609
26.2720749044975	56.7462535791954	3.9184302	46.6238898
26.4957843906642	56.7243037454864	6.5220454	46.8393292
26.7316455021905	56.7011617946395	6.1363219	48.8674613
26.9812078801405	56.6766755845502	9.4077401	50.7341371
27.236956686773	56.6515824431077	9.41537220000001	53.1681384
27.4998321481663	56.6257899311635	7.20936620000001	55.909681
27.7775748922519	56.5985381910921	6.14577610000001	57.4553139
28.0772257333954	56.5691359394673	8.7488745	58.9072962
28.3922506855407	56.5382240973981	13.6466825	56.641223
28.7147477338201	56.5065784971567	16.954408	52.9270638
29.0420583063591	56.474460724489	19.3270801	51.9549025
29.3716395596663	56.4421204427898	21.0216738	51.8703093
29.7014612559869	56.409756831879	20.6501388	50.1791373
30.0324439872361	56.377279655478	22.4746551	48.1041051
30.3618675507869	56.3449561443428	20.3277951	46.570702
30.6927006553089	56.3124948640444	18.6253841	45.1799856
31.0282598877453	56.2795702075343	16.0956015	47.1989931
31.3731110479565	56.245733702008	13.919931	46.2670929

Solution x	Solution y	Original x	Original y
31.7349310964324	56.210231802493	12.7057803	46.3942459
32.118835732042	56.1725622885002	15.6671545	41.9038059
32.5227434077599	56.1329297635386	13.5198617	39.2703319
33.0599931228217	56.0802100947085	14.7299938	38.6202015
33.8339731251244	56.0042543638989	23.0786229	38.1227731
34.6366401632206	55.9254835566267	24.3319298	37.4283803
35.4680922596533	55.8438881339953	25.6408756	32.9849766
36.413870960606	55.7510697904789	26.2175773	40.5220972
37.3925813984125	55.6550193545236	25.3533813	42.3962835
38.4321231010732	55.5529976306981	28.2512087	43.1796715
39.5123188146842	55.4469852258404	30.0937988	44.3308943
40.6250352500631	55.3377803891927	32.3078962	45.114069
41.7576285961548	55.2266241999892	34.4981613	43.6098189
42.9019717948289	55.1143146062962	32.8302989	42.2309887
44.1067869384917	54.9960685698288	34.2887402	41.9043439
45.3766625430438	54.8714354940146	36.1244237	41.0242921
46.709389717459	54.7406321800663	37.4597811	44.2188485
48.1023242580688	54.6039172799245	40.4352515	45.1450838
49.5360056515611	54.4632003664429	37.6481264	47.8813096
51.104863627985	54.3092098149442	39.4220046	48.156385
52.8330717208166	54.1395710247148	43.0965371	49.287121
54.6910749368344	53.9571841783159	49.3212736	48.3119567
56.5820562903522	53.7715558574123	49.7681271	46.8278362
58.5373607136775	53.5796136833675	53.5581269	47.7413894
60.4961224369018	53.3873406729085	53.1446811	48.4277704
62.5059950577563	53.1900627208908	55.3536754	50.0230289
64.5974730105121	52.9847818701037	57.0032853	47.929495
66.931708416966	52.7556607098904	58.3317264	48.8464518
69.6563764876929	52.4881772325082	58.9987357	45.7674431
72.8956593204745	52.170157561279	63.3830619	45.6708392
76.7721634398438	51.7895808167976	65.8501112	46.5185477
81.4780998677288	51.3275525742463	67.7343836	45.7338412
86.6267447497197	50.8221624524927	75.4422908	46.5496079

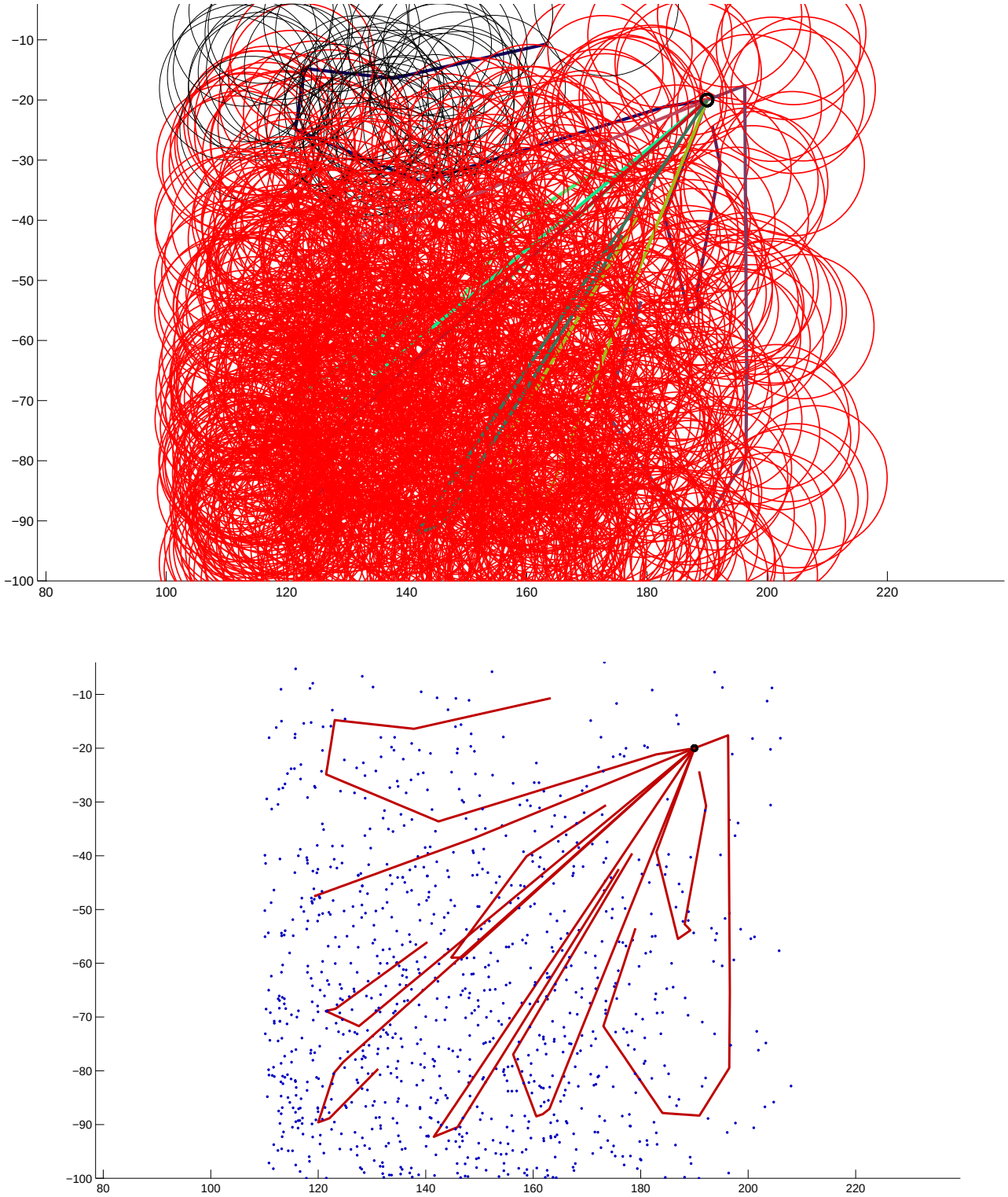


Figure O.7: *bonus*1000, Equal Radius, 2D, Euclidean, Length = 1358.4141657

Table O-10: Solution for *bonus*1000, Equal Radius, 2D, Euclidean

Total distance: 1358.4141657014 Total demand met: 25289 Depot: x 80 y 20			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 151.686763097617 Demand Met: 2923			
76.6420831829459	20.5459484802233	77.03036191	15.51069798
76.6420831829459	20.5459484802233	76.68650337	13.86956158
72.884315353325	21.1570233640526	72.1570689	9.179080442
72.884315353325	21.1570233640526	65.51501196	11.68636529
65.3466132196797	23.4768018945148	62.61153544	17.95816147
65.3466132196797	23.4768018945148	60.71671796	14.8721563
60.5958487194552	24.939202585176	63.04507341	24.29862677
60.5958487194552	24.939202585176	62.17589976	23.53474989
54.4376093835267	26.8347616619201	59.97712424	27.07719444
44.0650080656745	30.0273407028912	39.25918273	24.78783876
44.0650080656745	30.0273407028912	36.2315122	27.60710766
41.3029048258388	30.877621730369	37.07046765	30.04479215
39.2417720881926	31.5121156487905	36.77121212	29.70512597
39.2417720881926	31.5121156487905	37.51752459	33.09106605
37.4417060025896	32.0662221342008	38.78467609	39.06908374
37.4417060025896	32.0662221342008	38.90241804	39.45548462
35.6655679748646	32.6129506221396	39.58652985	43.55288071
35.6655679748646	32.6129506221396	38.72818734	43.64397508
33.706576913219	33.2159518705621	34.06373355	42.77086753
33.706576913219	33.2159518705621	34.31056081	43.95356429
32.3916953447129	33.6207112574675	31.80593192	45.60640645
31.8544628394951	33.3958216008667	30.28185343	43.77834378
31.2833768095343	33.1567576305268	29.65914735	42.12761495
31.2833768095343	33.1567576305268	30.33187934	43.75504148
30.6380362001846	32.8866067665148	35.17250587	39.36136713
30.6380362001846	32.8866067665148	32.06711817	41.12824267
29.8279244449728	32.5474776779833	30.41452332	39.55317391
28.9728447310586	32.1895233355521	29.90863496	38.4851443
28.9728447310586	32.1895233355521	28.54401437	40.13690379
28.0157338208483	31.7888545100308	27.42853428	33.27622768
28.0157338208483	31.7888545100308	28.08331623	42.02257662
26.8533502118703	31.3022488045925	31.80606468	35.45021175
26.8533502118703	31.3022488045925	30.83636789	38.35208021
24.9833183948781	30.5193852792473	31.17947294	31.40633137
22.5399272319921	29.496475946533	25.40396983	32.32053998
22.5399272319921	29.496475946533	22.33900559	31.60235215
19.6913008066263	28.303905154069	18.74305811	29.30240259
16.9716892714586	27.1653481267296	18.71921477	25.10440199
16.9716892714586	27.1653481267296	17.16840861	23.65521269
14.3783604906783	26.0796638275558	16.76117492	28.31246812
14.3783604906783	26.0796638275558	14.14878683	27.98719075
11.4712382535785	24.8626147371169	12.63680518	12.91935497
11.4712382535785	24.8626147371169	12.36712067	15.90584574
11.4712370462019	24.8626143266904	14.86812736	22.17705421
11.4712370462019	24.8626143266904	10.79914705	20.42039499
11.4712358535317	24.8626139224499	6.772905892	23.04434695
11.4712346586778	24.8626135175518	4.953508892	23.81507206
11.4712334522763	24.8626131086779	9.44237495500001	27.32019574
11.4712334522763	24.8626131086779	9.320660383	27.08555662
11.471232235758	24.8626126950073	3.815111582	26.65111472
11.471232235758	24.8626126950073	3.43019284899999	27.39779729
11.471232235758	24.8626126950073	2.694391803	27.62826968
11.471232235758	24.8626126950073	2.51827574799999	30.45426362
11.471232235758	24.8626126950073	1.354188569	31.31594018
11.471232235758	24.8626126950073	0.438114408000004	29.42535326
11.5749330060055	24.2117379652696	10.78091353	34.08373955
11.5749330060055	24.2117379652696	8.02660248300001	29.17059173
11.7425011433703	23.1601736354642	6.71940622700001	25.73868862
11.7425011433703	23.1601736354642	5.584406208	23.81184943
11.9259136811698	22.0092110857343	10.62327399	24.29073933
12.1156911706296	20.818307000824	10.89890727	16.02503912
12.1156911706296	20.818307000824	8.67995437099999	15.22687294
12.2654384117848	19.8784992421523	4.281409798	24.72152663
12.2654384117848	19.8784992421523	0.867278095000003	18.04823486
12.4609028982439	18.651823708008	5.72255099500001	17.38650207
12.4609028982439	18.651823708008	5.677247541	18.04924585
12.6475404909765	17.4804651264013	7.31997787899999	15.37807435
12.818436807091	16.4078274205206	3.177857831	14.97802426
12.9788640223022	15.4007922490739	3.082410661	9.043855976
12.9788640223022	15.4007922490739	2.197761157	16.16441336
13.0790174286299	14.771983694413	8.465864182	8.874062551
13.0790174286299	14.771983694413	5.801300438	5.23076571

Solution x	Solution y	Original x	Original y
15.7993222504804	15.0719809960634	18.20950886	6.619599382
15.7993222504804	15.0719809960634	8.98802709899999	7.925934732
20.425016763131	15.5821724012529	14.9958336	14.5728326
27.8288602455085	16.398774677239	39.07927218	20.57348801
27.8288602455085	16.398774677239	38.38951699	19.65672727
27.8288602455085	16.398774677239	38.46066343	17.33665094
27.8288602455085	16.398774677239	38.07401644	11.09458783
27.8288602455085	16.398774677239	36.57027062	15.62107689
27.8288602455085	16.398774677239	35.94447387	20.12395641
27.8288602455085	16.398774677239	35.85991513	20.90404301
27.8288602455085	16.398774677239	35.53984032	15.99196501
27.8288602455085	16.398774677239	35.62470684	10.73896033
27.8288602455085	16.398774677239	34.82834577	24.45085722
27.8288602455085	16.398774677239	34.15723352	12.84614068
27.8288602455085	16.398774677239	32.11403346	10.63014558
27.8288602455085	16.398774677239	30.90434674	20.96780911
27.8288602455085	16.398774677239	30.34406593	27.74432368
27.8288602455085	16.398774677239	29.56587444	24.57869021
27.8288602455085	16.398774677239	28.82263126	20.36706254
27.8288602455085	16.398774677239	28.59013959	24.83311171
27.8288602455085	16.398774677239	29.15811552	9.518746656
27.8288602455085	16.398774677239	27.39065822	19.10906735
27.8288602455085	16.398774677239	27.26619514	25.90196542
27.8288602455085	16.398774677239	25.83818458	22.03803134
27.8288602455085	16.398774677239	26.37919279	28.3108891
27.8288602455085	16.398774677239	24.87958822	27.09583401
27.8288602455085	16.398774677239	24.70443529	26.12365999
27.8288602455085	16.398774677239	24.23492671	17.98856994
27.8288602455085	16.398774677239	24.09498187	20.3828805
27.8288602455085	16.398774677239	23.64941173	19.80991504
27.8288602455085	16.398774677239	23.31975826	27.34182644
27.8288602455085	16.398774677239	21.70527032	21.60018691
27.8288602455085	16.398774677239	21.65865806	17.99154884
27.8288602455085	16.398774677239	20.73212412	24.23741148
27.8288602455085	16.398774677239	20.19850768	8.627828216
27.8288602455085	16.398774677239	18.39694528	22.72524013
53.2836828821759	10.700635607768	63.24920239	4.015695007
53.2836828821759	10.700635607768	44.45005227	17.91363181
53.2836828821759	10.700635607768	42.34346606	5.769949569
Route: 2 Length: 74.9170722546718 Demand Met: 1659			
75.5074097468911	32.2641025894847	69.67922342	40.74675918
74.6329244016568	34.6512334204798	75.00767938	29.50135545
74.6329244016568	34.6512334204798	75.19376171	39.75388964
73.7507429728103	37.0593949709839	73.13866372	41.71405139
73.7507429728103	37.0593949709839	70.24663893	43.40548551
73.148270580494	38.7040052774056	71.61626861	44.97765672
73.148270580494	38.7040052774056	66.65703205	47.7722791
72.9258432765567	39.3111711535813	71.99750065	50.82091856
72.9258432765567	39.3111711535813	67.10787364	49.80646667
72.9258432155459	39.3111713163549	63.76560063	37.45231942
72.9258432155459	39.3111713163549	61.01859213	37.82208646
74.3590352527463	45.0939919259183	64.75792457	49.92103542
74.3590352527463	45.0939919259183	63.59211348	50.34808715
74.3785456359567	45.1727192603653	63.12520069	41.24941139
74.3785456359567	45.1727192603653	64.47235297	44.07915445
74.417021247847	45.3279839714882	63.54041364	40.47906672
74.6495125533027	46.2662286868656	63.41360315	44.69674786
74.6495125533027	46.2662286868656	63.21772914	46.4808445
75.4383318226528	49.449527262071	64.66140077	51.58253517
75.4383318226528	49.449527262071	65.98277732	56.02257659
75.7185655361263	50.5804617577553	72.73426073	54.95021428
75.9815795639677	51.641907123382	72.13050555	55.03070373
75.9815795639677	51.641907123382	71.85259834	57.85616299
76.2107447794231	52.5667569253405	68.52022941	55.69012612
76.4376933997044	53.4826632810243	70.94365949	58.14560753
76.4376933997044	53.4826632810243	69.70404765	60.5822767
76.6262831484355	54.2437767682328	75.75634139	60.02200009
76.8062567108955	54.9701209746301	76.04244622	64.45001766
76.8062567108955	54.9701209746301	74.85083054	64.74645556
76.9315701629313	55.4758769030785	72.84290598	65.67053988
76.9315701629313	55.4758769030785	72.70378804	66.70645397
77.4601745671537	55.1081880777182	78.29263567	66.45988674
78.4037640055681	54.4518005036822	83.55927983	59.64747077
78.4037640055681	54.4518005036822	85.16088414	60.47696067
79.2570820863946	53.858204915914	91.19333201	55.09349477
79.2570820863946	53.858204915914	87.34079917	59.37931572
79.1372692041102	53.7313293481929	88.60564442	53.67349247
79.1372692041102	53.7313293481929	90.50689197	55.43830225
78.9853310511917	53.5704308128278	86.51848331	50.71555717
78.8296591691082	53.4055789747377	85.71414415	51.67250379

Solution x	Solution y	Original x	Original y
78.8296591691082	53.4055789747377	83.19197135	53.48639501
78.66915141592	53.2356055594036	84.14082278	54.46253046
78.66915141592	53.2356055594036	83.91646182	55.69492785
78.5029089094099	53.0595558082777	79.86750899	54.35421653
78.3384209222984	52.8853629531124	78.85550393	52.04144231
78.3384209222984	52.8853629531124	77.87000631	52.21112855
78.1826110032384	52.7203574684684	66.67873973	56.13517049
78.7705497493016	49.4827772940939	76.57028534	49.55513485
78.7705497493016	49.4827772940939	78.92131522	50.41345477
79.4155708955648	45.9308286976366	77.14427045	45.25079579
79.4155708955648	45.9308286976366	77.77449926	46.72256252
80.0993714336355	42.1653138424538	79.30599483	40.28434635
80.731907828561	38.6820804257066	74.78372311	42.05088328
80.731907828561	38.6820804257066	74.55729645	43.48740037
82.1787276110585	30.7154380997116	94.17807015	30.5898166
82.1787276110585	30.7154380997116	84.85983095	39.85329756
81.9207001707381	29.4463528374917	88.13068149	33.9074779
81.9207001707381	29.4463528374917	87.56748283	36.27406643
81.4803869391047	27.2807645557371	86.50661976	33.33916758
80.8733797162961	24.2953568166267	87.03899122	21.09553754
80.8733797162961	24.2953568166267	82.01891737	31.58538586
Route: 3 Length: 159.889379879281 Demand Met: 2929			
85.654014961243	17.8276593433064	94.15587216	20.2227246
85.654014961243	17.8276593433064	93.53556787	11.2495411
86.2683881030927	17.5916134081064	85.22979418	8.715884504
86.2683881030927	17.5916134081064	83.75499038	5.857780347
86.2684002620892	17.5916126330674	94.43184685	8.796264511
86.2958374761584	21.6705184501756	90.81819821	18.2159484
86.2958374761584	21.6705184501756	95.99475962	18.1472698
86.5901167101365	65.4027745641469	95.77662579	57.68215173
86.5901167101365	65.4027745641469	78.83068399	69.67274441
86.5901167101365	65.4027745641469	81.47694776	70.94126153
86.5901167101365	65.4027745641469	83.77232341	73.14211564
86.5901167101365	65.4027745641469	91.59995025	72.67875795
86.5901167101365	65.4027745641469	86.75397464	75.23932777
86.5901167101365	65.4027745641469	93.29522257	74.82458329
86.5901167101365	65.4027745641469	91.90328388	76.16243153
86.4707484509256	79.484817552536	97.99058573	82.84537681
86.4707484509256	79.484817552536	94.75890926	85.83537613
84.8062308397164	82.1443744023848	93.12739448	86.70709298
84.8062308397164	82.1443744023848	91.04765146	90.60180149
83.7981780957602	83.7550323524811	82.09017124	81.333147
83.7981780957602	83.7550323524811	81.4352048	82.89764497
82.7268990079779	85.4667147567654	75.38279951	84.8495864
82.7268990079779	85.4667147567654	77.11333094	85.3156461
81.8083824367217	86.9343181573115	76.68533256	86.49303137
80.9323931410047	88.3339730457285	86.37403118	99.02923308
80.5581697364212	88.3076358442393	82.53992082	88.87907996
80.5581697364212	88.3076358442393	86.10921689	91.46882481
80.1772272196252	88.2808263873357	87.63411723	89.72076827
80.1772272196252	88.2808263873357	79.19703593	96.06011661
79.7786441481849	88.2527758683505	80.84419352	99.98848979
78.9013903590993	88.1910467486008	79.39161289	97.26593015
78.9013903590993	88.1910467486008	78.18108034	99.79242924
77.9902162768074	88.1269351911202	76.48394754	93.81500316
77.9902162768074	88.1269351911202	73.04972269	93.68364053
77.1882347738411	88.0705068902578	72.91384846	91.54886288
76.4306726473279	88.0172040222545	72.48804708	89.57044348
75.7047919948447	87.966130306593	68.11557125	90.29313921
75.7047919948447	87.966130306593	69.82339194	93.15949799
75.1120914655951	87.9244274688672	71.17046416	92.96230041
75.1120914655951	87.9244274688672	71.22771139	93.77569631
74.5598880601276	87.885574215048	69.92952441	96.42807986
74.0518984915569	87.8498320069508	66.92699784	97.50570073
74.0518984915569	87.8498320069508	74.57969734	99.83821951
73.9818702966905	87.7470327373971	70.07355989	96.61021246
73.9818702966905	87.7470327373971	69.38304877	98.18671586
73.9039597674588	87.6326584806783	68.09186985	95.85522589
73.9039597674588	87.6326584806783	66.67195124	95.92017704
73.8272375441895	87.5200269034661	65.26732099	95.86741863
73.6525259701763	87.2635527137989	64.96530116	93.98228963
73.6525259701763	87.2635527137989	64.64609008	95.09261932
72.9788077056352	86.2745889838086	63.88368354	92.98872817
72.2887223386359	85.2616038701329	66.59307852	88.41880362
72.2887223386359	85.2616038701329	68.01446808	90.26524455
71.6113799703752	84.2673246967864	69.09548968	84.07624055
71.6113799703752	84.2673246967864	67.89989075	88.12316705
70.9588894384853	83.3095260065702	68.96890483	80.55619731
70.9588894384853	83.3095260065702	69.80433177	81.60817435
70.3761209664706	82.4540732663775	70.61748839	78.65460339

Solution x	Solution y	Original x	Original y
69.8272403959193	81.648364999548	72.09010058	81.417498
69.2731343162333	80.8349861387577	74.46580568	79.0435318
69.2731343162333	80.8349861387577	75.20998283	80.5662569
68.6745751719815	79.9563539623139	68.84275879	76.03221479
68.6745751719815	79.9563539623139	70.83372488	78.21085961
68.116164550669	79.1366562714265	73.75840634	73.11670598
68.116164550669	79.1366562714265	70.77169737	73.88064127
67.6107693240741	78.3947803067618	74.07680751	69.16329968
67.6107693240741	78.3947803067618	73.05372772	69.26625594
67.3218081618642	77.9706086898879	69.12634406	69.4594231
67.0590845454527	77.5849516337748	70.36283848	70.39401036
67.0590845454527	77.5849516337748	68.36889636	72.61479797
66.8165682823975	77.228957356724	66.81087893	72.19337817
66.8165682823975	77.228957356724	67.45457311	72.85375456
66.5891111216196	76.8950686765964	65.34735437	72.80394877
66.5891111216196	76.8950686765964	67.69295238	75.24403656
66.3709121585418	76.5747703451112	63.68037897	79.29990004
66.3709121585418	76.5747703451112	62.20174968	80.96664236
66.1497470033402	76.2501178925026	64.88497046	82.96772641
65.9179593152343	75.9098724488501	61.67834468	82.51967341
65.9179593152343	75.9098724488501	61.30013954	82.69641043
65.6707025987139	75.546919854848	60.70093329	80.64454551
65.6707025987139	75.546919854848	62.03157877	81.16617953
65.4148174633	75.1713015846879	56.64479831	82.24679775
65.4148174633	75.1713015846879	58.40265516	82.89286098
65.1233637171842	74.7434734963814	57.82109764	79.24611201
65.1233637171842	74.7434734963814	55.73082902	81.05870461
64.8327730025993	74.3169141422453	58.21523833	76.77458472
64.5482071825415	73.8991988615183	58.81674593	76.2826012
64.267348290131	73.4869250851953	61.63608438	74.03409399
64.267348290131	73.4869250851953	60.79681015	75.33369853
63.9884949347585	73.0775954641761	61.14896118	72.70410502
63.7131794157983	72.6734591668397	59.09181099	73.44789922
63.7131794157983	72.6734591668397	57.06276587	74.98770524
63.44555702579	72.2806158523264	56.76810138	74.93595817
63.44555702579	72.2806158523264	55.58088554	76.52999392
63.1819832005413	71.8937157752676	52.40986372	76.90026657
63.0591189412792	71.7133666058506	51.17754367	73.39508539
63.0591189412792	71.7133666058506	52.24575767	74.98560476
63.1271147290574	71.5058339801307	51.91696279	73.69595809
63.1271147290574	71.5058339801307	51.90516717	74.10528304
63.2899300958634	71.0088448375544	53.92763119	74.12654413
63.2899300958634	71.0088448375544	53.90080059	74.55382457
63.5005201868471	70.3660219316962	55.72002047	71.91921816
63.5005201868471	70.3660219316962	55.90538334	73.56581582
63.7364930867714	69.6457168939953	53.60239056	70.80290226
64.0078750870755	68.8173234976045	52.68458788	66.68600654
64.3475767308036	67.7803711483049	58.20433528	69.50520456
64.3475767308036	67.7803711483049	56.84900895	69.27095699
64.743703054738	66.5711790479917	59.0134746	66.34233581
64.743703054738	66.5711790479917	60.59756518	67.42291916
65.1588366469651	65.303965567917	63.48323083	69.36201841
65.6146948316985	63.9124378870574	63.53725064	67.03413314
65.6146948316985	63.9124378870574	63.47892732	68.70647259
66.1817026239888	62.1816187485717	65.55566867	66.58332744
66.8244523706757	60.2195912734132	67.87575086	63.89107621
66.8244523706757	60.2195912734132	65.09617026	64.32634731
67.6466247717235	57.7098601668495	65.84999623	61.37790202
67.6466247717235	57.7098601668495	65.33791464	63.72798066
69.0328787366456	53.4782228994076	62.81703196	55.94894639
69.0328787366456	53.4782228994076	58.50503897	53.8647284
Route: 4 Length: 120.761060713889 Demand Met: 2883			
67.0352390888635	31.6930732212004	62.83458953	32.37480154
67.0352390888635	31.6930732212004	59.48412304	31.97998889
62.9208052255028	35.403952220146	55.9549233	32.80200534
59.6811060288434	38.3259767601898	54.00076983	32.50218762
59.6811060288434	38.3259767601898	53.48089128	34.57431179
57.0325876902758	40.7148274002263	54.69460289	37.32086801
57.0325876902758	40.7148274002263	51.33580352	40.30660727
54.8509444149282	42.6825831975941	50.32982697	35.43640834
54.8509444149282	42.6825831975941	48.20619517	39.24794213
53.1153448420078	44.2481451764034	51.65508094	43.85648581
53.1153448420078	44.2481451764034	44.94410764	36.28576006
52.0405313079209	45.2176495276635	49.81718199	39.89953162
52.0405313079209	45.2176495276635	49.90577559	41.072269
50.8242911095433	46.3146884640417	52.03099226	42.50134863
50.8242911095433	46.3146884640417	51.12261026	42.05252276
49.2539351182824	47.7311073547674	53.79810347	45.16180718
47.2699387082793	49.520618175221	52.57887869	54.16196226
47.2699387082793	49.520618175221	53.50308144	57.04941766

Solution x	Solution y	Original x	Original y
44.9794957161062	51.5865647358219	48.91348948	54.77748717
44.9794957161062	51.5865647358219	48.01348394	55.67625048
42.7830477672682	53.5677318730028	45.68320409	63.6499192
42.7830477672682	53.5677318730028	44.96838238	64.05706864
41.9137080924679	54.3518456009294	48.65047008	56.26343732
41.9137080924679	54.3518456009294	46.15723029	56.4070148
40.8912888218477	55.2740354341444	42.95157888	64.84132436
40.0764590149214	56.0089781546146	45.47068469	56.96814934
40.0764590149214	56.0089781546146	44.98764045	56.96391467
39.1022318756825	56.8876949751023	41.72708173	62.5487287
39.1022318756825	56.8876949751023	41.95981534	64.94436816
38.2572030343468	57.6498746891385	40.91327599	65.05437313
37.4689907020811	58.3608084590602	39.73860453	66.92518954
37.4689907020811	58.3608084590602	39.83687168	68.05987049
36.8515605146332	58.9177055723233	42.13585343	68.94604524
36.8515605146332	58.9177055723233	41.30767537	70.05965636
36.3902245517802	58.9301885675607	39.12047899	68.75765335
36.3902245517802	58.9301885675607	38.57181853	69.29967661
35.8661044462113	58.9443963455607	37.43465738	70.14594443
35.8661044462113	58.9443963455607	33.57300136	70.51852673
35.4165432918616	58.9565648542149	34.32584869	66.311045
35.4165432918616	58.9565648542149	33.85806756	68.2147305
34.9872041254103	58.9681832641891	28.77703399	67.75671878
34.9872041254103	58.9681832641891	26.6523776	66.91672378
34.885150296855	58.9709428861678	31.96159565	70.60936436
34.885148128238	58.970943239953	30.01509861	69.93828769
34.8731421729013	58.9598843144247	38.18944723	65.54612606
34.8612038152502	58.948887718048	37.36735143	64.72519961
34.8612038152502	58.948887718048	36.88863481	65.11756178
34.8495332558763	58.9381378908807	38.05290287	66.43336709
34.8495332558763	58.9381378908807	36.53251416	65.89826385
34.8375489010478	58.9270987669934	41.10546356	60.73573959
34.8257020963865	58.9161865808964	38.87334077	61.97418169
34.813782719337	58.9052076501687	36.65639834	59.2724504
34.813782719337	58.9052076501687	35.39691212	60.01558524
34.8021110357145	58.894457040493	34.15128455	57.37934974
34.8021110357145	58.894457040493	33.50828257	58.48410354
34.79107402093	58.8842912590209	22.84438078	60.01413405
34.79107402093	58.8842912590209	26.03259253	67.05188068
34.8123822203709	58.8556299829564	28.86030824	61.83789689
34.8123822203709	58.8556299829564	26.46280572	62.61127777
34.834681415119	58.8256350989563	28.38294287	59.7022254
34.834681415119	58.8256350989563	28.66025221	61.13181458
34.8577201395376	58.794645776984	32.47933058	60.09950546
34.8807968199839	58.7636051886734	29.89833465	58.88393924
34.9044533828076	58.7317859851426	42.10911161	58.06602885
34.9275557809798	58.7007117403391	43.40294282	59.60424206
34.9275557809798	58.7007117403391	41.72170476	60.36141703
34.9493699013602	58.6713693224892	38.55825219	62.0328479
34.9493699013602	58.6713693224892	36.99117209	62.09652931
34.9713126615794	58.641853117644	39.00311055	58.98114927
34.9713126615794	58.641853117644	37.67648628	59.01822185
34.9924113332131	58.6134733910533	32.14669335	66.5741861
35.0141556864444	58.5842238708209	31.78300706	62.74548174
35.0141556864444	58.5842238708209	32.28903103	63.37386507
35.0361697816485	58.5546116751632	29.47881008	65.01108227
35.0361697816485	58.5546116751632	27.36103425	64.84526011
35.0592805461515	58.523523292431	26.36495426	64.10386589
35.0592805461515	58.523523292431	25.20403775	63.98638021
35.0840966420988	58.4901406059413	25.66105506	62.27941228
35.1094491464505	58.4560365182161	26.36749261	61.24478927
35.1094491464505	58.4560365182161	25.84588775	61.17671521
35.1355802165897	58.4208854677482	25.08011935	60.4806985
35.1355802165897	58.4208854677482	24.58618772	59.92581691
35.1624662595932	58.3847191211335	24.05460087	58.82740751
35.1624662595932	58.3847191211335	24.68488711	59.85199485
35.1887318232588	58.3493869896402	23.29263587	57.34435722
35.466368379822	57.9758697933041	24.61643689	54.01115924
35.8377900720925	57.4761732253018	25.6524776	56.5792119
36.2775621209909	56.8845160117413	28.17203359	56.51587977
36.2775621209909	56.8845160117413	27.13020332	56.00735022
36.819298021209	56.1556709606531	28.94274384	52.01860718
36.819298021209	56.1556709606531	26.97467166	54.66512134
37.4747370312472	55.2738512033496	32.83493269	54.50530143
37.4747370312472	55.2738512033496	31.12121771	52.61678334
38.177558576891	54.3282780366981	33.45977848	51.47641849
38.177558576891	54.3282780366981	31.52001616	50.89228775
38.8905040144096	53.3690870700477	34.17044541	50.63731129
39.6014117531021	52.412638523578	35.40868681	49.33377596
39.6014117531021	52.412638523578	34.68773061	48.27076221

Solution x	Solution y	Original x	Original y
40.2460444775783	51.5453648246515	37.58124673	53.7047325
40.2460444775783	51.5453648246515	33.45872958	53.85918585
41.0512707877945	50.4620325103008	39.86159624	55.58185516
41.0512707877945	50.4620325103008	36.93641703	55.80482127
42.2247658339641	48.8832156472426	40.32660467	53.626561
43.6267513393315	46.9969600665307	41.84687745	52.15158968
43.6267513393315	46.9969600665307	40.92420024	52.54921675
45.8868826515617	43.9559456048231	39.35568633	35.06788426
45.8868826515617	43.9559456048231	40.81010844	38.77304558
47.0550194063187	42.3843812108554	44.21687698	34.39769027
47.9468193071786	41.1846182184594	41.09480481	34.92509896
48.7633344526305	40.0861409575731	40.57036155	31.31828969
53.1097386841247	37.2911524365491	51.99282443	27.99909333
53.1097386841247	37.2911524365491	51.08696185	26.42044109
54.7022210927041	36.2670582175395	50.20668952	26.40233109
54.7022210927041	36.2670582175395	48.88810081	29.6929228
56.2704370976534	35.2586467580092	49.49892788	30.73465222
56.2704370976534	35.2586467580092	47.52772375	30.54529654
59.1651451667564	33.3972739408648	51.19858704	31.0981292
63.5265146214069	30.5928369067416	59.11600598	27.89604561
63.5265146214069	30.5928369067416	55.07321291	28.85442279
Route: 5 Length: 172.244573341872 Demand Met: 2962			
52.7979242344545	42.5237601171308	48.35826716	45.69665672
52.7979242344545	42.5237601171308	47.65008175	45.51867646
47.4875976588042	46.9207892646177	39.96945525	49.46230999
47.4875976588042	46.9207892646177	39.67150404	49.44131071
45.7145156044328	48.3889589216021	50.26037041	48.95030273
43.8094813917216	49.966397341008	49.48945411	49.44119699
43.8094813917216	49.966397341008	47.38308024	49.71863955
41.2396325663209	52.0943004066285	47.22851165	47.89903616
41.2396325663209	52.0943004066285	45.78512338	48.76667443
28.9603970002018	62.2615851060883	28.17365085	71.94302821
25.704478947208	64.9575563039156	29.09610379	74.18683092
25.704478947208	64.9575563039156	28.44331265	74.98671685
24.1795623217956	66.2202072151405	25.63863856	75.55318582
22.9996027602261	67.1972281613402	25.39416892	74.01493111
21.9120718178732	68.0977189324601	24.37529212	73.10827156
21.9120718178732	68.0977189324601	23.86908483	73.83689183
20.9164703004687	68.9220944806259	22.95922483	75.83051285
19.9952991707762	69.6848415104218	24.84752889	78.21896812
19.9952991707762	69.6848415104218	22.96398221	79.24584246
19.2769333738702	70.2796639092975	21.16552744	75.92926841
19.2769333738702	70.2796639092975	21.04749508	76.84597788
18.6203873188056	70.8232991928753	24.57644237	79.57543571
18.6203873188056	70.8232991928753	23.53960858	80.471438
18.0703595473676	71.2787372906528	21.51917751	80.74471553
17.5775946654083	71.6867608197507	19.16596982	83.58117432
17.0669296641502	71.4550068699697	20.11668251	80.56671914
16.4833349437337	71.1901594991262	19.29153506	80.52426775
15.7951624654772	70.8778579057735	15.50686687	76.44859369
15.0905568195993	70.5580996568497	14.09860615	77.68853822
15.0905568195993	70.5580996568497	10.28504553	75.43578797
14.3837213664126	70.2373300718959	9.360499311	76.63383999
13.69616285431	69.9253082781724	6.334374787	68.85467086
13.0897396192537	69.6501035065388	5.020361565	69.58798476
12.5556886858515	69.4077401773319	4.203561784	71.28689241
12.5556886858515	69.4077401773319	2.885089549	70.78781924
12.150579769175	69.2238902934029	2.881941531	70.78732912
12.150579769175	69.2238902934029	1.825477279	70.78130479
11.8519115007126	69.0883440212147	3.702577787	67.55965669
11.8519115007126	69.0883440212147	3.972668798	68.43095677
11.5947501173184	68.9716339859661	3.336609071	66.34370608
11.5947501173184	68.9716339859661	2.76637406099999	66.09545945
11.3812745509428	68.8747493055398	1.28261934699999	62.39268391
11.3812745509428	68.8747493055398	0.793870075000001	65.00803843
11.38127453086	68.8747493026072	2.82031094	66.9400554
11.38127453086	68.8747493026072	2.559418382	66.60707534
11.381274512423	68.8747493002777	3.705228073	66.5975084
11.3812744948126	68.8747492984357	2.781332517	68.35625636
11.381274478273	68.8747492970419	1.009741561	74.32200243
11.381274478273	68.8747492970419	0.155166121999997	73.1143838
11.4596483383971	68.8571783705279	1.09685186199999	69.20060768
11.5425660346211	68.8385900228175	0.299902086000003	68.51958527
11.5425660346211	68.8385900228175	1.834626902	71.15202574
11.6363744683336	68.8175611015155	3.390983182	60.32064994
11.6363744683336	68.8175611015155	3.16457285600001	61.67055704
11.947755634291	68.7476733569304	8.07711459799999	60.52651503
11.947755634291	68.7476733569304	8.01127751600001	61.69215045
12.8247654117288	68.5516123414491	18.15532249	77.80652015
12.8247654117288	68.5516123414491	16.93400358	77.9224885

Solution x	Solution y	Original x	Original y
13.2210117199234	68.4627729004965	18.15807888	79.40011164
13.2210117199234	68.4627729004965	14.92906226	79.42060964
13.4102234945675	68.3254558007371	9.964092428	69.02740379
13.4102234945675	68.3254558007371	9.088863996	70.57778186
13.6049828869749	68.184112860779	11.73654707	68.82383733
13.6049828869749	68.184112860779	11.54525803	68.93314303
13.8002020819779	68.0424363363724	9.89788954300001	67.94003152
13.9965234774242	67.8999600739503	11.17807544	66.07771318
14.1907106082207	67.7590329575039	18.79013692	77.54174683
14.1907106082207	67.7590329575039	18.46683587	77.29301103
14.3991141543018	67.6077875036679	8.689838933	62.80875147
14.3991141543018	67.6077875036679	8.88093920200001	67.16779099
14.6149035050064	67.4511824042535	10.36857839	64.9958121
14.6149035050064	67.4511824042535	8.93361225699999	64.19415642
14.8355125778648	67.2910798357822	11.71156616	63.23151575
14.8355125778648	67.2910798357822	12.00297966	63.9466553
15.0538980812728	67.1325912678526	10.63863267	61.64507704
15.2708659762249	66.9751317509542	13.17908278	60.05355856
15.2708659762249	66.9751317509542	10.83705181	59.65376627
15.4748565625782	66.8270907230365	18.31523717	76.27495825
15.6920808593889	66.6694453146336	19.47269695	75.25893863
15.6920808593889	66.6694453146336	18.49430275	75.1491321
15.9208219734219	66.5034411758003	17.45311026	57.02027397
15.9208219734219	66.5034411758003	16.07158763	60.00636388
16.1208571935171	66.3582703851671	19.29354577	63.34226321
16.1208571935171	66.3582703851671	17.25601024	61.69443137
16.3078330746986	66.222577309122	18.97844246	66.0992932
16.3078330746986	66.222577309122	16.73656026	65.26611785
16.4896465490824	66.0906308692659	16.63383213	64.77854357
16.4896465490824	66.0906308692659	15.77830732	66.19409337
16.6692027452496	65.9603228018159	14.06057656	63.93249207
16.8484193927856	65.8302612927706	14.35540419	64.70998039
16.8484193927856	65.8302612927706	14.11476256	66.58488992
17.0299088846479	65.6985505484113	14.52745655	66.82146945
17.0299088846479	65.6985505484113	13.50520564	67.72241024
17.2173557380288	65.5625166141245	16.29427026	68.63097998
17.2173557380288	65.5625166141245	14.01917911	69.22007201
17.4124028124484	65.4209672325881	14.51945543	70.49107423
17.4124028124484	65.4209672325881	13.34199807	71.15108407
17.6262922983825	65.2657436419668	13.78543979	72.75062985
17.6262922983825	65.2657436419668	11.56644578	72.10851879
17.8864607137587	65.076934787233	14.67447984	73.22055772
18.1729591792521	64.8690178306947	16.80968797	72.84815948
18.1729591792521	64.8690178306947	15.83973733	72.60736968
18.5062280268626	64.6271588834699	17.24413003	73.14298035
18.8707467414178	64.3626213681012	19.17901123	72.48982593
19.2598461422129	64.0802451275124	21.60880813	73.64895737
19.2598461422129	64.0802451275124	20.16006997	73.55306832
19.7348860329062	63.7354997304641	22.68191696	72.90808337
19.7348860329062	63.7354997304641	22.95220857	73.2582761
20.2978624160687	63.3269363535046	23.39691794	71.43920824
20.2978624160687	63.3269363535046	22.14002238	72.37729838
20.950514715561	62.8532925954258	24.00842436	69.26671548
21.6164332237973	62.3700210303304	24.66562586	67.58605744
21.6164332237973	62.3700210303304	24.34494447	68.89894191
22.30327843213	61.8715618097557	21.52581462	69.05739134
23.0605248243646	61.3220099116204	21.2618816	68.31108552
23.0605248243646	61.3220099116204	20.75020952	68.82081849
24.0698492135442	60.5895158711694	21.61039636	65.83676525
24.0698492135442	60.5895158711694	19.92687299	66.4828608
25.4914863195215	59.5577958234348	22.58317288	64.23875961
27.1933788706019	58.3226884263864	21.56136042	60.00845368
27.1933788706019	58.3226884263864	21.30645349	61.8915326
30.3064748059617	56.063418136417	22.06521443	57.50548607
30.3064748059617	56.063418136417	20.97945435	58.66863495
Route: 6 Length: 198.823552760612 Demand Met: 2998			
14.6442687545754	78.3835992403888	6.04179221699999	70.01715429
14.4988721889302	78.555740070029	6.979895184	73.91637244
14.3728969698302	78.704873295222	22.46431132	85.87828698
14.2494702097282	78.8509880202565	20.47481611	85.68176763
14.1280637258151	78.9947107807295	20.16675465	86.45561332
14.1280637258151	78.9947107807295	18.85500198	86.61471751
14.0106911402451	79.1336578330448	20.75129811	88.7330358
14.0106911402451	79.1336578330448	15.25088212	86.85170355
13.9151232162367	79.2467903299196	17.20155001	81.69531761
13.9151232162367	79.2467903299196	17.38954679	82.23173111
13.8193218679905	79.3601990248	18.16441332	83.32201509
13.8193218679905	79.3601990248	16.23739593	85.87006787
13.7250570072159	79.4717881322151	15.06397637	86.4956065
13.7250570072159	79.4717881322151	12.45480817	85.29988604

Solution x	Solution y	Original x	Original y
13.6343563658167	79.5791567409921	12.63857375	82.42671014
13.6343563658167	79.5791567409921	10.82142722	82.89323555
13.5454829147227	79.6843617389442	12.87616068	80.54131267
13.4567685612638	79.789378379608	10.08146406	81.46406963
13.4567685612638	79.789378379608	9.701793671	81.23141394
13.3698547155817	79.8922629984686	9.01858207399999	78.03824041
13.2831959052604	79.9948457750065	8.675234817	76.17385221
13.2831959052604	79.9948457750065	8.595205897	76.73972439
13.196596312186	80.0973588224253	5.863440787	76.06172049
13.1106242525451	80.19912908863	3.252339284	73.9521337
13.0296827071974	80.294943739449	2.544714587	74.45838234
12.8945928773783	80.7100983842321	3.10003410199999	78.61964126
12.7585710246453	81.1281169146002	5.065657714	76.41830653
12.7585710246453	81.1281169146002	3.765987951	77.28123402
12.615927473121	81.5664847571377	5.04273939700001	78.40053531
12.615927473121	81.5664847571377	4.297539438	80.73294711
12.4745173286467	82.0010616886034	1.696022601	79.3379408
12.3388936659518	82.4178550694108	0.773453591000006	79.81662315
12.216153297999	82.7950519563702	1.83782096500001	81.06813079
12.216153297999	82.7950519563702	1.45195925500001	80.87244268
12.1047007887423	83.1375585402122	0.848777487999996	80.80421078
12.1047007887423	83.1375585402122	3.10551266100001	84.71082736
12.006998970897	83.4378060397848	3.437419026	82.39656928
12.006998970897	83.4378060397848	3.05949055799999	82.05603574
11.9118507428596	83.7302057458794	3.795442881	81.20966501
11.9118507428596	83.7302057458794	3.380314451	80.99890539
11.8162377725988	84.0240336526502	4.961462551	81.51420623
11.720170813908	84.3192567752329	5.724809855	81.80721271
11.720170813908	84.3192567752329	5.779054124	82.01317499
11.6229604058471	84.6179940374207	7.992357197	82.08091397
11.5246532167883	84.9201020544186	7.936374341	83.63932008
11.5246532167883	84.9201020544186	6.810206318	85.20186256
11.4265968724629	85.2214391343087	5.912402555	83.10767778
11.4265968724629	85.2214391343087	5.902742913	84.57417463
11.3278812692622	85.5248024023229	4.377655918	84.98459142
11.3278812692622	85.5248024023229	4.724328509	85.88211036
11.230684839587	85.823497042355	3.319354366	86.8534104
11.135553143899	86.1158464277566	5.333729823	86.89695613
11.0412036563928	86.4057919809725	6.663988874	86.9326968
11.0412036563928	86.4057919809725	6.35930977699999	87.06467249
10.9473161930456	86.6943177645192	5.793118726	87.72031575
10.9473161930456	86.6943177645192	6.29169329299999	89.27097954
10.8552361777006	86.9772889497588	7.085383584	88.77850283
10.8552361777006	86.9772889497588	6.57919393199999	89.24907689
10.7644801216017	87.2561913401272	7.009024866	89.80852716
10.7644801216017	87.2561913401272	5.838459994	89.46110654
10.6755679997381	87.5294268284106	0.539457489	84.81338557
10.6755679997381	87.5294268284106	2.643010323	87.48230483
10.5866766025357	87.8025992658853	3.115821998	88.00026043
10.4982982933525	88.0741951174703	2.88784862599999	89.80188387
10.4982982933525	88.0741951174703	3.553988961	91.38716753
10.4135525589984	88.3346277161343	6.256438132	90.66257931
10.3291936131821	88.5938716895483	7.17818211399999	91.76838261
10.3291936131821	88.5938716895483	5.209294544	90.50333801
10.2456179203745	88.8507087786374	5.231683223	94.88567828
10.2456179203745	88.8507087786374	4.44010970700001	94.87692744
10.1680284983143	89.0891491291428	3.212591442	94.51392157
10.0935364217319	89.3180710420583	3.298576907	92.26869515
10.0935364217319	89.3180710420583	1.72500424899999	93.73701725
10.0231735167148	89.5343038520333	2.510162792	94.82470236
10.0231735167148	89.5343038520333	0.846436707999999	97.15575264
10.0053455296477	89.5890899775444	1.662890125	98.21483308
10.2269576976493	89.5087095062341	5.819691822	97.53170939
10.2269576976493	89.5087095062341	7.810086676	100
10.4887332022412	89.4137614744307	8.37640356200001	96.83801393
10.4887332022412	89.4137614744307	6.625140742	98.72893978
10.7843207761532	89.3065495104099	10.35439985	93.61856888
10.7843207761532	89.3065495104099	8.327911253	95.97957355
11.0906880663375	89.1954276439431	10.40564453	91.96900158
11.0906880663375	89.1954276439431	8.980893435	92.30918249
11.4031292363647	89.0821027390445	14.02380259	94.55773265
11.4031292363647	89.0821027390445	11.04946885	95.30278919
11.7184491073663	88.967733694161	11.51332542	99.95442641
12.0935608951644	88.831678357412	18.56973911	98.93410982
12.3583626411244	88.5632665442501	17.81960057	98.01765152
12.3583626411244	88.5632665442501	18.10270516	98.29192556
12.700083580214	88.2168886994622	17.25875189	95.69940805
13.0483798511576	87.8638459983251	17.22630202	94.08640458
13.0483798511576	87.8638459983251	16.10416337	94.62212285
13.4069307510013	87.500409014144	19.55892343	94.48515334

Solution x	Solution y	Original x	Original y
13.4069307510013	87.500409014144	18.65944439	93.90622028
13.7660371447956	87.1364091472695	16.85080568	91.45389056
14.1252068969013	86.7723450813709	8.842438164	89.89183088
14.505396196956	86.3869750420725	10.77763243	89.00986935
14.505396196956	86.3869750420725	9.577914639	89.11916471
14.9211312065029	85.9655749238415	9.98481624199999	87.60870523
15.3557878522344	85.524995331702	9.921883095	86.8721598
15.3557878522344	85.524995331702	9.940095688	86.998178
15.8381081989995	85.0361025479466	11.28159713	86.83718755
15.8381081989995	85.0361025479466	12.03430063	87.78817585
16.3688720460079	84.4981061810944	20.03955091	90.83830295
16.3688720460079	84.4981061810944	18.21730526	92.48725442
16.962785501624	83.8960997967123	13.01348985	89.5505908
17.6361111854619	83.2135991186586	14.30638295	91.72702037
17.6361111854619	83.2135991186586	12.48771043	90.90107319
19.2241812254698	81.603889781044	21.4032788	88.65695382
21.1642137065233	79.6374229295279	21.61123904	90.19731465
Route: 7 Length: 151.516406406324 Demand Met: 2977			
73.8063510910001	22.5253259340484	71.29498477	19.86081824
73.8063510910001	22.5253259340484	70.71952594	19.54937922
69.8282728722758	24.1472936436342	67.26622281	20.02005982
66.2980042374015	25.5866813624851	66.92261807	21.4897109
66.2980042374015	25.5866813624851	66.17419814	21.15751135
62.1709237388806	27.2694078419293	64.88897514	21.58345165
55.0935638671161	30.1550542010107	50.59311922	22.75724468
50.1588271535852	32.1670902093655	46.26887105	26.53209753
46.1277200810277	33.8106882775177	42.45831495	25.01806118
46.1277200810277	33.8106882775177	40.05041388	28.81118981
43.5529979637223	34.8604673003585	40.57741767	42.47262
43.5529979637223	34.8604673003585	39.91233765	41.2977364
42.0908228485577	35.4566343585508	41.57443341	43.13832473
40.7996066413451	35.9830968980353	45.94832838	45.50704308
40.7996066413451	35.9830968980353	43.74535734	43.87626012
39.3451501388701	36.5761215120715	43.66555329	47.77139353
37.2848349695417	37.3265720005401	43.11381093	45.00092033
37.2848349695417	37.3265720005401	42.25980634	46.86827481
32.8687086197426	38.9350704250641	30.62796082	46.77730777
32.8687086197426	38.9350704250641	30.55507662	47.73107042
31.2271927224183	39.5329908589016	25.99458773	34.37910238
31.2271927224183	39.5329908589016	23.91492832	35.50451908
30.0227327238721	39.9717156240562	30.18073163	48.32029982
28.9266201794011	40.3709754097557	28.72359173	49.06807614
28.9266201794011	40.3709754097557	26.567735	46.7768569
28.0473801644589	40.6912387502358	27.37711129	46.43616017
27.2171246008943	40.9936584534586	23.06731773	35.0375678
27.2171246008943	40.9936584534586	22.07359754	33.01769228
26.4596006898312	41.2695877659789	26.12441872	44.96485891
25.7177009487228	41.5398252162996	27.06311365	42.64274924
25.7177009487228	41.5398252162996	25.73174612	44.02606181
24.9742889285641	41.8106123083877	25.71821347	44.02373583
24.9742889285641	41.8106123083877	24.77779172	44.04083387
24.2422484518313	42.077256325937	19.64225061	34.99214308
23.5433505430848	42.3318302055531	23.73647568	45.21539639
23.5433505430848	42.3318302055531	22.68802089	46.28526246
22.8721042107878	42.5763303082899	22.79879511	41.59634367
22.8721042107878	42.5763303082899	23.40792676	43.64379836
22.195749605314	42.8226903135676	19.77510428	38.58926296
22.195749605314	42.8226903135676	18.69463352	36.26547074
21.5412571947224	43.0610882173223	19.40209516	41.66020767
20.8998984528616	43.2947020558261	17.93093151	43.30092715
20.8998984528616	43.2947020558261	17.47416259	43.6041515
20.3072849881227	43.5105600354799	17.44262234	43.68368222
20.3072849881227	43.5105600354799	17.80089583	46.64512233
19.7572429910021	43.7109109121105	14.50630809	38.16565664
19.2366895951068	43.9005209331348	18.21138052	45.58660191
19.2366895951068	43.9005209331348	18.21468575	45.65080463
18.7304913236238	44.0849016200674	19.18169919	47.05766373
18.2235666970476	44.2695464729517	22.81585575	48.67591425
18.2235666970476	44.2695464729517	22.00300591	49.77440842
17.658454274872	44.4753842116825	12.65054039	38.20990532
17.658454274872	44.4753842116825	12.97854061	40.66549102
17.1419936868583	44.6635012097279	23.68432498	51.4412716
17.1419936868583	44.6635012097279	20.72246404	50.29048837
16.4042453388552	44.9322158870382	20.53092136	55.63617906
16.4042453388552	44.9322158870382	20.16713628	56.2637712
16.0974535562464	45.0439953472784	14.44281578	41.35822358
15.7903158622967	45.1559028334271	16.54761864	53.09785344
15.7903158622967	45.1559028334271	15.36448886	54.97389236
15.5047590668612	45.2599462133969	20.37447933	52.92580791
15.5047590668612	45.2599462133969	18.10483235	51.48322234

Solution x	Solution y	Original x	Original y
15.2128971296194	45.3662878924365	10.16802995	51.02082052
15.2128971296194	45.3662878924365	8.91589750200001	48.83105962
14.9541518227102	45.4605645654914	13.48749824	42.29987548
14.9541518227102	45.4605645654914	12.31993183	42.07287161
14.6952995411506	45.5548813536015	18.13426387	49.15791018
14.6952995411506	45.5548813536015	18.80954314	50.67936902
14.4284316700401	45.6521181641826	8.736047039	47.86465463
14.4284316700401	45.6521181641826	8.81169210500001	48.50504439
14.1831835688137	45.7414788442409	16.47526591	49.4455512
13.937634671823	45.8309490886406	9.755265232	43.18329059
13.937634671823	45.8309490886406	9.020444459	42.86210706
13.6992880780505	45.9177955731316	14.81228179	50.29125842
13.4636790559366	46.0036444241678	11.00474377	35.14184161
13.4636790559366	46.0036444241678	6.668915236	38.80565327
13.2294428845196	46.0889888607035	9.832177112	38.08691559
13.2294428845196	46.0889888607035	7.974625907	40.8370263
12.9997347667286	46.172683391687	9.954481978	42.50823893
12.7712586709696	46.2559293673543	12.77181014	48.33401693
12.7712586709696	46.2559293673543	11.99216143	50.52822644
12.5452123662374	46.3382898678919	8.013859219	41.41457221
12.5452123662374	46.3382898678919	9.19676513100001	46.15569372
12.3243809826447	46.418751180375	12.24975114	50.92735248
12.1056060650014	46.4984630363037	7.871697725	40.35198819
12.1056060650014	46.4984630363037	6.302525489	40.0085763
11.8931138061033	46.5758861663387	10.30388261	47.84277995
11.8931138061033	46.5758861663387	9.26512226200001	48.10149258
11.6844157405853	46.6519272257476	10.84189087	50.74783931
11.4777770128311	46.7272178413378	10.71615729	46.62293177
11.4777770128311	46.7272178413378	10.20301226	47.6234059
11.2719659254488	46.8022073061294	6.962926975	47.87740863
11.2719659254488	46.8022073061294	6.810990128	49.52757429
11.0760021247017	46.8736097688435	7.342191074	50.36568708
11.0760021247017	46.8736097688435	5.28300793299999	51.8957834
10.8937603774105	46.9400129360203	5.668356774	43.14782971
10.7149396136028	47.0051702802814	9.89102482200001	52.16610985
10.7149396136028	47.0051702802814	8.078510661	52.12465727
10.5427921570963	47.0678964007077	13.21771043	55.16074821
10.3712839058063	47.1303896558272	13.89109091	56.92730438
10.3712839058063	47.1303896558272	11.86612062	56.83051802
10.2039711093882	47.1913550142166	7.88086425500001	53.63419396
10.0410691086326	47.2507134699891	5.351054934	54.87903352
9.88689094666945	47.3068932957361	2.885836634	40.60849192
9.88689094666945	47.3068932957361	0.224660494000005	41.43611847
9.75609077427869	47.3545494310497	3.857750749	53.93522034
9.75609077427869	47.3545494310497	3.166581108	54.38581172
9.6366292847849	47.398075911572	3.684518627	54.75346427
9.52170062452959	47.43995163407	1.250751092	48.74029716
9.52170062452959	47.43995163407	0.0735544159999932	50.20291794
9.40894053187516	47.4810391180697	0.102323447000003	55.05645207
9.40894055962164	47.4810390375467	3.200690229	54.90401263
9.40894055962164	47.4810390375467	0.715064701000003	54.34039001
9.40894059206109	47.4810389474475	0.0942256310000005	39.91558536
9.40894059206109	47.4810389474475	1.77561061599999	46.38397362
9.66693410042464	47.3806291621561	4.692804385	58.08052349
Route: 8 Length: 153.657075384688 Demand Met: 2980			
65.7475089895971	55.4387520584524	56.36080227	54.43871329
60.4138883785364	68.7007463006667	50.86986196	67.11854893
60.4138883785364	68.7007463006667	49.39322363	67.57061768
59.0161960379482	72.1760885312108	49.38151416	71.84627519
57.9221478796116	74.8964269602972	47.34853229	74.63427391
57.9221478796116	74.8964269602972	49.13669956	77.10708156
57.2736225204824	76.5089932864988	50.78444002	76.12504454
56.6639232559205	78.0250178655305	49.62844822	78.65994225
56.1071307420131	79.4094879518973	47.14165764	77.84331314
56.1071307420131	79.4094879518973	46.11608956	79.13405595
55.6670559412595	80.5037396839396	45.32225765	79.26748614
55.6670559412595	80.5037396839396	44.56064253	79.77318093
55.3669111701365	81.2500509626562	44.47086767	80.17305261
55.3669111701365	81.2500509626562	44.66930475	80.79724102
55.1436154727764	81.805275067426	45.13867401	81.86371268
55.1436154727764	81.805275067426	45.3176187	83.7901857
54.9640713836392	82.2517101450098	46.93472918	83.75304242
54.9640713836392	82.2517101450098	46.03038143	83.79986665
54.8075468166968	82.6409070456723	47.92908542	80.11129273
54.8075468166968	82.6409070456723	48.20934555	82.30314786
54.6574434687605	83.0141381838491	49.55654528	80.81624315
54.5088441536316	83.3836298830543	49.21219028	82.18677234
54.3630573684266	83.7461284267201	50.20394782	81.95454381
54.2188753085968	84.1046370446612	51.91564321	83.24154723
54.2188753085968	84.1046370446612	49.77274656	84.13753559

Solution x	Solution y	Original x	Original y
54.0788808525021	84.4527332946639	51.18829335	82.80979047
54.0788808525021	84.4527332946639	51.49657531	83.11057243
53.9399643955838	84.7981492054827	53.61605765	80.93460352
53.9399643955838	84.7981492054827	53.08761619	83.0335557
53.7985739693299	85.1497167971841	59.01602486	86.99268685
53.7985739693299	85.1497167971841	62.35255518	88.46202983
53.650027578036	85.5190779152763	55.99099974	83.60147673
53.650027578036	85.5190779152763	55.75342338	84.56592915
53.4965503768305	85.9006998815234	55.11001594	85.68607737
53.343064641966	86.2823432332465	63.32241418	89.29380754
53.343064641966	86.2823432332465	62.03675317	91.42777069
53.181676275834	86.6836356289493	52.83415121	85.50123146
53.181676275834	86.6836356289493	52.05342714	85.82620662
53.0207995611868	87.0836569677657	61.4906739	91.40517217
53.0207995611868	87.0836569677657	62.61309781	94.29391595
52.6996300562687	87.3349961251803	61.09603132	95.38804721
52.6996300562687	87.3349961251803	57.84005051	97.24933499
51.7850036451867	88.050737151409	57.43254842	97.94119843
51.7850036451867	88.050737151409	57.58318464	98.55697919
50.8647221337731	88.3809933087658	54.09260921	96.04789718
50.5853650204782	88.4813225130743	54.29998953	99.89190946
50.5853650204782	88.4813225130743	53.69991452	99.81161169
50.5852195159064	88.4813694218324	52.2623599	99.83573023
50.5850765726433	88.4814154229953	52.60387814	98.51053443
50.5850765726433	88.4814154229953	52.71570498	99.46690315
50.5849331326251	88.481461500247	50.67630959	98.08417141
50.5847899801633	88.4815074645877	48.82360524	98.37839062
50.5847899801633	88.4815074645877	48.39934621	99.02729511
50.584649362516	88.48155256932	47.31578899	98.13704672
50.584649362516	88.48155256932	48.86252985	99.44183304
50.5845116402892	88.4815967079218	45.34071838	99.2752365
50.5694012730977	88.4412952367063	44.56970667	97.22856143
50.5694012730977	88.4412952367063	44.53236455	98.59505273
50.5381837642751	88.3580352819539	46.20732106	94.82215894
50.5381837642751	88.3580352819539	45.01212749	95.47966426
50.5052413340377	88.270174868504	45.33430047	93.58613905
50.471903626235	88.1812601974787	48.69087386	94.64188777
50.471903626235	88.1812601974787	47.96746082	95.14523251
50.436383403568	88.0865247261072	49.03663551	90.65504513
50.436383403568	88.0865247261072	49.59427698	92.51123595
50.4001414522764	87.9898643704137	51.95218378	92.57992082
50.4001414522764	87.9898643704137	51.98537923	93.03310405
50.3618839662324	87.8878286145629	53.27314218	89.6748569
50.3618839662324	87.8878286145629	53.26472651	92.17526811
50.3225616777195	87.7829530428345	54.10050901	92.28618361
50.3225616777195	87.7829530428345	53.29556121	92.47449182
50.2813701797976	87.6730923243977	54.43632749	91.92787857
50.2396129993732	87.5617228672023	54.90972966	93.30800556
50.1967685191276	87.44745351365	57.53422575	91.73216299
50.1967685191276	87.44745351365	58.00620671	94.64720593
50.1479156298022	87.3171604816416	56.15571936	89.41500769
50.1479156298022	87.3171604816416	56.30399813	89.72916428
50.0983611451983	87.1849967259535	54.48965648	89.30641789
50.0484373076384	87.0518482548881	53.87450626	88.16447802
49.9985400826306	86.9187712038215	45.13861135	90.47060332
49.9481024899254	86.7842525614175	46.25821854	91.17761288
49.9481024899254	86.7842525614175	43.91518159	93.39792889
49.8949183106136	86.6424083714793	42.53215273	92.92397176
49.8949183106136	86.6424083714793	41.14116704	94.61634345
49.6140587692943	85.893349318498	51.44475874	86.59474587
49.6140587692943	85.893349318498	48.45592928	88.4082341
49.3282680176979	85.1311397908009	49.19512952	89.44346883
49.0275819711846	84.3292055374874	46.02083433	88.3362158
49.0275819711846	84.3292055374874	42.23200248	88.95299773
48.7074097102953	83.4752984021207	40.55838899	87.88304878
48.3783810414654	82.5977682442192	39.57638463	86.69599702
48.0433997094522	81.7043596786321	38.25086273	84.70191635
48.0433997094522	81.7043596786321	38.21932161	86.88940242
47.679747432516	80.7344794285771	38.24583972	80.95791524
47.679747432516	80.7344794285771	38.00030199	82.20200968
47.3769364845919	79.9268683737172	41.14833132	82.10595877
47.3769364845919	79.9268683737172	38.78697828	81.20736169
47.088884257728	79.1586211325091	40.58416037	81.54961967
46.8012028496477	78.3913635316882	43.12816365	79.63219046
46.8012028496477	78.3913635316882	40.77647626	81.23711291
46.508220045981	77.6099684407952	38.20769452	77.89743741
46.508220045981	77.6099684407952	35.96077646	77.38727187
46.2632630058266	76.9566608497316	34.30971303	75.90183293
46.2632630058266	76.9566608497316	36.17809574	80.13104248
46.5579236319078	76.4591953439698	35.03662295	76.31902131

Solution x	Solution y	Original x	Original y
46.966691816257	75.7690861205993	36.44207057	76.13900165
47.4903359010642	74.8850356111466	39.75179858	71.51477588
47.4903359010642	74.8850356111466	38.19879917	73.45302115
48.1014787904238	73.8532638099644	41.14789047	74.75727523
48.1014787904238	73.8532638099644	40.76978451	74.94346594
48.8791011038021	72.5404271264902	41.95376322	74.60739468
49.7941661627059	70.9955460292946	43.59103477	70.75648589
49.7941661627059	70.9955460292946	42.58773685	73.94634336
51.0837562717296	68.818368746811	45.59084573	70.21452412
51.0837562717296	68.818368746811	44.13660931	71.38940487
53.0769391180594	65.4533281358237	47.89205446	67.3947139
53.0769391180594	65.4533281358237	44.42598809	67.45202223
58.7025925409954	55.9556014267088	53.22205568	50.84724902
62.9195283600802	48.83625583043	59.28037529	42.02965748
65.5920783239715	44.3242942645469	58.48548965	38.49282405
65.5920783239715	44.3242942645469	55.55130491	39.21526309
68.4092859212736	39.5681398888454	58.14893689	37.55022655
Route: 9 Length: 174.918281862445 Demand Met: 2978			
66.0502676670316	40.7916478565242	58.09138733	33.97784367
66.0502676670316	40.7916478565242	56.1557774	36.1071959
60.3223225023394	49.3290647348074	67.27809665	56.79217526
60.3223225023394	49.3290647348074	61.56325619	58.635877
58.7044279061151	51.7405006921253	59.77266019	58.01872841
57.377395912157	53.7184123501092	61.59665848	60.86573745
56.263345733765	55.3788782802036	62.01287875	62.70691628
55.313735589406	56.7942487038912	61.64088805	64.72462094
54.5408851242721	57.946161967539	59.10597324	64.72617137
54.5408851242721	57.946161967539	57.97334153	65.39941546
53.9211359065938	58.8698808390156	56.20333441	63.09635143
53.9211359065938	58.8698808390156	54.15102156	63.89433124
53.3586244420006	59.7082880273494	54.03625818	65.02303827
53.3586244420006	59.7082880273494	52.45383187	66.17944394
52.8856334437466	60.4132667588918	50.37372436	63.54183807
52.8856334437466	60.4132667588918	50.29671492	64.07582579
52.4617313370246	61.0450795791283	49.52719402	60.88674536
52.042833756283	61.6694333585591	52.59359138	61.87082203
51.6219946289104	62.2966810056499	53.04622082	62.56220406
51.6219946289104	62.2966810056499	52.64945222	62.68533593
51.1976759174044	62.9291149900865	53.70737401	57.8077763
51.1976759174044	62.9291149900865	56.12304172	60.76926662
50.6980879630767	63.673736097121	56.73611746	58.87824868
50.6980879630767	63.673736097121	57.09480153	60.45993374
50.0263139439055	64.6749953857756	55.16481024	55.42346911
50.0263139439055	64.6749953857756	55.40337389	57.61168804
41.3147964433074	77.6592149939535	32.43971284	75.52883521
41.3147964433074	77.6592149939535	31.34183617	77.86791685
39.7175495349828	80.0398665046444	29.81370195	76.77877617
38.5419339723338	81.7920875691606	31.67974116	78.20082263
38.5419339723338	81.7920875691606	31.54519137	79.16359507
37.4599376498813	83.4047712555605	29.7776223	79.3796747
37.4599376498813	83.4047712555605	29.05539546	78.84402949
36.4478536627867	84.9132513764482	27.46499326	78.56518576
36.4478536627867	84.9132513764482	29.49613778	81.77737157
35.3708649264958	86.5184672233206	24.67927032	81.21698222
35.142273645422	86.8591715172676	25.47356848	81.94258519
35.142273645422	86.8591715172676	24.93956922	85.18138774
34.9485839696599	87.1478552645221	28.34961296	82.66841267
34.7549625998553	87.4364371357725	32.56942546	80.98884638
34.7549625998553	87.4364371357725	32.77989789	83.25231939
34.5493937599414	87.7428263057128	33.71990859	84.56649705
34.3402234298282	88.0545833054109	34.03327785	85.06694553
34.3402234298282	88.0545833054109	32.21271953	85.45061531
34.1251000768851	88.3752130062262	30.96168192	84.99460949
34.1251000768851	88.3752130062262	31.92346769	85.96439053
33.9054390369679	88.702605983486	28.95022635	86.79829568
33.687227310749	89.0278387806953	28.94608169	87.05476962
33.4697245190311	89.3520148798464	26.49994117	86.49656314
33.4697245190311	89.3520148798464	24.79158589	85.73273425
33.2576588488719	89.6680873128152	23.92476676	88.85275247
33.0578884148639	89.9658342141997	24.68088332	89.71453351
33.0578884148639	89.9658342141997	24.92385591	92.07997464
32.8781058180747	90.2337900799482	32.33676606	89.56266763
32.8781058180747	90.2337900799482	31.03913924	88.81924735
32.6936184622968	90.5087581986653	30.78074407	88.67743671
32.6936184622968	90.5087581986653	29.03165996	90.53300961
32.5078922281195	90.785572917475	25.24294214	93.18181598
32.33126948494	91.048819285132	30.46512782	92.10545477
32.33126948494	91.048819285132	30.51609732	92.20951413
32.1549788157525	91.3115707353727	30.18341718	92.15484297
32.1549788157525	91.3115707353727	30.08845088	94.04600611

Solution x	Solution y	Original x	Original y
31.9800394125581	91.572308162342	26.20322759	94.45704722
31.9800394125581	91.572308162342	25.58817455	94.62259734
31.8164687769072	91.8161009176711	21.63379999	90.72848541
31.8164687769072	91.8161009176711	23.10855555	93.46528062
31.6699078439224	92.0345417461124	22.62104276	94.03699994
31.5311362844196	92.2413729458106	20.42707279	96.69258649
31.5249527185617	92.2505872231537	21.95406549	97.08230078
31.5249527185617	92.2505872231537	22.06521104	97.80973943
31.5181570861553	92.2607134837518	21.53298817	97.76613815
31.5181570861553	92.2607134837518	22.00240146	99.12603644
31.5113222271332	92.2708989618559	22.19955839	99.83998701
31.6644988855062	92.2087872624361	23.65267964	99.40598609
31.6644988855062	92.2087872624361	23.23282295	99.37897746
31.9368119653833	92.0983663984807	25.64004891	98.33585155
31.9368119653833	92.0983663984807	25.34553204	99.20543489
32.2678741750193	91.9641229015171	25.35918107	97.93925835
32.633971682439	91.8156726747294	27.32463884	98.08040747
32.633971682439	91.8156726747294	27.03699297	98.99807723
33.0695442230534	91.6390504420254	28.69202489	99.34571575
33.0695442230534	91.6390504420254	27.50072899	99.76767751
33.6910913049506	91.3870147320267	36.49499514	99.8776323
33.6910913049506	91.3870147320267	31.65500689	99.46882276
34.8187523887739	90.9297647662694	37.35140359	99.57591236
35.9144323177578	90.4854807633123	43.63164404	99.67485887
35.9144323177578	90.4854807633123	37.87107476	99.67477247
36.0401466004834	90.2844846764779	44.01236363	95.54242778
36.0401466004834	90.2844846764779	41.23951851	98.4925435
36.1698552543047	90.0771020739658	33.91919319	90.52236574
36.1698552543047	90.0771020739658	32.87814817	90.10176773
36.2991987620547	89.8703033607638	36.43143728	90.48214242
36.2991987620547	89.8703033607638	35.55901251	90.85604615
36.4287286897699	89.6632065667777	40.16683897	89.097423
36.4287286897699	89.6632065667777	36.90788531	88.78292268
36.5546248905071	89.4619194451576	37.64776281	91.60925844
36.680895623075	89.2600334877751	36.26720319	91.81523904
36.680895623075	89.2600334877751	36.79414467	92.2553405
36.8086006435175	89.055854345893	36.86677729	93.06343809
36.9377485135285	88.8493683165036	35.60188133	93.1465045
36.9377485135285	88.8493683165036	36.31961338	94.1541845
37.0715866809005	88.6353832666073	34.28587406	93.01320732
37.2077347388012	88.4177051164854	33.84742868	94.52834747
37.348421907977	88.1927697169524	35.84999591	97.26233792
37.348421907977	88.1927697169524	31.89808649	95.62749105
37.5113841309986	87.9322203195802	39.47053756	98.01039691
37.5113841309986	87.9322203195802	35.92075185	99.04269187
37.8412330431993	87.4048470666415	37.83606476	96.13365876
37.8412330431993	87.4048470666415	37.35558564	97.30806318
38.3145761729979	86.6480508315927	39.86881125	93.47781189
38.3145761729979	86.6480508315927	39.84944538	96.227912
38.9663208056838	85.6060205573121	43.04035221	95.37042711
38.9663208056838	85.6060205573121	39.44288188	96.38027853
57.6478104043289	55.737389690167	55.80484172	50.30189669
57.6478104043289	55.737389690167	54.43373891	52.12894009
62.732574177996	47.6077078730982	57.56166222	41.97700689
62.732574177996	47.6077078730982	57.48443808	43.25173204
65.9307282875762	42.4943981923073	57.35658457	43.71456461

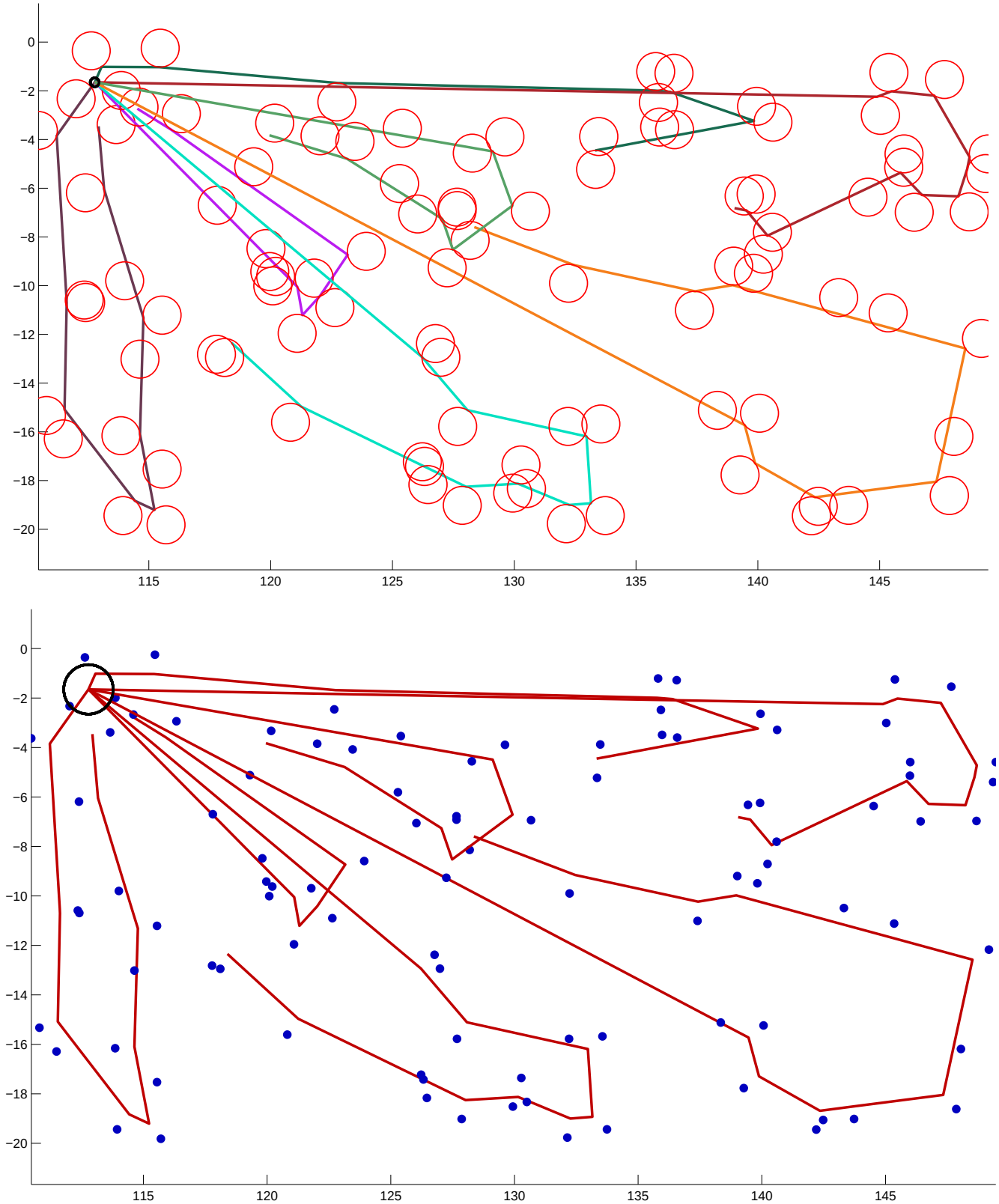


Figure O.8: $kroD100$, $r = 0.7798$, Equal Radius, 2D, Euclidean, Length = 376.2838372

Table O-11: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 2D, Euclidean

Total distance: 376.283837200746 Total demand met: 2719 Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 55.0741429178542 Demand Met: 392			
3.06317389443424	1.01500227297365	2.64	0.36
5.43306782781582	1.028928961696	5.47	0.25
12.7637966988328	1.68143764780398	12.72	2.46
25.7687497684814	1.98871396190971	25.81	1.21
26.0812620207087	2.01549125146477	25.92	2.48
26.3971621494324	2.04261469261284	26.56	1.28
29.505332205915	3.11665940775775	29.95	2.64
29.8422558902388	3.23319274761308	30.62	3.29
26.8116369891003	3.799213030445	26.58	3.6
25.9189874942962	3.96585680129152	25.97	3.49
23.853089273511	4.35154920135787	23.47	3.88
23.3216218997571	4.45040526802581	23.34	5.23
Route: 2 Length: 37.4327209025679 Demand Met: 351			
2.16082601095084	2.52093902458831	2.02	2.33
1.21961935782053	3.84486936739026	0.469999999999999	3.63
1.61827055327268	10.503342053833	2.34999999999999	10.59
1.63035195950702	10.7053116135742	2.41	10.69
1.54046192977182	15.0854278935168	0.799999999999997	15.33
2.10259800944215	15.815127059599	1.48999999999999	16.29
4.42724141203792	18.8311526099181	3.94	19.44
5.23054861648805	19.2049983201508	5.70999999999999	19.82
4.93407224205706	17.6521386813988	5.55	17.53
4.63732878632354	16.0978991359156	3.86	16.16
4.72607193394754	13.0615242661935	4.64	13.02
4.77715400879627	11.313953482172	5.55	11.21
4.26874158515015	9.65062739243719	4.01000000000001	9.8
3.16545862546408	6.04111248081247	2.40000000000001	6.19
2.9387381306282	3.45811036163952	3.66	3.39
Route: 3 Length: 76.5308681494563 Demand Met: 400			
34.8955918464322	2.24183492691245	35.03	3.01
35.4831475094146	2.02298553302826	35.38	1.25
37.2376255161749	2.19555558665249	37.66	1.54
38.6907165391568	4.71783040590208	39.46	4.59
38.5950212190297	5.20484362839693	39.35	5.4
38.2318195009648	6.33180562867258	38.68	6.97
36.7394855725409	6.27860471815446	36.42	6.99
36.0325775310372	5.53941885260753	35.99	5.14
35.8579665370424	5.35679608863754	36	4.59
34.3104363986176	6.0912953450208	34.52	6.37
30.397383502232	7.94833997689537	30.23	8.71
30.2124780101041	7.72648086492532	30.6	7.81
29.531961182859	6.91059888472873	29.93	6.24
29.0414791423282	6.81414623055536	29.44	6.32
Route: 4 Length: 28.6789932785755 Demand Met: 399			
3.55797918294817	2.435555385399	3.87	1.99
7.74575740152514	6.66428472278664	7.81	6.7
9.52249285820315	8.45838979553964	9.81	8.48
10.0752680738846	9.01656555223256	9.97	9.42
10.3773448597492	9.32158894006189	10.21	9.62
10.6300341306611	9.57674087578328	10.09	10.01
11.0977906047315	10.0490792989401	11.79	9.69
11.3059979835545	11.2107091349208	11.09	11.96
12.026554023463	10.4185696608311	12.64	10.9
13.1629253794593	8.7303152632008	13.93	8.59
8.89626718744049	5.70672859521566	9.31	5.12
5.90891330585498	3.58980878594933	6.34	2.94
4.52805266073379	2.73372261632074	4.59999999999999	2.67
Route: 5 Length: 56.9538903979631 Demand Met: 397			
16.2209700200865	12.9337645487377	16.77	12.38
16.6349669644477	13.4183824391729	16.99	12.94
18.0811885242329	15.111315895179	17.68	15.78
22.0175678783245	15.9787386565066	22.21	15.78
22.9686380581196	16.188313405454	23.56	15.68
23.1502142826215	18.9298585597733	23.74	19.44
22.2614797969603	18.9997184005413	22.14	19.77
20.8298755392963	18.4091211024097	20.5	18.33
20.3808215009411	18.2238654292415	19.94	18.52
20.151018212675	18.1290610300571	20.28	17.36
18.0224382962479	18.2552428530341	17.87	19.02
16.8278109960455	17.6741595079657	16.46	18.17
16.3344353824208	17.4341751530603	16.32	17.42
15.8545378768521	17.2007467003503	16.23	17.23
11.2585114002721	14.9651761450718	10.82	15.61
8.67431714229319	12.5975061503687	8.11	12.95
8.39775767563304	12.3441161432491	7.78	12.82
Route: 6 Length: 82.8372468472635 Demand Met: 390			
28.1095195140558	15.013531418236	28.34	15.12
29.4603613695147	15.7262582641762	30.07	15.24
29.8862344574682	17.2921284082216	29.27	17.77
32.3500124601107	18.684751716447	32.2	19.45
32.6885829091086	18.6413106920107	32.48	19.06
33.7223061073574	18.5087362869441	33.73	19.02
37.3325022684741	18.0456675755191	37.86	18.62
37.7558131047237	16.0849169960316	38.05	16.19
38.5138290327876	12.5753665917396	39.18	12.17
35.2114390511052	11.6767477906367	35.35	11.12
33.1362241961162	11.1121824686062	33.32	10.49
29.674356727699	10.170625910869	29.82	9.49
28.9691782360271	9.97874142189477	29.01	9.2
27.4201411930904	10.2304505665613	27.4	11.01
22.4523001385414	9.1525564797445	22.23	9.9
18.3609054932413	7.59225332170279	18.19	8.14
Route: 7 Length: 38.7759747070655 Demand Met: 390			
15.3382937991075	3.83085636245014	15.41	3.54
18.1510145378863	4.31935968519209	18.28	4.56
19.1188144679256	4.48741898244475	19.62	3.89
19.9235397588028	6.71440214847731	20.67	6.94
17.4814144282967	8.52532300374537	17.25	9.27
17.0753694368952	7.34400939443244	17.66	6.92
17.0475750073665	7.262734185715	17.66	6.78
16.1856347143785	6.71771962359447	16.04	7.06
15.0608070965371	6.00646691934518	15.29	5.81
13.1356212858683	4.78913445323265	13.46	4.08
11.8312638134731	4.39368669970632	12.03	3.85
9.95373698597317	3.82448968288513	10.17	3.33

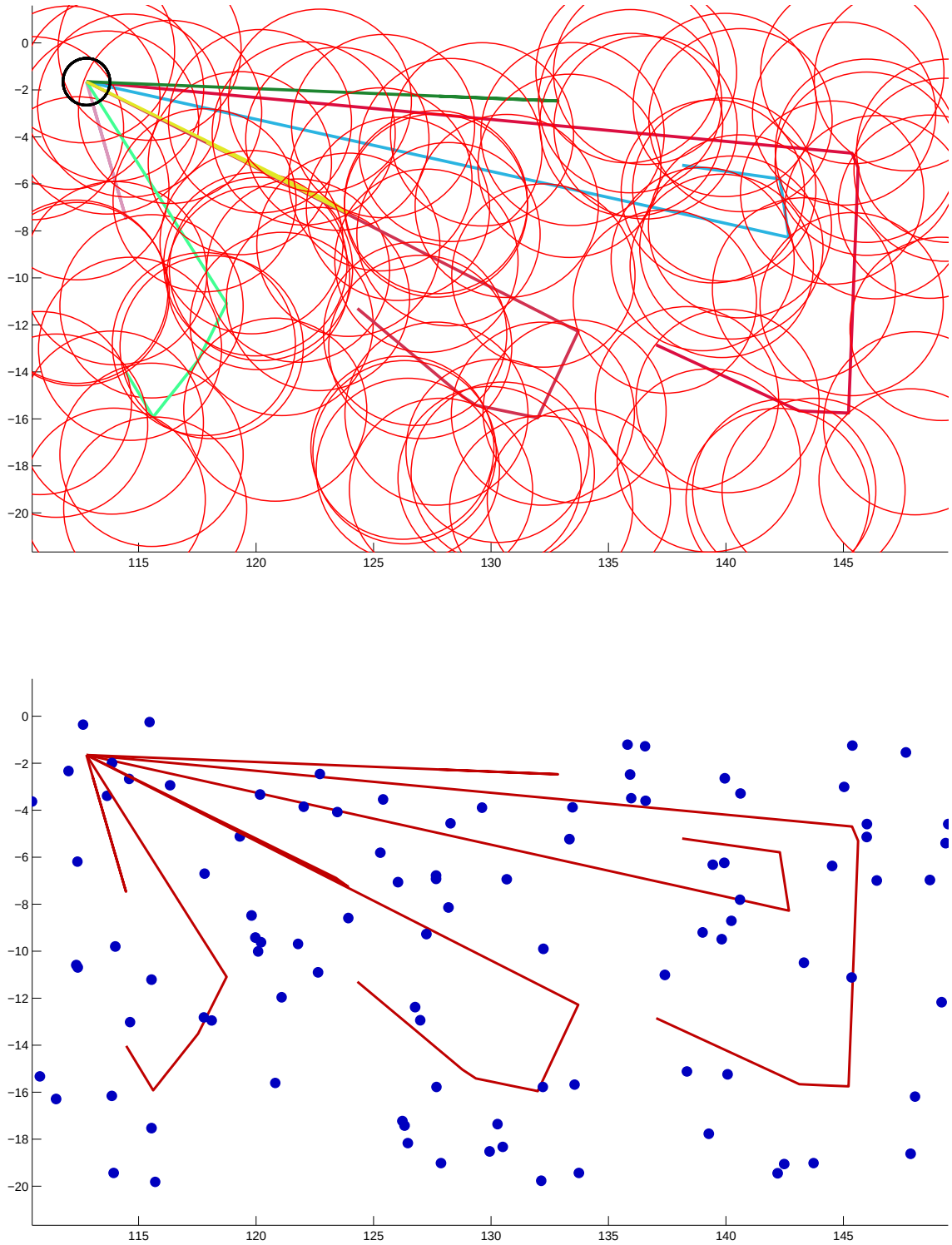


Figure O.9: $kroD100$, $r = 3.899$, Equal Radius, 2D, Euclidean, Length = 302.9671512

Table O-12: Solution for $kroD100$, $r = 3.899$, Equal Radius, 2D, Euclidean

Total distance: 302.967151191244 Total demand met: 2719 Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 79.3678934781157 Demand Met: 400			
33.8033301116872	4.5463698909747	35.38	1.25
35.3653392553144	4.69226344459602	37.66	1.54
35.6261106505778	5.29959882319432	39.46	4.59
35.605873458858	5.8192392094355	39.35	5.4
35.5361642522276	7.60695027952929	38.68	6.97
35.3647176398409	12.0050777517593	39.18	12.17
35.2579216372826	14.7443633172156	38.05	16.19
35.2186191895385	15.7520129496811	37.86	18.62
34.3587216683692	15.7147199630493	33.73	19.02
33.6073033110184	15.6821269128673	32.48	19.06
33.1194247669484	15.6609510347862	32.2	19.45
30.9369518609435	14.6531173930147	29.27	17.77
29.3162046886904	13.904632915218	30.07	15.24
27.0355604328169	12.8514043120814	28.34	15.12
Route: 2 Length: 62.9491131850728 Demand Met: 397			
26.6173003054066	6.93256318028841	29.44	6.32
28.0021724244907	7.23946979040464	29.93	6.24
28.9401956185876	7.44735604284392	30.6	7.81
29.6625191913323	7.60744042063392	30.23	8.71
30.324402082828	7.75413027163639	29.01	9.2
31.1065509330526	7.92747343228104	29.82	9.49
32.0790057873423	8.14299105837306	33.32	10.49
32.6821149449244	8.2766561968409	35.35	11.12
32.577676113197	7.60599769269174	36.42	6.99
32.4623730646746	6.86644429763954	34.52	6.37
32.3463327694652	6.1221884491335	35.99	5.14
32.2959215774486	5.79871909834901	36	4.59
32.2942712685929	5.78812970764179	35.03	3.01
30.2049115729354	5.49520188787136	30.62	3.29
28.1381141412245	5.20543020083671	29.95	2.64
Route: 3 Length: 12.108430634895 Demand Met: 335			
2.94053602311213	2.20412483490196	2.64	0.36
3.16186139989669	2.96805119055411	3.87	1.99
3.41902783432948	3.85566756247305	4.59999999999999	2.67
3.72205262402115	4.90156708690207	3.66	3.39
4.28069461650108	6.82957994631607	4.01000000000001	9.8
4.46480123568468	7.46506387755091	5.55	11.21
4.45770248405671	7.4405615745148	2.41	10.69
4.44265519336417	7.38863110401461	2.34999999999999	10.59
3.90083248520452	5.51857812730029	2.40000000000001	6.19
3.32938506450657	3.54631403556095	0.469999999999999	3.63
3.03674609552095	2.53622232899949	2.02	2.33
Route: 4 Length: 31.659243655335 Demand Met: 395			
3.51168862871776	2.80813399631229	5.47	0.25
6.07300748177768	6.86225169674524	9.31	5.12
7.18064721855202	8.61545349650446	9.97	9.42
7.71206416126999	9.45659558071012	10.21	9.62
8.11673721431856	10.0971234511131	10.09	10.01
8.47328575915581	10.6614782720873	11.79	9.69
8.7457683046652	11.0927708324331	12.64	10.9
8.26362829840477	12.0548405004978	11.09	11.96
7.53263439956177	13.5134722795474	10.82	15.61
7.23657859326659	13.8864968792881	8.11	12.95
6.91414217294519	14.2927603316056	7.78	12.82
6.53737256116221	14.7674824291369	4.64	13.02
6.15508518030956	15.2491575595435	3.86	16.16
5.86835150193859	15.6104370663442	5.55	17.53
5.6210646891125	15.9220144152481	5.70999999999999	19.82
5.62106468205127	15.922014408708	3.94	19.44
4.89198410598171	14.7172040450585	1.48999999999999	16.29
4.47556763279718	14.0290758544831	0.799999999999997	15.33
Route: 5 Length: 51.7774553456142 Demand Met: 400			
15.8379272874136	8.2800232978667	18.19	8.14
18.8990325793391	9.83426919095589	20.67	6.94
21.343495828565	11.0754235262187	22.23	9.9
23.7131490992538	12.2785945261035	27.4	11.01
22.9160963234561	13.9799507187119	23.56	15.68
22.4311620160402	15.0150730175225	22.21	15.78
21.990592195953	15.9554951611584	23.74	19.44
21.8378559011071	15.9241986462558	22.14	19.77
21.2266058280662	15.7989500104292	20.5	18.33
20.6259953476849	15.6758806607609	20.28	17.36
20.0216521907906	15.5520457427097	19.94	18.52
19.3577628524684	15.4160073312869	17.87	19.02
18.7846556257018	15.039795955176	16.46	18.17
18.2886275322267	14.6248106876671	16.32	17.42
17.7367247116771	14.1630783489934	16.23	17.23
16.9655301255811	13.5178813038201	17.68	15.78
15.7892173002415	12.5337538498074	16.99	12.94
14.3173668283649	11.302373054043	16.77	12.38
Route: 6 Length: 40.1690748242142 Demand Met: 398			
16.9222203711349	2.22959747680057	18.28	4.56
21.0795745635815	2.39985789317644	23.34	5.23
21.8708782291048	2.43217196542181	23.47	3.88
22.5092567649605	2.45824047503219	25.97	3.49
22.847705673281	2.47208875965856	26.58	3.6
22.8477056735146	2.47208871588815	25.92	2.48
22.8477056721991	2.47208867146394	26.56	1.28
22.6493435948999	2.46395639120638	25.81	1.21
17.7853944838778	2.26494583341518	19.62	3.89
Route: 7 Length: 24.9359400679972 Demand Met: 394			
5.78775299969271	3.13164478322252	6.34	2.94
8.30345039610394	4.37088386025478	10.17	3.33
9.92906018530276	5.17164961234541	12.03	3.85
11.0839394434674	5.74053498636103	12.72	2.46
12.2506486113188	6.31526345705817	13.46	4.08
13.4044391641598	6.88363971783062	15.41	3.54
13.5704800972398	7.00290361865718	15.29	5.81
13.7301645418224	7.11760546271212	16.04	7.06
13.8763770019891	7.22263333966501	17.66	6.78
13.8999693748571	7.23957884198356	17.66	6.92
13.9148862232606	7.2502926527528	17.25	9.27
12.6175166911365	6.59778742462701	13.93	8.59
10.6387837044326	5.60259720010446	9.81	8.48
7.89251883964511	4.22133836640786	7.81	6.7

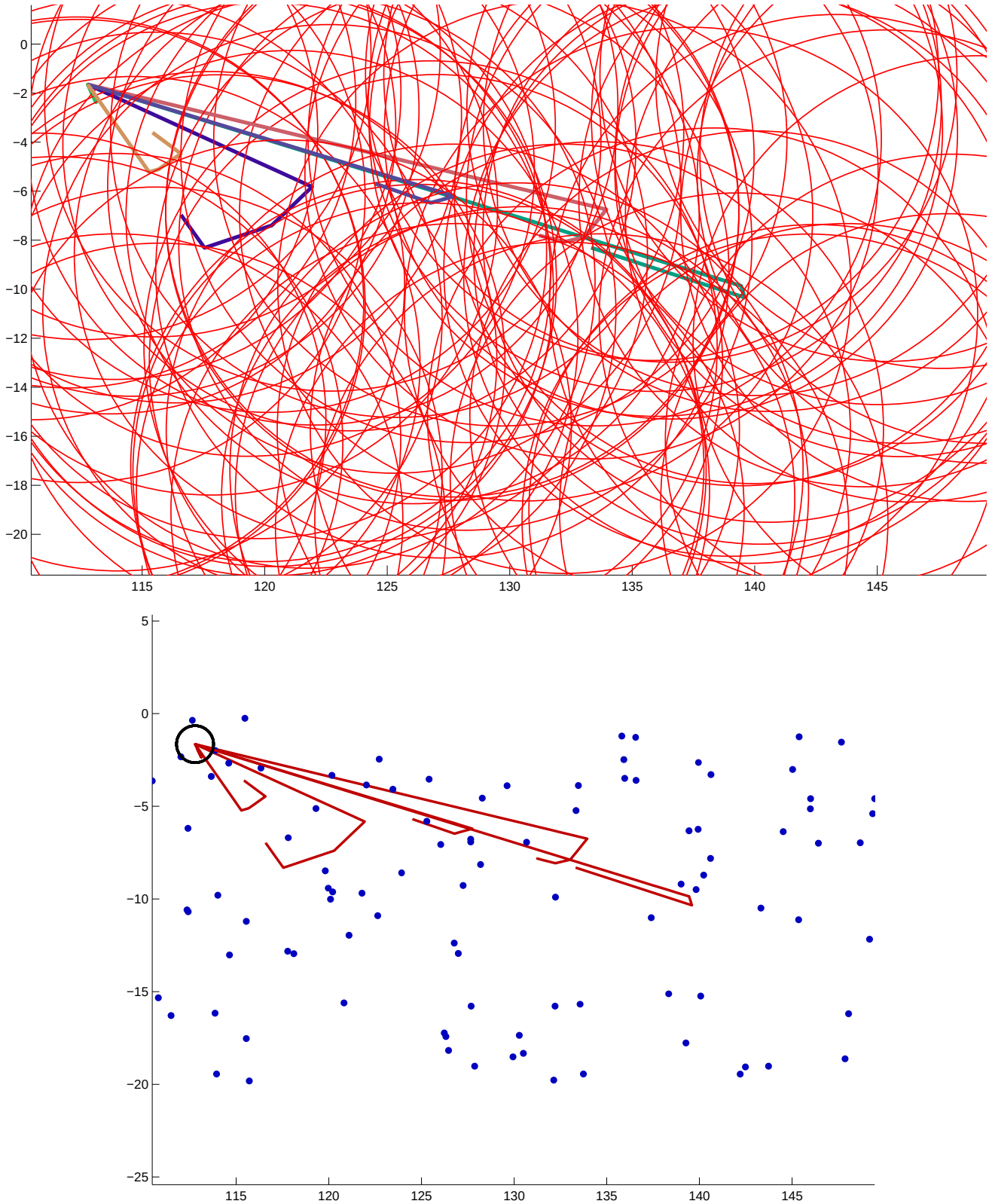


Figure O.10: $kroD100$, $r = 11.697$, Equal Radius, 2D, Euclidean, Length = 168.2115472

Table O-13: Solution for $kroD100$, $r = 11.697$, Equal Radius, 2D, Euclidean

Total distance: 168.211547217279 Total demand met: 2719 Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 56.5904339749771 Demand Met: 400			
19.3700064195695	6.76138049998548	27.4	11.01
24.9920089629531	8.49334761019512	35.35	11.12
26.5094282984534	8.96069834964658	36.42	6.99
27.4201123226231	9.24112653409059	35.99	5.14
28.2064216266172	9.48331603215149	36	4.59
28.8831074858778	9.69177595127116	35.38	1.25
29.4423398082481	9.86405427897897	37.66	1.54
29.4702003563335	9.95056813633333	39.46	4.59
29.5001794606031	10.0436838532009	39.35	5.4
29.5291400110289	10.133647612071	38.68	6.97
29.556180134808	10.2176545295617	39.18	12.17
29.5789705967457	10.2884668409621	38.05	16.19
29.596137943903	10.3418120388445	37.86	18.62
28.9733714921042	10.1400376241498	33.73	19.02
28.2376425023336	9.90173691938291	32.48	19.06
27.0639725760404	9.52152587337091	32.2	19.45
23.3192043863848	8.30757001625558	23.74	19.44
Route: 2 Length: 23.4234052728927 Demand Met: 397			
7.91657817111887	3.99221475761484	17.66	6.92
9.56637804096539	4.74463277933572	18.19	8.14
10.6734608731578	5.2495354145773	20.67	6.94
11.3573417382019	5.56150304981792	19.62	3.89
11.9359163090325	5.82544234285755	23.47	3.88
11.8406353043405	5.91633775016926	23.34	5.23
11.623271609921	6.12375363111112	22.23	9.9
11.2134526525873	6.51487518402106	16.77	12.38
10.8080348304709	6.90177179913393	16.99	12.94
10.4333919514266	7.2592563428278	16.23	17.23
10.2873884307	7.39865387042485	16.32	17.42
7.5677499228533	8.30693486331168	5.70999999999999	19.82
7.54825296878694	8.31344044292855	3.94	19.44
6.5856263994097	6.96843046769342	5.55	17.53
Route: 3 Length: 44.5348110583675 Demand Met: 400			
19.3818511377502	5.64955360760276	29.01	9.2
20.5051885266899	5.92016273125775	29.82	9.49
21.3127498172636	6.11470352660132	30.23	8.71
21.9633608951638	6.27143398031441	30.6	7.81
22.5203664401467	6.4056153443758	29.93	6.24
23.0323828912989	6.52895914815633	29.95	2.64
23.5079327301542	6.64351842095092	30.62	3.29
23.9467717982905	6.74923405271013	35.03	3.01
23.7852906582443	6.94750025813428	34.52	6.37
23.5908677173628	7.18618048409877	33.32	10.49
23.3846419311316	7.43933398410824	30.07	15.24
23.1960587372887	7.67082643335581	28.34	15.12
23.0270049242394	7.87834567419095	29.27	17.77
22.2265890734225	8.07332030973324	22.14	19.77
21.9077215516927	7.99059495559909	20.5	18.33
21.5632720408278	7.90122185576334	19.94	18.52
21.1977183065603	7.80634456679725	17.87	19.02
Route: 4 Length: 3.84025290109926E-10 Demand Met: 323			
2.77999999998914	1.65000000013966	2.64	0.36
2.77999999998657	1.65000000016652	5.47	0.25
2.77999999998542	1.65000000015308	3.87	1.99
2.77999999998345	1.65000000014817	3.66	3.39
2.77999999998177	1.6500000001604	4.59999999999999	2.67
2.77999999998023	1.65000000016255	6.34	2.94
2.77999999997834	1.65000000015882	10.17	3.33
2.77999999997886	1.65000000013647	7.81	6.7
2.77999999997918	1.65000000011738	4.01000000000001	9.8
2.77999999998048	1.65000000012519	2.40000000000001	6.19
2.77999999998394	1.65000000012486	0.469999999999999	3.63
2.77999999998627	1.65000000011998	2.02	2.33
Route: 5 Length: 1.59390906250948 Demand Met: 399			
2.83863437971849	1.77428106691993	9.31	5.12
2.88971157306034	1.88254929092269	12.03	3.85
2.93379442461077	1.97599127670395	12.72	2.46
2.97959143862468	2.07306746782648	13.46	4.08
3.0267185774951	2.17297551485882	11.79	9.69
3.05046070793591	2.22333722153114	9.81	8.48
3.07282895914314	2.2707783080303	9.97	9.42
3.09214031190304	2.31172999905183	10.21	9.62
3.10791432749734	2.34517501500389	10.09	10.01
3.11999723637371	2.37079012275744	8.11	12.95
3.08959784137443	2.30634227097088	7.78	12.82
3.05101166183579	2.22454688098604	5.55	11.21
3.01168292675898	2.14117959088606	4.64	13.02
2.95326995697779	2.01736272913986	2.41	10.69
2.88505896774998	1.87275107720503	2.34999999999999	10.59
Route: 6 Length: 31.4517153831197 Demand Met: 400			
15.7876567036669	5.61000323353989	25.81	1.21
16.4033554807997	5.79745220077459	26.56	1.28
16.806591548738	5.9202219362456	25.92	2.48
17.1578773557538	6.02717948377134	25.97	3.49
17.4718365677642	6.12277061133786	26.58	3.6
17.7435594787981	6.20550037102035	29.44	6.32
17.5403793279266	6.26310774269878	23.56	15.68
17.2869369428105	6.33496694193534	22.21	15.78
17.0232031819848	6.40971135399299	20.28	17.36
16.784096451467	6.47749102353487	16.46	18.17
14.5104864593708	5.69373878991695	17.68	15.78
Route: 7 Length: 10.6172724650283 Demand Met: 400			
4.92409939366553	4.71174333486795	0.799999999999997	15.33
5.28373408033701	5.22530829431799	1.48999999999999	16.29
5.39007335562876	5.19252962446953	3.86	16.16
5.68017799529898	5.10276424996566	10.82	15.61
5.81455286389172	5.00861209317406	11.09	11.96
5.96171871532147	4.90550002469624	12.64	10.9
6.12303124525938	4.79247344818901	13.93	8.59
6.28856611763581	4.67648305255176	15.29	5.81
6.44472622979902	4.56705737755309	16.04	7.06
6.5832974471917	4.46995299715245	17.25	9.27
6.58332160587338	4.46993567439961	17.66	6.78
6.583345863196	4.46991840919123	18.28	4.56
5.42347543915608	3.60994106059627	15.41	3.54

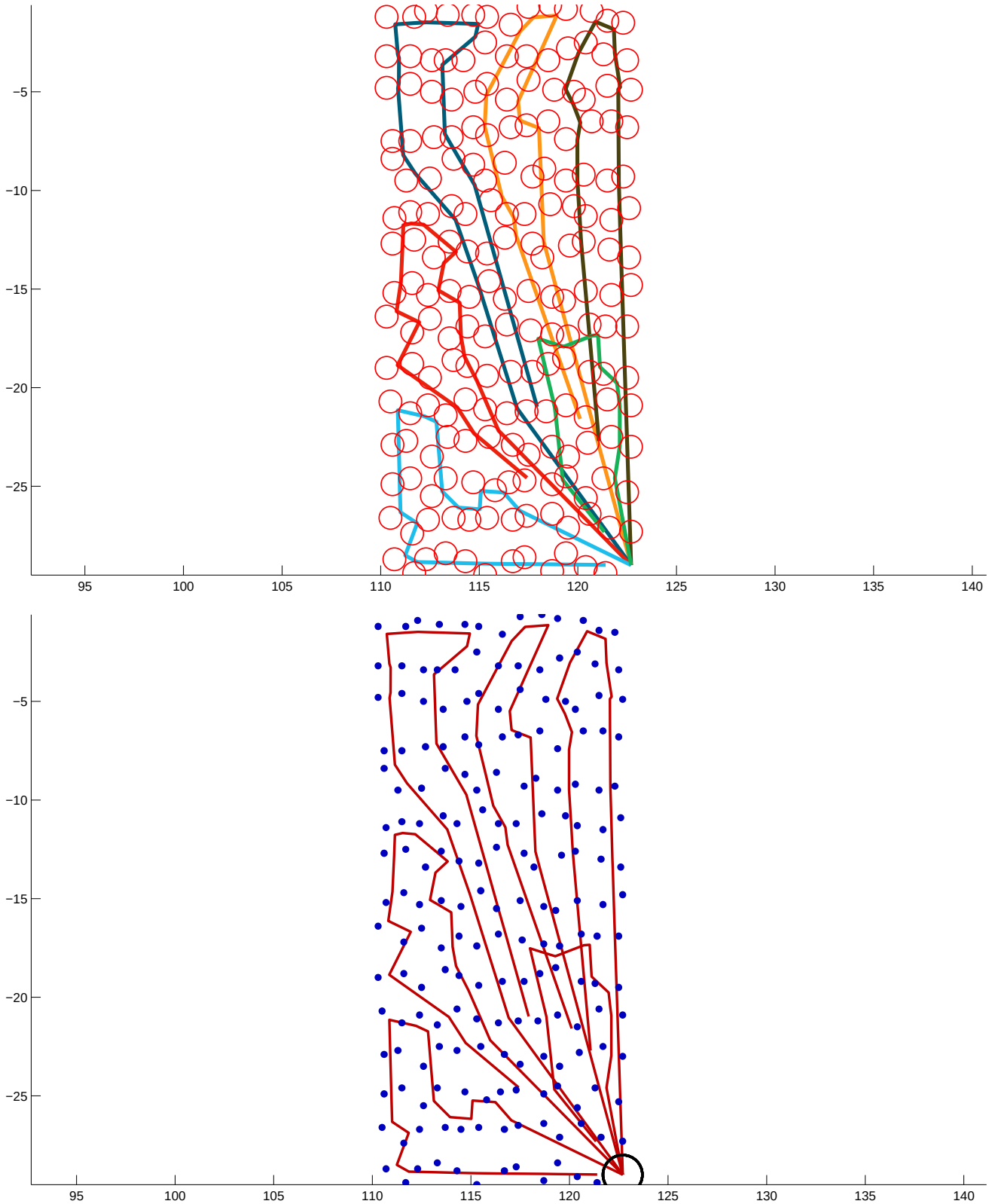


Figure O.11: $rat195$, $r = 0.578$, Equal Radius, 2D, Euclidean, Length = 294.3508149

Table O-14: Solution for $rat195$, $r = 0.578$, Equal Radius, 2D, Euclidean

Total distance: 294.350814937603 Total demand met: 11712 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 60.4616120238086 Demand Met: 1999			
9.04863071007154	15.4886330393417	8.7	15.4
9.04863071007154	15.4886330393417	9.3	15.6
8.48779356901406	13.4132224016903	8.2	13.4
8.27125871829787	12.6119511985827	7.7	12.7
8.19210750400951	10.7246231914257	8.59999999999999	10.7
8.12601736519311	9.14889019802205	8.3	8.9
8.12601736519311	9.14889019802205	7.7	9.3
8.02896886668783	6.83499328240072	8.5	6.5
7.47098900508372	6.61433996822065	7.40000000000001	6.7
7.06195506445415	6.45259798582379	6.59999999999999	6.8
6.97032289105546	5.49392442089545	6.40000000000001	5.4
7.46504709503132	4.39119360621691	7.5	4.4
7.89024237185571	3.44344338151161	7.40000000000001	3.2
8.02550988625322	3.14192899492459	8.5	3.4
8.92712692076137	1.13238617357341	9.40000000000001	0.8
8.62788112478412	1.15514074087575	8.59999999999999	0.6
7.74816191506346	1.22202086680595	7.5	0.7
7.06903398005883	1.93778062272096	6.59999999999999	1.6
6.3982070589631	3.19812250858913	6.40000000000001	3.2
5.65209452930174	4.59991064408472	5.40000000000001	4.6
5.35703914949227	5.15426299210943	4.8	5
5.27546447632972	6.7458726692508	4.7	6.8
5.41945397275315	7.33733724090914	5.40000000000001	7.2
5.75917162984706	8.73271896217767	6.3	8.6
6.13780794430846	10.2882173469045	5.59999999999999	10.5
6.75103569957115	11.3809135299378	6.40000000000001	11.2
6.75103569957115	11.3809135299378	7.3	11.2
6.86272733400102	12.267982830027	6.3	12.4
7.81850177334823	15.0076593029454	7.5	15.1
10.1124585699201	21.5830082522048	10.4	21.5
Route: 2 Length: 56.5542585775531 Demand Met: 1981			
12.3084366698966	16.9914047417898	12.5	16.9
12.2479001491366	15.1372616120746	12.7	14.8
12.2479001491366	15.1372616120746	11.7	15.3
12.1951267964877	13.5173823235468	12.6	13.4
12.1776860031277	12.9822226888392	11.6	13
12.1258774365628	11.1689850015811	12.6	10.9
12.1258774365628	11.1689850015811	11.7	11.5
12.0779089954983	9.48991109125971	11.5	9.5
12.0753587838585	9.08468694118177	12.3	9.3
12.0614480533561	6.87385471917074	12.5	6.8
12.0583737837466	6.38644825764767	11.7	6.5
12.048884931804	4.88114237456309	11.5	4.7
12.1392422455203	4.75986164513642	12.7	4.9
11.9438776017436	3.48997561775332	12.5	3.4
11.8753079157204	3.04428200464995	11.3	3.1
11.8260884643407	1.83090063914149	12.3	1.5
11.3563415378715	1.63657991393252	11.5	1.4
10.8928937889453	1.44486647616479	10.7	0.9
10.3876238567975	2.3739800012072	10.4	2.5
10.0277205860112	3.03579010966345	9.5	2.8
9.37677469487102	4.86233971562372	8.8	4.9
9.54400273861111	5.18933799556614	9.8	5
9.77201237217409	5.63518969648226	10.3	5.4
10.1248699900546	6.55755331793714	10.7	6.5
9.9760384614799	7.4476025444361	9.40000000000001	7.4
9.97735253531766	9.03489858409779	10.3	9.2
9.97772727645038	9.48222512977723	9.40000000000001	9.5
10.0734135035121	11.05962354935	9.8	10.8
10.0734135035121	11.05962354935	10.4	11.3
10.1523888111506	12.3614080419395	10.3	12.6
10.1763663427978	12.756595854308	9.59999999999999	12.8
10.3918124516316	15.1556648879981	10.4	15.1
11.0695302031112	22.7013937353578	10.5	22.8
Route: 3 Length: 65.3762357934741 Demand Met: 1984			
6.91629986720432	21.0401418665843	6.40000000000001	21.3
6.36058753307623	19.2702457700976	6.59999999999999	19.2
5.72883773680428	17.2581303367447	5.3	17.4
4.95140570509531	14.7819948584685	5.5	14.6
3.8003357657801	11.4905604373467	4.3	11.2
3.31933888275799	10.9388236261862	3.59999999999999	10.8
2.240004095129	9.70075245981725	2.5	9.4
1.76075356721	9.15101104102683	1.3	9.5
1.14692326549013	8.21301241773018	0.599999999999994	8.4
1.08778183008314	7.4697250771426	0.599999999999994	7.5
1.08778183008314	7.4697250771426	1.5	7.5
0.877435047183454	4.82562410073293	0.299999999999997	4.8
0.924120704946688	4.55051125960572	1.5	4.6
0.928389463429568	3.28572064813787	1.5	3.2
0.867249591374772	3.08902865468369	0.299999999999997	3.2
0.737900677076198	1.57726956015642	0.299999999999997	1.2
1.69265357807379	1.51691590555019	1.7	1.2
2.30967294732814	1.4779196634538	2.3	0.9
3.38911869993062	1.50995035407723	3.40000000000001	1.1
4.6101295824091	1.54616779406183	4.7	1.1
4.94470815948063	1.55608851599736	5.40000000000001	1.2
4.80401078388024	2.20321015253858	5.3	2.5
3.72992843257489	3.11992823272881	3.3	3.4
3.72992843257489	3.11992823272881	4.2	3.4
3.12908711752574	3.63271371606503	2.59999999999999	3.4
3.17738644083033	5.01324351789256	2.59999999999999	5
3.17738644083033	5.01324351789256	3.59999999999999	5.4
3.25505847706093	7.1387562169789	2.7	7.3
3.49052964773084	7.54143134149095	3.59999999999999	7.3
4.1548003832936	8.67737071530149	3.7	8.4
4.1548003832936	8.67737071530149	4.7	8.7
4.7680024319783	9.72598067985514	5.3	9.5
5.71545277243854	13.0944758729709	5.40000000000001	13.2
6.37058473686896	15.4236804973115	6.3	15.5
6.74058419996325	16.7391610813576	6.40000000000001	16.8
7.44685468302686	19.2501671331615	7.7	19.2
7.93122432474155	20.9722011638118	7.40000000000001	21.2
Route: 4 Length: 46.8962877170857 Demand Met: 1970			
7.42586852397442	23.6454044618317	7.5	23.4
6.68539204419656	22.8936302091221	6.7	22.9
5.97891225036621	22.1763740846015	5.5	22.5
5.47068489393538	21.0093033303986	5.3	21.1
4.8774773733189	19.6470839482017	5.40000000000001	19.4
4.50802595704485	18.9246092186705	4.40000000000001	18.9
4.24792746158413	18.4159772094145	3.7	18.6
4.07464075626855	17.4377606696193	3.5	17.5
4.05061686067987	16.8442448802795	4.40000000000001	16.9
4.00418141368428	15.6970763437617	4.5	15.4
3.38666082885416	15.3338841622576	3.5	15.1
2.92757636228519	15.0638780525693	2.40000000000001	15.3
3.20391839993135	13.6831176850809	2.7	13.4
3.82214965154584	13.1133877291324	4.40000000000001	13.1
3.29976295715935	12.6749815151693	3.5	12.6
2.17825843742911	11.7337785325753	2.40000000000001	11.2
1.53968650784573	11.6766390451917	1.5	11.1
1.14622766444731	11.7673831482147	0.700000000000003	11.4
1.12248062010484	12.4773080623405	1.7	12.5
1.10851216179233	12.7865645788419	0.599999999999994	12.7
1.02455982814385	14.6456718906379	1.59999999999999	14.7
0.933889694287217	15.2747959832658	0.700000000000003	15.2
0.810729486169478	16.1293601598252	0.299999999999997	16.4
1.95248493166778	16.6852511633325	2.5	16.5
1.62756126029606	17.332513526178	1.59999999999999	17.2
0.860788125267987	18.8599725206944	0.299999999999997	19
1.34853743832132	19.2053640649544	1.59999999999999	18.8
2.27590733816218	19.8620709200785	2.5	19.5
3.88262222781842	20.999857264503	4.3	20.6
4.73337737740289	22.3175417080086	4.3	22.7
7.42100323472779	24.5719488507461	7.3	24.7
Route: 5 Length: 36.9102591840857 Demand Met: 1909			
9.4031941120634	27.3869945334467	9.5	27.1
8.44660265973181	26.9189706947779	8.7	26.4
7.54589453099669	26.4812286207499	7.40000000000001	26.5
7.05074044471866	26.2405766167224	6.7	26.7
6.24263982103913	25.3175469228113	6.5	24.8
5.72764590980432	25.2810388258398	5.8	25.2
5.08040920555203	25.2351756383932	4.7	24.8
5.02149055189135	26.1631705657185	5.40000000000001	26.6
4.54650302131984	26.1249049165242	4.5	26.7
3.94296488954497	26.0755414842594	3.7	26.6
3.12423267379502	25.2565478038733	2.59999999999999	25.5
3.06449937624268	24.5495995895179	3.3	24.6
2.97312108553825	23.4682032461866	2.59999999999999	23.5
2.8943570443889	22.5358793053296	3.40000000000001	22.5
2.82635927804102	21.7312895553063	3.3	21.4
2.21424947712239	21.4473414034694	2.40000000000001	20.9
1.44968067765512	21.276420770019	1.5	21.3

Solution x	Solution y	Original x	Original y
0.867362035823106	21.1462430666966	0.5	20.7
0.905772897122077	22.5847316484233	1.3	22.7
0.916155378365786	22.9739034692503	0.599999999999994	22.9
0.959237539681212	24.5885390374036	1.5	24.6
0.969601635102663	24.9765621202446	0.599999999999994	24.9
1.00541555275184	26.3195640156863	0.5	26.6
1.85026123729399	26.8785404100208	2.40000000000001	26.7
1.61576449098165	27.504851700189	1.59999999999999	27.4
1.24274186499662	28.5012017130887	0.700000000000003	28.7
1.85232971585131	28.8424298982881	1.7	29.4
2.35753894392772	28.8540764544694	2.3	28.7
3.28319806681904	28.8754232580816	3.3	28.4
4.28210743114575	28.8984586810848	4.3	28.8
5.30968272029602	28.9221523845582	5.3	29.5
6.6124629053181	28.935826620583	6.7	28.8
7.34463635727903	28.943514956108	7.3	28.6
8.64680056990761	28.9571784049462	8.7	29.3
9.39509509509104	28.9650364520645	9.40000000000001	28.4
10.4080297228636	28.9757525300972	10.4	29.1
11.4066475094703	28.9863175132382	11.4	29.4
Route: 6 Length: 28.1521616415954 Demand Met: 1869			
12.3885628799069	27.3292677071994	12.7	27.3
12.031008872363	25.411191090845	12.5	25.3
11.8779142897285	24.5899297608533	11.3	24.6
12.1236041269281	22.9569502991997	12.7	23
12.1234563750116	22.4227694119115	11.7	22.5
12.1230645133196	20.9350767707978	12.7	20.9
12.0738830083196	20.5315051255394	11.5	20.6
11.9838997243052	19.7602435944448	12.5	19.5
11.4343220700642	19.24539511501	11.3	19.3
11.1229718790468	18.9538566155468	10.6	19.2
11.0226740042059	17.337848308715	11.4	16.9
10.7302229358124	17.3631406774166	10.6	16.8
9.73046102990142	17.7488516440899	9.5	17.4
9.28084247126525	17.9223157770449	9.3	18.5
8.5551506688858	17.6963919991165	8.7	17.3
7.99496865786907	17.5220017724405	7.59999999999999	17.1
8.31809867000011	18.8666542976744	8.5	18.8
8.83057998420632	20.9992245904947	9.40000000000001	20.9
8.86101200387887	21.2767946763555	8.40000000000001	21.2
9.03825024806325	22.8933146517543	8.7	23
9.11106254552712	23.5574004784458	9.5	23.5
9.19608876118703	24.3328628562547	9.40000000000001	24.5
9.2340258778838	24.6788603667022	8.7	24.9
10.1126978915568	25.7743170725993	10.4	25.6
10.6405208777398	26.4323692551446	10.6	26.4
11.3435156138262	27.3088223320637	11.6	27.1

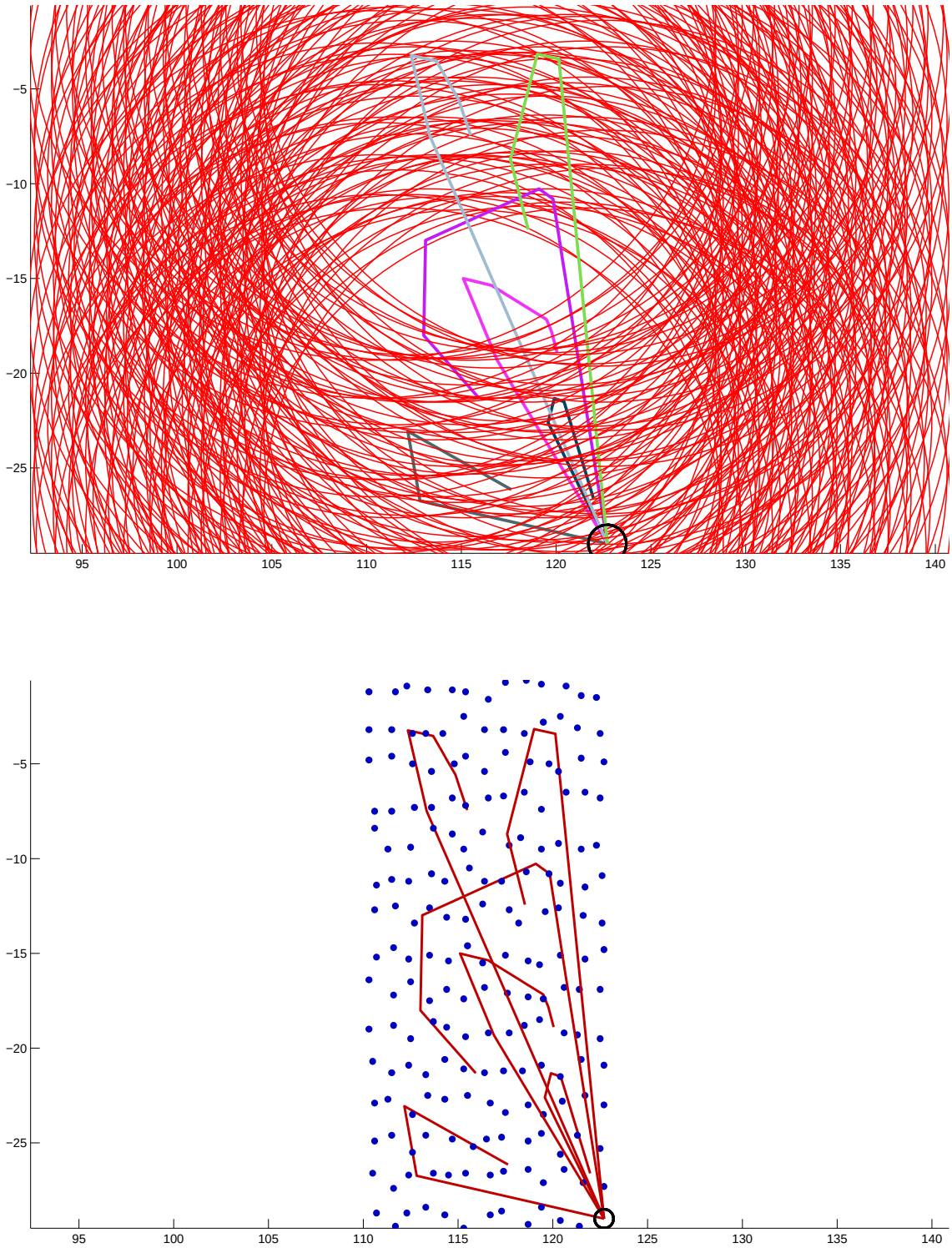


Figure O.12: $rat195$, $r = 2.89$, Equal Radius, 2D, Euclidean, Length = 231.2867000

Table O-15: Solution for $rat195$, $r = 2.89$, Equal Radius, 2D, Euclidean

Total distance: 231.286699983597 Total demand met: 11712 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 16.8177294386742 Demand Met: 1826			
12.0697633786223	27.710651740106	11.4	29.4
12.0697633786223	27.710651740106	11.6	27.1
11.2724844711368	26.0794465218246	10.6	26.4
10.5105264833383	24.5204918044218	9.40000000000001	24.5
10.5105264833383	24.5204918044218	10.5	22.8
10.1311365318785	23.7442908078073	8.7	24.9
10.1311365318785	23.7442908078073	9.5	23.5
9.77703980350596	23.0197745274898	8.7	23
9.77703980350596	23.0197745274898	7.5	23.4
9.57505754640887	22.6064872053912	6.7	22.9
9.69496944302131	22.1390476895495	8.40000000000001	21.2
9.69496944302131	22.1390476895495	7.40000000000001	21.2
9.8039659293064	21.7144569184563	9.40000000000001	20.9
9.9036101530003	21.3262626209493	9.3	18.5
9.90361104431915	21.3262585385335	8.5	18.8
9.92885577357644	21.335020261265	10.6	19.2
10.4180976651439	21.5044421923289	12.5	19.5
10.4180976651439	21.5044421923289	11.3	19.3
10.5206081822744	21.8410958037737	11.5	20.6
10.642890286419	22.2426604146184	10.4	21.5
10.7785779564593	22.6882305265097	12.7	20.9
11.0746973255661	23.6609331700526	12.7	23
11.0746973255661	23.6609331700526	11.7	22.5
11.4962699761684	25.0458308367696	10.4	25.6
11.4962699761684	25.0458308367696	11.3	24.6
11.9703606635314	26.6031909301992	12.7	27.3
11.9703606635314	26.6031909301992	12.5	25.3
Route: 2 Length: 25.9608658268652 Demand Met: 1939			
8.43923440388056	28.0234613828645	10.4	29.1
8.43923440388056	28.0234613828645	9.40000000000001	28.4
8.43923440388056	28.0234613828645	9.5	27.1
8.43923440388056	28.0234613828645	8.7	29.3
8.43923440388056	28.0234613828645	8.7	26.4
8.43923440388056	28.0234613828645	7.3	28.6
8.43923440388056	28.0234613828645	7.40000000000001	26.5
8.43923440388056	28.0234613828645	6.7	26.7
4.83368390553608	27.1973685021627	5.3	29.5
4.83368390553608	27.1973685021627	4.3	28.8
4.83368390553608	27.1973685021627	4.5	26.7
4.83368390553608	27.1973685021627	4.7	24.8
4.83368390553608	27.1973685021627	3.7	26.6
3.03351317253245	26.7847902976617	3.3	28.4
3.03351317253245	26.7847902976617	3.3	24.6
3.03351317253245	26.7847902976617	2.40000000000001	26.7
3.03351317253245	26.7847902976617	2.59999999999999	25.5
3.03351317253245	26.7847902976617	1.59999999999999	27.4
3.03351317253245	26.7847902976617	1.5	24.6
2.8199625334709	26.7358495891912	2.3	28.7
2.8199625334709	26.7358495891912	1.7	29.4
2.8199625334709	26.7358495891912	0.700000000000003	28.7
2.56534924138924	25.2960652147787	0.5	26.6
2.56534924138924	25.2960652147787	0.599999999999994	24.9
2.16978988563119	23.0587970482094	4.3	22.7
2.16978988563119	23.0587970482094	3.40000000000001	22.5
2.16978988563119	23.0587970482094	2.59999999999999	23.5
2.16978988563119	23.0587970482094	3.3	21.4
2.16978988563119	23.0587970482094	1.3	22.7
2.16978988563119	23.0587970482094	2.40000000000001	20.9
2.16978988563119	23.0587970482094	0.599999999999994	22.9
2.16978988563119	23.0587970482094	1.5	21.3
2.16978988563119	23.0587970482094	0.5	20.7
7.63754633002203	26.1440561121318	6.7	28.8
7.63754633002203	26.1440561121318	7.3	24.7
7.63754633002203	26.1440561121318	6.5	24.8
7.63754633002203	26.1440561121318	5.40000000000001	26.6
7.63754633002203	26.1440561121318	5.8	25.2
Route: 3 Length: 33.1716738876621 Demand Met: 1976			
8.07043624268802	21.2827979979666	5.5	22.5
7.63915208959843	20.5637284295241	5.3	21.1
7.34975408113929	20.0813135523962	6.40000000000001	21.3
7.34975408113929	20.0813135523962	6.59999999999999	19.2
7.11055133459564	19.6825860964873	7.7	19.2
6.88147407823298	19.3007338586641	4.3	20.6
6.45355747574842	18.2662849578797	4.40000000000001	18.9
6.08526475008937	17.375959646341	6.40000000000001	16.8
6.08526475008937	17.375959646341	5.3	17.4
5.78405401520403	16.6478291396786	4.40000000000001	16.9
5.5092238732805	15.9834751469936	3.5	17.5
5.5092238732805	15.9834751469936	3.5	15.1
5.2754170430416	15.4183170836803	4.40000000000001	13.1
5.18018875568924	15.1881393905903	5.5	14.6
5.18018875568924	15.1881393905903	5.40000000000001	13.2
5.10400890399028	15.0040083537119	2.7	13.4
5.10400904964762	15.004008359146	3.5	12.6
5.48610115432253	15.0973648477518	6.3	15.5
5.48610115432253	15.0973648477518	4.5	15.4
5.86631644070546	15.1902641947006	6.3	12.4
6.58300271027572	15.3654114502238	7.7	12.7
6.94578959149351	15.5899226163648	7.5	15.1
7.30228359122276	15.8105392704549	8.2	13.4
7.78323343503075	16.108164205388	8.7	15.4
8.23854932969203	16.3899276282146	8.7	17.3
8.23854932969203	16.3899276282146	7.59999999999999	17.1
8.66662614399668	16.6548337938613	9.3	15.6
9.09857674695139	16.9221379061998	10.4	15.1
9.49371850100047	17.1666610640828	11.7	15.3
9.57744573545287	17.3716102516347	9.5	17.4
9.66434509497226	17.5843216267345	11.4	16.9
9.75906649119747	17.8161791618443	12.5	16.9
10.0409057663087	18.8880011612745	10.6	16.8
Route: 4 Length: 45.5674612420386 Demand Met: 1996			
10.6691776558077	16.1087226578737	12.7	14.8
10.3420512625459	14.0325199761138	11.6	13
10.3420512625459	14.0325199761138	10.3	12.6
10.1597825137876	12.8754929359477	9.59999999999999	12.8
9.99043236200821	11.8004707932732	11.7	11.5
9.99043236200821	11.8004707932732	10.4	11.3
9.85598674519434	10.9471078852316	12.6	10.9
9.85598674519434	10.9471078852316	8.59999999999999	10.7
9.85598674519434	10.9471078852316	11.5	9.5
9.85598674519434	10.9471078852316	9.40000000000001	9.5
9.85598674519434	10.9471078852316	10.3	9.2
9.85598674519434	10.9471078852316	8.3	8.9
9.83387577846861	10.806762752772	12.3	9.3
9.10482041889804	10.2748861475275	9.40000000000001	7.4
8.13407497226133	10.7148040944387	7.7	9.3
7.04190322211151	11.2097344388808	7.3	11.2
7.04190322211151	11.2097344388808	6.40000000000001	11.2
5.98695856612704	11.6877788870212	5.59999999999999	10.5
4.82177045449129	12.2157778481309	4.3	11.2
4.82177045449129	12.2157778481309	3.59999999999999	10.8
3.93024705108228	12.6197816312715	2.40000000000001	11.2
3.3629822383563	12.8768524438139	1.5	11.1
3.11328951838196	12.990011289363	0.700000000000003	11.4
3.10508140935114	13.4030849721447	1.7	12.5
3.10508140935114	13.4030849721447	0.599999999999994	12.7
3.05318572624114	16.0143980938867	2.5	16.5
3.05318572624114	16.0143980938867	2.40000000000001	15.3
3.05318572624114	16.0143980938867	0.299999999999997	16.4
3.05318572624114	16.0143980938867	1.59999999999999	14.7
3.05318572624114	16.0143980938867	0.700000000000003	15.2
3.03418158684278	16.9700815685559	1.59999999999999	17.2
3.01358868751298	18.0057470506342	0.299999999999997	19
3.5150700872083	18.574958724244	1.59999999999999	18.8
4.27273532213631	19.4349186307488	3.7	18.6
4.27273532213631	19.4349186307488	2.5	19.5
5.93230558992813	21.3185243441825	5.40000000000001	19.4
Route: 5 Length: 56.2542640638448 Demand Met: 1982			
3.96732235823794	8.9258298849205	1.3	9.5
3.34392818953708	7.49282929860801	0.599999999999994	8.4
3.28070965859064	7.2206613600323	0.599999999999994	7.5
3.22981625673572	7.00151061689681	4.7	6.8
3.18008779136778	6.78737960491202	2.5	9.4
3.18008779136778	6.78737960491202	3.7	8.4
3.18008779136778	6.78737960491202	3.59999999999999	7.3
3.18008779136778	6.78737960491202	2.7	7.3
3.18008779136778	6.78737960491202	1.5	7.5
3.18008779136778	6.78737960491202	3.59999999999999	5.4
3.18008779136778	6.78737960491202	2.59999999999999	5
2.73173835289263	4.85683491097645	1.5	4.6
2.39592223782623	3.41086002343343	0.299999999999997	4.8
2.39592223782623	3.41086002343343	1.5	3.2

Solution x	Solution y	Original x	Original y
2.39592223782623	3.41086002343343	0.299999999999997	3.2
2.39592223782623	3.41086002343343	3.40000000000001	1.1
2.39592223782623	3.41086002343343	1.7	1.2
2.39592223782623	3.41086002343343	2.3	0.9
2.35449521428077	3.23252513753912	0.299999999999997	1.2
2.83129343276896	3.3380305879026	3.3	3.4
2.83129343276896	3.3380305879026	2.59999999999999	3.4
3.36227308177162	3.45555627235052	4.7	1.1
3.68647872303259	3.52721939909713	5.40000000000001	1.2
3.90525869189936	3.90941605970373	4.2	3.4
4.1353813992439	4.31142203866514	5.3	2.5
4.43812143088957	4.84025681860784	6.40000000000001	3.2
4.86279118892783	5.58204667318224	7.5	4.4
5.06149498807093	6.17578816075462	4.8	5
5.06149498807093	6.17578816075462	5.40000000000001	4.6
5.48563870013973	7.44301305574015	6.59999999999999	6.8
5.48563870013973	7.44301305574015	6.40000000000001	5.4
Route: 6 Length: 53.5147055245123 Demand Met: 1993			
11.1702210780546	13.7285922507319	12.6	13.4
10.4100033257276	6.14356349138986	12.5	6.8
10.4100033257276	6.14356349138986	11.7	6.5
10.4100033257276	6.14356349138986	10.7	6.5
10.4100033257276	6.14356349138986	8.5	6.5
10.4100033257276	6.14356349138986	10.3	5.4
10.4100033257276	6.14356349138986	9.8	5
10.4100033257276	6.14356349138986	8.8	4.9
10.1748638751471	3.79617726161781	8.5	3.4
10.1748638751471	3.79617726161781	7.40000000000001	3.2
10.1583363591323	3.63117090914533	12.7	4.9
10.1583363591323	3.63117090914533	11.5	4.7
10.1583363591323	3.63117090914533	12.5	3.4
10.1583363591323	3.63117090914533	11.3	3.1
10.1583363591323	3.63117090914533	9.5	2.8
10.1583363591323	3.63117090914533	10.4	2.5
10.1583363591323	3.63117090914533	11.5	1.4
10.1583363591323	3.63117090914533	10.7	0.9
10.1368502128249	3.41647909612416	12.3	1.5
10.1368502128249	3.41647909612416	9.40000000000001	0.8
9.366563504439	3.24373630088084	8.59999999999999	0.6
9.01037528544789	3.16391417886826	7.5	0.7
8.999446861461	3.20659331746765	6.59999999999999	1.6
8.27865204839446	6.01863853460654	7.40000000000001	6.7
7.83978780367455	7.7310750449837	6.3	8.6
7.83978780367455	7.7310750449837	5.40000000000001	7.2
7.58999480608448	8.70594719944977	4.7	8.7
7.85123879506365	9.74365179493446	5.3	9.5
8.52742732087084	12.4291593389843	9.8	10.8

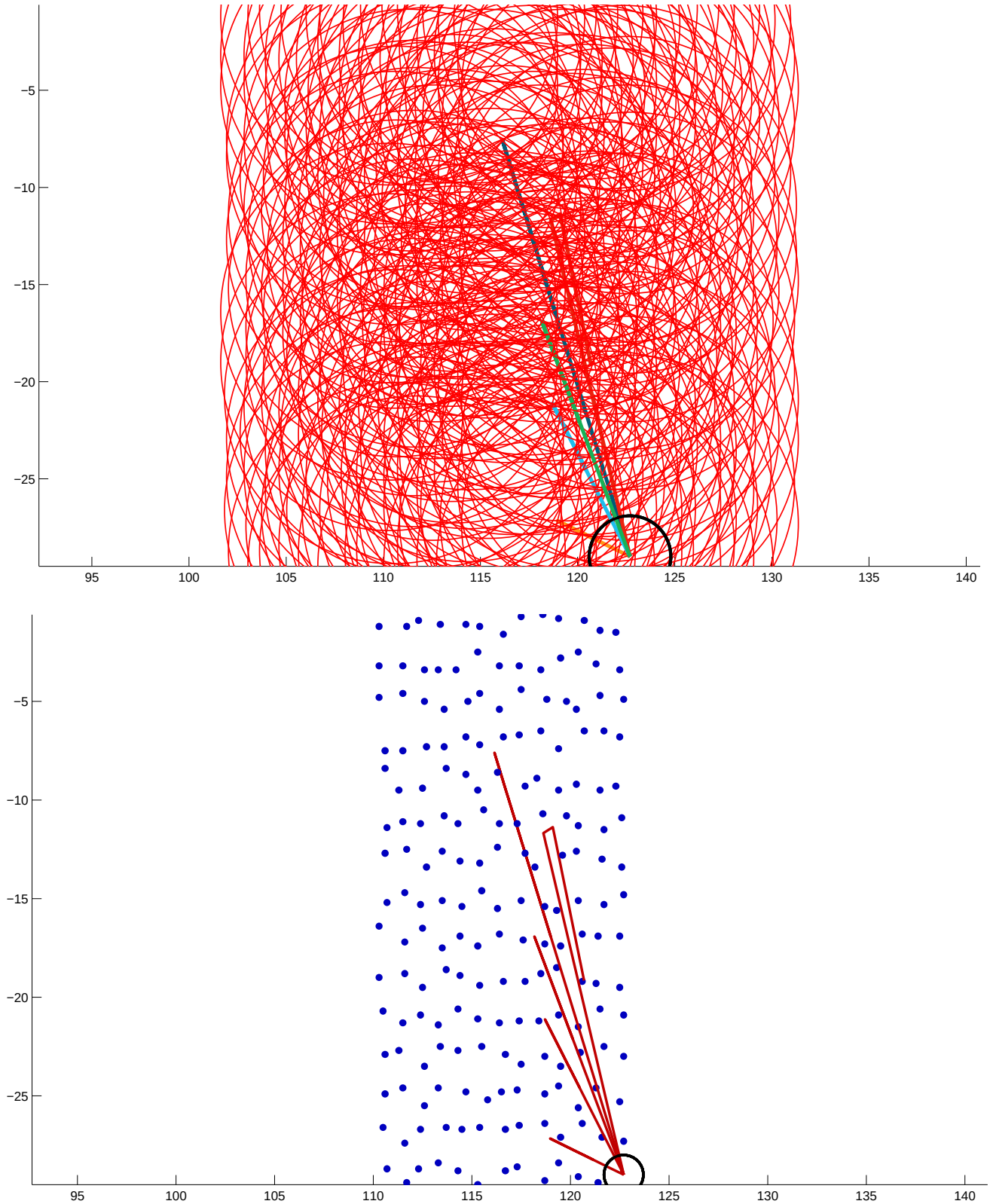


Figure O.13: $rat195$, $r = 8.67$, Equal Radius, 2D, Euclidean, Length = 133.3482658

Table O-16: Solution for $rat195$, $r = 8.67$, Equal Radius, 2D, Euclidean

Total distance: 133.348265765829 Total demand met: 11712 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 8.31634856173417 Demand Met: 1996			
11.9337541998222	28.6228455769858	7.40000000000001	26.5
11.3063382088627	28.3140236260492	6.5	24.8
10.820827357923	28.0750446696417	4.7	24.8
10.4536870796494	27.8943335189165	3.3	24.6
10.2149547582137	27.7768318625152	2.59999999999999	25.5
10.0436134045673	27.6925019887317	2.40000000000001	26.7
9.89978886589044	27.6217125666391	3.7	26.6
9.76688965935111	27.5562982230533	4.5	26.7
9.64226923493662	27.4949576126022	5.3	29.5
9.52051492795674	27.4350271943977	4.3	28.8
9.40361321873038	27.377485037523	3.3	28.4
9.29266096407558	27.3228711467882	2.3	28.7
9.18906218560937	27.2718766517112	1.7	29.4
9.09471804996844	27.2254374794023	0.700000000000003	28.7
9.04826871707118	27.2025754920066	1.59999999999999	27.4
9.00415817379236	27.1808642684942	0.5	26.6
8.96926600477627	27.1636902071678	0.599999999999994	24.9
8.96926668639885	27.1636902400697	1.5	24.6
8.96926736997423	27.1636902734246	2.59999999999999	23.5
8.96926805853514	27.1636903064107	3.40000000000001	22.5
8.96926875064746	27.1636903372469	4.3	22.7
8.96926944602716	27.1636903690635	5.5	22.5
8.96927014169043	27.1636904036108	7.40000000000001	21.2
8.96927083278841	27.1636904332756	6.40000000000001	21.3
8.96927153169061	27.1636904649108	5.3	21.1
8.96927224589795	27.1636905032939	5.40000000000001	19.4
8.96927275164651	27.1636904612506	6.59999999999999	19.2
8.96927313936666	27.1636903857622	7.7	19.2
8.96927350600315	27.1636903135477	8.5	18.8
8.9692738382557	27.1636902436055	9.3	18.5
9.15346016802866	27.2543365802479	10.6	19.2
9.3627662478407	27.3573458733429	11.3	19.3
9.60008700498616	27.4741393104537	12.5	19.5
9.91225163863802	27.6277535763474	12.7	20.9
10.2677305536195	27.8026751372444	11.5	20.6
10.7169481148626	28.0237122936058	10.5	22.8
11.1598895022885	28.2416515268612	10.4	25.6
Route: 2 Length: 0.473477885527192 Demand Met: 1716			
12.6923499250933	28.9861238617588	11.4	29.4
12.6844545190179	28.971804926258	9.40000000000001	28.4
12.67492556591	28.9545228074164	8.7	29.3
12.6664793290011	28.9392099587097	7.3	28.6
12.6594100249882	28.9263922019493	6.7	28.8
12.6508273259401	28.910836127889	6.7	26.7
12.6385715589192	28.8886181943123	5.8	25.2
12.6261126023929	28.8660122176499	7.3	24.7
12.6144396341927	28.8448257528697	6.7	22.9
12.6046116276956	28.8269840022265	7.5	23.4
12.5950762073797	28.8096740102625	8.7	23
12.5857116840705	28.7926753643807	8.40000000000001	21.2
12.5943972954095	28.8084188498135	9.40000000000001	20.9
12.6040257008158	28.8258706990973	10.4	21.5
12.6148073543402	28.8454129079087	11.7	22.5
12.6286787044021	28.8705616439304	12.7	23
12.6402124615583	28.891496794519	12.5	25.3
12.6480473702747	28.9057173380092	11.3	24.6
12.6550959303423	28.9185105994177	9.5	23.5
12.662279954453	28.9315498895131	9.40000000000001	24.5
12.6698269941345	28.9452484309402	8.7	24.9
12.677949269636	28.9599890740465	8.7	26.4
12.6852989323968	28.9733270865212	9.5	27.1
12.6906308607117	28.9830025321185	10.6	26.4
12.6948825109261	28.9907162151144	11.6	27.1
12.6982545938653	28.9968339107813	12.7	27.3
Route: 3 Length: 44.7545535380606 Demand Met: 2000			
7.34111198488799	11.5124887196873	0.599999999999994	7.5
6.88330842414027	10.0185551834833	0.299999999999997	4.8
6.74536890168014	9.56841427940651	1.5	4.6
6.64208489984341	9.23136596437196	2.59999999999999	5
6.55120906272857	8.93480912727916	3.59999999999999	5.4
6.46594585991144	8.65656821028847	4.2	3.4
6.38854438170355	8.40398350483551	3.3	3.4
6.31817899138021	8.17436017870234	2.59999999999999	3.4
6.25371927284103	7.96400908926369	1.5	3.2
6.19532493980256	7.77345118125459	0.299999999999997	3.2
6.14363000350775	7.60475531147146	0.299999999999997	1.2
6.14363027586524	7.60475541943091	1.7	1.2
6.14363055435427	7.6047555320021	2.3	0.9
6.14363083722634	7.60475564301101	3.40000000000001	1.1
6.14363112195736	7.60475575621115	4.7	1.1
6.1436314069571	7.60475586837919	5.40000000000001	1.2
6.14363169236611	7.6047559725832	5.3	2.5
6.14363197913617	7.60475609169626	6.59999999999999	1.6
6.14363226704981	7.60475621251088	7.5	0.7
6.14363255562543	7.60475632867128	8.59999999999999	0.6
6.14363284265065	7.60475644278434	9.40000000000001	0.8
6.14363312543796	7.60475655808288	10.7	0.9
6.14363339853898	7.60475666856932	11.5	1.4
6.14363366084173	7.60475678130875	12.3	1.5
6.33596701574766	8.23239116184376	10.4	2.5
6.58172814503155	9.03437492055759	9.5	2.8
6.93537069600153	10.188404408908	8.5	3.4
7.61857696929222	12.4178949598532	8.5	6.5
9.00194190284297	16.9322436055913	8.2	13.4
Route: 4 Length: 36.3448532351036 Demand Met: 2000			
9.91859378737487	17.173229563972	5.3	17.4
9.02261567795881	13.3636495683967	0.700000000000003	11.4
8.9165103676896	12.9125009094171	1.5	11.1
8.83004145914261	12.5448350462061	2.40000000000001	11.2
8.75275770289933	12.2162041306457	2.5	9.4
8.68383526978508	11.9231189418642	1.3	9.5
8.6262821551891	11.6783685525014	0.599999999999994	8.4
8.64451852323	11.666828049182	1.5	7.5
8.66703299617785	11.6525799776436	2.7	7.3
8.69312563691534	11.6360683643459	3.59999999999999	7.3
8.72135446104767	11.6182062151991	3.7	8.4
8.75081017313991	11.5995686424209	4.7	8.7
8.78045529949179	11.5808114940651	6.3	8.6
8.80927821126922	11.5625744439392	5.40000000000001	7.2
8.83781999231746	11.5445153118022	4.7	6.8
8.8665320226614	11.5263485413554	6.59999999999999	6.8
8.89487042177542	11.508418116099	7.40000000000001	6.7
8.92271201535628	11.4908019559944	6.40000000000001	5.4
8.95048609445743	11.4732285753094	4.8	5
8.97888991386311	11.4552568254077	5.40000000000001	4.6
9.00760110449983	11.4370907247331	6.40000000000001	3.2
9.02103709563815	11.4285867250633	7.40000000000001	3.2
9.03412541171321	11.4203026734286	7.5	4.4
9.04709868797254	11.4120919438229	8.8	4.9
9.0598392344522	11.404028758651	9.8	5
9.0721344049328	11.3962476137137	10.3	5.4
9.08368422104809	11.3889384106981	11.5	4.7
9.09400711992126	11.3824056834636	11.3	3.1
9.10292170296054	11.3767641866074	12.5	3.4
9.17230105336911	11.7166631525233	12.7	4.9
9.25918950810876	12.1423346483384	12.5	6.8
9.35845956153639	12.6286775424023	11.7	6.5
9.47647064093692	13.2068838957618	10.7	6.5
9.62965527553119	13.9574133300044	9.40000000000001	7.4
9.84126476825774	14.9941809585443	10.3	9.2
10.1319000113818	16.4181205875019	11.5	9.5
10.6905851913562	19.1551136538368	9.59999999999999	12.8
Route: 5 Length: 17.6645347465825 Demand Met: 2000			
11.4708528583065	26.5754883707148	10.4	29.1
10.4346414202897	24.5315431448199	5.40000000000001	26.6
9.42732135012518	22.5445899216603	1.3	22.7
9.05188304786249	21.8040323556488	0.599999999999994	22.9
8.91589282930494	21.5357907342378	1.5	21.3
8.79621212866196	21.2997199254648	0.5	20.7
8.70624343686303	21.1222562576551	0.299999999999997	19
8.70624346524282	21.1222562338017	1.59999999999999	18.8
8.70624349452319	21.1222562092118	2.5	19.5
8.70624352470911	21.1222561839921	2.40000000000001	20.9
8.7062435555051	21.1222561586657	3.3	21.4
8.70624358647967	21.1222561334555	4.3	20.6
8.70624361728045	21.1222561084776	4.40000000000001	18.9
8.70624364788246	21.1222560833306	3.7	18.6
8.70624367836263	21.1222560586432	4.40000000000001	16.9
8.70624370864209	21.1222560335014	3.5	17.5
8.70624373881394	21.1222560085916	1.59999999999999	17.2
8.70624376902313	21.1222559838919	2.5	16.5
8.70624379918341	21.1222559593253	2.40000000000001	15.3

Solution x	Solution y	Original x	Original y
8.70624383051421	21.1222559332554	3.5	15.1
8.70624386190724	21.1222559070341	4.5	15.4
8.70624389335299	21.1222558811018	5.5	14.6
8.70624392479121	21.1222558546879	6.3	15.5
8.70624395626264	21.1222558286514	7.5	15.1
8.70624398770428	21.1222558024412	8.7	15.4
8.70624401906846	21.1222557762805	9.3	15.6
8.70624405030665	21.1222557504933	10.4	15.1
8.70624408119852	21.1222557256723	10.3	12.6
8.71351868830413	21.1366050672478	12.6	13.4
8.84272691977795	21.3914693249444	12.7	14.8
8.99431416263449	21.6904764226453	11.7	15.3
9.16769737094121	22.032476455448	12.5	16.9
9.34865715487783	22.3894221420458	11.4	16.9
9.54350730553986	22.7737668702335	10.6	16.8
9.77391912438544	23.2282566652559	9.5	17.4
10.0565548569889	23.7857582114808	8.7	17.3
10.4641810882656	24.58980587042	7.59999999999999	17.1
Route: 6 Length: 25.7944977988205 Demand Met: 2000			
9.35596944202931	20.0822732925037	11.6	13
8.74715131574364	18.4588366138722	11.7	11.5
8.39792824905148	17.5276360146094	12.6	10.9
8.17152903173152	16.9239515164014	12.3	9.3
8.17152462936616	16.9239523855768	10.4	11.3
8.17152034536491	16.9239532640017	9.8	10.8
8.17151594328215	16.9239541799178	9.40000000000001	9.5
8.17151135005744	16.9239551283599	8.3	8.9
8.17150662673347	16.9239560902671	7.7	9.3
8.17150179083363	16.9239570698306	8.59999999999999	10.7
8.17149682828122	16.9239580900845	7.3	11.2
8.17149180874183	16.923959132516	6.40000000000001	11.2
8.17148676029487	16.9239601901675	5.59999999999999	10.5
8.17148168738407	16.9239612569413	5.3	9.5
8.17147651196083	16.9239622948693	4.3	11.2
8.17147132746597	16.9239633532885	3.59999999999999	10.8
8.17146616043729	16.9239643614003	1.7	12.5
8.17146124351865	16.9239652838903	0.599999999999994	12.7
8.22918453879342	17.0778921307133	0.700000000000003	15.2
8.29457501377027	17.2522671601988	0.299999999999997	16.4
8.37186891104939	17.4583882189294	1.59999999999999	14.7
8.45823154336924	17.6886921683901	2.7	13.4
8.55680403968731	17.9515552005964	3.5	12.6
8.67982372575447	18.2796133725948	4.40000000000001	13.1
8.83386583592642	18.690400238194	5.40000000000001	13.2
9.0319386061625	19.2186103889162	6.3	12.4
9.35889985411112	20.0905303472535	7.7	12.7
10.1213658093356	22.1237292596955	6.40000000000001	16.8

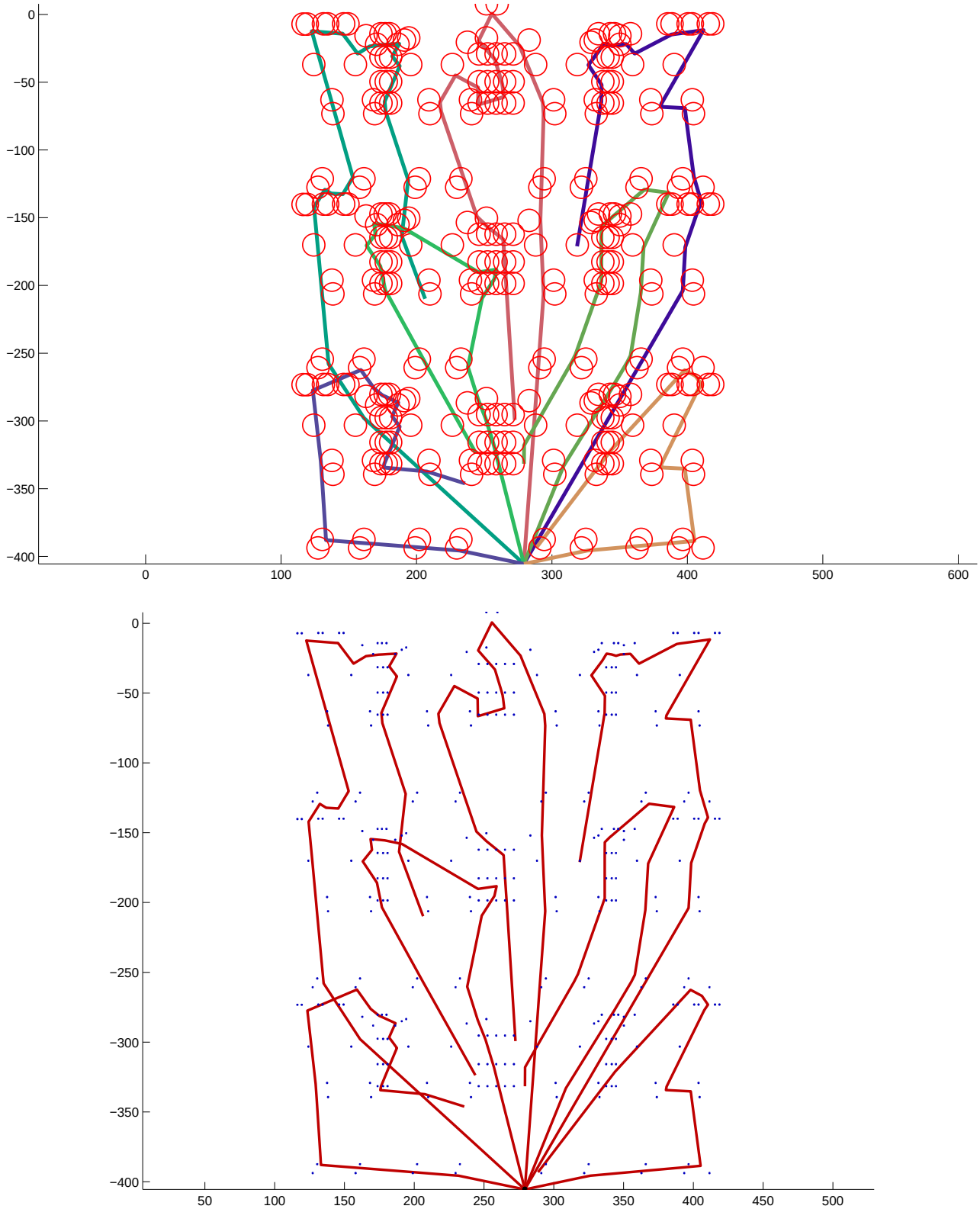


Figure O.14: $lin318$, $r = 8.268$, Equal Radius, 2D, Euclidean, Length = 5029.0931705

Table O-17: Solution for $lin318$, $r = 8.268$, Equal Radius, 2D, Euclidean

Total distance: 5029.09317052352 Total demand met: 6261 Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 961.653213621368 Demand Met: 949			
51.194088325997	297.838551659307	44.9	303.2
25.1055833583658	257.973546433446	17.3	260.7
24.5050661669945	251.503981084875	20.5	254.4
20.3954948851143	207.201226929032	28.3	206.3
19.4328362178404	196.828675543517	27.6	196.1
16.9190946305445	169.815805713705	14.2	170.1
14.3416133232077	142.121718864681	6.3	140.2
15.8850451962745	139.670504963701	21.3	140
15.8850451962745	139.670504963701	9.40000000000001	140.2
20.4402294022778	132.436377115983	17.3	127.6
22.3831422206992	129.350740811031	20.5	121.3
26.9018238320223	132.11955844003	24.4	140
34.4775140712279	132.611582503564	36.2	140
35.5532456969609	132.681320698524	39.4	140
40.9792224670753	123.599264264841	48	127.6
43.0041519877865	120.209757587587	51.2	121.3
28.3524491970153	68.0807607737811	28.3	73.2
28.3524491970153	68.0807607737811	27.6	63
19.2968572935802	35.862167037892	14.2	37
12.6880904483064	12.3490696815709	6.3	7.1
13.9082181057423	12.4455174055463	9.40000000000001	7.1
20.0596873570886	12.931693283915	21.3	6.9
24.8837794669279	13.3129736015818	24.4	6.9
33.6244397465298	14.0038463209315	36.2	6.9
35.4171425305622	14.1454998660396	39.4	6.9
46.4939045940903	28.8870485842492	44.9	37
54.289209150514	24.2305186054534	60.6	22
55.4707233730791	23.5248001712645	52.8	15.7
64.5424729330933	22.4345797430278	63.8	14.2
67.4282559033443	22.2604610345051	66.9	14.2
70.7489492381577	22.0599978407688	70.1	14.2
75.5748295884547	21.7687459240556	81.1	18.9
77.2786079621951	21.6658416938657	84.3	17.3
75.3147434029831	25.107604448161	76.4	22
72.0485239211066	30.8322353808264	63.8	31.4
72.8873413729126	31.922250870367	70.9	31.5
73.7807105594821	33.0831430853252	67.7	31.5
77.5987820472448	38.0490638497829	85.8	37
73.9130024769622	46.7266657216054	70.9	49.6
72.4637028155639	50.1396141894127	67.7	49.6
71.2891953595945	52.905566499774	63.8	49.6
67.5871025154374	61.6255464467969	70.9	65.4
67.5871025154374	61.6255464467969	67.7	65.4
66.4732054531747	64.2486469028542	58.3	63
66.7777243446043	67.3286254969985	63.8	65.4
67.1890906684332	71.4892065679458	59.1	73.2
83.8748199989624	122.140740487547	92.1	121.3
83.1179211784489	128.72293206953	89	127.6
79.1074194426765	163.600605744714	70.9	164.6
82.5957894588431	172.956844616642	85.8	170.1
92.0862751163154	198.410349587647	99.2	196.1
96.3415295192222	209.823914729662	100	206.3
Route: 2 Length: 930.351150642286 Demand Met: 946			
231.825982400923	298.033183899849	231.5	297.7
231.825982400923	298.033183899849	234.6	297.7
238.178773740588	287.114204972418	240.2	288.2
244.255818919454	276.669213795157	248	280.4
286.581543264565	203.921122578266	294.5	206.3
287.082507156714	195.105224425532	293.7	196.1
288.412990818866	171.693733407716	280.3	170.1
298.161314713115	143.344679464139	290.6	140
299.213094811836	141.42703368787	293.7	140
300.479003392779	139.118938693318	308.7	140
299.910091085362	137.199825753573	305.5	140
297.375861175787	128.650905348794	301.6	127.6
294.687897309402	119.583537065826	286.6	121.3
288.908211364639	75.3874145706462	294.5	73.2
288.0815664458	69.0658192733672	293.7	63
270.31738715974	68.1123085018437	263.8	73.2
270.750564929516	65.8791232665257	263	63
285.549768966105	40.0108800804754	280.3	37
301.84662984939	11.5251834811348	308.7	6.9
299.581584703248	11.8355501976778	293.7	6.9
299.581584703248	11.8355501976778	305.5	6.9
291.096150063038	12.998329767011	290.6	6.9
280.543082446185	14.4444838463313	278.7	6.9
278.109973609738	14.7778558952027	275.6	6.9
251.095094138794	28.8682304645327	249.6	37
244.86645081062	21.8512542900397	248	14.2
242.313271857592	22.0242186331321	240.2	22
240.101492933817	22.174049905277	240.2	15.7
237.648210952432	22.3402079909143	236.2	14.2
234.597351319588	23.2319470921221	234.6	31.5
231.288550587212	22.267138105327	233.1	14.2
227.84076805431	21.7181049834534	224.4	14.2
226.955399097651	23.1478101030519	222	18.9
225.911887296687	24.8328507530523	218.9	20.5
224.659450902883	26.8560299450283	231.5	31.5
222.197103114824	30.1742887003857	227.6	31.5
216.964991265716	37.225041860182	208.7	37
225.262995620635	49.7830838037324	227.6	49.6
225.262995620635	49.7830838037324	231.5	49.6
226.655531728686	51.8904376375185	234.6	49.6
226.368598103226	64.6227197775836	234.6	65.4
226.117945395241	66.1199085283579	227.6	65.4
225.853320994083	67.7005472775108	222	63
225.853320994083	67.7005472775108	231.5	65.4
224.431307636431	76.1943220958391	222.8	73.2
217.184119334436	119.481599458563	215	121.3
215.415244048576	130.047226688503	211.8	127.6
208.544351366339	171.08945216611	208.7	170.1
Route: 3 Length: 915.746849764466 Demand Met: 950			
178.019375570504	285.912260914584	173.2	285.1
180.135043613086	256.895355500008	184.3	254.4
180.135043613086	256.895355500008	181.1	260.7
183.832852972126	206.179261174721	192.1	206.3
183.404006289905	196.344353397519	191.3	196.1
182.26436265872	170.210568561808	178	170.1
181.467818340059	151.944256620384	173.2	152
182.302619671515	124.214444530406	181.1	127.6
182.302619671515	124.214444530406	184.3	121.3
183.833544069851	73.3603483346259	192.1	73.2
183.248162357355	64.8783970362402	191.3	63
172.859312653437	39.5669543338273	178	37
167.945566755601	27.5951020289405	161.4	29.1
166.148904078849	23.217691367453	173.2	18.9
145.687412393489	-0.616310129540649	149.6	-7.9
145.626717123633	-0.623916307356138	141.7	-7.9
138.598502883493	13.6933143958047	141.7	17.3
135.795084930335	19.4040624572382	127.6	20.5
140.09355735813	24.2834423525158	136.2	29.1
142.967439462059	27.5456654061802	142.5	29.1
145.580885751315	30.5122489717507	148.8	29.1
147.869612514909	33.1102292854306	155.1	29.1
151.772188201725	46.1600126412165	148.8	49.6
153.307061803646	51.2924898497196	161.4	49.6
153.624475491143	53.8874250581814	155.1	49.6
154.47929416087	60.8762420816532	161.4	65.4
151.628246327794	61.7307253115998	155.1	65.4
146.62140990453	63.2313345357871	148.8	65.4
139.279985130249	65.4316628100285	136.2	65.4
135.594400028457	66.5362627152638	130.7	73.2
135.552657685573	63.2651777397785	142.5	65.4
135.552657685573	63.2651777397785	129.9	63
135.433023525934	53.8916613257188	142.5	49.6
132.2775898953	52.2006357665507	136.2	49.6
118.755797885306	44.9543625618432	116.5	37
107.293750144748	64.688687186574	99.2	63
108.065725671129	71.3822217623261	100	73.2
124.072048162526	118.342809624256	122.8	121.3
126.56845116242	125.666864686956	119.7	127.6
134.313099133028	148.388169672631	141.7	150.4
134.577819869305	149.164849780847	127.6	153.6
141.670752341158	156.000737042449	136.2	162.2
145.744091586107	159.289150942203	142.5	162.2
150.651845754527	163.251191303834	155.1	162.2
150.651845754527	163.251191303834	148.8	162.2
154.057021846948	166.000176342898	161.4	162.2
155.148311110192	183.146231643086	161.4	182.7
156.195150307653	199.594557530446	161.4	198.5
162.194404086585	293.863983547491	155.1	295.3
162.53834262938	299.267606137452	161.4	295.3

Solution x	Solution y	Original x	Original y
Route: 4 Length: 620.47782463882 Demand Met: 933			
194.663153228644	342.845828687682	192.1	339.4
198.668382137333	332.950704984126	191.3	329.2
214.750544153951	307.125651718695	208.7	303.2
224.63419446411	291.255543920142	218.9	286.7
224.63419446411	291.255543920142	222	285.1
224.63419446411	291.255543920142	227.6	297.7
229.684092361031	283.147009906066	224.4	280.4
229.684092361031	283.147009906066	233.1	280.4
231.68191493457	279.93886317986	236.2	280.4
233.135189368735	277.604976920929	240.2	281.9
245.559256999379	256.708530683883	252.8	260.7
248.040758284406	251.832274517319	255.9	254.4
255.582873708094	205.383860451579	263.8	206.3
256.204358019546	195.225959857439	263	196.1
257.618901916537	172.114441043706	249.6	170.1
273.327148821135	137.97335001391	275.6	140
273.327148821135	137.97335001391	278.7	140
276.261448906023	131.595514023425	283.5	127.6
258.250511786926	129.226903470196	255.9	121.3
254.766580436879	132.205464509585	252.8	127.6
244.069830556485	141.352656658312	248	147.3
239.879022862464	144.935954497888	240.2	148.8
237.342972720517	147.104465098731	236.2	147.3
235.09956584954	149.022761879325	240.2	155.1
232.990440661628	150.826348717339	233.1	147.3
229.988078135426	153.393715746958	224.4	147.3
227.822376006062	155.523905460184	222	152
226.522823600593	156.802078936734	218.9	153.6
226.511432082288	164.277825517598	234.6	164.6
226.506847932284	167.241901511885	227.6	164.6
226.506847932284	167.241901511885	231.5	164.6
226.481936250817	182.65282221896	227.6	182.7
226.481936250817	182.65282221896	231.5	182.7
226.481936250817	182.65282221896	234.6	182.7
226.451365273135	197.099834577893	234.6	198.5
225.812709590458	198.911842166433	222	196.1
225.812709590458	198.911842166433	227.6	198.5
224.976893256509	201.283354071971	222.8	206.3
224.976893256509	201.283354071971	231.5	198.5
207.402513115542	251.138286219739	215	254.4
204.532522571764	256.757456794807	211.8	260.7
178.421134316651	302.209861879701	178	303.2
169.387751595272	317.934664037326	161.4	315.8
169.374280405718	331.607004376608	161.4	331.6
Route: 5 Length: 607.99833029784 Demand Met: 936			
150.201108040975	330.119600190193	155.1	331.6
150.201108040975	330.119600190193	148.8	331.6
150.201108040975	330.119600190193	142.5	331.6
147.139106768137	318.032191792058	155.1	315.8
147.139106768137	318.032191792058	148.8	315.8
147.139106768137	318.032191792058	142.5	315.8
141.000727279499	298.044351769085	148.8	295.3
141.000727279499	298.044351769085	136.2	295.3
137.752684870303	289.873857716484	141.7	283.5
137.752684870303	289.873857716484	142.5	295.3
135.390990641323	283.932253335852	127.6	286.7
127.957146552475	260.275137728084	119.7	260.7
129.268645982096	253.859537170142	122.8	254.4
138.354495451845	209.425622107599	130.7	206.3
147.474407544239	195.304517096378	155.1	198.5
147.474407544239	195.304517096378	148.8	198.5
147.474407544239	195.304517096378	142.5	198.5
149.037135827026	188.321610536227	155.1	182.7
147.215185293646	188.585690643624	148.8	182.7
143.044132504194	189.189385621072	142.5	182.7
135.73764717097	190.244873996219	136.2	198.5
135.73764717097	190.244873996219	136.2	182.7
135.73764717097	190.244873996219	129.9	196.1
112.599169326042	176.58283408878	116.5	170.1
81.3030675577648	158.105767228609	84.3	150.4
77.8705301513832	157.379835006556	81.1	152
68.8680721458275	155.47575350553	76.4	155.1
68.8680721458275	155.47575350553	70.1	147.3
65.0300853642924	155.12178419185	66.9	147.3
65.0300853642924	155.12178419185	63.8	147.3
61.690993857434	154.81391192537	60.6	155.1
58.7484481847204	154.542522529214	52.8	148.8
59.7455328690318	162.34450443407	67.7	164.6
59.7455328690318	162.34450443407	63.8	164.5

Solution x	Solution y	Original x	Original y
53.1582307673336	170.502943295934	44.9	170.1
60.3884374407898	181.49447989545	63.8	182.7
63.2587648364411	185.857905722636	70.9	182.7
63.2587648364411	185.857905722636	67.7	182.7
65.2219888000195	195.447792271466	70.9	198.5
65.2219888000195	195.447792271466	67.7	198.5
65.5851436943891	197.221438641447	63.8	198.5
65.5851436943891	197.221438641447	58.3	196.1
66.8581952083946	203.441506364501	59.1	206.3
96.2255516105473	256.683358361116	92.1	254.4
96.2255516105473	256.683358361116	89	260.7
120.736475221078	300.44607974279	116.5	303.2
133.760525255365	323.700001344119	136.2	315.8
133.760525255365	323.700001344119	129.9	329.2
133.760525255365	323.700001344119	136.2	331.6
Route: 6 Length: 522.968750060923 Demand Met: 852			
121.641722189938	395.686503644075	122.8	387.5
116.151315173203	395.257192352699	119.7	393.8
90.7261065531644	393.269939257723	92.1	387.5
90.7261065531644	393.269939257723	89	393.8
50.0312791786323	390.089666526854	51.2	387.5
50.0312791786323	390.089666526854	48	393.8
23.1840207868252	387.991432526875	17.3	393.8
22.9112267854532	383.808830469914	20.5	387.5
20.0530162663328	339.948718613738	28.3	339.4
19.3658638044802	329.946772920207	27.6	329.2
16.2998708456948	302.79402789872	14.2	303.2
13.4405183797124	277.468186529163	6.3	273.3
16.0001163643568	276.381481201943	21.3	273.1
16.0001163643568	276.381481201943	9.40000000000001	273.3
31.8988815908454	269.637815375543	39.4	273.1
31.8988815908454	269.637815375543	36.2	273.1
31.8988815908454	269.637815375543	24.4	273.1
45.1830904787532	263.968420652351	48	260.7
48.9566609213154	262.357901855515	51.2	254.4
58.8197288289645	276.232260321597	52.8	281.9
64.9360481697332	281.160177820908	60.6	288.2
67.4083934450772	282.281728402515	66.9	280.4
67.4083934450772	282.281728402515	63.8	280.4
72.7016908548371	284.682993606517	70.1	280.4
72.7016908548371	284.682993606517	76.4	288.2
76.5717659087831	286.438592808257	84.3	283.5
75.9779724004039	287.774562236694	81.1	285.1
72.0178912134784	296.690503421897	63.8	297.6
73.0822528763533	298.124718339239	67.7	297.7
74.6708946383777	300.265307654477	70.9	297.7
77.5929143168286	304.202336876885	85.8	303.2
72.9347082536894	315.365414654346	70.9	315.8
72.9347082536894	315.365414654346	67.7	315.8
71.4333344977009	318.963695532869	63.8	315.8
66.2266826775002	331.551279419478	58.3	329.2
65.9578306956468	332.991973101244	63.8	331.6
65.6930628326499	334.410759986947	59.1	339.4
70.2835687152866	334.827975795406	70.9	331.6
70.2835687152866	334.827975795406	67.7	331.6
97.5876361774506	337.3093161421	99.2	329.2
103.346232178825	339.103187737571	100	339.4
125.891192023518	346.125798722508	130.7	339.4
Route: 7 Length: 469.897051497821 Demand Met: 695			
209.728708786946	397.036383879464	211.8	393.8
216.216383874162	395.678062969406	215	387.5
250.109542316064	392.652431991642	252.8	393.8
257.88743694365	391.958118674489	255.9	387.5
284.198269797211	389.60961814835	286.6	387.5
284.198269797211	389.60961814835	283.5	393.8
295.145724523766	388.632471239453	301.6	393.8
288.885229854016	341.309198604042	294.5	339.4
288.086656276909	335.270513017565	293.7	329.2
270.332035592325	334.331129345441	263.8	339.4
270.826485309529	331.865844691203	263	329.2
284.037459792105	305.070438884402	280.3	303.2
297.773040527221	277.211908300604	290.6	273.1
298.998584033307	275.353442750972	293.7	273.1
300.43232071316	273.17914660007	308.7	273.1
299.570166890898	271.924977159285	305.5	273.1
296.093524078348	266.86761308535	301.6	260.7
287.98399016125	262.55140037851	286.6	254.4
285.48047633875	265.264064403264	283.5	260.7
279.45366125211	271.794254279007	278.7	273.1
275.134794137459	276.473826330432	275.6	273.1

Solution x	Solution y	Original x	Original y
250.620829487855	303.034467574199	249.6	303.2
239.033559465832	315.589469493034	234.6	315.8
236.155295634767	318.70812458479	231.5	315.8
233.926856917207	321.122680897228	227.6	315.8
229.58052188957	326.797339227144	234.6	331.6
226.943178054995	330.240689025332	227.6	331.6
226.943178054995	330.240689025332	231.5	331.6
223.25010728478	335.062380873555	222	329.2
223.25010728478	335.062380873555	222.8	339.4
184.830810172801	385.222852209495	184.3	387.5
178.741084850651	393.17368976406	181.1	393.8

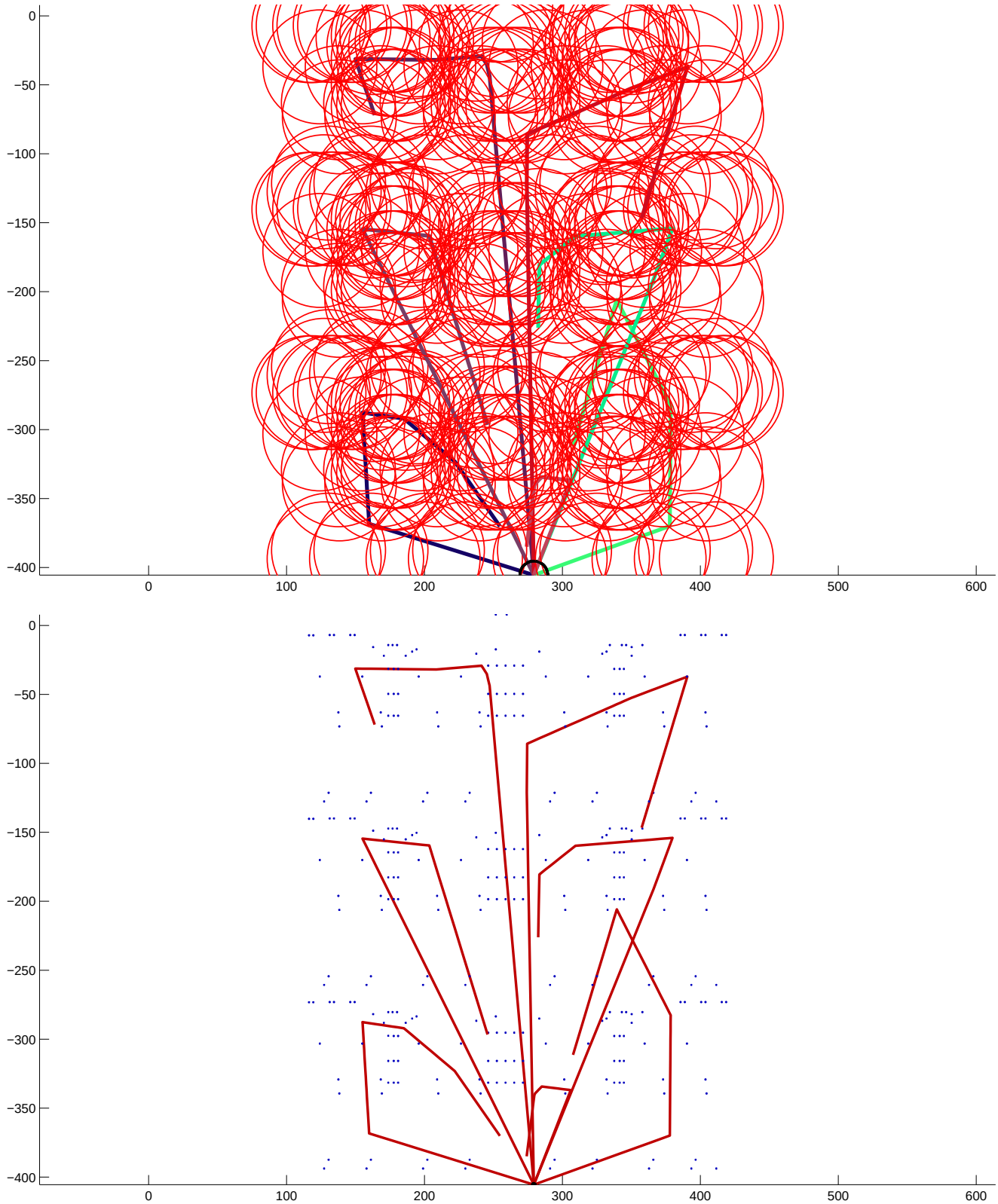


Figure O.15: $lin318$, $r = 41.34$, Equal Radius, 2D, Euclidean, Length = 3923.4927869

Table O-18: Solution for $lin318$, $r = 41.34$, Equal Radius, 2D, Euclidean

Total distance: 3923.49278692995 Total demand met: 6261 Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 384.820266338987 Demand Met: 942			
110.036288993759	387.052324460028	92.1	387.5
90.0675761964483	380.836324584765	89	393.8
69.400790974927	374.403194850069	48	393.8
59.1149940484485	371.201515597904	51.2	387.5
49.8528337468337	368.318449846502	17.3	393.8
49.6674391015571	365.190691967493	20.5	387.5
48.9891293684967	353.748314030149	28.3	339.4
48.5625370710905	346.552507969967	27.6	329.2
48.267417118125	341.574556333787	59.1	339.4
47.9769029806671	336.673919483562	67.7	331.6
47.7004744378822	332.010426536345	63.8	331.6
47.4277468120562	327.409023366045	58.3	329.2
47.1558094809497	322.820712611883	70.9	331.6
46.8541341564865	317.730438662315	70.9	315.8
46.5601622202962	312.769898328031	67.7	315.8
46.2568018984628	307.650800550804	63.8	315.8
46.2568018984628	307.650800550804	67.7	297.7
45.9687257085286	302.789148062812	44.9	303.2
45.9687257085286	302.789148062812	63.8	297.6
45.7136039662191	298.482845911184	14.2	303.2
45.1721111621536	289.346348612613	9.40000000000001	273.3
45.1064207564521	288.238408373135	17.3	260.7
45.0712226670887	287.645318812503	20.5	254.4
45.0712245074892	287.645319093806	6.3	273.3
46.7126528620467	287.888009483784	39.4	273.1
48.3980626445226	288.137197936365	24.4	273.1
48.3980626445226	288.137197936365	36.2	273.1
50.3856438885307	288.431048157577	21.3	273.1
53.0579214272154	288.826114521227	52.8	281.9
55.697182731161	289.216297433877	48	260.7
58.584532558644	289.643150169565	51.2	254.4
62.5981427278756	290.236473057424	60.6	288.2
62.5981427278756	290.236473057424	63.8	280.4
66.6665671024169	290.837899745883	66.9	280.4
66.6665671024169	290.837899745883	70.1	280.4
70.7561684613015	291.442457821404	70.9	297.7
75.1058078746944	292.085456377102	92.1	254.4
76.9391403456963	293.631415832702	76.4	288.2
78.8128575288029	295.211400399181	81.1	285.1
80.7357072293925	296.832777713604	84.3	283.5
82.7339084714052	298.517656100985	89	260.7
88.9078468307277	303.723368317658	85.8	303.2
95.4396036029477	309.230736660813	116.5	303.2
101.198539841047	314.086527380571	127.6	286.7
106.369858118889	318.446831449078	99.2	329.2
111.95211654851	323.15359801114	142.5	295.3
115.384189886224	328.082260035677	136.2	295.3
144.677007281012	370.145569213958	119.7	393.8
Route: 2 Length: 866.707187426109 Demand Met: 950			
141.966634803471	97.4239393878974	130.7	73.2
138.977095845144	63.7258765331603	161.4	49.6
137.19297805182	43.6169356411215	178	37
136.141758898094	39.1878227086075	161.4	29.1
135.178029328051	35.1273624843024	173.2	18.9
131.34058529815	29.1889684472127	149.6	-7.9
128.490580439105	29.4234537652209	141.7	-7.9
121.0798998964	30.0333795007239	84.3	17.3
121.0798998964	30.0333795007239	141.7	17.3
121.0798998964	30.0333795007239	127.6	20.5
121.0798998964	30.0333795007239	136.2	29.1
121.0798998964	30.0333795007239	142.5	29.1
121.0798998964	30.0333795007239	148.8	29.1
121.0798998964	30.0333795007239	155.1	29.1
121.0798998964	30.0333795007239	116.5	37
121.0798998964	30.0333795007239	136.2	49.6
121.0798998964	30.0333795007239	142.5	49.6
121.0798998964	30.0333795007239	148.8	49.6
98.5781023812232	31.8844618804306	63.8	14.2
98.5781023812232	31.8844618804306	66.9	14.2
98.5781023812232	31.8844618804306	70.1	14.2
98.5781023812232	31.8844618804306	60.6	22
98.5781023812232	31.8844618804306	81.1	18.9
98.5781023812232	31.8844618804306	76.4	22
98.5781023812232	31.8844618804306	67.7	31.5
98.5781023812232	31.8844618804306	70.9	31.5
98.5781023812232	31.8844618804306	85.8	37
98.5781023812232	31.8844618804306	67.7	49.6
98.5781023812232	31.8844618804306	70.9	49.6
98.5781023812232	31.8844618804306	99.2	63
98.5781023812232	31.8844618804306	100	73.2
74.7395641174016	31.6314373477464	63.8	31.4
58.40572637946	31.4581777074529	39.4	6.9
58.40572637946	31.4581777074529	52.8	15.7
50.7262677244176	31.3767639911527	36.2	6.9
44.6853383421936	31.3127269427784	21.3	6.9
44.6853383421936	31.3127269427784	24.4	6.9
41.4186776929928	31.2780984838535	9.40000000000001	7.1
39.8443565804532	31.2614109678837	6.3	7.1
43.1925246923581	40.9405566727838	14.2	37
43.1925246923581	40.9405566727838	44.9	37
48.348178450803	55.8449296396524	63.8	49.6
53.8815959809823	71.8414282621091	27.6	63
53.8815959809823	71.8414282621091	28.3	73.2
53.8815959809823	71.8414282621091	58.3	63
53.8815959809823	71.8414282621091	63.8	65.4
53.8815959809823	71.8414282621091	67.7	65.4
53.8815959809823	71.8414282621091	59.1	73.2
53.8815959809823	71.8414282621091	70.9	65.4
Route: 3 Length: 586.048562912502 Demand Met: 946			
132.244322669419	330.643382071104	100	339.4
132.244322669419	330.643382071104	130.7	339.4
122.397621572805	310.751596960825	141.7	283.5
117.846503858738	301.558181755506	148.8	295.3
117.846503858738	301.558181755506	155.1	295.3
97.1438056662579	259.737315693595	119.7	260.7
55.1634550624958	174.935001582513	14.2	170.1
55.1634550624958	174.935001582513	27.6	196.1
55.1634550624958	174.935001582513	28.3	206.3
55.1634550624958	174.935001582513	59.1	206.3
55.1634550624958	174.935001582513	58.3	196.1
55.1634550624958	174.935001582513	63.8	182.7
55.1634550624958	174.935001582513	63.8	198.5
55.1634550624958	174.935001582513	67.7	198.5
55.1634550624958	174.935001582513	70.9	198.5
49.6914044848749	163.876286283151	44.9	170.1
49.6914044848749	163.876286283151	63.8	164.5
49.2688882137586	163.025187220307	52.8	148.8
49.2688882137586	163.025187220307	60.6	155.1
48.5383070035481	161.549515739458	39.4	140
48.5383070035481	161.549515739458	48	127.6
47.5325265371645	159.517561597177	24.4	140
47.5325265371645	159.517561597177	36.2	140
46.6022457748542	157.63829024504	21.3	140
45.7646994937095	155.946481818566	9.40000000000001	140.2
45.3638144362212	155.136441345844	17.3	127.6
45.0712302040907	154.545312695963	6.3	140.2
45.0712324763338	154.545311642023	20.5	121.3
50.9526891382151	155.153549972498	51.2	121.3
56.9377027503097	155.772477418691	63.8	147.3
62.5644214703106	156.354347117166	66.9	147.3
62.5644214703106	156.354347117166	70.1	147.3
67.7169379909621	156.887179970963	67.7	164.6
72.87086083448	157.420143284826	70.9	164.6
78.1053979774777	157.961430756978	76.4	155.1
83.4335313467686	158.512400149267	92.1	121.3
83.4335313467686	158.512400149267	89	127.6
83.4335313467686	158.512400149267	67.7	182.7
83.4335313467686	158.512400149267	70.9	182.7
83.4335313467686	158.512400149267	85.8	170.1
88.4687293758385	159.033228009176	81.1	152
88.4687293758385	159.033228009176	84.3	150.4
93.4669734940604	159.550344549151	119.7	127.6
96.3806919482381	169.001839913898	127.6	153.6
100.428853792928	182.135259777853	99.2	196.1
100.428853792928	182.135259777853	116.5	170.1
105.114249793084	197.318665989606	136.2	182.7
105.114249793084	197.318665989606	142.5	198.5
108.118302978885	207.059867805217	100	206.3
108.118302978885	207.059867805217	129.9	196.1
111.868119007335	219.221762230691	136.2	198.5
117.506689280008	237.510235068202	122.8	254.4
117.506689280008	237.510235068202	130.7	206.3

Solution x	Solution y	Original x	Original y
135.736371961922	296.630003499684	173.2	285.1
Route: 4 Length: 486.656277903147 Demand Met: 943			
230.924177996002	383.256144736214	252.8	393.8
252.946683780298	375.30559885077	283.5	393.8
252.946683780298	375.30559885077	255.9	387.5
261.700198513616	372.145175524858	286.6	387.5
267.851746212459	369.924247233778	301.6	393.8
268.016320713691	346.626308541461	263.8	339.4
268.016320713691	346.626308541461	263	329.2
268.115777444962	332.556099605412	294.5	339.4
268.115777444962	332.556099605412	293.7	329.2
268.243122444577	314.493738454949	280.3	303.2
268.345820509238	299.915615069914	278.7	273.1
268.345820509238	299.915615069914	275.6	273.1
268.38548306387	294.286618726076	249.6	303.2
268.38548306387	294.286618726076	234.6	297.7
268.43043952249	287.916102817783	290.6	273.1
268.467902904435	282.606551500122	308.7	273.1
267.091385158168	279.903681288319	305.5	273.1
265.301548464105	276.389274307997	301.6	260.7
265.301548464105	276.389274307997	293.7	273.1
263.200910582084	272.264631497142	248	280.4
261.114770810883	268.168432898985	240.2	281.9
258.987978898594	263.992374805416	236.2	280.4
256.794862064437	259.686025361326	233.1	280.4
254.441658502305	255.065264287027	283.5	260.7
254.441658502305	255.065264287027	286.6	254.4
250.429827309956	247.187736537636	252.8	260.7
245.855107497746	238.204883234296	255.9	254.4
239.845694434587	226.404833059042	222.8	206.3
236.178551390311	219.204093542145	231.5	198.5
236.178551390311	219.204093542145	227.6	198.5
233.862167445275	214.655747174552	234.6	198.5
231.778139292922	210.563672362882	227.6	182.7
231.778139292922	210.563672362882	222	196.1
230.373622045135	207.80587023594	234.6	182.7
230.373622045135	207.80587023594	231.5	182.7
229.396063951695	205.886432203985	231.5	164.6
229.396061401023	205.886436071793	227.6	164.6
229.396060378347	205.886437121643	208.7	170.1
227.591650810847	211.878974957773	191.3	196.1
224.213066012814	223.100574307375	192.1	206.3
219.012224626531	240.37868748506	215	254.4
214.629299791514	254.94051129048	211.8	260.7
210.17954248785	269.722440603419	181.1	260.7
210.17954248785	269.722440603419	184.3	254.4
204.479090073687	288.662032288166	218.9	286.7
197.642514835883	311.377625145381	234.6	315.8
Route: 5 Length: 599.856715138223 Demand Met: 945			
209.586793284322	305.943248221054	231.5	297.7
209.586793284322	305.943248221054	227.6	297.7
218.178193515477	284.711599795008	224.4	280.4
225.203645597526	267.35058884906	240.2	288.2
225.203645597526	267.35058884906	222	285.1
243.160090793635	222.97552726568	263.8	206.3
250.337112578342	205.239756586921	263	196.1
255.958154483825	191.349398779736	294.5	206.3
260.922024949541	177.981513134005	293.7	196.1
269.814448758164	154.032478145243	308.7	140
269.814449327345	154.032472474583	301.6	127.6
269.221920821889	154.080678198129	305.5	140
268.099057230948	154.172045737637	286.6	121.3
266.443893324197	154.306758781753	290.6	140
266.443893324197	154.306758781753	278.7	140
264.210615640634	154.488555345171	283.5	127.6
264.210615640634	154.488555345171	275.6	140
261.263872527155	154.728457055823	293.7	140
255.310103524527	155.213159684095	280.3	170.1
255.310103524527	155.213159684095	249.6	170.1
247.724869487566	155.830622666428	255.9	121.3
235.201341478797	156.850116700758	234.6	164.6
223.457397509798	157.806119936629	248	147.3
223.457397509798	157.806119936629	240.2	148.8
223.457397509798	157.806119936629	215	121.3
223.457397509798	157.806119936629	240.2	155.1
223.457397509798	157.806119936629	236.2	147.3
223.457397509798	157.806119936629	233.1	147.3
223.457397509798	157.806119936629	211.8	127.6
223.457397509798	157.806119936629	224.4	147.3
223.457397509798	157.806119936629	222	152

Solution x	Solution y	Original x	Original y
223.457397509798	157.806119936629	218.9	153.6
199.463554036123	159.758591163161	184.3	121.3
196.065388088804	162.451264555977	181.1	127.6
188.319060271761	168.587490760104	161.4	162.2
184.614047092697	171.521765694049	178	170.1
184.614047092697	171.521765694049	161.4	182.7
180.895904969943	174.466999941447	155.1	162.2
180.895904969943	174.466999941447	155.1	182.7
177.96569720987	176.788675635007	148.8	162.2
175.460827651225	178.77357372316	142.5	162.2
173.260372659054	180.517324564144	136.2	162.2
173.064321295414	191.640464944934	142.5	182.7
173.064321295414	191.640464944934	148.8	182.7
172.791511577205	207.145172621496	148.8	198.5
172.458040780127	226.095040592162	161.4	198.5
172.458040780127	226.095040592162	155.1	198.5
Route: 6 Length: 830.480515846292 Demand Met: 948			
165.173625564349	178.056162542638	173.2	152
164.651960132378	149.342352492014	141.7	150.4
164.139478258974	121.09367769875	122.8	121.3
164.355980111887	94.5839700156957	148.8	65.4
164.428203062006	85.7332194895425	129.9	63
166.66115969017	84.7508432890609	136.2	65.4
169.499782203171	83.5019976062616	142.5	65.4
172.917064427244	81.9985681500239	161.4	65.4
176.462654968816	80.4386927304263	155.1	65.4
180.467899619886	78.6765903298287	155.1	49.6
188.308449385667	75.2271623899078	191.3	63
195.505764691377	72.0607214262765	192.1	73.2
203.011031620486	68.7587949376955	208.7	37
208.153307425133	66.4964560867993	227.6	49.6
212.189987960004	64.7205262934034	234.6	65.4
215.67324993941	63.188071785188	222.8	73.2
219.126186166555	61.6689569199678	222	63
222.574602711653	60.1518293393028	227.6	65.4
225.991448303182	58.648590282682	231.5	49.6
225.991448303182	58.648590282682	231.5	65.4
229.230176398133	57.2237142335728	218.9	20.5
232.01046129953	56.0005129038403	227.6	31.5
234.705218840537	54.8149393242551	234.6	49.6
237.368064103595	53.6434036288678	222	18.9
240.058178819164	52.4598537993624	224.4	14.2
242.802622858382	51.4191111381087	231.5	31.5
245.60175583258	50.3576242232336	234.6	31.5
248.455324932657	49.2754880265917	233.1	14.2
251.492049997991	48.1238704995262	236.2	14.2
254.709074115543	46.9038538548697	249.6	37
257.943412366648	45.6772601573671	240.2	15.7
261.571132108752	44.3014601836857	240.2	22
265.928123569273	42.6490725232323	248	14.2
271.284598500667	40.6176179486932	275.6	6.9
275.084321260457	39.1765415894701	290.6	6.9
277.554132096585	38.2398520790949	293.7	6.9
279.448820394158	37.5212796718701	305.5	6.9
280.495589599186	37.1242855650087	308.7	6.9
279.412987624931	40.7108126931141	280.3	37
278.291626478531	44.4257401492266	278.7	6.9
274.663111388499	56.4464342451836	293.7	63
271.05274630613	68.4069271514846	294.5	73.2
267.205640329802	81.1515733919911	263	63
261.653366781818	99.5449146788309	263.8	73.2
247.429932963197	146.667116108034	252.8	127.6
Route: 7 Length: 168.923261364692 Demand Met: 587			
173.202635770978	395.476195333619	181.1	393.8
176.577745084941	386.807406540454	184.3	387.5
179.694740134898	378.801428495983	211.8	393.8
183.613485710418	368.735806908485	215	387.5
190.157023645318	351.924719575034	222.8	339.4
192.776250711569	345.195651095139	227.6	331.6
193.998770044626	342.054617189568	192.1	339.4
195.194598186126	338.982338484109	234.6	331.6
195.645438933001	337.824020680367	227.6	315.8
195.983396093458	336.955785624007	231.5	315.8
194.649582005031	336.78802834802	231.5	331.6
192.52788040384	336.52122707995	222	329.2
189.875143082554	336.187696236847	191.3	329.2
187.145710342321	335.844558581223	208.7	303.2
180.686565462107	335.033006009736	178	303.2
175.042843728723	334.323957503417	161.4	295.3
174.281185886363	335.104613811995	148.8	331.6

Solution x	Solution y	Original x	Original y
173.51638433407	335.888515009004	161.4	315.8
172.706914816225	336.718231451872	155.1	315.8
171.867950443294	337.578230149141	148.8	315.8
171.033016285623	338.434159599865	142.5	315.8
170.265196785532	339.221328953216	136.2	315.8
169.648506692196	340.560120872274	129.9	329.2
169.283412185496	343.460621831142	161.4	331.6
168.904222049217	346.473621850234	155.1	331.6
168.486507629959	349.7920727908	142.5	331.6
168.011766358826	353.563468167462	136.2	331.6
164.060511969699	384.937466969146	122.8	387.5

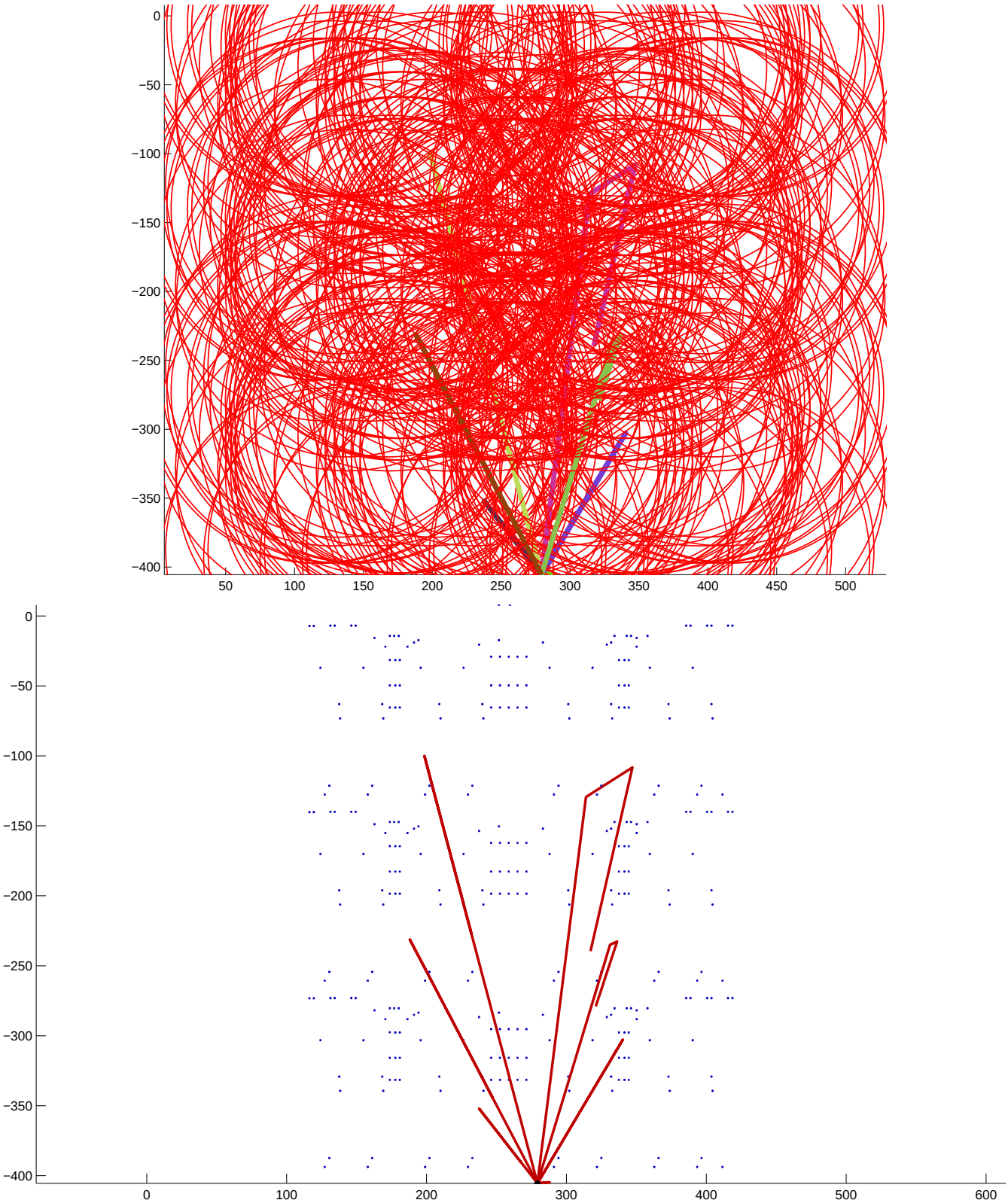


Figure O.16: $lin318$, $r = 124.02$, Equal Radius, 2D, Euclidean, Length = 2406.1951812

Table O-19: Solution for *lin*318, $r = 124.02$, Equal Radius, 2D, Euclidean

Total distance: 2406.19518118537 Total demand met: 6261 Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 135.516095313908 Demand Met: 934			
163.493788837267	398.072166311544	148.8	331.6
158.744255904256	391.995203770835	155.1	315.8
154.142366770042	386.106403837462	148.8	315.8
150.433791157819	381.360829937579	136.2	315.8
147.361047999245	377.429156315371	116.5	303.2
144.618362742635	373.919888756097	136.2	295.3
142.375767694545	371.050546413623	142.5	295.3
140.286060581977	368.376625089689	148.8	295.3
138.164221591091	365.661372878405	141.7	283.5
136.091417301411	363.008718946174	127.6	286.7
134.074227201281	360.42712639633	119.7	260.7
132.233789440733	358.071628341212	122.8	254.4
130.550136872931	355.916701141749	92.1	254.4
129.031492326781	353.972878627321	89	260.7
127.577135511977	352.111280369641	51.2	254.4
127.63274607576	352.182866864714	48	260.7
127.689412738825	352.255994631955	39.4	273.1
127.749703374158	352.333788995353	44.9	303.2
127.80943016012	352.410919839975	14.2	303.2
128.346297173866	353.098024987228	27.6	329.2
128.90029356343	353.807038329368	28.3	339.4
129.466596962162	354.531778079177	20.5	387.5
130.02731018083	355.249292311304	17.3	393.8
130.62259738307	356.011031865117	48	393.8
131.190184873938	356.737297857726	51.2	387.5
131.73215504548	357.430767400525	59.1	339.4
132.275749294468	358.126311626019	58.3	329.2
132.82187510893	358.825093631469	63.8	331.6
133.365231007433	359.520333866236	67.7	331.6
133.908265245464	360.215166823677	70.9	331.6
134.454988075515	360.91472704048	70.9	315.8
135.017297532214	361.63423903273	67.7	315.8
135.599831098154	362.379634589127	63.8	315.8
136.207403688665	363.157070173503	70.9	297.7
136.853449735413	363.983740153401	63.8	297.6
137.550049396703	364.875090218051	60.6	288.2
138.338757384196	365.884288939782	63.8	280.4
139.296275395981	367.10948524346	66.9	280.4
140.469030230569	368.610064785185	70.1	280.4
141.93018893872	370.479650503854	76.4	288.2
143.535252153718	372.533281410516	81.1	285.1
145.451293022511	374.984868442348	84.3	283.5
148.289107457248	378.616276149621	85.8	303.2
152.163541766842	383.574360019147	99.2	329.2
157.003028524715	389.767385775792	100	339.4
157.597106306724	390.527545165825	130.7	339.4
Route: 2 Length: 632.026182459998 Demand Met: 950			
110.659650771339	183.896129267739	51.2	121.3
100.319782877922	144.821781751481	28.3	73.2
94.6708494818533	123.474317107187	27.6	63
90.8246201212152	108.939291546241	14.2	37
88.4596157086312	100.001873180694	6.3	7.1
88.4596157841839	100.001873187041	9.40000000000001	7.1
88.4596158590471	100.001873189011	21.3	6.9
88.4596159366415	100.001873185908	24.4	6.9
88.4596160180308	100.001873182788	36.2	6.9
88.4596161027979	100.001873179459	39.4	6.9
88.4596161897485	100.001873163805	52.8	15.7
88.4596162775996	100.001873153531	60.6	22
88.4596163652852	100.001873163854	63.8	14.2
88.4596164524432	100.001873163062	66.9	14.2
88.4596165389633	100.00187316247	70.1	14.2
88.4596166248204	100.001873158551	84.3	17.3
88.459616709747	100.001873155168	81.1	18.9
88.4596167940233	100.001873149719	76.4	22
88.4596168779546	100.00187313639	70.9	31.5
88.4596169617546	100.001873136038	67.7	31.5
88.4596170455991	100.001873135864	63.8	31.4
88.459617129702	100.001873127776	44.9	37
88.4596172145688	100.001873103538	58.3	63
88.4596173000627	100.00187309566	59.1	73.2
88.4596173862997	100.001873102537	63.8	65.4
88.4596174733104	100.001873103101	67.7	65.4
88.4596175610233	100.001873103479	70.9	65.4
88.4596176493359	100.001873117277	63.8	49.6
88.4596177383926	100.001873117532	67.7	49.6
88.4596178281263	100.001873117556	70.9	49.6
88.4596179186081	100.001873131964	85.8	37
88.4596180096607	100.001873134528	116.5	37
88.4596181006704	100.001873156468	127.6	20.5
88.4596181914699	100.001873208812	141.7	-7.9
88.4596182823855	100.001873206812	149.6	-7.9
88.7387719418892	101.056834882437	141.7	17.3
89.0347238113274	102.175281470673	136.2	29.1
89.3437613805425	103.343182246424	142.5	29.1
89.666352738052	104.562305128638	148.8	29.1
90.0044401897113	105.839987965476	155.1	29.1
90.3614395963966	107.189135501787	161.4	29.1
90.7436027008382	108.633367483503	173.2	18.9
91.8312839012451	112.743745934163	178	37
93.243365185948	118.080032342745	161.4	49.6
94.7916379966364	123.931012883598	155.1	49.6
96.5359730075483	130.522932259054	148.8	49.6
98.6439624625054	138.489090856726	142.5	49.6
101.405016950014	148.923199226581	136.2	49.6
106.139234420306	166.813931412448	148.8	65.4
122.186756133501	227.458482356418	136.2	162.2
Route: 3 Length: 17.5926663524439 Demand Met: 577			
169.690801376	405.465562709919	122.8	387.5
170.079093471162	405.431336883793	119.7	393.8
170.560117764716	405.38886215024	89	393.8
171.005866385281	405.349346343174	92.1	387.5
171.442894630547	405.310572636204	129.9	329.2
171.941014261984	405.266424619436	136.2	331.6
172.534198483959	405.213990345632	142.5	331.6
173.2063027402	405.154810243056	161.4	331.6
173.909727681872	405.093101908633	191.3	329.2
174.591935524749	405.033362355715	192.1	339.4
175.245778859842	404.97607688492	222.8	339.4
175.83296575805	404.924542653801	222	329.2
176.364571891394	404.877829062469	227.6	331.6
176.846758230157	404.835354022136	231.5	331.6
177.285016172245	404.796631570984	234.6	331.6
177.693896997942	404.760441840112	286.6	387.5
178.062372994711	404.727804558175	301.6	393.8
176.984810075395	404.822849189695	283.5	393.8
175.658260263674	404.93995338233	255.9	387.5
174.223490625608	405.066573874225	252.8	393.8
172.725960205471	405.198639695355	215	387.5
171.479442980674	405.308274768513	211.8	393.8
169.942757722958	405.444180216238	181.1	393.8
Route: 4 Length: 622.604037253392 Demand Met: 950			
198.639241174934	171.850914258179	92.1	121.3
202.96704060228	137.382501909202	100	73.2
203.974657910086	129.356857102967	99.2	63
204.935680347734	128.745808686218	130.7	73.2
205.725460362834	128.243634186049	129.9	63
206.502310438959	127.749651881618	136.2	65.4
207.384971399309	127.188330301559	142.5	65.4
208.397361734036	126.544480494091	155.1	65.4
209.516129862685	125.83299618929	161.4	65.4
210.703700404543	125.077789643941	191.3	63
211.904171586311	124.314411522982	192.1	73.2
213.107800124496	123.549040487034	222.8	73.2
214.280065242184	122.803627046898	222	63
215.428456081418	122.073404901643	227.6	65.4
216.552415413815	121.358726599526	231.5	65.4
217.651539613028	120.659847150348	234.6	65.4
218.724314572279	119.977730130314	227.6	49.6
219.776167182767	119.308921485983	231.5	49.6
220.805467890015	118.654458140457	234.6	49.6
221.815326537901	118.012362055205	249.6	37
222.79483881124	117.389574224303	234.6	31.5
223.757844478051	116.777286286957	231.5	31.5
224.708481213835	116.172866195214	227.6	31.5
225.651060290934	115.573570835561	208.7	37
226.601953953184	114.968984143498	218.9	20.5
227.549819624809	114.366321788979	222	18.9
228.495858584519	113.764821730061	224.4	14.2
229.437472283317	113.166136870119	233.1	14.2
230.371180947296	112.572482536848	236.2	14.2
231.296501037192	111.98416760922	240.2	15.7

Solution x	Solution y	Original x	Original y
232.213339573615	111.401253310488	240.2	22
233.127479801795	110.820064461695	248	14.2
234.023777250962	110.25023413221	275.6	6.9
234.848958088789	109.725637396239	278.7	6.9
235.600332714725	109.247982422038	290.6	6.9
236.249596120081	108.835257908688	293.7	6.9
236.804643243138	108.482438445565	305.5	6.9
237.197334882019	108.232771442051	308.7	6.9
235.734996040166	114.635275691468	280.3	37
234.023429685968	122.129210350516	263	63
232.180849865833	130.197117426658	263.8	73.2
230.154613598318	139.069265625183	293.7	63
227.323464518095	151.465062768644	294.5	73.2
223.062652029178	170.119689572017	286.6	121.3
217.750276827798	193.37815855669	301.6	127.6
207.205578510645	239.544777937743	280.3	170.1
Route: 5 Length: 239.089222639339 Demand Met: 950			
173.522536700304	398.393380519893	184.3	387.5
178.045642872055	390.780905473338	227.6	315.8
182.020166597085	384.091572754204	231.5	315.8
185.620052434138	378.032630616646	234.6	315.8
188.886182975429	372.535264300223	263	329.2
191.831473645118	367.577731911759	263.8	339.4
194.581708103997	362.948405947407	294.5	339.4
196.912750940167	359.024564721048	293.7	329.2
198.91384750961	355.656040099931	280.3	303.2
200.648907073439	352.73529340466	249.6	303.2
202.278159673067	349.992639238973	234.6	297.7
203.831067593797	347.37849716673	231.5	297.7
205.336735741391	344.843880822038	227.6	297.7
206.8163844412	342.353075702626	208.7	303.2
208.293168396449	339.867117059007	218.9	286.7
209.746193779506	337.421166825348	222	285.1
211.171032553299	335.0226750638	224.4	280.4
212.560630912654	332.683512048892	233.1	280.4
213.908506548575	330.414584679033	236.2	280.4
215.215009219443	328.215303014966	240.2	281.9
216.482995981379	326.080856877742	240.2	288.2
217.722795651595	323.993860588794	248	280.4
218.925926516744	321.968585938609	252.8	260.7
220.07864737073	320.028158853699	255.9	254.4
221.18174942582	318.17124804836	275.6	273.1
222.247074269363	316.377920605327	278.7	273.1
223.283202635775	314.633734889627	290.6	273.1
224.285802107921	312.945983169734	293.7	273.1
225.257782351537	311.30976860549	305.5	273.1
226.189138171766	309.741933256491	308.7	273.1
227.08061437778	308.241223177912	301.6	260.7
227.936040605296	306.80119301914	283.5	260.7
228.784840996985	305.372313696562	286.6	254.4
229.63020363057	303.949217732004	294.5	206.3
230.357863028172	302.724266287711	293.7	196.1
229.701015907447	303.830093716636	263.8	206.3
228.978367728686	305.046696484267	263	196.1
228.095140780507	306.533635475945	234.6	198.5
227.084793248385	308.234578050795	231.5	198.5
225.892434540706	310.241926933155	227.6	198.5
224.407368802155	312.742030720532	222	196.1
221.832112496289	317.077230288332	222.8	206.3
217.719157044188	324.000552956687	215	254.4
213.472799208935	331.148208100809	211.8	260.7
209.166080289386	338.397233098712	184.3	254.4
204.40301245489	346.41435514928	181.1	260.7
198.950827496172	355.59154215398	173.2	285.1
193.145942688667	365.363174078213	161.4	295.3
186.672002780942	376.260969351735	178	303.2
179.616507729513	388.136164676531	161.4	315.8
170.353172664247	403.727138517164	155.1	331.6
Route: 6 Length: 365.811841026534 Demand Met: 950			
185.390708434347	352.615384559579	142.5	315.8
196.321083798655	316.690893223543	155.1	295.3
207.468532701993	280.052865064537	161.4	182.7
211.580288126443	266.538687782077	155.1	182.7
214.322693757599	257.525143769837	148.8	182.7
216.584140670951	250.092365367859	142.5	182.7
218.791055739735	242.838824397132	136.2	182.7
220.884850960302	235.957080000293	116.5	170.1
221.180084979388	234.986298219714	127.6	153.6
221.437914524063	234.866664235163	141.7	150.4
221.783204129949	234.706420482133	142.5	162.2

Solution x	Solution y	Original x	Original y
222.138976367797	234.541303411293	148.8	162.2
222.496504104282	234.375367105687	155.1	162.2
222.852031914818	234.210356393379	161.4	162.2
223.204645913404	234.046696616859	178	170.1
223.551753526218	233.885591584189	173.2	152
223.897443100082	233.725144446981	181.1	127.6
224.245272376392	233.563690340965	184.3	121.3
224.590054921908	233.403645628967	211.8	127.6
224.932704658039	233.244589942373	215	121.3
225.273961992695	233.086180023469	252.8	127.6
225.60739438108	232.931402290606	255.9	121.3
225.933136466957	232.780198307698	283.5	127.6
226.241783711618	232.63694999486	308.7	140
226.15695376178	232.894302348003	305.5	140
225.872041353637	233.758992304323	293.7	140
225.536890390424	234.776202559317	290.6	140
225.144578180394	235.966926116294	278.7	140
224.71145114374	237.281537801999	275.6	140
224.227353602911	238.750852536969	248	147.3
223.718428240719	240.295523669798	240.2	155.1
223.188501838393	241.90393594657	240.2	148.8
222.625393029298	243.613053633196	236.2	147.3
222.018765773992	245.454237722062	233.1	147.3
221.357473962758	247.461302234303	224.4	147.3
220.627902699332	249.675545171122	222	152
219.82488146134	252.112636303851	218.9	153.6
218.931524529769	254.823784840059	208.7	170.1
217.975601428367	257.724734679218	227.6	164.6
216.919868046747	260.928464702064	231.5	164.6
215.733123358794	264.529585566512	234.6	164.6
214.34796832454	268.732332762799	249.6	170.1
212.685264890308	273.776015754974	234.6	182.7
211.10439491518	278.569656547579	231.5	182.7
210.961599643156	279.002649943558	227.6	182.7
Route: 7 Length: 393.555136139754 Demand Met: 950			
111.843477116988	295.780010933204	192.1	206.3
105.736099779486	284.115684457869	191.3	196.1
104.108393317518	281.006816449941	161.4	198.5
102.679502363295	278.277669737468	155.1	198.5
101.380530062204	275.796802155233	148.8	198.5
100.192343171722	273.527644227351	142.5	198.5
99.0836214282221	271.410266256323	136.2	198.5
98.0173643514255	269.373930043163	129.9	196.1
96.9849758512755	267.402200187838	130.7	206.3
95.9665348818478	265.457046044815	100	206.3
94.972687569642	263.558816103041	99.2	196.1
94.0169417018031	261.733327234296	70.9	198.5
93.1006994459114	259.983262530885	67.7	198.5
92.2190180389754	258.299192233515	63.8	198.5
91.3665596749237	256.670928006701	59.1	206.3
90.533085368649	255.078920585235	58.3	196.1
89.7255654788921	253.536481446288	63.8	182.7
88.9508710345497	252.056735026762	67.7	182.7
88.2035206244514	250.629216081137	70.9	182.7
87.4792277717066	249.245740118461	85.8	170.1
86.7811148301993	247.912276458146	70.9	164.6
86.1155509418542	246.640979924617	67.7	164.6
85.4788218344959	245.424756886606	63.8	164.5
84.8673716547691	244.256816206327	44.9	170.1
84.2795585595977	243.134016103724	52.8	148.8
83.7290129678051	242.082392048443	60.6	155.1
83.201557394833	241.074867611196	63.8	147.3
82.6994836527104	240.115819744565	66.9	147.3
82.2187665252275	239.197560329994	70.1	147.3
81.7555521441815	238.3127287021	76.4	155.1
81.3015831507363	237.445554447012	81.1	152
80.856437440106	236.595230792909	84.3	150.4
80.4201267746033	235.761779322096	119.7	127.6
80.0147273906546	234.98736885243	122.8	121.3
79.7025426317044	234.390994714449	89	127.6
79.3982480591628	233.809690061713	48	127.6
79.1078432859016	233.254910703118	39.4	140
78.8227795631241	232.710329166544	36.2	140
78.543522611525	232.176834603524	24.4	140
78.2748126395336	231.663477845826	21.3	140
78.0191227368601	231.174979714392	20.5	121.3
78.5023669571235	232.097948209503	17.3	127.6
79.221559022034	233.471542932594	9.40000000000001	140.2
80.1967717276584	235.334083401257	6.3	140.2
82.2677341231204	239.289322351049	14.2	170.1

Solution x	Solution y	Original x	Original y
84.7586789000285	244.046620823616	27.6	196.1
87.5013624645097	249.284685594117	28.3	206.3
90.5381262343709	255.084385323563	20.5	254.4
93.7461900986054	261.21121583485	17.3	260.7
97.2195473461732	267.844627559166	6.3	273.3
101.027139040334	275.115880183734	9.40000000000001	273.3
105.198034650809	283.08082397343	21.3	273.1
110.181112285568	292.597061586176	24.4	273.1
116.585404293066	304.827785790016	36.2	273.1
125.520368686446	321.891621816078	52.8	281.9
137.365410894109	344.513043490938	67.7	297.7

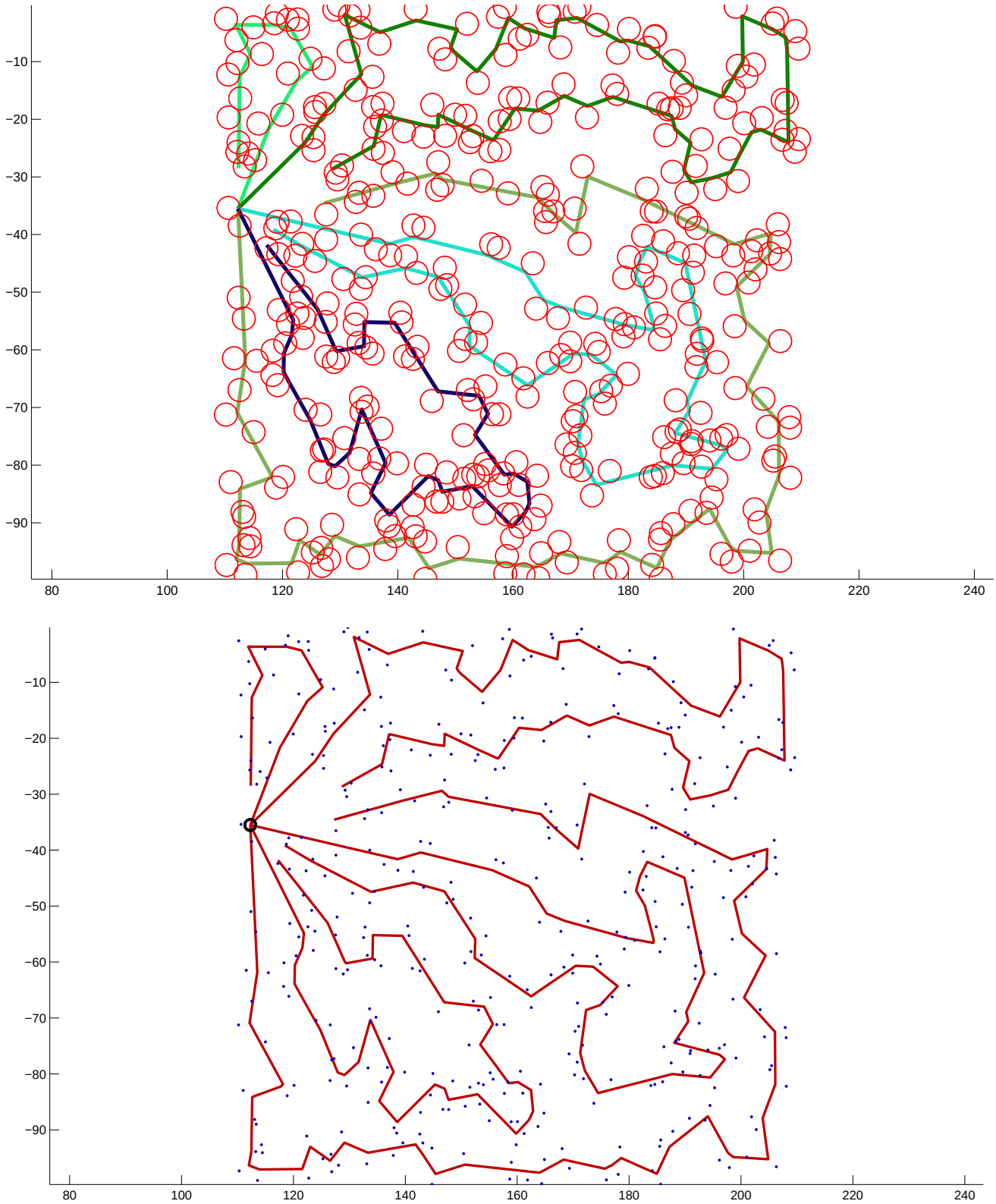


Figure O.17: $rd400$, $r = 1.9910618$, Equal Radius, 2D, Euclidean, Length = 1199.4870122

Table O-20: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 2D, Euclidean

Total distance: 1199.48701221812 Total demand met: 3297 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 349.499008071543 Demand Met: 797			
3.0057430031993	50.6580257255596	2.40393	50.9808
3.20062426061497	54.7435872619427	3.30116	54.5758
3.51190454842356	61.2694284574954	1.5771	61.4642
3.53750553435226	61.8061660429564	5.52590000000001	61.9092
2.76026729728056	66.9134203014366	2.55217	66.9796
2.15555632269528	70.8870312154319	0.194864999999993	71.2335
4.29829860230399	74.8015991095027	4.99968	74.2733
8.1429767989309	81.8254083408679	10.1219	82.045
7.76879673000315	82.2504624405559	8.89064000000001	83.8954
2.64517885229962	84.1101271167069	1.02508	82.9527
2.56531891631782	88.544571874137	3.35356	88.986
2.56531891631782	88.544571874137	3.06059000000001	88.1315
2.49545886826658	92.4227857729355	4.28894	92.6489
2.47987663373863	93.2881859781487	3.24988	93.8751
2.46897756809692	93.8935586679335	4.45068999999999	94.0863
2.03272959859612	96.3481164472164	0.299018000000004	97.3272
3.93031397286551	97.0769477239664	3.57801000000001	99.0366
11.5738616945213	96.9933072692038	12.7313	98.6134
12.9871611126218	93.011233894245	12.3803	91.1149
15.3432636333252	94.6587513121584	15.2733	95.1553
16.5621473596624	95.5110347845057	16.854	97.4806
16.890938710515	95.0929046605728	18.064	96.3276
17.5748370196204	94.2231969928962	16.7243	94.3593
19.1049110548859	92.2775068870589	18.6101	90.3489
23.3369202275813	94.0773988592663	23.1083	96.0553
28.4621962844984	93.1871127669719	27.8353	94.5623
28.4621962844984	93.1871127669719	29.5533	92.3189
31.8344844072727	92.6013256839879	32.5896	90.759
32.3296054915497	93.2937592239145	33.1283	92.3481
33.1083062678929	94.3827222790637	34.7487	93.2543
35.4176485185996	97.8732104267539	34.7579	99.7518
40.618697530512	96.2026374962768	40.4171	94.2218
48.7835042598853	97.0876220228981	48.6626	98.7924
48.7835042598853	97.0876220228981	48.9418	95.7946
51.9232523228837	97.4279406131074	51.8363	98.9629
53.9880341014776	97.6517465296194	54.3707	99.6057
55.7300448120929	96.711853458319	54.8665	95.2849
58.3127496221557	95.3183987682972	58.0371	93.3465
59.9561749323762	95.6808168053761	59.3326	96.8644
65.6784006856213	96.9426979048921	65.9332	98.9174
66.9842830895107	96.2733073851244	68.0526	97.9535
68.5944753759152	95.0256687800616	68.3546	93.0491
73.4869833465018	97.1954925724625	74.1314	97.2935
74.9423020672773	97.8409407321692	75.6359	99.7073
76.8055870092116	93.900843755732	75.4786	92.9344
77.2189602292017	93.0266874778864	75.6586	91.7899
78.9457783177439	91.652678155492	77.8131	90.2453
81.8295679811166	89.3580776055511	80.7777	87.9354
83.1436651498835	88.3124735758274	83.5669	88.2708
84.0689727055665	87.576219151864	84.4594	85.6238
87.6735453765155	94.1125837723133	86.1563	95.4019
88.638579322754	94.870896382523	87.9339	96.7331
91.1747405511497	95.0169432296015	91.0373	94.8618
94.8620574131799	95.2292915068302	96.3227	96.5824
94.1474226484617	89.9242935825931	92.7385	89.9534
93.8733840468574	87.8901715622312	91.8947	87.6684
96.1275230226377	81.8494320846573	98.0879	82.1977
96.1108127599678	78.8141966832966	95.1537	79.2325
96.1108127599678	78.8141966832966	95.4573	78.5053
96.0817830620371	73.5272501328374	98.0725	73.509
96.067108316102	72.4376497070357	97.9153	71.697
95.6708718807006	72.0108049231051	94.2046	73.3577
92.9504037688294	69.0193222055606	93.4248	68.5015
90.5446618461385	66.3739692706064	88.5712	66.6382
94.3872564037347	58.8425331034329	96.3481	58.4969
90.1680376084927	54.9112170295677	88.4474	55.9131
88.7681608727523	49.0343372141631	86.8559	48.4797
91.0124292763672	46.847829219084	92.0634	46.0336
91.0124292763672	46.847829219084	90.8764	48.3318
94.5106798793832	43.439463290311	96.3235	44.2629
94.5542212036095	42.6385269841669	94.61	43.2995
94.6334529999372	41.1812593599005	96.1419	41.3034
94.7086876519663	39.7975687891343	95.9404	38.2332
92.4083768933087	40.4870457644538	92.3029	41.017
90.7691491182993	40.9783370402449	91.3249	42.8902
88.3733791471665	41.6529909884962	88.1955	43.6361
85.9383140969236	40.4664886565311	85.2354	42.0312
80.7908393275774	37.9583311885211	81.8496	38.8539
80.7908393275774	37.9583311885211	80.5435	37.2793
80.7908393275774	37.9583311885211	80.0506	36.8529
74.92753708403	35.1014018342235	74.7866	36.0265
74.92753708403	35.1014018342235	74.0572	35.987
72.3906698977668	33.8653011521185	73.2088	32.0501
62.9439331749131	29.943200714535	62.0154	28.1819
61.7496800733566	35.6308344281564	60.6972	35.5066
60.892089628551	39.715870642676	61.5258	41.6034
57.0702854291229	36.3906514532682	55.717	37.8511
56.3893511415208	35.718801184161	56.9788	35.9946
55.2558843359363	34.6004343210647	56.0389	33.1015
55.2558843359363	34.6004343210647	55.5492	35.9315
54.1765735286488	33.5355049882373	55.099	31.771
49.1753968557697	32.6011107368541	49.1148	32.8614
44.3178823712132	31.6935550475215	44.5404	30.686
38.6929723453625	30.6426387002081	37.7688	31.4408
37.7325172061822	30.4631950902099	36.8488	32.2474
36.5451521125596	29.3899326978137	37.0272	27.4581
31.8623867320881	30.5654266024308	31.6686	31.1822
29.6140581634542	31.1298263104478	29.1053	29.2049
24.5765112497851	32.5282983751133	25.7714	33.2927
24.5765112497851	32.5282983751133	23.2874	32.7742
22.1734167485023	33.1953958378824	22.7183	34.3604
17.2711193662297	34.5562742423958	17.6023	36.5196
Route: 2 Length: 78.2476348808223 Demand Met: 209			
5.18159540121459	27.9473982026295	5.25835000000001	27.1001
5.75955926229238	26.4395888589623	4.056	25.9589
7.61146294519335	21.6104530800041	5.81823	20.7452
9.3632900171857	18.6422662831223	9.96077	19.2347
12.4935786655447	13.338506705254	10.9524	12.0779
15.2190751221208	10.8812678067905	17.1854	11.1942
14.30716411159	9.29548929406321	14.8737	9.51072
12.0640214458955	5.39495228077035	12.7116	4.29147
11.4341997342134	4.29981122209839	12.6307	2.70835
10.3918360519471	4.04422455090987	10.9477	2.73525
8.80800407398414	3.65590587352343	9.0496	1.67955
7.69183432507388	3.65268134856363	8.57052	3.36732
4.93678998179918	3.6444179305453	4.96047	4.06059
1.91126391087376	3.63524119368707	0.219756000000004	2.58493
3.05545773886261	5.93342695265834	2.00806	6.28968
4.44349061224753	8.72131537927303	6.43447000000001	8.70233
3.42229016173685	10.8769324786904	2.19732	10.251
2.55348497075471	12.7107980175695	0.613562000000002	12.2624
2.51007473392916	16.3624149903543	2.68873000000001	16.3883
2.4699677706483	19.73315599644	0.659450000000007	19.6999
2.42375056773275	23.6405805056315	2.38826	24.0295
2.39791300237597	25.8215979855685	2.1823	25.6845
2.3664011713321	28.486380418955	3.44571000000001	28.2052
Route: 3 Length: 294.79103962756 Demand Met: 791			
13.8573430636857	24.1183957550322	15.3897	25.3897
14.4130610835277	23.2912599934308	13.4	22.8874
15.1146830854195	22.246954931503	15.3759	23.0999
16.6788147973541	19.9188369185023	15.6993	18.7479
17.2036413315542	19.13768058943	15.6444	17.8995
18.3896832006398	17.8661407717501	17.2907	17.3232
21.7697218816799	14.2425279379465	22.6997	14.9199
23.6880574162533	12.1859008359798	25.6231	12.6549
22.4674920976581	7.86121176509787	21.4744	8.21886
20.7818028519731	1.88848642953445	19.7287	0.198716
20.7818040277611	1.88848685909663	19.0116	0.977048
21.5816083422846	2.28176722499891	21.7245	2.01127
22.4354732783932	2.70162815247479	23.1984	1.0131
24.1144830243873	3.52717629979748	23.5387	4.13129
26.9388549719304	4.91588793043282	26.7979	6.90196
33.2084737039094	2.87130826425237	33.1085	0.882753
40.2794287042615	4.41365285549474	42.0178	3.44287
39.1900197201808	7.51989433591711	37.2177	7.79249
39.7221742528292	8.27783137992803	38.2491	9.61738
43.7329028632389	11.7057394261244	43.8962	13.6901
46.9937374823373	7.82942223269025	48.6979	8.85907
48.9146842212379	3.12456852223535	47.3917	2.23053
49.1918186720702	2.44571755535783	48.5894	0.54797
51.9990850065487	4.23876970355669	51.1528	6.04103
53.3093361640643	4.65786751281918	52.4925	5.37248

Solution x	Solution y	Original x	Original y
57.1379401522248	5.88270837895271	58.2097	7.56071
57.4784490436973	3.16912817507732	56.3237	2.07366
57.5216032868544	2.8248179111653	56.1254	1.40532
60.2332652667771	2.53121276822381	60.7013	1.36116
61.1199407867956	2.43521066759168	61.5069	0.482106
64.3591701195899	4.20072892415606	64.5769	3.66176
68.602387752609	6.51344060107497	68.2389	8.47105
69.9678576495671	6.33198900856641	70.1018	4.34543
72.7055208273565	7.0825829344991	73.4709	7.6166
73.5533352893138	7.31502499441635	74.5771	5.70821
73.6675382202947	7.34632691897661	74.632	5.60444
77.1660730901868	10.5637523198681	77.911	9.90186
79.6827845784078	12.8783112007599	79.2919	13.6517
81.0826522239475	14.1657421611557	80.035	15.8589
86.217573472303	16.1255979367007	86.8707	18.0065
87.3025553151995	14.3064936920379	88.2698	14.9994
88.8610275223274	11.6935264564715	90.4883	12.6216
89.3566670960184	10.8625855712053	88.9914	10.7701
89.8662942179084	10.0082107636597	91.7898	10.5225
89.7449564047752	2.1469580732558	88.6343	0.494442
94.0550436612254	3.98312142873746	95.0473	3.39817
94.854300124511	4.32361196148469	95.7659	2.55349
97.281581628252	5.80650602540889	98.9579	4.73211
97.5297545530558	7.90733927042893	99.5164	7.77478
97.6596463568049	16.1277309946281	96.7716	16.6523
97.6844576776741	17.6977407020425	97.4766	17.1802
97.7472239513148	21.668485650505	97.2905	22.0419
97.7737731247193	23.3481769823319	99.5853	23.4577
97.7837905382283	23.9801175878587	98.8743	25.646
96.3528164845748	23.3283006605155	96.7473	23.5618
92.9971263887439	21.800069228369	93.1464	19.8146
91.3576183817582	22.2670145464342	90.11	20.7153
89.3265241325807	26.0389749552696	87.5589	25.1226
87.7448754360643	29.2099931455928	89.036	30.7257
84.5729359983639	30.2017966729874	85.0689	32.1301
80.9221130913918	30.9437366728616	80.1207	32.7664
79.6472372309108	28.8255138223396	77.6794	29.1288
79.9513010329856	27.5604667887879	81.7106	28.112
80.7855096568754	24.0887014379127	82.6839	23.4883
78.1071100601132	21.7283305886973	76.419	22.7841
77.4687781092677	19.4160544861411	78.906	18.0381
76.8950311187297	19.2313678256132	77.5205	18.1054
76.1311528157671	18.9854772511732	76.9072	18.2917
74.5979494052537	18.4919342388165	75.2455	17.3084
68.4587801693346	16.5157619581273	68.0574	15.6194
67.2989151967303	16.1424136907247	67.267	14.1516
62.8987163238573	17.7159684626312	62.8285	19.7058
58.8678785600077	15.9449421569636	58.7637	13.9566
56.3061862166755	17.4072223071086	55.9929	17.1432
54.3265218910044	18.5372611751483	54.7387	20.4852
50.9611692115114	18.1941042936424	50.9211	16.4053
50.3379844665423	18.1305303668058	49.4944	16.327
49.264937228835	19.7194335835019	49.4045	19.961
48.2944517403494	21.1564713018647	47.6864	20.3976
46.655216810571	23.5837124754073	47.6331	25.3181
46.4524729965535	23.5938323999621	46.0829	25.5503
44.0990398968788	22.5349731662368	42.987	22.9253
43.3318179013476	22.1896982134396	42.4972	23.9973
40.967171114494	21.0710465318582	41.7205	19.4188
39.2933382532178	20.279320038253	39.9475	19.2268
37.0309320015087	19.2091816830808	36.0033	17.5038
36.9351034309189	21.35073805174	38.2173	22.874
34.8212196606321	21.0805837196645	34.4638	23.0393
31.4989108168812	20.2898844558345	31.0765	22.0815
27.312719478127	19.2933163986773	27.3595	17.3028
27.0929679797684	19.3348835228201	25.7178	17.895
26.8370270560901	20.4134650085593	27.2482	20.2425
26.4934896926322	21.8611899398685	26.0672	21.3383
25.8333970384013	24.6427760394746	27.4222	25.8428
24.8515994537423	25.191934643575	25.8125	25.1372
20.7716073784268	27.4740432601126	20.3288	28.022
19.4054113953536	28.2382045029434	19.247	29.2712
18.654727147412	28.6580888682688	19.5262	30.4483
Route: 4 Length: 270.922411480245 Demand Met: 799			
8.9651630888891	37.0575452015356	9.16001	37.8018
11.8145108873707	37.7180559470062	11.4258	37.7412
17.986335661476	39.1487855572777	17.5856	40.8861
23.2974235476363	40.3797522438767	23.6339	40.0124
26.4517779118499	41.1108580301169	26.2003	42.5604
28.636888302061	41.6173116971329	28.6889	43.6077

Solution x	Solution y	Original x	Original y
32.7726535338254	40.4279175995276	32.7353	38.4372
33.9896328252587	40.728786378194	34.4656	38.8185
45.5589716098053	43.5899911506704	46.2037	41.7062
46.7136520980593	44.1019732701893	47.522	42.292
52.1336360985092	46.5049582062762	53.4254	44.9898
55.2686738887449	51.3307768149022	54.0007	52.8659
58.4550794233412	52.6259787701428	57.8122	54.5104
62.4177879392612	53.7291200943618	62.6521	52.6724
67.0981409535705	55.0320653873989	67.8108	54.6502
68.6840381310457	55.4735527867019	69.3672	55.5594
69.5833578697103	55.7239059571454	69.1414	57.6653
71.4467453504397	56.055606481144	70.983	56.1077
74.3287560303448	56.5686337364224	75.5117	58.1702
74.39919976107	55.99545617377	76.3859	55.8636
73.8230965613958	53.7837198123302	74.8357	53.7031
72.820949765181	49.9363863934385	74.6616	49.1772
71.7587644177149	48.1133217793329	72.4782	47.1166
71.252472313048	47.2443588634457	69.2786	47.5055
71.9565195140488	44.644864205829	70.0979	43.9308
72.3854515716893	43.7985100577225	73.064	44.6995
73.2480134299754	42.0965557995822	72.565	40.2263
75.2677850085112	42.953859388772	76.05	41.1841
78.0997129463998	44.1558770447017	78.6058	43.2582
79.8815875506142	44.9121877420346	81.4209	43.6493
80.2912607354796	46.8850827494774	81.1997	46.621
80.8358724889871	49.5078138423397	79.5061	49.6701
81.6764062079423	53.5556370834722	80.6139	53.7748
82.4845652849055	57.4475144056887	82.7455	58.0479
82.7529427193116	58.7399469686182	82.834	58.4111
83.0992303259297	60.4075757831365	81.8774	60.6902
83.4174433887823	61.9400049598809	85.3959	62.1638
82.5956222474646	63.7320127926349	81.8209	62.9891
80.1996240458063	68.9566932645224	78.2186	68.7569
80.5804363513625	70.5905696291058	82.5413	70.9361
79.0495147684415	72.9405722641341	78.9206	73.8168
78.4990145835923	73.7855927247346	78.3667	74.2083
78.0793489011631	74.429776381262	76.2214	75.1456
80.6014676653544	75.0950818003822	80.8889	76.3527
81.7334268755009	75.3936619238833	80.9911	75.8316
83.7246651907118	75.9189092858548	84.0931	75.7357
85.3030188751848	76.3352422650876	86.1254	75.412
86.1481828307482	76.5581715140216	87.0562	74.7862
87.1278291974123	77.3653558716832	89.1084	77.1611
84.5066075174531	80.6329772144935	85.2864	82.465
82.4459900294052	80.4473074837535	82.6909	80.2719
79.7709952198582	80.206295295701	79.6042	79.6519
77.695633048585	80.0192993295144	77.5352	78.0347
75.9091764443314	80.4777917627882	75.9957	81.402
74.4408760027928	80.8546296773002	74.5996	81.8744
73.1178993444576	81.1941705279998	73.8931	82.0767
67.2523250532065	82.6995236474686	66.7645	81.0279
64.4604933304194	83.4160379149324	63.6977	85.2552
62.8394503364458	80.6697983204844	61.8453	80.8454
62.0898554215879	79.3999238443839	60.2539	80.1704
61.6413259490493	77.7234630941296	60.7208	77.8844
61.2583703563069	76.2921113996238	59.2712	76.4167
61.4783487689443	74.6871797984303	61.6789	74.8507
61.7511673525779	72.6966807384581	60.356	72.3736
61.9393833978289	71.3234646269219	60.9907	71.4945
62.3160392048218	68.5754759892852	60.771	67.3196
64.8359669286695	67.6777347079264	65.9297	69.3415
65.5785455778685	66.8802936705006	65.3011	67.1869
66.6717510113836	65.7063292287532	66.9764	66.2314
67.9538137185295	64.3295646602502	69.9395	64.1832
64.5022684350251	61.5731731744659	64.8783	60.379
63.5536055594324	60.8155733189568	64.2573	58.953
60.4606691613078	60.6652380317619	59.9164	58.75
59.4856068086141	61.3356434067583	59.9164	61.9972
58.5363633440342	61.9882921142725	58.3448	60.9201
56.4516617028907	63.4216256905323	56.0439	62.2937
52.5056374331229	66.1345379547118	52.5118	68.1256
51.1362404492176	65.2054526081508	51.793	64.9464
48.1169848957773	63.1569828702407	48.6743	62.5481
43.4497210146372	59.9903853561788	43.5841	58.7522
42.4003754405122	59.2784406451138	40.6271	60.1839
42.4439439143239	57.8461971952625	41.7302	58.1199
42.5041700042776	55.8662329465039	44.4217	55.3301
40.5517651685329	52.8582988981541	41.6783	52.1535
38.4683185760624	49.6484915031907	38.5534	48.7846
37.8508608214843	48.6972354239937	37.4105	49.4356

Solution x	Solution y	Original x	Original y
36.9826899801654	47.3597274298257	38.1612	45.7549
33.6172166902907	46.4219639249838	33.2771	46.652
31.3786389308966	45.7982011556983	31.4339	43.8079
25.1281698003161	47.1711092232471	24.4594	47.3987
23.8711939974266	47.4471952641723	23.6126	49.4214
21.3665522176904	46.1538362175573	20.5641	47.7219
16.3090899061564	43.5421982565895	15.6372	44.5891
13.2242146004342	41.9491324861235	12.2621	43.6923
12.3672145685004	41.4446519655387	13.4598	41.6191
8.44912098164137	39.1381987001301	8.75416	38.928
Route: 5 Length: 206.026918157944 Demand Met: 701			
2.39681763352688	35.7375788685238	0.642905999999996	35.395
3.67433783635252	38.3121804604321	2.57158	38.4711
10.5483975479105	52.1655131839789	9.35554999999999	53.1101
11.4663573355312	54.0154738397623	10.9638	55.5178
11.6614131837134	54.4085693453573	12.5872	53.6987
11.8715576102348	54.8320744350915	13.8308	54.4775
11.604720164188	57.4254899184443	13.5318	57.9262
10.9191128211318	59.0208767514723	10.4725	58.878
10.2534232505311	60.56991574254	8.30742000000001	60.1487
10.185875728367	63.874295297248	8.25408	64.3565
10.9076380504618	65.1658497619421	9.17265	66.1356
13.6569177028386	70.0830126412814	14.0141	70.4084
14.7831518164906	72.0973395634698	16.576	71.2313
16.6555067322171	76.6498087278047	17.2306	77.2747
17.1525639835986	77.8583623359659	16.8354	77.4785
17.9301375687071	79.7489686405304	16.5471	81.1813
19.1340076185354	80.1954966305706	19.5225	82.1483
21.6308339313245	77.8790734668187	23.3293	78.9181
22.2817109120844	75.5735922453801	20.7262	75.308
23.4345045510032	71.4903257426565	23.7167	70.7298
23.7620771894788	70.3300386178359	23.6206	68.344
24.0661389118106	71.0157113611172	24.7619	69.8637
25.5772700712429	74.4233829243711	27.1361	73.6904
27.8920424500983	79.643374320524	29.8827	79.684
27.6420168647386	80.150312400591	26.7929	78.8352
26.6817669068844	82.0972593534586	25.7615	81.4539
25.3325914964996	84.8327908673423	23.3569	85.0798
28.1595628488264	88.1420937635715	27.9893	89.6021
28.5441617165071	88.5923101285929	28.4623	90.5817
31.4810027034968	85.6777898659477	32.7208	86.88
33.7921993867565	83.3841300448214	34.4937	83.7515
35.300036206447	81.8877325605277	34.9224	79.9328
37.0274714676796	82.6179711033712	38.4806	81.2568
37.7209758428325	84.6124903303824	36.723	86.3354
37.9868939046973	84.5624118801326	37.7453	86.3505
40.2913146381422	84.1284109064864	40.7053	85.7824
41.7405971202874	83.8554569108983	41.546	82.3742
42.9234935667982	83.6326757533917	43.0779	81.6476
42.9236409445274	83.6327249619225	43.9629	81.9344
44.1932923747412	84.9291154368374	43.3068	85.4106
46.2838615027972	87.0637121963312	44.9959	88.3516
47.969123628879	88.7844389359564	48.934	88.5471
48.872750080945	89.7070854212846	50.0418	88.5256
49.8120227552836	90.666133503019	49.8328	92.6571
50.6991964320266	89.7216322677094	51.2472	90.6526
52.0700381245367	88.2622061870306	53.7144	89.3849
52.828198061077	86.6683655493234	54.7886	87.0165
52.4774834341938	82.8878077635866	54.169	81.8375
51.4591219561456	82.26068317947	50.9984	83.4341
50.1489938158679	81.4538822004808	50.5772	79.5094
48.4996542914467	81.6500706218891	47.7087	83.4773
47.9599913972569	80.9183959180358	48.3206	81.4332
47.1582591413632	79.8314103402562	45.6946	80.9262
46.2868083256633	78.6498863053225	45.1636	79.7971
43.4025416631042	74.7393326603677	41.4131	74.8199
45.3074145675614	71.6637896665579	46.3399	71.17
45.6583332545694	71.0972114868581	47.6475	71.1843
44.0835814860855	67.9742176265364	45.2184	66.3382
42.9466738347442	67.8496397357327	43.1006	68.5786
41.485573755224	67.6895378479676	42.1545	66.9856
36.9648154950249	67.1941685757992	35.9094	68.8825
33.5399306244755	61.7623363583608	32.641	61.5676
32.7048290569961	60.4378732796612	31.2678	61.1344
32.1304296937258	59.5268783220213	33.4192	59.483
30.0877622944128	56.2872080346844	30.6696	55.2626
29.466433741531	55.3017862752241	30.4468	53.5688
24.2007840135545	55.1890278260527	22.8193	53.7552
24.1881507129142	55.9898419679323	22.5447	55.6169
24.134748110032	59.3741713799616	25.6513	60.6643

Solution x	Solution y	Original x	Original y
23.5759479189084	59.4739899839945	24.5176	59.5849
22.6250281953389	59.6438527010541	23.2085	58.8069
20.1594043309426	60.084288173291	19.6656	61.3862
19.4472122919464	60.2115067272383	18.9042	62.1271
19.2108366985895	60.0003061066794	17.6011	61.1721
17.2385850094734	55.5465905600778	17.5187	55.1629
16.1038335236944	52.9841124291689	17.8085	51.9553
13.9431646187846	50.2520518951261	13.2524	50.7626
11.923672653255	47.6984982630644	11.7937	48.0467
8.97341765626322	43.9680349244847	9.27453	43.3967
7.25642484767218	41.7969787513374	7.21925	42.3799

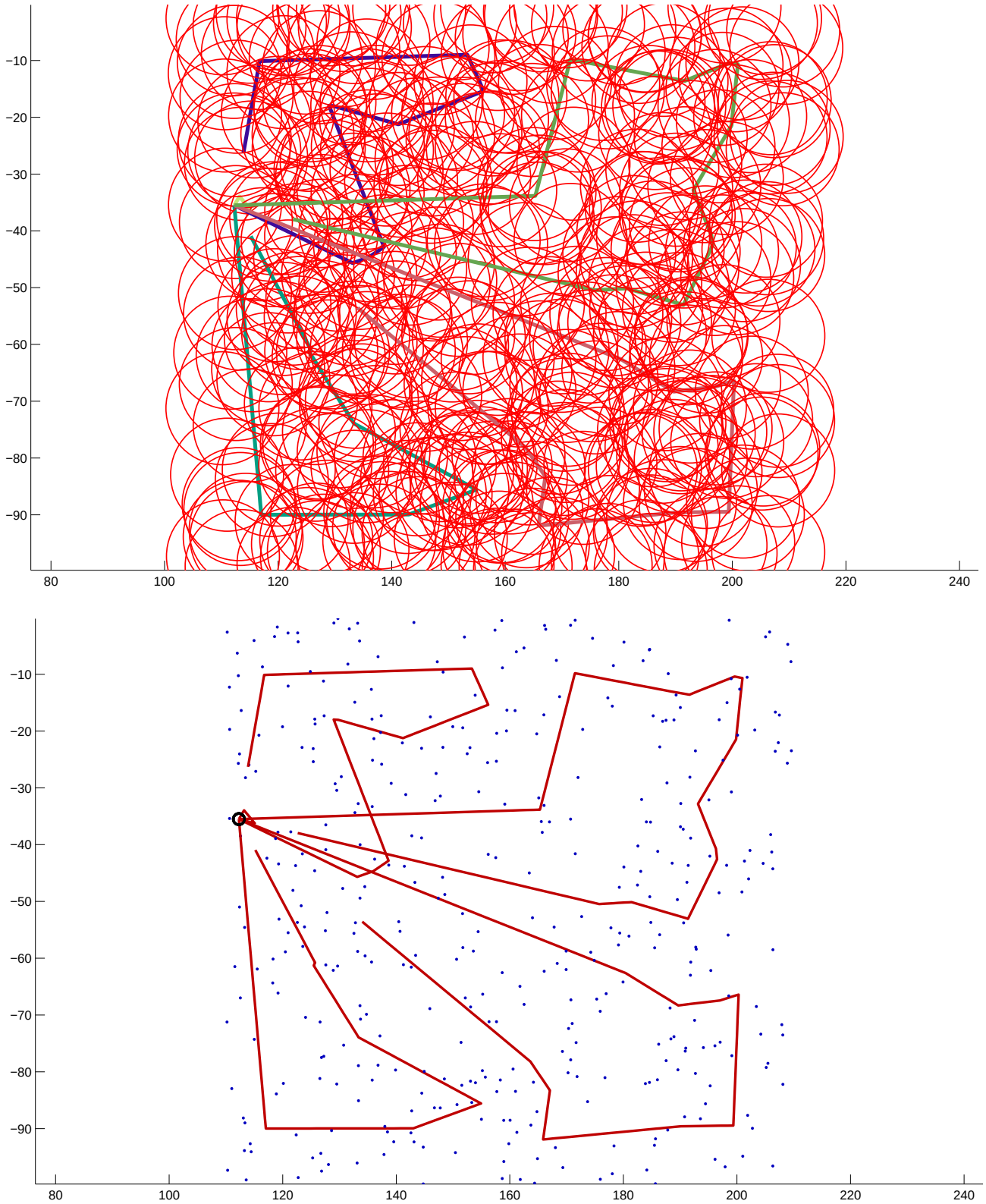


Figure O.18: $rd400$, $r = 9.955309$, Equal Radius, 2D, Euclidean, Length = 792.9690826

Table O-21: Solution for $rd400$, $r = 9.955309$, Equal Radius, 2D, Euclidean

Total distance: 792.969082591494 Total demand met: 3297 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 7.66375805479023 Demand Met: 100			
2.54850495565096	35.0538394157301	0.642905999999996	35.395
2.88268735887348	34.4811626230814	3.44571000000001	28.2052
3.06653699315835	34.1661863389392	2.1823	25.6845
3.19137237381133	33.9523633913783	2.38826	24.0295
3.4414850694659	34.2562827652129	4.056	25.9589
3.80606769570504	34.6992767510558	5.25835000000001	27.1001
4.36862266804579	35.3827974727872	9.16001	37.8018
4.77721072147196	35.8792853547964	11.4258	37.7412
5.07898129209158	36.2460119199938	13.4598	41.6191
4.29810506404898	36.0400068498782	7.21925	42.3799
2.98257676230162	35.6930275388355	2.57158	38.4711
Route: 2 Length: 161.970393406847 Demand Met: 797			
3.27058350574688	46.8608347285079	2.40393	50.9808
3.84294351597481	53.4411741365425	3.30116	54.5758
4.36872516104592	59.4860180765988	1.5771	61.4642
4.83198793138443	64.8118127941847	2.55217	66.9796
5.2336555715091	69.429286195748	0.194864999999993	71.2335
5.57781212431544	73.3852861670356	4.99968	74.2733
5.91285440578994	77.2366200765347	10.1219	82.045
6.13530380481421	79.7938750776637	8.89064000000001	83.8954
6.31222689798344	81.8278091075743	1.02508	82.9527
6.48638656464786	83.8299439422039	3.06059000000001	88.1315
6.63103350774877	85.4928028055047	3.35356	88.986
6.75988361261876	86.9740639550041	4.28894	92.6489
6.86305138196306	88.1600851279261	4.45068999999999	94.0863
6.94728170755748	89.1284037117824	3.24988	93.8751
7.02176416037666	89.9846616591314	0.299018000000004	97.3272
7.31449345768002	89.9842858342654	3.57801000000001	99.0366
11.1232620554759	89.9794115982245	12.7313	98.6134
13.3675844170701	89.9765422449134	16.854	97.4806
14.802146342094	89.9747093981632	18.064	96.3276
16.0095107598222	89.9731671080157	16.7243	94.3593
17.2026447587118	89.971643049578	15.2733	95.1553
18.4913330715598	89.9699970133564	12.3803	91.1149
20.2800855770635	89.9677124867699	18.6101	90.3489
22.2150025481488	89.9652414217027	23.1083	96.0553
24.0612223166685	89.9628839059946	27.8353	94.5623
25.5912890708496	89.9609301939754	29.5533	92.3189
26.93097792384	89.9592195896232	28.4623	90.5817
28.2347290523312	89.9575549924679	27.9893	89.6021
29.5653607224375	89.955856316005	32.5896	90.759
30.7911390291368	89.9542916389538	33.1283	92.3481
31.9429041070907	89.9528215444329	34.7487	93.2543
33.0081696996047	89.9514618774261	34.7579	99.7518
36.5626771402488	88.6456260252508	40.4171	94.2218
39.5376874518432	87.55267671821	44.9959	88.3516
41.5899995345169	86.7987031148758	48.934	88.5471
42.7962000714759	86.3555722602986	50.0418	88.5256
43.6788869718756	86.0312933779958	49.8328	92.6571
44.3012562038316	85.8026502697969	51.2472	90.6526
44.8059134514109	85.6172519535608	53.7144	89.3849
44.9391901513798	85.568290083235	54.7886	87.0165
44.9391900497092	85.5682899877588	54.169	81.8375
44.478684537272	85.3197473126326	50.9984	83.4341
43.9722974152193	85.0464413547712	50.5772	79.5094
43.3746114803093	84.7238590757744	48.3206	81.4332
42.7501779671339	84.3868406050451	47.7087	83.4773
42.0846315513001	84.0276326069429	45.6946	80.9262
41.4108351768749	83.6639720570501	45.1636	79.7971
40.7241338549521	83.2933465270704	41.4131	74.8199
40.1685480094098	82.9934865202045	38.4806	81.2568
39.6396864596739	82.7080501582175	41.546	82.3742
39.1038444967948	82.4188462969787	43.0779	81.6476
38.5480872639488	82.1188938131793	43.9629	81.9344
37.9480720726188	81.7950544773933	43.3068	85.4106
37.2418288779828	81.4138816676016	40.7053	85.7824
36.4467542967734	80.9847646927516	37.7453	86.3505
35.5780686577701	80.5159182545023	36.723	86.3354
34.6069893592304	79.9918077545986	32.7208	86.88
33.5819224636657	79.4385589663248	34.4937	83.7515
32.4780829483906	78.8427948582926	34.9224	79.9328
31.295156875896	78.2043462744505	29.8827	79.684
30.1456219517916	77.5839197480338	26.7929	78.8352
29.0862275878638	77.0121441364162	23.3293	78.9181
28.1822144280091	76.5242311551629	25.7615	81.4539
27.2744032833735	76.0342683446225	23.3569	85.0798
25.1531108790509	74.8893656038313	19.5225	82.1483
23.3581428043004	73.9205922356273	16.5471	81.1813
22.8955220458904	73.1806384133859	16.8354	77.4785
22.4193822979954	72.4190572740294	17.2306	77.2747
21.9260892942619	71.6300375266978	20.7262	75.308
21.4130523543862	70.809435241533	27.1361	73.6904
20.7957245716483	69.8220077440979	23.7167	70.7298
20.1545430848353	68.7964234712257	24.7619	69.8637
19.4562009268968	67.6794045608417	23.6206	68.344
18.7106288229144	66.4868378205261	16.576	71.2313
17.879690528134	65.157711559078	14.0141	70.4084
16.9369373290109	63.6497119128454	9.17265	66.1356
16.135031034724	62.3670163738279	8.25408	64.3565
15.4619597248835	61.2904096548114	5.52590000000001	61.9092
15.5266578690513	61.1509993104157	8.30742000000001	60.1487
15.5956882194942	61.0022518386862	10.4725	58.878
15.6627122202163	60.8578234947424	10.9638	55.5178
15.6967035127743	60.7845986278995	9.35554999999999	53.1101
15.696705440964	60.7845948554545	12.5872	53.6987
15.6967073942633	60.7845910407286	13.8308	54.4775
15.6967093663425	60.7845871938568	13.5318	57.9262
15.69671135733	60.7845833131898	17.6011	61.1721
15.6967133405266	60.7845794414395	18.9042	62.1271
15.6967153099434	60.78457558747	19.6656	61.3862
15.6967172628653	60.7845717566518	25.6513	60.6643
15.3155304385692	60.0662737036171	24.5176	59.5849
14.6083224947917	58.73362320763	23.2085	58.8069
13.2889011237713	56.2473266092224	17.5187	55.1629
11.9029456715663	53.6356569734743	17.8085	51.9553
10.4014897124864	50.8063514322232	13.2524	50.7626
8.81070016035305	47.8087175458065	11.7937	48.0467
7.08488867894394	44.5566639502927	12.2621	43.6923
5.1709732182171	40.9501673555398	9.27453	43.3967
Route: 3 Length: 154.284350338131 Demand Met: 800			
10.5432667457216	39.5389146690179	17.6023	36.5196
13.4195091247757	40.9423588119903	17.5856	40.8861
15.732652963958	42.0710463311409	15.6372	44.5891
18.0204975392654	43.1873830136159	20.5641	47.7219
19.8210076155611	44.0659259888017	24.4594	47.3987
21.1791780184187	44.7286330635898	23.6126	49.4214
22.3317366444882	45.2910132177202	22.8193	53.7552
23.1260235939512	45.6785781115116	22.5447	55.6169
25.9378410447453	44.6931328163911	30.4468	53.5688
27.4038122910871	43.6837698250989	33.2771	46.652
28.6456526892161	42.8287183827132	38.1612	45.7549
28.1913977179698	41.6613468479069	34.4656	38.8185
27.7536186741228	40.5363161866389	32.7353	38.4372
27.3261866148937	39.4378764712376	31.4339	43.8079
26.7835591784896	38.0433992261706	26.2003	42.5604
26.1429118008162	36.397021747656	23.6339	40.0124
25.4332487338206	34.5732809697772	22.7183	34.3604
24.7736685638229	32.8782470435199	25.7714	33.2927
24.1068225245555	31.1645420613507	23.2874	32.7742
23.4179626217316	29.3942647892645	19.5262	30.4483
22.7520852069344	27.6830494843205	19.247	29.2712
22.0875994711895	25.9754109903291	20.3288	28.022
21.3924948630257	24.1890871352388	15.3897	25.3897
20.7460603873027	22.5278403771597	15.3759	23.0999
20.1472586493904	20.9890051039867	13.4	22.8874
19.5763039883152	19.5217353264723	9.96077	19.2347
19.4191944512653	19.1179909834066	15.6993	18.7479
19.2662900770926	18.7250542333832	15.6444	17.8995
19.1181977608587	18.3444843861012	17.2907	17.3232
18.973978844627	17.9738691897046	10.9524	12.0779
19.1537341698143	17.9861089871534	14.8737	9.51072
19.4529327976767	18.006477924927	17.1854	11.1942
19.7783640306823	18.0286327763212	21.4744	8.21886
21.182078584993	18.4238228329823	25.6231	12.6549
22.3433518214371	18.7507584118425	22.6997	14.9199
23.5349972212516	19.0862445434391	25.7178	17.895
24.6728061272633	19.4065741013596	27.3595	17.3028
25.7503366387381	19.7099336280318	27.2482	20.2425
26.7953617971091	20.0041419434799	26.0672	21.3383
27.867088633088	20.3058674500314	25.8125	25.1372
28.9852010177464	20.6206516411545	27.4222	25.8428
30.1255051693404	20.9416833218431	29.1053	29.2049

Solution x	Solution y	Original x	Original y
31.1810006282005	21.2388391144788	31.6686	31.1822
32.3780648040314	20.7711934715467	37.0272	27.4581
33.4627188246379	20.3474623953436	38.2173	22.874
34.431394403158	19.9690395690584	34.4638	23.0393
35.4398300798665	19.5750840032039	31.0765	22.0815
36.6556711582051	19.1001031979578	36.0033	17.5038
37.8812979019104	18.6212995841175	39.9475	19.2268
39.0527125788928	18.1636745998478	41.7205	19.4188
40.1672082169186	17.7282857210963	42.987	22.9253
41.2698329758659	17.2975344411931	42.4972	23.9973
42.4788607316071	16.8252158063542	46.0829	25.5503
43.672438023929	16.3589357628126	47.6331	25.3181
44.5332189618881	16.0226694187058	47.6864	20.3976
45.3804495222905	15.6916967356745	49.4045	19.961
46.1962374152618	15.3730074906148	54.7387	20.4852
46.1962374234008	15.373007449145	55.9929	17.1432
45.8207483461907	14.540962143353	50.9211	16.4053
45.405834203547	13.6215545888875	49.4944	16.327
44.9382778940559	12.5854969025668	43.8962	13.6901
44.4688796088502	11.5453573713156	48.6979	8.85907
44.0105599153588	10.5297666785181	51.1528	6.04103
43.5912503285102	9.60061759894144	52.4925	5.37248
43.3167527800381	8.99233930434556	48.5894	0.54797
42.1733174799032	9.02726935421774	47.3917	2.23053
39.9850509742627	9.09411133976131	42.0178	3.44287
37.514117648328	9.16958617865514	38.2491	9.61738
35.0472389917396	9.24493666365468	37.2177	7.79249
32.3496128889405	9.32733387773077	33.1085	0.882753
29.0588550235122	9.42784948943424	26.7979	6.90196
26.2821186054311	9.51266523368409	23.5387	4.13129
24.0475265158112	9.58092205457443	23.1984	1.0131
22.0312841233109	9.64251084099675	21.7245	2.01127
20.0503757600673	9.70302152375832	19.7287	0.198716
18.129084422187	9.76171174012572	19.0116	0.977048
15.7651929025603	9.83392068419132	12.7116	4.29147
13.8663998730295	9.89192051685065	12.6307	2.70835
12.1355018795769	9.94479066160553	10.9477	2.73525
10.5424393478178	9.9934495821333	9.0496	1.67955
9.17184031780519	10.0353125584234	8.57052	3.36732
7.85443151541183	10.075550585253	4.96047	4.06059
6.73794195655975	10.1096514105679	0.219756000000004	2.58493
6.53293075230295	11.2785107677322	2.00806	6.28968
6.2779414520725	12.7323173184212	6.43447000000001	8.70233
5.97984426075303	14.4318915884179	2.19732	10.251
5.6144288303777	16.515277401037	0.613562000000002	12.2624
5.13266089737219	19.2620642725773	2.68873000000001	16.3883
4.56469112257524	22.5003473190686	0.659450000000007	19.6999
3.89548072746697	26.3158858496144	5.81823	20.7452
Route: 4 Length: 233.352980811941 Demand Met: 800			
23.5586207796372	43.9741865744101	28.6889	43.6077
31.7252367896697	47.2238090713591	37.4105	49.4356
35.5243222135859	48.7355110087944	38.5534	48.7846
38.7084943508076	50.0024960520375	41.6783	52.1535
41.3102721797704	51.0377282784619	44.4217	55.3301
43.3033390395705	51.8307620264408	41.7302	58.1199
45.2116438599826	52.5900724258991	40.6271	60.1839
47.8087155714478	53.6234482865753	43.5841	58.7522
51.0520329336073	54.913959666655	48.6743	62.5481
54.1051634558756	56.1288018228541	51.793	64.9464
56.3968339998779	57.0406767845567	56.0439	62.2937
58.5307951948382	57.8898064822671	58.3448	60.9201
60.6220512877988	58.7219489325214	59.9164	61.9972
62.7072874952041	59.5517007927162	60.771	67.3196
64.6164864805249	60.3114155608496	65.9297	69.3415
65.5180642331574	60.6701933621988	65.3011	67.1869
66.3609080936017	61.0056027127035	66.9764	66.2314
67.1581043532992	61.3228495845919	69.9395	64.1832
67.9062729207517	61.6205877181605	69.1414	57.6653
68.6728691232186	61.9256573889319	69.3672	55.5594
69.5003360375209	62.2549457126317	70.983	56.1077
70.3739486518111	62.602592185544	74.8357	53.7031
71.9206230354484	63.5526054074417	76.3859	55.8636
73.4334111283914	64.481821699257	75.5117	58.1702
75.1017891422252	65.5066080050001	78.2186	68.7569
76.5251386639534	66.3808997157332	82.5413	70.9361
77.4533195834677	66.9510520300944	78.9206	73.8168
78.2483537267053	67.4394212067734	78.3667	74.2083
78.9753692585308	67.8860102545577	76.2214	75.1456
79.665614764691	68.310013910933	77.5352	78.0347
80.7434701359712	68.180666578369	80.8889	76.3527

Solution x	Solution y	Original x	Original y
81.8920538766228	68.0428341919952	80.9911	75.8316
83.1813218954893	67.8881225728786	84.0931	75.7357
84.4915779798947	67.7308963951547	86.1254	75.412
85.7614714317359	67.5785174213802	87.0562	74.7862
87.0178841072985	67.4277589720256	89.1084	77.1611
88.1258070382519	67.0804692994882	94.2046	73.3577
88.8868149592602	66.8419268149016	93.4248	68.5015
89.5903618957378	66.6213967724308	88.5712	66.6382
90.2949486352334	66.4005414280359	96.3481	58.4969
90.1206468451161	70.7527477391777	97.9153	71.697
90.0129630742293	73.4421531517348	98.0725	73.509
89.8898463088258	76.5173882925952	95.4573	78.5053
89.7889883252468	79.0367449007539	95.1537	79.2325
89.6794920150635	81.7719872298784	98.0879	82.1977
89.5591561349773	84.7786450451187	91.8947	87.6684
89.4590109519346	87.2808099000579	92.7385	89.9534
89.3719811360325	89.4552900161043	96.3227	96.5824
88.3402461768474	89.4706091382041	91.0373	94.8618
87.2224870659002	89.4872061201398	87.9339	96.7331
86.089159246736	89.5040358273282	86.1563	95.4019
84.9800609371071	89.5205049263602	83.5669	88.2708
83.9230611353266	89.5361986939287	84.4594	85.6238
82.8671227660587	89.5518758096338	85.2864	82.465
81.6850006574443	89.5694249399694	82.6909	80.2719
80.1508606024988	89.5921888387481	79.6042	79.6519
78.9580366042787	89.7059498292841	75.9957	81.402
77.9957224853263	89.7977162058793	74.5996	81.8744
77.2036060599218	89.8732476281575	73.8931	82.0767
76.5217350073351	89.9382633961546	80.7777	87.9354
75.7904288874491	90.0079929681503	77.8131	90.2453
75.0398539249122	90.0795598291139	75.6586	91.7899
74.2813154865115	90.1518858372493	75.4786	92.9344
73.5062884221563	90.225784031075	75.6359	99.7073
71.4077029840186	90.4259579411194	74.1314	97.2935
68.8224510947165	90.6725439987806	68.3546	93.0491
66.3713662037828	90.9063314936622	68.0526	97.9535
63.7095229312589	91.1602191259218	65.9332	98.9174
60.4375710409471	91.4722972822692	59.3326	96.8644
57.7267582579255	91.7308759430636	54.3707	99.6057
56.5382993132383	91.8442638797719	51.8363	98.9629
55.8551736724022	91.9094449321346	48.6626	98.7924
55.9681568686765	91.1042688356851	48.9418	95.7946
56.1738179228779	89.6383970644987	54.8665	95.2849
56.4344431745159	87.7806725440001	58.0371	93.3465
56.7627013474019	85.4408057340612	63.6977	85.2552
57.0663892273359	83.2761955246012	66.7645	81.0279
56.6064663576271	82.5972051931401	61.8453	80.8454
56.117206706234	81.8749158535836	60.2539	80.1704
55.6127615035278	81.1302139270987	60.7208	77.8844
55.0978539981307	80.3700701461134	59.2712	76.4167
54.5927152383933	79.6243472072026	61.6789	74.8507
54.0672628570473	78.8486429293697	60.356	72.3736
53.6146505595708	78.1804615330314	60.9907	71.4945
50.0438115969309	75.2120649277805	52.5118	68.1256
47.6954500418928	73.2598972436133	47.6475	71.1843
45.5723160247085	71.4949577864184	46.3399	71.17
43.4510410046057	69.731561912821	45.2184	66.3382
41.4612792606415	68.0774910602352	43.1006	68.5786
39.325011135975	66.3016295258172	42.1545	66.9856
36.8544835124116	64.247900885482	35.9094	68.8825
33.9371746953486	61.8227390959165	32.641	61.5676
31.237199179358	59.5782184578258	31.2678	61.1344
28.4245960796108	57.2399954845672	33.4192	59.483
24.0126077704292	53.5721665571179	30.6696	55.2626
Route: 5 Length: 235.697599979786 Demand Met: 800			
30.7373728675965	34.6103747622932	36.8488	32.2474
36.3878973938252	34.4320198551889	37.7688	31.4408
41.5162813643467	34.2701492296369	44.5404	30.686
45.4771605836779	34.1451311892015	49.1148	32.8614
48.5938758664828	34.046755830926	55.099	31.771
50.4443662982409	33.9883463528113	56.0389	33.1015
51.8855858683155	33.942854892145	56.9788	35.9946
53.0889826677955	33.9048700560752	55.5492	35.9315
54.219988492424	33.869170151221	55.717	37.8511
55.2999334408329	33.8350819591287	61.5258	41.6034
56.0603504356548	30.8708244179234	60.6972	35.5066
57.28438673633	26.099293597302	62.0154	28.1819
58.6419842652252	20.8071174153645	62.8285	19.7058
59.6582742832585	16.8454250973407	68.0574	15.6194
60.1597649401341	14.89051681366	67.267	14.1516

Solution x	Solution y	Original x	Original y
60.5757687044321	13.268852302127	58.7637	13.9566
61.0047989101342	11.5964084442818	58.2097	7.56071
61.378382677662	10.140105728092	56.3237	2.07366
61.4634492043148	9.80849874818863	56.1254	1.40532
61.9842431356684	9.90747995523677	60.7013	1.36116
62.5934636125322	10.0232672626788	61.5069	0.482106
64.288629176676	10.3454449380041	64.5769	3.66176
66.1238211319708	10.6942354959654	68.2389	8.47105
67.8688830443741	11.0258964236416	70.1018	4.34543
69.5232102644621	11.3403126536507	74.632	5.60444
70.7855930868714	11.5802373380324	74.5771	5.70821
71.9052662130638	11.7930390981642	73.4709	7.6166
73.0054159376597	12.002130334953	77.911	9.90186
73.976044537151	12.1866051998851	79.2919	13.6517
74.8228647732155	12.3475494352161	80.035	15.8589
75.5592636897238	12.487507320917	78.906	18.0381
76.2319072754615	12.6153480474879	77.5205	18.1054
76.8844377898556	12.739366103969	76.9072	18.2917
77.5320093802861	12.862441621612	75.2455	17.3084
78.1999447018711	12.9893873044807	76.419	22.7841
81.6443860750894	13.5874116628897	82.6839	23.4883
83.2403393780979	12.9478599084536	86.8707	18.0065
84.7444179969494	12.3451254856645	88.2698	14.9994
86.1449678964367	11.7838784755358	90.4883	12.6216
87.3959861731029	11.2825537000546	91.7898	10.5225
88.5019685213789	10.8393495263769	88.9914	10.7701
89.5885765758626	10.4039092047552	88.6343	0.494442
90.1720982152529	10.515607316815	95.0473	3.39817
90.6790008574681	10.6126389660018	95.7659	2.55349
90.9654196246447	10.6674650942155	98.9579	4.73211
90.8909060812158	11.3803406602343	99.5164	7.77478
90.5336353486622	14.7984244210866	96.7716	16.6523
90.3125760663473	16.9133260215733	97.4766	17.1802
90.0543996311796	19.383343206378	97.2905	22.0419
89.8422715279046	21.4128098051203	99.5853	23.4577
89.7927925316321	21.5674706243042	98.8743	25.646
89.298475103291	22.40231822612	96.7473	23.5618
88.726227297975	23.368782030681	93.1464	19.8146
88.0346724801369	24.536742980883	90.11	20.7153
87.2293387749289	25.8968650255918	87.5589	25.1226
86.404234439769	27.2903779256819	89.036	30.7257
85.6254500808939	28.6056609995477	85.0689	32.1301
84.9234473779092	29.7912677492056	80.1207	32.7664
84.331179107902	30.7915445678673	81.7106	28.112
83.7237834579278	31.8173701973706	77.6794	29.1288
83.1349192642752	32.8118984734194	73.2088	32.0501
83.3498410964997	33.3478311679692	74.0572	35.987
83.6598134008561	34.1207793433765	74.7866	36.0265
84.027050102859	35.0365214274352	80.0506	36.8529
84.3962227650741	35.9570910931812	80.5435	37.2793
84.7702348248537	36.8897281448219	81.8496	38.8539
85.1412148391462	37.814803903398	85.2354	42.0312
85.4829549681129	38.6669660277232	88.1955	43.6361
85.7823694636824	39.4135840265086	91.3249	42.8902
86.0451791392039	40.0689238431708	92.3029	41.017
86.2908408898025	40.6815034102738	95.9404	38.2332
86.4269460102412	41.8539648896734	96.1419	41.3034
86.5113250164729	42.5808170784847	96.3235	44.2629
85.9950671257723	43.6357098183035	94.61	43.2995
85.2510709595669	45.1559481024116	92.0634	46.0336
84.4033593668463	46.8881124447974	90.8764	48.3318
83.4720716546084	48.7910510984959	86.8559	48.4797
82.2414812545666	51.3055607570492	88.4474	55.9131
81.3871353643444	53.0512818497291	85.3959	62.1638
81.3782192437932	53.0486513475462	81.8209	62.9891
80.7978099563414	52.877503821593	81.8774	60.6902
80.1597860762945	52.6893672081187	82.834	58.4111
79.4710197862322	52.4862679594381	82.7455	58.0479
78.7095713571667	52.2617365809092	80.6139	53.7748
77.9310253704994	52.0321635353206	79.5061	49.6701
77.1511353078591	51.8021941199156	81.1997	46.621
76.3255309829336	51.55874464187	81.4209	43.6493
74.9029367279143	51.1392555964532	78.6058	43.2582
73.223911505262	50.6441501250954	76.05	41.1841
71.4385001320567	50.1176689055472	72.565	40.2263
70.8490315578492	50.153050505681	70.0979	43.9308
70.2711109471158	50.1877393723677	73.064	44.6995
69.6662756837109	50.2240438368951	74.6616	49.1772
69.0151349413342	50.2631274577659	72.4782	47.1166
68.3298291535911	50.3042616488337	69.2786	47.5055

Solution x	Solution y	Original x	Original y
67.6369548542593	50.3458501931861	67.8108	54.6502
66.9435871201865	50.3874679901436	62.6521	52.6724
66.300257699439	50.4260824298231	64.2573	58.953
65.7308236806739	50.4602610311028	64.8783	60.379
62.0415478916892	49.5908625448105	59.9164	58.75
58.2517917621895	48.697785496015	57.8122	54.5104
54.2744019061885	47.7604893270274	54.0007	52.8659
50.2736535154147	46.8176841350917	53.4254	44.9898
45.4398210059984	45.6785523263903	47.522	42.292
39.848057004123	44.3608119719885	46.2037	41.7062
12.6336757083303	37.9476576755664	8.75416	38.928

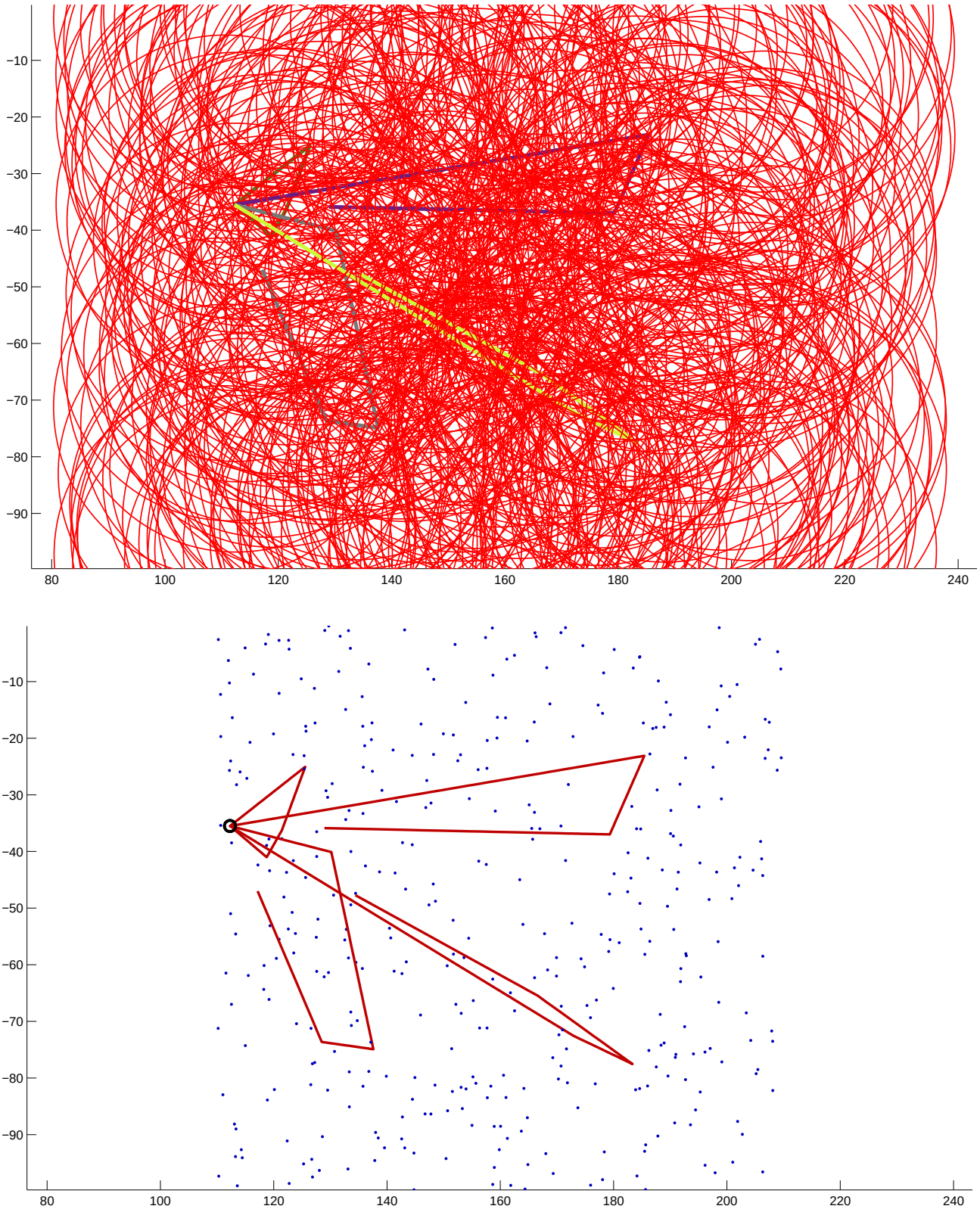


Figure O.19: $rd400$, $r = 29.865927$, Equal Radius, 2D, Euclidean, Length = 469.1149557

Table O-22: Solution for $rd400$, $r = 29.865927$, Equal Radius, 2D, Euclidean

Total distance: 469.114955729596 Total demand met: 3297 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 8.35475188171898E-10 Demand Met: 102			
2.28314999990766	35.5085000001506	2.57158	38.4711
2.28314999985031	35.5085000000496	0.642905999999996	35.395
2.28314999982405	35.5084999999909	3.44571000000001	28.2052
2.28314999981384	35.5084999999543	2.1823	25.6845
2.28314999981247	35.5084999999498	2.38826	24.0295
2.28314999981356	35.5084999999877	0.659450000000007	19.6999
2.28314999981723	35.5085000000283	2.68873000000001	16.3883
2.28314999982524	35.5085000000045	9.96077	19.2347
2.28314999983513	35.5084999999949	5.81823	20.7452
2.2831499998602	35.5085000000133	4.056	25.9589
2.28314999990967	35.5085000001311	5.25835000000001	27.1001
Route: 2 Length: 42.7948327110961 Demand Met: 795			
2.86395640243342	35.0510412483382	8.75416	38.928
3.38887455123094	34.637589282169	9.16001	37.8018
3.9285414997229	34.2125157458056	11.4258	37.7412
4.46389166317925	33.7908393851609	13.4598	41.6191
4.99223104648638	33.3746841017082	15.6372	44.5891
5.51231998654092	32.9650293475543	17.5856	40.8861
6.01396869665814	32.569904129547	17.6023	36.5196
6.4952848745762	32.1907987002044	19.5262	30.4483
6.94196501034419	31.8389799847339	19.247	29.2712
7.35766133298225	31.5115710940277	20.3288	28.022
7.74250597194298	31.2084694546746	15.3897	25.3897
8.10996645863725	30.9190628099671	15.3759	23.0999
8.45742433523691	30.6454139293632	13.4	22.8874
8.79585989048063	30.3788731972188	15.6993	18.7479
9.11893393950709	30.1244340016332	15.6444	17.8995
9.43799555232833	29.8731569561973	17.2907	17.3232
9.76117908043454	29.6186366980122	17.1854	11.1942
10.0744225201637	29.3719472228161	14.8737	9.51072
10.3797283780063	29.1315097372716	10.9524	12.0779
10.6918031487128	28.885740772704	6.43447000000001	8.70233
11.0071027466435	28.6374280990038	2.19732	10.251
11.3371261259638	28.3775138849048	0.613562000000002	12.2624
11.6888418012787	28.1005092116658	2.00806	6.28968
12.0495543146202	27.8164127136631	0.219756000000004	2.58493
12.4072091824919	27.534715632323	4.96047	4.06059
12.7685749222786	27.2500929963386	8.57052	3.36732
13.1246723848728	26.9696196834446	9.0496	1.67955
13.4677477685096	26.6994042262334	10.9477	2.73525
13.7973303215984	26.4398191485844	12.6307	2.70835
14.1113927776479	26.1924610361671	12.7116	4.29147
14.4131204189589	25.9548208314923	19.0116	0.977048
14.6859039954572	25.7399799785593	19.7287	0.198716
14.9333564821102	25.5450922776025	21.7245	2.01127
15.1590880527692	25.3673138875599	23.1984	1.0131
15.3678643062909	25.2028910071338	23.5387	4.13129
15.5614793110091	25.0504105703355	33.1085	0.882753
15.4124067962913	25.4559411287243	26.7979	6.90196
15.2533000533206	25.8887641790428	21.4744	8.21886
15.0839910434536	26.3493395457872	25.6231	12.6549
14.9079408289924	26.8282487025594	22.6997	14.9199
14.7306473377182	27.3105419685544	25.7178	17.895
14.554939074165	27.7885264525942	27.3595	17.3028
14.3753805452729	28.2769861741267	27.2482	20.2425
14.1961262807769	28.7646230033773	26.0672	21.3383
14.0155898483287	29.2557511262563	31.0765	22.0815
13.8241768480952	29.7764630834323	27.4222	25.8428
13.6281182639986	30.3098118761635	25.8125	25.1372
13.4169659190263	30.8842110302847	23.2874	32.7742
13.2046662088017	31.4617312693284	22.7183	34.3604
12.9902555617388	32.0449930705603	23.6339	40.0124
12.7812221952735	32.6136294408762	26.2003	42.5604
12.5785207986877	33.1650420959579	28.6889	43.6077
12.3792590016933	33.707095911226	31.4339	43.8079
12.1745317050033	34.2640064510267	32.7353	38.4372
11.9498791209038	34.8751040943148	34.4656	38.8185
11.7054345531601	35.5400301565675	38.1612	45.7549
11.4416124912994	36.2576481141736	38.5534	48.7846
11.2845193992989	36.5362295144997	37.4105	49.4356
11.1134100219411	36.8396635355191	33.2771	46.652
10.9378893123099	37.1509204272793	30.4468	53.5688
10.7649106121429	37.4576680684564	30.6696	55.2626
10.5961735491692	37.7568896197898	25.6513	60.6643
10.4404963729775	38.0329435905362	24.5176	59.5849
10.295131068304	38.2907089333525	23.2085	58.8069
10.1579564477444	38.533948190742	22.5447	55.6169
10.0247321366087	38.7701822412638	22.8193	53.7552
9.89303189960958	39.0037135196137	23.6126	49.4214
9.75743202707055	39.2441597756401	24.4594	47.3987
9.61572600281021	39.4954310687281	20.5641	47.7219
9.46974831830057	39.754275337076	17.8085	51.9553
9.32329278221779	40.0139673637488	17.5187	55.1629
9.17812904279637	40.2713702415875	17.6011	61.1721
9.03743250544348	40.5208533273207	19.6656	61.3862
8.89873670340643	40.7667883067421	18.9042	62.1271
8.76284277315126	41.0077555108129	14.0141	70.4084
8.74430852775414	40.9920225907882	9.17265	66.1356
8.70964964235446	40.9626084548949	8.25408	64.3565
8.62757390434776	40.8930034127576	8.30742000000001	60.1487
8.47868561922397	40.7667698944743	5.52590000000001	61.9092
8.17766947655164	40.5114453536393	1.5771	61.4642
7.78942829402479	40.182000653627	3.30116	54.5758
7.39420242108392	39.8465803042233	2.40393	50.9808
7.01438872406446	39.5242066824196	9.35554999999999	53.1101
6.63906975536278	39.2056417190781	10.9638	55.5178
6.26103103240722	38.8847639456397	10.4725	58.878
5.86909864110945	38.5520862202701	13.5318	57.9262
5.45600933473676	38.2014558385075	13.8308	54.4775
5.02992981927409	37.839808295491	12.5872	53.6987
4.58922586174529	37.4657547222341	13.2524	50.7626
4.13505572963331	37.0802846721327	11.7937	48.0467
3.67598193748282	36.6906566292501	12.2621	43.6923
3.22556431997093	36.3083678480119	9.27453	43.3967
2.78941010038061	35.9381631108862	7.21925	42.3799
Route: 3 Length: 156.392474832796 Demand Met: 800			
22.2990334573609	32.1154181968835	46.0829	25.5503
27.3811809658664	31.2536835991403	47.6331	25.3181
30.5567366680117	30.7152296848047	47.6864	20.3976
33.2444187767923	30.2594992693778	49.4045	19.961
35.6478611027489	29.8519672016308	49.4944	16.327
37.8030839554369	29.4865241251887	50.9211	16.4053
39.7393759732159	29.1582033785962	54.7387	20.4852
41.4587842402778	28.8666580407667	55.9929	17.1432
42.9767839251728	28.6092643523271	58.7637	13.9566
44.2776881666117	28.388683330734	58.2097	7.56071
45.3509690318092	28.2067026232252	52.4925	5.37248
46.3387668757081	28.0392238872439	51.1528	6.04103
47.2860771204606	27.8786173260139	48.6979	8.85907
48.2330477558291	27.7180681811811	43.8962	13.6901
49.2103060020007	27.5523760008978	38.2491	9.61738
50.2784339851733	27.3712735966023	37.2177	7.79249
51.5047036193795	27.1633588391578	42.0178	3.44287
52.8942504463975	26.9277596493628	47.3917	2.23053
54.3626783616857	26.6787817586598	48.5894	0.54797
55.9042744854768	26.4173917342877	56.1254	1.40532
57.3789486080873	26.1673423229462	56.3237	2.07366
58.8236424393934	25.9223724040694	60.7013	1.36116
60.1860036044375	25.6913595599094	61.5069	0.482106
61.4747885031759	25.4728207444547	64.5769	3.66176
62.716679848311	25.262230974337	68.2389	8.47105
63.9189480603538	25.0583572842982	70.1018	4.34543
65.0639541256199	24.8641919424623	74.632	5.60444
66.1338883194135	24.6827548416988	74.5771	5.70821
67.1498653535042	24.51046676091	73.4709	7.6166
68.1372706041882	24.3430240416816	77.911	9.90186
69.0850598470343	24.1822990977883	79.2919	13.6517
70.0008519673552	24.0270000992967	80.035	15.8589
70.8895889687008	23.8762892540719	86.8707	18.0065
71.731124858197	23.7335818791957	88.2698	14.9994
72.5246525210343	23.5990153875027	90.4883	12.6216
73.2619164636534	23.4739899147613	91.7898	10.5225
73.938079034987	23.3593261225227	88.9914	10.7701
74.5789025961199	23.2506555812512	88.6343	0.494442
75.0774415349007	23.1661155764014	95.0473	3.39817
75.3353845651767	23.1223852689139	95.7659	2.55349
75.4150338296278	23.1089178092887	98.9579	4.73211
75.3645958897029	23.2239701197215	99.5164	7.77478
75.2159192756879	23.5631944744487	96.7716	16.6523
75.064491006893	23.9087009893433	97.4766	17.1802
74.9058001312793	24.2707780226823	97.2905	22.0419
74.7411936561201	24.6463519302066	99.5853	23.4577

Solution x	Solution y	Original x	Original y
74.5665311545665	25.0448662485474	98.8743	25.646
74.3823699327507	25.46505066363	96.7473	23.5618
74.1879485117022	25.9086413967	93.1464	19.8146
73.9822882669122	26.3778669905391	90.11	20.7153
73.7643366231688	26.8751300734691	87.5589	25.1226
73.5376914243695	27.3922317506996	89.036	30.7257
73.3046273418297	27.9239874299164	85.0689	32.1301
73.0669842075044	28.4661983556834	80.1207	32.7664
72.8272405776024	29.0132087784627	80.0506	36.8529
72.5885438635287	29.5578376158887	80.5435	37.2793
72.3523891834617	30.0966728314658	81.8496	38.8539
72.1199263475341	30.6270898431176	85.2354	42.0312
71.892333472327	31.1463985487404	88.1955	43.6361
71.6700581836579	31.653575569064	91.3249	42.8902
71.4510191168353	32.1533674525337	92.3029	41.017
71.2323158937846	32.6523904729292	95.9404	38.2332
71.0036688373741	33.1740998383144	96.1419	41.3034
70.7649407400345	33.718812242692	96.3235	44.2629
70.519084785177	34.2797886553454	94.61	43.2995
70.267715358309	34.853340280162	92.0634	46.0336
70.0189777992905	35.4208837961469	90.8764	48.3318
69.7760260581089	35.9752232059149	86.8559	48.4797
69.5386001198593	36.5169555074126	88.4474	55.9131
69.3334650299632	36.9850037002577	85.3959	62.1638
69.0949680947968	36.9797242594236	81.8209	62.9891
68.6809760028539	36.9706124647119	81.8774	60.6902
68.2274950371907	36.9606320664801	82.834	58.4111
67.7461153833087	36.9500363460677	82.7455	58.0479
67.2327849740241	36.9387350547334	80.6139	53.7748
66.7125022013685	36.9272780609472	79.5061	49.6701
66.191526772116	36.915803244056	81.1997	46.621
65.6668137052465	36.9042429241974	81.4209	43.6493
65.1400690279459	36.8926345818875	78.6058	43.2582
64.6192424194426	36.8811529398636	76.05	41.1841
64.1104634730054	36.8699329750904	74.7866	36.0265
63.6098169255763	36.8588905602862	74.0572	35.987
63.1130262551908	36.8479311473001	73.2088	32.0501
62.6049834699636	36.8367251498994	77.6794	29.1288
62.0722825542618	36.8249786266914	81.7106	28.112
61.499859509666	36.8123580610641	82.6839	23.4883
60.8479218185425	36.7979865650061	76.419	22.7841
60.1483352521158	36.7825692114592	78.906	18.0381
59.3183057853203	36.7642808008951	77.5205	18.1054
58.3464778822656	36.7428715819747	76.9072	18.2917
57.1877027425586	36.7173476247003	75.2455	17.3084
55.7630239942553	36.6859721768948	68.0574	15.6194
54.2149330779178	36.6518846999904	67.267	14.1516
52.423436795827	36.6124423480646	62.8285	19.7058
50.570564164844	36.5716512598005	62.0154	28.1819
48.6575377771416	36.5295372532877	60.6972	35.5066
46.6560593035149	36.4854763050379	61.5258	41.6034
44.4485615215983	36.4368774204059	55.717	37.8511
42.1169167823674	36.3855425813109	55.5492	35.9315
39.5814812246156	36.3297152906497	56.9788	35.9946
36.6228638546458	36.2645685080117	56.0389	33.1015
33.0306075118928	36.1855138436631	55.099	31.771
27.925869749755	36.073203461499	49.1148	32.8614
18.9569994585862	35.8757410184826	36.8488	32.2474
Route: 4 Length: 104.685345361647 Demand Met: 800			
6.3722890188577	36.5575214604867	25.7714	33.2927
9.35258056082287	37.322077760369	29.1053	29.2049
11.7486549140567	37.9367597853471	31.6686	31.1822
13.8256542984905	38.4695869217048	37.7688	31.4408
15.4131386714262	38.8768343931082	37.0272	27.4581
16.7699724464096	39.2249111229788	38.2173	22.874
17.8377173613201	39.4988257569561	34.4638	23.0393
18.850787770407	39.7587144484761	36.0033	17.5038
19.6773575339776	39.9707589200938	39.9475	19.2268
20.1713578484609	40.0974868689197	41.7205	19.4188
20.3090480022653	40.7437898290342	42.987	22.9253
20.5210985129142	41.7391279730971	42.4972	23.9973
20.8261183315226	43.1708443310309	44.5404	30.686
21.1746839351456	44.8069542372294	46.2037	41.7062
21.516134960533	46.4096735195254	41.6783	52.1535
21.8340937370716	47.9021270428195	44.4217	55.3301
22.1190855418415	49.239843882967	43.5841	58.7522
22.3739141665345	50.4359830842555	41.7302	58.1199
22.6141821487281	51.5637786742734	40.6271	60.1839
22.8416652445906	52.6315658349108	33.4192	59.483
23.0663207377034	53.6860805595095	31.2678	61.1344

Solution x	Solution y	Original x	Original y
23.2884189564407	54.7285918691216	23.6206	68.344
23.5034131208866	55.7377572690557	24.7619	69.8637
23.7118484286261	56.7161364296418	23.7167	70.7298
23.9156826442809	57.6729186423558	27.1361	73.6904
24.1123734097567	58.5961716899262	20.7262	75.308
24.3022638373229	59.4875048131328	16.576	71.2313
24.4911459713134	60.3741037850868	17.2306	77.2747
24.6731183471234	61.2282689859353	16.8354	77.4785
24.849314390094	62.055320382802	16.5471	81.1813
25.0162507088761	62.8389077727813	19.5225	82.1483
25.1748387066068	63.5833092432398	23.3569	85.0798
25.322588956507	64.2768400171916	25.7615	81.4539
25.4651983437265	64.946239869477	23.3293	78.9181
25.6051782293177	65.6032964764796	26.7929	78.8352
25.7427541231688	66.2490683752135	29.8827	79.684
25.8776364474983	66.8821963862351	34.9224	79.9328
26.0095644058741	67.5014563740706	34.4937	83.7515
26.1369689147617	68.0994836938282	32.7208	86.88
26.2588067558063	68.671381841158	36.723	86.3354
26.3755299751193	69.2192726346573	37.7453	86.3505
26.4876774468055	69.7456854607927	40.7053	85.7824
26.5953971280301	70.2513148061481	43.3068	85.4106
26.6984604836972	70.7350879014244	44.9959	88.3516
26.7925438209763	71.1767096381559	48.934	88.5471
26.86505036738	71.5170507114627	50.0418	88.5256
26.9173678749221	71.7626248734229	50.9984	83.4341
26.9671334901533	71.9962206808674	47.7087	83.4773
27.0158030151028	72.2246716220604	48.3206	81.4332
27.0636343530929	72.4491882720565	45.6946	80.9262
27.1110196647657	72.6716113174169	45.1636	79.7971
27.1581928982543	72.8930388212891	43.9629	81.9344
27.2050737815756	73.1130940031259	43.0779	81.6476
27.2517915012498	73.3323832040042	41.546	82.3742
27.2982936776806	73.5506605826179	38.4806	81.2568
27.3446853649894	73.7684192475939	41.4131	74.8199
27.3914764663406	73.9880525536883	46.3399	71.17
27.4389836477732	74.2110468825569	47.6475	71.1843
27.4871968254087	74.4373548567912	50.5772	79.5094
27.5349861134255	74.6616730686944	54.169	81.8375
27.5806519885899	74.8760235424006	54.7886	87.0165
27.5886546235587	74.9135830026231	53.7144	89.3849
27.588654682026	74.913583509126	51.2472	90.6526
27.5886547421103	74.913584024158	49.8328	92.6571
27.5886548029413	74.9135845499652	48.9418	95.7946
27.138308687716	74.8502210097467	40.4171	94.2218
26.6729751648526	74.7847486947179	34.7579	99.7518
26.18224415213	74.7157027216546	34.7487	93.2543
25.6847097295149	74.6456995257614	33.1283	92.3481
25.1817287860033	74.5749300187299	32.5896	90.759
24.6731510136645	74.5033730883368	27.9893	89.6021
24.1664099073031	74.4320744124303	28.4623	90.5817
23.658753047139	74.3606467624551	29.5533	92.3189
23.1456246633486	74.2884492078317	27.8353	94.5623
22.6264763454703	74.215404598756	23.1083	96.0553
22.105940331137	74.142164625051	18.6101	90.3489
21.5902636920236	74.0696081307761	12.3803	91.1149
21.0871040026192	73.9988123523286	15.2733	95.1553
20.589623166449	73.9288154213493	16.7243	94.3593
20.0958629941681	73.8593418789663	18.064	96.3276
19.6054614307069	73.7903409663629	16.854	97.4806
19.1238834893193	73.7225817429551	12.7313	98.6134
18.6597319921414	73.6572745696696	3.57801000000001	99.0366
18.4787362809376	73.6318112558411	0.299018000000004	97.3272
18.0850913371378	72.7051992790901	3.24988	93.8751
17.639216773206	71.6556423879313	4.45068999999999	94.0863
17.1050254923766	70.3981934734545	4.28894	92.6489
16.4520462045386	68.8611242313378	3.35356	88.986
15.7048834523061	67.1023512196687	3.06059000000001	88.1315
14.8062925750853	64.9871219691745	1.02508	82.9527
13.8333341933899	62.696834961618	8.89064000000001	83.8954
12.7011279390108	60.0316856150005	10.1219	82.045
11.2447046111694	56.6033378771637	4.99968	74.2733
9.48070639010354	52.450966912803	0.194864999999993	71.2335
7.16966730660675	47.0108786680305	2.55217	66.9796
Route: 5 Length: 165.242302823222 Demand Met: 800			
17.9254650365258	45.0640243839268	32.641	61.5676
24.2828186182994	48.9475829957122	35.9094	68.8825
28.1629461370128	51.3178589909462	42.1545	66.9856
31.0587438577179	53.0868339298701	43.1006	68.5786
33.4358096333692	54.5389299198627	45.2184	66.3382

Solution x	Solution y	Original x	Original y
35.5389879319227	55.8237153187657	48.6743	62.5481
37.4674681424589	57.0017819305136	51.793	64.9464
39.2126875539103	58.0678986998305	52.5118	68.1256
40.8028813888107	59.0393137154065	56.0439	62.2937
42.2950222696073	59.9508302292548	58.3448	60.9201
43.7056759980454	60.8125679431731	59.9164	61.9972
45.041093776721	61.6283456268519	59.9164	58.75
46.3359319293216	62.4193340994086	64.2573	58.953
47.5599589298443	63.1670658577772	64.8783	60.379
48.7203490084464	63.87592348526	69.9395	64.1832
49.7656039790795	64.5144478650067	66.9764	66.2314
50.7469126125478	65.1139089542821	65.3011	67.1869
51.6846170119719	65.6867332964173	65.9297	69.3415
52.5799479894269	66.2336726953424	60.771	67.3196
53.4685464526444	66.7764993525716	60.9907	71.4945
54.3568861211506	67.3191677324345	60.356	72.3736
55.2487186479815	67.8639696820273	61.6789	74.8507
56.1366662037277	68.4063982952081	59.2712	76.4167
57.0263379234073	68.9498801097507	60.7208	77.8844
57.9103927345442	69.4899306531911	60.2539	80.1704
58.7871412333082	70.0255179154509	61.8453	80.8454
59.652987973511	70.5544455253128	66.7645	81.0279
60.4966894990462	71.0698451029025	63.6977	85.2552
61.3237986751934	71.5751088087931	58.0371	93.3465
62.1261497877979	72.0652484347448	54.8665	95.2849
62.9068644899993	72.542170973339	48.6626	98.7924
63.7563949563923	72.948317169863	51.8363	98.9629
64.620950837318	73.361647414335	54.3707	99.6057
65.4566924831037	73.7612028544478	59.3326	96.8644
66.2762312974738	74.1530122490392	65.9332	98.9174
67.0256085291707	74.5112790954618	68.0526	97.9535
67.7264610153246	74.8463473752339	68.3546	93.0491
68.4072669248934	75.1718319253062	74.1314	97.2935
69.0366895765303	75.4727511061662	75.6359	99.7073
69.588871415471	75.736742623227	75.4786	92.9344
70.1183529847747	75.9898815141521	75.6586	91.7899
70.6237189282069	76.2314911146672	77.8131	90.2453
71.0994819922465	76.4589480717176	80.7777	87.9354
71.5382762986074	76.6687309251235	83.5669	88.2708
72.1392862713978	76.9560648804887	86.1563	95.4019
72.5968472974678	77.1748189143086	87.9339	96.7331
72.9867994744985	77.3612497909758	91.0373	94.8618
73.3278604612401	77.5243058878413	96.3227	96.5824
73.3278604278988	77.5243058422124	92.7385	89.9534
73.3278603947513	77.5243057961934	91.8947	87.6684
73.3278603616647	77.5243057499511	84.4594	85.6238
73.327860328565	77.5243057037475	85.2864	82.465
73.3278602954146	77.5243056573428	82.6909	80.2719
73.3278602621944	77.5243056107513	79.6042	79.6519
73.3278602288862	77.5243055639252	75.9957	81.402
73.3278601954803	77.524305516974	74.5996	81.8744
73.3278601619892	77.5243054698297	73.8931	82.0767
73.3278601284391	77.5243054226937	77.5352	78.0347
73.3278600948504	77.5243053753358	76.2214	75.1456
73.3278600612982	77.5243053279589	78.3667	74.2083
73.327860027776	77.5243052805436	78.9206	73.8168
73.3278599943062	77.5243052331022	80.9911	75.8316
73.3278599608621	77.5243051856898	80.8889	76.3527
73.3278599274483	77.5243051383829	84.0931	75.7357
73.3278598940397	77.5243050910524	86.1254	75.412
73.3278598605945	77.5243050436702	87.0562	74.7862
73.3278598270476	77.5243049960771	89.1084	77.1611
73.3278597933474	77.5243049483887	95.4573	78.5053
73.3278597595452	77.5243049005323	95.1537	79.2325
73.3278597257081	77.5243048525757	98.0879	82.1977
73.3278596929226	77.524304806793	98.0725	73.509
73.3278596603545	77.5243047611549	97.9153	71.697
73.3278596279019	77.5243047157386	94.2046	73.3577
73.327859595117	77.524304670221	93.4248	68.5015
73.32785956206	77.524304624444	96.3481	58.4969
71.5918541127851	76.2730726614659	88.5712	66.6382
69.806370942985	74.9861810578215	82.5413	70.9361
68.0081808144578	73.6901326669479	78.2186	68.7569
66.2214068172542	72.4023128478521	75.5117	58.1702
64.4996634622074	71.1613616554406	76.3859	55.8636
62.8193439602288	69.9502651526333	74.8357	53.7031
61.1831252897867	68.7709526327716	74.6616	49.1772
59.5984873683853	67.628815271145	72.4782	47.1166
58.076464148705	66.5318052247318	73.064	44.6995
56.5927175872767	65.4623811231957	72.565	40.2263

Solution x	Solution y	Original x	Original y
55.0761996749072	64.6259650836614	70.0979	43.9308
53.5359205228742	63.7764438505436	69.2786	47.5055
51.9455934594593	62.8993194178661	70.983	56.1077
50.1990990799397	61.9360627478012	69.1414	57.6653
48.2572716100292	60.8650722924726	69.3672	55.5594
45.9677690187956	59.6023251900012	67.8108	54.6502
43.1238798206221	58.0338112435865	62.6521	52.6724
39.7955459547558	56.1981056633817	57.8122	54.5104
35.9854114555759	54.0966679829583	54.0007	52.8659
31.5427478123142	51.6463686849803	53.4254	44.9898
24.4306087782974	47.7237444401912	47.522	42.292

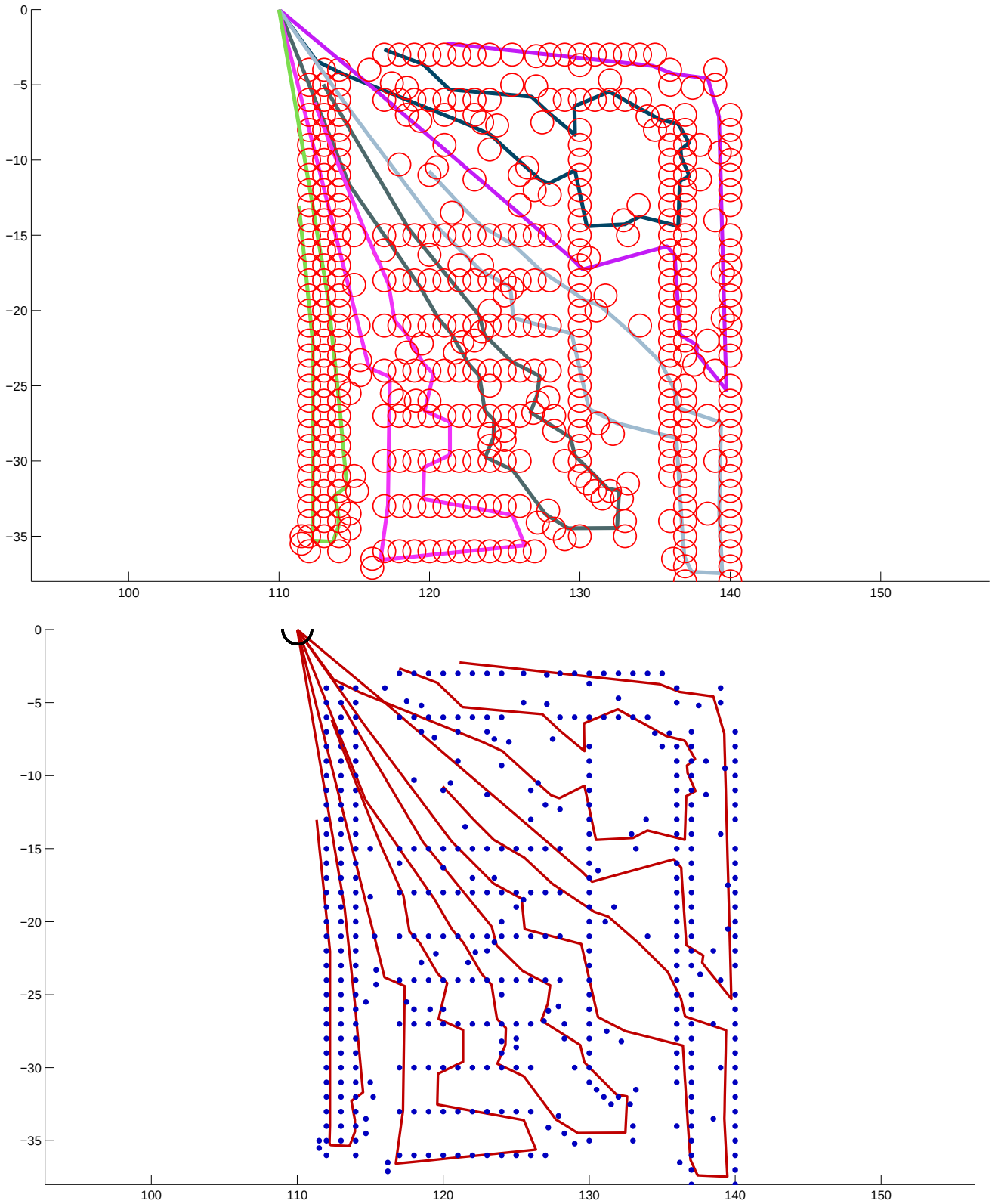


Figure O.20: $pcb442$, $r = 0.76$, Equal Radius, 2D, Euclidean, Length = 524.2074655

Table O-23: Solution for $pcb442$, $r = 0.76$, Equal Radius, 2D, Euclidean

Total distance: 524.207465527437			
Total demand met: 1100			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 73.1231879722142 Demand Met: 182			
2.48822152370627	3.41755428781149	2	4
3.13725216672509	3.73412286430495	3	4
3.8183590178146	4.06633623910119	4	4
4.30915337548801	4.30572338487378	4	5
7.21522915349762	5.48054655528225	7.5	4.9
8.21898031908532	5.88628544324896	8.5	5.2
8.96862967552926	6.18940698698449	9	6
9.82738958304408	6.53665257483937	10	6
11.0502990103726	7.03115954599659	11	7
12.6988644713255	7.69779144595391	13	7
13.3231602591001	7.98476456006699	13.5	7.5
14.0764364593402	8.33102878781208	14.5	7.7
14.5147454155524	8.74091455025437	14	9.3
16.4075916467786	10.4574854871826	16	11
16.7009951531803	10.7235758997698	16.5	10.5
17.3876438331731	11.3462899944935	17	12
17.9510520223119	11.541574440945	18	12.3
19.6701579455701	10.6846966218628	20	10
19.7725224724677	11.1642173626922	20	11
19.9555851589579	12.0217200495805	20	12
20.1552312265078	12.956883779742	20	13
20.3465610110188	13.8530859282922	20	14
20.4626903878994	14.3970712479408	20	15
23.001090365644	14.2664876074517	23.2	15
23.2937394364184	14.1148305815364	22.9	14
23.9885829713733	13.7548239797389	23.9	13
25.8540845824005	14.2208925186817	26	14
26.5427084219754	14.3929657701236	27	15
26.5582078326666	13.9464046874635	27	14
26.5860446792226	13.1459519952056	26	13
26.5976913576212	12.8101360732718	27	13
26.6201392647418	12.1640756265064	27	12
26.6303330451086	11.8701632103092	26	12
26.6464351006478	11.3996595072668	26	11
26.9887995553989	11.2132908056225	27	11
27.2807860950244	11.0543621776645	28	11.3
26.9308394345196	10.2565916720029	27	10
26.7371804630279	9.81514866983719	26	10
26.6972108856255	9.30249520848603	26	9
26.9911011606474	9.06724415037699	27	9
27.2535364106862	8.8571761265972	28	9
26.852107947607	8.15204113652035	27	8
26.5411761435937	7.60587656045837	27	7
26.1134616072407	7.49980109158762	26	8
25.6190904253731	7.37718040399272	25.5	7.1
25.2775083661649	7.29247389517597	25	8
24.5789999038275	6.9067341662649	24.5	7.1
23.7601273205485	6.45452966502443	24	6
23.0044536607494	6.03722327607381	23	6
22.3296200241511	5.66455661667901	22	6
21.9570116311611	5.4587864818159	22	4.7
20.9803653522293	5.86181685393238	21	6
20.1705439183662	6.19599940699126	20	6
19.6355427539992	6.41676187234807	19	6
19.6622670155405	7.86143029949986	20	8
19.6706586029653	8.3150624741553	20	9
18.0027329603943	6.93003830279306	17.5	7.5
17.5191652175051	6.47708278050586	18	6
16.7897107206629	5.79377614804066	17.1	5.1
15.4458801541888	5.67467895285516	15.5	5
14.0779671939085	5.55349294121867	14	6
13.0496054920468	5.46237064102403	13	6
12.068855418996	5.37546201825299	12	6
11.3158573880084	5.30874148470295	11	6
9.59253223671864	3.64153990497878	10	3
8.82831187885434	3.3514289611555	9	3
7.94293339902094	3.01532366735068	8	3
6.98463599958019	2.65153668391104	7	3
Route: 2 Length: 87.9640398939742 Demand Met: 184			
1.9851693847035	4.94881340864481	2	5
3.13304297376956	7.81033954228763	3	8
3.63722216348775	9.06718604794008	4	9
4.00314469131295	9.97938695794317	4	10
4.35001250390469	10.8440784470443	4	11
4.6692381425344	11.6398312236275	4	12
6.88543452767446	14.8384640359495	7	15
7.50185847154134	15.728141256344	7	16
8.91348850329315	17.7653669032598	9	18
9.35928323446842	18.4087554042802	10	18
10.6180440103573	20.5577074687392	10	21
10.9996520502688	20.9995613732692	11	21
11.3816451501507	21.4418585531115	12	21
11.8214009763684	22.1949483780571	12.2	22.1
12.1159049145354	22.6993149213975	11.7	22.8
12.6134022537807	23.5512911314428	12	24
12.9794599889858	23.9566435360388	13	24
13.3139677620731	24.3270530064476	14	24
13.4400574391889	25.1333506896711	14	25
13.6784078934256	26.657411207734	13	27
14.1653016398478	27.1493977643269	14	27
14.2927564290609	27.2782282010135	15	27
14.2720853974568	27.9581128860744	15	28
14.2647355351911	28.2006432100529	14	28.2
14.2575595020144	28.4375621263084	15	28.6
13.9952334114979	29.0569811292956	14	29
13.7103293180487	29.7297471760575	13	30
14.165150650433	29.9455827872457	14	30
14.8549885374992	30.2729516823992	15	30
15.5179247348947	30.5875442126907	16	30
17.468986057125	33.2105211985657	17.9	33.3
17.7145927204313	33.5407159119125	17.2	34.1
18.5499345894096	34.060210636005	18.3	34.5
19.2066668956929	34.4686356029444	19	35.2
20.0727695622757	34.4638032557225	20	35
22.4750360933295	34.4504387582999	23	35
22.5068970020643	33.8309867183701	23	34
22.5667169559022	32.6672238410364	22.8	32.5
22.6025686233494	31.9697670368738	23.2	31.5
22.2036394321067	31.8942367748596	22	32
21.8557473969423	31.8283977863511	21.5	32.5
21.5082786795591	31.4799180190374	21	32
21.0138365799665	30.9839932093079	20.5	31.5
20.5150542296253	30.4837086125465	20	31
20.0626238748279	30.0299212693082	20	30
19.6638231466779	29.6299408967603	19	30
19.5355804019404	29.0907433317417	20	29
19.3814994131297	28.4416580762568	20	28
18.5131628376077	27.8930373920444	18.3	28
17.9324083803221	27.5261168977229	18.3	27
17.0836373441277	26.9898739338687	16.9	26.8
16.721459900734	26.7610439594658	16	27
16.988995055822	26.0659977330438	17.2	26.1
17.1633084153139	25.6132121522649	17.9	25.8
17.3269792972249	24.3530542522054	18	24
16.8310966467192	24.0977517991236	17	24
16.1352373978946	23.7394837652982	16	24
15.4460187572131	23.3846377739302	15	24
13.6578405961	21.6194092709829	13	22
13.5845099099052	21.3406342034885	13.5	21.4
13.5094760468991	21.0553904262823	13	21
13.4592612614813	20.864508980757	14	21
13.3223774045774	20.3441378094846	14	20
11.7256061309919	18.380374873331	12	18
11.1612873740676	17.6863818965062	11	18
10.0361425236463	16.3026920195825	10	16.3
9.09471679958949	15.1449413860801	9	15
8.62354182956193	14.5654931211998	8	15
4.55298773575204	7.69029350476801	4	8
2.94749497447911	4.97851656319268	3	5
Route: 3 Length: 93.1847753313713 Demand Met: 184			
1.50656928366654	5.99812618801212	2	6
1.76808771344544	7.03934413553717	2	7
2.01317723612625	8.01515030193594	2	8
2.27583830856693	9.06091511939417	2	9
2.88968332980623	11.5048585218652	3	11
2.88968332980623	11.5048585218652	3	12
3.30513641830319	13.1589372530283	4	13
3.54442115223166	14.1116470431351	4	14
3.78095245310412	15.0533997109424	4	15
4.01700945920895	15.9932662020337	4	16
4.25203929690645	16.9290424332863	4	17
4.48076209157435	17.8397027824397	4	18

Solution x	Solution y	Original x	Original y
4.66235689326183	18.562712080612	5	18.3
5.27110406569624	20.9864741182364	5.3	21
5.79323187131784	23.0653468381506	5.40000000000001	23.3
5.97997341037078	23.8088446886685	5.40000000000001	24.3
6.78841723224025	24.1617545219655	7	24
7.36123055761543	24.4117964960603	8	24
7.34787275384514	25.3688669646318	7.5	25.5
7.33884726492388	26.0153776930999	8	26
7.32611910396577	26.927317185546	8	27
7.32046508255951	27.3323609052634	7	27
7.28401800104277	29.9434924227101	8	30
7.27833229051223	30.351019570827	7	30
7.24212295168202	32.9432198301563	8	33
7.18453309984277	33.3652261821947	7	33
6.85866942783601	35.7531501043085	7	36
6.77662166108237	36.3543728907839	6.2	36.5
6.74688770007586	36.572252383815	6.2	37.1
8.02062154197563	36.4444154156328	8	36
9.08271162031465	36.3378216524973	9	36
10.5119985392144	36.1943751126442	10	36
10.5119985392144	36.1943751126442	11	36
12.4990391564639	35.9949523247958	12	36
12.4990391564639	35.9949523247958	13	36
14.4814537137569	35.7959941758696	14	36
14.4814537137569	35.7959941758696	15	36
15.810434889518	35.6626152006014	16	36
16.3485254727173	35.6086116457941	17	36
15.5219296254308	33.5908065181344	16	33
14.864375429051	33.4720776661531	15	33
13.9353207595582	33.3043260403961	14	33
12.9739170319717	33.1307341687837	13	33
12.0110587867949	32.9568798641965	12	33
11.0569047370581	32.7845970729938	11	33
10.1659491913366	32.6237249347623	10	33
9.58885078908727	32.519523014977	9	33
9.6379691292983	30.4130347637862	9	30
10.1582847747311	30.1651391533948	10	30
10.818981149262	29.8503566089118	11	30
11.357738080543	29.5936714427521	12	30
11.362076512935	27.4131061286539	12	27
10.8189772369121	27.1709121292802	11	27
10.1830186768907	26.8873013564317	10	27
9.68152721943534	26.663661331745	9	27
9.79984763313435	26.1681714782251	9.09999999999999	26
9.91657196141517	25.6793597735623	10	26
10.2684181964358	24.2058904221494	11	24
9.96367893017857	23.899697305075	10	24
9.60262320187864	23.5369156042297	9	24
9.08503852753267	22.6481757433518	8.5	22.8
8.91004069793638	22.3476828618136	9.5	22.2
8.38609965340068	21.4480265918185	9	21
8.01967378166654	21.0414663913278	8	21
7.68432163911103	20.6693851447724	7	21
7.27251238135693	18.2199164923152	8	18
7.02403286837942	17.664351741648	7	18
5.69984910748516	14.7036741295255	5	15
3.70790216982431	9.72347791974399	3	10
3.34844949810213	8.78086521371538	3	9
2.73916775244227	7.18309928514405	3	7
2.36142847926212	6.19253349654959	3	6
Route: 4 Length: 93.2533921635844 Demand Met: 183			
5.50975293196439	4.58073454530786	6	4
7.427018332007	6.22401007649808	7	6
7.427018332007	6.22401007649808	8	6
8.82487722671812	7.42210596722403	8.5	7
8.82487722671812	7.42210596722403	9.40000000000001	7.4
10.8660318529559	9.1715690313288	11	9
13.1544761789526	11.1329854759758	13	11.3
15.6967946529766	13.3119949602999	16	13
17.5341809732026	14.8868112412366	18	15
17.5341809732026	14.8868112412366	17	15
19.4841414918286	16.5581130890811	20	16
20.1937858760213	17.2651194031016	20	18
20.3950836522914	17.2098612733289	20	17
20.8830802083993	17.0759060209087	20.6	16.5
25.7872820046956	15.7296257053099	26	15
26.0404364753614	16.0093847381403	26	16
26.3001985173305	16.2964466279447	27	16
26.3424726070359	16.9370664618649	27	17
26.362528903164	17.2410449935061	26	17

Solution x	Solution y	Original x	Original y
26.3992053571663	17.7969021930001	26	18
26.4234228798946	18.1639484704537	27	18
26.4687280373621	18.8505749761371	27	19
26.4913379716726	19.1932529404937	26	19
26.5444619991599	19.9983676534545	27	20
26.5444619991599	19.9983676534545	26	20
26.5995950902596	20.8339091278257	26	21
26.6218935865224	21.1718662883289	27	21
26.650616974442	21.6071888425476	26	22
27.1212901229603	21.896049745926	27	22
27.8100350777198	22.3186719692271	28.5	22
27.7342105466428	22.803689221252	27	23
28.1182528480522	23.2797536739184	27.6	23.6
28.8823908876239	24.2269900870534	29	24
29.737362321891	25.2868206679846	30	26
29.7237252145549	24.7791126079362	30	25
29.6790415071478	23.1155639676344	30	23
29.6488652102839	21.9926524564457	30	22
29.6088402247811	20.5031714034711	30	21
29.6088402247811	20.5031714034711	30	20
29.6088402247811	20.5031714034711	29.5	20.5
29.5699082173059	19.054522229183	30	19
29.5425804096344	18.0377316324116	30	18
29.5193988377558	17.1751978965432	30	17
29.5193988377558	17.1751978965432	29.5	17.5
29.474422539865	15.5014542928942	30	15
29.474422539865	15.5014542928942	30	16
29.4349864608029	14.033392979636	29	14
29.4077489355448	13.0194456686227	30	13
29.380850788463	12.0181060804626	30	12
29.3539763952676	11.0176345217072	30	11
29.3272277020311	10.0218655225472	30	10
29.3036237951283	9.14321787225221	30	9
29.2986898192789	8.95935496569636	29.3	9.5
29.2734581102941	8.02022541313486	30	8
29.2492148162282	7.11799941336581	30	7
28.6959910206436	5.22964267863871	29	5
28.5045987635786	4.57635081135159	29	4
27.5988560185105	4.45411661728305	27.5	5.2
26.1883157712133	4.26369922575959	26	5
25.729499376404	4.08749114075855	26	4
24.8212046937183	3.73867050113714	25	3
23.92427239711	3.64117533582068	24	3
22.9384915944601	3.53402155045298	23	3
21.910593997846	3.42228941494626	22	3
20.5076098898302	3.26978620322254	21	3
20.5076098898302	3.26978620322254	20	3
19.90830638111	3.20464176130526	20	3.7
18.4984498560839	3.05139221902388	19	3
18.4984498560839	3.05139221902388	18	3
17.0964888932296	2.89900057375563	17.1	3.1
15.4967446115141	2.72510977047098	15.5	3
13.5075321209885	2.50888384418038	13	3
13.5075321209885	2.50888384418038	14	3
12.0919309739093	2.35501026889643	12	3
11.116535830568	2.24898764740628	11	3
Route: 5 Length: 103.746410048011 Demand Met: 183			
4.03355988073335	5.7278373968557	4	6
4.61479329092101	6.55320890192209	4	7
7.62779366732525	10.5720284726325	8	10.3
10.5745614991043	14.5025252896815	10	15
11.0487602437721	14.9781548042707	11	15
11.5604391505527	15.4913830359688	12	15
12.5333487215073	16.4672742517433	12	17
13.128103582381	17.0636250797334	13.5	17
13.4542326225757	17.3906751787293	13	18
14.1326772139242	17.7562759001941	14	18
14.8244381079684	18.1290516298451	15	18
15.3678412284386	18.4218773573516	16	18
15.3966599717661	18.7077676704139	15.5	18.5
15.4371319092872	19.109241455069	15	19
15.577988733611	20.5065078528477	15	21
16.1736684804058	20.6635815965841	16	21
17.0569277033431	20.8964874436128	17	21
18.0387907880867	21.1553942639638	18	21
19.4538840112085	21.5285482050609	20	21
19.5971004843128	22.1540215635267	20	22
19.8152350065525	23.1066735018948	20	23
20.1323867815629	24.4917429306453	20	25
20.1323867815629	24.4917429306453	20	24

Solution x	Solution y	Original x	Original y
20.4335250062925	25.8068807485356	20	26
20.599866380963	26.5333455824261	20	27
21.4776405833497	26.9823015667108	21.2	27.5
22.467778490117	27.488733146639	22.2	28.2
25.7369817381398	28.3142761123098	26	28
26.4153371555744	28.4855687643207	27	28
26.4387025682997	28.8578336175322	26	29
26.4576604256493	29.1598821814586	27	29
26.5001432014693	29.8367448134927	27	30
26.5203580604582	30.1587869639542	26	30
26.5633324312458	30.8434592057232	26	31
26.5873906030376	31.2267552223834	27	31
26.6391876982273	32.0519750466116	27	32
26.699559739047	33.0138218317743	27	33
26.7581852346911	33.9478700099091	26	34
26.7850255272122	34.3049997796145	27	34
26.8396320107549	35.0313384682815	27	35
26.8985473768882	35.8149289353887	27	36
26.9357147803448	36.3093900286674	26.2	36.5
27.195591274116	36.8731318537464	27	37
27.4244328187589	37.3695508999319	27	38
29.4613929427178	37.4637988359747	30	38
29.4344884637267	36.9329419208102	30	37
29.3884232867242	36.0239213467187	30	36
29.3380177811714	35.029296176985	30	35
29.2886439683166	34.0551279458711	30	34
29.2599102002337	33.4881891430695	28.5	33.5
29.2701065223914	32.9677846033515	30	33
29.2893540209907	31.9862134692845	30	32
29.3086893090977	31.0000167544538	30	31
29.3232156183149	30.259117888215	29	30
29.330137601092	29.9061847362133	30	30
29.3481788058802	28.985735337316	30	29
29.3668130973858	28.034766103159	30	28
29.3785223762566	27.4374626341454	30	27
28.4018713101001	27.1089002468825	28.5	27
27.2283841801994	26.7141107334796	27	27
26.564036943749	26.4906184260165	26	27
26.4814868717931	26.1262913282783	27	26
26.39993197713	25.7663652877177	26	26
26.2840496602745	25.2549899194957	27	25
26.0578406642356	24.8001592153994	26	25
25.7236866791952	24.1282878722341	26	24
25.3837559877828	23.4448027643236	26	23
23.4813316038301	21.555503195876	24	21
21.3183366163574	19.6572201347656	21.7	19
20.9873765024794	19.543132963057	21.1	20
20.3377466479357	19.3191688165734	20	20
19.7774658037102	18.9447923406843	20	19
18.2183394744626	17.9030010431385	18	18
17.4717441457169	17.4041304261008	17	18
15.5469812728137	15.6102273524097	16	15
14.8591202012527	15.2099773959087	15	15
14.1409326597831	14.7920810836124	14	15
13.4645877827384	14.3985337795492	13	15
12.0480358223295	12.9734536766975	11.5	13.5
10.3238512748719	11.1168254166843	10	11
9.96835410500348	10.7340248026766	10.5	10.5
Route: 6 Length: 72.935660118282 Demand Met: 184			
1.69360614576543	9.87773992349484	2	10
1.88328606888474	10.9840416132198	2	11
2.05880852400431	12.0077706120096	2	12
2.25065272552052	13.126694708811	3	13
2.41252067148233	14.097601754205	3	14
2.57585740238511	15.0773231679163	3	15
2.74690023969541	16.1032699223408	3	16
2.979283206567	17.4971591229007	3	17
2.979283206567	17.4971591229007	3	18
3.17538510234405	18.6734209079107	3	19
3.24703856229412	19.1032040143378	4	19
3.31807887347985	19.7631392216545	3	20
3.36011459279219	20.1536382566296	4	20
3.45365614422086	21.0226008515097	3	21
3.45365614422086	21.0226008515097	4	21
3.56792701512882	22.0841291803767	4	22
3.72156008710539	23.5113142940403	4	24
3.72156008710539	23.5113142940403	4	23
3.92427792506751	25.3944873523553	4	26
3.92427792506751	25.3944873523553	4	25
3.94376390653649	25.5755066450931	4.7	25.5

Solution x	Solution y	Original x	Original y
4.12048174794161	27.4953267957272	4	28
4.12048174794161	27.4953267957272	4	27
4.30387622419613	29.4876816083604	4	30
4.30387622419613	29.4876816083604	4	29
4.44028677338174	30.9695912200407	4	31
4.44028677338174	30.9695912200407	5	31
4.50651496363784	31.6890583750808	5.2	32
4.39420768807334	31.7719888066324	4	32
3.70667697726618	32.2796670868797	3	32
3.83085291385632	32.9576529671969	4	33
3.94345962905864	33.5724677662262	4.7	33.5
3.94744369763367	33.9772202695846	4	34
3.95130381524955	34.3693850630763	4.7	34.5
3.75058112573079	34.9104076472484	4	35
3.581766674828	35.3654230862636	4	36
2.9865774581597	35.3356084774286	3	35
2.29868961053693	35.3011503239616	2	36
2.20259259332731	35.2102240909279	1.5	35.5
2.2097278418134	34.9777321064847	1.5	35
2.2097278418134	34.9777321064847	2	35
2.24009312624847	33.9881132266846	3	34
2.24026518729981	33.7219413768589	2	34
2.24057227170837	33.2709998350314	2	33
2.24074735160933	32.9984940126486	3	33
2.24114603515339	32.0671794572346	2	32
2.24146149281583	31.3164102168523	2	31
2.24158507382231	30.9974318085158	3	31
2.24188886342876	30.0011101292124	3	30
2.24198538341095	29.5000569660302	2	30
2.24198538341095	29.5000569660302	2	29
2.24208128428883	28.9984210367905	3	29
2.24219352059558	28.0015461378169	3	28
2.2422087301363	27.4997413186233	2	28
2.2422087301363	27.4997413186233	2	27
2.24222353603682	26.9984616751155	3	27
2.24216628964452	26.0017619228032	3	26
2.24209969007127	25.49915721404	2	26
2.24209969007127	25.49915721404	2	25
2.24203347255737	24.9987297706541	3	25
2.24178783007825	24.0015285594367	3	24
2.24161663082786	23.4980775453375	2	24
2.24161663082786	23.4980775453375	2	23
2.24144526925585	22.9992319066899	3	23
2.24098352145451	22.0386960253547	3	22
2.20485809702404	21.683427039407	2	22
2.12621567881119	20.9100223528256	2	21
2.02490296672732	19.9136609363294	2	20
1.88147612548094	18.503112956327	2	18
1.88147612548094	18.503112956327	2	19
1.73733763606091	17.0855732485025	2	17
1.63143270813254	16.0440551628571	2	16
1.52991165237526	15.0456540263131	2	15
1.42862065175919	14.0495166902058	2	14
1.32447809763133	13.0253357063953	2	13

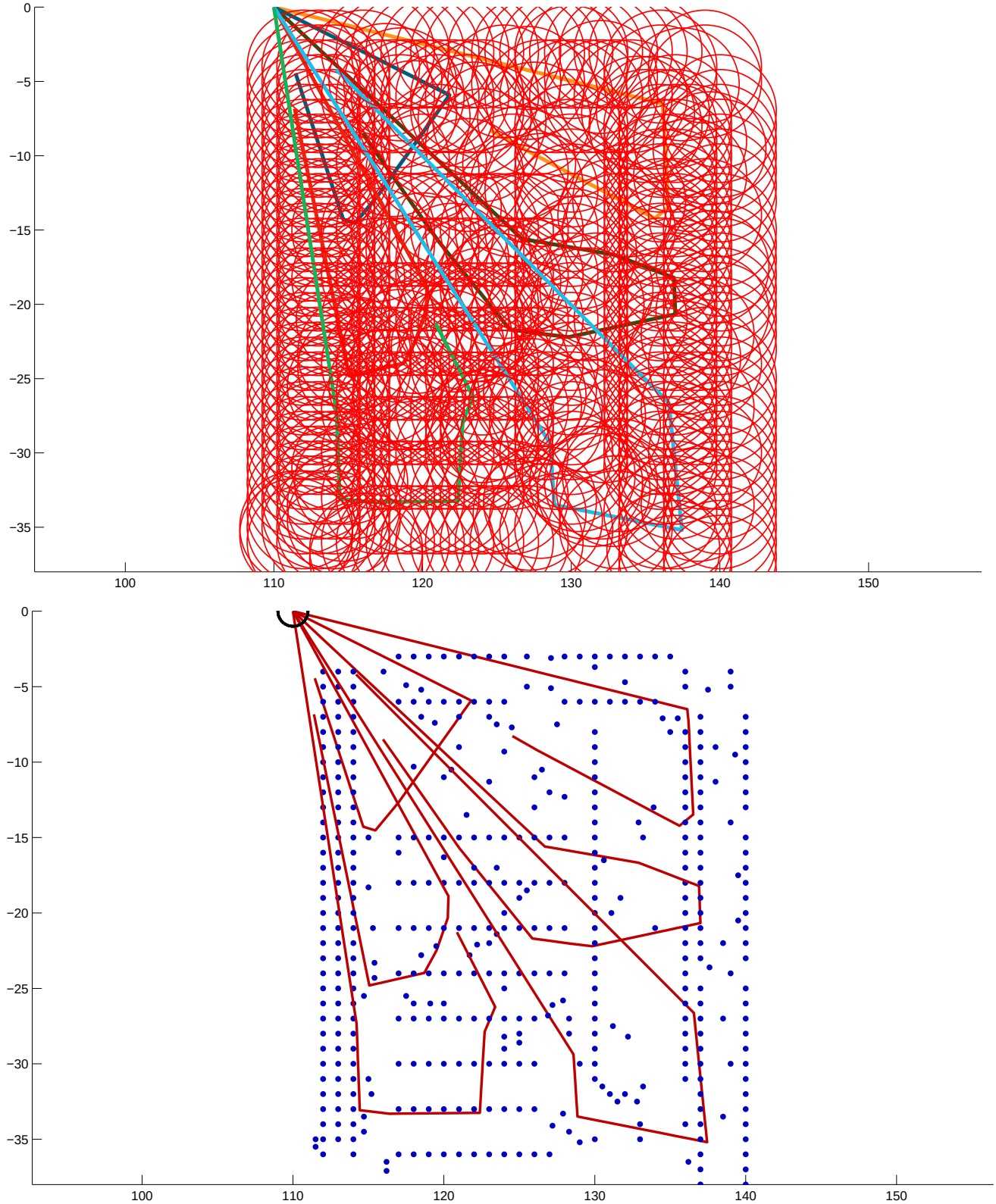


Figure O.21: $pcb442$, $r = 3.8$, Equal Radius, 2D, Euclidean, Length = 406.1321582

Table O-24: Solution for *pcb*442, $r = 3.8$, Equal Radius, 2D, Euclidean

Total distance: 406.132158154241			
Total demand met: 1100			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 64.3917844374329 Demand Met: 183			
11.5756732545117	2.87512384316976	14	3
14.4789100461806	3.59621843162183	17.1	3.1
15.7728775169665	3.91761137312891	15.5	3
17.1855376215976	4.26848829302756	19	3
17.1855376215976	4.26848829302756	18	3
18.1279790791802	4.50257816595595	17.1	5.1
18.1279790791802	4.50257816595595	18	6
19.2382228005915	4.77834053322018	19	6
19.2382228005915	4.77834053322018	20	8
19.8103098137854	4.92043222794041	20	6
20.359415648269	5.05681630358448	22	6
20.359415648269	5.05681630358448	21	6
20.7852194753266	5.1625758811049	20	3.7
20.7852194753266	5.1625758811049	22	4.7
21.2251061371429	5.27183341750266	20	3
21.8016579141398	5.41503519064006	22	3
21.8016579141398	5.41503519064006	21	3
22.6364403334611	5.62237499073824	24	3
22.6364403334611	5.62237499073824	23	3
23.3956207985009	5.81093640158733	24	6
23.3956207985009	5.81093640158733	23	6
24.173162005106	6.0040578337682	25	3
24.9497298764135	6.19693681518389	26	4
24.9497298764135	6.19693681518389	26	5
25.6286330753831	6.36555799220941	27.5	5.2
25.6286330753831	6.36555799220941	27	7
26.1294261832361	6.48994122052196	29	4
26.1633124803616	6.82180805002734	29	5
26.2109685010573	7.28851205799238	30	7
26.2109685010573	7.28851205799238	28	9
26.2242553805661	7.55255324819553	27	8
26.2372228702967	7.81025068792063	25.5	7.1
26.2372228702967	7.81025068792063	24.5	7.1
26.2509546705482	8.08311528550753	26	8
26.2509546705482	8.08311528550753	25	8
26.2646515981258	8.35528094273085	26	9
26.2779141943539	8.61881747772151	30	8
26.2779141943539	8.61881747772151	30	9
26.3125330619573	9.30626613151567	27	9
26.3483810683518	10.0181237960973	30	10
26.3483810683518	10.0181237960973	29.3	9.5
26.3802931852047	10.6517619237445	27	10
26.3802931852047	10.6517619237445	26	10
26.4177448963668	11.3954048054021	30	11
26.4749272023136	12.5310309543029	30	12
26.4749272023136	12.5310309543029	30	13
26.5221384048737	13.4688305439735	30	15
26.5221384048737	13.4688305439735	29	14
26.4040990688098	13.566500654913	27	14
26.4040990688098	13.566500654913	26	14
26.2904574627067	13.6605303129135	26	13
26.177773011694	13.7537676629406	27	11
26.177773011694	13.7537676629406	27	12
26.0433290724229	13.8650112286842	28	11.3
25.8561751524171	14.0198730912077	26	11
25.8561751524171	14.0198730912077	26	12
25.6148447219349	14.219569235068	26	17
25.6148447219349	14.219569235068	26	18
24.479656049975	13.6167391503548	27	13
22.0074831991048	12.3039325436236	20	13
20.6154667743094	11.5647235536386	20	11
20.6154667743094	11.5647235536386	20	12
19.5499462251255	10.9988982604608	20	9
19.5499462251255	10.9988982604608	20	10
18.6933451035049	10.5440210529211	18	12.3
17.7807944887993	10.0594321996204	16	11
17.7807944887993	10.0594321996204	17	12
16.9780186815645	9.63312810008619	16.5	10.5
16.1695225979164	9.20378358280788	13	11.3
16.1695225979164	9.20378358280788	16	13
14.5427781808369	8.27782581360967	17.5	7.5
14.5427781808369	8.27782581360967	14.5	7.7
Route: 2 Length: 74.1154482990982 Demand Met: 183			
13.13212405425	12.2716313700776	14	15
14.6508397421469	13.690827806442	16	15
15.6389204954433	14.6141635338595	18	15
15.6389204954433	14.6141635338595	17	15
16.1980040284028	15.1366133860283	15	15
16.1980040284028	15.1366133860283	15	18
16.6902655159317	15.5966188977343	15	19
17.1582914399591	15.6771496292404	15.5	18.5
17.7848374727206	15.7849586209803	17	18
17.7848374727206	15.7849586209803	16	18
18.7169230751844	15.9453433391849	20	18
18.7169230751844	15.9453433391849	18	18
19.4668380349699	16.0743778636209	20	17
20.1694121945772	16.1952655696532	20.6	16.5
20.1694121945772	16.1952655696532	20	16
20.8726988742298	16.3162750302375	20	14
20.8726988742298	16.3162750302375	20	15
22.0213654087023	16.513921852885	22.9	14
22.0213654087023	16.513921852885	23.2	15
22.8906068748124	16.6634854727815	23.9	13
24.4598244905942	17.2673210742737	26	15
24.4598244905942	17.2673210742737	26	16
25.4673965154643	17.655022795466	27	15
25.4673965154643	17.655022795466	27	16
26.2095705775185	17.9405993329632	27	17
26.2095705775185	17.9405993329632	27	18
26.9083630565262	18.2094753948253	30	16
26.9172887703667	18.4473073922272	30	17
26.9297995803221	18.7806729027798	29.5	17.5
26.944246919356	19.1656444690641	30	18
26.9633231989127	19.6739725930935	30	19
26.9633231989127	19.6739725930935	30	20
26.9837946158165	20.2194918442357	30	21
26.9837946158165	20.2194918442357	29.5	20.5
27.0005829683487	20.6668694734185	30	23
27.0005829683487	20.6668694734185	30	22
26.6490654050696	20.7421819679996	28.5	22
26.6490654050696	20.7421819679996	27	22
26.264173743168	20.8246446323549	27	21
25.8688620388923	20.9093396576034	27	19
25.8688620388923	20.9093396576034	27	20
25.3721221939725	21.0157650186311	26	21
25.3721221939725	21.0157650186311	26	20
24.831791278134	21.1315293048294	26	22
24.2506520938203	21.2560362574033	26	19
23.2626968928523	21.4677005417233	21.7	19
22.5545138604359	21.6194253030183	24	21
21.6909746283382	21.8044335904611	21.1	20
21.6909746283382	21.8044335904611	20	20
21.0448951645738	21.9428522609649	20	19
21.0448951645738	21.9428522609649	18	21
20.7251719603925	22.0113509097971	20	21
20.4143163096622	22.0779497256572	20	23
20.4143163096622	22.0779497256572	20	22
20.1168715029375	22.1416752787405	20	24
19.8260400169744	22.2039838864008	20	26
19.8260400169744	22.2039838864008	20	25
18.381928518924	22.030684479656	17.9	25.8
18.381928518924	22.030684479656	18	24
17.0921889572455	21.8556339095722	17	24
17.0921889572455	21.8556339095722	17	21
15.8648379688549	21.6890515253803	14	25
15.8648379688549	21.6890515253803	14	24
15.5732841080922	21.3283228536674	16	21
15.2872354088843	20.9744056212286	15	21
15.0083342049095	20.6293317933484	15	24
15.0083342049095	20.6293317933484	13	22
13.9978127558873	19.3790530492193	14	20
12.9218817233383	18.0478468906219	13.5	17
11.9929654923395	16.8985371359509	11	18
11.034297484525	15.7124164109886	8	18
11.034297484525	15.7124164109886	9	18
10.749135350085	15.3063531884437	11.5	13.5
10.749135350085	15.3063531884437	11	15
10.4946448812538	14.9439669472703	12	15
10.4946448812538	14.9439669472703	13	15
10.1675126459291	14.4781440596011	7	16
10.1675126459291	14.4781440596011	10	18
5.96267606459911	8.49058520028426	8.5	7

Solution x	Solution y	Original x	Original y
Route: 3 Length: 39.7780156098834 Demand Met: 182			
2.60489432584198	1.30481335921297	4	4
3.36627966593771	1.68619647402931	2	4
3.36627966593771	1.68619647402931	3	4
4.09422825789686	2.05082964996027	2	5
4.09422825789686	2.05082964996027	3	5
5.72621685335741	2.86828247134172	4	5
7.96272362290222	3.98851776421391	7.5	4.9
7.96272362290222	3.98851776421391	8.5	5.2
9.68941311502492	4.85339911391613	6	4
9.68941311502492	4.85339911391613	9	3
9.68941311502492	4.85339911391613	10	3
9.68941311502492	4.85339911391613	11	3
9.68941311502492	4.85339911391613	12	3
9.68941311502492	4.85339911391613	13	3
9.68941311502492	4.85339911391613	10	6
9.68941311502492	4.85339911391613	11	6
9.68941311502492	4.85339911391613	12	6
9.68941311502492	4.85339911391613	13	6
9.68941311502492	4.85339911391613	9.40000000000001	7.4
9.68941311502492	4.85339911391613	11	7
11.8121469970655	5.91637632793676	15.5	5
11.498122792438	6.35684929098077	14	6
11.0709504390215	6.95603964379842	13.5	7.5
11.0709504390215	6.95603964379842	14	9.3
10.7023113631779	7.47314492147654	13	7
10.2159192732793	8.15540362450854	8	6
10.2159192732793	8.15540362450854	9	6
9.42087763792749	9.27063882962442	11	9
9.42087763792749	9.27063882962442	10.5	10.5
8.37530977376755	10.7372691531475	8	10.3
8.37530977376755	10.7372691531475	10	11
6.9890171929824	12.6818144308654	9	15
6.9890171929824	12.6818144308654	10	15
6.08886375411638	13.7660248534313	5	15
6.08886375411638	13.7660248534313	7	15
5.45663134503769	14.5275341580462	7	18
5.45662511952118	14.5275341324488	5	18.3
4.65928562140169	14.2855561868747	2	16
4.65928562140169	14.2855561868747	2	17
4.65648275857097	14.2769621548716	4	18
4.61591945603286	14.1525892152306	4	16
4.61591945603286	14.1525892152306	4	17
4.56052949374099	13.9827561509024	3	16
4.56052949374099	13.9827561509024	3	17
4.44608529527051	13.6318596612673	2	14
4.44608529527051	13.6318596612673	2	15
4.32799673969663	13.2697867538801	4	15
4.19119542662074	12.8503423537743	4	12
4.19119542662074	12.8503423537743	4	13
4.07122364834966	12.4825074968894	3	14
4.07122364834966	12.4825074968894	3	15
3.87536997319475	11.8820292576674	3	12
3.87536997319475	11.8820292576674	3	13
3.66848544296968	11.2477345689202	2	12
3.66848544296968	11.2477345689202	2	13
3.41443729038983	10.4687700431861	2	10
3.41443729038983	10.4687700431861	2	11
3.21347840469566	9.85254855024818	3	10
3.21347840469566	9.85254855024818	3	11
2.9758391245617	9.12387839829144	4	11
2.62476694989637	8.04743247070329	2	8
2.62476694989637	8.04743247070329	2	9
2.263978797249	6.94119511735014	2	7
2.263978797249	6.94119511735014	3	7
1.8968762746329	5.81560918375656	4	6
1.449625377724	4.44429219962673	2	6
1.449625377724	4.44429219962673	3	6
Route: 4 Length: 55.9889130280678 Demand Met: 184			
3.05524813169869	5.59921666009132	3	8
4.04782126035046	7.41826250469191	4	7
5.24086810402041	9.60471064976297	4	10
6.65354271630618	12.1936661965195	4	14
7.75958010578297	14.2206500285958	8	15
8.7244278232871	15.9888789788847	10	16.3
9.57487703541676	17.5474552882715	12	17
9.57487703541676	17.5474552882715	12	18
10.1126947812251	18.5331229909789	11	21
10.1126947812251	18.5331229909789	12	21
10.3043443896845	18.8843816108032	13	18

Solution x	Solution y	Original x	Original y
10.3043443896845	18.8843816108032	14	18
10.2855768336476	19.5153281903895	9	21
10.2855768336476	19.5153281903895	10	21
10.2707005840801	20.0157506731087	11.7	22.8
10.2707005840801	20.0157506731087	13	21
10.26170751193	20.3179659614946	13.5	21.4
10.26170751193	20.3179659614946	14	21
9.89495499494166	21.384589571299	12.2	22.1
9.52216363000896	22.4687733179407	12	24
9.52216363000896	22.4687733179407	13	24
9.27375959343317	22.9253192020331	7	24
9.07038456263228	23.2991180615735	10	26
9.07038456263228	23.2991180615735	9.5	22.2
8.89246072852404	23.6261328749462	11	24
8.70441024192739	23.9717547839777	10	27
8.70441024192739	23.9717547839777	11	27
7.66104250495145	24.2103871191099	8	24
7.66104250495145	24.2103871191099	9	24
5.89376708052403	24.6145872795461	3	27
5.89376708052403	24.6145872795461	3	26
5.89376708052403	24.6145872795461	4	26
5.89376708052403	24.6145872795461	4.7	25.5
5.89376708052403	24.6145872795461	5.40000000000001	24.3
5.89376708052403	24.6145872795461	7.5	25.5
5.89376708052403	24.6145872795461	8	26
5.89376708052403	24.6145872795461	9.09999999999999	26
5.89376708052403	24.6145872795461	7	21
5.89376708052403	24.6145872795461	8.5	22.8
5.57041709761489	24.6885357339289	4	24
5.57041709761489	24.6885357339289	4	23
5.2786825407141	24.7552567356741	3	25
5.2786825407141	24.7552567356741	3	24
5.05822802054162	24.8056770805783	3	28
5.05822802054162	24.8056770805783	4	28
5.05073339878399	24.7689216535336	2	27
4.99360928689862	24.4887812802887	4	27
4.99360928689862	24.4887812802887	4	25
4.9233421328336	24.1441879172386	2	26
4.80818007789715	23.579431682328	2	25
4.80818007789715	23.579431682328	2	24
4.67235262315356	22.9133324773015	2	23
4.67235262315356	22.9133324773015	2	22
4.58542572472821	22.4870382783929	4	22
4.58542572472821	22.4870382783929	4	21
4.51424281329808	22.137949001742	5.40000000000001	23.3
4.43241774962267	21.736664172805	3	23
4.43241774962267	21.736664172805	3	22
4.35043204922039	21.3345758931927	8	21
4.21834354027874	20.6868223272079	5.3	21
4.08378616659779	20.0269968405011	4	19
4.08378616659779	20.0269968405011	4	20
3.97412891005852	19.4893152894013	3	21
3.84247513419839	18.8437426431527	3	20
3.69589069072805	18.1249184650454	2	20
3.5111423801641	17.2188983149	2	18
3.5111423801641	17.2188983149	2	19
3.27612225474152	16.0663362947765	3	18
3.27612225474152	16.0663362947765	3	19
2.20626302327611	10.8195927947085	4	9
1.80465364438206	8.85008493921195	3	9
1.39277126657338	6.83020425681128	4	8
Route: 5 Length: 93.8610553272711 Demand Met: 184			
14.2620489064101	22.5410859367893	16	24
17.0643165350984	26.9701098417381	16	30
17.0643165350984	26.9701098417381	18.3	28
17.6151245836249	27.8406448729945	20	27
17.6151245836249	27.8406448729945	18.3	27
18.1431737668416	28.6752145869123	21.2	27.5
18.5865331913611	29.3759530538046	22.2	28.2
18.6148205750373	29.8086865925768	20	29
18.6148205750373	29.8086865925768	20	28
18.6520690077187	30.3785232252998	20	30
18.6520690077187	30.3785232252998	19	30
18.6926198683546	30.9989253654134	20.5	31.5
18.7314280492953	31.5927044456077	22	32
18.7314280492953	31.5927044456077	21	32
18.7630256511673	32.0762221273814	21.5	32.5
18.792361999028	32.5251635742712	16	33
18.792361999028	32.5251635742712	20	31
18.8252553799772	33.0284904219905	17.2	34.1

Solution x	Solution y	Original x	Original y
18.8252553799772	33.0284904219905	17.9	33.3
18.8556084019376	33.4929082367742	17	36
18.8556084019376	33.4929082367742	16	36
19.6444056305634	33.6488429163726	19	35.2
19.6444056305634	33.6488429163726	18.3	34.5
20.7398517911636	33.8654032363785	20	35
22.1507874742678	34.1443231029445	22.8	32.5
22.1507874742678	34.1443231029445	23.2	31.5
23.1552701963288	34.3428898875853	23	35
23.1552701963288	34.3428898875853	23	34
24.3589441062051	34.5808206912801	26	34
25.2700245037655	34.7609124038978	27	35
25.2700245037655	34.7609124038978	27	34
25.8891240264393	34.8832860318078	27	36
26.4459048560695	34.9933416877202	27	37
26.4459048560695	34.9933416877202	26.2	36.5
26.963582873878	35.0956689802898	27	38
27.4416989911809	35.190177384196	30	38
27.4105183497999	34.8850607747659	30	37
27.3646252682264	34.4359607778426	30	36
27.3646252682264	34.4359607778426	30	35
27.2820188304394	33.627661735655	30	34
27.2820188304394	33.627661735655	30	33
27.2009046517237	32.8339149801167	30	32
27.2009046517237	32.8339149801167	28.5	33.5
27.1288207126844	32.1284963285193	27	33
27.1288207126844	32.1284963285193	27	32
27.052305711327	31.3797601178262	27	31
27.052305711327	31.3797601178262	27	30
26.9901031050622	30.7710737246855	26	31
26.9901031050622	30.7710737246855	26	30
26.9325688900068	30.2080722752564	26	29
26.9325688900068	30.2080722752564	26	27
26.9055706517557	29.9438399284595	27	28
26.9055706517557	29.9438399284595	26	28
26.8832110386544	29.7249883642421	27	29
26.8614432798013	29.5119248262384	29	30
26.8388174682976	29.290468192778	30	31
26.8388174682976	29.290468192778	30	30
26.7543490818963	28.4639173701117	30	29
26.7543490818963	28.4639173701117	30	28
26.6373852823499	27.3194721158317	30	27
26.6373852823499	27.3194721158317	30	26
26.5668229987107	26.6288968462913	30	25
26.4324417253125	26.4942178908218	28.5	27
26.4324417253125	26.4942178908218	27	27
26.2854884133041	26.346934279289	27	26
26.1376218339652	26.1987321233403	26	26
25.9922353044761	26.0530109259153	27	25
25.9922353044761	26.0530109259153	26	25
25.8521887614578	25.9126304600424	26	24
25.7174874476983	25.7776046397871	29	24
25.7174874476983	25.7776046397871	27.6	23.6
23.9764712192354	24.0324603679368	27	23
23.9764712192354	24.0324603679368	26	23
8.10664975490724	8.12546108745772	7	6
5.66445051286991	5.67753352349044	8	3
4.17804843873823	4.18771470168659	7	3
Route: 6 Length: 77.9969414524871 Demand Met: 184			
2.9540290350882	19.1652363885276	2	21
3.96128837054455	25.7002070192191	2	28
4.21702570649884	27.3593157893466	8	27
4.23655180726345	27.8949766651501	7	27
4.25825484465301	28.4903351874548	2	29
4.25825484465301	28.4903351874548	3	29
4.27814368129368	29.0358750734574	4	29
4.2982591702192	29.5877006643302	3	30
4.2982591702192	29.5877006643302	4	30
4.31746799696714	30.1147894380712	7	30
4.31746799696714	30.1147894380712	8	30
4.33590313970514	30.6207866356318	3	31
4.3540689455522	31.1193738507189	2	31
4.3540689455522	31.1193738507189	2	30
4.37752422914295	31.7627074360129	2	32
4.40106796214718	32.408339880046	2	34
4.40106796214718	32.408339880046	2	33
4.41876731221893	32.8938005846642	1.5	35
4.41876731221893	32.8938005846642	2	35
4.42535164192981	33.074649829983	2	36
4.42535164192981	33.074649829983	1.5	35.5

Solution x	Solution y	Original x	Original y
4.57182034122485	33.0917533326788	4	33
4.57182034122485	33.0917533326788	4.7	33.5
4.71669365620646	33.1086713307322	4	36
4.86248756382092	33.1256940858053	3	33
4.86248756382092	33.1256940858053	3	32
5.02874506257066	33.1451033639119	4	32
5.02874506257066	33.1451033639119	4	31
5.20983586024727	33.1662441603458	5.2	32
5.3909986712262	33.1873944709492	7	33
5.3909986712262	33.1873944709492	5	31
5.56490672997843	33.2077011686453	4	34
5.56490672997843	33.2077011686453	4.7	34.5
5.75335238909	33.2297024617868	3	34
5.97733855394542	33.2558474113978	3	35
5.97733855394542	33.2558474113978	4	35
6.40221800213133	33.3053837087513	6.2	37.1
6.40221800213133	33.3053837087513	6.2	36.5
7.3771497561423	33.2959188786939	7	36
7.3771497561423	33.2959188786939	8	36
8.30619722754562	33.2868969180856	9	36
9.08563243716227	33.2793262343881	8	33
9.08563243716227	33.2793262343881	9	33
9.99928676043413	33.2704541655192	10	36
9.99928676043413	33.2704541655192	11	36
10.7090835443006	33.2635606034328	10	33
11.4862553772813	33.2560138040628	12	36
11.4862553772813	33.2560138040628	13	36
11.9968462746467	33.2510556458829	14	36
12.3802995705221	33.2473329830397	15	36
12.4151043455326	32.6592332866249	15	33
12.4505294690618	32.0606569112613	14	33
12.4888316435378	31.4134762807054	12	33
12.4888316435378	31.4134762807054	13	33
12.5434935814587	30.4899557192578	13	30
12.5434935814587	30.4899557192578	14	30
12.5904395203883	29.6967695950239	11	33
12.5904395203883	29.6967695950239	9	30
12.5904395203883	29.6967695950239	10	30
12.5904395203883	29.6967695950239	15	30
12.5904395203883	29.6967695950239	14	29
12.5904395203883	29.6967695950239	15	28.6
12.5904395203883	29.6967695950239	14	28.2
12.5904395203883	29.6967695950239	15	28
12.5904395203883	29.6967695950239	13	27
12.5904395203883	29.6967695950239	14	27
12.5904395203883	29.6967695950239	15	27
12.6364437161982	28.9193170975415	11	30
12.6364437161982	28.9193170975415	12	30
12.6983626996071	27.8729927698144	9	27
13.2687399013209	26.5405357761807	16	27
13.2687399013209	26.5405357761807	16.9	26.8
13.4021848406986	26.2288605788238	17.2	26.1
12.5576200624278	24.5760049387785	12	27
10.8699351384192	21.2731093318079	10	24

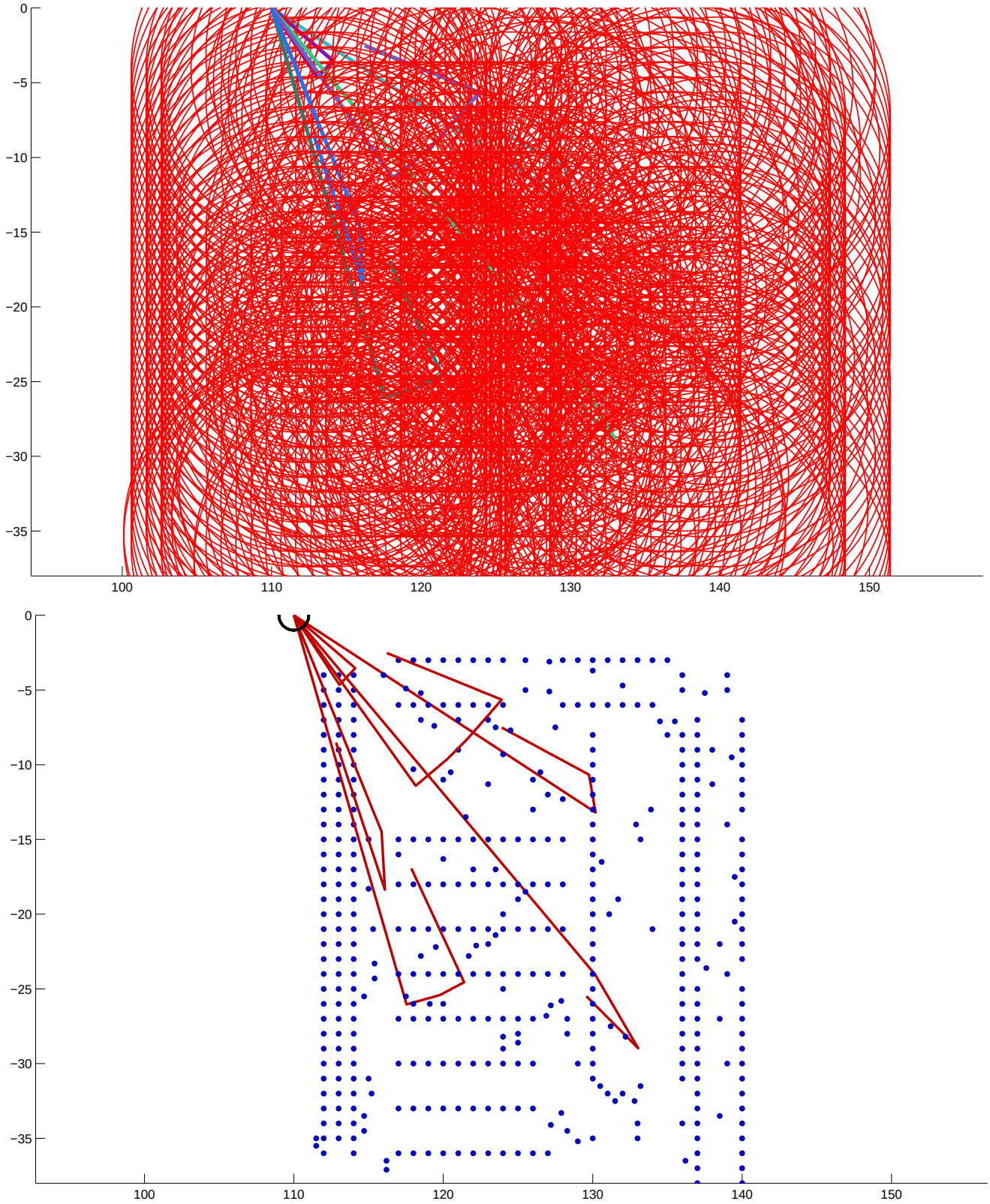


Figure O.22: $pcb442$, $r = 11.4$, Equal Radius, 2D, Euclidean, Length = 270.1722565

Table O-25: Solution for $pcb442$, $r = 11.4$, Equal Radius, 2D, Euclidean

Total distance: 270.172256516162 Total demand met: 1100 Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 49.1288475337888 Demand Met: 184			
15.1875153082603	9.92210844069484	14	21
15.8066267691586	10.3265874418104	15	21
16.2517198112149	10.6173750964484	16	21
16.61241365822	10.8530209627753	17	21
16.9185506378121	11.0530235593843	18	21
17.1861520067994	11.227852136691	20	22
17.3167001548937	11.3131430390935	20	21
17.4351434401793	11.3905256445484	20	20
17.5472265650195	11.4637529657738	21.1	20
17.6523935175225	11.5324617105522	21.7	19
17.7525580583988	11.5979021906093	20	19
17.8499445277245	11.6615276258737	20	18
17.9454741227978	11.7239398584235	20	17
18.0401065981478	11.7857659204056	20.6	16.5
18.1345164829412	11.8474465048215	23.2	15
18.2285718888705	11.9088954807327	22.9	14
18.3231765385402	11.9707032782372	23.9	13
18.4184863256059	12.0329717733597	26	13
18.5133976650338	12.0949800241942	26	12
18.6082265877489	12.1569345073451	26	11
18.7031152628891	12.2189281109186	27	11
18.7969598153826	12.2802396509566	28	11.3
18.8881095285462	12.3397906559829	27	12
18.9777655065474	12.3983657943518	27	13
19.0654106353257	12.4556271917814	27	14
19.1506169859254	12.5112952499751	26	14
19.2343650176928	12.5660105250624	26	15
19.3165184258748	12.6196839613519	27	15
19.3969680865031	12.6722442793366	27	16
19.4754436341642	12.7235148408046	26	16
19.5528290293992	12.7740731651264	26	17
19.6288701612166	12.8237532353129	27	17
19.7034715240895	12.8724926691071	27	18
19.7764079482884	12.9201443558802	26	18
19.8488855791867	12.9674963098876	26	19
19.9206327031164	13.0143710074949	26	20
19.9912159077807	13.0604852784356	26	21
20.0595503327319	13.105130340194	24	21
20.12730061485	13.1493937332152	26	22
20.1910309028241	13.1910307296769	26	23
20.1910309009168	13.191030711483	27	22
20.1910308990481	13.1910306930178	27	21
20.1910308972292	13.1910306744475	27	20
20.1910308954259	13.1910306557072	27	19
20.1910308936434	13.1910306369176	30	19
20.1703602413654	13.0725401009925	30	18
20.1455994172884	12.9306095664941	30	17
20.118699436687	12.7764204675952	30	16
20.0904015257466	12.6142178750593	30	15
20.0610403937469	12.4459159140329	29	14
20.0311312921003	12.2744703135825	30	13
19.9994107408602	12.0926509766631	30	12
19.9660820683644	11.9016409595171	30	11
19.9324126937096	11.7086963847256	30	10
19.8992495551516	11.518657348409	29.3	9.5
19.8665553770491	11.3313050716897	30	9
19.8347448638277	11.1490170266619	30	8
19.80450826823	10.9757423625313	30	7
19.776605334698	10.8158360269505	29	5
19.7499510764584	10.6630770048488	29	4
19.5366412367563	10.5479116238492	27.5	5.2
19.3176595644339	10.4296840435578	26	4
19.0982201742602	10.3112093232493	26	5
18.8770972341781	10.1918256271038	27	7
18.6475962606241	10.0679186164651	27	8
18.4061861137049	9.93758183444713	28	9
18.1300178584612	9.78847918027399	27	9
17.8224814116189	9.62244083688925	27	10
17.4619592523997	9.42779537878085	26	10
17.0507168542688	9.20576552390286	26	9
16.5717779884258	8.94718598403997	26	8
15.9872804564633	8.63161690711184	25	8
15.2476107708858	8.23226750204817	25.5	7.1
13.9067424011154	7.50832973329962	24.5	7.1
Route: 2 Length: 12.5218649186449 Demand Met: 180			
0.361455920131519	0.311206473984617	3	4
0.672331495312605	0.578865379468038	3	5
0.964115880399646	0.830078560479915	3	6
1.22808140950335	1.05733593112542	3	7
1.46538299449553	1.26163705897658	4	7
1.68133804240686	1.44756186697015	4	6
1.89175436467016	1.62872118960882	4	5
2.1055613796447	1.81280342682484	4	4
2.32508622308112	2.00181148189154	6	4
2.54259502441715	2.1890853755883	7	3
2.7583696593483	2.37486685495689	8	3
2.9714913615302	2.55836448287232	9	3
3.18114511778458	2.73887656341755	10	3
3.3861770585375	2.91540980612008	11	3
3.58465513005008	3.08630094479672	12	3
3.7738852274064	3.24923050898152	13	3
3.95082289755719	3.40157724234034	14	3
4.11284808174294	3.5410854593794	15.5	3
4.08160344595423	3.57363678270883	14	6
4.04869393441206	3.60792133054879	13.5	7.5
4.01484554953127	3.64318257567232	13	7
3.98068036109322	3.67877293294551	13	6
3.94593578380545	3.71496587823455	12	6
3.91095438448957	3.75140512700335	11	6
3.87606112256752	3.7877525760426	10	6
3.84150391287247	3.82375025601628	9	6
3.80736045996244	3.85931742857965	8.5	5.2
3.77327021833879	3.89482955905606	7.5	4.9
3.73929207486083	3.93022568640839	7	6
3.70575607816934	3.96516201438097	8	6
3.67220448100177	4.0001149184423	8.5	7
3.63878629099526	4.03492922878399	9.40000000000001	7.4
3.60533433362892	4.06977917474264	11	7
3.57084758214219	4.10570715037443	11	9
3.53559560841869	4.14243183057391	10.5	10.5
3.50000261891816	4.17951080005827	10	11
3.46405152698641	4.21696092697865	8	10.3
3.42777807467954	4.25474576375124	4	11
3.39180010070149	4.29222460843882	3	11
3.35643122344153	4.32907015867218	3	12
3.32171535785207	4.36523599315136	4	12
3.28678782799116	4.40162296277096	4	13
3.25194336870487	4.43792418139515	3	13
3.21794267625454	4.47334793182388	3	14
3.18531829292702	4.5073389715134	4	14
3.15353541042182	4.54045404199747	5	15
3.12265184273646	4.57263235293112	4	15
3.09346327750829	4.60304555180639	3	15
3.06651180440052	4.63112908067784	3	16
3.04988921082935	4.64844798321691	2	16
2.95802907275022	4.50844246137028	2	15
2.84763047513482	4.34018086834973	2	14
2.72634094816885	4.15531963103784	2	13
2.59743876233846	3.95885550354345	2	12
2.46322903773286	3.7543019788235	2	11
2.32590047986011	3.54499505316705	2	10
2.18785122642551	3.33458980858865	3	10
2.04596498016946	3.1183369621674	4	10
1.89584372828332	2.88953383597491	4	9
1.74028257543702	2.65244033236076	4	8
1.58363995204525	2.41369789551029	3	8
1.43231843075013	2.18306193869699	3	9
1.2740104357507	1.94177630905718	2	9
1.10042267264424	1.67720187610906	2	8
0.91273959831841	1.39114398641463	2	7
0.710354957585423	1.08267905196923	2	6
0.494614484261405	0.753858494053354	2	5
0.268261107513197	0.408862787533327	2	4
Route: 3 Length: 74.1359730641518 Demand Met: 184			
20.1775523935274	24.0613999184756	29.5	17.5
20.3255218851926	24.3146941772301	30	20
20.4670506958228	24.556961168963	29.5	20.5
20.605147495859	24.7933526370616	30	21
20.739159718416	25.0227521945546	30	22
20.8690342048275	25.2450690457547	30	23
20.9942299929864	25.4593771718713	28.5	22
21.1193361205988	25.6735318481709	27	23

Solution x	Solution y	Original x	Original y
21.2449247153149	25.8885123101215	27.6	23.6
21.37060252458	26.103645379698	29	24
21.4957761463429	26.3179152670456	30	25
21.6190194318385	26.5288807119187	30	26
21.7399129234161	26.7358237238865	28.5	27
21.8599089219444	26.9412302636229	30	27
21.9777704978817	27.1429830730344	30	28
22.0932442080438	27.3406482974147	30	29
22.2059476087755	27.5335712790255	30	30
22.3153189819895	27.7207905140795	29	30
22.4232238425196	27.9054992881791	30	31
22.5279421885457	28.0847534227911	30	32
22.629032130829	28.2577964917929	30	33
22.7258454241512	28.4235188592981	30	34
22.8175144004516	28.5804352999292	30	35
22.9028276873469	28.7264722525719	30	36
22.9797827406438	28.8582018760703	30	37
23.0440145323986	28.9681524273133	30	38
22.9836640725595	28.9076116273561	27	38
22.9209552567076	28.8447052142396	27	37
22.8566192347668	28.780166449526	26.2	36.5
22.7911125749278	28.7144531282614	27	36
22.7243114798904	28.6474411772569	27	35
22.6565437465533	28.5794594286109	26	34
22.5883856637948	28.5110858078424	27	34
22.5194757599926	28.4419578940867	28.5	33.5
22.4493538806256	28.3716143569709	27	33
22.3786346973565	28.3006715395888	27	32
22.3074652032685	28.2292769647641	27	31
22.2360165175011	28.1576023126276	27	30
22.1644586107811	28.085818094317	27	29
22.0929517351678	28.0140850707443	27	28
22.021669848433	27.9425777486662	27	27
21.9508295013763	27.8715133533507	27	26
21.8806933470796	27.8011553527636	27	25
21.8115375892749	27.7317808207456	26	24
21.7438442018617	27.6638730281495	26	25
21.6771586893904	27.596976138645	26	26
21.6111554623939	27.5307636018712	26	27
21.5455589684284	27.464959065675	26	28
21.4801117617752	27.3993043350668	26	29
21.4145714439368	27.3335562931559	26	30
21.3486702285693	27.2674463583658	26	31
21.2821037568109	27.2006693347261	23.2	31.5
21.215274676491	27.1336288749592	22	32
21.1482770763967	27.0664193799279	20	31
21.081697899229	26.9996294047497	20.5	31.5
21.0153311675393	26.933052434729	21	32
20.9489863223247	26.8664973773015	21.5	32.5
20.8825043534743	26.7998047826117	22.8	32.5
20.815724501745	26.7328135266359	23	34
20.7479041053705	26.6647787094039	23	35
20.6781887854236	26.5948433342343	20	35
20.6073550453801	26.5237859914634	19	35.2
20.5353499728319	26.4515535817852	18.3	34.5
20.4625711820044	26.3785449245555	17.9	33.3
20.3895422655653	26.3052851949402	17.2	34.1
20.3159911968525	26.2315015977421	17	36
20.2397641863303	26.1550336622337	16	36
20.1589010109342	26.0739149149892	15	36
20.0498542667983	25.9645347067782	16	33
19.9381541517424	25.8524944575999	15	33
19.8232509890713	25.7372423120929	14	33
19.7032948092041	25.616921798532	13	33
19.57633963905	25.4895805595732	11	33
Route: 4 Length: 37.1945446478272 Demand Met: 184			
4.63916530636303	6.48712376593846	14.5	7.7
6.09806144276425	8.52715156696666	14	9.3
7.22218268521266	10.0990462074324	18	12.3
7.56277740341955	10.5753199047917	18	15
7.5957720665851	10.6214636224824	17	15
7.62582053440666	10.6634845511575	16	15
7.65409899641304	10.7030286106123	13	15
7.6818072418959	10.74177436974	12	15
7.70873156799897	10.779423451489	11.5	13.5
7.73517215330281	10.8163959927479	11	15
7.76093458698765	10.8524200766174	10	16.3
7.78604762478697	10.8875358169857	10	15
7.81086029768801	10.9222314381209	9	15
7.83548814488969	10.9566685366966	8	15

Solution x	Solution y	Original x	Original y
7.85998812484246	10.99092677523	7	15
7.88445599029623	11.0251400344951	7	16
7.90888704104815	11.0593016287344	8	18
7.93304655318349	11.093083211945	7	18
7.95697846786553	11.1265462935193	5	18.3
7.98080659843183	11.1598640269603	4	17
8.00485029133114	11.1934830821685	4	16
8.02927266045847	11.2276316681573	3	17
8.05404724002332	11.2622726896619	2	17
8.079292104747	11.2975711167507	2	18
8.10484428222682	11.333298995258	3	19
8.13033582863645	11.3689419949638	2	20
8.15625647174494	11.4051833381143	2	21
8.15625654430968	11.4051833900189	5.3	21
8.15625661489048	11.4051834404488	7	21
8.15625668414792	11.4051834899134	8	21
8.15625675237391	11.4051835386529	9	21
8.15625681969463	11.4051835858642	8.5	22.8
8.2501044969159	11.325937580341	9.5	22.2
8.36208228887276	11.2313822898093	10	21
8.48237365142995	11.129806948464	11	21
8.61251264616797	11.0199162386618	12	21
8.75636798024328	10.8984435971118	13	21
8.92587743370245	10.7553094566845	14	20
9.10747113292543	10.6019717566425	15	19
9.29332440546227	10.4450374636016	14	18
9.48396836841258	10.2840580742728	15	18
9.67769200534335	10.1204782840996	15.5	18.5
9.87652524526844	9.95258409380294	16	18
10.0784722448219	9.78206074520609	17	18
10.2790292468977	9.61271138925843	18	18
11.6623209561938	8.22548348672918	20	16
11.8177099313617	8.047209114176	20	15
11.9671642528899	7.87574371530874	20	14
12.111546329165	7.71009749795087	20	13
12.2512762636961	7.54978840457171	20	12
12.3867255007518	7.39439031690219	20	11
12.5183569175022	7.24337226442575	20	10
12.6466202558348	7.09621835679872	20	9
12.7715565199727	6.95288160139743	20	8
12.8924598128812	6.81417181411709	17.5	7.5
13.013644206941	6.67513982577698	18	6
13.133948703725	6.5371176125024	19	6
13.2531929048459	6.40031209784777	20	6
13.3712957580043	6.26481623226046	21	6
13.4874989046287	6.1314999482426	22	6
13.6001357737105	6.00227506278616	22	4.7
13.7096639468712	5.87661668726009	23	6
13.8143209212398	5.75654665361286	24	6
13.9111866761152	5.64541493230504	25	3
13.6557062812234	5.541737375774	24	3
13.344679387708	5.41551809850039	23	3
12.9734377661462	5.26486237002188	22	3
12.5405326272139	5.08918193931119	21	3
12.0440868512461	4.88771467011197	20	3.7
11.4811031613185	4.65924400824694	20	3
10.8104200663936	4.38706857234773	19	3
10.052436853911	4.07947464374703	18	3
9.1955632092986	3.73175265193399	17.1	3.1
8.08317364501862	3.28032666513709	17.1	5.1
6.22462566354147	2.52608831765	15.5	5
Route: 5 Length: 58.3344021729238 Demand Met: 184			
5.43055696227297	18.7483439171586	3	29
5.89419227863132	20.3490143868045	2	30
6.13073549287896	21.1656664035982	3	30
6.31550102057757	21.803559353767	4	30
6.47648176944016	22.3593373863967	4	31
6.61590210475164	22.8406793804185	5	31
6.7422005635384	23.2767186314223	5.2	32
6.85349655671374	23.6609620839311	4	32
6.95402214630073	24.0080209555326	3	32
7.04595848364396	24.3254255779395	3	31
7.13380120261512	24.6286967908762	2	31
7.21820536185716	24.9200954780755	2	32
7.29758979189378	25.1941622328413	2	33
7.37022985817185	25.4449427998626	2	34
7.43349371577706	25.6633512797943	2	35
7.48134578526418	25.8285511268386	1.5	35
7.51811266992668	25.9554805115444	1.5	35.5
7.54193569867013	26.0377237382885	2	36

Solution x	Solution y	Original x	Original y
7.57590298357852	26.0281944595425	3	35
7.61161245630745	26.0181770042157	3	34
7.6491812330344	26.0076383304267	3	33
7.68882865896589	25.9965169227348	4	33
7.73057788151721	25.9848061254579	4.7	33.5
7.77438629070912	25.9725177391311	4	34
7.8203477618466	25.9596256924352	4.7	34.5
7.86821339945629	25.9461995417832	4	35
7.9183012556019	25.9321504686047	4	36
7.97302590375037	25.9168008464391	6.2	37.1
8.09408844997751	25.8828425548212	6.2	36.5
8.23257539658542	25.8439949650172	7	36
8.38192272433054	25.8021001406065	8	36
8.54922107466342	25.7551703075727	9	36
8.75736595364569	25.6967885311244	10	36
9.05176706235238	25.6142485871999	11	36
9.31400045673487	25.5407673972448	12	36
9.55034245858492	25.4745278627029	13	36
9.77727410289789	25.4109213638094	14	36
9.83028879325012	25.3829509834835	12	33
9.88344354519715	25.3549068250251	10	33
9.93732886821505	25.3264770058662	9	33
9.99193142171991	25.2976683453388	8	33
10.0474559708883	25.2683727766752	7	33
10.1042598746675	25.2384017946652	7	30
10.1619351407038	25.2079710448468	8	30
10.2199753879204	25.1773476936489	9	30
10.2781342120582	25.1466617242578	10	30
10.3361797160565	25.1160354792299	11	30
10.393892541907	25.0855846892446	12	30
10.4511091931331	25.0553956162267	13	30
10.5077316028712	25.0255200062811	14	30
10.5636913096174	24.9959939875277	15	30
10.6188065492508	24.9669134695993	16	30
10.6724814115521	24.9385929228953	15	28.6
10.7253613941007	24.91069176854	15	28
10.7770679596223	24.8834097721102	14	29
10.8280098142795	24.8565311848238	14	28.2
10.8777393893118	24.8302922237329	13	27
10.9264423003823	24.804594896325	14	27
10.9734756200408	24.7797785194006	15	27
11.0185447787429	24.7559985779774	16	27
11.0614526693419	24.7333591345959	16.9	26.8
11.1020083470031	24.7119610004823	17.2	26.1
11.1402171928762	24.691801345405	17.9	25.8
11.1763488562496	24.6727378814544	18.3	27
11.2118848682536	24.6539887689165	18.3	28
11.2482642030206	24.634794639102	19	30
11.2854919989616	24.6151528320773	20	30
11.322371488711	24.5956949053759	20	29
11.3597821582304	24.5759567889074	20	28
11.3981941714005	24.5556904494205	22.2	28.2
11.2764987898795	24.2935180226052	21.2	27.5
11.1034280915761	23.920667531767	20	27
10.9018460043418	23.4863956893061	20	26
10.6665852784734	22.9795712567152	20	25
10.3892226160524	22.3820486382154	20	24
10.0511548573369	21.6537511035566	20	23
9.59234660468309	20.6653422579498	18	24
8.96173204030669	19.3068069559829	17	24
7.86097040675737	16.9354398087919	14	25
Route: 6 Length: 38.8566241788257 Demand Met: 184			
3.66759392015638	9.04647259222089	13	11.3
5.1679882036515	12.7473406104183	16	11
5.74835120468255	14.1788600337089	16.5	10.5
5.87619764125533	14.494197772636	17	12
5.88996506831309	14.7397941864281	16	13
5.90339771865288	14.9794025957119	15	15
5.9166777738924	15.216280723845	14	15
5.93041813082246	15.4613705074051	13.5	17
5.94456372612687	15.713698371925	13	18
5.95896263812773	15.9705581415033	12	18
5.97358366578774	16.2313924300136	12	17
5.98856171006946	16.49860617846	11	18
6.00377070627087	16.7699506559004	10	18
6.01919992702013	17.0452317881752	9	18
6.03463471493622	17.3206129414247	11.7	22.8
6.04974182421196	17.5901679091124	12.2	22.1
6.06450272681923	17.853557343004	13	22
6.07887665482346	18.1100495230242	13.5	21.4

Solution x	Solution y	Original x	Original y
6.09288634463461	18.3600444067308	16	24
6.09288575466955	18.3600447225627	15	24
6.09288514027955	18.3600450540815	14	24
6.09288451612855	18.3600453921489	13	24
6.09288388712912	18.3600457334952	12	24
6.09288325556233	18.3600460766198	11	24
6.09288262262076	18.3600464207466	10	24
6.0928819890745	18.3600467654151	9	24
6.09288135659786	18.3600471082025	9.09999999999999	26
6.09288072518245	18.3600474524596	10	26
6.09288009454042	18.3600477958356	12	27
6.0928794638106	18.3600481384306	11	27
6.092878832306	18.3600484812453	10	27
6.09287820042191	18.3600488241765	9	27
6.09287756860957	18.3600491669619	8	27
6.09287693769447	18.3600495091383	7	27
6.09287630897154	18.3600498512472	8	26
6.09287568037678	18.3600501924898	7.5	25.5
6.09287505242735	18.3600505345305	8	24
6.09287442334636	18.3600508755071	7	24
6.09287379388874	18.3600512173087	5.40000000000001	23.3
6.09287316493693	18.360051557731	5.40000000000001	24.3
6.09287253553841	18.3600518994283	4	24
6.09287190645667	18.3600522402674	4	25
6.09287127729796	18.3600525819179	4.7	25.5
6.09287064674191	18.3600529241939	4	26
6.09287001574079	18.3600532666414	4	27
6.09286938457196	18.3600536093332	4	28
6.09286875304969	18.3600539521959	4	29
6.09286811589176	18.3600542955118	3	28
6.09286747653758	18.3600546389507	2	29
6.0482152692871	18.2255028923674	2	28
5.99173211875078	18.0553005662437	2	27
5.92974905703895	17.8685252968468	3	27
5.86129943791104	17.6622642198609	3	26
5.78854453027077	17.4430299447246	2	26
5.70938152288669	17.2044860249468	2	25
5.62576614542697	16.9525257640107	3	25
5.53645905566069	16.6834144922902	3	24
5.44270521604118	16.4009037000402	2	24
5.34276225360756	16.09974297635	2	23
5.23797822681043	15.7839944208911	2	22
5.12993716319275	15.458431174013	3	22
5.01731569111855	15.1190650442813	3	23
4.89438341036315	14.7486279207937	4	23
4.7563445132146	14.3326675624874	4	22
4.60505439833003	13.8767743466656	4	21
4.44300175526506	13.3884471480243	3	21
4.26785148745309	12.8606505364994	3	20
4.08157572119146	12.2993290671039	4	20
3.85691415180307	11.6223336316946	4	19
3.58490939306401	10.8026754291389	4	18
3.25436924325142	9.80663117855521	3	18
2.82559464068036	8.51457024502383	2	19

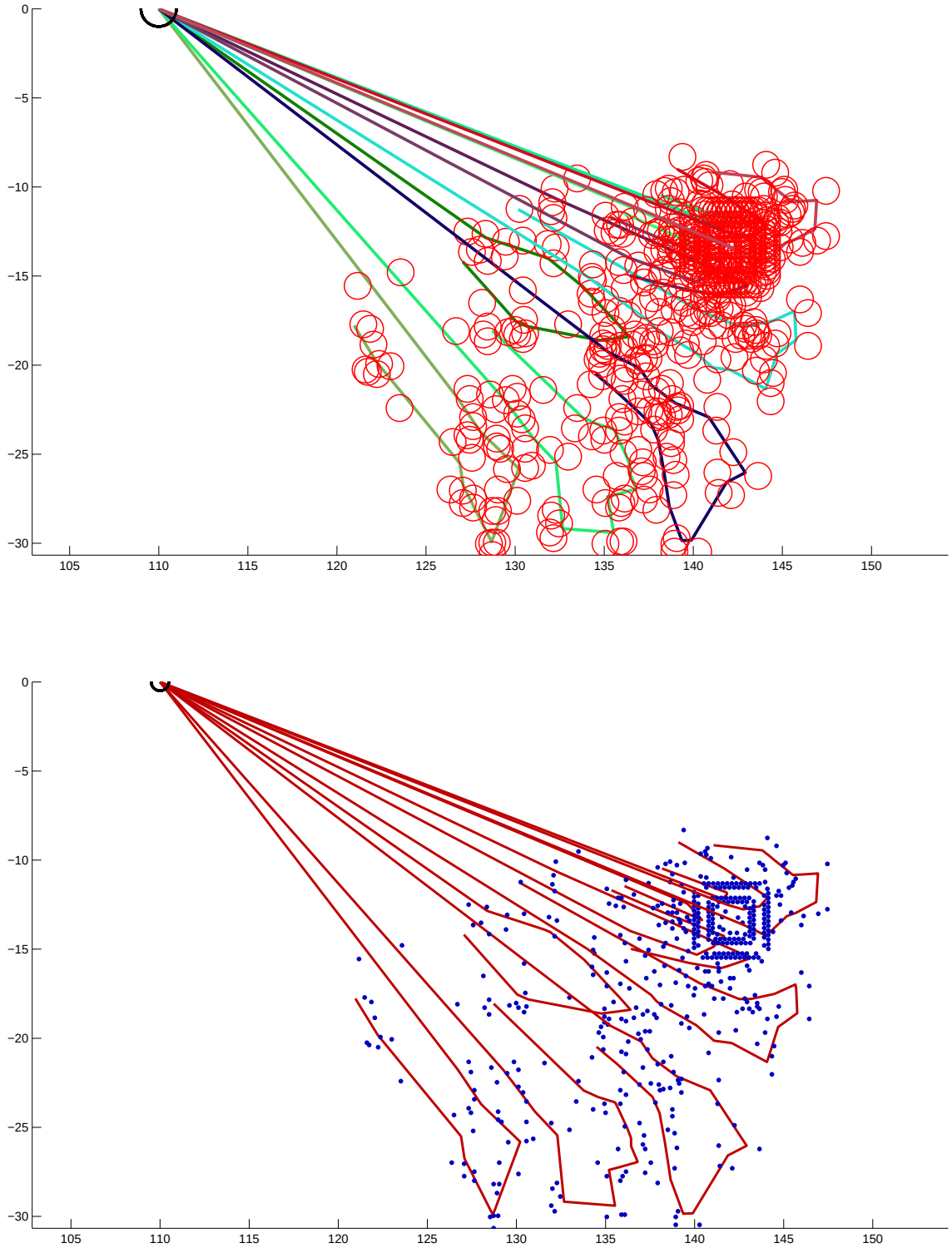


Figure O.23: $d493$, $r = 0.74904$, Equal Radius, 2D, Euclidean, Length = 830.1387149

Table O-26: Solution for $d493$, $r = 0.74904$, Equal Radius, 2D, Euclidean

Total distance: 830.138714892407			
Total demand met: 10514			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 72.6501442033251 Demand Met: 924			
11.6463351978606	15.1674777605828	11.163	15.552
16.715290075309	21.768896167392	17.323	21.331
17.032785383132	22.2390671176948	17.45	21.902
17.4345148005872	22.8339706917842	17.64	22.918
17.6914013332755	23.2143852739259	17.64	23.426
17.8917466052942	23.5110714230324	17.323	23.934
18.0234256705359	23.706075482628	17.45	24.188
18.5945015317829	24.2564286343052	18.974	24.125
18.9340715840307	24.5836696932034	18.974	24.569
19.2663662380589	24.9038995421643	19.164	24.696
19.8163938417011	25.4339714683237	19.545	25.839
20.2115226687025	25.8147532884059	20.942	25.649
20.1375214505069	26.0128332625615	20.561	25.776
19.7133069042773	27.1483519984569	20.117	27.617
19.6471048774556	27.3255596092578	19.037	26.982
19.3762932526104	28.0504720065427	19.037	28.189
19.2345512166661	28.4298842394872	18.72	28.189
19.0597950453309	28.8976749760803	18.91	28.697
18.8211347815123	29.5365449250061	18.72	29.967
18.7442976257073	29.742216881559	18.974	29.967
18.6789710015481	29.9170774600532	18.72	30.665
18.5356229943541	29.632873944201	18.529	30.03
17.8165811355396	28.2072983481138	17.64	27.998
17.5858513871089	27.7498582390758	17.64	27.49
17.4344719435725	27.4497377854134	17.069	27.744
17.241108792245	27.06638712084	17.069	27.046
17.0834435578526	26.753812416699	16.37	26.982
16.8929485416649	25.5091946331391	17.577	25.204
16.0998423971794	24.5433838808853	16.497	24.315
14.0203571400331	22.0110608592198	13.513	22.41
12.833238235467	20.565427995315	13.005	20.061
12.6275053937523	20.3148970754851	12.243	20.505
12.4548378302444	20.1046320406812	12.37	19.934
12.3128279880809	19.9317002690586	11.735	20.378
12.2176230381423	19.8157697043969	11.608	20.251
11.7478053301817	19.053769902177	12.052	18.854
11.3018362063202	18.3304532008254	11.862	17.965
10.9600382034477	17.7760899467919	11.481	17.711
Route: 2 Length: 82.6819938666357 Demand Met: 920			
13.2582509407157	14.9922726468561	13.576	14.79
16.2964556777553	18.4278368891611	16.688	18.092
19.2838617593632	21.8060369390754	18.593	21.648
19.2838617593632	21.8060369390754	19.863	21.331
19.2838617593632	21.8060369390754	19.482	21.966
19.6023236595409	22.2252729493592	18.91	22.474
19.6023236595409	22.2252729493592	20.117	22.728
19.6788659469398	22.3260282269373	20.117	21.775
20.3034393519397	23.148139195205	20.371	23.045
21.0451846586345	24.1244849481583	20.561	23.553
21.0451846586345	24.1244849481583	20.561	24.696
21.7455645642867	24.8698235784189	21.958	24.76
22.2925127600772	25.4518809873533	22.974	25.141
22.578500823069	28.2561268324398	22.276	28.125
22.578500823069	28.2561268324398	22.022	28.443
22.6720866156658	29.1735934020332	22.466	28.887
22.6720866156658	29.1735934020332	21.958	29.395
22.6724498126984	29.177207382046	22.149	29.713
25.4071390242447	29.3884477705083	25.07	30.03
25.4071390242447	29.3884477705083	25.895	29.903
25.5326552882502	29.3981406149019	26.086	29.903
25.2880957466275	27.9623748759768	25.07	27.744
25.1905044156595	27.3894985524365	24.562	26.982
25.6378536222294	27.2745677578653	26.149	27.49
25.6378536222294	27.2745677578653	25.959	27.744
25.6378536222294	27.2745677578653	25.832	27.998
26.7795075751571	26.9548102009588	27.229	27.554
26.7992771321442	26.9230297036248	27.546	26.982
26.6154852116198	26.4866965962638	27.229	26.22
26.4378162761589	26.0649152792488	25.705	26.22
26.4378162761589	26.0649152792488	27.102	25.966
26.4295335401253	25.5999871403567	27.165	25.458
26.2208813196191	25.051204799563	26.086	24.95
26.2208813196191	25.051204799563	26.911	24.76
25.7432837880875	24.0237681186334	25.832	23.68
25.5659232897317	23.6422050330102	26.149	23.172
25.4889770587011	23.5838869061166	25.832	22.918
25.1924271788747	23.4912057012105	25.006	24.188
24.5756563814821	23.2984109729956	24.308	23.998
24.5756563814821	23.2984109729956	24.943	23.68
23.7765266716837	22.933819634479	23.355	23.553
23.2085807662879	22.3860246853402	23.482	22.41
21.8187344165068	21.0455119527883	21.577	21.394
18.7265662072405	18.0630656128873	18.466	17.838
18.7265662072405	18.0630656128873	18.212	18.283
18.7265662072405	18.0630656128873	18.466	18.664
Route: 3 Length: 65.6132866493141 Demand Met: 799			
17.3525333217305	12.147531824961	17.323	12.504
18.356208911033	12.8501474668851	18.021	13.52
18.8584440564896	13.0150275106431	18.339	12.631
18.8584440564896	13.0150275106431	19.482	13.076
20.2725787108885	13.4792712076157	20.434	13.012
21.5725108025001	13.9060279399265	21.831	13.203
21.8933903179505	14.0369554768007	22.276	13.393
22.3758427395729	14.4309869179469	22.149	14.282
23.7971356115316	15.5918005205294	24.308	15.044
23.9769826081375	15.7830993138656	24.371	15.235
24.5225377747393	16.3633467347077	24.244	15.997
24.5225377747393	16.3633467347077	24.308	16.441
24.5225377747393	16.3633467347077	25.07	16.314
25.2856055094539	17.1749263218556	25.07	17.076
25.2856055094539	17.1749263218556	25.832	16.949
25.5989930218741	17.5082432190564	25.451	17.965
25.7866280172185	17.707814173347	26.34	17.203
26.2328925315385	18.2120689132551	26.721	18.283
26.4004863455582	18.4014129187008	27.102	18.664
26.230994005781	18.423499768254	26.594	18.854
25.9237362156945	18.4635362088504	25.895	18.918
25.9237362156945	18.4635362088504	26.149	19.045
25.3122668999021	18.543194248711	24.943	18.346
25.3122668999021	18.543194248711	25.197	18.918
25.0832101456683	18.5730493527241	24.943	19.108
25.0832101456683	18.5730493527241	25.133	19.235
24.928759624819	18.5931853770524	24.943	18.791
24.7745306393891	18.6132932348227	24.752	19.362
22.8696449012137	18.2472844425874	22.974	17.711
20.9903936573838	17.8861881218236	20.561	18.219
20.6587101766041	17.8224557908209	20.434	18.537
20.4499933100035	17.7292817816289	20.117	18.283
20.2933052973172	17.6593757381502	20.498	17.457
20.1557452324455	17.5980568365483	19.99	18.029
20.0508515020254	17.5511590459587	19.609	18.156
18.6869965556602	16.0183605589134	18.148	16.505
17.0562699995501	14.1854301178875	17.577	13.647
Route: 4 Length: 85.7106024326046 Demand Met: 991			
23.9529290643716	14.9675123609978	24.371	14.346
26.8703679055408	17.0760665315185	27.292	16.632
27.5507372175703	17.5677956767566	28.054	17.013
27.8628788186005	17.9215079177259	27.356	18.473
28.1009705298331	18.0984621545038	27.737	18.664
28.2746802743945	18.2275736270022	27.864	18.854
28.4973913945602	18.3555117517802	28.118	18.092
28.4973913945602	18.3555117517802	28.689	18.156
29.2045040056425	18.7617442692895	29.261	19.172
29.5148512028694	18.9400267336655	29.578	18.791
29.8246075365782	19.1179683110394	29.705	19.426
30.0965745162873	19.2742016075955	30.531	18.664
31.0915858348199	20.1395667178201	30.785	20.823
31.4571279256209	20.1863744771351	31.356	19.68
32.0798786381108	20.266148297809	32.309	19.553
33.1856900305395	20.8624089739133	33.515	20.315
34.0608297522407	21.3343200294311	34.341	22.029
34.1974018236164	20.907276463687	34.341	21.013
34.3604886258061	20.3973292280273	34.468	20.442
34.5283374289373	19.8724850830589	33.96	19.68
34.6926395212103	19.3587697763354	34.087	18.918
35.0250971677608	19.1203082179407	34.595	18.791
35.7615948094997	18.5920318759927	36.436	18.918
35.6930814513413	17.1716322018788	36.436	17.076
35.6530544239604	16.9819784487881	35.992	16.314
34.4871377025868	17.5077275493579	34.722	18.219
33.8238668829434	17.6519492431735	33.515	18.029
33.5737210797891	17.7063444472781	33.388	17.584

Solution x	Solution y	Original x	Original y
33.5737210797891	17.7063444472781	33.515	18.219
33.4084363653578	17.7422904590888	33.642	18.346
33.1764496630036	17.7927396526547	33.261	18.537
33.0188929158918	17.7946161719045	32.817	17.775
33.0188929158918	17.7946161719045	32.944	17.965
32.8857187400303	17.7962030386063	33.071	18.346
32.6998006154905	17.798416692528	32.69	18.346
32.5095165575873	17.8006819980187	32.372	18.537
31.2742837336384	17.3057282935237	30.594	17.076
31.2742837336384	17.3057282935237	30.785	16.949
31.2742837336384	17.3057282935237	30.975	17.076
31.2742837336384	17.3057282935237	31.102	17.775
31.2742837336384	17.3057282935237	31.61	17.775
31.2742837336384	17.3057282935237	31.991	17.203
30.2815293579012	16.9079504089692	29.959	17.584
30.0490900537239	16.7781505122129	30.023	17.203
29.7280587240041	16.5988876366758	29.642	17.076
29.2172730835568	16.3136848747453	28.943	16.886
28.4939668592727	15.9098270847052	28.308	15.933
27.9983769219104	15.633107034972	27.737	16.251
20.1702469158281	11.2621940042089	20.244	11.234
Route: 5 Length: 90.8157113872882 Demand Met: 977			
18.9420222592229	14.4616204667859	18.466	14.155
18.9420222592229	14.4616204667859	19.418	13.901
20.5925152917742	15.7219535003924	20.434	15.806
24.999150825446	19.0870162049712	24.625	19.68
25.2789258418161	19.3006531944023	24.879	19.934
26.5330476047575	19.9447067130342	26.276	20.188
26.5330476047575	19.9447067130342	26.975	20.061
26.8094516990956	20.0866193743391	26.848	19.743
26.8094516990956	20.0866193743391	27.229	19.616
26.9882707648351	20.1784207803027	27.483	19.616
27.3075702387972	20.6426803529968	27.356	20.632
27.6418887101906	21.1287768180543	27.102	21.648
27.6418887101906	21.1287768180543	27.927	21.458
28.0259498365681	21.4154898272696	28.245	21.331
28.3255801280585	21.639170334994	28.689	21.013
28.3255801280585	21.639170334994	28.816	21.902
28.8735662496601	22.0482160570314	29.07	22.347
28.8735662496601	22.0482160570314	29.261	22.283
28.9966839081447	22.1401042486245	28.626	22.791
28.9966839081447	22.1401042486245	29.134	22.537
29.5495184454913	22.3703914821937	29.261	23.045
30.8778760731877	22.9236051205968	31.356	22.347
31.3863755098145	23.698379757649	31.293	23.68
32.177807913202	24.9042709177009	32.245	24.887
32.9172180542351	26.0308745164737	33.642	26.22
31.867919031109	26.576822966769	31.356	26.03
31.6200441518068	26.9858015166925	32.118	27.3
31.3371134938212	27.4526273475328	31.42	27.173
29.8962178669053	29.8299571581169	30.277	30.475
29.3588629840846	29.8519948122286	28.943	30.475
29.2908677264801	29.6677308610546	29.07	29.713
29.2908677264801	29.6677308610546	28.943	30.03
28.6521739185593	27.9373931412936	27.927	28.125
28.540831952253	27.2139531544663	28.88	27.3
28.3290941439682	25.8384726853795	28.499	25.141
28.3290941439682	25.8384726853795	28.88	25.331
28.3290941439682	25.8384726853795	29.007	26.157
28.1017037479926	24.5786837083865	28.753	24.379
28.0360864016939	24.21504399686	28.753	23.998
27.8165541881173	23.7093577913968	27.8	23.617
27.6333956393927	23.2874530844843	28.245	22.855
27.4798499821121	23.1451429464238	27.991	22.601
27.4798499821121	23.1451429464238	28.054	22.918
27.0652989284235	22.7598692696652	26.911	22.601
27.0652989284235	22.7598692696652	27.546	22.537
26.1769923463199	21.9342629138472	26.022	21.902
25.6535002703468	21.4477308982797	25.895	20.759
25.6535002703468	21.4477308982797	26.149	20.886
24.9276068842457	20.8408362903811	24.879	20.632
24.494137010265	20.4784255046024	24.244	21.077
Route: 6 Length: 73.7125220754284 Demand Met: 976			
21.9232735322282	10.4835966831396	22.212	10.091
21.9232735322282	10.4835966831396	22.085	10.853
22.3356030033486	10.680769591146	22.022	11.361
26.1252686014204	12.3636318675268	26.022	12.631
29.2468604593182	13.7498232426194	29.007	14.409
29.6942617379332	13.9485056759362	29.515	14.028
30.3032054687192	14.2189255282287	29.975	14.661

Solution x	Solution y	Original x	Original y
32.1267351067031	15.028688618405	31.762	15.473
32.1267351067031	15.028688618405	31.892	15.246
32.1267351067031	15.028688618405	32.347	14.661
32.1267351067031	15.028688618405	32.477	14.433
32.1267351067031	15.028688618405	32.022	15.473
32.1267351067031	15.028688618405	32.607	14.661
32.2799585262602	15.0967287580558	32.152	15.246
32.2799585262602	15.0967287580558	32.412	15.246
32.4183644111998	15.1581889535891	32.282	15.473
32.4183644111998	15.1581889535891	32.542	15.473
32.5337112178373	15.2094098637592	32.672	15.246
32.5337112178373	15.2094098637592	32.932	15.246
32.6182563683058	15.2469529171875	32.802	15.473
32.6965384828507	15.2817147864091	33.062	15.473
32.6965384828507	15.2817147864091	33.322	15.473
32.7321928549236	15.2975473679716	33.127	14.661
32.8413821324395	15.3879730510299	32.944	15.933
32.8413821324395	15.3879730510299	33.582	15.473
32.844332364601	15.3904166992281	32.867	14.661
32.9464300535144	15.4748753947127	33.452	15.246
33.0319313206852	15.5455991711458	33.769	15.679
32.7337326567799	15.6487355439183	33.071	16.187
31.9513991277452	15.9193402895726	32.182	16.632
31.7484099181223	15.9805191088025	31.991	16.632
31.4368454491197	16.0743802586956	31.483	16.822
31.2977303901268	16.050572232465	31.356	16.06
31.1511819265615	16.0254924687632	31.356	16.251
30.9703326195872	15.9945435463712	31.293	15.806
30.7091696140047	15.9498521159285	30.785	16.251
30.3912343586748	15.8954475090002	30.594	16.251
29.6667991970889	15.771501602866	29.515	16.505
29.1684788843416	15.6502397139234	29.324	15.489
29.1684788843416	15.6502397139234	29.134	16.187
27.3782404094361	15.2146061496274	27.229	15.362
26.4249171167446	14.9826278968751	26.149	15.679
Route: 7 Length: 70.4194153278853 Demand Met: 992			
22.1675614706233	11.7419766562994	22.149	11.742
25.8711367576423	13.703730054057	25.832	14.219
26.3883339774916	13.9776851430411	26.086	14.663
27.0599613562077	14.218171324034	26.911	14.409
27.8583663042636	14.5040519942368	27.419	15.044
27.8583663042636	14.5040519942368	28.245	14.854
27.8583663042636	14.5040519942368	28.372	14.663
30.1142759683576	15.3118111959435	30.15	16.06
30.1824194924247	15.2797903262621	30.462	15.473
30.2472872331907	15.2493086214007	29.642	15.108
30.3518394133459	15.2001786779983	29.975	14.921
30.4730827329647	15.1432053027284	30.202	14.791
30.6020901433363	15.0825834535536	30.657	15.246
30.6020901433363	15.0825834535536	30.722	15.473
30.7388595218414	15.0183139435057	30.982	15.473
30.8724131669954	14.955555520152	31.112	15.246
30.8724131669954	14.955555520152	31.242	15.473
30.9756190070133	14.9070580218044	31.372	15.246
31.0633615882481	14.8658269666655	31.502	15.473
31.1371753203063	14.7879882366198	31.047	14.661
31.2099833164673	14.7112101057663	31.632	15.246
31.3078660577061	14.6079904753607	31.307	14.661
31.4077045042954	14.5027085425446	31.437	14.433
31.4077045042954	14.5027085425446	31.697	14.433
31.4900868841073	14.4158345215284	31.567	14.661
31.4900868841073	14.4158345215284	31.827	14.661
31.574026547134	14.3273184440779	32.087	14.661
31.6412332755384	14.2564477173867	32.372	14.092
31.6029163996288	14.2416206025403	31.957	14.433
31.6029163996288	14.2416206025403	32.217	14.433
31.5064948964058	14.2043093420113	31.991	14.092
31.3565686525979	14.1462939355104	31.399	13.754
31.3565686525979	14.1462939355104	31.61	13.901
31.1966438277527	14.0844094289839	31.275	14.173
31.0258108978028	14.0183038990909	31.015	14.076
31.0258108978028	14.0183038990909	31.177	14.433
30.7780805615774	13.9224422584809	30.787	14.206
30.7780805615774	13.9224422584809	30.787	14.466
30.2669751100534	13.7246656073478	29.975	14.141
30.2669751100534	13.7246656073478	29.975	14.401
30.0926020938259	13.6571899190651	30.202	14.271
29.5284114099735	13.4388698159484	29.197	13.52
29.5284114099735	13.4388698159484	29.388	13.838
29.2005645542537	13.3120057757271	29.134	13.33

Solution x	Solution y	Original x	Original y
28.8916183214974	13.1924555338821	28.753	13.457
28.8916183214974	13.1924555338821	28.753	13.838
28.2731070604392	12.9531150937636	27.991	13.647
28.2731070604392	12.9531150937636	28.372	13.52
25.6156999250146	11.8199122851285	25.197	12.441
25.6156999250146	11.8199122851285	25.578	12.568
25.3368441998794	11.6912391965987	25.07	11.615
25.3368441998794	11.6912391965987	25.705	12.123
Route: 8 Length: 66.5617419414203 Demand Met: 951			
23.2828264269215	9.78801494994141	23.482	9.52
26.1751877386353	11.0039528767974	26.149	11.107
28.6428978560648	12.0413666650688	28.816	12.25
29.1748134760876	12.2649810627751	29.197	12.441
29.5700331780248	12.4311283301066	29.975	11.801
29.6224881331406	12.4794444965945	29.975	12.061
29.6690947558887	12.5223785729058	30.202	11.996
29.7387949373238	12.5999557035449	29.975	12.321
29.8100267614903	12.6792366095107	29.975	12.581
29.8804960553612	12.7576678938497	30.202	12.451
29.9519662267654	12.8372119756961	30.202	12.711
30.0217733140246	12.9149041254507	29.975	12.841
30.0942616290666	12.9955792726981	30.202	12.971
30.1661859473036	13.0756254810552	29.975	13.361
30.1661859473036	13.0756254810552	29.975	13.621
30.221868490255	13.1375951459817	30.787	12.646
30.2598787736845	13.1827272697451	30.202	13.231
30.2980614440232	13.2280635824369	30.787	12.906
30.3350693084926	13.272004503576	31.015	13.036
30.355824771545	13.2966488797098	30.202	13.491
30.355824771545	13.2966488797098	30.202	13.751
30.3754790308657	13.3199853522201	30.787	13.166
30.3754790308657	13.3199853522201	30.787	13.426
30.3939056660667	13.3418634840566	31.015	13.296
30.3939056660667	13.3418634840566	31.015	13.556
30.4072414774642	13.3576971159474	30.787	13.686
30.4072414774642	13.3576971159474	30.787	13.946
30.4152433808253	13.3671978260195	31.015	13.816
30.3294217900899	13.3294796294868	30.202	14.011
30.1623143960708	13.2560382349416	29.975	13.881
29.9384292556282	13.1576441798233	29.705	13.393
29.7440550983138	13.072219015547	29.578	13.203
29.5670188206258	12.9944132762494	29.975	13.101
29.2366738897025	12.8492317758801	29.007	12.949
28.9790553712671	12.7360111591596	28.753	12.949
28.7577221412962	12.6387371773761	28.816	12.568
28.5290530107435	12.5382390901091	28.499	12.949
28.2422786070202	12.412204710857	28.181	12.441
27.9679452361529	12.2916379683694	27.927	12.568
27.6598021156926	12.1562122581469	27.673	12.695
26.7476402057551	11.7553314352006	26.594	11.933
26.0667513544143	11.4560900175921	25.895	12.123
Route: 9 Length: 68.1997298294382 Demand Met: 994			
27.636196164742	10.6697911507613	27.419	11.298
27.636196164742	10.6697911507613	27.927	10.409
29.1692133681744	11.261588082585	28.626	11.234
29.1692133681744	11.261588082585	29.261	11.425
29.1692133681744	11.261588082585	29.388	11.804
30.7876056906236	11.8860792348751	30.982	12.126
30.7876056906236	11.8860792348751	31.242	12.126
31.0397597612161	11.9834137083836	30.787	12.386
31.0397597612161	11.9834137083836	31.015	12.516
31.2539487945782	12.0660990403142	31.015	12.776
31.4137099117175	12.1122196922442	31.275	12.613
31.5651280584494	12.1559339923275	31.737	12.885
31.6100675918306	12.1145543277348	31.372	12.353
31.6100675918306	12.1145543277348	31.632	12.353
31.6617407472824	12.0669748832339	31.502	12.126
31.7151443816477	12.0178018926777	31.892	12.353
31.7151443816477	12.0178018926777	32.152	12.353
31.7678670567194	11.9692570987893	31.762	12.126
31.7678670567194	11.9692570987893	32.022	12.126
31.821999216978	11.9194154237505	32.542	12.126
31.8123985616818	11.8844168453137	32.282	12.126
31.794354358689	11.8186319932555	32.347	11.313
31.7909893795895	11.8173824085485	32.217	11.541
31.7909893795895	11.8173824085485	32.477	11.541
31.6799874728964	11.7760978085411	32.087	11.313
31.5338017701744	11.7217192720758	31.697	11.541
31.5338017701744	11.7217192720758	31.957	11.541
31.3320222248599	11.6466435624016	31.567	11.313

Solution x	Solution y	Original x	Original y
31.3320222248599	11.6466435624016	31.827	11.313
30.7728965413705	11.4385020117355	30.34	10.917
30.7728965413705	11.4385020117355	30.527	11.313
30.7728965413705	11.4385020117355	30.658	10.98
30.7728965413705	11.4385020117355	30.657	11.541
30.7728965413705	11.4385020117355	30.787	11.313
30.7728965413705	11.4385020117355	31.047	11.313
30.7728965413705	11.4385020117355	31.177	11.541
30.7728965413705	11.4385020117355	31.307	11.313
30.7728965413705	11.4385020117355	31.437	11.541
29.2031191329817	10.8547322647548	29.451	10.155
28.7579124773558	10.6892152941352	28.753	10.79
28.7579124773558	10.6892152941352	29.007	10.282
28.168445930271	10.4700889642647	28.372	10.218
28.168445930271	10.4700889642647	28.626	10.091
Route: 10 Length: 73.0983445441758 Demand Met: 998			
31.7906153191958	12.4946823881232	31.547	13.203
32.1477326085267	12.6004776006917	32.412	12.353
32.3768041159582	12.6683381637035	32.672	12.353
32.5528586137064	12.7204922764197	32.436	13.231
32.7261652361931	12.7718323137949	32.69	13.52
32.8273417777447	12.7522627556956	32.835	12.613
32.9263347174933	12.7331150707444	32.802	12.126
33.0260920305301	12.7138189100987	33.095	12.711
33.1237024987344	12.6949380541564	32.932	12.353
33.1237024987344	12.6949380541564	33.062	12.126
33.2232694422526	12.6756780744866	33.322	12.841
33.3205506282027	12.6568604253389	33.322	12.581
33.4179444822214	12.638021101289	33.322	12.321
33.5175604306257	12.6187520590661	33.322	13.101
33.6459628786903	12.5939155844233	33.907	13.296
33.6550449592579	12.5887042527716	33.907	13.036
33.664026466169	12.5835509500627	34.135	13.166
33.747816766848	12.4902179628275	34.135	12.646
33.747816766848	12.4902179628275	34.135	12.906
33.8258335291793	12.4033163493989	33.907	12.516
33.8258335291793	12.4033163493989	33.907	12.776
33.9199856621195	12.2984425796166	34.135	12.386
34.0101563249956	12.1980039239881	33.907	11.996
34.0101563249956	12.1980039239881	34.135	12.126
34.0907830963036	12.1081952712217	34.722	11.742
34.1060338480291	12.0912073572601	34.849	11.996
34.0164881965387	12.0319805746334	34.595	11.996
33.8862642249001	11.9458484208772	34.135	11.866
33.7448137504897	11.8522908177024	34.087	11.615
33.5859937785106	11.7472445578887	33.96	11.234
33.4194917820733	11.6371166704924	33.452	11.541
33.4194917820733	11.6371166704924	33.647	11.313
33.2554374784312	11.5286074809725	33.387	11.313
33.0963037392365	11.4233529142858	32.997	11.541
33.0963037392365	11.4233529142858	33.127	11.313
32.9433357530572	11.3221765197061	32.737	11.541
32.7989558607732	11.2266807238594	32.867	11.313
32.644874131951	11.1247679417088	32.607	11.313
32.4827439942604	11.0175318711218	32.944	10.536
32.1347108953847	10.7873314648145	32.182	10.98
31.6619361929758	10.4746228209953	32.055	9.837
30.6945250458795	9.92008199321321	30.721	9.329
30.499712485813	9.80840848451889	30.658	9.71
30.2838433354863	9.6846646960756	30.594	9.52
29.9928609134693	9.51786329839576	30.34	9.647
29.0892334208333	8.99987794323855	29.388	8.313
Route: 11 Length: 80.6752226348916 Demand Met: 992			
32.7885722806363	13.6544943323779	33.095	12.971
32.8623746515124	13.6899557354588	33.095	13.231
32.932053186787	13.7235125797372	32.835	14.173
32.9979067362543	13.7551899934689	33.095	14.011
32.9979067362543	13.7551899934689	33.095	14.271
33.0489190988036	13.7797288373618	33.095	13.491
33.0489190988036	13.7797288373618	33.095	13.751
33.1009963290823	13.804779939721	33.322	13.361
33.1009963290823	13.804779939721	33.322	13.621
33.1515123287956	13.8290795889478	32.737	14.433
33.1515123287956	13.8290795889478	33.322	14.401
33.3366739417193	13.9181581014854	33.322	13.881
33.5283315584002	14.0103578573394	33.322	14.141
33.5283315584002	14.0103578573394	33.907	14.076
33.6779093498296	14.082319308175	33.907	13.816
33.8179828443051	14.1497071835433	33.907	14.336
33.8179828443051	14.1497071835433	34.135	14.466

Solution x	Solution y	Original x	Original y
33.9094050705413	14.1936925641001	34.135	14.206
33.9094050705413	14.1936925641001	34.135	14.726
33.9667952952619	14.2213061470706	33.907	14.791
34.0183209868638	14.2460977444732	34.135	14.986
34.4707560136604	13.8149502171645	33.907	13.556
34.4707560136604	13.8149502171645	34.135	13.426
34.4707560136604	13.8149502171645	34.135	13.686
34.4707560136604	13.8149502171645	34.135	13.946
34.4707560136604	13.8149502171645	34.404	14.028
34.4707560136604	13.8149502171645	34.849	13.393
35.1759572636239	13.1429227822792	34.785	12.504
35.3675714613461	13.0752123864231	35.42	12.949
35.6892798046236	12.9618510724471	35.992	13.647
36.0660578232171	12.7594274007319	36.119	13.139
36.5630269862891	12.4924397395291	36.944	13.012
36.8215202588399	12.3535674258766	37.452	12.758
36.9226793098412	10.7479903530272	37.452	10.218
35.9720883981115	10.8090927099193	35.547	11.234
35.7985411926133	10.8202550244071	35.674	11.044
35.6388610841363	10.8305245456543	35.484	11.425
35.5199711519868	10.8381710910841	35.293	11.552
35.2577086536241	10.6264159943691	35.166	10.726
34.9976500509761	10.4164360431709	34.976	10.282
34.7639492858176	10.227730543734	35.103	10.155
34.429009746776	9.95731553014158	33.96	10.536
34.1903003782571	9.76453949299654	33.642	10.155
34.1903003782571	9.76453949299654	33.833	10.282
34.0833897809719	9.67821314741868	34.595	9.202
33.801356863401	9.450443357175	34.087	8.758
31.0572161158443	9.1661685731589	30.912	9.901

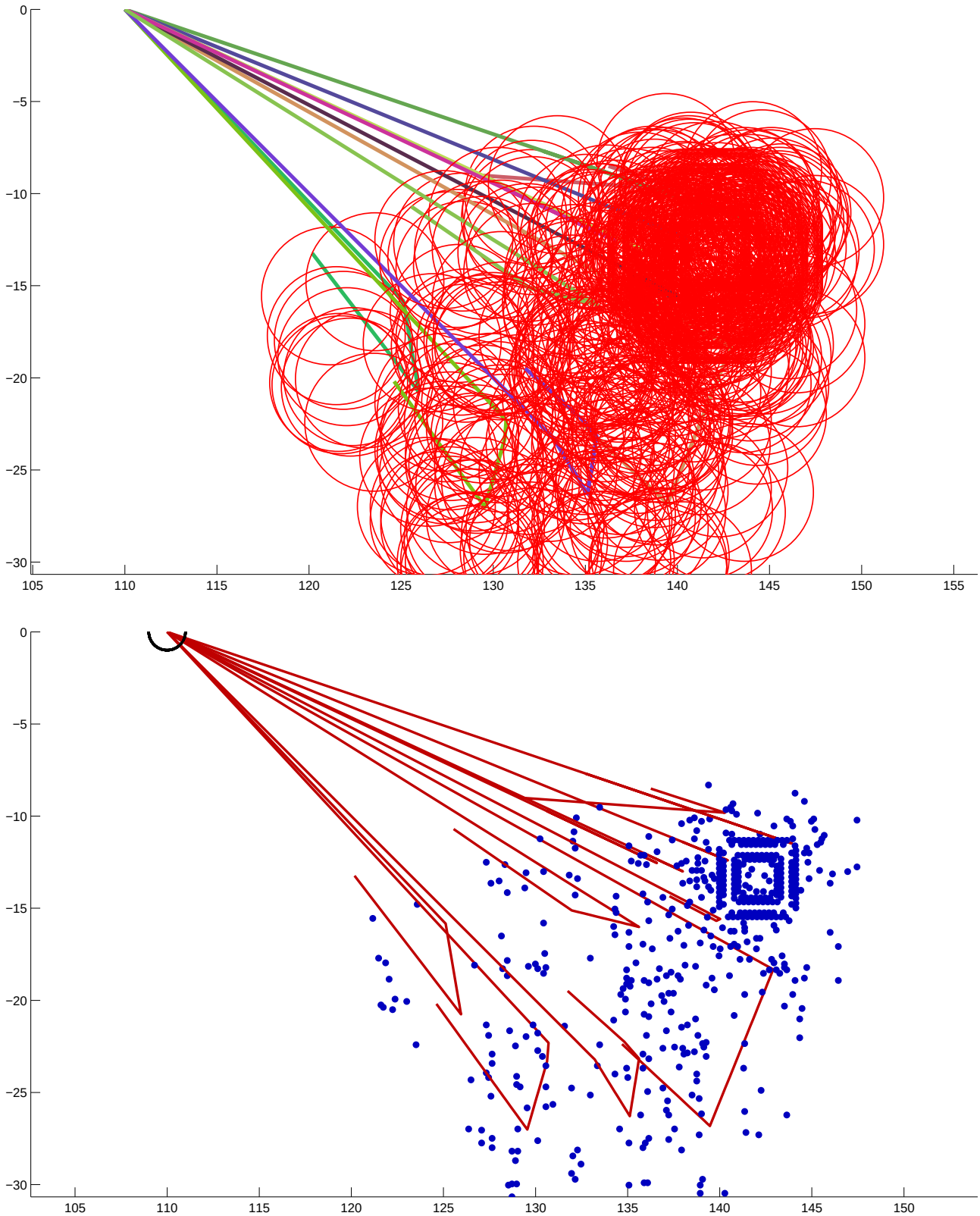


Figure O.24: $d493$, $r = 3.7452$, Equal Radius, 2D, Euclidean, Length = 732.9670615

Table O-27: Solution for $d493$, $r = 3.7452$, Equal Radius, 2D, Euclidean

Total distance: 732.967061485933			
Total demand met: 10514			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 64.1498694504394 Demand Met: 966			
19.2840582141604	9.00699826671166	18.339	12.631
21.0622185719124	9.13764288897644	22.022	11.361
22.6837555285523	9.25671651622772	22.212	10.091
24.5763318868202	9.39572883090941	26.149	11.107
25.8016957260633	9.48575104366792	28.372	10.218
26.4777977649002	9.53541635317136	28.626	10.091
27.000498445692	9.57381061448667	29.007	10.282
27.4331798146514	9.60559263601489	29.451	10.155
27.8040838877694	9.63283747006563	30.34	10.917
28.0880135435344	9.65369510128648	30.658	10.98
28.3169073313891	9.67051124656333	30.527	11.313
28.5179638807308	9.68528392867593	30.787	11.313
28.6969260998932	9.6984347136624	31.047	11.313
28.8574341869858	9.71023080653036	31.307	11.313
29.0017255075366	9.72083637550445	31.177	11.541
29.1357759585354	9.73069039399929	31.437	11.541
29.2597121828734	9.73980201246578	31.567	11.313
29.3765120150679	9.74838991052488	31.827	11.313
29.4858093480468	9.75642708852934	31.697	11.541
29.5898518738578	9.76407854138174	31.957	11.541
29.6881409939268	9.77130744119553	32.087	11.313
29.7821626074604	9.77822299024694	32.182	10.98
29.8732777884389	9.7849253106487	32.347	11.313
29.9608581505568	9.79136775011784	32.217	11.541
30.046018677057	9.79763177575321	32.477	11.541
30.1282149626851	9.80367698513367	32.607	11.313
30.208028074822	9.80954670582618	32.867	11.313
30.284817594205	9.81519427555801	33.96	10.536
30.2087105410284	9.79053453258326	33.833	10.282
30.1054410799003	9.75707156987281	33.642	10.155
29.9079270314467	9.69305661688623	32.944	10.536
29.6394710607988	9.60604842542647	32.055	9.837
29.3269055237442	9.50474409643341	30.912	9.901
28.9867736829221	9.3945053459915	30.658	9.71
28.6116206543979	9.2729154861122	30.34	9.647
28.1918443683582	9.13686181090545	30.594	9.52
27.6491484336096	8.96096802002085	30.721	9.329
26.2556479395233	8.50931595041737	29.388	8.313
Route: 2 Length: 71.6416351679187 Demand Met: 1000			
31.1918543918085	10.5613246490711	34.087	8.758
31.8964288722083	10.7998879425966	34.595	9.202
32.31604834839	10.9419674257506	35.103	10.155
32.6238609833236	11.0461900147738	34.976	10.282
32.8930294337505	11.1373279639928	35.166	10.726
33.1346037893827	11.2191227560234	35.293	11.552
33.3538042647515	11.2933419650984	35.484	11.425
33.5561365436207	11.3618497463587	35.547	11.234
33.7468843061784	11.4264351090486	35.674	11.044
33.9287019432302	11.4879968362506	37.452	10.218
33.9287030861119	11.4879971817812	37.452	12.758
33.8968212190721	11.4772042849561	36.944	13.012
33.8567408437456	11.4636356962118	36.119	13.139
33.8132262606902	11.4489035541649	35.992	13.647
33.7669906397953	11.4332496455319	35.42	12.949
33.7201375874514	11.4173863688334	34.849	13.393
33.6729776060399	11.4014189503901	34.404	14.028
33.6254478919508	11.3853261684986	34.135	14.206
33.5776239128853	11.3691336076539	34.135	14.466
33.5290677663932	11.3526930438158	34.135	14.726
33.478224604738	11.3354780523182	34.135	14.986
33.4091487620861	11.3120891185405	33.907	14.791
33.3341600862687	11.2866982808516	33.907	14.336
33.2563262001856	11.260344095096	33.907	14.076
33.176147593495	11.2331960162086	34.135	13.946
33.0928538987318	11.2049932044539	34.135	13.686
33.0067559338682	11.1758408959626	34.135	13.426
32.9180562085936	11.1458076572187	34.135	13.166
32.8268834431691	11.1149370707356	34.135	12.906
32.7332992578569	11.0832499997317	34.135	12.646
32.637297131134	11.0507442352527	34.135	12.386
32.5388359881768	11.0174058635703	34.785	12.504
32.4334553223233	10.981724603081	34.849	11.996
32.320542161993	10.9434928878928	34.722	11.742
32.1998773968884	10.9026365219941	34.595	11.996
32.0689618533318	10.8583093139611	34.135	12.126
31.9290501725667	10.810936085449	34.135	11.866
31.778077085788	10.7598175386054	34.087	11.615
31.6134406693498	10.7040726815173	33.96	11.234
31.4332497445254	10.6430611564348	33.647	11.313
31.2356648473655	10.5761601441642	33.452	11.541
31.013373564876	10.5008937309403	33.387	11.313
30.7542778720427	10.4131655960357	33.127	11.313
30.4411505738914	10.3071427476268	32.997	11.541
29.9876187723962	10.1535799405459	32.737	11.541
28.5084351197378	9.65273879040436	29.975	11.801
22.7056383174597	7.68795784197064	22.085	10.853
Route: 3 Length: 53.06131138954 Demand Met: 575			
12.2792209678275	12.8607941512479	13.576	14.79
14.4084180881378	15.0908300084086	17.577	13.647
15.0173921713829	15.7286471940031	18.021	13.52
15.1185265707312	15.834566893367	18.466	14.155
15.2892035644901	16.8422177972979	18.148	16.505
15.4593661763183	17.8468328890774	18.466	17.838
15.6095074643607	18.7332552924039	18.212	18.283
15.7661487760817	19.6580597801227	17.45	21.902
15.8594660859836	20.20901144576	17.64	22.918
15.9084795949588	20.4983921094631	17.64	23.426
15.9365042964468	20.6638526686726	17.323	23.934
15.9520144058234	20.7554262641451	17.45	24.188
15.9325196056686	20.7300605642121	16.497	24.315
15.5095848326141	20.179763019356	13.513	22.41
15.0391870134505	19.5677115563157	13.005	20.061
14.6455533813649	19.0555413744388	12.37	19.934
14.3035754065807	18.6105830793311	12.243	20.505
13.9535023459989	18.15509354555	11.735	20.378
13.5682664698996	17.653854201056	11.608	20.251
13.0296749736604	16.9530822161153	12.052	18.854
12.4076020006323	16.1436911864308	11.862	17.965
11.6480103959039	15.155372128599	11.481	17.711
10.1751463536128	13.2389997053264	11.163	15.552
Route: 4 Length: 65.7370947343801 Demand Met: 1000			
26.0630601593967	10.6205178036711	28.753	10.79
28.2053241490839	11.4934325051556	31.242	12.126
28.7024699960004	11.69599748341	31.502	12.126
29.0400661715279	11.8335520282882	31.762	12.126
29.3056503129538	11.9417641775229	32.022	12.126
29.5260676944602	12.0315724283424	32.282	12.126
29.7139839524614	12.1081377161396	32.542	12.126
29.8768325604001	12.1744890172907	32.802	12.126
30.0192232420547	12.2325046779711	33.062	12.126
30.1439104000279	12.2833070394238	33.322	12.321
30.2520009458067	12.3273471678002	33.907	11.996
30.2979174350381	12.3460550264755	33.907	12.516
30.334788608153	12.3610773507018	33.907	12.776
30.3663124443696	12.3739208567622	33.907	13.036
30.3937935645041	12.3851171055217	33.907	13.296
30.4175881204262	12.394811189554	33.907	13.556
30.4384508398275	12.4033106800157	33.907	13.816
30.4269482947522	12.3986115231028	33.322	13.881
30.4152021218414	12.3938130956177	33.322	14.141
30.4007787521686	12.3879239074355	33.322	14.401
30.3834977364781	12.3808734639928	33.127	14.661
30.3645613086621	12.3731511829159	32.867	14.661
30.3450544315715	12.3651979504909	32.607	14.661
30.3253742322245	12.357174755398	32.347	14.661
30.3056844057069	12.3491479930469	32.217	14.433
30.2860837952054	12.3411578112598	32.087	14.661
30.2665041173122	12.3331765062413	31.827	14.661
30.2470232806939	12.3252357163348	31.697	14.433
30.2277057631592	12.3173616726325	31.957	14.433
30.2084303846726	12.3095051429097	31.991	14.092
30.1892490169535	12.3016872865863	32.372	14.092
30.1700245662052	12.2938523970625	32.477	14.433
30.1506248039456	12.2859466347467	32.737	14.433
30.130802093803	12.2778690935795	32.835	14.173
30.1106384284732	12.2696530239766	33.095	14.271
30.0888058052249	12.2607570276343	33.095	14.011
30.06596567819	12.2514507722797	33.095	13.751
30.0424004315603	12.2418492666065	33.322	13.621
30.0168293108153	12.2314305953922	33.322	13.361
29.9896167084183	12.2203432070232	33.095	13.491
29.9613632563272	12.2088317764286	32.69	13.52

Solution x	Solution y	Original x	Original y
29.9327309214121	12.1971659698487	32.436	13.231
29.9040352295568	12.1854743259271	33.095	13.231
29.8740313501007	12.1732496536881	33.095	12.971
29.8427857887529	12.1605190253237	33.322	13.101
29.8050236839217	12.1451330815786	33.322	12.841
29.7585627655597	12.1262025999527	33.322	12.581
29.6966165951463	12.1009623419485	33.095	12.711
29.6215511770476	12.0703763651127	32.835	12.613
29.5356222556547	12.0353638060027	32.932	12.353
29.4247833958551	11.9902011624952	32.672	12.353
29.2856554607077	11.9335114882059	32.412	12.353
29.1105438418995	11.8621593410998	32.152	12.353
28.8837150008243	11.7697335683019	31.892	12.353
28.563141621699	11.6391088247637	31.632	12.353
27.9496302625589	11.3891146105162	31.372	12.353
Route: 5 Length: 86.6710780968913 Demand Met: 1000			
28.3376875682474	15.7792365840634	31.502	15.473
29.2146517395968	16.2675534078861	31.991	16.632
29.7075489756879	16.542010923196	32.182	16.632
30.0891590990782	16.7545006912543	31.991	17.203
30.424273881633	16.9411006064928	31.61	17.775
30.7362461259739	17.1148141636584	32.372	18.537
31.0083891190751	17.266349850738	32.69	18.346
31.2539232866625	17.4030691182075	32.817	17.775
31.4856152092972	17.5320806969593	32.944	17.965
31.706228335475	17.6549233527349	33.071	18.346
31.9167530788442	17.7721485822483	33.261	18.537
32.1182864966125	17.8843672596171	33.642	18.346
32.3117147150037	17.9920728078085	33.515	18.219
32.5010924305093	18.0975229890786	33.515	18.029
32.6885766026134	18.2019188655132	33.388	17.584
32.8777370273196	18.3072482042544	35.992	16.314
32.904120791008	18.3219348271185	36.436	17.076
32.8341419019519	18.4948785155528	36.436	18.918
32.7227588802584	18.7701583491246	34.722	18.219
32.6040568450281	19.063527282132	34.595	18.791
32.4790838847964	19.3723950603114	34.087	18.918
32.3476605738726	19.6972050919929	33.96	19.68
32.212542915149	20.0311460246998	34.468	20.442
32.0738337337441	20.373964140061	34.341	21.013
31.9337097259483	20.7202798854065	34.341	22.029
31.8003893994455	21.0497817845739	33.515	20.315
31.6553234391703	21.4083135551668	32.309	19.553
31.4860304956763	21.8267226907369	31.356	19.68
31.2783054376794	22.3401169096426	30.785	20.823
31.0435400636408	22.9203411678945	31.356	22.347
30.7944088347428	23.5360707199465	31.293	23.68
30.5445882457569	24.1535040786877	32.245	24.887
30.2962127805714	24.7673667301313	33.642	26.22
30.0821310441017	25.2965110297803	31.356	26.03
29.8698012357287	25.8213259156273	31.42	27.173
29.6721649035799	26.3098236989918	32.118	27.3
29.46632974653	26.8185894933345	30.277	30.475
29.4461480622479	26.7997863772305	28.943	30.475
29.3439021586475	26.7045340831819	28.943	30.03
29.1810559084922	26.5528317883669	29.07	29.713
28.9030098760516	26.2938175427609	27.927	28.125
28.6178353431163	26.0281633520788	27.229	27.554
28.3378241119739	25.7673195793307	27.546	26.982
28.0581969804275	25.5068338580785	28.88	27.3
27.73483531576	25.2056070893542	29.007	26.157
27.3731894541403	24.8687158917003	28.88	25.331
26.9717127596158	24.4947187973699	28.499	25.141
26.5122169666278	24.0666715772721	28.753	24.379
25.9076178259465	23.5034470403011	28.816	21.902
24.6948027528211	22.3736006050706	27.229	19.616
Route: 6 Length: 67.7481915922598 Demand Met: 1000			
26.9045204421894	13.9648479931844	29.642	15.108
27.7434988227234	14.400334298186	30.787	14.466
28.1456082685032	14.609056894629	31.047	14.661
28.4305200002339	14.7569456356941	31.307	14.661
28.655415259489	14.8736815985459	31.177	14.433
28.8560898594266	14.977845293504	31.437	14.433
29.0361637473864	15.0713157137883	31.567	14.661
29.2006048005064	15.156671529103	31.892	15.246
29.3480729036281	15.2332171632346	32.152	15.246
29.4804296230876	15.3019188793784	32.412	15.246
29.5987027459266	15.3633101687142	32.672	15.246
29.7032091553567	15.4175555173763	32.932	15.246
29.7934356030046	15.4643885130495	33.062	15.473

Solution x	Solution y	Original x	Original y
29.8718255072745	15.5050774933447	33.322	15.473
29.9354500578679	15.5381022096709	33.452	15.246
29.9863337218433	15.564513454943	33.582	15.473
30.024989373944	15.5845775250761	33.769	15.679
30.0154591708551	15.5889321754545	33.071	16.187
30.006044474229	15.5932340269336	32.944	15.933
29.9967583825905	15.5974770988925	32.802	15.473
29.9876049037177	15.6016595588601	32.542	15.473
29.9785753182813	15.6057853914176	32.282	15.473
29.9696593542376	15.6098592855288	32.022	15.473
29.9608461725312	15.6138861915744	31.762	15.473
29.9521251492325	15.6178709673925	31.632	15.246
29.9434833801841	15.6218195148298	31.372	15.246
29.9349105084507	15.6257365717397	31.112	15.246
29.9263995387535	15.6296253320504	31.242	15.473
29.917941693825	15.6334898184586	30.982	15.473
29.9095310499044	15.6373327359369	30.722	15.473
29.9011612187946	15.6411569933417	30.594	16.251
29.8928356363305	15.6449610193793	30.785	16.251
29.8845510042961	15.6487463290844	31.293	15.806
29.8763013702798	15.6525156652675	31.356	16.06
29.8680893205315	15.6562678581788	31.356	16.251
29.8599156728421	15.6600025289872	31.483	16.822
29.8517739320947	15.6637226533707	30.975	17.076
29.8436619400846	15.6674292033137	30.785	16.949
29.8355700176882	15.6711266026848	30.594	17.076
29.8274936244738	15.674816924637	31.102	17.775
29.8193775331451	15.6785254550049	30.531	18.664
29.8111114985028	15.6823026707086	29.705	19.426
29.6646706483911	15.6052657782267	29.261	19.172
29.4258591171753	15.4796378264805	29.578	18.791
29.0824504903033	15.2989868027216	29.959	17.584
28.6779229420208	15.0861842299368	30.023	17.203
28.149724985841	14.8083246784257	29.642	17.076
27.2695364278883	14.3452976144957	29.515	16.505
Route: 7 Length: 61.7278998945449 Demand Met: 1000			
27.1776340089756	12.6191511732805	30.657	11.541
27.494788276274	12.7664096912361	30.982	12.126
27.6264404022957	12.8275370558721	30.787	12.386
27.7363499905861	12.8785689087374	30.787	12.646
27.8342604189043	12.9240292676462	31.015	12.516
27.920423895086	12.9640353008808	31.275	12.613
27.9935040549354	12.9979665951746	31.737	12.885
27.9935040500612	12.9979665973523	31.547	13.203
27.9935040451157	12.9979665994335	31.399	13.754
27.9935040401902	12.9979666018955	31.61	13.901
27.9935040372666	12.9979666046034	31.275	14.173
27.9935040344	12.9979666075416	31.015	14.076
27.9935040315694	12.9979666106141	31.015	13.816
27.9935040287666	12.9979666136711	31.015	13.556
27.9935040259867	12.997966616723	31.015	13.296
27.9935040232241	12.9979666197839	31.015	13.036
27.9935040204747	12.9979666228653	31.015	12.776
27.9935040177329	12.9979666255771	30.787	12.906
27.993504015003	12.9979666282457	30.787	13.166
27.9935040122789	12.9979666309441	30.787	13.426
27.9935040095551	12.9979666336678	30.787	13.686
27.9935040068237	12.9979666364161	30.787	13.946
27.9935040040761	12.9979666391835	30.787	14.206
27.9935040013004	12.997966641427	30.657	15.246
27.9935039985151	12.9979666442024	30.462	15.473
27.9935039957152	12.9979666467178	30.15	16.06
27.9253299357866	12.9663121402806	29.975	14.921
27.8546799473438	12.9335080140085	30.202	14.791
27.7797950360436	12.8987375500665	29.975	14.661
27.7012363373506	12.862261291769	29.975	14.401
27.6185866729236	12.8238855363423	30.202	14.271
27.5285314017576	12.7820712439087	30.202	14.011
27.4291694859982	12.7359357260796	30.202	13.751
27.3174773439223	12.684075073223	30.202	13.491
27.1882708228469	12.6240821716524	30.202	13.231
27.0303783154342	12.5507698020345	30.202	12.971
26.8067585334048	12.4469389346501	30.202	12.711
25.8711270206714	12.0125091528375	28.753	12.949
Route: 8 Length: 68.6458745941309 Demand Met: 998			
15.2004126573949	16.3743915919194	16.688	18.092
17.0138756458094	18.327914034015	18.466	18.664
18.2939014466172	19.7068003942734	19.609	18.156
19.7085262027778	21.2306810893478	21.577	21.394
20.705857987821	22.3050399207587	24.244	21.077

Solution x	Solution y	Original x	Original y
20.6800940354655	22.6261632817473	23.482	22.41
20.6521233540886	22.9747974754226	23.355	23.553
20.6242334047582	23.3224296055115	24.308	23.998
20.5033604703988	23.7388839112145	22.974	25.141
20.3881184544095	24.1359386748377	21.958	24.76
20.2727336223942	24.5334861267402	20.942	25.649
20.1625793033701	24.9130126464689	20.561	25.776
20.055982249384	25.2802832124969	19.545	25.839
19.9525708243598	25.6365781560415	19.037	26.982
19.8581319038325	25.9619589943478	20.117	27.617
19.7712123024596	26.2614325931417	22.276	28.125
19.6961662109651	26.519997090168	22.022	28.443
19.6300708917618	26.7477224213246	22.466	28.887
19.5865167656956	26.8977833527249	21.958	29.395
19.552904956955	27.0135887735279	22.149	29.713
19.5529040653912	27.0135891497988	18.72	30.665
19.4938355454911	26.9319824506619	18.529	30.03
19.4259285718451	26.8381648444973	18.72	29.967
19.3458769569357	26.7275686368254	18.974	29.967
19.2423215319859	26.5845004229823	18.91	28.697
19.1326819024681	26.4330264785711	19.037	28.189
19.0180004040768	26.2745868495512	18.72	28.189
18.8973509159122	26.1079020360403	17.64	27.998
18.7728386670341	25.9358805551477	17.64	27.49
18.6461639509065	25.7608714661184	17.069	27.744
18.515484249837	25.580329233189	17.069	27.046
18.384092863231	25.398803750163	16.37	26.982
18.2536612296859	25.2186042592448	17.577	25.204
18.1263736441662	25.0427484705062	18.974	24.125
18.001130750771	24.8697175408592	18.974	24.569
17.8754062943379	24.6960212979474	19.164	24.696
17.74707163351	24.5187188873736	20.561	24.696
17.6002082162093	24.3158177676451	20.561	23.553
17.4346591252003	24.0871011284463	20.371	23.045
17.2496018463268	23.8314326015596	20.117	22.728
17.0446063905948	23.548218123796	20.117	21.775
16.8027523041431	23.2140809379523	19.863	21.331
16.5124385303371	22.8129935928617	19.482	21.966
16.1480969898765	22.30963213351	18.91	22.474
15.6305798960187	21.5946486803991	18.593	21.648
14.616572023851	20.1937318994872	17.323	21.331
Route: 9 Length: 58.7959032018243 Demand Met: 991			
18.9556929916952	8.94316166530136	20.244	11.234
21.7609311450459	10.2666696335429	22.149	11.742
23.9531051882395	11.300931135579	26.022	12.631
25.1113097789246	11.8473708178847	26.911	14.409
25.6510722587454	12.1020285735852	27.229	15.362
25.7884379593967	12.1668378331273	27.419	15.044
25.9003515581331	12.2196387928224	28.245	14.854
25.9779396335116	12.2562450210967	28.372	14.663
26.0423906511181	12.2866531774411	29.007	14.409
26.0800530844819	12.3044229296144	28.753	13.838
26.1156526633306	12.3212193704913	28.753	13.457
26.1498742481154	12.3373656593077	28.372	13.52
26.1832897458604	12.3531316157101	27.991	13.647
26.2162018074174	12.3686600285949	27.673	12.695
26.2490889691949	12.3841766939368	27.927	12.568
26.2819264613393	12.3996699645798	28.181	12.441
26.3146795128813	12.4151234388491	28.499	12.949
26.3470855595997	12.4304132305919	28.816	12.568
26.379078681961	12.4455082584486	28.816	12.25
26.4108080534818	12.4604789112698	29.197	12.441
26.4419588910162	12.4751766682345	29.007	12.949
26.4726514660568	12.4896582275794	29.134	13.33
26.5027053075002	12.5038384141032	29.197	13.52
26.5320656010346	12.5176913474655	29.388	13.838
26.560400976929	12.5310606812379	29.515	14.028
26.5874432870157	12.5438199038958	29.975	14.141
26.5805623761779	12.5405734700037	29.975	13.881
26.5733333050293	12.5371626479371	29.975	13.621
26.5659000589829	12.5336555690184	29.975	13.361
26.5583199513057	12.5300792725897	29.705	13.393
26.5506730014332	12.5264714461211	29.578	13.203
26.5429870513589	12.5228451975329	29.975	13.101
26.5351913091919	12.5191672030704	29.975	12.841
26.5273393520324	12.5154627195867	29.975	12.581
26.5195060026473	12.5117670378015	30.202	12.451
26.5106293031653	12.5075792286354	29.975	12.321
26.5019970502248	12.5035067621556	30.202	11.996
26.4132514018731	12.4616382032464	29.975	12.061

Solution x	Solution y	Original x	Original y
26.259866500075	12.3892741767232	29.388	11.804
26.0708350489199	12.3000923677619	29.261	11.425
25.8101590076129	12.1771093144805	28.626	11.234
25.4869539511323	12.0246254733471	27.927	10.409
25.1027191503361	11.8433481885205	27.419	11.298
24.6502629482299	11.6298841578861	26.594	11.933
24.1214502082171	11.3803948905609	25.895	12.123
23.4874681039617	11.0812863336661	25.705	12.123
22.5577732314456	10.6426606175064	25.07	11.615
20.6073752305119	9.72246561624375	23.482	9.52
Route: 10 Length: 74.1530764201697 Demand Met: 1000			
21.6737304060242	21.6722020684028	24.625	19.68
22.1319200758874	22.1303559309591	24.879	19.934
22.5474816021242	22.5458826904487	24.879	20.632
22.9531130950478	22.9514796193302	25.895	20.759
23.2136429410132	23.2119849124883	26.149	20.886
23.4008975490241	23.5141937442284	26.022	21.902
23.5881044033578	23.8163251060634	25.832	22.918
23.7691910956179	24.1085783940213	26.149	23.172
23.9435808421017	24.3900228870207	25.832	23.68
24.1142686058704	24.6654923362475	24.943	23.68
24.289991967123	24.9490885721393	25.006	24.188
24.469815199645	25.2393014441391	26.086	24.95
24.6446737825102	25.5215016160282	25.705	26.22
24.8103227937125	25.7888382550975	24.562	26.982
24.9700120062043	26.0465563478398	25.07	27.744
25.1178231710963	26.2851045785751	25.07	30.03
25.1178233332386	26.2851047208159	25.895	29.903
25.1178234982389	26.2851048513649	26.086	29.903
25.1528030477376	26.0672459479707	25.832	27.998
25.1912250802908	25.8279458041626	25.959	27.744
25.2337639393012	25.5630048018655	26.149	27.49
25.2814968918132	25.265713891474	27.229	26.22
25.3311114295745	24.956704448365	27.102	25.966
25.3829477845221	24.6338577403609	27.165	25.458
25.4364646943555	24.3005449880462	26.911	24.76
25.4905344245097	23.9637898117502	27.8	23.617
25.541618654001	23.6456290515975	28.753	23.998
25.5913281932324	23.3360341284555	29.261	23.045
25.6069833282692	23.2385553655957	29.134	22.537
25.6197315146562	23.1591821460196	29.261	22.283
25.6197233024337	23.1591708774145	29.07	22.347
25.6197152478756	23.1591598332577	28.626	22.791
25.6197071818898	23.1591487792144	28.245	22.855
25.619699094595	23.1591376960715	28.054	22.918
25.6196909780667	23.1591265728449	27.991	22.601
25.6196828415122	23.1591154161451	27.546	22.537
25.6196746856014	23.1591042266489	26.911	22.601
25.6196665095995	23.1590930115315	27.102	21.648
25.6196583327671	23.1590817890836	27.927	21.458
25.6196501950462	23.159070613571	28.245	21.331
25.6196423630699	23.1590598401229	28.689	21.013
25.151752741089	22.6267049009553	27.356	20.632
24.8211951395392	22.2506386263974	27.483	19.616
24.5150064536631	21.9761665659693	26.848	19.743
24.2155340866401	21.707714506649	26.975	20.061
23.8582987698756	21.3874812661087	26.276	20.188
23.4608057440673	21.0311592571523	26.149	19.045
22.9678238128863	20.5892363608478	25.133	19.235
22.4262190243572	20.103725887876	24.943	18.791
21.7408608573272	19.4893484616063	24.943	18.346
Route: 11 Length: 60.6351269438335 Demand Met: 984			
17.4461632218721	10.9074415216755	19.482	13.076
18.9638984481487	11.8563371344773	20.434	13.012
20.0068915099093	12.5084219097873	21.831	13.203
20.7887634897947	12.9972513851477	22.276	13.393
21.4622592237604	13.4183232738882	22.149	14.282
22.0878304568156	13.8094317977075	24.371	15.235
22.5158901740548	14.0770562529863	24.308	15.044
22.8809640043551	14.305301843415	24.371	14.346
23.2218099828687	14.5184001509975	25.197	12.441
23.5462776021393	14.7212586585322	25.578	12.568
23.8535656723898	14.9133764181234	25.832	14.219
24.1399020953057	15.0923952190279	26.086	14.663
24.4076241226933	15.2597762707089	26.149	15.679
24.6571050271969	15.4157528218674	25.832	16.949
24.8892631878265	15.5608988561795	26.34	17.203
25.100851854835	15.6931845521875	27.292	16.632
25.2909153469011	15.8120125927761	27.737	16.251
25.4630806574614	15.9196506299144	28.308	15.933

Solution x	Solution y	Original x	Original y
25.6159535134987	16.0152269667153	29.324	15.489
25.6159535213663	16.0152269780679	29.134	16.187
25.6159535291494	16.0152269895908	28.943	16.886
25.6159535367962	16.0152270014678	28.054	17.013
25.6159535443756	16.0152270128711	28.689	18.156
25.5844410741815	16.0074914847339	28.118	18.092
25.5512563095937	15.9993454841492	27.864	18.854
25.4822097249466	15.9824019975381	27.737	18.664
25.3950400884989	15.9610117568219	27.356	18.473
25.2985708513027	15.9373397868765	27.102	18.664
25.1889743573176	15.9104470067805	26.721	18.283
25.0724902052256	15.8818643749722	26.594	18.854
24.9348614072447	15.8480940718373	25.895	18.918
24.7815188061007	15.8104685770765	24.752	19.362
24.6032174787202	15.7667205428784	24.943	19.108
24.4014768160552	15.7172223029857	25.197	18.918
24.1595050829328	15.6578544724603	25.451	17.965
23.8899212591242	15.5917125281121	25.07	17.076
23.6033244327728	15.5213968017188	25.07	16.314
23.2959794871366	15.4459912042855	24.244	15.997
22.9777837247744	15.3679238823476	24.308	16.441
22.6337143211051	15.2835093894481	22.974	17.711
22.2664502865411	15.1934043842699	20.561	18.219
21.9670756865861	15.1199541548454	20.434	18.537
21.705682856948	14.9400347738961	20.117	18.283
21.3276793840997	14.6798528112282	19.99	18.029
20.7341229795561	14.2713039463658	20.498	17.457
19.7139425478713	13.5691068172716	20.434	15.806
18.144970932526	12.4891749051307	19.418	13.901
15.5502566689932	10.7032194122194	17.323	12.504

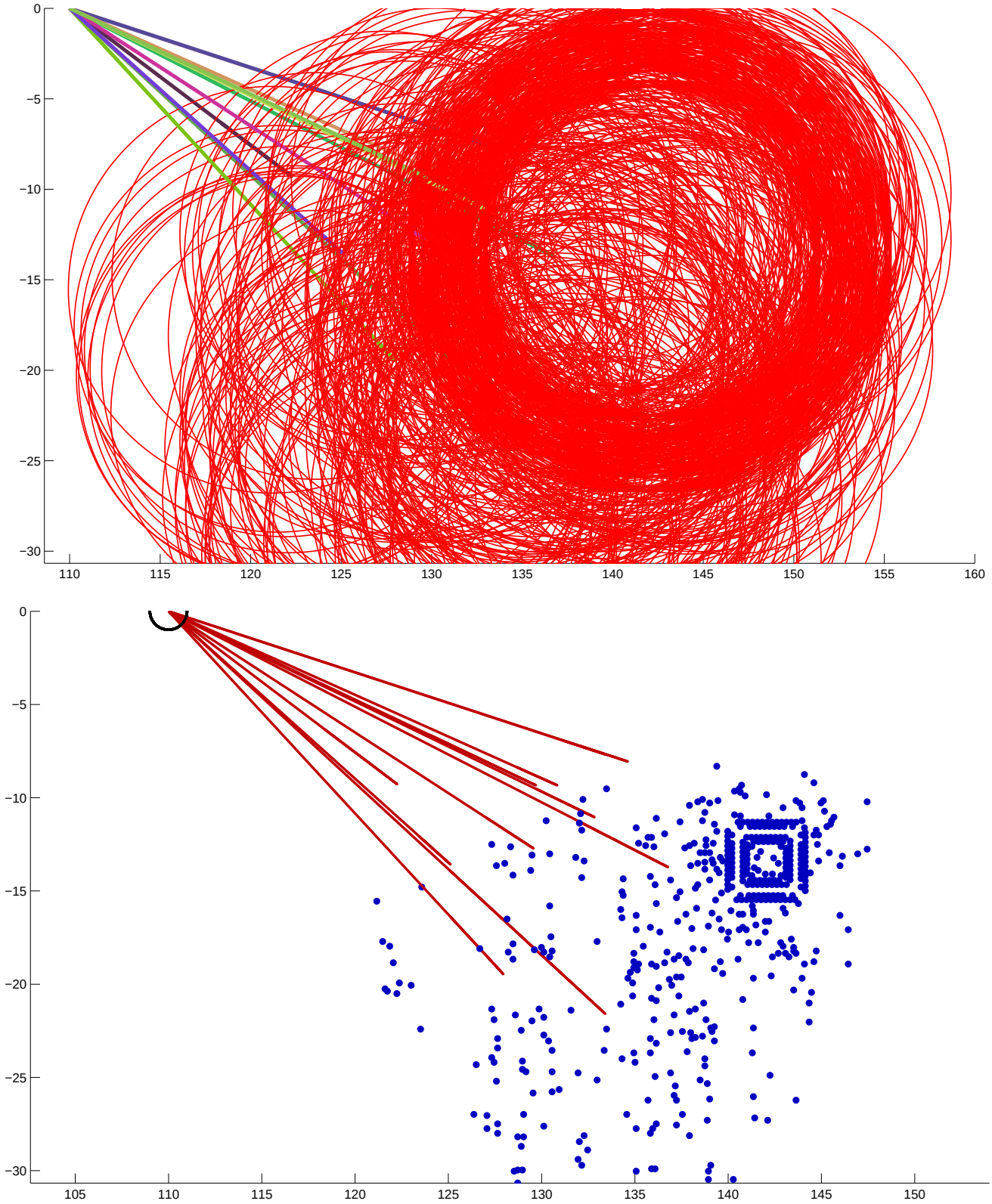


Figure O.25: $d493$, $r = 11.2356$, Equal Radius, 2D, Euclidean, Length = 535.9189087

Table O-28: Solution for $d493$, $r = 11.2356$, Equal Radius, 2D, Euclidean

Total distance: 535.918908662567			
Total demand met: 10514			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 49.3806514942984 Demand Met: 1000			
22.7350673982185	7.45515999706718	28.054	17.013
23.461159957559	7.69325393222953	29.642	17.076
23.4611599595751	7.69325393233215	29.515	16.505
23.4611599615662	7.69325393241994	30.15	16.06
23.4611599635069	7.69325393252279	29.642	15.108
23.4611599654253	7.69325393246	30.462	15.473
23.4611599673017	7.69325393241163	30.722	15.473
23.4611599691341	7.69325393234012	30.982	15.473
23.4611599709313	7.69325393224413	31.242	15.473
23.4611599727289	7.6932539321612	31.372	15.246
23.4611599745355	7.69325393201775	31.112	15.246
23.4611599763513	7.69325393196583	31.047	14.661
23.461159978172	7.69325393182524	31.307	14.661
23.4611599799977	7.69325393167844	31.567	14.661
23.4611599818328	7.69325393155894	31.697	14.433
23.4611599836753	7.69325393138172	31.437	14.433
23.4611599855193	7.69325393120011	31.177	14.433
23.4611599873602	7.6932539310726	31.275	14.173
23.4611599891952	7.69325393095393	31.61	13.901
23.4611599910227	7.69325393078941	31.399	13.754
23.4611599928389	7.69325393071308	31.547	13.203
23.4611599946398	7.69325393059557	31.737	12.885
23.4611599964227	7.69325393051141	31.632	12.353
23.4611599981847	7.69325393032902	31.892	12.353
23.4611599999231	7.69325393018976	32.022	12.126
23.4611600016372	7.69325393013587	32.217	11.541
23.4611600033248	7.69325392994779	32.477	11.541
23.4611600049864	7.69325392979486	32.347	11.313
23.4611600066214	7.693253929602	32.607	11.313
23.4611600082325	7.69325392940671	32.867	11.313
23.4611600098242	7.69325392913431	32.737	11.541
23.4611600114007	7.69325392893685	32.997	11.541
23.4611600129718	7.69325392878915	33.127	11.313
23.4611600145469	7.6932539288331	33.96	10.536
23.4611600161605	7.69325392869721	33.833	10.282
23.4611600178094	7.69325392889302	34.595	9.202
23.3744042748516	7.66480539506205	34.087	8.758
23.2729542936789	7.63153846874405	33.642	10.155
23.1506304712963	7.59142677789637	32.944	10.536
23.0112787596962	7.54573147587044	32.182	10.98
22.8572053257329	7.49520879505619	32.087	11.313
22.6818961036136	7.43772269541517	31.957	11.541
22.4750793572999	7.36990493926421	31.502	12.126
22.2222678896715	7.2870049198676	31.372	12.353
21.8614897493104	7.16870114352263	31.242	12.126
21.1155922871558	6.92411151246836	30.202	12.711
Route: 2 Length: 63.6798604126713 Demand Met: 1000			
15.8366416080804	14.6031367249038	24.943	18.791
17.3666358735511	16.0139600899377	25.133	19.235
18.3707174502721	16.939834260772	24.879	19.934
19.1961046054481	17.7009319194849	26.149	20.886
19.8784245743683	18.3301059318239	27.102	21.648
20.4474579145715	18.854817473602	27.927	21.458
20.9374454597046	19.3066401983922	28.245	21.331
21.3751543750348	19.7102562828414	28.689	21.013
21.7750668327964	20.0790198516192	30.785	20.823
22.1157911903614	20.3932054176765	31.356	19.68
22.4113508064374	20.6657440520207	32.372	18.537
22.6386985625356	20.8753836418541	32.69	18.346
22.8183599474383	21.0410510026349	32.309	19.553
22.9821582363846	21.1920909226196	31.356	22.347
23.1359518649489	21.3339055168259	31.293	23.68
23.2805206551556	21.4672138363911	32.245	24.887
23.4073610266246	21.5841747246925	33.642	26.22
23.4073610310491	21.5841747505258	31.356	26.03
23.4073610374298	21.5841747780904	31.42	27.173
23.4073610454836	21.5841748107578	32.118	27.3
23.4073610545227	21.5841748369857	30.277	30.475
23.3815101069872	21.5603361145508	28.943	30.475
23.3442919413896	21.5260164377555	28.943	30.03
23.2971088095015	21.482508249283	29.07	29.713
23.2376199791622	21.4276529750604	26.086	29.903
23.1734748377689	21.3685041119973	25.895	29.903
23.1042916519182	21.3047096596029	25.07	30.03
23.030142269689	21.2363358671971	25.832	27.998
22.9533648051323	21.1655387387358	25.959	27.744
22.8740870529356	21.0924361355198	26.149	27.49
22.792395252966	21.017107604273	27.229	26.22
22.7085858598172	20.9398265423897	27.546	26.982
22.621606207995	20.8596223018564	27.229	27.554
22.5305860020209	20.775692376785	27.927	28.125
22.4307782534415	20.6836594702213	28.88	27.3
22.3191334671845	20.5807115254783	29.007	26.157
22.1977445966675	20.4687784609373	28.88	25.331
22.067466620249	20.3486485981779	28.499	25.141
21.9285654227892	20.2205670426275	28.753	24.379
21.7810341654584	20.0845274212423	28.753	23.998
21.6248557177959	19.9405139383379	29.261	23.045
21.459045331036	19.787618608863	29.134	22.537
21.2835429799126	19.6257861357178	29.07	22.347
21.0967830851164	19.4535729226127	29.261	22.283
20.8940623486025	19.266642043751	28.816	21.902
20.6754225884525	19.0650320671813	28.626	22.791
20.4310623228957	18.8397049528096	28.245	22.855
20.1540047061047	18.5842272871373	28.054	22.918
19.8287289612511	18.2842872471583	27.546	22.537
19.4469304040958	17.9322271036619	26.911	22.601
18.988417669775	17.5094283201482	26.149	23.172
18.383376292369	16.9515140057299	25.832	22.918
17.3921090487123	16.0374564101612	23.355	23.553
15.0690796490207	13.8953651971428	18.91	22.474
Route: 3 Length: 60.1749943786007 Demand Met: 1000			
22.6777154212141	11.6207911268648	33.322	13.621
23.652560787357	12.1203022401404	33.907	13.816
24.1502805674957	12.375340097631	34.135	13.686
24.5057667720812	12.5574957950942	34.135	13.946
24.7941256273515	12.7052591526235	33.907	14.076
25.0441334895842	12.8333741622283	33.907	14.336
25.2648944905249	12.9465045197964	33.907	14.791
25.4624448389005	13.0477432541717	34.135	14.986
25.6402529860777	13.138868545159	34.135	14.726
25.8027819700869	13.22216898993	34.135	14.466
25.9521311805661	13.2987215461133	34.135	14.206
26.089490724027	13.3691350521482	34.404	14.028
26.2167483937603	13.4343732307568	34.849	13.393
26.3376808362025	13.4963681483331	35.42	12.949
26.4539659500205	13.5559777068811	35.484	11.425
26.5660581719119	13.6134347520503	35.547	11.234
26.6737738636385	13.6686451412344	35.674	11.044
26.7765374248181	13.7213144168008	37.452	10.218
26.776537433649	13.7213145153932	37.452	12.758
26.7765374585323	13.721314646744	36.944	13.012
26.7765374870058	13.7213147803994	36.119	13.139
26.7765375153271	13.7213149111808	35.992	13.647
26.7765375428964	13.7213150263932	35.992	16.314
26.7765375694124	13.7213151546142	36.436	17.076
26.7765375952901	13.7213152758738	36.436	18.918
26.7765376205722	13.7213153924018	34.468	20.442
26.7765376428172	13.7213155120476	34.341	21.013
26.7765376612857	13.7213156248667	34.341	22.029
26.7078504079437	13.6861248411977	33.515	20.315
26.6336305722301	13.6481007798468	33.96	19.68
26.5539000419524	13.607255711732	34.087	18.918
26.4694142516076	13.5639779460407	34.595	18.791
26.378561100822	13.5174426783087	34.722	18.219
26.2813353623325	13.4676480366418	33.515	18.029
26.1800354588358	13.4157710536558	33.515	18.219
26.0734061112908	13.3611676621488	33.642	18.346
25.9590260546721	13.3025956565265	33.261	18.537
25.8345448659545	13.2388478663495	33.071	18.346
25.6978607480625	13.1688430024973	32.944	17.965
25.548066826209	13.0921123550205	32.817	17.775
25.3843557853796	13.008241217809	33.388	17.584
25.2003733702132	12.9139753283049	33.071	16.187
24.9986088870509	12.8105919519517	33.769	15.679
24.7671105597777	12.6919678913813	33.582	15.473
24.4978167353233	12.5539713367093	33.452	15.246
24.1780687895327	12.3901141550322	33.322	15.473
23.7757000447765	12.183913596	33.062	15.473
23.2171803845647	11.8976933823579	32.932	15.246
22.1176847022755	11.3342434549023	32.152	15.246
Route: 4 Length: 51.7997785573275 Demand Met: 1000			

Solution x	Solution y	Original x	Original y
22.1407586399795	7.24676148961774	31.015	13.296
23.1356697126985	7.57238075921553	31.991	14.092
23.3831968675764	7.65339681164487	31.957	14.433
23.5292155718222	7.70118912345123	31.827	14.661
23.6393311184856	7.73723025382947	32.087	14.661
23.7218310053279	7.76423292957917	32.217	14.433
23.7908674751781	7.78682900944357	32.372	14.092
23.8519708007897	7.80682843908153	32.436	13.231
23.9091602165831	7.82554658461891	32.69	13.52
23.9619579154952	7.8428270039504	33.095	13.751
24.0078100802029	7.85783385735266	33.095	13.491
24.0499171931956	7.8716146363459	33.095	13.231
24.0895189063626	7.88457511839744	33.322	13.361
24.1260839829636	7.89654159803704	33.322	13.101
24.1606408371986	7.90785078626584	33.322	12.841
24.1937157555944	7.91867504627016	33.095	12.971
24.2256363528846	7.92912167954964	33.095	12.711
24.2565825867921	7.93924961454424	33.322	12.581
24.2864637848306	7.9490291863946	33.322	12.321
24.3153865776257	7.95849526652743	33.907	11.996
24.3430058582362	7.96753488172872	34.087	11.615
24.3693521442282	7.97615797895352	34.135	11.866
24.3943261100515	7.98433202777285	34.135	12.126
24.4178865425663	7.99204351599812	34.135	12.386
24.439988172099	7.99927760862547	33.907	12.516
24.4609547045598	8.0061402415526	33.907	12.776
24.4807461268752	8.0126183053705	33.907	13.036
24.4993044780735	8.01869281535484	33.907	13.296
24.5165357265661	8.0243329810845	33.907	13.556
24.5322870994106	8.02948878858868	34.135	13.426
24.5462389046445	8.03405558206491	34.135	13.166
24.5590796763293	8.03825872402573	34.135	12.906
24.5710400043041	8.04217368565317	34.135	12.646
24.5822474279659	8.04584220848915	34.785	12.504
24.5913631406136	8.04882606320398	34.849	11.996
24.5996945500682	8.05155318828489	34.595	11.996
24.6075387546623	8.05412083878083	34.722	11.742
24.614960188233	8.05655010247882	35.293	11.552
24.5650210382283	8.04020307039832	35.166	10.726
24.5084310909366	8.02167901877316	35.103	10.155
24.4452308515788	8.00099123150909	34.976	10.282
24.3743214644081	7.97778008436914	33.96	11.234
24.2986816420233	7.95302060226242	33.647	11.313
24.2184465145874	7.92675705071442	33.387	11.313
24.1336703102075	7.89900718389765	33.452	11.541
24.042693155858	7.86922766737165	33.062	12.126
23.9444680301741	7.83707572714299	32.802	12.126
23.8382352544955	7.80230264264372	32.932	12.353
23.7191550091554	7.76332426100739	32.835	12.613
23.5807699598076	7.71802703770746	32.672	12.353
23.4193360311559	7.66518560582231	32.412	12.353
23.229558107074	7.60306692785099	32.542	12.126
22.9907081868532	7.52488634081219	32.282	12.126
22.6682096164965	7.4193254889302	32.152	12.353
22.0204354200942	7.20729764462452	31.762	12.126
Route: 5 Length: 45.6499084643163 Demand Met: 1000			
19.4812220767697	8.72583094666556	28.245	14.854
20.4221197740606	9.14725461209537	29.975	14.921
20.526362049292	9.19394798102787	30.202	14.791
20.5645879106695	9.21106823073133	29.975	14.661
20.5983642439061	9.22619580810264	29.975	14.401
20.6299917326987	9.24036114706436	29.975	14.141
20.6600418351699	9.25382003837304	29.975	13.881
20.6887589490001	9.26668173474184	29.975	13.621
20.7163256484591	9.27902784238322	30.202	13.491
20.7425310765228	9.29076395324011	30.202	13.751
20.7673324064754	9.30187095240914	30.202	14.011
20.7907107895354	9.31234052945195	30.202	14.271
20.8126706747658	9.32217482650359	30.787	14.206
20.830838763645	9.330310390135	31.015	14.076
20.8308384018111	9.33031021250646	31.015	13.816
20.830838040709	9.33031003586735	31.015	13.556
20.8308376731865	9.33030985243753	30.787	13.686
20.8308372978265	9.3303096686846	30.787	13.426
20.8308369142548	9.3303094807166	30.787	13.166
20.8308365225333	9.33030928857298	30.787	12.906
20.8308361230509	9.33030908928083	31.015	13.036
20.8308357154443	9.3303088890259	31.015	12.776
20.8308353002597	9.33030868459917	31.275	12.613
20.8308348780465	9.33030847514538	31.015	12.516

Solution x	Solution y	Original x	Original y
20.8308344490453	9.33030826032625	30.787	12.646
20.8308340138773	9.33030804684427	30.787	12.386
20.8308335726615	9.33030783114438	30.982	12.126
20.8308331240618	9.33030761582824	31.177	11.541
20.8308326664492	9.3303073905816	31.437	11.541
20.8308321930811	9.3303071582082	31.697	11.541
20.8308316987641	9.33030691843327	31.827	11.313
20.8308312022179	9.33030669432228	32.055	9.837
20.7407002231602	9.28993476092729	31.567	11.313
20.6152347916435	9.23373713387594	31.307	11.313
20.4310651405594	9.15124664860603	31.047	11.313
20.1129667021917	9.00876967260608	30.787	11.313
18.6709025237892	8.36286597162552	28.753	10.79
Route: 6 Length: 30.7222776625598 Demand Met: 517			
8.36911940505516	6.33320931719804	13.576	14.79
9.77800460281701	7.39936314517176	17.577	13.647
10.4374800571795	7.89841208473424	18.021	13.52
10.9044419411138	8.25177874690389	17.323	12.504
11.3192148133132	8.5656518141092	18.339	12.631
11.6864170087307	8.84352659187307	20.244	11.234
12.0031489674576	9.08320906986006	22.212	10.091
12.2491950084739	9.26940120987167	23.482	9.52
12.2491949073478	9.26940127780444	22.022	11.361
12.2491948054261	9.26940134669093	19.482	13.076
12.2491947030946	9.26940141687417	18.466	14.155
12.2491946004359	9.2694014864319	18.148	16.505
12.2491944973399	9.26940155537735	13.005	20.061
12.2491943936817	9.269401626468	12.37	19.934
12.2491942897161	9.26940169697854	12.243	20.505
12.1896052581674	9.22430865614345	11.735	20.378
12.0675148876386	9.13191879996847	11.608	20.251
11.6256552937526	8.79754773747828	12.052	18.854
11.0165180936835	8.33659179238756	11.862	17.965
10.1710133480734	7.69676849366964	11.481	17.711
8.37161455729336	6.33510011437032	11.163	15.552
Route: 7 Length: 50.7180785562551 Demand Met: 1000			
21.3444875276061	10.3221286286086	28.689	18.156
22.1577210835476	10.7153773304509	29.578	18.791
22.3644065682158	10.8153276236332	29.261	19.172
22.5042614425313	10.8829593487831	29.705	19.426
22.5475908155369	10.9039137712861	30.531	18.664
22.5773696077883	10.9183152593586	29.959	17.584
22.6065337796419	10.9324192568442	30.023	17.203
22.6350641422666	10.9462163824304	30.594	17.076
22.6628388248407	10.9596476316237	30.785	16.949
22.6898846233858	10.9727258374507	30.975	17.076
22.7161117759401	10.9854075307472	31.102	17.775
22.7407512942385	10.997320861268	31.61	17.775
22.7611731465185	11.0071948454247	31.991	17.203
22.7791847514876	11.0159035854008	31.483	16.822
22.7968045835138	11.0244228018643	31.991	16.632
22.8137099912347	11.0325966573016	32.182	16.632
22.8296436727172	11.0403008457833	32.944	15.933
22.8201135707488	11.0356917804358	32.802	15.473
22.8097383843748	11.0306740091689	32.672	15.246
22.7985823663906	11.0252786009637	32.607	14.661
22.7867200973684	11.0195416033535	32.867	14.661
22.7739744234616	11.0133773162347	33.127	14.661
22.7599148252125	11.0065774943201	33.322	14.401
22.7441495519742	10.9989526711152	33.322	14.141
22.7264762765521	10.9904049073963	33.322	13.881
22.7068022702099	10.9808892887627	33.095	14.011
22.6854596163875	10.9705663406989	33.095	14.271
22.6618535543431	10.9591483915569	32.835	14.173
22.6366377228634	10.9469514432013	32.737	14.433
22.6096429116645	10.9338936014358	32.477	14.433
22.5812203239714	10.9201446305253	32.347	14.661
22.5513193550919	10.905680037253	32.412	15.246
22.5187962545489	10.8899468136003	32.542	15.473
22.479674422689	10.8710223831502	32.282	15.473
22.4356433433127	10.8497238236873	32.022	15.473
22.3874146391369	10.8263956439067	31.892	15.246
22.3353434137485	10.8012099604325	31.632	15.246
22.279830467152	10.7743607986217	31.762	15.473
22.2186921000916	10.7447919253075	31.502	15.473
22.1522464817064	10.7126569835988	31.293	15.806
22.0790169815382	10.6772415460069	31.356	16.06
21.9921074513735	10.6352101510089	31.356	16.251
21.8674253093984	10.5749103997797	30.785	16.251
21.7118932762402	10.4996902881582	30.594	16.251

Solution x	Solution y	Original x	Original y
21.5062708413064	10.4002440035987	30.657	15.246
21.2405009904145	10.2717077261729	30.787	14.466
20.8473512300404	10.0815664423982	30.787	13.946
19.7189753438468	9.53584461915716	29.975	11.801
Route: 8 Length: 52.9356608370928 Demand Met: 1000			
14.0866228263146	15.2733817807263	17.577	25.204
14.8321778368353	16.0817499076982	18.974	24.569
15.326735755158	16.6179740306994	19.164	24.696
15.7201997694856	17.0445869672732	19.545	25.839
16.0244408158412	17.3744599383267	20.561	25.776
16.2712939865296	17.642110259298	20.942	25.649
16.4833584376408	17.8720410567047	20.561	24.696
16.6810717421229	18.0864117085791	20.561	23.553
16.8714431235681	18.2928219304186	21.958	24.76
17.0479583637303	18.4842086852121	22.974	25.141
17.2080115756689	18.6577465259623	24.308	23.998
17.3551517796192	18.8172834708244	25.006	24.188
17.4879206834199	18.9612383561281	24.943	23.68
17.6121201733102	19.0959018538306	25.832	23.68
17.7257728652751	19.2191299763758	27.991	22.601
17.7942405584315	19.2933661098566	27.8	23.617
17.839730074739	19.3426881271261	26.911	24.76
17.8797951824971	19.3861287096588	26.086	24.95
17.9180220078383	19.4275761053986	27.165	25.458
17.9444224218362	19.4562007365758	27.102	25.966
17.9444222994009	19.4562007032683	25.705	26.22
17.9444221797763	19.4562006684759	24.562	26.982
17.9444220617509	19.4562006356711	25.07	27.744
17.9444219533791	19.4562006021169	22.276	28.125
17.9444218460968	19.4562005719064	22.022	28.443
17.9444217402244	19.4562005425018	22.466	28.887
17.9444216380605	19.4562005134997	21.958	29.395
17.9444215413268	19.4562004883567	22.149	29.713
17.9444214432228	19.4562004541075	18.72	30.665
17.8798355482492	19.3861729892623	18.529	30.03
17.8054216861603	19.3054894676331	18.72	29.967
17.7159357538791	19.2084639760946	18.974	29.967
17.5914746181087	19.0735165484997	18.91	28.697
17.454551694214	18.9250573591971	18.72	28.189
17.3061647106336	18.7641681911376	19.037	28.189
17.1407198676572	18.5847839990978	20.117	27.617
16.952476436597	18.380680461874	19.037	26.982
16.7468294112178	18.1577070819183	17.64	27.49
16.5163038537771	17.9077590793917	17.64	27.998
16.2171072874617	17.5833544199081	17.069	27.744
15.7882252799241	17.1183380091878	17.069	27.046
15.1177964336691	16.3914233520043	16.37	26.982
Route: 9 Length: 46.6513235690981 Demand Met: 1000			
13.9057839429087	9.03938066244264	20.434	15.806
16.3921396126204	10.6556617618782	19.99	18.029
18.0318535960917	11.7215694007678	24.625	19.68
18.6981846218867	12.1547237516748	24.879	20.632
19.067097584021	12.3945301724592	24.244	21.077
19.3490629209773	12.5778109271087	23.482	22.41
19.5568322142007	12.7128588482769	26.022	21.902
19.5568322601925	12.7128588010272	25.895	20.759
19.5568322888607	12.7128587450016	26.276	20.188
19.5568323100045	12.7128586860599	26.975	20.061
19.55683232664	12.7128586242509	27.356	20.632
19.5568323462129	12.712858573521	27.483	19.616
19.5568323641336	12.7128585190332	27.229	19.616
19.5568323809671	12.7128584637186	26.848	19.743
19.5568323969643	12.7128584102016	26.149	19.045
19.556832412352	12.7128583539221	25.895	18.918
19.5568324271261	12.712858296661	26.594	18.854
19.5568324410571	12.7128582388258	26.721	18.283
19.5568324541055	12.7128581756314	27.102	18.664
19.5568324661879	12.7128581125337	27.356	18.473
19.5568324772798	12.7128580462596	27.737	18.664
19.5568324874132	12.7128579780636	27.864	18.854
19.5568324966679	12.7128579122277	28.118	18.092
19.5568325049364	12.7128578479919	28.943	16.886
19.5568325121844	12.7128577801774	29.134	16.187
19.5568325183828	12.7128577117739	29.324	15.489
19.5568325234941	12.7128576476602	29.515	14.028
19.5568325274808	12.7128575753116	29.388	13.838
19.5568325303078	12.7128575050469	29.705	13.393
19.5568325320214	12.7128574318667	29.975	13.361
19.5568325327105	12.7128573600329	29.975	13.101
19.5568325324024	12.7128572860892	30.202	13.231

Solution x	Solution y	Original x	Original y
19.5568325312496	12.712857215204	30.202	12.971
19.5568325293644	12.7128571438841	29.975	12.841
19.5568325267788	12.7128570747737	29.975	12.581
19.556832523773	12.7128570059084	30.202	12.451
19.5568325209202	12.7128569372103	29.975	12.321
19.5568325184473	12.712856870299	29.975	12.061
19.556832516753	12.7128568022369	30.202	11.996
19.5568325164605	12.7128567379922	30.657	11.541
19.5568325148171	12.7128566660795	30.527	11.313
19.5568325301614	12.7128566056178	30.658	10.98
19.4674806367439	12.6547829921367	30.34	10.917
19.2540647602122	12.5160537695584	29.197	12.441
19.0020277957342	12.3522207652984	29.007	12.949
18.6870763906182	12.1474914391159	28.753	12.949
18.2513280227752	11.8642364557871	28.753	13.457
16.9977803278837	11.0494025979569	26.911	14.409
Route: 10 Length: 40.6267669014994 Demand Met: 997			
10.7062708193071	9.61636208218402	19.418	13.901
12.4542870501301	11.1864284789392	22.149	14.282
13.0902048470431	11.7576052068783	22.276	13.393
13.560800372938	12.1802901490527	21.831	13.203
13.9748241412463	12.5521624758481	22.149	11.742
14.3629754100103	12.9007961435747	25.07	11.615
14.5764468823481	13.0925327725656	25.197	12.441
14.735009260693	13.2349498659632	25.578	12.568
14.8461429967426	13.3347658708838	25.705	12.123
14.9299480388944	13.4100341712302	25.895	12.123
14.9905633835729	13.4644720741319	26.022	12.631
15.0360906609856	13.5053568094725	25.832	14.219
15.0775215014277	13.5425619433336	26.086	14.663
15.1123749663717	13.5738597799536	26.149	15.679
15.1123749655773	13.5738597811855	24.371	14.346
15.1123749648192	13.5738597820651	24.308	15.044
15.1123749640879	13.5738597830473	24.371	15.235
15.1123749633791	13.5738597839085	24.244	15.997
15.1123749626906	13.5738597848313	24.308	16.441
15.1123749620225	13.5738597858703	25.07	16.314
15.1123749613808	13.5738597867238	25.07	17.076
15.1123749607202	13.5738597875268	22.974	17.711
15.1123749600621	13.5738597884546	20.498	17.457
15.1123749594153	13.5738597893144	20.561	18.219
15.1123749587717	13.5738597902287	20.434	18.537
15.1123749581297	13.5738597912095	20.117	18.283
15.1123749574891	13.5738597921677	19.609	18.156
15.1123749568504	13.5738597931388	18.466	17.838
15.1123749562218	13.5738597939936	18.466	18.664
15.1123749555989	13.5738597950072	18.212	18.283
15.1123749549812	13.573859795975	16.688	18.092
15.1123749543849	13.5738597966109	17.323	21.331
15.1123749538004	13.5738597975562	17.45	21.902
15.1123749532283	13.5738597986106	18.593	21.648
15.1123749526585	13.5738597996195	19.482	21.966
15.1123749520804	13.5738598007368	19.863	21.331
15.1123749514927	13.5738598017701	20.117	21.775
15.1123749508903	13.5738598029513	21.577	21.394
15.1123749502541	13.5738598039393	20.117	22.728
15.1123749495809	13.5738598051224	20.371	23.045
15.1123749487799	13.573859806142	18.974	24.125
15.0643864628662	13.5307521937899	17.64	22.918
15.0165646525425	13.4877939218934	17.64	23.426
14.9684813664136	13.4446004460694	17.323	23.934
14.917706952372	13.3989897039392	17.45	24.188
14.8332024745271	13.3230820912001	16.497	24.315
13.4456197324771	12.0767581085851	13.513	22.41
Route: 11 Length: 43.5796078288478 Demand Met: 1000			
15.0504225194868	7.13190577117991	20.434	13.012
19.6908733324612	9.33086320595819	24.752	19.362
19.6908733788429	9.3308631858266	24.943	19.108
19.6908734226726	9.33086316538815	25.197	18.918
19.6908734652833	9.33086314546232	24.943	18.346
19.6908735077935	9.33086312460174	25.451	17.965
19.6908735500063	9.33086310508463	25.832	16.949
19.6908735919142	9.3308630801911	26.34	17.203
19.6908736334532	9.33086305843751	27.292	16.632
19.6908736744688	9.33086303525452	27.737	16.251
19.690873715131	9.33086301182241	28.308	15.933
19.6908737554772	9.33086298782191	27.229	15.362
19.690873795941	9.33086296394898	27.419	15.044
19.690873836493	9.33086294120767	28.372	14.663
19.6908738770497	9.33086291748722	29.007	14.409

Solution x	Solution y	Original x	Original y
19.6908739175616	9.33086289440972	28.753	13.838
19.6908739581436	9.33086287074622	29.197	13.52
19.6908739987706	9.33086284692282	29.578	13.203
19.6908740393774	9.33086281912125	29.134	13.33
19.6908740800171	9.33086279036556	28.372	13.52
19.6908741206142	9.33086276228735	27.991	13.647
19.6908741610874	9.33086274062547	27.673	12.695
19.6908742014221	9.33086271458163	27.927	12.568
19.6908742415991	9.33086268847667	28.181	12.441
19.6908742816441	9.33086265822459	28.499	12.949
19.6908743215731	9.33086263359097	28.816	12.568
19.6908743614301	9.3308626081175	28.816	12.25
19.6908744013025	9.33086258433595	29.388	11.804
19.6908744413124	9.33086255918444	29.261	11.425
19.6908744815605	9.3308625318942	28.626	11.234
19.6908745221902	9.33086251253531	29.007	10.282
19.6908745633935	9.33086248639088	29.451	10.155
19.690874605441	9.3308624646807	30.34	9.647
19.6908746492239	9.33086243610365	30.658	9.71
19.6908746952501	9.33086240454052	30.912	9.901
19.6476386117369	9.31037432424906	30.594	9.52
19.5952979454027	9.28557189173098	30.721	9.329
19.3868672128268	9.1868035750184	29.388	8.313
19.1394563163933	9.06956381686615	28.626	10.091
18.8530689457779	8.93385444969617	28.372	10.218
18.5109768960591	8.77174855304338	27.927	10.409
18.0912894293702	8.57287283347159	27.419	11.298
17.5208874796529	8.30257840899478	26.594	11.933
16.6220820596999	7.87666421688223	26.149	11.107
13.9856442209063	6.62734240629197	22.085	10.853

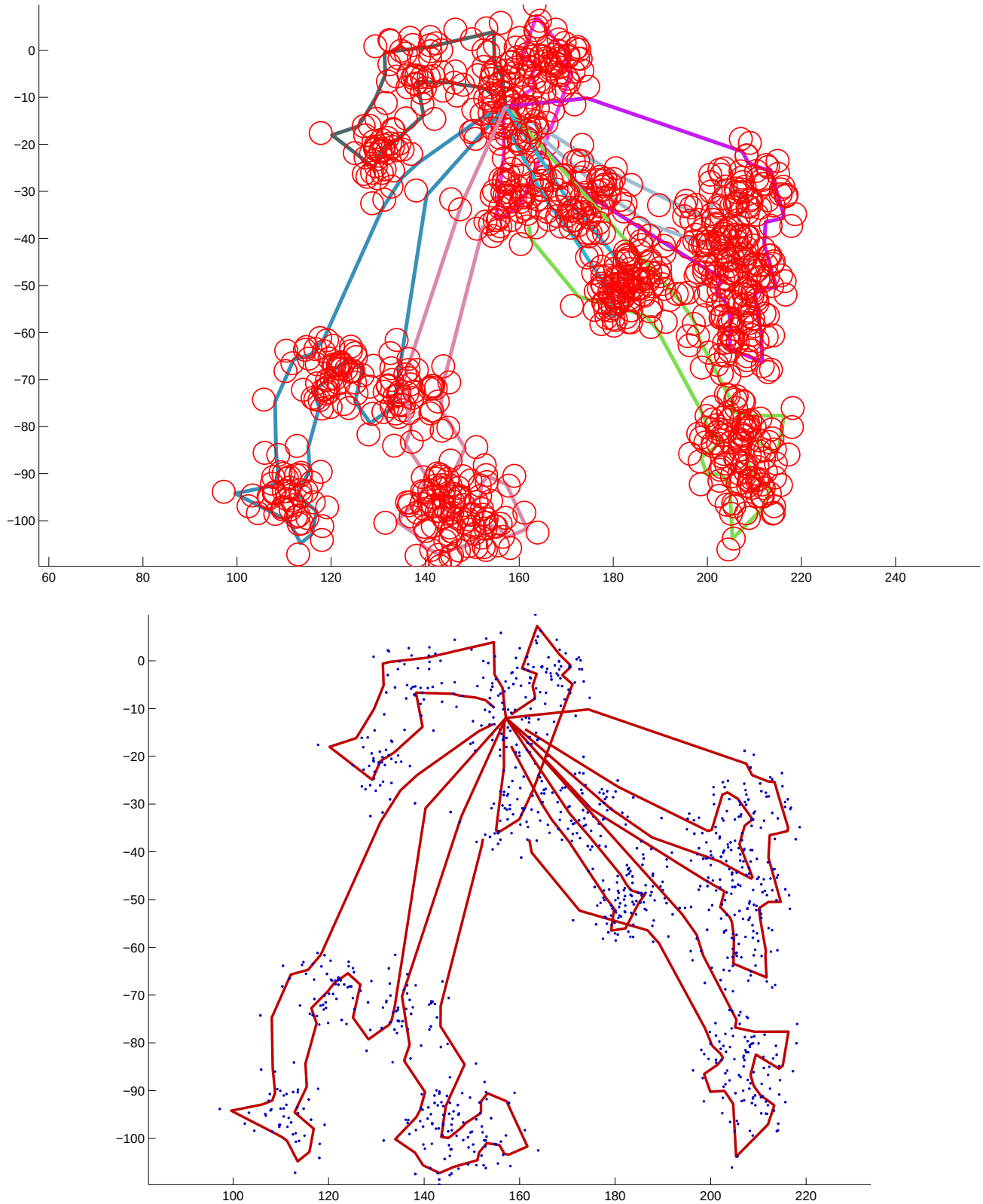


Figure O.26: $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Euclidean, Length = 1431.6074347

Table O-29: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Euclidean

Total distance: 1431.60743473052			
Total demand met: 76422			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 117.602727634448 Demand Met: 7771			
46.6877420114543	8.13535831342571	45.5397	7.2979
46.5598539176996	7.0242891637912	46.8369	6.4403
46.5598539176996	7.0242891637912	46.0043	6.8606
46.4729183266291	6.26899029550594	47.7278	5.7114
46.4020749171789	5.65349885848396	48.7027	4.8736
45.9990329567014	4.9794458920374	47.0712	4.3382
45.5773412934234	4.27422548882376	45.0418	3.8658
45.5773412934234	4.27422548882376	44.3097	5.4051
45.1424096336823	3.54685592035271	44.2937	4.7268
44.7484002038149	2.88796589831327	42.4139	3.5597
44.69021447368	0.15653016785263	42.4155	0.0668
44.6721988630922	-0.690241731393646	44.8479	-0.9391
44.6721988630922	-0.690241731393646	43.4311	0.4843
44.6039518824034	-3.89880697825109	46.0937	-5.8176
42.974893520836	-3.51887771384656	43.0131	-4.6452
39.9137369796971	-2.80500973207618	39.9467	-2.3317
36.9464372683526	-2.11302676040212	36.4279	-4.3699
33.2346931778297	-1.24732969871159	32.3564	-1.4633
33.2346931778297	-1.24732969871159	33.4349	0.0139
31.8546868164559	-0.925496342605088	31.1128	-2.8096
31.8546868164559	-0.925496342605088	31.0065	-1.0714
31.227897532528	-0.779330271859502	31.1391	0.2266
30.6592241464753	-0.64671653640409	31.0707	1.7474
28.5929454819854	-0.415760897658725	28.6989	1.5656
27.0599343349524	-0.244384459338779	26.7943	-2.6353
27.0599343349524	-0.244384459338779	27.3755	-1.0984
24.9169692939508	-0.00475122969708863	24.8641	0.1355
24.9169692939508	-0.00475122969708863	25.8989	0.7413
24.9169692939508	-0.00475122969708863	24.5208	1.7631
23.2879701192647	0.177396470204071	22.6294	-1.9579
22.8635211684548	0.224825099638059	22.4229	-2.1641
21.3631764678464	0.613455082484609	19.4163	-0.8394
21.4444758829282	2.92750551805389	22.4003	2.9895
21.5228620035379	5.15826107017507	23.9142	5.5856
20.8648871722506	6.76404039072434	22.0744	6.6433
19.4882284172336	10.1238468362605	21.6596	11.213
17.5758991478144	13.3077023563828	19.6468	14.5775
16.6929332718821	14.7182188377824	18.1963	16.0602
16.2069284141985	15.4946755788882	16.9397	16.157
15.7698411207975	16.1930053748067	17.2669	18.1061
10.1978176852448	18.0187405440525	7.8039	17.6061
15.9947306955233	22.4987764476128	15.0509	21.8739
15.9947306955233	22.4987764476128	17.3215	22.815
18.4578815535783	24.4023755711193	16.9754	26.2994
18.4578815535783	24.4023755711193	18.7218	26.0511
19.0938369900798	24.8939023564798	17.7323	26.9057
19.1376680132804	24.9197552372313	19.8821	27.2321
19.2867138793803	24.5819503992181	21.4132	25.3225
19.2867138793803	24.5819503992181	20.8129	26.0745
19.6065106086357	23.8572475317404	19.6457	23.2311
19.6065106086357	23.8572475317404	19.5225	24.6717
19.9843077025445	23.0011413233979	18.4916	22.031
20.3083872517882	22.2667417737602	19.4476	21.0876
20.5462435039621	21.7276793087807	19.4151	20.4264
20.5462435039621	21.7276793087807	19.3676	20.9011
20.7045243612625	21.3689334674117	20.5046	21.2685
20.7045243612625	21.3689334674117	20.5322	21.5891
20.8744409620622	20.9838188541912	19.0397	19.3917
21.3064721784914	20.7148297218498	20.7311	19.0512
21.6504758636201	20.5006575173437	21.2889	20.2133
22.0033657867118	20.2809519816963	22.0389	18.6688
22.0033657867118	20.2809519816963	22.5923	19.795
22.2425574057189	20.1320404674101	21.1889	21.267
22.2425574057189	20.1320404674101	23.1615	20.5337
22.5678053316259	19.9295476323355	21.7951	21.835
22.5678053316259	19.9295476323355	24.0847	21.2619
23.7595442465778	19.1874273640808	25.2224	21.1268
24.1694612397323	18.8163944631203	24.5729	19.8583
24.6403277596977	18.3901939337028	23.1228	16.7524
25.1295626742212	17.9473560670204	23.3217	16.9506
27.2918886120899	15.9900616844616	25.9081	14.4892
29.6622664075516	13.8445373393573	31.9656	14.6164
29.2436030406332	11.6476635349341	29.4417	11.4808
28.8251784082556	9.45190367240133	29.2451	9.0499
28.5031427917157	7.76203131553674	26.246	7.8923
28.4187501663395	7.31929447359816	27.9452	7.0873
28.4187501663395	7.31929447359816	28.0443	7.2557
28.3457148565043	6.93614039207688	27.2842	5.8331
28.2966866320373	6.6789424129369	26.4488	5.1021
28.6482583139438	6.6896497279567	27.6562	5.4902
28.6482583139438	6.6896497279567	28.1449	5.3771
29.3942456599309	6.71236809396462	29.2732	5.6917
30.2306981074154	6.73784093991892	30.7839	5.7178
30.2306981074154	6.73784093991892	29.6205	6.6839
31.1072127191561	6.76453264832914	31.7997	5.4917
31.1072127191561	6.76453264832914	29.9497	8.0977
33.1140285981375	6.82563537552936	33.7832	8.5886
33.884045078641	6.8490860012235	33.6792	4.7017
36.0407091517405	6.91477187701272	36.4235	4.5159
36.5486178179399	7.0638961366313	36.2059	6.8965
37.2809173534432	7.27892597209245	36.7928	9.6586
38.6337174224075	7.43980296102138	38.0686	7.3443
40.7170699315701	7.68760836427675	41.1669	5.3004
42.8685567230861	8.24660594804468	44.0031	6.0986
43.5977251086315	8.88321222870727	43.7681	7.8375
44.6120607902302	9.76878127274571	46.3909	8.819
44.6120607902302	9.76878127274571	43.984	9.2005
44.6120607902302	9.76878127274571	44.5689	9.75
44.6120607902302	9.76878127274571	42.7704	10.2739
44.6120607902302	9.76878127274571	43.7231	10.6871
Route: 2 Length: 101.730321352796 Demand Met: 9177			
46.8703995052752	12.4889127269194	44.5228	11.8645
46.8703995052752	12.4889127269194	47.1015	12.1757
46.7755845297339	14.0501422289671	47.5448	13.9665
46.7755845297339	14.0501422289671	45.8725	14.3747
46.690356116101	15.4538905886206	44.2621	15.3855
46.690356116101	15.4538905886206	46.213	15.3079
46.6942000898838	16.3283554785102	46.6598	16.011
46.6942000898838	16.3283554785102	46.503	16.5426
46.6980996263919	17.2151984057491	47.2642	16.1804
46.7039484612402	18.5488542132438	47.2412	18.0641
46.7112069799879	20.2069791517833	45.9242	19.9
46.7200329735217	22.2205501873295	49.1449	22.3659
46.3888345963661	24.8774000143798	46.7163	23.0055
46.3888345963661	24.8774000143798	48.493	25.186
46.3888345963661	24.8774000143798	47.7428	26.438
46.1615497715953	26.7007168049304	45.985	27.4123
46.1615497715953	26.7007168049304	46.7677	27.4481
46.0449592932079	27.6358408988758	46.684	28.1154
45.9428267461863	28.4549733631152	47.5893	27.8934
45.9428267461863	28.4549733631152	47.4152	28.2569
45.6949439366869	30.4433513695502	44.6028	29.9319
45.6949439366869	30.4433513695502	47.9812	30.2306
45.6949439366869	30.4433513695502	46.4115	30.3033
45.6949439366869	30.4433513695502	46.9054	30.8841
45.6949439366869	30.4433513695502	47.9603	31.0225
45.6949439366869	30.4433513695502	47.3356	31.1656
45.454691651541	32.369506361775	44.1303	30.8739
45.454691651541	32.369506361775	47.4903	33.2139
45.454691651541	32.369506361775	45.9581	33.5048
45.0642946985129	35.4979530469152	42.8212	36.4305
45.2355006099764	35.6304908278381	43.7884	36.8808
45.4220478708058	35.7749013811997	44.7872	36.1398
45.6093539598072	35.9198975203358	45.4903	38.3462
45.9737571062757	35.6910892334883	45.6407	35.658
45.9737571062757	35.6910892334883	45.4526	36.121
46.4423411589177	35.3968734340181	48.325	36.101
46.4423411589177	35.3968734340181	46.003	37.4534
48.8211771752723	33.903196511454	50.1654	34.298
49.9421297143676	33.199343096145	51.7623	34.8081
50.1954267378359	32.6578379477136	51.473	33.7115
50.5300128178037	31.9425390603734	50.8592	31.2824
50.5300128178037	31.9425390603734	50.3723	32.2399
50.5300128178037	31.9425390603734	48.6326	32.1618
51.3640960410312	30.1593638287783	49.5432	29.0024
51.8283993158936	29.1668037962182	53.915	28.4629
51.8283993158936	29.1668037962182	52.7074	28.2489
51.8283993158936	29.1668037962182	51.0819	30.8837
51.8283993158936	29.1668037962182	50.5738	30.8854
52.9202317327545	26.8326642696901	55.1607	27.7715
52.9202317327545	26.8326642696901	54.5895	27.7676
53.0963956475694	26.3588967205022	55.089	27.0379

Solution x	Solution y	Original x	Original y
53.2771928344893	25.8726832574648	54.6523	25.2022
53.2771928344893	25.8726832574648	55.4854	26.8201
54.1472517044032	23.532538162394	54.0368	23.8586
54.1472517044032	23.532538162394	54.2786	24.4277
59.3813550980783	9.45533360808507	59.4358	8.0877
59.3813550980783	9.45533360808507	58.6318	9.4344
60.371226310065	6.7929491705715	60.2628	6.0605
60.371226310065	6.7929491705715	60.5785	6.8128
61.0658042050408	4.92480597840583	63.4243	4.3429
60.7356694526693	4.62872491598132	61.565	4.5717
60.1765511766555	4.12722783753876	58.8992	5.3006
59.6032369835096	3.61300048354098	58.0725	5.2013
58.9200341162185	3.0000478717379	56.6752	3.9284
58.9200333882604	3.00004601430863	56.514	2.6652
58.9200333882604	3.00004601430863	56.6229	3.2945
59.1109214177515	2.81531212951532	57.7618	2.6586
59.1109214177515	2.81531212951532	58.0726	3.0503
59.3538877195932	2.58016455033284	58.5415	3.6684
59.6589208057339	2.28492391392105	58.2987	1.8222
60.0002221559914	1.95456290808561	58.6741	1.1796
60.3662023554013	1.6003010916699	60.4719	1.0667
60.3662023554013	1.6003010916699	60.4167	1.4088
60.7042448183951	1.27309986895029	63.0749	1.8033
60.5718267691	0.924070770270932	62.7821	-0.0838
60.5718267691	0.924070770270932	62.5325	1.766
60.5320973299515	0.850226059852192	61.9524	-0.333
60.4933782433347	0.778260780374106	62.4332	-0.684
59.3192581525495	-0.366620147487104	58.2864	0.0731
59.3192581525495	-0.366620147487104	58.2741	0.1622
58.4130310856336	-1.25025279186758	56.047	-0.6998
58.4130310856336	-1.25025279186758	57.3839	0.9502
57.8944706789335	-1.90934170075826	58.3955	-2.2935
57.8944706789335	-1.90934170075826	59.6709	-1.5476
55.7768141897666	-4.60067364570906	53.8048	-5.0553
55.7768141897666	-4.60067364570906	57.7878	-4.3732
54.6043382680792	-6.09082665561743	54.4331	-6.2551
53.6790719130566	-7.26680103674074	53.289	-9.6645
52.0714819005074	-2.77933954250784	53.412	-4.2453
52.0714819005074	-2.77933954250784	53.5826	-3.7128
52.0714819005074	-2.77933954250784	51.545	-0.7619
51.4014223710789	-0.909443062320641	50.0191	-2.6033
51.4014223710789	-0.909443062320641	49.2438	-0.5725
50.820746189393	0.711144714460776	49.5265	1.5006
50.5061107976088	1.58917877351305	49.309	3.6922
50.5049105531631	1.59253379308163	48.302	2.6164
50.5753381635969	1.61878514445653	50.9668	1.717
50.5753381635969	1.61878514445653	48.4975	2.4432
51.8413711259703	2.09014099376295	51.8363	2.0767
51.8413711259703	2.09014099376295	52.2056	3.4977
52.1786073294185	2.21580029408122	51.7765	0.7553
52.1786073294185	2.21580029408122	52.8937	1.339
53.1007478897121	2.55916177848848	54.5841	1.3
53.4096692561804	2.6742500746146	54.7597	1.1902
53.4096692561804	2.6742500746146	54.6465	1.327
53.5769968408723	2.73660004433233	55.7669	1.6852
53.5044602946623	2.95639183718865	55.5686	2.3786
53.077767279327	4.2489053031441	52.3291	3.6705
53.077767279327	4.2489053031441	52.0607	4.6851
52.718625948407	5.33733749041896	50.2911	5.2466
52.9541737658735	6.28612562787391	53.4617	5.8056
52.9541737658735	6.28612562787391	54.3108	6.5803
53.1482078304352	7.06769836409103	55.5508	6.709
53.193483007611	7.92423524515085	55.3647	9.0137
51.9490115605292	8.75357011481063	51.2901	7.6487
51.9490115605292	8.75357011481063	53.1154	7.9184
51.9490115605292	8.75357011481063	52.3173	10.0275
48.2012043925984	11.2511560596087	46.5714	10.174
48.2012043925984	11.2511560596087	47.6091	10.2274
48.2012043925984	11.2511560596087	49.0558	10.279
48.2012043925984	11.2511560596087	48.2378	10.888
48.2012043925984	11.2511560596087	48.9393	11.7496
48.2012043925984	11.2511560596087	47.4524	12.1509
Route: 3 Length: 190.911076565051 Demand Met: 9984			
55.767483415356	11.0794816855514	57.2331	12.7874
55.767483415356	11.0794816855514	53.965	12.2967
61.3278845086809	10.5089259180979	61.7542	11.527
64.414599009107	10.1922027755222	64.6914	7.7788
96.3132290225291	21.1407780002788	97.1071	18.8552
97.4517073149077	21.5315395989834	99.0428	19.6959
98.0267125367571	22.6547186066971	98.3827	22.3334

Solution x	Solution y	Original x	Original y
98.0267125367571	22.6547186066971	98.3241	22.4412
98.6814505907148	23.9336250275968	97.0499	25.7334
101.075945407514	24.876089530526	102.9016	24.8202
101.075945407514	24.876089530526	102.4997	24.4075
101.075945407514	24.876089530526	100.384	25.6874
101.482327784903	25.0360401844213	100.6297	27.3107
102.100651681415	25.2564216115829	101.5683	27.6266
103.384014098045	25.3845710906205	104.9423	23.521
103.671526961285	26.3946652122969	105.0575	26.2706
103.9180439856	27.2607194153217	102.211	28.3893
104.060633485993	27.7616603685121	101.7295	28.4449
104.843799755205	30.35853907325	106.8535	30.7643
104.843799755205	30.35853907325	106.1692	29.0085
104.843799755205	30.35853907325	105.6149	29.5786
104.843799755205	30.35853907325	105.5782	30.6326
105.196900094273	31.5293505135489	106.6895	31.0233
105.196900094273	31.5293505135489	104.0844	32.9988
105.196900094273	31.5293505135489	102.9211	31.879
106.229290689323	34.9525060716531	108.656	34.8419
106.082985823061	35.6675347255965	107.8221	37.3636
103.893352294627	36.1732310835859	103.4615	37.3033
102.38318063276	36.521973635329	100.5275	34.9543
102.105806874157	41.2193795172155	99.6903	41.4772
102.438363916886	42.4145392692752	102.0152	42.2262
102.87424297762	43.9811485484173	103.3956	43.6231
102.87424297762	43.9811485484173	103.0838	43.6629
103.51208893014	46.2738370758694	104.1102	44.8822
103.51208893014	46.2738370758694	103.8959	45.4099
103.51208893014	46.2738370758694	102.9297	48.0592
103.51208893014	46.2738370758694	102.543	45.6081
104.014816331465	48.0807908232601	105.6501	47.8555
104.405030234696	49.4833209968599	106.4442	49.0895
104.683344505647	50.4836364205855	106.6231	51.946
103.041407736544	50.4961920625368	103.8062	50.1176
103.041407736544	50.4961920625368	101.7941	49.0832
102.091390386046	50.5034095037956	101.377	48.1816
102.000000742638	50.5645215508401	100.8862	48.4618
100.640906806163	51.4732805895062	99.5987	51.3246
100.640906806163	51.4732805895062	99.0651	51.1078
100.204356241245	51.7651672955474	98.2004	50.3921
100.154407582203	51.9885209935604	98.1036	50.8139
100.154407582203	51.9885209935604	97.7455	51.8526
100.139513280449	52.0550880919214	97.7133	51.9341
100.194404718064	52.5087926215034	100.3439	52.2486
100.194404718064	52.5087926215034	99.5817	52.1789
100.256563469779	53.0225790493957	100.6388	53.8259
100.256563469779	53.0225790493957	100.5945	52.9653
100.309457494155	53.4597669748645	98.2152	53.7701
100.360766647819	53.8838556764414	97.9579	54.2407
100.839975442093	56.6035789528704	98.8606	57.9963
100.842329835038	56.6169351990308	99.9754	58.6633
100.842329835038	56.6169351990308	99.7259	57.0659
100.842329835038	56.6169351990308	98.9521	56.5952
100.842329835038	56.6169351990308	98.7715	55.3698
100.910436148148	57.0034058811387	102.1595	55.9791
100.997051842302	57.4948975382417	102.8738	56.4102
101.564252490555	60.7128926435268	103.9916	60.6173
101.523979119259	61.1326737610587	102.6402	60.9181
101.472077897233	61.6744099055147	99.3413	60.508
101.472077897233	61.6744099055147	99.0429	61.6589
101.530265107513	62.8396427015964	100.6854	61.817
101.70318942232	66.3037502427626	102.9023	68.4164
101.70318868074	66.3037501468842	103.5291	67.906
100.976553073987	65.9994239586902	101.778	67.1686
98.9474178531992	65.1495940188449	98.4258	65.8894
98.9474178531992	65.1495940188449	97.9014	66.9835
98.1060827412423	64.7972354062422	99.4285	63.8276
98.1060827412423	64.7972354062422	98.4228	65.0226
95.3600307297186	63.6471042994241	94.6788	63.8911
95.3600307297186	63.6471042994241	93.9444	64.9
94.7838929287678	63.4058118121843	92.749	64.7326
94.7969054563268	62.705155350118	93.5538	62.1822
94.8080192043547	62.1068543700212	95.4724	61.7777
94.8080192043547	62.1068543700212	94.5987	62.0376
94.818385946614	61.5488224378691	95.479	61.1306
94.818385946614	61.5488224378691	95.1558	61.2395
94.8275415002227	61.0560581509538	96.4356	62.0951
94.8451727342517	60.1063780846498	94.6583	60.3511
94.8643428445644	59.0737017695328	95.9041	59.3009
94.8851630623291	57.9519844933688	97.3108	57.82

Solution x	Solution y	Original x	Original y
94.8283671446796	57.5084414939887	95.4289	57.3916
94.7721083923203	57.0690930930139	94.6877	57.1733
94.7149622633473	56.6228152542528	94.8477	58.3247
94.7149622633473	56.6228152542528	94.4551	58.0456
94.7149622633473	56.6228152542528	93.2379	56.4517
94.7149622633473	56.6228152542528	92.9131	56.6287
94.7149622633473	56.6228152542528	92.8209	56.9207
94.4705334896431	54.7141209722865	96.8097	54.0588
94.0310999237015	53.7273845873084	96.0562	52.3857
93.6046537117674	53.2707926751296	95.0304	53.2116
93.0008438582157	52.6242853736373	93.3932	53.1876
93.0008438582157	52.6242853736373	92.1982	53.9806
92.0175755756342	51.571436172259	89.6611	52.1615
92.175160617083	50.9805167871521	90.3356	51.1932
92.4030935490328	50.1257416850466	93.0102	50.1223
92.6237383464509	49.2982951713838	92.412	50.9961
92.6237383464509	49.2982951713838	91.9756	47.4725
92.6237383464509	49.2982951713838	91.1842	48.1207
92.7346333712015	48.8824642814355	93.3823	48.5086
92.8375677104918	48.4964859509891	94.5726	47.3613
92.8375677104918	48.4964859509891	94.3452	48.7818
92.887111252256	48.3107156512395	95.0864	47.4256
92.8938002771056	48.285632986684	95.1396	47.3596
90.2857944259725	46.7646963062863	91.9732	45.8332
90.2857944259725	46.7646963062863	90.4865	46.0315
90.2857944259725	46.7646963062863	89.5287	45.4109
90.2857944259725	46.7646963062863	89.3464	46.1786
90.2857944259725	46.7646963062863	89.352	47.1855
89.3322152509899	46.2085853119166	87.8413	47.1867
88.7679231210516	45.8794989143737	87.5129	47.9594
82.2595517087475	41.8184248638289	80.8872	43.1227
80.8099617848337	40.9139026937663	81.9079	40.1742
80.8099617848337	40.9139026937663	80.8076	41.6004
75.5139318885153	37.6092638113761	74.5598	39.2546
67.8669267080501	32.8376116770425	67.4673	33.2544
67.8669267080501	32.8376116770425	66.5887	34.1226
66.3083054065249	31.8650515113668	65.4552	32.6167
65.1152255104611	31.1205834911393	63.5739	32.9982
63.8076448560692	29.728085009605	63.132	27.7543
63.8076448560692	29.728085009605	64.1748	30.2745
63.8076448560692	29.728085009605	64.2717	31.7627
63.8076448560692	29.728085009605	63.2951	31.2899
55.2548369465528	20.6197838268799	55.9782	19.9329
Route: 4 Length: 142.164945500771 Demand Met: 9799			
62.5471271780741	25.3209330785823	61.643	23.6955
62.5471271780741	25.3209330785823	63.8119	26.0212
62.5471271780741	25.3209330785823	62.9268	27.0211
66.6969890732861	28.9154237390629	67.242	26.9141
66.6969890732861	28.9154237390629	67.5765	27.7962
66.6969890732861	28.9154237390629	68.2062	28.5319
66.6969890732861	28.9154237390629	66.7482	27.6121
66.6969890732861	28.9154237390629	67.8857	28.9512
66.6969890732861	28.9154237390629	67.6588	29.7348
66.6969890732861	28.9154237390629	66.7818	30.0369
69.2087946548252	31.0911016425985	71.5231	31.8286
69.2087946548252	31.0911016425985	69.1853	30.9522
69.2087946548252	31.0911016425985	68.3701	31.308
69.2087946548252	31.0911016425985	67.7055	32.9993
71.7538383901866	32.851499101457	72.6191	32.6684
73.3671497723519	33.9674213701602	72.2401	34.2889
77.7484976668633	36.9979726576057	77.5882	39.4219
77.7484976668633	36.9979726576057	75.4748	37.8532
86.5173072879784	40.107429089356	87.5583	39.2312
86.5173072879784	40.107429089356	85.9182	41.843
88.935173868217	40.9648051871667	90.0385	42.8005
88.935173868217	40.9648051871667	88.4465	41.4478
88.935173868217	40.9648051871667	87.2346	40.5435
89.4936040059686	41.1628255551722	89.3668	41.343
89.4936040059686	41.1628255551722	89.0134	41.3658
90.0862907031096	41.3729930469461	90.4784	41.2284
90.0862907031096	41.3729930469461	90.1236	40.724
90.6541218012374	41.5743467453683	90.014	39.915
91.8180128888264	41.9870615089421	92.8093	39.7693
91.8180128888264	41.9870615089421	92.634	40.1716
93.1592109538413	42.7196084155334	94.5355	44.3621
93.1592109538413	42.7196084155334	93.2846	41.9379
93.1592109538413	42.7196084155334	92.2396	41.0703
93.1592109538413	42.7196084155334	92.1801	41.0349
94.7601603669198	43.5940276402586	94.4684	44.7163
94.7601603669198	43.5940276402586	93.9129	43.6355

Solution x	Solution y	Original x	Original y
96.5577712001421	44.5758610250057	96.6284	43.246
96.5577712001421	44.5758610250057	95.7654	46.8722
96.5577712001421	44.5758610250057	95.46	44.379
96.5577712001421	44.5758610250057	94.5838	45.9916
97.3918702705432	45.0163600362885	98.0763	43.3554
97.3918702705432	45.0163600362885	98.0879	44.5657
97.3918702705432	45.0163600362885	97.5519	44.8528
97.3918702705432	45.0163600362885	96.2485	47.1277
98.5093566629197	45.6065016729094	98.9198	48.0008
98.6905825531791	45.4100885667028	100.6036	46.802
98.6905825531791	45.4100885667028	99.7789	45.6905
98.7321440065072	45.3650603184139	100.0845	45.3198
98.7727368581519	45.32108150529	101.161	45.7653
97.0596461092626	41.0029451803325	98.7317	39.6579
97.0596461092626	41.0029451803325	98.4033	39.6451
97.0596461092626	41.0029451803325	98.3613	42.0392
97.0596461092626	41.0029451803325	96.8865	41.9997
97.0596461092626	41.0029451803325	96.2085	41.8253
96.3813559319886	39.2932397127995	96.2133	40.5576
96.3813559319886	39.2932397127995	94.3087	39.6383
96.0369706013327	38.4251684122642	93.6941	39.0671
96.0369616650445	38.4251374949774	94.1971	38.0204
96.0369616650445	38.4251374949774	93.6083	38.4774
96.2001374914561	37.8420663521273	96.6051	36.0943
96.2001374914561	37.8420663521273	97.0806	39.3994
96.2001374914561	37.8420663521273	96.5473	37.5774
96.2001374914561	37.8420663521273	97.0063	39.6578
96.2001374914561	37.8420663521273	95.8598	39.2349
96.2001374914561	37.8420663521273	95.1298	37.6897
97.1213075633213	34.550154653712	95.0864	33.2234
97.697609538971	34.0762017453053	96.3928	32.1668
97.697609538971	34.0762017453053	95.8908	32.6754
97.9104929858349	33.9011697841889	98.5859	34.5756
97.9104929858349	33.9011697841889	96.2582	32.5713
98.2302656354188	33.638261934664	98.5493	33.1624
98.5185164806918	33.40127107443	98.9301	33.2654
98.7883791908931	33.1793985099161	101.1976	33.4905
98.124659960615	32.2611185775685	99.272	31.5703
98.124659960615	32.2611185775685	99.0228	31.9463
97.1900684966383	30.9680788404559	97.4429	30.1528
96.470499385917	29.9725306469418	97.9141	29.0493
96.470499385917	29.9725306469418	97.1838	29.5842
95.6775781442797	28.8755016223784	97.3283	27.0933
95.6775781442797	28.8755016223784	97.5011	28.0267
95.2604977261295	28.6201983612122	96.0238	29.4057
95.2604977261295	28.6201983612122	96.156	30.1327
93.5169698071164	27.5529489296185	93.6487	25.1273
93.3444315632476	27.6343396734518	92.5592	25.4331
92.9450445744498	27.822738354585	92.942	26.4511
92.4555784464472	28.0536303039297	90.6179	26.4649
92.2151650976693	28.8428394187864	90.6435	28.0536
91.9059967948583	29.8577548203497	93.9312	28.9768
91.9059967948583	29.8577548203497	93.4265	31.4744
91.3737116137329	31.6050624942512	92.4351	33.0022
91.3737116137329	31.6050624942512	90.72	30.049
90.6477891036972	33.9879302890212	92.7124	33.4453
90.6477891036972	33.9879302890212	91.1655	36.0648
90.452203314538	34.6299854066342	91.0332	34.8187
90.2515363741197	35.2887206335105	91.9372	36.8319
90.2122220547303	35.4177766163075	91.8795	37.1845
89.3899269454641	35.6170772326342	89.1249	38.0318
88.5217065547436	35.1907822722747	88.2545	36.066
87.579985089446	34.7283983352701	86.5983	36.2039
86.7249897580449	34.3085966012171	87.5726	32.8781
85.8014824053724	33.8551559455439	85.065	35.2948
84.8715158488958	33.3985434518118	86.512	33.4131
84.8715158488958	33.3985434518118	85.525	32.0217
84.8715158488958	33.3985434518118	85.1876	33.113
80.4663859582465	31.2356384277271	79.7169	32.9378
74.3180844888727	28.2168243530138	73.7989	28.6287
70.609644140027	26.3959809457658	70.5469	25.0661
70.609644140027	26.3959809457658	70.1037	27.3839
70.609644140027	26.3959809457658	68.3676	27.331
70.609644140027	26.3959809457658	69.5886	28.6002
63.3451918974075	21.8905270189762	63.3795	20.1125
63.3451918974075	21.8905270189762	63.3607	23.5913
63.3451918974075	21.8905270189762	62.5649	23.4331
53.9737245141186	16.0782881406209	55.8132	15.4408
53.9737245141186	16.0782881406209	52.0827	15.9727
53.9737245141186	16.0782881406209	53.9046	16.3668

Solution x	Solution y	Original x	Original y
53.9737245141186	16.0782881406209	53.7123	16.59
51.1461158045763	14.3245821290734	51.32	11.9016
51.1461158045763	14.3245821290734	52.0306	12.0787
51.1461158045763	14.3245821290734	51.9742	12.9315
51.1461158045763	14.3245821290734	53.4554	15.0784
Route: 5 Length: 250.552510836175 Demand Met: 9987			
48.8625292695227	13.8969690059617	50.5069	12.3029
48.8625292695227	13.8969690059617	48.0446	14.6778
54.7237190375948	20.4251187906898	53.2794	21.4994
74.33608667526	42.2691067061581	75.9022	40.5634
74.33608667526	42.2691067061581	75.9853	41.4015
74.33608667526	42.2691067061581	75.73	42.7229
77.9642100090023	46.3101888339977	79.9479	46.2913
77.9642100090023	46.3101888339977	77.9223	44.6051
77.9642100090023	46.3101888339977	77.8794	45.0468
80.3084063495506	48.9211916229621	80.7698	50.729
80.3084063495506	48.9211916229621	80.3964	49.7264
80.3084063495506	48.9211916229621	80.0004	48.0282
80.3084063495506	48.9211916229621	79.533	47.2684
84.016567496547	53.0514036634293	85.9154	51.5363
84.016567496547	53.0514036634293	84.6532	51.7406
84.016567496547	53.0514036634293	83.5076	51.7826
84.016567496547	53.0514036634293	82.0477	53.0979
87.0922501235907	57.403567618344	89.2688	56.3248
87.4721590245987	58.6099288794896	87.1149	58.1702
87.9708085943288	60.1933327090004	88.0225	60.7529
87.9708085943288	60.1933327090004	85.8477	60.7859
88.4771542048684	61.8011860549793	86.2321	62.729
90.7222580880311	66.1273143357164	90.2672	64.2791
90.7222580880311	66.1273143357164	88.7937	67.447
92.3117940733895	69.1901583328637	94.6798	69.1984
92.3117940733895	69.1901583328637	93.0933	68.7697
92.3117940733895	69.1901583328637	92.0851	66.8651
94.5591009796339	73.520599016874	96.2521	73.5638
94.5591009796339	73.520599016874	94.549	73.3405
94.5591009796339	73.520599016874	93.9524	73.145
95.4148160426763	75.1695064988012	97.816	74.8015
95.4148160426763	75.1695064988012	97.5653	74.5618
95.4077567837539	75.2095349197791	96.1169	76.0362
95.4077567837539	75.2095349197791	95.9481	74.251
95.1297178284371	76.7842146294592	93.1133	78.1389
95.7747726697468	76.9239176813007	94.6945	78.572
95.7747726697468	76.9239176813007	94.4072	76.9857
98.2262842237099	77.4549147175462	99.1261	78.6323
98.2262842237099	77.4549147175462	98.5933	78.8152
98.2262842237099	77.4549147175462	97.7624	79.6432
98.2262842237099	77.4549147175462	97.1852	78.7831
99.1880954408152	77.6632323390141	98.9119	80.0767
100.067980872543	77.6762200029562	100.0565	80.1054
102.000464414783	77.6663371180201	101.2985	78.2917
106.30385375059	77.644346360668	108.1531	76.0691
105.964565218509	79.6844483203396	107.981	80.0957
105.713881728939	81.1918293884154	103.6911	80.62
105.12125584343	84.7550830589727	107.2392	85.9448
104.357349550834	85.4143382663055	104.5599	87.8351
103.147369717716	84.680864408739	104.3617	84.8664
103.147369717716	84.680864408739	102.0461	86.7072
103.147369717716	84.680864408739	102.2936	85.0217
103.147369717716	84.680864408739	101.1477	85.2681
102.178390249311	84.0933749243894	103.8313	82.5056
102.178390249311	84.0933749243894	103.1106	83.2736
102.178390249311	84.0933749243894	101.0606	82.9382
99.4751694731322	82.454773884425	98.567	80.2017
99.4655472256258	82.4910550847192	98.2007	80.5294
99.4436378561263	82.5736594027435	98.2345	80.86
99.413754929199	82.6863282589361	97.8831	81.9659
99.413754929199	82.6863282589361	97.4314	81.946
99.3805529449808	82.811513529424	96.9541	82.6989
99.3805529449808	82.811513529424	97.3132	81.5365
99.1548456231099	83.6773651844018	96.8706	83.0827
98.8766549854327	84.7445892709466	96.9343	84.943
98.8766549854327	84.7445892709466	97.0865	83.6094
98.3614160297118	86.7211281126869	96.2545	87.1498
98.3614160297118	86.7211281126869	95.9325	86.7596
98.5912014557312	87.500514572118	99.0152	86.155
98.5912014557312	87.500514572118	97.7943	87.7833
99.0232260941108	88.9658541284353	100.7126	88.5952
99.0232260941108	88.9658541284353	98.1138	89.594
99.0232260941108	88.9658541284353	98.3726	88.4744
99.0232260941108	88.9658541284353	96.8345	90.0197

Solution x	Solution y	Original x	Original y
100.394825569145	90.9249516356854	101.602	92.3175
100.394825569145	90.9249516356854	100.8882	91.1406
100.394825569145	90.9249516356854	100.5649	91.4192
100.394825569145	90.9249516356854	98.656	92.6213
100.394825569145	90.9249516356854	98.853	91.6792
100.394825569145	90.9249516356854	99.3434	90.9979
100.394825569145	90.9249516356854	98.9319	91.3958
100.822920485345	91.2407292666414	99.3782	93.0601
101.357892031893	91.6353324749108	102.4507	89.6037
102.882031277197	92.7596098984742	104.3693	90.8389
103.320260763489	93.1157275380141	105.6506	92.4297
103.044016026816	93.961067512462	102.0076	93.075
102.689269859712	95.0466277951623	100.6204	94.7646
102.471822994445	95.7120323347297	104.1728	96.9352
102.471822994445	95.7120323347297	103.2876	94.1817
102.471822994445	95.7120323347297	101.8123	94.891
102.471822994445	95.7120323347297	101.583	94.8217
102.028677173904	97.0681181526324	104.1034	98.3317
101.903662874181	97.1949317331633	103.8628	98.4843
99.3476010256791	99.7879382726624	98.8373	99.4165
99.3476010256791	99.7879382726624	98.2349	98.4363
95.3419879289707	103.851496382151	94.4828	106.1237
95.2662633977527	102.481360256921	95.6122	103.8055
95.0505183482317	98.5785114061725	95.0373	98.5247
94.8499370766978	94.9497654074663	95.7576	96.9635
94.8499370766978	94.9497654074663	95.504	96.351
94.8499370766978	94.9497654074663	94.0924	96.5838
94.8499370766978	94.9497654074663	92.4623	94.734
94.7309371751123	92.7963778269454	97.0347	92.0258
94.7309371751123	92.7963778269454	96.5235	92.1962
93.9229974647819	91.590601317735	95.2026	90.5293
93.248084617287	90.5833499056168	92.5654	91.5305
93.248084617287	90.5833499056168	92.7178	89.1801
92.8939945184948	90.0549074500929	93.9684	87.8762
92.4163639926166	90.0855286724994	93.1284	88.6615
89.9486081955255	90.2434880640462	88.6062	92.2681
88.6466524438268	86.5125666855857	86.3374	85.7586
89.8505778204058	85.6818630034544	88.3633	87.3681
89.8505778204058	85.6818630034544	89.5631	83.3752
90.6070634639123	85.1599360745793	91.1677	84.1211
91.1492000018682	84.7859059255376	92.288	83.6157
91.1492000018682	84.7859059255376	91.14	83.5499
91.4457863485635	84.5812851224698	93.0994	86.3608
91.4457863485635	84.5812851224698	93.4941	85.8189
92.5737120041135	83.1794142672915	94.9909	83.4209
92.1348935746747	82.3331904531587	94.0795	80.8773
91.7716542584508	81.9852505387798	93.2494	81.8793
91.2712106329174	81.5058773258478	92.6699	80.64
91.2712106329174	81.5058773258478	92.1151	81.2598
90.5281568673955	80.7940961524313	91.86	79.7087
90.5281568673955	80.7940961524313	88.6759	82.3658
90.5281568673955	80.7940961524313	89.95	80.2132
90.2070469966753	80.3250590768811	88.0687	81.4777
89.7276694265552	79.1538078107804	91.1291	78.4897
89.2669442628146	78.0281248242449	89.835	77.746
88.8163296595315	76.9271411785754	91.0116	75.887
79.1774137196807	59.1338044224048	81.1686	57.7423
78.3124054638257	58.1543765677718	77.9705	58.8491
77.3237405412631	57.0349378955979	77.8264	55.5164
76.8000398098187	56.4419671917039	78.0993	54.3894
66.6518500255625	53.5094380615548	66.0257	55.1875
62.5427861378247	52.3220588552052	61.2083	54.3519
52.5339235186762	40.168577817768	50.3352	41.2014
52.0069809678776	37.4192214201016	53.589	37.6567
52.0069809678776	37.4192214201016	51.6292	37.4529
Route: 6 Length: 267.214249725398 Demand Met: 9980			
43.616109829917	15.9110113605921	44.3034	16.6265
40.6039122940159	19.2941229239426	40.715	18.8306
30.2959263286814	30.8714465498591	28.099	29.8348
25.4942662412974	61.742124048489	23.9369	61.5866
25.0241405211609	64.7646590530401	22.6268	64.3936
24.5459482995007	67.8494036301371	22.8228	67.5784
24.0859467559794	70.8168940733329	22.1344	71.2137
23.9484465981506	71.7036464208359	22.0857	71.4539
23.8210273933712	72.52535818639	21.3934	72.6127
23.8210082671721	72.5254856640435	24.5076	73.115
23.8210082671721	72.5254856640435	24.5354	72.6275
23.8209887289558	72.5256159954772	26.2205	72.9044
23.6825051435958	73.1236021896663	24.1578	73.3792
23.5496949325754	73.6970937266413	23.527	73.6169

Solution x	Solution y	Original x	Original y
23.4158752883181	74.2749422546436	24.4797	75.354
23.3168896579837	74.7024071559198	24.7401	75.4523
23.2309403651596	75.073591394861	25.4767	75.481
23.124080135671	75.5350621806976	25.3366	76.538
22.9471633464265	75.7809325581192	22.8762	75.7017
22.7706461018379	76.0262476525242	23.796	77.2181
22.6098149453286	76.2497634933267	24.3218	77.9732
20.2892578207426	77.8963108597103	18.7356	77.2891
20.2892578207426	77.8963108597103	21.1184	76.9048
18.3629477018045	79.2631277831525	17.9606	81.6588
15.6499994392069	75.4702407418216	13.7649	76.0563
15.110499619576	74.7160028730964	12.73	75.2001
15.5117360198945	72.9189581227245	15.4332	72.9689
15.9305216011034	71.0433115430592	18.2654	71.5277
16.1209417978881	70.1905526771247	15.0856	70.6386
16.3836855818222	69.0136864575431	16.7224	69.1113
16.651664671238	67.813295651083	18.9682	67.082
16.0466064780719	67.261477950134	14.7433	68.1941
15.5182777018854	66.7796324527812	14.0233	68.3418
15.5182777018854	66.7796324527812	14.5018	68.1646
14.9648807791588	66.2749215945264	13.2613	67.7948
14.6171863747065	65.9578245169244	15.3124	65.205
14.2708003854657	65.6419189679262	14.2239	63.9607
14.2708003854657	65.6419189679262	15.1112	64.361
14.0475871812185	65.438347308244	14.2076	63.0144
13.3667283720179	65.9117852718881	12.5389	66.9051
12.9322197587795	66.2139148984345	12.0444	66.3239
12.567859758033	66.4672653765783	12.0877	66.3858
12.2238043402214	66.7064966425027	12.0097	66.7734
11.8898879108909	66.9386775642548	11.4442	66.9869
11.5751057393382	67.1575532675524	10.5042	66.7806
11.5751057393382	67.1575532675524	10.7344	66.9849
11.3182915258303	67.3361205037684	9.6606	65.5604
11.053859253078	67.665581760976	11.4886	67.7219
10.7761011483134	68.0116449855072	12.0587	67.8257
10.4048563926193	68.4741669912717	10.9416	69.7746
10.0994662685138	68.8546574387974	10.0835	69.723
9.83059996159018	69.1896498258653	11.6475	70.8021
9.21310899806211	69.8208574665226	9.1707	70.0865
8.62822644283438	70.4187223233733	9.3844	71.5303
8.10692833095531	70.9515778192904	9.45780000000001	72.6847
7.76541912845278	71.3006422817587	9.00020000000001	73.0359
7.51197896950462	71.5596891777547	7.0214	70.8048
7.24759518753291	71.8299221555386	8.8648	72.0358
6.88859036422249	72.1968764701471	8.3117	72.2049
6.3792691218033	72.7174867749441	4.0089	72.186
6.61698907851333	73.4042671754415	6.09139999999999	73.9114
6.84091001544674	74.0511494712121	6.65640000000001	74.2265
7.06421073809788	74.6962252072038	7.5677	74.3816
7.30385947325776	75.38852002106	8.0472	76.1743
7.48630686961482	75.9155209132349	9.9143	75.8382
5.15320804908706	84.3547353869484	2.7376	84.0979
5.43013336642836	89.1595817627845	7.8142	89.6258
5.04673679699287	89.963818420183	3.5998	89.8159
4.74402168642722	90.5988105570374	3.55029999999999	90.3653
4.47121688827946	91.1710593371128	5.8502	91.8647
4.20789478887245	91.7234181639028	2.57040000000001	90.3092
3.26747180452372	93.6964734659844	1.1743	92.9818
2.90403720764337	94.4588505760465	0.580200000000005	93.7511
2.88778082535485	94.5693137405995	0.613799999999998	95.4238
3.0966935574374	94.7474415749052	1.64530000000001	95.7178
3.33665392915768	94.9520367341073	4.77370000000001	93.7785
3.55743078006685	95.1402796066938	3.4538	93.5151
3.83059301101166	95.3731870337109	3.5924	94.7451
4.12824559614712	95.6269814955947	2.1469	96.6722
5.34424154420702	96.6635700519551	6.3198	96.0864
6.88046301721917	97.9739841341995	9.17	97.1621
6.57494425203053	99.6227961177944	4.95789999999999	99.4405
6.31309032559582	101.035960207793	8.1477	101.1634
5.97828876547794	102.842787278643	8.0611	104.093
5.31852501323774	104.802879086045	3.0162	107.1796
1.98604311822896	101.869757081437	3.81100000000001	100.5395
1.65085725965012	101.228113300426	3.1448	100.72
1.27160217209062	100.502123246849	3.11839999999999	98.924
0.884429350522353	100.215198315356	2.55330000000001	99.1767
0.11571566161011	99.645489598286	1.4019	97.5847
-0.627254435565831	99.2603875670439	-0.311599999999999	97.6012
-1.15810828341776	98.9852358221472	-0.171000000000006	97.1566
-1.6848828469184	98.7121941332267	-0.338999999999999	97.1979
-2.66775561892129	98.2027284153959	-1.86190000000001	98.5581

Solution x	Solution y	Original x	Original y
-4.83854009538905	97.0774796111022	-5.5457	98.4014
-7.1894561401628	95.8588510827993	-7.5489	96.9207
-10.3997539787301	94.1946797117962	-12.8049	93.8535
-7.05485441127327	93.5291632683166	-6.68600000000001	94.6391
-4.3403934126642	92.9892171853298	-3.26390000000001	94.8889
-3.82409271708249	92.8865268623987	-3.1358	95.2162
-2.80916058441059	92.4833452128612	-2.1508	94.1499
-1.7955445058853	92.0806729750146	-0.0468000000000046	93.7668
-1.73383392570375	91.907138732827	-1.9602	93.9224
-1.6115145790227	91.5631671299068	-2.5612	92.1356
-1.46796386059751	91.1594910788513	-2.30370000000001	90.7079
-1.32745695953732	90.7643739575913	0.619299999999996	91.0377
-1.20898583549385	90.431229713731	1.20229999999999	90.7259
-1.28170443488123	89.694849296005	-0.100899999999996	90.0487
-1.37557468768961	88.7442331004511	-0.735100000000003	89.6931
-1.57030661338324	86.7718338823373	-1.23350000000001	86.0108
-1.70043041690565	85.4540544403781	-4.1255	85.596
-1.89879366242052	74.7387260679204	-4.2807	74.2616
0.630161861049004	68.9814462575667	0.309600000000003	68.1954
1.49853175633649	67.0045740294214	1.76609999999999	66.5446
2.07081242021391	65.7017623227217	0.483800000000002	63.8626
3.80866432618521	65.226250707182	4.4426	63.6871
4.62032183370854	65.0042287689681	4.7342	63.0935
5.14929105820424	64.8595356226768	5.2812	65.5492
5.67834057839057	64.7148205092797	6.9842	66.7632
6.46907991569746	63.7810964000492	6.67010000000001	63.5082
7.16251960736798	62.9622670866113	8.4928	63.9998
7.84044056434414	62.1617661662925	7.6803	61.1857
8.3785309223113	61.5263789568012	10.4334	62.822
8.93796221740791	60.2818164986333	9.15690000000001	61.6426
20.8925608961826	33.6865727439116	18.7531	32.536
22.0504031324234	31.8577832614962	21.3113	31.7798
23.5631170355796	29.4684925297566	22.8581	29.0039
25.0309759433775	27.1500610291494	23.1689	25.59
28.5575066170782	23.9269409984734	27.0312	22.0371
38.3425421895014	16.96641358007	39.7266	17.3977
39.7410482796679	15.9715768443063	40.2335	17.1357
41.4751886086193	14.737984860714	40.2323	12.6508
42.733847394184	14.1208238035228	41.9974	13.5778
44.4425412119522	13.2830003079142	43.7175	13.3612
44.4425412119522	13.2830003079142	44.7075	13.3055
Route: 7 Length: 109.864778440668 Demand Met: 9894			
51.4365696029897	18.4363942172906	51.6732	17.1776
51.4365696029897	18.4363942172906	52.4859	17.4578
51.4365696029897	18.4363942172906	51.539	18.7116
51.4365696029897	18.4363942172906	52.1655	19.1446
57.7318540090947	27.8920965925564	59.5552	26.5288
57.7318540090947	27.8920965925564	58.9981	26.6128
57.7318540090947	27.8920965925564	58.5931	27.1316
57.7318540090947	27.8920965925564	56.8778	27.618
57.7318540090947	27.8920965925564	57.9508	29.6187
60.3731496897184	31.8595418356559	60.463	30.4795
60.3731496897184	31.8595418356559	60.1802	30.671
60.3731496897184	31.8595418356559	58.6228	31.6703
60.3731496897184	31.8595418356559	58.4334	33.3219
62.3350868127139	34.1673170222937	62.464	33.4003
62.3350868127139	34.1673170222937	61.5106	34.0654
62.3350868127139	34.1673170222937	60.8351	33.4935
62.3350868127139	34.1673170222937	61.1622	34.1592
62.3350868127139	34.1673170222937	60.137	35.2014
62.3350868127139	34.1673170222937	61.1452	36.2851
64.5331882103345	36.7076629357841	66.9624	36.7077
64.5331882103345	36.7076629357841	64.9829	35.6055
64.5331882103345	36.7076629357841	63.8645	34.3723
64.5331882103345	36.7076629357841	63.453	34.6286
66.1994788157213	38.7377534478512	68.0366	38.8903
66.1994788157213	38.7377534478512	66.7168	38.698
66.1994788157213	38.7377534478512	65.211	38.9167
66.1994788157213	38.7377534478512	64.8516	39.5774
66.1994788157213	38.7377534478512	64.2784	38.8059
71.2293932078053	44.8658533487053	73.6428	45.1426
71.2293932078053	44.8658533487053	73.2283	44.0709
71.2293932078053	44.8658533487053	72.9378	43.4347
71.2293932078053	44.8658533487053	72.4926	42.7909
71.2293932078053	44.8658533487053	72.9198	44.5581
71.2293932078053	44.8658533487053	72.7013	43.6681
71.2293932078053	44.8658533487053	72.4429	44.8985
72.3251240270152	46.7505016843782	70.5497	45.0925
72.3251240270152	46.7505016843782	70.7664	48.6137
72.3251240270152	46.7505016843782	70.6191	48.182

Solution x	Solution y	Original x	Original y
72.3251240270152	46.7505016843782	70.4096	46.4113
73.3008499761825	48.032044046573	73.6395	46.5004
73.3008499761825	48.032044046573	73.2561	47.9132
73.3008499761825	48.032044046573	72.0385	47.603
73.3008499761825	48.032044046573	72.0723	49.2863
73.3008499761825	48.032044046573	71.8327	48.0379
73.3008499761825	48.032044046573	71.8965	50.0142
76.1922756760551	48.9673180593328	78.2967	50.1808
76.1922756760551	48.9673180593328	77.9078	47.2474
76.1922756760551	48.9673180593328	77.6289	48.4559
76.1922756760551	48.9673180593328	77.4079	49.147
76.1922756760551	48.9673180593328	76.4125	46.981
76.1922756760551	48.9673180593328	76.379	48.6237
75.2346853477266	50.3254916262716	76.5498	52.218
75.2346853477266	50.3254916262716	76.2244	51.9684
75.2346853477266	50.3254916262716	76.0043	50.5809
75.2346853477266	50.3254916262716	75.5587	49.1352
75.2346853477266	50.3254916262716	75.5201	48.6107
75.2346853477266	50.3254916262716	75.2757	50.6388
75.2346853477266	50.3254916262716	74.8417	48.5823
75.2346853477266	50.3254916262716	74.4488	50.3129
74.947820198884	50.7323659114207	74.3979	53.0985
74.947820198884	50.7323659114207	73.911	51.0144
74.947820198884	50.7323659114207	73.6611	50.4924
74.947820198884	50.7323659114207	73.5268	49.2611
74.947820198884	50.7323659114207	73.2401	49.0047
73.1306633323039	54.1864422517121	73.8072	55.2741
73.1306633323039	54.1864422517121	73.3859	52.8201
73.1306633323039	54.1864422517121	72.0955	52.6394
73.1306633323039	54.1864422517121	72.0304	52.5053
73.1306633323039	54.1864422517121	71.2619	53.5794
73.1306633323039	54.1864422517121	70.916	53.3608
72.1596827764995	56.0321326284373	73.7963	57.8273
72.1596827764995	56.0321326284373	73.2116	57.797
72.1596827764995	56.0321326284373	72.7757	56.7077
72.1596827764995	56.0321326284373	70.5527	57.3223
72.1596827764995	56.0321326284373	69.9782	57.1009
69.8764554597189	56.3858057881286	70.1344	58.5671
69.8764554597189	56.3858057881286	69.8977	54.8286
69.8764554597189	56.3858057881286	69.2681	55.3133
69.8764554597189	56.3858057881286	68.5789	56.8701
69.1697565989761	56.4952644447905	67.4683	58.2291
69.1697565989761	56.4952644447905	68.2826	55.0673
69.5770347106636	53.4917453126615	70.694	53.8562
69.5770347106636	53.4917453126615	70.2011	52.705
69.5770347106636	53.4917453126615	70.1179	52.2878
69.5770347106636	53.4917453126615	69.1565	53.343
69.5770347106636	53.4917453126615	68.022	53.7678
69.5770347106636	53.4917453126615	67.8488	53.6384
69.7940690128237	51.8912736342794	72.1444	51.2772
69.7940690128237	51.8912736342794	71.0505	50.768
69.7940690128237	51.8912736342794	70.8564	51.5507
69.7940690128237	51.8912736342794	70.6462	49.6735
69.7940690128237	51.8912736342794	70.0624	50.1219
69.7940690128237	51.8912736342794	69.4154	51.8752
69.7940690128237	51.8912736342794	69.1689	51.2673
68.2711051374432	49.8699064967598	68.7356	47.889
68.2711051374432	49.8699064967598	67.7991	50.1342
68.2711051374432	49.8699064967598	67.6648	48.1141
68.2711051374432	49.8699064967598	66.949	50.6855
68.2711051374432	49.8699064967598	66.2863	51.2705
67.1038909894896	48.101151880345	67.5609	49.631
67.1038909894896	48.101151880345	65.7303	47.3671
65.3974976304623	45.5153388249254	67.4955	46.0347
65.3974976304623	45.5153388249254	65.3289	43.5846
65.3974976304623	45.5153388249254	64.4232	44.0581
60.3418949053722	37.854319110436	62.0243	36.102
60.3418949053722	37.854319110436	62.6603	37.129
60.3418949053722	37.854319110436	60.9493	37.7343
58.4532203349297	35.4460429388156	58.8785	37.4935
58.4532203349297	35.4460429388156	56.2795	36.0371
56.7316429245348	33.2508099286228	58.126	35.24
56.7316429245348	33.2508099286228	54.3132	33.4794
56.7316429245348	33.2508099286228	55.9275	34.3566
54.6115860709005	29.937430410092	54.8257	29.6059
54.6115860709005	29.937430410092	54.7376	29.7596
54.6115860709005	29.937430410092	52.5136	31.162
54.6115860709005	29.937430410092	53.8796	31.7093
52.2579420945675	25.4979044221478	50.8742	24.2729
52.2579420945675	25.4979044221478	50.1386	26.6573

Solution x	Solution y	Original x	Original y
49.3344364761734	19.9830226348695	49.9475	19.2284
49.3344364761734	19.9830226348695	49.1677	19.2175
49.3344364761734	19.9830226348695	49.9971	19.9155
48.2023718758558	17.8475152909057	49.3862	17.5735
48.2023718758558	17.8475152909057	45.9074	18.6439
Route: 8 Length: 251.566824675217 Demand Met: 9830			
37.8024214667828	32.5608699771756	35.5392	31.6783
37.0967416181618	34.7017290961026	37.4272	33.8061
26.5511209300844	66.6947727382734	28.241	67.9653
26.5511209300844	66.6947727382734	26.4833	65.6457
26.1601052293435	67.8810409541313	26.4747	67.9787
25.7719685661728	69.0585672159518	25.7737	68.9159
25.3643633559042	70.2951534893986	22.9431	70.0987
25.4786414402974	71.0195047149445	26.9783	71.0141
25.4786414402974	71.0195047149445	26.4587	69.6793
25.7833967640842	72.9510129856707	27.6433	72.5657
26.1830005087585	75.483660837768	26.6151	77.1467
26.1830005087585	75.483660837768	27.2709	73.9256
26.9555289330421	80.380110023119	29.376	80.5861
25.8174469163948	83.746549762756	23.4089	84.0628
26.250083927837	84.3966073526694	27.1736	83.2653
30.2017750546531	90.3342991692538	32.6009	89.9531
30.0530525858605	90.8670816817782	29.5221	90.7635
30.0530525858605	90.8670816817782	32.1756	91.0244
29.5435290873228	92.6923395985009	29.3468	93.7461
29.5435290873228	92.6923395985009	30.8807	93.5109
29.3447924312565	93.4043151655592	29.7064	94.0211
29.1739126562877	94.0164991429351	31.4281	94.9219
28.3371934128861	95.5791934348206	29.7849	97.5299
28.3371934128861	95.5791934348206	30.7482	95.8761
27.5981826665104	96.3542926072695	26.1674	96.1159
27.5981826665104	96.3542926072695	29.1897	96.4145
26.5872967891179	97.4145451931381	26.9511	99.1097
26.5872967891179	97.4145451931381	28.2891	98.27
26.5872967891179	97.4145451931381	26.55	96.735
26.5872967891179	97.4145451931381	26.6904	96.1713
23.954912345353	100.175658143669	21.5395	100.4343
28.1100681098179	102.99366059836	29.8552	101.3038
28.5079585808233	103.6227441387	30.1816	102.1772
29.7806613398199	105.634611826079	28.1717	107.4546
31.4205728725751	106.40862148245	31.3011	106.2109
33.2089391471492	107.252698376226	33.1638	109.6815
33.6029306646949	107.084353957999	33.1686	108.6172
34.2272987675968	106.817592281486	32.8361	107.2479
34.2272987675968	106.817592281486	35.3466	107.7036
35.2015824872175	106.401355308827	34.3074	104.3145
36.2134675944395	105.969082002357	35.4006	103.6799
37.1339641403973	105.70586713844	35.7224	107.36
37.1339641403973	105.70586713844	37.1983	106.347
37.1339641403973	105.70586713844	39.1965	105.4524
41.15751452687	104.555153577992	42.9285	106.2179
41.2181418980946	104.278510146067	42.4716	105.6496
41.2983106282084	103.91287335638	40.9527	105.6227
41.2983106282084	103.91287335638	42.0156	103.5929
41.4094243415551	103.406003605611	40.5226	102.8002
41.5077752784389	102.957397365309	39.3246	101.8921
41.937957929976	102.438949256709	40.2693	101.3043
42.4755402820083	101.791091701046	42.5793	100.4271
42.8199880179612	101.375959335363	42.8352	101.6931
42.8199880179612	101.375959335363	42.9226	100.4615
43.1248686024009	101.008510943146	42.2565	98.7398
43.6988856559919	101.093939143291	43.0828	99.6317
44.7613388914506	101.252068126584	45.0704	101.2748
44.7613388914506	101.252068126584	44.7902	101.1589
45.7609917079089	101.40084444337	47.126	99.3914
45.8420905026357	101.540663887244	46.0729	100.678
46.799061005647	103.190398581375	46.5537	103.4177
46.8373010135445	103.256328683491	45.465	105.2608
47.7573074231086	103.4002275049	48.0764	105.8084
51.6274441636359	101.681434869291	53.9006	102.5381
50.2437269905561	98.6801141296414	51.1106	98.2963
47.8333949784493	93.4523131640024	47.7789	92.5461
47.2675769045258	92.225028447578	48.9533	90.4759
43.2826482664441	90.5632849457611	42.6808	88.2098
42.907725130384	91.031737180414	42.9721	90.3177
42.4396600411967	91.6165698238297	43.1057	91.7939
41.9152372688515	92.2718232026588	39.6285	91.4521
41.9002677803974	93.3539521710225	41.599	92.4813
41.882216884171	94.6585130431728	44.0393	95.7757
41.3432210746772	95.050057485917	41.6896	94.8028

Solution x	Solution y	Original x	Original y
40.7315259827271	95.4944203946749	42.0978	97.503
39.167096402341	96.4899856225378	40.065	98.6098
38.9095668504094	96.6538601983916	40.9431	96.0349
38.9095668504094	96.6538601983916	37.1788	95.0118
38.8479021634486	96.693077892098	38.2186	96.6747
38.8479021634486	96.693077892098	37.3296	94.7968
38.2494681839193	97.2889925314565	39.7333	98.7582
37.5793527717372	97.956236897158	39.196	99.7694
36.6121056044076	98.7272730323423	38.189	100.3805
36.6121056044076	98.7272730323423	36.8108	99.4487
36.6121056044076	98.7272730323423	35.0473	98.5367
36.6121056044076	98.7272730323423	35.7859	98.3251
35.4571053244872	99.6478620813628	35.2228	101.4244
35.1033759285465	99.9298500790362	35.7306	102.2767
35.093443826925	99.9283287494685	35.5571	102.295
33.5869424734841	99.6994750158184	31.6341	101.1443
33.9211438857599	97.4265597720371	33.8351	99.3235
33.9211438857599	97.4265597720371	32.4952	97.9758
33.9211438857599	97.4265597720371	33.0573	97.9271
33.9211438857599	97.4265597720371	31.7064	96.988
33.9211438857599	97.4265597720371	31.6916	96.8159
33.9211438857599	97.4265597720371	34.0464	97.1856
33.9211438857599	97.4265597720371	33.9629	96.8355
34.0935818837975	96.2545189639678	35.7481	97.1257
34.0935818837975	96.2545189639678	35.9551	95.9225
34.2474928475193	95.2082556341324	34.0458	95.0903
34.2474928475193	95.2082556341324	35.2297	94.8683
34.3664308026386	94.3996447728462	36.1694	94.3523
34.4623701652628	93.747361622745	32.8593	93.0881
34.5368681891048	93.2408062319831	32.2034	92.5655
34.7100111510627	92.8501161314343	33.6244	92.4492
34.8851794713485	92.454849878616	34.0163	93.2553
35.074473906204	92.0275343451584	37.0706	93.0168
35.074473906204	92.0275343451584	35.4152	92.5489
35.074473906204	92.0275343451584	34.7819	91.1147
35.2489221061435	91.6335617735253	33.1881	90.5996
35.4399335665391	91.2025586799247	33.2241	90.2072
36.4529748500495	88.9690365168758	37.9917	90.5379
36.4529748500495	88.9690365168758	35.4073	87.2216
38.470338761483	84.5212231495516	40.8939	84.3555
36.0782691336143	80.7269423641965	34.9317	80.2335
35.3547296385729	79.5792333714449	33.517	80.8699
33.439885554181	76.5417109858395	31.105	77.2121
33.4415275396206	76.0680366896865	31.4187	76.5703
33.4473082339031	74.3943465123806	32.697	74.6737
33.4545153227763	72.3074978973497	31.0449	71.9995
33.5478043222378	71.9434539438423	31.4455	71.7336
33.5478043222378	71.9434539438423	31.4906	71.3219
33.6571878535881	71.5165591594004	31.7515	71.3679
33.79093748184	70.9945625638063	32.2488	71.8762
34.1458494165568	69.6094304847853	35.1535	70.6086
34.8035314960097	67.0426628825199	33.839	67.1668
41.9940943367432	38.9795901040617	44.3651	39.5082
42.3249228915829	37.2391029110285	40.9959	37.9409

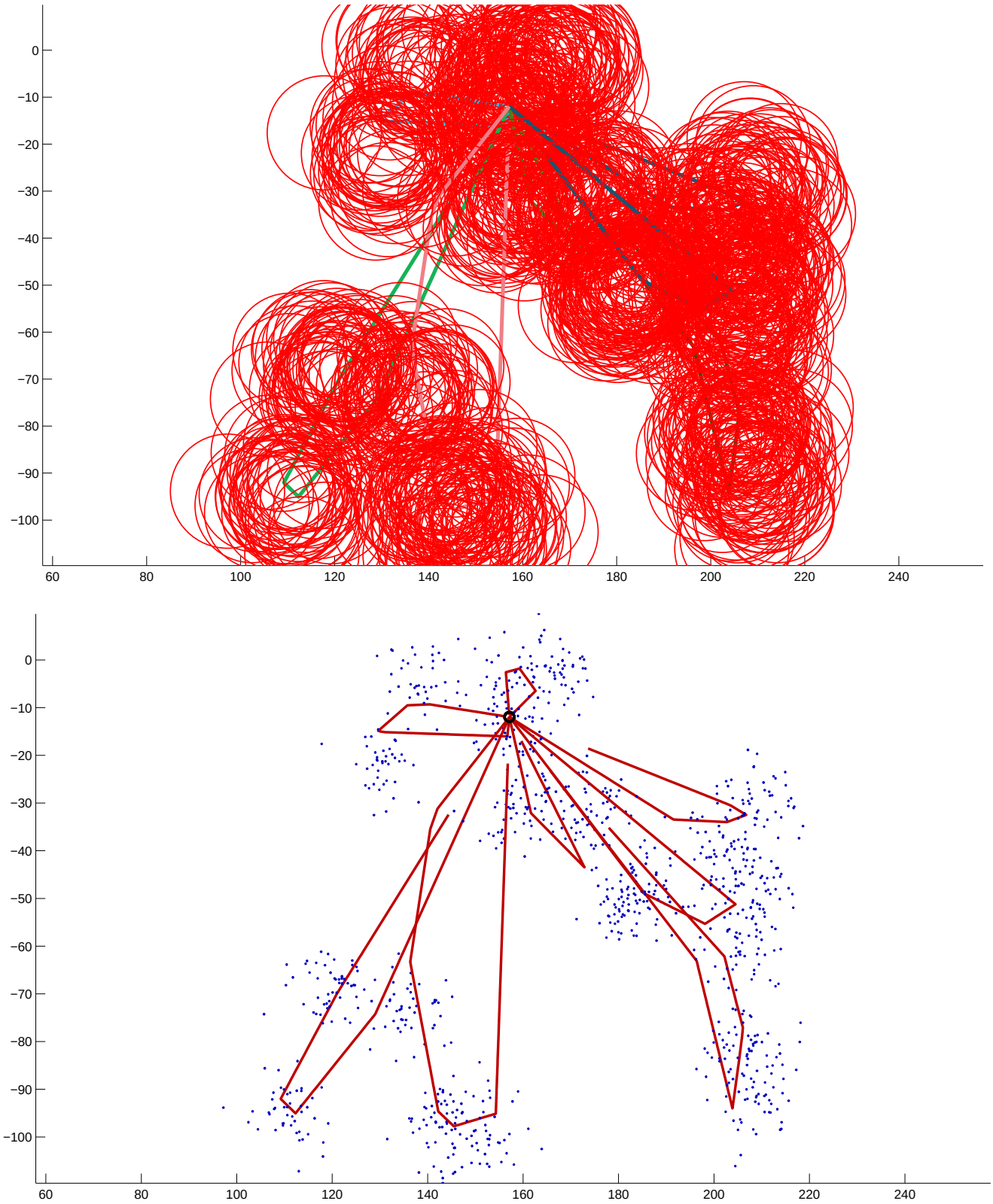


Figure O.27: $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Euclidean, Length = 973.0878722

Table O-30: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Euclidean

Total distance: 973.087872185032			
Total demand met: 76422			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 196.160393642098 Demand Met: 9997			
86.3553952359449	63.0646748480421	97.3108	57.82
86.3916177434867	63.2138134729618	95.9041	59.3009
86.4786755975271	63.5722440925783	94.6583	60.3511
86.5918752109372	64.0382972365376	95.1558	61.2395
86.7165561817833	64.55161255168	95.479	61.1306
86.8484259463398	65.0945183275938	96.4356	62.0951
86.9850433105021	65.6569636096576	95.4724	61.7777
87.1271019224942	66.2418063842276	94.5987	62.0376
87.2750209677161	66.8507733257886	93.5538	62.1822
87.4299881240502	67.4887545110033	94.6788	63.8911
87.5900347248096	68.1476453617501	93.9444	64.9
87.7544297487463	68.8244369370477	92.749	64.7326
87.9254580810862	69.5285359966404	92.0851	66.8651
88.1002552283317	70.2481502107134	93.0933	68.7697
88.2762515497627	70.9727008703769	94.6798	69.1984
88.4535331976065	71.7025425283806	93.9524	73.145
88.6256825766482	72.4112553495332	94.549	73.3405
88.7936040451715	73.1025624552231	95.9481	74.251
88.9556499215151	73.7696806751652	96.2521	73.5638
89.1148861152351	74.4252317496903	97.5653	74.5618
89.2691819753926	75.060444164962	97.816	74.8015
89.4196144331723	75.6797514499178	96.1169	76.0362
89.5671300286875	76.287050512673	94.4072	76.9857
89.7125336147734	76.885654777525	94.6945	78.572
89.8544641432938	77.4699611136809	93.1133	78.1389
89.9952605778949	78.0495985258868	91.0116	75.887
90.1390231460749	78.6414467085282	89.835	77.746
90.2846399124273	79.2409280284402	91.1291	78.4897
90.4317380304298	79.846507566025	89.95	80.2132
90.579353144069	80.4542151973388	91.86	79.7087
90.7284802111595	81.0681469503333	92.1151	81.2598
90.8779364329383	81.6834334741322	92.6699	80.64
91.0292695642032	82.3064464625597	94.0795	80.8773
91.1827408636633	82.9382614221088	93.2494	81.8793
91.3381395887929	83.5780107142524	92.288	83.6157
91.4942705963151	84.2207742086958	91.1677	84.1211
91.6516950300391	84.8688620084778	91.14	83.5499
91.812234886644	85.5297749085519	89.5631	83.3752
91.9780372220338	86.2123519070181	88.6759	82.3658
92.1537717628842	86.9358171747459	88.0687	81.4777
92.3476205024619	87.7338538222862	86.3374	85.7586
92.5526686407953	88.5779955991214	88.3633	87.3681
92.7651806325017	89.4528642053406	88.6062	92.2681
92.9741106914589	90.3129871519878	92.4623	94.734
93.1736883733546	91.1346089757406	94.0924	96.5838
93.3605899882406	91.9040468452189	95.504	96.351
93.5382190634384	92.6353121415113	95.7576	96.9635
93.7076203293853	93.3327057518056	95.0373	98.5247
93.8680526095751	93.9931764627494	94.4828	106.1237
93.8975605298982	93.7792153959758	95.6122	103.8055
93.9295704864497	93.5471216807075	98.8373	99.4165
93.9624549770446	93.3086912713322	98.2349	98.4363
93.9960604595455	93.0650371232431	103.8628	98.4843
94.0326812533547	92.7995325607485	104.1034	98.3317
94.0743856759967	92.4971924655944	104.1728	96.9352
94.1186178239254	92.1765370095936	101.8123	94.891
94.1633323043714	91.8523866821422	101.583	94.8217
94.2086068417525	91.5241779832097	100.6204	94.7646
94.2545031545123	91.1914637233593	99.3782	93.0601
94.3006148449986	90.8571882221007	98.656	92.6213
94.3469206430117	90.5215056107075	98.853	91.6792
94.3932479028361	90.1856664070586	98.9319	91.3958
94.4395924901412	89.8497005386362	99.3434	90.9979
94.4859109378041	89.513922770964	100.5649	91.4192
94.5323537149107	89.1772425428593	100.8882	91.1406
94.5789211323041	88.8396573358089	101.602	92.3175
94.6261328818453	88.4974013026804	102.0076	93.075
94.674574253455	88.1462330964647	103.2876	94.1817
94.7266154136703	87.7689755478825	105.6506	92.4297
94.8004925793981	87.2334489627045	104.3693	90.8389
94.8776464716511	86.6741702720108	102.4507	89.6037
94.9562953490008	86.1040530759527	100.7126	88.5952
95.0360062022971	85.5262364787158	102.0461	86.7072
95.1157399556726	84.9482482775178	104.5599	87.8351
95.1983384791661	84.349492782155	107.2392	85.9448
95.2123337786127	84.2395035478447	104.3617	84.8664
95.2262783662175	84.12991410386	102.2936	85.0217
95.2402024504649	84.0204867118272	101.1477	85.2681
95.2541173668432	83.9111322184169	99.0152	86.155
95.2680570479826	83.8015836700781	96.9343	84.943
95.2819969378407	83.6920341690145	95.9325	86.7596
95.2959937179802	83.5820378454587	96.2545	87.1498
95.3100624349686	83.4714763941066	97.7943	87.7833
95.3242254179123	83.3601743142658	98.3726	88.4744
95.3385203364614	83.2478354650474	98.1138	89.594
95.3530161626717	83.1339175670357	96.8345	90.0197
95.3677529305289	83.0181058313428	97.0347	92.0258
95.3829875382131	82.8983810238449	96.5235	92.1962
95.3988074793951	82.7740554939054	95.2026	90.5293
95.4149895560915	82.6468835072016	92.5654	91.5305
95.4318405616806	82.5144536175802	92.7178	89.1801
95.4490330463472	82.3793396621381	93.1284	88.6615
95.4665350955716	82.2417925429635	93.9684	87.8762
95.4842894093688	82.1022626952627	93.0994	86.3608
95.5022342908936	81.9612351765381	93.4941	85.8189
95.5203491776092	81.818871598982	94.9909	83.4209
95.5385145870247	81.676111435601	97.0865	83.6094
95.5567264159854	81.5329868133967	96.8706	83.0827
95.5749743126205	81.3895791083842	96.9541	82.6989
95.5932493000759	81.2459588585186	97.4314	81.946
95.6115211512377	81.1023636943064	97.3132	81.5365
95.6297838611899	80.9588408146456	97.8831	81.9659
95.6480613231164	80.8152022263056	98.2345	80.86
95.6663134554709	80.6717630256166	98.2007	80.5294
95.6845404999626	80.5285212274876	98.567	80.2017
95.702737050402	80.3855192351571	98.9119	80.0767
95.7209054849023	80.2427382170802	97.7624	79.6432
95.7390540579025	80.1001132552224	97.1852	78.7831
95.7571635153533	79.9577956917287	98.5933	78.8152
95.7752275020244	79.8158352127829	99.1261	78.6323
95.7932416726308	79.6742658439503	101.2985	78.2917
95.8111591212135	79.5334560792647	100.0565	80.1054
95.8291034526238	79.392434101607	101.0606	82.9382
95.8472281359891	79.2499932044875	103.1106	83.2736
95.8655882361008	79.1057006367606	103.8313	82.5056
95.8841574174124	78.9597634684748	103.6911	80.62
95.9028267403028	78.8130379470493	107.981	80.0957
96.0501021202922	77.0913301261014	108.1531	76.0691
95.4213828565818	74.6696101906223	103.5291	67.906
95.036841245068	73.1884519555206	102.9023	68.4164
94.6967581684422	71.8785376524543	101.778	67.1686
94.3878567620566	70.6887273784149	97.9014	66.9835
94.0953605476182	69.5621059002126	98.4258	65.8894
93.817268750758	68.4909669916068	98.4228	65.0226
93.5512118733763	67.4661840603877	99.4285	63.8276
93.2969628150956	66.4868825751737	99.0429	61.6589
93.0599568865663	65.573997847671	99.3413	60.508
92.8399215460591	64.7264800380123	100.6854	61.817
92.6248841037535	63.8982135574991	102.6402	60.9181
92.4145680191983	63.0881323286435	103.9916	60.6173
92.1724279699586	62.1554721067699	102.8738	56.4102
91.8556390601229	61.8024957185695	102.1595	55.9791
91.2885016396109	61.170568770869	99.9754	58.6633
90.6670601143273	60.478134343513	98.8606	57.9963
89.9938789244021	59.7280498508811	99.7259	57.0659
89.1852764190325	58.8270736223698	98.9521	56.5952
88.1727522377385	57.6988796102083	98.7715	55.3698
86.3790522298657	55.7002673636185	96.8097	54.0588
82.2005236262959	51.0443850612734	91.9756	47.4725
67.9534301550478	35.169691366477	72.6191	32.6684
Route: 2 Length: 109.799408040767 Demand Met: 9989			
55.3319639952631	17.0936104081833	55.9782	19.9329
61.6815637858057	21.0626339641453	68.2062	28.5319
64.0844570383682	22.5646457553881	67.8857	28.9512
65.9773691921405	23.7478759386323	67.6588	29.7348
67.6337094553987	24.7832287787447	66.7818	30.0369
69.2126490186259	25.7701995031566	68.3701	31.308
70.7190272344328	26.7118131435582	69.1853	30.9522
72.2141739574914	27.6464059276545	71.5231	31.8286
73.6784869781252	28.561725028728	72.2401	34.2889
75.1001453019116	29.4503810731375	75.4748	37.8532
76.3331138870033	30.2210903122499	74.5598	39.2546

Solution x	Solution y	Original x	Original y
77.4411716972915	30.9137194525455	77.5882	39.4219
78.4287901168263	31.5310639259057	75.9022	40.5634
79.3463697997107	32.1046279556604	75.9853	41.4015
80.2063514002292	32.6421880673016	75.73	42.7229
80.9910449091497	33.1326870664789	77.9223	44.6051
81.5066020290372	33.4549531265283	77.8794	45.0468
82.0992480627778	33.4833501732028	80.8872	43.1227
82.7084720437126	33.5125419853813	80.8076	41.6004
83.3377757540213	33.542696038029	81.9079	40.1742
83.9806588707933	33.5735006203655	85.9182	41.843
84.6037892519615	33.6033582307978	87.2346	40.5435
85.206582519167	33.6322408307649	87.5583	39.2312
85.7948353450549	33.6604262150594	88.4465	41.4478
86.3597797022631	33.6874942724992	89.0134	41.3658
86.9037867799007	33.7135587267014	89.3668	41.343
87.4303082218652	33.7387850686205	90.0385	42.8005
87.9312962929684	33.7627877861096	90.4784	41.2284
88.4179469375962	33.7861033912545	90.1236	40.724
88.8962051338007	33.8090167586088	90.014	39.915
89.3699068635484	33.8317117266272	92.8093	39.7693
89.8299474150184	33.8537520681616	92.634	40.1716
90.27920689105	33.8752758062148	92.1801	41.0349
90.7200035955192	33.896394015 26	92.2396	41.0703
91.1541630639168	33.9171941762468	93.2846	41.9379
91.5778543680975	33.9374927594031	93.9129	43.6355
91.9821877987572	33.9568638799319	94.5355	44.3621
92.3576738103891	33.9748528890391	94.4684	44.7163
92.7060104969157	33.99154119446	94.5838	45.9916
92.8321417198676	33.9443232366089	95.46	44.379
92.9597857097826	33.8965389217476	96.6284	43.246
93.0875791051908	33.8486984164165	96.8865	41.9997
93.2151252267942	33.8009501417209	96.2085	41.8253
93.3424347889587	33.7532899683524	96.2133	40.5576
93.4691783200706	33.7058411335947	97.0063	39.6578
93.5949850887388	33.6587423685508	98.4033	39.6451
93.7194940247969	33.6121288016532	98.7317	39.6579
93.8427608611147	33.5659796465522	97.0806	39.3994
93.9655523183754	33.5200081510386	95.8598	39.2349
94.0884631818128	33.4739919254175	94.3087	39.6383
94.2122491011983	33.4276483804797	93.6941	39.0671
94.337285177974	33.3808373058055	93.6083	38.4774
94.4636378586757	33.333533877899	94.1971	38.0204
94.5910609418811	33.2858301476149	95.1298	37.6897
94.7192178022067	33.2378519796035	96.5473	37.5774
94.847647942472	33.1897715744064	96.6051	36.0943
94.9760462409622	33.1417030855163	95.0864	33.2234
95.1044593461136	33.0936291629455	95.8908	32.6754
95.2325386751195	33.0456801898656	96.2582	32.5713
95.3601635645738	32.9979012561174	96.3928	32.1668
95.4873543396049	32.9502847649503	99.272	31.5703
95.6134979671611	32.9030601224444	99.0228	31.9463
95.7388870216578	32.8561178745176	98.5493	33.1624
95.863841218593	32.8093383331851	98.9301	33.2654
95.9884625107475	32.7626833960127	98.5859	34.5756
96.1131030598764	32.7160212854121	100.5275	34.9543
96.2372986182272	32.6695256815043	101.1976	33.4905
96.3608997085854	32.6232525251097	102.9211	31.879
96.4831644958647	32.5774793692348	104.0844	32.9988
96.6034506748526	32.5324462262439	103.4615	37.3033
96.7219157729412	32.4880937167891	107.8221	37.3636
96.7416256731465	32.4807138807436	108.656	34.8419
96.7416243657063	32.4807125641596	106.6895	31.0233
96.7416230347608	32.4807112193282	106.8535	30.7643
96.7416216761949	32.4807098482409	105.5782	30.6326
96.7416202974061	32.4807084628407	105.6149	29.5786
96.7416188994862	32.4807070602811	106.1692	29.0085
96.7416174776124	32.4807056414333	105.0575	26.2706
96.7416160386771	32.4807042092283	104.9423	23.521
96.3781151378404	32.2585449386158	102.4997	24.4075
96.0173665951162	32.0380666111054	102.9016	24.8202
95.6482702088029	31.8124869105016	102.211	28.3893
95.2676729194191	31.5798799649015	101.7295	28.4449
94.8722194249192	31.33819618943	101.5683	27.6266
94.4553896913845	31.0834528397859	100.6297	27.3107
94.0146917113665	30.8141287808928	100.384	25.6874
93.53913392773	30.5235118625846	99.0428	19.6959
92.532989145711	30.1070831095972	97.1071	18.8552
92.3276338693064	30.0250326273499	98.3827	22.3334
92.1189534996465	29.9416535795294	98.3241	22.4412
91.9067614092777	29.8568713351111	97.0499	25.7334

Solution x	Solution y	Original x	Original y
91.6924976691396	29.771261371321	97.3283	27.0933
91.474738286799	29.6842547264212	97.5011	28.0267
91.252277751583	29.5953697336731	97.9141	29.0493
91.023137982795	29.5038160620977	97.1838	29.5842
90.7872560551608	29.4095685768877	97.4429	30.1528
90.5429060673194	29.3119377129434	96.156	30.1327
90.2917658209801	29.2115938372293	96.0238	29.4057
90.034098992558	29.1086423106468	93.9312	28.9768
89.7729537369573	29.0043010386707	92.942	26.4511
89.5110344701045	28.8996505449219	93.6487	25.1273
89.2486631767459	28.7948194590833	92.5592	25.4331
88.9872760585423	28.6903816089124	90.6179	26.4649
88.7279293569266	28.5867590243643	90.6435	28.0536
88.4691748081033	28.4833730818783	90.72	30.049
88.2092853639227	28.379533764908	93.4265	31.4744
87.9425213358813	28.2729478249336	92.4351	33.0022
87.6671053496909	28.1629051477476	92.7124	33.4453
87.379288577752	28.0479079345256	91.0332	34.8187
87.0777968757608	27.9274471254531	91.1655	36.0648
86.7538318111056	27.7980073348871	91.9372	36.8319
86.3810370356068	27.6490579600664	91.8795	37.1845
85.9023171526392	27.4577868130635	89.1249	38.0318
85.2804367547066	27.2093166420799	88.2545	36.066
84.5836447267375	26.9309155448138	86.5983	36.2039
83.8014906005961	26.6184079686007	85.065	35.2948
82.9487619499309	26.2777021449236	86.512	33.4131
81.9971659373996	25.8974939670187	87.5726	32.8781
80.8360476740596	25.4335721598841	85.525	32.0217
79.4560958875634	24.8822166500512	85.1876	33.113
77.2692264246698	24.0084629777053	79.7169	32.9378
74.1763730931956	22.7727290827732	73.7989	28.6287
70.8713551842389	21.4522224499969	69.5886	28.6002
67.506582147388	20.1078155388108	70.1037	27.3839
63.6146570560853	18.5527613211999	70.5469	25.0661
Route: 3 Length: 25.9133243183428 Demand Met: 6926			
47.3169235493107	11.7780613627412	47.4524	12.1509
47.4975093022891	11.597841515117	48.9393	11.7496
47.6882354161286	11.4075014300465	50.5069	12.3029
47.8750443420392	11.2210705412106	51.32	11.9016
48.0571081910539	11.0393750202443	52.0306	12.0787
48.2374880398794	10.8593598395106	51.9742	12.9315
48.4190388933409	10.6781756375812	53.965	12.2967
48.600440677163	10.497139869211	52.3173	10.0275
48.7816759685958	10.3162699484633	51.2901	7.6487
48.961437048382	10.1368710213884	53.1154	7.9184
49.1378069725814	9.96085633695019	55.3647	9.0137
49.3090513189311	9.78995701764094	55.5508	6.709
49.4738614658446	9.62547903726127	54.3108	6.5803
49.6347027798088	9.46496198422276	53.4617	5.8056
49.7930965378597	9.30688759609171	52.0607	4.6851
49.9507126209092	9.14958929957587	52.3291	3.6705
50.1077278217646	8.99289069336881	52.2056	3.4977
50.2643411060343	8.8365933332696	51.8363	2.0767
50.4191757544024	8.68207124843034	52.8937	1.339
50.5698379065518	8.5317135597017	54.5841	1.3
50.7139706478199	8.38787243139722	54.6465	1.327
50.8516523006672	8.25046962840614	54.7597	1.1902
50.9831590646766	8.11922941697822	55.7669	1.6852
51.108711067028	7.99393204750287	55.5686	2.3786
51.2299518199334	7.87293728912481	56.514	2.6652
51.3470421131158	7.75608463482362	56.6229	3.2945
51.4608596224765	7.64249817125241	56.6752	3.9284
51.5719471208755	7.53163624139933	57.7618	2.6586
51.6795720094497	7.42422992991962	58.0726	3.0503
51.7842669563131	7.31974766105273	58.5415	3.6684
51.8867536938441	7.21746913908847	58.0725	5.2013
51.9885780737545	7.11585164026275	58.8992	5.3006
52.090369208378	7.01426728052516	60.2628	6.0605
52.1923087046059	6.9125347867437	60.5785	6.8128
52.2951297686139	6.809922362755	59.4358	8.0877
52.4000562771007	6.70520850113004	58.6318	9.4344
52.5072786350516	6.59820305258829	61.7542	11.527
52.6136623856464	6.49203417172398	64.6914	7.7788
52.5811623158996	6.44177781836723	63.4243	4.3429
52.5465596479988	6.38826925040783	61.565	4.5717
52.5107299633985	6.33286274325994	62.5325	1.766
52.4736046743761	6.27545222247603	63.0749	1.8033
52.4349943866618	6.21574508969159	62.7821	-0.0838
52.399880671786	6.16143730104321	62.4332	-0.684
52.208673298429	5.89559427909995	61.9524	-0.333

Solution x	Solution y	Original x	Original y
52.018747287848	5.63153198976376	60.4719	1.0667
51.8289017520937	5.36758164158068	60.4167	1.4088
51.6372530958453	5.10112422596589	58.6741	1.1796
51.4452933927407	4.83423417158763	58.2987	1.8222
51.2517701151566	4.56517000623091	57.3839	0.9502
51.0575164922042	4.29509003588239	56.047	-0.6998
50.864711908079	4.02702400674579	58.2741	0.1622
50.6695513324242	3.75568133087971	58.2864	0.0731
50.4719944117283	3.4810057138347	59.6709	-1.5476
50.2711253078276	3.20172383737018	58.3955	-2.2935
50.0726472773659	2.92576622271369	57.7878	-4.3732
49.8847828799956	2.6645659415371	53.5826	-3.7128
49.7092580765079	2.42052329268662	53.412	-4.2453
49.5476131912289	2.19578031302305	53.8048	-5.0553
49.398330981418	1.98822770635295	54.4331	-6.2551
49.2580605309691	1.79320694024727	53.289	-9.6645
48.2172114624253	2.08203692338975	46.0937	-5.8176
47.2673255229349	2.34562652774089	43.0131	-4.6452
46.3810770492542	2.59154949340451	36.4279	-4.3699
46.4024926696814	2.86009534331194	39.9467	-2.3317
46.425724458869	3.15139960292998	42.4155	0.0668
46.4492737703981	3.4466805523871	43.4311	0.4843
46.4724536261312	3.73733417754855	44.8479	-0.9391
46.4955476348655	4.02691656908629	49.2438	-0.5725
46.5188704075847	4.31936534730982	50.0191	-2.6033
46.5434926086758	4.62810210323972	51.545	-0.7619
46.5693362938849	4.95215056039788	51.7765	0.7553
46.5960735720701	5.28740373939847	50.9668	1.717
46.6234099558073	5.63017178547485	49.5265	1.5006
46.6513386088692	5.98036899397205	48.4975	2.4432
46.6797208458119	6.33625571294919	48.302	2.6164
46.7085991874056	6.69836434303042	49.309	3.6922
46.7378881320603	7.06562250889888	50.2911	5.2466
46.7674521889422	7.43633098999765	48.7027	4.8736
46.7975307413151	7.81348943775895	47.0712	4.3382
46.8284505742442	8.20119295131217	47.7278	5.7114
46.8601350882398	8.59847904577827	46.8369	6.4403
46.8925017877318	9.00431187125145	46.0043	6.8606
46.9254456704012	9.4173750184795	45.5397	7.2979
46.9588482583895	9.83618571526181	46.3909	8.819
46.9925195718078	10.2583655423143	46.5714	10.174
47.0265463436311	10.6850058175944	47.6091	10.2274
47.0607837311689	11.1142926656124	49.0558	10.279
47.0939259565202	11.529853899886	48.2378	10.888
Route: 4 Length: 60.8976550058925 Demand Met: 9553			
47.1045827416943	12.1908193405063	47.1015	12.1757
47.0826943435472	12.394782976199	47.5448	13.9665
47.0586663308525	12.6186891696171	48.0446	14.6778
47.0345636985273	12.8432996445257	49.3862	17.5735
47.0112853206364	13.0602648892732	49.1677	19.2175
46.9888212866869	13.2697029357808	49.9475	19.2284
46.9669901745842	13.4733000724041	49.9971	19.9155
46.9457371912734	13.6715554583741	51.539	18.7116
46.9248070947239	13.8668244556362	51.6732	17.1776
46.903922957393	14.0616681076349	52.0827	15.9727
46.8828734705216	14.2580366496602	53.4554	15.0784
46.8614968271439	14.4574175948741	55.8132	15.4408
46.8397147600649	14.6605185441441	53.9046	16.3668
46.8176617205686	14.8660886271052	53.7123	16.59
46.7954270992983	15.0732941188694	52.4859	17.4578
46.7731544399558	15.2808133901389	52.1655	19.1446
46.7511156425659	15.4861405834841	53.2794	21.4994
46.7298143617207	15.6846240085868	54.0368	23.8586
46.710470636825	15.8650048884765	54.2786	24.4277
46.6930894612418	16.027316964387	54.6523	25.2022
46.3057209759979	16.0139175098971	50.8742	24.2729
45.892192201414	15.9996129958505	49.1449	22.3659
45.4733020999058	15.9851223659687	48.493	25.186
45.0429958080436	15.9702363326331	47.7428	26.438
44.5922565291624	15.9546434660517	46.7163	23.0055
44.1489131173464	15.9393058091077	45.9242	19.9
43.7159384900049	15.9243263484118	45.9074	18.6439
43.2886411821062	15.9095430263724	47.2412	18.0641
42.8549369680416	15.8945381162117	46.503	16.5426
42.4143676233089	15.8792958827303	47.2642	16.1804
41.9566150515861	15.8634596650575	46.6598	16.011
41.47951055245	15.8469545690044	46.213	15.3079
40.9805624866703	15.8296945362678	45.8725	14.3747
40.4563032241375	15.811559766858	44.7075	13.3055
39.9105142341385	15.7926810225095	43.7175	13.3612

Solution x	Solution y	Original x	Original y
39.34727440887	15.7731992157202	44.2621	15.3855
38.7562263741521	15.7527560231095	44.3034	16.6265
38.1284295000752	15.7310418182109	40.715	18.8306
37.4949196074261	15.7091289199815	39.7266	17.3977
36.8673530475553	15.6874198488584	40.2335	17.1357
36.2374258914156	15.6656273854424	41.9974	13.5778
35.5661401706799	15.642403184428	40.2323	12.6508
34.8518995909142	15.6176926665554	36.7928	9.6586
34.1164249596037	15.592247704089	33.7832	8.5886
33.3813522417765	15.5668175560314	31.7997	5.4917
32.683540602538	15.5426767307395	30.7839	5.7178
32.0261597304957	15.5199354324454	29.2732	5.6917
31.4329064125775	15.4994120430498	28.1449	5.3771
30.9204714628021	15.4816826322878	27.6562	5.4902
30.4713754055209	15.4661426818571	27.2842	5.8331
30.0689920026001	15.4522175400861	26.4488	5.1021
29.7256013025198	15.4403319341895	26.246	7.8923
29.405788624213	15.4292618283689	27.9452	7.0873
29.0993961711469	15.4186559777456	28.0443	7.2557
28.8032848874128	15.4084060102679	29.6205	6.6839
28.5098175071301	15.3982478104356	29.9497	8.0977
28.2173944615428	15.3881263004565	29.2451	9.0499
27.9266104443046	15.3780620344189	29.4417	11.4808
27.63484212795	15.3679643438466	31.9656	14.6164
27.3320844968488	15.3574874424428	25.9081	14.4892
27.0303398286308	15.3470456185243	23.1228	16.7524
26.735587153725	15.3368453876038	23.3217	16.9506
26.444484246265	15.3267708431851	22.0389	18.6688
26.159604812121	15.3169109857746	22.5923	19.795
25.87869774568	15.3071880393358	23.1615	20.5337
25.5998603769975	15.2975363624677	24.5729	19.8583
25.3190001245531	15.2878145238693	27.0312	22.0371
25.0286433551593	15.2777642588899	25.2224	21.1268
24.7334065703837	15.2675451875524	24.0847	21.2619
24.4368435700137	15.257280223044	21.7951	21.835
24.146201703751	15.247220071463	21.1889	21.267
23.8634369340242	15.237432410296	20.5322	21.5891
23.5903744804733	15.2279804729473	20.5046	21.2685
23.326307147284	15.2188398855284	21.2889	20.2133
23.0686272779703	15.2099205373621	20.7311	19.0512
22.8179438061597	15.2012435386054	19.0397	19.3917
22.5767650741165	15.1928956063406	19.4151	20.4264
22.3432550313079	15.1848131820319	19.3676	20.9011
22.1159123699791	15.1769442866023	19.4476	21.0876
21.8926438262621	15.169216463902	18.4916	22.031
21.6734305918003	15.1616290418109	19.6457	23.2311
21.4543898516757	15.1540477453456	19.5225	24.6717
21.2354375746894	15.1464697907087	20.8129	26.0745
21.0129939786304	15.138771934628	19.8821	27.2321
20.6147107581676	15.0777612345236	18.7218	26.0511
20.2235586731603	15.0178433891179	17.7323	26.9057
20.0631503936242	14.9749762929512	16.9754	26.2994
19.9116119691095	14.934482293352	17.3215	22.815
19.7680161647694	14.8961121718841	15.0509	21.8739
19.6356602469271	14.8607476907426	7.8039	17.6061
20.231644442135	14.3411068691143	17.2669	18.1061
20.8557508683277	13.7969746951402	16.9397	16.157
21.5021479464317	13.2334323819182	18.1963	16.0602
22.1808572569728	12.6417297831335	19.6468	14.5775
22.8952125611769	12.0189569169948	21.6596	11.213
23.6247944449526	11.3829139065975	22.0744	6.6433
24.3480386320936	10.7524087989069	23.9142	5.5856
25.0644200991748	10.1278902621352	22.4003	2.9895
25.771863086238	9.51117170873724	19.4163	-0.8394
25.7718644896441	9.51117104605117	22.4229	-2.1641
25.971879430902	9.50279731486872	22.6294	-1.9579
26.3223424480012	9.48811251980339	24.8641	0.1355
26.6925495138112	9.47260039019898	24.5208	1.7631
27.0789960886043	9.45640767625164	25.8989	0.7413
27.4747947994499	9.43982272918901	26.7943	-2.6353
27.9703872464116	9.41899853987836	27.3755	-1.0984
28.4771545457988	9.39770447908547	28.6989	1.5656
28.9831943165568	9.37644124381179	31.0707	1.7474
29.4745371664794	9.35579542500074	31.1391	0.2266
29.9510639806172	9.33577235566337	31.0065	-1.0714
30.4134872829532	9.31634226566691	31.1128	-2.8096
31.3671053791423	9.46750855190417	32.3564	-1.4633
32.3615577285996	9.62514266564247	33.4349	0.0139
33.378717903658	9.78637291042379	33.6792	4.7017
34.4225818740497	9.95183184633319	36.4235	4.5159

Solution x	Solution y	Original x	Original y
35.459798863359	10.1162338316678	36.2059	6.8965
36.5131769281705	10.2831941320805	38.0686	7.3443
37.5627650945486	10.4495530926685	41.1669	5.3004
38.5617828883625	10.6078995215561	42.4139	3.5597
39.4985034320008	10.7563754508154	45.0418	3.8658
40.3251919720294	10.8874147011057	44.2937	4.7268
41.105164654247	11.0110512860192	44.3097	5.4051
41.8576431194782	11.1303308997701	44.0031	6.0986
42.600632120643	11.2481066151504	43.7681	7.8375
43.3449422833491	11.3660916293595	43.984	9.2005
44.0925546043266	11.484600375087	44.5689	9.75
44.8393659509461	11.6029841096302	42.7704	10.2739
45.601928392278	11.7238668634369	43.7231	10.6871
46.3621263061663	11.8443744582953	44.5228	11.8645
Route: 5 Length: 192.703511286216 Demand Met: 9975			
26.9510018469134	56.6700498068023	26.4833	65.6457
25.7882430161003	59.2461673953908	28.241	67.9653
25.0089465134049	60.9727163612078	26.4747	67.9787
24.3699504977203	62.3884265752587	25.7737	68.9159
23.8174594094176	63.6124831860474	26.4587	69.6793
23.3187355212078	64.7174173428942	26.9783	71.0141
22.8656675136215	65.7211998558301	27.6433	72.5657
22.4586899207931	66.6228679991064	27.2709	73.9256
22.0969033153166	67.424414476165	26.2205	72.9044
21.7539485582396	68.18423855983	24.5354	72.6275
21.4235684219578	68.9162032854122	24.5076	73.115
21.1033962360188	69.6255520547889	24.1578	73.3792
20.7909111420955	70.3178698847394	23.527	73.6169
20.4844222356039	70.9969030188057	24.4797	75.354
20.1866543145384	71.6566145947972	24.7401	75.4523
19.8941196548964	72.3047317467745	25.4767	75.481
19.6025679118857	72.9506712078293	25.3366	76.538
19.3133702199879	73.5913952094417	26.6151	77.1467
19.0233801707222	74.2338746837275	29.376	80.5861
18.1482144862388	75.3234183284984	27.1736	83.2653
17.486484041025	76.1472441424465	23.4089	84.0628
16.8889126762224	76.8911946749885	24.3218	77.9732
16.2379655956476	77.7015956593003	23.796	77.2181
15.4986974940927	78.6219524763057	22.8762	75.7017
14.5852347159357	79.7591740835419	21.1184	76.9048
13.4636662527601	81.1554781889557	18.7356	77.2891
12.0487065497498	82.917041558753	17.9606	81.6588
10.3187022799361	85.0708214886761	7.8142	89.6258
8.8925249175891	86.8463503611299	5.8502	91.8647
7.71797108088128	88.3086189907466	4.7737	93.7785
6.7327385620969	89.535190843756	3.4538	93.5151
5.85633602625281	90.6262741204877	3.5924	94.7451
5.05762966519293	91.6206290479161	6.3198	96.0864
4.29632912617672	92.5684153435798	9.17	97.1621
3.53880142038926	93.5115046010061	8.1477	101.1634
2.84612844307303	94.3738525207689	8.0611	104.093
2.29925368184506	95.0546879381538	3.0162	107.1796
2.15295815693965	94.9111279805992	3.1448	100.72
2.00394218847478	94.7648984617818	3.811	100.5395
1.85151059800909	94.6153171983919	4.9579	99.4405
1.69531008315622	94.4620374921313	3.1184	98.924
1.53657842470724	94.306273976463	2.5533	99.1767
1.37506784888387	94.1477835088176	1.4019	97.5847
1.2122298176608	93.9879904097686	2.1469	96.6722
1.04781144947852	93.8266465267236	1.6453	95.7178
0.882315956284472	93.664245661791	1.1743	92.9818
0.717210096704648	93.5022271493114	0.5802	93.7511
0.552258573775163	93.3403600896914	-0.0468	93.7668
0.387757048356917	93.178934614124	0.6138	95.4238
0.222417664664974	93.0166869467254	-0.1710	97.1566
0.0556185360004378	92.8530068270142	-0.339	97.1979
-0.112629033282573	92.6879053484614	-0.3116	97.6012
-0.282917565291513	92.5208010686248	-1.8619	98.5581
-0.455561222999933	92.3513856974033	-5.5457	98.4014
-0.628424237469517	92.1817550674634	-7.5489	96.9207
-0.798830087698889	92.014535656351	-12.8049	93.8535
-0.564127783698211	91.5754282552801	-6.6860	94.6391
-0.315475667662582	91.1102221088689	-3.2639	94.8889
-0.0567867020608332	90.6262379639512	-3.1358	95.2162
0.216276592515342	90.1153608452603	-2.1508	94.1499
0.501443442106918	89.5818391396778	-1.9602	93.9224
0.801285713217752	89.020861140413	-2.5612	92.1356
1.11447438398834	88.4349133282684	-2.3037	90.7079
1.43880917095566	87.8281122074191	-0.7351	89.6931
1.7702625982534	87.2079927518538	-0.1009	90.0487

Solution x	Solution y	Original x	Original y
2.11236767709826	86.5679450461378	0.6193	91.0377
2.47296296579681	85.8933039142927	1.2023	90.7259
2.85552314854989	85.1775685442185	2.5704	90.3092
3.26130409274923	84.4183892860943	3.5503	90.3653
3.69861276428165	83.6002245733966	3.5998	89.8159
4.17693347619459	82.705330119172	2.7376	84.0979
4.66295533781056	81.7960273602845	-1.2335	86.0108
5.22615973357335	80.7423235884553	-4.1255	85.596
6.46038930637866	78.4331991104841	-4.2807	74.2616
8.42551393179073	74.756647447008	0.3096	68.1954
9.809510707165	72.167327353753	1.7661	66.5446
10.9989813349951	69.9419461894255	0.4838	63.8626
11.0687857100803	69.8299333292814	4.7342	63.0935
11.1370987796114	69.7203135134367	4.4426	63.6871
11.2046428974235	69.6119276107413	5.2812	65.5492
11.2720377561795	69.5037812227294	6.9842	66.7632
11.3394099639945	69.395671182826	6.6701	63.5082
11.4060834055644	69.2886824287734	7.6803	61.1857
11.4710574713745	69.1844205985947	9.1569	61.6426
11.5346438045514	69.0823856052635	10.4334	62.822
11.5972207619524	68.9819703096675	8.4928	63.9998
11.6593034662581	68.8823481182643	9.6606	65.5604
11.7210689544988	68.7832349430961	10.5042	66.7806
11.7826244224391	68.6844587698344	10.7344	66.9849
11.8439654445551	68.5860266998009	11.4442	66.9869
11.9050302093171	68.4880379186852	11.4886	67.7219
11.9659542418514	68.3902749567597	12.0587	67.8257
12.0267311226515	68.2927481155012	12.0097	66.7734
12.0872422857421	68.1956476526461	12.0444	66.3239
12.1474543850083	68.0990270775555	12.0877	66.3858
12.2074115814791	68.0028155278646	12.5389	66.9051
12.2671832098536	67.906901746259	13.2613	67.7948
12.3268579468797	67.8111434383876	14.5018	68.1646
12.3863815434225	67.7156276547784	14.7433	68.1941
12.4457162757865	67.620414928842	14.0233	68.3418
12.504926150806	67.5254025527529	11.6475	70.8021
12.5645752661789	67.4296853498014	10.9416	69.7746
12.6245309260636	67.3334762496947	10.0835	69.723
12.6848324200752	67.2367122061576	9.1707	70.0865
12.7456313537285	67.1391499452107	9.3844	71.5303
12.8071772603162	67.040389051869	8.8648	72.0358
12.8696977385203	66.9400643080714	9.4578	72.6847
12.9333051992797	66.8379953314337	9.0002	73.0359
12.9982836482771	66.7337263880598	8.3117	72.2049
13.0645558686118	66.6273813821674	7.0214	70.8048
13.1320350354065	66.5190996345401	4.0089	72.186
13.2053683309611	66.4014239663954	6.0914	73.9114
13.2844385688031	66.274542422988	6.6564	74.2265
13.3702324039079	66.1368717492743	7.5677	74.3816
13.4627574824608	65.9883996735345	8.0472	76.1743
13.5921543765761	65.7807606433165	9.9143	75.8382
13.7457208468221	65.5343375166907	12.73	75.2001
13.9156483979545	65.2616603207445	13.7649	76.0563
14.1259735964337	64.9241584234488	15.4332	72.9689
14.3498571558053	64.5648998921561	15.0856	70.6386
14.5822810119196	64.1919370435128	16.7224	69.1113
14.8196708913818	63.8110053805283	18.9682	67.082
15.0568415383914	63.4304254829683	18.2654	71.5277
15.3109991897744	63.0225871778493	21.3934	72.6127
15.6509719724116	62.4770444796296	22.0857	71.4539
16.078750961466	61.7906023863653	22.1344	71.2137
16.7237909266767	60.7555296638487	22.9431	70.0987
17.9859391728723	58.7302068982004	22.8228	67.5784
20.2813999310517	55.0467673481646	22.6268	64.3936
34.3753716695582	32.4306985720928	37.4272	33.8061
Route: 6 Length: 71.7996115655277 Demand Met: 9999			
48.2770245705764	17.0778273034494	45.985	27.4123
48.6755622611707	18.852157210944	46.7677	27.4481
48.9901892668697	20.2529214851972	47.5893	27.8934
49.2531333158296	21.4235921965406	47.4152	28.2569
49.4837760672598	22.4504532354085	46.684	28.1154
49.6957229691827	23.3940743762048	44.6028	29.9319
49.8870921498816	24.2460756575339	44.1303	30.8739
50.0596839902178	25.0144712621702	46.4115	30.3033
50.2220685740639	25.7374141899598	46.9054	30.8841
50.3754110836293	26.4200911845967	47.3356	31.1656
50.5212630616741	27.069409436036	47.9812	30.2306
50.6626990803224	27.6990562019202	47.9603	31.0225
50.7995286158019	28.3081841095197	48.6326	32.1618
50.9307229461878	28.8922139726446	47.4903	33.2139

Solution x	Solution y	Original x	Original y
51.0557085276096	29.4485924144984	45.9581	33.5048
51.174868192095	29.9790266474182	45.6407	35.658
51.2853695955126	30.4709127778187	45.4526	36.121
51.3878259174064	30.9269863290482	44.7872	36.1398
51.48359293954	31.3532893387136	43.7884	36.8808
51.5722666347469	31.7480277073698	42.8212	36.4305
51.6554736847888	32.1184435812243	40.9959	37.9409
51.8065366860535	32.2714738723983	44.3651	39.5082
51.9576047859379	32.4245085108869	45.4903	38.3462
52.1069788938549	32.575826432741	46.003	37.4534
52.2548158864151	32.7255868625079	48.325	36.101
52.4010418541865	32.8737151389427	50.1654	34.298
52.5464119226991	33.0209763153281	50.3723	32.2399
52.692499451585	33.1689642803799	50.8592	31.2824
52.8400567519784	33.3184411351094	51.0819	30.8837
52.989526145217	33.469854931582	50.5738	30.8854
53.1415461692874	33.6238524896934	49.5432	29.0024
53.2987645114114	33.7831159248855	52.7074	28.2489
53.4603510329235	33.9468042659873	53.915	28.4629
53.6258139583284	34.1144193117777	54.5895	27.7676
53.7959289576813	34.2867468039313	55.089	27.0379
53.9719817245648	34.4650891513837	55.4854	26.8201
54.154849542385	34.6503350527084	56.8778	27.618
54.3428894520836	34.8408202283429	58.5931	27.1316
54.5363375466773	35.0367839079742	58.9981	26.6128
54.7372178031022	35.2402765142225	59.5552	26.5288
54.9465779676733	35.4523596128425	57.9508	29.6187
55.1600042860989	35.6685621057566	60.463	30.4795
55.374085726441	35.8854287108378	60.1802	30.671
55.5899880670061	36.1041404139349	58.6228	31.6703
55.8093878698781	36.3263955373026	58.4334	33.3219
56.0314346004092	36.5513324298046	55.9275	34.3566
56.2581543462375	36.781003303623	56.2795	36.0371
56.4877689516611	37.0136067865197	58.126	35.24
56.7193457869333	37.2481981316729	58.8785	37.4935
56.9496195973333	37.4814696664224	60.9493	37.7343
57.1760680501759	37.7108665133651	61.1452	36.2851
57.400717895945	37.9384419278674	60.137	35.2014
57.6267695027702	38.1674378674225	60.8351	33.4935
57.8564597602542	38.4001203245764	61.1622	34.1592
58.0895941285266	38.6362921277372	61.5106	34.0654
58.3268674347582	38.8766570040274	62.464	33.4003
58.5691520157444	39.1220986292408	63.5739	32.9982
58.8167408706625	39.3729138259212	63.8645	34.3723
59.067830758444	39.6272756953434	63.453	34.6286
59.3236145366843	39.8863925473675	62.0243	36.102
59.5849608766303	40.1511442619166	62.6603	37.129
59.8504782448523	40.4201211763502	64.2784	38.8059
60.1163167355767	40.6894232511972	65.211	38.9167
60.3816869787095	40.9582508992403	64.8516	39.5774
60.647202947063	41.2272260600807	65.3289	43.5846
60.9065754508052	41.4899774995692	64.4232	44.0581
61.1616536177711	41.7483783328273	65.7303	47.3671
61.4041459223562	41.9940290638625	67.4955	46.0347
61.6347141588818	42.2276001779627	68.7356	47.889
61.8453125663888	42.4409412321497	67.6648	48.1141
62.0434237486844	42.6416321950778	67.5609	49.631
62.2274264043247	42.8280306618311	67.7991	50.1342
62.3981889215319	43.0010163309863	66.949	50.6855
62.5590928421993	43.16401473052	66.2863	51.2705
62.7112254326316	43.3181272472673	61.2083	54.3519
62.8540573812189	43.4628167659318	66.0257	55.1875
62.8540574374117	43.4628167642798	69.4154	51.8752
62.8540574907674	43.4628167554026	69.1689	51.2673
62.8540575422668	43.4628167442783	70.8564	51.5507
62.8540575919713	43.4628167327001	71.0505	50.768
62.8540576400599	43.4628167194053	70.0624	50.1219
62.8540576869239	43.4628167054556	70.6462	49.6735
62.8540577325589	43.4628166898093	71.8965	50.0142
62.8540577765747	43.462816674176	72.0723	49.2863
62.8540578190267	43.4628166570302	73.5268	49.2611
62.8230227304285	43.4006649565982	73.2401	49.0047
62.78306096328	43.3206335914254	73.2561	47.9132
62.7380159140963	43.2304200653765	73.6395	46.5004
62.6882845425462	43.1308191338013	72.0385	47.603
62.6359746378091	43.0260522515532	71.8327	48.0379
62.5804821513473	42.9149092719639	70.7664	48.6137
62.5223000654375	42.7983773826176	70.6191	48.182
62.4616947326248	42.6769899694964	70.4096	46.4113
62.3996602287801	42.5527381701699	70.5497	45.0925

Solution x	Solution y	Original x	Original y
62.3364323519697	42.4260942604866	72.4429	44.8985
62.2698049562113	42.2926390285696	72.9198	44.5581
62.197548422593	42.1479060843785	73.6428	45.1426
62.085811459514	41.9240842209956	73.2283	44.0709
61.9460334789012	41.6440864118266	72.7013	43.6681
61.7796759855701	41.3108390017267	72.9378	43.4347
61.5485231826873	40.847778218803	72.4926	42.7909
61.2310178959947	40.2117068321235	68.0366	38.8903
60.9083450771519	39.5652788949605	66.7168	38.698
60.5830181247003	38.9135290210266	66.9624	36.7077
60.2586417146623	38.2636797960599	64.9829	35.6055
59.9413056487375	37.6279304557012	66.5887	34.1226
59.6290169671394	37.0022897917567	67.4673	33.2544
59.3187191382767	36.3806357948016	67.7055	32.9993
59.0058047869924	35.7537402200862	65.4552	32.6167
58.6949380099175	35.1309472982841	64.2717	31.7627
58.3877096542711	34.5154457540003	63.2951	31.2899
58.0834817783233	33.9059599908135	64.1748	30.2745
57.7800620384136	33.2981040666297	67.5765	27.7962
57.4796625897492	32.696314213401	68.3676	27.331
56.9955376611244	31.7267550930115	67.242	26.9141
56.5104640771767	30.7552919193359	66.7482	27.6121
55.977418718945	29.6877469053233	63.132	27.7543
55.4206709765364	28.5727188341227	62.9268	27.0211
54.8315052712543	27.392755012164	63.8119	26.0212
54.1813414450903	26.0906227029008	63.3607	23.5913
53.4804403670255	24.686877944369	62.5649	23.4331
52.7186816680269	23.1612601500646	61.643	23.6955
51.9112963010602	21.5442559957749	63.3795	20.1125
49.6357158210133	16.9867797229137	57.2331	12.7874
Route: 7 Length: 129.907865771144 Demand Met: 9998			
76.5574407527917	36.3516623729411	76.4125	46.981
78.1046904520437	37.6337720570841	75.5201	48.6107
78.9830765488931	38.3616359695227	74.8417	48.5823
79.6916941109163	38.9488235294636	75.5587	49.1352
80.2805606948229	39.4367811874305	76.379	48.6237
80.8223428103825	39.8857230007713	77.4079	49.147
81.3208268579589	40.2987864193594	78.2967	50.1808
81.767195594721	40.6686650938289	77.6289	48.4559
82.2027779079084	41.0296056871687	77.9078	47.2474
82.6374254273734	41.3897716296659	79.9479	46.2913
83.0711584276621	41.7491797277996	79.533	47.2684
83.5050877977668	42.1087505176562	80.0004	48.0282
83.9378493463489	42.4673535911638	80.3964	49.7264
84.3636664650258	42.8202022481927	80.7698	50.729
84.7788485901871	43.1642383598802	82.0477	53.0979
85.1570777628837	43.4776538750602	83.5076	51.7826
85.5190977050557	43.7776378359302	84.6532	51.7406
85.8660956253415	44.0651740111239	85.9154	51.5363
86.1993732798049	44.3413410849396	87.5129	47.9594
86.5276446017792	44.613359741354	87.8413	47.1867
86.8528280240743	44.8828196636509	89.352	47.1855
87.1735271862272	45.1485637734709	89.3464	46.1786
87.4921532887465	45.4125900795181	89.5287	45.4109
87.8101878975777	45.6761262613283	90.4865	46.0315
88.1262597669321	45.9380360515402	91.9732	45.8332
88.439113690199	46.1972793323678	91.1842	48.1207
88.7479402723291	46.4531854108798	90.3356	51.1932
89.0501159921558	46.7035803428914	89.6611	52.1615
89.3459759615046	46.9487418147572	92.412	50.9961
89.6345432932104	47.1878603338568	93.0102	50.1223
89.9173707382905	47.4222225680161	93.3823	48.5086
90.1967583009894	47.6537343872257	94.3452	48.7818
90.4717725488542	47.8816223144983	94.5726	47.3613
90.7443083578476	48.1074565131544	95.0864	47.4256
91.0142386835682	48.3311317089935	95.1396	47.3596
91.2821489346561	48.5531329937091	95.7654	46.8722
91.5482234195081	48.7736130900778	96.2485	47.1277
91.8122074680636	48.9923609689919	97.5519	44.8528
92.0748695587638	49.2100134117386	98.0879	44.5657
92.3362803953397	49.4266290051446	98.0763	43.3554
92.5985007128216	49.6439153530764	98.3613	42.0392
92.8641224620029	49.864020241952	99.6903	41.4772
93.1325904501509	50.0864835817615	102.0152	42.2262
93.3526128594839	50.2688026449212	103.0838	43.6629
93.5319035067816	50.4173695997116	103.3956	43.6231
93.6571470424794	50.5211507731204	104.1102	44.8822
93.7578162411332	50.6045686652197	103.8959	45.4099
93.852612798991	50.6831202352653	102.543	45.6081
93.9462154880084	50.760682514528	101.161	45.7653

Solution x	Solution y	Original x	Original y
94.0395739308268	50.8380423999548	100.0845	45.3198
94.1331875172513	50.9156137041394	99.7789	45.6905
94.2270703755403	50.9934081353058	100.6036	46.802
94.3207769703926	51.0710565079252	102.9297	48.0592
94.4131693412697	51.147615867936	105.6501	47.8555
94.4921756018979	51.2130829812028	106.4442	49.0895
94.4988116488037	51.2185817221074	106.6231	51.946
94.358626713606	51.3088474198194	103.8062	50.1176
94.2113939310416	51.4036512854262	101.7941	49.0832
94.0598207411085	51.501249995274	101.377	48.1816
93.9036003759802	51.6018410845093	100.8862	48.4618
93.7432171835505	51.7051126743034	98.9198	48.0008
93.5801473462299	51.8101142252042	98.2004	50.3921
93.4155278551161	51.9161136011775	98.1036	50.8139
93.2493856231309	52.0230934685533	99.0651	51.1078
93.0808807132796	52.1315946832863	99.5987	51.3246
92.909193402428	52.2421450855869	99.5817	52.1789
92.7341274039337	52.3548710711609	100.3439	52.2486
92.5541773921451	52.4707419449361	100.5945	52.9653
92.3684900525581	52.5903071616276	100.6388	53.8259
92.176349910522	52.7140274207291	97.9579	54.2407
91.9813937370653	52.8395609487222	98.2152	53.7701
91.7828204537804	52.9674235892225	97.7133	51.9341
91.5801421524299	53.0979295346742	97.7455	51.8526
91.3727796283144	53.2314517564035	96.0562	52.3857
91.1626139992613	53.366778963564	95.0304	53.2116
90.9506815089662	53.5032438926227	93.3932	53.1876
90.7380231416419	53.6401762277484	92.1982	53.9806
90.5254673512384	53.7770424962958	93.2379	56.4517
90.3128315134334	53.9139602755233	94.6877	57.1733
90.0988518074546	54.0517433615144	95.4289	57.3916
89.8823859471188	54.1911272957905	94.8477	58.3247
89.6639646989848	54.3317702957043	94.4551	58.0456
89.4435713509275	54.4736831328326	92.8209	56.9207
89.2221098863179	54.6162837311686	92.9131	56.6287
88.9991502400589	54.7598490363714	89.2688	56.3248
88.7770873756978	54.9028368720457	87.1149	58.1702
88.5579605025847	55.0439341064367	88.0225	60.7529
88.3421710123639	55.1828822119474	90.2672	64.2791
88.1307522695936	55.3190156204393	88.7937	67.447
87.3169174963331	54.9129060010407	86.2321	62.729
86.474928396302	54.4927472440817	85.8477	60.7859
85.6140213369246	54.0631483281631	81.1686	57.7423
84.7982742262582	53.6560844336581	77.9705	58.8491
84.0629856863444	53.289169815541	77.8264	55.5164
83.3850248338041	52.9508620320861	78.0993	54.3894
82.7470159639842	52.6324905267247	76.5498	52.218
82.1575921308806	52.3383632688721	76.2244	51.9684
81.6068487322805	52.063537817183	76.0043	50.5809
81.0902531824847	51.8057523884745	75.2757	50.6388
80.6042774148599	51.5632464581707	74.4488	50.3129
80.1478682872641	51.3354945011253	73.911	51.0144
79.7164384047129	51.1202073748767	73.6611	50.4924
79.3072618858299	50.9160248420779	72.1444	51.2772
78.9225451575242	50.7240479277171	72.0304	52.5053
78.556736598056	50.5415063342909	72.0955	52.6394
78.2059701989875	50.3664708956353	73.3859	52.8201
77.8636791704001	50.1956647362309	74.3979	53.0985
77.525877107594	50.0270986135078	73.8072	55.2741
77.1907075460641	49.8598461425854	72.7757	56.7077
76.8582645389875	49.6939542586887	73.7963	57.8273
76.522794218668	49.5265517420353	73.2116	57.797
76.1849819424159	49.3579805868498	70.5527	57.3223
75.85426708958	49.1929510985532	69.9782	57.1009
75.5318323371575	49.0320534289017	70.1344	58.5671
75.2145673147661	48.8737353995085	67.4683	58.2291
74.9232540311976	48.4909180975006	68.5789	56.8701
74.6153385305233	48.0862836875499	68.2826	55.0673
74.3011279953261	47.6733769313594	69.2681	55.3133
73.9743297043886	47.243928509944	69.8977	54.8286
73.6327572993245	46.7950653103139	70.694	53.8562
73.2763054956104	46.3266489768386	71.2619	53.5794
72.8996546795717	45.8316889681848	70.916	53.3608
72.4968466393151	45.3023555600116	70.2011	52.705
72.0650499824907	44.734928014217	70.1179	52.2878
71.5957030981399	44.1181554938235	69.1565	53.343
71.0416714532423	43.3900982070282	68.022	53.7678
70.2249384644331	42.3168228981256	67.8488	53.6384
55.6448014209291	23.1569673110018	50.1386	26.6573
Route: 8 Length: 185.906102555045 Demand Met: 9985			

Solution x	Solution y	Original x	Original y
38.0876214125932	23.4878158260606	35.5392	31.6783
35.1944917586634	27.1747068058158	28.099	29.8348
33.2773654821674	29.6178161833806	23.1689	25.59
32.0582884174701	31.1713984057118	21.4132	25.3225
31.5935425738048	32.4872541422033	22.8581	29.0039
31.0534164950379	34.0165902155832	21.3113	31.7798
30.5379941575672	35.4760314318637	18.7531	32.536
26.3508186190421	63.2785184556943	14.2076	63.0144
26.3508187436724	63.2785289370332	14.2239	63.9607
26.5128246926832	64.1449712395327	15.1112	64.361
26.6996540273379	65.1441468494198	15.3124	65.205
26.9218693646255	66.3325804658863	23.9369	61.5866
27.1672594444146	67.6449616018364	33.839	67.1668
27.4094043246215	68.9399930647392	35.1535	70.6086
27.6317225265641	70.1289958314681	32.2488	71.8762
27.8430062186909	71.2589893140539	31.7515	71.3679
28.0519821694543	72.3766429081154	31.4906	71.3219
28.2640303981435	73.5107280774206	31.4455	71.7336
28.4829880911772	74.6817654574707	31.0449	71.9995
28.7144814214601	75.9198433580048	32.697	74.6737
28.9519568095349	77.1899126763766	31.4187	76.5703
29.1943750155681	78.486414766126	31.105	77.2121
29.4460271795291	79.8322986698931	33.517	80.8699
29.693736257581	81.1570939912425	34.9317	80.2335
29.9470674373928	82.5119567015723	35.4073	87.2216
30.1705471416874	83.7071710880546	34.7819	91.1147
30.3490315891798	84.6617448604298	35.4152	92.5489
30.4893682985353	85.4122985694021	34.0163	93.2553
30.6092250261359	86.0533220331884	33.6244	92.4492
30.7193251417579	86.6421656183669	32.8593	93.0881
30.8213605961302	87.1878780662763	32.2034	92.5655
30.9185176401701	87.7074998682426	32.1756	91.0244
31.0138745856821	88.217494243449	33.1881	90.5996
31.1083214864071	88.7226215275732	33.2241	90.2072
31.202789385178	89.2278611462169	32.6009	89.9531
31.2981128869347	89.7376767099436	29.5221	90.7635
31.3945960531896	90.2536938814192	29.3468	93.7461
31.4896665737038	90.7621557925142	29.7064	94.0211
31.5835301404126	91.2641626366135	30.8807	93.5109
31.6770665786192	91.7644200694684	31.4281	94.9219
31.7692697644985	92.257547428251	30.7482	95.8761
31.8598040629764	92.7417496059258	29.1897	96.4145
31.9488719706259	93.2181093573156	26.6904	96.1713
32.0374965993445	93.6920980973271	26.1674	96.1159
32.1262741586949	94.1669043951856	26.55	96.735
32.2149033045046	94.6409166455474	21.5395	100.4343
32.3432565953429	94.7631937595414	26.9511	99.1097
32.472669461081	94.8864802256561	28.2891	98.27
32.6028898400357	95.0105359505378	29.7849	97.5299
32.7335609317511	95.1350210640677	31.6916	96.8159
32.8640999913932	95.2593804567386	31.7064	96.988
32.99467499564	95.3837741347214	32.4952	97.9758
33.1245589288317	95.5075094310203	33.0573	97.9271
33.2537765216554	95.6306099184815	34.0464	97.1856
33.3823973837578	95.7531419712523	33.9629	96.8355
33.510809091547	95.8754748503544	34.0458	95.0903
33.6400129330978	95.9985625765372	35.2297	94.8683
33.7695903044469	96.1220063930984	35.9551	95.9225
33.898820813119	96.2451199420618	35.7481	97.1257
34.0275478541244	96.367753969228	35.7859	98.3251
34.1553815472052	96.4895369840567	36.8108	99.4487
34.281101082798	96.6093058710147	35.0473	98.5367
34.40637530258	96.7286505975972	33.8351	99.3235
34.5315807745777	96.8479299071635	35.2228	101.4244
34.6549956926473	96.9655033443682	35.5571	102.295
34.7763674616315	97.0811302630505	35.7306	102.2767
34.8961306374617	97.1952247012721	35.4006	103.6799
35.0138864470705	97.3074067351903	34.3074	104.3145
35.1298911563569	97.4179205410451	31.6341	101.1443
35.247357209951	97.5298267571357	29.8552	101.3038
35.3671535302162	97.6439532697998	30.1816	102.1772
35.488997384053	97.7600307330243	28.1717	107.4546
35.4890051530837	97.7600370077254	31.3011	106.2109
35.4890128662101	97.7600432506841	32.8361	107.2479
35.489020507304	97.7600494478165	33.1686	108.6172
35.4890275848938	97.7600552566998	33.1638	109.6815
36.0220542449917	97.6000994946016	35.3466	107.7036
36.6081736533245	97.4242112191665	35.7224	107.36
37.2596311670732	97.2287156725858	37.1983	106.347
37.9463166780734	97.0226488246673	39.1965	105.4524

Solution x	Solution y	Original x	Original y
38.6420704033779	96.8138611322897	40.9527	105.6227
39.3352704268274	96.6058403279214	42.4716	105.6496
40.0149731177505	96.4018705588853	42.9285	106.2179
40.6916574152631	96.198807275229	45.465	105.2608
41.3298912436473	96.0072831030557	48.0764	105.8084
41.8450046459339	95.8527011063808	46.5537	103.4177
42.3411395163634	95.7038151958001	45.0704	101.2748
42.8317226253961	95.556595741763	44.7902	101.1589
43.321068102052	95.409747994475	46.0729	100.678
43.8049660694567	95.26453542262	47.126	99.3914
44.281839454096	95.1214311988118	53.9006	102.5381
44.2879361895472	94.9434142349072	51.1106	98.2963
44.2940317356163	94.7654215268371	48.9533	90.4759
44.2998713909535	94.5948994140872	47.7789	92.5461
44.305536505268	94.4294727136666	44.0393	95.7757
44.3111427193969	94.265766940136	41.6896	94.8028
44.3166778345326	94.1041400242819	40.9431	96.0349
44.3221763086351	93.9435854466696	42.0978	97.503
44.3276764556392	93.7829831828093	42.2565	98.7398
44.333221558089	93.6210688345271	43.0828	99.6317
44.3388496584867	93.4567304331756	42.9226	100.4615
44.3446125511592	93.2884549363667	42.5793	100.4271
44.3505248728548	93.1158148382135	42.8352	101.6931
44.3566989278069	92.9355296312627	42.0156	103.5929
44.3638169042796	92.7276765988234	40.5226	102.8002
44.3720197972606	92.4881381136242	40.2693	101.3043
44.3808977083198	92.2288847620872	39.3246	101.8921
44.3916269873505	91.9155602850014	38.189	100.3805
44.404053449877	91.5526677290899	39.196	99.7694
44.4179245688792	91.147581867599	39.7333	98.7582
44.4330260329257	90.7065621278867	40.065	98.6098
44.4497299576631	90.2187394311523	38.2186	96.6747
44.4679744683162	89.6859225897551	37.1788	95.0118
44.4877239865777	89.1091511229464	37.3296	94.7968
44.5095433828839	88.4719252208042	36.1694	94.3523
44.5357739802922	87.7058572461033	37.0706	93.0168
44.5655901395916	86.8350618474772	37.9917	90.5379
44.5973000107447	85.9089575253228	39.6285	91.4521
44.6325800963165	84.8785796630413	41.599	92.4813
44.6755713627143	83.6229905224946	43.1057	91.7939
44.731531389745	81.9886646962617	42.9721	90.3177
44.8118104832286	79.644160335491	42.6808	88.2098
44.952241824326	75.5429343080628	40.8939	84.3555
45.846544101047	49.4191350025841	50.3352	41.2014
46.0273725076377	44.1379966499481	51.6292	37.4529
46.1383797275709	40.8962361876737	53.589	37.6567
46.2316528761783	38.172139049352	51.7623	34.8081
46.3126341598261	35.806823999129	51.473	33.7115
46.3870672763683	33.6326699320281	54.3132	33.4794
46.459844670198	31.5067652987546	53.8796	31.7093
46.5319320379966	29.4009286343736	52.5136	31.162
46.607197535202	27.2020999331713	54.7376	29.7596
46.6884786338954	24.8271856455436	54.8257	29.6059
46.7946601913363	21.7244695137395	55.1607	27.7715

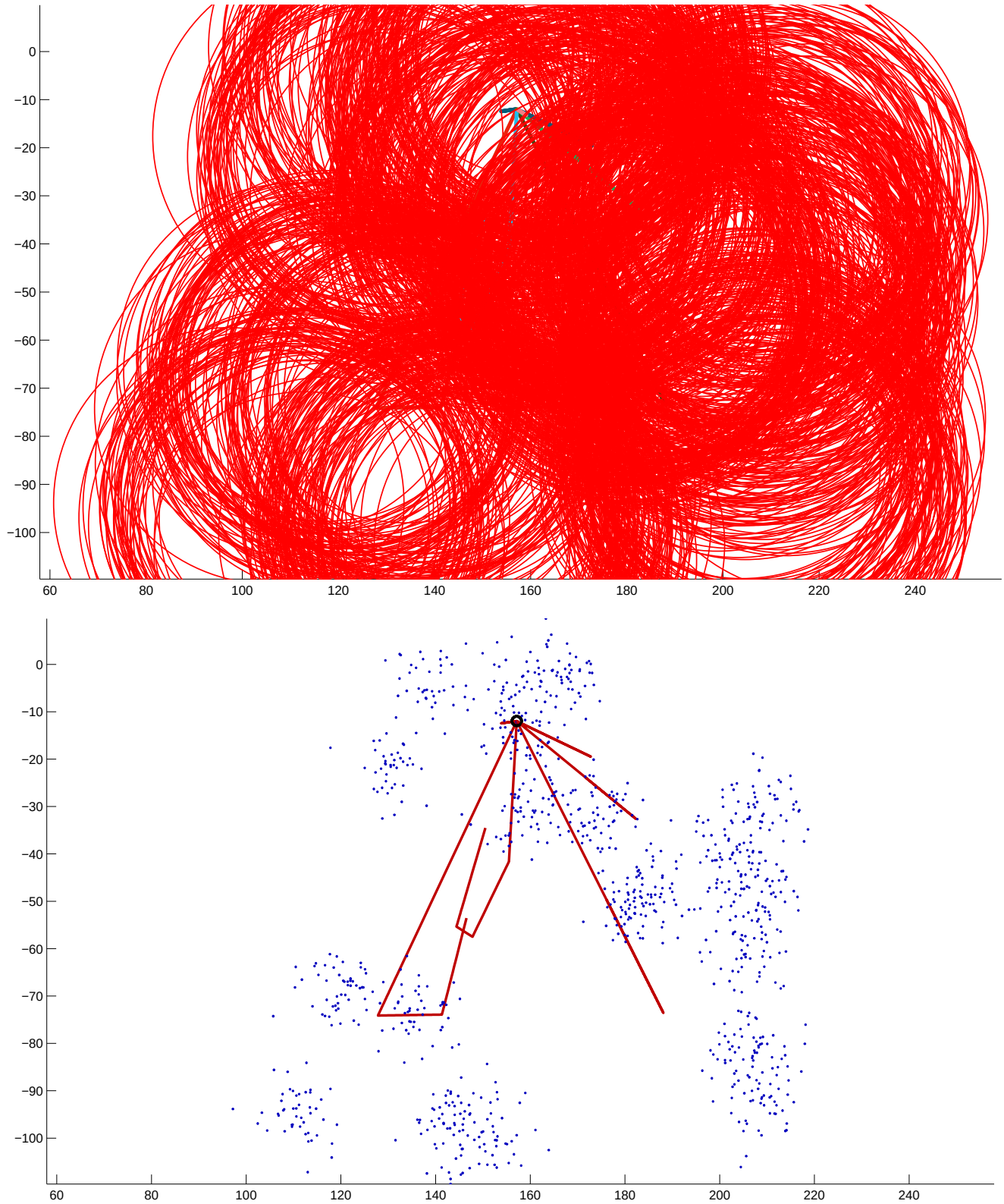


Figure O.28: $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Euclidean, Length = 491.5866746

Table O-31: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Euclidean

Total distance: 491.586674583231			
Total demand met: 76422			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 137.913422026044 Demand Met: 10000			
62.075404851037	41.6863849958105	86.2321	62.729
64.6706406862986	46.8467834033183	88.7937	67.447
66.1307090162546	49.7500048624137	92.0851	66.8651
67.2114132400682	51.8989012559765	93.0933	68.7697
68.0468770996388	53.5601512227556	94.6798	69.1984
68.7221758189434	54.9029207145404	93.9524	73.145
69.2745097228082	56.0011824973907	94.549	73.3405
69.7484520544614	56.9435689682341	95.9481	74.251
70.1563403712789	57.7546131756318	96.2521	73.5638
70.5230169546882	58.4837123617416	97.5653	74.5618
70.8506193729679	59.1351168043733	97.816	74.8015
71.1491340002021	59.7286834676965	96.1169	76.0362
71.4282544002928	60.2836870475	94.4072	76.9857
71.6934587554296	60.8110202568928	93.1133	78.1389
71.9471753138349	61.3155112471366	94.6945	78.572
72.1889647590871	61.7962862857612	97.1852	78.7831
72.4167489128805	62.2492129262411	97.7624	79.6432
72.6303050161943	62.6738481154976	98.5933	78.8152
72.8317500608399	63.0744012496526	99.1261	78.6323
73.0224031241453	63.45349515524	101.2985	78.2917
73.2006524562693	63.8079249593461	100.0565	80.1054
73.3686093907739	64.1418889085337	98.9119	80.0767
73.5293395261555	64.4614827034225	98.567	80.2017
73.6840628800651	64.7691322689005	98.2007	80.5294
73.8336347432356	65.066538308232	98.2345	80.86
73.9785017392557	65.3545889283343	97.8831	81.9659
74.118797287621	65.6335494654202	97.3132	81.5365
74.2554120938939	65.9051910241226	97.4314	81.946
74.3884598778345	66.1697397609988	96.9541	82.6989
74.5181141625584	66.427540745537	96.8706	83.0827
74.6445772636184	66.6789962983325	97.0865	83.6094
74.7679336130101	66.924274343746	94.9909	83.4209
74.8890099249939	67.1650187297394	94.0795	80.8773
75.008659264708	67.4029256765233	93.2494	81.8793
75.1269694956737	67.6381699202711	92.1151	81.2598
75.2442704806759	67.8714073624687	92.6699	80.64
75.3607491997491	68.1030098082455	91.86	79.7087
75.476672646992	68.3335081524176	91.1291	78.4897
75.5922989517384	68.5634156702437	91.0116	75.887
75.7079691205681	68.7934104340851	89.835	77.746
75.8235927925545	69.0233127881722	89.95	80.2132
75.9389509670122	69.2526872787031	88.0687	81.4777
76.0540044823167	69.4814560336955	88.6759	82.3658
76.1687142355283	69.7095413059793	89.5631	83.3752
76.2830004841415	69.9367845354121	86.3374	85.7586
76.3967334449758	70.1629276403873	88.3633	87.3681
76.5097366643349	70.3876197638137	91.1677	84.1211
76.6223731409034	70.6115827035706	91.14	83.5499
76.7347217219964	70.8349732418313	92.288	83.6157
76.8467345349696	71.0576961864012	93.4941	85.8189
76.9581248878958	71.2791814744243	93.0994	86.3608
77.0688553333245	71.4993546364721	93.9684	87.8762
77.1787273135818	71.7178208605959	93.1284	88.6615
77.287766005148	71.9346302066324	92.7178	89.1801
77.3960151203845	72.1498695942358	92.5654	91.5305
77.50320292634	72.3629987120267	88.6062	92.2681
77.6094401361852	72.5742376736842	92.4623	94.734
77.7141388665121	72.7824175493924	94.0924	96.5838
77.8167148482206	72.98637659208	95.504	96.351
77.9170918762419	73.1859632726921	95.7576	96.9635
78.0151363925776	73.38091202445	95.0373	98.5247
78.1105834372307	73.5706959969949	94.4828	106.1237
78.0892754657257	73.5283312027804	95.6122	103.8055
78.0674214214976	73.4848806438339	98.8373	99.4165
78.0453162507731	73.4409307955074	98.2349	98.4363
78.0230038179151	73.3965688717624	103.8628	98.4843
77.9975126113278	73.3458868851801	104.1034	98.3317
77.9646459998119	73.280541217393	104.1728	96.9352
77.9297535257561	73.2111677276071	103.2876	94.1817
77.8942726943687	73.1406244644365	101.8123	94.891
77.8582694937105	73.0690426250037	101.583	94.8217
77.8217573182591	72.9964488354815	100.6204	94.7646
77.7847961989587	72.9229624486669	102.0076	93.075
77.7474105049679	72.8486319129188	101.602	92.3175
77.7096598691874	72.7735757912335	100.8882	91.1406
77.6716189569962	72.6979425325829	100.5649	91.4192
77.6332826097235	72.6217218789031	99.3434	90.9979
77.5946869702611	72.5449856876796	98.9319	91.3958
77.5558137544437	72.4676976033443	98.853	91.6792
77.5166455691125	72.3898230394113	99.3782	93.0601
77.4770908554867	72.3111799539339	98.656	92.6213
77.4371780997147	72.2318249833874	97.0347	92.0258
77.3969549422687	72.1518528494582	96.5235	92.1962
77.3564100765883	72.0712410737957	95.2026	90.5293
77.3156087136782	71.9901193075734	96.8345	90.0197
77.2745390357952	71.9084640519227	98.1138	89.594
77.2331897553346	71.8262528615826	98.3726	88.4744
77.1916009995611	71.7435655142754	97.7943	87.7833
77.1498303803083	71.6605165493039	96.2545	87.1498
77.1079522117569	71.577253710246	95.9325	86.7596
77.0660033303268	71.493850230201	96.9343	84.943
77.0240132049859	71.4103646924133	99.0152	86.155
76.9818812088619	71.3265970312336	100.7126	88.5952
76.9393847038364	71.2421046002065	102.4507	89.6037
76.8962576075448	71.1563583701552	104.3693	90.8389
76.8518281806248	71.0680227508699	105.6506	92.4297
76.7831744703624	70.9315238846383	104.5599	87.8351
76.7122369434395	70.7904841593741	107.2392	85.9448
76.6370651641153	70.6410255775178	104.3617	84.8664
76.5602391145921	70.4882778533989	102.2936	85.0217
76.4821752355993	70.3330689998559	102.0461	86.7072
76.402550625405	70.1747570271702	101.1477	85.2681
76.3217092173061	70.0140257807969	101.0606	82.9382
76.2398511970191	69.85127328382	103.1106	83.2736
76.1563578394661	69.6852693060556	103.8313	82.5056
76.070852787731	69.5152654658933	103.6911	80.62
75.9835227440343	69.3416329040883	107.981	80.0957
75.8899664011385	69.155620149291	108.1531	76.0691
75.7921931382551	68.9612224234641	103.5291	67.906
75.693761281875	68.7655149452597	102.9023	68.4164
75.5947186123261	68.5685926694509	101.778	67.1686
75.4953391246645	68.3710003642318	99.4285	63.8276
75.3960157080621	68.1735191454707	98.4228	65.0226
75.296608115515	67.9758699952087	98.4258	65.8894
75.1969442242546	67.7777104804256	97.9014	66.9835
75.0968404199726	67.5786753141396	94.6788	63.8911
74.9965914500569	67.3793504497975	93.9444	64.9
74.8961102864482	67.1795626339205	92.749	64.7326
74.7954624803911	66.9794419800118	93.5538	62.1822
74.6948725271666	66.7794345387517	94.5987	62.0376
74.5943779265098	66.5796145775338	94.6583	60.3511
74.4941400513753	66.3803026469421	95.1558	61.2395
74.3940986686447	66.1813789736693	95.479	61.1306
74.2942413342133	65.982818996109	95.4724	61.7777
74.1944333961862	65.7843554583379	96.4356	62.0951
74.0944895912768	65.5856209061487	99.0429	61.6589
73.9941456733804	65.3860912427991	99.3413	60.508
73.8933463108409	65.1856572585887	100.6854	61.817
73.7917898618569	64.9837200869369	102.6402	60.9181
73.6893829924148	64.7800945785217	103.9916	60.6173
73.5859218166619	64.5743753895398	99.9754	58.6633
73.4823138921561	64.3683671799378	98.8606	57.9963
73.3786404205807	64.1622314728763	99.7259	57.0659
73.2748108714509	63.9557881548698	102.1595	55.9791
73.1703761730402	63.7481438573082	102.8738	56.4102
73.0647905895789	63.5382128376509	106.6231	51.946
72.9520563422065	63.3140673812139	106.4442	49.0895
72.1539136112894	61.7266288160488	105.6501	47.8555
70.9739579242753	59.3800436830696	102.9297	48.0592
69.7444378606441	56.9349021804927	103.8062	50.1176
68.1486701559792	53.7614611389129	100.5945	52.9653
66.0729016816202	49.6335005444531	98.1036	50.8139
Route: 2 Length: 6.57789360521983 Demand Met: 9994			
47.0867605562986	11.9719247928966	55.3647	9.0137
47.0481522212153	11.9774719291645	57.2331	12.7874
47.0060123100489	11.9835267331203	55.9782	19.9329
46.9613189433239	11.9899458925502	54.0368	23.8586
46.9164125206355	11.9963908150129	54.2786	24.4277
46.8729023953293	12.0026304868781	54.6523	25.2022
46.831295305774	12.0085935139291	55.089	27.0379
46.7912742132133	12.0143266128406	55.4854	26.8201
46.752648546843	12.0198582557649	63.3795	20.1125

Solution x	Solution y	Original x	Original y
46.7145694935535	12.0253106244931	61.7542	11.527
46.6773437426559	12.030640598612	64.6914	7.7788
46.6402169611557	12.0359560391988	63.4243	4.3429
46.6029802156949	12.0412869857894	61.565	4.5717
46.5652107444419	12.0466940787321	60.5785	6.8128
46.5263611633572	12.052255919353	60.2628	6.0605
46.4865078930337	12.0579618391436	58.8992	5.3006
46.4459129292368	12.0637747727178	58.5415	3.6684
46.4049015421783	12.0696484424874	58.0726	3.0503
46.363718720961	12.0755480785698	57.7618	2.6586
46.3225895099835	12.0814415694707	56.514	2.6652
46.2816786171251	12.0873053437908	55.7669	1.6852
46.2410936204595	12.0931238123573	54.7597	1.1902
46.2008857343777	12.0988896093929	56.047	-0.6998
46.1612299749664	12.1045773992145	58.2864	0.0731
46.12215606433	12.1101827594861	58.2741	0.1622
46.0836702922087	12.1157043611994	57.3839	0.9502
46.0455665782753	12.1211713945173	58.2987	1.8222
46.0076014013581	12.1266184359583	58.6741	1.1796
45.9696951304598	12.1320565909941	60.4167	1.4088
45.9316861402552	12.1375087467809	60.4719	1.0667
45.8935991687642	12.1429711094279	62.5325	1.766
45.8553096649581	12.1484612410335	63.0749	1.8033
45.8167975417682	12.1539819728565	62.7821	-0.0838
45.77818024237	12.1595166666279	62.4332	-0.684
45.7394566979656	12.1650658515723	61.9524	-0.333
45.7005061262854	12.1706473391743	58.3955	-2.2935
45.6614589783611	12.1762432188787	57.7878	-4.3732
45.6222429996854	12.1818645362781	53.289	-9.6645
45.5833542149384	12.1874404014185	54.4331	-6.2551
45.5445151426758	12.1930110371168	53.8048	-5.0553
45.5058218460883	12.1985624222169	53.412	-4.2453
45.467309786483	12.2040889192115	53.5826	-3.7128
45.4288746929584	12.2096046604825	51.545	-0.7619
45.3904152915693	12.2151235363739	51.7765	0.7553
45.3516568744262	12.2206842017105	51.8363	2.0767
45.3122765959253	12.2263323960236	48.4975	2.4432
45.2725024162518	12.2320354368298	49.2438	-0.5725
45.2320442615874	12.2378350507949	50.0191	-2.6033
45.1903564806094	12.2438099416553	46.0937	-5.8176
45.1478457335271	12.2499021857879	43.0131	-4.6452
45.1047377300506	12.2560796593781	44.8479	-0.9391
45.0602253351838	12.2624583578178	42.4155	0.0668
45.0145498314605	12.269004042051	39.9467	-2.3317
44.9679610073963	12.2756811835926	36.4279	-4.3699
44.920912374094	12.2824245642495	33.4349	0.0139
44.8736422244101	12.289200649651	32.3564	-1.4633
44.8261789679506	12.2960049461232	31.1128	-2.8096
44.7785711323774	12.3028302241822	31.0065	-1.0714
44.7306364777014	12.3097025785382	31.1391	0.2266
44.6821732160818	12.3166504668565	28.6989	1.5656
44.6333755157674	12.3236462511253	27.3755	-1.0984
44.5842169716369	12.3306940965695	26.7943	-2.6353
44.5345845801684	12.3378106954517	25.8989	0.7413
44.4845693336638	12.3449842204924	24.5208	1.7631
44.4344659451252	12.3521737593236	24.8641	0.1355
44.3843594016185	12.3593688019396	22.6294	-1.9579
44.334635900017	12.3665148566941	22.4229	-2.1641
44.2854771329364	12.3735859063558	19.4163	-0.8394
44.2374343080135	12.3805014497405	22.4003	2.9895
44.1903518880729	12.3872828945335	23.9142	5.5856
44.143990546647	12.3939633015789	22.0744	6.6433
44.0979505270691	12.4005984519945	21.6596	11.213
44.0522454870371	12.4071857574032	19.6468	14.5775
44.0069468270597	12.4137140002267	18.1963	16.0602
43.962005364327	12.420189277868	16.9397	16.157
43.9172698189055	12.4266322769781	17.2669	18.1061
43.8730902415647	12.4329926476809	7.8039	17.6061
43.9297590574339	12.424865105584	15.0509	21.8739
43.9890939500157	12.4163544215985	17.3215	22.815
44.0504156817348	12.4075577840952	18.4916	22.031
44.1131780042859	12.3985533216296	19.6457	23.2311
44.1765777822546	12.3894563202936	19.5225	24.6717
44.2403845723261	12.3802998049879	21.4132	25.3225
44.304089213697	12.3711570525458	23.1689	25.59
44.3674636489523	12.3620610973401	20.8129	26.0745
44.4312327288074	12.3529078437591	19.8821	27.2321
44.495807772445	12.3436383572781	18.7218	26.0511
44.561651531998	12.3341861216456	16.9754	26.2994
44.629492421305	12.3244462482759	17.7323	26.9057

Solution x	Solution y	Original x	Original y
44.6993098738086	12.3144209861646	18.7531	32.536
44.7713800316586	12.3040695422346	21.3113	31.7798
44.8444998917868	12.2935649984197	22.8581	29.0039
44.9174589778153	12.2830820429823	28.099	29.8348
44.989055493103	12.2727952121513	27.0312	22.0371
45.0591102872013	12.2627309029697	25.2224	21.1268
45.1276861118583	12.2528807741398	24.5729	19.8583
45.1949122166229	12.2432262629532	24.0847	21.2619
45.2611005225193	12.2337226553628	23.1615	20.5337
45.326531238555	12.2243293975977	22.5923	19.795
45.3914350711347	12.2150129862661	21.2889	20.2133
45.4560613788419	12.205737185697	21.1889	21.267
45.5206296785809	12.1964700736035	21.7951	21.835
45.5852756890964	12.1871917632585	20.5322	21.5891
45.6501132700009	12.1778854919779	20.5046	21.2685
45.7150838787629	12.1685593587332	19.4476	21.0876
45.7801018389023	12.159225426229	19.3676	20.9011
45.8448410050469	12.1499303978967	19.4151	20.4264
45.9087813346093	12.1407489567175	19.0397	19.3917
45.9712655511478	12.1317756033225	20.7311	19.0512
46.0314782849115	12.1231277981929	22.0389	18.6688
46.0887549858529	12.11490143463	23.3217	16.9506
46.1426713148467	12.1071577925444	23.1228	16.7524
46.1927128317969	12.0999711870768	25.9081	14.4892
46.2392542555328	12.0932878306539	31.9656	14.6164
46.2832074271285	12.0869768094409	29.4417	11.4808
46.3245314660985	12.0810439708841	29.2451	9.0499
46.3634144259216	12.0754622452364	29.9497	8.0977
46.4002015697692	12.0701819619026	29.6205	6.6839
46.435088260407	12.0651749492489	28.0443	7.2557
46.4680173435947	12.0604493170284	27.9452	7.0873
46.4991924963681	12.0559757132793	26.246	7.8923
46.5285814148387	12.0517587178694	26.4488	5.1021
46.5568484957668	12.0477028733115	27.2842	5.8331
46.5851112896132	12.0436477453287	27.6562	5.4902
46.6151275233904	12.0393411819275	28.1449	5.3771
46.6497880015746	12.0343690853726	29.2732	5.6917
46.6929246319989	12.028184624395	30.7839	5.7178
46.7474943172588	12.0203697289399	31.7997	5.4917
46.8152507962313	12.0106747395632	33.7832	8.5886
46.9002665786736	11.9985146302774	33.6792	4.7017
47.0035024365379	11.9837674646547	36.4235	4.5159
Route: 3 Length: 146.166831130521 Demand Met: 10000			
32.4118172354462	43.1836626814347	12.0097	66.7734
29.1390532262896	50.1259347143747	14.5018	68.1646
26.7461801537664	55.2017818635442	12.73	75.2001
24.9570995865957	58.9968507029409	17.9606	81.6588
23.4932140383948	62.1020861179806	7.8142	89.6258
22.5724243990602	64.0552770735043	5.8502	91.8647
21.936487374307	65.4042311165759	4.77370000000001	93.7785
21.4779541542901	66.3768715278297	3.4538	93.5151
21.1089570785796	67.1595859425687	3.5924	94.7451
20.8035199689372	67.8074761749889	2.1469	96.6722
20.5794607841329	68.2827478996716	1.64530000000001	95.7178
20.3880519805329	68.6887617697992	0.613799999999998	95.4238
20.2210278179581	69.0430511778593	-0.0468000000000046	93.7668
20.0679869003505	69.3676795686438	0.580200000000005	93.7511
19.9253844773127	69.6701660653674	1.1743	92.9818
19.7902329087782	69.956848048732	0.619299999999996	91.0377
19.660487688501	70.2320623402482	1.20229999999999	90.7259
19.5351115520696	70.4980091668682	2.57040000000001	90.3092
19.4130457820444	70.7569342565791	3.55029999999999	90.3653
19.2937229084197	71.0100412810356	3.5998	89.8159
19.1766965687505	71.2582770110655	2.7376	84.0979
19.0604990260906	71.5047548460758	-4.2807	74.2616
18.944408792143	71.7510052557695	-4.1255	85.596
18.8304765341215	71.9926781956021	-1.23350000000001	86.0108
18.7181286359091	72.2309904053591	-0.735100000000003	89.6931
18.6080904907724	72.4644031341103	-0.100899999999996	90.0487
18.5001987135765	72.6932629489746	-2.30370000000001	90.7079
18.3949797228692	72.9164532059068	-2.5612	92.1356
18.2926980383381	73.1334127962745	-1.9602	93.9224
18.1934621133136	73.3439116587324	-2.1508	94.1499
18.0970695214371	73.5483791878265	-3.1358	95.2162
18.003957062615	73.7458888560087	-3.26390000000001	94.8889
17.9136224588088	73.9375061005288	-6.68600000000001	94.6391
17.8275000732482	74.1201884109354	-12.8049	93.8535
17.8583384277156	74.119747098501	-7.5489	96.9207
17.8897668075752	74.1192973502468	-5.5457	98.4014
17.9217086365235	74.1188402690405	-1.86190000000001	98.5581

Solution x	Solution y	Original x	Original y
17.9542152569906	74.118375101761	-0.311599999999999	97.6012
17.9872789797745	74.1179019520963	-0.338999999999999	97.1979
18.0209304409126	74.1174203846761	-0.171000000000006	97.1566
18.0551924070259	74.1169300761029	1.4019	97.5847
18.0900376483248	74.1164314093016	2.55330000000001	99.1767
18.1254571049265	74.1159245071129	3.11839999999999	98.924
18.1614706073891	74.1154090915656	4.95789999999999	99.4405
18.1979931740228	74.1148863737102	3.81100000000001	100.5395
18.2350832245817	74.1143555352724	3.1448	100.72
18.2728336834377	74.1138152654246	3.0162	107.1796
18.5357282315295	74.1100503763798	8.0611	104.093
18.8044905954241	74.1062014244795	8.1477	101.1634
19.0781459206705	74.1022822964012	6.3198	96.0864
19.3591671944698	74.0982574790988	9.17	97.1621
19.6466123988748	74.0941404658497	21.5395	100.4343
19.9318880521844	74.0900545945114	26.1674	96.1159
20.2140273995564	74.086013780189	26.6904	96.1713
20.493378532255	74.0820130359643	26.55	96.735
20.7704458405233	74.0780451134164	26.9511	99.1097
21.0446488513803	74.0741183089115	28.2891	98.27
21.3157388488557	74.0702361877218	29.7849	97.5299
21.5832265975267	74.0664057713576	29.1897	96.4145
21.8486402762966	74.0626051091243	30.7482	95.8761
22.1113219722915	74.058843647525	31.4281	94.9219
22.3716426275843	74.0551160632755	31.6916	96.8159
22.6295635167144	74.0514228795094	31.7064	96.988
22.8856960130099	74.0477553097012	32.4952	97.9758
23.1396974591414	74.0441182611321	33.0573	97.9271
23.3916160408319	74.0405110434506	34.0464	97.1856
23.6411615387028	74.0369378370362	33.9629	96.8355
23.888533082085	74.0333957882939	34.0458	95.0903
24.1341962565546	74.0298782371461	35.2297	94.8683
24.377610858751	74.0263929487723	35.9551	95.9225
24.6184666022463	74.0229443698179	35.7481	97.1257
24.8570985473062	74.0195276828905	35.7859	98.3251
25.0935071097718	74.0161428824666	35.0473	98.5367
25.3283651479498	74.0127803258808	33.8351	99.3235
25.5622538587618	74.0094316813644	31.6341	101.1443
25.7959628981881	74.0060856175542	29.8552	101.3038
26.0305443630977	74.0027270534201	30.1816	102.1772
26.2658379639379	73.9993582987065	28.1717	107.4546
26.5025709050053	73.9959689310756	31.3011	106.2109
26.7390441090806	73.9925833024213	32.8361	107.2479
26.9731260136891	73.9892319663654	33.1686	108.6172
27.1990390134402	73.985997688007	33.1638	109.6815
27.3905696891526	73.9832558502142	35.3466	107.7036
27.5776347011293	73.9805779710526	35.7224	107.36
27.7611228708155	73.9779513179627	37.1983	106.347
27.9412491574767	73.9753728513799	34.3074	104.3145
28.1209472331838	73.9728005074792	35.4006	103.6799
28.2997069151478	73.9702416183473	35.7306	102.2767
28.4777627250104	73.9676928213094	35.5571	102.295
28.6551795265122	73.9651531716824	35.2228	101.4244
28.8322158645827	73.9626189478352	36.8108	99.4487
29.0087196997796	73.9600923462985	38.189	100.3805
29.1840942838902	73.9575819170034	39.196	99.7694
29.358121454082	73.9550907846718	39.7333	98.7582
29.5307901942934	73.9526191067441	40.065	98.6098
29.7020290040404	73.9501678987526	40.2693	101.3043
29.8712630089328	73.9477453737493	39.3246	101.8921
30.038960794276	73.9453447786103	40.5226	102.8002
30.2047053436685	73.9429720885665	42.0156	103.5929
30.367803968763	73.9406372302632	39.1965	105.4524
30.5290864414852	73.9383282412715	40.9527	105.6227
30.6875715855984	73.936059178462	42.4716	105.6496
30.8421932987216	73.9338452922634	42.9285	106.2179
30.9909178357071	73.9317156368386	45.465	105.2608
31.1322943092668	73.9296909990306	46.5537	103.4177
31.2700800051705	73.927717640556	48.0764	105.8084
31.3364940548174	73.9267622983352	53.9006	102.5381
31.4000661843492	73.6773370016772	51.1106	98.2963
31.4653190008803	73.4213171339654	47.126	99.3914
31.5323280504546	73.1584066791202	46.0729	100.678
31.601803675166	72.8858186042001	45.0704	101.2748
31.6742917015833	72.6014114046279	44.7902	101.1589
31.7500729794652	72.3040831067496	42.8352	101.6931
31.8297687157948	71.9913965700703	42.5793	100.4271
31.9128050962829	71.6656030771611	42.9226	100.4615
31.9998363803568	71.3241355217918	43.0828	99.6317
32.0908008085874	70.9672360817952	42.2565	98.7398

Solution x	Solution y	Original x	Original y
32.1854755022186	70.5957791703341	42.0978	97.503
32.2835296844825	70.211062379212	44.0393	95.7757
32.3844752689437	69.8150000193645	41.6896	94.8028
32.4881164183134	69.4083604038061	40.9431	96.0349
32.5955379701957	68.9868871468437	38.2186	96.6747
32.7077976449244	68.5464306269932	37.1788	95.0118
32.8244482412965	68.0887451967687	37.3296	94.7968
32.9461077205947	67.6114062192417	36.1694	94.3523
33.0734730536702	67.1116795071682	37.0706	93.0168
33.2064561766792	66.589910457627	35.4152	92.5489
33.3458796117766	66.0428729108533	34.0163	93.2553
33.4939905422049	65.4617518427594	33.6244	92.4492
33.6515762600741	64.8434601496984	32.8593	93.0881
33.8218815429797	64.1752702192186	32.2034	92.5655
34.006885809958	63.4494196823324	30.8807	93.5109
34.2149175030431	62.6332381314514	29.7064	94.0211
34.4624692289345	61.6620259606058	29.3468	93.7461
34.7795438357439	60.4180805430429	29.5221	90.7635
35.1725821929169	58.8761294622729	32.1756	91.0244
35.7281581166918	56.6965545062322	33.1881	90.5996
36.5313599776532	53.5460442653641	40.8939	84.3555
Route: 4 Length: 96.5698427114585 Demand Met: 10000			
46.9445634937096	15.2994755320814	59.6709	-1.5476
45.8311334830195	35.4564105299072	75.73	42.7229
45.5614060122352	40.3397549722983	80.3964	49.7264
45.491306788366	41.608942658222	80.7698	50.729
45.1939480292752	42.2232902974189	78.2967	50.1808
44.8627816447909	42.9074871415804	76.0043	50.5809
44.5089378293109	43.638536851244	76.5498	52.218
44.1350938495726	44.4109064813173	78.0993	54.3894
43.7174369563639	45.2737910205146	77.8264	55.5164
43.232509166505	46.2756573744248	73.8072	55.2741
42.7363439362311	47.3007401041864	72.7757	56.7077
42.2325857849242	48.341509931483	73.7963	57.8273
41.713271655077	49.4144191316264	73.2116	57.797
41.1745162169844	50.5274956693186	70.1344	58.5671
40.627361843086	51.657925889577	70.5527	57.3223
40.0589601743252	52.8322555961139	69.9782	57.1009
39.4596549977022	54.0704354702197	68.5789	56.8701
38.8234154915755	55.3849266180155	67.4683	58.2291
38.149380594581	56.7775090205461	48.9533	90.4759
37.7991426638513	57.5011007495002	47.7789	92.5461
37.75634297142	57.4739606683715	42.6808	88.2098
37.7134610682468	57.4467684421336	42.9721	90.3177
37.6702502340786	57.4193672766676	43.1057	91.7939
37.6264243584252	57.3915760730416	41.599	92.4813
37.581909822935	57.3633481752823	39.6285	91.4521
37.5374580396462	57.3351599974802	37.9917	90.5379
37.4933368349982	57.3071813835163	34.7819	91.1147
37.4496504606093	57.2794784650639	33.2241	90.2072
37.4065188920928	57.2521273176367	32.6009	89.9531
37.363940335473	57.225126810953	35.4073	87.2216
37.321876935768	57.1984529510571	34.9317	80.2335
37.2804666523099	57.1721932452554	33.517	80.8699
37.2394875181354	57.1462069319544	31.105	77.2121
37.1988480931767	57.1204360258534	31.4187	76.5703
37.1583388911514	57.0947476851501	32.697	74.6737
37.1177467497787	57.0690067382034	31.0449	71.9995
37.0769701094573	57.0431487803293	31.4455	71.7336
37.0358718146066	57.0170868344026	31.4906	71.3219
36.9943762489555	56.9907729459662	31.7515	71.3679
36.9524438438629	56.964182018714	32.2488	71.8762
36.9100358526577	56.9372894773757	35.1535	70.6086
36.86697131216	56.9099805729092	33.839	67.1668
36.8233707872484	56.8823317722863	28.241	67.9653
36.779551377474	56.8545441556123	26.4833	65.6457
36.7356707575422	56.8267177180661	26.4747	67.9787
36.6917107160394	56.7988409041934	25.7737	68.9159
36.647730961312	56.7709515720146	26.4587	69.6793
36.6037184369798	56.7430414402745	26.9783	71.0141
36.55964195574	56.715090727646	27.6433	72.5657
36.5154354204384	56.6870575148963	27.2709	73.9256
36.471079401581	56.6589294788972	26.2205	72.9044
36.4266610424218	56.6307618902288	24.5354	72.6275
36.3822803765774	56.602618189947	24.5076	73.115
36.3379324051826	56.5744952127362	24.1578	73.3792
36.2936425544546	56.5464090881457	23.527	73.6169
36.2494471971557	56.5183828867843	24.4797	75.354
36.205247888769	56.4903541832024	24.7401	75.4523
36.1610106708233	56.4623014496399	25.4767	75.481

Solution x	Solution y	Original x	Original y
36.1166649263578	56.4341799120941	25.3366	76.538
36.0721844407945	56.4059729486824	26.6151	77.1467
36.0274988274835	56.3776359261876	29.376	80.5861
35.9822742144631	56.3489571077135	27.1736	83.2653
35.9365393689357	56.3199547158541	23.4089	84.0628
35.8905170502761	56.2907700094244	24.3218	77.9732
35.8442897858187	56.2614553413403	23.796	77.2181
35.7978631946278	56.2320142770151	22.8762	75.7017
35.7513070759953	56.2024910812025	21.1184	76.9048
35.704636512798	56.1728953075423	18.7356	77.2891
35.6579124451907	56.1432655927237	13.7649	76.0563
35.6113983035262	56.1137689934535	15.4332	72.9689
35.5649769495178	56.0843312350623	15.0856	70.6386
35.5186549081752	56.0549564627271	14.7433	68.1941
35.4724650270098	56.0256655115783	14.0233	68.3418
35.4264025496977	55.9964553577884	13.2613	67.7948
35.3804949938221	55.967343446166	12.5389	66.9051
35.3347919709936	55.9383612353552	12.0877	66.3858
35.2893310625719	55.9095325535558	12.0444	66.3239
35.2441260903811	55.8808661589101	11.4442	66.9869
35.1992097165977	55.852382755751	10.5042	66.7806
35.1546585329079	55.8241309128905	10.7344	66.9849
35.1104930253242	55.7961236185394	11.4886	67.7219
35.0667128191815	55.7683606316555	12.0587	67.8257
35.0233498832576	55.7408622246141	11.6475	70.8021
34.9803889076748	55.7136186858349	10.9416	69.7746
34.9379171432944	55.6866853548174	10.0835	69.723
34.8959840476351	55.6600936033148	9.1707	70.0865
34.8546212492576	55.6338634950904	7.0214	70.8048
34.8138993463998	55.6080398086517	8.3117	72.2049
34.7737518151052	55.5825803586156	8.8648	72.0358
34.7341807584622	55.5574864815957	9.3844	71.5303
34.6951905075092	55.532760926261	9.45780000000001	72.6847
34.6567636684966	55.5083926634378	9.00020000000001	73.0359
34.6189094740718	55.4843875488587	9.9143	75.8382
34.5816206286856	55.4607409531988	8.0472	76.1743
34.545053752503	55.4375522070925	7.5677	74.3816
34.5092463820073	55.4148451140955	6.65640000000001	74.2265
34.4744138469321	55.392756237442	6.09139999999999	73.9114
34.4409648527211	55.3715447820565	4.0089	72.186
34.4091325424126	55.3513585940819	0.309600000000003	68.1954
34.4684287990752	55.1491018926076	1.76609999999999	66.5446
34.5389425319888	54.9085824837935	0.483800000000002	63.8626
34.6376912438417	54.5717544395091	4.7342	63.0935
34.7397972398722	54.2234747523665	4.4426	63.6871
34.8466260606967	53.8590856166987	5.2812	65.5492
34.9596208583208	53.4736645398672	6.9842	66.7632
35.0787034223062	53.0674783292145	9.6606	65.5604
35.2018295563196	52.6474995909407	8.4928	63.9998
35.3293887255859	52.2123998241248	6.67010000000001	63.5082
35.4635419458385	51.7548078684743	7.6803	61.1857
35.6025421382604	51.2806828407314	9.15690000000001	61.6426
35.7463541968049	50.7901444457479	10.4334	62.822
35.8956766423282	50.2808100441391	14.2076	63.0144
36.0495968375332	49.7557925376935	14.2239	63.9607
36.2093567710804	49.2108555840871	15.1112	64.361
36.3757076973829	48.6434367153789	15.3124	65.205
36.5502588059638	48.0480471449827	18.9682	67.082
36.7334518098199	47.4231803839539	16.7224	69.1113
36.9328244968618	46.7431256245348	18.2654	71.5277
37.1592664040146	45.9707395957898	21.3934	72.6127
37.4205057645991	45.0796623508764	22.0857	71.4539
37.7235047418773	44.0461468112584	22.1344	71.2137
38.1014279335351	42.7570711874828	22.9431	70.0987
38.6121211096717	41.0151284834429	22.8228	67.5784
39.3534133567277	38.4866317348037	22.6268	64.3936
40.5168301492979	34.5182953210051	23.9369	61.5866
Route: 5 Length: 65.0581764378993 Demand Met: 10000			
52.0463117403639	15.9962656616257	31.0707	1.7474
65.880200404631	27.3341145392417	77.9705	58.8491
68.7956936628891	29.7235854551214	81.1686	57.7423
70.9040740116013	31.4515608296622	85.8477	60.7859
72.2876584037942	32.5855104857184	90.2672	64.2791
72.287658414981	32.5855104499167	88.0225	60.7529
72.2876584206337	32.58551040667	87.1149	58.1702
72.2876584249181	32.5855103617293	89.2688	56.3248
72.2876584289106	32.5855103150869	92.8209	56.9207
72.2876584332345	32.5855102684499	92.9131	56.6287
72.2876584380165	32.585510222358	93.2379	56.4517
72.2876584432266	32.5855101764667	94.6877	57.1733

Solution x	Solution y	Original x	Original y
72.2876584488377	32.5855101312013	95.4289	57.3916
72.2876584547617	32.5855100854533	94.4551	58.0456
72.2876584609113	32.5855100404449	94.8477	58.3247
72.2876584672378	32.5855099950789	95.9041	59.3009
72.2876584740124	32.5855099516918	97.3108	57.82
72.2876584811629	32.5855099082638	98.9521	56.5952
72.2876584884299	32.5855098637991	98.7715	55.3698
72.2876584957983	32.5855098200271	100.6388	53.8259
72.2876585034129	32.5855097756531	100.3439	52.2486
72.287658510925	32.5855097296311	99.5817	52.1789
72.2876585182724	32.5855096841839	99.5987	51.3246
72.2876585254339	32.5855096377384	99.0651	51.1078
72.2876585324174	32.5855095913478	98.2004	50.3921
72.2876585392266	32.5855095429574	97.7455	51.8526
72.2876585458994	32.5855094956122	97.7133	51.9341
72.2876585524629	32.5855094467604	98.2152	53.7701
72.2876585590167	32.5855093986789	97.9579	54.2407
72.287658565586	32.585509350755	96.8097	54.0588
72.2876585721143	32.5855093039797	96.0562	52.3857
72.2876585785771	32.5855092549357	95.0304	53.2116
72.2876585850166	32.5855092062341	93.3932	53.1876
72.2876585915056	32.585509156831	92.1982	53.9806
72.2876585980846	32.5855091089248	89.6611	52.1615
72.2876586048575	32.5855090611194	90.3356	51.1932
72.2876586118104	32.5855090130163	92.412	50.9961
72.2876586188744	32.5855089650267	93.0102	50.1223
72.2876586260223	32.5855089176449	93.3823	48.5086
72.287658633242	32.5855088688448	94.3452	48.7818
72.2876586405001	32.5855088214029	94.5726	47.3613
72.2876586478324	32.5855087728088	95.0864	47.4256
72.28765865525	32.5855087242988	95.1396	47.3596
72.2876586627781	32.5855086764483	95.7654	46.8722
72.2876586703997	32.5855086279471	96.2485	47.1277
72.2876586781158	32.5855085795935	98.9198	48.0008
72.2876586858958	32.5855085314378	100.8862	48.4618
72.2876586938278	32.5855084828997	101.7941	49.0832
72.2876587020769	32.5855084355384	101.377	48.1816
72.2876587105487	32.5855083886556	100.6036	46.802
72.2876587191623	32.5855083416054	99.7789	45.6905
72.2876587279012	32.5855082942693	100.0845	45.3198
72.2876587367688	32.5855082464424	101.161	45.7653
72.2876587457908	32.5855081993896	102.543	45.6081
72.2876587550425	32.5855081525374	103.8959	45.4099
72.2876587647162	32.5855081059846	104.1102	44.8822
72.2876587747957	32.5855080602458	103.3956	43.6231
72.2876587850591	32.585508013537	103.0838	43.6629
72.2876587954739	32.5855079683408	102.0152	42.2262
72.2876588059427	32.5855079221533	99.6903	41.4772
72.2876588164483	32.5855078749663	98.3613	42.0392
72.287658827006	32.5855078273708	98.0763	43.3554
72.2876588376347	32.5855077799657	98.0879	44.5657
72.2876588483379	32.5855077332113	97.5519	44.8528
72.2876588591077	32.5855076880763	96.6284	43.246
72.2876588699532	32.5855076428675	96.8865	41.9997
72.2876588808566	32.5855075961535	96.2085	41.8253
72.2876588918543	32.585507550756	96.2133	40.5576
72.2876589029636	32.5855075053046	95.8598	39.2349
72.2876589142384	32.5855074584103	97.0063	39.6578
72.2876589256632	32.5855074119206	97.0806	39.3994
72.2876589372531	32.5855073652729	98.4033	39.6451
72.2876589489243	32.585507318508	98.7317	39.6579
72.2876589606411	32.5855072760146	103.4615	37.3033
72.2876589723731	32.5855072307435	107.8221	37.3636
72.2876589838015	32.5855071875581	108.656	34.8419
72.1940279233245	32.5087653680982	106.6895	31.0233
72.0972868498868	32.4294745851826	106.8535	30.7643
71.9967103601438	32.3470402763983	105.5782	30.6326
71.8937513882066	32.2626533014902	105.6149	29.5786
71.7882737327554	32.1762020065859	106.1692	29.0085
71.6791784577786	32.0867856536161	105.0575	26.2706
71.5676213970017	31.9953515719872	104.9423	23.521
71.4529700933626	31.9013813283155	102.9016	24.8202
71.3370730877298	31.8063900723182	102.4997	24.4075
71.2200123304456	31.7104449574412	100.384	25.6874
71.1023688600748	31.6140222096007	100.6297	27.3107
70.9839225228954	31.5169413940754	101.5683	27.6266
70.864275815129	31.4188767075887	101.7295	28.4449
70.7431482934041	31.3195983031653	102.211	28.3893
70.6201505261259	31.2187869868422	102.9211	31.879
70.4943559227672	31.1156833258213	104.0844	32.9988

Solution x	Solution y	Original x	Original y
70.3638157374654	31.0086900606517	101.1976	33.4905
70.2308400580096	30.8997006041878	100.5275	34.9543
70.0953685841788	30.7886655567206	99.272	31.5703
69.9583545658757	30.6763661784092	99.0228	31.9463
69.8198073733561	30.5628101581363	98.5493	33.1624
69.6796823035162	30.4479608655677	98.9301	33.2654
69.5377290498651	30.3316131515908	98.5859	34.5756
69.3936942133408	30.2135593484729	96.6051	36.0943
69.2478532664493	30.0940252483589	96.5473	37.5774
69.0997998976617	29.9726778624829	95.1298	37.6897
68.9498782325875	29.8497992451028	94.1971	38.0204
68.798204238519	29.725484463907	93.6083	38.4774
68.6448063238074	29.5997568251644	93.6941	39.0671
68.4895385005915	29.4724967026788	94.3087	39.6383
68.3320367853954	29.3434058092476	92.8093	39.7693
68.1727279956463	29.2128339825646	92.634	40.1716
68.0115073631859	29.0806953860362	92.1801	41.0349
67.8482073088257	28.9468526980129	92.2396	41.0703
67.6826311778009	28.8111447559119	93.2846	41.9379
67.5137838837199	28.6727560029786	93.9129	43.6355
67.3399881165217	28.5303117229345	94.5355	44.3621
67.1592531345282	28.3821802948757	94.4684	44.7163
66.9702563359191	28.2272776800638	95.46	44.379
66.7696893786486	28.062892290319	94.5838	45.9916
66.5542237802689	27.8862960349174	91.9732	45.8332
66.3286773432059	27.7014374542673	91.9756	47.4725
66.0878655447299	27.504067190136	91.1842	48.1207
65.8290795133066	27.2919648677888	90.4865	46.0315
65.5558877642945	27.0680550078328	89.5287	45.4109
65.2683989552457	26.8324265003987	89.3464	46.1786
64.961890796059	26.581208955573	89.352	47.1855
64.6270089981475	26.3067357800445	87.8413	47.1867
64.2617886746802	26.0073969882614	87.5129	47.9594
63.8529625742184	25.6723199288273	85.9154	51.5363
63.339724068736	25.2516705115439	84.6532	51.7406
62.6666831836949	24.7000578375399	83.5076	51.7826
61.6965602859242	23.9049712788646	82.0477	53.0979
Route: 6 Length: 4.52112572726543E-7 Demand Met: 6431			
47.1286999916684	11.965900043732	47.1015	12.1757
47.128699986801	11.9659000385841	47.5448	13.9665
47.1286999798973	11.9659000323876	48.0446	14.6778
47.1286999697613	11.9659000259536	47.2642	16.1804
47.1286999583153	11.9659000216321	46.503	16.5426
47.1286999470522	11.9659000183352	46.6598	16.011
47.1286999368912	11.9659000146696	46.213	15.3079
47.1286999283395	11.9659000112222	45.8725	14.3747
47.1286999216661	11.9659000064892	44.2621	15.3855
47.128699916998	11.9659000025401	44.3034	16.6265
47.1286999146835	11.9658999996377	40.2335	17.1357
47.1286999142293	11.9658999980551	39.7266	17.3977
47.1286999153457	11.9658999963479	40.715	18.8306
47.1286999177458	11.9658999957376	45.9242	19.9
47.1286999211635	11.9658999965073	45.9074	18.6439
47.128699924712	11.9658999970708	47.2412	18.0641
47.1286999277343	11.965899997519	49.3862	17.5735
47.1286999298545	11.9658999959805	49.1677	19.2175
47.1286999308862	11.9658999953407	49.9475	19.2284
47.1286999307848	11.9658999937759	49.9971	19.9155
47.1286999296364	11.9658999932983	51.539	18.7116
47.1286999276735	11.9658999913689	52.1655	19.1446
47.1286999251149	11.9658999907202	52.4859	17.4578
47.1286999220479	11.9658999889174	51.6732	17.1776
47.1286999184631	11.9658999879555	52.0827	15.9727
47.128699991441	11.9658999869	53.4554	15.0784
47.1286999100879	11.9658999838555	53.7123	16.59
47.1286999056019	11.9658999833632	55.8132	15.4408
47.1286999012788	11.9658999844481	53.965	12.2967
47.1286998972103	11.9658999824326	51.9742	12.9315
47.1286998932602	11.9658999817823	50.5069	12.3029
47.1286998894919	11.965899981514	51.32	11.9016
47.1286998861221	11.9658999810454	52.0306	12.0787
47.1286998833654	11.9658999831626	52.3173	10.0275
47.1286998814176	11.9658999861044	53.1154	7.9184
47.1286998804862	11.9658999873708	51.2901	7.6487
47.1286998803518	11.9658999916677	50.2911	5.2466
47.1286998809372	11.9658999963269	52.2056	3.4977
47.1286998823893	11.9658999973455	52.0607	4.6851
47.1286998845059	11.9658999989511	53.4617	5.8056
47.1286998871201	11.9659000009552	54.3108	6.5803
47.1286998899661	11.9659000036543	55.5508	6.709

Solution x	Solution y	Original x	Original y
47.1286998927638	11.9659000036232	58.6318	9.4344
47.1286998955528	11.9659000070101	59.4358	8.0877
47.1286998982627	11.9659000114707	58.0725	5.2013
47.1286999006903	11.9659000140431	56.6752	3.9284
47.1286999027961	11.9659000158767	56.6229	3.2945
47.1286999046406	11.9659000176745	55.5686	2.3786
47.1286999063701	11.9659000197924	54.6465	1.327
47.1286999081137	11.965900020832	54.5841	1.3
47.128699910174	11.9659000217984	52.8937	1.339
47.1286999125481	11.9659000223566	50.9668	1.717
47.1286999151835	11.9659000240508	49.5265	1.5006
47.1286999180384	11.965900024119	48.302	2.6164
47.128699921075	11.9659000249446	49.309	3.6922
47.1286999245336	11.9659000254512	48.7027	4.8736
47.128699928307	11.9659000276468	47.0712	4.3382
47.1286999321629	11.9659000278793	47.7278	5.7114
47.1286999360888	11.9659000283494	46.8369	6.4403
47.1286999398548	11.9659000287531	46.0043	6.8606
47.1286999432572	11.9659000285368	45.5397	7.2979
47.1286999461298	11.9659000275553	43.7681	7.8375
47.1286999481985	11.9659000287904	44.0031	6.0986
47.1286999495464	11.9659000287768	44.3097	5.4051
47.1286999503129	11.9659000288555	44.2937	4.7268
47.1286999508167	11.9659000337575	43.4311	0.4843
47.1286999514908	11.965900030223	42.4139	3.5597
47.1286999529173	11.9659000271122	38.0686	7.3443
47.1286999553519	11.9659000301297	36.2059	6.8965
47.128699958694	11.9659000308943	36.7928	9.6586
47.128699962813	11.9659000321412	40.2323	12.6508
47.1286999674002	11.9659000347095	41.9974	13.5778
47.1286999716892	11.9659000373321	43.7175	13.3612
47.1286999750868	11.9659000384646	44.7075	13.3055
47.1286999775478	11.9659000395613	44.5228	11.8645
47.1286999794043	11.9659000397938	43.7231	10.6871
47.1286999810762	11.9659000392029	42.7704	10.2739
47.1286999829248	11.9659000398275	43.984	9.2005
47.1286999857488	11.9659000400402	44.5689	9.75
47.128699990093	11.9659000434388	46.3909	8.819
47.1286999963244	11.9659000463279	46.5714	10.174
47.1287000035634	11.9659000517284	47.6091	10.2274
47.1287000101785	11.9659000563473	48.2378	10.888
47.1287000134694	11.9659000601334	49.0558	10.279
47.1287000108452	11.9659000579333	48.9393	11.7496
47.1287000052753	11.9659000546845	47.4524	12.1509
Route: 7 Length: 34.6706257969283 Demand Met: 9999			
53.8141441337275	15.1714898868957	52.3291	3.6705
61.4470776947732	18.8314090565993	97.1071	18.8552
62.6486384954537	19.4075442698494	99.0428	19.6959
62.6746564325189	19.4200170603198	98.3827	22.3334
62.6945259282851	19.4295431293709	98.3241	22.4412
62.7129302228185	19.4383669178325	97.0499	25.7334
62.7294567978113	19.4462905936832	97.3283	27.0933
62.7450971107456	19.453789416478	97.5011	28.0267
62.7599996462935	19.4609345562857	97.9141	29.0493
62.7599996121919	19.4609345506457	97.4429	30.1528
62.7599995838362	19.4609345465169	97.1838	29.5842
62.7599995575615	19.4609345427772	96.0238	29.4057
62.7599995326734	19.4609345393493	96.156	30.1327
62.7599995088845	19.4609345359452	96.3928	32.1668
62.759999486177	19.4609345332683	96.2582	32.5713
62.7599994643261	19.4609345308754	95.8908	32.6754
62.7599994429408	19.4609345284591	95.0864	33.2234
62.7599994217264	19.4609345260854	92.7124	33.4453
62.7599994004117	19.460934524041	92.4351	33.0022
62.7599993788215	19.4609345223359	93.4265	31.4744
62.7599993568232	19.4609345208146	93.9312	28.9768
62.7599993342932	19.4609345191208	92.942	26.4511
62.759999311122	19.4609345170658	93.6487	25.1273
62.7599992872714	19.4609345141872	92.5592	25.4331
62.7599992627167	19.4609345108577	90.6179	26.4649
62.7599992374634	19.4609345073669	90.6435	28.0536
62.7599992115594	19.4609345036408	90.72	30.049
62.7599991850563	19.4609344993706	87.5726	32.8781
62.7599991580284	19.4609344957597	86.512	33.4131
62.7599991305667	19.460934492553	85.525	32.0217
62.7599991027965	19.460934488675	85.1876	33.113
62.7599990747973	19.4609344845088	85.065	35.2948
62.759999046614	19.4609344807508	86.5983	36.2039
62.7599990182717	19.4609344772431	88.2545	36.066
62.7599989898005	19.4609344740999	91.0332	34.8187

Solution x	Solution y	Original x	Original y
62.7599989612272	19.4609344701982	91.1655	36.0648
62.7599989325742	19.4609344664916	91.9372	36.8319
62.7599989903899	19.4609344628583	91.8795	37.1845
62.7599988752221	19.4609344589561	89.1249	38.0318
62.7599988464948	19.4609344550762	90.014	39.915
62.7599988177967	19.4609344513999	90.1236	40.724
62.7599987892322	19.4609344478182	90.4784	41.2284
62.7599987609657	19.4609344439948	90.0385	42.8005
62.7599987338279	19.4609344410208	89.3668	41.343
62.7599987067919	19.4609344377528	89.0134	41.3658
62.7599986798056	19.460934434447	88.4465	41.4478
62.7599986528201	19.4609344315974	87.5583	39.2312
62.7599986257787	19.4609344280095	87.2346	40.5435
62.7599985986861	19.4609344243631	85.9182	41.843
62.7599985715389	19.4609344211608	81.9079	40.1742
62.7599985443633	19.4609344174829	80.8076	41.6004
62.7599985171727	19.4609344138567	80.8872	43.1227
62.7599984899732	19.4609344100676	77.9223	44.6051
62.7599984627818	19.4609344066266	77.8794	45.0468
62.7599984355978	19.4609344031406	79.9479	46.2913
62.7599984084079	19.4609343995662	79.533	47.2684
62.7599983812221	19.4609343960749	80.0004	48.0282
62.7599983540297	19.460934392709	77.9078	47.2474
62.7599983268152	19.4609343892754	76.4125	46.981
62.7599982995855	19.4609343856712	77.6289	48.4559
62.7599982723331	19.4609343821093	77.4079	49.147
62.7599982450672	19.4609343786839	76.379	48.6237
62.7599982177897	19.4609343750677	75.5587	49.1352
62.7599981905041	19.4609343716311	75.5201	48.6107
62.7599981632173	19.4609343680439	74.8417	48.5823
62.7599981359392	19.460934364297	73.2401	49.0047
62.7599981086819	19.4609343606303	73.5268	49.2611
62.7599980814424	19.4609343567483	73.6611	50.4924
62.7599980542178	19.4609343529261	73.911	51.0144
62.7599980270011	19.4609343492467	74.4488	50.3129
62.7599979997916	19.4609343453491	75.2757	50.6388
62.7599979725969	19.4609343412299	76.2244	51.9684
62.7599979453176	19.4609343368585	74.3979	53.0985
62.7599979176521	19.4609343324195	73.3859	52.8201
62.759997889838	19.4609343277809	72.0955	52.6394
62.7599978619664	19.4609343230756	72.0304	52.5053
62.7599978340467	19.4609343180436	71.2619	53.5794
62.7599978058748	19.4609343130038	70.916	53.3608
62.7599977775142	19.4609343076818	70.694	53.8562
62.7599977486726	19.460934301921	69.8977	54.8286
62.7599977165339	19.4609342941151	69.2681	55.3133
62.6950540656839	19.4297955176284	68.2826	55.0673
62.622278022836	19.3949013019988	68.022	53.7678
62.5478996787438	19.3592388567733	67.8488	53.6384
62.471961317901	19.3228284554785	66.0257	55.1875
62.3859400253757	19.2815837316681	61.2083	54.3519
62.2978050249554	19.2393256070458	66.2863	51.2705
62.2087778622987	19.1966397143774	66.949	50.6855
62.1189039181309	19.1535478059808	67.7991	50.1342
62.0281143324373	19.1100168522921	67.5609	49.631
61.9365046076309	19.0660926368489	68.7356	47.889
61.8443062224845	19.0218861391862	67.6648	48.1141
61.7516843319581	18.9774765361783	65.7303	47.3671
61.659059075963	18.9330652631564	67.4955	46.0347
61.5666839347356	18.8887738430487	70.5497	45.0925
61.4746589752458	18.8446502399554	70.4096	46.4113
61.382970815567	18.8006880225165	70.6191	48.182
61.2912957753636	18.7567319829066	70.7664	48.6137
61.1995540175428	18.7127438378066	70.6462	49.6735
61.1074249452171	18.6685698775702	70.0624	50.1219
61.014832708044	18.6241737442659	69.1689	51.2673
60.921220581387	18.579288528345	69.4154	51.8752
60.8254790099965	18.5333822524112	69.1565	53.343
60.7136994552346	18.4797860927609	70.2011	52.705
60.5870774841221	18.4190732732573	70.1179	52.2878
60.44807597712	18.352424722409	70.8564	51.5507
60.2985269683106	18.2807188719425	71.0505	50.768
60.1412365771254	18.2053012289818	72.1444	51.2772
59.9580259190974	18.1174552858863	71.8965	50.0142
59.7618564083177	18.0233958969885	72.0723	49.2863
59.5531191650336	17.9233105956586	71.8327	48.0379
59.333825849414	17.8181638940022	72.0385	47.603
59.1008831430118	17.7064725369893	73.2561	47.9132
58.844062183437	17.5833319015308	73.6395	46.5004
58.5622534978735	17.4482099159621	73.6428	45.1426

Solution x	Solution y	Original x	Original y
58.2536284593433	17.3002297443691	72.4429	44.8985
57.915765302719	17.1382303273357	72.9198	44.5581
57.5427672952233	16.9593844252381	73.2283	44.0709
57.1283365257196	16.7606724570221	72.7013	43.6681
56.6670398461961	16.5394894852269	72.9378	43.4347
56.1475564780479	16.2904072943588	72.4926	42.7909
55.5626784255391	16.0099696278228	75.9853	41.4015
54.8678315956818	15.6768025403073	75.9022	40.5634
54.0254920020828	15.2729123300883	77.5882	39.4219
52.8290711687404	14.699233955221	72.6191	32.6684
51.4795448538363	14.0521371544718	66.5887	34.1226
49.9938766001583	13.3397552583594	50.1386	26.6573
48.5951192360923	12.6690513817037	47.4152	28.2569
Route: 8 Length: 4.62988242304689 Demand Met: 9998			
47.1810029806582	11.9995698126587	41.1669	5.3004
47.233245340545	12.0332003865263	45.0418	3.8658
47.2876575583782	12.0682279372543	53.9046	16.3668
47.3397307256481	12.101748707381	53.2794	21.4994
47.3914402209576	12.1350354040111	50.8742	24.2729
47.4438969856052	12.1688038475207	52.7074	28.2489
47.4980979104291	12.2036962640065	53.915	28.4629
47.5548860976193	12.240255493706	54.7376	29.7596
47.613890252906	12.2782416955404	54.8257	29.6059
47.6742855546703	12.3171228452971	54.5895	27.7676
47.7351371256743	12.3562964844963	55.1607	27.7715
47.7957849992023	12.3953379080228	56.8778	27.618
47.8560131752521	12.4341085441695	58.5931	27.1316
47.9157627810071	12.4725710207615	58.9981	26.6128
47.9750452127079	12.5107331539978	59.5552	26.5288
48.033929681781	12.5486399245914	61.643	23.6955
48.092098899356	12.5860871125214	62.5649	23.4331
48.1495451321184	12.6230696318836	63.3607	23.5913
48.2062942611732	12.6596038437354	63.8119	26.0212
48.2625220688945	12.6958027024918	62.9268	27.0211
48.3181562496266	12.731619374613	63.132	27.7543
48.3731247262877	12.7670072464973	64.1748	30.2745
48.4275599758004	12.8020515592625	66.7818	30.0369
48.4815582875785	12.8368142799658	67.6588	29.7348
48.5351847372867	12.8713373245213	67.8857	28.9512
48.5885619639534	12.9056997406366	68.2062	28.5319
48.6419212227349	12.9400505900201	67.5765	27.7962
48.6954828789504	12.9745319235575	66.7482	27.6121
48.7494378026755	13.0092667834911	67.242	26.9141
48.8039550937451	13.0443641574618	68.3676	27.331
48.8590991102071	13.0798655431545	69.5886	28.6002
48.9144843031946	13.1155225439708	70.1037	27.3839
48.9693828414722	13.1508660525687	70.5469	25.0661
49.023174210043	13.1854961160086	73.7989	28.6287
49.0751744375279	13.218972073449	79.7169	32.9378
49.0747220875513	13.2186814364829	75.4748	37.8532
49.074615540338	13.2186129034523	74.5598	39.2546
49.0563472716917	13.2068677522798	72.2401	34.2889
49.0374372785741	13.1947110741827	71.5231	31.8286
49.0181870642799	13.1823364251435	69.1853	30.9522
48.998818424315	13.1698861108834	68.3701	31.308
48.9793449573119	13.1573687921802	67.7055	32.9993
48.9596847628961	13.1447318755075	67.4673	33.2544
48.9397302308079	13.1319062141668	65.4552	32.6167
48.919523246279	13.1189186368293	64.2717	31.7627
48.8991254245557	13.105808579696	63.2951	31.2899
48.878662049992	13.092656314582	60.463	30.4795
48.8582651062167	13.0795463548336	60.1802	30.671
48.8380349246056	13.0665428815889	57.9508	29.6187
48.8178353882172	13.0535580769266	58.6228	31.6703
48.79769876274	13.0406124514451	58.4334	33.3219
48.777549190452	13.027657054226	60.137	35.2014
48.7575078196319	13.0147697796096	60.8351	33.4935
48.7375317447685	13.0019228672863	61.1622	34.1592
48.7176576392586	12.9891405077139	61.5106	34.0654
48.6978718922937	12.9764145058514	62.464	33.4003
48.6782050911871	12.9637649332287	63.5739	32.9982
48.6586550540377	12.9511906557378	63.8645	34.3723
48.6390948839159	12.9386105590002	63.453	34.6286
48.6191697356459	12.9257965206068	64.9829	35.6055
48.5987925120319	12.9126925361573	66.9624	36.7077
48.5778512250449	12.8992262977589	66.7168	38.698
48.5560680858443	12.8852187790803	68.0366	38.8903
48.5331648650092	12.8704897859656	65.3289	43.5846
48.508622390698	12.8547057351224	64.4232	44.0581
48.4823794914596	12.8378270139501	64.8516	39.5774

Solution x	Solution y	Original x	Original y
48.4549590131236	12.820187399907	65.211	38.9167
48.4267704812194	12.8020501666311	64.2784	38.8059
48.3980721864195	12.7835823823333	62.6603	37.129
48.369045492219	12.7649008445795	62.0243	36.102
48.339840634783	12.7461021193854	61.1452	36.2851
48.3105621248745	12.7272532905664	60.9493	37.7343
48.2812444930733	12.7083767134958	58.8785	37.4935
48.2519615038581	12.6895199122162	58.126	35.24
48.2230056643452	12.6708703754916	56.2795	36.0371
48.1943182606729	12.652391917337	55.9275	34.3566
48.1661439303028	12.6342421637301	54.3132	33.4794
48.1384953136699	12.6164303710559	53.8796	31.7093
48.1115482247799	12.5990700594755	52.5136	31.162
48.0852835433873	12.5821495998488	51.0819	30.8837
48.0596872144671	12.5656602776731	50.5738	30.8854
48.0348694845067	12.549673059019	50.8592	31.2824
48.0110113807333	12.5343043900901	50.3723	32.2399
47.9881858018794	12.5196013123755	48.6326	32.1618
47.9662512905498	12.505472564294	47.4903	33.2139
47.9450215046241	12.4917980908947	45.9581	33.5048
47.9241407274762	12.4783484899159	48.325	36.101
47.9036066928106	12.4651224570262	50.1654	34.298
47.8829890634061	12.451842452678	51.473	33.7115
47.8617983004481	12.4381929433795	51.7623	34.8081
47.8396518388174	12.4239273708309	53.589	37.6567
47.8163963415987	12.4089468406676	51.6292	37.4529
47.7918957602806	12.39316321254	50.3352	41.2014
47.7664546734233	12.3767725534312	44.3651	39.5082
47.7403138061874	12.3599297825691	45.4903	38.3462
47.7136384660479	12.342741577645	46.003	37.4534
47.6864648801618	12.3252316077431	45.4526	36.121
47.6587116686901	12.3073477700115	45.6407	35.658
47.630360345546	12.2890783469626	44.7872	36.1398
47.6017438108399	12.2706377568633	43.7884	36.8808
47.5734551182532	12.2524080496733	42.8212	36.4305
47.5461854692983	12.2348349356038	40.9959	37.9409
47.5201818823371	12.2180784504	37.4272	33.8061
47.495139825072	12.2019423709481	35.5392	31.6783
47.4703990887987	12.1860011044043	44.1303	30.8739
47.4459538966354	12.1702512329679	44.6028	29.9319
47.4214226857267	12.1544466965155	46.4115	30.3033
47.3965102823733	12.138397136671	46.9054	30.8841
47.3709589263616	12.121936143598	47.3356	31.1656
47.344790106637	12.1050771056081	47.9603	31.0225
47.3184082858787	12.088080163998	47.9812	30.2306
47.292514090696	12.0713966448358	49.5432	29.0024
47.268470440789	12.0559057117067	47.5893	27.8934
47.2468674731544	12.0419889565542	46.684	28.1154
47.2278103284526	12.029714600093	45.985	27.4123
47.2111267583237	12.0189711885623	46.7677	27.4481
47.196022942136	12.0092464241327	47.7428	26.438
47.180991387567	11.9995686059584	48.493	25.186
47.164547892018	11.9889813538078	46.7163	23.0055
47.1485871254937	11.9787055017847	49.1449	22.3659

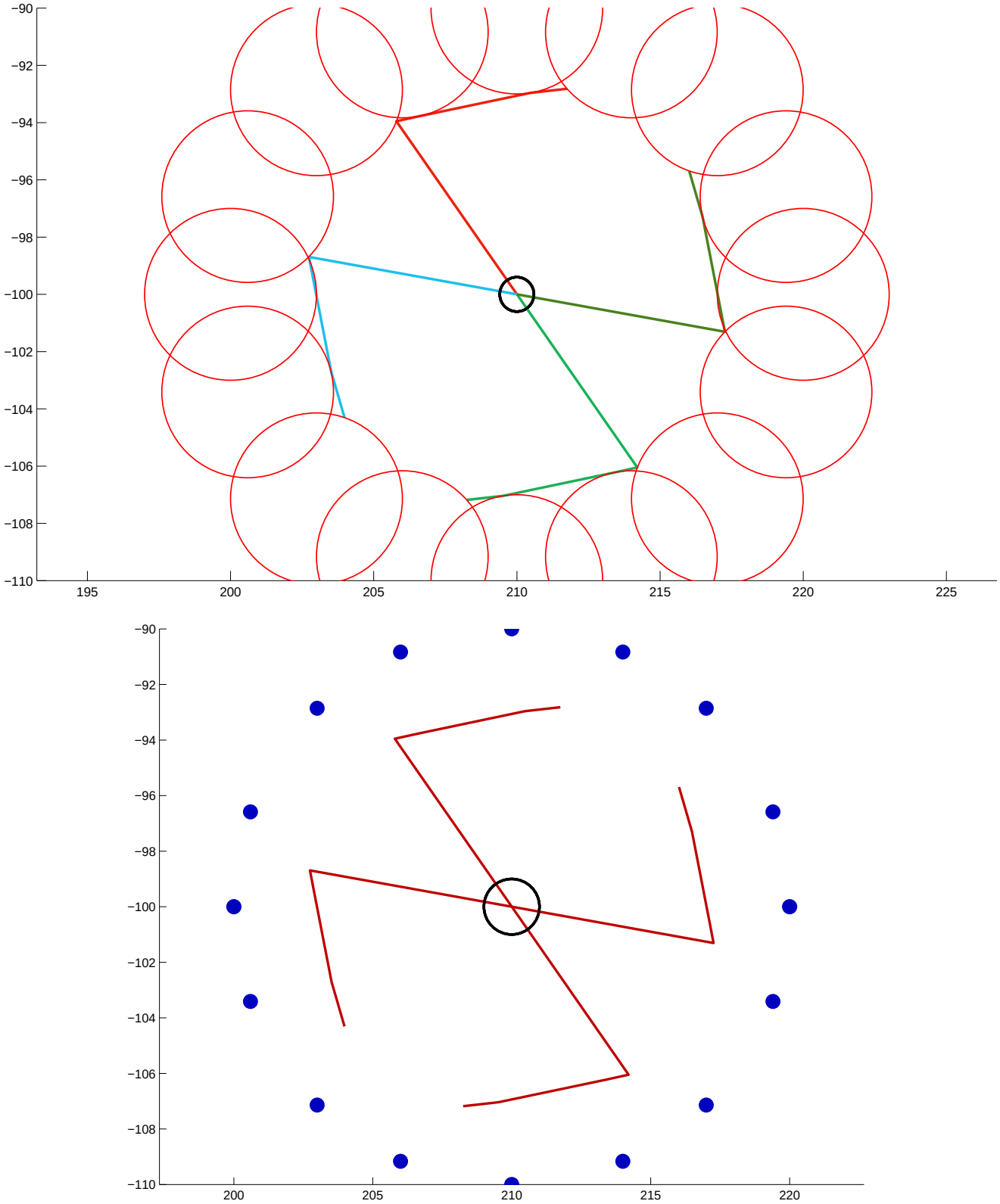


Figure O.29: *concentricCircles*1, Equal Radius, 2D, Euclidean, Length = 82.7198592

Table O-32: Solution for *concentricCircles*1, Equal Radius, 2D, Euclidean

Total distance: 82.7198592195314 Total demand met: 192 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 20.8258174345524 Demand Met: 48			
95.7933978695768	93.9526352383372	93	92.8585715715
96.6278359463296	93.7677204697307	96	90.8348486101
100.476762243054	92.9618564399389	100	90
101.748989641609	92.8180289600196	104	90.8348486101
Route: 2 Length: 20.5341079774407 Demand Met: 48			
92.7362335650349	98.6945579174172	90.6	96.5882555782
92.8797371736083	99.4330659081891	90	100
93.5157874210726	102.705927550902	90.6	103.4117444218
93.9814900876872	104.306524064527	93	107.1414284285
Route: 3 Length: 20.8258345810275 Demand Met: 48			
104.206373894348	106.047968487986	107	107.1414284285
103.37148247612	106.231734642708	104	109.1651513899
99.522819926235	107.038193414127	100	110
98.250880585614	107.181836547662	96	109.1651513899
Route: 4 Length: 20.5340992265108 Demand Met: 48			
107.263444506644	101.305763843755	109.4	103.4117444218
107.125880949864	100.60034992923	110	100
106.484023753698	97.2932753973766	109.4	96.5882555782
106.018503880436	95.6934763634074	107	92.8585715715

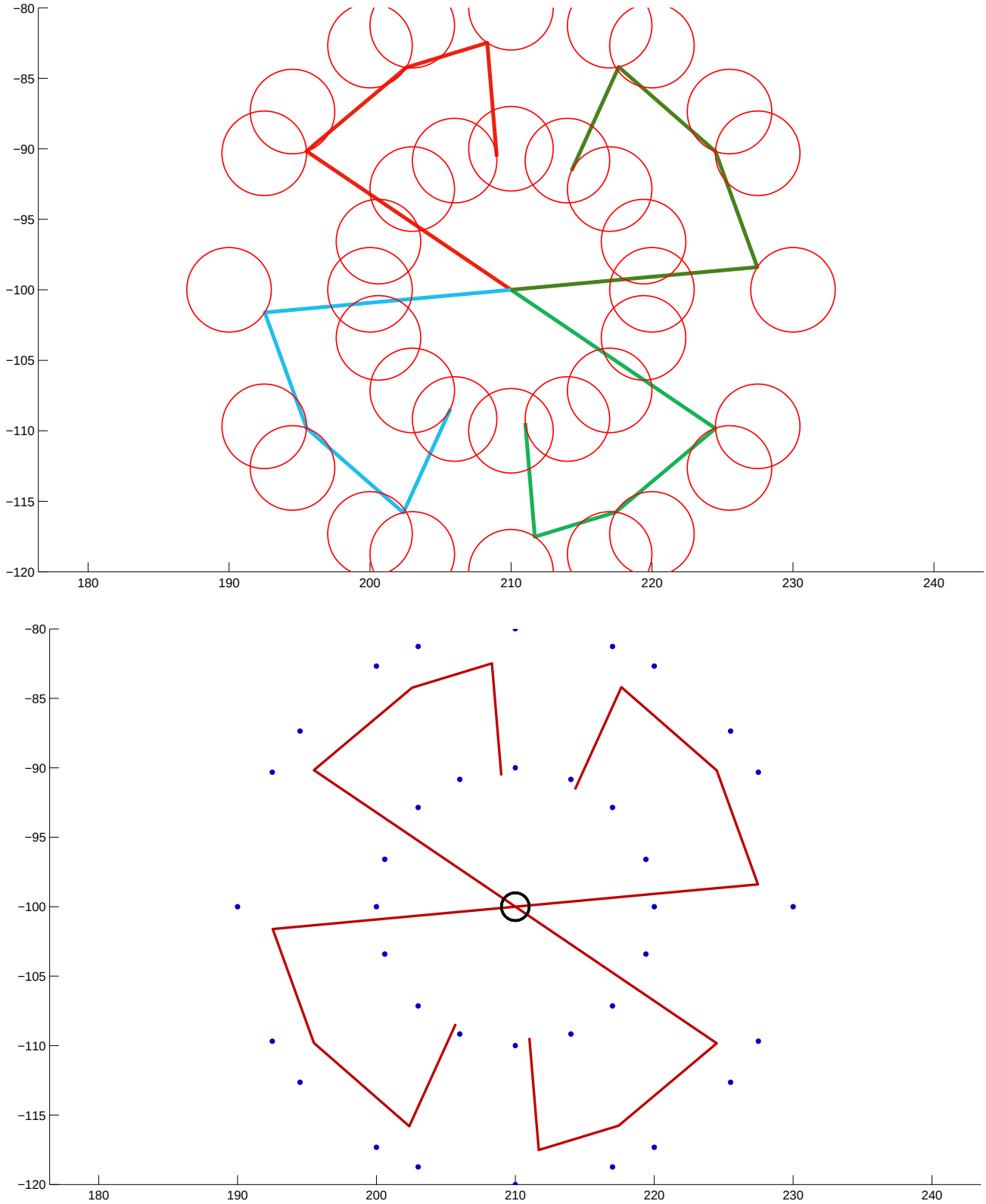


Figure O.30: *concentricCircles*2, Equal Radius, 2D, Euclidean, Length = 206.5896055

Table O-33: Solution for *concentricCircles*2, Equal Radius, 2D, Euclidean

Total distance: 206.589605528986 Total demand met: 352 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 50.3623447033994 Demand Met: 88			
91.9028098212028	94.5091567967401	90.6	96.5882555782
91.9028098212028	94.5091567967401	93	92.8585715715
85.4960961673214	90.1644865780941	82.5	90.3175416345
85.4960961673214	90.1644865780941	84.5	87.3607753402
92.5661561830346	84.2334719181749	90	82.6794919243
92.5661561830346	84.2334719181749	93	81.2650060048
98.3156585665655	82.482543148972	100	80
98.9864828617161	90.5505971829259	96	90.8348486101
98.9864828617161	90.5505971829259	100	90
Route: 2 Length: 52.9324907733319 Demand Met: 88			
90.1995850536298	100.902802850385	90	100
90.1995850536298	100.902802850385	90.6	103.4117444218
82.532481852832	101.608276100262	80	100
85.4972960884477	109.809841264053	82.5	109.6824583655
85.4972960884477	109.809841264053	84.5	112.6392246598
92.3640500775705	115.803170929269	90	117.3205080757
92.3640500775705	115.803170929269	93	118.7349939952
95.7034173831352	108.441997207346	93	107.1414284285
95.7034173831352	108.441997207346	96	109.1651513899
Route: 3 Length: 50.3623254113322 Demand Met: 88			
108.041798876646	105.453945841954	107	107.1414284285
108.041798876646	105.453945841954	109.4	103.4117444218
114.503951268618	109.83658327027	115.5	112.6392246598
114.503951268618	109.83658327027	117.5	109.6824583655
107.433840201854	115.766524474581	107	118.7349939952
107.433840201854	115.766524474581	110	117.3205080757
101.684636591153	117.517650663545	100	120
101.013533312833	109.448506163098	100	110
101.013533312833	109.448506163098	104	109.1651513899
Route: 4 Length: 52.9324446409228 Demand Met: 88			
109.669191146736	99.1090477922685	109.4	96.5882555782
109.669191146736	99.1090477922685	110	100
117.467942667532	98.3910309139539	120	100
114.502694148543	90.1901716141894	115.5	87.3607753402
114.502694148543	90.1901716141894	117.5	90.3175416345
107.634288289011	84.1972066972554	107	81.2650060048
107.634288289011	84.1972066972554	110	82.6794919243
104.296590555348	91.5584586288091	104	90.8348486101
104.296590555348	91.5584586288091	107	92.8585715715

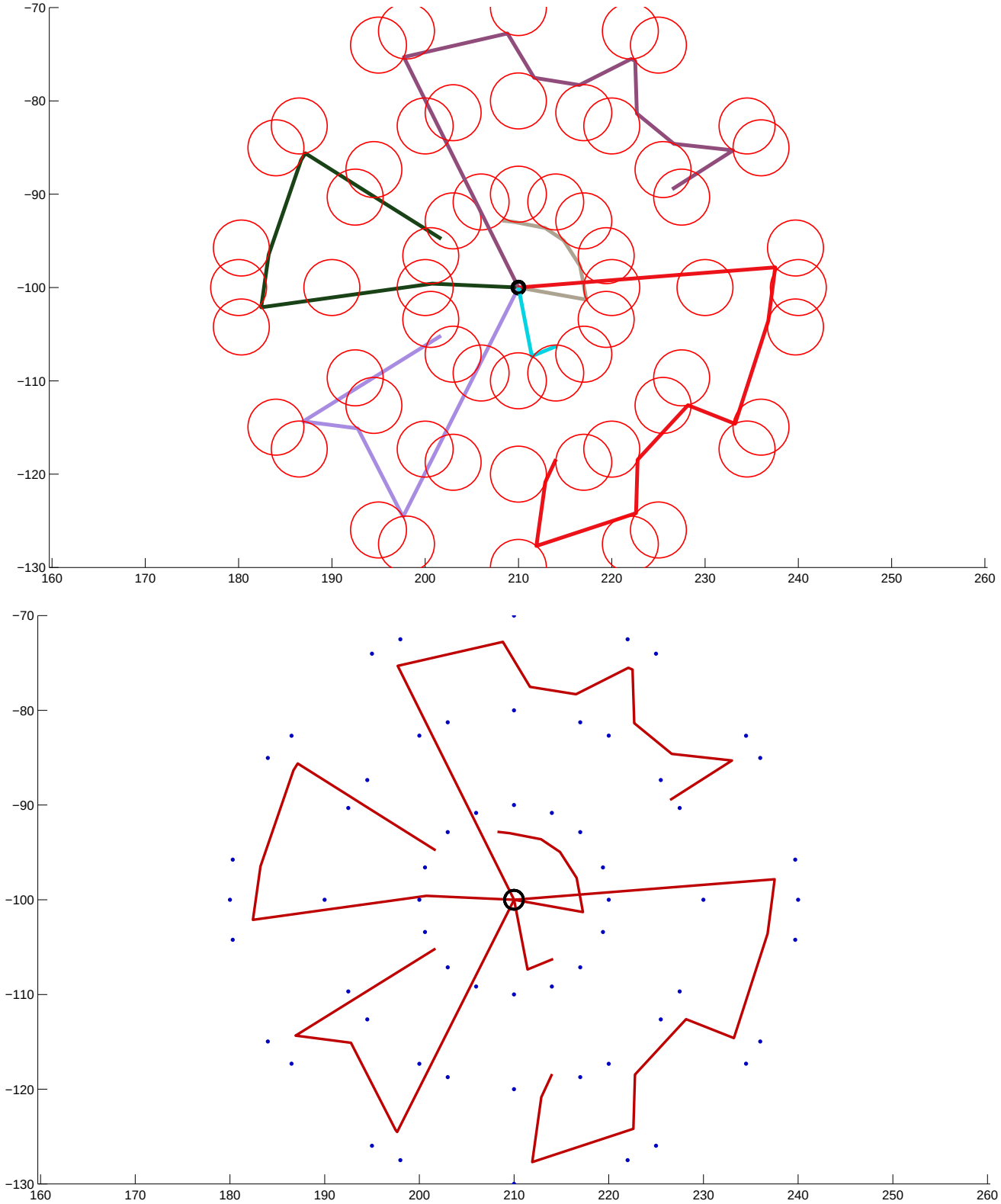


Figure O.31: *concentricCircles*3, Equal Radius, 2D, Euclidean, Length = 394.2431392

Table O-34: Solution for *concentricCircles*3, Equal Radius, 2D, Euclidean

Total distance: 394.243139204668 Total demand met: 448 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 28.7808341997846 Demand Met: 84			
107.272892676962	101.296222875298	109.4	103.4117444218
107.100650779813	100.359361123929	110	100
106.609793403032	97.6904162492104	109.4	96.5882555782
104.854975562177	94.955922032491	107	92.8585715715
102.852958455273	93.6069077480074	104	90.8348486101
99.5449671579612	92.9652887732268	100	90
98.2506172751302	92.8184651742365	96	90.8348486101
Route: 2 Length: 72.0233680371776 Demand Met: 80			
90.738501104235	99.5850587646923	90.6	96.5882555782
88.4943127463613	99.8946858862887	90	100
80.1532532964875	101.046091998182	80	100
72.4238356645449	102.113213820786	70.3	104.2320207939
72.7013260065003	100.138501480124	70	100
73.2171721936747	96.4680631283375	70.3	95.7679792061
76.704056096468	86.3326377618364	74	85.0333704529
77.1597704270715	85.6132641204458	76.5	82.6867103068
82.6615006659417	89.0786589294054	84.5	87.3607753402
84.2330839024382	90.0685682086382	82.5	90.3175416345
91.7225209961269	94.7859111988981	93	92.8585715715
Route: 3 Length: 71.1135571017631 Demand Met: 84			
95.5010207943732	108.937419328246	96	109.1651513899
90.9706056691829	117.937048774645	93	118.7349939952
90.9706056691829	117.937048774645	90	117.3205080757
87.6593084888535	124.514855950995	88	127.4954541697
87.5031426990257	124.327189566006	85	125.9807621135
82.7753429418678	115.093932523132	84.5	112.6392246598
76.9450159531494	114.346494637897	76.5	117.3132896932
76.9349127819037	114.345085998719	74	114.9666295471
83.0976319021682	110.512229577949	82.5	109.6824583655
91.7009784367503	105.161500819015	90.6	103.4117444218
91.7009784367503	105.161500819015	93	107.1414284285
Route: 4 Length: 100.617795264954 Demand Met: 84			
91.1983002988609	82.3112657159649	90	82.6794919243
91.1983002988609	82.3112657159649	93	81.2650060048
87.7109942004157	75.3039890153729	85	74.0192378865
87.7109942004157	75.3039890153729	88	72.5045458303
98.8257407920356	72.760652157261	100	70
101.682974633672	77.5165183879354	100	80
106.540028365919	78.3004651793143	107	81.2650060048
112.075095970911	75.5036228271912	112	72.5045458303
112.513687297238	75.6980293847112	115	74.0192378865
112.690185376844	81.3517104746313	110	82.6794919243
116.660500080435	84.5943146336444	115.5	87.3607753402
123.011031149064	85.2911454923527	124.5	82.6867103068
123.011075649867	85.2911787305506	126	85.0333704529
116.476621778585	89.4693552061508	117.5	90.3175416345
Route: 5 Length: 103.787568036173 Demand Met: 80			
119.576339891944	98.4593221434784	120	100
127.524536654563	97.8337447080274	129.7	95.7679792061
127.259317106416	99.859714200702	130	100
126.772980763408	103.574322475716	129.7	104.2320207939
123.520357903329	113.663863609451	126	114.9666295471
123.218240255948	114.600887029099	124.5	117.3132896932
118.169026931152	112.606911261969	117.5	109.6824583655
116.637249320998	114.268443994642	115.5	112.6392246598
112.776963289808	118.455628443759	110	117.3205080757
112.597400028602	124.184225348833	115	125.9807621135
111.03835079078	124.697310508762	112	127.4954541697
101.922729209104	127.697144751298	100	130
102.876895372891	120.850578279166	100	120
104.018371888614	118.40345702659	107	118.7349939952
Route: 6 Length: 17.9200165648162 Demand Met: 36			
101.427467493469	107.361373225651	100	110
102.887009446867	106.765274070944	104	109.1651513899
104.133615629726	106.256071211035	107	107.1414284285

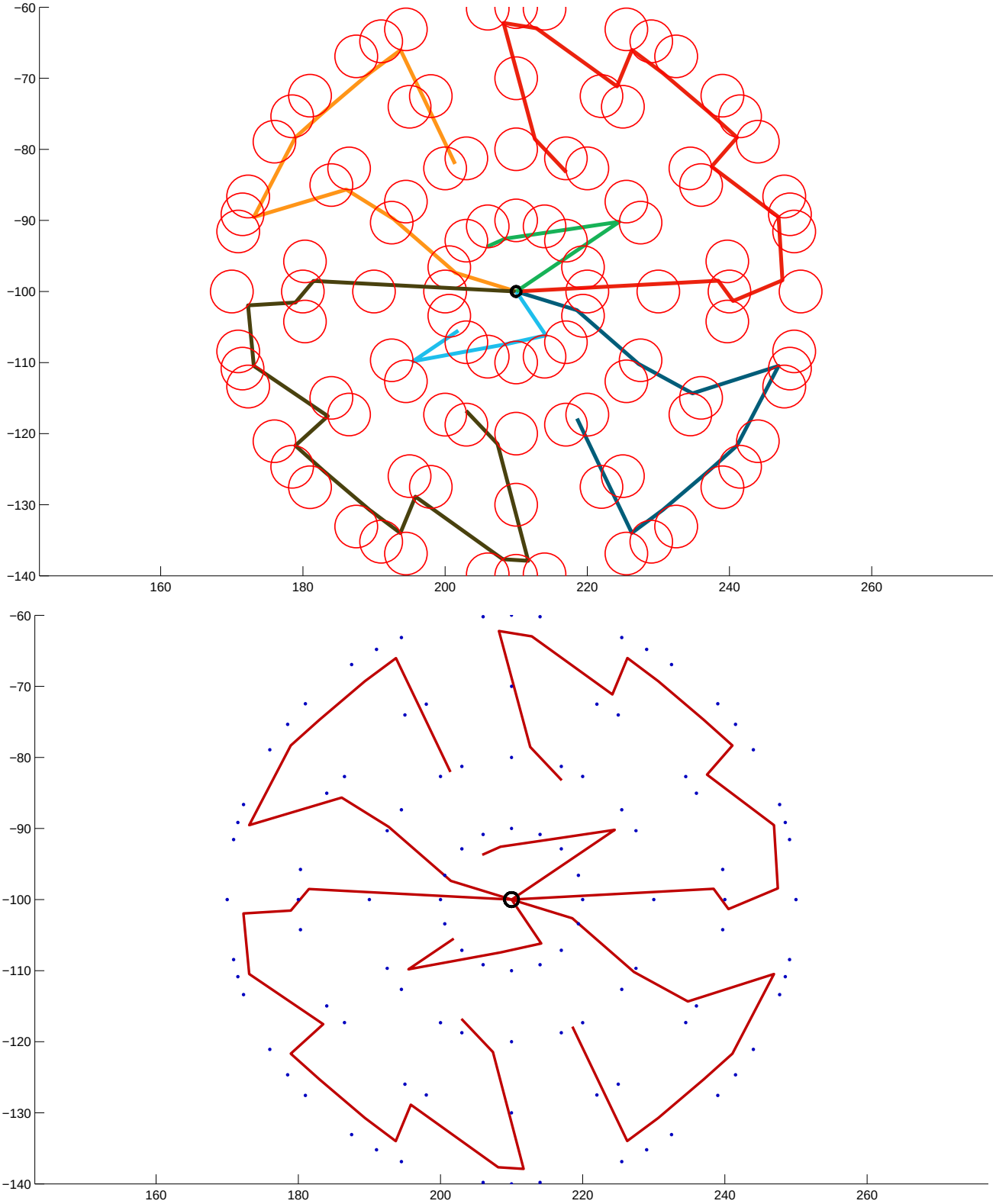


Figure O.32: *concentricCircles*4, Equal Radius, 2D, Euclidean, Length = 613.0437957

Table O-35: Solution for *concentricCircles*4, Equal Radius, 2D, Euclidean

Total distance: 613.04379571339 Total demand met: 536 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 111.425082679765 Demand Met: 90			
91.4567653454579	97.3774202985951	90	100
91.4567653454579	97.3774202985951	90.6	96.5882555782
82.7177128085564	89.7739682689329	84.5	87.3607753402
82.7177128085564	89.7739682689329	82.5	90.3175416345
76.1004440914524	85.6599980048108	74	85.0333704529
76.1004440914524	85.6599980048108	76.5	82.6867103068
63.1001268064415	89.523085917871	60.9	91.5625833337
63.1001268064415	89.523085917871	61.5	89.1487327929
63.1001268064415	89.523085917871	62.3	86.6317540418
68.9366688570521	78.315474598995	66	78.9286924943
68.9366688570521	78.315474598995	68.5	75.3474139288
72.9706621956409	74.7118829875454	71	72.4500453721
79.3673628541046	69.2760594349266	77.5	66.9281086117
83.7379221032411	66.0268216706821	84.5	63.125211865
83.7379221032411	66.0268216706821	81	64.8005681864
87.1105836016725	73.0727562999804	85	74.0192378865
87.1105836016725	73.0727562999804	88	72.5045458303
91.4033308189912	82.0402588914017	90	82.6794919243
91.4033308189912	82.0402588914017	93	81.2650060048
Route: 2 Length: 151.592984140809 Demand Met: 90			
80.3655913506843	98.9797545745563	80	100
71.4968615753638	98.5188924570231	70.3	95.7679792061
71.4968615753638	98.5188924570231	70	100
68.951720021436	101.552068840988	70.3	104.2320207939
62.2796790752808	101.950144831237	60	100
63.1001074123371	110.476908941061	60.9	108.4374166663
63.1001074123371	110.476908941061	61.5	110.8512672071
63.1001074123371	110.476908941061	62.3	113.3682459582
73.5076282365881	117.527096399915	74	114.9666295471
73.5076282365881	117.527096399915	76.5	117.3132896932
68.9366571017116	121.684534269819	66	121.0713075057
68.9366571017116	121.684534269819	68.5	124.6525860712
72.9706007880966	125.28793767261	71	127.5499546279
79.372583283448	130.728085142556	77.5	133.0718913883
83.7074843703309	133.981360829258	84.5	136.874788135
83.7074843703309	133.981360829258	81	135.1994318136
85.8244545472092	128.865251200508	85	125.9807621135
85.8244545472092	128.865251200508	88	127.4954541697
98.1118313392786	137.668729864408	96	139.7994974843
98.1118313392786	137.668729864408	100	140
101.683669293807	137.893030858777	104	139.7994974843
99.654777859485	130.14883125415	100	130
97.3776532967962	121.457154600688	100	120
92.9513978874621	116.78268602814	90	117.3205080757
92.9513978874621	116.78268602814	93	118.7349939952
Route: 3 Length: 111.333045605476 Demand Met: 90			
108.542643445538	102.622239892994	110	100
108.542643445538	102.622239892994	109.4	103.4117444218
117.216005737009	110.178462806717	115.5	112.6392246598
117.216005737009	110.178462806717	117.5	109.6824583655
124.789354051614	114.327268468434	124.5	117.3132896932
124.789354051614	114.327268468434	126	114.9666295471
136.899883067747	110.476912461508	139.1	108.4374166663
136.899883067747	110.476912461508	138.5	110.8512672071
136.899883067747	110.476912461508	137.7	113.3682459582
131.063335239919	121.684528362674	134	121.0713075057
131.063335239919	121.684528362674	131.5	124.6525860712
127.02919553595	125.288138403851	129	127.5499546279
120.632660487229	130.7239079467	122.5	133.0718913883
116.262083215281	133.973186547143	115.5	136.874788135
116.262083215281	133.973186547143	119	135.1994318136
112.913041405195	126.976665973858	115	125.9807621135
112.913041405195	126.976665973858	112	127.4954541697
108.560383646822	117.883551542109	110	117.3205080757
108.560383646822	117.883551542109	107	118.7349939952
Route: 4 Length: 150.65049518646 Demand Met: 90			
119.702756163431	98.9445355273992	120	100
128.412942250694	98.477866641406	129.7	95.7679792061
130.5031177339	101.341516888969	129.7	104.2320207939
130.5031177339	101.341516888969	130	100
137.450833845936	98.4183035643876	140	100
136.899889824382	89.5230919474156	139.1	91.5625833337
136.899889824382	89.5230919474156	138.5	89.1487327929
136.899889824382	89.5230919474156	137.7	86.6317540418
127.488905136361	82.4289223176184	124.5	82.6867103068
127.488905136361	82.4289223176184	126	85.0333704529
131.063341360059	78.31546639761	134	78.9286924943
131.063341360059	78.31546639761	131.5	75.3474139288
127.029367214357	74.712023576887	129	72.4500453721
120.627347712406	69.2718560824014	122.5	66.9281086117
116.29306163721	66.0184905017956	115.5	63.125211865
116.29306163721	66.0184905017956	119	64.8005681864
114.178756029598	71.1338320923056	115	74.0192378865
114.178756029598	71.1338320923056	112	72.5045458303
102.849856550772	62.9712737627894	104	60.2005025157
98.2250401812399	62.2127654605959	96	60.2005025157
98.2250401812399	62.2127654605959	100	60
100.321875676168	70.0039371423443	100	70
102.617710796058	78.5345329234017	100	80
107.048526210918	83.2169021100509	110	82.6794919243
107.048526210918	83.2169021100509	107	81.2650060048
Route: 5 Length: 43.9689525549753 Demand Met: 88			
104.161516637423	106.169589949069	104	109.1651513899
104.161516637423	106.169589949069	107	107.1414284285
98.446732673747	107.434253227139	100	110
98.446732673747	107.434253227139	96	109.1651513899
85.4974867956659	109.809720572807	84.5	112.6392246598
85.4974867956659	109.809720572807	82.5	109.6824583655
91.8683246196815	105.500006531905	90.6	103.4117444218
91.8683246196815	105.500006531905	93	107.1414284285
Route: 6 Length: 44.0732355459053 Demand Met: 88			
108.135081533376	94.4993555393217	109.4	96.5882555782
114.502685546333	90.1901681703725	115.5	87.3607753402
114.502685546333	90.1901681703725	117.5	90.3175416345
105.625707870666	91.504577077187	104	90.8348486101
105.625707870666	91.504577077187	107	92.8585715715
98.4488251002174	92.5678600151519	100	90
98.4488251002174	92.5678600151519	96	90.8348486101
95.8775103403578	93.707119228829	93	92.8585715715

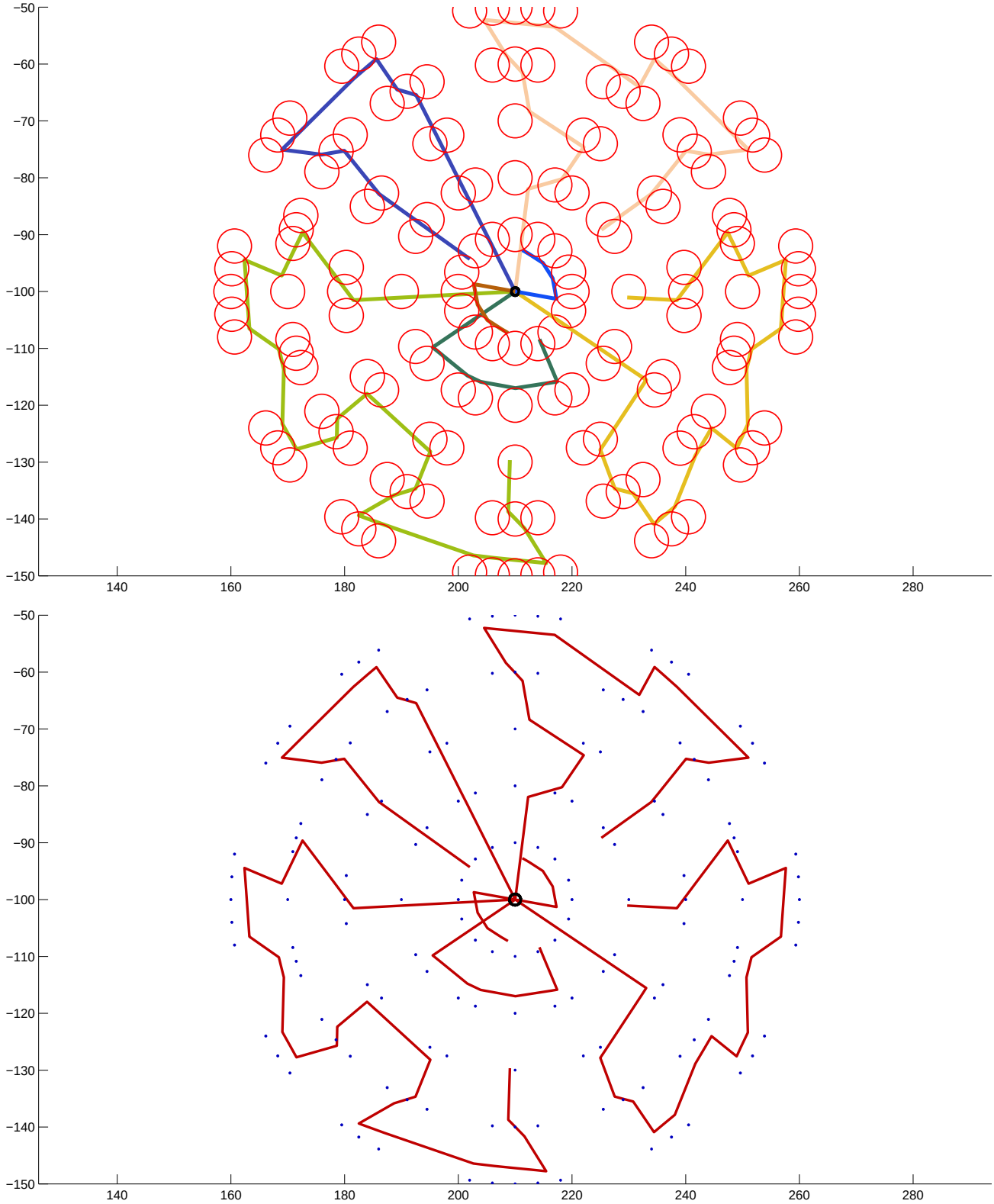


Figure O.33: *concentricCircles*5, Equal Radius, 2D, Euclidean, Length = 814.9371911

Table O-36: Solution for *concentricCircles*5, Equal Radius, 2D, Euclidean

Total distance: 814.937191068533 Total demand met: 580 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 230.6944716 Demand Met: 88			
80.27090033	101.0493457	80	100
71.56621109	101.5123292	70.3	104.2320208
70.08329222	99.54621991	70	100
68.1945565	97.04205374	70.3	95.76797921
62.59455154	89.6172609	62.3	86.63175404
62.10879821	90.62407482	61.5	89.14873279
61.1679634	92.5741343	60.9	91.56258333
58.93914381	97.19382885	60	100
52.39172496	94.4384403	50.64414928	92
52.51362255	96.14687102	50.16025682	96
52.77497096	99.81013363	50	100
53.05842834	103.7832433	50.16025682	104
53.25368145	106.5200155	50.64414928	108
58.42877357	110.1383139	60.9	108.4374167
58.79246478	111.5928745	61.5	110.8512672
59.31766253	113.6933146	62.3	113.368246
59.05027482	123.2855986	56.1365756	124
60.62164291	126.1030403	58.24176728	127.5
61.52816206	127.728434	60.37992933	130.5
68.62760529	125.7137194	71	127.5499546
68.66288077	124.1890934	68.5	124.6525861
68.705023	122.3685605	66	121.0713075
73.93728469	117.9659764	74	114.9666295
75.39910353	119.3042536	76.5	117.3132897
83.33785502	126.5720706	85	125.9807621
85.07509168	128.1624841	88	127.4954542
82.4691158	134.6667285	84.5	136.8747881
80.70655621	135.2072054	81	135.1994318
78.69163887	135.8250723	77.5	133.0718914
72.48967543	139.3713519	69.5	139.6200707
73.76165533	139.840497	72.5	141.7582327
77.00732486	141.0376121	76	143.8634244
92.66606745	146.430724	92	149.3558507
96.32327717	146.8572333	96	149.8397432
100.261519	147.251349	100	150
103.7041808	147.5958799	104	149.8397432
105.4528601	147.7708895	108	149.3558507
101.6363246	141.6469416	104	139.7994975
100.1036119	140.0647343	100	140
98.79780861	138.7167757	96	139.7994975
99.07915719	129.6557969	100	130
Route: 2 Length: 59.10213943 Demand Met: 80			
85.49717703	109.8134155	82.5	109.6824584
86.43114585	110.5733854	84.5	112.6392247
91.60126405	114.7835705	90	117.3205081
93.91857541	115.8790606	93	118.734994
100.0382436	117.000204	100	120
106.3560643	116.0143868	107	118.734994
107.3825594	115.8544677	110	117.3205081
105.0123521	110.164698	104	109.1651514
104.2775968	108.4016585	107	107.1414284
Route: 3 Length: 180.6809504 Demand Met: 89			
115.6774339	110.5764323	115.5	112.6392247
117.2515321	111.6383649	117.5	109.6824584
123.0584305	115.5558526	126	114.9666295
122.2360315	116.8058788	124.5	117.3132897
116.339839	125.7679951	115	125.9807621
114.9808875	127.8335717	112	127.4954542
117.5173099	134.6543206	115.5	136.8747881
119.1250988	135.0824099	119	135.1994318
120.764443	135.5189012	122.5	133.0718914
124.4187392	140.8927889	124	143.8634244
125.9207293	139.6441806	127.5	141.7582327
128.0760299	137.852478	130.5	139.6200707
131.6923869	128.8732291	129	127.5499546
133.3757466	126.0051854	131.5	124.6525861
134.5395165	124.0223988	134	121.0713075
138.9485285	127.5761242	139.6200707	130.5
139.6216685	126.1495544	141.7582327	127.5
140.9279258	123.3812414	143.8634244	124
140.6819513	113.6968414	137.7	113.368246
141.2096974	111.5851566	138.5	110.8512672
141.5713174	110.1381826	139.1	108.4374167
146.7463392	106.5199778	149.3558507	108
146.9414751	103.7848856	149.8397432	104
147.2246292	99.81586758	150	100
147.4840763	96.1791272	149.8397432	96
147.608261	94.43843115	149.3558507	92
141.0609127	97.19384969	140	100
138.863662	92.63965918	139.1	91.56258333
137.894589	90.6310824	138.5	89.14873279
137.4054533	89.61726181	137.7	86.63175404
131.8086613	97.0377569	129.7	95.76797921
129.9013831	99.56652309	130	100
128.4337903	101.5123285	129.7	104.2320208
119.7128034	101.0484757	120	100
Route: 4 Length: 170.6330992 Demand Met: 89			
102.2769487	81.95333495	100	80
106.2568051	80.81650881	107	81.265006
108.2399112	80.25006801	110	82.67949192
112.0585391	74.6090027	115	74.01923789
110.376222	73.50685745	112	72.50454583
102.506012	68.35078338	100	70
101.312837	61.53435605	104	60.20050252
99.87051008	59.98055034	100	60
98.38306166	58.37813602	96	60.20050252
94.54823506	52.22734543	92	50.64414928
96.17750689	52.38845075	96	50.16025682
99.69044651	52.7357972	100	50
103.6994765	53.13220257	104	50.16025682
106.9495882	53.45424639	108	50.64414928
117.1880979	60.71543067	115.5	63.12521187
120.1010758	62.78128379	119	64.80056819
121.8262366	64.00474445	122.5	66.92810861
124.5161743	59.09183862	124	56.1365756
125.8830667	60.30047153	127.5	58.24176728
128.4493688	62.56965469	130.5	60.37992933
137.5320746	71.57595649	139.6200707	69.5
139.8439857	73.86844931	141.7582327	72.5
141.0222475	75.03681074	143.8634244	76
134.0595555	75.92928166	134	78.92869249
131.8677436	75.55938665	131.5	75.34741393
130.0640819	75.25499564	129	72.45004537
125.09486	81.41971437	124.5	82.68671031
123.9398511	82.85259151	126	85.03337045
116.6677293	88.06141456	117.5	90.31754163
115.1660569	89.13700905	115.5	87.36077534
Route: 5 Length: 121.9830569 Demand Met: 90			
95.52871838	91.12363001	96	90.83484861
91.40079851	82.92893782	93	81.265006
90.43428636	81.01025289	90	82.67949192
86.9753149	74.14360453	85	74.01923789
86.02087641	72.2488961	88	72.50454583
82.59051165	65.4390518	84.5	63.12521187
81.03913497	65.00007563	81	64.80056819
79.25556154	64.49541366	77.5	66.92810861
75.6002792	59.10982708	76	56.1365756
74.15868805	60.34194335	72.5	58.24176728
71.53219628	62.58677733	69.5	60.37992933
62.47831048	71.56536458	60.37992933	69.5
60.26459318	73.7606505	58.24176728	72.5
58.97774084	75.03678606	56.1365756	76
65.9404394	75.92928367	66	78.92869249
68.1627119	75.5542558	68.5	75.34741393
69.93593003	75.25499744	71	72.45004537
75.06426605	81.61713398	76.5	82.68671031
76.06014063	82.85258589	74	85.03337045
83.21625876	87.97831857	82.5	90.31754163
84.85118918	89.14936749	84.5	87.36077534
92.0333665	94.2937282	93	92.85857157
Route: 6 Length: 25.92154027 Demand Met: 72			
92.72841598	98.70264445	90.6	96.58825558
92.87573963	99.51460931	90	100
93.39135394	102.3122197	90.6	103.4117444
95.12909312	105.0277372	93	107.1414284
97.57216131	106.6117865	96	109.1651514
98.73131679	107.2812734	100	110
Route: 7 Length: 25.92193329 Demand Met: 72			
107.272638	101.2964312	109.4	103.4117444
107.114939	100.4409109	110	100
106.6091397	97.68882475	109.4	96.58825558
104.8725955	94.9738251	107	92.85857157

Solution x	Solution y	Original x	Original y
102.4279352	93.38982937	104	90.83484861
101.2685983	92.71860723	100	90

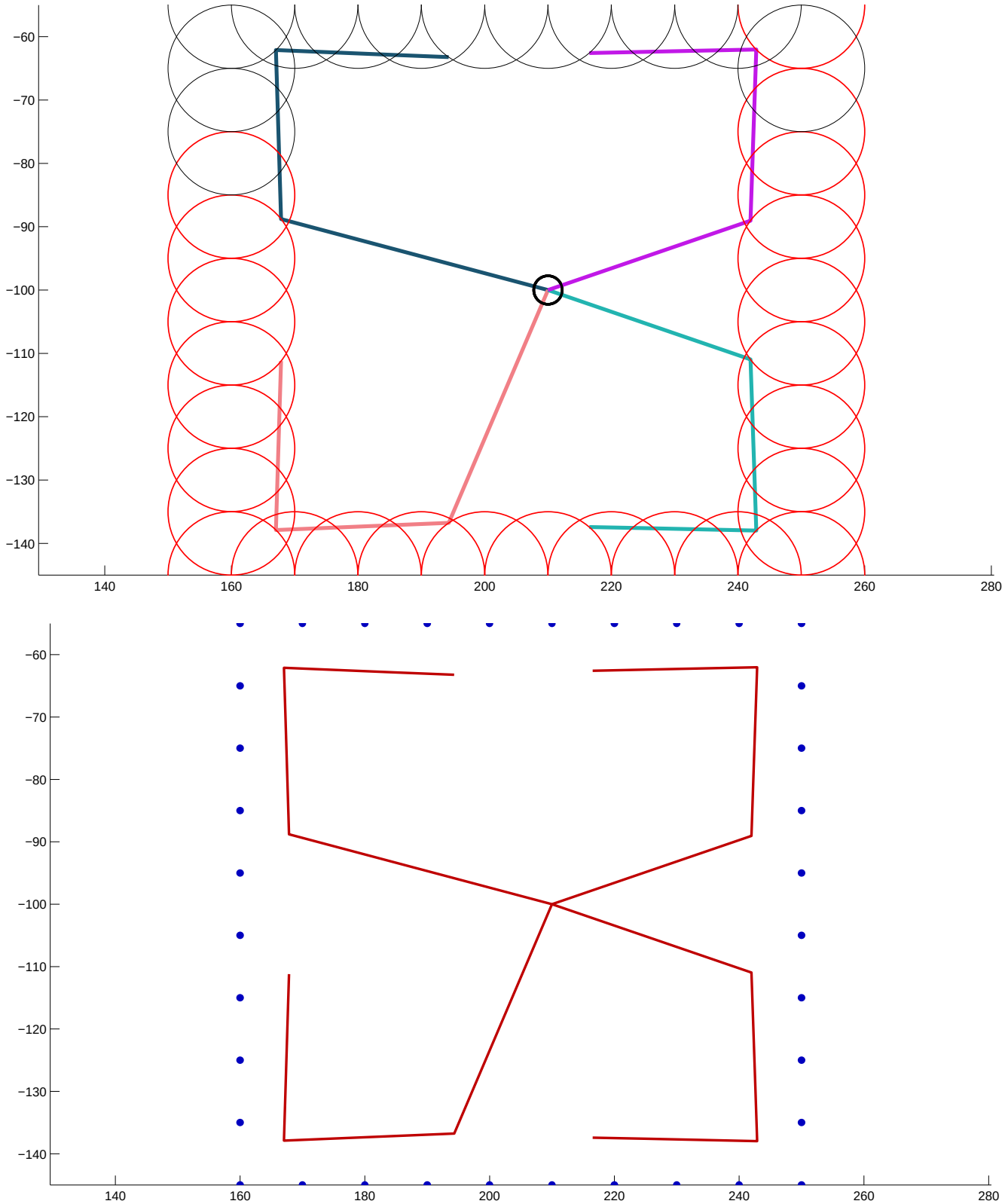


Figure O.34: *bubbles*1, Equal Radius, 2D, Euclidean, Length = 525.5619380

Table O-37: Solution for *bubbles*1, Equal Radius, 2D, Euclidean

Total distance: 525.561937957425 Total demand met: 432 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 137.603346566051 Demand Met: 108			
57.8366342082639	88.788135695327	50	85
57.8366342082639	88.788135695327	50	95
57.2793283571717	70.3289028178316	50	65
57.2793283571717	70.3289028178316	50	75
57.0310705356842	62.1108483453384	50	55
57.0310705356842	62.1108483453384	60	55
74.9660000672761	62.8429220528029	70	55
74.9660000672761	62.8429220528029	80	55
84.3153314580645	63.2270709394539	90	55
Route: 2 Length: 137.603286377009 Demand Met: 108			
84.3215111918314	136.768638677215	80	145
84.3215111918314	136.768638677215	90	145
65.1352965059543	137.557349767134	60	145
65.1352965059543	137.557349767134	70	145
57.0341096642638	137.892134323479	50	145
57.0341096642638	137.892134323479	50	135
57.571639111177	120.037838942339	50	125
57.571639111177	120.037838942339	50	115
57.8354903096946	111.213327652847	50	105
Route: 3 Length: 125.177611977942 Demand Met: 108			
131.963976174125	110.951704330879	140	115
131.963976174125	110.951704330879	140	105
132.606510505511	129.82327667344	140	135
132.606510505511	129.82327667344	140	125
132.88390537924	137.974205919875	140	145
132.88390537924	137.974205919875	130	145
114.970809885145	137.594469621074	120	145
114.970809885145	137.594469621074	110	145
106.516971506749	137.415176321073	100	145
Route: 4 Length: 125.177693036422 Demand Met: 108			
131.964100554379	89.0481572643069	140	95
132.27613394782	79.8882385871935	140	75
132.27613394782	79.8882385871935	140	85
132.883560314194	62.0254101286332	140	55
132.883560314194	62.0254101286332	140	65
124.681236196631	62.1993423822138	130	55
124.681236196631	62.1993423822138	120	55
106.516321271421	62.585355440553	110	55
106.516321271421	62.585355440553	100	55

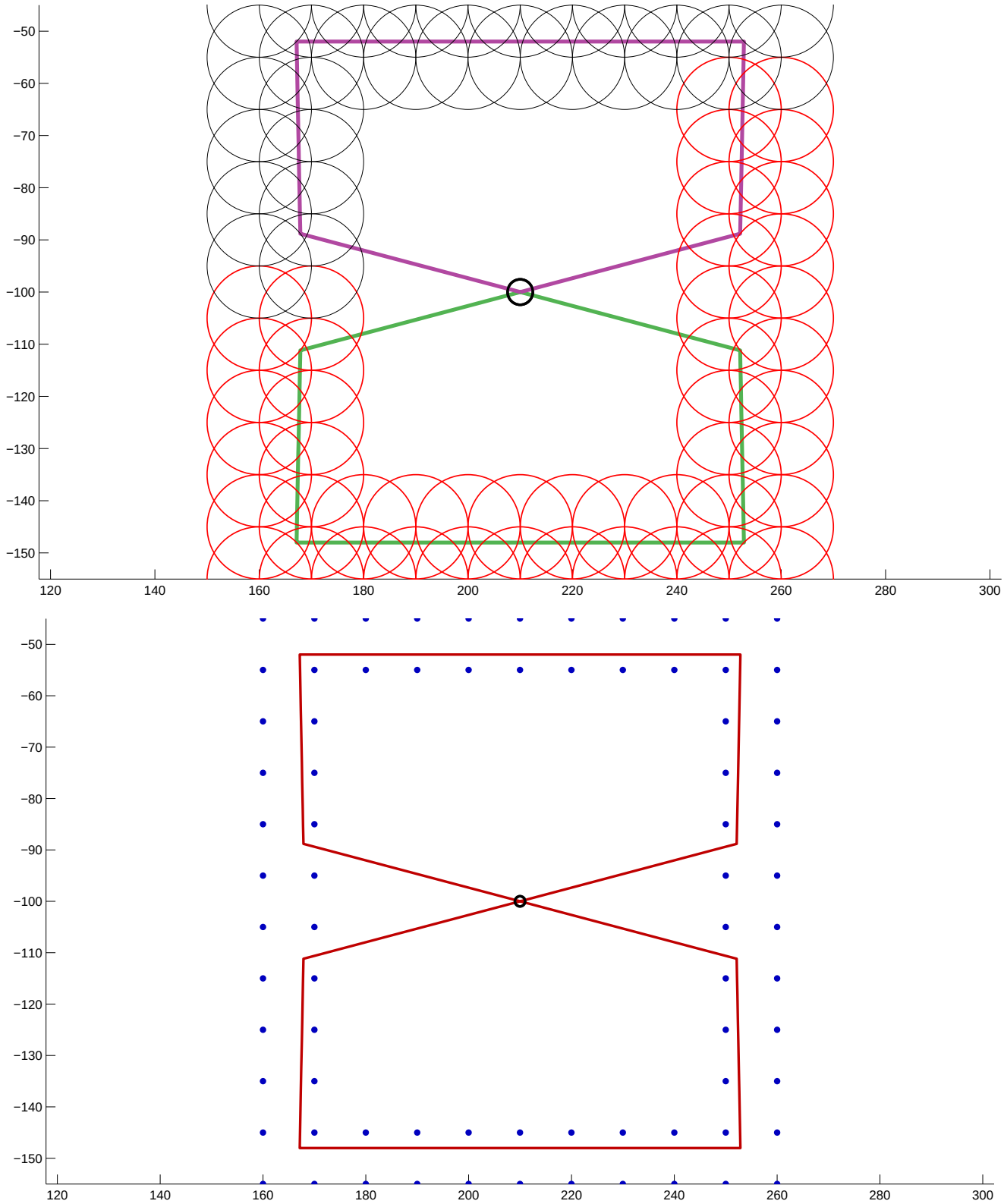


Figure O.35: *bubbles*2, Equal Radius, 2D, Euclidean, Length = 493.1269456

Table O-38: Solution for *bubbles*2, Equal Radius, 2D, Euclidean

Total distance: 493.126945564769			
Total demand met: 752			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 246.563473496782 Demand Met: 376			
64.7183704557653	109.35774672608	60	115
61.2368672163601	110.281137541832	60	105
57.8654350491034	111.175348966859	50	105
57.7696303145166	116.041050481986	50	115
57.6322670019053	123.017271054041	50	125
57.5502277562475	127.183737001118	60	125
57.444783821857	132.539114133533	60	135
57.3603503173802	136.827238101522	50	135
57.2277423868123	143.563530888739	50	145
57.1404200619159	147.998971050605	50	155
60.1263288879993	147.998974612625	60	155
63.3641797340509	147.998981974132	60	145
67.9874512177284	147.999000334523	70	145
71.905640343602	147.999016051261	70	155
77.9807584044711	147.999047019968	80	155
82.1830916610502	147.999061337603	80	145
87.5740266491691	147.999087350324	90	145
91.8057190946053	147.9991097634	90	155
98.0221283681171	147.999136999585	100	155
102.255807784008	147.999149974375	100	145
107.668944264392	147.999170806088	110	145
111.94364028474	147.999191091899	110	155
118.197584388048	147.999211732379	120	155
122.468117891901	147.999228545621	120	145
127.883734455192	147.999247595356	130	145
132.187504267792	147.999265870328	130	155
138.421347472814	147.999285803433	140	155
142.859250123807	147.999307462114	150	155
142.797279904951	144.851523030395	150	145
142.73176822782	141.523635598521	140	145
142.64326204364	137.027487582009	140	135
142.56767161542	133.187769865377	150	135
142.444163842689	126.912764795291	150	125
142.36567973022	122.925819324742	140	125
142.270928588531	118.112205064915	140	115
142.201566000799	114.588583483005	150	115
142.134371729966	111.17510302438	150	105
134.623461012917	109.183007890801	140	105
Route: 2 Length: 246.563472067988 Demand Met: 376			
136.178265237183	90.4043538232866	140	85
139.138082032999	89.619383280974	140	95
142.134522123793	88.8247049561238	150	95
142.233811158603	83.7833169951208	150	85
142.369830471865	76.8764975909601	150	75
142.454477134364	72.5781250328089	140	75
142.560575118276	67.1907705931116	140	65
142.642866633017	63.0128650730541	150	65
142.77306275617	56.401228301711	150	55
142.859713731842	52.0011659685709	150	45
139.70456652092	52.0011727428251	140	45
136.386033469937	52.0011778888765	140	55
131.650566353638	52.0011800476606	130	55
127.824229586023	52.0011835412753	130	45
121.667389433513	52.0011803960818	120	45
117.523840956253	52.0011795328711	120	55
112.147418342782	52.0011739256548	110	55
108.033893569152	52.0011686366992	110	45
101.74219873506	52.00116169766	100	45
97.5534333924911	52.0011617821454	100	55
92.1466923079675	52.0011574031533	90	55
87.9744478842015	52.0011510690451	90	45
81.6564143434891	52.0011467255321	80	45
77.4908322081014	52.0011459794923	80	55
72.0817328081986	52.0011419861543	70	55
67.9278448438557	52.0011365529972	70	45
61.4111188374754	52.0011291778625	60	45
57.1403300729651	52.0011208844388	50	45
57.2003492403801	55.0495959044552	50	55
57.2660048906768	58.3840899479137	60	55
57.3566383339911	62.9873316652485	60	65
57.4328041197973	66.8557575384906	50	65
57.5534910803981	72.9849024689435	50	75
57.6304332810502	76.892153706328	60	75
57.7238797368258	81.6377454216517	60	85
57.7956376582171	85.2820381208765	50	85
57.8653915188169	88.8245951597604	50	95
65.0304092649501	90.7250332258834	60	95

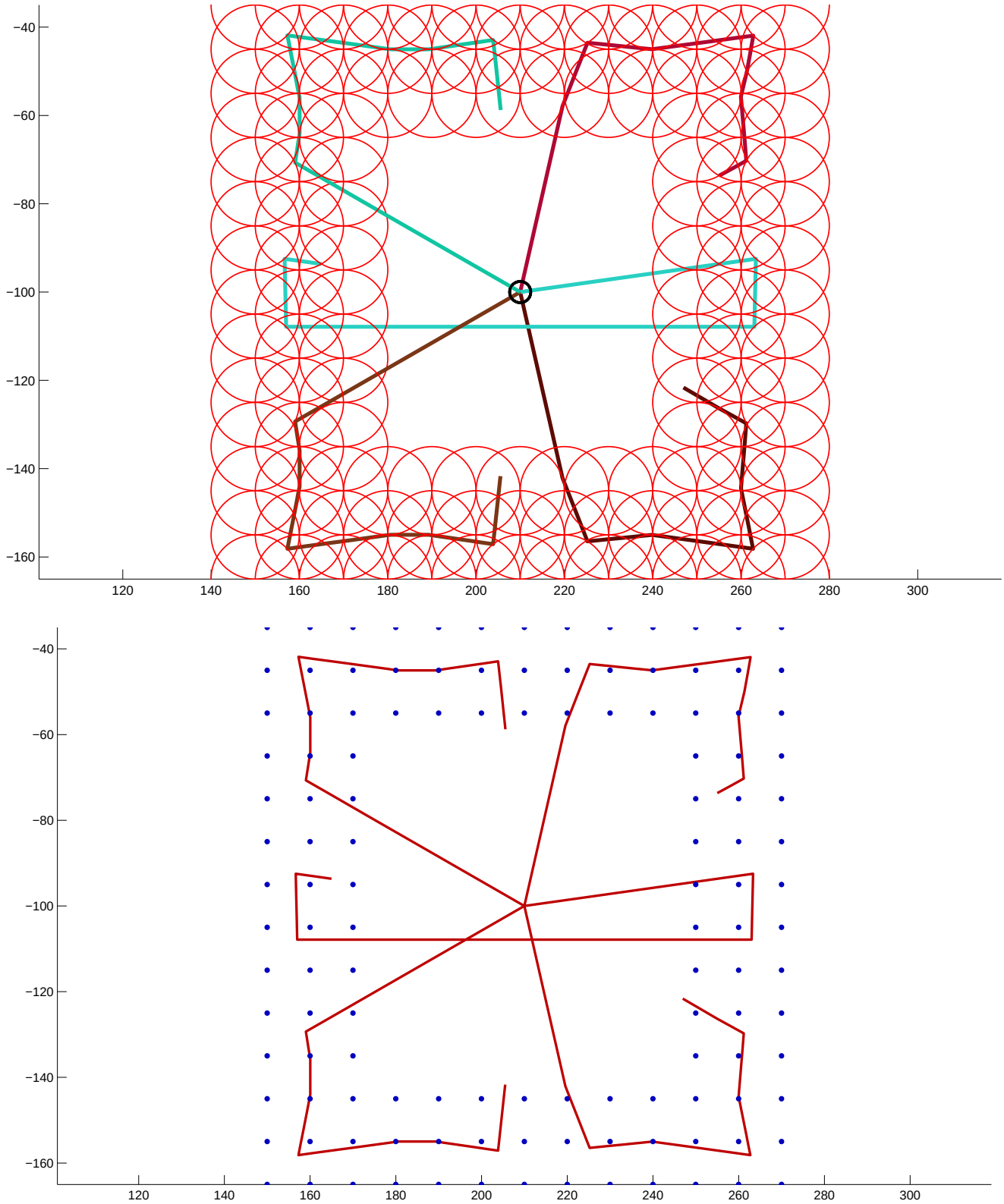


Figure O.36: *bubbles*3, Equal Radius, 2D, Euclidean, Length = 997.9625028

Table O-39: Solution for *bubbles*3, Equal Radius, 2D, Euclidean

Total distance: 997.962502781319			
Total demand met: 1052			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 184.337267858117 Demand Met: 212			
109.557535111068	142.058311519641	100	145
110.831108203465	145.303197586844	110	145
112.170124328723	148.714639990279	120	145
113.772496075319	152.797172440025	110	155
115.212562156552	156.4659953495	110	165
119.02719890965	156.082687386691	120	165
123.296963819807	155.653721305556	120	155
129.82002307152	154.998381329374	130	145
130.900025689295	155.146797996881	130	155
132.001183360866	155.298099411471	130	165
139.69392295904	156.355303052233	140	165
143.590217888382	156.890894521218	140	155
148.916000429227	157.62284955871	150	165
152.7187831881	158.145517437661	160	165
152.219119736728	155.639702682787	150	155
151.738987178751	153.231942841492	160	155
150.700044747075	148.020912204936	160	145
150.337369551399	146.202168894811	150	145
149.983657346115	144.428484189279	140	145
150.49821401844	138.170853356832	150	135
150.854800286372	133.835243160747	160	135
151.192193629409	129.735249243273	160	125
148.182895151523	128.084220181336	150	125
144.930337305475	126.299906281244	140	135
136.951173985676	121.629413544764	140	125
Route: 2 Length: 184.344186150199 Demand Met: 212			
109.557204655894	57.9427611758674	100	55
111.102480124466	54.0057866837536	110	55
112.887071392246	49.4590973467787	120	45
112.887071392246	49.4590973467787	120	55
114.071547783413	46.4413140791752	110	45
115.212711056993	43.5339128048693	110	35
119.66392147789	43.9807085249562	120	35
125.821274732062	44.5987490627581	130	45
129.832678092371	45.0013991475162	130	55
131.693598518024	44.7513576550658	130	35
137.522129527764	43.9682587762721	140	45
142.120085398238	43.3504939905337	140	35
148.918667852699	42.4370782241846	150	35
152.779446368784	41.9183552825333	160	35
152.081408911253	45.8367390145325	150	45
151.339750602091	49.9999953226953	160	45
151.339750602091	49.9999953226953	160	55
151.339750602091	49.9999953226953	150	55
149.97194192135	55.7485969851195	140	55
150.755682754014	65.0884490036456	160	65
151.190350076632	70.2681817929112	160	75
148.143169486568	71.9379135880723	150	75
145.000450680946	73.659988022517	150	65
145.000450680946	73.659988022517	140	65
145.000450680946	73.659988022517	140	75
Route: 3 Length: 244.546121071411 Demand Met: 208			
145.007511864817	93.6482522688292	150	85
145.007511864817	93.6482522688292	140	85
145.007511864817	93.6482522688292	140	95
150.898633606738	92.8165938655354	150	95
153.354816099481	92.4727430285898	160	85
153.258060601863	96.7833992731521	160	95
153.113461761558	103.226095863385	160	105
153.009651245115	107.849097220412	160	115
148.915977650702	107.849131970455	150	105
144.588419191722	107.849173878106	150	115
144.588419191722	107.849173878106	140	115
144.588419191722	107.849173878106	140	105
54.913144598342	107.849907468535	50	115
54.913144598342	107.849907468535	60	115
54.913144598342	107.849907468535	60	105
50.9005749375716	107.84991186229	50	105
46.9911815484218	107.849921321321	40	115
46.88776013605	103.256533257416	40	105
46.7452044219242	96.9240272047599	40	95
46.6450029392811	92.4728946363742	40	85
Solution x	Solution y	Original x	Original y
50.7274967262329	93.0466412218641	50	95
54.9920090348398	93.645967953213	50	85
54.9920090348398	93.645967953213	60	85
54.9920090348398	93.645967953213	60	95
Route: 4 Length: 192.367465030728 Demand Met: 210			
63.1701938393989	121.181654052454	60	125
54.4253033930151	126.210868927959	50	125
49.0185730496434	129.320340592616	40	125
49.5568055197085	132.757652012764	40	135
49.7947413570582	134.277083819922	50	135
50.0308442734927	135.784815445766	60	135
50.0460163077928	144.041767072006	60	145
49.6799789869482	145.906283121553	50	145
49.2971273231719	147.856463428906	40	145
48.2504819826634	153.188010505529	40	155
47.7747313028449	155.611341226195	50	155
47.2779085084666	158.142008195205	40	165
50.9281611561479	157.648218523644	50	165
56.5214765783969	156.891605263886	60	155
60.3944805795029	156.367691504888	60	165
67.916730462559	155.350157381043	70	165
69.3227809890966	155.159971160528	70	155
70.6731466461807	154.977317980723	70	145
79.28017002624	154.974058657364	80	145
80.7781632543108	155.192069820194	80	155
82.2841116477194	155.411237811091	80	165
88.3952145979234	156.300725084534	90	165
90.9766285925246	156.676475768702	90	155
93.8716855566742	157.097863181812	100	165
94.5296093410836	150.967815657503	100	155
95.5245152332195	141.698151579977	90	145
Route: 5 Length: 192.367462670864 Demand Met: 210			
63.7702063586042	79.1639517670649	60	75
54.6213591200706	73.9023669472888	50	75
49.0188648709064	70.6802674709704	40	75
49.5483490909761	67.2966377313948	40	65
49.7973928431841	65.7056928865337	50	65
50.0309827831356	64.2134250930556	60	65
50.0457096181631	55.9550408084349	60	55
49.6802411222469	54.0938959522923	50	55
49.3068515158441	52.1924152062485	40	55
48.2106858775663	46.6082585933742	40	45
47.7505495422153	44.2645532354102	50	45
47.2780455037492	41.8578473717682	40	35
50.7780763966618	42.3313370142786	50	35
56.4899706916634	43.1039670809072	60	45
60.2864731267069	43.61753497573	60	35
67.9829248188793	44.6586764280258	70	35
69.3326507698639	44.8413336852663	70	45
70.6723423332549	45.0226279167269	70	55
79.2809608660829	45.0258841917171	80	55
80.7713770496572	44.8090038450066	80	45
82.2754620471836	44.5901393580768	80	35
88.3593813282652	43.7047354558953	90	35
90.9503905507921	43.3276201968362	90	45
93.8719981406441	42.9023801126701	100	35
94.5323744907647	49.0554455815443	100	45
95.5733584386662	58.7547530585791	90	55

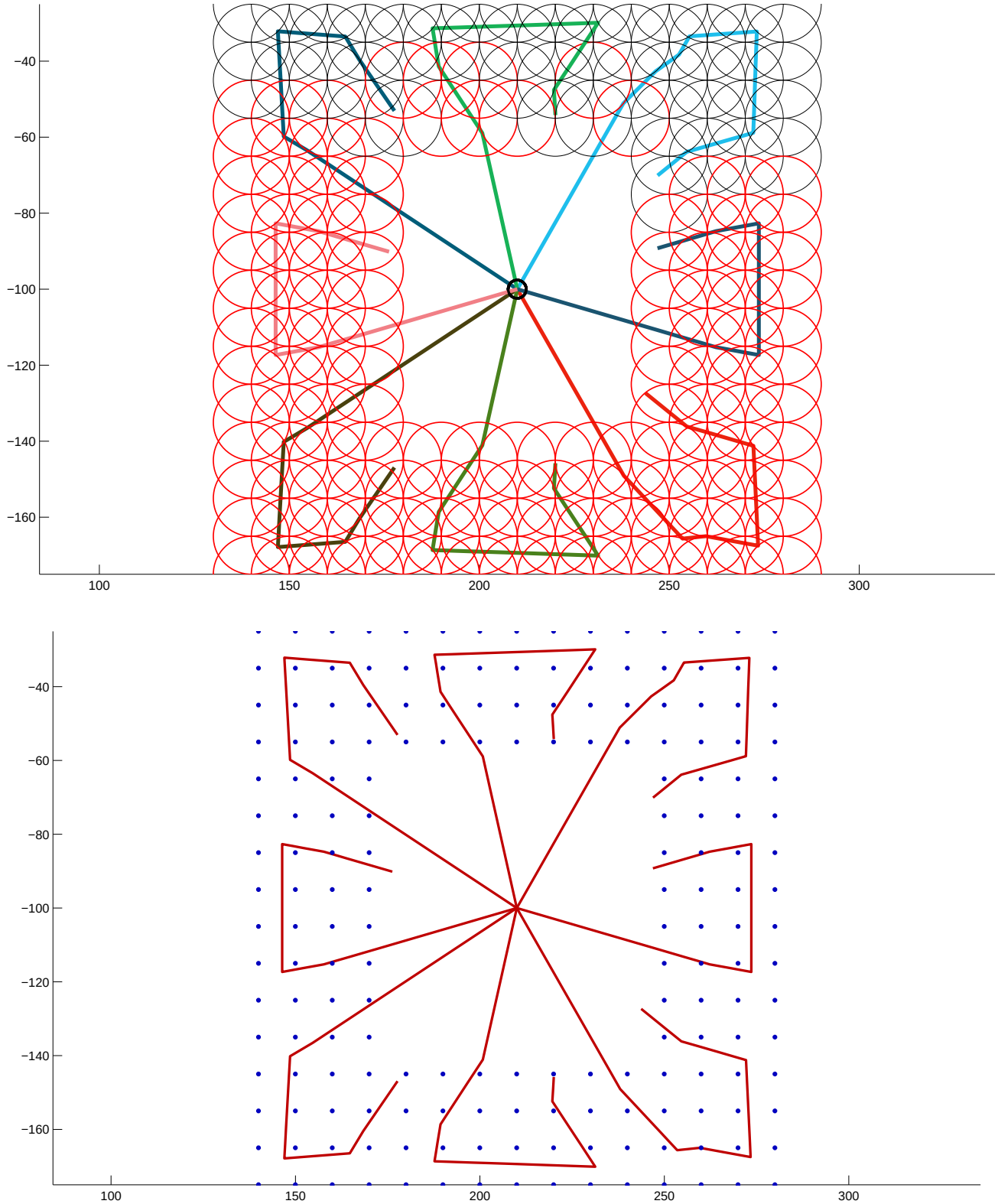


Figure O.37: *bubbles*4, Equal Radius, 2D, Euclidean, Length = 1517.6153350

Table O-40: Solution for *bubbles*4, Equal Radius, 2D, Euclidean

Total distance: 1517.61533500695			
Total demand met: 1284			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 199.386977151038 Demand Met: 148			
58.3863594532409	127.481400355988	60	135
58.3863594532409	127.481400355988	60	125
44.684446498637	136.529781455134	40	145
44.684446498637	136.529781455134	50	145
44.684446498637	136.529781455134	50	135
38.5521002422126	140.182842200777	30	145
38.5521002422126	140.182842200777	30	135
38.5521002422126	140.182842200777	40	135
37.4621006346659	159.583362242961	30	165
37.4621006346659	159.583362242961	30	155
37.4621006346659	159.583362242961	40	155
37.2197773658161	163.897040924915	40	165
36.9973743798272	167.85597263997	30	175
36.9973743798272	167.85597263997	40	175
54.7489316775879	166.489614100794	50	175
54.7489316775879	166.489614100794	60	175
54.7489316775879	166.489614100794	60	165
58.405706072618	160.417008255287	50	165
58.405706072618	160.417008255287	50	155
58.405706072618	160.417008255287	60	155
67.686118922018	146.93675624535	60	145
67.686118922018	146.93675624535	70	145
Route: 2 Length: 199.386996376946 Demand Met: 148			
58.2826674929158	72.4504201096448	60	65
58.2826674929158	72.4504201096448	60	75
44.6782004532206	63.4663221488052	40	55
44.6782004532206	63.4663221488052	50	55
44.6782004532206	63.4663221488052	50	65
38.5531961575741	59.8189720130114	30	55
38.5531961575741	59.8189720130114	30	65
38.5531961575741	59.8189720130114	40	65
37.4715767212433	40.5615727864056	30	35
37.4715767212433	40.5615727864056	30	45
37.4715767212433	40.5615727864056	40	45
37.2234173146424	36.1439331101431	40	35
36.9986661345978	32.1427518169133	30	25
43.0543909285485	32.6091965278086	40	25
54.748321239337	33.5100004358407	50	25
54.748321239337	33.5100004358407	60	25
54.748321239337	33.5100004358407	60	35
58.4059817912918	39.5833969316136	50	35
58.4059817912918	39.5833969316136	50	45
58.4059817912918	39.5833969316136	60	45
67.6835266081847	53.0600928960998	60	55
67.6835266081847	53.0600928960998	70	55
Route: 3 Length: 201.311334234128 Demand Met: 170			
125.50352973658	144.612316172611	130	145
128.050625004775	149.068087514684	120	155
132.173199704909	153.48765063267	130	155
136.507848703475	158.134491668219	130	165
138.537438123307	160.309928663901	140	155
141.111870083582	163.069436988487	140	165
143.504536666162	165.634185135009	140	175
148.881672039964	165.073013534374	150	175
149.26092263416	165.032792003837	150	165
149.633401845192	164.9932877521	150	155
159.204286447735	166.722803249208	160	175
163.405945768577	167.482104286366	170	175
163.227578518198	163.741464702452	160	165
163.026092675152	159.516220075176	170	165
163.026092675152	159.516220075176	170	155
163.026092675152	159.516220075176	160	155
162.412420712629	146.64204718851	170	145
162.152993549204	141.198769150986	170	135
158.662973813123	140.190338269127	160	135
155.187799861057	139.186179386318	160	145
155.187799861057	139.186179386318	150	145
149.75244115752	137.615631196111	150	135
144.626007472802	136.134320997117	140	145
139.827359211127	132.248424213385	140	135
133.732511743031	127.312944441006	140	125
Route: 4 Length: 201.453903974651 Demand Met: 170			
124.108723780538	57.7860101124493	130	55
127.935413662064	51.0851689595218	120	45
136.4373943478	42.6524537313179	130	35
136.4373943478	42.6524537313179	130	45
139.332299319806	40.5985172055795	140	45
142.584627458987	38.2908700328923	150	35
142.584627458987	38.2908700328923	150	45
145.3316554219	33.4601190263502	150	25
145.3316554219	33.4601190263502	140	25
145.3316554219	33.4601190263502	140	35
157.547641413189	32.5893340444675	160	25
163.056816112729	32.1966932227791	170	25
162.916148446039	36.1940334912354	160	35
162.759912990774	40.6336819285895	170	35
162.759912990774	40.6336819285895	170	45
162.759912990774	40.6336819285895	160	45
162.310681451805	53.4033784116018	170	55
162.119351307718	58.8440620216877	170	65
158.314277623295	59.9367306890813	160	65
154.191984196705	61.1204812910059	160	55
154.191984196705	61.1204812910059	150	55
154.191984196705	61.1204812910059	150	65
144.618558546582	63.8695598125996	140	55
136.953788797543	70.0764340208868	140	65
136.953788797543	70.0764340208868	140	75
Route: 5 Length: 191.471229738878 Demand Met: 164			
90.7899070430125	58.8954270906712	100	55
86.6329827113385	52.5470753935309	90	45
86.6329827113385	52.5470753935309	90	55
84.5695287264561	49.3965133286155	80	55
81.7890491570961	45.1511786310745	80	45
79.3256532578962	41.3899685284321	70	45
78.4993878129287	36.2348086058468	70	35
78.1198538090227	33.8662147980803	80	35
77.7180370163377	31.3586216999296	70	25
82.4124654926845	31.2009758382525	80	25
90.7204330602005	30.9219720622935	90	25
90.7204330602005	30.9219720622935	90	35
104.241117808111	30.4681797337724	110	25
104.241117808111	30.4681797337724	100	25
104.241117808111	30.4681797337724	100	35
116.607790211979	30.0526835846989	120	25
121.280344065325	29.8956944860305	130	25
117.785905256512	35.2161262467003	120	35
113.726148726572	41.3974953458802	110	35
113.726148726572	41.3974953458802	110	45
109.658646917842	47.5905098475736	100	45
109.866898461267	51.2814275336573	110	55
110.03161950016	54.2053381596494	120	55
Route: 6 Length: 191.471229766802 Demand Met: 164			
90.7899285859223	141.104526823902	100	145
86.5278017797115	147.612432226227	90	155
86.5278017797115	147.612432226227	90	145
84.4681992775296	150.757417295943	80	145
81.7506805372906	154.907086918467	80	155
79.3255908427081	158.610193134792	70	155
78.5347253386606	163.542071394388	70	165
78.1315128760764	166.057754747276	80	165
77.7175143182684	168.640742815164	70	175
81.9552419808147	168.78321878391	80	175
87.7070091720589	168.976520107783	90	165
92.2908283522929	169.130559841122	90	175
98.3403490281445	169.33373302555	100	165
103.232742751122	169.498056815078	100	175
110.536346394282	169.743336392043	110	175
117.127559838611	169.964622959263	120	175
121.28049791097	170.104031920493	130	175
117.86627638837	164.905373527851	120	165
113.689326153466	158.54536863235	110	165
113.689326153466	158.54536863235	110	155
109.658115620674	152.407516715824	100	155
109.861013356325	148.811298463842	110	145
110.03142636787	145.792273072284	120	145
Route: 7 Length: 166.566835229396 Demand Met: 164			
137.00404971306	110.802261531956	140	115
137.00404971306	110.802261531956	140	105
145.723600840341	113.347738454518	150	105
149.139897001605	114.345343111189	150	115
152.299333475047	115.267933130365	150	125
158.06378416236	116.316553286129	160	125

Solution x	Solution y	Original x	Original y
160.80060823676	116.81423540977	160	115
163.593043908495	117.322041518544	170	125
163.593005825718	112.997105940873	170	115
163.592902735068	106.028227631941	160	105
163.592789056186	99.4851738486785	170	105
163.592789056186	99.4851738486785	170	95
163.592789056186	99.4851738486785	160	95
163.592485113274	88.2884674258805	170	85
163.592325530826	82.6773571578575	170	75
160.642458928902	83.2139908020982	160	85
157.740344265409	83.7419402974271	160	75
152.299806842245	84.7319558819817	150	75
149.139782115919	85.6545312372469	150	85
145.749377905896	86.6445797947593	150	95
136.903949447361	89.2266532259808	140	85
136.903949447361	89.2266532259808	140	95
Route: 8 Length: 166.566828535109 Demand Met: 156			
63.1863076884265	110.746614644233	60	115
63.1863076884265	110.746614644233	60	105
54.3083342171729	113.338369447839	50	105
50.8664399168555	114.3434955064	50	115
47.700997845719	115.267854251038	50	125
41.9174331929396	116.320060547846	40	125
39.1797835283955	116.817940305882	40	115
36.4071642874398	117.322211915704	30	125
36.4072828765514	112.29813337988	30	115
36.4074463205354	105.728719472822	40	105
36.407615293702	99.9758830342274	30	105
36.407615293702	99.9758830342274	30	95
36.4079128719593	94.0780556295281	40	95
36.4083466054958	87.4195155219488	30	85
36.4086670865398	82.6765312657754	30	75
39.2450977776717	83.1926796996704	40	85
42.0639243001758	83.7056047961308	40	75
47.6992637905287	84.7317356205345	50	75
50.7314109295412	85.6170933531526	50	85
53.9450415327136	86.5554391461554	50	95
59.673416784599	88.2276405973125	60	85
66.2665814037677	90.1526864544027	60	95

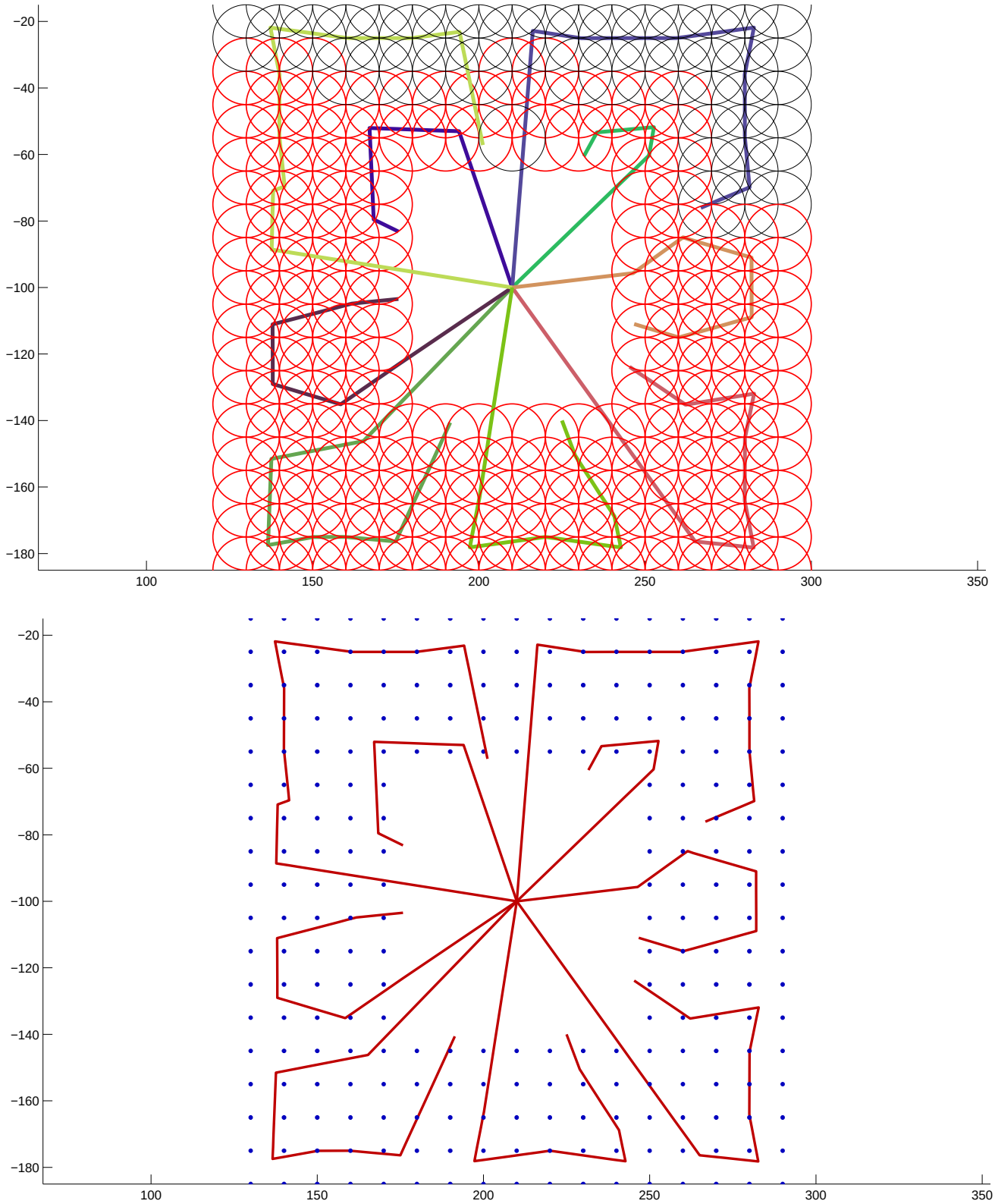


Figure O.38: *bubbles*5, Equal Radius, 2D, Euclidean, Length = 1873.6646995

Table O-41: Solution for *bubbles*5, Equal Radius, 2D, Euclidean

Total distance: 1873.66469945897			
Total demand met: 1416			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 150.472346636499 Demand Met: 156			
84.0269866224787	53.0201835967743	90	45
84.0269866224787	53.0201835967743	90	55
75.3698514255196	52.7048408494114	70	45
75.3698514255196	52.7048408494114	80	45
75.3698514255196	52.7048408494114	80	55
67.9224074307612	52.4327817191644	70	55
57.1041453272011	52.0378495737067	50	45
57.1041453272011	52.0378495737067	60	45
57.2938995781508	56.1767329826098	60	55
57.4962883315178	60.5947009147439	50	55
57.4962883315178	60.5947009147439	50	65
57.4962883315178	60.5947009147439	60	65
58.0365579246568	72.3521740004329	60	75
58.3661801693026	79.5221111154517	50	75
58.3661801693026	79.5221111154517	50	85
65.8070415640393	83.1840507763693	60	85
Route: 2 Length: 242.511840878429 Demand Met: 168			
129.180520992661	140.492987657786	130	145
135.269667906273	148.942679037363	140	145
142.113417998061	158.439538557116	150	155
142.113417998061	158.439538557116	140	155
147.268585758754	165.593380772215	150	165
151.626783132408	171.641267984038	150	175
155.021652684297	176.352277680109	150	185
158.701882149873	176.743296526115	160	175
162.167690937832	177.111530410185	160	185
168.160163327563	177.748208830692	170	185
172.645029653437	178.2247126949	180	185
172.155208036023	175.647127918756	170	175
171.684082988555	173.168022320288	180	175
170.631124033268	167.62663380133	180	165
170.294293849702	165.854317723349	170	165
169.958071327744	164.085179046884	160	165
169.999344206239	155.052791059668	160	155
169.999888232404	154.979799382597	170	155
170.000432024001	154.907227068618	180	155
170.018653205634	145.610498615429	180	145
169.992104696401	145.397393810383	160	145
170.819351963869	141.390273488492	170	145
172.116239063973	135.108123646154	180	135
172.775584321903	131.914326825288	180	125
169.536412220342	132.435929141946	170	125
164.73619532458	133.208912878212	170	135
164.73619532458	133.208912878212	160	135
160.465507993301	133.896622843467	160	125
152.155064298368	135.234972378289	150	145
148.218824664567	132.575734127767	150	135
142.781127029142	128.902150965036	140	135
135.316349610593	123.858976499482	140	125
Route: 3 Length: 241.145250246477 Demand Met: 168			
62.8883626218867	138.312125883298	70	145
59.0174826204114	142.308150920453	60	145
55.2444654962518	146.203123145436	60	155
47.6082558684928	147.670555012824	50	155
36.1756039575341	149.867550346393	30	155
36.1756039575341	149.867550346393	40	155
36.1756039575341	149.867550346393	40	145
31.5611796384428	150.754307957402	30	145
27.5832819060024	151.518741822492	20	145
27.3933605827373	156.366895287334	20	155
27.106780851475	163.683119472041	30	165
26.8593774050499	169.999194098109	20	175
26.8593774050499	169.999194098109	20	165
26.7052300182644	173.934841853214	30	175
26.567209872079	177.45865056113	20	185
30.3858050375126	176.775574205884	30	185
40.3453941468464	174.994040565615	40	165
40.4378740381948	175.004045800577	40	175
40.5307333222946	175.014091494065	40	185
49.7190146386089	175.003947054173	50	185
49.7710001987641	175.001165180103	50	175
49.8221756811175	174.998424423212	50	165
Route: 4 Length: 136.22684970557 Demand Met: 108			
132.971164899169	68.2137785851842	140	75
137.33623821935	64.0052995098833	140	65
141.166877869888	60.312146616656	150	65
142.0253300019	55.3747368209812	150	55
142.65017670418	51.7808638581614	150	45
139.728200644627	52.0494751994745	140	45
136.61241678109	52.3359065285599	140	55
132.57488709728	52.7070750928443	130	55
129.330596355267	53.0053230148156	130	45
125.489711238541	53.3584140030947	120	45
121.569566085426	60.531709044646	120	55
Route: 5 Length: 270.160429201563 Demand Met: 176			
103.470141956465	56.8998586757535	110	55
104.295679644065	46.6461136080416	110	45
104.815561479551	40.1888291145594	100	35
104.815561479551	40.1888291145594	100	45
105.308902338736	34.061254537757	110	35
105.84648222207	27.3841821748398	100	25
106.212662868266	22.8360035808621	100	15
108.826625247938	23.2304024222284	110	25
111.281139366818	23.6007429731905	110	15
117.795322496217	24.5836149509278	120	15
119.270515419017	24.8061902369254	120	25
120.733622955232	25.0269423869637	120	35
129.939181972836	25.0003777152857	130	35
130.037104692104	24.9998463203478	130	15
139.958095034865	25.0001143822009	140	35
139.97776439374	24.9999315822125	140	15
139.988279582192	24.9999565672325	130	25
142.893798397296	25.0067497190807	140	25
146.525310958047	25.0152399736855	150	25
149.3396851804	25.0218198947141	150	35
151.623312288656	24.7128070752005	150	15
157.442253440136	23.9254140110187	160	25
161.951932588432	23.3151806895992	160	15
168.67817878701	22.4050255500371	170	15
172.72193579363	21.8578410520117	180	15
172.23126951792	24.356053266141	170	25
171.767310716034	26.7182854187371	180	25
170.680241402065	32.2531217009547	180	35
170.312393802234	34.125997802704	170	35
169.955374581625	35.9437413015959	160	35
169.999226221788	44.9041110372575	160	45
169.999704448126	44.9776393102784	170	45
170.000183535168	45.0512688849877	180	45
170.00403635043	54.7159366460749	180	55
169.998315404224	54.8161060304202	160	55
170.310223687148	58.1262474157611	170	55
170.720799007486	62.4835862453991	170	65
171.057292016804	66.0546805108673	180	65
171.416695905741	69.8690058785048	180	75
167.366464950261	71.5778138824025	170	75
162.785965778352	73.510344444143	160	65
156.759886203275	76.0527754021901	160	75
Route: 6 Length: 169.612112228159 Demand Met: 152			
136.383974362356	95.6766673787746	140	105
140.433855799507	92.7728237466944	140	95
145.161498174281	89.3829143210312	140	85
151.41333442398	84.8996298853436	150	75
151.41333442398	84.8996298853436	150	85
153.057896647014	85.4790387410158	150	95
162.965314418424	88.3692960735664	170	85
162.965314418424	88.3692960735664	160	85
162.965314418424	88.3692960735664	160	95
168.267040078387	89.9162745046	170	95
172.005237835105	91.0069939233968	180	85
172.01600828496	96.8272442128959	180	95
172.02910123538	104.046003985291	180	105
172.037848511397	108.949843794548	180	115

Solution x	Solution y	Original x	Original y
168.093079084767	110.038464121671	170	105
162.878909735095	111.477482727171	170	115
162.878909735095	111.477482727171	160	115
162.878909735095	111.477482727171	160	105
153.270846993066	114.12786437034	150	105
150.109115775554	115.000584173416	150	125
145.184548297421	113.52668609361	150	115
136.698020986425	110.986563874658	140	115
Route: 7 Length: 174.749828163285 Demand Met: 156			
65.6419859516394	123.256338406014	60	115
60.9370711697512	126.501790437718	60	125
56.6317035324828	129.471638301438	50	125
54.1654287322759	131.172861889818	60	135
51.0877937538253	133.295771058721	50	135
48.439545594212	135.122488496724	50	145
40.0748180976662	132.620206380204	40	125
35.9959277853118	131.400008208124	30	135
35.9959277853118	131.400008208124	40	135
31.444082086153	130.038309513128	30	125
28.0077365713668	129.010311108377	20	135
27.984189110782	123.555798173467	20	125
27.9507082101634	115.802233692952	20	115
27.9303524642349	111.091773011253	20	105
31.7312740005064	110.095386087271	30	105
35.7867083248688	109.032299048867	30	115
35.7867083248688	109.032299048867	40	115
35.7867083248688	109.032299048867	40	105
46.1778498045917	106.308341829809	50	115
49.0117617768454	105.565414255398	50	105
51.7726178529097	104.841642876019	50	95
59.9980222941587	104.015862217138	60	95
65.7789961391452	103.435644716382	60	105
Route: 8 Length: 278.46605778194 Demand Met: 172			
42.0569933988326	90.8608865033489	40	95
35.6184196984349	89.8453414286969	30	85
35.6184196984349	89.8453414286969	40	85
31.4646185595187	89.1901844464458	30	95
27.6778465960702	88.5929135433937	20	95
27.7785648554229	84.3138867301193	20	85
27.911977506905	78.6462180850707	30	75
27.9995563706229	74.9253178818557	20	75
28.0949835386152	70.8712278563662	20	65
31.550619251636	69.6513512979508	40	75
31.2359671188931	66.6007520426378	30	65
30.9525719411485	63.8532280600815	40	65
30.1966058519385	56.5236914145775	40	55
30.0909722141299	55.4996389703423	30	55
29.9871444877456	54.4930840043098	20	55
29.9998126609707	45.0478789112338	20	45
30.0002814042259	44.977568907714	30	45
30.0007517128913	44.9070227379029	40	45
30.0446237010261	35.9436728926313	40	35
29.6870852431374	34.1232805984255	30	35
29.3178465855837	32.2433193074088	20	35
28.2278117912853	26.6934508704364	20	25
27.7605321225567	24.314349562059	30	25
27.2780497128819	21.857846775341	20	15
31.1426314187448	22.3807876301741	30	15
37.8861701072319	23.2932750315733	40	15
42.4310010432257	23.9082615024749	40	25
48.3363427568811	24.7073425572872	50	15
50.6603293182966	25.0218244991063	50	35
54.2396787832945	25.0135575356748	50	25
59.9297346553059	25.0004358487951	60	35
59.970889372281	25.0002156307185	60	25
60.0119421484161	24.9999957666105	60	15
69.6125837362077	24.9924929116186	70	15
69.681124072036	24.9978501283902	70	25
69.748925128309	25.0031501320148	70	35
79.8497007616705	23.6999924947867	80	15
84.1911523546667	23.139862974218	90	15
84.8984147031671	26.5784392364572	90	25
85.6726102064501	30.3424491885806	80	25
85.6726102064501	30.3424491885806	80	35
87.4528257784133	38.99748602096	90	35
91.1891679297825	57.1626070620341	100	55
Route: 9 Length: 210.319984617046 Demand Met: 160			
93.5136636281137	141.66772319542	100	145
92.0906785521581	150.808167583378	90	155
91.3945824741559	155.279705676414	100	155

Solution x	Solution y	Original x	Original y
90.1495874161698	163.276832291772	100	165
89.7188765193892	165.493064575565	90	165
89.2893022027343	167.703477019328	80	165
88.119960224452	173.720448543356	80	175
87.7018720699608	175.87168097586	90	175
87.2635856251173	178.126832170088	80	185
90.6149534007189	177.665728593439	90	185
98.0986216530067	176.636211646964	100	185
101.74969886829	176.133865003045	100	175
106.895776968218	175.425840248887	110	175
109.990782714802	174.999999584935	110	165
111.614465556375	175.226502444866	110	185
117.930918302323	176.107654957458	120	175
122.014040000673	176.677309343926	120	185
129.296870748291	177.693088699546	130	185
132.698062668272	178.167589996051	140	185
132.244315858152	175.986387764719	130	175
131.810749596341	173.902160839091	140	175
130.748312340711	168.795572591205	140	165
128.483822993948	165.290169278234	130	165
126.082106458082	161.572334243452	120	165
123.894856920269	158.186477334241	130	155
121.384646688992	154.300663124875	120	155
118.933252311207	150.50588513942	110	155
117.031599887478	145.43310657642	120	145
114.994244971819	139.998348027335	110	145

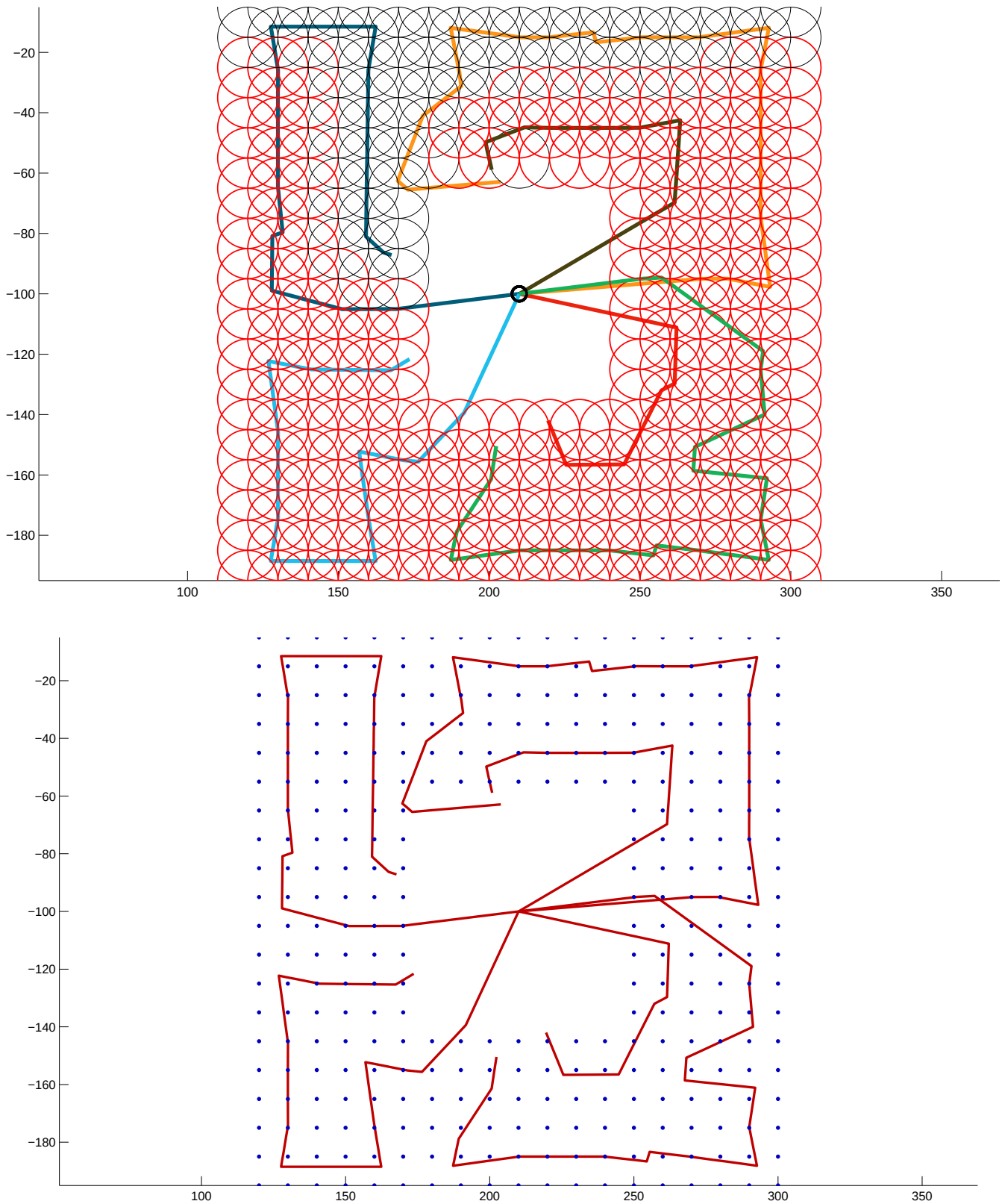


Figure O.39: *bubbles*6, Equal Radius, 2D, Euclidean, Length = 1840.3033167

Table O-42: Solution for *bubbles*6, Equal Radius, 2D, Euclidean

Total distance: 1840.30331670224			
Total demand met: 1490			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 410.280344556195 Demand Met: 255			
160.43402233094	94.9905778781745	160	85
169.052489163376	94.9550160050564	170	85
170.866011785728	95.3111653976712	170	95
172.757349231299	95.6825965909496	170	105
178.232849760511	96.7578881953385	180	105
180.651146006815	97.2328057549947	180	95
183.142099829589	97.7219903786623	190	105
182.650073382083	94.0857791462891	190	95
181.887259041872	88.4483335356397	180	85
181.359580729317	84.5486474792413	190	85
180.340970681577	77.0208153682147	190	75
180.157894742612	75.6678151885525	180	75
179.978175761991	74.3396233407941	170	75
179.990869086985	68.8147992252998	180	65
179.999516811365	65.0560967349897	170	65
180.000184273563	64.9655012619916	190	65
180.000259523464	55.0530627339996	190	55
179.999993751325	54.999829851275	180	55
179.999728050946	54.9466030635527	170	55
179.999727716437	45.0535105436736	170	45
179.999993737087	45.0002474944378	180	45
180.000259895424	44.946949819749	190	45
180.000177338081	35.0464520688601	190	35
179.999640120858	34.9722871271927	180	35
179.999102654281	34.8980625382213	170	35
179.955371141575	25.9437629692424	170	25
180.311138546671	24.1323814391426	180	25
180.679276774476	22.2580152008835	190	25
181.762426805711	16.7431100691977	190	15
182.230818232797	14.3583106776216	180	15
182.721929588089	11.8578326605591	190	5
179.006912979674	12.3605353538525	180	5
173.368937905433	13.1234400529684	170	15
169.506634753803	13.6460732701518	170	5
161.982985697431	14.6641396230403	160	5
160.644130012502	14.8453062939811	160	15
159.339622248066	15.0218250458626	160	25
150.071957924719	15.0004722099136	150	25
150.004714360783	15.0000546068961	150	15
149.937554331	14.9996375798918	150	5
140.543444105271	14.9852249250697	140	5
139.464591274663	15.1047003163453	140	15
138.375254600302	15.2253367752331	140	25
130.103363779354	16.141363209696	130	15
130.103363779354	16.141363209696	130	25
125.503654020374	16.6507534540157	120	25
124.501721661583	13.3527877851432	130	5
120.620242140929	13.787740238653	120	5
116.286931934356	14.2733223501183	120	15
109.780561301181	15.0024049572542	110	25
109.720265847199	14.9983134132079	110	15
109.659743020097	14.9942064152026	110	5
100.410245921346	14.9915801279399	100	5
100.265545158707	15.0035230678357	100	25
96.7258097083371	14.5210860803496	100	15
91.8696895462533	13.8592368874414	90	15
87.7607298432033	13.2992192593581	90	5
81.1756528928655	12.401732997185	80	5
77.2674531060309	11.8690782347059	70	5
77.7517252939929	14.3628814529997	80	15
78.202454810316	16.6839544665124	70	15
79.3217930245289	22.4481126551827	70	25
79.7306821687734	24.5537343723859	80	25
80.13301906354	26.6256142465455	90	25
80.7524827327632	31.1942758139303	90	35
76.9523944369622	34.1143503264091	80	35
72.3480614277666	37.6524255193428	70	35
68.0113323623409	40.9848673349655	60	35
66.2492760776832	45.5602126209166	70	45
64.0026771476367	51.3937180595983	60	45
64.0026771476367	51.3937180595983	60	55
59.699565450887	62.5671948454895	50	65
61.3631722305363	64.001995504208	60	65
63.0863796049699	65.4881983519295	60	75
70.9332161181413	64.8261465490308	70	55
93.8585343867715	62.8919279373883	100	55
Route: 2 Length: 204.228759417724 Demand Met: 254			
137.389222688892	78.0297027819011	140	75
144.84444804093	73.6489681665777	140	65
148.237842302094	71.6550255963423	150	75
151.494136582959	69.7416313119209	160	75
151.735270044504	66.1938709886552	150	65
151.954723499982	62.9650960316455	160	65
152.320912857146	57.5773946298378	150	55
152.601226063969	53.453212259158	160	55
152.970998760261	48.01278715004	160	45
153.160103357392	45.2305363899189	150	45
153.347961815398	42.4666284767553	160	35
149.688537800697	43.1447484923957	150	35
143.660858509528	44.2617166348629	140	45
139.642263815553	45.0063945853035	140	55
139.450681221541	44.9849054691578	140	35
130.054687552785	44.9996850815613	130	35
130.007847268961	44.9999119693752	130	45
129.961176463644	45.000137989397	130	55
120.039699747023	45.0001760456144	120	55
119.998985179403	45.0000026389771	120	45
119.958347502978	44.9998294928773	120	35
110.074093034454	44.9996918196471	110	35
110.056570862961	44.999894607399	110	45
110.039184266757	45.0000958656588	110	55
101.714233167813	44.8519796182888	100	35
97.7814548705586	46.3428019117939	100	45
92.8569172287673	48.2095756647432	90	45
88.8015556548048	49.746864918783	80	45
89.5453741372216	53.08479601935	80	55
90.8331547167926	58.8637332503192	90	55
Route: 3 Length: 332.769497972874 Demand Met: 256			
65.3265554312332	104.283884601705	60	105
59.3690171256674	105.019924286407	60	115
53.8006432568856	105.038702176457	50	105
49.8763511865691	105.051923495005	50	115
41.2683556066367	105.080758755186	40	115
38.9106659065376	104.459275442284	40	105
36.4619107037413	103.813785054147	40	95
29.9499311049847	102.09725974232	30	95
25.3938916716118	100.896307951493	20	105
25.3938916716118	100.896307951493	30	105
21.1811424431274	99.7858270721839	20	95
17.950189233862	98.9341464265866	10	105
17.9903712000951	94.7245196632391	10	95
18.0475751329092	88.732152830159	20	85
18.0836537483293	84.9517473974839	10	85
18.1229599712638	80.8324614164115	10	75
21.5603403924188	79.6360246546372	30	85
21.1972509069386	76.1408304070353	30	75
20.8543165231014	72.8394809624159	20	75
20.4543014215586	68.988591283883	20	65
20.1650301194288	66.2038742308615	30	65
19.9869638613551	64.4895327193803	10	65
19.9996107219447	55.0560427797056	10	55
19.999863217163	55.0141192121762	20	55
20.0001155656418	54.9721894258805	30	55
20.000196387948	45.0371966904342	30	45
19.9999961174983	44.9997192752875	20	45
19.999795597357	44.9620734524843	10	45
19.9999841817122	35.0189401125093	10	35
20.0003897436183	34.9661997267013	20	35
20.0007968320099	34.9126348744916	30	35
20.0328744374941	25.8102108400668	30	25
19.7654088986244	24.2115807300256	20	25
19.4994740494976	22.622097370269	10	25
18.4017261210001	16.0611367862008	10	15
18.0231217940561	13.798346388292	20	15
17.6321233964024	11.4614828228258	10	5
21.6902772250411	11.4616281395338	20	5
28.9325200707879	11.4618839713648	30	15
34.9960369964234	11.4621005816113	30	5
34.9960369964234	11.4621005816113	40	5
40.9907257789083	11.4623133967828	40	15
48.366070494542	11.4625740726362	50	5
52.3689216321084	11.4627172765261	60	5

Solution x	Solution y	Original x	Original y
51.9065509193626	14.2328161211534	60	15
50.5104033808067	22.5972568949637	50	15
50.5104033808067	22.5972568949637	50	25
50.5104033808067	22.5972568949637	60	25
49.9597463740315	25.8963713239432	40	25
49.8341452598802	34.7662599347003	40	35
49.7885868508708	37.9862721703745	50	35
49.7281903434878	42.2541878212152	50	45
49.6786595125261	45.7547315934103	40	45
49.5537118845368	54.5856671540859	40	55
49.4962173022282	58.6495486071954	50	55
49.400874161295	65.389156844724	40	65
49.2765790358251	74.1763473981014	40	75
49.2338103407732	77.1981923186629	50	75
49.1795388591959	81.0331186895612	40	85
54.9506689990805	86.3114468181867	50	95
57.6705614506612	87.1379076013419	50	85
57.6705614506612	87.1379076013419	60	85
57.6705614506612	87.1379076013419	60	95
Route: 4 Length: 182.379837378227 Demand Met: 220			
144.738882948871	109.577244728883	150	115
144.738882948871	109.577244728883	140	115
144.738882948871	109.577244728883	140	105
148.608275855611	110.405950391703	150	105
152.121367991408	111.158539651604	160	115
152.121367991408	111.158539651604	160	105
151.759315193715	122.304679569513	150	125
151.51937176714	129.700998147362	160	135
151.51937176714	129.700998147362	160	125
147.128440415267	132.0132580115	150	135
147.128440415267	132.0132580115	140	135
147.128440415267	132.0132580115	140	125
138.462866212302	149.12426002211	140	155
138.462866212302	149.12426002211	140	145
138.462866212302	149.12426002211	130	145
134.727476582888	156.502882537567	140	165
130.481921254662	156.540770741998	130	165
126.315415915984	156.577813755337	130	155
120.413622199086	156.630328115383	120	165
115.537946999773	156.673442613228	110	165
114.240290102043	153.499065824812	110	155
112.847568139119	150.091555213982	120	155
112.847568139119	150.091555213982	120	145
112.847568139119	150.091555213982	110	145
109.537026706123	141.992464359882	100	145
Route: 5 Length: 314.094867578496 Demand Met: 254			
81.7116366192418	139.405080572256	90	145
77.915594276342	143.455222355411	80	145
73.9026588458372	147.736812097562	80	155
71.6997600220903	150.087208348428	70	145
68.9444138550171	153.027048991881	70	155
66.5038300870987	155.631065859787	70	165
61.4769594162111	155.109669673935	60	165
59.5332493133893	154.729516770312	60	155
57.4776906853369	154.327484831719	60	145
53.0600281859775	153.463339370507	50	155
49.5937419015279	152.785301380382	50	145
46.882317357318	152.254917351547	40	145
47.3763895938722	155.748548802261	40	155
48.3934393204717	162.940537264681	40	165
49.0231695468451	167.393718987837	50	165
49.8844590201594	173.484396359797	40	175
50.1936728425712	175.35395116798	50	175
50.5072418320426	177.249833356103	60	175
51.3160743817546	182.138838110264	50	185
51.9020931383824	185.68117426125	60	185
52.3736591864028	188.531686018764	60	195
48.2935247764986	188.532477418321	50	195
42.6823112161197	188.533583449681	40	185
38.3618418349915	188.53443522697	40	195
32.4778458939942	188.535587659342	30	185
27.9805154614097	188.536470616157	30	195
21.6703398800422	188.537692715302	20	195
17.6320710374825	188.538449254716	10	195
18.0411567672429	186.093848844009	20	185
18.4350970716675	183.739761739923	10	185
19.4943496911742	177.408443652358	10	175
19.7657044588262	175.78667720336	20	175
20.0328497591499	174.190061168449	30	175
20.0007662291536	165.065953148725	30	165

Solution x	Solution y	Original x	Original y
20.0001777680887	164.988054400538	20	165
19.9995914151019	164.910606997823	10	165
19.9996492029479	155.081485742343	10	155
20.0001146069687	155.012293406511	20	155
20.000579025453	154.943131896177	30	155
20.0217681311655	145.659502246654	30	145
19.8415877996119	144.327358517048	20	145
19.659006822907	142.977430417564	10	145
18.6052806936907	135.186630648122	10	135
18.0812374972644	131.312202304451	20	135
17.3190474249735	125.677037962087	10	125
16.8591232176064	122.276849078893	10	115
19.4573227420006	122.786073751658	20	115
22.8859677987907	123.458033205259	20	125
27.3008905269179	124.323276687621	30	115
29.1776838389955	124.691061372177	30	125
31.0207330467321	125.052227557413	30	135
39.8506937281668	125.149873954224	40	135
43.0458267556882	125.18506167244	40	125
47.0808045066088	125.229509027541	50	125
50.4993015942591	125.267166282271	50	135
57.4020534328275	125.343355468066	60	135
63.6367040992028	121.634094801935	60	125
Route: 6 Length: 396.550009798728 Demand Met: 251			
135.067154841525	95.6782192324842	140	95
140.899436273125	94.9594638969461	140	85
147.191119344219	94.5974140437669	150	85
151.163798531826	97.4753099232817	150	95
156.969616149751	101.681202268995	160	95
169.778030339227	110.960195820172	170	115
176.516022414589	115.84145325755	180	115
180.815969498509	118.956489486476	190	115
180.257382452377	123.219501377985	190	125
180.126896062001	124.21538245983	180	125
179.998027897292	125.198913964861	170	125
180.575593985048	131.568964176604	180	135
180.955080248589	135.753940873084	190	135
181.340042163768	139.999461792379	190	145
173.958523280495	143.411818048272	180	145
173.958523280495	143.411818048272	170	145
173.958523280495	143.411818048272	170	135
164.012962169484	148.009770019348	160	145
158.227162836811	150.684540158849	150	145
158.029505121827	153.444646471806	160	155
157.847034200321	155.992705984874	150	155
157.662160993051	158.574152410202	150	165
162.141538671289	159.039719355924	160	165
173.603564052709	160.231402398844	180	165
173.603564052709	160.231402398844	170	165
173.603564052709	160.231402398844	170	155
178.365716647485	160.726351258748	180	155
182.086017167409	161.113030734444	190	155
181.433912640861	165.37439135382	190	165
179.997203142679	174.763167839596	170	175
180.284245120681	176.184411766302	180	175
180.58577462564	177.677375608525	190	175
181.741662841301	183.400163101827	190	185
182.205352935135	185.695841368146	180	185
182.703440078736	188.161834646675	190	195
178.592315642815	187.605688679934	180	195
172.04567479857	186.720099039148	170	195
167.587256332712	186.116982970093	170	185
161.890125985261	185.346299659727	160	195
160.314615674794	185.133197138419	160	185
158.745986612857	184.921022689455	160	175
151.020328089178	184.012251191047	150	175
148.397433088207	183.703726418971	150	185
145.485483710036	183.361202296783	140	175
144.493181351789	186.652832474383	150	195
140.612760323681	186.216271610583	140	195
136.298063540705	185.730828313712	140	185
129.781420573015	184.997617657219	130	175
129.72271425586	185.001626191994	130	185
129.663843340476	185.00564554618	130	195
120.065129823711	185.00041124976	120	195
119.951297235535	184.999620526839	120	175
116.914364498893	184.999849139804	120	185
113.075039617756	185.000154864323	110	185
110.057818991446	185.000377229947	110	195
109.953336064161	184.999677189845	110	175

Solution x	Solution y	Original x	Original y
100.402135185466	185.008088293528	100	195
100.333612052842	185.002295627695	100	185
100.265007729885	184.996496236544	100	175
92.9453509119048	186.007988821699	90	185
88.0608310291154	186.682985172062	90	195
80.9174996496934	187.670102611328	80	195
77.3037329737285	188.169502484135	70	195
77.7526274988506	186.002553816509	80	185
78.1808630221855	183.93533141736	70	185
79.2393872050988	178.825424477714	70	175
81.8162088171318	174.899475741274	80	175
84.6711219674028	170.54982146109	80	165
86.6087537551728	167.597690196214	90	175
86.6087537551728	167.597690196214	90	165
90.6618039807046	161.422536808522	100	165
91.6422536346372	154.973764385598	100	155
92.33041588654	150.447326051235	90	155

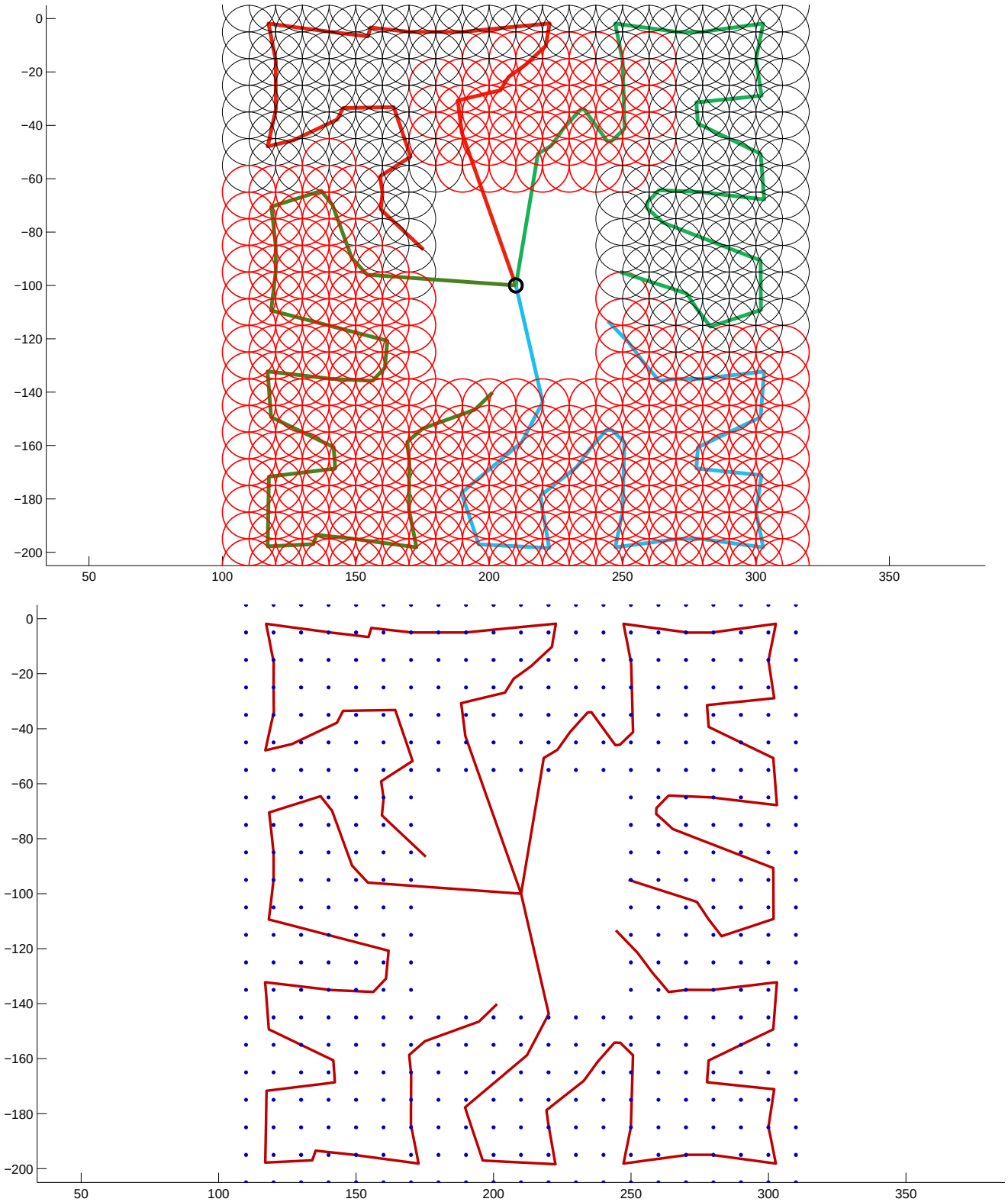


Figure O.40: *bubbles*7, Equal Radius, 2D, Euclidean, Length = 1983.5504413

Table O-43: Solution for *bubbles*7, Equal Radius, 2D, Euclidean

Total distance: 1983.55044130888			
Total demand met: 1818			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 433.612710911749 Demand Met: 395			
84.5060617012278	56.195822604406	80	55
82.6126084074413	50.8427500212608	90	45
82.6126084074413	50.8427500212608	90	55
81.0762350218558	46.4991974704509	80	45
79.7308936294162	42.6957064066806	70	45
78.8633787270771	35.7969490771111	70	35
78.5521848919595	33.3219782455928	80	35
78.2215787312947	30.6926039285275	70	25
82.5320613585105	29.6628207974288	80	25
88.6483843505121	28.201598654423	90	25
88.6483843505121	28.201598654423	90	35
94.1550658173005	26.886009379172	100	35
97.3005671485179	21.8338705105162	90	15
100.277527238018	19.695755405038	100	15
100.277527238018	19.695755405038	100	25
103.662747789291	17.264414912951	110	25
107.603925471606	13.593731881503	110	15
111.206298681215	10.2386010061973	120	15
111.906010244184	6.20140698658545	120	5
112.278847564071	4.05015697930586	110	5
112.668676432312	1.80086743328622	120	-5
108.212899381743	2.2324612159122	110	-5
100.657414918051	2.96426202355613	100	-5
100.657414918051	2.96426202355613	100	5
93.8475088235224	3.62386380772812	90	5
89.6477308928686	4.03066084816756	90	-5
81.4351170343405	4.82617868857876	80	-5
80.4767611691546	4.91902701385793	80	5
79.5240343164927	5.01133391305271	80	15
73.8862578425474	5.00477644486902	70	5
70.036050286321	5.00027319648106	70	15
69.9608543251983	4.99979148757485	70	-5
60.3335939207557	4.99443160627057	60	-5
60.2750996235296	4.99840051116908	60	5
60.2169205671776	5.00234825712205	60	15
53.6334556725039	4.26192660949012	50	5
49.28872812671	3.77331329579245	50	-5
45.5057456884337	3.34786529082245	40	-5
44.5152208178287	6.63834412232419	50	15
40.4241280771853	6.15732841715322	40	5
40.4241280771853	6.15732841715322	40	15
34.6902203398686	5.48301076650122	30	5
31.2498836269213	5.0784564289782	30	15
28.4167734137471	4.69749130037787	30	-5
22.4574094727406	3.89615821548523	20	5
17.8888494880128	3.28184844358602	20	-5
10.9778724705876	2.35257689179089	10	-5
7.28035618740779	1.85539902579452	0	-5
7.74291061321061	4.21266653722774	10	5
8.19429790937978	6.51302743117421	0	5
9.32496104887343	12.275339350419	0	15
9.69095810430788	14.1406531032535	10	15
10.0445234976724	15.9426109818051	20	15
9.99995123555698	24.9726764284579	0	25
10.0005135519736	25.0363763561005	10	25
10.001074708674	25.0999842517566	20	25
10.0547942810596	33.9545707536335	20	35
9.61964053634668	35.9414350879397	10	35
9.16514011790164	38.0166323651576	0	35
7.74695248187498	44.4919984507029	0	45
7.00789877489329	47.8663162415231	0	55
9.40307918229662	47.2968540362149	10	55
12.6495666255132	46.5249841916627	10	45
16.684222827772	45.5657181288262	20	55
21.5999854963498	43.2362600802743	20	45
28.5675058808735	39.93451465144	30	35
28.5675058808735	39.93451465144	30	45
33.0490289833005	37.8108360233277	40	45
35.2750041673137	33.4955524598789	30	25
39.7900399750661	33.4201252912474	40	25
43.6546821895346	33.3555858284021	40	35
49.7166620386927	33.2543625746979	50	25
54.2460230672932	33.1787431600897	60	25
55.3118994185602	36.3118850292311	60	35
56.411298084234	39.5435795783418	50	35
56.411298084234	39.5435795783418	50	45
58.4510544875779	45.5394099720253	60	45
60.5534355308094	51.7193723835629	70	55
58.7566259451682	52.8823066822366	60	55
52.2271166879338	57.1087591140509	50	55
49.1087687736481	59.1267935730994	40	55
50.0025162744397	65.2244161691961	60	65
49.7185819888093	68.0354783561301	50	65
49.3684113700931	71.5024339054972	40	75
52.4759329370177	74.4294631390305	50	75
56.1044308406433	77.8471988970018	50	85
58.6131508762862	80.2101871092705	60	75
61.9129322966312	83.3182805144763	60	85
65.3364634033676	86.5429176022623	60	95
Route: 2 Length: 506.621223216945 Demand Met: 451			
110.082096814821	143.721205164554	120	145
108.237479848177	147.237788991981	110	145
105.379927299275	152.685399102093	110	155
102.20808064177	158.732136726002	110	165
100.094951744385	160.508553410147	100	155
96.7122457073357	163.352246327895	100	165
92.5606172847492	166.842337174003	90	165
88.7470495565299	170.048228742524	90	175
85.9909701637898	172.365133638505	80	165
82.5106278911688	175.290909558736	80	175
79.6235663962657	177.717922348202	70	175
82.2527545888339	185.619682287867	90	185
83.648108590535	189.813238067012	80	195
83.648108590535	189.813238067012	80	185
85.058875872155	194.053146227179	90	195
86.0526215655867	197.039728676573	80	205
90.8191631054934	197.281072322019	90	205
100.093744370927	197.750687594342	100	205
100.093744370927	197.750687594342	100	195
108.579332391143	198.180356095516	110	205
112.505664301688	198.379192037231	120	205
112.059568003665	195.844311518631	110	195
111.644959479669	193.488329239962	120	195
110.560128367155	187.323410285087	120	185
110.219392596303	185.387321461212	110	185
109.884289128928	183.483229776685	100	185
109.265401789366	178.761977206065	100	175
112.996936285935	175.811147906432	110	175
117.836748834264	171.983890385853	120	175
122.805013309119	168.05505366162	130	175
124.333117447122	165.975516410515	120	165
126.167229947074	163.479549965578	130	165
127.798116548772	161.260139829395	120	155
131.178975807485	157.39893523382	130	155
134.01690335623	154.157762859132	130	145
136.103999979357	154.209848936323	140	145
138.368704123219	156.429795556018	140	155
140.72584695631	158.740351765875	150	155
140.563447168805	164.408827135406	150	165
140.454440933089	168.211989968107	140	165
140.264565474589	174.837795453578	150	175
140.264565474589	174.837795453578	140	175
139.987607016166	184.502232112188	130	185
140.006146429605	184.649215639415	150	185
138.938781918703	189.959295652634	140	195
138.938781918703	189.959295652634	140	185
137.895004766453	195.152044096714	130	195
137.291156975417	198.156082945548	130	205
140.549880901321	197.713058824727	140	205
146.444398079914	196.911753084478	150	195
150.156197001767	196.407137483335	150	205
158.153115780143	195.320026037163	160	205
159.432832199764	195.146057168173	160	195
160.674936495193	194.97720153309	160	185
169.324263545768	194.977147733546	170	185
170.569185038558	195.146596948871	170	195
171.828560777944	195.318012908124	170	205
177.602683045829	196.103939521798	180	195
181.974347876113	196.698987310652	180	205
189.246259065334	197.68866076254	190	205
192.705620438648	198.159516063057	200	205
192.274642523022	196.027784202416	190	195

Solution x	Solution y	Original x	Original y
191.865495193832	194.004069511598	200	195
190.556540140936	187.528955261749	200	185
190.269948633441	186.111433216312	190	185
189.997182298562	184.762298320904	180	185
191.378254388835	175.741055072579	200	175
191.716617534312	173.530974170904	190	175
192.086674021654	171.113873665005	200	165
188.013200837971	170.691711550397	190	165
182.312159909502	170.100812361053	180	175
177.796594242422	169.632857605726	180	165
172.064790036725	169.038807942112	170	175
167.669892893839	168.583388229747	160	175
167.869132229556	165.904593828997	160	165
168.055323140935	163.400973544177	170	165
168.261007790831	160.635237357393	160	155
172.924328454832	158.394971174962	170	155
178.450959724769	155.739966993762	180	155
183.224593403268	153.446719105106	180	145
186.584723411547	151.832581554206	190	155
189.486286546454	150.438731128888	190	145
191.747296951603	149.352605308613	200	155
192.179381740085	143.771570125853	200	145
192.815768174831	135.552134414314	200	135
193.07427409366	132.213493063239	200	125
189.906889837095	132.588939403982	190	125
185.186251995044	133.148486442422	190	135
185.186251995044	133.148486442422	180	135
180.398234866556	133.716009107561	180	125
173.598552716669	134.521968755215	170	135
169.427157686824	135.016417445193	170	145
160.516047474769	134.986677918081	160	125
159.541041172829	135.091026273915	160	135
158.560031999274	135.196017405973	160	145
153.712634759942	135.714716631984	150	145
150.926035525278	132.429438605993	150	135
147.824646457143	128.773057720818	140	135
146.046088826868	126.388845256974	150	125
144.078645824195	123.751433442445	140	125
142.388547306947	121.485818068128	150	115
138.342399355983	117.317386770617	140	115
134.480498938479	113.338777466724	140	105
Route: 3 Length: 511.421173100402 Demand Met: 490			
106.980393100064	58.307585863903	100	55
107.625685288276	54.4534282930296	110	55
108.266239460639	50.6275574669049	100	45
110.851970678451	49.07315824793	110	45
113.219222323558	47.6500914204413	120	55
115.706002964672	44.1798809138003	120	45
117.799835866072	41.2579996448726	110	35
121.216348200828	37.44448580032	120	35
124.259847043457	34.0473106491235	120	25
125.626373670729	33.9928597704627	130	25
128.314301452302	37.7131434157478	130	35
131.50085397006	42.1235389944088	130	45
134.271363636248	45.9581200000067	130	55
135.959908591257	45.8524427981692	140	55
138.354421970274	43.5339550376039	140	45
140.740422037358	41.2237102993046	150	45
140.640151463386	37.5183558750011	140	35
140.556368797906	34.4225815583454	150	35
140.316528179353	25.5590327566183	150	25
140.210585223255	21.6438088471841	140	25
140.060532649544	16.098661083587	150	15
139.453013930448	12.9923837903578	130	15
138.733874823637	9.31537619650116	140	5
138.733874823637	9.31537619650116	140	15
137.841110072096	4.75054061796133	130	5
137.275827894843	1.86020866840498	130	-5
140.563649038572	2.3046342275365	140	-5
146.34255869594	3.08575850500793	150	5
150.123598052559	3.59684819479109	150	-5
158.113029320856	4.67675582801208	160	-5
159.400320681003	4.85076158159469	160	5
160.671185472235	5.02254758352519	160	15
165.933601441937	5.02272672642198	170	5
169.32443973791	5.02284241895786	170	15
171.543787315419	4.72076682290939	170	-5
177.509504146196	3.90878879385994	180	5
182.01798185803	3.2951402102304	180	-5
189.160710017689	2.32300565036001	190	-5

Solution x	Solution y	Original x	Original y
192.705641418321	1.84050503579795	200	-5
192.256025855199	4.06442360562301	190	5
191.82750763468	6.18398397755838	200	5
190.576360831934	12.3729435563404	200	15
190.281387728117	13.8319361525582	190	15
189.997182012418	15.2376681668411	180	15
190.955568147473	21.4979720004073	190	25
191.595232738042	25.6762269244899	200	25
192.086653088226	28.8861517086188	200	35
188.151382540988	29.2939732002032	190	35
182.167349475123	29.9141292974016	180	25
177.788961966201	30.3678610739456	180	35
171.83822731316	30.9845461665304	170	25
167.669991274124	31.4164935463996	160	25
167.865463853237	34.0444608572513	160	35
168.054690049395	36.5886269593861	170	35
168.261188955074	39.3650276429478	160	45
173.889253384204	42.0686386757545	170	45
182.563242781164	46.2354898673046	180	55
185.757896530314	47.770091078302	190	45
185.757896530314	47.770091078302	180	45
191.747148398263	50.6471787172496	200	45
192.093616331553	55.1261602357768	200	55
192.366786448948	58.6574445806892	190	55
192.806024384368	64.3354143484683	200	65
193.073089385819	67.7876427995372	200	75
189.527897320591	67.3689201569773	190	75
182.878297294145	66.5835559866286	190	65
182.878297294145	66.5835559866286	180	65
182.878297294145	66.5835559866286	180	75
169.196971336191	64.9677037761635	170	55
166.568957396741	64.8540953063247	170	65
162.304876029701	64.6697626363423	160	65
159.205268401388	64.5357714281931	160	55
153.682756444619	64.2971747570796	150	55
151.399732517679	66.6361931594659	150	65
149.221865416439	68.8674718740864	140	65
149.176764768083	71.026697008478	140	75
151.981249114997	73.5502624527613	150	75
155.240744976276	76.4832678026321	150	85
159.016811767507	77.9502168934674	160	75
163.043522963357	79.5145410902927	160	85
167.846963807723	81.3806182025432	170	75
173.239053608059	83.4753895963087	170	85
181.379600243609	86.6379504413833	180	95
184.899870040565	88.0055184314682	190	85
184.899870040565	88.0055184314682	180	85
188.993621726651	89.5958839260278	190	95
191.764377981789	90.6722766600161	200	85
191.795915252033	95.9185046895536	200	95
191.847595316413	104.507812403783	200	105
191.875662192806	109.169447607168	200	115
188.642247011814	110.240294874145	190	105
183.658017474229	111.890980044785	190	115
183.658017474229	111.890980044785	180	115
183.658017474229	111.890980044785	180	105
172.937911633071	115.441293434188	170	125
170.693523665325	112.516965601092	170	115
168.124171884345	109.169236018093	160	115
166.105826551447	106.157673944185	170	105
163.978986726753	102.984207104812	170	95
160.516363606662	101.867858242515	160	105
156.829331487492	100.679149918657	160	95
152.269009247681	99.2089016780003	150	105
147.861868919171	97.7880331349957	150	95
142.862139933913	96.1761341622791	140	95
139.083455192203	94.9579151992624	140	85
Route: 4 Length: 531.895334079783 Demand Met: 482			
62.2634033080485	97.2749213229633	60	105
54.2428889737621	96.6956759094818	50	95
49.8000034158961	96.3748130366248	50	105
44.3145322904182	95.9786432206197	40	105
41.5066188503293	92.9686122883593	40	95
38.5243551416274	89.7716712726347	30	95
35.1124721715906	80.4150597037161	30	75
35.1124721715906	80.4150597037161	30	85
35.1124721715906	80.4150597037161	40	85
31.2695956420794	69.8764823740186	40	65
29.032126291126	67.0472019612324	30	65
27.0648123869496	64.5595362958106	30	55

Solution x	Solution y	Original x	Original y
19.2575449993874	67.0248321261834	20	75
14.8338441129462	68.4216958563633	10	65
14.8338441129462	68.4216958563633	20	65
8.37760681215066	70.4603813587687	0	65
8.787152424748	74.1795782629255	0	75
9.26263331037039	78.4975370150961	10	75
10.002303850533	85.2146931500768	20	85
9.99839547675686	85.2735127922167	10	85
9.9944598421058	85.332752564911	0	85
9.99378096676155	94.6475607556935	0	95
9.99822976229235	94.7089033051611	10	95
10.0026471865468	94.7698049877795	20	95
9.21956012686462	101.340605577775	10	105
8.70562538544594	105.652936294179	0	105
8.2629176760482	109.367570219463	0	115
16.3889131874646	111.490620900408	10	115
16.3889131874646	111.490620900408	20	115
16.3889131874646	111.490620900408	20	105
27.3511178928844	114.354663564413	30	105
32.415603814296	115.677848279832	30	125
32.415603814296	115.677848279832	30	115
39.229743324529	117.458175892804	40	115
45.9404664117027	119.211485573484	40	125
45.9404664117027	119.211485573484	50	125
45.9404664117027	119.211485573484	50	115
51.8160664514896	120.746591169024	60	115
51.4428326529852	124.842942509058	60	125
50.8939262152396	130.867265151344	60	135
48.577361075921	133.298588265046	50	135
46.2677887842222	135.722571401029	50	145
40.8688985087655	135.481697986439	40	145
37.660563116029	135.338536808894	40	135
33.7680319788887	135.164845574634	30	135
30.8098968858064	135.032850963547	30	145
20.1347074760153	133.772150995573	20	125
15.0840639472317	133.175720365341	10	135
15.0840639472317	133.175720365341	20	135
10.3622587780543	132.618119499191	10	125
6.92683483554046	132.212422446869	0	125
7.24785436060323	136.364683626694	0	135
7.81211971622572	143.66308489144	0	145
8.25191196213998	149.351457356703	0	155
11.2799991525836	150.804610160988	10	145
16.2069321270909	153.168986816253	10	155
16.2069321270909	153.168986816253	20	155
16.2069321270909	153.168986816253	20	145
25.7835706234441	157.764819148971	30	155
31.7264209534332	160.616758457367	40	155
31.9182650081552	163.374258050782	30	165
32.0924145587918	165.877429286718	40	165
32.2844980041418	168.638308111844	40	175
27.3374860244214	169.246319991011	30	175
16.2625861242541	170.60754775863	10	175
16.2625861242541	170.60754775863	20	175
16.2625861242541	170.60754775863	20	165
11.5046654221502	171.192324707716	10	165
7.42979344148105	171.693150179816	0	165
7.34496063976428	176.387456822623	0	175
7.21187887049797	183.751387789327	10	185
7.10021503284827	189.930341504343	0	195
7.10021503284827	189.930341504343	0	185
7.02483097788195	194.102277942278	10	195
6.9577008173234	197.817346809058	0	205
11.001938727728	197.615391075373	10	205
17.4093971314642	197.295341887952	20	205
20.6679534453358	197.13263244083	20	195
24.0485222892088	196.963830256223	30	205
25.3037155913091	193.477659274385	20	185
29.245571114616	193.901183654297	30	185
33.3279618027296	194.339810501704	30	195
38.800109563124	194.927736543332	40	185
40.3544585666961	195.136750523391	40	195
41.9294685583447	195.348542950603	40	205
49.5247226597942	196.369930197392	50	205
53.4435123597175	196.896914523399	50	195
59.0265711727115	197.647699299949	60	205
62.7198670579997	198.144361558606	70	205
62.1065308902126	195.017926591461	70	195
61.245542051044	190.629017236545	60	195
61.245542051044	190.629017236545	60	185

Solution x	Solution y	Original x	Original y
60.5456136123721	187.061165265753	70	185
59.9546587151501	184.048774163504	50	185
59.9706961004204	178.846033638626	60	175
59.9825074092998	175.013431567594	50	175
60.0124355387521	165.498563570105	70	165
59.9110630633913	164.51713321371	60	165
59.8098868546178	163.537616348506	50	165
59.3060347790958	158.660301370104	50	155
62.0839890140031	156.231952748646	60	155
65.0779448563896	153.614786544892	60	145
69.9853158277825	151.840661285327	70	145
72.4844284824915	150.937183398824	70	155
77.1382297589478	149.254741909958	80	155
80.8647332858446	147.907544346908	80	145
84.6961833104967	146.522405415811	90	155
88.1035173917442	143.210523308165	90	145
91.2579240289884	140.144468175595	100	145

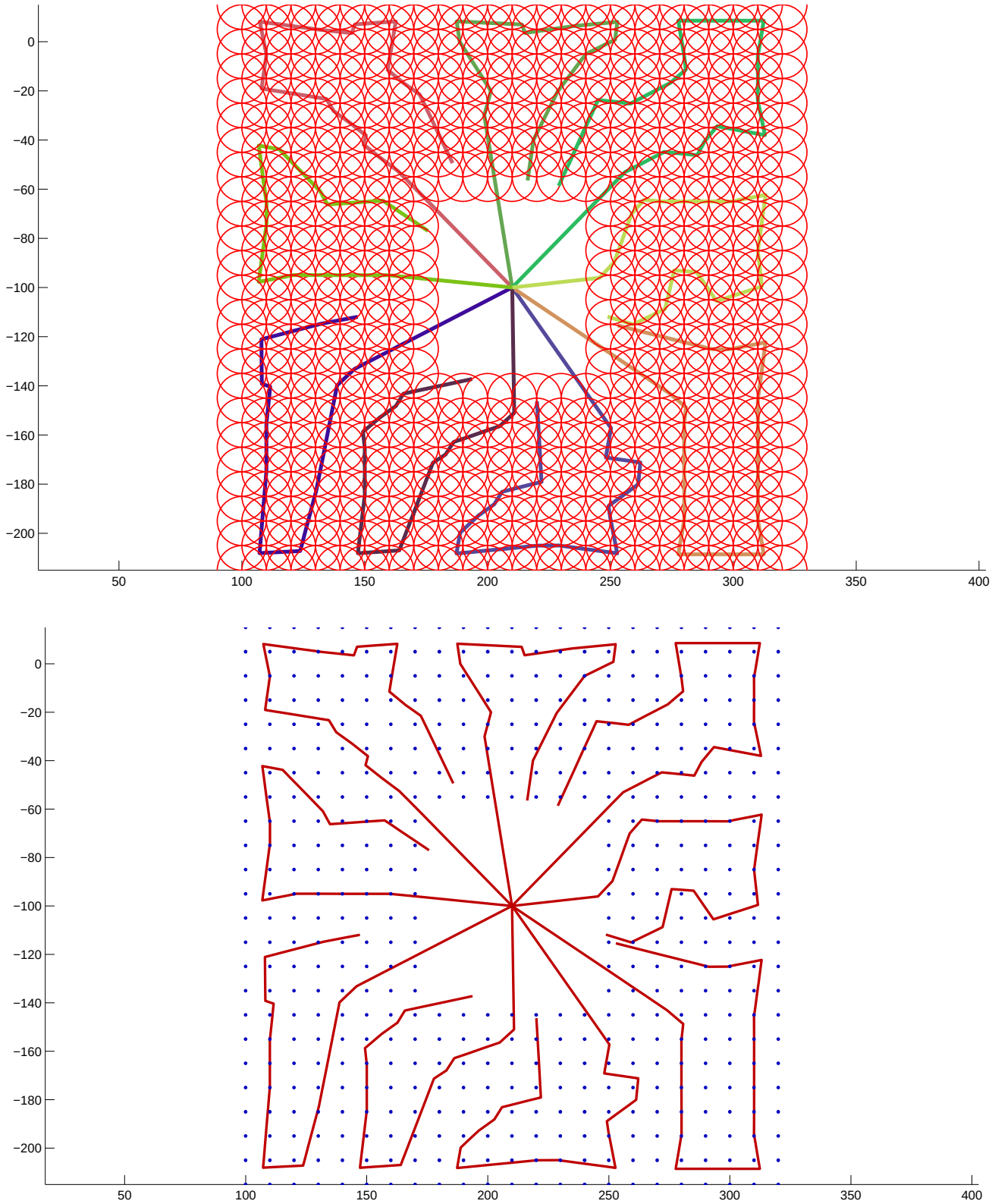


Figure O.41: *bubbles*8, Equal Radius, 2D, Euclidean, Length = 2935.0259367

Table O-44: Solution for *bubbles*8, Equal Radius, 2D, Euclidean

Total distance: 2935.0259366769			
Total demand met: 2538			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 361.464641826034 Demand Met: 282			
65.8943744860805	117.608555557932	60	115
59.2833505649277	121.022059078835	60	125
53.7730660987226	123.867204424888	50	125
53.7730660987226	123.867204424888	50	115
37.8711046205713	132.078106195648	30	135
37.8711046205713	132.078106195648	40	135
37.8711046205713	132.078106195648	40	125
35.7932415260367	133.150985918526	30	125
28.7589297070438	139.825081235023	20	135
26.7254033270207	150.091438003773	20	155
26.7254033270207	150.091438003773	20	145
26.7254033270207	150.091438003773	30	145
23.161418854345	168.085764334196	20	175
23.161418854345	168.085764334196	20	165
23.161418854345	168.085764334196	30	165
21.9365365093808	174.269790838818	30	175
20.2595838395449	182.736299419289	20	185
20.2595838395449	182.736299419289	30	185
18.8824962459184	187.887541605069	10	185
15.7717017076562	199.52406644934	10	205
15.7717017076562	199.52406644934	10	195
15.7717017076562	199.52406644934	20	195
14.6553690196487	203.699887265273	20	205
13.7135063228457	207.22308817882	20	215
8.64417596777798	207.477053696799	10	215
0.991227383315078	207.860602905459	0	215
-2.80900759569207	208.050901064524	-10	215
-2.49359671036157	204.304695216229	0	205
-2.13134607049406	200.001361817755	-10	205
-2.13134607049406	200.001361817755	-10	195
-2.13134607049406	200.001361817755	0	195
-1.25096978275867	189.541604180461	0	185
-0.873828276800182	185.063657090631	-10	185
-0.129795975606228	176.227960152773	-10	175
-0.0607697046632154	175.40899812032	0	175
0.00853258086678466	174.586838471205	10	175
0.000415434533323378	165.072883879011	10	165
-0.000189038242226047	164.998337058794	0	165
-0.000795065199014289	164.923594481569	-10	165
-0.0128787838305158	155.507454327155	-10	155
0.0940977743559728	154.476468779623	0	155
0.202614147534888	153.430664192072	10	155
1.06696717529135	145.100639209343	0	145
1.06696717529135	145.100639209343	10	145
1.55904841448283	140.361956287071	10	135
-1.87615278438039	139.16876585973	-10	145
-1.9162861766159	135.14878955303	-10	135
-1.9544248070889	131.332649725382	0	135
-2.01123266169151	125.652204676061	-10	125
-2.05702471164315	121.075309366524	-10	115
1.61333004431287	120.118930936862	0	115
5.54390952805335	119.094748266359	0	125
5.54390952805335	119.094748266359	10	125
5.54390952805335	119.094748266359	10	115
17.0270998003433	116.102676758666	20	125
22.1934862411407	114.756465716411	20	115
22.1934862411407	114.756465716411	20	105
30.7164247805342	113.140003384903	30	105
37.1586494261733	111.918206472078	30	115
37.1586494261733	111.918206472078	40	115
37.1586494261733	111.918206472078	40	105
Route: 2 Length: 346.076039738904 Demand Met: 292			
62.8802592848423	62.0219193377522	70	55
58.1222571434613	57.2460862964221	60	55
53.4505148759186	52.5567394989436	60	45
49.3469908288654	49.4968875216354	50	45
46.0879330970222	47.0667454175879	40	55
42.5201587581698	44.2505348489443	40	45
39.4951427447919	41.8627381828486	30	45
40.5036941364464	38.1337439841589	50	35
33.9829147391926	32.987153149366	40	25
33.9829147391926	32.987153149366	40	35
31.7285040715963	31.3678827234371	30	35
29.3657424930179	29.6707738997837	30	25
27.359819123507	28.2299791326481	20	35
24.3949829580272	23.2815422693796	30	15
20.3880485051877	22.6401346979599	20	25
16.3449381636615	21.9929491312458	20	15
5.88446281667046	20.3184987073596	0	15
5.88446281667046	20.3184987073596	10	15
5.88446281667046	20.3184987073596	10	25
1.71814171720435	19.6516399666234	0	25
-1.95226558986258	19.064165721219	-10	25
-1.37670559885707	15.0123056391465	-10	15
0.00413470062140675	5.28771658419205	10	5
-0.282267216336209	3.86620339079971	0	5
-0.579837921104016	2.3892641694212	-10	5
-1.73902930289159	-3.36253438385636	-10	-5
-2.20870264323314	-5.69272304141109	0	-5
-2.70585791723481	-8.15926566582098	-10	-15
1.35752013768968	-7.60988154225061	0	-15
8.13005462457066	-6.69442147446416	10	-15
12.5216194579686	-6.10077377279235	10	-5
18.4972906384437	-5.29303430715724	20	-15
21.1965891633003	-4.92811435958779	20	5
24.577564333777	-4.56967501412652	20	-5
30.3672963756495	-3.95604530736711	30	-5
30.3672963756495	-3.95604530736711	30	5
34.7230160810482	-3.49432760694351	40	5
36.0208774114412	-7.01569032963297	30	-15
40.0709418764606	-7.3169523913347	40	-15
43.5686762836982	-7.57714038073069	40	-5
49.0310939215139	-7.98357737002274	50	-15
52.6212159892111	-8.25065097176757	60	-15
51.9852968909652	-4.39143622556723	60	-5
50.8442171880285	2.53425925863209	50	-5
50.8442171880285	2.53425925863209	50	5
50.8442171880285	2.53425925863209	60	5
49.3670827943873	11.4988695918759	40	15
52.4949907053281	14.0908765844222	50	15
56.0640132312493	17.0484083257063	50	25
58.95358012139	19.0726616429243	60	15
62.3740826029802	21.4688127687559	70	15
64.5840724156379	26.081491954685	70	25
66.4890330473545	30.0574607286747	60	25
66.4890330473545	30.0574607286747	60	35
66.4890330473545	30.0574607286747	70	35
75.7458678606793	49.3774621240895	70	45
75.7458678606793	49.3774621240895	80	45
75.7458678606793	49.3774621240895	80	55
Route: 3 Length: 303.789599171535 Demand Met: 237			
92.2551571097822	52.1894859816246	90	45
92.2551571097822	52.1894859816246	90	55
92.2551571097822	52.1894859816246	100	55
88.6602633796767	30.0000044401697	80	25
88.6602633796767	30.0000044401697	80	35
88.6602633796767	30.0000044401697	90	35
91.3397247398938	20.0000064604144	100	15
91.3397247398938	20.0000064604144	90	25
91.3397247398938	20.0000064604144	100	25
85.7599333564633	11.198707681368	90	5
85.7599333564633	11.198707681368	80	15
85.7599333564633	11.198707681368	90	15
78.6602591357248	-2.01037327727249E-5	70	-5
78.6602591357248	-2.01037327727249E-5	70	5
78.6602591357248	-2.01037327727249E-5	80	5
77.4162402228306	-8.29181059318714	70	-15
77.4162402228306	-8.29181059318714	80	-15
77.4162402228306	-8.29181059318714	80	-5
89.7491639223483	-7.69042007739677	90	-15
89.7491639223483	-7.69042007739677	90	-5
104.006251118377	-6.99528933486236	110	-15
104.006251118377	-6.99528933486236	100	-15
104.006251118377	-6.99528933486236	100	-5
105.206497862885	-3.53773229422783	110	-5
105.206497862885	-3.53773229422783	110	5
105.206497862885	-3.53773229422783	100	5
125.000046005697	-6.33983583953966	130	-15
125.000046005697	-6.33983583953966	120	-15
125.000046005697	-6.33983583953966	120	-5
142.811185678066	-8.0486371361767	150	-15
142.811185678066	-8.0486371361767	140	-15

Solution x	Solution y	Original x	Original y
142.811185678066	-8.0486371361767	140	-5
141.87331682629	-0.82730721714611	150	-5
141.87331682629	-0.82730721714611	150	5
141.87331682629	-0.82730721714611	140	5
130.000017159924	5.00001890803213	130	-5
130.000017159924	5.00001890803213	130	5
130.000017159924	5.00001890803213	120	5
118.504174733202	20.2611229138674	120	15
118.504174733202	20.2611229138674	110	15
118.504174733202	20.2611229138674	110	25
113.79747389406	29.6991336909429	120	25
113.79747389406	29.6991336909429	120	35
113.79747389406	29.6991336909429	110	35
108.660258751578	40.0000222809244	100	35
108.660258751578	40.0000222809244	110	45
108.660258751578	40.0000222809244	100	45
106.287189162604	56.442563420144	110	55
Route: 4 Length: 356.961539014166 Demand Met: 300			
137.147784024965	61.9925386417309	130	55
141.712223955229	57.3465679246076	140	55
145.934928188446	53.0484001796627	140	45
151.554680530657	50.1478165797587	150	45
156.527757423031	47.5810512605645	160	55
161.870252301524	44.8235583036499	160	35
165.541881308555	45.1926047111606	170	45
165.541881308555	45.1926047111606	160	45
170.803260006049	45.7214553971896	170	55
175.299783857844	46.173442280995	180	55
176.782179836781	43.4086043633501	180	45
178.300085010492	40.5775171064931	170	35
180.982381265884	37.3358237937096	180	35
183.411506525034	34.4000949857866	180	25
192.892809488295	36.1577395635207	200	35
192.892809488295	36.1577395635207	190	35
192.892809488295	36.1577395635207	190	45
199.151426612906	37.3179843321983	200	45
202.854225357527	38.0044238640294	210	45
202.108030886153	34.4072508496391	210	35
200.768152957518	27.9480219023111	210	25
200.353487861686	25.9490387543201	200	25
199.950530001054	24.0064888666557	190	25
199.979589805438	18.7231802430886	200	15
200.000012634756	15.0086600936866	210	15
199.999488496022	14.9479227000692	190	15
199.967133976819	5.81015115305788	190	5
200.238416081167	4.18901530810218	200	5
200.514690048303	2.53804468925077	210	5
201.551137291377	-3.65591237425138	210	-5
201.946161907358	-6.01652136827093	200	-5
202.368139395304	-8.53819827530649	210	-15
198.185165298861	-8.53753160721523	200	-15
191.174086109321	-8.53642551888128	190	-5
184.992999343595	-8.53545079585086	190	-15
184.992999343595	-8.53545079585086	180	-15
178.895097406716	-8.53445618728064	180	-5
171.915890015049	-8.53331763870699	170	-15
167.62713100846	-8.53261852267246	160	-15
168.2749298021	-4.61813011951408	160	-5
169.467461656376	2.5880324345038	170	-5
169.467461656376	2.5880324345038	170	5
169.467461656376	2.5880324345038	160	5
170.099521835888	6.40728028766672	180	5
170.68802023458	11.3548413172845	180	15
167.772120001973	13.8413564855442	170	15
164.410306417326	16.7081102183301	170	25
159.262795516765	19.3890428655245	160	25
155.245152381611	21.4815062811326	160	15
155.245152381611	21.4815062811326	150	15
155.245152381611	21.4815062811326	150	25
148.162697396916	25.1702260951908	150	35
142.64826655349	24.5578799264358	140	25
138.860065408703	24.1372136595149	140	15
134.929287165842	23.7007047165384	130	15
133.260614310794	27.3457271647439	130	25
131.387025410746	31.4384522565136	140	35
129.067625056159	36.5048697243826	130	35
126.175854943378	42.8215979249135	130	45
123.376189290504	48.9371212010799	120	45
118.94369967924	58.6195419535721	120	55
Route: 5 Length: 334.944782082587 Demand Met: 271			

Solution x	Solution y	Original x	Original y
128.492606210214	140.480579263254	130	145
133.148179948652	147.094797379141	140	145
135.68786680023	150.703498405594	130	155
138.133011291252	154.177585284055	140	155
140.237908894582	157.168370640439	150	155
138.414926274716	167.425314649514	140	175
138.414926274716	167.425314649514	140	165
138.414926274716	167.425314649514	130	165
138.108918180444	169.148017697039	130	175
146.807403633473	170.409528798323	150	165
152.140725596975	171.183211315746	160	165
151.878453900706	173.975433021875	160	175
151.606742042414	176.868016521431	150	175
151.307169510386	180.056821473401	160	185
147.363474266399	182.934962327285	150	185
142.964435848391	186.145489298626	140	185
139.216200362815	188.88097557903	130	185
139.860367436579	193.334874591974	130	195
140.28016063302	195.500367707988	140	195
140.700196417226	197.667132425339	150	195
141.770563051678	203.190041146657	150	205
142.247073865568	205.647937042593	140	205
142.729108767708	208.134543966184	150	215
139.090181653984	207.643494171635	140	215
133.617053279668	206.905079425457	130	205
129.662212814563	206.371333697091	130	215
121.958079642422	205.331721653983	120	215
120.634123871134	205.152963899061	120	205
119.339476149027	204.978165945104	120	195
110.481587027058	204.988393759547	110	195
109.523585395862	205.081186838728	110	205
108.566887807329	205.17384556468	110	215
100.15879896735	205.988109943708	100	215
96.2201991370212	206.369622534736	100	205
89.3494861621658	207.035090416903	90	215
89.3494861621658	207.035090416903	90	205
81.5061614534518	207.79477516132	80	215
77.3314642306099	208.199273131918	70	215
77.7287514025482	205.906616917546	80	205
78.106798156866	203.725024276232	70	205
78.7936711846378	199.761472578574	70	195
82.3754831854198	196.425494630313	80	195
86.337389140579	192.735477668566	80	185
89.6643350071226	190.344562460025	90	195
89.6643350071226	190.344562460025	90	185
92.7073870086502	188.157625282701	100	195
95.878239037467	183.089905824059	90	175
101.205052950909	181.757649649069	100	185
101.205052950909	181.757649649069	100	175
107.158673284927	180.268475522842	110	185
111.947394019164	179.070765202427	120	185
111.776231402842	176.051683325214	110	175
111.611860294372	173.151439932978	120	175
111.238037186523	166.555511122578	120	165
110.974807942299	161.913578304649	110	165
110.602917601831	155.355518122082	120	155
110.091670176689	146.350972900253	120	145
Route: 6 Length: 374.689677386173 Demand Met: 300			
141.295177425479	127.743412952889	140	135
149.042466759458	132.948249055678	150	135
154.736736868022	136.773815592764	150	145
157.911980444971	138.906990321526	160	135
161.111552338429	141.056533504579	160	145
163.963956294765	142.972849880701	170	135
167.570326086782	146.037983904214	170	145
170.713395001756	148.709347075496	180	145
170.414689872258	151.508723605571	170	155
170.164935478657	153.849223234331	180	155
169.986303667124	155.523271990348	160	155
169.996604522253	161.373354060963	170	165
170.002722345073	165.01676992671	180	165
170.009703276009	171.117709133809	170	175
170.014174082681	175.0361342422	180	175
170.024524185073	184.963419938832	180	185
170.02834149407	188.733993092341	170	185
170.033855101441	194.177700337845	180	195
169.591395176034	196.823219047923	160	195
168.984223418674	200.453566734283	170	205
168.984223418674	200.453566734283	170	195
168.223183262104	205.003932640662	160	205

Solution x	Solution y	Original x	Original y
167.632043555878	208.538402028248	160	215
172.177491886371	208.538447745689	170	215
179.261777755117	208.53852920531	180	205
184.968650169879	208.538585792559	190	215
184.968650169879	208.538585792559	180	215
190.983134293608	208.538663088859	190	205
198.07740811154	208.538762785244	200	215
202.367604202813	208.538815089872	210	215
201.916158163824	205.840202309698	200	205
201.48634571631	203.271059514536	210	205
200.52488987219	197.523516789326	210	195
200.244142876149	195.845500178275	200	195
199.967142048426	194.189865385903	190	195
199.999291905182	185.08125763141	190	185
199.999741903442	185.011665041766	200	185
200.00019230064	184.942117784379	210	185
200.000180557194	175.034548993011	210	175
199.999779124819	174.968608572686	190	175
199.999905529602	171.929336776236	200	175
200.00007348134	168.099625158077	200	165
200.00020083626	165.032115138525	210	165
199.999795058219	164.966989697952	190	165
200.000175045016	155.04335631152	210	155
199.999826230639	154.986033217493	200	155
199.999478616433	154.928803843943	190	155
199.978198762222	145.660097395848	190	145
200.158334332314	144.328516246016	200	145
200.340957936861	142.978540529765	210	145
201.372524069471	135.353208343201	210	135
201.892855745619	131.507054073656	200	135
202.666475990068	125.788533726431	210	125
203.141480252876	122.277431982736	210	115
199.64651637566	122.963085921538	200	115
192.666115589097	124.332503369641	200	125
192.666115589097	124.332503369641	190	125
192.666115589097	124.332503369641	190	115
189.016718020004	125.04844886466	190	135
181.213529710819	125.073894148624	180	135
176.498024106957	123.887018378168	180	125
169.099667826742	122.024901331926	170	125
159.42386305915	119.589562988093	160	125
142.91609313417	115.43462069565	140	125
Route: 7 Length: 287.811066411693 Demand Met: 294			
100.651386671367	140.29545321698	100	145
100.737942423831	145.658537790354	110	145
100.824564567732	151.023613673598	110	155
94.9041851677793	156.395761806887	100	165
94.9041851677793	156.395761806887	90	155
94.9041851677793	156.395761806887	100	155
88.1881736428324	158.715167848842	90	165
82.164209616962	160.795609821897	80	155
76.1787932524032	162.862745324153	70	155
72.9108071349461	167.947092231549	80	175
72.9108071349461	167.947092231549	80	165
70.5667898771233	169.472837679503	70	165
67.7728983710642	171.291446218648	60	165
65.8293430160631	176.346238447525	60	175
64.1624259872348	180.681582951016	60	185
64.1624259872348	180.681582951016	70	185
64.1624259872348	180.681582951016	70	175
56.6627867648085	200.186740824261	50	205
56.6627867648085	200.186740824261	50	195
56.6627867648085	200.186740824261	60	195
55.3238612593106	203.669053372308	60	205
54.0604408457568	206.955005102884	60	215
48.5306179385929	207.332364711636	50	215
40.7347848222552	207.864479543061	40	215
37.2409220509508	208.102945246378	30	215
37.6730845231604	204.416054961113	40	205
38.1777334349489	200.11067319092	30	205
38.1777334349489	200.11067319092	30	195
38.1777334349489	200.11067319092	40	195
40.0169668069113	184.417628980802	40	185
40.0169668069113	184.417628980802	50	185
40.0169605943321	175.000420160607	50	175
40.0142125918738	165.533058870129	40	175
40.0142125918738	165.533058870129	40	165
40.0142125918738	165.533058870129	50	165
39.2855424207704	158.711998942075	30	155
42.4139815922847	156.056815513748	40	155

Solution x	Solution y	Original x	Original y
46.1597369270785	152.877667378413	40	145
52.6783737778716	148.188690138944	50	155
52.6783737778716	148.188690138944	60	155
52.6783737778716	148.188690138944	60	145
54.1877109197024	145.734507874899	50	145
55.7636968524212	143.171903330795	50	135
61.9197567546235	141.86545566536	60	135
69.6909833799525	140.216265130328	70	145
77.8284535349732	138.489333813613	80	145
83.6846889616546	137.246480187729	90	145
Route: 8 Length: 285.266012932629 Demand Met: 294			
135.539938223643	96.0496923682145	140	105
138.503973694257	92.9116755071561	140	95
141.486382112367	89.7541963073774	150	95
144.791824944225	80.6295477906618	150	75
144.791824944225	80.6295477906618	150	85
144.791824944225	80.6295477906618	140	85
146.427534109583	76.1141766809718	140	75
148.613208987723	70.0806255957449	140	65
151.261675911788	67.0507042465213	150	65
153.66105968258	64.3057402049762	150	55
160.519829718979	65.0135167540169	160	75
165.189386211276	65.0186713310203	170	65
165.189386211276	65.0186713310203	160	65
170.013116890386	65.0240059493305	170	75
176.229023302397	65.030717175573	180	65
180.013115095169	65.0348246279987	180	75
189.035764987593	65.0465896178573	190	75
190.834854378131	64.6926588072358	190	65
192.676064725287	64.330441600275	190	55
198.74446926911	63.1366340773677	200	55
200.901656788406	62.7122491698483	200	65
203.136376917601	62.2726116567014	210	55
202.685159802686	65.5600734671539	210	65
201.8809362511	71.4195666973823	200	75
201.364605431603	75.1814340733075	210	75
200.280816974531	83.0777995813176	210	85
200.138477004954	84.1148438084048	200	85
199.999163929269	85.1298371112079	190	85
200.701087264319	91.4610397431584	200	95
201.17030157648	95.6932713330411	210	95
201.600478306348	99.5733762317833	210	105
195.239207307625	101.633901468479	200	105
195.239207307625	101.633901468479	190	105
190.903749040107	103.038222891101	190	95
183.211756574296	105.529792874378	180	115
180.802444282462	102.035189933724	180	105
177.729157418966	97.5776066886571	180	95
175.046922012443	93.687186220579	180	85
169.758768218491	93.3207856123684	170	85
165.925699020595	93.055201413061	160	85
165.319651238163	95.6074608931935	170	95
164.633484323757	98.4971258989284	160	95
163.712001072946	102.377756620461	170	105
162.945098052568	105.607425364229	160	105
162.20103895378	108.740894785817	170	115
158.323509837189	110.620348474702	160	115
154.678027678405	112.387320390197	150	105
151.814448756524	113.775302742846	150	115
149.225843345428	115.030003388343	150	125
138.804592639647	111.848088366131	140	115
Route: 9 Length: 284.022578113177 Demand Met: 268			
62.7459430299262	96.3024069797127	60	105
57.5646387828917	95.7880377022205	60	95
51.2654681945755	95.1627546721112	50	105
51.2654681945755	95.1627546721112	50	95
49.5012950432041	94.9875607132453	50	85
44.3694815991279	94.9832458529708	40	95
40.0075313730419	94.9795792904187	40	85
33.999888549823	94.9746132778468	30	95
29.987947652093	94.9712832224328	30	85
20.0418554382573	94.9627001751282	20	85
16.8907242555309	94.9602434372306	20	95
10.9633653683002	94.9534932722633	10	85
9.05536175650002	95.328002197292	10	95
7.11670586673826	95.7085318487139	10	105
1.68373204918419	96.7749430158268	0	105
-0.675784273358445	97.2380853602918	0	95
-3.14192528788082	97.7221590806127	-10	105
-2.64623809494417	94.0577751374394	-10	95

Solution x	Solution y	Original x	Original y
-1.87515449092136	88.3573984521182	0	85
-1.36033446287844	84.5515344060347	-10	85
-0.342176747372179	77.0246763787389	-10	75
-0.156654189530812	75.6533348353113	0	75
0.022559368305707	74.3286214042936	10	75
0.0223052906930832	69.0290603553578	0	65
0.0221435247681541	65.6651642925692	10	65
-0.289065207656918	63.3409566678161	-10	65
-1.08154767238027	57.4219215539942	0	55
-1.67580389435717	52.9834498468349	-10	55
-2.52619450296953	46.6318767890904	-10	45
-3.11283144163167	42.2503130310003	-10	35
-0.70752185137583	42.6990750807896	0	45
1.61528701607985	43.1324460237027	0	35
5.28056306504845	43.8162942612352	10	35
8.15911974143886	46.7716568270533	10	45
11.122571901927	49.8141754636883	10	55
13.2839318540733	52.033202545348	20	45
17.6775931247933	56.5441781737483	20	55
21.9436693385362	60.9241571396318	30	55
23.3652895718853	63.5521721302987	20	65
24.8176453819259	66.2369845306471	20	75
29.8159262594032	65.8886585057545	30	75
35.5205128488993	65.4908404796675	30	65
35.5205128488993	65.4908404796675	40	65
39.5911655731444	65.2071383836391	40	75
47.4192391702427	64.6612533194411	50	55
50.4825666527175	66.7200628115811	50	65
54.0427852606993	69.112838424934	60	65
56.6240991080679	70.8477121904624	50	75
61.0571078396416	73.8271184402462	60	75
65.7206593158817	76.9615705955107	60	85

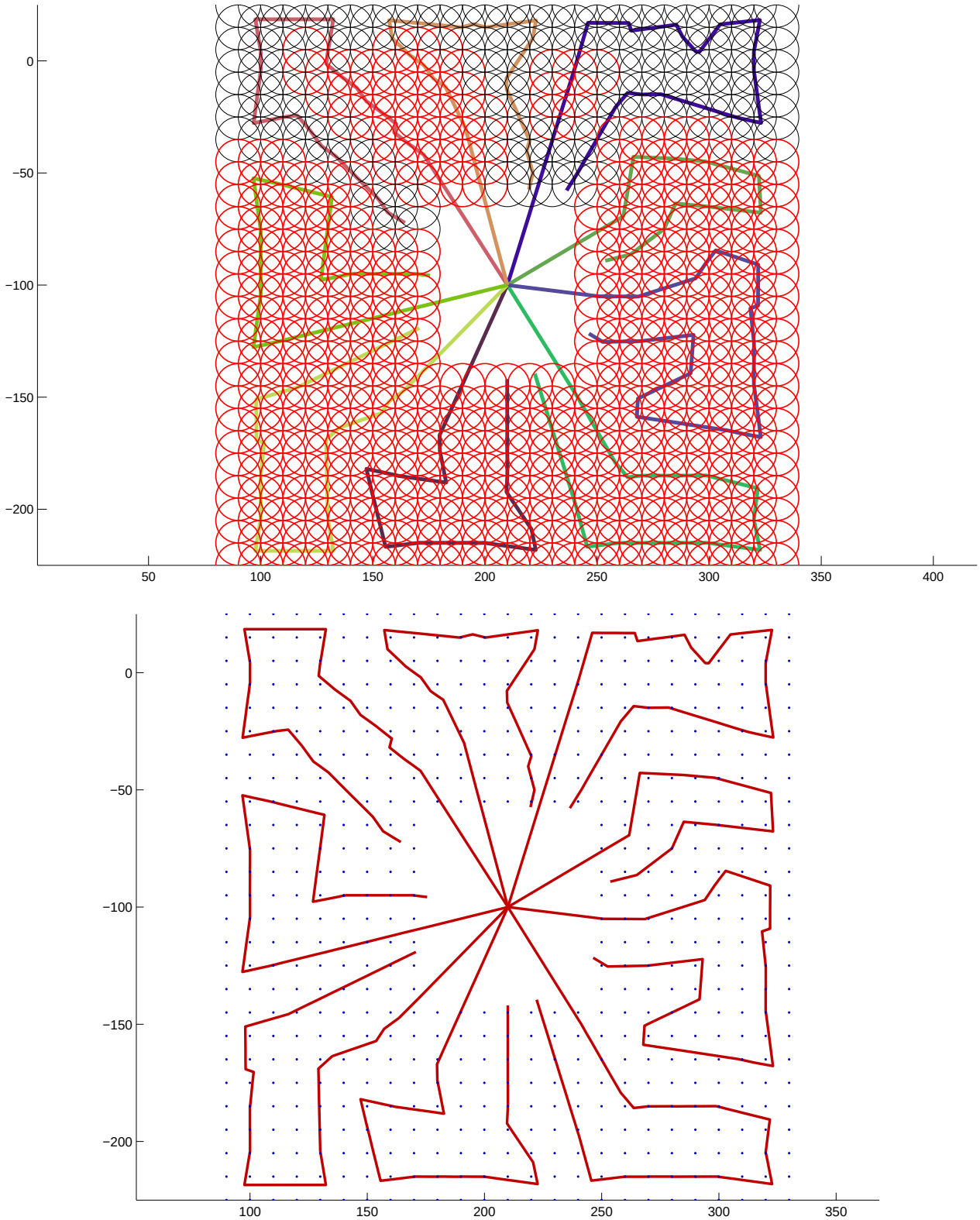


Figure O.42: *bubbles*9, Equal Radius, 2D, Euclidean, Length = 3286.4711570

Table O-45: Solution for *bubbles*9, Equal Radius, 2D, Euclidean

Total distance: 3286.47115704795			
Total demand met: 3714			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 423.131840371318 Demand Met: 454			
124.62911285072	20.7624967888651	130	15
124.62911285072	20.7624967888651	130	25
124.62911285072	20.7624967888651	120	25
127.848390783539	10.4053020959856	130	5
127.848390783539	10.4053020959856	120	5
127.848390783539	10.4053020959856	120	15
130.424026312466	2.11906012024176	140	5
133.812782472452	-9.5294325618971	140	-15
133.812782472452	-9.5294325618971	140	-5
133.812782472452	-9.5294325618971	130	-5
134.935182424195	-13.3875149811544	130	-15
135.982277180861	-16.9867263561978	130	-25
140.344184003274	-16.9644281076008	140	-25
146.222879722438	-16.9343690680971	150	-15
150.04873391911	-16.914811676821	150	-25
154.144145957491	-16.8938793227177	160	-25
155.292123562327	-13.4849063048773	150	-5
158.790631505567	-13.9452546756716	160	-5
162.593185785879	-14.4456084580646	160	-15
167.420199407996	-15.0807688713103	170	-15
171.268876820487	-15.5871920530414	170	-25
175.384648767218	-16.1287668638328	180	-25
178.209656682851	-10.7097893066631	170	-5
180.264455014847	-8.43619486371528	180	-15
180.264455014847	-8.43619486371528	180	-5
184.2099346169	-4.07064881696754	180	5
185.686292663689	-4.02176073966166	190	5
188.586178860778	-7.87159257734569	190	-5
191.889213421201	-12.2566310022235	190	-15
194.938097651095	-16.3042864815139	190	-25
199.905257948019	-16.8412428969745	200	-25
203.454510675364	-17.2249285829078	200	-15
208.997810060457	-17.8241687856214	210	-25
212.650273399543	-18.2190130791939	220	-25
212.171700661678	-15.7053782686561	210	-15
211.713336641002	-13.2978926073414	220	-15
210.630302967513	-7.60920126673344	220	-5
210.288119500708	-5.81191027782386	210	-5
209.956848985128	-4.07193597005636	200	-5
209.975606645331	4.30189075985484	200	5
210.160712356343	5.63920506488166	210	5
210.34953646217	7.00338222452854	220	5
211.393159308944	14.5432015701712	220	15
211.922460175321	18.3671262889912	210	15
212.71664416527	24.1048445512106	220	25
213.208713958931	27.6597883013569	220	35
210.301661562546	27.0243690638074	210	35
205.668241332353	26.0116171523527	210	25
205.668241332353	26.0116171523527	200	25
202.537627852684	25.3273340868868	200	35
196.899346804908	23.5959418341889	200	15
186.319735384617	20.3471850047737	190	15
186.319735384617	20.3471850047737	190	25
186.319735384617	20.3471850047737	180	25
179.377505391344	18.2153813617548	180	15
172.795471946823	16.1941888198445	170	15
172.795471946823	16.1941888198445	170	25
168.573618775267	14.8977587363828	170	5
160.357165909303	14.9936171639567	160	5
160.288614057732	14.9980161954011	160	15
160.220104839815	15.0024140133778	160	25
153.69198617658	14.2935170428815	150	5
148.171598650019	20.7641212500037	140	15
146.966252936029	22.8579551364238	150	15
146.966252936029	22.8579551364238	150	25
146.966252936029	22.8579551364238	140	25
138.526198392008	37.5194532021515	140	35
138.526198392008	37.5194532021515	130	35
136.006129015981	41.8972513844339	140	45
133.654097678421	45.9831052670342	130	45
131.428427763382	49.8494777414371	140	55
126.455959807317	57.7841330664392	130	55

Solution x	Solution y	Original x	Original y
Route: 2 Length: 374.082824969696 Demand Met: 446			
67.3459358890668	49.0647722944945	60	45
67.3459358890668	49.0647722944945	60	55
67.3459358890668	49.0647722944945	70	55
65.2188120637345	45.7467147775144	70	45
62.7337386288015	41.870338434742	70	35
59.0664498021575	39.2183584102939	60	35
56.0289794368583	37.0218172690274	50	45
52.2817616829168	34.0629368702242	50	35
49.4955995728722	31.8641251266033	40	35
50.5044430272279	28.1360063513319	60	25
47.647831706618	25.881207692721	50	25
43.9523421974132	22.9640322003058	50	15
41.654989566916	21.2870346620286	40	25
39.2180001288514	19.5081151268258	40	15
37.1145536530005	17.9726791752831	30	25
34.7786456228566	14.6884750850871	30	15
32.8870712269826	12.0289640115747	40	5
29.1724439517178	9.32009599025513	30	5
26.1743422460119	7.13377325312387	20	15
22.4940877861293	4.02854465573275	20	5
19.3054016076251	1.3380843689411	10	5
19.8993251976854	-3.58465429047413	10	-5
20.5272896227488	-7.37985149287429	20	-15
20.5272896227488	-7.37985149287429	20	-5
20.5272896227488	-7.37985149287429	30	-5
21.7095095485537	-14.5251058966949	30	-15
22.3726391184032	-18.5328915228857	30	-25
17.4003610646703	-18.5336328777627	20	-25
5.43740643896318	-18.5354398634553	0	-25
5.43740643896318	-18.5354398634553	10	-25
5.43740643896318	-18.5354398634553	10	-15
-0.978787052474303	-18.5363549832456	0	-15
-8.22332955251846	-18.5373825865097	-10	-25
-12.3683111622738	-18.5380004510299	-20	-25
-11.9540070693329	-16.0615862596001	-10	-15
-11.5635974071334	-13.7279963041191	-20	-15
-10.4884401555489	-7.30064167477156	-20	-5
-10.224738553231	-5.72426009655958	-10	-5
-9.96623984235832	-4.17895996429583	0	-5
-9.97713687434118	4.32416334505176	0	5
-10.1500287241041	5.60545427045501	-10	5
-10.3262727613704	6.91156781343039	-20	5
-11.3683601564611	14.6343904526137	-20	15
-11.8723856496138	18.3695324333008	-10	15
-12.6432663967557	24.082407445059	-20	25
-13.1352748307015	27.728434110043	-20	35
-9.40289475730856	27.0042389900029	-10	35
-2.66622291666668	25.6971933497936	-10	25
-2.66622291666668	25.6971933497936	0	25
-2.66622291666668	25.6971933497936	0	35
1.54952246334021	24.8792173569606	0	15
6.33565965060893	24.3044470748031	10	15
9.03868155218153	27.5072529983663	10	25
12.1367684775648	31.1781546388577	20	25
14.3581811334298	34.2187718763031	10	35
17.0625591199715	37.9204273448494	10	45
19.2969418107404	39.5446526963061	20	45
21.0452866209476	40.8155669336298	20	35
23.504987472792	42.6036109041043	30	35
28.0744053903483	47.1718491518548	30	45
32.9523034164689	52.0485049965801	40	45
37.7561308988291	56.8512460239873	40	55
42.3704610545916	61.4645362855351	50	55
44.3431281712213	64.2261901388551	40	65
46.8045269037505	67.6720715969428	40	75
50.8436580921634	70.1267074372647	50	75
54.3517951589022	72.2586210624388	50	65
54.3517951589022	72.2586210624388	60	65
54.3517951589022	72.2586210624388	60	75
Route: 3 Length: 286.651729710 32 Demand Met: 282			
145.771539140297	72.8839782311586	150	65
145.771539140297	72.8839782311586	140	65
145.771539140297	72.8839782311586	140	75
151.757236518525	69.338072040224	160	65
151.757236518525	69.338072040224	160	75
151.757236518525	69.338072040224	150	75
154.939302154272	50.6242315514915	160	45
154.939302154272	50.6242315514915	160	55
154.939302154272	50.6242315514915	150	55

Solution x	Solution y	Original x	Original y
156.271481041585	42.7890389796146	160	35
156.271481041585	42.7890389796146	150	35
156.271481041585	42.7890389796146	150	45
174.999977635231	43.6601412188884	180	35
174.999977635231	43.6601412188884	170	35
174.999977635231	43.6601412188884	170	45
188.249099792219	44.8455473270699	190	35
188.249099792219	44.8455473270699	190	45
188.249099792219	44.8455473270699	180	45
204.06386444063	49.1011236564463	210	45
204.06386444063	49.1011236564463	200	45
204.06386444063	49.1011236564463	200	55
212.233620809302	51.2995240668258	220	45
212.233620809302	51.2995240668258	220	55
212.233620809302	51.2995240668258	210	55
213.141044426289	67.722945720833	220	65
213.141044426289	67.722945720833	220	75
213.141044426289	67.722945720833	210	75
203.107253440667	66.5706159879584	210	65
203.107253440667	66.5706159879584	200	65
203.107253440667	66.5706159879584	200	75
188.965274858131	64.9462681993064	190	55
188.965274858131	64.9462681993064	190	65
188.965274858131	64.9462681993064	180	65
175.053188108253	63.6293642647825	180	55
175.053188108253	63.6293642647825	170	55
175.053188108253	63.6293642647825	170	65
169.999972356082	74.9999745761078	180	75
169.999972356082	74.9999745761078	170	75
169.999972356082	74.9999745761078	170	85
154.999915647139	86.3397606140665	160	85
154.999915647139	86.3397606140665	160	95
154.999915647139	86.3397606140665	150	95
143.689513701403	89.1489813466586	150	85
143.689513701403	89.1489813466586	140	85
143.689513701403	89.1489813466586	140	95
Route: 4 Length: 387.392321160848 Demand Met: 458			
126.371401456819	142.081004105735	130	145
131.428393696402	150.150485220255	140	145
133.517878662645	153.780224398174	130	155
135.686073292739	157.546685956939	140	155
137.833175070881	161.276512453139	130	165
140.795616984011	166.42269002056	140	165
144.412275890852	172.705340612018	140	175
148.171755224277	179.236096296333	140	185
150.237345295392	181.657382709987	150	185
150.237345295392	181.657382709987	150	175
153.69144341929	185.706267008393	150	195
160.211825179996	184.997766239373	160	175
160.267735386604	185.001472468186	160	185
160.325489146806	185.005300157766	160	195
169.971507327337	184.999762719076	170	175
170.032472338871	185.000207492919	170	195
173.103432636369	185.000042578977	170	185
176.915365596978	184.999826691285	180	185
179.939963275898	184.999658550724	180	175
179.995381820698	184.999988760834	180	195
188.819740284523	184.930115734298	190	175
190.969686553075	185.466554158151	190	185
193.241394142821	186.033373217253	190	195
197.984673923082	187.216882231073	200	185
202.291441452995	188.291472877686	200	195
207.379861937788	189.56108764678	210	185
211.750100716369	190.651497904788	220	185
211.299323288027	194.239272081177	220	195
210.785742280793	198.326740505159	210	195
209.993314554717	204.634068957628	200	205
210.295528892267	206.138526867274	210	205
210.612776351657	207.717805565436	220	205
211.67290486744	212.995949294511	220	215
212.174415888048	215.492575541239	210	215
212.709338257765	218.155547339276	220	225
208.391927153847	217.5685950586	210	225
201.780924695966	216.669841091749	200	225
197.407071490534	216.075187847615	200	215
191.631278082402	215.289942525164	190	225
189.336742212677	214.977988628004	190	205
186.644430057444	214.984374820456	190	215
182.965038520928	214.99310954083	180	215
180.023603471107	215.000089648521	180	225

Solution x	Solution y	Original x	Original y
179.952685151324	214.999698502839	180	205
170.052935194861	215.000260112498	170	225
169.999791901101	214.999994753871	170	215
169.946242678749	214.999726285378	170	205
160.053296389858	214.999713335514	160	205
159.998829899011	215.000003145633	160	215
159.94415346081	215.000294781185	160	225
150.349517197193	215.00610693886	150	225
150.288447517924	215.001762275741	150	215
150.227452144839	214.997423161118	150	205
143.438282233621	215.791151477948	140	215
139.123485810499	216.295629793116	140	225
135.59056824673	216.708692392391	130	225
134.46118922583	212.594361545295	130	215
133.07219357397	207.534258974918	140	205
131.837396532484	203.035892990264	130	205
130.402343978566	197.808011617306	140	195
129.433868375528	194.69228544598	130	195
128.432223756136	191.469854627984	120	195
126.700530096165	185.898820615461	120	185
125.658004465343	182.544885004339	130	185
124.053034617636	177.381538807702	130	175
122.565619132225	172.596378559869	120	175
120.761115070153	166.791149433586	120	165
119.293852496906	162.07085531895	110	165
117.655560413426	156.800306912827	120	155
116.173027167706	152.030852746427	110	155
114.343349286145	146.144566254821	120	145
112.291288755841	139.542873795033	110	145
Route: 5 Length: 398.131065370141 Demand Met: 448			
134.666861177611	104.282583933945	140	105
140.640375648082	105.020524150566	140	115
150.053668488295	105.069971655152	150	115
158.492675106604	105.114251715018	160	115
159.166540888812	104.899974862252	150	105
163.926120103141	103.386510595249	160	105
173.556223411291	100.324301346407	180	105
173.556223411291	100.324301346407	170	105
173.556223411291	100.324301346407	170	95
179.333865091303	98.4871089865117	180	95
183.992233613824	97.0058269752618	190	105
186.16061495953	93.7653717064014	190	95
188.126581250157	90.8274065158354	180	85
190.6886866562	87.4882085041467	190	85
192.935991951037	84.5592893060263	190	75
203.283497746631	87.9923452759346	210	85
203.283497746631	87.9923452759346	200	85
203.283497746631	87.9923452759346	200	95
208.428342373825	89.6992818320895	210	95
211.88745037963	90.8469313378006	220	85
211.88062990714	95.5695306784881	220	95
211.872236555382	101.378558752043	210	105
211.866705200286	105.205583542955	220	105
211.860929599106	109.190042485254	220	115
208.433876064979	110.373062458198	200	105
208.88552008464	114.702720292141	210	115
208.88552008464	114.702720292141	200	115
209.47329840261	120.337442731466	210	125
209.830481563134	123.76153972375	200	125
210.013145042572	125.512600649778	220	125
210.000247400595	134.942202482931	220	135
209.999960666482	135.003670965843	210	135
209.999674303923	135.065074107508	200	135
209.987121417933	140.706401072955	210	145
209.979003486093	144.3522898556	200	145
210.29170875897	146.709905269357	220	145
211.322197836292	154.479313853612	220	155
211.843484770485	158.409558251236	210	155
212.579436228086	163.958287670075	220	165
213.085734304333	167.775526954749	220	175
209.140167220026	167.074917560273	210	165
205.000006765725	166.339753900192	210	175
205.000006765725	166.339753900192	200	175
201.431268053326	165.551440585025	200	165
198.172409919009	164.831578197647	200	155
184.854739963814	162.816340220674	190	165
184.854739963814	162.816340220674	190	155
184.854739963814	162.816340220674	180	155
173.80101829387	161.143701739487	180	165
173.80101829387	161.143701739487	170	165

Solution x	Solution y	Original x	Original y
173.80101829387	161.143701739487	170	155
163.311824393207	159.556486322392	160	165
157.7818960542	158.719700752322	150	165
158.015341245132	154.994200969325	150	155
158.291279809276	150.590594064563	150	145
161.87660501249	148.872484025051	160	155
161.87660501249	148.872484025051	160	145
174.0551782021	143.036458458759	180	145
174.0551782021	143.036458458759	170	145
174.0551782021	143.036458458759	170	135
181.749615543119	139.349227937137	190	145
182.081525739596	135.054590603645	190	135
182.356684370248	131.494264540981	180	135
182.787139717598	125.92454781737	190	125
183.073970912895	122.213195276628	190	115
179.208857276937	122.670407936856	180	115
172.728950610732	123.436928226889	180	125
172.728950610732	123.436928226889	170	125
172.728950610732	123.436928226889	170	115
159.319075306864	125.02320879536	160	135
159.319075306864	125.02320879536	160	125
153.512878768644	125.130895067574	150	125
149.620510007328	125.203083828644	150	135
142.562816972569	125.333975875772	140	135
136.389237654813	121.659378152441	140	125
Route: 6 Length: 325.52678560129 Demand Met: 385			
89.1585236140431	59.330140129209	90	55
86.5688391333863	49.6169142620937	80	45
86.5688391333863	49.6169142620937	80	55
84.8249311610752	43.0748271116826	90	45
81.3397475068755	30.0000121482965	90	25
81.3397475068755	30.0000121482965	80	35
81.3397475068755	30.0000121482965	90	35
76.5729525136647	20.1194583482891	70	15
76.5729525136647	20.1194583482891	70	25
76.5729525136647	20.1194583482891	80	25
74.6562685677394	16.1459545098745	80	15
72.4333122924154	11.537994317139	80	5
69.4363604151429	9.50879158006191	70	5
67.0018715439017	7.86039929288114	60	15
64.7500741973725	4.67058078429186	60	5
62.8809774328755	2.0227928475889	70	-5
59.357769138718	-0.536542185522357	60	-5
56.3869291676117	-2.6946206351529	50	5
52.3538191461556	-6.50785871963808	50	-5
48.6602472626806	-10.0000242736998	40	-15
48.6602472626806	-10.0000242736998	40	-5
47.9699318820203	-14.1435518463758	50	-15
47.2998964935809	-18.1654095609586	40	-25
51.9061685075052	-17.7066614962804	50	-25
58.141285357637	-17.0857270254719	60	-25
62.5073216081607	-16.6509448019187	60	-15
68.5318075614538	-16.0510131674032	70	-25
72.889094706909	-15.6170980313995	70	-15
79.3188105025129	-14.976777529394	80	-15
79.3188105025129	-14.976777529394	80	-5
84.999999968892	-16.3397401306537	80	-25
84.999999968892	-16.3397401306537	90	-25
84.999999968892	-16.3397401306537	90	-15
90.5157537187653	-14.9866970918819	90	-5
100.528484107587	-16.3736243796845	100	-25
100.528484107587	-16.3736243796845	100	-15
108.664603150321	-17.5006390362708	110	-25
112.788771396394	-18.0719178467166	120	-25
112.072010742646	-14.0792050695827	110	-15
111.339741340513	-10.0000064110668	120	-15
111.339741340513	-10.0000064110668	120	-5
107.899937789706	-4.792682057196	110	-5
103.822998805581	1.37922443038223	100	-5
103.822998805581	1.37922443038223	110	5
103.822998805581	1.37922443038223	100	5
99.614205983479	7.75085058470325	90	5
99.7488887063741	12.7730514247226	90	15
101.476073261223	16.6143895660053	100	15
103.620984388279	21.3846974051276	110	15
103.620984388279	21.3846974051276	110	25
103.620984388279	21.3846974051276	100	25
110.018646837061	35.6105347120601	120	35
109.47392352203	37.3711408734086	110	35
108.660261351421	39.9999978365616	100	35

Solution x	Solution y	Original x	Original y
108.660261351421	39.9999978365616	100	45
109.956556953479	44.8379850440407	110	45
111.339737774907	49.9999999368771	120	45
111.339737774907	49.9999999368771	120	55
110.477002398805	53.8047787001482	110	55
109.667140705208	57.3755009352764	100	55
Route: 7 Length: 355.955646946325 Demand Met: 377			
81.8631356992541	140.235043430605	90	145
79.3322036818396	145.849539731595	80	145
76.664861953048	151.766653136669	80	155
74.5464900309403	156.465957937693	70	155
72.6222596679329	160.734615337251	80	165
71.1316716422202	164.041283647917	70	165
69.7979927888898	166.999880013311	60	165
69.9420711649226	173.925109540635	60	175
70.548676501787	177.002975481715	80	175
71.2454667887926	180.538439573226	70	185
71.2454667887926	180.538439573226	70	175
72.0995757812192	184.87211157587	80	185
72.7402415065848	188.122779172724	80	195
69.1373758600085	187.613320865927	70	195
63.4886145197079	186.814571257176	60	185
59.7041082194443	186.279429651569	60	195
51.7604316720424	185.156172020401	50	195
49.5147783083137	184.66939525964	50	185
47.2579423587675	184.180194244461	50	175
43.0238207605379	183.262403531095	40	185
39.7252611393158	182.547401413621	40	175
37.1516775509537	181.989544612344	30	175
37.9576104678465	185.334969208763	30	185
39.7147731996369	192.62907948838	30	195
40.9442727194777	197.602424957883	40	195
42.7527049075163	204.917510660782	50	205
43.8698107831679	209.436225601726	40	215
43.8698107831679	209.436225601726	40	205
44.9063704811436	213.629133046563	50	215
45.6833412663619	216.772005171999	40	225
50.1379648083293	216.237222397282	50	225
58.200838808138	215.269274251227	60	225
59.4015194695836	215.125131579369	60	215
60.5878072133437	214.982716743942	60	205
69.9799926455017	215.000109766037	70	225
70.0333458813477	214.999806634703	70	205
73.094919884402	214.999921935894	70	215
76.9258040809859	215.000069392096	80	215
79.9698830080227	215.000183619096	80	225
80.0248777424962	214.999863498499	80	205
89.5860103874259	215.008570939351	90	225
89.6587381215439	215.002487314751	90	215
89.7314431516182	214.996404895477	90	205
96.9494784148306	215.99284670429	100	215
101.89273580186	216.675269261427	100	225
108.690949152081	217.613761856013	110	225
112.698580727024	218.167022986226	120	225
112.219685513676	215.845904264552	110	215
111.763568343888	213.63517449189	120	215
110.781563280336	208.875650927377	120	205
108.348357790905	205.261354068432	110	205
105.751744032827	201.404326073373	110	195
104.123979847621	198.986437599463	100	205
101.757874669323	195.471804137071	100	195
99.6329111146275	192.315363811326	90	195
99.955569659505	185.724420855076	90	185
99.9792165046804	185.241519721411	100	185
100.002963877502	184.756590137059	110	185
100.000245015702	175.045550166987	110	175
100.000013695146	175.000829839901	100	175
99.9997858758705	174.957064604306	90	175
99.994714166977	165.011480580648	90	165
99.9945713711251	161.949559509339	100	165
99.9943836380839	158.165921722174	100	155
99.9942227900013	154.981871206822	90	155
99.9956044404405	141.949794842738	100	145
Route: 8 Length: 386.243675520472 Demand Met: 464			
66.129795896306	134.653467162534	60	135
62.8803171405693	137.977959948291	70	145
58.0435653514508	142.837744266244	60	145
53.5150978074718	147.387766140922	60	155
50.6017214044682	149.482600968823	50	145
47.2345016420754	151.90377066434	40	145

Solution x	Solution y	Original x	Original y
45.6061393617332	154.407387300942	50	155
43.8402631143506	157.122327948849	50	165
40.0274277873976	158.44093666133	40	155
35.7772601553503	159.910798077198	40	165
27.6417044106992	162.724529814649	20	165
27.6417044106992	162.724529814649	30	165
27.6417044106992	162.724529814649	30	155
25.0927104298504	163.606065412562	20	155
19.184751173122	168.95479682293	10	165
19.2608717217375	172.419571521879	20	175
19.325751100765	175.371391699678	10	175
19.5256919848917	184.473471047004	10	185
19.6134348517801	188.466504783256	20	185
19.7538847285365	194.856950473247	10	195
19.7538847285365	194.856950473247	20	195
19.9561759627394	204.064785214766	10	205
20.5203394145131	207.447813312884	20	215
20.5203394145131	207.447813312884	20	205
20.5203394145131	207.447813312884	30	205
21.7899715678164	215.062488337122	30	215
22.3692918006977	218.536844551259	30	225
18.5875129196721	218.53703112203	20	225
11.1152693626132	218.537499297926	10	215
4.92974869632924	218.537846645825	0	225
4.92974869632924	218.537846645825	10	225
-0.624848601148102	218.538179170264	0	215
-9.12718145480743	218.538789883426	-10	225
-12.3674889711606	218.538973647772	-20	225
-11.9897351093655	216.28126901433	-10	215
-11.6197967534997	214.070429294625	-20	215
-10.4769299626944	207.236089318375	-20	205
-10.2196760141651	205.698913776522	-10	205
-9.96713773253958	204.189917912877	0	205
-9.99942995654189	195.060768736001	0	195
-9.99977268547478	195.008769383472	-10	195
-10.0001140600142	194.956983033437	-20	195
-10.0130665881906	185.511089421422	-20	185
-9.91298912502002	184.549094273717	-10	185
-9.81034040866221	183.562415008949	0	185
-8.92593230294936	175.060428385427	-10	175
-8.92593230294936	175.060428385427	0	175
-8.43764156958731	170.36714747326	0	165
-11.8707269199655	169.176343020012	-20	175
-11.8974758759702	165.029985228715	-20	165
-11.92207701119	161.220951652974	-10	165
-11.9604854575263	155.261840548339	-20	155
-11.9881151698183	150.98412618586	-20	145
-8.51932685335319	149.981685230565	-10	145
-4.72376270595343	148.884803253634	-10	155
-4.72376270595343	148.884803253634	0	155
-4.72376270595343	148.884803253634	0	145
6.40575371044581	145.668256524118	10	155
12.701213114935	142.59654188394	10	145
12.701213114935	142.59654188394	10	135
19.4872509516495	139.285439346539	20	135
24.4968184890081	136.841125170263	20	145
24.4968184890081	136.841125170263	30	145
31.0376143438646	133.649754387805	30	135
39.1301657584777	129.701287314752	40	135
39.1301657584777	129.701287314752	40	125
45.7339627719335	126.47917001516	50	135
51.8447773556162	123.497488605615	50	125
60.751445098229	119.151614170871	60	125
Route: 9 Length: 349.355267397546 Demand Met: 400			
64.1460796129652	108.855794604894	60	105
55.2444386475722	111.054473847118	50	115
55.2444386475722	111.054473847118	60	115
50.0251776362292	112.343644828801	50	105
42.6449049677523	114.166610673116	40	105
37.904200310926	115.337613129192	40	115
32.2087745826813	116.744454036525	30	115
27.3868299819851	117.935538330734	30	125
21.5602116733467	119.37476977273	20	125
17.4830288349307	120.381852316168	20	115
10.622218784492	122.076533993362	10	125
10.622218784492	122.076533993362	10	115
3.37133858017353	123.867575387845	0	115
0.487571249907631	124.57990887187	0	125
-2.26944893429199	125.260927411559	0	135
-7.86997221173857	126.488285436837	-10	135

Solution x	Solution y	Original x	Original y
-10.5119583624533	127.067259420344	-10	125
-13.2100778948294	127.658533724075	-20	135
-12.6690672619005	123.753790696883	-20	125
-11.9094930022705	118.271429257397	-10	115
-11.3809652038504	114.456742066295	-20	115
-10.3625212375409	107.105791152817	-20	105
-10.1683706095843	105.704477050239	-10	105
-9.97715228748866	104.324330150245	0	105
-9.99945984973652	95.0781988915367	0	95
-9.99978899507674	95.0200297802456	-10	95
-10.0001177370326	94.9620505635922	-20	95
-9.99971070715	85.0409865205513	0	85
-10.0000505660764	84.9879673023736	-20	85
-9.99074351012649	81.2003152473159	-10	85
-9.97716014392526	75.6755438448836	0	75
-10.1689495165319	74.2913276067405	-10	75
-10.3614237703035	72.9021669723267	-20	75
-11.420472946421	65.2585932136136	-20	65
-11.9505081460007	61.4331596131168	-10	65
-12.7435010067755	55.7098049988802	-20	55
-13.2101920038435	52.3415690616805	-20	45
-11.0550477859224	52.8138517448011	-10	55
-8.97480434318291	53.2697199948649	-10	45
-2.26616858805879	54.7398320940061	0	45
0.4983889168156	55.4207136931353	0	55
3.38224161872944	56.1309785606537	0	65
14.4502678683332	58.8569504997777	10	55
14.4502678683332	58.8569504997777	10	65
14.4502678683332	58.8569504997777	20	65
18.2353475974347	59.7891765244132	20	55
21.7528528931007	60.6555023420011	30	55
21.2245942544038	64.7867258263662	30	65
20.0849869875926	73.6993624715684	30	75
19.8766832635201	75.2489318507935	20	75
19.6635128960016	76.8347013417827	10	75
18.5804514116499	84.890756978553	10	85
18.1512499610586	88.0833944176889	20	85
17.2959132656241	94.445500350649	10	95
16.855706464392	97.7199283823389	10	105
19.1750952286026	97.2650820203387	20	95
21.3809607433086	96.8324992378885	20	105
27.101166532242	95.7107319432878	30	105
29.0500632666233	95.3285458380686	30	95
30.9618263595075	94.9536424335171	30	85
36.098020626629	94.958443514531	40	95
39.9967610524002	94.9620912640962	40	85
49.9838855014417	94.9716525736764	50	85
53.9058456383323	94.9754804541079	50	95
59.3810228349845	94.9808294592619	60	85
65.5598330245883	95.7444194938341	60	95

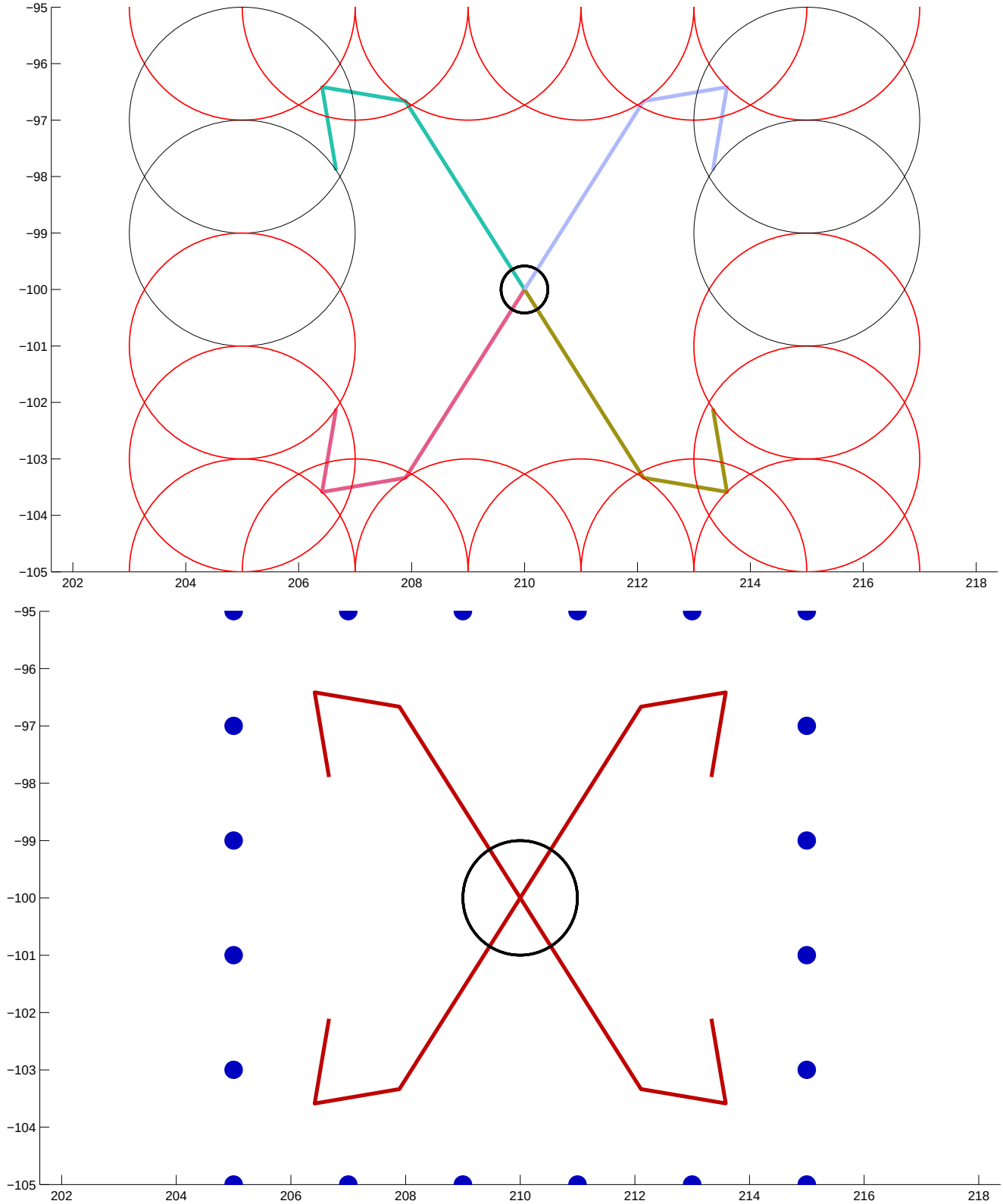


Figure O.43: $rotatingDiamonds1$, Equal Radius, 2D, Euclidean, Length = 43.5540318

Table O-46: Solution for $rotatingDiamonds1$, Equal Radius, 2D, Euclidean

Total distance: 43.5540318496497 Total demand met: 20 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 10.8885098256461 Demand Met: 5			
97.8922525972581	96.6652019147687	99	95
96.4139714912512	96.4144560845457	95	95
96.4139714912512	96.4144560845457	97	95
96.664727458942	97.8915397434924	95	97
96.664727458942	97.8915397434924	95	99
Route: 2 Length: 10.8885078712709 Demand Met: 5			
97.891727741741	103.33514635859	97	105
97.891727741741	103.33514635859	99	105
96.4143874844883	103.585958330613	95	105
96.5445773881098	102.817674415833	95	103
96.6647359407115	102.108445922494	95	101
Route: 3 Length: 10.888509426459 Demand Met: 5			
102.108507483296	103.335303958	101	105
102.85532268352	103.461953328682	103	105
103.585786159228	103.585786159228	105	105
103.461953328618	102.855322683142	105	103
103.335303958	102.108507483295	105	101
Route: 4 Length: 10.8885047262736 Demand Met: 5			
102.10849949216	96.6647021868751	103	95
102.10849949216	96.6647021868751	101	95
103.585788457124	96.4142188151787	105	95
103.47367454543	97.0755425545637	105	97
103.335341987775	97.891433074641	105	99

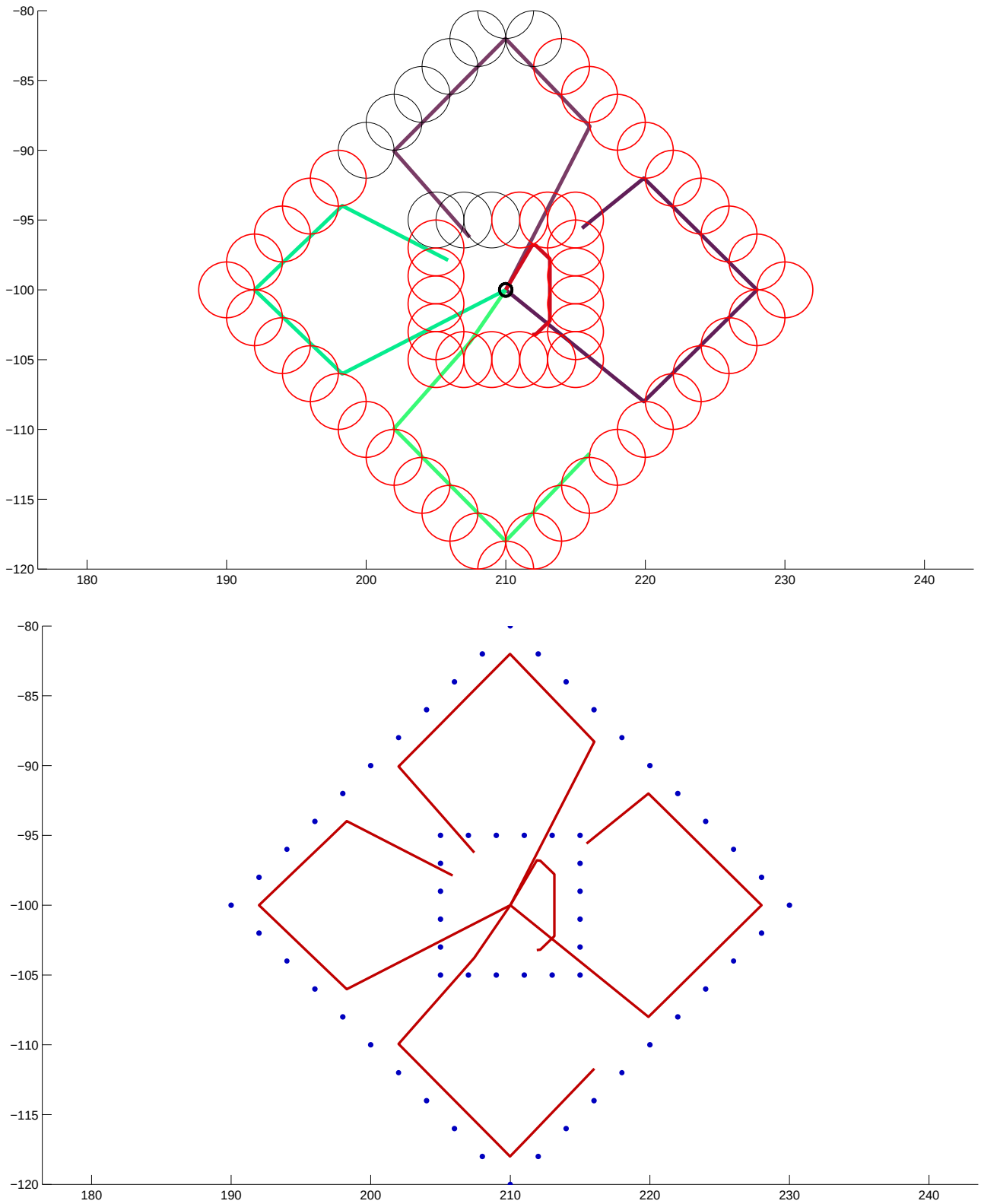


Figure O.44: $rotatingDiamonds2$, Equal Radius, 2D, Euclidean, Length = 199.2152797

Table O-47: Solution for *rotatingDiamonds*2, Equal Radius, 2D, Euclidean

Total distance: 199.215279694603 Total demand met: 60 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 48.2325583895998 Demand Met: 13			
105.459059267786	104.413107955809	105	105
109.899212616993	108.002538641094	110	110
111.042816729033	106.872791915629	112	108
112.97569716073	104.963337624746	114	106
114.98413803742	102.979240903877	116	104
116.852066804609	101.133952150251	118	102
117.999997325644	99.9999390345896	120	100
116.844848207467	98.8586445288817	118	98
114.979808326183	97.0159705339822	116	96
112.962683533666	95.0230406566701	114	94
111.00626409558	93.0900891227036	112	92
109.900433195288	91.9975223839601	110	90
105.461977903816	95.5851118916813	105	95
Route: 2 Length: 46.0130723487717 Demand Met: 13			
106.021010909887	88.2891865010335	108	88
104.817992853802	87.0357998427144	106	86
102.94999966478	85.089667193602	104	84
101.102001617674	83.164406803054	102	82
99.984248229872	81.9999477264887	100	80
98.8699808329531	83.1245639170286	98	82
97.0171983005912	84.9945139387273	96	84
95.0348976328297	86.9952668345509	94	86
93.1832924974128	88.8641870822873	92	88
91.9991235834309	90.0593649932367	90	90
95.3311264148425	93.8499234800382	95	95
96.4450234567298	95.1171160186148	97	95
97.4203309434432	96.2266435551563	99	95
Route: 3 Length: 46.0130784251283 Demand Met: 13			
97.4204966145242	103.773146138263	99	105
96.4772437950901	104.84616212534	97	105
95.3750919559221	106.099938394192	95	105
91.99911582996	109.940357564236	90	110
93.159870750405	111.111963254009	92	112
95.0186058207311	112.988081997004	94	114
96.9996387915978	114.98763350371	96	116
98.852168817241	116.857465063222	98	118
99.9841874506666	118.000056366033	100	120
101.104749802016	116.832671291321	102	118
102.940701721281	114.919993861389	104	116
104.796195365296	112.986941563116	106	114
106.020991754935	111.710952985118	108	112
Route: 4 Length: 43.7493419720911 Demand Met: 13			
95.8886879330236	102.113171417136	95	101
94.1978250977703	102.982241622869	95	103
88.2865908318861	106.020636096267	88	108
86.9719627624785	104.76163705442	86	106
85.0586402801562	102.929306389358	84	104
83.2298845685665	101.177940384871	82	102
82.0000033065117	100.000079877603	80	100
83.2513267158692	98.8018768797226	82	98
85.0797156673452	97.0511311519632	84	96
86.9932557018218	95.2188756674691	86	94
88.2879438055948	93.9791673154723	88	92
94.1608678548946	96.9983275031992	95	97
95.8715746405228	97.8777270226693	95	99
Route: 5 Length: 15.2072285590119 Demand Met: 8			
101.900601935933	96.7857639534179	101	95
102.153798244817	96.812172757927	103	95
103.159114372767	97.7817750798017	105	97
103.159037611515	99.0622378458859	105	99
103.15886725115	100.940895624849	105	101
103.158763798492	102.219050818824	105	103
102.155262550849	103.187142926565	103	105
101.899551171095	103.213708004618	101	105

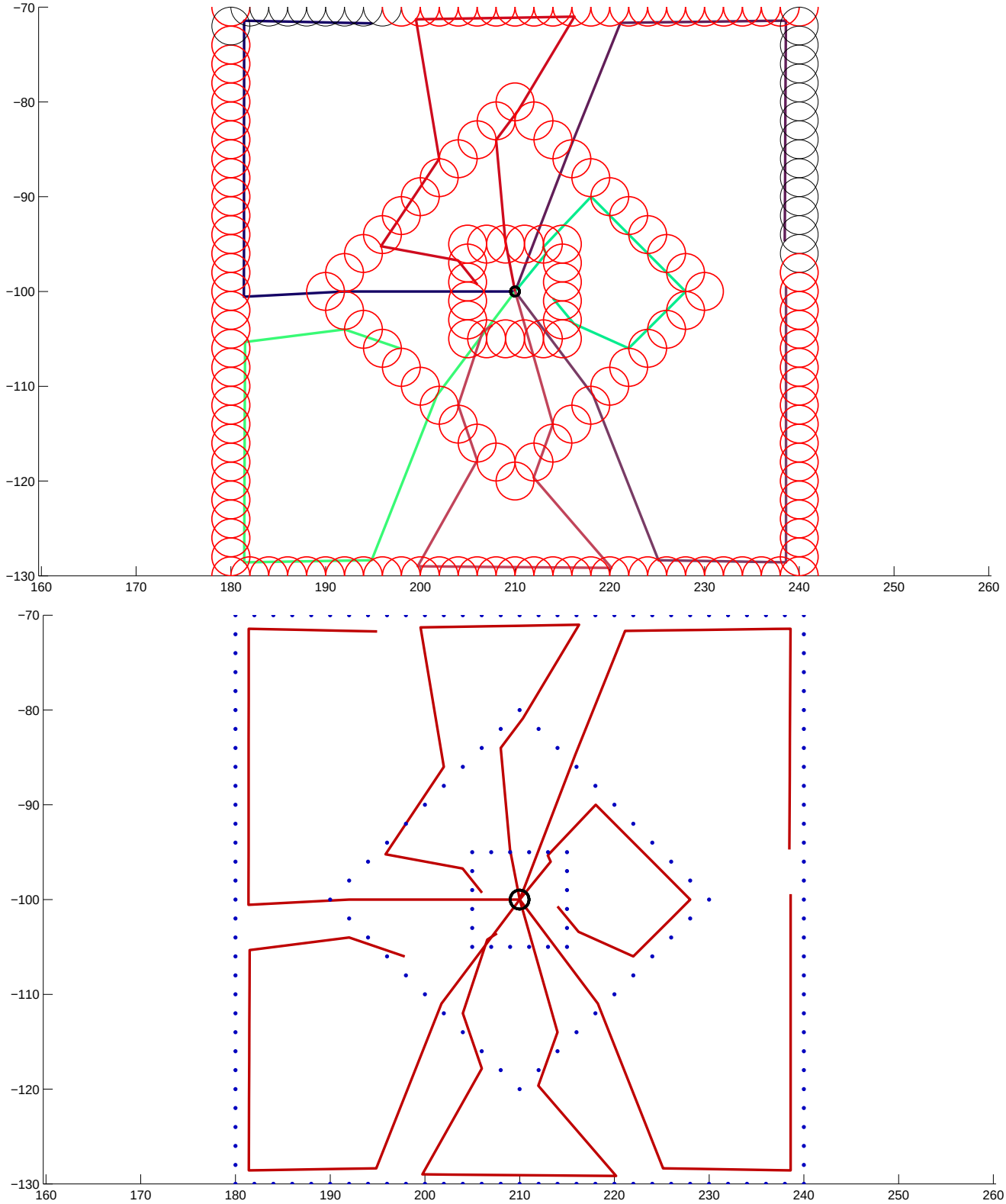


Figure O.45: $rotatingDiamonds3$, Equal Radius, 2D, Euclidean, Length = 632.5342941

Table O-48: Solution for *rotatingDiamonds*3, Equal Radius, 2D, Euclidean

Total distance: 632.534294081259			
Total demand met: 180			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 103.362231366673 Demand Met: 27			
81.9998416389627	100.000000565515	80	100
81.9998416389627	100.000000565515	82	98
71.3777432144572	100.550230636272	70	102
71.3788766322161	98.9759863176988	70	98
71.3788766322161	98.9759863176988	70	100
71.3818095637718	94.99459880147	70	94
71.3818095637718	94.99459880147	70	96
71.384728382718	90.9982951351004	70	90
71.384728382718	90.9982951351004	70	92
71.3876507280696	86.9996362302441	70	86
71.3876507280696	86.9996362302441	70	88
71.3906397354548	82.9985370064306	70	82
71.3906397354548	82.9985370064306	70	84
71.3936674700992	78.9984746033626	70	78
71.3936674700992	78.9984746033626	70	80
71.3966512590994	75.0050539098945	70	74
71.3966512590994	75.0050539098945	70	76
71.3993012762878	71.4289723491755	70	70
71.3993012762878	71.4289723491755	70	72
72.9943986973665	71.4613411716925	72	70
72.9943986973665	71.4613411716925	74	70
76.9928424716173	71.5423829033022	76	70
76.9928424716173	71.5423829033022	78	70
80.9926146147924	71.6235268453841	80	70
80.9926146147924	71.6235268453841	82	70
84.9525546763686	71.7037793415897	84	70
84.9525546763686	71.7037793415897	86	70
Route: 2 Length: 100.169619919664 Demand Met: 26			
105.861181370629	84.7320638091317	104	84
105.861181370629	84.7320638091317	106	86
111.130201771979	71.6500520253381	112	70
111.130201771979	71.6500520253381	110	70
115.002053587803	71.5989428362542	116	70
115.002053587803	71.5989428362542	114	70
119.003322851548	71.5461481302275	120	70
119.003322851548	71.5461481302275	118	70
123.005738075563	71.4933613735848	124	70
123.005738075563	71.4933613735848	122	70
126.986896762729	71.4408762621434	128	70
126.986896762729	71.4408762621434	126	70
128.591304171639	71.4197231001883	130	70
128.591304171639	71.4197231001883	130	72
128.572051661549	74.995983104725	130	74
128.572051661549	74.995983104725	130	76
128.55050308416	78.9958899591441	130	78
128.55050308416	78.9958899591441	130	80
128.528928170949	82.9976439813976	130	82
128.528928170949	82.9976439813976	130	84
128.507343915349	86.998388100944	130	86
128.507343915349	86.998388100944	130	88
128.485767638494	90.9956120288389	130	90
128.485767638494	90.9956120288389	130	92
128.465670294954	94.7170826469761	130	94
128.465670294954	94.7170826469761	130	96
Route: 3 Length: 103.639165091549 Demand Met: 27			
108.255420842289	110.977991839602	108	112
108.255420842289	110.977991839602	110	110
115.137759951715	128.355143708405	116	130
115.137759951715	128.355143708405	114	130
119.001658093026	128.4180672835	120	130
119.001658093026	128.4180672835	118	130
123.006813167326	128.483307703843	124	130
123.006813167326	128.483307703843	122	130
127.001017757311	128.548275760826	128	130
127.001017757311	128.548275760826	126	130
128.597397173599	128.574249872296	130	130
128.597397173599	128.574249872296	130	128
128.597763771183	124.996030582315	130	126
128.597763771183	124.996030582315	130	124
128.598152893351	121.000534004769	130	122
128.598152893351	121.000534004769	130	120
128.59853824031	117.002475837869	130	118
128.59853824031	117.002475837869	130	116
128.598890533024	113.001390946443	130	114
128.598890533024	113.001390946443	130	112
128.599188464831	109.000590613507	130	110
128.599188464831	109.000590613507	130	108
128.599482951411	105.005003912184	130	106
128.599482951411	105.005003912184	130	104
128.599716774458	102.037703378888	130	102
128.599926990903	99.4282297248797	130	98
128.599926990903	99.4282297248797	130	100
Route: 4 Length: 99.4595203759361 Demand Met: 27			
91.7445733550038	110.977990801572	90	110
84.8623181675512	128.355103915061	84	130
84.8623181675512	128.355103915061	86	130
80.9968672970569	128.418885130358	80	130
80.9968672970569	128.418885130358	82	130
76.9931021748971	128.484923074921	76	130
76.9931021748971	128.484923074921	78	130
73.0125655136766	128.550464943791	72	130
73.0125655136766	128.550464943791	74	130
71.4053541597278	128.576981151838	70	130
71.4053541597278	128.576981151838	70	128
71.4195283862416	125.001980304654	70	126
71.4195283862416	125.001980304654	70	124
71.4353829227124	120.998896717751	70	122
71.4353829227124	120.998896717751	70	120
71.451241573115	116.998603950004	70	118
71.451241573115	116.998603950004	70	116
71.4671678031931	112.997918383625	70	114
71.4671678031931	112.997918383625	70	112
71.4830595843028	108.999390800916	70	110
71.4830595843028	108.999390800916	70	108
71.4975760700889	105.32561978748	70	106
71.4975760700889	105.32561978748	70	104
82.0000004045009	104.00000044085	82	102
82.0000004045009	104.00000044085	84	104
87.8694794413509	106.004262828015	86	106
87.8694794413509	106.004262828015	88	108
Route: 5 Length: 49.7318669508088 Demand Met: 19			
103.267939780153	96.0000006524585	105	95
103.267939780153	96.0000006524585	105	97
102.971546696023	95.3362497840106	103	95
102.971546696023	95.3362497840106	101	95
108.026306436374	89.9998445817141	108	88
108.026306436374	89.9998445817141	110	90
110.975828823269	92.9546663860874	112	92
114.007581321429	95.9918411376649	116	96
114.007581321429	95.9918411376649	114	94
117.999975871906	99.9983523392356	120	100
117.999975871906	99.9983523392356	118	98
116.002365791149	102.002436178085	118	102
116.002365791149	102.002436178085	116	104
111.999986094913	105.999979102438	114	106
111.999986094913	105.999979102438	112	108
106.210508994851	103.407915897849	105	105
106.210508994851	103.407915897849	105	103
103.989543050333	100.725990878348	105	99
103.989543050333	100.725990878348	105	101
Route: 6 Length: 89.9032660293386 Demand Met: 27			
98.9801521646016	94.7189356720737	97	95
98.9801521646016	94.7189356720737	99	95
98.0000020810639	84.0000012905768	98	82
98.0000020810639	84.0000012905768	96	84
100.340521128136	80.8836977804343	100	80
100.340521128136	80.8836977804343	102	82
106.268020551704	71.0001275414162	108	70
106.268020551704	71.0001275414162	106	70
103.031522569661	71.0541898592973	104	70
103.031522569661	71.0541898592973	102	70
100.01230078902	71.1046608728722	100	70
96.9986130996329	71.1550309560173	96	70
96.9986130996329	71.1550309560173	98	70
93.0090237876695	71.2216711832937	92	70
93.0090237876695	71.2216711832937	94	70
89.537151544137	71.2795198270562	88	70
89.537151544137	71.2795198270562	90	70
91.9999979729506	85.9999994601549	94	86
91.9999979729506	85.9999994601549	92	88
88.8100481720035	90.7767734095268	88	92
88.8100481720035	90.7767734095268	90	90

Solution x	Solution y	Original x	Original y
85.8420720480958	95.2210408424009	84	96
85.8420720480958	95.2210408424009	86	94
93.9728422406227	96.71608741602	95	95
93.9728422406227	96.71608741602	95	97
96.0242411843354	99.2821700215288	95	99
96.0242411843354	99.2821700215288	95	101
Route: 7 Length: 86.2686243472905 Demand Met: 27			
101.511516772091	105.290053590416	103	105
101.511516772091	105.290053590416	101	105
103.999996822831	113.999997115185	104	116
103.999996822831	113.999997115185	106	114
101.966657374821	119.636308982384	100	120
101.966657374821	119.636308982384	102	118
110.184931339378	129.160035751884	112	130
110.184931339378	129.160035751884	110	130
107.01216329609	129.134691427482	108	130
107.01216329609	129.134691427482	106	130
103.042666975987	129.103009757872	104	130
103.042666975987	129.103009757872	102	130
100.053769800079	129.079152937891	100	130
96.9936061366809	129.054717659901	96	130
96.9936061366809	129.054717659901	98	130
92.9987656227296	129.02278901255	92	130
92.9987656227296	129.02278901255	94	130
89.7301386698271	128.996688580955	88	130
89.7301386698271	128.996688580955	90	130
96.008054006914	117.820661347002	98	118
96.008054006914	117.820661347002	96	116
94.0000027423474	112.000321418512	94	114
94.0000027423474	112.000321418512	92	112
96.5798115002914	104.226460063723	95	105
96.5798115002914	104.226460063723	95	103
97.6006543029164	103.571071109755	97	105
97.6006543029164	103.571071109755	99	105

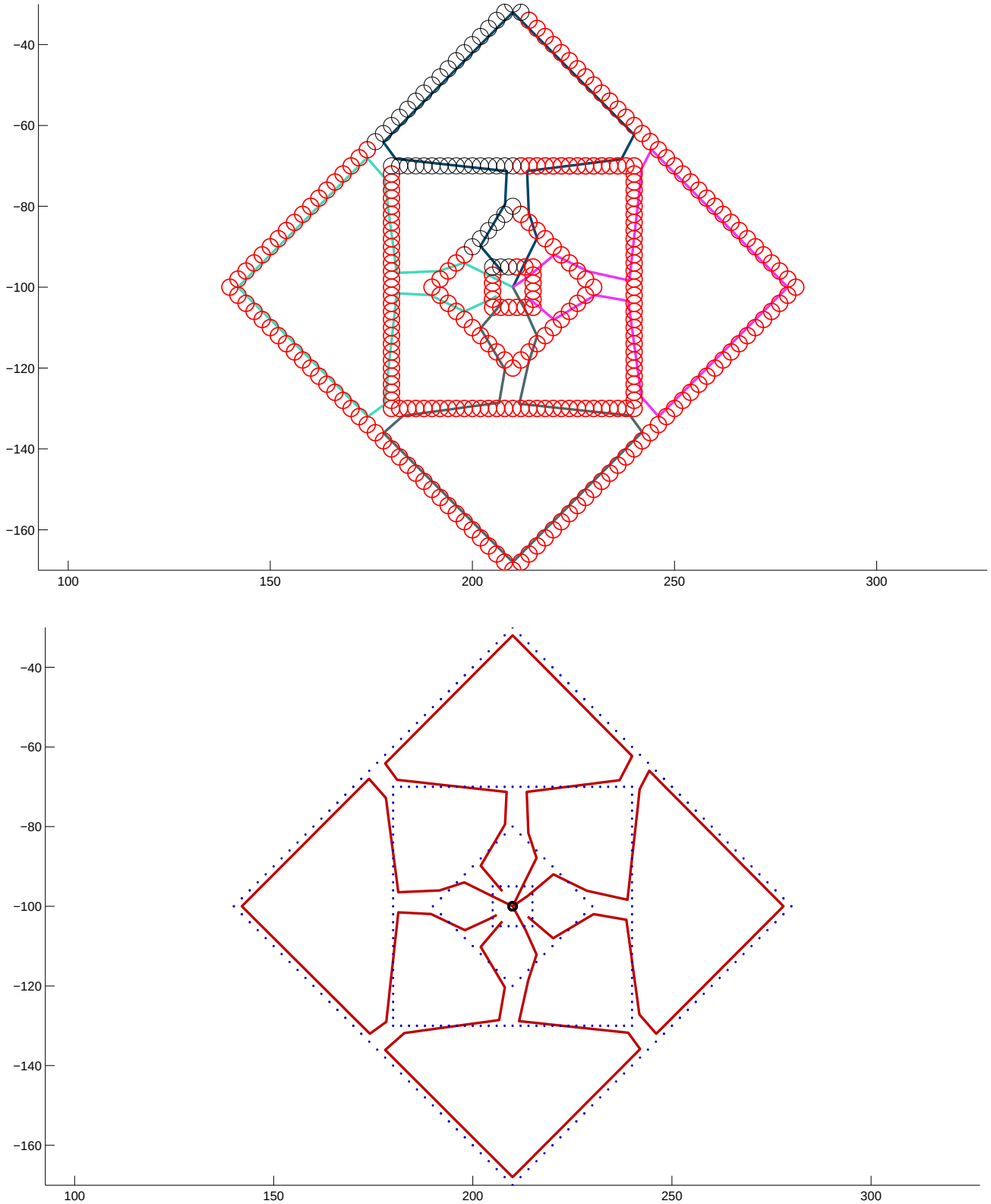


Figure O.46: $rotatingDiamonds4$, Equal Radius, 2D, Euclidean, Length = 870.0369334

Table O-49: Solution for *rotatingDiamonds*4, Equal Radius, 2D, Euclidean

Total distance: 870.036933360009			
Total demand met: 320			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 215.101253438582 Demand Met: 79			
95.2495372414203	97.6506509305828	95	97
95.2495372414203	97.6506509305828	95	99
87.8576051590293	93.9949353120411	88	92
84.9731470870664	94.9404726708188	84	96
84.9731470870664	94.9404726708188	86	94
81.6429841866594	96.0321134538991	82	98
71.2868634786931	96.4689791506619	70	98
71.1510812088774	95.4361524355592	70	96
70.8215218723657	92.9293678048624	70	92
70.8215218723657	92.9293678048624	70	94
70.3002034853527	88.9640139591453	70	88
70.3002034853527	88.9640139591453	70	90
69.7801606712232	85.0083764490434	70	84
69.7801606712232	85.0083764490434	70	86
69.2598333634576	81.0505702006954	70	80
69.2598333634576	81.0505702006954	70	82
68.7373221409719	77.0761185777015	70	76
68.7373221409719	77.0761185777015	70	78
68.376300107229	74.3299523117669	70	74
68.1786163052709	72.8261945638821	70	72
63.936461927453	67.9989991609779	64	66
62.6780339846593	69.2594669103018	62	68
59.9713646636766	71.9715120588069	58	72
59.9713646636766	71.9715120588069	60	70
55.9744611816226	75.9750806588574	54	76
55.9744611816226	75.9750806588574	56	74
51.9780629521308	79.9783364128974	50	80
51.9780629521308	79.9783364128974	52	78
47.9817725067617	83.9818359517201	46	84
47.9817725067617	83.9818359517201	48	82
43.9857118128104	87.9857844766736	42	88
43.9857118128104	87.9857844766736	44	86
41.0474575631582	90.9302191563732	40	90
38.9811304150153	93.0008990625081	38	92
36.9728820122079	95.0133713068395	36	94
34.9723796917217	97.0180776091468	34	96
33.0925669454894	98.9018453615061	32	98
32.0000073558122	99.996688515455	30	100
33.0914426523203	101.083274157457	32	102
34.980517432855	102.963972069345	34	104
36.9859949215105	104.96056045753	36	106
38.9965686397444	106.962225418306	38	108
41.0052691011999	108.96202503397	40	110
43.0132646026038	110.961118469163	42	112
45.0209952811068	112.959940510979	44	114
47.028354965861	114.958383595586	46	116
49.0352356609549	116.956340267547	48	118
51.041714454238	118.953888838339	50	120
53.0482079861214	120.951446249882	52	122
55.0560935961497	122.950385456806	54	124
57.0686536652584	124.953975003222	56	126
59.0889425808041	126.965256169258	58	128
61.1038988254595	128.971227169336	60	130
62.9828012831499	130.841752081543	62	132
64.1520300490077	132.00577381026	64	134
68.2692974997893	128.997643810791	70	130
68.4175278681724	127.652234958564	70	128
68.7181317557005	124.9239379781	70	126
68.7181317557005	124.9239379781	70	124
69.1574525878366	120.936616875571	70	122
69.1574525878366	120.936616875571	70	120
69.594677458074	116.968282948585	70	118
69.594677458074	116.968282948585	70	116
70.0315543634139	113.003123147701	70	114
70.0315543634139	113.003123147701	70	112
70.4687657189	109.034948583593	70	110
70.4687657189	109.034948583593	70	108
70.9042466774769	105.082477151673	70	106
70.9042466774769	105.082477151673	70	104
71.18059904956	102.574247732823	70	102
71.296433270763	101.522925996686	70	100
79.5090704482033	101.938821708394	80	100
82.6477419045597	103.437212987617	82	102
82.6477419045597	103.437212987617	84	104
86.1789673625471	105.123010219041	86	106
88.0160883226394	106.00005334149	88	108
94.1047154275125	103.211569020536	95	105
95.0137558194071	102.716354729872	95	103
96.0138339099226	102.171547548937	95	101
Route: 2 Length: 214.712967507328 Demand Met: 79			
102.056404555526	95.8418970730737	101	95
102.828870843816	94.2799503011924	103	95
106.005061215086	87.8576201540407	108	88
105.389394033553	85.979410985551	106	86
104.630892702571	83.6654584765303	104	84
103.967830396556	81.6426653087448	102	82
103.527610640953	71.2909131248211	102	70
104.364693454828	71.1856724827067	104	70
106.0709355405	70.9711576180635	106	70
108.030355190821	70.7248109168958	108	70
110.018004517669	70.474914126799	110	70
112.003799278181	70.2252500570491	112	70
113.986283554673	69.9760021494441	114	70
115.966890883566	69.7269905020898	116	70
117.950031251919	69.4776609344658	118	70
119.938955728237	69.227604995285	120	70
121.87290221051	68.9844626512471	122	70
123.738988614723	68.7498530602643	124	70
125.776796619983	68.4936488002676	126	70
126.85864372483	68.3576344649146	128	70
130.02239280594	62.2985376752264	132	62
128.896524098143	61.1623770935561	130	60
126.897626166112	59.1452159962391	128	58
124.882329031801	57.111513320844	126	56
122.886821550925	55.0977842792322	124	54
120.896441261641	53.0892314425259	122	52
118.906629264924	51.081254366694	120	50
116.916003995362	49.0724598397355	118	48
114.924144876344	47.0624249856396	116	46
112.931048552017	45.051147923845	114	44
110.936885363494	43.0388012312664	112	42
108.941675150092	41.0254042261237	110	40
106.944561983819	39.0100911816403	108	38
104.941738748283	36.9890178025271	106	36
102.927416572086	34.9563407156345	104	34
101.010991664469	33.0224565598596	102	32
99.9977738016115	32.0000103682219	100	30
98.9755248538077	33.0269839857658	98	32
97.050411726102	34.9610009321767	96	34
95.0331725538557	36.9875766324845	94	36
93.0297649615795	39.0002561583524	92	38
91.0315981987201	41.0076698856333	90	40
89.034207448599	43.0143050949279	88	42
87.0363131160314	45.0214499865894	86	44
85.0377759881463	47.0292471190042	84	46
83.0390196774085	49.0372726420172	82	48
81.0406693994657	51.0448984494017	80	50
79.0431616114911	53.0516844056994	78	52
77.0462831796791	55.0578421628483	76	54
75.0484216021026	57.0649894565313	74	56
73.0447895677925	59.0779345481571	72	58
71.0253310000615	61.1067808258263	70	60
69.0654936436979	63.0757363282501	68	62
67.9942265689609	64.151992519897	66	64
71.0021160373918	68.2691602832559	70	70
72.2311980669273	68.4046431359582	72	70
74.1275321509353	68.6136782577915	74	70
76.1026556350783	68.8313999849909	76	70
78.1008769925221	69.0516688014917	78	70
80.2087932615449	69.284030091903	80	70
83.0413318482937	69.5962680949356	82	70
83.0413318482937	69.5962680949356	84	70
86.9628767205711	70.0285480325792	86	70
86.9628767205711	70.0285480325792	88	70
89.7962324677594	70.3408767889772	90	70
91.9381079992571	70.5769828529504	92	70
93.9676219513984	70.8007028434208	94	70
95.9297334225545	71.0169917933389	96	70
97.6124991273077	71.2024859910068	98	70
98.4783471553724	71.2979297331713	100	70
98.0830914488009	79.4294652434325	100	80
96.8742953269153	81.4929800982989	98	82

Solution x	Solution y	Original x	Original y
94.8744658035085	84.906861300535	96	84
94.8744658035085	84.906861300535	94	86
92.8865386575425	88.3004219294497	92	88
91.9924852799666	89.8266390603535	90	90
95.5724136439456	94.0469340782902	95	95
96.5426301254907	95.190696532065	97	95
97.4098686288082	96.2130613277801	99	95
Route: 3 Length: 217.595366394693 Demand Met: 80			
102.149491874595	103.94531009672	101	105
102.707440988833	104.969412996492	103	105
103.20835914634	105.888838797501	105	105
106.002996289838	112.10964022198	108	112
105.423462275039	113.903077132147	106	114
104.686347403269	116.184181242849	104	116
103.929523963967	118.526271245091	102	118
101.698938573811	128.501517678261	102	130
101.62468166063	128.833613118338	100	130
103.978292165135	129.082865341477	104	130
106.17982675926	129.316013592596	106	130
109.055030559434	129.620505192604	110	130
109.055030559434	129.620505192604	108	130
113.007243957102	130.039052571251	114	130
113.007243957102	130.039052571251	112	130
116.977167969059	130.459474623564	118	130
116.977167969059	130.459474623564	116	130
120.951315515486	130.880343556681	122	130
120.951315515486	130.880343556681	120	130
124.943286239206	131.303102631402	126	130
124.943286239206	131.303102631402	124	130
127.715741200862	131.596716759172	128	130
129.001375529614	131.732860216464	130	130
132.005796635319	135.847648972548	134	136
130.826577517531	137.032158841653	132	138
128.923697222634	138.943586896136	130	140
126.92772481678	140.948521210446	128	142
124.93178896274	142.953415830049	126	144
122.937680286117	144.956473120958	124	146
120.943583607284	146.959516005456	122	148
118.948990272813	148.96305409093	120	150
116.954042584903	150.966942961768	118	152
114.959109693831	152.970810873281	116	154
112.964587504492	154.974260104708	114	156
110.970762025688	156.97700414596	112	158
108.977609661784	158.979067860994	110	160
106.984256506266	160.981330000426	108	162
104.987714546071	162.986792010403	106	164
102.986308285613	164.99713567595	104	166
101.07423577422	166.917741306486	102	168
99.9968079330182	167.999987032289	100	170
98.9278480846953	166.933086239453	98	168
97.0160040929109	165.024940956367	96	166
95.0057484934501	163.018573015283	94	164
93.0002517375466	161.016954311498	92	162
90.9983807571751	159.018954609839	90	160
88.9963166933414	157.020760879694	88	158
86.9925559814405	155.020868382316	86	156
84.9871994290888	153.019372411839	84	154
82.9813925639108	151.017412811549	82	152
80.9764198560656	149.016272360958	80	150
78.9729738125683	147.016646539888	78	148
76.970937595019	145.01842382846	76	146
74.9688758097264	143.02017519603	74	144
72.96159581734	141.016718943603	72	142
70.9389045058189	138.997879006518	70	140
69.0051064264481	137.067759302918	68	138
67.9990003976306	136.063581054112	66	136
72.8309398389337	131.819225471852	72	130
74.3087055914184	131.616757237588	74	130
77.0702765049688	131.238379478705	76	130
77.0702765049688	131.238379478705	78	130
81.045315012528	130.693742723414	80	130
81.045315012528	130.693742723414	82	130
85.0038987036168	130.151362910846	84	130
85.0038987036168	130.151362910846	86	130
88.9618850865488	129.609063712471	88	130
88.9618850865488	129.609063712471	90	130
92.924233432466	129.066163360175	92	130
92.924233432466	129.066163360175	94	130
95.57439875703	128.703051266645	96	130
96.6109653805706	128.561030697006	98	130

Solution x	Solution y	Original x	Original y
98.032885755777	120.361255954829	100	120
96.9078195684171	118.462695203503	98	118
94.9047630193665	115.082479298934	96	116
94.9047630193665	115.082479298934	94	114
92.9537829449862	111.790150671642	92	112
91.992887703232	110.168639084124	90	110
96.2754901172977	105.123333096489	97	105
97.4100593918805	103.78669469336	99	105
Route: 4 Length: 222.627346019406 Demand Met: 82			
103.79059481766	97.4070884216282	105	99
105.36143717614	96.0870558314388	105	95
105.36143717614	96.0870558314388	105	97
110.242468393286	91.9852629834616	110	90
112.782583393284	93.2305131323929	114	94
112.782583393284	93.2305131323929	112	92
116.344682731652	94.9767296642716	116	96
118.661737801751	96.1126319833544	118	98
128.499784525173	98.298543343385	130	98
128.836390988432	98.3733203090542	130	100
129.212531627164	94.9765633076239	130	94
129.212531627164	94.9765633076239	130	96
129.655206030921	90.978892739058	130	90
129.655206030921	90.978892739058	130	92
130.09584576723	86.9995961866788	130	86
130.09584576723	86.9995961866788	130	88
130.535931704876	83.0252799896318	130	82
130.535931704876	83.0252799896318	130	84
130.976452387274	79.0470058487358	130	78
130.976452387274	79.0470058487358	130	80
131.41919450027	75.0486683021418	130	74
131.41919450027	75.0486683021418	130	76
131.729964314978	72.2422018838525	130	72
131.914003060924	70.5802164607525	130	70
134.301366338889	65.9771804962104	134	64
135.213133290921	66.8974578564498	136	66
138.146466876675	69.8596695364671	140	70
138.146466876675	69.8596695364671	138	68
142.126159085341	73.8763053801026	144	74
142.126159085341	73.8763053801026	142	72
146.106440801619	77.8937686784045	148	78
146.106440801619	77.8937686784045	146	76
150.087431446748	81.9115550700901	152	82
150.087431446748	81.9115550700901	150	80
154.068564393746	85.9299899242026	156	86
154.068564393746	85.9299899242026	154	84
158.049584781634	89.9487343183494	160	90
158.049584781634	89.9487343183494	158	88
162.031175928759	93.9679619127704	164	94
162.031175928759	93.9679619127704	162	92
165.013683531087	96.981296793965	166	96
166.939837665143	98.9260070627772	168	98
167.999981214927	99.9963355476391	170	100
166.927405101598	101.071517531497	168	102
165.020396469739	102.983206602105	166	104
163.012670193663	104.995823366509	164	106
161.010493108556	107.002859832996	162	108
159.011538393613	109.006663849723	160	110
157.007753120446	111.015317192479	158	112
154.945213007051	113.082878994784	156	114
152.017765350687	116.017488013831	154	116
152.017765350687	116.017488013831	152	118
148.021712002954	120.021944902046	150	120
148.021712002954	120.021944902046	148	122
144.025245174341	124.025906999669	146	124
144.025245174341	124.025906999669	144	126
141.090630450654	126.96547540778	142	128
139.019482546995	129.040104257285	140	130
137.14522451557	130.917514079049	138	132
136.063575938541	132.000989324537	136	134
131.819256063896	127.169107331507	130	128
131.616592377375	125.68985430625	130	126
131.238208866657	122.928267010385	130	124
131.238208866657	122.928267010385	130	122
130.694064086646	118.956991773771	130	120
130.694064086646	118.956991773771	130	118
130.15185278558	114.999908906339	130	116
130.15185278558	114.999908906339	130	114
129.608938244053	111.03774714933	130	112
129.608938244053	111.03774714933	130	110
129.064895050431	107.067342483451	130	108

Solution x	Solution y	Original x	Original y
129.064895050431	107.067342483451	130	106
128.704905926446	104.440042806793	130	104
128.560892745885	103.388899931622	130	102
120.361280939141	101.967114664577	120	100
118.481986705848	103.080780122466	118	102
115.075290573157	105.09950823379	116	104
115.075290573157	105.09950823379	114	106
111.653570999086	107.127130481041	112	108
110.168637952032	108.00710653995	110	110
105.094417014202	103.699954714283	105	103
103.786703951753	102.589950522989	105	101

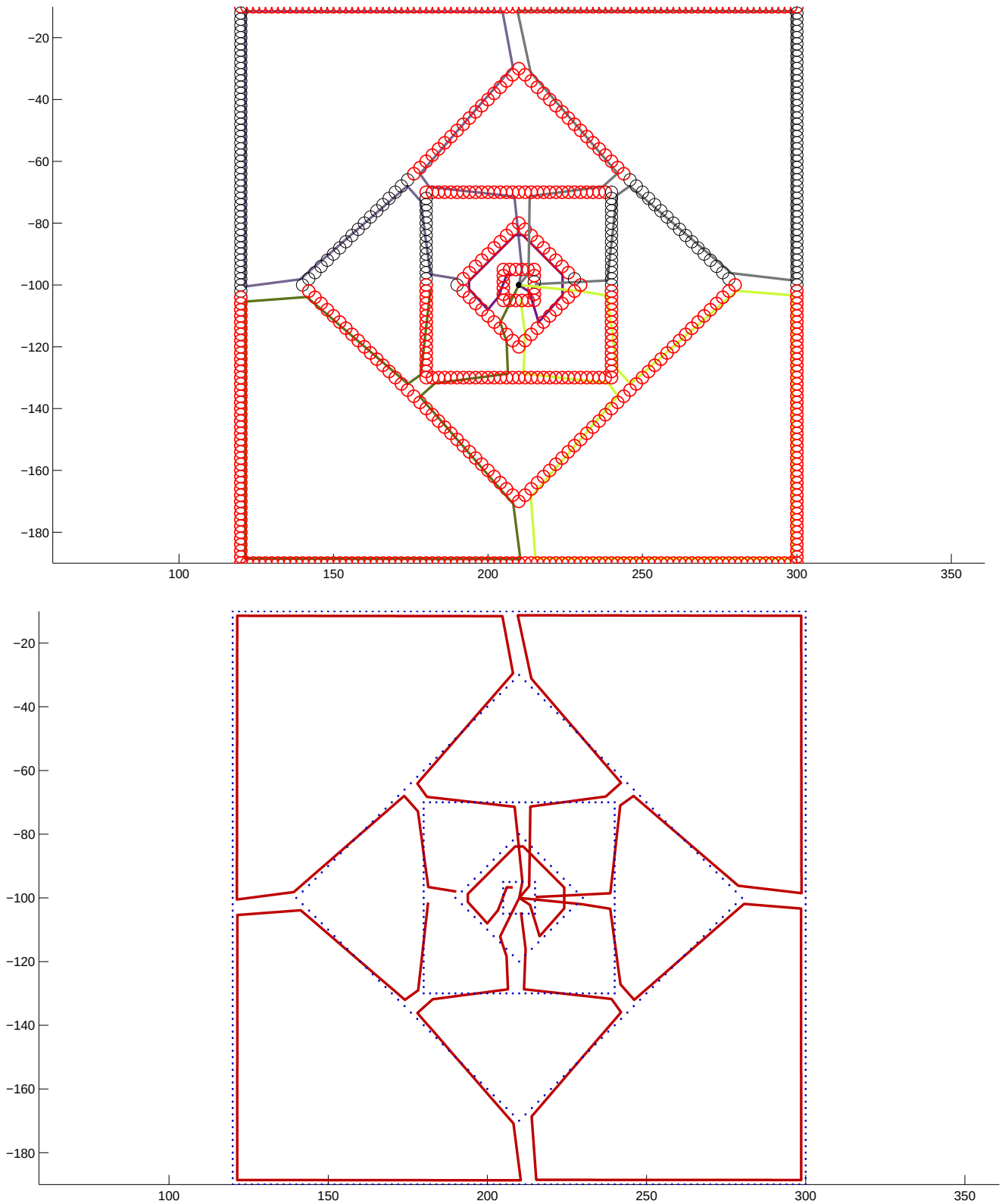


Figure O.47: $rotatingDiamonds5$, Equal Radius, 2D, Euclidean, Length = 1788.7227365

Table O-50: Solution for *rotatingDiamonds*5, Equal Radius, 2D, Euclidean

Total distance: 1788.72273651424 Total demand met: 680 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 421.450107500989 Demand Met: 160			
100.832250834442	95.7712502774051	101	95
101.002081573742	94.9084499301515	103	95
99.4709572843847	80.0601690228812	100	80
98.5784715992703	71.4068834408982	100	70
97.7098397776342	71.3081958227786	98	70
95.9220814950855	71.1050656789285	96	70
93.8311916211128	70.8674748651265	94	70
90.9518297268352	70.5402701136302	90	70
90.9518297268352	70.5402701136302	92	70
86.9923021780394	70.0902958004047	86	70
86.9923021780394	70.0902958004047	88	70
83.0247083933186	69.6393977449756	82	70
83.0247083933186	69.6393977449756	84	70
79.0623777691238	69.189092885129	78	70
79.0623777691238	69.189092885129	80	70
76.2155400236233	68.8655771287641	76	70
74.1441871017807	68.6302050810112	74	70
72.2465652764281	68.4145928219807	72	70
71.0107890935273	68.2742063408812	70	70
67.9979393956375	64.0910551070434	66	64
69.1038706937573	62.8180389118769	68	62
70.8832159360791	60.7698325484543	70	60
72.8001595372576	58.5632227789767	72	58
75.4955159583285	55.4605846065947	76	54
75.4955159583285	55.4605846065947	74	56
79.2082386474799	51.1869520295624	80	50
79.2082386474799	51.1869520295624	78	52
82.9198111561153	46.9146631403945	84	46
82.9198111561153	46.9146631403945	82	48
86.6323596712608	42.6412183618105	88	42
86.6323596712608	42.6412183618105	86	44
90.3470928915887	38.3652012724276	92	38
90.3470928915887	38.3652012724276	90	40
94.0705292791181	34.0791645584023	96	34
94.0705292791181	34.0791645584023	94	36
96.7665680570773	30.9757594119082	98	32
98.069992170718	29.4754764234447	100	30
94.7210499992155	11.5376424489987	96	10
93.6871945958473	11.5361238475385	94	10
91.9568068268465	11.5335537458381	92	10
89.8995737706574	11.5305137267409	90	10
86.9946475129124	11.5262107268959	86	10
86.9946475129124	11.5262107268959	88	10
82.9972364748802	11.5203381369015	82	10
82.9972364748802	11.5203381369015	84	10
80.0913545953415	11.5160579821666	80	10
78.0061828948008	11.5129960243964	78	10
75.999298341993	11.5100435053537	76	10
74.0008967282872	11.5070964117451	74	10
72.0022621280681	11.5041431325083	72	10
70.0027551815433	11.5011847343548	70	10
68.002671263572	11.4982237978108	68	10
66.0022778408928	11.4952626867371	66	10
64.0017343324911	11.492303298704	64	10
62.0011228056514	11.4893470877422	62	10
60.0004787814768	11.4863951461032	60	10
57.999811256319	11.4834482935363	58	10
55.9991151939818	11.4805071560747	56	10
53.9983810564274	11.4775722271508	54	10
51.9976063244425	11.474643909209	52	10
49.9968151852567	11.471722537565	50	10
47.9960927705363	11.4688083898369	48	10
45.9956243399264	11.4659016669071	46	10
43.995604994703	11.4630022730999	44	10
41.9950895736541	11.4601081428522	42	10
39.9838862676104	11.4572038990513	40	10
37.8877379058794	11.4541835383352	38	10
34.9962879828902	11.4500377346432	34	10
34.9962879828902	11.4500377346432	36	10
30.9978891968291	11.4443252947553	30	10
30.9978891968291	11.4443252947553	32	10
26.9979874428678	11.4385575286662	26	10
26.9979874428678	11.4385575286662	28	10
23.0001393294859	11.4327494605211	22	10
23.0001393294859	11.4327494605211	24	10
20.0954449101776	11.4285506430422	20	10
17.994193948028	11.4255059442433	18	10
15.972259148938	11.4225801527523	16	10
13.9844252042653	11.4197103157967	14	10
12.2594246978603	11.4172291806288	12	10
11.4124635046388	11.4159784880219	10	10
11.4108394747887	12.9782450474298	10	12
11.4108394747887	12.9782450474298	10	14
11.4077747732354	15.8927609738991	10	16
11.4054890429136	18.0930511919701	10	18
11.4024509282587	20.9998266445689	10	20
11.4024509282587	20.9998266445689	10	22
11.3994309177669	23.8926684201483	10	24
11.397132147713	26.0943683219257	10	26
11.3940838825487	29.0012146631363	10	28
11.3940838825487	29.0012146631363	10	30
11.3898621619001	32.9980883634479	10	32
11.3898621619001	32.9980883634479	10	34
11.3855980850223	36.9957478821099	10	36
11.3855980850223	36.9957478821099	10	38
11.382545917191	39.8809086969785	10	40
11.3803368417431	41.9844852548822	10	42
11.3782289142752	43.99777728589	10	44
11.376139033384	45.9986030978748	10	46
11.3740554325095	47.9985682194736	10	48
11.3719772981069	49.9989676755832	10	50
11.3699051185105	51.9996679201534	10	52
11.3678392382417	54.0004909216164	10	54
11.3657797801428	56.0013554987195	10	56
11.3637267346988	58.002242546037	10	58
11.3616800188152	60.0031514328435	10	60
11.3596394860862	62.0040594728523	10	62
11.3576048991511	64.0048736599744	10	64
11.355575862615	66.0053835947573	10	66
11.3535515869753	68.0053784159175	10	68
11.3515295149302	70.006000932519	10	70
11.3494967350189	72.0186758476851	10	72
11.3473748863746	74.1214626293038	10	74
11.3444811749069	77.0035864686455	10	76
11.3444811749069	77.0035864686455	10	78
11.3404771167088	80.9986685847063	10	80
11.3404771167088	80.9986685847063	10	82
11.3364295675928	84.9959872073268	10	84
11.3364295675928	84.9959872073268	10	86
11.3323599693521	88.9911351994386	10	88
11.3323599693521	88.9911351994386	10	90
11.3282897683422	92.9866689920478	10	92
11.3282897683422	92.9866689920478	10	94
11.3242375945533	96.9790291081088	10	96
11.3242375945533	96.9790291081088	10	98
11.3218519567529	99.3387757635808	10	100
11.3206737725548	100.498041718771	10	102
29.1796378898879	98.1759760613641	30	100
30.8762090190422	96.7000616340499	32	98
32.9894470607414	94.8617169301276	34	96
35.1212322779752	93.0072604827668	36	94
37.2509247935955	91.1546329045839	38	92
39.3784154025717	89.3039226804488	40	90
41.5137267888816	87.4464080109942	42	88
43.7375722251514	85.5118735460806	44	86
46.8277471205744	82.8236878396227	46	84
46.8277471205744	82.8236878396227	48	82
49.9184113672025	80.1350619408342	50	80
52.1539244879419	78.1903681096701	52	78
54.2960025241959	76.3269574629199	54	76
56.4263897149301	74.4737184798461	56	74
58.5580682248362	72.619357480441	58	72
60.6872985605676	70.7671260335464	60	70
62.704993189057	69.0119112481142	62	68
63.8728417588197	67.9959676640757	64	66
68.1834523766156	72.8367855105779	70	72
68.3769149072689	74.2530008951287	70	74
68.6400617644159	76.1790911933194	70	76
68.9225369762388	78.2465484475516	70	78
69.3079098081113	81.0669887335456	70	80
69.3079098081113	81.0669887335456	70	82
69.8470381928377	85.0125816274856	70	84

Solution x	Solution y	Original x	Original y
69.8470381928377	85.0125816274856	70	86
70.386932023614	88.9637832014278	70	88
70.386932023614	88.9637832014278	70	90
70.7808047568163	91.8464326884578	70	92
71.069860184663	93.962058244792	70	94
71.3112401083954	95.7288490364746	70	96
71.430562720237	96.6023038755391	70	98
80.2582596291829	98.0167344885915	80	100
Route: 2 Length: 421.688955473158 Demand Met: 160			
97.3956143238034	105.266140657342	97	105
93.9949430736772	112.142397106007	92	112
94.5760627387665	113.915157999122	94	114
95.2648669583282	116.016452762612	96	116
96.0321101831582	118.35704323968	98	118
96.4690216874004	128.713069978877	98	130
95.5247714596887	128.83712510483	96	130
92.933614655259	129.177564632858	92	130
92.933614655259	129.177564632858	94	130
88.9756069990697	129.697595267587	88	130
88.9756069990697	129.697595267587	90	130
85.0097522373221	130.218654366428	84	130
85.0097522373221	130.218654366428	86	130
81.0424726010137	130.739900990858	80	130
81.0424726010137	130.739900990858	82	130
77.0611827069651	131.262999168088	76	130
77.0611827069651	131.262999168088	78	130
74.296193558938	131.626294952407	74	130
72.8322630920587	131.818629125366	72	130
67.9959819225529	136.127022706995	66	136
68.9982484145527	137.279164470211	68	138
70.759795881141	139.304137265043	70	140
72.6881620454343	141.520880145224	72	142
75.395813151612	144.63345169298	76	146
75.395813151612	144.63345169298	74	144
79.1083175635518	148.901136953006	80	150
79.1083175635518	148.901136953006	78	148
82.8217496804229	153.169890764557	84	154
82.8217496804229	153.169890764557	82	152
86.5377663356065	157.441622788108	88	158
86.5377663356065	157.441622788108	86	156
90.2587879440721	161.719123511104	92	162
90.2587879440721	161.719123511104	90	160
92.9536565669542	164.817021463499	94	164
94.8535442871887	167.001034175466	96	166
96.7052667507177	169.12968563489	98	168
98.1759461272777	170.820319802289	100	170
100.498164584165	188.679165461314	102	190
99.6455505590938	188.6782901802	100	190
97.962777019689	188.676606285447	98	190
95.9025872578921	188.674526904935	96	190
93.0021594679694	188.671602782663	92	190
93.0021594679694	188.671602782663	94	190
90.1045737668821	188.668656139584	90	190
87.8879731012091	188.666374923322	88	190
84.9919669744531	188.663409756923	84	190
84.9919669744531	188.663409756923	86	190
80.9997519235986	188.659326794439	80	190
80.9997519235986	188.659326794439	82	190
76.9998972941639	188.655218019602	76	190
76.9998972941639	188.655218019602	78	190
73.0002182058028	188.651100050116	72	190
73.0002182058028	188.651100050116	74	190
68.9997460922551	188.646976684069	68	190
68.9997460922551	188.646976684069	70	190
65.0046858901465	188.642856115937	64	190
65.0046858901465	188.642856115937	66	190
62.1174726218844	188.639869068023	62	190
60.016294921247	188.637692083715	60	190
58.0029359175212	188.635606498166	58	190
56.0021398215124	188.633534448462	56	190
54.002907892085	188.631464472103	54	190
52.0026953749822	188.629393917898	52	190
49.9909008393942	188.627311847927	50	190
47.8925903336283	188.625140711993	48	190
44.9960339346753	188.622142002845	44	190
44.9960339346753	188.622142002845	46	190
40.9999265238994	188.61799374006	40	190
40.9999265238994	188.61799374006	42	190
36.999388924381	188.613834510092	36	190
36.999388924381	188.613834510092	38	190

Solution x	Solution y	Original x	Original y
32.9996841875055	188.609668108795	32	190
32.9996841875055	188.609668108795	34	190
29.0001047336749	188.605490060803	28	190
29.0001047336749	188.605490060803	30	190
24.9999181862713	188.601294368388	24	190
24.9999181862713	188.601294368388	26	190
21.0026451795032	188.59708030579	20	190
21.0026451795032	188.59708030579	22	190
18.0948055631341	188.594004053444	18	190
15.9888309311077	188.591785458104	16	190
14.0001755130318	188.589675812759	14	190
12.2761157365258	188.587833970989	12	190
11.4154046020742	188.586942108985	10	190
11.4159130492192	187.723778239083	10	188
11.4168710936742	186.002773733482	10	186
11.4179869804763	184.025192489749	10	184
11.4191431526158	182.004757472818	10	182
11.4203566798009	179.90134662734	10	180
11.4220162116437	176.996153770368	10	178
11.4220162116437	176.996153770368	10	176
11.4243104698881	172.999296347677	10	174
11.4243104698881	172.999296347677	10	172
11.4266269985224	168.999614619548	10	170
11.4266269985224	168.999614619548	10	168
11.4289605713559	164.999836846663	10	166
11.4289605713559	164.999836846663	10	164
11.4313057462417	161.002516583698	10	162
11.4313057462417	161.002516583698	10	160
11.4330296035739	158.094289990688	10	158
11.4342739424418	156.004620229835	10	156
11.4354699711874	153.996020499221	10	154
11.4366600626875	151.996571384048	10	152
11.4378493855564	149.997336634581	10	150
11.4390381580447	147.997682638574	10	148
11.4402261001201	145.997857567613	10	146
11.4414129818976	143.998124763579	10	144
11.4425986837553	141.998669965434	10	142
11.4437836830937	139.99874597441	10	140
11.4449732898662	137.989475548104	10	138
11.4462095181035	135.900364488481	10	136
11.4479332513831	132.996798073556	10	134
11.4479332513831	132.996798073556	10	132
11.4503245096692	128.999383086899	10	130
11.4503245096692	128.999383086899	10	128
11.4527269687487	124.999446191473	10	126
11.4527269687487	124.999446191473	10	124
11.4551444153388	120.99972819345	10	122
11.4551444153388	120.99972819345	10	120
11.4575838522112	117.002867191725	10	118
11.4575838522112	117.002867191725	10	116
11.4593640843041	114.098818216992	10	114
11.46063539636	112.002605018024	10	112
11.4618705108419	109.980513993297	10	110
11.4630976743898	107.993534946154	10	108
11.4641952832331	106.239396367702	10	106
11.4647148814413	105.36186330097	10	104
31.3742469753295	103.899603526417	32	102
32.9474955170514	105.251162120672	34	104
35.0681657808167	107.072992480555	36	106
37.2725424748941	108.966731055957	38	108
40.3833663896818	111.639172404369	40	110
40.3833663896818	111.639172404369	42	112
44.6824182864892	115.332409195374	44	114
44.6824182864892	115.332409195374	46	116
48.9773163238137	119.022085264633	48	118
48.9773163238137	119.022085264633	50	120
53.2711416906802	122.710842626928	52	122
53.2711416906802	122.710842626928	54	124
57.5682314352804	126.402399913187	56	126
57.5682314352804	126.402399913187	58	128
60.6880141566474	129.082534527204	60	130
62.8206278250964	130.914623923878	62	132
64.0861715147489	132.001838357561	64	134
68.273977228862	128.989594316989	70	130
68.4195019531654	127.695529599493	70	128
68.7289527765173	124.944014127923	70	126
68.7289527765173	124.944014127923	70	124
69.1780473883369	120.950723264104	70	122
69.1780473883369	120.950723264104	70	120
69.6252339750675	116.974315782821	70	118

Solution x	Solution y	Original x	Original y
69.6252339750675	116.974315782821	70	116
70.0711133701491	113.009530742151	70	114
70.0711133701491	113.009530742151	70	112
70.5169169131782	109.045439499317	70	110
70.5169169131782	109.045439499317	70	108
70.9648201708893	105.062751216122	70	106
70.9648201708893	105.062751216122	70	104
71.260135021518	102.436737995785	70	102
71.3703318153583	101.456796652916	70	100
Route: 3 Length: 104.739259958448 Demand Met: 40			
103.40389625599	102.205217670595	105	101
103.772125659968	103.406019697876	105	103
104.146227149677	104.62596248338	103	105
104.523266550549	105.855478862893	105	105
106.421262212112	112.044840286186	106	114
107.377383046181	110.959073822664	108	112
109.021181910894	109.092359767352	110	110
110.876261713553	106.985682379861	112	108
112.723744472376	104.88760734055	114	106
114.130019095752	103.290580106366	116	104
114.151028232002	96.7624989703495	116	96
112.698801973441	95.310376102573	114	94
110.709113847386	93.3208497451467	112	92
108.70244588542	91.3143452386852	110	90
106.687826714487	89.2999773409646	108	88
104.67264311761	87.2851716742518	106	86
102.685574454306	85.2984618639184	104	84
101.234689407253	83.847807750348	102	82
98.7652786853295	83.8478206110991	98	82
97.3120744450537	85.3006760955038	96	84
95.3235632103865	87.2887035655308	94	86
93.3158151658848	89.2959094901714	92	88
91.3010290800312	91.3101997226226	90	90
89.2867723347419	93.3241344553114	88	92
87.2824174455949	95.328236528442	86	94
85.301700670423	97.3086656243943	84	96
83.8498908569537	98.7602608632183	82	98
83.864090525756	101.275251029509	82	102
85.2745632224159	102.832552944515	84	104
87.1579235284628	104.911963020339	86	106
88.9499600891472	106.890494850367	88	108
89.9553220117239	108.000473121179	90	110
93.2706244209665	103.99365248982	95	103
93.2739227020212	103.989668251301	95	105
94.3935112575616	101.093284290789	95	101
95.1097291205807	99.2404195774874	95	99
95.6936485630046	97.7298125378201	95	97
96.1042656534264	96.6675416414463	95	95
96.9817483551111	96.6960564731852	97	95
97.9946510558395	96.7289804633607	99	95
Route: 4 Length: 424.674783102428 Demand Met: 160			
103.126875351662	96.2989587270917	105	97
103.146422003732	94.9604653901369	105	95
103.494767894425	71.3288028225157	102	70
104.474754831565	71.1985707906211	104	70
106.166613275055	70.9736961246878	106	70
108.202351768721	70.7030890696367	108	70
111.052106067792	70.3242477647471	112	70
111.052106067792	70.3242477647471	110	70
114.993760840901	69.8002381038075	116	70
114.993760840901	69.8002381038075	114	70
118.955851059411	69.2735360502806	120	70
118.955851059411	69.2735360502806	118	70
122.939978336448	68.7438826710107	124	70
122.939978336448	68.7438826710107	122	70
125.716717955089	68.3747436448632	126	70
127.165994633329	68.1821753102849	128	70
132.004316052576	63.8684774305352	134	64
131.021273696142	62.7271319657238	132	62
129.272902710837	60.6971466542873	130	60
127.403538377688	58.526669934541	128	58
125.477677604085	56.2905867519628	126	56
122.799696674323	53.1812257271984	122	52
122.799696674323	53.1812257271984	124	54
119.111734996732	48.8992272489376	118	48
119.111734996732	48.8992272489376	120	50
116.440981231549	45.7982381088768	116	46
114.519315678756	43.5669841229475	114	44
112.669695994358	41.4193732921735	112	42
110.827514830782	39.2803856161571	110	40

Solution x	Solution y	Original x	Original y
108.985503581578	37.1415813174778	108	38
107.142473586325	35.0015912510821	106	36
105.304711156097	32.8677399867446	104	34
103.791489830256	31.1108391374402	102	32
99.5525778352989	11.2607673423947	98	10
100.331856475547	11.262232118651	100	10
102.001056272893	11.2649494170769	102	10
103.974315666939	11.2682609423188	104	10
105.99152790948	11.2716578427805	106	10
108.002460566738	11.2750674713385	108	10
110.019033435369	11.2785136137755	110	10
112.127457799452	11.2821292476551	112	10
114.998246963053	11.2869375930454	116	10
114.998246963053	11.2869375930454	114	10
117.889472606219	11.2918723938121	118	10
120.099067579563	11.2957150476078	120	10
123.002076921157	11.3006928575496	124	10
123.002076921157	11.3006928575496	122	10
126.992872867466	11.3074821472357	128	10
126.992872867466	11.3074821472357	126	10
129.885265131038	11.312457325363	130	10
131.985355411659	11.3161065446378	132	10
133.996473610258	11.3196013125347	134	10
135.996023715448	11.32307165417	136	10
137.994965117072	11.3265361300074	138	10
139.994386463744	11.3299963382003	140	10
141.994143078238	11.3334515848954	142	10
143.994078159699	11.3369011684659	144	10
145.994115630212	11.3403446794476	146	10
147.994226809864	11.3437820088647	148	10
149.99440298613	11.3472133224463	150	10
151.994638724131	11.3506390312994	152	10
153.994918333055	11.3540597528388	154	10
155.995197522691	11.3574762418887	156	10
157.99537035869	11.3608892564501	158	10
159.995219148637	11.3642993280806	160	10
161.994459370877	11.367706628905	162	10
163.993835518879	11.3711127513127	164	10
166.003564127015	11.374536155454	166	10
168.100764406851	11.3781175451388	168	10
170.998894308167	11.3831643048568	172	10
170.998894308167	11.3831643048568	170	10
173.897752135582	11.3882269764535	174	10
175.998655031152	11.391849226938	176	10
178.012632649594	11.3953270834928	178	10
180.01896205803	11.3988079418099	180	10
182.029670969419	11.4023101836632	182	10
184.041324591354	11.4058172927107	184	10
186.012115066428	11.4092381169518	186	10
187.707907980836	11.412228363737	188	10
188.585252145538	11.4137025668147	190	10
188.58606832375	12.2898986160384	190	12
188.587739767057	13.9857000138791	190	14
188.589532851853	15.9690241257025	190	16
188.591516775122	17.9790943770201	190	18
188.593536585477	19.9905429162977	190	20
188.595545238788	21.9973503578989	190	22
188.597533349394	24.0003010653281	190	24
188.599500629314	26.0006506144844	190	26
188.601450030878	28.0002769790691	190	28
188.603395287143	30.0099915952377	190	30
188.605422559134	32.1059330819618	190	32
188.608294654902	35.0009687381037	190	34
188.608294654902	35.0009687381037	190	36
188.612312413705	38.9969237237747	190	38
188.612312413705	38.9969237237747	190	40
188.615157783754	41.8976794245095	190	42
188.617187901245	43.9950887373054	190	44
188.619136949715	46.0057692852764	190	46
188.621081769756	48.0057011068198	190	48
188.623032015971	50.0052876032543	190	50
188.624987840824	52.0054855103775	190	52
188.626948458511	54.0061093201104	190	54
188.628913243493	56.0069703411561	190	56
188.630881762651	58.0079465555777	190	58
188.632853788997	60.0089501886721	190	60
188.634829568711	62.0100658326318	190	62
188.636811206357	64.0128282023801	190	64
188.638810522378	66.028509038489	190	66
188.6408994177	68.1320538546024	190	68

Solution x	Solution y	Original x	Original y
188.643716439823	71.0049564842603	190	70
188.643716439823	71.0049564842603	190	72
188.647550602233	75.0008550612468	190	74
188.647550602233	75.0008550612468	190	76
188.651391327783	78.9951365636646	190	78
188.651391327783	78.9951365636646	190	80
188.654098452673	81.8698759520024	190	82
188.656170543321	83.9762601351809	190	84
188.658143445143	85.9903759076107	190	86
188.660077881111	87.9916082478843	190	88
188.661981694885	89.9935884815286	190	90
188.663858151229	91.999548890584	190	92
188.665729143039	94.0060730097352	190	94
188.667717902055	95.993502196941	190	96
188.669287628917	97.6886795812776	190	98
188.670169776132	98.5061365691678	190	100
168.802262319549	96.1679400284828	168	98
167.116223431268	94.7236369118854	166	96
164.960506258874	92.8770980616638	164	94
162.761824682245	90.9938046882824	162	92
159.646394348413	88.3253522533884	160	90
159.646394348413	88.3253522533884	158	88
156.485473526281	85.6179402339802	156	86
154.166366905365	83.6315902786183	154	84
151.037110854034	80.9512599840887	152	82
151.037110854034	80.9512599840887	150	80
146.744730124792	77.2745313092806	148	78
146.744730124792	77.2745313092806	146	76
143.603126398311	74.5835567458175	144	74
141.365484597723	72.6668833563522	142	72
139.194169031883	70.8070090118536	140	70
137.143800497421	69.0507205661963	138	68
135.915099010473	67.9982105731638	136	66
131.725959378717	71.0105036256856	130	70
131.589195621244	72.2271726418185	130	72
131.375435807535	74.1281156155549	130	74
131.141761887864	76.2062156078614	130	76
130.821229322282	79.0563607629464	130	78
130.821229322282	79.0563607629464	130	80
130.375677189341	83.0179294007647	130	82
130.375677189341	83.0179294007647	130	84
129.929233923657	86.9875081546194	130	86
129.929233923657	86.9875081546194	130	88
129.48432931738	90.9430741159289	130	90
129.48432931738	90.9430741159289	130	92
129.162361037044	93.8057076858776	130	94
128.931263941386	95.8606392823382	130	96
128.740089260481	97.5608151607353	130	98
128.629665730594	98.5432083219775	130	100
118.041164958275	99.0818911187539	118	98
105.149906162727	99.7378557908215	105	99
Route: 5 Length: 416.169630479213 Demand Met: 160			
117.465365654347	101.754550323188	118	102
119.741623148837	101.983248658228	120	100
128.569533774723	103.397799674466	130	102
128.709063313017	104.419241155916	130	104
128.944752655896	106.144288631616	130	106
129.209474457565	108.081760209664	130	108
129.482606078149	110.080782909634	130	110
129.771659923171	112.196335559337	130	112
130.15314199842	114.9882107342	130	116
130.15314199842	114.9882107342	130	114
130.53319313524	117.769644068673	130	118
130.819750172596	119.866982661458	130	120
131.091294514945	121.85447036746	130	122
131.359839935525	123.820007764151	130	124
131.621476077164	125.73494382104	130	126
131.8166231426	127.163359890652	130	128
136.125547397316	132.003920957928	136	134
137.255082456278	131.018283443023	138	132
139.301489833981	129.23263672279	140	130
141.442684590586	127.364268480479	142	128
143.575614805408	125.503107110407	144	126
145.701492045173	123.648100583897	146	124
147.826157422004	121.794153241118	148	122
149.951785864877	119.939366794658	150	120
152.078444541308	118.083681652938	152	118
154.20561532477	116.2275488587	154	116
156.33282584493	114.371379508118	156	114
158.459819144281	112.515396665029	158	112

Solution x	Solution y	Original x	Original y
160.586654787281	110.659547180662	160	110
162.713953169446	108.803288917537	162	108
164.843132552141	106.945385162547	164	106
166.974094759237	105.08592716977	166	104
169.072233246653	103.255131435825	168	102
170.625664018425	101.899642112853	170	100
188.529582496823	103.35572104024	190	102
188.530227273148	104.342134243135	190	104
188.53142070519	106.008476475603	190	106
188.532786468789	107.972773024985	190	108
188.534160803629	109.98938325192	190	110
188.53551464043	112.003030692277	190	112
188.536847655379	114.009298989632	190	114
188.538164808616	116.01106942063	190	116
188.539471376531	118.010871649893	190	118
188.540771635754	120.010078858057	190	120
188.542068715802	122.009272219307	190	122
188.543364817159	124.008637662857	190	124
188.544661466766	126.008201146604	190	126
188.545959720315	128.007937492664	190	128
188.547260305827	130.007812516238	190	130
188.548563721353	132.007796219208	190	132
188.549870299872	134.007865156579	190	134
188.551180251497	136.008001447968	190	136
188.552493690263	138.008191149768	190	138
188.553810650463	140.008422800627	190	140
188.5551310958	142.008686256092	190	142
188.556454923429	144.008971727054	190	144
188.557781964289	146.009268883937	190	146
188.559111980691	148.009565893115	190	148
188.560444661997	150.009848247985	190	150
188.561779619242	152.010097235675	190	152
188.563116379731	154.010287849631	190	154
188.564454382923	156.010385910148	190	156
188.565792979296	158.010344113374	190	158
188.567131434262	160.010096729717	190	160
188.568468939495	162.009552761906	190	162
188.569804633964	164.008587686133	190	164
188.571137636185	166.007034619392	190	166
188.572467087152	168.004677255004	190	168
188.573792199538	170.001249838749	190	170
188.575112302616	171.996455124717	190	172
188.576426864632	173.990022123257	190	174
188.577735467416	175.981846443312	190	176
188.579037705355	177.972296183347	190	178
188.580332970409	179.962832298629	190	180
188.581619907929	181.957046832565	190	182
188.582893693223	183.960252249894	190	184
188.584127187367	185.955343509621	190	186
188.585173149495	187.719108807274	190	188
188.585731338238	188.58579338058	190	190
187.719067064583	188.585279202645	188	190
185.955025282427	188.584321930171	186	190
183.959905800478	188.583189416181	184	190
181.956769177829	188.582017422264	182	190
179.962634814448	188.580831932032	180	190
177.972168537417	188.579637904038	178	190
175.981775200035	188.578436817657	176	190
173.989995661435	188.577229332721	174	190
171.996464110891	188.576015863765	172	190
170.001286654593	188.574796817251	170	190
168.004735447403	188.573572705554	168	190
166.007108566993	188.57234417936	166	190
164.008672423096	188.571112008608	164	190
162.009643872658	188.569877038683	162	190
160.010190260757	188.568640141144	160	190
158.010436487165	188.567402170174	158	190
156.010473846363	188.566163929576	156	190
154.010368308192	188.564926151087	154	190
152.010167404262	188.563689482671	152	190
150.009905600591	188.562454484561	150	190
148.009608347333	188.561221630798	148	190
146.00929510009	188.559991314212	146	190
144.008981606307	188.558763853224	144	190
142.008681715727	188.557539499123	142	190
140.008408947242	188.556318442774	140	190
138.008178007707	188.555100819689	138	190
136.008006452769	188.553886712318	136	190
134.007916641539	188.552676147884	134	190
132.007938057151	188.551469089357	132	190

Solution x	Solution y	Original x	Original y
130.008109750475	188.550265415873	130	190
128.00848186426	188.549064887215	128	190
126.009113161513	188.547867084845	126	190
124.01005695041	188.546671319475	124	190
122.011318759271	188.54547649304	122	190
120.01275533865	188.544280904296	120	190
118.013878590522	188.543082006431	118	190
116.013587731063	188.541876206232	116	190
114.010158158035	188.540659034214	114	190
112.002959069984	188.539426666678	112	190
110.00208679265	188.538182516102	110	190
108.070480118349	188.536966560534	108	190
106.432543067262	188.535943305388	106	190
105.361877279962	188.535283847973	104	190
103.899599751656	168.625792103084	102	168
105.254587554809	167.048576619805	104	166
107.066722381764	164.939212246192	106	164
108.904853989761	162.799577208803	108	162
110.749094216581	160.652817536479	110	160
112.65554326614	158.433633253388	112	158
115.334597722618	155.315088790812	114	156
115.334597722618	155.315088790812	116	154
119.022374438562	151.022338481794	118	152
119.022374438562	151.022338481794	120	150
122.709509492233	146.730334793814	122	148
122.709509492233	146.730334793814	124	146
125.382674422184	143.618642172154	126	144
127.2933836439	141.39449564234	128	142
129.146235426397	139.237701507	130	140
130.94457961119	137.144352841492	132	138
132.001840765971	135.913688106078	134	136
128.991278195847	131.727011459513	130	130
127.755457043643	131.590643850312	128	130
125.85754064204	131.381176012527	126	130
123.879253261624	131.162842222607	124	130
121.897102009945	130.944082683581	122	130
119.914516536565	130.725274506868	120	130
117.913381904561	130.504418020402	118	130
115.803257023921	130.271530372274	116	130
113.000885576203	129.962225578368	114	130
113.000885576203	129.962225578368	112	130
110.19146546881	129.652138677081	110	130
108.070050019013	129.41800070857	108	130
106.057414178862	129.195869347405	106	130
104.102219958939	128.980077497866	104	130
102.403170010693	128.792559539241	102	130
101.515240935015	128.694577518635	100	130
101.845454044311	120.136724669013	100	120
101.926299813824	118.041853979571	102	118
102.001801301872	116.085246685783	104	116
100.728758249305	105.855557236667	101	105
100.564155108528	104.533133683207	99	105

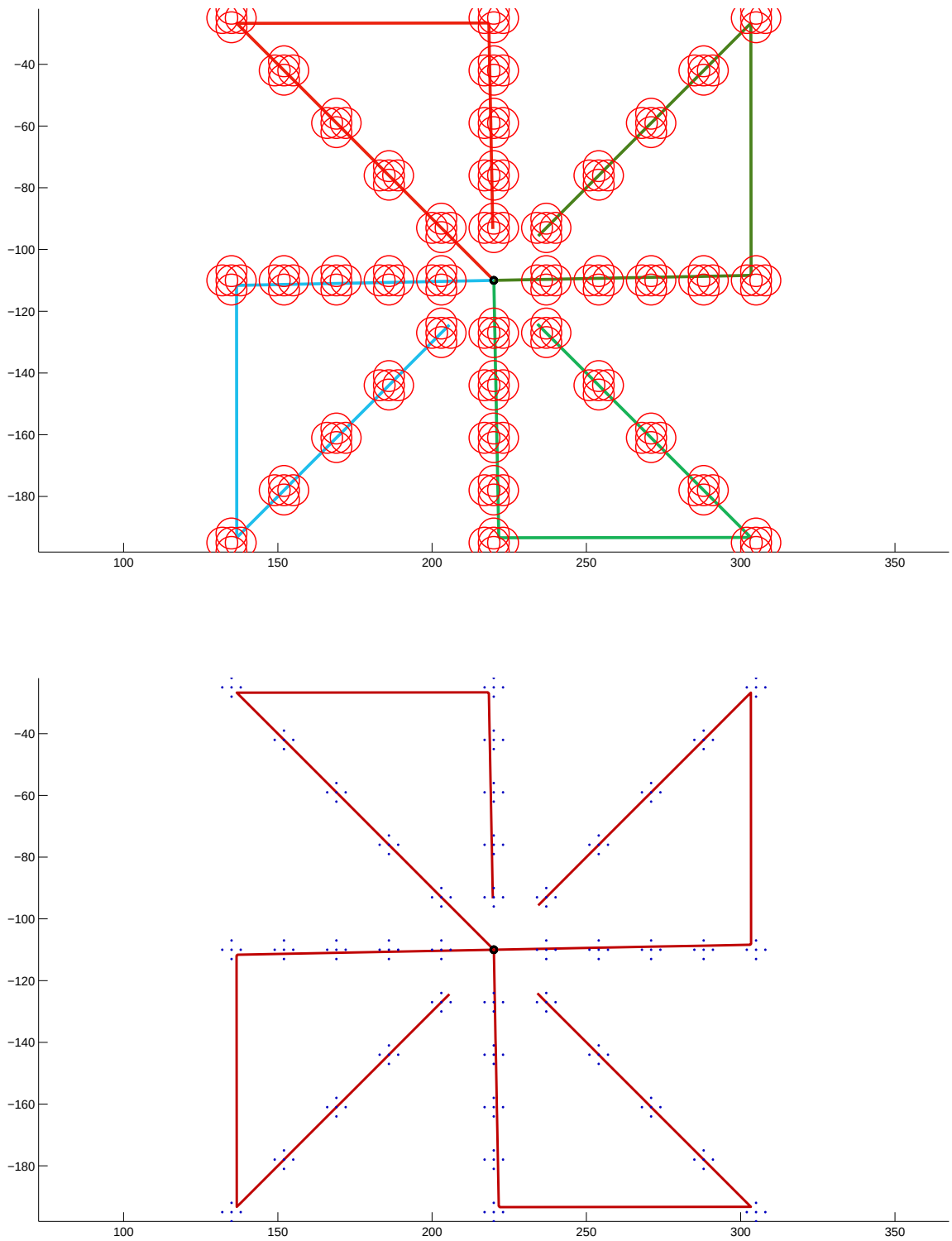


Figure O.48: *chaoSingleDep*, Equal Radius, 2D, Euclidean, Length = 1130.8193561

Table O-51: Solution for *chaoSingleDep*, Equal Radius, 2D, Euclidean

Total distance: 1130.81935610958 Total demand met: 1080 Depot: x 110 y 110			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 282.704879959282 Demand Met: 270			
95.5304294707271	95.5304673687999	96	93
92.5411556391248	92.5411962436948	93	90
92.5411556391248	92.5411962436948	90	93
92.5411556391248	92.5411962436948	93	93
92.5411556391248	92.5411962436948	93	96
78.5073314229932	78.5074013772017	79	76
75.5442965118271	75.5443655755627	76	73
75.5442965118271	75.5443655755627	73	76
75.5442965118271	75.5443655755627	76	76
75.5442965118271	75.5443655755627	76	79
61.5216836702881	61.521772398251	62	59
58.5432755957718	58.5433645297529	59	56
58.5432755957718	58.5433645297529	56	59
58.5432755957718	58.5433645297529	59	59
58.5432755957718	58.5433645297529	59	62
44.5001179273073	44.5002181887117	45	42
41.595974277092	41.5960751857605	42	39
41.595974277092	41.5960751857605	39	42
41.595974277092	41.5960751857605	42	42
41.595974277092	41.5960751857605	42	45
28.1242028285812	28.1241873833652	25	28
26.7015728861982	26.701561129025	22	25
26.7015842457523	26.7015599231316	25	22
26.7015842457523	26.7015599231316	25	25
28.8167337928359	26.6992420456913	28	25
104.559724094935	26.616373723692	107	25
108.070033711593	26.6125217472805	110	22
108.22691270815	26.7722422318962	110	25
108.391698216575	26.9400153094588	113	25
108.391698216575	26.9400153094588	110	28
108.640275078202	39.7695670699146	107	42
108.688494434909	42.2605127978742	110	39
108.688494434909	42.2605127978742	113	42
108.688494434909	42.2605127978742	110	42
108.688494434909	42.2605127978742	110	45
108.968953258058	56.7440865075422	107	59
109.018484258584	59.3024710103335	110	56
109.018484258584	59.3024710103335	113	59
109.018484258584	59.3024710103335	110	59
109.018484258584	59.3024710103335	110	62
109.300503872354	73.8689037259414	107	76
109.348196526188	76.3322726906595	110	73
109.348196526188	76.3322726906595	113	76
109.348196526188	76.3322726906595	110	76
109.348196526188	76.3322726906595	110	79
109.631530108747	90.9673017425172	107	93
109.677655982085	93.3496410574502	110	90
109.677655982085	93.3496410574502	113	93
109.677655982085	93.3496410574502	110	93
109.677655982085	93.3496410574502	110	96
Route: 2 Length: 282.704835805981 Demand Met: 270			
92.9937032958256	110.329295509166	90	110
92.9937032958256	110.329295509166	93	107
92.9937032958256	110.329295509166	93	113
92.9937032958256	110.329295509166	93	110
92.9937032958256	110.329295509166	96	110
76.0048754048293	110.658276283923	73	110
76.0048754048293	110.658276283923	76	107
76.0048754048293	110.658276283923	76	113
76.0048754048293	110.658276283923	76	110
76.0048754048293	110.658276283923	79	110
59.013259550374	110.987351727216	56	110
59.013259550374	110.987351727216	59	107
59.013259550374	110.987351727216	59	113
59.013259550374	110.987351727216	59	110
59.013259550374	110.987351727216	62	110
42.0284146869947	111.316373631202	39	110
42.0284146869947	111.316373631202	42	113
42.0284146869947	111.316373631202	42	107
42.0284146869947	111.316373631202	42	110
42.0284146869947	111.316373631202	45	110
26.9391577429396	111.60867086139	25	107
26.9391577429396	111.60867086139	28	110
26.6125190549275	111.929990902015	22	110
26.6125190549275	111.929990902015	25	110
26.6160358327707	115.145498209139	25	113
26.7015684660203	193.298393425341	22	195
26.7015684660203	193.298393425341	25	192
26.7015707882451	193.298411751723	25	198
26.7015707882451	193.298411751723	25	195
28.4094783777458	191.590511437634	28	195
41.5173849658034	178.48258860833	42	181
41.5173849658034	178.48258860833	39	178
41.5173849658034	178.48258860833	42	178
41.5173849658034	178.48258860833	42	175
44.6538709950625	175.346107923146	45	178
58.5913619721075	161.408595528725	59	164
58.5913619721075	161.408595528725	56	161
58.5913619721075	161.408595528725	59	161
58.5913619721075	161.408595528725	59	158
61.6140233784166	158.385939660268	62	161
75.5764242816904	144.423532402899	76	147
75.5764242816904	144.423532402899	73	144
75.5764242816904	144.423532402899	76	144
75.5764242816904	144.423532402899	76	141
78.5957637779416	141.404195617862	79	144
92.5683266671567	127.431638227424	93	130
92.5683266671567	127.431638227424	90	127
92.5683266671567	127.431638227424	93	127
92.5683266671567	127.431638227424	93	124
95.5922609840528	124.407711557254	96	127
Route: 3 Length: 282.704804529018 Demand Met: 270			
110.286009387415	124.774571322083	113	127
110.286009387415	124.774571322083	110	124
110.337745275025	127.445725926543	110	130
110.337745275025	127.445725926543	110	127
110.369513568407	129.085781157746	107	127
110.561317339637	138.992873753024	110	141
110.628398697488	142.456516924028	113	144
110.668579840973	144.530992133203	110	147
110.668579840973	144.530992133203	110	144
110.69643841478	145.969215512047	107	144
110.940025819617	158.547580446186	113	161
110.940025819617	158.547580446186	110	158
110.988192310802	161.03441320934	107	161
111.039342447454	163.675386351397	110	164
111.039342447454	163.675386351397	110	161
111.306536293264	177.470016101744	110	181
111.306536293264	177.470016101744	113	178
111.306536293264	177.470016101744	110	178
111.306536293264	177.470016101744	110	175
111.335748263963	178.978245684124	107	178
111.608749408169	193.06100018653	107	195
111.713786135936	193.167760745609	113	195
111.713786135936	193.167760745609	110	192
111.819398714763	193.275086015309	110	195
111.930031352588	193.387489880754	110	198
191.989665363073	193.299859717737	195	195
193.298402815638	193.298426456963	198	195
193.298397810902	193.298421900873	195	198
193.298397810902	193.298421900873	192	195
191.780478905485	191.780496433034	195	192
178.463550405762	178.463665677587	181	178
178.463550405762	178.463665677587	178	181
178.463550405762	178.463665677587	178	178
178.463550405762	178.463665677587	175	178
175.359221953181	175.359315149434	178	175
161.451929793316	161.45199120999	164	161
161.451929793316	161.45199120999	161	164
161.451929793316	161.45199120999	161	161
161.451929793316	161.45199120999	158	161
158.363413853847	158.363438443896	161	158
145.786927901617	145.786923418426	147	144
145.786927901617	145.786923418426	144	144
143.826764674525	143.826753508168	144	147
143.826764674525	143.826753508168	141	144
141.171743852645	141.171708390365	144	141
128.795779005235	128.795771816757	130	127
128.795779005235	128.795771816757	127	127
126.816803998385	126.816802434279	127	130
126.816803998385	126.816802434279	124	127
124.114509360138	124.11448840758	127	124

Solution x	Solution y	Original x	Original y
Route: 4 Length: 282.7048358153 Demand Met: 270			
124.864431124482	109.712420862857	127	107
124.864431124482	109.712420862857	124	110
127.434489572981	109.662640913787	130	110
127.434489572981	109.662640913787	127	110
129.00040467237	109.632307690199	127	113
143.512628143522	109.351559041937	147	110
143.512628143522	109.351559041937	144	107
143.512628143522	109.351559041937	144	110
143.512628143522	109.351559041937	141	110
145.497934203549	109.313109264142	144	113
160.452617112676	109.023690405511	164	110
160.452617112676	109.023690405511	161	107
160.452617112676	109.023690405511	161	110
160.452617112676	109.023690405511	158	110
162.227249711881	108.989325503392	161	113
177.351832194312	108.696331084341	181	110
177.351832194312	108.696331084341	178	107
177.351832194312	108.696331084341	178	110
177.351832194312	108.696331084341	175	110
179.031763733462	108.663815695095	178	113
189.822334791277	108.454692405817	192	110
193.05910601532	108.39205245673	195	113
193.27155576829	108.182932185611	195	110
193.388337512665	108.067946608287	198	110
193.384447010524	104.532326282779	195	107
193.299710496166	27.8702624537034	195	25
193.298435690007	26.7016060720747	198	25
193.298433257233	26.7015843953619	195	22
192.480753766981	27.5192849026233	192	25
191.333390531165	28.6666706404425	195	28
178.365987840114	41.6334754698771	181	42
178.365987840114	41.6334754698771	178	39
178.365987840114	41.6334754698771	178	42
178.365987840114	41.6334754698771	175	42
175.38961978407	44.6098691537902	178	45
161.410066766309	58.5894363425559	164	59
161.410066766309	58.5894363425559	161	56
161.410066766309	58.5894363425559	161	59
161.410066766309	58.5894363425559	158	59
158.447196735449	61.5523186382882	161	62
145.714491428088	74.2851146986959	147	76
145.714491428088	74.2851146986959	144	76
143.846566693045	76.1530506467348	144	73
143.846566693045	76.1530506467348	141	76
141.262312027751	78.7373163755506	144	79
127.42664614917	92.5731410703246	130	93
127.42664614917	92.5731410703246	127	90
127.42664614917	92.5731410703246	127	93
127.42664614917	92.5731410703246	124	93
124.389972951279	95.6098343148163	127	96

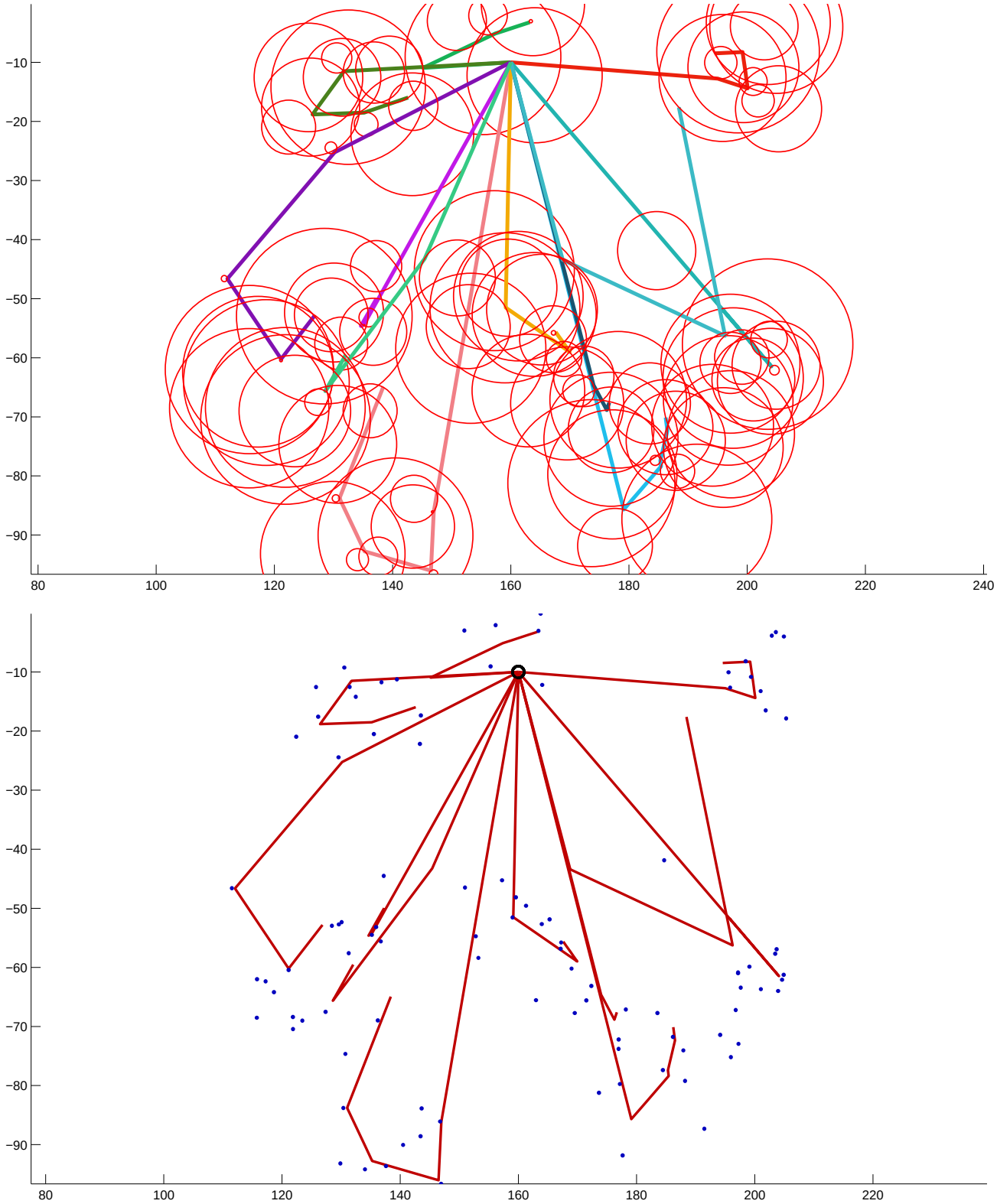


Figure O.49: *team*1_100, arbitrary radius, 2D, Euclidean, Length = 1419.2041059

Table O-52: Solution for *team*1_100, arbitrary radius, 2D, Euclidean

Total distance: 1419.20410585227 Total demand met: 543 Depot: x 50 y 10				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 85.9235666272479 Demand Met: 41				
85.0187134989463	12.7533026133399	85.554	10.061	2.745
90.0929591997567	14.4014741003556	91.857	16.502	2.743
89.9332140456782	13.2708521422462	95.317	17.864	7.295
89.6993816217903	11.615865481091	91.007	13.249	2.373
89.4239450835804	9.66641911960121	89.359	10.839	9.385
89.2261003137196	8.26614095484401	93.574	3.255	10.497
89.2259604130424	8.26515078930203	92.889	3.855	5.733
84.5887777804942	8.47023977677691	94.926	4.006	11.26
Route: 2 Length: 161.721385552029 Demand Met: 45				
69.1076617636162	85.6759202086922	67.643	91.829	6.325
71.530840036061	82.8833872190976	81.476	87.316	12.684
75.4340576721219	78.3852187239906	78.214	79.218	2.902
75.3059451485942	77.4245820585064	74.447	77.382	0.86
75.9587747224513	74.6569797960815	85.968	75.194	10.133
76.4975893494669	72.3727318758129	87.252	72.952	10.77
76.216507640484	70.1180462559011	84.146	71.427	10.315
76.2163839324925	70.1170539372362	77.919	74.057	8.389
76.2162602245064	70.1160616185705	76.154	71.763	8.051
76.2161365164966	70.1150692999078	86.785	67.217	10.959
Route: 3 Length: 42.0321931292543 Demand Met: 45				
35.1459032344179	10.9306136659016	22.494	14.202	13.068
41.4164055380457	7.95184020723266	40.868	2.981	5.001
47.3664429321741	5.12530293301325	53.754	0.148	8.742
47.3664429321741	5.12530293301325	46.154	2.083	3.275
48.828530646303	4.64890196216581	54.032	12.197	11.442
51.0225180871348	3.93402123909119	45.293	9.057	13.174
53.1949624714661	3.22616002972399	53.405	3.041	0.28
Route: 4 Length: 72.3010060155975 Demand Met: 45				
31.923603955942	10.9639293796508	26.839	11.732	5.19
21.7613992393296	11.5058320722271	20.541	9.26	2.556
21.1219230824505	12.3855900292011	21.459	12.53	6.577
19.4655852932355	14.6642932049063	15.772	12.549	9.192
17.8156015288131	16.9342548445866	16.123	17.568	8.298
16.4451065632997	18.8197103661451	12.414	20.962	4.565
23.6067725724032	18.5710653751666	33.341	22.178	10.381
25.1746638968563	18.5166299521381	25.542	20.506	2.023
32.6313012279155	15.9585408696142	29.447	11.243	5.69
Route: 5 Length: 122.46559663612 Demand Met: 45				
62.311031200379	58.0221638490227	62.352	63.144	5.122
64.002736443425	64.6210705563511	61.493	65.592	2.691
64.4255579865409	65.4189456684484	66.971	72.201	7.244
65.1787686576977	66.8402735531384	66.957	73.797	11.351
65.9821667052599	68.3563063050095	63.631	81.224	14.134
66.2478932673922	68.8577391539098	67.179	79.746	10.928
66.6580633784143	67.6061646506441	73.523	67.727	6.866
Route: 6 Length: 188.070860889758 Demand Met: 46				
43.8301935444465	45.9982566890152	43.243	58.404	12.71
37.4984453423855	82.9413734208956	33.626	83.869	3.982
36.9548695507946	86.112912588948	36.762	86.092	0.194
36.7260407934816	91.0548155083016	33.443	88.578	7.057
36.4953718061564	96.0364611176559	36.924	96.636	0.737
30.7931672582483	94.3771544964646	27.59	93.644	3.286
25.2643116749319	92.7682913647853	24.053	94.189	1.867
23.9433706292845	89.976610195685	30.503	90.056	13.109
22.3488244309583	86.6066909800737	19.881	93.181	12.244
21.0076497834884	83.7722480444846	20.393	83.793	0.615
28.4007703662213	64.9601434149719	26.213	68.977	4.574
Route: 7 Length: 135.562428020964 Demand Met: 46				
72.0790279527363	35.7823714270545	74.679	41.865	6.615
87.5340774756958	53.8297150583886	93.456	57.69	14.427
90.0378419705745	56.753438660748	94.894	61.262	7.46
90.0378419705745	56.753438660748	91.043	63.691	7.01
91.3024267930819	58.2301340562391	93.694	56.925	3.099
92.2613693310165	59.3499212117547	93.946	64.003	8.979
94.0882334753727	61.4832073763453	94.619	62.103	0.816
85.7137049959626	51.7040094351142	87.633	63.432	11.884
Route: 8 Length: 102.756818984044 Demand Met: 46				
31.3725985153815	43.2621264592955	27.219	44.51	4.337
26.5973753381068	51.7890314095459	25.923	53.185	1.603
25.1236993216943	54.4205095084216	25.201	54.507	0.116
24.6433876928142	54.6226801586104	21.299	57.593	4.473
25.6250125684899	52.8952122913995	19.619	52.734	6.234
25.6250125684899	52.8952122913995	20.103	52.347	8.385
27.2908959237903	49.9635832885338	26.732	55.612	5.676
Route: 9 Length: 105.047067791443 Demand Met: 46				
49.5429523553252	31.9256248474712	47.232	45.27	13.543
49.3527977492928	41.0477778779521	49.571	48.14	8.233
49.1348369168167	51.5038597167563	42.804	54.74	7.11
56.8978040213341	56.8704220654441	52.975	65.56	9.534
57.7882129018994	57.4859636945731	59.007	60.213	2.987
59.9627633982843	58.989235745269	68.193	67.124	11.572
59.4718727140886	58.2965596415885	59.534	67.732	9.572
58.7766354812549	57.31553834141	51.29	49.58	10.97
58.0781431553602	56.329923910399	57.142	56.857	5.652
57.5943647251502	55.6472836224864	57.243	55.792	0.38
Route: 10 Length: 133.761752968509 Demand Met: 46				
58.771944584349	43.4086609497831	53.958	52.681	10.486
58.7721985412807	43.4096281653107	55.281	51.871	9.377
58.7724524981633	43.4105953808512	49.02	51.541	12.697
86.2464738491881	56.2671217238836	89.091	59.886	4.603
86.1478367590369	55.7818346773658	87.18	60.86	5.182
84.8728423649422	49.4630999634203	87.173	60.998	11.762
79.1054156146446	20.8952507542548	85.841	12.653	10.749
78.440160858812	17.6000381103617	88.457	8.185	13.747
Route: 11 Length: 141.353425341752 Demand Met: 46				
34.7417854644892	17.7952132870254	33.5	17.352	4.16
20.188087128713	25.230498641753	19.569	24.449	0.997
2.04716247067883	46.6285297154964	1.527	46.599	0.521
4.94685210639584	50.9612837600132	7.235	62.367	12.76
8.03963082289802	55.5825540366698	18.45	52.954	14.862
11.1312843183595	60.2021430216372	11.123	60.442	0.24
13.9923095113603	56.5068936712324	5.777	62.003	14.244
16.8497696801722	52.8162488007393	8.641	64.188	14.025
Route: 12 Length: 128.208003895553 Demand Met: 46				
35.4195699811581	43.2436443932253	40.978	46.49	6.437
18.6031179975241	65.6479689135576	17.374	67.529	2.247
18.8146503945262	65.273047974185	20.735	74.659	9.97
18.8160273231052	65.2706074997661	13.454	69.007	9.443
18.8165187120623	65.2697365595313	5.739	68.535	13.479
21.3091764035538	60.8517393737562	11.878	70.444	14.354
22.0535624400437	59.5323863894407	11.844	68.394	13.519

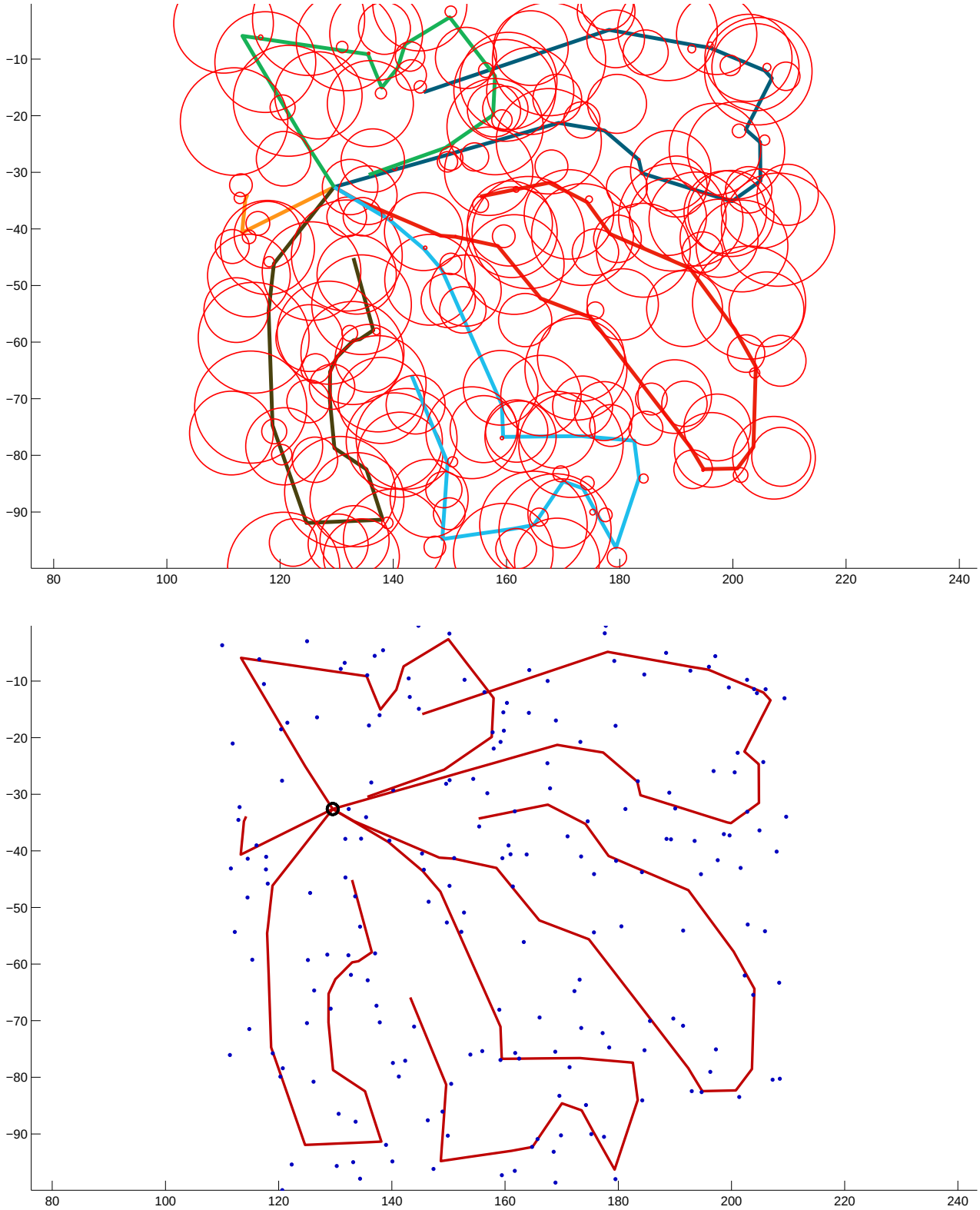


Figure O.50: *team*2_200, arbitrary radius, 2D, Euclidean, Length = 911.1879857

Table O-53: Solution for *team*2_200, arbitrary radius, 2D, Euclidean

Total distance: 911.187985749524				
Total demand met: 617				
Depot: x 19.5535 y 32.6157				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 40.3457933899821 Demand Met: 23				
8.03942280818126	38.3249508324296	6.091625	39.029145	2.102568
4.01303099910238	40.3214354092737	4.535275	41.40327	1.201293
3.29847054869312	40.6571131100392	1.56824	43.114435	3.00535
3.48681487189661	38.687504998849	7.79806	41.063165	5.901659
3.68424663246333	36.6228650984126	7.76847	43.27595	8.308131
3.85894880759926	34.7959194815857	2.888575	34.539165	1.003767
4.25653086719399	33.9103746565918	3.09506	32.271765	2.008496
Route: 2 Length: 144.466032805103 Demand Met: 119				
8.90660677221689	46.1394477424679	8.071465	45.7971455	0.90257
8.54183271589218	49.4108680607328	15.566305	47.445917	8.70734
8.08128820892891	53.5411910154877	4.493385	48.2428075	7.3014
7.96849390544369	54.5527695602772	2.26292	54.336059	5.709688
8.23381293942536	62.105042089653	5.35045	59.245825	9.802178
8.39193079372818	66.6058465004265	4.81189	71.48163	9.90886
8.67669577691811	74.7116451204174	1.401765	76.07236	7.401092
8.67702425677785	74.7125896313923	8.96414	75.77293	2.204212
9.83068802667047	78.0298347907437	10.737535	78.399525	6.808137
11.0265859434643	81.4685200253406	10.302265	79.88844	1.80828
14.6687066742072	91.9410751101972	12.30828	95.415795	4.20063
15.2413899134453	91.9166138133246	10.636965	99.941455	9.901623
17.8822484553253	91.8038135414342	20.26183	95.676245	5.307169
20.4743868571291	91.6930942762531	20.60172	86.45345	9.802386
23.1937877373546	91.5769391870733	24.384515	97.907795	6.707286
23.1937877373546	91.5769391870733	23.159665	94.99055	6.103619
25.745969302401	91.4679266175724	30.09705	94.85711	8.906507
25.745969302401	91.4679266175724	23.602775	87.83846	8.306271
28.1432247114196	91.3655314842979	28.966505	91.93771	1.002586
26.2389424399731	85.4892991476586	31.22881	79.877355	7.509507
25.2602750001761	82.4693281339962	32.35548	77.08328	8.907943
22.2289302073514	80.4590697481743	30.1948	77.47401	8.506801
19.6057071406049	78.7194602596735	16.17437	80.77798	4.001447
18.7963700082101	70.2696751901243	14.99811	70.439575	3.802058
18.799556561435	69.7462961788098	19.19225	67.891335	4.001137
18.8270485640469	65.2308419738722	16.28216	64.658715	2.608407
20.0179271882849	62.6760236046846	15.17562	59.299125	5.903506
21.1234609230774	61.5623624754745	24.393135	53.387308	8.804674
22.0098821597562	60.6694246565721	18.601355	58.3359	9.106551
22.0098821597562	60.6694246565721	22.77816	61.91876	9.100277
22.9800010710843	59.6921738493013	22.32618	58.45293	1.401145
24.0973869371234	59.4866488998738	25.726765	62.875185	6.002164
24.09837043878	59.4864680007554	27.294235	67.36467	8.501742
26.4664205177047	57.9048670546653	27.03592	58.11764	0.607949
22.9775386402554	45.141677258692	21.800035	44.699325	9.804285
22.9775386402554	45.141677258692	23.528225	48.047471	7.005381
Route: 3 Length: 191.135088233679 Demand Met: 120				
30.1078313534875	29.6012699812721	30.249755	29.28668	0.408718
37.9684674991633	27.3561881448318	39.58443	28.150345	1.800561
42.9008639108636	25.9474429261581	44.38625	27.294685	2.501465
48.1796147041776	24.4397751836668	46.870011	29.816545	7.806658
53.4601651961311	22.9315934304301	57.48649	24.517395	9.301244
59.2242373389488	21.2853127170425	58.979255	16.987345	4.304944
63.7795419604013	22.0406882173818	63.31789	20.756115	3.203825
67.3325361616365	22.6298573285321	69.52818	17.90893	5.206535
73.3590412282486	27.7714861576584	73.44882	27.71684	0.105102
73.9173521158464	30.1658544414741	71.273045	32.62062	3.608079
76.1005443233523	30.8493191677912	79.01289	29.7258	7.100822
78.3498452495309	31.5534797275279	80.066985	32.520545	5.404485
80.5991461760199	32.2576402861614	78.52122	37.890255	6.801958
82.8484471051361	32.9618008454263	83.48933	38.25693	8.302552
85.0977480320196	33.6659614034605	89.661665	37.28143	7.609892
89.2879444049437	34.9777339211258	87.57797	41.66484	6.902275
89.9005608987376	35.1001978826016	91.6164	43.026115	8.109517
91.2977197324142	34.094945832331	88.660005	37.051535	7.30023
93.0618984813837	32.8256239232937	97.982935	40.137435	10.003975
93.0618984813837	32.8256239232937	94.955665	36.40187	7.002314
94.8182320855026	31.5619465573788	92.788305	33.10169	4.109114
94.8569916690625	31.5340591362809	99.67714	33.98061	5.405501
94.8040198503222	24.6883958790323	95.62369	24.314785	0.900802
92.2804438293282	22.4607647263149	91.09643	22.6866	1.205359
92.9265620219588	21.1908687615209	86.845365	25.906095	8.100197
93.7367551881919	19.5984959528807	90.572985	26.136825	8.602133
94.5490655043959	18.0019620446985	94.4971	12.154995	9.50306
95.3631174951559	16.4020050009772	93.997115	11.43328	7.703152
96.1754278048544	14.8054710903662	92.761655	9.792985	7.707934
96.8961633545179	13.3889203809916	99.37313	13.042045	2.501137
95.641105989528	12.0388177098134	96.04228	11.46233	0.702338
91.0276875529111	10.1204976146382	89.544625	11.14329	1.801549
89.0731958350413	9.30779421280666	87.144585	5.62369	7.10022
86.6297202430045	8.29176491369193	78.44886	5.02628	8.808511
85.8784514380866	7.97937746369632	86.016245	7.495035	0.503562
82.8604245221	7.49145497444588	82.741185	8.18936	0.708018
77.7022813352016	6.5626509749861	74.60069	8.85595	4.00271
73.1069378965826	5.73518781579899	69.299455	6.449115	5.10428
68.50906733936	4.90726963160224	67.61759	1.570395	5.100981
68.130903737488	4.83917538629558	67.794775	0.2453923	4.606064
49.9564318704223	10.9475824777662	54.294115	8.069135	6.606257
35.365959516312	15.8514139196211	34.77264	14.924575	1.100481
Route: 4 Length: 199.79285195953 Demand Met: 120				
23.3362879070802	34.7587026906258	22.373755	32.6144	4.900414
23.3362879070802	34.7587026906258	21.779985	37.899125	3.504901
38.3784866075874	41.2030687856382	36.49954	48.989475	8.009904
40.9921467815681	41.3831876303906	41.00732	41.27668	0.107583
45.1031821157905	42.2775471646939	51.37375	46.298003	8.802177
48.4707786325639	43.0101708915639	49.52113	41.29678	2.009713
52.8599604833412	48.3813358868655	50.972003	40.60627	8.001002
56.0502407042911	52.2853709077978	53.302235	56.10093	4.70213
64.8096050546953	55.6089782646129	65.705495	54.4013975	1.503619
66.6564321399831	58.0040244741788	70.55475	53.342402	6.30295
69.0990478532951	61.1717148988828	63.17424	62.764205	7.706659
71.2395232883732	63.9475771266115	62.26967	64.78212	9.008592
74.1174139269277	67.6797513574172	75.60926	70.05143	2.801868
76.4222577980567	70.6687735229947	79.72973	69.6285	6.503827
78.7370810493439	73.6707374522793	81.449	70.90379	4.00725
82.3850833102404	78.4016262291637	87.254685	75.06877	5.900928
83.0060344605742	79.429318378	86.26193	79.048	6.603528
84.825143731091	82.4399969019129	84.72455	82.62255	0.208434
86.3872833172356	82.4087492113007	82.980165	82.460215	3.407507
90.7774008720605	82.3209333508362	91.37176	83.481715	1.3041
93.191852416796	79.1072887495069	97.272905	80.426715	7.307128
93.6220623253687	78.5346776462655	98.53739	80.25874	5.208919
93.994133987398	66.2787029170333	93.854515	65.44994	0.901393
94.0521908323079	64.3663208081103	98.425325	63.29758	4.501834
91.104372617218	59.0929646581417	92.344515	62.02096	3.309346
90.3720141469304	57.7828472950147	95.92709	54.202926	6.608684
90.3720141469304	57.7828472950147	92.878595	53.021252	10.006179
85.4922446385406	51.1625252352118	81.466395	54.091358	6.706774
82.3825491065135	46.9436403521708	84.61874	44.121625	3.6006
77.5102875226374	44.8573195659403	79.319755	37.96047	9.501655
77.5102875226374	44.8573195659403	74.17807	43.76639	8.300269
72.6217441877873	42.7640267727956	69.610075	41.75992	4.204327
68.2899814155332	40.9091496727748	65.72564	44.111465	4.10252
64.2014091667012	35.2416397903541	64.595135	34.78327	0.604254
62.0565205868908	34.1426248272134	61.04328	37.44322	7.908259
59.5738250718834	32.8705218046483	63.437195	41.00367	9.004095
57.5535742795642	31.8353699878654	57.95186	28.956245	2.906543
52.2127982585379	32.9101174541924	51.719243	33.03008	0.507925
49.4249444810193	33.4711293444498	50.608737	39.047145	7.509385
46.6341436183841	34.0327343111784	53.824634	40.64213	9.902994
45.3267713826095	34.2958225000029	45.420784	35.70231	1.409626
Route: 5 Length: 206.261202591851 Demand Met: 120				
24.1705153335343	35.3505151585249	24.567885	37.86062	3.403033
28.8605306541698	38.1285706705642	35.347265	40.483415	6.900943
29.4010220620634	38.4487221136318	29.577285	38.20107	0.303974
35.4433845453543	43.5624977398996	35.65863	43.345715	0.305492
38.5724486100389	47.2068402587475	40.184205	46.1874365	1.907077
40.057770623172	50.5467868646708	42.753335	50.906813	6.308285
41.7715936684874	54.400548761249	39.724355	52.657318	4.803105
43.4815965466929	58.2457203933698	42.291825	54.317701	4.104253
46.1846150609339	64.323821167772	48.983044	68.08194	6.601797
49.1826914727332	71.0653991386965	56.10401	69.44853	7.107666
49.412350324079	76.7282239972916	49.200624	76.95068	0.307107
51.7193072270196	76.7077344816105	45.96408	75.36881	5.908922
56.3652827885723	76.6664707193374	58.86286	75.490835	6.800719
56.3652827885723	76.6664707193374	52.486843	76.711165	6.306844
56.3652827885723	76.6664707193374	51.801592	75.702955	5.507245
63.2540776446037	76.6052871792679	63.457115	71.302795	5.306378
64.9481240271282	76.7503526610326	67.24276	72.18951	5.208708
69.0741926372466	77.1036783037476	68.40623	74.741575	3.705743
72.5616205714051	77.4023155610694	74.635475	75.231085	3.002518
73.434533161006	84.0126437425764	74.234205	84.088705	0.803281
69.3493842691548	96.300714871182	69.51155	98.000325	1.707329
66.435389724825	91.1058886290319	67.48261	90.51293	1.203441

Solution x	Solution y	Original x	Original y	Radius
65.9385067588127	90.2364822393133	59.88564	90.256965	6.102678
65.6810440757521	89.7859944713213	65.23767	90.033385	0.507723
64.1623870153722	86.997313654848	61.393495	78.21387	9.209541
63.5249614733765	85.8268216802389	64.30468	84.91	1.203546
60.0499533823023	84.6077562036392	59.609455	83.27302	1.405546
56.6651814960369	89.5995092382758	55.7501	90.920415	1.606912
55.0002518783149	92.05489388782	58.59379	93.155945	9.907152
55.0002518783149	92.05489388782	54.766852	92.295455	9.502154
54.823038655957	92.3162422162267	58.9163	98.60932	7.507171
51.1464783027644	92.9792972568752	51.725585	96.536445	3.603979
43.7049353670622	94.0609419677885	49.437672	97.29667	8.8097
38.6525747942136	94.7953131726092	37.353615	96.195315	1.909791
38.8391499389545	92.1151590319222	39.89323	90.309885	2.808165
39.0491605540296	89.0983567762458	36.34587	87.597465	6.900084
39.2590418590177	86.0834080143353	38.950185	86.058925	3.201927
39.4870073683829	82.8086796737392	43.88264	75.9979	8.106066
39.5918972472442	81.3019341568295	40.48646	81.157135	0.906206
33.2524912694748	65.8994164885436	27.85894	70.297015	7.608202
33.2524912694748	65.8994164885436	33.93752	71.055425	5.201316
Route: 6 Length: 129.18701676938 Demand Met: 115				
15.513241306147	26.3431406939133	11.54701	17.37734	9.803906
14.7032852769089	25.0856725435889	10.613375	27.61233	4.807428
11.6142452180675	19.8681039965226	16.776285	16.423415	7.709348
9.62824896040802	16.5136407860455	10.44323	18.54025	2.209906
8.01018478684438	13.7806363840307	1.875835	21.036865	9.501742
3.35032244883445	5.90985794925129	0.024125	3.6794065	8.802177
5.68286268531307	6.25083720990721	15.031135	2.9821155	9.903269
6.80512025801869	6.41489291161162	6.5851	6.152225	0.405995
13.4199937811353	7.38187928313632	7.39533	10.545265	8.903739
20.0864628460879	8.35640806447519	20.9699	7.87089	1.008062
22.7148651937635	8.74063750890298	21.673354	6.8005655	8.80316
25.5355396336896	9.15297398755791	25.662895	8.989655	0.207105
26.7630606994263	12.1277846869583	25.954135	17.869355	7.603419
27.9700428388553	15.0528213332135	27.827995	16.04415	1.001454
30.7781428906251	11.5517220428664	33.169445	12.82499	2.709158
31.1395443751617	10.3938928859873	32.973595	9.54291	2.603527
31.8745427815523	8.03916339246473	26.97316	5.55935	8.204253
32.0726745340791	7.40440462969674	28.448025	4.56492	4.604428
36.6763563090769	4.61784503240985	34.695715	0.250565	8.309293
39.9750707474479	2.62116825142432	40.16046	1.62977	1.008583
43.0526569873048	6.61313781583368	42.845635	9.79738	5.407265
46.2263788209075	10.7298056670693	46.358401	11.954405	1.303234
47.9763673630416	12.9997342458939	57.51838	10.00522	10.000856
47.9523327149653	13.4939896130274	50.337118	13.87323	8.600173
47.8770947210736	15.0412060754953	49.707097	15.54357	9.000518
47.8018567449861	16.5884224009045	54.207021	15.63022	7.700153
47.7266186740142	18.1356387360961	49.796921	18.777515	4.003148
47.6521530799876	19.6669709795012	47.801417	19.06334	4.70736
47.6415644032729	19.8847194946462	49.216563	20.76273	1.803198
42.5043916918122	23.4163904700678	47.997827	21.94091	8.509285
39.244881963932	25.6572176316508	40.19826	27.52955	2.101085
31.8072721843306	28.2854981381012	26.379295	27.934205	5.600223
25.6680336588786	30.4549641106716	25.46019	34.06066	5.200669

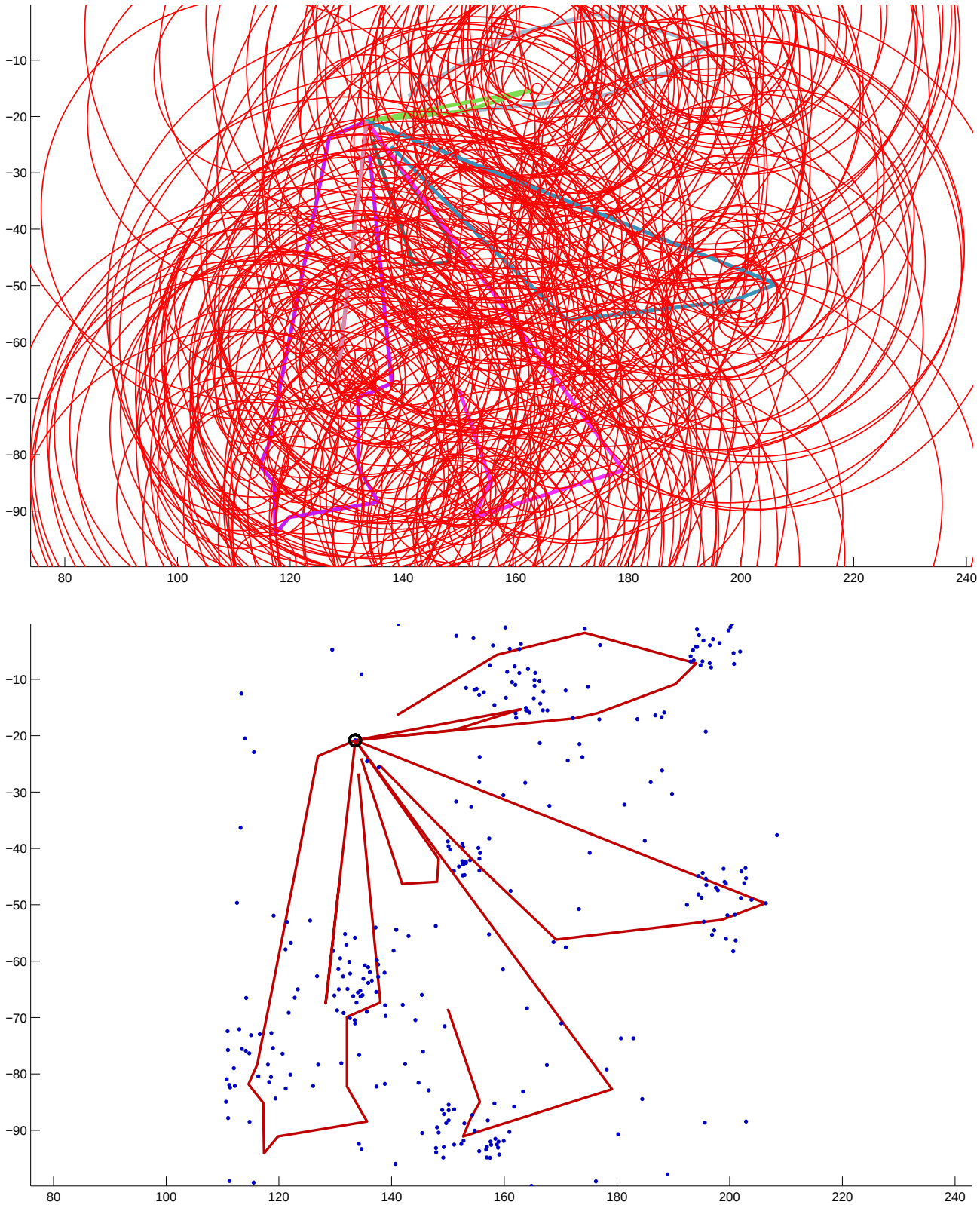


Figure O.51: *team*3_300, arbitrary radius, 2D, Euclidean, Length = 864.1079332

Table O-54: Solution for *team*3_300, arbitrary radius, 2D, Euclidean

Total distance: 864.107933162231				
Total demand met: 9490				
Depot: x 23.55 y 20.83				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 62.7554398278477 Demand Met: 1297				
28.3484021696243	27.6477021058191	41.47	31.69	27.11
33.5998403561745	35.1090902759991	42.69	39.78	10.22
33.7412157919349	35.3099603931496	41.07	43.98	16.59
34.4743152259335	36.3515682822599	40.11	39.6	36.03
35.2267016433788	37.4205796493245	48.25	85.26	49.96
35.8327439996527	38.2816613392213	43.96	42.1	13.34
36.4505040164087	39.1593918041495	37.85	53.76	19.4
37.060124058191	40.0255567682645	45.6	43.93	19.94
37.6794781277212	40.9055521074073	51.12	47.54	20.96
38.3560182921926	41.866799026923	45.42	39.91	7.33
38.2817894489468	42.8844473069015	41.97	43.22	4.65
38.1976740666109	44.0376361532647	42.56	42.28	38.94
38.1137511856379	45.1881858818536	58.75	56.63	26.43
38.0613817714291	45.9061499783682	47.3	55.25	13.14
33.7271979331684	46.1729814193802	30.36	58.14	13.13
33.7261998228862	46.1730428674437	27.36	59.94	22.06
32.1981342210064	46.2671173141962	25.84	61.09	17.04
32.1929729866038	46.2674350625362	27.62	60.61	40.48
32.1919748763214	46.2674965105979	28.77	62.05	31.17
31.9005593922304	46.2854373308197	26.15	61.96	39.04
31.8825937271906	46.2865433762536	25.24	60.77	37.65
31.8815956169084	46.2866048243183	26.5	63.44	28.82
31.8805975066263	46.286666272383	25.86	63.85	38.15
31.8795993963442	46.2867277204493	20.56	61.44	30.47
31.8786012860621	46.2867891685152	19.65	58.2	41.68
31.8776031757797	46.286850616575	8.29	81.45	44.4
31.8766050654972	46.2869120646357	8.6	80.56	41.43
30.3420765516728	41.595401288616	21.39	62.71	35.55
30.3417656727396	41.5944508390966	21.49	69.2	28.99
28.6594583522013	36.4511362247509	24.47	65.24	32.36
28.0001483031718	34.435429005734	25.01	63.12	28.84
26.684886077521	30.4142805818486	15.54	52.83	26.09
25.6411660206679	27.2233174561988	30.85	54.39	33.55
24.5957890251648	24.0272885772862	42.95	44.74	47.83
Routey: 2 Length: 179.25539843706 Demand Met: 1294				
45.7438353532709	50.9657038345001	60.12	71.05	24.74
51.3218297440904	58.539734504537	49.78	61.48	3.32
54.6679895347865	63.0832881213028	54.05	68.39	14.97
61.0524704375636	71.7523995555736	57.57	78.44	7.54
61.0530634388189	71.7532047571082	92.92	88.46	39.57
62.9095300179017	74.27399149353	70.7	73.7	18.06
64.9872777570096	77.0952429689906	72.93	73.7	16.22
67.0666897246794	79.9187542019065	68.17	79.21	25.07
69.126518823415	82.7156750106101	74.49	84.46	5.64
67.0488585250819	83.3746812751705	78.98	97.83	29.46
64.9558536050308	84.0385546578439	70.23	90.73	37.84
62.8627377418221	84.702463230474	66.26	99.07	34.13
60.7650289099046	85.3678286338199	54.83	99.88	28.66
58.6778043011853	86.0298685783858	53.35	83.14	7.08
56.5838929498539	86.6940294660141	51.75	85.81	36.53
54.2283595876901	87.4411733793679	50.91	90.3	4.38
53.5263953885181	87.6638271052594	48.89	93.1	36.74
52.571489225731	87.9667106651547	48.68	92.55	20.63
51.5698776326101	88.2844085679243	46.92	92.94	12.72
50.5922793483023	88.5944897690688	48.42	91.53	30.91
49.6083578568723	88.9065766098891	47.67	92.59	35.3
48.6272498764273	89.2177710418072	47.56	92.03	9.48
47.6580506831651	89.5251881663432	47.08	88.26	25.21
46.6600558344633	89.8417388898639	47.48	94.9	26.29
45.6791289061722	90.152875895814	44.75	90.08	11.27
44.7342048242832	90.4525932759304	45.57	93.71	20.17
43.731633826365	90.7705954907169	35.46	90.5	36.39
42.6964762022886	91.098933750798	41.11	92.55	2.15
42.9480856942936	90.4975394602599	37.93	93.92	38.41
43.2392314647683	89.8016459811747	37.88	93.16	38.09
43.5406097154244	89.0812949378496	38.99	86.42	12.82
43.8129710553925	88.4302998008737	42.93	88.78	12.51
44.0807688486742	87.7902123931258	40.14	88.25	7.74
44.0811548079812	87.7892898773192	49.11	94.31	17.31
44.0815407672804	87.7883673615094	40.13	86.48	6.39
44.0819267265763	87.7874448456982	39.31	87.14	5.32
44.0823126858645	87.7865223298838	41.11	86.33	3.31
45.5321988615215	85.2248168031372	44.33	87.3	27.93
45.6678167187727	84.9852028167339	85.6	88.65	40.1
43.6879052032763	79.2422474976943	40.14	85.47	26.51
43.3499622094677	78.2620059881359	39.28	92.99	15.28
39.9692465878129	68.4558620218086	35.58	76.06	8.78
Route: 3 Length: 172.594995089497 Demand Met: 1286				
16.9308566813431	23.6048971497455	3.36	12.54	17.51
11.4733135960846	51.3499265320372	9.07	51.92	2.47
11.137900212123	53.0550997399026	11.46	53.07	1.04
10.1416172112433	58.119998111437	12.14	56.76	5.34
9.22497116577304	62.7800375175899	2.57	49.67	15.72
8.04418472663448	68.7829141606159	2.99	72.09	6.04
7.8789105772795	69.6231341289087	4.75	76.37	18.12
7.41812721505906	71.9656618682273	6.62	72.96	3.81
6.95473521002998	74.3214517184368	5.07	73.15	4.26
6.48944371676971	76.686898255532	8.06	78.36	4.56
6.17529372124666	78.2839725521356	12.07	80.14	6.18
4.61101794401461	81.8262367455409	2.19	82.13	2.44
5.06581154849117	82.40564444959	1.36	82.41	36.76
5.92233468215271	83.4968564250117	11.23	82.6	5.9
6.77399032183564	84.5818674884963	0.76	80.97	8.89
7.22279228078274	85.1536422900776	9.41	84.38	2.32
7.26023939919946	87.7407946051357	4.8	88.51	18.34
7.28628943357857	89.5405386548535	0.91	72.43	18.26
7.35239724947993	94.107788482696	5.54	99.29	5.49
9.82730731436284	91.092877167239	0.97	75.78	17.69
12.4801661290813	90.6501637238595	1.21	81.97	14.68
15.7991446070836	90.0962872908922	24.2	92.42	40.35
19.0774009410039	89.5492069276762	24.67	93.34	18.16
22.3681244596168	89.0000450317586	30.69	95.98	13.17
25.6507164078258	88.4522402133967	39.18	94.86	14.97
24.5944879003298	86.6108845194491	42.37	92.45	18.71
23.2059825626584	84.1902614471788	27.35	82.24	4.58
22.0762862164035	82.2208274419715	24.25	76.66	7.23
22.0757886486652	82.2199600168474	1.01	87.83	21.8
22.0781107017541	73.0371331973822	22.6	70.1	3.11
22.0785706923503	71.2179973796885	23.52	71.05	2.83
22.0789070810023	69.8883234624925	20.35	68.75	2.07
25.21434369765	68.5384992557383	1.24	99.01	41.19
28.0080071892576	67.3358093114274	28.86	67.84	0.99
27.7628286380225	64.7781150712928	0.62	84.95	36.73
27.5093433730758	62.1337630455894	4.15	75.92	36
27.2558611580902	59.4894466701993	21.99	57.15	10.23
27.0024031524607	56.8453804140122	27.28	65.47	12.73
26.7505179787186	54.217720572735	10.66	76.44	43.81
26.6035215221237	52.6842578682867	22.65	62.2	11.7
26.6034261004726	52.6832624313431	3.44	75.58	32.57
25.6553812188677	42.7932834626368	30.83	54.42	13.2
24.1126346001354	26.6993901650411	25.65	24.53	2.83
Route: 4 Length: 129.207026901396 Demand Met: 1299				
35.9359522017429	19.5838204386359	64.87	11.36	35.55
49.3127753892595	18.237947043039	55.24	13.37	7.67
50.6956511757931	18.0988126708476	56.38	14.32	21.79
53.4167881480182	17.825032734532	56.85	15.49	20.36
56.6879840628004	17.4959100673226	63.88	23.81	9.81
57.4681212750474	17.4174186419247	83.5	4.83	37.8
58.9180635559014	17.2715365638367	56.94	12.18	13.04
60.3721953382185	17.125232954798	51.86	7.7	17.94
62.5967414600575	16.90141616923	63.35	21.49	4.65
63.2551253967945	16.7506304681488	62.16	16.88	21
64.6910779045775	16.4217629274747	60.89	11.99	21.62
66.1241188002541	16.0935622159242	85.34	3.13	40.46
66.5407038759624	15.9981542473223	66.87	17.1	1.15
69.0653810989382	15.0602983265674	77.94	16.73	14.1
70.6415866570895	14.4747764548817	75.98	28.26	25
72.2191079918589	13.8887657994733	78.01	26.19	23.38
73.7966015223042	13.3027654637408	76.81	16.4	34.4
75.3693672762603	12.7185213691024	79.79	30.32	35.55
80.3622539447595	10.8637857793692	85.76	19.27	9.99
80.3629606644184	10.8630782856775	89.81	1.33	26.05
80.3636673840784	10.8623707919871	86.46	7.15	18.46
80.3643741037516	10.8616632983097	87.06	2.89	20.41
81.1698257364416	10.0553295127144	83.08	5.9	14.32
82.0848153808727	9.13933775448773	90.14	0.74	21.22
83.0012247109254	8.22192477720072	90.71	5.35	17.99
84.0604173862627	7.1615721207545	91.86	5.09	8.07
83.4244612136595	6.98780145078063	90.79	7.27	30.18
82.5454912524568	6.74762894608777	88.21	3.61	26.68
81.7117860154141	6.5198247347071	86.71	7.9	17.03
80.855159925443	6.28575757178927	83.98	4.24	15.73

Solution x	Solution y	Original x	Original y	Radius
79.9957693553499	6.05093504233522	84.85	7.49	13.74
79.1370362014552	5.81629215286417	85.18	6.81	43.66
78.2803148235988	5.58219896869429	84.22	4.25	43.87
77.4177909948425	5.34652029731184	84.21	1.15	11.63
76.5763576963256	5.11660445567341	83.63	6.61	7.21
72.2995642320537	3.94800007342277	86.49	3.97	35.89
68.0244363581712	2.77985068325988	90.45	0.18	30.09
64.2918787605251	1.75995482426614	64.3	1.03	0.73
56.9096368400653	3.60161766958618	57.66	15.51	35.11
48.6868836447534	5.65296426415406	48	4	1.79
46.0141585979856	7.26669029172282	51.98	10.99	14.06
42.0598165721633	9.65422532559505	44.72	11.87	20.59
40.0338986379597	10.8774250403404	41.49	2.29	8.71
30.9694279898565	16.3503307874934	31.22	0.18	17.31
Route: 5 Length: 59.9277703024558 Demand Met: 1189				
34.875647880264	18.7015606759296	52.67	4.65	26.24
48.5050541076192	16.1401739470761	52.67	8.88	8.37
48.5060369030182	16.1399892494753	54.22	8.18	10.41
48.5070196984136	16.1398045518547	50.3	13.28	17.44
48.5080024938085	16.1396198542318	56.26	10.34	24.93
48.5080024938085	16.1396198542318	55.5	8.86	30.33
48.5297781737293	16.1355275308858	54.5	15.91	18.5
49.4053280171431	15.9709846514042	52.12	16.84	26.81
49.4053280171431	15.9709846514042	51.38	10.51	13.35
50.2903053012469	15.8046700643563	42.59	39.16	36.88
50.2903053012469	15.8046700643563	56.31	21.31	24.49
52.6670563926851	15.3580050673324	55.38	10.13	5.89
52.6680391880783	15.3578203697	55.4	11.17	24.33
52.9280048137263	15.3089647932823	53.85	15.08	0.95
52.0045227061534	15.5957042378907	67	3.94	32.81
51.0322930414545	15.897579780231	50.21	0.82	29.59
50.0614839720002	16.1990141945502	50.97	4.59	36.43
49.0906749249617	16.5004486019348	47.45	7.49	16.55
48.1157300718015	16.8031671695596	52.96	3.75	34.45
47.1536541409382	17.1018899605701	84.57	2.19	42.77
46.1889005635422	17.401444155806	48.26	14.58	3.5
45.1707549324165	17.7175764847049	78.41	15.88	33.29
43.7499904951465	18.1587212056855	45.63	23.76	13.71
42.3587478566649	18.5906994629336	83.08	6.85	42.38
40.9346038085329	19.0328935468814	45.6	41.81	23.25
38.8831030184247	19.2449642590449	45.57	12.76	29.32
37.119320892348	19.4272925004754	49.85	30.56	44.85
35.3400837345446	19.6112183818426	58.02	32.46	35.22
33.579634849539	19.7932020546496	61.27	24.41	39.95
31.8107729532422	19.9760554094517	42.72	42.84	48.6
30.1778255429859	20.1448588150789	71.33	32.23	42.89
27.8889711872393	20.3814655838031	73.63	17.07	49.78
25.7166416642379	20.6060267786897	45.57	28.26	48.56
25.7166416642379	20.6060267786897	53.73	28.37	48.55
Route: 6 Length: 166.425478393563 Demand Met: 1294				
38.5036564294853	26.7661360029029	47.34	38.25	14.49
38.5036564294853	26.7661360029029	44.15	32.64	10.23
50.2140283062826	31.4147882104703	74.93	38.63	25.85
60.2651679536548	35.4047773203202	84.47	48.16	27.36
64.2193296869718	36.9744564223338	84.47	44.91	21.75
68.3522523304666	38.6150979633003	65.16	40.78	37.77
72.4319884583177	40.2346258706927	85.21	44.35	35.25
76.5311633947699	41.861869792943	82.42	49.99	11.64
80.6273030272606	43.4879086337011	89.11	45.94	8.83
81.8789100586889	43.9847574019608	85.78	45.37	33.83
83.1476829836511	44.48842062941	85.02	48.75	30.39
84.4032547173372	44.9868434628597	85.85	46.49	8.76
86.2009705562818	45.700480569243	88.92	43.62	3.46
86.8457504796482	45.956438098455	87.56	46.99	41.58
88.0367529270158	46.4292287147889	87.92	47.46	19.28
89.2258219287936	46.9012519158773	92.82	43.5	36.84
90.4148909751864	47.3732750045722	89.33	46.23	10.42
91.6039599966559	47.8452981560298	92.92	45.3	44.4
92.7930290362033	48.3173212619553	92.59	46.16	30.13
93.9820980129545	48.7893445260708	92	48.8	13.39
95.1806943777991	49.2651498805813	93.86	49.11	7.68
96.3500028150883	49.7293288768451	96.43	49.73	0.08
94.4030744739986	50.4646318961612	90.93	51.78	5.57
92.4565080852404	51.1997981901637	89.59	51.88	4.09
90.521797857996	51.9304865962325	91.08	56.32	17.84
88.5794883871841	52.6640456053945	90.65	58.26	31.68
88.5407022361879	52.6786941091252	89.36	56.03	3.45
84.038609557164	53.2143627843057	98.41	37.64	22.32
81.3921169939276	53.5292481823832	87.26	54.53	10.31
78.7406933358906	53.8447203132518	86.88	55.34	10.88

Solution x	Solution y	Original x	Original y	Radius
76.0917592353213	54.1598962974737	85.43	53	9.41
72.4243239401997	54.5962558526727	32.42	78.27	49.72
68.7582824560389	55.0324496225043	63.26	50.77	14.97
65.0899312639572	55.4689182400338	60.94	57.56	37.6
61.42444187379	55.905046167597	27.18	54.04	49.76
59.2013087051457	56.1695592833408	46.8	93.43	39.27
55.7913967259678	52.9220020557802	92.09	44.08	37.36
50.0612375490612	47.4646707177031	46.89	94.85	49.64
44.8718403818746	42.5223560385063	42.62	44.81	3.21
41.0107416895061	38.5941698833446	43.21	42.61	13.5
36.6435204916155	34.1510615143233	43.21	42.35	16.43
32.2790482214751	29.7107475222086	45.71	40.8	34.61
27.927196360607	25.2832675569472	40	38.77	18.88
Route: 7 Length: 0.0153760266757044 Demand Met: 533				
23.5497159552738	20.8290411889688	23.55	20.83	11.78
23.5498782244847	20.8290074423191	27.4	59.84	47.68
23.5501389336893	20.8282674742246	52.03	16.04	40.73
23.5507908161535	20.8275091542045	43.23	11.54	40.96
23.5516431366191	20.8269861342968	3.21	36.35	37.4
23.5521612933812	20.8261308485914	54.15	15.54	39.45
23.5512823330413	20.8256539537154	53.87	15.51	48.76
23.551865271122	20.8248414370934	24.66	9.13	37.86
23.5526253634129	20.8254912523931	45.09	11.7	48.9
23.5536213582108	20.8254018411938	4.01	20.5	30.01
23.5532128435219	20.8263145929686	50.52	8.68	38.38
23.5532113934878	20.8273145919174	27.74	25.63	7.06
23.5522201536528	20.8274466661545	46.38	12.31	40.75
23.551559215196	20.8281971062646	5.58	22.9	47.89
23.5508749285966	20.8289263194379	19.48	4.75	45.94
23.5508328962302	20.8289874854304	40.4	40.19	32.32
23.5503142431342	20.8298424702155	44.53	2.72	49.48
Route: 8 Length: 93.9264481837348 Demand Met: 1298				
21.7312676563321	37.1300097148602	21.75	55.19	18.06
21.5057826252698	39.1508723249681	33.01	55.55	36.48
21.2731962805727	41.2353789870348	36.6	82.94	44.77
21.040527263005	43.3206265811212	39.42	71.54	47.2
20.807864791913	45.4058155004243	23.5	55.84	18.38
20.5751563701602	47.4914162464205	23.78	67.37	23.49
20.34247515164	49.5767731872521	23.47	70.49	29.96
20.0525043619346	52.1755759838507	39.7	88.73	41.5
19.9206553737812	53.3572450432194	11.74	69.17	18.09
19.8810781658145	53.711947522326	4.21	66.53	21.01
19.8246036806606	54.2180883311735	8.67	72.77	28.82
19.7677084757459	54.7279997570259	12.82	66.49	17.6
19.7111339272728	55.2350373661676	31.99	67.74	46.93
19.6543203850739	55.7442168887966	6.36	80.44	34.29
19.5972883494931	56.2553546263879	35.37	65.99	42.77
19.5405699974143	56.7636810409081	24.49	66.27	27.9
19.483588405302	57.274366688907	13.36	65	29.08
19.4268722728161	57.782673220395	21.1	78.12	28.48
19.3700011286986	58.2923689987365	24.03	65.56	12.46
19.2676741386086	59.2094533302552	38.08	89.48	35.64
19.2564330921057	59.310198866994	20.88	59.51	36.31
19.1996522426597	59.8190853999858	22.51	60.15	23.44
19.0593138718415	61.076838815227	49.91	91.9	43.61
19.0592029815613	61.0778326478818	34.79	81.57	35.28
19.0296858787798	61.3423735134519	28.82	81.78	43.64
18.7983862307312	63.4153483284619	48.98	92.03	41.59
18.79827533998	63.4163421610641	34.24	70.46	46.56
18.7981644495053	63.4173359936972	28.95	69.72	21.24
18.7980535590836	63.4183298263362	25.62	68.98	43.08
18.7719428905384	63.6523412650337	23.19	66.22	5.11
18.7332472969419	63.9991424631353	16.07	82.14	24.27
18.6844243510818	64.4367079671122	16.79	62.67	4.76
18.6749176236831	64.5219100772566	22.17	64.94	3.52
18.5742031864159	65.3107047471697	20.64	65	4.42
18.5183803769446	65.7479085747451	8.95	75.43	30.95
18.4404641402382	66.3581479674291	42.78	91.87	35.26
18.4064132245258	66.6248344936276	38.36	90.43	47.27
18.3504641997299	67.0630268431929	19.86	66.11	2.9
18.2949130290856	67.4981032049355	16.99	78.36	10.94
18.9200116789247	61.9468785609396	27.64	62.78	15.95
19.5450045769495	56.3965930731792	2.01	79.01	42.13
20.1676200652553	50.8674202928807	11.18	57.92	14
20.7070255886329	46.0771984053672	24.86	66.05	20.4

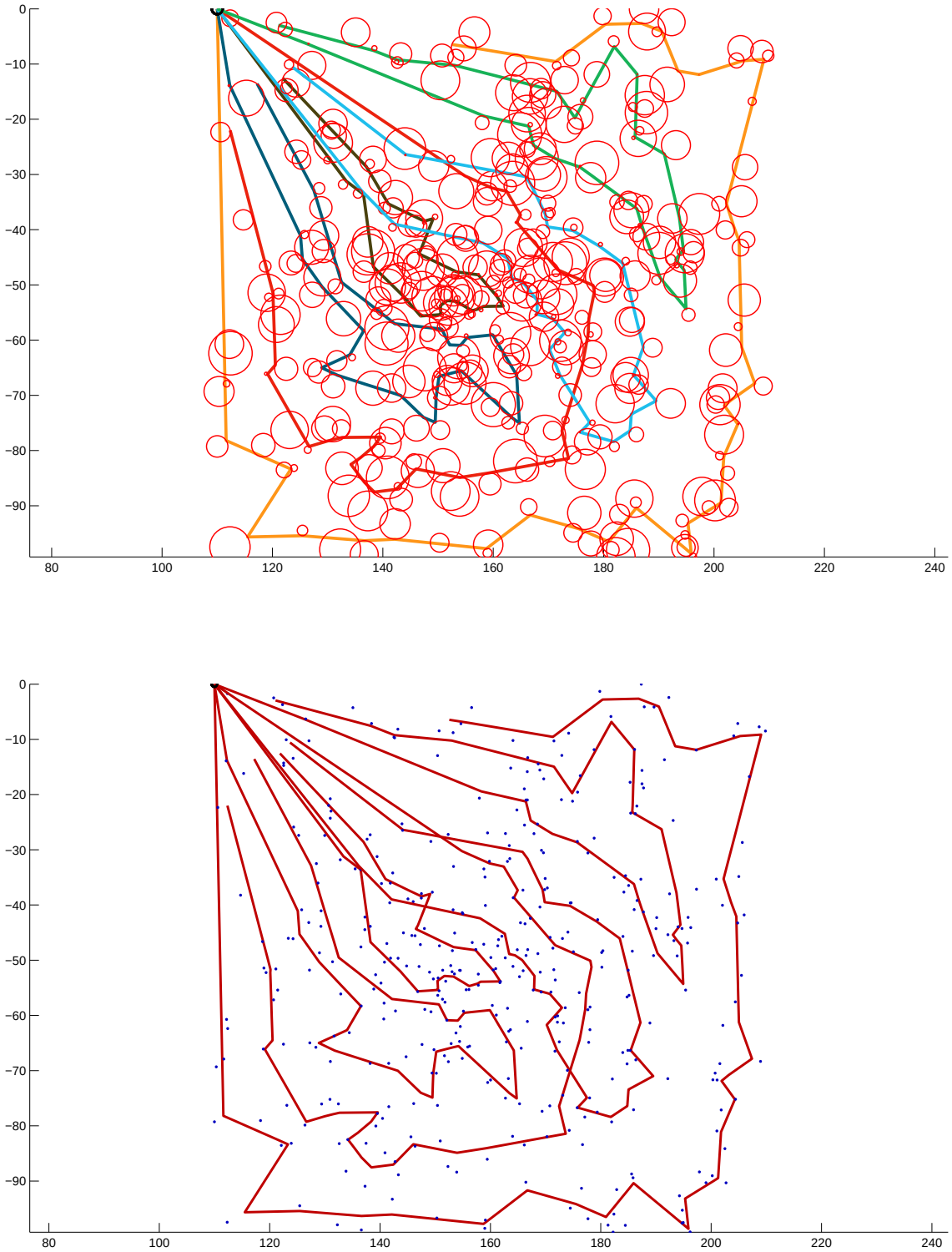


Figure O.52: *team*4_400, arbitrary radius, 2D, Euclidean, Length = 1558.6012361

Table O-55: Solution for *team*4_400, arbitrary radius, 2D, Euclidean

Total distance: 1558.6012361007				
Total demand met: 2245				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 401.150368483953 Demand Met: 374				
1.21076701999922	58.3181107102431	2.206275	60.72485	2.6045019
1.30230585850687	62.7272090347432	2.404275	62.37445	3.9363141
1.39898421502915	67.3838251190871	1.692025	67.9044	0.5973869
1.48887321395301	71.7134615614451	0.331025	69.303175	2.7183647
1.62304020330681	78.1757823219807	0.00155	79.256375	1.9485664
6.7487278350286	80.4395639760651	8.347775	79.0334	2.1293776
11.2301767555973	82.4188161151742	12.1212	83.525275	1.4206244
13.330838453348	83.3465828390312	13.92855	83.165725	0.6244747
5.48889291757442	95.6554016016721	2.307925	97.449675	3.6521191
15.4244636857605	95.4207589558684	15.45105	94.471525	0.9496062
20.7889252938017	95.8487480645268	22.27635	97.920025	3.7249339
26.6617954393582	96.3172993610235	26.6212	98.85125	2.5342758
32.147886848945	96.0561007533399	32.22375	93.28635	2.7707895
40.9298696252709	96.9580079849054	40.290225	96.689525	1.7024114
48.7652758211954	97.7627023047853	48.99045	98.5583	0.8268489
51.4202401619911	95.7277287373482	49.100125	97.070175	2.680503
56.7091625319092	91.6738825228381	56.428075	90.20545	1.4950934
65.4944807695966	94.1592873312867	66.508125	91.303225	3.030605
65.495399325221	94.1596826230333	64.46975	94.91155	1.6813097
68.1202840764072	95.2892726504358	67.679475	96.828325	2.2617553
70.9452313130476	96.5049571810828	71.306475	97.9771	1.5158171
71.4874031460592	95.8388025593846	72.222075	99.2555	3.494791
72.4508435410292	94.6550445238899	74.44305	98.0205	3.9109049
73.6306265809842	93.205471055297	72.374675	95.981125	3.0465832
74.6606942017983	91.9398496402731	72.88955	91.55335	1.8128248
75.933996471682	90.3753712206312	75.8385	89.39705	0.982971
77.3851327545096	91.5804782600337	75.589675	88.707575	3.3878078
82.8475975073312	96.1168232658692	84.730325	97.611875	2.4041303
84.3716392952014	97.3824752626388	84.9479	97.513325	1.6436369
85.8919652413426	98.6450414283805	86.192975	99.203225	0.6341733
85.534326505071	95.4471465340123	84.77555	95.283075	0.7763126
85.2790447686784	93.1644948794023	84.25115	92.664475	1.1430606
87.4731737619436	91.8073856812785	87.858275	88.334025	3.4946441
88.7352719523406	91.0267550817096	90.195175	89.03695	3.7016857
90.2448939408018	90.0930270510744	89.0595	90.291	1.201812
91.2659428571415	89.4614905949945	92.685275	90.310575	1.653919
91.5568139209322	84.7269524184115	92.480625	84.1266	1.2780059
91.7795703315836	81.1011190308137	91.03755	80.9252	0.7625888
94.3054401958457	75.1962614605588	94.404	75.185075	0.0991926
93.4196951549727	73.9820467328733	91.825175	77.123475	3.5229343
92.0372789820012	72.086976490427	90.725625	70.444425	2.1020018
91.8719011336367	71.8602700179772	90.314475	71.662575	1.5699234
93.1537490149905	70.8065441928099	91.08095	71.69145	3.6485541
93.1545215107067	70.8059091728351	91.5733	68.725	2.6135119
97.3936197718206	67.8333798653434	98.93765	68.322275	1.6195826
95.0202833874691	61.2490833903375	92.124775	61.791725	2.9459173
94.9182356231682	57.0949985611262	94.377175	57.5521	0.7082996
94.7643590419874	50.8311009987953	95.486225	52.746525	2.9208705
94.6149796525085	44.7502719891702	94.807975	43.25145	1.5111964
94.5493093994778	42.0770187701145	95.9689	41.808	1.4448559
93.6155862341121	39.5191246849347	92.049975	40.056175	1.6551621
92.2506177596222	35.2710838990934	90.921925	35.308625	1.329223
92.8308961057834	33.0395688796783	94.997925	34.851	2.8244109
94.4784125355068	26.7038890453589	95.640625	28.68455	2.2964659
96.9469741009074	17.2108041792002	96.9141	16.74635	0.7260841
99.0434980633929	9.1484251626701	99.82775	8.49955	1.0178851
97.430086272643	9.25512594284954	98.6909	7.723575	2.0288551
95.239745931279	9.39998111489785	94.81355	7.137025	2.3027404
92.957096903964	10.1218078222024	94.09005	9.358875	1.3658877
87.3005119071086	11.9105515324238	87.3023	11.937375	0.026883
83.4834598618016	11.2429543325332	81.52085	13.687775	3.1351213
81.0210818250864	5.27121650388798	77.882675	4.11235	3.3455297
80.5226366289734	4.06239151051021	79.6523	4.144625	0.8742129
80.5223275308081	4.06144048037149	82.33615	2.420325	2.4460605
76.8727532761312	2.6406182919818	77.335225	0.00945	2.6715027
70.3320960227271	2.79291064121731	69.817575	1.306825	1.5726355
64.1508826393401	7.42723718431326	64.181275	8.885925	1.4590044
61.3262873905405	9.54496025197741	61.5062	10.2838	0.7604293
54.4570400284905	8.3967534732118	54.0981	10.209075	1.9657569
46.1517084653204	7.00850198673651	46.59205	4.24755	2.7958463
42.5611638529718	6.46325047065314	44.6523	7.1683	2.2507146
Route: 2 Length: 167.898287189581 Demand Met: 374				
2.41247914579829	3.22008060988974	2.34935	1.70725	1.5141472
11.2423134561874	15.0057907553681	12.5519	14.734025	2.0899186
20.0149834019517	26.7151996077553	19.9845	27.40155	0.687027
23.3890301884302	31.2187423882173	22.793175	31.8095	0.8390697
26.4944863679022	33.5872736871132	26.51415	33.575825	0.0227537
27.2872103835895	39.4113716262687	27.2689	42.18555	2.7742388
27.5960179588278	41.6801628577235	28.231575	43.86655	3.8908642
27.9020039722735	43.9282240854487	27.251975	44.47235	3.7272714
28.2828825985555	46.7265169227096	26.549225	47.5983	1.9405088
29.1092713507994	47.5346238279597	31.24645	46.9846	2.8458636
30.3937681771646	48.7907044324226	31.916925	49.63125	3.3038515
31.6731458363616	50.041779033914	30.804475	50.3614	3.2757758
33.5547755255155	51.8817823948455	37.074525	51.14655	3.5957201
33.7401901252443	52.0630951732482	34.822	51.041775	1.4877525
34.5988510838308	53.0486365348134	33.276075	49.648225	3.6486347
36.8524727126673	55.6352651299073	36.8297	55.690525	0.0597683
38.7943600741731	55.4946248317849	41.89655	53.797625	3.5360134
39.6037066688279	55.4360082845537	40.529725	53.231175	3.1574837
40.5120517740784	55.3702218232411	40.703325	55.537825	0.2543153
40.4587127007979	54.4736605358004	38.966475	52.166125	3.6894736
40.415786403214	53.7521247342178	39.658325	53.39295	0.8383044
41.6603615459579	52.8526462875757	41.3638	51.811825	1.0822466
42.0112992209254	52.8774856681269	42.80595	50.969325	2.8313705
42.7459463551781	52.9294840025674	44.549375	51.8385	3.4753711
43.3237696552992	52.970382342557	43.47965	52.4779	0.5165632
44.2057484525227	53.5019759955105	44.413025	51.821425	1.9013123
44.9677144285566	53.9612345188667	43.054225	52.07985	3.6716308
46.0277066130187	54.6001219064397	45.616825	55.349625	0.8547389
46.1746467531682	54.6730157312882	46.119125	55.3112	0.6405949
47.67014207035	54.2317146324136	47.802925	54.5327	0.3289734
48.2124964718	53.9036445216572	47.81055	52.508825	1.4515793
50.5656079597938	53.8633451551992	51.731775	54.063975	1.2006342
51.8056506864766	53.8421082006116	51.8225	53.851	0.0190516
50.5070260479649	51.8707998390723	50.9611	51.5263	0.5699678
50.3095118786129	51.6435762706717	50.5204	51.7746	0.2497815
49.2794583224174	50.4585856453359	50.075475	49.526025	1.2581756
48.2682354353988	49.2952581571804	48.801425	47.111675	3.261649
47.2994494991355	48.1807508728454	47.35915	48.071	0.1249376
45.2199899477033	47.8852445087065	46.718325	46.79505	2.1962207
43.3086567838574	47.6136301204339	43.10885	48.272275	0.6882847
41.2759838683028	46.636967533649	40.7628	47.39015	2.9963842
39.3561832336571	45.7145380249518	37.32375	47.164775	3.8061293
36.7392056963544	44.4571275806534	35.77655	45.5234	1.4365385
36.4925893582445	44.3386329396007	34.241775	45.041325	2.3579528
36.8651352702135	43.6844402174939	38.0514	44.25295	1.3154571
37.5049663327464	42.0643768323087	36.34605	45.558575	3.6813731
38.303377909642	40.0427848906802	37.4986	37.94785	3.3389816
39.1096276196411	38.0013466740965	39.47365	37.672175	0.4907813
37.7329188492519	38.3907820810961	36.0198	39.389875	1.9831699
37.5149952657485	38.4524270413844	37.4906	38.735475	0.2840973
35.2710518822866	37.3750510100299	35.05695	38.887125	2.3714259
33.1891207529154	36.3754612678575	31.8731	36.0461	1.8377332
30.992743195416	35.3209227808342	30.2641	36.115	1.0777196
29.9510466494538	33.5572669986722	32.29465	34.1886	3.1017705
28.8435208756226	31.6821583448945	29.46595	31.229925	2.0362226
27.6344559485753	29.6351376947675	28.216025	27.287675	2.41843
27.006082080761	28.5712623822839	27.65685	28.081275	0.8146082
24.0994865958455	25.4962102779463	20.995625	24.282225	3.5058599
22.2605827555849	23.5507298263435	21.1268	22.989225	2.3000479
20.3750088829976	21.5558746441901	20.686175	21.9667	1.6301674
18.6300155318928	19.7097473778904	20.9892	20.7572	2.581261
11.866245144627	12.5539721427148	14.259	13.428825	2.5476741
Route: 3 Length: 230.3664202689 Demand Met: 375				
2.26756925243232	13.8465104480244	2.125025	13.8908	0.1492663
15.0884296589665	41.0671314026092	15.806625	40.87695	0.7429492
15.2042254827306	42.5573648449971	17.095675	43.177	3.0748926
15.4171442628018	45.2975186512323	13.3837	46.032275	2.1621199
15.8236470307226	45.8718526638309	14.24105	46.110125	1.6004334
18.988212949995	50.3429667373865	17.219275	51.795125	2.288647
22.9159760470366	54.4853674214192	22.891175	56.122525	3.1174634
26.5401263342645	58.3075640058556	26.5978	58.30075	0.0580748
24.0241421616758	62.6653326570139	24.44465	63.1281	0.6252843
21.6436645898581	63.751276765985	21.668825	63.73225	1.824597
18.9270735601857	64.9905516146169	17.272875	64.973225	1.6542893
20.3929889412876	65.6967456782944	18.3822	65.772725	2.0122239
21.7962557718622	66.3727603805852	21.0091	68.35155	2.1296062
26.6675430930292	67.9239003601221	28.20205	68.6988	3.0947027
30.1993024547948	69.0485021430629	31.583525	68.6781	2.5702207
33.2255310241878	70.0121302993662	34.7277	67.482525	2.9420086
37.3921679645003	73.9999647005475	36.110325	75.95995	2.3419359

Solution x	Solution y	Original x	Original y	Radius
39.4954059599461	74.8765791468379	40.4153	76.30845	1.7018987
39.5775031723994	72.4493225564053	40.205375	70.4585	2.1049867
39.6452352790865	70.4467768708915	39.430175	70.428325	0.2158504
40.1822138649905	66.5623257681123	39.7753	66.19835	0.5459462
40.9951657556134	66.3559124776971	37.615325	65.262725	3.9137176
42.0950586365644	66.0766431438276	44.898775	67.784675	3.8144474
42.0950586365644	66.0766431438276	42.3891	68.379025	3.3982575
42.0950586365644	66.0766431438276	41.683175	67.299925	2.7312469
43.1949514572742	65.7973735727005	42.88515	65.09985	2.6385081
44.2095021179844	65.5397728675525	44.4217	64.703925	0.8623628
45.0778533410042	66.3420842772998	43.7645	63.186425	3.8299193
45.8888557258068	67.0914083281602	46.228875	65.56925	2.8726006
46.5620890130631	67.7134411281318	45.884675	65.715725	2.1094453
49.759324050873	70.6675194437462	49.5023	72.1454	1.6675468
49.759324050873	70.6675194437462	50.03295	71.692275	4.0015227
53.4551432878031	74.0822646329961	52.726325	74.9715	1.1497459
54.7575267954556	75.0263974924676	55.289875	75.9977	1.1076205
54.5198420527815	71.0158488693657	53.249925	71.4317	2.1097265
54.2432692802439	66.3491190158842	55.5813	65.9389	1.399502
53.1116976636166	64.4431673600049	52.902425	64.80215	2.0317535
53.1116976636166	64.4431673600049	53.6353	62.58645	1.9291342
52.3981949865783	63.2413851696726	53.3194	62.871025	3.2245451
51.4884473826889	61.7090596941097	53.1029	58.71345	3.7092457
50.5786997311794	60.1767342468191	51.0767	59.931625	0.8096439
49.9062112237276	59.0440341293721	50.342	58.1772	0.970213
45.2722020378666	59.5246764814905	45.110025	59.219325	0.3457469
44.0785416932805	60.9485067517969	44.541975	62.0002	1.1492733
42.1195036016559	60.8642203920386	42.114525	60.87195	0.0091942
41.3950353980966	59.4357723229522	41.765825	57.606275	1.8921573
40.6694844275791	58.0051891438019	41.323875	57.06515	1.1453823
39.1551953774441	57.8305478168591	39.243575	59.34405	2.5403868
39.1551953774441	57.8305478168591	40.468775	56.35765	2.0428185
37.6383986346935	57.6556175861119	38.122975	58.912025	1.3466157
35.1031738285306	57.3632327216933	32.800625	59.186225	2.9956219
32.1659209532592	57.0244823066172	30.688625	60.637275	3.9031621
31.2914217474913	56.3436740181218	30.732825	57.781	3.9919808
29.6579869263043	55.0720340254707	28.87265	55.2137	1.0577671
28.6755640442232	54.3071985519079	30.1798	54.1346	1.5141057
26.9703156205586	52.9796413197836	29.2116	52.625	2.2691686
22.5176866567555	49.5132183443431	21.4066	50.274675	1.3469706
21.6312459680896	46.5676975946247	19.028925	48.6519	3.3340627
20.5105954626471	42.8439298529242	19.292975	43.870425	2.0965358
19.443078929377	39.2967189378192	19.322625	41.061025	2.6823985
18.3755624034779	35.7495080204959	18.77905	36.01655	2.0153111
17.5166986049193	32.8956233432312	18.476575	32.50015	1.0381531
15.0468051354727	28.2572664094142	15.2685	27.387025	1.686213
12.9446096424961	24.3094316998039	14.358825	25.883825	2.1162985
7.22125603170878	13.5612147550512	5.2982	16.16745	3.2389206
Route: 4 Length: 266.572622652324 Demand Met: 373				
18.2228839415536	12.2890075531273	17.13825	10.254625	2.541304
38.3597376178563	25.868748702504	39.217825	28.48755	2.7558001
44.850605830859	30.2460121660482	43.312375	33.022625	3.1742295
47.9361203403995	31.6183463773178	48.825175	33.4678	2.052047
49.8324128629348	32.4617528982687	49.014675	34.9475	2.6167984
50.8497697352014	32.6862053114631	49.821325	32.088775	2.6868713
52.4189305144162	33.0323988821087	53.08505	32.116125	1.1328164
53.69340564991	35.2039816509048	53.51985	31.610925	3.9899375
54.9419556695201	37.3313904953128	55.894525	37.29925	0.9531114
54.2707128783646	38.6751572232812	54.125425	38.6935	0.1464412
55.9676777124815	40.6318129028599	57.24125	42.40615	2.5354041
57.6664066866801	42.5905022920908	56.281125	43.406775	1.8663211
60.1187647599008	45.4181507413154	58.59885	48.807625	3.714657
60.4101957433477	45.7541802385291	60.81405	45.86495	3.5607331
61.7311219521594	47.2772509464255	61.33205	47.81805	0.6721027
63.0086692702935	47.8402861290883	63.06625	46.073225	3.8790845
64.0044090971594	48.2791243392875	64.04505	44.910675	3.3686945
66.1402530201441	49.2204241687141	65.024675	48.473875	1.4488497
68.1085916225464	50.0879013741615	70.38585	48.289775	2.9015796
68.2988794928157	51.127430058342	70.163125	48.595475	3.4643229
68.3203922723284	51.2449526485829	70.20275	51.264575	1.88246
67.3395577352092	56.0369176948773	66.095725	55.876775	1.2540995
67.1840460685242	58.9035617170396	67.662425	58.9604	0.4817437
67.0317269175675	59.7297154239378	68.048425	58.486425	1.6060654
66.4225939654553	63.0335437488356	68.033375	62.578975	2.4747025
66.1571401457579	64.4733177689944	67.8084	64.88	1.7006027
63.2606835928528	73.8157208104387	63.106325	74.44845	0.6512855
62.6600734742591	75.752964104759	59.360575	77.3659	3.7611478
62.4498761991082	76.4309477604233	60.77085	76.3761	1.6799218
63.2675232638069	79.8410932252446	64.2971	80.8087	1.6296583
63.6465247647875	81.4217862553725	66.686275	83.4025	3.6281274

Solution x	Solution y	Original x	Original y	Radius
59.7269969047895	82.1369074811433	60.2356	81.956375	0.9615343
56.2553587062532	82.7703106736992	56.13655	83.451075	2.1163693
52.805008661569	83.39982978443	54.01775	81.8894	3.9555254
49.0993762179075	84.0759253016139	49.4347	86.0537	2.0059997
43.967815565867	84.8800368016556	43.9034	88.387225	3.5077797
43.6350060470814	84.8152835499134	42.31835	87.347525	3.5183382
41.1567014490059	84.3330912933837	40.913925	82.729825	3.0771461
38.6936500867565	83.8538666959288	36.3513	83.686975	3.004223
36.026461683996	83.3349241584396	35.60905	81.995775	1.4026949
34.7038208244716	84.687195386425	30.896	84.86835	3.8695341
33.3046841984846	86.1176761318381	32.733925	86.47665	0.6742613
32.4146168425594	87.0276831286975	33.324025	88.862275	2.0476207
28.4489204931031	87.5216810381002	27.27955	90.9405	3.6132742
26.6584197705546	85.7395333581078	23.831575	88.204275	3.750467
25.4200407752761	84.0983399562678	22.609375	83.218325	2.9452111
24.2177584195981	82.504984546014	24.1584	82.49565	0.0600879
26.0078557086572	81.2473837082962	27.4824	83.15295	2.409453
28.3817934534536	79.2286628986738	29.23795	80.022375	1.1674686
28.7156820494985	78.7698085492952	30.46345	78.65395	2.8521408
29.597026975238	77.5585995051398	31.60195	76.5275	2.2545249
28.6351572730484	77.5665539128058	29.5312	77.759375	0.9421706
22.6635595111897	77.6159382213355	22.467675	76.02705	1.6009174
21.4424391346195	77.9109648801119	20.9401	75.2051	3.2102784
20.0139570474391	78.256090583432	19.41455	76.0326	2.3028676
16.6418517247543	79.2608219392744	16.4015	79.860725	0.6462605
13.004874003109	72.89517920447	13.11545	76.27845	3.3850773
9.13461381547715	66.1212323974559	8.8531	66.09375	0.2828521
10.5330613993132	64.5064090215943	12.50315	65.202575	2.0894727
10.3892464607534	60.3236821446901	10.71515	57.182775	3.2469865
10.2620041053054	56.6229449509272	11.458875	55.406825	3.5619902
10.1120380301089	52.2612988855136	9.352575	52.2461	0.7596151
10.1560858647058	51.6704411769714	11.134375	51.580675	0.9823989
9.29164489342151	48.3867919235345	8.9679	51.422725	3.3986294
8.5548519725299	45.5880262083695	8.7059	46.626875	1.0497725
6.45789692814294	37.6225713013681	4.729125	38.22055	1.829267
2.3482394159925	22.011633610045	0.610975	22.331075	1.7663891
Route: 5 Length: 248.592102318563 Demand Met: 375				
12.1433095233262	15.2920686619921	12.54795	14.295525	1.0755618
26.1257283886815	32.9001277296932	25.49855	33.45475	0.8372327
32.1027766139247	38.9780161551209	31.7652	39.5927	0.7012804
41.2503414652812	40.9342079399081	43.242475	40.8624	1.9934273
43.2794372310142	41.3681267536546	43.5222	45.0811	3.7775081
45.0220855601119	41.7407892524827	45.015525	41.584025	2.3336041
46.8666706211516	42.1352507457737	44.89855	41.381	2.1076985
48.1512660120431	42.4099593836943	49.0937	40.0849	2.5088011
52.6184739718277	45.2077081914038	55.460475	43.213925	3.4716194
52.6577637468169	45.3900332678817	52.0729	45.66175	2.0135272
53.0115655048987	47.0318579660521	51.332325	47.3944	2.0193416
53.0115655048987	47.0318579660521	51.464375	46.273425	1.9665818
53.4085299957111	48.8739803315485	52.703075	49.56845	0.9899267
54.438954938132	49.1130108717021	54.870925	48.098925	1.102256
55.7167368981932	49.9455106935256	56.4549	49.1402	1.0924331
55.9275380969493	50.2146735464909	56.7604	48.090675	3.4617573
56.2622976356001	50.6421134284924	54.099275	51.121125	2.2154275
56.9916684186988	51.5734152063556	55.262125	52.9866	3.5612885
57.5443260452726	52.2790796642619	55.9361	51.897075	2.2731123
57.9949369800754	52.8544451611895	59.0369	52.162425	3.0447964
57.9955535643491	52.8552324501028	61.491825	51.7088	3.6794322
57.9204903690678	55.3004394045216	57.767975	55.4125	0.1892578
60.1124164870404	55.9136135195239	61.751375	53.5726	2.857714
60.7588554998117	56.0944497639289	60.964225	55.767775	0.3858666
61.5509259477504	56.995531947996	59.205025	55.76	2.6513752
62.9722411661103	58.6124611815025	63.564825	58.6141	0.5925861
62.4686639855858	59.1789949343419	63.23165	61.378	3.0992482
61.8549690016138	59.8694132774713	62.1796	60.091575	3.7726122
61.3133747563982	60.4787169816392	62.138225	61.218175	1.1077798
61.3133747563982	60.4787169816392	61.732525	60.28975	0.5327791
60.2069905736959	61.7024105725841	56.708375	61.084725	3.5527238
61.292306812736	64.3761735616731	62.481725	64.778425	1.7172899
62.0677617360535	66.2865685586555	61.692525	66.479075	0.4217361
64.8519422635607	70.7034675584426	63.9561	69.944325	2.046353
67.4949824717556	74.8964577791303	67.97015	74.943825	0.4775226
65.7879961678734	76.6883027590775	65.721375	76.70655	0.0690749
67.9001922103125	77.2841843498803	67.096325	78.407125	2.3790582
70.0150866132878	77.880827214002	69.349625	77.516575	2.180516
71.8262536089212	78.3917841398475	71.96685	79.285825	0.9050284
74.7910749728688	76.4198153448103	75.94035	77.0935	1.3321727
75.022098890707	73.4070233558694	72.106325	71.513625	3.4765924
79.5046604599811	70.984480307147	82.150425	71.4598	2.6881218
77.8055513924809	69.0464807398233	76.3481	68.05155	1.7646676

Solution x	Solution y	Original x	Original y	Radius
76.5091943560089	67.5678589184756	74.758025	68.76505	2.7316723
76.5091943560089	67.5678589184756	73.97555	66.71955	2.6718873
76.022848365429	67.0131338514554	74.919425	66.332825	3.2122786
75.4150558848274	66.3198872412534	75.320425	66.338125	0.0963723
77.1870231041844	61.2950911624365	78.897475	61.3791	1.7125137
76.5304540387259	58.6222784046194	74.7548	56.66355	2.6437784
75.7480852221267	55.4373502049658	75.12385	56.355025	2.2591934
74.9585751751942	52.2233510056795	74.97575	51.8098	1.2273588
74.166126439998	48.9973887434184	75.70595	48.354275	2.7185379
73.4478862269504	46.073520272306	74.018375	45.692475	0.6860415
69.2239917353114	42.9683591062662	69.4258	42.661825	0.367001
64.4311770737546	40.1567622905751	64.627025	39.598675	0.591454
62.734958169009	39.9099867573754	64.48255	39.62755	1.7702677
59.8385080957428	39.488594757785	58.980725	40.369175	1.2293142
59.6025471790069	38.1197240878033	59.82755	37.21565	1.095882
59.442059005718	37.1886903624107	60.313175	36.907775	0.9152904
58.4944682376655	35.2429438291997	59.92645	35.207	1.4324328
56.728877200686	31.6175472139856	59.25755	30.092125	2.9531507
55.8205206408991	30.378006262437	57.8987	27.066925	3.9092312
52.5028425770067	29.7653296995273	53.429725	29.230175	2.9604889
51.1586591124039	29.5170990497869	52.727475	27.05645	2.9182147
46.4694190707455	28.6511357479476	49.48335	26.949275	3.4612295
42.0475178267499	27.834541782071	42.344525	27.231625	0.6721026
37.3693330379807	26.9706209694018	33.989075	25.3104	3.7659631
34.147150787655	26.3755802170165	34.098725	26.483975	0.1187202
13.6957918411624	10.5787583459672	13.011825	10.0758	0.8489863
Route: 6 Length: 244.021435187381 Demand Met: 374				
11.2212218422025	4.36270283676117	12.34295	3.720825	1.2923936
16.4944268581367	6.41287273400397	16.533825	6.314025	0.10641
48.3772419171618	19.4359636532769	47.99765	20.639375	1.2618593
51.7585847738653	20.2038811055645	54.7913	22.79115	3.9863921
56.4332004408328	21.2655072766635	56.707375	20.9848	0.3923879
56.5219137851937	21.6175416687824	56.46315	20.9863	3.1469731
56.6793618570218	22.2423310035726	56.145325	18.970525	3.3151033
57.2991152507302	24.7016516779218	56.18475	25.5187	1.3818024
59.8904606741947	26.2987703415264	58.5251	25.335175	2.8927993
61.2223512499845	27.1196516795997	59.6161	30.5374	3.7763801
65.687203994114	28.6307334585784	65.757275	28.49595	0.1519096
67.8709477734638	30.2313384105695	68.792375	27.90175	3.9463741
70.1032008058982	31.8675000462634	67.6691	30.587025	2.7503569
72.9821055814754	33.9776365225099	74.4851	34.7013	1.668137
72.9821055814754	33.9776365225099	72.419975	34.998125	1.302263
74.6208122569398	35.1787527836715	75.0516	36.4713	3.1806421
74.6208122569398	35.1787527836715	74.186175	37.664625	3.0650817
76.0192819751934	36.2037846209734	77.267275	35.3236	1.527158
76.8832353399133	39.0964544187986	76.5757	39.19325	0.3224087
77.3132128929453	40.3957278128621	76.046775	40.829925	1.3388025
78.4391117832915	43.5686327278471	80.128375	42.2928	2.9296913
78.4391117832915	43.5686327278471	77.736325	41.257125	2.4159837
80.2758692269185	48.7448136245428	79.556325	49.1563	0.8288938
84.9415870338327	54.3070027648197	85.3769	55.416	1.1913741
84.781809723455	51.1221353845526	83.835575	49.221375	3.0061312
84.5915030571584	47.3287261444677	85.726975	46.8848	1.2191665
83.6219628576318	46.1665010172093	83.247325	46.458225	0.4748225
83.4327816231398	45.9059181453841	80.003925	44.278875	3.7953033
83.0618555253998	45.3949954326741	82.166	45.384	0.895923
83.8474775309284	44.3669149897259	83.98185	43.958725	0.6740969
84.4445644657265	43.5855552108315	84.710775	44.260425	3.5456061
84.4451716444093	43.5847606455119	86.306375	44.08645	1.9276333
84.0875303814543	40.7595120265106	85.82305	42.253575	2.2900333
83.7127667067085	37.7990034629903	87.349525	37.1432	3.6954146
83.7127667067085	37.7990034629903	82.455325	37.974875	2.6754574
81.0015070771265	26.2660873065988	83.1155	24.690275	2.6366931
75.6901341893532	23.2210059123199	75.41995	23.365625	0.3064542
75.7691702651423	22.0486898563109	76.538875	22.08605	0.7706109
75.8235968790635	20.2166344627534	77.750225	18.79385	3.8375488
75.8235968790635	20.2166344627534	76.27055	23.463675	3.2776576
75.8878340120358	18.054353563083	75.3053	17.780525	0.815641
75.8946654936807	17.8243962260502	77.472675	18.057475	1.59513
75.9991747513519	14.3062715076055	77.464	15.628175	3.5672263
76.0722129836174	11.8475721587626	76.1173	11.832075	0.047676
71.9222455799172	6.83805772995834	71.829525	5.85575	0.986674
69.3270769852543	11.5480300913826	68.784175	11.8632	2.318307
66.6854714627776	16.342284951468	66.273425	16.5814	0.4764014
65.7558463305602	18.0294648685523	65.789175	19.559925	2.251298
64.8092749840543	19.7474017282911	64.881075	21.1972	1.4515751
63.5642736658339	17.9375968692564	62.8697	20.929125	3.2881032
61.9511487157659	15.5926664742601	59.666825	17.15215	2.7658857
61.5138014867784	14.9470651907544	62.944875	12.9098	2.4896628
58.3127737161193	14.131912305118	58.962525	15.549225	2.3682429

Solution x	Solution y	Original x	Original y	Radius
58.3127737161193	14.131912305118	58.66755	14.455925	1.8727735
55.7314943383958	13.4745802816357	56.680125	15.845675	3.207153
53.1743626187755	12.8233971533778	56.7601	13.3255	3.6207209
53.1743626187755	12.8233971533778	53.686425	15.19815	3.2492576
42.9995231354779	10.2323341701744	43.2503	8.7931	1.4609189
39.2173382033644	9.8694152945399	40.4237	12.94705	3.5125829
39.2173382033644	9.8694152945399	40.718225	8.45085	2.0651849
33.6064364380351	9.33102386236191	33.240325	8.160175	1.9941137
33.6064364380351	9.33102386236191	32.636425	9.71905	1.0447423
32.6180634875704	9.23618490882592	32.5307	9.603625	0.3776832
28.3274465524343	7.56611828641078	28.471925	7.124375	0.46477
23.4302530915401	6.2581008632142	25.090375	4.2535	2.6027734
11.0683198739952	2.95629060247182	10.7326	2.49095	1.8617797

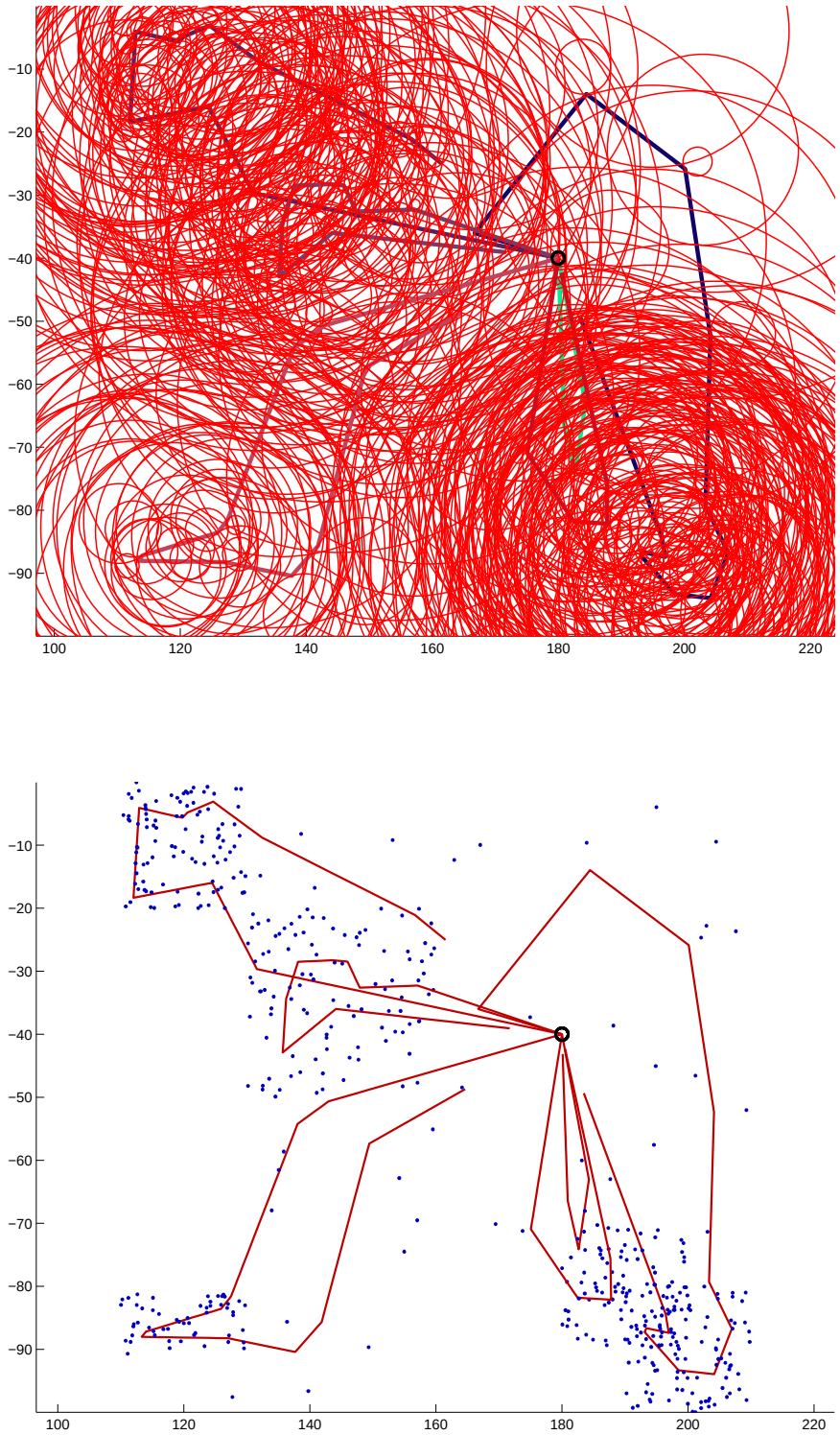


Figure O.53: *team*5_499, arbitrary radius, 2D, Euclidean, Length = 825.9850379

Table O-56: Solution for *team*5_499, arbitrary radius, 2D, Euclidean

Total distance: 825.985037931262				
Total demand met: 9744				
Depot: x 70 y 40				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 200.04656791723 Demand Met: 1621				
67.7573362041617	39.32596472143	54.1532	48.4548	21.9974
65.5149209533698	38.6520041313914	49.5874	32.9921	32.9977
63.2738167917717	37.9784375808797	49.5234	55.0957	33.4236
61.036687929194	37.3060657947503	47.084	47.7144	24.8395
58.4898398028626	36.5406074910458	45.8434	28.1097	15.1991
57.8896377146982	36.3602160252702	45.8095	43.1051	19.6777
56.7328220322474	36.012533675423	48.0614	30.3792	10.3406
56.7145356507759	36.0070376815382	44.3864	36.3116	25.6737
56.7135779699004	36.0067498493982	44.7486	39.7162	12.5268
59.2930364025223	32.8010985456622	47.2998	37.9687	27.2808
61.1070081663364	30.5467645276462	45.8348	38.3992	22.4696
62.9419046874265	28.2664260065963	49.2766	27.3707	19.0778
64.7739556278225	25.9896238602941	49.7446	26.3767	17.8751
66.6062457845008	23.7125243799482	38.8284	23.4703	29.4494
68.4460156366761	21.4261294036607	52.9148	12.3625	18.1234
70.2822970839746	19.1440696666716	57.0413	9.9678	25.5663
72.1187298025961	16.8618219355082	94.4757	9.4701	35.9228
73.9537119341084	14.5813770014267	84.9979	3.9891	21.6131
74.4511310600076	13.963203737815	73.9225	9.6395	4.3559
90.110768002099	25.8652868695874	92.0943	24.688	2.3066
91.9399196663665	37.9351302876903	92.9329	22.8145	15.1532
94.1254240980859	52.3564047835752	99.2739	52.0431	5.158
93.5973441241705	70.6588670480351	89.2994	73.1482	4.9668
93.54781004186	72.3756444739661	89.4099	75.3847	13.3372
93.3476121701645	79.3142039788717	89.4354	80.1567	4.0019
93.3480498954475	79.3151030876398	90.3741	83.7882	6.0655
93.6120525847963	79.8573777896696	99.7949	88.8243	10.9809
94.4467187405353	81.5718237165339	98.6006	82.3388	4.9458
95.285604219507	83.2949363517473	97.4362	85.8361	6.7092
96.1236608160196	85.016346420501	92.7639	86.5161	5.447
96.9563996289738	86.7268334972637	97.0785	86.7219	0.1222
96.2749069384494	88.4719606473478	94.4375	89.8165	6.7853
95.5925265828694	90.219360975729	96.809	92.5136	11.7087
94.9126108045371	91.9604500127452	99.292	98.0492	20.4892
94.1449173725094	93.9263146993102	95.4796	96.129	2.5755
92.9381500160569	93.7943110691328	84.0572	98.2927	11.5023
91.4747033837048	93.6342302641492	98.1513	96.345	8.7509
90.0106607384728	93.4740842924681	89.983	98.6224	7.2459
88.4903936765972	93.3077882026332	88.3602	93.5594	0.2833
87.7204510064752	92.4382897081071	96.6676	92.6743	10.3882
86.9130918525441	91.5265366696939	82.0258	98.9707	16.4132
86.1091566918051	90.6186503640521	93.4254	97.8126	10.7468
85.2516970067499	89.6503186589625	92.8113	98.2407	11.443
84.7318048193852	89.0632029071384	83.6163	95.496	6.5288
83.1137154306652	87.2358898759613	74.9451	88.4605	8.2599
83.1141296914626	87.2349797177378	78.0272	82.0721	8.7342
83.3887147182609	86.6316986201489	83.1803	86.2205	0.461
83.7491412480327	86.7068063473159	83.3685	88.3604	8.2767
84.1534210683158	86.791052473649	88.3919	89.421	7.2563
84.5575698091475	86.875271288344	89.3359	93.6392	11.0562
84.9620218534015	86.9595533118343	84.3334	97.0716	13.2701
85.3664738968668	87.0438353402152	83.3686	96.8014	13.9298
85.7709259387851	87.1281173740937	97.9735	93.9042	16.4454
86.1792465644506	87.2132055709451	86.994	98.105	12.5626
86.5787068456872	87.296447403051	92.0809	99.3222	13.6093
86.955994980335	87.3750688776441	87.6085	88.0524	0.9405
86.8729730789548	86.885883870144	94.509	92.4532	10.0411
86.7965229886538	86.4354215615897	96.1791	97.5552	14.7422
86.7186983740527	85.9768602327344	96.0605	94.495	12.9494
86.6450865224492	85.54312151913	90.6972	96.9626	12.1171
86.448690823462	84.3859108784379	89	83.7031	2.6411
86.4147184929008	84.2942383631689	87.7484	83.7546	5.1562
86.2821244173949	83.9364403712211	85.9222	83.4369	1.3228
86.0930139608918	83.4261359411129	84.5701	92.5098	11.4862
85.9042878093366	82.9168685252497	88.2673	94.5543	14.161
85.7156449164786	82.4078257656411	96.5452	93.172	16.1374
85.5270522856494	81.8989186373134	86.0867	81.533	7.8826
85.3385207759599	81.3901764547552	90.256	83.0105	8.936
85.1499644418251	80.8813672985489	99.0472	85.7396	19.7408
84.961591359143	80.3730526471272	99.7041	87.1751	20.8453
84.7732880854582	79.8649263732226	87.8518	83.2273	10.2812
84.5852645021342	79.3575548201992	89.6546	85.279	10.469
Route: 2 Length: 171.384122739338 Demand Met: 1623				
62.7861874320676	38.460451564989	42.5333	36.3249	34.2929
55.5764702213498	36.9217771517643	42.0622	41.0674	34.7982
48.3738092037818	35.3846086246761	24.4655	29.9184	29.8304
40.2710355536071	33.6553409712053	30.3241	25.8121	12.6672
37.4503944295026	33.0533688880912	12.295	19.9912	28.6871
33.6919122174471	32.2512457974642	37.9243	23.9119	11.4323
28.7608037579509	31.1988646304063	9.0075	17.4052	24.0927
28.4501350929731	31.1325627302661	30.555	31.3009	18.8032
25.721783453971	30.5502867700792	13.9396	19.5452	16.1224
24.8253742861807	30.3589780383457	2.4532	11.1564	29.4831
23.5206905721814	30.0805366719142	15.42	17.0914	16.8786
21.5906261826914	29.6686285859158	20.5677	31.0115	1.6881
21.459993318342	29.4171582165298	14.7151	17.4542	14.2143
21.1335058565651	28.788664597472	11.5168	3.287	27.8697
20.7975855775819	28.1420126549703	11.5459	0.8736	30.4629
20.4602634260263	27.4926620839831	15.7685	10.3669	18.5804
20.1228158554505	26.8430700815557	19.7672	14.9362	14.1421
19.7858003174407	26.194309749066	17.8934	15.1905	13.0517
19.4494417041192	25.5468140063554	12.5256	4.7007	23.5883
19.1131714416092	24.8994883404595	4.0211	5.0495	26.717
18.7768313319925	24.2520282176451	2.6723	10.4123	24.6134
18.4282038982422	23.5809147991432	5.4781	9.3534	25.1036
18.0972696132417	22.9438609767023	2.3396	12.8751	24.3453
17.7663093526787	22.3067571509842	3.7626	17.1174	21.877
17.4120924919496	21.6248839939942	9.9074	11.0867	12.9373
17.3000381485611	21.4091775805733	5.2006	6.8919	22.5304
17.1729142223126	21.1644619768769	8.0267	2.1019	25.3395
17.0434509072422	20.9152430119968	10.6256	1.7583	24.4015
16.913048566567	20.6642164078548	18.047	6.7045	18.9999
16.7828870834237	20.4136534582054	18.8587	8.5087	16.8623
16.6541487456143	20.1658300867418	15.3812	8.8682	15.4856
16.5203103588595	19.9081890392047	13.2084	1.5682	22.8241
16.3954529185601	19.6678364570024	8.9599	2.5066	22.9145
16.2626804574539	19.4122473332749	19.5822	17.4941	10.5093
16.1328476391119	19.1623170693094	10.526	3.779	20.82
16.0073622015629	18.9207555828962	12.9432	8.6486	15.3773
15.8749606046883	18.6658803786495	18.6523	3.9117	19.4015
15.7463141741303	18.4182339302402	2.8757	1.3778	25.9254
15.6160403626666	18.167454747375	12.1595	5.1953	17.8764
15.4869021774182	17.9188616628716	16.5052	19.9903	2.3082
15.1430917521591	17.2570210628289	13.7484	0.7577	20.4003
14.7964384358967	16.5897078514649	9.7281	5.4172	13.7083
14.4778048714174	15.9763331127374	14.5843	15.7568	0.244
13.3613284305819	16.189177351834	16.6256	12.3206	7.479
12.3017373930392	16.3911770001841	16.2452	9.322	31.0488
11.2400294510711	16.5935802135934	14.7479	11.7757	30.4615
10.1755549636155	16.7965108393412	5.6246	7.277	11.7089
9.11271282335547	16.9991302757637	5.0355	11.9367	6.6489
8.04823832908477	17.2020609028823	8.098	10.1576	7.8091
7.5491162542839	17.2972131650111	8.4009	11.7989	5.5639
5.91740006094418	17.6082823279181	2.5621	10.2967	12.6169
4.85050903060477	17.8116736422226	4.8686	17.5054	8.1304
3.78497087014378	18.0148070466992	3.5607	15.7968	5.1124
2.71992939411176	18.217845763525	1.5116	19.0597	16.8413
2.00465219061493	18.3542056787235	0.7828	19.7397	1.8473
2.15407617823526	15.9862662565133	2.785	16.9995	3.817
2.28570946395735	13.9002581737403	2.2625	16.1551	18.392
2.41744768520691	11.8125871658322	4.243	12.8676	6.736
2.54884983145251	9.73024198333875	2.4914	14.471	5.3662
2.7370688523575	6.74751312574966	1.4037	6.1535	1.4597
2.73713183016631	6.74651511082211	2.7247	6.6491	8.9474
2.79029817375624	5.90398184655685	1.2192	5.9144	28.8322
2.84535662760601	5.0314640867086	4.1027	5.9391	6.8207
2.90461553419635	4.09238125847986	1.2646	1.8964	2.7408
3.89137843963054	4.31806481907543	2.4773	0.052	34.0937
4.92373041491113	4.55417510235366	3.8933	3.6617	1.7453
5.9563285783186	4.79034169157259	3.9473	4.1638	2.4396
6.98715256745666	5.02610250782246	1.729	2.5191	7.1357
8.03007334790681	5.26462999373316	1.2522	5.4022	7.2247
9.05157804365108	5.49825938457956	8.8668	5.4121	1.245
9.75914511180761	5.66008777721173	10.2894	7.4847	1.9001
10.5808035765715	4.83002185386251	9.4253	3.1222	2.062
12.5532694849784	3.99793405736358	0.4211	5.2548	12.1971

Solution x	Solution y	Original x	Original y	Radius
14.6579929483238	3.11005320551224	14.8098	1.8409	1.2782
15.3065193996513	3.59018871094825	5.6082	3.0104	11.8319
17.256309581945	5.03371248166265	15.4595	7.4752	3.0314
17.2571166517318	5.03430293772298	18.0288	10.2093	31.7011
18.2084190764974	5.73028091106723	15.5961	8.5134	9.1422
19.1261927875543	6.40172797131069	12.8565	9.4609	9.659
20.077538063885	7.09773664217219	11.3126	12.1774	11.447
21.0288407567816	7.79371415993796	22.1476	14.8515	12.414
22.4353171542324	8.82269889605037	19.0819	14.2893	6.4132
22.9553828422308	9.08612838421549	10.31	1.5005	14.7461
27.8323725554082	11.5564757497907	28.6149	8.2266	6.0195
32.6829079437392	14.0134231749573	18.2952	1.0836	19.3439
37.6767505891115	16.5429601936928	32.1965	21.571	23.9954
42.7092448120729	19.0920754428616	44.6412	21.1681	2.8359
46.6736859286488	21.1001884877095	47.312	20.115	1.1739
48.9165160348358	22.9174094231192	47.7847	28.4345	34.5556
51.5236034740134	25.0297646391368	49.2796	22.4102	3.4493
Route: 3 Length: 107.478347585564 Demand Met: 1621				
48.7807970721392	32.8480727356748	15.9493	16.7531	36.5644
48.2626577763322	32.6734340101464	45.5527	26.8832	29.6166
47.3968815683415	32.3816243466102	41.7938	26.8087	25.8964
47.1064288512191	32.2837273278643	47.2249	31.4694	0.8229
45.3829889659054	32.3460599980979	44.5785	34.1629	2.9998
44.3060434861434	32.3850105225349	33.916	28.6484	11.305
43.1584961621861	32.4265145456848	30.1704	30.5441	13.1238
42.1631058858053	32.4625154147835	28.392	21.3903	19.1959
41.0972388005535	32.5010652603936	11.8636	12.6991	36.7112
40.0312595226934	32.5396191637215	38.1953	36.049	32.0805
38.9645888840218	32.5781980718488	28.4031	32.2444	13.356
37.9132742275998	32.6162215910548	36.1356	35.5262	3.41
37.4527310182385	31.6325327342984	40.4113	32.0356	16.7439
37.0148103110656	30.6971639979127	13.8628	4.3052	36.3913
36.5619705955295	29.7299292780541	37.4163	24.6203	31.2894
35.9776163306157	28.4817884583743	37.8149	25.869	3.1941
35.4603059108752	28.4336445777685	21.8127	22.4456	26.3083
34.6262782325585	28.3560251689166	35.1494	28.8106	32.8637
33.7622891736016	28.2756173817626	20.4824	37.2243	26.8839
33.5591361679475	28.2567107955665	27.0169	46.6583	30.8141
33.5581404706343	28.2566181302525	33.6715	23.2449	5.013
31.2554966296081	28.3662338293514	35.5448	24.2684	19.4434
30.4274890435661	28.4056505332135	31.0534	27.3935	17.9341
28.9299406854326	28.4769402425918	3.6086	13.0876	29.6311
28.928941816594	28.4769877930223	29.0027	23.8765	31.6897
28.9279429477554	28.4770353434528	30.4469	21.4825	31.6307
28.9269440789168	28.4770828938831	25.9644	23.203	29.8543
28.8407563163249	28.4811858001631	25.1657	24.0751	31.1219
28.5931932212071	28.4929708627031	27.0718	22.4926	16.8129
28.3763368233395	28.5032941551063	4.753	19.8404	29.0972
28.1262804090249	28.5151979103358	26.5855	26.5008	2.5361
28.0099197288232	28.875416951108	19.3111	17.5672	32.0992
27.9131024106123	29.1751353906857	12.6858	19.6571	29.725
27.8234709115902	29.452608610563	8.6382	10.3371	27.1817
27.7226744561034	29.7646453093244	15.3264	12.7877	21.1927
27.6496459928503	29.9907203283093	17.3372	11.1211	21.5037
27.5308301665779	30.3585397918871	23.8984	35.8981	7.2024
27.4330133986315	30.661352239052	22.5985	27.2784	18.0514
27.3363478089188	30.9606009710884	27.0476	34.4285	22.5144
27.240122103516	31.2584879483728	24.5672	24.4137	9.9276
27.1441902547049	31.5554652305212	27.7157	24.2487	7.9151
27.0478317314047	31.8537633736171	29.6006	20.2054	12.7079
26.9510597264586	32.153341536455	36.302	43.7274	22.8064
26.9510597264586	32.153341536455	30.9136	43.9894	22.4068
26.855226095877	32.4500147634016	33.3877	38.8388	13.1359
26.855226095877	32.4500147634016	29.5705	36.67	21.5656
26.7594424910637	32.7465331248841	9.2095	19.5087	29.1422
26.6632079343379	33.0444475034423	8.6500	19.7295	27.9816
26.5658241885324	33.3459194389798	13.2666	12.9678	29.5528
26.4712616968756	33.6386575873488	23.4789	26.9268	12.6384
26.3769111854066	33.9307395059805	23.4201	21.9457	16.8924
26.2813023224395	34.2267169172547	9.9632	1.8111	39.4027
26.2223576132448	34.409192703585	4.1301	7.1548	37.1524
26.2220502252899	34.4101442878668	3.9756	4.3104	39.2995
26.2217428373352	34.4110958721486	5.4981	6.1028	36.5373
26.2214354493806	34.4120474564303	20.9805	20.9752	15.7265
26.2211280614256	34.412999040712	11.169	1.5527	37.2188
26.2208206734701	34.4139506249935	22.8416	32.9746	3.8923
26.2205132855159	34.4149022092755	24.2607	34.0424	1.9949
26.0125235769349	37.700837037155	20.8616	31.8567	16.439
25.907138231785	39.3657721834154	20.1974	25.6106	21.4356
25.8021102402419	41.0250616626676	23.1185	40.5549	4.3029

Solution x	Solution y	Original x	Original y	Radius
25.6841857676052	42.8880967819287	23.5397	47.0618	4.6924
26.8630626884368	41.9255034221093	27.2789	43.4795	3.5918
28.1886004287839	40.8431564827655	22.5313	48.1754	10.3014
29.5190275309857	39.7568172122271	23.8226	36.8408	22.7865
30.8426261234505	38.6760536536631	28.4876	46.0461	21.3519
32.1618573101268	37.5988562314459	29.0396	36.1372	26.8002
34.1304178253208	35.9914591851048	33.7228	34.609	1.4413
34.5098272609304	36.0338594067758	26.8183	32.6012	9.1398
34.8796498201281	36.0751882630323	12.3192	17.7013	29.1964
35.6748650550323	36.1640561149121	6.693	16.2603	35.4947
36.2562025469283	36.229022443464	4.024	17.3232	37.3677
36.7350091697009	36.2825306188223	19.0824	1.094	39.3681
37.3544129673161	36.3517509798954	16.1355	6.6685	36.4875
37.7299463650722	36.3937180422626	36.9556	37.1182	17.3813
37.730940178569	36.3938291041089	5.3173	19.9696	36.3373
42.5996749968946	36.9379258385242	41.4412	38.9568	5.527
46.1562774767658	37.3353875737062	43.5486	39.6053	27.6035
49.7343314840858	37.7352465827877	37.7223	44.0563	29.1657
53.3292384219417	38.1369889569389	37.6461	42.0792	22.0605
56.9335672929768	38.5397842604845	44.7377	48.2657	29.7234
60.5398078870161	38.9427932059172	47.3754	37.9401	18.8601
61.7102185810959	39.0735903526401	43.1416	9.2079	35.1675
Route: 4 Length: 0 Demand Met: 18				
70	40	64.954	37.309	38.0588
Route: 5 Length: 68.9509620449684 Demand Met: 1619				
70.3089940129369	41.6647469689816	84.5964	57.5663	31.6899
70.6179881882811	43.3294948502765	89.379	76.0987	38.3025
70.9267188848756	44.9928233589183	85.22	71.0885	39.2361
71.2362345880415	46.6603815974196	48.8851	33.6728	37.4425
71.5446763120906	48.3221543036866	72.5026	72.4828	37.2859
71.8539347182938	49.9883276413133	75.6074	70.2776	26.094
72.1648011923108	51.6631652569028	78.9268	79.6337	28.7763
72.3852154211816	52.8506787398778	76.3867	80.9989	33.1367
72.6073895052002	54.0476739885768	77.4302	82.5606	33.5083
72.8292574672014	55.2430202835525	88.1669	82.2879	36.2685
73.0517389312816	56.4416722506158	80.2014	81.5949	32.3848
73.2950663457456	57.7526351777212	86.8222	80.0693	26.0963
73.4597670676762	58.6399850537061	73.1545	60.0435	34.4744
73.6460102489773	59.6433982471505	87.5661	81.6563	27.3837
73.8319119215135	60.6449715007166	87.8874	83.7559	28.0801
74.0178059963484	61.6465037615252	94.7976	88.4491	36.0251
74.205886682376	62.6598166661214	94.4683	90.0421	36.408
74.2817659993801	63.0686278697919	77.6803	63.0066	3.3991
74.0397021538889	64.7031901423969	73.6361	68.0431	6.0588
73.884984223412	65.747939682861	79.3483	75.3688	27.2443
73.7299256581268	66.7949893318981	79.7296	78.3022	15.676
73.5756550490204	67.8367182122706	80.7551	80.6861	19.901
73.4211303289149	68.8801629445766	85.5459	86.1581	23.0206
73.2663439280595	69.9253746942172	82.5335	87.3296	23.2737
72.6464934937707	74.1109810883037	94.6937	81.204	23.1601
72.6462546346325	74.1119521425309	93.0738	84.8753	27.0049
72.6460157754507	74.1129231967474	87.2864	89.2526	24.3141
72.6457769162757	74.1138942509656	72.5273	88.3137	14.2003
72.6455568434082	74.11291876753	84.7929	84.8117	17.1593
72.6453367705462	74.1119432840931	83.0689	84.7397	17.7189
72.645116697687	74.1109678006556	81.9035	87.9149	16.8426
72.6448966248394	74.1099923172155	85.5265	86.4226	27.3567
72.6422155748447	74.0981084354276	81.0772	83.8409	24.7807
72.641995501958	74.0971329519963	82.7718	81.5009	13.2622
72.6263258005114	74.0276762527843	84.0326	80.947	25.7062
72.6209934162742	74.0040402028625	89.0638	74.5581	18.603
72.6123817053888	73.9658683814543	93.093	71.3467	21.4346
72.5987771870551	73.905565707899	74.3211	82.1244	8.5161
72.5854467476668	73.8464778977949	75.4182	80.175	23.5169
72.5852266748093	73.845502414357	75.5773	80.7384	16.9072
72.5850066019521	73.8445269309191	84.3608	92.148	27.0972
72.5847865290991	73.8435514474802	84.785	93.3953	25.851
72.5845664562435	73.842575964042	88.5666	89.9178	22.668
72.5307867071372	73.60419466594	71.4242	75.4202	25.4968
72.518404431238	73.5493096377676	73.6863	74.2382	25.5224
72.5063606399276	73.4959249614027	80.2922	75.8098	14.5911
72.4938517155857	73.4404785576866	79.4655	74.4467	12.4177
72.4847406054747	73.4000931288991	80.5183	71.0301	20.9716
72.4713968480661	73.3409462887741	82.4808	71.6064	18.1512
72.4614975439146	73.2970671537892	89.7033	80.1502	26.8819
72.4559755317931	73.2725905693728	86.7862	83.711	21.1375
72.4557554589164	73.2716150859393	80.7173	88.9602	17.7309
72.4083760162943	73.0616034529353	80.4141	88.4668	26.3631
72.3725440277155	72.9027764570603	70.8021	79.2974	26.617
72.2447719346319	72.3364205632924	44.9743	74.4953	27.6089

Solution x	Solution y	Original x	Original y	Radius
72.2445518617685	72.3354450798558	73.1002	79.4037	12.7865
72.2443317888928	72.3344695964221	70.0314	77.1275	35.8588
72.2441117160497	72.3334941129809	73.6161	81.1388	38.2238
72.2438916432517	72.3325186295296	79.6279	80.9538	23.4026
72.2222085602499	72.2364073309946	79.415	85.235	23.8334
72.1978720385878	72.1285345429267	73.5126	71.3248	18.5601
72.1976519657333	72.1275590594882	81.6179	74.1421	15.9576
72.1974318928777	72.12658357605	76.1847	74.2911	17.8739
72.1972118200216	72.125608092612	76.1087	74.9228	26.6713
72.1969917467208	72.1246326092742	77.4087	74.0915	5.5705
72.070043643095	71.5619291065119	88.176	88.8141	24.7619
72.0415589610254	71.4356694012039	87.1273	84.0324	22.6844
72.0162724937011	71.3235859376594	84.7887	79.7551	24.4915
71.9897111215592	71.2058513946935	83.5177	79.6473	24.9276
71.9639446076328	71.0916400967107	88.9513	72.6403	19.8606
71.940670097947	70.9884747320845	84.8025	72.2361	24.0623
71.9271250449173	70.9284356333644	82.7574	74.2926	14.8137
71.9269049720238	70.9274601499348	73.5352	77.8165	36.1475
71.9266848991706	70.9264846664961	76.8895	78.6378	24.9962
71.9264648263031	70.9255091830605	80.3025	81.1115	15.7523
71.9262447534214	70.9245336996282	80.1131	82.5047	19.9521
71.9260246805448	70.9235582161947	81.7913	86.2239	19.3521
71.9258046076788	70.9225827327589	81.9044	86.793	18.7468
71.7477412149944	70.1333082954572	75.2812	79.5319	38.4796
71.7306598821498	70.0575944582708	78.4966	80.8407	27.0644
71.7304398092833	70.0566189748351	78.4301	80.0876	24.8331
71.730219736414	70.0556434913999	77.9819	77.7483	19.944
71.7299996635401	70.0546680079659	76.4126	75.548	18.6216
71.7297795906637	70.0536925245324	77.364	70.7565	18.9213
71.7295595175275	70.0527170411574	77.1908	76.3248	8.3165
70.915239960232	66.4432070069361	71.0504	85.2637	27.4246
70.9150198874652	66.4422315234778	73.8575	87.669	25.5244
70.9147998145684	66.4412560400489	47.0351	69.5204	24.0774
70.5377243027936	55.5423138488111	44.1821	62.8241	34.6478
70.4002417390273	51.568535640884	35.3466	47.2689	39.4146
70.2628302872693	47.5968127969889	43.0635	31.4686	35.4855
70.1089276962106	43.1484320530428	78.1743	38.6355	9.4129
Route: 6 Length: 92.749170158842 Demand Met: 1620				
69.0659685015923	45.8550981188094	97.6128	23.6668	38.6763
68.0907418379608	51.968433473545	70.8501	86.3243	34.4665
67.932639570034	52.9595181132478	70.5598	83.7819	31.7327
67.724837259907	54.2621539507373	76.9521	88.589	36.7425
67.5158725621231	55.5720764372652	77.1151	89.3423	37.2077
67.3062764225293	56.8859573044449	83.1514	91.319	39.4372
67.0818194237402	58.292995542288	80.5965	92.0964	36.4049
66.8858201183	59.5216433501546	81.0134	86.425	31.9429
66.6752535971376	60.8416078112583	80.026	88.4312	31.2606
66.4647539118947	62.1611533039832	83.3441	85.5151	31.408
66.253750576997	63.483856009044	82.7904	89.3622	32.2308
66.0430304332665	64.804783524364	86.8895	84.3247	31.0852
65.8321944003883	66.1264374826566	89.697	88.1654	35.3374
65.6212184487501	67.4489685471167	85.7193	87.9646	30.5682
65.4105860367073	68.7693461126064	82.1226	91.9552	29.2899
65.2008979731098	70.0838038986904	59.4827	70.1321	13.0297
65.0654475908075	70.9328928201257	63.7544	71.2264	1.3435
66.4641490622853	72.9832020136752	80.252	96.9762	27.7656
67.6481201375229	74.7187451684115	88.2817	96.351	29.8948
68.7760857682275	76.3721918383416	92.093	98.3621	32.0505
69.2330264790225	77.0420057743112	94.2258	98.7848	33.585
69.7355151034341	77.7785868579761	87.8356	87.4643	27.6715
70.2381317371248	78.5153555879201	92.1839	88.8237	30.3052
70.7405929014948	79.2518964179124	96.671	90.7145	32.754
71.4465487043162	80.2867331542696	85.8335	84.6274	15.0275
71.9820602950247	81.0717214840151	96.8293	85.3988	25.2212
72.0947378762201	81.2368917411827	71.008	83.9726	10.613
72.4840656588838	81.8075941745699	70.0787	86.0551	4.8813
73.0105471399698	81.8383865998677	72.6803	81.9225	4.2531
73.5636351636163	81.8707351683706	87.485	79.3312	14.9303
74.1233834429447	81.9034732758197	89.9071	81.4441	15.7904
74.5328602820907	81.9274224289859	87.0156	79.966	12.6359
74.9217928274612	81.9501700019047	99.1691	80.9928	24.2662
75.2207218948357	81.9676535239208	84.2824	83.9445	9.6857
75.5299992791699	81.9857422940229	89.5983	91.5249	17.2739
75.8405025587296	82.0039027552189	91.4519	94.5103	21.3367
76.1518908080846	82.0221149839133	85.4655	89.4614	13.9477
76.4617505526743	82.0402378091083	85.3838	89.3565	14.2439
76.772367046806	82.0584048991846	76.7822	82.9894	3.1025
77.0828808740189	82.0765659814899	84.1657	89.6201	13.6552
77.3935174501721	82.0947342424479	91.162	99.965	25.8943
77.6984324052439	82.112567865903	81.2522	99.2612	19.7395

Solution x	Solution y	Original x	Original y	Radius
77.7923762157335	82.1180623735874	93.3103	99.0843	24.3725
77.7933745097366	82.1181207609443	85.8774	87.324	11.0712
77.794372803737	82.1181791483457	89.931	94.5372	17.4038
77.7953710977357	82.1182375357773	79.3747	83.7664	2.2827
77.7626899370352	80.0463841078208	95.9324	92.1458	31.1565
77.7415972537783	78.7091932242971	92.5909	80.0433	19.5797
77.7106508847531	76.747318625367	79.9937	73.4457	4.0141
77.7081700743468	76.5900451473439	83.9295	97.9734	22.5699
77.6926075503321	75.6034440696389	78.8402	71.1237	4.6244
77.692497609409	75.6024501315154	89.0976	96.4455	23.7594
77.4009121891812	74.2529331868567	95.3031	91.4204	25.4609
77.3624791818986	74.075057307605	87.314	87.2617	16.5203
76.945555121906	72.1454474920237	84.4799	87.8799	17.7516
76.6708256197317	70.8739431284728	94.8083	91.5304	29.5468
76.3947830627882	69.5963616827199	85.8291	89.3215	27.9965
76.1181491723669	68.3160434157155	88.0059	90.774	31.4291
75.8409651230409	67.0331788569007	93.255	98.1789	39.9406
75.5634870669542	65.7489535273894	85.1326	93.3031	30.9423
75.2856739158876	64.463177267051	90.7381	99.8897	39.8736
75.007617444781	63.1762748104179	97.0848	81.6578	37.2835
74.7295814457371	61.8894670706687	88.7272	81.0174	30.12
74.4515405344928	60.6026366070814	94.7529	81.9671	38.2984
74.1728591435636	59.3128419259764	84.7658	77.8153	28.1634
73.8948397588458	58.0261112150718	84.6626	79.7388	28.8542
73.6161549205102	56.7363007325506	86.675	81.8002	31.4898
73.337976866819	55.4488358469095	90.1019	83.486	37.2389
73.0593679169115	54.1593767770951	82.0065	75.6791	28.4662
72.7811141783505	52.8715618020338	85.6153	86.7737	37.7006
72.5037658420703	51.58793732695	79.7775	80.296	29.6152
72.0012429805233	49.2621592610979	72.3356	86.155	38.7669
71.5009558462177	46.9467286725329	75.9291	73.9471	36.4707
71.0010365000281	44.6330002896693	84.4928	76.9707	35.8799
70.500462598231	42.3162426045662	91.1956	46.5873	33.1213
Route: 7 Length: 185.37586748532 Demand Met: 1622				
51.3708278210003	45.3550533463912	25.8602	58.6207	28.7536
39.0689687366005	48.8912873252006	25.0595	61.5431	18.8768
37.1707505112782	49.436940119752	15.4215	81.5375	38.9838
32.9560743935995	50.6484708969359	32.0319	48.7602	2.1023
32.8340378030174	50.7375246575116	32.7117	42.3778	10.9453
31.8626078698618	51.4464062173092	32.0569	46.2162	8.3019
30.8483528519602	52.1865385260002	30.7692	16.7931	37.8932
29.8542621041847	52.9119563621302	32.6554	40.5505	13.7264
29.6451347603981	53.0645628574873	41.315	20.08	34.9881
28.0415644081175	54.2347362420655	17.1642	87.7833	37.7116
28.0407566172714	54.235325711275	20.1897	48.2132	9.8947
24.9029198180247	62.3675918380479	41.9344	32.8635	35.1115
23.2584588891282	66.6295068975256	23.9463	67.9458	30.7026
21.6106495854849	70.9000998698951	17.7167	97.5636	31.3797
19.9506215224282	75.2023599459407	17.0519	88.8308	13.9972
19.7264637832226	75.7833048792125	13.2856	89.4879	21.8166
19.495168666514	76.3827476045876	32.6566	40.0511	38.6421
19.1854730097009	77.1853793730893	0.7751	88.6342	34.6112
18.8807099927863	77.9752273217469	13.6279	83.3943	17.0874
18.5757649804365	78.7655469441704	14.2132	82.4414	14.4019
18.2706667277066	79.5562637164858	15.9151	82.9337	11.014
17.9647909946109	80.3489954684123	8.8756	85.3213	16.0341
17.4851049309328	81.5921878255996	18.7876	82.3448	1.5043
17.3218988050147	81.7941516193753	19.7188	83.0222	29.297
16.8389431478151	82.3917980386463	17.0206	82.7787	29.1615
15.8889005721386	83.5674536812758	19.4915	88.9148	6.4477
15.8879436530576	83.5677440360112	2.0599	86.005	20.2991
15.359520949307	83.7280815579576	10.8331	85.8288	11.4013
14.7168643908144	83.9230806738565	13.8296	81.5783	24.0124
14.0745674200286	84.1179706812767	13.617	84.1913	7.3733
13.4319109189851	84.3129697797575	17.8246	84.0918	15.5287
12.7887490427323	84.5081222225154	14.2245	83.0966	3.3966
12.1460925265877	84.7031213255674	7.6764	88.6806	9.6476
11.5040081488983	84.8979468265839	10.6041	85.0219	25.6845
10.8613516501352	85.092945924368	9.9966	85.8576	5.4423
10.2195612604646	85.2876822215657	7.7403	89.8119	8.6997
9.5766772982399	85.4827503378096	5.091	83.7862	25.4049
8.93412215024935	85.6777186830827	5.1015	81.8103	31.1473
8.29176314136848	85.872627514493	2.625	81.2761	30.3022
7.65001466131982	86.0673510952134	1.1933	81.8445	20.336
7.00771512042539	86.2622418824682	3.3964	83.4982	22.6969
6.36547520865042	86.4571145766713	4.4842	86.5445	5.1195
4.02457263921966	87.1674067621746	2.5389	82.9669	4.4555
4.02364595996153	87.1677826152743	1.8225	87.776	36.7171
3.98701202964727	87.1826410208644	0.2473	82.0871	6.3206
3.98637560433156	87.1834123591932	0.029	82.9455	21.0457

Solution x	Solution y	Original x	Original y	Radius
3.61920475878482	87.62841814216	1.0919	90.7016	28.434
3.30534399807068	88.0088128691718	1.5647	88.8122	1.9171
4.88720742786784	88.0343044629677	5.387	87.7604	6.3922
6.38708326717716	88.058474833787	6.7503	86.812	32.5272
7.89036440447035	88.0827000806867	7.4797	86.7529	25.8983
9.39305490099531	88.1069158094756	9.2565	85.6186	2.8621
10.8954912191479	88.1311274421268	11.6247	87.7046	3.2321
12.3988332535758	88.1553536703453	9.5220	88.7288	27.8783
13.9014866093381	88.1795688006245	17.8311	84.5721	18.6031
15.4026220302221	88.2037594695068	2.696	85.7661	16.7328
16.9054934887928	88.2279781144228	1.983	86.3665	17.6822
17.0295776460262	88.2299777200053	19.3715	86.9483	2.6697
17.0305767841475	88.2300192292181	16.072	81.5553	6.7432
19.0099067948997	88.6346149191327	16.2773	81.3093	7.8184
24.2612295215617	89.7080400326871	19.5543	89.8549	33.619
27.6690124353389	90.4046263884672	29.7505	96.621	6.5556
29.3965656657105	88.4466270281625	26.3736	85.6358	33.6814
31.1772445624965	86.428415328797	16.4864	81.6235	21.8233
31.8620629073634	85.6522459711282	39.3354	89.658	8.4792
33.0392994304844	81.2467546726909	16.887	83.4344	34.5743
33.8084937800375	78.368251544523	12.6448	83.0865	35.3802
34.5784016239221	75.4870783562017	6.0677	84.3942	37.1993
35.3485443491863	72.6050261876586	5.1953	87.1361	37.283
36.1183030417224	69.7244111580979	11.8372	87.4011	35.7247
36.8889137466814	66.840607702018	28.8128	30.4765	39.1387
37.6585625814723	63.9604037851034	22.2385	33.2025	37.3358
38.4281715514433	61.0803490517208	21.333	28.4534	38.4741
39.1981083362281	58.1990675596569	22.0871	33.226	33.6947
39.4259301254015	57.3465057424541	20.821	23.0825	38.9893
39.4263865428012	57.3456159766662	31.0932	49.2942	14.8063
39.4268429601905	57.344726210873	22.4944	48.7727	18.9786
47.771725002965	52.6105178949086	24.5323	49.8988	23.3971
54.6241797421362	48.7229916201708	25.2216	48.8368	29.4028

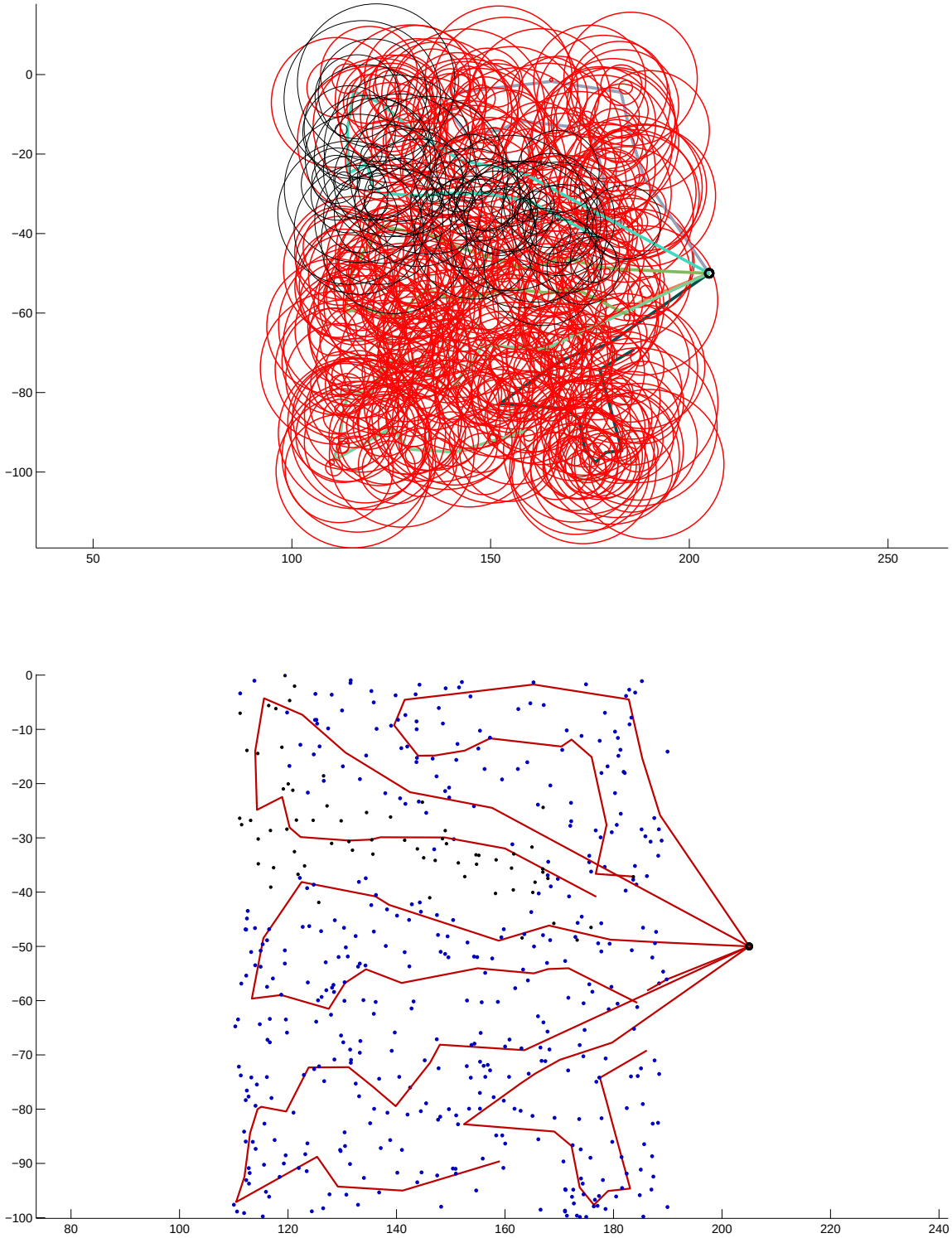


Figure O.54: *team*6_500, arbitrary radius, 2D, Euclidean, Length = 1068.2905716

Table O-57: Solution for *team*6_500, arbitrary radius, 2D, Euclidean

Total distance: 1068.29057159335 Total demand met: 25539 Depot: x 95 y 50				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 160.929568979626 Demand Met: 4981				
69.7226703093149	67.7356232006883	75.4040099	79.0607348	12.6702712
69.7226703093149	67.7356232006883	73.7932186	65.1929118	5.5307734
69.7226703093149	67.7356232006883	66.8428254	74.9418962	11.9134957
69.7226703093149	67.7356232006883	68.5426632	70.6500378	3.2232857
69.7226703093149	67.7356232006883	64.4543682	70.2655389	6.7382235
60.1123569826025	70.900344983899	57.8283627	65.6998258	5.6799674
60.1123569826025	70.900344983899	57.0800315	64.0172849	9.5428133
60.1123569826025	70.900344983899	51.8847181	57.7017397	17.2459771
55.6242953471778	73.4080031059271	58.1838222	68.9986011	5.0984315
55.6242953471778	73.4080031059271	50.7478618	74.0551131	4.9191824
52.7907135848353	75.3237981108008	56.5346421	68.6367247	7.6638079
52.7907135848353	75.3237981108008	47.2434466	72.8348775	7.3999265
52.7907135848353	75.3237981108008	46.8228713	71.844353	6.908088
49.2122410741531	77.8943452977693	49.7783583	78.4397036	1.598943
49.2122410741531	77.8943452977693	43.6827488	74.1878852	13.0248043
49.2122410741531	77.8943452977693	42.9598051	72.0704928	12.5037762
49.2122410741531	77.8943452977693	44.3710695	67.9205927	17.6190773
49.2122410741531	77.8943452977693	45.5118999	65.9532613	17.6961201
45.8239672581841	80.328265825384	41.3355343	82.7796974	5.9611972
45.8239672581841	80.328265825384	32.5068688	76.0167984	18.6744309
42.4196327792422	82.773723319523	44.680977	94.9895485	12.4233676
42.4196327792422	82.773723319523	50.0446513	86.3510967	11.408718
42.4196327792422	82.773723319523	37.6570142	81.9317057	6.23332
42.4196327792422	82.773723319523	38.0621359	81.3957333	6.4246672
42.4196327792422	82.773723319523	34.482979	80.365325	8.2940253
42.4196327792422	82.773723319523	45.3945603	79.9114427	10.2225307
42.4196327792422	82.773723319523	43.3709663	79.9295648	6.4309473
42.4196327792422	82.773723319523	39.6568849	80.0063838	8.4281529
42.4196327792422	82.773723319523	47.9098314	77.7959758	9.5350991
42.4196327792422	82.773723319523	46.3729602	74.0499355	10.9997053
50.3766848807001	83.4120677125481	48.3895216	84.8378656	2.445755
50.3766848807001	83.4120677125481	46.0567355	72.019762	17.1499692
50.3766848807001	83.4120677125481	45.412979	71.2677197	19.9703759
59.0786498371417	84.1101717924879	69.765468	86.0199863	10.8561261
59.0786498371417	84.1101717924879	56.1389342	85.561632	4.4417673
59.0786498371417	84.1101717924879	59.1397084	81.6064397	2.5044765
59.0786498371417	84.1101717924879	49.4827685	84.8462228	10.3517087
59.0786498371417	84.1101717924879	55.0653569	81.234009	5.9096312
62.2583160809021	86.7733941637982	62.4719528	86.6470186	0.2482165
62.2583160809021	86.7733941637982	51.7496653	79.9144917	15.0357032
63.7680788191	94.4254292105515	79.9522127	98.0359405	18.7966063
63.7680788191	94.4254292105515	68.523768	98.3881808	8.1618794
63.7680788191	94.4254292105515	64.9776601	99.8572829	14.8646935
63.7680788191	94.4254292105515	63.7965883	99.8649883	5.4396338
63.7680788191	94.4254292105515	67.0620012	97.8077872	8.2792999
63.7680788191	94.4254292105515	63.2522018	99.6147456	18.4401179
63.7680788191	94.4254292105515	71.5874534	94.5399994	16.9233519
63.7680788191	94.4254292105515	61.4066356	99.633296	16.0904388
63.7680788191	94.4254292105515	67.3268965	96.007007	10.9024154
63.7680788191	94.4254292105515	61.0701287	98.8683739	7.9054547
63.7680788191	94.4254292105515	61.0630253	98.699805	11.0127062
63.7680788191	94.4254292105515	62.6982725	97.3778678	9.4559017
63.7680788191	94.4254292105515	64.4754864	95.6952093	6.985863
63.7680788191	94.4254292105515	62.3573907	96.159986	5.0891887
63.7680788191	94.4254292105515	56.5514993	98.5201232	8.4190197
63.7680788191	94.4254292105515	62.5782193	94.8345715	11.8936571
63.7680788191	94.4254292105515	64.3381393	93.722702	16.872102
63.7680788191	94.4254292105515	61.1689993	94.8861498	3.5486281
63.7680788191	94.4254292105515	61.0866811	94.7582572	17.8354325
63.7680788191	94.4254292105515	64.0121883	92.7907393	9.0477095
63.7680788191	94.4254292105515	65.7364961	88.9695394	13.1578882
63.7680788191	94.4254292105515	60.774398	89.648206	12.5083419
63.7680788191	94.4254292105515	63.9530194	87.4245185	11.3124411
63.7680788191	94.4254292105515	52.878421	80.2956919	17.8391178
66.3876624857602	97.6342042722513	66.3729212	97.9005203	0.2667237
66.3876624857602	97.6342042722513	63.6802314	81.8267454	19.0132656
68.9947355102348	95.0779610405922	75.4923392	99.8090463	10.3077719
68.9947355102348	95.0779610405922	66.5761879	96.7049476	4.0776062
68.9947355102348	95.0779610405922	68.0410206	93.0677269	2.2249974
68.9947355102348	95.0779610405922	71.4909917	88.8238404	8.4049975
73.0575508541971	94.6275461830711	74.8496365	95.8479299	2.1681576
73.0575508541971	94.6275461830711	75.6464183	86.4517504	11.7494177
72.4416453315794	92.355199225356	76.9820609	94.8106777	5.1618551
72.4416453315794	92.355199225356	77.3466754	92.4222135	14.6923437

Solution x	Solution y	Original x	Original y	Radius
72.4416453315794	92.355199225356	70.4834315	96.1070737	17.0458905
72.4416453315794	92.355199225356	75.0360354	91.1497098	11.023678
72.4416453315794	92.355199225356	77.1265753	88.6843079	19.9105474
72.4416453315794	92.355199225356	72.4289329	91.88372	10.9387068
72.4416453315794	92.355199225356	77.2293497	82.6694496	19.9727905
69.4941086968747	81.4804376293824	72.4566884	79.8068651	3.4026054
69.4941086968747	81.4804376293824	73.2290706	73.9762718	18.8679238
68.6775444726227	78.467771589498	78.2121151	82.5216358	10.3605913
68.6775444726227	78.467771589498	67.7945884	81.6777909	7.7525837
68.6775444726227	78.467771589498	74.4567732	73.8913977	9.1604579
68.6775444726227	78.467771589498	61.6425082	72.8564323	8.9988257
67.492436845438	74.2162248585755	67.3900644	74.174693	0.1104763
67.492436845438	74.2162248585755	63.772212	68.1836695	14.1434905
67.492436845438	74.2162248585755	57.43771	71.1535593	13.3451357
67.492436845438	74.2162248585755	56.7397866	71.0931061	12.7871715
67.492436845438	74.2162248585755	50.8238583	67.1806384	19.5280512
76.1342967991094	69.1743884183433	77.5651358	71.0148631	2.331233
76.1342967991094	69.1743884183433	78.4065879	56.8222853	18.7893207
Route: 2 Length: 41.0144627117955 Demand Met: 868				
79.8475905339529	56.0836147939401	79.155929	54.6404138	1.6003827
79.8475905339529	56.0836147939401	73.3690079	50.7128517	17.0196572
79.8475905339529	56.0836147939401	66.0988248	58.3515559	17.5072809
79.8475905339529	56.0836147939401	67.1669184	49.4371849	15.5982026
79.8475905339529	56.0836147939401	64.4880133	60.4854675	17.3914578
79.8475905339529	56.0836147939401	65.5436157	56.992435	17.084027
76.1920838549767	58.1381294412119	78.4106856	73.5257917	15.5467792
76.1920838549767	58.1381294412119	75.0689318	72.4744486	14.9698309
76.1920838549767	58.1381294412119	79.80288	56.0883078	5.2865846
76.1920838549767	58.1381294412119	77.8566059	47.3210428	13.3824609
76.1920838549767	58.1381294412119	77.1618533	52.0527053	6.548551
76.1920838549767	58.1381294412119	75.4422908	46.5496079	15.4085245
76.1920838549767	58.1381294412119	69.1126526	61.5737532	13.1055803
76.1920838549767	58.1381294412119	69.6306367	57.4599551	8.6491765
76.1920838549767	58.1381294412119	61.6781701	59.473286	14.5751959
Route: 3 Length: 193.497703622241 Demand Met: 4705				
78.5896330482106	25.8317245256371	77.5184606	26.3492827	1.1896541
78.5896330482106	25.8317245256371	78.3681704	28.4149174	15.9637623
78.5896330482106	25.8317245256371	78.8734057	30.5074156	17.7741551
78.5896330482106	25.8317245256371	76.8303918	30.6898889	15.6982902
78.5896330482106	25.8317245256371	75.8801773	29.7113355	15.8480612
78.5896330482106	25.8317245256371	75.1791401	28.4357222	18.0653964
78.5896330482106	25.8317245256371	73.9542296	35.1681427	17.0431609
78.5896330482106	25.8317245256371	69.6772126	28.9703915	10.4491408
78.5896330482106	25.8317245256371	62.1748486	23.5386262	19.2663276
78.5896330482106	25.8317245256371	67.6344777	29.9025036	17.8609779
75.3117584035334	15.372121619268	72.9487249	9.0752285	6.7256814
75.3117584035334	15.372121619268	72.0757838	18.033427	4.1897587
72.8178517222503	4.46667649711999	73.9903157	3.2090585	1.7193821
72.8178517222503	4.46667649711999	72.8917692	2.6849909	5.1292918
72.8178517222503	4.46667649711999	72.320279	3.8462993	12.1872623
72.8178517222503	4.46667649711999	68.4102584	6.9403941	16.8109375
72.8178517222503	4.46667649711999	68.9038468	16.8104734	18.4978064
72.8178517222503	4.46667649711999	67.7860652	18.0440513	17.8951575
55.2466645645212	1.72536641440129	55.2537104	1.3428502	0.3825811
55.2466645645212	1.72536641440129	42.0438698	1.2746098	18.5219549
55.2466645645212	1.72536641440129	57.1362338	5.5136309	10.1201436
55.2466645645212	1.72536641440129	54.6678163	5.1970784	9.6677205
55.2466645645212	1.72536641440129	43.6411268	3.9331303	18.3321607
55.2466645645212	1.72536641440129	52.4413086	6.2567644	17.7872557
55.2466645645212	1.72536641440129	45.3795945	10.2393952	17.2768189
55.2466645645212	1.72536641440129	54.100404	16.0525172	18.9251989
55.2466645645212	1.72536641440129	46.2315326	17.3070005	18.9782971
40.0661445377847	3.52393153535298	41.5241877	2.2495139	5.9346817
40.0661445377847	3.52393153535298	37.7928549	6.0601138	3.405887
31.4979240175664	4.53908132040342	21.5004558	1.4444458	10.4654737
31.4979240175664	4.53908132040342	25.3620642	2.9418291	9.3612642
31.4979240175664	4.53908132040342	34.237799	1.769458	3.8958604
31.4979240175664	4.53908132040342	39.0651937	2.4238303	9.0370307
31.4979240175664	4.53908132040342	29.8399494	3.731908	5.1894117
31.4979240175664	4.53908132040342	33.5301093	3.5426558	3.7368294
31.4979240175664	4.53908132040342	30.2787157	8.2280249	8.4927039
31.4979240175664	4.53908132040342	38.5584867	8.9239146	8.3130054
29.5496668587805	9.23487531691695	28.9980611	9.3107142	0.5567948
29.5496668587805	9.23487531691695	33.6893922	8.5224136	19.9918892
29.5496668587805	9.23487531691695	33.7088519	9.9711832	13.226048
29.5496668587805	9.23487531691695	24.4057133	14.819481	14.1480218
29.5496668587805	9.23487531691695	31.9710737	13.1659452	6.1525799
29.5496668587805	9.23487531691695	41.2499501	12.693222	15.4469364
29.5496668587805	9.23487531691695	36.6688954	15.3802855	16.9765386
29.5496668587805	9.23487531691695	33.6742877	16.0147514	19.9827348

Solution x	Solution y	Original x	Original y	Radius
29.5496668587805	9.23487531691695	27.922577	21.764341	14.2606988
29.5496668587805	9.23487531691695	39.7157151	22.5518047	19.2813071
29.5496668587805	9.23487531691695	34.0986738	23.3047286	16.797077
33.9647005706282	14.8473942706553	30.8819888	13.4626957	3.5848945
33.9647005706282	14.8473942706553	33.7699504	15.2531662	0.4500872
37.0533176369933	14.8186805055332	37.3849664	18.6565566	3.8521791
37.0533176369933	14.8186805055332	35.4889656	25.3753347	17.6050983
37.0533176369933	14.8186805055332	40.565033	30.2350611	16.7047972
42.5668253157323	13.9113408453854	31.6461166	7.3585956	12.8469017
42.5668253157323	13.9113408453854	45.092729	13.545129	9.6124868
42.5668253157323	13.9113408453854	52.3761166	17.3066951	10.3802999
42.5668253157323	13.9113408453854	41.0252369	15.6288565	2.3078897
42.5668253157323	13.9113408453854	39.7052051	20.7340789	9.9402181
47.2432723944522	11.6414172592346	47.2237184	11.5265695	0.1165005
47.2432723944522	11.6414172592346	44.272376	24.1529526	13.4087757
60.3914006101895	13.1549498619798	60.5482992	13.7850738	0.6493638
62.2555724973577	11.8722611215229	64.1033853	11.196525	1.9674937
62.2555724973577	11.8722611215229	61.3811866	10.1841347	1.9011369
65.9682934687181	15.1001719619423	75.2339764	1.1053279	16.7841753
65.9682934687181	15.1001719619423	64.943613	1.686391	14.0946653
65.9682934687181	15.1001719619423	79.9570853	14.106802	15.0949781
65.9682934687181	15.1001719619423	73.292725	7.8305571	14.0833606
65.9682934687181	15.1001719619423	70.2907843	10.4186099	7.1185577
65.9682934687181	15.1001719619423	70.8086056	11.5809577	15.5821047
65.9682934687181	15.1001719619423	71.2868972	13.7571779	15.5198317
65.9682934687181	15.1001719619423	70.9135058	14.8761766	6.3074316
65.9682934687181	15.1001719619423	67.4654721	12.1137109	14.0781794
65.9682934687181	15.1001719619423	71.8742878	17.8343061	6.5081686
65.9682934687181	15.1001719619423	70.2766166	21.7580017	9.1846004
65.9682934687181	15.1001719619423	58.3586123	20.3359236	10.6167883
65.9682934687181	15.1001719619423	56.0727891	23.8686819	15.5553362
68.705606238684	27.5994131353618	70.5957341	27.6007009	1.8901283
68.705606238684	27.5994131353618	66.7264937	28.6241638	9.8453178
68.705606238684	27.5994131353618	62.1996928	26.9322785	11.912547
68.705606238684	27.5994131353618	58.429274	38.9397266	18.6397178
68.0119006502105	30.7465160921653	71.3343578	25.5495623	6.1682291
68.0119006502105	30.7465160921653	65.5339196	33.299582	4.4914809
66.7175748274664	36.6184246050508	74.2228108	38.6099587	8.4402478
66.7175748274664	36.6184246050508	65.5247054	34.4819771	3.6959394
66.7175748274664	36.6184246050508	65.884583	36.2103636	2.551361
66.7175748274664	36.6184246050508	64.136723	44.5156078	8.3082067
66.7175748274664	36.6184246050508	59.7400431	37.5401839	7.0381524
73.7350490509084	37.1357167791144	78.2442809	33.2914556	5.9254971
73.7350490509084	37.1357167791144	76.1612584	37.0439506	3.365582
73.7350490509084	37.1357167791144	73.6393721	37.6930766	4.535198
73.7350490509084	37.1357167791144	72.24704	39.7077335	3.7506664
73.7350490509084	37.1357167791144	68.3855742	35.3493495	5.6398572
Route: 4 Length: 241.220138558537 Demand Met: 4999				
68.5866752928793	62.1916716684353	64.6626599	65.39963	5.0684212
53.5660205860139	69.1247969928154	54.3749565	73.471727	4.4215583
53.5660205860139	69.1247969928154	53.0250996	68.7918887	1.5438111
53.5660205860139	69.1247969928154	50.0180258	68.4527432	3.7667027
46.1400330252503	68.6454679102194	43.8195847	68.1613988	3.0343172
46.1400330252503	68.6454679102194	45.6990417	60.3070344	16.3509992
37.9736278806319	68.1183467155099	37.415218	67.1119326	1.1509522
37.9736278806319	68.1183467155099	39.5709227	52.0192185	18.7792196
36.1922358697077	71.4323845169048	37.7594155	72.4638416	1.8761545
36.1922358697077	71.4323845169048	35.1926471	70.9963316	1.4121083
29.8374428485353	79.4376708118571	19.6070156	87.5155962	13.0351264
29.8374428485353	79.4376708118571	32.0336769	81.0046037	2.6979108
27.16540164445	77.1682869521244	19.6994488	87.7215703	12.92719
27.16540164445	77.1682869521244	25.8819635	79.9487476	9.3875474
27.16540164445	77.1682869521244	28.3264783	80.6515072	7.0901709
27.16540164445	77.1682869521244	23.1076735	77.6165558	6.3711973
27.16540164445	77.1682869521244	22.4809106	75.2843669	6.1954617
27.16540164445	77.1682869521244	21.5799527	71.4486566	10.0338577
27.16540164445	77.1682869521244	20.1950128	67.681815	11.7719782
27.16540164445	77.1682869521244	30.51178	74.0433946	12.6878142
27.16540164445	77.1682869521244	23.2409835	69.6045703	11.4000663
27.16540164445	77.1682869521244	29.1113171	69.2428114	9.8595935
25.5992785645296	75.8290416354584	26.7897314	74.395765	1.8631854
25.5992785645296	75.8290416354584	29.6716712	65.8677857	16.7115843
25.5992785645296	75.8290416354584	32.7632095	61.4478694	19.7763438
21.1585002288613	72.2470389671906	21.6218153	70.9164832	1.4089143
21.1585002288613	72.2470389671906	21.4467307	69.0185063	4.517097
21.1585002288613	72.2470389671906	23.3330747	67.4297538	6.4618896
21.1585002288613	72.2470389671906	26.1534967	60.2417469	15.8350837
13.8071090495139	72.3102656247462	6.2196931	67.2192158	9.1371587
13.8071090495139	72.3102656247462	14.8230271	72.6203252	2.4779351
13.8071090495139	72.3102656247462	15.7168362	72.1075902	1.9558061

Solution x	Solution y	Original x	Original y	Radius
13.8071090495139	72.3102656247462	19.7736057	66.4248411	8.3807699
9.66078459050097	80.4263641097528	13.4475731	91.4293541	11.6363893
9.66078459050097	80.4263641097528	6.9413921	77.9428724	8.4884288
9.66078459050097	80.4263641097528	11.0262565	80.6460603	8.6895387
9.66078459050097	80.4263641097528	6.0949397	74.0865476	7.6811646
9.66078459050097	80.4263641097528	16.6661596	74.8364156	8.962299
5.06389283455056	79.5539862395632	4.2645198	75.4568775	4.1743619
5.06389283455056	79.5539862395632	0.7950307	63.4582891	17.1080484
5.06389283455056	79.5539862395632	9.8142501	65.891213	15.3270767
4.38587500430903	79.9913701788356	2.2118306	78.338365	2.7310978
4.38587500430903	79.9913701788356	6.6502494	63.3598676	19.9843888
3.5175217455923	82.7759347393576	2.2068367	85.97283	4.2948267
3.5175217455923	82.7759347393576	4.0094679	79.3774545	4.1542009
3.01521451445221	84.3866927027422	1.9077799	84.1438746	1.1337425
3.01521451445221	84.3866927027422	5.6520223	82.6769432	11.1746738
3.01521451445221	84.3866927027422	2.7334234	77.6753662	7.9974461
3.01521451445221	84.3866927027422	2.4095765	76.567725	13.9285738
3.01521451445221	84.3866927027422	1.295681	73.7881021	19.2219951
3.01521451445221	84.3866927027422	0.9335658	72.1659561	13.4077909
3.01521451445221	84.3866927027422	3.2443278	74.1558976	17.4562068
3.01521451445221	84.3866927027422	6.6484375	67.6725429	18.7895827
3.01521451445221	84.3866927027422	12.9149435	73.6813943	16.8344008
1.9687066170427	92.4286412262216	2.8109458	93.7321232	1.5519124
1.9687066170427	92.4286412262216	2.9296139	91.7761922	1.1614786
1.22986181892135	94.6841015311278	2.2885744	93.0945686	2.1740904
1.22986181892135	94.6841015311278	17.6447354	95.7025091	18.1912178
1.22986181892135	94.6841015311278	11.9839899	90.8471274	12.6071325
1.22986181892135	94.6841015311278	7.5281123	85.6801168	14.3445898
0.435918930666062	97.1077589046321	0.0137858	97.6201473	0.6638812
0.435918930666062	97.1077589046321	3.4980922	86.0326352	13.3409157
1.00482665502891	96.7901885554921	0.6045586	98.8714353	2.1193873
1.00482665502891	96.7901885554921	1.8947773	99.155621	13.566985
1.00482665502891	96.7901885554921	5.3401207	99.7769332	19.3172668
1.00482665502891	96.7901885554921	6.5131248	96.1438685	18.9754882
1.00482665502891	96.7901885554921	2.7731053	90.8551563	11.768651
1.00482665502891	96.7901885554921	8.4509457	92.4898096	15.3075709
1.00482665502891	96.7901885554921	5.5712407	90.2337915	18.9787731
1.00482665502891	96.7901885554921	4.0389978	87.3302987	15.0585227
1.00482665502891	96.7901885554921	9.2263989	90.0124515	19.4614621
8.4754053518249	92.6200318700692	5.9392628	95.2323551	4.2724995
15.3629141006931	88.7753507568739	16.4819632	98.2716229	9.7324435
15.3629141006931	88.7753507568739	9.5621792	88.5032381	5.8071138
15.3629141006931	88.7753507568739	13.1891897	88.2938542	7.7896989
15.3629141006931	88.7753507568739	13.5790401	86.3111074	4.776713
15.3629141006931	88.7753507568739	20.5127244	86.7993916	6.7971193
15.3629141006931	88.7753507568739	20.4274735	84.2677658	6.7799767
19.1916569096457	94.2582618191606	14.3875276	98.8261078	6.6290931
19.1916569096457	94.2582618191606	20.7475398	95.759314	2.1619272
23.1688678093784	94.5087343502766	23.9936704	92.6751712	7.0508341
27.1460784906856	94.759206866455	26.8042407	95.3391438	3.8148041
27.1460784906856	94.759206866455	21.4283979	90.119601	12.23519
27.1460784906856	94.759206866455	34.617789	91.6565199	17.1587159
27.1460784906856	94.759206866455	27.0999394	87.1794445	15.3093219
27.1460784906856	94.759206866455	31.00496	87.5127119	15.7467648
27.1460784906856	94.759206866455	28.8394854	85.6978668	18.7042447
27.1460784906856	94.759206866455	25.1363027	82.596723	16.9876139
31.1232887887726	95.009679251559	22.9057445	97.6296948	8.6251096
31.1232887887726	95.009679251559	38.2308224	97.9753907	7.7014595
31.1232887887726	95.009679251559	33.8269693	93.4852631	7.8640695
31.1232887887726	95.009679251559	30.1525293	91.7059859	6.8413479
31.1232887887726	95.009679251559	37.489488	92.2138591	7.9102312
39.5814021669158	92.4520053009093	40.9379615	91.8870672	1.5042087
42.3068893800683	91.6278367733088	40.8799687	90.9919823	1.5621823
42.3068893800683	91.6278367733088	35.4564008	78.9241199	15.1810796
49.0287175863719	89.595200879737	49.7030604	90.8227548	1.4005809
49.0287175863719	89.595200879737	40.3910959	90.932739	16.8734606
49.0287175863719	89.595200879737	45.8972803	89.1189208	14.0274616
49.0287175863719	89.595200879737	40.9923031	81.1407106	14.9699296
49.0287175863719	89.595200879737	45.3765455	76.9954785	19.7202249
Route: 5 Length: 209.169378396951 Demand Met: 4990				
77.6509768619693	49.2079338072586	77.6409989	49.4044045	0.1967239
77.6509768619693	49.2079338072586	67.7343836	45.7338412	10.9613064
69.4025228460041	48.7466812124137	69.2934493	49.5142976	0.775327
69.4025228460041	48.7466812124137	67.7686962	50.942416	9.9071922
69.4025228460041	48.7466812124137	63.3830619	45.6708392	11.4259131
69.4025228460041	48.7466812124137	61.8021468	40.7857588	13.1222565
69.4025228460041	48.7466812124137	58.3317264	48.8464518	16.6689028
69.4025228460041	48.7466812124137	56.2067364	40.2417677	19.6165059
58.1038293234896	46.1436027306084	57.9600279	34.4089577	11.7355261
58.1038293234896	46.1436027306084	57.8811625	36.8910334	11.1609103

Solution x	Solution y	Original x	Original y	Radius
58.1038293234896	46.1436027306084	57.0032853	47.929495	2.0977627
58.1038293234896	46.1436027306084	54.8328865	43.6672378	6.4152555
58.1038293234896	46.1436027306084	55.3536754	50.0230289	10.7398558
48.8204174769803	48.9288240560782	48.6878693	60.2173135	11.2892676
48.8204174769803	48.9288240560782	49.7681271	46.8278362	2.4284766
48.8204174769803	48.9288240560782	49.3212736	48.3119567	3.8293124
48.8204174769803	48.9288240560782	46.3458684	54.8708712	8.2955698
44.1769058962804	47.4159480177445	40.4352515	45.1450838	4.3768484
44.1769058962804	47.4159480177445	43.0965371	49.287121	2.8888775
39.1996800003013	45.7943466289354	37.6481264	47.8813096	7.0802754
34.1724158088838	44.1564426702399	34.2887402	41.9043439	4.1016802
34.1724158088838	44.1564426702399	37.4597811	44.2188485	8.3563058
28.6357079517782	42.3525600390014	28.2512087	43.1796715	0.9121146
28.6357079517782	42.3525600390014	34.4981613	43.6098189	7.4849006
28.6357079517782	42.3525600390014	38.128444	50.990683	14.1351688
26.1133264136948	40.787477291022	26.2175773	40.5220972	0.2851225
26.1133264136948	40.787477291022	30.0937988	44.3308943	9.1718387
26.1133264136948	40.787477291022	32.8302989	42.2309887	9.1323516
12.5021778349431	38.1233111487994	12.1928408	37.3702852	0.8140869
12.5021778349431	38.1233111487994	13.5198617	39.2703319	5.6665967
12.5021778349431	38.1233111487994	14.7299938	38.6202015	5.5606508
12.5021778349431	38.1233111487994	23.0786229	38.1227731	15.8911359
12.5021778349431	38.1233111487994	24.3319298	37.4283803	13.053577
12.5021778349431	38.1233111487994	22.4746551	48.1041051	15.816336
12.5021778349431	38.1233111487994	25.3533813	42.3962835	16.55549
7.61519889440329	45.2980155348261	6.5220454	46.8393292	1.8896117
5.45526551736935	48.4690713392248	1.389212	56.8496436	9.3148689
5.45526551736935	48.4690713392248	2.27936	46.9159446	4.2205505
5.45526551736935	48.4690713392248	3.9184302	46.6238898	2.4013658
5.45526551736935	48.4690713392248	4.944301	50.787374	6.1768296
5.45526551736935	48.4690713392248	5.3360715	49.6056788	1.5688834
4.87561625504044	51.498434102057	4.8021518	64.3437535	13.9826688
4.87561625504044	51.498434102057	2.1729785	46.8604253	11.1913394
4.87561625504044	51.498434102057	2.5746679	43.4683609	9.7340669
4.87561625504044	51.498434102057	2.4253981	44.8523436	11.7215543
4.87561625504044	51.498434102057	3.2029124	51.042154	12.1504864
4.87561625504044	51.498434102057	3.9504558	53.4738105	13.2039761
4.87561625504044	51.498434102057	6.1457761	57.4553139	10.5969023
4.87561625504044	51.498434102057	7.2093662	55.909681	8.5307974
4.87561625504044	51.498434102057	12.7057803	46.3942459	11.1678278
4.3198502599313	54.4029785623543	4.9451086	53.7479899	0.9055154
4.3198502599313	54.4029785623543	6.1363219	48.8674613	18.2256529
4.3198502599313	54.4029785623543	9.6122245	63.4753738	15.5818673
4.3198502599313	54.4029785623543	9.4153722	53.1681384	17.5248196
4.3198502599313	54.4029785623543	9.4077401	50.7341371	15.2153276
4.3198502599313	54.4029785623543	13.6466825	56.641223	16.9874359
4.3198502599313	54.4029785623543	13.919931	46.2670929	15.1163989
4.3198502599313	54.4029785623543	17.0586402	58.0717087	18.9407433
4.3198502599313	54.4029785623543	16.0956015	47.1989931	14.2319044
4.3198502599313	54.4029785623543	18.1200543	57.6122523	15.16683
4.3198502599313	54.4029785623543	16.954408	52.9270638	16.3581023
4.3198502599313	54.4029785623543	18.6253841	45.1799856	17.6321283
3.32344877169506	59.6103718391507	0.2763329	64.7359652	5.9629374
3.32344877169506	59.6103718391507	2.2999767	55.3764405	4.3558776
8.74483629646329	58.9569116364344	8.7488745	58.9072962	0.0497795
8.74483629646329	58.9569116364344	18.5593029	70.8497614	16.4543343
8.74483629646329	58.9569116364344	16.1987878	59.3187745	8.6880066
8.74483629646329	58.9569116364344	18.3784185	57.1026507	10.6506348
8.74483629646329	58.9569116364344	20.3908302	60.0437447	17.1200275
8.74483629646329	58.9569116364344	19.3270801	51.9549025	14.5767542
8.74483629646329	58.9569116364344	20.6501388	50.1791373	16.3804834
17.503260300967	61.4979919330218	15.1928212	63.8863652	3.6655736
17.503260300967	61.4979919330218	17.9198509	62.5969087	1.1752301
20.5285075655023	56.7122023263909	20.4303529	56.6155569	0.1377486
20.5285075655023	56.7122023263909	20.3277951	46.570702	10.9961913
20.5285075655023	56.7122023263909	23.9069485	59.9121563	8.0586758
20.5285075655023	56.7122023263909	22.9209187	53.7233909	7.2787759
20.5285075655023	56.7122023263909	23.2467308	53.1536864	11.4161743
20.5285075655023	56.7122023263909	25.8175111	47.2716024	14.9058581
20.5285075655023	56.7122023263909	32.3710377	53.6854	15.9945905
20.5285075655023	56.7122023263909	31.5095969	51.0684653	15.7915136
21.200148702991	56.2729261338191	15.5276897	59.9411898	6.7609848
21.200148702991	56.2729261338191	18.474215	58.4012448	5.4896057
21.200148702991	56.2729261338191	21.0216738	51.8703093	6.5542883
24.3588699764983	54.2070149799624	24.284459	53.5118781	0.6991082
24.3588699764983	54.2070149799624	28.018456	49.9258106	6.3626175
24.3588699764983	54.2070149799624	32.3078962	45.114069	14.2581658
24.3588699764983	54.2070149799624	39.4220046	48.156385	18.6805968
30.9461635417108	56.7311705073688	25.824676	62.4300357	7.6620297
30.9461635417108	56.7311705073688	33.1471098	60.1558513	4.0709462

Solution x	Solution y	Original x	Original y	Radius
41.7694566349308	54.6445585985671	43.0002757	59.9692573	5.8261393
41.7694566349308	54.6445585985671	44.2906965	51.8898251	3.7343282
44.9753907889513	54.0264907505966	44.8729194	51.9811136	2.0479424
44.9753907889513	54.0264907505966	38.9617732	51.3997809	12.7914782
55.282404134251	54.9601473916861	56.0822206	62.8731122	7.9532835
55.282404134251	54.9601473916861	53.3341085	54.2742297	4.845343
57.9280306102753	54.1654477668075	57.7424662	53.0431767	1.1375089
57.9280306102753	54.1654477668075	54.2235528	56.265496	13.6774223
57.9280306102753	54.1654477668075	53.5581269	47.7413894	13.1857928
57.9280306102753	54.1654477668075	47.6524078	52.2249928	17.0127082
61.7132979461176	54.0294170192374	62.9728444	48.2610974	5.9042331
61.7132979461176	54.0294170192374	61.0935569	52.6920317	2.1590612
68.660604737933	57.5225254248649	70.748982	60.565778	4.327335
74.3683024473257	60.3923590514487	74.3685871	61.179785	0.787426
Route: 6 Length: 222.459319324204 Demand Met: 4996				
57.1130989660256	29.5781425291603	62.0390375	27.7696953	7.3539199
57.1130989660256	29.5781425291603	51.358437	31.183912	5.9744983
47.5975821489824	24.449074365919	49.4509792	19.23293	5.5356339
40.4408751707674	23.084302964281	38.9701661	21.3778805	5.0370217
40.4408751707674	23.084302964281	36.9545772	32.1019086	17.1509479
32.4816141565007	21.5664858624008	30.6527015	22.708305	3.2179614
32.4816141565007	21.5664858624008	31.6418617	23.7354033	2.3258089
20.5793184411812	14.2630905692539	25.7941467	5.022901	13.154074
20.5793184411812	14.2630905692539	15.820225	13.1438067	7.149623
20.5793184411812	14.2630905692539	14.7546051	14.610274	12.5838102
20.5793184411812	14.2630905692539	20.1050057	16.8211128	7.104643
20.5793184411812	14.2630905692539	13.6477983	21.6503409	10.1300266
20.5793184411812	14.2630905692539	16.5956207	19.4929376	6.6403358
20.5793184411812	14.2630905692539	23.260163	19.1726271	5.5937891
15.8703481191495	10.1413174199722	9.8269964	6.8843491	6.8651251
15.8703481191495	10.1413174199722	17.3929381	9.8303298	5.6745961
12.6239134001299	7.2997055338579	15.0419936	3.4632806	4.5348945
12.6239134001299	7.2997055338579	21.5694811	0.9567502	13.3401903
12.6239134001299	7.2997055338579	18.0605132	3.6100683	8.5868999
12.6239134001299	7.2997055338579	14.9649191	8.2569823	11.1052011
12.6239134001299	7.2997055338579	15.2275578	8.2482088	10.0059049
12.6239134001299	7.2997055338579	19.95828	6.5164086	19.0088103
12.6239134001299	7.2997055338579	15.3634563	8.946465	13.8278483
12.6239134001299	7.2997055338579	12.2844966	12.8434228	16.9324181
12.6239134001299	7.2997055338579	10.2638739	16.7343669	18.8298176
12.6239134001299	7.2997055338579	26.3324067	9.9110212	19.0585155
5.56413996048566	4.26654067014654	3.796854	1.0310825	3.6866637
5.56413996048566	4.26654067014654	1.1893308	3.3623299	7.3969025
5.56413996048566	4.26654067014654	9.4518233	0.0818322	12.2091392
5.56413996048566	4.26654067014654	1.1696301	7.0254341	16.3262783
5.56413996048566	4.26654067014654	11.2137447	2.0282324	19.8233424
5.56413996048566	4.26654067014654	6.4321646	5.6038094	10.5758755
5.56413996048566	4.26654067014654	7.7653349	6.167634	19.726704
5.56413996048566	4.26654067014654	10.2956976	4.6843351	13.6376992
3.94556670177587	13.97957610191	2.4227502	13.8762399	1.5263186
3.94556670177587	13.97957610191	4.4183327	14.4467589	11.646626
3.94556670177587	13.97957610191	8.8711802	13.2955279	15.7653907
3.94556670177587	13.97957610191	9.1420339	20.9818632	15.7590069
3.94556670177587	13.97957610191	10.881307	21.222109	15.2562401
3.94556670177587	13.97957610191	6.7702019	28.6398243	18.6590849
3.94556670177587	13.97957610191	16.5565287	18.5575743	18.4350632
4.15868993576244	21.174543627083	1.0903939	26.3844516	6.0462866
4.15868993576244	21.174543627083	1.4410502	27.5670412	9.0702473
4.15868993576244	21.174543627083	4.5207011	34.7763494	18.0479256
4.26680456240408	24.8244568862346	3.1062568	26.7803784	2.2743131
4.26680456240408	24.8244568862346	4.4919615	30.1971308	9.6799472
4.26680456240408	24.8244568862346	6.820668	39.0713932	16.2462105
4.26680456240408	24.8244568862346	17.2034005	24.1027648	19.2446407
4.26680456240408	24.8244568862346	14.6392528	26.7492086	14.0759419
4.26680456240408	24.8244568862346	11.8541821	36.7134083	16.0938551
8.93096568292798	22.4543323377522	10.0346396	20.0550826	2.640927
8.93096568292798	22.4543323377522	24.4888337	25.329984	19.8782132
9.79085663308911	25.9933712083769	11.5512784	26.7283657	1.9160125
10.3005446940912	28.0910863261959	9.7861225	28.4044715	0.6023624
10.3005446940912	28.0910863261959	7.3492035	35.5012058	9.3339917
10.3005446940912	28.0910863261959	13.0553452	35.1491327	12.3752896
10.3005446940912	28.0910863261959	19.7989907	26.8559855	13.3335104
10.3005446940912	28.0910863261959	18.0420031	31.0087706	9.8590332
10.3005446940912	28.0910863261959	15.6671545	41.9038059	18.2677056
10.3005446940912	28.0910863261959	21.8832831	32.2702186	16.0376904
12.3149878469951	29.8395795929219	11.1949114	32.5347928	2.918689
21.2232362032397	30.4900559834118	21.2205961	30.6755865	0.1855493
21.2232362032397	30.4900559834118	35.0133629	33.6653342	15.142596
25.2652081862898	30.3103445732743	25.6408756	32.9849766	2.7008855
27.0355606229971	29.8871282666894	28.9097869	26.1468646	4.1835746

Solution x	Solution y	Original x	Original y	Radius
27.0355606229971	29.8871282666894	25.434095	30.36432	1.6710488
32.8585534022961	29.9042242959384	34.7673517	23.4200763	8.3957645
32.8585534022961	29.9042242959384	31.5115819	30.4349931	4.1547529
32.8585534022961	29.9042242959384	39.21475	31.0795566	8.3251067
32.8585534022961	29.9042242959384	33.8398153	32.0377234	2.359689
32.8585534022961	29.9042242959384	37.130172	34.1670861	7.7958056
38.861038856372	29.9218474201869	38.9767874	28.6595996	1.2675438
38.861038856372	29.9218474201869	36.1244237	41.0242921	15.4858909
44.3679935572073	30.9236791227416	54.9748886	31.6899499	11.8489378
44.3679935572073	30.9236791227416	38.4714341	30.1541626	8.9883187
44.3679935572073	30.9236791227416	44.6441662	33.1239716	11.3823841
44.3679935572073	30.9236791227416	41.3950957	34.602479	10.330203
44.3679935572073	30.9236791227416	42.5831476	37.1399223	8.4151487
50.0091777174443	31.9499298427575	57.0336699	24.3925592	10.3178167
50.0091777174443	31.9499298427575	57.9145816	37.4787407	9.8427718
50.0091777174443	31.9499298427575	51.6262531	32.9510025	3.6157759
50.0091777174443	31.9499298427575	55.5353048	38.1752447	10.1702798
50.0091777174443	31.9499298427575	51.2078647	35.5791539	4.4951633
50.0091777174443	31.9499298427575	48.3601763	34.0464698	2.951746
50.0091777174443	31.9499298427575	45.1705924	33.2150554	5.0012449
56.7634168334296	35.5236562423402	56.9481598	35.7189477	0.7997132
56.7634168334296	35.5236562423402	56.98499	36.3050676	14.2729457
56.7634168334296	35.5236562423402	51.5218465	39.5765057	17.6859637
56.7634168334296	35.5236562423402	44.7688336	34.8472485	19.5683767
56.7634168334296	35.5236562423402	53.1446811	48.4277704	14.7395753
56.7634168334296	35.5236562423402	48.2549784	40.2375649	18.4484604
58.9261702497945	36.6679876940772	55.1300701	40.0588307	5.0900091
66.8119078897689	40.8403996211095	73.6483802	37.1698351	9.29445
66.8119078897689	40.8403996211095	65.8501112	46.5185477	5.7590293
66.8119078897689	40.8403996211095	63.3053921	48.8331121	9.0739339
66.8119078897689	40.8403996211095	58.9987357	45.7674431	9.2369593

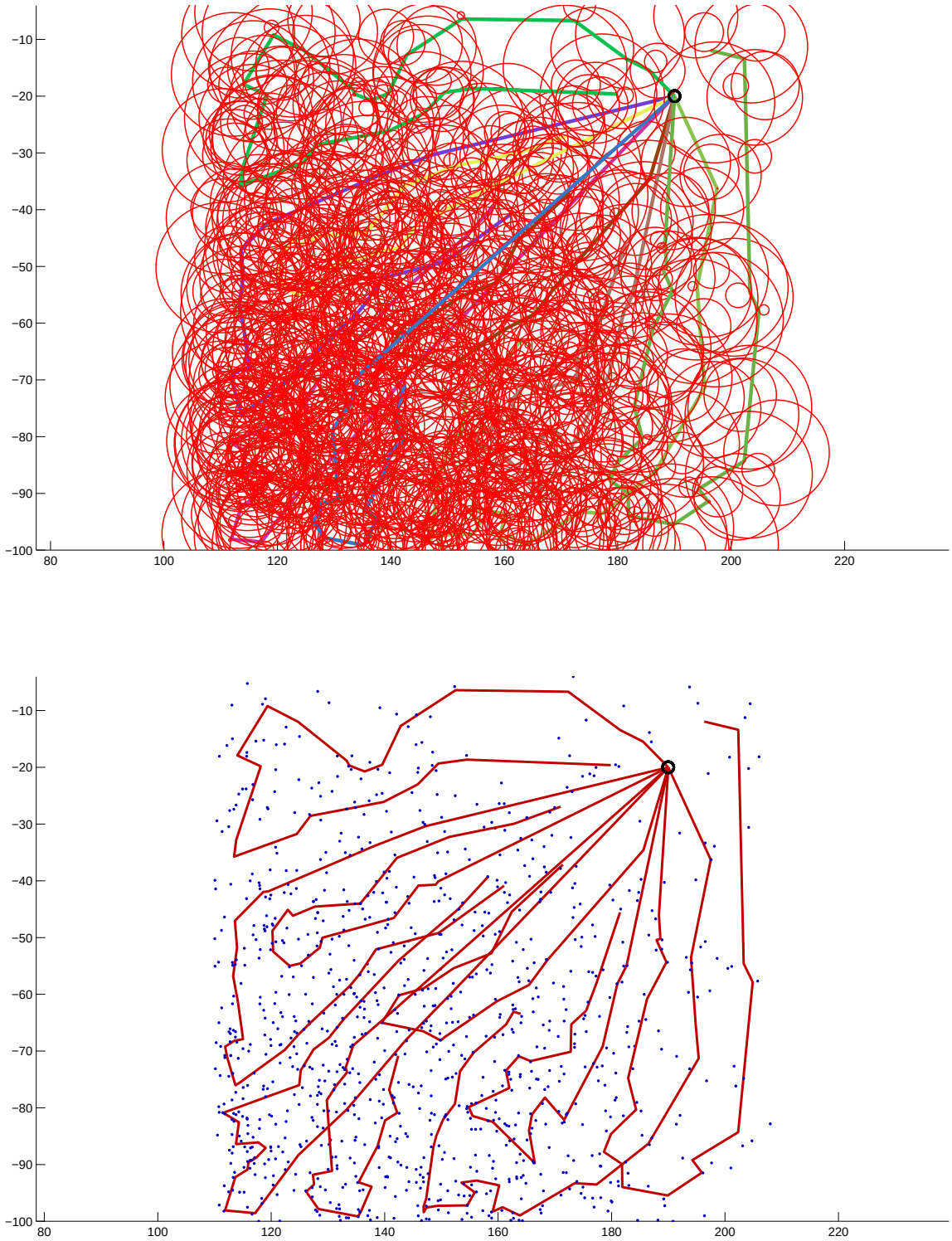


Figure O.55: *bonus*1000, arbitrary radius, 2D, Euclidean, Length = 1768.6912579

Table O-58: Solution for *bonus*1000, arbitrary radius, 2D, Euclidean

Total distance: 1768.69125790916 Total demand met: 25289 Depot: x 80 y 20				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 241.000957935046 Demand Met: 2978				
42.4216190517522	59.1124326230256	45.47068469	56.96814934	4.238980951
42.4216190517522	59.1124326230256	41.10546356	60.73573959	2.160394708
42.4216190517522	59.1124326230256	39.00311055	58.98114927	3.475306118
41.4624738246506	60.110731899154	41.72170476	60.36141703	0.360615737
41.4624738246506	60.110731899154	38.57181853	69.29967661	10.842735
38.4675734172952	63.1880642145073	38.87334077	61.97418169	1.279905437
38.4675734172952	63.1880642145073	33.57300136	70.51852673	11.82127081
33.7509021903925	68.0345586592428	32.14669335	66.5741861	2.169371802
28.7113078031441	73.9553712790492	28.44331265	74.98671685	1.065596119
28.7113078031441	73.9553712790492	25.39416892	74.01493111	4.846769394
28.7113078031441	73.9553712790492	27.46499326	78.56518576	6.680683032
28.7113078031441	73.9553712790492	24.57644237	79.57543571	7.621327433
26.8799027848317	76.1070113841655	28.17365085	71.94302821	4.360337135
26.8799027848317	76.1070113841655	29.09610379	74.18683092	3.584248474
26.8799027848317	76.1070113841655	25.63863856	75.55318582	1.789599458
23.332539708202	80.2746614792302	23.53960858	80.471438	0.285654541
23.332539708202	80.2746614792302	16.23739593	85.87006787	9.998633909
17.6850849808002	85.6008162340351	17.38954679	82.23173111	4.9464631
17.6850849808002	85.6008162340351	18.16441332	83.32201509	4.389263708
17.6850849808002	85.6008162340351	20.47481611	85.68176763	4.269604774
17.6850849808002	85.6008162340351	18.85500198	86.61471751	1.746017703
17.6850849808002	85.6008162340351	15.06397637	86.4956065	2.769631739
14.8156122687883	88.3070367329011	20.16675465	86.45561332	5.662375247
14.8156122687883	88.3070367329011	9.921883095	86.8721598	5.099750684
14.8156122687883	88.3070367329011	9.984816242	87.60870523	5.654212003
14.8156122687883	88.3070367329011	12.48771043	90.90107319	3.496358466
11.7091073799757	92.482535438394	14.30638295	91.72702037	2.704929464
11.7091073799757	92.482535438394	10.35439985	93.61856888	1.829714932
7.17637135320419	98.5750509325266	7.810086676	100	1.559511127
1.87375434446766	98.073884955558	1.662890125	98.21483308	0.253633777
2.60697358070219	95.6876842115589	11.51332542	99.95442641	9.875636287
2.60697358070219	95.6876842115589	6.625140742	98.72893978	8.11126017
2.60697358070219	95.6876842115589	2.510162792	94.82470236	1.092397933
3.67390966282562	92.2154364139271	3.553988961	91.38716753	0.836905203
3.67390966282562	92.2154364139271	3.298576907	92.26869515	0.379092562
5.82596171349655	90.8961676588805	7.178182114	91.76838261	1.609117439
5.88925752444734	90.3919787944825	12.45480817	85.29988604	8.467366828
5.88925752444734	90.3919787944825	11.28159713	86.83718755	7.508047868
5.88925752444734	90.3919787944825	7.936374341	83.63932008	7.056138248
5.88925752444734	90.3919787944825	9.577914639	89.11916471	4.320583214
5.88925752444734	90.3919787944825	5.333729823	86.89695613	7.779774892
5.88925752444734	90.3919787944825	5.209294544	90.50333801	7.245222646
5.88925752444734	90.3919787944825	2.887848626	89.80188387	3.077223153
5.88925752444734	90.3919787944825	5.231683223	94.88567828	5.753061171
5.88925752444734	90.3919787944825	4.440109707	94.87692744	8.411496493
5.88925752444734	90.3919787944825	1.725004249	93.73701725	6.881927737
5.99320807279888	89.5639504696856	5.838459994	89.46110654	0.185805925
5.99320807279888	89.5639504696856	8.327911253	95.97957355	8.978439052
5.99320807279888	89.5639504696856	8.376403562	96.83801393	9.194583524
5.99320807279888	89.5639504696856	3.212591442	94.51392157	10.08518593
5.99320807279888	89.5639504696856	5.819691822	97.53170939	10.47278678
5.99320807279888	89.5639504696856	0.846436708	97.15575264	11.19775474
7.4180144660703	88.7433167889144	10.40564453	91.96900158	4.396700555
7.4180144660703	88.7433167889144	7.085383584	88.77850283	1.129697938
7.4180144660703	88.7433167889144	6.579193932	89.24907689	0.979496385
9.02520007451051	87.0685817796142	9.940095688	86.998178	0.917600499
9.02520007451051	87.0685817796142	8.980893435	92.30918249	10.59560796
7.7524865598529	86.0962821339529	12.63857375	82.42671014	6.575237335
7.7524865598529	86.0962821339529	10.08146406	81.46406963	5.184740001
7.7524865598529	86.0962821339529	7.992357197	82.08091397	4.51998708
7.7524865598529	86.0962821339529	5.912402555	83.10767778	4.777473299
7.7524865598529	86.0962821339529	6.810206318	85.20186256	3.122176307
7.7524865598529	86.0962821339529	6.663988874	86.9326968	2.017737523
7.7524865598529	86.0962821339529	6.359309777	87.06467249	5.433004527
7.7524865598529	86.0962821339529	5.793118726	87.72031575	2.544917974
7.7524865598529	86.0962821339529	3.105512661	84.71082736	5.063715926
7.7524865598529	86.0962821339529	6.291693293	89.27097954	4.843225065
3.79292608635745	86.3964283738333	2.643010323	87.48230483	1.581592217
3.90822192956246	85.5341889214309	3.319354366	86.8534104	1.444683466
4.10865308489187	84.0352638598623	4.377655918	84.98459142	1.270737521
4.30850176717105	82.540695010487	2.885089549	70.78781924	11.83875801
4.30850176717105	82.540695010487	5.042739397	78.40053531	10.26257011
4.30850176717105	82.540695010487	12.03430063	87.78817585	9.339380238
4.30850176717105	82.540695010487	4.297539438	80.73294711	11.22405457

Solution x	Solution y	Original x	Original y	Radius
4.30850176717105	82.540695010487	3.380314451	80.99890539	11.39696855
4.30850176717105	82.540695010487	5.902742913	84.57417463	10.96205759
4.30850176717105	82.540695010487	3.437419026	82.39656928	1.58437925
4.30850176717105	82.540695010487	8.842438164	89.89183088	9.248878075
4.30850176717105	82.540695010487	4.724328509	85.88211036	10.66842937
4.30850176717105	82.540695010487	0.848777488	80.80421078	10.36784038
4.30850176717105	82.540695010487	7.009024866	89.80852716	9.591229282
4.30850176717105	82.540695010487	6.256438132	90.66257931	10.99795307
4.30850176717105	82.540695010487	3.115821998	88.00026043	11.67905671
4.30850176717105	82.540695010487	0.539457489	84.81338557	5.520424731
1.52362970068828	80.8792246200702	1.451959255	80.87244268	0.071990607
9.42455468815953	78.0020725111472	10.28504553	75.43578797	2.70670664
9.42455468815953	78.0020725111472	9.018582074	78.03824041	0.473501375
14.9297695574729	75.9973275168316	15.50686687	76.44859369	0.73258615
14.9297695574729	75.9973275168316	10.82142722	82.89323555	9.472743412
15.2051783297851	73.4018954300803	14.67447984	73.22055772	0.560824618
15.2051783297851	73.4018954300803	9.360499311	76.63383999	9.675555003
15.2051783297851	73.4018954300803	8.595205897	76.73972439	10.65699304
17.483735632698	69.7087005130806	16.29427026	68.63097998	1.605088602
20.1643437201547	67.6654135209326	21.52581462	69.05739134	1.947101759
20.1643437201547	67.6654135209326	14.01917911	69.22007201	9.959122763
20.1643437201547	67.6654135209326	15.83973733	72.60736968	9.12349234
21.2993270342047	66.2429244462524	21.2618816	68.31108552	3.123606085
22.7697645155611	64.4000062528053	22.58317288	64.23875961	0.246610864
22.7697645155611	64.4000062528053	21.61039636	65.83676525	4.44331993
22.7697645155611	64.4000062528053	19.92687299	66.4828608	7.674542398
22.7697645155611	64.4000062528053	20.75020952	68.82081849	6.986664743
22.7697645155611	64.4000062528053	17.25601024	61.69443137	6.772109512
22.7697645155611	64.4000062528053	16.73656026	65.26611785	7.348251841
22.7697645155611	64.4000062528053	19.17901123	72.48982593	10.20159412
22.7697645155611	64.4000062528053	14.35540419	64.70998039	9.721773775
22.7697645155611	64.4000062528053	14.52745655	66.82146945	9.209129847
26.5053524829061	60.4051534614655	25.84588775	61.17671521	1.034434548
26.5053524829061	60.4051534614655	26.46280572	62.61127777	3.79783788
26.5053524829061	60.4051534614655	25.20403775	63.98638021	4.126692706
32.4717572132338	54.0246597668305	31.12121771	52.61678334	1.950915934
32.4717572132338	54.0246597668305	29.89833465	58.88393924	9.428399067
32.4717572132338	54.0246597668305	26.97467166	54.66512134	11.66012717
32.4717572132338	54.0246597668305	27.13020332	56.00735022	9.113612959
43.0456085783754	44.9305290164411	43.11381093	45.00092033	0.098012743
43.0456085783754	44.9305290164411	43.74535734	43.87626012	7.961235625
43.0456085783754	44.9305290164411	39.91233765	41.2977364	9.100834641
43.0456085783754	44.9305290164411	34.17044541	50.63731129	11.2605766
43.0456085783754	44.9305290164411	34.06373355	42.77086753	11.54083384
48.2288342864518	39.2755340807437	48.20619517	39.24794213	0.03569097
48.2288342864518	39.2755340807437	39.35568633	35.06788426	9.948736286
48.2288342864518	39.2755340807437	49.49892788	30.73465222	9.148611436
48.2288342864518	39.2755340807437	48.88810081	29.6929228	11.17097838
Route: 2 Length: 209.731094652842 Demand Met: 2955				
53.9107992920725	26.3212799735989	50.20668952	26.40233109	3.704996422
53.9107992920725	26.3212799735989	51.08696185	26.42044109	3.4213392
37.1741816223845	30.3764768796592	37.07046765	30.04479215	0.347521723
37.1741816223845	30.3764768796592	36.77121212	29.70512597	4.799880351
37.1741816223845	30.3764768796592	36.2315122	27.60710766	7.544747892
37.1741816223845	30.3764768796592	42.45831495	25.01806118	11.16727795
37.1741816223845	30.3764768796592	39.25918273	24.78783876	9.890531084
28.1778314547282	33.849272937114	31.17947294	31.40633137	3.870118229
28.1778314547282	33.849272937114	27.42853428	33.27622768	0.943306484
19.2943572905778	37.6569216329967	23.91492832	35.50451908	5.452232026
19.2943572905778	37.6569216329967	23.06731773	35.0375678	8.814338039
9.43466556541804	41.8829981438608	9.755265232	43.18329059	1.339232837
9.43466556541804	41.8829981438608	11.00474377	35.14184161	10.56540176
9.43466556541804	41.8829981438608	8.013859219	41.41457221	9.523443187
9.43466556541804	41.8829981438608	7.974625907	40.8370263	8.509762243
9.43466556541804	41.8829981438608	7.871697725	40.35198819	6.3641027
9.43466556541804	41.8829981438608	5.668356774	43.14782971	8.305775856
9.43466556541804	41.8829981438608	6.668915236	38.80565327	8.512380576
8.62639484271	41.9466121473059	10.71615729	46.62293177	5.678630364
8.62639484271	41.9466121473059	9.020444459	42.86210706	2.418478506
8.62639484271	41.9466121473059	9.832177112	38.08691559	4.043657799
8.62639484271	41.9466121473059	6.302525489	40.0085763	3.025946417
3.60780468288014	47.0516660107311	1.775610616	46.38397362	1.950063647
3.60780468288014	47.0516660107311	1.250751092	48.74029716	5.852672895
3.60780468288014	47.0516660107311	0.224660494	41.43611847	9.809410917
3.97861530378033	51.8004258940067	7.342191074	50.36568708	3.656790591
3.97861530378033	51.8004258940067	5.283007933	51.8957834	3.483971696
3.97861530378033	51.8004258940067	5.351054934	54.87903352	3.370669882
3.97861530378033	51.8004258940067	3.200690229	54.90401263	3.339909369
3.97861530378033	51.8004258940067	3.166581108	54.38581172	2.806090341
3.62412113824728	54.3882775326751	0.715064701	54.34039001	5.620649576

Solution x	Solution y	Original x	Original y	Radius
3.29426825187696	56.7962447867434	2.766374061	66.09545945	9.314186257
3.29426825187696	56.7962447867434	0.102323447	55.05645207	3.635297833
4.10974911883761	61.1677146077667	8.077114598	60.52651503	4.01884632
4.10974911883761	61.1677146077667	3.164572856	61.67055704	3.732266773
4.51230777774661	64.1085656220362	0.793870075	65.00803843	9.318627115
5.03264966238105	67.909869927362	8.689838933	62.80875147	6.672826006
5.03264966238105	67.909869927362	6.334374787	68.85467086	1.608457989
5.03264966238105	67.909869927362	5.020361565	69.58798476	2.661868193
5.03264966238105	67.909869927362	3.972668798	68.43095677	4.819982765
5.03264966238105	67.909869927362	2.82031094	66.9400554	6.180554629
5.03264966238105	67.909869927362	2.559418382	66.60707534	5.994415632
5.03264966238105	67.909869927362	4.203561784	71.28689241	5.184520227
5.03264966238105	67.909869927362	2.781332517	68.35625636	5.523577876
5.03264966238105	67.909869927362	1.096851862	69.20060768	4.924336954
3.52485480730395	68.1828145881091	3.390983182	60.32064994	8.156128877
3.52485480730395	68.1828145881091	6.979895184	73.91637244	7.031194882
3.52485480730395	68.1828145881091	1.282619347	62.39268391	6.209124989
3.52485480730395	68.1828145881091	2.881941531	70.78732912	7.680996283
3.52485480730395	68.1828145881091	1.009741561	74.32200243	6.745106086
1.8812049924061	69.2129633823765	1.825477279	70.78130479	2.330446868
1.8812049924061	69.2129633823765	0.299902086	68.51958527	1.726641853
2.22547212943714	71.0580058710262	1.834626902	71.15202574	0.401994686
2.22547212943714	71.0580058710262	3.795442881	81.20966501	11.97973034
3.59663246248591	75.6922160034274	3.705228073	66.5975084	9.299418871
3.59663246248591	75.6922160034274	9.701793671	81.23141394	8.243525166
3.59663246248591	75.6922160034274	5.863440787	76.06172049	5.891195528
3.59663246248591	75.6922160034274	3.765987951	77.28123402	9.204063574
3.59663246248591	75.6922160034274	5.724809855	81.80721271	6.479054365
3.59663246248591	75.6922160034274	4.961462551	81.51420623	9.226598726
3.59663246248591	75.6922160034274	3.100034102	78.61964126	6.829391359
3.59663246248591	75.6922160034274	1.696022601	79.3379408	6.739019376
3.59663246248591	75.6922160034274	3.059490558	82.05603574	7.23908529
3.59663246248591	75.6922160034274	0.773453591	79.81662315	6.785233233
3.69989246389078	76.041211306659	3.336609071	66.34370608	10.13002568
3.69989246389078	76.041211306659	3.702577787	67.55965669	9.862533299
3.69989246389078	76.041211306659	5.779054124	82.01317499	10.01915756
3.69989246389078	76.041211306659	0.155166122	73.1143838	9.943054863
3.69989246389078	76.041211306659	1.837820965	81.06813079	5.360711684
4.46756931215091	75.5452171203626	8.675234817	76.17385221	4.360484441
4.46756931215091	75.5452171203626	5.065657714	76.41830653	1.058298093
4.46756931215091	75.5452171203626	3.252339284	73.9521337	4.320781181
4.46756931215091	75.5452171203626	2.544714587	74.45838234	3.751572119
12.4187491578569	69.7772739541154	16.80968797	72.84815948	5.35823493
12.4187491578569	69.7772739541154	13.34199807	71.15108407	2.435319437
12.4187491578569	69.7772739541154	9.897889543	67.94003152	3.836811672
12.4187491578569	69.7772739541154	11.56644578	72.10851879	2.482161061
14.7296186734884	67.1652890071475	14.11476256	66.58488992	0.845524181
14.7296186734884	67.1652890071475	11.17807544	66.07771318	3.944211846
14.7296186734884	67.1652890071475	8.880939202	67.16779099	7.575125342
15.660895539773	66.2404162067365	15.77830732	66.19409337	0.843394073
15.660895539773	66.2404162067365	9.088863996	70.57778186	9.588159879
15.660895539773	66.2404162067365	6.041792217	70.01715429	11.62482668
16.877554692407	65.0321235811039	16.63383213	64.77854357	0.351715097
16.877554692407	65.0321235811039	14.06057656	63.93249207	5.381459732
16.877554692407	65.0321235811039	13.50520564	67.72241024	9.360297306
16.877554692407	65.0321235811039	12.00297966	63.9466553	5.950994709
16.877554692407	65.0321235811039	14.51945543	70.49107423	7.364687094
16.877554692407	65.0321235811039	10.63863267	61.64507704	8.169031835
16.877554692407	65.0321235811039	11.73654707	68.82383733	7.948897757
16.877554692407	65.0321235811039	11.54525803	68.93314303	9.632544021
16.877554692407	65.0321235811039	8.933612257	64.19415642	8.119454693
16.877554692407	65.0321235811039	9.964092428	69.02740379	10.49120227
20.7754071084267	61.406645680218	20.97945435	58.66863495	2.745603401
20.7754071084267	61.406645680218	21.30645349	61.8915326	1.625246019
23.8040794194269	58.5896112370085	24.05460087	58.82740751	0.345409995
23.8040794194269	58.5896112370085	18.97844246	66.0992932	9.320379407
25.5509374284853	56.5034338388516	25.6524776	56.5792119	0.126699333
25.5509374284853	56.5034338388516	24.61643689	54.01115924	7.411713322
25.5509374284853	56.5034338388516	24.58618772	59.92581691	6.813403422
25.5509374284853	56.5034338388516	23.29263587	57.34435722	5.760491154
25.5509374284853	56.5034338388516	22.06521443	57.50548607	6.030659205
25.5509374284853	56.5034338388516	20.53092136	55.63617906	5.894866268
25.5509374284853	56.5034338388516	20.16713628	56.2637712	7.589009856
25.5509374284853	56.5034338388516	19.29354577	63.34226321	9.732805781
28.4831703793321	52.0776593114523	32.83493269	54.50530143	5.131563652
28.4831703793321	52.0776593114523	28.94274384	52.01860718	4.898024634
28.4831703793321	52.0776593114523	28.72359173	49.06807614	3.019170961
28.4831703793321	52.0776593114523	28.17203359	56.51587977	4.557563307
28.4831703793321	52.0776593114523	23.68432498	51.4412716	4.840858032
39.5485741113575	49.180528725591	39.67150404	49.44131071	0.288303678

Solution x	Solution y	Original x	Original y	Radius
39.5485741113575	49.180528725591	36.93641703	55.80482127	9.247821291
39.5485741113575	49.180528725591	33.50828257	58.48410354	11.3670918
41.7764799810968	47.5733796926116	43.66555329	47.77139353	2.714393217
41.7764799810968	47.5733796926116	39.96945525	49.46230999	2.614076519
51.0597046413172	40.8767208907619	51.12261026	42.05252276	1.177483398
51.0597046413172	40.8767208907619	49.90577559	41.072269	2.801182703
51.0597046413172	40.8767208907619	51.33580352	40.30660727	4.986289138
51.0597046413172	40.8767208907619	55.55130491	39.21526309	11.86807905
51.0597046413172	40.8767208907619	58.48548965	38.49282405	11.79894595
Route: 3 Length: 220.275440973387 Demand Met: 2998				
85.7978517708124	32.5956154384006	84.85983095	39.85329756	7.318048431
85.7978517708124	32.5956154384006	86.50661976	33.33916758	4.865256989
85.7978517708124	32.5956154384006	88.13068149	33.9074779	7.167241247
87.4949554559016	36.2825097471073	87.56748283	36.27406643	0.073017187
85.1502278230218	47.8729414840671	86.51848331	50.71555717	3.154772102
84.0039555592294	53.5391812000675	83.19197135	53.48639501	0.813698186
84.0039555592294	53.5391812000675	90.50689197	55.43830225	10.39640446
84.8229230826437	65.2583226638451	78.29263567	66.45988674	6.639910385
84.8229230826437	65.2583226638451	85.16088414	60.47696067	4.793291165
85.3701764117544	71.2787675013953	81.47694776	70.94126153	6.403879885
85.3701764117544	71.2787675013953	91.59995025	72.67875795	6.385143329
80.6186309082395	79.3373426345482	83.77232341	73.14211564	8.533805631
80.6186309082395	79.3373426345482	86.75397464	75.23932777	8.469131771
80.6186309082395	79.3373426345482	81.4352048	82.89764497	3.652744946
78.6545219415204	82.66845246608	77.11333094	85.3156461	3.063152598
76.496720385313	86.3280626231824	76.68533256	86.49303137	0.250577812
67.3578833005642	93.5133940588764	62.61309781	94.29391595	5.245785935
67.3578833005642	93.5133940588764	69.82339194	93.15949799	3.201208435
67.3578833005642	93.5133940588764	71.17046416	92.96230041	4.264714687
67.3578833005642	93.5133940588764	71.22771139	93.77569631	4.877275027
67.3578833005642	93.5133940588764	68.09186985	95.85522589	2.454162297
63.5122369942226	93.2868473629214	62.35255518	88.46202983	4.962229956
63.5122369942226	93.2868473629214	62.03675317	91.42777069	2.470705606
63.5122369942226	93.2868473629214	63.88368354	92.98872817	4.684052733
63.5122369942226	93.2868473629214	64.96530116	93.98228963	1.618288248
60.6667977586742	94.956363799288	61.4906739	91.40517217	5.140621126
57.6290469700889	96.7387162175806	57.58318464	98.55697919	7.09566511
53.9003074460782	98.9264953095336	54.29998953	99.89190946	1.044878103
53.7827859134416	98.9570582033229	53.69991452	99.81161169	0.858562362
50.787159212404	97.5182210926205	49.59427698	92.51123595	5.147122326
50.787159212404	97.5182210926205	52.60387814	98.51053443	2.070061212
50.787159212404	97.5182210926205	52.2623599	99.83573023	3.745784047
49.0400214978006	98.2736255174849	48.39934621	99.02729511	0.989182834
49.0400214978006	98.2736255174849	52.71570498	99.46690315	5.481309266
50.1980482688967	93.6687988516752	49.19512952	89.44346883	4.342724929
50.1980482688967	93.6687988516752	51.95218378	92.57992082	2.064617824
50.1980482688967	93.6687988516752	48.69087386	94.64188777	2.380405111
46.1966548883227	92.8128201004024	46.25821854	91.17761288	1.63636571
46.1966548883227	92.8128201004024	47.96746082	95.14523251	8.805162658
46.1966548883227	92.8128201004024	45.01212749	95.47966426	8.619068903
46.1966548883227	92.8128201004024	43.04035221	95.37042711	9.4350131
46.1966548883227	92.8128201004024	44.01236363	95.54242778	10.44212715
46.1966548883227	92.8128201004024	47.31578899	98.13704672	11.87713881
46.1966548883227	92.8128201004024	48.86252985	99.44183304	10.4064769
46.1966548883227	92.8128201004024	43.63164404	99.67485887	11.34349589
43.5308812394061	93.1762093990314	48.45592928	88.4082341	6.862006444
43.5308812394061	93.1762093990314	42.23200248	88.95299773	4.651433464
43.5308812394061	93.1762093990314	45.13861135	90.47060332	6.162353189
43.5308812394061	93.1762093990314	42.53215273	92.92397176	1.03008857
43.5308812394061	93.1762093990314	43.91518159	93.39792889	1.222268104
43.5308812394061	93.1762093990314	45.33430047	93.58613905	5.098588574
43.5308812394061	93.1762093990314	39.86881125	93.47781189	5.895861926
43.5308812394061	93.1762093990314	45.34071838	99.2752365	6.545950484
45.8815260014889	94.8910081543246	46.20732106	94.82215894	0.332990442
45.8815260014889	94.8910081543246	50.67630959	98.08417141	8.634086059
45.8815260014889	94.8910081543246	48.82360524	98.37839062	7.220914682
45.8815260014889	94.8910081543246	44.53236455	98.59505273	8.99567986
44.5500138587572	97.1950197914768	44.56970667	97.22856143	0.038895351
39.3322895806585	97.2733204392675	36.79414467	92.2553405	5.623371076
39.3322895806585	97.2733204392675	39.44288188	96.38027853	1.997947716
39.3322895806585	97.2733204392675	39.47053756	98.01039691	1.338634383
39.3322895806585	97.2733204392675	41.23951851	98.4925435	2.263631388
39.3322895806585	97.2733204392675	35.92075185	99.04269187	5.09129157
39.3322895806585	97.2733204392675	37.87107476	99.67477247	5.142647072
39.3322895806585	97.2733204392675	37.35140359	99.57591236	4.551929256
37.3735902394018	97.5828963270013	34.28587406	93.01320732	5.515074689
37.3735902394018	97.5828963270013	37.35558564	97.30806318	0.287005759
36.8833920114025	98.4023471316325	36.49499514	99.8776323	1.525555131
36.8594527773504	97.415036272032	35.84999591	97.26233792	1.02094072
37.3305096688316	96.0147185583415	37.83606476	96.13365876	0.51935799

Solution x	Solution y	Original x	Original y	Radius
37.7830289479927	92.7475141081139	35.55901251	90.85604615	4.28990011
37.7830289479927	92.7475141081139	36.26720319	91.81523904	3.763004237
37.7830289479927	92.7475141081139	36.86677729	93.06343809	3.595056547
37.7830289479927	92.7475141081139	39.84944538	96.227912	4.047622309
38.584535691148	86.9606085541337	38.21932161	86.88940242	0.372090901
38.584535691148	86.9606085541337	32.33676606	89.56266763	6.977995049
38.584535691148	86.9606085541337	37.64776281	91.60925844	7.287109974
38.584535691148	86.9606085541337	33.91919319	90.52236574	7.193036058
38.584535691148	86.9606085541337	35.60188133	93.1465045	7.692381008
39.0847240270876	84.980933956442	38.25086273	84.70191635	0.879303979
39.0847240270876	84.980933956442	34.03327785	85.06694553	9.82794583
39.0847240270876	84.980933956442	40.55838899	87.88304878	7.94496914
39.0847240270876	84.980933956442	32.21271953	85.45061531	9.951664756
39.0847240270876	84.980933956442	40.16683897	89.097423	10.1742901
39.0847240270876	84.980933956442	36.90788531	88.78292268	8.871911482
39.0847240270876	84.980933956442	36.43143728	90.48214242	6.954373264
39.0847240270876	84.980933956442	32.87814817	90.10176773	9.598818493
39.0847240270876	84.980933956442	41.14116704	94.61634345	11.9580341
39.0847240270876	84.980933956442	36.31961338	94.1541845	11.14531248
40.3042534937842	82.0828651594225	38.78697828	81.20736169	1.751750667
40.3042534937842	82.0828651594225	41.14833132	82.10595877	1.515527703
42.396118101154	79.321954074734	43.12816365	79.63219046	0.795070626
42.396118101154	79.321954074734	36.17809574	80.13104248	8.234427368
42.396118101154	79.321954074734	33.71990859	84.56649705	11.87467854
43.2871886355495	73.5551241609999	42.13585343	68.94604524	4.750703238
43.2871886355495	73.5551241609999	42.58773685	73.94634336	0.801427016
44.4844144723561	71.9183542900196	43.59103477	70.75648589	1.830314492
44.4844144723561	71.9183542900196	44.13660931	71.38940487	5.060740493
44.4844144723561	71.9183542900196	39.75179858	71.51477588	9.864345808
44.4844144723561	71.9183542900196	47.34853229	74.63427391	8.300992216
44.4844144723561	71.9183542900196	41.95376322	74.60739468	10.5272795
44.4844144723561	71.9183542900196	38.19879917	73.45302115	11.60064907
44.4844144723561	71.9183542900196	41.14789047	74.75727523	7.341258219
44.4844144723561	71.9183542900196	40.76978451	74.94346594	8.186468819
44.4844144723561	71.9183542900196	36.44207057	76.13900165	11.50367704
44.4844144723561	71.9183542900196	38.20769452	77.89743741	10.9290231
45.6744703523866	70.2913867220031	47.89205446	67.3947139	3.735189713
45.6744703523866	70.2913867220031	45.59084573	70.21452412	0.113582292
51.405388876435	65.3079555608063	52.45383187	66.17944394	1.363350544
52.7173058822779	63.0787515659886	53.50308144	57.04941766	6.080321585
52.7173058822779	63.0787515659886	50.37372436	63.54183807	3.991959404
52.7173058822779	63.0787515659886	50.29671492	64.07582579	2.617903286
52.7173058822779	63.0787515659886	54.03625818	65.02303827	5.354401863
52.7173058822779	63.0787515659886	50.86986196	67.11854893	4.50428609
53.9685370011339	63.4337270016084	54.15102156	63.89433124	0.495436049
53.9685370011339	63.4337270016084	56.20333441	63.09635143	7.090992634
53.9685370011339	63.4337270016084	57.97334153	65.39941546	9.414607276
53.9685370011339	63.4337270016084	59.10597324	64.72617137	7.277653794
53.9685370011339	63.4337270016084	59.0134746	66.34233581	8.63026105
53.9685370011339	63.4337270016084	56.84900895	69.27095699	9.651018813
53.9685370011339	63.4337270016084	58.20433528	69.50520456	8.582697416
53.9685370011339	63.4337270016084	53.90080059	74.55382457	11.74270355
Route: 4 Length: 145.193459479623 Demand Met: 2850				
75.6126957337897	34.5901105089026	79.30599483	40.28434635	6.78710395
75.6126957337897	34.5901105089026	75.00767938	29.50135545	5.124594895
70.5141057512358	40.4278580936109	69.67922342	40.74675918	1.020269779
70.5141057512358	40.4278580936109	71.61626861	44.97765672	11.56039904
70.5141057512358	40.4278580936109	74.55729645	43.48740037	11.94062462
70.5141057512358	40.4278580936109	75.19376171	39.75388964	11.99616742
64.6549149348052	47.1364729931472	59.28037529	42.02965748	8.171091803
64.6549149348052	47.1364729931472	63.21772914	46.4808445	2.251010045
64.6549149348052	47.1364729931472	64.66140077	51.58253517	4.820243123
64.6549149348052	47.1364729931472	64.75792457	49.92103542	4.153788299
64.6549149348052	47.1364729931472	64.47235297	44.07915445	7.777532307
64.6549149348052	47.1364729931472	66.65703205	47.7722791	4.863538053
58.6657344996427	53.9939225341344	58.50503897	53.8647284	0.206189664
58.6657344996427	53.9939225341344	59.77266019	58.01872841	6.553588622
58.6657344996427	53.9939225341344	61.56325619	58.635877	7.786489382
58.6657344996427	53.9939225341344	62.81703196	55.94894639	5.494902887
58.6657344996427	53.9939225341344	63.59211348	50.34808715	9.725987624
56.8552831405314	56.4439214993617	55.16481024	55.42346911	2.604442543
56.8552831405314	56.4439214993617	55.40337389	57.61168804	1.863254992
55.4467801903299	58.3499824960384	56.36080227	54.43871329	4.01664825
55.4467801903299	58.3499824960384	57.09480153	60.45993374	2.677287543
49.7417064241571	61.2476348478202	49.52719402	60.88674536	0.419829482
49.7417064241571	61.2476348478202	52.59359138	61.87082203	8.855134315
49.7417064241571	61.2476348478202	56.73611746	58.87824868	10.42122905
49.7417064241571	61.2476348478202	52.64945222	62.68533593	7.539647236
49.7417064241571	61.2476348478202	53.04622082	62.56220406	11.46013038
49.7417064241571	61.2476348478202	56.12304172	60.76926662	8.549372537

Solution x	Solution y	Original x	Original y	Radius
49.7417064241571	61.2476348478202	44.96838238	64.05706864	9.942108139
49.7417064241571	61.2476348478202	42.95157888	64.84132436	9.17378456
49.7417064241571	61.2476348478202	52.68458788	66.68600654	11.1378938
49.7417064241571	61.2476348478202	49.39322363	67.57061768	11.53351655
44.8692469159307	64.599896878245	45.68320409	63.6499192	2.984457028
44.8692469159307	64.599896878245	41.95981534	64.94436816	2.929752986
40.5550614819954	67.5680652184034	44.42598809	67.45202223	3.872665591
40.5550614819954	67.5680652184034	39.73860453	66.92518954	1.039178085
39.8765560948893	68.146651501588	40.91327599	65.05437313	3.322312195
39.8765560948893	68.146651501588	41.30767537	70.05965636	2.389077221
39.8765560948893	68.146651501588	37.43465738	70.14594443	3.15595335
36.8368460445499	66.5197845980831	43.40294282	59.60424206	9.536160415
36.8368460445499	66.5197845980831	41.72708173	62.5487287	8.265204335
36.8368460445499	66.5197845980831	37.67648628	59.01822185	8.663388767
36.8368460445499	66.5197845980831	38.55825219	62.0328479	8.230604564
36.8368460445499	66.5197845980831	37.36735143	64.72519961	8.210035462
36.8368460445499	66.5197845980831	38.18944723	65.54612606	4.457511574
36.8368460445499	66.5197845980831	36.88863481	65.11756178	1.700574542
36.8368460445499	66.5197845980831	38.05290287	66.43336709	5.771110944
36.8368460445499	66.5197845980831	39.83687168	68.05987049	8.931405029
36.8368460445499	66.5197845980831	39.12047899	68.75765335	3.957947734
36.8368460445499	66.5197845980831	32.28903103	63.37386507	5.529867185
36.8368460445499	66.5197845980831	34.32584869	66.311045	8.8122254
36.8368460445499	66.5197845980831	33.85806756	68.2147305	8.272925857
29.5145657464988	64.9958484396765	29.47881008	65.01108227	0.038865631
29.5145657464988	64.9958484396765	24.68488711	59.85199485	7.587909595
29.5145657464988	64.9958484396765	26.36495426	64.10386589	5.012038977
29.5145657464988	64.9958484396765	24.66562586	67.58605744	8.251747258
29.5145657464988	64.9958484396765	24.37529212	73.10827156	9.946110191
29.5145657464988	64.9958484396765	22.14002238	72.37729838	10.56803504
32.5368097066807	60.1761216487851	32.47933058	60.09950546	0.095780428
32.5368097066807	60.1761216487851	28.38294287	59.7022254	6.876187581
32.5368097066807	60.1761216487851	28.66025221	61.13181458	8.682831908
32.5368097066807	60.1761216487851	28.86030824	61.83789689	5.323228343
32.5368097066807	60.1761216487851	26.36749261	61.24478927	10.05967123
32.5368097066807	60.1761216487851	25.08011935	60.4806985	8.52356797
32.5368097066807	60.1761216487851	25.66105506	62.27941228	9.39136023
32.5368097066807	60.1761216487851	30.01509861	69.93828769	10.72586107
32.5368097066807	60.1761216487851	22.84438078	60.01413405	9.832099483
32.5368097066807	60.1761216487851	21.56136042	60.00845368	11.66584778
36.9185603228512	58.9324015724017	40.92420024	52.54921675	7.535927257
36.9185603228512	58.9324015724017	42.10911161	58.06602885	5.369736734
36.9185603228512	58.9324015724017	37.58124673	53.7047325	6.278048118
36.9185603228512	58.9324015724017	36.65639834	59.2724504	2.438593171
36.9185603228512	58.9324015724017	33.45872958	53.85918585	6.545746658
36.9185603228512	58.9324015724017	34.15128455	57.37934974	3.806785854
36.9185603228512	58.9324015724017	35.39691212	60.01558524	7.016255469
36.9185603228512	58.9324015724017	36.99117209	62.09652931	3.164960791
36.9185603228512	58.9324015724017	36.53251416	65.89826385	7.253690252
42.1698449271095	55.4034488518816	46.15723029	56.4070148	5.286178878
42.1698449271095	55.4034488518816	41.84687745	52.15158968	3.267858024
42.1698449271095	55.4034488518816	39.86159624	55.58185516	2.315133001
48.8072393315554	52.7822028751225	47.38308024	49.71863955	4.361961303
48.8072393315554	52.7822028751225	48.91348948	54.77748717	1.998111236
48.8072393315554	52.7822028751225	48.01348394	55.67625048	3.794373864
48.8072393315554	52.7822028751225	52.57887869	54.16196226	4.016092555
50.5590576497085	49.2213784417038	50.26037041	48.95030273	0.987355419
50.5590576497085	49.2213784417038	45.78512338	48.76667443	10.70444172
50.5590576497085	49.2213784417038	47.22851165	47.89903616	11.51868038
50.5590576497085	49.2213784417038	48.65047008	56.26343732	11.1175127
50.5590576497085	49.2213784417038	53.22205568	50.84724902	8.874987766
50.5590576497085	49.2213784417038	44.98764045	56.96391467	10.72794423
50.5590576497085	49.2213784417038	48.35826716	45.69665672	9.422444764
50.5590576497085	49.2213784417038	54.43373891	52.12894009	7.548403707
50.5590576497085	49.2213784417038	47.65008175	45.51867646	10.88958897
50.5590576497085	49.2213784417038	45.94832838	45.50704308	7.19052718
50.5590576497085	49.2213784417038	55.80484172	50.30189669	7.040116877
50.5590576497085	49.2213784417038	53.70737401	57.8077763	11.42963583
50.5590576497085	49.2213784417038	49.81718199	39.89953162	11.40867509
50.5590576497085	49.2213784417038	57.35658457	43.71456461	10.0633535
52.4166280363125	45.4455976038537	49.48945411	49.44119699	4.953096168
52.4166280363125	45.4455976038537	51.65508094	43.85648581	1.762166358
52.4166280363125	45.4455976038537	53.79810347	45.16180718	1.985311525
57.6176141610891	40.6476999337369	52.03099226	42.50134863	7.192186477
57.6176141610891	40.6476999337369	57.48443808	43.25173204	5.068521277
57.6176141610891	40.6476999337369	57.56166222	41.97700689	1.823459763
57.6176141610891	40.6476999337369	63.41360315	44.69674786	7.070238855
57.6176141610891	40.6476999337369	56.1557774	36.1071959	6.201998603
61.425893424998	37.1345708765513	54.69460289	37.32086801	6.733868048
61.425893424998	37.1345708765513	63.12520069	41.24941139	6.279661735

Solution x	Solution y	Original x	Original y	Radius
61.425893424998	37.1345708765513	61.01859213	37.82208646	0.850005209
61.425893424998	37.1345708765513	58.09138733	33.97784367	4.941158085
Route: 5 Length: 163.993656303659 Demand Met: 2924				
54.8484093978785	32.469719370563	53.48089128	34.57431179	2.509863553
50.1121535704184	34.8178722562638	50.32982697	35.43640834	1.581696088
50.1121535704184	34.8178722562638	54.00076983	32.50218762	8.205190824
50.1121535704184	34.8178722562638	55.9549233	32.80200534	9.08801586
50.1121535704184	34.8178722562638	51.99282443	27.99909333	9.260790549
45.0280636201919	37.3384759268929	44.94410764	36.28576006	3.530989553
39.4411229678458	40.108385321802	38.90241804	39.45548462	0.84645279
39.4411229678458	40.108385321802	37.51752459	33.09106605	9.30247437
39.0047435233862	40.6808065048906	42.25980634	46.86827481	6.991437475
39.0047435233862	40.6808065048906	41.57443341	43.13832473	5.186489261
39.0047435233862	40.6808065048906	39.58652985	43.55288071	5.227108341
39.0047435233862	40.6808065048906	40.57741767	42.47262	3.80870253
39.0047435233862	40.6808065048906	38.72818734	43.64397508	6.801536894
39.0047435233862	40.6808065048906	40.81010844	38.77304558	5.734432078
39.0047435233862	40.6808065048906	38.78467609	39.06908374	2.608214338
39.0047435233862	40.6808065048906	41.09480481	34.92509896	6.686212606
35.947913952952	40.8311153581396	35.17250587	39.36136713	1.66175135
31.6112676892035	46.5476047778331	40.32660467	53.626561	11.22803277
31.6112676892035	46.5476047778331	35.40868681	49.33377596	6.467074744
31.6112676892035	46.5476047778331	34.68773061	48.27076221	4.719701242
31.6112676892035	46.5476047778331	33.45977848	51.47641849	7.198818879
31.6112676892035	46.5476047778331	34.31056081	43.95356429	3.881034988
31.6112676892035	46.5476047778331	31.52001616	50.89228775	10.98721573
31.6112676892035	46.5476047778331	31.80593192	45.60640645	10.76621751
31.6112676892035	46.5476047778331	30.55507662	47.73107042	10.01719534
31.6112676892035	46.5476047778331	30.62796082	46.77730777	8.83821808
31.6112676892035	46.5476047778331	30.18073163	48.32029982	9.58620967
31.6112676892035	46.5476047778331	32.06711817	41.12824267	9.236365321
31.6112676892035	46.5476047778331	30.33187934	43.75504148	8.637269115
31.6112676892035	46.5476047778331	30.28185343	43.77834378	7.043480934
31.6112676892035	46.5476047778331	29.65914735	42.12761495	5.483604448
31.6112676892035	46.5476047778331	26.567735	46.7768569	5.167125033
31.6112676892035	46.5476047778331	28.08331623	42.02257662	9.317039589
31.6112676892035	46.5476047778331	27.06311365	42.64274924	7.281813729
31.6112676892035	46.5476047778331	24.77779172	44.04083387	11.013687
31.6112676892035	46.5476047778331	22.68802089	46.28526246	10.38254064
31.6112676892035	46.5476047778331	23.40792676	43.64379836	8.702120093
27.5304595682991	47.6782974917486	27.37711129	46.43616017	2.003178979
27.5304595682991	47.6782974917486	18.80954314	50.67936902	11.57690137
27.5304595682991	47.6782974917486	19.40209516	41.66020767	11.97444555
23.4232027186345	48.8163168609075	22.81585575	48.67591425	0.788075572
23.4232027186345	48.8163168609075	22.00300591	49.77440842	6.521574248
23.4232027186345	48.8163168609075	20.72246404	50.29048837	3.507005939
23.4232027186345	48.8163168609075	18.10483235	51.48322234	8.264928029
23.4232027186345	48.8163168609075	16.47526591	49.4455512	9.818184126
19.0287660990195	50.0339076201102	18.13426387	49.15791018	1.2520007
19.0287660990195	50.0339076201102	18.21468575	45.65080463	4.897381571
19.0287660990195	50.0339076201102	11.99216143	50.52822644	8.464820885
19.0287660990195	50.0339076201102	12.31993183	42.07287161	11.95610617
19.0287660990195	50.0339076201102	9.196765131	46.15569372	11.9809647
19.0287660990195	50.0339076201102	8.078510661	52.12465727	11.74516273
18.5845740924726	51.7779247987502	20.37447933	52.92580791	2.126357542
18.5845740924726	51.7779247987502	16.54761864	53.09785344	6.228334506
15.156090769902	54.5487361353488	15.36448886	54.97389236	0.473484508
15.156090769902	54.5487361353488	16.07158763	60.00636388	7.250262131
15.156090769902	54.5487361353488	13.89109091	56.92730438	9.141496171
15.156090769902	54.5487361353488	13.17908278	60.05355856	7.781969298
15.156090769902	54.5487361353488	10.83705181	59.65376627	8.510330825
15.156090769902	54.5487361353488	11.71156616	63.23151575	10.95254356
15.156090769902	54.5487361353488	9.891024822	52.16610985	9.993987041
15.156090769902	54.5487361353488	9.265122262	48.10149258	9.899762573
15.156090769902	54.5487361353488	10.36857839	64.9958121	11.82219863
15.156090769902	54.5487361353488	8.011277516	61.69215045	10.57580758
15.156090769902	54.5487361353488	4.692804385	58.08052349	11.75765381
13.258348912515	54.9966786434153	17.45311026	57.02027397	4.698442012
13.258348912515	54.9966786434153	13.21771043	55.16074821	0.169027539
13.258348912515	54.9966786434153	11.86612062	56.83051802	3.1512409
10.3498442580705	52.4590465414179	7.880864255	53.63419396	2.73437995
10.2865553292428	50.655603441335	10.16802995	51.02082052	0.802611588
10.2865553292428	50.655603441335	10.20301226	47.6234059	9.015245558
10.2865553292428	50.655603441335	8.736047039	47.86465463	7.075947311
10.2865553292428	50.655603441335	6.962926975	47.87740863	8.307462013
10.2865553292428	50.655603441335	6.810990128	49.52757429	9.894324521
10.2865553292428	50.655603441335	3.857750749	53.93522034	9.829595519
10.2865553292428	50.655603441335	3.684518627	54.75346427	10.66155854
10.2865553292428	50.655603441335	0.073554416	50.20291794	11.48330524
10.2221687246103	48.8208824473321	12.24975114	50.92735248	3.387131358

Solution x	Solution y	Original x	Original y	Radius
10.2221687246103	48.8208824473321	10.84189087	50.74783931	3.28397178
10.2221687246103	48.8208824473321	10.30388261	47.84277995	0.981509885
10.2221687246103	48.8208824473321	8.811692105	48.50504439	1.445405816
12.9317304892301	45.0992865992502	17.93093151	43.30092715	5.511425972
12.9317304892301	45.0992865992502	12.97854061	40.66549102	4.434042673
12.9317304892301	45.0992865992502	8.915897502	48.83105962	5.482065711
13.8327596625721	46.1483116777809	18.21138052	45.58660191	4.414503197
13.8327596625721	46.1483116777809	14.81228179	50.29125842	4.356482226
13.8327596625721	46.1483116777809	12.77181014	48.33401693	2.429592834
16.1966596907934	45.1712803924658	19.18169919	47.05766373	3.954790614
16.1966596907934	45.1712803924658	17.80089583	46.64512233	2.679415185
17.6962281191153	44.5514889024377	17.47416259	43.6041515	0.973016574
17.6962281191153	44.5514889024377	13.48749824	42.29987548	9.005353542
17.6962281191153	44.5514889024377	12.65054039	38.20990532	8.455350331
17.6962281191153	44.5514889024377	9.954481978	42.50823893	10.6166074
25.7064987467384	44.0013081914487	25.71821347	44.02373583	0.02530284
25.7064987467384	44.0013081914487	14.44281578	41.35822358	11.77700274
26.1495565377535	43.4496613316879	25.73174612	44.02606181	0.711901016
26.1495565377535	43.4496613316879	22.79879511	41.59634367	7.012240784
26.1495565377535	43.4496613316879	19.77510428	38.58926296	11.91376449
26.1495565377535	43.4496613316879	17.44262234	43.68368222	10.91295355
27.080079508862	42.2910764847433	30.83636789	38.35208021	5.711258926
27.080079508862	42.2910764847433	28.54401437	40.13690379	5.278992328
27.080079508862	42.2910764847433	26.12441872	44.96485891	2.839436564
27.080079508862	42.2910764847433	23.73647568	45.21539639	5.188751838
29.8140536683424	38.8870321489479	30.41452332	39.55317391	2.75931255
29.8140536683424	38.8870321489479	29.90863496	38.4851443	2.311172422
32.1746079416145	35.9479286092044	31.80606468	35.45021175	0.619311075
32.1746079416145	35.9479286092044	25.99458773	34.37910238	11.0175516
32.1746079416145	35.9479286092044	25.40396983	32.32053998	11.43146897
32.1746079416145	35.9479286092044	26.37919279	28.3108891	11.05276225
41.3654835174006	32.2704720128043	44.21687698	34.39769027	3.557457265
41.3654835174006	32.2704720128043	40.57036155	31.31828969	1.240512039
51.0360998472137	30.2980417572871	51.19858704	31.0981292	0.816420237
51.0360998472137	30.2980417572871	46.26887105	26.53209753	8.81744986
52.837676521745	29.9297644545033	58.14893689	37.55022655	9.288752836
52.837676521745	29.9297644545033	47.52772375	30.54529654	5.345510096
52.837676521745	29.9297644545033	55.07321291	28.85442279	3.578504928
52.837676521745	29.9297644545033	59.11600598	27.89604561	6.714910247
52.837676521745	29.9297644545033	59.97712424	27.07719444	8.051501149
52.837676521745	29.9297644545033	50.59311922	22.75724468	8.529458236
61.0158991371115	26.9400403743448	63.76560063	37.45231942	11.55334525
61.0158991371115	26.9400403743448	59.48412304	31.97998889	5.267581898
61.0158991371115	26.9400403743448	62.83458953	32.37480154	11.26631142
61.0158991371115	26.9400403743448	63.04507341	24.29862677	4.664845393
61.0158991371115	26.9400403743448	62.17589976	23.53474989	5.377142852
61.0158991371115	26.9400403743448	67.26622281	20.02005982	10.98398776
Route: 6 Length: 176.255786373814 Demand Met: 3000				
72.6627846509759	54.9251267325381	72.73426073	54.95021428	0.075751006
71.0206731438449	58.1736096040332	70.94365949	58.14560753	0.08194644
71.0206731438449	58.1736096040332	71.99750065	50.82091856	11.82057255
71.0206731438449	58.1736096040332	74.85083054	64.74645556	10.29426937
71.0206731438449	58.1736096040332	76.04244622	64.45001766	10.41499903
68.4443600073728	69.2047998395795	69.12634406	69.4594231	0.727966519
68.4443600073728	69.2047998395795	67.69295238	75.24403656	11.35995088
68.4443600073728	69.2047998395795	74.07680751	69.16329968	10.96743145
68.4443600073728	69.2047998395795	70.77169737	73.88064127	8.726232409
68.4443600073728	69.2047998395795	68.84275879	76.03221479	10.79538264
68.4443600073728	69.2047998395795	78.83068399	69.67274441	11.30182844
66.4955380866878	72.9008820389628	66.81087893	72.19337817	0.774597684
63.359948369292	78.8477558350139	60.70093329	80.64454551	3.209176581
63.359948369292	78.8477558350139	63.68037897	79.29990004	1.33873582
61.6331826784884	82.1226928934057	61.67834468	82.51967341	0.399541158
61.6331826784884	82.1226928934057	61.30013954	82.69641043	3.087682485
61.6331826784884	82.1226928934057	64.88497046	82.96772641	9.339812785
61.6331826784884	82.1226928934057	63.32241418	89.29380754	7.42798409
58.2547421006527	78.2062151019867	55.58088554	76.52999392	3.50422197
58.2547421006527	78.2062151019867	58.21523833	76.77458472	1.432175303
55.973052606165	81.1668471329877	55.73082902	81.05870461	0.265267923
55.973052606165	81.1668471329877	62.20174968	80.96664236	8.789809443
55.973052606165	81.1668471329877	62.03157877	81.16617953	8.754951123
55.973052606165	81.1668471329877	55.75342338	84.56592915	5.992730061
55.973052606165	81.1668471329877	52.83415121	85.50123146	6.270496768
55.973052606165	81.1668471329877	53.87450626	88.16447802	7.742268204
55.973052606165	81.1668471329877	54.48965648	89.30641789	9.13140765
55.973052606165	81.1668471329877	53.27314218	89.6748569	11.35118685
55.440362741568	84.041868698943	50.20394782	81.95454381	5.63710621
55.440362741568	84.041868698943	56.64479831	82.24679775	3.64219376
55.440362741568	84.041868698943	58.40265516	82.89286098	3.789211097
55.440362741568	84.041868698943	55.11001594	85.68607737	1.677066237

Solution x	Solution y	Original x	Original y	Radius
56.4733813378176	89.7324962503009	59.01602486	86.99268685	4.144714535
56.4733813378176	89.7324962503009	56.15571936	89.41500769	1.432185748
56.4733813378176	89.7324962503009	57.53422575	91.73216299	2.263638208
56.2858668949331	89.5488941669271	56.30399813	89.72916428	0.18367023
56.2858668949331	89.5488941669271	53.26472651	92.17526811	6.470026475
56.2858668949331	89.5488941669271	53.29556121	92.47449182	6.766260463
56.2858668949331	89.5488941669271	54.90972966	93.30800556	7.380299806
56.2858668949331	89.5488941669271	58.00620671	94.64720593	11.42342539
56.2858668949331	89.5488941669271	54.09260921	96.04789718	7.918650854
56.2858668949331	89.5488941669271	61.09603132	95.38804721	8.526033691
56.2858668949331	89.5488941669271	57.84005051	97.24933499	10.98084378
56.2858668949331	89.5488941669271	57.43254842	97.94119843	10.09429194
52.6762186965793	86.0145585046962	52.05342714	85.82620662	2.610320997
52.6762186965793	86.0145585046962	49.03663551	90.65504513	8.507710049
52.6762186965793	86.0145585046962	54.43632749	91.92787857	10.0796961
52.6762186965793	86.0145585046962	54.10050901	92.28618361	9.480891031
52.6762186965793	86.0145585046962	51.98537923	93.03310405	10.9895755
49.0816243439376	82.4949622845449	45.32225765	79.26748614	4.954739166
49.0816243439376	82.4949622845449	53.61605765	80.93460352	4.795394132
49.0816243439376	82.4949622845449	51.91564321	83.24154723	4.641150631
49.0816243439376	82.4949622845449	49.77274656	84.13753559	4.242971999
49.0816243439376	82.4949622845449	51.44475874	86.59474587	4.908082369
45.5103989853163	81.4405465052027	46.11608956	79.13405595	3.077288175
45.5103989853163	81.4405465052027	44.66930475	80.79724102	1.096402137
45.5103989853163	81.4405465052027	45.13867401	81.86371268	0.563248674
44.8152020495927	79.8683938097589	44.56064253	79.77318093	0.271783078
44.8152020495927	79.8683938097589	44.47086767	80.17305261	4.558123438
44.8152020495927	79.8683938097589	40.77647626	81.23711291	8.680043042
44.8152020495927	79.8683938097589	40.58416037	81.54961967	7.064640642
44.8152020495927	79.8683938097589	38.24583972	80.95791524	10.77332683
44.8152020495927	79.8683938097589	46.93472918	83.75304242	7.122281837
44.8152020495927	79.8683938097589	38.00030199	82.20200968	9.151482372
44.8152020495927	79.8683938097589	46.03038143	83.79986665	6.928032766
44.8152020495927	79.8683938097589	45.3176187	83.7901857	4.538711056
44.8152020495927	79.8683938097589	39.57638463	86.69599702	10.21132869
44.8152020495927	79.8683938097589	46.02083433	88.3362158	9.025977842
48.4141909263668	78.180154934038	49.13669956	77.10708156	1.314416719
48.4141909263668	78.180154934038	47.14165764	77.84331314	3.855818645
48.4141909263668	78.180154934038	49.62844822	78.65994225	3.895592856
48.4141909263668	78.180154934038	47.92908542	80.11129273	4.896396861
48.4141909263668	78.180154934038	49.55654528	80.81624315	5.359214828
48.4141909263668	78.180154934038	48.20934555	82.30314786	7.596162818
48.4141909263668	78.180154934038	51.18829335	82.80979047	7.761910446
48.4141909263668	78.180154934038	51.49657531	83.11057243	7.887384084
48.4141909263668	78.180154934038	55.99099974	83.60147673	11.10984141
51.9806140357867	76.507191766042	52.24575767	74.98560476	1.544515511
51.9806140357867	76.507191766042	52.40986372	76.90026657	0.582033584
51.3855378923855	73.4517418427345	51.17754367	73.39508539	0.21557261
51.3855378923855	73.4517418427345	49.21219028	82.18677234	11.80432558
53.6291280759628	70.9154438710528	53.60239056	70.80290226	0.11567415
53.6291280759628	70.9154438710528	49.38151416	71.84627519	5.560857427
53.6291280759628	70.9154438710528	51.91696279	73.69595809	5.533020939
53.6291280759628	70.9154438710528	51.90516717	74.10528304	4.497348507
53.6291280759628	70.9154438710528	53.92763119	74.12654413	8.444710151
53.6291280759628	70.9154438710528	55.90538334	73.56581582	5.910476566
53.6291280759628	70.9154438710528	59.09181099	73.44789922	8.247004523
53.6291280759628	70.9154438710528	50.78444002	76.12504454	8.918500215
53.6291280759628	70.9154438710528	56.76810138	74.93595817	10.01955077
53.6291280759628	70.9154438710528	57.06276587	74.98770524	9.477514768
53.6291280759628	70.9154438710528	57.82109764	79.24611201	11.76834886
55.7325545208137	71.7557014037485	55.72002047	71.91921816	0.163996439
55.7325545208137	71.7557014037485	60.79681015	75.33369853	8.472276725
55.7325545208137	71.7557014037485	53.08761619	83.0335557	11.99564131
62.8008427038632	70.1227441201332	62.01287875	62.70691628	7.75530817
62.8008427038632	70.1227441201332	60.59756518	67.42291916	6.033901052
62.8008427038632	70.1227441201332	65.09617026	64.32634731	6.924546531
62.8008427038632	70.1227441201332	63.53725064	67.03413314	7.164195385
62.8008427038632	70.1227441201332	63.47892732	68.70647259	6.807486056
62.8008427038632	70.1227441201332	65.55566867	66.58332744	6.556838353
62.8008427038632	70.1227441201332	63.48323083	69.36201841	5.452872617
62.8008427038632	70.1227441201332	61.14896118	72.70410502	3.400508534
62.8008427038632	70.1227441201332	61.63608438	74.03409399	7.121975094
62.8008427038632	70.1227441201332	58.81674593	76.2826012	7.335997979
62.8008427038632	70.1227441201332	68.36889636	72.61479797	6.100291297
62.8963990302489	65.2920406585533	61.64088805	64.72462094	1.377778269
62.8963990302489	65.2920406585533	65.84999623	61.37790202	9.405960407
62.8963990302489	65.2920406585533	67.45457311	72.85375456	11.61655168
65.5079821052978	62.899579005605	61.59665848	60.86573745	4.870665397
65.5079821052978	62.899579005605	65.33791464	63.72798066	0.84567857
65.5079821052978	62.899579005605	67.87575086	63.89107621	2.566981804

Solution x	Solution y	Original x	Original y	Radius
67.3529881055979	57.9955137929294	67.10787364	49.80646667	8.845260172
67.3529881055979	57.9955137929294	68.52022941	55.69012612	6.004927032
67.3529881055979	57.9955137929294	69.70404765	60.5822767	3.495543351
67.3529881055979	57.9955137929294	72.13050555	55.03070373	5.622701454
67.3529881055979	57.9955137929294	71.85259834	57.85616299	6.145303146
67.9963408094864	56.0626854920764	65.98277732	56.02257659	2.034393571
67.9963408094864	56.0626854920764	66.67873973	56.13517049	1.600074425
67.9963408094864	56.0626854920764	67.27809665	56.79217526	1.980408171
71.4901526457991	45.5662009899657	63.54041364	40.47906672	10.09103037
71.4901526457991	45.5662009899657	73.13866372	41.71405139	6.333819835
71.4901526457991	45.5662009899657	74.78372311	42.05088328	8.48875153
71.4901526457991	45.5662009899657	76.57028534	49.55513485	6.459051132
Route: 7 Length: 218.334374590352 Demand Met: 2993				
31.7349375871222	62.6906447054976	31.78300706	62.74548174	0.072923073
31.7349375871222	62.6906447054976	27.36103425	64.84526011	5.82414556
31.7349375871222	62.6906447054976	26.6523776	66.91672378	7.970867369
28.1855871133405	65.7740859918603	28.77703399	67.75671878	2.359780417
24.4819783299285	68.991536646166	24.34494447	68.89894191	0.165384594
24.4819783299285	68.991536646166	24.00842436	69.26671548	3.536360214
24.4819783299285	68.991536646166	22.95220857	73.2582761	8.329429805
24.4819783299285	68.991536646166	21.60880813	73.64895737	8.789616797
24.4819783299285	68.991536646166	22.95922483	75.83051285	9.548150341
24.4819783299285	68.991536646166	20.16006997	73.55306832	7.784192094
24.4819783299285	68.991536646166	18.49430275	75.1491321	9.770365975
24.4819783299285	68.991536646166	18.79013692	77.54174683	11.83768723
24.3547931309622	69.3593176589391	26.03259253	67.05188068	2.852941681
24.3547931309622	69.3593176589391	23.39691794	71.43920824	2.45996491
23.1247824645738	72.9161353911443	22.68191696	72.90808337	0.442938698
23.1247824645738	72.9161353911443	17.24413003	73.14298035	6.329084859
23.1247824645738	72.9161353911443	13.78543979	72.75062985	9.733830208
23.3770725226258	73.7416962144829	23.86908483	73.83689183	0.501137023
23.3770725226258	73.7416962144829	18.31523717	76.27495825	7.153261702
23.3770725226258	73.7416962144829	21.51917751	80.74471553	9.9567065
23.3770725226258	73.7416962144829	18.15807888	79.40011164	9.804701845
23.3770725226258	73.7416962144829	14.09860615	77.68853822	11.70742841
23.3770725226258	73.7416962144829	19.16596982	83.58117432	11.91490763
21.447097004203	76.1340640017778	21.16552744	75.92926841	0.348170438
21.447097004203	76.1340640017778	19.47269695	75.25893863	3.538510883
21.447097004203	76.1340640017778	22.96398221	79.24584246	5.253467184
21.447097004203	76.1340640017778	18.46683587	77.29301103	4.716670657
21.447097004203	76.1340640017778	18.15532249	77.80652015	5.054973135
21.447097004203	76.1340640017778	20.11668251	80.56671914	7.222669816
21.447097004203	76.1340640017778	14.92906226	79.42060964	9.914113666
21.447097004203	76.1340640017778	12.87616068	80.54131267	11.25097601
20.7560789994849	77.19143099632	21.04749508	76.84597788	0.462481096
20.7560789994849	77.19143099632	19.29153506	80.52426775	5.162100755
20.7560789994849	77.19143099632	17.20155001	81.69531761	7.066943728
19.7960537592537	78.6604239019286	16.93400358	77.9224885	2.955652193
20.4785982585055	87.8456610137276	20.75129811	88.7330358	0.972274996
20.4785982585055	87.8456610137276	15.25088212	86.85170355	8.312417494
20.4785982585055	87.8456610137276	19.55892343	94.48515334	8.137719702
20.4785982585055	87.8456610137276	17.22630202	94.08640458	10.84424377
20.4785982585055	87.8456610137276	10.77763243	89.00986935	11.5413795
20.4785982585055	87.8456610137276	22.06521104	97.80973943	10.44097889
20.7216773762746	91.1168555670157	22.46431132	85.87828698	5.64815455
20.7216773762746	91.1168555670157	23.92476676	88.85275247	4.755388035
20.7216773762746	91.1168555670157	21.4032788	88.65695382	2.971051139
20.7216773762746	91.1168555670157	21.63379999	90.72848541	0.991362215
20.7216773762746	91.1168555670157	20.03955091	90.83830295	2.258156755
20.7216773762746	91.1168555670157	22.62104276	94.03699994	3.483508579
17.3529976750398	91.8110918664524	18.21730526	92.48725442	1.5701409
17.3529976750398	91.8110918664524	16.85080568	91.45389056	0.616270698
17.5766834552354	93.5083451706529	18.65944439	93.90622028	1.153549238
17.5766834552354	93.5083451706529	16.10416337	94.62212285	7.114799892
17.5766834552354	93.5083451706529	11.04946885	95.30278919	11.15137795
16.1609652674629	94.7892976225477	13.01348985	89.5505908	6.625491116
16.1609652674629	94.7892976225477	17.25875189	95.69940805	3.398739413
16.1609652674629	94.7892976225477	14.02380259	94.55773265	2.149671288
18.3309329231359	97.8322616693519	20.42707279	96.69258649	2.602601065
18.3309329231359	97.8322616693519	17.81960057	98.01765152	0.543902723
18.3309329231359	97.8322616693519	18.10270516	98.29192556	0.6619415
18.3309329231359	97.8322616693519	18.56973911	98.93410982	1.127429706
25.3185008722166	99.1479973583449	25.34553204	99.20543489	0.063480344
25.9008724000199	98.0943882361457	33.84742868	94.52834747	8.71001742
25.9008724000199	98.0943882361457	31.89808649	95.62749105	8.151929048
25.9008724000199	98.0943882361457	31.65500689	99.46882276	7.475813284
25.9008724000199	98.0943882361457	27.32463884	98.08040747	2.022977234
25.9008724000199	98.0943882361457	28.69202489	99.34571575	3.476487599
25.9008724000199	98.0943882361457	25.35918107	97.93925835	0.894739291
25.9008724000199	98.0943882361457	25.64004891	98.33585155	1.834844509

Solution x	Solution y	Original x	Original y	Radius
25.9008724000199	98.0943882361457	27.50072899	99.76767751	2.315046026
25.9008724000199	98.0943882361457	21.95406549	97.08230078	5.310921574
25.9008724000199	98.0943882361457	21.53298817	97.76613815	6.447332374
25.9008724000199	98.0943882361457	23.65267964	99.40598609	5.864138835
25.9008724000199	98.0943882361457	22.00240146	99.12603644	7.885601786
25.9008724000199	98.0943882361457	22.19955839	99.83998701	6.495340695
27.7071858696855	93.906342676931	29.03165996	90.53300961	3.624031953
27.7071858696855	93.906342676931	30.08845088	94.04600611	2.38535719
25.4054556486572	93.1171113498956	25.24294214	93.18181598	0.174920924
25.4054556486572	93.1171113498956	27.03699297	98.99807723	9.045435578
25.4054556486572	93.1171113498956	23.23282295	99.37897746	9.140009252
27.0523891524427	89.9740362222377	24.92385591	92.07997464	3.317074037
27.0523891524427	89.9740362222377	23.10855555	93.46528062	6.046811031
28.7572282356031	86.7204516785043	28.95022635	86.79829568	0.208105648
28.7572282356031	86.7204516785043	31.03913924	88.81924735	5.700862296
28.7572282356031	86.7204516785043	30.46512782	92.10545477	8.699579279
28.7572282356031	86.7204516785043	30.51609732	92.20951413	7.873323153
28.7572282356031	86.7204516785043	30.18341718	92.15484297	6.43104448
28.7572282356031	86.7204516785043	24.68088332	89.71453351	5.772547732
28.7572282356031	86.7204516785043	21.61123904	90.19731465	9.443600344
28.7572282356031	86.7204516785043	26.20322759	94.45704722	10.10698797
28.7572282356031	86.7204516785043	25.58817455	94.62259734	11.27075496
29.4499418089576	84.3482436585672	28.34961296	82.66841267	2.008122438
30.0730533221543	82.2143890374481	29.49613778	81.77737157	0.723751207
30.0730533221543	82.2143890374481	30.96168192	84.99460949	5.800733164
30.0730533221543	82.2143890374481	24.67927032	81.21698222	7.738446369
30.0730533221543	82.2143890374481	25.47356848	81.94258519	6.220239291
30.0730533221543	82.2143890374481	31.92346769	85.96439053	5.672562244
30.0730533221543	82.2143890374481	28.94608169	87.05476962	8.550013673
30.0730533221543	82.2143890374481	24.93956922	85.18138774	10.96633056
30.0730533221543	82.2143890374481	30.78074407	88.67743671	9.308222123
30.0730533221543	82.2143890374481	26.49994117	86.49656314	11.41565502
30.0730533221543	82.2143890374481	24.79158589	85.73273425	9.89839469
32.2268171928999	80.869085841833	35.96077646	77.38727187	5.108866084
32.2268171928999	80.869085841833	32.56942546	80.98884638	0.362936649
32.2268171928999	80.869085841833	32.77989789	83.25231939	4.247864371
30.8000307767776	76.8344203416662	35.03662295	76.31902131	4.632798788
30.8000307767776	76.8344203416662	32.43971284	75.52883521	2.656140818
30.8000307767776	76.8344203416662	29.81370195	76.77877617	0.987897175
30.8000307767776	76.8344203416662	31.34183617	77.86791685	1.166905359
30.8000307767776	76.8344203416662	31.54519137	79.16359507	3.505835342
30.8000307767776	76.8344203416662	29.05539546	78.84402949	4.430792212
30.8000307767776	76.8344203416662	29.7776223	79.3796747	3.220365403
32.3923189251136	70.8481680583889	31.96159565	70.60936436	0.492493397
32.3923189251136	70.8481680583889	34.30971303	75.90183293	10.30780315
32.3923189251136	70.8481680583889	31.67974116	78.20082263	10.5302733
32.3923189251136	70.8481680583889	24.84752889	78.21896812	11.0945574
Route: 8 Length: 198.325084256202 Demand Met: 2651				
77.4229937757181	17.3797841374518	77.03036191	15.51069798	4.834719524
75.5295383993594	15.454580503526	76.68650337	13.86956158	1.962359022
71.5263760089778	13.4343768519004	60.71671796	14.8721563	10.90485749
71.5263760089778	13.4343768519004	70.71952594	19.54937922	6.168002999
71.5263760089778	13.4343768519004	65.51501196	11.68636529	7.30737771
71.5263760089778	13.4343768519004	72.1570689	9.179080442	9.589007965
62.3531288222856	6.67961992862566	63.24920239	4.015695007	2.810594924
42.5244244781246	6.39688316909035	42.34346606	5.769949569	0.652527155
32.809548015811	12.7100136509288	35.85991513	20.90404301	8.748151694
32.809548015811	12.7100136509288	35.53984032	15.99196501	8.611862088
32.809548015811	12.7100136509288	34.15723352	12.84614068	4.597761329
32.809548015811	12.7100136509288	38.07401644	11.09458783	6.973490769
32.809548015811	12.7100136509288	35.62470684	10.73896033	6.976212454
32.809548015811	12.7100136509288	32.11403346	10.63014558	3.943215754
32.809548015811	12.7100136509288	29.15811552	9.518746656	4.849447835
29.5775531320139	19.5402851780703	30.90434674	20.96780911	1.948898626
26.46640724631	20.7428947317892	28.82263126	20.36706254	2.386009522
26.46640724631	20.7428947317892	25.83818458	22.03803134	1.439459118
26.46640724631	20.7428947317892	27.39065822	19.10906735	2.166651987
23.7732060369129	19.6683101882659	23.64941173	19.80991504	0.188087651
23.7732060369129	19.6683101882659	21.65865806	17.99154884	8.718780186
23.2824745869	18.7984853407004	24.23492671	17.98856994	1.250251176
14.7472318666283	11.9657694798071	20.19850768	8.627828216	7.471216408
14.7472318666283	11.9657694798071	18.20950886	6.619599382	6.369371766
9.34366956479855	9.19141612728997	2.197761157	16.16441336	10.88783855
9.34366956479855	9.19141612728997	8.988027099	7.925934732	1.314505506
9.34366956479855	9.19141612728997	5.801300438	5.23076571	10.356567
6.73825006047056	13.4550266238216	8.465864182	8.874062551	11.71772619
4.0238469374068	17.8969822424036	9.442374955	27.32019574	10.87002293
4.0238469374068	17.8969822424036	9.320660383	27.08555662	10.8588123
4.0238469374068	17.8969822424036	10.62327399	24.29073933	10.64782213
4.0238469374068	17.8969822424036	12.63680518	12.91935497	10.77386908

Solution x	Solution y	Original x	Original y	Radius
4.0238469374068	17.8969822424036	8.679954371	15.22687294	10.6053774
4.0238469374068	17.8969822424036	5.722550995	17.38650207	10.68361364
4.0238469374068	17.8969822424036	0.867278095	18.04823486	3.160190534
4.0238469374068	17.8969822424036	3.177857831	14.97802426	5.317837399
4.0238469374068	17.8969822424036	3.082410661	9.043855976	9.949435792
8.15896591576831	19.8135278784194	14.14878683	27.98719075	10.13344558
8.15896591576831	19.8135278784194	14.86812736	22.17705421	8.397529002
8.15896591576831	19.8135278784194	8.026602483	29.17059173	9.758103666
8.15896591576831	19.8135278784194	10.79914705	20.42039499	9.255684285
8.15896591576831	19.8135278784194	14.9958336	14.5728326	8.817791313
8.15896591576831	19.8135278784194	12.36712067	15.90584574	8.460729812
8.15896591576831	19.8135278784194	5.584406208	23.81184943	9.409363681
8.15896591576831	19.8135278784194	10.89890727	16.02503912	4.675459945
8.15896591576831	19.8135278784194	5.677247541	18.04924585	6.000363709
8.15896591576831	19.8135278784194	7.319977879	15.37807435	6.081166637
7.2756930181017	22.4690860002958	6.772905892	23.04434695	2.6690689
6.39104994926333	25.1287635442629	4.281409798	24.72152663	3.095213609
5.51796784081198	27.7536830781523	6.719406227	25.73868862	2.345987396
5.51796784081198	27.7536830781523	3.815111582	26.65111472	5.810017463
5.51796784081198	27.7536830781523	4.953508892	23.81507206	11.32693583
5.51796784081198	27.7536830781523	0.438114408	29.42535326	10.7393682
3.83894209323631	32.8016704858047	2.885836634	40.60849192	7.864786769
3.83894209323631	32.8016704858047	2.518275748	30.45426362	5.70976178
3.83894209323631	32.8016704858047	3.430192849	27.39779729	6.526989384
3.83894209323631	32.8016704858047	1.354188569	31.31594018	7.295671947
3.83894209323631	32.8016704858047	2.694391803	27.62826968	5.298497076
3.44672898537077	35.7509979976697	0.094225631	39.91558536	5.346313369
14.508791129691	31.7451316761388	22.07359754	33.01769228	8.049766298
14.508791129691	31.7451316761388	19.64225061	34.99214308	6.554722745
14.508791129691	31.7451316761388	18.69463352	36.26547074	6.160741982
14.508791129691	31.7451316761388	14.50630809	38.16565664	6.420525444
14.508791129691	31.7451316761388	18.74305811	29.30240259	6.990859055
14.508791129691	31.7451316761388	10.78091353	34.08373955	6.747292093
16.9141385056421	28.5586681728232	22.33900559	31.60235215	6.287046338
16.9141385056421	28.5586681728232	16.76117492	28.31246812	0.289848796
24.7512355731434	27.0703167240866	24.87958822	27.09583401	0.141251684
24.7512355731434	27.0703167240866	20.73212412	24.23741148	6.929326091
24.7512355731434	27.0703167240866	18.71921477	25.10440199	9.380442313
24.7512355731434	27.0703167240866	18.39694528	22.72524013	8.568057279
24.7512355731434	27.0703167240866	17.16840861	23.65521269	10.62185038
27.8980228494137	26.4727070433184	27.26619514	25.90196542	1.092233728
27.8980228494137	26.4727070433184	24.09498187	20.3828805	10.45340098
27.8980228494137	26.4727070433184	21.70527032	21.60018691	8.932392927
29.7850529052301	26.1143391335089	30.34406593	27.74432368	1.723178802
29.7850529052301	26.1143391335089	29.56587444	24.57869021	7.997446269
29.7850529052301	26.1143391335089	28.59013959	24.83311171	10.05513054
29.7850529052301	26.1143391335089	24.70443529	26.12365999	8.158816457
29.7850529052301	26.1143391335089	23.31975826	27.34182644	8.782240679
35.8127707628698	23.0289530725899	40.05041388	28.81118981	7.168813073
35.8127707628698	23.0289530725899	34.82834577	24.45085722	2.058629996
35.8127707628698	23.0289530725899	39.07927218	20.57348801	5.646872091
35.8127707628698	23.0289530725899	38.38951699	19.65672727	4.440566438
37.7962911110631	21.019861100414	35.94447387	20.12395641	2.090335546
37.7962911110631	21.019861100414	36.57027062	15.62107689	9.745800746
39.4618422550968	19.3328377069915	38.46066343	17.33665094	2.23318621
44.4860023590514	18.635253659904	44.45005227	17.91363181	0.722516784
59.3314545372678	19.205740758093	66.17419814	21.15751135	7.122166774
59.3314545372678	19.205740758093	62.61153544	17.95816147	4.324411312
69.8558132749589	19.6101750967051	64.88897514	21.58345165	5.371825022
69.8558132749589	19.6101750967051	66.92261807	21.4897109	4.897969721
69.8558132749589	19.6101750967051	71.29498477	19.86081824	1.460834206
Route: 9 Length: 195.58140334424 Demand Met: 1940				
79.1746069284754	32.959292606629	82.01891737	31.58538586	7.858683337
78.3425239218447	46.0236222443047	77.14427045	45.25079579	1.425858377
78.3425239218447	46.0236222443047	77.77449926	46.72256252	0.900649502
78.6112469060439	50.202345829347	78.92131522	50.41345477	0.375112442
78.6112469060439	50.202345829347	83.91646182	55.69492785	10.80258547
78.6112469060439	50.202345829347	83.55927983	59.64747077	10.99948591
78.6112469060439	50.202345829347	85.71414415	51.67250379	10.80797757
78.6112469060439	50.202345829347	88.60564442	53.67349247	11.4446079
77.9102079302906	50.4277326994198	70.24663893	43.40548551	10.39433718
77.9102079302906	50.4277326994198	77.87000631	52.21112855	1.783848909
77.9102079302906	50.4277326994198	78.85550393	52.04144231	8.272925398
77.9102079302906	50.4277326994198	84.14082278	54.46253046	9.425227564
79.6649039501814	54.3476691099449	79.86750899	54.35421653	0.202710806
79.6649039501814	54.3476691099449	87.34079917	59.37931572	11.8500657
76.2417599130264	60.8356334346254	72.84290598	65.67053988	5.910036243
76.2417599130264	60.8356334346254	75.75634139	60.02200009	0.947433566
74.4156347305471	68.4917029631919	72.70378804	66.70645397	3.620764964
74.4156347305471	68.4917029631919	73.05372772	69.26625594	1.566755571

Solution x	Solution y	Original x	Original y	Radius
72.9197678366375	74.7631574373709	65.34735437	72.80394877	7.821760947
72.9197678366375	74.7631574373709	70.36283848	70.39401036	6.760808749
72.9197678366375	74.7631574373709	73.75840634	73.11670598	1.876459737
72.9197678366375	74.7631574373709	70.83372488	78.21085961	5.320597925
72.9197678366375	74.7631574373709	70.61748839	78.65460339	7.660924967
72.9197678366375	74.7631574373709	74.46580568	79.0435318	7.178734541
72.9197678366375	74.7631574373709	72.09010058	81.417498	6.705862814
74.3392969473386	80.3189237593482	75.20998283	80.5662569	0.905134017
74.3392969473386	80.3189237593482	82.09017124	81.333147	9.364452955
72.1556370148338	82.4240596802839	68.96890483	80.55619731	4.842060922
72.1556370148338	82.4240596802839	69.80433177	81.60817435	4.561618689
69.8912110306582	84.607057056318	69.09548968	84.07624055	0.956524245
69.8912110306582	84.607057056318	67.89989075	88.12316705	7.944934507
69.8912110306582	84.607057056318	75.38279951	84.8495864	9.738201242
69.8912110306582	84.607057056318	68.01446808	90.26524455	9.658401998
69.8912110306582	84.607057056318	68.11557125	90.29313921	9.036263761
68.6515806635028	87.7759715524392	66.59307852	88.41880362	2.156539854
68.6515806635028	87.7759715524392	64.64609008	95.09261932	9.659748021
68.6515806635028	87.7759715524392	66.67195124	95.92017704	9.763847817
71.8396294136017	89.9222999887389	72.48804708	89.57044348	0.737731979
71.8396294136017	89.9222999887389	72.91384846	91.54886288	4.973733961
71.8396294136017	89.9222999887389	69.92952441	96.42807986	9.02685985
71.8396294136017	89.9222999887389	69.38304877	98.18671586	10.74668541
71.8396294136017	89.9222999887389	79.19703593	96.06011661	11.2419465
71.9047524717625	93.9687277510141	65.26732099	95.86741863	6.903660169
71.9047524717625	93.9687277510141	66.92699784	97.50570073	6.78636185
71.9047524717625	93.9687277510141	74.57969734	99.83821951	6.450291742
74.2177155180314	94.3944401189259	73.04972269	93.68364053	1.367275869
74.2177155180314	94.3944401189259	70.07355989	96.61021246	7.658895206
74.2177155180314	94.3944401189259	79.39161289	97.26593015	9.87516425
74.2177155180314	94.3944401189259	78.18108034	99.79242924	11.42083614
77.840026151587	95.06114528993	76.48394754	93.81500316	3.73579719
79.9075190770722	95.4416786966553	80.84419352	99.98848979	4.64228932
85.9128718451496	91.4351155152663	86.10921689	91.46882481	0.199217703
85.9128718451496	91.4351155152663	93.12739448	86.70709298	11.17874385
85.9128718451496	91.4351155152663	86.37403118	99.02923308	11.96387757
84.2470421399414	89.2088873588024	82.53992082	88.87907996	1.738688046
89.6329700293596	85.9310581334719	91.90328388	76.16243153	10.02897755
89.6329700293596	85.9310581334719	87.63411723	89.72076827	4.425243646
89.6329700293596	85.9310581334719	91.04765146	90.60180149	7.6089096
89.6329700293596	85.9310581334719	97.99058573	82.84537681	9.301137649
92.3125607789434	84.3002823821768	93.29522257	74.82458329	10.91349472
92.3125607789434	84.3002823821768	94.75890926	85.83537613	2.888102094
94.8792693572853	57.8434874040357	95.77662579	57.68215173	0.911744354
93.2947097781599	54.5839582286361	91.19333201	55.09349477	2.162271031
92.7939359701844	33.0777720780589	94.17807015	30.5898166	2.95308255
92.4825568329563	19.7053074251622	90.81819821	18.2159484	2.233445753
92.3351348243679	13.3741379369929	87.03899122	21.09553754	10.64878101
92.3351348243679	13.3741379369929	94.15587216	20.2227246	8.426061551
92.3351348243679	13.3741379369929	95.99475962	18.1472698	6.014618976
92.3351348243679	13.3741379369929	93.53556787	11.2495411	9.93311926
92.3351348243679	13.3741379369929	94.43184685	8.796264511	5.035188817
86.3469224550053	11.9345081519175	85.22979418	8.715884504	3.406980154
86.3469224550053	11.9345081519175	83.75499038	5.857780347	7.422722871

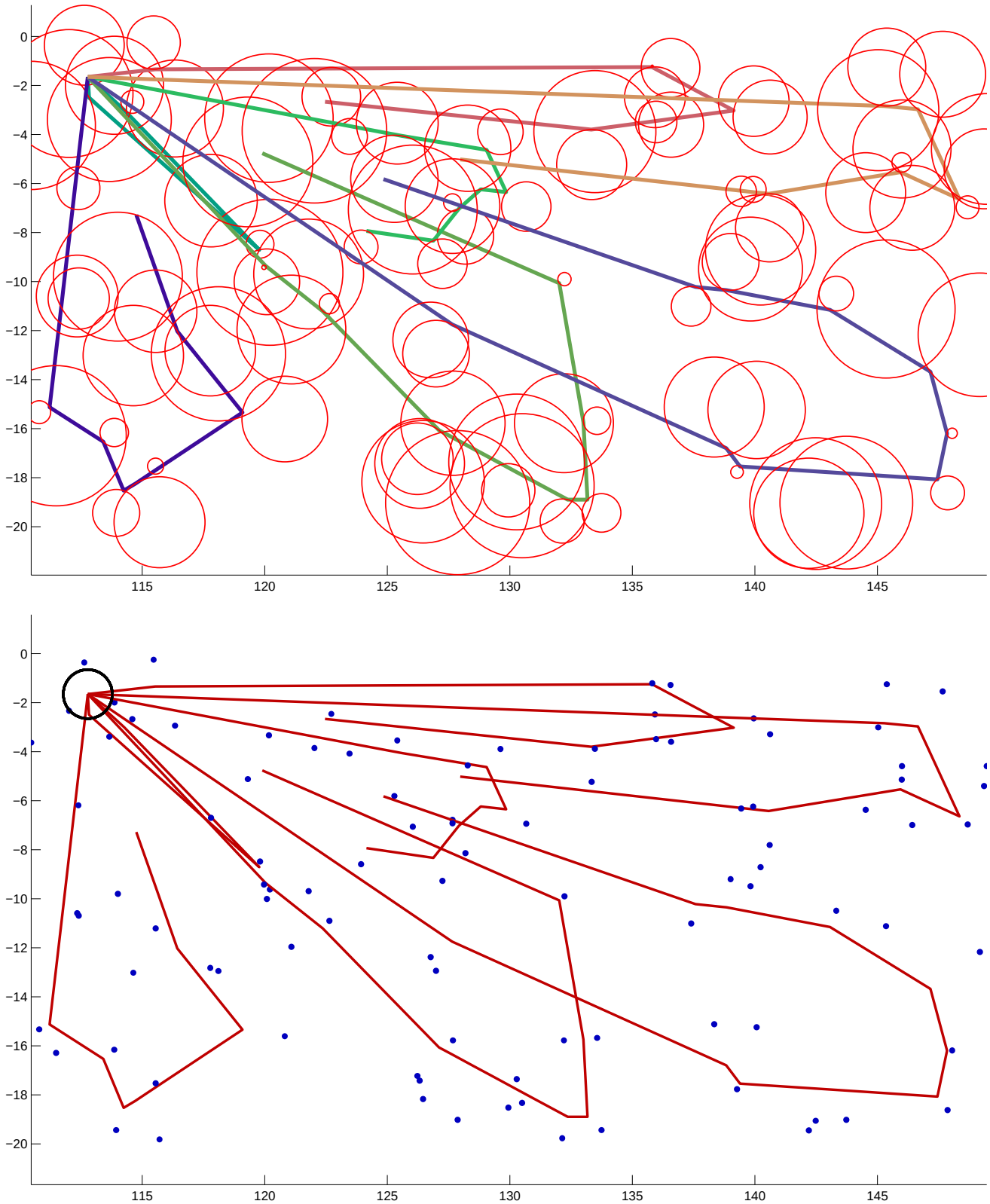


Figure O.56: $kroD100$, arbitrary radius, 2D, Euclidean, Length = 362.6083673

Table O-59: Solution for *kroD*100, arbitrary radius, 2D, Euclidean

Total distance: 362.608367276927 Total demand met: 2719 Depot: x 2.78 y 1.65				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 20.106746892314 Demand Met: 354				
2.82937171971037	2.48992833180017	2.02	2.33	2.61
2.82943039930393	2.49092660866802	0.47	3.63	2.62
5.16971883407611	4.58514139958635	3.66	3.39	2.53
6.70164444643663	5.95599008605993	7.81	6.7	1.89
8.26915975911905	7.35868640843921	10.21	9.62	2.98
9.28206680555192	8.2650894553543	9.81	8.48	0.57
9.7761952015358	8.70726190335093	10.09	10.01	1.34
9.7771772759718	8.70707340984399	11.79	9.69	2.24
6.09913464088412	4.89853909401334	6.34	2.94	1.98
4.27268962408952	3.00729500119065	4.6	2.67	0.47
3.92896155949512	2.69474487706068	3.87	1.99	2
3.0856244459526	1.92790269250661	2.64	0.36	1.63
Route: 2 Length: 39.3832931675029 Demand Met: 395				
2.35753124798742	5.31102536720192	2.4	6.19	0.88
1.93502463284925	8.97237969700605	2.35	10.59	1.67
1.68418296031884	11.146121417956	2.41	10.69	1.25
1.4205345067402	13.4308437354271	1.49	16.29	2.86
1.22462803790494	15.1285278445414	0.8	15.33	0.47
3.41523653576567	16.5322706822761	3.86	16.16	0.58
4.24275302459353	18.5289892393062	3.94	19.44	0.96
4.71986612714578	18.2454413589613	5.71	19.82	1.86
5.87577573247886	17.4773675753139	5.55	17.53	0.33
9.0907871192789	15.3410709886452	10.82	15.61	1.75
7.70949396808726	13.6179933315578	7.78	12.82	1.85
7.70949396808726	13.6179933315578	8.11	12.95	2.74
6.43201286013111	12.0244147906258	4.64	13.02	2.05
5.55392776499912	9.53000459147586	5.55	11.21	1.68
4.76178671537261	7.27973875667794	4.01	9.8	2.63
Route: 3 Length: 53.332069880954 Demand Met: 387				
5.53382413262219	1.33812980872303	5.47	0.25	1.09
25.8004026314016	1.2488315659742	25.81	1.21	0.04
27.4240059107811	2.11276274312271	26.56	1.28	1.2
29.1338664331618	3.02259203009516	30.62	3.29	1.51
29.1338664331618	3.02259203009516	29.95	2.64	1.44
27.1393047155862	3.28932565111151	26.58	3.6	1.33
25.3700330972113	3.5259311275423	25.92	2.48	1.24
25.3700330972113	3.5259311275423	25.97	3.49	0.85
23.319524358688	3.80014656646654	23.47	3.88	2.49
23.319524358688	3.80014656646654	23.34	5.23	1.43
12.457917888134	2.66311702772762	10.17	3.33	2.62
12.457917888134	2.66311702772762	12.72	2.46	1.2
Route: 4 Length: 57.0400260062543 Demand Met: 398				
10.0308846078262	9.35371980288312	9.97	9.42	0.09
12.3653920154902	11.2044510713456	11.09	11.96	2.22
12.3653920154902	11.2044510713456	12.64	10.9	0.41
17.1090696090014	16.0643085217219	16.23	17.23	1.46
17.1099496877109	16.0647833495487	16.32	17.42	1.83
17.6342255209465	16.3476452841738	17.87	19.02	2.94
17.6342255209465	16.3476452841738	16.46	18.17	2.5
18.5060750583468	16.818033255635	17.68	15.78	2.13
19.3813303208056	17.2902587158093	20.5	18.33	2.94
20.258358330214	17.763440624224	20.28	17.36	2.77
20.9629423276592	18.1435840143097	19.94	18.52	1.09
22.35988210285	18.89727331836	22.14	19.77	0.9
23.1668125428362	18.8963492491037	23.74	19.44	0.79
23.0674743198566	16.9779620493457	22.21	15.78	2.02
23.0035000990949	15.7425128810136	23.56	15.68	0.56
22.0175630706747	10.0666449850995	22.23	9.9	0.27
17.0653251412437	7.89998653770738	18.19	8.14	1.15
9.89869627185907	4.76450775013466	9.31	5.12	2.65
Route: 5 Length: 38.0948604417155 Demand Met: 398				
12.9483560491222	3.55930770360015	13.46	4.08	0.73
14.756684067731	3.89885665275384	12.03	3.85	2.95
14.756684067731	3.89885665275384	15.41	3.54	1.67
15.5996841739934	4.05714640868016	15.29	5.81	1.78
19.0562049922556	4.6296182726532	19.62	3.89	0.93
19.8500982438691	6.35020248364923	20.67	6.94	1.01
18.8137604423762	6.23711054798259	18.28	4.56	1.76
17.9208725220424	7.02808371015291	17.66	6.78	0.36
16.8789048085321	8.33064471105473	17.25	9.27	1.01
14.1498855360952	7.93597373828252	13.93	8.59	0.69
Route: 6 Length: 80.3851019116648 Demand Met: 397				
Solution x	Solution y	Original x	Original y	Radius
16.4033349474432	10.903575552556	16.77	12.38	1.54
17.6542398216448	11.7532458302827	16.99	12.94	1.36
26.3816345886512	15.6913185763062	28.34	15.12	2.04
28.8290149019268	16.7956529132041	30.07	15.24	1.99
29.3933289961786	17.5411114710136	29.27	17.77	0.26
33.4100403088298	17.8050064406156	33.73	19.02	2.71
33.4100403088298	17.8050064406156	32.2	19.45	2.25
33.4100403088298	17.8050064406156	32.48	19.06	2.69
37.4433567586576	18.0699923551042	37.86	18.62	0.69
37.8400794530331	16.1957761545493	38.05	16.19	0.21
37.1602875938716	13.6770374237327	39.18	12.17	2.52
34.927489993079	12.3009429524704	35.35	11.12	2.82
33.0630624331359	11.1518784531422	33.32	10.49	0.71
28.8426678350297	10.347867564909	29.01	9.2	1.16
28.6687626677896	10.3301968993035	30.23	8.71	2.25
28.6687626677896	10.3301968993035	29.82	9.49	2.12
27.5743996639151	10.2189976250184	27.4	11.01	0.81
14.8441511075468	5.81939645923955	16.04	7.06	2.63
Route: 7 Length: 74.2662689765217 Demand Met: 390				
35.2752117463233	2.83654323045318	35.38	1.25	1.59
36.6483344727995	2.96794707922793	37.66	1.54	1.75
36.9715454612731	3.66637919589552	35.03	3.01	2.47
37.7565725635843	5.36275757382338	39.46	4.59	2.26
37.7565725635843	5.36275757382338	39.35	5.4	1.63
38.3469048125841	6.6384165321967	38.68	6.97	0.47
37.1001557989449	6.06833402793896	36.42	6.99	1.73
35.9369945634758	5.53647247533612	35.99	5.14	0.4
34.4291458948392	5.78454780135219	36	4.59	2
34.4291458948392	5.78454780135219	34.52	6.37	1.63
30.5638966792883	6.42046894592676	30.6	7.81	1.39
30.2270222128374	6.38288429084248	29.93	6.24	0.53
28.8270614229578	6.22669243989094	29.44	6.32	0.62
17.9761479562852	5.01606973086285	17.66	6.92	1.93

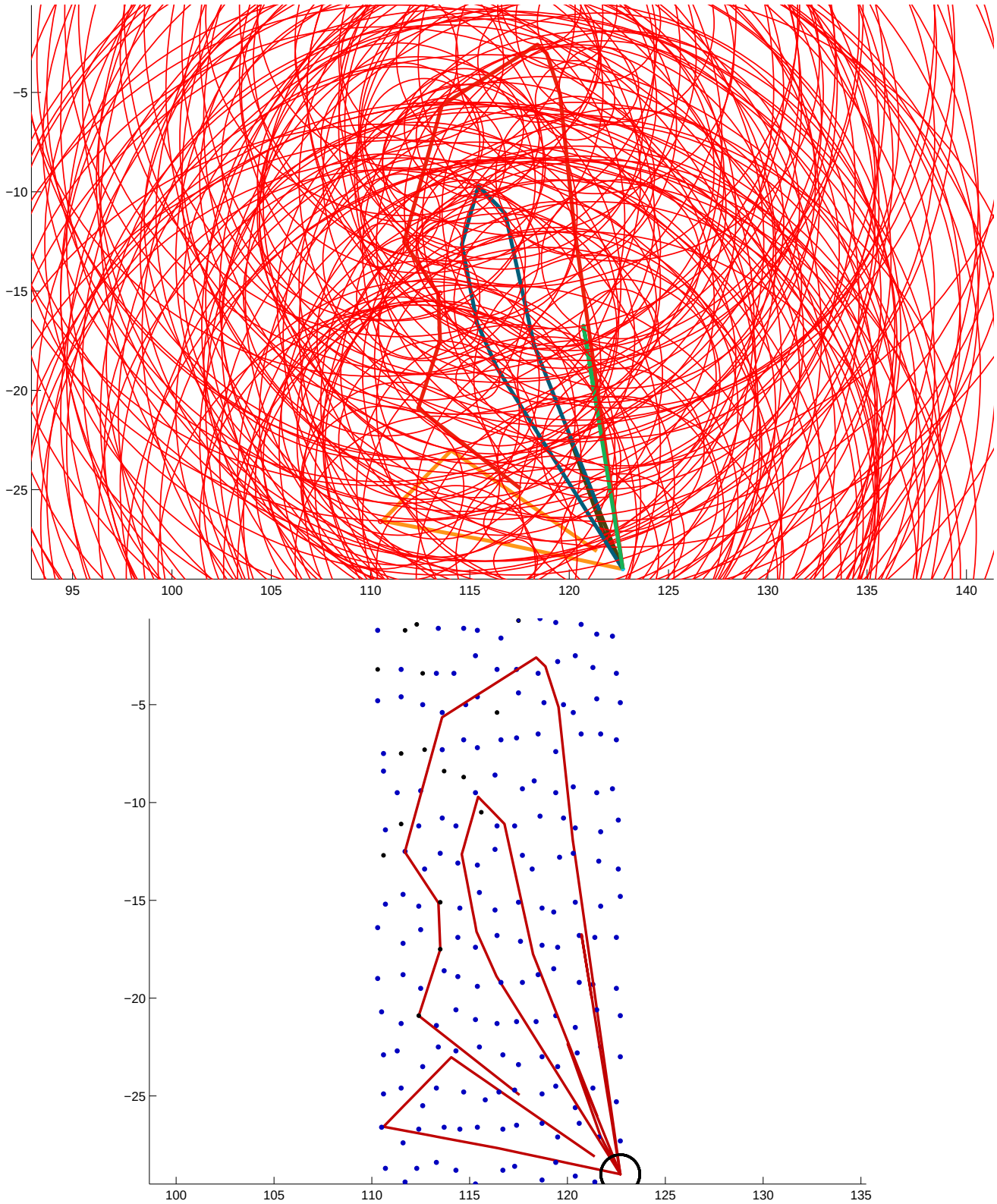


Figure O.57: $rat195$, arbitrary radius, 2D, Euclidean, Length = 171.3521618

Table O-60: Solution for *rat*195, arbitrary radius, 2D, Euclidean

Total distance: 171.352161842645				
Total demand met: 11712				
Depot: x 12.7 y 29				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 27.8093812633246 Demand Met: 1999				
11.8269964720022	28.8141007451359	11.4	29.4	9.1
10.9538619720571	28.6281736015102	7.4	26.5	18
10.0807274700141	28.4422464681059	7.7	12.7	23
9.20858168054426	28.2565298731525	8.5	6.5	24.1
8.25457197089908	28.0533809805261	7.3	28.6	1.1
7.66137712317932	27.9270648077983	4.3	28.8	4
6.50347076481842	27.680497970342	6.7	26.7	1
6.2783197678399	27.6381742543354	1.6	18.8	10
5.83943648720322	27.5556740349074	3.3	28.4	7.1
5.25686381498856	27.4461634388289	2.6	23.5	8
4.67429114607856	27.3366528248095	5.3	29.5	24
4.09171847879344	27.2271422020401	4.5	26.7	21.1
3.50914580928951	27.1176315910132	3.7	26.6	21.1
2.92657313901292	27.0081209845228	1.7	29.4	22
2.92657313901292	27.0081209845228	0.7	28.7	22.1
2.34400047347097	26.8986103528567	6.7	22.9	22
2.34400047347097	26.8986103528567	8.4	21.2	24
1.76139682220835	26.7890938864389	1.6	27.4	19.1
1.1788241540545	26.6795832683972	1.5	21.3	6
0.595364262883905	26.5699058583008	0.5	26.6	0.1
0.945243894474601	26.2116912598961	0.6	24.9	4.1
1.29999389229219	25.8484902875887	1.5	24.6	5
1.64094297527595	25.4994189604096	3.3	21.4	7
1.99970948554133	25.132105777999	1.3	22.7	22.1
2.35029944257271	24.7731639151858	0.5	20.7	19
2.35029944257271	24.7731639151858	0.3	19	19.1
2.7008894011788	24.4142220540316	0.3	16.4	19
2.7008894011788	24.4142220540316	1.6	17.2	21.1
3.05053418218378	24.0562478626778	4.4	18.9	24
3.40112414882591	23.6973060092768	4.3	20.6	21.1
3.75171412065492	23.3383641609373	4.8	5	21.1
4.05810044846277	23.024678979569	0.7	11.4	12.1
4.05908831546272	23.024834281824	10.7	0.9	23.1
4.99011120431595	23.668634011554	4.3	22.7	8
5.44271375501825	23.9816073774909	4.7	24.8	24
5.7537641489842	24.1966977771878	1.5	4.6	22
5.75458665064237	24.1972665398996	5.4	1.2	23
6.89546869002629	24.9861831828117	5.8	25.2	22.1
7.46711749590011	25.3814767198277	3.4	22.5	5
8.7782392568237	26.288113618287	12.5	25.3	5
10.0876092767725	27.1935392380678	8.7	24.9	12.1
11.3925762361977	28.0959202024081	5.4	26.6	19.1
Route: 2 Length: 14.4041470654161 Demand Met: 1995				
12.2417574917376	27.8626527058671	12.7	27.3	3.1
11.7330179256321	26.5999728838704	11.7	6.5	20.1
11.5861406736234	26.235426945645	9.4	20.9	9.1
11.3798959568571	25.723532334971	3.7	18.6	17
11.172935709262	25.2098617930244	12.7	23	4.1
10.9655822381312	24.6952152784711	10.6	16.8	19.1
10.7581405613796	24.1803498409466	6.5	24.8	19.1
10.5509557668459	23.6661219790841	9.5	23.5	3.1
10.343228036569	23.150546563417	7.7	19.2	23
10.1243938117948	22.6074050856459	6.4	11.2	12
10.1041651590883	22.5571980380312	8.6	10.7	14
10.0617331194269	22.4518826983483	6.3	15.5	11
10.0182644168666	22.3439943852968	3.3	3.4	20.1
10.0112149096322	22.3264976716099	3.6	5.4	18.1
10.0300603405829	22.3795817261791	8.7	17.3	13.1
10.0450482473448	22.4217998565873	5.3	9.5	19.1
10.0598328022694	22.4634451829072	6.3	8.6	20
10.0626090479947	22.4712653478398	9.5	17.4	17
10.0629436021563	22.4722077243646	4.4	13.1	16
10.0632781563182	22.4731501008893	5.5	14.6	9.1
10.3096516389724	23.1671381260467	5.5	22.5	14.1
10.5333343504178	23.7972104922828	11.3	19.3	6.1
10.757631448821	24.4290134717597	10.4	21.5	16
10.757631448821	24.4290134717597	10.6	19.2	11
10.9827577375471	25.0631521257343	2.3	28.7	13
11.2081454082649	25.6980270439844	11.7	22.5	14.1
11.43309070752	26.3316558843737	10.4	11.3	24
11.6917026687943	27.0601174149419	11.6	27.1	0.1
11.7237764804094	27.1218248372664	9.3	18.5	9.1
11.7978704843395	27.264375713103	3.6	7.3	22
11.8771054285924	27.4168173428569	3.3	24.6	9.1
11.9561771829106	27.5689450083454	10.4	25.6	8.1
12.0096846935523	27.6718891348721	5.4	4.6	24
12.1245075628452	27.8927990565478	12.7	4.9	23
12.4355450793108	28.4912101032511	10.5	22.8	15.1
Route: 3 Length: 42.357944995142 Demand Met: 1980				
6.37104751109123	18.8832150048584	5.4	19.4	1.1
5.35415942827389	16.6007011770214	4.4	16.9	1
5.34285671255849	16.5415480105395	0.7	15.2	7.1
5.26778402425228	16.1486524146513	2.4	15.3	3.1
5.13120426365448	15.4338573602015	2.7	13.4	5.1
4.99348919388909	14.7131206258342	0.6	8.4	8.1
4.99348919388909	14.7131206258342	1.3	9.5	7
4.85556591209888	13.991294205374	5.4	13.2	3.1
4.59894163618186	12.6482418932664	3.5	12.6	1.1
4.61086095664223	12.6062447019339	1.7	12.5	18.1
4.70030774214018	12.291082964766	4.3	11.2	10
4.84957575576114	11.7651438123943	8.3	8.9	9
4.84957575576114	11.7651438123943	2.4	11.2	8
5.00022439074824	11.2343401031361	2.6	5	9.1
5.14899317861574	10.7101599500873	5.3	2.5	9.1
5.14899317861574	10.7101599500873	4.2	3.4	10.1
5.29254024268259	10.2043783063018	12.5	3.4	10.1
5.29254024268259	10.2043783063018	7.4	3.2	9
5.4331224963835	9.70904303943692	4.7	6.8	3
5.7645378491666	10.0506277448162	4.7	1.1	20.1
5.95745638937386	10.2494659161804	5.4	7.2	3.1
6.77679610430509	11.0939467546265	10.3	9.2	4
7.08802267156804	12.5109687101877	6.6	1.6	18
7.36997776859194	13.794716965148	9.8	10.8	8.1
7.65135673753868	15.0758420935786	1.5	3.2	14.1
7.9324557806594	16.3556927175318	2.5	9.4	11.1
8.1823590810125 8	17.4935083796578	0.3	1.2	18.1
8.23760066588447	17.74502461588	2.5	19.5	6
10.3595734559867	23.0970224226319	7.3	11.2	18.1
11.5295559182344	26.0479290663681	8.2	13.4	18
Route: 4 Length: 61.9334247858868 Demand Met: 1983				
10.3964625496181	12.7997393367837	6.6	6.8	7.1
10.2693627283962	11.9058749833845	6.3	12.4	4
9.9108659664782	8.55087037725905	7.4	6.7	8
9.60765119586438	5.71322417121017	12.3	1.5	5
9.60260924018991	5.66603886754606	10.3	5.4	2
9.54392879754353	5.11687582194283	11.5	4.7	2
9.33727098737923	4.47942906002029	11.3	3.1	7
9.11252712315319	3.78619479355877	9.4	0.8	3
8.97413524047033	3.35931764262204	8.5	3.4	3.1
8.8719943522045	3.0442585913277	11.5	1.4	3.1
8.3998542386482	2.58996021925388	8.6	0.6	2
7.49661199090563	3.16339598878892	6.4	3.2	5.1
6.72299990598525	3.65453426875984	7.5	0.7	14.1
5.94957561067042	4.14555330830076	1.7	1.2	10
5.17458700256049	4.63756547004683	6.4	5.4	8
4.39959839215109	5.12957762801874	2.3	0.9	8
3.62478961980841	5.62147558140777	2.6	3.4	4.1
3.59427851314553	5.64084597585775	0.3	3.2	4.1
3.07240795370406	7.52494060225865	2.7	7.3	3
2.76387119933489	8.63884240756691	1.5	7.5	4
2.45373802472159	9.75850777726709	3.7	8.4	3.1
2.14441611887983	10.8752442337521	4.7	8.7	4.1
1.83485422000734	11.9928472135632	1.5	11.1	2
1.68652553651371	12.5283542645217	0.6	12.7	1.1
3.40482363255752	15.1306832051857	3.5	15.1	0.1
3.5	17.5	3.5	17.5	0
2.40000000000001	20.9	2.4	20.9	0
7.54999999994259	24.950000000092	5.6	10.5	25
Route: 5 Length: 0.0202220448932097 Demand Met: 1772				
12.6997975592465	29.0004782810156	8.7	23	11
12.6988064213554	29.0006111180618	10.6	26.4	17
12.6988053854706	29.000607117609	9.4	28.4	5.1
12.6978378491369	29.0008598505655	0.6	22.9	14
12.699006648258	29.0001151756732	11.7	15.3	18
12.6993084148203	28.9997428475246	8.5	18.8	23
12.6997777611254	28.9994784768701	7.5	15.1	23.1
12.7000757859517	28.999002875863	7.5	23.4	15.1
12.6997736438322	28.9980496123886	8.7	26.4	9.1
12.7006942819258	28.9976591273012	11.5	20.6	14
12.7016832271047	28.9975108457004	8.7	29.3	21
12.7026831279949	28.9975249243976	5.3	21.1	15.1
12.7030632787223	28.9984498550503	2.4	26.7	11

Solution x	Solution y	Original x	Original y	Radius
12.7040487047415	28.9982797456412	12.7	20.9	21
12.7050480788164	28.9982443696826	6.7	28.8	14.1
12.7053706104669	28.9991909283853	2.6	25.5	11
12.7043935687479	28.9989778799264	10.4	15.1	18
12.7034070194876	28.998814415603	9.5	27.1	21
12.7024273673458	28.9986137124092	6.4	21.3	20
12.7014290200635	28.9986711816036	4.5	15.4	20.1
12.700486754622	28.998336314293	7.6	17.1	19.1
12.7002025850803	28.999295114956	3.6	10.8	22
Route: 6 Length: 24.8270416879827 Demand Met: 1983				
12.5392960422111	28.0069319640191	7.3	24.7	8
12.3804600783331	27.0254071605435	11.3	24.6	14.1
12.2199835172814	26.0337440591342	11.5	9.5	21
12.060516939736	25.0483226211529	9.4	24.5	16.1
11.9012499964145	24.0641345338095	10.4	29.1	17.1
11.6171476599016	22.3085278284837	6.6	19.2	8.1
11.6171476599016	22.3085278284837	5.3	17.4	8
11.6169879123475	22.307540670584	9.4	7.4	19
11.4114210727034	21.0372430467166	2.5	16.5	10
11.3701327202036	20.7821022880115	0.6	7.5	17.1
11.3602544889855	20.7210598792231	12.5	19.5	5.1
11.2646540015795	20.130297953229	11.7	11.5	9.1
11.1690687774223	19.5396301982724	12.6	10.9	9
11.1690687774223	19.5396301982724	12.7	14.8	9
11.0537360452348	18.8269331129642	7.7	9.3	10.1
11.0251657626127	18.6503834686869	7.4	21.2	20.1
10.9734816751563	18.331002361845	6.4	16.8	6
10.9216771263151	18.0108767805414	11.6	13	12
10.9216771263151	18.0108767805414	10.3	12.6	10
10.8541820517714	17.5937918605471	3.4	1.1	18.1
10.7797212943658	17.1336625618309	12.5	16.9	2
10.7795615468134	17.1326754039309	10.4	2.5	19
10.751971012668	16.9621800632766	7.5	4.4	14.1
10.7169704971374	16.7458948211228	8.8	4.9	12
10.7176683826179	16.7502073981908	12.6	13.4	4
10.7638132299173	17.0353589734427	12.3	9.3	13.1
10.8082971832785	17.3102470234909	9.6	12.8	5
10.8521234046833	17.5810705402132	12.5	6.8	14.1
10.8521234046833	17.5810705402132	10.7	6.5	12
10.8958407612711	17.851221345935	9.5	2.8	19
10.9085282309943	17.929623417194	9.8	5	13
11.0688501394789	18.9203306198789	8.7	15.4	17
11.2030070311437	19.7493515941383	9.4	9.5	13
11.2420459357505	19.9905919817236	9.3	15.6	5.1
11.2422056832946	19.9915791396249	0.3	4.8	20
11.2423654309549	19.9925662975074	11.4	16.9	15
11.2425251783136	19.9935534554387	1.6	14.7	11

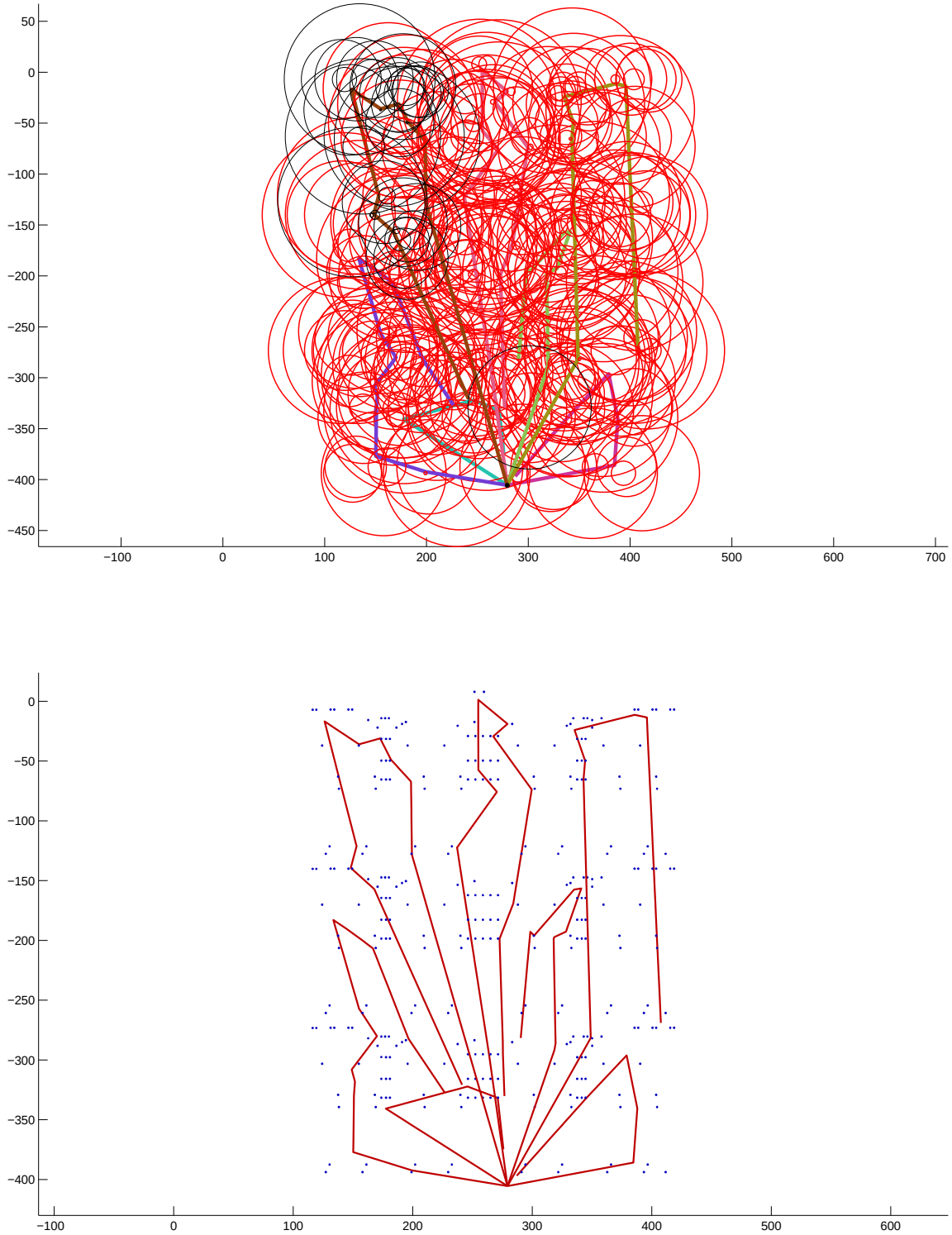


Figure O.58: *lin*318, arbitrary radius, 2D, Euclidean, Length = 4433.3799090

Table O-61: Solution for *lin*318, arbitrary radius, 2D, Euclidean

Total distance: 4433.37990903867				
Total demand met: 6261				
Depot: x 169.3 y 405.5				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 345.819380600339 Demand Met: 781				
206.445652667305	398.576535223111	215	387.5	42
243.681129710344	391.636327942097	211.8	393.8	37.7
243.681129710344	391.636327942097	255.9	387.5	12.9
255.99030396559	389.342058435171	301.6	393.8	56.6
268.4347377172	387.022578409471	286.6	387.5	29.3
274.629033195879	385.868042614828	283.5	393.8	11.9
277.933202256233	340.449386733825	294.5	339.4	16.6
277.841577520541	339.995377413197	227.6	331.6	65.9
277.841577520541	339.995377413197	293.7	329.2	38.2
274.872082717066	325.281247761444	290.6	273.1	54.5
271.985263319711	310.976782712404	283.5	260.7	62.8
268.997888778523	296.174057454623	275.6	273.1	24
260.455310007204	305.225202226277	249.6	303.2	11.1
258.571719051976	307.220929150141	252.8	260.7	64.9
254.750732660195	311.269390629828	255.9	254.4	74.1
250.925229762886	315.322637496709	305.5	273.1	77.3
247.093327034923	319.382665194122	293.7	273.1	71.8
243.263344884178	323.440657971447	227.6	315.8	32.6
239.428290495622	327.504024948149	278.7	273.1	72.9
235.1152030886	332.073883717487	234.6	331.6	0.7
234.741111123139	332.491236003582	252.8	393.8	64.1
234.741111123139	332.491236003582	222	329.2	53.4
234.741111123139	332.491236003582	208.7	303.2	47.1
234.741111123139	332.491236003582	234.6	315.8	30.3
234.741111123139	332.491236003582	248	280.4	61.5
234.741111123139	332.491236003582	280.3	303.2	54.2
231.444828242225	336.168703842954	231.5	331.6	33.6
228.261624106855	339.720015809585	236.2	280.4	68.9
225.076592693145	343.273365727847	224.4	280.4	71.8
221.890907110395	346.827445344795	222.8	339.4	9.8
218.694237947402	350.393779104733	233.1	280.4	78.4
215.501147153354	353.95612119764	234.6	297.7	68.2
212.321932827524	357.502982408602	240.2	288.2	74.7
208.876130485357	361.347260032408	263.8	339.4	73.1
205.661470035461	364.933665942829	263	329.2	67.9
190.66910877724	381.659752911727	119.7	393.8	72
184.891902802581	388.105038961604	184.3	387.5	61.5
177.100842605304	396.797062711396	181.1	393.8	9
Route: 2 Length: 292.719858016851 Demand Met: 776				
143.603627551733	389.138310680854	122.8	387.5	61.9
100.230796431462	361.521463723727	48	393.8	61.4
100.229952910552	361.52092662739	67.7	331.6	72.5
100.229109389643	361.520389531053	70.9	331.6	81.8
100.228265868734	361.519852434716	58.3	329.2	56.8
95.7551205044312	358.671659667763	70.9	315.8	68
88.767643591714	354.222512985772	63.8	315.8	50.8
81.7664409528609	349.764626676299	44.9	303.2	67.2
74.7576899121202	345.30193406475	60.6	288.2	62.7
67.50269707003	340.682451538778	59.1	339.4	8.5
77.9989114013578	337.844316175577	63.8	331.6	16.8
91.4637992675424	334.203463080313	100	339.4	61.5
107.235643283184	329.938818051321	130.7	339.4	25.3
108.779953429191	329.52124261889	136.2	331.6	42.4
113.783844974212	328.16820988642	116.5	303.2	28.2
119.757618890527	326.552924747441	119.7	260.7	67.1
123.632039861796	325.505296448183	129.9	329.2	48.2
128.439623559528	324.205344590209	63.8	297.6	81.2
135.884688864216	322.192228006544	136.2	315.8	6.4
135.993722074037	322.233599322143	67.7	297.7	81
136.913214094654	322.582489308139	99.2	329.2	46.6
139.208179378591	323.453285776291	148.8	295.3	39.6
141.40904963935	324.28837904152	161.4	295.3	52.8
143.634384555064	325.132755119519	148.8	315.8	45
145.889188765997	325.988312961366	155.1	315.8	37.1
148.107930846923	326.83018746951	161.4	315.8	25.4
150.340593928627	327.677344131586	148.8	331.6	79
152.577368434931	328.526060823896	155.1	331.6	4.2
154.807104363258	329.372106814785	231.5	315.8	80.7
157.078064702964	330.233794904803	127.6	286.7	75.6
159.304533215566	331.078601116919	136.2	295.3	62.2
161.162825920259	331.783707528151	161.4	331.6	0.3
161.166083239846	331.813216241431	222	285.1	76.7
163.280352885688	350.966809378524	192.1	339.4	44.1
164.647146781148	363.348869074443	142.5	331.6	70.4
165.897223084929	374.673561172334	142.5	315.8	63.6
Route: 3 Length: 612.110247447064 Demand Met: 944				
89.3452010600874	392.340261589149	89	393.8	1.5
67.6720098501538	385.604997331623	92.1	387.5	46.4
67.6720098501538	385.604997331623	51.2	387.5	18.6
40.2614281232051	377.086747218363	17.3	393.8	28.4
40.3686342872762	367.429738328322	20.5	387.5	30.2
40.5372098210172	352.244627192481	28.3	339.4	44.9
40.7153254506482	336.200519664991	6.3	273.3	71.7
40.7863896147664	329.799273666686	27.6	329.2	13.2
41.7119567860337	318.214872648614	67.7	315.8	26.1
38.9389389630881	307.998426719312	14.2	303.2	25.2
43.8289124703004	301.542005305803	92.1	254.4	70.4
49.230331329057	294.41030256233	66.9	280.4	41.3
49.230331329057	294.41030256233	63.8	280.4	22
54.6436726159635	287.262858699127	52.8	281.9	48.7
60.106106006003	280.050596455726	70.1	280.4	10
55.258616496784	272.624461982768	24.4	273.1	45.5
50.3729499976753	265.139842636923	36.2	273.1	28.7
45.0287617666499	256.952788158976	9.4	273.3	39.2
42.9999265459701	249.950550548833	51.2	254.4	9.5
39.5722190607041	238.120308328406	20.5	254.4	56.1
37.0908666942604	229.556275182789	17.3	260.7	36.9
32.1708917051119	212.575677350395	28.3	206.3	25.7
27.9022055359694	197.842911841682	20.5	121.3	76.9
26.727211689533	193.787585624294	27.6	196.1	35.6
25.5078424901783	189.579102914753	6.3	140.2	53.1
24.488444878255	186.060793935766	52.8	148.8	54.4
24.488444878255	186.060793935766	21.3	140	51.1
23.5831129733459	182.936167299075	14.2	170.1	15.9
34.0836105850531	189.972429153106	63.8	147.3	52
34.3213407839423	190.144389973101	44.9	170.1	42
39.4136955697612	193.827911951282	58.3	196.1	20.4
47.6027433905102	199.751406842534	84.3	150.4	61.5
49.568481942977	201.253772551204	67.7	164.6	53.4
56.7661891886064	206.754803519203	67.7	198.5	13.7
57.7372562370978	209.220769602167	85.8	170.1	56
59.800111580553	214.459266360702	59.1	206.3	26
61.817835257054	219.58315340993	63.8	198.5	60.1
62.4155486714476	221.101010885889	70.1	147.3	74.2
70.4791936946588	241.578149819595	89	260.7	48.3
77.611043670428	259.689052197475	76.4	288.2	37.9
86.501144980624	282.264928061181	81.1	285.1	6.1
87.3609933032042	283.544698536092	21.3	273.1	71.9
91.0615659985898	289.052511683629	39.4	273.1	61.9
93.0123011152399	291.955923411587	48	260.7	54.8
99.6287672220658	301.803660155396	85.8	303.2	50.8
101.061944482753	303.936754365801	70.9	297.7	30.8
116.759176149795	327.299993695193	84.3	283.5	54.6
Route: 4 Length: 864.02138818195 Demand Met: 922				
153.912827461588	295.474989611236	155.1	295.3	1.2
142.891910911471	224.356331164332	129.9	196.1	31.1
142.060965720636	218.994183493559	100	206.3	53.6
141.067402491823	212.582645661218	70.9	198.5	76.6
140.069761175107	206.144795032374	99.2	196.1	46.1
139.070730891194	199.697985159287	63.8	182.7	81.7
138.173145109218	193.905797307694	136.2	198.5	5
134.893658881547	172.742968130692	119.7	127.6	64
131.734135033754	152.354269172971	127.6	153.6	25.7
128.360534003112	130.584089326482	142.5	65.4	66.7
127.666897598576	126.107984746197	148.8	65.4	68.2
127.079991701375	122.320622866765	122.8	121.3	4.4
141.934284700561	101.598125203046	92.1	121.3	64.6
160.452698948248	75.7639913344281	222.8	73.2	62.4
158.024213520982	72.9048273226839	208.7	37	62.2
154.724638710717	69.0200910549737	142.5	49.6	28.5
148.567673941634	61.7712228431891	130.7	73.2	24.6
144.913669060666	57.4692006583911	129.9	63	16
144.899412822003	49.4973959748447	136.2	49.6	8.7
144.864637316898	28.7565276731059	136.2	29.1	21.8
144.840410844879	14.3072900452865	127.6	20.5	20.4
144.81434086169	-1.24136150462394	149.6	-7.9	8.2
144.814246540467	-1.29761645423897	141.7	-7.9	7.3
169.30035392525	18.9525403815077	173.2	18.9	3.9
157.385322802845	29.359421831762	155.1	29.1	2.3
167.173625800508	42.8751464597461	178	37	22.7
177.016495957793	56.466207357431	141.7	17.3	52.8
189.570313394938	73.8005711283201	192.1	73.2	2.6

Solution x	Solution y	Original x	Original y	Radius
189.433980822092	74.6421250856391	233.1	14.2	77.3
188.907374585281	77.892762322068	234.6	31.5	69.7
188.393041845712	81.0676394221608	191.3	63	18.3
187.719313295522	85.2264380894157	148.8	29.1	68.3
187.035555282741	89.4471470024971	155.1	49.6	57
186.382188106543	93.4802582821879	142.5	29.1	81.1
185.718167377073	97.5791308453476	148.8	49.6	66.7
185.061780342568	101.630881560027	155.1	65.4	62
184.426680469323	105.551230867934	161.4	65.4	60
184.292310495791	106.380671064402	161.4	29.1	80.6
181.302720332365	124.834845808408	161.4	49.6	79.4
178.779632071569	140.409406275715	181.1	127.6	13.2
174.139211872837	169.053904862283	178	170.1	4
173.378818894586	171.02258969475	184.3	121.3	57.9
171.177033566222	176.723089756331	227.6	198.5	71.7
168.902988710268	182.61066964702	136.2	162.2	53.2
166.649875012638	188.444055680824	227.6	182.7	69
164.403199683201	194.26077095673	141.7	150.4	56
162.68156987932	198.718125295234	161.4	198.5	1.3
165.40165057125	285.260456184479	173.2	285.1	7.8
165.494410827675	294.792978611741	142.5	295.3	23
166.712868531865	330.238688267389	178	303.2	29.3
Route: 5 Length: 539.269283667645 Demand Met: 942				
200.883368045806	314.006795424734	227.6	297.7	31.3
208.537490069427	291.833728808831	231.5	297.7	23.7
209.526182612683	285.998895450569	218.9	286.7	9.4
209.150303115389	265.729854274289	211.8	260.7	12.9
208.783027128268	245.924751253094	215	254.4	15.5
208.210432936374	215.048004085403	161.4	182.7	56.9
208.210414395051	215.047004257308	222.8	206.3	36.2
207.901668877764	198.398110718922	136.2	182.7	73.4
208.485265053002	197.188782201932	240.2	155.1	52.7
208.485410189792	197.187792790333	155.1	182.7	57.9
208.48555532651	197.186803378723	148.8	198.5	59.7
210.542264205952	196.232832413181	142.5	198.5	69.8
212.218901404921	195.455151515283	155.1	198.5	57.2
218.227334172628	192.668237689615	222	196.1	5.1
219.042164036053	190.362778618782	233.1	147.3	53.4
220.24764840879	186.95201152068	218.9	153.6	44.9
221.453135927622	183.541235521571	215	121.3	69.7
222.658407866762	180.131069478642	255.9	121.3	72.9
223.864442509842	176.718745448326	275.6	140	63.7
225.068756888957	173.311288700336	211.8	127.6	53.8
226.274111418675	169.900888972514	234.6	164.6	25.4
227.47926355446	166.491061890218	231.5	164.6	80.6
228.682601826954	163.086366924579	249.6	170.1	30.4
229.886707689297	159.679500147515	248	147.3	33
231.006223706559	156.511969752674	240.2	148.8	12
226.197142832268	157.31213752231	236.2	147.3	14.3
225.074317766911	157.49896083529	222	152	6.3
217.08228731232	166.683019953214	224.4	147.3	27.7
211.005479080667	173.666197300661	263.8	206.3	78
204.948515361074	180.626570290857	263	196.1	74.1
198.892566547796	187.585776996942	191.3	196.1	65.9
191.648958137888	195.90978531316	192.1	206.3	10.4
191.131177622456	195.409793896281	231.5	198.5	54.9
189.62640905201	193.956723755343	231.5	182.7	62.1
188.389162148293	192.761984167026	173.2	152	43.5
188.12628834985	195.691561446086	234.6	198.5	64.9
188.126198977925	195.692557444409	155.1	162.2	51.3
188.126109606001	195.693553442732	142.5	162.2	56.6
187.057690508439	207.600471199396	227.6	164.6	68.2
186.752716251582	210.999233146057	208.7	170.1	55.8
186.719516692946	211.369222930562	142.5	182.7	52.7
186.357588484437	215.402714676823	148.8	182.7	49.8
186.255321454418	216.542422606525	148.8	162.2	66
186.220050051784	216.935501417516	161.4	162.2	60.1
183.058275310214	252.1716983276	184.3	254.4	21.5
180.419513577115	281.579219039175	181.1	260.7	21.4
Route: 6 Length: 906.768404998295 Demand Met: 950				
231.251474158142	295.265397185554	286.6	254.4	68.8
238.937893345039	281.588412465743	240.2	281.9	1.3
236.174665984301	182.676245674483	234.6	182.7	1.6
235.920446061144	173.576218734312	294.5	206.3	67.1
234.59990156135	126.306160793236	252.8	127.6	21.2
233.603696674748	90.646126008439	231.5	49.6	41.1
233.417848310365	83.9935196760563	231.5	31.5	56.7
233.238206323135	77.5630756617894	227.6	49.6	30.7
233.047136802582	70.7235732774814	227.6	31.5	39.6
232.984110375134	68.4674867636553	280.3	37	73

Solution x	Solution y	Original x	Original y	Radius
232.925474099675	66.3685492385985	227.6	65.4	8.3
232.899481193075	65.4381102378682	231.5	65.4	1.4
233.412803652729	59.2209698081651	234.6	65.4	24.2
233.82054869687	54.2825379735073	222	63	20.4
234.203077046926	49.6495193833101	234.6	49.6	0.4
231.123647524442	40.6770714236049	249.6	37	20.7
228.122765347757	31.9334855083476	222	18.9	14.4
225.4077175624	24.0227279384073	218.9	20.5	7.4
230.990436691897	22.6098179735254	224.4	14.2	14.2
236.496775547257	21.2162383882949	236.2	14.2	10.1
241.856281163401	19.8598202196856	240.2	22	3.2
249.555890586955	17.9111535954547	248	14.2	37.6
256.191157802959	16.2318572373137	240.2	15.7	16
275.680945791544	11.2992553664037	275.6	6.9	4.4
276.60804560457	11.4979123948558	305.5	6.9	29.6
281.07937507416	12.4560196485361	278.7	6.9	32.7
285.806889456632	13.4690218862389	308.7	6.9	32.2
285.91681765637	13.4925770838008	293.7	6.9	10.2
286.660679791639	29.7147626037313	290.6	6.9	35.4
287.24722702061	42.5062362586302	263	63	43
287.835202571225	55.3288257008549	293.7	63	37
288.42404924249	68.1704411543058	294.5	73.2	59.4
289.013209378576	81.0188949466855	263.8	73.2	55.8
289.602476111949	93.8696487172256	283.5	127.6	48.7
290.191839231577	106.722536573332	286.6	121.3	53.2
291.063676844722	125.735624867233	301.6	127.6	10.7
291.337413233678	131.705276454191	278.7	140	31.7
291.895613342727	143.878545626796	290.6	140	58.6
292.453853918582	156.05269901462	308.7	140	57.3
293.011969216986	168.224116404383	305.5	140	43.2
293.569977779876	180.393212658974	280.3	170.1	29.1
294.145448658836	192.94312434791	293.7	196.1	3.7
294.50547782915	200.794664284533	293.7	140	60.8
296.47967705351	243.848139803916	301.6	260.7	17.7
297.633245327918	269.005254461147	308.7	273.1	11.8
Route: 7 Length: 872.671346126525 Demand Met: 946				
135.300191201913	287.684702139984	141.7	283.5	8.5
127.983662320776	262.331653237631	122.8	254.4	25.8
118.812420914212	230.551703381947	130.7	206.3	42
109.66272901615	198.846412596227	116.5	170.1	39
96.3090259768268	152.573463447445	24.4	140	73
89.334574020933	128.405769372598	9.4	140.2	80.8
89.2449574730151	120.957020048588	89	127.6	17.7
88.9472955444305	96.2164211241787	85.8	37	59.3
88.8805753524186	90.6709259687694	70.9	31.5	68.2
88.813927330675	85.1314481360075	67.7	49.6	74
88.7460135566455	79.4867805027172	63.8	65.4	57.7
88.6777956903964	73.8168165996106	100	73.2	54.1
88.5980701617033	67.1903560354508	99.2	63	11.4
85.9772234265269	64.3244840596896	52.8	15.7	64.3
82.561746718587	60.5896912641179	136.2	65.4	54.2
82.561746718587	60.5896912641179	59.1	73.2	29.3
82.561746718587	60.5896912641179	67.7	65.4	19.9
82.561746718587	60.5896912641179	116.5	37	49.6
82.561746718587	60.5896912641179	67.7	31.5	48.5
79.1378763503704	56.8457194627484	24.4	6.9	74.1
75.8269457103186	53.2252462635337	63.8	31.4	27.9
71.8854713508311	48.9152765399877	70.9	49.6	1.2
70.6753170059173	46.5546510301012	63.8	49.6	33.5
69.0588268646349	43.4013953450738	76.4	22	28.1
67.390575658727	40.1471721606959	81.1	18.9	25.4
65.7871277379037	37.0193585582561	84.3	17.3	27.4
64.1648372377418	33.8547874501405	66.9	14.2	52
62.732400277575	31.0605597276639	70.1	14.2	18.4
58.8125454133634	32.1587230456265	63.8	14.2	23.68
55.1308596029296	33.1901619074258	60.6	22	36.4
51.5272515440363	34.1997266785135	14.2	37	44.6
47.840731059052	35.2325201274003	21.3	6.9	41
45.0569828560015	36.0123986720734	44.9	37	1
35.0857316853101	29.3588648627498	39.4	6.9	37.7
25.5505936871402	22.9963375221686	36.2	6.9	19.4
16.2794387220231	16.8099599829212	9.4	7.1	11.9
22.6488465657628	41.7097712025714	6.3	7.1	39.2
28.9669370759424	66.4089640332124	28.3	73.2	20.4
35.2696060301107	91.0478666506388	58.3	63	68.9
43.0000609549555	121.268382637553	51.2	121.3	8.2
42.9998056690029	121.269349503315	70.9	65.4	71.5
41.1990953368051	128.089332115452	27.6	63	76.3
39.2416862799898	135.502785665986	39.4	140	4.5
38.2125808345828	139.400401480763	36.2	140	2.1

Solution x	Solution y	Original x	Original y	Radius
47.3919507429628	147.674035370633	81.1	152	42.7
47.3919507429628	147.674035370633	48	127.6	40.8
57.8516977241372	157.101707920873	60.6	155.1	3.4
59.0539854598919	159.781390503623	70.9	164.6	21.9
59.0539854598919	159.781390503623	76.4	155.1	19.1
61.3754154138926	164.955438073628	66.9	147.3	43.6
63.6928844626565	170.120661037636	17.3	127.6	73.4
65.8802197409468	174.995841358816	63.8	164.5	10.7
76.0774055646194	197.723546585437	67.7	182.7	29.6
86.1263424525111	220.120829701104	70.9	182.7	40.4
131.288058106202	320.778193178693	191.3	329.2	60.6

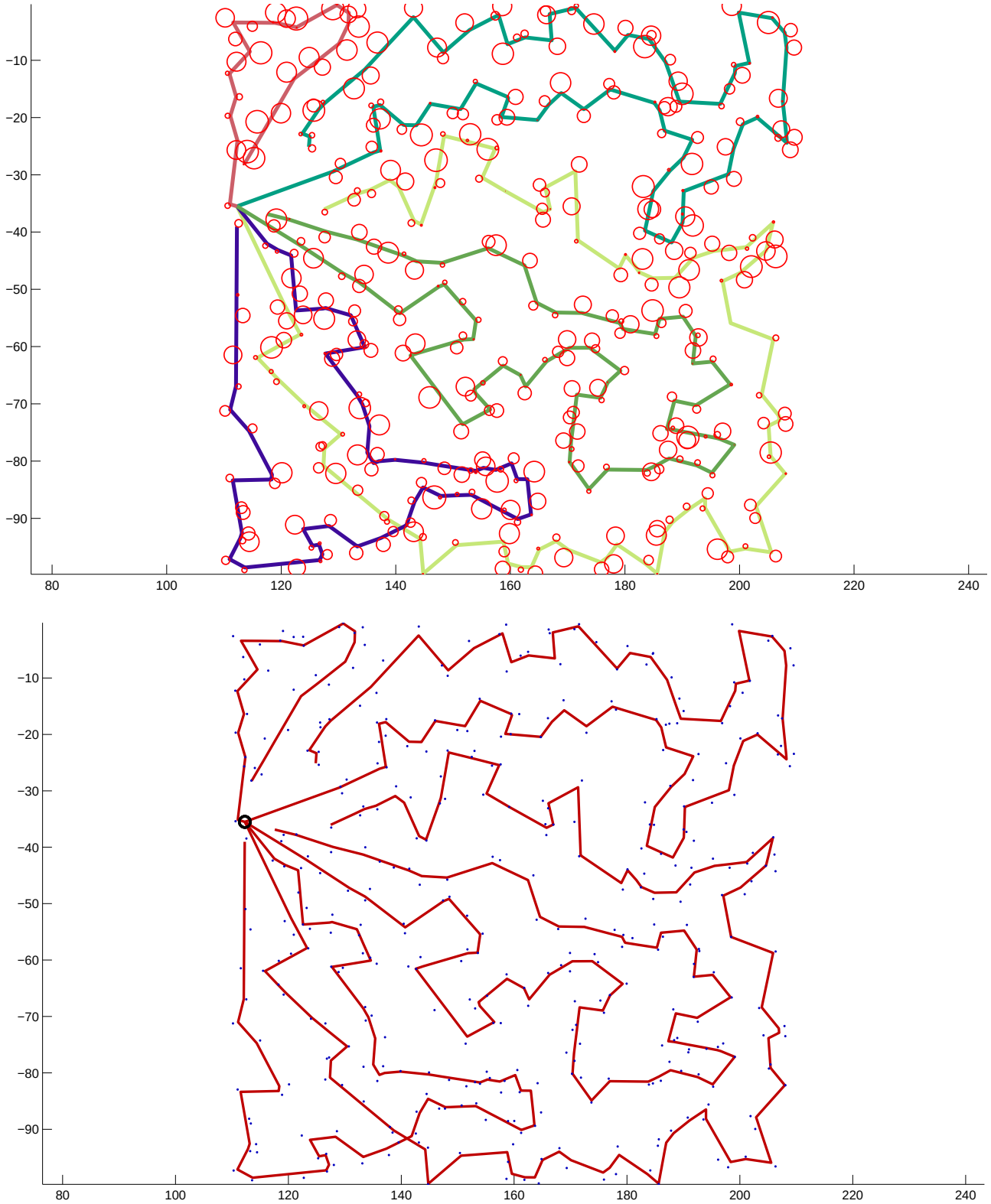


Figure O.59: $rd400$, arbitrary radius, 2D, Euclidean, Length = 1395.4245586

Table O-62: Solution for $rd400$, arbitrary radius, 2D, Euclidean

Total distance: 1395.42455859158				
Total demand met: 3297				
Depot: x 2.28315 y 35.5085				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 392.523607194341 Demand Met: 794				
10.4667353446891	52.5459354215534	9.35555	53.1101	1.2462
11.5762724822605	54.6168622654028	10.9638	55.5178	1.4157
13.3148401638606	57.8618562395689	13.5318	57.9262	0.2263
10.8189477404266	59.2329307482838	10.4725	58.878	1.3585
8.32774380615002	60.6014321346285	8.30742	60.1487	1.8807
5.85481384884892	61.9599101572003	5.52590	61.9092	0.3328
7.97062548215882	64.1747847657852	8.25408	64.3565	0.3367
9.51569940895746	65.7921902403628	9.17265	66.1356	0.4854
14.1712123627514	70.2301600901292	14.0141	70.4084	0.2376
17.2033136028514	72.6996080513562	16.576	71.2313	1.5967
20.4121395850418	75.312986557576	20.7262	75.308	0.3141
17.8229337945301	77.5621564938521	17.2306	77.2747	0.6584
17.5295666439767	77.8169966179899	16.8354	77.4785	0.7723
17.3737943171135	80.8189972729161	16.5471	81.1813	0.9026
20.620275411291	83.514112738396	19.5225	82.1483	1.7523
23.5440289536869	85.9413110647531	23.3569	85.0798	0.8816
27.3672793780954	89.1152403118706	27.9893	89.6021	0.7899
28.7113697742419	90.2310573648867	28.4623	90.5817	0.4301
34.2478888813143	93.5677212236001	34.7487	93.2543	0.5908
34.7970988892894	99.6554701132644	34.7579	99.7518	0.104
40.6075290598345	94.6823858586308	40.4171	94.2218	0.4984
48.785617282389	94.0580850698479	49.8328	92.6571	1.7491
49.1186711121562	95.6141345968285	48.9418	95.7946	0.9184
49.6068129298627	97.894764337228	48.6626	98.7924	1.3028
51.8987975056224	98.5079728610085	51.8363	98.9629	0.4592
53.6786633689897	98.5286682728258	54.3707	99.6057	1.2802
55.0416579717456	95.4513038609967	54.8665	95.2849	0.2416
57.9889373400137	93.9608149014822	58.0371	93.3465	0.6162
60.0861865558146	95.4729629504374	59.3326	96.8644	1.5824
65.7686954295892	97.6641505251092	65.9332	98.9174	1.264
66.9293084375418	96.8195902700345	68.0526	97.9535	1.5961
68.6108984263678	94.5538285724147	68.3546	93.0491	1.5264
73.6314293809626	97.9511249615849	74.1314	97.2935	0.8261
75.6104197066176	99.635592506325	75.6359	99.7073	0.0761
76.6058170393409	94.2504461945614	75.4786	92.9344	1.7328
76.9534099053693	92.3699523674269	75.6586	91.7899	1.4188
78.2594803187372	90.6856108118636	77.8131	90.2453	0.627
81.1201440926914	88.4040109296429	80.7777	87.9354	0.5804
83.9992677256059	86.4808986699736	84.4594	85.6238	0.9728
83.9934475537071	88.1580408565629	83.5669	88.2708	0.4412
87.4217995310411	94.1410527061012	86.1563	95.4019	1.7864
88.3668887782465	95.7903808064364	87.9339	96.7331	1.0374
91.0463937466293	95.2769004020391	91.0373	94.8618	0.4152
95.5542978093368	95.9375995010954	96.3227	96.5824	1.0031
93.6494649501596	90.1896457821444	92.7385	89.9534	0.9411
92.8820408843054	87.8738999469078	91.8947	87.6684	1.0085
97.9682256317756	82.1952229876673	98.0879	82.1977	0.1197
96.2941469310564	80.1628263056681	95.4573	78.5053	1.8568
95.4353319987102	79.1201894603906	95.1537	79.2325	0.3032
95.0662844698222	73.8475747946846	94.2046	73.3577	0.9912
96.962387662689	72.8914947866198	98.0725	73.509	1.2703
96.8931795607351	72.111582690952	97.9153	71.697	1.103
93.8727312656291	68.3929348524035	93.4248	68.5015	0.4609
95.8948796038186	58.7446166172977	96.3481	58.4969	0.5165
88.4506961033226	55.9103385324752	88.4474	55.9131	0.0043
87.0587813786166	48.5830752205076	86.8559	48.4797	0.2277
90.1061756213882	47.1462263639092	90.8764	48.3318	1.4138
91.5063130519843	45.9386546473622	92.0634	46.0336	1.8841
93.3773690364936	44.324932819743	94.61	43.2995	1.6034
94.6449701005772	43.2316689993296	96.3235	44.2629	1.97
95.2887505272171	40.6316196223147	96.1419	41.3034	1.4714
95.8414358702686	38.3994779330715	95.9404	38.2332	0.1935
92.8673305620374	41.1139712877007	92.3029	41.017	0.5727
91.205944492778	42.6303322888246	91.3249	42.8902	0.2858
88.1472467845109	42.9952764055222	88.1955	43.6361	1.3319
85.5184038086151	43.3089341406996	85.2354	42.0312	1.3087
81.9569177736606	44.4780665209938	81.4209	43.6493	0.987
80.3299678483049	46.2606318093624	81.1997	46.621	1.799
78.7463739043953	47.9956944488693	79.5061	49.6701	1.8387
74.8838213117395	48.076406336951	74.6616	49.1772	1.123
72.5451208453042	47.0340088959761	72.4782	47.1166	0.1063
71.6666078005946	45.8243876615205	73.064	44.6995	1.7939
70.1183131096614	44.0852569355968	70.0979	43.9308	0.1558
68.9804927391099	46.3554071033153	69.2786	47.5055	1.1881
61.7981897983996	41.4529033630679	61.5258	41.6034	0.3112
61.571559205796	35.4397594164941	60.6972	35.5066	1.483
61.3426042114517	29.3648601163815	62.0154	28.1819	1.3609
56.095727474271	32.2236614982897	55.099	31.771	1.0947
56.4390965215912	33.7641262552352	56.0389	33.1015	0.7741
56.9311815533124	35.9717893986254	56.9788	35.9946	0.0528
55.7505368345034	36.5538334234123	55.717	37.8511	1.2977
54.5809112316825	35.9000309493234	55.5492	35.9315	0.9688
49.1220922275218	32.8486362459374	49.1148	32.8614	0.0147
45.1054298181558	30.5037337260966	44.5404	30.686	0.5937
46.4832869577252	27.4040536336487	46.0829	25.5503	1.8965
47.3495962221078	25.4551679317766	47.6331	25.3181	0.3149
43.8600645740565	24.5573505689289	42.987	22.9253	1.8509
42.4475279202779	24.1939228013765	42.4972	23.9973	0.2028
38.429620012916	23.1995885472739	38.2173	22.874	0.3887
37.7859852683727	26.8942012593065	37.0272	27.4581	1.9712
37.0276251209351	31.2473683618343	37.7688	31.4408	0.766
36.6950712413216	32.1932108059185	36.8488	32.2474	0.163
34.4067475116671	38.6702548158724	34.4656	38.8185	0.1595
33.1640810266907	38.0306171165061	32.7353	38.4372	0.5909
30.5035985665897	32.1085402291555	31.6686	31.1822	1.4884
28.9457362961023	30.9255171638103	29.1053	29.2049	1.728
25.5152792592704	32.644570556009	25.7714	33.2927	0.6969
23.4683370848057	33.2512385847519	23.2874	32.7742	0.5102
21.664532746268	34.0936724705583	22.7183	34.3604	1.087
17.5038773731061	36.0368306176699	17.6023	36.5196	0.4927
Route: 2 Length: 343.794513161938 Demand Met: 777				
19.0957869584735	29.4139805598976	19.5262	30.4483	1.1203
19.2952696050952	29.319846852132	19.247	29.2712	0.0965
21.1047903619341	28.465959512984	20.3288	28.022	0.8967
26.1670123655625	26.0771692243295	25.8125	25.1372	1.0046
27.284542924899	25.7553234907267	27.4222	25.8428	0.1631
26.737669086554	22.3274896703744	26.0672	21.3383	1.195
26.4133115953721	20.2943996222423	27.2482	20.2425	1.7718
26.0670874793719	18.124248984194	25.7178	17.895	0.4178
27.2406112576198	17.8233972214057	27.3595	17.3028	0.534
31.3699067592103	21.301456389905	31.0765	22.0815	0.8334
33.5772221773899	21.3445969214473	34.4638	23.0393	1.9126
36.0545162759591	17.6227417633842	36.0033	17.5038	0.1295
39.7741224870298	18.2624617408824	39.9475	19.2268	0.9798
41.3113933704869	18.526846270433	41.7205	19.4188	0.9813
44.0069066892388	14.034231194398	43.8962	13.6901	0.3615
49.4483145508607	16.3856625210645	49.4944	16.327	0.0746
49.6154865022542	16.6069893762797	50.9211	16.4053	1.3211
48.446625326766	19.907520718104	47.6864	20.3976	0.9045
50.7745061296394	20.1063977123282	49.4045	19.961	1.3777
54.7198509352503	20.4434585007688	54.7387	20.4852	0.0458
56.6980737664674	17.7712385729286	55.9929	17.1432	0.9443
58.8793797339332	15.7275258282484	58.7637	13.9566	1.7747
62.8168958917153	18.5527583898788	62.8285	19.7058	1.1531
67.4332757751415	15.0975982117325	67.267	14.1516	0.9605
69.1989164146109	15.6332143104768	68.0574	15.6194	1.1416
75.1505594617205	17.4386756085816	75.2455	17.3084	0.1612
75.9083779690681	18.5327457610167	76.9072	18.2917	1.0706
76.0667545758672	18.7613956187461	77.5205	18.1054	1.5949
76.9405042396878	22.3012668839158	76.419	22.7841	0.7107
81.7380589270275	23.8856103002422	82.6839	23.4883	1.0259
80.202516411448	27.0125639718745	81.7106	28.112	1.8663
77.8481942622624	29.2835562503664	77.6794	29.1288	0.229
74.9416692819717	32.872923760959	73.2088	32.0501	1.9183
74.5819824890377	34.5945454182456	74.7866	36.0265	1.4465
74.0454382222689	37.1626856475812	74.0572	35.987	1.8168
73.5056122875491	39.7465361679814	72.565	40.2263	1.0559
75.8722690098301	40.8077249192786	76.05	41.1841	0.878
78.1289053672414	41.8195843914209	78.6058	43.2582	1.5156
80.0636017539924	38.3534069378526	81.8496	38.8539	1.8548
80.0722451577516	38.122141377818	80.5435	37.2793	1.6755
80.1252652965349	36.7035209737143	80.0506	36.8529	0.167
80.2684602496037	32.8721440241198	80.1207	32.7664	0.1817
84.174287268722	31.3758170326137	85.0689	32.1301	1.2391
88.0502900098126	29.8909157732415	89.036	30.7257	1.2917
88.9379016595994	25.521726274282	87.5589	25.1226	1.4356
90.5918844505633	21.1677470978084	90.11	20.7153	0.661
93.1171253684815	20.0217415843078	93.1464	19.8146	0.2092
96.6100602424302	23.0047569685003	96.7473	23.5618	0.5737
98.262323686243	24.4158126193947	98.8743	25.646	1.374
98.2120277541568	23.5680658877613	99.5853	23.4577	1.3777
97.9239778532611	20.729375497589	97.2905	22.0419	1.4574

Solution x	Solution y	Original x	Original y	Radius
97.6412319251465	17.9429626223634	96.7716	16.6523	1.5563
97.5636885193526	17.1787858582246	97.4766	17.1802	0.0871
98.2081763958777	7.80616409851404	99.5164	7.77478	1.3086
97.9023572536088	5.19579946564512	98.9579	4.73211	1.1529
96.8750664267201	4.00350878890657	95.0473	3.39817	1.9254
95.7104510827645	2.65183545021229	95.7659	2.55349	0.1129
89.8480235381106	1.66252394192319	88.6343	0.494442	1.6845
91.6803410196357	10.4529239867651	91.7898	10.5225	0.1297
89.282803615006	11.0215596253109	88.9914	10.7701	0.3849
89.1756128126502	12.2652344739348	90.4883	12.6216	1.3602
87.7070702576591	15.3509063034002	88.2698	14.9994	0.9013
86.6334265261372	17.6068247085432	86.8707	18.0065	0.4648
79.5236286569783	17.2146964949799	78.906	18.0381	1.0293
78.8267363169354	15.2368967973227	80.035	15.8589	1.8794
77.9625934508219	12.7844353700789	79.2919	13.6517	1.5872
77.0964556750014	10.3263123443364	77.911	9.90186	0.9185
75.3910915277386	7.94753314551558	73.4709	7.6166	1.9485
74.7422277791514	7.04244507902261	74.5771	5.70821	1.6887
74.197615318897	6.28277634638226	74.632	5.60444	0.8055
70.5399645845694	5.57806905374978	70.1018	4.34543	1.3082
68.2358417149395	8.32818272980668	68.2389	8.47105	0.1429
64.8554204429436	4.62742727968001	64.5769	3.66176	1.772
61.396850949948	0.841117777779072	61.5069	0.482106	0.3755
60.0527156296962	1.16396282811916	60.7013	1.36116	0.6779
56.8514915744637	1.93285888528991	56.1254	1.40532	0.8975
56.9740606992681	3.49239727336945	56.3237	2.07366	1.5607
57.2126878605294	6.52862870778106	58.2097	7.56071	1.435
52.5739567668602	6.00223375753758	52.4925	5.37248	0.635
51.1248793572773	6.56471177829491	51.1528	6.04103	0.6171
49.5063622418938	7.19296003561231	48.6979	8.85907	1.8519
47.9439572510396	2.08787316183018	48.5894	0.54797	1.6697
46.7917474817686	2.68772302911122	47.3917	2.23053	0.7543
42.8830101709764	4.72264279234987	42.0178	3.44287	1.5448
38.3264864946733	8.63091075038179	38.2491	9.61738	0.9895
36.3918508695429	6.35838148816302	37.2177	7.79249	1.6549
33.0744549571831	2.4615859788359	33.1085	0.882753	1.5792
28.58269746682	7.29887883607785	26.7979	6.90196	1.8284
24.603349206623	11.5843531446921	25.6231	12.6549	1.4785
21.437266863558	14.2498801559138	22.6997	14.9199	1.8126
17.5112438195917	17.5552009345669	17.2907	17.3232	0.3201
16.5316036580538	18.6059364650384	15.6444	17.8995	1.1341
15.2022796580918	20.5721031876218	15.6993	18.7479	1.8907
13.6960481515105	22.7999289648669	13.4	22.8874	0.3087
14.9752786951142	23.3433666508408	15.3759	23.0999	0.4688
14.839518764005	25.1047354977213	15.3897	25.3897	0.6196
Route: 3 Length: 245.209885194955 Demand Met: 673				
7.5152619443308	42.0371240690866	7.21925	42.3799	0.4529
9.40121894790435	43.1407365837097	9.27453	43.3967	0.2856
11.7193572208475	44.0929437765373	12.2621	43.6923	0.6746
12.0160274746545	47.3532121664798	11.7937	48.0467	1.685
12.3046722624252	50.5252844555248	13.2524	50.7626	1.3367
12.5928362097469	53.6920725465155	12.5872	53.6987	0.0087
14.7011972652417	53.5430613431732	13.8308	54.4775	1.5454
17.2822895375536	53.3606393686685	17.5187	55.1629	1.8177
17.7501882463406	53.270507964312	17.8085	51.9553	1.3165
22.1444159301925	54.5289211269703	22.8193	53.7552	1.0267
22.6228476663078	55.61433944286	22.5447	55.6169	0.7794
23.3582926049063	57.2828435261397	23.2085	58.8069	1.5314
24.0955256325148	58.9554036629876	24.5176	59.5849	0.7579
24.5964344976991	60.0918152298483	25.6513	60.6643	1.2002
20.52576280416	60.7536628545768	19.6656	61.3862	1.0677
17.7024722403205	61.2126993705913	17.6011	61.1721	0.1092
19.3348803468967	63.3701022883313	18.9042	62.1271	1.3155
23.2731881891954	68.5749997266529	23.6206	68.344	0.4172
24.1733463547229	70.1261042046749	24.7619	69.8637	0.6444
24.8487426047218	72.2133123023082	23.7167	70.7298	1.8661
25.3929945463184	73.8952399066256	27.1361	73.6904	1.7551
25.0270531021187	78.5178289740108	23.3293	78.9181	1.7443
26.1383431730302	80.363058108184	25.7615	81.4539	1.1541
27.0593589625263	80.0127283059402	26.7929	78.8352	1.2073
29.8817415146504	79.7818953078984	29.8827	79.684	0.0979
34.8764840916862	80.289053237713	34.9224	79.9328	0.3592
37.5320909995189	80.7044808567446	38.4806	81.2568	1.0976
40.8336667515789	81.2209603921153	41.546	82.3742	1.3555
42.6434944923791	81.5040796009321	43.0779	81.6476	0.4575
43.939037934374	81.7067471682055	43.9629	81.9344	0.2289
45.3048128477085	81.1863414806801	45.1636	79.7971	1.3964
46.3526238343827	81.3569961342652	45.6946	80.9262	1.6109
47.4755256068497	81.539881185603	47.7087	83.4773	1.9514
48.6363574274361	81.0477131169149	48.3206	81.4332	0.4983

Solution x	Solution y	Original x	Original y	Radius
50.1956441141021	80.3866107306344	50.5772	79.5094	0.9566
51.2010475433805	83.1475080022715	50.9984	83.4341	0.351
52.9648000438962	83.1640492926249	54.169	81.8375	1.7916
53.390136304216	87.1618798265985	54.7886	87.0165	1.406
53.6089324702802	89.3172487607197	53.7144	89.3849	0.1253
51.2884850888869	90.1093665497819	51.2472	90.6526	0.5448
49.9571347223447	89.4151213745712	50.0418	88.5256	1.6597
48.6387026367666	88.72761226353	48.934	88.5471	0.3461
45.9132977239182	87.3064226151491	44.9959	88.3516	1.7636
43.1980653343119	85.890536644233	43.3068	85.4106	0.4921
40.9696340964965	85.9687197397765	40.7053	85.7824	0.3234
38.6993659151711	86.0483700723759	36.723	86.3354	1.9971
37.8023261991954	86.0798423331838	37.7453	86.3505	0.2766
34.7520707113866	84.6049479864045	34.4937	83.7515	0.8917
33.263503693678	87.131150753271	32.7208	86.88	0.598
32.257654698953	90.0262847230246	32.5896	90.759	0.8044
31.8442263363494	91.2162556130282	33.1283	92.3481	1.7117
28.9446251144723	92.6537130193839	29.5533	92.3189	0.8869
27.3590899968439	93.4397313415628	27.8353	94.5623	1.2194
23.2740215176253	94.8947726764972	23.1083	96.0553	1.1723
18.3523058600294	91.3374386898839	18.6101	90.3489	1.0216
13.8307794185887	91.8627014885328	12.3803	91.1149	1.6319
15.4439705167149	94.7938699725748	15.2733	95.1553	0.3997
16.5981730330194	94.5774650480722	16.7243	94.3593	0.252
17.1945508520202	96.279114754026	18.064	96.3276	0.8708
16.7131288235502	97.2795389106623	16.854	97.4806	0.2455
11.4978424206945	97.8029290196101	12.7313	98.6134	1.4759
3.66886659271458	98.5886206594374	3.57801	99.0366	0.4571
0.978965851816099	97.1183493145538	0.299018	97.3272	0.7113
2.85014767254229	93.4758630597545	4.45069	94.0863	1.713
2.8504682032511	93.4749158216298	3.24988	93.8751	0.5654
3.14673033305886	92.5675914102906	4.28894	92.6489	1.1451
2.62334624199423	89.5808898234733	3.35356	88.986	1.2038
2.26095098866462	87.512873738392	3.06059	88.1315	1.011
1.53521752936936	83.3714597176532	1.02508	82.9527	0.66
8.27945817705653	83.2187641900509	8.89064	83.8954	0.9118
8.38662349319392	82.3603619110344	10.1219	82.045	1.7637
4.36743112871289	74.7103438476361	4.99968	74.2733	0.7686
1.08666604405632	71.0140701528492	0.194865	71.2335	0.9184
2.10248221967966	66.9232871219003	2.55217	66.9796	0.4532
2.13571728309208	61.1444137713602	1.5771	61.4642	1.5502
2.17031650167323	55.128309676198	3.30116	54.5758	1.2586
2.19452123592595	50.9194876067184	2.40393	50.9808	0.2182
2.2627999624452	39.0469354352032	2.57158	38.4711	0.6534
Route: 4 Length: 97.9309682028685 Demand Met: 263				
1.02943196939296	35.1402960836877	0.642906	35.395	0.4629
1.97238458209949	27.3100271353248	2.1823	25.6845	1.6403
2.36723085469183	24.0312277290319	2.38826	24.0295	0.0211
1.10503354482087	19.7037294366268	0.65945	19.6999	0.4456
2.13564992351304	16.3836054293746	2.68873	16.3883	0.5531
0.956206121716292	12.343016411811	0.613562	12.2624	0.352
2.7275773815162	10.4268713973687	2.19732	10.251	1.6516
4.52290607226979	8.4848108969294	6.43447	8.70233	1.9239
3.04325484023674	5.89784839598825	2.00806	6.28968	1.1788
1.61525841259279	3.40119705583877	0.219756	2.58493	1.6167
5.06289749851632	3.42629364435301	4.96047	4.06059	0.8823
8.57911028945283	3.4518895268565	8.57052	3.36732	0.0917
8.86497007051378	3.4539704093558	9.0496	1.67955	1.784
10.559706883884	3.79764544830975	10.9477	2.73525	1.5193
11.6600377558751	4.02078116915809	12.6307	2.70835	1.996
12.7024505234281	4.23217171099889	12.7116	4.29147	0.06
19.7227058955276	0.339788714270326	19.7287	0.198716	0.1412
20.77639688427	1.04709780601683	19.0116	0.977048	1.9383
21.7960160105932	1.73153554773925	23.1984	1.0131	1.5757
21.7406392395703	3.42217740727294	21.7245	2.01127	1.4575
21.7319396250716	3.68777550464667	23.5387	4.13129	1.8604
20.0856243234766	7.10736031024525	21.4744	8.21886	1.7788
16.3207253730689	10.0875486132079	17.1854	11.1942	1.4044
14.8597609996293	11.2143521101336	14.8737	9.51072	1.7498
12.2554837397903	13.2229575780763	10.9524	12.0779	1.7347
9.66878315975173	17.6574832556537	9.96077	19.2347	1.6989
7.65383223258851	21.1118264512815	5.81823	20.7452	1.9707
5.56581577015552	24.6914300673429	4.056	25.9589	1.9713
4.54498942755765	26.4414898737843	5.25835	27.1001	1.8723
3.50391902144956	28.2262551614089	3.44571	28.2052	0.0619
Route: 5 Length: 315.965584837474 Demand Met: 790				
7.68308840592864	38.8361814813137	8.75416	38.928	1.075
13.1052993302289	42.1775903985667	13.4598	41.6191	0.6615
16.5360572736404	44.4197834116303	15.6372	44.5891	1.712
20.8526228847235	47.2408975518724	20.5641	47.7219	0.5609

Solution x	Solution y	Original x	Original y	Radius
23.5847494698632	48.7395457257063	24.4594	47.3987	1.6009
24.737372950858	49.6235822173637	23.6126	49.4214	1.1428
29.7783413489715	53.4898909265905	30.4468	53.5688	0.6731
30.6987159680921	54.1957972532833	30.6696	55.2626	1.0672
37.4780258642281	49.5607443073437	37.4105	49.4356	0.1422
38.4664907186928	49.1545280697957	38.5534	48.7846	0.38
41.2420307000782	52.3230654310582	41.6783	52.1535	0.5487
43.9883494411637	55.4582440718741	44.4217	55.3301	0.4519
43.519760935461	58.6817610564088	43.5841	58.7522	0.0954
41.8420995559715	58.772272669095	41.7302	58.1199	0.6619
39.9641822229472	59.3242097180473	40.6271	60.1839	1.0856
33.9207205042632	61.1004302902924	33.4192	59.483	1.6934
32.5691970611387	61.5415494189748	31.2678	61.1344	1.3636
32.5999689454956	61.5821205250406	32.641	61.5676	0.0686
37.1063033694069	67.5234573659378	35.9094	68.8825	1.885
41.6865956828568	73.5622954868646	41.4131	74.8199	1.287
45.5336741652878	71.4924047044385	46.3399	71.17	0.8683
46.4828939006294	70.981684493907	47.6475	71.1843	1.1821
43.9095075880255	68.1215493200581	43.1006	68.5786	0.9291
43.7064291519544	67.4554703622432	42.1545	66.9856	1.6215
45.4441163124713	66.0303899347216	45.2184	66.3382	0.3817
48.7452033327766	63.3231636150676	48.6743	62.5481	0.7783
51.7528891589274	64.9835915370546	51.793	64.9464	0.0547
52.6641913848584	66.9762587861645	52.5118	68.1256	1.1594
56.3000002302701	62.5940344170352	56.0439	62.2937	0.3947
57.782026538718	61.7178767364865	58.3448	60.9201	0.9763
59.2965485200251	60.8225088122041	59.9164	61.9972	1.3282
60.3214560487179	60.216591915772	59.9164	58.75	1.5215
63.8463639515961	60.1988784748683	64.2573	58.953	1.3119
65.0122317610852	61.0709576022943	64.8783	60.379	0.7048
69.2217277971351	64.2197069143387	69.9395	64.1832	0.7187
67.0091926934992	66.2556750747285	66.9764	66.2314	0.0408
66.3316932373788	67.6670566395136	65.3011	67.1869	1.457
65.7169535894755	68.9476920203841	65.9297	69.3415	0.4476
61.6056542296323	68.3991765266799	60.771	67.3196	1.3646
61.3476510173714	70.5055470530839	60.9907	71.4945	1.0514
61.1100066702987	72.4457268232576	60.356	72.3736	1.0968
60.8738319078451	74.3739364588422	61.6789	74.8507	1.3431
60.6076386011199	76.5472515432192	59.2712	76.4167	1.3428
60.4867410525826	78.2034531290145	60.7208	77.8844	0.3957
60.3450168468499	80.1449661599396	60.2539	80.1704	0.0946
61.5525379849076	81.8461565601195	61.8453	80.8454	1.0427
63.7222284517555	84.9028527351396	63.6977	85.2552	0.3532
66.9549440131055	81.4762274337719	66.7645	81.0279	0.4871
73.7790345889543	81.5521589415464	73.8931	82.0767	0.5368
74.7432642842791	81.0989556722813	74.5996	81.8744	1.5343
75.6298168173803	80.6822609801555	75.9957	81.402	0.8074
77.7270922039052	79.5331631700817	77.5352	78.0347	1.5107
79.9338351839902	80.0884199256586	79.6042	79.6519	0.547
82.5201966378297	80.7391971347812	82.6909	80.2719	0.4975
85.1915235890465	82.0427272129954	85.2864	82.465	0.4328
89.0943649294054	77.1647423609915	89.1084	77.1611	0.0145
86.5782275550541	76.1358642478417	87.0562	74.7862	1.4318
85.9916335174519	75.9591868219812	86.1254	75.412	0.5633
83.9573743539043	75.5743672780945	84.0931	75.7357	0.2514
81.7442713188207	75.1557165635841	80.8889	76.3527	1.4712
80.9238622857731	75.0005196483396	80.9911	75.8316	1.9298
79.5955391337724	74.7492415454888	78.9206	73.8168	1.3456
78.3209868431225	74.5081352836506	78.3667	74.2083	0.3033
77.3287954454084	74.3928740688081	76.2214	75.1456	1.339
78.648466785965	69.4553114520282	78.2186	68.7569	0.8201
82.4210090279064	70.2442799930381	82.5413	70.9361	0.7022
88.3575699946409	66.6006789284497	88.5712	66.6382	0.2169
85.1971060270476	62.6327002519919	85.3959	62.1638	0.5093
81.8549678880527	62.9552861122669	81.8209	62.9891	0.048
82.0315323777914	61.2588504832447	81.8774	60.6902	1.3427
82.2086170903572	59.5574162841832	82.834	58.4111	1.5249
82.3557394124439	58.1438616818732	82.7455	58.0479	0.4014
80.1260321786888	54.7885109987217	80.6139	53.7748	1.125
76.0318676677404	55.1463370424337	74.8357	53.7031	1.8745
75.7277794408948	56.2288614523634	76.3859	55.8636	0.8017
75.2825982961967	57.8136626957604	75.5117	58.1702	0.4238
71.8930998415774	57.2851793069777	70.983	56.1077	1.4882
69.6637953815234	56.9375907824116	69.1414	57.6653	0.8958
69.1122835905963	55.8788578441935	69.3672	55.5594	0.4087
66.9696499700743	55.3170239551476	67.8108	54.6502	1.0734
62.4506049317806	54.132058174877	62.6521	52.6724	1.4735
57.9265892483485	54.0510279722682	57.8122	54.5104	0.4734
54.5947073086057	52.3577561155309	54.0007	52.8659	0.7817
52.4696368777295	45.8292970304343	53.4254	44.9898	1.2721

Solution x	Solution y	Original x	Original y	Radius
48.356207818354	43.8724504819189	47.522	42.292	1.7871
46.1289066766571	42.8128754713033	46.2037	41.7062	1.1092
38.1129309731228	45.372433856342	38.1612	45.7549	0.3855
33.6408429914191	45.1127957912615	33.2771	46.652	1.5816
31.3154659598209	44.1128061956202	31.4339	43.8079	0.3271
28.296757092363	43.062419763127	28.6889	43.6077	1.8201
25.2393148582362	41.9985561531596	26.2003	42.5604	1.3196
23.2456634349217	41.3048483044061	23.6339	40.0124	1.3495
17.8607892406875	39.9368857080448	17.5856	40.8861	0.9883
11.4006983787037	37.8277327603183	11.4258	37.7412	0.0901
7.60077604606438	36.8611457187178	9.16001	37.8018	1.821

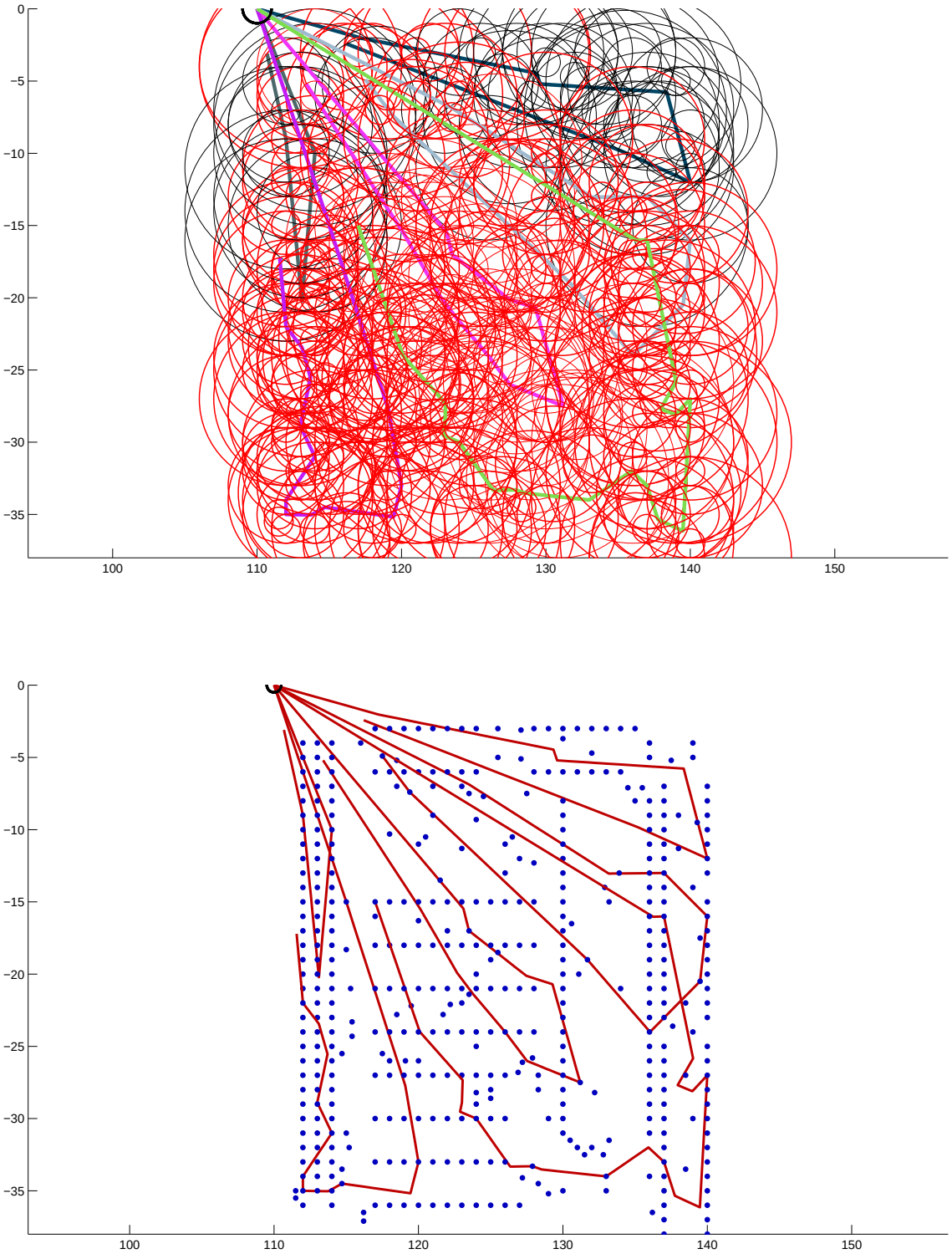


Figure O.60: *pcb*442, arbitrary radius, 2D, Euclidean, Length = 451.1431498

Table O-63: Solution for *pcb*442, arbitrary radius, 2D, Euclidean

Total distance: 451.143149821312				
Total demand met: 1066				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 68.190837653559 Demand Met: 178				
2.5143654581594	0.704810999996515	2	4	6
4.77731441163425	1.33914651109082	10	6	7
5.99668657575518	1.68095318929093	7	6	5
7.23335853416495	2.02760923773788	7	3	1
7.23433904314473	2.02780571201198	6	4	3
7.87660975689147	2.15650384174295	8	3	2
8.68428535506089	2.31834578117657	9	3	6
9.49196092819716	2.48018771229539	10	3	4
10.299636517974	2.64202964980738	13	6	5
11.1073121248516	2.80387159699203	17.1	3.1	6
11.6461120091471	2.91183625863014	11	3	1
12.2349775175588	3.02983306303254	13	3	6
12.7737774101871	3.13779772421322	12	3	2
13.3125772943633	3.24576238538656	18	3	5
13.8513772014157	3.35372705432246	14	3	3
14.3901770769707	3.46169172056635	18	6	5
14.9289769553618	3.5696563892588	19	3	5
15.4677768334632	3.67762105917271	15.5	3	1
16.0065767284919	3.78558573534588	17.5	7.5	6
16.5453766395655	3.89355041859466	15.5	5	4
17.0841765146359	4.00151509725626	23	3	6
17.4800256896089	4.08083532713223	17.1	5.1	2
17.8565351520765	4.15628026607302	21	6	5
18.2523843203541	4.23560049197278	21	3	4
18.6482335081966	4.31492072031903	22	3	4
19.0440827160083	4.39424095266089	25.5	7.1	7
19.2510025713586	4.43570353744635	24	6	5
19.3433688852664	4.45421189274911	20	3.7	1
19.6050536064907	5.20381526435582	19	6	1
19.8871216667897	5.22210211235907	24	3	5
20.3580290273158	5.25263167363137	20	6	5
20.8289363909534	5.28316125307712	26	5	6
21.2998437376289	5.31369085455254	20	3	5
21.7707510815533	5.34422048142832	25	8	7
22.2416584134328	5.37475013033431	22	6	3
22.7091493384629	5.40505830663813	22	4.7	1
23.1108886941561	5.43110371634902	27	10	6
24.1980115392169	5.5015836812336	23	6	2
24.8321525229564	5.54269610881424	24.5	7.1	2
25.466293498663	5.58380855620958	27	11	6
26.1004344723559	5.62492101340196	25	3	3
26.7345754582576	5.66603347472503	26	4	2
27.3687164376296	5.70714593829182	27.5	5.2	6
28.0320241155631	5.75014933281382	29	4	2
28.3639774195745	5.77167044597345	29	5	1
28.6182972929716	6.73986445299959	30	7	5
28.8412489600548	7.58863999684039	27	8	4
29.0700240110633	8.45958531746557	30	8	4
29.2929755826932	9.30836088073037	30	9	2
29.5159271138798	10.1571364574606	29.3	9.5	1
29.7395552447731	11.0084879394551	30	15	4
29.8704098732391	11.5066509778052	30	11	1
30	12	30	12	0
29.9990000001248	12.0000005	30	13	1
28.2188421053692	11.1959658969393	28	11.3	1
26.8243278112526	10.5661127622617	26	10	1
26.4623689221781	10.4026286536258	26	11	6
25.8434712390509	10.1230943601834	27	15	7
25.2245735443289	9.84356009179146	26	8	2
24.591939787855	9.59668303890576	30	10	6
24.0173793366202	9.37246832297541	28	9	4
22.4646452910289	8.76653413207623	27	7	6
21.0515610045285	8.21509649181935	27	9	6
18.0257922986091	7.0343297622542	20	8	6
15.4523600580858	6.03008143990012	16	11	5
12.4277722888736	4.84977563810061	13	7	3
9.30287262218934	3.6303244235047	8.5	5.2	4
6.20943076758091	2.42314917505424	8	6	4
Route: 2 Length: 41.5061003803729 Demand Met: 171				
1.07846265589713	2.69615663830675	3	5	3
1.77875218162318	4.44688045263412	3	6	3
2.52459935095594	6.31149837713596	3	7	3
3.31034482737462	8.27586206916701	4	9	1
3.76398585408602	9.40996463714013	2	13	4
4	10	4	10	0
3.86304146270288	11.5646552642146	4	11	5
3.74403167242768	12.9242586752646	8	10.3	5
3.74403167242768	12.9242586752646	3	15	4
3.59373949753233	14.6412413698028	4	13	2
3.4416660196043	16.3785742174971	4	17	1
3.2989551854409	18.0089454223483	3	23	5
3.27223802954387	18.3141702001533	4	19	1
3.23296153506729	18.7628765990566	5	18.3	4
3.23296153506729	18.7628765990566	3	20	4
3.1994262471885	19.1459937497408	2	24	5
3.17401414888249	19.43630915055	4	20	1
3.16700437598625	19.5163908888124	9.5	22.2	7
3.15368754059003	19.6685263920607	7	24	6
3.14037070584747	19.8206618877241	3	25	6
3.12933249271452	19.9467657321347	8.5	22.8	7
3.11601565892518	20.0989012208437	4	24	4
3.10621886379622	20.2108227364047	4	22	2
3.10523704060682	20.2110125342572	2	23	3
3.07210799105557	19.8749668029841	5.4	24.3	5
3.03548541136178	19.5034843265438	4	18	3
3.03548541136178	19.5034843265438	2	21	3
3.03548541136178	19.5034843265438	3	21	3
3.03548541136178	19.5034843265438	4	21	2
3.00020127496954	19.1455783995933	2	20	4
2.96491713908851	18.7876724713836	8	21	6
2.92952328097297	18.4286535725585	3	19	2
2.89412942788286	18.0696347210378	3	18	2
2.8732632789845	17.8579781751015	5.4	23.3	6
2.80588189776634	17.1744926651604	2	17	5
2.72705591505566	16.3749184074912	3	17	1
2.66311107333584	15.7262915516934	3	16	4
2.66311107333584	15.7262915516934	4	16	5
2.59674087039669	15.0530629434143	2	15	1
2.53031642852171	14.3792841733472	3	12	4
2.46394622219199	13.7060555490095	7	18	7
2.39703226279052	13.0273113407232	2	18	5
2.29496953644407	11.9920343328815	2	12	1
2.19256359925912	10.9532759515755	3	4	7
2.19256359925912	10.9532759515755	4	7	7
2.19256359925912	10.9532759515755	2	8	4
2.19256359925912	10.9532759515755	3	8	5
2.19256359925912	10.9532759515755	4	8	7
2.19256359925912	10.9532759515755	2	10	3
2.19256359925912	10.9532759515755	3	10	6
2.19256359925912	10.9532759515755	2	11	7
2.19256359925912	10.9532759515755	3	13	6
2.19256359925912	10.9532759515755	2	14	7
2.19256359925912	10.9532759515755	3	14	6
2.19256359925912	10.9532759515755	2	16	7
2.14362408239117	10.4568561343742	4	14	4
2.06812155530842	9.69099349853778	4	15	6
2	9	2	9	0
1.38102061274536	6.21459276922486	2	7	1
0.68712953922018	3.09208293190023	2	5	3
Route: 3 Length: 71.2522708765066 Demand Met: 177				
4.2740471145339	5.03907450993634	4	4	4
4.2740471145339	5.03907450993634	4	5	4
8.55567996883961	10.0870925590902	12	15	6
9.52695193361029	11.2322160613472	10	11	1
11.0689368993899	13.0502065793171	16.5	10.5	6
11.0689368993899	13.0502065793171	16	13	6
11.2054414770789	13.2111446137349	11.5	13.5	2
12.2065175067854	14.3914069233371	13	15	1
13.110841299302	15.4575989564817	14	15	1
13.1508077446569	15.6160029361575	13	18	5
13.1508077446569	15.6160029361575	14	20	5
13.3259233480405	16.310060370735	12	17	6
13.5	17	13.5	17	0
14.2313704673143	17.5743692987696	16	15	5
14.9575843993135	18.1446889996671	20	23	7
15.4046469657823	18.495781946679	15.5	18.5	5
15.8224238174949	18.8238758580196	14	18	2
15.8224238174949	18.8238758580196	17	18	2
16.6803452806102	19.4976298182292	15	19	3
16.6803452806102	19.497629818292	16	21	3
17.4682760332243	20.1164177702626	17	21	1
18.4113366072508	20.417408241984	18	21	1

Solution x	Solution y	Original x	Original y	Radius
19.2809482044502	20.694956484477	20	20	1
19.5546572121893	21.6655408702638	20	21	2
19.8312511852708	22.6463554724588	18	24	6
20.1049602080433	23.6169399114391	20	22	2
20.3786692334598	24.5875243597791	20	24	4
20.6523782657537	25.5581088324423	20	25	5
20.9262909542588	26.5294154793867	20	26	4
20.9262909542588	26.5294154793867	20	27	3
21.2	27.5	21.2	27.5	0
20.9043183782062	27.3803932432969	22.8	32.5	7
20.6086367531855	27.2607864852693	22	32	7
20.3129551256209	27.1411797260929	20	28	2
20.3129551256209	27.1411797260929	20	29	7
19.9644629975238	27.0002104871416	22.2	28.2	3
19.9644629975238	27.0002104871416	20	30	3
19.7226688904566	26.9024018754591	26	26	7
19.7226688904566	26.9024018754591	26	30	7
19.4120100952579	26.7767366728417	21	32	6
19.1013512906241	26.6510714662764	20	31	6
18.7906924995571	26.5254062652415	21.5	32.5	7
18.4800337255247	26.39974107116	19	30	4
18.1693749507761	26.2740758768133	15	30	7
18.1693749507761	26.2740758768133	16	30	7
17.8480229668349	26.1440851512319	13	27	7
17.8480229668349	26.1440851512319	16	27	7
17.6097465899676	26.0476995034904	18.3	28	7
17.5102474845256	26.0074509238521	17.9	25.8	5
17.5102474845256	26.0074509238521	18.3	27	5
17.5093204571535	26.0070759301835	16.9	26.8	1
16.8556827983873	25.1378765453064	17.2	26.1	6
16.4512243989113	24.6000327008196	17	24	2
16	24	16	24	0
15.3918227802944	23.2806879051071	14	25	3
14.7836455584764	22.5613758079433	15	24	4
13.7816292439928	21.3762566834544	13	22	1
13.7536135976239	21.3390321230348	13.5	21.4	3
13.2806188623772	20.7105611293442	12	21	4
13.2806188623772	20.7105611293442	13	21	4
12.6685423779535	19.8972913653311	11	21	2
12.3350740402329	19.3186441031889	9	18	6
12.3350740402329	19.3186441031889	12	18	6
11.9426589909706	18.6377102082567	10	18	3
11.550243950035	17.9567763278717	11	18	1
11.1578289119661	17.2758424527172	10	16.3	5
10.8678606274306	16.7726781790098	15	15	7
10.1479427448034	15.5234485971582	11	15	1
10.0706853036708	15.4052668192493	14	21	7
9.66857594665824	14.7901545644003	8	15	3
9.66857594665824	14.7901545644003	10	15	2
9.20247588428866	14.0771548427518	15	18	7
7.98739288255453	12.2184255441094	9	15	5
7.19333167355587	11.0037391116956	7	16	5
3.39954954774703	5.20033803742507	4	6	1
Route: 4 Length: 80.8538142631791 Demand Met: 183				
2	6	2	6	0
2.66666666706247	8.0000000015813	3	9	2
3.33333333496553	9.99999999826151	3	11	2
4	12	4	12	0
5	15	5	15	0
5.71832976108551	17.2351356435194	5.3	21	5
6.45811013497848	19.537016422454	8	18	5
6.45811013497848	19.537016422454	7	21	3
7.1764399069808	21.7721520853552	10	21	4
7.89304050793012	24.0019073284743	8	27	3
8.24263168111591	25.0896858602954	8	26	2
8.5981697474741	26.1959685796423	7	27	2
9.08674943369908	27.7162200345895	12	27	3
9.19778859452565	28.3585359607037	4	28	6
9.19778859452565	28.3585359607037	7	30	5
9.19778859452565	28.3585359607037	15	27	6
9.19778859452565	28.3585359607037	15	28.6	6
9.19778859452565	28.3585359607037	13	30	5
9.19778859452565	28.3585359607037	13	33	6
9.35015804914028	29.2399306354662	10	30	1
9.48091088068509	29.9962820322242	9	30	2
9.60390924248432	30.7077770098492	14	36	7
9.71551799196359	31.3533877635827	4.7	33.5	6
9.71551799196359	31.3533877635827	8	33	4
9.94230063121353	32.6652321395137	9	33	1
10.000000125	32.9990000000078	14	33	4

Solution x	Solution y	Original x	Original y	Radius
10	33	10	33	0
9.87994215895486	33.468161130647	11	33	4
9.87994215895486	33.468161130647	12	33	4
9.73445414751876	34.0354863049064	13	36	6
9.61439630915361	34.5036474273829	12	36	4
9.49433846774225	34.9718085637995	11	36	6
9.44377830581925	35.1689660494765	10	36	1
8.53697280939274	35.0410886344191	7	36	6
8.53697280939274	35.0410886344191	9	36	5
7.76957821067296	34.9328709034617	8	36	2
7.00218363774891	34.8246531760207	7	33	3
6.23478909404325	34.7164354519856	6.2	36.5	3
5.46739454830878	34.6082177258103	6.2	37.1	3
4.7	34.5	4.7	34.5	0
4.24903594572417	34.753202287458	4	35	5
3.75535984052937	35.0303860601382	4	36	1
3.51488341194755	35.0262233068261	3	34	5
3.51488341194755	35.0262233068261	4	34	5
3.08212306524921	35.0187320333138	3	35	3
2.03461062339197	35.0005991271021	2	36	1
2.03361077318546	35.0005818191697	1.5	35	1
2.03361077318546	35.0005818191697	1.5	35.5	1
2	35	2	35	0
2	34	2	34	0
2.49999999984263	33.2499999992313	3	33	1
3.00000000533679	32.499999998469	3	32	1
3.50000000892064	31.7499999991508	8	30	5
3.50000000892064	31.7499999991508	5.2	32	3
4	31	4	31	0
4.00000049999987	30.999000000125	5	31	1
3.54730769816618	30.0474307959338	2	28	4
3.54730769816618	30.0474307959338	2	30	3
3.54730769816618	30.0474307959338	2	31	3
3.54730769816618	30.0474307959338	3	31	3
3.54730769816618	30.0474307959338	2	32	3
3.54730769816618	30.0474307959338	4	32	4
3.54730769816618	30.0474307959338	2	33	4
3.54730769816618	30.0474307959338	4	33	4
3.2481575897642	29.4186113660655	3	30	2
2.99306000401728	28.882391206021	2	29	1
3.13192240843991	28.2253592455554	4	30	5
3.27691704062482	27.5393124670975	2	26	2
3.27691704062482	27.5393124670975	3	28	1
3.27691704062482	27.5393124670975	3	29	2
3.42191166507632	26.8532657229435	2	25	3
3.42191166507632	26.8532657229435	3	26	2
3.42191166507632	26.8532657229435	4	26	3
3.42191166507632	26.8532657229435	4	29	3
3.58299474534714	26.0910959249778	4	27	1
3.70060020983561	25.5346418737856	4.7	25.5	1
3.41305369612013	24.5254823055941	3	24	3
3.10613576996713	23.4483377502151	4	23	1
2.87231502294007	23.142180563484	2	27	6
2.43615750814989	22.5710902773344	3	27	6
2	22	2	22	0
1.95993982454968	21.559338075233	4	25	4
1.56458822334793	17.210470479113	2	19	5
1.56458822334793	17.210470479113	3	22	5
Route: 5 Length: 79.7670254712206 Demand Met: 173				
9.28549088970587	4.72272152991991	12	6	3
9.97295457984531	5.0723745157048	14	9.3	7
10.6604183352331	5.42202755878226	10.5	10.5	7
11.3478820813299	5.77168063440674	11	9	5
11.9949099969287	6.10076754443416	11	6	1
13.5038103520645	6.86821416325794	14	6	1
14.4999928535872	7.50378057861627	13.5	7.5	1
16.8509632220828	9.00370428047762	17	12	3
17.9623601747599	9.71277777132588	18	12.3	3
19.3440049945714	10.5942698758083	20	10	1
19.3440049945714	10.5942698758083	20	11	1
20.1517721243521	11.1096268410155	20	9	6
20.1517721243521	11.1096268410155	20	12	5
21.0905591615708	11.7085747635637	20	14	6
22.0293461786543	12.3075227418916	23.2	15	6
23.1752945115735	13.0386400612166	22.9	14	1
23.5037891416807	13.0353213590103	23.9	13	1
24.3798665765162	13.0264705614951	29	14	5
25.847868730606	13.0116397029055	26	14	1
26.2160529217214	13.0079200275231	26	9	5
26.2160529217214	13.0079200275231	26	12	5

Solution x	Solution y	Original x	Original y	Radius
26.2160529217214	13.0079200275231	26	13	5
26.2160529217214	13.0079200275231	27	12	4
26.2160529217214	13.0079200275231	26	15	5
26.2160529217214	13.0079200275231	26	18	5
27	13	27	13	0
28.023951922208	14.0239519511619	27	14	2
29.072172662251	15.0721727056766	30	21	6
30	16	30	16	0
29.8749999780199	17.1250000078859	30	17	2
29.8749999780199	17.1250000078859	30	18	6
29.7499999642848	18.2500000153346	29.5	17.5	5
29.7499999642848	18.2500000153346	30	19	5
29.6249999835156	19.3750000186283	30	20	1
29.5	20.5	29.5	20.5	0
28.6614524254147	21.346724732011	30	23	5
27.7403699833901	22.2767891657026	27	21	4
27.7403699833901	22.2767891657026	30	22	4
27.7403699833901	22.2767891657026	30	25	4
26.9018225476882	23.1235138471126	26	22	3
26.9018225476882	23.1235138471126	26	24	3
26.9018225476882	23.1235138471126	27	23	3
26.9018225476882	23.1235138471126	27	25	2
26.9018225476882	23.1235138471126	27	26	3
26.0332533749848	24.0005530464041	26	25	1
25.8257401459914	23.7610838778495	29	30	7
25.2451269134238	23.0910592564256	26	27	6
24.7338748109544	22.5010769527782	27	27	7
24.2679714596244	21.9634268507919	24	21	1
23.8035295560582	21.4274632034606	27	19	5
23.3983701904587	20.959911305718	26	19	5
22.9932108509643	20.4923593896424	26	21	4
22.7667133012525	20.2309822980071	28.5	22	6
22.1465646182813	19.5153335609858	27.6	23.6	7
21.7	19	21.7	19	0
21.6074728696223	18.9127386419639	26	23	6
20.9098276031135	18.2547967769327	20	19	2
20.9098276031135	18.2547967769327	21.1	20	4
20.2628566331717	17.644645296729	20	18	1
19.6158856395978	17.0344937839376	18	18	3
19.0392938583939	16.4907161561129	16	18	4
18.6379540711731	16.1122168477439	20	17	3
18.6379540711731	16.1122168477439	20.6	16.5	2
18.0909859881243	15.596376980158	20	15	2
15.8664071270221	13.498400260038	17	15	6
15.8664071270221	13.498400260038	18	15	6
14.2642292005643	11.9874031679795	20	16	7
11.8191874661439	9.68151014821842	14.5	7.7	4
11.8191874661439	9.68151014821842	13	11.3	4
9.40000000000001	7.4	9.4	7.4	0
8.44999999780534	6.14999999715214	9	6	1
8.44999999780534	6.14999999715214	8.5	7	1
7.5	4.9	7.5	4.9	0
Route: 6 Length: 109.573101176474 Demand Met: 184				
9.75205395846899	5.95587422399011	11	7	2
19.7160202554069	12.0411697206174	20	13	1
26.2502424696837	16.0318168012371	26	17	1
27	16	27	16	0
27.1970766121638	16.963331400173	26	16	3
27.1970766121638	16.963331400173	27	18	3
27.3927201960162	17.9196580058049	27	17	1
27.6872668164378	19.3594331527568	26	20	2
27.9817497355545	20.7988969209803	27	20	2
27.9817497355545	20.7988969209803	27	22	2
28.2790441890569	22.2521037677441	30	28	6
28.4987633078181	23.3261141436299	29	24	1
28.6860884428572	24.2417792884552	27	30	6
29.0129566869066	25.8395459627254	30	26	1
28.8716395968525	26.0840340559175	27	32	7
28.5093979654591	26.7107365000456	30	30	7
28.1471563287812	27.3374389533923	26	34	7
28.0483079345767	27.5084533395981	30	31	4
27.9480558769405	27.6818961581518	27	28	1
28.9608170580496	28.109182193829	30	33	5
28.9992249861905	28.0681871117603	26	28	3
28.9992249861905	28.0681871117603	28.5	27	2
28.9992249861905	28.0681871117603	27	29	3
30	27	30	27	0
29.9363049645502	28.1320185206987	26	29	5
29.8725040716074	29.2659183907037	30	29	1
29.8088090384617	30.3979368703282	27	31	3

Solution x	Solution y	Original x	Original y	Radius
29.7450081476141	31.5318367027831	30	38	7
29.6656377828825	32.9424446444032	30	32	1
29.6019427493018	34.0744631317003	30	34	3
29.6019427493018	34.0744631317003	30	36	3
29.538247713839	35.2064816523551	27	35	3
29.538247713839	35.2064816523551	30	35	2
29.4855832454802	36.1424596786918	30	37	1
28.8595788721784	35.8523747673866	27	38	4
28.3049769025411	35.5953771008857	27	37	6
27.7503749301248	35.3383794330975	26.2	36.5	3
27.7494676114036	35.3379589895958	27	36	1
27.3245260827536	34.0123568530061	27	34	2
27	33	27	33	0
25.9249496111525	31.9971797426411	26	31	1
24.9333211046435	32.6761841443102	28.5	33.5	5
23.9416925879418	33.3551885529434	23.2	31.5	2
23	34	23	34	0
21.640402411566	33.8558496916364	20	35	2
20.856834577174	33.7727725032605	17	36	5
20.0272377555263	33.6848151262444	20.5	31.5	4
19.1976408965891	33.5968577452717	16	36	4
18.524198684677	33.5254565428935	18.3	34.5	1
17.9	33.3	17.9	33.3	0
17.2428336174859	33.3103150459185	23	35	6
16.5731924371903	33.3208258992982	17.2	34.1	1
16.3565527142271	33.3242263299144	15	36	3
15.3867409868169	31.9561798356385	16	33	2
14.7115229426134	31.0036963255421	19	35.2	6
14	30	14	30	0
12.8821458614764	29.5290236958401	12	30	1
13.0063374667496	28.8875955071432	14	29	1
13.0590760421839	27.3386179345631	14	27	1
13.0481964038944	27.3263360407732	15	33	6
12.7567574750759	26.9973341131055	15	28	3
12.0942540757746	26.2494419345153	15	21	6
12.0942540757746	26.2494419345153	14	24	5
12.0935909930712	26.2486933883721	13	24	5
11.9137009558409	26.0456176728451	11	30	7
11.9130378731404	26.0448691266994	14	28.2	3
11.4824204340702	25.5587502403944	11	27	5
10.979485325924	24.9909928007812	9	27	6
10.979485325924	24.9909928007812	10	27	5
10.4765502493111	24.4232353967723	9.1	26	5
10.4765502493111	24.4232353967723	10	26	4
10.0919750131205	23.9890930036103	11.7	22.8	3
10.0913119304181	23.9883444574663	7.5	25.5	3
9.54028893685128	22.3861818217664	10	24	4
9.54028893685128	22.3861818217664	12	24	5
9.25775806678152	21.5646908699374	9	21	1
8.98065739392672	20.7589888401686	11	24	5
8.69812651770557	19.9374978704816	12.2	22.1	5
8.38860257738882	19.0375214668853	9	24	5
8.0318025063429	18.0000842838761	8	24	6
7	15	7	15	0

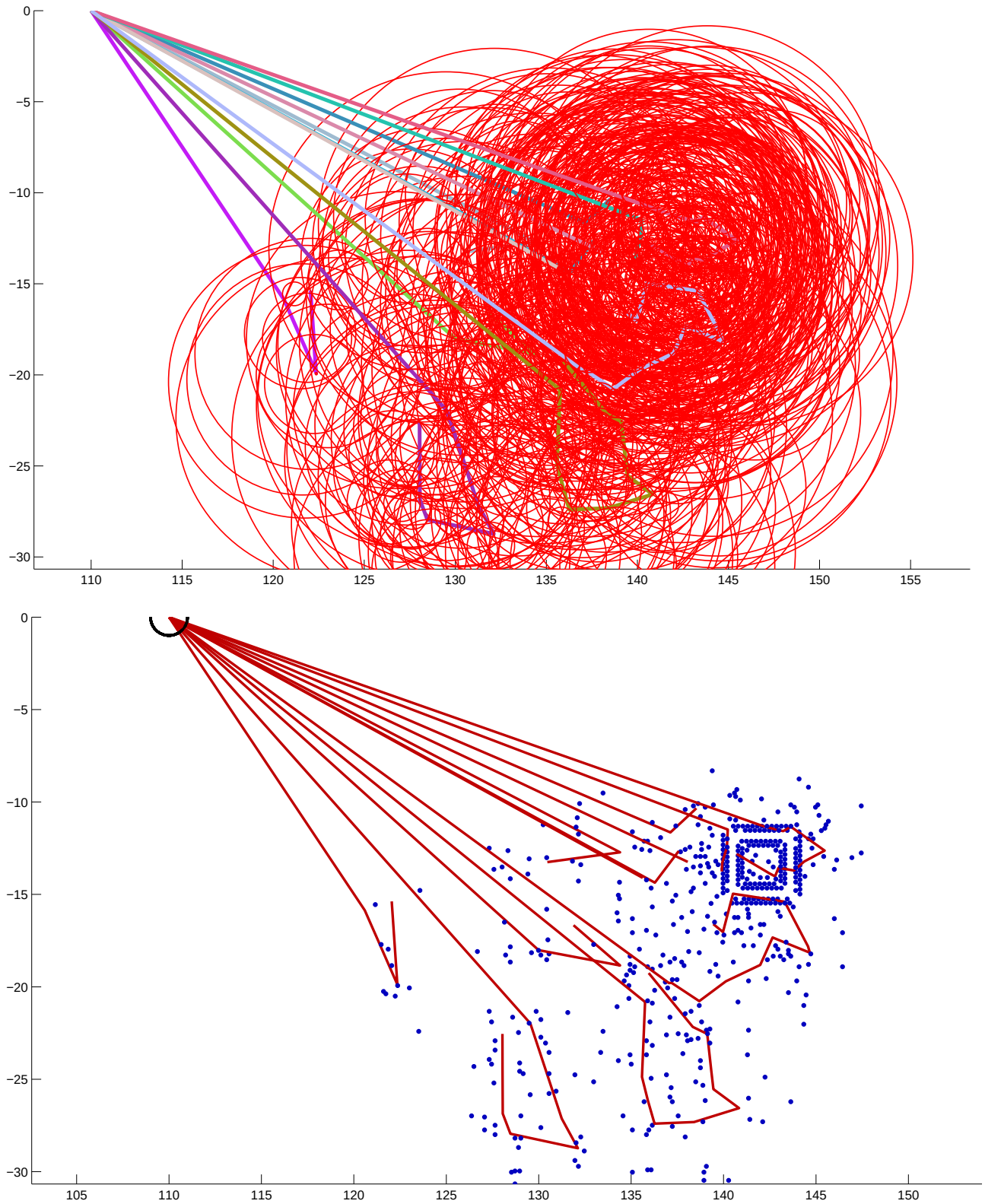


Figure O.61: $d493$, arbitrary radius, 2D, Euclidean, Length = 801.4571962

Table O-64: Solution for $d493$, arbitrary radius, 2D, Euclidean

Total distance: 801.457196205245				
Total demand met: 11160				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 47.4992294573284 Demand Met: 564				
10.5921572150639	15.864952895637	11.163	15.552	0.651
10.5921572150639	15.864952895637	11.481	17.711	3.058
10.5921572150639	15.864952895637	12.052	18.854	6.347
10.5921572150639	15.864952895637	11.608	20.251	6.345
10.5921572150639	15.864952895637	19.482	13.076	9.717
10.5921572150639	15.864952895637	11.735	20.378	7.485
10.5921572150639	15.864952895637	16.688	18.092	8.156
10.5921572150639	15.864952895637	13.513	22.41	8.854
11.3336272846279	17.551117331319 6	11.862	17.965	2.45
12.3554233450802	19.8747672292447	12.37	19.934	0.061
12.3554233450802	19.8747672292447	12.243	20.505	2.717
12.3554233450802	19.8747672292447	13.005	20.061	3.941
12.3554233450802	19.8747672292447	20.561	18.219	9.121
12.3554233450802	19.8747672292447	17.323	21.331	8.168
12.3554233450802	19.8747672292447	20.434	18.537	8.447
12.3554233450802	19.8747672292447	17.45	21.902	6.347
12.3554233450802	19.8747672292447	18.593	21.648	9.517
12.3554233450802	19.8747672292447	19.863	21.331	9.178
12.3554233450802	19.8747672292447	17.64	23.426	9.913
12.3554233450802	19.8747672292447	18.974	24.125	8.219
12.3554233450802	19.8747672292447	19.164	24.696	8.537
12.0476914010857	15.3765507877739	13.576	14.79	1.637
12.0476914010857	15.3765507877739	17.577	13.647	6.049
12.0476914010857	15.3765507877739	18.212	18.283	7.954
12.0476914010857	15.3765507877739	20.434	15.806	8.615
12.0476914010857	15.3765507877739	18.466	18.664	8.295
Route: 2 Length: 55.8701663575777 Demand Met: 819				
20.677691177438	10.7839863930869	22.085	10.853	1.409
20.677691177438	10.7839863930869	22.149	11.742	9.67
20.677691177438	10.7839863930869	21.831	13.203	7.88
20.677691177438	10.7839863930869	25.07	11.615	8.154
20.677691177438	10.7839863930869	25.197	12.441	9.295
20.677691177438	10.7839863930869	24.371	14.346	7.57
20.677691177438	10.7839863930869	25.705	12.123	8.029
20.677691177438	10.7839863930869	24.308	15.044	9.423
20.677691177438	10.7839863930869	24.371	15.235	7.737
20.677691177438	10.7839863930869	24.244	15.997	8.356
20.677691177438	10.7839863930869	27.927	10.409	7.95
20.677691177438	10.7839863930869	26.149	15.679	9.977
20.677691177438	10.7839863930869	28.181	12.441	9.321
20.677691177438	10.7839863930869	28.816	12.25	9.823
20.677691177438	10.7839863930869	29.261	11.425	8.741
20.677691177438	10.7839863930869	28.753	12.949	9.829
20.677691177438	10.7839863930869	28.753	13.457	9.22
20.677691177438	10.7839863930869	29.007	12.949	8.697
20.677691177438	10.7839863930869	27.292	16.632	9.708
20.677691177438	10.7839863930869	27.737	16.251	9.503
24.3997287024607	12.7251320199522	18.339	12.631	6.166
24.3997287024607	12.7251320199522	22.212	10.091	4.948
24.3997287024607	12.7251320199522	23.482	9.52	3.464
24.3997287024607	12.7251320199522	25.578	12.568	5.855
24.3997287024607	12.7251320199522	25.895	12.123	4.686
24.3997287024607	12.7251320199522	26.022	12.631	1.625
24.3997287024607	12.7251320199522	24.308	16.441	3.717
24.3997287024607	12.7251320199522	25.07	17.076	5.925
24.3997287024607	12.7251320199522	27.673	12.695	3.999
24.3997287024607	12.7251320199522	26.911	14.409	5.204
24.3997287024607	12.7251320199522	25.451	17.965	5.492
24.3997287024607	12.7251320199522	27.229	15.362	4.245
24.3997287024607	12.7251320199522	28.372	13.52	4.868
24.3997287024607	12.7251320199522	28.245	14.854	5.84
24.3997287024607	12.7251320199522	29.134	13.33	6.084
20.46858307167	13.2538468270817	17.323	12.504	3.533
20.46858307167	13.2538468270817	18.466	14.155	2.196
20.46858307167	13.2538468270817	22.276	13.393	3.052
20.46858307167	13.2538468270817	22.149	14.282	1.97
Route: 3 Length: 62.2399080685969 Demand Met: 990				
19.9953238885277	18.0182456422347	19.99	18.029	0.012
19.9953238885277	18.0182456422347	20.498	17.457	7.365
19.9953238885277	18.0182456422347	20.117	18.283	0.424
19.9953238885277	18.0182456422347	20.117	22.728	7.823
19.9953238885277	18.0182456422347	20.371	23.045	6.483
19.9953238885277	18.0182456422347	20.561	23.553	7.372
19.9953238885277	18.0182456422347	24.752	19.362	9.904
19.9953238885277	18.0182456422347	24.625	19.68	9.202
19.9953238885277	18.0182456422347	25.133	19.235	5.738
19.9953238885277	18.0182456422347	25.895	18.918	7.438
19.9953238885277	18.0182456422347	26.721	18.283	8.04
19.9953238885277	18.0182456422347	23.482	22.41	8.804
19.9953238885277	18.0182456422347	26.594	18.854	6.988
19.9953238885277	18.0182456422347	28.054	17.013	8.339
19.9953238885277	18.0182456422347	20.942	25.649	8.469
19.9953238885277	18.0182456422347	26.848	19.743	9.863
19.9953238885277	18.0182456422347	27.737	18.664	7.927
19.9953238885277	18.0182456422347	28.118	18.092	9.723
19.9953238885277	18.0182456422347	27.356	20.632	8.262
19.9953238885277	18.0182456422347	24.943	23.68	9.291
19.9953238885277	18.0182456422347	25.832	23.68	9.355
24.4026421467519	18.8472062299583	24.943	19.108	0.6
24.4026421467519	18.8472062299583	24.244	21.077	4.835
24.4026421467519	18.8472062299583	24.879	20.632	4.555
24.4026421467519	18.8472062299583	26.276	20.188	3.614
24.4026421467519	18.8472062299583	23.355	23.553	6.4
24.4026421467519	18.8472062299583	26.149	20.886	5.887
24.4026421467519	18.8472062299583	27.483	19.616	4.477
24.4026421467519	18.8472062299583	26.022	21.902	6.288
24.4026421467519	18.8472062299583	25.832	22.918	6.514
24.4026421467519	18.8472062299583	26.911	22.601	7.439
24.4026421467519	18.8472062299583	27.546	22.537	5.492
24.4026421467519	18.8472062299583	28.245	22.855	6.887
24.4026421467519	18.8472062299583	27.8	23.617	6.658
24.4026421467519	18.8472062299583	26.911	24.76	7.931
24.4026421467519	18.8472062299583	28.626	22.791	9.57
24.4026421467519	18.8472062299583	29.07	22.347	8.48
24.4026421467519	18.8472062299583	28.88	25.331	8.431
24.4026421467519	18.8472062299583	31.356	22.347	9.352
21.8833317489854	16.6668583492554	18.021	13.52	4.982
21.8833317489854	16.6668583492554	18.466	17.838	4.44
21.8833317489854	16.6668583492554	24.943	18.346	3.687
21.8833317489854	16.6668583492554	25.197	18.918	4.006
21.8833317489854	16.6668583492554	24.879	19.934	4.656
Route: 4 Length: 61.783826146754 Demand Met: 986				
27.1270386315481	11.6468272946675	20.244	11.234	6.925
27.1270386315481	11.6468272946675	26.149	11.107	6.643
27.1270386315481	11.6468272946675	26.594	11.933	0.605
27.1270386315481	11.6468272946675	27.419	11.298	1.537
27.1270386315481	11.6468272946675	27.991	13.647	2.618
27.1270386315481	11.6468272946675	28.816	12.568	3.752
27.1270386315481	11.6468272946675	29.388	11.804	6.15
27.1270386315481	11.6468272946675	29.975	12.581	3.034
27.1270386315481	11.6468272946675	29.515	14.028	5.055
27.1270386315481	11.6468272946675	29.975	13.101	5.333
27.1270386315481	11.6468272946675	30.657	11.541	6.88
27.1270386315481	11.6468272946675	31.047	11.313	6.138
27.1270386315481	11.6468272946675	29.975	14.401	4.095
27.1270386315481	11.6468272946675	29.642	15.108	5.237
27.1270386315481	11.6468272946675	30.982	12.126	5.546
27.1270386315481	11.6468272946675	30.787	12.906	6.569
27.1270386315481	11.6468272946675	31.242	12.126	5.83
27.1270386315481	11.6468272946675	31.015	12.776	4.762
27.1270386315481	11.6468272946675	30.202	14.791	5.659
27.1270386315481	11.6468272946675	31.015	13.036	5.03
27.1270386315481	11.6468272946675	30.787	13.686	6.343
27.1270386315481	11.6468272946675	31.275	12.613	5.931
27.1270386315481	11.6468272946675	31.697	11.541	4.577
27.1270386315481	11.6468272946675	31.015	13.296	5.495
27.1270386315481	11.6468272946675	31.762	12.126	6.006
27.1270386315481	11.6468272946675	31.015	14.076	6.371
27.1270386315481	11.6468272946675	30.462	15.473	6.788
27.1270386315481	11.6468272946675	31.737	12.885	5.959
27.1270386315481	11.6468272946675	31.399	13.754	6.233
27.1270386315481	11.6468272946675	31.372	15.246	6.866
27.1270386315481	11.6468272946675	32.802	12.126	6.243
27.1270386315481	11.6468272946675	32.436	13.231	5.906
27.1270386315481	11.6468272946675	31.892	15.246	6.832
27.1270386315481	11.6468272946675	32.022	15.473	6.4
27.1270386315481	11.6468272946675	33.322	12.581	6.265
27.1270386315481	11.6468272946675	33.095	13.231	6.668
27.1270386315481	11.6468272946675	33.322	13.101	6.817
28.3040015097137	10.5523776738241	28.753	10.79	0.508
28.3040015097137	10.5523776738241	30.721	9.329	3.502
28.3040015097137	10.5523776738241	32.055	9.837	5.02

Solution x	Solution y	Original x	Original y	Radius
28.5298600923026	10.342353331032	29.451	10.155	0.94
Route: 5 Length: 62.4330197077725 Demand Met: 974				
26.2844796350968	14.3629322686293	19.418	13.901	6.882
26.2844796350968	14.3629322686293	22.974	17.711	5.019
26.2844796350968	14.3629322686293	25.07	16.314	2.3
26.2844796350968	14.3629322686293	26.086	14.663	1.968
26.2844796350968	14.3629322686293	28.372	10.218	4.687
26.2844796350968	14.3629322686293	25.832	16.949	3.416
26.2844796350968	14.3629322686293	24.943	18.791	4.875
26.2844796350968	14.3629322686293	26.34	17.203	3.101
26.2844796350968	14.3629322686293	29.007	14.409	6.619
26.2844796350968	14.3629322686293	28.308	15.933	3.661
26.2844796350968	14.3629322686293	27.102	18.664	5.391
26.2844796350968	14.3629322686293	29.134	16.187	3.747
26.2844796350968	14.3629322686293	27.864	18.854	5.87
26.2844796350968	14.3629322686293	28.689	18.156	4.491
26.2844796350968	14.3629322686293	30.657	15.246	4.816
26.2844796350968	14.3629322686293	29.959	17.584	6.004
26.2844796350968	14.3629322686293	30.594	17.076	5.185
26.2844796350968	14.3629322686293	31.356	16.251	5.882
26.2844796350968	14.3629322686293	30.531	18.664	6.676
27.5749718469155	12.6565730273082	27.927	12.568	0.363
27.5749718469155	12.6565730273082	30.787	14.206	3.808
27.5749718469155	12.6565730273082	33.322	13.361	9.946
27.5749718469155	12.6565730273082	33.907	11.996	7.29
27.5749718469155	12.6565730273082	32.867	14.661	8.465
27.5749718469155	12.6565730273082	33.095	14.271	9.731
27.5749718469155	12.6565730273082	34.135	12.126	8.535
27.5749718469155	12.6565730273082	32.182	16.632	9.605
27.5749718469155	12.6565730273082	33.907	12.776	9.552
27.5749718469155	12.6565730273082	33.907	13.816	8.76
27.5749718469155	12.6565730273082	34.135	13.426	8.117
27.5749718469155	12.6565730273082	34.849	11.996	7.912
27.5749718469155	12.6565730273082	34.785	12.504	9.071
27.5749718469155	12.6565730273082	34.135	14.466	7.813
27.5749718469155	12.6565730273082	34.404	14.028	9.888
27.5749718469155	12.6565730273082	34.135	14.986	7.609
27.5749718469155	12.6565730273082	32.817	17.775	7.615
27.5749718469155	12.6565730273082	32.309	19.553	9.666
27.5749718469155	12.6565730273082	35.992	13.647	9.144
27.5749718469155	12.6565730273082	34.087	18.918	9.955
Route: 6 Length: 62.0640587522178 Demand Met: 966				
28.0647409442107	13.2422491644746	20.434	13.012	7.723
28.0647409442107	13.2422491644746	22.022	11.361	6.97
28.0647409442107	13.2422491644746	28.626	11.234	4.284
28.0647409442107	13.2422491644746	29.007	10.282	4.077
28.0647409442107	13.2422491644746	28.499	12.949	0.524
28.0647409442107	13.2422491644746	29.197	12.441	7.211
28.0647409442107	13.2422491644746	28.753	13.838	1.257
28.0647409442107	13.2422491644746	30.594	9.52	7.585
28.0647409442107	13.2422491644746	30.34	10.917	4.723
28.0647409442107	13.2422491644746	29.975	12.061	7.414
28.0647409442107	13.2422491644746	29.388	13.838	7.053
28.0647409442107	13.2422491644746	29.975	13.881	2.974
28.0647409442107	13.2422491644746	30.787	12.386	7.465
28.0647409442107	13.2422491644746	31.307	11.313	7.443
28.0647409442107	13.2422491644746	31.567	11.313	7.667
28.0647409442107	13.2422491644746	31.372	12.353	3.954
28.0647409442107	13.2422491644746	30.787	13.946	7.399
28.0647409442107	13.2422491644746	32.182	10.98	7.118
28.0647409442107	13.2422491644746	32.022	12.126	7.596
28.0647409442107	13.2422491644746	32.152	12.353	7.264
28.0647409442107	13.2422491644746	32.607	11.313	7.65
28.0647409442107	13.2422491644746	31.61	13.901	7.404
28.0647409442107	13.2422491644746	32.737	11.541	5.142
28.0647409442107	13.2422491644746	31.957	14.433	4.494
28.0647409442107	13.2422491644746	31.502	15.473	5.299
28.0647409442107	13.2422491644746	31.632	15.246	4.737
28.0647409442107	13.2422491644746	30.785	16.949	7.677
28.0647409442107	13.2422491644746	32.372	14.092	6.932
28.0647409442107	13.2422491644746	33.095	12.711	5.532
28.0647409442107	13.2422491644746	33.96	10.536	7.536
28.0647409442107	13.2422491644746	32.152	15.246	4.552
28.0647409442107	13.2422491644746	33.095	13.751	7.425
28.0647409442107	13.2422491644746	33.322	13.621	7.179
28.0647409442107	13.2422491644746	32.542	15.473	5.858
28.0647409442107	13.2422491644746	32.932	15.246	6.384
28.0647409442107	13.2422491644746	33.322	14.401	5.546
28.0647409442107	13.2422491644746	33.062	15.473	7.07
28.0647409442107	13.2422491644746	33.071	16.187	6.12

Solution x	Solution y	Original x	Original y	Radius
28.0647409442107	13.2422491644746	34.135	13.946	7.157
Route: 7 Length: 74.7500412615551 Demand Met: 931				
19.5437797080033	21.9764433399164	19.609	18.156	3.821
19.5437797080033	21.9764433399164	19.482	21.966	0.074
19.5437797080033	21.9764433399164	21.577	21.394	2.115
20.3514075844945	24.4195042847004	20.561	24.696	0.361
20.3514075844945	24.4195042847004	22.022	28.443	5.071
20.3514075844945	24.4195042847004	24.562	26.982	7.031
20.3514075844945	24.4195042847004	25.07	27.744	6.389
20.3514075844945	24.4195042847004	26.149	27.49	8.339
20.3514075844945	24.4195042847004	27.546	26.982	8.192
20.3514075844945	24.4195042847004	25.895	29.903	9.341
21.2470263665944	27.1287363306557	20.117	27.617	1.231
21.2470263665944	27.1287363306557	18.91	28.697	3.011
22.1173370286537	28.7354122750309	18.974	29.967	3.376
22.1173370286537	28.7354122750309	22.276	28.125	2.538
22.1173370286537	28.7354122750309	21.958	29.395	1.302
22.1173370286537	28.7354122750309	25.07	30.03	3.224
20.2924777191849	28.3436602088349	18.72	30.665	3.298
18.4676183415219	27.9519063322356	16.37	26.982	2.311
18.4676183415219	27.9519063322356	17.64	27.49	0.99
18.4676183415219	27.9519063322356	17.64	27.998	1.574
18.4676183415219	27.9519063322356	18.529	30.03	2.079
18.0541816235123	26.8631854253794	17.069	27.046	1.002
18.0541816235123	26.8631854253794	17.069	27.744	2.549
18.0541816235123	26.8631854253794	19.037	28.189	3.611
18.0541816235123	26.8631854253794	18.72	29.967	7.58
18.0541816235123	26.8631854253794	22.466	28.887	7.763
18.0541816235123	26.8631854253794	22.149	29.713	6.925
18.0446901673247	24.5079153980399	17.45	24.188	1.702
18.0446901673247	24.5079153980399	19.037	26.982	6.169
18.0446901673247	24.5079153980399	21.958	24.76	6.761
18.0446901673247	24.5079153980399	18.72	28.189	7.716
18.036801392099	22.5503539525191	18.148	16.505	6.09
18.036801392099	22.5503539525191	17.64	22.918	3.23
18.036801392099	22.5503539525191	18.91	22.474	4.101
18.036801392099	22.5503539525191	16.497	24.315	2.342
18.036801392099	22.5503539525191	17.323	23.934	5.56
18.036801392099	22.5503539525191	20.117	21.775	2.22
18.036801392099	22.5503539525191	17.577	25.204	4.26
18.036801392099	22.5503539525191	18.974	24.569	2.27
18.036801392099	22.5503539525191	19.545	25.839	4.367
18.036801392099	22.5503539525191	20.561	25.776	5.596
Route: 8 Length: 58.5036274956866 Demand Met: 993				
25.6261276372891	14.1056793475494	25.832	14.219	0.235
25.6261276372891	14.1056793475494	28.626	10.091	7.98
25.6261276372891	14.1056793475494	27.419	15.044	7.778
25.6261276372891	14.1056793475494	28.372	14.663	8.657
25.6261276372891	14.1056793475494	30.658	9.71	8.685
25.6261276372891	14.1056793475494	29.197	13.52	8.532
25.6261276372891	14.1056793475494	29.975	11.801	8.467
25.6261276372891	14.1056793475494	29.975	12.321	7.85
25.6261276372891	14.1056793475494	30.658	10.98	9.268
25.6261276372891	14.1056793475494	29.705	13.393	8.359
25.6261276372891	14.1056793475494	29.975	12.841	8.339
25.6261276372891	14.1056793475494	30.202	12.711	9.036
25.6261276372891	14.1056793475494	30.787	11.313	9.249
25.6261276372891	14.1056793475494	29.975	13.361	8.8
25.6261276372891	14.1056793475494	30.202	12.971	8.778
25.6261276372891	14.1056793475494	29.975	13.621	8.631
25.6261276372891	14.1056793475494	30.202	13.491	9.735
25.6261276372891	14.1056793475494	29.324	15.489	9.524
25.6261276372891	14.1056793475494	30.202	13.751	8.941
25.6261276372891	14.1056793475494	30.202	14.011	8.617
25.6261276372891	14.1056793475494	31.015	12.516	8.72
25.6261276372891	14.1056793475494	30.787	13.426	9.125
25.6261276372891	14.1056793475494	31.502	12.126	9.301
25.6261276372891	14.1056793475494	31.632	12.353	8.922
25.6261276372891	14.1056793475494	31.957	11.541	8.595
25.6261276372891	14.1056793475494	30.787	14.466	9.289
25.6261276372891	14.1056793475494	32.087	11.313	9.723
25.6261276372891	14.1056793475494	30.15	16.06	8.901
25.6261276372891	14.1056793475494	31.177	14.433	9.897
25.6261276372891	14.1056793475494	31.437	14.433	8.72
25.6261276372891	14.1056793475494	30.982	15.473	9.722
25.6261276372891	14.1056793475494	31.112	15.246	8.972
25.6261276372891	14.1056793475494	32.412	12.353	7.931
25.6261276372891	14.1056793475494	31.697	14.433	8.117
25.6261276372891	14.1056793475494	32.672	12.353	8.34
25.6261276372891	14.1056793475494	31.827	14.661	8.515

Solution x	Solution y	Original x	Original y	Radius
25.6261276372891	14.1056793475494	33.387	11.313	9.319
25.6261276372891	14.1056793475494	31.762	15.473	7.919
25.6261276372891	14.1056793475494	33.833	10.282	9.452
25.6261276372891	14.1056793475494	32.347	14.661	7.755
25.6261276372891	14.1056793475494	32.477	14.433	7.82
25.6261276372891	14.1056793475494	31.483	16.822	9.589
25.6261276372891	14.1056793475494	33.96	11.234	9.284
25.6261276372891	14.1056793475494	32.412	15.246	8.256
25.6261276372891	14.1056793475494	33.907	13.296	9.748
Route: 9 Length: 67.5657938305869 Demand Met: 991				
30.2304785518979	11.4912343981513	29.388	8.313	3.288
30.2304785518979	11.4912343981513	30.202	11.996	1.233
30.2304785518979	11.4912343981513	30.527	11.313	2.614
30.2304785518979	11.4912343981513	31.177	11.541	1.55
30.2304785518979	11.4912343981513	30.787	13.166	1.867
30.2304785518979	11.4912343981513	31.437	11.541	2.677
30.2304785518979	11.4912343981513	31.827	11.313	3.091
30.2304785518979	11.4912343981513	31.015	13.556	2.877
30.2304785518979	11.4912343981513	31.892	12.353	3.015
30.2304785518979	11.4912343981513	32.282	12.126	3.133
30.2304785518979	11.4912343981513	31.991	14.092	3.28
30.2304785518979	11.4912343981513	33.127	11.313	2.902
30.1832805974241	12.4477466990301	30.202	12.451	0.019
30.1832805974241	12.4477466990301	32.944	10.536	3.833
30.1832805974241	12.4477466990301	31.567	14.661	2.638
30.1832805974241	12.4477466990301	33.452	11.541	4.46
30.1832805974241	12.4477466990301	34.087	11.615	4.861
30.1832805974241	12.4477466990301	34.135	12.646	4.083
30.1832805974241	12.4477466990301	34.595	11.996	4.778
30.1832805974241	12.4477466990301	34.135	13.686	4.602
30.1832805974241	12.4477466990301	35.293	11.552	5.688
30.1832805974241	12.4477466990301	35.547	11.234	6.26
30.1832805974241	12.4477466990301	35.674	11.044	6.002
30.029392132019	12.954464383985	30.202	13.231	0.532
29.9340316304973	13.2684635630372	29.578	13.203	0.362
29.9340316304973	13.2684635630372	29.975	14.921	2.292
29.9340316304973	13.2684635630372	31.547	13.203	3.992
29.9340316304973	13.2684635630372	31.047	14.661	2.465
29.9340316304973	13.2684635630372	32.477	11.541	3.772
29.9340316304973	13.2684635630372	32.932	12.353	3.826
29.9340316304973	13.2684635630372	33.062	12.126	4.87
29.9340316304973	13.2684635630372	33.322	12.841	4.98
29.9340316304973	13.2684635630372	32.607	14.661	4.485
29.9340316304973	13.2684635630372	32.737	14.433	4.264
29.9340316304973	13.2684635630372	34.135	12.386	5.584
29.9340316304973	13.2684635630372	34.849	13.393	6.061
29.9340316304973	13.2684635630372	33.261	18.537	7.388
29.9000190597937	13.7618128912157	30.202	14.271	0.592
29.9000190597937	13.7618128912157	31.307	14.661	1.899
29.9000190597937	13.7618128912157	30.594	16.251	2.691
29.9000190597937	13.7618128912157	30.785	16.251	3.205
29.9000190597937	13.7618128912157	31.293	15.806	3.238
29.9000190597937	13.7618128912157	31.356	16.06	3.559
29.9000190597937	13.7618128912157	30.975	17.076	3.584
29.9000190597937	13.7618128912157	31.61	17.775	4.415
29.9000190597937	13.7618128912157	33.642	18.346	5.973
Route: 10 Length: 76.9302968885038 Demand Met: 988				
30.2923299498304	10.6524552745024	30.34	9.647	1.289
30.2923299498304	10.6524552745024	30.912	9.901	0.974
31.9181029501428	11.2241668945425	32.347	11.313	0.438
32.273542436689	11.3491590428156	32.217	11.541	0.2
32.273542436689	11.3491590428156	32.542	12.126	1.441
32.273542436689	11.3491590428156	32.867	11.313	1.814
32.273542436689	11.3491590428156	33.642	10.155	3.353
32.273542436689	11.3491590428156	34.087	8.758	5.137
32.273542436689	11.3491590428156	33.095	12.971	2.042
32.273542436689	11.3491590428156	33.907	12.516	2.372
32.273542436689	11.3491590428156	33.907	13.036	3.305
32.273542436689	11.3491590428156	34.976	10.282	4.446
32.273542436689	11.3491590428156	35.103	10.155	3.418
32.273542436689	11.3491590428156	35.992	16.314	6.3
33.2202471378549	11.5759158738467	32.997	11.541	0.865
33.2202471378549	11.5759158738467	33.322	12.321	0.752
33.6455226953468	11.3399595543545	33.647	11.313	0.027
33.6455226953468	11.3399595543545	34.595	9.202	3.337
33.6455226953468	11.3399595543545	34.135	11.866	1.771
33.6455226953468	11.3399595543545	35.484	11.425	2.932
33.6455226953468	11.3399595543545	37.452	10.218	4.761
34.5353146083997	11.9698719109256	34.722	11.742	0.519
35.4700274290019	12.6315850965624	37.452	12.758	1.986

Solution x	Solution y	Original x	Original y	Radius
34.9260101965436	12.9208060396705	35.42	12.949	1.498
34.3550466989219	13.2243527136586	34.135	12.906	0.387
34.3550466989219	13.2243527136586	34.135	13.166	1.621
34.3550466989219	13.2243527136586	36.119	13.139	3.085
34.3550466989219	13.2243527136586	36.944	13.012	3.218
33.8047409537701	13.7079414619056	33.907	13.556	0.805
33.8047409537701	13.7079414619056	33.907	14.076	0.382
32.9745057371047	13.557755602955	32.835	12.613	0.955
32.9745057371047	13.557755602955	32.69	13.52	0.287
32.9745057371047	13.557755602955	33.322	13.881	0.777
32.7828064284697	14.027051957564	32.835	14.173	0.155
32.7828064284697	14.027051957564	33.907	14.336	1.948
32.7828064284697	14.027051957564	34.135	14.206	1.632
32.7828064284697	14.027051957564	34.135	14.726	3.323
32.474957017568	13.8604249594268	31.275	14.173	1.24
32.474957017568	13.8604249594268	32.217	14.433	0.628
32.474957017568	13.8604249594268	33.095	13.491	0.844
30.7044452568848	12.8104406105232	30.787	12.646	0.184
30.7044452568848	12.8104406105232	31.015	13.816	1.481
30.7044452568848	12.8104406105232	33.095	14.011	2.901
30.7044452568848	12.8104406105232	33.322	14.141	3.297
30.7044452568848	12.8104406105232	35.166	10.726	5.004
Route: 11 Length: 86.165448093599 Demand Met: 967				
25.7564839021259	20.8215882627156	25.895	20.759	0.152
25.7564839021259	20.8215882627156	26.086	24.95	5.746
25.7564839021259	20.8215882627156	28.054	22.918	3.972
25.6849526685803	22.5166975126916	26.149	23.172	0.891
25.6849526685803	22.5166975126916	25.959	27.744	5.865
25.6849526685803	22.5166975126916	27.229	27.554	5.774
25.6849526685803	22.5166975126916	27.927	28.125	6.761
25.5854510594276	24.8746386582898	22.974	25.141	2.625
25.5854510594276	24.8746386582898	24.308	23.998	2.157
25.5854510594276	24.8746386582898	25.006	24.188	1.627
25.5854510594276	24.8746386582898	27.165	25.458	2.59
25.5854510594276	24.8746386582898	27.102	25.966	2.428
25.9087495825395	26.1651628984545	25.705	26.22	0.211
25.9087495825395	26.1651628984545	27.229	26.22	2.987
25.9087495825395	26.1651628984545	26.086	29.903	5.939
25.9087495825395	26.1651628984545	28.88	27.3	4.959
25.9087495825395	26.1651628984545	28.943	30.03	6.569
25.9087495825395	26.1651628984545	30.277	30.475	7.266
26.2642751515607	27.3998510274662	25.832	27.998	0.738
28.4038719927478	27.3166844692469	31.356	26.03	3.642
28.4038719927478	27.3166844692469	28.943	30.475	3.204
30.840606693917	26.5648031594407	32.245	24.887	2.188
30.840606693917	26.5648031594407	31.42	27.173	0.84
30.1452602147372	26.0521025257644	33.642	26.22	5.615
29.4499137355097	25.5394018920877	28.499	25.141	1.031
29.4499137355097	25.5394018920877	29.007	26.157	0.76
29.337964892783	24.5422699773554	28.753	24.379	0.74
29.337964892783	24.5422699773554	32.118	27.3	5.473
29.2260250744662	23.5452184427126	29.261	22.283	1.411
29.2260250744662	23.5452184427126	28.753	23.998	1.239
29.1143840195166	22.5508279900808	29.134	22.537	0.024
28.3330266259891	22.1690060334688	27.991	22.601	0.551
27.4468564565756	21.086435179357	27.102	21.648	0.659
27.4468564565756	21.086435179357	29.261	23.045	3.259
27.4468564565756	21.086435179357	29.07	29.713	9.61
25.9481820781279	19.2556019046844	26.149	19.045	0.291
25.9481820781279	19.2556019046844	28.245	21.331	3.596
25.9481820781279	19.2556019046844	28.816	21.902	4.368
25.9481820781279	19.2556019046844	30.785	20.823	6.267
25.9481820781279	19.2556019046844	33.071	18.346	7.578
25.9481820781279	19.2556019046844	34.468	20.442	9.777
25.9481820781279	19.2556019046844	34.341	21.013	9.585
Route: 12 Length: 85.6517801450666 Demand Met: 991				
27.0450783918121	19.7981825367274	27.356	18.473	1.404
27.0450783918121	19.7981825367274	26.975	20.061	0.272
27.1887786938316	19.7822024263666	27.229	19.616	0.171
27.1887786938316	19.7822024263666	29.261	19.172	3.212
27.1887786938316	19.7822024263666	31.293	23.68	6.085
27.1887786938316	19.7822024263666	33.96	19.68	7.146
27.1887786938316	19.7822024263666	34.341	22.029	7.918
28.6827863076619	20.7730804509267	27.927	21.458	1.027
28.6827863076619	20.7730804509267	28.689	21.013	0.24
30.1270859483599	19.703540202574	29.578	18.791	1.065
31.9834217540925	18.8160947072403	33.515	20.315	2.143
32.655408924013	17.3288688527265	29.642	17.076	3.024
32.655408924013	17.3288688527265	31.102	17.775	2.111
32.655408924013	17.3288688527265	32.672	15.246	2.909

Solution x	Solution y	Original x	Original y	Radius
32.655408924013	17.3288688527265	33.127	14.661	2.812
32.655408924013	17.3288688527265	32.802	15.473	3.005
32.655408924013	17.3288688527265	31.991	17.203	2.464
32.655408924013	17.3288688527265	32.944	15.933	2.412
32.655408924013	17.3288688527265	33.322	15.473	2.231
32.655408924013	17.3288688527265	33.452	15.246	2.23
32.655408924013	17.3288688527265	32.69	18.346	1.033
32.655408924013	17.3288688527265	32.944	17.965	2.152
33.6625374775911	17.7432808051975	33.388	17.584	0.393
34.6661578667744	18.156249253735	34.722	18.219	0.084
34.5708366286647	17.8170901417705	36.436	17.076	2.007
33.303034996314	15.3961869746802	32.087	14.661	1.421
33.303034996314	15.3961869746802	33.582	15.473	0.316
33.303034996314	15.3961869746802	33.907	14.791	0.855
32.3082512171534	15.2415058489153	32.282	15.473	0.309
32.3082512171534	15.2415058489153	33.515	18.029	3.593
32.3082512171534	15.2415058489153	34.595	18.791	4.79
32.3082512171534	15.2415058489153	36.436	18.918	5.753
31.3121203608181	15.0866152255862	31.242	15.473	0.426
31.3121203608181	15.0866152255862	33.769	15.679	3.318
30.5131883247824	14.9623874402911	29.975	14.141	0.982
30.5131883247824	14.9623874402911	29.975	14.661	0.642
30.5131883247824	14.9623874402911	30.722	15.473	0.772
29.9692769337301	17.0364502111963	30.023	17.203	0.175
29.9692769337301	17.0364502111963	29.705	19.426	2.488
29.9692769337301	17.0364502111963	31.991	16.632	2.73
29.9692769337301	17.0364502111963	31.356	19.68	4.172
29.9692769337301	17.0364502111963	32.372	18.537	3.113
29.9692769337301	17.0364502111963	33.515	18.219	4.061
29.4464924373947	16.6047382267034	28.943	16.886	0.628
29.4464924373947	16.6047382267034	29.515	16.505	0.121

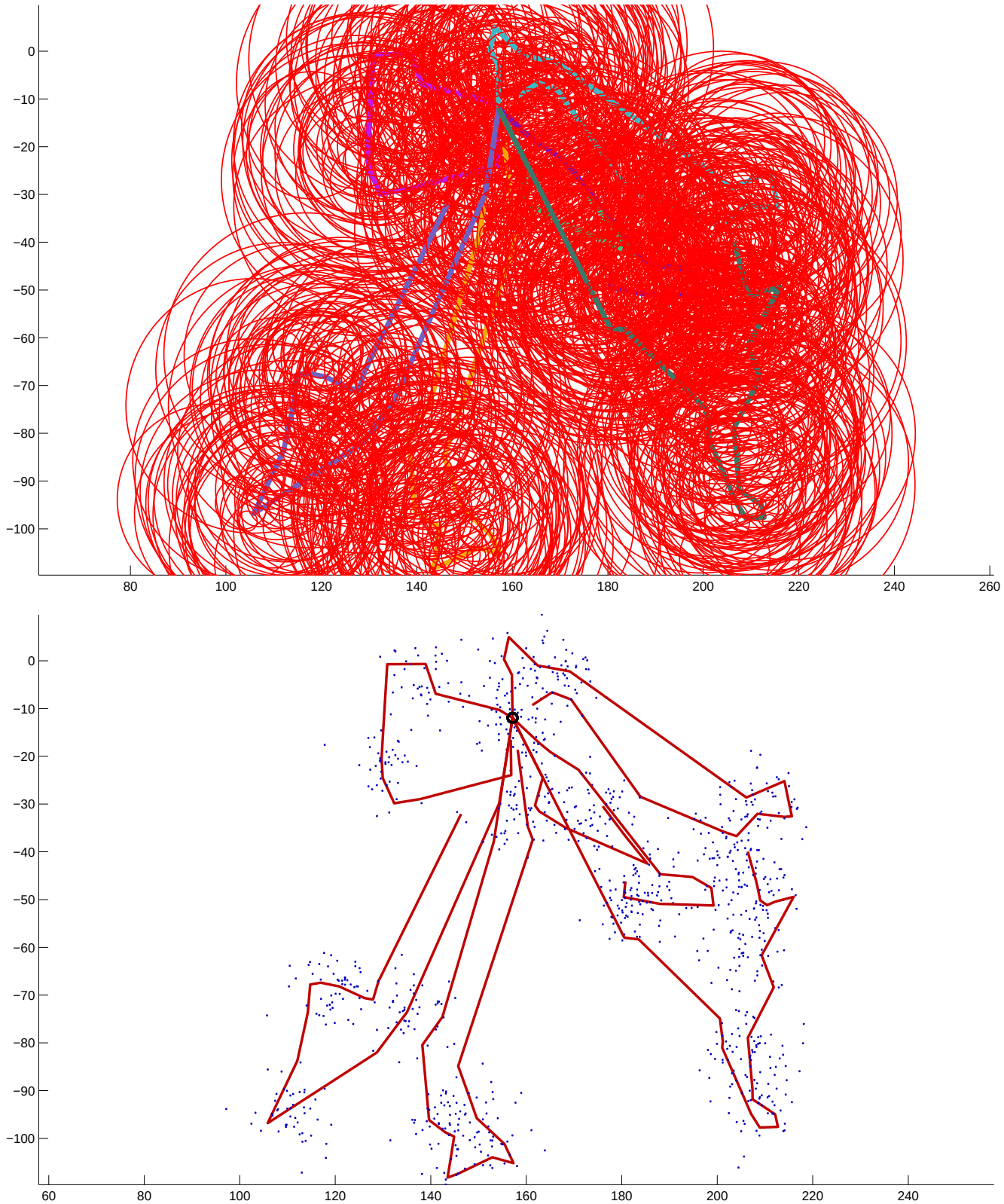


Figure O.62: $dsj1000$, arbitrary radius, 2D, Euclidean, Length = 1147.2716801

Table O-65: Solution for $dsj1000$, arbitrary radius, 2D, Euclidean

Total distance: 1147.2716801295 Total demand met: 76422 Depot: x 47.1287 y 11.9659				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 0 Demand Met: 9861				
47.1287	11.9659	47.1015	12.1757	0.8443
47.1287	11.9659	47.4524	12.1509	13.8821
47.1287	11.9659	48.2378	10.888	5.8133
47.1287	11.9659	47.6091	10.2274	11.8474
47.1287	11.9659	48.9393	11.7496	17.8826
47.1287	11.9659	46.5714	10.174	27.098
47.1287	11.9659	47.5448	13.9665	6.8471
47.1287	11.9659	49.0558	10.279	25.3924
47.1287	11.9659	44.5228	11.8645	25.0082
47.1287	11.9659	45.8725	14.3747	19.0119
47.1287	11.9659	44.7075	13.3055	12.6011
47.1287	11.9659	48.0446	14.6778	8.8581
47.1287	11.9659	46.3909	8.819	24.8054
47.1287	11.9659	50.5069	12.3029	19.1593
47.1287	11.9659	43.7231	10.6871	24.1762
47.1287	11.9659	43.7175	13.3612	11.2776
47.1287	11.9659	46.6598	16.011	13.039
47.1287	11.9659	43.984	9.2005	7.1984
47.1287	11.9659	51.32	11.9016	29.8963
47.1287	11.9659	44.2621	15.3855	17.5289
47.1287	11.9659	52.0306	12.0787	25.2448
47.1287	11.9659	51.9742	12.9315	19.8738
47.1287	11.9659	43.7681	7.8375	19.4193
47.1287	11.9659	41.9974	13.5778	24.1613
47.1287	11.9659	44.3034	16.6265	9.4533
47.1287	11.9659	46.8369	6.4403	14.1993
47.1287	11.9659	52.3173	10.0275	24.0147
47.1287	11.9659	49.3862	17.5735	29.4535
47.1287	11.9659	47.2412	18.0641	26.9311
47.1287	11.9659	47.7278	5.7114	28.1097
47.1287	11.9659	52.0827	15.9727	11.4211
47.1287	11.9659	44.0031	6.0986	17.8329
47.1287	11.9659	45.9074	18.6439	15.0199
47.1287	11.9659	53.965	12.2967	9.8572
47.1287	11.9659	40.2323	12.6508	15.4062
47.1287	11.9659	44.3097	5.4051	11.9467
47.1287	11.9659	53.1154	7.9184	19.9574
47.1287	11.9659	48.7027	4.8736	25.6148
47.1287	11.9659	49.1677	19.2175	29.9217
47.1287	11.9659	47.0712	4.3382	28.9099
47.1287	11.9659	49.9475	19.2284	17.8419
47.1287	11.9659	45.9242	19.9	25.1738
47.1287	11.9659	53.7123	16.59	19.1512
47.1287	11.9659	53.9046	16.3668	12.2702
47.1287	11.9659	45.0418	3.8658	10.1722
47.1287	11.9659	49.309	3.6922	20.878
47.1287	11.9659	40.2335	17.1357	11.2782
47.1287	11.9659	52.1655	19.1446	15.5087
47.1287	11.9659	52.0607	4.6851	25.9984
47.1287	11.9659	53.4617	5.8056	21.7012
47.1287	11.9659	41.1669	5.3004	27.2131
47.1287	11.9659	54.3108	6.5803	23.4136
47.1287	11.9659	39.7266	17.3977	17.8866
47.1287	11.9659	55.8132	15.4408	11.5975
47.1287	11.9659	40.715	18.8306	23.0792
47.1287	11.9659	42.4139	3.5597	13.287
47.1287	11.9659	52.3291	3.6705	19.2214
47.1287	11.9659	52.2056	3.4977	20.8953
47.1287	11.9659	38.0686	7.3443	25.6467
47.1287	11.9659	36.7928	9.6586	12.2244
47.1287	11.9659	49.1449	22.3659	23.3416
47.1287	11.9659	50.9668	1.717	23.9816
47.1287	11.9659	46.7163	23.0055	28.4765
47.1287	11.9659	43.4311	0.4843	25.8563
47.1287	11.9659	49.2438	-0.5725	17.8927
47.1287	11.9659	55.5686	2.3786	17.8085
47.1287	11.9659	50.8742	24.2729	23.767
47.1287	11.9659	54.5841	1.3	17.8466
47.1287	11.9659	54.6465	1.327	23.7327
47.1287	11.9659	36.4235	4.5159	16.6099
47.1287	11.9659	44.8479	-0.9391	19.1888
47.1287	11.9659	56.514	2.6652	22.7885
47.1287	11.9659	55.7669	1.6852	24.4965
47.1287	11.9659	51.545	-0.7619	25.0267
47.1287	11.9659	58.8992	5.3006	25.2792
47.1287	11.9659	33.7832	8.5886	17.2676
47.1287	11.9659	58.5415	3.6684	22.039
47.1287	11.9659	57.7618	2.6586	24.3155
47.1287	11.9659	47.7428	26.438	28.0445
47.1287	11.9659	50.0191	-2.6033	29.6269
47.1287	11.9659	58.2987	1.8222	22.9315
47.1287	11.9659	54.6523	25.2022	28.2307
47.1287	11.9659	46.7677	27.4481	29.3514
47.1287	11.9659	45.985	27.4123	25.7471
47.1287	11.9659	56.047	-0.6998	25.6513
47.1287	11.9659	58.6741	1.1796	18.8015
47.1287	11.9659	47.5893	27.8934	19.7112
47.1287	11.9659	39.9467	-2.3317	24.6235
47.1287	11.9659	46.684	28.1154	27.5206
47.1287	11.9659	61.565	4.5717	20.8967
47.1287	11.9659	53.5826	-3.7128	20.6553
47.1287	11.9659	60.4167	1.4088	18.4179
47.1287	11.9659	55.089	27.0379	20.8338
47.1287	11.9659	43.0131	-4.6452	20.9992
47.1287	11.9659	30.7839	5.7178	20.1469
47.1287	11.9659	53.915	28.4629	20.5718
47.1287	11.9659	63.4243	4.3429	22.7299
47.1287	11.9659	64.6914	7.7788	22.2178
47.1287	11.9659	58.3955	-2.2935	20.2689
47.1287	11.9659	46.4115	30.3033	28.1751
47.1287	11.9659	59.6709	-1.5476	26.9171
47.1287	11.9659	63.0749	1.8033	22.3131
47.1287	11.9659	46.9054	30.8841	23.9447
47.1287	11.9659	47.3356	31.1656	22.3253
47.1287	11.9659	50.5738	30.8854	21.7078
47.1287	11.9659	61.9524	-0.333	23.4378
47.1287	11.9659	57.7878	-4.3732	27.1183
47.1287	11.9659	28.0443	7.2557	23.7219
47.1287	11.9659	50.8592	31.2824	23.4486
47.1287	11.9659	27.9452	7.0873	24.5101
47.1287	11.9659	62.4332	-0.684	29.6949
47.1287	11.9659	52.5136	31.162	28.7958
47.1287	11.9659	32.3564	-1.4633	25.6089
47.1287	11.9659	63.3607	23.5913	24.1094
47.1287	11.9659	48.6326	32.1618	29.9479
47.1287	11.9659	31.0065	-1.0714	23.9753
47.1287	11.9659	63.8119	26.0212	22.8759
47.1287	11.9659	62.9268	27.0211	28.5574
47.1287	11.9659	53.289	-9.6645	25.3042
47.1287	11.9659	54.3132	33.4794	25.0485
47.1287	11.9659	60.1802	30.671	27.7411
47.1287	11.9659	58.6228	31.6703	25.6598
47.1287	11.9659	45.6407	35.658	25.0567
47.1287	11.9659	58.4334	33.3219	26.7455
47.1287	11.9659	24.5208	1.7631	29.7307
47.1287	11.9659	64.1748	30.2745	28.016
47.1287	11.9659	46.003	37.4534	29.0578
47.1287	11.9659	22.0744	6.6433	29.8611
47.1287	11.9659	22.5923	19.795	27.7634
47.1287	11.9659	61.1622	34.1592	28.1161
47.1287	11.9659	65.4552	32.6167	29.012
47.1287	11.9659	61.1452	36.2851	29.605
Route: 2 Length: 98.4725833729722 Demand Met: 7056				
44.3407203664301	10.2991831614534	44.5689	9.75	0.5947
44.3407203664301	10.2991831614534	42.7704	10.2739	5.5443
44.3407203664301	10.2991831614534	45.5397	7.2979	4.7628
44.3407203664301	10.2991831614534	48.4975	2.4432	10.4173
44.3407203664301	10.2991831614534	33.6792	4.7017	13.2435
44.3407203664301	10.2991831614534	31.9656	14.6164	14.4873
44.3407203664301	10.2991831614534	36.4279	-4.3699	20.2708
44.3407203664301	10.2991831614534	27.2842	5.8331	18.4271
44.3407203664301	10.2991831614534	28.6989	1.5656	19.8786
44.3407203664301	10.2991831614534	25.8989	0.7413	22.2466
44.3407203664301	10.2991831614534	26.7943	-2.6353	24.1177
44.3407203664301	10.2991831614534	20.7311	19.0512	27.1888
44.3407203664301	10.2991831614534	20.5322	21.5891	28.8292
37.6554249875473	8.60098923741866	36.2059	6.8965	2.2375
37.6554249875473	8.60098923741866	31.7997	5.4917	9.7028
37.6554249875473	8.60098923741866	29.4417	11.4808	11.6626
37.6554249875473	8.60098923741866	33.4349	0.0139	13.2105
37.6554249875473	8.60098923741866	29.2732	5.6917	15.7976
37.6554249875473	8.60098923741866	28.1449	5.3771	15.5333

Solution x	Solution y	Original x	Original y	Radius
37.6554249875473	8.60098923741866	25.9081	14.4892	15.0463
37.6554249875473	8.60098923741866	31.1128	-2.8096	18.9309
37.6554249875473	8.60098923741866	23.9142	5.5856	20.6816
37.6554249875473	8.60098923741866	21.6596	11.213	23.4533
37.6554249875473	8.60098923741866	22.4003	2.9895	21.9707
37.6554249875473	8.60098923741866	21.7951	21.835	24.0928
37.6554249875473	8.60098923741866	19.0397	19.3917	27.4702
37.6554249875473	8.60098923741866	16.9397	16.157	23.6795
31.0379506665334	6.92002316113896	29.9497	8.0977	1.6035
31.0379506665334	6.92002316113896	29.2451	9.0499	5.6713
31.0379506665334	6.92002316113896	29.6205	6.6839	7.8815
31.0379506665334	6.92002316113896	27.6562	5.4902	8.29
31.0379506665334	6.92002316113896	26.246	7.8923	7.1855
31.0379506665334	6.92002316113896	26.4488	5.1021	9.3497
31.0379506665334	6.92002316113896	25.2224	21.1268	20.0558
31.0379506665334	6.92002316113896	23.1228	16.7524	13.0518
31.0379506665334	6.92002316113896	24.0847	21.2619	18.4856
31.0379506665334	6.92002316113896	23.1615	20.5337	18.9562
31.0379506665334	6.92002316113896	22.0389	18.6688	16.6692
31.0379506665334	6.92002316113896	21.1889	21.267	20.9082
31.0379506665334	6.92002316113896	22.6294	-1.9579	16.8768
31.0379506665334	6.92002316113896	19.3676	20.9011	22.1053
31.0379506665334	6.92002316113896	18.1963	16.0602	17.912
31.0379506665334	6.92002316113896	17.3215	22.815	26.1071
31.0379506665334	6.92002316113896	17.7323	26.9057	28.6742
31.0379506665334	6.92002316113896	16.9754	26.2994	25.4942
29.5580324189459	2.5660320387949	31.1391	0.2266	2.8236
28.918891101011	0.685647339427971	31.0707	1.7474	2.3995
28.918891101011	0.685647339427971	27.3755	-1.0984	2.359
24.5272655386713	0.707644751328131	22.4229	-2.1641	7.0873
20.8957914509792	0.725834642626975	24.8641	0.1355	6.251
20.8957914509792	0.725834642626975	19.4163	-0.8394	2.1538
20.0598741899087	14.3415799451166	27.0312	22.0371	12.0381
20.0598741899087	14.3415799451166	24.5729	19.8583	11.2071
20.0598741899087	14.3415799451166	19.6468	14.5775	7.1553
20.0598741899087	14.3415799451166	21.4132	25.3225	11.064
20.0598741899087	14.3415799451166	18.4916	22.031	8.3539
20.0598741899087	14.3415799451166	17.2669	18.1061	10.6475
19.6862999804693	20.4265029252098	19.4151	20.4264	0.2712
19.6862999804693	20.4265029252098	7.8039	17.6061	13.3149
19.9373946417604	24.5678263929648	19.5225	24.6717	0.4277
21.2162397027401	27.3556936833133	23.3217	16.9506	12.0877
21.2162397027401	27.3556936833133	22.8581	29.0039	5.9592
21.2162397027401	27.3556936833133	19.6457	23.2311	5.0904
21.2162397027401	27.3556936833133	19.8821	27.2321	8.0149
22.3524191021491	29.8325515245505	21.2889	20.2133	12.2867
22.3524191021491	29.8325515245505	21.3113	31.7798	2.2081
27.9103352473436	28.9428344731148	28.099	29.8348	0.9117
27.9103352473436	28.9428344731148	20.5046	21.2685	15.1676
27.9103352473436	28.9428344731148	19.4476	21.0876	13.323
27.9103352473436	28.9428344731148	20.8129	26.0745	16.1762
27.9103352473436	28.9428344731148	18.7218	26.0511	18.3773
27.9103352473436	28.9428344731148	15.0509	21.8739	20.7664
46.8541887831454	23.9408152604887	48.493	25.186	2.0582
46.8541887831454	23.9408152604887	50.1386	26.6573	9.4164
46.8541887831454	23.9408152604887	49.5432	29.0024	8.1871
46.8541887831454	23.9408152604887	47.9812	30.2306	11.8841
46.8541887831454	23.9408152604887	47.4903	33.2139	11.8665
46.8541887831454	23.9408152604887	48.325	36.101	13.1633
46.8541887831454	23.9408152604887	42.8212	36.4305	19.4237
46.8541887831454	23.9408152604887	43.7884	36.8808	16.446
46.8541887831454	23.9408152604887	64.4232	44.0581	28.7966
46.7570542475001	16.5512069348298	46.503	16.5426	0.2542
46.7570542475001	16.5512069348298	54.0368	23.8586	14.1498
46.7570542475001	16.5512069348298	55.1607	27.7715	18.2237
46.7570542475001	16.5512069348298	59.5552	26.5288	17.0515
46.7570542475001	16.5512069348298	54.8257	29.6059	17.9639
46.7570542475001	16.5512069348298	54.7376	29.7596	17.0277
46.7570542475001	16.5512069348298	51.7623	34.8081	20.8873
46.7570542475001	16.5512069348298	55.9275	34.3566	23.3784
46.7570542475001	16.5512069348298	23.1689	25.59	25.7524
46.7570542475001	16.5512069348298	64.9829	35.6055	27.8112
46.7570542475001	16.5512069348298	64.2784	38.8059	29.0239
Route: 3 Length: 217.073880725753 Demand Met: 9970				
43.2096781795869	37.8414963718616	45.4903	38.3462	2.3358
32.4438986877722	74.5507134733048	32.697	74.6737	0.2814
32.4438986877722	74.5507134733048	34.7819	91.1147	26.8877
32.4438986877722	74.5507134733048	37.0706	93.0168	27.7874
32.4438986877722	74.5507134733048	32.2034	92.5655	28.0393
32.4438986877722	74.5507134733048	36.1694	94.3523	28.0801

Solution x	Solution y	Original x	Original y	Radius
32.4438986877722	74.5507134733048	30.7482	95.8761	28.9897
32.4438986877722	74.5507134733048	31.6916	96.8159	27.5118
32.4438986877722	74.5507134733048	31.7064	96.988	27.9597
32.4438986877722	74.5507134733048	38.189	100.3805	26.8425
32.4438986877722	74.5507134733048	21.5395	100.4343	29.9057
28.2467978152866	80.4376575415215	23.9369	61.5866	22.0202
28.2467978152866	80.4376575415215	33.839	67.1668	20.2124
28.2467978152866	80.4376575415215	35.1535	70.6086	16.7445
28.2467978152866	80.4376575415215	22.8228	67.5784	16.2582
28.2467978152866	80.4376575415215	22.0857	71.4539	17.4147
28.2467978152866	80.4376575415215	27.2709	73.9256	19.9916
28.2467978152866	80.4376575415215	14.0233	68.3418	20.9704
28.2467978152866	80.4376575415215	24.1578	73.3792	11.3579
28.2467978152866	80.4376575415215	11.4442	66.9869	21.9247
28.2467978152866	80.4376575415215	23.527	73.6169	21.6834
28.2467978152866	80.4376575415215	11.4886	67.7219	21.8599
28.2467978152866	80.4376575415215	31.105	77.2121	19.85
28.2467978152866	80.4376575415215	24.4797	75.354	15.2855
28.2467978152866	80.4376575415215	25.3366	76.538	21.2393
28.2467978152866	80.4376575415215	10.9416	69.7746	20.3266
28.2467978152866	80.4376575415215	26.6151	77.1467	15.3985
28.2467978152866	80.4376575415215	11.6475	70.8021	20.1612
28.2467978152866	80.4376575415215	23.796	77.2181	18.2059
28.2467978152866	80.4376575415215	21.1184	76.9048	8.7289
28.2467978152866	80.4376575415215	29.376	80.5861	14.4218
28.2467978152866	80.4376575415215	12.73	75.2001	18.6111
28.2467978152866	80.4376575415215	40.8939	84.3555	20.2802
28.2467978152866	80.4376575415215	9.9143	75.8382	21.3192
28.2467978152866	80.4376575415215	27.1736	83.2653	16.1862
28.2467978152866	80.4376575415215	8.0472	76.1743	21.0495
28.2467978152866	80.4376575415215	17.9606	81.6588	21.1617
28.2467978152866	80.4376575415215	23.4089	84.0628	9.7975
28.2467978152866	80.4376575415215	32.6009	89.9531	11.1863
28.2467978152866	80.4376575415215	39.6285	91.4521	19.1143
28.2467978152866	80.4376575415215	33.1881	90.5996	12.9818
28.2467978152866	80.4376575415215	43.1057	91.7939	21.808
28.2467978152866	80.4376575415215	33.6244	92.4492	13.8672
28.2467978152866	80.4376575415215	34.0163	93.2553	18.0121
28.2467978152866	80.4376575415215	32.8593	93.0881	18.3654
28.2467978152866	80.4376575415215	30.8807	93.5109	15.6566
28.2467978152866	80.4376575415215	26.1674	96.1159	22.0166
28.2467978152866	80.4376575415215	40.065	98.6098	21.6771
28.2467978152866	80.4376575415215	26.55	96.735	21.6617
28.2467978152866	80.4376575415215	35.0473	98.5367	21.3919
28.2467978152866	80.4376575415215	28.2891	98.27	21.2566
29.0038559236891	88.9376229292833	29.5221	90.7635	1.898
29.0038559236891	88.9376229292833	8.1477	101.1634	26.7278
29.0038559236891	88.9376229292833	8.0611	104.093	29.9646
29.6472463670559	96.1613681529442	29.1897	96.4145	0.5229
33.0763264360025	98.7626389415588	31.6341	101.1443	2.7843
34.8821852703961	99.6128260956322	31.7515	71.3679	28.4179
34.8821852703961	99.6128260956322	31.4187	76.5703	26.413
34.8821852703961	99.6128260956322	35.9551	95.9225	5.5858
34.8821852703961	99.6128260956322	35.7859	98.3251	3.261
34.8821852703961	99.6128260956322	33.0573	97.9271	8.5196
34.8821852703961	99.6128260956322	32.4952	97.9758	7.8091
34.8821852703961	99.6128260956322	29.7849	97.5299	6.777
34.8821852703961	99.6128260956322	47.126	99.3914	14.4896
34.8821852703961	99.6128260956322	43.0828	99.6317	26.6664
34.8821852703961	99.6128260956322	36.8108	99.4487	12.3219
34.8821852703961	99.6128260956322	39.196	99.7694	4.3434
34.8821852703961	99.6128260956322	44.7902	101.1589	13.5802
34.8821852703961	99.6128260956322	45.0704	101.2748	15.9718
34.8821852703961	99.6128260956322	40.2693	101.3043	10.0221
34.8821852703961	99.6128260956322	39.3246	101.8921	13.7336
34.8821852703961	99.6128260956322	53.9006	102.5381	26.8445
34.8821852703961	99.6128260956322	46.5537	103.4177	24.5733
34.8821852703961	99.6128260956322	30.1816	102.1772	8.5674
34.8821852703961	99.6128260956322	9.17	97.1621	26.9226
34.8821852703961	99.6128260956322	45.465	105.2608	13.9094
34.8821852703961	99.6128260956322	40.9527	105.6227	16.0561
34.8821852703961	99.6128260956322	42.9285	106.2179	10.4101
34.8821852703961	99.6128260956322	31.3011	106.2109	16.9428
34.8821852703961	99.6128260956322	35.7224	107.36	11.5177
34.8821852703961	99.6128260956322	32.8361	107.2479	24.978
34.8821852703961	99.6128260956322	28.1717	107.4546	16.9459
34.8821852703961	99.6128260956322	33.1638	109.6815	13.4189
34.2922514069648	103.505408176934	35.4006	103.6799	1.122
34.2922514069648	103.505408176934	37.1983	106.347	4.5493
33.5278847016197	108.185434562312	33.1686	108.6172	0.5617

Solution x	Solution y	Original x	Original y	Radius
35.6491737135417	107.423969622763	39.1965	105.4524	4.0584
35.6491737135417	107.423969622763	35.3466	107.7036	0.412
42.8926625815809	103.963041732052	42.5793	100.4271	3.5498
42.8926625815809	103.963041732052	40.5226	102.8002	3.2203
42.8926625815809	103.963041732052	42.4716	105.6496	1.9926
47.3368862634595	105.187977947307	48.0764	105.8084	0.9653
45.4205356995666	101.155590901843	46.0729	100.678	0.8085
42.898842620419	98.8037591846935	42.9226	100.4615	4.0129
39.6274113977533	95.752693418795	38.2186	96.6747	1.6837
38.8216286700633	93.4658048896497	41.599	92.4813	2.9467
38.8216286700633	93.4658048896497	42.0978	97.503	9.3352
38.5841627060576	92.7999003570367	42.9721	90.3177	7.6955
38.5841627060576	92.7999003570367	37.9917	90.5379	3.3721
38.5841627060576	92.7999003570367	35.4152	92.5489	4.9112
38.5841627060576	92.7999003570367	37.1788	95.0118	2.6206
36.949722093404	88.2165845910699	35.4073	87.2216	1.8355
36.949722093404	88.2165845910699	51.1106	98.2963	24.3822
36.949722093404	88.2165845910699	35.2228	101.4244	27.011
35.7545822696839	84.865161281929	22.6268	64.3936	24.3192
35.7545822696839	84.865161281929	31.0449	71.9995	23.5272
35.7545822696839	84.865161281929	33.517	80.8699	7.8126
35.7545822696839	84.865161281929	48.9533	90.4759	19.0092
35.7545822696839	84.865161281929	32.1756	91.0244	9.1133
35.7545822696839	84.865161281929	47.7789	92.5461	17.3786
35.7545822696839	84.865161281929	29.3468	93.7461	24.255
35.7545822696839	84.865161281929	35.2297	94.8683	10.0169
35.7545822696839	84.865161281929	44.0393	95.7757	16.7138
35.7545822696839	84.865161281929	34.0458	95.0903	23.4922
35.7545822696839	84.865161281929	40.9431	96.0349	13.182
35.7545822696839	84.865161281929	33.9629	96.8355	13.8521
35.7545822696839	84.865161281929	35.7481	97.1257	23.4808
35.7545822696839	84.865161281929	34.0464	97.1856	23.2445
35.7545822696839	84.865161281929	42.2565	98.7398	24.1013
35.7545822696839	84.865161281929	39.7333	98.7582	18.7088
35.7545822696839	84.865161281929	26.9511	99.1097	22.0884
35.7545822696839	84.865161281929	42.8352	101.6931	21.2677
35.7545822696839	84.865161281929	29.8552	101.3038	17.7782
35.7545822696839	84.865161281929	35.7306	102.2767	20.2694
35.7545822696839	84.865161281929	35.5571	102.295	22.4132
35.7545822696839	84.865161281929	42.0156	103.5929	23.2765
35.7545822696839	84.865161281929	34.3074	104.3145	24.0514
51.3681597837034	37.4584870811607	51.6292	37.4529	0.2611
50.3435280876367	34.7442666279377	44.7872	36.1398	5.7289
50.3435280876367	34.7442666279377	53.589	37.6567	4.7875
48.2164962741976	18.6224334029508	46.213	15.3079	3.873
48.2164962741976	18.6224334029508	47.2642	16.1804	3.1622
48.2164962741976	18.6224334029508	51.539	18.7116	3.3237
Route: 4 Length: 168.939399034031 Demand Met: 9853				
47.0651991925305	7.54448134767338	46.0043	6.8606	2.7263
47.0651991925305	7.54448134767338	53.412	-4.2453	16.6165
46.9990746059457	2.9403755816853	44.2937	4.7268	3.889
46.9990746059457	2.9403755816853	48.302	2.6164	1.3426
45.3356309854397	-0.30968043491638	42.4155	0.0668	2.9443
45.3356309854397	-0.30968043491638	54.4331	-6.2551	16.56
46.3544692776853	-4.93918946168919	46.0937	-5.8176	0.9163
46.3544692776853	-4.93918946168919	53.8048	-5.0553	14.1877
52.3939967670418	0.999958120053257	51.8363	2.0767	1.2126
52.3939967670418	0.999958120053257	52.8937	1.339	0.8894
52.3939967670418	0.999958120053257	51.7765	0.7553	1.0658
55.2008910376344	1.50721240633372	49.5265	1.5006	5.684
55.2008910376344	1.50721240633372	54.7597	1.1902	4.007
55.2008910376344	1.50721240633372	57.3839	0.9502	3.1655
59.1186291854778	2.21521535469947	58.6318	9.4344	7.474
59.1186291854778	2.21521535469947	58.2741	0.1622	6.0785
59.1186291854778	2.21521535469947	58.2864	0.0731	2.2981
59.1186291854778	2.21521535469947	62.5325	1.766	5.6387
59.1186291854778	2.21521535469947	62.7821	-0.0838	4.3251
90.3241524368667	24.5079638297337	92.942	26.4511	3.2602
90.3241524368667	24.5079638297337	91.0332	34.8187	16.4532
90.3241524368667	24.5079638297337	93.9312	28.9768	14.5805
90.3241524368667	24.5079638297337	92.7124	33.4453	14.4155
90.3241524368667	24.5079638297337	97.1071	18.8552	18.2973
90.3241524368667	24.5079638297337	97.0499	25.7334	22.9168
90.3241524368667	24.5079638297337	98.3241	22.4412	19.863
90.3241524368667	24.5079638297337	96.156	30.1327	15.6026
90.3241524368667	24.5079638297337	98.3827	22.3334	15.4136
90.3241524368667	24.5079638297337	97.3283	27.0933	16.7318
90.3241524368667	24.5079638297337	99.0428	19.6959	17.7192
90.3241524368667	24.5079638297337	95.8908	32.6754	17.855
90.3241524368667	24.5079638297337	97.1838	29.5842	15.6415

Solution x	Solution y	Original x	Original y	Radius
90.3241524368667	24.5079638297337	96.2582	32.5713	16.7348
90.3241524368667	24.5079638297337	93.6083	38.4774	16.8124
90.3241524368667	24.5079638297337	97.9141	29.0493	23.1555
90.3241524368667	24.5079638297337	100.384	25.6874	21.4485
90.3241524368667	24.5079638297337	96.6051	36.0943	18.2734
90.3241524368667	24.5079638297337	99.0228	31.9463	24.3368
90.3241524368667	24.5079638297337	98.5493	33.1624	15.8362
90.3241524368667	24.5079638297337	100.6297	27.3107	20.9684
90.3241524368667	24.5079638297337	102.4997	24.4075	22.2451
90.3241524368667	24.5079638297337	101.7295	28.4449	24.6989
90.3241524368667	24.5079638297337	100.5275	34.9543	18.18
90.3241524368667	24.5079638297337	101.1976	33.4905	15.926
90.3241524368667	24.5079638297337	102.9211	31.879	24.191
90.3241524368667	24.5079638297337	105.0575	26.2706	21.5332
90.3241524368667	24.5079638297337	99.6903	41.4772	20.1453
90.3241524368667	24.5079638297337	105.5782	30.6326	17.6401
90.3241524368667	24.5079638297337	103.4615	37.3033	18.992
90.3241524368667	24.5079638297337	106.6895	31.0233	23.9388
90.3241524368667	24.5079638297337	106.8535	30.7643	22.1596
90.3241524368667	24.5079638297337	107.8221	37.3636	23.6325
96.1056085003992	28.6381474094484	96.0238	29.4057	0.7719
96.1056085003992	28.6381474094484	105.6149	29.5786	12.2754
101.777602854207	26.1867309276597	102.9016	24.8202	1.7694
104.075796600499	25.193459511813	104.9423	23.521	1.8836
104.827266562873	28.7753285593402	102.211	28.3893	3.0468
104.827266562873	28.7753285593402	106.1692	29.0085	2.1859
105.622762986798	32.5670493517722	108.656	34.8419	3.7915
104.08998495269	32.6853497514699	104.0844	32.9988	0.3135
98.4271482688021	32.0446643470106	92.5592	25.4331	8.84
98.4271482688021	32.0446643470106	97.5011	28.0267	4.1233
98.4271482688021	32.0446643470106	96.3928	32.1668	2.1401
98.4271482688021	32.0446643470106	99.272	31.5703	3.1541
96.2783304839791	34.3307918662077	90.6435	28.0536	9.6928
96.2783304839791	34.3307918662077	93.6941	39.0671	9.1173
96.2783304839791	34.3307918662077	95.1298	37.6897	8.2516
96.2783304839791	34.3307918662077	94.3087	39.6383	5.7437
96.2783304839791	34.3307918662077	95.8598	39.2349	9.5298
96.2783304839791	34.3307918662077	98.5859	34.5756	9.3554
96.2783304839791	34.3307918662077	101.5683	27.6266	8.8382
94.0288098350176	36.7240572021068	86.512	33.4131	8.2137
94.0288098350176	36.7240572021068	92.8093	39.7693	4.7222
94.0288098350176	36.7240572021068	94.1971	38.0204	3.1512
94.0288098350176	36.7240572021068	98.9301	33.2654	6.2044
94.0288098350176	36.7240572021068	97.0063	39.6578	6.2182
94.0288098350176	36.7240572021068	96.2085	41.8253	7.8844
94.0288098350176	36.7240572021068	96.8865	41.9997	5.9999
91.2795970611237	35.7672238734542	91.1655	36.0648	0.3187
91.2795970611237	35.7672238734542	96.5473	37.5774	13.5522
91.2795970611237	35.7672238734542	95.46	44.379	10.525
91.2795970611237	35.7672238734542	98.7317	39.6579	13.6077
91.2795970611237	35.7672238734542	102.0152	42.2262	18.485
91.2795970611237	35.7672238734542	103.8959	45.4099	16.5891
89.0569493188931	34.8344643635411	85.525	32.0217	5.5598
89.0569493188931	34.8344643635411	91.9372	36.8319	3.8859
89.0569493188931	34.8344643635411	91.8795	37.1845	3.6728
81.8898958589496	31.8267288223135	79.7169	32.9378	5.5373
81.8898958589496	31.8267288223135	85.065	35.2948	4.702
73.9171431005825	28.4808721975925	73.7989	28.6287	0.1893
73.9171431005825	28.4808721975925	71.5231	31.8286	7.639
73.9171431005825	28.4808721975925	77.5882	39.4219	18.0454
73.9171431005825	28.4808721975925	80.8076	41.6004	22.8911
73.9171431005825	28.4808721975925	87.5726	32.8781	19.8465
73.9171431005825	28.4808721975925	90.6179	26.4649	21.9514
73.9171431005825	28.4808721975925	90.72	30.049	25.9851
73.9171431005825	28.4808721975925	79.9479	46.2913	20.0233
73.9171431005825	28.4808721975925	93.6487	25.1273	25.1293
73.9171431005825	28.4808721975925	87.2346	40.5435	24.2659
73.9171431005825	28.4808721975925	92.4351	33.0022	23.0347
73.9171431005825	28.4808721975925	93.4265	31.4744	21.1215
73.9171431005825	28.4808721975925	88.4465	41.4478	21.203
73.9171431005825	28.4808721975925	89.0134	41.3658	27.9234
73.9171431005825	28.4808721975925	90.014	39.915	25.9424
73.9171431005825	28.4808721975925	80.7698	50.729	24.0359
73.9171431005825	28.4808721975925	95.0864	33.2234	27.2565
73.9171431005825	28.4808721975925	97.4429	30.1528	27.9419
73.9171431005825	28.4808721975925	92.1801	41.0349	29.4376
73.9171431005825	28.4808721975925	92.2396	41.0703	23.428
73.9171431005825	28.4808721975925	89.3464	46.1786	28.4968
73.9171431005825	28.4808721975925	93.2846	41.9379	28.0563
73.9171431005825	28.4808721975925	93.3823	48.5086	29.5211

Solution x	Solution y	Original x	Original y	Radius
62.1120134471761	11.9033754326022	56.6752	3.9284	9.6519
62.1120134471761	11.9033754326022	61.7542	11.527	4.9252
59.4144731757479	8.11532565053309	59.4358	8.0877	0.0349
59.4144731757479	8.11532565053309	58.0726	3.0503	10.1594
59.4144731757479	8.11532565053309	60.2628	6.0605	10.0471
59.4144731757479	8.11532565053309	60.5785	6.8128	2.6428
59.4144731757479	8.11532565053309	60.4719	1.0667	17.5347
55.430849251034	6.60278973613345	51.2901	7.6487	4.2708
55.430849251034	6.60278973613345	55.5508	6.709	3.2447
55.430849251034	6.60278973613345	56.6229	3.2945	3.6572
55.430849251034	6.60278973613345	58.0725	5.2013	2.9904
51.2797746255166	9.28434486806486	53.4554	15.0784	7.1719
51.2797746255166	9.28434486806486	50.2911	5.2466	6.9728
51.2797746255166	9.28434486806486	57.2331	12.7874	7.0243
Route: 5 Length: 124.330398091936 Demand Met: 9995				
52.719295805711	17.1915046604298	52.4859	17.4578	0.3541
52.719295805711	17.1915046604298	49.9971	19.9155	3.9588
52.719295805711	17.1915046604298	55.3647	9.0137	9.4748
52.719295805711	17.1915046604298	55.4854	26.8201	10.8698
52.719295805711	17.1915046604298	58.5931	27.1316	12.8934
52.719295805711	17.1915046604298	62.5649	23.4331	17.3284
52.719295805711	17.1915046604298	57.9508	29.6187	14.7612
52.719295805711	17.1915046604298	66.7482	27.6121	22.4893
52.719295805711	17.1915046604298	66.9624	36.7077	25.6742
52.719295805711	17.1915046604298	66.7168	38.698	29.069
55.0243361466607	19.0848121150643	51.6732	17.1776	3.9198
55.0243361466607	19.0848121150643	53.2794	21.4994	2.9791
55.0243361466607	19.0848121150643	55.9782	19.9329	2.6736
60.9315823394545	22.8206080807807	63.3795	20.1125	3.6505
60.9315823394545	22.8206080807807	61.643	23.6955	3.0344
68.0325260996635	31.8808784952253	68.3676	27.331	4.5622
68.0325260996635	31.8808784952253	67.8857	28.9512	7.9175
68.0325260996635	31.8808784952253	70.5469	25.0661	16.1699
68.0325260996635	31.8808784952253	69.5886	28.6002	10.8714
76.1033718964096	42.1786711829998	77.9223	44.6051	3.0325
76.1033718964096	42.1786711829998	95.0304	53.2116	22.3786
78.0720470423576	44.6905527304373	77.8794	45.0468	0.405
78.0720470423576	44.6905527304373	89.6611	52.1615	14.4321
78.0720470423576	44.6905527304373	98.3613	42.0392	22.2209
78.0720470423576	44.6905527304373	85.8477	60.7859	18.5843
78.0720470423576	44.6905527304373	99.0651	51.1078	22.694
78.0720470423576	44.6905527304373	102.6402	60.9181	29.8857
82.6649717988932	45.0837878875612	70.5497	45.0925	13.3393
82.6649717988932	45.0837878875612	85.1876	33.113	12.2337
82.6649717988932	45.0837878875612	81.9079	40.1742	6.2209
82.6649717988932	45.0837878875612	87.5129	47.9594	13.3149
82.6649717988932	45.0837878875612	91.9732	45.8332	12.7139
82.6649717988932	45.0837878875612	94.5838	45.9916	12.3529
84.8368830333036	45.2697416750525	85.9182	41.843	3.5933
84.8368830333036	45.2697416750525	93.9129	43.6355	15.3805
84.8368830333036	45.2697416750525	96.2133	40.5576	17.1844
84.8368830333036	45.2697416750525	94.5355	44.3621	13.4241
84.8368830333036	45.2697416750525	95.0864	47.4256	15.4813
84.8368830333036	45.2697416750525	96.2485	47.1277	17.9146
84.8368830333036	45.2697416750525	100.0845	45.3198	20.4175
84.8368830333036	45.2697416750525	101.161	45.7653	23.4902
84.8368830333036	45.2697416750525	98.2004	50.3921	18.7026
84.8368830333036	45.2697416750525	102.543	45.6081	21.8293
84.8368830333036	45.2697416750525	101.377	48.1816	20.458
84.8368830333036	45.2697416750525	104.1102	44.8822	24.3902
84.8368830333036	45.2697416750525	99.5817	52.1789	22.5087
86.854413431483	46.4408089651711	89.5287	45.4109	3.6829
88.7822656350163	47.5598229132137	89.352	47.1855	0.6817
88.7822656350163	47.5598229132137	90.4865	46.0315	3.9724
88.7822656350163	47.5598229132137	94.4684	44.7163	7.0613
88.7822656350163	47.5598229132137	90.3356	51.1932	6.8103
88.7822656350163	47.5598229132137	94.5726	47.3613	6.423
88.7822656350163	47.5598229132137	92.412	50.9961	8.4715
88.7822656350163	47.5598229132137	96.0562	52.3857	12.0834
88.7822656350163	47.5598229132137	97.7133	51.9341	11.5332
88.7822656350163	47.5598229132137	96.8097	54.0588	13.9289
88.7822656350163	47.5598229132137	100.5945	52.9653	16.0066
88.7822656350163	47.5598229132137	103.8062	50.1176	16.2282
88.7822656350163	47.5598229132137	98.8606	57.9963	15.8873
88.7822656350163	47.5598229132137	99.3413	60.508	18.4113
88.7822656350163	47.5598229132137	106.6231	51.946	20.5204
89.2183758653026	51.2479628604817	92.1982	53.9806	4.0431
89.2183758653026	51.2479628604817	93.2379	56.4517	7.5848
89.2183758653026	51.2479628604817	94.4551	58.0456	10.0481
89.2183758653026	51.2479628604817	94.8477	58.3247	10.8435

Solution x	Solution y	Original x	Original y	Radius
89.2183758653026	51.2479628604817	95.479	61.1306	12.7416
89.2183758653026	51.2479628604817	102.1595	55.9791	15.0641
89.2183758653026	51.2479628604817	98.4228	65.0226	19.713
89.2183758653026	51.2479628604817	97.5653	74.5618	26.0912
86.4681573100073	51.162097878159	85.9154	51.5363	1.4882
86.4681573100073	51.162097878159	94.6788	63.8911	17.5158
86.4681573100073	51.162097878159	98.4258	65.8894	20.8311
86.4681573100073	51.162097878159	101.778	67.1686	23.9527
83.5863611050526	51.0721248047529	83.5076	51.7826	1.0852
83.5863611050526	51.0721248047529	87.1149	58.1702	8.6573
83.5863611050526	51.0721248047529	92.9131	56.6287	15.0729
83.5863611050526	51.0721248047529	92.8209	56.9207	12.3836
83.5863611050526	51.0721248047529	94.6877	57.1733	13.9646
83.5863611050526	51.0721248047529	95.4289	57.3916	14.9929
83.5863611050526	51.0721248047529	95.9041	59.3009	16.7412
83.5863611050526	51.0721248047529	96.4356	62.0951	20.9554
83.5863611050526	51.0721248047529	93.0933	68.7697	21.8016
83.5863611050526	51.0721248047529	103.9916	60.6173	27.4308
83.5863611050526	51.0721248047529	95.9481	74.251	27.2231
80.6959439201324	50.9818826072854	80.3964	49.7264	1.7131
80.6959439201324	50.9818826072854	86.2321	62.729	16.3953
80.6959439201324	50.9818826072854	97.3108	57.82	22.7988
80.6959439201324	50.9818826072854	94.5987	62.0376	22.0196
80.6959439201324	50.9818826072854	92.749	64.7326	21.2415
80.6959439201324	50.9818826072854	93.9444	64.9	23.8239
78.0073958030392	50.8979430687114	65.7303	47.3671	12.9967
78.0073958030392	50.8979430687114	73.2283	44.0709	10.2788
78.0073958030392	50.8979430687114	67.6648	48.1141	12.6345
78.0073958030392	50.8979430687114	70.6191	48.182	10.2546
78.0073958030392	50.8979430687114	72.0723	49.2863	10.8405
78.0073958030392	50.8979430687114	76.4125	46.981	12.1404
78.0073958030392	50.8979430687114	74.8417	48.5823	11.9548
78.0073958030392	50.8979430687114	75.5201	48.6107	10.8007
78.0073958030392	50.8979430687114	70.2011	52.705	12.1835
78.0073958030392	50.8979430687114	77.9078	47.2474	6.5423
78.0073958030392	50.8979430687114	79.533	47.2684	8.9398
78.0073958030392	50.8979430687114	71.2619	53.5794	11.3066
78.0073958030392	50.8979430687114	80.0004	48.0282	9.8035
78.0073958030392	50.8979430687114	78.2967	50.1808	11.8299
78.0073958030392	50.8979430687114	74.3979	53.0985	4.2274
78.0073958030392	50.8979430687114	76.2244	51.9684	3.4858
78.0073958030392	50.8979430687114	78.0993	54.3894	5.6239
78.0073958030392	50.8979430687114	89.2688	56.3248	12.5008
70.4072937679389	49.4756767113165	68.7356	47.889	2.3048
70.4072937679389	49.4756767113165	70.0624	50.1219	0.7325
70.7713958044448	46.1725111689223	74.5598	39.2546	7.8873
70.7713958044448	46.1725111689223	67.4955	46.0347	3.4091
70.7713958044448	46.1725111689223	67.7991	50.1342	7.0884
70.7713958044448	46.1725111689223	66.2863	51.2705	7.8797
70.7713958044448	46.1725111689223	75.5587	49.1352	7.8556
70.7713958044448	46.1725111689223	76.379	48.6237	7.5959
70.7713958044448	46.1725111689223	74.4488	50.3129	5.5377
70.7713958044448	46.1725111689223	72.0955	52.6394	7.0709
70.7713958044448	46.1725111689223	75.2757	50.6388	7.5436
Route: 6 Length: 88.4303238938907 Demand Met: 9880				
53.4477035774906	24.5093648336871	54.2786	24.4277	0.8349
53.4477035774906	24.5093648336871	56.8778	27.618	8.9898
53.4477035774906	24.5093648336871	58.9981	26.6128	10.0374
53.4477035774906	24.5093648336871	63.132	27.7543	11.7407
53.4477035774906	24.5093648336871	67.242	26.9141	16.4624
53.4477035774906	24.5093648336871	67.5765	27.7962	15.1317
53.4477035774906	24.5093648336871	64.2717	31.7627	14.3523
53.4477035774906	24.5093648336871	63.5739	32.9982	17.0906
53.4477035774906	24.5093648336871	70.1037	27.3839	17.3373
53.4477035774906	24.5093648336871	58.8785	37.4935	17.2077
53.4477035774906	24.5093648336871	66.5887	34.1226	18.4197
53.4477035774906	24.5093648336871	65.211	38.9167	22.6036
53.4477035774906	24.5093648336871	72.6191	32.6684	20.9501
53.4477035774906	24.5093648336871	75.4748	37.8532	28.9661
53.4477035774906	24.5093648336871	75.9853	41.4015	28.8962
53.4477035774906	24.5093648336871	72.9198	44.5581	29.4271
52.7782064843164	26.921706103818	52.7074	28.2489	1.3637
52.7782064843164	26.921706103818	50.3723	32.2399	6.6627
52.7782064843164	26.921706103818	56.2795	36.0371	11.477
52.7782064843164	26.921706103818	63.8645	34.3723	14.5693
52.7782064843164	26.921706103818	65.3289	43.5846	21.6754
51.8365238089417	30.3147902621881	47.4152	28.2569	4.917
51.8365238089417	30.3147902621881	54.5895	27.7676	3.8179
51.8365238089417	30.3147902621881	47.9603	31.0225	3.9403
51.8365238089417	30.3147902621881	51.0819	30.8837	1.7131

Solution x	Solution y	Original x	Original y	Radius
51.8365238089417	30.3147902621881	53.8796	31.7093	3.1598
52.7270229563463	31.5312893658617	51.473	33.7115	2.7502
52.7270229563463	31.5312893658617	71.8327	48.0379	28.84
52.7276136295727	31.532096276724	50.1654	34.298	3.7703
58.2676158495574	34.9705481283156	58.126	35.24	0.3044
58.2676158495574	34.9705481283156	61.5106	34.0654	10.912
58.2676158495574	34.9705481283156	66.7818	30.0369	10.9633
58.2676158495574	34.9705481283156	63.453	34.6286	7.4277
58.2676158495574	34.9705481283156	69.1853	30.9522	13.139
58.2676158495574	34.9705481283156	60.9493	37.7343	9.1697
58.2676158495574	34.9705481283156	67.7055	32.9993	14.8259
58.2676158495574	34.9705481283156	67.4673	33.2544	16.5328
58.2676158495574	34.9705481283156	62.6603	37.129	12.7997
58.2676158495574	34.9705481283156	64.8516	39.5774	16.3435
58.2676158495574	34.9705481283156	72.4926	42.7909	23.9047
58.2676158495574	34.9705481283156	75.9022	40.5634	19.0711
58.2676158495574	34.9705481283156	72.9378	43.4347	22.409
58.2676158495574	34.9705481283156	72.7013	43.6681	23.6645
58.2676158495574	34.9705481283156	72.4429	44.8985	21.9495
58.2676158495574	34.9705481283156	70.4096	46.4113	21.9243
58.2676158495574	34.9705481283156	73.6428	45.1426	25.8084
58.2676158495574	34.9705481283156	72.0385	47.603	19.8624
58.2676158495574	34.9705481283156	73.6395	46.5004	26.6417
58.2676158495574	34.9705481283156	70.7664	48.6137	19.7705
58.2676158495574	34.9705481283156	73.2561	47.9132	27.6156
58.2676158495574	34.9705481283156	70.6462	49.6735	27.2687
58.2676158495574	34.9705481283156	61.2083	54.3519	20.9342
58.2676158495574	34.9705481283156	67.8488	53.6384	21.5605
58.2676158495574	34.9705481283156	72.1444	51.2772	22.7706
58.2676158495574	34.9705481283156	68.022	53.7678	25.621
58.2676158495574	34.9705481283156	70.916	53.3608	25.4746
58.2676158495574	34.9705481283156	77.4079	49.147	24.2468
58.2676158495574	34.9705481283156	76.0043	50.5809	29.1787
58.2676158495574	34.9705481283156	69.8977	54.8286	26.5823
58.2676158495574	34.9705481283156	69.2681	55.3133	27.1365
58.2676158495574	34.9705481283156	76.5498	52.218	29.3359
62.9862058971721	37.0344008634804	60.463	30.4795	7.3122
62.9862058971721	37.0344008634804	60.8351	33.4935	6.3537
62.9862058971721	37.0344008634804	62.464	33.4003	5.2338
62.9862058971721	37.0344008634804	60.137	35.2014	3.3879
62.9862058971721	37.0344008634804	62.0243	36.102	3.1072
75.3801729898997	42.4553682766394	75.73	42.7229	0.4404
75.3801729898997	42.4553682766394	67.5609	49.631	13.5732
75.3801729898997	42.4553682766394	69.1689	51.2673	13.4858
75.3801729898997	42.4553682766394	73.2401	49.0047	19.489
75.3801729898997	42.4553682766394	71.8965	50.0142	19.3441
75.3801729898997	42.4553682766394	71.0505	50.768	14.6692
75.3801729898997	42.4553682766394	73.5268	49.2611	16.8647
75.3801729898997	42.4553682766394	80.8872	43.1227	14.1296
75.3801729898997	42.4553682766394	70.8564	51.5507	19.1375
75.3801729898997	42.4553682766394	86.5983	36.2039	13.6175
75.3801729898997	42.4553682766394	73.6611	50.4924	19.7557
75.3801729898997	42.4553682766394	69.1565	53.343	16.8114
75.3801729898997	42.4553682766394	66.0257	55.1875	16.5761
75.3801729898997	42.4553682766394	73.911	51.0144	19.7234
75.3801729898997	42.4553682766394	77.6289	48.4559	16.6228
75.3801729898997	42.4553682766394	72.0304	52.5053	20.8079
75.3801729898997	42.4553682766394	88.2545	36.066	15.726
75.3801729898997	42.4553682766394	73.3859	52.8201	15.2561
75.3801729898997	42.4553682766394	87.5583	39.2312	14.1099
75.3801729898997	42.4553682766394	89.1249	38.0318	15.9201
75.3801729898997	42.4553682766394	68.5789	56.8701	16.6688
75.3801729898997	42.4553682766394	67.4683	58.2291	22.4924
75.3801729898997	42.4553682766394	69.9782	57.1009	18.2604
75.3801729898997	42.4553682766394	73.8072	55.2741	22.0263
75.3801729898997	42.4553682766394	70.5527	57.3223	18.2025
75.3801729898997	42.4553682766394	89.3668	41.343	15.2017
75.3801729898997	42.4553682766394	72.7757	56.7077	24.2193
75.3801729898997	42.4553682766394	90.1236	40.724	15.0486
75.3801729898997	42.4553682766394	90.4784	41.2284	19.2596
75.3801729898997	42.4553682766394	73.2116	57.797	20.4365
75.3801729898997	42.4553682766394	90.0385	42.8005	21.625
75.3801729898997	42.4553682766394	77.8264	55.5164	14.0686
75.3801729898997	42.4553682766394	92.634	40.1716	17.8594
75.3801729898997	42.4553682766394	87.8413	47.1867	18.3729
75.3801729898997	42.4553682766394	82.0477	53.0979	18.2605
75.3801729898997	42.4553682766394	84.6532	51.7406	13.6619
75.3801729898997	42.4553682766394	91.1842	48.1207	17.5671
75.3801729898997	42.4553682766394	81.1686	57.7423	24.938
75.3801729898997	42.4553682766394	91.9756	47.4725	19.7423

Solution x	Solution y	Original x	Original y	Radius
75.3801729898997	42.4553682766394	95.1396	47.3596	26.132
75.3801729898997	42.4553682766394	93.0102	50.1223	27.268
75.3801729898997	42.4553682766394	98.0763	43.3554	27.4576
75.3801729898997	42.4553682766394	95.7654	46.8722	22.8599
75.3801729898997	42.4553682766394	98.0879	44.5657	26.354
75.3801729898997	42.4553682766394	93.3932	53.1876	28.8804
75.3801729898997	42.4553682766394	88.0225	60.7529	27.571
75.3801729898997	42.4553682766394	103.0838	43.6629	28.7382
75.3801729898997	42.4553682766394	98.2152	53.7701	29.4627
75.3801729898997	42.4553682766394	97.9579	54.2407	26.2321
75.3801729898997	42.4553682766394	90.2672	64.2791	29.5547
75.3801729898997	42.4553682766394	95.1558	61.2395	27.409
70.7072382696007	36.6454354889561	68.3701	31.308	5.8267
70.7072382696007	36.6454354889561	72.2401	34.2889	2.9732
70.7072382696007	36.6454354889561	68.0366	38.8903	3.4888
66.0178954292289	30.4602314018971	63.2951	31.2899	4.0204
66.0178954292289	30.4602314018971	68.2062	28.5319	2.9167
66.0178954292289	30.4602314018971	67.6588	29.7348	2.8615
Route: 7 Length: 214.052435500106 Demand Met: 9875				
44.3327852595954	29.8526661690676	44.6028	29.9319	0.2814
44.3327852595954	29.8526661690676	44.1303	30.8739	4.2334
44.3327852595954	29.8526661690676	45.9581	33.5048	9.009
44.3327852595954	29.8526661690676	37.4272	33.8061	15.7441
44.3327852595954	29.8526661690676	45.4526	36.121	8.6374
44.3327852595954	29.8526661690676	40.9959	37.9409	12.8365
44.3327852595954	29.8526661690676	44.3651	39.5082	12.4052
44.3327852595954	29.8526661690676	50.3352	41.2014	12.9522
44.3327852595954	29.8526661690676	18.7531	32.536	27.0946
27.6556875286359	67.6222970346125	28.241	67.9653	4.4101
27.6556875286359	67.6222970346125	25.7737	68.9159	2.2837
26.4170907691013	70.4274220240375	26.2205	72.9044	6.2191
26.4170907691013	70.4274220240375	24.5354	72.6275	5.9717
25.0293254871252	73.5703777622905	26.4587	69.6793	4.4461
25.0293254871252	73.5703777622905	27.6433	72.5657	2.8004
25.0293254871252	73.5703777622905	25.4767	75.481	1.9623
23.1337158967241	76.1062854873403	26.4747	67.9787	12.3016
23.1337158967241	76.1062854873403	32.2488	71.8762	10.0488
23.1337158967241	76.1062854873403	24.5076	73.115	8.9241
23.1337158967241	76.1062854873403	24.3218	77.9732	3.9436
18.7149349379712	82.0176397922593	31.4906	71.3219	26.6563
18.7149349379712	82.0176397922593	26.9783	71.0141	24.9531
18.7149349379712	82.0176397922593	34.9317	80.2335	24.9565
18.7149349379712	82.0176397922593	42.6808	88.2098	26.1251
18.7149349379712	82.0176397922593	33.2241	90.2072	24.6184
18.7149349379712	82.0176397922593	41.6896	94.8028	26.2925
18.7149349379712	82.0176397922593	37.3296	94.7968	26.3816
18.7149349379712	82.0176397922593	29.7064	94.0211	26.0785
18.7149349379712	82.0176397922593	31.4281	94.9219	25.0918
18.7149349379712	82.0176397922593	26.6904	96.1713	25.5008
18.7149349379712	82.0176397922593	33.8351	99.3235	26.1581
18.7149349379712	82.0176397922593	-2.5612	92.1356	25.3912
18.7149349379712	82.0176397922593	-2.1508	94.1499	24.1365
18.7149349379712	82.0176397922593	-0.339	97.1979	24.9263
9.19823838329714	88.1744323678759	7.8142	89.6258	2.0055
9.19823838329714	88.1744323678759	2.5533	99.1767	13.4676
1.43255042505842	93.1984167068582	4.9579	99.4405	7.1688
0.174376647111814	94.0123874222731	1.6453	95.7178	2.5699
0.174376647111814	94.0123874222731	1.4019	97.5847	8.9245
0.174376647111814	94.0123874222731	3.1184	98.924	10.2515
0.174376647111814	94.0123874222731	3.0162	107.1796	15.3823
-4.15096576174334	96.8106518223693	-5.5457	98.4014	2.1156
-1.98782028736109	92.2525925237649	3.5924	94.7451	6.9732
-1.98782028736109	92.2525925237649	-3.1358	95.2162	4.3309
-1.98782028736109	92.2525925237649	-6.6860	94.6391	5.5087
0.148936583875468	87.7501378208633	-0.1009	90.0487	2.3121
0.148936583875468	87.7501378208633	0.5802	93.7511	6.2472
0.148936583875468	87.7501378208633	-0.1710	97.1566	11.053
2.04982722470017	83.7446872846514	14.2076	63.0144	24.0324
2.04982722470017	83.7446872846514	4.4426	63.6871	23.1902
2.04982722470017	83.7446872846514	22.8762	75.7017	22.7687
2.04982722470017	83.7446872846514	9.4578	72.6847	17.4171
2.04982722470017	83.7446872846514	2.7376	84.0979	22.8219
2.04982722470017	83.7446872846514	-1.2335	86.0108	9.9154
2.04982722470017	83.7446872846514	3.5998	89.8159	20.0402
2.04982722470017	83.7446872846514	3.5503	90.3653	9.6646
2.04982722470017	83.7446872846514	5.8502	91.8647	18.0105
2.04982722470017	83.7446872846514	1.2023	90.7259	19.1166
2.04982722470017	83.7446872846514	0.6193	91.0377	11.2677
2.04982722470017	83.7446872846514	4.7737	93.7785	12.9549
2.04982722470017	83.7446872846514	3.4538	93.5151	19.9908

Solution x	Solution y	Original x	Original y	Radius
2.04982722470017	83.7446872846514	-2.3037	90.7079	19.8948
2.04982722470017	83.7446872846514	1.1743	92.9818	22.3694
2.04982722470017	83.7446872846514	6.3198	96.0864	13.0595
2.04982722470017	83.7446872846514	-0.0468	93.7668	20.328
2.04982722470017	83.7446872846514	-1.9602	93.9224	23.076
2.04982722470017	83.7446872846514	0.6138	95.4238	17.1272
2.04982722470017	83.7446872846514	2.1469	96.6722	20.9499
2.04982722470017	83.7446872846514	-3.2639	94.8889	23.5193
2.04982722470017	83.7446872846514	-0.3116	97.6012	20.2615
2.04982722470017	83.7446872846514	3.8110	100.5395	22.995
2.04982722470017	83.7446872846514	3.1448	100.72	20.6463
2.04982722470017	83.7446872846514	-1.8619	98.5581	15.9681
2.04982722470017	83.7446872846514	-7.5489	96.9207	21.6
2.04982722470017	83.7446872846514	-12.8049	93.8535	19.948
4.2448118325389	73.6320401965336	4.0089	72.186	2.2824
4.2448118325389	73.6320401965336	6.0914	73.9114	1.8676
4.75182553467093	67.7889008704628	31.4455	71.7336	27.0146
4.75182553467093	67.7889008704628	15.3124	65.205	17.4654
4.75182553467093	67.7889008704628	16.7224	69.1113	26.0784
4.75182553467093	67.7889008704628	12.5389	66.9051	25.9958
4.75182553467093	67.7889008704628	4.7342	63.0935	4.7706
4.75182553467093	67.7889008704628	0.4838	63.8626	5.7993
4.75182553467093	67.7889008704628	9.3844	71.5303	26.9324
4.75182553467093	67.7889008704628	1.7661	66.5446	26.4568
4.75182553467093	67.7889008704628	7.0214	70.8048	24.0693
4.75182553467093	67.7889008704628	9.0002	73.0359	24.3533
4.75182553467093	67.7889008704628	-4.2807	74.2616	26.6495
4.75182553467093	67.7889008704628	-4.1255	85.596	25.3799
4.75182553467093	67.7889008704628	2.5704	90.3092	25.529
6.97525572314096	67.4074379140593	6.9842	66.7632	0.6443
10.8260729739928	68.1787255616696	26.4833	65.6457	15.8608
10.8260729739928	68.1787255616696	15.1112	64.361	9.0815
10.8260729739928	68.1787255616696	14.2239	63.9607	12.6801
10.8260729739928	68.1787255616696	9.1569	61.6426	9.3858
10.8260729739928	68.1787255616696	10.4334	62.822	8.2889
10.8260729739928	68.1787255616696	7.6803	61.1857	15.0459
10.8260729739928	68.1787255616696	12.0444	66.3239	13.9456
10.8260729739928	68.1787255616696	12.0877	66.3858	4.791
10.8260729739928	68.1787255616696	8.4928	63.9998	9.7983
10.8260729739928	68.1787255616696	14.7433	68.1941	9.3958
10.8260729739928	68.1787255616696	12.0097	66.7734	5.0159
10.8260729739928	68.1787255616696	13.2613	67.7948	9.5466
10.8260729739928	68.1787255616696	9.6606	65.5604	2.866
10.8260729739928	68.1787255616696	10.5042	66.7806	12.8873
10.8260729739928	68.1787255616696	12.0587	67.8257	15.0634
10.8260729739928	68.1787255616696	10.7344	66.9849	3.0771
10.8260729739928	68.1787255616696	5.2812	65.5492	11.3895
10.8260729739928	68.1787255616696	10.0835	69.723	14.2892
10.8260729739928	68.1787255616696	9.1707	70.0865	9.3679
10.8260729739928	68.1787255616696	8.8648	72.0358	5.5515
10.8260729739928	68.1787255616696	8.3117	72.2049	15.4861
10.8260729739928	68.1787255616696	13.7649	76.0563	11.1171
10.8260729739928	68.1787255616696	0.3096	68.1954	12.3905
10.8260729739928	68.1787255616696	6.6564	74.2265	11.3789
16.1547367033138	70.6379189199028	15.4332	72.9689	2.4401
17.895692322259	70.9331781391578	18.2654	71.5277	0.7001
17.895692322259	70.9331781391578	-0.7351	89.6931	28.3044
19.0373472343735	67.1091873128233	18.9682	67.082	0.0743
19.0373472343735	67.1091873128233	22.9431	70.0987	5.5998
19.0373472343735	67.1091873128233	22.1344	71.2137	6.3651
19.0373472343735	67.1091873128233	14.5018	68.1646	28.3495
19.0373472343735	67.1091873128233	6.6701	63.5082	29.6501
19.0373472343735	67.1091873128233	21.3934	72.6127	27.5896
19.0373472343735	67.1091873128233	15.0856	70.6386	28.271
19.0373472343735	67.1091873128233	24.7401	75.4523	27.8452
19.0373472343735	67.1091873128233	18.7356	77.2891	27.8207
19.0373472343735	67.1091873128233	7.5677	74.3816	29.6105
36.3464043666985	32.0938761306704	35.5392	31.6783	0.9079
Route: 8 Length: 235.972659510808 Demand Met: 9932				
66.4743131822203	49.9872773170211	66.949	50.6855	0.8443
66.4743131822203	49.9872773170211	69.4154	51.8752	4.1739
66.4743131822203	49.9872773170211	70.1179	52.2878	5.6226
66.4743131822203	49.9872773170211	70.694	53.8562	5.7549
66.4743131822203	49.9872773170211	77.9705	58.8491	15.3336
70.5410774311156	57.9799925932835	68.2826	55.0673	4.1147
70.5410774311156	57.9799925932835	70.1344	58.5671	0.7142
73.5637636536978	58.3183211173142	73.7963	57.8273	0.5433
90.5613432983394	74.9031344549194	88.7937	67.447	7.6628
90.5613432983394	74.9031344549194	91.0116	75.887	1.8515
90.5613432983394	74.9031344549194	94.549	73.3405	4.2829

Solution x	Solution y	Original x	Original y	Radius
90.5613432983394	74.9031344549194	93.1133	78.1389	7.0122
90.8427415832639	77.0948648824086	89.835	77.746	1.1998
90.8427415832639	77.0948648824086	88.0687	81.4777	18.8265
90.8427415832639	77.0948648824086	97.1852	78.7831	16.1734
90.8427415832639	77.0948648824086	91.1677	84.1211	16.3324
90.8427415832639	77.0948648824086	92.288	83.6157	16.0638
90.8427415832639	77.0948648824086	98.9119	80.0767	14.6996
90.8427415832639	77.0948648824086	88.3633	87.3681	27.6489
90.8427415832639	77.0948648824086	96.9541	82.6989	14.592
90.8427415832639	77.0948648824086	93.4941	85.8189	18.0194
90.8427415832639	77.0948648824086	96.9343	84.943	15.8069
90.8427415832639	77.0948648824086	101.0606	82.9382	16.7992
90.8427415832639	77.0948648824086	95.9325	86.7596	20.5114
90.8427415832639	77.0948648824086	96.2545	87.1498	21.7369
90.8427415832639	77.0948648824086	88.6062	92.2681	22.8388
90.8427415832639	77.0948648824086	103.8313	82.5056	18.7916
90.8427415832639	77.0948648824086	101.1477	85.2681	21.9848
90.8427415832639	77.0948648824086	102.2936	85.0217	21.6835
90.8427415832639	77.0948648824086	92.5654	91.5305	28.4592
90.8427415832639	77.0948648824086	104.3617	84.8664	23.8168
90.8427415832639	77.0948648824086	100.7126	88.5952	21.6123
90.8427415832639	77.0948648824086	107.2392	85.9448	25.7344
90.8427415832639	77.0948648824086	98.656	92.6213	22.9191
90.8427415832639	77.0948648824086	100.5649	91.4192	20.5542
90.8427415832639	77.0948648824086	99.3782	93.0601	23.8531
90.8427415832639	77.0948648824086	101.602	92.3175	24.3611
90.8427415832639	77.0948648824086	95.504	96.351	27.717
91.1791280700235	79.7148826345544	91.86	79.7087	0.6809
91.1791280700235	79.7148826345544	103.1106	83.2736	15.1682
91.1791280700235	79.7148826345544	102.0461	86.7072	14.3206
91.1791280700235	79.7148826345544	99.3434	90.9979	16.5588
91.1791280700235	79.7148826345544	105.6506	92.4297	20.7058
91.1791280700235	79.7148826345544	98.2349	98.4363	21.6189
91.036493534706	81.0118901603489	92.0851	66.8651	14.1856
91.036493534706	81.0118901603489	88.6759	82.3658	2.7213
91.036493534706	81.0118901603489	92.6699	80.64	12.8577
91.036493534706	81.0118901603489	86.3374	85.7586	11.3801
91.036493534706	81.0118901603489	93.2494	81.8793	4.3234
91.036493534706	81.0118901603489	91.14	83.5499	11.1932
91.036493534706	81.0118901603489	98.5933	78.8152	8.4088
91.036493534706	81.0118901603489	101.2985	78.2917	13.0659
91.036493534706	81.0118901603489	97.3132	81.5365	6.4549
91.036493534706	81.0118901603489	94.9909	83.4209	6.6825
91.036493534706	81.0118901603489	97.4314	81.946	7.1176
91.036493534706	81.0118901603489	97.0865	83.6094	9.8674
91.036493534706	81.0118901603489	103.6911	80.62	12.7759
91.036493534706	81.0118901603489	93.9684	87.8762	12.1102
91.036493534706	81.0118901603489	99.0152	86.155	11.2918
91.036493534706	81.0118901603489	98.3726	88.4744	13.4661
91.036493534706	81.0118901603489	95.2026	90.5293	13.6073
91.036493534706	81.0118901603489	96.8345	90.0197	11.1201
93.5628572407934	86.7926105302371	92.7178	89.1801	2.5518
93.5628572407934	86.7926105302371	92.4623	94.734	13.3072
93.5628572407934	86.7926105302371	95.7576	96.9635	15.3189
93.5628572407934	86.7926105302371	98.8373	99.4165	17.0801
97.1326979740709	94.9609716298818	94.0924	96.5838	3.4463
97.2552328168642	95.1527415644858	95.0373	98.5247	4.6173
98.8988351104623	97.7250181323993	94.4828	106.1237	9.4889
102.716195072735	97.5949247413094	101.583	94.8217	5.6707
102.716195072735	97.5949247413094	104.1728	96.9352	2.9606
102.716195072735	97.5949247413094	103.8628	98.4843	1.4511
102.136515438164	94.9692229656989	103.2876	94.1817	1.3947
100.796476915881	94.0757640146732	101.8123	94.891	1.3025
98.3664396778985	92.4555579642643	96.5235	92.1962	1.8611
98.3664396778985	92.4555579642643	95.6122	103.8055	14.657
97.4118842050704	91.8191164606326	97.0347	92.0258	0.4301
97.3685813329213	89.6341600328375	98.1138	89.594	0.7463
97.3685813329213	89.6341600328375	100.8882	91.1406	9.708
97.3685813329213	89.6341600328375	104.1034	98.3317	13.8815
96.8145335375971	83.3443888002426	96.8706	83.0827	1.8883
96.8145335375971	83.3443888002426	98.9319	91.3958	11.9055
96.8145335375971	83.3443888002426	98.853	91.6792	14.5242
96.8145335375971	83.3443888002426	104.5599	87.8351	14.6615
96.8145335375971	83.3443888002426	102.4507	89.6037	13.3753
96.8145335375971	83.3443888002426	102.0076	93.075	14.2567
96.8145335375971	83.3443888002426	100.6204	94.7646	15.4911
96.4239396972985	78.9102117286675	94.6945	78.572	1.7622
101.839369084226	68.3568094949524	102.9023	68.4164	1.0646
99.3091625274279	61.6773357394195	99.0429	61.6589	0.2669
99.3091625274279	61.6773357394195	94.6798	69.1984	14.7127

Solution x	Solution y	Original x	Original y	Radius
99.3091625274279	61.6773357394195	97.9014	66.9835	12.1626
99.3091625274279	61.6773357394195	93.9524	73.145	21.3513
99.3091625274279	61.6773357394195	96.2521	73.5638	18.6663
99.3091625274279	61.6773357394195	91.1291	78.4897	23.993
99.3091625274279	61.6773357394195	94.4072	76.9857	17.5737
99.3091625274279	61.6773357394195	89.95	80.2132	25.9539
99.3091625274279	61.6773357394195	97.816	74.8015	15.0437
99.3091625274279	61.6773357394195	92.1151	81.2598	24.5532
99.3091625274279	61.6773357394195	89.5631	83.3752	25.9016
99.3091625274279	61.6773357394195	94.0795	80.8773	27.9293
99.3091625274279	61.6773357394195	97.7624	79.6432	23.8114
99.3091625274279	61.6773357394195	99.1261	78.6323	23.8719
99.3091625274279	61.6773357394195	98.567	80.2017	23.8946
99.3091625274279	61.6773357394195	98.2007	80.5294	24.0186
99.3091625274279	61.6773357394195	98.2345	80.86	27.4352
99.3091625274279	61.6773357394195	97.8831	81.9659	26.0286
99.3091625274279	61.6773357394195	93.0994	86.3608	27.9466
99.3091625274279	61.6773357394195	108.1531	76.0691	21.0274
99.3091625274279	61.6773357394195	93.1284	88.6615	29.2956
99.3091625274279	61.6773357394195	97.7943	87.7833	29.1465
99.3091625274279	61.6773357394195	107.981	80.0957	26.4329
99.3091625274279	61.6773357394195	104.3693	90.8389	29.9766
99.4038395584234	61.5041780203549	93.5538	62.1822	5.8892
99.4038395584234	61.5041780203549	95.4724	61.7777	4.4248
100.883494366738	58.7979920715794	94.6583	60.3511	8.4724
100.883494366738	58.7979920715794	99.7259	57.0659	5.4613
100.883494366738	58.7979920715794	100.6854	61.817	3.0255
106.003021411333	49.4347325200519	106.4442	49.0895	0.5602
102.017562276042	50.484494262882	99.5987	51.3246	2.5606
102.017562276042	50.484494262882	101.7941	49.0832	1.419
100.445649965161	51.1667744574147	100.3439	52.2486	1.0866
100.445649965161	51.1667744574147	99.4285	63.8276	13.2796
100.445649965161	51.1667744574147	96.1169	76.0362	25.7488
100.445649965161	51.1667744574147	100.0565	80.1054	29.4827
99.0202699198293	50.1977535011214	98.1036	50.8139	1.1045
99.0202699198293	50.1977535011214	97.7455	51.8526	5.024
99.0202699198293	50.1977535011214	98.7715	55.3698	10.7015
99.0202699198293	50.1977535011214	98.9521	56.5952	9.6017
99.0202699198293	50.1977535011214	99.9754	58.6633	10.7282
99.0202699198293	50.1977535011214	102.8738	56.4102	11.5644
99.0202699198293	50.1977535011214	103.5291	67.906	21.3267
98.3984772998169	47.2784135568585	94.3452	48.7818	4.4406
98.3984772998169	47.2784135568585	97.5519	44.8528	3.8542
98.3984772998169	47.2784135568585	100.6036	46.802	2.256
98.1408613106473	46.1026747956701	99.7789	45.6905	1.6891
98.1408613106473	46.1026747956701	98.9198	48.0008	5.0724
98.1408613106473	46.1026747956701	100.6388	53.8259	11.1764
98.1408613106473	46.1026747956701	105.6501	47.8555	11.3295
96.3876765834626	39.9436374011533	97.0806	39.3994	0.8811
96.3876765834626	39.9436374011533	98.4033	39.6451	2.523
96.3876765834626	39.9436374011533	96.6284	43.246	6.0243
96.3876765834626	39.9436374011533	103.3956	43.6231	9.5596
96.3876765834626	39.9436374011533	100.8862	48.4618	10.9264
96.3876765834626	39.9436374011533	102.9297	48.0592	14.2478

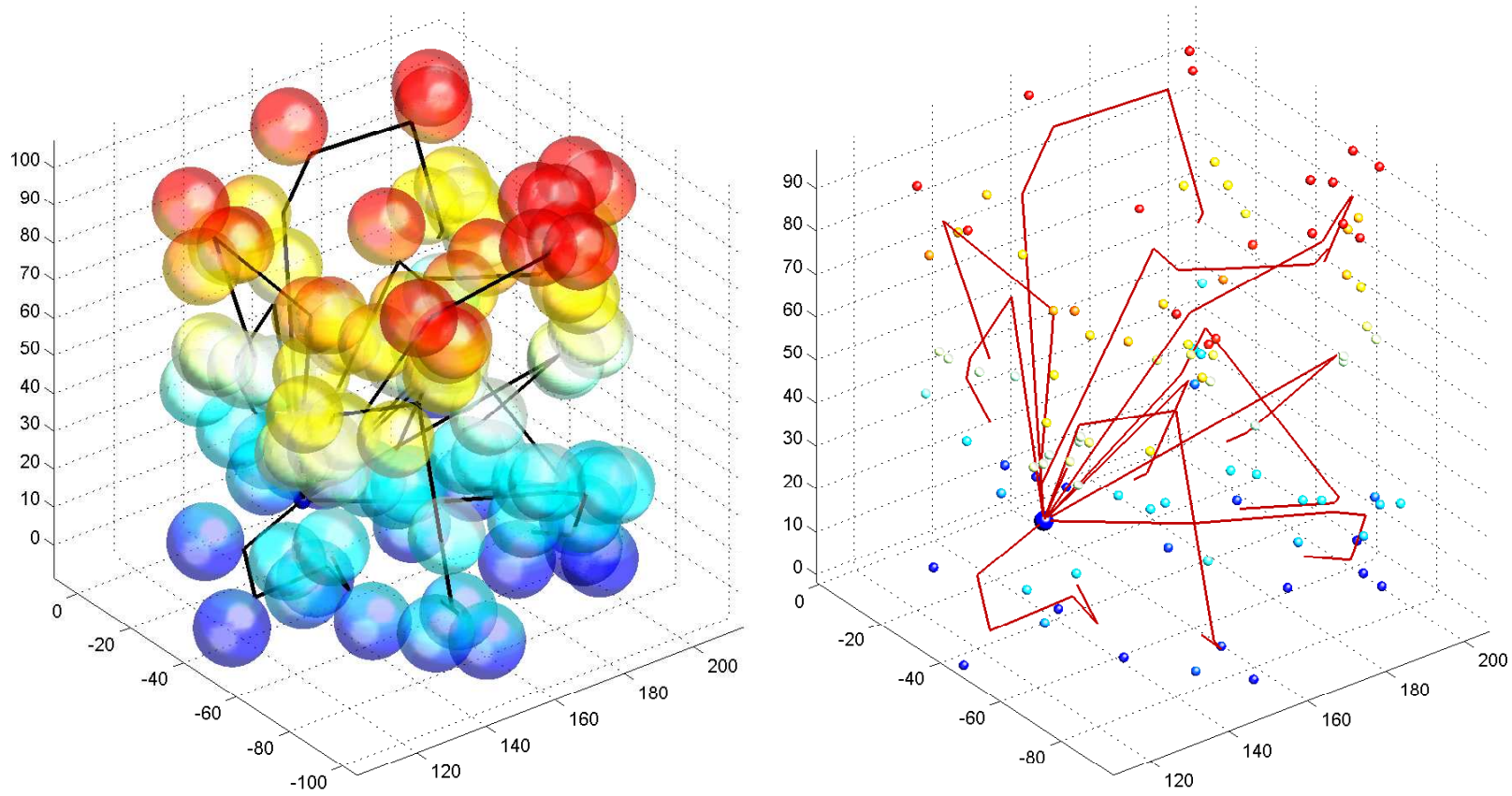


Figure O.63: *team*1_100, Equal Radius, 3D, Euclidean, Length = 2290.7803688

Table O-66: Solution for *team*1_100, Equal Radius, 3D, Euclidean

Total distance: 2290.78036875582 Total demand met: 543 Depot: x 50 y 10 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 163.946539001138 Demand Met: 41					
87.4847199088441	6.52528151339148	19.193212123883	93.574	3.255	13.429
89.815002811362	7.41914346719426	24.0293257032211	92.889	3.855	22.202
92.3857640924447	8.40548790996948	29.3648690939632	94.926	4.006	36.794
92.3170386498138	15.5206441531998	26.3585515640222	89.359	10.839	25.32
91.9519468605818	53.2084635900704	10.433092152144	94.894	61.262	13.169
91.2174262317394	52.6801385204926	9.15176155112985	93.694	56.925	1.612
77.680245823786	38.6631589522979	6.14684092710028	74.679	41.865	10.639
Route: 2 Length: 159.332646323769 Demand Met: 46					
22.1477902779674	24.204657069491	3.63262972848787	16.123	17.568	4.443
8.77557171464032	45.9049019491796	5.33927760309595	1.527	46.599	0.05
12.0327205222582	58.7498253220751	15.1038514271902	8.64100000000001	64.188	15.551
13.2127114070577	63.403176959786	18.6414114382925	5.777	62.003	23.29
13.9956212544591	66.4950534586209	20.9927753480752	11.878	70.444	28.798
19.7692769879469	67.1858032085405	12.8992538704338	20.735	74.659	7.978
31.4827320927833	45.0271473587988	7.90018756921114	27.219	44.51	3.327
Route: 3 Length: 122.49253889166 Demand Met: 45					
49.0510602162398	9.99381492086617	6.37081341124172	53.405	3.041	5.972
41.8014233626028	9.94897397714958	55.0339819750383	45.293	9.057	63.281
29.3052703635956	12.5427716899348	46.2373783580994	25.542	20.506	48.088
29.3052664227789	12.542770630422	46.2373743921322	22.494	14.202	49.345
29.3052628104148	12.54276961348	46.2373706163915	21.459	12.53	50.646
29.0715125270335	11.6594321562903	41.3016096879234	20.541	9.26	39.729
35.6647950965047	11.1366315762113	28.2890744129211	29.447	11.243	26.345
Route: 4 Length: 232.296114347251 Demand Met: 46					
48.8331564690438	10.4234473441221	8.65624586892355	46.154	2.083	10.72
48.7177537501782	48.0663502571596	81.4094473562439	47.232	45.27	89.834
50.2515236683428	54.0828283154235	78.6883127231561	43.243	58.404	75.054
56.4860811136271	57.6152011802183	78.194646409799	52.975	65.56	80.551
62.8043638762217	60.0302880530429	77.4510666382287	62.352	63.144	84.329
76.4441663084307	65.2443655949492	75.847791106472	77.919	74.057	76.926
83.4317231168886	59.8094140322253	73.7943890239414	89.091	59.886	77.014
85.3588793378891	58.3096110201975	73.2281903936151	93.456	57.69	77.108
Route: 5 Length: 214.051752739032 Demand Met: 46					
49.4685429242747	3.55276284738765	73.4358225107149	40.868	2.981	76.025
57.9332294928384	2.81107984619924	85.7961963854257	53.754	0.148	93.309
82.9056846330525	8.22927690792494	88.073136430321	88.457	8.185	95.157
83.0985394153671	8.51340867120298	86.8146905499401	85.841	12.653	93.498
85.3499820709765	11.8306428033211	72.1206453266507	91.007	13.249	70.645
86.317232838803	13.2558380637446	65.8075994705856	91.857	16.502	66.492
87.1148301769646	14.4310803097971	60.6017053521835	95.317	17.864	59.209
85.8667860459738	14.2820547674892	58.5638480288473	85.554	10.061	65.642
Route: 6 Length: 249.748962882079 Demand Met: 46					
23.7985526755237	52.6489336653213	44.9832204345614	25.201	54.507	48.664
17.3266254198865	63.1830300197822	56.093195383957	17.374	67.529	56.063
14.0591286134395	68.5016166955937	61.7026179870715	5.739	68.535	65.134
29.1187615131594	81.1154915283473	65.6708169177977	33.626	83.869	72.958
29.229355335302	82.0847533100935	60.4701923092867	20.393	83.793	60.447
30.5831828152228	86.541296610438	35.7019467027075	27.59	93.644	36.826
31.7059803609075	90.2367455646033	15.160907332836	24.053	94.189	12.551
33.8320733179556	89.8723990279114	12.2948973398642	36.924	96.636	7.226
35.6696836078792	80.7969037989044	10.8974046207986	36.762	86.092	10.176
Route: 7 Length: 136.328409447602 Demand Met: 45					
50.6718635344885	16.2437201673858	7.4864438842908	54.032	12.197	7.44
54.3501780666774	50.4332538209649	48.478578537554	49.571	48.14	55.073
54.4490178192593	51.3521395604405	49.5803322439183	55.281	51.871	55.993
54.5202379249661	52.0143495398798	50.3743434969105	53.958	52.681	59.332
54.5202381700161	52.0143511382868	50.3743439147872	57.142	56.857	57.493
53.4479735893919	51.3944805442345	47.2942997569273	57.243	55.792	50.963
47.646865333114	48.0412896342408	30.6311352705091	49.02	51.541	23.534
47.2100969660093	47.7888452778456	29.3765056903527	42.804	54.74	25.734
47.5675147668306	42.9483778829026	25.6135337724484	40.978	46.49	25.743
Route: 8 Length: 168.447275719206 Demand Met: 45					
59.5810033999916	46.2687373024156	12.6268933332355	51.29	49.58	11.489
68.3752360331588	66.3218077697652	20.4822099194433	66.971	72.201	17.644
70.9968396118989	72.2996300580714	22.8239705832035	66.957	73.797	28.023
72.7894464412668	76.387038569988	24.4251258013889	67.179	79.746	30.609
77.8517880489049	80.4716796312968	23.777198196415	81.476	87.316	28.362
78.673886909043	78.2251247649055	19.9243329855986	78.214	79.218	18.292
79.4488161702881	76.1075122922546	16.2926162920872	87.252	72.952	19.479
80.6222079013737	71.7975582734117	8.37927309580728	85.968	75.194	1.985
78.9097443307388	68.7427013488253	7.89478337794251	84.146	71.427	3.869
75.6068453947686	62.850872400871	6.96041383045105	68.193	67.124	4.172
Route: 9 Length: 302.279301497875 Demand Met: 46					
31.3434751521948	72.9314992415874	74.069539094699	26.213	68.977	77.227

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.6291062068797	88.8368700866621	92.7886338122486	19.881	93.181	96.862
30.0133182978388	88.4141252101164	92.9112433374373	30.503	90.056	84.685
33.7333849803394	87.9494136789097	93.0459526517571	33.443	88.578	84.328
64.0408633980846	84.1637322525884	94.1434946367171	67.643	91.829	97.188
67.2220525985479	81.4408070649439	93.4236353246013	63.631	81.224	94.784
71.5252928766006	77.7573890816546	92.4498142947411	74.447	77.382	91.404
74.7088867549104	75.0322944408752	91.7293653733299	76.154	71.763	97.979
76.7573895361672	73.2787884644873	91.2657510690053	73.523	67.727	97.567
85.0941036327903	66.3108174731767	89.2665408453598	87.633	63.432	97.407
85.7116947000154	65.8370362388793	88.6262075852763	93.946	64.003	91.762
82.4999798778962	60.7082409457519	72.1827932074605	86.785	67.217	67.68
Route: 10 Length: 214.25116738103 Demand Met: 46					
41.9695576506073	19.2861969700827	17.8706319317342	33.5	17.352	15.52
24.5086181875271	45.8862290587899	68.3112181371051	20.103	52.347	63.856
23.0035094549707	48.194069982397	73.6932360954855	26.732	55.612	72.392
22.1236231477991	49.5431284066925	76.8395111722756	21.299	57.593	80.779
21.7370746643424	46.1742340156926	77.6423074320534	19.619	52.734	79.19
19.6386820637061	27.8815732300904	82.0011694980759	19.569	24.449	84.923
18.9501525343775	21.880346057694	83.4311606871723	12.414	20.962	80.147
18.4741685224978	17.7312449109021	84.4198324194452	15.772	12.549	91.264
22.8105086351494	16.6679044111482	72.8084199929487	26.839	11.732	76.118
33.030510005002	14.1622445183064	45.4413179955062	33.341	22.178	45.103
Route: 11 Length: 169.165918659347 Demand Met: 45					
83.3856091490767	56.7008025907262	45.3723339238188	87.18	60.86	47.333
84.8913068210583	58.8070932616663	47.4187382354944	87.173	60.998	48.592
85.9708597587025	60.317259180171	48.8859501516074	94.619	62.103	50.624
85.9708595030601	60.3172595069674	48.8859504414874	91.043	63.691	55.511
65.2929950884247	61.8738245431047	41.5586202175977	59.534	67.732	45.235
63.9473874141993	59.0675265231931	38.0177354641867	61.493	65.592	32.325
62.5051942641404	53.9942076819791	34.0867946535137	59.007	60.213	31.626
Route: 12 Length: 158.439741865828 Demand Met: 46					
21.4349206591044	53.631757896497	40.3758674463637	25.923	53.185	46.671
16.0329207285365	61.8826287432499	48.0108004262384	13.454	69.007	48.213
15.6888911163668	62.4078557700033	48.4969319624621	11.844	68.394	54.009
15.6888928940303	62.4078529463821	48.4969293780499	7.235	62.367	51.584
17.1389333147835	60.1929812963479	46.4473851160713	11.123	60.442	50.101
21.1920627977792	54.0024016077282	40.7188645506122	18.45	52.954	46.14

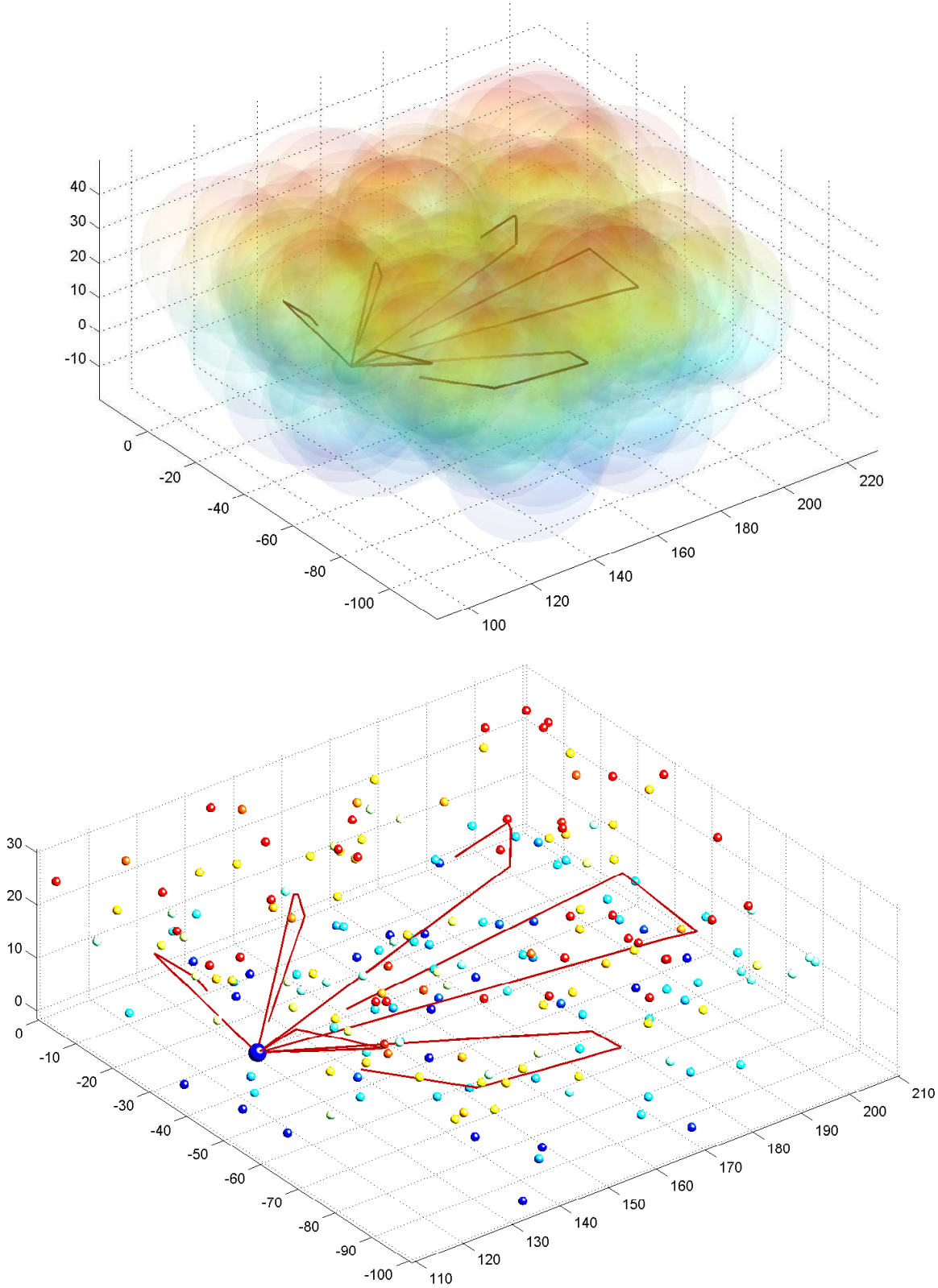


Figure O.64: *team*2_200, Equal Radius, 3D, Euclidean, Length = 642.6087972

Table O-67: Solution for *team*2_200, equal radius, 3D, Euclidean

Total distance: 642.608797184271 Total demand met: 617 Depot: x 19.5535 y 32.6157 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 47.9875792645968 Demand Met: 56					
13.9897302113705	24.6396202651895	8.59371074659121	25.954135	17.869355	4.361083
13.9897302113705	24.6396202651895	8.59371074659121	26.379295	27.934205	23.031473
12.2178889929207	22.0988332379948	11.3309796335729	20.9699	7.87089	11.180156
12.2178889929207	22.0988332379948	11.3309796335729	16.776285	16.423415	15.502152
10.9286767405205	20.2501749183024	13.3227052483366	21.673354	6.8005655	13.961641
9.92523427149371	18.8112950052398	14.8729639612196	15.031135	2.9821155	24.523433
9.92523427149371	18.8112950052398	14.8729639612196	25.662895	8.989655	21.265898
9.74074162611224	18.5467143183529	15.1580250472774	6.5851	6.152225	13.546134
9.74074162611224	18.5467143183529	15.1580250472774	7.39533	10.545265	21.25087
9.56855608640804	18.2997779613774	15.4240826205981	1.87583499999999	21.036865	8.472142
9.37446317632275	18.0214146873466	15.723999935851	0.024124999999998	3.6794065	26.062187
9.8897243285861	18.8565225928651	15.3522284300968	11.54701	17.37734	26.244082
9.8897243285861	18.8565225928651	15.3522284300968	10.44323	18.54025	17.132759
10.4977136117527	19.8417358012677	14.9135349959504	3.09506	32.271765	28.722779
10.4977136117527	19.8417358012677	14.9135349959504	10.613375	27.61233	15.443404
13.5607991513932	23.8582336113006	12.37410030664	22.373755	32.6144	28.047693
14.6231352459065	25.4104430295692	10.1807848705539	25.46019	34.06066	24.177315
Route: 2 Length: 80.2072000027425 Demand Met: 116					
18.2331873367838	37.1574812129378	3.77215066018422	2.888575	34.539165	0.815621
16.7972039385386	42.094461220031	7.87303990020804	6.09162499999999	39.029145	21.745986
16.7972039385386	42.094461220031	7.87303990020804	7.79806000000001	41.063165	21.758433
16.7972039385386	42.094461220031	7.87303990020804	21.779985	37.899125	15.006029
16.7972039385386	42.094461220031	7.87303990020804	24.567885	37.86062	12.401465
16.7972039385386	42.094461220031	7.87303990020804	29.577285	38.20107	12.365171
16.7972039385386	42.094461220031	7.87303990020804	35.347265	40.483415	12.676508
15.7324558251745	45.7598308411511	10.9176681302711	21.800035	44.699325	19.798588
14.6451713590321	49.5031522229847	14.0271043352596	1.56824	43.114435	27.74491
14.8846416402257	50.5795184457401	14.2174529460038	7.76846999999999	43.27595	27.165517
14.8846416402257	50.5795184457401	14.2174529460038	15.566305	47.445917	16.822861
15.1340290275407	51.7003083087968	14.4156145593957	4.535275	41.40327	15.496926
15.4503025208521	53.1218520001023	14.6669224386883	4.493385	48.2428075	1.749018
15.4503025208521	53.1218520001023	14.6669224386883	8.071465	45.7971455	5.631658
16.0482325375884	55.8103546747405	15.1422281095341	2.26291999999999	54.336059	8.412226
16.0482325375884	55.8103546747405	15.1422281095341	5.35044999999999	59.245825	2.02242
16.9059108561134	59.6664024670198	15.8239657382898	16.28216	64.658715	7.376906
17.7231070305781	63.3396621762371	16.4733774423123	4.81189000000001	71.48163	19.467897
18.4351031990275	66.5394560152488	17.039092717534	1.401765	76.07236	14.516115
18.6591877927861	67.546805965174	17.2170849736341	20.60172	86.45345	23.44328
18.6693401902894	67.1502928735142	17.0216411814922	32.35548	77.08328	26.131092
18.6824821736883	66.6365219798794	16.7683952200865	16.17437	80.77798	18.674423
18.6824821736883	66.6365219798794	16.7683952200865	31.22881	79.877355	13.445056
18.6976858836926	66.0422373536144	16.4754698253922	10.302265	79.88844	24.724981
18.6976858836926	66.0422373536144	16.4754698253922	10.737535	78.399525	25.651463
18.7276007654916	64.8736878312477	15.8994931155157	14.99811	70.439575	28.594361
18.7276007654916	64.8736878312477	15.8994931155157	19.19225	67.891335	25.986874
18.7623918652254	63.5146662940734	15.2296093009363	8.96414	75.77293	21.604208
18.8114254644377	61.6000067495521	14.2858646828831	27.294235	67.36467	25.05905
18.875035359493	59.1162273158591	13.0616203698144	22.77816	61.91876	23.535116
18.875035359493	59.1162273158591	13.0616203698144	27.03592	58.11764	25.51317
18.9525511649155	56.0877667866221	11.5688624350595	15.17562	59.299125	20.231796
18.9525511649155	56.0877667866221	11.5688624350595	18.601355	58.3359	16.263038
19.0392123674775	52.7031936241726	9.90057854893531	22.32618	58.45293	10.978007
19.0392123674775	52.7031936241726	9.90057854893531	25.726765	62.875185	13.655865
19.1789861536541	47.2455862640587	7.21056403143576	23.528225	48.047471	10.497692
19.3205992552564	41.7149647120599	4.48454348783076	24.393135	53.387308	3.209069
Route: 3 Length: 152.027720499736 Demand Met: 119					
29.750808857564	47.4537200190351	4.4996228863384	36.49954	48.989475	3.669737
37.8151156026436	59.1879675931619	8.05819461113778	33.93752	71.055425	5.905417
43.7920442423586	67.8843675447153	10.6956515165348	43.88264	75.9979	6.534575
43.7920442423586	67.8843675447153	10.6956515165348	45.96408	75.36881	19.356846
47.5917705981058	73.4127280809829	12.3722948300316	62.26967	64.78212	6.975531
51.5185598053764	79.1263760224348	14.1052308250918	65.23767	90.033385	6.608827
51.5185598053764	79.1263760224348	14.1052308250918	52.486843	76.711165	9.36826
51.8978538490272	79.6782393585039	14.2726705859866	67.48261	90.51293	17.817861
51.8978538490272	79.6782393585039	14.2726705859866	64.30468	84.91	26.009678
52.0791104746852	79.941954691794	14.3526826351085	59.609455	83.27302	29.920795
52.2618243635993	80.2077919835944	14.4333287367824	59.88564	90.256965	29.954013
52.2618304541808	80.2078002800148	14.4333304941002	61.393495	78.21387	27.829379
52.2618304541808	80.2078002800148	14.4333304941002	58.86286	75.490835	22.793064
52.261836862202	80.2078090831115	14.4333323003173	63.457115	71.302795	28.410692
52.4020579221092	80.739650731181	14.3441480922558	56.10401	69.44853	29.951816
52.4020579221092	80.739650731181	14.3441480922558	48.983044	68.08194	24.712405
52.7590576189089	82.0935576629341	14.1170127764328	49.200624	76.95068	27.905495
52.7590576189089	82.0935576629341	14.1170127764328	51.801592	75.702955	19.859805

Solution x	Solution y	Solution z	Original x	Original y	Original z
53.5879307089476	85.2369415086879	13.5893207548999	58.9163	98.60932	2.300231
53.8062130658097	86.0649682671676	13.4503477995727	69.51155	98.000325	10.150379
51.5303272685191	86.0815538617914	13.6829911949654	58.59379	93.155945	12.405414
51.5303272685191	86.0815538617914	13.6829911949654	55.7501	90.920415	19.617278
49.1082264647887	86.0992035097839	13.9305890583544	49.437672	97.29667	7.39626
49.1082264647887	86.0992035097839	13.9305890583544	54.766852	92.295455	6.553331
46.489295985314	86.1182758572107	14.1983300808711	51.725585	96.536445	28.40681
40.9380147959	86.1590742535958	14.765837404947	38.950185	86.058925	28.399966
36.7735998676171	86.1895031351367	15.1916426739001	40.48646	81.157135	14.786912
32.4339022213895	86.2212476877963	15.635364128343	37.353615	96.195315	18.415189
32.4339022213895	86.2212476877963	15.635364128343	39.89323	90.309885	11.775799
26.2481464615115	86.2671078787513	16.2676739864873	24.384515	97.907795	0.111537
26.2481464615115	86.2671078787513	16.2676739864873	36.34587	87.597465	1.344209
24.9958374918857	86.2569160637924	16.422722815128	20.26183	95.676245	17.846167
23.9002431166699	86.2479992564326	16.5583840934718	10.636965	99.941455	22.606097
23.9002431166699	86.2479992564326	16.5583840934718	12.30828	95.415795	18.734286
23.7758681825619	84.7151565978349	16.0851212169739	23.159665	94.99055	21.634541
23.7758681825619	84.7151565978349	16.0851212169739	28.966505	91.93771	20.861988
23.6059281944613	82.6199454398106	15.4380940529615	23.602775	87.83846	18.275699
23.4191206831512	80.3156193241738	14.726517291524	30.09705	94.85711	4.685105
22.6124836582273	70.3604174427158	11.6527808817475	30.1948	77.47401	0.923346
21.6117687357809	58.0116238027718	7.84019626628719	27.85894	70.297015	5.978866
Route: 4 Length: 132.623936410165 Demand Met: 118					
32.2141119191629	31.2688770610823	2.8018420362757	41.00732	41.27668	4.938398
40.1247504371481	30.4272658480059	4.55244191635832	50.608737	39.047145	0.30438
45.3506042189074	29.8712036528971	5.70896024338354	50.972003	40.60627	2.976184
49.8389949222198	29.3934470227209	6.70232508876792	58.979255	16.987345	1.276103
52.5312419448436	29.1071265164327	7.29820553655605	49.52113	41.29678	9.327678
55.7545734189031	28.7642079644624	8.01156481044745	53.824634	40.64213	16.603226
59.1906560519865	28.398627508559	8.77195236561808	51.719243	33.03008	9.909651
63.5045328957236	27.9396745079681	9.72658536610099	69.610075	41.75992	4.719164
67.1273530355992	27.5542324923288	10.5282948946561	73.44882	27.71684	3.250298
70.427638375929	27.2031024945794	11.258645578689	79.01289	29.7258	2.755744
70.427638375929	27.2031024945794	11.258645578689	83.48933	38.25693	16.203282
70.427638375929	27.2031024945794	11.258645578689	63.31789	20.756115	1.726904
70.427638375929	27.2031024945794	11.258645578689	57.95186	28.956245	5.320699
70.427638375929	27.2031024945794	11.258645578689	64.595135	34.78327	9.989898
70.427638375929	27.2031024945794	11.258645578689	61.04328	37.44322	1.978623
76.5434457680725	26.5523263185718	12.6121599448381	88.660005	37.051535	6.873362
76.5434457680725	26.5523263185718	12.6121599448381	87.57797	41.66484	5.551613
80.5901614398229	21.5432951718546	16.1778874638369	95.62369	24.314785	12.804988
80.5901614398229	21.5432951718546	16.1778874638369	90.572985	26.136825	24.857885
80.5901614398229	21.5432951718546	16.1778874638369	92.788305	33.10169	27.022649
80.5901614398229	21.5432951718546	16.1778874638369	86.845365	25.906095	9.026374
80.5901614398229	21.5432951718546	16.1778874638369	69.52818	17.90893	23.466902
80.5901614398229	21.5432951718546	16.1778874638369	80.066985	32.520545	19.480329
80.5901614398229	21.5432951718546	16.1778874638369	71.273045	32.62062	26.349189
80.8056004453934	20.8836199835621	16.3663220961932	91.09643	22.6866	6.913126
81.0225665638991	20.2192561776555	16.5561028209261	93.997115	11.43328	4.127594
81.0225665977232	20.2192540238222	16.5561045133516	99.37313	13.042045	19.983146
81.0225660686287	20.2192531627927	16.5561052455531	96.04228	11.46233	26.220597
81.0225660686287	20.2192531627927	16.5561052455531	94.4971	12.154995	26.111766
81.0225655720471	20.219251922978	16.5561062841343	92.761655	9.792985	28.945088
81.0225655720471	20.219251922978	16.5561062841343	86.016245	7.495035	26.90563
79.405711317218	20.1975990661179	16.1455550098964	87.144585	5.62369	21.911356
77.4033607584701	20.1707249357742	15.6371763054661	89.544625	11.14329	6.653118
77.4033607584701	20.1707249357742	15.6371763054661	82.741185	8.18936	9.780027
74.5229088490436	20.1319459765901	14.9059799086515	78.44886	5.02628	2.732259
74.5229088490436	20.1319459765901	14.9059799086515	74.60069	8.85595	6.459838
70.2787834663473	20.0748550472778	13.8283958212977	67.794775	0.2453923	14.617193
70.1573209056049	20.1051806383946	13.7952789949446	67.61759	1.570395	20.822479
70.1573209056049	20.1051806383946	13.7952789949446	69.299455	6.449115	15.081267
Route: 5 Length: 62.6291248309127 Demand Met: 88					
32.5925118236219	21.8797144738661	9.7134795086682	45.420784	35.70231	13.427579
37.097334518797	18.1702516544161	13.0695004285038	44.38625	27.294685	26.050788
39.9084860516174	15.8554862491854	15.1637013100286	34.695715	0.250565	26.535311
39.9779030110707	15.8767029452067	15.1553156999107	49.796921	18.777515	27.389734
39.9779030110707	15.8767029452067	15.1553156999107	40.19826	27.52955	29.10549
40.131338660576	15.9235974958812	15.1367836383433	42.845635	9.79738	11.955362
40.131338660576	15.9235974958812	15.1367836383433	46.358401	11.954405	18.491997
40.2884032759424	15.9716023676421	15.1178137015388	40.16046	1.62977	24.917947
40.2884032759424	15.9716023676421	15.1178137015388	32.973595	9.54291	20.606347
40.4700797781624	16.0271367337397	15.095869051521	34.77264	14.924575	26.641448
40.4700797781624	16.0271367337397	15.095869051521	39.58443	28.150345	20.548662
40.6341775534783	16.0772981490392	15.0760458332236	57.51838	10.00522	23.910843
40.5505637280537	16.4179208367788	14.7316021282353	54.294115	8.069135	15.776464
40.4533601550573	16.8138146685381	14.3312625474264	54.207021	15.63022	20.585643
40.3456543470323	17.252418431098	13.8877288201034	49.707097	15.54357	19.872896
40.2306859674037	17.7205286758921	13.4143510565927	47.997827	21.94091	22.00424
40.1125409238099	18.2015549515194	12.9279072305536	50.337118	13.87323	4.749218

Solution x	Solution y	Solution z	Original x	Original y	Original z
39.9957281072853	18.6771594511682	12.4469500503842	57.48649	24.517395	4.703245
38.4952251321833	19.7002234815581	11.5333161850657	28.448025	4.56492	10.374303
37.0092698245137	20.71340600299	10.6285152098539	47.801417	19.06334	7.814097
35.2867647421343	21.8878258378868	9.57964614924592	26.97316	5.55935	2.320922
34.2322639392344	22.6068679543158	8.93758254665385	46.870011	29.816545	8.525673
32.9271528916399	23.496775836682	8.14290644062741	49.216563	20.76273	2.277188
30.4542984844564	25.1828782606992	6.6372432987479	33.169445	12.82499	1.129185
27.5208519267522	27.1830734241895	4.85115418101391	30.249755	29.28668	9.627144
24.2689780797577	29.4003890728314	2.87115364307331	27.827995	16.04415	0.143676
Route: 6 Length: 167.133236176118 Demand Met: 120					
35.930293314475	42.7014953088938	5.03699890984398	40.184205	46.1874365	21.269314
41.3415603085684	46.034239834589	6.70078050948407	39.724355	52.657318	1.123019
46.6652972739332	49.3128460111499	8.3378174888562	42.753335	50.906813	15.568394
51.9262292969293	52.552770459526	9.9553302757527	42.291825	54.317701	14.78098
58.633603521217	56.6835966916746	12.0177233048158	65.705495	54.4013975	3.082521
58.633603521217	56.6835966916746	12.0177233048158	53.302235	56.10093	10.554691
67.2081378413703	61.964720250941	14.6546384881628	63.17424	62.764205	21.920947
77.4667591662509	68.2830929544011	17.8094638945372	74.234205	84.088705	29.630347
79.5675989609389	67.9481078745759	17.2826397146976	82.980165	82.460215	28.432538
82.2016295366333	67.5279944122813	16.622062605901	91.37176	83.481715	13.123111
83.6284384549785	67.3003944787826	16.2641122927202	97.272905	80.426715	12.650593
84.1470121167249	67.2176753156654	16.1340077629096	98.53739	80.25874	11.354076
84.1912889338397	65.5661628922802	16.247975397837	98.425325	63.29758	13.439936
84.1912889338397	65.5661628922802	16.247975397837	84.72455	82.62255	16.621981
84.1912889338397	65.5661628922802	16.247975397837	93.854515	65.44994	7.938496
84.1912889338397	65.5661628922802	16.247975397837	86.26193	79.048	11.651774
84.1912889338397	65.5661628922802	16.247975397837	92.344515	62.02096	28.826016
84.1912889338397	65.5661628922802	16.247975397837	95.92709	54.202926	8.883113
84.1912889338397	65.5661628922802	16.247975397837	87.254685	75.06877	11.123991
84.1912889338397	65.5661628922802	16.247975397837	81.449	70.90379	9.10693
84.1912889338397	65.5661628922802	16.247975397837	74.635475	75.231085	23.616275
84.1912889338397	65.5661628922802	16.247975397837	79.72973	69.6285	5.76607
84.1912889338397	65.5661628922802	16.247975397837	81.466395	54.091358	0.343064
84.1912889338397	65.5661628922802	16.247975397837	75.60926	70.05143	9.458663
84.1912889338397	65.5661628922802	16.247975397837	68.40623	74.741575	8.582781
84.1912889338397	65.5661628922802	16.247975397837	67.24276	72.18951	20.816233
84.1912889338397	65.5661628922802	16.247975397837	70.55475	53.342402	18.770686
84.4216435961403	56.9670429216749	16.8408105889425	92.878595	53.021252	1.55944
84.5784018916332	51.1147217459028	17.2443742873277	91.6164	43.026115	2.808093
84.6625350705416	47.9740961331638	17.4610500344013	94.955665	36.40187	7.771411
84.7081568441342	46.271383921097	17.5785803936935	99.67714	33.98061	22.565216
83.9023044739167	46.1024893550009	17.3611851574435	97.982935	40.137435	28.75306
81.0067018576841	45.4955723561339	16.5800165934565	84.61874	44.121625	19.170305
81.0067018576841	45.4955723561339	16.5800165934565	74.17807	43.76639	28.605582
78.3219561958596	44.9328316345335	15.8557271129166	89.661665	37.28143	20.914346
74.4785188767112	44.1272351550924	14.8188763907462	79.319755	37.96047	22.926601
70.0070966404766	43.1900638559323	13.6126000972168	78.52122	37.890255	25.630233
62.126252738665	41.5384639373561	11.486428512559	63.437195	41.00367	26.99622
62.126252738665	41.5384639373561	11.486428512559	65.72564	44.111465	7.622314
49.9560726122287	38.9879051724518	8.20289725473569	51.37375	46.298003	11.79476
35.4953373234225	35.9571490005683	4.30130797426898	35.65863	43.345715	7.513468

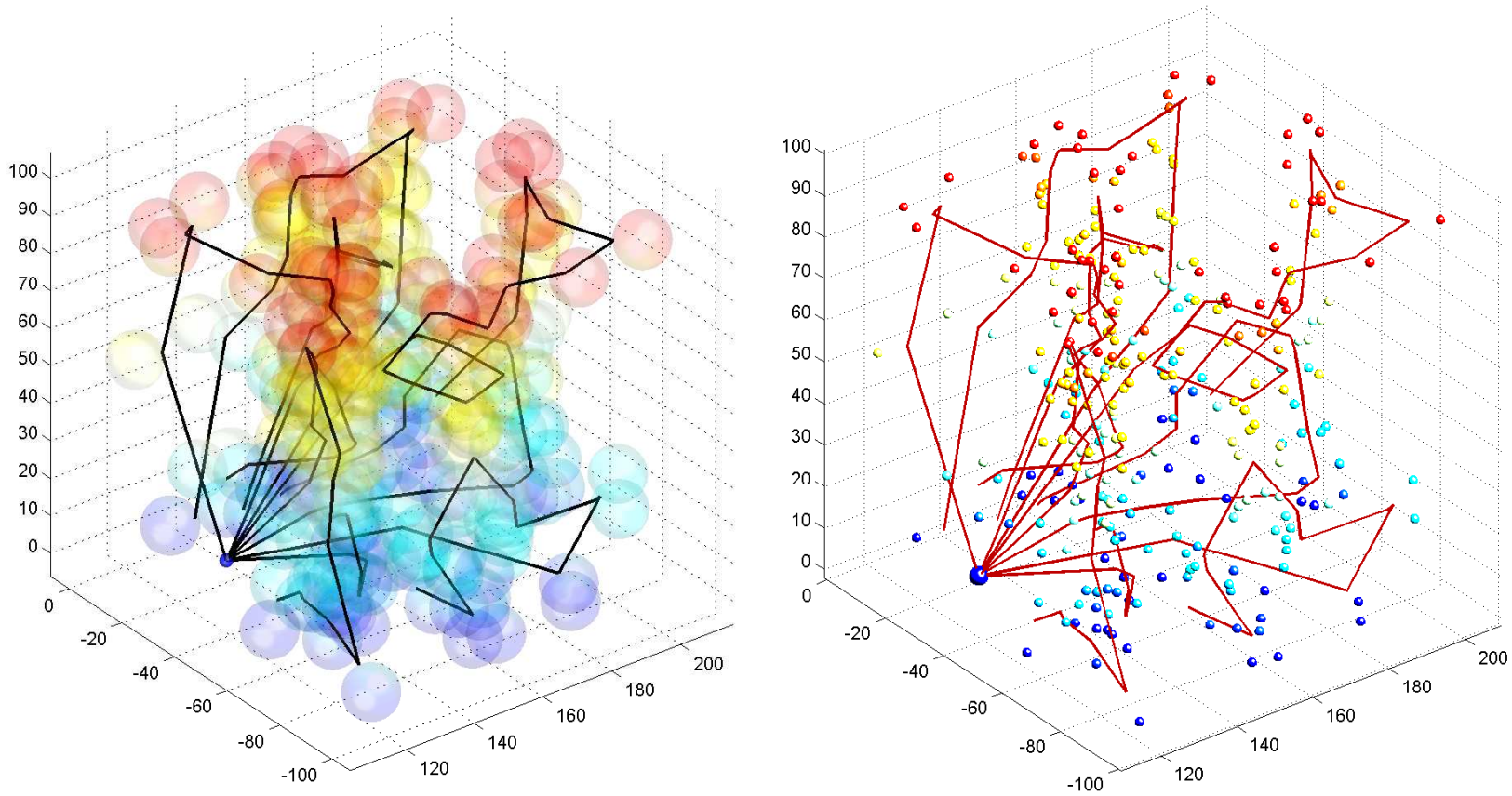


Figure O.65: *team*3_300, Equal Radius, 3D, Euclidean, Length = 2164.8084510

Table O-68: Solution for *team*3_300, Equal Radius, 3D, Euclidean

Total distance: 2164.80845098577 Total demand met: 9490 Depot: x 23.55 y 20.83 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 281.090777046035 Demand Met: 1296					
47.9007385489076	55.7130715664211	16.261212175242	47.3	55.25	23.22
52.0237997477096	61.4104878399268	15.1453026622473	49.78	61.48	16.59
59.1151640064702	71.2095957748278	13.2258880084646	60.12	71.05	6.63
59.1151640064702	71.2095957748278	13.2258880084646	54.05	68.39	12.29
70.1387266555041	86.4423175556497	10.2424254395853	74.49	84.46	5.13
70.1387382275246	86.4423397360498	10.242425508617	70.23	90.73	4.71
79.5783187744267	89.8666649583407	29.0345284603546	85.6	88.65	32.39
76.9554415739029	91.1313008646884	29.4406090370461	78.98	97.83	29.61
52.8826953056094	94.3071691373969	32.6365645847829	49.11	94.31	36.24
52.8826953056094	94.3071691373969	32.6365645847829	48.89	93.1	33.02
52.8826953056094	94.3071691373969	32.6365645847829	50.91	90.3	36.65
51.7208877832161	94.4604292576793	32.7908265052712	46.89	94.85	27.74
51.7208877832161	94.4604292576793	32.7908265052712	49.91	91.9	29.51
50.462396957419	94.9418435276394	40.2165471639741	54.83	99.88	42.57
49.19063864683	94.1383825568117	42.2315422306848	45.57	93.71	36.64
49.19063864683	94.1383825568117	42.2315422306848	47.08	88.26	42.71
47.366966202471	92.9861800672194	45.1210878681069	46.8	93.43	44.07
45.3489240658195	91.7111564563319	48.3186392663221	48.42	91.53	51.1
43.6095919919529	90.6122215097509	51.0745815268848	47.67	92.59	55.65
42.6446543233135	90.0025713801262	52.6034923286455	42.93	88.78	59.49
42.0647907649264	89.9703338208475	51.7744499139033	39.31	87.14	57.08
42.0647907649264	89.9703338208475	51.7744499139033	39.7	88.73	54.48
38.1012806136922	89.7499579957351	46.107334651405	37.93	93.92	46.64
38.1012806136922	89.7499579957351	46.107334651405	38.36	90.43	43.39
35.0344735919967	89.579426058706	41.7223933820068	40.13	86.48	38.33
30.4018711989876	89.3219316747752	35.0989666639551	24.67	93.34	35.07
30.4018677230709	89.3219300780221	35.098959135294	24.2	92.42	34.13
31.5139396091336	87.6552862438004	33.0223057493645	28.82	81.78	35.71
35.743568197773	82.9845747789169	25.5182779285636	35.58	76.06	26.53
38.6128147327474	84.3762945697209	19.9648295313191	38.99	86.42	22.62
38.6128147327474	84.3762945697209	19.9648295313191	40.14	85.47	20.22
42.6487489024196	86.3339202222492	12.1532393049349	42.78	91.87	12.41
42.6487489024196	86.3339202222492	12.1532393049349	41.11	86.33	11.14
44.4645476744554	87.2146697960521	8.63875328849946	47.56	92.03	4.61
44.1691695930201	86.2841143149624	8.7442609209296	44.33	87.3	2.27
43.4891616914258	84.1419689051829	8.98717255065866	48.25	85.26	10.69
42.3325592986488	80.4986270186732	9.40034484418989	36.6	82.94	12.12
39.571760987168	71.8015006000241	10.3865298780349	39.42	71.54	17.38
Route: 2 Length: 415.470973369216 Demand Met: 1298					
40.5043243372334	35.0533651010463	34.6062617791591	40.4	40.19	35.32
42.3396492528004	36.5930452167766	38.3524348705121	40.11	39.6	39.05
43.9025740699458	37.904214745599	41.5426030319767	42.56	42.28	42.23
44.984059905123	38.8115123284219	43.7500863550921	41.07	43.98	42.76
48.1884989519162	41.499680907774	50.290779467454	42.72	42.84	54.45
60.2817580198346	45.3449107749337	58.6908819234332	65.16	40.78	60.78
60.4897489076491	54.2191811685134	60.7066305134946	60.94	57.56	60.13
60.5610872550591	57.2630469983081	61.3980429986308	58.75	56.63	68.13
62.1523212116314	76.0597206703463	61.2621509844225	68.17	79.21	59.57
45.1700014180638	87.0283205561462	66.3818299165589	48.68	92.55	68.87
41.3302452728412	88.6257826045779	67.1375689305931	39.18	94.86	64.79
41.3302018558974	88.6257367202531	67.1376119207014	41.11	92.55	72.93
41.3302018558974	88.6257367202531	67.1376119207014	37.88	93.16	68.12
41.2367828173893	88.4946863841502	67.1726847832379	38.08	89.48	68.3
41.1416540840825	88.3612369571298	67.2083985137338	39.28	92.99	62.54
32.6874463657932	76.5049573588765	70.3798812620617	34.24	70.46	67.21
30.3092292936878	76.5273667925579	72.3287113324515	28.95	69.72	73.23
28.3204459132445	77.8151256815843	73.9979602729795	32.42	78.27	77.18
25.7450486366102	79.4827265650028	76.1595975142158	27.35	82.24	75.13
22.9063586278861	81.3208167112549	78.5422304262966	16.07	82.14	77.28
32.3848311697025	86.7669878545676	93.0642599154362	34.79	81.57	97.09
33.5248442349481	91.2084554153519	94.6143068087031	30.69	95.98	98.88
36.5482225959483	90.9471747030689	92.5433371696469	35.46	90.5	93.34
40.3140145096532	90.6217379235846	89.9638569475825	42.37	92.45	91.48
43.4231325010708	90.3530555375506	87.8341634138739	47.48	94.9	89.56
44.3159825397253	90.275918387838	87.2225817228795	40.14	88.25	82.87
45.592511038388	90.1656199174762	86.3481565063039	44.75	90.08	82.93
46.7424338334039	90.0662604860227	85.5604548706005	46.92	92.94	79.18
48.364475875795	89.077249630142	86.2884691794035	48.98	92.03	89.79
49.9271995604497	88.1244032223164	86.9898645112793	51.75	85.81	80.64
55.7219439965176	84.7037416474739	90.2599878025265	57.57	78.44	87.74
56.3986080475624	85.1596180557422	91.2311439364334	53.35	83.14	97.2
67.3368193236701	92.4871785366935	94.2770179714339	66.26	99.07	96.4
86.3499737794176	86.2517007107833	93.2789292147702	92.92	88.46	92.3
78.2402026192446	74.262437033474	95.8331994514639	72.93	73.7	97.12

Solution x	Solution y	Solution z	Original x	Original y	Original z
77.4053914063601	73.0283361136007	96.0961382839241	70.7	73.7	97.99
85.0955460536394	55.5567718463559	94.2683781280369	87.26	54.53	99.96
86.1480318406455	53.1656132615887	94.0182671512635	82.42	49.99	99.02
89.1134908939809	48.8281624583182	92.4653050658112	92.09	44.08	96.66
89.2639738767201	48.9123219543751	87.9499123516599	85.78	45.37	88.36
89.4679962937643	49.026436405681	81.8285398430167	96.43	49.73	81.64
89.4384243645342	49.0284508871682	81.5007886427599	89.59	51.88	82.73
89.4073809709237	49.0305732172944	81.1567554529454	89.36	56.03	81.08
88.9912016110726	48.8659668001238	76.530894976819	88.92	43.62	77.06
88.4348156077515	48.6458698163779	70.3464526610993	92.59	46.16	69.75
87.9529037288069	48.455238147021	64.989972519333	84.47	48.16	64.66
87.5535512654623	48.2972669937555	60.5511620578211	85.85	46.49	60.83
87.1521517812703	48.1384903408968	56.0895716226609	93.86	49.11	54.34
86.5869029075006	48.0242926358688	54.769981271959	92	48.8	50.4
83.5361176305801	47.4986068461862	52.4956262321577	85.43	53	49.96
66.2565532076824	44.5212084371268	39.6134415137328	63.26	50.77	40.6
Route: 3 Length: 291.864843002493 Demand Met: 1253					
10.2519241983503	13.755752949127	56.7970182643458	3.36	12.54	56.95
19.605539805257	12.856514924567	87.0571640024721	24.66	9.13	90.15
9.985477727584	22.7778775781244	92.7430585599441	4.01000000000001	20.5	95.59
10.469177709214	25.2794313377832	92.7005145071126	5.58	22.9	91.06
14.9023163306184	48.2055165767357	92.3105718825018	9.06999999999999	51.92	93.4
20.7816280037362	52.666930118765	91.35200295008	21.75	55.19	94.83
23.8458491523617	54.9922022126247	90.8523950462151	27.18	54.04	89.82
25.8451720842171	56.5093653092846	90.5264147660858	30.83	54.42	86.59
26.2387823521659	56.8080372774541	90.4622460100455	33.01	55.55	89.21
23.928302819762	60.5246246678767	90.965151286284	20.88	59.51	94.7
22.2836571032095	63.1701643601693	91.3231199142247	24.86	66.05	97.16
20.351401220322	64.9130291338231	90.5002572977382	22.6	70.1	92.91
19.1742685143475	65.974782566526	89.9989785292296	12.82	66.49	92.89
20.4925636573937	68.2769500029197	86.8144489112657	21.49	69.2	86.43
21.589044845879	70.1917136252145	84.1658103564971	24.25	76.66	84.45
20.7316951861256	66.7736746952536	79.1694164971275	23.52	71.05	74.38
20.3573916681739	65.7211923593	78.3406742290407	24.03	65.56	79.56
19.9240439107952	64.5026563585846	77.3811576265824	26.5	63.44	75.23
19.0087016860058	62.5810116393133	75.9117693119317	21.99	57.15	79.17
17.5717964434714	61.1398614650702	73.8109348346657	12.14	56.76	74.37
18.4644719132188	61.6836741490083	72.3176516894471	13.36	65	72.75
21.6043766109722	63.5965190781916	67.0651455815569	26.15	61.96	69.66
21.6043766109722	63.5965190781916	67.0651455815569	27.62	60.61	68.71
21.9285786771262	63.7940210817802	66.5228226263538	23.47	70.49	67.86
22.337468285345	63.6302711616905	65.5583056323283	27.28	65.47	69.94
22.337468285345	63.6302711616905	65.5583056323283	25.84	61.09	65.42
22.337468285345	63.6302711616905	65.5583056323283	25.86	63.85	60.16
27.3411452880906	61.6267290764506	53.7458396083674	23.78	67.37	54.34
27.3411452880906	61.6267290764506	53.7458396083674	21.39	62.71	50.33
28.1826117592545	61.2897665702296	51.7616272249902	30.36	58.14	54.2
29.2406190423961	60.8662149613235	49.2639224703189	30.85	54.39	47.15
29.5423094847401	62.4105651967492	48.0719141156498	35.37	65.99	46.58
28.5768277180817	62.5250377817341	47.7387531506496	28.77	62.05	46.68
27.6141681919047	62.6391735589714	47.4065647959571	28.86	67.84	42.89
23.0414767688345	62.2963968994199	46.6472278568855	20.35	68.75	46.32
19.7700271689887	59.3762677159466	46.0558387446917	19.65	58.2	51.17
19.7700271689887	59.3762677159466	46.0558387446917	22.51	60.15	43.07
19.7700271689887	59.3762677159466	46.0558387446917	23.5	55.84	45.92
8.21646144086803	49.0635324228571	43.9673504929737	2.56999999999999	49.67	48.06
8.26790697470005	40.6459854715906	36.3124106229545	3.20999999999999	36.35	38.54
Route: 4 Length: 247.928913956741 Demand Met: 1243					
30.4616761255705	19.940979217671	10.2423164957881	27.74	25.63	13.28
49.324394397747	13.6561346652002	33.0836822190381	51.86	7.7	30.42
49.4825543613384	13.6530756544206	33.3309242437647	53.85	15.08	32.9
49.6257343462117	13.6503043050893	33.5547761725344	44.72	11.87	38.22
53.0433355081561	14.0103894327735	36.0927422862959	55.4	11.17	38.22
55.0575071656575	14.2225703833168	37.5885214127356	56.38	14.32	39.64
56.6871947943168	14.3942415881522	38.7987792826914	56.31	21.31	38.26
60.5120568996077	14.7970854801996	41.6391961238144	66.87	17.1	39.83
58.6691380434822	12.8287356178983	47.3651572554392	51.98	10.99	46.43
59.4521842357255	11.9538681982019	51.9373633450747	64.87	11.36	51.75
60.0198703244502	11.3195871164382	55.2522348976065	56.94	12.18	54.17
60.7776946996909	10.4728550588396	59.6773717099103	56.85	15.49	62.45
60.8114942513084	10.4351326973684	59.8747978469191	55.38	10.13	64.28
62.9799700331004	10.0998372039824	60.7035848728538	60.89	11.99	66.92
65.1527941634349	9.76414435495031	61.5342686000912	67	3.94	64.95
70.9308107084263	16.4951530974654	60.0130376351002	73.63	17.07	53.58
71.6312698617879	18.1519219617009	61.700800993226	77.94	16.73	64.38
67.5193576667159	26.5694219641734	65.6910616347396	71.33	32.23	64.13
63.0341777199223	27.9333756914795	68.8023237607611	61.27	24.41	67.08
57.2169449604673	29.7024315286844	72.8376112285499	58.02	32.46	71.61
49.2188868489386	32.13472217047	78.3856933569631	45.57	28.26	77.82
47.082509648442	32.7843368081809	79.8675998442085	41.47	31.69	75.83

Solution x	Solution y	Solution z	Original x	Original y	Original z
42.0121241044332	37.651236453274	92.7994188503082	40	38.77	99.41
42.01212488445	37.6512366390513	92.7994148774309	47.34	38.25	97.3
42.2823081470701	37.7102930374258	89.314350314997	43.96	42.1	91.03
42.7753925187421	37.8180193515794	82.9542546538442	43.21	42.61	80.16
42.9624345325118	37.8589074876285	80.5417232984855	42.62	44.81	79.79
43.2772055268557	37.0758335757753	77.1084742420966	41.97	43.22	75.7
43.6665991333149	36.1071236034873	72.8613812551368	44.15	32.64	73.77
44.0734224964614	35.0950780549041	68.4241987508936	45.42	39.91	67.31
44.4567732829621	34.1413858880786	64.2429440937441	42.69	39.78	60.49
46.0947456699089	29.3238110683475	60.1335966363467	49.85	30.56	58.41
47.2540938449912	25.9139251255121	57.2250578661736	53.73	28.37	56.21
48.0055954646326	21.4424787216686	53.7380442845689	52.03	16.04	55.64
47.481179655576	21.4544551873676	52.722340350502	52.12	16.84	52.03
43.2865670341983	21.5501760603664	44.5978028167583	45.63	23.76	45.59
31.5754237641851	21.817124084843	21.9146813348665	25.65	24.53	24.47
28.0204489737838	21.3798589886691	12.2075450010367	23.55	20.83	14.19
Route: 5 Length: 280.42531568309 Demand Met: 1279					
16.5216536791514	48.3490225083369	27.1566447177129	15.54	52.83	23.01
14.3290709322386	56.9335734392369	35.6292598373872	11.18	57.92	34.05
12.2296709309735	65.1535121331505	43.7416318458311	11.74	69.17	44.25
11.5725279640956	67.7263182633521	46.280590164746	8.67	72.77	42.39
11.461935841789	70.3809747795739	52.0184032274742	8.95	75.43	49.37
11.2916081217341	74.4648544931465	60.845394855308	16.99	78.36	62.01
7.21140313198555	74.5140201623369	66.0047046227566	0.909999999999997	72.43	63.78
7.0670017008897	74.9198302655471	68.0896657687358	3.44	75.58	64.88
6.81298614778743	75.6334176113474	71.7553743883367	2.98999999999999	72.09	73.38
6.64477140650426	76.1061071130035	74.1838299641585	6.36	80.44	74.53
6.50698153642557	76.4933851510245	76.1735728283368	6.62000000000001	72.96	75.87
6.3555415733809	76.919016637726	78.360321827234	5.06999999999999	73.15	76.92
6.15123961711448	77.4931310338548	81.3096865575943	8.06	78.36	80.59
5.93544838201139	78.0995725806116	84.4250003683195	11.23	82.6	85.27
5.2739548304543	78.0008166702942	86.1675253283033	8.28999999999999	81.45	86.91
4.58466503006026	77.8979281372727	87.9832806959648	10.66	76.44	91.14
3.81038962094961	77.8964215449435	89.0980949631256	4.75	76.37	88.59
3.00655027160731	77.894861037309	90.2554747963963	0.969999999999999	75.78	96.61
2.8850796267657	79.5719679252627	87.7108249848506	0.760000000000005	80.97	91.36
2.64256679539787	82.92002346923	82.6305513782439	1.36	82.41	81.26
2.44704041043921	85.6193477392435	78.534776974479	1.20999999999999	81.97	77.86
1.97802470032796	92.0940126316991	68.7096824539804	1.23999999999999	99.01	69.5
2.17240694168467	90.8874099675116	65.4478102986201	1.01000000000001	87.83	68.27
2.49433526321562	88.8893587263315	60.0459810312504	2.19	82.13	61.84
3.0923882560631	87.3096717909046	50.829574666734	9.41	84.38	51.54
3.13308700672449	86.8396937028158	47.618712016614	4.8	88.51	50.28
3.21567791385809	85.8852051600303	41.097265185951	2.01000000000001	79.01	40.57
4.07773406629974	88.6433937550573	31.5570516135464	0.620000000000005	84.95	30.66
5.85485369642385	94.3294618385343	11.8888989239392	5.54000000000001	99.29	6.96
7.77873678612781	83.2016831667188	14.9622028554191	8.59999999999999	80.56	11.38
8.54891304541113	78.7471951852365	16.1925474367084	12.07	80.14	22.08
8.71696767685657	75.3518741233395	16.4317742736549	4.15000000000001	75.92	20.91
9.04108191304718	68.8037678876653	16.893332203838	4.20999999999999	66.53	21.42
14.2203179530173	60.9216838901017	13.2176971109034	20.56	61.44	16.14
14.380754200597	58.3668728722782	11.4169329028606	16.79	62.67	10.23
14.8350143128244	51.1343287275285	6.31915027295667	11.46	53.07	0.5
Route: 6 Length: 266.76464504984 Demand Met: 1279					
55.1598714761348	10.0687409683284	18.7792174470081	55.5	8.86	22.02
63.4513382407928	7.24596578940605	23.7050969906853	64.3	1.03	20.6
85.0413595918217	5.98175942497923	40.2380323444532	86.71	7.9	46.76
85.0413595918217	5.98175942497923	40.2380323444532	90.71	5.35	36.18
85.0413595918217	5.98175942497923	40.2380323444532	85.18	6.81	41.52
85.0413595918217	5.98175942497923	40.2380323444532	83.08	6.85	43.86
85.0413595918217	5.98175942497923	40.2380323444532	86.46	7.15	36.07
85.8913140272269	5.95523884404219	55.8397411965249	83.5	4.83	59.12
85.8913140272269	5.95523884404219	55.8397411965249	83.98	4.24	58.09
85.8913140272269	5.95523884404219	55.8397411965249	83.63	6.61	58.86
85.8913140272269	5.95523884404219	55.8397411965249	83.08	5.9	51.4
86.4911865105016	5.93662265688299	66.8449754702405	90.45	0.18	67.28
86.4911865105016	5.93662265688299	66.8449754702405	90.14	0.74	66.47
86.1486495750349	6.94233567806426	73.3202135216206	84.21	1.15	74
86.1486495750349	6.94233567806426	73.3202135216206	84.57	2.19	72.59
85.4567775678134	8.97596173030237	86.406620197847	88.21	3.61	89.96
85.4567775678134	8.97596173030237	86.406620197847	87.06	2.89	85.23
85.4567775678134	8.97596173030237	86.406620197847	86.49	3.97	82.84
82.4377698007767	15.319574187657	91.9316578925972	85.76	19.27	96.66
62.3339821703671	14.6434858200401	86.2808359365117	63.35	21.49	87.32
62.3339821703671	14.6434858200401	86.2808359365117	62.16	16.88	79.65
58.8027662273579	13.8592961979869	87.1262113804331	57.66	15.51	81.33
51.7287388130417	12.2878115625616	88.8195498045169	50.3	13.28	95.6
51.7287388130417	12.2878115625616	88.8195498045169	54.5	15.91	93.18
50.9616981099131	11.9785390463086	88.3192370927221	45.09	11.7	92.12
50.9616981099131	11.9785390463086	88.3192370927221	55.24	13.37	88.36

Solution x	Solution y	Solution z	Original x	Original y	Original z
50.3009059551604	10.4789283241477	83.3849205357692	48	4	84.7
50.3009059551604	10.4789283241477	83.3849205357692	50.97	4.59	83.57
50.3009059551604	10.4789283241477	83.3849205357692	46.38	12.31	81.64
50.3009059551604	10.4789283241477	83.3849205357692	50.52	8.68	79.3
50.3009059551604	10.4789283241477	83.3849205357692	45.57	12.76	80.46
49.9362820594692	10.0627616574909	74.5993353277446	52.96	3.75	74.52
49.9362820594692	10.0627616574909	74.5993353277446	52.67	4.65	71.84
49.3843040280754	10.1971767361258	67.0121873972474	53.87	15.51	67.82
49.3843040280754	10.1971767361258	67.0121873972474	51.38	10.51	60.31
48.8103659900404	9.78112123303093	65.1745202311358	43.23	11.54	68.02
46.7797199339825	8.30747913332632	58.6685762885994	52.67	8.88	54.93
42.6985919254842	6.8256314534593	54.6302941205539	44.53	2.72	56.05
35.9097679122169	4.36068394495652	47.9132407253093	31.22	0.18	51
35.2793627909248	4.63931507791369	45.705465272714	41.49	2.29	43.49
22.4804800563501	10.203696096496	6.54225754577693	19.48	4.75	3.34
Route: 7 Length: 144.818041986117 Demand Met: 744					
38.8038160738429	38.6418195440296	4.05792846050106	42.59	39.16	5.9
42.5383710882545	43.0028187375111	5.05147062977164	45.71	40.8	10.89
43.4904667623032	44.7996890917515	4.72546819171695	45.6	41.81	1.51
44.5104718059617	46.7246843349775	4.37626767686008	51.12	47.54	2.22
38.2587217668336	53.8455178223184	6.34537735041425	37.85	53.76	4.29
31.4715890178098	61.576131092401	8.48316956519934	27.4	59.84	3.43
28.968711150181	64.4271301824645	9.27164346850878	24.47	65.24	5.9
27.6938223805876	65.8793410229284	9.67328098459152	25.62	68.98	3.75
27.4741839525376	66.0933314331818	10.0650002049363	27.36	59.94	13.4
27.1476448605458	66.4176032833633	10.6442962468972	20.64	65	8.49
26.7445422777652	67.0688538052229	11.79571687321	22.65	62.2	11.71
26.1356401264725	68.0526122861968	13.535026919565	27.64	62.78	13.86
24.8258268059722	70.1687811670623	17.2763847661279	19.86	66.11	18.19
23.8697885159267	71.7133959890907	20.0072785240726	21.1	78.12	20.54
25.2928541311422	66.9063899120439	25.5207278334472	31.99	67.74	24.97
25.7899122266036	65.2271456830884	27.4467528713645	24.49	66.27	29.11
26.2761077267073	63.584622635874	29.3306439650255	23.19	66.22	32.78
26.2761077267073	63.584622635874	29.3306439650255	22.17	64.94	33.7
26.5456879877067	62.6739686780807	30.3751037761278	25.01	63.12	37.19
26.6438439467553	62.5224754761381	30.2706242828167	25.24	60.77	36.77
37.7673009583672	45.3549680247546	18.427260951569	42.95	44.74	22.67
38.6058850577082	44.0606319645629	17.5343221511252	45.6	43.93	17.79
37.6605686541432	42.6020178015095	16.4333685759332	43.21	42.35	12.25
Route: 8 Length: 236.444940892237 Demand Met: 1098					
47.8116547798438	21.2582961270624	4.48076757221111	48.26	14.58	6.53
51.6916470941075	22.0874209137364	4.97366475059079	54.15	15.54	5.27
62.0489403584464	27.9848947848514	6.29802041559034	63.88	23.81	11.61
72.1903179303634	34.049625842141	7.31239313984951	75.98	28.26	8.37
77.6332495616351	38.135979076146	7.78690783445478	74.93	38.63	8.7
87.9515659712271	45.8826112568126	8.68646226517468	92.92	45.3	3.79
88.250623701558	47.395103902894	10.3042858909814	89.33	46.23	11.31
88.5456619800865	48.8872320156033	11.9003316005509	87.92	47.46	7.48
89.0966548398535	51.6736209675592	14.8807682142795	90.65	58.26	13.09
88.6197954428421	50.305341027862	20.6845989169959	91.08	56.32	19.58
88.6197954428421	50.305341027862	20.6845989169959	90.93	51.78	26.41
88.4459245337191	49.8065991029333	22.7997304452621	89.11	45.94	22.79
88.2859445121933	49.3476947189131	24.7459775596019	86.88	55.34	28.08
88.2859442488355	49.3476811624516	24.7459961181979	85.21	44.35	20.93
88.8554012572089	46.9986106343117	30.5912061039274	85.02	48.75	32.58
89.300453932935	45.1632643559976	35.158056949953	92.82	43.5	36.14
89.6018766755131	43.9203936320499	38.2507019214919	84.47	44.91	39.53
89.87108056615	42.8106194449218	41.0122064501846	87.56	46.99	46.13
91.5339415056654	38.8672444104443	42.3775846458872	98.41	37.64	42.84
83.5588927054927	30.8525329574233	45.0853109103486	79.79	30.32	50.96
83.2552441282084	22.4314017362012	33.7225406865015	78.01	26.19	31.01
83.0969064479831	12.9564176623468	21.203170013711	84.85	7.49	23.97
83.0618257428476	10.8673235268344	18.4428322413705	84.22	4.25	20.41
83.0165310512035	10.8849878004341	18.0822033133464	78.41	15.88	16.4
85.6743582379552	7.33081305199717	11.7062627638607	91.86	5.09	13.18
85.9446600175807	6.96947046473479	11.058127059414	89.81	1.33	12.56
85.8008886321512	7.25527502069412	9.26852583826968	85.34	3.13	7.91
85.6671458535197	7.52114263467897	7.60375735311627	90.79	7.27	2.84
76.2662991117873	9.47269588067225	6.05669122302896	76.81	16.4	5.21
56.5418822265289	7.83964752578099	3.57345249031241	56.26	10.34	5.55
56.5418822265289	7.83964752578099	3.57345249031241	54.22	8.18	8.6
51.2478909953015	7.40131196198456	2.90689644383038	50.21	0.82	0.76
48.3065500061555	8.72593864235484	3.02342437551343	47.45	7.49	9.86

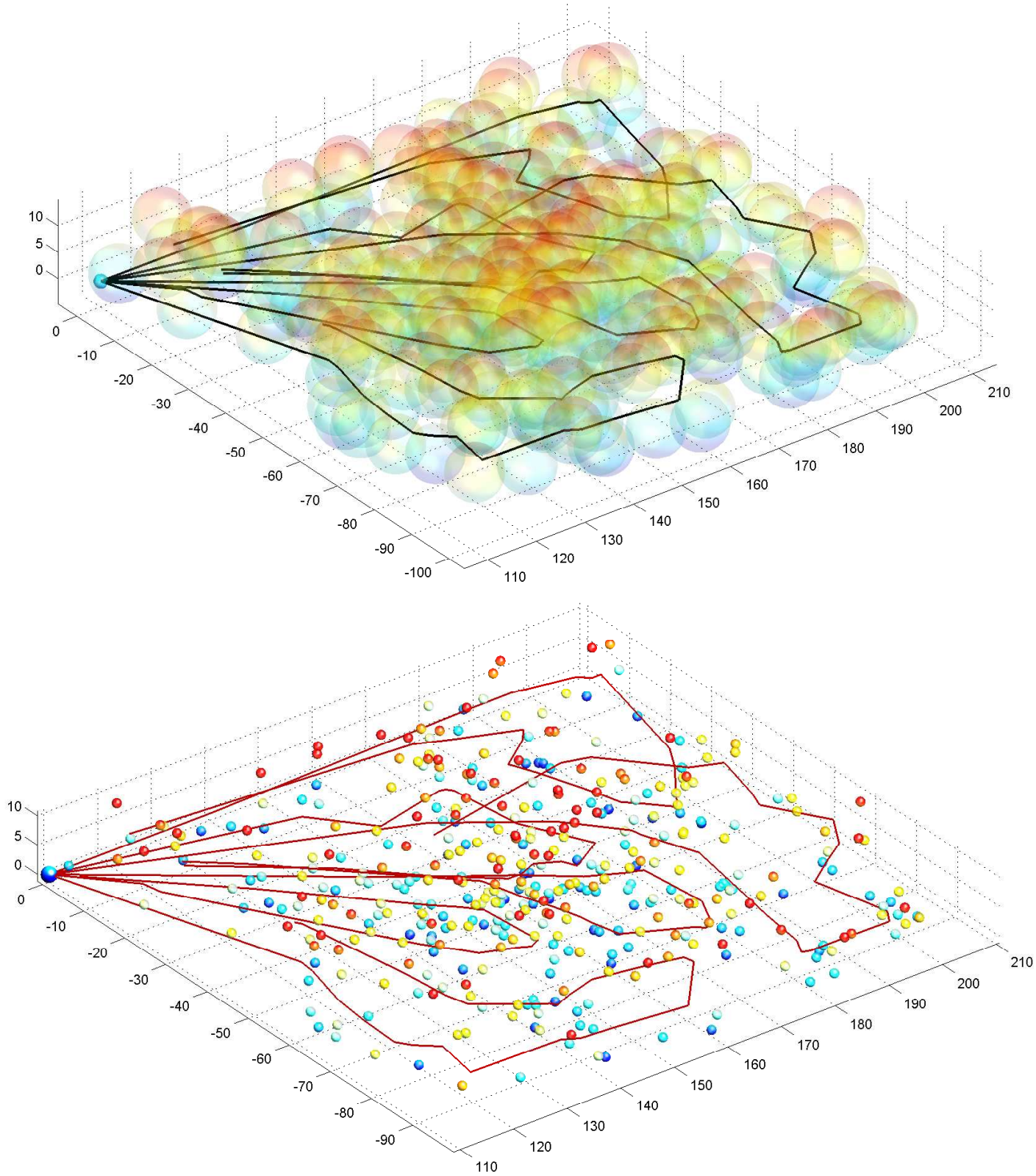


Figure O.66: *team*4_400, Equal Radius, 3D, Euclidean, Length = 1401.1221480

Table O-69: Solution for *team*4_400, Equal Radius, 3D, Euclidean

Total distance: 1401.12214800013 Total demand met: 2245 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 162.891118487373 Demand Met: 375					
3.74539935960546	14.1315562338934	3.84609370292118	2.12502499999999	13.8908	8.215003
4.49225748103773	16.9495215741856	4.61306859957467	5.29819999999999	16.16745	9.485319
5.1956679809156	20.3573703095309	4.53785791602276	0.610974999999996	22.331075	4.829551
10.258327685688	27.6679805844327	4.13772525007285	14.358825	25.883825	4.414924
11.6823234521837	29.7242427989088	4.02516400039912	15.2685	27.387025	1.441223
14.8917969633036	35.268693140451	4.05001131973936	18.476575	32.50015	2.42942
14.8917969633036	35.268693140451	4.05001131973936	18.77905	36.01655	4.45503
22.8610461716285	49.0362329936394	4.1118245551614	26.549225	47.5983	5.827804
22.8610461716285	49.0362329936394	4.1118245551614	21.4066	50.274675	5.660638
25.834138553243	54.1724851190796	4.13481635940194	29.2116	52.625	7.111098
25.834138553243	54.1724851190796	4.13481635940194	28.87265	55.2137	3.915468
26.5796864546473	55.4604735300387	4.14057813813066	30.1798	54.1346	0.93414
26.9367975344178	56.5171338837118	4.33190010442527	22.891175	56.122525	6.014662
27.6240492382135	58.5507107378375	4.70012878310642	30.732825	57.781	6.904491
28.1652491228235	60.1521380972182	4.99010822423192	30.688625	60.637275	0.70091
28.2483649343252	60.5140748915847	5.12838079047734	26.5978	58.30075	8.947543
28.2483649343252	60.5140748915847	5.12838079047734	32.800625	59.186225	6.71386
28.3796030297584	61.7253121796592	5.5277321183247	24.44465	63.1281	8.275156
30.7586407827978	64.4022426441124	5.24256828554398	28.20205	68.6988	5.301267
32.3747592142902	64.7825850942808	5.09852208304127	31.583525	68.6781	7.867205
36.8881697912926	65.8447902667636	4.69625633045841	37.615325	65.262725	9.608735
36.8881697912926	65.8447902667636	4.69625633045841	34.7277	67.482525	7.589491
39.1055563245498	66.3872394716104	4.36293622501542	39.430175	70.428325	1.436461
39.6761165134434	66.1946777339802	4.5184176483178	40.205375	70.4585	3.559151
40.4269113523542	65.9413345415039	4.7229641639779	41.683175	67.299925	9.367966
40.7208645635355	65.7330244778049	4.53961317951182	39.7753	66.19835	5.821872
40.7208645635355	65.7330244778049	4.53961317951182	42.3891	68.379025	5.906332
41.025835517246	65.5169100548357	4.349390148157	44.898775	67.784675	2.145396
40.915259139978	64.3344412827403	4.36513882225057	42.88515	65.09985	8.113938
40.915259139978	64.3344412827403	4.36513882225057	44.4217	64.703925	2.042243
40.6265275018677	61.2469480428909	4.40627005452663	39.243575	59.34405	2.988695
40.4471907931441	59.3292465566426	4.43181838560404	38.122975	58.912025	4.096565
40.2843104513183	57.5874956475774	4.45502348265759	40.468775	56.35765	3.688499
40.1442314761475	56.0895893249035	4.47498134223433	40.529725	53.231175	6.058478
40.1442314761475	56.0895893249035	4.47498134223433	40.703325	55.537825	6.299364
40.0601404473177	55.1904062236195	4.48696118323912	39.658325	53.39295	5.48876
39.9879675338607	54.4186617662833	4.49724319614272	41.89655	53.797625	8.251962
39.9237698315519	53.7321998570973	4.50638874931989	44.549375	51.8385	4.639375
39.638305427736	53.3821998331113	4.50537979557685	43.054225	52.07985	5.94327
39.3084894732118	52.9778212369354	4.50421361593563	41.3638	51.811825	0.610596
39.3084894732118	52.9778212369354	4.50421361593563	42.80595	50.969325	5.199786
38.881618332599	52.4544481367613	4.50270674151297	36.8297	55.690525	7.310631
37.628865113495	50.9184253382279	4.49825941817099	37.074525	51.14655	9.462196
36.7422615580803	49.8146060381124	4.40344616356295	37.32375	47.164775	1.301487
36.7422615580803	49.8146060381124	4.40344616356295	38.966475	52.166125	2.317575
35.666365476816	48.4751098709638	4.28836536178621	34.241775	45.041325	3.482667
35.666365476816	48.4751098709638	4.28836536178621	36.34605	45.558575	2.970524
35.2508258304314	47.957790619118	4.24393544796284	31.916925	49.63125	4.365548
35.2508258304314	47.957790619118	4.24393544796284	34.822	51.041775	1.965488
34.7400959881507	47.3219405171831	4.18932215878943	30.804475	50.3614	3.667235
34.1562419990028	46.5128311001359	4.12793794584336	31.24645	46.9846	0.258005
34.1562419990028	46.5128311001359	4.12793794584336	33.276075	49.648225	0.482877
29.6851985878605	40.3165736805533	3.65816422107888	31.8731	36.0461	3.846108
29.6851985878605	40.3165736805533	3.65816422107888	27.2689	42.18555	1.296271
29.6851985878605	40.3165736805533	3.65816422107888	27.251975	44.47235	3.840979
29.6851985878605	40.3165736805533	3.65816422107888	28.231575	43.86655	5.176578
24.1936677787954	32.7061228836786	3.08100374350809	22.793175	31.8095	6.267813
24.1936677787954	32.7061228836786	3.08100374350809	25.49855	33.45475	4.180424
21.0400454681333	28.3357448211416	2.74951381501028	19.9845	27.40155	0.660019
19.264765489312	25.8755260119345	2.56290100923817	20.686175	21.9667	1.804567
19.264765489312	25.8755260119345	2.56290100923817	20.995625	24.282225	3.380339
18.7053054721265	25.1002094369186	2.50409205291522	21.1268	22.989225	6.335554
2.78141819828953	3.73235220926536	0.372345637304797	2.34935	1.70725	1.418964
Route: 2 Length: 258.785821476636 Demand Met: 374					
12.7934284515812	0.948846606117023	0.634881232922547	12.34295	3.720825	3.558355
28.763827366299	2.13335367715997	1.42742783786501	25.090375	4.2535	0.574579
28.763827366299	2.13335367715997	1.42742783786501	28.471925	7.124375	1.494169
46.6133425750284	2.8752551288115	2.30379364654874	46.59205	4.24755	0.914106
69.8340101162389	3.84038013964769	3.44391226409344	69.817575	1.306825	4.894499
69.8340101162389	3.84038013964769	3.44391226409344	71.829525	5.85575	2.05089
76.3745324716945	4.11224590621949	3.7650410541532	77.335225	0.00945	1.073545
78.1915930949769	4.60516923132755	4.13018343288242	77.882675	4.11235	4.515775
80.0658802298992	5.11362031697782	4.5068240453792	79.6523	4.144625	8.31435
81.9023375228391	5.61181276787052	4.87584964311518	82.33615	2.420325	8.700274

Solution x	Solution y	Solution z	Original x	Original y	Original z
91.3730906364864	9.03432772312923	5.81504425512426	87.3023	11.937375	5.783418
91.3730906364864	9.03432772312923	5.81504425512426	94.09005	9.358875	9.999877
94.1050310442954	9.34844521048708	4.85477449884027	94.81355	7.137025	0.426722
95.2985061880472	9.98253393465769	5.3407423952425	99.82775	8.49955	3.828547
95.298507046717	9.9825349988846	5.34074317045423	98.6909	7.723575	8.237085
94.1873068927787	16.3443792778556	4.86758159063628	96.9141	16.74635	0.695888
91.5896137724946	27.7443237963216	4.91774490616905	95.640625	28.68455	2.397586
90.3746943593199	33.0757735523133	4.94123783153897	94.997925	34.851	5.629957
87.9776232688793	37.4117323643763	4.76949344686919	90.921925	35.308625	2.502062
87.9776232688793	37.4117323643763	4.76949344686919	92.049975	40.056175	5.962344
87.7437981756306	37.7374073015745	4.74398668590993	87.349525	37.1432	9.692858
87.7437981756306	37.7374073015745	4.74398668590993	85.82305	42.253575	5.699647
82.4856584148669	45.0872604203662	4.0195873610151	84.710775	44.260425	5.70064
82.4856584148669	45.0872604203662	4.0195873610151	83.835575	49.221375	2.182226
82.2938339134478	45.3553907388303	3.99316022476019	80.003925	44.278875	7.256115
82.2938339134478	45.3553907388303	3.99316022476019	82.166	45.384	5.835084
82.1110004430567	45.6109553589086	3.96797119600136	79.556325	49.1563	6.397826
82.2792742671458	45.381127547591	3.41522961706752	85.726975	46.8848	0.120938
81.12450982363	43.9991129015424	3.38314166883283	80.128375	42.2928	0.877447
81.12450982363	43.9991129015424	3.38314166883283	83.98185	43.958725	1.112514
79.7537559416052	42.3585959168291	3.34504805709266	77.736325	41.257125	4.306668
78.855337589933	41.2833755422813	3.32008223173721	82.455325	37.974875	2.274181
76.6636943373869	39.1276814512391	3.32950703158324	77.267275	35.3236	0.141297
75.7495012738984	39.1015345895982	3.96577999374055	74.4851	34.7013	1.961771
75.7495012738984	39.1015345895982	3.96577999374055	74.186175	37.664625	1.593253
74.4725095185078	39.0653767248543	4.85495089549347	76.5757	39.19325	8.28894
73.3027898166132	39.0322514121006	5.66942527690939	76.046775	40.829925	8.304908
71.7514439018702	38.9883287885314	6.7496238716883	69.4258	42.661825	9.2188
71.081969223442	36.0103229296892	6.54339563008407	72.419975	34.998125	8.679512
71.081969223442	36.0103229296892	6.54339563008407	75.0516	36.4713	6.125794
69.3668343702229	28.3814463788513	6.01499916340612	65.757275	28.49595	9.473031
69.3668343702229	28.3814463788513	6.01499916340612	67.6691	30.587025	1.957775
69.1473220706776	26.0019465446522	5.55092461346764	68.792375	27.90175	4.368368
68.8338371226594	22.6036943400206	4.88816686550235	64.881075	21.1972	7.607995
69.2942596887783	21.2835983683981	4.17470133821765	65.789175	19.559925	1.053267
75.0537408992981	17.1043563965707	4.2101255964783	75.3053	17.780525	0.662947
75.0537408992981	17.1043563965707	4.2101255964783	77.472675	18.057475	0.141489
75.33296539664	16.9017523868613	4.21183579357215	77.750225	18.79385	0.265085
76.8014189820364	15.2919565419452	4.81223500464722	81.52085	13.687775	5.204149
74.668929373643	14.9460261676675	5.09638491707098	76.1173	11.832075	5.793623
74.668929373643	14.9460261676675	5.09638491707098	77.464	15.628175	3.533669
65.5575270164161	13.4680865296217	6.31038746357123	64.181275	8.885925	4.857898
65.5575270164161	13.4680865296217	6.31038746357123	66.273425	16.5814	2.463993
65.5575270164161	13.4680865296217	6.31038746357123	68.784175	11.8632	9.776368
58.0032029424859	12.6887318694825	7.69198794605529	54.0981	10.209075	9.589747
58.0032029424859	12.6887318694825	7.69198794605529	53.686425	15.19815	7.953267
58.0032029424859	12.6887318694825	7.69198794605529	56.7601	13.3255	9.545614
58.0032029424859	12.6887318694825	7.69198794605529	56.680125	15.845675	6.62366
58.0032029424859	12.6887318694825	7.69198794605529	58.66755	14.455925	4.659081
58.0032029424859	12.6887318694825	7.69198794605529	58.962525	15.549225	6.884037
58.0032029424859	12.6887318694825	7.69198794605529	61.5062	10.2838	8.047741
58.0032029424859	12.6887318694825	7.69198794605529	62.944875	12.9098	8.420704
43.9260892050649	10.5610505325862	7.09842099621704	43.2503	8.7931	9.432262
43.9260892050649	10.5610505325862	7.09842099621704	44.6523	7.1683	9.495828
33.0313792376542	8.9144100605795	6.63901006902367	33.240325	8.160175	9.454403
18.6965160437503	6.74783927100017	6.03450644678156	16.533825	6.314025	5.413684
14.587549887124	6.12679728240799	5.86122999863197	13.011825	10.0758	8.49229
11.3669591844374	4.5887003968474	5.04811295219819	10.7326	2.49095	9.542224
Route: 3 Length: 182.436196389586 Demand Met: 373					
31.244708250366	10.3003248829631	1.92138531200196	32.636425	9.71905	0.854223
31.244708250366	10.3003248829631	1.92138531200196	32.5307	9.603625	5.102178
37.6801225634523	12.4219823193187	2.31712187756644	40.718225	8.45085	2.325605
39.5746079607323	15.2949921306387	2.51428791478942	40.4237	12.94705	3.760655
44.4664500413407	22.7134050261604	3.02337858558351	42.344525	27.231625	2.735005
48.7702604080488	22.2763458905992	3.53207181288005	47.99765	20.639375	7.512605
55.1401426664873	21.6294332412769	4.28506332932932	54.7913	22.79115	2.590985
55.1401426664873	21.6294332412769	4.28506332932932	56.707375	20.9848	8.081779
56.2167425336047	21.5201307106773	4.41234174797327	56.145325	18.970525	8.712859
56.2167425336047	21.5201307106773	4.41234174797327	56.46315	20.9863	9.377425
57.4135991958089	21.5664716431623	4.26214333979168	59.666825	17.15215	3.601254
58.1879401027857	22.5866272753292	4.24817160069455	62.8697	20.929125	3.670375
58.2905448329701	25.3766610007959	4.41369461426538	58.5251	25.335175	8.213376
58.3918410632045	28.1309796855929	4.57707411865347	56.18475	25.5187	0.990177
58.3918410632045	28.1309796855929	4.57707411865347	57.8987	27.066925	9.346556
58.3918410632045	28.1309796855929	4.57707411865347	59.25755	30.092125	1.789844
58.3918410632045	28.1309796855929	4.57707411865347	59.6161	30.5374	8.744708
58.6252654019348	34.4778476233503	4.95352478423198	59.92645	35.207	4.720771
58.6252654019348	34.4778476233503	4.95352478423198	60.313175	36.907775	7.157937
58.6831627884429	36.0520384186646	5.04687408080959	59.82755	37.21565	1.143092
58.7252575531521	37.1966767006411	5.11476001064703	54.125425	38.6935	6.380106

Solution x	Solution y	Solution z	Original x	Original y	Original z
58.7252575531521	37.1966767006411	5.11476001064703	55.894525	37.29925	9.136585
60.6713252137685	40.1249639673215	4.82381603445513	57.24125	42.40615	5.476964
60.6713252137685	40.1249639673215	4.82381603445513	58.980725	40.369175	5.096252
63.6792341204266	44.6510225167523	4.3740912495281	64.04505	44.910675	0.523975
65.5160353373942	47.4148632703362	4.09948250098383	70.163125	48.595475	2.681471
65.516035442604	47.414864065612	4.09948261501018	70.38585	48.289775	4.820236
61.7159811179957	49.7777710440366	4.17699224465045	61.491825	51.7088	3.765748
59.2405782108075	51.3170144608046	4.22744601841561	61.751375	53.5726	3.689653
59.2405782108075	51.3170144608046	4.22744601841561	60.964225	55.767775	5.605242
59.1407619036112	51.3791115977631	4.22946001442931	59.0369	52.162425	0.980631
59.1407619036112	51.3791115977631	4.22946001442931	59.205025	55.76	1.820366
58.6706532419154	51.243146296693	4.47228627862039	55.262125	52.9866	2.328913
58.6706532419154	51.243146296693	4.47228627862039	57.767975	55.4125	2.368927
57.7596604843689	50.9796588465499	4.9428732364368	54.870925	48.098925	4.394617
57.2117526288735	50.8211786412049	5.22593047072492	56.4549	49.1402	6.740043
56.7172542081189	50.6781459155516	5.48139701820197	56.7604	48.090675	9.498427
56.7172542081189	50.6781459155516	5.48139701820197	58.59885	48.807625	9.719414
52.0572712203501	50.0073672799514	6.4272834028286	52.0729	45.66175	8.843258
51.9341407250167	49.9896471609254	6.45229097895359	51.464375	46.273425	9.764247
51.9341263823879	49.9896518982263	6.45228794974847	50.9611	51.5263	9.096967
51.9341263823879	49.9896518982263	6.45228794974847	51.8225	53.851	9.626807
50.836105628969	49.9715056806336	5.94944298330463	50.075475	49.526025	6.785114
49.7909660398818	49.9542418253023	5.47080901240563	47.802925	54.5327	5.178486
49.7909660398818	49.9542418253023	5.47080901240563	51.731775	54.063975	3.386729
49.5123025467866	49.7708604147894	5.35114177843443	50.5204	51.7746	0.922891
49.5123025467866	49.7708604147894	5.35114177843443	52.703075	49.56845	2.111726
48.1449205678209	48.8709736672409	4.76465253720303	44.413025	51.821425	3.225875
48.1449205678209	48.8709736672409	4.76465253720303	47.81055	52.508825	5.320082
48.1449190722192	48.8709718299214	4.76465185530754	48.801425	47.111675	0.180447
48.1449190722192	48.8709718299214	4.76465185530754	51.332325	47.3944	1.206534
44.4300464310172	46.1861019994361	5.01143284635012	43.5222	45.0811	1.214529
44.4300464310172	46.1861019994361	5.01143284635012	43.10885	48.272275	1.575949
42.0106197570801	44.4374261407809	5.17237850482531	40.7628	47.39015	6.093812
39.0918324677478	42.3276432993198	5.36642828787782	35.77655	45.5234	7.314779
31.9367583240357	31.9595372574162	4.2361409821579	29.46595	31.229925	1.232208
31.9367583240357	31.9595372574162	4.2361409821579	32.29465	34.1886	4.533526
30.3013918668483	29.5896673261531	3.97782633859673	34.098725	26.483975	3.010898
27.0784505091158	26.4265823641111	3.74304437399733	28.216025	27.287675	5.4487
27.0784505091158	26.4265823641111	3.74304437399733	27.65685	28.081275	4.203862
14.3918974413399	13.9756262830006	2.81875065554815	17.13825	10.254625	1.09375
14.3918974413399	13.9756262830006	2.81875065554815	12.54795	14.295525	6.980367
14.3918974413399	13.9756262830006	2.81875065554815	14.259	13.428825	7.786985
Route: 4 Length: 212.161611716066 Demand Met: 373					
38.1381893778787	35.2427780085324	2.28249648063128	35.05695	38.887125	3.774047
39.1117222210123	35.9685327462132	2.29584508830404	36.0198	39.389875	2.90819
40.5918916302365	37.0719883212295	2.31613896408211	37.4906	38.735475	3.373994
40.5918916302365	37.0719883212295	2.31613896408211	39.47365	37.672175	3.042346
43.8914932064695	39.5318286869423	2.36149499677775	43.242475	40.8624	6.853519
45.5154496715688	40.7424951747907	2.38380041724655	45.015525	41.584025	2.803346
45.5154496715688	40.7424951747907	2.38380041724655	44.89855	41.381	7.163397
47.5519270821189	42.2607159405646	2.41182498673867	49.0937	40.0849	6.606023
52.0261588782446	45.5959879968825	2.4737738497079	55.460475	43.213925	0.442759
52.5742580926046	46.0045581898522	2.48136342928029	56.281125	43.406775	0.357518
54.6379699722223	50.7287804460114	3.80190433559074	54.099275	51.121125	0.198175
54.6379699722223	50.7287804460114	3.80190433559074	55.9361	51.897075	1.720125
56.870359131819	55.8389041842646	5.23028118790579	53.1029	58.71345	6.825055
59.3911535800901	57.4857693817428	5.40673707089113	56.708375	61.084725	7.280884
62.5303601837289	59.5373201181998	5.62655075716162	62.138225	61.218175	0.933898
62.7727775856139	59.6816191821088	5.67731738547807	61.732525	60.28975	3.358698
63.0199894857072	59.8287707386895	5.72908950970116	63.23165	61.378	8.16167
63.2509081003391	59.9662230212409	5.77745198750609	66.095725	55.876775	6.205798
63.8963002211172	60.5188257747373	5.9174557225227	67.662425	58.9604	5.24713
64.3139200065333	60.8763507770631	6.0080565763203	68.048425	58.486425	8.31929
64.4572574683469	61.404528657036	5.93018692031995	63.564825	58.6141	2.885043
64.4572574683469	61.404528657036	5.93018692031995	62.1796	60.091575	6.795975
65.0124357921329	63.4503043292901	5.62860662791418	68.033375	62.578975	2.177441
65.3043013924181	64.5256948233451	5.47003594142418	62.481725	64.778425	2.883198
65.6108575787802	65.6552278593803	5.30347847961398	67.8084	64.88	6.618444
65.9375813014461	66.8590459270803	5.12596661229682	61.692525	66.479075	4.622593
67.1210896671299	71.2197432521607	4.4831627584205	72.106325	71.513625	4.730422
66.1094622595785	73.8442019975829	3.99413581356679	63.9561	69.944325	5.325084
66.1094622595785	73.8442019975829	3.99413581356679	65.721375	76.70655	7.829144
65.9123033623747	74.3556258094394	3.89883411144923	67.97015	74.943825	1.28227
65.7225381863425	74.847877788386	3.80710330260126	67.096325	78.407125	5.545343
65.6168467478003	75.1220456876665	3.75601366404804	69.349625	77.516575	1.446757
63.3467716653731	77.2080945724419	3.95396049149417	64.2971	80.8087	0.617407
61.9647884492305	77.5944188689576	4.71723465530398	59.360575	77.3659	4.085186
61.9647884492305	77.5944188689576	4.71723465530398	63.106325	74.44845	6.994666
60.9163663966365	77.8874868448441	5.29628058479519	60.2356	81.956375	8.121308
58.5767963509227	75.536271022967	4.69067450493256	55.289875	75.9977	8.05121

Solution x	Solution y	Solution z	Original x	Original y	Original z
58.5767963509227	75.536271022967	4.69067450493256	60.77085	76.3761	8.633151
55.1863179148777	72.128802943043	3.81294934305729	53.249925	71.4317	1.507319
55.1863179148777	72.128802943043	3.81294934305729	52.726325	74.9715	6.042198
52.8793007593514	69.8102349391826	3.21568847128098	49.5023	72.1454	0.362105
52.5895559172461	69.0690707763984	3.29612445851497	50.03295	71.692275	1.548117
52.073795652684	67.7499357515289	3.43927771284292	55.5813	65.9389	1.049446
51.5573487139725	66.4290746771759	3.58260461745333	52.902425	64.80215	1.303032
51.0993441452775	65.257642629306	3.70971566135561	53.6353	62.58645	0.328338
49.9896004509374	64.0431815296406	4.4922877990861	53.3194	62.871025	8.033264
48.166813327755	62.3306673389329	5.4323049622898	45.884675	65.715725	8.319043
46.9383263406537	60.81646193602	5.9544668830324	43.7645	63.186425	9.005722
46.9082309509606	60.7406238794732	5.95676635022583	44.541975	62.0002	4.336081
46.9082309509606	60.7406238794732	5.95676635022583	46.228875	65.56925	6.129679
46.707656709446	60.2353109605702	5.97207918153816	50.342	58.1772	6.133715
46.707656709446	60.2353109605702	5.97207918153816	51.0767	59.931625	7.815468
46.0992201579525	58.7024888396529	6.0185498665918	42.114525	60.87195	6.966651
46.0992201579525	58.7024888396529	6.0185498665918	45.110025	59.219325	7.835164
44.9697384972566	55.8572804545957	6.10482526150089	41.323875	57.06515	2.903463
44.9697384972566	55.8572804545957	6.10482526150089	41.765825	57.606275	4.678763
44.5343348003254	54.6152737413941	6.18667054739594	46.119125	55.3112	3.945632
43.9620512779086	52.9828486325716	6.29424418592018	43.47965	52.4779	9.729662
43.9620512779086	52.9828486325716	6.29424418592018	45.616825	55.349625	8.112205
42.8554406224639	49.8265005097242	6.50227931399932	47.35915	48.071	7.780887
42.6576003012442	49.3978459125439	6.51972360903353	46.718325	46.79505	7.837302
38.4383818756487	44.4616795417795	6.27378972775459	38.0514	44.25295	8.429467
34.9821312202743	40.4181448416613	6.07230027420884	37.4986	37.94785	9.024015
32.6382847425595	37.6760290806331	5.93564724531993	31.7652	39.5927	8.134315
28.7752610174275	33.1566062253351	5.71043650554394	26.51415	33.575825	9.461971
28.7752610174275	33.1566062253351	5.71043650554394	30.2641	36.115	4.866777
19.5334595978642	22.3443260084805	5.17156380713072	20.9892	20.7572	9.683969
13.1833751920119	15.1422681653828	4.49582539781546	12.5519	14.734025	9.438961
Route: 5 Length: 266.507509360743 Demand Met: 375					
5.13002383251808	36.7286233101165	4.39981949699017	4.729125	38.22055	5.844342
6.53044844507913	46.7543936665563	5.60076386677897	8.7059	46.626875	9.397095
7.02166530373182	50.2711232626087	6.02204813672133	8.9679	51.422725	2.23495
7.24474493346392	51.868033969317	6.21335523668329	11.134375	51.580675	9.341968
7.17309026248542	53.1526023036213	6.16512908319916	9.352575	52.2461	8.408063
7.08320408450274	54.7641744251709	6.10463312572845	11.458875	55.406825	8.437123
6.6819679451681	57.1626134475041	5.87172664339504	10.71515	57.182775	5.281599
6.05375342977459	60.917895799497	5.50707628021014	2.20627500000001	60.72485	3.544594
5.70668629257941	62.9924924716175	5.30560017648824	2.404275	62.37445	1.602613
5.47756067064904	65.5863007166794	5.27997601608087	8.8531	66.09375	2.882202
5.28359109620321	67.7823883114423	5.258271015263	1.692025	67.9044	4.763979
5.12098500412243	69.6234170689583	5.24007308052555	0.331024999999997	69.303175	3.842333
4.76578225480462	77.7592503584502	5.26544170042609	0.00154999999999461	79.256375	5.511897
6.47830851400874	80.0066716561406	5.17931781141086	8.347775	79.0334	0.64524
8.99425354677395	83.9536930727514	5.88858318608181	13.92855	83.165725	6.067072
8.65691651498032	85.2214622486952	6.04902397557339	12.1212	83.525275	6.555356
6.22122176204003	94.3768668688609	7.2076797924018	2.307925	97.449675	7.701639
15.3363291713766	94.1430356561252	6.87077829758548	15.45105	94.471525	3.135131
21.2644304281204	93.9909405268973	6.65170446466355	22.27635	97.920025	9.573749
24.0622810129322	93.1586279636515	5.97893248416815	23.831575	88.204275	5.345531
27.0963370775453	93.9142745279128	5.47692129844153	26.6212	98.85125	4.844028
28.8307653429394	93.7629038627357	5.27217075606796	27.27955	90.9405	3.131217
32.323618547266	93.458243022047	4.85988067423811	32.22375	93.28635	0.1273
33.6175198309695	93.3452901758077	4.70701272438717	33.324025	88.862275	2.512368
40.5784846020251	93.6256008908876	4.32402035099019	40.290225	96.689525	2.280132
47.194786848419	93.8919781024385	3.96001610032941	48.99045	98.5583	3.927321
47.1947897903941	93.8919774606647	3.96001591169114	49.100125	97.070175	0.603113
52.3878724538093	88.4759570491179	7.1779211640194	56.428075	90.20545	9.562383
52.1187158764218	86.3854195021924	7.05864206093878	56.13655	83.451075	6.561985
52.1186590997866	86.3853926305649	7.05864474625837	54.01775	81.8894	8.14471
49.2833119481659	85.67104651169	7.03528956840188	49.4347	86.0537	7.963635
45.8634313207382	84.8094415192227	7.00711645896163	43.9034	88.387225	9.898098
44.2669345924255	83.7648306895882	6.53537023401344	42.31835	87.347525	7.738111
41.8086142780214	82.1562907167465	5.80896714726203	40.913925	82.729825	6.876661
39.4697222819802	80.6258748665795	5.11783884985475	40.4153	76.30845	7.455735
37.5328248814287	80.1927511389811	4.19767679445537	36.3513	83.686975	3.385766
35.9879658519908	79.8472999116747	3.46373435874242	36.110325	75.95995	0.32151
34.938880142231	80.3326050463705	3.55392692788187	35.60905	81.995775	1.580638
33.8895106009435	80.818047789064	3.64413664104061	31.60195	76.5275	2.478681
32.9128858033432	81.3581438744745	3.75068664741034	30.46345	78.65395	2.876347
32.1710850341564	81.7686081232072	3.83162431450969	29.23795	80.022375	0.178216
32.1710599505328	81.7686251491017	3.83162907755089	32.733925	86.47665	2.244896
30.8674972950018	81.5215605864932	4.37035676415809	30.896	84.86835	8.084952
28.3710415456398	80.467707263563	4.7543608563961	27.4824	83.15295	4.645899
25.5222356667396	79.2651053132944	5.19255994172683	24.1584	82.49565	6.916419
25.5222356667396	79.2651053132944	5.19255994172683	22.609375	83.218325	5.878629
25.4329815472443	79.2274999892841	5.206302053775	29.5312	77.759375	2.944562
22.2541177919736	77.8853921360345	5.69529248378527	22.467675	76.02705	4.2329

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.3040717477039	76.6399420983303	6.14907452989886	20.9401	75.2051	6.209147
19.3040717477039	76.6399420983303	6.14907452989886	16.4015	79.860725	3.65876
18.1804646387234	75.5310758688446	6.74105310565323	19.41455	76.0326	9.16761
16.9827773447393	74.3491294971309	7.3720252548638	13.11545	76.27845	9.886291
17.0480895343458	68.5338730934268	6.84960290641282	21.0091	68.35155	4.610936
17.077468007225	65.9270511940163	6.61547034887671	17.272875	64.973225	8.378801
17.101401940403	63.8069351217896	6.42507282581982	21.668825	63.73225	4.392072
17.101401940403	63.8069351217896	6.42507282581982	18.3822	65.772725	3.391578
17.0684143831685	63.4818454721292	6.4121263818819	12.50315	65.202575	6.796126
16.0273479563988	53.2358632974195	6.0053014726448	17.219275	51.795125	6.528901
15.5548767569154	48.5892504861589	5.82085227658446	13.3837	46.032275	5.26473
15.3898470419561	46.9670559170004	5.75652271313773	14.24105	46.110125	0.966331
15.3898238793516	46.9668313584235	5.75651623835825	19.028925	48.6519	8.742576
15.1164270757679	44.3756754494553	5.69529102049533	17.095675	43.177	5.934841
15.1164270757679	44.3756754494553	5.69529102049533	19.292975	43.870425	8.142944
14.8883545301623	42.2143086336071	5.64426034556559	19.322625	41.061025	7.646061
14.396437518998	40.8195614352388	5.45777463281387	15.806625	40.87695	9.361797
Route: 6 Length: 318.339890569728 Demand Met: 375					
34.7327185174939	22.9863017980469	4.87999983208066	33.989075	25.3104	7.891632
40.2588060466701	26.6434728202994	5.65639353010223	39.217825	28.48755	6.718496
45.4816465485027	30.0999447570174	6.39018414408664	43.312375	33.022625	9.818329
46.8898266130452	30.9157748969062	6.48858592330114	49.48335	26.949275	8.082485
46.8898266130452	30.9157748969062	6.48858592330114	48.825175	33.4678	4.421401
49.7691712757276	33.1436839918595	6.54521735671562	49.014675	34.9475	8.94848
52.1279537025832	34.968802249657	6.59160478468249	53.51985	31.610925	8.734185
61.8912338645143	42.5232610794757	6.783549893091	64.48255	39.62755	9.929967
62.4456561051271	43.05034502689	6.73249414449302	64.627025	39.598675	9.161247
63.8255872050753	44.3622276101776	6.60542086003104	60.81405	45.86495	6.053591
63.8255872050753	44.3622276101776	6.60542086003104	61.33205	47.81805	9.220678
64.8199696967154	45.0774514333891	6.41962760495185	63.06625	46.073225	9.963062
66.4893418144704	46.2781748949043	6.10772069097362	65.024675	48.473875	9.912197
70.8195560873951	49.3927765972691	5.29866448780066	74.018375	45.692475	4.261669
70.8195560873951	49.3927765972691	5.29866448780066	75.70595	48.354275	5.510084
71.1906847061754	51.0177219796987	5.18291050074166	70.20275	51.264575	0.287703
71.1906847061754	51.0177219796987	5.18291050074166	74.97575	51.8098	4.043794
72.3874792308185	55.6293240467088	5.52479495314419	75.12385	56.355025	6.655597
73.0425115089856	58.1533518242687	5.71191559780741	74.7548	56.66355	6.610021
73.9407129572027	61.6143837577935	5.96849865324095	78.897475	61.3791	6.581026
73.3098626575513	65.288180878895	6.04189795026899	73.97555	66.71955	2.504
73.3098626575513	65.288180878895	6.04189795026899	74.919425	66.332825	2.561604
73.0430943841187	66.8416502053866	6.07294009345516	75.320425	66.338125	2.101527
73.0430943841187	66.8416502053866	6.07294009345516	74.758025	68.76505	2.771423
72.7035920943215	68.8187060808535	6.11244173528493	76.3481	68.05155	4.299693
71.4144124672988	76.3264379642769	6.2624994180521	75.94035	77.0935	8.244154
70.8508181182788	79.4101746577015	6.30973396284484	71.96685	79.285825	7.324255
70.2525108610443	82.6838847507062	6.35988010457413	66.686275	83.4025	9.789982
71.6458595975017	88.4169137884527	4.01793000141749	75.589675	88.707575	0.958209
71.4952705346343	88.6769557012587	4.07403753886269	75.8385	89.39705	2.129044
69.0472592338507	92.9046534132806	4.98622336837566	66.508125	91.303225	8.984758
69.0472592338507	92.9046534132806	4.98622336837566	64.46975	94.91155	5.12346
69.0472592338507	92.9046534132806	4.98622336837566	72.88955	91.55335	2.086078
69.0472592338507	92.9046534132806	4.98622336837566	72.374675	95.981125	5.386278
70.1373617155869	93.7177499954943	5.22598001306122	67.679475	96.828325	2.179153
70.1373617155869	93.7177499954943	5.22598001306122	71.306475	97.9771	2.882666
73.4958807194936	95.3965717499722	6.43494180088054	72.222075	99.2555	9.348041
75.9504071136913	95.3418773795531	6.35732896646115	74.44305	98.0205	8.628544
82.6533179645661	95.1925160332459	6.1453895585909	84.730325	97.611875	9.216212
83.7366763316058	95.1683768013646	6.11113635041763	86.192975	99.203225	7.750239
85.3967391228467	92.8256262136718	5.09071051549313	84.25115	92.664475	5.874601
85.3967391228467	92.8256262136718	5.09071051549313	89.0595	90.291	3.16566
85.3967391228467	92.8256262136718	5.09071051549313	84.77555	95.283075	3.666391
85.3967391228467	92.8256262136718	5.09071051549313	84.9479	97.513325	6.355392
87.3758052489633	90.0326726126372	3.87419391525792	87.858275	88.334025	4.100051
87.3758052489633	90.0326726126372	3.87419391525792	90.195175	89.03695	6.180904
88.2542035698269	88.7930536889983	3.33425221976958	92.685275	90.310575	1.584168
87.8134048701197	84.6345860773453	3.00623109284458	92.480625	84.1266	1.286063
87.2057987398405	80.8971883308017	2.78667462072759	91.03755	80.9252	1.385966
86.0757798032623	73.9465700397849	2.37837011706989	82.150425	71.4598	0.532397
88.5457922949382	72.9130140521915	3.59125839922758	91.08095	71.69145	1.548548
89.6895884596534	72.4344784156967	4.15287511426988	91.5733	68.725	1.37953
89.6895884596534	72.4344784156967	4.15287511426988	90.314475	71.662575	4.957094
91.4272263040632	72.9314552425097	6.55543791089578	91.825175	77.123475	9.251483
92.1153956156032	71.6878822341841	6.74933983589266	90.725625	70.444425	7.760216
92.1153956156032	71.6878822341841	6.74933983589266	94.404	75.185075	7.131673
94.2232762589011	67.8788491954577	7.34325688246262	98.93765	68.322275	8.948906
92.5273611542136	62.731622432746	6.61132927587907	92.124775	61.791725	6.696503
91.2483823050545	58.849862628377	6.05935029733382	94.377175	57.5521	6.223661
90.087506652337	55.3265576969923	5.55834491482844	85.3769	55.416	3.88436
91.0601447842635	52.1644008806408	5.82576327760446	95.486225	52.746525	3.57388
91.6844077869047	45.6891690310847	7.02740623029445	94.807975	43.25145	7.382414

Solution x	Solution y	Solution z	Original x	Original y	Original z
91.7974281682587	44.5167517728188	7.24497718646148	95.9689	41.808	7.756384
88.4299553053232	43.4606505791338	7.43327324775766	86.306375	44.08645	5.63357
86.4669483061998	42.8450332958869	7.54303864012178	83.247325	46.458225	8.799584
79.4804956732746	28.1150791713098	5.01376174176597	83.1155	24.690275	4.773978
76.1577069932655	26.3442551144098	4.5452696784213	76.27055	23.463675	8.429053
75.519942647434	26.0043690671909	4.45535082265537	75.41995	23.365625	8.701179
75.2260723654762	25.9033381845329	4.32234518970706	76.538875	22.08605	1.37194
54.8180882085805	27.0464732786416	1.86024656511436	53.429725	29.230175	5.838259
53.7441864231852	27.1066147638963	1.73068896715997	52.727475	27.05645	3.021539
52.7115564912108	27.1644462377892	1.60611103725777	53.08505	32.116125	1.177184
50.8281184754053	27.2696389085421	1.37889766889643	49.821325	32.088775	0.505787

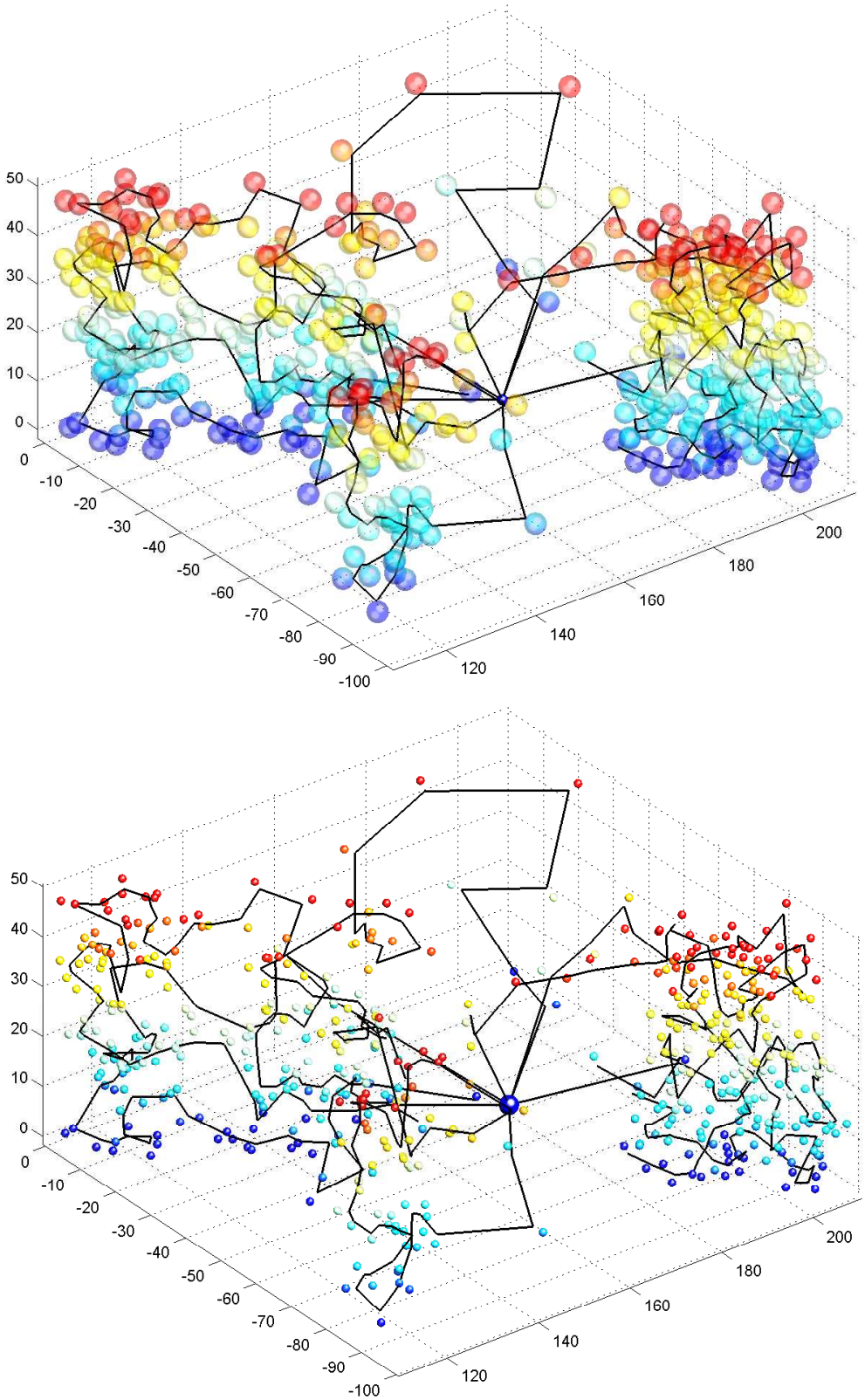


Figure O.67: *team*5_499, Equal Radius, 3D, Euclidean, Length = 2227.2851840

Table O-70: Solution for *team*5_499, Equal Radius, 3D, Euclidean

Total distance: 2227.2851839509 Total demand met: 9744 Depot: x 70 y 40 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 367.613688791598 Demand Met: 1580					
47.5683914104824	70.0271544824094	11.4807060353543	47.0351	69.5204	13.3405
38.4264529888801	87.999436886652	8.7040097844907	39.3354	89.658	8.0536
18.4813763859767	86.6313705553401	13.5577818861047	17.1642	87.7833	12.5892
17.4479464148271	84.6688148732661	15.7709597878947	17.8311	84.5721	16.3475
16.9759994626592	83.7723675268564	16.782138144066	17.8246	84.0918	18.5648
16.1001460406259	82.7766783221282	16.7976005547277	15.4215	81.5375	18.2132
15.5835349532334	83.090377791445	14.103020398577	13.6279	83.3943	14.3913
15.4081204191013	83.3268411617761	11.6460015757401	13.617	84.1913	11.8486
15.340131852777	83.4262981005772	10.5664779741086	17.0206	82.7787	9.6966
12.5525032371082	84.7894282446096	7.61434648167555	12.6448	83.0865	6.5696
11.2886774192495	85.5960442740978	6.40591415082193	10.8331	85.8288	6.1261
10.677054489393	85.9864348457917	5.8210753526746	11.6247	87.7046	5.4339
5.9368818573231	86.718555892596	2.56564071043063	5.387	87.7604	0.9494
3.58696928826687	82.9819361052874	6.25803138743727	2.625	81.2761	5.8521
4.25522760776498	84.4327983321878	9.43246675855238	3.3964	83.4982	10.9781
4.85004656852162	85.3010925311983	9.69969363619625	4.4842	86.5445	8.1765
7.92174207241759	87.952956833686	12.4804556213994	7.74030000000001	89.8119	11.7653
11.6805386598752	88.45178904685	16.6339371168892	13.2856	89.4879	17.2258
10.2963458838091	86.7893070773785	17.2273841714935	10.6041	85.0219	16.3433
9.73715397002876	86.8204925872661	17.7143548396265	9.9966	85.8576	17.8499
9.09896885084711	86.8560709989775	18.2701185690931	8.87560000000001	85.3213	18.2881
8.52417641751677	86.8880889659767	18.7706728295022	9.2565	85.6186	20.1316
4.9640850095435	87.8192398130758	20.6789520072367	5.1953	87.1361	22.5444
2.18157913039815	89.02524704902	20.6417106363969	1.0919	90.7016	20.5918
2.13671320093667	84.1635714818755	20.7845154431544	2.5389	82.9669	19.2333
1.64273450919409	83.5182528787817	22.6770521360614	0.247299999999996	82.0871	22.6092
2.80088059693816	84.4091903747086	26.8320040638533	2.0599	86.005	27.783
4.04855443697411	83.2138545815622	27.7194904432179	5.1015	81.8103	26.7596
4.22410042701026	83.6571323849719	30.4843605469937	6.0677	84.3942	30.725
2.18048108647194	83.5753965873196	35.6204108083756	1.19329999999999	81.8445	35.7922
1.47291270973221	86.9016357312392	41.9783503109713	1.5647	88.8122	41.3941
1.36058067869018	87.0193253091303	42.9454948958411	1.82250000000001	87.776	42.1327
0.994077673106162	87.403433128835	46.1017094741384	0.775099999999995	88.6342	47.6629
1.07933591223362	86.3126873807033	45.6922761864086	1.983	86.3665	46.2259
1.21719978565211	84.5497350659584	45.0305889943567	0.0289999999999964	82.9455	44.9095
2.67753874721086	84.9118533788525	44.6213167349316	2.696	85.7661	44.4643
4.01073409897894	85.2424543199851	44.2476697778576	5.09099999999999	83.7862	45.0917
6.71082874137261	87.4308322263207	42.4804878002866	7.6764	88.6806	43.7076
8.41018199330099	87.7294934630542	37.0756283497643	6.7503	86.812	36.4409
8.92832542604943	87.8483903375565	35.6906941479827	7.47969999999999	86.7529	34.8532
9.4854364442415	88.0586837479804	34.7103538915508	9.52200000000001	88.7288	32.8263
10.2130998760033	87.4118537309834	35.9848435505601	11.8372	87.4011	35.0448
13.5306844355593	84.46311703327	41.7953309890946	14.2245	83.0966	40.7659
14.3380702669382	83.7454321407724	43.2094714689157	15.9151	82.9337	42.2853
14.957050525458	82.9277140089618	45.9657515307464	16.072	81.5553	45.6344
15.0772506741476	82.7688525758287	46.5012827724062	13.8296	81.5783	47.5142
17.3492214320972	83.6499417337218	47.6346971755521	18.7876	82.3448	48.1119
17.8736070107803	87.4623287111495	48.3617518599938	17.0519	88.8308	49.5668
18.6370836594658	87.4456736198526	47.6426853579596	19.3715	86.9483	48.882
25.597181469324	87.2941405692421	41.0881431963522	26.3736	85.6358	40.2837
28.0981517627231	95.4988433700426	39.0985787622052	29.7505	96.621	38.9958
19.0835896251782	96.1268741248871	37.7567120936674	17.7167	97.5636	38.0165
18.9391881563777	90.3314731223462	35.7304372170315	19.5543	89.8549	35.5989
18.8914331429804	88.4133564602484	35.0598441532575	19.4915	88.9148	34.46
18.7908759178829	84.3780424836769	33.6490186002903	19.7188	83.0222	34.7895
16.2084923563271	82.3102432517462	28.6767856523786	14.2132	82.4414	28.7174
16.6264539475611	81.8346279146245	27.6617994491045	16.887	83.4344	26.4901
16.745965458153	81.5236737342991	27.4213224476663	16.2773	81.3093	25.7994
16.8015665360063	81.3789905062822	27.309428335081	16.4864	81.6235	25.3496
23.0630029770374	68.7504014485209	31.2235829334641	23.9463	67.9458	29.6197
24.8763139154669	61.1306776554873	41.1024667616895	25.0595	61.5431	43.0509
25.214398693405	49.0403827638864	34.3649258335655	24.5323	49.8988	32.6923
25.2580506396203	48.0851563967792	33.8880045643023	23.5397	47.0618	33.8948
26.2074042790144	47.509378147714	33.329837446883	27.0169	46.6583	34.9486
29.5654304338672	45.7390519486648	29.8067079728536	28.4876	46.0461	28.1502
32.802111641357	44.1988703325298	28.1828264825383	32.7117	42.3778	27.3609
34.922227498506	45.418541984542	28.1561820432025	35.3466	47.2689	27.5268
36.6789701033287	43.3341394125453	29.3367441194025	37.7223	44.0563	30.8827
37.7051810651596	38.7008174653065	28.5542295942191	36.9556	37.1182	29.5204
42.2143924520313	38.6475554821493	23.5023984332828	41.4412	38.9568	21.684
44.6626957467529	38.3073066974175	23.5439491623479	45.8348	38.3992	25.1619
44.6989288055784	38.2842817173364	23.4317047766432	44.3864	36.3116	23.5359
47.264301688353	38.2291208151589	16.1092718633134	47.3754	37.9401	16.076
48.8126820768024	38.1958141199815	11.689769532083	47.2998	37.9687	10.4015

Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 2 Length: 352.304898128413 Demand Met: 1478					
52.6119986395119	14.0120440577651	14.4881597110315	52.9148	12.3625	13.3985
43.9949580958846	10.6824133360111	25.4720154573221	43.1416	9.2079	26.5197
44.9784762485167	19.8364304642188	24.5252000951259	44.6412	21.1681	25.9788
45.4849879288454	20.2373170935211	22.9477365775956	47.312	20.115	22.1433
41.5287788659859	21.6851843253498	21.0029460883268	41.315	20.08	19.8292
37.6773323899399	23.7684177658104	19.537488256435	37.4163	24.6203	17.7469
34.5899211848362	23.5540192989525	22.8469157137805	35.5448	24.2684	24.4525
32.2668815694756	22.9908182212191	23.7065579494261	32.1965	21.571	25.1134
30.0786881038877	23.9440391003439	23.0555417187211	30.3241	25.8121	22.3846
26.9600472044042	23.1409622969116	22.9418801486313	27.0718	22.4926	21.0532
25.7071963525271	22.870608922944	23.0423822847952	24.5672	24.4137	22.4773
20.6018566473241	15.6218237019025	25.7077404984929	19.7672	14.9362	24.0245
20.2182339799119	14.9317825263842	26.5249176913528	19.0819	14.2893	25.2658
18.5153726754577	11.8689438952567	30.1519888975788	16.6256	12.3206	29.6782
17.7463325948881	10.3765447896587	31.9175943753977	17.3372	11.1211	33.7282
17.4931626139857	8.20468968247847	31.5468244774777	15.5961	8.5134	30.9972
17.3489901640621	6.89710277281617	31.3261652136287	18.047	6.7045	32.7171
17.1597406559822	5.18055261160292	31.0364941949805	18.6523	3.9117	30.6336
10.8408592007029	3.53724746346197	31.46912886047	10.6256	1.7583	32.3574
10.8408328091591	3.53724701880018	31.4691272228287	9.42529999999999	3.1222	32.8197
10.8409502629747	3.53844025583065	31.4646815540959	9.9632	1.8111	30.9688
11.1255228627378	5.36323132105719	25.6954970097225	10.526	3.779	24.6321
11.2934295958876	5.95642262099475	25.1196632002957	9.7281	5.4172	24.1163
11.4856784137574	6.63564066614417	24.4603075993725	10.2894	7.4847	25.4008
12.7132450569988	10.9721729007076	20.2505378148533	11.8636	12.6991	19.7066
13.7602344790833	10.2924092673722	19.8617459338345	12.8565	9.4609	19.9198
15.6268294642999	9.08056081583953	19.1685687817946	15.4595	7.4752	20.3496
16.9711873524602	8.69283229386866	18.3526355952938	18.8587	8.5087	18.9878
15.6019358362007	8.2675481209523	15.1294173730716	16.2452	9.322	13.5564
11.2615118355314	4.22208206168149	14.6550645540958	11.5168	3.287	14.9558
9.80369788394026	2.86354547465335	14.4959272639466	8.02670000000001	2.1019	15.008
13.828599330086	2.84226834180293	11.9570389657737	13.8628	4.3052	10.5937
14.5212273687202	2.38253165127305	11.9384125600098	13.7484	0.7577	11.0651
17.0979013404305	1.47629994361618	12.2053407326898	18.2952	1.0836	13.7585
17.3103643889167	1.35818719120545	10.0464945201714	19.0824	1.094	9.1576
14.8114047637584	1.61392030314086	8.52633660827754	14.8098	1.8409	8.2695
12.8655234855086	1.813060123716	7.34262401036216	13.2084	1.5682	5.3875
11.4473186402203	2.06521750918962	7.58462516062947	11.169	1.5527	6.9406
10.1700786623288	2.29232126059672	7.80256355543879	10.31	1.5005	9.6337
9.50422696946082	2.4190243328287	7.89608258502033	8.95990000000001	2.5066	9.8186
2.85027668338512	3.74199789525183	2.23282421505999	1.729	2.5191	1.116
2.87714671150091	5.14420587097423	2.413895368975	1.2522	5.4022	3.551
4.36153813910232	9.52171344215014	2.0307634001534	2.5621	10.2967	1.629
5.33773811275465	11.2565881801698	1.94172056865567	4.24299999999999	12.8676	1.4876
8.2775098354012	11.7283475314383	2.41375187366631	8.40090000000001	11.7989	4.4087
12.973966585121	12.4262063836107	0.996276113220131	14.7479	11.7757	0.3405
9.38382314956061	16.5310001634747	2.69062682780735	9.00749999999999	17.4052	0.9316
8.09368736207578	17.831944386989	4.0592735924646	8.65000000000001	19.7295	4.359
4.06555401795809	16.2356706243754	6.28470821276955	2.2625	16.1551	5.423
4.729431255232	15.2284096444869	9.64059040902325	3.5607	15.7968	11.1608
8.91277777218204	12.1918782465179	10.3771820922553	8.6382	10.3371	11.0732
11.3729123705708	12.9986184003505	9.87085873289874	11.3126	12.1774	8.305
14.0711651600792	13.8834438674084	9.31554028256316	15.3264	12.7877	8.2093
14.5844787724581	15.526197392757	10.0391585918348	14.5843	15.7568	10.6354
14.9122120477968	16.5750925049572	10.5012026202973	14.7151	17.4542	12.2868
16.8895694403525	17.8143824288719	6.33413159958441	15.9493	16.7531	4.9236
18.4370667053618	19.087967559494	5.25723768854078	19.5822	17.4941	4.8723
21.242236543289	21.7787274145345	3.24305342015704	20.9805	20.9752	1.6334
22.1698057051896	22.6684410133996	2.57703646806656	23.4201	21.9457	1.1934
22.1858654772103	23.4653855300694	2.76307325312143	21.8127	22.4456	3.4445
22.2562883125551	26.9582045892047	3.57842620907439	22.5985	27.2784	2.308
22.3185418301812	30.0461878853052	4.29930396752004	20.5677	31.0115	4.2467
26.9814517043576	33.2000782425605	5.7575883650559	27.0476	34.4285	7.3345
29.3120713469173	32.7670581547457	3.84383601480564	28.4031	32.2444	2.4033
29.7818731120373	32.6796640129176	3.45808878196463	30.555	31.3009	2.2328
30.3503890955628	35.9288285734222	4.59507650515878	29.5705	36.67	2.9094
31.0121147720075	39.5696852141576	5.92191693925849	32.6566	40.0511	6.9534
21.7336256053902	48.2763928320001	3.1244831998095	20.1897	48.2132	1.8547
22.5296997344519	50.0744264176514	4.71828810726602	22.4944	48.7727	6.2361
25.4074387997943	56.6839565441156	10.3370336213389	25.8602	58.6207	10.547
24.945544855178	50.1855030687377	13.5224042488589	25.2216	48.8368	12.0716
24.3796120220493	48.0736633103281	16.9197407699228	22.5313	48.1754	17.677
27.3194368978759	45.469862019976	19.322703747039	27.2789	43.4795	19.1307
30.7121172037843	47.6797258936359	22.5042224052401	32.0319	48.7602	21.6234
30.7904277983015	47.730734593076	22.5776570535957	31.0932	49.2942	23.7876
31.1843880606961	46.9351461363069	22.2339890048716	32.0569	46.2162	23.8838
31.6944123278631	45.5215383789731	20.9025759156929	30.9136	43.9894	21.9238
33.6949385005672	42.2299728496044	16.3001914123636	32.6554	40.5505	15.9859
37.2593992095013	42.8722752760735	13.2938830747753	36.302	43.7274	11.7602

Solution x	Solution y	Solution z	Original x	Original y	Original z
41.1781629988109	42.7791131782466	11.8100180373107	42.0622	41.0674	12.3472
45.3852504839499	46.4453055807805	8.27482177989827	44.7377	48.2657	7.7582
Route: 3 Length: 295.509676050457 Demand Met: 1596					
97.4307874870798	52.7685929940619	4.61760501304628	99.2739	52.0431	4.3408
91.319313977085	70.4248138414094	11.1896907259526	93.093	71.3467	11.2543
88.4728836351503	74.1867561167543	12.795535713949	89.4099	75.3847	11.7139
85.5434025229305	78.0583786727381	14.4482529648043	84.7658	77.8153	16.2748
85.1351265575963	79.5122620898396	13.6803414192692	83.5177	79.6473	12.5117
87.3610769565435	82.4543745327337	14.2467221167905	87.1273	84.0324	13.0404
88.2644609576087	82.5329643595631	15.1544921103258	87.5661	81.6563	15.3738
90.6338758404279	82.7390587252915	17.5354247542971	90.1019	83.486	18.038
92.710852764914	82.9197295065074	19.6225216593879	93.0738	84.8753	19.4127
95.2661517563968	82.3008143215028	22.4414437569391	94.7529	81.9671	23.1963
96.4756420310517	82.0078598036188	23.7757329266592	97.0965	81.0307	25.4066
96.7379682294061	83.5874255781478	22.1852218888183	96.8293	85.3988	23.0282
97.0429864523574	83.8751618948336	18.6189170968027	97.4362	85.8361	18.6294
97.2501691191095	83.4718145904835	14.461254745156	97.0848	81.6578	13.6354
98.0887658069516	88.5819727687949	10.7139938436879	99.7949	88.8243	9.6989
96.8287988483811	89.7459862555039	10.589702619471	96.671	90.7145	10.1968
96.2319840389601	90.2973060357976	10.530833425141	94.4375	89.8165	9.7901
96.4674338783495	91.3728587583423	10.8949540275308	94.8083	91.5304	12.0006
97.9485516406849	95.44675201782	11.9080079527681	98.1513	96.345	10.1326
98.3060147403281	96.3256983651471	12.7383096577962	99.292	98.0492	12.4987
98.0912478254523	96.0676608860289	13.2140580730364	96.6476	96.9796	12.6166
97.1735139632225	94.9650435947619	15.247009431362	97.9735	93.9042	14.8216
95.7947337767675	93.308596679623	18.3012641751932	95.3031	91.4204	17.8619
95.0824371494263	93.9254647461921	21.6135543098636	96.5452	93.172	22.7505
95.0824203103035	93.9254756423109	21.6135756012041	94.509	92.4532	22.8398
94.1301959608074	96.534931952565	22.2694950863125	93.4254	97.8126	20.9017
94.2464810681411	97.0413358214454	24.5280077541816	96.1791	97.5552	24.4974
94.1458993122557	97.1820792618925	25.3258111848742	93.255	98.1789	24.6576
93.9694001083959	97.4290772971463	26.7258302279396	93.3103	99.0843	27.6346
95.1341060613608	93.9542129115395	28.3598240070332	96.6676	92.6743	28.4611
91.5827867182094	94.5428557605668	29.602844906647	91.4519	94.5103	31.5983
89.5163135430533	94.9341476976894	28.5718806348634	89.0976	96.4455	27.3307
89.516302096883	94.9341380927902	28.5718836681479	88.2817	96.351	29.2562
89.0078504276313	93.7276563894999	28.6123023359166	88.2673	94.5543	28.7709
87.8593041714534	91.0024096454871	28.7034947721833	88.3919	89.421	29.806
86.9091733393498	91.1248511132664	27.8225493004074	88.0059	90.774	26.7084
85.6996475461993	91.2807158668811	26.7010821882959	85.3838	89.3565	26.2565
84.0546088484544	92.3322571500279	25.2405629667509	82.1226	91.9552	25.5944
84.1535781867991	92.6017714979935	24.9012991880721	83.1514	91.319	24.221
84.8408617562019	94.4735623220607	22.54502581286	84.785	93.3953	20.8615
85.4908602938036	97.0200173033431	21.8880867172496	86.994	98.105	22.6387
83.9208426712393	97.7083722450409	20.2435381322594	83.9295	97.9734	19.8967
82.8654961918916	98.1710727452226	19.138110648303	81.2522	99.2612	19.5952
83.2986931549102	97.5365643261508	17.0981174002021	84.3334	97.0716	17.1577
83.5769145588333	97.1290390258104	15.7879392498571	83.3686	96.8014	16.23
84.007504195509	96.4983416793234	13.760201972588	84.0572	98.2927	13.228
84.5487505289091	95.705504290013	11.2112941040781	83.6163	95.496	9.4544
88.1719584967802	95.1790290198171	12.8055116421037	88.3602	93.5594	13.9637
90.7140679856622	96.8801432800199	12.525676411392	90.6972	96.9626	11.6096
92.6150811745604	98.1522853133743	12.3164287911586	94.2258	98.7848	13.3192
92.238330527086	98.1936291065375	11.5806509961288	92.0809	99.3222	11.7562
91.8586907213242	98.2352959429764	10.8392377862602	90.7381	99.8897	10.9244
91.5234902126281	97.4701800359551	8.99439098020453	92.8113	98.2407	8.6156
90.9187611379482	96.089897641218	5.66633580895633	89.931	94.5372	6.4495
90.4007082848285	94.862384956711	2.41538573829956	89.3359	93.6392	1.2449
92.116833690542	96.4157525645854	2.53206411169454	92.093	98.3621	2.0725
94.6380913245567	94.5484215346964	3.66953069818982	95.4796	96.129	4.4906
95.0702580496618	94.2283108013183	3.86452852360089	96.0605	94.495	5.5816
95.5852666271425	92.0433331834923	1.80711615573585	96.809	92.5136	0.2967
94.493204663212	89.3480783059845	1.7971575415468	94.7976	88.4491	0.0367
92.8995435014792	87.37674255795	3.87874646924679	92.1839	88.8237	5.0595
90.6637090081142	83.1450003752757	6.64451766067518	90.3741	83.7882	8.516
89.8549424393414	80.7778251258968	6.58265777465209	89.4354	80.1567	8.4369
89.1788117372554	78.0317896998083	4.14625313068986	89.379	76.0987	3.6739
88.2755592090492	80.3541684534196	3.49580039719536	86.8222	80.0693	3.9589
87.6618471690039	81.932218130048	3.05379707615323	86.0867	81.533	3.6186
87.1575451482603	83.2289424936493	2.69059126787487	86.7862	83.711	0.7854
86.9620722213862	84.0402419084013	3.61972266319803	87.7484	83.7546	3.1863
86.4435379753996	86.192217719904	6.08416738989076	87.314	87.2617	7.5328
85.2541664077005	85.8836937856861	5.48014905541574	85.8335	84.6274	4.9143
84.0454639349441	85.5701840369566	4.86633081034224	84.2824	83.9445	3.7257
82.3327663231282	86.1382200344596	4.75320812817808	81.7913	86.2239	2.8298
77.9259631274932	87.7776172837639	8.03507058963779	77.1151	89.3423	7.0894
75.0534520299686	87.1130060485237	12.3006441403293	74.9451	88.4605	13.7746
72.8871425795945	83.3043368645068	12.3535911539096	71.008	83.9726	12.5028
72.7325353368223	82.3837209435786	12.3405043778985	72.6803	81.9225	14.2859
71.8200794180254	77.1435590311891	9.7470448825684	70.0314	77.1275	8.8524

Solution x	Solution y	Solution z	Original x	Original y	Original z
72.4622486910077	75.9038271496317	9.55948193141603	71.4242	75.4202	7.9198
74.3894641136494	72.9348474751532	9.58350008955708	73.5126	71.3248	10.3828
76.0177436123363	72.7043361686889	8.98050970522728	75.9291	73.9471	7.416
79.2928858899928	71.6153038179145	8.57990877066692	79.9937	73.4457	8.9779
83.5360376867075	70.0109046024858	8.01555450731259	85.22	71.0885	8.0711
82.7788377158871	58.2937190563584	6.15921905408006	84.5964	57.5663	6.5683
Route: 4 Length: 289.740483742001 Demand Met: 1367					
54.3799731163843	50.2361377387969	25.0734237279549	54.1532	48.4548	25.954
49.3604432724016	55.9459857308586	32.4822779390335	49.5234	55.0957	34.2852
45.3522340771317	62.3189950804074	32.8252373572625	44.1821	62.8241	31.2839
46.1284475495611	73.5708779376408	47.870946289572	44.9743	74.4953	49.2176
59.6384531314617	71.6847646654332	44.1124174489623	59.4827	70.1321	42.8614
63.4402936194649	72.3408655615529	44.0305030473924	63.7544	71.2264	45.6612
71.7065106591752	74.1908833352228	43.2596075464364	72.5026	72.4828	42.5897
74.4062468412201	76.2913374157281	43.4806532617457	73.5352	77.8165	42.524
76.0311112278867	77.1697536205923	43.7687739198366	76.8895	78.6378	42.7161
77.4735572912438	75.091369635541	47.4541096866281	76.1087	74.9228	48.9063
80.3043861993733	73.840248037685	48.1441763604911	81.6179	74.1421	49.6219
80.2827549075332	72.450706283683	46.3013441984154	78.8402	71.1237	45.9036
84.3966182716316	73.2056597425792	43.3714347645754	84.8025	72.2361	43.599
87.5255695884335	73.77996556888	41.1429293115346	89.2994	73.1482	41.8171
87.3989009038343	75.3661861512804	37.976496948214	89.0638	74.5581	37.2181
86.2583458545212	77.8902004580422	34.3291635478283	84.4928	76.9707	34.1362
85.6907704054371	79.8370264571264	31.7337229143535	84.0326	80.947	31.8699
86.202010741259	79.9629483421905	30.9023921157202	84.6626	79.7388	29.6454
87.1019935185768	80.1613262216737	30.0038483415704	87.485	79.3312	28.225
88.4660487058811	82.443958727074	31.6688657696676	90.256	83.0105	30.9795
87.1103646801864	84.6533015455588	35.3130320057907	85.9222	83.4369	36.366
87.274004834571	86.9003395312324	36.5793932885602	87.6085	88.0524	34.9791
87.274004834571	86.9003395312324	36.5793932885602	85.5459	86.1581	36.8243
87.3204548143884	88.3575649285308	37.9361310693942	88.5666	89.9178	38.0498
86.2565913887381	88.0163728925624	38.796823983608	87.3294	86.7915	39.9582
83.5916084988328	87.6378930420616	40.3368245760459	81.9044	86.793	39.6738
83.632895898517	87.732090941862	40.5520352929919	81.9035	87.9149	41.5399
85.0155369321635	88.3503819791788	41.6145459755603	85.4655	89.4614	40.2893
88.1612631820106	89.7570323130798	44.0322012010014	88.3323	91.5035	43.0727
88.3709003653776	89.812406646143	44.2183530721166	87.2864	89.2526	43.6381
88.726917657467	89.9064630067464	44.5344849317888	89.697	88.1654	44.368
90.7325739931866	91.3153064284216	46.7674050474086	89.5983	91.5249	48.4013
94.0766581659758	92.7133586428294	47.7522249838809	95.9324	92.1458	48.2362
90.5121055696731	97.8739336272756	47.0119703760847	89.983	98.6224	48.7896
90.003868343167	98.6180252855672	46.0174814490988	91.162	99.965	45.0985
83.5841054340173	97.8640278372147	44.0839589243672	82.0258	98.9707	44.6731
83.4624436841797	94.0040653272892	40.8913883753663	84.5701	92.5098	41.6265
82.291565384613	93.1579439917353	38.2379019745325	80.5965	92.0964	38.2365
83.1631743760997	93.6276212253097	36.422513835237	85.1326	93.3031	36.2953
80.8988406543721	95.5476238099257	32.136126811096	80.252	96.9762	30.8948
81.8189211962428	90.0453237328015	33.9688462944649	82.7904	89.3622	35.5781
80.9220166810708	89.1075582995093	32.5827795883895	80.026	88.4312	32.9439
80.3810255499982	88.5419028688214	31.7467827502767	80.4141	88.4668	31.9981
80.3810255499982	88.5419028688214	31.7467827502767	80.7173	88.9602	30.7691
79.8433295828525	87.9797170842729	30.9158881380974	81.0134	86.425	30.4534
77.6386557331139	87.8014685676059	29.2472570636368	76.9521	88.589	30.1519
73.9883817412917	87.5061942339097	26.4843192627689	72.5273	88.3137	27.5858
71.4480553045395	86.1795829869572	21.8880535566431	70.8501	86.3243	19.985
71.5076873482467	85.9203191322318	22.5171135931734	70.0787	86.0551	23.7512
71.5076873482467	85.9203191322318	22.5171135931734	72.3356	86.155	20.9164
72.172610751877	83.0269338828979	29.5363315966223	70.5598	83.7819	30.4468
73.5489011252165	81.2696186328224	31.9477890411293	73.6161	81.1388	33.9424
73.6498867240913	81.1503338802437	31.7206883271333	75.5773	80.7384	32.0605
73.2547909797027	80.5863413443104	30.0253123526426	73.1002	79.4037	30.5501
72.649702003059	79.7224371190662	27.4283386550598	70.8021	79.2974	26.7913
74.6479014671994	79.5510417561844	26.0381510026947	75.4182	80.175	27.0139
76.4154250523397	79.3994181326362	24.8083849786153	76.3867	80.9989	23.608
78.0709038152675	78.3812890783516	24.3258896881529	79.7296	78.3022	25.4406
77.422509711574	75.9019420043921	19.6279391550531	77.1908	76.3248	19.088
77.422509711574	75.9019420043921	19.6279391550531	79.3483	75.3688	19.5443
76.2321907042479	73.3407329036956	14.5416976196074	77.4087	74.0915	13.1093
76.2321029304764	73.3405580430211	14.5413747414859	76.1847	74.2911	12.7823
75.54701494873	70.2592580718844	14.8853104315195	75.6074	70.2776	13.8577
73.3870452800006	60.5459290413907	15.9695339536053	73.1545	60.0435	17.8914
Route: 5 Length: 334.219432567741 Demand Met: 1479					
49.2426192029403	32.7518802190208	4.03160057720868	48.8851	33.6728	5.7706
44.1326280706802	29.8975162457245	3.31594377550706	43.0635	31.4686	2.6925
38.4512887265992	24.7056869666645	2.96107291795287	37.9243	23.9119	1.2026
37.2835116215218	24.025865311966	5.02876811681298	38.8284	23.4703	6.171
33.7573776945935	23.242622672789	7.88893822748706	33.6715	23.2449	9.8871
30.1217344039456	22.359594230172	4.38152716674976	30.4469	21.4825	3.8833
28.8021420863534	22.0390747949413	3.10846549247059	28.392	21.3903	1.2616
26.8011958163474	24.0440503865006	7.76022689510932	27.7157	24.2487	8.5851

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.3101062039834	24.5360338424966	8.90175207693269	26.5855	26.5008	8.649
23.4215841274255	24.3251057993792	15.0814807750679	25.1657	24.0751	15.8892
20.0102745455182	24.0763307194854	22.3760326990361	20.1974	25.6106	23.6453
19.766838703697	23.6939675832428	22.4963633591424	20.821	23.0825	24.0822
16.4859214072547	20.420337631981	22.3710726655514	16.5052	19.9903	24.3242
14.6827457141231	18.7566075591992	21.7139866273545	15.42	17.0914	20.8872
13.9074223072274	18.7531221660967	21.7639137222195	13.9396	19.5452	20.1112
12.3447533881578	18.7461005290136	21.8645452889663	12.6858	19.6571	22.2672
9.2746907878694	18.7323176747856	22.0621956557853	9.20950000000001	19.5087	23.9042
5.48822618006857	18.4487141797982	21.6749453705589	5.3173	19.9696	21.9865
3.33107622860568	18.2871451760745	21.4543295745783	1.5116	19.0597	21.7588
3.80030677778215	17.6797978220655	21.1555326090849	2.785	16.9995	21.2146
4.39496097851013	16.9100942037674	20.776864865005	4.8686	17.5054	20.7421
5.1323620873936	15.9555788610712	20.3072914789985	6.693	16.2603	19.0942
4.09753635945376	12.7473290363073	21.395068786138	2.3396	12.8751	20.4499
4.06838912731929	12.6119086577638	21.448285156983	3.6086	13.0876	23.3357
3.39962805994593	7.08201005065996	21.6974931184239	5.20059999999999	6.8919	22.4547
3.23642504443937	5.72386340022394	21.7590972981592	3.9473	4.1638	20.7291
2.90153910273447	5.78440112995891	22.1747572070347	4.0211	5.0495	22.5141
2.30897516880509	5.89150783275662	22.910224012274	0.421099999999996	5.2548	22.7354
3.09849991065224	7.03102907130862	25.2315153952143	2.7247	6.6491	25.454
4.12521404587112	8.51293534937671	28.2502738976025	5.6246	7.277	28.7239
4.25115796532503	10.0973018320745	30.2439079444336	5.0355	11.9367	30.2057
3.43590086347173	9.20978036410016	31.8729131775533	2.67230000000001	10.4123	33.2768
3.26343334044429	6.13700970217074	32.3904538023115	1.4037	6.1535	31.8542
3.06196107510743	2.54214897623353	32.9960362652151	2.87569999999999	1.3778	31.3806
3.09737860690366	1.9432682443431	34.1292221715247	2.4773	0.052	34.3258
3.74530889353521	2.898643054942	35.5757299827367	3.8933	3.6617	34.8265
4.63012775099101	4.20334811440735	37.5511097027452	4.1027	5.9391	36.7092
4.76158339161992	4.37273335860822	37.8413167759144	3.9756	4.3104	38.409
4.88550842754486	4.53241733347612	38.1149058118087	5.6082	3.0104	39.1925
5.53598107294866	6.9178777516596	39.8776088703172	5.49809999999999	6.1028	41.7036
5.66297623584978	7.46324556989958	39.9946450692393	4.1301	7.1548	40.2018
5.96201891365257	8.74756725905284	40.270265222067	5.4781	9.3534	39.1694
6.17736608222964	9.67243859902972	40.4687425061711	8.098	10.1576	40.7441
3.89342583157047	12.0845738751608	40.7166655685778	2.4532	11.1564	41.7483
3.07103579741144	13.9327112401009	40.4557731875031	2.4914	14.471	42.2927
1.41880829706921	18.8169749288112	36.8352355303232	0.782799999999995	19.7397	35.1787
3.38827353782381	18.3815583567283	42.6299906581808	4.753	19.8404	42.7266
3.55846164358682	16.2495799310432	47.7917777763138	4.024	17.3232	48.8138
3.57234457021816	16.0756551305041	48.2129523944025	3.76260000000001	17.1174	49.9096
2.74248506502312	5.93705164242452	47.4640950097402	1.2192	5.9144	48.7598
2.63164378325368	3.3181516852163	47.1822572366788	1.2646	1.8964	47.5137
8.55845881952583	3.48376761287886	45.0055434264881	8.8668	5.4121	44.5737
10.8204770553411	2.31749981301392	44.3790392150279	11.5459	0.8736	43.2005
11.8345971548368	4.59105056414314	46.6532604111614	12.1595	5.1953	46.5778
12.2804901124455	5.59071960993983	47.6532887984945	12.5256	4.7007	49.4275
13.5402157683721	11.1954022373002	48.1136847346152	13.2666	12.9678	48.999
14.3530558137328	10.1886512048406	46.8869722724174	15.7685	10.3669	47.703
15.6567300731519	8.57391725833203	44.9193583898629	16.1355	6.6685	45.2938
16.2692704018114	9.82118519830906	42.3178233008603	18.0288	10.2093	41.4498
15.1028648442436	10.0359830811191	41.9174264455679	15.3812	8.8682	40.3179
13.90827561276	10.292576871751	41.5629216014283	12.9432	8.6486	42.1679
11.6587574464264	11.9139140881783	40.3472018690344	9.9074	11.0867	39.8487
12.6106626981316	16.9513438882682	39.6348252378011	12.3192	17.7013	37.8038
13.3477099269867	18.3947241083755	41.2796488625703	12.295	19.9912	41.8654
18.5795161196199	17.0020555018235	43.6171092342264	17.8934	15.1905	44.1135
18.8832431404263	16.9277062313113	43.7502150247179	19.3111	17.5672	45.5963
22.1683820968157	14.4056636601497	41.3624487020184	22.1476	14.8515	41.0167
28.1356668468927	9.82458902610909	37.025389675877	28.6149	8.2266	35.9223
30.0051299707393	15.6150822274355	40.1007576981925	30.7692	16.7931	38.6765
30.537333357558	20.393348987097	48.03574246906	29.6006	20.2054	49.7928
35.9335946235383	25.4100072670011	45.4363379850954	37.8149	25.869	45.9364
31.7016515739066	27.4498160972807	40.9619796138605	31.0534	27.3935	41.3669
29.3846281827142	28.5667281571437	38.5123122905335	28.8128	30.4765	38.3516
27.4614522164182	24.5161739652747	35.1262967549206	25.9644	23.203	35.3119
29.4937414016544	25.01534529032	32.9066593827384	29.0027	23.8765	31.3376
33.3670657165802	27.4764061788275	31.7978577401218	33.916	28.6484	33.3227
36.2950297490624	27.9860797916415	28.1999448945188	35.1494	28.8106	26.783
42.2662476286854	27.4379354194208	25.2414258906124	41.7938	26.8087	24.3703
46.9783753172895	27.005349581872	22.9067307432043	48.2875	25.5427	23.29
47.3320771359238	28.6304563867774	21.4572728364625	48.0614	30.3792	22.0976
46.7182637368071	28.2478007564663	18.4480231349504	45.5527	26.8832	17.5652
48.5867333416361	30.8137223781298	16.9916812797415	47.2249	31.4694	15.6819
49.5848241820782	31.6736428509457	16.693203920495	49.5874	32.9921	18.1971
Route: 6 Length: 273.122217132716 Demand Met: 1411					
79.0042907257287	40.2145140143384	22.5332367642092	78.1743	38.6355	23.4376
84.038901359425	43.8032813978214	28.4998811543108	84.8772	45.0654	27.1944
89.5035993365273	47.3221402306225	36.278707409529	91.1956	46.5873	37.0515
79.2325053039449	63.2982328133378	41.9120415557472	77.6803	63.0066	43.1391

Solution x	Solution y	Solution z	Original x	Original y	Original z
80.8608554410088	71.1759328207813	39.5734534941991	80.5183	71.0301	37.6084
81.5212355355454	73.6916877951018	39.7288810604632	82.7574	74.2926	38.276
81.2638347518099	74.4514403094146	40.4071651423486	79.4655	74.4467	41.2824
82.5179184105463	75.837659276855	40.8026047788234	82.0065	75.6791	41.5159
85.1888315906913	78.7899656654309	41.6447717808624	84.7887	79.7551	43.3502
87.9410729512486	79.9522799221178	40.0663279984942	89.7033	80.1502	39.6028
87.9410729512486	79.9522799221178	40.0663279984942	87.0156	79.966	38.2934
90.2421052661253	80.8809083064189	38.9922194211949	89.9071	81.4441	38.6007
92.3211671714262	81.7199592453992	38.0217226890174	92.5909	80.0433	37.2966
97.1346691940028	83.6628009051538	35.7749113086842	98.6006	82.3388	36.0882
98.3679458177248	86.3466883671002	34.0606053708828	99.0472	85.7396	32.4859
98.4917398031455	86.6160799299031	33.8885170148817	99.7041	87.1751	32.3993
95.3685485498358	88.2770102372086	37.4322102537554	94.4683	90.0421	37.16
94.7553552983215	86.6646188282677	40.0776880295445	92.7639	86.5161	40.1878
95.8858534164936	85.1831918620678	42.6250208642714	97.0785	86.7219	43.0832
97.8691022913855	81.8513044368432	47.6205801615435	99.1691	80.9928	48.8748
94.7214497741373	82.798087501057	46.3085666766856	94.6937	81.204	45.1011
90.0219342587828	84.4058653737269	44.4946740575608	89.6546	85.279	42.7332
88.9962290802754	84.071377994791	45.5837597587997	87.8874	83.7559	45.2883
88.9962290802754	84.071377994791	45.5837597587997	89	83.7031	44.7227
88.1133014739285	83.7834506361783	46.5212703472772	87.8518	83.2273	45.632
86.807801440509	83.3577775088779	47.9074397037929	86.675	81.8002	49.155
84.7213253846803	86.2482156961698	47.5136474637228	85.7193	87.9646	47.7548
84.6856428863466	86.253349742913	47.506162541142	84.4799	87.8799	46.3607
83.3927814722625	85.6854490372125	47.7549039824395	82.5335	87.3296	48.5022
83.3927814722625	85.6854490372125	47.7549039824395	83.1803	86.2205	46.5816
82.8607853504142	85.2799677362224	47.8078197087666	83.0689	84.7397	49.7222
79.0057110052958	82.8516679930423	46.7794454656133	79.6279	80.9538	46.8845
78.4062624993067	82.7940162970771	46.6280221788094	78.4966	80.8407	46.208
76.656788706263	82.9719214507819	46.2641917242758	76.7822	82.9894	44.8431
75.4559927518613	83.0940268944261	46.014468278225	74.3211	82.1244	47.3456
73.0374482184981	85.09104095506	42.9822155242141	71.0504	85.2637	43.1302
74.2688488063718	85.9608016219378	41.1344724548984	73.8575	87.669	40.179
77.7042756647466	83.1404823042324	40.1081335930642	78.0272	82.0721	40.7931
78.487183800456	82.4977512844729	39.8742429571492	80.1131	82.5047	41.0389
78.3711291957712	79.700218081806	36.3509556399474	77.9819	77.7483	36.1545
78.8060322112821	80.9972373882125	35.1883528748585	80.2014	81.5949	36.2605
78.8060322112821	80.9972373882125	35.1883528748585	78.4301	80.0876	35.2889
79.5804344825847	83.3074461123442	33.1170087526513	79.415	85.235	33.6242
80.3788823156332	82.6617051577688	30.9012834554638	81.0772	83.8409	29.4446
80.100186027136	80.0304918086124	30.8863887418676	79.7775	80.296	30.6811
79.6984015104034	76.2371053799531	30.8648872453834	80.2922	75.8098	32.7263
78.7684905939898	72.1628649748028	29.388262413625	77.364	70.7565	29.611
83.0107518572047	72.883304695973	26.892709501025	82.4808	71.6064	25.4475
87.4484096249574	73.901924564239	24.6743067954011	88.9513	72.6403	24.2874
87.1041175750783	80.6430402745192	23.2995298532718	88.7272	81.0174	24.4065
86.9354364849932	82.2383080648488	22.9114040046644	88.1669	82.2879	22.5207
86.7715485138542	83.788192339012	22.5343222679165	86.8895	84.3247	23.0154
86.654446204513	84.8957391111376	22.2648667026383	84.7929	84.8117	21.5385
87.0558617902772	87.3800438245457	21.9257250672418	88.176	88.8141	22.7557
86.7208036685984	87.3421082530704	21.551213300255	87.8356	87.4643	21.4217
86.7208036685984	87.3421082530704	21.551213300255	85.5265	86.4226	22.7788
84.5613192697671	87.0973901575024	19.1373105032918	83.3441	85.5151	19.0157
84.4665021915604	88.7143634619905	17.632714961083	85.8291	89.3215	18.2752
84.4665021915604	88.7143634619905	17.632714961083	84.1657	89.6201	18.7606
84.3814547839781	90.1598159148301	16.2874895108383	84.3608	92.148	16.0712
84.3267870009365	88.3794041962072	15.238794802118	85.8774	87.324	15.9329
84.1449890986636	88.1280738354326	14.9461089059514	85.6153	86.7737	15.008
83.1001049260544	87.1203535500489	13.5612557774448	83.3685	88.3604	12.0152
80.8744188812951	84.3816292408988	11.7588036096104	79.3747	83.7664	12.9303
80.8391735756053	82.8607391018016	8.86476308554289	80.3025	81.1115	9.6723
80.8757040396727	82.0724468361027	6.90795896366886	82.7718	81.5009	6.6283
79.5659003180243	81.4230450066939	4.47976434887417	78.9268	79.6337	5.1041
78.9858495396442	81.3140135162419	3.1850554923761	77.4302	82.5606	3.0237
79.2014220574267	80.4481736889355	1.71654748114291	80.7551	80.6861	0.4798
76.8752925369599	78.4778279468535	1.23959489786619	75.2812	79.5319	0.6498
76.1492471729708	75.7812191062866	1.31847917235653	76.4126	75.548	2.1999
75.6120487406477	73.7859464368288	1.37682965288669	73.6863	74.2382	1.6716
74.4753208551966	67.9265288474588	1.48195669994352	73.6361	68.0431	3.2936
Route: 7 Length: 314.774787537973 Demand Met: 833					
90.4638752758857	23.6093407458358	4.87757288864239	92.0943	24.688	5.2999
93.4735785034316	10.5850895594415	5.4454971702058	94.4757	9.4701	4.1216
86.0225999377523	5.52632371667497	21.5608939213763	84.9979	3.9891	22.3271
92.5909213560325	21.316230158484	26.878798298228	92.9329	22.8145	25.5988
96.185378298644	22.930803102584	45.9672631538975	97.6128	23.6668	47.1593
73.8051805789266	11.0794246349268	48.2644924571357	73.9225	9.6395	49.6476
58.084569690988	11.6377187364882	41.6270901675482	57.0413	9.9678	41.9779
49.8021814045583	22.406818764446	33.2748449631344	49.2796	22.4102	31.3443
48.6155978194682	26.755075489902	37.9019475976543	49.7446	26.3767	39.5089
43.7985233575125	33.5140431435901	39.2711436787059	41.9344	32.8635	38.9519

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.6781315929909	34.539281885305	39.5280384306638	44.5785	34.1629	40.8334
43.4248621652572	36.6968915467392	40.0688836125934	42.5333	36.3249	41.241
43.1643394914338	38.9156911960098	40.6251650807965	44.7486	39.7162	41.5468
39.5526302283712	41.9501429552162	39.9888294057564	37.6461	42.0792	39.3984
45.806952193934	46.2630238742305	42.7458239562601	47.084	47.7144	42.2332
44.459586257752	42.7912483072487	46.944204326582	45.8095	43.1051	48.3862
42.4194220596324	40.4605787046087	48.0786673111737	43.5486	39.6053	49.4906
37.858269413986	37.5308812763401	48.4459878112656	38.1953	36.049	49.7462
34.0814774089244	37.1630601329314	47.1414297641538	33.3877	38.8388	47.9844
23.6866031941613	33.7855158682136	42.0811251707714	22.0871	33.226	43.1435
23.6866031941613	33.7855158682136	42.0811251707714	22.8416	32.9746	42.6888
23.6866031941613	33.7855158682136	42.0811251707714	24.2607	34.0424	42.9391
23.7810259060579	34.0314073293752	32.1432632420811	23.8984	35.8981	31.4349
23.7570932817904	33.5636156958286	31.6402555899177	22.2385	33.2025	32.4261
23.6448291044104	31.3730478219102	29.284906978647	24.4655	29.9184	30.3851
23.2125485872589	28.9006730650894	25.7182001774126	23.4789	26.9268	25.8998
22.5303389641071	30.0053027780299	22.9815792532746	21.333	28.4534	22.585
21.3450406323821	32.5946578738998	17.3830370365942	20.8616	31.8567	15.5881
21.9066328370264	36.1354962688667	18.7363403255042	20.4824	37.2243	17.8497
22.279380181285	36.6361636096731	19.1671178176986	23.8226	36.8408	17.9115
23.5919930469918	39.0234534793939	21.6998317790781	23.1185	40.5549	22.8959
27.462057613471	35.8465956488482	20.1596317353751	29.0396	36.1372	21.3542
28.0489506436409	34.1055709083862	18.478279681341	26.8183	32.6012	18.9499
30.7529350369845	32.1616383275712	14.3312209572044	30.1704	30.5441	13.3093
33.604001884091	33.9469983881283	13.5656427682673	33.7228	34.609	11.6821
36.0223341924554	34.6748602770475	15.3945613145057	36.1356	35.5262	17.2008
41.5383608543687	31.9884003868124	10.4277138599555	40.4113	32.0356	8.7762
46.261575985854	30.0236267845883	7.95854918353533	45.8434	28.1097	8.3609
48.0613464037984	29.5801186502798	6.99085970306298	47.7847	28.4345	6.8217
49.2664098606616	29.2831304431461	6.3429235237909	49.2766	27.3707	5.7576
64.6807292797875	37.2504317492718	1.62726960093651	64.954	37.309	2.2557

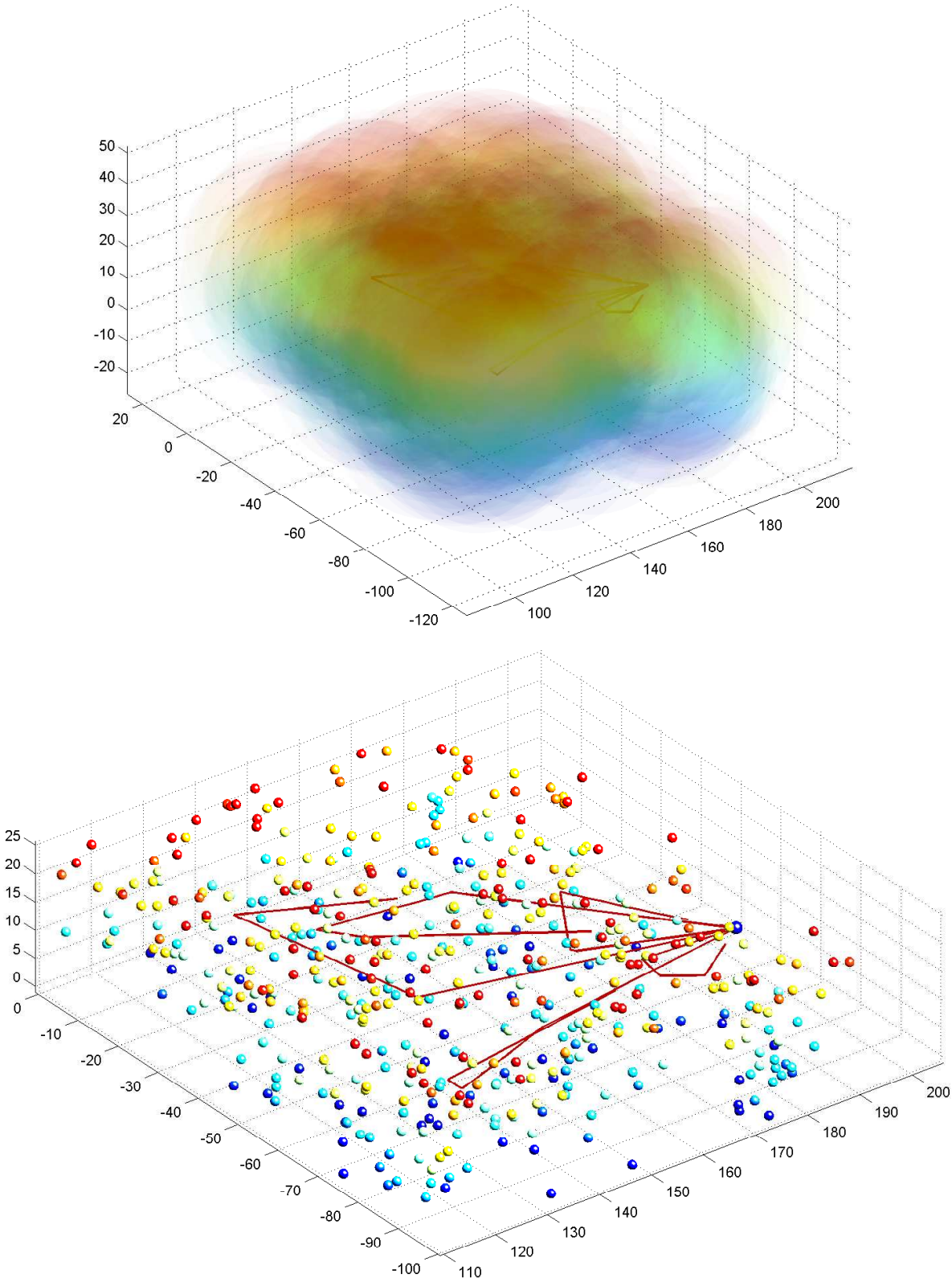


Figure O.68: *team*6_500, Equal Radius, 3D, Euclidean, Length = 655.5062813

Table O-71: Solution for *team6_500*, Equal Radius, 3D, Euclidean

Total distance: 655.506281257898 Total demand met: 25539 Depot: x 95 y 50 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 73.0606319760826 Demand Met: 4788					
88.3097998056188	49.7339838695271	1.31296438823343	77.8566059	47.3210428	1.4302369
82.2295880128257	49.492230703552	2.50623171484164	78.4065879	56.8222853	10.2773712
76.513130795667	49.2649491339299	3.62812420778965	69.6306367	57.4599551	14.1507992
71.8676587172171	49.080265018039	4.53983139095848	69.1126526	61.5737532	13.3447692
67.7007997195216	48.9145968798035	5.35759600399099	56.0822206	62.8731122	23.9833277
66.819605703602	48.8795640844364	5.53052969461588	57.8283627	65.6998258	15.4827548
65.9938617984244	48.8467345892735	5.6925830236091	58.1838222	68.9986011	16.3418061
65.2471095098802	48.8170456364507	5.83913545736762	54.3749565	73.471727	7.5546522
65.1901509441717	48.7570693808609	5.85127515182754	50.0180258	68.4527432	3.6702061
65.1325594869251	48.6964290226795	5.86354936420174	53.0250996	68.7918887	2.0307378
65.0744269705399	48.6352189547718	5.87593887094487	57.0800315	64.0172849	6.0370203
65.0160571145993	48.5737588762419	5.88837920323104	48.6878693	60.2173135	5.6974781
64.9576302600815	48.5122389373281	5.90083173575438	54.2235528	56.265496	3.5115961
64.8993968798325	48.4509233570143	5.91324277825227	53.3341085	54.2742297	9.8426206
64.8410168439017	48.389454433277	5.92568507319525	53.5581269	47.7413894	5.6200486
64.7825814458111	48.3279288566044	5.93813878014628	58.9987357	45.7674431	3.4982849
64.7237669661974	48.2660059118082	5.95067304365111	53.1446811	48.4277704	1.8438372
64.6646729056194	48.2037892799758	5.96326692542485	43.0965371	49.287121	4.5164689
64.606210500797	48.1422367737778	5.97572673096995	38.128444	50.990683	1.5244057
64.61771334506	48.12003439543	5.98454749615097	37.6481264	47.8813096	6.5793036
65.0176518476172	47.3489402408469	6.2909763486037	42.5831476	37.1399223	7.4293369
65.3990340976123	46.6136550549096	6.58317616671999	41.3950957	34.602479	9.5059407
65.5496360510087	46.3543184042993	6.68721786974322	45.1705924	33.2150554	0.7183829
65.6991324883046	46.0968863101275	6.79049531491788	51.6262531	32.9510025	3.9807244
65.8452616947718	45.8452533126017	6.89144632632947	48.3601763	34.0464698	9.5017871
65.989169051123	45.5974467107256	6.99086235558537	51.2078647	35.5791539	12.2358489
66.1323048809108	45.3509693572153	7.08974524767583	51.5218465	39.5765057	8.1668107
66.2769944054029	45.1018173175373	7.18970114556686	55.1300701	40.0588307	9.3430467
66.4241821245177	44.8483640151541	7.29138266562842	61.8021468	40.7857588	11.6604123
66.5740758683688	44.5902512049639	7.39493349753352	56.2067364	40.2417677	14.7422616
66.7255642072997	44.3293924014229	7.49958585119815	58.429274	38.9397266	17.4146787
66.8769705623207	44.0686744259632	7.60418151324861	55.5353048	38.1752447	17.6684542
67.0272161053129	43.8099549997891	7.70797518483707	56.98499	36.3050676	16.2652139
67.1756718950847	43.5543172563753	7.81053243651085	56.9481598	35.7189477	11.6860928
67.3224084016089	43.3016400698311	7.91190190223183	54.9748886	31.6899499	9.1125802
67.4678098173196	43.0512621788423	8.01234899619426	57.9600279	34.4089577	5.7051211
67.6131069248788	42.8010645758024	8.11272388577924	57.8811625	36.8910334	2.4827855
67.7597220643077	42.5485986123291	8.21400896659609	57.9145816	37.4787407	0.4915272
67.9088210946711	42.291857159194	8.31700945113568	59.7400431	37.5401839	2.8523374
68.0605678497	42.0305581987686	8.42183875209126	65.884583	36.2103636	0.6036001
68.2138475773939	41.7666208834382	8.52772677326392	65.5339196	33.299582	2.2513726
68.3677139275451	41.5016737236945	8.63402019101836	66.7264937	28.6241638	4.754423
68.5205760173869	41.2384551157789	8.73962026750623	69.6772126	28.9703915	6.8785128
68.6712655644255	40.9789760101614	8.84372005170221	78.8734057	30.5074156	10.2492504
68.8181695975593	40.7260124496203	8.94520566380194	75.1791401	28.4357222	11.5456464
68.9608696366749	40.4802855181979	9.0437877342442	70.5957341	27.6007009	14.8208364
69.0998970561415	40.2408813334924	9.13983302648181	67.6344777	29.9025036	14.033884
69.2372995466592	40.0042750628491	9.23475578267989	62.0390375	27.7696953	8.7011853
69.3739870499475	39.7689009812537	9.32918414641065	62.1748486	23.5386262	9.8971034
69.5097688749193	39.5350882979578	9.42298631246209	56.0727891	23.8686819	7.47443
69.6444457633667	39.3031795643078	9.5160248257625	58.3586123	20.3359236	6.4801103
69.7762347365778	39.0762442598573	9.60706831355716	70.9135058	14.8761766	3.8438809
69.8963503279328	38.8694109988177	9.6900472177509	72.0757838	18.033427	9.5185824
70.0111647652287	38.6717049006086	9.76936451667114	71.8742878	17.8343061	13.6189325
70.1207283336024	38.4830392052814	9.8450548954911	79.9570853	14.106802	16.0131314
70.1207283142943	38.4830393058662	9.84505484745697	68.9038468	16.8104734	21.7337542
70.1207282931379	38.4830394084743	9.84505488191986	70.2766166	21.7580017	19.3250026
70.1207282709277	38.4830395121567	9.84505490077022	77.5184606	26.3492827	20.0048231
70.1207282475105	38.4830396164313	9.84505492107851	78.3681704	28.4149174	19.0447715
70.1207282223435	38.4830397206562	9.84505491835758	75.8801773	29.7113355	20.1473913
70.1207281953153	38.4830398240756	9.84505493322919	76.8303918	30.6898889	19.4810071
70.1207281672266	38.4830399261371	9.84505490502019	78.2442809	33.2914556	24.7068001
70.1207281397875	38.4830400259032	9.84505491746347	73.9542296	35.1681427	22.8323041
70.1207281151857	38.4830401232778	9.84505495108985	68.3855742	35.3493495	17.8360025
70.1207280927716	38.4830402189776	9.84505491381658	65.5247054	34.4819771	22.2818751
70.1207280709906	38.4830403141833	9.84505491911674	62.1996928	26.9322785	20.2466983
70.1207280487792	38.4830404109061	9.84505491558929	57.0336699	24.3925592	19.6603049
70.1207280263427	38.4830405101102	9.84505490980712	51.358437	31.183912	20.2786449
70.1207280052386	38.483040611592	9.84505493285445	44.6441662	33.1239716	16.5654644
70.1207279932371	38.4830407202407	9.84505491830475	44.7688336	34.8472485	18.3927145
70.5668419194551	38.7996892879522	9.693774620571	48.2549784	40.2375649	15.7273532
71.0768336919577	39.161678133746	9.52083300379167	49.7681271	46.8278362	16.9025729
71.6548536369288	39.5719526750037	9.32482266641905	54.8328865	43.6672378	22.5503676
72.2855152116764	40.0195915049207	9.11096110972391	57.0032853	47.929495	24.4820709

Solution x	Solution y	Solution z	Original x	Original y	Original z
72.9760091635355	40.5096985145428	8.87680996996888	57.7424662	53.0431767	19.7584506
73.7116937772199	41.0318813129047	8.62733446490205	55.3536754	50.0230289	15.6187386
74.5154818565556	41.6024033364246	8.35476469155196	58.3317264	48.8464518	15.1551224
75.3829330743824	42.2181129865258	8.06060638089738	62.9728444	48.2610974	18.088966
76.3153181990008	42.8799122042092	7.74442869655862	63.3830619	45.6708392	19.4411223
77.3435443185144	43.6097382824801	7.395750851299	65.8501112	46.5185477	18.4012114
78.4731205541119	44.4115006059918	7.01270453565876	67.7686962	50.942416	23.8888342
79.7431127000344	45.3129255503895	6.58204233638591	70.748982	60.565778	20.2126548
81.0444156280577	46.2365653905048	6.14076246152134	74.3685871	61.179785	20.6768635
82.2755313115731	47.1103846132958	5.72328296262109	73.7932186	65.1929118	21.2635249
83.5605041857659	48.0224382523631	5.28753929312734	77.5651358	71.0148631	15.8380209
84.5887590323148	48.7522892561468	4.93885156409615	78.4106856	73.5257917	13.7197973
86.5578861200282	48.9882574966862	4.00473173487382	75.0689318	72.4744486	0.4051745
Route: 2 Length: 6.12712650766477 Demand Met: 754					
94.5743312640814	49.9334096731612	0.186157873521029	77.1618533	52.0527053	6.1051205
94.136797707048	49.864952667347	0.377502035924181	77.6409989	49.4044045	6.2831565
93.6481589045459	49.7882446743513	0.591032692341802	75.4422908	46.5496079	10.6773392
93.3020211613492	49.7337445136338	0.742271147685152	73.6483802	37.1698351	8.0638871
93.0178613149246	49.6889891009528	0.866361137771307	73.6393721	37.6930766	12.5724621
92.7363129069221	49.6447976106691	0.989196166097368	76.1612584	37.0439506	15.0269683
92.4962100371806	49.607335430904	1.0941002053226	74.2228108	38.6099587	15.750928
92.3331246484119	49.5819118450205	1.16542492211553	72.24704	39.7077335	13.756154
92.2213122068231	49.5644551213982	1.21433645497087	67.7343836	45.7338412	11.9249335
92.419887705716	49.5956241347162	1.12758579714728	69.2934493	49.5142976	7.1641629
92.6375648094788	49.6297799681736	1.03247015631448	73.3690079	50.7128517	12.3210863
92.8271235302482	49.6594704295578	0.949623949028052	79.155929	54.6404138	23.5670664
93.4793988738466	49.7616586773792	0.664322185975752	79.80288	56.0883078	18.4129389
Route: 3 Length: 181.651691352038 Demand Met: 5000					
44.897373401026	53.1842146005176	9.50732751954199	35.1926471	70.9963316	12.3857242
31.9659081447921	54.0060580020374	11.9611576930014	32.0336769	81.0046037	12.2328895
31.8615824233984	53.9996067984578	11.9808159424374	28.3264783	80.6515072	10.7169993
31.7268929505932	53.9912831186697	12.0061942472303	25.8819635	79.9487476	10.2285525
31.6127876719848	53.9842261512135	12.0276913865956	23.1076735	77.6165558	13.9842376
31.5057809165695	53.9776071114144	12.0478519358764	21.5799527	71.4486566	7.5717836
31.3971495428929	53.9708891516988	12.0683200091108	20.1950128	67.681815	12.2807597
31.2865070521654	53.9640489930901	12.0891680062241	17.9198509	62.5969087	8.2401641
31.1756573784866	53.9571975339751	12.1100555415105	18.3784185	57.1026507	1.60641
31.0654682556855	53.950387868508	12.1308188650667	15.5276897	59.9411898	0.034091
30.9576074388187	53.9437226484102	12.1511436442684	13.6466825	56.641223	0.3772494
30.8531025526688	53.9372650870105	12.1708361404938	8.7488745	58.9072962	5.1240813
30.7536791891842	53.931121534544	12.1895712466608	9.6122245	63.4753738	1.8891309
30.6606914257995	53.9253752156235	12.2070935016893	9.81425009999999	65.891213	10.4751695
30.5728052164073	53.9199438281954	12.223654644133	12.9149435	73.6813943	7.0579
30.5728050444968	53.9199437010365	12.2236547013589	14.8230271	72.6203252	11.2037362
30.5728048724802	53.9199435728324	12.2236547778081	15.7168362	72.1075902	13.3837018
30.5728046996551	53.919943443308	12.2236548234958	16.6661596	74.8364156	22.1285239
30.4938696837471	53.6560493209167	12.2476227086018	22.4809106	75.2843669	23.7038192
30.383157542555	53.2859164337404	12.2812398549884	26.7897314	74.395765	23.1412606
30.2539816697957	52.8540554209412	12.3204634976178	25.824676	62.4300357	22.6279041
30.1209577021916	52.4093290292262	12.3608555791408	19.7736057	66.4248411	22.4431961
29.9835213630778	51.9498511390413	12.4025874263322	15.1928212	63.8863652	20.6093336
29.843702145331	51.4824065778302	12.4450428452872	16.1987878	59.3187745	15.8426137
29.7037928292484	51.0146602228297	12.4875256316586	17.0586402	58.0717087	14.4615884
29.5638543423308	50.5468156631458	12.5300172990439	18.1200543	57.6122523	16.2352309
29.4236962661922	50.0782363546461	12.5725756951585	20.3908302	60.0437447	17.3381089
29.2822271120785	49.6052734714482	12.6155321909981	18.474215	58.4012448	21.6380189
29.1397913820487	49.1290790045935	12.658782176187	20.4303529	56.6155569	23.1754411
28.9966278369689	48.6504512157323	12.7022530927878	22.9209187	53.7233909	24.603033
28.8533769131248	48.1715312231536	12.7457504708084	19.3270801	51.9549025	21.8491926
28.7108985250117	47.6951938639228	12.7890132098322	16.954408	52.9270638	19.3144339
28.5689444404152	47.2206093485805	12.8321167608406	21.0216738	51.8703093	12.3795264
28.4276764005676	46.7483184432897	12.8750119485448	20.6501388	50.1791373	13.3126618
28.2878818915237	46.2809539837741	12.9174597150937	20.3277951	46.570702	14.9318681
28.1508477464168	45.8228181580375	12.9590692818991	18.6253841	45.1799856	19.5247549
28.0171990863302	45.3760009573577	12.999650855936	16.0956015	47.1989931	18.8482809
27.8864065601394	44.9387325971065	13.0393650926323	12.7057803	46.3942459	23.5548248
27.7587276959461	44.511874084915	13.0781338546835	9.4077401	50.7341371	22.0830838
27.6322955650575	44.08918384816	13.1165240288223	9.41537220000001	53.1681384	17.4096726
27.5050948863828	43.6639242127908	13.1551474972182	7.20936620000001	55.909681	20.1638147
27.3724685435229	43.2205257413393	13.1954184533689	6.14577610000001	57.4553139	19.7085867
27.2046083480218	42.6593340098477	13.246388198407	3.2029124	51.042154	21.6188315
27.0336145421751	42.0876720918105	13.2983094630824	4.944301	50.787374	18.9241415
26.8626049351827	41.5159579854009	13.350235423996	6.1363219	48.8674613	19.7646406
26.6937981106651	40.9516085464735	13.4014924379667	3.9184302	46.6238898	20.1933306
26.5311902397591	40.4079839859742	13.4508670735981	2.1729785	46.8604253	18.9044886
26.3763747518094	39.8904121482102	13.4978754636558	2.57466789999999	43.4683609	15.573931
26.2284281583615	39.3958046131327	13.542798121719	6.5220454	46.8393292	9.3610404
26.0810057578273	38.9029496794269	13.5875615809884	2.27936	46.9159446	7.984275
25.9312697606201	38.4023612270847	13.6330274786024	2.4253981	44.8523436	2.2881323
25.7678923434376	37.8561769537915	13.6826335791178	5.3360715	49.6056788	2.051856

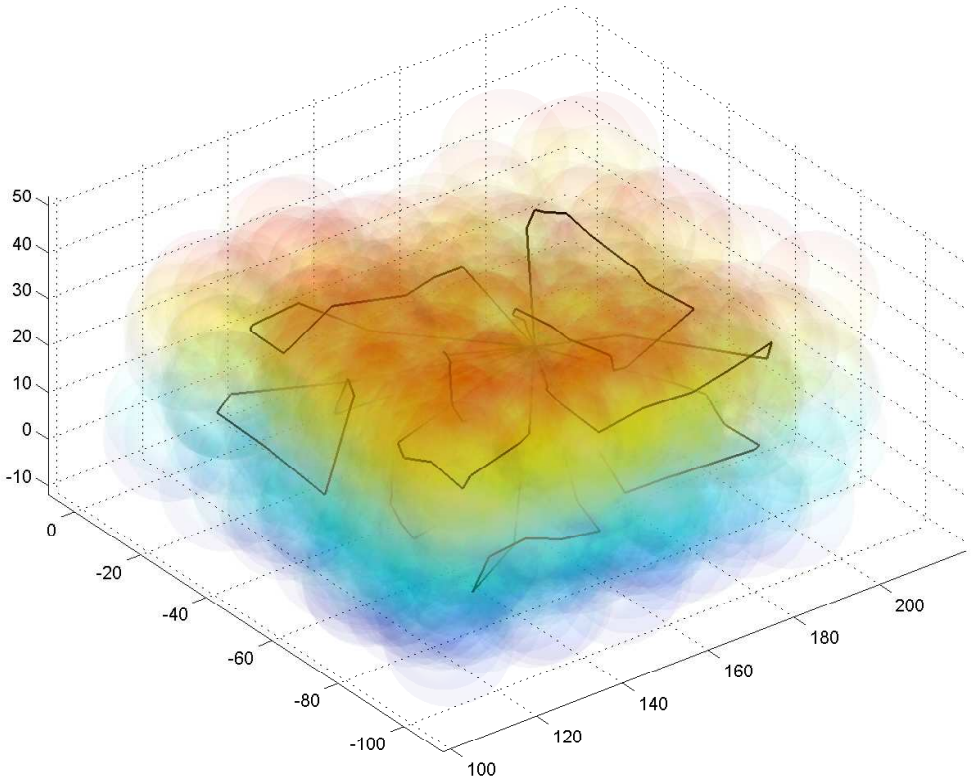
Solution x	Solution y	Solution z	Original x	Original y	Original z
25.5575958174787	37.1531414965384	13.7464853566972	13.919931	46.2670929	1.9535236
25.3401287647554	36.4261341405995	13.8125144387779	13.5198617	39.2703319	6.7423337
25.1225222526067	35.6986607271088	13.8785859681413	15.6671545	41.9038059	9.4975475
24.9016668868258	34.960326116389	13.9456440482462	14.7299938	38.6202015	11.4606651
24.6800512387065	34.2194500129639	14.0129330024273	12.1928408	37.3702852	11.5867049
24.4591350525571	33.4809125514972	14.0800094993069	11.8541821	36.7134083	15.5034658
24.2389631972237	32.7448636406337	14.1468599354147	13.0553452	35.1491327	19.4677587
24.0194807026359	32.0111195095641	14.2135010521471	7.3492035	35.5012058	13.5793477
23.801706552455	31.2830865005737	14.2796234048196	6.820668	39.0713932	12.1631417
23.5801954645214	30.5425600772685	14.3468805184161	4.5207011	34.7763494	11.5308277
23.3601437980178	29.8069124826658	14.4136946237996	6.7702019	28.6398243	6.655852
23.1469602564558	29.0942259385465	14.4784233638146	10.2638739	16.7343669	2.745395
22.9531138354852	28.4461858230397	14.5372804993913	10.0346396	20.0550826	11.5771729
22.7686730385616	27.8295903942335	14.5932817235763	10.881307	21.222109	11.4410052
22.5910231164792	27.235697986989	14.6472208587485	3.1062568	26.7803784	17.2167375
22.4187779629789	26.6598741777286	14.6995189491442	1.0903939	26.3844516	18.4073439
22.2526362693314	26.1044547384747	14.7499638082296	1.44105020000001	27.5670412	20.5926225
22.0902886195972	25.5617190857124	14.7992566514068	4.4919615	30.1971308	23.0431363
21.9278956587368	25.0188318844635	14.8485632435102	9.1420339	20.9818632	21.7425538
21.7699739710492	24.4908926142437	14.8965121052959	14.7546051	14.610274	24.9337615
21.6192303695219	23.9869503285996	14.942281420992	19.95828	6.5164086	22.2907726
21.4806983061439	23.5238321281298	14.984342876508	15.2275578	8.2482088	20.735321
21.3525782175849	23.0955220123501	15.0232428844224	14.9649191	8.2569823	17.1672819
21.2341868206869	22.6997355389924	15.0591889193713	12.2844966	12.8434228	15.9512599
21.1233948239686	22.3293542566675	15.0928275069012	8.8711802	13.2955279	17.3948906
21.0186014877673	21.9790269016921	15.1246447107692	2.4227502	13.8762399	13.6085461
20.9185244627894	21.6444667059114	15.1550297691127	4.41833269999999	14.4467589	21.446539
20.8223927340382	21.3230961318129	15.1842168411486	1.16963010000001	7.0254341	24.7260216
20.7476563536234	21.0732510364549	15.2069079662109	1.18933079999999	3.3623299	20.9336159
20.7476565158256	21.0732510275124	15.2069079186594	9.4518233	0.0818322	21.8708164
20.7476566783441	21.0732510192508	15.2069078891347	6.43216459999999	5.6038094	17.9548593
20.7476568388027	21.0732510114217	15.2069078512753	9.8269964	6.8843491	16.4620329
20.7476569964646	21.0732510038202	15.2069078451683	3.796854	1.0310825	8.8837938
21.358975481711	21.225494452066	15.1274049824853	7.7653349	6.167634	7.7136991
22.028857462428 1	21.392322836129	15.0402858300785	10.2956976	4.6843351	8.4372721
22.7619923009049	21.5749039940118	14.9449405831502	11.2137447	2.0282324	10.133715
23.5947416031935	21.7822934579056	14.8366403662296	15.0419936	3.4632806	14.5409941
24.4996079650102	22.0076432712417	14.7189613105192	21.5004558	1.4444458	11.8706015
25.4622780043883	22.2473886482925	14.5937648510901	21.5694811	0.9567502	13.1824134
26.5098184710338	22.5082703314995	14.4575308681002	25.3620642	2.9418291	18.8013171
27.6225022289361	22.785375404486	14.3128249050525	25.7941467	5.022901	22.6635913
28.8177591471171	23.0830447808443	14.1573800526018	31.6461166	7.3585956	24.5416178
30.0562225275308	23.3914743885673	13.9963160080306	30.8819888	13.4626957	23.5805357
31.3434731799423	23.7120544684381	13.828906751697	33.7088519	9.9711832	22.3346661
32.6864392353519	24.0465113065517	13.654250856122	38.5584867	8.9239146	23.1054293
34.0524699679492	24.3867154216964	13.4765937642666	33.5301093	3.5426558	21.7233363
35.5459802411905	24.7586728001576	13.2823553797146	34.237799	1.769458	21.0926833
37.2690386546533	25.1877971223357	13.0582642269024	39.0651937	2.4238303	22.4127866
39.5199611530207	25.7483804773662	12.7655235297652	41.5241877	2.2495139	17.9679654
42.4456774913659	26.4770103177661	12.3850268738056	42.0438698	1.2746098	8.4709115
47.1270687394331	27.642864997902	11.7762057630431	57.1362338	5.5136309	23.5708492
Route: 4 Length: 140.248062742283 Demand Met: 5000					
77.8922380473307	36.9723316187215	3.19728074859036	71.3343578	25.5495623	21.1336705
72.2161466580932	32.6499156174563	4.25815725306287	67.7860652	18.0440513	10.7235759
68.0248200388881	29.4581726186033	5.04150889107378	60.5482992	13.7850738	16.8556106
65.3329266067426	27.4082988469621	5.54468123040239	52.3761166	17.3066951	24.8659343
64.0100166272517	26.4008987658235	5.79193690670392	49.4509792	19.23293	17.9552005
62.9125042136477	25.5651020208708	5.99704704073924	46.2315326	17.3070005	18.3576471
62.0440586159884	24.903746759601	6.15934379527917	45.092729	13.545129	18.3076608
61.3876304236021	24.4038535675365	6.28201913221928	41.2499501	12.693222	14.1376671
60.9037077224355	24.0353304008577	6.37245716268092	47.2237184	11.5265695	11.522225
60.4793843287936	23.712195305585	6.45175762934169	43.6411268	3.9331303	13.8180098
60.4793842219871	23.7121952221444	6.45175761546469	52.4413086	6.2567644	20.6204114
60.4793841059397	23.7121951333066	6.45175763349496	55.2537104	1.3428502	19.4907476
60.4793839836188	23.7121950424048	6.45175765379486	64.943613	1.686391	19.5930668
60.4793838550419	23.7121949503633	6.45175765569041	67.4654721	12.1137109	23.8276929
60.4793837230886	23.7121948564482	6.45175768160858	71.2868972	13.7571779	21.261272
60.4793835896111	23.7121947610356	6.45175770086949	73.292725	7.8305571	19.3842603
60.47938345385	23.7121946654177	6.45175771971115	70.8086056	11.5809577	17.5154997
60.479383316004	23.7121945686072	6.45175774439363	70.2907843	10.4186099	14.6666305
60.4793831764874	23.7121944708077	6.4517577905717	72.8917692	2.6849909	9.1068195
60.4793830346418	23.7121943732089	6.45175782042569	75.2339764	1.1053279	6.9329867
59.7643212658723	23.7092253053459	6.51811792681367	73.9903157	3.2090585	6.7443046
58.8067498208264	23.7052591837388	6.60698516597744	72.320279	3.8462993	6.5608426
57.6000116031452	23.7002711099212	6.71897786388136	72.9487249	9.0752285	0.6396625
56.1427425558921	23.6942578698428	6.85422193939841	68.4102584	6.9403941	4.658299
54.4679386313766	23.687358716538	7.00965539299888	64.1033853	11.196525	7.8712992
52.6656042862375	23.6799419701076	7.17692505925908	61.3811866	10.1841347	3.2294003
50.7314876191767	23.6719920218099	7.35642536791612	54.6678163	5.1970784	7.0182008
48.7436167609573	23.6638304891666	7.54091574159604	54.100404	16.0525172	0.8678853

Solution x	Solution y	Solution z	Original x	Original y	Original z
46.6677837927267	23.6553083072993	7.73357236980036	45.3795945	10.2393952	3.6711995
44.6351215967629	23.6469604326187	7.92222469119925	37.7928549	6.0601138	4.720283
42.7787365256432	23.6393290512157	8.09451767794161	33.6893922	8.5224136	7.0176775
41.0959155771867	23.6323997403685	8.25070262174756	31.9710737	13.1659452	6.9350237
39.5393031676255	23.6259775238807	8.39517403727717	28.9980611	9.3107142	10.3932004
38.1346070131305	23.6201727214215	8.52554575905253	29.8399494	3.731908	9.1569031
36.8679148830839	23.6149348379499	8.64310917011796	30.2787157	8.2280249	1.312123
35.6738192426172	23.6099972784443	8.75393493616728	26.3324067	9.9110212	1.9657306
34.5659530740057	23.6054150802957	8.85675849019822	18.0605132	3.6100683	1.3230623
34.482848269512	23.8625773514618	8.98161186814348	17.3929381	9.8303298	1.4719335
34.3958428829823	24.1318119227008	9.11232577049031	15.3634563	8.946465	9.6121679
34.306137631089	24.4094034046928	9.24709661313683	15.820225	13.1438067	8.0447276
34.2154261257336	24.6901094390403	9.38337935914311	20.1050057	16.8211128	11.4177964
34.1245929868685	24.9711906543169	9.5198443553274	24.4057133	14.819481	14.2616378
34.032317701893	25.2567330547338	9.65847533343806	16.5956207	19.4929376	15.3111277
33.9400079180727	25.542383209549	9.79715850540564	16.5565287	18.5575743	19.3585299
33.848196435378	25.8264937381872	9.93509395133357	13.6477983	21.6503409	20.9429038
33.7594616707575	26.1010873307184	10.0684086058208	9.78612250000001	28.4044715	22.2738758
33.8514164464223	26.2147052958394	10.0621544002127	11.1949114	32.5347928	13.765914
33.9443870979604	26.3295787673339	10.0558317482891	11.5512784	26.7283657	10.5788887
34.0390988048336	26.446603954048	10.0493914724293	14.6392528	26.7492086	4.8139494
34.1356696050462	26.5659266860006	10.042825617174	17.2034005	24.1027648	4.0750954
34.2344771810775	26.6880135406667	10.0361087161478	19.7989907	26.8559855	1.6393695
34.3352595637308	26.8125402832478	10.0292585313141	24.4888337	25.329984	1.2423959
34.438040274492	26.9395358101185	10.0222734373828	23.260163	19.1726271	1.8635456
34.5434193242309	27.0697419468003	10.0151125898098	27.922577	21.764341	5.4511195
34.6504636135983	27.2020055641516	10.0078392249665	30.6527015	22.708305	8.3283902
34.7584302532578	27.3354086399372	10.0005034692551	31.6418617	23.7354033	9.0609597
34.8667785349742	27.4692832116617	9.99314167476316	35.4889656	25.3753347	12.2670294
34.9743542445963	27.6022029312588	9.98583183044332	39.7157151	22.5518047	13.0027284
35.0808549801175	27.7337944412194	9.97859409337278	44.272376	24.1529526	16.7575015
35.1841876670073	27.8614709249843	9.97156969474869	38.9701661	21.3778805	18.3750053
35.2870366524716	27.9885500628328	9.96457755376836	33.6742877	16.0147514	17.7329183
35.3912777557233	28.117350255254	9.95749065891944	33.7699504	15.2531662	14.0155756
35.4975463056862	28.2486567412434	9.95026593870494	36.6688954	15.3802855	11.2906359
35.6060376051229	28.3827110603503	9.94289031330648	41.0252369	15.6288565	6.5265879
35.7162241141721	28.518861345362	9.93539966046965	37.3849664	18.6565566	4.7787046
35.827866167501	28.6568109383725	9.92781049134445	39.7052051	20.7340789	2.9027737
35.940002168876	28.7953709809769	9.92018800572875	34.7673517	23.4200763	4.8203284
36.0524775939869	28.9343501218827	9.91254277408566	34.0986738	23.3047286	4.238405
36.164840512058	29.073189753974	9.90490543629029	38.4714341	30.1541626	2.0837059
36.2754664029699	29.209882569008	9.89738632324724	38.9767874	28.6595996	7.54261
36.3843166665924	29.3443817863325	9.88998850399632	33.8398153	32.0377234	11.3609992
36.4920620866539	29.4775161092378	9.88266627235456	31.5115819	30.4349931	13.1711147
36.6000067962328	29.6108972830465	9.87533087377025	28.9097869	26.1468646	19.859402
36.7091974197012	29.7458186375183	9.86791120680227	25.434095	30.36432	15.4263508
36.8208252780718	29.8837525602616	9.86032635748751	21.2205961	30.6755865	15.8621351
36.9359660731326	30.026028554596	9.85250356893692	18.0420031	31.0087706	14.9562459
37.0559628334578	30.1743067775294	9.84435168368082	21.8832831	32.2702186	24.0783885
37.1799313224575	30.3274944766733	9.83593057956966	25.6408756	32.9849766	23.8146293
37.3066063274671	30.4840279113067	9.82732545542751	23.0786229	38.1227731	23.1605385
37.4353418160603	30.6431069918993	9.81857935233091	26.2175773	40.5220972	21.9150058
37.5641948021411	30.8023295578665	9.80982387651741	25.8175111	47.2716024	20.9185995
37.6906337953176	30.9585654583286	9.80123075528446	28.018456	49.9258106	18.7011667
37.8132496459762	31.1100735942125	9.79289605048506	23.2467308	53.1536864	15.3512789
38.2567562991669	31.2565675262006	9.71694717081528	24.284459	53.5118781	4.6981631
39.0053903672445	31.5038542687585	9.58874225835531	22.4746551	48.1041051	9.2672876
39.8463123830197	31.7816239380714	9.44473317317958	25.3533813	42.3962835	8.9845466
40.7441887127696	32.0782051927145	9.29097043332295	24.3319298	37.4283803	9.9719727
41.7235457612076	32.4017001921266	9.12325442486039	28.2512087	43.1796715	6.8189779
42.7749504344665	32.7489924223946	8.94319983096774	32.3078962	45.114069	10.6720814
43.8865419799277	33.1161638904503	8.75283770317143	30.0937988	44.3308943	14.5383671
45.119157368236	33.523311662632	8.54175171410947	32.8302989	42.2309887	13.616708
46.4826825181689	33.9737017157678	8.30825224365763	36.1244237	41.0242921	19.6707957
47.9894965907257	34.4714144592074	8.05022978047887	37.130172	34.1670861	22.6509329
49.6769722214679	35.0287545732357	7.76130039734323	35.0133629	33.6653342	20.0549291
51.7696919833022	35.7199034083423	7.40298897648141	36.9545772	32.1019086	19.1323386
54.7948675007919	36.7191422374692	6.88495477682155	39.21475	31.0795566	21.1487172
59.7432164794874	38.3536979837533	6.03755521578439	40.565033	30.2350611	14.624538
72.8003685008899	42.6668435537715	3.80157171345812	64.136723	44.5156078	8.6797357
Route: 5 Length: 87.4467214449671 Demand Met: 4998					
88.5846041423472	53.3979389671417	2.64391233627206	67.1669184	49.4371849	3.0262948
85.0509600333551	55.2695029756667	4.10017997060658	63.3053921	48.8331121	7.8682203
82.7590121048682	56.4833983600668	5.04471742190481	61.0935569	52.6920317	4.4207174
81.0278927426714	57.4002555430172	5.7581270709402	65.5436157	56.992435	13.1266946
79.4689183405885	58.2259512218868	6.40059850046785	66.0988248	58.3515559	13.6719306
78.0590592468025	58.9726727311645	6.98161915928358	64.4880133	60.4854675	12.6069191
76.7857788288559	59.647056120937	7.5063539881319	61.6781701	59.473286	10.2741841
75.6167644881158	60.2662157344403	7.98811943090317	64.6626599	65.39963	6.8345581
74.5070452958561	60.8539731328981	8.44545001791246	68.5426632	70.6500378	2.313903

Solution x	Solution y	Solution z	Original x	Original y	Original z
73.4264818375137	61.4262938585384	8.89076845879337	64.4543682	70.2655389	2.1929672
72.3780025256316	61.9816236237938	9.3228678792865	61.6425082	72.8564323	6.6704147
71.3809097646821	62.5097363115504	9.7337922294691	63.772212	68.1836695	14.3458559
70.4152584910258	63.0211980436527	10.13176091794	56.7397866	71.0931061	18.3430984
69.5270947059211	63.491618430917	10.4977932262265	57.43771	71.1535593	20.5447257
68.703281369372	63.9279573465768	10.8373024183479	56.5346421	68.6367247	22.9662555
67.9386001165826	64.3329767853816	11.152438232101	50.7478618	74.0551131	24.8207298
67.3174687199142	64.6619599603554	11.4084098339287	51.7496653	79.9144917	22.4057667
66.8169265587036	64.9270706036944	11.6146824467789	52.878421	80.2956919	22.1921533
66.3856771246615	65.155480903776	11.7923974945438	49.7783583	78.4397036	19.1457188
66.0091114186693	65.3549319234333	11.9475751780472	46.3729602	74.0499355	16.6434815
65.6781119708709	65.5302531959838	12.0839726122669	43.8195847	68.1613988	20.4285954
65.3851203415422	65.6854445440311	12.2047087961363	50.8238583	67.1806384	20.6239323
65.0989801841672	65.8370086006588	12.3226253666511	51.8847181	57.7017397	23.1071854
64.811666620418	65.9891883019899	12.4410277304499	47.6524078	52.2249928	24.4877735
64.5410383864037	66.1325273250654	12.5525538266616	44.8729194	51.9811136	24.4648411
64.5200067203651	66.4531458814111	12.5132653048811	46.3458684	54.8708712	24.5219613
64.4969375063922	66.8048996106534	12.4701608657228	45.6990417	60.3070344	11.94067
64.4730102332053	67.1697925023759	12.4254455409247	43.0002757	59.9692573	5.0791111
64.4480560631149	67.5503923271942	12.378804749219	45.5118999	65.9532613	1.4856264
64.4228144533445	67.9354074924685	12.3316224164825	46.0567355	72.019762	4.0391076
64.3977890705623	68.3171432489473	12.2848420541928	43.6827488	74.1878852	3.8851851
64.3734221306799	68.6888455374612	12.2392910591294	46.8228713	71.844353	9.3127449
64.3493317537878	69.0563311126332	12.1942569421353	47.2434466	72.8348775	10.3871125
64.3255450605681	69.4191893651932	12.14978977697	45.3765455	76.9954785	11.855076
64.302272605916	69.7742138276949	12.1062824284006	47.9098314	77.7959758	13.7573709
64.2794090915071	70.123054027231	12.063538803937	45.3945603	79.9114427	16.0984045
64.2571706205713	70.462266929507	12.0219631596604	43.3709663	79.9295648	12.3122786
64.2357910559375	70.7884356453118	11.9819920002126	40.9923031	81.1407106	10.4646561
64.2168686847494	71.0771538919623	11.9466101542874	39.6568849	80.0063838	5.1586736
64.5001691646473	71.3689007389884	11.9826839161476	49.4827685	84.8462228	4.1362821
64.7852036022133	71.6624327646552	12.0189784910986	48.3895216	84.8378656	6.8593636
65.0749442034514	71.9608087046792	12.0558727663728	49.7030604	90.8227548	10.5216088
65.3527562204324	72.2468933305987	12.0912492182077	50.0446513	86.3510967	14.724494
65.6319316273679	72.5343792019213	12.1267996623867	56.1389342	85.561632	20.0765614
65.9110478199181	72.8218007456292	12.162343011102	55.0653569	81.234009	22.9552522
66.1929933224684	73.1121330411433	12.198246966107	59.1397084	81.6064397	24.1713239
66.4752429197683	73.4027771096439	12.2341897307869	63.6802314	81.8267454	23.9676687
66.7547589103877	73.6906071172692	12.2697841608919	67.3900644	74.174693	20.6721334
67.0303514907536	73.9744006658201	12.3048783342754	66.8428254	74.9418962	18.8280244
67.3018380510733	74.2539703243933	12.3394490224499	73.2290706	73.9762718	17.115174
67.5638886652758	74.5238291931164	12.3728174019172	72.4566884	79.8068651	12.2176684
67.8181153852412	74.7856355289023	12.4051888464268	67.7945884	81.6777909	13.5506647
68.0694749104331	75.0444897550406	12.4371951534587	69.765468	86.0199863	16.8900143
68.316720058151	75.299106070139	12.4686777427523	75.6464183	86.4517504	17.8073467
68.5586866068498	75.548284075492	12.4994884466288	75.0360354	91.1497098	19.4705099
68.7936403409444	75.7902357012186	12.5294066802501	77.3466754	92.4222135	24.9773835
69.0157926365946	76.0189968958163	12.5576959183233	75.4923392	99.8090463	23.5616918
69.0157927810025	76.0189968424071	12.5576958706811	79.9522127	98.0359405	21.2412381
69.015792918674	76.0189967789996	12.5576958437871	76.9820609	94.8106777	15.132467
69.0157930561815	76.018996713646	12.5576957280076	70.4834315	96.1070737	18.6164445
69.0157931928675	76.0189966455697	12.5576956851349	68.0410206	93.0677269	14.2384361
69.0157933295482	76.018996574543	12.5576956386926	66.3729212	97.9005203	11.9390694
69.015793466216	76.0189965014053	12.5576956340609	68.523768	98.3881808	6.8534875
69.0157936042288	76.0189964270293	12.5576955701041	67.0620012	97.8077872	5.6584534
69.0157937431576	76.0189963510118	12.5576954794095	67.3268965	96.007007	6.0328841
69.0157938831642	76.0189962729409	12.557695365677	66.5761879	96.7049476	8.0800553
69.0157940243644	76.0189961927755	12.5576952560397	64.4754864	95.6952093	9.6236824
69.0157941667909	76.018996110283	12.5576951337915	62.5782193	94.8345715	12.3846974
69.0157943103973	76.0189960256569	12.5576950338056	64.0121883	92.7907393	13.624016
69.0157944560569	76.0189959402816	12.5576949030653	63.9530194	87.4245185	17.4311618
69.0157946037635	76.0189958539648	12.5576948144914	62.4719528	86.6470186	17.4140053
69.015794753737	76.0189957664892	12.5576946965474	60.774398	89.648206	21.5223541
69.0157949056674	76.0189956771631	12.5576946189007	64.3381393	93.722702	21.2607142
69.0157950601204	76.0189955862433	12.5576945059552	61.0630253	98.699805	24.8594975
69.0157954991247	76.0189952236822	12.5576942366344	64.9776601	99.8572829	20.7305349
69.0157959379673	76.0189948606094	12.5576939427668	62.6982725	97.3778678	18.7400798
69.0157963808068	76.0189944898826	12.5576936645765	56.5514993	98.5201232	15.0548231
69.0157968341085	76.0189941022509	12.5576934126064	61.4066356	99.633296	10.2157007
69.0157972897003	76.0189937087583	12.5576931545182	63.7965883	99.8649883	6.5257645
69.0157977488402	76.0189933100471	12.5576928252813	62.3573907	96.159986	6.7572642
69.0157982115846	76.0189929034761	12.5576925641116	61.0701287	98.8683739	3.7920781
69.0157986951403	76.0189924720689	12.5576923101495	63.2522018	99.6147456	0.7669575
69.5542849263567	75.4797843984774	12.297448424494	61.1689993	94.8861498	0.1686343
70.1844251118974	74.8488002727688	11.9929112568108	61.0866811	94.7582572	1.1597592
70.9525315081683	74.0796659135927	11.6216987132314	65.7364961	88.9695394	1.2659879
71.7736509436463	73.2574452131974	11.2248664265202	72.4289329	91.88372	3.0217722
72.6537411571631	72.3761747405461	10.7995357359545	71.5874534	94.5399994	3.1033191
73.6911581554184	71.337369600766	10.2981731706833	74.8496365	95.8479299	7.1137605
75.1480647997111	69.8785234911913	9.59408308716525	71.4909917	88.8238404	7.979611

Solution x	Solution y	Solution z	Original x	Original y	Original z
76.8520453260434	68.1722773035186	8.77059094785579	77.1265753	88.6843079	7.3792466
78.8859341818404	66.135688022994	7.78766759683806	78.2121151	82.5216358	9.4131561
81.1754835993098	63.8430803647956	6.68118963359895	75.4040099	79.0607348	6.3376777
83.6235317639034	61.3917132978849	5.49809273159318	77.2293497	82.6694496	0.4080071
86.3080022601184	58.7035994915828	4.20072161698852	74.4567732	73.8913977	2.9219836
Route: 6 Length: 166.972047234863 Demand Met: 4999					
67.2891437665701	59.2378381070782	4.2646233381528	49.3212736	48.3119567	9.5488066
59.8269095211769	61.7254477179281	5.41304777951335	44.2906965	51.8898251	11.3116798
54.6487147356158	63.4516466017758	6.20996422601501	39.5709227	52.0192185	20.9490324
52.3192912514089	64.2281771468078	6.56845668893647	38.9617732	51.3997809	16.210445
50.4191158297576	64.8616145530516	6.86088836791642	39.4220046	48.156385	14.5273965
48.3654617507361	65.5462180175756	7.17693983464178	37.4597811	44.2188485	16.422469
46.7214394204464	66.094266554039	7.42995096220061	40.4352515	45.1450838	11.9573703
45.060736227609	66.647875843062	7.68553003394243	34.2887402	41.9043439	6.835982
44.0200029335778	67.2031126549733	7.86413076389689	34.4981613	43.6098189	6.3838863
42.8852435346662	67.8085115017773	8.05886742626046	31.5095969	51.0684653	11.523883
41.7869943288345	68.3944327029444	8.24733912983075	32.3710377	53.6854	0.0060466
40.7070137336387	68.970607697522	8.43267605618264	33.1471098	60.1558513	4.4414558
39.6660176773196	69.5259846355177	8.61132321097026	23.9069485	59.9121563	8.8002389
38.7101067056838	70.035969505428	8.77536868243569	26.1534967	60.2417469	15.9637624
37.8183521786229	70.5117273804731	8.92840403682103	32.7632095	61.4478694	17.2734289
36.9606284320929	70.969330166531	9.07559919296609	29.6716712	65.8677857	16.615982
36.1331700423494	71.4107866159161	9.21760026885714	37.7594155	72.4638416	24.7804303
35.3345229029263	71.8368724721262	9.3546569151135	32.5068688	76.0167984	20.6942387
34.5432360005792	72.2590315572866	9.49045038357022	35.4564008	78.9241199	21.2236154
33.7345013325136	72.6904987900681	9.62923812252526	41.3355343	82.7796974	17.0555529
32.8948238447403	73.1384738703766	9.77333595663276	45.8972803	89.1189208	23.3584238
31.9806716953974	73.6261815574703	9.93021490882074	44.680977	94.9895485	20.4805113
31.3271903670122	73.9496578619779	10.0309774191345	40.9379615	91.8870672	23.915222
30.6604074853632	74.2797171000572	10.133790618599	40.3910959	90.932739	23.935083
29.9821408230742	74.6154597314485	10.2383742802267	40.8799687	90.9919823	19.2349904
29.2898443682629	74.958146024849	10.3451209589968	37.489488	92.2138591	10.0537289
28.5920072684405	75.3035739024664	10.4527216739264	33.8269693	93.4852631	8.3635932
27.8966292178944	75.6477834741313	10.5599432214521	34.617789	91.6565199	3.2534463
27.1953590346651	75.9949085280341	10.668073374817	38.2308224	97.9753907	0.1604725
26.3031592498965	76.4365446912052	10.8056404284037	22.9057445	97.6296948	0.3244356
25.5044881435813	76.8318877038118	10.9287874187964	20.7475398	95.759314	10.8106372
24.7577905405768	77.2015068718967	11.0439216035195	14.3875276	98.8261078	17.7695633
24.184650281536	77.4852164981826	11.132295691639	16.4819632	98.2716229	22.9610856
23.7196188229634	77.7154118694141	11.2040007509833	17.6447354	95.7025091	24.4008135
23.286950903761	77.9295880976244	11.2707158154226	13.4475731	91.4293541	19.9118277
22.8695391064981	78.1362132984428	11.3350785422884	13.1891897	88.2938542	23.4034575
22.4624897442554	78.3377093158854	11.3978434704758	19.6070156	87.5155962	19.7643343
22.0510899608884	78.5413584169727	11.4612790156089	11.0262565	80.6460603	18.6716382
21.6426042657997	78.7435650432202	11.5242651424204	3.4980922	86.0326352	18.0570339
21.2509275664759	78.9374519817981	11.5846595611384	4.0389978	87.3302987	23.4710958
20.8832350923744	79.1194673459886	11.6413559814391	2.92961390000001	91.7761922	24.0474062
20.5748310092958	79.272133534247	11.6889105758584	5.5712407	90.2337915	20.7281907
20.2795066664062	79.4183256885889	11.7344484468304	8.45094570000001	92.4898096	19.3229772
19.9937948903646	79.5597598924243	11.7785041803666	5.93926279999999	95.2323551	18.983803
19.7223657456861	79.6941245359559	11.8203577238294	6.5131248	96.1438685	22.6159881
19.4673936649176	79.8203431554119	11.8596738100023	5.3401207	99.7769332	23.3119522
19.4673936178293	79.8203431395994	11.8596738148821	1.8947773	99.155621	15.7943163
19.4673935709939	79.8203431226422	11.8596737967059	0.604558600000004	98.8714353	15.0611354
19.530190141497	79.6305601607762	11.7973716519431	0.0137857999999937	97.6201473	12.5524591
19.6201560356287	79.3586702835988	11.7081170742548	2.8109458	93.7321232	7.4419786
19.7137440567978	79.0758316788456	11.6152678433831	2.2885744	93.0945686	4.7870646
19.8112506189905	78.781149666458	11.5185306675806	2.7731053	90.8551563	10.3958831
19.9109911046426	78.4797157525144	11.4195770894688	7.5281123	85.6801168	11.1420674
20.0108428255423	78.1779461998815	11.3205135611788	5.6520223	82.6769432	10.5413091
20.1101761382641	77.8777446216829	11.2219651484033	2.4095765	76.567725	8.2487866
20.2084864679878	77.5806360581403	11.1244324383319	0.933565799999997	72.1659561	13.9038289
20.3057244666591	77.2867693498444	11.0279643127702	4.2645198	75.4568775	14.9212902
20.402775150759	76.9934694092483	10.9316823768407	2.2118306	78.338365	17.5236695
20.5009447143827	76.6967876689212	10.8342901343562	2.73342340000001	77.6753662	22.8134911
20.6013245561186	76.3934251865007	10.7347045284593	3.24432779999999	74.1558976	22.7592184
20.7033771851067	76.0850065933471	10.633458882188	0.2763329	64.7359652	24.1588067
21.3336288039452	74.2319041859335	10.0128424126604	4.8021518	64.3437535	14.9149548
21.368535572431	74.1292884278002	9.97847660932072	0.795030699999998	63.4582891	12.408302
21.4622656231458	73.8537862542144	9.88621692473722	1.389212	56.8496436	7.9005554
21.5787592778687	73.5113190130386	9.77152778974411	2.2999767	55.3764405	4.437231
21.673461835581	73.4809938421641	9.75892415893357	3.9504558	53.4738105	7.1081084
21.8637844870729	73.4200518576494	9.73359588064285	4.9451086	53.7479899	10.2966488
22.0697100679658	73.3541116633928	9.70619102475117	6.65024940000001	63.3598676	12.1766222
22.2732524663147	73.288934742064	9.67910333206552	6.6484375	67.6725429	4.7357573
22.475299912303	73.2242366422937	9.65221457611052	6.2196931	67.2192158	1.3051514
22.6795826353108	73.1588228485709	9.62502838008274	1.295681	73.7881021	0.4861457
22.8935541020556	73.0903065894636	9.59655273967801	6.0949397	74.0865476	5.2825592
23.1135375223293	73.0198652619391	9.56727715650672	6.9413921	77.9428724	3.7844258
23.3401201759314	72.9473107993075	9.53712341680348	4.0094679	79.3774545	3.2513282

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.5790964847361	72.8707876989614	9.50532039851486	1.90777989999999	84.1438746	3.0185488
23.8614811536371	72.7803643922433	9.46774030583113	2.2068367	85.97283	4.4333903
24.259227174543	72.6530001021381	9.41480701436825	9.5621792	88.5032381	1.7950294
24.6910524392547	72.5147228669187	9.35733825343646	9.22639889999999	90.0124515	4.4717238
25.176179816839	72.3593771907767	9.2927757571869	11.9839899	90.8471274	5.5312557
25.7067689614718	72.1894736726297	9.22216292335945	13.5790401	86.3111074	8.8070912
26.2620075865247	72.0116767659196	9.14826961732025	20.4274735	84.2677658	10.0950289
26.8244215529506	71.8315821049303	9.07342134839092	20.5127244	86.7993916	9.2772764
27.3988084772507	71.6476534017589	8.99697958888063	19.6994488	87.7215703	8.9292535
27.9943227684368	71.4569591548166	8.91772598232308	21.4283979	90.119601	10.9146393
28.6184286409915	71.2571090325901	8.83466709387213	23.9936704	92.6751712	13.4234383
29.2841845776972	71.0439213556708	8.74606491829353	26.8042407	95.3391438	15.0909578
30.0669854712052	70.7932534755662	8.6418853382953	30.1525293	91.7059859	19.8161573
30.8970099054535	70.5274634094405	8.53142065340094	27.0999394	87.1794445	14.318048
31.7467032790874	70.2553748766594	8.41833799720995	31.00496	87.5127119	14.2496673
32.6008373089706	69.9818646483309	8.30466429748692	38.0621359	81.3957333	12.1235509
33.4261528416174	69.7175835965211	8.19482623845423	37.6570142	81.9317057	5.2409906
34.2284414329032	69.4606772862012	8.08805305848672	34.482979	80.365325	2.7097027
35.0218032677807	69.2066305287384	7.98246822512143	28.8394854	85.6978668	0.4508897
35.8566002115029	68.9393162050258	7.87136910493572	25.1363027	82.596723	1.6788626
36.7594428204933	68.6502129204378	7.75121416038568	30.51178	74.0433946	6.2558417
37.7044240773822	68.3476167688635	7.62545137982184	23.2409835	69.6045703	6.9223743
38.7349998501922	68.0176111057819	7.48829715999085	18.5593029	70.8497614	1.5511613
40.0013276093769	67.6121111870757	7.31976705702966	21.6218153	70.9164832	0.5487705
41.5375261539696	67.1201888042876	7.11531941140011	21.4467307	69.0185063	0.8942161
43.5264915019159	66.4832726408277	6.85061151668166	23.3330747	67.4297538	2.1722534
46.1703076193448	65.6366504296877	6.49874939720713	29.1113171	69.2428114	2.3178943
49.4084528205444	64.5997176732599	6.06779550401168	37.415218	67.1119326	2.4786359
53.2220563370689	63.3785030567801	5.56025425860428	42.9598051	72.0704928	1.9046969
58.051552606718	61.831941173376	4.91749585503911	45.412979	71.2677197	7.8505587
64.3346878083441	59.8198539638984	4.08126704046361	44.3710695	67.9205927	10.1383529



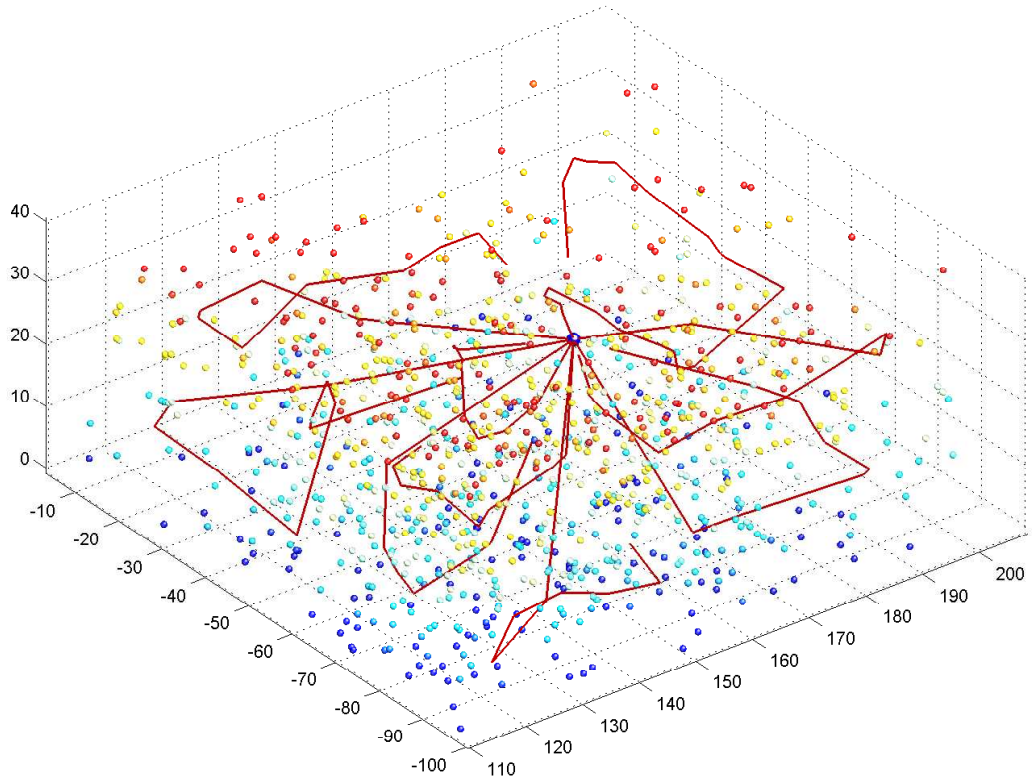


Figure O.69: *bonus*1000, Equal Radius, 3D, Euclidean, Length = 1776.6307639

Table O-72: Solution for *bonus*1000, Equal Radius, 3D, Euclidean

Total distance: 1776.63076394511 Total demand met: 25289 Depot: x 80 y 20 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 217.627612271872 Demand Met: 2904					
27.8380829854443	81.6858861253141	4.35012470116073	35.55901251	90.85604615	4.893665446
20.6599921020344	85.8593375594533	4.66878661986529	26.20322759	94.45704722	0.043122659
10.430460973346	91.8069246569565	5.12293056737852	0.846436707999999	97.15575264	0.271481864
10.430460973346	91.8069246569565	5.12293056737852	2.510162792	94.82470236	6.564520873
10.430460973346	91.8069246569565	5.12293056737852	4.44010970700001	94.87692744	8.233710837
10.430460973346	91.8069246569565	5.12293056737852	3.298576907	92.26869515	0.703140302
10.430460973346	91.8069246569565	5.12293056737852	8.37640356200001	96.83801393	4.582503625
10.430460973346	91.8069246569565	5.12293056737852	7.009024866	89.80852716	6.686928303
10.430460973346	91.8069246569565	5.12293056737852	7.085383584	88.77850283	10.21283209
10.430460973346	91.8069246569565	5.12293056737852	10.40564453	91.96900158	9.717112894
10.430460973346	91.8069246569565	5.12293056737852	3.10551266100001	84.71082736	3.992777578
10.430460973346	91.8069246569565	5.12293056737852	4.724328509	85.88211036	2.778795893
10.430460973346	91.8069246569565	5.12293056737852	4.377655918	84.98459142	5.210127271
10.430460973346	91.8069246569565	5.12293056737852	8.842438164	89.89183088	2.824200169
10.430460973346	91.8069246569565	5.12293056737852	6.35930977699999	87.06467249	1.39262333
10.430460973346	91.8069246569565	5.12293056737852	6.810206318	85.20186256	2.844617135
10.430460973346	91.8069246569565	5.12293056737852	20.42707279	96.69258649	1.544902576
10.430460973346	91.8069246569565	5.12293056737852	12.45480817	85.29988604	5.441763796
10.430460973346	91.8069246569565	5.12293056737852	15.25088212	86.85170355	0.622562014
10.430460973346	91.8069246569565	5.12293056737852	12.87616068	80.54131267	1.790579055
10.430460973346	91.8069246569565	5.12293056737852	20.47481611	85.68176763	4.096992025
14.0846344725386	92.1222871797616	11.4825242163296	3.319354366	86.8534104	10.89284525
14.0846344725386	92.1222871797616	11.4825242163296	5.793118726	87.72031575	18.95737877
14.0846344725386	92.1222871797616	11.4825242163296	6.29169329299999	89.27097954	11.1353809
14.0846344725386	92.1222871797616	11.4825242163296	18.10270516	98.29192556	19.61359774
14.0846344725386	92.1222871797616	11.4825242163296	18.56973911	98.93410982	17.86986814
14.0846344725386	92.1222871797616	11.4825242163296	14.02380259	94.55773265	18.6627295
14.0846344725386	92.1222871797616	11.4825242163296	17.81960057	98.01765152	13.9964983
14.0846344725386	92.1222871797616	11.4825242163296	6.663988874	86.9326968	14.76370285
14.0846344725386	92.1222871797616	11.4825242163296	22.19955839	99.83998701	15.37683497
14.0846344725386	92.1222871797616	11.4825242163296	10.77763243	89.00986935	18.62168793
14.0846344725386	92.1222871797616	11.4825242163296	9.98481624199999	87.60870523	18.9809529
14.0846344725386	92.1222871797616	11.4825242163296	5.902742913	84.57417463	9.395938461
14.0846344725386	92.1222871797616	11.4825242163296	17.25875189	95.69940805	8.290437664
14.0846344725386	92.1222871797616	11.4825242163296	23.23282295	99.37897746	14.24859303
14.0846344725386	92.1222871797616	11.4825242163296	13.01348985	89.5505908	15.47048063
14.0846344725386	92.1222871797616	11.4825242163296	11.28159713	86.83718755	19.13922705
14.0846344725386	92.1222871797616	11.4825242163296	21.95406549	97.08230078	10.07565883
14.0846344725386	92.1222871797616	11.4825242163296	19.55892343	94.48515334	9.227774263
14.0846344725386	92.1222871797616	11.4825242163296	22.62104276	94.03699994	18.3046068
14.0846344725386	92.1222871797616	11.4825242163296	20.03955091	90.83830295	21.35984013
14.0846344725386	92.1222871797616	11.4825242163296	23.10855555	93.46528062	15.33870171
14.0846344725386	92.1222871797616	11.4825242163296	15.06397637	86.4956065	14.41870487
14.0846344725386	92.1222871797616	11.4825242163296	21.61123904	90.19731465	15.12916055
14.0846344725386	92.1222871797616	11.4825242163296	25.24294214	93.18181598	14.28875041
14.0846344725386	92.1222871797616	11.4825242163296	12.63857375	82.42671014	11.06948651
14.0846344725386	92.1222871797616	11.4825242163296	24.92385591	92.07997464	15.00916266
14.0846344725386	92.1222871797616	11.4825242163296	21.4032788	88.65695382	8.541884
14.0846344725386	92.1222871797616	11.4825242163296	24.68088332	89.71453351	6.983081462
14.0846344725386	92.1222871797616	11.4825242163296	18.16441332	83.32201509	7.61422766
22.1441720783973	92.7449098646562	12.8140208557886	21.53298817	97.76613815	23.69582939
22.1441720783973	92.7449098646562	12.8140208557886	17.22630202	94.08640458	22.99978352
22.1441720783973	92.7449098646562	12.8140208557886	22.06521104	97.80973943	1.986453498
22.1441720783973	92.7449098646562	12.8140208557886	27.03699297	98.99807723	18.13725322
22.1441720783973	92.7449098646562	12.8140208557886	27.32463884	98.08040747	18.9687539
22.1441720783973	92.7449098646562	12.8140208557886	25.58817455	94.62259734	16.80660453
22.1441720783973	92.7449098646562	12.8140208557886	30.46512782	92.10545477	16.97866967
22.1441720783973	92.7449098646562	12.8140208557886	30.51609732	92.20951413	14.80192542
22.1441720783973	92.7449098646562	12.8140208557886	33.84742868	94.52834747	10.85109907
22.1441720783973	92.7449098646562	12.8140208557886	26.49994117	86.49656314	20.04082186
22.1441720783973	92.7449098646562	12.8140208557886	24.93956922	85.18138774	19.5490822
22.1441720783973	92.7449098646562	12.8140208557886	29.03165996	90.53300961	6.710005169
22.1441720783973	92.7449098646562	12.8140208557886	24.79158589	85.73273425	15.36547182
22.1441720783973	92.7449098646562	12.8140208557886	32.87814817	90.10176773	12.94837243
22.1441720783973	92.7449098646562	12.8140208557886	31.03913924	88.81924735	11.29281098
22.1441720783973	92.7449098646562	12.8140208557886	28.95022635	86.79829568	12.40202554
22.1441720783973	92.7449098646562	12.8140208557886	28.34961296	82.66841267	14.80317352
30.9228938034428	92.1067709773056	9.26225501254533	37.87107476	99.67477247	15.46291348
30.9228938034428	92.1067709773056	9.26225501254533	23.92476676	88.85275247	0.073261016
30.9228938034428	92.1067709773056	9.26225501254533	33.71990859	84.56649705	17.88810749
30.9228938034428	92.1067709773056	9.26225501254533	38.25086273	84.70191635	10.62939488
35.8176783111307	91.1731930279235	7.92858591693153	39.47053756	98.01039691	0.046804559
37.407933497093	90.8698955366149	7.49530684067902	44.01236363	95.54242778	0.007676566
37.407933497093	90.8698955366149	7.49530684067902	46.25821854	91.17761288	0.218810451

Solution x	Solution y	Solution z	Original x	Original y	Original z
37.7542989264999	90.8038413152401	7.40093598496724	45.33430047	93.58613905	11.44191552
37.7542989264999	90.8038413152401	7.40093598496724	43.91518159	93.39792889	6.973666169
38.0697028225472	90.7436918081237	7.315001319965	37.35140359	99.57591236	15.11952707
38.0697028225472	90.7436918081237	7.315001319965	41.23951851	98.4925435	12.0504117
41.4728171542061	90.0947774634838	6.38788433012743	48.86252985	99.44183304	4.964951227
41.4728171542061	90.0947774634838	6.38788433012743	47.96746082	95.14523251	6.669541987
42.0987152348651	88.5182600212537	6.13731042912407	46.20732106	94.82215894	11.38854737
42.8970044515112	86.5075101571563	5.817733044712	36.90788531	88.78292268	9.064555312
43.8555545883117	84.0930721823103	5.43401589006722	38.21932161	86.88940242	6.390388464
45.0175951357758	81.1660544530874	4.96886225837558	42.23200248	88.95299773	4.136491045
47.2014677370461	75.6650896137682	4.09480697714711	38.00030199	82.20200968	0.019607641
47.2014677370461	75.6650896137682	4.09480697714711	36.17809574	80.13104248	5.688631409
47.2014677370461	75.6650896137682	4.09480697714711	38.24583972	80.95791524	3.839199962
47.2014677370461	75.6650896137682	4.09480697714711	44.47086767	80.17305261	3.885836986
47.2014677370461	75.6650896137682	4.09480697714711	49.55654528	80.81624315	0.169379697
47.2014677370461	75.6650896137682	4.09480697714711	38.19879917	73.45302115	2.159211899
47.2014677370461	75.6650896137682	4.09480697714711	41.95376322	74.60739468	6.926728294
47.2014677370461	75.6650896137682	4.09480697714711	39.75179858	71.51477588	1.359571846
47.2014677370461	75.6650896137682	4.09480697714711	41.30767537	70.05965636	6.684179381
47.2014677370461	75.6650896137682	4.09480697714711	44.13660931	71.38940487	9.812814914
47.2014677370461	75.6650896137682	4.09480697714711	52.24575767	74.98560476	14.55357765
47.2014677370461	75.6650896137682	4.09480697714711	39.83687168	68.05987049	1.771904532
47.2014677370461	75.6650896137682	4.09480697714711	51.91696279	73.69595809	14.416915
47.2014677370461	75.6650896137682	4.09480697714711	53.90080059	74.55382457	8.588853077
47.2014677370461	75.6650896137682	4.09480697714711	51.17754367	73.39508539	6.606709632
47.2014677370461	75.6650896137682	4.09480697714711	58.21523833	76.77458472	1.682398914
47.2014677370461	75.6650896137682	4.09480697714711	47.89205446	67.3947139	7.919602812
47.2014677370461	75.6650896137682	4.09480697714711	53.60239056	70.80290226	5.406808424
47.2014677370461	75.6650896137682	4.09480697714711	50.86986196	67.11854893	6.466301231
47.2014677370461	75.6650896137682	4.09480697714711	52.45383187	66.17944394	1.57361944
47.2014677370461	75.6650896137682	4.09480697714711	50.29671492	64.07582579	3.765527546
Route: 2 Length: 223.583074730744 Demand Met: 2975					
44.9549909494338	18.1489901556923	5.27966769359144	38.07401644	11.09458783	4.920078282
40.5882412281925	17.9183470239362	5.93753611632431	35.62470684	10.73896033	9.362523366
38.2184688542355	17.7931802855317	6.29455203936624	36.57027062	15.62107689	13.23399254
38.2184688542355	17.7931802855317	6.29455203936624	36.77121212	29.70512597	6.399428168
34.5344920706021	17.0783745073779	6.85446831208267	35.85991513	20.90404301	13.98769394
30.6405285869634	16.3228249569914	7.44629869189295	30.90434674	20.96780911	4.645040707
30.6405285869634	16.3228249569914	7.44629869189295	34.15723352	12.84614068	2.236297964
24.5089456600317	15.1331089312403	8.37821654722715	24.09498187	20.3828805	2.129534364
24.5089456600317	15.1331089312403	8.37821654722715	24.23492671	17.98856994	0.400117348
14.3795506897639	13.1676893593674	9.91775358818202	8.98802709899999	7.925934732	19.26951737
14.3795506897639	13.1676893593674	9.91775358818202	20.19850768	8.627828216	19.22611956
14.3795506897639	13.1676893593674	9.91775358818202	21.65865806	17.99154884	8.745957007
14.3795506897639	13.1676893593674	9.91775358818202	23.64941173	19.80991504	13.65279264
11.0328837942077	13.4148426133354	7.17438632442402	0.867278095000003	18.04823486	8.201101929
11.0328837942077	13.4148426133354	7.17438632442402	3.082410661	9.043855976	8.462200359
11.0328837942077	13.4148426133354	7.17438632442402	5.801300438	5.23076571	0.128009607
11.0328837942077	13.4148426133354	7.17438632442402	8.67995437099999	15.22687294	13.91463376
11.0328837942077	13.4148426133354	7.17438632442402	10.89890727	16.02503912	12.34011368
11.0328837942077	13.4148426133354	7.17438632442402	12.63680518	12.91935497	10.56277797
11.0328837942077	13.4148426133354	7.17438632442402	14.9958336	14.5728326	1.422152891
11.0328837942077	13.4148426133354	7.17438632442402	18.20950886	6.619599382	5.445678785
7.22386351963061	33.0211420262156	10.2705715391123	0.224660494000005	41.43611847	14.21171956
7.22386351963061	33.0211420262156	10.2705715391123	1.354188569	31.31594018	20.59719751
7.22386351963061	33.0211420262156	10.2705715391123	0.438114408000004	29.42535326	2.454773911
7.22386351963061	33.0211420262156	10.2705715391123	3.43019284899999	27.39779729	20.1502757
7.22386351963061	33.0211420262156	10.2705715391123	2.694391803	27.62826968	12.84474665
7.22386351963061	33.0211420262156	10.2705715391123	5.584406208	23.81184943	17.55438576
7.22386351963061	33.0211420262156	10.2705715391123	7.974625907	40.8370263	13.38849506
7.22386351963061	33.0211420262156	10.2705715391123	6.668915236	38.80565327	2.074648475
7.22386351963061	33.0211420262156	10.2705715391123	9.954481978	42.50823893	15.05115407
7.22386351963061	33.0211420262156	10.2705715391123	8.02660248300001	29.17059173	11.48261049
7.22386351963061	33.0211420262156	10.2705715391123	11.00474377	35.14184161	13.52979102
7.22386351963061	33.0211420262156	10.2705715391123	9.320660383	27.08555662	0.10230943
6.49914730856546	39.9402826643362	10.3046353677378	0.0942256310000005	39.91558536	7.02793547
6.49914730856546	39.9402826643362	10.3046353677378	1.77561061599999	46.38397362	3.634697851
6.31385843851767	41.7093085537636	10.3133333578428	7.871697725	40.35198819	7.19843067
6.11918321493835	43.5679492983509	10.322471830614	9.020444459	42.86210706	4.331128313
5.91361652524873	45.5305747605943	10.3321213850124	5.668356774	43.14782971	2.118277692
5.66872371481506	47.8686595589978	10.3436183580523	8.81169210500001	48.50504439	3.044600386
5.66872371481506	47.8686595589978	10.3436183580523	10.20301226	47.6234059	3.00365475
5.40303908432129	50.4052532612624	10.3560894550886	5.28300793299999	51.8957834	3.767703534
5.40303908432129	50.4052532612624	10.3560894550886	8.91589750200001	48.83105962	4.105846181
5.02159448255327	54.0470044547007	10.3740117298648	1.28261934699999	62.39268391	2.604217434
5.40310663056535	54.03783350003	11.4115072364568	3.200690229	54.90401263	9.791910202
5.8015624708096	54.0282550946839	12.4950797400031	0.0735544159999932	50.20291794	9.32702938
6.27008493360691	54.0169917605977	13.7691928006463	6.810990128	49.52757429	10.46442277
6.27008493360691	54.0169917605977	13.7691928006463	9.89102482200001	52.16610985	9.967821485
6.8157706510267	54.0038724934801	15.2531450353038	10.84189087	50.74783931	12.90312929

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.8157706510267	54.0038724934801	15.2531450353038	11.99216143	50.52822644	12.13005328
7.3959883821348	53.9899225686951	16.8310044821892	7.342191074	50.36568708	15.52547031
7.3959883821348	53.9899225686951	16.8310044821892	6.962926975	47.87740863	12.6680673
8.12671389528573	53.9723527226196	18.8181574708109	8.078510661	52.12465727	17.30721805
8.90399029446436	53.953663391982	20.9319019613281	0.715064701000003	54.34039001	17.34040242
8.90399029446436	53.953663391982	20.9319019613281	3.857750749	53.93522034	16.19502855
11.9388976794664	53.880659498656	29.1850712370711	0.102323447000003	55.05645207	30.68754948
11.9388976794664	53.880659498656	29.1850712370711	3.166581108	54.38581172	37.35766501
11.9388976794664	53.880659498656	29.1850712370711	3.390983182	60.32064994	30.61068338
11.9388976794664	53.880659498656	29.1850712370711	3.684518627	54.75346427	34.67646632
11.9388976794664	53.880659498656	29.1850712370711	8.07711459799999	60.52651503	33.72017469
11.9388976794664	53.880659498656	29.1850712370711	1.250751092	48.74029716	30.02493246
11.9388976794664	53.880659498656	29.1850712370711	5.351054934	54.87903352	31.2051026
11.9388976794664	53.880659498656	29.1850712370711	4.692804385	58.08052349	25.21182896
11.9388976794664	53.880659498656	29.1850712370711	7.88086425500001	53.63419396	36.66849242
11.9388976794664	53.880659498656	29.1850712370711	14.06057656	63.93249207	34.35643485
11.9388976794664	53.880659498656	29.1850712370711	10.16802995	51.02082052	39.350114
11.9388976794664	53.880659498656	29.1850712370711	9.26512226200001	48.10149258	36.29819804
11.9388976794664	53.880659498656	29.1850712370711	15.36448886	54.97389236	39.50883453
11.9388976794664	53.880659498656	29.1850712370711	17.25601024	61.69443137	35.1920429
11.9388976794664	53.880659498656	29.1850712370711	11.86612062	56.83051802	27.8782456
11.9388976794664	53.880659498656	29.1850712370711	12.77181014	48.33401693	34.40572033
11.9388976794664	53.880659498656	29.1850712370711	19.29354577	63.34226321	29.80733532
11.9388976794664	53.880659498656	29.1850712370711	9.755265232	43.18329059	30.87649008
11.9388976794664	53.880659498656	29.1850712370711	8.736047039	47.86465463	22.63362148
11.9388976794664	53.880659498656	29.1850712370711	10.71615729	46.62293177	28.86994808
11.9388976794664	53.880659498656	29.1850712370711	18.10483235	51.48322234	38.87016683
11.9388976794664	53.880659498656	29.1850712370711	12.24975114	50.92735248	27.57127396
11.9388976794664	53.880659498656	29.1850712370711	13.21771043	55.16074821	22.9111302
11.9388976794664	53.880659498656	29.1850712370711	20.97945435	58.66863495	34.56781671
11.9388976794664	53.880659498656	29.1850712370711	14.81228179	50.29125842	28.12065032
11.9388976794664	53.880659498656	29.1850712370711	20.37447933	52.92580791	35.47903396
11.9388976794664	53.880659498656	29.1850712370711	22.06521443	57.50548607	32.39286042
11.9388976794664	53.880659498656	29.1850712370711	13.48749824	42.29987548	28.42807605
11.9388976794664	53.880659498656	29.1850712370711	23.29263587	57.34435722	30.94445508
11.9388976794664	53.880659498656	29.1850712370711	17.47416259	43.6041515	31.53434731
11.9388976794664	53.880659498656	29.1850712370711	22.00300591	49.77440842	32.73357505
11.9388976794664	53.880659498656	29.1850712370711	19.18169919	47.05766373	27.00382561
11.9388976794664	53.880659498656	29.1850712370711	18.21138052	45.58660191	25.83715904
16.6991705098735	45.7916725267215	27.3549222267866	9.19676513100001	46.15569372	17.99642834
16.6991705098735	45.7916725267215	27.3549222267866	18.21468575	45.65080463	39.25800482
16.6991705098735	45.7916725267215	27.3549222267866	10.30388261	47.84277995	17.55376223
16.6991705098735	45.7916725267215	27.3549222267866	17.44262234	43.68368222	35.8944745
16.6991705098735	45.7916725267215	27.3549222267866	19.40209516	41.66020767	37.5577128
16.6991705098735	45.7916725267215	27.3549222267866	23.40792676	43.64379836	35.72280889
16.6991705098735	45.7916725267215	27.3549222267866	22.81585575	48.67591425	26.59144604
16.6991705098735	45.7916725267215	27.3549222267866	17.93093151	43.30092715	17.11460176
16.6991705098735	45.7916725267215	27.3549222267866	22.68802089	46.28526246	22.76975049
16.6991705098735	45.7916725267215	27.3549222267866	25.71821347	44.02373583	30.1225615
16.6991705098735	45.7916725267215	27.3549222267866	24.77779172	44.04083387	26.11612996
16.6991705098735	45.7916725267215	27.3549222267866	26.12441872	44.96485891	27.03242338
16.6991705098735	45.7916725267215	27.3549222267866	27.37711129	46.43616017	27.11673494
16.6991705098735	45.7916725267215	27.3549222267866	28.08331623	42.02257662	27.79667825
16.6991705098735	45.7916725267215	27.3549222267866	27.06311365	42.64274924	23.39166283
24.1027043340445	32.6803750849113	12.8671757559646	23.06731773	35.0375678	21.55663613
24.1027043340445	32.6803750849113	12.8671757559646	28.59013959	24.83311171	20.75915805
24.7086956457127	31.6041791388757	11.17599845979	24.70443529	26.12365999	11.74081492
24.7086956457127	31.6041791388757	11.17599845979	30.34406593	27.74432368	15.48974465
25.2268458931623	30.6839830477155	9.72996531387374	29.56587444	24.57869021	18.08116751
25.2268458931623	30.6839830477155	9.72996531387374	28.82263126	20.36706254	14.69297653
25.2268461443704	30.6839826594444	9.72996444261609	16.76117492	28.31246812	1.562447455
25.2268461443704	30.6839826594444	9.72996444261609	18.74305811	29.30240259	6.154559295
26.8688101124248	30.3637031010925	9.43828293731647	22.33900559	31.60235215	9.968662506
28.8310454867217	29.9809518390018	9.08970839023726	23.31975826	27.34182644	2.882941415
28.8310454867217	29.9809518390018	9.08970839023726	25.40396983	32.32053998	7.877867709
31.8911221058179	29.3840568607768	8.5461126281209	25.99458773	34.37910238	4.84512326
37.7151789783175	28.2480239759211	7.51152057241237	31.17947294	31.40633137	5.155453447
56.9816645073053	24.4899372681702	4.08904696534995	51.19858704	31.0981292	6.058142298
56.9816645073053	24.4899372681702	4.08904696534995	55.07321291	28.85442279	12.55016086
56.9816645073053	24.4899372681702	4.08904696534995	62.17589976	23.53474989	9.188656209
56.9816645073053	24.4899372681702	4.08904696534995	64.88897514	21.58345165	8.959362969
Route: 3 Length: 189.108378391681 Demand Met: 2907					
69.6862319650285	30.9125030723894	12.9283439671803	66.17419814	21.15751135	18.97034229
69.6862319650285	30.9125030723894	12.9283439671803	70.71952594	19.54937922	9.466423791
65.3665856715423	36.1290040661192	18.2645552540842	74.55729645	43.48740037	20.58508364
65.3665856715423	36.1290040661192	18.2645552540842	73.13866372	41.71405139	17.04301109
58.9282710629298	40.7176123586765	23.8573234106525	48.35826716	45.69665672	26.59304148
58.9282710629298	40.7176123586765	23.8573234106525	50.26037041	48.95030273	24.30726963
58.9282710629298	40.7176123586765	23.8573234106525	49.81718199	39.89953162	25.94554765
58.9282710629298	40.7176123586765	23.8573234106525	51.65508094	43.85648581	22.32830057

Solution x	Solution y	Solution z	Original x	Original y	Original z
58.9282710629298	40.7176123586765	23.8573234106525	52.03099226	42.50134863	22.51431543
58.9282710629298	40.7176123586765	23.8573234106525	55.9549233	32.80200534	27.96563646
58.9282710629298	40.7176123586765	23.8573234106525	62.83458953	32.37480154	31.54745986
58.9282710629298	40.7176123586765	23.8573234106525	58.48548965	38.49282405	23.12403661
58.9282710629298	40.7176123586765	23.8573234106525	63.12520069	41.24941139	24.07122315
58.9282710629298	40.7176123586765	23.8573234106525	63.21772914	46.4808445	18.00555738
58.9282710629298	40.7176123586765	23.8573234106525	59.28037529	42.02965748	18.78086606
58.9282710629298	40.7176123586765	23.8573234106525	58.14893689	37.55022655	17.10511358
58.9282710629298	40.7176123586765	23.8573234106525	64.47235297	44.07915445	14.05919317
58.9282710629298	40.7176123586765	23.8573234106525	56.1557774	36.1071959	13.13084437
57.1414815262099	43.4153864266059	26.2566583526093	55.80484172	50.30189669	30.08035465
57.1414815262099	43.4153864266059	26.2566583526093	61.01859213	37.82208646	31.82775528
55.8229553927549	45.4061677461274	28.0271993452363	57.48443808	43.25173204	37.88033317
55.8229553927549	45.4061677461274	28.0271993452363	63.54041364	40.47906672	32.95919177
54.4052072003304	47.5467639919097	29.9309703736614	45.94832838	45.50704308	38.19660802
54.9128723718231	48.6197117891433	29.633162432306	47.38308024	49.71863955	31.58389373
54.9128723718231	48.6197117891433	29.633162432306	51.12261026	42.05252276	30.83772297
55.6753911828839	50.2313303682715	29.1858613767797	48.65047008	56.26343732	32.64491993
55.6753911828839	50.2313303682715	29.1858613767797	48.91348948	54.77748717	32.9330217
56.370482471428	51.7004377575793	28.7781133501968	52.57887869	54.16196226	35.47497689
56.370482471428	51.7004377575793	28.7781133501968	58.50503897	53.8647284	36.33438611
57.0840144945264	53.2085211497333	28.3595479459795	57.09480153	60.45993374	34.61199265
57.0840144945264	53.2085211497333	28.3595479459795	55.16481024	55.42346911	31.47512835
57.6405695829113	54.3848131689912	28.0330637897655	65.98277732	56.02257659	36.50214422
57.6405706213317	54.3848169249114	28.0330617353056	56.36080227	54.43871329	23.33898219
57.6405706213317	54.3848169249114	28.0330617353056	64.66140077	51.58253517	18.71344865
57.2483303564856	57.1745160261144	28.2062528775501	48.01348394	55.67625048	22.64155069
57.2483303564856	57.1745160261144	28.2062528775501	53.50308144	57.04941766	21.52167719
56.7628756066827	60.6272409691715	28.420613428327	52.59359138	61.87082203	17.23711721
56.7628756066827	60.6272409691715	28.420613428327	56.73611746	58.87824868	26.03485933
56.3290098842468	66.3102521836254	29.8028444169736	52.68458788	66.68600654	36.07142386
56.3290098842468	66.3102521836254	29.8028444169736	54.03625818	65.02303827	30.15017844
55.9298638388798	71.5385186626384	31.074467847139	47.34853229	74.63427391	38.87043339
55.9298638388798	71.5385186626384	31.074467847139	49.38151416	71.84627519	34.52041136
56.4972528618714	72.2585078433795	30.7243262206593	53.92763119	74.12654413	38.27376011
57.1093573930502	73.0352353110492	30.3465869832956	62.20174968	80.96664236	37.77358899
57.1093573930502	73.0352353110492	30.3465869832956	59.09181099	73.44789922	33.41304482
57.1790149282876	73.0640166297806	29.874760199243	65.34735437	72.80394877	34.67473005
57.1790149282876	73.0640166297806	29.874760199243	63.48323083	69.36201841	31.45080353
57.2544713371826	73.0951937882345	29.3636589967582	60.79681015	75.33369853	28.93747546
57.2544713371826	73.0951937882345	29.3636589967582	58.20433528	69.50520456	29.55764241
57.3294708657211	73.1261823243598	28.8556460153241	55.90538334	73.56581582	30.52666899
57.3294708657211	73.1261823243598	28.8556460153241	56.76810138	74.93595817	28.17323894
57.4053300040323	73.1575258804497	28.3418130853002	55.58088554	76.52999392	28.31600672
57.4813685793793	73.1889434465785	27.8267660933129	49.13669956	77.10708156	27.62901252
57.4813685793793	73.1889434465785	27.8267660933129	52.40986372	76.90026657	30.53428803
57.5614303497138	73.2220227866838	27.2844773546806	49.62844822	78.65994225	20.1083463
57.5614303497138	73.2220227866838	27.2844773546806	50.78444002	76.12504454	23.00978791
58.5873697345007	72.7155401835279	26.8376000908725	51.90516717	74.10528304	22.83711571
59.7530606913433	72.1400779661542	26.3298499362154	57.06276587	74.98770524	20.67544591
59.7530606913433	72.1400779661542	26.3298499362154	55.72002047	71.91921816	21.5952445
60.9951296572082	71.5269154493887	25.788831824309	58.81674593	76.2826012	22.48412381
62.3199151518694	70.8729213029424	25.2117843678914	56.84900895	69.27095699	14.65228976
62.3199151518694	70.8729213029424	25.2117843678914	67.87575086	63.89107621	33.2359079
62.3199151518694	70.8729213029424	25.2117843678914	60.59756518	67.42291916	21.31629348
62.3199151518694	70.8729213029424	25.2117843678914	62.01287875	62.70691628	29.4740589
62.3199151518694	70.8729213029424	25.2117843678914	56.12304172	60.76926662	25.75259057
62.3199151518694	70.8729213029424	25.2117843678914	59.10597324	64.72617137	21.25191915
62.3199151518694	70.8729213029424	25.2117843678914	57.97334153	65.39941546	18.27090119
62.3199151518694	70.8729213029424	25.2117843678914	73.05372772	69.26625594	20.0928079
62.3199151518694	70.8729213029424	25.2117843678914	61.59665848	60.86573745	25.73038778
62.3199151518694	70.8729213029424	25.2117843678914	65.84999623	61.37790202	25.6974767
65.1237673472033	70.9893115097035	26.5671612009245	63.47892732	68.70647259	29.32775126
65.1237673472033	70.9893115097035	26.5671612009245	63.53725064	67.03413314	29.14142524
68.04109250141	71.1104145694182	27.9773898700863	68.84275879	76.03221479	29.69910657
68.04109250141	71.1104145694182	27.9773898700863	67.45457311	72.85375456	29.93900874
70.742675208515	71.2225644132324	29.2833305054475	70.77169737	73.88064127	33.24954023
70.742675208515	71.2225644132324	29.2833305054475	72.84290598	65.67053988	28.7186167
73.0318317848881	71.3175991334475	30.389907277331	70.61748839	78.65460339	33.23222305
75.3676295990748	71.4145683067528	31.5190297002852	72.09010058	81.417498	36.30236671
75.3676295990748	71.4145683067528	31.5190297002852	75.20998283	80.5662569	34.55930276
77.6876058683362	71.5108784155166	32.6405023306239	81.4352048	82.89764497	33.18556014
77.6876058683362	71.5108784155166	32.6405023306239	86.75397464	75.23932777	39.5614605
77.7136592928623	68.5145386019237	32.3745989221861	81.47694776	70.94126153	23.66230135
77.7464622055	64.7419903665255	32.0398122463842	78.83068399	69.67274441	24.24069079
77.7464622055	64.7419903665255	32.0398122463842	74.85083054	64.74645556	30.78568814
77.8055001654616	57.9551673458501	31.4375355134131	66.67873973	56.13517049	35.54640769
78.2447202087123	56.0154408776414	31.103532180479	83.91646182	55.69492785	39.74024442
78.2447202087123	56.0154408776414	31.103532180479	72.73426073	54.95021428	39.57914747
78.2447202087123	56.0154408776414	31.103532180479	77.87000631	52.21112855	39.93820594

Solution x	Solution y	Solution z	Original x	Original y	Original z
78.2447202087123	56.0154408776414	31.103532180479	67.27809665	56.79217526	31.19414535
78.2447202087123	56.0154408776414	31.103532180479	86.51848331	50.71555717	36.90102142
78.2447202087123	56.0154408776414	31.103532180479	69.70404765	60.5822767	24.01827102
78.2447202087123	56.0154408776414	31.103532180479	83.55927983	59.64747077	24.27812457
78.2447202087123	56.0154408776414	31.103532180479	83.19197135	53.48639501	32.18766969
78.2447202087123	56.0154408776414	31.103532180479	88.60564442	53.67349247	30.97358927
78.2447202087123	56.0154408776414	31.103532180479	71.99750065	50.82091856	33.04720741
78.2447202087123	56.0154408776414	31.103532180479	72.13050555	55.03070373	28.54528132
78.2447202087123	56.0154408776414	31.103532180479	78.85550393	52.04144231	24.20403351
78.2447202087123	56.0154408776414	31.103532180479	76.57028534	49.55513485	21.13053287
79.7887060571668	51.4159550297005	31.0867168484419	91.19333201	55.09349477	31.72721103
79.7887060571668	51.4159550297005	31.0867168484419	79.30599483	40.28434635	35.54252376
80.1287355915372	47.2504528013007	30.9685693389387	71.61626861	44.97765672	39.11549021
82.2733750866107	38.7252631058774	29.3590689606447	84.85983095	39.85329756	21.28837281
84.068251838856	31.5903634416866	28.0120752704356	88.13068149	33.9074779	16.96093724
84.585923731378	29.0248609162589	27.8435728660778	82.01891737	31.58538586	22.96295297
85.1463762824938	26.2473488188779	27.6611492322925	94.17807015	30.5898166	23.81736257
86.0637924258838	21.7007397643333	27.3625330928107	94.15587216	20.2227246	36.0994515
86.0637924258838	21.7007397643333	27.3625330928107	90.81819821	18.2159484	35.33294835
85.5749852979332	16.1420820588336	25.1722172435084	95.99475962	18.1472698	27.39786086
85.5749852979332	16.1420820588336	25.1722172435084	94.43184685	8.796264511	23.29859307
85.551361335526	15.873417609535	25.0663499448006	93.53556787	11.2495411	17.39352488
83.9802947448658	14.858891297589	25.6999550702011	83.75499038	5.857780347	33.63275215
80.8338607299812	16.5080113391982	23.7097718676721	71.29498477	19.86081824	30.17263192
80.6001579026342	17.4867059115924	17.0650168393293	77.03036191	15.51069798	15.03164451
80.43448338437	18.1804940122544	12.3544166671425	85.22979418	8.715884504	12.16207554
Route: 4 Length: 183.048301501609 Demand Met: 2506					
66.8023203035891	48.5507061621065	4.82913763153554	68.52022941	55.69012612	11.12241046
65.1083346054759	52.2146768781655	5.44878392165796	71.85259834	57.85616299	9.805797889
63.8576497666601	54.9196752372811	5.90623914967088	62.81703196	55.94894639	0.04067048
63.8576497666601	54.9196752372811	5.90623914967088	70.94365949	58.14560753	5.076539278
62.6505236486329	57.5305091035635	6.34783523483112	59.77266019	58.01872841	1.019723189
62.6505236486329	57.5305091035635	6.34783523483112	61.56325619	58.635877	0.997422198
61.5284220596963	59.957535882094	6.75836671951832	54.15102156	63.89433124	1.875052021
60.7931315048191	61.5479451558699	7.02738443977687	59.0134746	66.34233581	2.610073656
60.7931315048191	61.5479451558699	7.02738443977687	53.04622082	62.56220406	2.597564218
60.235028179612	62.755123189546	7.23157653284672	56.20333441	63.09635143	9.893720293
60.235028179612	62.755123189546	7.23157653284672	61.64088805	64.72462094	13.53456764
59.7228391238137	63.8629918403839	7.41896864246075	65.09617026	64.32634731	13.59892336
59.7228391238137	63.8629918403839	7.41896864246075	65.33791464	63.72798066	4.706052333
59.143622938784	65.1158235584146	7.63087892094445	65.55566867	66.58332744	7.127202217
58.5266807845379	66.4502468661261	7.85658828689706	66.81087893	72.19337817	6.977880898
58.5266807845379	66.4502468661261	7.85658828689706	69.12634406	69.4594231	3.844630021
55.7854347029707	72.3794576176985	8.85948292193427	61.63608438	74.03409399	0.746346368
55.7854347029707	72.3794576176985	8.85948292193427	61.14896118	72.70410502	7.635652533
48.094869325987	89.0147912133723	11.6733026607059	44.53236455	98.59505273	17.96036731
48.094869325987	89.0147912133723	11.6733026607059	52.2623599	99.83573023	14.38314162
48.094869325987	89.0147912133723	11.6733026607059	50.67630959	98.08417141	16.59101162
48.094869325987	89.0147912133723	11.6733026607059	54.09260921	96.04789718	12.52208915
48.094869325987	89.0147912133723	11.6733026607059	49.59427698	92.51123595	3.551090207
48.094869325987	89.0147912133723	11.6733026607059	54.90972966	93.30800556	12.19693664
48.094869325987	89.0147912133723	11.6733026607059	51.98537923	93.03310405	5.658677856
48.094869325987	89.0147912133723	11.6733026607059	49.03663551	90.65504513	13.8830876
48.094869325987	89.0147912133723	11.6733026607059	53.26472651	92.17526811	13.38443287
48.094869325987	89.0147912133723	11.6733026607059	54.43632749	91.92787857	15.4166252
48.094869325987	89.0147912133723	11.6733026607059	54.10050901	92.28618361	12.05829408
48.094869325987	89.0147912133723	11.6733026607059	46.02083433	88.3362158	14.03418258
48.094869325987	89.0147912133723	11.6733026607059	57.53422575	91.73216299	13.63995038
48.094869325987	89.0147912133723	11.6733026607059	45.13867401	81.86371268	20.6390675
48.094869325987	89.0147912133723	11.6733026607059	56.30399813	89.72916428	6.343295144
48.094869325987	89.0147912133723	11.6733026607059	40.58416037	81.54961967	6.0287924
48.094869325987	89.0147912133723	11.6733026607059	53.87450626	88.16447802	6.291517338
48.094869325987	89.0147912133723	11.6733026607059	49.77274656	84.13753559	18.23448828
48.094869325987	89.0147912133723	11.6733026607059	52.05342714	85.82620662	0.803032132
48.094869325987	89.0147912133723	11.6733026607059	51.49657531	83.11057243	16.78262105
48.094869325987	89.0147912133723	11.6733026607059	55.99099974	83.60147673	17.9737132
48.094869325987	89.0147912133723	11.6733026607059	48.20934555	82.30314786	4.491594241
48.094869325987	89.0147912133723	11.6733026607059	53.08761619	83.0335557	12.88369987
48.094869325987	89.0147912133723	11.6733026607059	51.18829335	82.80979047	5.597845952
48.094869325987	89.0147912133723	11.6733026607059	46.11608956	79.13405595	12.05021293
48.094869325987	89.0147912133723	11.6733026607059	45.32225765	79.26748614	7.718311017
48.094869325987	89.0147912133723	11.6733026607059	47.92908542	80.11129273	4.265931676
48.094869325987	89.0147912133723	11.6733026607059	47.14165764	77.84331314	10.33249494
48.094869325987	89.0147912133723	11.6733026607059	55.73082902	81.05870461	7.770192012
58.4694495327048	86.7934895562806	9.89474676095526	57.43254842	97.94119843	9.821238574
58.4694495327048	86.7934895562806	9.89474676095526	58.00620671	94.64720593	1.304858734
58.4694495327048	86.7934895562806	9.89474676095526	61.09603132	95.38804721	2.385400865
58.4694495327048	86.7934895562806	9.89474676095526	62.35255518	88.46202983	5.064300638
58.4694495327048	86.7934895562806	9.89474676095526	67.89989075	88.12316705	3.528198384
58.4694495327048	86.7934895562806	9.89474676095526	55.75342338	84.56592915	0.703415223

Solution x	Solution y	Solution z	Original x	Original y	Original z
58.4694495327048	86.7934895562806	9.89474676095526	58.40265516	82.89286098	16.95320583
58.4694495327048	86.7934895562806	9.89474676095526	60.70093329	80.64454551	19.95511414
58.4694495327048	86.7934895562806	9.89474676095526	61.67834468	82.51967341	13.24261796
58.4694495327048	86.7934895562806	9.89474676095526	69.09548968	84.07624055	12.89569188
58.4694495327048	86.7934895562806	9.89474676095526	62.03157877	81.16617953	8.458189727
58.4694495327048	86.7934895562806	9.89474676095526	57.82109764	79.24611201	0.587934441
58.4694495327048	86.7934895562806	9.89474676095526	63.68037897	79.29990004	5.705664659
65.8555612745879	88.7297474538991	10.8252302437854	69.92952441	96.42807986	14.30332435
65.8555612745879	88.7297474538991	10.8252302437854	64.64609008	95.09261932	13.24961232
69.1164042842514	89.5846990984781	11.2360324115904	69.38304877	98.18671586	10.95698255
71.894092099279	90.31299301787	11.585968182921	70.07355989	96.61021246	6.954740599
71.894092099279	90.31299301787	11.585968182921	71.17046416	92.96230041	3.31475723
74.9679301545621	91.1189352656598	11.9732111239469	73.04972269	93.68364053	0.740152131
74.9679301545621	91.1189352656598	11.9732111239469	86.10921689	91.46882481	10.98097302
76.4374685278729	91.5042679686465	12.1583058129102	78.18108034	99.79242924	3.657350909
76.4374685278729	91.5042679686465	12.1583058129102	79.39161289	97.26593015	10.2457076
76.9609679944748	91.467455568612	12.4181293364707	79.19703593	96.06011661	13.22486099
77.4862767715683	91.43051726727	12.6788483857256	80.84419352	99.98848979	20.3915349
77.4862767715683	91.43051726727	12.6788483857256	86.37403118	99.02923308	15.37465632
77.2121259409188	86.7624841195785	12.7371250892724	82.53992082	88.87907996	14.07314191
77.2121259409188	86.7624841195785	12.7371250892724	75.38279951	84.8495864	16.86303573
76.9216624181806	81.8164614860362	12.7988738740598	77.11333094	85.3156461	2.683835286
76.9216624181806	81.8164614860362	12.7988738740598	74.46580568	79.0435318	1.384862598
76.9805820740305	80.3514928756111	13.5408084146931	82.09017124	81.333147	13.10533341
77.0385469681935	78.910247899113	14.2707271587747	70.83372488	78.21085961	24.5182183
77.0385469681935	78.910247899113	14.2707271587747	67.69295238	75.24403656	20.54681948
78.7329661490432	75.866534951714	13.3168092262131	68.36889636	72.61479797	11.90493723
78.7329661490432	75.866534951714	13.3168092262131	70.36283848	70.39401036	9.239076068
80.5126872031828	72.6695098167603	12.3148702953707	73.75840634	73.11670598	12.48249331
80.5126872031828	72.6695098167603	12.3148702953707	74.07680751	69.16329968	17.32839223
83.1131351579136	67.9980352116796	10.850932512523	91.90328388	76.16243153	11.12653143
83.1131351579136	67.9980352116796	10.850932512523	83.77232341	73.14211564	19.82850896
83.1131351579136	67.9980352116796	10.850932512523	78.29263567	66.45988674	19.86750284
83.1131351579136	67.9980352116796	10.850932512523	72.70378804	66.70645397	9.083647724
83.1131351579136	67.9980352116796	10.850932512523	76.04244622	64.45001766	13.22117777
83.1131351579136	67.9980352116796	10.850932512523	85.16088414	60.47696067	19.97453885
83.1131351579136	67.9980352116796	10.850932512523	87.34079917	59.37931572	10.08579475
83.1131351579136	67.9980352116796	10.850932512523	75.75634139	60.02200009	5.726434896
84.6665087301462	55.8139521333913	7.20157063740646	95.77662579	57.68215173	3.069360741
84.6665087301462	55.8139521333913	7.20157063740646	90.50689197	55.43830225	17.11301088
84.6665087301462	55.8139521333913	7.20157063740646	79.86750899	54.35421653	8.27403967
84.6665087301462	55.8139521333913	7.20157063740646	84.14082278	54.46253046	0.380513445
84.6665087301462	55.8139521333913	7.20157063740646	85.71414415	51.67250379	7.296357424
84.6665087301462	55.8139521333913	7.20157063740646	78.92131522	50.41345477	7.556720976
84.6665087301462	55.8139521333913	7.20157063740646	77.77449926	46.72256252	10.92269156
82.9294150665413	42.4847422463647	4.52092503370917	77.14427045	45.25079579	0.327384457
80.9180254482559	27.0430726553762	1.41638157869517	87.03899122	21.09553754	1.216015821
Route: 5 Length: 172.394831467394 Demand Met: 2175					
72.5516857558629	17.9557457259858	2.49184678459017	72.1570689	9.179080442	1.515121588
72.5516857558629	17.9557457259858	2.49184678459017	76.68650337	13.86956158	1.8774276
67.0898676643315	16.4567023698485	4.31910741115869	65.51501196	11.68636529	3.24100338
62.8207718466871	15.285008689914	5.7473389256701	63.24920239	4.015695007	1.646238652
51.5538793733866	14.4782039917637	10.3110707254952	50.20668952	26.40233109	10.32749181
46.4558200240117	13.6835762069465	12.3949879899871	42.34346606	5.769949569	4.366098536
28.6969713184433	15.1124899865531	25.2576825121804	29.15811552	9.518746656	35.77137383
28.6969713184433	15.1124899865531	25.2576825121804	32.11403346	10.63014558	35.85165647
28.6969713184433	15.1124899865531	25.2576825121804	35.94447387	20.12395641	25.28688733
28.6969713184433	15.1124899865531	25.2576825121804	35.53984032	15.99196501	21.54085765
28.6969713184433	15.1124899865531	25.2576825121804	38.38951699	19.65672727	24.71703453
28.6969713184433	15.1124899865531	25.2576825121804	38.46066343	17.33665094	24.22591115
21.5040417874417	17.0731230001947	26.175155845491	18.71921477	25.10440199	21.46380598
17.8669300305661	18.0645156781518	26.6390732886029	14.86812736	22.17705421	27.08627601
14.9175693909738	18.8684427394194	27.0152664917806	8.465864182	8.874062551	25.43796737
14.9175693909738	18.8684427394194	27.0152664917806	18.39694528	22.72524013	21.81072027
13.8426602386379	20.0660024538481	27.3371059442339	5.72255099500001	17.38650207	24.6119319
13.8426602386379	20.0660024538481	27.3371059442339	12.36712067	15.90584574	24.47249551
12.8407398861609	21.1822475992892	27.6370937828358	2.197761157	16.16441336	29.99258788
12.8407398861609	21.1822475992892	27.6370937828358	3.177857831	14.97802426	24.78576733
12.8295688240896	21.2959710844082	27.6454257267121	5.677247541	18.04924585	36.67897415
12.8295688240896	21.2959710844082	27.6454257267121	7.31997787899999	15.37807435	33.05725748
12.693242942239	22.6836006304294	27.7471142717246	10.79914705	20.42039499	35.93251466
12.5442706724884	24.1999554836283	27.8582355490018	6.772905892	23.04434695	34.36872103
12.3933087809963	25.7365640745443	27.9708407614788	4.281409798	24.72152663	26.34546352
12.3933087809963	25.7365640745443	27.9708407614788	4.953508892	23.81507206	25.41914679
12.2236112272177	27.4638889041413	28.0974223141608	10.62327399	24.29073933	35.14972626
12.0322884710876	29.4113325219393	28.2401337012452	2.51827574799999	30.45426362	34.97941135
12.0322884710876	29.4113325219393	28.2401337012452	3.815111582	26.65111472	27.4138472
11.9535748298608	30.2125317938415	28.2988478173402	6.71940622700001	25.73868862	24.12156356
11.9535748298608	30.2125317938415	28.2988478173402	9.44237495500001	27.32019574	23.59921997
11.85876880609	31.1775359778352	28.3695662366928	10.78091353	34.08373955	26.71276523

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.85876880609	31.1775359778352	28.3695662366928	14.14878683	27.98719075	26.90047422
11.7607175575775	32.1755742862016	28.4427053657624	14.44281578	41.35822358	23.25943932
11.7024237621329	32.7689266909772	28.4861881655936	2.885836634	40.60849192	26.29324057
11.7024237621329	32.7689266909772	28.4861881655936	8.013859219	41.41457221	25.49555223
11.7024245979086	32.7689268143262	28.4861884770855	12.65054039	38.20990532	17.83269917
11.7024245979086	32.7689268143262	28.4861884770855	19.64225061	34.99214308	28.17560222
12.8851182653306	32.8110330880818	29.1326114996662	6.302525489	40.0085763	32.06550398
14.6013491738834	32.8721308476252	30.0706446249527	9.832177112	38.08691559	39.13126485
14.6013491738834	32.8721308476252	30.0706446249527	12.31993183	42.07287161	37.42873621
16.0852125718407	32.5537130399213	30.5375024058274	12.97854061	40.66549102	35.96453487
16.0852125718407	32.5537130399213	30.5375024058274	14.50630809	38.16565664	31.09752118
18.2225632721932	32.0950655826764	31.2099616823692	18.69463352	36.26547074	33.27071747
18.2225632721932	32.0950655826764	31.2099616823692	22.07359754	33.01769228	30.23180819
20.1360470085731	31.6844563203748	31.8119880189372	24.87958822	27.09583401	32.67332021
21.6926084687133	31.3504384070203	32.3017183272767	17.16840861	23.65521269	38.43535721
21.6926084687133	31.3504384070203	32.3017183272767	20.73212412	24.23741148	36.78766314
23.3147135639287	31.0023572440516	32.8120687289902	21.70527032	21.60018691	37.91508039
24.5811838335634	30.7305895375257	33.2105291777399	25.83818458	22.03803134	36.60516078
24.5811838335634	30.7305895375257	33.2105291777399	27.39065822	19.10906735	34.23380192
25.4965062593096	31.543728596947	33.4857404309219	27.26619514	25.90196542	35.39277783
25.4965062593096	31.543728596947	33.4857404309219	34.82834577	24.45085722	36.05632865
25.4965096196831	31.543731883125	33.4857414444069	27.42853428	33.27622768	38.61257115
25.4965096196831	31.543731883125	33.4857414444069	26.37919279	28.3108891	38.48025156
25.4965123176958	31.5437345723033	33.485742266911	22.79879511	41.59634367	39.45795983
25.4965123176958	31.5437345723033	33.485742266911	30.41452332	39.55317391	35.96788826
32.2143227103853	30.0435442170353	31.1669442038271	30.83636789	38.35208021	33.99399048
44.3321118739651	27.3374589395825	26.9842417919535	39.35568633	35.06788426	34.69629234
44.3321118739651	27.3374589395825	26.9842417919535	39.25918273	24.78783876	35.71196052
44.3321118739651	27.3374589395825	26.9842417919535	44.94410764	36.28576006	32.88778098
44.3321118739651	27.3374589395825	26.9842417919535	36.2315122	27.60710766	22.87055815
44.3321118739651	27.3374589395825	26.9842417919535	40.05041388	28.81118981	27.86495236
44.3321118739651	27.3374589395825	26.9842417919535	39.07927218	20.57348801	18.57850652
44.3321118739651	27.3374589395825	26.9842417919535	51.08696185	26.42044109	32.70824117
44.3321118739651	27.3374589395825	26.9842417919535	50.59311922	22.75724468	32.75181399
44.3321118739651	27.3374589395825	26.9842417919535	48.88810081	29.6929228	28.59078684
44.3321118739651	27.3374589395825	26.9842417919535	53.48089128	34.57431179	29.79987824
44.3321118739651	27.3374589395825	26.9842417919535	42.45831495	25.01806118	18.69304905
44.3321118739651	27.3374589395825	26.9842417919535	51.99282443	27.99909333	30.19770488
44.3321118739651	27.3374589395825	26.9842417919535	46.26887105	26.53209753	18.29584073
44.3321118739651	27.3374589395825	26.9842417919535	47.52772375	30.54529654	17.6892221
44.3321118739651	27.3374589395825	26.9842417919535	49.49892788	30.73465222	20.32700892
53.3257635576624	24.1492207912991	26.243603640823	44.45005227	17.91363181	31.37577496
53.3257635576624	24.1492207912991	26.243603640823	60.71671796	14.8721563	28.06290831
56.3710653059373	23.5369626958518	25.7911988023557	59.48412304	31.97998889	33.72997467
56.3710653059373	23.5369626958518	25.7911988023557	59.97712424	27.07719444	29.13491814
61.3833714584177	22.3785774309135	24.9070009079982	67.26622281	20.02005982	35.0966755
63.7434403129359	22.0770411662836	21.7494869643019	66.92261807	21.4897109	27.4812889
63.7434403129359	22.0770411662836	21.7494869643019	63.04507341	24.29862677	23.57575014
67.0336986837993	21.6566582527124	17.3474885420643	62.61153544	17.95816147	22.4620849
Route: 6 Length: 166.718965329032 Demand Met: 2842					
65.0364840656911	33.9070778003277	4.68100191118421	69.67922342	40.74675918	12.58912096
62.6100957590411	36.1620679136854	5.43995608706156	63.76560063	37.45231942	9.842542758
62.6100957590411	36.1620679136854	5.43995608706156	70.24663893	43.40548551	1.656037041
60.1454817299007	38.4526012681267	6.21088823211663	63.41360315	44.69674786	5.219771375
57.9907945549843	40.4551004325804	6.88487866761085	64.75792457	49.92103542	3.951957012
56.2276445935444	41.7049955545288	7.45653181260883	57.35658457	43.71456461	3.914439364
54.4830850951053	42.9417084446352	8.02215754039569	55.55130491	39.21526309	7.425393497
54.4830850951053	42.9417084446352	8.02215754039569	57.56166222	41.97700689	5.193477838
52.4291066027803	44.3977625561009	8.68809441180037	50.32982697	35.43640834	3.785700884
52.4291066027803	44.3977625561009	8.68809441180037	54.69460289	37.32086801	4.721267047
44.9031815838256	49.7330833710237	11.128163602214	34.68773061	48.27076221	5.003934468
44.9031815838256	49.7330833710237	11.128163602214	43.74535734	43.87626012	1.779657186
44.9031814734309	49.7330834951877	11.1281636849367	41.57443341	43.13832473	6.475589725
44.9031813698623	49.7330836185268	11.1281637666595	53.22205568	50.84724902	15.61737169
44.9031813698623	49.7330836185268	11.1281637666595	53.79810347	45.16180718	4.496135918
44.9031738124067	49.7330915255552	11.1281695456644	53.70737401	57.8077763	9.994366281
44.9031738124067	49.7330915255552	11.1281695456644	54.43373891	52.12894009	7.9067999
42.7837985300611	51.8644258020557	12.7241430757264	49.52719402	60.88674536	13.02441036
41.345536791323	53.3107971555847	13.8072006358494	46.15723029	56.4070148	19.959172
41.345536791323	53.3107971555847	13.8072006358494	49.48945411	49.44119699	20.62289914
34.9363321567954	59.7561373337929	18.6335404713519	26.36749261	61.24478927	19.91950535
32.2810561872916	62.4263915773282	20.6330428550115	26.36495426	64.10386589	19.00754119
30.1578737376924	64.5615523718714	22.2318649226037	26.46280572	62.61127777	22.19141047
30.1578737376924	64.5615523718714	22.2318649226037	24.68488711	59.85199485	22.75052505
28.2325831683391	66.4977087844184	23.6816685256397	24.58618772	59.92581691	21.04332426
25.8638067500391	68.8798550818371	25.4654326629143	16.63383213	64.77854357	18.98571058
25.8638067500391	68.8798550818371	25.4654326629143	21.61039636	65.83676525	18.75923326
25.0818811175128	69.6999716278381	26.0881386276507	14.01917911	69.22007201	23.43359605
25.0818811175128	69.6999716278381	26.0881386276507	14.11476256	66.58488992	23.55512122
24.8136230735104	69.9813147816356	26.301754826001	14.67447984	73.22055772	21.75092301

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.8136230735104	69.9813147816356	26.301754826001	14.51945543	70.49107423	24.26034768
24.660057663361	70.1423655263674	26.4240351116802	19.17901123	72.48982593	17.20855307
24.5048017419161	70.3051894419163	26.5476617861061	20.16006997	73.55306832	21.43875646
24.3502495785587	70.4672751970602	26.670728031734	20.11668251	80.56671914	21.763779
24.3502495785587	70.4672751970602	26.670728031734	19.47269695	75.25893863	20.7798111
24.3366279376829	70.448897711435	26.7293771611018	17.24413003	73.14298035	27.78293034
24.3366279376829	70.448897711435	26.7293771611018	18.49430275	75.1491321	23.37172362
24.3218096428711	70.4289036038436	26.7931802763856	21.16552744	75.92926841	33.87335876
24.3218096428711	70.4289036038436	26.7931802763856	25.39416892	74.01493111	32.17996221
24.3119816715138	70.4156831623163	26.83541963534	22.14002238	72.37729838	30.29531679
24.3119816715138	70.4156831623163	26.83541963534	22.95220857	73.2582761	29.61659281
24.3018218631758	70.402020302336	26.8790749984981	24.37529212	73.10827156	29.72637521
24.3018218631758	70.402020302336	26.8790749984981	24.00842436	69.26671548	26.32388978
24.2913312242589	70.3879121761908	26.9241514504362	29.09610379	74.18683092	25.64666307
24.2913312242589	70.3879121761908	26.9241514504362	30.01509861	69.93828769	21.72402497
24.2811808638435	70.374251803117	26.9677898936314	28.17365085	71.94302821	19.49378883
24.2811808638435	70.374251803117	26.9677898936314	28.77703399	67.75671878	24.26797752
24.2612188552883	70.3472871434889	27.0537931315598	26.03259253	67.05188068	24.42560707
24.2369974734843	70.3145567735192	27.1581605753867	21.51917751	80.74471553	21.88319617
24.2369974734843	70.3145567735192	27.1581605753867	22.68191696	72.90808337	38.77088424
24.2369974734843	70.3145567735192	27.1581605753867	23.86908483	73.83689183	36.6939804
24.2369974734843	70.3145567735192	27.1581605753867	21.2618816	68.31108552	38.60957073
24.2369974734843	70.3145567735192	27.1581605753867	25.63863856	75.55318582	34.2564448
24.2369974734843	70.3145567735192	27.1581605753867	19.92687299	66.4828608	36.85195291
24.2369974734843	70.3145567735192	27.1581605753867	29.81370195	76.77877617	33.99746475
24.2369974734843	70.3145567735192	27.1581605753867	29.7776223	79.3796747	28.90759999
24.2369974734843	70.3145567735192	27.1581605753867	31.54519137	79.16359507	27.34637643
24.2369974734843	70.3145567735192	27.1581605753867	32.43971284	75.52883521	28.48064207
24.2369974734843	70.3145567735192	27.1581605753867	31.96159565	70.60936436	21.8177247
24.2369974734843	70.3145567735192	27.1581605753867	32.14669335	66.5741861	28.83764483
24.2369974734843	70.3145567735192	27.1581605753867	31.78300706	62.74548174	25.97934086
24.4235056351296	68.7822495957446	27.8086585171335	21.52581462	69.05739134	31.57893426
24.4235056351296	68.7822495957446	27.8086585171335	18.97844246	66.0992932	30.20753751
24.595191939722	67.3717177211057	28.4074603156651	14.52745655	66.82146945	34.730647
24.6313276080851	67.0748284819732	28.5334963161437	14.35540419	64.70998039	34.26175056
26.3643494514726	64.6357659309153	28.926657499499	21.30645349	61.8915326	27.89064267
26.3643494514726	64.6357659309153	28.926657499499	25.66105506	62.27941228	31.77717439
27.9194038571362	62.4471756221198	29.2794451685725	25.20403775	63.98638021	32.83153178
29.6571426476139	60.0014738117076	29.6736771375745	24.05460087	58.82740751	33.73414623
29.6571426476139	60.0014738117076	29.6736771375745	29.89833465	58.88393924	31.18403904
31.5160630002504	57.3852196371088	30.0954006560611	23.68432498	51.4412716	36.97532542
31.5160630002504	57.3852196371088	30.0954006560611	31.52001616	50.89228775	38.01036066
31.8534802045222	57.0459824825584	30.1027390359891	32.83493269	54.50530143	23.93617923
32.1833921126037	56.7142912521082	30.1099144195772	30.55507662	47.73107042	32.65818922
32.478488688886	56.4176043962374	30.1163321386467	41.72708173	62.5487287	34.68501321
32.754292373704	55.8219524403812	30.0322170350738	28.94274384	52.01860718	30.54475385
32.754292373704	55.8219524403812	30.0322170350738	30.18073163	48.32029982	32.22769732
32.9988210474763	55.2938390673055	29.9576372701031	28.72359173	49.06807614	23.44175989
32.9988210474763	55.2938390673055	29.9576372701031	33.45872958	53.85918585	23.94292918
33.2056732057992	54.8470901591778	29.894545791778	36.93641703	55.80482127	27.58013236
33.2056732057992	54.8470901591778	29.894545791778	40.32660467	53.626561	31.93108458
33.4027554287564	54.4214405032562	29.8344336819495	37.67648628	59.01822185	34.10509713
33.4027554287564	54.4214405032562	29.8344336819495	39.00311055	58.98114927	34.60197054
33.6213383971974	53.9493598974858	29.767766325871	35.39691212	60.01558524	36.77171252
33.8732156707067	53.4053793474122	29.6909476027159	39.86159624	55.58185516	39.85963663
33.8732156707067	53.4053793474122	29.6909476027159	41.84687745	52.15158968	38.57062516
34.7183201222977	51.5043438848743	29.3744786841995	31.80593192	45.60640645	39.41102857
35.3223645785998	50.6894285295883	28.7574750897562	30.62796082	46.77730777	34.94066727
35.9906559228215	49.7878372732285	28.0748459914764	30.28185343	43.77834378	32.70178342
36.6864309759706	48.8491676276303	27.3641435413746	34.06373355	42.77086753	33.9464291
37.3850171059401	47.9067057121135	26.6505697948674	38.72818734	43.64397508	34.64285831
37.3850171059401	47.9067057121135	26.6505697948674	39.67150404	49.44131071	30.57444188
38.1237810736262	46.9100394873855	25.8959559753879	43.66555329	47.77139353	28.778171
38.8327234561093	45.9536054806393	25.1718035822285	39.96945525	49.46230999	23.88525166
39.5462067119594	44.9910447984967	24.4430127575115	29.65914735	42.12761495	24.52937867
39.5462067119594	44.9910447984967	24.4430127575115	32.06711817	41.12824267	27.14001544
40.6064187101478	43.5607089189482	23.3600523304157	31.80606468	35.45021175	24.23960074
40.6064187101478	43.5607089189482	23.3600523304157	38.90241804	39.45548462	22.15074575
41.0921938658212	43.0508533733847	22.922904374264	41.09480481	34.92509896	27.7383049
41.5356476215896	42.5854172749604	22.5238413009204	39.91233765	41.2977364	28.26450372
42.0031213048144	42.0947706136205	22.1031626142916	42.25980634	46.86827481	24.73500352
42.0031213048144	42.0947706136205	22.1031626142916	40.57741767	42.47262	24.8981708
42.5339904167111	41.5375861771036	21.6254342864285	47.65008175	45.51867646	25.16647853
42.5339904167111	41.5375861771036	21.6254342864285	49.90577559	41.072269	23.3893886
43.022388890528	41.0249772122889	21.1859244519252	47.22851165	47.89903616	20.36250944
43.022388890528	41.0249772122889	21.1859244519252	45.78512338	48.76667443	13.05604142
43.4790431116422	40.5456844318936	20.7749798353823	39.58652985	43.55288071	14.45846769
43.4790431116422	40.5456844318936	20.7749798353823	43.11381093	45.00092033	20.21315796
43.9841789014706	40.015504005786	20.3204054241942	35.17250587	39.36136713	13.28284014
43.9841789014706	40.015504005786	20.3204054241942	38.78467609	39.06908374	12.83761672

Solution x	Solution y	Solution z	Original x	Original y	Original z
44.5453496151183	39.4265146810359	19.8154132581957	37.51752459	33.09106605	16.01141602
44.5453496151183	39.4265146810359	19.8154132581957	40.57036155	31.31828969	15.51939441
44.9939726318099	38.9556563411562	19.4117008547699	37.07046765	30.04479215	18.0646406
46.6824919011424	38.0102118290212	18.2990648050445	40.81010844	38.77304558	7.861958026
51.4236418572147	35.4473201185721	15.695053681232	44.21687698	34.39769027	11.89272829
58.4282215435969	31.6609054652703	11.8478871768169	54.00076983	32.50218762	13.15428984
58.4282215435969	31.6609054652703	11.8478871768169	58.09138733	33.97784367	3.040604697
65.6719140195251	27.7452390014407	7.86942123015676	59.11600598	27.89604561	4.171146498
Route: 7 Length: 211.917370324669 Demand Met: 2998					
82.3976044750299	30.7016757851916	5.35084937828075	86.50661976	33.33916758	0.489048022
84.6733373670308	40.859526096263	10.4298713589569	87.56748283	36.27406643	21.13489416
89.0467404025837	69.3846432486387	18.0062752145178	93.29522257	74.82458329	19.9847248
89.0467404025837	69.3846432486387	18.0062752145178	91.59995025	72.67875795	22.12004218
90.2504068448547	77.23585463668	20.0915218172161	97.99058573	82.84537681	12.83735391
88.3070604846192	80.4941419531941	24.0617014493059	91.04765146	90.60180149	20.03455373
88.3070604846192	80.4941419531941	24.0617014493059	93.12739448	86.70709298	18.39915073
86.4748912382545	83.5659668010349	27.8046897543045	94.75890926	85.83537613	36.18471901
82.8614168085986	85.4477274135608	28.6462807566426	87.63411723	89.72076827	28.65831969
78.5040412234983	87.7168203162716	29.6611284064127	76.68533256	86.49303137	21.67959601
78.5040412234983	87.7168203162716	29.6611284064127	69.80433177	81.60817435	25.92271927
76.9110428622526	88.5464064021746	30.0321424068522	72.48804708	89.57044348	25.63543235
75.4109378247029	89.3276155694265	30.3815208908186	71.22771139	93.77569631	25.9346523
75.4109378247029	89.3276155694265	30.3815208908186	72.91384846	91.54886288	27.04740893
74.1277420143601	89.9958658626809	30.6803797958637	69.82339194	93.15949799	27.73705762
72.9492560772674	90.6095872633951	30.9548510743645	65.26732099	95.86741863	25.98441419
72.9492560772674	90.6095872633951	30.9548510743645	68.09186985	95.85522589	22.47153407
72.3746780534639	90.9088141296371	31.0886701424484	66.92699784	97.50570073	24.16462464
71.9374617267039	91.1365072978965	31.1904975195602	74.57969734	99.83821951	39.01985633
71.9374617267039	91.1365072978965	31.1904975195602	76.48394754	93.81500316	33.05082675
69.9901589981149	91.2600109597739	30.8977412707069	66.67195124	95.92017704	38.76714707
69.9901589981149	91.2600109597739	30.8977412707069	64.96530116	93.98228963	34.40488013
68.4986674225846	91.3546269633548	30.6735176224924	68.01446808	90.26524455	37.65674979
68.4986674225846	91.3546269633548	30.6735176224924	66.59307852	88.41880362	32.58136924
67.0198430993715	91.4484362059918	30.4511975877722	63.88368354	92.98872817	38.82161587
67.0198430993715	91.4484362059918	30.4511975877722	62.03675317	91.42777069	38.34727303
65.838375663652	91.5233902273025	30.2735835734401	64.88497046	82.96772641	30.52764719
64.6648914810832	91.5978339287487	30.0971686800282	61.30013954	82.69641043	22.92622968
64.6648914810832	91.5978339287487	30.0971686800282	68.96890483	80.55619731	30.92710539
63.6190948144827	91.6641679154012	29.9399462704891	63.32241418	89.29380754	27.27800065
63.6190948144827	91.6641679154012	29.9399462704891	68.11557125	90.29313921	19.6765572
61.9967292788754	91.7670554312457	29.6960409634568	62.61309781	94.29391595	17.98130243
61.9967292788754	91.7670554312457	29.6960409634568	59.01602486	86.99268685	19.95901958
49.9626255857698	91.976403040307	30.4344056247804	43.63164404	99.67485887	36.08960829
49.9626255857698	91.976403040307	30.4344056247804	43.04035221	95.37042711	39.63020675
49.9626255857698	91.976403040307	30.4344056247804	48.82360524	98.37839062	35.9745595
49.9626255857698	91.976403040307	30.4344056247804	52.71570498	99.46690315	35.19170787
49.9626255857698	91.976403040307	30.4344056247804	53.69991452	99.81161169	33.42740223
49.9626255857698	91.976403040307	30.4344056247804	48.39934621	99.02729511	30.05026749
49.9626255857698	91.976403040307	30.4344056247804	45.34071838	99.2752365	24.31073394
49.9626255857698	91.976403040307	30.4344056247804	54.29998953	99.89190946	28.80232628
49.9626255857698	91.976403040307	30.4344056247804	47.31578899	98.13704672	24.13193979
49.9626255857698	91.976403040307	30.4344056247804	57.84005051	97.24933499	35.2604133
49.9626255857698	91.976403040307	30.4344056247804	52.60387814	98.51053443	27.61605738
49.9626255857698	91.976403040307	30.4344056247804	48.69087386	94.64188777	30.6210566
49.9626255857698	91.976403040307	30.4344056247804	57.58318464	98.55697919	27.3972425
49.9626255857698	91.976403040307	30.4344056247804	49.19512952	89.44346883	37.79505672
49.9626255857698	91.976403040307	30.4344056247804	51.95218378	92.57992082	30.72068519
49.9626255857698	91.976403040307	30.4344056247804	51.44475874	86.59474587	38.70943792
49.9626255857698	91.976403040307	30.4344056247804	56.15571936	89.41500769	36.83882342
49.9626255857698	91.976403040307	30.4344056247804	45.3176187	83.7901857	37.67961833
49.9626255857698	91.976403040307	30.4344056247804	54.48965648	89.30641789	34.42411824
49.9626255857698	91.976403040307	30.4344056247804	53.29556121	92.47449182	25.90682802
49.9626255857698	91.976403040307	30.4344056247804	61.4906739	91.40517217	33.71736683
49.9626255857698	91.976403040307	30.4344056247804	53.27314218	89.6748569	31.66096453
49.9626255857698	91.976403040307	30.4344056247804	52.83415121	85.50123146	31.48102764
49.9626255857698	91.976403040307	30.4344056247804	49.21219028	82.18677234	33.0110742
49.9626255857698	91.976403040307	30.4344056247804	55.11001594	85.68607737	27.25029831
49.9626255857698	91.976403040307	30.4344056247804	53.61605765	80.93460352	33.38542247
49.9626255857698	91.976403040307	30.4344056247804	51.91564321	83.24154723	26.19545671
49.9626255857698	91.976403040307	30.4344056247804	56.64479831	82.24679775	31.938846
49.9626255857698	91.976403040307	30.4344056247804	50.20394782	81.95454381	24.2461412
46.8449274249244	91.8022514402891	29.815572409083	48.45592928	88.4082341	31.5542414
46.8449274249244	91.8022514402891	29.815572409083	46.03038143	83.79986665	30.96050312
43.5598868648802	91.6187731447027	29.1635321734461	39.57638463	86.69599702	34.69521123
43.5598868648802	91.6187731447027	29.1635321734461	40.77647626	81.23711291	32.65865455
42.280853179451	91.547262684677	28.909636264866	41.14833132	82.10595877	30.01446557
42.280853179451	91.547262684677	28.909636264866	46.93472918	83.75304242	25.57195373
40.7558735642611	91.4620105650805	28.6069198521427	40.55838899	87.88304878	23.6255072
40.7558735642611	91.4620105650805	28.6069198521427	38.78697828	81.20736169	22.75217398
40.6666666699579	91.4570178806177	28.5892080195342	41.14116704	94.61634345	23.98672915

Solution x	Solution y	Solution z	Original x	Original y	Original z
40.6666666699579	91.4570178806177	28.5892080195342	40.16683897	89.097423	24.82067356
40.582097969473	91.4522838600943	28.5724172984095	39.86881125	93.47781189	29.627917
40.582097969473	91.4522838600943	28.5724172984095	36.86677729	93.06343809	25.83290646
40.5026203988778	91.4478339534134	28.5566374261371	44.56970667	97.22856143	30.36827838
40.4226072192678	91.4433544572247	28.5407512625611	45.01212749	95.47966426	34.75016178
40.4226072192678	91.4433544572247	28.5407512625611	45.13861135	90.47060332	31.83589749
40.3409951448304	91.4387862377226	28.5245475878651	37.83606476	96.13365876	36.97541326
40.3409951448304	91.4387862377226	28.5245475878651	42.53215273	92.92397176	36.17653823
40.2596856756402	91.4342352842413	28.508403683919	39.44288188	96.38027853	38.94704805
40.1772136396417	91.4296195962593	28.4920292856697	36.49499514	99.8776323	35.60714208
40.1772136396417	91.4296195962593	28.4920292856697	35.92075185	99.04269187	36.73360907
40.1771902333954	91.4296178455906	28.4920235820877	31.65500689	99.46882276	25.89517482
40.1771902333954	91.4296178455906	28.4920235820877	35.84999591	97.26233792	26.33021041
40.1799277680294	90.7860263051201	28.5336738698192	37.35558564	97.30806318	23.47070651
40.1799277680294	90.7860263051201	28.5336738698192	36.31961338	94.1541845	22.11569666
40.1833269840775	89.98643446135	28.5854206261195	39.84944538	96.227912	20.60442108
40.1879429005584	88.9003074292341	28.6557112177379	36.26720319	91.81523904	18.88940672
40.1958496203865	87.0419302268164	28.7759732306544	33.91919319	90.52236574	22.93790886
40.1958496203865	87.0419302268164	28.7759732306544	36.43143728	90.48214242	22.55722277
40.2089702145358	83.9658904824961	28.9750140129117	44.66930475	80.79724102	25.59577081
40.2089702145358	83.9658904824961	28.9750140129117	43.12816365	79.63219046	23.15451647
40.2173737610041	81.9898118252653	29.1028936041608	32.77989789	83.25231939	22.10896744
40.2280628266352	79.4803365984299	29.2652788907664	32.56942546	80.98884638	22.4278796
40.2280628266352	79.4803365984299	29.2652788907664	31.67974116	78.20082263	20.94127433
40.3742600362757	77.837797372371	29.5084203998658	35.96077646	77.38727187	28.20511129
40.3742600362757	77.837797372371	29.5084203998658	40.76978451	74.94346594	30.5932008
40.5104193712467	76.3080548599405	29.7348624818015	38.20769452	77.89743741	37.44950686
40.5104193712467	76.3080548599405	29.7348624818015	41.14789047	74.75727523	32.931636
40.6404863186641	74.846826536891	29.9511544457756	33.57300136	70.51852673	38.6296637
42.215978999207	72.9382737760616	28.7176841326327	38.57181853	69.29967661	29.47346952
42.215978999207	72.9382737760616	28.7176841326327	42.13585343	68.94604524	25.50967647
43.6109891031884	71.2483431044408	27.6255158865824	42.58773685	73.94634336	30.2774743
45.2017193163902	69.3212863065904	26.3801127486758	44.56064253	79.77318093	20.51948675
45.2017193163902	69.3212863065904	26.3801127486758	49.39322363	67.57061768	37.48715692
45.2017193163902	69.3212863065904	26.3801127486758	44.42598809	67.45202223	18.20113405
45.2017193163902	69.3212863065904	26.3801127486758	40.91327599	65.05437313	16.01674823
45.2017193163902	69.3212863065904	26.3801127486758	41.72170476	60.36141703	24.46424235
45.2017193163902	69.3212863065904	26.3801127486758	50.37372436	63.54183807	17.2232387
45.2017193163902	69.3212863065904	26.3801127486758	52.64945222	62.68533593	20.742851
50.4892342919771	61.827295647681	22.3717736358416	45.68320409	63.6499192	24.04332627
59.5119353976736	49.0393194309257	15.5317720690086	55.40337389	57.61168804	14.09596446
59.5119353976736	49.0393194309257	15.5317720690086	63.59211348	50.34808715	9.20862338
59.5119353976736	49.0393194309257	15.5317720690086	67.10787364	49.80646667	13.82525922
59.5119353976736	49.0393194309257	15.5317720690086	66.65703205	47.7722791	14.44067044
69.6712823293314	34.6396504196916	7.8300692060136	74.78372311	42.05088328	3.322634156
69.6712823293314	34.6396504196916	7.8300692060136	75.19376171	39.75388964	3.378695446
Route: 8 Length: 227.001792571556 Demand Met: 2989					
70.8387416104637	31.645367615719	5.30213858179879	75.00767938	29.50135545	13.77877729
47.8126456958828	60.9149589438277	18.6285326520375	41.10546356	60.73573959	25.88754111
44.4607145830483	65.1757750629139	20.5684645944651	38.05290287	66.43336709	23.58284008
44.4607145830483	65.1757750629139	20.5684645944651	39.73860453	66.92518954	24.34934694
42.6495606027612	67.4780393630907	21.6166747270109	38.18944723	65.54612606	17.9243242
42.6495606027612	67.4780393630907	21.6166747270109	42.95157888	64.84132436	26.30910849
40.81067517645	69.8155696047116	22.6809438621682	43.59103477	70.75648589	19.17067552
40.81067517645	69.8155696047116	22.6809438621682	41.95981534	64.94436816	23.77879253
38.248984781702	73.0718922524878	24.1635456864417	45.59084573	70.21452412	23.93560611
32.1454259340966	80.8304753011322	27.6960103484287	29.49613778	81.77737157	38.35679407
32.1454259340966	80.8304753011322	27.6960103484287	27.46499326	78.56518576	33.59652638
30.9762405794721	82.3166951075176	28.37267826744	25.47356848	81.94258519	37.44485814
30.9762405794721	82.3166951075176	28.37267826744	24.67927032	81.21698222	36.79859251
30.4307228178849	83.0101353451585	28.6883996643578	24.84752889	78.21896812	35.91459865
30.4307228178849	83.0101353451585	28.6883996643578	30.96168192	84.99460949	29.50639116
29.94685868158	83.625202777069	28.9684398106711	22.96398221	79.24584246	32.40861489
29.4902596104022	84.2056128617063	29.2327008928245	32.21271953	85.45061531	28.67707968
29.0275159345699	84.7938336684425	29.5005180523601	28.94608169	87.05476962	32.15968695
28.5809077354316	85.3615436337486	29.7589965815353	30.78074407	88.67743671	34.14412331
28.5809077354316	85.3615436337486	29.7589965815353	31.92346769	85.96439053	34.03343791
28.1507043978754	85.9084008609366	30.0079796543077	32.33676606	89.56266763	36.70990188
27.7432308789501	86.4263645502812	30.2438070298851	35.60188133	93.1465045	36.33325574
27.7432308789501	86.4263645502812	30.2438070298851	36.79414467	92.2553405	34.07762876
27.3988354941697	86.6336627023044	30.2964001966267	37.64776281	91.60925844	32.09349115
27.3988354941697	86.6336627023044	30.2964001966267	34.03327785	85.06694553	30.01520061
26.6894924891107	87.0606294009408	30.4047263465121	30.18341718	92.15484297	29.45540328
26.6894924891107	87.0606294009408	30.4047263465121	34.28587406	93.01320732	33.5082721
25.8743241369148	87.5512921507839	30.5292129408994	31.89808649	95.62749105	29.09944527
25.0088276252103	88.0722452822362	30.6613851118307	21.63379999	90.72848541	25.0330528
25.0088276252103	88.0722452822362	30.6613851118307	30.08845088	94.04600611	25.46859145
24.1445083673091	88.592489313966	30.7933801909558	23.65267964	99.40598609	29.7230242
24.1445083673091	88.592489313966	30.7933801909558	25.34553204	99.20543489	30.35671629
23.6319468633219	88.9010047433428	30.8716561043492	27.50072899	99.76767751	31.96071673

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.6319468633219	88.9010047433428	30.8716561043492	28.69202489	99.34571575	27.8214658
22.1157695760941	89.6084770579767	31.1378317670236	25.35918107	97.93925835	33.70510702
20.6988901992723	90.2696157799813	31.3865744855941	20.75129811	88.7330358	32.51930493
20.6988901992723	90.2696157799813	31.3865744855941	20.16675465	86.45561332	33.59426088
19.2120144204179	90.9634180651835	31.6476059457635	22.00240146	99.12603644	39.9893956
19.2120144204179	90.9634180651835	31.6476059457635	25.64004891	98.33585155	37.39052093
18.0449915296832	91.1604876598921	31.5282391234105	18.21730526	92.48725442	38.15120003
18.0449915296832	91.1604876598921	31.5282391234105	22.46431132	85.87828698	39.40664672
16.1552106241142	91.479604368048	31.3349457732821	16.85080568	91.45389056	39.93862668
14.1309010807971	91.8214385401082	31.127891638129	16.10416337	94.62212285	35.78598723
14.1309010807971	91.8214385401082	31.127891638129	18.65944439	93.90622028	36.26618878
11.485938442857	92.2680772485207	30.8573535563925	5.231683223	94.88567828	37.04813984
9.35091363367161	92.6286088865386	30.6389735951848	1.662890125	98.21483308	37.96621421
9.2441609524989	92.3302739126575	30.0294012836314	5.838459994	89.46110654	32.98505569
9.2441609524989	92.3302739126575	30.0294012836314	10.35439985	93.61856888	31.55963283
9.13368979497032	92.0215519681672	29.3986012058761	5.209294544	90.50333801	29.97691556
9.13368979497032	92.0215519681672	29.3986012058761	6.256438132	90.66257931	27.09179537
9.02871563355301	91.7281961851875	28.7991940403451	3.115821998	88.00026043	26.66042774
8.93091992664661	91.4549042167876	28.2407792651312	3.212591442	94.51392157	23.83849287
8.8382326338965	91.1958877088029	27.7115339202401	1.72500424899999	93.73701725	20.97210735
8.8382326338965	91.1958877088029	27.7115339202401	3.553988961	91.38716753	22.96960314
8.76596470751522	90.9939368698689	27.2988869805199	6.625140742	98.72893978	20.20468371
8.76596470751522	90.9939368698689	27.2988869805199	8.327911253	95.97957355	16.39239366
8.75009007330402	90.8545144637397	27.3368322747731	2.88784862599999	89.80188387	16.96831616
8.75009007330402	90.8545144637397	27.3368322747731	6.57919393199999	89.24907689	23.95110219
8.72221291552913	90.6097515387782	27.4034315555234	11.51332542	99.95442641	21.54207323
8.67699537231935	90.212740226086	27.5114555650306	7.810086676	100	26.21604958
8.67699537231935	90.212740226086	27.5114555650306	5.819691822	97.53170939	24.16806715
8.61330757446505	89.6535578530907	27.6636038201451	11.04946885	95.30278919	26.87229799
8.61330757446505	89.6535578530907	27.6636038201451	8.980893435	92.30918249	24.9496481
8.54263519136722	89.0330486896578	27.8324386172954	7.17818211399999	91.76838261	25.47562666
8.46984899892179	88.393977973514	28.0063241408437	9.577914639	89.11916471	27.81169318
8.39696205656085	87.7540218562686	28.1804509367212	12.03430063	87.78817585	32.36153594
8.32532203769699	87.1250142691287	28.3515988693752	12.48771043	90.90107319	36.2773466
8.32532203769699	87.1250142691287	28.3515988693752	14.30638295	91.72702037	37.41288443
8.12717537472953	85.3852726843911	28.8249553281666	9.940095688	86.998178	38.16021851
7.9449248902414	83.7850773405117	29.2603527928707	7.992357197	82.08091397	36.27596397
7.9449248902414	83.7850773405117	29.2603527928707	10.08146406	81.46406963	37.62633094
7.81725142496583	82.6640469871158	29.5653826749798	2.643010323	87.48230483	39.26134045
7.81725142496583	82.6640469871158	29.5653826749798	1.83782096500001	81.06813079	39.8464095
7.81725204509809	82.6640435222795	29.5653821045684	1.696022601	79.3379408	35.04130759
7.81725204509809	82.6640435222795	29.5653821045684	5.779054124	82.01317499	31.17715184
7.81725268103821	82.6640400933193	29.5653815381205	14.92906226	79.42060964	37.22040132
7.81725268103821	82.6640400933193	29.5653815381205	19.16596982	83.58117432	33.35557023
7.7974658379421	82.5269240919447	29.5269126578905	10.82142722	82.89323555	36.78865334
7.7974658379421	82.5269240919447	29.5269126578905	9.701793671	81.23141394	32.23008983
7.7777342281023	82.3901971181405	29.4885522930897	16.23739593	85.87006787	34.99641701
7.75625951263336	82.2413909767952	29.4468023029453	18.85500198	86.61471751	28.9549492
7.75625951263336	82.2413909767952	29.4468023029453	17.38954679	82.23173111	30.2609052
7.5252858014598	80.6400884493241	28.9974390495002	18.46683587	77.29301103	30.42019724
7.3723256091851	79.5795935768765	28.6999586847395	18.15807888	79.40011164	23.44302335
7.3723256091851	79.5795935768765	28.6999586847395	18.31523717	76.27495825	29.81755027
7.32212507893053	79.2694506576274	28.6155740875764	9.921883095	86.8721598	22.00737941
7.32212507893053	79.2694506576274	28.6155740875764	9.01858207399999	78.03824041	22.65782791
7.26727345135426	78.9305716257434	28.523373464095	0.539457489	84.81338557	26.32883597
7.26727345135426	78.9305716257434	28.523373464095	3.795442881	81.20966501	27.41200193
7.2092783740557	78.5722651011277	28.4258890262166	5.333729823	86.89695613	31.50319232
7.14374114026037	78.1673604811329	28.315729575858	5.912402555	83.10767778	28.97692543
7.14374114026037	78.1673604811329	28.315729575858	7.936374341	83.63932008	31.96057141
7.07115561067626	77.7189080840701	28.1937252966622	10.28504553	75.43578797	21.16629174
7.00291708088912	77.2973116947757	28.0790259147545	5.863440787	76.06172049	20.11271942
6.93840105189234	76.8987107133776	27.9705818699568	8.675234817	76.17385221	29.29611493
6.87397967055976	76.5006945133185	27.8622967991586	3.05949055799999	82.05603574	19.35294441
6.87397967055976	76.5006945133185	27.8622967991586	4.961462551	81.51420623	19.50536364
6.8000800761053	76.0441151797872	27.7380870658024	3.765987951	77.28123402	18.22137656
6.8000800761053	76.0441151797872	27.7380870658024	5.065657714	76.41830653	16.15003851
6.75161872572241	75.7446942864794	27.6566234506718	1.009741561	74.32200243	17.21598932
6.75161872572241	75.7446942864794	27.6566234506718	2.544714587	74.45838234	20.47608884
6.79616758642739	75.5862360260885	27.7415440467869	0.155166121999997	73.1143838	18.2350269
6.94661291167884	75.0510635276556	28.0283439344015	6.979895184	73.91637244	25.14533012
6.94661291167884	75.0510635276556	28.0283439344015	11.56644578	72.10851879	29.32762892
7.09023286612296	74.5401709451429	28.3021317138312	0.299902086000003	68.51958527	21.52036301
7.2304192617936	74.0414940740312	28.5693725159163	4.203561784	71.28689241	26.51244139
7.2304192617936	74.0414940740312	28.5693725159163	2.559418382	66.60707534	29.94444397
7.35752680512037	73.5893473676335	28.8116775244112	2.76637406099999	66.09545945	29.36453565
7.35752680512037	73.5893473676335	28.8116775244112	3.705228073	66.5975084	22.49684982
7.46875281041467	73.1936994817354	29.0237050655008	5.020361565	69.58798476	32.44258164
7.46875281041467	73.1936994817354	29.0237050655008	3.972668798	68.43095677	28.84137669
7.5724916480649	72.8246876147855	29.2214579250568	1.09685186199999	69.20060768	38.65184391
8.97578476989769	71.8012030423769	28.6552951510731	3.702577787	67.55965669	35.63856131

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.7330649610997	70.5195395224009	27.9463148356217	9.964092428	69.02740379	34.44916177
10.7330649610997	70.5195395224009	27.9463148356217	8.88093920200001	67.16779099	33.76570468
12.8055008704296	69.0080183628641	27.1101776367363	11.54525803	68.93314303	25.95468917
14.9908899990552	67.414115415959	26.2284706165227	9.89788954300001	67.94003152	30.38024953
14.9908899990552	67.414115415959	26.2284706165227	11.17807544	66.07771318	32.92555185
19.1897540279607	64.3516870204426	24.534394510697	8.689838933	62.80875147	27.12937634
Route: 9 Length: 185.230437356553 Demand Met: 2993					
51.2332110497266	34.438246555	5.94899998042158	51.33580352	40.30660727	1.042528676
36.3908972899177	41.8874821496105	9.01845555781683	28.54401437	40.13690379	8.087159098
28.4338707787909	45.8811470255294	10.6640069601065	23.91492832	35.50451908	14.65205958
28.4338707787909	45.8811470255294	10.6640069601065	29.90863496	38.4851443	12.83287597
26.2649823974762	47.0207514659134	11.1002151085626	19.77510428	38.58926296	16.64922472
25.8272194554446	47.5712819115887	11.0733806249845	17.80089583	46.64512233	2.63462135
25.8272194554446	47.5712819115887	11.0733806249845	25.73174612	44.02606181	8.459085063
25.5906767112895	47.8687569001755	11.0588896169226	23.73647568	45.21539639	11.53681715
25.5906767112895	47.8687569001755	11.0588896169226	26.567735	46.7768569	17.70634543
25.348233793618	48.1736582885296	11.0440341189855	30.33187934	43.75504148	14.96541955
25.080706731761	48.5101061069205	11.0276378762749	34.17044541	50.63731129	14.2756352
25.080706731761	48.5101061069205	11.0276378762749	34.31056081	43.95356429	5.695822859
22.9007168573422	51.2518277440594	10.894091145013	26.97467166	54.66512134	21.38913798
22.9007168573422	51.2518277440594	10.894091145013	27.13020332	56.00735022	18.32075531
20.2466349629483	54.5896786664388	10.7313161855708	22.84438078	60.01413405	11.39370551
20.2466349629483	54.5896786664388	10.7313161855708	25.84588775	61.17671521	8.212138725
18.3769857816889	56.9409626285845	10.6166849004389	21.56136042	60.00845368	9.387366518
16.5993002902322	59.1765906956945	10.5076972222856	10.83705181	59.65376627	0.709551762
16.5993002902322	59.1765906956945	10.5076972222856	15.77830732	66.19409337	0.808180704
16.5993002902322	59.1765906956945	10.5076972222856	13.17908278	60.05355856	0.206865651
16.5993002902322	59.1765906956945	10.5076972222856	16.07158763	60.00636388	16.82852088
16.5993002902322	59.1765906956945	10.5076972222856	13.89109091	56.92730438	11.2581209
16.5993002902322	59.1765906956945	10.5076972222856	17.45311026	57.02027397	2.53786626
16.5993002902322	59.1765906956945	10.5076972222856	20.53092136	55.63617906	20.16527215
16.5993002902322	59.1765906956945	10.5076972222856	16.54761864	53.09785344	0.161381972
16.5993002902322	59.1765906956945	10.5076972222856	16.47526591	49.4455512	6.794569926
16.5993002902322	59.1765906956945	10.5076972222856	20.16713628	56.2637712	6.937664837
16.5993002902322	59.1765906956945	10.5076972222856	18.80954314	50.67936902	11.76647286
16.5993002902322	59.1765906956945	10.5076972222856	18.13426387	49.15791018	7.430088572
16.5993002902322	59.1765906956945	10.5076972222856	20.72246404	50.29048837	10.84675569
16.5993002902322	59.1765906956945	10.5076972222856	25.6524776	56.5792119	5.011755882
16.5993002902322	59.1765906956945	10.5076972222856	24.61643689	54.01115924	6.209992422
16.5993002902322	59.1765906956945	10.5076972222856	28.17203359	56.51587977	9.985576368
15.4106269070289	60.6843173928163	10.6656607132363	13.50520564	67.72241024	17.09707449
14.5878478675071	61.7279598895142	10.7749942284177	10.63863267	61.64507704	12.52958841
14.5878478675071	61.7279598895142	10.7749942284177	16.73656026	65.26611785	12.28815231
13.8220903829518	62.6992775595276	10.8767495524308	11.73654707	68.82383733	18.16264782
13.2353260974229	63.4435671538892	10.9547110848087	9.088863996	70.57778186	13.84286783
13.2353260974229	63.4435671538892	10.9547110848087	13.34199807	71.15108407	14.18117491
12.8214102720624	63.9686248943622	11.00969320588	8.93361225699999	64.19415642	15.31500377
12.8214102720624	63.9686248943622	11.00969320588	12.00297966	63.9466553	16.56981835
12.4184259803742	64.4798170270892	11.063222353512	10.36857839	64.9958121	20.62230905
12.0463524322789	64.9518034735047	11.1126413914704	8.01127751600001	61.69215045	17.84993877
11.6893574303282	65.4046672417636	11.1600535376267	3.16457285600001	61.67055704	18.73530868
10.9574207823939	67.9712419769221	10.5315979068214	0.793870075000001	65.00803843	8.045595465
10.2738718071097	70.3681365503439	9.94467456537466	2.82031094	66.9400554	1.18723785
10.2738718071097	70.3681365503439	9.94467456537466	11.71156616	63.23151575	10.39694521
9.97113790119711	71.9585532828816	9.72680294095779	3.336609071	66.34370608	12.08281041
9.57155757806615	74.0578704668515	9.43926362066357	3.380314451	80.99890539	17.02151813
9.72526556053543	74.174483148409	9.11557403318832	1.834626902	71.15202574	0.775939504
9.72526556053543	74.174483148409	9.11557403318832	1.825477279	70.78130479	1.056192161
9.76223772055818	74.2024674316058	9.03762534868291	6.04179221699999	70.01715429	8.958731963
9.76223772055818	74.2024674316058	9.03762534868291	6.334374787	68.85467086	8.438723386
9.7996500679277	74.2307855235256	8.95874782622756	2.781332517	68.35625636	3.710000307
9.83698051234599	74.2590411391901	8.88004362935742	2.885089549	70.78781924	5.964704064
9.83698051234599	74.2590411391901	8.88004362935742	2.881941531	70.78732912	3.789169139
9.8741224653179	74.2871527254974	8.8017384270663	3.252339284	73.9521337	6.052632886
9.91111964413511	74.3151541620745	8.72373910469851	3.10003410199999	78.61964126	7.805263196
9.91111964413511	74.3151541620745	8.72373910469851	5.04273939700001	78.40053531	10.86923314
9.94848894536021	74.3434378657347	8.6449545834244	1.45195925500001	80.87244268	12.37991353
9.94848894536021	74.3434378657347	8.6449545834244	3.437419026	82.39656928	11.4164042
9.98440721441659	74.370617429981	8.56923304315068	0.848777487999996	80.80421078	5.669295757
9.98440721441659	74.370617429981	8.56923304315068	0.773453591000006	79.81662315	5.077053724
10.0205961327926	74.3979956985673	8.49294538544515	4.297539438	80.73294711	0.059971047
10.9335559300241	74.1147900313068	8.44090330185619	5.724809855	81.80721271	6.405774196
10.9335559300241	74.1147900313068	8.44090330185619	8.595205897	76.73972439	1.498449057
12.2162678692291	73.7168676727647	8.367787824643	9.360499311	76.63383999	11.96842635
12.2162678692291	73.7168676727647	8.367787824643	14.09860615	77.68853822	13.45994873
13.6080305910187	73.2851037398106	8.28845663660428	13.78543979	72.75062985	12.01531817
13.6080305910187	73.2851037398106	8.28845663660428	16.80968797	72.84815948	15.34934359
14.8462141216588	72.9009975081146	8.21787598896956	15.50686687	76.44859369	16.39940441
14.8462141216588	72.9009975081146	8.21787598896956	18.15532249	77.80652015	16.99185344
15.985953470601	72.5474388809425	8.15290549828537	19.29153506	80.52426775	7.949521468

Solution x	Solution y	Solution z	Original x	Original y	Original z
15.985953470601	72.5474388809425	8.15290549828537	18.79013692	77.54174683	13.67079469
17.0503900584309	72.2172521678066	8.09222644388348	17.20155001	81.69531761	4.530646889
18.2839696133686	71.8345928674179	8.02190622321623	16.93400358	77.9224885	0.924123088
18.2839696133686	71.8345928674179	8.02190622321623	15.83973733	72.60736968	8.73861151
19.791094355566	71.367062459172	7.93599573189768	16.29427026	68.63097998	5.127480774
21.4335761140403	70.857524768948	7.8423737643497	24.66562586	67.58605744	10.297776
21.4335761140403	70.857524768948	7.8423737643497	22.58317288	64.23875961	11.9213097
22.7872893335314	70.4375867008474	7.76520915744822	26.6523776	66.91672378	14.68008016
23.9429243872217	70.0791076345293	7.69933333834479	29.47881008	65.01108227	16.71360152
24.2450778701049	69.9853910669924	7.68211239987278	27.36103425	64.84526011	12.45761345
24.2450778701049	69.9853910669924	7.68211239987278	28.86030824	61.83789689	13.23528428
24.4958196694639	69.9076230852682	7.66782178935313	28.66025221	61.13181458	11.59083816
24.4958196694639	69.9076230852682	7.66782178935313	28.38294287	59.7022254	11.36065683
24.6668919296468	69.8545670660568	7.65807204383663	25.08011935	60.4806985	0.592321921
24.6668919296468	69.8545670660568	7.65807204383663	32.28903103	63.37386507	1.032108002
24.6668982180146	69.8545652878466	7.65807170636889	21.60880813	73.64895737	1.318444959
24.6668982180146	69.8545652878466	7.65807170636889	23.39691794	71.43920824	1.906907845
24.6669046821993	69.8545634480555	7.65807137312439	23.53960858	80.471438	3.12432842
24.6669046821993	69.8545634480555	7.65807137312439	21.04749508	76.84597788	0.391094884
24.6669112040602	69.8545615492513	7.65807104459949	22.95922483	75.83051285	0.740171728
24.6669177600857	69.8545596314147	7.65807072388317	20.75020952	68.82081849	3.659175109
24.6669177600857	69.8545596314147	7.65807072388317	24.34494447	68.89894191	6.614252607
24.6669243862493	69.8545577121304	7.65807040911815	24.57644237	79.57543571	13.43961074
24.6669243862493	69.8545577121304	7.65807040911815	29.05539546	78.84402949	14.28609887
26.1972832926082	68.9604578274017	7.29828623268222	28.44331265	74.98671685	9.740464776
27.8219778610352	68.0112501763807	6.91633846148551	31.34183617	77.86791685	6.462154326
27.8219778610352	68.0112501763807	6.91633846148551	34.30971303	75.90183293	2.096267325
29.0175192266568	67.312767534294	6.6352614006755	36.44207057	76.13900165	9.824805701
29.0175192266568	67.312767534294	6.6352614006755	37.43465738	70.14594443	13.87115315
29.2159761254661	67.1968612360289	6.58860970546323	35.03662295	76.31902131	1.401481412
29.2159761254661	67.1968612360289	6.58860970546323	33.85806756	68.2147305	3.068667124
31.2203578367821	65.3340413623199	6.32857170443398	34.32584869	66.311045	4.144300462
33.1201278945093	63.5684446056778	6.08210821946932	36.53251416	65.89826385	3.47943245
33.1201278945093	63.5684446056778	6.08210821946932	37.36735143	64.72519961	6.841621681
34.8128712807276	61.9952411420708	5.86249686706083	36.88863481	65.11756178	9.028914476
34.8128712807276	61.9952411420708	5.86249686706083	32.47933058	60.09950546	10.14811096
36.7500677282808	60.1948542771125	5.61116563756156	39.12047899	68.75765335	13.33882614
36.7500677282808	60.1948542771125	5.61116563756156	36.99117209	62.09652931	16.1628835
36.7500677282808	60.1948542771125	5.61116563756156	33.50828257	58.48410354	3.557102036
36.7500677282808	60.1948542771125	5.61116563756156	36.65639834	59.2724504	14.55953297
36.7500677282808	60.1948542771125	5.61116563756156	34.15128455	57.37934974	2.952751483
36.7500677282808	60.1948542771125	5.61116563756156	38.55825219	62.0328479	1.356643655
36.7500677282808	60.1948542771125	5.61116563756156	38.87334077	61.97418169	4.472466865
36.7500677282808	60.1948542771125	5.61116563756156	31.12121771	52.61678334	1.82071962
36.7500677282808	60.1948542771125	5.61116563756156	44.96838238	64.05706864	11.93558957
36.7500677282808	60.1948542771125	5.61116563756156	33.45977848	51.47641849	1.316430254
36.7500677282808	60.1948542771125	5.61116563756156	42.10911161	58.06602885	13.19335194
36.7500677282808	60.1948542771125	5.61116563756156	37.58124673	53.7047325	1.291628295
36.7500677282808	60.1948542771125	5.61116563756156	43.40294282	59.60424206	0.51389979
36.7500677282808	60.1948542771125	5.61116563756156	44.98764045	56.96391467	9.231659535
36.7500677282808	60.1948542771125	5.61116563756156	45.47068469	56.96814934	6.687113785
36.7500677282808	60.1948542771125	5.61116563756156	40.92420024	52.54921675	3.399585878
43.1239217125305	54.2712841543117	4.78430941994191	35.40868681	49.33377596	1.880059691
54.7599595192745	43.4570991790938	3.27445528803242	48.20619517	39.24794213	0.08063613

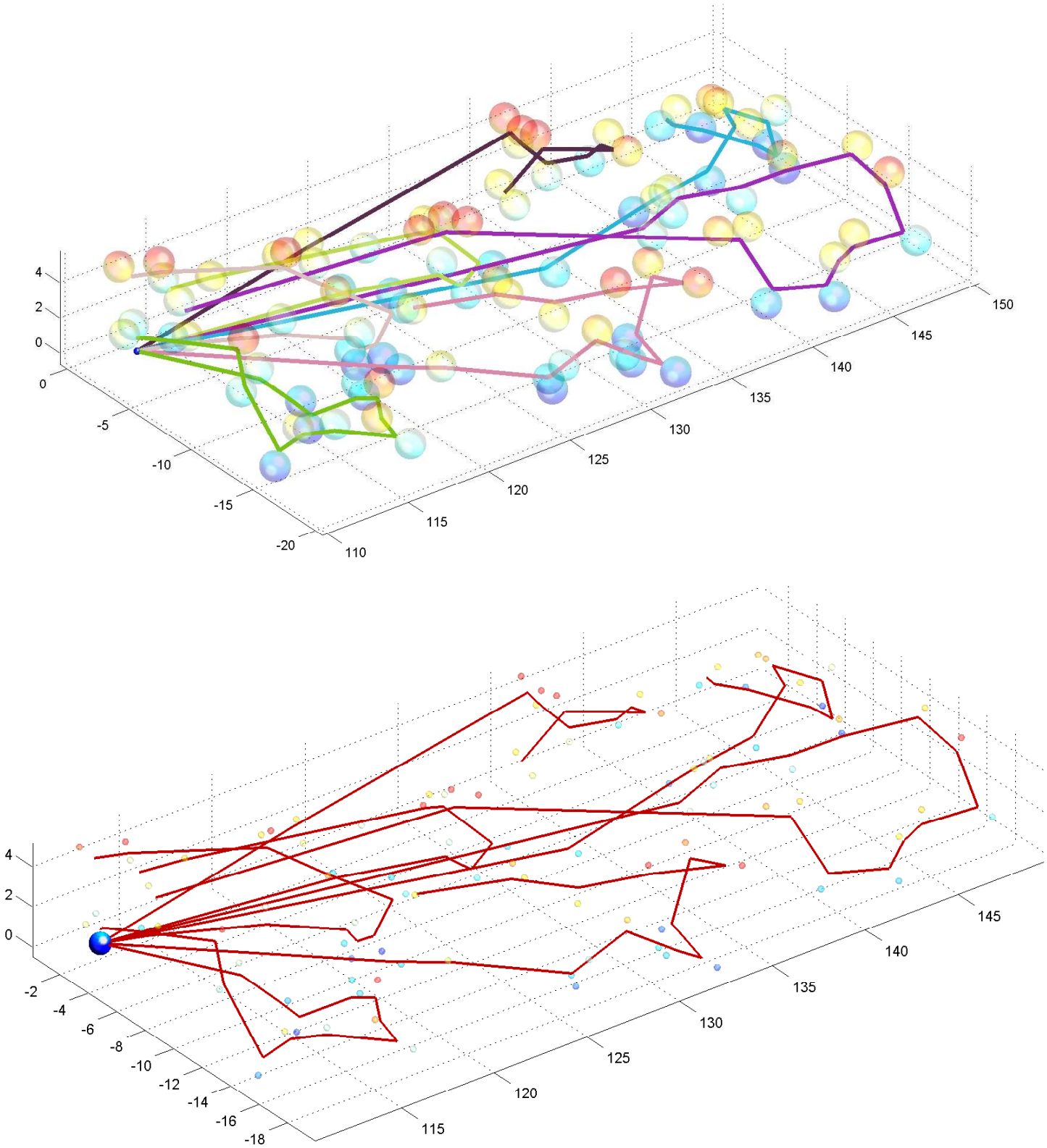


Figure O.70: $kroD100$, $r = 0.7798$, Equal Radius, 3D, Euclidean, Length = 413.1622723

Table O-73: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 3D, Euclidean

Total distance: 413.162272324453 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 81.7555462329411 Demand Met: 398					
22.2585695779171	9.13052367859909	1.28666184200156	22.23	9.9	1.41
29.7954672205438	6.83714327400303	0.953175573069209	29.93	6.24	0.47
30.7691554448032	7.24779344127654	1.51672804805154	30.6	7.81	2.03
34.2546761146571	6.51476077448169	1.4088827228562	34.52	6.37	0.69
36.0694377263257	6.36631736101784	3.21970825802849	36.42	6.99	3.53
36.3375285836819	5.16718998082698	3.55864388996361	35.99	5.14	4.02
36.3375285836819	5.16718998082698	3.55864388996361	36	4.59	3.96
38.6738062575626	5.59728688789498	2.19533992164631	39.35	5.4	2.53
38.6906655854332	6.29526166445065	0.610876489815448	38.68	6.97	0.22
38.7402369117285	4.75977822755203	0.447513819510661	39.46	4.59	0.2
37.3020619117133	2.16869700091627	0.661153316199467	37.66	1.54	0.37
35.6899230960342	1.91831309861242	1.39582837330666	35.38	1.25	1.14
34.7214652637628	2.60944178017644	2.37628508786086	35.03	3.01	2.97
Route: 2 Length: 59.4697078182528 Demand Met: 396					
12.8495965021642	2.02200766760806	2.3980899259958	12.72	2.46	3.03
25.6779859034005	1.8148820847273	4.43256150797522	25.92	2.48	4.76
25.6901780552257	1.80495017694099	4.43025963041854	25.81	1.21	4.92
26.3618703663032	1.97318569843786	3.56731335688449	26.56	1.28	3.27
27.0139058815966	3.01590903444006	2.78055020470058	26.58	3.6	2.5
29.5737519760542	2.99968639768628	2.28072417013656	29.95	2.64	1.7
29.9512266365588	3.5549500965236	2.99883217803881	30.62	3.29	3.3
29.135451605637	5.61851314455241	3.98720776444297	29.44	6.32	4.14
25.9655611093635	4.0782687083979	4.43806036951331	25.97	3.49	4.95
23.6279280902582	4.54198359995363	3.38192195849392	23.47	3.88	3.22
23.1880124278295	4.62920672546124	3.18337543841217	23.34	5.23	2.71
Route: 3 Length: 65.2734059004169 Demand Met: 400					
10.4689338794918	12.1632645828295	1.21551325546689	11.09	11.96	0.79
11.325429596071	15.207785804829	2.28310444582549	10.82	15.61	2.72
16.0937672607235	17.4405558020465	1.08599736734465	16.32	17.42	0.34
16.2490796211162	17.5505855101127	1.25027461728872	16.23	17.23	0.85
16.8151185033355	17.9515879887368	1.84904981957535	16.46	18.17	1.97
17.9942473930678	18.7868780359898	3.09628519424048	17.87	19.02	3.83
19.9611949540267	18.9077692811138	1.74884866553791	19.94	18.52	1.49
20.6913726242511	18.9526637900589	1.24866362401772	20.5	18.33	0.82
21.775800295054	19.1533677121679	0.628627586082828	22.14	19.77	0.32
22.3036707690216	16.3572479778677	0.855878159588126	22.21	15.78	0.34
23.3432165973931	16.3059789537538	3.71856869725742	23.56	15.68	4.13
23.3570591750813	18.7813590651007	4.50365672523754	23.74	19.44	4.67
20.5772126670931	17.0830577846011	4.27436923090875	20.28	17.36	4.94
18.1089631439551	15.2818255550336	3.62942522885111	17.68	15.78	3.21
16.6935536686146	13.3714318048243	3.59196442095345	16.99	12.94	3.45
16.3244095989151	12.8732023861771	3.5821990582552	16.77	12.38	3.99
13.1299432493162	10.4035938540917	2.83137038902057	12.64	10.9	3.18
Route: 4 Length: 40.9934709797871 Demand Met: 400					
13.1263431934437	4.7581102209165	1.06223025872671	13.46	4.08	0.87
15.0600448730553	5.95953045709547	1.44109461115725	15.29	5.81	0.79
17.0924869427219	7.22259949599707	1.83972223247789	17.66	6.78	2.14
17.4997700808305	8.53126233079524	1.66770856713611	17.25	9.27	1.67
19.9808098117814	6.76679917435382	1.27116410673224	20.67	6.94	0.95
19.1141901232174	4.463357279745	2.33656730248711	19.62	3.89	2.49
18.2144552349926	4.34885493275159	2.52218395827243	18.28	4.56	3.27
15.3658276216255	3.87024268005465	2.67352060581766	15.41	3.54	2.28
12.1465488198448	3.32953751873503	2.84468152533106	12.03	3.85	2.73
10.1796806188812	2.99905223998051	2.94925885282484	10.17	3.33	3.55
6.70545380839651	2.41526372245933	3.1336651318756	6.34	2.94	3.58
5.38118719954751	0.988875067893957	2.32698769148269	5.47	0.25	2.56
Route: 5 Length: 87.3119096406233 Demand Met: 392					
27.4217053113765	10.2325347019191	2.24656333947056	27.4	11.01	2.19
29.1660837188282	9.76049798234328	2.4806747706122	29.01	9.2	2.88
29.7462970126405	9.60345240881678	2.55855500172005	29.82	9.49	1.92
30.212808801438	9.47717304944087	2.62116534492981	30.23	8.71	2.76
33.2082483407648	10.5209602728549	2.69114057208555	33.32	10.49	1.92
35.407642516888	11.3307492207901	3.22144002874681	35.35	11.12	3.97
38.5064838082419	12.5584651482735	3.61987271460684	39.18	12.17	3.68
37.9738605680601	15.9610616559426	3.69842895432155	38.05	16.19	4.44
37.3823189309612	18.2246500457963	2.19292970883544	37.86	18.62	1.72
33.7638465649975	18.9580449231427	2.94337420408958	33.73	19.02	3.72
32.6853715636297	19.135028864266	2.58717650647116	32.2	19.45	3.11
32.1219992324582	18.8479057676149	1.29953713111962	32.48	19.06	0.64
29.8344836892201	17.5775192176458	1.2724354976102	29.27	17.77	0.77
29.4761213955508	15.404713370051	3.20218366725517	30.07	15.24	3.68
28.5062005464389	14.7723035580476	3.30242002874081	28.34	15.12	3.98
18.2550584043701	7.95431761639387	4.16837854873557	18.19	8.14	4.91
17.4388002463458	7.41099517727867	4.23598038400124	17.66	6.92	4.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
16.1706567403247	6.93213987975125	4.00810007599601	16.04	7.06	4.67
4.94015752495693	2.69103212380307	1.98860601067003	4.59999999999999	2.67	2.69
Route: 6 Length: 45.7489046879347 Demand Met: 353					
4.21959850813872	9.68131592265322	1.60831736622726	4.01000000000001	9.8	2.35
4.90052878820788	11.5177390026407	0.882558022840017	5.55	11.21	0.58
5.1545500504533	12.5540801215856	0.545347936739218	4.64	13.02	0.19
7.40020069502441	13.2233849046067	1.00192913454151	8.11	12.95	0.83
7.3997387988717	13.2243858770448	1.00258690269227	7.78	12.82	1.55
5.36741739302008	17.6153792479201	3.74668028816266	5.55	17.53	4.5
4.49929041139276	19.078614990548	3.58414778223381	3.94	19.44	3.99
5.20221601381438	19.3484420784122	2.43764503922615	5.70999999999999	19.82	2.08
3.365988634888	16.7564320003694	2.2212828180495	3.86	16.16	2.13
1.93212483103738	16.1149224899792	2.21194632077949	1.48999999999999	16.29	2.83
1.21316019961552	15.128115863039	1.09980578759148	0.799999999999997	15.33	0.47
2.18795134013381	11.0984355058166	2.53863567849233	2.34999999999999	10.59	1.97
2.28892743766319	10.3639876806418	4.2720218464137	2.41	10.69	4.97
1.63221225754218	6.32389799575544	3.09011098064246	2.40000000000001	6.19	3.07
1.14228662296988	3.89554781739639	2.37738010848982	0.469999999999999	3.63	2.67
1.87441062026437	2.82473916274625	1.49509164433688	2.02	2.33	2.08
Route: 7 Length: 32.6093270644969 Demand Met: 380					
4.08959066191406	3.20918940564051	0.624955404145232	3.66	3.39	1.25
7.71215589004939	6.90507418590693	1.61406661908034	7.81	6.7	2.36
10.0361082492591	9.49704392692586	1.72470530504135	10.09	10.01	2.31
10.0361082492591	9.49704392692586	1.72470530504135	9.97	9.42	1.03
10.6008585586001	9.50357884692912	0.954966292333953	10.21	9.62	0.29
11.5794047186327	9.3939964236707	0.820308001397519	11.79	9.69	0.13
13.1541872178809	8.66382088606677	1.75137742877122	13.93	8.59	1.72
10.147780369463	7.84723149550983	3.74337580423321	9.81	8.48	4.05
8.81102409183302	5.49370261733718	4.40121406899436	9.31	5.12	4.87
4.12505099378001	1.82820282133263	4.09100984319748	3.87	1.99	4.81
3.03185384056601	0.860075211259276	3.78745134750825	2.64	0.36	4.24

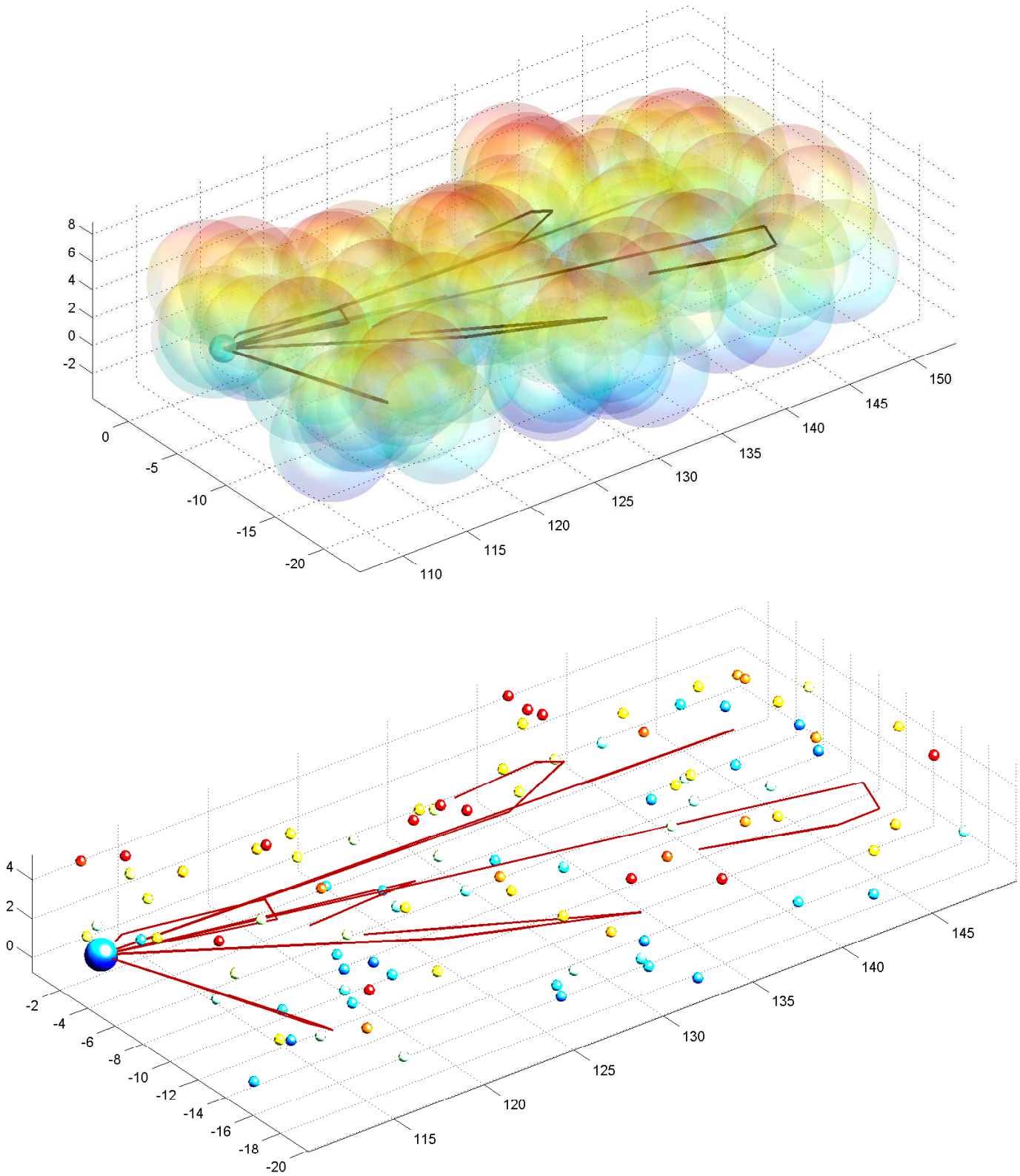


Figure O.71: $kroD100$, $r = 3.899$, Equal Radius, 3D, Euclidean, Length = 312.1328212

Table O-74: Solution for $kroD100$, $r = 3.899$, Equal Radius, 3D, Euclidean

Total distance: 312.132821218024 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 17.7254644721138 Demand Met: 358					
4.92040785140347	3.23911777266291	0.60237634668499	4.59999999999999	2.67	2.69
7.22586456194095	4.95074820479417	1.25118596559075	7.81	6.7	2.36
8.69767211122117	6.04342218806429	1.66536359737292	9.81	8.48	4.05
9.03785354217116	6.29598531013823	1.76110340875836	10.09	10.01	2.31
9.14873103659723	6.0025089272861	1.7599316593153	9.97	9.42	1.03
9.69315763522744	4.56072584982772	1.7543121223306	13.46	4.08	0.87
9.69315757380096	4.56072562456428	1.75431201610798	12.72	2.46	3.03
9.36197193651748	4.41227136684197	1.70413974119483	12.03	3.85	2.73
8.92543823307878	4.21659821874076	1.63800954527121	10.17	3.33	3.55
8.426928771725	3.99314723331499	1.56249017219086	9.31	5.12	4.87
6.47491412475908	3.11818052579785	1.26684090734543	6.34	2.94	3.58
4.42126021311313	2.19764034290947	0.955763409908224	3.87	1.99	4.81
3.75085490037429	1.89685476187409	0.833200795851965	2.64	0.36	4.24
3.43436488879942	1.81638237041609	0.561576066009469	5.47	0.25	2.56
Route: 2 Length: 66.2105010278836 Demand Met: 372					
28.4553546601504	4.01476996705128	1.01265913167753	29.93	6.24	0.47
32.7959155146096	4.41454803838964	1.18385543945598	34.52	6.37	0.69
34.7018337711473	4.5900887655859	1.25902800382049	36.42	6.99	3.53
35.0751556118851	4.62447163873254	1.27375191461971	35.99	5.14	4.02
35.4096670709826	4.65528069707027	1.2869452765547	36	4.59	3.96
35.7203275797335	4.68389361935559	1.29919853495664	39.35	5.4	2.53
35.7203275812536	4.68389361157609	1.29919860204388	38.68	6.97	0.22
35.7203275904423	4.68389360988711	1.2991985874527	39.46	4.59	0.2
35.6227396979213	4.67490823089944	1.29535093695769	37.66	1.54	0.37
34.5836288271382	4.57920273030575	1.25436691867895	35.38	1.25	1.14
33.2172256038809	4.45335156892034	1.20047520116768	35.03	3.01	2.97
30.5310122309188	4.20594296700334	1.09452781360008	30.62	3.29	3.3
27.7196913335939	3.94701309096445	0.98364588990032	29.95	2.64	1.7
Route: 3 Length: 29.4034396645826 Demand Met: 353					
3.62424992509787	8.00248603624404	0.933044189697781	4.01000000000001	9.8	2.35
3.91779074158519	10.2110389576902	1.25743161410615	5.55	11.21	0.58
4.14064401544513	11.8877009974395	1.50369759495169	4.64	13.02	0.19
4.32414476388898	13.2682456228686	1.70647511458829	8.11	12.95	0.83
4.39885887498129	13.9825810668128	1.81578461878855	7.78	12.82	1.55
4.5528475835101	15.4549404948239	2.04108434333455	5.55	17.53	4.5
4.61794848659146	16.077479911629	2.13634169329261	3.94	19.44	3.99
4.61794850737873	16.0774799285724	2.13634181886672	5.70999999999999	19.82	2.08
4.53753267031864	15.6236056151821	2.0619217420796	3.86	16.16	2.13
4.45275949580954	15.1451548226018	1.98347437642806	1.48999999999999	16.29	2.83
4.3525122402108	14.5793684642196	1.89070727199852	0.799999999999997	15.33	0.47
4.05264537356001	12.1529925237826	1.54771964257092	2.34999999999999	10.59	1.97
3.91321946405047	11.024422513497	1.38806619661693	2.41	10.69	4.97
3.3927328475792	6.7187470031702	0.750522816768899	2.40000000000001	6.19	3.07
3.07869472579998	4.12091462026105	0.365867458747142	0.469999999999999	3.63	2.67
2.92517289191748	2.85094286701789	0.177829491930441	2.02	2.33	2.08
Route: 4 Length: 0 Demand Met: 49					
2.78	1.65	0	3.66	3.39	1.25
Route: 5 Length: 73.0016192165735 Demand Met: 394					
25.5087758102236	10.0742978218948	1.93416459309507	27.4	11.01	2.19
26.8805068479582	10.5827103320243	2.05089676907879	29.01	9.2	2.88
27.826353365709	10.9332542741335	2.131380795895	29.82	9.49	1.92
28.5805050556816	11.2127528865266	2.19555353503138	30.23	8.71	2.76
29.2186869274611	11.4492960504725	2.24985813946959	30.6	7.81	2.03
32.0285514394945	12.505535962781	2.49017529694135	33.32	10.49	1.92
34.1645428248578	13.3084374978849	2.67286014217836	35.35	11.12	3.97
35.8085611692139	13.9263458891101	2.8134713126003	39.18	12.17	3.68
35.5898029858536	14.8746502774422	2.59766966168303	38.05	16.19	4.44
35.4064390198471	15.6709098673162	2.41651470417129	37.86	18.62	1.72
34.1251328338194	15.6869550244632	2.42393330164407	33.73	19.02	3.72
33.0265078319073	15.7007175667562	2.43030074256028	32.2	19.45	3.11
32.9041016366866	15.6438599430289	2.4204572627871	32.48	19.06	0.64
30.824162866452	14.6776739040863	2.25334161072592	29.27	17.77	0.77
29.383005345883	14.0081806408257	2.13755934889292	30.07	15.24	3.68
27.3456365523584	13.0617233064377	1.97385378853688	28.34	15.12	3.98
Route: 6 Length: 48.4347636455198 Demand Met: 400					
10.4495608021366	9.66342062105112	1.58482347990083	11.09	11.96	0.79
13.3417692918409	12.685289076269	2.1824612559699	10.82	15.61	2.72
16.2147822292652	14.5704022917002	2.56344869967292	16.32	17.42	0.34
17.1298625510167	15.1708600434891	2.68482196202558	16.23	17.23	0.85
18.0173685154445	15.7531788499255	2.80257079738845	16.46	18.17	1.97
18.8861587527487	16.3231470731888	2.91781856079443	17.87	19.02	3.83
19.5971313118217	16.7895935441676	3.01210729228119	19.94	18.52	1.49
20.1911996716804	17.1793665648065	3.09089298013436	20.5	18.33	0.82
20.7041038476481	17.5158991195954	3.15891504382985	22.14	19.77	0.32

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.7041040070213	17.5158991592765	3.15891518757872	22.21	15.78	0.34
20.7041041609086	17.5158991992908	3.15891514428845	23.56	15.68	4.13
20.7041043040098	17.5158992390104	3.15891528142547	23.74	19.44	4.67
19.4966081523976	16.4470652547597	2.94614662808569	20.28	17.36	4.94
17.9173967179267	15.0491836601231	2.6678844304383	17.68	15.78	3.21
16.2884724320121	13.6072394323309	2.38084977502209	16.99	12.94	3.45
14.6239114941634	12.1338219632066	2.08748713415963	16.77	12.38	3.99
11.5017564391025	9.37021995398281	1.53719919287532	12.64	10.9	3.18
Route: 7 Length: 29.9024946988405 Demand Met: 400					
13.4759096605357	5.0559960080411	0.682517151422009	15.29	5.81	0.79
14.7792010205136	5.47101758057838	0.765679926082848	15.41	3.54	2.28
16.1528848614585	5.90846480937608	0.853332536232366	18.28	4.56	3.27
16.8559166860698	6.13235637398944	0.898182837133577	19.62	3.89	2.49
16.855917031739	6.13235651226005	0.898182876317822	20.67	6.94	0.95
16.5620310421056	6.12238396905976	0.895910403397568	17.66	6.78	2.14
16.2396257808686	6.11144499044395	0.893415108891631	16.04	7.06	4.67
15.6586901266826	6.08159743843708	0.8488508631761	17.25	9.27	1.67
13.9537674310928	5.99395662003398	0.718059949923044	13.93	8.59	1.72
12.2277203115973	5.90522019653638	0.585648735735526	11.79	9.69	0.13
11.1876942355183	5.85174918408311	0.505872820623317	10.21	9.62	0.29
Route: 8 Length: 47.45453849251 Demand Met: 393					
17.1573985260522	5.03970942892749	1.92940208204725	17.66	6.92	4.8
19.1623356199364	5.51240963375747	2.19845677568791	18.19	8.14	4.91
22.0582085842321	6.18317760481654	2.57529914113354	22.23	9.9	1.41
25.6852361029485	5.44584288952315	3.5570761563917	29.44	6.32	4.14
25.1837417108675	5.07023911700344	3.54771579546381	26.58	3.6	2.5
24.6396509003499	4.66273144729933	3.53756057755367	26.56	1.28	3.27
24.6396463535287	4.66272870010256	3.53756051227278	25.81	1.21	4.92
24.1011202776508	4.58850735203444	3.45041064567648	25.92	2.48	4.76
23.3956186306853	4.49127402255835	3.3362385083474	25.97	3.49	4.95
22.1385474807163	4.31802440971466	3.13280415182919	23.47	3.88	3.22
20.6053192965283	4.10671542877189	2.88467902462778	23.34	5.23	2.71

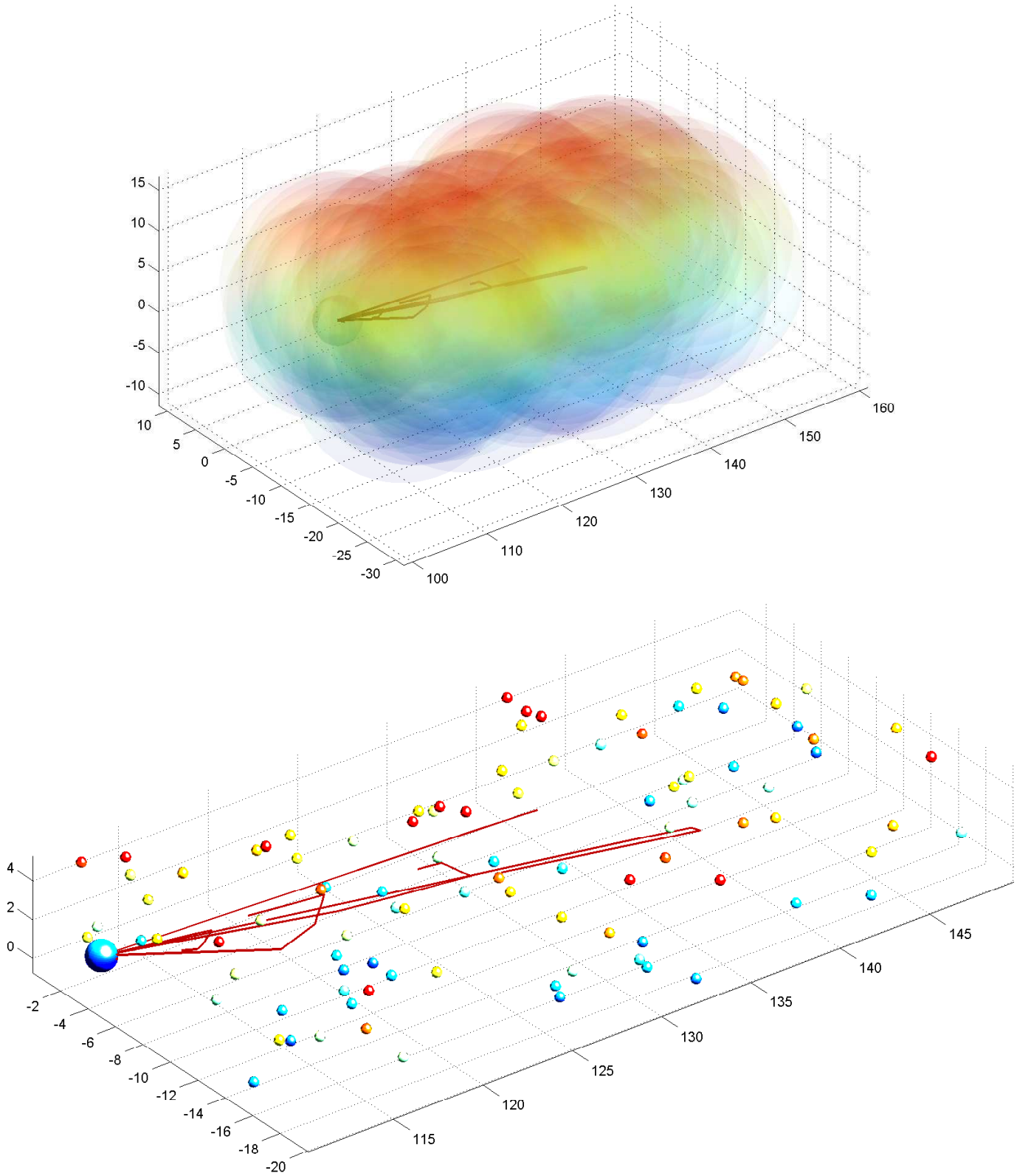


Figure O.72: $kroD100$, $r = 11.697$, Equal Radius, 3D, Euclidean, Length = 172.5595712

Table O-75: Solution for $kroD100$, $r = 11.697$, Equal Radius, 3D, Euclidean

Total distance: 172.559571209228 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 24.2033524909699 Demand Met: 398					
7.54830533730598	8.5314949713476	1.7980859674011	3.94	19.44	3.99
7.77118587893027	8.44894456174962	1.79301414251558	5.70999999999999	19.82	2.08
10.2038633083035	7.54784595353735	1.73760130624011	16.32	17.42	0.34
10.5649824051546	7.20881180621002	1.75066045173046	17.68	15.78	3.21
11.0096819820033	6.79135387347615	1.76673354316643	16.77	12.38	3.99
11.4724968647512	6.35688115400914	1.78345287456195	22.23	9.9	1.41
11.7215632992331	6.12301903080288	1.79245744488015	20.67	6.94	0.95
11.9303215659295	5.92699829563161	1.80000663432275	23.34	5.23	2.71
12.0253363126197	5.83777800219081	1.80344657797212	23.47	3.88	3.22
10.7373238938749	5.25429468112496	1.55220698769018	19.62	3.89	2.49
8.87809276602523	4.41213599938981	1.18953799058764	17.66	6.92	4.8
Route: 2 Length: 56.6793242388594 Demand Met: 400					
26.4368990126565	8.91923416299277	0.831612799188441	35.03	3.01	2.97
29.4393943409908	9.84179493205609	0.937142083955662	37.66	1.54	0.37
29.4551182162876	9.89042224550353	0.941170342574383	39.46	4.59	0.2
29.4707844889106	9.93888758133219	0.94517889586324	38.68	6.97	0.22
29.4865782371905	9.98774996085743	0.949220027172361	39.35	5.4	2.53
29.5041579033403	10.04214880615	0.95371755743624	36	4.59	3.96
29.5227607879277	10.0997209428317	0.958477442031898	35.99	5.14	4.02
29.5416251983631	10.1581064209529	0.963305112073726	36.42	6.99	3.53
29.5601915119739	10.2155709742314	0.968057431905617	35.35	11.12	3.97
29.5780222433653	10.2707581723018	0.972622233691162	39.18	12.17	3.68
29.5942142033212	10.3208728100692	0.976768269232142	38.05	16.19	4.44
29.6078816798238	10.3631746853014	0.980267650811548	37.86	18.62	1.72
29.0389228850055	10.1783840579289	0.959480004888002	33.73	19.02	3.72
28.2876622271743	9.93441475870271	0.932020553610647	32.2	19.45	3.11
27.2024207956248	9.58201084652372	0.892333153064929	32.48	19.06	0.64
24.8725867294283	8.82540410073852	0.807165313014503	29.27	17.77	0.77
20.6886897200286	7.46656308230202	0.65429399724969	19.94	18.52	1.49
Route: 3 Length: 8.6967773157335E-10 Demand Met: 323					
2.77999999997107	1.64999999997027	3.28279625705363E-10	3.66	3.39	1.25
2.77999999996761	1.64999999996684	2.9413982360893E-10	4.59999999999999	2.67	2.69
2.77999999996835	1.64999999996503	2.66306088292367E-10	3.87	1.99	4.81
2.77999999996609	1.64999999996247	2.73857381216658E-10	2.64	0.36	4.24
2.77999999995701	1.6499999999554	3.17777804070829E-10	5.47	0.25	2.56
2.77999999994199	1.64999999995298	3.16644488407292E-10	6.34	2.94	3.58
2.77999999993459	1.64999999994848	3.22055271340105E-10	10.17	3.33	3.55
2.77999999993472	1.64999999994909	3.41490391519983E-10	7.81	6.7	2.36
2.77999999993528	1.64999999995215	3.46863870959169E-10	4.01000000000001	9.8	2.35
2.77999999994228	1.64999999996161	3.13681525199172E-10	2.40000000000001	6.19	3.07
2.77999999994988	1.64999999996814	3.13175263499943E-10	0.469999999999999	3.63	2.67
2.77999999995997	1.64999999997335	3.11105807782042E-10	2.02	2.33	2.08
Route: 4 Length: 1.6489869781759 Demand Met: 399					
2.83196121841138	1.76013184939494	0.00809843945570954	13.46	4.08	0.87
2.86840921219101	1.83739017360313	0.0137774929484156	12.72	2.46	3.03
2.90180014845492	1.90816569208245	0.0189818711717642	12.03	3.85	2.73
2.94294681984513	1.99538526092198	0.0253902783082278	9.31	5.12	4.87
2.98704410299469	2.08886457304982	0.032254487020321	9.81	8.48	4.05
3.02618926830289	2.17184880639453	0.0383474191712665	10.09	10.01	2.31
3.05841533628032	2.24016665990398	0.0433640420258392	9.97	9.42	1.03
3.0874085726942	2.30163022609493	0.0478785323721524	10.21	9.62	0.29
3.11288477481347	2.35563703433018	0.0518464021125418	11.79	9.69	0.13
3.13100003519062	2.39404298989673	0.0546673284987662	8.11	12.95	0.83
3.09900349080775	2.32622291007288	0.0496817900259607	7.78	12.82	1.55
3.0521016169197	2.22680333668889	0.0423763067838721	5.55	11.21	0.58
3.00651991812857	2.13018469451702	0.0352757835731605	4.64	13.02	0.19
2.94536046107063	2.00054667842537	0.0257467035114143	2.34999999999999	10.59	1.97
2.87832022101988	1.85843377705002	0.0153040752578875	2.41	10.69	4.97
Route: 5 Length: 43.9240066544428 Demand Met: 400					
19.6904617529477	4.46329581713056	1.18263001297292	29.93	6.24	0.47
20.8590762694618	4.65771301296582	1.26435727855372	30.6	7.81	2.03
21.6014289498897	4.78121542574777	1.31627407249796	30.23	8.71	2.76
22.1915768915136	4.87939616883247	1.35754638887115	29.82	9.49	1.92
22.7060564944127	4.96498804489968	1.39352675774617	29.01	9.2	2.88
23.1808011607228	5.04396925321943	1.4267281579755	29.44	6.32	4.14
23.6215034785204	5.11728699836365	1.45754872581356	30.62	3.29	3.3
24.0218108609634	5.18388443665693	1.48554424885262	29.95	2.64	1.7
24.39287830475	5.24561734104794	1.51149487473742	35.38	1.25	1.14
24.3928782935185	5.24561735686868	1.5114948782146	34.52	6.37	0.69
24.392878281995	5.2456173723909	1.5114948789684	33.32	10.49	1.92
24.3928782708278	5.24561738741532	1.51149487913886	30.07	15.24	3.68
23.678388773561	5.12674955859831	1.46152698687584	28.34	15.12	3.98
15.5084944040244	3.76757080338623	0.890167820961915	18.19	8.14	4.91
Route: 6 Length: 34.7192702323885 Demand Met: 399					

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.37988065607	7.69560257476206	2.02675866483916	5.55	17.53	4.5
12.7444735024791	8.24894855612888	2.23628777383297	16.99	12.94	3.45
13.8690410113418	8.70499715935369	2.40896297325718	16.23	17.23	0.85
14.8594585518233	9.10662082665762	2.56104163446221	16.46	18.17	1.97
15.7371251995042	9.46248932553316	2.6958080493911	17.87	19.02	3.83
16.4473144192792	9.75044667580967	2.80486078579726	20.28	17.36	4.94
17.0634303499981	10.0002722337136	2.89947195474751	23.74	19.44	4.67
17.0547081515878	9.81823797590061	2.87837375112884	22.14	19.77	0.32
17.042530537311	9.56395355604298	2.84890678169299	20.5	18.33	0.82
17.0287198556149	9.27543195258215	2.81547659769852	22.21	15.78	0.34
17.0139749539086	8.96733222911098	2.77978176591476	23.56	15.68	4.13
16.9975104619435	8.62319595729495	2.73991816947253	27.4	11.01	2.19
16.979547113387	8.24779676704542	2.69643543955734	26.58	3.6	2.5
16.9649101224838	7.942072136991	2.66101903993689	26.56	1.28	3.27
16.7988287974751	7.86842538395101	2.6299203874353	25.81	1.21	4.92
16.441266143565	7.70984810653278	2.56284333184208	25.92	2.48	4.76
15.9868078744265	7.50828729833022	2.47757733943509	25.97	3.49	4.95
Route: 7 Length: 11.3846306135218 Demand Met: 400					
5.12246074219993	3.32366585964315	0.726073817974035	15.29	5.81	0.79
6.10893715604581	4.02863380581857	1.03184463354079	15.41	3.54	2.28
6.76171551699467	4.49532699560828	1.2341327467382	18.28	4.56	3.27
6.73601953124482	4.51245976385568	1.23284850732797	16.04	7.06	4.67
6.69680926047935	4.53863617858075	1.23089378986838	17.66	6.78	2.14
6.64082332178408	4.57605595508686	1.22810474360399	17.25	9.27	1.67
6.41438028363071	4.72722774518011	1.21681825872939	13.93	8.59	1.72
6.16122477490259	4.89621010895263	1.20420391342539	12.64	10.9	3.18
5.90753355674764	5.06547375123436	1.19154642994832	11.09	11.96	0.79
5.68567620833636	5.21344506427686	1.18046030852566	10.82	15.61	2.72
5.41949592874323	5.30895113110454	1.1594767210338	3.86	16.16	2.13
5.28930565317006	5.35564602609386	1.14922685167591	1.48999999999999	16.29	2.83
4.88631685927425	4.76083794549561	0.96471030572817	0.799999999999997	15.33	0.47

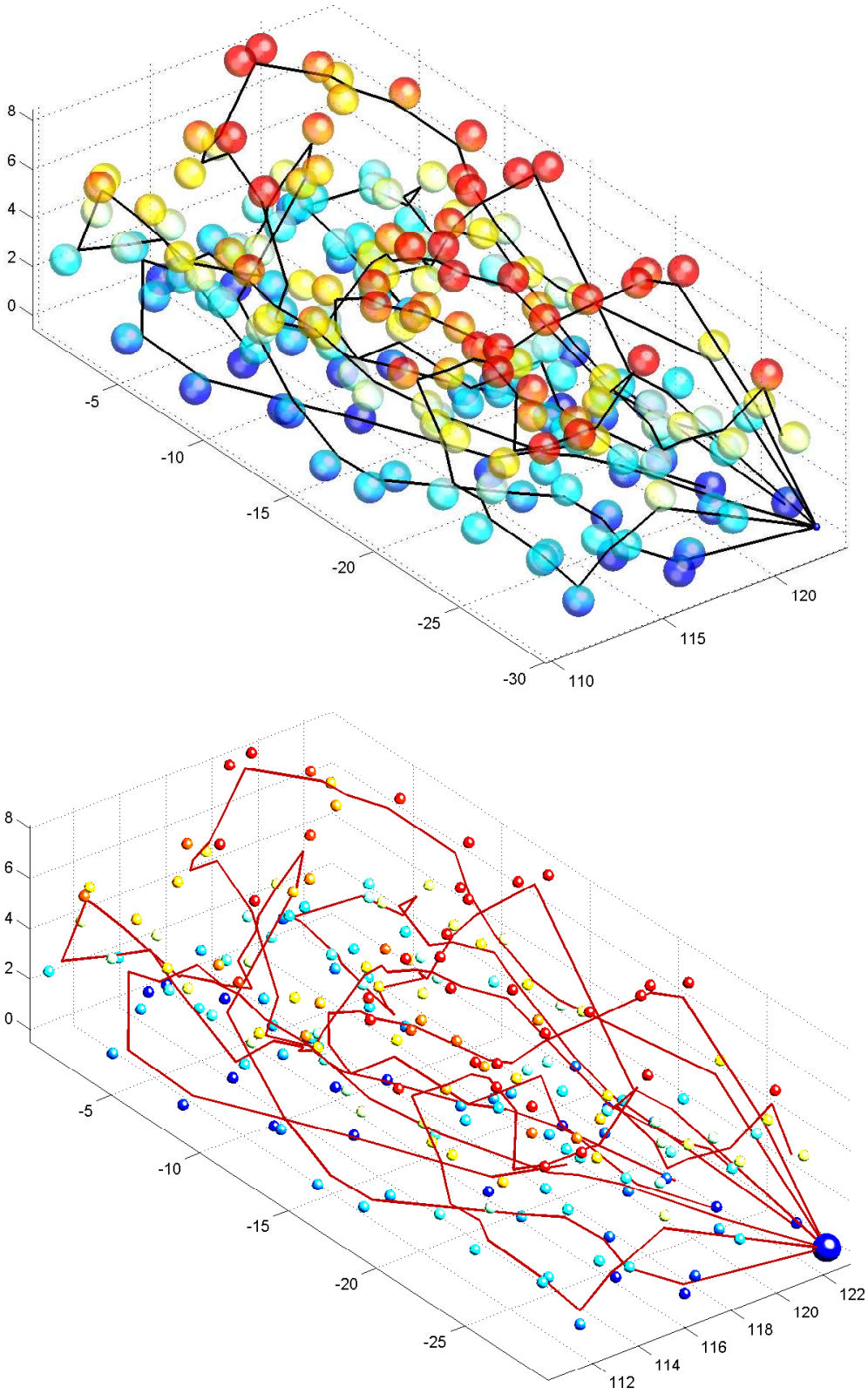


Figure O.73: $rat195$, $r = 0.578$, Equal Radius, 3D, Euclidean, Length = 405.3975662

Table O-76: Solution for $rat195$, $r = 0.578$, Equal Radius, 3D, Euclidean

Total distance: 405.397566194992 Total demand met: 11712 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 57.7555042676632 Demand Met: 1815					
8.68508369963389	29.1978884068029	1.93749928513604	8.7	29.3	1.9
5.36019809818872	29.3615803280601	3.54204557883194	5.3	29.5	4.1
3.98421865274156	29.0023310849458	2.53980881591466	4.3	28.8	2.1
3.42248928037915	28.9052468986617	2.24738971354166	3.3	28.4	2.5
2.00498250869251	29.0012134207769	1.28644886506094	1.7	29.4	1
1.95307683902959	27.4353880589872	1.58207053109769	1.59999999999999	27.4	1.8
1.93501000567734	26.8918958546972	1.68469751655858	2.40000000000001	26.7	1.4
1.10532188179508	24.9895565489066	2.56593684347027	0.599999999999994	24.9	2.3
1.18723516140982	24.417519302784	3.04947521815798	1.5	24.6	3.5
0.876321789870545	23.1559311110163	3.23845135562716	0.599999999999994	22.9	2.8
1.13733901251359	22.2840341748676	4.43312263286726	1.3	22.7	4.8
1.2106881551346	21.6981784849191	4.90305790374993	1.5	21.3	4.6
0.925268423023596	20.9449012606894	6.49460819625843	0.5	20.7	6.8
2.13873323296416	21.2308332913394	6.59544996798876	2.40000000000001	20.9	6.2
2.87208948432115	21.7426205614833	7.0167042406901	3.3	21.4	7.2
3.01846892099864	22.514663489342	7.16605125617526	3.40000000000001	22.5	7.6
2.89350534873013	23.4603025974012	7.00320633041605	2.59999999999999	23.5	7.4
2.77372108578069	24.3669331069985	6.84704232674481	3.3	24.6	6.9
2.14375107616711	25.1670711074212	6.62149730270853	2.59999999999999	25.5	6.5
0.911771204714739	26.6714413795054	6.1992953285628	0.5	26.6	5.8
1.07088925542132	28.3150564079565	7.08009727376095	0.700000000000003	28.7	7.3
2.08958216977412	28.2468699005086	7.0093232766399	2.3	28.7	7.3
3.89938032753319	27.1122912622606	6.22144170418815	3.7	26.6	6.4
4.47223183206992	26.8448197933377	5.95888622135288	4.5	26.7	5.4
6.41085127005239	26.5107627814317	7.43666517269763	6.7	26.7	7.9
6.32767711079858	25.2088102071888	6.03574518965952	5.8	25.2	5.8
7.42867683389873	23.9655840553592	5.20448926650561	7.5	23.4	5.3
8.23086891116017	25.1023105508096	3.9703381949593	8.7	24.9	3.7
7.83798933962251	26.3390179370381	3.64109943373189	7.40000000000001	26.5	3.3
8.40211075358462	26.8361202253107	4.06515956818884	8.7	26.4	4.3
9.30078255541493	28.0318265194397	4.73439645658541	9.40000000000001	28.4	4.3
10.3594545954268	28.9687557836074	6.53854669637091	10.4	29.1	7.1
11.1841336189908	28.9798894306558	4.23500537269225	11.4	29.4	4.3
Route: 2 Length: 69.3642324845567 Demand Met: 1986					
12.1476385707588	20.9759918512115	2.04764946745018	12.7	20.9	2.2
11.6407120171988	19.4610100469415	2.33827219128608	11.3	19.3	1.9
11.8047517980923	17.0196237801799	4.41148790028647	11.4	16.9	4.3
12.0511364025143	13.3534426782979	7.52486106879796	12.6	13.4	7.7
12.0511364025143	13.3534426782979	7.52486106879796	11.6	13	7.6
9.73067587974973	13.1245893200921	7.03994573853013	9.59999999999999	12.8	7.5
8.6169359135487	13.1606232897427	6.57913614131866	8.2	13.4	6.9
8.09762411729821	12.4219289001368	4.71410443945958	7.7	12.7	4.4
8.76594707139537	11.1155932189588	4.13416942177413	8.59999999999999	10.7	4.5
9.25166658241221	10.6995821504327	3.55276522528857	9.8	10.8	3.4
8.18705039530758	9.51440776975845	2.97438685156855	7.7	9.3	3.2
8.69177701780042	9.28900228855783	2.0710800545014	8.3	8.9	1.9
9.15079800780687	9.19717120691733	1.42459782215879	9.40000000000001	9.5	1
8.96794906418141	7.48302619123456	2.04770219723622	9.40000000000001	7.4	2
8.87345261122918	6.59724455341646	2.36969077492828	8.5	6.5	2.8
9.8603864905259	5.10768671993206	1.66466513230013	9.8	5	1.1
9.8603864905259	5.10768671993206	1.66466513230013	10.3	5.4	1.9
9.97222717687065	2.81105123827362	1.96688061819491	10.4	2.5	2.2
9.97222717687065	2.81105123827362	1.96688061819491	9.5	2.8	2.3
10.7106485605207	1.39897716708043	1.19154492573044	10.7	0.9	0.9
12.0144762617514	3.59805835512847	2.55683650280409	12.5	3.4	2.8
11.9142569907561	4.80240507292313	2.81017512718273	11.5	4.7	3.2
11.8487237979808	6.1704317810889	3.05094965899548	11.7	6.5	2.6
12.039535550057	6.6893771520001	3.9686002262326	12.5	6.8	4.3
11.1180127439039	6.8842178712937	3.99168575334635	10.7	6.5	4.1
10.7903014614717	9.04831505235662	3.56586835755221	10.3	9.2	3.3
11.3426360035318	9.66890620139839	3.77009924450352	11.5	9.5	4.3
12.159379354001	10.9133817017065	3.62614962281572	12.6	10.9	4
12.1896397903948	11.6324238576935	3.17709742566804	11.7	11.5	2.9
12.5254981739177	15.0196541334144	1.20535831975925	12.7	14.8	0.7
12.5311549268274	16.9919441424382	0.669789409299704	12.5	16.9	0.1
12.5665109423634	19.5071723257805	0.529499365112618	12.5	19.5	0.7
12.6753447061496	27.2463923558557	0.0978145590427899	12.7	27.3	0.2
Route: 3 Length: 81.5105415923928 Demand Met: 1954					
7.01726561034565	28.3186706535222	0.241868414738906	6.7	28.8	0.2
7.01726561034565	28.3186706535222	0.241868414738906	7.3	28.6	0.6
5.94558736683743	26.5074119164777	0.466882552305513	5.40000000000001	26.6	0.3
6.05984595395863	25.1292694660056	0.878700708208089	6.5	24.8	0.7
4.83142944232183	24.4915126143047	1.9292031006946	4.7	24.8	2.4
3.90997863615536	22.9123709578258	1.66995402035353	4.3	22.7	1.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
1.1559929496751	19.1510545624214	1.41705068035944	1.59999999999999	18.8	1.3
0.840084349899001	18.794097993109	1.4003220611457	0.299999999999997	19	1.4
0.830877024959065	16.463967598614	1.31946093625191	0.299999999999997	16.4	1.1
1.74387355630199	12.6099990678355	1.56573840076978	1.7	12.5	1
2.54747124520233	9.57320367669961	2.44930020284414	2.5	9.4	1.9
3.03628632909755	7.72933574187015	2.99149024973064	2.7	7.3	2.8
4.67981539403513	7.1981806133428	4.20846308026216	4.7	6.8	4
7.02502946400911	6.44025893870276	5.94501021635421	7.40000000000001	6.7	6.3
7.02502946400911	6.44025893870276	5.94501021635421	6.59999999999999	6.8	6.1
8.43456217257199	4.98896302287019	6.26110679842542	8.8	4.9	6.7
8.08555451330589	3.79874042067265	4.25768148660145	8.5	3.4	4.2
7.41495413540524	3.74028401640746	3.40483078367346	7.40000000000001	3.2	3.2
7.1100161420102	4.04049535395396	3.1296829526922	7.5	4.4	2.9
5.92711315426438	4.56114112770683	2.56605955334194	5.40000000000001	4.6	2.8
6.27625030722666	4.88535440464644	1.53219020028372	6.40000000000001	5.4	1.3
6.30176302904135	3.15626325460938	0.867910582629058	6.40000000000001	3.2	0.3
6.19583900199896	1.90686880652276	1.1232840720566	6.59999999999999	1.6	1.4
4.96412338750558	1.35432176411797	0.646816817639674	4.7	1.1	0.2
4.96412338750558	1.35432176411797	0.646816817639674	5.40000000000001	1.2	0.3
3.52823205829674	1.5018231580452	1.60480275747438	3.40000000000001	1.1	2
2.25389520463348	3.15158263521664	1.32175105867398	2.59999999999999	3.4	1.3
0.85428663780327	4.96350467483583	1.01087636027538	0.299999999999997	4.8	1
1.14531145626863	8.24293039977629	0.609773096600042	0.599999999999994	8.4	0.5
2.68856742705159	11.0460009003828	0.47655530921796	2.40000000000001	11.2	0.3
3.92896316198812	13.2989658382856	0.369483920045699	4.40000000000001	13.1	0.1
5.77579958952785	19.131982731808	0.747890665752371	5.40000000000001	19.4	0.4
7.38344270687455	21.2637212066054	1.62575918349093	7.40000000000001	21.2	2.2
Route: 4 Length: 48.52510602911 Demand Met: 1966					
11.779094289279	26.6741828853694	4.25258777884465	11.6	27.1	4.6
11.5417906000902	22.4071317598331	7.3518802436205	11.7	22.5	7.9
11.1517012452692	21.0565137397967	7.06612947273171	11.5	20.6	7
10.4264131931054	21.063965436575	7.02152767617679	10.4	21.5	7.4
8.43430045810561	21.0447595616938	6.86437918527104	8.40000000000001	21.2	7.3
6.55967181667384	21.0266336771783	6.71640470615281	6.40000000000001	21.3	7.2
5.38684025682059	20.7564358076171	6.15663075587894	5.3	21.1	5.7
4.7766255378743	20.276408375855	6.2530389833772	4.3	20.6	6.3
4.38408730785028	18.877552793248	6.35927931876644	4.40000000000001	18.9	6.5
3.91312926700455	17.199199715316	6.48674207719004	4.40000000000001	16.9	6.4
3.76017387818152	17.0493245258397	6.51939850120994	3.5	17.5	6.6
2.99743289192556	16.301903667513	6.68226917741236	2.5	16.5	6.9
3.02898980301506	15.2464819564765	6.49870351908741	3.5	15.1	6.8
2.63814233340933	13.9608512861865	5.97467723540931	2.7	13.4	6.1
2.16202558949739	14.5969143058268	5.21288626135341	1.59999999999999	14.7	5.3
2.68852707549173	15.1857033589288	4.0876235237811	2.40000000000001	15.3	3.6
4.3080365640164	15.5165183572378	4.36740110333673	4.5	15.4	4.9
6.56372230828141	16.757940432598	2.25273429459241	6.40000000000001	16.8	1.7
7.47716131379326	17.0608824748604	2.46339991400046	7.59999999999999	17.1	1.9
9.07021957448683	17.5893109189814	2.86304394829592	9.5	17.4	3.2
9.07021957448683	17.5893109189814	2.86304394829592	8.7	17.3	3.1
8.94527339408386	18.2409935030324	2.35311508828125	9.3	18.5	2.6
8.79663131942289	19.0164167656033	1.74638801831095	8.5	18.8	1.3
9.23584012955061	22.7837124707985	0.913578612414322	8.7	23	0.9
10.8778976161982	24.8958564814388	0.361509020019822	11.3	24.6	0.1
Route: 5 Length: 70.6552462395209 Demand Met: 1996					
9.90284328615756	26.7063155704075	1.12966108007365	9.5	27.1	1
7.47681580168734	24.405390434201	2.23521158906205	7.3	24.7	2.7
6.45235623691121	23.0836731577182	2.41110113951359	6.7	22.9	2.9
5.77111260731517	22.3403340721046	2.38486200704304	5.5	22.5	1.9
3.56840476413433	19.0823469362896	3.19001935387529	3.7	18.6	2.9
2.69113334931681	19.014991667315	3.95035590736334	2.5	19.5	4.2
1.8410235805635	17.3153255166047	4.41253619702377	1.59999999999999	17.2	3.9
0.950518980369807	15.0122686656348	5.81411550639167	0.700000000000003	15.2	6.3
0.804859252104308	12.7557051787384	5.83760064152088	0.599999999999994	12.7	5.3
0.823096720906108	11.3956407919771	6.13527528630082	0.700000000000003	11.4	6.7
1.00163800989681	9.60622805478149	5.81649241479398	1.3	9.5	6.3
1.02212062928882	7.75767941316294	5.20083217320144	0.599999999999994	7.5	5.5
1.22518170281032	7.36864876406226	4.89123123685216	1.5	7.5	4.4
0.934132700814715	4.652979204895	5.69479133574485	1.5	4.6	5.8
0.680294677740449	3.3031157206118	6.07711785259536	0.299999999999997	3.2	6.5
1.88396810292097	1.26041307814952	4.92363098388992	2.3	0.9	5.1
1.42970224920352	1.3225495159421	4.17946985815303	1.7	1.2	4.1
0.688281757789497	1.42398521339574	2.96490270191915	0.299999999999997	1.2	2.6
1.89006953497562	2.81972600464817	3.40681006677019	1.5	3.2	3.6
2.91487535429177	3.52263204300681	3.58680915575765	3.3	3.4	4
3.09142027257298	4.74513749269242	2.63376340115324	2.59999999999999	5	2.8
3.35616464355935	5.54337203826738	1.90820489832657	3.59999999999999	5.4	1.9
3.87969056110796	7.121866376977	0.473421586409073	3.59999999999999	7.3	0
5.15762701999635	7.60320466116608	1.06419118654374	5.40000000000001	7.2	1.4
5.74820319750468	8.49342683800212	1.03508887085681	6.3	8.6	0.9
5.25075897783755	8.87314705767128	1.22777177516992	4.7	8.7	1.2

Solution x	Solution y	Solution z	Original x	Original y	Original z
5.40983893492603	9.42045430456988	1.43813326522679	5.3	9.5	2
5.94721151313539	10.4328761878904	0.857191877066887	5.59999999999999	10.5	0.4
6.85863812023266	11.4637042348123	0.664094419128608	7.3	11.2	0.4
7.95341067629754	14.8013609757841	0.901706942825414	7.5	15.1	1.1
8.98684725391961	15.745952775114	0.736620414062526	9.3	15.6	1.2
8.98684725391961	15.745952775114	0.736620414062526	8.7	15.4	1.1
10.1461953672264	17.0457720301333	0.260277859985987	10.6	16.8	0
10.4656683928685	19.2315087969223	0.30784529461879	10.6	19.2	0.8
10.9719624325605	22.6952344804981	0.383202338991641	10.5	22.8	0.7
Route: 6 Length: 77.586935581748 Demand Met: 1995					
12.6164544675342	25.0916306916121	2.64119537322996	12.5	25.3	2.9
12.5684358765459	22.8462314203226	4.15858171211996	12.7	23	4.7
11.4300248248725	15.5553252814564	4.14272937036971	11.7	15.3	3.7
10.8897234319278	14.8315879394509	4.75096221184327	10.4	15.1	4.9
10.7461617521257	12.7667415904171	5.72744528582452	10.3	12.6	5.4
10.8168847824626	11.2654138093921	6.6011301080886	10.4	11.3	7
11.813890367345	9.16034473876593	6.92021466843986	12.3	9.3	7.2
12.1431113319258	4.93708939741539	6.64971857794533	12.7	4.9	6.8
11.837539503727	3.03747816504563	6.40304201599469	11.3	3.1	6.2
11.8389425100617	1.65920591414849	6.3101071265525	12.3	1.5	6
11.8389425100617	1.65920591414849	6.3101071265525	11.5	1.4	6.7
9.10394565192065	0.80383310698369	7.40358931405244	9.40000000000001	0.8	7.9
9.10394565192065	0.80383310698369	7.40358931405244	8.59999999999999	0.6	7.6
7.43940388120888	0.961745077444599	5.11176539199256	7.5	0.7	4.6
5.38048188147535	2.75249908778209	5.98633562340922	5.3	2.5	6.5
4.67538874049343	3.47766871757752	6.11946694140413	4.2	3.4	5.8
4.61175757575936	5.11299556117944	7.26531987219236	4.8	5	7.8
3.7597590468728	8.18069852427509	6.96856633657907	3.7	8.4	7.5
3.11168919150832	10.5002277834635	4.87599390444965	3.59999999999999	10.8	4.8
2.06687911336661	11.1374936911621	4.00643663174157	1.5	11.1	3.9
3.51413914120319	12.0864250344764	3.46481563442388	3.5	12.6	3.2
4.23661044397892	11.6394033164595	3.67012517284937	4.3	11.2	3.3
5.99609924761788	11.6134608971696	5.20079615891588	6.40000000000001	11.2	5.2
6.00564877199531	12.5628984661422	6.0299916003879	6.3	12.4	6.5
5.80489963638851	13.141891967705	6.10836960881834	5.40000000000001	13.2	5.7
5.80568358864215	14.7676900000456	6.93899835910943	5.5	14.6	7.4
5.90317431199216	15.6048706840682	7.19303995129621	6.3	15.5	7.6
5.84219446649085	17.2951254417974	7.42937465137534	5.3	17.4	7.6
6.62853825961891	18.8967415072038	7.40876987334222	6.59999999999999	19.2	7.9
7.35281708849554	19.5498997746113	6.2741371340533	7.7	19.2	6.3
9.23010147012086	21.2427792197912	3.33327163742344	9.40000000000001	20.9	2.9
9.71397469500806	23.3968568990171	3.15415209795278	9.5	23.5	3.6
9.92380634493782	24.3309704187667	3.07647030405242	9.40000000000001	24.5	2.9
10.4142668459088	25.3911042710601	3.06125436359721	10.4	25.6	3.6
10.8430852993544	26.0681737963997	2.48696355663585	10.6	26.4	2.7

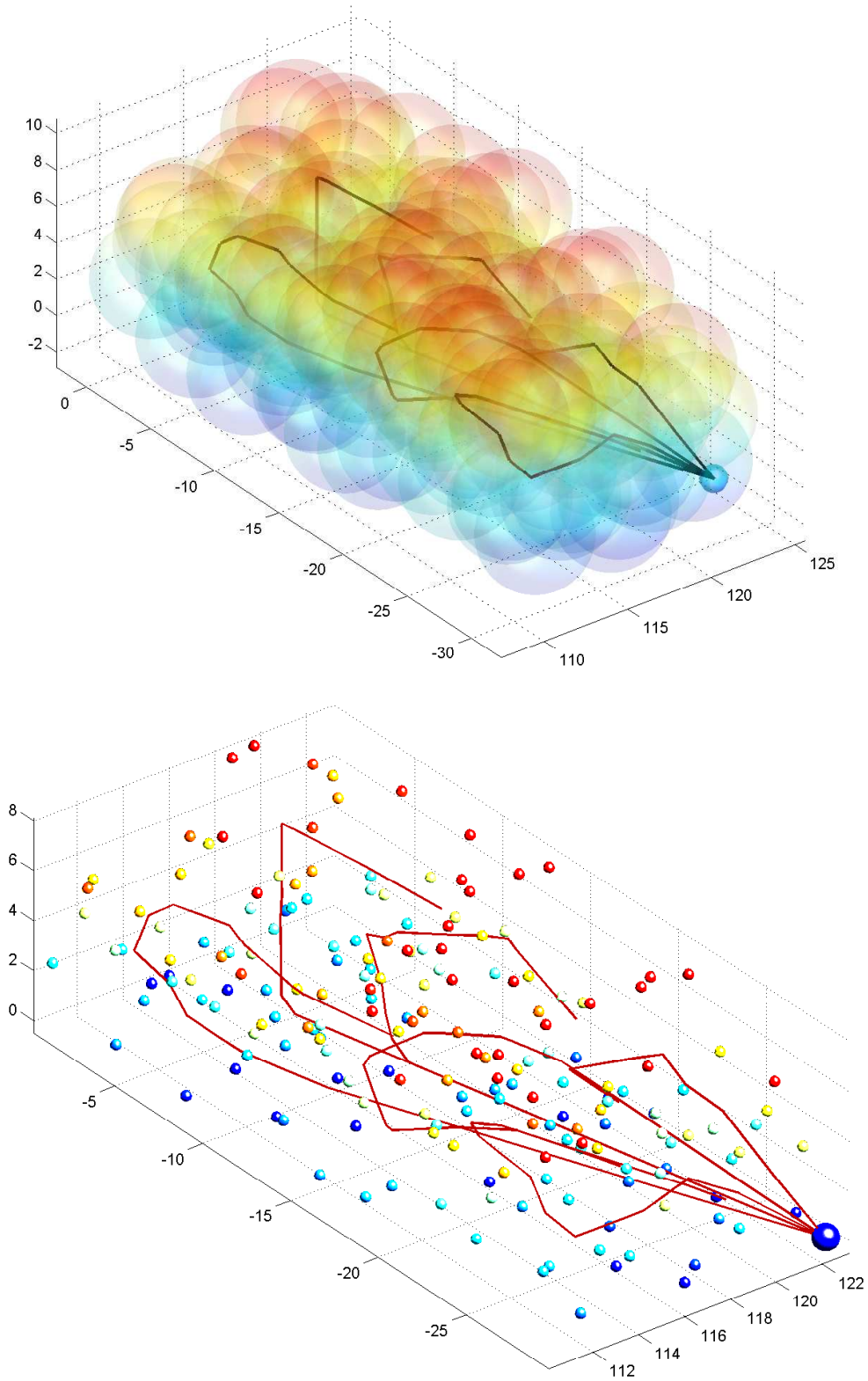


Figure O.74: $rat195$, $r = 2.89$, Equal Radius, 3D, Euclidean, Length = 267.6733710

Table O-77: Solution for $rat195$, $r = 2.89$, Equal Radius, 3D, Euclidean

Total distance: 267.673370968309 Total demand met: 11712 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 32.6402768958148 Demand Met: 1998					
10.5081491115936	26.9555155671499	1.61785393990858	12.5	25.3	2.9
9.68109294590775	26.4644137585315	2.00870897419402	10.4	25.6	3.6
8.98041666535583	26.0483577282976	2.33983869235702	9.5	23.5	3.6
8.61397693365252	26.1633806966488	2.33771421842563	9.40000000000001	24.5	2.9
8.17947929303131	26.299766127643	2.335195657811	8.7	26.4	4.3
8.17947929303131	26.299766127643	2.335195657811	8.7	24.9	3.7
7.5741675057279	26.4897679970287	2.3316872459537	7.40000000000001	26.5	3.3
7.5741675057279	26.4897679970287	2.3316872459537	7.3	24.7	2.7
6.90764814034611	26.6989836073929	2.32782430442642	7.3	28.6	0.6
6.36158630040411	26.8703884248554	2.32465895999008	6.7	28.8	0.2
6.07411412558567	26.9223076302836	2.36301682836674	6.5	24.8	0.7
5.32721502821991	27.0572092326106	2.46267585426817	5.40000000000001	26.6	0.3
4.46813598061702	27.2123716600607	2.57730335272105	5.3	29.5	4.1
4.46813598061702	27.2123716600607	2.57730335272105	4.5	26.7	5.4
3.9911545303007	27.298520947929	2.640951430048	4.3	28.8	2.1
3.51356466365758	27.3847803049919	2.70468288816996	2.40000000000001	26.7	1.4
3.51356466365758	27.3847803049919	2.70468288816996	1.59999999999999	27.4	1.8
3.22073266474277	27.4376706109668	2.74376360007368	3.3	28.4	2.5
2.93532032814589	27.4892208262437	2.78185496257613	1.7	29.4	1
2.10626882361761	26.8927951073506	3.75327984053643	0.599999999999994	24.9	2.3
1.74236435127159	26.8080541256539	4.80632149157865	3.7	26.6	6.4
1.56815125313008	26.7674815188841	5.31042967824175	2.3	28.7	7.3
1.56044530041518	26.765686353413	5.33272647049259	0.700000000000003	28.7	7.3
1.628311043897	25.9573759180319	5.3376245162252	0.5	26.6	5.8
1.71627302109047	24.9096469122538	5.34397079943833	2.59999999999999	25.5	6.5
1.83898128759756	23.4478535461978	5.35281847463232	0.599999999999994	22.9	2.8
1.89409066709922	23.2014054974344	5.42277879348358	1.5	24.6	3.5
1.89409066709922	23.2014054974344	5.42277879348358	1.3	22.7	4.8
1.97632608597326	22.8336535233342	5.52717465384924	0.5	20.7	6.8
2.15514590265039	22.8528355256762	5.45919484151339	1.5	21.3	4.6
2.35177257804682	22.8739278798821	5.38444595821724	3.3	21.4	7.2
2.35177257804682	22.8739278798821	5.38444595821724	2.40000000000001	20.9	6.2
2.58573419055645	22.8990262899186	5.29550445232622	3.40000000000001	22.5	7.6
2.83930199307231	22.9262287846497	5.19910915778062	3.3	24.6	6.9
2.83930199307231	22.9262287846497	5.19910915778062	2.59999999999999	23.5	7.4
3.17867471318755	22.9626375188097	5.07009192777139	4.3	20.6	6.3
4.84475804161613	23.5856509896245	4.14037361909438	5.8	25.2	5.8
5.75953093066477	23.9277189082678	3.62989285038367	4.7	24.8	2.4
6.84171181688933	24.3323771155306	3.02599821654233	6.7	22.9	2.9
8.2735476311756	24.8677868140187	2.22699001742891	8.7	23	0.9
9.30543800758785	25.2536503704906	1.65116871077241	10.5	22.8	0.7
10.3344042763797	26.3892411481089	1.15065569133893	11.3	24.6	0.1
Route: 2 Length: 37.528756149511 Demand Met: 1986					
9.01257438385142	22.4991296936904	3.63816185824313	7.5	23.4	5.3
8.00606965834872	20.7240828876438	4.631053202696	8.40000000000001	21.2	7.3
7.77861822835291	20.3230711897675	4.85540472023639	6.40000000000001	21.3	7.2
7.54282551064536	18.8281396080569	4.77543324024265	9.5	17.4	3.2
7.51257394275324	18.8034811043921	4.79224203987564	9.3	18.5	2.6
7.34313359702924	18.6654860682786	4.88633380717772	8.7	17.3	3.1
7.07325021793858	18.4457572983777	5.03617745650547	7.7	19.2	6.3
6.80136639948533	18.224406129411	5.18710970786205	6.59999999999999	19.2	7.9
5.93543668975123	17.2935209955638	5.1523363192567	5.3	17.4	7.6
5.31220708230811	16.6235453896209	5.12734678871094	6.3	15.5	7.6
5.25313427218759	16.5636418326606	5.12100596587223	4.40000000000001	18.9	6.5
5.25313427218759	16.5636418326606	5.12100596587223	3.5	17.5	6.6
5.08586804451571	16.3940045867426	5.10299298419996	4.40000000000001	16.9	6.4
4.92844545865886	16.2343448740842	5.08605386904407	5.5	14.6	7.4
4.42784294350869	15.9258771270736	4.82943926244814	4.5	15.4	4.9
3.94920464122868	15.6309516797269	4.58407868968377	3.5	15.1	6.8
3.37063746679615	15.2744516502801	4.28750984831401	3.5	12.6	3.2
3.25439236602509	15.3523963324547	4.2905961662999	2.7	13.4	6.1
3.25439236602509	15.3523963324547	4.2905961662999	1.59999999999999	14.7	5.3
2.84655046751722	15.6259368511846	4.30134415270662	2.5	16.5	6.9
2.72853655211787	15.7050603383831	4.30449054948831	0.700000000000003	15.2	6.3
2.58351025476148	16.5387960747806	3.54201339608069	1.59999999999999	17.2	3.9
2.58351025476148	16.5387960747806	3.54201339608069	2.40000000000001	15.3	3.6
2.43961258011802	17.36591251345	2.78557823275811	0.299999999999997	16.4	1.1
2.50818013795408	17.6338535754525	2.66873541520694	0.299999999999997	19	1.4
2.91768870701735	17.8688356837451	2.6582470163808	1.59999999999999	18.8	1.3
3.41159121324635	18.1522828415863	2.64561963582515	2.5	19.5	4.2
3.95195454930777	18.4623741967539	2.63178325215395	3.7	18.6	2.9
4.50518427941164	18.7798403771823	2.61761062370473	6.40000000000001	16.8	1.7
4.97938737105385	19.47446604216	2.72514433005328	5.40000000000001	19.4	0.4
5.71777991172269	20.5560157469682	2.89257308576511	5.3	21.1	5.7

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.40731140439939	21.3899756668943	2.60685539507328	4.3	22.7	1.3
7.09136640938871	22.2172977146656	2.32340487003547	5.5	22.5	1.9
8.04842443542852	23.3747601480773	1.92690039231952	7.40000000000001	21.2	2.2
Route: 3 Length: 60.7664704675985 Demand Met: 1988					
4.40272520852947	11.4796961199037	0.920263952137483	1.7	12.5	1
4.40272520852947	11.4796961199037	0.920263952137483	2.40000000000001	11.2	0.3
3.82378404883001	9.44490494611892	1.01114468351643	2.5	9.4	1.9
3.39074900450151	7.9219692796779	1.07906012199595	0.599999999999994	8.4	0.5
3.28036078505745	6.66346113496691	1.1823538712235	2.7	7.3	2.8
3.14962240447632	5.17273205107529	1.30467853005474	0.299999999999997	4.8	1
3.44220109192017	4.30727847142111	1.41957566250821	2.59999999999999	5	2.8
3.44220109192017	4.30727847142111	1.41957566250821	2.59999999999999	3.4	1.3
3.79957623338792	3.25022083385719	1.55991387353936	6.40000000000001	3.2	0.3
3.79957623338792	3.25022083385719	1.55991387353936	3.40000000000001	1.1	2
3.79957615896498	3.2502092689036	1.55991802252382	5.40000000000001	1.2	0.3
3.6720209482332	3.22083116633145	1.71688020987309	4.7	1.1	0.2
2.73907267528946	3.00609177518154	2.86531146480518	1.5	3.2	3.6
2.73907267528946	3.00609177518154	2.86531146480518	1.7	1.2	4.1
2.53392850514081	2.95885536075849	3.11778279130307	0.299999999999997	1.2	2.6
2.5731978550839	3.30186083662089	3.94664371433404	2.3	0.9	5.1
2.59745647264972	3.51373556111609	4.45875642245679	1.5	4.6	5.8
2.59745647264972	3.51373556111609	4.45875642245679	3.3	3.4	4
2.61530146058013	3.66957990670713	4.83537323766864	0.299999999999997	3.2	6.5
3.30158918925336	4.1544248506178	5.22668083012919	5.3	2.5	6.5
3.5252739749191	5.31396033554053	5.31129747017185	4.8	5	7.8
3.5252739749191	5.31396033554053	5.31129747017185	4.2	3.4	5.8
3.79445585835313	6.7066721891034	5.41274470951573	3.7	8.4	7.5
3.79445585835313	6.7066721891034	5.41274470951573	6.59999999999999	6.8	6.1
3.59279163938586	7.45048022221954	5.38265561500839	1.5	7.5	4.4
3.44138207939896	8.00899033355767	5.36006500306203	0.599999999999994	7.5	5.5
3.31701824332819	9.33045122520796	5.29727034923364	1.3	9.5	6.3
3.21907008897429	10.3715436083036	5.24778266895951	3.59999999999999	10.8	4.8
3.21907008897429	10.3715436083036	5.24778266895951	1.5	11.1	3.9
3.15503464562778	11.0522496532385	5.21541893062659	0.700000000000003	11.4	6.7
3.2828104838528	11.6497035397075	5.07303703935303	0.599999999999994	12.7	5.3
4.88068872306263	14.5934377300063	4.21295048112797	5.40000000000001	13.2	5.7
Route: 4 Length: 59.0124472994956 Demand Met: 1999					
6.74312098221122	9.27240928783918	1.22497363254326	6.3	8.6	0.9
6.74312098221122	9.27240928783918	1.22497363254326	4.7	8.7	1.2
6.15747220781137	7.33270774148027	1.34550149273982	3.59999999999999	7.3	0
6.22553120598225	6.84887932077189	1.48882144493538	5.40000000000001	7.2	1.4
6.22553120598225	6.84887932077189	1.48882144493538	6.40000000000001	5.4	1.3
6.28260423090194	6.44314427188111	1.60900239712689	4.7	6.8	4
6.28260423090194	6.44314427188111	1.60900239712689	5.40000000000001	4.6	2.8
6.28424016829254	6.43162332147903	1.61239542314347	3.59999999999999	5.4	1.9
7.40608730877371	4.93975473792446	2.05764658180234	7.5	4.4	2.9
8.13596698580427	3.96918434500464	2.34736832982028	9.8	5	1.1
8.13596698580427	3.96918434500464	2.34736832982028	9.5	2.8	2.3
8.51237753188776	3.46867488306308	2.49679394570204	6.59999999999999	1.6	1.4
9.28790294582095	2.54306456610948	2.81270217348183	10.7	0.9	0.9
9.32563075249595	2.48993249426349	3.30318193386752	7.40000000000001	3.2	3.2
9.32563075249595	2.48993249426349	3.30318193386752	10.4	2.5	2.2
9.37818653046439	2.41592752917927	3.98644663424821	8.5	3.4	4.2
9.43038019249072	2.34243254347075	4.66501238315328	7.5	0.7	4.6
9.48757009791689	2.26190725286835	5.40856271171057	9.40000000000001	0.8	7.9
9.4875702301581	2.2619072222762	5.40856379830906	8.59999999999999	0.6	7.6
9.6314986805067	2.48271022727896	5.34032583786114	11.5	1.4	6.7
9.77497556143166	2.70283368601466	5.27230048120603	12.3	1.5	6
10.5715548522675	4.33146888450941	4.74050706483047	12.5	3.4	2.8
10.7039686036503	5.12722055609004	4.72242246851593	12.7	4.9	6.8
10.7039686036503	5.12722055609004	4.72242246851593	11.3	3.1	6.2
10.7278013439064	5.29892263889032	4.71361155570274	11.5	4.7	3.2
10.7545157246103	5.49152707886404	4.70373964389979	8.8	4.9	6.7
11.2475023616916	9.04119735397076	4.52093728950205	12.3	9.3	7.2
Route: 5 Length: 47.9300661197 Demand Met: 1999					
7.82320688663484	16.4182686862438	1.57498627125733	7.59999999999999	17.1	1.9
7.82320688663484	16.4182686862438	1.57498627125733	7.5	15.1	1.1
6.66484740683302	13.4297185726933	1.94904781508705	7.3	11.2	0.4
6.59722513818312	13.2552578422256	1.97088242551983	4.40000000000001	13.1	0.1
6.61653963837598	12.2620841266553	2.45275687353279	5.59999999999999	10.5	0.4
6.78600691418754	11.684803506175	3.1706905488597	5.3	9.5	2
6.8887329867579	11.4660742604961	3.51310190803937	7.7	12.7	4.4
6.8887329867579	11.4660742604961	3.51310190803937	4.3	11.2	3.3
7.03356777245258	11.1576775995741	3.99587950493931	9.8	10.8	3.4
7.03356777245258	11.1576775995741	3.99587950493931	6.3	12.4	6.5
7.03356777245258	11.1576775995741	3.99587950493931	8.59999999999999	10.7	4.5
7.03356777245258	11.1576775995741	3.99587950493931	6.40000000000001	11.2	5.2
7.03356777245258	11.1576775995741	3.99587950493931	7.7	9.3	3.2
8.42909206218388	8.46978167797368	4.26015984720381	7.40000000000001	6.7	6.3
9.67896374023006	7.90948426523509	3.39677760013776	9.40000000000001	9.5	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.67896374023006	7.90948426523509	3.39677760013776	8.3	8.9	1.9
9.71537372224655	7.8850273475845	3.3860025821932	9.40000000000001	7.4	2
9.75093584211946	7.86114051549009	3.37548084866734	8.5	6.5	2.8
9.7860943272656	7.83752851677487	3.36508045875286	10.3	5.4	1.9
9.87216904089439	7.94322178679024	3.4421536714488	11.7	6.5	2.6
9.96452526524028	8.05663367378384	3.52485303092275	10.7	6.5	4.1
10.0472804065835	8.15823267515313	3.59894555295949	12.5	6.8	4.3
10.1793799588853	9.46515370180562	4.10887892372694	11.5	9.5	4.3
10.1793799588853	9.46515370180562	4.10887892372694	10.3	9.2	3.3
10.3344221833701	10.9989017236283	4.70730534853353	10.3	12.6	5.4
10.3344221833701	10.9989017236283	4.70730534853353	12.6	10.9	4
10.4196641404276	11.8423958467599	5.03641971139366	10.4	11.3	7
10.4970468335825	12.6081313744579	5.33519128387572	8.2	13.4	6.9
10.70036433551	12.8205115137002	5.32198364521549	9.59999999999999	12.8	7.5
11.0078290756211	13.1416726280634	5.30200803859426	12.6	13.4	7.7
11.0078290756211	13.1416726280634	5.30200803859426	11.6	13	7.6
11.1307360901944	13.471948143465	4.93456683233272	11.7	11.5	2.9
11.4663747040979	14.8407875436978	3.97522955902119	10.4	15.1	4.9
11.7598318458741	16.037621022067	3.13649016755003	12.7	14.8	0.7
Route: 6 Length: 29.7953540361889 Demand Met: 1742					
11.2091304377081	28.029854908019	2.56562662741009	12.7	27.3	0.2
11.2091304377081	28.029854908019	2.56562662741009	9.5	27.1	1
11.2091304377081	28.029854908019	2.56562662741009	10.6	26.4	2.7
11.2091304377081	28.029854908019	2.56562662741009	8.7	29.3	1.9
11.2091304377081	28.029854908019	2.56562662741009	11.4	29.4	4.3
11.2091304377081	28.029854908019	2.56562662741009	11.6	27.1	4.6
11.2091304377081	28.029854908019	2.56562662741009	9.40000000000001	28.4	4.3
9.74468606666206	26.9985713444675	5.22738763280817	10.4	29.1	7.1
8.88167451983688	26.0322760682491	6.1261464308558	6.7	26.7	7.9
10.207703713186	22.9790702459417	5.47190275113226	11.7	22.5	7.9
10.207703713186	22.9790702459417	5.47190275113226	10.4	21.5	7.4
10.6730713075825	20.9879326359364	4.25813910327507	12.7	23	4.7
10.6730713075825	20.9879326359364	4.25813910327507	12.7	20.9	2.2
10.6730713075825	20.9879326359364	4.25813910327507	9.40000000000001	20.9	2.9
10.6730713075825	20.9879326359364	4.25813910327507	11.5	20.6	7
10.3911415088437	17.436479003279	2.25970146733317	11.4	16.9	4.3
10.3911415088437	17.436479003279	2.25970146733317	8.7	15.4	1.1
10.3911415088437	17.436479003279	2.25970146733317	11.7	15.3	3.7
10.474045441862	17.6302870218219	2.1766514473468	10.6	16.8	0
10.474045441862	17.6302870218219	2.1766514473468	9.3	15.6	1.2
10.6433086475958	18.025974272613	2.00708905124948	12.5	16.9	0.1
10.7552406017043	18.6232335949859	1.89785185358881	12.5	19.5	0.7
10.7552406017043	18.6232335949859	1.89785185358881	11.3	19.3	1.9
10.8385039387958	19.0675420948843	1.81658828142746	10.6	19.2	0.8
10.9263946292945	19.5365531362701	1.73080816674868	8.5	18.8	1.3

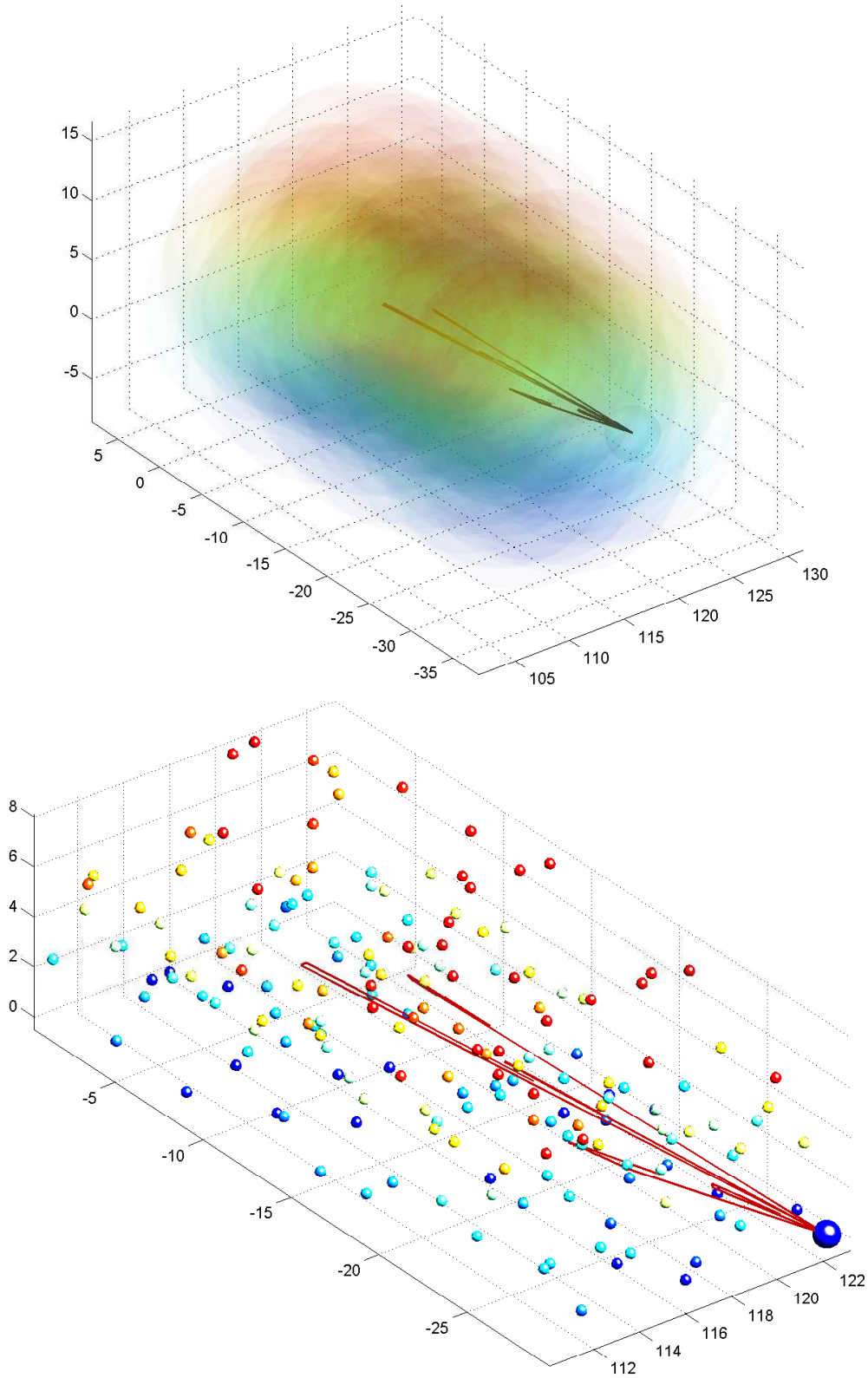


Figure O.75: $rat195$, $r = 8.67$, Equal Radius, 3D, Euclidean, Length = 144.6288277

Table O-78: Solution for $rat195$, $r = 8.67$, Equal Radius, 3D, Euclidean

Total distance: 144.628827724444 Total demand met: 11712 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 21.2582324592827 Demand Met: 1998					
9.49425872801385	26.8025804792216	1.60429285122367	5.40000000000001	26.6	0.3
7.21539053250009	25.240495970853	2.74473724286344	0.700000000000003	28.7	7.3
7.25004539877499	24.8510598459559	2.65989811807316	0.5	26.6	5.8
7.28598397823632	24.4468790463584	2.57187779413772	0.599999999999994	24.9	2.3
7.33444526135082	23.9020925680166	2.45321961636495	0.599999999999994	22.9	2.8
7.35043855460354	23.722454171137	2.41407685825809	1.3	22.7	4.8
7.37670294088626	23.4273942823679	2.34978903734915	1.5	21.3	4.6
7.40742201876439	23.0822292048194	2.2745894975946	0.5	20.7	6.8
7.42333694037757	22.9034069036389	2.23563014331335	2.40000000000001	20.9	6.2
7.43924805570651	22.7246276558004	2.19668014008934	2.59999999999999	23.5	7.4
7.45578239624349	22.5388417282913	2.15620400284881	3.40000000000001	22.5	7.6
7.47266343509018	22.3491546792734	2.11487846264576	3.3	21.4	7.2
7.48971176524843	22.1575826355069	2.07314271963909	4.3	20.6	6.3
7.50666888178975	21.9670319934293	2.03162977806908	4.40000000000001	18.9	6.5
7.52325756328113	21.7806186776162	1.99101835195495	6.59999999999999	19.2	7.9
7.53945912546447	21.5985555350966	1.95135452154544	6.3	15.5	7.6
7.55097787331226	21.4691201643761	1.92315539666206	4.40000000000001	16.9	6.4
7.56186523386931	21.3467804470666	1.89650200108771	3.5	17.5	6.6
7.57227264377954	21.2298344861337	1.87102363095147	2.5	16.5	6.9
7.57855703270721	21.1592133856711	1.85563790323261	4.5	15.4	4.9
7.58457391088589	21.0915994683298	1.84090730012984	2.40000000000001	15.3	3.6
7.59011862166761	21.0292936613787	1.82733306009974	0.299999999999997	16.4	1.1
7.59066895862706	21.0230902965647	1.82598109058135	1.59999999999999	17.2	3.9
7.59122546278604	21.0168198902627	1.82461455394515	3.7	18.6	2.9
7.59179540307767	21.0103998948723	1.82321547927306	6.40000000000001	16.8	1.7
7.59238714409844	21.0037352093176	1.82176317390479	7.59999999999999	17.1	1.9
7.59301775456487	20.9966328478476	1.82021567799392	9.3	15.6	1.2
7.59368055249973	20.9891667459812	1.8185891670758	8.7	15.4	1.1
7.5943386457119	20.9817526405778	1.81697416114209	7.5	15.1	1.1
7.594922998315	20.9751692387657	1.81554007174899	4.40000000000001	13.1	0.1
7.59492301381525	20.9751692468966	1.81554005414056	7.7	12.7	4.4
7.724366460027	21.1786429274501	1.76950554632431	10.4	15.1	4.9
7.87048115790355	21.4083200732988	1.71754216957784	11.4	16.9	4.3
8.03433546705628	21.6658840429065	1.65926978286945	11.7	15.3	3.7
8.22288114436586	21.9622614700566	1.59221534382955	12.7	14.8	0.7
9.3442965712473	23.7250116226116	1.19339049034796	12.5	16.9	0.1
Route: 2 Length: 38.0609547878959 Demand Met: 2000					
11.8015957221512	25.2661964063502	0.726426334443666	10.4	29.1	7.1
9.3376888828666	15.0257255576671	2.71877088141412	3.59999999999999	10.8	4.8
8.83582393577848	12.9399236323168	3.12456011710222	1.5	11.1	3.9
8.55163626869421	11.7588301730993	3.35433773187772	0.700000000000003	11.4	6.7
8.46541241087151	11.4005871840044	3.4240053776024	1.3	9.5	6.3
8.39961887457605	11.1272073283935	3.47716093069646	3.7	8.4	7.5
8.3387473086335	10.8742326489396	3.52636166299216	0.599999999999994	7.5	5.5
8.33874741161164	10.8742323956955	3.52636168979968	1.5	7.5	4.4
8.33874752897367	10.8742321448176	3.52636172852075	2.7	7.3	2.8
8.3387476538342	10.8742318951281	3.52636176082826	2.5	9.4	1.9
8.3387477827559	10.8742316472806	3.52636180330762	0.599999999999994	8.4	0.5
8.34375332899478	10.8705338246998	3.52800259300299	3.59999999999999	7.3	0
8.34876904760117	10.8668285384037	3.52964661204381	5.40000000000001	7.2	1.4
8.3537512134983	10.8631480383158	3.53127968678939	6.3	8.6	0.9
8.35869580606658	10.8594952422411	3.53290036014216	9.40000000000001	7.4	2
8.36358051862462	10.8558866201926	3.53450143443468	8.5	6.5	2.8
8.36845409791592	10.8522861990487	3.53609897997473	9.8	5	1.1
8.37330764081014	10.8487005177044	3.53768998010775	10.3	5.4	1.9
8.37812022744539	10.8451450397196	3.53926764841539	11.7	6.5	2.6
8.38286792720221	10.8416374448524	3.54082409574679	12.5	6.8	4.3
8.38753492580142	10.8381894144472	3.54235418266397	10.7	6.5	4.1
8.39216533136646	10.8347683742765	3.54387231257083	11.5	4.7	3.2
8.39673148095305	10.8313947297462	3.54536942049229	12.5	3.4	2.8
8.40103124804864	10.8282179467646	3.54677917495883	10.4	2.5	2.2
8.4010315793987	10.8282177745743	3.5467792989814	9.5	2.8	2.3
8.40103192045908	10.8282175940523	3.54677939187463	8.5	3.4	4.2
8.40103226556113	10.8282174108255	3.54677954212558	7.40000000000001	3.2	3.2
8.40103261288706	10.8282172271386	3.54677968524174	7.5	4.4	2.9
8.40103295407693	10.8282170509434	3.54677985649148	6.40000000000001	5.4	1.3
8.40103327993731	10.8282168895861	3.54677996139404	3.59999999999999	5.4	1.9
8.40103358995769	10.8282167411942	3.54678004107364	4.7	6.8	4
8.4010338756233	10.8282166110695	3.54678011910183	7.40000000000001	6.7	6.3
8.40103414832092	10.8282164890796	3.54678021565079	8.8	4.9	6.7
8.40103445636058	10.8282163318047	3.5467803409093	11.3	3.1	6.2
8.51836242117149	11.3241249291227	3.44999138404721	12.7	4.9	6.8
9.24275668262003	14.3860389014888	2.85243230861042	12.3	9.3	7.2
Route: 3 Length: 45.6611020223988 Demand Met: 2000					

Solution x	Solution y	Solution z	Original x	Original y	Original z
8.34705834356302	13.9162860262613	2.09687009039532	4.7	8.7	1.2
7.42939332536787	10.736667901819	2.53888800491958	5.40000000000001	4.6	2.8
6.93955811907313	9.03931969507278	2.77484720070692	3.3	3.4	4
6.64421844965153	8.01592990228368	2.91711471463817	1.5	3.2	3.6
6.43972892249161	7.3073639455694	3.01561650125026	0.299999999999997	1.2	2.6
6.44746029214841	7.30948062611823	3.0173790981143	1.7	1.2	4.1
6.45678902616456	7.31203479279785	3.01950581366562	2.3	0.9	5.1
6.46810528500029	7.31513333137843	3.02208554869423	0.299999999999997	3.2	6.5
6.48116821577992	7.31871036644831	3.02506336305117	1.5	4.6	5.8
6.49512714711285	7.3225329004924	3.02824523782132	2.59999999999999	5	2.8
6.50917963211972	7.32638095361144	3.0314483772206	0.299999999999997	4.8	1
6.52342802663925	7.33028237612733	3.03469616226589	2.59999999999999	3.4	1.3
6.53778890362253	7.33421441035553	3.03796967647706	3.40000000000001	1.1	2
6.5523329766026	7.33819650953303	3.04128514248196	4.7	1.1	0.2
6.56698159778705	7.34220720091026	3.04462463155839	5.40000000000001	1.2	0.3
6.58173006866528	7.34624525617681	3.04798717305038	6.40000000000001	3.2	0.3
6.59652467965995	7.35029595149747	3.05136047436399	6.59999999999999	1.6	1.4
6.61143249401636	7.35437777308853	3.05475982486912	10.7	0.9	0.9
6.6260763413286	7.35838807259558	3.05809913969463	12.3	1.5	6
6.63189455717324	7.37911570059319	3.05517036632096	11.5	1.4	6.7
6.6384030247869	7.40230370035079	3.05189398259233	9.40000000000001	0.8	7.9
6.66658379926088	7.5027097038342	3.03770739445201	8.59999999999999	0.6	7.6
6.7657801595347	7.85616286127795	2.98776712148525	7.5	0.7	4.6
6.89550305611526	8.31839463064145	2.92245800552019	5.3	2.5	6.5
7.07845950670821	8.97030822606569	2.83034586277381	4.2	3.4	5.8
7.35331035463012	9.94962571696041	2.69196686665041	4.8	5	7.8
7.93825485333309	12.0338082692828	2.39746396507598	6.59999999999999	6.8	6.1
9.27493751026549	16.796487468309	1.72443408473267	5.3	17.4	7.6
Route: 4 Length: 1.84309081295969 Demand Met: 1715					
12.6115685792519	28.7717337636937	0.0388912493768796	12.7	27.3	0.2
12.5262235283406	28.5513373074702	0.0764357396809867	11.3	24.6	0.1
12.4424039804053	28.3347600311426	0.113322492116406	10.5	22.8	0.7
12.3714514156015	28.1512358085996	0.144569686791863	12.5	19.5	0.7
12.371451285303	28.1512358239026	0.144569662096208	12.7	20.9	2.2
12.3714511466527	28.1512358795378	0.144569660254026	9.40000000000001	20.9	2.9
12.3714510099426	28.1512359622438	0.144569778723939	8.7	23	0.9
12.3714508777525	28.1512360633685	0.144569823317839	6.5	24.8	0.7
12.3714507554255	28.1512361687693	0.144569777203909	4.7	24.8	2.4
12.3793667515525	28.1716796073805	0.141087707006159	7.3	24.7	2.7
12.3873670196978	28.1923391678286	0.137569157592802	6.7	22.9	2.9
12.3957126287352	28.2138899806654	0.13389856061176	7.5	23.4	5.3
12.4093872818255	28.249208510092	0.127886445526446	9.5	23.5	3.6
12.423074290277	28.2845622683131	0.121868219789199	9.40000000000001	24.5	2.9
12.4367374992107	28.3198582425515	0.115859750882464	8.7	24.9	3.7
12.4504789769692	28.3553596824478	0.109816247682305	10.4	25.6	3.6
12.4643125458134	28.3911026939559	0.103731775301101	10.6	26.4	2.7
12.4782976504464	28.4272416302381	0.0975795793579017	12.5	25.3	2.9
12.4923729828539	28.4636136089086	0.0913866331322826	11.6	27.1	4.6
12.5065283625901	28.5001924396635	0.0851578287022043	11.4	29.4	4.3
12.5213636550606	28.5385325179629	0.0786287603952935	9.40000000000001	28.4	4.3
12.536784421907	28.5783896643242	0.0718405274493268	8.7	26.4	4.3
12.5530083687886	28.6203254625477	0.0646971260129483	7.40000000000001	26.5	3.3
12.5704498537747	28.6654090921452	0.0570151745565148	5.3	29.5	4.1
12.5900201844498	28.7159884397541	0.0483960646373074	4.3	28.8	2.1
12.613388981343	28.7763636486068	0.038108444802349	6.7	28.8	0.2
12.636632803365	28.8363814518822	0.0278800148660956	7.3	28.6	0.6
12.6597357982987	28.8960359153268	0.0177147942073894	8.7	29.3	1.9
12.6801207408615	28.9486705223333	0.00874618722549947	9.5	27.1	1
Route: 5 Length: 11.4114030977108 Demand Met: 2000					
11.050282859396	28.1190510034746	1.05692380453038	6.7	26.7	7.9
10.5111354381178	27.831096380247	1.40238522314487	5.8	25.2	5.8
10.0738610397616	27.5975472942605	1.68253859190909	4.5	26.7	5.4
9.75249342525635	27.4258990544741	1.88838793553092	3.7	26.6	6.4
9.50206559111855	27.2921450705686	2.04879746920299	3.3	24.6	6.9
9.31822836308673	27.193961565199	2.16655590682718	2.59999999999999	25.5	6.5
9.17392780624165	27.1168983933662	2.25898735510723	2.3	28.7	7.3
9.25138503987958	27.0136473201074	2.19180634179048	3.3	28.4	2.5
9.33171163229946	26.9065681475591	2.12213754931347	1.7	29.4	1
9.41893008591057	26.7903023860906	2.04649231377709	1.59999999999999	27.4	1.8
9.51029055262137	26.6685149398846	1.96725628170261	2.40000000000001	26.7	1.4
9.60204331320919	26.5462043471449	1.8876819832182	1.5	24.6	3.5
9.75795662384834	26.338349943742	1.75245918960216	4.3	22.7	1.3
9.91015295332606	26.1354514227175	1.62046178797994	5.5	22.5	1.9
10.0608914711188	25.9345014395418	1.48972937424922	7.40000000000001	21.2	2.2
10.2082148796546	25.7381104103328	1.36195934457633	5.40000000000001	19.4	0.4
10.3417605897947	25.5600931594157	1.24613773888209	8.5	18.8	1.3
10.4664049596952	25.3939474075168	1.13803551650931	10.6	16.8	0
10.4756816340154	25.4089152432966	1.13331366131846	10.6	19.2	0.8
10.4852967819865	25.4244347087232	1.12841835694669	11.3	19.3	1.9
10.4950957029346	25.4402568410631	1.12342764319893	9.3	18.5	2.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.5050547840172	25.4563404500352	1.11835458509449	9.5	17.4	3.2
10.5157217626668	25.47356819026	1.11292112886996	8.7	17.3	3.1
10.5299645086635	25.4965701581283	1.10566761554681	7.7	19.2	6.3
10.5620122886218	25.5483094173347	1.08934647512882	5.3	21.1	5.7
10.6006680049728	25.6107002925735	1.06966929282299	6.40000000000001	21.3	7.2
10.700963502689	25.7725684114036	1.01859227885386	8.40000000000001	21.2	7.3
10.835304180907	25.989365409772	0.950181050597648	10.4	21.5	7.4
10.9871148084042	26.234367224858	0.872791922009752	11.5	20.6	7
11.2343481928334	26.6335260614632	0.746804612575613	11.7	22.5	7.9
11.7941791208783	27.5374726534089	0.46156368809382	12.7	23	4.7
Route: 6 Length: 26.394044544196 Demand Met: 1999					
8.46799078364957	19.0211896844249	2.75670089268801	12.6	13.4	7.7
8.26082924938856	18.5327275683736	2.8916405798304	11.6	13	7.6
8.11379307339627	18.1860507648871	2.98741154182244	10.4	11.3	7
8.03021549316736	17.9889938288452	3.04184410679269	9.59999999999999	12.8	7.5
7.95992445356886	17.8232567942514	3.0876220437235	8.2	13.4	6.9
7.89158196656039	17.6621211059272	3.13213242577421	10.3	12.6	5.4
7.82440051371717	17.5037247879883	3.17588956917447	11.7	11.5	2.9
7.76132185487835	17.3550018499369	3.21697573026253	12.6	10.9	4
7.70630895939895	17.2252960619844	3.25280856112525	11.5	9.5	4.3
7.70630887561713	17.2252960697535	3.25280857418606	10.3	9.2	3.3
7.70630878874714	17.2252960781739	3.25280858464224	9.8	10.8	3.4
7.70630870216743	17.2252960865965	3.25280859056832	8.59999999999999	10.7	4.5
7.70630861620263	17.2252960948478	3.25280860433195	7.7	9.3	3.2
7.70630852977639	17.2252961029864	3.25280862006088	8.3	8.9	1.9
7.70630844289602	17.2252961127475	3.25280863586583	9.40000000000001	9.5	1
7.70630835497279	17.2252961230805	3.25280864999681	7.3	11.2	0.4
7.70630826736703	17.2252961335084	3.25280865956216	5.59999999999999	10.5	0.4
7.70630818033214	17.2252961441287	3.25280866103159	5.3	9.5	2
7.70630809478224	17.2252961551811	3.25280868151739	2.40000000000001	11.2	0.3
7.70630800828047	17.2252961657902	3.25280868910556	1.7	12.5	1
7.70630792337408	17.2252961760529	3.25280869069324	3.5	12.6	3.2
7.70630783840232	17.2252961862449	3.25280870148471	4.3	11.2	3.3
7.70630775264903	17.2252961967824	3.25280870753134	6.40000000000001	11.2	5.2
7.70630766482384	17.2252962079744	3.25280871631621	6.3	12.4	6.5
7.70630757408748	17.2252962196214	3.25280873035885	5.40000000000001	13.2	5.7
7.70630748101631	17.2252962313817	3.25280873900597	5.5	14.6	7.4
7.70630738703076	17.2252962428015	3.25280875232508	3.5	15.1	6.8
7.70630729958628	17.2252962537093	3.25280876471959	2.7	13.4	6.1
7.70630722410328	17.2252962627797	3.25280877709091	0.599999999999994	12.7	5.3
7.80434629069921	17.4564780441219	3.1889473313707	1.59999999999999	14.7	5.3
7.91821971970751	17.7249904593194	3.11477404120433	0.700000000000003	15.2	6.3
8.19014680943859	18.3661617290182	2.93764519963138	2.5	19.5	4.2
8.4909259237493	19.0753651751373	2.74172549968314	0.299999999999997	19	1.4
9.17327313439364	20.6842921252024	2.29725470658797	1.59999999999999	18.8	1.3

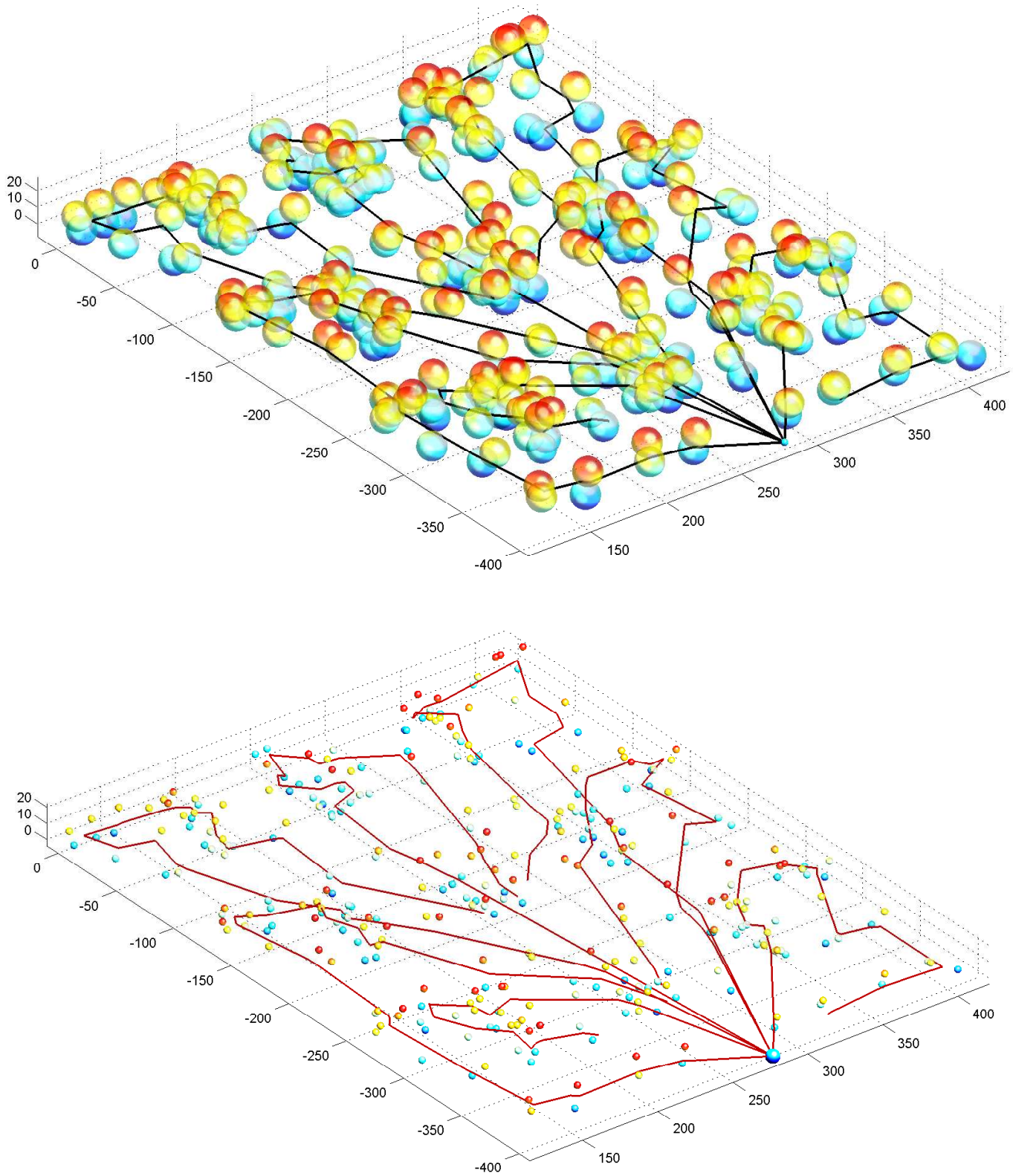


Figure O.76: $lin318$, $r = 8.268$, Equal Radius, 3D, Euclidean, Length = 5152.4383252

Table O-79: Solution for $lin318$, $r = 8.268$, Equal Radius, 3D, Euclidean

Total distance: 5152.43832524597 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 500.48207280012 Demand Met: 871					
180.791811604573	391.678686155316	6.31462231926873	181.1	393.8	14.3
180.791811604573	391.678686155316	6.31462231926873	184.3	387.5	3.8
222.329920613636	335.12234678669	8.44024585159658	222.8	339.4	15.5
222.329920613636	335.12234678669	8.44024585159658	222	329.2	14.2
226.073822375183	330.010541157166	8.06805737118657	227.6	331.6	9.8
226.073822375183	330.010541157166	8.06805737118657	231.5	331.6	8.7
228.087274125038	327.26094449593	7.86784587740701	234.6	331.6	5.2
233.085986114608	318.492091244214	7.66706887993633	227.6	315.8	6.5
233.085986114608	318.492091244214	7.66706887993633	234.6	315.8	11.2
235.29266597719	314.621562616232	7.57845516293696	231.5	315.8	7.2
241.367495662007	303.965377148421	7.33442455428268	249.6	303.2	7.3
238.013928503174	300.000493937311	7.25836605871916	234.6	297.7	7.7
236.366594142478	298.056163629286	7.22054302897563	231.5	297.7	7.4
235.199079874876	296.678315751786	7.19369722834459	227.6	297.7	4.1
238.497313794406	286.350823224828	11.4193662011823	240.2	288.2	11.3
238.497313794406	286.350823224828	11.4193662011823	240.2	281.9	12.5
239.162672708381	284.266525242046	12.2728480881273	236.2	280.4	11.1
239.604491541388	282.881881063315	12.8398630465354	233.1	280.4	17.3
244.641561550374	277.199863281988	13.6456476882679	248	280.4	9.5
255.703302129494	264.721841026752	15.4147891953925	252.8	260.7	8.8
258.364438800896	262.036447077647	16.1069956622527	255.9	254.4	18.1
276.09220322002	265.506982659824	15.1634141500735	275.6	273.1	17.9
277.051200753895	265.694977971288	15.1124272210825	278.7	273.1	18.4
284.978964937601	261.611371687806	11.9947003136475	286.6	254.4	15.7
287.186355796677	262.432619095049	9.79510880310364	283.5	260.7	2.6
297.150809618402	266.37236278339	6.74844694352266	301.6	260.7	2.7
300.692417059012	272.583392921299	7.40678553341915	308.7	273.1	9.4
300.692335170962	272.583518439674	7.40675901610577	305.5	273.1	0.7
297.069856862399	277.228308684248	7.62456664201999	290.6	273.1	10.7
297.069856862399	277.228308684248	7.62456664201999	293.7	273.1	6.2
283.02952533949	304.631569823967	6.43586787608809	280.3	303.2	11.5
269.818041312398	330.423058898503	5.31436624973609	263	329.2	0.8
269.751810996284	334.038109420581	6.25371527539082	263.8	339.4	8.3
288.807683493418	335.146769319371	4.41037492802038	293.7	329.2	1.4
290.832034073607	341.080685969331	6.58318060521837	294.5	339.4	13.8
295.287637551623	388.634389338239	2.25339224315454	301.6	393.8	0.9
282.213875310415	390.102230993952	4.11779056097846	283.5	393.8	11.4
282.213875310415	390.102230993952	4.11779056097846	286.6	387.5	8.3
252.423280580862	392.843782072955	7.1960705162454	252.8	393.8	15.4
252.423280580862	392.843782072955	7.1960705162454	255.9	387.5	4.9
216.099490464884	395.594874193418	6.02565079711108	215	387.5	7.3
213.004418074194	396.170606929199	5.8712558321087	211.8	393.8	13.7
Route: 2 Length: 757.569039490069 Demand Met: 927					
122.753335978099	394.229816711724	8.40290919738389	122.8	387.5	3.6
118.318658794275	393.781267015656	9.64817556794539	119.7	393.8	17.8
91.8095809912622	391.184027217102	11.3037914145094	92.1	387.5	18.7
86.2959258231021	390.961390813501	11.013919380651	89	393.8	11
52.718376353306	389.606397456318	9.24973875890013	51.2	387.5	1.4
46.1994343672805	390.202751610838	12.1765309564234	48	393.8	19.4
23.3136386759931	388.196448957972	13.7072197716325	17.3	393.8	14.6
23.2461493652131	384.414126554979	13.4096889632072	20.5	387.5	17.4
22.4570374686022	340.135154396142	9.92788707448531	28.3	339.4	12.9
22.2705393054606	329.662230639197	9.10424710295427	27.6	329.2	2.8
18.164830101307	303.032996813848	11.2751835341622	14.2	303.2	5.3
13.9220288745265	275.510312521519	13.5194327045155	6.3	273.3	11.2
14.9331387474575	274.073880509452	14.0595785747972	9.40000000000001	273.3	14
16.5240093342318	271.81281205733	14.9094987770799	21.3	273.1	15.8
17.6386062540569	270.229155833134	15.5049522390279	24.4	273.1	19.3
17.9798018527167	261.104464643917	15.5593163430354	17.3	260.7	14.5
18.2623654774565	253.545932068909	15.6044689342554	20.5	254.4	9
20.0327174252181	206.236407765233	15.8868887013455	28.3	206.3	15.8
19.8221601291125	196.650012129479	15.9499901480745	27.6	196.1	18.7
16.7592881182935	169.562150883674	15.2580075390237	14.2	170.1	13.5
13.8749759161435	144.052075449497	14.6063810801605	9.40000000000001	140.2	11.5
13.694157066747	142.452893940915	14.5655109206288	6.3	140.2	17.5
17.5757843715528	136.684050797519	12.5194421929738	24.4	140	15.5
18.7863353456466	134.884755225415	11.8811986889174	21.3	140	9.6
20.8195670987116	131.862055649616	10.8089232454814	17.3	127.6	16.4
22.6413621585177	129.153540508809	9.84803094700001	20.5	121.3	8.4
37.4503208555514	137.068552538258	9.02910648573173	36.2	140	1.4
40.9391854429742	138.668997398062	9.40130476230526	39.4	140	3.5
54.1176595353803	144.714765894596	10.8069914845628	52.8	148.8	15.5
59.7269075024375	147.28802128079	11.405331393778	63.8	147.3	12.9
62.1243115226363	148.387815242585	11.6610654859572	66.9	147.3	5

Solution x	Solution y	Solution z	Original x	Original y	Original z
63.3910090957527	149.832733488022	13.6847785167792	70.1	147.3	17.8
59.8025276108274	156.424477863383	14.879452034123	60.6	155.1	13.8
52.7040918296593	169.468999544905	17.2432255428513	44.9	170.1	19.9
63.410365178555	183.663596069422	13.5329028903947	70.9	182.7	16.9
63.3249619757793	184.851268843317	12.8505188063758	67.7	182.7	12.4
63.2227852684207	186.272387353183	12.0340396815765	63.8	182.7	4.6
62.558239343135	194.832345330548	8.57287164859647	58.3	196.1	1.6
63.3978771777255	196.317898959914	9.45529644882517	63.8	198.5	2.5
65.0298195171292	199.205091094932	11.1692246493162	67.7	198.5	11.8
66.4014187119337	201.63170025973	12.610029451968	70.9	198.5	18.8
66.6753716678886	203.850026623701	12.670271733056	59.1	206.3	14.9
92.8682081578112	253.055515130928	8.47830354290454	92.1	254.4	16.6
94.8287021059053	256.665284315587	7.95531404864908	89	260.7	3.7
124.93645930731	287.83878579643	9.46778104327633	127.6	286.7	5.8
133.482077520898	296.687342740161	9.89705643757696	136.2	295.3	3.1
136.278095822215	299.58264794552	10.0373528139385	142.5	295.3	13.4
143.33058582556	313.605556987713	8.47994470504889	142.5	315.8	4.2
146.073097293488	319.058855025102	7.87411541214237	148.8	315.8	8.4
151.273480511053	329.399311490235	6.72525000130628	148.8	331.6	0.2
152.523240223209	331.88460466316	6.44900888140932	155.1	331.6	14.3
153.774275444312	334.428806902293	6.08548526969221	161.4	331.6	4.6
Route: 3 Length: 691.789372784875 Demand Met: 900					
193.377372009977	342.066246655979	4.91938120372579	192.1	339.4	1.6
197.512950847002	331.170308459365	5.76445026516185	191.3	329.2	9.3
208.211124943336	302.992750647094	7.94902611988465	208.7	303.2	16.2
214.069689334362	287.13177874994	6.81662476044924	218.9	286.7	3.7
215.313395178974	283.765231400431	6.57639684988624	222	285.1	1.9
216.879654666211	263.596601297898	9.04532442484017	211.8	260.7	3.2
220.048037308451	255.767276429141	12.996187240589	215	254.4	19.4
263.315399046928	206.113349894524	14.424659704232	263.8	206.3	6.2
266.012746698038	203.01807650498	14.5199827045558	263	196.1	17.9
288.349705015302	201.056027027719	7.34233265171703	294.5	206.3	5.6
287.726782643675	195.820405877582	7.32884645287088	293.7	196.1	5.6
284.628593905688	169.790678445253	7.26258327499855	280.3	170.1	14.3
282.226449271224	144.513097761566	6.22066405976538	275.6	140	4.2
288.995541199487	142.226435455781	8.19863442495304	290.6	140	0.4
294.12507147654	140.513430436661	9.79426773404634	293.7	140	9.3
300.181536063735	138.490775887768	11.6783366617292	305.5	140	11.2
301.998853598381	137.883926950762	12.2436307560347	308.7	140	16.6
298.316902038671	131.303216511842	7.02331551204002	301.6	127.6	0.4
286.644809857429	129.157784522697	12.5281975204985	286.6	121.3	15.1
283.181845193787	130.679502588601	13.4612852978175	283.5	127.6	15
277.787757744693	133.050081125609	14.9151109076855	278.7	140	19.3
258.35510207952	128.8251891212	12.1115113047184	255.9	121.3	14.5
254.83322033394	131.754361872012	10.1533223739773	252.8	127.6	3.3
245.483640347429	143.981701344225	9.31125996166412	248	147.3	4.5
242.724636728557	147.589920611268	9.06291011993497	240.2	148.8	5.8
241.074536418321	149.747929156958	8.91440411434489	236.2	147.3	7.3
239.678647383569	151.573521261329	8.7887749406468	233.1	147.3	11.4
237.144976565312	155.72833220025	8.35131644004257	240.2	155.1	5.1
232.339794883248	163.607970665302	7.52163764405426	234.6	164.6	0.1
230.969341443505	165.855080533041	7.28542500233921	231.5	164.6	6.5
229.419248725217	168.396821283918	7.01831490684636	227.6	164.6	1.4
223.243123919096	178.524578800779	5.95193276253668	227.6	182.7	0.3
197.468879295115	200.271838627498	13.1081268542817	191.3	196.1	16.7
195.44213686135	207.913430324469	12.4806141476045	192.1	206.3	17
183.363272727979	253.478074028004	8.74858216772833	184.3	254.4	16.9
181.180517925112	261.698612421298	8.05547051449267	181.1	260.7	13.4
175.013729041879	284.923931395678	6.10529723254345	173.2	285.1	12.1
170.808701118747	300.762244302518	4.77156420560674	178	303.2	1.5
164.589540012192	314.254074928694	4.6678936832615	161.4	315.8	7.1
163.202219188978	317.264509399447	4.64480848184972	155.1	315.8	5.4
Route: 4 Length: 414.722519460473 Demand Met: 756					
137.898786648915	336.100551562037	8.78491906537719	130.7	339.4	10.6
137.898786648915	336.100551562037	8.78491906537719	136.2	331.6	10.8
136.890678115605	333.872373371375	9.06688675996043	142.5	331.6	14.7
133.323475765642	327.287390191602	9.42688432896799	129.9	329.2	5.1
130.157679980129	321.443468152522	9.74637962069292	136.2	315.8	9.7
112.270403006554	310.090669766048	10.8225895037454	116.5	303.2	9.1
90.3516608570403	296.407107318828	12.1757053453594	85.8	303.2	13.4
82.6034858932686	290.679551231486	12.5668532410508	84.3	283.5	16.3
82.1569443867021	290.701705949743	12.429838909212	81.1	285.1	18.2
75.9537912674596	291.009044250453	10.5271242825998	76.4	288.2	6.4
71.5701883274661	291.226230555555	9.18258595644264	70.9	297.7	11.7
68.3563042555787	291.38549260471	8.19685912150646	67.7	297.7	2.9
68.3562204277133	291.385477428854	8.19684919895599	63.8	297.6	5.2
66.2445873623006	286.553414769905	9.44085907297699	60.6	288.2	12.5
65.1993061783288	284.161103335891	10.0568859090422	70.1	280.4	12.5
64.5744611672728	282.730973709906	10.4251627063318	63.8	280.4	12.2
64.0726767830702	281.582477491543	10.7209121696058	66.9	280.4	18.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
51.2401098380913	261.487809135369	6.95696246347866	51.2	254.4	2.7
49.0088704632236	263.758766023387	9.78511129025202	48	260.7	17.4
44.416506102086	273.764577816787	7.3385975023891	39.4	273.1	0.8
44.4164946076313	273.764627934616	7.33859929971739	36.2	273.1	6.7
47.4101532195055	283.5626374739	8.10509082025166	52.8	281.9	9
52.3414648132854	299.702583270782	9.3677568681348	44.9	303.2	8.5
60.994642605304	313.398004353298	11.0384837929859	63.8	315.8	14.7
62.6419410277723	316.004978498761	11.356500453655	67.7	315.8	13.4
63.7262145125201	317.720928431673	11.5658066240788	70.9	315.8	15.2
63.6476314861787	327.861449835449	9.80975074013949	58.3	329.2	7.6
63.6212458339339	331.179499286246	9.23482563214817	67.7	331.6	4.4
63.6011695533554	333.729526540114	8.79321827309128	59.1	339.4	4.8
66.6143348066022	333.50813842954	10.8634833033723	63.8	331.6	18.4
70.6712925398516	333.732462913505	11.3149798097253	70.9	331.6	19.3
95.7704938319652	336.704516989406	8.2303178267353	99.2	329.2	7.7
101.842990885988	342.386232619925	7.55068641146638	100	339.4	3.8
Route: 5 Length: 906.786240831585 Demand Met: 935					
156.767153764626	295.589228016319	3.96276109579697	161.4	295.3	10.8
156.32202482657	291.73736958273	4.09301012931331	155.1	295.3	0.7
145.57808793194	198.757573124204	7.23790371882793	142.5	198.5	1.1
143.968379674025	184.827984985332	7.70872804699397	142.5	182.7	2.1
143.558560158041	181.281252079601	7.82860790071369	136.2	182.7	6.2
141.686401406657	165.079950759954	8.37620276885082	148.8	162.2	5.3
140.88171924532	163.792426560303	8.69919831744462	142.5	162.2	2.7
139.906179804258	162.231495422212	9.09073985275964	136.2	162.2	1.7
134.773556031069	153.252594379203	12.3007646258612	141.7	150.4	15.8
133.091858914841	150.489128968739	13.2593701313515	127.6	153.6	18.6
127.758900059403	127.314704927939	13.6743350052329	119.7	127.6	15.5
128.587015191499	121.625298559978	13.2944201470478	122.8	121.3	7.8
135.387308877118	74.8843145073789	10.1713730103595	130.7	73.2	7.2
136.368428003116	68.1397558909451	9.72052733364323	129.9	63	9.4
138.687197407889	67.242112451974	9.65310551915427	136.2	65.4	3.7
142.886153698069	65.6163708615815	9.53082711252993	142.5	65.4	2.7
147.540332173411	63.8142724227747	9.3953933378504	148.8	65.4	6.2
151.784087324224	62.1711212040195	9.27191516553015	155.1	65.4	8.7
154.647842494587	61.062441669902	9.1885577956288	161.4	65.4	7.2
154.548586066801	53.5227764824528	11.144325515044	161.4	49.6	13.6
152.552503474515	52.4533567809526	11.0087582393689	155.1	49.6	5.1
149.881191683555	51.0221239517628	10.8272863138177	148.8	49.6	18.9
142.842127203652	47.4848781131243	8.0855812949383	142.5	49.6	0.1
138.20313244122	44.3938914599661	8.888954902185	136.2	49.6	6.3
124.545557441791	35.2929924743695	11.2541557511656	116.5	37	12.1
130.431841805635	26.2172416261073	11.2412770894945	127.6	20.5	16.5
137.666190006924	23.5861463568225	6.78387994296778	136.2	29.1	0.8
137.881490945423	23.5013981922287	6.66048183629569	142.5	29.1	2.7
140.326209045775	15.7899404102031	6.45869893513054	141.7	17.3	2
145.564426170528	-0.731219618379809	6.02655598470473	141.7	-7.9	4.6
145.564437402679	-0.731219639815919	6.02655835595104	149.6	-7.9	5.2
152.264665892354	24.4616084482811	13.2973053525035	148.8	29.1	19.2
158.2363023668	26.3976012210976	8.55688635141238	155.1	29.1	1.4
163.23369218861	26.6011316807811	8.26311120537401	161.4	29.1	11.5
171.296653416852	26.929715538584	7.78890573987778	173.2	18.9	8.3
181.029463954481	31.2331539766018	6.91718463519278	178	37	4.3
201.26013153305	40.1780221587544	5.10557488847487	208.7	37	3.4
192.973175191184	64.5026548217543	10.3437081931808	191.3	63	18.3
190.146446000055	74.1698715551224	10.6570095500274	192.1	73.2	7.8
177.014234945587	119.088534791409	12.1122749039794	184.3	121.3	14.5
175.021921025184	125.903335786267	12.3332409621168	181.1	127.6	7.7
167.982989046284	149.976577776101	13.1132368463222	173.2	152	19.2
163.543923518018	160.656616947982	12.0938212337646	161.4	162.2	17.4
162.139652137263	164.035360740906	11.7712877108469	155.1	162.2	15.7
157.776831414206	180.919122529106	8.88270399564676	155.1	182.7	16.5
157.410465427296	182.980262584097	7.93639865974622	161.4	182.7	0.7
156.814183060195	184.328526857448	7.98295824951134	148.8	182.7	9.2
157.025997212609	198.169626126533	7.53668131955812	148.8	198.5	8.3
157.158889675121	200.41447698623	7.45511925894492	161.4	198.5	1.4
Route: 6 Length: 943.110526967426 Demand Met: 944					
217.645699460664	278.619558547474	13.4761850770424	224.4	280.4	17.9
226.445167153902	207.278037130268	9.64372856855191	222.8	206.3	17
227.27374285516	201.28108391983	9.14659263597078	227.6	198.5	10.4
227.738248296912	197.918627612257	8.86795332803407	222	196.1	3.2
227.876022915347	197.592838585677	8.92647792738431	231.5	198.5	1.6
229.186302973504	194.494841250264	9.48226706835747	234.6	198.5	10.6
233.539844251945	184.200238400151	11.3292366121344	231.5	182.7	19.2
235.730847995323	180.543582582303	10.1539286974791	234.6	182.7	13.3
243.905468050468	166.900226646587	5.76895575006614	249.6	170.1	0.7
266.463154252608	76.4535962170004	2.04020090689034	263.8	73.2	0.8
268.245981037409	69.3045286426512	1.74552532172188	263	63	0.7
288.774480090399	67.888956618717	4.01515297235346	294.5	73.2	1.3
290.067377503531	60.6456205884292	8.35574099613382	293.7	63	15.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
288.400786914258	38.6319139820869	9.87332265227875	280.3	37	9.6
302.656949096828	10.4420292876072	12.6088122969531	305.5	6.9	5.7
302.770134498799	10.0158524767654	13.3534688254454	308.7	6.9	18.2
294.976595374735	10.786293205194	12.895190536808	293.7	6.9	18.6
290.802596731043	11.1990247125137	12.6498002108078	290.6	6.9	18.4
280.131768200423	12.2539320620537	12.0225386873821	278.7	6.9	10.2
275.537693095429	12.7081325077832	11.7525161366396	275.6	6.9	6.7
248.547170885884	15.3760150362338	10.1656545305682	248	14.2	2
242.881171497785	16.1245370965983	11.0788857415196	240.2	15.7	7.9
239.618707960733	16.5555421098538	11.604816029568	240.2	22	17.8
235.259693464802	16.3461280100881	11.4129769092702	233.1	14.2	19.1
232.461944280566	16.5780547008528	9.89408648882131	236.2	14.2	3.3
227.747088802485	16.9691361868373	7.3348738682006	224.4	14.2	0.3
227.403545586633	17.659918129577	8.2826752021157	222	18.9	3.1
225.476954237805	21.5336316461717	13.5973639729376	218.9	20.5	18.5
230.405188197607	26.6377764406492	13.9439358195173	227.6	31.5	14.9
233.383240944635	29.7217418554672	14.1533173300025	231.5	31.5	11.2
236.455158949705	32.9029181178941	14.3693207284537	234.6	31.5	11.8
241.477115812441	38.103820791964	14.722514817085	249.6	37	15.8
234.217401484113	51.6576345686884	13.0904166594239	227.6	49.6	17.6
233.928586452134	52.5227681152965	12.8898251552213	231.5	49.6	10.4
233.619772509682	53.4477993392321	12.6753424458415	234.6	49.6	6
230.290338382028	63.4218364568695	10.3630140446673	234.6	65.4	4.6
229.711119365927	65.1569527042722	9.9606823289825	222	63	7.9
229.618345767422	65.9005017769259	9.83547935563989	231.5	65.4	1.8
229.199033293866	68.5654340969763	9.7741017350026	227.6	65.4	13.5
228.13673597371	75.3166952489522	9.61863187271914	222.8	73.2	10.5
220.937839933299	121.064639294993	8.5652684575779	215	121.3	10.5
219.777022414696	128.441694317123	8.39539721366383	211.8	127.6	10.4
218.61240263337	144.84670557641	7.67081549072159	224.4	147.3	2.3
216.089792047935	149.463277489463	9.40433842498813	222	152	14.6
213.690859760393	152.309954638396	9.98285649004908	218.9	153.6	11.5
203.523312902914	164.375484135021	12.4348178848946	208.7	170.1	15.4
183.33815711657	176.253146093253	13.0153931346376	178	170.1	11.6
162.722994685356	201.118457312093	15.7576572729239	155.1	198.5	17.6
Route: 7 Length: 937.978552911418 Demand Met: 928					
141.470895783458	297.59161921193	11.3351924564592	148.8	295.3	14.4
136.39914617168	285.906334521369	11.8288568740327	141.7	283.5	17.7
123.701664559881	260.577000850063	11.3501106018583	119.7	260.7	11.7
119.974830182734	253.142685423262	11.209613193313	122.8	254.4	9.9
97.3427730820512	207.995108761432	10.356349884571	100	206.3	18
93.0003311747901	199.707493310624	9.78838459658703	99.2	196.1	13.9
79.0731426720251	174.025255469873	7.77521172114243	85.8	170.1	5
74.3134769992524	167.007778064914	7.4911612891926	70.9	164.6	8.4
72.5521117900139	164.410930608371	7.38608296630972	67.7	164.6	2.1
71.9561201623391	163.532239446369	7.35050872006424	63.8	164.5	8.3
74.2848010288559	156.983959301738	6.38573917391001	76.4	155.1	3.4
75.5800769931873	153.342921565449	5.84926652902034	81.1	152	7.1
76.2151441737475	151.557992550542	5.5862940602304	84.3	150.4	4.3
55.2600444651152	123.67143353369	5.96720744374671	48	127.6	5.5
53.052123235858	117.617508051361	6.1447655472855	51.2	121.3	6.2
36.1110023147066	71.1666817538662	7.50728189941174	28.3	73.2	9.3
34.8433711890619	63.1496172718398	7.38388339755569	27.6	63	3.4
37.7630164290178	40.718946407945	10.6044266577231	44.9	37	12.5
20.2224534671628	31.6215797042802	8.07846456107129	14.2	37	6.3
12.8133505493836	11.0641050428757	8.80273674700107	9.40000000000001	7.1	2.4
12.8133498229882	11.0640976908412	8.80274248530453	6.3	7.1	12
20.4768972571193	11.0926966346441	8.30756288856931	21.3	6.9	14.1
25.1053383261479	11.1100885235122	8.00854267846143	24.4	6.9	1.6
35.3786737359437	11.1489231752678	7.34501411298489	36.2	6.9	0.3
39.3564115255205	11.8072558056244	8.14590955744375	39.4	6.9	14.8
52.6893736496833	15.1091650444834	9.34914110205322	52.8	15.7	13.8
61.667080518745	17.3325333976074	10.1593705219588	60.6	22	16.9
63.711043471688	17.6373400856519	10.0646215038425	63.8	14.2	14.4
66.0373648313748	17.9842489069786	9.95680048211381	66.9	14.2	11.4
68.3877507335134	18.3347441285201	9.84786808627769	70.1	14.2	16.8
75.3681296344329	20.0966295574186	8.37007091714011	81.1	18.9	10.9
77.0792008328323	20.5284981570399	8.00772674847843	84.3	17.3	5.6
75.9279618151903	22.7903470937334	8.69539631072186	76.4	22	1.9
72.1055876310756	30.3016204248469	10.9784039820027	67.7	31.5	4.3
71.9281548340171	30.6501230224	11.0842894593119	63.8	31.4	12.4
74.1481233119639	33.2733742505218	11.3826470755656	70.9	31.5	11.6
77.8336503520848	37.6288760191663	11.8781833854986	85.8	37	14
71.6967325459354	48.4261869612049	9.16316123616244	70.9	49.6	14.9
71.6967325459354	48.4261869612049	9.16316123616244	67.7	49.6	9.5
69.431879708571	52.4108643059768	8.16108253563211	63.8	49.6	2.8
66.333033314099	64.9487067815618	8.3924227967458	58.3	63	8.5
65.9683194928446	66.4839762201889	8.42064134326168	63.8	65.4	13.7
65.5769052590018	68.131560628525	8.45093286537347	59.1	73.2	9.3
69.5605232681748	68.2046909267289	7.87936991895797	67.7	65.4	8.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
74.9306439861584	68.3032692724706	7.10890566139639	70.9	65.4	6.9
94.382822190959	68.6624824846698	4.31820432145621	99.2	63	0.7
96.2554942825342	74.976544511798	7.24578042851625	100	73.2	14.4
96.4927920571092	119.423291510907	3.67979566759488	92.1	121.3	6.9
96.5281846319077	126.051980354533	3.14801255351404	89	127.6	0.1
115.570124821682	170.854055053172	6.85033040334371	116.5	170.1	13.6
125.932668101107	195.23502773746	8.86497530905849	129.9	196.1	10
128.351288769119	200.925548908878	9.33523077689914	136.2	198.5	8.4
129.631261468378	206.725371933857	9.91238717743454	130.7	206.3	18.1

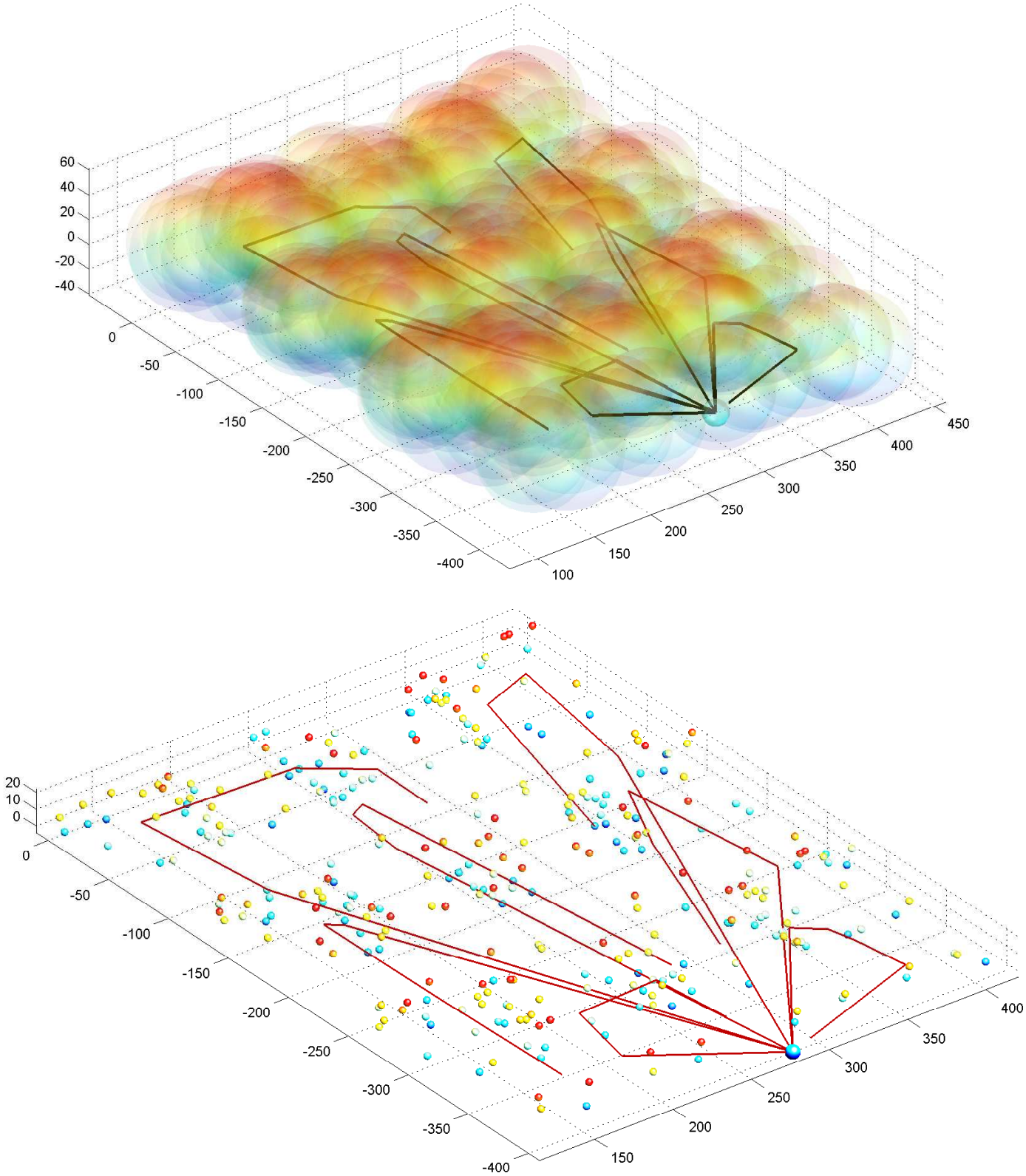


Figure O.77: *lin*318, $r = 41.34$, Equal Radius, 3D, Euclidean, Length = 4009.1943364

Table O-80: Solution for $lin318$, $r = 41.34$, Equal Radius, 3D, Euclidean

Total distance: 4009.19433636304 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 582.919659220672 Demand Met: 942					
104.208602450247	275.970285326505	6.06505917109605	89	260.7	3.7
93.0372226733952	253.739600940695	7.10597783934857	92.1	254.4	16.6
82.4969046131556	232.764708417412	8.08809583569927	100	206.3	18
77.5942388562068	223.008576410566	8.54490865234139	99.2	196.1	13.9
74.6755883966289	217.200578014094	8.8168557203745	70.9	198.5	18.8
72.3242077707201	212.521414289393	9.0359496011431	67.7	198.5	11.8
70.2774597219783	208.448453213283	9.22665931692662	59.1	206.3	14.9
68.3811396931015	204.674837048204	9.40335420558845	63.8	198.5	2.5
66.6045415355274	201.139462951102	9.568892896801	58.3	196.1	1.6
64.9307093274121	197.808589513141	9.72485573848643	63.8	182.7	4.6
63.390315024215	194.743253096756	9.86838492745961	67.7	182.7	12.4
61.9205604184807	191.818487303742	10.0053324480636	70.9	182.7	16.9
60.4828423103631	188.957472994556	10.1392957120516	70.9	164.6	8.4
59.1882927541974	186.381359496929	10.2599183533053	63.8	164.5	8.3
57.9938851355753	184.004525174846	10.3712106459171	67.7	164.6	2.1
56.8605486728963	181.749220415499	10.4768117671581	76.4	155.1	3.4
55.8420703801287	179.722479888818	10.5717108214907	84.3	150.4	4.3
54.730317117541	179.168737265908	10.7451555102121	81.1	152	7.1
53.4836153709731	178.547778314997	10.9396538092107	66.9	147.3	5
52.2419315127375	177.929318296577	11.1333684485954	63.8	147.3	12.9
51.021446890678	177.321417092359	11.3237761097727	70.1	147.3	17.8
49.7801715753382	176.703160373678	11.5174278519201	60.6	155.1	13.8
48.5488551372371	176.08986420201	11.7095255101102	52.8	148.8	15.5
47.3702522925644	175.502824387831	11.8933993284281	44.9	170.1	19.9
46.2330749107747	174.936419189665	12.0708108655333	24.4	140	15.5
46.3612149091944	183.895497860235	12.0423070301976	14.2	170.1	13.5
46.5817333285787	199.314081874713	11.9932517717271	27.6	196.1	18.7
46.8298386737228	216.661783182486	11.9380594833531	28.3	206.3	15.8
47.1950406239857	242.197736397673	11.8568169134503	20.5	254.4	9
47.418902228709	257.850305305042	11.8070171696018	17.3	260.7	14.5
47.6284133111039	272.499354163406	11.7604108760054	6.3	273.3	11.2
47.6763694487236	274.388397141667	11.7546828513848	9.40000000000001	273.3	14
47.7252600288203	276.314275500379	11.7488432760127	21.3	273.1	15.8
47.7743513225374	278.248071593424	11.7429795846522	24.4	273.1	19.3
47.8242248669541	280.212689776032	11.7370236699245	36.2	273.1	6.7
47.8751474879244	282.218636347093	11.7309421230309	39.4	273.1	0.8
47.9278776422672	284.295785129801	11.7246437056163	51.2	254.4	2.7
47.9926367705841	286.846773226609	11.7169076504374	48	260.7	17.4
48.0689599724562	289.853284728468	11.7077924595544	52.8	281.9	9
48.1491034201559	293.010274113439	11.6982199848962	63.8	280.4	12.2
48.235909443678	296.429698900108	11.6878520485502	70.1	280.4	12.5
48.3354789058284	300.351860904658	11.6759593796383	66.9	280.4	18.4
48.4579592323264	305.17643641412	11.6613315203244	60.6	288.2	12.5
48.6012859468959	310.822025667338	11.6442143183337	44.9	303.2	8.5
48.7515093587023	316.739092270751	11.6262738448163	14.2	303.2	5.3
49.0930966130291	330.193980562983	11.5854793577119	27.6	329.2	2.8
49.4653520966696	344.857178585931	11.5410194194389	28.3	339.4	12.9
49.9546532280762	364.131018696235	11.4825806743121	20.5	387.5	17.4
50.0731236511695	368.797765694229	11.4684310214858	17.3	393.8	14.6
Route: 2 Length: 788.068488053575 Demand Met: 949					
256.403877271037	164.441926213491	10.634558181027	275.6	140	4.2
262.563845379094	147.394367354318	11.3866336063064	290.6	140	0.4
266.314390058482	137.014836442507	11.8445406491405	301.6	127.6	0.4
267.690548603549	133.206366471376	12.012552984643	305.5	140	11.2
268.805060789453	130.122006773714	12.1486213931049	308.7	140	16.6
269.559837351175	124.448690359356	12.2532633205283	293.7	140	9.3
270.421470361846	117.972186810022	12.3727172343422	278.7	140	19.3
271.499647408055	109.868032011327	12.5221921910569	283.5	127.6	15
272.79316198419	100.145293125295	12.7015200123505	286.6	121.3	15.1
274.617983670659	86.4290004347579	12.9545078973849	263.8	73.2	0.8
276.075074310418	75.4767264122156	13.1565099106654	263	63	0.7
277.293733156463	66.3165986391681	13.3254536514123	294.5	73.2	1.3
278.574179384941	56.6920371461123	13.5029596399226	293.7	63	15.4
279.902167383847	46.7101142018239	13.6870550773657	280.3	37	9.6
281.102523662824	37.6875157827538	13.8534538237339	305.5	6.9	5.7
281.140025764502	37.4056757300721	13.8586512011781	308.7	6.9	18.2
279.135557887778	37.865187982321	13.537582943745	293.7	6.9	18.6
276.553006642529	38.4571988263168	13.1238953636707	290.6	6.9	18.4
273.018847359104	39.2673428474456	12.5577674639605	278.7	6.9	10.2
268.822434940575	40.2292924666471	11.8855537384826	275.6	6.9	6.7
263.281974165169	41.4993362587105	10.998040205496	248	14.2	2
258.619351665576	42.5681478657201	10.2511464224615	240.2	15.7	7.9
254.690938300858	43.4686528037397	9.62186458340442	236.2	14.2	3.3
251.429406158035	44.216285204915	9.09940816036612	224.4	14.2	0.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
251.429405452414	44.2162868444742	9.09940808797254	222	18.9	3.1
251.429404723671	44.2162885360133	9.09940769366891	218.9	20.5	18.5
251.100175225661	45.6646123184436	9.06292924908553	233.1	14.2	19.1
250.648964400294	47.6495361309097	9.01293649867142	240.2	22	17.8
250.14009102646	49.8881190748336	8.9565552943226	249.6	37	15.8
249.60974974432	52.2211372110469	8.89779568192352	234.6	31.5	11.8
249.034184297975	54.7530968558236	8.83402550196505	231.5	31.5	11.2
248.384261921147	57.6121527539964	8.76201699148377	227.6	31.5	14.9
247.55293617231	61.2691995299455	8.6699108176545	227.6	49.6	17.6
246.680428203282	65.107402410637	8.57324256529158	231.5	49.6	10.4
245.738483627191	69.2510527053529	8.46888132299454	234.6	49.6	6
244.672344311813	73.9410297553879	8.35076021565772	234.6	65.4	4.6
243.562058595834	78.8251998765279	8.22774830770512	231.5	65.4	1.8
242.358439232777	84.1199358647212	8.09439566856123	222	63	7.9
240.858432358796	90.7184653575828	7.92820610430936	227.6	65.4	13.5
238.667846311183	100.35481582481	7.68550642632388	222.8	73.2	10.5
233.764833635801	121.922973762269	7.14229057763539	215	121.3	10.5
229.142832205577	142.25496192521	6.63020880111729	211.8	127.6	10.4
222.489029067124	171.524892473636	5.89300976556913	224.4	147.3	2.3
Route: 3 Length: 274.309781074695 Demand Met: 608					
182.833057761739	387.258028069798	2.44380588361169	184.3	387.5	3.8
196.453770680768	368.897866958338	4.90344008941923	192.1	339.4	1.6
203.647682077153	359.200738857208	6.20251771929456	191.3	329.2	9.3
208.350865332893	352.860987632819	7.05181663904175	222.8	339.4	15.5
212.193684080441	347.680979726484	7.74575185685058	222	329.2	14.2
215.377482731696	343.389310038469	8.32068260272546	227.6	331.6	9.8
218.199184564045	339.585734571254	8.83022691161428	231.5	331.6	8.7
220.772472173598	336.117011525467	9.29491341548444	234.6	331.6	5.2
223.170379567193	332.884693744172	9.72792983952907	234.6	315.8	11.2
225.308860351105	330.002071565157	10.1140995609193	231.5	315.8	7.2
227.302792930353	327.314294910927	10.4741667761511	227.6	315.8	6.5
229.212595524911	324.739924345878	10.8190418537293	227.6	297.7	4.1
230.901275623904	322.463620893526	11.123985673491	231.5	297.7	7.4
232.408446158779	320.431992282466	11.3961515838292	224.4	280.4	17.9
232.724074244794	320.620205303542	11.357164585797	233.1	280.4	17.3
240.854382788837	325.468248392735	10.3529304012703	249.6	303.2	7.3
249.380859973401	330.552538937106	9.29975940201148	280.3	303.2	11.5
251.471014566906	335.13600263944	8.60290481963499	263	329.2	0.8
253.597136659535	339.798320637263	7.89406000724227	263.8	339.4	8.3
255.6921334547	344.392393507253	7.19559227608933	293.7	329.2	1.4
258.585101438921	353.868686948861	6.0124970764458	294.5	339.4	13.8
264.973281379809	374.793974991237	3.40003669481371	301.6	393.8	0.9
260.172567737239	376.334745115812	3.22942507459706	286.6	387.5	8.3
254.13153579585	378.273607286448	3.01473691388874	283.5	393.8	11.4
244.099298144611	381.493436956882	2.65821037193185	255.9	387.5	4.9
232.66362085843	385.163725919293	2.25181076179197	252.8	393.8	15.4
216.663488429334	390.298985345037	1.68320447028881	215	387.5	7.3
200.551066757306	395.470277257705	1.11060326405364	211.8	393.8	13.7
184.605320520949	400.587923298415	0.543919553518684	181.1	393.8	14.3
Route: 4 Length: 890.218869194932 Demand Met: 950					
74.020336779516	192.644396447278	8.99968858625287	85.8	170.1	5
57.4076525106425	155.531447398486	10.568712226083	51.2	121.3	6.2
54.7162363163361	149.518871103881	10.8229362779198	48	127.6	5.5
52.5892993144608	144.76737205687	11.0238339223424	39.4	140	3.5
50.6442500275207	140.422263352315	11.2075437047385	36.2	140	1.4
48.811188943088	136.327318538526	11.3806795941322	21.3	140	9.6
47.1384888959417	132.590585753988	11.5386737279138	9.40000000000001	140.2	11.5
45.870901768413	129.758946643704	11.6584104630578	6.3	140.2	17.5
44.7952113057906	117.949990350396	11.5595866030745	17.3	127.6	16.4
43.524964373583	104.005412820533	11.4430202904685	20.5	121.3	8.4
41.379236649724	80.45072681618	11.246309827656	28.3	73.2	9.3
39.8022902635776	63.1400180542752	11.1017347762318	27.6	63	3.4
38.3136312507241	46.7985420045805	10.9652519840806	14.2	37	6.3
37.2665165216019	35.3040949316087	10.8692308759254	9.40000000000001	7.1	2.4
37.1971020909176	34.5421587978481	10.8628528072897	6.3	7.1	12
38.8974692075958	34.4936449361926	10.7803388166081	21.3	6.9	14.1
40.7758460405937	34.4400528415269	10.6891869301149	24.4	6.9	1.6
42.8276893914559	34.3815092542331	10.5896142065938	36.2	6.9	0.3
44.9294423891356	34.3215402378114	10.4876158048233	39.4	6.9	14.8
47.0799927020903	34.2601780463343	10.3832507758656	52.8	15.7	13.8
49.1918414322449	34.1999190450781	10.2807624108557	60.6	22	16.9
51.2362397336087	34.1415831997693	10.1815471258701	63.8	14.2	14.4
53.1954122552203	34.0856784446066	10.0864670914194	66.9	14.2	11.4
55.0669766245073	34.0322730159484	9.99563687291155	70.1	14.2	16.8
56.8413613229585	33.9816399462303	9.90952381495249	81.1	18.9	10.9
58.4441232717128	33.9359029373857	9.8317395563964	84.3	17.3	5.6
59.8634604943399	33.8953986357547	9.76285675857839	76.4	22	1.9
61.2197036574706	33.856694386257	9.69703522242279	67.7	31.5	4.3
62.5599334422538	33.8184471519664	9.63199033336038	70.9	31.5	11.6
63.8798140972329	33.7807807581587	9.56793395926798	63.8	31.4	12.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
65.20597426966	33.7429361995019	9.50357247579444	44.9	37	12.5
66.621634893183	33.70253957546	9.4348667792972	58.3	63	8.5
68.1037159488376	33.6602484212442	9.36293601309609	59.1	73.2	9.3
71.1797435621442	33.5725316501981	9.21366008940845	63.8	65.4	13.7
74.5503035956506	33.4764194971152	9.05009115867559	67.7	65.4	8.4
78.2185913394292	33.3718224809164	8.87207167229939	70.9	65.4	6.9
82.2814445015457	33.2559819745385	8.67490251674258	63.8	49.6	2.8
87.0547262165724	33.1198854023813	8.4432513523612	67.7	49.6	9.5
92.9325925872089	32.9522929354363	8.15799002697911	70.9	49.6	14.9
101.599211023748	32.7051832173629	7.73737568083419	85.8	37	14
112.882189111759	32.3834541795753	7.18976453304825	116.5	37	12.1
123.883033367732	32.0697800213828	6.6558457598455	127.6	20.5	16.5
134.627359812625	31.7634405285171	6.13438202199197	141.7	-7.9	4.6
137.679906832048	31.676373656313	5.98624403204672	149.6	-7.9	5.2
140.553761297681	33.7070699319477	5.85796128227956	141.7	17.3	2
143.591418233958	35.8535118622892	5.72236670880336	136.2	29.1	0.8
146.82526783488	38.138584243508	5.57801393012714	142.5	29.1	2.7
150.263056209989	40.5677597000271	5.42455840651002	155.1	29.1	1.4
153.812525874755	43.0758488209565	5.26611415583259	148.8	29.1	19.2
157.762371648745	45.8668469891466	5.08980187637825	161.4	29.1	11.5
161.974485982466	48.8431717506537	4.90178179499765	173.2	18.9	8.3
166.852154501754	52.2897842474353	4.68405599037803	178	37	4.3
171.941243923807	55.8857897840829	4.45689499706167	208.7	37	3.4
171.80394165667	74.0642768008721	4.22510689476622	191.3	63	18.3
171.620338054716	98.4060109944518	3.91469711305357	192.1	73.2	7.8
Route: 5 Length: 287.764731914671 Demand Met: 913					
142.098925078804	395.558642327072	4.21537402938339	122.8	387.5	3.6
124.515165337021	389.132205230656	6.9403055546025	119.7	393.8	17.8
106.271064459974	382.46436702177	9.76755104910726	92.1	387.5	18.7
94.4809854449886	378.155306015253	11.5946382893242	89	393.8	11
83.92453518001	374.297132239758	13.2305638186709	48	393.8	19.4
84.6703095660697	371.191728727149	13.052727055227	51.2	387.5	1.4
87.64567910994	358.802370129722	12.3431669033255	59.1	339.4	4.8
89.2841875628853	351.979672155853	11.9524185917546	67.7	331.6	4.4
90.6389462476064	346.338539402923	11.6293143973985	58.3	329.2	7.6
91.7033110775605	341.906595069639	11.3754620695868	63.8	331.6	18.4
92.7279470737645	337.640078170518	11.1310859575937	70.9	331.6	19.3
93.7430025265687	333.413451585253	10.8889954059532	70.9	315.8	15.2
94.6572166697039	329.60672332915	10.6709537869352	67.7	315.8	13.4
95.5146486611384	326.036432387	10.4664536296579	63.8	315.8	14.7
96.3437288515697	322.584193026019	10.2687174113805	63.8	297.6	5.2
96.3438064519472	322.584150537316	10.2687215779555	67.7	297.7	2.9
96.3438838691154	322.584108355569	10.2687247626826	70.9	297.7	11.7
96.3439609336361	322.584066424096	10.2687292185055	76.4	288.2	6.4
96.3440382840345	322.584024078428	10.2687324302064	84.3	283.5	16.3
96.51264349358	322.570447910975	10.2657861311033	81.1	285.1	18.2
101.115410100717	322.200003042873	10.1855157931114	85.8	303.2	13.4
106.330064103056	321.780316557812	10.0945767490251	99.2	329.2	7.7
111.850836671025	321.335997428486	9.9983007421725	100	339.4	3.8
118.098854258633	320.833148103853	9.889341544935	116.5	303.2	9.1
124.379165930513	320.32769724558	9.77982033097251	127.6	286.7	5.8
129.914057674958	319.882232858317	9.68329787808755	136.2	295.3	3.1
135.020646694259	319.471237306545	9.59424245852191	141.7	283.5	17.7
138.794795450574	319.167470385147	9.52842223082398	142.5	295.3	13.4
142.413570904214	318.876206254836	9.46530992853036	148.8	295.3	14.4
145.820250661301	318.602008765568	9.40589481374775	161.4	295.3	10.8
148.805119863271	318.361755152984	9.35383187607532	173.2	285.1	12.1
149.345922779904	320.661083507181	9.10700763515738	178	303.2	1.5
149.93426231621	323.162525899728	8.8384851051862	161.4	315.8	7.1
150.526340318154	325.679864286287	8.56825637264627	155.1	315.8	5.4
151.132211650096	328.255847957552	8.29173135064849	148.8	315.8	8.4
151.770563714659	330.969930712924	8.00038305867111	142.5	315.8	4.2
152.469202757917	333.940337616424	7.68151987132238	136.2	315.8	9.7
153.282116177249	337.396607023453	7.31050537698133	129.9	329.2	5.1
154.200384213657	341.300810194136	6.89141136355907	130.7	339.4	10.6
155.192633521012	345.519525733864	6.43856372496542	136.2	331.6	10.8
156.321808115904	350.320364184294	5.92322849105806	142.5	331.6	14.7
157.707206369019	356.210626306922	5.29094184444405	155.1	331.6	14.3
159.415802245684	363.475051249437	4.51113050236048	161.4	331.6	4.6
Route: 6 Length: 533.359392989436 Demand Met: 950					
225.162290873394	325.736228337122	4.95264896693373	234.6	297.7	7.7
234.802584170752	311.971002915111	5.80739651733197	240.2	288.2	11.3
241.125754859847	302.942017739191	6.36800238177638	236.2	280.4	11.1
245.83006770973	296.224265543511	6.78507013230479	240.2	281.9	12.5
250.123196963615	290.093891035526	7.1656712747143	248	280.4	9.5
254.136730674175	284.363093844827	7.52146617577729	252.8	260.7	8.8
257.356848282635	279.765302299067	7.80690607117398	255.9	254.4	18.1
259.912283536043	276.116602418537	8.03341943045041	275.6	273.1	17.9
262.232159181043	272.804267421693	8.23904892912836	278.7	273.1	18.4
264.414445168346	269.688397906412	8.43248352527468	290.6	273.1	10.7

Solution x	Solution y	Solution z	Original x	Original y	Original z
266.444724036435	266.78958390941	8.61244364274321	293.7	273.1	6.2
268.369348886291	264.04163634961	8.78303681248916	308.7	273.1	9.4
267.961231825299	261.672316586904	8.87779948714834	305.5	273.1	0.7
266.947452409509	255.784343476894	9.11334167455573	301.6	260.7	2.7
265.551279996962	247.673989996055	9.43780909510939	283.5	260.7	2.6
263.80850939154	237.548919984641	9.84292601278091	286.6	254.4	15.7
260.6455890732	219.16476367436	10.5789524928981	294.5	206.3	5.6
258.947249811926	209.297844445843	10.9736449385421	293.7	196.1	5.6
257.870611096834	203.043338969432	11.2237674538709	263.8	206.3	6.2
256.769484619078	196.646539127192	11.4795763350005	263	196.1	17.9
255.67423369352	190.283913851377	11.734014757275	280.3	170.1	14.3
254.846487995547	185.475445077295	11.9262918087552	249.6	170.1	0.7
254.103890829388	181.161693809337	12.0987765523008	234.6	164.6	0.1
253.476217755533	177.515632423223	12.2445544987939	227.6	164.6	1.4
252.934691035604	174.370063319232	12.370313711241	231.5	164.6	6.5
252.426067578553	171.415619305434	12.4884299762155	240.2	155.1	5.1
251.953825678913	168.672514648202	12.5980943494817	240.2	148.8	5.8
251.52241512637	166.166615738706	12.6982735345522	248	147.3	4.5
251.118995384741	163.823354443566	12.7919486547343	252.8	127.6	3.3
250.856374834125	162.298107405433	12.8529096375626	255.9	121.3	14.5
249.557812735097	165.242285655754	12.7338126117812	236.2	147.3	7.3
248.186428268987	168.351469203876	12.6080351807906	233.1	147.3	11.4
246.703212683186	171.714098708781	12.472000938959	222	152	14.6
245.109253784136	175.327729956208	12.3258115219729	218.9	153.6	11.5
243.301700309653	179.425432653713	12.1600347475712	208.7	170.1	15.4
241.741388358493	182.962905994611	12.0169265791881	231.5	182.7	19.2
240.229266254319	186.391178310204	11.8782363690228	234.6	182.7	13.3
238.72036395368	189.812153789946	11.7398416346152	227.6	182.7	0.3
237.203792194632	193.250508029199	11.6007402502237	222	196.1	3.2
235.757745573363	196.528989688277	11.4681067818927	231.5	198.5	1.6
234.323749738395	199.780083966205	11.3365784295618	234.6	198.5	10.6
232.850924240154	203.119024724232	11.2014937756833	227.6	198.5	10.4
231.312749906068	206.605795500011	11.0604193672712	222.8	206.3	17
229.73399622858	210.184167783011	10.9156249568339	191.3	196.1	16.7
226.359319272018	221.091582924397	10.3062239238157	192.1	206.3	17
219.583134752626	242.994240442831	9.08235612090791	215	254.4	19.4
214.143454194035	260.578174938626	8.09978656474205	211.8	260.7	3.2
207.544158834153	281.908789612725	6.90773654166291	222	285.1	1.9
200.56834642874	304.454529294789	5.64779167892968	218.9	286.7	3.7
Route: 7 Length: 652.553413915055 Demand Met: 949					
159.891112255916	338.501804450577	1.17063890978481	148.8	331.6	0.2
154.780773328724	302.113534512197	1.80649065700097	155.1	295.3	0.7
150.033149297641	268.309441779546	2.39729073089631	119.7	260.7	11.7
147.271848867593	248.649146257658	2.74106819854812	122.8	254.4	9.9
144.705793820551	230.376541703013	3.06055786000164	130.7	206.3	18.1
143.28747230223	220.276282565734	3.23706905461206	129.9	196.1	10
142.307272487367	213.296179269333	3.35904455321121	136.2	198.5	8.4
141.479276814263	207.400176873061	3.46208259564364	142.5	198.5	1.1
140.727920916593	202.050000269304	3.55558338502408	148.8	198.5	8.3
140.009835318339	196.936758963931	3.64494420282614	155.1	198.5	17.6
139.286829955518	191.788510825824	3.73491504547941	155.1	182.7	16.5
138.608596057004	186.9591286653	3.81930875464509	148.8	182.7	9.2
137.950335500334	182.272021883575	3.90121214656376	142.5	182.7	2.1
137.296719573552	177.617998671712	3.98253531720016	136.2	182.7	6.2
136.636043083766	172.913634188548	4.06473823244523	116.5	170.1	13.6
136.01229472595	168.472021989766	4.14235198512849	136.2	162.2	1.7
135.417855349611	164.239077463244	4.21632444379132	142.5	162.2	2.7
134.833226865263	160.076045493936	4.28908188054034	148.8	162.2	5.3
134.239191889854	155.846157898655	4.36301013639389	155.1	162.2	15.7
133.607301631371	151.346917973139	4.44164360702201	161.4	162.2	17.4
132.859830395541	146.024921243131	4.5346549238057	141.7	150.4	15.8
132.105436794721	140.653668409019	4.62852715443716	127.6	153.6	18.6
131.332502235953	135.150350658455	4.72471943590269	119.7	127.6	15.5
130.641465856515	130.230101043817	4.81072741261296	122.8	121.3	7.8
130.023747403909	125.831813153648	4.88762027547673	89	127.6	0.1
130.448299093091	116.755466346452	5.24217039257652	92.1	121.3	6.9
131.475342541311	94.7700839515694	6.10048310905844	100	73.2	14.4
131.802304940761	87.7768881599575	6.3737600666192	99.2	63	0.7
133.10373889321	87.3101329326912	6.64378240375761	129.9	63	9.4
134.24734596621	86.9000076164031	6.8810566219327	130.7	73.2	7.2
135.40138871422	86.4861386542413	7.12049608917321	136.2	65.4	3.7
136.509143834732	86.0888799162308	7.35032983157499	142.5	65.4	2.7
137.578869670295	85.7052683378504	7.572272226946	142.5	49.6	0.1
138.546979487989	85.3580808775504	7.77312577020917	136.2	49.6	6.3
139.482647951721	85.0225244692067	7.96724776339814	148.8	49.6	18.9
140.301883818894	84.7286711490155	8.13721580056373	161.4	49.6	13.6
140.431393685706	85.7255279726144	8.12294091543551	155.1	49.6	5.1
140.843402934472	88.8973570348078	8.07752259140572	148.8	65.4	6.2
141.315967799933	92.5350809961586	8.02543739953009	155.1	65.4	8.7
141.871134250968	96.8082851083006	7.96426029593819	161.4	65.4	7.2

Solution x	Solution y	Solution z	Original x	Original y	Original z
145.257807747195	122.867329093075	7.59129540559734	184.3	121.3	14.5
147.03047582627	136.510456453446	7.39597555814023	181.1	127.6	7.7
149.322785288151	154.155228010261	7.14336736879125	173.2	152	19.2
151.689763221503	172.37763314679	6.8823209751683	178	170.1	11.6
154.01090264074	190.252602614799	6.62610628213345	161.4	182.7	0.7
156.929989155764	212.730780910528	6.30409560113468	161.4	198.5	1.4
161.49067381367	247.841540120342	5.8013105426997	184.3	254.4	16.9
164.788982422784	273.231020690575	5.43775071554715	181.1	260.7	13.4
168.977903415436	305.474882963626	4.97610967175752	208.7	303.2	16.2

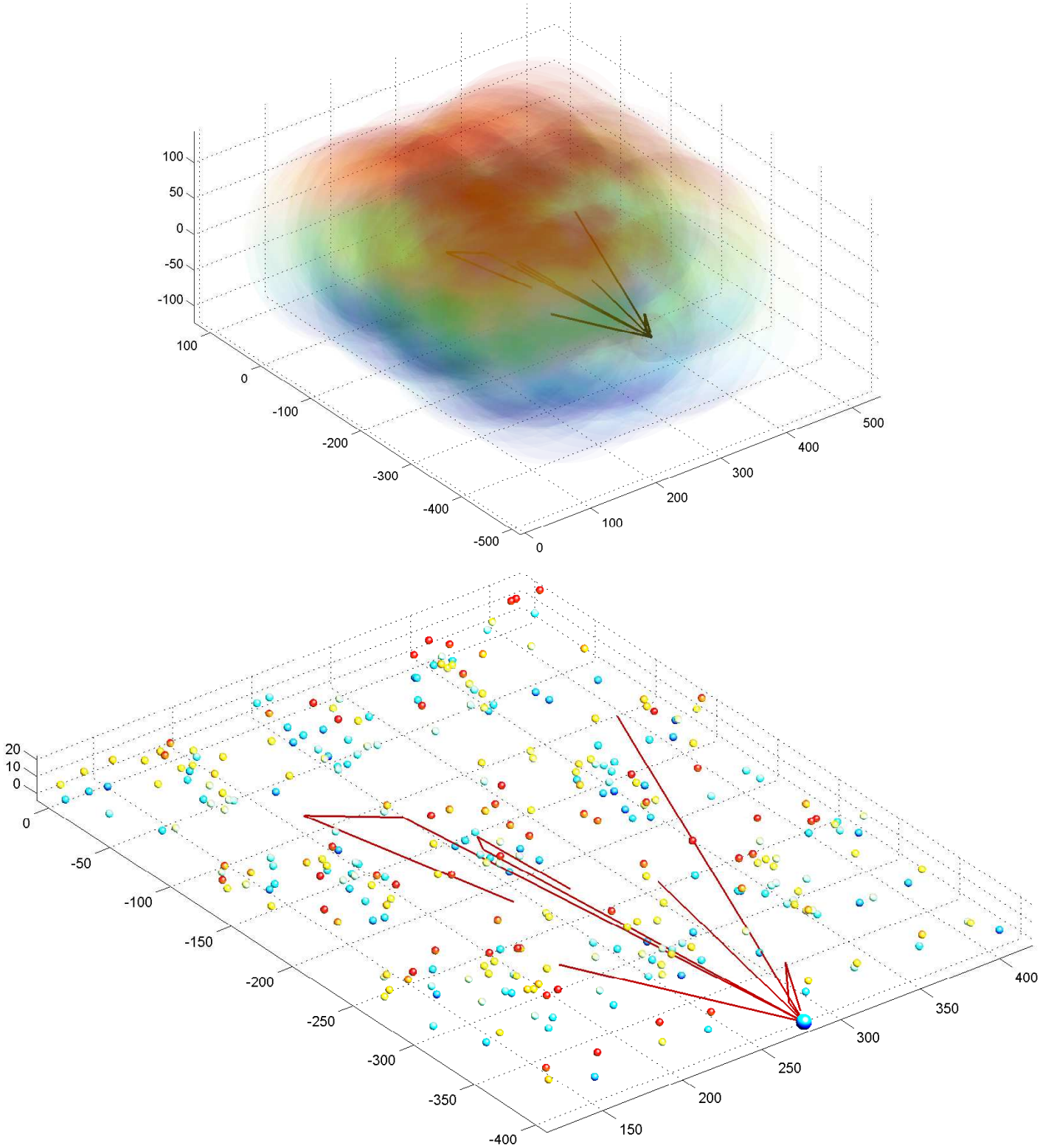


Figure O.78: $lin318$, $r = 124.02$, Equal Radius, 3D, Euclidean, Length = 2367.9567361

Table O-81: Solution for *lin*318, $r = 124.02$, Equal Radius, 3D, Euclidean

Total distance: 2367.95673608988 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 103.193568535905 Demand Met: 948					
171.492463480825	395.332075416232	1.14119814804782	100	339.4	3.8
172.981704550552	388.426558534489	1.91630824443597	59.1	339.4	4.8
173.625865154456	387.496282701115	2.03002300775285	67.7	331.6	4.4
174.170000698595	386.710427384422	2.12607137686079	99.2	329.2	7.7
175.011474217862	385.494657195257	2.27470433450456	116.5	303.2	9.1
176.077587777037	383.954209342596	2.4630998226139	127.6	286.7	5.8
177.204728897729	382.325834951946	2.66229271478534	136.2	295.3	3.1
178.314740317491	380.722535453136	2.85843225366372	141.7	283.5	17.7
179.359221183568	379.213946863068	3.04298265377793	142.5	295.3	13.4
180.358605564586	377.77047130904	3.21955483405662	148.8	295.3	14.4
181.321181436536	376.380080088188	3.38961812685363	161.4	295.3	10.8
182.246084120991	375.044044481125	3.55301597969876	173.2	285.1	12.1
183.120292477241	373.781253095585	3.70744659590645	181.1	260.7	13.4
183.882166846805	372.680722666592	3.8420213846579	184.3	254.4	16.9
184.464299266649	371.839813634892	3.94484098377745	211.8	260.7	3.2
184.97294683955	371.105072919164	4.03467918380662	222	285.1	1.9
185.4492055628	370.417168978697	4.11879787269041	218.9	286.7	3.7
185.907514324332	369.75519762095	4.19974944650014	227.6	297.7	4.1
186.350059411645	369.116016861358	4.27791575523503	231.5	297.7	7.4
186.780092371223	368.494917621374	4.35387140278544	234.6	297.7	7.7
187.198604625643	367.890462232458	4.4277899087177	249.6	303.2	7.3
187.603515003279	367.30567191401	4.49930131950194	234.6	315.8	11.2
187.995421046097	366.739680718605	4.56851305016403	231.5	315.8	7.2
188.377205687908	366.188317011242	4.6359333779298	227.6	315.8	6.5
188.750089106825	365.649810612356	4.701779369706	234.6	331.6	5.2
189.110074344218	365.129944597268	4.76534342922355	231.5	331.6	8.7
189.456664403046	364.629432033971	4.82653928517135	227.6	331.6	9.8
189.789225764864	364.149190065988	4.88525412550555	222	329.2	14.2
190.108820949066	363.687687804147	4.94167546713354	208.7	303.2	16.2
190.419209782388	363.239487578881	4.99646816974163	224.4	280.4	17.9
190.72152065185	362.802961526642	5.04983143800459	233.1	280.4	17.3
191.018788120615	362.373729999791	5.10230067663011	236.2	280.4	11.1
191.315843202037	361.944814486624	5.1547283397409	240.2	281.9	12.5
191.617627701658	361.509077486333	5.20798772651284	240.2	288.2	11.3
191.927212376738	361.06208645824	5.2626205018166	248	280.4	9.5
192.230212950354	360.624620629434	5.31608470875395	252.8	260.7	8.8
192.504322205956	360.228896032057	5.36443998136772	255.9	254.4	18.1
191.813907015157	361.57593606191	5.20484967573421	275.6	273.1	17.9
190.768602427837	363.615383781791	4.96322274684056	280.3	303.2	11.5
189.594484624948	365.906264630925	4.69179846097583	263	329.2	0.8
188.364603324257	368.306068545645	4.4074689768841	263.8	339.4	8.3
187.064607181763	370.842811875813	4.10692577823127	293.7	329.2	1.4
185.33662413296	374.214537998299	3.70739594544813	294.5	339.4	13.8
182.913022038758	378.9427846742	3.14699787449575	301.6	393.8	0.9
179.368036350954	385.857839895384	2.32724236236676	286.6	387.5	8.3
175.874021666122	392.673848759078	1.51937665063583	283.5	393.8	11.4
173.587896137503	397.134027446114	0.99111994771259	255.9	387.5	4.9
Route: 2 Length: 597.289657369706 Demand Met: 950					
200.052879064955	317.561184915957	4.01604432140439	155.1	295.3	0.7
223.359630570744	250.915687526865	7.05947064619494	234.6	164.6	0.1
234.817667455589	218.151596838139	8.55573221154813	248	147.3	4.5
241.652082413798	198.608927017884	9.44808262363671	252.8	127.6	3.3
246.009380783276	186.150143981732	10.0168799185104	255.9	121.3	14.5
250.198012555579	174.173050562017	10.5637489798393	263.8	73.2	0.8
252.983734833146	166.207196494798	10.927475474531	263	63	0.7
255.034563413823	160.342803629963	11.1952534074549	222.8	73.2	10.5
256.88006041729	155.065681269663	11.4362180246999	227.6	65.4	13.5
258.51130894193	150.40124754453	11.6492046722495	227.6	49.6	17.6
259.846502203146	146.583307311282	11.8235409990112	231.5	49.6	10.4
261.012111526007	143.250251373164	11.9757372678979	234.6	49.6	6
262.060417539974	140.252587988119	12.1126195916378	249.6	37	15.8
262.967358406155	137.659120751122	12.2310471656794	234.6	31.5	11.8
263.734984276522	135.46398649554	12.3312868150391	231.5	31.5	11.2
264.407759916104	133.54006923111	12.4191420645118	227.6	31.5	14.9
265.008701347827	131.821576345848	12.4976166662271	240.2	22	17.8
265.52675242333	130.340131861424	12.5652656542118	233.1	14.2	19.1
265.907768185607	129.250614007476	12.6150152615164	218.9	20.5	18.5
266.23371975099	128.318628163545	12.6575728155766	222	18.9	3.1
266.517055570153	127.50858055055	12.6945641286958	224.4	14.2	0.3
266.746261568803	126.853406426662	12.7244876653048	236.2	14.2	3.3
266.951985534339	126.265444460139	12.7513465664625	240.2	15.7	7.9
267.142408981967	125.721308981144	12.7762094351056	248	14.2	2
267.317446716188	125.221279927836	12.7990617205446	275.6	6.9	6.7
267.466134567781	124.796671638432	12.8184751001801	278.7	6.9	10.2

Solution x	Solution y	Solution z	Original x	Original y	Original z
267.588201174498	124.448246176929	12.8344105007762	290.6	6.9	18.4
267.695142279843	124.14301327506	12.8483653300781	293.7	6.9	18.6
267.794861906703	123.858240503044	12.8613755996467	308.7	6.9	18.2
267.688301343806	124.162921289307	12.8474570244481	305.5	6.9	5.7
266.117910531432	128.653638308866	12.6423995722475	280.3	37	9.6
264.226380206947	134.062592593673	12.3954006182965	293.7	63	15.4
262.104075541166	140.131448100973	12.1182684759216	294.5	73.2	1.3
259.716687821485	146.958336218617	11.8065224762457	286.6	121.3	15.1
257.236154330459	154.051637088838	11.482622939604	283.5	127.6	15
254.660688617965	161.416503674059	11.1463410004359	301.6	127.6	0.4
251.919521058608	169.25541515676	10.7884444665079	308.7	140	16.6
249.038997216252	177.493195745487	10.4123911498357	305.5	140	11.2
246.029857258294	186.099169921065	10.0195798685163	293.7	140	9.3
242.797706793807	195.343128449609	9.5976781184329	290.6	140	0.4
238.667534201205	207.15565192041	9.05860624165263	275.6	140	4.2
232.979769769136	223.42275793223	8.31620786973875	278.7	140	19.3
225.255282811765	245.518828068348	7.30812960900383	280.3	170.1	14.3
Route: 3 Length: 259.017945873327 Demand Met: 949					
153.205313624588	381.717818989532	2.12531184539921	51.2	387.5	1.4
141.574167727826	364.531419604011	3.66077171532217	48	393.8	19.4
131.63144375293	349.839981512336	4.97326735732258	17.3	393.8	14.6
129.418055663994	346.570244773805	5.26530890366456	20.5	387.5	17.4
127.254973198561	343.374483649539	5.55071175443129	28.3	339.4	12.9
125.298000076334	340.482985316363	5.80899680126484	27.6	329.2	2.8
123.594927398294	337.966619476941	6.03380046083964	14.2	303.2	5.3
122.285994438323	336.032584269547	6.20657034200625	44.9	303.2	8.5
121.092166309883	334.268630803909	6.36414532656585	58.3	329.2	7.6
119.956556420322	332.590700391946	6.51403467415699	63.8	331.6	18.4
118.850485200549	330.956415150115	6.66002516414261	70.9	331.6	19.3
117.751814520953	329.33306058202	6.80503827139452	63.8	315.8	14.7
116.658137499579	327.717079599634	6.94939024057658	67.7	315.8	13.4
115.566018725867	326.103396357622	7.09353479017656	85.8	303.2	13.4
114.477738192742	324.495383979361	7.2371718982406	70.9	297.7	11.7
113.401085968786	322.90455509229	7.37927456423699	63.8	297.6	5.2
112.341035246505	321.338257811073	7.51918677942066	67.7	297.7	2.9
111.297561260252	319.796456838119	7.65691183495267	76.4	288.2	6.4
110.270389192248	318.27874830072	7.79248501561688	84.3	283.5	16.3
109.257843012271	316.782656459803	7.92612750303056	81.1	285.1	18.2
108.261540419389	315.310570084216	8.05762519440134	70.1	280.4	12.5
107.287093458597	313.87077876513	8.18623601748413	66.9	280.4	18.4
106.335803522042	312.46520330622	8.31178987275834	63.8	280.4	12.2
105.411163447057	311.099003145227	8.43382530707891	60.6	288.2	12.5
104.516370954106	309.776901911789	8.55192139993542	52.8	281.9	9
103.658178380584	308.508875789523	8.66518639246263	48	260.7	17.4
102.839804331233	307.299680292873	8.77319687122846	51.2	254.4	2.7
102.062561681603	306.151254026126	8.87577811178593	39.4	273.1	0.8
101.325155242596	305.061682289036	8.97310128850046	36.2	273.1	6.7
100.626875577309	304.029916036118	9.06526009251789	24.4	273.1	19.3
99.9677689273158	303.056023981073	9.15224896521369	21.3	273.1	15.8
99.3502072114819	302.143510426382	9.23375432379439	9.40000000000001	273.3	14
98.779575697698	301.300332995079	9.30906550760588	6.3	273.3	11.2
98.2591744310133	300.531367829422	9.37774686726604	17.3	260.7	14.5
97.7799168126794	299.823189597851	9.44099806657005	20.5	254.4	9
97.3309195757562	299.159718306361	9.50025499268978	28.3	206.3	15.8
96.909952722951	298.53766286453	9.55581238795935	27.6	196.1	18.7
97.1204935410215	298.848779180632	9.52802658226958	59.1	206.3	14.9
97.3381781195794	299.170456297249	9.49929775907529	58.3	196.1	1.6
97.5664462603894	299.507782049891	9.46917096382256	63.8	198.5	2.5
97.7992594530803	299.851840107978	9.43844345052969	67.7	198.5	11.8
98.03061645099	300.193761491704	9.40790749100435	70.9	198.5	18.8
98.250712639026	300.51905197514	9.37885818735927	67.7	182.7	12.4
98.6260143994046	301.073680502676	9.32931603229935	70.9	182.7	16.9
101.555413415176	305.402606873535	8.94272253751666	99.2	196.1	13.9
105.437783729398	311.1394601986	8.4303022232524	100	206.3	18
110.482647995067	318.593623357606	7.76435851832224	92.1	254.4	16.6
116.177631282219	327.008189874214	7.01258481904077	89	260.7	3.7
123.479663170151	337.797970626289	6.0488105904119	122.8	254.4	9.9
131.834517032161	350.142592014362	4.94588557549957	119.7	260.7	11.7
142.575133854303	366.012282320529	3.52796078179344	148.8	331.6	0.2
154.9303447875	384.267819743773	1.89692621932336	184.3	387.5	3.8
Route: 4 Length: 645.030927608646 Demand Met: 950					
141.950361231629	221.181766511875	4.11432043076047	234.6	182.7	13.3
133.678667449733	165.436159428942	5.35866392106087	215	121.3	10.5
128.31537526311	129.291222984139	6.16548544679102	234.6	65.4	4.6
127.069225559434	128.370708939239	6.21470672960649	231.5	65.4	1.8
125.41044615745	127.145402389768	6.28022604314404	222	63	7.9
123.577591636812	125.791508970657	6.35262116237456	208.7	37	3.4
119.607315348607	122.858702490588	6.50944247317034	178	37	4.3
115.445328274862	119.784264745394	6.67383662680845	173.2	18.9	8.3
111.412555761675	116.805272302708	6.83312706383631	161.4	29.1	11.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
107.421263827961	113.856921541099	6.99077899322211	148.8	29.1	19.2
103.555412719717	111.001236469079	7.14347617256112	155.1	29.1	1.4
99.7782988371471	108.211102793561	7.29266814758674	142.5	29.1	2.7
96.1237716511269	105.511524459504	7.43701807890957	136.2	29.1	0.8
92.5888891147232	102.900327409104	7.57664216111024	141.7	17.3	2
89.1553791938473	100.364012908356	7.71226215767138	149.6	-7.9	5.2
89.1250575431748	100.351781614826	7.71346798217218	141.7	-7.9	4.6
89.0942832060947	100.339367672159	7.7146917392422	127.6	20.5	16.5
89.0635361165212	100.326964713689	7.71591449764122	116.5	37	12.1
89.0327966769887	100.314564839862	7.71713689928745	85.8	37	14
89.0021485294482	100.302201820856	7.71835568343622	70.9	49.6	14.9
88.9715889059021	100.289874547272	7.71957098228006	67.7	49.6	9.5
88.9411065453305	100.277578476394	7.72078322193562	63.8	49.6	2.8
88.9107086334458	100.265316505487	7.72199205142144	70.9	65.4	6.9
88.8803707143846	100.253078769581	7.72319850733348	67.7	65.4	8.4
88.8501656863243	100.240894670564	7.72439966057254	63.8	65.4	13.7
88.8201895659585	100.22880293493	7.72559177154312	59.1	73.2	9.3
88.7905760433168	100.216857488304	7.7267694410335	58.3	63	8.5
88.7614335815617	100.205102079739	7.7279283449567	44.9	37	12.5
88.7327898572369	100.193547867569	7.72906745735	63.8	31.4	12.4
88.7046098771636	100.182180739639	7.7301881319213	70.9	31.5	11.6
88.6768580394183	100.170986333064	7.73129181804893	67.7	31.5	4.3
88.6495073850407	100.159953768826	7.73237952728258	76.4	22	1.9
88.6224838271668	100.149053162667	7.73345419497738	84.3	17.3	5.6
88.5957308930876	100.138261736707	7.73451809255434	81.1	18.9	10.9
88.5692013776149	100.127560448301	7.7355731012486	70.1	14.2	16.8
88.5428040013899	100.116912477633	7.7366229180256	66.9	14.2	11.4
88.5164186851148	100.106269392325	7.73767220976555	63.8	14.2	14.4
88.4898658097053	100.095558747235	7.73872816809202	60.6	22	16.9
88.4628030824749	100.08464248426	7.73980442186564	52.8	15.7	13.8
88.4350368750632	100.073442514341	7.7409086235389	39.4	6.9	14.8
88.4066898224705	100.06200831503	7.74203601252941	36.2	6.9	0.3
88.3778597543599	100.050379356759	7.74318251786761	24.4	6.9	1.6
88.3489891697153	100.038734115079	7.74433057938327	21.3	6.9	14.1
88.3206027802515	100.027284215435	7.74545946767532	6.3	7.1	12
88.5021305410102	100.712054519166	7.72809689002204	9.40000000000001	7.1	2.4
90.0584773751125	106.582966180642	7.57923655157228	14.2	37	6.3
92.0911362118815	114.25062531707	7.38481826013901	27.6	63	3.4
94.479185685261	123.258884444802	7.15640806950938	28.3	73.2	9.3
97.3538323097464	134.102676603797	6.8814573699749	20.5	121.3	8.4
100.506949041605	145.996901339573	6.57987304150083	17.3	127.6	16.4
104.263505997201	160.167460953255	6.22056883013357	6.3	140.2	17.5
109.471786557931	179.814274555034	5.7224108619408	9.40000000000001	140.2	11.5
122.3385633805	228.350647258696	4.49173822444985	63.8	182.7	4.6
Route: 5 Length: 291.354906971698 Demand Met: 948					
178.141240409352	338.086074379149	3.73771732603348	215	254.4	19.4
181.497403226236	312.495521382064	5.156559721957	192.1	206.3	17
182.988411826285	301.126675414003	5.78689049148872	191.3	196.1	16.7
183.812404870122	294.843804246595	6.13523433620773	161.4	182.7	0.7
184.276629847008	291.304109626321	6.33148660033254	161.4	198.5	1.4
184.756400811978	287.64586726718	6.53431245558446	148.8	198.5	8.3
185.202204495252	284.246673547132	6.72277610985503	142.5	198.5	1.1
185.608475981414	281.14893296279	6.89452584288281	136.2	198.5	8.4
185.980632383662	278.311321792011	7.05185308515954	129.9	196.1	10
186.322407001063	275.705365727805	7.19633649881786	130.7	206.3	18.1
186.647384832333	273.227478078444	7.33371943062619	155.1	198.5	17.6
186.957327504032	270.86422594967	7.46474655006713	155.1	182.7	16.5
187.247362565514	268.652761823176	7.5873580407559	148.8	182.7	9.2
187.520337019341	266.57137914762	7.70275737637803	142.5	182.7	2.1
187.778092026548	264.606041244011	7.81172271036044	136.2	182.7	6.2
188.021666351827	262.748829774239	7.91469312553369	116.5	170.1	13.6
188.21466856614	261.27722047932	7.99628448139126	127.6	153.6	18.6
188.214670471554	261.277221302394	7.99628433460484	141.7	150.4	15.8
188.214672371545	261.277222137431	7.9962842778645	136.2	162.2	1.7
188.214674278701	261.277222973751	7.9962841024502	142.5	162.2	2.7
188.214676194455	261.27722381306	7.99628391394961	148.8	162.2	5.3
188.214678119823	261.277224656692	7.99628366753601	155.1	162.2	15.7
188.214680055086	261.277225505462	7.99628348830831	161.4	162.2	17.4
188.21468200003	261.277226360126	7.99628330506636	173.2	152	19.2
188.214683949243	261.277227219305	7.99628320242269	178	170.1	11.6
188.214685905731	261.277228085495	7.9962830220378	208.7	170.1	15.4
188.214687867866	261.277228958727	7.99628287464768	218.9	153.6	11.5
188.214689827052	261.277229840257	7.99628267821103	222	152	14.6
188.214691787951	261.277230755988	7.99628262483856	227.6	164.6	1.4
188.214693746143	261.277231675773	7.99628240640502	231.5	164.6	6.5
188.214695699918	261.277232597065	7.99628230284347	249.6	170.1	0.7
188.214697649798	261.277233517988	7.99628196797121	231.5	182.7	19.2
188.214699597585	261.277234438262	7.99628194628744	227.6	182.7	0.3
188.214701547326	261.277235358895	7.99628174998395	222	196.1	3.2
188.214703503589	261.277236281954	7.99628159964257	231.5	198.5	1.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
188.214705469254	261.27723720922	7.99628134316922	227.6	198.5	10.4
188.214707445213	261.277238142282	7.99628111724101	222.8	206.3	17
188.214709432088	261.277239082745	7.99628099356622	234.6	198.5	10.6
188.214711425313	261.277240032971	7.99628088459244	263.8	206.3	6.2
188.214713412203	261.277240994068	7.99628073254075	293.7	196.1	5.6
187.94909996965	263.302563706917	7.8839893219961	294.5	206.3	5.6
187.573775424067	266.164449240046	7.72531545525723	286.6	254.4	15.7
187.180308134297	269.164679408874	7.55897174674078	283.5	260.7	2.6
186.769180129784	272.2995776506	7.38516213393649	301.6	260.7	2.7
186.312806442727	275.779454063462	7.19222792845562	305.5	273.1	0.7
185.801498226321	279.678096461889	6.97608036770268	308.7	273.1	9.4
184.406428391688	290.315014441697	6.38632877641473	293.7	273.1	6.2
182.680424266885	303.475646402308	5.65664770788266	290.6	273.1	10.7
180.256044865781	321.961692476055	4.6317042796226	278.7	273.1	18.4
Route: 6 Length: 472.0697268613 Demand Met: 950					
153.005454569968	292.108668857801	4.69631363354077	70.9	315.8	15.2
141.550819139042	212.397605434145	7.99767919457969	44.9	170.1	19.9
137.409808570216	183.581018123907	9.19118467512288	14.2	170.1	13.5
137.409854535794	183.580894841924	9.19118772560904	24.4	140	15.5
137.409894648632	183.580786045986	9.19119049505821	21.3	140	9.6
137.567927700028	183.226633890387	9.20035108360841	36.2	140	1.4
137.744142101971	182.831738711718	9.21056560277651	39.4	140	3.5
137.927795087617	182.420175856186	9.22121130685937	48	127.6	5.5
138.110782024519	182.01010674354	9.23181837224382	51.2	121.3	6.2
138.290333117497	181.60773764756	9.24222630408178	66.9	147.3	5
138.466317362793	181.213361430844	9.25242736515759	70.1	147.3	17.8
138.639160055062	180.826024844092	9.26244657993462	63.8	147.3	12.9
138.810332378625	180.442431120532	9.27236894978355	52.8	148.8	15.5
138.981557156808	180.058719633176	9.28229445933616	60.6	155.1	13.8
139.153704367641	179.672940911844	9.29227351344738	63.8	164.5	8.3
139.327737890324	179.282935117757	9.30236193929497	67.7	164.6	2.1
139.504009259864	178.887914656944	9.31257993356016	70.9	164.6	8.4
139.68253581024	178.487840753572	9.32292878392468	85.8	170.1	5
139.862896329404	178.083657412755	9.33338387399019	76.4	155.1	3.4
140.04429138704	177.677156074019	9.34389887709318	81.1	152	7.1
140.226029814475	177.269885632878	9.3544338580665	84.3	150.4	4.3
140.407264801666	176.863743765872	9.36493964472007	89	127.6	0.1
140.586755633348	176.461510798447	9.37534417424973	92.1	121.3	6.9
140.763688828401	176.065009657566	9.38560042581739	119.7	127.6	15.5
140.936653973172	175.677401015548	9.39562677611536	122.8	121.3	7.8
141.104605948563	175.301026857731	9.4053622577168	100	73.2	14.4
141.266800557823	174.937554767549	9.41476421785583	99.2	63	0.7
141.4171384518	174.600653008769	9.42347860491915	129.9	63	9.4
141.560996590861	174.278272069375	9.43181743849433	130.7	73.2	7.2
141.700371027214	173.965938870929	9.43989632584086	136.2	65.4	3.7
141.835024434724	173.664185241945	9.44770148427807	142.5	65.4	2.7
141.965806604511	173.371106827957	9.45528214505177	148.8	65.4	6.2
142.093875637552	173.084108367277	9.46270550569312	155.1	65.4	8.7
142.220662435134	172.799983261131	9.47005453793187	161.4	65.4	7.2
142.34763614702	172.515439192072	9.47741433366693	155.1	49.6	5.1
142.401109171266	172.395608395554	9.48051382945033	142.5	49.6	0.1
142.447796242589	172.290984623797	9.48321982687966	136.2	49.6	6.3
142.490761779081	172.194700649365	9.48571004044115	148.8	49.6	18.9
142.529886692747	172.107023381063	9.48797782005116	161.4	49.6	13.6
142.737740795772	173.919176287786	9.41431140456157	191.3	63	18.3
143.083143980369	176.93053095149	9.29189516782901	192.1	73.2	7.8
143.54098993721	180.922196594262	9.12962646862985	184.3	121.3	14.5
144.0265320037	185.155318004081	8.9575418051418	181.1	127.6	7.7
144.539983803144	189.631746372972	8.77556559533173	211.8	127.6	10.4
145.098767698914	194.503354612369	8.57752420147963	224.4	147.3	2.3
145.689320887017	199.651855728395	8.36822827547652	233.1	147.3	11.4
146.365038091068	205.542816990166	8.12875332332223	236.2	147.3	7.3
147.195199713703	212.780428429989	7.83452635406246	240.2	148.8	5.8
148.339744647386	222.7590700182	7.42887006748524	240.2	155.1	5.1
150.188150823894	238.874435967708	6.77374054166785	263	196.1	17.9
Route: 7 Length: 2.86929949883382E-6 Demand Met: 566					
169.300000076596	405.500000155652	8.29699416726726E-7	122.8	387.5	3.6
169.30000012764	405.500000288205	7.50759724610361E-7	119.7	393.8	17.8
169.300000128635	405.500000320286	7.81277506689548E-7	89	393.8	11
169.300000094593	405.500000253085	7.41705150630878E-7	92.1	387.5	18.7
169.300000068073	405.500000193258	7.68053908473121E-7	130.7	339.4	10.6
169.300000054124	405.500000150492	7.94650730995272E-7	129.9	329.2	5.1
169.300000053661	405.500000137594	7.65734100127702E-7	136.2	331.6	10.8
169.300000062486	405.50000015461	7.45505388977108E-7	142.5	331.6	14.7
169.300000071165	405.500000182308	7.49929142784822E-7	155.1	331.6	14.3
169.300000071565	405.500000201964	8.04041093260821E-7	161.4	331.6	4.6
169.300000062125	405.500000204499	7.83285202032857E-7	142.5	315.8	4.2
169.300000047486	405.500000187756	7.45353560205331E-7	136.2	315.8	9.7
169.300000030102	405.500000151987	7.55700270360649E-7	148.8	315.8	8.4
169.300000017486	405.500000107583	7.75609350966988E-7	155.1	315.8	5.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
169.300000012573	405.500000066487	7.70217525314365E-7	161.4	315.8	7.1
169.300000015396	405.50000004032	8.05846937623755E-7	178	303.2	1.5
169.30000002374	405.500000016976	7.8516674761886E-7	191.3	329.2	9.3
169.300000038741	405.50000002761	8.42790058186438E-7	192.1	339.4	1.6
169.300000049912	405.500000049831	7.75378296680174E-7	222.8	339.4	15.5
169.300000054963	405.500000065132	8.30271360996449E-7	252.8	393.8	15.4
169.300000066277	405.500000133095	8.53567499348173E-7	215	387.5	7.3
169.300000059277	405.500000124909	8.15373525142604E-7	211.8	393.8	13.7
169.300000017331	405.500000050379	7.91305140523946E-7	181.1	393.8	14.3

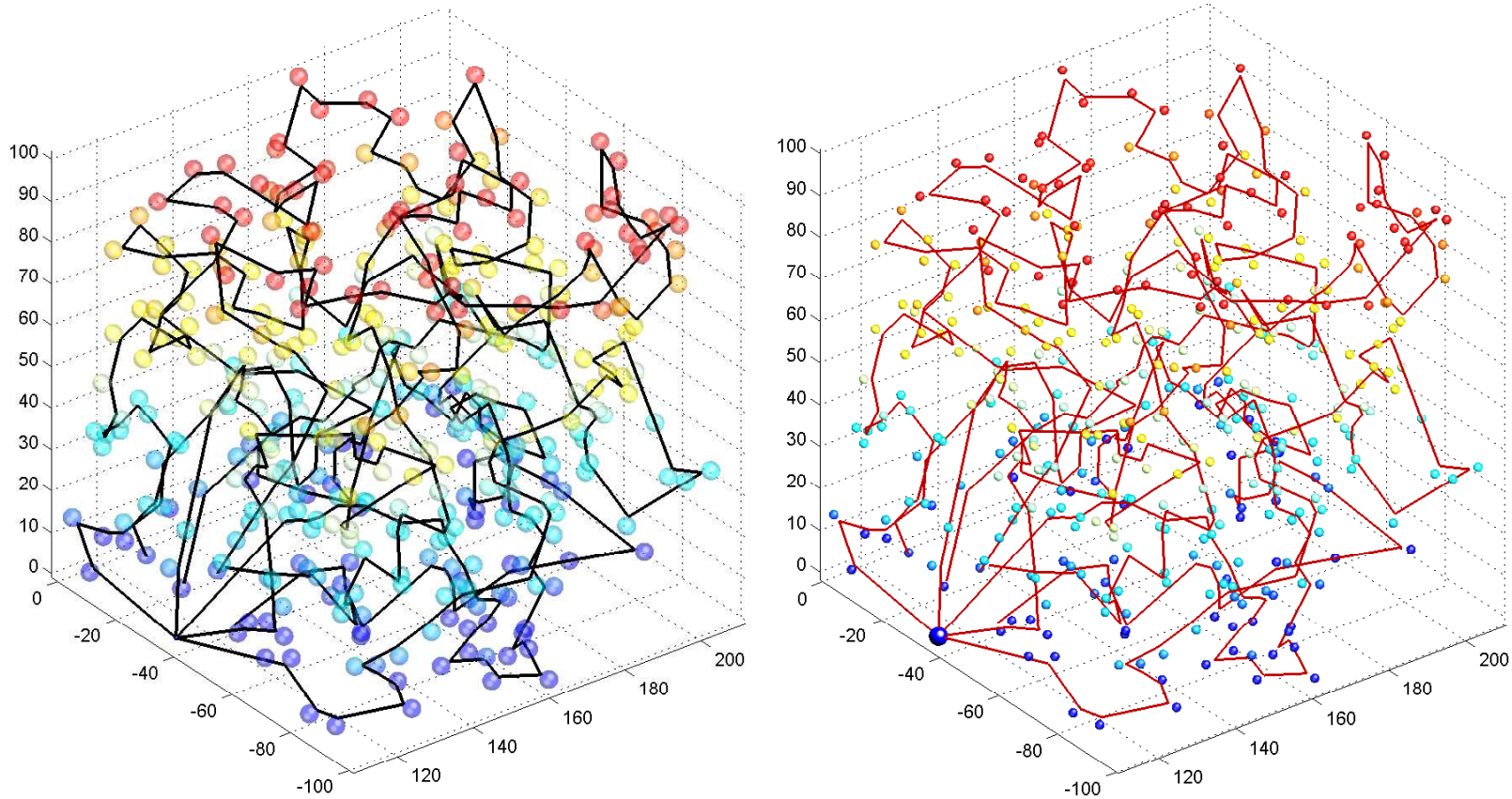


Figure O.79: $rd400$, $r = 1.9910618$, Equal Radius, 3D, Euclidean, Length = 3434.9746874

Table O-82: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 3D, Euclidean

Total distance: 3434.97468740324 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 541.145917885347 Demand Met: 572					
24.6172583893089	43.6993391376159	24.0856640194464	26.2003	42.5604	24.4871
23.2027644327852	50.2765426266287	27.9480084044577	23.6126	49.4214	29.6987
22.2391916345576	54.5706336054924	30.0696112158429	22.5447	55.6169	28.4034
20.4966846243047	61.0227878355884	34.4500011318916	18.9042	62.1271	34.907
25.5161290626263	60.908254339556	35.5002615633814	25.6513	60.6643	37.4717
31.6521719948979	61.1968876498582	33.3262540783434	32.641	61.5676	34.0062
32.4750316838202	61.2356350331658	33.0347181606718	33.4192	59.483	33.0004
37.1187293969227	67.751654088634	30.3376247553656	35.9094	68.8825	29.2317
44.6229446294434	71.5519220056871	30.2831573529383	46.3399	71.17	31.2162
43.3777118313306	74.7211634962842	27.4212357738431	41.4131	74.8199	27.7293
44.4038580596839	79.8448695167555	22.1666395139675	45.6946	80.9262	23.2292
44.5565381724186	83.3746752955638	17.4250529586528	43.9629	81.9344	16.1851
44.6119155698108	83.9873895929027	16.7744010505781	43.3068	85.4106	16.2891
49.8870075739733	82.7313800055171	14.2525023913521	50.9984	83.4341	15.7476
52.2180739648775	81.8760736078114	12.5099556131379	54.169	81.8375	12.9059
49.670675118387	80.5506515979551	8.22580392527997	50.5772	79.5094	6.7911
45.8744190493244	81.6395730420393	7.83526898660087	45.1636	79.7971	7.5816
40.0187824608412	84.681288305272	7.35321919862317	40.7053	85.7824	6.0265
34.3573392031901	87.6218833511682	6.88733798089965	32.7208	86.88	6.0296
35.327835074995	98.4045358972537	12.0940857210345	34.7579	99.7518	13.4448
41.2470043743643	95.4542817243483	4.40457595914346	40.4171	94.2218	3.0792
50.5550858888613	97.9544051890116	2.73902076137132	51.8363	98.9629	1.5963
49.8087163933092	94.5018143254896	7.34192177980451	48.9418	95.7946	8.5835
49.8394587003058	92.7806132571374	8.59427169233683	49.8328	92.6571	10.5815
49.9326097830918	89.0984571387958	5.14391911488362	48.934	88.5471	3.512
54.3777828625214	87.301779351853	8.30777236890395	54.7886	87.0165	7.4948
61.9957734844932	84.2224506928229	13.7303834972563	63.6977	85.2552	13.695
61.6391561482319	79.5623484099194	16.9580074139996	60.7208	77.8844	16.4053
64.8551177846859	80.4645328199031	23.1667745632985	66.7645	81.0279	23.2022
62.171859075304	79.6359017555171	27.968168868437	61.8453	80.8454	29.5157
62.1718002183596	79.6356925979578	27.9681369122128	60.2539	80.1704	27.9583
61.7222452767094	72.8985769032098	27.0409682671446	60.356	72.3736	25.6911
64.254671568383	68.7962683466986	29.1693788783921	65.3011	67.1869	28.6409
60.1439546879612	74.6338800142716	39.213849983138	59.2712	76.4167	39.0582
60.4411803889988	73.4693615443381	41.6144204449715	61.6789	74.8507	42.3385
60.3903153238169	67.2158190564126	50.8061150857103	60.771	67.3196	52.7577
58.0260594751452	62.1898544004196	45.3211894647586	56.0439	62.2937	45.4781
58.3331546829619	60.4933014646638	43.4458565447649	58.3448	60.9201	41.5011
58.868775006621	56.1979957459757	45.2837841383764	57.8122	54.5104	45.2899
64.0712032750836	57.9768247941146	47.5870527020985	64.2573	58.953	49.3124
68.3231455072913	56.5731468935129	44.3231423000333	67.8108	54.6502	44.2592
72.0797846836581	55.9843832717367	41.5815345919212	70.983	56.1077	39.9244
79.1796715695186	54.8873388332533	37.1791968450096	80.6139	53.7748	37.9975
80.8470897911216	58.6459389515626	28.4465005383035	82.7455	58.0479	28.4959
81.0763815204722	59.3983714986803	26.7630497406555	81.8774	60.6902	25.477
77.4833760988162	54.8387923796632	28.284263384989	76.3859	55.8636	29.5918
76.5811277668093	53.2138431139688	28.4990908105485	74.8357	53.7031	27.6754
75.6312451966206	48.6849510209645	29.6868288954851	74.6616	49.1772	30.6996
74.8723825217565	45.0669903978914	30.63568898519	73.064	44.6995	31.3834
80.1716475023813	38.339973522607	29.8747984180186	81.8496	38.8539	28.9342
80.1893551233382	36.7329838147396	30.2915227553199	80.5435	37.2793	30.7227
80.2245533870145	33.5460052569409	31.117947099339	80.1207	32.7664	32.9471
81.0799173829098	27.8840770995132	21.1114419238933	81.7106	28.112	19.2367
77.5279584984341	22.2495466999006	26.230926225537	76.419	22.7841	27.7958
78.9597327157514	14.3031600029657	24.3179263387704	79.2919	13.6517	22.466
78.861491689821	9.82041667266287	30.3958451870621	77.911	9.90186	32.1435
87.0367648193241	1.57331672767803	25.2736308568366	88.6343	0.494442	25.7719
74.1155737426865	5.58095332374275	7.96325616078177	74.5771	5.70821	6.0306
71.2819679548404	5.9030166162945	9.41962338062057	70.1018	4.34543	9.0382
66.1677388608217	13.2637263705615	16.0079651219182	67.267	14.1516	17.4107
59.9139081164761	14.9003098083981	15.6586270771427	58.7637	13.9566	16.9818
56.3649515922397	19.3898766706227	11.4899958008704	54.7387	20.4852	11.8363
61.5321267918156	18.5974543881025	4.08299748321431	62.8285	19.7058	3.0557
57.2125474667547	8.6689452668961	3.54879245516363	58.2097	7.56071	2.229
49.0383895021215	2.78166905147163	8.01517172869591	47.3917	2.23053	7.041
50.1474688189544	1.48056259144621	13.6096742842154	48.5894	0.54797	14.4264
54.3125856032586	2.06867594811351	17.4151288494326	56.1254	1.40532	17.903
47.9686746246783	7.67318356156578	19.8795352718735	48.6979	8.85907	21.303
38.5795478835165	10.2474063626062	18.1928027662806	38.2491	9.61738	19.3363
26.7041173533252	13.5038480806073	16.0585042603102	25.6231	12.6549	17.499
13.2836162499644	23.9207138699979	4.031052279396	13.4	22.8874	2.3331
Route: 2 Length: 634.682923280254 Demand Met: 559					
10.1359845501703	48.9584253341996	5.62177477893815	11.7937	48.0467	6.2423
12.3191145446584	56.7710031504836	7.79958818683097	13.5318	57.9262	6.7229

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.4508055017245	57.3566506317571	9.58489158267097	10.9638	55.5178	10.1729
7.03751763352059	62.8098981870054	19.1313029046015	8.25408	64.3565	18.8288
1.272427421437	69.5863533930423	31.3367877706937	0.194864999999993	71.2335	31.0366
2.73495960443607	65.5870175211723	43.7096418796562	2.55217	66.9796	45.1209
4.74371831759376	55.9453042796034	46.9560856301437	3.30116	54.5758	46.8676
8.444434709822	54.8633169700905	48.4258403273329	9.35554999999999	53.1101	48.6717
9.2715749496836	57.7605422106438	48.9992574799382	10.4725	58.878	47.8708
6.62475647040932	59.4866864604672	54.1449678764894	8.30742000000001	60.1487	54.798
3.16825935293939	61.7404869919399	60.8639277308575	1.5771	61.4642	62.0285
14.7112939977409	68.632766619242	59.590382183501	14.0141	70.4084	60.1608
16.9759388455061	69.3051689455256	59.1874618464993	16.576	71.2313	59.4946
22.3362036821123	70.2632645473657	58.1605915699327	23.7167	70.7298	59.5174
23.3560798030395	69.6028089154515	51.7477964036036	23.6206	68.344	50.228
22.7973599585175	77.7372094718829	54.234846102597	23.3293	78.9181	52.7226
20.6889673042068	82.7107576963918	61.1546002137595	19.5225	82.1483	62.667
26.0629713262575	93.6601543992504	60.0279596738925	27.8353	94.5623	59.9313
18.5285689939855	94.9516467248516	59.9186115074495	18.064	96.3276	61.2807
4.1215041977979	89.7907910250635	51.6523233284477	3.06059000000001	88.1315	51.3598
4.08138669768789	91.7260666888952	51.1474433862236	4.28894	92.6489	49.3954
3.72559201804842	92.5025542508537	53.2097275079036	3.24988	93.8751	52.5027
1.98624670912749	96.2985524011844	63.2916084913131	0.299018000000004	97.3272	63.0477
4.81381294959525	98.4630426695142	78.3881404717099	3.57801000000001	99.0366	79.8401
12.0313316699773	96.7763102292231	78.7184812292348	12.7313	98.6134	79.0339
26.7175356839085	88.6452270101779	78.7249012170019	27.9893	89.6021	79.9213
30.8909019971136	81.3757464852696	75.1564595077626	29.8827	79.684	74.8634
40.5578786879526	81.9546791998023	72.7259953016203	41.546	82.3742	71.0491
42.7664124754691	80.0636433256431	80.1913876981196	43.0779	81.6476	81.3569
44.7337769058935	68.6230599487803	86.2480762875886	43.1006	68.5786	87.3861
47.2334758813614	63.3881203556493	87.9330451936176	48.6743	62.5481	86.8455
43.6472406534147	58.6461432694346	97.100630139989	41.7302	58.1199	97.2119
43.9975978170865	58.538621149506	97.5659855291406	43.5841	58.7522	99.5019
53.9433272766151	54.8528987022293	92.6137989848708	54.0007	52.8659	92.5002
59.4332045718061	57.5643696756219	90.0856498661198	59.9164	58.75	88.5608
62.7108799206144	54.3046816726356	95.2859317371829	62.6521	52.6724	96.4246
65.6823178552214	59.1191779578589	94.3395165000362	64.8783	60.379	95.6551
69.7923983986123	62.514414770236	91.6808491146854	69.9395	64.1832	90.6048
73.7026687229956	57.6244204055611	94.2991893931875	75.5117	58.1702	94.9268
70.5790416582937	44.9032378762747	95.6639992903029	70.0979	43.9308	97.3335
71.2399598165673	40.9240461949531	85.5117663939352	72.565	40.2263	84.1996
54.6779419294724	44.017496220132	87.1921897551752	53.4254	44.9898	88.3964
54.5397566066995	39.201434137048	80.1430295682533	55.717	37.8511	81.0117
54.2099548997628	33.439030231901	71.3239011549086	55.099	31.771	70.6981
46.1412505284685	41.2062072095085	66.547690390571	47.522	42.292	65.6102
39.583997698129	45.9980190860888	63.7711565349367	38.1612	45.7549	62.3997
40.149130469234	47.7440013286633	65.3048058405267	38.5534	48.7846	64.7262
41.5111087501969	51.7751900604434	68.8900645870017	41.6783	52.1535	70.8377
42.6608787285575	56.1223389692217	59.6986017269599	44.4217	55.3301	59.2126
41.1631853914289	61.4741093588728	51.5781616624351	40.6271	60.1839	50.1596
41.1430738765411	66.936875688197	48.9671494911229	42.1545	66.9856	47.2528
35.5616614332253	79.2202351288091	52.3509616850598	34.9224	79.9328	54.0968
35.7187448324942	82.2484890003793	45.6550400868029	34.4937	83.7515	46.1073
36.7459479277065	84.3658366778418	38.3148415648532	36.723	86.3354	38.0239
37.4267850626864	81.812444053349	34.3419330424903	38.4806	81.2568	32.7466
26.5652057931838	81.3072253315299	42.4290638979674	25.7615	81.4539	44.2448
26.1188728399848	80.5946863792033	38.1857199354228	26.7929	78.8352	37.5421
22.9179310005537	85.4132777703638	32.4450313428378	23.3569	85.0798	30.5318
17.2507545747637	92.4423365555163	34.6719057942563	16.7243	94.3593	34.7835
15.9205353533249	82.5720421430093	36.0629100156076	16.5471	81.1813	37.3426
10.635159445756	82.9484243719188	28.9054121471943	8.89064000000001	83.8954	29.0611
11.4674034394874	81.5374432769062	25.8952810189561	10.1219	82.045	24.5182
16.0803075725625	77.6886247443034	23.1928308381989	17.2306	77.2747	24.7644
19.6423688764649	73.8705378154114	17.6242676964292	20.7262	75.308	17.3361
23.9573506005772	69.2451332732771	10.8785157313909	24.7619	69.8637	9.1655
23.3068422488026	60.4528960894335	14.8124652446194	24.5176	59.5849	13.4915
22.3271368294052	55.6807636400025	17.7878068985182	22.8193	53.7552	17.9075
19.266485834059	59.5012531330931	20.0885730217662	19.6656	61.3862	20.5906
12.2580138131613	54.880984603805	20.8576501997682	12.5872	53.6987	19.2898
3.58317726766427	50.7904793309045	23.5920477197355	2.40393	50.9808	25.185
Route: 3 Length: 812.200010072559 Demand Met: 800					
6.78859590736116	61.8709984666724	4.85632175715615	5.52590000000001	61.9092	6.1438
7.51176425330983	66.1003643072811	5.63506350032429	9.17265	66.1356	6.7326
3.00858929488123	82.8853217886181	3.86705433822081	1.02508	82.9527	3.7072
4.76861533496255	87.8291235932634	3.58643073770794	3.35356	88.986	2.7967
16.0980613470517	95.6894932826275	6.52077083852929	16.854	97.4806	6.0907
17.1946220731193	91.7336206844595	9.13520029639593	18.6101	90.3489	8.9268
11.7115714948474	92.6251120710657	14.2480556287487	12.3803	91.1149	15.3598
6.37219187018675	93.9367585090219	18.6780684081867	4.45068999999999	94.0863	19.178
14.8399961842456	94.3708211319776	20.1838349878271	15.2733	95.1553	18.4059
22.7583329958602	94.2807412731048	22.7992804409756	23.1083	96.0553	21.9675
30.025188049171	93.8349044718435	25.3928756009011	29.5533	92.3189	26.5937

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.1988256369115	93.762856538007	26.416854754136	33.1283	92.3481	27.8161
34.8980075266683	94.218768437816	26.4688186169467	34.7487	93.2543	26.9859
47.8957087899037	97.7064026412133	26.8652162512839	48.6626	98.7924	25.383
56.1245497073272	93.8261264487161	37.5305678716137	58.0371	93.3465	37.2538
54.6518562812832	93.7422266589781	40.7015019003378	54.8665	95.2849	41.9419
50.9397756006165	88.1301118194203	42.6844534834158	50.0418	88.5256	42.3177
48.5974856614332	84.588556642653	43.9356110620558	47.7087	83.4773	42.5429
48.1527177136421	83.3912955248752	48.385704785202	48.3206	81.4332	48.7053
46.7017628473112	88.0840513748327	55.7709661793465	44.9959	88.3516	56.7624
52.7034546607754	90.4674229845588	57.15399965585	53.7144	89.3849	55.8234
59.7113359191887	94.9245061879363	60.5330526236194	59.3326	96.8644	60.2925
67.0552740118292	94.3634286616308	64.2136297385592	68.3546	93.0491	63.4728
68.5331614767621	97.1038262719884	68.2238822700566	68.0526	97.9535	69.9593
73.4982033572696	95.7965720859072	63.3371318631212	74.1314	97.2935	62.187
76.038390884005	89.9259453998194	62.4842461128622	77.8131	90.2453	61.6399
75.5467435320988	83.091816150458	63.0975186871149	73.8931	82.0767	63.5442
82.4470273922328	80.0610191384823	61.7680417699761	82.6909	80.2719	62.172
88.0209994443584	77.6127914649076	60.6940726586407	89.1084	77.1611	62.2997
93.3205993950292	75.1417749754001	49.4687993246877	94.2046	73.3577	49.4797
94.4050759576889	79.8223402325007	40.0514783393841	95.4573	78.5053	38.9919
92.815729476688	88.0223267680846	33.0899417551012	91.8947	87.6684	31.3605
95.1715944188707	95.151849061253	34.7047074795216	96.3227	96.5824	35.4748
92.3065776938956	93.6430905216534	32.807147485762	91.0373	94.8618	33.7328
81.3997970872454	87.7712729818213	25.4592928593603	80.7777	87.9354	23.575
77.0286207136742	80.8498126990709	35.9316235914604	75.9957	81.402	37.5418
78.0748402939726	78.2634174214063	35.1021757805716	77.5352	78.0347	33.1993
81.6358768016775	72.4998043730456	36.811084884106	82.5413	70.9361	35.9747
80.8911594330719	73.994897991207	40.2045253721987	78.9206	73.8168	40.4273
82.1126610024178	75.6948823699355	43.4328551597279	84.0931	75.7357	43.6346
79.5937384634835	77.8444153439018	47.2564945374364	79.6042	79.6519	48.0916
78.0078582058084	75.1881648896048	47.7853080987949	76.2214	75.1456	46.9071
78.4844058252429	73.284361249152	48.9764762813118	78.3667	74.2083	50.3369
80.8177328342956	63.9629517650765	54.8083193853004	81.8209	62.9891	53.3907
81.2673330815705	59.2302529951791	59.7309067715409	82.834	58.4111	60.6469
70.0981059842704	57.6113293975107	60.9285562026354	69.1414	57.6653	59.1832
69.7297002725925	57.5148369931695	61.3820126254312	69.3672	55.5594	61.2856
60.7270201620863	62.5684153565555	74.6225106592715	59.9164	61.9972	76.3491
62.0321656127327	70.3959040534196	68.2500205793575	60.9907	71.4945	66.9566
66.5172767540238	70.0379944518988	70.0224106649669	65.9297	69.3415	71.7927
76.9008055681939	69.8308903281712	72.451366351242	78.2186	68.7569	71.4148
79.3354020792027	74.9931833312475	79.70943577595	80.9911	75.8316	78.9882
79.2438005417278	77.0009661634893	84.0975201236625	80.8889	76.3527	85.0129
75.3270987262756	82.0239069468569	89.7518837879091	74.5996	81.8744	91.5993
76.3781903479663	91.1582007265905	80.5140358105682	75.4786	92.9344	80.494
76.711139360305	90.9633866221282	80.1393658664897	75.6586	91.7899	79.8395
84.6085761017854	86.3426383891125	71.2513278572203	84.4594	85.6238	69.4005
92.2363847629061	88.0826874868072	78.2034072486266	92.7385	89.9534	78.6648
96.1473829882609	81.8701834328143	81.7531759337117	98.0879	82.1977	81.4504
95.9171946856579	78.50238830284	83.8040508916158	95.1537	79.2325	85.4918
96.1754391591667	74.1118589701347	85.0139405842068	98.0725	73.509	85.0617
90.3455441300613	66.9894203774605	87.3737999765756	88.5712	66.6382	86.5414
95.5195209648752	60.1170295365713	96.5424936185051	96.3481	58.4969	97.3507
92.6631258461021	67.8228308774645	96.4506975934709	93.4248	68.5015	98.1606
88.4285934014019	74.9845364486197	93.6869312871016	87.0562	74.7862	94.9506
87.6392162205865	76.3196766674224	93.1714791911562	86.1254	75.412	92.2501
85.7846644807573	82.8359672709887	91.8954386377603	85.2864	82.465	90.0038
84.5815326592879	87.7943895448489	91.6010388776236	83.5669	88.2708	89.9554
86.3021143611264	95.5937448233181	97.6374404760568	87.9339	96.7331	97.5762
85.8237667694855	95.6744996827773	98.0393513840042	86.1563	95.4019	99.9835
76.1306278032233	98.4137781279557	94.9163200550793	75.6359	99.7073	96.3469
65.5396692058034	98.6732234825376	87.7368069540532	65.9332	98.9174	85.8003
55.1911888488542	97.8901888135347	89.7121702392246	54.3707	99.6057	90.3024
50.2463675272175	92.179075570635	89.3547328482531	51.2472	90.6526	88.5593
38.3469673961194	87.7726893502877	91.5154403853721	37.7453	86.3505	90.2585
32.4104914718758	90.0210740130549	97.6571674601534	32.5896	90.759	99.4978
29.5814320529547	89.1408339742947	95.6763839328316	28.4623	90.5817	94.8789
26.0483481493572	75.2366241772312	93.3021016201587	27.1361	73.6904	92.6772
16.7796860677087	75.9129540088941	95.7195161418181	16.8354	77.4785	96.9485
6.8905274838322	73.6974033394836	95.9719001572092	4.99968	74.2733	96.2118
18.1638769534047	61.5820319230863	92.8774700582481	17.6011	61.1721	91.0121
21.2344325110103	58.8337643880268	93.1326793829681	23.2085	58.8069	93.3912
15.1117583952188	53.5792113039635	92.0411310460437	13.8308	54.4775	90.8096
9.18659492136564	40.2501569813533	95.1250479109328	8.75416	38.928	96.5496
8.9260313979394	41.6698327460245	88.3763211876152	9.27453	43.3967	88.7547
8.61981389670055	43.3369372799122	80.4455670961508	7.21925	42.3799	79.403
13.8124431188501	48.9534296348505	75.8221544007451	13.2524	50.7626	76.4367
18.1309558035905	50.019525114429	71.8040773892454	17.8085	51.9553	71.4677
23.4403442575195	48.9814599038605	67.6058983799108	24.4594	47.3987	68.2546
28.5428732366397	52.9861347871118	58.3112751127795	30.4468	53.5688	58.3124
18.8505235711864	53.6851417729419	44.3551242841566	17.5187	55.1629	44.2721

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.0565157644783	48.8809247223286	38.2925629174502	20.5641	47.7219	38.8826
17.1440412942821	44.6000488810146	29.9410836015385	15.6372	44.5891	30.235
16.0502966430514	42.1500309944175	25.1608774897435	17.5856	40.8861	25.0628
14.3113970612949	41.2994452496585	21.9694689352373	13.4598	41.6191	22.5554
10.2235849756465	39.3024074141837	14.4701885475886	11.4258	37.7412	14.2255
Route: 4 Length: 686.547474809934 Demand Met: 753					
2.47605162279956	36.1461400851213	17.2197520022574	0.642905999999996	35.395	17.4189
3.99269613373379	37.0941798543656	27.1336774087508	2.57158	38.4711	27.3546
10.5259883451193	37.1391516346705	52.8832442843241	9.16001	37.8018	54.1714
17.3738694839058	34.7633786504465	55.8191784949958	17.6023	36.5196	56.7286
22.1540398995913	33.0641157306076	57.8505526543088	23.2874	32.7742	59.4617
21.6915106804035	32.7135443289709	52.5089526918421	22.7183	34.3604	52.0641
20.9201952549221	31.7392757441036	49.1209052199288	19.5262	30.4483	48.5255
24.0386181609629	34.273046296748	46.2843075647385	25.7714	33.2927	46.3113
24.8063865426488	39.050713487195	42.7976649305949	23.6339	40.0124	41.5074
31.6815299033064	40.0337674048063	45.0590322699795	32.7353	38.4372	45.6112
34.0062637551425	44.8079683648224	45.3010978727906	33.2771	46.652	45.1216
45.2188572836025	40.7118081920658	47.3092008719129	46.2037	41.7062	48.7254
49.7109014931199	34.318534766387	43.7628231217863	49.1148	32.8614	42.5439
54.2593679916824	35.2906232009309	45.6282582636691	55.5492	35.9315	44.2535
56.3898163811231	34.9734496364204	50.5292768302808	56.0389	33.1015	51.1098
57.6681320122669	36.0642929034006	52.545966646769	56.9788	35.9946	54.4126
59.4199568102619	36.9885586447487	52.0588509897132	60.6972	35.5066	52.4287
61.9129016918346	39.7282073811956	50.8866425292393	61.5258	41.6034	50.3406
72.7998029748707	33.9781205313086	51.3732803906927	73.2088	32.0501	51.6558
77.5862690162403	39.9186007568338	50.2801425485473	76.05	41.1841	50.3284
80.6913067641049	43.6567533529885	49.582027692852	81.4209	43.6493	50.298
81.6848180915164	44.8528609972838	49.3586581106547	81.1997	46.621	50.135
87.1410887585825	44.4262593500455	46.1476845798082	88.1955	43.6361	47.6404
91.4969988660092	44.5088812501569	42.3204195658609	91.3249	42.8902	41.6597
92.1348504947111	44.5209896536785	41.7599749032056	92.0634	46.0336	40.4672
95.1222885958295	42.1779921933485	41.2838417322133	96.1419	41.3034	39.8142
95.143807982334	42.8755557238721	53.7454118046139	94.61	43.2995	53.8065
95.1530209908592	43.1740379114196	59.0775019732376	96.3235	44.2629	60.2644
92.1527902032903	40.6045487771537	60.1026580288708	92.3029	41.017	61.4442
84.2118509237504	33.8037214855524	62.8160265959296	85.0689	32.1301	62.1612
78.2482617972904	30.9123323587109	65.1868353198094	77.6794	29.1288	65.8649
75.8496972945468	35.8276188290781	64.3186049874329	74.0572	35.987	63.4666
76.1389632754984	36.2763108402722	64.483508069665	74.7866	36.0265	64.8468
79.6837708506728	41.7749933595805	66.5042638069841	78.6058	43.2582	65.7281
86.6521044126759	46.507365466936	70.787977627096	86.8559	48.4797	70.9689
93.9700782062126	37.9791264221474	74.8772531314008	95.9404	38.2332	74.7444
90.9779353818538	31.0332800737679	78.2528832646217	89.036	30.7257	77.9388
95.2099223481221	24.4096113861025	83.2871786901433	96.7473	23.5618	82.348
93.1858931163496	19.746662469585	94.7886770859485	93.1464	19.8146	96.7782
91.6025713837225	14.2712744380899	83.4859653950829	90.4883	12.6216	83.5226
95.0438879083967	16.8328606631587	74.184325508627	96.7716	16.6523	73.2113
83.00080542768	21.904536398154	71.3559138470718	82.6839	23.4883	70.1916
78.7555976201866	18.8043727646704	74.0321418608785	77.5205	18.1054	72.6356
76.8583517502494	17.0541079156938	79.1358437247235	76.9072	18.2917	80.6948
73.8951788069799	9.33580114942368	80.0416298668731	73.4709	7.6166	79.1313
73.8475556187041	15.9506707744032	91.4706228102239	75.2455	17.3084	91.8789
68.636817657138	14.4957249120197	96.1432199214495	68.0574	15.6194	97.6814
64.3081847613622	4.39235131360062	92.9766916631408	64.5769	3.66176	91.1441
61.3596177977046	1.5851990946031	96.90938177407	61.5069	0.482106	98.5604
53.2960020884932	6.66916822363364	88.7031005382289	52.4925	5.37248	88.2454
52.6912513365911	7.05044407564441	88.0876652172351	51.1528	6.04103	87.327
54.4759070588325	15.8537826404192	85.8660583876902	55.9929	17.1432	85.8884
44.6648287073354	15.5143811613139	83.2530451157426	43.8962	13.6901	83.4665
41.0587674677774	19.0124938027795	81.4499438978098	39.9475	19.2268	79.8118
41.5863627869178	20.9736900618226	84.8132084274693	41.7205	19.4188	86.0496
42.1628214362781	24.6896379195041	88.1955482328782	42.4972	23.9973	88.7768
43.0856575824942	30.6386133408692	93.6103823678776	44.5404	30.686	94.969
31.9342562157167	41.9194613671127	92.1527560356004	31.4339	43.8079	91.7683
28.264101222154	29.0041441251973	95.5109316615119	29.1053	29.2049	97.3043
25.8914034056899	20.9517520717707	97.4059429818444	27.2482	20.2425	98.6789
22.1426533179869	16.8312886528712	96.5852163545692	22.6997	14.9199	96.5597
11.9084015353192	19.647254561504	95.1664674354519	9.96077	19.2347	95.1963
20.211907001513	26.4727715694566	93.4374746689351	20.3288	28.022	94.6827
25.4514009396463	26.1245852780258	88.2795170366187	27.4222	25.8428	88.2494
18.4856102063465	27.6495312506429	81.6857979751238	19.247	29.2712	80.817
5.62555570874882	26.3031175475599	73.2117632923179	4.056	25.9589	74.3875
4.37539983526452	26.4477537214904	69.002761059933	3.44571000000001	28.2052	68.896
3.86152225937401	24.379165627655	63.3728970107256	2.38826	24.0295	62.08
14.1575931497249	23.4804193812415	63.5158362373926	15.3759	23.0999	65.044
14.9280146271192	24.0360375002608	60.0930056879712	15.3897	25.3897	58.7078
14.1562789723288	19.553174269935	60.9595275106662	15.6993	18.7479	59.9926
10.6685181967285	12.8647195370337	63.8119587156991	10.9524	12.0779	65.6188
6.90210333242543	10.5707004551403	59.3429724116429	6.43447000000001	8.70233	59.8478
2.55085480011518	12.5093923082529	51.1091093936624	0.613562000000002	12.2624	51.4967

Solution x	Solution y	Solution z	Original x	Original y	Original z
2.77728919009934	14.4177136873356	44.2012160172581	2.68873000000001	16.3883	43.9305
3.40677938657007	9.5768614512078	36.0989635318097	2.19732	10.251	34.6682
6.22942754432574	5.58815962276039	34.6788652423379	4.96047	4.06059	34.5353
9.26306987073264	4.32678880007127	33.8650714936702	8.57052	3.36732	32.2638
12.4963677012733	3.24648971249639	33.3760485876129	12.6307	2.70835	31.4638
17.6234942927285	2.33608299200591	35.6792008884294	19.0116	0.977048	36.1157
15.799874012458	9.37177992640647	35.9884491346286	14.8737	9.51072	37.7455
15.4577372870684	16.5675610230307	33.308991546907	17.2907	17.3232	33.1257
15.3402778396376	16.6834539952188	33.2599542216945	15.6444	17.8995	34.8069
4.75064173350658	25.1827689951547	27.0145940783356	5.25835000000001	27.1001	26.8402
3.70060369900909	24.9432694865166	26.6158905680717	2.1823	25.6845	27.6693
1.94412857100009	21.1906684952024	20.9254288974595	0.659450000000007	19.6999	21.228
4.68951841423696	22.2523956776642	12.7158768860119	5.81823	20.7452	12.0688
Route: 5 Length: 760.39836135515 Demand Met: 613					
1.89976924026925	7.46729333950799	4.25932394058385	2.00806	6.28968	2.6575
1.26443113643118	3.08459146016857	13.1635282800534	0.219756000000004	2.58493	14.7832
9.37228490219488	3.05799717868543	8.17423134373704	9.0496	1.67955	6.7742
12.4090482783034	4.10316011555709	7.52821273267984	12.7116	4.29147	5.5693
20.5272255179147	6.5901146370095	12.7122306752159	21.4744	8.21886	12.0685
24.09308440509	2.75091439220894	19.5892854334934	23.1984	1.0131	19.9686
37.0500244085048	5.82907361706096	31.3087617294666	37.2177	7.79249	31.0238
41.767358079339	5.17000452721057	35.9795464036607	42.0178	3.44287	36.938
49.6279324040193	15.8916297112666	38.7999098635213	49.4944	16.327	40.7382
60.4134852459231	27.0001514815228	31.0812440630659	62.0154	28.1819	31.0401
50.1071108960022	21.7103066674006	25.8847083684713	49.4045	19.961	26.5255
46.8451339145635	25.3707142564865	20.4177553406067	47.6331	25.3181	18.59
38.0236897047129	30.9092747575212	22.1419327538281	36.8488	32.2474	21.2512
38.3242545186852	28.8823133280166	25.5131663935903	37.0272	27.4581	25.0096
41.201297268096	23.8058411519035	38.0020769975186	42.987	22.9253	37.986
36.9381573850108	23.122278492769	47.571509528125	38.2173	22.874	49.077
31.3060180202794	23.3769922885939	49.0365282024266	31.0765	22.0815	48.5077
27.0400900718394	23.5699688294718	50.1461667264856	25.8125	25.1372	50.1121
25.7927097782992	17.5316569595586	51.8953580697406	25.7178	17.895	52.7372
22.9045221936785	3.55041261128778	55.9454880453884	21.7245	2.01127	55.495
26.6975957471869	4.93205758515355	59.1923924616516	26.7979	6.90196	59.464
31.2998480699687	1.62875684925334	62.6536088828541	33.1085	0.882753	62.284
23.4148920527581	2.16175874633499	72.7835391234661	23.5387	4.13129	73.048
19.2609792258571	1.02621851803427	77.8167765085343	19.7287	0.198716	79.5663
12.8488182841807	3.29576418495205	75.8343468315875	10.9477	2.73525	75.6448
18.3119265756495	10.0482828014048	74.7188475300757	17.1854	11.1942	73.5432
27.1168970559768	16.339727515646	75.463514412175	27.3595	17.3028	77.1892
34.0580130668116	17.869940174467	68.6455425665402	36.0033	17.5038	68.4307
28.0399063637054	21.3747183963854	64.2503183862587	26.0672	21.3383	63.983
33.0078629835167	24.0924549984562	62.3237927943306	34.4638	23.0393	61.4662
33.6347788432591	30.9111914657888	63.1066454683471	31.6686	31.1822	62.9487
34.6482782888068	37.0433800881355	63.8534398620548	34.4656	38.8185	62.9703
38.7876631874975	30.9381261040674	74.9984871274687	37.7688	31.4408	76.6336
45.1631440643415	25.1388095628208	76.3851110125965	46.0829	25.5503	78.1024
47.5421325519598	20.5748671219246	73.9851889666252	47.6864	20.3976	74.364
50.2879913170402	15.30713619358	71.2151546668567	50.9211	16.4053	69.6798
56.0789108269641	3.68103562731221	65.5735486549088	56.3237	2.07366	66.7228
61.6310150773027	2.8969199399369	47.2786575815403	60.7013	1.36116	46.4176
68.233490024102	7.87361179339918	39.4334145522998	68.2389	8.47105	37.5341
74.2461247285785	7.48706470319214	47.9801498191051	74.632	5.60444	48.5009
79.8593212357429	15.7914064053093	56.0879431685908	80.035	15.8589	58.0701
80.6917618439652	17.3745158349432	54.1338354199562	78.906	18.0381	53.555
87.0542962933723	23.2655771327404	46.4944853820236	87.5589	25.1226	45.9834
87.8517939192606	18.2888994738369	45.1473039254438	86.8707	18.0065	43.4379
89.2992819250952	15.34963000886	45.9053961541039	88.2698	14.9994	45.4757
94.465284415167	4.85969373102945	48.6109178432491	95.0473	3.39817	49.8314
93.4305453130361	9.62136202883201	39.3612332373181	91.7898	10.5225	38.6828
98.1363485875194	9.20120331591756	36.7530640327375	99.5164	7.77478	36.5945
96.9912964873766	20.1536592335691	32.3378697974536	97.2905	22.0419	32.8941
90.9623947441602	10.614706566392	17.5444514633185	88.9914	10.7701	17.3091
95.9564890005752	3.78895536891078	9.10163037721734	95.7659	2.55349	7.5519
97.9541494324001	5.50599973040645	11.2895405437443	98.9579	4.73211	12.8251
97.7978885114375	16.6456444642208	8.1148944635854	97.4766	17.1802	10.0021
97.7084396267655	23.2111118024928	6.22644506967322	99.5853	23.4577	6.8435
97.6594190257657	24.1026699338595	5.95654147757297	98.8743	25.646	5.6301
90.7974093909692	22.5795583284795	5.66525526367356	90.11	20.7153	5.7932
80.2581848847783	36.3258650423964	3.74159505076486	80.0506	36.8529	1.8328
70.7375638079587	46.9841820032145	14.8504960679624	69.2786	47.5055	16.1011
73.0894698787943	47.2802147001894	13.2961374866454	72.4782	47.1166	11.4083
78.914461353722	48.1451665030126	12.9317979912101	79.5061	49.6701	11.7965
85.0278609050381	43.6891822833724	16.6487319398765	85.2354	42.0312	17.7315
89.2808813297768	49.1558440285499	13.7957178747316	90.8764	48.3318	12.9357
89.6386405787909	55.1737685051947	13.149148744837	88.4474	55.9131	14.5629
96.5641548807338	70.287892403775	4.23900826479127	97.9153	71.697	3.8476
85.1089171829585	63.8549396412993	2.71956502131528	85.3959	62.1638	1.7086
67.0265219872062	65.7720108173689	7.15770073836781	66.9764	66.2314	9.0944

Solution x	Solution y	Solution z	Original x	Original y	Original z
52.7569760638645	65.3804484893624	2.58851967368651	51.793	64.9464	0.9013
50.6614536231683	67.8101508609052	10.3295916579649	52.5118	68.1256	10.9937
47.3403095903711	69.5632269790804	16.2056978099964	47.6475	71.1843	17.3202
45.1973839990291	67.200228387043	16.7484355651569	45.2184	66.3382	18.5431
32.0975515060125	60.7347795099401	3.84046764119177	31.2678	61.1344	2.0752
32.0547347341234	54.870314891411	10.6419501797636	30.6696	55.2626	12.0174
35.4989685782346	49.7878706237028	11.9454693929289	37.4105	49.4356	12.3771
28.5139501120829	45.070829669751	11.0779767656924	28.6889	43.6077	12.417
12.4781041976878	42.0689262075505	2.56600125708249	12.2621	43.6923	1.4336

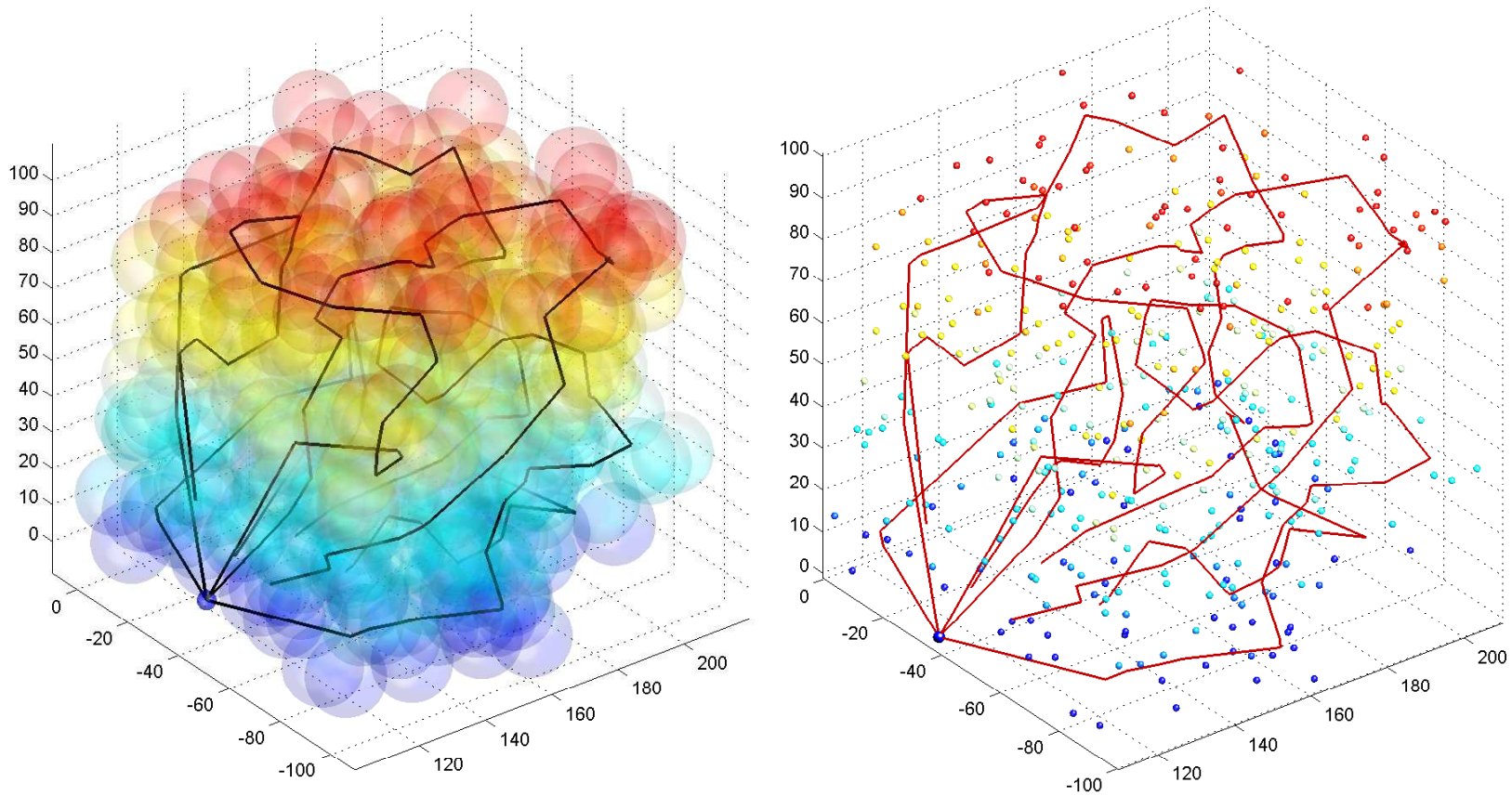


Figure O.80: $rd400$, $r = 9.955309$, Equal Radius, 3D, Euclidean, Length = 1888.0184327

Table O-83: Solution for $rd400$, $r = 9.955309$, Equal Radius, 3D, Euclidean

Total distance: 1888.01843268973 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 213.664950368582 Demand Met: 284					
4.13717002328478	23.0689650276787	5.23494459492174	13.4	22.8874	2.3331
4.92086515907198	17.8099952721231	7.44812267423268	5.81823	20.7452	12.0688
5.7913771583783	11.9683410869723	9.90646550645886	2.00806	6.28968	2.6575
6.68625432671033	9.74023337092826	12.0158017534123	9.0496	1.67955	6.7742
6.73076230737136	9.6294670669523	12.1205925143809	0.219756000000004	2.58493	14.7832
8.822753699923	9.60992717294873	13.0324807867615	12.7116	4.29147	5.5693
16.6792444483691	10.1417373899516	17.5064011241196	21.4744	8.21886	12.0685
21.9933706674242	10.5015102472455	20.5326519829534	23.1984	1.0131	19.9686
26.0946254973168	10.779229949939	22.8682164809801	25.6231	12.6549	17.499
33.1514206297119	11.2571160600666	26.8868597371962	38.2491	9.61738	19.3363
37.3795018758085	11.54340744425	29.2946827219037	37.2177	7.79249	31.0238
41.4063426087959	11.816073650201	31.587881553016	42.0178	3.44287	36.938
45.9760291633869	14.6196481260419	32.7079445073717	49.4045	19.961	26.5255
47.3629737568981	15.4705207734047	33.0478522703364	42.987	22.9253	37.986
51.6167787261386	16.9907074185677	33.4445350621414	49.4944	16.327	40.7382
58.4036134275758	19.4162161424125	34.0775286695341	62.0154	28.1819	31.0401
66.1710539518922	7.88580051457953	41.2582350336453	60.7013	1.36116	46.4176
68.1095462672871	7.59259549098549	41.2474164233344	74.632	5.60444	48.5009
68.6395856903045	8.19153495382837	36.3032545853495	68.2389	8.47105	37.5341
69.2599970924425	8.89259522488	30.5161492210106	77.911	9.90186	32.1435
70.0981698313149	9.8398386576433	22.6967029588384	79.2919	13.6517	22.466
69.1632374318515	9.80347853478556	18.1525613012232	67.267	14.1516	17.4107
68.3579818246173	9.77215327953067	14.2386737603584	70.1018	4.34543	9.0382
67.9510629435057	9.7563242927394	12.2608962426931	74.5771	5.70821	6.0306
62.2794713913741	12.3403410217435	9.73078573975543	62.8285	19.7058	3.0557
59.639332097212	11.3376678448267	10.5571708063121	58.2097	7.56071	2.229
57.1794374972797	10.4034469596551	11.3271404561849	58.7637	13.9566	16.9818
54.4783558955839	9.37763464661873	12.172587216082	56.1254	1.40532	17.903
51.6585488158993	9.71142550539793	12.0348350604621	47.3917	2.23053	7.041
51.6585478877122	9.71142617324489	12.0348353178214	48.5894	0.54797	14.4264
48.3140933514278	12.9574486619753	12.9159135839808	54.7387	20.4852	11.8363
47.3250411482107	13.7651520367431	13.1696644164937	48.6979	8.85907	21.303
41.3121237888181	18.6759829007649	14.712444681665	47.6331	25.3181	18.59
35.589936220066	23.2161850081395	16.1186711967683	37.0272	27.4581	25.0096
13.3553672331801	31.9823385414708	6.33750516535151	11.4258	37.7412	14.2255
Route: 2 Length: 389.173883741147 Demand Met: 727					
4.36764872778258	41.6461749747231	12.9398163920886	0.642905999999996	35.395	17.4189
5.83868187057651	45.9774904212795	22.0719424670467	2.57158	38.4711	27.3546
6.10041463443031	46.7480203906212	23.6962387224495	13.4598	41.6191	22.5554
6.48872453125293	47.8915770712978	26.106901353747	2.40393	50.9808	25.185
6.90830743638875	49.1271062475074	28.7114796048877	15.6372	44.5891	30.235
7.23171471411051	56.4132352532478	41.7488058778295	9.35554999999999	53.1101	48.6717
7.29893064169278	57.9279113987716	44.4590674489462	3.30116	54.5758	46.8676
7.35876944464547	59.2760778208316	46.8714228914698	10.4725	58.878	47.8708
7.41561784473541	60.557014264252	49.16349433168	2.55217	66.9796	45.1209
7.48322538744833	62.080198251486	51.8890962622074	8.30742000000001	60.1487	54.798
7.54315006254851	63.430462936333	54.3052721826678	1.5771	61.4642	62.0285
12.4090584168026	68.3646368649506	54.2485278005567	14.0141	70.4084	60.1608
15.216916142076	71.2118915047134	54.215778762285	16.576	71.2313	59.4946
17.7237384302207	73.7538859690366	54.1865373687621	23.6206	68.344	50.228
19.7544616088605	75.8130986958963	54.162848673006	23.7167	70.7298	59.5174
22.2969900276537	78.3912900085929	54.1331845077483	23.3293	78.9181	52.7226
24.6048086737316	80.7314741865329	54.1062579665816	25.7615	81.4539	44.2448
25.0486133764714	81.189988981501	54.2865530739805	34.9224	79.9328	54.0968
22.8580284713031	85.1360316292674	55.6731461643148	19.5225	82.1483	62.667
21.4209626442059	87.724756276998	56.5827978452831	27.8353	94.5623	59.9313
16.1436300525717	89.5226038644849	56.8180781175935	18.064	96.3276	61.2807
10.5149882642272	91.4399733130184	57.0689271523837	3.06059000000001	88.1315	51.3598
10.5149876462815	91.4399735649156	57.0689272611737	4.28894	92.6489	49.3954
10.4002459377797	91.6337701379015	57.7860064949234	3.24988	93.8751	52.5027
9.35846025595838	93.3933088478616	64.2963778278089	0.299018000000004	97.3272	63.0477
9.98901249123428	94.8998050400326	73.445244932712	3.57801000000001	99.0366	79.8401
12.5478801876617	93.8258367845215	73.8426020997523	12.7313	98.6134	79.0339
27.4875965321998	87.5553892737052	76.1611294673728	27.9893	89.6021	79.9213
34.086630817879	84.7856741761952	77.185124737813	41.546	82.3742	71.0491
33.8380101297969	84.6842539856511	79.2329046380715	43.0779	81.6476	81.3569
33.280842012622	84.7192147809498	80.8077188990525	29.8827	79.684	74.8634
31.1041145648728	84.8557958229541	86.9600906474378	37.7453	86.3505	90.2585
29.8130535595055	84.9368064404942	90.6092234771279	28.4623	90.5817	94.8789
29.2842477671404	84.9699869519739	92.1038719622939	32.5896	90.759	99.4978
23.2146019084357	79.3498919201975	92.510360436914	27.1361	73.6904	92.6772
18.4867385645159	74.9721880831732	92.8269738699008	16.8354	77.4785	96.9485
13.7078002715238	70.5471918130628	93.1470072941681	4.99968	74.2733	96.2118
13.4392271146167	61.5602275677013	91.3256478447581	17.6011	61.1721	91.0121

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.1906732381896	53.2432238394495	89.6400691207075	13.8308	54.4775	90.8096
12.8846700316608	43.0049745815275	87.5651374285315	7.21925	42.3799	79.403
13.4469199681004	40.8260283463588	88.0162870651885	9.27453	43.3967	88.7547
14.1340952503765	38.1629656420583	88.5676738291189	8.75416	38.928	96.5496
15.9474107851462	31.1356478925497	90.022689952304	19.247	29.2712	80.817
17.1552716821258	25.3986334579538	92.1379899975499	9.96077	19.2347	95.1963
19.8458144585855	24.6770359940043	92.1692084570471	20.3288	28.022	94.6827
22.8529855496238	23.8705137785468	92.2041050348649	22.6997	14.9199	96.5597
25.3642253796932	24.2366787043981	91.7294208387653	27.2482	20.2425	98.6789
27.991235680972	24.6197202457302	91.232859870247	27.4222	25.8428	88.2494
30.6741656916282	25.0109157059806	90.7257294101221	29.1053	29.2049	97.3043
37.7272318495811	26.0393531052695	89.3924772837725	44.5404	30.686	94.969
38.027282699674	24.8454019666765	87.0101239010594	42.4972	23.9973	88.7768
38.3479623703874	23.5693666448969	84.4639855631538	41.7205	19.4188	86.0496
38.6423501445418	22.3979549674329	82.1266099482205	46.0829	25.5503	78.1024
38.7686118279551	21.8955484998819	81.124141296811	43.8962	13.6901	83.4665
38.3898180836061	21.5865564099092	77.7208046052771	47.6864	20.3976	74.364
38.0141235739835	21.5650463349797	77.1675063088369	39.9475	19.2268	79.8118
37.6027261407838	21.5414986363243	76.5616301553852	37.7688	31.4408	76.6336
35.7983640138956	21.4383079804651	73.9041831488538	27.3595	17.3028	77.1892
34.8778625387795	22.1370192569317	69.3163994170008	36.0033	17.5038	68.4307
33.9712642907285	22.8251732996475	64.7979261916888	26.0672	21.3383	63.983
33.4301045424039	23.2359529209849	62.1007766403382	31.6686	31.1822	62.9487
32.9548343549067	23.5967216973573	59.7320253681465	34.4638	23.0393	61.4662
32.4259392301686	23.9981963177788	57.0960094452847	38.2173	22.874	49.077
31.0142237356817	24.4351863308295	57.2137916721556	31.0765	22.0815	48.5077
28.5001350114223	25.2134045951643	57.4235203900782	25.7178	17.895	52.7372
26.1297410678386	25.9471332785583	57.6212727854713	25.8125	25.1372	50.1121
23.5774131784312	26.7371774745909	57.8342021804993	23.2874	32.7742	59.4617
21.4630205119788	27.3916659805748	58.0105994632138	22.7183	34.3604	52.0641
19.6795607472802	27.9437302914516	58.1593806671403	19.5262	30.4483	48.5255
17.431370099885	28.6256972682619	58.401645995562	15.3897	25.3897	58.7078
15.3126932471808	29.2683818840113	58.6299463058602	17.6023	36.5196	56.7286
13.0748800948248	29.9471978339197	58.8711028102318	9.16001	37.8018	54.1714
10.3220911689634	26.8287512121102	62.2047591780356	15.6993	18.7479	59.9926
8.49395107417853	25.2707753414949	64.2630477984516	3.44571000000001	28.2052	68.896
7.65172478206856	24.5530250061697	65.2113096935332	4.056	25.9589	74.3875
7.55976410404388	23.0916389469333	63.7283772876879	15.3759	23.0999	65.044
7.4553872892466	21.4329801804581	62.0452664609208	2.38826	24.0295	62.08
7.33921154697373	19.5869135752708	60.1719874999889	10.9524	12.0779	65.6188
7.06659037099817	18.5383095264165	58.4470438282319	6.43447000000001	8.70233	59.8478
6.61203149529217	20.0186531307459	53.2191613502331	0.613562000000002	12.2624	51.4967
5.8937888725015	22.58784047319	44.3909012839481	2.68873000000001	16.3883	43.9305
4.93260269078132	26.026104578729	32.5762217505553	5.25835000000001	27.1001	26.8402
4.55734746137327	27.3684312182352	27.9637716508469	2.1823	25.6845	27.6693
4.18669398212428	28.6943335496091	23.4077727364238	0.659450000000007	19.6999	21.228
Route: 3 Length: 430.686477457266 Demand Met: 781					
3.35337678612336	44.0887026884345	1.7648741440016	12.2621	43.6923	1.4336
4.27841357437541	51.504041766318	3.29025398605996	11.7937	48.0467	6.2423
7.90217221379116	80.5663946201568	9.26784120250361	1.02508	82.9527	3.7072
8.37768943893911	84.3787610304416	10.0520228794814	3.35356	88.986	2.7967
10.5528449863513	88.8139190489707	13.340711030709	4.45068999999999	94.0863	19.178
12.8535211080293	89.3375720658762	13.275565015177	12.3803	91.1149	15.3598
15.5814399471291	89.9584774928386	13.1983259552619	15.2733	95.1553	18.4059
18.4373755470375	90.6085087506929	13.1174539250543	16.854	97.4806	6.0907
20.5443307761314	91.0330958007756	13.1115456987067	18.6101	90.3489	8.9268
22.9753700618443	91.5229889808016	13.1047293430737	23.1083	96.0553	21.9675
31.1910156895729	92.4135385463462	11.5769616110197	32.7208	86.88	6.0296
35.3327528652456	92.8625261237286	10.8067349658846	34.7579	99.7518	13.4448
39.7416124927612	93.3404734834514	9.9868289681786	40.7053	85.7824	6.0265
42.9491007223258	93.6881793869192	9.39032520093433	40.4171	94.2218	3.0792
46.7960247824787	94.1051970052761	8.67490226179435	51.8363	98.9629	1.5963
46.9754060772879	93.7663837173629	9.15187465296094	48.9418	95.7946	8.5835
47.160632525027	93.4165286989238	9.64438939360742	48.934	88.5471	3.512
47.3404463031409	93.0769018320643	10.1224954926541	49.8328	92.6571	10.5815
47.3404463031409	93.0769018320643	10.1224954926541	54.7886	87.0165	7.4948
45.5918676250712	92.1189285704899	17.4092841546544	43.3068	85.4106	16.2891
44.0201737648748	91.2579042946877	23.9589483629088	48.6626	98.7924	25.383
44.0201737648748	91.2579042946877	23.9589483629088	34.7487	93.2543	26.9859
46.7483110890693	89.9500621884034	26.6935750732531	45.6946	80.9262	23.2292
52.972087873363	86.9663097243468	32.9320573664769	50.0418	88.5256	42.3177
55.4100269313614	85.7650298905593	32.7811083915376	58.0371	93.3465	37.2538
60.3755120240748	83.3183309081809	32.4736770903497	59.2712	76.4167	39.0582
61.662239812403	82.6842916689202	32.3939998770618	61.8453	80.8454	29.5157
61.662239812403	82.6842916689202	32.3939998770618	60.2539	80.1704	27.9583
62.9007293241493	82.0740199598158	32.3173062819414	66.7645	81.0279	23.2022
64.8801828829934	80.8245681840762	35.0465210681469	61.6789	74.8507	42.3385
71.5899175255127	83.4077142617005	34.3100931204404	75.9957	81.402	37.5418
75.634426421881	84.9648817329177	33.866092345934	77.5352	78.0347	33.1993
79.8826622248488	86.6004808469263	33.3997217440396	80.7777	87.9354	23.575

Solution x	Solution y	Solution z	Original x	Original y	Original z
87.1386241074633	89.0163147842802	36.312627670569	91.0373	94.8618	33.7328
89.2995818145571	89.7357998357294	37.1801346367493	96.3227	96.5824	35.4748
88.8695229106685	88.0697741599499	38.5359189801266	91.8947	87.6684	31.3605
87.6527552658743	83.3557412557088	42.3720760925396	95.4573	78.5053	38.9919
86.4388204154998	78.6529205992856	46.1992148411663	94.2046	73.3577	49.4797
85.8770646756487	78.4818581171214	46.3967252726293	84.0931	75.7357	43.6346
85.3143165555555	78.3104917602609	46.5945839071811	78.9206	73.8168	40.4273
84.6596514368143	78.7872095388304	49.0587852243659	76.2214	75.1456	46.9071
83.711031550639	79.4780508816499	52.6297302423854	79.6042	79.6519	48.0916
83.711031550639	79.4780508816499	52.6297302423854	78.3667	74.2083	50.3369
81.5446135102995	81.0554644017415	60.784913081972	77.8131	90.2453	61.6399
81.5446135102995	81.0554644017415	60.784913081972	73.8931	82.0767	63.5442
81.5474824378231	80.866887686669	61.1542397258295	84.4594	85.6238	69.4005
81.5474824378231	80.866887686669	61.1542397258295	82.6909	80.2719	62.172
80.5694809273425	77.7433446766372	61.2364699589183	89.1084	77.1611	62.2997
77.802453159756	68.9059366085943	61.4693155465786	78.2186	68.7569	71.4148
77.0321732451814	66.466294171338	61.3960382180428	81.8209	62.9891	53.3907
77.0321629422578	66.4662680010725	61.3960405281897	82.834	58.4111	60.6469
68.4759258602839	66.1161302569668	62.7250657688916	65.9297	69.3415	71.7927
67.4844066535037	65.7586383700667	62.0535519948969	60.9907	71.4945	66.9566
65.9869751412293	64.9034411779246	60.6763416063059	69.3672	55.5594	61.2856
63.9212931538484	64.322706290054	58.9093052259708	69.1414	57.6653	59.1832
59.3248479877578	63.0304721333446	54.9774449245804	60.771	67.3196	52.7577
59.3248479877578	63.0304721333446	54.9774449245804	64.2573	58.953	49.3124
55.9308947291663	62.0763129489937	52.0742172880442	56.0439	62.2937	45.4781
54.0377416950855	61.5440859941091	50.4547656255568	58.3448	60.9201	41.5011
53.2706387887433	61.4051112113765	50.3267589756249	57.8122	54.5104	45.2899
49.4955901928489	60.7211375127793	49.6968038347666	42.1545	66.9856	47.2528
49.4598287990896	58.9196921741412	49.9789489251619	40.6271	60.1839	50.1596
49.3827901924183	55.0417268955735	50.5863236516689	44.4217	55.3301	59.2126
50.4292529684251	44.1106310773497	50.092297395058	46.2037	41.7062	48.7254
50.8842960070277	39.3572715587284	49.877437827028	49.1148	32.8614	42.5439
51.3753991571626	39.1698967034232	51.2618828262748	56.0389	33.1015	51.1098
51.3753991571626	39.1698967034232	51.2618828262748	55.5492	35.9315	44.2535
52.9587643395383	38.565744785217	55.7254506801625	56.9788	35.9946	54.4126
54.4242655359466	38.0065790042623	59.8567549189333	47.522	42.292	65.6102
57.008473403044	36.7009285276822	62.2625819675294	55.099	31.771	70.6981
65.099735360481	38.7397358585985	59.1799763086297	61.5258	41.6034	50.3406
66.1597187502481	38.9668219096606	58.8845944061319	60.6972	35.5066	52.4287
72.2504551001487	40.2716329818843	57.1871790765641	73.2088	32.0501	51.6558
73.0274140170627	40.5371051964512	57.0325247390659	74.0572	35.987	63.4666
73.0274140170627	40.5371051964512	57.0325247390659	76.05	41.1841	50.3284
73.7748874085434	40.7924994466174	56.8837384426468	74.7866	36.0265	64.8468
75.1408645891734	41.2592072973375	56.6118234078727	78.6058	43.2582	65.7281
80.0177631797692	42.7018187339154	52.9504504817755	81.4209	43.6493	50.298
83.2007198973012	43.6433434847942	50.5608238501658	81.1997	46.621	50.135
86.6760604567843	44.6713616775098	47.9516853752211	94.61	43.2995	53.8065
86.6760604567843	44.6713616775098	47.9516853752211	88.1955	43.6361	47.6404
88.4363290418643	46.0222410701413	43.9933120346229	96.1419	41.3034	39.8142
88.4363290418643	46.0222410701413	43.9933120346229	91.3249	42.8902	41.6597
86.9690769249824	48.7673107615429	42.5055549634598	92.0634	46.0336	40.4672
83.4387007815817	55.3723187416777	38.9257870737008	80.6139	53.7748	37.9975
80.3033318686442	61.238279630532	35.7465731193008	82.5413	70.9361	35.9747
79.2522136567235	60.5018385222508	35.0781019068826	81.8774	60.6902	25.477
77.7834634526911	59.6119444432771	35.0941163317441	82.7455	58.0479	28.4959
74.7284671764046	57.760943403049	35.127398495151	76.3859	55.8636	29.5918
71.6541352719786	55.8982336779959	35.160879346665	70.983	56.1077	39.9244
71.6541352719786	55.8982336779959	35.160879346665	67.8108	54.6502	44.2592
69.6341093004915	54.3484902035926	32.4534850798462	74.8357	53.7031	27.6754
67.9735505586988	53.0746063153553	30.2279366809862	74.6616	49.1772	30.6996
67.9735505586988	53.0746063153553	30.2279366809862	73.064	44.6995	31.3834
63.0908707343239	49.3286885362229	23.6837264970909	69.2786	47.5055	16.1011
37.0127195282512	40.4418753661579	15.6003695630046	36.8488	32.2474	21.2512
35.6446744619954	40.2476140334758	14.9858237220668	37.4105	49.4356	12.3771
26.3347850939344	38.9251584816969	10.8038845562309	28.6889	43.6077	12.417
Route: 4 Length: 467.073688071989 Demand Met: 748					
10.2097439595926	15.7398508501382	28.6978145529843	17.2907	17.3232	33.1257
10.9338215500298	13.9340430788962	31.3192609341769	15.6444	17.8995	34.8069
11.541534414878	12.4184252468855	33.5194196952606	2.19732	10.251	34.6682
11.541534414878	12.4184252468855	33.5194196952606	14.8737	9.51072	37.7455
11.9415857174967	11.4205953560314	34.9679090798379	8.57052	3.36732	32.2638
12.2321854805875	10.6957779604453	36.0200930563537	4.96047	4.06059	34.5353
12.770319867733	10.021089648521	37.299060567326	12.6307	2.70835	31.4638
13.9152064438407	8.58564106494207	40.0200925395621	19.0116	0.977048	36.1157
16.2319641829281	6.36115626281154	54.4491993599225	21.7245	2.01127	55.495
17.2562916141556	5.37743064501151	60.830702521827	26.7979	6.90196	59.464
18.64154205621	4.04638370641766	69.464673247892	10.9477	2.73525	75.6448
21.5157277131854	3.99261928450615	70.5373995852792	19.7287	0.198716	79.5663
22.4753739814403	4.0903762476036	70.6024412771498	23.5387	4.13129	73.048
22.4753739814403	4.0903762476036	70.6024412771498	17.1854	11.1942	73.5432

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.7764972730457	5.03794848082857	71.2320855749492	33.1085	0.882753	62.284
49.4038006437704	7.29896980520536	73.4054924995342	50.9211	16.4053	69.6798
51.3856307458402	6.70178993530331	74.0237686008578	56.3237	2.07366	66.7228
55.4575280618284	7.22987348348469	80.2373801604604	51.1528	6.04103	87.327
56.8932815671393	7.41619230463651	82.42828011415	52.4925	5.37248	88.2454
57.9744454876994	7.55651442221593	84.0781109313687	55.9929	17.1432	85.8884
62.8670779195943	6.37246909485255	90.6507971081334	61.5069	0.482106	98.5604
65.0015320666394	8.07004626979916	90.0514556131278	64.5769	3.66176	91.1441
67.8298627769916	10.3195007334861	89.2571759675342	68.0574	15.6194	97.6814
71.5618129331014	12.4796618524324	86.8690837427325	75.2455	17.3084	91.8789
73.957637696867	13.866321330639	85.3359199623512	73.4709	7.6166	79.1313
76.4446242911768	15.3058726563908	83.7443859142087	76.9072	18.2917	80.6948
78.5285510173029	16.5120081553343	82.410731036333	77.5205	18.1054	72.6356
84.9724453924993	18.686382824242	85.7131531646344	90.4883	12.6216	83.5226
88.9505248239196	20.0288708529804	87.7528462122877	93.1464	19.8146	96.7782
90.2839727379269	21.9627703120944	82.1831575900786	96.7473	23.5618	82.348
91.2746453740856	23.3995718135551	78.0451499294288	96.7716	16.6523	73.2113
90.3634613848874	27.712391099469	74.9127835574999	82.6839	23.4883	70.1916
90.1132452266048	30.9386359347787	72.9616734482214	89.036	30.7257	77.9388
89.7848596440215	35.1727921285405	70.4009240665969	95.9404	38.2332	74.7444
89.4577092119273	39.3906191426175	67.8500100489005	86.8559	48.4797	70.9689
90.0995148643484	38.6531225509927	65.6403362708858	96.3235	44.2629	60.2644
89.1980499306538	36.4155354674574	64.6261055210206	92.3029	41.017	61.4442
87.8662549973554	33.1096551329972	63.1275727321466	85.0689	32.1301	62.1612
86.7110273877271	30.2421159459151	61.8277595936839	77.6794	29.1288	65.8649
88.0013238445231	20.9498862586708	54.9511601343664	80.035	15.8589	58.0701
88.3163436178191	20.3119213354511	54.2992886777238	78.906	18.0381	53.555
89.2591063413276	18.4019465767076	52.3478655210062	87.5589	25.1226	45.9834
90.9283439435861	15.0202506325526	48.8928834980457	88.2698	14.9994	45.4757
92.3360129642697	12.1684686754063	45.9792506589734	95.0473	3.39817	49.8314
92.6756365199361	12.3695428642986	42.707727946498	86.8707	18.0065	43.4379
93.1122863729192	12.6280305783204	38.5015555254922	91.7898	10.5225	38.6828
93.5643395293107	12.8956406396816	34.1470654567309	97.2905	22.0419	32.8941
93.421790001875	12.0998193149547	31.9689978772886	99.5164	7.77478	36.5945
92.9362028566925	9.3883425461889	24.54699257917	88.6343	0.494442	25.7719
93.5522949377755	9.61043225009823	19.7150915626768	88.9914	10.7701	17.3091
94.0195213318398	9.77885830835059	16.0509172382524	98.9579	4.73211	12.8251
94.2635511759673	9.86682069132309	14.137217210125	95.7659	2.55349	7.5519
93.8834282859759	15.4569490235917	13.32880838431	97.4766	17.1802	10.0021
93.5797648111171	19.9229671574634	12.6829787341074	99.5853	23.4577	6.8435
93.5138403021171	20.8930771013924	12.5426586629026	98.8743	25.646	5.6301
92.1448250015444	21.9093894363587	13.8194610388787	90.11	20.7153	5.7932
85.8580043241567	26.576791139717	19.6821926071984	81.7106	28.112	19.2367
82.3115474468404	29.2095697955864	22.9896088403895	76.419	22.7841	27.7958
81.9723421971466	30.7044059152295	23.3853059800299	80.5435	37.2793	30.7227
81.9723411813246	30.7044098386494	23.3853069578013	80.1207	32.7664	32.9471
81.9488284247322	31.6044375660895	22.3011568815369	81.8496	38.8539	28.9342
81.8039186045527	37.1638880560968	15.6062120311268	85.2354	42.0312	17.7315
81.6945629419599	41.3559514858492	10.55794605144	80.0506	36.8529	1.8328
82.0751399420767	44.7346930840381	10.2535375799187	72.4782	47.1166	11.4083
83.3189658825531	48.1377679560111	9.82756906569514	79.5061	49.6701	11.7965
84.5969262439952	51.6342393443889	9.38991466619345	90.8764	48.3318	12.9357
86.3669388181625	56.4769422155993	8.78375156981546	88.4474	55.9131	14.5629
88.3094067937086	61.7914861925008	8.11852880339974	85.3959	62.1638	1.7086
90.1091267220938	66.7154607784882	7.50221358437058	97.9153	71.697	3.8476
71.8002709273717	69.9539822654755	16.9670853322203	66.9764	66.2314	9.0944
67.0106887419072	70.8442593796047	19.5409385385695	65.3011	67.1869	28.6409
64.9609318095817	72.4480390552408	18.1252400390967	60.356	72.3736	25.6911
62.4906038137792	74.3808036194559	16.4191855261678	60.7208	77.8844	16.4053
60.5254266284858	75.9183731153985	15.0619749515559	63.6977	85.2552	13.695
56.2831827384388	75.3605358561345	13.2987443836219	50.9984	83.4341	15.7476
55.3118228806064	74.3957110176733	12.4516784341409	54.169	81.8375	12.9059
53.878387312976	72.9720442053932	11.2017108159997	50.5772	79.5094	6.7911
52.614649095494	71.7169008956347	10.0996951370859	52.5118	68.1256	10.9937
51.4709158679623	70.5809248394191	9.102315236135	51.793	64.9464	0.9013
48.5571832966	71.7117625856249	12.2953149716371	45.1636	79.7971	7.5816
45.9507959013461	72.186398474024	15.8204334433578	43.9629	81.9344	16.1851
44.7952997638696	71.2731682640442	17.6615319681447	47.6475	71.1843	17.3202
43.5412357276047	70.2820519878076	19.6596699754865	45.2184	66.3382	18.5431
42.2872265363395	69.2909883015787	21.6577176718983	41.4131	74.8199	27.7293
41.5361128974173	68.697353236683	22.8545076879478	46.3399	71.17	31.2162
37.9428324914676	66.2424360004429	23.9210383838394	35.9094	68.8825	29.2317
35.11343641495	64.3094088785115	24.7607799099817	32.641	61.5676	34.0062
35.0350888260635	64.2741320567181	24.6364085681587	33.4192	59.483	33.0004
27.318192295241	60.7969532709972	12.385389541079	24.7619	69.8637	9.1655
26.9050694251992	60.236126277689	11.6989289084363	24.5176	59.5849	13.4915
26.4924116502105	59.6759202246716	11.0132337280231	30.6696	55.2626	12.0174
26.0811169239985	59.1175812851956	10.3298330728018	31.2678	61.1344	2.0752
Route: 5 Length: 387.419433050745 Demand Met: 757					
14.7351330641507	45.4774891809475	19.4440405906699	12.5872	53.6987	19.2898

Solution x	Solution y	Solution z	Original x	Original y	Original z
17.8416754181222	47.9645331848442	24.2949576944839	22.8193	53.7552	17.9075
17.8416754181222	47.9645331848442	24.2949576944839	17.5856	40.8861	25.0628
17.8416754181222	47.9645331848442	24.2949576944839	22.5447	55.6169	28.4034
17.8416754181222	47.9645331848442	24.2949576944839	26.2003	42.5604	24.4871
17.8416754181222	47.9645331848442	24.2949576944839	23.6126	49.4214	29.6987
20.8658764926165	52.3767607869128	34.4700558827868	18.9042	62.1271	34.907
21.0598231512209	52.2205484085213	34.8775541418058	25.6513	60.6643	37.4717
22.4470525288784	49.5290578635565	38.7066017404335	17.5187	55.1629	44.2721
22.4470525288784	49.5290578635565	38.7066017404335	20.5641	47.7219	38.8826
24.311521203834	45.9116174819583	43.8528916055367	23.6339	40.0124	41.5074
25.7422540453045	43.1357275933978	47.801993591308	25.7714	33.2927	46.3113
26.1798866219145	43.5956118776427	49.2200305019718	32.7353	38.4372	45.6112
26.1798866219145	43.5956118776427	49.2200305019718	33.2771	46.652	45.1216
28.7941893401023	46.3427349471541	57.6908349066962	30.4468	53.5688	58.3124
29.9576830214721	47.5653718785268	61.4608159852885	34.4656	38.8185	62.9703
29.9576830214721	47.5653718785268	61.4608159852885	38.1612	45.7549	62.3997
31.1877534311795	48.9290141787097	65.5155199386372	38.5534	48.7846	64.7262
32.1754767968179	50.0239826440379	68.7713667435114	41.6783	52.1535	70.8377
28.6244544979986	50.4449391127201	72.2348947205895	24.4594	47.3987	68.2546
24.9861008939582	50.8762473180419	75.7835996422269	17.8085	51.9553	71.4677
23.1352013192709	51.0956610857442	77.5888874734781	13.2524	50.7626	76.4367
29.3892869381399	52.5949568107575	87.5593313902737	31.4339	43.8079	91.7683
29.851177842346	53.4978504310021	88.2146124251378	23.2085	58.8069	93.3912
40.1549464855738	56.6810000655429	89.298059704391	41.7302	58.1199	97.2119
43.2010614439999	57.6220800733922	89.6183609668743	43.5841	58.7522	99.5019
46.7987528087948	58.6016105400004	88.7131455850004	54.0007	52.8659	92.5002
47.1542242133262	59.5090503824942	88.0339077106335	43.1006	68.5786	87.3861
49.900281015105	58.3027296675811	86.3380425913159	48.6743	62.5481	86.8455
53.455655418109	56.740898970335	84.1423823606402	59.9164	58.75	88.5608
55.5812712999812	55.8071193056405	82.8296707591109	59.9164	61.9972	76.3491
58.4294898733558	49.4163080007855	83.4857319773166	53.4254	44.9898	88.3964
59.7117738668351	46.5390505646783	83.7810920014926	55.717	37.8511	81.0117
66.6558674988485	47.6819665887594	87.1327592477639	72.565	40.2263	84.1996
68.8746546052549	50.0661121191176	89.5894800097938	70.0979	43.9308	97.3335
69.8124237257644	51.5644943273076	90.206946303953	62.6521	52.6724	96.4246
71.5837734812521	54.3947844438579	91.3732415427724	69.9395	64.1832	90.6048
71.5837985906351	54.3948234428752	91.3732576911444	64.8783	60.379	95.6551
77.810087431859	57.4176020528511	91.9251835390394	75.5117	58.1702	94.9268
86.0290096168958	61.4077703350438	92.6537440616914	88.5712	66.6382	86.5414
88.4548021318167	62.5854769663159	92.8687754119726	96.3481	58.4969	97.3507
88.4394956408097	66.0863554791021	91.1921845980899	93.4248	68.5015	98.1606
88.4179540538143	71.0125194831412	88.8330259579049	87.0562	74.7862	94.9506
88.4179540538143	71.0125194831412	88.8330259579049	86.1254	75.412	92.2501
88.4045962269641	74.0677217515068	87.3698733466555	98.0725	73.509	85.0617
88.2140438149087	75.9321794883131	86.5255799726881	80.8889	76.3527	85.0129
88.0496928416733	77.54026059798	85.7973827550609	80.9911	75.8316	78.9882
88.4578896384309	79.7693824316479	85.4547748346804	95.1537	79.2325	85.4918
88.8435876121208	81.8756237414502	85.1310536078345	98.0879	82.1977	81.4504
88.2053343322962	83.9794173813627	85.2123339818829	92.7385	89.9534	78.6648
86.1148639600058	85.3993921065088	87.0400789097812	85.2864	82.465	90.0038
84.1525136055233	86.7323398915095	88.7558059095473	83.5669	88.2708	89.9554
82.3958803278443	87.9255446898967	90.2916657728645	74.5996	81.8744	91.5993
81.7992746427549	91.0768734854897	92.1464907767421	87.9339	96.7331	97.5762
81.7992728912299	91.0768741907043	92.1464905979922	86.1563	95.4019	99.9835
76.6481964215939	91.7273591637053	90.4814254154921	75.6359	99.7073	96.3469
72.4245731161809	92.177586161137	89.0505933881178	75.4786	92.9344	80.494
72.4245731161809	92.177586161137	89.0505933881178	75.6586	91.7899	79.8395
65.7032286776828	92.8940526186041	86.7736437077476	65.9332	98.9174	85.8003
60.0385766822022	93.4978758506185	84.8546566000765	54.3707	99.6057	90.3024
60.03857440658	93.4978751311533	84.8546543967465	51.2472	90.6526	88.5593
64.0965853477547	94.8379625180469	67.8939798083125	68.0526	97.9535	69.9593
64.0965853477547	94.8379625180469	67.8939798083125	68.3546	93.0491	63.4728
64.8131587902541	95.0745915457061	64.8990243963023	74.1314	97.2935	62.187
59.7295099420012	94.0189534302949	59.8363630178792	59.3326	96.8644	60.2925
54.4003811059187	92.912330462745	54.5292381733992	53.7144	89.3849	55.8234
49.2896720041333	91.8510705225441	49.4396335841796	54.8665	95.2849	41.9419
46.7184771021509	91.1944125534479	47.5829245697082	44.9959	88.3516	56.7624
46.7184771021509	91.1944125534479	47.5829245697082	48.3206	81.4332	48.7053
43.2281005481825	90.3593359850673	45.0626356763021	47.7087	83.4773	42.5429
38.7791371050015	89.29493889143	41.8502041171722	34.4937	83.7515	46.1073
36.1680207932483	88.6702272675165	39.9647995297151	36.723	86.3354	38.0239
33.7885600999719	88.1009367704186	38.2466665734863	38.4806	81.2568	32.7466
30.4506966013975	87.7550475258343	36.3415615249153	26.7929	78.8352	37.5421
29.9788877723266	87.7061549565387	36.0722747916006	23.3569	85.0798	30.5318
29.6833433949175	87.6755280715418	35.9035918759817	33.1283	92.3481	27.8161
27.5927791538103	87.3395626876287	34.9883854159801	29.5533	92.3189	26.5937
21.866288275297	85.9436893757461	33.424944312384	16.7243	94.3593	34.7835
18.3105492197969	82.4482166285442	31.7031246766779	16.5471	81.1813	37.3426
14.9387755492887	79.1335869310435	30.0703823507071	8.89064000000001	83.8954	29.0611
12.4867364054018	76.7230916797738	28.8830071150539	10.1219	82.045	24.5182

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.4867364054018	76.7230916797738	28.8830071150539	17.2306	77.2747	24.7644
9.14054077384259	73.4335856437042	27.2626463212012	0.194864999999993	71.2335	31.0366
12.8235570325304	70.3198915619383	20.7676048035569	20.7262	75.308	17.3361
11.451825705345	65.7898830782137	18.0645434173313	19.6656	61.3862	20.5906
10.6899370301287	63.2738674576126	16.5632256375221	8.25408	64.3565	18.8288
9.86593611540781	60.5527285328829	14.9395118647073	5.52590000000001	61.9092	6.1438
9.86593611540781	60.5527285328829	14.9395118647073	9.17265	66.1356	6.7326
8.70612238804684	56.722044496672	12.6544358888038	10.9638	55.5178	10.1729
7.67433921630038	53.3142414343209	10.6216175347708	13.5318	57.9262	6.7229

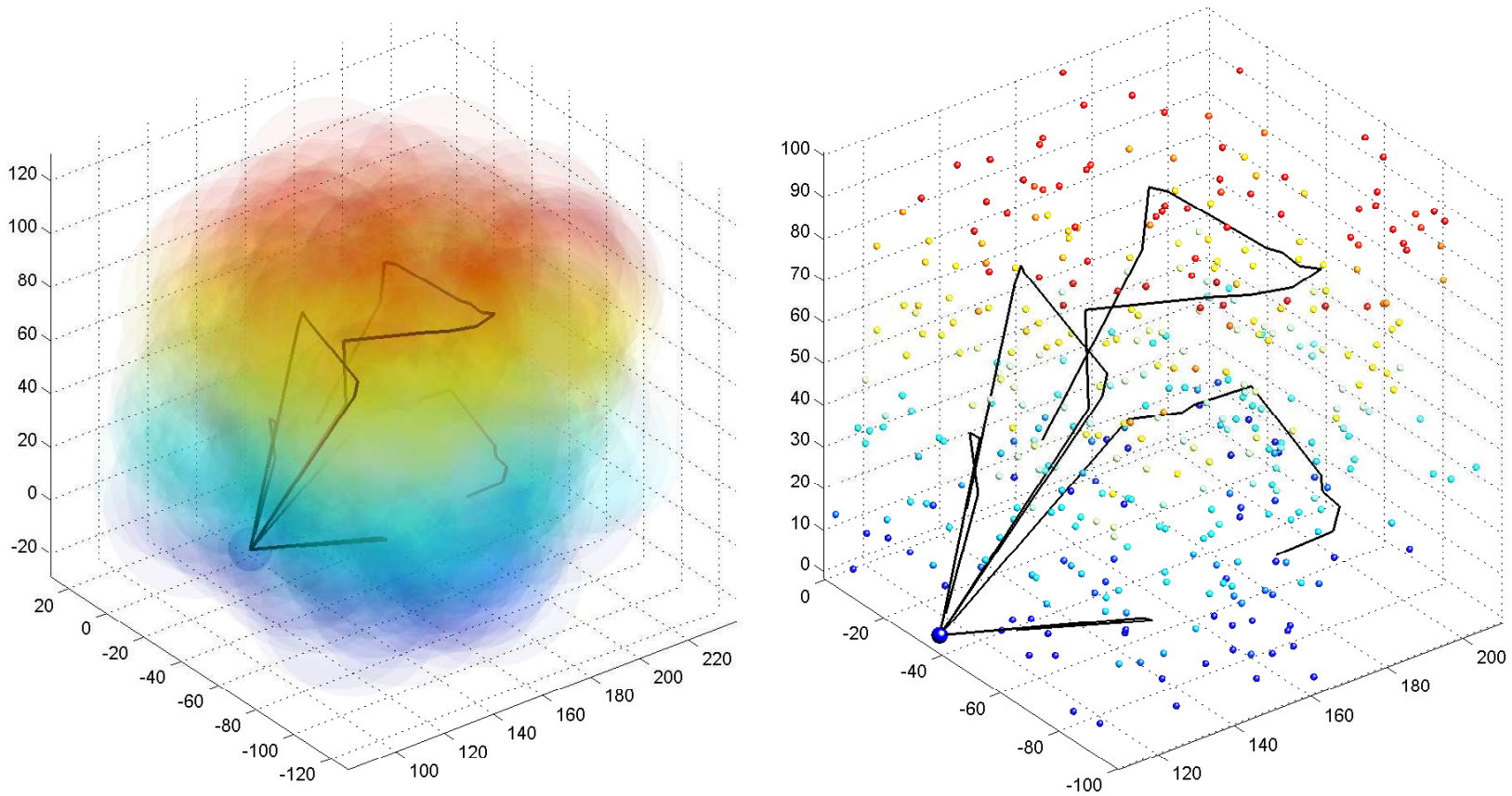


Figure O.81: $rd400$, $r = 29.865927$, Equal Radius, 3D, Euclidean, Length = 962.6975809

Table O-84: Solution for $rd400$, $r = 29.865927$, Equal Radius, 3D, Euclidean

Total distance: 962.69758089045 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 99.0819300209373 Demand Met: 466					
5.55784636546616	33.6206559333563	6.18701052667029	12.2621	43.6923	1.4336
5.55784636546616	33.6206559333563	6.18701052667029	11.7937	48.0467	6.2423
9.41997142348748	31.3941034769352	13.4839946996508	2.40393	50.9808	25.185
9.41997142348748	31.3941034769352	13.4839946996508	2.57158	38.4711	27.3546
12.843294183781	29.4205193719473	19.9519121347099	15.6372	44.5891	30.235
15.756647997249	27.7409527763684	25.4562797339695	23.6126	49.4214	29.6987
15.756647997249	27.7409527763684	25.4562797339695	20.5641	47.7219	38.8826
16.7543092938679	27.1658426177586	27.3411475185539	8.57052	3.36732	32.2638
16.7543092938679	27.1658426177586	27.3411475185539	12.6307	2.70835	31.4638
18.1886835531747	26.3389185030721	30.0511913264175	19.0116	0.977048	36.1157
18.1886835531747	26.3389185030721	30.0511913264175	14.8737	9.51072	37.7455
19.0540214088073	25.8400580160852	31.6861101272321	15.6444	17.8995	34.8069
19.8393770214011	25.387313909084	33.169905179851	25.7714	33.2927	46.3113
19.8393770214011	25.387313909084	33.169905179851	23.6339	40.0124	41.5074
20.6510379829751	24.9193976765541	34.7033993197573	32.7353	38.4372	45.6112
20.6510379829751	24.9193976765541	34.7033993197573	33.2771	46.652	45.1216
21.2243434839486	24.5888890828775	35.7865603648057	49.1148	32.8614	42.5439
21.2243433326321	24.5888886906964	35.7865609145498	49.4944	16.327	40.7382
20.8296583058236	24.4143699756975	36.109660550857	21.7245	2.01127	55.495
20.8296583058236	24.4143699756975	36.109660550857	42.0178	3.44287	36.938
19.8757731947466	23.9922569723317	36.8907571772672	9.16001	37.8018	54.1714
19.2312323177669	23.7072591174061	37.4186114213661	2.38826	24.0295	62.08
19.231232624339	23.7072586964577	37.4186103370263	6.43447000000001	8.70233	59.8478
19.5460023374514	23.4481038903831	36.4223814014569	0.613562000000002	12.2624	51.4967
19.5460023374514	23.4481038903831	36.4223814014569	2.68873000000001	16.3883	43.9305
20.3341237577049	22.7992260316326	33.9280055626262	4.96047	4.06059	34.5353
20.3341237577049	22.7992260316326	33.9280055626262	2.19732	10.251	34.6682
22.0548569151568	21.3824590051444	28.4805962889065	17.2907	17.3232	33.1257
22.0548569151568	21.3824590051444	28.4805962889065	37.0272	27.4581	25.0096
23.074027380687	20.5433555180644	25.2549055230221	25.6231	12.6549	17.499
23.9608174964113	19.8132327401891	22.4482238458906	23.1984	1.0131	19.9686
23.9608174964113	19.8132327401891	22.4482238458906	21.4744	8.21886	12.0685
24.5673396841565	19.3138542285887	20.5285972440349	38.2491	9.61738	19.3363
24.5673396841565	19.3138542285887	20.5285972440349	37.2177	7.79249	31.0238
25.246749272201	18.7544769786662	18.3782823592568	47.3917	2.23053	7.041
25.2467490830358	18.7544771297385	18.3782821516568	48.5894	0.54797	14.4264
25.2467490830358	18.7544771297385	18.3782821516568	48.6979	8.85907	21.303
24.7738036035132	19.099539656903	17.9997835630649	47.6331	25.3181	18.59
24.7738036035132	19.099539656903	17.9997835630649	49.4045	19.961	26.5255
24.0436741078535	19.6322411362316	17.4154625486943	36.8488	32.2474	21.2512
24.0436741078535	19.6322411362316	17.4154625486943	42.987	22.9253	37.986
21.2675824611281	21.6576677533449	15.1936957061632	28.6889	43.6077	12.417
21.2675824611281	21.6576677533449	15.1936957061632	26.2003	42.5604	24.4871
19.2097028607173	23.1590921162208	13.5467449655278	17.5856	40.8861	25.0628
17.3435540483755	24.5206296739701	12.0532385730267	11.4258	37.7412	14.2255
17.3435540483755	24.5206296739701	12.0532385730267	13.4598	41.6191	22.5554
16.2104516114841	25.3473307470715	11.146400439462	2.1823	25.6845	27.6693
16.2104516114841	25.3473307470715	11.146400439462	5.25835000000001	27.1001	26.8402
15.4805417434808	25.8798656189434	10.5622450942836	0.219756000000004	2.58493	14.7832
15.4805417434808	25.8798656189434	10.5622450942836	12.7116	4.29147	5.5693
13.68481130756	27.189992596735	9.12501751672669	2.00806	6.28968	2.6575
13.68481130756	27.189992596735	9.12501751672669	9.0496	1.67955	6.7742
11.4093057456534	28.8501866630065	7.30386723483246	5.81823	20.7452	12.0688
11.4093057456534	28.8501866630065	7.30386723483246	0.659450000000007	19.6999	21.228
8.68187735720727	30.8400869180744	5.12104421851843	0.642905999999996	35.395	17.4189
5.80181311319808	32.9413363839947	2.81607203198537	13.4	22.8874	2.3331
Route: 2 Length: 307.522876731166 Demand Met: 795					
24.9548680704876	49.0793666103133	44.444158490298	42.1545	66.9856	47.2528
27.1026897666281	50.3650896077969	48.6546785081133	40.6271	60.1839	50.1596
29.0250943017856	51.5158443984345	52.4233311939626	57.8122	54.5104	45.2899
29.0870822163271	51.552943533183	52.5449101199853	56.0439	62.2937	45.4781
28.5759640840072	51.9158009748241	58.9658349131024	44.4217	55.3301	59.2126
28.0278892588393	52.3048373995869	65.849907021086	41.6783	52.1535	70.8377
27.5088415754053	52.6732277856774	72.3688611174241	9.27453	43.3967	88.7547
27.293185202224	52.826236805895	75.0781958231034	7.21925	42.3799	79.403
27.0913560823962	52.9694147591088	77.6139302091661	8.75416	38.928	96.5496
30.6615424162553	56.2801019269304	78.4381350619342	31.4339	43.8079	91.7683
35.0664428022288	60.3648024049426	79.4550314485132	43.5841	58.7522	99.5019
38.7119704828762	63.7453510268211	80.2966213643781	41.7302	58.1199	97.2119
42.4431552769125	67.205323876207	81.1579824963569	43.1006	68.5786	87.3861
46.2759161368605	70.7594718141118	82.0427922305962	32.5896	90.759	99.4978
46.5361407869736	70.8675143278279	82.0188232531913	28.4623	90.5817	94.8789
48.3366060287865	71.6153087415957	81.8531400228304	48.6743	62.5481	86.8455
50.2267942272503	72.4003717611968	81.6792024649602	54.0007	52.8659	92.5002

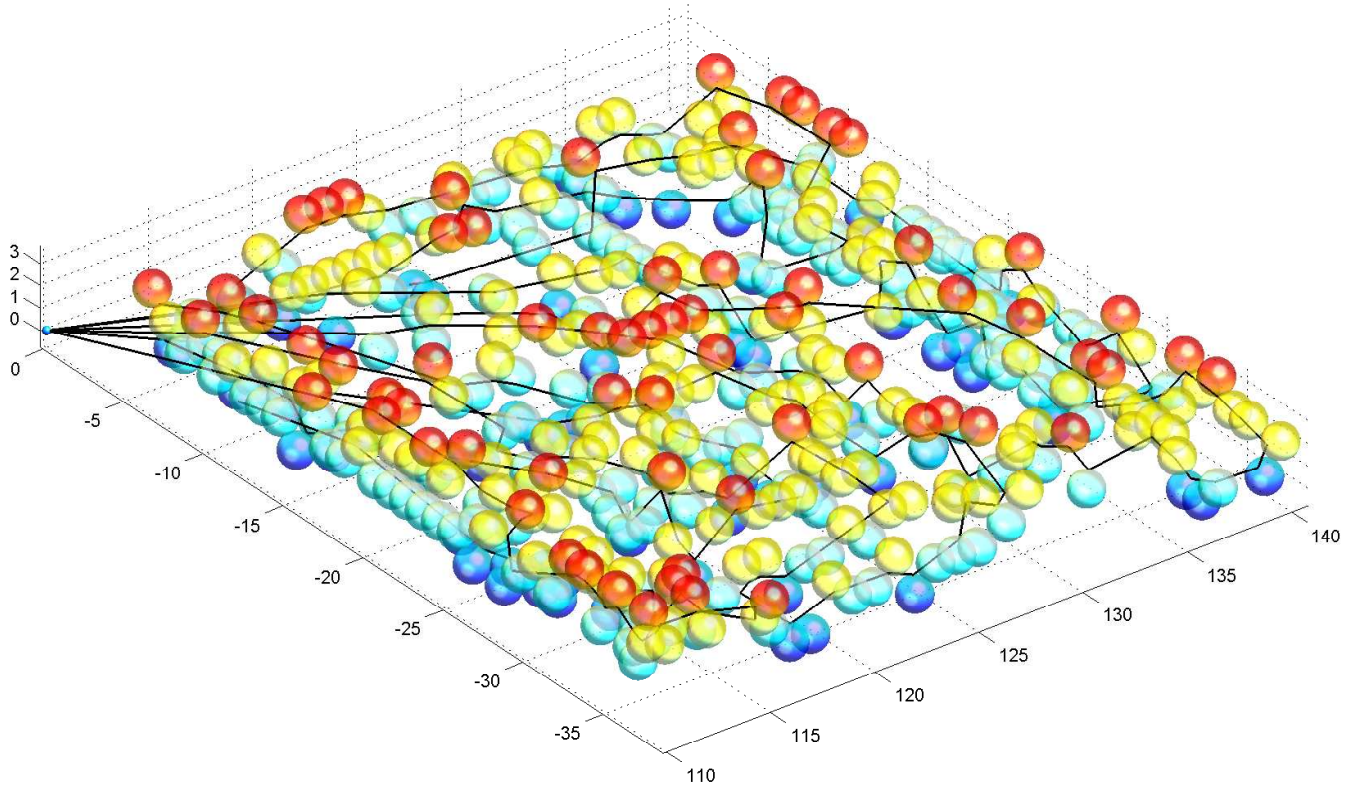
Solution x	Solution y	Solution z	Original x	Original y	Original z
52.2679998919819	73.2481564034239	81.4913639422604	64.8783	60.379	95.6551
54.1896743357401	74.0462756806336	81.3145053016023	75.5117	58.1702	94.9268
54.1896932484185	74.0462836479276	81.3145030121539	54.3707	99.6057	90.3024
54.1897125750238	74.0462917901033	81.3145006760634	65.9332	98.9174	85.8003
54.1897325421092	74.0463002018417	81.3144982646647	44.9959	88.3516	56.7624
62.9760675866342	77.1361071910266	81.4390638342402	75.6359	99.7073	96.3469
62.976068280038	77.1361072854428	81.4390635403928	53.7144	89.3849	55.8234
63.2557322661213	77.1353323715002	81.5085503956996	59.3326	96.8644	60.2925
65.39140210776	77.1292698078893	82.0391996924111	74.1314	97.2935	62.187
65.7529093531783	77.1283167073012	82.1289966869432	77.8131	90.2453	61.6399
66.1046074657195	77.1273902900185	82.2163573600389	73.8931	82.0767	63.5442
66.4621893772375	77.1264540888532	82.3051801476807	51.2472	90.6526	88.5593
66.8359318782418	77.125479610975	82.3980164802548	84.4594	85.6238	69.4005
67.1960280747156	77.1245385941323	82.4874635194687	68.3546	93.0491	63.4728
67.5684811181925	77.123570470548	82.5799805879803	68.0526	97.9535	69.9593
67.9493829268601	77.1225810870249	82.6745964510482	75.4786	92.9344	80.494
68.3281752333451	77.1215940403366	82.768687807297	75.6586	91.7899	79.8395
68.7115441530896	77.1205991043935	82.8639160677865	92.7385	89.9534	78.6648
69.0542743581487	77.1197035826854	82.9490491876549	95.1537	79.2325	85.4918
69.3685892983789	77.1188793157862	83.0271237397201	83.5669	88.2708	89.9554
69.6754379095111	77.1180726602088	83.1033432294698	85.2864	82.465	90.0038
69.9937678852003	77.1172437489595	83.1824147140657	86.1563	95.4019	99.9835
70.1715153884076	77.1167822545965	83.2265673401474	98.0879	82.1977	81.4504
70.3427502121779	77.1163415621141	83.2691026093422	93.4248	68.5015	98.1606
70.5090064996758	77.1159186409902	83.310401736044	87.9339	96.7331	97.5762
70.7292721647635	76.0021845299342	82.8020239914513	74.5996	81.8744	91.5993
70.9558943937562	74.8563536889528	82.2789942785385	80.8889	76.3527	85.0129
71.1807796745572	73.7193130931597	81.7599761979067	80.9911	75.8316	78.9882
71.401666518869	72.6024701112318	81.2501771514913	78.2186	68.7569	71.4148
71.6128409748094	71.5347299419243	80.7627915355601	82.834	58.4111	60.6469
71.7785235869119	70.6970309683955	80.3804095400601	69.3672	55.5594	61.2856
71.9209027725971	69.9771863847664	80.0518248697284	89.1084	77.1611	62.2997
72.0633010306831	69.2572553228734	79.7231999308851	82.6909	80.2719	62.172
72.2070283018246	68.5306147942619	79.3915127111502	60.9907	71.4945	66.9566
72.3483384597195	67.8162140485763	79.0654136784425	65.9297	69.3415	71.7927
72.4863508933375	67.118496503434	78.7469309684175	78.3667	74.2083	50.3369
72.5735510831905	66.1947734522152	78.7404201949009	69.1414	57.6653	59.1832
72.6559557312082	65.3219351768483	78.7342749725289	59.9164	61.9972	76.3491
72.7394208066335	64.4378487693859	78.7280489219275	60.771	67.3196	52.7577
72.8301199115461	63.4771825775631	78.7212824046459	53.4254	44.9898	88.3964
72.8913845141182	62.8283943966122	78.7167253352168	98.0725	73.509	85.0617
72.9662186375571	62.0357185333175	78.71114043727	88.5712	66.6382	86.5414
73.0410446829328	61.2430961903658	78.7055531501833	62.6521	52.6724	96.4246
73.1092203077959	60.521058249541	78.7004742565438	96.3481	58.4969	97.3507
72.9627988215507	59.3077314454381	78.4805848556705	87.0562	74.7862	94.9506
72.7475585448613	57.5240046565631	78.1573383078311	81.8209	62.9891	53.3907
72.5259145168893	55.6871979105469	77.8244707709337	64.2573	58.953	49.3124
72.4648253533505	54.7548127842309	77.8282793298004	86.1254	75.412	92.2501
72.2925653697401	52.125319039022	77.8389677297772	69.9395	64.1832	90.6048
72.1015174414327	49.2089529008233	77.8508122011437	59.9164	58.75	88.5608
71.8962948561229	46.076135219738	77.8635359499556	70.0979	43.9308	97.3335
71.700569731024	43.0882814236626	77.8756681509544	72.565	40.2263	84.1996
71.5137084629827	40.235737680196	77.8872570394742	86.8559	48.4797	70.9689
71.3057763739013	37.0614649773004	77.9001446232503	95.9404	38.2332	74.7444
71.0839875947552	33.6755781319079	77.9138822398753	89.036	30.7257	77.9388
70.8689398302094	30.3926171015335	77.927210367285	96.7473	23.5618	82.348
70.6916384081631	27.6858820388976	77.9382112442605	96.7716	16.6523	73.2113
70.5961870780785	26.2285616554835	77.9441490781682	82.6839	23.4883	70.1916
70.5014892525766	24.7827256945396	77.9500460692702	93.1464	19.8146	96.7782
70.2291689278547	23.7211601458819	77.7883389317594	90.4883	12.6216	83.5226
69.9682299371013	22.7039630898907	77.6333918192273	68.0574	15.6194	97.6814
69.7100655686884	21.697579188265	77.480090432121	55.9929	17.1432	85.8884
69.4574373326875	20.7127701115252	77.3300753388077	52.4925	5.37248	88.2454
69.241733370415	19.8719035354745	77.2019877686421	61.5069	0.482106	98.5604
69.3419207634994	19.5036368930498	75.4317250760486	75.2455	17.3084	91.8789
69.4541990656267	19.0909143026331	73.4477934331111	76.9072	18.2917	80.6948
69.5674146677347	18.6747417191905	71.4472871670056	64.5769	3.66176	91.1441
69.7227159852849	18.1038227849421	68.7030331559874	73.4709	7.6166	79.1313
69.8833155261041	17.5134155210076	65.865114488921	77.5205	18.1054	72.6356
70.0452379540593	16.9181114577502	63.0036956552984	77.6794	29.1288	65.8649
70.2040470822745	16.3341818151494	60.1970189084783	95.0473	3.39817	49.8314
67.3427014361978	17.1419547815307	57.6610352487904	74.632	5.60444	48.5009
64.5261304257644	17.9371095155577	55.164742542629	56.3237	2.07366	66.7228
61.7833460857742	18.7114934115345	52.7338002840015	80.035	15.8589	58.0701
58.0175593054159	19.7746788770708	49.3962327741765	78.906	18.0381	53.555
52.338405934914	21.3779869143181	44.3629656468921	56.9788	35.9946	54.4126
45.7105366575498	23.2490722853971	38.4888384304282	56.0389	33.1015	51.1098
36.5644371263297	25.8310313700853	30.3828476650922	46.2037	41.7062	48.7254
Route: 3 Length: 99.2582748905894 Demand Met: 512					
7.83446064631528	44.807949617675	3.3337666860543	10.9638	55.5178	10.1729

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.83446064631528	44.807949617675	3.3337666860543	12.5872	53.6987	19.2898
10.9889543647362	50.0922739331553	5.22812416472697	13.5318	57.9262	6.7229
13.7587586518991	54.7320633571623	6.89149311358619	24.5176	59.5849	13.4915
13.7587586518991	54.7320633571623	6.89149311358619	22.8193	53.7552	17.9075
15.9807648712141	58.4543065709229	8.22601083840602	37.4105	49.4356	12.3771
15.9807648712141	58.4543065709229	8.22601083840602	22.5447	55.6169	28.4034
17.8000559982465	61.5022635898188	9.31862011506152	31.2678	61.1344	2.0752
17.8000559982465	61.5022635898188	9.31862011506152	30.6696	55.2626	12.0174
19.7632708881077	64.7912073294734	10.4978000257311	24.7619	69.8637	9.1655
21.7044852390787	68.0432754252775	11.6637889425671	20.7262	75.308	17.3361
21.7044852390787	68.0432754252775	11.6637889425671	17.2306	77.2747	24.7644
23.5754011889123	71.1775580105587	12.7875525519572	23.3569	85.0798	30.5318
23.5754011889123	71.1775580105587	12.7875525519572	26.7929	78.8352	37.5421
24.7449739029342	73.1369154010969	13.4900839848452	16.5471	81.1813	37.3426
25.7405155680405	74.8047285030416	14.0880831916645	16.7243	94.3593	34.7835
25.8329145897048	74.8094837435599	14.0305489566352	8.89064000000001	83.8954	29.0611
25.8329145897048	74.8094837435599	14.0305489566352	10.1219	82.045	24.5182
25.9333115227749	74.8146517911847	13.9680333652036	4.45068999999999	94.0863	19.178
26.0585490039109	74.8211002297418	13.890052483466	12.3803	91.1149	15.3598
26.0585490039109	74.8211002297418	13.890052483466	15.2733	95.1553	18.4059
26.1982001783083	74.8282881364379	13.8030957771373	3.35356	88.986	2.7967
26.1982001783083	74.8282881364379	13.8030957771373	1.02508	82.9527	3.7072
26.3535630536705	74.8362878859435	13.7063572691608	16.854	97.4806	6.0907
26.3535630536705	74.8362878859435	13.7063572691608	18.6101	90.3489	8.9268
26.5101750971759	74.8443526068026	13.6088431337684	34.7579	99.7518	13.4448
26.6640882898441	74.8522791604393	13.5130117251869	23.1083	96.0553	21.9675
26.6640882898441	74.8522791604393	13.5130117251869	29.5533	92.3189	26.5937
26.8156675738454	74.860084892355	13.4186325705609	34.7487	93.2543	26.9859
26.8156675738454	74.860084892355	13.4186325705609	33.1283	92.3481	27.8161
26.9643066576479	74.8677392073003	13.3260840116666	36.723	86.3354	38.0239
27.1210617665445	74.8758100439533	13.2284796152149	38.4806	81.2568	32.7466
27.2808774336725	74.8840376541155	13.1289675083576	45.6946	80.9262	23.2292
27.2808774336725	74.8840376541155	13.1289675083576	41.4131	74.8199	27.7293
27.4367958450513	74.892065652716	13.0318816914487	50.9984	83.4341	15.7476
27.4367958450513	74.892065652716	13.0318816914487	43.9629	81.9344	16.1851
27.5797263941556	74.8994270189748	12.9428868454771	43.3068	85.4106	16.2891
27.7192159226426	74.9066119554559	12.8560360118559	32.7208	86.88	6.0296
27.7192159226426	74.9066119554559	12.8560360118559	45.1636	79.7971	7.5816
27.853573260789	74.9135325916289	12.7723812568734	40.4171	94.2218	3.0792
27.853573260789	74.9135325916289	12.7723812568734	40.7053	85.7824	6.0265
27.9812988032264	74.9201122837358	12.6928574882943	48.9418	95.7946	8.5835
27.9812988032264	74.9201122837358	12.6928574882943	49.8328	92.6571	10.5815
27.9812995787073	74.9201120646912	12.6928569215374	48.934	88.5471	3.512
27.9813003822238	74.9201118602376	12.6928563682419	54.7886	87.0165	7.4948
27.9813003822238	74.9201118602376	12.6928563682419	54.169	81.8375	12.9059
27.4354627226244	74.0830479664459	12.4232595473275	50.5772	79.5094	6.7911
26.8482700414219	73.1825591929174	12.1332409350988	51.793	64.9464	0.9013
26.8482700414219	73.1825591929174	12.1332409350988	52.5118	68.1256	10.9937
26.2313163679719	72.2364305527101	11.8285216328489	47.6475	71.1843	17.3202
26.2313163679719	72.2364305527101	11.8285216328489	45.2184	66.3382	18.5431
25.5896607062649	71.2524209379642	11.5116110207936	46.3399	71.17	31.2162
24.3146497391628	69.297118329407	10.8819081877859	35.9094	68.8825	29.2317
24.3146497391628	69.297118329407	10.8819081877859	32.641	61.5676	34.0062
22.7650268245488	66.9206718885067	10.1165756941548	33.4192	59.483	33.0004
21.0524128654753	64.2942796394708	9.27071401471088	18.9042	62.1271	34.907
21.0524128654753	64.2942796394708	9.27071401471088	25.6513	60.6643	37.4717
16.8822695323473	57.8989285491252	7.21100184279207	8.25408	64.3565	18.8288
16.8822695323473	57.8989285491252	7.21100184279207	19.6656	61.3862	20.5906
11.502655853385	49.6486684288077	4.55391682652382	5.52590000000001	61.9092	6.1438
11.502655853385	49.6486684288077	4.55391682652382	9.17265	66.1356	6.7326
Route: 4 Length: 214.666464581744 Demand Met: 752					
6.41805991405376	47.1732218128846	21.5048941107514	0.194864999999993	71.2335	31.0366
7.7365557145898	50.8924756263144	28.3619090276712	2.55217	66.9796	45.1209
8.50265831850712	53.0535024576566	32.3460806404928	3.30116	54.5758	46.8676
9.12802092811091	54.8174411376117	35.5981572867321	10.4725	58.878	47.8708
9.63104668888674	56.2362825625388	38.2139660377531	17.5187	55.1629	44.2721
10.1687409530373	57.7529223756469	41.0100685089776	9.35554999999999	53.1101	48.6717
10.7359183773845	59.3527950103472	43.9596019011161	1.5771	61.4642	62.0285
11.1834987250462	60.6153597867426	46.2872618010097	8.30742000000001	60.1487	54.798
11.6205135406495	61.8481380254579	48.5600012576481	23.6206	68.344	50.228
12.060956972691	63.0905952052628	50.8505852583073	23.7167	70.7298	59.5174
12.4538264002969	64.1988569065539	52.8937630121696	23.3293	78.9181	52.7226
12.8255261170927	65.2474012953861	54.8268462276231	25.7615	81.4539	44.2448
13.21607053053	66.3491042143157	56.8579360016614	34.4937	83.7515	46.1073
13.4594215261609	67.0355764470511	58.1235012800261	30.4468	53.5688	58.3124
13.7231322333112	67.7794848099276	59.4949516991264	34.9224	79.9328	54.0968
13.9635623880447	68.4577199928845	60.7453244441114	16.576	71.2313	59.4946
14.210757480196	69.1550380406614	62.0308768524428	14.0141	70.4084	60.1608
14.4676607430012	69.8797418451471	63.3669164083965	19.5225	82.1483	62.667
14.7138891925778	70.5743320620989	64.6474368417095	4.28894	92.6489	49.3954

Solution x	Solution y	Solution z	Original x	Original y	Original z
15.0440019581859	71.5055585987414	66.3642111205909	3.24988	93.8751	52.5027
15.4812669023082	72.7390685686547	68.6382636137442	41.546	82.3742	71.0491
15.7706842888337	73.5555025713071	70.1434013363308	3.57801000000001	99.0366	79.8401
15.9325655432462	73.415415207346	70.2566790236188	3.06059000000001	88.1315	51.3598
16.100275516591	73.2702841927579	70.374035550457	0.299018000000004	97.3272	63.0477
17.5009627660346	72.0581761832642	71.3541912741146	43.0779	81.6476	81.3569
17.8452072679181	71.7602781028053	71.5950802334847	18.064	96.3276	61.2807
18.2404263715115	71.4182682254101	71.8716398958677	27.8353	94.5623	59.9313
18.7061918823465	71.0152097969116	72.1975660633295	27.9893	89.6021	79.9213
19.1687825306689	70.6148982741234	72.5212699905838	29.8827	79.684	74.8634
19.623398137836	70.2214886488897	72.8393937115827	37.7453	86.3505	90.2585
19.623398263606	70.221488095964	72.8393937339813	12.7313	98.6134	79.0339
19.9081490355774	69.0292537000792	72.8964625194958	16.8354	77.4785	96.9485
20.2195279673285	67.7255367446427	72.9588683207171	27.1361	73.6904	92.6772
20.534777991921	66.4056093057405	73.022049226897	4.99968	74.2733	96.2118
21.2869797887587	63.2562071450617	73.1728101088271	23.2085	58.8069	93.3912
21.9668556693963	60.4096144248477	73.3090728938762	17.6011	61.1721	91.0121
22.6413583817448	57.5855230150092	73.4442582363313	13.8308	54.4775	90.8096
23.2818584724267	54.9038000519205	73.5726269871769	13.2524	50.7626	76.4367
23.9026674590442	52.3045323723656	73.6970499847303	17.8085	51.9553	71.4677
24.521250806043	49.7145969983002	73.8210280534305	24.4594	47.3987	68.2546
25.125083030097	47.1864294137092	73.942050969247	38.5534	48.7846	64.7262
25.7387603298302	44.6170440342016	74.0650494076232	38.1612	45.7549	62.3997
26.3519810386976	42.0495628075967	74.1879582019983	34.4656	38.8185	62.9703
26.932587023048	39.6186191152855	74.3043295130744	37.7688	31.4408	76.6336
27.4676156562137	37.3784867763979	74.4115633820131	46.0829	25.5503	78.1024
27.9131690757419	35.5129630480924	74.500861651193	42.4972	23.9973	88.7768
28.2923300600594	33.9254128606088	74.5768518540524	41.7205	19.4188	86.0496
28.6094224576316	32.5977351967994	74.640401275467	39.9475	19.2268	79.8118
28.8883708121405	31.4297616340116	74.6963054408157	20.3288	28.022	94.6827
29.1718129282994	30.2429739466444	74.7531103500264	29.1053	29.2049	97.3043
29.4577392704109	29.0457857839329	74.8104131654592	9.96077	19.2347	95.1963
29.8412079731795	28.3912300812876	74.6346150075317	22.6997	14.9199	96.5597
30.201338035416	27.7765124482617	74.4695150240082	27.2482	20.2425	98.6789
30.5528827887005	27.1764495491561	74.3083498075415	43.8962	13.6901	83.4665
30.8744151456303	26.6276157416122	74.1609424490927	47.522	42.292	65.6102
31.2167971347274	26.043192270668	74.003978389619	55.099	31.771	70.6981
31.5425844725055	25.487093937938	73.854622028628	50.9211	16.4053	69.6798
31.8374437601479	24.9837882136394	73.7194435465	47.6864	20.3976	74.364
32.1174011684189	24.5059193249507	73.5910962782488	51.1528	6.04103	87.327
31.8896949244335	24.5380527319338	73.1245377054618	55.717	37.8511	81.0117
31.6047294721484	24.5782659467423	72.5406596310327	44.5404	30.686	94.969
31.2620109981336	24.6266254915633	71.8384560714888	38.2173	22.874	49.077
30.9678007467851	24.668142654966	71.2356376052649	25.7178	17.895	52.7372
30.7120072847745	24.7042395579291	70.7115302616695	23.5387	4.13129	73.048
30.4530342257048	24.7407849537924	70.1809089995743	19.7287	0.198716	79.5663
30.1627466650391	24.7817480272743	69.5861283238231	10.9477	2.73525	75.6448
29.786825083826	24.9263894462731	68.6478232691564	17.1854	11.1942	73.5432
29.4245162735814	25.0657931443639	67.7434951178118	19.247	29.2712	80.817
29.0480199538082	25.2106556145462	66.8037545240262	27.4222	25.8428	88.2494
28.6144246324992	25.3774875854342	65.7214949214096	27.3595	17.3028	77.1892
28.1657039726251	25.5501393661194	64.6014823819918	36.0033	17.5038	68.4307
27.7088200486131	25.7259320713678	63.4610955268361	34.4638	23.0393	61.4662
27.264960856538	25.8967131220112	62.3532193490821	26.0672	21.3383	63.983
26.8292436160495	26.0643613785572	61.2656656004428	31.6686	31.1822	62.9487
26.3960697683626	26.2310302643012	60.184461991696	10.9524	12.0779	65.6188
25.9628880974679	26.397702503489	59.1032380154942	15.6993	18.7479	59.9926
25.5468188323821	26.5577906580937	58.0647261555431	4.056	25.9589	74.3875
25.080694477715	26.7371375385978	56.9012780749335	26.7979	6.90196	59.464
24.5914512904339	26.9253800910091	55.6801270507817	33.1085	0.882753	62.284
23.7896622398826	27.2338764017693	53.6788709343087	31.0765	22.0815	48.5077
23.0383486971434	27.5229518490164	51.8036085540682	25.8125	25.1372	50.1121
22.3445605527141	27.7898947732199	50.0719376068331	3.44571000000001	28.2052	68.896
21.4233029114805	28.1443624611024	47.7725114200248	23.2874	32.7742	59.4617
20.4116032382347	28.5336315293542	45.2473630144418	15.3897	25.3897	58.7078
19.3174210785246	28.9546363637959	42.5163309077089	15.3759	23.0999	65.044
17.7287987577267	29.5658792279941	38.5511848359513	17.6023	36.5196	56.7286
15.5972656471544	30.3859992196988	33.23096192681	22.7183	34.3604	52.0641
12.3199548212139	31.64694290379	25.0510051573086	19.5262	30.4483	48.5255
Route: 5 Length: 242.168034666013 Demand Met: 772					
63.9921824357683	19.5303752229953	22.9437140464923	60.7013	1.36116	46.4176
76.8805762433917	21.3796840729372	21.0015312891384	95.7659	2.55349	7.5519
76.8805762433917	21.3796840729372	21.0015312891384	98.9579	4.73211	12.8251
76.8805762433917	21.3796840729372	21.0015312891384	99.5853	23.4577	6.8435
76.8805762433917	21.3796840729372	21.0015312891384	98.8743	25.646	5.6301
76.8805762433917	21.3796840729372	21.0015312891384	97.4766	17.1802	10.0021
76.8805762433917	21.3796840729372	21.0015312891384	88.6343	0.494442	25.7719
76.8805762433917	21.3796840729372	21.0015312891384	74.5771	5.70821	6.0306
76.8805762433917	21.3796840729372	21.0015312891384	90.11	20.7153	5.7932
76.8805762433917	21.3796840729372	21.0015312891384	88.9914	10.7701	17.3091

Solution x	Solution y	Solution z	Original x	Original y	Original z
76.8805762433917	21.3796840729372	21.0015312891384	70.1018	4.34543	9.0382
76.8805762433917	21.3796840729372	21.0015312891384	58.2097	7.56071	2.229
76.8805762433917	21.3796840729372	21.0015312891384	91.7898	10.5225	38.6828
76.8805762433917	21.3796840729372	21.0015312891384	80.0506	36.8529	1.8328
76.8805762433917	21.3796840729372	21.0015312891384	97.2905	22.0419	32.8941
76.8805762433917	21.3796840729372	21.0015312891384	56.1254	1.40532	17.903
76.8805762433917	21.3796840729372	21.0015312891384	62.8285	19.7058	3.0557
76.8805762433917	21.3796840729372	21.0015312891384	79.2919	13.6517	22.466
76.8805762433917	21.3796840729372	21.0015312891384	77.911	9.90186	32.1435
76.8805762433917	21.3796840729372	21.0015312891384	67.267	14.1516	17.4107
76.8805762433917	21.3796840729372	21.0015312891384	86.8707	18.0065	43.4379
76.8805762433917	21.3796840729372	21.0015312891384	81.7106	28.112	19.2367
76.8805762433917	21.3796840729372	21.0015312891384	58.7637	13.9566	16.9818
76.8805762433917	21.3796840729372	21.0015312891384	85.2354	42.0312	17.7315
76.8805762433917	21.3796840729372	21.0015312891384	79.5061	49.6701	11.7965
76.8805762433917	21.3796840729372	21.0015312891384	54.7387	20.4852	11.8363
76.8805762433917	21.3796840729372	21.0015312891384	68.2389	8.47105	37.5341
76.8805762433917	21.3796840729372	21.0015312891384	72.4782	47.1166	11.4083
76.8805762433917	21.3796840729372	21.0015312891384	76.419	22.7841	27.7958
76.8805762433917	21.3796840729372	21.0015312891384	81.8496	38.8539	28.9342
76.8805762433917	21.3796840729372	21.0015312891384	69.2786	47.5055	16.1011
76.8805762433917	21.3796840729372	21.0015312891384	80.1207	32.7664	32.9471
76.8805762433917	21.3796840729372	21.0015312891384	80.5435	37.2793	30.7227
76.8805762433917	21.3796840729372	21.0015312891384	62.0154	28.1819	31.0401
76.8805762433917	21.3796840729372	21.0015312891384	73.064	44.6995	31.3834
77.939404386864	23.8207850282526	23.5970929564531	99.5164	7.77478	36.5945
77.939404386864	23.8207850282526	23.5970929564531	88.2698	14.9994	45.4757
78.2852301528831	28.7223124299603	26.9335909802026	87.5589	25.1226	45.9834
78.5847103783869	32.9669625731194	29.8229477123757	96.1419	41.3034	39.8142
78.5847103783869	32.9669625731194	29.8229477123757	91.3249	42.8902	41.6597
78.7835869607991	35.7856851831112	31.7416842933633	92.0634	46.0336	40.4672
78.7835869607991	35.7856851831112	31.7416842933633	88.1955	43.6361	47.6404
78.9330457648634	37.90396797708	33.1836342820273	81.1997	46.621	50.135
78.9330457648634	37.90396797708	33.1836342820273	76.05	41.1841	50.3284
79.0551045720172	39.633889480049	34.3612254869175	81.4209	43.6493	50.298
79.1697422370665	41.2586276031733	35.4672173541499	94.61	43.2995	53.8065
79.1697422370665	41.2586276031733	35.4672173541499	92.3029	41.017	61.4442
79.2145571671418	41.8937633071029	35.8995712681078	96.3235	44.2629	60.2644
79.2145570729665	41.8937638057789	35.8995714699286	78.6058	43.2582	65.7281
79.2145569841374	41.8937642770482	35.8995716603723	85.0689	32.1301	62.1612
79.2145569841374	41.8937642770482	35.8995716603723	74.7866	36.0265	64.8468
79.1984740249509	42.5653712084157	35.6309872868055	74.0572	35.987	63.4666
79.1984740249509	42.5653712084157	35.6309872868055	73.2088	32.0501	51.6558
79.1610899465511	44.1265184108531	35.0066681811713	60.6972	35.5066	52.4287
79.1610899465511	44.1265184108531	35.0066681811713	55.5492	35.9315	44.2535
79.0950642830855	46.883771190185	33.9040149087935	67.8108	54.6502	44.2592
79.0950642830855	46.883771190185	33.9040149087935	61.5258	41.6034	50.3406
79.0171455898781	50.1376492966899	32.6027571391752	80.6139	53.7748	37.9975
79.0171455898781	50.1376492966899	32.6027571391752	70.983	56.1077	39.9244
78.9432075213135	53.2252513769298	31.3679953806204	74.6616	49.1772	30.6996
78.8667072574977	56.4198688971618	30.0904372148841	76.3859	55.8636	29.5918
78.8667072574977	56.4198688971618	30.0904372148841	74.8357	53.7031	27.6754
78.7891460616734	59.6587738082771	28.7951684484721	90.8764	48.3318	12.9357
78.7891460616734	59.6587738082771	28.7951684484721	82.7455	58.0479	28.4959
78.7031360461228	63.2505292715968	27.3587914387052	88.4474	55.9131	14.5629
78.7031360461228	63.2505292715968	27.3587914387052	94.2046	73.3577	49.4797
78.6248840203663	66.5183013184608	26.051981415973	97.9153	71.697	3.8476
78.6248840203663	66.5183013184608	26.051981415973	81.8774	60.6902	25.477
76.6702121885689	69.2078003934732	26.9367127997103	66.9764	66.2314	9.0944
74.6482857009357	71.9898390758284	27.8518868859992	65.3011	67.1869	28.6409
72.6426778083233	74.7494249196386	28.7596750317295	60.2539	80.1704	27.9583
72.6426778083233	74.7494249196386	28.7596750317295	60.356	72.3736	25.6911
70.856715615361	77.2067885623128	29.5680441074916	48.3206	81.4332	48.7053
70.856715615361	77.2067885623128	29.5680441074916	58.3448	60.9201	41.5011
71.1516926916526	77.5542404108408	29.1831437866618	47.7087	83.4773	42.5429
71.4932779782725	77.9565941897893	28.7374289070461	54.8665	95.2849	41.9419
71.4932779782725	77.9565941897893	28.7374289070461	50.0418	88.5256	42.3177
71.9040239786022	78.440414729773	28.2014723504132	58.0371	93.3465	37.2538
71.9040239786022	78.440414729773	28.2014723504132	61.8453	80.8454	29.5157
72.3262936534208	78.9378071173095	27.6504785635783	75.9957	81.402	37.5418
72.7514919378523	79.4386492677292	27.0956623093106	82.5413	70.9361	35.9747
72.7514919378523	79.4386492677292	27.0956623093106	78.9206	73.8168	40.4273
73.1857960481214	79.9502218333025	26.528965743182	96.3227	96.5824	35.4748
72.6026194486956	79.9690690808075	24.6894671005726	91.0373	94.8618	33.7328
72.6026194486956	79.9690690808075	24.6894671005726	91.8947	87.6684	31.3605
72.065550817591	79.9864256444986	22.9953930547584	80.7777	87.9354	23.575
72.065550817591	79.9864256444986	22.9953930547584	77.5352	78.0347	33.1993
71.5023119829524	80.0046283333209	21.2187687328429	85.3959	62.1638	1.7086
71.5023119829524	80.0046283333209	21.2187687328429	95.4573	78.5053	38.9919
71.5023119829524	80.0046283333209	21.2187687328429	48.6626	98.7924	25.383

Solution x	Solution y	Solution z	Original x	Original y	Original z
71.5023119829524	80.0046283333209	21.2187687328429	84.0931	75.7357	43.6346
71.5023119829524	80.0046283333209	21.2187687328429	79.6042	79.6519	48.0916
71.5023119829524	80.0046283333209	21.2187687328429	76.2214	75.1456	46.9071
71.5023119829524	80.0046283333209	21.2187687328429	59.2712	76.4167	39.0582
71.5023119829524	80.0046283333209	21.2187687328429	61.6789	74.8507	42.3385
66.1394815733711	77.5042591775778	19.1674274829197	60.7208	77.8844	16.4053
66.1394815733711	77.5042591775778	19.1674274829197	66.7645	81.0279	23.2022
60.3594667075062	74.8093705327608	16.9565160368162	51.8363	98.9629	1.5963
60.3594667075062	74.8093705327608	16.9565160368162	63.6977	85.2552	13.695



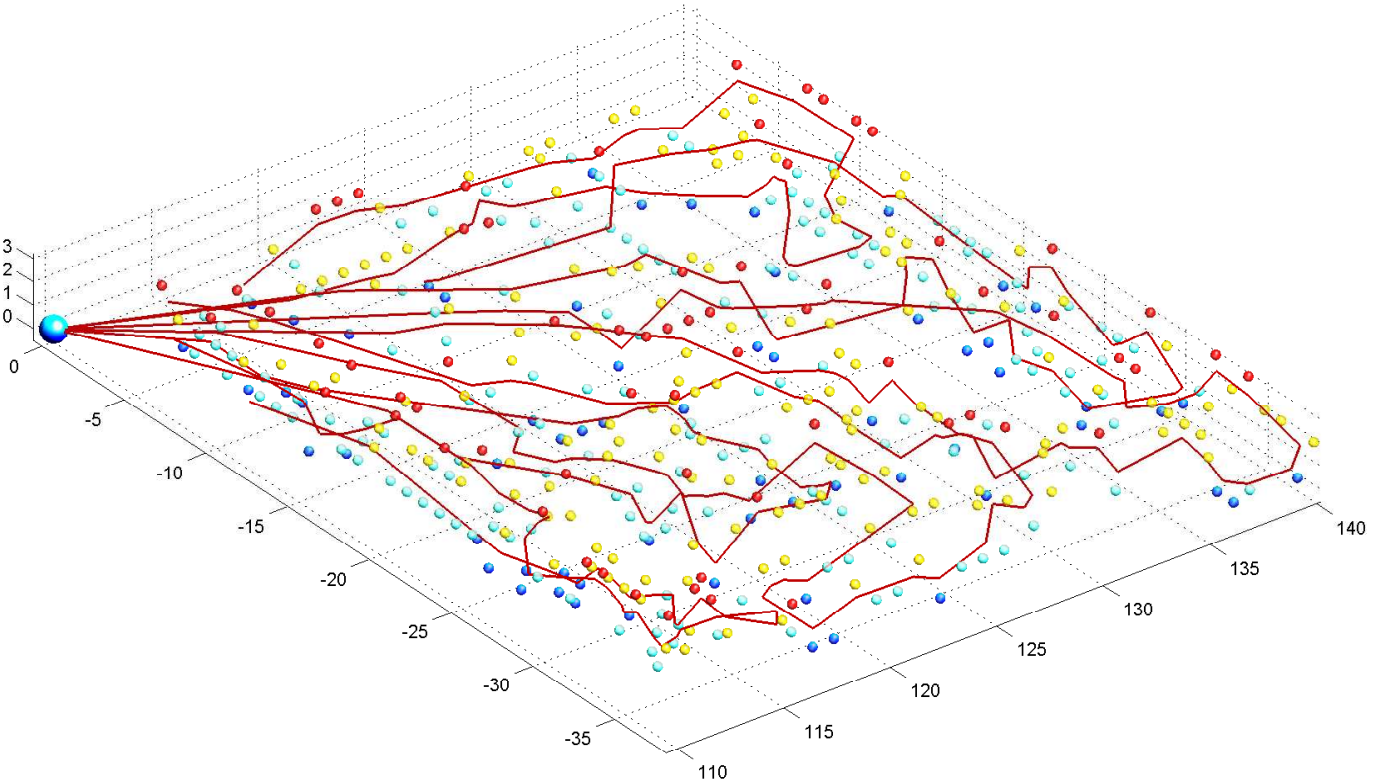


Figure O.82: *pcb*442, $r = 0.76$, Equal Radius, 3D, Euclidean, Length = 583.4034164

Table O-85: Solution for *pcb*442, $r = 0.76$, Equal Radius, 3D, Euclidean

Total distance: 583.403416371046 Total demand met: 1100 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 112.771360633298 Demand Met: 184					
7.35804723412404	5.63787993212395	1.43584995446193	7	6	2
7.99393802813958	6.08522364476039	1.52020257670565	8	6	2
8.62439206774546	6.52874268600979	1.60383302746342	9	6	2
9.594011879245	7.37227165353042	1.66196195204004	9.40000000000001	7.4	2
13.3365750193491	10.6281390868374	1.88632115705507	13	11.3	2
15.8596742169879	11.1677478407822	1.80788209828206	16	11	2
17.0828718361124	11.4293508729239	1.76985430795687	17	12	2
17.865203713653	11.5966655110106	1.74553199107457	18	12.3	2
19.6505612680135	10.6502687901833	1.18068522700305	20	10	1
19.6876313304457	11.1236948600027	1.24331607741327	20	11	1
19.7562416083471	11.9999346766378	1.35923668269613	20	12	1
19.8396614392992	13.0653187633408	1.50018062165244	20	13	2
19.9136862732573	14.0107120973052	1.62524925785387	20	14	2
19.9739335306684	14.7801424321073	1.72703897552767	20	15	1
20.0530273416379	15.8483922112523	2.25716249362238	20	16	3
20.2596239883058	16.740268336114	1.23945662848211	20.6	16.5	1
20.4016600837178	17.3534559435423	0.539760174762771	20	17	0
20.4841638868684	17.5666359669824	0.394188550437826	20	18	0
25.6728556513198	18.5084192581458	0.478466346558606	26	19	0
26.3080649434561	17.9006172351143	1.29824926451514	27	18	1
26.4704124243783	17.5609956696828	1.79603723441363	26	17	2
26.5252453798252	17.5694689617623	1.83291265653858	27	17	2
26.593882013785	18.0048346818933	1.97963373472849	26	18	2
26.739093372597	18.9259038771414	2.29004042153313	27	19	3
26.5196865052143	20.1526212069225	1.56886613662559	27	20	1
26.4766904430546	20.2861359817131	1.51816422291285	26	20	1
26.3886944579865	20.7190786734953	1.41042016103421	26	21	2
26.4347339921887	21.1549479079038	1.03421278137645	27	21	1
26.4978741717237	21.7527335493871	0.51825297933704	26	22	0
26.9098297147524	21.9057749872582	0.616418776918765	27	22	0
27.7982698571989	22.2358740374288	0.828115729201452	28.5	22	1
27.1464701446249	23.234469755082	0.661144892377943	27.6	23.6	1
26.5440203460593	24.1574401320722	0.50681315366389	26	24	0
26.4569509034714	24.989415168853	0.743555953030276	26	25	1
26.4120725967825	25.418241884995	0.865580108768955	26	26	1
26.4120725967825	25.418241884995	0.865580108768955	27	25	1
26.2559399289024	26.9100431836654	1.29006460061166	26	27	2
26.3174766615971	27.2217224834848	1.11739016443073	27	27	1
26.431171760016	27.797604513178	0.798348760617966	26	28	1
26.5356859087948	28.326980059865	0.505071192389112	27	28	0
26.574864055612	28.6539018880243	0.356866300299011	26	29	0
27.1616374327946	28.9337658061899	0.409491504526335	27	29	1
28.9727678449813	29.7976035562771	0.571923520923959	29	30	0
29.578080545542	30.0863101207698	0.626211766451243	30	30	0
29.7605164412524	30.2854651356156	0.901542133488346	30	31	1
29.784367116221	28.9180504711512	1.74629197787089	30	29	2
29.7991603323909	28.0697637136345	2.27034037926156	30	28	3
29.4035346505681	27.0738887680838	1.4651613854701	30	27	1
29.1540760090598	26.7921559809592	1.3264837263802	28.5	27	1
29.357004700091	25.9136810447021	1.39585982814558	30	26	1
29.5067765555626	24.9811286107761	1.50803636759806	30	25	1
29.6536200576882	24.0667855928781	1.61802557588487	29	24	2
29.8136223082145	23.1702404187052	1.71685836423018	30	23	1
29.9367140223298	22.0079012131114	2.24267687819706	30	22	3
29.9753484216001	20.6228695359846	1.56522235088242	30	20	2
29.9720093486932	20.5698863598732	1.05006806945143	29.5	20.5	1
29.9690312293154	20.5226537302606	0.590582476691321	30	21	0
29.8769986275928	19.0998610543143	0.74329470747053	30	19	0
29.7647045193756	17.498758818706	0.965994380150885	29.5	17.5	1
29.7647045193756	17.498758818706	0.965994380150885	30	18	1
29.7647045193756	17.498758818706	0.965994380150885	30	17	1
29.6253715769384	15.5121716172735	1.24230993848308	30	16	1
29.6253715769384	15.5121716172735	1.24230993848308	30	15	1
29.5215673365001	14.032255577961	1.44815692128439	29	14	2
29.6913010640402	13.1661223340881	1.32567656870011	30	13	2
29.7668330030934	11.9116811707238	0.717939866750163	30	12	0
29.3998635598528	9.43629280347418	1.16458907867468	30	9	1
29.1445613221004	9.27199871498153	1.2787544691154	29.3	9.5	1
28.4046634585422	8.79587319483494	1.60959316328151	28	9	1
26.9766959040811	7.87548876928735	2.25062846513325	27	8	3
26.6781500026595	7.65721358789923	2.2051500377845	27	7	2
26.0652821996412	7.50599110252866	2.1963294278014	26	8	2
25.2345998233072	7.30102225445715	2.18437463356917	25	8	2
25.0151553787721	7.207545409638	2.1906216416595	25.5	7.1	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.8471608940455	6.71001676939171	2.22387315283791	24	6	2
21.3030009103507	6.53542271998145	2.55377495378073	21	6	3
20.0198353291406	8.00721572182477	1.48674240174394	20	8	1
19.7359016611029	8.33288789903757	1.25063383324223	20	9	1
17.4062059070145	7.63787563091362	0.945659954342208	17.5	7.5	1
13.2064534619526	6.38497472850219	0.395880587364777	13	7	0
12.6779505532507	6.12945791290767	0.380037244993767	13	6	0
Route: 2 Length: 84.364051604385 Demand Met: 182					
2.58584719804161	13.9091160430774	2.52447565217543	2	14	3
3.32271781607157	16.1317537665287	2.68136057342198	4	16	3
3.37211348638561	16.9810031040229	2.63569611359537	4	17	3
3.3859246779577	17.2182261696255	2.62294999598552	3	17	3
3.43186657559653	18.0080544718172	2.58047543759777	3	18	2
3.48928812661485	18.9951289212017	2.52740137477137	3	19	2
3.53557259196013	19.7906787458595	2.48462906326801	4	20	2
3.54068370501166	19.8785129315354	2.4799017173238	3	20	3
3.70992241002884	20.8268937644048	2.31919849065258	4	21	3
3.72447937687279	21.0257748428573	2.22817066863794	3	21	2
3.87965795725756	22.1594365050831	1.73328035505537	4	22	1
3.92882447772219	23.0164046095203	1.74363201922971	4	23	2
3.98011211228341	23.9103383573429	1.75443099168653	4	24	1
4.02411024853848	24.7394205188426	1.94627988277868	4	25	2
4.0441740465462	25.1174336867846	2.03373999442746	4.7	25.5	2
3.07208419162767	25.6245928127842	2.34313129231832	3	26	3
2.48678033883176	25.5594570034184	1.83369979305235	2	25	2
2.15966227865053	26.2501480994556	0.699669137635646	2	26	0
2.18798766511217	27.0519924585275	1.01206353487887	2	27	1
2.22696675208471	28.1551861365291	1.44184353563878	2	28	2
2.24677783857261	28.716206294595	1.66041992729653	2	29	1
2.26621008224635	29.0939444888839	1.82588409082721	3	29	2
2.26667742576076	29.8772352456255	2.15737931344123	3	30	2
2.22356451331885	30.1708761327893	2.29400883787341	2	30	3
2.22392057026345	30.8303448377766	2.29382716733266	2	31	3
2.26744855302442	31.1277476107262	2.15700238931433	3	31	2
2.27735136307473	31.8024658965863	1.87208325066394	3	32	2
2.17594369882094	32.0474068477409	1.73783481567662	2	32	1
2.03624057896604	33.0280367709119	2.24137989425647	2	33	3
1.92545211822232	34.2177172591532	1.72432315374031	2	34	1
1.86679592602019	34.7559720699428	1.61928581157141	1.5	35	1
2.08119675246471	35.1040791940267	1.97535383279962	1.5	35.5	2
2.19015711050302	35.2809620461564	2.15629708303196	2	36	2
2.35003638449012	35.2631164271024	2.37883328322874	2	35	3
2.90806706894644	35.392378743489	2.4533175938196	3	35	2
3.81872009191564	35.6033368096749	2.57488222895608	4	35	3
4.20675384122345	35.7840439334236	2.57021446339483	4	36	2
5.89384023885238	36.5696500074496	2.54988997236054	6.2	37.1	3
6.13726341551055	36.256227345995	2.0474369702246	6.2	36.5	2
6.41490481743077	35.8987468972844	1.47435777476146	7	36	1
5.01141971433918	34.5796083516482	1.68868289219393	4.7	34.5	1
4.4208063110254	33.849117018063	2.38536837415827	4.7	33.5	3
4.42077394888355	33.8491131845221	2.38535701739525	4	34	3
3.51007461130862	33.5822614174452	1.37805059126859	3	34	1
3.59030981471702	33.3057341283165	1.36832616753803	3	33	1
3.88597699214597	32.8837950209693	1.4447058301106	4	33	1
4.54722350244425	31.939962076129	1.61544555374755	5.2	32	2
4.46098619682975	31.6733796987156	1.50834085767662	4	32	1
4.32921615861177	31.1898668081366	1.34184480861545	4	31	2
4.29303987164052	31.0250826883892	1.26233698629677	5	31	1
4.06293167980481	29.9776773648626	0.75706334088729	4	30	0
3.901972926772	28.8148230175018	1.2694506415936	4	29	2
3.81746731499463	28.3087209390462	1.32994289631573	4	28	2
3.38005309895445	27.6219814882157	0.538762380587894	3	28	0
3.38067311365582	26.9604572323804	0.438711626466374	4	27	0
3.36810494308258	26.7430834282571	0.415003318444564	3	27	0
3.33116112383966	26.1047280968822	0.345381696484596	4	26	0
2.99846765930479	25.0304780050496	0.362138926431713	3	25	0
2.72701292345411	24.1539841580136	0.375808481632683	3	24	1
2.65288452591085	23.9146305019553	0.379546698970498	2	24	0
2.59564902097043	22.9166396640402	0.535404615669737	2	23	1
2.59411067143347	22.7406929096203	0.556084596479357	3	23	1
2.58846093783858	22.0908514494007	0.63242512391287	3	22	0
2.58157141526074	21.839251617877	0.66931475838715	2	22	1
2.55710203502586	20.9469720475582	0.800165669059914	2	21	1
2.53043186340123	19.974488452623	0.942778110823884	2	20	1
2.50360173519407	18.9961227269496	1.08625184838659	2	19	1
2.4765288332619	18.0088438025969	1.23103271649245	2	18	1
2.44691240942358	16.9285962015529	1.38945182760062	2	17	2
2.464248113092	16.0378658484487	1.46228545211579	3	16	2
2.4212668366975	15.7580985510914	1.43678409634254	2	16	1
2.27491361553889	14.8055924054808	1.34993789064451	2	15	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
1.71368571524843	11.1527006775754	1.01688165910149	2	11	1
1.53081955508173	9.96256177416484	0.908368737649662	2	10	1
Route: 3 Length: 113.016523998475 Demand Met: 184					
8.78862727507916	6.55858217351182	0.453835612134246	8.5	7	0
11.331990688352	8.45658127599399	0.585176900109046	11	9	1
13.7341235520687	9.6857832752782	0.401603474867365	14	9.3	1
15.8402014171665	10.8518544874167	0.135886554563804	16.5	10.5	0
15.6482030795426	13.0106496027202	0.326410910501767	16	13	1
15.477026120159	14.5640833118707	0.400029614618088	15	15	0
16.0808177875092	14.8284466084624	1.03323463901972	16	15	1
16.9441357457136	15.206442591269	1.9386132153522	17	15	2
17.5717149344786	15.4812214901269	2.59676456318059	18	15	3
17.6436970218915	17.6391395081873	2.81824510423727	17	18	3
18.0957977260051	17.9396467734989	2.75151833325861	18	18	2
19.9267251913098	19.1139998536595	2.744453502744	20	19	2
20.2857471900841	19.3442866187737	2.74311612925836	20	20	3
21.169739909576	19.6077951247617	2.64723427285275	21.1	20	2
21.4456371440536	19.6449893151071	2.68872954379438	21.7	19	3
23.7506512933718	21.3873820263489	2.46002255199907	24	21	2
25.8973708743988	23.0101374463768	2.24703181521974	26	23	3
26.3531823895601	23.3575236761842	2.17721498643079	27	23	2
26.5682953043374	26.0444131830665	2.37609430631259	27	26	3
26.6684054452788	29.9538448441589	2.35875230115091	26	30	2
26.6874887710364	30.1505737067309	2.36539460359984	27	30	3
26.73547682469	30.6452411682623	2.38212075512304	27	31	3
26.4722315142969	31.1404299083312	1.57868702812327	26	31	1
27.0493451791087	31.8759031535456	1.81301086066706	27	32	2
27.4527759149025	32.3900344070245	1.97681584720949	27	33	2
28.4896967490374	32.777292853354	2.23492506179288	28.5	33.5	2
29.5946293666363	32.5752537578064	2.71301638122841	30	32	3
29.6540868236461	33.1648180262834	2.60503833727157	30	33	2
29.7768501932844	34.3820919578565	2.38209168488044	30	34	3
29.7768501932844	34.3820919578565	2.38209168488044	30	35	2
29.8134667856956	35.9533498515562	1.97778332471035	30	36	2
29.8463167985909	37.3629673802823	1.61506779114991	30	38	2
29.5738245230656	37.1628090288727	0.607840175049494	30	37	0
27.3828334382236	37.3665408906187	0.827459998908084	27	38	1
27.1466363063223	36.8152665946625	0.722472958856047	27	37	0
26.9654121542811	36.3799388586219	0.657306680985314	27	36	0
26.5199089933878	36.0120978152538	1.51295626088077	26.2	36.5	2
26.4960251241245	35.039687718029	1.72020168188812	27	35	2
26.4835213493681	34.530574282117	1.82870322837177	27	34	2
25.9367536662723	34.5405388531103	1.76643147399854	26	34	2
23.4199269462499	34.586404727254	1.47979378029387	23	35	1
23.0775212472761	33.8166359983616	2.26653576832043	23	34	3
22.7895762820945	32.413712720255	1.75501456895475	22.8	32.5	1
22.7166257502445	32.0504520256955	1.79763006744421	23.2	31.5	2
22.2343948233604	32.00670967641	1.69291805180288	22	32	2
21.8986233408557	31.976255981856	1.6200090905098	21.5	32.5	2
21.3457836494383	31.4685824860534	1.11869288363416	21	32	1
20.5840638673379	30.7690900478981	0.427962011210006	20	31	0
21.4711107307395	28.2492446529668	0.790484433827727	22.2	28.2	1
21.1831500456875	27.7018390204226	0.732515079166796	21.2	27.5	0
20.429081283627	26.5733572950356	1.5401455741815	20	27	2
20.317261587792	26.2037853024347	1.65986129514976	20	26	1
20.0792535661979	25.1292620587974	2.25527755619397	20	25	3
19.9637681529027	23.8554531351154	0.74524811592991	20	24	0
19.8264743831983	22.8286951501519	1.28017760479699	20	23	2
19.6720684446817	22.1228674988097	1.32548909695346	20	22	2
19.453758136812	21.4800772032551	1.22078679975349	20	21	1
18.1767180140672	20.8836821386995	1.33964144342421	18	21	1
17.4538637772576	20.5460985698536	1.40691766524965	17	21	1
15.4999949429007	18.2808874969613	2.50130300041786	15.5	18.5	2
15.4999949429007	18.2808874969613	2.50130300041786	15	18	3
15.4999910168705	18.2808828942522	2.50130511273567	16	18	3
14.5077272679279	17.5509173309523	2.65628719197608	14	18	3
14.0831374732799	16.7679968377188	2.57136954257476	13.5	17	3
13.4703743408117	15.4134917881799	2.35513644609032	14	15	2
12.9844232198137	15.0415775715277	2.42393239848958	13	15	2
12.4266469977804	14.6146936349013	2.50289649581345	12	15	3
11.5537012887147	13.3265163983945	2.24605054401334	11.5	13.5	2
9.99573221193867	11.0274669692322	1.787649049685	10.5	10.5	2
9.85002635047513	10.911592346457	1.73978949873633	10	11	1
8.42217061691299	9.77952086402369	1.35843187653921	8	10.3	1
3.44823251263101	4.00396167027371	0.55616760933026	4	4	1
3.44823251263101	4.00396167027371	0.55616760933026	3	4	0
Route: 4 Length: 84.4619357410538 Demand Met: 183					
6.15290522707033	3.69766671394489	0.546278231696532	6	4	1
7.58399447584364	4.55769000195619	0.673326692278504	7.5	4.9	0
8.63539881753881	5.10254981163455	0.914171535922913	8.5	5.2	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.1805483880785	5.90327234930173	1.26812209268405	10	6	2
10.8660717925942	6.24208597707422	1.35836716874294	11	6	2
11.0895781431135	6.35254833620152	1.38779296923756	11	7	1
12.0932673801	6.4402224858623	1.74196576716072	12	6	2
13.5709164502643	6.569313299293	2.2633845790552	14	6	2
13.9355580155847	6.98282842780146	2.65297767122325	13.5	7.5	3
14.2800550600408	7.02131217967803	2.73806703344654	14.5	7.7	3
15.6685199827664	5.6140828361075	2.58514448904981	15.5	5	3
17.3301034573127	5.41872958705261	1.65043476218438	17.1	5.1	1
18.0940817916041	5.46819753578912	1.53472643346882	18	6	1
18.9232964237557	5.48919396282274	1.44251197437309	19	6	2
20.0495254284002	5.46246980253981	1.25581010583393	20	6	1
21.7636824999907	5.42177025353616	0.971652238738972	22	4.7	1
22.2379449987795	5.7778147590786	0.858405131688044	22	6	1
22.8884645284915	6.26618270410793	0.703070156016887	23	6	0
24.2286660403018	7.40564886299681	0.64074676216526	24.5	7.1	0
25.7843514003187	8.85234483804241	0.713649726609253	26	9	0
26.241216824912	9.31226740727178	1.21549977388456	26	10	1
26.5688932021001	9.45010316947826	1.56507886620997	27	9	2
26.5582770835053	9.75047659923192	1.5658809118617	27	10	1
25.980255200424	10.9324018012219	2.2432681978977	26	11	3
25.4194055470695	11.88184677725	1.47597447928231	26	12	1
24.1124564531279	13.2214533350635	0.695286316671464	23.9	13	0
23.6516497207654	14.0920858502495	0.935618293802345	22.9	14	1
23.7649414754009	14.4917155599765	1.00949891273799	23.2	15	1
25.6596652303332	15.2613852620837	1.3964637792163	26	15	1
25.9998670772135	15.3995807874976	1.46593848319319	26	16	1
26.5565246665927	15.4534121989513	1.71333991063498	27	16	2
26.5780597862259	14.9014421690753	1.62437948842737	27	15	1
26.5866715951314	14.1792065490356	1.53740864738052	27	14	1
26.587732682178	14.0903010503631	1.52669781494924	26	14	2
26.6503844731354	13.1345063149328	1.36947312585997	26	13	1
26.7852364514175	12.8286491412081	1.37964797979811	27	13	2
27.1092367602454	12.0938075192454	1.40411070808977	27	12	1
27.3642328667914	11.5154639239544	1.42336014414305	27	11	1
28.153517912614	11.1602092909005	1.90632937356525	28	11.3	2
29.4448390000605	10.5789522720917	2.69649087712624	30	11	3
29.4168710939099	9.99319124117383	2.71165896853334	30	10	3
29.3234346016908	8.03568105990958	2.76235972799011	30	8	3
29.2793702985726	7.11232949631393	2.786278761788	30	7	3
28.737057602768	5.06288278137405	2.7102853032435	29	5	2
28.6001814583279	4.58046978182242	2.71574250122629	29	4	3
27.4542726708774	4.51325316796676	2.16219327124233	27.5	5.2	2
26.0816248401199	4.43271043656986	1.49912154434314	26	5	1
25.7438837810326	4.20200102758718	1.50543342103933	26	4	1
24.7989213837463	3.55651906122818	1.52307661040123	25	3	2
24.1563917783581	3.37425741234796	1.35729135944174	24	3	2
22.9130392902505	3.16651678384161	0.736418421226031	23	3	0
21.9720165987038	3.17589092382438	0.984009806753912	22	3	1
20.8569369939703	3.18700223479288	1.27739128122141	21	3	2
19.938558302811	3.22223576065657	1.41215122462332	20	3.7	2
19.7628696375182	3.21647075479412	1.4223870406051	20	3	2
18.9956046855555	3.19130250621292	1.46708786092533	19	3	1
18.0255983692857	3.15948709217642	1.52360201141549	18	3	1
17.0183795157701	3.12645529263376	1.58229598506866	17.1	3.1	2
15.534945357118	3.07781217600912	1.66872521811123	15.5	3	1
14.1049129865914	3.0309221777334	1.75208876122721	14	3	1
13.0031343201155	3.00144653434553	2.0000972647097	13	3	2
11.9128369949595	2.97227851801643	2.24552342354513	12	3	3
10.9924791404549	2.94119288507185	2.25554343313015	11	3	3
10.1704846700071	2.91342709146596	2.26444479544111	10	3	3
8.80027810770163	2.78135329061573	1.59739198977073	9	3	1
8.34270190953035	2.73724075857691	1.37461643132712	8	3	2
6.91415863386742	2.58036182184783	0.62780280957279	7	3	0
Route: 5 Length: 80.7089584241084 Demand Met: 183					
3.35523792977504	5.22377041724247	0.665619956099607	4	5	1
3.38322165944999	5.49416190860828	0.63302365839776	3	6	1
3.38322165944999	5.49416190860828	0.63302365839776	3	5	1
3.5241454231433	6.85588367205501	0.468868989139005	3	7	1
3.66987052791205	7.81229409512982	0.306008128124884	3	8	0
4.20333844511694	8.84161663784176	0.278511706131788	4	9	0
4.61213337369536	9.63038332095861	0.257441381981058	4	10	0
9.49036622401846	16.6327325484155	0.455135883477991	10	16.3	0
10.2023374570682	17.6913206933211	0.500354224585091	10	18	0
10.4440508605146	18.0507078802499	0.515704538264358	11	18	0
10.6731648177632	20.6508751511994	1.9493733397044	10	21	2
11.2132060296286	21.0522483770207	2.27239086572163	11	21	3
11.6885549020388	21.3773313191942	2.32960851184772	12	21	2
12.1135125825439	21.6679532598458	2.38076024235217	12.2	22.1	3
12.7022659746135	21.6686331016762	1.79534124474272	13	21	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.9931690438039	21.7386651527578	1.45390604422348	13.5	21.4	1
12.8532759536972	22.0187677706152	1.52208128750585	13	22	1
12.4047657743035	22.9168178287091	1.74065254956094	11.7	22.8	2
12.5293142111247	23.5276959335319	1.72731384517622	12	24	2
13.2222514928012	23.8608180475348	1.43730595901311	13	24	1
13.8742177100212	24.1742433995636	1.16444663240579	14	24	1
14.3597540177536	24.4076584150126	0.961241289755482	15	24	1
14.3958355302982	25.1742735654414	0.624935475269303	14	25	0
14.6170360369579	26.6389658662141	0.257921592634904	14	27	0
15.3079659411411	27.1077099148527	0.29511037551196	16	27	0
14.6984745548974	28.3445423868312	1.21259716392246	14	28.2	1
14.6043289674134	28.5355941881066	1.35432293978028	15	28.6	2
14.111527736183	29.0041129709493	1.33548386234845	14	29	1
13.7312125880149	29.3656890065522	1.32094450593964	14	30	1
12.8282893876942	29.495141433092	1.55776757216137	13	30	2
11.9091137054356	29.6269213327207	1.79885395235399	12	30	2
10.9834905691726	29.7596265092415	2.04163194550272	11	30	2
10.1405313062166	29.8804808274505	2.26272879895101	10	30	3
9.26087161407203	29.8784575113548	1.59026457511821	9	30	2
8.14335588285917	29.8758855224364	0.735966968032352	8	30	0
7.55582813099206	29.5995495878104	1.67091494238901	7	30	2
8.53514108227002	27.2633598479985	2.45949068577496	9	27	3
7.83277856309151	26.7861814723171	1.47082084357946	8	27	1
7.64668683021556	26.6597463216812	1.20886842224117	7	27	1
7.94955777953008	25.8803606293331	0.748828653629207	8	26	0
8.06298458182327	25.4866161387737	0.851057921069486	7.5	25.5	1
8.3732639813833	24.4095389842912	1.13069858234193	9	24	1
7.95649049456473	24.3136735726708	1.36263117284427	8	24	1
6.92243847901592	24.0758186709397	1.93807895641908	7	24	2
5.79404236155965	23.8162629034169	2.56602845727732	5.40000000000001	24.3	3
5.60448133508368	23.0783542450573	2.41199995400318	5.40000000000001	23.3	2
5.08422614279721	21.0530836582217	1.98924145100295	5.3	21	2
4.52562125285903	18.8785234310334	1.53531986828805	4	19	1
4.50508120867639	18.1332168898603	1.55182292120721	5	18.3	1
4.50508120867639	18.1332168898603	1.55182292120721	4	18	1
4.42909154170118	15.327313496773	1.61982740803746	5	15	2
3.95787159631037	14.8743651651029	1.33614166785039	4	15	1
3.54447655930818	14.4769990945456	1.08726773921782	3	15	1
3.40258096469231	14.2816416138421	0.988288874111042	4	14	1
3.01021231540332	13.7414504575878	0.714596720915151	3	14	0
2.51773788922851	12.9920531285211	0.556314698858648	2	13	0
2.56338418692499	12.6822998418231	0.756784810631622	3	13	1
2.63790642522643	12.1765993143397	1.08407172090443	2	12	1
2.69566074261428	11.7846818746267	1.33771824725914	3	12	2
2.61580080611542	11.020795222978	1.37306832666575	3	11	1
2.51513108619055	10.0578681798612	1.41763198836678	3	10	2
2.35945036008418	9.10246880971799	1.39595520939507	3	9	1
2.31452531575499	8.85163432365498	1.39268986800584	2	9	2
2.13860390990011	7.86938947688797	1.37990096008298	2	8	1
1.82436611262072	6.11486679522964	1.35705911196897	2	6	1
1.65552096302264	5.17212985237424	1.34478537502922	2	5	2
Route: 6 Length: 108.080585969726 Demand Met: 184					
2.26532486289653	7.04062476187616	2.28897760360957	2	7	3
3.86879685274121	10.9300472936028	2.54270035868854	4	11	3
4.24579028571785	11.8444923005238	2.60233752672006	4	12	2
4.57485503021432	12.6426369652417	2.65440715612673	4	13	3
6.6220710807997	15.0614619608973	2.34349913999721	7	15	3
7.1694870290348	15.9791477364671	1.87969659302294	7	16	2
8.26448742338113	17.8147692678037	0.951904270419259	9	18	1
7.96911520373152	18.0100722323054	0.759784574226849	8	18	1
7.51530752257229	18.3101661673285	0.464604615377658	7	18	0
7.68130704218677	20.669233433444	1.06337558339504	7	21	1
8.10576641436714	21.0906433775922	1.25287322609111	8	21	2
8.41268881432427	21.3933702993187	1.27915377787186	9	21	1
8.98771831222191	22.4886549209223	1.50725581960127	8.5	22.8	2
9.0312873250726	22.5343191608065	1.50387492264433	9.5	22.2	2
10.0134165010846	23.8208521391005	1.26153860976303	10	24	2
10.2765109634448	24.1584892743926	1.17043255208769	11	24	1
9.81446904157477	25.8005335799414	1.16537749959239	9.09999999999999	26	1
10.0622951027994	26.0524887363277	1.24437721172748	10	26	2
10.4196450855728	26.4141191107156	1.24133792635481	10	27	1
10.9690791930968	26.701509248888	1.3017522234331	11	27	2
11.9697347372137	26.9593500331459	0.758310330658895	12	27	0
13.2358774911978	27.2170890553874	1.61607786849991	13	27	2
14.6329407473339	27.5014865792831	2.56252808503197	15	27	3
14.8010915098871	28.1930095012558	2.46108108807375	15	28	2
15.173056664377	29.7226793011336	2.23667637218703	15	30	2
15.2728389574321	30.1330259221422	2.17647318954445	16	30	2
15.4286321933811	32.5027978576105	1.93729451090044	16	33	2
14.8765575002662	32.5536870919712	1.81575612226183	15	33	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.8475410889402	32.6485700154234	1.58921678777258	14	33	1
13.084417013984	32.7189179547415	1.42122078529654	13	33	2
11.964777270199	32.8221348806303	1.17474432522293	12	33	1
10.9934448126832	32.911682164341	0.960915276674649	11	33	1
10.0672248266425	32.9970743241249	0.757017510078586	10	33	0
8.85030322758824	33.1127238086493	1.26346307423944	9	33	2
8.17661476140611	33.207975706744	1.29066509961673	8	33	2
7.66519545828467	33.3615449244706	1.06635854361662	7	33	1
8.39202621372468	35.5136917866358	0.432923922236317	8	36	0
8.7928551031526	35.5903336902639	0.605690908488172	9	36	0
10.1788059439269	35.8112648413123	1.28584965447409	10	36	2
10.9925574140103	35.8311739912242	1.27993044026067	11	36	1
11.9612119087545	35.8548807590334	1.27288135544574	12	36	1
12.8442544477237	35.8764991417397	1.26645109813234	13	36	2
14.0714448185827	35.8215203503677	0.735285106291214	14	36	0
14.9544224064364	35.6611003427219	0.881284795805022	15	36	1
15.8695565975476	35.4948442465359	1.03259824487221	16	36	1
16.6260628536992	35.3574178121584	1.15767977377758	17	36	1
17.6057243923929	34.3843323068273	1.56531051824268	17.2	34.1	2
17.9897740419404	34.0028509067119	1.7251451043632	17.9	33.3	2
18.4432441629839	34.286358479534	1.62478058269866	18.3	34.5	2
18.9934698538046	34.6303399837021	1.50303963004892	19	35.2	1
19.4852864821593	34.4765497381186	1.80334397871332	20	35	2
19.8937946001307	31.5049002344457	2.54163950726859	20.5	31.5	3
19.5164160587896	30.1932216711329	2.4464593754548	20	30	3
19.4969510503058	30.1314308761332	2.44020643463873	19	30	3
19.6192114769808	28.8125795901925	1.6304575946276	20	29	1
19.5543403042018	28.468180622104	1.60025292792876	20	28	2
18.4342583499758	27.7996033709993	0.720707487744749	18.3	28	0
18.0137396153039	27.2237729720434	1.1030128280043	18.3	27	1
17.456942424867	26.4613298232987	1.60920503690296	16.9	26.8	2
17.4279057517761	26.0540738916653	1.67416722529204	17.2	26.1	2
17.3993095837549	25.6530244681931	1.73813966128982	17.9	25.8	2
17.3027725672111	24.298957612919	1.95416124385207	18	24	2
16.9899242019695	23.9662839365669	2.00797411088634	17	24	2
16.6365484667378	23.5905124593869	2.06875975009715	16	24	2
15.6677645583828	21.3766420174896	2.42959395343118	16	21	3
15.0875022514936	20.9634784087767	2.08782442467267	15	21	2
14.658266897301	20.6578492533577	1.83501492322451	14	21	2
14.5572584952915	20.2601705217122	1.55348554552499	14	20	2
14.4466455302918	19.1125124244099	0.508667226119369	15	19	0
13.0471700762628	18.0963931546651	0.52090270113124	13	18	1
12.4032229297399	17.6288061330257	0.52652397339143	12	18	0
11.7808756550609	16.9516041786327	0.71186334915635	12	17	1
10.5328112588934	15.5935922252026	1.083569315466	11	15	1
9.82786255667241	15.1578912911299	1.27678505127499	10	15	2
9.12817538394654	14.7991975262975	1.2535831561622	9	15	1
8.50013192862214	14.4772235015174	1.23275419810644	8	15	1
4.34124213929644	7.74193696667153	2.37186255830835	4	8	3
3.96188669252966	7.01304113311869	2.40021747149667	4	7	2
3.56826065319122	6.25671369339442	2.42965069408862	4	6	3
2.2058474130848	4.10062227826842	2.27536003318336	2	4	3

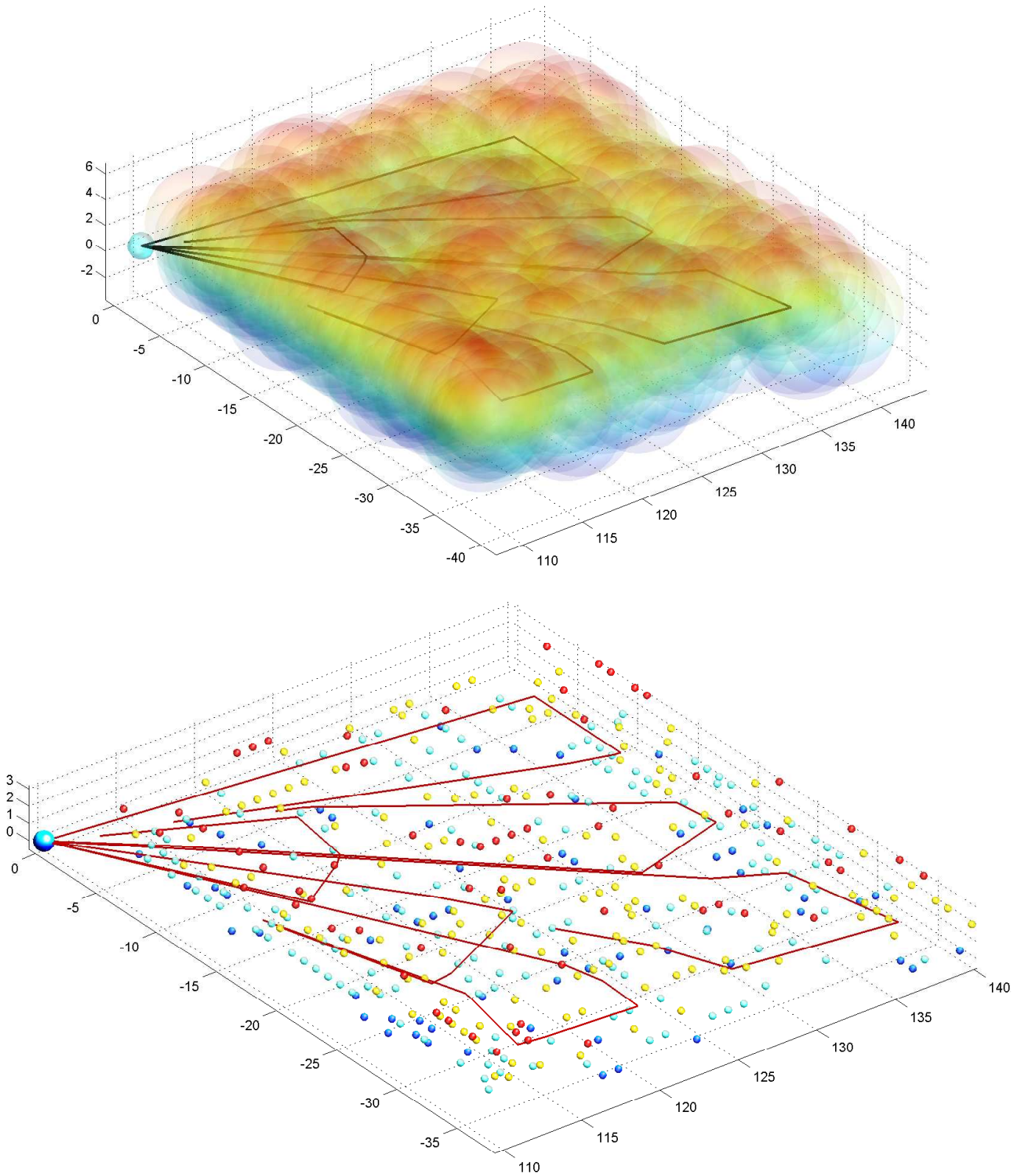


Figure O.83: *pcb*442, $r = 3.8$, Equal Radius, 3D, Euclidean, Length = 410.2656132

Table O-86: Solution for *pcb*442, $r = 3.8$, Equal Radius, 3D, Euclidean

Total distance: 410.26561316886 Total demand met: 1100 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 63.1589764999921 Demand Met: 184					
8.2704099586729	2.04954173970912	0.689216803122108	9	3	1
14.2171743853099	3.52315595573582	1.18478732904376	15.5	5	3
14.9847210831749	3.71334649461259	1.24873963389831	15.5	3	1
15.7545345941248	3.90409814705519	1.31287994261837	17.1	3.1	2
16.438681208829	4.07362279292497	1.36987643236763	18	3	1
17.0418397421997	4.2230841805176	1.4201227790405	17.1	5.1	1
17.6420653885373	4.37181240940118	1.47012580719297	19	3	1
18.1884951690662	4.50721833647804	1.5156513969797	18	6	1
18.7357871175207	4.64283096007133	1.56125209121159	19	6	2
19.2485845656616	4.76989409343023	1.6039785444083	20	6	1
19.7117006959963	4.88464726420632	1.64256671474996	20	3	2
20.193010225847	5.00391041802709	1.68267065884117	20	3.7	2
20.7054678734887	5.13089251385083	1.72536971507554	21	6	3
21.1829443299392	5.24920626837268	1.76515350696903	22	4.7	1
21.6366533679258	5.36163078740267	1.80295719020379	22	3	1
21.6366533679258	5.36163078740267	1.80295719020379	21	3	2
22.2338355829345	5.50960572340991	1.85271530931014	23	3	0
22.8641617777423	5.66579021388666	1.90523340874044	24	3	2
23.4393407473076	5.80830855233048	1.95315626159342	25	3	2
23.8814262298322	5.91784753980631	1.98998938323438	26	4	1
23.8814262298322	5.91784753980631	1.98998938323438	26	5	1
24.1655516765519	5.98824739270206	2.01366136930034	24.5	7.1	0
24.1655516765519	5.98824739270206	2.01366136930034	22	6	1
24.5158531157509	6.07504348672262	2.04284631516163	24	6	2
24.5158531157509	6.07504348672262	2.04284631516163	23	6	0
24.9770155886223	6.18930712155392	2.08126589159349	25	8	2
25.435483469494	6.30290305135158	2.11946070649585	25.5	7.1	2
25.435483469494	6.30290305135158	2.11946070649585	26	8	2
25.8701435338821	6.41060035091638	2.15567175536464	27.5	5.2	2
26.2629136851947	6.50791889664738	2.18839293810451	29	4	3
26.3120017767155	6.7939728906855	2.14231306566103	29	5	2
26.3743264739014	7.15716046294761	2.08380743208214	27	7	2
26.4356427495704	7.51446881325853	2.02624905985843	30	7	3
26.5048843054197	7.91782711684103	1.96128078557695	27	8	3
26.5744421913034	8.32302705494229	1.89601561880444	30	8	3
26.6381262617779	8.69396548736851	1.83627237922481	26	9	0
26.6381262617779	8.69396548736851	1.83627237922481	26	10	1
26.6944433036716	9.02199067362479	1.78344066555187	27	9	2
26.7512592751513	9.35292133744149	1.73014087273114	28	9	1
26.7512592751513	9.35292133744149	1.73014087273114	27	10	1
26.8062256740816	9.67307686230063	1.67857665100656	29.3	9.5	1
26.8601137145813	9.98694985134211	1.62802412025207	30	9	1
26.9251641748518	10.3658273775324	1.56699921351524	30	10	3
26.9994085203644	10.7982383728254	1.49735053667429	30	11	3
27.0631436486613	11.1694286633895	1.43756390228608	30	12	0
27.1052836298643	11.414844063347	1.3980356257536	30	13	2
27.1052836298643	11.414844063347	1.3980356257536	29	14	2
27.1294068324742	11.555327088871	1.37540690844285	28	11.3	2
27.1294068324742	11.555327088871	1.37540690844285	27	11	1
27.1555379137517	11.7075105528873	1.3508928861402	27	12	1
27.1817325009526	11.860064565524	1.32631954017805	26	13	1
27.2075082191625	12.0101728221521	1.30214066063671	27	13	2
27.2075082191625	12.0101728221521	1.30214066063671	27	14	1
27.2304632631927	12.1438542009018	1.28060794465639	26	14	2
27.2522844329153	12.2709292807093	1.2601392428028	27	15	1
27.2522844329153	12.2709292807093	1.2601392428028	26	15	1
27.2691131634643	12.3689256816106	1.24435562078496	30	15	1
27.1031060977331	12.3453610965189	1.23538906282489	27	16	2
26.9147974773358	12.3186377252542	1.22521273379048	26	16	1
26.0916009089803	12.0171328735527	1.18938790806809	26	12	1
25.3507305087931	11.7457801530382	1.15714808196761	26	11	3
24.6353588032477	11.4837709672704	1.12601748436813	23.2	15	1
23.8306399747416	11.1182796994595	1.09211930310668	23.9	13	0
22.9207023541041	10.7050101703318	1.05379846225796	22.9	14	1
19.9836839958249	9.37105796638115	0.930108056102434	18	12.3	2
19.2730046413072	9.04823394105676	0.900175734657549	20	8	1
18.562566533325	8.72554653750705	0.87025208282539	17	12	2
17.4462014486621	8.20079389995901	0.817918644980811	16.5	10.5	0
16.3589507436075	7.68971991405062	0.76695168807614	16	11	2
9.70568401542391	4.56224038108641	0.455045594370487	10	3	3
6.04900543664563	2.84338351482874	0.283598873281071	7	3	0
Route: 2 Length: 41.1085153292932 Demand Met: 181					
0.755445569923907	2.88877300196471	0.437097950845284	2	4	3
1.09142947511987	4.17398500470911	0.63144678398974	2	5	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
1.34931231926144	5.16049315187396	0.780627804283545	2	6	1
1.57126018381426	6.00953645630414	0.90902172588841	3	6	1
1.78306483273074	6.81979036305844	1.03154548600109	2	8	1
1.96739037338789	7.5249104874772	1.13816774881242	3	8	0
2.1428376887402	8.19607486321915	1.23965561593206	4	10	0
2.26210633940978	8.65237054612768	1.30865935214859	3	9	1
2.37579096778778	9.08733202483537	1.37443448452808	2	9	2
2.49297057126421	9.53562976499567	1.44221488361556	4	9	0
2.61643563293374	10.008016092629	1.5136504762656	3	10	2
2.73640757512806	10.4670254397508	1.58305847978729	2	11	1
2.73640757512806	10.4670254397508	1.58305847978729	2	12	1
2.84146023585589	10.8689063324217	1.6438314579416	2	10	1
2.96305997925307	11.3340724909318	1.71417740732631	3	11	1
3.09222721370846	11.8281870622763	1.78890321509661	4	11	3
3.09222721370846	11.8281870622763	1.78890321509661	4	14	1
3.18621829346415	12.1877450252435	1.84327553034146	4	12	2
3.27911656756336	12.5431217877846	1.89701444011389	3	12	2
3.3770679221837	12.9178252109297	1.95367486867036	4	13	3
3.46788461577195	13.2652305692595	2.00620578687962	2	13	0
3.46788461577195	13.2652305692595	2.00620578687962	3	13	1
3.5854727274357	13.7150470702731	2.07422291617257	3	14	0
3.7094874039893	14.189448288609	2.14595697775874	3	15	1
3.82842990892918	14.6444458870576	2.2147558100055	4	15	1
3.94710039540762	15.0984027700906	2.28339605540383	3	16	2
4.0613922871166	15.5356115557395	2.34950320023313	2	16	1
4.0613922871166	15.5356115557395	2.34950320023313	2	17	2
4.17263307878066	15.961167870203	2.41384824527914	2	18	1
4.17263307878066	15.961167870203	2.41384824527914	3	18	2
4.22596526967138	16.1651920928846	2.44469597147895	4	18	1
4.22596526967138	16.1651920928846	2.44469597147895	4	19	1
4.25721084868627	16.2847230663886	2.46276982507251	5	18.3	1
4.25721084868627	16.2847230663886	2.46276982507251	7	16	2
4.28568022933899	16.3936474588477	2.47924165561079	4	20	2
4.29570700064409	16.432010883352	2.48504306516502	3	19	2
4.30503157583996	16.4676859716784	2.49043881693788	3	20	3
4.58715818228994	16.2693862903351	2.46412427565738	3	17	3
4.95307812418196	16.0121898027709	2.4299938662018	4	17	3
5.4162744850658	15.6866189889124	2.38678972431082	4	16	3
5.98357953518396	15.2878720105511	2.33387404447199	5	15	2
6.59443083131636	14.8585150013899	2.27689641104622	7	15	3
7.17443377515389	14.4508397247448	2.22279679505108	8	15	1
7.70813847094568	14.0757058695501	2.17301562756986	9	15	1
7.70813847094568	14.0757058695501	2.17301562756986	10	15	2
8.07655849325474	13.8167479040139	2.13865223107052	10	16.3	0
8.48835221714515	13.4355233868728	2.14712666233985	11	15	1
8.78353047954109	13.1622691251932	2.15319912188653	12	15	3
8.97150370648679	12.3825733405256	2.05888393477611	11.5	13.5	2
9.21485766849864	11.3731681065214	1.93677813726047	10.5	10.5	2
9.39629229965799	10.6205659379388	1.84572619943463	10	11	1
9.58531645264614	9.8365088128666	1.75087632557217	8	10.3	1
9.81464868489906	8.88534861490098	1.63583735607638	10	6	2
9.92280695686117	8.43673860062608	1.58157257919164	11	6	2
9.92280695686117	8.43673860062608	1.58157257919164	12	6	2
9.96596175525841	8.25774583810865	1.55992074826668	11	7	1
9.96596175525841	8.25774583810865	1.55992074826668	11	9	1
10.0075532715892	8.08523293958814	1.53905693657901	13	7	0
10.031098657669	7.98754816194765	1.52723963706081	13.5	7.5	3
9.95435613204323	7.75859204367586	1.43923951418075	13	6	0
9.4207401824726	7.34269872580008	1.36209783895048	9.40000000000001	7.4	2
8.88950193452151	6.92865695393604	1.28529796029432	9	6	2
8.3942861369337	6.5426903396723	1.2137032251743	8.5	7	0
7.89843545850401	6.15622592469034	1.1420209654961	8	6	2
7.40494847876091	5.77160268218906	1.07067726594615	7	6	2
6.92769034365256	5.39962429815594	1.00167661793878	8.5	5.2	1
6.37312078430425	4.96739647331848	0.921499437137816	8	3	2
5.80366426794583	4.52357112313874	0.839171217717381	7.5	4.9	0
5.10361568959021	3.97796652765051	0.737966948350031	6	4	1
4.33752102098421	3.38088363018121	0.627215318675953	4	5	1
3.43727418799291	2.67924645276471	0.497065569273985	3	5	1
2.2113096910371	1.72375100364247	0.319799236881516	3	4	0
Route: 3 Length: 72.0293803202449 Demand Met: 184					
2.37835115528934	2.8735004211711	0.319196319665662	4	4	1
3.57439896421799	4.31863609790068	0.479736983360775	3	7	1
4.2560874840749	5.1422327941084	0.571261483754785	2	7	3
5.06822813159438	5.97586411521093	0.592340837434127	4	6	3
5.06822813159438	5.97586411521093	0.592340837434127	4	7	2
6.29830692072511	7.23847355926936	0.624201224228489	4	8	3
10.5866313207915	11.6397666171813	0.735051434987428	13	11.3	2
12.576856632329	13.6826001324245	0.786443130965831	13	15	2
12.576856632329	13.6826001324245	0.786443130965831	14	15	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.4442693418514	14.5728952867236	0.808838764049959	16	13	1
14.1886323263851	15.3369588078066	0.828059775380462	15	15	0
14.9103900675725	16.0778192355771	0.846724384190037	16	15	1
15.6369592638889	16.8236234505339	0.865519848284515	18	15	3
15.6369592638889	16.8236234505339	0.865519848284515	17	15	2
16.1155139768342	17.3148535780481	0.87789289586039	18	18	2
16.4917834809303	17.7010688698812	0.887628911487265	17	18	3
16.4917834809303	17.7010688698812	0.887628911487265	16	18	3
16.857013231538	18.0759413861583	0.897082283260596	15	18	3
17.3266585784051	18.5579891902866	0.909235309771575	16	21	3
17.3266585784051	18.5579891902866	0.909235309771575	15	21	2
17.6228970019087	18.8620467379102	0.916909454132481	17	21	1
17.6228970019087	18.8620467379102	0.916909454132481	15	19	0
17.9613675952629	19.2094500926273	0.925679484872277	20	17	0
18.3271658020951	19.5849028349793	0.935156446874337	20	18	0
18.70036925687	19.9679571771401	0.944825532083818	20	19	2
18.70036925687	19.9679571771401	0.944825532083818	18	21	1
19.0691209318645	20.346440701079	0.954380159829471	20	20	3
19.4264329391301	20.7131820041104	0.963638619618513	20	21	1
19.7736325403535	21.069543077779	0.97263599494877	21.7	19	3
19.7736325403535	21.069543077779	0.97263599494877	21.1	20	2
20.1528282656988	21.4587429417812	0.982462596040834	20	23	2
20.1528282656988	21.4587429417812	0.982462596040834	20	22	2
20.5042837851255	21.8194668577284	0.991572759317664	20	24	0
20.8198162468836	22.1433177121878	0.99975432323861	20	25	3
21.007563424863	22.3360133035631	1.00462498469339	20	26	1
23.8437299889749	21.5764346631603	1.06133884051572	26	24	0
23.8437299889749	21.5764346631603	1.06133884051572	24	21	2
24.4995021454249	21.4007977346054	1.07442750488928	26	22	0
24.4995021454249	21.4007977346054	1.07442750488928	26	21	2
25.0112318235442	21.2637404532453	1.0846424052324	27	22	0
25.4372560044893	21.1496363026387	1.09314491724495	27	21	1
25.8185054207054	21.0475235031136	1.10075264247359	26	20	1
26.196575997772	20.9462621861449	1.10829715929918	27	18	1
26.196575997772	20.9462621861449	1.10829715929918	26	19	0
26.5043810829452	20.8638193414113	1.11443830245092	27	19	3
26.5043810829452	20.8638193414113	1.11443830245092	26	18	2
26.7871694873716	20.7880765837605	1.12007994221801	30	20	2
26.7871694873716	20.7880765837605	1.12007994221801	27	20	1
26.9428804938291	20.7463695277287	1.12318517139569	30	23	1
26.9428805223657	20.7463690395774	1.12318521048502	30	22	3
26.9129851537755	20.4344358079406	1.1136638574828	28.5	22	1
26.8794933631688	20.0849899772599	1.10299645315627	30	21	0
26.8794933631688	20.0849899772599	1.10299645315627	29.5	20.5	1
26.8090918305836	19.350759537431	1.08055259246643	30	19	0
26.7384510989471	18.6140280636726	1.058021849074	30	18	1
26.7384510989471	18.6140280636726	1.058021849074	29.5	17.5	1
26.688788412018	18.0958137905245	1.04218637243678	30	17	1
26.6619645278525	17.8155965606632	1.03364666133579	30	16	1
25.2348048170613	16.6861254921701	0.990968089925191	27	17	2
25.2348048170613	16.6861254921701	0.990968089925191	26	17	2
22.4599800392832	14.4901276559369	0.908036642343056	20	16	3
21.6290117980766	13.8324642686312	0.883183831832929	20.6	16.5	1
20.6757989431377	13.077996925425	0.854683254432627	20	14	2
20.6757989431377	13.077996925425	0.854683254432627	20	15	1
19.8189284076781	12.399741349515	0.829056025785811	20	12	1
19.8189284076781	12.399741349515	0.829056025785811	20	13	2
19.0243688874956	11.7707992967961	0.805288922191554	20	11	1
18.1702494150977	11.0947041820079	0.779750123424685	20	10	1
17.0441218498545	10.2033124524041	0.746106667060229	17.5	7.5	1
17.0441218498545	10.2033124524041	0.746106667060229	20	9	1
15.4165459793745	8.91533924598074	0.697516677969658	14.5	7.7	3
14.3515006859509	8.07254298786435	0.665667845129342	14	9.3	1
13.1570337217568	7.12721041722265	0.629953013382552	14	6	2
11.9623256915426	6.18170033570386	0.594205796791961	14	3	1
11.3422882170381	5.86125361503586	0.56341647052106	13	3	2
10.5618631761988	5.457908791103	0.524666980854649	11	3	3
10.5618631761988	5.457908791103	0.524666980854649	12	3	3
Route: 4 Length: 77.7876829703895 Demand Met: 183					
9.22580436895899	22.1873846636924	1.18519399749605	10	24	2
9.22580436895899	22.1873846636924	1.18519399749605	11	24	1
10.2343542501585	24.6128855066966	1.31475409679679	9	27	3
10.2343542501585	24.6128855066966	1.31475409679679	10	26	2
10.5760659564486	25.4346172754924	1.35864232564975	14	24	1
10.9821605172606	26.4112479870287	1.41080307004207	14	25	0
11.6907150658293	28.1154197325949	1.50184373164279	15	27	3
11.7495420503853	28.3543559431304	1.49788289238505	15	28	2
11.8035151657199	28.5735923643881	1.49424528987108	12	27	0
11.8035151657199	28.5735923643881	1.49424528987108	13	27	2
11.8644394660786	28.8210397053017	1.49013898973661	14	28.2	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.8644394660786	28.8210397053017	1.49013898973661	14	27	0
11.9344678136854	29.1054470009883	1.4854180717431	11	30	2
11.9344678136854	29.1054470009883	1.4854180717431	12	30	2
11.9998639525581	29.3710099917457	1.48100814605913	13	30	2
12.0628915249468	29.6269463410524	1.47675760370966	10	30	3
12.0628915249468	29.6269463410524	1.47675760370966	15	28.6	2
12.1305701346359	29.9017740685515	1.47219366546891	14	30	1
12.1305701346359	29.9017740685515	1.47219366546891	14	29	1
12.1990009486648	30.1796735986893	1.46757965006765	15	30	2
12.2647054220454	30.4465078679097	1.46315030940858	16	30	2
12.2700065683499	31.3743092647732	1.41700898643517	15	33	2
12.2700065683499	31.3743092647732	1.41700898643517	14	33	1
12.2725218095708	31.8140771655599	1.39514077424736	13	33	2
12.2748595565848	32.2228234935584	1.37481493855943	11	33	1
12.2771157036295	32.617302283711	1.35519876777698	9	33	2
12.279216299722	32.9851181744727	1.33690923969787	10	33	0
12.279216299722	32.9851181744727	1.33690923969787	12	33	1
12.2813799048504	33.3641048075012	1.31806450604516	15	36	1
11.9390378069141	33.3730925185727	1.34134048158604	14	36	0
11.3710101799677	33.3880081800393	1.37995833998159	12	36	1
11.3710101799677	33.3880081800393	1.37995833998159	13	36	2
10.2379224356555	33.4177779788218	1.45699699718359	10	36	2
10.2379224356555	33.4177779788218	1.45699699718359	11	36	1
8.98808021132804	33.4506303241033	1.54197484166324	9	36	0
7.69383773127407	33.4846561647623	1.62996714865537	7	36	1
7.69383773127407	33.4846561647623	1.62996714865537	8	36	0
6.29398985682542	33.521468614072	1.72513502603998	6.2	37.1	3
6.29398985682542	33.521468614072	1.72513502603998	6.2	36.5	2
6.08490002333544	33.4984549044874	1.72923863151478	7	33	1
5.86919541614076	33.4747138252815	1.73347235975593	5	31	1
5.86919541614076	33.4747138252815	1.73347235975593	8	33	2
5.64525360398854	33.4500695260264	1.73786858401556	4	32	1
5.64525360398854	33.4500695260264	1.73786858401556	4	31	2
5.46461844756924	33.4301931271741	1.74141406439762	4.7	33.5	3
5.46461844756924	33.4301931271741	1.74141406439762	5.2	32	2
5.29230480256439	33.4112329120179	1.74479510590258	4	35	3
5.29230480256439	33.4112329120179	1.74479510590258	4	34	3
5.13427806232595	33.3938446954327	1.74789497608416	4	36	2
5.13427806232595	33.3938446954327	1.74789497608416	3	35	2
4.99339875814667	33.3783429365221	1.75065834237699	4.7	34.5	1
4.99339875814667	33.3783429365221	1.75065834237699	4	33	1
4.85344015590452	33.3629437360293	1.7534045302117	3	34	1
4.85344015590452	33.3629437360293	1.7534045302117	3	33	1
4.72465232135701	33.3487744440768	1.75593214270189	1.5	35	1
4.72465232135701	33.3487744440768	1.75593214270189	2	34	1
4.65121828347506	33.3406957355548	1.75737324751956	2	36	2
4.61473072541929	33.3366843068534	1.75808932388756	1.5	35.5	2
4.67111292258457	33.1108275287875	1.74024283577075	2	35	3
4.77310267277052	32.7022475916373	1.70795714234965	2	33	3
4.89667012402147	32.2072023931559	1.66883916419513	2	32	1
5.03048954149251	31.6710676508544	1.62647466409658	3	32	2
5.17767227596281	31.0813670446907	1.57987794106459	2	31	3
5.17767227596281	31.0813670446907	1.57987794106459	3	31	2
5.44809842912859	29.9978008503261	1.49424587743652	3	30	2
5.44809842912859	29.9978008503261	1.49424587743652	4	30	0
5.75005736030028	28.7881290564988	1.39866470900325	8	30	0
5.75005736030028	28.7881290564988	1.39866470900325	9	30	2
6.20878825268291	26.9504220004996	1.25349085647985	10	27	1
5.95554065243694	25.8509137646319	1.20236035168004	4.7	25.5	2
5.95554065243694	25.8509137646319	1.20236035168004	5.40000000000001	24.3	3
5.7462734070557	24.9423435145209	1.16009642319893	9.09999999999999	26	1
5.7462734070557	24.9423435145209	1.16009642319893	9	24	1
3.21911873425933	13.9731547413455	0.649864390271828	2	14	3
3.21911873425933	13.9731547413455	0.649864390271828	2	15	1
Route: 5 Length: 62.6235835852436 Demand Met: 184					
8.43545828813706	15.2303848475219	1.38731917903054	7	18	0
8.99189659383752	16.2350244157615	1.47882950208862	8	18	1
9.43919805964268	17.0426377835629	1.5523976562329	9	18	1
9.84371801539875	17.7730107314823	1.61893066047981	9	21	1
10.0198284301495	18.0909833162968	1.64789638702839	10	18	0
10.0198284301495	18.0909833162968	1.64789638702839	11	18	0
10.1954643080473	18.4080981951618	1.67678462380481	12	17	1
10.1954643080473	18.4080981951618	1.67678462380481	12	18	0
10.3748987338792	18.7320733145045	1.70629760462972	13.5	17	3
10.596508014929	19.185592752359	1.73710821074372	13	18	1
10.8214477568071	19.6459350793724	1.76838094423294	14	18	3
11.0718022811431	20.1581779443971	1.80319537860937	8	21	2
11.3777515791967	20.7841782571429	1.84573989750358	14	21	2
11.6245332343704	21.2891082155782	1.88005789942682	13.5	21.4	1
11.8510135521592	21.7524971635953	1.91155311940935	14	20	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.1131455420044	22.2888317625374	1.94800409263034	13	22	1
12.3818527925719	22.8386202478643	1.98536847608317	16	24	2
12.188886881329	22.94276476304	1.99762216949494	15	24	1
11.9636112540217	23.0643456883	2.01192731652599	11.7	22.8	2
11.9636112540217	23.0643456883	2.01192731652599	12.2	22.1	3
11.7352697336221	23.1875817600968	2.0264264304046	13	24	1
11.498341469444	23.3154512796604	2.04147091711416	12	24	2
11.2618328241804	23.4430932817367	2.0564884297666	12	21	2
11.2618328241804	23.4430932817367	2.0564884297666	13	21	2
10.861710490797	23.659037264882	2.08189627634063	11	21	3
10.3632996063519	23.9280267573193	2.11354605451602	9.5	22.2	2
10.3632996063519	23.9280267573193	2.11354605451602	10	21	2
9.71273740506751	24.2791284107419	2.15485743118247	11	27	2
9.09177931016744	24.6142540130731	2.19428913280375	8.5	22.8	2
8.43700273668694	24.9676307305648	2.23586808118732	7.5	25.5	1
8.43700273668694	24.9676307305648	2.23586808118732	8	24	1
7.85502478970513	25.281717180567	2.27282192315681	8	27	1
7.85502478970513	25.281717180567	2.27282192315681	8	26	0
7.326052888147	25.5671962704384	2.3064085293373	7	27	1
6.85168286507017	25.8232063643595	2.336527076519	7	24	2
6.30615164586143	26.1176227796796	2.37116518072143	5.40000000000001	23.3	2
5.64854585119438	26.4725261493739	2.41292220587387	7	30	2
4.99069219383419	26.641814556382	2.46898030761495	2	25	2
4.70591932296315	26.7150955169945	2.49324218559188	2	27	1
4.49033217941866	26.7705733618971	2.51160931068217	4	29	2
4.49033217941866	26.7705733618971	2.51160931068217	4	28	2
4.28891480332007	26.8224047411507	2.52876951717778	3	29	2
4.10548598609462	26.8696070541809	2.54439706767383	2	30	3
4.07995384785207	26.683003619345	2.52595219657041	2	29	1
4.04583888223814	26.4336694259651	2.50130828498718	2	28	2
4.00898463943426	26.1643165761548	2.47468594839135	3	28	0
4.00898463943426	26.1643165761548	2.47468594839135	3	27	0
3.9611871549442	25.8149883162961	2.44015922038501	3	26	3
3.91404966628826	25.4704870587937	2.40610906301565	4	27	0
3.91404966628826	25.4704870587937	2.40610906301565	4	26	0
3.85747955960592	25.0570521088295	2.36524469039609	2	26	0
3.85747955960592	25.0570521088295	2.36524469039609	3	25	0
3.80028433715215	24.6390598968973	2.32392872827076	4	25	2
3.74216547201316	24.2143193594102	2.28194492403102	2	24	0
3.6903120653415	23.8353738726184	2.24448717447082	2	23	1
3.64430981574078	23.4991922859344	2.21125630421791	3	24	1
3.59765433639608	23.1582358537761	2.1775531479326	3	23	1
3.59765433639608	23.1582358537761	2.1775531479326	4	24	1
3.54997880622258	22.8098225884495	2.14311246154284	4	23	2
3.54997880622258	22.8098225884495	2.14311246154284	4	22	1
3.50424954621026	22.4756335804569	2.11007712848436	3	22	0
3.50424954621026	22.4756335804569	2.11007712848436	3	21	2
3.46504534269681	22.1891277878677	2.08175545599724	2	22	1
3.46504534269681	22.1891277878677	2.08175545599724	2	21	1
3.43067952091287	21.9379703224588	2.05692837072287	4	21	3
3.39683589644818	21.6906295587933	2.03247765921557	5.3	21	2
3.36225440305898	21.4379016454786	2.00749395427849	7	21	1
3.00242373478397	19.1435902533424	1.79264711723845	2	20	1
2.59612192892838	16.5531787935202	1.55008852030494	2	19	1
Route: 6 Length: 93.557474463697 Demand Met: 184					
16.2364208494214	16.9724013086959	0.563037904180103	15.5	18.5	2
23.5999995894977	24.6697654844205	0.818400085150818	21.2	27.5	0
24.2782033361536	25.1526816853078	0.873040657991875	22.2	28.2	1
24.8353788480179	25.5494173578993	0.917930414829001	26	23	3
25.5294511324159	26.0436284582617	0.973849473238871	27	23	2
26.6941273273616	26.872925456217	1.06768371959976	29	24	2
26.6941273273616	26.872925456217	1.06768371959976	27.6	23.6	1
26.6941721250604	26.8729585578701	1.06768715878827	27	26	3
26.694216968509	26.872991676361	1.06769060006894	27	25	1
26.694216968509	26.872991676361	1.06769060006894	26	25	1
26.6942621962414	26.8730250736961	1.06769407689648	26	26	1
26.6943076016999	26.8730586013877	1.06769756884043	28.5	27	1
26.6943076016999	26.8730586013877	1.06769756884043	27	27	1
26.6943529423699	26.8730920764675	1.06770105957881	26	28	1
26.6943529423699	26.8730920764675	1.06770105957881	26	27	2
26.6943985658776	26.8731257582026	1.06770456969109	27	29	1
26.6943985658776	26.8731257582026	1.06770456969109	27	28	0
26.694444288792	26.8731595045757	1.06770809151937	30	25	1
26.7306930472743	27.2484168182342	1.09626294833709	30	26	1
26.7852881711121	27.8135972398712	1.13926917636331	30	27	1
26.850397282433	28.4876177740453	1.19055727682497	30	28	3
26.9200008705837	29.2081562750256	1.24538608455256	30	29	2
26.9861841486292	29.8932851638399	1.29752088973392	30	31	1
26.9861841486292	29.8932851638399	1.29752088973392	30	30	0
27.0245599167446	30.2905458881015	1.32775134224673	29	30	0

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.0639782281089	30.6985988128126	1.35880303767645	26	31	1
27.0639782281089	30.6985988128126	1.35880303767645	26	29	0
27.1126044821841	31.2019713110878	1.39710815724145	26	30	2
27.1679427830454	31.7748260139519	1.44070060721095	27	31	3
27.1679427830454	31.7748260139519	1.44070060721095	27	30	3
27.2519312878986	32.6442653232822	1.50686175528709	30	32	3
27.2519312878986	32.6442653232822	1.50686175528709	28.5	33.5	2
27.3456116569103	33.6140342099171	1.58065716282463	30	34	3
27.3456116569103	33.6140342099171	1.58065716282463	30	33	2
27.4399590639034	34.590705671357	1.65497718028972	30	36	2
27.4948270442836	35.1586909956006	1.69819903470319	30	38	2
27.3958162326192	35.1362457818361	1.69277320404183	30	37	0
27.3958162326192	35.1362457818361	1.69277320404183	30	35	2
27.0383103560386	35.0552012151295	1.67318158282529	27	37	0
27.0383103560386	35.0552012151295	1.67318158282529	27	36	0
26.6803463609348	34.9740528639775	1.65356489978055	27	38	1
26.2543252247354	34.8774763224795	1.63021858439567	26.2	36.5	2
25.8260221806842	34.7803824966625	1.60674722797489	27	35	2
25.8260221806842	34.7803824966625	1.60674722797489	27	34	2
25.3384193092305	34.6698455983288	1.5800261124168	27	33	2
25.3384193092305	34.6698455983288	1.5800261124168	27	32	2
24.5544051058615	34.4921128323169	1.53706082965515	26	34	2
23.6227176929808	34.2809026355995	1.48600252982675	23	35	1
23.6227176929808	34.2809026355995	1.48600252982675	23	34	3
22.8751635210957	34.1114353805239	1.44503543579881	23.2	31.5	2
22.1827403022848	33.9544662816195	1.40708973799449	22.8	32.5	1
21.4814657435469	33.7954906004186	1.36865896688951	22	32	2
20.7796521343206	33.6363927463042	1.33019868037468	21	32	1
20.1065975548589	33.4838145977411	1.29331452187878	20	35	2
19.4180124436867	33.3277155848551	1.25557918516675	19	35.2	1
19.4180124436867	33.3277155848551	1.25557918516675	18.3	34.5	2
18.8138823782495	33.1907622615688	1.2224721623753	17	36	1
18.4595003034089	33.1104259666567	1.20305176859538	16	36	1
18.3406224786425	32.8133750216016	1.20188417017478	17.2	34.1	2
18.3406224786425	32.8133750216016	1.20188417017478	17.9	33.3	2
18.2164563360629	32.503109546832	1.20066464402421	16	33	2
18.2164563360629	32.503109546832	1.20066464402421	20.5	31.5	3
18.0997576083661	32.2115033871168	1.19951849328684	21.5	32.5	2
17.8591127499137	31.6101837095788	1.19715469337077	20	31	0
17.6142582566896	30.9983452012834	1.19474951830206	19	30	3
17.3894577550481	30.4366168579341	1.19254139119774	20	30	3
17.1185049164202	29.7595649079547	1.18987979109727	20	28	2
16.9209237113858	29.2658516808304	1.18793902653133	20	29	1
16.6712001706729	28.6418477472941	1.18548583561411	20	27	2
16.3822307166643	28.145387018833	1.16493724275164	18.3	28	0
16.3822307166643	28.145387018833	1.16493724275164	18.3	27	1
16.0728176884892	27.6138031933739	1.14293491206684	16	27	0
15.7860213403178	27.1210756298845	1.12254086961733	16.9	26.8	2
15.494006468974	26.6193823520313	1.10177573864568	17.2	26.1	2
15.1886330466245	26.0947385523013	1.08006068026667	17.9	25.8	2
14.7960549608378	25.42027356772	1.052144502885	18	24	2
14.0554391881253	24.1478637691123	0.999479577392152	17	24	2

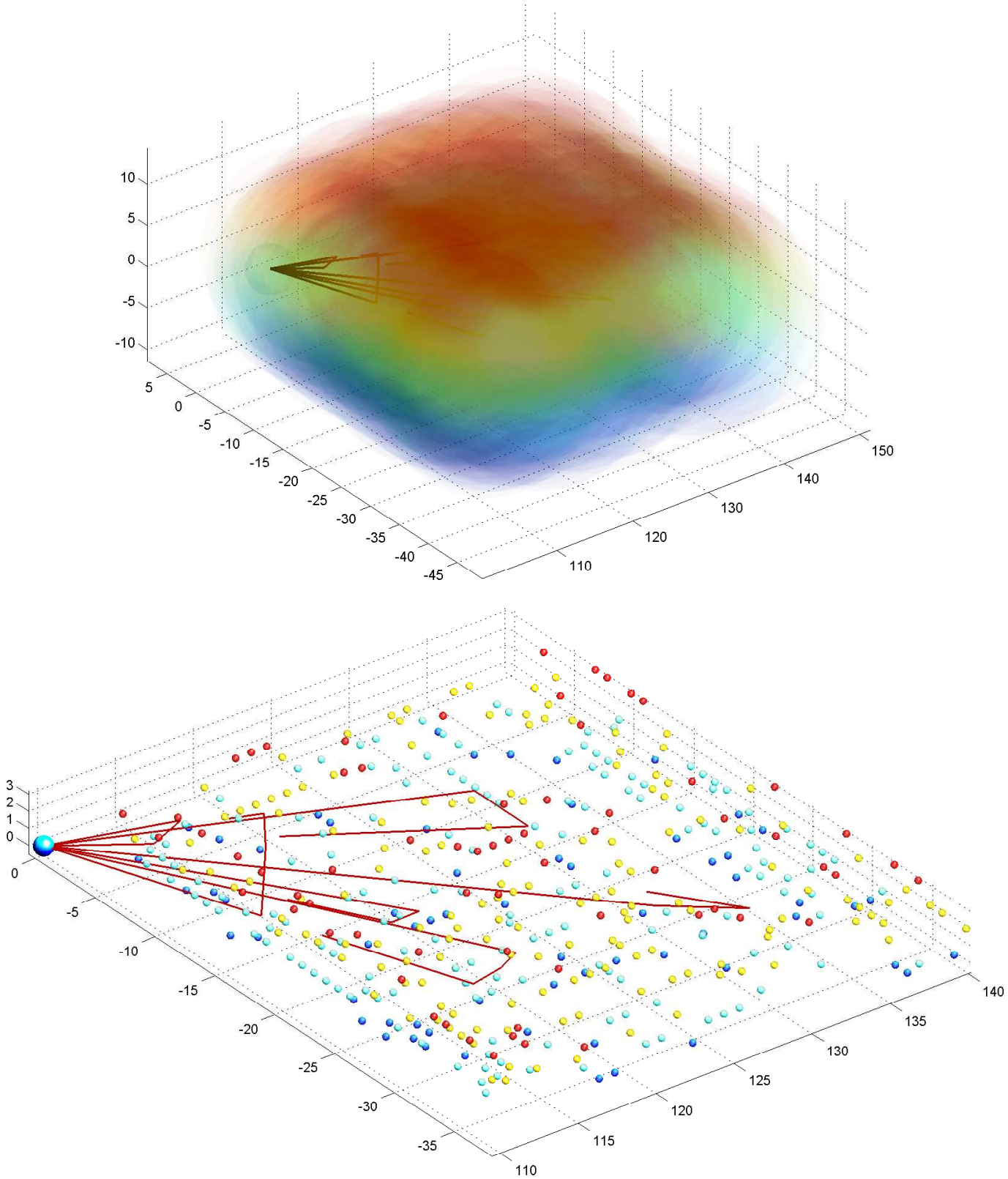


Figure O.84: *pcb*442, $r = 11.4$, Equal Radius, 3D, Euclidean, Length = 274.9591569

Table O-87: Solution for *pcb*442, $r = 11.4$, Equal Radius, 3D, Euclidean

Total distance: 274.959156856103 Total demand met: 1100 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 50.9183635469218 Demand Met: 184					
12.2229910738448	6.39500082337714	0.644205216752226	22	3	1
14.4519793309341	7.56111533563648	0.761676319316351	23	3	0
15.8442357593804	8.2894728467188	0.835053679342382	24	3	2
16.8801893730985	8.83142171846426	0.889653727632998	25	3	2
17.7600672252237	9.29173850657671	0.936026528003913	26	4	1
18.4903026641568	9.67376863841535	0.974512065906641	26	5	1
19.1489230946025	10.0183286118668	1.00922327262733	27.5	5.2	2
19.7124593068868	10.3131424709968	1.03892338764751	29	4	3
19.7334548087735	10.4932609259434	1.01773967976017	29	5	2
19.756118778548	10.6876528605353	0.994878669130644	30	7	3
19.7797065044397	10.8899714276741	0.971085075245888	30	8	3
19.8035500000009	11.0944783775671	0.94703417086761	30	10	3
19.8269892802832	11.2955126246281	0.923391807126826	30	11	3
19.8498382137835	11.4914783106679	0.900345678970973	28	11.3	2
19.8722923213079	11.6840489460157	0.877699029599214	26	11	3
19.8944350668501	11.8739333368658	0.855368739651642	27	13	2
19.9162221607777	12.060765190154	0.833397480372183	26	14	2
19.9377275380189	12.2451793964102	0.8117105916832	27	14	1
19.959032881661	12.427876265498	0.790225722618629	27	15	1
19.9800890960313	12.6084399473301	0.768991647691545	26	15	1
20.0009738646673	12.7875357529833	0.747930139848062	26	16	1
20.0216169931149	12.9645645879486	0.727111534907927	27	16	2
20.041995063078	13.1393226457884	0.70655992514045	27	17	2
20.0619880436268	13.3107824621278	0.686396049779281	26	17	2
20.081724585994	13.4800473617021	0.666490136429944	26	18	2
20.1011104821363	13.6463105711749	0.646937004250841	27	19	3
20.1198036039884	13.8066371221741	0.62808190301987	26	21	2
20.1374240814323	13.9577718187293	0.610307505936429	24	21	2
20.1544952130701	14.104203132652	0.593085923059725	26	23	3
20.1640073950098	14.185767270721	0.583494317636504	27	23	2
20.1682003359516	14.2217297598508	0.579264938809001	26	24	0
20.1443021908859	14.2048754158753	0.578578885169165	26	22	0
20.1194727187517	14.1873658489719	0.577866113630577	27	22	0
20.0934974233609	14.1690499794243	0.577120379365727	27	21	1
20.0668768871607	14.1502797608734	0.576356170721997	27	20	1
20.039725638532	14.131135584669	0.57557675565762	26	20	1
20.0119591475127	14.1115575733321	0.574779721219635	26	19	0
19.9836340056647	14.0915855447378	0.573966621613881	27	18	1
19.9549153667434	14.0713360197044	0.573142279868131	30	18	1
19.9246989537777	14.0500315063574	0.572274926878118	30	17	1
19.8939292315837	14.0283374873493	0.571391702630041	30	16	1
19.8626975847412	14.0063180811421	0.570495220396236	30	15	1
19.83097743869	13.9839543728614	0.569584678796703	29	14	2
19.7988495154295	13.9613031245267	0.568662444584572	30	13	2
19.7666458056028	13.9385984967424	0.567738052620832	30	12	0
19.7354387173912	13.9165966210005	0.566842193165247	30	9	1
19.6065340705512	13.8256992215794	0.563140585061392	29.3	9.5	1
19.4640250861644	13.7252084780637	0.559048281166339	28	9	1
19.3159721487216	13.620808385578	0.554796778367891	27	9	2
19.1646297090058	13.5140887513703	0.55045082170165	27	8	3
19.0085255508758	13.4040113795469	0.545968142724725	27	7	2
18.8467610812113	13.2899424566067	0.541322876943619	26	8	2
18.6830414452954	13.1744949698118	0.536621414678573	25	8	2
18.5195875338067	13.059234993773	0.531927511549611	25.5	7.1	2
18.3566325471645	12.9443270980653	0.527247860209629	24	6	2
18.1990574207956	12.8332131310746	0.522722670643317	22	4.7	1
18.0503794042885	12.7283733621357	0.518452954679308	22	6	1
17.9074984569376	12.6276219179062	0.514349739108081	23	6	0
17.7692124209741	12.5301113768427	0.510378479041094	24.5	7.1	0
17.6338398765723	12.4346564676474	0.506490910601546	26	9	0
17.4982874977055	12.339075518287	0.502598195450204	26	10	1
17.3572526627764	12.2396276271381	0.498548084609176	27	10	1
17.2031030599789	12.1309301562747	0.494121413298505	27	11	1
17.0315335991844	12.0099472514197	0.489194563164517	27	12	1
16.8347110774319	11.8711554586456	0.483542570717823	26	12	1
16.6193321787012	11.7192774886147	0.477357736290175	26	13	1
16.3753608792999	11.5472364367252	0.470351872423437	23.9	13	0
16.1158953265406	11.3642688360848	0.462901070772681	22.9	14	1
15.8398226974005	11.1695900495733	0.454973427891161	23.2	15	1
15.5348893773249	10.954559287333	0.446217082286429	20	17	0
15.2043904411331	10.721500092031	0.436726626028541	18	18	2
14.8428186233153	10.4665291015024	0.42634395903298	17	18	3
14.4436865813542	10.1850721684909	0.414882698381966	16	18	3
14.0012619606509	9.8730883432678	0.402177919087196	15	18	3

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.5088677062506	9.52587222055762	0.388036566856426	14	18	3
12.9561735360747	9.13613832146912	0.372157681822381	15.5	18.5	2
12.2184442254641	8.61591678979744	0.350962698325777	15	19	0
9.80555501421463	6.91443631605411	0.281654544983329	15	15	0
Route: 2 Length: 15.5200865094422 Demand Met: 180					
0.581593420839326	0.249351256373922	0.0415413673928207	3	4	0
1.0767465241566	0.461626933888319	0.0769176361744037	3	5	1
1.56833265117588	0.672356990785351	0.112041025284125	4	5	1
2.04686241828718	0.877488398212394	0.146226136375915	4	4	1
2.52856776188214	1.08398528858496	0.180634717344585	6	4	1
2.99253762595394	1.28287781663482	0.213776683344125	7	3	0
3.44702342238295	1.47770465820008	0.246241631595918	9	3	1
3.87457566626153	1.66098556868143	0.276783018508088	8	3	2
4.30233003744173	1.8443534219295	0.307338441251771	10	3	3
4.71230653346326	2.02010047174998	0.336623586504823	11	3	3
5.10151033034688	2.18694267642797	0.364424745806041	12	3	3
5.46625614121805	2.34329947787313	0.390479137953671	13	3	2
5.80553839219687	2.48873918498707	0.414715303972756	14	3	1
6.11772475308942	2.6225619942596	0.437016665915507	15.5	3	1
6.39113964381926	2.73976246671315	0.456549141511299	17.1	3.1	2
6.61340879294575	2.83503808272803	0.472428401265716	18	3	1
6.56313864648267	2.85484273991738	0.47134316502382	17.1	5.1	1
6.50773650135784	2.87666893806936	0.47014713711126	15.5	5	3
6.4483682192986	2.90005726085025	0.468865379191838	14	6	2
6.38758253382068	2.92400365725913	0.467552826553712	13.5	7.5	3
6.32625618419028	2.94816243866626	0.466228339495377	14.5	7.7	3
6.26291974626659	2.97311241603117	0.464860229940889	14	9.3	1
6.19856463617963	2.99846313516363	0.463470126298043	13	11.3	2
6.13164372250965	3.02482480025476	0.462024886281048	10.5	10.5	2
6.06693857545231	3.05031352748234	0.460627556209412	10	11	1
6.00436891029399	3.07496057551706	0.459276434610041	8	10.3	1
5.945857541066	3.09800931535665	0.458013106038404	11	9	1
5.88775585818502	3.12089636627705	0.456758711456644	11	7	1
5.82997001061571	3.1436591018103	0.45551128830598	13	7	0
5.77056314763981	3.16706010095111	0.454229073942516	13	6	0
5.70928337532879	3.19119852245581	0.452906641367182	12	6	2
5.64660814960604	3.21588619363386	0.451554205932791	11	6	2
5.5827951663892	3.24102152683314	0.450177198174243	10	6	2
5.51803926198296	3.26652773278247	0.44877980999911	9	6	2
5.45264142571739	3.29228643640891	0.447368526725741	9.40000000000001	7.4	2
5.38598881667089	3.31853848629074	0.445930281726945	8.5	7	0
5.31872562784494	3.34503061538516	0.444479145192808	7.5	4.9	0
5.25055959392714	3.371878706649	0.443008851413229	8.5	5.2	1
5.18006984026484	3.3996420733298	0.441488669143592	8	6	2
5.10757338738286	3.42819589286493	0.439925199845971	7	6	2
5.03372128938001	3.45728415002846	0.438332195792286	4	6	3
4.96083020208769	3.48599574894463	0.436759399962375	4	7	2
4.8889364684929	3.51431584948675	0.435207636970048	4	8	3
4.81790542042781	3.54229692255365	0.433674033502337	2	7	3
4.74863707120555	3.56958543089489	0.432178135841992	2	9	2
4.68191453238474	3.59587189882896	0.430737118759945	3	10	2
4.61681500281941	3.62151922792796	0.429331215538234	3	9	1
4.5519546765798	3.64707288211915	0.427930611162958	2	10	1
4.48805400948437	3.67224877193992	0.426550927464802	2	11	1
4.42509752821718	3.69705271962335	0.425191797230612	2	12	1
4.36327321817569	3.72141049279018	0.423857299296786	2	13	0
4.30307575000585	3.7451271191127	0.422558064051675	3	13	1
4.24341578728948	3.76863172133091	0.421270556626691	4	14	1
4.18402702716953	3.79202877621799	0.419988987918254	3	14	0
4.12565835418866	3.81502343748507	0.418729458155937	2	15	1
3.9684095954167	3.66954921481755	0.402765578079318	2	14	3
3.77643860587185	3.49197343287495	0.383278234687365	4	13	3
3.56342495779478	3.29495234068171	0.361656039190498	4	11	3
3.34411079228624	3.09211204530344	0.339394719754729	4	12	2
3.10993454735777	2.8755416683084	0.315625697462597	3	12	2
2.85809980665316	2.64265488124681	0.290065207471134	3	11	1
2.59530707635946	2.39964427423088	0.263393123998503	4	10	0
2.32403275213359	2.14880505161259	0.23586115596914	4	9	0
2.04868196155556	1.89421041696815	0.207916443356947	3	8	0
1.77280241547703	1.63913030958825	0.179918239837251	2	8	1
1.49193852112795	1.37943842590657	0.151413958534915	3	7	1
1.20606904841689	1.11511675853393	0.122401402915461	3	6	1
0.917177912137461	0.847989619496607	0.0930812434717758	2	6	1
0.624956647926311	0.577770310496545	0.0634221822809682	2	5	2
0.324851216873768	0.300270227730728	0.0329634165097801	2	4	3
Route: 3 Length: 58.4348378157364 Demand Met: 184					
7.14361421514944	15.4399764691357	0.622404492336676	7.5	25.5	1
8.4838661249964	18.3368207362275	0.739174470429704	4	27	0
9.2290105601185	19.9474765897389	0.804103984293658	3	28	0
9.72695474196209	21.0238561147829	0.847503668830566	4	30	0

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.0557480329287	21.7345159432398	0.876164471608128	5	31	1
10.2874093726753	22.2352251108681	0.896351656197949	5.2	32	2
10.4116612463426	22.5037939466719	0.90717824476533	7	33	1
10.4914442620328	22.6762485854084	0.914129969990766	8	33	2
10.5579431343769	22.8199909038962	0.919924149464599	9	33	2
10.6170996713325	22.9478631303041	0.925078598692588	10	33	0
10.6709550574517	23.0642768855757	0.92977114818154	8	30	0
10.7236793369723	23.1782448259658	0.934365186778784	7	30	2
10.7746977329416	23.2885237952983	0.938810618235243	9	30	2
10.8245904075011	23.3963676763047	0.943157936656274	10	30	3
10.8737174762049	23.5025549087558	0.947438552467359	11	30	2
10.9223032249984	23.6075706578317	0.951671954270056	12	30	2
10.9703367530032	23.7113920818641	0.955857218834151	13	30	2
11.017821568983	23.8140273995819	0.959994699297992	14	30	1
11.0647480541965	23.9154562109131	0.964083548633463	14	29	1
11.1114964275351	24.0165000923971	0.968156883903049	15	28.6	2
11.1578667334008	24.1167273725421	0.972197312756451	15	28	2
11.2040327935596	24.2165138295727	0.976219943843979	16.9	26.8	2
11.249940497329	24.3157432344759	0.980220088749199	18.3	27	1
11.2952624190833	24.4137081588649	0.984169235291084	18.3	28	0
11.3398644088682	24.5101178289686	0.988055671678838	20	29	1
11.3825530714579	24.6023924585586	0.991775460981952	22.2	28.2	1
11.2899079099728	24.6523998057893	0.99551609748019	21.2	27.5	0
11.1875755151871	24.7076335965395	0.99964750876819	20	26	1
11.0794923810039	24.7659716609523	1.00401109064626	20	25	3
10.9648140064899	24.8278704495423	1.00864107511836	20	27	2
10.8434513638027	24.8933775677048	1.01354092169695	20	28	2
10.7140775855078	24.9632088472753	1.01876417351283	20	30	3
10.5477875666199	25.0529723753162	1.02547807472848	19	30	3
10.3590769317006	25.1548481965032	1.03309640022113	16	30	2
10.1672508073914	25.2584059901651	1.04083857231403	15	30	2
9.98901019891716	25.3546159380834	1.04802626982899	13	33	2
9.81475342775342	25.4486707237595	1.0550519133883	14	36	0
9.56948766139078	25.5163809194685	1.06945910013633	13	36	2
9.32572518931507	25.5836940093426	1.08378121134985	12	36	1
9.08411817691289	25.6504103341095	1.09797619164972	11	36	1
8.84675193646414	25.7159495409905	1.11192083189516	10	36	2
8.61684938730178	25.77941979845	1.12542584047455	9	36	0
8.3971688175445	25.840060788024	1.13832903544442	8	36	0
8.18977949822816	25.897302075621	1.15050908537802	7	36	1
7.99602010917231	25.9507752864604	1.16188769727311	6.2	36.5	2
7.82968633978187	25.9966727898848	1.17165467719897	6.2	37.1	3
7.81088555750217	26.0018556595707	1.17275771283206	4	36	2
7.79207478866422	26.0070419408676	1.17386134434731	4	35	3
7.77354667838391	26.0121503477032	1.17494840008099	4	34	3
7.75541123518494	26.01715038087	1.17601236436768	4.7	33.5	3
7.73763269294578	26.0220518268553	1.17705537839371	4.7	34.5	1
7.72022250162227	26.0268515550923	1.17807674972794	4	33	1
7.70325065133363	26.0315302421114	1.17907242425789	4	32	1
7.68678894070175	26.0360680289468	1.1800381493235	4	31	2
7.67081914408242	26.0404699618488	1.18097501802464	3	31	2
7.65520789138138	26.0447729879574	1.1818908494886	3	32	2
7.63993027145764	26.0489840042309	1.18278713152205	2	32	1
7.6247895714456	26.0531574199002	1.18367539773095	3	33	1
7.60973599502222	26.0573069074505	1.1845585932632	3	34	1
7.59464960466036	26.0614656314459	1.18544377475355	2	34	1
7.5791676387126	26.0657338884412	1.18635225965611	1.5	35	1
7.56344835282053	26.0700683257175	1.18727476180117	1.5	35.5	2
7.54810186291354	26.0743005762391	1.188175542402	2	36	2
7.48286237175272	25.8489218160901	1.17790687166498	3	35	2
7.40572401854911	25.5824367841652	1.16576524405144	2	35	3
7.27451625460276	25.1291727863823	1.14511311400099	2	33	3
7.12011992728043	24.5958024356596	1.12081087298265	2	31	3
6.95238962535856	24.0163673991794	1.09440952928645	2	30	3
6.77252447182731	23.3950111165821	1.06609772293804	3	30	2
6.57562879342021	22.7148229603563	1.03510445317939	4	29	2
6.36209285987067	21.97714895885	1.00148972684241	4	28	2
6.13630064377936	21.1971071423139	0.965938915721081	3	29	2
5.87627587319857	20.2987524944646	0.924990573140697	2	29	1
5.50360053514555	19.0112876019879	0.866316777827436	2	28	2
4.89069015719353	16.8939862979738	0.769834892246527	2	27	1
Route: 4 Length: 74.2193804355973 Demand Met: 184					
19.5635281063487	25.4804563425332	1.28713286330627	11	33	1
19.7095781992234	25.6268952980622	1.29609263959425	12	33	1
19.849356876372	25.7670512988557	1.30466816847534	14	33	1
19.9870250027726	25.9050912454408	1.31311440156765	15	33	2
20.1249099446798	26.0433436077549	1.32157350357279	16	33	2
20.260848857354	26.1796421496711	1.32991291297134	15	36	1
20.372108994367	26.2912016027464	1.33673829093049	16	36	1
20.4754827011886	26.3948542282326	1.34307977106057	17	36	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.5741501875483	26.4937880689355	1.34913248629111	17.2	34.1	2
20.6714081602776	26.5913085315744	1.35509873799166	17.9	33.3	2
20.7675667701616	26.6877266029279	1.36099753698973	18.3	34.5	2
20.8624182358066	26.7828339434092	1.36681616422259	19	35.2	1
20.955702262791	26.8763695899187	1.37253859168679	20	35	2
21.0471649251886	26.9680789737794	1.37814931501392	23	35	1
21.1369204421124	27.0580767286906	1.38365525047776	23	34	3
21.2254685022877	27.1468639147109	1.38908716997077	22.8	32.5	1
21.3137491435176	27.2353830731929	1.39450266218265	21	32	1
21.4020198559134	27.3238922784382	1.39991759589905	20	31	0
21.4907859108853	27.4128981105393	1.40536286287144	20.5	31.5	3
21.5804680705164	27.5028224506881	1.41086444305583	21.5	32.5	2
21.6715143539588	27.5941145226986	1.41644972435956	22	32	2
21.7634033548051	27.686251559778	1.42208672125603	23.2	31.5	2
21.8557711383123	27.7788687366537	1.42775312557024	26	31	1
21.9483988754813	27.8717467438199	1.43343545469562	26	30	2
22.0410845962198	27.9646831457531	1.43912133719029	27	30	3
22.1333356419458	28.0571839755032	1.44478053986314	27	31	3
22.2250112282321	28.1491079877774	1.45040443512326	27	32	2
22.3161517393011	28.2404955806067	1.45599547866313	27	33	2
22.4066183588649	28.3312074719684	1.46154519649561	27	34	2
22.4959776844104	28.4208090032291	1.46702700182735	26	34	2
22.584312920485	28.5093835814542	1.47244598349729	27	35	2
22.6708580645851	28.5961631043452	1.47775514863791	26.2	36.5	2
22.7553943638382	28.6809282569398	1.48294112660528	27	38	1
22.8351401212689	28.7608899063434	1.48783321420221	27	37	0
22.9113593687052	28.8373155167284	1.49250885369159	27	36	0
22.9841390176076	28.9102921884267	1.49697341751448	30	37	0
23.0505638092035	28.9768968631549	1.50104805805194	30	38	2
22.9882604206592	28.8702210078324	1.49565839941827	30	36	2
22.9218075209944	28.7564400825904	1.48990974826518	30	35	2
22.851702870288	28.6364059578201	1.48384505743075	30	34	3
22.7783434835881	28.5107981115968	1.47749869230727	28.5	33.5	2
22.7034890364948	28.3826299414012	1.47102288653436	30	33	2
22.6268740534055	28.2514474150444	1.46439475924279	30	32	3
22.5486341035682	28.1174826644295	1.45762616332885	30	31	1
22.4692612767855	27.9815783581186	1.45075957535163	30	30	0
22.3888281099202	27.8438586144621	1.44380123982931	29	30	0
22.307661765874	27.704883661061	1.43677945366734	30	29	2
22.2255588814521	27.5643053622313	1.42967671882166	30	28	3
22.1425189405637	27.4221227577109	1.42249299857279	28.5	27	1
22.0594591266949	27.2799062737961	1.41530752300026	30	27	1
21.9761850204731	27.1373232703492	1.40810355170546	30	26	1
21.8932298157694	26.9952867886636	1.40092723530378	30	25	1
21.8108297500005	26.8542013021822	1.39379897107803	29	24	2
21.7291721363075	26.7143874476744	1.38673496447402	27	26	3
21.6480148809944	26.5754305020315	1.37971427685403	26	27	2
21.5671373899727	26.4369525183779	1.37271777780458	26	28	1
21.4861123255126	26.2982215571014	1.36570849192122	26	29	0
21.4045910904534	26.158640551392	1.3586562176169	27	29	1
21.3220554482219	26.0173221317484	1.35151621372322	27	28	0
21.2388056978048	25.8747806396727	1.34431440470621	27	27	1
21.1550617300723	25.7313926919135	1.3370698884917	26	26	1
21.0711912759782	25.5877880778395	1.32981446795842	26	25	1
20.987468443744	25.4444363732964	1.32257188131268	27	25	1
20.9037144334223	25.3010315975685	1.3153266724909	27.6	23.6	1
20.81951474253	25.1568638509326	1.30804294216746	28.5	22	1
20.7345198560527	25.0113342423987	1.30069038216123	30	23	1
20.6465535280496	24.8607158341684	1.29308056901794	30	22	3
20.5547597047196	24.703541734752	1.28513931482431	30	20	2
20.4610549553313	24.5430932150533	1.27703217379196	29.5	20.5	1
20.3672343232457	24.3824486866179	1.26891465689572	30	21	0
20.2727207303396	24.2206193959495	1.26073775803532	30	19	0
20.1737085830122	24.0510834431104	1.25217203501123	29.5	17.5	1
Route: 5 Length: 34.1975181563247 Demand Met: 184					
1.60458815691743	4.9740920643605	0.11661583631321	3	15	1
2.03504934561941	6.30820749422422	0.147859635360465	4	15	1
2.32662360205748	7.21188052978231	0.169024672867261	5	15	2
2.55390091188173	7.91628944181244	0.185522966064314	4	16	3
2.75068947533519	8.52620217642018	0.199807354021829	4	17	3
2.91366863210881	9.03133333560666	0.211637845253888	3	17	3
3.05715678895987	9.4760595239336	0.222054052961726	3	16	2
3.19296406739871	9.89698283601115	0.231913130762184	2	16	1
3.32404833047002	10.3032686063865	0.241429484602207	2	17	2
3.44833503560805	10.6884863114287	0.250452441170033	2	18	1
3.56546239349343	11.0515138775944	0.2589556099893	2	19	1
3.67448290771341	11.3894143712523	0.266870175487433	2	20	1
3.77406193449052	11.6980510367392	0.274099221719355	3	21	2
3.86136260437949	11.9686315977379	0.280436869880118	4	22	1
3.93310600247744	12.1909937106824	0.285645131467911	3	22	0

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.99601218497335	12.3859650902359	0.290211774416615	2	22	1
4.05228965310245	12.5603906566886	0.294297140970707	2	23	1
4.09483988499778	12.6922692724743	0.297385899490916	3	23	1
4.13121391317915	12.8050050160874	0.300026279214665	2	24	0
4.1457659356247	12.7873548610915	0.301595173027499	3	24	1
4.17110908751155	12.756615867021	0.304327492317222	4	24	1
4.2240881503679	12.6923564349555	0.310039342680962	4	23	2
4.28224599367303	12.6218157521721	0.316309557563315	5.40000000000001	23.3	2
4.35769352964743	12.5303040623596	0.324443919331268	7	21	1
4.43457885611434	12.4370484601739	0.332733296465708	5.3	21	2
4.51443472169251	12.3401898214256	0.341342947909592	4	20	2
4.5967792349645	12.2403126645291	0.350220901345542	4	21	3
4.68460879829559	12.133782568114	0.359690221770494	3	20	3
4.77703120859121	12.0216817226246	0.369654707916279	3	19	2
4.87289284321159	11.9054093909855	0.379989971731419	3	18	2
4.97157941438697	11.7857106719134	0.390629797909105	4	18	1
5.07277978375767	11.6629629577032	0.401540640958595	4	19	1
5.17844339674687	11.5348017035195	0.412932684710038	5	18.3	1
5.28746211589498	11.402570994737	0.424686471182932	7	18	0
5.39889692333989	11.2674097498956	0.436700752662894	8	18	1
5.51300843252805	11.1290018198291	0.449003638556604	9	18	1
5.62996021117593	10.9871487729524	0.461612761965863	10	18	0
5.7496467413164	10.8419785862289	0.474516745875798	11	18	0
5.87180084995002	10.6938153389928	0.487686799252476	12	18	0
5.99614013677605	10.5430016347167	0.501092471740678	13	18	1
6.12245192383648	10.3897955739793	0.514710839239076	12	17	1
6.24908120228163	10.2362045447605	0.52836345943548	10	16.3	0
6.37729927327615	10.0806864566906	0.542187378220889	9	15	1
6.50589330343635	9.92471238847423	0.5560518405588	8	15	1
6.63579588026192	9.76715114167037	0.570057374203008	7	16	2
6.77026431674376	9.60405174796422	0.584555156254227	7	15	3
6.90834935174124	9.43656568345892	0.599442832268668	10	15	2
7.04794744671948	9.26724446687465	0.614493621632898	11	15	1
7.18860166146469	9.09664233099287	0.629658255717702	11.5	13.5	2
7.32782200684952	8.92777952412453	0.644668291978268	12	15	3
7.46850214731583	8.75714612329667	0.659835682654362	13.5	17	3
7.62067176930807	8.57257682021673	0.676241748726202	13	15	2
7.77563163736249	8.38462317184743	0.69294860220857	14	15	2
7.93350805011133	8.19313197196684	0.70996987478623	16	15	1
8.09229459620234	8.00053707458376	0.727089230003566	17	15	2
8.31144799501556	7.69863207038569	0.750083198933762	16	13	1
8.53028398378836	7.39716431043719	0.773043878325289	16.5	10.5	0
8.74110561516464	7.10673729376567	0.795163733756256	16	11	2
8.94917925777222	6.82009595333357	0.816995302766912	17	12	2
9.15666813264384	6.53426017374782	0.838765524402472	18	12.3	2
9.36089126481072	6.25292335308316	0.860193113555548	20	10	1
9.46295697132395	6.11231867113551	0.870902009553216	20	9	1
9.55244107552946	5.98904652505857	0.880290843404364	20	8	1
9.63352203079816	5.87735057039339	0.888798027881492	17.5	7.5	1
9.71156875640274	5.76983458560737	0.896986879165395	18	6	1
9.782362811233	5.6723099066303	0.904414791535388	19	6	2
9.84256560915618	5.58937574365797	0.910731479904547	20	6	1
9.89057479596553	5.52323944437251	0.915768783626515	21	6	3
9.90908871423325	5.49773520229492	0.917711352837037	20	3.7	2
9.92476121587282	5.47614524478684	0.919355785430634	21	3	2
9.39695922383711	5.18492243561295	0.870464722156761	20	3	2
8.31816301162544	4.58968039011375	0.770533412348479	19	3	1
Route: 6 Length: 41.6689703920807 Demand Met: 184					
9.63333809985754	15.5743784225793	0.297513154297198	20	11	1
9.76528546616545	15.7876789037027	0.301588131430485	20	12	1
9.88287039104631	15.9777741746326	0.305221034091414	20	13	2
9.99002443588785	16.1510110481028	0.308532193697578	20	14	2
10.0936118965601	16.3184899898138	0.311732701985616	18	15	3
10.1994565459183	16.4896135364362	0.315002074324573	20	16	3
10.3000494758941	16.6522398752153	0.318108648516279	20	15	1
10.3983061539986	16.8110858586093	0.321142852236898	20.6	16.5	1
10.4905866090962	16.9602678676234	0.323992327115778	20	18	0
10.5785762860597	17.1025121522803	0.326709199605956	20	19	2
10.661571357867	17.236681216556	0.329271752165686	20	20	3
10.7385281288081	17.3610879931873	0.331647755313226	21.7	19	3
10.7385281231629	17.3610880243597	0.33164775478933	21.1	20	2
10.7385281177232	17.3610880569979	0.331647754814343	20	21	1
10.7385281122346	17.3610880901113	0.331647740956187	20	22	2
10.7385281067334	17.3610881239031	0.331647734425633	20	23	2
10.7385281013846	17.3610881588032	0.331647744228924	20	24	0
10.7309615554275	17.3609141428171	0.331363452725327	18	21	1
10.7234156585383	17.3607406756509	0.331079978450877	17	21	1
10.7158660979939	17.3605671748623	0.330796366294074	16	21	3
10.7083147614612	17.3603936646132	0.330512675278348	15	21	2
10.7008087278488	17.3602212072844	0.33023066106667	14	21	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.6933711783672	17.3600503079146	0.329951203528962	14	20	2
10.6860156404601	17.3598813109877	0.329674814164827	13	21	2
10.6787289176271	17.3597138436489	0.329401010512756	13.5	21.4	1
10.6714971779953	17.3595476036858	0.329129274696839	13	22	1
10.6643200259172	17.359382571881	0.328859605476129	13	24	1
10.6571724001217	17.359218127593	0.328591076153678	14	25	0
10.6500428306736	17.3590540290333	0.328323246088678	14	24	1
10.6429089320039	17.3588898007672	0.328055282197285	15	24	1
10.6357147857265	17.3587241820354	0.327785059992326	16	24	2
10.6284170723151	17.3585561982637	0.327510948640263	17	24	2
10.6209932576886	17.3583853614821	0.32723208950196	18	24	2
10.6134453946091	17.3582117758958	0.3269485584094	17.9	25.8	2
10.6053588476695	17.358026242914	0.326644879474923	17.2	26.1	2
10.596984082664	17.3578341543136	0.326330389302182	16	27	0
10.5882277690008	17.3576331616114	0.326001629506285	14	27	0
10.5794127360843	17.3574307008182	0.325670711624358	14	28.2	1
10.5324398043425	17.3563622416147	0.323908474781923	15	27	3
10.4821039274456	17.3552168234236	0.322020187743524	13	27	2
10.431057595404	17.3540549788055	0.320105274523652	12	27	0
10.3798385266211	17.352889114266	0.318183899357646	11	27	2
10.3287003297823	17.351725027713	0.316265596347467	10	27	1
10.2780021029641	17.3505710281834	0.314363804283946	9.09999999999999	26	1
10.2279740662598	17.3494324413139	0.312487171937963	8	26	0
10.1788607845255	17.348314880623	0.31064484177312	7	27	1
10.1309859258964	17.3472257072396	0.30884895488823	8	27	1
10.0839069882066	17.3461547986168	0.307082886640703	9	27	3
10.0372576812469	17.3450936539468	0.305332907772806	10	26	2
9.99088302188558	17.3440386562378	0.303593206472273	10	24	2
9.94472859537548	17.3429886236793	0.301861759787066	11	24	1
9.89859313911673	17.3419388891519	0.300131033286004	12	24	2
9.85221845622924	17.340883458816	0.298391357971845	11.7	22.8	2
9.8055821462485	17.3398219414639	0.296641858621541	12.2	22.1	3
9.7584752351475	17.3387494703298	0.294874695052908	12	21	2
9.7108506395799	17.3376650607295	0.29308808804158	11	21	3
9.66286882471448	17.3365724666937	0.291288060086673	10	21	2
9.61471737468878	17.3354761119348	0.289481662986027	9	21	1
9.56654812588401	17.3343795711845	0.287674598242768	8	21	2
9.51848596119903	17.33328579848	0.285871545286621	9.5	22.2	2
9.47020932813263	17.3321871966161	0.28406045357937	8.5	22.8	2
9.42191731569993	17.3310883996575	0.282248793630115	9	24	1
9.37342079623478	17.3299849093391	0.280429504896437	8	24	1
9.32461584387228	17.328874478438	0.278598673313171	7	24	2
9.27543340346088	17.327755570816	0.276753652285528	5.40000000000001	24.3	3
9.22624969077478	17.3266368013325	0.274908494548347	4.7	25.5	2
9.1776718450777	17.325531839819	0.273085986572768	4	25	2
9.13029156737463	17.3244541105044	0.271308318784563	3	26	3
9.08709102849383	17.3234713828978	0.269687358849216	2	25	2
9.04874738766365	17.3225990104348	0.26824855095699	2	26	0
9.01857727636148	17.3219125333342	0.267116357826534	3	27	0
8.66468853677233	16.6422045611877	0.256628215386277	4	26	0
8.10392028764808	15.56514615944	0.240011361559656	3	25	0
6.31901324091008	12.1369364423353	0.187123410431894	2	21	1

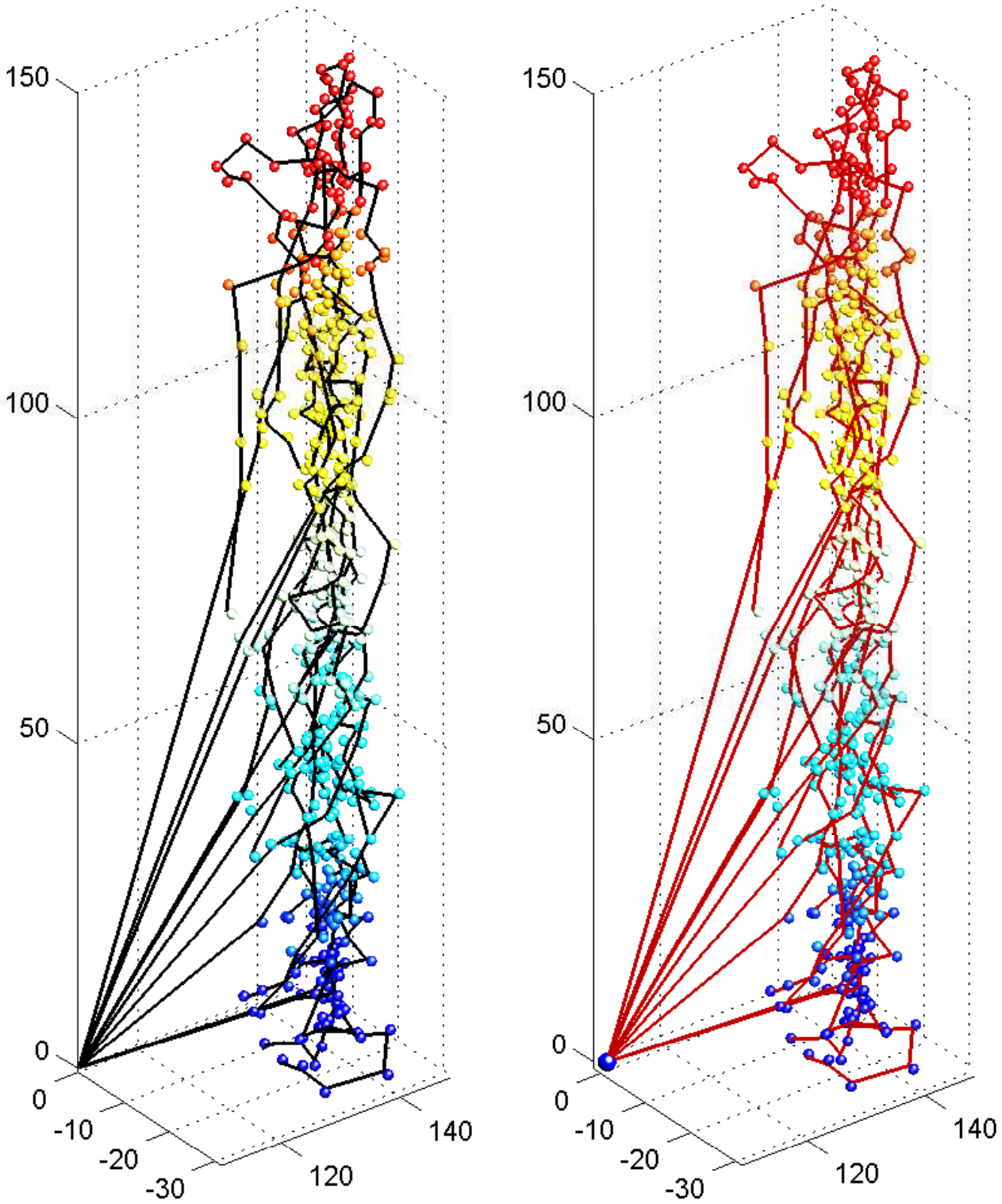


Figure O.85: $d493$, $r = 0.74904$, Equal Radius, 3D, Euclidean, Length = 2697.5562730

Table O-88: Solution for $d493$, $r = 0.74904$, Equal Radius, 3D, Euclidean

Total distance: 2697.55627302711 Total demand met: 10514 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 173.714043895973 Demand Met: 986					
18.4149335366543	14.1032726784505	8.80854891004049	18.466	14.155	8.671
24.740696083009	18.9479186790448	11.8344268874881	24.625	19.68	11.726
27.544505861746	18.3207520426042	13.3551023571288	28.118	18.092	12.931
28.0969031225534	18.601192793778	16.6110701379809	27.864	18.854	16.375
28.0969031225534	18.601192793778	16.6110701379809	28.689	18.156	16.722
26.961186919834	20.6959232918722	22.0198129425893	26.975	20.061	22.417
26.635061113335	21.7805889246579	23.2045071539644	26.022	21.902	22.93
26.3823518106802	22.6211343548392	24.1225971368132	25.832	22.918	24.535
28.1913579832607	22.6625128100398	23.8193811247927	28.626	22.791	23.223
29.0148653158763	21.5621733105291	28.6234476178704	28.689	21.013	29.015
30.7810419815465	23.2456483158833	29.5121617318442	31.293	23.68	29.18
29.8667105581563	22.7188342159901	32.8427842200091	29.261	22.283	32.908
33.4793438046826	25.6981010752853	41.8238923727727	33.642	26.22	42.336
33.2944077450215	19.7325561417381	39.7495684425812	33.96	19.68	39.41
32.9505338956088	18.8670153339016	39.6012489312714	32.372	18.537	39.944
35.92090698053	16.9570773183831	35.9436857666302	36.436	17.076	35.413
33.9531806763366	14.7917492184489	37.5773227265004	34.135	14.726	38.301
33.4197594415018	14.3929838373947	37.4008862327893	33.095	14.271	36.737
33.2443688785485	14.0797910345447	38.1819139465426	33.322	13.361	37.986
33.2443688785485	14.0797910345447	38.1819139465426	33.095	13.491	38.538
32.6621636323885	13.5841293470246	40.6800149222512	33.095	13.231	40.765
32.4614814583747	13.4132838253982	41.5409906721804	32.372	14.092	41.845
32.0245581875178	11.7445396619246	43.5532541138345	32.607	11.313	43.742
30.9952596048843	11.5716140482392	44.2310103326109	30.658	10.98	44.543
30.6297885942602	13.4711830731918	44.141966466718	31.015	13.816	44.684
29.901018077121	14.4331485868152	43.4245907393829	29.642	15.108	43.621
29.8083701653986	13.6558553576732	42.1137112959817	29.134	13.33	42.125
30.1051982541027	13.4546206087084	41.4914956774736	30.787	13.686	41.698
30.4593561653832	13.1104749829262	40.5038324698256	30.202	13.751	40.213
30.4593561653832	13.1104749829262	40.5038324698256	31.015	13.296	40.037
30.3660419075674	12.2699527485053	40.3601068493882	29.975	12.321	39.763
30.3660419075674	12.2699527485053	40.3601068493882	29.975	11.801	40.794
32.6177775129513	11.0650783322816	36.5340126143068	32.217	11.541	36.145
33.2398707460783	10.7319924244804	35.4778052460618	33.642	10.155	35.22
32.4413098400271	12.9887641562268	34.6846298672744	32.436	13.231	35.38
31.9191476303841	14.4640162094754	34.1649221066588	31.567	14.661	34.796
31.248994118481	17.1866185943094	32.4788136509364	31.61	17.775	32.188
30.4896289700774	16.8983694707698	32.5364534215975	30.023	17.203	33.037
30.1238991207408	16.067012101145	31.8957808674628	30.15	16.06	32.059
29.2895065208999	14.170327054243	30.4341414582366	29.007	14.409	30.293
28.4226873061968	12.1998037727447	28.9157082320923	28.181	12.441	28.249
28.3038980623356	10.8108964214194	29.0515384046864	27.927	10.409	29.559
29.9560814662952	9.91257752749473	26.7762476699394	30.594	9.52	26.782
29.0396879771756	10.548277224224	25.3837296687932	28.372	10.218	25.305
29.5606663052997	12.6895965558479	23.2237376231376	29.705	13.393	23.437
29.5394149476766	12.4346544539144	22.0749994447031	30.202	12.451	21.726
29.0487138661761	12.2875744834143	21.7182317357771	28.816	12.25	22.231
26.1277120348059	11.4120875023819	19.5945241409021	26.149	11.107	19.141
26.1277120348059	11.4120875023819	19.5945241409021	25.895	12.123	19.556
Route: 2 Length: 104.3444797858 Demand Met: 607					
20.5417068746273	12.2831752340614	7.37528961265622	20.434	13.012	7.24
28.797008167693	11.3270730568583	11.0567136630834	28.753	10.79	11.577
30.566825090223	11.9448661501972	11.0255442108431	30.787	11.313	10.711
31.5689328204994	12.2961147247942	11.0085307216354	31.762	12.126	11.712
33.560315323837	13.2176666577085	10.3097780625295	34.135	13.686	10.417
32.7255693676698	11.9954536915388	9.32846844106352	32.022	12.126	9.107
34.0137576561571	9.49873783089849	8.55507817078786	34.087	8.758	8.639
34.4208821425882	10.7565544994295	7.87339657953015	35.166	10.726	7.803
34.0862601702228	11.7743895268089	7.39828523700039	33.647	11.313	7.765
34.0862601702228	11.7743895268089	7.39828523700039	34.135	12.386	7.828
33.8693426101055	11.8494709219048	6.80695433212813	33.452	11.541	6.941
33.6173883228113	11.9366717778742	6.1201347584404	32.997	11.541	6.26
33.2904605245215	12.1443124511507	4.94534417947366	32.542	12.126	4.969
33.5804518373593	12.4101250310962	3.51363879676663	33.322	12.841	4.069
33.5804518373593	12.4101250310962	3.51363879676663	34.135	12.906	3.426
32.7396521493672	11.554208947281	0.70402581592734	33.127	11.313	0.11
32.0895099365095	11.6583682634797	0.806857603004365	31.567	11.313	0.396
31.4517347937489	13.324544456216	2.70726103028706	30.787	13.166	3.014
31.4517347937489	13.324544456216	2.70726103028706	31.399	13.754	2.704
32.5270652711729	15.3241988299339	3.75069022198757	31.892	15.246	4.139
32.5270652711729	15.3241988299339	3.75069022198757	32.932	15.246	4.376
32.2833709383981	17.7758608989475	2.6248697649613	32.69	18.346	2.359
28.4685447178414	16.5910815267957	3.20422915823755	28.308	15.933	3.524
26.2557000847714	18.5022364867265	2.27790774894036	26.149	19.045	2.783

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.1506706560572	18.7067065553387	0.900442307447568	24.943	19.108	0.303
24.7051961699765	16.3252340506096	2.64386633341491	25.07	16.314	3.298
21.6571026281475	12.2534737206299	1.59981082234082	22.149	11.742	1.36
Route: 3 Length: 181.414241401491 Demand Met: 960					
28.9706260588982	10.7286915756169	5.62800311397961	29.451	10.155	5.592
30.3995530853175	13.0631337855525	6.21625298714032	31.015	13.036	5.79
30.4927503523972	14.2408938553474	6.92960456886036	31.177	14.433	6.693
30.0063219287078	16.8710694599605	8.88925402693908	29.959	17.584	8.664
29.8680664856442	16.2560989014579	10.6864295301219	29.134	16.187	10.819
31.3664122011328	15.3502965290877	13.4969047673694	31.112	15.246	13.662
31.9132509412548	15.0197746267692	14.5225114218757	31.632	15.246	15.179
32.9240944113028	14.3181435693716	14.5076998980317	33.095	13.751	14.049
35.3269114235967	16.0112471045516	17.8919094695897	35.992	16.314	18.057
31.7188708793482	14.9199216497375	19.5598664288213	31.242	15.473	19.727
31.5179379125252	14.2955030284764	19.6958030251184	31.61	13.901	20.326
31.0804492128553	14.0308309344027	18.8775675996447	30.787	13.426	19.207
30.6330349093471	13.7907821402049	17.9776483324967	29.975	14.141	17.903
31.0986018420496	12.4482683881556	16.0869641217519	31.372	12.353	15.396
30.683110781565	12.1284085504368	16.8561546927244	29.975	12.061	16.621
30.683110781565	12.1284085504368	16.8561546927244	31.242	12.126	17.355
31.2681402341201	11.8367949113108	18.0346915305887	30.657	11.541	18.351
32.2178946627702	11.6190035648297	19.2889308032266	32.182	10.98	18.901
32.2178946627702	11.6190035648297	19.2889308032266	31.827	11.313	19.849
33.3492570466675	11.4482349388479	20.7159622226783	32.867	11.313	21.273
34.5892794516598	11.4174373177038	21.4029386359174	35.293	11.552	21.184
33.9115689688772	10.9641142427176	22.9103151342112	33.833	10.282	23.21
33.9115689688772	10.9641142427176	22.9103151342112	33.96	10.536	22.989
33.6331502656531	11.9086252011545	23.3052573645945	33.062	12.126	22.872
33.84130950226	13.3462705857063	24.5593410849153	33.907	14.076	24.403
33.8480851140222	12.3109689538541	26.7632808808997	34.087	11.615	26.904
32.7221925087298	14.2793914744438	28.9400112083367	33.322	14.401	29.372
31.9789387240289	14.8695178098664	29.4121730661037	32.022	15.473	29.854
30.7258287311349	14.0258820297611	28.8552159314413	30.202	13.491	28.883
30.7258287311349	14.0258820297611	28.8552159314413	30.787	13.946	28.148
31.7495771321176	15.639081375796	27.9910421300095	32.152	15.246	27.742
33.0795167611258	17.7358479324313	26.8682755610476	33.515	18.219	27.24
32.4198878847316	17.8344863395785	23.2871653176948	32.944	17.965	22.768
31.4394932115706	17.6637806166777	23.0755340712807	31.102	17.775	23.735
29.8422941518174	17.1698697435317	21.8009294733435	29.515	16.505	21.691
28.7917053337271	21.5879876906519	19.6898457157732	28.245	21.331	19.247
28.5182907850735	25.6272096552294	18.3993149395733	29.007	26.157	18.195
23.2226855294579	25.318756585652	18.8530408487082	22.974	25.141	19.537
21.5047484070398	25.6604957911626	17.2068426905603	20.942	25.649	17.701
17.0440840385068	26.7544907083274	11.2026824458161	16.37	26.982	10.968
23.2265945940941	24.2905405200677	9.27517878149526	23.355	23.553	9.247
26.2448110931137	27.0521716437286	8.26580786012738	25.959	27.744	8.296
30.7441890155951	27.3329687370114	7.02405599826707	31.42	27.173	7.305
28.6966198781792	29.2873828925753	2.77457127118899	29.07	29.713	2.284
20.6656005935515	27.1457572369957	1.977452152111	20.117	27.617	1.782
20.0691111483534	22.6956341740719	2.89814101751629	20.117	22.728	3.645
19.4517954238793	18.6274704212174	2.49229603926457	20.117	18.283	2.485
Route: 4 Length: 186.21097649713 Demand Met: 991					
21.3776149638727	11.4161305305081	20.3068983072431	22.022	11.361	19.929
24.1046209145568	15.2832924926488	28.8756516737249	24.244	15.997	28.696
24.9900501150865	15.1892636989269	33.2725369776855	24.308	15.044	33.546
26.7440354980325	15.3540662785393	36.0808006208686	27.419	15.044	35.984
26.4208184378201	16.4908268754418	39.2425226359115	26.34	17.203	39.025
25.7997891681443	18.175134125374	46.4928157994325	25.895	18.918	46.48
25.4352326442366	17.7253348182868	49.1711666700464	25.07	17.076	49.249
26.0338595550018	19.0477138530628	52.4249476041615	26.594	18.854	52.883
24.5635883807505	20.4432666216602	52.8254555663483	24.244	21.077	52.586
24.479848931829	17.1564844378604	56.1751572776115	24.308	16.441	56.035
25.2143734827164	18.2123661214898	59.1032557414513	25.197	18.918	59.354
26.3441908038244	14.6081500890271	61.3171898603374	25.832	14.219	61.701
28.5119472212151	13.9434614967475	61.2777126026309	28.372	13.52	60.757
30.8515085307046	13.2263168015251	61.235330368876	30.202	12.971	61.507
30.8515085307046	13.2263168015251	61.235330368876	31.015	12.516	61.408
32.6150664187501	14.4992925079764	60.7071425504952	32.672	15.246	60.724
32.6150664187501	14.4992925079764	60.7071425504952	33.095	14.011	61.011
31.7626699304766	14.4489281015844	58.5798697481027	31.827	14.661	58.532
31.1505113921084	14.4127245363888	57.052223649372	31.275	14.173	56.999
30.6962506775946	14.3858631504915	55.9186519764937	29.975	14.401	55.717
32.7193903073114	14.267881260453	54.3936581803464	32.69	13.52	54.423
32.7193903073114	14.267881260453	54.3936581803464	33.322	14.141	54.817
33.4277026201905	14.276718047775	53.8517268945117	34.135	14.206	54.088
33.2510358273908	14.3552923620177	53.1929017229591	32.607	14.661	52.963
35.3934197318459	13.3152777567065	51.3443916333302	36.119	13.139	51.404
33.3532640274628	13.2984740870475	49.1792173101854	33.095	12.971	48.557
33.3532640274628	13.2984740870475	49.1792173101854	33.322	13.881	49.4
33.3532640274628	13.2984740870475	49.1792173101854	33.907	13.036	49.61

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.4027331012101	15.3117684014551	49.0055237409672	30.657	15.246	48.98
31.4027331012101	15.3117684014551	49.0055237409672	30.982	15.473	49.591
33.1614194158862	17.9024884641954	48.9417117648162	33.388	17.584	48.735
33.1614194158862	17.9024884641954	48.9417117648162	33.642	18.346	49.307
31.8051544058422	17.4617305970534	46.7358486776241	31.483	16.822	46.955
30.9003004639358	17.5421000720124	44.7447543623449	30.785	16.949	44.302
30.150430627097	20.5221267407645	44.0075044258206	30.785	20.823	44.268
29.1559676269553	22.6679433457582	43.2623560763761	29.261	23.045	43.901
28.339595634359	24.0574121826497	42.3055384948214	27.8	23.617	42.03
26.1931803416829	29.2107297514166	39.3957351847062	26.086	29.903	39.661
25.0386063059999	26.514905206948	32.6692967841951	25.705	26.22	32.496
18.0415696136563	23.9800930869464	22.1494011648401	17.64	23.426	22.454
16.2267762218204	23.8035703574166	18.3519246016728	16.497	24.315	17.876
14.1154593835908	22.103452369391	17.1422861912765	13.513	22.41	17.465
12.7484706223604	19.9629095384981	15.4822157775972	12.37	19.934	15.842
Route: 5 Length: 233.345458675041 Demand Met: 995					
18.7511854366003	18.1317466159504	35.7551258461303	18.212	18.283	36.255
20.1631463634084	18.5900625455869	36.3838298451054	20.561	18.219	35.874
25.5566064058584	20.8245714848444	39.4358326680147	26.149	20.886	38.979
28.0311031675649	24.2429635290673	51.1720784586656	28.753	24.379	51.035
28.449676129873	25.8291622334544	57.3165640309826	28.499	25.141	57.61
28.523306783033	26.7024255725714	58.7085833650089	28.88	27.3	58.991
27.3505978043537	25.5404779569073	59.1872443225977	27.102	25.966	59.543
26.8299607717085	25.0177155140596	59.3928759707389	26.086	24.95	59.469
30.9250436453758	22.3086903313358	59.9668089393855	31.356	22.347	59.353
33.3491514689529	18.9630988005098	63.9495785704761	34.087	18.918	64.082
31.1707969344265	17.3670044017867	65.4859745205385	30.594	17.076	65.103
31.2464235607577	17.1379972604212	67.1638259067472	31.991	17.203	67.188
31.1072942884168	16.9029614005774	68.7619700579255	31.356	16.251	69.04
29.9762033315575	18.8123429305279	70.6174123115956	29.705	19.426	70.279
29.8417393676854	18.841163955866	71.7658267656734	30.531	18.664	72.004
28.0772959053369	19.2699473635996	74.8842892749165	27.483	19.616	74.587
27.4557089816958	19.3139299493449	76.6913821389688	26.848	19.743	76.594
27.1743990411202	18.7787471809403	80.1995629064443	26.721	18.283	80.536
27.1743990411202	18.7787471809403	80.1995629064443	27.737	18.664	80.683
27.5237355905615	21.1846832918475	79.5506908124376	27.102	21.648	79.965
28.099880488132	21.7064845714842	78.8483976753601	28.816	21.902	78.963
26.4747728007019	22.3851824000096	76.1358166984479	26.911	22.601	75.564
23.444597957973	22.2964770015567	75.4659322729803	23.482	22.41	74.725
19.912408420386	22.0288594706088	75.7969877003066	19.863	21.331	75.529
18.0094177697798	22.258546977439	76.1231609448	17.45	21.902	76.475
18.4434433071084	24.8191193321546	74.4714126286732	19.164	24.696	74.306
18.2078149262322	27.2172196892796	73.1418661888817	17.64	27.49	72.733
21.8240949950205	28.8445448484069	73.9674959104701	21.958	29.395	74.461
23.9394941218188	27.3967161825905	72.1973783142677	24.562	26.982	72.259
19.3749748605102	30.298578913721	66.9640440190782	18.72	30.665	66.986
21.9042542889614	29.0781608771198	63.9125708891379	22.466	28.887	64.369
22.4328615183112	28.8013455056712	62.9705624033368	22.022	28.443	62.892
24.3271121673212	27.822285515351	59.6159552146114	25.07	27.744	59.542
17.6592280084466	26.5849975342215	52.3831876292463	17.069	27.046	52.438
17.5097551472136	24.5628905692013	49.7826546330101	17.323	23.934	50.146
17.5802108038278	23.6342507245557	47.4257420395442	17.64	22.918	47.209
17.3007944913198	27.071221704789	44.9788308699473	17.069	27.744	45.218
19.993145736083	25.1498140513142	36.0884975358522	20.561	24.696	36.269
21.381403194367	24.3195241506946	23.8295340972252	21.958	24.76	23.638
19.1104832575403	21.5898778742854	18.3651645034215	19.482	21.966	17.833
Route: 6 Length: 207.330918310188 Demand Met: 984					
17.8768559846708	12.8021937671485	41.9426270186991	18.021	13.52	41.784
21.9928544144804	12.7272832394061	54.0441215556626	22.276	13.393	54.239
22.0783650111761	11.571820530642	55.3931558742295	22.085	10.853	55.182
22.4568700903495	12.8592960393462	64.6230903615046	21.831	13.203	64.85
25.5343694418289	12.0054875103107	68.739526539805	25.07	11.615	69.179
29.0378880833412	12.1188858358102	71.2059015358985	28.816	12.568	71.763
30.7345498630735	11.7298041390589	71.7058776970035	31.307	11.313	71.461
30.5873006711055	12.1785223268468	72.2633488335842	31.015	12.776	72.117
29.4204233174757	12.8254789142764	74.4273889028092	29.197	13.52	74.598
29.1372047230156	10.9619259704489	75.8203956058805	28.626	11.234	75.345
29.1372047230156	10.9619259704489	75.8203956058805	29.007	10.282	76.107
30.5285662688275	12.2448344683082	76.4915865159047	29.975	12.581	76.539
30.5285662688275	12.2448344683082	76.4915865159047	30.787	12.906	76.252
30.5286339041726	12.244860071698	76.4916575518299	30.787	12.646	75.914
31.1269607945779	12.0560737080922	78.2280109466697	31.047	11.313	78.28
31.1269607945779	12.0560737080922	78.2280109466697	31.437	11.541	78.241
32.5627768456133	12.7084536709409	81.9869674992298	32.672	12.353	81.337
32.5627768456133	12.7084536709409	81.9869674992298	32.152	12.353	82.503
33.4511443226904	13.3415451582998	82.7598275867017	34.135	13.166	82.509
33.4511443226904	13.3415451582998	82.7598275867017	33.907	13.296	83.348
33.6203645623388	14.6024845630025	84.3403992485622	34.135	14.466	84.176
33.6203645623388	14.6024845630025	84.3403992485622	34.135	14.986	84.727
30.0529344754414	13.9816683056821	84.261981496802	29.388	13.838	84.576

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.5217503895196	14.1148251238861	83.6658867224131	29.975	13.621	83.535
30.5217503895196	14.1148251238861	83.6658867224131	31.015	13.556	83.741
32.6244604360141	15.6066858746503	80.3722286423014	33.071	16.187	80.531
32.6652034059785	14.9009963818597	77.9078208721872	32.835	14.173	77.958
32.6652034059785	14.9009963818597	77.9078208721872	33.062	15.473	78.089
32.521682139386	15.1294791074332	76.0954855044527	32.087	14.661	75.705
32.521682139386	15.1294791074332	76.0954855044527	32.477	14.433	75.823
32.5469363051262	16.0887737415605	75.0184037948162	32.182	16.632	75.383
32.981780908453	17.843833036072	72.0491928336406	33.261	18.537	71.995
31.5623090549234	15.2283609531873	68.4507245643146	31.307	14.661	68.868
31.347914511802	14.8564436619098	67.6525714469606	31.437	14.433	67.041
31.347914511802	14.8564436619098	67.6525714469606	31.762	15.473	67.554
30.1059276799724	13.3979720608287	66.3188462627976	30.202	12.711	66.602
29.4853988638349	13.300187390758	65.5102631327658	28.753	13.457	65.491
30.4474252330601	12.702284015982	64.1888712808519	30.202	11.996	64.142
36.2167643132949	12.8319529458887	57.9278706428186	36.944	13.012	57.936
33.0924148046284	11.2523018638525	53.9642449213158	32.944	10.536	54.126
28.8322669441839	12.6452371165924	46.6262729070797	28.499	12.949	46.85
27.6228438149962	13.0405509335105	44.5425913770053	27.991	13.647	44.302
26.1409921283363	12.8145671608447	42.8448457997276	25.578	12.568	43.273
19.5127961270796	12.3400618524097	31.664431172152	19.482	13.076	31.528
Route: 7 Length: 255.191030011819 Demand Met: 999					
20.5438153328061	11.8059057567326	37.2671155229094	20.244	11.234	37.646
24.3021117279717	14.26265046366	43.3997923218712	24.371	14.346	43.342
27.0446781153	16.0553917422526	47.8750352226321	27.737	16.251	47.666
25.5931606525753	18.6061089187797	63.7416256623881	24.943	18.346	64.008
27.3030915632219	19.8853346433433	65.9479008137695	27.356	20.632	65.916
28.7783410522716	18.6135020380275	68.187360145161	29.261	19.172	68.315
30.287510434203	15.779907762477	71.4293324635567	30.785	16.251	71.611
31.9107760925712	12.7173317241182	74.9257424982723	31.502	12.126	74.715
31.9107760925712	12.7173317241182	74.9257424982723	32.282	12.126	74.654
32.1078221753728	12.7289448294393	75.9224214633226	32.835	12.613	75.794
32.4088364878895	12.7604176497658	77.7511195585692	32.802	12.126	77.71
33.6502705333239	13.1441736691507	86.20629310274	34.135	12.646	86.486
33.0733137694104	14.0064136770992	87.1307770041011	32.737	14.433	86.615
32.3584569838089	15.1086575664753	88.7585742555218	32.412	15.246	88.024
32.3584569838089	15.1086575664753	88.7585742555218	32.542	15.473	89.387
30.6907507439297	14.7490569114358	90.6157152328491	29.975	14.921	90.476
30.6907507439297	14.7490569114358	90.6157152328491	30.722	15.473	90.573
31.2286526647043	13.8672138453993	92.859344877251	31.547	13.203	92.722
31.2286526647043	13.8672138453993	92.859344877251	31.697	14.433	93.007
30.5879554349578	13.8324695501284	95.2719028194502	30.202	13.231	95.497
30.7014247475846	14.2393425872456	95.6923488120664	30.202	14.791	95.605
32.292162409677	14.9263353982746	97.8097193347133	32.802	15.473	97.861
31.7445474827963	13.603890355506	99.1650657655165	31.737	12.885	98.954
30.9171432415016	14.219119048229	102.069544527213	30.202	14.011	102.151
31.2236117053848	14.5832800833013	102.93645450578	31.957	14.433	102.967
30.7502222229713	15.6581177107888	104.872145215064	31.372	15.246	104.804
30.7502222229713	15.6581177107888	104.872145215064	31.293	15.806	105.367
29.4016577674798	16.5219766059511	105.862507985748	29.642	17.076	106.306
27.7110048087729	16.2413458986232	105.91013135551	27.292	16.632	106.393
26.6941071652078	14.7165014028564	104.549454493037	26.086	14.663	104.115
29.1490779801173	12.9528965790043	105.426847577743	29.578	13.203	105.988
29.279717890107	12.4844878525945	105.199757325023	29.388	11.804	105.494
29.3539817400861	12.95229014034	103.858828642548	29.197	12.441	103.553
29.3539817400861	12.95229014034	103.858828642548	29.975	13.361	103.951
29.1867333704226	13.2365015925238	102.562807691456	28.753	13.838	102.669
29.1768641508753	13.3789577184549	99.2243508939065	28.753	12.949	99.196
29.173503643189	13.43103773651	98.0083249122135	29.515	14.028	97.711
28.080260119671	11.6501214004799	96.1782132142359	27.419	11.298	96.166
28.7796477941505	11.630972078025	95.6015306186822	29.261	11.425	96.137
30.0828862470816	11.6392424838718	94.315051799873	30.527	11.313	94.769
32.0021788395707	11.6536527622035	92.4144847118111	32.737	11.541	92.508
31.4690407443927	11.8618926668306	91.4682505019403	31.957	11.541	90.999
30.4730100809135	12.3240935290617	90.4521636849179	29.975	12.841	90.667
30.3704144078828	11.6651461114898	88.5571499026848	30.34	10.917	88.584
30.0889020929463	14.4424440437363	78.3920167629814	30.202	14.271	77.775
30.0889020929463	14.4424440437363	78.3920167629814	30.787	14.466	78.121
23.2230616831648	17.0190571321383	70.718758629035	22.974	17.711	70.862
19.7381944035626	14.5772924211275	64.1843068731652	19.418	13.901	64.222
19.2094849391686	17.754359833931	58.1713705402802	18.466	17.838	58.207
19.9142536903361	21.0551807650562	51.5910601087585	20.117	21.775	51.546
19.1183038941908	18.7069115471649	47.921190131824	19.609	18.156	48.051
Route: 8 Length: 279.423741004903 Demand Met: 999					
12.6961749454502	18.4775453142481	46.058551210048	12.052	18.854	46.124
18.3007909479018	23.8363428555823	61.2757704463678	18.974	24.125	61.119
18.1483218996852	24.085754892728	63.0709633140639	17.45	24.188	63.322
24.7304465008069	24.273001569376	69.5326559945924	24.943	23.68	69.938
26.0536565168345	27.3532618550193	69.8323509395221	25.832	27.998	69.522
27.0173301207563	27.1308867454582	70.6033541297463	27.546	26.982	70.094

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.7275118494625	26.352581882199	76.2831170783433	31.356	26.03	76.034
31.5875049382383	26.796072359167	81.5644836851687	32.118	27.3	81.725
28.5647018159173	23.3687517892036	88.1326370319545	28.054	22.918	87.821
28.1560655089136	22.7320537618112	90.9375369965788	28.245	22.855	90.204
28.1560655089136	22.7320537618112	90.9375369965788	27.546	22.537	91.326
29.4625738060177	22.0845395967779	95.83553919579	29.134	22.537	96.334
32.6711170156325	18.7795150401412	97.6178493014584	33.071	18.346	97.156
33.0801919112431	18.4753552471402	101.549078994439	32.817	17.775	101.585
33.8583677233917	18.8543526121854	106.293558747283	34.595	18.791	106.414
32.8736351409953	19.1419227001489	108.235152232551	32.309	19.553	108.506
34.052404175888	17.929692923566	108.880426911385	34.722	18.219	109.051
33.7691090107781	14.0759695740208	109.555380916888	34.135	13.426	109.486
31.6529988738297	15.0856008196104	110.348731525853	31.047	14.661	110.232
31.3561838788671	16.4318060175201	111.038465873045	30.975	17.076	111.068
32.7033303536634	15.2272048937562	111.782313551604	33.452	15.246	111.765
31.4681293187639	13.9700939584186	112.572973830558	31.015	14.076	113.16
31.6679939151647	12.4087338350885	111.521047100631	30.982	12.126	111.418
31.6679939151647	12.4087338350885	111.521047100631	31.632	12.353	111.341
32.6284767892552	11.4999028520898	110.806568425982	32.347	11.313	110.138
34.7029178320905	10.480946854311	111.090999271965	35.103	10.155	111.634
34.944893536343	11.1136517151734	108.298337039345	34.722	11.742	108.413
34.9951221047668	11.244757480842	107.718882566049	35.674	11.044	107.474
34.035509550684	11.9761606281878	106.341182442782	34.135	12.126	105.614
32.9754971254221	12.1280325883983	107.34918052516	33.095	12.711	107.498
32.7307570426486	12.1629968564132	107.581902177928	32.932	12.353	108.278
32.3078320432273	12.1041325841586	107.500511146675	32.477	11.541	107.287
31.6813516272519	12.0169567329228	107.379893260873	31.275	12.613	107.178
30.664990138428	10.0754724417322	107.524513075657	30.34	9.647	108.046
30.8699375644272	10.0501394280692	106.470462318543	30.721	9.329	106.333
31.7340171813327	11.0408139389367	103.365571514136	31.177	11.541	103.36
32.783330811658	12.096305831956	99.8552260551457	33.322	12.581	100.045
33.1073910427211	12.5274545473485	95.1460704136726	32.412	12.353	94.929
33.1073910427211	12.5274545473485	95.1460704136726	33.322	12.321	95.076
34.2474968612783	13.002162538079	92.9052186344085	34.849	13.393	93.121
35.2866036901721	12.7801758604093	84.3496514105811	35.42	12.949	84.367
36.7720902190794	12.4626975921405	72.1178844409101	37.452	12.758	72.01
35.020102958677	11.2729797522074	67.0521735951048	35.484	11.425	66.484
32.6648835645405	10.2033147472344	66.446496073787	32.055	9.837	66.681
34.2524431903201	11.5747845057878	64.0061831299443	34.849	11.996	64.173
33.2407934627505	11.1814307835752	60.0302931921305	33.96	11.234	59.829
32.781009052732	11.0200934860304	58.4567342536239	33.387	11.313	58.128
31.0018244524617	10.2838071593615	55.711133993903	30.658	9.71	56.048
29.222890904654	9.72984050163709	52.6011461807743	28.626	10.091	52.872
Route: 9 Length: 386.621061516888 Demand Met: 999					
16.9590625013284	13.1421881340756	65.5694845516476	17.323	12.504	65.716
19.9636213739532	25.3241916612884	90.6922212702636	20.561	25.776	90.646
18.8993263620246	25.5749346163713	93.4746333747704	19.545	25.839	93.739
18.1691756714201	25.6546325253078	94.9507363037231	17.577	25.204	95.05
19.1934929561345	28.0121436149106	98.1461370828354	18.91	28.697	98.028
21.5352031732862	28.0783312995164	102.401618524821	22.276	28.125	102.29
18.782771434212	27.6744900223915	115.753015043757	18.72	28.189	115.769
18.0144223600226	27.5542519432786	119.484127137054	17.64	27.998	119.961
20.1433062057446	23.8769407444727	119.853018681026	20.561	23.553	119.319
19.629301951742	22.6866265207931	122.946571342199	18.91	22.474	122.979
20.2891499070584	22.3653268744423	124.439228775619	20.371	23.045	124.747
21.0214634730616	21.0461164174019	125.927378561765	21.577	21.394	126.294
20.4580382864663	16.4901247790693	127.927798751659	20.434	15.806	127.618
20.1413259380049	17.8699028067736	132.223602247007	20.434	18.537	132.408
17.2078919281719	14.2755358871358	136.972982315358	17.577	13.647	137.156
14.0671014218561	14.8119057701799	138.892120086594	13.576	14.79	138.325
11.8279192586497	15.3522821467162	141.545791215366	11.163	15.552	141.832
17.9680624262982	13.2634274595837	142.036436155493	18.339	12.631	142.199
19.0121554762623	18.1551843776775	140.733284971074	18.466	18.664	140.644
24.6222105757591	19.5280155992223	139.99795943303	24.879	19.934	139.42
27.2213206679199	17.9147046710736	143.210354487296	27.356	18.473	143.695
28.6548413366174	15.483404112019	144.218137246265	28.245	14.854	144.187
30.0643280049379	15.2815406048412	144.783386369987	29.975	14.661	145.197
32.5411519812031	15.7990330749163	145.160386007736	32.944	15.933	144.54
33.1050274370989	15.8543778009349	146.126185390886	33.769	15.679	145.826
33.4956119696357	15.9569229289461	147.179165392774	33.582	15.473	147.748
34.2644504855709	19.9592172079141	146.737805080617	34.468	20.442	147.277
33.7494608632927	20.7250095708844	143.124693540737	33.515	20.315	142.968
33.7494608632927	20.7250095708844	143.124693540737	34.341	21.013	142.761
31.5958856981437	20.3876216656338	141.712949776531	31.356	19.68	141.631
26.3004928346562	27.3196690884202	137.384407455946	26.149	27.49	136.669
24.6568279692953	29.7887760699634	142.859393802358	25.07	30.03	143.44
22.4034290776749	29.7209668876218	142.525303677319	22.149	29.713	141.818
18.8835573467894	29.6110253887148	146.457499519374	18.529	30.03	146.971
18.9686879787843	28.8139829028468	146.144851142134	19.037	28.189	146.557
18.9206639769793	29.255063946038	134.995600578913	18.72	29.967	135.012

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.9287865818852	29.256175673583	133.693966589951	18.974	29.967	133.455
18.7811312665	26.4885715146233	130.043211178057	19.037	26.982	129.54
18.44606885615	24.3096215307389	128.267206398358	18.974	24.569	127.812
17.9528279808191	21.9354785955106	126.507142881429	18.593	21.648	126.239
11.9567772255925	18.1317011773771	124.097000332985	11.481	17.711	124.498
11.8308210170713	19.6393169855299	116.149162605507	11.735	20.378	116.222
11.9420125972795	19.7591785126794	101.42629068546	11.608	20.251	101.424
12.00247874825	19.7988676148858	94.6884037810832	12.243	20.505	94.648
11.3386490426115	17.4487270864038	74.0465381868176	11.862	17.965	73.909
Route: 10 Length: 364.410006109076 Demand Met: 995					
13.6087247684249	19.640112939505	68.5043536538064	13.005	20.061	68.646
25.4658463300656	21.3640687277068	90.3116047230151	25.895	20.759	90.426
25.6343706710238	22.7576194382081	92.0050593185057	26.149	23.172	91.657
25.6719029584937	24.3574832570046	94.234684472389	25.006	24.188	94.535
26.9928264351632	26.9721111755129	96.8577967821087	27.229	27.554	96.447
28.8844960334233	29.8634731869724	107.118727447007	28.943	30.03	106.391
28.8844960334233	29.8634731869724	107.118727447007	28.943	30.475	107.548
29.6287973266227	30.1004315296007	112.246054749669	30.277	30.475	112.299
27.9671434937118	28.8721634574977	119.152992506903	27.927	28.125	119.109
26.159909236231	29.5439327043237	127.249438514198	25.895	29.903	127.854
27.7480906185281	26.5805465202424	125.449932008259	27.229	26.22	125.044
31.7863230844424	24.5295575555342	124.973843032561	32.245	24.887	125.449
33.9228646837861	21.8976941075973	123.336950180211	34.341	22.029	122.727
33.7763487960117	18.6422674861517	124.991668665722	33.515	18.029	124.645
35.9594075150374	18.4958898234124	131.240797575463	36.436	18.918	131.64
33.4334611302501	14.8307998738035	132.160246821611	32.867	14.661	131.697
33.4334611302501	14.8307998738035	132.160246821611	33.127	14.661	132.624
34.2381019143015	12.6197382631393	135.300407195583	34.595	11.996	135.081
34.1028136011699	12.603541404987	136.522044220939	34.135	11.866	136.659
33.8097212119924	13.4353757773513	138.668177363863	33.907	12.776	139.011
33.6728455480401	13.9082446671177	139.438365925006	34.404	14.028	139.514
33.3568991993933	14.7340354567888	140.795984975561	33.322	15.473	140.664
33.3568991993933	14.7340354567888	140.795984975561	33.907	14.336	141.111
32.0478687638039	13.4383544935958	145.302782337082	31.991	14.092	145.487
31.6771601233386	13.0661883867229	146.579097704377	31.892	12.353	146.679
30.9907272501515	13.5383025094572	147.893212048624	30.787	14.206	147.62
30.5392790418405	13.7176072569005	148.922437093672	29.975	13.881	149.391
33.5370241972959	12.9848526121238	148.249455617283	33.907	13.556	148.567
36.8581896207716	10.6048444729888	146.553757709235	37.452	10.218	146.804
34.4309920808727	11.9022150039362	141.509723693589	34.785	12.504	141.232
31.7660573954772	10.908511273419	139.071660951069	31.697	11.541	138.673
29.560065185733	9.01914767514282	137.598821531372	29.388	8.313	137.407
28.4027598589113	12.6451603428686	137.462512657405	29.007	12.949	137.787
26.8101392305078	15.323225634278	137.007476231807	26.149	15.679	137.044
28.6606142828195	15.4308093099496	136.572848960545	29.324	15.489	136.921
28.1691639394669	15.3479195346661	135.316854306693	28.372	14.663	135.085
25.6902896342634	17.2722640110285	131.429625761798	25.451	17.965	131.595
24.2003675903143	15.955981659921	126.458868777083	24.371	15.235	126.557
22.0097377121179	14.9022144121374	119.626391786437	22.149	14.282	119.226
20.2975253480455	17.5391259400773	118.486591943135	19.99	18.029	118.966
19.9803382101443	17.9564082697624	115.25974025849	20.498	17.457	115.048
17.5400191332531	20.6142235383936	107.061826306121	17.323	21.331	107.01
17.4182225737221	18.2557142237532	103.141660970769	16.688	18.092	103.09
18.7896762855375	16.6101342488803	99.9632210123539	18.148	16.505	99.59
25.3293926714964	12.7248798935163	93.2265665113914	25.705	12.123	93.472
26.3345121508751	13.9292664317269	89.1806876618057	26.911	14.409	89.199
Route: 11 Length: 325.550315818798 Demand Met: 999					
22.7394763453209	9.52806944674546	92.2477467215978	23.482	9.52	92.151
22.8988999186705	10.3547028298485	100.299373444177	22.212	10.091	100.44
25.4136711151875	12.2237029290659	109.339875938472	26.022	12.631	109.182
25.7458517847944	12.5381527386921	114.227153436467	25.197	12.441	114.729
29.2804573648241	13.3576622905795	114.897008729809	29.975	13.101	114.777
27.9516481568575	15.4152174335907	116.069240881203	27.229	15.362	116.263
29.6451507860419	18.0599717904673	116.574496315367	29.578	18.791	116.421
31.7560438443201	16.1719557136818	118.030816590717	31.502	15.473	118.128
31.7560438443201	16.1719557136818	118.030816590717	31.991	16.632	118.575
32.6315624255144	15.0403096676583	117.159252414759	32.217	14.433	117.304
33.5018230193575	14.5124126618334	116.431457987342	33.907	14.791	115.865
33.4742408243971	12.9830522814971	117.126225145726	33.907	12.516	116.73
32.5652134242247	11.8907525370701	118.851939821335	32.087	11.313	118.866
33.1620457705087	12.6157760578929	119.911022365428	33.322	13.101	119.477
33.7772831320743	13.3607743884491	121.008131130018	34.135	13.946	120.705
34.0089172493568	13.4394321720492	122.655920910479	33.907	13.816	122.673
34.0089172493568	13.4394321720492	122.655920910479	33.322	13.621	122.895
35.4153036427687	13.2991812117698	125.05842559066	35.992	13.647	125.389
34.4424326358825	12.1627481150108	125.384129619335	33.907	11.996	124.886
34.6616936357087	9.94857973234043	128.960070821949	34.595	9.202	128.931
34.9779702505616	10.9462285160141	130.975002171798	34.976	10.282	131.121
34.9779702505616	10.9462285160141	130.975002171798	35.547	11.234	131.369
31.3721193609967	10.4774820672009	131.370446832137	30.912	9.901	131.507

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.1722049565523	12.4657446017015	131.056548667529	30.787	12.386	130.829
30.9172286499948	15.0300155931557	130.652843522615	30.462	15.473	131.052
31.4340802411781	15.320522282349	129.983565791255	31.356	16.06	129.885
31.7935314103995	15.1100868921396	129.622949719965	32.347	14.661	129.857
31.6356539477382	15.4877946448377	127.980258564757	32.282	15.473	127.6
29.1163350164598	16.2465366022369	126.205689267096	28.943	16.886	125.854
26.9275729085552	12.3961280268612	126.430378737838	26.594	11.933	126.917
27.1445411896732	12.5058250001319	125.420380162694	27.673	12.695	125.598
28.0829109513768	12.982149384297	121.022565226449	27.927	12.568	120.417
29.8749806239662	16.1178671332718	121.501793815316	30.594	16.251	121.669
28.3440509827273	17.3825313877249	121.1808037602	28.054	17.013	121.063
27.1207401834107	18.3947567306244	120.924416061775	27.102	18.664	121.623
25.8652094351056	19.3256671003978	120.360619513407	25.133	19.235	120.496
26.530311804817	20.4139375441362	119.500587217039	26.276	20.188	119.025
27.4428363872036	21.906228510969	118.324618283504	27.927	21.458	117.97
28.3793301894174	24.791710603923	116.821094586838	28.88	25.331	116.966
26.9520074521625	24.4300576643404	115.297086466445	26.911	24.76	115.286
25.0219824831289	23.9398315434723	113.235981056956	24.308	23.998	113.458
25.4478174923718	23.0797048967659	109.715439808406	25.832	23.68	109.484
25.2348003469328	21.1657079943169	106.465655221564	24.879	20.632	106.077
28.1659515118169	23.8791458941548	106.477686674058	28.753	23.998	106.929
27.5030072749489	24.792513060178	104.857402961776	27.165	25.458	104.784
28.4334615722246	22.1978836873798	102.198354660377	27.991	22.601	101.939
28.4334615722246	22.1978836873798	102.198354660377	29.07	22.347	101.831
27.3316267041774	20.154363424647	101.492137163329	27.229	19.616	102.004
25.4729476532046	19.1906158598788	96.1988619877246	24.752	19.362	96.308
25.2263873943515	18.177840552032	91.988883589527	24.943	18.791	91.664
25.3673942380655	17.4914616464422	91.1849823756029	25.832	16.949	91.413

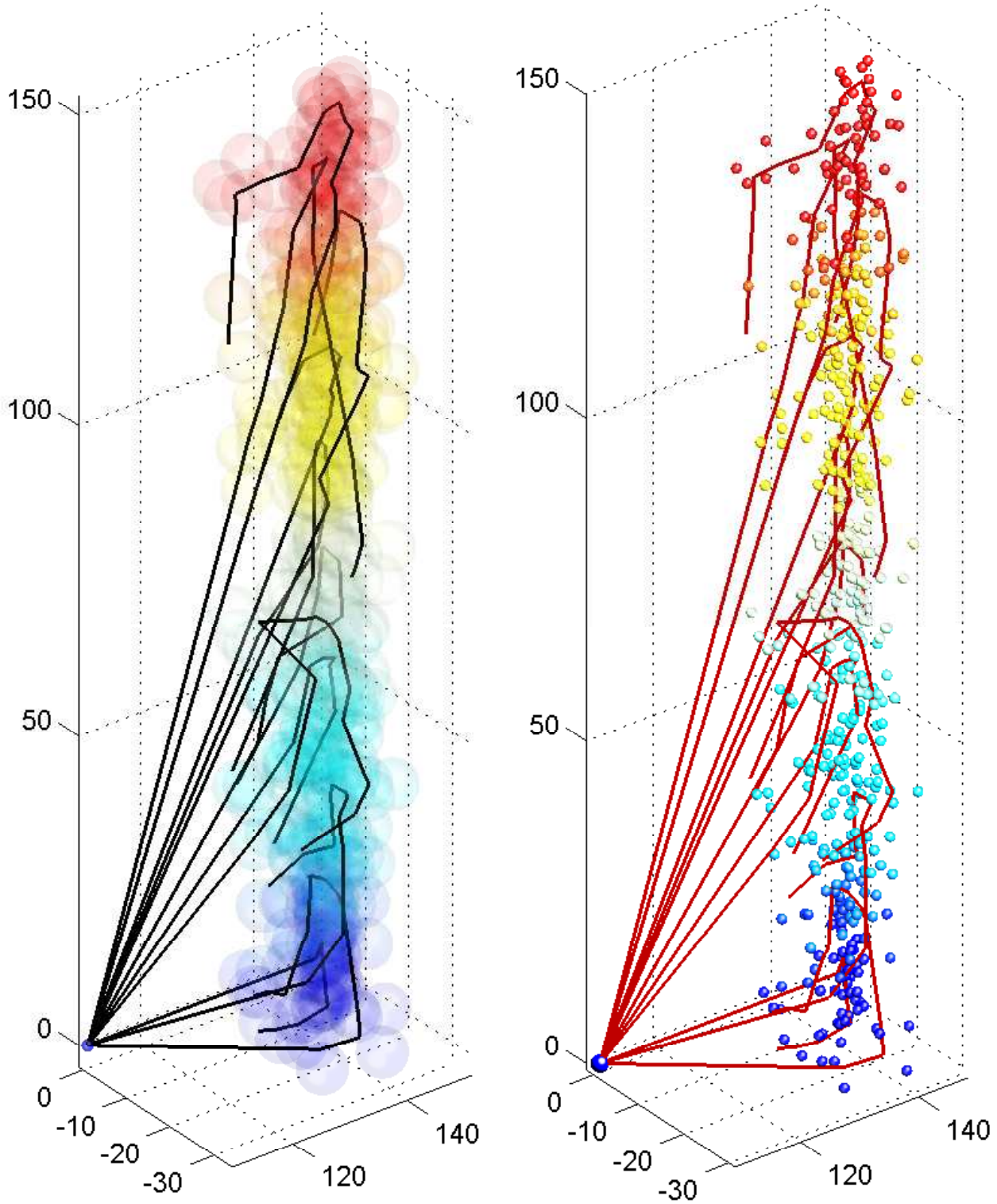


Figure O.86: $d493$, $r = 3.7452$, Equal Radius, 3D, Euclidean, Length = 2198.7001179

Table O-89: Solution for $d493$, $r = 3.7452$, Equal Radius, 3D, Euclidean

Total distance: 2198.70011786895 Total demand met: 10514 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 287.359323720104 Demand Met: 1000					
24.3833289754233	22.9483359910351	88.4300144507134	25.895	20.759	90.426
24.6239521415868	23.1747965665805	89.3026775268545	28.245	22.855	90.204
24.6239521415868	23.1747965665805	89.3026775268545	28.054	22.918	87.821
22.9958871419807	24.2738318205358	92.3437971800354	20.561	25.776	90.646
21.9396202602902	24.9868753721481	94.3168761939132	19.545	25.839	93.739
21.2825478833404	25.4304370274686	95.5442500861129	17.577	25.204	95.05
21.6802250359412	26.2064898746437	97.6408996173653	18.91	28.697	98.028
23.8742191581864	26.6106348870654	101.846389279565	22.276	28.125	102.29
26.7952721388064	27.148728045264	107.445546841335	28.943	30.03	106.391
26.7952721388064	27.148728045264	107.445546841335	28.753	23.998	106.929
26.7952721388064	27.148728045264	107.445546841335	27.165	25.458	104.784
27.2859771001514	27.409874801162	108.777755297757	28.943	30.475	107.548
28.0562867922049	27.8197519194024	110.869045211051	30.277	30.475	112.299
27.2419370783509	26.4544696284439	111.567520816907	25.832	23.68	109.484
27.1222795789827	26.4679152412562	113.381330421335	24.308	23.998	113.458
27.2417263898715	26.8166765638387	117.107700829331	27.927	28.125	119.109
27.2417263898715	26.8166765638387	117.107700829331	28.88	25.331	116.966
27.2417263898715	26.8166765638387	117.107700829331	26.911	24.76	115.286
27.5072138037067	27.591567776687	125.387276163129	25.895	29.903	127.854
28.8975441095335	25.902626048865	125.550022858921	27.229	26.22	125.044
32.5998055463738	21.4049612547854	125.983603988006	32.245	24.887	125.449
32.5998055463738	21.4049612547854	125.983603988006	33.515	18.029	124.645
32.5998055463738	21.4049612547854	125.983603988006	34.341	22.029	122.727
34.4771505712373	17.6627167954441	128.705062657961	36.436	18.918	131.64
34.4461392149851	15.411715576639	128.617399326623	32.282	15.473	127.6
34.415168610929	13.1630852143599	128.52982858747	35.547	11.234	131.369
34.4117654679795	12.9172348653101	128.520255549214	34.976	10.282	131.121
34.403340704701	12.9153013293408	128.482409554004	34.595	9.202	128.931
34.403340704701	12.9153013293408	128.482409554004	33.907	11.996	124.886
33.724718040675	13.1056137647826	125.485667676969	35.992	13.647	125.389
32.4989997811867	13.4493703005437	120.072598147385	33.322	13.621	122.895
32.4989997811867	13.4493703005437	120.072598147385	33.907	13.816	122.673
32.4989997811867	13.4493703005437	120.072598147385	30.594	16.251	121.669
32.4989997811867	13.4493703005437	120.072598147385	34.135	13.946	120.705
32.4989997811867	13.4493703005437	120.072598147385	33.322	13.101	119.477
32.4989997811867	13.4493703005437	120.072598147385	31.991	16.632	118.575
32.4989997811867	13.4493703005437	120.072598147385	32.087	11.313	118.866
32.4989997811867	13.4493703005437	120.072598147385	31.502	15.473	118.128
32.4989997811867	13.4493703005437	120.072598147385	32.217	14.433	117.304
32.4989997811867	13.4493703005437	120.072598147385	33.907	12.516	116.73
32.0834423475284	12.5291106762059	115.36628081004	33.907	14.791	115.865
32.0834423475284	12.5291106762059	115.36628081004	31.015	14.076	113.16
31.9319458526483	12.1926664419816	113.650425047887	29.975	13.101	114.777
31.9319458526483	12.1926664419816	113.650425047887	30.982	12.126	111.418
31.8356069088261	11.9786736817204	112.559483005025	31.632	12.353	111.341
31.8356069088261	11.9786736817204	112.559483005025	31.047	14.661	110.232
31.8238599881118	11.9525775609464	112.426477285939	33.452	15.246	111.765
31.7808411832125	11.8570123454696	111.939634598667	34.135	13.426	109.486
31.7807890820541	11.8568992796084	111.93906417308	35.103	10.155	111.634
30.9253046882483	11.5377500569617	108.925834032202	32.347	11.313	110.138
Route: 2 Length: 336.424414082944 Demand Met: 981					
16.4753273449506	19.8107372072286	99.0415995212308	18.148	16.505	99.59
18.8069325587436	24.9171924704514	117.175879850854	20.561	23.553	119.319
18.9021011663418	25.1255526241798	117.915811778901	17.64	27.998	119.961
18.9021011663418	25.1255526241798	117.915811778901	18.72	28.189	115.769
20.378289015987	24.8468821444396	125.477007345506	21.577	21.394	126.294
20.378289015987	24.8468821444396	125.477007345506	18.593	21.648	126.239
20.378289015987	24.8468821444396	125.477007345506	20.371	23.045	124.747
20.378289015987	24.8468821444396	125.477007345506	18.91	22.474	122.979
20.7863715723532	25.7863975682687	128.695210087161	19.037	26.982	129.54
20.7863715723532	25.7863975682687	128.695210087161	18.974	24.569	127.812
21.54471856266	27.5313046870688	134.672672826466	18.72	29.967	135.012
21.54471856266	27.5313046870688	134.672672826466	18.974	29.967	133.455
22.4355768173288	27.7459646392383	137.083439393045	26.149	27.49	136.669
21.755265775052	28.4113177406496	142.792593476921	25.07	30.03	143.44
21.755265775052	28.4113177406496	142.792593476921	22.149	29.713	141.818
21.0881151259145	28.4412823013227	144.74530533872	18.529	30.03	146.971
21.5078246885722	28.0772968709339	144.749724441752	19.037	28.189	146.557
30.8684194341454	19.9578287536282	144.850120375517	31.356	19.68	141.631
32.013777779869	18.9645754316827	144.86213716677	34.341	21.013	142.761
32.0185915818953	18.9587368997488	144.863054109536	34.468	20.442	147.277
32.0185915818953	18.9587368997488	144.863054109536	33.515	20.315	142.968
32.9827699780997	16.6435366779941	144.550711048942	33.769	15.679	145.826
32.9827699780997	16.6435366779941	144.550711048942	32.944	15.933	144.54

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.4277936395612	15.5746876048004	144.406350733604	33.322	15.473	140.664
34.1995356446906	13.7728508155587	144.706769157975	34.785	12.504	141.232
34.7277351898755	12.5198971804194	145.660988876801	37.452	10.218	146.804
33.4265221386228	12.9527344618289	145.722403291917	33.907	13.556	148.567
33.4265221386228	12.9527344618289	145.722403291917	33.582	15.473	147.748
31.1233317650092	13.717743212817	145.829892641725	29.975	13.881	149.391
31.1233317650092	13.717743212817	145.829892641725	30.787	14.206	147.62
30.7168191910721	13.8754628227486	145.489800658497	31.892	12.353	146.679
30.0308779968076	14.1415615966824	144.915998150534	31.991	14.092	145.487
30.0308779968076	14.1415615966824	144.915998150534	29.975	14.661	145.197
28.5553335151076	14.7138579256302	143.681989603678	28.245	14.854	144.187
27.0170381472149	15.3104897930787	142.395482933692	27.356	18.473	143.695
24.6961621518406	16.2101376933501	140.454854156045	26.149	15.679	137.044
24.3116681873765	16.3576327875368	140.376302178132	24.879	19.934	139.42
18.3151312642214	15.6604414875456	139.997095380377	18.339	12.631	142.199
16.7004889986276	15.605474741933	139.798837519974	18.466	18.664	140.644
16.7004889986276	15.605474741933	139.798837519974	13.576	14.79	138.325
14.0743093908341	15.5159240419367	139.476205892532	11.163	15.552	141.832
14.2720734518636	15.4081423514858	137.206530708404	17.577	13.647	137.156
12.8291228749647	16.1672934317844	124.357700969216	11.481	17.711	124.498
11.930524610283	16.6403064062518	116.356372026641	11.735	20.378	116.222
Route: 3 Length: 236.612849942374 Demand Met: 996					
27.7149811642144	13.8010936155358	87.7763955927471	26.911	14.409	89.199
29.6958779691633	14.7874995724238	94.0501023173003	30.202	14.791	95.605
30.3991353343864	15.1376937599246	96.2773827782298	29.515	14.028	97.711
30.8809639010151	15.377623521667	97.8033728458844	33.071	18.346	97.156
30.9394849755086	15.3555200773777	98.1956192979933	32.802	15.473	97.861
30.995868137733	15.3342228669989	98.5735182602574	31.737	12.885	98.954
31.0423310343904	15.3166661838444	98.8848934770085	33.322	12.581	100.045
30.2818703598963	16.4694284405034	100.307426301316	31.957	14.433	102.967
29.7228081342962	17.3088213078173	101.259979126284	32.817	17.775	101.585
28.5867484331036	19.014522787185	103.195680186648	29.07	22.347	101.831
28.4767107095854	19.1797169668711	103.383137837631	27.991	22.601	101.939
28.0373308111913	19.1565720859602	104.70780816406	24.879	20.632	106.077
28.3069549873235	18.9682279190303	104.900723829167	27.229	19.616	102.004
29.0923318176719	18.4195749276647	105.46264471014	27.292	16.632	106.393
29.8608457081577	17.8827025603897	106.012502912922	29.642	17.076	106.306
30.5830532358448	17.37818014141	106.529229942661	31.372	15.246	104.804
31.1335248957139	16.993635874134	106.923081904006	31.293	15.806	105.367
31.7001123283168	16.5978299153228	107.328462863383	34.595	18.791	106.414
31.8341705282531	16.4234873460069	107.481539815687	34.722	18.219	109.051
31.8341725261651	16.423471910056	107.48154659949	30.975	17.076	111.068
31.8341725261651	16.423471910056	107.48154659949	32.309	19.553	108.506
32.2299179842194	14.7484642396447	107.328109158756	32.932	12.353	108.278
32.3896510393917	14.0724209047392	107.26618005179	33.095	12.711	107.498
32.521898463824	13.5127093810598	107.214907844869	34.722	11.742	108.413
32.6032685345759	13.1683301920487	107.183362545474	35.674	11.044	107.474
32.1576187942145	13.1039597364617	107.090389271272	34.135	12.126	105.614
31.5923563871394	13.0223127098905	106.972461139385	32.477	11.541	107.287
30.9844780960331	12.9345100410846	106.845641989747	31.275	12.613	107.178
30.3622681081054	12.844637534775	106.715832697433	30.34	9.647	108.046
29.8527460639633	12.771037235543	106.609534389149	30.721	9.329	106.333
29.1377613574307	12.6677472417425	106.460368016657	29.388	11.804	105.494
28.4275102127873	12.5651406409084	106.312188587236	26.022	12.631	109.182
28.0298587848695	12.3978989571186	105.333668371884	26.086	14.663	104.115
28.0298587848695	12.3978989571186	105.333668371884	28.753	13.838	102.669
27.8921183897715	12.3399713204006	104.994744679404	29.578	13.203	105.988
27.8921183897715	12.3399713204006	104.994744679404	29.975	13.361	103.951
27.7360743352321	12.2743427957578	104.610753277047	31.177	11.541	103.36
27.5402436558851	12.1920579198964	104.129199381994	29.197	12.441	103.553
27.3420838340739	12.108796287093	103.641914909471	30.202	14.011	102.151
26.2119091755401	11.6322328845856	100.886751296598	28.753	12.949	99.196
25.508115019678	11.3354233480718	99.1697164709684	22.212	10.091	100.44
24.8574877507534	11.0462941628477	96.6402181301027	27.419	11.298	96.166
24.0986278385858	10.7090688517565	93.6899400168291	25.705	12.123	93.472
23.1441924030335	10.2849287263675	89.9793851720088	23.482	9.52	92.151
Route: 4 Length: 298.521331044714 Demand Met: 999					
13.6271273342888	17.0464129798945	95.0330307745107	12.243	20.505	94.648
14.4793880095812	17.9579203958466	100.700433062247	11.608	20.251	101.424
17.1719463744067	17.605075301863	106.661729338521	17.323	21.331	107.01
17.1719463744067	17.605075301863	106.661729338521	16.688	18.092	103.09
20.3425873979195	16.4118579794828	113.678667033646	20.498	17.457	115.048
21.4865123667903	15.9813606481494	116.210228968603	19.99	18.029	118.966
23.0550404951567	14.691181407643	116.820735354525	25.197	12.441	114.729
23.1278661024608	15.1725496518437	120.090842876891	22.149	14.282	119.226
23.2850698127585	16.210945468125	127.145595931925	20.434	15.806	127.618
23.3687424785023	16.7637980796021	130.901439995134	20.434	18.537	132.408
25.1783433054833	16.0662377708382	132.464265877731	25.451	17.965	131.595
28.6024654570419	14.7462734250634	135.421563300221	29.324	15.489	136.921
30.2178352962417	14.1235799176543	136.816653606497	29.007	12.949	137.787

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.7611683227235	13.5286507562566	138.149534506728	33.907	14.336	141.111
31.6862448340267	13.3346261816756	137.933692376803	34.404	14.028	139.514
31.5444034509818	12.9674015025987	137.525149422589	33.907	12.776	139.011
31.5444034509818	12.9674015025987	137.525149422589	31.697	11.541	138.673
31.3048593649621	12.3475287296922	136.83544466462	34.135	11.866	136.659
31.3048593649621	12.3475287296922	136.83544466462	34.595	11.996	135.081
30.6403543970551	11.623774792172	136.183450903964	29.388	8.313	137.407
29.9919311373641	12.8159052614715	133.156147790712	30.912	9.901	131.507
29.7126276866113	13.3294548824104	131.852227945599	28.372	14.663	135.085
29.7126276866113	13.3294548824104	131.852227945599	33.127	14.661	132.624
29.7126276866113	13.3294548824104	131.852227945599	32.867	14.661	131.697
29.7126276866113	13.3294548824104	131.852227945599	30.462	15.473	131.052
29.7126276866113	13.3294548824104	131.852227945599	30.787	12.386	130.829
29.7126276866113	13.3294548824104	131.852227945599	32.347	14.661	129.857
29.7126276866113	13.3294548824104	131.852227945599	31.356	16.06	129.885
28.052547348284	15.0058618688434	125.908663052386	28.943	16.886	125.854
28.052547348284	15.0058618688434	125.908663052386	26.594	11.933	126.917
28.052547348284	15.0058618688434	125.908663052386	24.371	15.235	126.557
28.052547348284	15.0058618688434	125.908663052386	27.673	12.695	125.598
27.8678239775379	16.0898459731955	121.689684222671	27.927	12.568	120.417
27.6934954853783	17.7281594183154	118.215672404496	27.102	18.664	121.623
27.6934954853783	17.7281594183154	118.215672404496	28.054	17.013	121.063
27.6934954853783	17.7281594183154	118.215672404496	25.133	19.235	120.496
27.6934954853783	17.7281594183154	118.215672404496	26.276	20.188	119.025
27.6934954853783	17.7281594183154	118.215672404496	27.927	21.458	117.97
27.6934954853783	17.7281594183154	118.215672404496	29.578	18.791	116.421
27.6934954853783	17.7281594183154	118.215672404496	27.229	15.362	116.263
28.2116010273217	23.9819772628781	95.8976808132918	27.229	27.554	96.447
28.3001360479462	24.0476314682808	94.7991168913393	25.006	24.188	94.535
28.3872944803425	24.1122685049343	93.7175238140289	29.134	22.537	96.334
28.3872944803425	24.1122685049343	93.7175238140289	27.546	22.537	91.326
28.599518865876	24.2696327609281	91.083979088945	26.149	23.172	91.657
29.3316392229652	24.8125306905938	81.9994225024078	32.118	27.3	81.725
28.4802257734262	23.9936768669025	77.3028187686587	31.356	26.03	76.034
28.1231562608376	23.6928603870783	76.3336125266616	28.816	21.902	78.963
Route: 5 Length: 207.005359899584 Demand Met: 998					
20.6895298063898	12.1353652490041	64.1168955928388	17.323	12.504	65.716
24.432569182554	13.1212770831429	69.5060318769487	25.07	11.615	69.179
29.4664128251331	14.4471832122681	76.7536622843581	32.182	16.632	75.383
29.7655873110889	14.3573435927374	77.7903779516018	30.202	14.271	77.775
30.0569019989056	14.2698653148653	78.799859784254	30.787	14.466	78.121
30.3742763750036	14.1745633458764	79.8996456359387	33.071	16.187	80.531
30.3742763750036	14.1745633458764	79.8996456359387	33.062	15.473	78.089
30.9838223290897	13.9915503966809	82.0118226766328	29.388	13.838	84.576
31.1675557882618	13.9363843326923	82.6484735887677	31.015	13.556	83.741
31.1675557882618	13.9363843326923	82.6484735887677	29.975	13.621	83.535
31.3207401362094	13.8903901697804	83.1792692998512	32.152	12.353	82.503
31.3207401362094	13.8903901697804	83.1792692998512	32.672	12.353	81.337
31.554682876432	13.8201470632703	83.9898977731186	33.907	13.296	83.348
31.7864678265022	13.7505520396929	84.7930432008107	35.42	12.949	84.367
31.7748881326339	13.7493067504161	84.9653070113003	34.135	14.466	84.176
31.7748881326339	13.7493067504161	84.9653070113003	34.135	13.166	82.509
31.7259350693741	13.7440393564187	85.693704727119	34.135	14.986	84.727
31.6460847012111	13.7354473530392	86.8819048167792	32.412	15.246	88.024
31.6460847012111	13.7354473530392	86.8819048167792	32.737	14.433	86.615
31.5817595379143	13.728526691685	87.839096869405	30.34	10.917	88.584
31.5817595379143	13.728526691685	87.839096869405	34.135	12.646	86.486
31.466364007527	13.7161022327413	89.5563236018807	30.722	15.473	90.573
31.3871010668887	13.7075684027643	90.7358478399967	29.975	14.921	90.476
31.3871010668887	13.7075684027643	90.7358478399967	29.975	12.841	90.667
31.305707063954	13.6988044918048	91.9470680770232	34.849	13.393	93.121
31.305707063954	13.6988044918048	91.9470680770232	32.542	15.473	89.387
31.171352023578	13.7071680712063	92.1563881755028	31.697	14.433	93.007
31.171352023578	13.7071680712063	92.1563881755028	31.547	13.203	92.722
31.0433107286499	13.715138853648	92.3558719673672	32.737	11.541	92.508
31.0433107286499	13.715138853648	92.3558719673672	31.957	11.541	90.999
30.8843488543416	13.7250331552386	92.603530642588	33.322	12.321	95.076
30.8843488543416	13.7250331552386	92.603530642588	32.412	12.353	94.929
29.7621917602256	13.976496649714	93.4415910054254	29.261	11.425	96.137
29.7621917602256	13.976496649714	93.4415910054254	30.527	11.313	94.769
29.2080546127477	14.5746102033425	93.4422072195575	30.202	13.231	95.497
26.4043283271294	17.600781087542	93.4454001609099	24.752	19.362	96.308
26.1960065643105	17.8401334515768	91.5809744356199	24.943	18.791	91.664
26.0023528602489	18.0626317130411	89.8478328063465	25.832	16.949	91.413
25.1126256427953	19.0847403812464	81.8856246564495	27.737	18.664	80.683
24.8920355161623	19.3381865711077	79.911393279373	27.102	21.648	79.965
24.8920355161623	19.3381865711077	79.911393279373	26.721	18.283	80.536
24.5094826954301	19.777721438622	76.4876399298629	26.848	19.743	76.594
24.5094826954301	19.777721438622	76.4876399298629	27.483	19.616	74.587
24.4721989498129	19.820565787045	76.1539051330516	26.911	22.601	75.564

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.2455510479212	18.9268329396052	70.087282538099	22.974	17.711	70.862
13.5663110940354	15.4432138524984	46.4401367644842	12.052	18.854	46.124
Route: 6 Length: 143.360938984021 Demand Met: 993					
17.0630722272468	11.0333072242366	33.420989312192	19.482	13.076	31.528
22.5128856824571	14.5573495097589	44.0940167975485	25.578	12.568	43.273
23.0947221583823	14.994233096497	45.337800664185	24.371	14.346	43.342
24.1694635495695	15.8012426987129	47.63539171813	25.895	18.918	46.48
24.4624140990807	15.8213847135878	48.7930266493515	25.07	17.076	49.249
24.4624140990807	15.8213847135878	48.7930266493515	27.737	16.251	47.666
26.0206064619954	15.9280105281526	54.9521395441362	24.308	16.441	56.035
26.686155823463	15.9737278995193	57.5819217113958	25.197	18.918	59.354
27.4638065098076	15.1551181038896	58.4625648224326	25.832	14.219	61.701
28.705688891649	14.6825020082508	58.2709374202391	28.372	13.52	60.757
29.9911988991498	14.193270416932	58.0725852353293	30.202	12.971	61.507
30.5945436155832	13.9635729630096	57.9795421060998	31.015	12.516	61.408
30.9186858779656	13.8672343739679	57.8560702973369	29.975	14.401	55.717
31.2667741133368	13.763780951604	57.7234792972604	31.275	14.173	56.999
31.2667741133368	13.763780951604	57.7234792972604	33.322	14.141	54.817
31.3524311145254	13.7383257886117	57.690841219233	31.827	14.661	58.532
31.4386876123146	13.7126924199991	57.6579742092184	32.672	15.246	60.724
31.547296258523	13.6804274093662	57.6166089090909	33.095	14.011	61.011
32.5900611060937	13.3514722198181	57.123517119639	33.387	11.313	58.128
33.3949303646596	13.0975810454963	56.7429508501523	36.944	13.012	57.936
32.7703266399158	12.7653819384021	55.5691505241471	30.658	9.71	56.048
32.6805752014187	13.2030721008214	54.2835638807384	34.135	14.206	54.088
32.6805752014187	13.2030721008214	54.2835638807384	32.69	13.52	54.423
32.6001814011326	13.59528372767	53.1315224593211	32.607	14.661	52.963
32.527409154828	13.9503057172898	52.0887000376288	36.119	13.139	51.404
32.527409154828	13.9503057172898	52.0887000376288	33.907	13.036	49.61
32.3572125400822	14.3560220276529	50.9751673325412	33.095	12.971	48.557
32.269065670845	14.5661507854285	50.398528946033	33.322	13.881	49.4
32.1858427896667	14.7645480602683	49.8540939799911	30.982	15.473	49.591
32.1858427896667	14.7645480602683	49.8540939799911	30.657	15.246	48.98
32.1179247815882	14.926465493588	49.4097827804305	33.642	18.346	49.307
31.7707519539461	14.7687120686176	48.5462170369811	33.388	17.584	48.735
31.7707519539461	14.7687120686176	48.5462170369811	31.483	16.822	46.955
30.8166994657034	14.3355995061382	46.1729433624322	30.785	16.949	44.302
30.5434274172574	14.2114163221053	45.4931832175784	29.642	15.108	43.621
30.3455084419131	14.1214679500768	45.0008654520193	31.015	13.816	44.684
30.1475260071291	14.0314908233625	44.5083887228678	32.607	11.313	43.742
30.1475260071291	14.0314908233625	44.5083887228678	30.658	10.98	44.543
29.9560626945513	14.0021752609642	44.1356700858037	28.499	12.949	46.85
29.6039539388691	13.9483130415206	43.4502693737808	27.991	13.647	44.302
29.2495921077739	13.8941075971086	42.7604823046966	32.372	14.092	41.845
29.2495921077739	13.8941075971086	42.7604823046966	30.787	13.686	41.698
28.74253523969	13.8165960411427	41.7734736335023	31.015	13.296	40.037
28.74253523969	13.8165960411427	41.7734736335023	30.202	13.751	40.213
28.3798153512314	13.7611121883261	41.0673988211504	29.134	13.33	42.125
27.9492180835599	13.6952546761297	40.2292009211765	29.975	11.801	40.794
27.2325268494497	13.5857204812796	38.8341572807891	26.34	17.203	39.025
25.9573426053171	13.3902828565081	36.3517119057853	27.419	15.044	35.984
24.4009088842838	13.1517911904323	33.3217496051702	24.308	15.044	33.546
22.8495521438856	12.9141622628403	30.3016744531833	24.244	15.997	28.696
Route: 7 Length: 186.746897148304 Demand Met: 990					
14.6301902628227	19.1325547710139	36.9445258473203	18.212	18.283	36.255
16.8913813272391	24.1640494408196	46.3038313079991	17.069	27.744	45.218
17.7211574177818	24.4954149195992	50.604806750171	17.069	27.046	52.438
17.7211574177818	24.4954149195992	50.604806750171	20.117	21.775	51.546
17.7211574177818	24.4954149195992	50.604806750171	17.323	23.934	50.146
17.7211574177818	24.4954149195992	50.604806750171	17.64	22.918	47.209
18.5930266566183	26.5475133906341	60.2526717765702	18.974	24.125	61.119
19.016378362568	27.5439031888403	64.937202346071	18.72	30.665	66.986
19.016378362568	27.5439031888403	64.937202346071	22.466	28.887	64.369
19.016378362568	27.5439031888403	64.937202346071	22.022	28.443	62.892
18.3121418857903	26.4765868898688	66.0879463857675	17.45	24.188	63.322
15.1046796195268	21.6154513292375	71.3294837294874	13.005	20.061	68.646
14.3449966277909	20.4522894387073	72.6148721151636	11.862	17.965	73.909
17.1781506396824	22.5412514503447	72.794895394843	17.45	21.902	76.475
18.4095970786864	23.4546174469018	72.8499160870112	19.863	21.331	75.529
19.3938965727103	24.1847590727591	72.8937843732258	17.64	27.49	72.733
20.2460230256691	24.4873391421966	72.9376861424824	19.164	24.696	74.306
21.2131658318584	24.8307667655551	72.9874957195019	23.482	22.41	74.725
22.0317592885013	26.2179011433418	72.4792656459917	21.958	29.395	74.461
22.0317592885013	26.2179011433418	72.4792656459917	24.562	26.982	72.259
24.2314935701816	25.888926469616	68.7353781807582	27.546	26.982	70.094
24.2314935701816	25.888926469616	68.7353781807582	25.832	27.998	69.522
24.2314935701816	25.888926469616	68.7353781807582	24.943	23.68	69.938
26.7296271067433	24.7289327787222	61.0190242908487	25.07	27.744	59.542
27.9816564340059	23.7033915749207	58.4582097595531	28.88	27.3	58.991
27.9816564340059	23.7033915749207	58.4582097595531	31.356	22.347	59.353

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.9816564340059	23.7033915749207	58.4582097595531	27.102	25.966	59.543
27.9816564340059	23.7033915749207	58.4582097595531	26.086	24.95	59.469
27.9816564340059	23.7033915749207	58.4582097595531	28.499	25.141	57.61
27.7161790404478	22.4259841179943	52.9743327519127	28.753	24.379	51.035
27.7161790404478	22.4259841179943	52.9743327519127	24.244	21.077	52.586
27.7161864494131	22.4259725956144	52.9742643428171	26.594	18.854	52.883
29.6818478876066	24.2788743120946	45.1989215621325	30.785	20.823	44.268
29.6818478876066	24.2788743120946	45.1989215621325	27.8	23.617	42.03
29.8724512102681	24.74563524601	44.2401745664853	29.261	23.045	43.901
30.0967557625362	25.2949143548532	43.1119495290092	33.642	26.22	42.336
26.8925710113616	26.2516767164406	39.8705794046101	26.086	29.903	39.661
23.5193064069166	22.6920302123674	35.6462431265606	20.561	24.696	36.269
21.6399294761599	20.7087645587302	33.2926221648428	20.561	18.219	35.874
Route: 8 Length: 173.038555579991 Demand Met: 989					
16.2761881946158	12.6892468210688	42.40875289994	18.021	13.52	41.784
18.7128700212315	14.588919488239	48.7577083303605	19.609	18.156	48.051
20.0011646413431	14.3296991768148	53.4546805892954	22.276	13.393	54.239
20.474787010307	14.2343848303288	55.181412983325	22.085	10.853	55.182
20.8517647896167	14.9537192367086	58.0820929709127	18.466	17.838	58.207
22.0116057147262	15.0656074142731	61.784078793326	19.418	13.901	64.222
23.4089341957429	15.5210586612854	62.478603905609	24.943	18.346	64.008
23.4089341957429	15.5210586612854	62.478603905609	21.831	13.203	64.85
28.5085454223834	17.1857112891573	65.0097493353728	27.356	20.632	65.916
31.3213506798052	17.4988906685798	66.1709885137513	34.087	18.918	64.082
31.4560989379792	17.2789200968667	66.9097000027309	29.261	19.172	68.315
31.4560989379792	17.2789200968667	66.9097000027309	31.991	17.203	67.188
31.5687928735282	17.0949478518109	67.5275308243025	31.762	15.473	67.554
31.5687928735282	17.0949478518109	67.5275308243025	30.594	17.076	65.103
31.7755925028864	16.7573951051603	68.6610556252188	29.705	19.426	70.279
32.0950875849701	16.2818160054657	69.5739007561848	30.531	18.664	72.004
32.3135053712873	15.954484545465	69.9183978452329	30.785	16.251	71.611
32.3135053712873	15.954484545465	69.9183978452329	31.356	16.251	69.04
32.5481498680702	15.6028330633555	70.2884914667404	33.261	18.537	71.995
32.9503610747326	15.0000611076639	70.9229071031655	31.307	14.661	68.868
33.8339763237001	13.6757582447785	72.3168975946932	37.452	12.758	72.01
32.9250093378458	13.0528659930146	73.5330555570197	32.835	12.613	75.794
32.9250093378458	13.0528659930146	73.5330555570197	32.282	12.126	74.654
32.4946667787246	12.7580540605444	74.1087871354518	32.087	14.661	75.705
32.4946667787246	12.7580540605444	74.1087871354518	30.787	12.906	76.252
32.2563291356768	12.5947852169403	74.4276584116482	32.477	14.433	75.823
32.0207730331843	12.433422367833	74.7428072820151	32.835	14.173	77.958
31.9747582350895	12.3878384080558	74.7531823875593	32.802	12.126	77.71
31.9294866059989	12.3429906653862	74.763389927198	31.437	11.541	78.241
31.8957346832361	12.3095550532318	74.7709993629259	31.047	11.313	78.28
31.8528606287227	12.2707503123798	74.7025387912048	29.007	10.282	76.107
31.8503593911858	12.2480707275257	74.4917528195757	28.626	11.234	75.345
31.8471117051174	12.2186665962387	74.2184843289642	29.975	12.581	76.539
31.8424352015382	12.1763506871848	73.825211745863	30.787	12.646	75.914
31.8424352015382	12.1763506871848	73.825211745863	31.502	12.126	74.715
31.8360781494574	12.1188595771299	73.2908917370854	29.197	13.52	74.598
31.8223335814545	11.9947735300149	72.1375324403747	31.015	12.776	72.117
31.8084362751536	11.8692952764768	70.9712426620632	31.307	11.313	71.461
31.8084362751536	11.8692952764768	70.9712426620632	28.816	12.568	71.763
31.7752188346849	11.5701386523303	68.1900497373482	32.055	9.837	66.681
31.759583229688	11.42898193671	66.878023917183	35.484	11.425	66.484
31.4840479669265	11.2793802376559	65.5119731783028	34.849	11.996	64.173
31.4511843351793	11.2615352910279	65.34905761117	31.437	14.433	67.041
31.4511843351793	11.2615352910279	65.34905761117	30.202	12.711	66.602
31.3092804202407	11.1844926405596	64.645592173176	28.753	13.457	65.491
30.9730569545994	11.0019411446688	62.9788093445498	30.202	11.996	64.142
30.4714825282838	10.7296058333772	60.4922954095786	33.96	11.234	59.829
29.44840948523	10.1741207391428	55.4207745293746	32.944	10.536	54.126
27.6271602646656	9.64648220466052	51.9824161432266	28.626	10.091	52.872
20.3473594802836	7.53744869574954	38.2387294225545	20.244	11.234	37.646
Route: 9 Length: 124.534903423566 Demand Met: 966					
16.5284714314772	15.3827248360836	8.70958781537704	18.466	14.155	8.671
22.59319474232	21.0272352099065	11.9053340646049	23.355	23.553	9.247
23.8885700318614	21.5272819981886	13.7762290552992	24.625	19.68	11.726
27.3272805538745	22.8547270008443	18.7428378061465	29.007	26.157	18.195
27.7790227913552	22.2617653821454	20.2550826442467	28.245	21.331	19.247
28.3708006734749	21.4849861582639	22.2361214446725	28.626	22.791	23.223
28.3708006734749	21.4849861582639	22.2361214446725	26.022	21.902	22.93
28.898950032357	20.7917371655452	24.004181717568	31.102	17.775	23.735
28.898950032357	20.7917371655452	24.004181717568	26.975	20.061	22.417
28.6045467971407	21.2205103766398	25.6049252719489	25.832	22.918	24.535
28.2152740874	21.7874632658354	27.7215360911776	28.689	21.013	29.015
27.9690937734907	22.1459881175418	29.0600210841796	31.293	23.68	29.18
27.4287752670624	22.9326773841374	31.997298504941	25.705	26.22	32.496
27.8878858370926	21.8938027624648	33.7300647015705	29.261	22.283	32.908
28.5181066084749	20.4677311062036	36.1086377274356	26.149	20.886	38.979

Solution x	Solution y	Solution z	Original x	Original y	Original z
32.0977834645092	17.7257464490923	36.8139202946275	33.96	19.68	39.41
32.0977834645092	17.7257464490923	36.8139202946275	32.372	18.537	39.944
32.9393947065879	16.6174619751403	36.6739836341349	36.436	17.076	35.413
32.9393947065879	16.6174619751403	36.6739836341349	34.135	14.726	38.301
32.4836998422473	15.3495219812633	37.00072496757	33.322	13.361	37.986
32.4836998422473	15.3495219812633	37.00072496757	33.095	14.271	36.737
32.256444203508	14.7172393862863	37.1636515774854	33.095	13.491	38.538
32.0718114753728	14.2035472951441	37.29601911295	33.095	13.231	40.765
32.0718114753728	14.2035472951441	37.29601911295	29.975	12.321	39.763
32.300506004538	13.6508936601206	35.1444392458916	33.642	10.155	35.22
32.2590016977346	13.7697135141348	34.6088086365513	32.217	11.541	36.145
32.1865600073596	13.9771001423756	33.6738998897181	32.436	13.231	35.38
32.1865600073596	13.9771001423756	33.6738998897181	31.567	14.661	34.796
32.0107887709206	14.4803132057164	31.4053656011259	31.61	17.775	32.188
32.0107887709206	14.4803132057164	31.4053656011259	30.023	17.203	33.037
32.0107887709206	14.4803132057164	31.4053656011259	30.15	16.06	32.059
32.0107887709206	14.4803132057164	31.4053656011259	33.322	14.401	29.372
32.0107887709206	14.4803132057164	31.4053656011259	32.022	15.473	29.854
32.0107887709206	14.4803132057164	31.4053656011259	32.152	15.246	27.742
32.0107887709206	14.4803132057164	31.4053656011259	29.007	14.409	30.293
32.0107887709206	14.4803132057164	31.4053656011259	30.787	13.946	28.148
32.0107887709206	14.4803132057164	31.4053656011259	30.202	13.491	28.883
32.0667296943988	14.782665160256	27.5874354612102	33.515	18.219	27.24
32.0667296943988	14.782665160256	27.5874354612102	33.907	14.076	24.403
31.6762530787366	14.4313550529961	27.4359705994592	34.087	11.615	26.904
28.6897730431604	12.3724621231902	26.462296127361	27.927	10.409	29.559
28.6897730431604	12.3724621231902	26.462296127361	28.181	12.441	28.249
28.6897730431604	12.3724621231902	26.462296127361	30.594	9.52	26.782
23.8633028276122	10.2904335581995	21.9919437368891	26.149	11.107	19.141
23.8633028276122	10.2904335581995	21.9919437368891	22.022	11.361	19.929
Route: 10 Length: 121.14752966182 Demand Met: 855					
19.6727769189928	21.9167287156988	2.53019211666196	20.117	22.728	3.645
22.1032036917544	24.624308828759	2.84282482084404	20.117	27.617	1.782
27.2889766675455	26.9297989659057	4.04703926671482	29.07	29.713	2.284
28.0491957014824	25.5988583467583	6.04750530205492	25.959	27.744	8.296
28.3801431432123	25.0246895130765	6.8920341986857	31.42	27.173	7.305
30.4946947622024	20.3858140165517	13.2483571656806	28.118	18.092	12.931
31.1432639402431	18.9632375961756	15.1976993859449	27.864	18.854	16.375
31.5841659304	17.9962985413573	16.5226922796038	28.689	18.156	16.722
32.2994438307759	16.4274970740673	18.6723883165799	35.992	16.314	18.057
32.272263601377	15.8501561743302	19.5250156007574	29.515	16.505	21.691
32.272263601377	15.8501561743302	19.5250156007574	29.975	14.141	17.903
32.2643592490289	15.6820541338943	19.7733008112486	31.242	15.473	19.727
32.2565021406957	15.5150313900226	20.0199898076834	32.944	17.965	22.768
32.1062121735541	14.3591209198887	20.6608387407344	31.61	13.901	20.326
31.9640951046847	13.2660861925539	21.2668268939295	35.293	11.552	21.184
31.7687046674805	13.0757199732273	21.4220130552628	33.062	12.126	22.872
31.7687046674805	13.0757199732273	21.4220130552628	30.787	13.426	19.207
31.5697289350738	12.8818609671131	21.5800444414856	32.867	11.313	21.273
31.5697289350738	12.8818609671131	21.5800444414856	31.827	11.313	19.849
31.3747655328362	12.6919113552422	21.7348840447947	33.96	10.536	22.989
31.3747655328362	12.6919113552422	21.7348840447947	33.833	10.282	23.21
29.8494564180853	12.0144345968761	22.3696113408795	28.372	10.218	25.305
29.7601552044532	12.1675763798974	22.0142600335619	28.816	12.25	22.231
29.6713318397943	12.3198975813099	21.6608151058787	29.705	13.393	23.437
29.5715333080191	12.4910445931095	21.2636753058741	30.202	12.451	21.726
29.4689991810076	12.6668846967204	20.8556355372115	32.182	10.98	18.901
29.4689991810076	12.6668846967204	20.8556355372115	30.657	11.541	18.351
29.1149317708157	13.0972871335693	20.2068319631869	31.242	12.126	17.355
29.0387191322148	13.1899324666027	20.0670764660104	29.975	12.061	16.621
27.9433747349855	14.517486136868	20.1643635837132	25.895	12.123	19.556
21.4002440212362	22.4476755398113	20.7451427545941	21.958	24.76	23.638
20.9068600631187	22.6069662149743	20.3571090225198	22.974	25.141	19.537
20.2602245202644	22.8157105836819	19.8485202545345	17.64	23.426	22.454
19.1516968208301	23.2136644634027	18.182940349591	20.942	25.649	17.701
19.1516968208301	23.2136644634027	18.182940349591	19.482	21.966	17.833
17.8673870663224	23.6747332471942	16.2531968928896	16.497	24.315	17.876
16.0886548231823	24.3133262835269	13.5805819588696	16.37	26.982	10.968
14.5280280663963	22.4770525805795	13.8605900875982	13.513	22.41	17.465
13.2810922849854	20.5479334512362	12.670958596295	12.37	19.934	15.842
Route: 11 Length: 83.9480143815266 Demand Met: 747					
20.960926461968	10.3081440888755	7.43089962328187	20.434	13.012	7.24
29.1439728203266	14.3312173970179	10.3318592926113	29.959	17.584	8.664
29.6573456292656	14.1011404388881	10.8447753487154	29.134	16.187	10.819
30.3102482078892	13.808862424012	11.4968624111029	31.112	15.246	13.662
30.7407897768125	13.6158575913016	11.9270772570918	33.095	13.751	14.049
30.7407897768125	13.6158575913016	11.9270772570918	31.632	15.246	15.179
30.7407929154507	13.6158537027853	11.9270777096357	31.372	12.353	15.396
30.7407929154507	13.6158537027853	11.9270777096357	32.022	12.126	9.107
30.7407929154507	13.6158537027853	11.9270777096357	30.787	11.313	10.711

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.7407929154507	13.6158537027853	11.9270777096357	28.753	10.79	11.577
31.4074734456432	12.8322153052159	10.1606384827838	34.135	13.686	10.417
31.4074734456432	12.8322153052159	10.1606384827838	31.762	12.126	11.712
32.1693864237892	11.9365779286456	8.14298271291224	34.087	8.758	8.639
32.1693864237892	11.9365779286456	8.14298271291224	31.177	14.433	6.693
32.0656424594548	12.3756886703867	6.50209902991296	35.166	10.726	7.803
32.0656424594548	12.3756886703867	6.50209902991296	34.135	12.386	7.828
32.0656424594548	12.3756886703867	6.50209902991296	34.135	12.906	3.426
32.0656424594548	12.3756886703867	6.50209902991296	33.647	11.313	7.765
32.0656424594548	12.3756886703867	6.50209902991296	33.452	11.541	6.941
32.0656424594548	12.3756886703867	6.50209902991296	33.322	12.841	4.069
32.0656424594548	12.3756886703867	6.50209902991296	32.997	11.541	6.26
32.0656424594548	12.3756886703867	6.50209902991296	32.542	12.126	4.969
32.0656424594548	12.3756886703867	6.50209902991296	31.015	13.036	5.79
32.0656424594548	12.3756886703867	6.50209902991296	29.451	10.155	5.592
31.842546011582	13.0155321673172	4.20800755171968	30.787	13.166	3.014
31.7149055973418	13.3818943963214	2.89429599684204	33.127	11.313	0.11
31.7149055973418	13.3818943963214	2.89429599684204	31.567	11.313	0.396
31.3245872154371	14.0575419676021	2.75904902919068	32.932	15.246	4.376
31.3245872154371	14.0575419676021	2.75904902919068	31.399	13.754	2.704
30.6640605110842	15.2007135972063	2.53040114990135	32.69	18.346	2.359
30.6640605110842	15.2007135972063	2.53040114990135	31.892	15.246	4.139
28.4028545919442	15.393895263729	2.23545535077216	28.308	15.933	3.524
26.138686229711	15.5872696765273	1.94012324079169	26.149	19.045	2.783
25.0742991354452	15.6780572654484	1.80129154807422	24.943	19.108	0.303
23.7109772448072	15.3777602912017	1.80391075602987	25.07	16.314	3.298
21.6071209161769	14.9143433930294	1.80800955606298	20.117	18.283	2.485
19.5774423879432	13.5133076812883	1.63805601999628	22.149	11.742	1.36

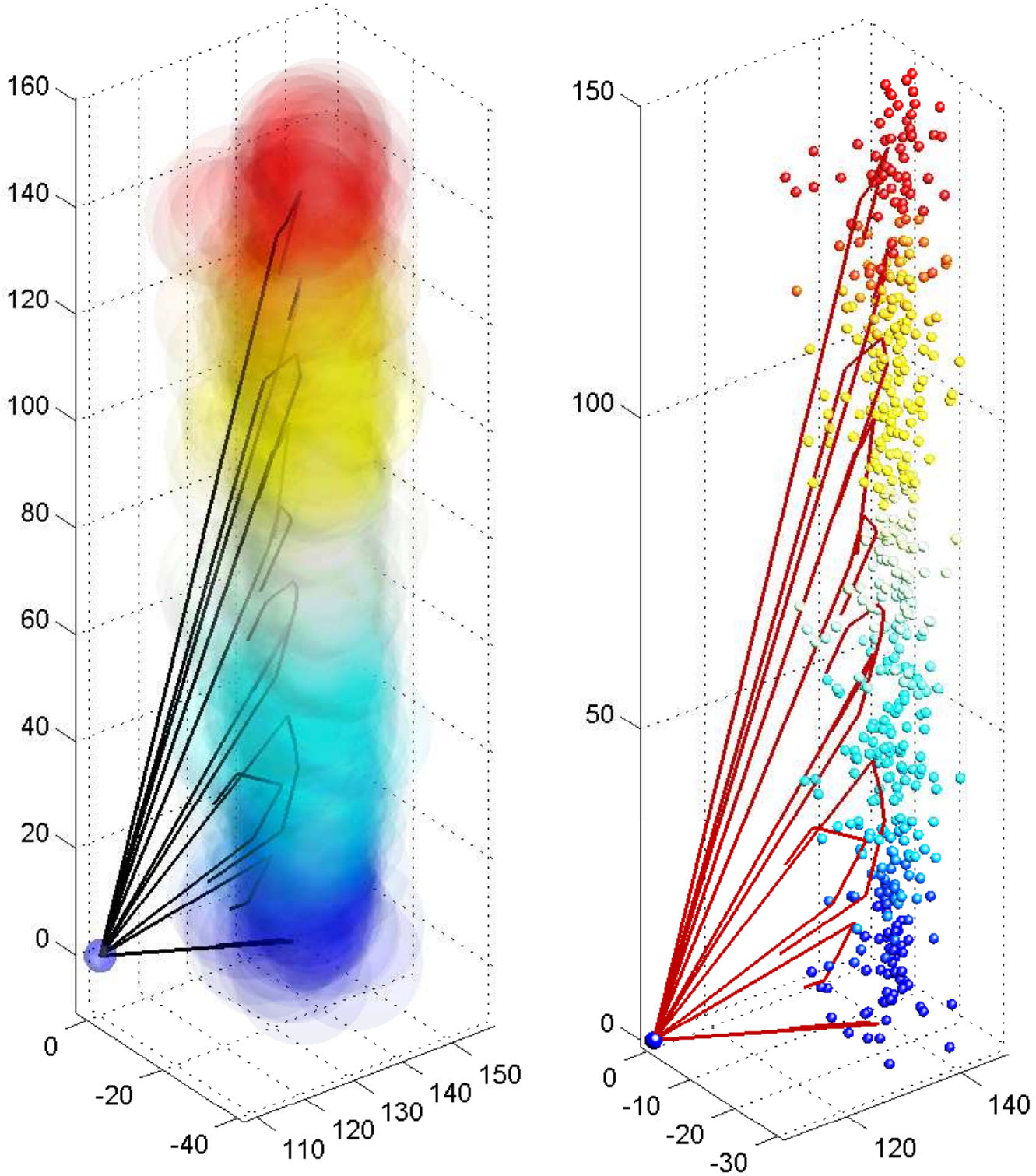


Figure O.87: $d493$, $r = 11.2356$, Equal Radius, 3D, Euclidean, Length = 1835.3061007

Table O-90: Solution for $d493$, $r = 11.2356$, Equal Radius, 3D, Euclidean

Total distance: 1835.30610073134 Total demand met: 10514 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 63.3484433478421 Demand Met: 545					
15.0693216910827	12.0245743255727	1.84274092303522	20.117	18.283	2.485
19.4723835464829	15.5379895768937	2.38116263441414	20.117	22.728	3.645
22.5358878112791	17.9824997938131	2.75577731374299	20.117	27.617	1.782
24.4385017060359	19.5006688101961	2.98843572851841	29.07	29.713	2.284
24.4385017283278	19.5006687997831	2.9884356512034	31.42	27.173	7.305
24.4055302265871	19.3716373643748	2.95762823217136	25.959	27.744	8.296
24.367249313795	19.2218289883327	2.92186041669599	23.355	23.553	9.247
24.3255875849698	19.0587909225022	2.88293398197372	26.149	19.045	2.783
24.2821842590759	18.8889391648575	2.84238082247557	24.943	19.108	0.303
24.2373771997881	18.7135949553374	2.80051644372014	25.07	16.314	3.298
24.1922475411858	18.5369882830434	2.7583505695354	28.308	15.933	3.524
24.1465578802504	18.3581912489684	2.71566188729375	32.69	18.346	2.359
24.098059738445	18.1684081730923	2.67035162625184	32.932	15.246	4.376
24.0484953578068	17.9744569359039	2.62404698687009	31.892	15.246	4.139
23.9981144321892	17.7773138197634	2.57698087945304	31.399	13.754	2.704
23.9481506991345	17.5818058221698	2.53030528251769	30.787	13.166	3.014
23.8990526209068	17.389687228886	2.48443907422251	31.567	11.313	0.396
23.8538626828184	17.2128622844124	2.44222328673353	33.127	11.313	0.11
23.8402305254068	17.2030253422857	2.44082756667251	34.135	12.906	3.426
23.5437634849303	16.9890923046299	2.41047619461668	33.322	12.841	4.069
23.1481520338362	16.703616344784	2.36997485086349	32.542	12.126	4.969
22.5697463442214	16.2862382819747	2.31075834210147	31.177	14.433	6.693
21.7994425402401	15.7303863284193	2.23189328914221	31.015	13.036	5.79
20.5062942447466	14.7972533775106	2.09949618886037	29.451	10.155	5.592
15.215362555291	10.9793509867011	1.55779158580221	22.149	11.742	1.36
Route: 2 Length: 298.169818421214 Demand Met: 1000					
18.8895979714572	19.7411518861189	129.652514255031	17.577	13.647	137.156
19.5836651667031	20.4665278696426	134.416515981109	13.576	14.79	138.325
20.039194195266	20.9426085444461	137.543253405377	11.163	15.552	141.832
20.3634338016668	21.1852384334309	138.155036707961	18.339	12.631	142.199
20.689328019368	21.4291046163039	138.769939266432	18.466	18.664	140.644
21.0184798168052	21.6754086025678	139.390986597492	19.037	28.189	146.557
21.2241647033208	21.8293236216504	139.779072508823	18.529	30.03	146.971
21.6932282917546	21.4321135625779	139.765016307738	22.149	29.713	141.818
22.2280403651097	20.97922888681	139.748990657234	25.07	30.03	143.44
23.0683615519721	20.2676413489672	139.723807651284	26.149	27.49	136.669
24.1635920533466	19.340179493233	139.690964794493	24.879	19.934	139.42
25.2138062513546	18.450841786379	139.659475867824	26.149	15.679	137.044
26.1048761106085	17.6962767134813	139.632767252249	28.372	14.663	135.085
26.8896663173098	17.0317091061098	139.609244263752	29.324	15.489	136.921
27.6308276466208	16.4040851829346	139.587027779467	29.007	12.949	137.787
28.329716038048	15.8122566676137	139.566077253614	29.388	8.313	137.407
28.9253902463432	15.307827978165	139.548219160074	31.697	11.541	138.673
29.4836019658727	14.8351223182215	139.531483659928	34.785	12.504	141.232
29.9944021134416	14.4025654918964	139.516169575595	37.452	10.218	146.804
29.9869286395082	14.3989827571852	139.48143402955	33.907	13.556	148.567
29.9792347133813	14.3952924353863	139.445670613629	29.975	13.881	149.391
29.971359405087	14.3915138467031	139.409061634551	30.787	14.206	147.62
29.9634472479334	14.3877169350161	139.372280402564	31.892	12.353	146.679
29.955513663332	14.3839091774312	139.335398935901	31.991	14.092	145.487
29.9475933494008	14.380107436597	139.298579042482	29.975	14.661	145.197
29.9397008293236	14.3763187789184	139.261887891072	28.245	14.854	144.187
29.931856517604	14.3725530788176	139.225420019719	27.356	18.473	143.695
29.9240555316491	14.3688078588358	139.189152495378	31.356	19.68	141.631
29.9163084953713	14.3650882687962	139.153135775551	33.515	20.315	142.968
29.9085803423885	14.3613775014211	139.117206791574	34.341	21.013	142.761
29.9008661809913	14.3576731824726	139.081342645642	34.468	20.442	147.277
29.8240418714404	14.3207852345902	138.724018002366	33.582	15.473	147.748
29.7155622799822	14.2686969618788	138.219455302675	33.769	15.679	145.826
29.5808313085267	14.2040032186885	137.592789101989	32.944	15.933	144.54
29.4184958557803	14.126054459102	136.837725853021	33.322	15.473	140.664
29.2439323064331	14.042233965446	136.025784952851	33.907	14.336	141.111
29.0427112439856	13.9456129277485	135.089850095485	34.404	14.028	139.514
28.8085609972541	13.8331796833996	134.00074857126	33.907	12.776	139.011
28.5175221586624	13.6934290390651	132.647036477998	34.135	11.866	136.659
28.1538173447903	13.5187843500048	130.955325489677	34.595	11.996	135.081
27.6131404573769	13.2591588258254	128.440443894327	33.127	14.661	132.624
26.685183203066	12.8135723386756	124.124148347119	31.356	16.06	129.885
Route: 3 Length: 69.0451319905511 Demand Met: 969					
15.3668942488999	6.61782727361296	8.62561308172614	18.466	14.155	8.671
22.2096019051636	9.56464161609454	12.4664973108549	24.625	19.68	11.726
23.6054612910399	10.1657664783436	13.2500069649623	27.864	18.854	16.375
24.109664599921	10.3829020205061	13.5330212223172	28.118	18.092	12.931
24.550400840312	10.572704760959	13.7804099229853	29.134	16.187	10.819

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.9634758526633	10.7505949450727	14.0122718549044	29.959	17.584	8.664
25.3240766075399	10.9058868903776	14.2146796780179	34.135	13.686	10.417
25.6309200048279	11.0380288385338	14.386913625554	34.135	12.386	7.828
25.8657942489952	11.1391777131456	14.5187507884381	32.997	11.541	6.26
26.0682023232448	11.2263450860024	14.6323641617376	33.452	11.541	6.941
26.2524740945279	11.305702129301	14.7357973846244	33.647	11.313	7.765
26.4260954221569	11.3804726101553	14.8332523703542	35.166	10.726	7.803
26.4260955963093	11.3804727622176	14.8332526660184	34.087	8.758	8.639
26.42609577112	11.3804729154267	14.8332529664344	32.022	12.126	9.107
26.4260959449291	11.3804730677328	14.8332532579921	30.787	11.313	10.711
26.4260961183967	11.380473219786	14.8332535549121	28.753	10.79	11.577
26.4260962929602	11.3804733727286	14.8332538587703	31.762	12.126	11.712
26.4260964668445	11.380473525428	14.8332541499881	33.095	13.751	14.049
26.4260966393545	11.3804736771278	14.8332544536038	31.112	15.246	13.662
26.4260968122091	11.380473828527	14.8332547486487	31.632	15.246	15.179
26.4260969854968	11.3804739796406	14.833255040219	35.992	16.314	18.057
26.4260969931835	11.3804739927275	14.8332550699386	35.293	11.552	21.184
26.4260970041342	11.3804740072736	14.8332551096532	33.96	10.536	22.989
26.4260970180899	11.3804740235883	14.8332551598983	33.833	10.282	23.21
26.3315453801464	11.4296099854965	14.7882025268794	33.062	12.126	22.872
26.219211584553	11.4879868641546	14.7346772242839	32.867	11.313	21.273
26.0995468289392	11.5501734581578	14.6776589216378	31.827	11.313	19.849
25.9760842246218	11.6143337256915	14.6188310332699	32.182	10.98	18.901
25.8479522689136	11.6809205600551	14.557778282458	30.657	11.541	18.351
25.7175420451774	11.7486913882231	14.4956399973367	31.242	12.126	17.355
25.5842313428109	11.8179695051013	14.4321197230917	31.372	12.353	15.396
25.4483454852634	11.8885858371016	14.3673725037368	29.975	12.061	16.621
25.3107459264253	11.9600927691767	14.3018087872009	29.975	14.141	17.903
25.1713328145079	12.0325420847824	14.2353809640157	30.787	13.426	19.207
25.026503255486	12.1078061159096	14.1663722200423	31.61	13.901	20.326
24.8704838344253	12.1888850642051	14.0920316000119	31.242	15.473	19.727
24.7058898474226	12.2744196911299	14.0136052958628	29.515	16.505	21.691
24.5309648790656	12.3653227785707	13.9302564892548	29.705	13.393	23.437
24.1933875631129	12.5407520698129	13.7694070445389	30.202	12.451	21.726
23.7435751342228	12.7745068778325	13.5550800609148	28.816	12.25	22.231
23.036070587945	13.142178476131	13.2179688043204	25.895	12.123	19.556
22.2498510859781	13.5507565306974	12.8433524111577	26.149	11.107	19.141
21.244056588179	14.0734428051554	12.3641134171996	22.022	11.361	19.929
19.1398622975259	15.1669456250356	11.3614475997538	19.482	21.966	17.833
17.8356115074453	15.8447332389238	10.7400001032403	16.37	26.982	10.968
17.2000712429645	15.2801373998892	10.357294871625	13.513	22.41	17.465
15.6427599568261	13.8966588734979	9.4195250964217	12.37	19.934	15.842
Route: 4 Length: 96.7199498353001 Demand Met: 1000					
17.2480667917901	13.7007206861592	19.7237476034563	16.497	24.315	17.876
18.5536387934695	14.7377677128555	21.2167168880651	17.64	23.426	22.454
19.5233643054643	15.508043041686	22.3256272949734	20.942	25.649	17.701
19.9249699695901	15.5620521912125	22.9685174470013	22.974	25.141	19.537
20.3610580025459	15.6206992623688	23.6666034170737	21.958	24.76	23.638
20.7814381896194	15.6772308207552	24.3395413502389	25.832	22.918	24.535
21.1657844724812	15.7289150271716	24.9547992817996	26.022	21.902	22.93
21.5432235029611	15.7796694136803	25.5590027246764	26.975	20.061	22.417
21.9231269001216	15.8307551609399	26.167153579147	28.245	21.331	19.247
22.5241841107244	15.9115792954071	27.129321240491	28.626	22.791	23.223
23.1112614369818	15.9905230584383	28.069106974596	28.689	21.013	29.015
23.6327192222436	16.0606456462308	28.9038485974781	31.293	23.68	29.18
23.9019318220591	16.0968465803332	29.3347995327669	29.261	22.283	32.908
24.1365416196869	16.1283975042691	29.7103574528221	25.705	26.22	32.496
24.3282950673203	16.1541848873674	30.0173127028365	20.561	24.696	36.269
24.5322152728792	16.0317095163352	30.140259582039	26.149	20.886	38.979
24.7274400713961	15.9144572039665	30.2579630752488	26.34	17.203	39.025
24.9127958655388	15.8031320824475	30.3697160972913	27.419	15.044	35.984
25.0936893270456	15.6944870535069	30.4787786597301	33.642	10.155	35.22
25.0936893199	15.6944870623553	30.4787786502643	31.567	14.661	34.796
25.0936893126037	15.6944870713428	30.4787786441334	31.61	17.775	32.188
25.0936893052617	15.6944870800198	30.4787786322732	30.023	17.203	33.037
25.093689298009	15.6944870885018	30.4787786233091	30.15	16.06	32.059
25.093689290748	15.6944870969412	30.4787786155223	29.007	14.409	30.293
25.0936892836282	15.6944871055143	30.4787786075395	30.202	13.491	28.883
25.0936892765113	15.6944871143107	30.4787785984855	30.787	13.946	28.148
25.0936892693827	15.6944871232734	30.478778585895	33.322	14.401	29.372
25.0936892619351	15.6944871324416	30.4787785742746	32.022	15.473	29.854
25.0936892543992	15.6944871417292	30.4787785687886	33.515	18.219	27.24
25.0936892469226	15.6944871508763	30.4787785655325	31.102	17.775	23.735
25.093689239728	15.6944871598388	30.4787785574933	32.944	17.965	22.768
24.9927007119806	15.6966135918373	30.5377667000919	33.907	14.076	24.403
24.7921460985033	15.7008368171445	30.654911881091	34.087	11.615	26.904
24.3652576675129	15.7098265682978	30.9042583336307	30.594	9.52	26.782
23.804384759506	15.7216378340257	31.2318642887726	28.372	10.218	25.305
23.0670437016614	15.7371646104177	31.6625435915536	27.927	10.409	29.559
22.2265922130637	15.754861833279	32.1534483353794	28.181	12.441	28.249

Solution x	Solution y	Solution z	Original x	Original y	Original z
21.1410758849528	15.7777182547348	32.7874919116141	24.244	15.997	28.696
19.9085282679366	15.8036701383796	33.5074140848665	24.308	15.044	33.546
18.5215171869766	15.8328742637388	34.3175558465666	20.561	18.219	35.874
17.1323683678437	15.8621228474273	35.1289470799072	18.212	18.283	36.255
15.7498899284477	15.8912311974261	35.9364427837077	12.052	18.854	46.124
15.09869608903	15.2342045542301	34.4506373301954	18.021	13.52	41.784
14.1710530857623	14.2982424249022	32.3340282948108	20.244	11.234	37.646
12.954171493584	13.0704613754541	29.5574563092247	19.482	13.076	31.528
Route: 5 Length: 268.965313651748 Demand Met: 1000					
25.6553941032685	16.0326573488239	113.36651762406	26.911	24.76	115.286
27.1063504487955	16.9393994748504	119.778037546041	27.927	28.125	119.109
27.1700372315777	16.9234089198359	120.081911517214	28.88	25.331	116.966
27.2353598412542	16.907006404474	120.393590437386	27.927	21.458	117.97
27.301304478445	16.8904470640275	120.708237362481	26.276	20.188	119.025
27.3681539884604	16.8736596484638	121.027202186539	25.133	19.235	120.496
27.4356169188076	16.8567171317518	121.349094474231	27.102	18.664	121.623
27.5031301712925	16.8397608920562	121.671227415235	28.054	17.013	121.063
27.571042092894	16.8227038553708	121.995262683417	30.594	16.251	121.669
27.6390216317777	16.8056293140729	122.319620425087	34.135	13.946	120.705
27.707353710273	16.7884660749998	122.645659196532	33.907	13.816	122.673
27.775095656924	16.7714509608815	122.968881180846	33.322	13.621	122.895
27.8426517370212	16.7544826803432	123.291215244103	33.907	11.996	124.886
27.9085844569938	16.7379225318164	123.605801951675	35.992	13.647	125.389
27.972478367285	16.7218756933748	123.910657629434	32.282	15.473	127.6
28.0351196381651	16.7061437140162	124.209535660571	32.347	14.661	129.857
28.0949449126211	16.6911192187167	124.494976666693	32.867	14.661	131.697
28.1494490662929	16.6774319122688	124.755026887271	36.436	18.918	131.64
28.1726823444043	16.671597816777	124.865869272081	35.547	11.234	131.369
28.172682350882	16.6715978675428	124.865869715219	34.976	10.282	131.121
28.0508914318376	16.807508606923	124.901481872032	34.595	9.202	128.931
27.8376308017777	17.0454923579111	124.963841421602	30.912	9.901	131.507
27.5610007715777	17.3541967502299	125.044732223084	30.787	12.386	130.829
27.2641460556572	17.6854717777572	125.131537399638	30.462	15.473	131.052
26.9590944725075	18.0258944485159	125.220739712411	25.451	17.965	131.595
26.6634433640051	18.3558278556945	125.307193370354	20.434	18.537	132.408
26.4111441234902	18.6373847178817	125.380970619226	20.434	15.806	127.618
26.1655658299767	18.911442117345	125.452782652337	24.371	15.235	126.557
25.9180057663129	19.1877114345692	125.525174271094	26.594	11.933	126.917
25.6541018016518	19.4822202775495	125.60234521683	27.673	12.695	125.598
25.370306286141	19.7989278769935	125.685332859228	28.943	16.886	125.854
25.0754865621462	20.1279383966165	125.771544231733	33.515	18.029	124.645
24.7285106726462	20.5151549088221	125.8730069482	34.341	22.029	122.727
24.1702771430775	21.1381196544849	126.036244012302	32.245	24.887	125.449
23.4734999889341	21.9156752897605	126.239992397566	27.229	26.22	125.044
22.7803458924728	22.6891890063487	126.442681288042	25.895	29.903	127.854
22.1855690645585	23.3529314725688	126.616603958687	18.72	29.967	135.012
22.1237788708935	23.2892440181365	126.278168495612	18.974	29.967	133.455
22.0379427191678	23.200774304785	125.808046497693	19.037	26.982	129.54
21.9493747376239	23.1094893861894	125.322965096807	18.974	24.569	127.812
21.86021287215	23.0175927258044	124.834633670238	18.593	21.648	126.239
21.7719248487593	22.9265970491543	124.351091074141	21.577	21.394	126.294
21.6834396384265	22.8353986862292	123.866474155592	20.371	23.045	124.747
21.5952418308571	22.7444970352484	123.383435865465	18.91	22.474	122.979
21.507500494862	22.6540662623967	122.90290072306	20.561	23.553	119.319
21.4193314196393	22.5631959255058	122.420034873481	17.64	27.998	119.961
21.3161630407439	22.4568789794721	121.855168345812	11.481	17.711	124.498
Route: 6 Length: 238.644000326032 Demand Met: 1000					
17.2242299994549	15.3324924199157	94.1723827520832	19.545	25.839	93.739
18.3057664625478	16.295243705182	100.085630058802	16.688	18.092	103.09
19.1848491156668	17.0777805191174	104.891965880651	17.323	21.331	107.01
19.9377378659144	17.7479840038379	109.008345203104	11.735	20.378	116.222
21.4882186911327	17.6008595715188	109.479490684328	20.498	17.457	115.048
23.0176891543003	17.4557297262351	109.944249926607	19.99	18.029	118.966
24.6258256623705	17.3031348252948	110.432914397179	22.149	14.282	119.226
26.1973194657962	17.1540163858493	110.910445055154	27.927	12.568	120.417
26.7816649414444	17.0985684599597	111.088010717568	32.087	11.313	118.866
26.9358089621571	17.0839416597954	111.1348511185	33.322	13.101	119.477
26.9358089640065	17.0839416638277	111.134851111973	33.907	12.516	116.73
26.9358089658546	17.0839416678367	111.134851105448	33.907	14.791	115.865
26.9358089677015	17.0839416718265	111.134851098893	32.217	14.433	117.304
26.9358089695503	17.0839416758057	111.134851092363	31.502	15.473	118.128
26.9358089714067	17.0839416797737	111.134851085848	31.991	16.632	118.575
26.9358089732661	17.0839416837229	111.13485107938	29.578	18.791	116.421
26.935808975125	17.0839416876423	111.134851072871	27.229	15.362	116.263
26.935808976996	17.083941691555	111.134851066378	25.197	12.441	114.729
26.9358089788952	17.083941695474	111.13485105996	26.022	12.631	109.182
26.9358089808115	17.0839416993838	111.134851053498	30.34	9.647	108.046
26.9358089827296	17.0839417032951	111.134851047055	31.275	12.613	107.178
26.9358089846435	17.0839417071878	111.134851040616	32.477	11.541	107.287
26.935808986556	17.0839417110675	111.134851034205	33.095	12.711	107.498

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.9358089884655	17.0839417149283	111.134851027801	32.932	12.353	108.278
26.9358089903797	17.0839417187772	111.13485102141	34.135	13.426	109.486
26.9358089922933	17.0839417226077	111.134851015063	34.722	11.742	108.413
26.935808994193	17.0839417264259	111.134851008743	35.674	11.044	107.474
26.8803385631166	17.1867646299421	111.094036667809	35.103	10.155	111.634
26.7793249044464	17.3740093855045	111.019710004527	32.347	11.313	110.138
26.6728466705831	17.5713835797543	110.941362458797	31.632	12.353	111.341
26.5620716468312	17.7767225257022	110.859853301486	30.982	12.126	111.418
26.4463240791215	17.9912788729037	110.774685299977	29.975	13.101	114.777
26.3248498214651	18.2164505575791	110.685303538332	31.015	14.076	113.16
26.19817699123	18.4512586214115	110.592096613851	33.452	15.246	111.765
26.0638425041077	18.7002688015675	110.493252167626	31.047	14.661	110.232
25.924135759174	18.9592373638449	110.390454748957	30.975	17.076	111.068
25.7809104598214	19.2247281139451	110.285068333965	34.722	18.219	109.051
25.6272344542644	19.5095910483113	110.171992131131	34.595	18.791	106.414
25.4597109682762	19.8201229532699	110.048726649341	32.309	19.553	108.506
25.2869581486693	20.1403484678302	109.92161332097	28.753	23.998	106.929
25.1189386865819	20.4517997350985	109.797982893847	25.832	23.68	109.484
24.9538160262264	20.7578812807044	109.676483974357	24.308	23.998	113.458
24.7896974725417	21.0621016686135	109.555723821273	18.72	28.189	115.769
24.7896974735514	21.0621016734836	109.555723806449	30.277	30.475	112.299
24.5816005925087	20.8852957445795	108.636070836179	28.943	30.475	107.548
24.3134420801257	20.6574607163226	107.450983334704	28.943	30.03	106.391
23.9492003118528	20.3479918255702	105.841267073226	27.165	25.458	104.784
23.5840189680868	20.037724560107	104.227397085352	27.991	22.601	101.939
23.2358941845486	19.7419488627586	102.688905146286	29.07	22.347	101.831
22.8805445740813	19.4400345448875	101.118482389317	27.229	19.616	102.004
22.5052469085504	19.1211715409187	99.4598993804322	29.134	22.537	96.334
22.1438004283966	18.8140762867742	97.86252625417	33.071	18.346	97.156
19.5432508825285	16.6045653518832	86.3696305139144	26.911	14.409	89.199
Route: 7 Length: 117.813672213304 Demand Met: 1000					
22.001396822821	15.1940875719392	38.6488676944227	32.217	11.541	36.145
22.5305410263912	15.5595036309946	39.578390137591	32.436	13.231	35.38
23.0050949884056	15.8872195524346	40.4120112275233	33.095	14.271	36.737
23.3801533668555	16.1462275145951	41.0708575668641	34.135	14.726	38.301
23.4895424433618	16.2217717274429	41.2630307096835	33.322	13.361	37.986
23.5927854685927	16.2930724988341	41.4444077595193	33.095	13.491	38.538
23.6923286171631	16.3618180119862	41.6192840606788	33.095	13.231	40.765
23.7866500903056	16.4269565281053	41.784983970485	32.372	14.092	41.845
23.8770360421212	16.4893751370633	41.9437651269282	30.787	13.686	41.698
23.9657011646363	16.55060411828	42.0995200414914	30.202	13.751	40.213
24.0536951452888	16.6113690268285	42.2540948706269	29.975	12.321	39.763
24.1413908736048	16.6719282760732	42.4081460117562	29.975	11.801	40.794
24.2280639821991	16.7317814189296	42.5604000868033	29.134	13.33	42.125
24.3134151268043	16.7907207421371	42.7103297618456	25.578	12.568	43.273
24.3991656211397	16.8499359424338	42.8609604270032	24.371	14.346	43.342
24.4858625418815	16.9098043537979	43.0132531188361	27.991	13.647	44.302
24.5715000613768	16.9689401769085	43.1636824676282	28.499	12.949	46.85
24.6551878497174	17.0267283375546	43.3106834409607	30.658	10.98	44.543
24.7371360507006	17.0833152908856	43.4546278958062	32.607	11.313	43.742
24.8162606237266	17.1379526026023	43.5936124578064	31.015	13.816	44.684
24.8943695202091	17.1918883174832	43.7308123498242	31.483	16.822	46.955
24.9706335003147	17.2445486618486	43.8647691541444	33.388	17.584	48.735
25.0414253124067	17.2934288482232	43.9891116003063	33.322	13.881	49.4
25.1078850721762	17.3393154210253	44.1058380622167	33.907	13.036	49.61
25.080911135423	17.3799286887022	44.1152521148139	33.095	12.971	48.557
25.0526634122288	17.4224579930053	44.1251109922226	30.982	15.473	49.591
25.0241176087739	17.4654361898842	44.1350721784022	30.657	15.246	48.98
24.9952049022948	17.5089664005922	44.1451601783768	27.737	16.251	47.666
24.9663769583217	17.5523692370742	44.1552178105486	25.895	18.918	46.48
24.9381687907421	17.5948393106377	44.1650579245242	25.07	17.076	49.249
24.910118991327	17.6370707871037	44.17484179045	22.276	13.393	54.239
24.0936131646666	18.8674125972536	44.4593070754285	19.609	18.156	48.051
23.5505071818156	19.6856522410821	44.6487123974708	17.64	22.918	47.209
23.0900607595129	20.3793493547422	44.8091972608864	17.069	27.744	45.218
22.7410193547594	20.9052130775327	44.9308250183859	17.069	27.046	52.438
22.842668084046	20.8699731122633	44.6242422774482	17.323	23.934	50.146
22.9541298479	20.8313315557038	44.288063043366	20.117	21.775	51.546
23.0777911009127	20.7884615751387	43.9150884142878	24.244	21.077	52.586
23.2213378152739	20.7386988900529	43.4821347049619	26.594	18.854	52.883
23.4322146323199	20.6655956391832	42.8461064149964	28.753	24.379	51.035
24.2127430974468	20.3951866658656	40.4922626033111	33.642	26.22	42.336
24.3570786251495	20.2919385094668	39.8797759950863	26.086	29.903	39.661
24.5095572273922	20.1828645167695	39.2327308935306	27.8	23.617	42.03
24.6679830749829	20.0695363211791	38.5604488395583	29.261	23.045	43.901
24.8429780591528	19.9443550268722	37.817850029423	30.785	20.823	44.268
25.047080040979	19.7983522419067	36.9517289118516	32.372	18.537	39.944
25.2548029738976	19.6497591991706	36.0702397119835	33.96	19.68	39.41
25.4672269044183	19.4978038124344	35.1688099688813	36.436	17.076	35.413
24.1238892339899	19.1475534758807	29.5583840729679	32.152	15.246	27.742

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.7870041223939	18.7989970073272	23.9751553769029	29.007	26.157	18.195
20.1104472233809	16.5908988531383	21.159011956697	28.689	18.156	16.722
13.4324608711931	11.0816701441805	14.132821284543	20.434	13.012	7.24
Route: 8 Length: 210.167506144833 Demand Met: 1000					
19.4963331897312	17.2367564910809	88.6793015687911	12.243	20.505	94.648
20.991619052756	18.558762358076	95.480705153683	11.608	20.251	101.424
21.2407206286812	18.5827807435677	95.6585599030309	17.577	25.204	95.05
21.6896256398103	18.6260611098675	95.9790224421316	18.91	28.697	98.028
22.0528209162747	18.6610848404849	96.2382872262343	22.276	28.125	102.29
22.4286983058149	18.3844939008335	96.3114469592865	27.229	27.554	96.447
22.8460898274174	18.0773519901499	96.3926901936777	25.006	24.188	94.535
23.2775334116189	17.7598674877394	96.476670192361	24.752	19.362	96.308
23.7096358763443	17.4418978366868	96.5607785480837	18.148	16.505	99.59
24.1648908245517	17.1068863316559	96.6493971206562	22.212	10.091	100.44
24.5942941846431	16.790901009086	96.7329816987225	26.086	14.663	104.115
25.0026980824103	16.490371713375	96.8124767550614	24.879	20.632	106.077
25.4370699227686	16.1707327564011	96.8970298526008	27.292	16.632	106.393
25.8335071007898	15.8790123648598	96.9741976567035	29.642	17.076	106.306
26.1654008904418	15.63479226247	97.0387998732558	31.293	15.806	105.367
26.4511899953754	15.4245000490109	97.0944273435148	31.372	15.246	104.804
26.713465618204	15.2315098397408	97.1454786462435	29.578	13.203	105.988
26.953769735235	15.0546863902834	97.1922543728397	29.388	11.804	105.494
27.1776045063545	14.8899803620616	97.2358258946317	30.721	9.329	106.333
27.1776048523112	14.8899801539464	97.2358258628585	34.135	12.126	105.614
27.1699049781213	14.8581381143246	96.9876446975804	31.177	11.541	103.36
27.1619027265753	14.8250448551047	96.7297126737173	29.975	13.361	103.951
27.1535107961061	14.7903392300588	96.4592151495491	29.197	12.441	103.553
27.1447108042541	14.7539453166134	96.1755598461198	28.753	13.838	102.669
27.1355816072369	14.7161892339789	95.8812884961207	30.202	14.011	102.151
27.1260756328432	14.6768743687653	95.5748684948649	31.957	14.433	102.967
27.1156117892648	14.6335970604061	95.2375658464745	32.817	17.775	101.585
27.1039251744228	14.585261284252	94.8608379982919	32.802	15.473	97.861
27.0920150427471	14.536000612338	94.4769020565823	33.322	12.581	100.045
27.0791209329505	14.4826690328249	94.0612381358684	31.737	12.885	98.954
27.0655991881373	14.4267408272237	93.6253366146119	28.753	12.949	99.196
27.0513664111857	14.3678708790825	93.1665075920121	29.515	14.028	97.711
27.0365628569739	14.3066395019251	92.689274225385	30.202	14.791	95.605
27.021441314647	14.2440925025931	92.20178776752	30.202	13.231	95.497
27.005924418753	14.1799098744414	91.7015538886173	27.419	11.298	96.166
26.9897549654204	14.1130272985261	91.1802771211237	29.261	11.425	96.137
26.9726579602914	14.0423072629094	90.6290921629468	30.527	11.313	94.769
26.9547393619349	13.968187961308	90.0514143745405	32.412	12.353	94.929
26.935268429575	13.8876461502097	89.4236813702366	33.322	12.321	95.076
26.9125731987392	13.7937642631131	88.6919790153163	34.849	13.393	93.121
26.8856752671914	13.6824931848965	87.8247494015226	31.697	14.433	93.007
26.8550868199643	13.5559531257546	86.8385170316569	31.547	13.203	92.722
26.8182808446178	13.4036889456747	85.6517961086825	32.737	11.541	92.508
26.7565266093985	13.1482015438195	83.6605737697726	31.957	11.541	90.999
26.5833094760128	12.4315221141057	78.0749011957595	32.282	12.126	74.654
26.4632113202993	11.9346796520111	74.2025772453621	37.452	12.758	72.01
Route: 9 Length: 179.412062060047 Demand Met: 1000					
21.9495491299628	13.9112842191613	71.1443613393193	30.531	18.664	72.004
23.184963302077	14.6942704810092	75.148670362999	33.261	18.537	71.995
23.2619702831663	14.7542712322425	75.5559117824098	32.182	16.632	75.383
23.3357519809645	14.8117591499256	75.9460985379853	32.087	14.661	75.705
23.4077766020843	14.867878038738	76.3269930788032	32.477	14.433	75.823
23.4786350413739	14.9230883005712	76.7017205459573	30.787	14.466	78.121
23.5476583764602	14.976868762335	77.0667440109781	30.202	14.271	77.775
23.6156928092718	15.0298787357228	77.4265383585246	30.787	12.906	76.252
23.6840796475415	15.0831632862228	77.7881963694208	29.975	12.581	76.539
23.7529560508318	15.13682926633	78.1524432113128	31.047	11.313	78.28
23.8211411384963	15.189956615633	78.5130344021352	31.437	11.541	78.241
23.8888791212512	15.2427356018564	78.871261283182	32.802	12.126	77.71
23.9566665892208	15.2955531342251	79.2297498910261	32.835	14.173	77.958
24.0243804626876	15.3483133102437	79.587849265468	33.062	15.473	78.089
24.0920428811436	15.4010333775728	79.9456764548843	33.071	16.187	80.531
24.1573410505348	15.4519113454698	80.2910012532482	29.975	13.621	83.535
24.2204514256763	15.5010846901728	80.6247565299813	29.388	13.838	84.576
24.2812483111546	15.5484554704004	80.9462776022551	31.015	13.556	83.741
24.3400509667887	15.594272444703	81.2572528271943	32.152	12.353	82.503
24.3975104390937	15.639042880929	81.561125046211	32.672	12.353	81.337
24.454561634956	15.6834952106279	81.8628382410296	34.135	13.166	82.509
24.5091847155585	15.7260557025057	82.1517114893948	33.907	13.296	83.348
24.5614764335902	15.7667997402522	82.4282563599751	34.135	14.466	84.176
24.6109458261076	15.8053447829972	82.6898764622154	34.135	14.986	84.727
24.6577315545609	15.8417988612717	82.9373049682988	35.42	12.949	84.367
24.6577294915543	15.8418008030374	82.9373116275107	34.135	12.646	86.486
24.6577274285544	15.8418027391028	82.937318254838	32.737	14.433	86.615
24.657725365889	15.8418046742981	82.9373248768078	32.412	15.246	88.024
24.657723302261	15.8418066097935	82.9373314996514	32.542	15.473	89.387

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.6577212375265	15.8418085465557	82.9373381261266	30.722	15.473	90.573
24.6577191713121	15.8418104845569	82.9373447585684	29.975	14.921	90.476
24.6577171032647	15.841812423971	82.9373513955366	29.975	12.841	90.667
24.6577150316801	15.8418143666882	82.9373580458222	30.34	10.917	88.584
24.657712954903	15.8418163143191	82.9373647028612	23.482	9.52	92.151
24.6559628390745	15.8531055934884	82.9359112811394	25.705	12.123	93.472
24.5399780041361	16.6013463987324	82.8396294233793	25.832	16.949	91.413
24.4209578149915	17.3691687735679	82.7408278427206	24.943	18.791	91.664
24.302059908206	18.1362015241767	82.6421281338497	25.895	20.759	90.426
24.1859722422681	18.8851031839184	82.5457621267668	20.561	25.776	90.646
24.2182565585539	18.9305612982458	82.4016700621847	26.149	23.172	91.657
24.2547452768694	18.98193951372	82.2388125883902	27.546	22.537	91.326
24.2953511295938	19.0391148013134	82.0575794824012	28.245	22.855	90.204
24.3369528744351	19.0976919999049	81.8719019765092	28.054	22.918	87.821
24.3780854719376	19.1556083689561	81.688318658247	32.118	27.3	81.725
23.8981404905698	18.7784812457135	80.0800757315286	28.816	21.902	78.963
23.4060271533924	18.3917925495029	78.4310578320817	27.102	21.648	79.965
22.8559680551216	17.9595716735476	76.587869677367	27.737	18.664	80.683
22.1271813737617	17.3869117981026	74.1457842716034	26.721	18.283	80.536
20.4566521420141	16.0742588605696	68.5480198115176	24.943	23.68	69.938
Route: 10 Length: 136.415737389309 Demand Met: 1000					
21.2193215231031	11.0257643222531	45.0499210818886	31.015	13.296	40.037
22.2812905451542	11.5942701681806	47.4574103064154	29.642	15.108	43.621
23.348132221066	12.1653936096062	49.8760159011669	28.626	10.091	52.872
24.2061358698913	12.6247195482378	51.8211745133312	30.658	9.71	56.048
24.8111985600128	12.9486371365543	53.1929087032954	32.944	10.536	54.126
25.3211190672647	13.2216210083735	54.3489511040121	36.119	13.139	51.404
25.5106503703268	13.3230865317036	54.7786264999771	34.135	14.206	54.088
25.6903172239872	13.4192681800177	55.1859301352676	33.322	14.141	54.817
25.8621298721833	13.5112430985452	55.5754215462412	32.69	13.52	54.423
26.0300986016052	13.6011592801314	55.9561951220846	32.607	14.661	52.963
26.1977126588473	13.6908847414598	56.3361626465409	29.975	14.401	55.717
26.3641713592951	13.7799909992383	56.713508797516	31.275	14.173	56.999
26.5269586822161	13.867131432388	57.0825302979418	31.827	14.661	58.532
26.6838715335144	13.9511265710114	57.4382328887911	32.672	15.246	60.724
26.8306722632148	14.0297077742272	57.7710101321035	33.095	14.011	61.011
26.9691989662783	14.1038593830126	58.0850296612364	36.944	13.012	57.936
27.0961485745802	14.1718138883484	58.3728064333001	33.387	11.313	58.128
27.2224464911228	14.2394194095474	58.6591052943422	33.96	11.234	59.829
27.3458305460929	14.3054649042096	58.9387980837696	34.849	11.996	64.173
27.4576129365658	14.365299599942	59.1921903806889	35.484	11.425	66.484
27.3291539804231	14.4726103432873	59.166285598787	32.055	9.837	66.681
27.1900819602342	14.5887901711197	59.1382421874152	31.437	14.433	67.041
27.0459077856202	14.7092327754193	59.1091700910406	30.202	12.711	66.602
26.8971218085849	14.8335289283559	59.0791683891142	28.753	13.457	65.491
26.7459049076906	14.9598559165484	59.0486763815087	30.202	11.996	64.142
26.5913746612611	15.0889524724395	59.0175171546851	31.015	12.516	61.408
26.4344403506101	15.2200593282926	58.9858743541506	30.202	12.971	61.507
26.2757166561713	15.3526627854636	58.953871821098	28.372	13.52	60.757
26.1156459142319	15.4863923074118	58.9215980855673	25.832	14.219	61.701
25.9544360577128	15.6210731356951	58.8890943463826	25.07	11.615	69.179
25.5122108017255	15.9904998496366	58.799876550137	21.831	13.203	64.85
25.0731109527846	16.3573019963399	58.711287342648	19.418	13.901	64.222
24.8108755254818	16.5763292459627	58.6583638269778	18.466	17.838	58.207
24.505959544167	16.8310247390017	58.5968435890819	17.45	24.188	63.322
24.5059595968001	16.8310246561994	58.5968432654617	18.974	24.125	61.119
24.5059596534767	16.8310245715494	58.5968429373568	26.086	24.95	59.469
24.5059597086105	16.8310244854244	58.5968426083665	28.499	25.141	57.61
24.5059597623517	16.8310243976781	58.5968422595706	31.356	22.347	59.353
24.5059598134645	16.8310243099969	58.5968418962474	34.087	18.918	64.082
24.3149562849995	16.6998442406767	58.1401297191564	30.594	17.076	65.103
24.0583695274694	16.5236222004291	57.5265991265221	27.356	20.632	65.916
23.5414384714081	16.1685925539322	56.290549728689	24.943	18.346	64.008
22.7719946880269	15.6401328640302	54.4507008782806	25.197	18.918	59.354
21.7385507044347	14.9303526840944	51.9795836999953	24.308	16.441	56.035
20.4082202713029	14.0166581032058	48.7985552120827	22.085	10.853	55.182
Route: 11 Length: 156.604465351154 Demand Met: 1000					
20.84504046274	15.5871793683558	47.6531716419349	30.785	16.949	44.302
22.8906506347241	17.1168409623319	52.3296464090065	33.642	18.346	49.307
23.3056851147351	18.5547771226783	57.8482322032059	28.88	27.3	58.991
23.450225420866	19.0555750922271	59.7702263837694	27.102	25.966	59.543
23.5802770901736	19.5061823612166	61.4995887944152	25.07	27.744	59.542
23.709289903073	19.9532007943598	63.2151879811059	22.022	28.443	62.892
23.8271325825925	20.3615198356492	64.7822597094172	22.466	28.887	64.369
23.9368919924266	20.7418421116422	66.2418821542993	18.72	30.665	66.986
24.2679076313044	20.5323536744736	67.2459248976908	17.64	27.49	72.733
24.4797188167682	20.3982934925953	67.8887147596887	19.164	24.696	74.306
24.6791521758294	20.2720574853273	68.4939237069333	21.958	29.395	74.461
24.7983035368356	20.101723767467	68.6730576180792	24.562	26.982	72.259
24.9189300534522	19.9292798349306	68.854409448782	25.832	27.998	69.522

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.0439629399722	19.7505329964854	69.0423879888551	27.546	26.982	70.094
25.171662566671	19.5679704922961	69.2343778516785	31.356	26.03	76.034
25.1841139946638	19.477138225441	69.2650366477936	26.911	22.601	75.564
25.1964952287886	19.3868172802573	69.2955221677555	26.848	19.743	76.594
25.2087041840614	19.2977538333488	69.3255828593882	27.483	19.616	74.587
25.2207971349043	19.2095368717237	69.3553576127881	29.705	19.426	70.279
25.232899064802	19.1212532620127	69.3851548539567	29.261	19.172	68.315
25.2450988819859	19.0322557018374	69.4151930508708	31.991	17.203	67.188
25.2572958609744	18.9432770535385	69.44522504243	31.762	15.473	67.554
25.269392338728	18.8550309334074	69.475010048033	31.307	14.661	68.868
25.2813593752745	18.7677292356924	69.5044764908729	31.356	16.251	69.04
25.2933569757988	18.6802035447346	69.5340185218542	30.785	16.251	71.611
25.3053921115578	18.5924027074452	69.5636531506252	29.197	13.52	74.598
25.3172512619086	18.5058866926697	69.5928538264688	28.626	11.234	75.345
25.3285099117709	18.4237534369672	69.6205750665814	29.007	10.282	76.107
25.3363013350999	18.3669191808295	69.6397574595676	30.787	12.646	75.914
25.3438639703358	18.3117508086333	69.6583773261103	32.835	12.613	75.794
25.0682016288764	18.249112020317	69.501054481067	31.502	12.126	74.715
24.7127450990911	18.1683369038155	69.2981894695298	31.015	12.776	72.117
24.3203789907124	18.0791721988967	69.0742580908193	31.307	11.313	71.461
23.8270218181866	17.9670522392897	68.7926843808504	28.816	12.568	71.763
23.2919786638689	17.8454578571917	68.4873170151299	22.974	17.711	70.862
22.7606757131627	17.7247134599465	68.1840845635194	23.482	22.41	74.725
22.1808447636578	17.5929343144868	67.8531478226512	19.863	21.331	75.529
21.5677631288257	17.4535963600204	67.503229036666	17.45	21.902	76.475
20.7002337313714	17.2564338203788	67.0081086980822	11.862	17.965	73.909
19.7941429230156	16.5010862776969	64.0749904555276	13.005	20.061	68.646
18.3693402142094	15.3132783191542	59.4626496098868	17.323	12.504	65.716

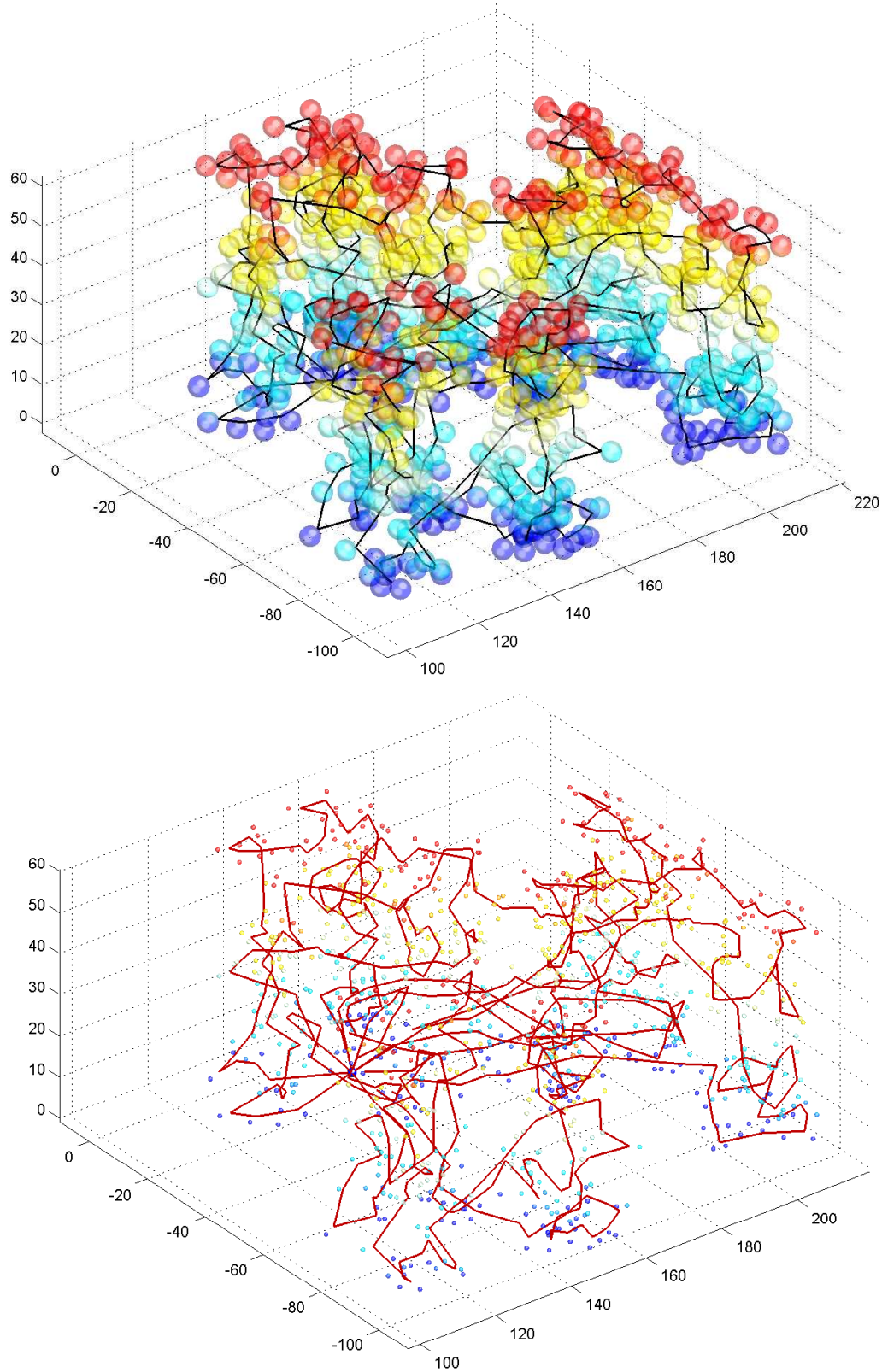


Figure O.88: $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Euclidean, Length = 3580.9338122

Table O-91: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Euclidean

Total distance: 3580.93381220446 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 526.055777478447 Demand Met: 9998					
37.2713172444655	32.9762419931416	5.57903603231344	37.4272	33.8061	3.3013
23.0736804463567	61.4575117698894	16.9679881006887	23.9369	61.5866	18.0383
22.0625951380273	63.4858056379772	17.7790466233684	22.6268	64.3936	19.9605
17.1295612512211	66.8715799054933	13.3288465632752	16.7224	69.1113	14.1768
14.6461102731355	66.251464756114	9.64808218546949	14.2239	63.9607	10.3191
13.8567471479304	66.0577390563765	8.476168666791	15.1112	64.361	7.2726
11.9091131114158	66.4740125963893	6.95414971784338	12.0877	66.3858	4.5331
10.5984178371452	66.7884332683041	7.67754291462816	9.6606	65.5604	9.552
8.98422567501376	70.0350972003341	5.89876439065697	10.0835	69.723	3.7551
8.62486720593745	70.6390654200022	5.71282130421997	9.00020000000001	73.0359	5.8372
1.76872873428631	64.8282029956497	2.56506058532408	0.483800000000002	63.8626	0.7436
3.58093462641972	65.5665186921846	11.3310330798246	1.76609999999999	66.5446	12.6159
8.73521872654928	64.0235202021939	14.9147276451938	9.15690000000001	61.6426	15.1483
12.3361968364889	67.3259272587349	17.5344062319173	14.5018	68.1646	16.8217
12.0908149893266	67.3989682389701	17.9502759118098	13.2613	67.7948	17.1077
11.462156068819	67.5861061557765	19.0157445139166	12.0587	67.8257	18.5408
10.2290056679017	67.9531799895012	21.1058196346232	9.1707	70.0865	21.5855
10.1761199848681	67.1615342333332	21.7787655410617	12.5389	66.9051	22.2814
9.59027864219051	66.0157012178563	22.6918303239218	10.5042	66.7806	23.1982
8.31902046893026	63.5292673456612	24.6733504928827	7.6803	61.1857	24.6436
8.50073785366789	66.7811859966488	27.1032421664181	6.9842	66.7632	27.251
8.69294509237443	70.2208667883377	29.6734355218794	7.0214	70.8048	31.3366
8.69294509237443	70.2208667883377	29.6734355218794	8.3117	72.2049	29.6247
9.70862953995332	70.8637871199035	29.4484655252467	11.6475	70.8021	30.9107
9.56399658173106	73.5856887794093	25.3515794887225	9.9143	75.8382	26.191
9.07504327634736	74.3374649645974	20.1864436566883	6.65640000000001	74.2265	20.3804
8.68179494292423	75.0653222183046	15.2041575798723	8.0472	76.1743	13.1381
8.6817952840253	75.0653218870137	15.2041534364408	7.5677	74.3816	13.1566
12.6910471846094	77.2077754657328	18.6223403060776	13.7649	76.0563	18.1156
16.9996835275943	79.5102276672384	22.2957988597351	17.9606	81.6588	21.6946
19.4880008567459	76.2544014579125	28.4001444570371	18.7356	77.2891	30.4652
22.1229628737822	72.7310436917929	28.973775320727	22.0857	71.4539	26.9077
25.3882138711471	70.1307164261122	32.4226700700444	26.4747	67.9787	32.7219
25.1537438503023	72.4793811255134	33.6002201597663	26.2205	72.9044	33.175
24.9207141735523	74.8134438934432	34.7704583848553	22.8762	75.7017	33.805
25.515175902707	76.3228068998441	36.0648949847551	24.4797	75.354	37.647
26.1833562375529	78.0193571427976	37.5198614312071	24.3218	77.9732	38.2426
27.3236116910716	80.9143445452396	40.0025771219023	27.1736	83.2653	40.5956
29.2286586381113	76.5396216822467	41.0498820191723	31.105	77.2121	42.4385
29.7613869366584	72.0673356795284	41.1101420249205	31.7515	71.3679	39.9054
27.1141597623488	67.9410459534034	43.1643226100097	26.4833	65.6457	42.68
26.8753885468499	69.8229767259561	45.0227269515657	26.4587	69.6793	44.9112
26.3762164283941	73.7590564362378	48.9098203892533	24.7401	75.4523	49.5075
28.2862328649699	73.1049613780235	49.6454142688856	27.6433	72.5657	51.9251
30.9491816796248	72.4564801699175	49.7943131733511	32.2488	71.8762	47.8257
31.653298154882	72.4875943967317	51.4010904493161	32.697	74.6737	51.2201
33.3032921092343	71.3892696173019	56.569584763808	35.1535	70.6086	57.9365
27.9527889654384	73.2355870196633	56.6554496017192	26.9783	71.0141	56.5271
26.3708216922619	74.0845663974919	56.697945979799	24.1578	73.3792	57.4094
27.2733257974344	76.3507854156636	55.7262813073183	25.3366	76.538	54.326
28.7605172435398	80.0826019864548	54.1268606290676	29.376	80.5861	55.9809
33.0205615547227	90.7719795495596	49.5458144480299	32.1756	91.0244	47.2823
35.4675469088625	94.2402325091625	50.4871186114865	36.1694	94.3523	52.0418
36.0344174027957	95.0435615222213	50.7052366771044	37.1788	95.0118	52.8478
36.2680438802711	96.3691944735077	49.7692197062659	35.9551	95.9225	47.402
37.029323788308	99.3538641284117	50.3546690378461	39.196	99.7694	49.3378
36.145254382089	101.902348132018	51.6725462879159	35.4006	103.6799	50.1937
36.0154278103307	103.066202493666	57.4068663154562	35.2228	101.4244	59.0123
36.7955207763086	105.282639654823	58.1243778192803	35.7224	107.36	58.7833
41.1853904768665	103.829321745006	57.6905451230805	42.4716	105.6496	56.7244
43.7345960572425	100.696085771727	58.293347370051	44.7902	101.1589	57.6534
44.7227469202481	99.481499818565	58.5270970770144	47.126	99.3914	58.8698
43.9337077702273	98.6667394233546	58.4812131301096	43.0828	99.6317	56.4863
42.3116284977352	96.9919414936955	58.3867204259751	42.0978	97.503	57.9578
39.1124465679093	93.6886674173092	58.2005140408871	39.6285	91.4521	58.9959
36.2892144403419	94.3193103620854	57.0562885918092	35.4152	92.5489	58.019
34.4745252312117	94.7246807266994	56.320740270943	33.6244	92.4492	56.3457
31.8559867024772	96.1114287243555	55.1394951053237	30.7482	95.8761	57.2879
31.1452147394095	96.4911648450436	54.8084678494131	31.4281	94.9219	54.3744
29.7415742562832	97.2410409086824	54.1545297783382	29.7849	97.5299	53.9895
28.5599255794127	97.87232136336	53.6040726710042	26.9511	99.1097	54.9389
28.5599112895154	97.8723021513637	53.6039047740378	26.55	96.735	54.3574
28.3135983195575	97.3979270434019	47.9849259301418	26.6904	96.1713	46.6576
30.5417667651718	98.935524380529	47.0613193357215	32.4952	97.9758	48.1403

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.6792698964983	101.422705269766	45.1973205505402	29.8552	101.3038	43.5974
34.1973613727233	105.59547436681	42.6518846433699	32.8361	107.2479	41.504
34.8903276106448	105.670827670244	42.644331698408	35.3466	107.7036	41.395
38.4388498279115	104.212104069841	43.7631331474473	39.1965	105.4524	44.823
39.49504834378	103.77791190823	44.0961537332763	39.3246	101.8921	42.5744
41.4425744061692	103.137319306665	44.8303276117768	42.0156	103.5929	44.0945
43.0109825053118	102.621439903476	45.4215769207643	42.8352	101.6931	44.9574
44.4929422948966	102.133995219877	45.9802346837356	46.5537	103.4177	45.8992
43.7744914989398	96.1266778785699	48.4397837063489	44.0393	95.7757	50.8289
43.003548903299	93.3653873229611	46.346259090034	41.599	92.4813	48.0171
41.5058710259209	87.999874919308	42.277707864063	42.6808	88.2098	40.1619
40.5864877340317	86.5945885184431	42.2859075525692	40.8939	84.3555	43.1765
37.2899493091866	88.6872301458743	39.963345895479	35.4073	87.2216	40.4202
34.6702207704343	92.8414007071823	36.4487160809394	32.8593	93.0881	38.0081
34.4789666667266	93.1446386706424	36.1921563808273	32.2034	92.5655	35.5696
35.8239515125153	97.0709492356492	34.4790119729565	34.0464	97.1856	33.2284
36.6286293210512	99.4198230696232	33.4542467023096	38.189	100.3805	31.8594
35.8493297584817	99.6936103922989	34.1678912350774	36.8108	99.4487	34.5912
34.6172776167379	100.126468869672	35.2960579060677	33.8351	99.3235	37.4512
33.6535326231054	102.995309438227	32.8004510358735	34.3074	104.3145	33.9426
32.9502383299925	105.088853579738	30.9792554305489	31.3011	106.2109	32.3658
32.7437272569663	107.400956004232	27.908634532392	33.1638	109.6815	28.6324
31.6464034629224	107.438420852187	21.277710729969	33.1686	108.6172	19.7963
29.9857941301777	106.428979558626	20.4934369053646	28.1717	107.4546	19.2451
30.5690973179759	98.8555630351249	22.2274804682618	28.2891	98.27	21.6276
31.0156961971392	97.3872438984357	22.6689571245443	29.1897	96.4145	23.036
31.1756085204257	96.8615269355442	22.8270423842857	31.7064	96.988	25.1942
31.6860746497729	93.7596987799517	21.9304842611039	34.0163	93.2553	22.3961
30.9720949639761	92.3141091617161	21.2534948545417	29.5221	90.7635	22.4343
31.842087609279	92.0655387291303	18.3698703545523	32.6009	89.9531	17.4409
31.7208313444577	94.5396522053555	16.7307472259766	31.6916	96.8159	17.5787
31.6700133541507	94.0247355192915	14.8941458262725	29.3468	93.7461	14.2413
34.5992422885133	93.0194922944097	10.8609634324592	35.2297	94.8683	9.4168
35.2183991766853	91.313799322992	10.4250834980744	34.7819	91.1147	8.0437
35.6711216731332	90.3706891988524	10.6898544188579	37.9917	90.5379	9.9912
34.7041486169145	81.2213303948357	14.713181124175	34.9317	80.2335	16.9208
33.0177070303039	78.8910211082585	8.04792937422419	33.517	80.8699	6.7304
31.2689181764945	75.3444243689724	4.02197614214855	31.4187	76.5703	2.7936
30.3194219102828	73.4187681548169	1.83607264280209	31.0449	71.9995	0.0029
30.3194172227738	73.4187680415392	1.83607341373518	31.4906	71.3219	1.4719
26.9861375484159	75.0922772864589	2.58848770070436	26.6151	77.1467	3.8306
26.1150509441196	74.3520469400763	2.0550504673088	25.4767	75.481	0.001
25.3760250365833	73.2320723106201	2.09189675211646	23.527	73.6169	0.5641
25.2065289362113	72.1195647020518	2.53525511194857	24.5076	73.115	4.3052
24.8499917828535	69.779662672379	3.46779292619152	22.9431	70.0987	4.2047
24.7267633145598	68.9710089803282	3.79007671629172	22.8228	67.5784	3.2098
28.741086154199	67.3585779518832	7.29113164369582	28.241	67.9653	9.5896
32.0026181023227	65.5825626107105	6.99519828275312	33.839	67.1668	7.1332
42.1335525299619	38.8368096004858	3.57172774489567	44.3651	39.5082	4.2576
42.8480386213794	36.5110324666191	3.23384612410927	42.8212	36.4305	1.5446
43.2876807595875	35.0799523462584	3.02595143886235	45.6407	35.658	2.8521
45.3541646463764	22.6455327573801	1.39798443474296	46.7163	23.0055	0.3229
Route: 2 Length: 396.37132423132 Demand Met: 8817					
26.846962922581	19.6150878004192	1.48573307025669	27.0312	22.0371	1.4535
21.7837201827144	18.5522582792303	1.87886080392872	21.2889	20.2133	0.1771
17.3667272315546	17.5884263459525	2.25796929006324	16.9397	16.157	0.3423
10.1883879197106	18.0642030651001	5.85275704373319	7.8039	17.6061	5.7787
16.0954210378736	20.9484719799987	9.63692219392037	15.0509	21.8739	10.7741
19.266632865951	22.4969076412951	11.668470122937	20.5046	21.2685	13.3595
19.8286833324957	24.934654325071	10.9684857534534	19.8821	27.2321	11.7559
20.5803222164355	22.5083959202448	7.68157131860812	19.6457	23.2311	5.559
22.8117017141875	18.8974249453926	7.64607925419154	23.3217	16.9506	6.2856
23.2420482942427	19.8577110301398	9.63693411486172	25.2224	21.1268	9.0297
23.1838626597487	20.0889868799599	10.4876165272936	24.0847	21.2619	9.4135
22.8594824514257	21.378486754885	15.2305889132948	24.5729	19.8583	16.0395
21.8026234703449	23.2864068423382	19.4736259895251	20.5322	21.5891	20.6595
22.0742302163874	26.722872747847	22.2349698908155	22.8581	29.0039	22.5241
21.2056526473263	25.3005197763093	23.0260669778473	20.8129	26.0745	22.3222
18.1064645024598	20.2254330884911	25.8488581208643	17.2669	18.1061	25.0094
18.1108451512044	20.6732069743886	26.7942810141535	19.0397	19.3917	26.8913
18.1201625748531	21.6247523091686	28.8033692351409	18.4916	22.031	28.1174
18.14468158127	24.1281456143479	34.0891305337657	19.5225	24.6717	34.6116
18.1494770605033	24.6177919104758	35.1229643747877	17.7323	26.9057	35.8248
18.8255323642609	22.2239294474469	36.6386780189816	17.3215	22.815	38.4524
19.4235899236322	20.4696579170646	37.5814374493423	21.1889	21.267	39.0474
19.3859176894666	17.2155158693369	38.2636561578008	18.1963	16.0602	36.4885
19.5008250745554	16.9603427454731	38.5193143650543	19.6468	14.5775	38.07
19.987413263981	17.8101063075933	40.3278321818313	20.7311	19.0512	39.2565
21.1728372541092	19.8803778364429	44.7338155715465	19.3676	20.9011	45.1036
21.4152025842257	20.3036685897809	45.6346767461773	21.7951	21.835	45.5134

Solution x	Solution y	Solution z	Original x	Original y	Original z
21.566946058482	20.5686975565801	46.1987118196061	19.4151	20.4264	46.5071
21.8508735282032	21.0645995431956	47.2541116124354	22.5923	19.795	49.1879
21.4044628270804	25.3909515936565	47.228352280352	23.1689	25.59	48.8728
20.9630672130862	29.63807413585	47.199990455437	21.3113	31.7798	46.1078
19.2177226925436	27.0015246362818	51.0313541280647	16.9754	26.2994	50.4148
19.4296168653771	26.5408965417008	52.1766549300226	21.4132	25.3225	51.4824
19.8291908013371	24.7722126726921	57.6576504524877	18.7218	26.0511	59.401
21.4323718512724	22.2153216497538	58.4311391700746	19.4476	21.0876	59.2618
22.3503955573882	21.0017599436779	58.7696304920174	22.0389	18.6688	59.3708
35.0517690891451	31.0919444371389	56.440446986657	35.5392	31.6783	58.7469
41.3340844088546	35.8362562716589	52.3237092313396	40.9959	37.9409	51.1587
45.7833966829433	33.3715991544445	52.8301342763665	47.4903	33.2139	54.5514
45.3949426241125	32.2233535328831	50.1440001648544	44.6028	29.9319	49.9927
45.5586000774262	32.6890307724683	49.3363021032379	47.3356	31.1656	48.6863
46.0353379632494	35.1762719706559	45.5878586378238	46.003	37.4534	46.4333
46.1976269753698	35.3610723921789	44.1522817523402	44.7872	36.1398	42.3342
47.0165901797115	35.0733322908855	44.2239229293943	45.9581	33.5048	45.1742
48.9910685574816	34.3797050918182	44.3965590600388	48.6326	32.1618	43.4727
50.3164035670098	34.2577613998561	44.6433058178639	51.473	33.7115	46.7085
51.0874397834225	34.6730686461401	42.7421462588377	51.7623	34.8081	42.2217
51.5176569560553	34.9048003388802	41.6813720689965	50.1654	34.298	41.7388
52.371777957941	35.3648433859152	39.5754090117549	51.6292	37.4529	39.3047
52.5732590809229	35.4733826740008	39.0786134746421	53.589	37.6567	38.7584
52.5683442972806	35.1643659767592	38.6816829641596	54.3132	33.4794	38.814
48.8564323955563	34.5394435027988	33.0776276566951	48.325	36.101	31.2943
48.0853715399208	31.6727133461063	33.5400195695044	46.9054	30.8841	31.5685
48.1318097477272	30.8787449614768	34.2318290479645	46.4115	30.3033	33.5708
48.1885427798441	29.9084057562187	35.0772898851186	46.684	28.1154	34.4272
48.5828237394892	29.7182035351692	35.7697472518675	47.9603	31.0225	36.0363
49.112955512973	29.4624249449898	36.7008255936792	51.0819	30.8837	36.7669
49.1454830422049	28.8934704873638	37.5492794899392	47.9812	30.2306	39.2099
51.5511845654338	21.4513935962965	41.9931549535172	52.1655	19.1446	41.5432
51.3274447520164	22.6273779654887	43.466782574653	49.1449	22.3659	43.2644
50.8468056566268	25.154524399286	46.633613095105	48.493	25.186	47.2334
53.8830033336035	28.939056449758	50.4795382018477	52.7074	28.2489	52.4902
54.248622556387	29.3540033507154	50.7584849958923	53.8796	31.7093	51.2249
55.9001037257388	28.1292449179627	51.182909164628	55.1607	27.7715	51.8295
58.288048131485	26.3583639028843	51.7965844308706	58.9981	26.6128	49.6223
63.4869839281095	22.5029297528113	53.1329478062116	63.3795	20.1125	53.5518
68.3503081357468	25.676677565178	53.1572578360289	70.5469	25.0661	53.9959
67.9480726372778	26.8838977079612	52.5601266788934	67.8857	28.9512	53.8343
66.3012173320823	26.7672475079341	46.4380300342487	68.3676	27.331	45.292
62.3535009989899	26.007946116953	41.9043322761868	61.643	23.6955	42.1255
61.9588353243101	26.2670623522119	41.2914124468008	59.5552	26.5288	41.5263
63.44222071625	27.119720695371	38.0881132756819	62.9268	27.0211	37.7555
64.8238165573249	27.9138654676013	35.1046437026783	63.8119	26.0212	34.0563
64.9992221916767	28.0146850885819	34.725833162168	63.132	27.7543	33.1939
66.9175239781563	28.7419932089787	33.1538010406736	67.5765	27.7962	32.158
67.530302191389	28.9742485102349	32.6516637301039	69.5886	28.6002	31.4169
65.6844758638648	30.3023203682569	33.3703554662501	64.1748	30.2745	31.4674
64.6734895581706	31.4930188040175	34.8001117385155	65.4552	32.6167	36.7679
64.6734895581706	31.4930188040175	34.8001117385155	63.5739	32.9982	33.2424
63.6874223661343	32.5910157590478	37.1258194201877	63.8645	34.3723	36.4179
62.8989427618009	33.4689891106764	38.9855768459631	63.453	34.6286	41.047
61.4213272602474	32.6862322243196	37.8664560985838	60.1802	30.671	38.4138
60.9428993879575	34.4832052037615	35.2585289449491	62.464	33.4003	33.7046
60.4954242188983	35.3497670009353	34.5503827249689	60.9493	37.7343	34.646
58.8371943151452	34.0105563375005	32.7943675257531	58.4334	33.3219	33.0094
57.7643133799506	33.1440832652695	31.6582336382318	55.9275	34.3566	30.6301
58.1001652947168	30.5922555440377	31.0537569885856	60.463	30.4795	30.5011
57.3015204326598	28.0917781330706	30.7141860843206	58.5931	27.1316	32.5338
56.7691187729878	27.0267274886357	30.3350646190633	55.4854	26.8201	32.387
55.9826370440117	25.2881184743403	29.5673933634085	54.6523	25.2022	31.3259
53.9259521942138	20.7415454670622	27.5598891953372	55.9782	19.9329	26.5423
51.7440414241588	17.8294269333896	26.510312004078	49.9475	19.2284	25.6639
51.3607656326316	17.1089022482997	26.3249665021824	51.6732	17.1776	23.9169
47.8371374363855	10.9003401117884	26.6728831299424	49.0558	10.279	28.6803
45.7860928868799	7.4257450499185	26.7683638003145	46.0043	6.8606	27.4465
44.7545948636338	5.6782894268392	26.81640631225	45.0418	3.8658	25.2247
42.9330176938308	5.635119421923	28.9898811006455	44.0031	6.0986	31.1209
37.1748429456525	4.68191931133474	29.5069647169323	36.2059	6.8965	29.7476
36.281547876031	3.96985741735519	29.5506621797237	36.4235	4.5159	28.6582
34.9911236768147	2.94126164526109	29.6137870333334	33.6792	4.7017	30.2163
30.6102036147095	-0.550619523223626	29.8280978392328	31.1128	-2.8096	30.5667
25.9232843127238	0.305893606356248	28.7394715418244	24.5208	1.7631	30.0851
25.5517925296267	-0.203363417848696	27.8499026715146	24.8641	0.1355	28.7608
24.8655591144689	-1.14407124949695	26.2066639662305	22.6294	-1.9579	25.7184
32.59546739173	-1.53875175482954	20.9614643358224	32.3564	-1.4633	20.5286
38.771991142403	-1.85410199081188	16.7703255558089	39.9467	-2.3317	18.5214
43.0943916729133	-2.07477571234126	13.8373127695044	44.8479	-0.9391	15.0769

Solution x	Solution y	Solution z	Original x	Original y	Original z
45.1198494246719	-3.63811711568805	9.56801122356193	46.0937	-5.8176	9.1179
44.3422482422505	4.10878398681343	3.185533431654	42.4139	3.5597	1.814
Route: 3 Length: 410.728644885706 Demand Met: 9785					
47.8229166032719	9.47033968447841	3.92308329934962	46.5714	10.174	4.4604
48.9177878004288	5.53430446537202	10.1106398527121	47.0712	4.3382	9.7807
49.1252248264059	4.7885825421429	11.2828874955322	48.4975	2.4432	11.2037
49.1253349420124	4.78867646207777	11.2831398462295	48.302	2.6164	11.9932
50.2008478857461	5.74482922732785	13.6921565112249	48.7027	4.8736	15.3944
53.8866945955121	8.52436366871039	16.4876083755275	53.1154	7.9184	18.71
59.8939463528325	13.0750297704324	18.709602044449	61.7542	11.527	18.9198
64.214850105677	22.7530841126551	21.3425617847561	62.5649	23.4331	22.9907
66.9673115012283	26.5152574234818	21.5624380847227	67.242	26.9141	23.9429
68.6511074055328	28.8017739933004	20.1964593173925	70.1037	27.3839	19.7642
72.1248858495117	33.5190559087492	17.3782087823586	72.6191	32.6684	16.6889
76.6408253907513	39.6516115288062	13.7143808453774	77.5882	39.4219	14.211
79.2473303640205	43.1911655171064	11.5997495347785	77.8794	45.0468	10.8339
80.7213525412545	43.3876042828171	11.3157775335502	80.8076	41.6004	10.0065
81.6876598454211	43.5163763794614	11.129611950194	80.8872	43.1227	9.5119
85.2836709974295	43.9955110550042	10.4367621157827	85.9182	41.843	9.5066
89.1345655830951	46.2436873499259	10.3213951783754	89.5287	45.4109	8.5583
92.7518411118455	48.3555369989178	10.2131119215298	94.5726	47.3613	8.9492
93.4308790656745	51.6161667866143	11.8765806855697	92.412	50.9961	13.3675
94.2692709251585	55.6418048877438	13.9303553868653	92.8209	56.9207	15.4027
97.8246978615119	56.4890448776742	12.7452114895694	97.3108	57.82	10.7791
97.8247888997363	56.4890546235342	12.7451979652862	98.9521	56.5952	10.596
100.104732309653	56.7665784139707	17.5795318042007	102.1595	55.9791	16.6639
100.781347678569	56.8489805328064	19.0144289878757	102.8738	56.4102	20.1678
96.2125130020971	58.5016502832352	19.7844512522515	94.6877	57.1733	21.1304
95.0860204244937	61.5681366206392	18.4338562222001	94.5987	62.0376	18.5629
94.4396893034196	63.3276099666233	17.6589133933125	93.5538	62.1822	15.7085
93.0710954117512	67.2340122639991	16.0632042802348	93.0933	68.7697	14.1811
92.3681869357979	66.8603744530777	18.0832511683528	92.0851	66.8651	17.5763
90.607257229556	65.9243166243912	23.1438625909862	88.7937	67.447	23.6857
91.1359119625003	64.2179893181526	25.356684197627	92.749	64.7326	27.0986
88.7379166897555	60.5794232588914	25.2832434835057	88.0225	60.7529	26.1198
86.9424719621114	57.8551293527604	25.2282424108984	87.1149	58.1702	24.9275
83.1133955972743	52.0449961455451	25.1109827169062	83.5076	51.7826	22.7284
82.2923680923402	50.8175416450186	25.1368109593997	80.7698	50.729	27.0276
82.2729373607	50.5743266259129	24.9570076886056	80.3964	49.7264	23.6683
87.0937196311552	48.7489183075312	25.4248192299137	87.5129	47.9594	27.6836
88.0415107815494	48.6091595314401	24.7463663422093	87.8413	47.1867	25.6907
90.0526668494241	48.312617570281	23.3068178209512	89.3464	46.1786	22.3858
91.7712206816738	48.3871941556733	22.2857400331016	91.9756	47.4725	20.0446
92.231117413033	48.6475027456183	22.5641066034381	93.0102	50.1223	20.798
94.5910941704808	49.4571785916218	25.1312732699363	95.0864	47.4256	26.3676
96.5926357984667	52.2567237246471	26.6392090433967	96.0562	52.3857	26.7058
98.5582991516358	55.0061400153691	28.1201175521644	98.7715	55.3698	27.9452
99.5677893443492	56.4181839665056	28.8806590098531	99.9754	58.6633	29.714
100.975617103059	50.5001775139004	27.4631143882558	101.7941	49.0832	29.2585
100.493740801671	48.1818503367345	22.3255406661674	100.6036	46.802	22.0951
100.337581015012	47.4305721854594	20.6606806741909	101.377	48.1816	18.5975
97.8636506636095	44.2202888062962	21.1707790729788	95.46	44.379	21.4845
98.7284395420119	42.764458396569	21.1355799843982	98.3613	42.0392	20.5386
99.3027038367477	41.79774586765	21.1122157424245	99.6903	41.4772	23.4888
101.778770873789	37.3699961898481	19.1400621639062	103.4615	37.3033	20.8908
104.135021076947	31.9089620259601	15.9528567567082	102.9211	31.879	13.8489
104.897260604134	30.877556310437	15.8903734143129	106.8535	30.7643	14.4546
103.87274364549	28.1527496083386	18.0437412839177	105.0575	26.2706	17.0665
102.492382426949	26.9153758697136	20.2134504898294	102.9016	24.8202	19.8795
102.17939234091	26.6348083039996	20.7054053793768	102.4997	24.4075	19.7902
99.1140925438823	24.4923491008807	25.6226672366564	98.3241	22.4412	26.657
99.1664456668911	27.1273229104685	25.9429277910141	100.6297	27.3107	24.1251
99.232152480907	30.4403276621892	26.345761338028	99.0228	31.9463	24.4512
99.3021221045619	30.6634694582395	26.9422809438862	97.4429	30.1528	28.42
99.9315432739052	31.10848873914	27.3123333104729	98.9301	33.2654	27.8083
104.537453491847	31.5104060903161	28.9397788312741	105.6149	29.5786	27.9356
107.118862035418	32.9667280454646	30.6932810811816	108.656	34.8419	30.8419
104.552133557543	25.6775170036992	34.1418217536024	104.9423	23.521	33.0938
101.566473010595	26.2889232179563	39.6109885369002	101.5683	27.6266	39.8262
100.438347768995	26.5199810762545	41.6774539353396	100.384	25.6874	43.9589
97.9042210834775	30.2205995585218	38.0907272154051	97.1838	29.5842	37.1942
97.1281712354428	31.3538368326859	36.9923467717722	98.5493	33.1624	37.7737
96.1556488320167	32.6356562337678	35.6596943582637	95.8908	32.6754	36.0409
94.9792752922735	34.1861655481394	34.0477013292289	92.7124	33.4453	33.5856
95.6326836654293	36.6490018091991	32.585649852747	96.6051	36.0943	31.9245
96.2291262506444	38.897155593084	31.2510633065654	97.0063	39.6578	31.3742
96.5228027087889	40.0040420450626	30.5940047451198	96.8865	41.9997	31.9305
96.6067393538093	40.1010010219047	29.6510542281506	98.4033	39.6451	29.8224
96.7016250989903	40.2106275390553	28.5850631102181	98.7317	39.6579	27.3708
95.3090178875685	40.8024380917305	27.8326998668252	96.2133	40.5576	25.5914

Solution x	Solution y	Solution z	Original x	Original y	Original z
94.0474955534792	41.3271814530275	27.37377750473	93.9129	43.6355	26.629
93.3737703314889	40.8585835544671	27.3599333099436	93.6941	39.0671	28.969
93.373754884154	40.8585791927671	27.3599270865232	92.1801	41.0349	29.4683
92.3734494981393	40.372100184722	26.2401960609567	93.6083	38.4774	26.0941
89.9848312910204	39.2105259200877	23.5664765602789	87.5583	39.2312	23.679
90.7298677727065	38.7870049859778	22.5490320228061	91.9372	36.8319	23.3371
91.8951102741661	39.3913384666121	18.5255868041105	94.3087	39.6383	18.4042
91.301429321815	39.5044942397409	17.1342999717123	92.8093	39.7693	16.6418
90.6998209712009	39.6191629574769	15.7244096103671	89.0134	41.3658	15.8043
90.7082401875182	39.4584985782134	15.2940918596214	89.3668	41.343	14.5671
90.7189881598278	39.256911194081	14.7549986384751	89.1249	38.0318	13.3915
93.2515617942729	40.2039013991002	14.3114266309292	94.1971	38.0204	14.8005
96.0414312434024	41.3523910523503	13.7956356059976	97.0806	39.3994	12.7921
98.328814963082	43.2056420795398	13.683465611241	98.0879	44.5657	15.6818
100.775755135174	44.261863164631	12.3800948330426	102.0152	42.2262	11.91
101.598755786447	45.2067965660098	11.898099556817	102.543	45.6081	13.7083
102.146132913108	45.8352657077777	11.5775339197055	104.1102	44.8822	12.643
104.0598201538	48.6431038465857	10.034991906419	106.4442	49.0895	9.9061
102.784507500557	49.4643310798767	9.48116149809697	103.8062	50.1176	9.3383
100.838989936792	50.7171396407526	8.63624749848895	99.5987	51.3246	10.6347
99.3855156760071	51.7588978532736	6.59968270582963	98.2152	53.7701	7.2972
99.3855029968412	51.758905700322	6.59966162786091	100.6388	53.8259	6.8403
98.8747979267389	51.8548039135971	5.88841333047941	100.3439	52.2486	6.1962
97.4543947188678	52.1214779153359	3.91026786504914	96.8097	54.0588	2.5941
97.0482934427434	50.3241667128494	3.77618111196624	98.2004	50.3921	3.9008
96.2381838321785	46.7389769274005	3.50867768034829	95.7654	46.8722	1.8076
95.5156120031119	43.5411310001692	3.270091559867	96.6284	43.246	1.131
94.3528634808475	39.7771252840844	3.54948109732683	92.634	40.1716	1.8791
94.088068538995	38.8967765462469	3.62121910897603	95.8598	39.2349	3.852
93.2493813689618	36.108105650551	3.84852148190779	91.1655	36.0648	5.0962
94.0886787349146	32.7106417526251	3.00712907873079	96.3928	32.1668	2.4627
92.9683127580781	31.5248351158984	2.98029545361391	93.4265	31.4744	1.0443
90.470168220616	28.880770760523	2.92048256583336	90.6179	26.4649	2.7134
87.2931370988254	31.4835417917465	3.33292402692605	87.5726	32.8781	1.3636
86.5254562805007	31.86980312069	3.72149294430817	85.1876	33.113	2.1197
85.3531621494198	31.9130376261428	6.5007664813944	86.512	33.4131	7.017
84.4362062243418	31.9468130685946	8.67473268547158	85.525	32.0217	10.845
79.49787200687	31.8157918790254	7.45891673577167	79.7169	32.9378	5.3155
73.5389239149641	31.041493712405	7.20448968470983	73.7989	28.6287	7.3132
68.5689213597038	30.5965388074358	6.98427313918363	68.3701	31.308	4.6701
67.0808997906138	30.3744334941894	7.19916533877072	67.6588	29.7348	5.9837
63.3280282589918	29.8143223579292	7.74118586473611	63.2951	31.2899	8.2512
58.3161329229527	29.0662527382492	8.46502610814359	57.9508	29.6187	7.6435
55.0876871602329	28.5843467169683	8.93129538114956	54.5895	27.7676	11.1642
54.2080792253237	28.7011306300104	8.33616682147782	53.915	28.4629	8.3577
53.4115915177598	28.8068743804521	7.79727089260468	54.8257	29.6059	7.5612
50.0777367363749	29.2496002423904	5.54156670756248	50.8592	31.2824	4.4654
45.7854638779471	29.1828703035584	3.11562546805815	44.1303	30.8739	2.5661
45.9235512195252	27.4126122062968	2.79526583653532	47.5893	27.8934	1.3329
Route: 4 Length: 440.17758254927 Demand Met: 9931					
50.5577452150757	12.1324345745827	8.72451190606784	52.0306	12.0787	8.641
51.3019169633301	12.1685808119428	10.6179074775897	52.3173	10.0275	11.1526
51.7433233596956	15.5966280995065	14.9251479317018	53.9046	16.3668	14.1276
51.8131893927231	16.3307969389411	15.8687297693275	53.4554	15.0784	17.1477
51.2933535178667	19.387002637321	18.4673944655227	49.9971	19.9155	18.5508
51.107854009413	20.4781376649552	19.3950987645803	53.2794	21.4994	19.0176
48.7423922918313	25.5416038108976	24.4992934013476	47.7428	26.438	23.4687
47.908532877757	27.3265268488567	26.2985532245961	45.985	27.4123	27.7797
51.0146043502663	29.8376696165713	25.6609901549239	50.5738	30.8854	25.5173
52.6741728191909	31.1793634398439	25.3203413169113	52.5136	31.162	22.8965
56.9894448778058	34.6158507070857	25.5745952056509	56.2795	36.0371	23.7369
59.3463477401181	36.0298866871613	26.131788270415	58.8785	37.4935	28.0133
61.0844454566734	36.2984918891218	25.6587380299887	61.1622	34.1592	24.5106
63.5197842805852	36.7807964841012	25.0514367118523	64.9829	35.6055	23.509
64.8354474786661	42.3430384500652	28.9850469420134	64.4232	44.0581	27.3148
65.6310912872914	44.3395056992637	31.5371081825807	65.3289	43.5846	33.8262
67.0057864475368	47.7827245316144	30.8308765860849	67.6648	48.1141	30.5928
67.6575406261155	49.4151873988381	30.495988339288	67.5609	49.631	28.0783
68.2051187752702	50.6506461585656	30.9462269651376	67.7991	50.1342	31.512
69.0378783391912	52.5294261959625	31.63087178564	70.8564	51.5507	32.2844
69.6525211593998	53.9160492131576	32.1362124080746	68.2826	55.0673	33.7791
73.3090597473044	55.9962373292212	31.1159786472954	73.8072	55.2741	29.1095
73.650810213251	56.1906487570887	31.0205789304306	73.2116	57.797	29.252
80.0221373687959	56.4234103805024	32.6974944988761	81.1686	57.7423	31.0101
85.8668744546462	53.9567083417466	38.4103598929658	85.9154	51.5363	38.6114
90.0299173267163	56.5795120027889	42.1988917017331	89.2688	56.3248	44.4917
91.9659177757283	57.667394502212	42.2062813874596	92.9131	56.6287	40.2251
93.4905131102983	58.8507977103308	42.6246938888202	95.4289	57.3916	42.7453
94.5313653069439	61.6114504294798	43.1812753277347	95.4724	61.7777	41.2303
95.0020100021426	62.8598613439126	43.4329102158192	93.9444	64.9	44.2206

Solution x	Solution y	Solution z	Original x	Original y	Original z
98.1053503826953	62.1187833790915	42.5853224608017	99.3413	60.508	43.9191
98.7067028983877	62.6862321955177	41.5176808749165	99.0429	61.6589	39.3422
100.474826906062	68.4768982191632	43.2127520537058	102.9023	68.4164	43.143
99.1285865979272	74.2115183418296	44.9574030748281	97.5653	74.5618	43.9951
98.8168487886606	75.5393103484644	45.3613347348966	97.816	74.8015	47.4482
98.1374316636281	79.2323158229855	46.1153819233378	98.567	80.2017	48.301
97.0004738406332	80.9165847541117	43.7564069185211	97.7624	79.6432	41.8331
96.1639735337373	82.1963439491712	43.0114926755307	97.0865	83.6094	41.2641
95.0480260285718	82.3104356555593	43.4667198860114	94.0795	80.8773	41.7611
92.6543292363709	82.7181529125021	44.666432213165	91.1677	84.1211	45.979
92.9184523991354	81.4514424212044	43.9311660027022	92.1151	81.2598	42.8198
93.1006243063496	80.5779282867675	43.4241398910616	92.6699	80.64	42.9825
93.2836642124381	79.7002362509447	42.9146802084638	94.6945	78.572	44.5388
93.2123605275104	76.8591207618268	39.9766751670409	91.0116	75.887	40.3125
94.0204951458102	75.5582420421433	38.1121284989158	95.9481	74.251	38.8025
93.9378175880258	75.4847082346711	37.7115568796844	94.549	73.3405	36.7472
92.8042360467725	77.2328115619684	36.2426607845488	94.4072	76.9857	34.4342
91.8518328843396	78.4861694813704	35.3848802804641	93.1133	78.1389	33.5399
90.3822460756967	80.4200046466991	34.0617014413851	89.95	80.2132	31.6802
89.9729712914842	81.333356776803	34.6545421610528	88.0687	81.4777	36.1559
90.7728361818703	82.2089541208892	34.3110956230678	89.5631	83.3752	32.5568
96.3101578013768	85.4020729731454	34.5521720785905	96.2545	87.1498	32.8659
97.9482761729867	85.4921135692601	35.4319006671527	97.7943	87.7833	36.2243
101.692830980819	84.5615363166192	37.0108942384765	103.1106	83.2736	35.5168
103.344632019107	85.3915100703673	40.481938884109	104.3617	84.8664	42.6246
100.54691078811	90.3461370289769	34.5718569792313	101.602	92.3175	35.5214
100.192989282467	90.8007765403847	33.8815188947683	100.5649	91.4192	35.2273
99.513695695123	91.6734576002893	32.5564845571763	99.3434	90.9979	30.2293
99.3180959958483	92.2173455807638	32.8278080215766	98.853	91.6792	31.3431
97.114349352849	98.3462377085194	35.8848288639183	98.8373	99.4165	35.0062
95.1565953434141	103.789813317735	38.6003116115296	94.4828	106.1237	38.6118
96.5275693758778	97.5779731125921	41.5130949266634	98.2349	98.4363	43.0129
96.9986162256262	92.1524419567435	43.3287661148007	96.8345	90.0197	42.1774
97.2456534987924	92.493537024117	44.6925620554143	97.0347	92.0258	44.3343
97.6595348242828	93.0650109911401	46.9775892875498	96.5235	92.1962	47.4754
98.0358333993506	93.5846000494448	49.0550259471608	98.9319	91.3958	49.6094
98.2557381551166	94.2218206345731	50.6972931361072	100.6204	94.7646	50.8195
97.765786601918	94.5621079642716	51.9302882663642	98.656	92.6213	53.0887
96.0971248817199	96.1415123636605	55.0494959984046	94.0924	96.5838	56.3482
102.348877664412	96.7375770502251	54.3242092211153	103.8628	98.4843	53.5771
102.637877366894	93.7918659208092	55.3508614606899	103.2876	94.1817	57.6589
102.606123907158	89.1619137046627	55.2390325726621	104.5599	87.8351	55.8078
99.3400488591031	87.5962827184215	54.2055560421387	98.3726	88.4744	52.1576
98.2818664957869	86.1432073571103	55.0981856663906	95.9325	86.7596	55.1395
98.4538708491134	84.8443768776038	55.7280935586367	96.9343	84.943	57.6208
98.9495263525212	83.7211448742866	55.825917186829	101.0606	82.9382	56.7378
96.8429219660355	82.4110835742863	54.656862411387	94.9909	83.4209	53.4521
96.9454416516154	81.7187134554325	54.7756646886817	97.4314	81.946	52.8698
97.3447261521477	79.0211910198523	55.2383831731446	99.1261	78.6323	53.6332
97.0734553755833	75.787544272928	56.5206969940485	96.1169	76.0362	57.1147
96.8351914038382	72.9475066237361	57.646948816378	96.2521	73.5638	59.9232
96.7434857333865	67.3685477909373	58.3658336722356	97.9014	66.9835	57.8832
96.7038848085173	64.9623461379082	58.6758496232777	94.6788	63.8911	59.4837
98.8451217322205	63.4842420535856	58.1435483603723	99.4285	63.8276	59.6975
101.252272658658	61.8225031494048	57.5450411187031	102.6402	60.9181	59.3218
102.404425893935	60.9012226568932	52.2770815567372	103.9916	60.6173	50.4601
101.049033963097	60.9544945277434	52.7834563125919	100.6854	61.817	51.0639
96.56845449779	61.1304790981514	54.4574390661835	96.4356	62.0951	55.4366
94.9698840328031	61.1932837166907	55.0546359467878	95.1558	61.2395	57.4763
87.8731382233576	61.3842925397794	53.575917144371	85.8477	60.7859	54.7762
88.1349807565182	61.8678716423745	52.4109243484635	86.2321	62.729	51.1705
89.5646225489897	61.9751404954016	51.6690368592116	90.2672	64.2791	51.3539
92.7194940043953	58.8888022745547	49.9600500443062	94.6583	60.3511	50.0221
93.7637961025026	57.0473963879928	49.1229660002546	94.8477	58.3247	47.7413
95.7544431414453	53.5372804355745	47.5274824735074	97.9579	54.2407	46.7851
95.6742493874926	52.4921326016438	47.3269559010935	97.7133	51.9341	48.5236
95.5358941262057	51.8079758296578	47.1419666840277	95.0304	53.2116	46.2852
94.7225375779077	47.787005975522	46.0542629915728	93.3823	48.5086	44.2946
94.3147677672685	45.771176220661	45.5090197090752	91.9732	45.8332	46.1527
94.279788448725	43.2255888762602	44.6925137815912	96.2085	41.8253	45.162
92.8704676659119	42.4978784767021	43.7988905421006	93.2846	41.9379	42.3812
92.101767120684	42.1010802291235	43.3115411022747	90.0385	42.8005	44.3862
91.9492322912123	41.6972418943118	42.7758226607154	90.4784	41.2284	44.1276
91.6137746106131	40.8096798938412	41.5985174187058	92.2396	41.0703	39.2658
90.8192868842356	39.7578038465375	42.2204309270876	90.014	39.915	40.6629
88.7235776341763	36.9827553938174	43.8610099830299	86.5983	36.2039	44.7429
89.2402974748528	36.8927078708447	43.7539558371974	88.2545	36.066	42.1212
92.0700505095361	36.3996600711509	43.1676037186615	91.8795	37.1845	41.8015
95.5697289495115	35.7895739609375	42.4426671703631	96.5473	37.5774	41.1201
96.7362272875378	34.52916731972	42.8051264637756	98.5859	34.5756	44.3792

Solution x	Solution y	Solution z	Original x	Original y	Original z
95.9907508635979	32.6144623748348	41.2444952447546	95.0864	33.2234	41.4865
94.2731580672133	28.2024239544718	37.6483524884359	92.942	26.4511	38.6789
95.2224227665262	27.6395142101317	32.7657979666417	97.3283	27.0933	33.194
95.5766687461149	27.42952345912	30.943870004089	97.5011	28.0267	29.587
94.6741677775868	26.9707577222473	30.7042310713765	93.6487	25.1273	31.9089
94.6741359098398	26.9707929024687	30.7041642743088	93.9312	28.9768	31.8553
93.0007234134571	27.9143931254465	25.2929319594423	90.6435	28.0536	25.8632
92.2455072854343	28.6821383853555	20.4981109769347	90.72	30.049	19.1921
93.455212698794	27.6292695009622	20.147462655369	92.5592	25.4331	20.672
95.5959692233742	27.2439847073486	19.3955649023499	97.0499	25.7334	20.6225
96.0845298588529	27.896100215094	18.1945860556984	96.156	30.1327	19.1399
97.2489519359993	28.8198637270981	15.0017400465364	96.0238	29.4057	14.5945
98.1612752565922	29.5436588993703	12.5001402911482	99.272	31.5703	11.7517
97.7071893644898	28.1269848801606	11.6262750575306	97.9141	29.0493	9.3885
95.3467220615881	20.5137742388168	9.45677392274633	97.1071	18.8552	9.2302
64.4452656643934	10.192989256168	3.51912754114275	64.6914	7.7788	3.6297
Route: 5 Length: 351.547456639364 Demand Met: 8536					
42.3855670744218	10.3421501489321	0.439006033562055	42.7704	10.2739	1.2183
29.8829983686816	6.06205541613542	1.59617343562517	28.0443	7.2557	0.5495
29.1622732851975	2.30661375429919	4.00479838226947	31.0707	1.7474	5.3999
26.0699533220103	-0.434741714913352	4.44355561869449	26.7943	-2.6353	5.1743
21.1891618034041	-0.0464940102013216	3.75354092581781	19.4163	-0.8394	2.2943
22.2722839364076	4.20919177389765	9.52545474514452	23.9142	5.5856	8.3806
22.3838251549252	5.03347388063943	10.872504391421	22.4003	2.9895	12.1851
22.9071457617312	9.19501478893753	17.0409935261872	21.6596	11.213	17.563
24.5773517678602	8.11453574848568	18.4098784146943	26.246	7.8923	16.6585
25.6993493326982	7.2324912712618	19.8978161528979	26.4488	5.1021	19.0029
26.8206059578407	7.4079868795932	22.6801274889726	28.1449	5.3771	22.529
27.2618059764526	7.77192665013642	24.2278025662572	29.2451	9.0499	23.6495
27.520618277409	8.08384503750392	27.2072972146376	29.9497	8.0977	27.1858
27.4926949584897	8.12501679291921	27.6045343556229	27.2842	5.8331	28.3822
27.369633424839	10.2403404275936	30.9831101681451	29.4417	11.4808	30.7206
25.8716156532615	12.1609421901671	35.5012929566334	25.9081	14.4892	36.1934
23.9732265730783	7.35042464780876	38.7803144586006	22.0744	6.6433	40.1203
28.9380054907312	5.45290227463963	37.0471792758047	29.6205	6.6839	35.8272
29.9803727504299	5.05451759031762	36.6833092970928	31.7997	5.4917	35.1341
29.3613298107651	3.81181012865036	38.0934415533129	28.6989	1.5656	37.4478
29.2319743595095	4.43142820586378	40.4553376079179	29.2732	5.6917	40.0529
29.0943421615588	5.09069379177559	42.9683797214703	27.9452	7.0873	43.7392
32.0256823529078	1.03163128859511	46.9596886193531	33.4349	0.0139	45.2628
34.4913558732017	-2.9059621777306	52.3436084181516	36.4279	-4.3699	52.432
30.4066950499937	-1.59612642132048	56.6769374504839	31.1391	0.2266	57.7289
30.1417652368033	-1.51117054270949	56.958001886265	31.0065	-1.0714	59.1851
27.3385420859041	-1.36650075769248	56.6243357533216	27.3755	-1.0984	56.1861
24.6630741779744	-1.22842551379644	56.3058753049567	22.4229	-2.1641	56.3911
26.2392145219153	0.556643784395682	55.8687658976659	25.8989	0.7413	53.4706
29.1888195617133	3.61059258762582	56.3038990008831	27.6562	5.4902	56.4427
31.4507936395348	5.01149164223977	56.5385314262878	30.7839	5.7178	56.2846
34.6451510176059	6.9898380049169	56.8698753168917	33.7832	8.5886	57.2507
36.3470648901686	8.04386891092079	57.04641145221	36.7928	9.6586	58.8057
38.9812316156268	7.09449793142114	54.0171716298264	38.0686	7.3443	51.7798
43.6218395393555	5.55346587646243	54.1444985617914	44.2937	4.7268	51.9613
44.9288673096563	5.4163676067953	55.2635550214187	46.8369	6.4403	54.1626
45.3802565135274	5.00811742281524	56.4563231213705	45.5397	7.2979	57.1732
45.884757328256	4.55175673307354	57.7894298028368	44.3097	5.4051	59.4302
46.7367718590238	3.94022894336414	58.4244058280874	47.7278	5.7114	59.7593
47.1612625351233	3.29967346017948	58.6600741023081	49.309	3.6922	59.7251
45.0735322090592	-3.36009293522816	57.8448857282746	43.0131	-4.6452	57.9101
52.8475710308206	-4.5867017090749	56.5994323948059	54.4331	-6.2551	57.3764
53.335199845799	0.843703056369769	52.5180885623578	51.8363	2.0767	53.9783
53.467863907579	2.28727782344646	51.4286316195209	52.2056	3.4977	49.7426
54.6160930711601	2.31742368919395	52.0499652614954	54.7597	1.1902	50.9644
56.2415985193628	2.36011093257449	52.9295493787968	56.6229	3.2945	52.4352
57.5537262706666	2.39456592042717	53.6395813192125	56.514	2.6652	55.8183
58.1447347805687	2.40177641389857	53.8829480495632	58.2987	1.8222	52.9601
58.7289361616308	2.40890481944945	54.1235115839338	60.4719	1.0667	55.1539
57.2421047990003	7.85245849191824	52.2587618119245	58.6318	9.4344	53.4701
53.8542165975078	10.892258495797	48.756091877462	53.965	12.2967	46.7771
51.455246170403	9.55606129123	51.1324294162765	51.2901	7.6487	52.6277
50.5150530522518	10.8797676448497	50.7087057730214	50.5069	12.3029	52.6774
49.2941568266979	11.939778984585	49.2378061440921	47.6091	10.2274	48.878
48.1574012776489	14.1360964411403	47.2320747006727	47.2642	16.1804	48.1934
48.1056366289568	13.8649851462585	44.1845702602786	46.213	15.3079	43.6977
48.9532599980629	12.8489092487094	40.7898116873774	47.5448	13.9665	39.1563
49.4380883324992	12.3943169544014	40.461350660336	48.9393	11.7496	40.9103
49.4380883324992	12.3943169544014	40.461350660336	48.2378	10.888	40.0435
49.8231834842988	12.033239767217	40.2004583626103	51.9742	12.9315	39.5168
49.6760829709675	11.2885435418933	40.0658916858976	51.32	11.9016	40.4537
48.843547650347	7.07374851544398	39.304241380354	50.2911	5.2466	39.9878
46.573658092771	6.76340419046581	38.0102256821328	46.3909	8.819	37.7186

Solution x	Solution y	Solution z	Original x	Original y	Original z
44.9167208570964	6.53685667825296	37.0656376335558	43.7681	7.8375	35.3656
43.7374223758152	1.75849997889411	39.7040741253657	42.4155	0.0668	38.5675
44.9956997025074	1.07995225603418	43.3428851061707	43.4311	0.4843	45.1031
48.3846732786288	1.34459163006588	44.0083462644529	49.2438	-0.5725	42.7886
49.3463349221395	1.77175313172635	44.4435316014854	49.5265	1.5006	43.2383
50.6694048566472	2.35944632244775	45.0422666689804	50.9668	1.717	44.4164
52.2535203462663	3.06309137842397	45.7591341091587	52.0607	4.6851	47.5572
54.1812761567273	2.54346041698266	45.1124248947529	54.6465	1.327	47.163
56.0915642926154	2.1041126434725	44.318712689856	57.3839	0.9502	46.0215
56.5826633503453	2.18432191165896	43.6097489640778	55.7669	1.6852	42.4618
56.9192974452848	2.23931315766848	43.1236839824511	55.5686	2.3786	41.1094
59.0481149490059	2.34879851362549	42.67312343164	60.4167	1.4088	44.4464
61.0152433398379	3.58317096524552	39.9431316866764	62.5325	1.766	39.3982
61.069327426803	3.75497344939556	39.7903748048406	63.4243	4.3429	39.6925
60.3535304201939	4.38492301091018	39.0512799878911	61.565	4.5717	36.954
56.372782437597	6.59256732480096	38.403139119561	55.5508	6.709	40.6861
56.0863418814391	6.77122973226443	38.2154627695744	55.3647	9.0137	38.8085
55.3896510242772	5.93435263803236	37.0029058378872	53.4617	5.8056	38.0578
54.9225337299501	5.37324001732805	36.1899040574838	54.3108	6.5803	34.1725
54.110003333653	1.19085546949369	36.348741113683	52.8937	1.339	38.4463
53.5164714015088	-3.59395708630937	35.9628609841664	53.412	-4.2453	38.3008
53.0783914561172	-7.25123693175619	34.0928160720561	53.289	-9.6645	34.2743
52.019473086144	-3.9757981137707	31.6565535072964	50.0191	-2.6033	31.7826
54.2564381891193	-3.7381469190019	29.7751100388647	53.5826	-3.7128	29.3577
57.6654529765897	-3.37596171476341	26.9079140484682	57.7878	-4.3732	24.6962
60.741136988658	-0.906298732191438	28.7944253827366	62.7821	-0.0838	27.7653
60.0387421588816	-0.538552803914511	30.9661896640855	59.6709	-1.5476	33.1451
59.8552997974463	2.28491357151541	29.168435103751	58.0726	3.0503	30.5544
59.7075421423378	4.56014903753874	27.7196837911591	60.5785	6.8128	27.9807
59.5154858613849	4.4011660512317	27.4836187384454	60.2628	6.0605	25.9406
57.0454012767346	2.35642254864449	24.4476344905739	57.7618	2.6586	23.6599
53.9244712833315	-0.227122594594112	20.6117216419449	51.7765	0.7553	20.0441
54.7501209826426	-2.81755593514266	19.1686095211648	53.8048	-5.0553	19.1679
56.2450938094181	-2.0712095101202	18.2826753061561	56.047	-0.6998	19.4659
58.4697995650804	-0.960559836027986	16.9642989195015	58.3955	-2.2935	14.9348
61.3491032443424	1.0555648692985	16.1838830698404	63.0749	1.8033	17.7213
61.1656975011835	1.65650836127578	13.0592877164427	61.9524	-0.333	11.9086
60.0785341297722	4.5955618503825	9.94974138467929	58.0725	5.2013	11.1785
59.7028443111362	5.69856333536885	8.7488653313107	59.4358	8.0877	8.3998
59.6221028604758	4.39803750081765	8.00721311044723	58.8992	5.3006	6.9433
59.5138655329699	2.65450805104563	7.0129219328626	58.5415	3.6684	5.0311
59.5104391926791	1.71340987686138	6.61223742975413	58.2741	0.1622	8.0145
60.6238332483379	0.326048260790584	4.14692532777927	62.4332	-0.684	2.8792
59.181660448971	0.750003694712001	4.31869545724908	58.6741	1.1796	4.0744
58.068059134226	1.07736937122626	4.45133116268116	58.2864	0.0731	4.559
56.523753953878	1.53134827489694	4.6352659045105	56.6752	3.9284	4.2715
54.4606715547979	1.28957675228854	5.00110722953082	54.5841	1.3	6.274
52.6567083183122	1.07816653439907	5.32099899371235	51.545	-0.7619	6.4521
51.7279861084938	2.90734991269422	4.42705541057981	52.3291	3.6705	6.1162
Route: 6 Length: 499.276462459906 Demand Met: 9970					
48.5032248665892	17.4351582082474	5.11751904169306	49.3862	17.5735	5.4967
48.9910001362088	19.3757863746959	6.93337796375239	49.1677	19.2175	6.1526
51.0288962009783	27.485259604875	14.5213000259391	49.5432	29.0024	13.3417
52.0483928316348	31.1614290723226	18.0941048292244	50.3723	32.2399	19.4829
58.2454497911169	32.4178446659579	18.3066736594374	58.6228	31.6703	20.587
61.61207843989	33.3977273821714	17.6039618801934	61.5106	34.0654	15.2705
64.1130654368189	33.7895871052643	18.216850534479	64.2717	31.7627	18.8904
66.3677821506546	34.1428329415313	18.769409377536	67.7055	32.9993	17.0949
73.9232340825831	39.2493927568389	26.4270488088458	74.5598	39.2546	26.0148
78.2994733468875	42.20720175993	30.8625153207925	77.9223	44.6051	30.7678
82.5331950868726	41.2597790299898	34.7403310050368	81.9079	40.1742	36.8216
86.7083255276416	42.3228415599351	34.2387318418814	87.2346	40.5435	32.6709
86.9819179108897	42.44131193631	34.2442579959915	88.4465	41.4478	32.5802
89.904106647769	46.9118109525917	37.6371913315835	90.4865	46.0315	39.3528
90.3023424071737	47.5210143130197	38.0996004832801	89.352	47.1855	40.3099
91.9888159248009	49.581016000419	38.5165859556334	90.3356	51.1932	37.7625
93.1124002226487	50.7857947644611	38.8102842587504	93.3932	53.1876	39.0419
94.0971903394417	49.0109894998352	38.8544185758642	94.3452	48.7818	37.6589
94.8768850877687	47.60576106498	38.8893647113554	95.1396	47.3596	38.3213
95.5160211694163	46.4538398097575	38.9180075989103	94.4684	44.7163	40.2539
97.6126208073366	45.8107474712146	37.8160588783331	97.5519	44.8528	38.2336
99.6591617778495	45.183020388094	36.7404125849021	99.7789	45.6905	34.3678
100.683566311892	44.6281637975004	37.2234850621291	100.0845	45.3198	38.3951
102.041290113517	43.8927377724578	37.8636525341324	103.8959	45.4099	37.4639
102.083024481815	43.8059055519956	37.9158210052633	103.0838	43.6629	35.7673
102.6601982641	42.6056428709673	38.636633769196	103.3956	43.6231	38.3961
105.495166562172	36.710290274857	42.177328563827	107.8221	37.3636	42.4217
105.484752393362	31.0258479212689	44.929876947098	106.1692	29.0085	43.7624
104.90631664073	31.0119124202619	46.7390662215151	105.5782	30.6326	47.1426
104.381253194401	30.9992743057297	48.3812918072897	106.6895	31.0233	49.137

Solution x	Solution y	Solution z	Original x	Original y	Original z
103.891600672966	30.9877757969346	49.8433094903167	104.0844	32.9988	51.1923
99.5998233847048	22.0307663357304	54.1547985682121	99.0428	19.6959	54.528
99.6434305435096	23.1702165246818	54.2776797528587	98.3827	22.3334	54.4737
99.846612997657	28.4787573634614	54.8503603731885	102.211	28.3893	55.4005
99.8420156945526	28.9206932032431	54.892932202424	101.7295	28.4449	56.1482
99.805059905545	32.4241896123076	55.2303669507055	101.1976	33.4905	53.5496
98.7626177895923	34.0669371021519	56.6908614201172	100.5275	34.9543	58.1047
95.7634880671998	35.730105416956	57.6478467921746	95.1298	37.6897	58.9361
95.1160241297346	34.7033836864723	56.918420556791	96.2582	32.5713	56.693
92.1095841702723	35.0361041064776	55.4865277711155	92.4351	33.0022	54.3205
91.1744762387308	35.1396698604933	55.0411842545751	91.0332	34.8187	52.6374
87.1261175445736	36.2033771831241	57.3766630275683	85.065	35.2948	58.2863
90.0320422981245	40.6804383153627	56.710408588184	90.1236	40.724	54.2833
92.6166695885178	44.7250412689654	57.6592718755036	94.5355	44.3621	59.1041
92.4937053332052	45.7149188647848	57.3540961498796	94.5838	45.9916	57.9488
92.2223254104806	47.9005086649454	56.6804718607778	91.1842	48.1207	54.4953
93.2666113348459	51.9928113629699	58.6708128843873	92.1982	53.9806	59.5699
97.1958873156461	50.2833480565604	58.0269587502226	99.0651	51.1078	59.3413
98.2131837745688	45.7662669139393	53.827864348868	98.0763	43.3554	53.563
98.4927233542263	46.6892187072292	53.2690447343187	96.2485	47.1277	52.4491
100.111833640941	49.8240666999107	51.5268515276186	99.5817	52.1789	51.8005
101.083834665883	49.215881728668	50.7002768509965	100.8862	48.4618	50.2894
101.845776022287	48.7391369993816	50.0523091319066	102.9297	48.0592	51.9744
103.283800809977	47.8393515306719	48.8292267855513	105.6501	47.8555	48.2801
102.333805861699	47.3575777361684	48.5839030010711	101.161	45.7653	49.9947
101.244980390523	48.4732159286562	45.4438787413839	98.9198	48.0008	44.9228
104.389080499512	51.4759789069868	41.0306037981721	106.6231	51.946	40.2003
101.135840044416	52.0575873305734	40.4854373988629	100.5945	52.9653	41.549
99.7133911900723	52.3117838925121	40.2470873616762	98.1036	50.8139	41.2796
99.3706491044497	53.0422210568941	39.7014176298322	97.7455	51.8526	39.6885
98.2100715165899	55.5158625078522	37.8537033535171	99.7259	57.0659	38.9488
96.869678497259	58.2788554245543	35.7456031621302	94.4551	58.0456	35.6169
97.6735984137418	60.6720430064237	34.1575486573887	95.479	61.1306	33.7151
98.8322635334771	64.1210502802976	31.8688868578717	98.4228	65.0226	33.0945
100.118918937677	67.9510547747111	29.3274013453653	101.778	67.1686	27.7348
99.1000705067826	77.387210652728	27.6682253414855	101.2985	78.2917	28.1682
97.240895264305	80.2214234661428	26.7240456685616	98.2345	80.86	27.262
93.9236044083221	85.2785139462409	25.0395117211058	93.4941	85.8189	27.3685
90.8194182038917	90.0192653913288	23.272113044055	92.5654	91.5305	24.0262
90.2411344771498	90.8012818001856	22.9487028759965	88.6062	92.2681	23.9863
91.7345379566829	90.4560782145525	19.3898764664272	93.1284	88.6615	20.1351
92.3483929496472	90.3142980508291	17.9267417600808	92.7178	89.1801	18.823
93.6297490505847	90.0182817464138	14.8728205880577	93.9684	87.8762	13.7783
94.0227356550919	91.4919345929468	14.1534191881297	95.2026	90.5293	12.2607
94.3550944441927	93.8073881801504	13.4920525998619	92.4623	94.734	14.7003
95.0856497201714	95.7342689963571	12.6116988257995	95.504	96.351	10.2996
95.1335396877387	95.9816132006785	13.0038901731604	95.7576	96.9635	11.4638
95.3405445881563	97.0509026314369	14.6991425316	95.0373	98.5247	13.5608
96.2477620741734	101.735989584805	22.1270192471571	95.6122	103.8055	23.229
100.720483051117	94.5439718203366	23.0583304025956	101.583	94.8217	23.7006
102.623415924919	91.4840276795862	23.4545534525674	104.3693	90.8389	25.0156
101.612273473848	90.3654948076946	21.7241006276211	100.7126	88.5952	23.1233
100.527436459518	89.3192370923442	19.2841447774108	98.1138	89.594	19.2781
101.21410104553	88.2768544618375	17.2777081470642	102.4507	89.6037	15.6617
100.959640562032	86.9945477537154	16.9812853700337	102.0461	86.7072	16.2393
100.744140772054	85.9085968162993	16.7302504618572	102.2936	85.0217	15.0829
97.4550183837451	82.5778833715809	18.1572582785547	96.9541	82.6989	20.5312
97.060541760992	82.0230233445363	17.7947646223078	97.8831	81.9659	16.6355
96.6934628055971	81.5067006131429	17.4574466789933	98.2007	80.5294	17.4055
96.3162197858483	80.9760619839678	17.1107831989987	97.1852	78.7831	16.5303
93.3319055984113	82.0254345549792	16.4869103540529	92.288	83.6157	17.9977
91.5172870944666	80.8850740174482	13.5929250239578	91.1291	78.4897	13.7054
90.793369674969	81.5987739041306	12.0405822039852	88.6759	82.3658	11.13
91.4337017837196	81.528890061758	11.8704086054096	91.14	83.5499	11.0268
96.1669076073609	81.0127516495905	10.6124291891241	96.8706	83.0827	11.4782
96.5900758924596	80.9665632686231	10.4999555161963	97.3132	81.5365	12.7479
98.0401639700695	80.7879050450804	10.0375356146571	98.9119	80.0767	11.0692
98.955656525209	80.6751317399588	9.74562578407653	98.5933	78.8152	8.2256
103.41339851988	81.0943565840143	9.15619485162603	103.8313	82.5056	7.2236
106.660605017585	80.0259097896417	10.6065431657081	107.981	80.0957	12.6444
106.734780714218	77.6622538444282	3.92349537266722	108.1531	76.0691	2.761
104.1043787502	79.5306621493989	2.92411011735121	103.6911	80.62	5.0557
101.921694209938	80.8467343553523	1.42064699605888	100.0565	80.1054	0.0522
103.233504889338	84.0321597045005	2.502391673255	101.1477	85.2681	2.6541
104.959811052709	86.0146542867838	3.26966923985253	107.2392	85.9448	2.4326
103.23457361633	91.00773704961	7.30544080609006	100.8882	91.1406	6.6906
103.24808210795	92.4032337760496	8.58893518560338	105.6506	92.4297	8.9472
102.920425042722	93.4961379853072	9.5472729700974	102.0076	93.075	9.5996
102.575087800204	94.6480796906845	10.5573603710906	101.8123	94.891	12.8509
103.225277535647	96.1608550017056	8.55505703914201	104.1034	98.3317	9.2012

Solution x	Solution y	Solution z	Original x	Original y	Original z
103.042845362879	95.555937674678	4.38285315601009	104.1728	96.9352	2.733
100.527248655497	92.0878305035295	3.4420566910576	99.3782	93.0601	2.9898
97.5572208338975	87.9931895409571	2.33130370633041	99.0152	86.155	1.7016
93.1507640268812	86.4914396173891	2.07993481801027	93.0994	86.3608	2.8092
89.164968176842	85.1330654077364	1.85256027233076	88.3633	87.3681	2.2205
88.6038666953702	84.9431851266148	1.82077105721283	86.3374	85.7586	1.5055
91.0574566332988	80.8823769895988	2.53397781544849	93.2494	81.8793	2.8544
91.3711778003557	79.771432394495	2.66570509220042	91.86	79.7087	2.2114
91.6531809943432	78.7727700587968	2.78411398390911	89.835	77.746	1.5427
94.4703163658284	73.9330289354525	4.295717542037	93.9524	73.145	3.1932
96.2134196371471	70.9384120291908	5.23106246842057	94.6798	69.1984	4.5089
101.415956671399	67.2984231355289	7.90071679596222	103.5291	67.906	8.9335
100.148865459134	64.8089195461215	7.33401459534047	98.4258	65.8894	6.8362
97.3688313897895	59.3467851283097	6.09067169716988	98.8606	57.9963	4.7298
96.1641821876477	58.6128891816376	6.32535174191822	95.9041	59.3009	4.8034
93.3133344548004	56.8761291608068	6.880682320122	93.2379	56.4517	4.9219
89.000732696507	54.2488860637985	7.72085226569394	89.6611	52.1615	6.6683
83.7709799215442	52.7061797925714	9.34955176176833	84.6532	51.7406	11.3965
77.4439468951752	50.9439204902624	11.1227603530558	76.5498	52.218	12.9878
72.9277194422266	46.0352860148372	8.51862139802127	73.6428	45.1426	7.6389
71.6141724457505	44.6076544893615	7.76130801068938	72.9198	44.5581	6.5665
66.9327620969083	39.5197256653681	5.06218570299759	68.0366	38.8903	2.9918
65.6327857364187	38.5903528210075	5.02839017051178	66.9624	36.7077	4.2616
63.3536395507847	37.0385463837727	4.9910811658403	62.6603	37.129	7.3175
59.2955898528186	33.7409536717403	2.70686820886444	58.126	35.24	1.1949
53.8479534038704	23.9913355734619	1.49494410907225	54.0368	23.8586	2.2143
Route: 7 Length: 344.279902746061 Demand Met: 9487					
54.803021664643	14.4486912201318	4.18676534841266	55.8132	15.4408	3.6174
55.958358504767	14.822506799481	4.81706154595313	57.2331	12.7874	5.1838
63.1249822222888	24.638509495306	9.7336049678778	63.3607	23.5913	11.9128
65.5367551186542	28.2817815734947	10.8874087420838	66.7482	27.6121	12.1372
66.2887512505812	29.4177874055774	11.247162596449	68.2062	28.5319	10.0866
66.6808471573535	30.0102520707949	11.4348208248284	66.7818	30.0369	13.8618
67.5119574595396	31.3142556195588	10.9190928125058	69.1853	30.9522	12.1629
68.1151713250494	32.2606824029511	10.5447856906787	66.5887	34.1226	10.8677
68.8532423243042	32.6326878245	10.2020822609817	67.4673	33.2544	9.192
70.4131879583077	33.418990969365	9.4777337429563	71.5231	31.8286	8.0149
71.2996392007787	34.880551417615	9.51335652013693	72.2401	34.2889	7.5435
73.576917826116	38.6353201184594	9.60491914341921	75.4748	37.8532	8.3059
74.119405554424	40.1526410695886	9.8457406289151	75.9022	40.5634	8.2476
73.4488180827086	45.0198457930648	13.0692740070686	73.2283	44.0709	14.6285
73.1137751733284	47.451553994547	14.6797937546721	73.2561	47.9132	17.0605
72.9014776548162	48.0691791993277	13.8071645601447	71.8965	50.0142	14.8598
72.8832347791702	48.1915499330293	13.3651545817881	72.0723	49.2863	13.9841
72.8629181091023	48.3278231790485	12.8729300679951	71.8327	48.0379	13.6369
72.8356249960836	48.5108766398298	12.211733742109	70.7664	48.6137	12.8047
72.7003188860091	49.4186356703664	8.93313073081747	71.0505	50.768	8.8572
72.6697744467145	49.6234493979699	8.19334789741676	70.6462	49.6735	6.8503
73.3568889089261	49.8066616283717	7.94345535997209	72.1444	51.2772	8.2689
76.6623568137458	50.6880649371035	6.7413205849479	76.2244	51.9684	6.7104
80.1483333490467	51.6175750874514	5.4735423925548	82.0477	53.0979	5.7932
78.914814179618	49.0827325070365	3.63343750749412	77.6289	48.4559	5.3003
77.897437885174	46.99203444873	2.1157446778863	79.9479	46.2913	1.0177
75.9881840568956	44.9749059291416	0.880066589185435	75.73	42.7229	0.0066
74.8950468801401	47.0828594416106	1.33709772687768	73.6395	46.5004	2.2066
74.0604882549533	48.6922242850083	1.68601950472765	75.2757	50.6388	0.889
73.2328181094161	48.8978082735293	2.12583237165579	73.911	51.0144	2.5794
72.5901640858756	49.0574067849318	2.46730140121906	73.6611	50.4924	3.9757
72.1062967559726	49.1775771941886	2.72440833621052	73.5268	49.2611	4.4383
70.3091682380051	49.623921531955	3.67924484948092	68.7356	47.889	4.3235
69.7184439734562	52.8091908072644	4.26771585220158	67.8488	53.6384	2.957
70.3034124283177	53.8712223543845	5.13102821131883	70.916	53.3608	4.8842
71.0306915956689	55.1916581393172	6.20439253435766	72.7757	56.7077	5.4576
70.0749885331157	55.25893637947	8.41848990255368	70.5527	57.3223	8.5137
68.4471946936757	55.3735361473525	12.1896092827866	69.9782	57.1009	12.9468
66.9293477807965	55.2042889298274	15.0584563780746	68.022	53.7678	15.3935
63.1719962312413	54.7853518258298	22.1602271084034	61.2083	54.3519	23.523
65.9768779414327	55.5536709314754	21.8475973287718	66.0257	55.1875	22.0287
69.2384419386434	56.4470671502101	21.4840826193298	70.1344	58.5671	20.707
70.5571285134997	54.3148433511854	22.2378862500755	70.694	53.8562	23.1583
71.2808039724605	53.1447024320679	22.6515606200986	71.2619	53.5794	21.4252
73.5801099894378	49.4269956679849	23.9659445983003	75.5201	48.6107	22.753
73.3275399410173	49.0939588701912	24.5633928215737	75.5587	49.1352	25.3998
72.3717064175089	47.8335544391876	26.8243732139793	70.4096	46.4113	26.9931
74.1720340453806	48.5504716991135	28.9287585918082	76.379	48.6237	27.9163
74.339044322776	48.8429469342593	30.1316040189231	76.0043	50.5809	30.4596
72.1228981883384	47.0545398855812	34.8862132989279	72.4429	44.8985	35.9587
71.4924198367887	47.9133934712956	35.2423929329211	72.0385	47.603	37.589
70.6688913893375	48.9947571372833	35.4596878421948	70.6191	48.182	36.9413
69.3363641010538	50.7444957848768	35.8113213250251	69.1689	51.2673	37.9561

Solution x	Solution y	Solution z	Original x	Original y	Original z
69.3363641010538	50.7444957848768	35.8113213250251	70.0624	50.1219	34.6274
69.0516453337843	51.1183594969395	35.8864477258553	66.949	50.6855	34.7495
68.9712575084394	52.1154706190806	36.3798992357351	70.2011	52.705	34.7749
68.7923626186818	54.3342800480613	37.4780177632729	69.1565	53.343	39.551
68.6343254411507	56.2942875577767	38.4479212380059	67.4683	58.2291	37.5546
70.119367899903	56.1842819679857	41.0985690454357	68.5789	56.8701	42.2821
70.8208760632986	56.1323192205907	42.3506715370112	69.8977	54.8286	42.1718
72.2086158228437	56.0295218878894	44.8275828533426	73.7963	57.8273	45.2128
71.9317588440306	53.5271977580807	47.558683394214	70.1179	52.2878	46.5219
71.9856383084607	52.9337597936221	48.3767267573073	74.3979	53.0985	48.6112
71.685473384265	51.5263934810065	50.2353383705219	72.0955	52.6394	50.8408
71.2334543009748	49.4070785951744	53.0341353656215	73.2401	49.0047	54.3428
68.4038504422633	47.822744859645	54.2012415511408	67.4955	46.0347	52.8305
67.0150938374552	48.4262505422498	56.6577036332526	65.7303	47.3671	58.4265
67.8327272906134	50.5271617059291	55.9765354308011	66.2863	51.2705	54.2569
69.2199874271916	52.0397105641698	56.1291818072384	69.4154	51.8752	55.6067
70.5943246007893	53.5381755967936	56.2804114798191	69.2681	55.3133	57.276
71.0887978520483	53.7840179436703	56.2308951609254	72.0304	52.5053	58.0692
72.624210193612	54.6624553893665	55.9498433126652	73.3859	52.8201	55.9097
76.654687471516	56.9683765981557	55.2121034941	77.9705	58.8491	56.0075
76.6515017646517	55.3673751093382	53.7434597892148	77.8264	55.5164	53.7679
76.6476929858643	53.4541049620196	51.9883654344369	78.0993	54.3894	50.2798
76.129255741857	51.456495763759	51.0669130019824	74.4488	50.3129	52.3971
76.3762627615693	50.9257625074943	50.3055135568315	77.4079	49.147	51.5989
77.2576260802811	48.8692010603479	45.9272591701348	76.4125	46.981	46.4216
77.5621118077785	48.1587961907109	44.4147758611494	78.2967	50.1808	43.2865
77.6647146618466	47.5660997372768	43.6667196730136	80.0004	48.0282	43.1849
77.6647110923534	47.566022006769	43.6666299811515	79.533	47.2684	42.1428
77.5023722261061	47.4649335432072	43.6464640413063	77.9078	47.2474	41.2613
76.6019615365744	46.9083536800228	43.555342192346	74.8417	48.5823	43.578
74.6610425974206	43.3958208615296	43.1905916997444	75.9853	41.4015	43.6031
73.299704695677	43.1786412795426	42.8510802160784	72.4926	42.7909	40.5929
73.2775969441335	43.1796722238136	42.8818578296636	72.9378	43.4347	40.5471
72.0179946356268	43.2386016155206	44.6352479923144	70.5497	45.0925	44.08
71.6248582283601	42.9525955634744	45.62599088262	72.7013	43.6681	47.6828
66.0707130003458	39.1088091548262	45.6736725707218	65.211	38.9167	43.4098
65.3801853504707	38.5028260713053	46.4016819079904	66.7168	38.698	48.2341
65.0554199176312	38.2178250247095	46.7440868641362	64.2784	38.8059	47.0778
64.7541888891041	37.9534766475539	47.0616787572267	64.8516	39.5774	48.8657
62.0807044181055	35.0849488263493	49.2330226266336	60.8351	33.4935	47.8851
61.8746278833808	35.0173845649691	50.8222264330143	61.1452	36.2851	50.8184
61.6565251560518	34.945877469779	52.5041436165866	60.137	35.2014	51.7925
61.0082348009945	34.7332503157682	57.5033146871228	62.0243	36.102	59.234
55.9637062203409	28.9476658565419	58.2386821593473	54.7376	29.7596	56.3053
55.8651335709231	28.8332550262396	58.2543630416609	56.8778	27.618	56.4108
54.7818027122363	27.6644043705594	58.4890767152696	55.089	27.0379	56.5554
53.6357821239078	26.4278829675047	58.7373978223433	54.2786	24.4277	59.9569
49.3699875823169	26.8194105553066	57.1423429386753	47.4152	28.2569	57.2588
49.7974353101792	25.7271477709244	56.5929056226768	50.1386	26.6573	56.0437
50.5948581859373	23.6895023005089	55.5679254642203	50.8742	24.2729	53.2264
52.277634222213	17.7864852097114	55.8555329362839	53.7123	16.59	54.3027
51.2071605748567	16.9003701732472	57.8477370521783	52.0827	15.9727	59.9151
47.1529421421437	17.5693536194846	56.3886155667349	45.9074	18.6439	58.1761
41.9585042895905	16.6490142950952	49.94586915674	39.7266	17.3977	50.5452
42.0785561186991	14.209305297358	42.8509375951545	40.2323	12.6508	42.5989
44.6170821671405	14.4982739014153	38.0092780635029	43.7175	13.3612	37.2361
45.8662965059749	14.6404836214733	35.6266738357842	44.7075	13.3055	33.9605
50.1119473265852	16.9888850793543	33.5371673377413	52.4859	17.4578	33.7507
50.012380344502	17.003438996551	33.4721739474403	51.539	18.7116	33.0294
45.3605209508025	17.6835840302321	30.4358688828999	45.9242	19.9	29.6168
42.3114529161434	17.4659438012789	28.7882426507878	40.2335	17.1357	30.0024
42.3968189687174	17.8950549110653	23.398851478418	40.715	18.8306	21.9165
43.8663789755325	17.2238842056491	23.016197868946	44.3034	16.6265	25.3299
45.4511899189108	16.5233926243949	22.4612165001745	47.2412	18.0641	21.8927
45.5898106841829	15.7676992435991	22.3953128257368	46.6598	16.011	21.0885
45.7219280482349	15.0474658920873	22.3324991711229	48.0446	14.6778	22.9405
45.1700372897234	13.7998650375327	22.0020140420364	45.8725	14.3747	21.2711
44.1912518301124	11.5871994577326	21.4158910520097	43.7231	10.6871	23.6231
42.3737631904372	7.33713605603501	18.1003547460827	41.1669	5.3004	18.6447
43.4702966929129	8.49860362247001	15.1965394819807	43.984	9.2005	15.6271
44.5038179359724	9.59332396128356	12.4595739473767	44.5228	11.8645	13.3212
44.8745661733024	9.94548341772458	11.4613286771003	44.5689	9.75	12.1988
45.5025454662997	10.5419699965207	9.77048502173245	47.1015	12.1757	10.5923
46.2365440026841	11.1846857944785	5.36051521563267	47.4524	12.1509	5.76
Route: 8 Length: 612.496661214386 Demand Met: 9898					
43.1897330782279	13.2400295733832	4.33681810493752	44.2621	15.3855	4.7212
40.9108150297694	13.8922114131072	6.79255265059482	41.9974	13.5778	7.3366
32.0506594602516	16.4276606631838	16.3400831416845	31.9656	14.6164	16.7619
24.7956301171032	18.5039609244406	24.1579736086435	23.1228	16.7524	24.3445
24.2458369722382	21.2328276872103	26.6137109087512	23.1615	20.5337	28.672

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.9967149774834	28.8994330633064	26.2844474763039	28.099	29.8348	27.0633
19.8484456288488	33.4670488414466	22.9696848036944	18.7531	32.536	21.0115
8.59738554737717	63.0152533415768	33.5135329094302	6.67010000000001	63.5082	34.9077
9.50384911367199	63.880850304508	32.9567770193341	10.4334	62.822	33.9682
12.5292715758533	66.7698429451737	31.0985927247771	10.7344	66.9849	31.9545
12.5292715758533	66.7698429451737	31.0985927247771	12.0444	66.3239	28.7604
14.2567772983212	68.414570375507	30.7842063430129	14.7433	68.1941	29.0053
14.8474103080937	68.9769199561439	30.6767085815118	15.0856	70.6386	28.9208
16.9419735199309	68.336370012188	33.4402331254164	18.9682	67.082	33.9115
11.8602748022322	72.9534261691937	37.3630892952237	12.73	75.2001	37.6748
9.15948542500985	72.6354972969924	38.5506655037607	9.45780000000001	72.6847	40.961
8.19629536254391	72.5188629749113	38.3916847425916	8.8648	72.0358	37.3381
6.9313846836255	72.3656878174971	38.1829097555495	6.09139999999999	73.9114	36.5077
2.60040143285059	68.7855115283611	40.3180831164162	0.309600000000003	68.1954	39.7657
5.77024234250897	67.6950372255646	43.5426260628087	5.2812	65.5492	44.5709
9.31809842959478	69.4413366525418	45.1954685638594	9.3844	71.5303	46.4336
10.845942575859	68.3445108137647	44.8217960771279	11.4886	67.7219	43.0579
11.1777141198844	68.1063181957059	44.7406365830712	12.0097	66.7734	42.888
12.4502124647239	69.1267948165134	48.7650871556788	14.0233	68.3418	48.6515
13.1668712778339	69.7015328417931	51.0316382458194	10.9416	69.7746	52.0032
15.1197092817629	70.6058559098728	54.3546223613777	15.4332	72.9689	53.8868
17.0575491687371	70.5501936716774	58.0823262583585	18.2654	71.5277	59.9496
14.225897719359	65.7696577124303	54.8266478184809	15.3124	65.205	52.7286
13.6381685530068	65.3695519481671	54.9770950217035	14.2076	63.0144	54.8035
11.4191848941542	65.5725121060158	55.5624572972051	11.4442	66.9869	57.5373
8.38187463227244	64.9432077406483	55.0947776129027	8.4928	63.9998	55.0759
5.97242425715589	64.4439900498291	54.7237742806457	4.7342	63.0935	56.3188
4.89155424431962	65.3142456223975	52.7712874282259	4.4426	63.6871	51.0243
3.07415588288818	71.0960687728871	51.5208475191577	4.0089	72.186	49.5614
-2.36317564143114	75.3588323415056	56.1285942983825	-4.2807	74.2616	57.1387
-0.696859425870017	85.5954566632484	57.445722383873	-1.23350000000001	86.0108	56.7294
0.0352401637642714	90.0928744804916	58.0243943798787	-2.30370000000001	90.7079	58.2529
1.24487330518055	93.1674491006987	58.3765397474953	1.1743	92.9818	59.2535
1.24487330518055	93.1674491006987	58.3765397474953	-0.0468000000000046	93.7668	57.0052
3.12982461884897	97.9584763581781	58.9252994209258	4.95789999999999	99.4405	59.5277
-5.25637721448879	96.7971234824986	56.0366433903537	-7.5489	96.9207	56.8305
-1.33272980305212	95.2267671839211	49.7991131117283	-3.26390000000001	94.8889	48.3647
-0.848774234995688	95.1000940844366	49.3015409532601	0.580200000000005	93.7511	50.7296
1.57645370180578	94.7617150760353	45.9272234950961	2.1469	96.6722	44.5395
2.07337960475854	93.3734980027689	45.6294706977693	3.4538	93.5151	43.6356
2.05859684509858	91.1976353172555	46.2852124157384	3.55029999999999	90.3653	48.0124
0.595019986162299	89.871717981796	45.250775661789	1.20229999999999	90.7259	43.7677
-2.35171776217973	87.2021090491657	43.168077873994	-4.1255	85.596	43.5867
1.55831537702183	90.7402658981664	37.4150629540458	3.5998	89.8159	36.4775
0.950096982058938	92.0633048097492	36.9134094464142	0.619299999999996	91.0377	37.0534
-1.16603563587584	96.6665174573186	35.1679667342295	-1.86190000000001	98.5581	36.524
-1.28658347386761	96.4876660140674	32.815504187107	-3.1358	95.2162	31.8855
0.0562858110750994	97.3268284754997	31.4832515448363	1.64530000000001	95.7178	31.8751
0.684794970071991	97.7195892464137	30.8597093383688	-0.311599999999999	97.6012	28.6474
2.28369782327378	98.4960299559886	30.6869324881047	3.1448	100.72	31.1491
2.70140503339907	97.6198874764701	30.3100862333845	3.11839999999999	98.924	29.022
4.29803339217504	94.271009642826	28.8695786512818	3.5924	94.7451	26.9481
5.84236809356452	91.0318454029506	27.4763665456636	7.8142	89.6258	27.2865
0.440808484911059	91.7716446600318	26.1851025739663	-0.735100000000003	89.6931	26.6301
-1.1861018294389	93.4048073956475	25.3389809597346	-2.5612	92.1356	23.79
-2.07050314023688	95.5391562110861	25.271343822723	-0.338999999999999	97.1979	25.6607
-4.6667008946792	96.8316467332171	24.8539100407973	-5.5457	98.4014	26.4862
-10.4401102931843	94.3982999346885	15.610773481372	-12.8049	93.8535	15.5008
-4.39305356827944	94.8435884619692	8.18557779931647	-6.68600000000001	94.6391	7.4364
-4.39305356827944	94.8435884619692	8.18557779931647	-2.1508	94.1499	7.6254
-2.35606364820528	94.9941135211642	5.68710705720721	-1.9602	93.9224	5.6614
-0.917970936669008	95.100387768972	3.92321199997889	-0.171000000000006	97.1566	2.8672
0.539123231925132	90.3307443111129	2.47705969852735	-0.100899999999996	90.0487	0.1507
2.52339513516773	86.4877901808376	3.81234010527326	2.7376	84.0979	3.4333
3.53193971794454	89.1782129372422	5.72117224746834	2.57040000000001	90.3092	4.6781
4.53298985697484	91.8486404845333	7.61582022187801	4.77370000000001	93.7785	6.1602
5.37111108623399	92.8574552590574	11.0234721294052	5.8502	91.8647	13.1882
4.90900124912351	98.654300131797	8.26659420962737	2.55330000000001	99.1767	7.9857
6.43217076005595	100.835879858706	7.25293933778876	8.1477	101.1634	5.5645
5.06381256147354	102.413951541918	9.07197858541626	3.81100000000001	100.5395	9.9764
3.50447710351305	104.800160809443	11.2796970288007	3.0162	107.1796	11.3112
2.43763831276563	98.4666587964708	16.0104038964941	1.4019	97.5847	15.4849
2.23049636344145	97.236922305541	16.9289039934035	0.613799999999998	95.4238	16.9249
5.85963059889141	98.2804302263398	19.7265134965323	6.3198	96.0864	20.0555
7.37357195370646	98.7157438798103	20.8935667605264	9.17	97.1621	20.3835
9.24090685551317	102.253573170845	25.0800085924544	8.0611	104.093	26.141
20.6337048181066	98.1872279698299	27.2915797945177	21.5395	100.4343	27.1149
27.6949205627701	95.2302498043577	28.7222322853219	26.1674	96.1159	30.3905
27.6949205627701	95.2302498043577	28.7222322853219	29.7064	94.0211	29.3487
33.7725386026166	92.6832314299974	29.7890518828029	33.1881	90.5996	30.8927

Solution x	Solution y	Solution z	Original x	Original y	Original z
41.6950351369466	92.1166751272576	29.7533244508996	42.9721	90.3177	28.7365
45.4469302229828	99.70853459171	34.3901747009136	46.0729	100.678	36.5278
45.1389416271719	100.567606289001	27.2054937502912	42.9226	100.4615	26.2167
46.1358115563171	100.774486717617	26.3665802128638	45.0704	101.2748	27.009
51.6557962721249	101.920062485832	21.7212422760936	53.9006	102.5381	21.0284
43.203366197731	99.1341911914931	20.723746916611	42.2565	98.7398	22.9258
40.8523489851485	98.4319401204586	18.4049115224304	40.9431	96.0349	18.7884
39.9803614675428	98.3471987315026	17.523542908008	38.2186	96.6747	17.5328
40.2592542249614	100.273073561675	15.5422217472664	42.5793	100.4271	14.8388
37.1023441019231	103.923958984956	12.6604483458351	37.1983	106.347	12.5162
35.0943573227713	101.765804737075	11.2374202824234	35.5571	102.295	9.2843
34.0988765266273	100.695846305281	10.5319549418158	35.0473	98.5367	9.9491
33.2380225288158	100.822527314155	10.3371617096563	31.6341	101.1443	12.133
31.6432988558989	100.878743467093	5.48292988115298	30.1816	102.1772	4.0412
33.7200600627834	98.1117033686312	5.30673414145628	33.0573	97.9271	5.3628
33.7200600627834	98.1117033686312	5.30673414145628	33.9629	96.8355	4.449
34.1667737768437	97.5164928141458	5.26883467161342	34.0458	95.0903	5.2592
34.808276727127	98.2144998916054	5.22635331427219	35.7481	97.1257	4.802
35.5941993586638	99.0696462347337	5.17430770708355	35.7859	98.3251	5.4495
36.6597174992149	100.229006356084	5.10374668424267	35.7306	102.2767	4.1846
38.6317066081469	100.428526324732	5.59724516034539	39.7333	98.7582	4.2197
39.1639095524151	100.724456692622	5.95507019747218	40.065	98.6098	6.7408
39.7246377816636	101.172849190422	6.32267283303097	40.2693	101.3043	8.6864
41.1300656150793	102.832737632493	3.70672251831765	40.5226	102.8002	1.3549
41.9883583841403	103.425982660668	4.24709499457672	40.9527	105.6227	4.1926
43.756260867923	103.97190328044	5.22145552794963	42.9285	106.2179	5.6354
44.2944587478958	104.09633612281	5.50354940368727	45.465	105.2608	3.7217
47.3359514775615	104.216465277501	8.66002477275484	48.0764	105.8084	10.3389
48.9947595522729	98.0889969646816	6.77362099026795	51.1106	98.2963	5.5983
47.6355581412639	92.3937581318525	6.67529448076394	48.9533	90.4759	7.3728
45.3704325156917	92.4757417501135	5.73653793417473	47.7789	92.5461	5.4276
45.3704325156917	92.4757417501135	5.73653793417473	43.1057	91.7939	5.1823
41.2655511516636	92.797868229179	4.32842693854189	41.6896	94.8028	3.024
37.6565199972249	92.6419244748977	3.4028264010166	37.3296	94.7968	3.7833
36.3605766010615	92.5859217102995	3.07046907300129	37.0706	93.0168	1.0492
32.2466780778239	92.4081122565774	2.01541767576408	30.8807	93.5109	0.3364
31.5883240817967	89.9976230404814	4.57073888442865	33.2241	90.2072	6.3544
25.4813530450539	83.0605354207444	6.57158036624289	23.4089	84.0628	5.796
23.4602950691507	77.7729405623539	8.53029575059386	23.796	77.2181	9.3562
22.8520470231746	76.1816020269649	9.11978474060711	21.1184	76.9048	10.6601
22.6861849494622	73.9210275139067	9.32915702470988	21.3934	72.6127	7.7423
23.9748277718167	72.7243993948311	11.4043545791691	22.1344	71.2137	11.8857
24.8446758871653	72.181326540982	12.5219428104777	24.5354	72.6275	12.2334
26.2727221238758	71.2897684726926	14.356701226868	25.7737	68.9159	14.4865
27.5985128865021	71.6235105734215	15.7266217227868	27.2709	73.9256	16.4296
30.6985610517737	70.1929637594545	17.9641327345832	31.4455	71.7336	19.6874
47.9356918745454	41.3878736334388	17.3090208196043	50.3352	41.2014	16.9793
45.001119924652	37.7672776399415	17.9523175474832	43.7884	36.8808	19.8614
45.4196616057903	36.3191157221725	12.5661099855073	45.4903	38.3462	11.2293
45.5266894731113	34.8284825961336	11.4000812155034	45.4526	36.121	9.3446
46.0205021979777	27.7815665093704	7.88628180642439	46.7677	27.4481	8.8301
46.7965042605021	16.706688787117	2.36391362226424	46.503	16.5426	2.0548

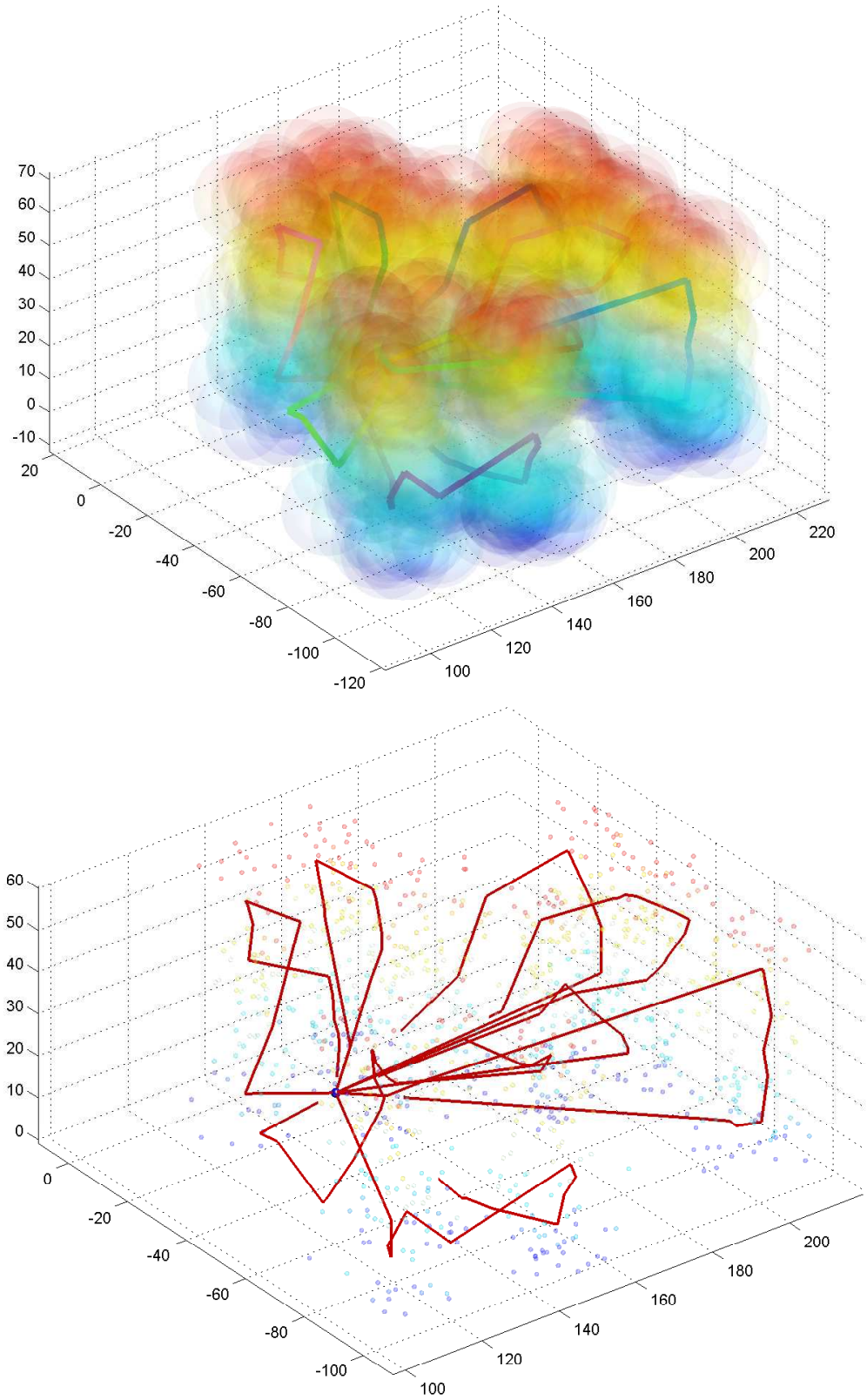


Figure O.89: $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Euclidean, Length = 1587.8133964

Table O-92: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Euclidean

Total distance: 1587.81339643093 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 131.235713592836 Demand Met: 9310					
53.2786657407091	8.93059874232019	7.62349117753141	64.6914	7.7788	3.6297
53.0179125036424	7.79473760323058	12.4203948437498	44.5228	11.8645	13.3212
52.7489434664452	6.62272273070594	17.3699679996531	43.984	9.2005	15.6271
52.4868122661949	5.47982527075483	22.196398716545	49.0558	10.279	28.6803
52.334476948832	4.81556806743064	25.0014135743742	60.5785	6.8128	27.9807
52.1859853613976	4.16811502349107	27.7353498338773	54.3108	6.5803	34.1725
52.0778351570604	3.69657734229953	29.7264320363388	58.0726	3.0503	30.5544
51.966834307847	3.21274399342631	31.7694418929732	59.6709	-1.5476	33.1451
51.868534246794	2.78440983262793	33.5781963545538	53.5826	-3.7128	29.3577
51.7613572306645	2.31736845164407	35.5504848338903	53.289	-9.6645	34.2743
51.7410427159993	2.3181555141244	35.7957925116384	46.0043	6.8606	27.4465
51.7162990479306	2.31911259460473	36.0946031598912	50.0191	-2.6033	31.7826
51.6916178869927	2.3200669228303	36.3926600135102	44.0031	6.0986	31.1209
51.6652072660386	2.32108721587924	36.7116133227922	43.7681	7.8375	35.3656
51.6393639199936	2.32208351269463	37.0237229378999	46.3909	8.819	37.7186
51.6149229070072	2.32302368199694	37.3188980608142	50.2911	5.2466	39.9878
51.5919349911695	2.32390655199662	37.5965236437349	53.4617	5.8056	38.0578
51.5692617625803	2.32477693623203	37.8703493068174	61.565	4.5717	36.954
51.5451806108575	2.32570236152883	38.1611779877422	63.4243	4.3429	39.6925
51.4530977608601	2.31929669133401	38.6902970743828	62.5325	1.766	39.3982
51.3571657621615	2.312623351839	39.2415372479834	60.4167	1.4088	44.4464
51.2754473075613	2.30693565275989	39.7110880806351	55.5686	2.3786	41.1094
51.1951279850574	2.3013446711076	40.1725959191826	52.8937	1.339	38.4463
51.112708969878	2.29560844072827	40.6461732764633	48.9393	11.7496	40.9103
51.0312040447752	2.2899357443181	41.1144984961075	55.5508	6.709	40.6861
50.9494571673087	2.28424614125199	41.5842131988113	55.3647	9.0137	38.8085
50.8628991116119	2.27822281514243	42.0815784180626	51.9742	12.9315	39.5168
50.766214242589	2.2714957972832	42.6371355769646	51.32	11.9016	40.4537
50.6659376299731	2.26451848735717	43.213328903218	48.2378	10.888	40.0435
50.5610924432313	2.25722308505765	43.8157724842616	53.412	-4.2453	38.3008
50.4382295131779	2.24867935385638	44.5217746526577	49.2438	-0.5725	42.7886
50.3140098793691	2.24004192583421	45.2355759361257	49.5265	1.5006	43.2383
50.1884782845317	2.23131318850289	45.9569162918808	50.9668	1.717	44.4164
50.0612950867219	2.22246959397692	46.6877475646127	55.7669	1.6852	42.4618
49.9200035685973	2.21264820976145	47.4996664143625	57.3839	0.9502	46.0215
49.7714328991706	2.20232153983844	48.3534160019776	52.0607	4.6851	47.5572
49.6192144698975	2.19174142564937	49.2281295628046	43.4311	0.4843	45.1031
49.4542383149286	2.18027801373166	50.1761813222436	60.4719	1.0667	55.1539
49.4507240961096	2.18003369520614	50.1964305553976	54.4331	-6.2551	57.3764
49.4507240381901	2.18003376839602	50.1964306352684	43.0131	-4.6452	57.9101
49.5261242409646	2.64189920595406	50.1812337102276	56.514	2.6652	55.8183
49.6001209133072	3.09516746958047	50.1663197812443	47.7278	5.7114	59.7593
49.6703929716556	3.52561892396888	50.1521570947492	51.8363	2.0767	53.9783
49.7419429153541	3.96389770236676	50.13773656073	56.6229	3.2945	52.4352
49.8130023680162	4.39917245085758	50.1234149636479	58.2987	1.8222	52.9601
49.8849988827144	4.84018823649348	50.1089043309668	54.7597	1.1902	50.9644
49.9594536870185	5.29626364838322	50.0938976648839	52.2056	3.4977	49.7426
50.0346113919924	5.75664523037149	50.0787492239454	54.6465	1.327	47.163
50.1113373257299	6.22663468988075	50.0632846858754	44.2937	4.7268	51.9613
50.1918548878734	6.71985030834463	50.047055104844	46.8369	6.4403	54.1626
50.2733901710042	7.21929981880835	50.0306200927281	44.3097	5.4051	59.4302
50.3709713786581	7.81704450250779	50.0109501382574	45.5397	7.2979	57.1732
50.4715966154369	8.43343525298546	49.9906660744032	51.2901	7.6487	52.6277
50.5738648253897	9.05989140382546	49.9700504135432	49.309	3.6922	59.7251
50.7373879801361	10.0615984771731	49.9370801664453	58.6318	9.4344	53.4701
50.8931577729666	11.0158120440485	49.9056743457431	53.965	12.2967	46.7771
51.043137969319	11.934558162846	49.8754374226245	46.213	15.3079	43.6977
51.1864496356352	12.8124479513301	49.846546654766	50.5069	12.3029	52.6774
51.3298857550497	13.6911009487581	49.817630732943	47.6091	10.2274	48.878
51.4870606580165	14.6539228655166	49.785943075336	47.2642	16.1804	48.1934
51.6433808763229	15.6115046123809	49.7544289894887	39.7266	17.3977	50.5452
51.8266517813397	16.7342656364675	49.7174804194564	45.9074	18.6439	58.1761
52.0067156907408	17.8373784167387	49.6811786023298	55.089	27.0379	56.5554
52.0482381334912	18.0917391496857	49.6728127019977	63.3795	20.1125	53.5518
51.5010347542707	19.2847020377506	49.3674996203319	53.7123	16.59	54.3027
50.723083169087	20.9808478225575	48.9334158307414	54.7376	29.7596	56.3053
50.7230828406424	20.9808483407753	48.9334156221382	52.0827	15.9727	59.9151
50.6682834588379	21.0781286517259	48.8899971701295	54.2786	24.4277	59.9569
50.4400292172167	21.4833397585193	48.709153510595	50.1386	26.6573	56.0437
50.2247929254045	21.8654387452216	48.5386264546011	50.8742	24.2729	53.2264
50.0149325483834	22.2379931724361	48.3723605195938	55.1607	27.7715	51.8295
49.8063275640022	22.608318513095	48.2070891135211	56.8778	27.618	56.4108
49.4664892361317	23.2116284969246	47.9378386138222	52.1655	19.1446	41.5432
49.1028257186627	23.8572400242707	47.6497072969776	49.1449	22.3659	43.2644

Solution x	Solution y	Solution z	Original x	Original y	Original z
48.7488724758817	24.4856108608384	47.3692749269292	52.7074	28.2489	52.4902
48.3843154458839	25.1328089765299	47.0804370911599	53.8796	31.7093	51.2249
48.0317723858893	25.7586773414704	46.8011187032526	47.4903	33.2139	54.5514
47.7267817417927	26.3001247255602	46.5594784923079	47.4152	28.2569	57.2588
47.391424527826	26.89548555503	46.2937743037267	44.6028	29.9319	49.9927
47.0670715855599	27.4713101723957	46.0367905252303	47.3356	31.1656	48.6863
46.7484007482018	28.0370471817649	45.7843089754155	48.493	25.186	47.2334
46.405120716157	28.6464783420642	45.5123231322942	40.9959	37.9409	51.1587
46.461120127247	28.5617368609332	45.0848192562133	46.003	37.4534	46.4333
46.5211050624542	28.4709654479456	44.6268922033589	45.9581	33.5048	45.1742
46.5818522727397	28.3790406769986	44.1631468164299	44.7872	36.1398	42.3342
46.6418184918223	28.2882970649138	43.7053633419486	50.1654	34.298	41.7388
46.7004169703336	28.1996223888813	43.2580193834274	48.6326	32.1618	43.4727
46.7590737110436	28.1108595273733	42.8102307537171	51.473	33.7115	46.7085
46.8232056672663	28.013813497306	42.3206481009005	51.7623	34.8081	42.2217
46.8881580881409	27.9155261036953	41.8248023992565	51.6292	37.4529	39.3047
46.950069587933	27.8218404739449	41.3521718330202	53.589	37.6567	38.7584
46.9452878636683	27.4578790762117	40.4908301465857	47.9812	30.2306	39.2099
46.9406236242319	27.1028616717416	39.6506563835687	51.0819	30.8837	36.7669
46.9361415005225	26.7617469296902	38.8433860885456	54.3132	33.4794	38.814
46.9310855915463	26.3768873411072	37.9325850887908	47.9603	31.0225	36.0363
46.9260622630395	25.9944982592811	37.0276313153695	46.4115	30.3033	33.5708
46.9212759480771	25.6301833408778	36.1654548917578	48.325	36.101	31.2943
46.9169250803373	25.2990091495002	35.3816965694708	46.9054	30.8841	31.5685
46.9128323503557	24.9875534610705	34.6446082752415	46.684	28.1154	34.4272
46.9087019483618	24.6732286634526	33.9007303848333	47.5448	13.9665	39.1563
46.9031813572514	24.2529223822976	32.9060512128849	43.7175	13.3612	37.2361
46.9110607109955	23.8237035309028	31.756538581701	45.9242	19.9	29.6168
46.9182362403834	23.4328249464812	30.7097018020198	51.539	18.7116	33.0294
46.9256175407164	23.0307281644429	29.6328231122595	52.4859	17.4578	33.7507
46.9336001056336	22.5958589044272	28.468178438938	49.9475	19.2284	25.6639
46.9408143948693	22.2028283639515	27.4155787223861	44.7075	13.3055	33.9605
46.9510736086363	21.6439017661545	25.9186864834592	43.7231	10.6871	23.6231
46.9548762193996	21.4367029081197	25.3637770480742	45.985	27.4123	27.7797
46.9591485401402	21.2039302517173	24.7403819193288	47.7428	26.438	23.4687
46.9635009528161	20.9667937170788	24.1053025599929	51.6732	17.1776	23.9169
46.9676946684338	20.7382844312801	23.4933263836785	47.2412	18.0641	21.8927
46.9716437763733	20.5231020552415	22.9170392854716	55.9782	19.9329	26.5423
46.9759810816103	20.2867339901151	22.284017342769	40.715	18.8306	21.9165
46.9802613922537	20.0535124490622	21.6594230280622	40.2335	17.1357	30.0024
46.9876246239033	19.652370262687	20.5851273174245	44.3034	16.6265	25.3299
46.9956695867441	19.2141715596306	19.4115946960468	48.0446	14.6778	22.9405
47.0040483878084	18.7578113849302	18.1894243590763	45.8725	14.3747	21.2711
47.0124954154014	18.2978094443062	16.9574974191386	46.6598	16.011	21.0885
47.0213958258079	17.8132276861193	15.6597400299787	53.4554	15.0784	17.1477
47.030338138424	17.3262723516179	14.3556190698874	49.9971	19.9155	18.5508
47.0408195011751	16.7555737044741	12.8272189397124	53.2794	21.4994	19.0176
47.0599155716031	15.7146711850052	10.039519214345	49.1677	19.2175	6.1526
47.0773312851725	14.7652011083333	7.49672210547014	49.3862	17.5735	5.4967
47.0940279134446	13.8547364040901	5.05840428626971	44.2621	15.3855	4.7212
47.1107827352866	12.942725257725	2.61594389309545	46.503	16.5426	2.0548
Route: 2 Length: 277.652784553919 Demand Met: 9769					
44.8065342477816	21.2958174053468	6.96270300742678	46.7163	23.0055	0.3229
34.2382242581991	63.7578006910441	38.6511099868077	31.7515	71.3679	39.9054
33.5075984180746	66.6932894653931	40.8417949355614	26.4833	65.6457	42.68
32.8544718963253	69.3174027606028	42.8001074193753	26.4587	69.6793	44.9112
32.2962459188565	71.5602246908563	44.4738714232391	24.7401	75.4523	49.5075
32.0434138216177	72.5760441288885	45.2319533212885	31.105	77.2121	42.4385
31.8031296557156	73.5414489001577	45.9524119611966	32.2488	71.8762	47.8257
31.5584473779167	74.5245237174357	46.6860574176545	27.6433	72.5657	51.9251
31.325447730433	75.4606600425043	47.3846739943807	26.9783	71.0141	56.5271
31.1632597204448	76.1122856414201	47.8709701447871	35.1535	70.6086	57.9365
31.1632521579123	76.1123148165774	47.8709911458616	24.1578	73.3792	57.4094
31.5428034921496	77.6399831422138	47.811696248924	25.3366	76.538	54.326
31.9809937339999	79.4036726751931	47.7432412850183	32.697	74.6737	51.2201
32.4980182733719	81.4846987061877	47.6624752398694	29.376	80.5861	55.9809
33.0882444881819	83.8603504452923	47.5702738444615	27.1736	83.2653	40.5956
33.8003135625954	86.7265151694624	47.4590488009741	42.6808	88.2098	40.1619
34.0347601347961	87.6701230448749	47.4224174277776	40.8939	84.3555	43.1765
34.2858248301697	88.6806238375086	47.3831904650226	35.4073	87.2216	40.4202
34.5488415139367	89.7392394944389	47.3420970477378	32.1756	91.0244	47.2823
34.8139893059721	90.8064250899167	47.3006697396473	32.2034	92.5655	35.5696
35.0177794558498	91.452024633187	47.4416254166863	32.8593	93.0881	38.0081
35.2267405313231	92.1140064192219	47.5861546972129	41.599	92.4813	48.0171
35.4288771801646	92.754367260727	47.7259622401936	44.0393	95.7757	50.8289
35.5965176337884	93.2854424201878	47.8419069182914	33.8351	99.3235	37.4512
36.3944699968037	94.7843401109487	49.2065569394604	39.6285	91.4521	58.9959
36.7968073478121	95.5400852427298	49.8946343082204	42.0978	97.503	57.9578
37.1081451554354	96.1248692874432	50.4270785001507	42.8352	101.6931	44.9574
37.4000166565001	96.6730823380264	50.926229480994	39.3246	101.8921	42.5744

Solution x	Solution y	Solution z	Original x	Original y	Original z
37.6993053557355	97.2352287348326	51.4380651226953	46.5537	103.4177	45.8992
37.7067157660493	97.2491325540466	51.4507276741233	32.4952	97.9758	48.1403
37.7144480653231	97.263639810881	51.4639405630612	35.9551	95.9225	47.402
37.7225907648015	97.2789171980887	51.4778560424147	47.126	99.3914	58.8698
37.3649669624706	97.4539203000233	51.3394105946256	43.0828	99.6317	56.4863
36.9827835827365	97.6409411196452	51.1914583683059	37.1788	95.0118	52.8478
36.6046145520666	97.8259980656518	51.0450606318292	36.1694	94.3523	52.0418
36.2309841844641	98.0088345548035	50.9004201310015	35.4152	92.5489	58.019
35.8475129528228	98.196487282486	50.7519714071172	35.2228	101.4244	59.0123
35.4567116154772	98.3877270833514	50.6006828330418	35.7224	107.36	58.7833
35.4273957622498	98.3986064899241	50.5862531789431	42.4716	105.6496	56.7244
35.3964467403684	98.4100935956682	50.5710196118713	44.7902	101.1589	57.6534
35.0829860031444	98.5264305154188	50.416758600175	39.196	99.7694	49.3378
34.7656185530722	98.6442179363318	50.2605751773365	35.4006	103.6799	50.1937
34.4503504594016	98.7612267081394	50.1054244924036	42.0156	103.5929	44.0945
34.0875750462805	98.8958641422623	49.9268974296147	39.1965	105.4524	44.823
33.7156580643275	99.0338918971414	49.7438749680953	35.3466	107.7036	41.395
33.2060574696528	98.8989095765694	49.8128912906726	32.8361	107.2479	41.504
31.7319128248301	98.5084478140421	50.012527950451	29.8552	101.3038	43.5974
30.3191943340786	98.1342563027466	50.2038461720474	26.6904	96.1713	46.6576
29.069784909836	97.8033208115479	50.3730489643065	33.6244	92.4492	56.3457
27.676056519883	97.4341588859384	50.5617962055401	31.4281	94.9219	54.3744
26.2043656776343	97.0443468705255	50.7611015711654	30.7482	95.8761	57.2879
24.5300059196145	96.6008533661127	50.9878537115299	26.9511	99.1097	54.9389
22.7606863719741	96.1322077982578	51.2274661872979	26.55	96.735	54.3574
20.8364377197799	95.622526049376	51.4880604983566	29.7849	97.5299	53.9895
8.97218979211777	92.4801946873301	53.0946880409114	4.95789999999999	99.4405	59.5277
7.06845131212891	91.9759480791759	53.3525091269555	1.1743	92.9818	59.2535
5.76372222296773	91.6303619051069	53.5292069416932	-2.30370000000001	90.7079	58.2529
4.99545663205876	91.4268702324078	53.6332523904716	-0.0468000000000046	93.7668	57.0052
4.293730023649	91.2410030087551	53.7282863938924	0.580200000000005	93.7511	50.7296
3.61837768525959	91.0621217167554	53.8197484471977	-3.26390000000001	94.8889	48.3647
3.04808581181081	90.9110684569937	53.8969820255163	-1.23350000000001	86.0108	56.7294
2.52777353972581	90.7732534595046	53.9674470246416	-7.5489	96.9207	56.8305
2.62629355381549	90.2969378088452	53.8687245126095	2.1469	96.6722	44.5395
2.7986268806888	89.4637567374765	53.6960352067665	3.4538	93.5151	43.6356
3.00329526311657	88.4742458687405	53.4909429824172	1.20229999999999	90.7259	43.7677
3.21314161050108	87.4597002035705	53.2806613539058	3.55029999999999	90.3653	48.0124
3.43253421171052	86.3990011594411	53.0608131916298	-4.1255	85.596	43.5867
5.75147252504368	79.4670586663315	52.6905285466192	-4.2807	74.2616	57.1387
8.9366975159559	74.3692796771215	51.824110816438	4.4426	63.6871	51.0243
9.13390529955012	74.0536525254414	51.7704758804052	5.2812	65.5492	44.5709
9.24570999022958	73.8747102025959	51.7400684978867	4.0089	72.186	49.5614
9.35907115164585	73.6932767490227	51.7092378665789	11.4442	66.9869	57.5373
9.47186101310811	73.5127576308766	51.6785628729525	15.4332	72.9689	53.8868
9.58479413931968	73.3320090373418	51.6478489499399	18.2654	71.5277	59.9496
9.58054943309301	73.2712042703216	51.5893883075569	15.3124	65.205	52.7286
9.57639493428238	73.2116859557415	51.5321649062622	14.2076	63.0144	54.8035
9.57272382960274	73.1590763686973	51.4815856688717	8.4928	63.9998	55.0759
9.56906328645417	73.1066164370969	51.4311508320765	4.7342	63.0935	56.3188
10.0288090394235	72.7504958024468	49.3885651924928	10.9416	69.7746	52.0032
10.4989800014602	72.3863000835469	47.2996708140381	14.0233	68.3418	48.6515
10.9489575394791	72.0377443899606	45.3004704982778	9.3844	71.5303	46.4336
11.4095242038355	71.6809868571814	43.2542358130866	0.309600000000003	68.1954	39.7657
11.8556631487049	71.5862555215771	42.3683206707731	11.4886	67.7219	43.0579
12.3006777820403	71.4917635496026	41.4846395158016	12.0097	66.7734	42.888
12.7487145518145	71.3966295228479	40.5949565149409	10.4334	62.822	33.9682
13.0200952317658	71.3390234290398	40.0561023405535	8.8648	72.0358	37.3381
13.2894831285705	71.2818404762898	39.5212053680974	9.45780000000001	72.6847	40.961
13.5676219405879	71.2227982232255	38.9689289989861	6.09139999999999	73.9114	36.5077
13.8517887194214	71.1624758898483	38.4046821729364	6.67010000000001	63.5082	34.9077
14.1151383019313	71.1065761168902	37.8817775530537	12.73	75.2001	37.6748
14.3817853400035	71.0499756536815	37.3523240121725	24.3218	77.9732	38.2426
14.4380093280599	70.5615202792269	36.1525622148413	24.4797	75.354	37.647
14.5342250624846	69.725956197555	34.1001806173232	26.4747	67.9787	32.7219
14.5342248628289	69.7259549855259	34.100177671566	18.7356	77.2891	30.4652
14.5342246660273	69.7259537757063	34.1001747258269	18.9682	67.082	33.9115
14.5342244710098	69.7259525722882	34.10017178896	26.2205	72.9044	33.175
14.4173042964426	69.4247578311143	33.4060010400991	22.0857	71.4539	26.9077
14.3204862488533	69.1753451989255	32.8311733748852	15.0856	70.6386	28.9208
14.2281518916189	68.9374818931024	32.2829636358912	22.8762	75.7017	33.805
14.0713656502971	68.5335866226801	31.3520933764219	9.9143	75.8382	26.191
13.9348087679429	68.1818029264078	30.5413253338491	11.6475	70.8021	30.9107
13.7976265614822	67.8284085073657	29.7268448757727	7.0214	70.8048	31.3366
13.6566194535108	67.4651617859492	28.8896572659595	10.7344	66.9849	31.9545
13.5119831853869	67.0925666350549	28.0309239071577	12.0444	66.3239	28.7604
13.3691981740345	66.7247397966944	27.1831802386739	14.7433	68.1941	29.0053
13.2221946180203	66.346046256942	26.3103916046869	8.3117	72.2049	29.6247
13.0532356124472	65.910797152994	25.3072568028805	6.9842	66.7632	27.251
12.8819208430919	65.4694795331574	24.2901356071263	9.1707	70.0865	21.5855

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.7174139846178	65.0456988957885	23.3134324074854	10.5042	66.7806	23.1982
12.5536439470446	64.6238163219298	22.3411037035503	7.6803	61.1857	24.6436
12.3925855614926	64.2089180455262	21.3848721253165	22.6268	64.3936	19.9605
12.226903968095	63.7821090534348	20.4011891820208	23.9369	61.5866	18.0383
11.8750299483548	63.4189516872329	19.5189225921884	12.5389	66.9051	22.2814
11.4997291596798	63.0316150822545	18.5779143565135	13.2613	67.7948	17.1077
11.1194694056132	62.6391602796899	17.6244716540678	14.5018	68.1646	16.8217
10.7184207091906	62.2252489639057	16.6189017077886	14.2239	63.9607	10.3191
10.3601842283586	61.8555250355644	15.7206812465878	12.0587	67.8257	18.5408
9.95151136039388	61.4337446509121	14.6959934137174	9.15690000000001	61.6426	15.1483
9.54258716402082	61.0117047667596	13.6706750341795	1.76609999999999	66.5446	12.6159
9.16263477818167	60.6195662601229	12.7179992523311	9.6606	65.5604	9.552
8.78980567805672	60.2347796228759	11.783184209245	15.1112	64.361	7.2726
8.4197089727009	59.8528130648964	10.8552198694278	12.0877	66.3858	4.5331
8.08113340554425	59.5033798154431	10.0062919586529	10.0835	69.723	3.7551
7.69661505599376	58.9841367330358	9.21138665343193	0.483800000000002	63.8626	0.7436
15.4584081331961	33.3787905267775	9.35121611085974	18.7531	32.536	21.0115
16.1509894406337	30.2714190417983	8.41189614870406	19.8821	27.2321	11.7559
16.7858303976858	27.4231081625514	7.55088629722118	15.0509	21.8739	10.7741
17.3040080492981	25.0982190235462	6.84809820242671	7.8039	17.6061	5.7787
19.2412137843355	24.2452374458011	6.40328842641778	20.5046	21.2685	13.3595
21.0920219645164	23.430298064117	5.97831712698473	19.6457	23.2311	5.559
23.0200889576019	22.5813404068322	5.53560633596927	24.5729	19.8583	16.0395
24.8248307887934	21.786684316905	5.12121555959548	25.2224	21.1268	9.0297
26.6459976261152	20.9847960208211	4.7030535634895	24.0847	21.2619	9.4135
28.7496309026294	20.0585330584128	4.22003428769438	21.2889	20.2133	0.1771
32.5267101806252	18.3954224733772	3.35277328374431	27.0312	22.0371	1.4535
40.2290242145149	15.0039513257468	1.58424110309991	41.9974	13.5778	7.3366
Route: 3 Length: 255.790231244051 Demand Met: 9876					
21.0896029961409	59.5437042760057	8.98308601706811	22.8228	67.5784	3.2098
19.703940463401	62.0755547574567	9.46113651373906	25.7737	68.9159	14.4865
18.7714360740004	63.7794145320407	9.78283711985286	28.241	67.9653	9.5896
17.8063215381082	65.5428645915766	10.1157887060133	22.9431	70.0987	4.2047
16.8789970332933	67.2372710494738	10.4357055878728	24.5076	73.115	4.3052
16.0303068199927	68.7880165899211	10.7284934503754	21.3934	72.6127	7.7423
15.1931215053685	70.3177472221789	11.0173124409361	22.1344	71.2137	11.8857
14.2764240654628	71.9927630666151	11.3335624337457	16.7224	69.1113	14.1768
13.2473663163042	73.8730799835191	11.6885769511598	21.1184	76.9048	10.6601
12.145461160893	75.886502326442	12.068724761034	13.7649	76.0563	18.1156
11.0545240685487	77.8798868642907	12.4450892425754	17.9606	81.6588	21.6946
10.3728456526474	78.7532442081138	12.4161960164981	6.65640000000001	74.2265	20.3804
9.64741069249904	79.682662662956	12.3854504040021	8.0472	76.1743	13.1381
8.90084787688275	80.6391503798151	12.3538095964668	7.5677	74.3816	13.1566
8.07487119339302	81.697383520505	12.3188049870267	9.00020000000001	73.0359	5.8372
5.83090897406046	84.5723575988532	12.2238344339202	2.7376	84.0979	3.4333
3.92076708254352	87.0196363287592	12.142971946719	4.77370000000001	93.7785	6.1602
2.57412036506685	88.7449576426255	12.0859351373554	2.55330000000001	99.1767	7.9857
2.13135783298328	89.3122220706663	12.0671653523826	-0.100899999999996	90.0487	0.1507
1.99236065683026	89.5068798908175	12.153608368502	5.8502	91.8647	13.1882
1.85345317528143	89.7014119936619	12.2399952562634	-0.171000000000006	97.1566	2.8672
1.45716817485395	90.0550556245061	12.9498275496196	-1.9602	93.9224	5.6614
1.03509031423356	90.431719532001	13.7058618786275	2.57040000000001	90.3092	4.6781
0.498462353418603	90.910621602818	14.667084831535	-2.1508	94.1499	7.6254
-0.0889417670703665	91.4348425763927	15.7192616539262	-6.68600000000001	94.6391	7.4364
-0.893514633435785	92.1529099879001	17.1604462352066	-12.8049	93.8535	15.5008
-0.373556491665028	92.6447452017225	18.6905365933059	-2.5612	92.1356	23.79
0.10144929897227	93.0940568462806	20.0883516762943	-0.735100000000003	89.6931	26.6301
0.518483198980192	93.4885310978292	21.3155776983792	7.8142	89.6258	27.2865
0.821686842639537	93.7753281889681	22.2078370846129	3.5924	94.7451	26.9481
1.10198127414256	94.0404549007385	23.0326811527856	1.64530000000001	95.7178	31.8751
1.32798326850212	94.2542247589716	23.6977545093515	-0.311599999999999	97.6012	28.6474
1.54222503928818	94.4568705172623	24.3282199403461	-5.5457	98.4014	26.4862
1.75792418354582	94.6608957073438	24.9629738291843	-0.338999999999999	97.1979	25.6607
1.97687382232407	94.8679963804833	25.6072933463146	-1.86190000000001	98.5581	36.524
1.97687395037808	94.8679964063191	25.6072934081447	0.619299999999996	91.0377	37.0534
1.98920964333367	94.8748831605774	25.594674918278	3.5998	89.8159	36.4775
2.57840323302452	95.2034789011216	24.9925033999892	-3.1358	95.2162	31.8855
3.37625783832445	95.6484455885697	24.17708245735	3.1448	100.72	31.1491
4.25852601653641	96.140488329936	23.2753899917959	3.11839999999999	98.924	29.022
5.22410538383971	96.678993617977	22.2885542222682	8.0611	104.093	26.141
6.11695142888254	97.176933157133	21.376045394501	0.613799999999998	95.4238	16.9249
7.04078726866058	97.6921566044939	20.4318706684795	6.3198	96.0864	20.0555
7.9811837178008	98.2166170417624	19.4707710770636	9.17	97.1621	20.3835
8.93046239848371	98.746032187457	18.5005909777349	1.4019	97.5847	15.4849
9.97679596002897	99.329574794404	17.4312283114434	3.0162	107.1796	11.3112
9.97681577362334	99.3295780044033	17.4312168659822	8.1477	101.1634	5.5645
11.044272478705	99.3561863862365	17.718384943684	3.81100000000001	100.5395	9.9764
19.1367200346132	99.5579241406249	19.8953973207746	21.5395	100.4343	27.1149
23.5205824990817	99.6672146501343	21.0747350922066	26.1674	96.1159	30.3905
25.5696580326695	99.7182939551648	21.6259784684969	29.7064	94.0211	29.3487

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.7646620520123	99.7480796226889	21.9474611384086	31.7064	96.988	25.1942
27.8074253202033	99.7740701858215	22.2279880706704	29.1897	96.4145	23.036
28.8292084799825	99.7995388817787	22.5028707506374	28.1717	107.4546	19.2451
29.8962795792514	99.8261368049562	22.7899361482981	33.1686	108.6172	19.7963
30.8370543511978	99.8495862941837	23.0430249355015	32.6009	89.9531	17.4409
31.7741718649303	99.8729401508397	23.2951247473695	34.3074	104.3145	33.9426
32.1097078440683	99.881302899426	23.3853984409798	31.3011	106.2109	32.3658
32.4268026829666	99.8892061936792	23.4707114857491	34.0464	97.1856	33.2284
32.7230888766634	99.8965912322719	23.5504261603177	33.1638	109.6815	28.6324
32.995479941873	99.9033799823349	23.623712590431	29.3468	93.7461	14.2413
33.6633920706025	99.920024836689	23.8034000502729	34.0163	93.2553	22.3961
34.3261101373757	99.9365397529806	23.9816904134707	29.5221	90.7635	22.4343
35.1643018417234	99.9574280228607	24.2071864198746	33.1881	90.5996	30.8927
36.0830815961309	99.9803164515124	24.4543683923042	38.2186	96.6747	17.5328
36.9894877759397	100.002895469441	24.6982214301051	40.9431	96.0349	18.7884
37.8438051556342	100.024175683998	24.9280614612771	42.5793	100.4271	14.8388
38.5651838857223	100.042142244012	25.1221345104907	36.8108	99.4487	34.5912
39.2802281869337	100.059950851291	25.3145025722718	38.189	100.3805	31.8594
39.9899468984045	100.077626495658	25.5054375227222	42.9721	90.3177	28.7365
40.6398765682335	100.093813073736	25.6802878348233	46.0729	100.678	36.5278
40.9937399904677	100.055714646246	24.7944274259925	42.9226	100.4615	26.2167
41.3515949103318	100.017186513725	23.8985743447425	45.0704	101.2748	27.009
41.7154818057117	99.9780087056625	22.9876218139571	42.2565	98.7398	22.9258
42.0818072759213	99.9385686305681	22.0705696741866	53.9006	102.5381	21.0284
39.8899384369386	98.8880774480314	18.0827349553986	28.2891	98.27	21.6276
39.7779053549169	98.5485417341833	16.4514988288033	31.6916	96.8159	17.5787
39.6669547503778	98.2123008950078	14.8360932309958	31.6341	101.1443	12.133
39.5721349647883	97.924945298556	13.4555319476093	35.7306	102.2767	4.1846
39.5185688986753	97.7625829218934	12.6754655976937	33.0573	97.9271	5.3628
39.4747599840943	97.6297925290022	12.0374744172975	33.9629	96.8355	4.449
39.4376071583999	97.5171738586711	11.4963939534848	40.9527	105.6227	4.1926
39.4063771945342	97.4225061489458	11.0415563240258	42.9285	106.2179	5.6354
39.3778626607641	97.3360690055803	10.6262587646866	45.465	105.2608	3.7217
39.3778625159985	97.3360686946229	10.6262579742123	37.1983	106.347	12.5162
39.3778623734605	97.3360683811962	10.6262571790976	40.2693	101.3043	8.6864
39.3778622305186	97.3360680681616	10.6262563815804	48.0764	105.8084	10.3389
39.3381924570571	97.2708159067219	10.4838193600468	35.0473	98.5367	9.9491
39.2985188481528	97.2055568857655	10.3413662465222	30.1816	102.1772	4.0412
39.3753275746908	97.0757538421155	10.2780111746085	35.5571	102.295	9.2843
39.4540915132705	96.942644179225	10.2130422341168	40.065	98.6098	6.7408
39.5321815024395	96.8106741499059	10.1486295033038	39.7333	98.7582	4.2197
39.6095926368179	96.6798522463291	10.0847773056092	40.5226	102.8002	1.3549
39.6877397434686	96.5477854780237	10.0203175728817	35.7859	98.3251	5.4495
39.7671382908511	96.4136031206495	9.95482533879128	35.7481	97.1257	4.802
39.8476915340526	96.2774690141506	9.8883805842812	37.3296	94.7968	3.7833
39.9282675176563	96.1412979236771	9.82191780660262	51.1106	98.2963	5.5983
39.664719184476	95.3509264452166	9.74577741305324	47.7789	92.5461	5.4276
39.4079357252993	94.5808464264732	9.6715943112589	48.9533	90.4759	7.3728
39.1674597647646	93.8596717129931	9.60212567046299	35.2297	94.8683	9.4168
38.9304720315334	93.1489559527954	9.5336652494011	41.6896	94.8028	3.024
38.6864073877299	92.4170166250863	9.46316016787936	43.1057	91.7939	5.1823
38.4427788339871	91.6863883195057	9.39278208878627	37.0706	93.0168	1.0492
38.2018515820175	90.9638632508838	9.32318645113436	34.0458	95.0903	5.2592
37.9530795928823	90.2178117878304	9.25132477124337	34.7819	91.1147	8.0437
37.7081800118219	89.4833752383468	9.18058283078932	37.9917	90.5379	9.9912
37.4609131532233	88.7418418996486	9.10915697957827	30.8807	93.5109	0.3364
36.6228580918925	86.2284146960118	8.86692859679917	33.2241	90.2072	6.3544
35.676786124219	83.3909585646624	8.59347064274406	34.9317	80.2335	16.9208
34.8764451568173	80.9907001872133	8.36214968926527	23.4089	84.0628	5.796
34.1629737693589	76.8169756795099	8.11513956687912	27.2709	73.9256	16.4296
33.8749343991614	75.1323936223376	8.01551634994756	24.5354	72.6275	12.2334
33.6629202806142	73.8925117100943	7.94220215569458	31.4455	71.7336	19.6874
33.5836024595448	73.2432650531324	7.70014574111481	23.796	77.2181	9.3562
33.4909029889582	72.4844787096663	7.41725885051965	23.527	73.6169	0.5641
33.5721946136736	72.1237412328205	7.37305092033361	26.6151	77.1467	3.8306
33.660403797125	71.7323070693882	7.32508100590429	25.4767	75.481	0.001
33.7903151449976	71.1558026171661	7.2544263558666	31.0449	71.9995	0.0029
33.9200090805065	70.5802622321073	7.18389018779159	31.4906	71.3219	1.4719
34.0499311542868	70.0037096064698	7.1132301230823	31.4187	76.5703	2.7936
34.1955523355049	69.3574918711983	7.03403223649267	33.517	80.8699	6.7304
36.06155640417	61.0772353932771	6.01918915503209	33.839	67.1668	7.1332
Route: 4 Length: 174.242133784483 Demand Met: 9816					
65.1472825666819	22.184977616672	9.05765512422819	66.7818	30.0369	13.8618
70.5233840321341	25.2339001746426	11.7599691490325	70.1037	27.3839	19.7642
74.3927891117303	27.4283608904144	13.7048744846842	67.7055	32.9993	17.0949
78.8287897996159	29.9439903028318	15.9344381771993	72.6191	32.6684	16.6889
84.3308340668279	33.0640692933803	18.6997929287516	87.5583	39.2312	23.679
87.2954288768873	34.7452591133807	20.1898293531982	94.3087	39.6383	18.4042
89.0958938922262	35.7663203394837	21.0948168725669	91.9372	36.8319	23.3371
90.7450097637396	36.7015600009823	21.9237352581765	95.46	44.379	21.4845

Solution x	Solution y	Solution z	Original x	Original y	Original z
91.8374942452212	37.3211296303818	22.4728781428039	93.6083	38.4774	26.0941
92.871952020923	37.907793249015	22.992855919965	93.6941	39.0671	28.969
93.839277980769	38.4563859357147	23.4790913721172	97.0063	39.6578	31.3742
94.6413207416962	38.9112432843387	23.8822489763209	96.8865	41.9997	31.9305
95.3056197665794	39.2879828745098	24.2161700956023	101.377	48.1816	18.5975
95.6570836416837	38.8094945720288	25.4711178599192	96.2133	40.5576	25.5914
96.0106038373204	38.3282072946042	26.7334072803866	98.7317	39.6579	27.3708
96.3564934520809	37.8573131764062	27.9684426199471	103.0838	43.6629	35.7673
96.4192196394551	37.7719351475635	28.1923876090205	98.3613	42.0392	20.5386
96.487681013222	37.67875009309	28.4368093415835	100.6036	46.802	22.0951
97.047415410849	36.9170175053877	30.4349688166568	100.0845	45.3198	38.3951
97.0946263559657	36.8527683726075	30.6035141029424	99.6903	41.4772	23.4888
97.1443066018427	36.7851586522146	30.7808751048313	103.4615	37.3033	20.8908
97.229283212651	36.6695164023447	31.0842385889348	93.9129	43.6355	26.629
97.3217335356969	36.5437018670414	31.414284853125	92.1801	41.0349	29.4683
97.4184158124315	36.4121274168497	31.7594389592045	108.656	34.8419	30.8419
97.5007299013799	36.3001110709474	32.0532869604922	105.6149	29.5786	27.9356
97.5795782106172	36.1928128441176	32.3347566580321	93.9312	28.9768	31.8553
97.6589481982141	36.0848049581931	32.6180880782483	88.4465	41.4478	32.5802
97.7481778728968	35.9633785838081	32.9366176910881	103.8959	45.4099	37.4639
97.7790352924654	35.5890367369897	33.3717728915568	103.3956	43.6231	38.3961
97.810806448951	35.2035775050981	33.8198436606193	98.4033	39.6451	29.8224
97.8447018696943	34.7923925975607	34.2978282016942	96.6051	36.0943	31.9245
97.8794102132398	34.3713596330771	34.7872635026787	93.6487	25.1273	31.9089
97.91032797054	33.9962850451465	35.2232684663352	97.3283	27.0933	33.194
97.9400535274382	33.6356495036615	35.6424838605415	95.8908	32.6754	36.0409
97.9696210266376	33.2769174690111	36.0594833295598	98.9301	33.2654	27.8083
98.002140759105	32.8824141223342	36.5180737891538	104.9423	23.521	33.0938
98.002140412426	32.8824138634086	36.5180746186816	99.0228	31.9463	24.4512
97.9195390823019	32.8061927414603	36.8213544856483	97.4429	30.1528	28.42
97.8312203042557	32.7246958553117	37.1456197328863	97.5011	28.0267	29.587
97.7379623128049	32.6386418855086	37.4880088917365	97.1838	29.5842	37.1942
97.6462833878675	32.5540454413112	37.8246000590495	98.5493	33.1624	37.7737
97.5553812412498	32.4701658338341	38.1583390887793	107.8221	37.3636	42.4217
97.2815127903476	32.2306532755035	39.0429670214464	101.5683	27.6266	39.8262
97.014496923819	31.9971338957996	39.9054615169594	92.7124	33.4453	33.5856
96.7133836630807	31.7337930178466	40.8780914678034	86.5983	36.2039	44.7429
96.5798819487704	31.6170436887467	41.309306271329	95.0864	33.2234	41.4865
96.4470658490109	31.5008940823482	41.7383059573788	91.8795	37.1845	41.8015
96.3144113824059	31.3848858682463	42.1667831987627	90.014	39.915	40.6629
96.1739857841198	31.2620823740707	42.6203590145047	88.2545	36.066	42.1212
96.0359400758732	31.1413604758489	43.0662481904698	92.942	26.4511	38.6789
95.8960857528454	31.0190568628399	43.5179800544879	100.384	25.6874	43.9589
95.7566471411529	30.8971168305679	43.9683690538734	105.5782	30.6326	47.1426
95.6165541327738	30.7746038137622	44.4208732574689	98.5859	34.5756	44.3792
95.4751767852484	30.6509672467302	44.8775263642091	96.5473	37.5774	41.1201
95.3243278830331	30.5190466915226	45.3647733490646	106.1692	29.0085	43.7624
95.1098426702494	30.3314683721296	46.0575665665106	106.6895	31.0233	49.137
94.6263095352033	29.9084887962824	47.6195377745717	98.3827	22.3334	54.4737
94.4211183315553	29.7290077293684	48.2824150346314	101.7295	28.4449	56.1482
94.2680918886114	29.5951558026372	48.7767781703488	101.1976	33.4905	53.5496
94.12105778239	29.4665449467951	49.2517808806591	99.0428	19.6959	54.528
93.879603265776	29.6556626427185	49.4295949565913	100.5275	34.9543	58.1047
93.6501080164086	29.7412523183629	49.4769635527023	104.0844	32.9988	51.1923
93.3611473536325	29.8490205908714	49.5366069899051	102.211	28.3893	55.4005
92.9806099118212	29.990944660425	49.6151530954258	92.4351	33.0022	54.3205
92.6088842255554	30.1295824525195	49.6918807046282	91.0332	34.8187	52.6374
92.2481200802566	30.2641318383517	49.7663460868867	95.1298	37.6897	58.9361
90.2637485539641	30.623611446985	49.7387566691569	96.2582	32.5713	56.693
83.9919742446296	31.7598094180991	49.6514789449224	85.065	35.2948	58.2863
75.0316822482478	33.3830629371011	49.5268229522451	70.5469	25.0661	53.9959
73.2249775726802	33.7103533451353	49.5017121150668	68.3676	27.331	45.292
71.7207518608452	33.9828483995088	49.4808032203996	67.8857	28.9512	53.8343
70.4009042066817	34.2219426346305	49.4624586456889	72.7013	43.6681	47.6828
69.0250785219258	34.4711786842334	49.4433352942874	67.4955	46.0347	52.8305
69.0250760343443	34.4711788780034	49.4433351577206	60.137	35.2014	51.7925
69.0250736659612	34.471179069561	49.4433350388682	62.0243	36.102	59.234
68.8230301418546	34.416889835181	48.869534380506	64.8516	39.5774	48.8657
68.6162454542357	34.3613313604196	48.2822591617436	66.7168	38.698	48.2341
68.407225592856	34.3051741783168	47.6886326820689	64.2784	38.8059	47.0778
68.1990780565392	34.2492544418351	47.0974788155982	61.1452	36.2851	50.8184
67.9827497879543	34.191138405192	46.4830889956781	60.8351	33.4935	47.8851
67.767639312475	34.1333525966537	45.8721539961839	58.9981	26.6128	49.6223
67.4869843264962	34.0606964982608	45.0601026087514	70.5497	45.0925	44.08
67.1197636656258	33.9656233056545	43.997568367195	65.211	38.9167	43.4098
66.7600128731668	33.8724840510639	42.9566479905508	63.453	34.6286	41.047
66.4197859789576	33.7844013450748	41.9722198168619	65.4552	32.6167	36.7679
66.1120153585738	33.7047233463995	41.0817032747772	60.1802	30.671	38.4138
65.8344475572051	33.63286674608	40.2785781896194	59.5552	26.5288	41.5263
65.5706299805591	33.5645702495581	39.5152399533103	61.643	23.6955	42.1255

Solution x	Solution y	Solution z	Original x	Original y	Original z
65.3014043700455	33.4948723060038	38.7362564649066	62.9268	27.0211	37.7555
65.0419607095051	33.4277070474559	37.985576722258	63.8119	26.0212	34.0563
64.809325029309	33.3674835538834	37.3124646795164	63.132	27.7543	33.1939
64.5960783523074	33.3122810811868	36.695453983814	63.8645	34.3723	36.4179
64.3814860323334	33.2567291949963	36.0745494584633	69.5886	28.6002	31.4169
64.1780145138993	33.204056536241	35.4858223036459	62.464	33.4003	33.7046
63.9794389898043	33.1526517364036	34.911261485886	63.5739	32.9982	33.2424
63.7843265793069	33.1021437916071	34.3467210854594	60.9493	37.7343	34.646
63.5879350427455	33.0513040286414	33.7784792920472	65.3289	43.5846	33.8262
63.3658093867466	32.9938006772778	33.1357762498863	58.8785	37.4935	28.0133
63.1661375312939	32.9421116954981	32.5580424213503	56.2795	36.0371	23.7369
63.0780010141519	32.919299373847	32.303029142684	55.9275	34.3566	30.6301
62.9920688537688	32.8970578843417	32.0543937946056	58.4334	33.3219	33.0094
62.9056418725737	32.8746882369017	31.804326362636	64.4232	44.0581	27.3148
62.4973389648628	32.3335703470058	30.9812551957316	64.1748	30.2745	31.4674
62.0934758736182	31.7983365324952	30.1671340299941	67.5765	27.7962	32.158
61.6739337421259	31.2423232227625	29.3214057182388	58.5931	27.1316	32.5338
61.2651672978101	30.7005908870236	28.4973997116168	54.6523	25.2022	31.3259
60.9045228426065	30.2226343566259	27.7704014903831	55.4854	26.8201	32.387
60.5499640506782	29.7527432665325	27.0556714545154	60.463	30.4795	30.5011
60.1762752473595	29.2574993264539	26.3023775880912	64.9829	35.6055	23.509
59.7626092951455	28.7092740979808	25.4684943119685	64.2717	31.7627	18.8904
59.3727617662596	28.1926151119985	24.6826243209054	61.1622	34.1592	24.5106
58.9477204230285	27.6293140954299	23.8258069349057	58.6228	31.6703	20.587
58.52976001407	27.0753970320707	22.9832620681986	61.5106	34.0654	15.2705
58.1538154103274	26.5771634139008	22.2254118144204	67.242	26.9141	23.9429
57.6963748323855	25.9709273091235	21.3032772595673	62.5649	23.4331	22.9907
57.2186260790415	25.3377837051784	20.340208061859	52.5136	31.162	22.8965
56.6708420006724	24.6118232458899	19.235951969184	50.5738	30.8854	25.5173
55.4556398032418	23.0013333993105	16.7862227082533	50.3723	32.2399	19.4829
Route: 5 Length: 202.903269780967 Demand Met: 9932					
76.3056019225145	37.4294818761023	20.1947383454433	73.2561	47.9132	17.0605
78.8589330785794	39.6578565291926	21.9620243785924	75.5201	48.6107	22.753
80.7997770688805	41.3516929392385	23.3053779388104	75.5587	49.1352	25.3998
82.4676095261296	42.8072628117091	24.4597667189989	77.9223	44.6051	30.7678
84.0758208729948	44.2107990577757	25.5728885473619	81.9079	40.1742	36.8216
84.9440370498398	45.0183368012839	25.8776823518458	80.3964	49.7264	23.6683
85.8225687434065	45.8354691330222	26.1860970482684	76.379	48.6237	27.9163
86.9418641119081	46.8765387160258	26.5790343158652	87.2346	40.5435	32.6709
88.1891793774151	48.0366811508905	27.0169139492336	87.8413	47.1867	25.6907
89.4697000001179	49.2277083099705	27.4664502683721	87.5129	47.9594	27.6836
90.8256148564797	50.4888605153161	27.9424545322776	95.0864	47.4256	26.3676
92.1583565107401	51.7284590451779	28.410323319916	96.0562	52.3857	26.7058
93.3992997853262	52.8826748154732	28.8459649647282	99.7789	45.6905	34.3678
94.4039081315451	53.8170718225565	29.198638431581	101.7941	49.0832	29.2585
95.3226956762103	54.6716458396668	29.5211837188176	102.8738	56.4102	20.1678
95.5743133804213	55.1724775052603	30.2155441223941	98.7715	55.3698	27.9452
95.827748152368	55.6769258343249	30.91491870522	99.9754	58.6633	29.714
96.0701713840107	56.1594554524756	31.5839047267222	94.6877	57.1733	21.1304
96.5259832334767	57.0667304048526	32.8417647193376	92.749	64.7326	27.0986
97.0323794621824	58.0746936803972	34.2392202749687	101.778	67.1686	27.7348
97.194174939331	58.4022570931676	34.9930878316145	98.4228	65.0226	33.0945
97.3512562648919	58.7202761223046	35.7249900046895	99.7259	57.0659	38.9488
97.5028416715234	59.0271682786646	36.4312844549072	106.6231	51.946	40.2003
97.3922164247032	59.7017458207626	37.2779791647819	95.4289	57.3916	42.7453
97.288567831552	60.3337724529357	38.0712642559961	94.4551	58.0456	35.6169
97.1810557205933	60.9893605050565	38.8941229690235	92.9131	56.6287	40.2251
97.0724571026252	61.6515727226813	39.725295756207	95.479	61.1306	33.7151
96.9545028308262	62.3708419558897	40.6280853698765	99.0429	61.6589	39.3422
96.8352172451838	63.0982263486569	41.541060057534	99.3413	60.508	43.9191
96.7179820402238	63.813100403913	42.4383307154255	95.4724	61.7777	41.2303
96.5997443814119	64.5340857381705	43.3432715895658	93.9444	64.9	44.2206
96.4858826267181	65.2283788937091	44.2147078240004	90.2672	64.2791	51.3539
96.3917302891563	65.8024769250555	44.9352790316003	95.9481	74.251	38.8025
96.3103252302364	66.298833815877	45.5582710819854	91.0116	75.887	40.3125
96.5878586001414	67.5055260390051	49.2775386937818	96.1169	76.0362	57.1147
96.5956553551113	67.5394246402285	49.3820231394162	99.1261	78.6323	53.6332
96.5956552617734	67.539424206578	49.3820235023618	96.2521	73.5638	59.9232
96.4882044078086	66.7087258109509	49.3688169629893	97.816	74.8015	47.4482
96.3619042252671	65.7323025101331	49.353293335522	97.5653	74.5618	43.9951
96.149989327028	64.0940204478543	49.3272548799961	97.9014	66.9835	57.8832
95.9114581687375	62.2499692667686	49.2979454859919	102.6402	60.9181	59.3218
95.8604960328844	61.9269295189022	49.2794472644885	102.9023	68.4164	43.143
95.7899467450686	61.4797396265546	49.2538390954634	94.6583	60.3511	50.0221
95.7201240408553	61.037153037493	49.2284946771224	94.8477	58.3247	47.7413
95.651352027337	60.6012254483256	49.2035316461559	100.5945	52.9653	41.549
95.6271593865306	60.4478667715598	49.194750109324	97.9579	54.2407	46.7851
95.6030829974079	60.2952453239763	49.1860107680389	89.2688	56.3248	44.4917
95.579430817563	60.145312412105	49.1774254237794	86.2321	62.729	51.1705
95.5552387677801	59.9919572776982	49.1686441036686	85.8477	60.7859	54.7762

Solution x	Solution y	Solution z	Original x	Original y	Original z
95.531476077994	59.8413230671106	49.1600186804679	94.6788	63.8911	59.4837
95.5057164740346	59.6780305515162	49.1506684315687	99.4285	63.8276	59.6975
95.4081912662171	59.0598406070358	49.1152700248247	95.1558	61.2395	57.4763
95.3080979548604	58.4253687732041	49.0789395926981	96.4356	62.0951	55.4366
95.2030400428624	57.7594266798836	49.0408072177252	100.6854	61.817	51.0639
95.0900741135754	57.0433612159384	48.9998044441141	103.9916	60.6173	50.4601
94.9561706417572	56.194595216438	48.9512016978459	99.5817	52.1789	51.8005
94.8282073524155	55.3834776573215	48.9047551396219	97.7133	51.9341	48.5236
94.7042230580792	54.5975794674284	48.8597528801747	95.0304	53.2116	46.2852
94.5817827164941	53.8214656806674	48.8153110833363	99.0651	51.1078	59.3413
94.4848969027008	53.2073299686981	48.7801458886957	94.5838	45.9916	57.9488
94.4359373465604	52.8969734724932	48.7623760468437	98.0763	43.3554	53.563
94.3983171500057	52.658495075547	48.7487218456971	101.161	45.7653	49.9947
94.3620230608014	52.4284236057	48.7355489563361	96.2085	41.8253	45.162
94.3327046616952	52.2425700659856	48.7249078887577	93.2846	41.9379	42.3812
94.3327039421386	52.2425651882613	48.7249076596608	98.9198	48.0008	44.9228
94.3327032154752	52.2425602894575	48.7249074305418	98.1036	50.8139	41.2796
94.3327024856404	52.2425553695697	48.7249072056097	102.9297	48.0592	51.9744
94.3327017461735	52.242550432665	48.7249069766828	96.2485	47.1277	52.4491
94.3327010106325	52.2425454959328	48.7249067470242	105.6501	47.8555	48.2801
93.7034461286946	51.3996592016035	48.6924364421928	100.8862	48.4618	50.2894
93.0472100413589	50.5206314650634	48.6585762717835	90.1236	40.724	54.2833
92.9040762749462	50.3289020642058	48.6511929555121	94.5355	44.3621	59.1041
91.9518776586007	49.5963059651706	47.9117422006125	97.5519	44.8528	38.2336
91.9518708068054	49.5963036623956	47.9117416660528	90.4865	46.0315	39.3528
91.9518639812806	49.59630136815	47.9117411354624	94.4684	44.7163	40.2539
91.9518571767788	49.5962990843615	47.9117406102345	90.4784	41.2284	44.1276
91.951850394355	49.5962968089852	47.9117400859195	90.0385	42.8005	44.3862
91.9518436263327	49.5962945379353	47.9117395609666	93.3823	48.5086	44.2946
91.9518368596895	49.5962922688499	47.9117390374243	95.1396	47.3596	38.3213
91.9518368596895	49.5962922688499	47.9117390374243	94.3452	48.7818	37.6589
91.9518301605157	49.5962900263702	47.9117385263466	90.3356	51.1932	37.7625
91.9518234551745	49.5962877814912	47.9117380166042	92.2396	41.0703	39.2658
91.656010887364	49.6073279472137	47.9971696071843	89.352	47.1855	40.3099
91.3626087262015	49.6182781657996	48.0819049279609	97.7455	51.8526	39.6885
91.3626087262015	49.6182781657996	48.0819049279609	93.3932	53.1876	39.0419
91.0218623168443	49.6309952450558	48.1803130067904	91.9732	45.8332	46.1527
90.6773696630371	49.6438521467778	48.2798031066818	85.9154	51.5363	38.6114
90.6773696630371	49.6438521467778	48.2798031066818	80.0004	48.0282	43.1849
90.5256542712391	49.6495144574208	48.3236188108824	91.1842	48.1207	54.4953
90.3723751137767	49.655235148483	48.3678862234946	92.1982	53.9806	59.5699
79.1560063982303	49.0636924530652	48.9104657172666	77.9705	58.8491	56.0075
78.6663185483123	48.9705643001563	48.8860433030534	77.8264	55.5164	53.7679
78.0977598175668	48.8624356386203	48.8576872426847	77.9078	47.2474	41.2613
77.477197145238	48.744416217727	48.8267374806573	78.2967	50.1808	43.2865
76.8297733171511	48.621287971437	48.7944480122447	79.533	47.2684	42.1428
76.1420583204613	48.490496708058	48.760149014303	74.8417	48.5823	43.578
75.4540862990015	48.3596565004924	48.7258371664733	76.4125	46.981	46.4216
74.7578741835439	48.2272491343665	48.6911143345239	77.4079	49.147	51.5989
74.0317270331494	48.0891483696432	48.654898496525	78.0993	54.3894	50.2798
73.2161693296379	47.9340424452848	48.6142233301459	69.2681	55.3133	57.276
73.0310828270198	47.8988441809829	48.6049935057957	69.4154	51.8752	55.6067
72.8463283901853	47.8637090455374	48.5957802599646	65.7303	47.3671	58.4265
72.7547010292634	47.8259487479637	48.3494430144506	66.2863	51.2705	54.2569
72.6609932205431	47.7873310981899	48.0975125076703	72.0304	52.5053	58.0692
72.5278111480271	47.7324458670626	47.739457145795	73.3859	52.8201	55.9097
72.5278111480271	47.7324458670626	47.739457145795	73.2401	49.0047	54.3428
72.3646415887545	47.6652026111493	47.300781673055	74.4488	50.3129	52.3971
72.1932398508366	47.5945668246433	46.8399743401475	72.0955	52.6394	50.8408
72.1932398508366	47.5945668246433	46.8399743401475	74.3979	53.0985	48.6112
72.0096850928427	47.5189226868418	46.3464941318316	70.1179	52.2878	46.5219
71.8267899358499	47.4435503690305	45.8547871612114	75.9853	41.4015	43.6031
71.6470181770296	47.3694652440106	45.3714773535297	72.4926	42.7909	40.5929
71.4761380041643	47.2990444225991	44.9120721545719	72.9378	43.4347	40.5471
71.311195343787	47.2310705052914	44.4686297112579	72.4429	44.8985	35.9587
71.162959459368	47.1699815767547	44.0701026779041	72.0385	47.603	37.589
71.0211801108595	47.1115534367754	43.6889337785968	70.6191	48.182	36.9413
70.8864868480027	47.0560455294846	43.326815501988	69.1689	51.2673	37.9561
70.7570096342451	47.0026871932661	42.9787203408551	69.1565	53.343	39.551
70.6303230385961	46.9504788884677	42.6381276393279	69.8977	54.8286	42.1718
70.5023494722553	46.897740210067	42.2940750002024	73.7963	57.8273	45.2128
69.8696869907609	46.6370180749937	40.5931939359466	68.5789	56.8701	42.2821
68.9973991926912	46.2775447742525	38.2481017423233	66.949	50.6855	34.7495
68.2243826812801	45.9589820280917	36.1698915302849	67.7991	50.1342	31.512
67.548350016693	45.680386894646	34.3524150178194	67.5609	49.631	28.0783
66.9892498512872	45.4499802295404	32.8493030741701	67.6648	48.1141	30.5928
66.4530464633888	45.2290092830522	31.407748164819	70.0624	50.1219	34.6274
65.8431763176292	44.9776795045359	29.7681467603709	70.4096	46.4113	26.9931
65.2445847018871	44.7309977324063	28.1588668030841	66.0257	55.1875	22.0287
64.9123077973416	44.1300300448905	27.64238570764	61.2083	54.3519	23.523

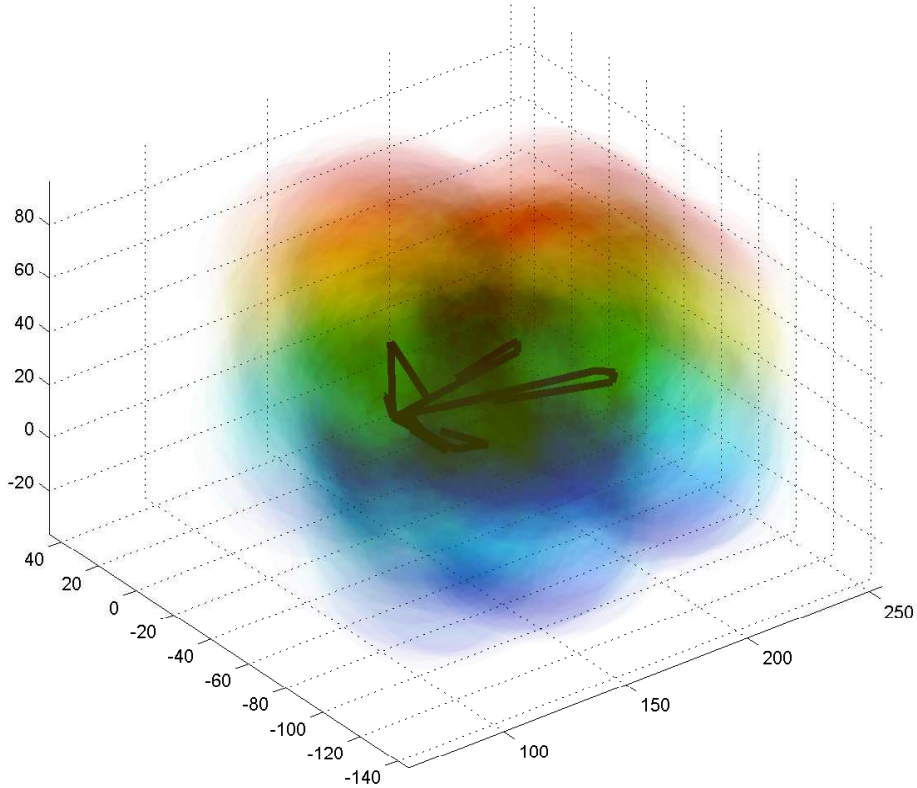
Solution x	Solution y	Solution z	Original x	Original y	Original z
63.7704388645057	42.0648098703886	25.8674985173594	74.5598	39.2546	26.0148
Route: 6 Length: 241.999276367362 Demand Met: 9999					
47.4663670665923	19.9784191752346	3.22558370968252	47.5893	27.8934	1.3329
47.6256074275781	23.7573149058906	4.74684595236448	50.8592	31.2824	4.4654
47.7295314911584	26.2235609317042	5.73967755833031	46.7677	27.4481	8.8301
47.8254911360091	28.5007964616553	6.65641914900225	37.4272	33.8061	3.3013
48.2529454392522	29.0945428667725	7.10347594702156	44.1303	30.8739	2.5661
48.7131081939327	29.7337220679536	7.58474108696749	42.8212	36.4305	1.5446
49.2184439054168	30.4356479052987	8.11325071923986	45.6407	35.658	2.8521
49.7368425869858	31.1557182485188	8.65542238636203	53.915	28.4629	8.3577
50.2558133721941	31.8765836297823	9.19819256984524	49.5432	29.0024	13.3417
50.7809609510534	32.606029168864	9.74742274929741	54.5895	27.7676	11.1642
51.3143868602234	33.3469741530143	10.305311059703	44.3651	39.5082	4.2576
52.0054403306345	34.3068706605054	11.0280558491773	45.4526	36.121	9.3446
52.7597005612066	35.3545639375299	11.8169059996403	43.7884	36.8808	19.8614
54.5194363361116	37.3608698642765	13.1115930847722	45.4903	38.3462	11.2293
57.9695396020901	41.2944054663825	15.6499377017256	50.3352	41.2014	16.9793
65.9307101396068	50.3711105017158	21.5073019836677	70.1344	58.5671	20.707
68.145558726753	52.8962954038191	23.1368294081842	68.2826	55.0673	33.7791
69.1312774980768	54.0201263705351	23.8620514972731	70.694	53.8562	23.1583
70.1235643992969	55.1514457932205	24.5921064912833	76.0043	50.5809	30.4596
70.9989428118751	56.1494762417527	25.2361490220341	70.8564	51.5507	32.2844
71.8901380396388	57.1655396373005	25.8918284965671	70.2011	52.705	34.7749
72.7979177888788	58.2005110704261	26.5597099139529	73.2116	57.797	29.252
73.6924957824777	59.2204308394927	27.2178784215574	67.4683	58.2291	37.5546
74.3375714503672	59.9558916279415	27.6924834336951	80.7698	50.729	27.0276
75.2163185956603	60.9577636793194	28.3390033356606	73.8072	55.2741	29.1095
76.2120974496431	62.0930646121752	29.071621332149	81.1686	57.7423	31.0101
77.1983590439404	63.2175150112501	29.7972358456272	87.1149	58.1702	24.9275
78.8365209695188	65.3133098116893	31.1721543732702	88.0225	60.7529	26.1198
80.7566793100182	67.7698798014494	32.7837525020705	88.7937	67.447	23.6857
84.2005705608629	72.1764698063357	35.6751357289412	94.549	73.3405	36.7472
85.5495363033724	73.9025053418847	36.807667399828	93.1133	78.1389	33.5399
86.5676097604944	75.2051521284083	37.6623929879701	94.4072	76.9857	34.4342
87.4451519796767	76.327983944902	38.3991327578384	89.95	80.2132	31.6802
88.299142043358	77.4206792818459	39.1160986336504	88.0687	81.4777	36.1559
89.1321572124286	78.4865355252195	39.8154537650225	89.5631	83.3752	32.5568
89.9570631292502	79.5420151946536	40.5080004860614	97.7624	79.6432	41.8331
90.676547654468	80.4626049145882	41.1120383634421	94.0795	80.8773	41.7611
91.369888314798	81.3497429253003	41.6941269306971	92.1151	81.2598	42.8198
92.0560028981347	82.2276349050394	42.2701486964423	92.6699	80.64	42.9825
92.7452686494548	83.1095586488506	42.8488156515895	94.6945	78.572	44.5388
93.4479882625146	84.0086966814561	43.4387773945637	91.1677	84.1211	45.979
94.1513629303126	84.9086725870685	44.0292887000929	97.0865	83.6094	41.2641
94.8642466225907	85.8208157134685	44.6277837797542	104.3617	84.8664	42.6246
95.4776873364393	86.605718843888	45.1427899154846	98.567	80.2017	48.301
96.1099919054531	87.4147587173265	45.6736334235303	94.9909	83.4209	53.4521
96.7361895391912	88.2159839358528	46.1993486419446	97.4314	81.946	52.8698
97.3759799925856	89.034600819482	46.736474804727	96.9343	84.943	57.6208
97.8378582592911	89.6255762825633	47.1242366512065	94.0924	96.5838	56.3482
97.8378785707671	89.6256020168407	47.1242534769527	101.0606	82.9382	56.7378
98.0660470730753	90.0274002171085	47.2423492444826	104.5599	87.8351	55.8078
98.2224105270614	90.3027484903602	47.3232746019554	103.2876	94.1817	57.6589
98.2224105270614	90.3027484903602	47.3232746019554	98.656	92.6213	53.0887
98.1777866261934	90.5096979894867	46.8632585026412	103.8628	98.4843	53.5771
98.1777866261934	90.5096979894867	46.8632585026412	100.6204	94.7646	50.8195
98.1036386150225	90.8535781867785	46.0988659058358	98.3726	88.4744	52.1576
98.1036386150225	90.8535781867785	46.0988659058358	95.9325	86.7596	55.1395
97.9900464886304	91.3803973448744	44.9278238248784	96.5235	92.1962	47.4754
97.8751041754136	91.9134801579057	43.7428571828006	97.0347	92.0258	44.3343
97.7604811402162	92.4450828392058	42.5611798750001	98.9319	91.3958	49.6094
97.6301919047075	93.0493451859889	41.2179872175634	96.8345	90.0197	42.1774
97.4937377217399	93.6822010617295	39.8112351576681	98.2349	98.4363	43.0129
97.3552778256936	94.3243588408754	38.383805453367	94.4828	106.1237	38.6118
97.5718637816549	93.5344276566635	36.412389232822	98.8373	99.4165	35.0062
97.7905755365922	92.7367431566039	34.4216224043814	96.2545	87.1498	32.8659
97.9871925615047	92.0196398406746	32.6319634078823	101.602	92.3175	35.5214
97.9871925615047	92.0196398406746	32.6319634078823	100.5649	91.4192	35.2273
98.219564098815	91.1721356132424	30.5168629309811	97.7943	87.7833	36.2243
98.5108691325569	90.1096923781187	27.8653422742093	103.1106	83.2736	35.5168
98.5108691325569	90.1096923781187	27.8653422742093	101.2985	78.2917	28.1682
98.4513820705661	90.4177675573821	26.9893015236049	98.2345	80.86	27.262
98.3850968200978	90.7610491733155	26.0131520668908	99.3434	90.9979	30.2293
98.3850968200978	90.7610491733155	26.0131520668908	100.7126	88.5952	23.1233
98.3166473654666	91.1155381956812	25.0051376599935	98.853	91.6792	31.3431
98.2424447391962	91.4998217778418	23.9124011787055	93.4941	85.8189	27.3685
98.1568748073306	91.9429718436351	22.6522761762747	95.6122	103.8055	23.229
98.2043608277768	91.7484768418229	21.8647546280001	92.5654	91.5305	24.0262
98.2534889049705	91.5472568427902	21.0500030558095	88.6062	92.2681	23.9863
98.3093708320291	91.3183750658545	20.1232464429428	101.583	94.8217	23.7006

Solution x	Solution y	Solution z	Original x	Original y	Original z
98.3093708320291	91.3183750658545	20.1232464429428	104.3693	90.8389	25.0156
98.3763362598994	91.0440967481788	19.0126762805119	98.1138	89.594	19.2781
98.3763362598994	91.0440967481788	19.0126762805119	92.7178	89.1801	18.823
98.4426954935601	90.7723017920814	17.9121615470428	93.1284	88.6615	20.1351
98.4426954935601	90.7723017920814	17.9121615470428	92.288	83.6157	17.9977
98.508479229954	90.502863395993	16.8211893407449	96.9541	82.6989	20.5312
98.508479229954	90.502863395993	16.8211893407449	98.2007	80.5294	17.4055
98.5733720488911	90.2370728543284	15.7449890118205	97.1852	78.7831	16.5303
98.6241258747569	90.0291916592704	14.9032701589206	102.2936	85.0217	15.0829
98.6241258747569	90.0291916592704	14.9032701589206	97.8831	81.9659	16.6355
98.6737477132706	89.825946295263	14.0803228306601	102.4507	89.6037	15.6617
98.6737477132706	89.825946295263	14.0803228306601	102.0461	86.7072	16.2393
98.7250312488793	89.615894444163	13.2298160021586	102.0076	93.075	9.5996
98.7250312488793	89.615894444163	13.2298160021586	100.8882	91.1406	6.6906
98.7686198490464	89.4373600769964	12.5069249938274	105.6506	92.4297	8.9472
98.809688711955	89.2691459143143	11.8258209739077	95.0373	98.5247	13.5608
98.809688711955	89.2691459143143	11.8258209739077	95.7576	96.9635	11.4638
98.8599247946173	89.0633846205584	10.9926844785788	104.1034	98.3317	9.2012
98.8599247946173	89.0633846205584	10.9926844785788	101.8123	94.891	12.8509
98.9131570966333	88.8453533821428	10.1098623275447	104.1728	96.9352	2.733
98.9131570966333	88.8453533821428	10.1098623275447	99.3782	93.0601	2.9898
98.7126148789604	88.3399216655164	9.8603253515449	95.504	96.351	10.2996
98.4884257700303	87.7748920312586	9.58136443007435	95.2026	90.5293	12.2607
98.2578856319753	87.1938556273232	9.29450090156281	92.4623	94.734	14.7003
97.9260133171623	86.3574310969462	8.88155094956594	91.14	83.5499	11.0268
97.6227520149621	85.5931156967259	8.50420170222259	93.9684	87.8762	13.7783
97.3058388996303	84.7943936739663	8.10986577743441	103.8313	82.5056	7.2236
96.9897454530448	83.9977378061357	7.71655001440811	103.6911	80.62	5.0557
96.6871695241184	83.2351507137546	7.34005428397552	86.3374	85.7586	1.5055
96.7324308712039	83.0078334543778	7.31231759875934	96.8706	83.0827	11.4782
96.7324308712039	83.0078334543778	7.31231759875934	97.3132	81.5365	12.7479
96.7773142345761	82.7824145564384	7.28481252874834	89.835	77.746	1.5427
96.7773142345761	82.7824145564384	7.28481252874834	93.9524	73.145	3.1932
96.816173453411	82.5872493726163	7.26099891538412	88.6759	82.3658	11.13
96.8555851547473	82.3893091848689	7.23684665689524	98.5933	78.8152	8.2256
96.8946188155241	82.1932689251745	7.2129263371961	107.2392	85.9448	2.4326
96.9466328216931	81.9320418847108	7.18105057708323	101.1477	85.2681	2.6541
96.9997017456178	81.6655172569011	7.14852843506573	100.0565	80.1054	0.0522
96.9997017456178	81.6655172569011	7.14852843506573	93.2494	81.8793	2.8544
97.0539246876538	81.3931990830436	7.11529952230212	99.0152	86.155	1.7016
97.0539246876538	81.3931990830436	7.11529952230212	93.0994	86.3608	2.8092
97.111945805115	81.1018044831077	7.07974277897927	88.3633	87.3681	2.2205
97.2301627718126	80.5080750319212	7.00729169437961	107.981	80.0957	12.6444
97.1459457807975	79.3624821474587	6.7010182057557	108.1531	76.0691	2.761
96.1427627354307	77.9578667310414	6.5702475613678	91.86	79.7087	2.2114
95.185250133716	76.6172001139719	6.44542997349966	98.9119	80.0767	11.0692
94.0700546753359	75.0557437838949	6.30005877611336	103.5291	67.906	8.9335
92.7773108250719	73.3182781924248	6.12655948839728	91.1291	78.4897	13.7054
91.1733122863469	71.1624810449497	5.9112869072936	93.0933	68.7697	14.1811
89.5767382414803	69.0166633556911	5.69700962107519	94.6798	69.1984	4.5089
87.785649991969	66.6094180836703	5.4566275856461	98.4258	65.8894	6.8362
79.9130981159719	56.028767403565	4.4000705996933	70.5527	57.3223	8.5137
77.4486028911613	52.7164649715778	4.06930606197642	72.7757	56.7077	5.4576
75.0023889899167	49.4287276679894	3.74099067363989	67.8488	53.6384	2.957
72.8407223912136	46.5233943662196	3.45086258039386	75.2757	50.6388	0.889
70.0687534830549	42.7977906983464	3.07883421403187	75.73	42.7229	0.0066
66.6096061775392	38.1486405510279	2.61460821031257	66.9624	36.7077	4.2616
63.4303734556851	33.8757122687577	2.18795452855364	62.6603	37.129	7.3175
59.5481309143374	28.657890264397	1.66691016138423	57.9508	29.6187	7.6435
55.7633439002476	23.5710473325983	1.15891815651233	54.8257	29.6059	7.5612
Route: 7 Length: 146.035971538356 Demand Met: 9011					
53.642791467422	19.5659924357186	2.74592387169176	54.0368	23.8586	2.2143
58.4458506393536	25.1696977137988	4.77064255326559	58.126	35.24	1.1949
60.2386046091026	27.2610635277592	5.52645037776491	68.3701	31.308	4.6701
61.4694692461767	28.6970235043119	6.04541680716704	63.2951	31.2899	8.2512
62.6024434313259	30.0188005957082	6.52308860875339	67.6588	29.7348	5.9837
63.6706389313171	31.2650452941643	6.97345188762235	66.5887	34.1226	10.8677
64.6074476742058	32.3580155738525	7.36840445774535	69.1853	30.9522	12.1629
65.4635433662151	33.3568318590548	7.72931869444089	67.4673	33.2544	9.192
66.293373046676	34.325006185243	8.07915542714338	71.5231	31.8286	8.0149
67.0904789836019	35.2550069121028	8.41519404509982	68.2062	28.5319	10.0866
67.9800852430256	36.2929316201702	8.79022742439307	72.2401	34.2889	7.5435
68.8470679973619	37.304463404967	9.15572115351464	68.0366	38.8903	2.9918
69.757604117633	38.3668081531747	9.53957895836102	75.4748	37.8532	8.3059
70.5991714850003	39.3486881832431	9.89435695060024	68.7356	47.889	4.3235
71.2919641800673	40.1569918655371	10.1864125899513	73.6395	46.5004	2.2066
71.859235187664	40.8188472900831	10.4255486558237	73.5268	49.2611	4.4383
72.3033702045143	41.3370378154909	10.6127721996477	75.9022	40.5634	8.2476
72.7530141862039	41.8616572252666	10.8023192733653	80.8076	41.6004	10.0065
73.1663784428323	42.3439503690983	10.9765705087738	76.5498	52.218	12.9878

Solution x	Solution y	Solution z	Original x	Original y	Original z
73.4533303066086	42.6787544452325	11.0975311902968	71.8965	50.0142	14.8598
73.7204855892317	42.9904604392711	11.2101454093089	73.6428	45.1426	7.6389
73.9902761426892	43.3052415549869	11.3238710111198	72.9198	44.5581	6.5665
74.2665281286012	43.6275622426288	11.440321375731	70.6462	49.6735	6.8503
74.5406276711909	43.9473714627748	11.5558646425415	72.1444	51.2772	8.2689
74.8023587374067	44.2527497612881	11.6661934467785	70.7664	48.6137	12.8047
75.0637465085304	44.5577272086602	11.7763769904869	72.0723	49.2863	13.9841
75.3192938868044	44.8558903997985	11.8840974008264	71.8327	48.0379	13.6369
75.5741047846673	45.1531943403218	11.9915064136303	73.2283	44.0709	14.6285
75.8339449239645	45.4563668001039	12.1010344530982	73.6611	50.4924	3.9757
76.0948710411913	45.7608067488801	12.2110203192188	73.911	51.0144	2.5794
76.3589587245377	46.0689373568423	12.3223373504288	79.9479	46.2913	1.0177
76.6461200554071	46.4039860824423	12.443366773012	80.8872	43.1227	9.5119
76.9339896529406	46.7398638430022	12.5646943633211	70.916	53.3608	4.8842
77.269102319995	47.1308776214109	12.7059300999167	68.022	53.7678	15.3935
77.621481566511	47.5420549889507	12.8544514615414	71.0505	50.768	8.8572
77.9902025680055	47.9722988398507	13.009862188546	69.9782	57.1009	12.9468
77.9902087928247	47.9723045271908	13.0098642905611	71.2619	53.5794	21.4252
78.647154519969	48.381706175948	13.0819906333344	77.6289	48.4559	5.3003
79.3256353131829	48.8045303620636	13.1564845453105	76.2244	51.9684	6.7104
80.0154090426662	49.2343919128764	13.2322177555069	77.8794	45.0468	10.8339
80.753426747827	49.6943215256101	13.3132519966202	77.5882	39.4219	14.211
81.907080367111	50.4132916469851	13.4399585160156	82.0477	53.0979	5.7932
83.0054032959001	51.0977732156958	13.5605755862333	89.3668	41.343	14.5671
83.9844362891668	51.7078824287455	13.66808346375	89.0134	41.3658	15.8043
85.2364664808438	52.4881101798431	13.8056030433651	89.3464	46.1786	22.3858
86.2360167209965	53.1109641979282	13.9153649345418	83.5076	51.7826	22.7284
87.342827586372	53.8006512078207	14.0369013647451	84.6532	51.7406	11.3965
88.5770001893484	54.5697106775159	14.1724372625919	89.6611	52.1615	6.6683
89.8715975528348	55.3764349021901	14.3146259817112	92.0851	66.8651	17.5763
90.2025748754243	54.9593484202132	14.1649997748768	93.5538	62.1822	15.7085
90.5587118660638	54.5105588551244	14.0040000119157	94.5987	62.0376	18.5629
90.9722031449772	53.9894978802867	13.8170719233706	97.3108	57.82	10.7791
91.377028185523	53.4793578808862	13.6340623111571	98.2152	53.7701	7.2972
91.7382362402885	53.0241809111941	13.4707720604214	96.8097	54.0588	2.5941
91.8400959552631	52.8958143802965	13.4247394652742	93.2379	56.4517	4.9219
91.9442624335117	52.7645406138239	13.3776643661063	92.8209	56.9207	15.4027
92.0540817908251	52.626141597139	13.328033322865	92.412	50.9961	13.3675
92.1652506329607	52.4860431355526	13.2777922479174	100.6388	53.8259	6.8403
92.2707173931311	52.3531299675139	13.2301273776581	98.8606	57.9963	4.7298
92.582425459133	51.6821513750672	13.1993828122866	103.8062	50.1176	9.3383
92.6911639077051	51.4481424539073	13.1886179469962	95.9041	59.3009	4.8034
92.9448353642632	50.9023394922137	13.1634480215978	98.9521	56.5952	10.596
93.2118797124729	50.3277692624444	13.1369494097445	102.1595	55.9791	16.6639
93.5109162562578	49.6843875511333	13.1072727676785	99.5987	51.3246	10.6347
93.8058434371716	49.0498501167735	13.0780052272224	100.3439	52.2486	6.1962
94.0977320234474	48.4218539184111	13.0490371649605	98.2004	50.3921	3.9008
94.384006528406	47.8059385697408	13.0206237705879	94.5726	47.3613	8.9492
94.6696599274747	47.1913609078707	12.9922708188609	89.5287	45.4109	8.5583
94.9656114108602	46.5546338533722	12.9628948671367	106.4442	49.0895	9.9061
94.9716217553591	45.5541547193051	13.0317958305716	95.7654	46.8722	1.8076
94.9791045827199	44.3101481295244	13.1174466502196	96.6284	43.246	1.131
94.9792639903002	43.9014449268433	13.162427830453	102.543	45.6081	13.7083
94.9794272716151	43.4804370608734	13.2087632110999	104.1102	44.8822	12.643
94.97959374197	43.0498130327997	13.2561558669064	98.0879	44.5657	15.6818
94.9797620240774	42.6181244638783	13.3036643109069	93.0102	50.1223	20.798
94.9799742541958	42.079222014644	13.3629757451691	91.9756	47.4725	20.0446
94.9802057718051	41.4929567192846	13.4275010160024	92.8093	39.7693	16.6418
94.9804305339041	40.923947884497	13.4901247399402	92.634	40.1716	1.8791
94.9806866703986	40.2705676713332	13.5620205759054	91.1655	36.0648	5.0962
94.9809169460252	39.6855544078619	13.6263883819357	102.0152	42.2262	11.91
94.9811594519713	39.0648742771305	13.6946840439899	97.0806	39.3994	12.7921
94.9814018973055	38.4453770756598	13.7628482369748	95.8598	39.2349	3.852
94.9816555381119	37.7999907050536	13.8338607137838	94.1971	38.0204	14.8005
94.9819099530175	37.1520830173672	13.905150601633	85.9182	41.843	9.5066
94.9822639882601	36.2522165931438	14.0041731414172	89.1249	38.0318	13.3915
94.9826306861371	35.3232615116526	14.106398022702	96.3928	32.1668	2.4627
94.9465805299047	34.3882606310346	14.519248277385	99.272	31.5703	11.7517
94.9112919768096	33.4730460650168	14.923365532236	97.9141	29.0493	9.3885
94.8777526521222	32.6032247674789	15.3074519597716	106.8535	30.7643	14.4546
94.7383123068173	31.926998756257	15.621715918564	102.9211	31.879	13.8489
94.5924756250603	31.2197492441981	15.9503947772691	96.0238	29.4057	14.5945
94.4501632456159	30.5295997762378	16.2711373586406	105.0575	26.2706	17.0665
94.3372417914312	29.9819516623405	16.5256596375404	102.9016	24.8202	19.8795
94.240259340597	29.5115994441945	16.7442617485929	100.6297	27.3107	24.1251
94.1514217504098	29.0807419539722	16.9445073702215	97.0499	25.7334	20.6225
94.0661372587936	28.6671181011949	17.1367462253964	98.3241	22.4412	26.657
93.8184748153091	28.6107350951985	16.880579328117	90.6435	28.0536	25.8632
93.5576211404734	28.551348093298	16.6107656904157	96.156	30.1327	19.1399
93.2872538218386	28.4897911221476	16.3311142974562	90.72	30.049	19.1921

Solution x	Solution y	Solution z	Original x	Original y	Original z
93.0187951910788	28.4286675638054	16.0534345080345	92.5592	25.4331	20.672
92.7465523258706	28.3666825188754	15.7718372624603	102.4997	24.4075	19.7902
90.6247816258293	27.8832958228703	13.5772705424822	97.1071	18.8552	9.2302
88.4824272925377	27.3953048346811	11.3615018147526	93.4265	31.4744	1.0443
87.5420911350587	27.0444550461897	11.1031774249288	87.5726	32.8781	1.3636
86.3760656228108	26.6094261748308	10.782821753405	85.525	32.0217	10.845
85.1895643602809	26.1667752145402	10.4568240883717	90.6179	26.4649	2.7134
83.8324544240051	25.6605432724542	10.0839556164554	86.512	33.4131	7.017
82.201579705528	25.0522695748751	9.63585926166645	85.1876	33.113	2.1197
78.9681754060508	23.8462478402654	8.74773234357932	79.7169	32.9378	5.3155
74.5445420604871	22.1959941543727	7.53283417391708	73.7989	28.6287	7.3132
69.7405656237903	20.4036550876694	6.21347415883256	66.7482	27.6121	12.1372
63.8434977352829	18.2030422748207	4.59339662952469	63.3607	23.5913	11.9128
55.7128770462881	15.1690638779847	2.35906785540204	55.8132	15.4408	3.6174
Route: 8 Length: 157.954015568954 Demand Met: 8709					
42.6234881283569	11.3110714705301	1.24023696682658	42.7704	10.2739	1.2183
38.2398870645967	10.6739140972337	2.44699545358836	42.4139	3.5597	1.814
31.9477036351086	9.75935945140166	4.17917056286992	31.0707	1.7474	5.3999
27.2597682828895	9.07798487814387	5.46970702386581	26.7943	-2.6353	5.1743
25.7844115426599	8.86354384126732	5.87585680329271	19.4163	-0.8394	2.2943
25.5798461867095	9.23357518484767	6.17513753679553	28.0443	7.2557	0.5495
25.3627494192024	9.62627245018562	6.49275133194199	23.3217	16.9506	6.2856
25.1797338943031	9.9573223380103	6.76050463525292	16.9397	16.157	0.3423
25.2705352521237	10.6608827232052	8.46920024349191	23.9142	5.5856	8.3806
25.3730991246965	11.4555905842168	10.3992620880699	22.4003	2.9895	12.1851
25.499360247869	12.4339299234093	12.7752999990116	26.4488	5.1021	19.0029
25.597051544673	13.1908863982557	14.6136728560558	26.246	7.8923	16.6585
25.6950353008589	13.9501070190745	16.4575437699861	21.6596	11.213	17.563
25.7965843342798	14.7369496071912	18.3684981966824	28.1449	5.3771	22.529
25.8874930610457	15.4413400771254	20.0792052330027	31.9656	14.6164	16.7619
25.9884997015709	16.2239757688012	21.9799419121299	20.5322	21.5891	20.6595
26.095478506652	17.052894192216	23.9930812574242	20.8129	26.0745	22.3222
26.1895316535479	17.7816587435439	25.7629846381677	22.8581	29.0039	22.5241
26.3791691011949	18.1844328786139	27.6194006580403	28.099	29.8348	27.0633
26.4658911014351	18.3686260714052	28.4683390709549	23.1615	20.5337	28.672
26.4658911014351	18.3686260714052	28.4683390709549	23.1228	16.7524	24.3445
26.5627151817023	18.5742756864016	29.4161716918508	17.2669	18.1061	25.0094
26.7044001343948	18.8752057669367	30.8031671093717	19.0397	19.3917	26.8913
26.881253585909	19.2508320739787	32.5344501618524	19.5225	24.6717	34.6116
27.030337771058	19.5674769808684	33.9938767837953	17.7323	26.9057	35.8248
27.077727788707	19.6681355967711	34.45780575288	18.1963	16.0602	36.4885
27.1243362955486	19.7671344675332	34.9140833481569	19.6468	14.5775	38.07
27.1686197552446	19.8611955912028	35.3476002284009	18.4916	22.031	28.1174
27.2568621688073	20.0486253574331	36.2114536480546	29.4417	11.4808	30.7206
27.3950051618671	20.3420388116652	37.5638033999884	25.9081	14.4892	36.1934
27.5411567572127	20.6524661926855	38.9945643900433	17.3215	22.815	38.4524
27.5411567572127	20.6524661926855	38.9945643900433	21.1889	21.267	39.0474
27.7032813796249	20.9968179019493	40.5816888763423	20.7311	19.0512	39.2565
27.8822002487099	21.3768360935821	42.3332098700839	19.3676	20.9011	45.1036
28.0432893146977	21.7189898070401	43.9101994399613	21.7951	21.835	45.5134
28.1984636136405	22.0485838506567	45.4292944451382	19.4151	20.4264	46.5071
28.354557709915	22.3801307103637	46.9573910206292	21.3113	31.7798	46.1078
28.4924713064705	22.6730680662426	48.3075279066653	23.1689	25.59	48.8728
28.6296772663165	22.9645029048767	49.6507394373423	16.9754	26.2994	50.4148
28.8405847626959	23.2525034012085	51.0613078943293	21.4132	25.3225	51.4824
29.0528577180116	23.5423663567582	52.4810031233927	35.5392	31.6783	58.7469
28.3030216568507	22.6215840339294	52.7703039978587	18.7218	26.0511	59.401
28.3335884129217	20.9825949457797	52.4347813535088	19.4476	21.0876	59.2618
28.376592682317	18.677021157791	51.9628041352652	22.0389	18.6688	59.3708
28.4267550735255	15.9879163835724	51.412316966592	22.5923	19.795	49.1879
28.4866056792424	12.7795237599196	50.7555284849503	27.6562	5.4902	56.4427
28.523352432852	10.8094017161328	50.3522222189374	30.7839	5.7178	56.2846
28.5546958210845	9.1289160714558	50.0082071209549	31.1391	0.2266	57.7289
28.5565940019643	9.02710627851556	49.9873659011003	25.8989	0.7413	53.4706
28.5583088665988	8.93513778140613	49.9685394925531	33.7832	8.5886	57.2507
28.5601619758526	8.83575105066406	49.9481945199749	36.7928	9.6586	58.8057
28.5985430851709	6.77810028145056	49.5269727449873	27.3755	-1.0984	56.1861
28.6230345465137	5.46532926324884	49.2582425356135	22.4229	-2.1641	56.3911
28.6383179535119	5.45449964426622	49.2353499651055	31.0065	-1.0714	59.1851
29.0920627216039	5.13287166978296	48.5556361180597	38.0686	7.3443	51.7798
29.5258715390991	4.82537456138512	47.905789129822	33.4349	0.0139	45.2628
29.969124128707	4.511184766996	47.2418107130363	36.4279	-4.3699	52.432
31.5031402510746	4.21393294736155	42.2134723800862	40.2323	12.6508	42.5989
31.6314350978052	3.85753091561198	40.8436584510728	42.4155	0.0668	38.5675
31.6996705076618	3.66798512075611	40.1151330593591	27.9452	7.0873	43.7392
31.77627878445	3.45518116871476	39.2972167208155	29.2732	5.6917	40.0529
31.8558685528055	3.23409573610264	38.4474714856201	22.0744	6.6433	40.1203
31.8558685528055	3.23409573610264	38.4474714856201	29.6205	6.6839	35.8272
31.9476746660151	2.97907929403458	37.4673140742611	28.6989	1.5656	37.4478
32.037744139782	2.72888838909272	36.5057010374331	31.7997	5.4917	35.1341

Solution x	Solution y	Solution z	Original x	Original y	Original z
32.1288509159297	2.4758167911829	35.5330164349423	36.2059	6.8965	29.7476
32.1288509159297	2.4758167911829	35.5330164349423	36.4235	4.5159	28.6582
32.2002086528344	2.27759803449575	34.7711602893809	29.9497	8.0977	27.1858
32.2598013924713	2.11206025412289	34.1349134072037	31.1128	-2.8096	30.5667
32.3162787810769	1.95517669121086	33.5319272468187	24.5208	1.7631	30.0851
32.3707732202178	1.803802742548	32.950116655561	24.8641	0.1355	28.7608
32.4205756557402	1.66546298805986	32.4184018888829	29.2451	9.0499	23.6495
32.4428409658178	1.60361531761438	32.1806852138378	33.6792	4.7017	30.2163
32.4666648088112	1.53743744466373	31.9263264231321	22.6294	-1.9579	25.7184
34.5413558426232	1.61281054295108	30.8470734654859	27.2842	5.8331	28.3822
37.5726842158929	1.72293506833076	29.2701666223446	32.3564	-1.4633	20.5286
41.1971346555979	1.85460707260908	27.3847113188471	39.9467	-2.3317	18.5214
43.7498763031177	1.94734781728973	26.0567739028477	41.1669	5.3004	18.6447
46.0803092925453	2.03201149324364	24.8444840351333	44.8479	-0.9391	15.0769
47.7180447374523	2.09151006513373	23.9925376899434	45.0418	3.8658	25.2247
49.5817572328464	2.15921800332451	23.0230372999174	51.7765	0.7553	20.0441
51.2722173508407	2.22063207273233	22.1436632650187	57.7618	2.6586	23.6599
52.7133701506013	2.27298894393534	21.3939781524383	62.7821	-0.0838	27.7653
52.8468590220277	2.64402007430791	19.7631641874272	60.2628	6.0605	25.9406
53.0550229277037	3.2226116748809	17.2201041381444	61.7542	11.527	18.9198
53.0491665359046	3.2526803392131	16.9764050185776	57.7878	-4.3732	24.6962
53.0491665359046	3.2526803392131	16.9764050185776	56.047	-0.6998	19.4659
53.034596648149	3.32752208751044	16.3698875957004	53.8048	-5.0553	19.1679
53.034596648149	3.32752208751044	16.3698875957004	58.3955	-2.2935	14.9348
53.0203476111977	3.40070348614939	15.7768134165094	53.1154	7.9184	18.71
53.0050690809743	3.47918327397903	15.140818733603	47.1015	12.1757	10.5923
52.9944745590048	3.53358804367213	14.6998968531052	44.5689	9.75	12.1988
52.9855064776483	3.57963216446857	14.326716391565	48.7027	4.8736	15.3944
52.9769241842797	3.6236938118422	13.9695991397797	63.0749	1.8033	17.7213
52.9769241842797	3.6236938118422	13.9695991397797	61.9524	-0.333	11.9086
52.9653965695362	3.6829040819172	13.4897532569964	58.2741	0.1622	8.0145
52.9653965695362	3.6829040819172	13.4897532569964	58.8992	5.3006	6.9433
52.9559968319497	3.73116918676017	13.0985857409573	58.0725	5.2013	11.1785
52.9466411279099	3.77920831373883	12.7092512069025	59.4358	8.0877	8.3998
52.9466411279099	3.77920831373883	12.7092512069025	48.302	2.6164	11.9932
52.9374178828577	3.82657312365506	12.3253903096017	52.3291	3.6705	6.1162
52.9374178828577	3.82657312365506	12.3253903096017	52.0306	12.0787	8.641
52.9290336956254	3.86962756934238	11.9764533859331	57.2331	12.7874	5.1838
52.9257947239331	3.88625835241807	11.8416635756648	58.5415	3.6684	5.0311
52.9257947239331	3.88625835241807	11.8416635756648	56.6752	3.9284	4.2715
52.9228976221182	3.90113032577527	11.7211266792793	58.2864	0.0731	4.559
52.9201857190035	3.91505011416518	11.6083070754827	46.0937	-5.8176	9.1179
53.0024128817167	4.14959988110735	10.9006429989643	48.4975	2.4432	11.2037
53.0917627617675	4.40446606128874	10.1316782920709	47.0712	4.3382	9.7807
53.1842206466721	4.66819570524231	9.33596845301805	51.545	-0.7619	6.4521
53.275492495665	4.92854189363547	8.55046806361185	62.4332	-0.684	2.8792
52.9689974423879	5.36873807929886	8.15865527476083	58.6741	1.1796	4.0744
52.6387786081687	5.84300634269848	7.73651530378416	54.5841	1.3	6.274
52.291403698521	6.34191492971929	7.29244346659216	52.3173	10.0275	11.1526
51.9340450098838	6.85516162845432	6.83560722005251	53.9046	16.3668	14.1276
50.193462226519	8.70636584383011	4.35962428034829	46.5714	10.174	4.4604
48.7207914571213	10.2726272863539	2.26475170385203	47.4524	12.1509	5.76



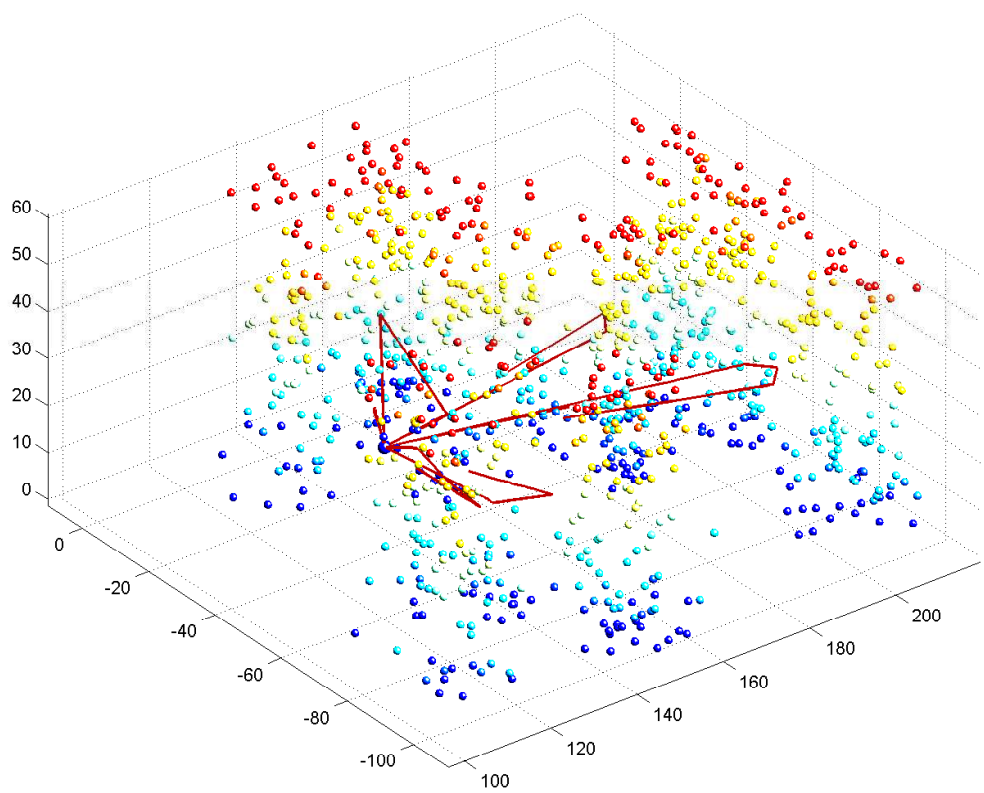


Figure O.90: $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Euclidean, Length = 740.6639853

Table O-93: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Euclidean

Total distance: 740.663985288729 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 69.6323655740068 Demand Met: 10000					
51.0649861708924	14.9067603262863	1.22065638987777	53.9046	16.3668	14.1276
54.6024827481005	17.5496618473231	2.31763253381446	72.6191	32.6684	16.6889
57.3385798414711	19.5938201684278	3.16609155282825	77.5882	39.4219	14.211
59.3102419477076	21.0668516461687	3.77749355824641	73.6428	45.1426	7.6389
60.9597621977837	22.299204172051	4.28899674570589	70.6462	49.6735	6.8503
62.3543877696479	23.3411223166591	4.72145651523634	71.0505	50.768	8.8572
63.5516316835338	24.2355759143877	5.09270907547651	72.1444	51.2772	8.2689
64.6082334602933	25.024955593524	5.42035034026813	76.5498	52.218	12.9878
65.510256865265	25.6988497572997	5.70005858912282	69.9782	57.1009	12.9468
66.2793031247314	26.2733962762427	5.93853212123844	70.5527	57.3223	8.5137
66.9706444466167	26.7898888660302	6.15291058888064	72.7757	56.7077	5.4576
67.6111503127366	27.268401696682	6.35152596641996	70.916	53.3608	4.8842
68.2299046160474	27.7306629941781	6.54339729526342	67.8488	53.6384	2.957
68.8338115925989	28.1818307240662	6.73066524473318	73.911	51.0144	2.5794
69.4290953369032	28.6265551462616	6.91525968995869	75.2757	50.6388	0.889
70.0183578933642	29.0667803709147	7.09798711585731	77.6289	48.4559	5.3003
70.5999479038929	29.5012732130704	7.27833542894395	76.2244	51.9684	6.7104
71.1693342175399	29.9266488228015	7.45489939408684	82.0477	53.0979	5.7932
71.7158729948169	30.3349559935783	7.62437799215651	84.6532	51.7406	11.3965
72.2322088117604	30.7207002187653	7.7844903727047	89.6611	52.1615	6.6683
72.7103786368161	31.0779325585043	7.9327669201388	93.2379	56.4517	4.9219
73.1369565555924	31.3966222932257	8.06504428892925	95.9041	59.3009	4.8034
73.1700402416009	31.4213390362181	8.07530289705461	96.8097	54.0588	2.5941
73.2026866308604	31.4457290687436	8.08542591841805	98.2004	50.3921	3.9008
73.2341377555902	31.4692261465357	8.09517834657085	95.7654	46.8722	1.8076
73.2646339086978	31.4920097891012	8.10463467406058	96.6284	43.246	1.131
73.2943654381186	31.5142222070675	8.11385391000626	95.8598	39.2349	3.852
73.323619415781	31.5360778711761	8.12292508203374	92.634	40.1716	1.8791
73.352759321822	31.5578483306897	8.13196087390531	91.1655	36.0648	5.0962
73.3820294628002	31.5797161065645	8.14103706409576	96.3928	32.1668	2.4627
73.4117087629829	31.6018895781662	8.15024012258624	93.4265	31.4744	1.0443
73.4418008817155	31.6243714786127	8.15957118103619	90.6179	26.4649	2.7134
73.4720807132392	31.6469936382831	8.16896044107347	97.1071	18.8552	9.2302
73.5022824216853	31.6695574560664	8.17832549294227	97.9141	29.0493	9.3885
73.5323904440452	31.692051296	8.18766149473836	99.272	31.5703	11.7517
73.5621344261681	31.7142731723809	8.19688462055607	102.9211	31.879	13.8489
73.5913292628651	31.7360847911056	8.20593747387661	106.8535	30.7643	14.4546
73.6197936907544	31.7573507310536	8.21476384038959	105.0575	26.2706	17.0665
73.6476823747066	31.7781865450342	8.22341168202462	102.9016	24.8202	19.8795
73.6750339185671	31.7986210731618	8.23189297207633	102.4997	24.4075	19.7902
73.7019270756905	31.8187131509874	8.24023212513019	97.0499	25.7334	20.6225
73.7286151018585	31.8386519840258	8.2485076758487	96.156	30.1327	19.1399
73.7553282392748	31.8586095865264	8.25679101750972	96.0238	29.4057	14.5945
73.7822413713757	31.8787166147057	8.26513636228423	90.72	30.049	19.1921
73.8093166721804	31.8989448094076	8.27353199624903	92.5592	25.4331	20.672
73.8364950157629	31.9192499970721	8.28195957763811	90.6435	28.0536	25.8632
73.8637885798877	31.9396412749467	8.29042288952461	98.3241	22.4412	26.657
73.8910461697377	31.9600056864667	8.29887504807362	100.6297	27.3107	24.1251
73.9183063159456	31.9803720175649	8.30732799487822	99.0228	31.9463	24.4512
73.9456656334581	32.000812449275	8.31581168645979	97.4429	30.1528	28.42
73.9730610124865	32.0212798319081	8.32430655954718	97.5011	28.0267	29.587
74.0004945493772	32.0417757330475	8.33281325964503	97.3283	27.0933	33.194
74.0278160719176	32.0621879601576	8.34128522040652	92.942	26.4511	38.6789
74.0522914475204	32.0804737805221	8.34887472154146	93.6487	25.1273	31.9089
74.0766074624103	32.0986405513767	8.35641479888156	93.9312	28.9768	31.8553
74.1008206083621	32.1167304769993	8.36392297228282	92.7124	33.4453	33.5856
74.124920621912	32.1347358881354	8.37139606198081	88.4465	41.4478	32.5802
74.1491060132366	32.1528050941128	8.37889561782592	87.2346	40.5435	32.6709
74.1733917779159	32.1709492969416	8.38642628605395	81.9079	40.1742	36.8216
74.1976841895719	32.1890984694982	8.39395900552614	75.9853	41.4015	43.6031
74.1976842948411	32.1890985436323	8.39395899623003	72.4926	42.7909	40.5929
74.197684400742	32.1890986180061	8.39395898557207	72.9378	43.4347	40.5471
74.1976845074391	32.1890986927369	8.39395897704824	72.4429	44.8985	35.9587
74.1976846150113	32.1890987679084	8.39395896508496	72.0385	47.603	37.589
74.1976847230439	32.1890988432212	8.39395895390665	70.6191	48.182	36.9413
74.197684831238	32.1890989184756	8.39395894374739	70.0624	50.1219	34.6274
74.1976849396246	32.1890989937059	8.3939589336395	70.8564	51.5507	32.2844
74.1976850483241	32.1890990690232	8.39395891962512	66.949	50.6855	34.7495
74.1976851573528	32.1890991443901	8.39395890947362	67.7991	50.1342	31.512
74.1976852667989	32.189099219888	8.39395889746157	67.6648	48.1141	30.5928
74.1976853766209	32.1890992954858	8.39395888673542	67.5609	49.631	28.0783
74.1976854868493	32.1890993711603	8.39395887917376	66.0257	55.1875	22.0287
74.1976855980395	32.1890994471756	8.39395886835558	70.1344	58.5671	20.707
74.197685710318	32.1890995236054	8.39395885244026	70.694	53.8562	23.1583

Solution x	Solution y	Solution z	Original x	Original y	Original z
74.1976858234015	32.1890996003078	8.39395884065831	71.2619	53.5794	21.4252
74.1976859373762	32.1890996773213	8.39395882591432	75.5201	48.6107	22.753
74.1976860524061	32.1890997547693	8.39395880995065	75.5587	49.1352	25.3998
74.1976861684573	32.1890998326238	8.39395879402928	76.379	48.6237	27.9163
74.1976862855645	32.1890999108956	8.39395878126877	80.7698	50.729	27.0276
74.1976864037863	32.1890999896075	8.39395876946008	80.3964	49.7264	23.6683
74.1976865227668	32.1891000685432	8.39395875637847	83.5076	51.7826	22.7284
74.1976866422865	32.1891001475799	8.39395874092401	87.1149	58.1702	24.9275
74.19768676225	32.1891002266783	8.39395872546701	88.0225	60.7529	26.1198
74.1976868703979	32.1891002965567	8.39395871409425	94.6877	57.1733	21.1304
74.1976869790446	32.1891003666374	8.39395869201677	96.0562	52.3857	26.7058
74.1976870870604	32.1891004362362	8.39395867492796	95.0864	47.4256	26.3676
74.1976871938484	32.189100504969	8.39395866298157	100.6036	46.802	22.0951
74.1976872994129	32.1891005729056	8.39395865035344	101.377	48.1816	18.5975
74.1976874041302	32.1891006402976	8.39395863623538	98.0879	44.5657	15.6818
74.1976875080094	32.1891007071251	8.39395861427325	98.3613	42.0392	20.5386
74.1976876101463	32.1891007728462	8.39395859692877	95.46	44.379	21.4845
74.1976877111312	32.1891008377987	8.39395858171598	93.0102	50.1223	20.798
74.1976878114083	32.1891009022352	8.39395856310546	89.3464	46.1786	22.3858
74.1976879106679	32.1891009659538	8.39395854410311	87.8413	47.1867	25.6907
74.1976880086735	32.1891010288053	8.39395852665947	87.5129	47.9594	27.6836
74.1976881051328	32.1891010906186	8.39395851329731	87.5583	39.2312	23.679
74.1976881994763	32.1891011510483	8.39395850406139	94.3087	39.6383	18.4042
74.1976882916278	32.1891012100731	8.39395849051252	92.8093	39.7693	16.6418
74.1976883807818	32.1891012671685	8.39395847795873	94.1971	38.0204	14.8005
74.197688466288	32.1891013218917	8.39395846698013	97.0806	39.3994	12.7921
74.1976885484069	32.1891013743971	8.39395845568674	102.0152	42.2262	11.91
74.1976886278718	32.1891014251824	8.39395844020463	102.543	45.6081	13.7083
74.1976887054624	32.1891014747437	8.39395842853849	104.1102	44.8822	12.643
74.1976887819487	32.1891015236017	8.39395842049173	106.4442	49.0895	9.9061
74.1976887672472	32.1891015173933	8.39395841551281	103.8062	50.1176	9.3383
74.1976887522915	32.189101511071	8.39395840733879	99.5987	51.3246	10.6347
74.197688737013	32.189101504613	8.39395840970313	100.3439	52.2486	6.1962
74.1976887214423	32.1891014980439	8.39395840349091	100.6388	53.8259	6.8403
74.1976887055301	32.1891014913222	8.39395839675578	98.2152	53.7701	7.2972
74.1976886893134	32.189101484442	8.39395838666343	98.9521	56.5952	10.596
74.1976886726628	32.1891014772755	8.39395838091674	97.3108	57.82	10.7791
74.1976886554685	32.1891014696558	8.39395836874429	93.5538	62.1822	15.7085
73.529342569893	31.6897794710731	8.18670262231505	92.8209	56.9207	15.4027
72.7337237027275	31.0953719323015	7.93998059945936	92.412	50.9961	13.3675
71.8541041537775	30.4382085838698	7.66721169534166	94.5726	47.3613	8.9492
70.8835093535129	29.7130789181043	7.36623312873475	89.5287	45.4109	8.5583
69.8457127035178	28.9377439528441	7.0444169316125	85.9182	41.843	9.5066
68.7561547233526	28.1237390035612	6.70655092628514	89.3668	41.343	14.5671
67.559692818994	27.2298669899525	6.33553536616454	89.0134	41.3658	15.8043
66.2007826890957	26.2146308599881	5.91414602078746	89.1249	38.0318	13.3915
64.6273757547708	25.0391453427847	5.42624201564969	85.525	32.0217	10.845
62.885337600527	23.7376754819629	4.88604377803998	86.512	33.4131	7.017
60.8521706356679	22.2186953376799	4.25556034205032	87.5726	32.8781	1.3636
58.2808597250011	20.2976591092875	3.4582144221856	85.1876	33.113	2.1197
54.6629694813475	17.5947330931172	2.33634378433145	79.7169	32.9378	5.3155
Route: 2 Length: 100.227346267022 Demand Met: 10000					
61.4833576343801	22.9491972732774	10.9847195830487	70.4096	46.4113	26.9931
65.8490359919621	26.2895446195935	14.3254984240944	77.9223	44.6051	30.7678
68.8527391343739	28.5877958937009	16.6240455041913	76.0043	50.5809	30.4596
71.356463121336	30.5034948330944	18.539990937419	73.8072	55.2741	29.1095
73.533612735479	32.1693158160311	20.2060273734183	73.2116	57.797	29.252
75.4589181750803	33.6424384127576	21.6793413917692	81.1686	57.7423	31.0101
77.1349535705228	34.9248337939138	22.9619038570813	92.749	64.7326	27.0986
78.0997645079153	35.6630430593011	23.7002099998938	88.7937	67.447	23.6857
78.8394282047948	36.2289843302704	24.2662256152145	92.0851	66.8651	17.5763
79.4243955155056	36.6765621291827	24.7138622304165	93.0933	68.7697	14.1811
79.4434679729639	36.6416791013583	24.7764635655134	94.5987	62.0376	18.5629
79.462470967788	36.6069230651457	24.8388370093852	102.1595	55.9791	16.6639
79.4813559440707	36.5723828402617	24.9008231517788	102.8738	56.4102	20.1678
79.5001137989123	36.5380750660048	24.9623921308323	101.7941	49.0832	29.2585
79.5186918331572	36.50409613251	25.0233709790859	98.7715	55.3698	27.9452
79.5371847608981	36.4702728144786	25.0840705542695	99.9754	58.6633	29.714
79.5556695245317	36.4364643886344	25.1447433975204	95.479	61.1306	33.7151
79.574207855899	36.4025579467821	25.2055921358969	94.4551	58.0456	35.6169
79.5928056660633	36.368542694639	25.2666361386521	99.7259	57.0659	38.9488
79.6114355980564	36.3344686826631	25.3277855860005	106.6231	51.946	40.2003
79.6299952737461	36.3005231610476	25.3887044413507	100.5945	52.9653	41.549
79.6485098129379	36.266660217316	25.4494750974081	97.7455	51.8526	39.6885
79.6670371155096	36.2327739702381	25.5102875672264	98.1036	50.8139	41.2796
79.6855715147338	36.1988748036031	25.571123218225	98.9198	48.0008	44.9228
79.7040754143607	36.1650315057899	25.6318586073007	93.3823	48.5086	44.2946
79.7226147937051	36.1311234109677	25.6927102805341	91.9732	45.8332	46.1527
79.7411669590855	36.0971920397066	25.7536037289522	90.0385	42.8005	44.3862
79.7597303412354	36.0632402660414	25.8145337942412	90.4784	41.2284	44.1276

Solution x	Solution y	Solution z	Original x	Original y	Original z
79.7782796310131	36.0293143679323	25.8754174276758	93.2846	41.9379	42.3812
79.7967977234667	35.9954455973773	25.9361985398174	96.2085	41.8253	45.162
79.8152230833836	35.9617464795543	25.9966751966603	96.5473	37.5774	41.1201
79.8335504788283	35.9282265768593	26.0568302321174	98.5859	34.5756	44.3792
79.8517182468328	35.8949986580964	26.1164612764298	95.0864	33.2234	41.4865
79.8697649518111	35.8619921778021	26.1756949296238	98.5493	33.1624	37.7737
79.8877014345133	35.8291872916108	26.234566799676	97.1838	29.5842	37.1942
79.9055254367952	35.7965881203497	26.2930694947267	95.8908	32.6754	36.0409
79.9232764597203	35.7641224124644	26.3513326785071	96.6051	36.0943	31.9245
79.9410018781556	35.7317035318165	26.409511827043	98.9301	33.2654	27.8083
79.9587109792095	35.6993145001282	26.4676374102382	91.9372	36.8319	23.3371
79.9764555919265	35.6668605319837	26.5258795257286	93.6083	38.4774	26.0941
79.9942346017867	35.6343436555942	26.5842345377629	93.6941	39.0671	28.969
80.0120449499304	35.6017694591576	26.6426924196195	92.1801	41.0349	29.4683
80.0298938109871	35.5691248176741	26.7012767265445	93.9129	43.6355	26.629
80.0477886743932	35.5363960251382	26.7600120453186	96.8865	41.9997	31.9305
80.0657032216859	35.5036312184682	26.8188120001081	97.0063	39.6578	31.3742
80.0836288185528	35.470846190838	26.8776482458084	98.4033	39.6451	29.8224
80.1015645755038	35.4380425612149	26.9365178762634	98.7317	39.6579	27.3708
80.119509589623	35.4052219721351	26.9954179418376	96.2133	40.5576	25.5914
80.1374613150662	35.3723890690251	27.0543401074791	99.6903	41.4772	23.4888
80.1554002828176	35.3395794533749	27.1132204815953	103.4615	37.3033	20.8908
80.1733112314788	35.3068210428149	27.1720089531529	108.656	34.8419	30.8419
80.1911552042229	35.2741851118725	27.2305776334239	105.6149	29.5786	27.9356
80.2089484310096	35.2416419910758	27.2889797532338	104.9423	23.521	33.0938
80.2266723668787	35.2092256180183	27.3471544143109	101.5683	27.6266	39.8262
80.2443633637179	35.1768695038986	27.4052209392355	100.384	25.6874	43.9589
80.2619898558548	35.1446314007257	27.4630756821353	99.0428	19.6959	54.528
80.269764045629	35.1304129999733	27.4885921621196	98.3827	22.3334	54.4737
80.2773855456115	35.1164738992251	27.5136074104374	101.7295	28.4449	56.1482
80.2799284311443	35.1118232184465	27.5219536063117	102.211	28.3893	55.4005
80.2825385649078	35.107049526664	27.5305205717159	101.1976	33.4905	53.5496
80.2851201633802	35.1023280297086	27.5389938663042	104.0844	32.9988	51.1923
80.2876790427997	35.0976480880427	27.5473925847385	106.6895	31.0233	49.137
80.2902271029086	35.0929879356409	27.5557557902697	105.5782	30.6326	47.1426
80.292759024767	35.0883573022975	27.5640660215092	106.1692	29.0085	43.7624
80.2952788114892	35.0837488675083	27.5723364154607	107.8221	37.3636	42.4217
80.297793072323	35.0791505417045	27.5805886680845	103.3956	43.6231	38.3961
80.3003118547406	35.0745439480999	27.5888557566914	103.8959	45.4099	37.4639
80.3028343861478	35.0699304970703	27.5971351509115	103.0838	43.6629	35.7673
80.3053610551996	35.0653094768334	27.6054281282981	99.7789	45.6905	34.3678
80.3078954367255	35.0606743471337	27.6137464232441	100.0845	45.3198	38.3951
80.3104323951968	35.0560345003369	27.6220731851304	97.5519	44.8528	38.2336
80.3129721266056	35.0513895781465	27.6304090549909	95.1396	47.3596	38.3213
80.3155143152069	35.0467401560365	27.6387529999063	94.3452	48.7818	37.6589
80.318057846347	35.0420882717509	27.6471013611457	93.3932	53.1876	39.0419
80.3206011840654	35.0374367325939	27.6554491002713	92.9131	56.6287	40.2251
80.323142927202	35.0327881003114	27.6637916184625	95.4289	57.3916	42.7453
80.3256741395141	35.028158720688	27.6720995799667	89.2688	56.3248	44.4917
80.3281900687487	35.0235572873416	27.680357384494	95.0304	53.2116	46.2852
80.3306858599888	35.0189926840188	27.6885490874558	99.5817	52.1789	51.8005
80.3331760440999	35.014438336535	27.6967223845305	100.8862	48.4618	50.2894
80.335653078761	35.0099080429312	27.70485250959	102.9297	48.0592	51.9744
80.3381320038123	35.0053742964622	27.7129888262102	105.6501	47.8555	48.2801
80.3406264292632	35.0008121925373	27.7211760326763	101.161	45.7653	49.9947
80.3431072767494	34.9962749296323	27.7293186561678	98.0763	43.3554	53.563
80.3455710821114	34.9917688464213	27.7374053216951	94.5838	45.9916	57.9488
80.3480108314444	34.9873067740059	27.7454130032428	94.5355	44.3621	59.1041
80.3504230990364	34.9828949815801	27.7533304497615	95.1298	37.6897	58.9361
80.3528155112161	34.9785195353598	27.7611826688334	100.5275	34.9543	58.1047
80.3527985757752	34.9785078269479	27.7611685759502	96.2582	32.5713	56.693
80.3527816572216	34.9784961304066	27.7611544976915	92.4351	33.0022	54.3205
80.3527647411488	34.9784844357458	27.7611404219608	91.0332	34.8187	52.6374
80.3527478345916	34.9784727477921	27.7611263509773	85.065	35.2948	58.2863
80.3527309459637	34.9784610723706	27.7611122999543	90.1236	40.724	54.2833
80.3527140902636	34.9784494199009	27.7610982780405	86.5983	36.2039	44.7429
80.352697248087	34.9784377768388	27.7610842652429	88.2545	36.066	42.1212
80.3526804117857	34.9784261379348	27.7610702569887	91.8795	37.1845	41.8015
80.3526635769786	34.9784145001233	27.7610562494858	90.014	39.915	40.6629
80.352646732525	34.9784028556738	27.7610422346809	92.2396	41.0703	39.2658
80.3526298730989	34.9783912008706	27.7610282057122	94.4684	44.7163	40.2539
80.3526129952004	34.9783795333125	27.7610141615169	90.4865	46.0315	39.3528
80.3525960967438	34.9783678515098	27.7610000990596	89.352	47.1855	40.3099
80.352579182651	34.9783561588954	27.7609860261817	90.3356	51.1932	37.7625
80.3525622638916	34.978344463013	27.7609719463923	85.9154	51.5363	38.6114
80.3525453440732	34.9783327663716	27.7609578633129	80.0004	48.0282	43.1849
80.3525284196302	34.9783210665087	27.7609437804425	79.533	47.2684	42.1428
80.352511495118	34.9783093665841	27.7609296974543	77.9078	47.2474	41.2613
80.3524945749637	34.9782976696844	27.7609156175751	78.2967	50.1808	43.2865
80.3524776591044	34.9782859757377	27.7609015414739	74.8417	48.5823	43.578

Solution x	Solution y	Solution z	Original x	Original y	Original z
80.3524607506133	34.9782742868878	27.7608874713782	76.4125	46.981	46.4216
80.352443851518	34.9782626045988	27.7608734096331	72.7013	43.6681	47.6828
80.3524269598914	34.9782509275714	27.7608593575773	70.5497	45.0925	44.08
80.3524100855527	34.9782392626289	27.7608453187371	70.1179	52.2878	46.5219
80.352393228244	34.9782276095446	27.7608312979202	69.8977	54.8286	42.1718
80.3523764017243	34.9782159778503	27.7608173025376	69.1565	53.343	39.551
80.352359613392	34.9782043727186	27.7608033397253	69.1689	51.2673	37.9561
80.352342866971	34.9781927967784	27.7607894145132	70.2011	52.705	34.7749
80.352326161016	34.9781812489838	27.7607755225507	68.2826	55.0673	33.7791
80.3523094809338	34.9781697191228	27.7607616499731	67.4683	58.2291	37.5546
80.3522927936678	34.978158184094	27.760747771055	68.5789	56.8701	42.2821
80.3522760593304	34.9781466160249	27.76073385348	73.7963	57.8273	45.2128
80.3522592379007	34.9781349869765	27.7607198601103	74.3979	53.0985	48.6112
80.352242296786	34.9781232743323	27.760705765424	72.0955	52.6394	50.8408
80.3522252151009	34.9781114636085	27.7606915515102	74.4488	50.3129	52.3971
80.3522079838274	34.9780995486401	27.7606772119401	77.4079	49.147	51.5989
80.3521906075647	34.9780875327693	27.7606627479717	73.2401	49.0047	54.3428
80.352173060537	34.9780753980803	27.7606481418283	67.4955	46.0347	52.8305
80.3521553770431	34.9780631684049	27.760633421605	66.2863	51.2705	54.2569
80.3521374935015	34.9780507988082	27.7606185319714	65.7303	47.3671	58.4265
80.3521158536433	34.9780357912138	27.7606004223503	62.0243	36.102	59.234
64.1161792143775	23.7322472084848	14.1942868144648	55.3647	9.0137	38.8085
Route: 3 Length: 164.826899866484 Demand Met: 10000					
75.589656168843	51.5443909441132	20.6481065821642	69.4154	51.8752	55.6067
78.0952150840103	55.0286708754168	22.4658641787347	69.2681	55.3133	57.276
79.0362988256587	56.3373589651773	23.1486151439098	72.0304	52.5053	58.0692
79.7178443616202	57.2851277208319	23.6430739372486	73.3859	52.8201	55.9097
80.3708476681139	58.1932048847324	24.1168254475464	78.0993	54.3894	50.2798
81.013895249841	59.0874373894126	24.5833539423539	77.8264	55.5164	53.7679
81.6386793437078	59.9562724489987	25.0366321619408	77.9705	58.8491	56.0075
82.2327186267655	60.7823533785213	25.4676049500597	85.8477	60.7859	54.7762
82.7953784621431	61.5647976857316	25.8758117428286	86.2321	62.729	51.1705
83.3383859138622	62.3199132957554	26.2697603041836	90.2672	64.2791	51.3539
83.8586413303585	63.0433898598943	26.6472017221652	94.6583	60.3511	50.0221
84.3617338298076	63.7429997484556	27.0121907848554	94.8477	58.3247	47.7413
84.8565773450346	64.4311388217949	27.3711945503318	97.9579	54.2407	46.7851
85.3506224769293	65.1181681612005	27.7296187674959	97.7133	51.9341	48.5236
85.8499316291712	65.812518331353	28.0918620595867	96.2485	47.1277	52.4491
86.3603427633579	66.5223075483552	28.4621602469955	91.1842	48.1207	54.4953
86.8875610033598	67.2554691707149	28.8446525522998	92.1982	53.9806	59.5699
87.4051771215037	67.975277760689	29.2201793166039	99.0651	51.1078	59.3413
87.5689604000696	68.3027303724142	29.2737255134384	102.6402	60.9181	59.3218
87.7408158908955	68.6463240610567	29.3299101611417	103.9916	60.6173	50.4601
87.9133791157179	68.991332899904	29.3863261299652	100.6854	61.817	51.0639
88.0866752172182	69.3378069142428	29.4429817346903	96.4356	62.0951	55.4366
88.2608005794102	69.6859387105681	29.4999085374387	95.1558	61.2395	57.4763
88.4362869056189	70.0367913764139	29.5572803562011	94.6788	63.8911	59.4837
88.6127321194559	70.3895611652421	29.6149657075681	99.4285	63.8276	59.6975
88.7893514571315	70.7426792284153	29.6727079816134	97.9014	66.9835	57.8832
88.9656295263311	71.0951149340644	29.7303387228496	96.2521	73.5638	59.9232
89.1389439126909	71.4416252116188	29.7870006358365	96.1169	76.0362	57.1147
89.309749040344	71.7831184748152	29.8428422988789	99.1261	78.6323	53.6332
89.4783046558044	72.1201141702055	29.8979485574811	97.4314	81.946	52.8698
89.6442914265438	72.4519738659725	29.9522150061846	94.9909	83.4209	53.4521
89.8074510010677	72.7781809903781	30.00555720367	95.9325	86.7596	55.1395
89.9664636065921	73.0960971595489	30.0575435936082	96.9343	84.943	57.6208
90.1202984803628	73.4036613081572	30.1078373018177	101.0606	82.9382	56.7378
90.2691753311959	73.7013124620145	30.1565102188664	104.5599	87.8351	55.8078
90.4094305989158	73.9817262638102	30.2023645398607	103.2876	94.1817	57.6589
90.4094306034907	73.9817262830382	30.202364523499	103.8628	98.4843	53.5771
90.4028504643726	73.9755744165412	30.1602211141009	100.6204	94.7646	50.8195
90.3962085361658	73.9693647604032	30.1176820850982	94.0924	96.5838	56.3482
90.3894644267469	73.9630595759492	30.074488765548	98.656	92.6213	53.0887
90.382672289431	73.9567094629796	30.030987760853	98.3726	88.4744	52.1576
90.3758291363196	73.9503116166243	29.9871599286792	98.9319	91.3958	49.6094
90.3689733517744	73.9439019288075	29.9432508325703	96.5235	92.1962	47.4754
90.3621124603679	73.9374874361432	29.8993087295335	97.0347	92.0258	44.3343
90.3552356729107	73.9310580450476	29.855264686383	96.8345	90.0197	42.1774
90.3483319397651	73.9246034172091	29.8110481472159	98.2349	98.4363	43.0129
90.3414439925079	73.9181635280125	29.7669326299926	94.4828	106.1237	38.6118
90.3346102175834	73.9117743494718	29.7231634707954	98.8373	99.4165	35.0062
90.3278075105096	73.9054142096537	29.6795931174536	101.602	92.3175	35.5214
90.3210220578266	73.89907019716	29.6361332425714	100.5649	91.4192	35.2273
90.3142712808573	73.8927586107143	29.5928953697211	98.853	91.6792	31.3431
90.3075625216852	73.8864863234666	29.5499263708793	99.3434	90.9979	30.2293
90.3008936026276	73.8802513059174	29.5072122815852	96.2545	87.1498	32.8659
90.2942581109492	73.8740475648893	29.4647121980091	97.7943	87.7833	36.2243
90.2876547747763	73.8678739148237	29.4224179728401	103.1106	83.2736	35.5168
90.2810784147138	73.8617255039589	29.3802963483998	104.3617	84.8664	42.6246
90.2745312573961	73.8556044191125	29.3383615957635	97.0865	83.6094	41.2641

Solution x	Solution y	Solution z	Original x	Original y	Original z
90.2679945440682	73.8494931125866	29.2964936739895	97.7624	79.6432	41.8331
90.2614652907864	73.8433887886578	29.2546734900387	94.0795	80.8773	41.7611
90.2549368587792	73.8372852332271	29.2128584827395	92.6699	80.64	42.9825
90.2484092983306	73.8311824871541	29.1710489492394	92.1151	81.2598	42.8198
90.2418854662362	73.8250832150598	29.1292631385056	91.1677	84.1211	45.979
90.235381492905	73.8190025030719	29.0876043418466	88.0687	81.4777	36.1559
90.2288879479633	73.8129315264443	29.0460122185077	89.5631	83.3752	32.5568
90.2224161148953	73.8068808382684	29.0045590182483	89.95	80.2132	31.6802
90.2159704557698	73.80085461329	28.9632733735164	93.1133	78.1389	33.5399
90.2095576235491	73.7948590762512	28.9221979032353	94.4072	76.9857	34.4342
90.2031750538884	73.7888918308393	28.8813161897414	94.549	73.3405	36.7472
90.1968090944562	73.7829401143932	28.8405408351299	95.9481	74.251	38.8025
90.1904505628157	73.7769953425491	28.7998130157916	91.0116	75.887	40.3125
90.1840679157999	73.771028023622	28.7589308033898	94.6945	78.572	44.5388
90.1776647998826	73.7650415713611	28.7179174938831	98.567	80.2017	48.301
90.1712423814069	73.7590370814317	28.6767805263741	97.816	74.8015	47.4482
90.1647738916637	73.7529895259771	28.6353485780132	97.5653	74.5618	43.9951
90.1582529713447	73.746892969646	28.593580837862	102.9023	68.4164	43.143
90.1516783830701	73.740746270909	28.5514692896418	93.9444	64.9	44.2206
90.1450304880988	73.7345310801271	28.5088882573985	95.4724	61.7777	41.2303
90.1383191915487	73.7282566754187	28.4659010932429	99.3413	60.508	43.9191
90.1315644796331	73.7219417686458	28.4226357462365	99.0429	61.6589	39.3422
90.1247777518038	73.7155970173367	28.3791652521667	98.4228	65.0226	33.0945
90.1179603218114	73.709223636113	28.3354981037304	101.778	67.1686	27.7348
90.1111236474288	73.7028323191306	28.2917076943473	101.2985	78.2917	28.1682
90.1043023167213	73.6964553764708	28.2480154811933	98.2345	80.86	27.262
90.0974767307937	73.6900744683222	28.2042959933523	93.4941	85.8189	27.3685
90.0906432256615	73.6836861528948	28.1605257948755	92.5654	91.5305	24.0262
90.0838475167612	73.6773331439087	28.116997579357	88.6062	92.2681	23.9863
90.0770847553486	73.6710109011084	28.0736803509796	93.1284	88.6615	20.1351
90.0703471058584	73.6647120981669	28.0305239327922	92.7178	89.1801	18.823
90.0636291542266	73.6584316757168	27.9874936980731	98.1138	89.594	19.2781
90.056936091471	73.6521744869686	27.9446228710199	100.7126	88.5952	23.1233
90.0502541492939	73.6459276623032	27.9018233371538	104.3693	90.8389	25.0156
90.0435910080921	73.639698379853	27.85914430999	101.583	94.8217	23.7006
90.0369571477255	73.6334964367293	27.8166528863508	95.6122	103.8055	23.229
90.0303708245343	73.6273389729876	27.7744658310616	95.0373	98.5247	13.5608
90.0238197393022	73.6212144158772	27.7325045417228	95.7576	96.9635	11.4638
90.0173065789453	73.6151252736778	27.6907862837355	95.504	96.351	10.2996
90.0108329720245	73.6090730720375	27.6493213707423	92.4623	94.734	14.7003
90.0044016417954	73.6030603669981	27.6081272885025	95.2026	90.5293	12.2607
89.9979923757743	73.5970682734581	27.5670743173989	93.9684	87.8762	13.7783
89.9916009192037	73.5910928287354	27.5261351482418	91.14	83.5499	11.0268
89.9852071634877	73.5851152370079	27.4851809866624	88.6759	82.3658	11.13
89.9787970634886	73.579122374299	27.4441219014296	91.1291	78.4897	13.7054
89.9723652763559	73.573109247178	27.4029236805403	92.288	83.6157	17.9977
89.9659197444256	73.5670832861706	27.3616371948393	96.9541	82.6989	20.5312
89.9594711349412	73.5610544598536	27.3203308389362	97.8831	81.9659	16.6355
89.9530114193903	73.5550152567136	27.2789532357364	98.2007	80.5294	17.4055
89.9465358969801	73.5489612823857	27.2374743778089	97.1852	78.7831	16.5303
89.9400439223974	73.5428919332115	27.1958901967707	97.3132	81.5365	12.7479
89.9335551609834	73.5368255928964	27.1543266076241	96.8706	83.0827	11.4782
89.9270911603292	73.5307824078054	27.1129216308437	98.9119	80.0767	11.0692
89.9206625789916	73.524772340395	27.0717436604165	98.5933	78.8152	8.2256
89.9142665685311	73.5187927227849	27.0307746181435	100.0565	80.1054	0.0522
89.9079144225214	73.5128541038511	26.9900867678499	108.1531	76.0691	2.761
89.9016278177984	73.5069767430453	26.9498189878879	103.6911	80.62	5.0557
89.8954075838701	73.5011614087118	26.9099766698098	103.8313	82.5056	7.2236
89.8892637993536	73.4954175145931	26.8706243607339	107.981	80.0957	12.6444
89.8832178743762	73.4897650625411	26.8318992286515	102.2936	85.0217	15.0829
89.8772558017436	73.4841909643853	26.7937116330186	102.0461	86.7072	16.2393
89.8713549452755	73.4786740657498	26.755916614815	102.4507	89.6037	15.6617
89.865482593625	73.473183805228	26.7183045830102	101.8123	94.891	12.8509
89.8596217989901	73.467704355149	26.6807667694175	104.1034	98.3317	9.2012
89.8539024499956	73.4623571403277	26.6441345379885	104.1728	96.9352	2.733
89.4681633053762	72.9071460001721	26.4035827315505	99.3782	93.0601	2.9898
89.0478278825965	72.3021387841379	26.1414557764909	100.8882	91.1406	6.6906
88.5952375877861	71.6507054694758	25.8592136993813	102.0076	93.075	9.5996
88.1062321230059	70.9468580887743	25.5542624512061	105.6506	92.4297	8.9472
87.5514478983277	70.1483323416364	25.2082908118674	107.2392	85.9448	2.4326
86.8932962860991	69.2010249486745	24.7978573376602	101.1477	85.2681	2.6541
86.1825070406113	68.1779537058324	24.3545980342007	99.0152	86.155	1.7016
85.4024855140827	67.0552333335128	23.8681643110934	93.0994	86.3608	2.8092
84.5732034331348	65.8616103510291	23.3510111971121	88.3633	87.3681	2.2205
83.6838053364803	64.5814601641534	22.7963691418537	86.3374	85.7586	1.5055
82.7353994792843	63.2163780848648	22.2049294177016	93.2494	81.8793	2.8544
81.7153789772998	61.7482185863804	21.5688305053666	91.86	79.7087	2.2114
80.6165144298667	60.1665758982042	20.8835637948546	89.835	77.746	1.5427
79.4278954782253	58.4557458227801	20.1423247627017	93.9524	73.145	3.1932
78.1274389595723	56.5839421091983	19.3313409538574	94.6798	69.1984	4.5089

Solution x	Solution y	Solution z	Original x	Original y	Original z
76.719959169325	54.5580922054615	18.4536136643928	98.4258	65.8894	6.8362
75.1874400631843	52.3522628057175	17.4979098132479	103.5291	67.906	8.9335
72.1842115088582	48.0295704126702	15.6250564229026	98.8606	57.9963	4.7298
66.8142677634826	40.3003544907291	12.2762802944852	91.9756	47.4725	20.0446
Route: 4 Length: 180.179842284797 Demand Met: 10000					
29.1282346211537	53.614683128974	18.9392438445811	26.4587	69.6793	44.9112
25.8164443946884	61.277378947301	22.4237620928236	24.7401	75.4523	49.5075
23.9540706032179	65.5864707825734	24.3832715695625	25.3366	76.538	54.326
22.7233562475721	68.4340506811189	25.6781750605138	29.376	80.5861	55.9809
21.9107596074807	70.3142029261111	26.5331506263082	27.6433	72.5657	51.9251
21.1394603080435	72.0988022139032	27.3446738931563	26.9783	71.0141	56.5271
20.4188741691289	73.7660630466155	28.1028384836703	24.1578	73.3792	57.4094
19.7476833352735	75.3190349573525	28.8090314253426	18.2654	71.5277	59.9496
19.1288120286339	76.7509521918428	29.4601763296205	15.4332	72.9689	53.8868
18.5223902782036	78.1540644186205	30.09822268054	4.0089	72.186	49.5614
17.929977517411	79.5247635816949	30.721529740906	-4.2807	74.2616	57.1387
17.4913285459063	80.539690389308	31.1830539321429	-1.23350000000001	86.0108	56.7294
17.1117591085167	81.4179214790393	31.5824175344826	-2.30370000000001	90.7079	58.2529
16.8225005131467	82.0871950446502	31.8867604463926	-0.0468000000000046	93.7668	57.0052
16.5708881161592	82.6693644332734	32.1514938229559	1.1743	92.9818	59.2535
16.3510976883047	83.1779055135931	32.3827456442346	4.95789999999999	99.4405	59.5277
16.1651645055618	83.6081090931612	32.5783744494227	-7.5489	96.9207	56.8305
16.1936279192762	83.618966002394	32.5497156629446	-3.26390000000001	94.8889	48.3647
16.2220965408535	83.6298248753305	32.5210516655734	0.580200000000005	93.7511	50.7296
16.250626547124	83.6407071481521	32.4923258908287	3.55029999999999	90.3653	48.0124
16.2793147071165	83.6516497387378	32.463440895256	2.1469	96.6722	44.5395
16.3082852289413	83.6627000233807	32.4342716146784	3.4538	93.5151	43.6356
16.3375862638621	83.6738763716636	32.4047695665694	1.20229999999999	90.7259	43.7677
16.3672266224652	83.6851821442403	32.3749258797718	-4.1255	85.596	43.5867
16.3972257443451	83.6966247550652	32.3447209940495	3.5998	89.8159	36.4775
16.4275992878303	83.7082101776646	32.3141391217951	0.619299999999996	91.0377	37.0534
16.4582779958527	83.7199119928546	32.2832500112653	-1.86190000000001	98.5581	36.524
16.4891818637225	83.731699679033	32.25213422019	-3.1358	95.2162	31.8855
16.5203002978478	83.7435691958435	32.2208024160194	-5.5457	98.4014	26.4862
16.5516029128958	83.7555089513256	32.1892851822066	-0.338999999999999	97.1979	25.6607
16.5830636965772	83.7675090266785	32.1576087059239	-0.311599999999999	97.6012	28.6474
16.6146529485063	83.779558093332	32.1258028954339	1.64530000000001	95.7178	31.8751
16.6463537478848	83.7916496974485	32.0938847955145	3.1448	100.72	31.1491
16.6781172166046	83.8037651938319	32.0619036132661	3.11839999999999	98.924	29.022
16.7099333920235	83.8159007822163	32.0298693806976	3.5924	94.7451	26.9481
16.7418010085721	83.8280559804061	31.9977833684878	7.8142	89.6258	27.2865
16.7737112661525	83.8402274306604	31.9656544451776	-0.735100000000003	89.6931	26.6301
16.8056826491391	83.8524221846313	31.9334640010901	-2.5612	92.1356	23.79
16.83772208554	83.8646428857525	31.901205066234	-12.8049	93.8535	15.5008
16.8702046566502	83.8770326017625	31.8684999793077	-6.68600000000001	94.6391	7.4364
16.9025626855865	83.8893748142733	31.8359202640644	-2.1508	94.1499	7.6254
16.9348347876678	83.9016842483375	31.8034270806318	-1.9602	93.9224	5.6614
16.9669787331956	83.913944798085	31.7710629460672	-0.171000000000006	97.1566	2.8672
16.9976514235097	83.9256441856164	31.7401801505173	-0.100899999999996	90.0487	0.1507
17.24224048609	83.96375950273	31.7068913103406	2.57040000000001	90.3092	4.6781
17.4906221411193	84.0024658148415	31.6730863656824	4.77370000000001	93.7785	6.1602
17.741494320835	84.041560218033	31.6389425143565	8.1477	101.1634	5.5645
17.9940580846705	84.0809182142515	31.6045684521351	2.55330000000001	99.1767	7.9857
18.2512566520712	84.120998460076	31.5695636317735	3.81100000000001	100.5395	9.9764
18.5125009136428	84.1617091640905	31.5340082201312	3.0162	107.1796	11.3112
18.7827024756456	84.2038157180939	31.4972337180488	1.4019	97.5847	15.4849
19.0581987717449	84.2467473792247	31.4597386648408	0.613799999999998	95.4238	16.9249
19.3390619285593	84.2905153828614	31.4215132509715	5.8502	91.8647	13.1882
19.6240184657319	84.3349212682925	31.3827307881804	6.3198	96.0864	20.0555
19.9127598556995	84.3799169667639	31.343433277812	9.17	97.1621	20.3835
20.2046483778389	84.4254030954615	31.3037074960148	8.0611	104.093	26.141
20.5000729346469	84.4714402593721	31.2635005198196	21.5395	100.4343	27.1149
20.7951482335403	84.5174230077774	31.2233410411676	26.1674	96.1159	30.3905
21.0884863868624	84.5631350598781	31.1834179242155	29.7064	94.0211	29.3487
21.3791618743224	84.6084321809675	31.1438571177358	33.1881	90.5996	30.8927
21.6661559034901	84.6531556048978	31.1047972645901	32.2034	92.5655	35.5696
21.9497554817357	84.6973500531346	31.0661993204988	32.8593	93.0881	38.0081
22.2300324132292	84.7410267133876	31.0280535264685	33.8351	99.3235	37.4512
22.5068492722889	84.7841641676769	30.9903786042755	34.0464	97.1856	33.2284
22.7810285607084	84.8268905882382	30.9530626327744	36.8108	99.4487	34.5912
23.0515028397836	84.869039639864	30.9162508629549	38.189	100.3805	31.8594
23.3181383453791	84.910590478949	30.8799614957976	34.3074	104.3145	33.9426
23.581539380531	84.9516372778862	30.8441122891221	31.3011	106.2109	32.3658
23.8424013509188	84.9922884056575	30.8086086055353	33.1638	109.6815	28.6324
24.1001204501379	85.0324497762551	30.7735326366729	33.1686	108.6172	19.7963
24.3556393631519	85.0722683051118	30.7387560832771	28.1717	107.4546	19.2451
24.6101546317049	85.1119304597151	30.7041160622106	28.2891	98.27	21.6276
24.8641475483395	85.1515112385705	30.6695470704336	29.1897	96.4145	23.036
25.1178684912221	85.1910496511928	30.635015056837	31.7064	96.988	25.1942
25.3716416116889	85.2305962039608	30.6004759604574	34.0163	93.2553	22.3961

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.6249783622154	85.2700747655732	30.5659962579606	31.6916	96.8159	17.5787
25.8776486782076	85.3094494897711	30.5316072329847	31.6341	101.1443	12.133
26.128684239133	85.3485694826791	30.497440638163	35.0473	98.5367	9.9491
26.3766894646349	85.3872172640413	30.4636863950281	35.5571	102.295	9.2843
26.6207601619287	85.4252519276674	30.4304675630364	37.1983	106.347	12.5162
26.8600295278354	85.4625383952613	30.3979021429496	40.2693	101.3043	8.6864
27.0940170193049	85.4990017879098	30.3660555107244	40.065	98.6098	6.7408
27.3231514948687	85.5347089386876	30.3348692983493	39.7333	98.7582	4.2197
27.5465588963078	85.5695236391173	30.3044624702013	35.7859	98.3251	5.4495
27.7673446478807	85.6039298126922	30.2744124159097	35.7481	97.1257	4.802
27.9858219487579	85.6379762638321	30.2446765149224	33.9629	96.8355	4.449
28.20259012315	85.671756388277	30.2151731954824	33.0573	97.9271	5.3628
28.4179817858058	85.7053220223804	30.1858571877479	30.1816	102.1772	4.0412
28.6319421375486	85.7386646316849	30.1567359242047	35.7306	102.2767	4.1846
28.842821764257	85.771527184537	30.1280339022274	40.5226	102.8002	1.3549
29.0379486905122	85.8019349912901	30.1014758861572	40.9527	105.6227	4.1926
29.224148288393	85.8309516567742	30.076132857173	42.9285	106.2179	5.6354
29.4019111161338	85.8586536284398	30.0519380311378	45.465	105.2608	3.7217
29.4019112193833	85.8586535676516	30.0519381200206	51.1106	98.2963	5.5983
29.4019113226375	85.8586535069	30.0519382037765	48.0764	105.8084	10.3389
29.4019114258571	85.8586534460802	30.0519382731335	53.9006	102.5381	21.0284
29.401911528946	85.8586533851955	30.0519383845802	42.5793	100.4271	14.8388
29.4019116320169	85.8586533242816	30.0519384745784	38.2186	96.6747	17.5328
29.4019117350152	85.85865326331	30.0519385720822	40.9431	96.0349	18.7884
29.4019118379719	85.8586532023371	30.0519386645476	42.2565	98.7398	22.9258
29.401911940956	85.8586531414024	30.0519387593734	42.9226	100.4615	26.2167
29.4019120439721	85.8586530805203	30.0519388593669	45.0704	101.2748	27.009
29.401912146992	85.8586530196844	30.0519389449514	46.0729	100.678	36.5278
29.4019122499353	85.8586529588613	30.0519390351081	46.5537	103.4177	45.8992
29.4019123527153	85.8586528979588	30.0519391353719	42.8352	101.6931	44.9574
29.4019124553799	85.8586528370013	30.0519392368819	42.0156	103.5929	44.0945
29.4019125579222	85.8586527759287	30.0519393375329	39.3246	101.8921	42.5744
29.4019126603652	85.8586527147785	30.0519394356819	39.1965	105.4524	44.823
29.401912762723	85.8586526535016	30.0519395391049	35.3466	107.7036	41.395
29.4019128651145	85.858652592121	30.0519396377724	32.8361	107.2479	41.504
29.4019129675627	85.8586525306211	30.0519397324182	29.8552	101.3038	43.5974
29.4019130700432	85.8586524690344	30.0519398264553	26.6904	96.1713	46.6576
29.401913172555	85.8586524073978	30.0519399185236	26.55	96.735	54.3574
29.4019132751486	85.8586523457391	30.0519400173395	26.9511	99.1097	54.9389
29.4019133778522	85.8586522841079	30.0519401165134	29.7849	97.5299	53.9895
29.4019134805794	85.8586522225194	30.0519402138705	31.4281	94.9219	54.3744
29.4019135832219	85.8586521609213	30.0519403093931	30.7482	95.8761	57.2879
29.4019136857175	85.8586520992526	30.051940407349	35.2228	101.4244	59.0123
29.4019137880542	85.8586520375096	30.0519405060109	35.7224	107.36	58.7833
29.4019138713034	85.8586519026758	30.0519405108913	42.4716	105.6496	56.7244
29.4019139556082	85.8586517638428	30.0519405103122	44.7902	101.1589	57.6534
29.401914040313	85.8586516234809	30.051940509593	47.126	99.3914	58.8698
29.5079770180961	85.4165357267091	29.8721334873465	43.0828	99.6317	56.4863
29.6239692537995	84.9330304224902	29.6754935358445	42.0978	97.503	57.9578
29.7519305375098	84.3996330031582	29.4585626340253	39.6285	91.4521	58.9959
29.8868669435292	83.8371602845328	29.2298069063924	35.4152	92.5489	58.019
30.0284988144277	83.2467780181897	28.9897004536071	33.6244	92.4492	56.3457
30.1757942985124	82.6327874425226	28.7399925705166	37.1788	95.0118	52.8478
30.3283116274167	81.9970300745086	28.481432184463	36.1694	94.3523	52.0418
30.4863980629247	81.3380583595101	28.2134305856249	32.1756	91.0244	47.2823
30.648183645999	80.6636670599299	27.9391578690025	35.9551	95.9225	47.402
30.8169796100557	79.960053525995	27.6530005446648	32.4952	97.9758	48.1403
30.9967223899693	79.2108090242115	27.3482852390653	35.4006	103.6799	50.1937
31.2417470525738	78.1894418748719	26.9328985632119	39.196	99.7694	49.3378
31.5428146568242	76.9344639161278	26.4225031413123	44.0393	95.7757	50.8289
31.955993807528	75.2121573676154	25.7220467619321	41.599	92.4813	48.0171
32.4531969457463	73.1396030720476	24.8791458035514	42.6808	88.2098	40.1619
32.9954167102615	70.8794002479402	23.9599287906292	40.8939	84.3555	43.1765
33.5930061331774	68.3883928703053	22.9468442736721	35.4073	87.2216	40.4202
34.2945121869901	65.4642159256623	21.7575909089859	27.1736	83.2653	40.5956
35.1584782216061	61.862835038426	20.2929202311743	24.3218	77.9732	38.2426
36.2569567464562	57.2839065089491	18.43068309703	24.4797	75.354	37.647
38.2586908509706	48.9398312804691	15.0371725489416	14.5018	68.1646	16.8217
Route: 5 Length: 1.13842516896733E-8 Demand Met: 6422					
47.1286999997484	11.965899999857	8.83716211319552E-10	46.5714	10.174	4.4604
47.1286999997	11.9658999997893	8.51592574235838E-10	47.4524	12.1509	5.76
47.1286999996948	11.9658999997141	6.76486422435119E-10	49.3862	17.5735	5.4967
47.1286999996564	11.9658999996286	5.53782797396707E-10	49.1677	19.2175	6.1526
47.1286999995961	11.9658999995399	5.27926147242397E-10	46.503	16.5426	2.0548
47.1286999995532	11.9658999994437	3.49508866293036E-10	44.2621	15.3855	4.7212
47.12869999952	11.965899999302	2.15081286114582E-10	41.9974	13.5778	7.3366
47.1286999994954	11.9658999992288	-2.29221086556208E-11	44.5689	9.75	12.1988
47.1286999994782	11.9658999991226	-1.4438938933381E-10	43.984	9.2005	15.6271
47.1286999994707	11.9658999990071	-1.52695633914846E-10	44.5228	11.8645	13.3212
47.1286999994649	11.9658999989945	-2.86618728750909E-10	47.1015	12.1757	10.5923

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.1286999994683	11.9658999988635	-3.4066971466018E-10	52.3173	10.0275	11.1526
47.128699999459	11.9658999988228	-4.02529565235454E-10	52.0306	12.0787	8.641
47.1286999994662	11.9658999987922	-4.32500257829815E-10	57.2331	12.7874	5.1838
47.1286999994485	11.9658999987764	-5.17857756676676E-10	55.8132	15.4408	3.6174
47.1286999994272	11.9658999987485	-5.96436677824386E-10	54.0368	23.8586	2.2143
47.1286999994063	11.9658999986855	-5.82780046443077E-10	46.7163	23.0055	0.3229
47.1286999993911	11.9658999986938	-7.22579329703876E-10	47.5893	27.8934	1.3329
47.1286999993602	11.9658999986659	-8.28620727588714E-10	44.1303	30.8739	2.5661
47.1286999993394	11.9658999985946	-8.41176017729595E-10	45.6407	35.658	2.8521
47.1286999993225	11.9658999985667	-9.02396379842685E-10	42.8212	36.4305	1.5446
47.1286999993128	11.9658999985262	-1.01105257499512E-9	44.3651	39.5082	4.2576
47.1286999993136	11.9658999985017	-1.22030030524911E-9	45.4903	38.3462	11.2293
47.1286999993255	11.9658999984384	-1.14336984324837E-9	45.4526	36.121	9.3446
47.1286999993585	11.9658999984304	-1.21532650609879E-9	46.7677	27.4481	8.8301
47.1286999993924	11.9658999984476	-1.18384946290462E-9	50.8592	31.2824	4.4654
47.1286999994221	11.965899998373	-9.8842178886116E-10	58.126	35.24	1.1949
47.1286999994436	11.9658999983571	-1.19434417911179E-9	63.2951	31.2899	8.2512
47.1286999994708	11.9658999983832	-1.16002496497458E-9	68.3701	31.308	4.6701
47.1286999994892	11.9658999983504	-1.16009601924816E-9	67.6588	29.7348	5.9837
47.1286999995066	11.9658999983497	-1.2567014096021E-9	68.2062	28.5319	10.0866
47.1286999995156	11.9658999983152	-1.27010935102589E-9	66.7482	27.6121	12.1372
47.1286999995246	11.9658999983254	-1.3577547974819E-9	63.3607	23.5913	11.9128
47.1286999995155	11.965899998338	-1.29821131622521E-9	57.9508	29.6187	7.6435
47.1286999995039	11.9658999983018	-1.25597665601163E-9	54.8257	29.6059	7.5612
47.1286999994942	11.9658999983334	-1.37338673766862E-9	53.915	28.4629	8.3577
47.1286999994778	11.9658999983099	-1.37858080506703E-9	54.5895	27.7676	11.1642
47.1286999994661	11.9658999982886	-1.35394628841823E-9	49.5432	29.0024	13.3417
47.1286999994653	11.9658999983443	-1.47805678807345E-9	50.3723	32.2399	19.4829
47.1286999994655	11.9658999983107	-1.44790845979514E-9	47.7428	26.438	23.4687
47.1286999994712	11.9658999983423	-1.48124001952965E-9	49.9475	19.2284	25.6639
47.1286999994727	11.9658999983306	-1.44993350659206E-9	51.6732	17.1776	23.9169
47.128699999474	11.9658999983123	-1.38212641331847E-9	53.2794	21.4994	19.0176
47.1286999994793	11.9658999983184	-1.34962618858481E-9	49.9971	19.9155	18.5508
47.1286999994822	11.9658999983704	-1.40890676902927E-9	47.2412	18.0641	21.8927
47.1286999994805	11.9658999983576	-1.36141409257107E-9	46.6598	16.011	21.0885
47.1286999994686	11.9658999983822	-1.38119560233463E-9	48.0446	14.6778	22.9405
47.1286999994449	11.9658999983994	-1.36235200898227E-9	45.8725	14.3747	21.2711
47.1286999994106	11.9658999984207	-1.40902756129435E-9	43.7231	10.6871	23.6231
47.1286999993732	11.9658999984011	-1.42046019391273E-9	44.3034	16.6265	25.3299
47.128699999331	11.9658999983878	-1.39264955123508E-9	40.715	18.8306	21.9165
47.1286999992828	11.9658999983986	-1.38212641331847E-9	31.9656	14.6164	16.7619
47.1286999992478	11.9658999983828	-1.15145581958132E-9	27.0312	22.0371	1.4535
47.1286999992284	11.9658999983746	-1.19833742928677E-9	28.0443	7.2557	0.5495
47.1286999992284	11.9658999983561	-1.30052058011643E-9	23.9142	5.5856	8.3806
47.1286999992409	11.9658999983477	-1.18049570119183E-9	26.7943	-2.6353	5.1743
47.1286999992681	11.9658999983713	-1.27190702414737E-9	39.9467	-2.3317	18.5214
47.128699999306	11.9658999984385	-1.16468612532117E-9	44.8479	-0.9391	15.0769
47.1286999993512	11.9658999984397	-9.78090497483208E-10	46.0937	-5.8176	9.1179
47.128699999405	11.9658999984726	-8.34766922253038E-10	51.545	-0.7619	6.4521
47.128699999449	11.9658999985595	-8.09507127996767E-10	54.5841	1.3	6.274
47.1286999994802	11.965899998595	-7.45565387205716E-10	52.3291	3.6705	6.1162
47.1286999995106	11.9658999986174	-6.76529054999264E-10	56.6752	3.9284	4.2715
47.1286999995293	11.9658999986707	-6.36575236967474E-10	58.5415	3.6684	5.0311
47.1286999995435	11.9658999987472	-5.9867488744203E-10	58.8992	5.3006	6.9433
47.128699999539	11.9658999987491	-4.71565897441906E-10	58.0725	5.2013	11.1785
47.1286999995413	11.9658999988065	-3.73418629351363E-10	59.4358	8.0877	8.3998
47.1286999995572	11.9658999988399	-4.60694593584776E-10	64.6914	7.7788	3.6297
47.1286999995541	11.9658999988607	-1.1397105481592E-11	62.4332	-0.684	2.8792
47.1286999995403	11.9658999989119	9.88791271083755E-11	58.6741	1.1796	4.0744
47.1286999995334	11.965899998925	2.52150300639187E-10	58.2864	0.0731	4.559
47.128699999518	11.9658999989516	3.50816264926834E-10	58.2741	0.1622	8.0145
47.1286999995123	11.9658999989928	4.39598579760059E-10	61.9524	-0.333	11.9086
47.1286999994809	11.9658999990038	5.98454619193944E-10	58.3955	-2.2935	14.9348
47.1286999994901	11.9658999990651	6.79364120514947E-10	63.0749	1.8033	17.7213
47.1286999994906	11.9658999990945	8.06444688805641E-10	61.7542	11.527	18.9198
47.1286999994868	11.9658999991345	9.6552810191497E-10	53.4554	15.0784	17.1477
47.1286999995095	11.9658999992028	1.00318686691026E-9	53.1154	7.9184	18.71
47.1286999995343	11.9658999992249	1.06636122154669E-9	51.7765	0.7553	20.0441
47.1286999995606	11.9658999993499	1.08518349861697E-9	48.7027	4.8736	15.3944
47.1286999995958	11.9658999994033	1.11324993667949E-9	48.302	2.6164	11.9932
47.1286999996414	11.9658999995012	1.0767493563435E-9	48.4975	2.4432	11.2037
47.1286999996847	11.9658999996169	1.07552011741063E-9	47.0712	4.3382	9.7807
47.1286999996974	11.9658999996843	1.31727517782565E-9	42.4139	3.5597	1.814
47.1286999997495	11.9658999998409	1.09505293721668E-9	42.7704	10.2739	1.2183
Route: 6 Length: 128.653599017811 Demand Met: 10000					
44.9044065437237	16.7650032328075	2.96908129519831	31.0707	1.7474	5.3999
42.460019371418	22.0389839794954	6.23196888164761	41.1669	5.3004	18.6447
39.5256688685269	28.3701635637969	10.1489717723125	40.2323	12.6508	42.5989
38.3113314702557	30.9901246470141	11.7699898144044	46.213	15.3079	43.6977
35.8708696589716	36.2513358127984	14.8916677432768	48.493	25.186	47.2334

Solution x	Solution y	Solution z	Original x	Original y	Original z
34.5437727353699	38.9680447712035	16.15615838763	44.6028	29.9319	49.9927
33.998127579434	40.0518718992599	16.5515915480511	47.3356	31.1656	48.6863
33.3663985966648	41.3067155683476	17.0094576313525	51.473	33.7115	46.7085
32.6161022652081	42.7971051986944	17.5533016582563	51.7623	34.8081	42.2217
31.8047710392838	44.4087515944719	18.1414058434815	50.1654	34.298	41.7388
30.915580796783	46.1750892777348	18.7859812748928	48.6326	32.1618	43.4727
29.836668626151	48.3183661566446	19.5681607735403	45.9581	33.5048	45.1742
28.4874761554261	50.998649327829	20.5463884913465	44.7872	36.1398	42.3342
26.9068524329867	54.1387874443131	21.6925209107371	46.003	37.4534	46.4333
22.7893572805974	62.3183178189801	24.6777159050583	35.1535	70.6086	57.9365
22.7893567993189	62.3183184887224	24.6777158165324	32.697	74.6737	51.2201
22.789356317183	62.3183191573896	24.6777157201282	32.2488	71.8762	47.8257
22.789355838873	62.3183198178619	24.6777156316033	31.105	77.2121	42.4385
22.7893553644316	62.3183204701918	24.6777155325551	31.7515	71.3679	39.9054
22.7893548919698	62.3183211183544	24.6777154190719	26.4833	65.6457	42.68
22.7893544210388	62.3183217639493	24.6777153362285	18.9682	67.082	33.9115
22.7893539520513	62.3183224073829	24.6777152592884	22.0857	71.4539	26.9077
22.7893534844078	62.3183230488245	24.6777151378427	26.4747	67.9787	32.7219
22.7893530165677	62.3183236901169	24.6777150368683	26.2205	72.9044	33.175
22.7893525486421	62.3183243303596	24.6777149329155	22.8762	75.7017	33.805
22.7893520809052	62.3183249691084	24.6777148397766	18.7356	77.2891	30.4652
22.7893516133265	62.3183256070354	24.6777147722865	17.9606	81.6588	21.6946
22.789351145884	62.3183262438437	24.6777146804054	13.7649	76.0563	18.1156
22.7893506782141	62.318326880908	24.6777146009004	7.5677	74.3816	13.1566
22.7893502102005	62.3183275191129	24.6777145013209	8.0472	76.1743	13.1381
22.7893497410953	62.3183281595474	24.6777144767558	2.7376	84.0979	3.4333
22.7893497372024	62.3183281796725	24.6777145045664	9.00020000000001	73.0359	5.8372
22.7893497337843	62.3183281994942	24.6777145777316	10.0835	69.723	3.7551
22.7893497305909	62.3183282190215	24.6777146289563	12.0877	66.3858	4.5331
22.7893497273811	62.3183282385211	24.6777146688172	15.1112	64.361	7.2726
22.789349723803	62.3183282582855	24.6777147102169	14.2239	63.9607	10.3191
22.789349719986	62.3183282784507	24.6777147787468	9.6606	65.5604	9.552
22.7893497164132	62.3183282988636	24.6777149102689	0.483800000000002	63.8626	0.7436
22.7893497140087	62.3183283198929	24.6777148916369	1.76609999999999	66.5446	12.6159
22.7893497127499	62.3183283409953	24.6777149465116	9.15690000000001	61.6426	15.1483
22.7893497119055	62.3183283628113	24.6777149750232	7.6803	61.1857	24.6436
22.7893497117005	62.3183283850846	24.6777150396333	6.9842	66.7632	27.251
22.7893497121894	62.3183284070691	24.67771510642	12.0444	66.3239	28.7604
22.789349712843	62.3183284289433	24.6777151780265	14.7433	68.1941	29.0053
22.7893497133369	62.318328450618	24.6777152503725	15.0856	70.6386	28.9208
22.7893497136195	62.3183284719043	24.6777153136087	11.6475	70.8021	30.9107
22.789349714043	62.3183284927326	24.6777153784727	10.7344	66.9849	31.9545
22.7893497146765	62.3183285135245	24.6777154407756	10.4334	62.822	33.9682
22.789349715542	62.3183285347523	24.6777155076889	6.67010000000001	63.5082	34.9077
22.789349717152	62.3183285564966	24.6777155664413	0.309600000000003	68.1954	39.7657
22.7893497205212	62.3183285782544	24.6777156250667	5.2812	65.5492	44.5709
22.7893497251275	62.3183286005377	24.6777156799932	4.4426	63.6871	51.0243
22.7893497314203	62.3183286235466	24.6777157364671	4.7342	63.0935	56.3188
22.8944007778016	62.3318566363106	24.5631729408885	8.4928	63.9998	55.0759
23.005750979583	62.346193051852	24.4417604872361	11.4442	66.9869	57.5373
23.1261199390828	62.3616874361655	24.3105128717268	14.2076	63.0144	54.8035
23.2504052640018	62.3776847287899	24.17499351162	15.3124	65.205	52.7286
23.3769356123055	62.3939703681532	24.0370249328143	14.0233	68.3418	48.6515
23.5048049735459	62.4104279638093	23.8975954535543	10.9416	69.7746	52.0032
23.6361497213844	62.4273316797844	23.7543752477479	9.3844	71.5303	46.4336
23.7696139538327	62.4445072650016	23.6088432362399	11.4886	67.7219	43.0579
23.9045577384561	62.4618730855297	23.4616973167129	12.0097	66.7734	42.888
24.0411677886177	62.4794532779664	23.3127337950211	9.45780000000001	72.6847	40.961
24.1798966463426	62.4973053790171	23.1614593130278	12.73	75.2001	37.6748
24.3197781673518	62.5153054229106	23.0089275169199	8.8648	72.0358	37.3381
24.4618660244753	62.53358874245	22.853989378793	6.09139999999999	73.9114	36.5077
24.6064384868948	62.5521904028644	22.6963414195888	7.0214	70.8048	31.3366
24.7528608962253	62.5710293437717	22.5366760127135	8.3117	72.2049	29.6247
24.9007221563219	62.5900528160891	22.3754417025739	9.9143	75.8382	26.191
25.0492904740684	62.6091667519693	22.2134369178286	6.65640000000001	74.2265	20.3804
25.198851523627	62.6284077896192	22.0503506449177	9.1707	70.0865	21.5855
25.3492532943637	62.6477567854784	21.8863483758724	10.5042	66.7806	23.1982
25.5008792726622	62.6672631823112	21.7210116281378	12.5389	66.9051	22.2814
25.6534698342996	62.6868937455029	21.5546234454615	12.0587	67.8257	18.5408
25.8070839567593	62.7066560767544	21.3871197919001	13.2613	67.7948	17.1077
25.9615662819803	62.7265303645464	21.2186701454712	16.7224	69.1113	14.1768
26.1158917296005	62.7463849366627	21.0503920274685	22.6268	64.3936	19.9605
26.2699129723329	62.7662014645202	20.8824450620718	23.9369	61.5866	18.0383
26.4236591662765	62.7859842054032	20.7147975361375	25.7737	68.9159	14.4865
26.5757441960799	62.8055541908895	20.5489612805266	28.241	67.9653	9.5896
26.7247747693336	62.824732808047	20.3864560447803	22.8228	67.5784	3.2098
26.8716468686361	62.8436348082752	20.226305377442	22.9431	70.0987	4.2047
27.016179114283	62.8622362906687	20.0687069223012	24.5076	73.115	4.3052
27.1579825138535	62.8804868992599	19.9140846709789	23.527	73.6169	0.5641
27.2972026868284	62.8984053413688	19.7622799053294	25.4767	75.481	0.001

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.433676145432	62.9159706465351	19.6134706670102	26.6151	77.1467	3.8306
27.568169483645	62.9332814359016	19.4668209528615	23.4089	84.0628	5.796
27.7014263332668	62.9504326905937	19.3215197813242	23.796	77.2181	9.3562
27.8343434073196	62.9675401926991	19.1765895053965	21.1184	76.9048	10.6601
27.9668069088032	62.9845890473566	19.0321543863311	21.3934	72.6127	7.7423
28.0992985719309	63.0016414360419	18.8876892595322	22.1344	71.2137	11.8857
28.2318898851069	63.0187065703125	18.7431162686984	24.5354	72.6275	12.2334
28.3647455963642	63.0358056198501	18.5982556462592	27.2709	73.9256	16.4296
28.4982622260574	63.0529892629534	18.4526745959398	31.4455	71.7336	19.6874
28.6325867180186	63.0702764329604	18.3062124794383	34.9317	80.2335	16.9208
28.7667380734018	63.0875411867789	18.1599390000613	42.9721	90.3177	28.7365
28.8987652041482	63.1045312906652	18.0159799827964	29.5221	90.7635	22.4343
29.0323674680387	63.1217225368105	17.8703031364201	32.6009	89.9531	17.4409
29.1663395614158	63.1389604936254	17.724222260857	29.3468	93.7461	14.2413
29.3004999984876	63.1562218132662	17.5779357895897	35.2297	94.8683	9.4168
29.4322347711731	63.1731715425955	17.4342939719912	34.0458	95.0903	5.2592
29.5600934222261	63.1896237588326	17.2948783953415	30.8807	93.5109	0.3364
29.6843677333975	63.2056162730952	17.1593709705257	37.0706	93.0168	1.0492
29.803581228352	63.2209589056849	17.0293813315153	37.3296	94.7968	3.7833
29.9176335289901	63.2356387614568	16.9050193598031	41.6896	94.8028	3.024
29.9602781914627	63.1085296669522	16.863127870064	43.1057	91.7939	5.1823
30.0033771723571	62.9800658181277	16.8207898013538	47.7789	92.5461	5.4276
30.2369366376796	62.2842027285336	16.5913609612375	48.9533	90.4759	7.3728
30.5588334995613	61.3251826820545	16.2751605032015	37.9917	90.5379	9.9912
30.9220579965557	60.2430490670696	15.9183663362201	34.7819	91.1147	8.0437
31.3688242206564	58.9120587412239	15.4795165688811	33.2241	90.2072	6.3544
31.9838662878458	57.0798390624691	14.8753924155002	33.517	80.8699	6.7304
32.6476238280416	55.102516740549	14.2234236083155	31.4187	76.5703	2.7936
33.356637929536	52.990397106935	13.5270081921473	31.0449	71.9995	0.0029
34.1069293034186	50.7553213277792	12.790051011877	31.4906	71.3219	1.4719
34.9250884047462	48.3180815533472	11.9864349048145	33.839	67.1668	7.1332
35.8007180646233	45.7096688605813	11.1263779885954	61.2083	54.3519	23.523
36.7118253992948	42.9956740074675	10.2315007693426	68.022	53.7678	15.3935
37.6468301934948	40.2105917549939	9.31317996921242	71.8965	50.0142	14.8598
38.5576327384638	37.4974928879698	8.41860098650076	72.0723	49.2863	13.9841
39.5365287590731	34.581389805422	7.45710357192061	71.8327	48.0379	13.6369
41.3077208551317	29.3053044441361	5.7174415927568	72.9198	44.5581	6.5665
Route: 7 Length: 21.5038812924035 Demand Met: 10000					
46.9316826757626	12.0287729894287	0.663191250986536	37.4272	33.8061	3.3013
46.7971480684756	12.0717157318486	1.11609985484036	43.7884	36.8808	19.8614
46.6396362672149	12.1219842015017	1.64632278021905	50.3352	41.2014	16.9793
46.4707582501736	12.1758708003245	2.21477045561935	56.2795	36.0371	23.7369
46.3097875719458	12.227231324608	2.75659153773042	60.463	30.4795	30.5011
46.2284530538659	12.253188747389	3.03038598937949	58.5931	27.1316	32.5338
46.1605587953132	12.2748582686589	3.2589428247012	55.4854	26.8201	32.387
46.099216048399	12.2944379088568	3.46544952792944	54.6523	25.2022	31.3259
46.0418452564009	12.3127505657843	3.65858817173782	55.9782	19.9329	26.5423
45.9869597486671	12.3302704749957	3.84336232985569	62.5649	23.4331	22.9907
45.9342792635899	12.3470869038968	4.02071470754434	67.242	26.9141	23.9429
45.8838898114305	12.3631722373681	4.19035512348918	70.1037	27.3839	19.7642
45.8351572139529	12.3787287731545	4.35441795471291	67.7055	32.9993	17.0949
45.787276874695	12.3940131983496	4.51561133945102	66.7818	30.0369	13.8618
45.7392431757522	12.4093463880926	4.6773201497831	69.1853	30.9522	12.1629
45.6903798720269	12.4249439631401	4.84181994960892	67.4673	33.2544	9.192
45.6407086179131	12.4407990303735	5.00903801534499	71.5231	31.8286	8.0149
45.5897067888966	12.4570781917575	5.18073282549884	73.7989	28.6287	7.3132
45.5371884019235	12.4738407361626	5.35753010218149	72.2401	34.2889	7.5435
45.4829512517131	12.4911510384621	5.54011008399659	68.0366	38.8903	2.9918
45.426635811595	12.5091238336932	5.72968318336254	66.9624	36.7077	4.2616
45.3691628080685	12.5274653234811	5.92315026155869	62.6603	37.129	7.3175
45.3114721024612	12.5458758117353	6.11734860676873	61.5106	34.0654	15.2705
45.2542617092506	12.5641327441382	6.30992927917159	64.2717	31.7627	18.8904
45.1972195480321	12.5823358154435	6.50194298686083	64.9829	35.6055	23.509
45.1417512939985	12.6000367111462	6.68865910296884	58.6228	31.6703	20.587
45.0860641108021	12.617807447366	6.87611212087295	52.5136	31.162	22.8965
45.0306021497133	12.6355064051053	7.06280750481202	50.5738	30.8854	25.5173
44.9756250852128	12.6530508338928	7.24787158692251	45.985	27.4123	27.7797
44.9214604307451	12.6703364030566	7.43020254334593	46.9054	30.8841	31.5685
44.8683099809926	12.6872987956257	7.60912146472199	48.325	36.101	31.2943
44.8167788442192	12.7037450757021	7.78259206837204	46.4115	30.3033	33.5708
44.766776887061	12.7197039488538	7.95091747984794	46.684	28.1154	34.4272
44.718453905164	12.735127542954	8.1135931616707	47.9603	31.0225	36.0363
44.6726856730455	12.7497363118231	8.26767088808002	51.0819	30.8837	36.7669
44.6298335180519	12.7634148517225	8.4119339692766	47.9812	30.2306	39.2099
44.5923500576719	12.7753805487321	8.53812672327962	49.1449	22.3659	43.2644
44.5736244180199	12.781357510143	8.60116792004304	52.1655	19.1446	41.5432
44.5557991106754	12.7870472991203	8.66117855598212	52.4859	17.4578	33.7507
44.5380482061281	12.7927133270334	8.72093853897877	51.539	18.7116	33.0294
44.5202185902904	12.7984044022396	8.78096320088662	45.9242	19.9	29.6168
44.5022594961503	12.8041367234431	8.84142352430573	40.2335	17.1357	30.0024

Solution x	Solution y	Solution z	Original x	Original y	Original z
44.48424023078	12.8098882124829	8.90208636820014	44.7075	13.3055	33.9605
44.4661809276465	12.8156524366872	8.96288384816057	43.7175	13.3612	37.2361
44.4482153243351	12.8213867662924	9.02336594121527	47.5448	13.9665	39.1563
44.4304772424645	12.8270485020068	9.08308216574672	51.9742	12.9315	39.5168
44.4130727348182	12.8326037906679	9.14167542770617	51.32	11.9016	40.4537
44.3961039086691	12.8380200789825	9.19880211883405	48.9393	11.7496	40.9103
44.3795839036122	12.8432931947376	9.25441812707436	48.2378	10.888	40.0435
44.3634411628794	12.848445962013	9.30876431486851	46.3909	8.819	37.7186
44.3476008908781	12.8535022427604	9.3620924525386	43.7681	7.8375	35.3656
44.3320687235975	12.8584602475225	9.41438359331823	42.4155	0.0668	38.5675
44.316982105707	12.8632761449165	9.46517508663419	49.2438	-0.5725	42.7886
44.308280898539	12.8660531472265	9.49446921984511	49.5265	1.5006	43.2383
44.2999569724414	12.8687096128352	9.52249303812793	50.2911	5.2466	39.9878
44.291875166494	12.8712889166714	9.54970189758163	52.8937	1.339	38.4463
44.2840092116017	12.8737994302662	9.57618416889065	53.412	-4.2453	38.3008
44.2763249573871	12.8762520389776	9.60205474060729	53.289	-9.6645	34.2743
44.2687327814416	12.878675326182	9.62761525974562	50.0191	-2.6033	31.7826
44.2611216187492	12.8811046918523	9.65323966076809	53.5826	-3.7128	29.3577
44.2534354348133	12.8835579972129	9.67911651162452	57.7878	-4.3732	24.6962
44.2456119104045	12.8860551016901	9.70545547205806	53.8048	-5.0553	19.1679
44.2375805281268	12.8886184942197	9.73249391480856	56.047	-0.6998	19.4659
44.2293127241642	12.8912572544517	9.76032793094127	57.7618	2.6586	23.6599
44.2208288212039	12.8939648839582	9.78888915321848	60.2628	6.0605	25.9406
44.2121711249986	12.8967278750088	9.81803517204093	60.5785	6.8128	27.9807
44.203376445147	12.8995344878812	9.84764208532789	58.0726	3.0503	30.5544
44.194474830711	12.9023751834564	9.87760885927134	62.7821	-0.0838	27.7653
44.1854386233398	12.905258779414	9.90802824188641	59.6709	-1.5476	33.1451
44.1763940632742	12.9081451022478	9.93847564682837	61.565	4.5717	36.954
44.1674358702548	12.911003943898	9.9686323205762	63.4243	4.3429	39.6925
44.1670659428104	12.9111543793935	9.96861101807352	62.5325	1.766	39.3982
44.1552316114036	12.9159614031167	9.96814087414499	55.7669	1.6852	42.4618
44.1414948044295	12.9215405687814	9.96759501960438	55.5686	2.3786	41.1094
44.1274339727086	12.9272512574754	9.96703629218439	55.5508	6.709	40.6861
44.1130749644606	12.9330829869402	9.96646571806816	53.4617	5.8056	38.0578
44.0985403907894	12.9389859826527	9.9658881726598	54.3108	6.5803	34.1725
44.083824984364	12.9449623749282	9.96530344426136	49.0558	10.279	28.6803
44.069100978704	12.9509422581493	9.96471836856268	46.0043	6.8606	27.4465
44.054433248334	12.9568992892689	9.96413553775065	45.0418	3.8658	25.2247
44.0398270336415	12.9628313370936	9.96355513594877	44.0031	6.0986	31.1209
44.0252276614642	12.9687606102851	9.96297501636704	36.2059	6.8965	29.7476
44.0107450153448	12.9746425204704	9.9623995340494	36.4235	4.5159	28.6582
43.9963387853062	12.9804934311879	9.96182707565527	33.6792	4.7017	30.2163
43.9820043511895	12.9863152259188	9.96125745501134	31.7997	5.4917	35.1341
43.9677261490162	12.9921142293272	9.96069006594374	29.6205	6.6839	35.8272
43.953505110678	12.9978900692316	9.96012492658559	29.2732	5.6917	40.0529
43.9394147666179	13.003612879334	9.95956497562844	28.6989	1.5656	37.4478
43.9254513625549	13.009284167676	9.95901006832709	31.1128	-2.8096	30.5667
43.9115892747538	13.0149143152268	9.95845919821137	32.3564	-1.4633	20.5286
43.8978956307393	13.0204760623445	9.95791498320013	22.6294	-1.9579	25.7184
43.8844078249232	13.0259542375504	9.95737895752845	24.8641	0.1355	28.7608
43.871087959092	13.0313642288605	9.95684960694357	24.5208	1.7631	30.0851
43.8579466002832	13.0367017484507	9.95632735761671	27.2842	5.8331	28.3822
43.8449849360578	13.0419663097823	9.95581226396619	28.1449	5.3771	22.529
43.8321606649455	13.0471750874182	9.95530261748308	29.2451	9.0499	23.6495
43.8194584596353	13.0523343023515	9.95479782103052	29.9497	8.0977	27.1858
43.8068172630712	13.057468748134	9.95429545132901	29.4417	11.4808	30.7206
43.794214296089	13.0625876794038	9.95379459278715	25.9081	14.4892	36.1934
43.7817089047282	13.0676670076805	9.95329763254836	23.1615	20.5337	28.672
43.769298432681	13.0727078169358	9.9528044270632	23.1228	16.7524	24.3445
43.7568970360584	13.0777449616903	9.95231155217088	17.2669	18.1061	25.0094
43.7445657429346	13.0827536668656	9.95182144182814	19.0397	19.3917	26.8913
43.7322705745289	13.0877477345876	9.95133274398069	18.4916	22.031	28.1174
43.7200568967148	13.0927087405119	9.95084724757872	19.5225	24.6717	34.6116
43.7200567101559	13.0927085942784	9.9508451427925	28.099	29.8348	27.0633
43.7200565254772	13.0927084474648	9.95084302935356	22.8581	29.0039	22.5241
43.7200563427066	13.0927083002268	9.95084091294831	18.7531	32.536	21.0115
43.7200561628063	13.0927081517767	9.95083879033602	20.8129	26.0745	22.3222
43.7200559831032	13.0927080025543	9.95083667045588	20.5322	21.5891	20.6595
43.7200558022545	13.09270785266	9.95083455270355	24.5729	19.8583	16.0395
43.7200556154939	13.0927077009057	9.95083239447808	20.5046	21.2685	13.3595
43.7200554247496	13.0927075481247	9.95083021441365	19.8821	27.2321	11.7559
43.7200552289725	13.0927073941215	9.95082800211787	15.0509	21.8739	10.7741
43.7200550330909	13.0927072410128	9.95082581412087	7.8039	17.6061	5.7787
43.9847301272847	13.0052249693978	9.17817530238199	16.9397	16.157	0.3423
44.2503463303848	12.9174272515438	8.40277158039926	21.2889	20.2133	0.1771
44.5172111149316	12.8292121936574	7.62371679087651	19.6457	23.2311	5.559
44.7880463765493	12.7396826155581	6.83306876423615	24.0847	21.2619	9.4135
45.0579384917241	12.6504639992178	6.04517405846119	25.2224	21.1268	9.0297
45.3199185908924	12.5638590144225	5.28037639099289	23.3217	16.9506	6.2856
45.5682554224826	12.4817590725946	4.5554029942789	21.6596	11.213	17.563

Solution x	Solution y	Solution z	Original x	Original y	Original z
45.8227823889926	12.3976089121969	3.81235485015591	26.246	7.8923	16.6585
46.0876625084899	12.3100344659109	3.03908090827932	26.4488	5.1021	19.0029
46.3960289881954	12.2080966702692	2.13887170820143	22.4003	2.9895	12.1851
46.7414522881937	12.0939122034908	1.1304861914408	19.4163	-0.8394	2.2943
Route: 8 Length: 75.6400509748207 Demand Met: 10000					
45.7563682767128	13.4238051903936	8.71265940424237	61.1622	34.1592	24.5106
45.3485366596135	13.8571289556556	11.3018790224889	58.8785	37.4935	28.0133
45.0099772085207	14.2168684313566	13.4513444769654	55.9275	34.3566	30.6301
44.6875591676531	14.5594538064959	15.4983284993888	58.4334	33.3219	33.0094
44.3879499486237	14.8777922619871	17.4004815143207	62.464	33.4003	33.7046
44.1195603377599	15.1629474792574	19.1044067377798	63.5739	32.9982	33.2424
43.8746255360791	15.4231752817878	20.6594122025297	64.1748	30.2745	31.4674
43.6419012310215	15.6704276085531	22.1368938175177	69.5886	28.6002	31.4169
43.4208081365248	15.9053214226113	23.5405321111332	67.5765	27.7962	32.158
43.2073987822744	16.1320520554859	24.8953902826734	63.132	27.7543	33.1939
42.9996566355302	16.352762484264	26.2142714322755	63.8119	26.0212	34.0563
42.7961928215411	16.5689286402564	27.5059935414324	62.9268	27.0211	37.7555
42.598591484584	16.778866273223	28.7604971956926	59.5552	26.5288	41.5263
42.4082097258847	16.9811326039381	29.9691648322007	61.643	23.6955	42.1255
42.2242087475097	17.1766193631494	31.1373225965784	68.3676	27.331	45.292
42.0535366373896	17.3579424882357	32.2208559217336	67.8857	28.9512	53.8343
41.9774868821048	17.4387332149069	32.7036611894012	70.5469	25.0661	53.9959
41.9774867827065	17.4387332094445	32.703661251706	63.3795	20.1125	53.5518
41.9774866826998	17.4387332037638	32.7036613141783	58.6318	9.4344	53.4701
41.9774865825233	17.4387331982737	32.7036613793201	53.965	12.2967	46.7771
41.9774864825711	17.4387331928864	32.7036614411102	47.6091	10.2274	48.878
41.9774863830014	17.4387331876967	32.7036615042768	47.2642	16.1804	48.1934
41.9774862835374	17.4387331825143	32.7036615655924	39.7266	17.3977	50.5452
41.9774861847307	17.4387331773206	32.7036616257927	45.9074	18.6439	58.1761
41.9774860861575	17.4387331719513	32.7036616871618	52.0827	15.9727	59.9151
41.9774859877016	17.4387331664524	32.7036617500151	53.7123	16.59	54.3027
41.9774858893774	17.4387331608089	32.7036618111532	50.5069	12.3029	52.6774
41.9774857912766	17.4387331551515	32.7036618718976	51.2901	7.6487	52.6277
41.9774856931795	17.4387331495726	32.703661932068	51.8363	2.0767	53.9783
41.9774855950206	17.4387331442271	32.7036619909613	49.309	3.6922	59.7251
41.9774854968639	17.4387331390911	32.7036620510768	47.7278	5.7114	59.7593
41.9774853988347	17.4387331341148	32.703662110689	44.3097	5.4051	59.4302
41.9774853011775	17.4387331293337	32.7036621706589	45.5397	7.2979	57.1732
41.9774852037473	17.4387331246944	32.7036622304577	46.8369	6.4403	54.1626
41.9774851062278	17.4387331202198	32.7036622896761	44.2937	4.7268	51.9613
41.9774850083827	17.4387331159377	32.7036623482347	38.0686	7.3443	51.7798
41.9774849104246	17.4387331117738	32.7036624050384	36.7928	9.6586	58.8057
41.9774848121538	17.4387331076167	32.703662463816	33.7832	8.5886	57.2507
41.9774847137738	17.4387331035004	32.7036625222462	30.7839	5.7178	56.2846
41.9774846157213	17.438733099507	32.7036625802161	27.6562	5.4902	56.4427
41.9774845185762	17.4387330956805	32.7036626384883	25.8989	0.7413	53.4706
41.9774844228239	17.4387330921754	32.7036626946344	22.4229	-2.1641	56.3911
41.9774844140094	17.4387331037989	32.7036626920572	27.3755	-1.0984	56.1861
41.9774844053385	17.4387331153547	32.7036626887561	31.0065	-1.0714	59.1851
41.9774843967384	17.4387331267889	32.7036626865727	31.1391	0.2266	57.7289
41.9774843881039	17.4387331380845	32.7036626857816	36.4279	-4.3699	52.432
41.9774843794059	17.4387331493862	32.7036626824564	43.0131	-4.6452	57.9101
41.9774843706847	17.4387331608223	32.7036626809837	54.4331	-6.2551	57.3764
41.9774843626205	17.4387331718271	32.7036626796415	56.514	2.6652	55.8183
41.9774843547023	17.4387331832282	32.7036626775059	60.4719	1.0667	55.1539
41.9774843467371	17.4387331950019	32.703662675122	58.2987	1.8222	52.9601
41.9774843386269	17.4387332070831	32.7036626721213	56.6229	3.2945	52.4352
41.9774843303479	17.4387332193745	32.7036626691422	54.7597	1.1902	50.9644
41.9774843219377	17.4387332318589	32.7036626685851	60.4167	1.4088	44.4464
41.9774843128222	17.4387332445809	32.7036626647157	57.3839	0.9502	46.0215
41.9774843032652	17.438733257534	32.7036626612635	54.6465	1.327	47.163
41.9774842934507	17.4387332706817	32.7036626575828	52.2056	3.4977	49.7426
41.9774842835939	17.4387332839454	32.7036626557173	52.0607	4.6851	47.5572
41.9774842738358	17.438733297309	32.7036626541648	50.9668	1.717	44.4164
41.9774842642991	17.4387333108353	32.7036626510354	43.4311	0.4843	45.1031
41.9774842550225	17.4387333244944	32.7036626481126	33.4349	0.0139	45.2628
41.9774842458434	17.4387333383379	32.7036626464375	27.9452	7.0873	43.7392
41.9774842367073	17.4387333522906	32.7036626453023	22.0744	6.6433	40.1203
41.9774842276776	17.4387333663785	32.7036626443778	19.6468	14.5775	38.07
41.977484218887	17.4387333804067	32.7036626432441	18.1963	16.0602	36.4885
41.977484210437	17.4387333943109	32.703662640824	20.7311	19.0512	39.2565
41.9774842022722	17.4387334080747	32.7036626395962	21.1889	21.267	39.0474
41.9774841943629	17.4387334216597	32.7036626383071	17.3215	22.815	38.4524
41.9774841867347	17.438733435021	32.703662638401	17.7323	26.9057	35.8248
41.9774841794228	17.4387334480859	32.7036626336284	21.3113	31.7798	46.1078
41.977484172178	17.4387334609074	32.7036626303592	16.9754	26.2994	50.4148
41.9774841649059	17.4387334736253	32.7036626288345	21.4132	25.3225	51.4824
41.9774841575332	17.4387334863194	32.7036626282897	23.1689	25.59	48.8728
41.9774841500678	17.4387334990163	32.7036626276309	21.7951	21.835	45.5134
41.9774841426505	17.4387335117802	32.7036626261269	19.3676	20.9011	45.1036

Solution x	Solution y	Solution z	Original x	Original y	Original z
41.9774841354182	17.4387335245842	32.7036626242338	19.4151	20.4264	46.5071
41.9774841284526	17.4387335374063	32.7036626221849	22.5923	19.795	49.1879
41.9774841217904	17.4387335502396	32.7036626180261	22.0389	18.6688	59.3708
41.9774841152726	17.4387335629311	32.7036626169896	19.4476	21.0876	59.2618
41.9774841090858	17.4387335756616	32.7036626159696	18.7218	26.0511	59.401
42.0745339816811	17.4761517169567	32.512740229229	35.5392	31.6783	58.7469
42.1750984312423	17.5149248175133	32.3149038360659	40.9959	37.9409	51.1587
42.276515267192	17.5540264639699	32.1153906934292	47.4903	33.2139	54.5514
42.3799896235697	17.5939213140785	31.9118298837175	47.4152	28.2569	57.2588
42.4868683506857	17.6351286215506	31.7015718081929	50.1386	26.6573	56.0437
42.5967872861216	17.6775079791772	31.4853328511923	50.8742	24.2729	53.2264
42.7087415683694	17.7206719855937	31.2650898803896	54.2786	24.4277	59.9569
42.8251207484199	17.7655419015914	31.0361420427401	55.089	27.0379	56.5554
42.9441342672718	17.8114273820051	30.8020119076432	56.8778	27.618	56.4108
43.0657566813379	17.8583186341677	30.5627495542171	54.7376	29.7596	56.3053
43.1899096582953	17.9061854292643	30.3185092124466	53.8796	31.7093	51.2249
43.31481181832	17.9543409615824	30.0727953413791	52.7074	28.2489	52.4902
43.4409192556078	18.0029610597011	29.8247107987479	55.1607	27.7715	51.8295
43.5683117551505	18.0520764987768	29.5740985829282	58.9981	26.6128	49.6223
43.6966427799668	18.101553730988	29.3216403097593	60.8351	33.4935	47.8851
43.8257726426348	18.1513388777008	29.067610693226	60.137	35.2014	51.7925
43.9577850154425	18.2022352852144	28.807910788582	61.1452	36.2851	50.8184
44.0926035797991	18.2542135896761	28.5426907043276	64.8516	39.5774	48.8657
44.256451718486	18.3173844134356	28.2203647058148	66.7168	38.698	48.2341
44.6867915202643	18.4833039474326	27.3738065464073	64.2784	38.8059	47.0778
45.1633885404625	18.6670574867215	26.436254020591	65.211	38.9167	43.4098
45.6492103427748	18.8543678834218	25.4805547514701	63.453	34.6286	41.047
46.1393678697674	19.0433500760429	24.5163261707495	63.8645	34.3723	36.4179
46.6272852532936	19.2314688746939	23.5565039852304	65.4552	32.6167	36.7679
47.1149588220543	19.4194937166986	22.5971614856579	60.1802	30.671	38.4138
47.6130490145753	19.6115339930231	21.6173288609476	54.3132	33.4794	38.814
48.1289327525619	19.8104334915132	20.6024949598517	51.6292	37.4529	39.3047
48.6720574081374	20.0198344209646	19.5340754693759	53.589	37.6567	38.7584
49.2464973925893	20.2413075856143	18.4040554525929	60.9493	37.7343	34.646
49.8384300162401	20.4695241232987	17.2396258554422	65.3289	43.5846	33.8262
50.4500271204323	20.7053212642227	16.0365146780917	64.4232	44.0581	27.3148
51.0559656101822	20.9389365272241	14.8445354091848	74.5598	39.2546	26.0148
51.6300063208811	21.1602547470063	13.7153029681339	73.2283	44.0709	14.6285
52.142531967079	21.3578572476013	12.7070793204197	73.2561	47.9132	17.0605
52.5680106074101	21.5219005643539	11.8700898188696	70.7664	48.6137	12.8047
52.9552648159182	21.6712070929909	11.1082935485779	68.7356	47.889	4.3235
53.3166431591585	21.8105373802492	10.3973995917474	73.6611	50.4924	3.9757
53.4964539659808	21.8798644596984	10.0436800313661	73.5268	49.2611	4.4383
53.6606492493152	21.9431704679106	9.72067999005026	73.6395	46.5004	2.2066
53.8170651425975	22.0034768989863	9.4129840914632	75.73	42.7229	0.0066
53.9666953288585	22.0611670307777	9.1186374293436	79.9479	46.2913	1.0177
53.7320003137943	21.7146735549287	8.80566318752784	77.8794	45.0468	10.8339
53.4546215402538	21.3051638196061	8.43576895796937	80.8872	43.1227	9.5119
53.0100046858231	20.6487529723912	7.84285883522932	80.8076	41.6004	10.0065
52.1625969014026	19.397686237001	6.7128244082934	75.9022	40.5634	8.2476
51.2174182905541	18.0022705996829	5.45240002015466	75.4748	37.8532	8.3059
49.7928834050919	15.8991597904938	3.55274756568577	66.5887	34.1226	10.8677

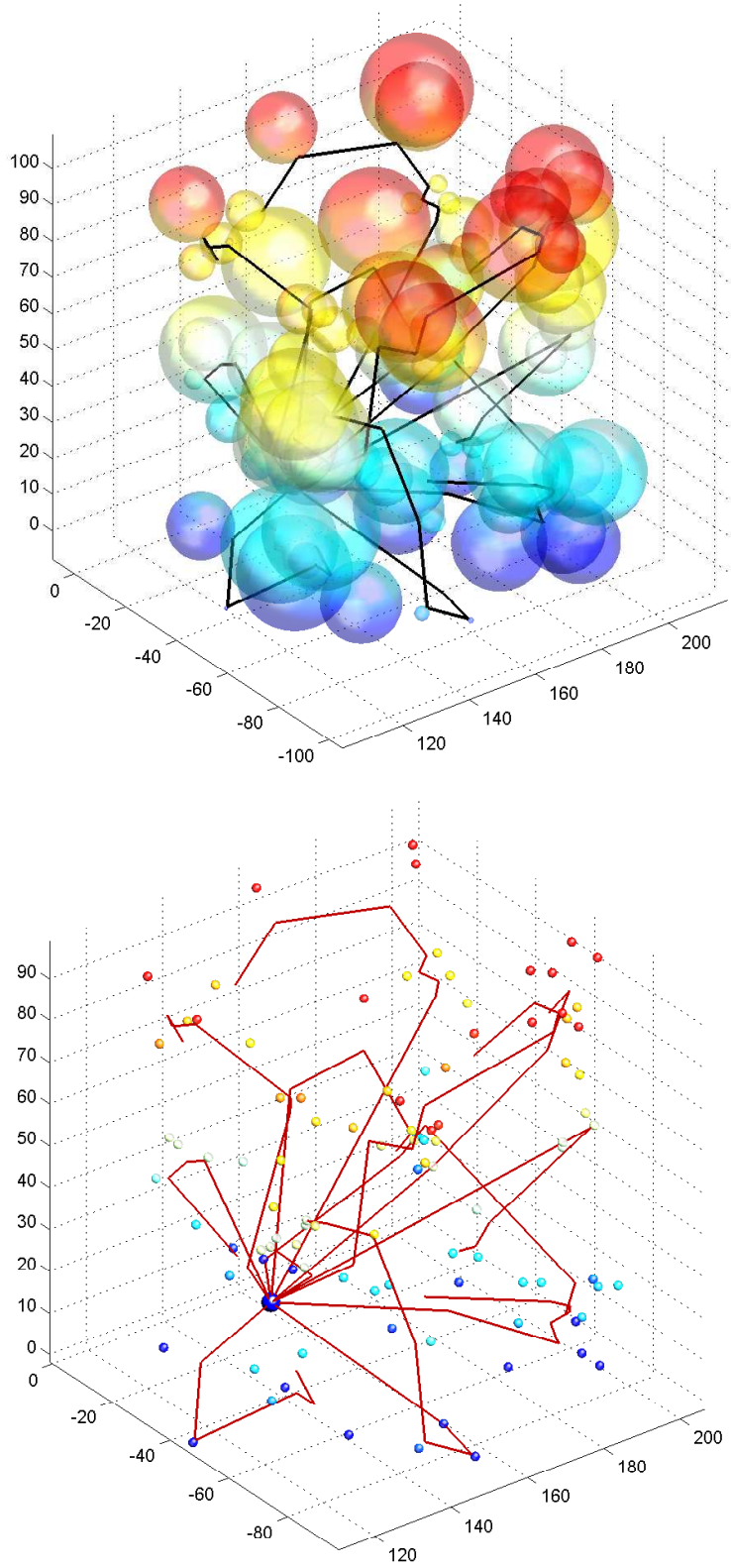


Figure O.91: *team*1_100, arbitrary radius, 3D, Euclidean, Length = 2371.7310651

Table O-94: Solution for *team*1_100, arbitrary radius, 3D, Euclidean

Total distance: 2371.73106505555 Total demand met: 543 Depot: x 50 y 10 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 181.514001486999 Demand Met: 45						
47.058305000668	20.3455665212551	56.7230856859942	45.293	9.057	63.281	13.174
48.3100364803503	43.844489711893	76.4094476139599	47.232	45.27	89.834	13.543
49.3194345324504	47.8705233637866	71.3571211370671	43.243	58.404	75.054	12.71
52.9407390297441	50.5575530800973	62.2654641059973	53.958	52.681	59.332	10.486
54.6372465732728	51.8163718489118	58.006207671178	49.571	48.14	55.073	8.233
54.6372465732728	51.8163718489118	58.006207671178	57.142	56.857	57.493	5.652
54.1246498993497	47.1940304303161	51.5942574091982	55.281	51.871	55.993	9.377
Route: 2 Length: 223.856774390152 Demand Met: 45						
57.5544972855772	55.5748933338269	50.9476984778128	57.243	55.792	50.963	0.38
79.3735879482654	65.8951580829657	75.6438801061904	86.785	67.217	67.68	10.959
79.3735879482654	65.8951580829657	75.6438801061904	77.919	74.057	76.926	8.389
87.6040721856184	62.6648067280448	85.5481741765585	93.456	57.69	77.108	14.427
87.6040721856184	62.6648067280448	85.5481741765585	93.946	64.003	91.762	8.979
87.603518582317	62.6640289199831	85.5478766231956	87.633	63.432	97.407	11.884
85.1646197883532	58.9294756000159	79.2176806728053	89.091	59.886	77.014	4.603
Route: 3 Length: 253.235835224379 Demand Met: 45						
36.8315424331062	86.0890705706634	9.99491640482504	36.762	86.092	10.176	0.194
36.5305247161076	96.1097511731705	7.5597789286738	36.924	96.636	7.226	0.737
25.6494566183283	94.2332650007212	13.5179828723958	24.053	94.189	12.551	1.867
25.34060645554	91.371210275463	36.0693947196981	27.59	93.644	36.826	3.286
20.3614171846321	83.4664226140416	59.9268320110253	20.393	83.793	60.447	0.615
17.1490895311267	71.4800747093786	58.5903135124101	5.739	68.535	65.134	13.479
18.983302685478	67.6240347996504	56.3048874698322	17.374	67.529	56.063	2.247
25.1897567902042	54.5763004916444	48.571658069701	25.201	54.507	48.664	0.116
26.4278464667831	52.3518377811363	46.1478176541482	25.923	53.185	46.671	1.603
Route: 4 Length: 163.449200024249 Demand Met: 46						
36.0973848932007	42.3036556662814	26.0414732807447	40.978	46.49	25.743	6.437
12.0847939838834	59.7115272302938	49.1562445258581	13.454	69.007	48.213	9.443
12.084155389821	59.7119901775721	49.1568592432347	18.45	52.954	46.14	14.862
12.084155389821	59.7119901775721	49.1568592432347	11.844	68.394	54.009	13.519
12.084155389821	59.7119901775721	49.1568592432347	7.235	62.367	51.584	12.76
11.2580355510926	60.3108837782476	49.9520908446856	11.123	60.442	50.101	0.24
Route: 5 Length: 298.0219107037 Demand Met: 45						
41.4936661231083	49.1826976436209	29.9709228988563	42.804	54.74	25.734	7.11
28.6281287901231	71.2573876538644	74.0824076456206	26.213	68.977	77.227	4.574
31.8599183330844	81.826755817661	75.8848615009062	33.626	83.869	72.958	3.982
30.561446387899	85.62860596901	83.5933062453359	33.443	88.578	84.328	7.057
29.4120687279011	88.993916745722	90.4166451823215	30.503	90.056	84.685	13.109
29.4120687279011	88.993916745722	90.4166451823215	19.881	93.181	96.862	12.244
65.024389117654	86.7044620581662	94.5635737904134	67.643	91.829	97.188	6.325
73.6428673268335	77.1889011939271	91.639973504952	74.447	77.382	91.404	0.86
71.8013172655296	71.3542062780931	91.9967523980335	63.631	81.224	94.784	14.134
71.8013172655296	71.3542062780931	91.9967523980335	76.154	71.763	97.979	8.051
71.8010167910048	71.3532542664087	91.9968106115419	73.523	67.727	97.567	6.866
62.1306996375283	63.2620737396299	79.2131453557021	52.975	65.56	80.551	9.534
62.1306996375283	63.2620737396299	79.2131453557021	62.352	63.144	84.329	5.122
Route: 6 Length: 185.582525200711 Demand Met: 45						
93.9716752162275	61.8636528243779	50.1886385939985	94.619	62.103	50.624	0.816
90.3322151499941	62.179469958921	48.7029046839848	87.173	60.998	48.592	11.762
90.3322151499941	62.179469958921	48.7029046839848	91.043	63.691	55.511	7.01
83.1201524496313	62.8053028420352	45.7587302852388	87.18	60.86	47.333	5.182
65.500812716362	64.3342360888218	38.5660022933031	59.534	67.732	45.235	9.572
62.5040042224624	63.357311957732	33.4320324367046	61.493	65.592	32.325	2.691
61.4625228722233	58.9130837706942	30.6474172841836	59.007	60.213	31.626	2.987
Route: 7 Length: 163.876042227571 Demand Met: 44						
69.9802487107838	44.4441400235259	6.76240380473593	74.679	41.865	10.639	6.615
77.0680223418211	64.8149032110438	7.41605981395789	84.146	71.427	3.869	10.315
79.0156422834403	70.4125007954992	7.59567523016185	85.968	75.194	1.985	10.133
77.9943954245924	70.9989455624159	8.94993141632369	68.193	67.124	4.172	11.572
73.7541396514786	74.3459515525698	16.2788130876442	66.971	72.201	17.644	7.244
76.0405374188357	77.7989248873031	19.5896479618152	78.214	79.218	18.292	2.902
75.8306723429248	78.3588441516773	21.3774820672347	81.476	87.316	28.362	12.684
72.7507711115951	75.5016428534376	22.2207950017647	66.957	73.797	28.023	11.351
72.7507711115951	75.5016428534376	22.2207950017647	67.179	79.746	30.609	10.928
59.3569907363421	49.9670136777189	16.3310146068419	49.02	51.541	23.534	12.697
59.3569907363421	49.9670136777189	16.3310146068419	51.29	49.58	11.489	10.97
Route: 8 Length: 114.879993665792 Demand Met: 45						
45.2551617203394	11.7843908503313	9.07159806691103	54.032	12.197	7.44	11.442
30.9004305437341	17.1827732429922	36.5162314723526	33.341	22.178	45.103	10.381
25.637224257709	19.1621067916316	46.5788902010639	25.542	20.506	48.088	2.023
23.974888650695	15.3657387031842	45.2714470600275	21.459	12.53	50.646	6.577
23.3093738352638	12.8886894062328	42.3292565491673	22.494	14.202	49.345	13.068
22.7008677623793	10.6238272857467	39.6390979216712	20.541	9.26	39.729	2.556
33.1742046259721	8.04595587212804	25.9318021074845	29.447	11.243	26.345	5.69

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 9 Length: 224.303933011965 Demand Met: 45						
37.3038053443288	18.538432693947	16.7154256000225	33.5	17.352	15.52	4.16
25.5756504574888	46.0450528614939	64.6583616601153	20.103	52.347	63.856	8.385
23.3577878849335	51.246715505236	73.7246514481708	26.732	55.612	72.392	5.676
21.7934251101213	53.6132665363063	78.7978401456626	19.619	52.734	79.19	6.234
21.7934251101213	53.6132665363063	78.7978401456626	21.299	57.593	80.779	4.473
18.9274921959064	24.713961590474	84.2072681417862	19.569	24.449	84.923	0.997
16.1800592238268	20.4726313758626	82.6800892744513	12.414	20.962	80.147	4.565
17.2290559078755	17.395808417819	83.5907803209937	15.772	12.549	91.264	9.192
23.3080383809854	14.8291307840102	73.9097901021306	26.839	11.732	76.118	5.19
Route: 10 Length: 159.802223962847 Demand Met: 46						
20.9957331238396	23.8600114037071	2.09270886921307	16.123	17.568	4.443	8.298
1.97827893513929	46.5635527933893	0.307937624713927	1.527	46.599	0.05	0.521
8.02256305940712	55.4289262444921	7.76345135911814	8.64100000000001	64.188	15.551	14.025
14.5328544796667	64.9778097106527	15.7937765548096	11.878	70.444	28.798	14.354
14.5328544796667	64.9778097106527	15.7937765548096	5.777	62.003	23.29	14.244
18.5089403325724	65.8262551210403	12.031168669111	20.735	74.659	7.978	9.97
29.6539495233659	45.0818587036537	6.87010138744556	27.219	44.51	3.327	4.337
Route: 11 Length: 217.150762056458 Demand Met: 46						
89.1208285041023	15.1698887759486	61.9596814620864	95.317	17.864	59.209	7.295
89.983077517668	15.0108164677324	65.154526559776	91.857	16.502	66.492	2.743
87.3705593492958	11.8011994766837	66.7405640226385	85.554	10.061	65.642	2.745
88.7647088792012	12.4920463142612	70.4709866463933	91.007	13.249	70.645	2.373
80.6719150129115	10.6384486317087	84.2913098140118	85.841	12.653	93.498	10.749
80.3491487941611	10.5399108421916	84.3081681389513	88.457	8.185	95.157	13.747
56.3837309244796	3.22347208602483	85.5599000062641	53.754	0.148	93.309	8.742
45.5470785012815	3.43989919334735	74.3204071133575	40.868	2.981	76.025	5.001
Route: 12 Length: 186.057863100732 Demand Met: 46						
53.5597589943776	3.26662043629839	5.91245948955546	53.405	3.041	5.972	0.28
86.7472458267543	6.5423331623867	20.6937007603603	93.574	3.255	13.429	10.497
88.5886391295315	7.45069264739502	23.4041562999233	92.889	3.855	22.202	5.733
90.863023714089	9.31966931073158	27.7361447264645	94.926	4.006	36.794	11.26
90.4914714702497	18.9774872457352	25.5094582631792	89.359	10.839	25.32	9.385
88.7927014234831	63.133883746603	15.3288515257333	87.252	72.952	19.479	10.77
89.5825721827484	61.1039919356096	11.8714393331769	94.894	61.262	13.169	7.46
91.4585366095228	56.2829439651089	3.65999132759323	93.694	56.925	1.612	3.099

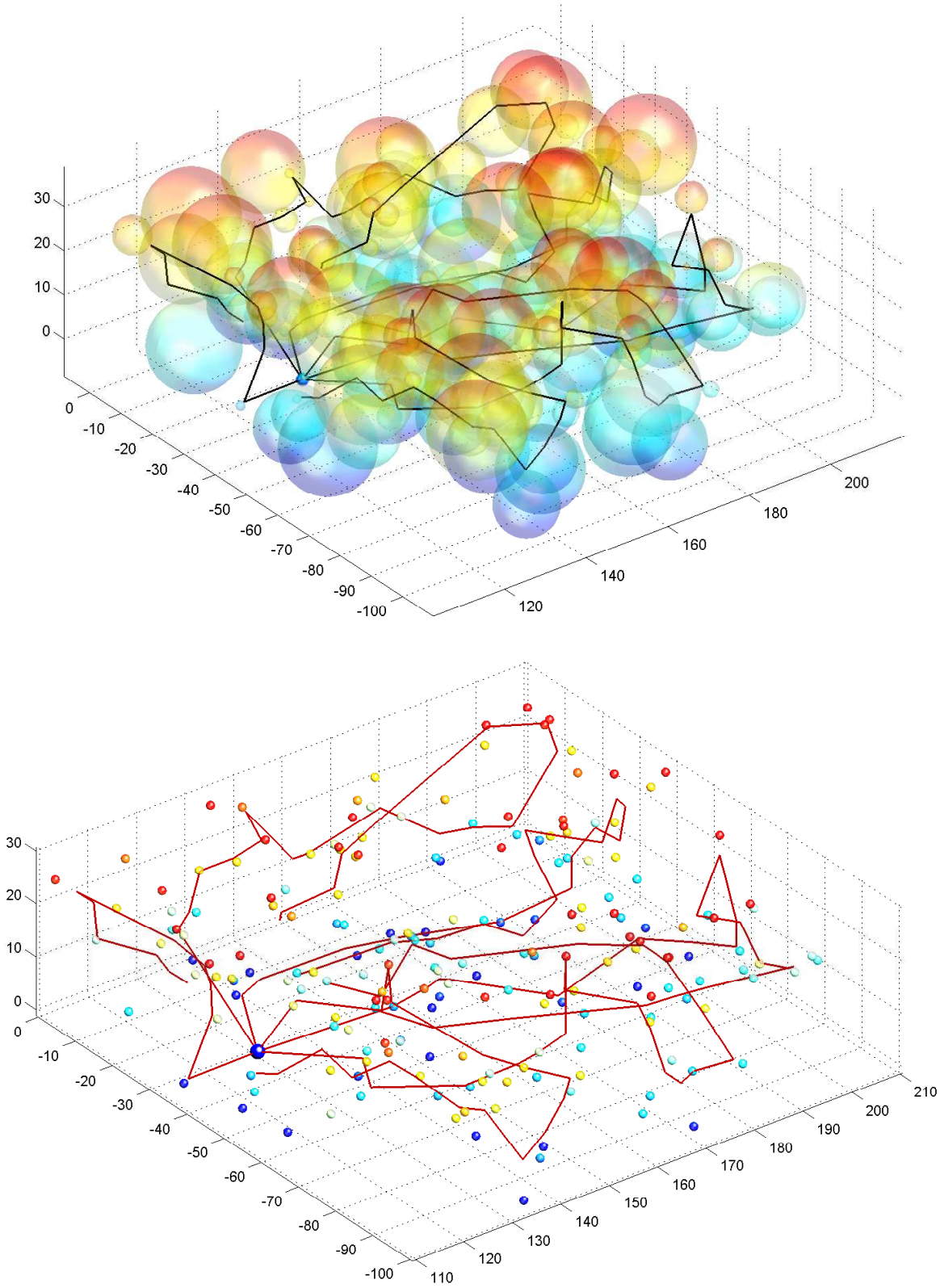


Figure O.92: *team*2_200, arbitrary radius, 3D, Euclidean, Length = 1304.9378206

Table O-95: Solution for *team*2_200, arbitrary radius, 3D, Euclidean

Total distance: 1304.93782055717 Total demand met: 617 Depot: x 19.5535 y 32.6157 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 251.082318126327 Demand Met: 116						
20.5353431555355	45.7060134289914	5.01847994100229	24.393135	53.387308	3.209069	8.804674
20.8118500561896	49.3925112030329	6.43178563927911	23.528225	48.047471	10.497692	7.005381
21.2548002365886	55.2980947396802	8.69583013746593	18.601355	58.3359	16.263038	9.106551
21.4833337810482	58.344992713478	9.863930205339	22.32618	58.45293	10.978007	1.401145
18.7568588050759	64.1511979133969	8.02658231064343	16.28216	64.658715	7.376906	2.608407
22.3024614190764	67.0060783171034	8.1917321318044	27.85894	70.297015	5.978866	7.608202
30.7714540854312	73.8252185288263	8.58620800575539	30.1948	77.47401	0.923346	8.506801
31.8250372614727	74.4409244901881	9.06715702639652	33.93752	71.055425	5.905417	5.201316
38.4632830747305	78.3202652068159	12.0974426381036	43.88264	75.9979	6.534575	8.106066
40.7672483246996	80.4495368705774	14.2953104149882	40.48646	81.157135	14.786912	0.906206
48.4092055197125	77.8936629128076	14.0320409238746	52.486843	76.711165	9.36826	6.306844
48.690783734429	77.5613391910522	19.9646673797611	51.801592	75.702955	19.859805	5.507245
48.6908310696272	77.5612833244942	19.9656646953113	45.96408	75.36881	19.356846	5.908922
49.0578949886527	77.1280683631035	27.699396704509	49.200624	76.95068	27.905495	0.307107
42.1143857865313	85.7906090895753	27.9898727568699	38.950185	86.058925	28.399966	3.201927
50.939775296385	93.8104100092812	26.1842212005315	51.725585	96.536445	28.40681	3.603979
54.8541832954254	92.2091266024047	19.2727176423847	55.7501	90.920415	19.617278	1.606912
56.2877196971039	93.542080693124	12.7321384250822	58.59379	93.155945	12.405414	9.907152
56.6365300492839	93.866417414496	11.1406723805887	49.437672	97.29667	7.39626	8.8097
60.104580632812	93.6376838572523	7.79876532304162	54.766852	92.295455	6.553331	9.502154
60.1052999029983	93.6376364181658	7.79807221415279	58.9163	98.60932	2.300231	7.507171
65.108047053908	90.4749657158102	6.82327281600031	65.23767	90.033385	6.608827	0.507723
68.735653337919	96.5210274871359	10.5034166076945	69.51155	98.000325	10.150379	1.707329
66.4347076945494	91.1022539256938	17.8714175991959	67.48261	90.51293	17.817861	1.203441
63.3692492670646	85.6359831750945	25.7941768457675	64.30468	84.91	26.009678	1.203546
61.7698074728543	85.0023412527414	27.4879389985419	59.88564	90.256965	29.954013	6.102678
60.433066341627	83.0967639442042	28.7955582609736	59.609455	83.27302	29.920795	1.405546
61.2964698544265	79.3283183632064	26.7678567145074	61.393495	78.21387	27.829379	9.209541
62.0139209348105	76.1969026180482	25.0829242151302	58.86286	75.490835	22.793064	6.800719
62.7545897750226	72.964149758644	23.3434647474301	67.24276	72.18951	20.816233	5.208708
62.263667429866	72.4719780083726	23.3741910847654	63.457115	71.302795	28.410692	5.306378
58.1369562308647	68.5336302368341	23.2028157767569	56.10401	69.44853	29.951816	7.107666
57.6406373980758	68.0068664550071	23.0551145602122	63.17424	62.764205	21.920947	7.706659
53.6704128042672	64.305120401536	22.0016982577169	48.983044	68.08194	24.712405	6.601797
43.6952559416686	53.1614388671436	18.4604272628506	42.291825	54.317701	14.78098	4.104253
42.9382446126488	51.8611667118563	18.7225450069982	42.753335	50.906813	15.568394	6.308285
40.2303176357675	47.2099258193882	19.6601738878629	40.184205	46.1874365	21.269314	1.907077
35.3517031306206	45.1814464539954	10.6224308091163	36.49954	48.989475	3.669737	8.009904
32.399695829906	41.6720399507652	11.3740749417469	35.347265	40.483415	12.676508	6.900943
29.5881800313583	38.3296525016445	12.0899473977442	29.577285	38.20107	12.365171	0.303974
Route: 2 Length: 249.384180275344 Demand Met: 116						
23.187850097643	11.244759268284	6.86595419826191	21.673354	6.8005655	13.961641	8.80316
23.187850097643	11.244759268284	6.86595419826191	26.97316	5.55935	2.320922	8.204253
23.187850097643	11.244759268284	6.86595419826191	25.954135	17.869355	4.361083	7.603419
21.9068131111714	8.11534239917721	10.8997529998457	20.9699	7.87089	11.180156	1.008062
25.1771042648239	6.90444654779445	12.6167236303778	28.448025	4.56492	10.374303	4.604428
25.8181023998797	8.99692518928034	21.1289663075559	25.662895	8.989655	21.265898	0.207105
31.3829115228518	10.6493729368711	22.3452600756272	32.973595	9.54291	20.606347	2.603527
34.6912215251167	13.9514335048932	26.1340772343758	34.77264	14.924575	26.641448	1.100481
37.5683864235222	7.95049495490347	25.3092654291062	34.695715	0.250565	26.535311	8.309293
40.1449431793801	2.57653797545297	24.5706297144763	40.16046	1.62977	24.917947	1.008583
44.6418970557457	9.417986351327	17.0414231347743	42.845635	9.79738	11.955362	5.407265
46.6122321707982	10.801829842699	17.9392229934874	46.358401	11.954405	18.491997	1.303234
53.6152864108695	8.58090733486451	17.5443608007716	57.51838	10.00522	23.910843	10.000856
53.6152864108695	8.58090733486451	17.5443608007716	54.294115	8.069135	15.776464	6.606257
53.6152864108695	8.58090733486451	17.5443608007716	54.207021	15.63022	20.585643	7.700153
53.6152864108695	8.58090733486451	17.5443608007716	49.707097	15.54357	19.872896	9.000518
66.4505767854463	4.5103669591838	16.8206478942851	67.61759	1.570395	20.822479	5.100981
67.6437931652851	4.66281417619896	15.9131150753621	67.794775	0.2453923	14.617193	4.606064
72.2718388469433	6.37088584000169	12.690427994128	69.299455	6.449115	15.081267	5.10428
76.1311546163063	7.79524348933672	10.0030381214399	78.44886	5.02628	2.732259	8.808511
76.1311546163063	7.79524348933672	10.0030381214399	74.60069	8.85595	6.459838	4.00271
82.5571143908192	8.78542638659036	9.44519515871707	82.741185	8.18936	9.780027	0.708018
88.9074632560855	10.8117003673256	8.30528385940874	89.544625	11.14329	6.653118	1.801549
90.5078203154667	11.1001359339545	10.681712817362	93.997115	11.43328	4.127594	7.703152
97.0219691772216	12.2741949306466	20.3548116416659	99.37313	13.042045	19.983146	2.501137
95.6040946096065	11.3565869122952	25.6819963786743	96.04228	11.46233	26.220597	0.702338
92.1451021276652	10.1419452784332	26.0980183180896	94.4971	12.154995	26.111766	9.50306
88.7303214284323	8.9428289065431	26.5087228835013	92.761655	9.792985	28.945088	7.707934
88.7303214284323	8.9428289065431	26.5087228835013	87.144585	5.62369	21.911356	7.10022
86.0264740876787	7.99336017434606	26.833921742301	86.016245	7.495035	26.90563	0.503562
70.1107457833285	14.6342125208357	27.0059428040313	69.52818	17.90893	23.466902	5.206535
51.3940124490281	22.443787523279	27.2082440597179	49.796921	18.777515	27.389734	4.003148
45.0292535608396	25.3413291388625	27.2678715354246	47.997827	21.94091	22.00424	8.509285

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
45.0292535608396	25.3413291388625	27.2678715354246	44.38625	27.294685	26.050788	2.501465
41.1863142155009	27.0908181729588	27.3038736622641	40.19826	27.52955	29.10549	2.101085
38.7422709090956	28.2355327322246	22.1378539426572	39.58443	28.150345	20.548662	1.800561
31.5334303139646	30.1222867461823	23.1298858400966	26.379295	27.934205	23.031473	5.600223
25.0520247659926	31.8186515394095	24.0218126218176	22.373755	32.6144	28.047693	4.900414
24.7368298232405	31.8643411177628	22.6447972757615	25.46019	34.06066	24.177315	5.200669
Route: 3 Length: 255.615707780181 Demand Met: 92						
41.0299939427164	41.1723375632327	4.95153763850912	41.00732	41.27668	4.938398	0.107583
47.7191240997965	41.8795712680521	6.63038678163176	50.608737	39.047145	0.30438	7.509385
47.7199898336926	41.8797704437174	6.6308459481325	50.972003	40.60627	2.976184	8.001002
49.5131154806594	42.2923071422111	7.5818808127615	49.52113	41.29678	9.327678	2.009713
50.8283126514431	43.0540449321986	7.4776834335619	51.37375	46.298003	11.79476	8.802177
50.8291759634732	43.0545449464972	7.47761503736378	53.824634	40.64213	16.603226	9.902994
65.9851010801069	53.017920214602	3.60086561308661	65.705495	54.4013975	3.082521	1.503619
77.9197847749153	50.2490951430542	4.54299132514925	81.466395	54.091358	0.343064	6.706774
86.0008839968931	48.3742947125159	5.18091450374213	87.57797	41.66484	5.551613	6.902275
86.0017090036918	48.3748586996909	5.18095031224653	91.6164	43.026115	2.808093	8.109517
88.5321653767513	53.5296771153263	6.26624422021691	92.878595	53.021252	1.55944	10.006179
90.3216182932799	57.174989852129	7.03372725984595	95.92709	54.202926	8.883113	6.608684
93.6437199206462	64.769164867235	8.4904199019811	93.854515	65.44994	7.938496	0.901393
94.035077506555	64.2637324484553	13.1974782589415	98.425325	63.29758	13.439936	4.501834
91.0318774971481	63.7355987745468	26.3182744649443	92.344515	62.02096	28.826016	3.309346
76.7645053773937	76.1235652556017	25.5361247300101	74.635475	75.231085	23.616275	3.002518
74.7482439547354	83.6330774225194	29.2139003304073	74.234205	84.088705	29.630347	0.803281
80.5416766899666	82.902518133121	26.093895946305	82.980165	82.460215	28.432538	3.407507
84.8765709983447	82.6141004653634	16.7643290023839	84.72455	82.62255	16.621981	0.208434
91.0572442505463	82.2379652206087	13.3572971217278	91.37176	83.481715	13.123111	1.3041
91.5481964245825	81.8975660935043	13.1016175327985	97.272905	80.426715	12.650593	7.307128
93.399932111013	80.6136748212062	12.1372649045063	98.53739	80.25874	11.354076	5.208919
89.5733169896788	78.8759574094821	11.5393085443831	87.254685	75.06877	11.123991	5.900928
85.9707108949393	77.2399655105763	10.9763563894956	86.26193	79.048	11.651774	6.603528
79.8972217071685	74.4819123546689	10.0272979195926	81.449	70.90379	9.10693	4.00725
76.5394153976046	73.3299710031999	9.6038428732228	79.72973	69.6285	5.76607	6.503827
74.7892526087176	72.7295537359797	9.38312875314168	75.60926	70.05143	9.458663	2.801868
70.0040263641366	71.4039658058686	8.78263801901693	68.40623	74.741575	8.582781	3.705743
59.3598090585083	63.5691775940968	7.44607385777309	62.26967	64.78212	6.975531	9.008592
52.2264534527444	58.3185960994016	6.55035863728965	53.302235	56.10093	10.554691	4.70213
41.763130032906	50.7692414853662	5.04071999434761	39.724355	52.657318	1.123019	4.803105
35.5873980491135	43.4522330855379	7.23615000799381	35.65863	43.345715	7.513468	0.305492
Route: 4 Length: 203.03536916945 Demand Met: 113						
21.7728412068295	39.5894790236338	11.518622845508	24.567885	37.86062	12.401465	3.403033
21.9058560351982	40.0074478529385	12.208983728633	21.779985	37.899125	15.006029	3.504901
23.1764273484168	46.373770502156	14.0214405907168	21.800035	44.699325	19.798588	9.804285
23.8049382279406	49.5229859411593	14.9180048309562	15.566305	47.445917	16.822861	8.70734
25.5311883713837	58.1725320049975	17.3804827352621	25.726765	62.875185	13.655865	6.002164
26.7135782407161	58.4608602480585	25.1285953802635	27.03592	58.11764	25.51317	0.607949
24.4754096988715	61.6123467670966	25.6053208063618	22.77816	61.91876	23.535116	9.100277
22.2787016559125	64.7054549289254	26.0732156787486	27.294235	67.36467	25.05905	8.501742
20.0958335373033	67.7790759861469	26.5381629505657	19.19225	67.891335	25.986874	4.001137
18.3921964647437	70.1779084356814	26.901035067308	14.99811	70.439575	28.594361	3.802058
24.7656735965988	78.7475328079067	21.7748838046131	32.35548	77.08328	26.131092	8.907943
27.659424423651	82.6384009577377	19.4474561207569	31.22881	79.877355	13.445056	7.509507
28.5009235312671	86.3671370674301	19.8464566153352	23.602775	87.83846	18.275699	8.306271
29.6270933338999	91.3572709716648	20.3804360558685	28.966505	91.93771	20.861988	1.002586
36.3255678508834	94.8009372868732	17.611365937374	37.353615	96.195315	18.415189	1.909791
37.4473796571174	91.6835322903839	11.9050270506193	39.89323	90.309885	11.775799	2.808165
33.8702578279191	91.2838457323697	6.62560092604698	36.34587	87.597465	1.344209	6.900084
31.1387316281499	92.6115146095971	6.27571862658251	30.09705	94.85711	4.685105	8.906507
26.5272966292903	94.8529205080505	5.68503807324012	24.384515	97.907795	0.111537	6.707286
19.6152652204783	93.632209049529	16.8547601512203	23.159665	94.99055	21.634541	6.103619
19.6143484734682	93.6319659837831	16.855077159048	20.26183	95.676245	17.846167	5.307169
15.5529207729599	92.5551215541332	18.2595042013412	10.636965	99.941455	22.606097	9.901623
15.2943022774382	92.4865516092213	18.3489335468848	12.30828	95.415795	18.734286	4.20063
14.3362837457969	87.6630951123245	19.4749984671752	20.60172	86.45345	23.44328	9.802386
13.3988711315132	82.9433858142828	20.5768429810525	16.17437	80.77798	18.674423	4.001447
10.6012811162472	79.7786923161444	22.9449749981807	10.302265	79.88844	24.724981	1.80828
9.94702423462182	78.6032019327999	22.0149171256533	10.737535	78.399525	25.651463	6.808137
8.56301688682429	76.116583334642	20.0474835888315	8.96414	75.77293	21.604208	2.204212
7.37294152035726	73.9783984881459	18.3557337652583	4.81189000000001	71.48163	19.467897	9.90886
7.37254148389923	73.9776797504938	18.3551650939827	1.401765	76.07236	14.516115	7.401092
10.9941141876866	61.1156913009149	16.4812654897914	15.17562	59.299125	20.231796	5.903506
7.78590993656044	53.2998642444938	9.42490465956348	5.35044999999999	59.245825	2.02242	9.802178
7.78565996156534	53.2990432498817	9.42439135619427	2.26291999999999	54.336059	8.412226	5.709688
8.35676862366648	49.6099373787197	7.59977828305302	4.493385	48.2428075	1.749018	7.3014
8.90523490435996	46.067091137885	5.84750448264597	8.071465	45.7971455	5.631658	0.90257
Route: 5 Length: 125.075216381501 Demand Met: 60						
3.65533032258075	34.710346770931	1.44038596931587	2.888575	34.539165	0.815621	1.003767
4.35852909996453	40.2315622040662	15.6943255937647	4.535275	41.40327	15.496926	1.201293
4.27647889601806	40.0043166761308	21.3275639428644	7.76846999999999	43.27595	27.165517	8.308131
4.27647889601806	40.0043166761308	21.3275639428644	6.09162499999999	39.029145	21.745986	2.102568

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
4.27647889601806	40.0043166761308	21.3275639428644	7.79806000000001	41.063165	21.758433	5.901659
2.38262380393368	40.7744094661142	26.043972569301	1.56824	43.114435	27.74491	3.00535
2.64132661324278	32.2789335282655	26.7662180354419	3.09506	32.271765	28.722779	2.008496
2.51106389997133	21.1402570604073	25.6884687075838	11.54701	17.37734	26.244082	9.803906
2.43695637871211	14.8034690228327	25.0753376528425	7.39533	10.545265	21.25087	8.903739
2.33877027438396	6.40774057499359	24.2629889661246	0.024124999999998	3.6794065	26.062187	4.00481
6.40173335122704	5.73308101599955	20.5183920763268	15.031135	2.9821155	24.523433	9.903269
6.64907791785768	6.4006870407884	13.8607852042548	6.5851	6.152225	13.546134	0.405995
9.13902966764675	15.6494952131403	14.7898137818307	16.776285	16.423415	15.502152	7.709348
9.81975455104913	18.1780168407041	15.0437999214878	10.44323	18.54025	17.132759	2.209906
10.0911486548035	21.1869654103878	13.2438494988485	1.87583499999999	21.036865	8.472142	9.501742
11.5060131434484	24.3692789815289	12.0087015075505	10.613375	27.61233	15.443404	4.807428
Route: 6 Length: 220.745028824369 Demand Met: 120						
28.4241729660004	16.831251061052	0.310870098766888	27.827995	16.04415	0.143676	1.001454
33.2382789442153	15.5322550827519	1.05492377997158	33.169445	12.82499	1.129185	2.709158
43.0080925071504	17.7200764189953	2.41466588369304	50.337118	13.87323	4.749218	8.600173
48.0690801640655	18.853418091044	3.11904349739294	47.801417	19.06334	7.814097	4.70736
49.5809125756853	19.1762012141318	3.05288048128252	49.216563	20.76273	2.277188	1.803198
57.7646009626211	20.853810750882	2.72786090332665	58.979255	16.987345	1.276103	4.304944
60.7044456571826	22.1248377181919	2.83904290937147	57.48649	24.517395	4.703245	9.301244
64.116110234035	23.5998536213892	2.96806867151689	63.31789	20.756115	1.726904	3.203825
73.4628269185838	27.6408592424834	3.32155220073929	73.44882	27.71684	3.250298	0.105102
79.3182000303587	28.8232386462412	4.70612088866428	79.01289	29.7258	2.755744	7.100822
86.1770118547848	30.2082431002567	6.32796391729175	88.660005	37.051535	6.873362	7.30023
88.3281029563348	27.3859653533416	6.85804426279865	86.845365	25.906095	9.026374	8.100197
91.1295258722176	23.7104383030633	7.54838194157289	91.09643	22.6866	6.913126	1.205359
95.1383807090419	24.9060765026799	12.3292848423773	95.62369	24.314785	12.804988	0.900802
94.927481059011	31.8038590077944	13.0525000861282	94.955665	36.40187	7.771411	7.002314
94.6554544139542	33.6701237712752	20.588928258381	99.67714	33.98061	22.565216	5.405501
92.3302646671099	34.3813550113246	23.1442965973725	90.572985	26.136825	24.857885	8.602133
92.3296230139053	34.381650859021	23.1450042380339	92.788305	33.10169	27.022649	4.109114
91.7961269160896	34.8141617868924	22.9681067735574	97.982935	40.137435	28.75306	10.003975
86.3447304210296	39.2336665043474	21.1605241201891	89.661665	37.28143	20.914346	7.609892
84.4241056689993	40.7907372772216	20.52368034167	84.61874	44.121625	19.170305	3.6006
81.9827341801824	39.2042657423461	21.1633895207184	83.48933	38.25693	16.203282	8.302552
78.7835074233411	37.1253186431524	22.0016784642289	80.066985	32.520545	19.480329	5.404485
77.3252371027934	36.6989185242381	22.5931889003949	79.319755	37.96047	22.926601	9.501655
75.0414336278241	36.0311314477407	23.5195559600946	78.52122	37.890255	25.630233	6.801958
72.702955284448	35.3473573725482	24.4681004986743	71.273045	32.62062	26.349189	3.608079
71.0009916871511	40.1104812075516	22.1936248447207	63.437195	41.00367	26.99622	9.004095
70.8571464994251	41.3331269202546	21.3982826888545	74.17807	43.76639	28.605582	8.300269
70.1716771618283	47.1594334235896	17.6082172966464	70.55475	53.342402	18.770686	6.30295
68.2265114224337	41.2285645400661	9.12737128029445	65.72564	44.111465	7.622314	4.10252
68.0967396716866	40.7847786089913	8.51854302486042	69.610075	41.75992	4.719164	4.204327
64.3262222488029	35.1073111094072	9.5565318866804	64.595135	34.78327	9.989898	0.604254
60.8806567371232	33.0255949643649	8.34279740586403	61.04328	37.44322	1.978623	7.908259
57.7444955079343	31.1308123953046	7.23805364157197	57.95186	28.956245	5.320699	2.906543
51.8928873108916	32.815845698384	9.69476204052532	51.719243	33.03008	9.909651	0.507925
48.2136900501982	33.8753099913369	11.2394168575579	46.870011	29.816545	8.525673	7.806658
45.3541925383154	34.6987329467318	12.4399332460678	45.420784	35.70231	13.427579	1.409626
30.3581517465742	29.585467962482	9.3701881626816	30.249755	29.28668	9.627144	0.408718

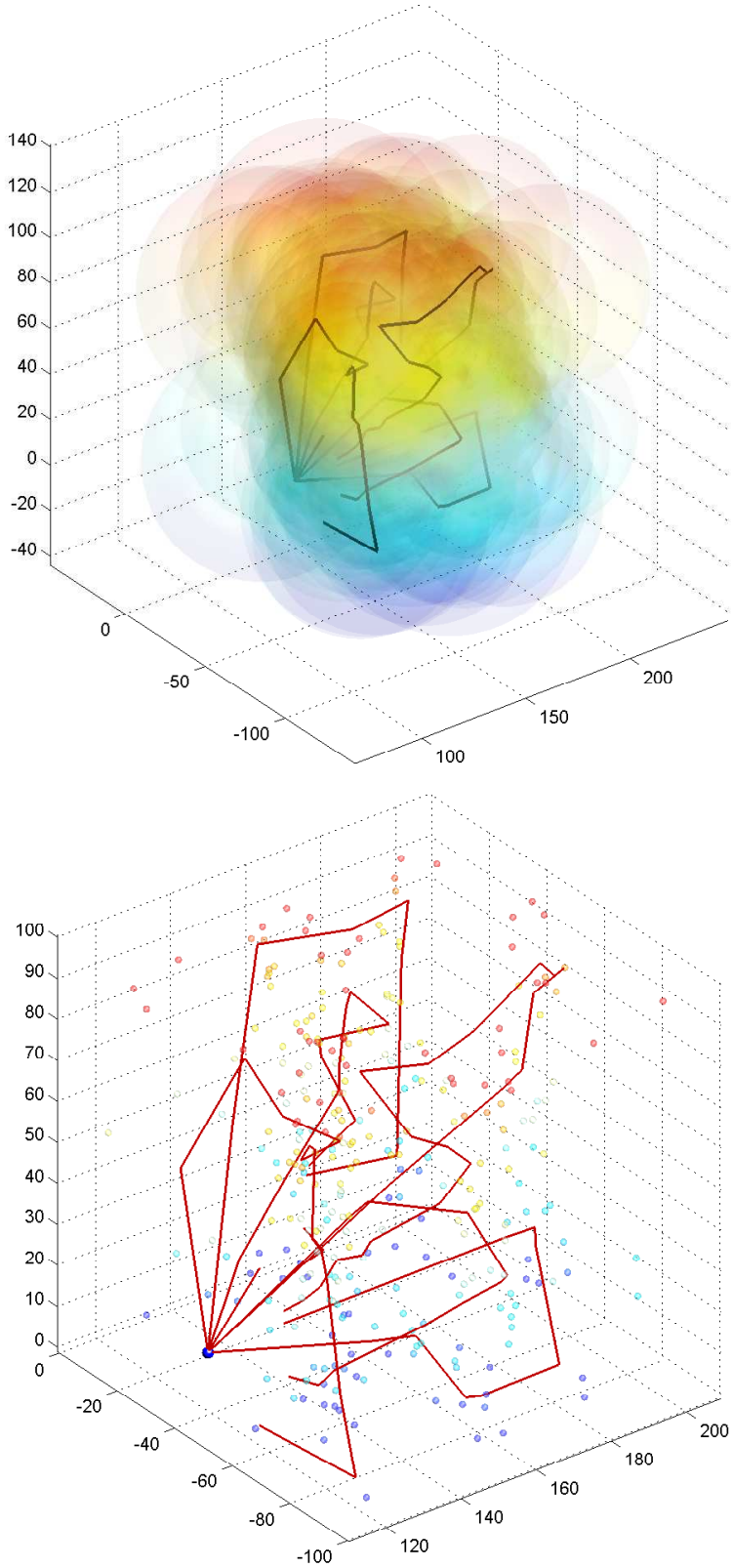


Figure O.93: *team*3_300, arbitrary radius, 3D, Euclidean, Length = 1745.4890697

Table O-96: Solution for *team*3_300, arbitrary radius, 3D, Euclidean

Total distance: 1745.4890696527 Total demand met: 9490 Depot: x 23.55 y 20.83 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 194.027558114664 Demand Met: 1264						
26.5482430741224	26.0746448393471	7.51531877938419	23.55	20.83	14.19	11.78
27.8646934915535	28.3774314839022	10.8150975698251	27.74	25.63	13.28	7.06
36.1350814724877	42.8443301791391	31.5454268325526	53.87	15.51	67.82	48.76
36.1353924164486	42.8448740949159	31.5462062358377	41.07	43.98	42.76	16.59
39.6941463620888	49.0699876466409	40.4664730367744	23.5	55.84	45.92	18.38
42.7695899344586	51.3047327281311	44.0493534852066	61.27	24.41	67.08	39.95
42.7698266834565	51.3056721938788	44.0496011826448	42.72	42.84	54.45	48.6
44.546026148203	58.3539760400627	45.9079403872887	71.33	32.23	64.13	42.89
44.546026148203	58.3539760400627	45.9079403872887	58.75	56.63	68.13	26.43
44.546262896299	58.3549155064266	45.9081880832518	45.57	28.26	77.82	48.56
45.5712136140919	62.4221349395301	46.9805349011159	38.08	89.48	68.3	35.64
45.5712136140919	62.4221349395301	46.9805349011159	37.88	93.16	68.12	38.09
45.8712122919837	63.6125924568632	47.2944061446909	23.78	67.37	54.34	23.49
49.377879825787	77.3138292762935	50.8926464798048	48.98	92.03	89.79	41.59
49.3781308412628	77.314371479247	50.8918446025149	68.17	79.21	59.57	25.07
49.3781308412628	77.314371479247	50.8918446025149	51.75	85.81	80.64	36.53
49.3783818566966	77.3149136822629	50.891042725254	39.7	88.73	54.48	41.5
49.3786328720852	77.3154558853443	50.8902408480233	46.8	93.43	44.07	39.27
49.3786328720852	77.3154558853443	50.8902408480233	48.42	91.53	51.1	30.91
49.3788838874281	77.3159980884064	50.8894389707651	47.08	88.26	42.71	25.21
49.5455118283877	77.6759211373677	50.3571401312382	47.67	92.59	55.65	35.3
51.751088185989	82.4400561653049	43.3113471937547	54.83	99.88	42.57	28.66
53.383895860803	85.966988866743	38.0952825378772	78.98	97.83	29.61	29.46
51.3820799022142	85.9773667004596	37.1757203854116	50.91	90.3	36.65	4.38
51.381201517911	85.977080379372	37.1753376828497	70.23	90.73	4.71	37.84
44.8908611208956	83.8643705069569	34.432448414087	49.11	94.31	36.24	17.31
43.4337892351373	83.3900710358749	33.8166748472062	45.57	93.71	36.64	20.17
43.4329069218261	83.3897838292193	33.8163019724843	40.13	86.48	38.33	6.39
37.0886550942383	80.7866303383377	30.371874933005	37.93	93.92	46.64	38.41
36.6203908827294	80.5944936193827	30.1176445148164	24.67	93.34	35.07	18.16
32.6500581679412	76.544615690648	26.3928588432577	38.99	86.42	22.62	12.82
29.4521505614155	73.2826365550666	23.3927263003277	35.58	76.06	26.53	8.78
27.1891287668635	70.9742741096222	21.2696613465452	36.6	82.94	12.12	44.77
27.1891287668635	70.9742741096222	21.2696613465452	42.78	91.87	12.41	35.26
25.2091148183382	68.9545904087194	19.4121015993181	49.91	91.9	29.51	43.61
25.2091148183382	68.9545904087194	19.4121015993181	48.89	93.1	33.02	36.74
22.3831363495639	66.0719930362157	16.7608959337351	19.86	66.11	18.19	2.9
21.2531176620057	62.3612438735673	11.9824851950655	20.64	65	8.49	4.42
21.2146993027865	62.0226385400219	11.8611220739281	16.79	62.67	10.23	4.76
21.5952131507698	55.310713566119	9.92847187186568	24.47	65.24	5.9	32.36
21.836527720285	51.0541409553398	8.7028223816156	22.65	62.2	11.71	11.7
Route: 2 Length: 76.6764023507134 Demand Met: 811						
47.4125237328059	17.3776097177927	8.4548802153523	48.26	14.58	6.53	3.5
50.5177823105952	17.7678916642722	10.2534865026474	47.45	7.49	9.86	16.55
50.5177823105952	17.7678916642722	10.2534865026474	54.22	8.18	8.6	10.41
55.1164066788299	19.8137562134441	13.4716035290999	63.88	23.81	11.61	9.81
51.1446996423004	17.9379435088104	19.6229196893674	19.48	4.75	3.34	45.94
51.1446996423004	17.9379435088104	19.6229196893674	42.59	39.16	5.9	36.88
51.1446996423004	17.9379435088104	19.6229196893674	54.15	15.54	5.27	39.45
51.1446996423004	17.9379435088104	19.6229196893674	45.71	40.8	10.89	34.61
51.1446996423004	17.9379435088104	19.6229196893674	50.21	0.82	0.76	29.59
51.1446996423004	17.9379435088104	19.6229196893674	56.26	10.34	5.55	24.93
51.1446996423004	17.9379435088104	19.6229196893674	55.5	8.86	22.02	30.33
51.1446996423004	17.9379435088104	19.6229196893674	51.86	7.7	30.42	17.94
51.1446996423004	17.9379435088104	19.6229196893674	44.72	11.87	38.22	20.59
51.1446996423004	17.9379435088104	19.6229196893674	40.11	39.6	39.05	36.03
51.1446996423004	17.9379435088104	19.6229196893674	56.31	21.31	38.26	24.49
51.1446996423004	17.9379435088104	19.6229196893674	55.4	11.17	38.22	24.33
51.1446996423004	17.9379435088104	19.6229196893674	42.56	42.28	42.23	38.94
51.1446996423004	17.9379435088104	19.6229196893674	56.38	14.32	39.64	21.79
51.1446996423004	17.9379435088104	19.6229196893674	76.81	16.4	5.21	34.4
51.1446996423004	17.9379435088104	19.6229196893674	78.41	15.88	16.4	33.29
51.1446996423004	17.9379435088104	19.6229196893674	52.03	16.04	55.64	40.73
51.1446996423004	17.9379435088104	19.6229196893674	85.34	3.13	7.91	40.46
51.1446996423004	17.9379435088104	19.6229196893674	49.85	30.56	58.41	44.85
51.1446996423004	17.9379435088104	19.6229196893674	84.22	4.25	20.41	43.87
51.1446996423004	17.9379435088104	19.6229196893674	64.87	11.36	51.75	35.55
51.1446996423004	17.9379435088104	19.6229196893674	83.08	6.85	43.86	42.38
51.1446996423004	17.9379435088104	19.6229196893674	85.18	6.81	41.52	43.66
Route: 3 Length: 228.343930489584 Demand Met: 1274						
27.9105136074275	25.9213268640998	23.488578689925	25.65	24.53	24.47	2.83
35.4169444961772	32.8552282391784	44.6233456910113	45.63	23.76	45.59	13.71
37.090052384796	37.347958092042	53.7540933866239	42.69	39.78	60.49	10.22
39.1390598886591	42.8500761829439	64.9362596274581	45.42	39.91	67.31	7.33

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
38.1380938073578	45.2299678761023	67.636764130228	60.94	57.56	60.13	37.6
36.2282500300967	49.7708024036685	72.7893280563516	28.95	69.72	73.23	21.24
36.2282114201958	49.7707709574459	72.7903268157874	25.84	61.09	65.42	17.04
36.5291660873335	49.3813682929967	73.8619352161312	23.47	70.49	67.86	29.96
36.5294213030193	49.3810380716102	73.8628439618545	13.36	65	72.75	29.08
36.5294213030193	49.3810380716102	73.8628439618545	26.5	63.44	75.23	28.82
37.3899394532855	48.2676210201512	76.9268884350193	21.49	69.2	86.43	28.99
37.3901946689542	48.2672907987735	76.9277971807506	33.01	55.55	89.21	36.48
37.3901946689542	48.2672907987735	76.9277971807506	20.88	59.51	94.7	36.31
37.3904498846301	48.2669605773905	76.928705926478	30.83	54.42	86.59	13.2
42.3397680806732	42.9193766957541	79.6168180047001	41.97	43.22	75.7	4.65
43.1676393391244	42.024887629187	80.0664578672807	42.62	44.81	79.79	3.21
44.4183864577876	40.6734943868042	80.7457733474587	43.21	42.61	80.16	13.5
46.1381941088376	38.8152958520258	81.6798486284869	44.15	32.64	73.77	10.23
47.782621243725	37.1385514938063	82.6550462141933	43.96	42.1	91.03	13.34
48.2352703873649	36.6770066154014	82.9234815499191	47.34	38.25	97.3	14.49
48.6630703766164	36.2253799011977	82.8289710752751	40	38.77	99.41	18.88
50.9785071651517	33.7809826391892	82.3174398899751	41.47	31.69	75.83	27.11
54.2457331736666	30.3317853277238	81.5956374218485	54.5	15.91	93.18	18.5
57.7323554075393	30.4496572995505	77.7011082171719	46.38	12.31	81.64	40.75
60.7920759461821	30.5530970725367	74.2834248098014	58.02	32.46	71.61	35.22
62.4855456231813	30.6103480946327	72.3918327069612	65.16	40.78	60.78	37.77
64.2383984074916	30.669606673297	70.4339101377868	84.47	48.16	64.66	27.36
63.0039929243797	27.439926720134	68.6213299571726	43.23	11.54	68.02	40.96
62.2748771051007	25.5322790454795	67.5507085890318	52.96	3.75	74.52	34.45
61.4913206511256	23.4821937148862	66.4001475121832	56.85	15.49	62.45	20.36
60.5828971577215	21.1054081368781	65.0662337796696	45.57	12.76	80.46	29.32
59.3471942380953	17.8723335867984	63.2517484589614	67	3.94	64.95	32.81
58.0526749040345	14.4853726546408	61.3508981075164	55.38	10.13	64.28	5.89
58.2285642635173	14.4282311859504	60.264796304737	51.38	10.51	60.31	13.35
58.7688107359819	14.2527204160005	56.9288203866691	52.67	8.88	54.93	8.37
60.8066711139647	15.0202399087976	52.0544598930562	56.94	12.18	54.17	13.04
63.6692050141826	16.0983562463613	45.20756188699	51.98	10.99	46.43	14.06
65.784222911569	16.8949355810382	40.1486482360131	66.87	17.1	39.83	1.15
54.3084708701181	15.724609258921	32.3738979523263	53.85	15.08	32.9	0.95
Route: 4 Length: 212.089270260557 Demand Met: 1278						
30.811259901869	34.7017343596363	4.9470284036728	40.4	40.19	35.32	32.32
31.6080962328356	36.2239911113927	5.48990553716813	37.85	53.76	4.29	19.4
34.2647207286841	41.2991419529325	7.29983893860716	43.21	42.35	12.25	16.43
34.2647207286841	41.2991419529325	7.29983893860716	45.6	43.93	17.79	19.94
37.2269226702581	46.9580605164163	9.31795939313997	27.36	59.94	13.4	22.06
41.294976240497	54.7295711423303	12.0894862104294	27.64	62.78	13.86	15.95
43.8776555169396	58.1183373310462	13.3478212053153	47.3	55.25	23.22	13.14
47.0400948693553	62.2678140583088	14.8886273528125	49.78	61.48	16.59	3.32
45.2688962250582	73.6595238959451	12.8789489651661	20.56	61.44	16.14	30.47
45.2688962250582	73.6595238959451	12.8789489651661	40.14	85.47	20.22	26.51
43.631724234846	84.1892227112639	11.0213430009566	41.11	86.33	11.14	3.31
47.8779337066283	84.2671177679666	10.0420325486662	47.56	92.03	4.61	9.48
54.534482365388	83.1588493108436	9.37873973614538	48.25	85.26	10.69	49.96
56.0824433492352	82.9011247122274	9.22449292639332	54.05	68.39	12.29	14.97
65.7087155768066	81.3979079625173	8.24609994003709	60.12	71.05	6.63	24.74
65.7087155768066	81.3979079625173	8.24609994003709	44.33	87.3	2.27	27.93
71.3613278408484	80.5152089037645	7.67158095043452	74.49	84.46	5.13	5.64
76.8888932359081	70.2668295393176	11.817005238077	85.6	88.65	32.39	40.1
78.9327529525871	66.4774126355498	13.3498076754504	90.65	58.26	13.09	31.68
78.9327529525871	66.4774126355498	13.3498076754504	87.56	46.99	46.13	41.58
81.5908076664422	61.5492478589903	15.3432286088543	87.92	47.46	7.48	19.28
82.5309384098823	59.8061990078552	16.0482841874158	91.08	56.32	19.58	17.84
86.3657148901535	52.6963339331932	18.9241932765149	89.33	46.23	11.31	10.42
86.7356773139055	52.1338101619515	20.4526413247764	89.11	45.94	22.79	8.83
87.1831981234226	51.4533597234516	22.3015110042923	90.93	51.78	26.41	5.57
82.1167941341644	48.9149990330337	20.703982615296	86.88	55.34	28.08	10.88
81.145808632359	48.428517608029	20.3978134056892	92.82	43.5	36.14	36.84
81.1449481111111	48.4280864712082	20.3975420678487	79.79	30.32	50.96	35.55
67.4248148582674	41.8537351377352	15.5384875085498	73.63	17.07	53.58	49.78
65.9639005893279	41.1537008527282	15.0210973339873	74.93	38.63	8.7	25.85
62.8321271780503	39.6530318488188	13.9119639464709	85.02	48.75	32.58	30.39
55.0949268264632	35.9455552150125	11.171795323473	75.98	28.26	8.37	25
55.0949268264632	35.9455552150125	11.171795323473	85.21	44.35	20.93	35.25
44.7539271339875	30.9904018019256	7.50947799935408	51.12	47.54	2.22	20.96
38.314804625909	27.9049322320547	5.22903020758291	45.6	41.81	1.51	23.25
38.3139455634247	27.9045205903829	5.22872596626073	25.62	68.98	3.75	43.08
Route: 5 Length: 307.44241211058 Demand Met: 1271						
11.0206433271371	27.6679204092124	52.5841475164782	3.36	12.54	56.95	17.51
10.395867503395	40.2320717393009	72.7951952608728	45.09	11.7	92.12	48.9
10.2608668195802	42.0980294334154	75.7140877286957	4.01000000000001	20.5	95.59	30.01
9.88836886640449	47.2466349232042	83.7679812824259	21.75	55.19	94.83	18.06
9.5548588644847	51.8563483971358	90.9788927419479	9.06999999999999	51.92	93.4	2.47
13.9512587732577	59.2646334520429	78.7245094932966	12.14	56.76	74.37	5.34
14.9664119899805	60.8412080166494	78.1970762409869	21.99	57.15	79.17	10.23

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
17.8107084606806	65.2585177852741	76.7192927381918	24.03	65.56	79.56	12.46
17.8107084606806	65.2585177852741	76.7192927381918	12.82	66.49	92.89	17.6
20.9427666472618	70.1227327855774	75.0919998304712	23.52	71.05	74.38	2.83
18.3419720007907	70.888787952135	75.4635239152346	27.28	65.47	69.94	12.73
18.3419720007907	70.888787952135	75.4635239152346	16.07	82.14	77.28	24.27
15.3860724826325	71.759437963669	75.8857748896713	34.79	81.57	97.09	35.28
12.5879607143608	72.5836120600414	76.2854859515543	35.46	90.5	93.34	36.39
7.34616705193014	74.1275636978282	77.0342773284156	2.98999999999999	72.09	73.38	6.04
7.3459506758842	74.1281869483032	77.0350288204329	5.06999999999999	73.15	76.92	4.26
7.34573429973477	74.1288101987481	77.0357803124454	6.62000000000001	72.96	75.87	3.81
6.93127808464125	75.3226111980264	78.4752210178637	8.06	78.36	80.59	4.56
6.70875507979058	75.9635670107645	79.2480617198526	6.36	80.44	74.53	34.29
6.66255003222963	76.0966560854452	79.4085356107079	0.909999999999997	72.43	63.78	18.26
6.66255003222963	76.0966560854452	79.4085356107079	4.75	76.37	88.59	18.12
6.46158514266212	76.6755155868633	80.1065030407362	1.23999999999999	99.01	69.5	41.19
6.46158514266212	76.6755155868633	80.1065030407362	10.66	76.44	91.14	43.81
5.96408072405468	78.1085276768263	81.8343761518123	1.36	82.41	81.26	36.76
5.96408072405468	78.1085276768263	81.8343761518123	8.28999999999999	81.45	86.91	44.4
5.74104162208707	78.7509699003548	82.6090090153385	0.969999999999999	75.78	96.61	17.69
5.38134276436281	79.7870474009642	83.858272585417	0.760000000000005	80.97	91.36	8.89
6.2952834107639	80.3563896954893	82.9408832177384	11.23	82.6	85.27	5.9
5.0416402613927	81.3784166543131	68.3890454799998	1.01000000000001	87.83	68.27	21.8
4.92541851381615	81.4731658238326	67.0399847420197	4.8	88.51	50.28	18.34
4.92541851381615	81.4731658238326	67.0399847420197	1.20999999999999	81.97	77.86	14.68
4.52968470465174	81.7957856261002	62.4464455747206	2.19	82.13	61.84	2.44
7.12828275072994	81.689896533028	58.642222992117	16.99	78.36	62.01	10.94
7.82772233665263	82.7126984112126	51.2255118315037	9.41	84.38	51.54	2.32
9.10916538231049	84.9401681555181	28.2885826913595	46.89	94.85	27.74	49.64
9.35079222179793	85.3601762928723	23.9636317395661	12.07	80.14	22.08	6.18
6.5266009863159	94.3491048190272	9.14042961464959	5.54000000000001	99.29	6.96	5.49
12.2653338039322	53.190226366514	1.1469799726722	11.46	53.07	0.5	1.04
Route: 6 Length: 109.346549624884 Demand Met: 1080						
18.8366681596137	33.6621687200439	15.2064131809007	15.54	52.83	23.01	26.09
18.2284057761257	35.3181798711974	17.1688237181522	39.42	71.54	17.38	47.2
15.9531741894062	41.5125565570619	24.5093018270979	24.49	66.27	29.11	27.9
15.6838102844584	42.2459068474088	25.3783386460546	3.20999999999999	36.35	38.54	37.4
15.035169336216	44.0118488376261	27.4710201681156	25.01	63.12	37.19	28.84
13.9284348016779	47.0249626221224	31.0416287002495	11.18	57.92	34.05	14
13.9284348016779	47.0249626221224	31.0416287002495	25.24	60.77	36.77	37.65
13.9088625856639	47.0782484926316	31.1047736721456	35.37	65.99	46.58	42.77
13.8892282591032	47.1317034600007	31.168119028121	30.85	54.39	47.15	33.55
13.8892282591032	47.1317034600007	31.168119028121	28.77	62.05	46.68	31.17
13.608391954613	47.8962876274484	32.0741687185769	25.86	63.85	60.16	38.15
12.7303365275977	50.2868163793198	34.906999892861	27.62	60.61	68.71	40.48
12.7303365275977	50.2868163793198	34.906999892861	26.15	61.96	69.66	39.04
11.5744864390417	53.4336482888954	38.6360676245844	2.56999999999999	49.67	48.06	15.72
11.5742559341626	53.4342758444222	38.6368112922263	11.74	69.17	44.25	18.09
11.5742559341626	53.4342758444222	38.6368112922263	8.67	72.77	42.39	28.82
11.5740254292842	53.4349033999491	38.6375549598682	2.01000000000001	79.01	40.57	42.13
11.5740254292842	53.4349033999491	38.6375549598682	8.95	75.43	49.37	30.95
11.5737949244064	53.4355309554769	38.6382986275096	4.15000000000001	75.92	20.91	36
11.5120410740138	53.6036574209061	38.8375323309212	8.59999999999999	80.56	11.38	41.43
11.5120410740138	53.6036574209061	38.8375323309212	0.620000000000005	84.95	30.66	36.73
11.0942098274792	54.741213871588	40.1855627189889	28.82	81.78	35.71	43.64
11.0942098274792	54.741213871588	40.1855627189889	24.2	92.42	34.13	40.35
10.9475437160473	55.1405162013315	40.6587450903988	3.44	75.58	64.88	32.57
11.0939793226111	54.7418414273937	40.1863063863989	38.36	90.43	43.39	47.27
12.7301060227189	50.2874439348482	34.9077435605016	34.24	70.46	67.21	46.56
13.3977574931232	48.4697454361407	32.7537293164982	22.51	60.15	43.07	23.44
13.7761459281241	47.4395730583917	31.5329515293519	19.65	58.2	51.17	41.68
13.7761459281241	47.4395730583917	31.5329515293519	21.39	62.71	50.33	35.55
20.1787949853677	30.0081934061612	10.8763689943676	42.95	44.74	22.67	47.83
20.1787949853677	30.0081934061612	10.8763689943676	31.99	67.74	24.97	46.93
21.6350872882389	26.043400174183	6.1779981562672	27.4	59.84	3.43	47.68
Route: 7 Length: 267.19414232055 Demand Met: 1229						
38.3837421774365	10.0791466916115	45.8446668886111	41.49	2.29	43.49	8.71
39.8459094048285	9.37734335160374	51.1362279915307	31.22	0.18	51	17.31
41.6829976068512	8.49558755575952	57.7846225442818	44.53	2.72	56.05	49.48
41.6829976068512	8.49558755575952	57.7846225442818	53.73	28.37	56.21	48.55
46.0865467844389	6.38199586428493	73.7210015496815	52.67	4.65	71.84	26.24
46.0865467844389	6.38199586428493	73.7210015496815	62.16	16.88	79.65	21
48.7930414547625	5.08294721865639	83.5157658286333	48	4	84.7	1.79
49.6859867465199	5.75046717060239	83.7110166111753	5.58	22.9	91.06	47.89
49.6859867465199	5.75046717060239	83.7110166111753	84.57	2.19	72.59	42.77
57.7820300133457	11.8026521484057	85.4812916736648	55.24	13.37	88.36	7.67
61.8912510843062	14.8744945686579	86.3798110328514	24.66	9.13	90.15	37.86
61.8912510843062	14.8744945686579	86.3798110328514	50.3	13.28	95.6	17.44
64.8789253295547	17.1079260604899	87.0330935251469	63.35	21.49	87.32	4.65
79.6210073798111	17.2729959091356	89.036034872172	85.76	19.27	96.66	9.99
79.926559677811	16.5346294366724	86.4655341988968	50.52	8.68	79.3	38.38

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
79.926559677811	16.5346294366724	86.4655341988968	83.5	4.83	59.12	37.8
79.926559677811	16.5346294366724	86.4655341988968	57.66	15.51	81.33	35.11
79.926559677811	16.5346294366724	86.4655341988968	50.97	4.59	83.57	36.43
79.926559677811	16.5346294366724	86.4655341988968	90.45	0.18	67.28	30.09
79.926559677811	16.5346294366724	86.4655341988968	86.49	3.97	82.84	35.89
79.926559677811	16.5346294366724	86.4655341988968	88.21	3.61	89.96	26.68
80.3019983020722	15.6273829094784	83.307105456728	87.06	2.89	85.23	20.41
81.7157597715471	12.2110320163845	71.4136441823875	84.21	1.15	74	11.63
82.0902070920002	11.5932872573647	66.9192245225138	60.89	11.99	66.92	21.62
82.0902070920002	11.5932872573647	66.9192245225138	77.94	16.73	64.38	14.1
82.1275806385351	11.5316302202484	66.470636982589	90.14	0.74	66.47	21.22
82.8119308316174	10.4026228776364	58.2565119582113	83.98	4.24	58.09	15.73
82.8120130896642	10.4024871723872	58.2555246296443	83.63	6.61	58.86	7.21
83.7533800796685	8.84946715418986	46.9564822563055	86.71	7.9	46.76	17.03
83.7533800796685	8.84946715418986	46.9564822563055	83.08	5.9	51.4	14.32
84.4791721597179	7.65208981313827	38.2449306077842	90.71	5.35	36.18	17.99
85.5365545667772	5.90767391061662	25.5533813878973	84.85	7.49	23.97	13.74
85.5365545667772	5.90767391061662	25.5533813878973	86.46	7.15	36.07	18.46
86.0968719509092	4.98328958309608	18.8279968110455	91.86	5.09	13.18	8.07
83.707809591136	4.60656356602009	18.9724617882178	89.81	1.33	12.56	26.05
83.7068235540988	4.60640808029318	18.9725214132965	92.92	45.3	3.79	44.4
67.9949042823848	2.12883041393035	19.9226115433945	90.79	7.27	2.84	30.18
64.4585470506933	1.57119016228356	20.1364527629622	64.3	1.03	20.6	0.73
Route: 8 Length: 350.368804381172 Demand Met: 1283						
60.6368756302394	35.0756678666442	34.3184395945183	52.12	16.84	52.03	26.81
60.6375965936392	35.0759703308925	34.3190630743934	78.01	26.19	31.01	23.38
65.2740975757904	37.0211045645684	38.328667212569	63.26	50.77	40.6	14.97
71.7270578802539	39.7282916462652	43.9091347874955	84.47	44.91	39.53	21.75
84.2165954855312	44.9679795935527	54.7099892289753	85.43	53	49.96	9.41
87.7985436846718	46.1776286673941	58.0335546165054	93.86	49.11	54.34	7.68
87.7987251485355	46.1776125181774	58.0345378815098	98.41	37.64	42.84	22.32
87.7987251485355	46.1776125181774	58.0345378815098	92	48.8	50.4	13.39
88.3811256013681	46.1257815098412	61.1902707385878	85.85	46.49	60.83	8.76
89.9608793370971	45.98518934244	69.7501427143727	92.59	46.16	69.75	30.13
89.9608793370971	45.98518934244	69.7501427143727	85.78	45.37	88.36	33.83
91.0248690731847	45.8904971354719	75.5153418039693	88.92	43.62	77.06	3.46
96.3534818896267	49.7379593656477	81.6180539916272	96.43	49.73	81.64	0.08
92.8367749525989	52.3499956404771	82.9437853492571	89.59	51.88	82.73	4.09
90.2309996695254	54.2854361499898	83.9261125327232	89.36	56.03	81.08	3.45
84.6945570395116	57.0677870852868	89.859307321901	92.09	44.08	96.66	37.36
83.9804579829431	57.4266589205139	90.6245797493327	87.26	54.53	99.96	10.31
82.6941676427666	58.1932373434553	90.7664353646073	82.42	49.99	99.02	11.64
71.6563018852235	64.7713685318677	91.9837280033806	92.92	88.46	92.3	39.57
67.2336439066978	67.4070985251878	92.4714745982208	72.93	73.7	97.12	16.22
62.3323566659188	70.3280738442643	93.0120076660397	70.7	73.7	97.99	18.06
55.8457159999105	74.1938601915527	93.7273818497034	57.57	78.44	87.74	7.54
50.3192258817019	77.3391081103979	94.499914532989	53.35	83.14	97.2	7.08
47.8193733274326	78.3106586854889	94.6620912173296	66.26	99.07	96.4	34.13
42.0652625677303	80.5469543754233	95.0353852284364	47.48	94.9	89.56	26.29
37.9393974325434	82.1504433908755	95.3030477040279	42.37	92.45	91.48	18.71
34.0124602484675	83.6766198429639	95.5578027438445	30.69	95.98	98.88	13.17
28.698713143808	77.502036970976	93.5779976915324	24.86	66.05	97.16	20.4
24.3723764807322	72.4748275227447	91.966084830209	22.6	70.1	92.91	3.11
26.5123660411255	76.0578350981796	87.1855709622421	27.18	54.04	89.82	49.76
26.5123660411255	76.0578350981796	87.1855709622421	32.42	78.27	77.18	49.72
28.0717258731118	78.6686858050611	83.7021289765208	24.25	76.66	84.45	7.23
30.3748588596325	82.5248489761973	78.5571693772066	27.35	82.24	75.13	4.58
36.3600068163381	87.3910223399271	76.1706411567251	48.68	92.55	68.87	20.63
36.3600068163381	87.3910223399271	76.1706411567251	40.14	88.25	82.87	7.74
36.360579024248	87.3915865896454	76.1700460093793	46.92	92.94	79.18	12.72
36.360579024248	87.3915865896454	76.1700460093793	44.75	90.08	82.93	11.27
39.8631539530295	90.8454406950918	72.5270700914486	41.11	92.55	72.93	2.15
37.1109193767143	84.1149270607837	61.0183426751473	39.28	92.99	62.54	15.28
37.1109193767143	84.1149270607837	61.0183426751473	39.18	94.86	64.79	14.97
37.003565248138	83.8523955479327	60.5694313567854	42.93	88.78	59.49	12.51
37.0033630780412	83.8519011432717	60.5685859626273	39.31	87.14	57.08	5.32
29.8018370139434	69.2427642087673	47.2132997054752	30.36	58.14	54.2	13.13
28.3714433313705	68.0691842665795	43.7199921406195	28.86	67.84	42.89	0.99
21.6818283871027	68.0371649365651	44.9047264152661	20.35	68.75	46.32	2.07
21.4881572394428	62.4555092441562	35.7873976404038	23.19	66.22	32.78	5.11
21.4006247308496	61.8043580892281	35.1022166389795	22.17	64.94	33.7	3.52
20.8254045126939	57.5253143632869	30.5995462558628	4.20999999999999	66.53	21.42	21.01
21.3929932486611	49.8809303602522	24.2250374269085	21.1	78.12	20.54	28.48

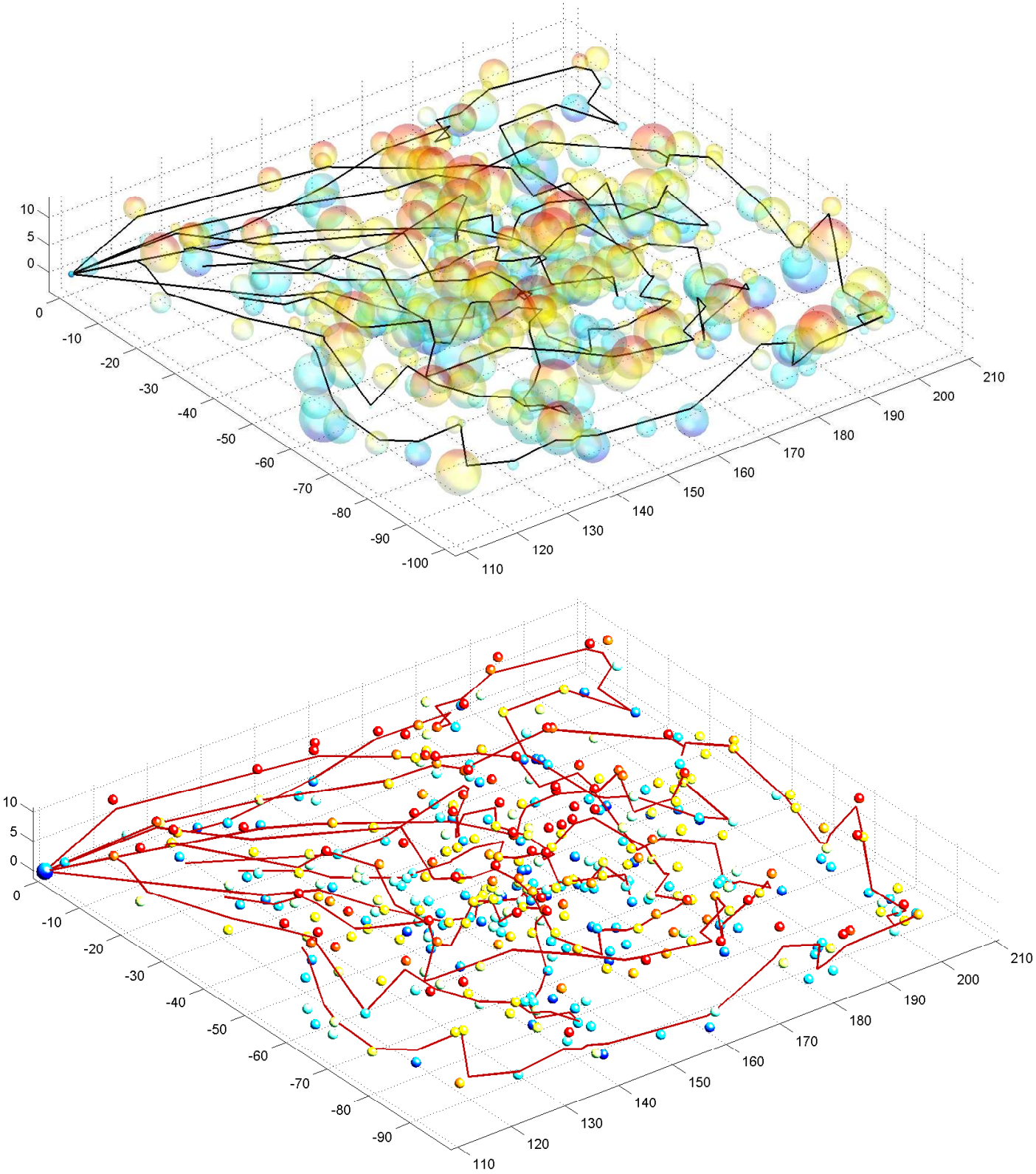


Figure O.94: *team*4_400, arbitrary radius, 3D, Euclidean, Length = 1788.5826537

Table O-97: Solution for *team*4_400, arbitrary radius, 3D, Euclidean

Total distance: 1788.58265370804 Total demand met: 2245 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 332.343305556217 Demand Met: 374						
3.1894098824428	0.713894860050676	2.19368117621908	2.34935	1.70725	1.418964	1.5141472
11.2925136461755	2.52763035165996	7.76701276976142	10.7326	2.49095	9.542224	1.8617797
32.8197735059966	6.75246838481837	8.10607515594639	33.240325	8.160175	9.454403	1.9941137
43.9927402874447	8.94522076080275	8.28205297715368	44.6523	7.1683	9.495828	2.2507146
43.9927402874447	8.94522076080275	8.28205297715368	43.2503	8.7931	9.432262	1.4609189
51.8939783313608	12.6424519242121	7.05148141757895	53.686425	15.19815	7.953267	3.2492576
56.7574634273709	14.9182243950419	6.29402332994018	56.7601	13.3255	9.545614	3.6207209
56.7574634273709	14.9182243950419	6.29402332994018	58.962525	15.549225	6.884037	2.3682429
56.7574634273709	14.9182243950419	6.29402332994018	56.680125	15.845675	6.62366	3.207153
57.9071582794772	15.5067351344639	6.00996333202379	58.66755	14.455925	4.659081	1.8727735
59.1766778700102	16.9208261358236	6.31351666543583	59.666825	17.15215	3.601254	2.7658857
63.6161497776382	21.9025854753639	7.70528726037544	64.881075	21.1972	7.607995	1.4515751
65.771086251836	28.4313597946614	9.33623231115685	65.757275	28.49595	9.473031	0.1519096
68.1745489982441	30.9966568870586	4.6300747782166	68.792375	27.90175	4.368368	3.9463741
68.1745489982441	30.9966568870586	4.6300747782166	67.6691	30.587025	1.957775	2.7503569
72.226045266137	34.9416849686731	7.3930071603835	72.419975	34.998125	8.679512	1.302263
74.215254663866	37.3497614146193	4.64198078768878	75.0516	36.4713	6.125794	3.1806421
74.215254663866	37.3497614146193	4.64198078768878	74.186175	37.664625	1.593253	3.0650817
76.4140989942965	39.2835961783037	8.02498914689039	76.5757	39.19325	8.28894	0.3224087
75.8583643196918	41.1373796022808	7.0155805718079	76.046775	40.829925	8.304908	1.3388025
74.5524479817949	45.4935699707745	4.6435796953442	74.018375	45.692475	4.261669	0.6860415
76.3164944048664	46.4244057457446	5.31494812203935	75.70595	48.354275	5.510084	2.7185379
78.426225099296	47.5376489977432	6.11787855973714	80.003925	44.278875	7.256115	3.7953033
79.5609134613705	48.3369795390266	6.5233563147894	79.556325	49.1563	6.397826	0.8288938
82.9932769543645	46.4482007361715	8.39856590670518	83.247325	46.458225	8.799584	0.4748225
82.8948207701551	45.365980553816	6.35582732111035	82.166	45.384	5.835084	0.895923
84.7514251576269	44.2756764583083	5.78318384591537	85.82305	42.253575	5.699647	2.2900333
84.8091046759258	45.2992358397398	5.57787239823232	86.306375	44.08645	5.63357	1.9276333
84.9469062971332	47.744597972477	5.08736736508772	84.710775	44.260425	5.70064	3.5456061
85.3123962100269	54.2304131312899	3.786404479623	85.3769	55.416	3.88436	1.1913741
85.124749694421	50.647130650919	2.42645131413334	83.835575	49.221375	2.182226	3.0061312
84.9334518177041	46.9941191963353	1.04003387486506	85.726975	46.8848	0.120938	1.2191665
83.5419300591865	44.3667514672023	1.41974596175985	83.98185	43.958725	1.112514	0.6740969
79.6573038382585	40.5672934076615	3.01401572044435	80.128375	42.2928	0.877447	2.9296913
79.6573038382585	40.5672934076615	3.01401572044435	77.736325	41.257125	4.306668	2.4159837
79.8857536763499	38.6829815288881	2.5064753297547	82.455325	37.974875	2.274181	2.6754574
77.0928228516069	35.3356824184208	1.65841005449741	77.267275	35.3236	0.141297	1.527158
76.0366331313006	34.127489589847	1.74690451483773	74.4851	34.7013	1.961771	1.668137
76.1807445248614	22.1406844732551	1.29572113325544	77.750225	18.79385	0.265085	3.8375488
76.1895646698606	21.4070491389081	1.26810704235221	76.538875	22.08605	1.37194	0.7706109
76.2309273372467	17.9666192316071	1.13860869607316	77.464	15.628175	3.533669	3.5672263
76.2309273372467	17.9666192316071	1.13860869607316	77.472675	18.057475	0.141489	1.59513
75.9496622703899	17.698731665651	1.15627990568862	75.3053	17.780525	0.662947	0.815641
76.1504315768912	11.8590679465715	5.7724881845492	76.1173	11.832075	5.793623	0.047676
81.7268276130516	11.9065531595632	5.76818041987241	81.52085	13.687775	5.204149	3.1351213
87.2941858772579	11.953961412698	5.76387963735139	87.3023	11.937375	5.783418	0.026883
96.5404994838886	16.1621087917095	0.911022806968627	96.9141	16.74635	0.695888	0.7260841
96.1328284561968	8.71711705308032	1.45891714075586	94.81355	7.137025	0.426722	2.3027404
98.8232965096275	8.49390242468948	3.99326302039414	99.82775	8.49955	3.828547	1.0178851
97.282676484844	8.27391127275352	6.88420306315175	98.6909	7.723575	8.237085	2.0288551
93.9239761967578	8.60568001180176	8.87259442200448	94.09005	9.358875	9.999877	1.3658877
82.0198904144355	4.65323787916595	7.75301906163589	82.33615	2.420325	8.700274	2.4460605
80.0951944609657	4.01419282204249	7.57200227963836	79.6523	4.144625	8.31435	0.8742129
77.7773211471455	2.34614685600312	4.81551045082799	77.882675	4.11235	4.515775	3.3455297
76.4049204257676	1.35850464884571	3.18340557115213	77.335225	0.00945	1.073545	2.6715027
70.9580267023762	2.15768698943906	4.22473321606061	69.817575	1.306825	4.894499	1.5726355
71.1548534700584	5.51465480312629	2.6849231029474	71.829525	5.85575	2.05089	0.986674
65.5517696071906	8.91653988074175	5.35739885081119	64.181275	8.885925	4.857898	1.4590044
66.9683222931887	11.0028060839203	8.62010306384175	68.784175	11.8632	9.776368	2.318307
63.5066620266869	10.5621114439186	8.41695844908618	62.944875	12.9098	8.420704	2.4896628
60.9891010035283	10.2416076765996	8.2692178726468	61.5062	10.2838	8.047741	0.7604293
54.7652310029234	9.44926393682146	7.90397608937012	54.0981	10.209075	9.589747	1.9657569
45.7632495392386	6.08679310874619	2.84983095887527	46.59205	4.24755	0.914106	2.7958463
40.6245158606572	6.39154471383199	2.44997946191593	40.718225	8.45085	2.325605	2.0651849
28.5171032484762	6.66373025756569	1.53631754722634	28.471925	7.124375	1.494169	0.46477
22.8132330293996	5.33087935705661	1.22903109028177	25.090375	4.2535	0.574579	2.6027734
Route: 2 Length: 248.511995210213 Demand Met: 375						
2.13649644526394	13.9199067603289	8.06905221801368	2.12502499999999	13.8908	8.215003	0.1492663
2.51203578218819	15.9707965578714	7.84543393445704	5.29819999999999	16.16745	9.485319	3.2389206
1.87793601220083	22.3547609728652	6.06015216238142	0.610974999999996	22.331075	4.829551	1.7663891
5.90055988089523	37.7465050617552	7.16693017242146	4.729125	38.22055	5.844342	1.829267
8.76197504436463	46.7195541829171	8.35292621084962	8.7059	46.626875	9.397095	1.0497725
10.4547256994627	52.0059712849122	8.77424668012472	11.458875	55.406825	8.437123	3.5619902
10.4547256994627	52.0059712849122	8.77424668012472	11.134375	51.580675	9.341968	0.9823989

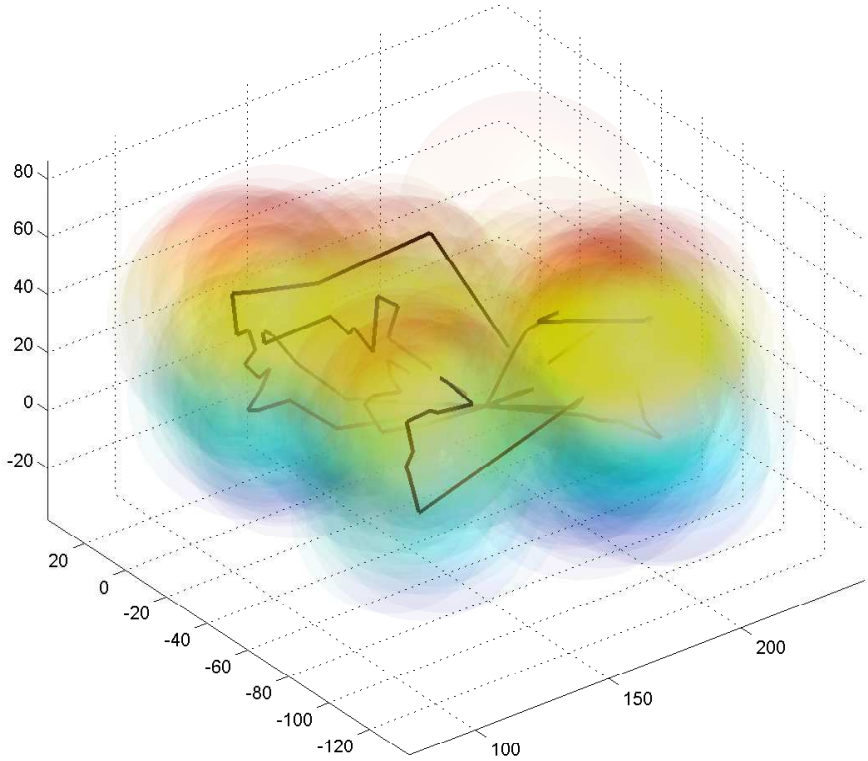
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
10.0511229298121	52.5382479587197	8.46885329626974	9.352575	52.2461	8.408063	0.7596151
9.50684434977124	59.5748234156746	5.62106487943098	10.71515	57.182775	5.281599	3.2469865
9.01512020657506	65.9319520419256	3.0482627837473	8.8531	66.09375	2.882202	0.2828521
13.2961173610538	66.0415291236919	5.88965143487953	12.50315	65.202575	6.796126	2.0894727
16.2126448785497	66.1161809599449	7.82541428954363	17.272875	64.973225	8.378801	1.6542893
15.6285218219795	74.4735097798238	8.51318898394867	13.11545	76.27845	9.886291	3.3850773
18.5050197138839	75.6277893655302	7.09105459683398	19.41455	76.0326	9.16761	2.3028676
21.7493413320715	76.9274228276444	5.3447732096905	20.9401	75.2051	6.209147	3.2102784
21.7493413320715	76.9274228276444	5.3447732096905	22.467675	76.02705	4.2329	1.6009174
24.1571603402118	82.4918361864419	6.85646506938517	24.1584	82.49565	6.916419	0.0600879
25.1368023587842	84.7303731192769	5.8881081678566	23.831575	88.204275	5.345531	3.750467
25.1368023587842	84.7303731192769	5.8881081678566	22.609375	83.218325	5.878629	2.9452111
28.5166157976668	85.2888972000535	5.06254153461361	30.896	84.86835	8.084952	3.8695341
28.5166157976668	85.2888972000535	5.06254153461361	27.4824	83.15295	4.645899	2.409453
32.647364602449	86.9407996601921	2.72624897983616	32.733925	86.47665	2.244896	0.6742613
32.6481851761984	86.941232134925	2.72587531644855	33.324025	88.862275	2.512368	2.0476207
33.6893366032441	84.0650975149623	2.04549361285036	36.3513	83.686975	3.385766	3.004223
34.2793373016295	82.4352388989828	1.65993871752757	35.60905	81.995775	1.580638	1.4026949
30.1020927675231	79.765583310012	0.920036892990965	29.23795	80.022375	0.178216	1.1674686
30.2059367503161	77.942892643706	2.31310572144375	29.5312	77.759375	2.944562	0.9421706
32.1613607332242	76.5110124855845	2.06417393079644	30.46345	78.65395	2.876347	2.8521408
32.1613607332242	76.5110124855845	2.06417393079644	31.60195	76.5275	2.478681	2.2545249
34.9724431564222	74.4525664035222	1.70631444934636	36.110325	75.95995	0.32151	2.3419359
39.2974029287305	70.4346064879694	1.60653014823057	39.430175	70.428325	1.436461	0.2158504
39.6686810222093	68.672550854705	3.61963909645439	40.205375	70.4585	3.559151	2.1049867
40.1051252007287	66.6012236351315	5.98608352327054	39.7753	66.19835	5.821872	0.5459462
40.6024526229967	66.0361785957004	7.20124179091751	37.615325	65.262725	9.608735	3.9137176
40.6024526229967	66.0361785957004	7.20124179091751	42.3891	68.379025	5.906332	3.3982575
40.6024526229967	66.0361785957004	7.20124179091751	41.683175	67.299925	9.367966	2.7312469
42.4771431314551	65.414491668752	7.54144728650388	42.88515	65.09985	8.113938	2.6385081
44.0010268599772	64.9091422930593	7.81799061236971	45.884675	65.715725	8.319043	2.1094453
44.0006106548214	64.9082530524295	7.81780081149164	46.228875	65.56925	6.129679	2.8726006
42.8521803459007	62.4584243121453	7.29665352053452	43.7645	63.186425	9.005722	3.8299193
42.1112456796531	60.877866536008	6.96042412491121	42.114525	60.87195	6.966651	0.0091942
39.4097167514872	58.6868323289668	4.42360898691795	38.122975	58.912025	4.096565	1.3466157
39.988545606147	58.0163402772874	4.17539069991573	39.243575	59.34405	2.988695	2.5403868
39.988545606147	58.0163402772874	4.17539069991573	41.765825	57.606275	4.678763	1.8921573
40.7120627202039	57.1782469423433	3.86512584584394	41.323875	57.06515	2.903463	1.1453823
40.6938363699806	56.9525966125898	4.16266794800366	40.468775	56.35765	3.688499	2.0428185
40.5761992857302	55.4961991452202	6.08307111338577	40.703325	55.537825	6.299364	0.2543153
39.542035644503	54.1486865267254	5.83240713743687	39.658325	53.39295	5.48876	0.8383044
36.8314301990516	55.6822705132951	7.25146074104016	36.8297	55.690525	7.310631	0.0597683
33.7209805077543	56.9507135589479	4.94490977344404	32.800625	59.186225	6.71386	2.9956219
31.499979329479	57.3201827973156	2.59122157479467	30.688625	60.637275	0.70091	3.9031621
30.3406691310041	54.9713127215925	2.18575855810308	30.1798	54.1346	0.93414	1.5141057
29.7883801776153	54.6848728144524	3.94098833450724	28.87265	55.2137	3.915468	1.0577671
29.7472816780856	54.164190953444	5.53215452924251	30.732825	57.781	6.904491	3.9919808
29.7472816780856	54.164190953444	5.53215452924251	29.2116	52.625	7.111098	2.2691686
29.0741602572351	50.3789500380417	5.87388088212188	31.916925	49.63125	4.365548	3.3038515
28.8723352264533	49.5253909708115	5.97743413145392	30.804475	50.3614	3.667235	3.2757758
28.4496884981144	47.7379305121156	6.19429576711473	26.549225	47.5983	5.827804	1.9405088
29.3309853625863	45.0376721616357	6.83395017914334	27.251975	44.47235	3.840979	3.7272714
30.060181330075	42.8034407395948	7.36320888991551	28.231575	43.86655	5.176578	3.8908642
31.0730943399505	39.6999075067859	8.09839139713264	31.7652	39.5927	8.134315	0.7012804
26.5102376572747	33.5854728341243	9.44173875507175	26.51415	33.575825	9.461971	0.0227537
23.0032839854008	31.3490581738788	6.93705548256528	22.793175	31.8095	6.267813	0.8390697
12.3627267676752	15.293315165776	7.43417478863029	12.5519	14.734025	9.438961	2.0899186
11.4793850940219	14.2005773474754	6.90299018997581	12.54795	14.295525	6.980367	1.0755618
Route: 3 Length: 416.562281679749 Demand Met: 374						
11.1543111500646	4.22764650756743	3.58182543272617	12.34295	3.720825	3.558355	1.2923936
16.559706789564	6.27637024403081	5.3175833214283	16.533825	6.314025	5.413684	0.10641
32.3926178950894	9.92882559550762	5.23567895335746	32.5307	9.603625	5.102178	0.3776832
48.4352109523647	19.4707760211896	7.32497309257104	47.99765	20.639375	7.512605	1.2618593
53.9301718675067	20.3316574693323	7.62845255039556	56.145325	18.970525	8.712859	3.3151033
53.9301718675067	20.3316574693323	7.62845255039556	56.46315	20.9863	9.377425	3.1469731
56.6208996974925	20.753206906684	7.77705793861564	56.707375	20.9848	8.081779	0.3923879
61.2032476400523	19.3225459033836	5.07454712500749	62.8697	20.929125	3.670375	3.2881032
65.3249063625136	18.0357172865195	2.64373490700635	65.789175	19.559925	1.053267	2.251298
66.2890473627537	17.0261460157501	2.63403775051732	66.273425	16.5814	2.463993	0.4764014
75.4909534671732	23.2941599002793	8.41175643027015	75.41995	23.365625	8.701179	0.3064542
79.042891086442	24.5493917898609	7.39690141078518	76.27055	23.463675	8.429053	3.2776576
84.6935928823836	26.5463135385978	5.78238977174697	83.1155	24.690275	4.773978	2.6366931
93.7686555448542	29.75338217922	3.1894722049107	95.640625	28.68455	2.397586	2.2964659
92.9300529981462	33.7330846248324	4.0642407006814	94.997925	34.851	5.629957	2.8244109
91.465077535472	35.1379796827427	3.70318617452878	90.921925	35.308625	2.502062	1.329223
90.1971398319694	37.6686153785582	7.39696655774582	87.349525	37.1432	9.692858	3.6954146
92.5797113101405	40.153755601465	7.45267653123797	92.049975	40.056175	5.962344	1.6551621
94.632997996655	42.2954356394416	7.50068709617401	95.9689	41.808	7.756384	1.4448559
94.5218539122183	44.6821648197419	7.19942106241229	94.807975	43.25145	7.382414	1.5111964
94.1378014371761	52.9294064933462	6.15840949923098	95.486225	52.746525	3.57388	2.9208705

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
93.8149361867206	57.4270448556977	5.81142678127566	94.377175	57.5521	6.223661	0.7082996
93.0940071954155	61.1147992398695	5.18998832395867	92.124775	61.791725	6.696503	2.9459173
91.6752997507744	68.37188241381	3.96706714419864	91.5733	68.725	1.37953	2.6135119
91.2900129023286	70.4325775194425	4.96665856011825	91.08095	71.69145	1.548548	3.6485541
91.2900129023286	70.4325775194425	4.96665856011825	90.314475	71.662575	4.957094	1.5699234
92.0434361860979	70.2686943533538	6.13205630733228	90.725625	70.444425	7.760216	2.1020018
97.7000899034842	69.2332206954929	8.43736837127885	98.93765	68.322275	8.948906	1.6195826
94.4054074156015	75.1500276797891	7.03888896892659	94.404	75.185075	7.131673	0.0991926
93.764530951379	76.194437761371	6.46098942623766	91.825175	77.123475	9.251483	3.5229343
91.3817541776498	81.2130038635939	2.00259724967392	91.03755	80.9252	1.385966	0.7625888
91.4359394250872	84.1210138858259	2.0222015231956	92.480625	84.1266	1.286063	1.2780059
91.398336792616	89.4422353677197	2.15445248334833	92.685275	90.310575	1.584168	1.653919
89.6705037595421	90.4404839647758	2.96689710663865	89.0595	90.291	3.16566	1.201812
88.698511709656	91.002048597268	3.42393763822887	90.195175	89.03695	6.180904	3.7016857
88.698511709656	91.002048597268	3.42393763822887	87.858275	88.334025	4.100051	3.4946441
85.0088365901112	93.1337446603231	5.158860437828	84.25115	92.664475	5.874601	1.1430606
84.9306707707748	95.1484646610146	4.41504235813091	84.77555	95.283075	3.666391	0.7763126
85.7350428733808	98.8698622769311	7.46503164260704	86.192975	99.203225	7.750239	0.6341733
84.7621416331765	98.7918877779367	7.37142020387638	84.730325	97.611875	9.216212	2.4041303
84.7621416331765	98.7918877779367	7.37142020387638	84.9479	97.513325	6.355392	1.6436369
77.8778531401443	98.3353510609278	6.78513049925414	74.44305	98.0205	8.628544	3.9109049
73.733053292688	98.0604851642449	6.43214520710338	72.222075	99.2555	9.348041	3.494791
73.733053292688	98.0604851642449	6.43214520710338	72.374675	95.981125	5.386278	3.0465832
70.9657142483181	96.8947994955299	3.8877576419863	71.306475	97.9771	2.882666	1.5158171
69.7341339695527	96.2524204771957	2.92898467212947	67.679475	96.828325	2.179153	2.2617553
72.3128091497956	93.1748618186857	2.65564201665051	72.88955	91.55335	2.086078	1.8128248
73.9344898632293	91.2394425207775	2.48374192654921	75.589675	88.707575	0.958209	3.3878078
75.040454797945	89.9195120465039	2.3665082126324	75.8385	89.39705	2.129044	0.982971
66.4855614794005	92.2038384119621	6.0911524574705	66.508125	91.303225	8.984758	3.030605
63.8323277047247	93.4249850276661	5.58239322807419	64.46975	94.91155	5.12346	1.6813097
49.113791698772	97.8443038237126	3.5289802049227	48.99045	98.5583	3.927321	0.8268489
48.3180809570941	97.5882186019137	3.1141156432644	49.100125	97.070175	0.603113	2.680503
40.4243211001712	96.0672781375364	2.86443265030455	40.290225	96.689525	2.280132	1.7024114
32.3513621432661	94.5118100440122	2.60908106905726	32.22375	93.28635	0.1273	2.7707895
28.4947523157558	94.3102401701172	3.60438183604107	27.27955	90.9405	3.131217	3.6132742
25.7630708606823	96.4667139260454	4.85651490231635	26.6212	98.85125	4.844028	2.5342758
22.3201833230589	96.5562602547715	6.10772001586977	22.27635	97.920025	9.573749	3.7249339
15.4135366274126	94.9040848419076	3.97966440083438	15.45105	94.471525	3.135131	0.9496062
5.37774229718246	95.6242923841668	6.93863573112199	2.307925	97.449675	7.701639	3.6521191
12.9565789844606	84.2491987092158	5.66302752828546	12.1212	83.525275	6.555356	1.4206244
13.727181013963	83.2333340216153	5.47983422652232	13.92855	83.165725	6.067072	0.6244747
15.8133771400808	80.1047668648635	3.76924847765593	16.4015	79.860725	3.65876	0.6462605
8.52761723815286	79.0589744991689	2.76685534632233	8.347775	79.0334	0.64524	2.1293776
1.44680977917189	78.0422307024643	5.02817310077803	0.00154999999999461	79.256375	5.511897	1.9485664
1.99447834545303	71.2539337261941	4.74619692885467	0.331024999999997	69.303175	3.842333	2.7183647
2.25375605414024	68.0402126240513	4.61270354840781	1.692025	67.9044	4.763979	0.5973869
4.56580915627474	61.7822344750378	3.85759046072359	2.404275	62.37445	1.602613	3.9363141
4.56580915627474	61.7822344750378	3.85759046072359	2.20627500000001	60.72485	3.544594	2.6045019
9.02431699845775	53.8794312981831	3.00774403050423	8.9679	51.422725	2.23495	3.3986294
13.2577115679314	46.3756463390294	2.20080700801815	14.24105	46.110125	0.966331	1.6004334
13.0422095760656	45.3438605973853	3.24378161802441	13.3837	46.032275	5.26473	2.1621199
Route: 4 Length: 276.150797242297 Demand Met: 373						
12.911907149685	10.4103401765452	7.71841854358529	13.011825	10.0758	8.49229	0.8489863
16.5018131655936	14.6223625441438	7.59751058280867	14.259	13.428825	7.786985	2.5476741
22.1190464884531	21.2130396880293	7.4083228408908	20.9892	20.7572	9.683969	2.581261
22.1190464884531	21.2130396880293	7.4083228408908	21.1268	22.989225	6.335554	2.3000479
30.3010464137726	26.0413863022252	7.6758027997281	33.989075	25.3104	7.891632	3.7659631
37.5219425493995	30.3025684420587	7.91186306837928	39.217825	28.48755	6.718496	2.7558001
40.3966771018873	33.690218343197	8.75589885465837	43.312375	33.022625	9.818329	3.1742295
39.2880514302429	37.7246691979577	8.16180646251095	37.4986	37.94785	9.024015	3.3389816
37.6056283750808	43.8472497322911	7.26022693348707	38.0514	44.25295	8.429467	1.3154571
37.100222971382	45.2903054960254	6.8076304231197	35.77655	45.5234	7.314779	1.4365385
37.2614565815375	45.7075862328441	6.53315425647735	36.34605	45.558575	2.970524	3.6813731
39.4895368054925	49.3581124865738	7.62069435396255	40.7628	47.39015	6.093812	2.9963842
40.359201391635	50.7829863281801	8.04518312203717	37.074525	51.14655	9.462196	3.5957201
40.359201391635	50.7829863281801	8.04518312203717	40.529725	53.231175	6.058478	3.1574837
40.359201391635	50.7829863281801	8.04518312203717	41.89655	53.797625	8.251962	3.5360134
43.2609753967216	52.690961393546	9.31298010687826	43.47965	52.4779	9.729662	0.5165632
44.8253477835781	55.6233252760841	8.28317447660266	45.616825	55.349625	8.112205	0.8547389
45.0681091264281	59.0656047658749	7.52831865129343	45.110025	59.219325	7.835164	0.3457469
45.0953557816951	61.7429719481172	5.17053026315789	44.541975	62.0002	4.336081	1.1492733
45.125760175842	64.7306265080374	2.53949132537249	44.4217	64.703925	2.042243	0.8623628
46.3609338485948	66.3702266781444	1.99720942916371	44.898775	67.784675	2.145396	3.8144474
47.9138456122937	68.4316001557905	1.31543011392101	50.03295	71.692275	1.548117	4.0015227
49.4720558571543	70.5000069185595	0.631324667858356	49.5023	72.1454	0.362105	1.6675468
53.4633807411114	64.4746222904292	0.684439013320803	52.902425	64.80215	1.303032	2.0317535
53.4633807411114	64.4746222904292	0.684439013320803	53.6353	62.58645	0.328338	1.9291342
54.2117970620879	66.0856107848616	1.29752561758179	55.5813	65.9389	1.049446	1.399502
53.8478712859469	70.4674740973639	3.28599113184728	53.249925	71.4317	1.507319	2.1097265
53.7286650462329	74.4130823393299	5.96871478738322	52.726325	74.9715	6.042198	1.1497459

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
55.6635239394005	75.3624856872283	7.22434095416795	55.289875	75.9977	8.05121	1.1076205
59.0143775883914	75.3603453579611	7.24811671429595	59.360575	77.3659	4.085186	3.7611478
60.4010682203802	75.2306183298442	7.46128478198977	60.77085	76.3761	8.633151	1.6799218
62.5370920160472	74.1360377658259	6.94421594124076	63.106325	74.44845	6.994666	0.6512855
62.3131728364157	70.376364925517	5.79112389259609	63.9561	69.944325	5.325084	2.046353
62.0894827958224	66.6205308824011	4.63920864663701	61.692525	66.479075	4.622593	0.4217361
63.0403670179076	65.6300545935393	4.26585151114377	62.481725	64.778425	2.883198	1.7172899
66.8237706742584	64.0986357005741	5.4730076352378	67.8084	64.88	6.618444	1.7006027
67.3719587621382	62.3147067997545	4.54742904683443	68.033375	62.578975	2.177441	2.4747025
67.5265203176313	59.2134698994906	5.63386315835569	67.662425	58.9604	5.24713	0.4817437
67.3578831342956	57.9307893704373	6.9799367799915	68.048425	58.486425	8.31929	1.6060654
66.5640569432973	55.9724326518068	7.3652290503167	66.095725	55.876775	6.205798	1.2540995
64.0901986669074	49.3540270329758	9.24044419209475	65.024675	48.473875	9.912197	1.4488497
61.4084695088	48.3106970107239	8.76992194530202	61.33205	47.81805	9.220678	0.6721027
60.4506332021377	48.3344250800191	8.20442061444058	63.06625	46.073225	9.963062	3.8790845
60.4506332021377	48.3344250800191	8.20442061444058	60.81405	45.86495	6.053591	3.5607331
60.4506332021377	48.3344250800191	8.20442061444058	58.59885	48.807625	9.719414	3.714657
58.8204819173122	48.374808148056	7.24198815514509	56.7604	48.090675	9.498427	3.4617573
57.0869590774054	48.4177520330833	6.2185256601703	56.4549	49.1402	6.740043	1.0924331
55.8811186172387	47.6814724267177	4.53678061801298	54.870925	48.098925	4.394617	1.102256
57.4084410771528	44.380502553357	1.48187006333764	56.281125	43.406775	0.357518	1.8663211
57.4084410771528	44.380502553357	1.48187006333764	55.460475	43.213925	0.442759	3.4716194
60.9879677347552	43.9660638683344	1.57756907163736	64.04505	44.910675	0.523975	3.3686945
58.0901197605471	40.9224551226332	4.45444454002502	58.980725	40.369175	5.096252	1.2293142
56.4966480891823	39.9909193530987	5.27571075910107	57.24125	42.40615	5.476964	2.5354041
54.2641719776127	38.6858247862884	6.42631630572563	54.125425	38.6935	6.380106	0.1464412
55.169557981426	37.2855951575101	8.51799166988203	55.894525	37.29925	9.136585	0.9531114
51.1921420724085	34.621198051795	7.53433783832851	53.51985	31.610925	8.734185	3.9899375
51.1921420724085	34.621198051795	7.53433783832851	49.014675	34.9475	8.94848	2.6167984
50.8529885884596	33.3524042333086	4.71389503019088	48.825175	33.4678	4.421401	2.052047
51.7047925039702	32.1806173013989	2.41978609506926	49.821325	32.088775	0.505787	2.6868713
52.5899733386134	31.769069784243	2.13516352622967	53.08505	32.116125	1.177184	1.1328164
53.9615311658634	29.5628652807313	3.86472631922833	52.727475	27.05645	3.021539	2.9182147
56.990916594968	28.3781564640329	7.09937335257866	59.6161	30.5374	8.744708	3.7763801
56.7994702387665	27.452383360501	7.25858047895721	57.8987	27.066925	9.346556	3.9092312
56.799270539712	27.4514176789301	7.25874654939778	58.5251	25.335175	8.213376	2.8927993
51.7063381844573	27.3132745077075	5.89976771397683	53.429725	29.230175	5.838259	2.9604889
48.0765569734116	27.2148177887335	4.93121064517715	49.48335	26.949275	8.082485	3.4612295
42.2549082892867	27.0569090970205	3.3777842026302	42.344525	27.231625	2.735005	0.6721026
34.1419734165823	26.373526244537	3.00588474079727	34.098725	26.483975	3.010898	0.1187202
16.3843108202835	12.6563294726914	1.44248680557099	17.13825	10.254625	1.09375	2.541304
Route: 5 Length: 302.615643959641 Demand Met: 374						
32.1873401852971	10.6597509556729	0.924158789183594	32.636425	9.71905	0.854223	1.0447423
39.0774643757402	15.0398384175245	1.28151706256429	40.4237	12.94705	3.760655	3.5125829
51.1344588844486	23.5638557015433	1.20470907892316	54.7913	22.79115	2.590985	3.9863921
55.1250663496778	26.3851211938196	1.17928741427086	56.18475	25.5187	0.990177	1.3818024
57.2559468670505	31.1100431050296	1.52899385310835	59.25755	30.092125	1.789844	2.9531507
59.6706509688621	36.4643026275002	1.92527943136772	59.82755	37.21565	1.143092	1.095882
60.2540157749235	36.565926735063	4.40790918010845	59.92645	35.207	4.720771	1.4324328
60.909103044034	37.1922917346983	6.52415745603959	60.313175	36.907775	7.157937	0.9152904
64.7317375892107	39.7006946919971	8.58814570858468	64.627025	39.598675	9.161247	0.591454
65.4858494923383	40.2138192789623	8.64979047327387	64.48255	39.62755	9.929967	1.7702677
69.1830415458674	42.7295204715359	8.95201283748706	69.4258	42.661825	9.2188	0.367001
70.0343261047496	46.3377103404106	5.80970088839439	70.38585	48.289775	4.820236	2.9015796
70.6373413432442	48.8936050804719	3.58381524208614	70.163125	48.595475	2.681471	3.4643229
71.0964680594785	50.8396249220624	1.88905902319494	70.20275	51.264575	0.287703	1.88246
74.1998762580429	52.6594764975175	3.61661791213314	74.97575	51.8098	4.043794	1.2273588
75.7645838490594	56.5550593610523	4.49842264272809	75.12385	56.355025	6.655597	2.2591934
75.7645838490594	56.5550593610523	4.49842264272809	74.7548	56.66355	6.610021	2.6437784
77.6529248653966	61.1784348118312	5.42191788709438	78.897475	61.3791	6.581026	1.7125137
75.3395822072088	66.3491457245545	2.19533086585629	75.320425	66.338125	2.101527	0.0963723
75.1444442161157	67.3726867060072	2.65501466830089	74.919425	66.332825	2.561604	3.2122786
74.9669507647952	68.3036780394926	3.07313346264116	74.758025	68.76505	2.771423	2.7316723
74.9669507647952	68.3036780394926	3.07313346264116	73.97555	66.71955	2.504	2.6718873
74.7340241329248	69.5254279152339	3.6218353616665	72.106325	71.513625	4.730422	3.4765924
75.805969435462	69.5421562730109	3.52623380369792	76.3481	68.05155	4.299693	1.7646676
79.9148666143537	71.7165729201319	2.00288847685017	82.150425	71.4598	0.532397	2.6881218
75.3390315136024	76.8722144877492	7.07619299782151	75.94035	77.0935	8.244154	1.3321727
72.2123678558054	78.5730126939869	6.82355948006434	71.96685	79.285825	7.324255	0.9050284
69.0661948426945	76.192044254997	2.89185897317524	69.349625	77.516575	1.446757	2.180516
67.9661599748684	75.359557625954	1.51717061074374	67.97015	74.943825	1.28227	0.4775226
64.9627277744225	79.613344553088	1.50276071248675	64.2971	80.8087	0.617407	1.6296583
65.4245026730965	77.8338040990715	5.43534207178141	67.096325	78.407125	5.545343	2.3790582
65.7018889704795	76.7648432049014	7.79762355067156	65.721375	76.70655	7.829144	0.0690749
64.1042668226459	81.1119469767358	8.67198868592228	66.686275	83.4025	9.789982	3.6281274
60.8428097051536	82.6224434752296	8.45626675917639	60.2356	81.956375	8.121308	0.9615343
57.1154162009015	84.3487316821535	8.20972662285852	56.13655	83.451075	6.561985	2.1163693
57.1146378810721	84.3493209869335	8.20994327492864	54.01775	81.8894	8.14471	3.9555254
55.7366613591143	88.9118752009779	9.27270094799144	56.428075	90.20545	9.562383	1.4950934
50.7031554460401	87.2572444622331	8.94676078302043	49.4347	86.0537	7.963635	2.0059997

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
45.5236352532979	85.5546156303779	8.61136558538065	43.9034	88.387225	9.898098	3.5077797
43.4081696187907	84.0252030158196	8.12948488966281	42.31835	87.347525	7.738111	3.5183382
43.4081696187907	84.0252030158196	8.12948488966281	40.913925	82.729825	6.876661	3.0771461
39.0320827458146	77.2938957866136	7.5655795011427	40.4153	76.30845	7.455735	1.7018987
33.1682416098707	69.8965191770442	6.96009744654874	34.7277	67.482525	7.589491	2.9420086
29.6055520218407	68.791503746385	6.22989106104812	28.20205	68.6988	5.301267	3.0947027
29.6055520218407	68.791503746385	6.22989106104812	31.583525	68.6781	7.867205	2.5702207
21.749989681929	66.3549964427287	4.61982077557224	21.0091	68.35155	4.610936	2.1296062
20.1819572148942	65.6706052087383	4.28572034851081	18.3822	65.772725	3.391578	2.0122239
21.6485129856133	64.5961239778118	5.58460300252148	21.668825	63.73225	4.392072	1.824597
24.22566220793	62.7079590227605	7.86710408909273	24.44465	63.1281	8.275156	0.6252843
26.5447901231554	58.3063681498964	8.92449800610223	26.5978	58.30075	8.947543	0.0580748
23.58303708977	54.6352751284215	7.68411099984301	22.891175	56.122525	6.014662	3.1174634
20.7230656172471	51.0903401070666	6.48635040633347	21.4066	50.274675	5.660638	1.3469706
18.9960299080422	50.3637867051152	6.70867244643514	17.219275	51.795125	6.528901	2.288647
18.1782440976845	46.4397728871247	7.48513812250834	19.028925	48.6519	8.742576	3.3340627
17.4389838684915	42.8925526648019	8.18704548550515	17.095675	43.177	5.934841	3.0748926
17.4389838684915	42.8925526648019	8.18704548550515	19.322625	41.061025	7.646061	2.6823985
17.4389838684915	42.8925526648019	8.18704548550515	19.292975	43.870425	8.142944	2.0965358
16.2639644742998	40.888025579932	8.77639846006588	15.806625	40.87695	9.361797	0.7429492
17.0948495269118	35.8403319993195	5.36707206577297	18.77905	36.01655	4.45503	2.0153111
17.6566169691976	32.4275496503906	3.06200191248165	18.476575	32.50015	2.42942	1.0381531
15.3967699328819	28.2771906775303	2.67010031843559	15.2685	27.387025	1.441223	1.686213
13.8598802266822	25.4545900899078	2.40357349692023	14.358825	25.883825	4.414924	2.1162985
Route: 6 Length: 212.398630059923 Demand Met: 375						
20.0403538612363	27.2375936350917	1.32485338187294	19.9845	27.40155	0.660019	0.687027
25.252345975014	33.688122713916	3.41499644041779	25.49855	33.45475	4.180424	0.8372327
29.4283256829642	40.9375460972196	2.51108293462123	27.2689	42.18555	1.296271	2.7742388
32.4365516292646	45.243180736474	2.16851720863147	31.24645	46.9846	0.258005	2.8458636
33.2222265924806	46.3676967354261	2.07905050083094	33.276075	49.648225	0.482877	3.6486347
33.2222265924806	46.3676967354261	2.07905050083094	34.241775	45.041325	3.482667	2.3579528
35.6158250504155	49.7935901490212	1.8064789768204	34.822	51.041775	1.965488	1.4877525
38.0894596392196	50.2771109610158	1.4368183449797	37.32375	47.164775	1.301487	3.8061293
38.0894596392196	50.2771109610158	1.4368183449797	38.966475	52.166125	2.317575	3.6894736
41.0397732470461	50.8538107182755	0.995917946766517	41.3638	51.811825	0.610596	1.0822466
42.9599683635847	48.7938021859553	1.62599650902402	43.5222	45.0811	1.214529	3.7775081
42.9599683635847	48.7938021859553	1.62599650902402	43.10885	48.272275	1.575949	0.6882847
44.2388385627826	51.1892432480991	2.76768295138731	43.054225	52.07985	5.94327	3.6716308
44.2388385627826	51.1892432480991	2.76768295138731	42.80595	50.969325	5.199786	2.8313705
44.2388385627826	51.1892432480991	2.76768295138731	44.413025	51.821425	3.225875	1.9013123
44.2388385627826	51.1892432480991	2.76768295138731	44.549375	51.8385	4.639375	3.4753711
46.3205793429771	54.7144876135653	4.06273153662189	46.119125	55.3112	3.945632	0.6405949
47.7308269938908	54.3481247630686	4.9158886707366	47.802925	54.5327	5.178486	0.3289734
48.227043248384	53.7679885310474	4.73006247462866	47.81055	52.508825	5.320082	1.4515793
50.7320457054646	53.4448744771936	3.14428650677664	51.731775	54.063975	3.386729	1.2006342
50.5902805075722	51.6741342360674	1.14063888789189	50.5204	51.7746	0.922891	0.2497815
50.9907642205675	49.3764847673027	1.02648759856239	48.801425	47.111675	0.180447	3.261649
50.9907642205675	49.3764847673027	1.02648759856239	51.332325	47.3944	1.206534	2.0193416
52.4749042544758	50.1617292350694	1.37692538585406	52.703075	49.56845	2.111726	0.9899267
53.780542978598	50.8525305275559	1.68521514391086	54.099275	51.121125	0.198175	2.2154275
55.5422285521602	51.7846217535335	2.10118747929437	55.262125	52.9866	2.328913	3.5612885
56.6856528156504	52.3895968407552	2.37117484180479	55.9361	51.897075	1.720125	2.2731123
58.3062153315851	53.2470213260126	2.75382532158103	61.491825	51.7088	3.765748	3.6794322
58.3062153315851	53.2470213260126	2.75382532158103	59.0369	52.162425	0.980631	3.0447964
57.8867637114978	55.3062445503177	2.47099333281558	57.767975	55.4125	2.368927	0.1892578
59.9644591569777	55.6996131594877	4.35993360923657	61.751375	53.5726	3.689653	2.857714
59.9644591569777	55.6996131594877	4.35993360923657	59.205025	55.76	1.820366	2.6513752
60.9022695551972	55.9133700572843	5.2533092860466	60.964225	55.767775	5.605242	0.3858666
62.9868438092354	58.7240722055232	2.95576883013325	63.564825	58.6141	2.885043	0.5925861
62.1984187757138	60.6816221505403	1.90119517997878	62.138225	61.218175	0.933898	1.1077798
61.8124571149085	60.7517866147072	3.41946954745955	61.732525	60.28975	3.358698	0.5327791
61.3966201338788	60.8273843606379	5.05526920051288	62.1796	60.091575	6.795975	3.7726122
61.1838156965508	60.8660718980198	5.89238736241981	63.23165	61.378	8.16167	3.0992482
57.3189783784588	60.3199635936347	6.51444260938476	56.708375	61.084725	7.280884	3.5527238
53.6871201457756	59.8067758311665	7.09899956867912	53.3194	62.871025	8.033264	3.2245451
51.5272343247142	59.3907231699409	7.41550890546498	51.0767	59.931625	7.815468	0.8096439
51.088232785981	58.5382713663394	7.07131141473304	53.1029	58.71345	6.825055	3.7092457
50.9024716517379	58.1775596483473	6.92566491231843	50.342	58.1772	6.133715	0.970213
51.8111343998464	53.8514626537641	9.61152391957273	51.8225	53.851	9.626807	0.0190516
50.6565014007762	51.8639548871625	8.75335069718075	50.9611	51.5263	9.096967	0.5699678
49.3982874448568	49.8344569612959	7.79965457624415	50.075475	49.526025	6.785114	1.2581756
47.4831099367651	48.0731357389055	7.79633939757122	47.35915	48.071	7.780887	0.1249376
48.5451745450225	47.1334150924175	8.0592171123447	46.718325	46.79505	7.837302	2.1962207
50.1011911960466	45.7566428639931	8.4443568088725	51.464375	46.273425	9.764247	1.9665818
50.1015674934416	45.7557450945427	8.44412787594544	52.0729	45.66175	8.843258	2.0135272
47.5663805385498	42.0752106015265	6.61249845270666	49.0937	40.0849	6.606023	2.5088011
46.7600332202064	41.7904896801891	6.26362403440734	44.89855	41.381	7.163397	2.1076985
44.428876534949	40.9673637752575	5.25502395648417	43.242475	40.8624	6.853519	1.9934273
44.0419747965304	40.7830970922367	4.76712363085083	45.015525	41.584025	2.803346	2.3336041
39.3805404289036	38.1009024755686	3.2623224621332	39.47365	37.672175	3.042346	0.4907813

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
37.526710052889	38.4549210878204	3.40039177090266	37.4906	38.735475	3.373994	0.2840973
35.642084494246	37.5982723410867	3.67006516139702	35.05695	38.887125	3.774047	2.3714259
35.642084494246	37.5982723410867	3.67006516139702	36.0198	39.389875	2.90819	1.9831699
33.1284720629349	36.4557193987972	4.02974126869711	32.29465	34.1886	4.533526	3.1017705
33.1284720629349	36.4557193987972	4.02974126869711	31.8731	36.0461	3.846108	1.8377332
30.9426499593431	35.4621627669956	4.34251271921741	30.2641	36.115	4.866777	1.0777196
28.968549236137	31.3632089695965	3.20224108102402	29.46595	31.229925	1.232208	2.0362226
27.192036847909	28.4257658796514	3.63039771290435	27.65685	28.081275	4.203862	0.8146082
26.919510145685	28.1408837819996	3.59400656466052	28.216025	27.287675	5.4487	2.41843
22.7028831842638	23.7329274911367	3.03106000834832	20.995625	24.282225	3.380339	3.5058599
19.9819497903267	20.8885363636165	2.66779569292004	20.686175	21.9667	1.804567	1.6301674



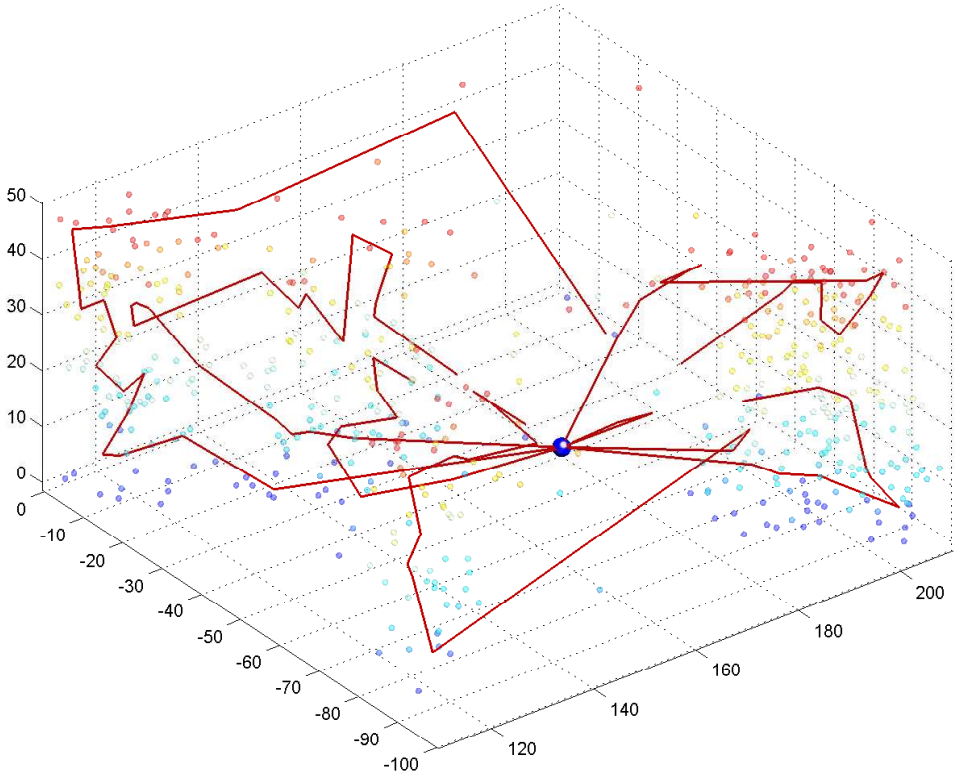


Figure O.95: *team*5_499, arbitrary radius, 3D, Euclidean, Length = 1309.0039164

Table O-98: Solution for *team*5_499, arbitrary radius, 3D, Euclidean

Total distance: 1309.00391640462 Total demand met: 9744 Depot: x 70 y 40 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 125.311996076651 Demand Met: 1244						
50.3221761617794	44.9850558489161	4.86507955720386	25.8602	58.6207	10.547	28.7536
43.6222551170303	46.6823715655356	6.5215456966335	47.0351	69.5204	13.3405	24.0774
43.6212673869934	46.682308924847	6.52168875437803	49.5234	55.0957	34.2852	33.4236
43.6212673869934	46.682308924847	6.52168875437803	37.7223	44.0563	30.8827	29.1657
40.6155685752079	46.4916909434955	6.95701873290068	44.3864	36.3116	23.5359	25.6737
40.6155685752079	46.4916909434955	6.95701873290068	49.5874	32.9921	18.1971	32.9977
37.238928671332	46.2775483023433	7.44607391112624	41.9344	32.8635	38.9519	35.1115
37.238928671332	46.2775483023433	7.44607391112624	48.2875	25.5427	23.29	34.7388
27.7143975493429	45.6735134433161	8.82555805676048	23.9463	67.9458	29.6197	30.7026
26.7006313400158	45.3376883713283	8.72814848303783	20.1897	48.2132	1.8547	9.8947
26.2079276966421	43.3523349601532	10.9430506979296	25.2216	48.8368	12.0716	29.4028
25.9285569073879	42.2266080539627	12.1989354219019	29.0396	36.1372	21.3542	26.8002
25.9285569073879	42.2266080539627	12.1989354219019	23.8226	36.8408	17.9115	22.7865
25.5389172750701	40.6565519396207	13.9505232013714	20.4824	37.2243	17.8497	26.8839
25.5389172750701	40.6565519396207	13.9505232013714	25.1657	24.0751	15.8892	31.1219
25.1249220031016	38.9883545809713	15.8115994288129	42.5333	36.3249	41.241	34.2929
25.1249220031016	38.9883545809713	15.8115994288129	41.7938	26.8087	24.3703	25.8964
25.1249220031016	38.9883545809713	15.8115994288129	27.0169	46.6583	34.9486	30.8141
25.1249220031016	38.9883545809713	15.8115994288129	22.5313	48.1754	17.677	10.3014
25.1249220031016	38.9883545809713	15.8115994288129	30.1704	30.5441	13.3093	13.1238
25.1249220031016	38.9883545809713	15.8115994288129	24.4655	29.9184	30.3851	29.8304
25.1249220031016	38.9883545809713	15.8115994288129	29.0027	23.8765	31.3376	31.6897
25.1249220031016	38.9883545809713	15.8115994288129	30.555	31.3009	2.2328	18.8032
25.1249220031016	38.9883545809713	15.8115994288129	20.8616	31.8567	15.5881	16.439
25.1249220031016	38.9883545809713	15.8115994288129	25.9644	23.203	35.3119	29.8543
25.1249220031016	38.9883545809713	15.8115994288129	22.0871	33.226	43.1435	33.6947
25.1249220031016	38.9883545809713	15.8115994288129	22.5985	27.2784	2.308	18.0514
25.1249220031016	38.9883545809713	15.8115994288129	21.8127	22.4456	3.4445	26.3083
25.1249220031016	38.9883545809713	15.8115994288129	12.6858	19.6571	22.2672	29.725
25.1249220031016	38.9883545809713	15.8115994288129	9.20950000000001	19.5087	23.9042	29.1422
25.1249220031016	38.9883545809713	15.8115994288129	16.2452	9.322	13.5564	31.0488
25.1249220031016	38.9883545809713	15.8115994288129	8.65000000000001	19.7295	4.359	27.9816
25.9319509415332	41.2108577962763	19.7069877122298	23.1185	40.5549	22.8959	4.3029
29.822630906709	44.4127506946317	20.7229909599507	27.2789	43.4795	19.1307	3.5918
32.683837129102	46.767422865997	21.4701597836954	54.1532	48.4548	25.954	21.9974
32.683837129102	46.767422865997	21.4701597836954	47.3754	37.9401	16.076	18.8601
32.683837129102	46.767422865997	21.4701597836954	32.0319	48.7602	21.6234	2.1023
32.683837129102	46.767422865997	21.4701597836954	32.0569	46.2162	23.8838	8.3019
32.683837129102	46.767422865997	21.4701597836954	36.9556	37.1182	29.5204	17.3813
32.683837129102	46.767422865997	21.4701597836954	32.7117	42.3778	27.3609	10.9453
32.683837129102	46.767422865997	21.4701597836954	31.0932	49.2942	23.7876	14.8063
32.683837129102	46.767422865997	21.4701597836954	32.6554	40.5505	15.9859	13.7264
32.683837129102	46.767422865997	21.4701597836954	28.4876	46.0461	28.1502	21.3519
32.683837129102	46.767422865997	21.4701597836954	22.4944	48.7727	6.2361	18.9786
36.2825585636618	37.4028525412463	20.4505516521852	41.4412	38.9568	21.684	5.527
36.4630299028494	36.7505196599812	20.3665433611876	36.1356	35.5262	17.2008	3.41
38.3245115774479	33.2914129387646	24.0054857424028	47.084	47.7144	42.2332	24.8395
38.3245115774479	33.2914129387646	24.0054857424028	48.0614	30.3792	22.0976	10.3406
38.3245115774479	33.2914129387646	24.0054857424028	40.4113	32.0356	8.7762	16.7439
38.3245115774479	33.2914129387646	24.0054857424028	24.5323	49.8988	32.6923	23.3971
38.3245115774479	33.2914129387646	24.0054857424028	33.916	28.6484	33.3227	11.305
38.3245115774479	33.2914129387646	24.0054857424028	35.5448	24.2684	24.4525	19.4434
38.3245115774479	33.2914129387646	24.0054857424028	30.3241	25.8121	22.3846	12.6672
38.3245115774479	33.2914129387646	24.0054857424028	32.1965	21.571	25.1134	23.9954
38.3245115774479	33.2914129387646	24.0054857424028	27.0718	22.4926	21.0532	16.8129
38.3245115774479	33.2914129387646	24.0054857424028	20.1974	25.6106	23.6453	21.4356
43.5302406780735	32.6882091075395	19.3340297039081	45.8348	38.3992	25.1619	22.4696
43.5302406780735	32.6882091075395	19.3340297039081	30.9136	43.9894	21.9238	22.4068
47.3268499557829	32.2482843215066	15.9270730617894	47.2249	31.4694	15.6819	0.8229
Route: 2 Length: 220.140075101093 Demand Met: 1131						
61.2969869883724	38.4070203918095	2.71760674169576	44.7377	48.2657	7.7582	29.7234
52.5926137908678	36.8137918186007	5.43563821582426	47.2998	37.9687	10.4015	27.2808
43.8862048510402	35.2201906276033	8.15430537183708	36.302	43.7274	11.7602	22.8064
34.4248254321747	33.4884013660659	11.1087199478487	33.7228	34.609	11.6821	1.4413
32.4452682597065	30.1632745967779	10.8867949028762	45.8434	28.1097	8.3609	15.1991
32.4452682597065	30.1632745967779	10.8867949028762	27.7157	24.2487	8.5851	7.9151
30.6679516376396	27.1778578784753	10.6875427281829	33.6715	23.2449	9.8871	5.013
27.7935184705334	26.3778872488071	10.8755190411142	26.5855	26.5008	8.649	2.5361
26.0993349632447	25.5012021087074	13.0210277673703	28.4031	32.2444	2.4033	13.356
25.5544381662662	25.2192356475607	13.7110833774652	26.8183	32.6012	18.9499	9.1398
20.3425524266792	21.2788000708416	19.0473551332145	23.4789	26.9268	25.8998	12.6384
20.3425524266792	21.2788000708416	19.0473551332145	24.5672	24.4137	22.4773	9.9276
15.8066027017968	17.8494045376371	23.6915590950235	12.8565	9.4609	19.9198	9.659
15.7497084776673	17.8685100289391	23.81832878075	19.0819	14.2893	25.2658	6.4132

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
15.7493028401475	17.8686462448864	23.8192326078453	16.5052	19.9903	24.3242	2.3082
14.3681046664845	17.3130506545702	25.9572880319392	16.6256	12.3206	29.6782	7.479
13.0679620880375	16.7900601839195	27.9698717036322	20.821	23.0825	24.0822	38.9893
13.0679620880375	16.7900601839195	27.9698717036322	12.3192	17.7013	37.8038	29.1964
11.8389832781113	16.2956957828625	29.8722958896955	5.6246	7.277	28.7239	11.7089
10.0282908718566	15.5673334563982	32.6751961480406	5.0355	11.9367	30.2057	6.6489
10.027769637242	15.5671271663002	32.6760242536329	15.5961	8.5134	30.9972	9.1422
8.55339955251779	15.0089837569304	34.9987692642879	17.8934	15.1905	44.1135	13.0517
6.47902592617032	14.4858310747217	36.4045657021708	9.9074	11.0867	39.8487	12.9373
6.45929138132304	14.4808540640116	36.41793974006	5.6082	3.0104	39.1925	11.8319
4.63949399377252	15.7885410816448	37.3062622099363	8.098	10.1576	40.7441	7.8091
4.27472963246427	16.0506568660346	37.4843196024478	2.4914	14.471	42.2927	5.3662
2.3790438148919	19.2068148396518	35.9406425039332	0.782799999999995	19.7397	35.1787	1.8473
4.79028230264127	20.0877375583241	36.664812091077	3.9756	4.3104	38.409	39.2995
6.92782449228224	20.868667978985	37.3067822071887	12.295	19.9912	41.8654	28.6871
9.02710440123684	21.6356196458469	37.9372609788507	4.024	17.3232	48.8138	37.3677
11.1386947109442	22.4070687940097	38.5714369386832	13.2666	12.9678	48.999	29.5528
11.1386947109442	22.4070687940097	38.5714369386832	12.5256	4.7007	49.4275	23.5883
13.2295359793617	23.1709374836011	39.1993813213612	11.5459	0.8736	43.2005	30.4629
15.2643310036429	23.9143302181208	39.8104932805806	4.1301	7.1548	40.2018	37.1524
15.2643310036429	23.9143302181208	39.8104932805806	5.49809999999999	6.1028	41.7036	36.5373
17.1437680542537	24.6009644127698	40.3749464266698	18.0288	10.2093	41.4498	31.7011
17.1437680542537	24.6009644127698	40.3749464266698	16.1355	6.6685	45.2938	36.4875
18.4042751353965	25.0614785136417	40.7535157371039	19.3111	17.5672	45.5963	32.0992
21.852804786488	26.3213655524506	41.7892159840282	29.6006	20.2054	49.7928	12.7079
23.6302983096521	33.458770377238	38.2063369402032	23.8984	35.8981	31.4349	7.2024
23.7980732701724	33.8555652978492	39.1341893715753	22.8416	32.9746	42.6888	3.8923
24.1446339762104	34.675196200571	41.0507876167687	24.2607	34.0424	42.9391	1.9949
24.4454612470826	38.0237663360228	39.0916651752141	33.3877	38.8388	47.9844	13.1359
24.6539491094707	40.3444875509813	37.7338984778021	31.0534	27.3935	41.3669	17.9341
24.9058141006135	43.1480484940785	36.0936404157652	23.5397	47.0618	33.8948	4.6924
29.3794527697293	38.1453803717718	38.7598504057644	45.8095	43.1051	48.3862	19.6777
31.7456791466787	35.4993362583501	40.1700797227272	37.6461	42.0792	39.3984	22.0605
35.2066296536836	31.6291115811322	42.2327453735053	44.7486	39.7162	41.5468	12.5268
38.0696942579307	28.3653783826385	43.9601789428252	37.8149	25.869	45.9364	3.1941
43.341673391015	31.5202733454097	40.1365611780651	44.5785	34.1629	40.8334	2.9998
46.8201825567929	24.2622368282232	29.7890199876056	49.2796	22.4102	31.3443	3.4493
46.9435551793449	23.6178254771154	28.3752233370213	32.6566	40.0511	6.9534	38.6421
46.9435551793449	23.6178254771154	28.3752233370213	49.7446	26.3767	39.5089	17.8751
46.9435551793449	23.6178254771154	28.3752233370213	43.5486	39.6053	49.4906	27.6035
46.9435551793449	23.6178254771154	28.3752233370213	43.0635	31.4686	2.6925	35.4855
46.9435551793449	23.6178254771154	28.3752233370213	38.1953	36.049	49.7462	32.0805
46.9435551793449	23.6178254771154	28.3752233370213	30.7692	16.7931	38.6765	37.8932
46.9435551793449	23.6178254771154	28.3752233370213	43.1416	9.2079	26.5197	35.1675
47.1692135602952	22.4391456444758	25.7892763375653	44.6412	21.1681	25.9788	2.8359
47.8027539731582	21.1229265654891	22.4915610894301	47.312	20.115	22.1433	1.1739
57.7329517008946	29.5678062366501	12.4296980745895	49.2766	27.3707	5.7576	19.0778
57.7329517008946	29.5678062366501	12.4296980745895	52.9148	12.3625	13.3985	18.1234
Route: 3 Length: 270.929059733955 Demand Met: 1605						
73.1042167972533	67.9918980385359	11.2525488222129	96.671	90.7145	10.1968	32.754
73.8656797901316	74.8582974977592	14.0127938051198	92.093	98.3621	2.0725	32.0505
74.224665698186	78.0954099193931	15.3140905052991	77.4087	74.0915	13.1093	5.5705
74.224665698186	78.0954099193931	15.3140905052991	72.6803	81.9225	14.2859	4.2531
74.4665241089057	79.875562895859	17.8891266194473	82.4808	71.6064	25.4475	18.1512
74.4665241089057	79.875562895859	17.8891266194473	79.7296	78.3022	25.4406	15.676
74.7237040022244	81.7684855450923	20.6272868953098	80.2922	75.8098	32.7263	14.5911
74.7237040022244	81.7684855450923	20.6272868953098	75.5773	80.7384	32.0605	16.9072
74.723550239213	81.7693863784027	20.6276929202881	85.3838	89.3565	26.2565	14.2439
72.8684434922052	82.1411819334807	20.4642041181504	84.7929	84.8117	21.5385	17.1593
72.8684434922052	82.1411819334807	20.4642041181504	84.1657	89.6201	18.7606	13.6552
70.1888533714067	82.6782181656751	20.2280544099965	72.5273	88.3137	27.5858	14.2003
70.187876509733	82.6784139456606	20.227968320114	70.0787	86.0551	23.7512	4.8813
68.2369566002544	82.8070849727629	19.7797861498993	80.7173	88.9602	30.7691	17.7309
56.8499483236859	83.5581043446302	17.163864268816	93.255	98.1789	24.6576	39.9406
56.8499483236859	83.5581043446302	17.163864268816	90.7381	99.8897	10.9244	39.8736
48.900289262276	84.0824170655696	15.3376004311415	16.887	83.4344	26.4901	34.5743
41.2161041216657	84.5892206167227	13.5723233359702	39.3354	89.658	8.0536	8.4792
33.171108098072	85.1198208993015	11.7241576680515	16.4864	81.6235	25.3496	21.8233
28.1843068579972	85.448720651721	10.5785466498042	15.4215	81.5375	18.2132	38.9838
21.6410477824371	85.8802754240784	9.07537316122398	17.1642	87.7833	12.5892	37.7116
21.6410477824371	85.8802754240784	9.07537316122398	5.1953	87.1361	22.5444	37.283
13.8130087542609	86.3965660891867	7.27704844857063	11.6247	87.7046	5.4339	3.2321
13.109579214554	86.4429600581774	7.11545077224103	12.6448	83.0865	6.5696	35.3802
8.94255204131613	86.7177925673049	6.15816571394649	5.387	87.7604	0.9494	6.3922
8.61094956679179	86.3468918690249	8.21665592760654	10.8331	85.8288	6.1261	11.4013
8.61094956679179	86.3468918690249	8.21665592760654	7.74030000000001	89.8119	11.7653	8.6997
8.61094956679179	86.3468918690249	8.21665592760654	4.4842	86.5445	8.1765	5.1195
8.39884583304033	86.1096516143783	9.53333341345841	2.625	81.2761	5.8521	30.3022
7.89708753187639	85.5484291889822	12.6481019151465	3.3964	83.4982	10.9781	22.6969
7.43093044965244	85.0270273121705	15.5418687221468	13.617	84.1913	11.8486	7.3733

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
7.43093044965244	85.0270273121705	15.5418687221468	9.9966	85.8576	17.8499	5.4423
6.8171229709961	84.3404767146742	19.3522047293707	9.2565	85.6186	20.1316	2.8621
6.23669528905414	83.817567023299	21.5687134250111	17.8246	84.0918	18.5648	15.5287
6.23669528905414	83.817567023299	21.5687134250111	14.2132	82.4414	28.7174	14.4019
6.23669528905414	83.817567023299	21.5687134250111	2.5389	82.9669	19.2333	4.4555
6.23669528905414	83.817567023299	21.5687134250111	0.247299999999996	82.0871	22.6092	6.3206
8.86134729311087	83.7744925218004	26.0314556822055	16.2773	81.3093	25.7994	7.8184
7.93468018882241	84.4929607910393	28.3094625793146	5.1015	81.8103	26.7596	31.1473
7.1932399422992	85.0678180012746	30.1321299082749	17.8311	84.5721	16.3475	18.6031
7.1932399422992	85.0678180012746	30.1321299082749	13.6279	83.3943	14.3913	17.0874
7.1932399422992	85.0678180012746	30.1321299082749	8.87560000000001	85.3213	18.2881	16.0341
7.1932399422992	85.0678180012746	30.1321299082749	2.696	85.7661	44.4643	16.7328
5.61768759693392	86.2893832477369	34.0052778066481	6.0677	84.3942	30.725	37.1993
5.61768759693392	86.2893832477369	34.0052778066481	7.47969999999999	86.7529	34.8532	25.8983
4.50463497373602	87.1523608406965	36.7414721650601	9.52200000000001	88.7288	32.8263	27.8783
4.50463497373602	87.1523608406965	36.7414721650601	6.7503	86.812	36.4409	32.5272
3.05293708535054	88.2778987999265	40.3101511933733	1.5647	88.8122	41.3941	1.9171
7.68940648102091	87.3285477605929	39.9052241803374	1.82250000000001	87.776	42.1327	36.7171
7.68940648102091	87.3285477605929	39.9052241803374	0.775099999999995	88.6342	47.6629	34.6112
13.5476879735751	86.1290218501705	39.3935899900185	14.2245	83.0966	40.7659	3.3966
13.9250602324411	86.3105000630291	39.2326440813563	26.3736	85.6358	40.2837	33.6814
13.9250602324411	86.3105000630291	39.2326440813563	19.7188	83.0222	34.7895	29.297
15.6486182299323	87.1393586510805	38.4975618659058	17.0206	82.7787	9.6966	29.1615
15.6486182299323	87.1393586510805	38.4975618659058	15.9151	82.9337	42.2853	11.014
15.6486182299323	87.1393586510805	38.4975618659058	10.6041	85.0219	16.3433	25.6845
15.6486182299323	87.1393586510805	38.4975618659058	13.2856	89.4879	17.2258	21.8166
15.6486182299323	87.1393586510805	38.4975618659058	17.0519	88.8308	49.5668	13.9972
15.6486182299323	87.1393586510805	38.4975618659058	1.19329999999999	81.8445	35.7922	20.336
15.6486182299323	87.1393586510805	38.4975618659058	5.09099999999999	83.7862	45.0917	25.4049
15.6486182299323	87.1393586510805	38.4975618659058	2.0599	86.005	27.783	20.2991
15.6486182299323	87.1393586510805	38.4975618659058	7.6764	88.6806	43.7076	9.6476
15.6486182299323	87.1393586510805	38.4975618659058	0.0289999999999964	82.9455	44.9095	21.0457
15.6486182299323	87.1393586510805	38.4975618659058	1.0919	90.7016	20.5918	28.434
15.6486182299323	87.1393586510805	38.4975618659058	1.983	86.3665	46.2259	17.6822
18.2041985008161	88.5841763330459	39.0586751443553	19.4915	88.9148	34.46	6.4477
20.4443490166306	89.8506631825032	39.5505314089636	17.7167	97.5636	38.0165	31.3797
22.5822003322839	91.0593143417559	40.0199264839654	19.5543	89.8549	35.5989	33.619
22.5822003322839	91.0593143417559	40.0199264839654	11.8372	87.4011	35.0448	35.7247
24.9709863272971	92.4098334816531	40.5444177601979	29.7505	96.621	38.9958	6.5556
20.4058543442092	85.5997942814248	46.8231310125253	19.3715	86.9483	48.882	2.6697
19.8393507157707	82.9087318507549	47.1960835393596	18.7876	82.3448	48.1119	1.5043
22.357122370227	80.7549637079314	44.82711565166	16.072	81.5553	45.6344	6.7432
26.7825691845636	76.9693199714813	40.6632186834584	44.9743	74.4953	49.2176	27.6089
29.1294838470614	74.9617074248255	38.4550098131962	25.0595	61.5431	43.0509	18.8768
31.4495444703736	72.97706643772	36.2720679075509	13.8296	81.5783	47.5142	24.0124
45.1596427017511	61.2490875031775	23.3722550536489	22.2385	33.2025	32.4261	37.3358
49.7605894337873	57.3133188283003	19.0432310708363	28.8128	30.4765	38.3516	39.1387
Route: 4 Length: 194.241711787394 Demand Met: 1621						
75.2302653118311	47.1658392084611	20.7601648180674	78.1743	38.6355	23.4376	9.4129
77.0435655852016	50.7578602718368	28.7517681006177	97.6128	23.6668	47.1593	38.6763
75.8423837310211	64.6850781522839	40.8242229642746	77.6803	63.0066	43.1391	3.3991
75.2846305351073	68.8592472694329	44.0022176156937	78.8402	71.1237	45.9036	4.6244
70.3396014406964	70.1444537121501	44.7612941780055	59.4827	70.1321	42.8614	13.0297
65.063279696973	71.5157626404817	45.5712252749537	63.7544	71.2264	45.6612	1.3435
67.5296129055343	73.5269322451689	45.6600212715204	71.0504	85.2637	43.1302	27.4246
67.5296129055343	73.5269322451689	45.6600212715204	87.8874	83.7559	45.2883	28.0801
69.8973861182369	75.4577300424	45.7452691986229	81.6179	74.1421	49.6219	15.9576
72.2224035009164	77.3536626982196	45.8289779397476	74.3211	82.1244	47.3456	8.5161
75.7954727671117	80.267320168136	45.9576209764241	76.7822	82.9894	44.8431	3.1025
75.7962474596878	80.2679518907695	45.9576488677643	82.0065	75.6791	41.5159	28.4662
75.7962474596878	80.2679518907695	45.9576488677643	78.4966	80.8407	46.208	27.0644
77.8565303179156	81.9480084775398	46.031826823008	91.162	99.965	45.0985	25.8943
80.3745053473857	84.0012882137535	46.1224836186225	76.8895	78.6378	42.7161	24.9962
80.3745053473857	84.0012882137535	46.1224836186225	79.6279	80.9538	46.8845	23.4026
81.0158145129138	84.5242423897463	46.145573219282	76.1087	74.9228	48.9063	26.6713
81.0158145129138	84.5242423897463	46.145573219282	80.1131	82.5047	41.0389	19.9521
82.2401126987319	85.522593497757	46.1896527566123	83.0689	84.7397	49.7222	17.7189
82.2401126987319	85.522593497757	46.1896527566123	84.4799	87.8799	46.3607	17.7516
83.1867341986967	86.294512979668	46.2237351196159	83.1803	86.2205	46.5816	0.461
85.3400135017345	88.0503963370629	46.3012627846092	73.8575	87.669	40.179	25.5244
87.1683805012255	89.5413312510332	46.3670917788233	81.9044	86.793	39.6738	18.7468
87.1683805012255	89.5413312510332	46.3670917788233	81.9035	87.9149	41.5399	16.8426
88.8458408097679	90.9092103611845	46.4274875340307	82.0258	98.9707	44.6731	16.4132
89.8893371506915	91.7601264743912	46.4650578643546	89.983	98.6224	48.7896	7.2459
94.0884063646508	88.7860110131732	44.4276742906193	89.697	88.1654	44.368	35.3374
96.971307224846	86.7441104644541	43.0288930554754	97.0785	86.7219	43.0832	0.1222
96.4835066149773	86.2127464363874	41.5299227847658	89.7033	80.1502	39.6028	26.8819
96.4835066149773	86.2127464363874	41.5299227847658	96.8293	85.3988	23.0282	25.2212
96.1472508383705	85.8464612434269	40.4966373821118	92.7639	86.5161	40.1878	5.447
95.5728887239469	85.2208058530602	38.7316720221316	98.6006	82.3388	36.0882	4.9458

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
93.8137112251869	85.7135860957064	37.983062021402	78.4301	80.0876	35.2889	24.8331
93.8137112251869	85.7135860957064	37.983062021402	84.8025	72.2361	43.599	24.0623
93.8137112251869	85.7135860957064	37.983062021402	81.0772	83.8409	29.4446	24.7807
93.8137112251869	85.7135860957064	37.983062021402	79.415	85.235	33.6242	23.8334
93.8137112251869	85.7135860957064	37.983062021402	89.0638	74.5581	37.2181	18.603
93.8137112251869	85.7135860957064	37.983062021402	84.7887	79.7551	43.3502	24.4915
93.8137112251869	85.7135860957064	37.983062021402	85.5459	86.1581	36.8243	23.0206
93.8137112251869	85.7135860957064	37.983062021402	89.9071	81.4441	38.6007	15.7904
93.8137112251869	85.7135860957064	37.983062021402	92.5909	80.0433	37.2966	19.5797
93.8137112251869	85.7135860957064	37.983062021402	88.176	88.8141	22.7557	24.7619
93.8137112251869	85.7135860957064	37.983062021402	82.5335	87.3296	48.5022	23.2737
93.8137112251869	85.7135860957064	37.983062021402	88.5666	89.9178	38.0498	22.668
93.8137112251869	85.7135860957064	37.983062021402	87.2864	89.2526	43.6381	24.3141
93.8137112251869	85.7135860957064	37.983062021402	94.6937	81.204	45.1011	23.1601
93.8137112251869	85.7135860957064	37.983062021402	89.0976	96.4455	27.3307	23.7594
93.8137112251869	85.7135860957064	37.983062021402	99.0472	85.7396	32.4859	19.7408
93.8137112251869	85.7135860957064	37.983062021402	91.4519	94.5103	31.5983	21.3367
93.8137112251869	85.7135860957064	37.983062021402	89.5983	91.5249	48.4013	17.2739
93.8137112251869	85.7135860957064	37.983062021402	99.7041	87.1751	32.3993	20.8453
93.8137112251869	85.7135860957064	37.983062021402	99.1691	80.9928	48.8748	24.2662
93.8137112251869	85.7135860957064	37.983062021402	93.3103	99.0843	27.6346	24.3725
93.0071516829684	85.9395192679098	37.6398343353443	82.7904	89.3622	35.5781	32.2308
93.0071516829684	85.9395192679098	37.6398343353443	86.675	81.8002	49.155	31.4898
93.0071516829684	85.9395192679098	37.6398343353443	88.0059	90.774	26.7084	31.4291
93.0071516829684	85.9395192679098	37.6398343353443	85.1326	93.3031	36.2953	30.9423
93.0071516829684	85.9395192679098	37.6398343353443	85.7193	87.9646	47.7548	30.5682
93.0071516829684	85.9395192679098	37.6398343353443	95.9324	92.1458	48.2362	31.1565
91.9142942324373	86.2456500233867	37.174773991194	94.4683	90.0421	37.16	36.408
91.2128334863649	86.4421428496212	36.8762706986211	80.252	96.9762	30.8948	27.7656
90.4149678691169	86.6656404633027	36.5367428345867	84.785	93.3953	20.8615	25.851
90.4149678691169	86.6656404633027	36.5367428345867	83.9295	97.9734	19.8967	22.5699
89.6161894518349	86.889393675776	36.1968265971954	85.4655	89.4614	40.2893	13.9477
89.6161894518349	86.889393675776	36.1968265971954	84.5701	92.5098	41.6265	11.4862
87.9659594221137	87.3516547187547	35.4945794490132	87.6085	88.0524	34.9791	0.9405
86.7223470306762	84.2195358867602	37.0710146367676	85.9222	83.4369	36.366	1.3228
87.196190617803	83.665183473552	38.9082599261165	89.6546	85.279	42.7332	10.469
87.196190617803	83.665183473552	38.9082599261165	88.3323	91.5035	43.0727	13.825
88.0585199343396	82.6563380894523	42.2517964051467	87.8518	83.2273	45.632	10.2812
88.1221085909912	82.5819451504919	42.4983511767655	89	83.7031	44.7227	2.6411
86.5983826422487	77.1241450179391	40.5659130884985	89.2994	73.1482	41.8171	4.9668
86.5975734031485	77.1240499765945	40.5653333478482	82.7574	74.2926	38.276	14.8137
86.5975734031485	77.1240499765945	40.5653333478482	87.0156	79.966	38.2934	12.6359
84.9446126718949	76.9299178485983	39.3811459324735	78.0272	82.0721	40.7931	8.7342
84.9443487533095	76.9293408593927	39.3803729962297	87.3294	86.7915	39.9582	10.1629
83.6108244721146	73.6975000019717	35.9111021152788	79.4655	74.4467	41.2824	12.4177
82.8418217670204	71.8337930444815	33.9104764046534	73.1002	79.4037	30.5501	12.7865
78.0034979532817	59.8400016705445	21.1342681950339	88.9513	72.6403	24.2874	19.8606
Route: 5 Length: 293.075018846997 Demand Met: 1624						
62.1333737574569	38.3394849817178	0.769740057248634	45.5527	26.8832	17.5652	29.6166
54.2911846869568	36.6841282686824	1.53708895885764	47.7847	28.4345	6.8217	34.5556
46.5322027642019	35.0463352010529	2.29629614965409	41.315	20.08	19.8292	34.9881
36.4743611880457	32.9232907763956	3.28044402131221	21.333	28.4534	22.585	38.4741
36.4743611880457	32.9232907763956	3.28044402131221	37.9243	23.9119	1.2026	11.4323
36.4743611880457	32.9232907763956	3.28044402131221	28.392	21.3903	1.2616	19.1959
36.4743611880457	32.9232907763956	3.28044402131221	15.9493	16.7531	4.9236	36.5644
36.4743611880457	32.9232907763956	3.28044402131221	14.7479	11.7757	0.3405	30.4615
35.4089263440577	32.6983950620678	3.38469555728417	27.0476	34.4285	7.3345	22.5144
35.4089263440577	32.6983950620678	3.38469555728417	29.5705	36.67	2.9094	21.5656
32.0620456914887	31.9919237771168	3.7121838551174	38.8284	23.4703	6.171	29.4494
28.5232236820946	31.2449368446701	4.05845340010466	30.4469	21.4825	3.8833	31.6307
24.9661414593286	30.4940954828046	4.40650968851985	11.8636	12.6991	19.7066	36.7112
24.9661414593286	30.4940954828046	4.40650968851985	5.3173	19.9696	21.9865	36.3373
24.9661414593286	30.4940954828046	4.40650968851985	6.693	16.2603	19.0942	35.4947
24.9661414593286	30.4940954828046	4.40650968851985	9.00749999999999	17.4052	0.9316	24.0927
24.9661414593286	30.4940954828046	4.40650968851985	13.8628	4.3052	10.5937	36.3913
21.6249852710544	29.7888325417167	4.73343786791899	20.5677	31.0115	4.2467	1.6881
19.7005806161176	26.0644296221227	6.27622236595586	23.4201	21.9457	1.1934	16.8924
19.7005806161176	26.0644296221227	6.27622236595586	20.9805	20.9752	1.6334	15.7265
17.9383173437535	22.6538275696265	7.68901900919366	19.5822	17.4941	4.8723	10.5093
16.1828549261393	19.2563875541043	9.09636345453	14.7151	17.4542	12.2868	14.2143
14.4456472301115	15.8942768345244	10.4890732103426	14.5843	15.7568	10.6354	0.244
7.57341845618754	13.3084996535752	9.20042102200737	3.5607	15.7968	11.1608	5.1124
7.50858361117824	12.964701673331	8.97154165505602	8.40090000000001	11.7989	4.4087	5.5639
6.90492306796587	9.76368707124	6.84050445561405	4.24299999999999	12.8676	1.4876	6.736
6.85191238280116	8.97172598563896	6.53338278026444	9.9632	1.8111	30.9688	39.4027
6.85191238280116	8.97172598563896	6.53338278026444	13.2084	1.5682	5.3875	22.8241
6.85191238280116	8.97172598563896	6.53338278026444	8.95990000000001	2.5066	9.8186	22.9145
6.85191238280116	8.97172598563896	6.53338278026444	11.169	1.5527	6.9406	37.2188
6.85191238280116	8.97172598563896	6.53338278026444	2.5621	10.2967	1.629	12.6169
6.65475358662658	6.02624143929346	5.39112688687953	1.2522	5.4022	3.551	7.2247

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
6.62989760116282	5.6549015189344	5.24712164269783	1.729	2.5191	1.116	7.1357
11.410246998699	3.67574767417555	7.532514975877	10.31	1.5005	9.6337	14.7461
13.9227335456757	2.63553132026186	8.73368682712025	14.8098	1.8409	8.2695	1.2782
13.6415993676725	4.59036241750538	12.4204263907473	13.7484	0.7577	11.0651	20.4003
13.1887710013428	7.73904703535255	18.358730713333	15.4595	7.4752	20.3496	3.0314
11.4270823067358	8.95816261787523	18.8899122481378	18.8587	8.5087	18.9878	16.8623
11.4270823067358	8.95816261787523	18.8899122481378	11.3126	12.1774	8.305	11.447
9.92968563973427	9.99438361559734	19.3414050345284	19.7672	14.9362	24.0245	14.1421
9.92968563973427	9.99438361559734	19.3414050345284	15.42	17.0914	20.8872	16.8786
8.15946215252036	11.2194048283434	19.8751603347385	13.9396	19.5452	20.1112	16.1224
6.35320521661996	12.4693610708177	20.419780494399	1.5116	19.0597	21.7588	16.8413
4.62406574360897	13.6659507842532	20.9411483280763	2.785	16.9995	21.2146	3.817
4.7647540122978	11.0743379387133	21.2388909180719	15.3264	12.7877	8.2093	21.1927
4.7647540122978	11.0743379387133	21.2388909180719	4.8686	17.5054	20.7421	8.1304
4.7647540122978	11.0743379387133	21.2388909180719	9.7281	5.4172	24.1163	13.7083
4.7647540122978	11.0743379387133	21.2388909180719	10.526	3.779	24.6321	20.82
4.7647540122978	11.0743379387133	21.2388909180719	2.2625	16.1551	5.423	18.392
4.7647540122978	11.0743379387133	21.2388909180719	2.7247	6.6491	25.454	8.9474
4.7647540122978	11.0743379387133	21.2388909180719	0.421099999999996	5.2548	22.7354	12.1971
4.90556697707956	8.48042332343877	21.5368980460856	19.0824	1.094	9.1576	39.3681
4.90556697707956	8.48042332343877	21.5368980460856	2.3396	12.8751	20.4499	24.3453
5.03712680468749	6.05695754484436	21.8153229081471	3.9473	4.1638	20.7291	2.4396
8.69474635659941	6.52668250422529	25.7876620495462	10.2894	7.4847	25.4008	1.9001
8.38864336190017	5.35386918730505	28.6436157097686	4.753	19.8404	42.7266	29.0972
8.38864336190017	5.35386918730505	28.6436157097686	8.6382	10.3371	11.0732	27.1817
8.38864336190017	5.35386918730505	28.6436157097686	18.2952	1.0836	13.7585	19.3439
8.38864336190017	5.35386918730505	28.6436157097686	11.5168	3.287	14.9558	27.8697
8.38864336190017	5.35386918730505	28.6436157097686	5.20059999999999	6.8919	22.4547	22.5304
8.38864336190017	5.35386918730505	28.6436157097686	5.4781	9.3534	39.1694	25.1036
8.38864336190017	5.35386918730505	28.6436157097686	2.67230000000001	10.4123	33.2768	24.6134
8.38864336190017	5.35386918730505	28.6436157097686	4.0211	5.0495	22.5141	26.717
8.38864336190017	5.35386918730505	28.6436157097686	8.02670000000001	2.1019	15.008	25.3395
8.38864336190017	5.35386918730505	28.6436157097686	2.87569999999999	1.3778	31.3806	25.9254
8.38864336190017	5.35386918730505	28.6436157097686	1.2192	5.9144	48.7598	28.8322
8.06801171283891	4.1253900010574	31.6351231441928	9.42529999999999	3.1222	32.8197	2.062
2.48371379757708	5.60617026998724	32.6695063557261	4.1027	5.9391	36.7092	6.8207
2.48371379757708	5.60617026998724	32.6695063557261	1.4037	6.1535	31.8542	1.4597
2.70677221217173	4.88690920734989	35.1967516670316	3.8933	3.6617	34.8265	1.7453
2.75233270204272	4.4642499119676	37.1775245048073	2.4773	0.052	34.3258	34.0937
2.87687788180216	3.30886106269996	42.5922006800222	3.6086	13.0876	23.3357	29.6311
2.87687788180216	3.30886106269996	42.5922006800222	3.76260000000001	17.1174	49.9096	21.877
2.87687788180216	3.30886106269996	42.5922006800222	12.1595	5.1953	46.5778	17.8764
2.87687788180216	3.30886106269996	42.5922006800222	2.4532	11.1564	41.7483	29.4831
2.94370698257347	2.68889742478043	45.4976314960078	1.2646	1.8964	47.5137	2.7408
9.09748221083387	4.18900503462352	44.5445551329303	8.8668	5.4121	44.5737	1.245
11.403059965667	4.51583364741464	44.188685045787	15.7685	10.3669	47.703	18.5804
14.8545302784719	5.0050989650768	43.6559443538145	17.3372	11.1211	33.7282	21.5037
18.1940387296691	5.47849304250595	43.1404851601625	22.1476	14.8515	41.0167	12.414
21.5085866114599	5.94834881246147	42.6288786795271	15.3812	8.8682	40.3179	15.4856
21.5085866114599	5.94834881246147	42.6288786795271	12.9432	8.6486	42.1679	15.3773
24.7972912227978	6.41454117162649	42.1212611763918	18.047	6.7045	32.7171	18.9999
27.9951339404381	6.8678533588743	41.6276684129458	18.6523	3.9117	30.6336	19.4015
31.6223851218569	7.38203661136545	41.067795717078	57.0413	9.9678	41.9779	25.5663
31.6223851218569	7.38203661136545	41.067795717078	28.6149	8.2266	35.9223	6.0195
32.6443301138598	7.46224835069896	41.1933323014424	10.6256	1.7583	32.3574	24.4015
46.5717678776932	8.55540298619686	42.9041905512958	35.1494	28.8106	26.783	32.8637
46.762780734023	8.57039536027757	42.9276547808175	37.4163	24.6203	17.7469	31.2894
71.7242385850544	10.5296029990143	45.9939404355732	73.9225	9.6395	49.6476	4.3559
80.6941959444014	17.6618656433328	26.6273577244699	92.9329	22.8145	25.5988	15.1532
83.033748672243	19.522108996814	21.5761473733413	84.9979	3.9891	22.3271	21.6131
86.6208261610458	22.3742939045977	13.8314695906753	94.4757	9.4701	4.1216	35.9228
90.0873412873147	25.1306162255976	6.34709203702766	92.0943	24.688	5.2999	2.3066
Route: 6 Length: 154.677053206241 Demand Met: 1598						
75.2027351193563	62.5914812980995	6.62844369312677	80.7551	80.6861	0.4798	19.901
75.5436652531029	64.0718789478533	7.06279911936161	76.4126	75.548	2.1999	18.6216
76.0158540980657	66.1222324000399	7.66438216952662	73.6361	68.0431	3.2936	6.0588
77.0789613437252	70.7384905290105	9.01881336171888	79.9937	73.4457	8.9779	4.0141
77.6535487463936	73.233482151337	9.75085528748088	89.4099	75.3847	11.7139	13.3372
78.5975230684611	77.3324371889571	10.9535074064764	77.1908	76.3248	19.088	8.3165
79.1386590356681	79.3739478914085	11.0430745902002	71.008	83.9726	12.5028	10.613
79.9466240387272	82.4221082980668	11.1768065220541	74.9451	88.4605	13.7746	8.2599
79.9475625626584	82.4222580732992	11.1764954911709	79.3747	83.7664	12.9303	2.2827
80.305579640945	82.4755520683473	11.0536630629487	83.3685	88.3604	12.0152	8.2767
84.0680745280458	83.0356325423887	9.7627850384601	84.2824	83.9445	3.7257	9.6857
85.3703854618069	83.2294927976983	9.31597392791185	80.3025	81.1115	9.6723	15.7523
85.3703854618069	83.2294927976983	9.31597392791185	82.7718	81.5009	6.6283	13.2622
87.2657808873261	83.5116390257009	8.66568078972978	89.4354	80.1567	8.4369	4.0019
87.9125465188718	84.5951279881131	8.30538667206213	90.3741	83.7882	8.516	6.0655
88.1181342316906	84.9395371727391	8.19085981426711	87.7484	83.7546	3.1863	5.1562
89.5507630717964	87.3656205353487	7.63309716468265	80.026	88.4312	32.9439	31.2606

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
89.5507630717964	87.3656205353487	7.63309716468265	93.093	71.3467	11.2543	21.4346
89.5507630717964	87.3656205353487	7.63309716468265	86.8222	80.0693	3.9589	26.0963
89.5507630717964	87.3656205353487	7.63309716468265	87.1273	84.0324	13.0404	22.6844
89.5507630717964	87.3656205353487	7.63309716468265	86.0867	81.533	3.6186	7.8826
89.5507630717964	87.3656205353487	7.63309716468265	82.1226	91.9552	25.5944	29.2899
89.5507630717964	87.3656205353487	7.63309716468265	85.8335	84.6274	4.9143	15.0275
89.5507630717964	87.3656205353487	7.63309716468265	86.7862	83.711	0.7854	21.1375
89.5507630717964	87.3656205353487	7.63309716468265	92.1839	88.8237	5.0595	30.3052
89.5507630717964	87.3656205353487	7.63309716468265	88.2817	96.351	29.2562	29.8948
89.5507630717964	87.3656205353487	7.63309716468265	94.8083	91.5304	12.0006	29.5468
89.5507630717964	87.3656205353487	7.63309716468265	89.931	94.5372	6.4495	17.4038
89.5507630717964	87.3656205353487	7.63309716468265	89.3359	93.6392	1.2449	11.0562
89.5507630717964	87.3656205353487	7.63309716468265	96.0605	94.495	5.5816	12.9494
89.5507630717964	87.3656205353487	7.63309716468265	99.292	98.0492	12.4987	20.4892
90.6858123737415	89.287768264015	7.19119047372498	81.7913	86.2239	2.8298	19.3521
90.6858123737415	89.287768264015	7.19119047372498	87.314	87.2617	7.5328	16.5203
91.3525419203996	90.4168404300588	6.93161380861078	94.4375	89.8165	9.7901	6.7853
92.1309144718884	91.734974222777	6.62857130259756	98.1513	96.345	10.1326	8.7509
92.8630489479866	92.9748061487142	6.3435305444398	99.7949	88.8243	9.6989	10.9809
93.8908437016949	94.7153233570611	5.94338079000399	95.4796	96.129	4.4906	2.5755
92.2676078614003	94.3776037649297	8.15074215187175	90.6972	96.9626	11.6096	12.1171
92.2676078614003	94.3776037649297	8.15074215187175	96.809	92.5136	0.2967	11.7087
91.0699793249284	94.1284332554111	9.7793403772488	84.0572	98.2927	13.228	11.5023
91.0699793249284	94.1284332554111	9.7793403772488	92.8113	98.2407	8.6156	11.443
89.2494000585131	93.7496556557979	12.2550596726937	83.6163	95.496	9.4544	6.5288
89.1944560567089	93.7203122947246	12.3939818329125	97.9735	93.9042	14.8216	16.4454
89.1944560567089	93.7203122947246	12.3939818329125	92.0809	99.3222	11.7562	13.6093
88.5890274799868	93.3969774884483	13.9247666962076	88.3602	93.5594	13.9637	0.2833
88.9162218370159	92.0692943549474	15.9459846222323	85.8774	87.324	15.9329	11.0712
88.9162218370159	92.0692943549474	15.9459846222323	94.509	92.4532	22.8398	10.0411
88.981555441618	91.8041849311184	16.3495778609159	83.3686	96.8014	16.23	13.9298
88.981555441618	91.8041849311184	16.3495778609159	84.3334	97.0716	17.1577	13.2701
89.7232941281301	88.7943728513096	20.9316098596196	93.4254	97.8126	20.9017	10.7468
89.938149154224	87.9225388552926	22.2588592982828	96.6676	92.6743	28.4611	10.3882
89.9382832332179	87.9219947924262	22.2596875605726	86.994	98.105	22.6387	12.5626
90.0641186507154	87.4113825111645	23.0370257776554	88.3919	89.421	29.806	7.2563
90.5218896223588	86.4300186856533	22.7279370773053	90.256	83.0105	30.9795	8.936
91.6699155450953	84.1385154597397	21.609590422405	97.4362	85.8361	18.6294	6.7092
91.6697706212682	84.1375324731562	21.6094775753356	88.2673	94.5543	28.7709	14.161
91.6696256971983	84.1365494865936	21.609364728397	81.2522	99.2612	19.5952	19.7395
91.6261269974149	83.8415074947902	21.5754938498499	96.1791	97.5552	24.4974	14.7422
90.9090764935077	78.9779139722392	21.0171523662503	77.9819	77.7483	36.1545	19.944
90.8667560104811	78.2364124764791	20.8517140134906	80.5183	71.0301	37.6084	20.9716
90.8735329568907	78.1925332115218	20.8247714693496	87.485	79.3312	28.225	14.9303
90.873663447216	78.1916883192355	20.8242526926157	97.0965	81.0307	25.4066	20.0164
90.8737939373752	78.1908434268725	20.8237339159651	84.0326	80.947	31.8699	25.7062
90.8737939373752	78.1908434268725	20.8237339159651	80.4141	88.4668	31.9981	26.3631
90.8739244278276	78.1899985345535	20.8232151393166	84.3608	92.148	16.0712	27.0972
90.8740549179155	78.1891536421841	20.8226963626583	85.5265	86.4226	22.7788	27.3567
90.8741854081105	78.1883087498553	20.822177585961	87.8356	87.4643	21.4217	27.6715
90.8741854081105	78.1883087498553	20.822177585961	85.8291	89.3215	18.2752	27.9965
90.8743159007122	78.1874638405172	20.8216587992793	96.5452	93.172	22.7505	16.1374
91.3382578711909	75.1835486619531	18.9772100736597	96.6476	96.9796	12.6166	23.7398
92.0240700989974	70.7430764735772	16.2506937317576	93.0738	84.8753	19.4127	27.0049
92.0240700989974	70.7430764735772	16.2506937317576	95.3031	91.4204	17.8619	25.4609
92.4508174475079	67.9799884166127	14.5541161850425	83.1514	91.319	24.221	39.4372
92.4508174475079	67.9799884166127	14.5541161850425	80.5965	92.0964	38.2365	36.4049
92.8355714526679	65.4887968250316	13.0244871788566	94.7976	88.4491	0.0367	36.0251
92.8355714526679	65.4887968250316	13.0244871788566	94.2258	98.7848	13.3192	33.585
94.6458127290625	53.7679042654147	5.82768347176014	99.2739	52.0431	4.3408	5.158
Route: 7 Length: 50.6290016522868 Demand Met: 921						
71.679922472147	56.3506135562056	11.7447731428032	76.3867	80.9989	23.608	33.1367
72.0992044295674	60.4314669113958	14.676081911187	75.4182	80.175	27.0139	23.5169
72.0989974277678	60.4306002643014	14.6756279584706	70.8501	86.3243	19.985	34.4665
72.0989974277678	60.4306002643014	14.6756279584706	72.3356	86.155	20.9164	38.7669
72.0987904259681	60.4297336172073	14.6751740057538	83.3441	85.5151	19.0157	31.408
72.098583424168	60.4288669701133	14.6747200530369	86.8895	84.3247	23.0154	31.0852
72.0983764223678	60.4280003230194	14.6742661003197	88.7272	81.0174	24.4065	30.12
72.0983764223678	60.4280003230194	14.6742661003197	88.1669	82.2879	22.5207	36.2685
72.0981694205675	60.4271336759258	14.673812147602	94.7529	81.9671	23.1963	38.2984
72.0979624187669	60.4262670288318	14.6733581948854	87.5661	81.6563	15.3738	27.3837
72.0977554169661	60.4254003817381	14.6729042421682	84.7658	77.8153	16.2748	28.1634
72.097548415165	60.4245337346448	14.6724502894504	85.22	71.0885	8.0711	39.2361
72.0973414133635	60.423667087551	14.6719963367338	89.379	76.0987	3.6739	38.3025
72.0973414133635	60.423667087551	14.6719963367338	97.0848	81.6578	13.6354	37.2835
72.0971344115621	60.4228004404572	14.6715423840169	78.9268	79.6337	5.1041	28.7763
72.0971344115621	60.4228004404572	14.6715423840169	83.5177	79.6473	12.5117	24.9276
72.0969274097608	60.4219337933627	14.6710884313015	77.1151	89.3423	7.0894	37.2077
72.0969274097608	60.4219337933627	14.6710884313015	85.6153	86.7737	15.008	37.7006
72.0967204079595	60.4210671462682	14.670634478586	75.2812	79.5319	0.6498	38.4796

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
72.0967204079595	60.4210671462682	14.670634478586	77.4302	82.5606	3.0237	33.5083
72.0965134061577	60.4202004991741	14.6701805258701	73.6863	74.2382	1.6716	25.5224
72.0963064043561	60.4193338520798	14.6697265731543	71.4242	75.4202	7.9198	25.4968
72.0963064043561	60.4193338520798	14.6697265731543	70.0314	77.1275	8.8524	35.8588
72.0960994025544	60.4184672049854	14.669272620439	73.5126	71.3248	10.3828	18.5601
72.0958924007525	60.4176005578912	14.6688186677232	76.1847	74.2911	12.7823	17.8739
72.0958924007525	60.4176005578912	14.6688186677232	75.9291	73.9471	7.416	36.4707
72.0956853989507	60.4167339107963	14.6683647150088	73.1545	60.0435	17.8914	34.4744
72.0956853989507	60.4167339107963	14.6683647150088	75.6074	70.2776	13.8577	26.094
72.0954783971495	60.4158672637013	14.6679107622943	79.3483	75.3688	19.5443	27.2443
72.0952713953489	60.4150006166018	14.6674568095882	77.364	70.7565	29.611	18.9213
72.0430109851507	60.2184084689987	14.5464272848791	70.5598	83.7819	30.4468	31.7327
72.0430109851507	60.2184084689987	14.5464272848791	73.6161	81.1388	33.9424	38.2238
72.0427901993445	60.2175779214457	14.5459159685484	76.9521	88.589	30.1519	36.7425
72.0427901993445	60.2175779214457	14.5459159685484	81.0134	86.425	30.4534	31.9429
71.8523441901205	59.5011619994154	14.1048633650196	84.4928	76.9707	34.1362	35.8799
71.8523441901205	59.5011619994154	14.1048633650196	84.6626	79.7388	29.6454	28.8542
71.8521234043143	59.5003314518625	14.1043520486889	73.5352	77.8165	42.524	36.1475
71.8521234043143	59.5003314518625	14.1043520486889	80.2014	81.5949	36.2605	32.3848
71.654263066993	58.7560244611681	13.6461286536241	72.5026	72.4828	42.5897	37.2859
71.6540422811868	58.7551939136151	13.6456173372934	44.1821	62.8241	31.2839	34.6478
71.6540422811868	58.7551939136151	13.6456173372934	70.8021	79.2974	26.7913	26.617
71.6538214953807	58.7543633660622	13.6451060209626	84.8772	45.0654	27.1944	32.4975
71.6536007095745	58.7535328185092	13.6445947046318	91.1956	46.5873	37.0515	33.1213
71.6533799237684	58.7527022709563	13.644083388301	79.7775	80.296	30.6811	29.6152
71.3958904457852	57.7840835923502	13.0477652763034	90.1019	83.486	18.038	37.2389
70.3332569888313	53.7866906780091	10.5868197584673	35.3466	47.2689	27.5268	39.4146
70.3332569888313	53.7866906780091	10.5868197584673	42.0622	41.0674	12.3472	34.7982
70.111225651352	44.6013548156057	3.53338703358189	48.8851	33.6728	5.7706	37.4425
70.0618325623573	42.5579850972366	1.96428046451793	64.954	37.309	2.2557	38.0588
70.0618325623573	42.5579850972366	1.96428046451793	84.5964	57.5663	6.5683	31.6899

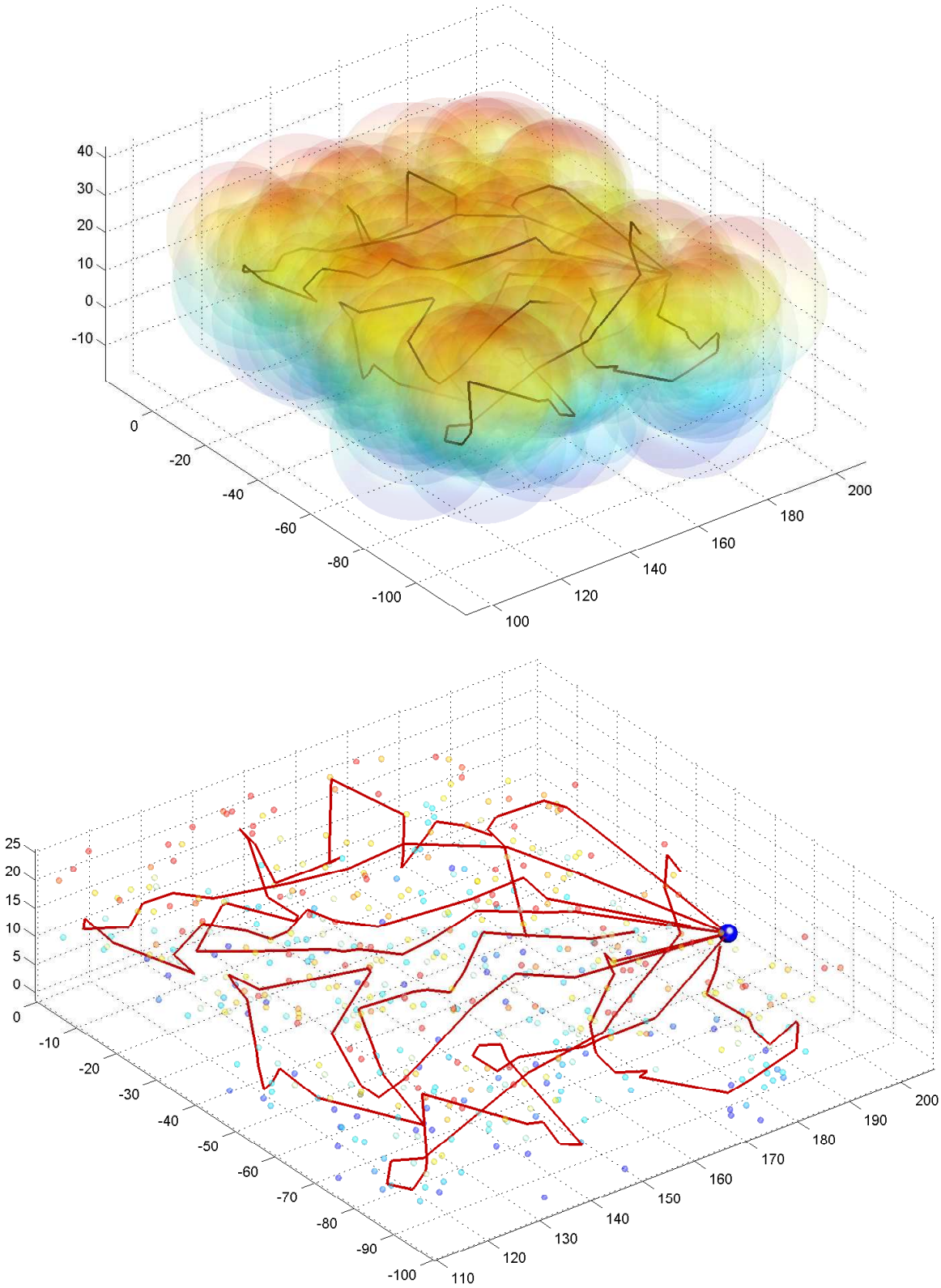


Figure O.96: *team*6_500, arbitrary radius, 3D, Euclidean, Length = 1441.8847857

Table O-99: Solution for *team6_500*, arbitrary radius, 3D, Euclidean

Total distance: 1441.88478571873 Total demand met: 25539 Depot: x 95 y 50 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 270.14441458714 Demand Met: 4915						
78.9821577545391	44.4146911126183	5.72943231191276	77.8566059	47.3210428	1.4302369	13.3824609
78.9821577545391	44.4146911126183	5.72943231191276	73.6483802	37.1698351	8.0638871	9.29445
71.3108574396315	41.7397627419541	8.4733846499806	74.2228108	38.6099587	15.750928	8.4402478
71.3099056155787	41.7395123127024	8.47356161371287	67.7343836	45.7338412	11.9249335	10.9613064
66.5050660514065	40.4753377099181	9.36687645494398	63.3053921	48.8331121	7.8682203	9.0739339
64.4149813253625	39.5681215839571	9.8367758793864	63.3830619	45.6708392	19.4411223	11.4259131
64.4140906198877	39.5676860773509	9.83690617809328	64.136723	44.5156078	8.6797357	8.3082067
62.8618541453279	38.8087259368959	10.0639833577034	61.8021468	40.7857588	11.6604123	13.1222565
60.2302287112224	37.5220025530797	10.4489647042554	55.5353048	38.1752447	17.6684542	10.1702798
57.0040965451191	35.9445972725389	10.9209166417118	56.9481598	35.7189477	11.6860928	0.7997132
54.9914656269811	35.3255174717906	9.82202917158203	51.2078647	35.5791539	12.2358489	4.4951633
54.9906187444844	35.3252566474622	9.82156574876595	53.5581269	47.7413894	5.6200486	13.1857928
52.9093385519882	34.6238764188174	8.69871803949633	54.9748886	31.6899499	9.1125802	11.8489378
50.0540915546025	33.6616736066719	7.15831625741918	51.6262531	32.9510025	3.9807244	3.6157759
49.8099940775091	33.5956059583526	7.07917393909972	48.3601763	34.0464698	9.5017871	2.951746
45.3951239521149	32.4006735757557	5.64776606386766	45.1705924	33.2150554	0.7183829	5.0012449
45.394229245424	32.4003281210287	5.64804919099233	38.4714341	30.1541626	2.0837059	8.9883187
45.394229245424	32.4003281210287	5.64804919099233	34.0986738	23.3047286	4.238405	16.797077
44.6556610006133	32.1151598823283	5.88176677183748	42.5831476	37.1399223	7.4293369	8.4151487
44.6556610006133	32.1151598823283	5.88176677183748	41.3950957	34.602479	9.5059407	10.330203
43.3103854124234	31.5957361055776	6.3074750333282	44.6441662	33.1239716	16.5654644	11.3823841
41.8035192442256	31.013920756301	6.78431831093456	36.9545772	32.1019086	19.1323386	17.1509479
40.2858182309631	30.4279220700648	7.26459049567545	35.0133629	33.6653342	20.0549291	15.142596
40.2858182309631	30.4279220700648	7.26459049567545	35.4889656	25.3753347	12.2670294	17.6050983
38.9690681448242	29.9195124486833	7.68127258233928	38.9767874	28.6595996	7.54261	1.2675438
36.747223024361	30.5742515908473	8.54752553909031	36.1244237	41.0242921	19.6707957	15.4858909
34.8119755005096	31.1445355088407	9.30204020484259	32.3078962	45.114069	10.6720814	14.2581658
34.5083058616485	30.8906817300005	9.41021783013984	33.8398153	32.0377234	11.3609992	2.359689
33.229963810358	29.4710784795302	9.513245938732	31.5115819	30.4349931	13.1711147	4.1547529
31.4237143957532	26.7676256263499	8.80402289908052	24.3319298	37.4283803	9.9719727	13.053577
30.0291601156142	24.6803654173446	8.25645185660956	31.6418617	23.7354033	9.0609597	2.3258089
28.8360613064651	22.8946281214337	7.78798251315031	34.7673517	23.4200763	4.8203284	8.3957645
28.8360613064651	22.8946281214337	7.78798251315031	30.6527015	22.708305	8.3283902	3.2179614
27.6676139325441	21.1457869897661	7.32919267098545	27.922577	21.764341	5.4511195	14.2606988
26.4948965163338	19.390554785932	6.86872613228076	19.7989907	26.8559855	1.6393695	13.3335104
26.0466291955103	18.7196230633923	6.69271426338034	23.260163	19.1726271	1.8635456	5.5937891
26.0460871392638	18.7188096851089	6.69250309805698	14.6392528	26.7492086	4.8139494	14.0759419
22.3464105713439	12.542074494826	5.18746854913181	15.820225	13.1438067	8.0447276	7.149623
21.6443088674426	11.369891796681	4.90185226275022	10.2956976	4.6843351	8.4372721	13.6376992
21.6440381704867	11.3690133218678	4.90145855580233	17.3929381	9.8303298	1.4719335	5.6745961
23.7739666153787	10.5753377315381	6.26829175845256	26.3324067	9.9110212	1.9657306	19.0585155
27.2679695679198	9.27336714292212	8.51048931849778	15.3634563	8.946465	9.6121679	13.8278483
28.6166875161559	8.77079426123912	9.37599879488858	30.2787157	8.2280249	1.312123	8.4927039
28.6174905625946	8.77049502193437	9.37651413192027	29.8399494	3.731908	9.1569031	5.1894117
29.1206093751489	9.27587907632624	9.85117744502142	28.9980611	9.3107142	10.3932004	0.5567948
31.9983571902076	11.235811376273	8.69044056017339	33.6893922	8.5224136	7.0176775	19.9918892
31.9983571902076	11.235811376273	8.69044056017339	24.4057133	14.819481	14.2616378	14.1480218
34.4480989815434	12.9042434457179	7.70233977177386	31.9710737	13.1659452	6.9350237	6.1525799
37.7693396608004	15.1662223304598	6.36272091990718	37.3849664	18.6565566	4.7787046	3.8521791
38.9707928672792	14.5773809309163	6.53029079133968	41.0252369	15.6288565	6.5265879	2.3078897
38.6725319790573	12.8259239236419	6.75626841764303	54.100404	16.0525172	0.8678853	18.9251989
38.6725319790573	12.8259239236419	6.75626841764303	39.7052051	20.7340789	2.9027737	9.9402181
38.40481209838	11.2538110564214	6.9591065776398	45.3795945	10.2393952	3.6711995	17.2768189
38.40481209838	11.2538110564214	6.9591065776398	42.0438698	1.2746098	8.4709115	18.5219549
37.8885290537441	8.22207747114552	7.35026889306512	37.7928549	6.0601138	4.720283	3.405887
37.2632261993437	6.81679419532042	11.6521476222644	43.6411268	3.9331303	13.8180098	18.3321607
36.5366114594899	5.18382566427717	16.6510202244367	41.5241877	2.2495139	17.9679654	5.9346817
36.4557325021747	5.17437310091085	16.773349652	38.5584867	8.9239146	23.1054293	8.3130054
36.4557325021747	5.17437310091085	16.773349652	33.7088519	9.9711832	22.3346661	13.226048
35.9330554003828	5.11328625093556	17.5638987478635	39.0651937	2.4238303	22.4127866	9.0370307
34.9589517637773	4.99943971450791	19.0372307776757	34.237799	1.769458	21.0926833	3.8958604
34.5228682453816	6.21572595892502	19.3081717990738	33.5301093	3.5426558	21.7233363	3.7368294
33.5757060840598	8.85746792307359	19.896648426561	25.7941467	5.022901	22.6635913	13.154074
33.0825186846914	10.2330231058014	20.2030682507383	31.6461166	7.3585956	24.5416178	12.8469017
33.0825186846914	10.2330231058014	20.2030682507383	19.95828	6.5164086	22.2907726	19.0088103
32.4046683905632	12.1236238283987	20.6242200938275	30.8819888	13.4626957	23.5805357	3.5848945
34.010450425026	15.2138172516464	14.39397999457	33.7699504	15.2531662	14.0155756	0.4500872
36.2085535083495	15.9750551423077	14.9251094397189	36.6688954	15.3802855	11.2906359	16.9765386
38.233071948045	16.676178222433	15.4142957228357	39.7157151	22.5518047	13.0027284	19.2813071
38.233071948045	16.676178222433	15.4142957228357	41.2499501	12.693222	14.1376671	15.4469364
39.5411324162578	17.1291801767836	15.7303634271803	38.9701661	21.3778805	18.3750053	5.0370217
43.6828834511288	16.4735164921806	15.4231929572614	44.272376	24.1529526	16.7575015	13.4087757
43.6828834511288	16.4735164921806	15.4231929572614	40.565033	30.2350611	14.624538	16.7047972
45.7157398174938	16.1517033083949	15.2724274001751	49.4509792	19.23293	17.9552005	5.5356339

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
47.2523825149396	11.5361734590255	11.6347349950494	47.2237184	11.5265695	11.522225	0.1165005
49.9362294020564	8.22022560847367	14.2248404950072	54.6678163	5.1970784	7.0182008	9.6677205
49.9362294020564	8.22022560847367	14.2248404950072	45.092729	13.545129	18.3076608	9.6124868
52.5778333954138	4.95646964708796	16.7741785642049	52.4413086	6.2567644	20.6204114	17.7872557
55.2236075447757	1.68756133469377	19.3275411362714	55.2537104	1.3428502	19.4907476	0.3825811
57.8126166371609	7.41589500126694	17.931667138657	64.943613	1.686391	19.5930668	14.0946653
57.8126166371609	7.41589500126694	17.931667138657	57.1362338	5.5136309	23.5708492	10.1201436
60.4466438921789	13.2438311438942	16.5115235029533	60.5482992	13.7850738	16.8556106	0.6493638
62.1798452412268	10.8244351313457	7.69032105954233	58.3586123	20.3359236	6.4801103	10.6167883
62.1800314121711	10.8241752532014	7.68937353448723	64.1033853	11.196525	7.8712992	1.9674937
62.4789578745405	9.97758152311648	4.76776161206393	61.3811866	10.1841347	3.2294003	1.9011369
66.0650970362485	8.26217113522839	5.394731943992	68.4102584	6.9403941	4.658299	16.8109375
66.0650970362485	8.26217113522839	5.394731943992	75.2339764	1.1053279	6.9329867	16.7841753
70.3696727748606	6.20309985110908	6.14730786388647	72.9487249	9.0752285	0.6396625	6.7256814
70.3696727748606	6.20309985110908	6.14730786388647	72.320279	3.8462993	6.5608426	12.1872623
73.1878753710178	4.72756171866548	6.82500341737873	73.9903157	3.2090585	6.7443046	1.7193821
73.5581052417412	7.56330204602691	7.66886574150072	72.8917692	2.6849909	9.1068195	5.1292918
73.950018755565	10.5651255058673	8.56215124322791	79.9570853	14.106802	16.0131314	15.0949781
73.950018755565	10.5651255058673	8.56215124322791	73.292725	7.8305571	19.3842603	14.0833606
73.9501429228015	10.5660765506888	8.56243425602773	70.2907843	10.4186099	14.6666305	7.1185577
74.8727413839568	13.6360105369857	8.59468826090159	70.9135058	14.8761766	3.8438809	6.3074316
75.5404301097106	15.8562319059507	8.61851271638615	72.0757838	18.033427	9.5185824	4.1897587
75.5407601611374	15.8571758688551	8.61851301757523	71.8742878	17.8343061	13.6189325	6.5081686
Route: 2 Length: 325.66008358719 Demand Met: 4802						
62.1084431689663	54.1175330924839	5.68542958324007	61.0935569	52.6920317	4.4207174	2.1590612
59.6016407685797	55.8426645921819	7.42787203187675	53.1446811	48.4277704	1.8438372	14.7395753
56.11397417142	58.2428070011906	9.85209904951639	53.3341085	54.2742297	9.8426206	4.845343
47.8139503867521	64.1319021569352	15.6798214081593	48.6878693	60.2173135	5.6974781	11.2892676
41.9067858570678	68.32319874792	19.8274377037342	43.8195847	68.1613988	20.4285954	3.0343172
37.1310945490385	71.7116834793548	23.1806094812769	37.7594155	72.4638416	24.7804303	1.8761545
27.2786930864146	73.6567474217591	21.5022885675099	26.7897314	74.395765	23.1412606	1.8631854
27.2778223922767	73.6567919225798	21.5017987600017	22.4809106	75.2843669	23.7038192	6.1954617
22.6443727109333	73.8936027250738	18.8952597033231	23.1076735	77.6165558	13.9842376	6.3711973
22.3766022782844	73.9072882454213	18.7446258141213	20.1950128	67.681815	12.2807597	11.7719782
19.5168569209982	74.0534480568016	17.1358789581577	9.81425009999999	65.891213	10.4751695	15.3270767
17.8705516346573	74.1375898675284	16.2097512776207	16.6661596	74.8364156	22.1285239	8.962299
15.553800126569	74.2559979819705	14.9064642199407	11.0262565	80.6460603	18.6716382	8.6895387
14.3924361623437	73.5438894408691	13.4624488637162	14.8230271	72.6203252	11.2037362	2.4779351
14.391479492039	73.5437107200007	13.4622189924926	15.7168362	72.1075902	13.3837018	1.9558061
8.50564838494566	74.6041559300252	12.5572313483044	6.0949397	74.0865476	5.2825592	7.6811646
6.09399086823072	75.4104488619311	14.8828217220533	4.2645198	75.4568775	14.9212902	4.1743619
3.81515709495812	76.1723344824777	17.0803286143459	2.2118306	78.338365	17.5236695	2.7310978
4.19690439725096	73.552075044668	18.3985896080915	3.24432779999999	74.1558976	22.7592184	17.4562068
4.64809980569881	70.4551355205387	19.9566699086702	2.73342340000001	77.6753662	22.8134911	7.9974461
5.1363703250036	67.1037192863315	21.642778232247	0.2763329	64.7359652	24.1588067	5.9629374
8.57599343814763	64.8830955737446	21.9668551530822	6.14577610000001	57.4553139	19.7085867	10.5969023
12.2546280689176	62.5081658447612	22.3134514007101	15.1928212	63.8863652	20.6093336	3.6655736
12.9762849412692	62.0422634335935	22.3814450574265	16.1987878	59.3187745	15.8426137	8.6880066
15.0170806798749	60.7247239871427	22.5737261808618	19.7736057	66.4248411	22.4431961	8.3807699
17.2183044134589	59.3036121206179	22.7811225582302	25.8175111	47.2716024	20.9185995	14.9058581
18.1310501048545	58.7143426184588	22.8671205983229	18.474215	58.4012448	21.6380189	5.4896057
19.091786792608	58.0940899656607	22.9576396238691	22.9209187	53.7233909	24.603033	7.2787759
19.928822773698	57.5536989918778	23.0365043528223	25.824676	62.4300357	22.6279041	7.6620297
20.3023206660559	56.6559485045224	23.1446037499618	20.4303529	56.6155569	23.1754411	0.1377486
18.4710034784298	55.4620089965111	22.7447271195968	19.3270801	51.9549025	21.8491926	14.5767542
16.7342908688987	54.3297475647408	22.3655077672526	18.1200543	57.6122523	16.2352309	15.16683
14.9777812515169	53.184579313212	21.981965767543	16.954408	52.9270638	19.3144339	16.3581023
13.2636597307134	52.0670463597973	21.6076793461622	16.0956015	47.1989931	18.8482809	14.2319044
13.2636597307134	52.0670463597973	21.6076793461622	9.4077401	50.7341371	22.0830838	15.2153276
11.706161149792	51.0516246573891	21.2675922232566	12.7057803	46.3942459	23.5548248	11.1678278
9.45200028101135	49.5820094084104	20.7753857844096	9.41537220000001	53.1681384	17.4096726	17.5248196
9.45200028101135	49.5820094084104	20.7753857844096	6.820668	39.0713932	12.1631417	16.2462105
7.67161400829147	48.4212746279745	20.3866300547986	6.1363219	48.8674613	19.7646406	18.2256529
6.17165101371491	47.4433637052033	20.0591062030278	3.9184302	46.6238898	20.1933306	2.4013658
6.17237644426244	47.4430415025777	20.0584979793938	4.944301	50.787374	18.9241415	6.1768296
6.17310187472486	47.4427192997086	20.0578897557874	7.20936620000001	55.909681	20.1638147	8.5307974
6.68186119045447	44.9617159428093	19.3851032922769	3.2029124	51.042154	21.6188315	12.1504864
7.11107398204687	42.868628317425	18.8175098291956	2.1729785	46.8604253	18.9044886	11.1913394
7.41691735930074	41.3771590670548	18.4130605268871	2.57466789999999	43.4683609	15.573931	9.7340669
8.33858272470019	36.8825889442831	17.1942447512096	4.4919615	30.1971308	23.0431363	9.6799472
9.22524374754497	36.2720668777814	15.9104960822058	7.3492035	35.5012058	13.5793477	9.3339917
10.5380340109412	35.3681279388932	14.0097778250698	11.1949114	32.5347928	13.765914	2.918689
11.444447363955	37.5050177231678	11.8773797919968	12.1928408	37.3702852	11.5867049	0.8140869
10.3281392501285	39.5729197812226	10.865867967313	13.5198617	39.2703319	6.7423337	5.6665967
9.71070510396238	40.7166848118696	10.3063964880981	14.7299938	38.6202015	11.4606651	5.5606508
6.91792218147651	45.8901693996569	7.77579290384135	6.5220454	46.8393292	9.3610404	1.8896117
6.23499644231403	47.0847876220631	6.52226306667387	2.27936	46.9159446	7.984275	4.2205505
5.41131345699145	49.6564275311274	3.6188332236956	2.4253981	44.8523436	2.2881323	11.7215543
5.41110572159185	49.6570761066119	3.61810096974731	5.3360715	49.6056788	2.051856	1.5688834
4.84230139010042	52.5062860692134	6.50422601202188	2.2999767	55.3764405	4.437231	4.3558776

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
5.16931887784939	53.8909406034875	9.43105479163564	4.9451086	53.7479899	10.2966488	0.9055154
8.505135797913	58.5260996109101	5.48703256593277	20.3908302	60.0437447	17.3381089	17.1200275
8.505135797913	58.5260996109101	5.48703256593277	18.5593029	70.8497614	1.5511613	16.4543343
8.505135797913	58.5260996109101	5.48703256593277	13.919931	46.2670929	1.9535236	15.1163989
8.505135797913	58.5260996109101	5.48703256593277	13.6466825	56.641223	0.3772494	16.9874359
8.505135797913	58.5260996109101	5.48703256593277	12.9149435	73.6813943	7.0579	16.8344008
8.505135797913	58.5260996109101	5.48703256593277	3.9504558	53.4738105	7.1081084	13.2039761
8.505135797913	58.5260996109101	5.48703256593277	4.8021518	64.3437535	14.9149548	13.9826688
8.505135797913	58.5260996109101	5.48703256593277	1.389212	56.8496436	7.9005554	9.3148689
8.505135797913	58.5260996109101	5.48703256593277	0.795030699999998	63.4582891	12.408302	17.1080484
8.77803633923493	58.905298551208 1	5.16437515997933	8.7488745	58.9072962	5.1240813	0.0497795
11.672225430103	61.5197420396337	4.2169682531157	6.2196931	67.2192158	1.3051514	9.1371587
13.6793742052039	63.3328844244238	3.55993217490873	9.6122245	63.4753738	1.8891309	15.5818673
15.9937637579388	65.4235704094027	2.80232146216903	15.5276897	59.9411898	0.034091	6.7609848
18.4118235615709	67.6079060891157	2.0107744975289	18.3784185	57.1026507	1.60641	10.6506348
20.9215756668197	69.8750714858231	1.18921222447147	21.6218153	70.9164832	0.5487705	1.4089143
20.7098531743841	69.1557503087906	1.78963555168137	21.4467307	69.0185063	0.8942161	4.517097
20.0855824522598	67.0348095407887	3.5600023640627	23.3330747	67.4297538	2.1722534	6.4618896
19.5536742366689	65.227667625659	5.06843868238845	23.2409835	69.6045703	6.9223743	11.4000663
18.7319958489907	62.4360402181244	7.39863324902498	21.5799527	71.4486566	7.5717836	10.0338577
18.7296237026769	62.4279809227908	7.40536040925716	17.9198509	62.5969087	8.2401641	1.1752301
19.9927983476696	59.9452430111028	7.21394911003688	17.0586402	58.0717087	14.4615884	18.9407433
21.3773544746251	57.2239329657334	7.00414462891355	23.9069485	59.9121563	8.8002389	8.0586758
22.4850762626347	55.0467337765547	6.83628944884809	21.0216738	51.8703093	12.3795264	6.5542883
24.1193115201567	53.2650735809533	5.33106602666972	24.284459	53.5118781	4.6981631	0.6991082
24.6903678799574	51.9359922050059	5.60088526571931	23.2467308	53.1536864	15.3512789	11.4161743
25.500070512292	50.0514828492434	5.98346331870297	20.6501388	50.1791373	13.3126618	16.3804834
26.6575241959114	47.3576149923249	6.5303506692835	22.4746551	48.1041051	9.2672876	15.816336
27.2325703330982	46.0192474065996	6.80205508526399	25.3533813	42.3962835	8.9845466	16.55549
28.1050769964503	43.9885677277968	7.21430746050229	28.2512087	43.1796715	6.8189779	0.9121146
28.1649520258346	44.2013925705659	7.59146162258788	20.3277951	46.570702	14.9318681	10.9961913
30.6059219214293	44.795128293516	7.8035440076078	32.8302989	42.2309887	13.616708	9.1323516
34.3241479424773	45.6995405746398	8.12660026025331	34.4981613	43.6098189	6.3838863	7.4849006
34.4541930629808	45.7311724274148	8.13789917152435	30.0937988	44.3308943	14.5383671	9.1718387
34.4551612875746	45.7314079360399	8.13798329538244	34.2887402	41.9043439	6.835982	4.1016802
36.9587103684905	46.3403651670521	8.35550291747811	37.4597811	44.2188485	16.422469	8.3563058
39.1171575819755	46.9614592120526	8.19941674926985	38.9617732	51.3997809	16.210445	12.7914782
39.1181162751423	46.9617350764848	8.19934742231139	37.6481264	47.8813096	6.5793036	7.0802754
39.1190749683251	46.9620109408526	8.19927809531899	40.4352515	45.1450838	11.9573703	4.3768484
42.5004886787254	48.3705254861431	7.19045322184626	43.0965371	49.287121	4.5164689	2.8888775
45.0244493285816	48.4601890268939	10.0293341765766	44.2906965	51.8898251	11.3116798	3.7343282
48.5054814560565	47.2662991884664	13.1411202003483	49.3212736	48.3119567	9.5488066	3.8293124
50.0117473629312	46.7496950868559	14.487610844258	49.7681271	46.8278362	16.9025729	2.4284766
55.8960940938828	44.7491864555958	11.1656719398198	55.1300701	40.0588307	9.3430467	5.0900091
64.6438925666093	47.3706276547708	8.77592150400147	58.9987357	45.7674431	3.4982849	9.2369593
69.4818715984509	48.8204184391516	7.45426754407833	69.2934493	49.5142976	7.1641629	0.775327
77.5946855123792	49.367935170195	6.09547232127984	77.6409989	49.4044045	6.2831565	0.1967239
Route: 3 Length: 192.237432949618 Demand Met: 4874						
82.6057380161848	54.817807048256	4.60717676032439	77.1618533	52.0527053	6.1051205	6.548551
72.3081300349944	58.8206180246345	8.43498838718699	69.1126526	61.5737532	13.3447692	13.1055803
72.3081300349944	58.8206180246345	8.43498838718699	63.772212	68.1836695	14.3458559	14.1434905
63.2421607692776	62.3446754903908	11.8049770627095	54.2235528	56.265496	3.5115961	13.6774223
63.2415834529942	62.3452223310759	11.8055834216577	57.0800315	64.0172849	6.0370203	9.5428133
61.2270540203954	64.253407955498	13.921456460105	45.6990417	60.3070344	11.94067	16.3509992
60.321194995999	65.11144813648	14.8728859383108	57.8283627	65.6998258	15.4827548	5.6799674
59.3873148105268	65.9960302894224	15.8537462243839	58.1838222	68.9986011	16.3418061	5.0984315
57.3923743589284	67.8856610487554	17.9490448430087	56.0822206	62.8731122	23.9833277	7.9532835
56.537039361925	69.2532725354824	18.432184145778	56.5346421	68.6367247	22.9662555	7.6638079
55.5873736831386	70.7717111664555	18.9686065067222	56.7397866	71.0931061	18.3430984	12.7871715
55.5873736831386	70.7717111664555	18.9686065067222	44.3710695	67.9205927	10.1383529	17.6190773
54.5424114302481	72.4425213271635	19.55885751749	57.43771	71.1535593	20.5447257	13.3451357
52.8576635864572	75.1362968829219	20.5104938976533	50.7478618	74.0551131	24.8207298	4.9191824
52.4046184172784	76.7833819610242	20.1204452212949	55.0653569	81.234009	22.9552522	5.9096312
50.5839193063838	77.3331650194269	18.3191218293147	49.7783583	78.4397036	19.1457188	1.598943
48.0156596342707	77.4083061578801	14.4609961687033	63.6802314	81.8267454	23.9676687	19.0132656
48.0156596342707	77.4083061578801	14.4609961687033	45.5118999	65.9532613	1.4856264	17.6961201
48.0156596342707	77.4083061578801	14.4609961687033	46.0567355	72.019762	4.0391076	17.1499692
48.0156596342707	77.4083061578801	14.4609961687033	47.2434466	72.8348775	10.3871125	7.3999265
48.0156596342707	77.4083061578801	14.4609961687033	47.9098314	77.7959758	13.7573709	9.5350991
48.0156596342707	77.4083061578801	14.4609961687033	52.878421	80.2956919	22.1921533	17.8391178
48.0156596342707	77.4083061578801	14.4609961687033	46.3729602	74.0499355	16.6434815	10.9997053
48.0156596342707	77.4083061578801	14.4609961687033	43.6827488	74.1878852	3.8851851	13.0248043
48.0156596342707	77.4083061578801	14.4609961687033	51.7496653	79.9144917	22.4057667	15.0357032
48.0156596342707	77.4083061578801	14.4609961687033	50.0446513	86.3510967	14.724494	11.408718
48.0156596342707	77.4083061578801	14.4609961687033	45.3945603	79.9114427	16.0984045	10.2225307
48.0156596342707	77.4083061578801	14.4609961687033	43.3709663	79.9295648	12.3122786	6.4309473
48.0156596342707	77.4083061578801	14.4609961687033	40.9923031	81.1407106	10.4646561	14.9699296
48.0156596342707	77.4083061578801	14.4609961687033	35.4564008	78.9241199	21.2236154	15.1810796
48.0156596342707	77.4083061578801	14.4609961687033	32.5068688	76.0167984	20.6942387	18.6744309
47.2775133421955	77.4299025536546	13.3521280970835	46.8228713	71.844353	9.3127449	6.908088

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
45.4295998337773	80.6215891179228	12.4570746022599	45.412979	71.2677197	7.8505587	19.9703759
44.4079510778868	82.3861644584733	11.9622298561722	38.0621359	81.3957333	12.1235509	6.4246672
44.4075463874751	82.3870454049083	11.9619845827547	41.3355343	82.7796974	17.0555529	5.9611972
44.2083230210877	83.0848459712986	11.5493889743201	39.6568849	80.0063838	5.1586736	8.4281529
44.0886315178657	87.886920710712	10.6020596791557	37.489488	92.2138591	10.0537289	7.9102312
48.9539416402935	89.7597183062485	10.0016074978352	49.7030604	90.8227548	10.5216088	1.4005809
49.5403850115815	86.9014164775175	7.49101912622047	48.3895216	84.8378656	6.8593636	2.445755
52.4995153279898	88.5991533167707	6.50125585599234	49.4827685	84.8462228	4.1362821	10.3517087
52.4995153279898	88.5991533167707	6.50125585599234	45.3765455	76.9954785	11.855076	19.7202249
56.4763961636302	90.8808024410441	5.1710776773637	65.7364961	88.9695394	1.2659879	13.1578882
61.437084998488	93.7268900703795	3.51183760366793	61.1689993	94.8861498	0.1686343	3.5486281
61.43797177477	93.7271356061205	3.51222919021732	61.0866811	94.7582572	1.1597592	17.8354325
61.43797177477	93.7271356061205	3.51222919021732	61.4066356	99.633296	10.2157007	16.0904388
62.67640727305	94.070040786175	4.05910295239266	67.3268965	96.007007	6.0328841	10.9024154
62.67640727305	94.070040786175	4.05910295239266	68.523768	98.3881808	6.8534875	8.1618794
63.4930221207441	94.2961498260214	4.41970730721289	71.5874534	94.5399994	3.1033191	16.9233519
63.4930221207441	94.2961498260214	4.41970730721289	63.2522018	99.6147456	0.7669575	18.4401179
64.4940557192457	94.5733217957572	4.86174810004577	62.3573907	96.159986	6.7572642	5.0891887
65.364779738192	94.8144128954779	5.2462462187178	61.0701287	98.8683739	3.7920781	7.9054547
65.3844904299484	94.8198705024182	5.25495014993486	63.7965883	99.8649883	6.5257645	5.4396338
68.1781178030819	95.2246436650719	6.3559941502849	66.5761879	96.7049476	8.0800553	4.0776062
68.1781178030819	95.2246436650719	6.3559941502849	67.0620012	97.8077872	5.6584534	8.2792999
69.7353594282762	95.4502749080394	6.96974513400379	72.4289329	91.88372	3.0217722	10.9387068
71.3147557592534	95.6791161818138	7.59222788566894	71.4909917	88.8238404	7.979611	8.4049975
73.0114418813186	95.9249517619762	8.26093771170982	74.8496365	95.8479299	7.1137605	2.1681576
72.6697367142106	96.7874295246413	13.0975074392645	76.9820609	94.8106777	15.132467	5.1618551
72.0300966542936	97.2613253005532	14.0750497051919	75.0360354	91.1497098	19.4705099	11.023678
71.9434076378762	97.3255513568583	14.2075338675104	77.3466754	92.4222135	24.9773835	14.6923437
71.9429002594877	97.3259272627682	14.2083092783161	75.4923392	99.8090463	23.5616918	10.3077719
67.7127667558725	97.676723575887	12.6285946946206	79.9522127	98.0359405	21.2412381	18.7966063
67.7127667558725	97.676723575887	12.6285946946206	70.4834315	96.1070737	18.6164445	17.0458905
67.1770581634329	97.7211487927882	12.4285379647561	64.3381393	93.722702	21.2607142	16.872102
67.1770581634329	97.7211487927882	12.4285379647561	64.9776601	99.8572829	20.7305349	14.8646935
66.4600985266621	97.7806047876917	12.1607942650144	66.3729212	97.9005203	11.9390694	0.2667237
64.5822179571495	96.0216877459426	14.6736789794782	56.5514993	98.5201232	15.0548231	8.4190197
64.6362557482786	95.8384153161807	14.8433020601963	61.0630253	98.699805	24.8594975	11.0127062
65.9294800164986	93.1844378959687	14.9300923279438	68.0410206	93.0677269	14.2384361	2.2249974
65.8555757547024	93.0357383417218	14.9844963770514	64.4754864	95.6952093	9.6236824	6.985863
65.8555757547024	93.0357383417218	14.9844963770514	62.5782193	94.8345715	12.3846974	11.8936571
65.0455752242915	91.4059714599439	15.5807719871032	64.0121883	92.7907393	13.624016	9.0477095
63.6066107512783	88.510693548637	16.6400545275528	60.774398	89.648206	21.5223541	12.5083419
63.6066107512783	88.510693548637	16.6400545275528	62.6982725	97.3778678	18.7400798	9.4559017
62.9966076861019	87.2833328773022	17.0891035549008	63.9530194	87.4245185	17.4311618	11.3124411
62.6955699257342	86.6776278753977	17.3107101684096	62.4719528	86.6470186	17.4140053	0.2482165
64.4963908026564	84.8425512353655	16.7832564823576	67.7945884	81.6777909	13.5506647	7.7525837
64.4963908026564	84.8425512353655	16.7832564823576	69.765468	86.0199863	16.8900143	10.8561261
66.2255244292365	83.0805255029769	16.2767997225115	77.2293497	82.6694496	0.4080071	19.9727905
66.2255244292365	83.0805255029769	16.2767997225115	77.1265753	88.6843079	7.3792466	19.9105474
67.8061973064023	81.4697845850744	15.8138265591856	75.6464183	86.4517504	17.8073467	11.7494177
69.2480531215971	80.0005013490287	15.3915123926371	66.8428254	74.9418962	18.8280244	11.9134957
71.1898106039116	78.0218071651893	14.822778901033	78.4106856	73.5257917	13.7197973	15.5467792
71.1898106039116	78.0218071651893	14.822778901033	78.2121151	82.5216358	9.4131561	10.3605913
71.1904967282832	78.0211079891774	14.822577937725	72.4566884	79.8068651	12.2176684	3.4026054
75.6206151377761	72.990035203557	13.9002669813215	73.2290706	73.9762718	17.115174	18.8679238
77.0018215151969	71.4214654335483	13.6127121890165	77.5651358	71.0148631	15.8380209	2.331233
79.5832240795507	68.3490753085212	11.6602984888222	75.0689318	72.4744486	0.4051745	14.9698309
79.5832240795507	68.3490753085212	11.6602984888222	75.4040099	79.0607348	6.3376777	12.6702712
Route: 4 Length: 261.635934303361 Demand Met: 4848						
77.1349328143566	40.5525809965549	11.0889510908705	75.4422908	46.5496079	10.6773392	15.4085245
77.1349328143566	40.5525809965549	11.0889510908705	67.1669184	49.4371849	3.0262948	15.5982026
74.029151008212	38.8122406661197	13.1153170476346	76.1612584	37.0439506	15.0269683	3.365582
73.3884931338008	38.4874153592407	13.4952254709581	73.6393721	37.6930766	12.5724621	4.535198
73.3884931338008	38.4874153592407	13.4952254709581	72.24704	39.7077335	13.756154	3.7506664
69.912463756039	36.7250055741667	15.556501690053	68.3855742	35.3493495	17.8360025	5.6398572
64.4987141748819	33.9801362120418	18.7668408501489	65.5247054	34.4819771	22.2818751	3.6959394
63.8267043616304	33.6407105615373	18.8743093643122	56.98499	36.3050676	16.2652139	14.2729457
61.0412877370155	32.2338236940188	19.3197562473948	56.2067364	40.2417677	14.7422616	19.6165059
55.4418292282146	29.405591573437	20.2152277083044	62.1748486	23.5386262	9.8971034	19.2663276
55.4418292282146	29.405591573437	20.2152277083044	68.9038468	16.8104734	21.7337542	18.4978064
50.064358812945	26.6894838829299	21.0751986718066	52.3761166	17.3066951	24.8659343	10.3802999
49.2395875780482	26.7064414014377	21.0361352605264	46.2315326	17.3070005	18.3576471	18.9782971
47.4175685775537	26.7439025634309	20.9498395192026	51.358437	31.183912	20.2786449	5.9744983
42.2608221690606	26.8499267109687	20.705602454473	44.7688336	34.8472485	18.3927145	19.5683767
39.0788907182317	26.9153478298338	20.5548978005731	39.21475	31.0795566	21.1487172	8.3251067
39.0778920485482	26.915368362705	20.5548505008377	37.130172	34.1670861	22.6509329	7.7958056
31.2815857141644	22.8369910620297	18.899399926284	28.9097869	26.1468646	19.859402	4.1835746
21.7837343887286	15.4233960995412	16.0962186919584	20.1050057	16.8211128	11.4177964	7.104643
21.7837343887286	15.4233960995412	16.0962186919584	16.5956207	19.4929376	15.3111277	6.6403358
21.4089363068281	14.4749795812902	15.925329496838	14.7546051	14.610274	24.9337615	12.5838102
21.4089363068281	14.4749795812902	15.925329496838	15.2275578	8.2482088	20.735321	10.0059049

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
19.1462704354262	8.74936389293348	14.8936688395336	25.3620642	2.9418291	18.8013171	9.3612642
15.5933153646598	5.75672317714259	12.9747067096687	9.4518233	0.0818322	21.8708164	12.2091392
15.5929647540789	5.7564569782079	12.9738088174993	9.8269964	6.8843491	16.4620329	6.8651251
15.5926141434018	5.75619077925401	12.9729109253733	15.0419936	3.4632806	14.5409941	4.5348945
14.8874429614541	5.2207941011349	11.1670119795682	21.5694811	0.9567502	13.1824134	13.3401903
14.8874429614541	5.2207941011349	11.1670119795682	14.9649191	8.2569823	17.1672819	11.1052011
14.6840859240398	5.06639631029966	10.6462266900414	21.5004558	1.4444458	11.8706015	10.4654737
13.9700107178488	4.52423769431874	8.8175224976813	18.0605132	3.6100683	1.3230623	8.5868999
7.3309706093699	3.63773821826735	10.3856798134409	10.2638739	16.7343669	2.745395	18.8298176
7.3309706093699	3.63773821826735	10.3856798134409	8.8711802	13.2955279	17.3948906	15.7653907
5.88691095733687	3.44491556831808	10.7267699447941	3.796854	1.0310825	8.8837938	3.6866637
3.85250151318841	6.39683898756743	14.7357579680696	11.2137447	2.0282324	10.133715	19.8233424
3.85250151318841	6.39683898756743	14.7357579680696	7.7653349	6.167634	7.7136991	19.726704
3.85250151318841	6.39683898756743	14.7357579680696	1.16963010000001	7.0254341	24.7260216	16.3262783
3.85250151318841	6.39683898756743	14.7357579680696	1.18933079999999	3.3623299	20.9336159	7.3969025
3.89213158896597	11.6840558924186	13.9217880461371	4.41833269999999	14.4467589	21.446539	11.646626
3.89213158896597	11.6840558924186	13.9217880461371	6.43216459999999	5.6038094	17.9548593	10.5758755
3.90587036430087	13.5170205118349	13.6396021480015	2.4227502	13.8762399	13.6085461	1.5263186
7.84104294225997	21.1940573018086	12.3944419094407	10.0346396	20.0550826	11.5771729	2.640927
10.2242151779432	25.84333415554	11.6403623313877	11.5512784	26.7283657	10.5788887	1.9160125
5.37584636154283	26.9014915523232	17.1343062965526	3.1062568	26.7803784	17.2167375	2.2743131
6.60900883026387	27.2861471016724	18.3771008180119	1.0903939	26.3844516	18.4073439	6.0462866
8.41955950626834	27.8509055206536	20.2017946652624	1.44105020000001	27.5670412	20.5926225	9.0702473
9.89508395677349	28.3111604210112	21.6888451132753	9.78612250000001	28.4044715	22.2738758	0.6023624
18.1743421480404	28.6264802755173	17.6576006801354	33.6742877	16.0147514	17.7329183	19.9827348
18.1743421480404	28.6264802755173	17.6576006801354	24.4888337	25.329984	1.2423959	19.8782132
18.1743421480404	28.6264802755173	17.6576006801354	23.0786229	38.1227731	23.1605385	15.8911359
18.1743421480404	28.6264802755173	17.6576006801354	18.6253841	45.1799856	19.5247549	17.6321283
18.1743421480404	28.6264802755173	17.6576006801354	21.8832831	32.2702186	24.0783885	16.0376904
18.1743421480404	28.6264802755173	17.6576006801354	15.6671545	41.9038059	9.4975475	18.2677056
18.1743421480404	28.6264802755173	17.6576006801354	18.0420031	31.0087706	14.9562459	9.8590332
18.1743421480404	28.6264802755173	17.6576006801354	17.2034005	24.1027648	4.0750954	19.2446407
18.1743421480404	28.6264802755173	17.6576006801354	13.0553452	35.1491327	19.4677587	12.3752896
18.1743421480404	28.6264802755173	17.6576006801354	11.8541821	36.7134083	15.5034658	16.0938551
18.1743421480404	28.6264802755173	17.6576006801354	16.5565287	18.5575743	19.3585299	18.4350632
18.1743421480404	28.6264802755173	17.6576006801354	13.6477983	21.6503409	20.9429038	10.1300266
18.1743421480404	28.6264802755173	17.6576006801354	10.881307	21.222109	11.4410052	15.2562401
18.1743421480404	28.6264802755173	17.6576006801354	6.7702019	28.6398243	6.655852	18.6590849
18.1743421480404	28.6264802755173	17.6576006801354	12.2844966	12.8434228	15.9512599	16.9324181
18.1743421480404	28.6264802755173	17.6576006801354	4.5207011	34.7763494	11.5308277	18.0479256
18.1743421480404	28.6264802755173	17.6576006801354	9.1420339	20.9818632	21.7425538	15.7590069
21.2770426151332	30.5801614497841	16.0109181415442	21.2205961	30.6755865	15.8621351	0.1855493
24.2593137048633	30.9832540869144	16.4408524493993	25.434095	30.36432	15.4263508	1.6710488
25.5045195658845	34.348900751198	21.4874205801277	25.6408756	32.9849766	23.8146293	2.7008855
26.4668471208055	40.3961394824252	21.8576119865244	26.2175773	40.5220972	21.9150058	0.2851225
31.0256031640769	45.0310812733134	21.4364166343507	28.018456	49.9258106	18.7011667	6.3626175
45.1646509591806	50.1267268650194	23.6461771834723	44.8729194	51.9811136	24.4648411	2.0479424
46.486154533776	50.0208351709489	23.5959497865045	46.3458684	54.8708712	24.5219613	8.2955698
49.6847491148942	49.7645327184585	23.4743784057065	51.8847181	57.7017397	23.1071854	17.2459771
49.6847491148942	49.7645327184585	23.4743784057065	47.6524078	52.2249928	24.4877735	17.0127082
52.6246927389267	49.5289559225581	23.3626377059784	54.8328865	43.6672378	22.5503676	6.4152555
55.9671056479777	49.2611294437284	23.2355999687215	57.0032853	47.929495	24.4820709	2.0977627
58.3289628841411	52.1049184965642	20.022306016386	57.7424662	53.0431767	19.7584506	1.1375089
60.1608091118869	51.9997704759012	19.0221219945539	55.3536754	50.0230289	15.6187386	10.7398558
61.985449400595	51.8950360066206	18.0258722952732	58.429274	38.9397266	17.4146787	18.6397178
61.985449400595	51.8950360066206	18.0258722952732	48.2549784	40.2375649	15.7273532	18.4484604
65.1278231622044	51.7146635794801	16.3101430432801	65.8501112	46.5185477	18.4012114	5.7590293
65.1278231622044	51.7146635794801	16.3101430432801	62.9728444	48.2610974	18.088966	5.9042331
68.6991289074783	51.5096704279402	14.3602178923266	67.7686962	50.942416	23.8888342	9.9071922
68.6991289074783	51.5096704279402	14.3602178923266	58.3317264	48.8464518	15.1551224	16.6689028
71.8910122528864	51.3264562578374	12.6174565045786	66.0988248	58.3515559	13.6719306	17.5072809
71.8910122528864	51.3264562578374	12.6174565045786	64.4880133	60.4854675	12.6069191	17.3914578
73.0420821319391	51.2603848129732	11.9889748594832	61.6781701	59.473286	10.2741841	14.5751959
78.4580998724315	50.9495053095184	9.03184104634094	65.5436157	56.992435	13.1266946	17.084027
87.6324368473609	50.422898314249	4.02267318233202	78.4065879	56.8222853	10.2773712	18.7893207
87.6324368473609	50.422898314249	4.02267318233202	73.3690079	50.7128517	12.3210863	17.0196572
Route: 5 Length: 295.909889487175 Demand Met: 4758						
70.7848417943157	65.5108008762934	2.4786941140689	74.4567732	73.8913977	2.9219836	9.1604579
67.3964706440989	67.6811913857646	2.82553206221534	68.5426632	70.6500378	2.313903	3.2232857
66.6993723349158	67.8252495754086	2.92909444827168	64.6626599	65.39963	6.8345581	5.0684212
63.1944953639077	68.5495466326099	3.44978631892676	64.4543682	70.2655389	2.1929672	6.7382235
58.782215307064	69.4613622099323	4.10528389195113	61.6425082	72.8564323	6.6704147	8.9988257
55.1115155239389	70.2199272139469	4.65061074782026	54.3749565	73.471727	7.5546522	4.4215583
52.617183678339	69.045846963071	3.49786509984708	53.0250996	68.7918887	2.0307378	1.5438111
48.2029932811806	67.5360160341613	3.56629083188311	50.0180258	68.4527432	3.6702061	3.7667027
42.542289170931	65.5998272039186	3.65403915820838	43.0002757	59.9692573	5.0791111	5.8261393
39.8623147927175	65.9921423982006	3.3716485553217	42.9598051	72.0704928	1.9046969	12.5037762
39.8623147927175	65.9921423982006	3.3716485553217	29.6716712	65.8677857	16.615982	16.7115843
37.8427478730181	66.2877820871695	3.15884550487431	37.415218	67.1119326	2.4786359	1.1509522
35.1806407651339	63.5148018817971	5.51607469345998	33.1471098	60.1558513	4.4414558	4.0709462

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
35.2011747443785	63.649612765035	5.76073593682179	32.3710377	53.6854	0.0060466	15.9945905
35.2011747443785	63.649612765035	5.76073593682179	31.5095969	51.0684653	11.523883	15.7915136
35.2494156688979	63.966326895884	6.33552390270647	38.128444	50.990683	1.5244057	14.1351688
35.3757159402853	64.7955208052747	7.84038470090621	39.4220046	48.156385	14.5273965	18.6805968
35.3757892503413	64.7960021047598	7.84125818613293	39.5709227	52.0192185	20.9490324	18.7792196
35.0987243398383	68.8879011653153	9.94635036948599	32.7632095	61.4478694	17.2734289	19.7763438
35.0986642385961	68.8887887849236	9.94680700859049	26.1534967	60.2417469	15.9637624	15.8350837
34.9607588303991	70.9254776323226	10.9945889094496	35.1926471	70.9963316	12.3857242	1.4121083
34.3849557699942	73.1290551169057	9.68657321391629	29.1113171	69.2428114	2.3178943	9.8595935
34.0605586744327	79.460894043043	7.97442048081456	30.51178	74.0433946	6.2558417	12.6878142
33.9111151364847	82.3778511456948	7.18566446038999	25.1363027	82.596723	1.6788626	16.9876139
33.7239652683308	86.0307901988663	6.19789619063839	37.6570142	81.9317057	5.2409906	6.23332
33.7239652683308	86.0307901988663	6.19789619063839	34.482979	80.365325	2.7097027	8.2940253
33.5867018541317	88.7100060095851	5.47342629741381	34.617789	91.6565199	3.2534463	17.1587159
33.5867018541317	88.7100060095851	5.47342629741381	28.8394854	85.6978668	0.4508897	18.7042447
33.3375749186878	93.5726624415855	4.15854596097214	38.2308224	97.9753907	0.1604725	7.7014595
29.2816541023561	94.5619134831052	6.08783744475708	33.8269693	93.4852631	8.3635932	7.8640695
28.0424113154468	94.8641684513854	6.67731161439052	22.9057445	97.6296948	0.3244356	8.6251096
24.6222538736259	95.0673275709507	11.9736224397072	26.8042407	95.3391438	15.0909578	3.8148041
21.5358625809188	94.9986285955948	12.6744596504252	20.7475398	95.759314	10.8106372	2.1619272
18.120762426936	94.4739642577814	14.6276232026024	11.9839899	90.8471274	5.5312557	12.6071325
18.120762426936	94.4739642577814	14.6276232026024	14.3875276	98.8261078	17.7695633	6.6290931
17.5169043498459	94.381193099196	14.9729816207142	23.9936704	92.6751712	13.4234383	7.0508341
15.1451576441337	94.0168199158471	16.3294306300159	21.4283979	90.119601	10.9146393	12.23519
13.2900455325679	93.7318176836465	17.3904060620111	17.6447354	95.7025091	24.4008135	18.1912178
13.2900455325679	93.7318176836465	17.3904060620111	13.4475731	91.4293541	19.9118277	11.6363893
11.4190804155673	93.4443799425401	18.4604481423658	19.6070156	87.5155962	19.7643343	13.0351264
9.92694247422604	93.215141697765	19.3138314429522	13.1891897	88.2938542	23.4034575	7.7896989
9.92694247422604	93.215141697765	19.3138314429522	16.4819632	98.2716229	22.9610856	9.7324435
7.62310054352882	92.8612007745946	20.6314443635528	8.45094570000001	92.4898096	19.3229772	15.3075709
7.62310054352882	92.8612007745946	20.6314443635528	5.5712407	90.2337915	20.7281907	18.9787731
5.75978653789727	92.5749384794289	21.6971106214579	6.5131248	96.1438685	22.6159881	18.9754882
5.75978653789727	92.5749384794289	21.6971106214579	5.3401207	99.7769332	23.3119522	19.3172668
3.3706931682588	92.2079003156752	23.0634805319587	2.92961390000001	91.7761922	24.0474062	1.1614786
3.03353583535403	92.8045431173838	21.9527021064183	4.0389978	87.3302987	23.4710958	15.0585227
2.26681599835143	94.1613514282309	19.4267126952244	3.4980922	86.0326352	18.0570339	13.3409157
2.00777467277466	94.6197580150289	18.5732906053808	5.93926279999999	95.2323551	18.983803	4.2724995
1.41928057627342	95.6611732006434	16.6344730802291	1.8947773	99.155621	15.7943163	13.566985
0.739656128064098	96.8638551388897	14.3954229380252	0.604558600000004	98.8714353	15.0611354	2.1193873
0.330053119791287	97.0590346212495	12.7132875548548	0.0137857999999937	97.6201473	12.5524591	0.6638812
1.52217944914494	92.9746547541886	7.85881783013272	2.8109458	93.7321232	7.4419786	1.5519124
1.85430935887236	91.8367344753694	6.50634824627291	2.2885744	93.0945686	4.7870646	2.1740904
1.96684494405365	90.4909613035474	6.03092283890208	2.7731053	90.8551563	10.3958831	11.768651
2.12873218820728	88.5550091380497	5.34700309230113	7.5281123	85.6801168	11.1420674	14.3445898
2.12873218820728	88.5550091380497	5.34700309230113	5.6520223	82.6769432	10.5413091	11.1746738
2.29159846424278	86.6073490751614	4.65894726113266	2.2068367	85.97283	4.4333903	4.2948267
2.46507884522222	84.5327586996261	3.9260503697058	1.90777989999999	84.1438746	3.0185488	1.1337425
4.56564980284688	82.6221095612731	5.78515146571155	4.0094679	79.3774545	3.2513282	4.1542009
4.919847646325	82.3231951489563	6.11129345069237	1.295681	73.7881021	0.4861457	19.2219951
4.919847646325	82.3231951489563	6.11129345069237	2.4095765	76.567725	8.2487866	13.9285738
4.92047263968982	82.3226677050533	6.11186893850548	0.933565799999997	72.1659561	13.9038289	13.4077909
4.92143479340209	82.3229383417989	6.11183706396287	6.6484375	67.6725429	4.7357573	18.7895827
4.92239694711697	82.3232089785327	6.11180518941658	6.65024940000001	63.3598676	12.1766222	19.9843888
9.74403329582225	84.2697750065482	5.76625614186062	6.9413921	77.9428724	3.7844258	8.4884288
9.74495853912261	84.2701485409789	5.76618983300274	9.5621792	88.5032381	1.7950294	5.8071138
16.1017024015781	83.9528914772711	7.97819099442663	9.22639889999999	90.0124515	4.4717238	19.4614621
17.252047235376	83.8954792182233	8.37848462911029	13.5790401	86.3111074	8.8070912	4.776713
20.6200532032981	83.7273862904772	9.55047350773715	20.5127244	86.7993916	9.2772764	6.7971193
23.2636216222383	83.5954491265561	10.4703747241758	20.4274735	84.2677658	10.0950289	6.7799767
26.0848143010602	83.4546469603303	11.4520851117299	28.3264783	80.6515072	10.7169993	7.0901709
26.0848143010602	83.4546469603303	11.4520851117299	19.6994488	87.7215703	8.9292535	12.92719
28.828621801343	83.3177069911353	12.4068672304066	25.8819635	79.9487476	10.2285525	9.3875474
30.7477560118295	83.22192542456	13.0746819470547	32.0336769	81.0046037	12.2328895	2.6979108
33.6456067157584	86.179024203114	15.9403259906282	31.00496	87.5127119	14.2496673	15.7467648
33.6456067157584	86.179024203114	15.9403259906282	27.0999394	87.1794445	14.318048	15.3093219
35.0875029633142	87.6504007749438	17.366197029985	30.1525293	91.7059859	19.8161573	6.8413479
40.0098110417495	90.3576509987775	20.3667425762784	40.8799687	90.9919823	19.2349904	1.5621823
41.3949628980561	90.9692303038062	22.8145999180319	40.9379615	91.8870672	23.915222	1.5042087
46.0551789388436	88.0790754299998	22.617367659012	45.8972803	89.1189208	23.3584238	14.0274616
46.0551789388436	88.0790754299998	22.617367659012	44.680977	94.9895485	20.4805113	12.4233676
50.707452614464	85.1938462216183	22.4204715414259	40.3910959	90.932739	23.935083	16.8734606
55.8946436244348	81.9768740368465	22.2009363546711	56.1389342	85.561632	20.0765614	4.4417673
58.2259299971578	80.5310658139401	22.1022703543584	59.1397084	81.6064397	24.1713239	2.5044765
67.3105763975949	74.1024298833698	20.6979154152478	67.3900644	74.174693	20.6721334	0.1104763
69.3571060272454	70.2463330735287	20.6343914699013	50.8238583	67.1806384	20.6239323	19.5280512
74.1234341342626	61.2655578428028	20.4864454264561	69.6306367	57.4599551	14.1507992	8.6491765
74.1240647180419	61.2648117140786	20.48665909916	70.748982	60.565778	20.2126548	4.327335
74.4422880833877	60.8882787269531	20.5944887767617	74.3685871	61.179785	20.6768635	0.787426
74.4422880833877	60.8882787269531	20.5944887767617	73.7932186	65.1929118	21.2635249	5.5307734
79.0751096964602	55.4065625933812	22.1643158687097	79.155929	54.6404138	23.5670664	1.6003827

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
82.8073256877609	54.139460655062	16.9698051029752	79.80288	56.0883078	18.4129389	5.2865846
Route: 6 Length: 96.2970308042434 Demand Met: 1342						
83.7158849253881	36.6523210387375	13.3900643647425	76.8303918	30.6898889	19.4810071	15.6982902
83.7158849253881	36.6523210387375	13.3900643647425	75.8801773	29.7113355	20.1473913	15.8480612
78.6324362413156	30.6392450708173	19.4222347799373	78.2442809	33.2914556	24.7068001	5.9254971
78.6319636485562	30.6383661787726	19.4222996248109	78.3681704	28.4149174	19.0447715	15.9637623
76.8057434192789	27.2421000620027	19.6728769356025	77.5184606	26.3492827	20.0048231	1.1896541
76.0020393276389	26.9983842467379	19.5408112399844	71.3343578	25.5495623	21.1336705	6.1682291
74.638735790815	26.5849750893668	19.3167914405418	73.9542296	35.1681427	22.8323041	17.0431609
74.638735790815	26.5849750893668	19.3167914405418	70.2766166	21.7580017	19.3250026	9.1846004
73.1315336893323	26.1279300259385	19.0691260415643	62.1996928	26.9322785	20.2466983	11.912547
71.2380398141933	25.553745564079	18.7579846786314	71.2868972	13.7571779	21.261272	15.5198317
69.3629468629163	24.9851410112702	18.4498669792987	67.4654721	12.1137109	23.8276929	14.0781794
66.9712570340984	25.8706882598808	17.3115099133445	57.0336699	24.3925592	19.6603049	10.3178167
67.1766578706332	26.0970518456525	16.9942146912334	67.7860652	18.0440513	10.7235759	17.8951575
67.1766578706332	26.0970518456525	16.9942146912334	70.8086056	11.5809577	17.5154997	15.5821047
68.7311236019111	27.8101628673452	14.5929364984787	70.5957341	27.6007009	14.8208364	1.8901283
68.3182313075466	29.3403863162919	12.5056181728095	78.8734057	30.5074156	10.2492504	17.7741551
68.3182313075466	29.3403863162919	12.5056181728095	69.6772126	28.9703915	6.8785128	10.4491408
68.1539219152336	29.9493346753795	11.6749753861759	75.1791401	28.4357222	11.5456464	18.0653964
68.1539219152336	29.9493346753795	11.6749753861759	67.6344777	29.9025036	14.033884	17.8609779
67.825938167753	31.16487787809	10.0169001519095	62.0390375	27.7696953	8.7011853	7.3539199
67.5793808393505	32.0786459725169	8.77046461342997	66.7264937	28.6241638	4.754423	9.8453178
67.3489507350525	32.9326448332324	7.60555796372199	56.0727891	23.8686819	7.47443	15.5553362
67.1459547229156	33.6849699831276	6.57934047092539	51.5218465	39.5765057	8.1668107	17.6859637
66.67434619823	35.4328021262111	4.19519058460612	57.8811625	36.8910334	2.4827855	11.1609103
66.5481450769122	35.9005171167245	3.55719874623213	59.7400431	37.5401839	2.8523374	7.0381524
67.0907714665939	36.303831972465	2.85029700102877	57.9145816	37.4787407	0.4915272	9.8427718
67.0907714665939	36.303831972465	2.85029700102877	57.9600279	34.4089577	5.7051211	11.7355261
67.0913262029079	36.3042442882037	2.84957432312435	65.884583	36.2103636	0.6036001	2.551361
67.0913262029079	36.3042442882037	2.84957432312435	65.5339196	33.299582	2.2513726	4.4914809

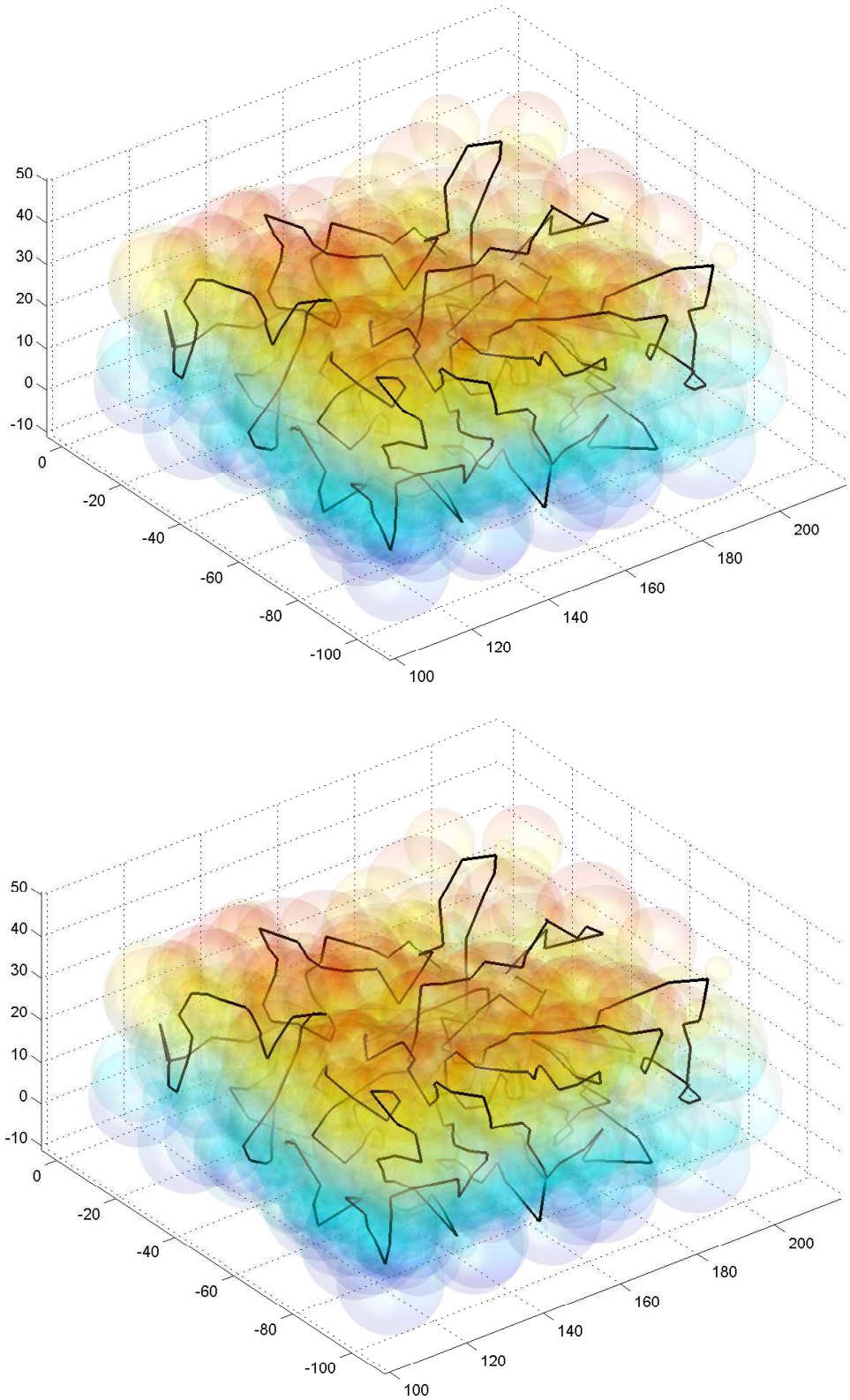


Figure O.97: *bonus*1000, arbitrary radius, 3D, Euclidean, Length = 2912.1509290

Table O-100: Solution for *bonus*1000, arbitrary radius, 3D, Euclidean

Total distance: 2912.15092896269 Total demand met: 25289 Depot: x 80 y 20 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 343.693027688183 Demand Met: 2993						
51.5976279318118	31.624321988787	6.53817304605044	51.19858704	31.0981292	6.058142298	0.816420237
45.4774922134542	35.1447586532815	8.78939592753436	44.21687698	34.39769027	11.89272829	3.557457265
40.1187677338785	38.2272148276982	10.7605422742513	38.78467609	39.06908374	12.83761672	2.608214338
37.8322956501288	39.5424438559275	11.6015952357152	39.58652985	43.55288071	14.45846769	5.227108341
35.203100383379	39.7702576555905	11.6724705976091	35.17250587	39.36136713	13.28284014	1.66175135
30.841950188001	40.1983294278499	11.5937483062345	29.90863496	38.4851443	12.83287597	2.311172422
29.1554584321065	41.5071693207728	10.7676713251576	25.40396983	32.32053998	7.877867709	11.43146897
28.2331486374031	42.2229485995433	10.3159057663405	25.99458773	34.37910238	4.84512326	11.0175516
26.9807647185485	43.1948893329263	9.7024633805074	28.54401437	40.13690379	8.087159098	5.278992328
25.8674815705506	44.0588777818054	9.15715530018256	25.73174612	44.02606181	8.459085063	0.711901016
24.0756544723787	46.0324308174941	10.9445162864498	23.73647568	45.21539639	11.53681715	5.188751838
22.498052001465	47.7700327035913	12.518186598219	20.72246404	50.29048837	10.84675569	3.507005939
22.2669003869443	47.6583332118757	14.9814596985611	26.567735	46.7768569	17.70634543	5.167125033
20.7867527700519	47.849843474288	15.8786966462888	17.93093151	43.30092715	17.11460176	5.511425972
20.0028264404371	49.7205596277612	16.5320482815728	26.97467166	54.66512134	21.38913798	11.66012717
19.1715955603736	51.7041606058991	17.2248251845065	27.13020332	56.00735022	18.32075531	9.113612959
19.1710487989784	51.7049482184311	17.2251092944783	21.56136042	60.00845368	9.387366518	11.66584778
17.6633961835032	52.6340217064806	18.706287936278	20.53092136	55.63617906	20.16527215	5.894866268
15.8748481313085	53.7361937579425	20.4634295692326	16.07158763	60.00636388	16.82852088	7.250262131
14.5776856786928	54.5052634670528	21.7541255438531	9.19676513100001	46.15569372	17.99642834	11.9809647
13.3679819158946	55.2224801271287	22.9577988176683	13.21771043	55.16074821	22.9111302	0.169027539
12.7725488906511	57.0195052942424	25.4285893857327	11.86612062	56.83051802	27.8782456	3.1512409
11.4579572628061	60.9869611455655	30.8835783728655	3.684518627	54.75346427	34.67646632	10.66155854
11.4578889264799	60.987637072953	30.8843121659652	3.390983182	60.32064994	30.61068338	8.156128877
11.3679395690486	61.8773429671514	31.8501852146522	8.07711459799999	60.52651503	33.72017469	4.01884632
11.3679707879295	61.8780692974301	31.8508718511702	14.06057656	63.93249207	34.35643485	5.381459732
11.3680020068109	61.8787956277086	31.8515584876882	17.25601024	61.69443137	35.1920429	6.772109512
10.44707616005	63.018279854128	32.3505769657884	18.97844246	66.0992932	30.20753751	9.320379407
9.97545261520412	63.601831279201	32.6061337669526	19.29354577	63.34226321	29.80733532	9.732805781
8.26669425656651	65.7161200719599	33.5320519593524	11.17807544	66.07771318	32.92555185	3.944211846
7.29100727503183	66.9233615990682	34.0607436387332	14.52745655	66.82146945	34.730647	9.209129847
6.58738152277081	67.7939750682684	34.4420145664865	9.964092428	69.02740379	34.44916177	10.49120227
5.98828520511228	68.5352516940499	34.7666445392961	14.35540419	64.70998039	34.26175056	9.721773775
5.65033843850931	68.9534015500194	34.9497664288338	5.020361565	69.58798476	32.44258164	2.661868193
4.75918209270719	70.0581353817564	35.4736246037691	1.09685186199999	69.20060768	38.65184391	4.924336954
6.31882621458043	77.0007553480674	32.8706630495391	8.675234817	76.17385221	29.29611493	4.360484441
6.3172446265519	77.0518136660586	32.8714637566416	1.696022601	79.3379408	35.04130759	6.739019376
6.26316228791903	78.7977512450299	32.898843908843	5.779054124	82.01317499	31.17715184	10.01915756
6.19748879733982	80.9178854508047	32.9320922899508	9.701793671	81.23141394	32.23008983	8.243525166
6.13201289164752	83.0316410391642	32.965240640284	7.936374341	83.63932008	31.96057141	7.056138248
6.06646902408266	85.1475906272951	32.998423397159	5.912402555	83.10767778	28.97692543	4.777473299
6.0011007309173	87.2578721473358	33.0315172661867	5.333729823	86.89695613	31.50319232	7.779774892
5.93707514416929	89.3248071579028	33.0639313666189	5.838459994	89.46110654	32.98505569	0.185805925
9.63301010631432	88.8832514291665	36.2173138903691	12.48771043	90.90107319	36.2773466	3.496358466
9.58870283269533	88.7022562560536	36.3671207169789	16.23739593	85.87006787	34.99641701	9.998633909
9.31723203880343	87.5932983019796	37.2849875815631	14.92906226	79.42060964	37.22040132	9.914113666
9.24258911580367	87.2883820271394	37.5373619331967	10.82142722	82.89323555	36.78865334	9.472743412
9.21618096548866	87.1805047562746	37.6266502348536	9.940095688	86.998178	38.16021851	0.917600499
7.97035521948311	86.1885929696862	37.9482432793429	10.08146406	81.46406963	37.62633094	5.184740001
6.70858518073118	85.9402918951217	38.2476167398089	7.992357197	82.08091397	36.27596397	4.51998708
4.60437054266559	85.5262079180533	38.746872545814	1.83782096500001	81.06813079	39.8464095	5.360711684
4.05619768959814	87.7674787093441	38.6109472871345	2.643010323	87.48230483	39.26134045	1.581592217
2.77348741574444	93.6039228249461	38.1951797722321	5.231683223	94.88567828	37.04813984	5.753061171
1.80265118172518	98.0213127396274	37.8805006304429	1.662890125	98.21483308	37.96621421	0.253633777
5.81722600463145	96.2987627395803	34.2823450081567	5.209294544	90.50333801	29.97691556	7.245222646
7.4104153967331	95.6151664663938	32.854412133187	12.03430063	87.78817585	32.36153594	9.339380238
9.06667444824617	94.9045086371916	31.3699516160234	10.35439985	93.61856888	31.55963283	1.829714932
7.85694352053125	98.5359747160184	26.7513152703072	7.810086676	100	26.21604958	1.559511127
7.56369688381467	96.6571383294873	26.3747360238764	11.04946885	95.30278919	26.87229799	11.15137795
7.27392622386017	94.8005725883663	26.0026205310837	8.980893435	92.30918249	24.9496481	10.59560796
6.69118856932843	91.0669621329058	25.254284900687	9.577914639	89.11916471	27.81169318	4.320583214
6.69074213726709	91.0661920732547	25.2538291523481	7.17818211399999	91.76838261	25.47562666	1.609117439
5.9340634449006	89.7609817765893	24.4813598725742	6.57919393199999	89.24907689	23.95110219	0.979496385
5.51639696122366	89.5787661409464	24.4488155002069	6.256438132	90.66257931	27.09179537	10.99795307
4.81636337532939	89.2733620209782	24.3942692184971	3.115821998	88.00026043	26.66042774	11.67905671
3.76441392954391	88.8144273337325	24.312301821492	0.539457489	84.81338557	26.32883597	5.520424731
3.80523771569118	90.6185862366837	22.7538088452682	3.553988961	91.38716753	22.96960314	0.836905203
4.45461710877598	90.2238080962951	20.9390427612955	1.72500424899999	93.73701725	20.97210735	6.881927737
5.01963767962906	89.8803143351545	19.3600271969769	4.961462551	81.51420623	19.50536364	9.226598726
5.11605344543284	89.8217001610522	19.0905821496027	2.88784862599999	89.80188387	16.96831616	3.077223153
7.47107494693047	89.3140724479375	18.1226807460533	5.793118726	87.72031575	18.95737877	2.544917974
7.95579357442361	89.2095907655521	17.9234639459733	9.921883095	86.8721598	22.00737941	5.099750684
11.7929879360256	88.8901529918248	15.0485942435696	11.28159713	86.83718755	19.13922705	7.508047868
13.6148265550255	88.7384890369343	13.6836520086691	15.06397637	86.4956065	14.41870487	2.769631739

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
14.8465974003158	89.8895375762842	11.6852812233726	21.61123904	90.19731465	15.12916055	9.443600344
16.5431385201181	91.4748983479495	8.93288760766302	19.55892343	94.48515334	9.227774263	8.137719702
17.7738797942153	92.6249847881033	6.93618715302115	17.25875189	95.69940805	8.290437664	3.398739413
20.1370396074786	94.6027264047571	3.0686800796678	20.42707279	96.69258649	1.544902576	2.602601065
20.6121805693016	93.0804651724557	3.38152327451353	22.06521104	97.80973943	1.986453498	10.44097889
20.6124729480121	93.0795284466934	3.38171578304758	26.20322759	94.45704722	0.043122659	10.10698797
21.5411284812991	90.1042928202308	3.99316288613366	23.92476676	88.85275247	0.073261016	4.755388035
21.631650827082	88.8214589542724	4.90628989280578	24.68088332	89.71453351	6.983081462	5.772547732
21.7194831549336	87.576746580313	5.79228184772377	21.4032788	88.65695382	8.541884	2.971051139
21.71958736242	87.575768497868	5.79246211289111	15.25088212	86.85170355	0.622562014	8.312417494
21.8093265317578	86.9887946462446	5.9226823262756	20.47481611	85.68176763	4.096992025	4.269604774
22.4532934877771	82.776678946674	6.85714065616651	24.57644237	79.57543571	13.43961074	7.621327433
22.4531127952511	82.7761434199055	6.85631569477908	19.29153506	80.52426775	7.949521468	5.162100755
22.4529321027247	82.775607893137	6.85549073339137	18.16441332	83.32201509	7.61422766	4.389263708
22.6693224320752	82.1614074009991	5.91719463908858	17.20155001	81.69531761	4.530646889	7.066943728
23.0054677493908	81.2072953568899	4.45962562717168	12.87616068	80.54131267	1.790579055	11.25097601
23.2864209918762	80.4098400341641	3.24137649823646	23.53960858	80.471438	3.12432842	0.285654541
22.0381714807453	78.6467535288911	1.98389965126607	22.95922483	75.83051285	0.740171728	9.548150341
20.8541414040945	76.9743735830063	0.791116962916574	21.04749508	76.84597788	0.391094884	0.462481096
19.2167831812825	76.0697389311866	1.2276296171157	16.93400358	77.9224885	0.924123088	2.955652193
17.9691692327563	72.6530009219827	2.35910562183736	21.60880813	73.64895737	1.318444959	8.789616797
16.6155370113666	68.9459193628579	3.58673086572097	16.29427026	68.63097998	5.127480774	1.605088602
16.238937071815	66.718110492291	1.28203706373384	15.77830732	66.19409337	0.808180704	0.843394073
19.2072493218551	68.1697956621178	2.28435292758534	20.75020952	68.82081849	3.659175109	6.986664743
22.391894037227	69.7272805609013	3.35971820248723	23.39691794	71.43920824	1.906907845	2.45996491
24.1991872143697	68.8229672145811	6.59595692391137	24.34494447	68.89894191	6.614252607	0.165384594
23.8237900300392	67.8563638129224	7.80538508631169	24.66562586	67.58605744	10.297776	8.251747258
22.8799008078632	65.4259605725134	10.8463407870764	19.17901123	72.48982593	17.20855307	10.20159412
22.7568655936698	64.6973880494143	11.3807280520806	26.6523776	66.91672378	14.68008016	7.970867369
22.6838755383964	64.2651658674113	11.6977507538487	22.58317288	64.23875961	11.9213097	0.246610864
24.0150599084504	62.1578035563952	9.66416612391322	22.84438078	60.01413405	11.39370551	9.832099483
24.9138964152627	60.7348795641254	8.29105797553491	25.84588775	61.17671521	8.212138725	1.034434548
25.7563618166266	56.6319223235364	5.06157958889868	25.6524776	56.5792119	5.011755882	0.126699333
31.5252434448081	53.8667981223696	3.26304386614078	31.12121771	52.61678334	1.82071962	1.950915934
32.9870896828717	53.7950717437456	3.49054335271654	34.15128455	57.37934974	2.952751483	3.806785854
34.8314924446233	53.7045749965019	3.77757811073082	33.45977848	51.47641849	1.316430254	7.198818879
37.1810077987025	53.5892945910634	4.14322090061734	35.40868681	49.33377596	1.880059691	6.467074744
39.2841169559819	53.4861042560791	4.47051678231744	37.58124673	53.7047325	1.291628295	6.278048118
41.8499760507551	53.3602088129174	4.86982801723471	43.40294282	59.60424206	0.51389979	9.536160415
44.0611295503968	53.2517172165525	5.21393827503295	45.47068469	56.96814934	6.687113785	4.238980951
47.883551275771	50.0236607302188	4.8017653917337	54.43373891	52.12894009	7.9067999	7.548403707
47.8842658527857	50.0229715160545	4.80164554380654	40.92420024	52.54921675	3.399585878	7.535927257
54.7679133462729	43.5878842259363	3.77246666353849	53.79810347	45.16180718	4.496135918	1.985311525
Route: 2 Length: 320.5492293903219 Demand Met: 2823						
70.3292681168909	45.8530652046874	4.31159422741239	63.41360315	44.69674786	5.219771375	7.070238855
68.7752300150657	50.007526512345	5.00444619717377	64.75792457	49.92103542	3.951957012	4.153788299
68.9036010888838	50.645574931444	5.20494091002577	67.10787364	49.80646667	13.82525922	8.845260172
70.8636868574632	58.1280151722707	5.07336028077824	70.94365949	58.14560753	5.076539278	0.08194644
66.1752153209612	63.8451006323571	4.68648896176247	65.33791464	63.72798066	4.706052333	0.84567857
68.5275615551234	69.3116146816766	4.23134365679729	69.12634406	69.4594231	3.844630021	0.727966519
66.4510854254153	72.120565643929	6.29578959753935	66.81087893	72.19337817	6.977880898	0.774597684
64.96158049311	73.3634499785109	6.341925576307	61.63608438	74.03409399	0.746346368	7.121975094
63.905977167628	74.2442747525594	6.37462187172405	61.14896118	72.70410502	7.635652533	3.400508534
63.0188646016073	78.1698578987384	5.42706621116895	63.68037897	79.29990004	5.705664659	1.33873582
58.6498501460476	77.4334557418653	2.87744186068477	58.21523833	76.77458472	1.682398914	1.432175303
55.9841206449254	80.9826292818376	7.74962582226192	55.73082902	81.05870461	7.770192012	0.265267923
61.826707470309	82.5318039226716	12.8718424618208	61.67834468	82.51967341	13.24261796	0.399541158
68.2039810388862	83.9375783764512	13.2133769059599	69.09548968	84.07624055	12.89569188	0.956524245
66.4521414866642	83.8139596932064	14.7778173021241	68.11557125	90.29313921	19.6765572	9.036263761
61.1060175386394	83.4367107574584	19.5520512653231	59.01602486	86.99268685	19.95901958	4.144714535
61.1055619736653	83.4360905346664	19.5526898451866	58.40265516	82.89286098	16.95320583	3.789211097
61.1053467201914	83.4355472057469	19.5535013004396	55.99099974	83.60147673	17.9737132	11.10984141
60.7164339912297	82.4538791591454	21.019610652912	60.70093329	80.64454551	19.95511414	3.209176581
60.7162187379862	82.453335830254	21.020422108245	61.30013954	82.69641043	22.92622968	3.087682485
59.5420916670785	79.4896820663408	25.4466017263042	68.84275879	76.03221479	29.69910657	10.79538264
58.133264412245	78.8367216988391	26.5200032888041	58.81674593	76.2826012	22.48412381	7.335997979
56.7377665920547	78.189939310572	27.5832488221943	55.58088554	76.52999392	28.31600672	3.50422197
55.5243938546438	77.6275678568502	28.507731205909	59.09181099	73.44789922	33.41304482	8.247004523
55.3533548721416	77.5482950660798	28.6380477388887	56.76810138	74.93595817	28.17323894	10.01955077
55.3526085451791	77.5479491605041	28.6386163735673	58.20433528	69.50520456	29.55764241	8.582697416
54.0052763663497	77.404685370219	29.5062919297697	55.90538334	73.56581582	30.52666899	5.910476566
52.7841480734481	77.2748410319403	30.2926927317634	52.40986372	76.90026657	30.53428803	0.582033584
53.1979753963523	79.1188289243775	30.0231899403603	53.61605765	80.93460352	33.38542247	4.795394132
53.867268229996	82.1011543378472	29.5873167025946	56.64479831	82.24679775	31.938846	3.64219376
53.8783636413712	82.3384377319658	29.516195215289	51.91564321	83.24154723	26.19545671	4.641150631
54.0317473135947	85.6186577127143	28.5330073660441	55.11001594	85.68607737	27.25029831	1.677066237
53.8161158343918	86.2405449698272	28.633970195979	52.83415121	85.50123146	31.48102764	6.270496768
53.3520934386397	87.5787991352043	28.8512347717765	49.21219028	82.18677234	33.0110742	11.80432558
52.8837590792176	88.9294902049409	29.0705187230598	54.48965648	89.30641789	34.42411824	9.13140765
52.4292493687614	90.2403109814224	29.2833299678603	48.45592928	88.4082341	31.5542414	6.862006444

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
51.9661983256361	91.5757658607142	29.5001408445125	53.27314218	89.6748569	31.66096453	11.35118685
51.4856477349538	92.9616905148055	29.725145609712	51.95218378	92.57992082	30.72068519	2.064617824
50.9710023452798	94.4459454386246	29.9661144758583	48.69087386	94.64188777	30.6210566	2.380405111
51.1140118692045	94.6940649882931	29.9418800786843	53.29556121	92.47449182	25.90682802	6.766260463
52.3308576181385	96.8052758433218	29.735673390349	57.58318464	98.55697919	27.3972425	7.09566511
53.1956746295533	98.3057224543976	29.5891215936132	52.60387814	98.51053443	27.61605738	2.070061212
53.8106426895876	99.3389860469386	29.5416405698641	54.29998953	99.89190946	28.80232628	1.044878103
53.3821817678214	99.5856291983374	32.0928332200442	57.84005051	97.24933499	35.2604133	10.98084378
53.2806939440434	99.6440505826249	32.6971237122869	53.69991452	99.81161169	33.42740223	0.858562362
52.0331246869527	99.3635139494079	32.244963710932	52.71570498	99.46690315	35.19170787	5.481309266
49.7474209032563	98.8495350320133	31.4165500199791	48.82360524	98.37839062	35.9745595	7.220914682
48.3311912681337	98.531072064736	30.9032623741165	48.39934621	99.02729511	30.05026749	0.989182834
47.3569144227022	98.190249625876	30.7723431290809	47.31578899	98.13704672	24.13193979	11.87713881
45.9463886004147	97.6968180169524	30.5828025774844	45.34071838	99.2752365	24.31073394	6.545950484
44.5904738677185	97.222490676333	30.4006004742745	44.56970667	97.22856143	30.36827838	0.038895351
43.9737623400188	96.3292872736854	31.8179701789976	39.86881125	93.47781189	29.627917	5.895861926
43.6127185448919	95.8063756632394	32.6477460553521	45.13861135	90.47060332	31.83589749	6.162353189
43.2833586524629	95.3293529681993	33.4047041379776	45.01212749	95.47966426	34.75016178	8.619068903
43.0107084222627	94.9344648141028	34.0313280849033	43.63164404	99.67485887	36.08960829	11.34349589
42.5801262015514	94.3108385764394	35.0209220428116	43.04035221	95.37042711	39.63020675	9.4350131
42.2495235449381	93.8320158128353	35.7807362543772	42.53215273	92.92397176	36.17653823	1.03008857
39.4499681475244	96.4130106601987	36.949381043631	39.44288188	96.38027853	38.94704805	1.997947716
38.8881314968608	96.9399728989348	36.7273253231738	35.92075185	99.04269187	36.73360907	5.09129157
37.1503086627047	98.5699249285209	36.0404826795986	36.49499514	99.8776323	35.60714208	1.525555131
37.4191499790822	96.2132678133294	36.6761187798346	37.83606476	96.13365876	36.97541326	0.51935799
36.9095222324021	95.3674596530332	36.4913543590085	35.60188133	93.1465045	36.33325574	7.692381008
36.2298590533516	94.2394506782647	36.2449441667083	34.28587406	93.01320732	33.5082721	5.515074689
35.2650210846305	92.6381489067262	35.8951448064389	31.89808649	95.62749105	29.09944527	8.151929048
34.9012871606839	91.9449543466925	35.8214601272462	36.79414467	92.2553405	34.07762876	5.623371076
34.2958055124615	90.7910435943234	35.6988026507206	37.64776281	91.60925844	32.09349115	7.287109974
33.6885630975579	89.6337772854886	35.575788522565	39.57638463	86.69599702	34.69521123	10.21132869
33.0835491495914	88.4807578511816	35.4532259654721	34.03327785	85.06694553	30.01520061	9.82794583
32.4803521908181	87.3312011475773	35.3310316637254	32.33676606	89.56266763	36.70990188	6.977995049
31.8738913742235	86.175424205535	35.2081760961482	31.92346769	85.96439053	34.03343791	5.672562244
31.7383088844924	85.9170346540972	35.1807100675831	30.78074407	88.67743671	34.14412331	9.308222123
31.737846288736	85.9161530513854	35.1806163561925	30.96168192	84.99460949	29.50639116	5.800733164
30.1521807347721	82.6611243615132	37.1655975404087	32.21271953	85.45061531	28.67707968	9.951664756
29.7429803610996	81.8211244425047	37.6778461810293	29.49613778	81.77737157	38.35679407	0.723751207
29.7910223334287	81.0681730061839	36.9372323574416	25.47356848	81.94258519	37.44485814	6.220239291
30.0090965903264	77.65034221684	33.5754050517336	29.81370195	76.77877617	33.99746475	0.987897175
30.0961734296518	77.5757099194821	33.082445277599	33.57300136	70.51852673	38.6296637	11.82127081
30.7353700256596	77.0278638105404	29.4638227630722	29.7776223	79.3796747	28.90759999	3.220365403
30.8858235911652	76.8989122408361	28.6120741940528	38.57181853	69.29967661	29.47346952	10.842735
30.8776934289419	76.9118380372447	28.3967939312004	35.96077646	77.38727187	28.20511129	5.108866084
30.8336245875697	76.9651573588006	27.4936365848385	32.43971284	75.52883521	28.48064207	2.656140818
30.8132199940597	76.9898450372024	27.0754600898436	29.09610379	74.18683092	25.64666307	3.584248474
31.9460818947057	79.3438041084057	24.5268934907108	30.01509861	69.93828769	21.72402497	10.72586107
32.0124957118551	79.4818045810993	24.3774842076994	31.54519137	79.16359507	27.34637643	3.505835342
32.7357301282968	80.9846050472354	22.750443980531	32.56942546	80.98884638	22.4278796	0.362936649
33.9974744402684	82.0424875814768	23.0266753063262	32.77989789	83.25231939	22.10896744	4.247864371
35.8782255229023	83.6193632114525	23.4384247350743	33.91919319	90.52236574	22.93790886	7.193036058
35.8840660403965	83.6186616501923	23.4397503146444	36.43143728	90.48214242	22.55722277	6.954373264
36.6960325472009	83.5211276787648	23.6240366253552	41.14116704	94.61634345	23.98672915	11.9580341
38.0244508067294	82.5001984534205	23.9734008319513	40.16683897	89.097423	24.82067356	10.1742901
38.3055874553731	82.2841365834913	24.047337715615	38.78697828	81.20736169	22.75217398	1.751750667
40.2152180105458	82.040074215907	27.0107415208952	40.55838899	87.88304878	23.6255072	7.94496914
41.1821252861903	81.9164977840807	28.5112068693014	41.14833132	82.10595877	30.01446557	1.515527703
42.5898721446982	81.2527072797171	26.6299186746621	40.76978451	74.94346594	30.5932008	8.186468819
43.635488869614	80.759671181347	25.2325754373616	44.66930475	80.79724102	25.59577081	1.096402137
43.7432983496074	80.1351655425381	23.182132914614	43.12816365	79.63219046	23.15451647	0.795070626
44.5989717125788	79.9640143205745	20.7091694647949	44.56064253	79.77318093	20.51948675	0.271783078
45.4535177710599	81.3975789535148	20.6680817019982	45.13867401	81.86371268	20.6390675	0.563248674
47.340155813232	81.6915990412965	20.7048542534447	49.77274656	84.13753559	18.23448828	4.242971999
48.0937069489896	79.9146699431085	23.0272235631506	49.62844822	78.65994225	20.1083463	3.895592856
48.8106835151872	78.2239860611844	25.2368741136504	46.93472918	83.75304242	25.57195373	7.122281837
48.8759254546009	78.0701407009037	25.4379433139096	50.20394782	81.95454381	24.2461412	5.63710621
49.1696403219946	77.377539055782	26.3431435685273	49.13669956	77.10708156	27.62901252	1.314416719
50.6837309739759	76.1809179820764	21.5496508157896	50.78444002	76.12504454	23.00978791	8.918500215
51.6316721827294	75.4317375301131	18.5485422209466	51.90516717	74.10528304	22.83711571	4.497348507
52.4114839114614	74.815433502556	16.0797181152753	52.24575767	74.98560476	14.55357765	1.544515511
53.7377105816737	73.6461041446158	18.2217473381827	51.91696279	73.69595809	14.416915	5.533020939
54.9241639943017	72.6000122698879	20.1380245890627	57.06276587	74.98770524	20.67544591	9.477514768
55.7262562606736	71.8928102489463	21.4335083903856	55.72002047	71.91921816	21.5952445	0.163996439
59.1539127099911	67.7555342216122	17.8071031994323	57.97334153	65.39941546	18.27090119	9.414607276
61.9857718513082	64.3374033213188	14.8110435065635	61.64088805	64.72462094	13.53456764	1.377778269
65.4167605735426	60.2434081190681	13.8521545961375	65.09617026	64.32634731	13.59892336	6.924546531
70.213826794022	54.519354186117	12.5114754947683	68.52022941	55.69012612	11.12241046	6.004927032
72.2342179141453	52.1085422279165	11.946819334987	71.85259834	57.85616299	9.805797889	6.145303146
76.9650084145262	46.4635745795872	10.624665817374	77.77449926	46.72256252	10.92269156	0.900649502
Route: 3 Length: 328.662499699186 Demand Met: 3000						

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
73.8813678229018	31.7346938549725	9.30607176838538	75.00767938	29.50135545	13.77877729	5.124594895
69.5279804098175	40.1141033958882	13.3751379017014	69.67922342	40.74675918	12.58912096	1.020269779
67.8868591577819	42.3914432970811	15.5242272073671	73.13866372	41.71405139	17.04301109	6.333819835
67.6013924805563	42.7875777671835	15.8980529922916	64.47235297	44.07915445	14.05919317	7.777532307
65.1674287064515	46.1651246008079	19.0853901302553	63.21772914	46.4808445	18.00555738	2.251010045
64.9960571785157	47.0309486864447	20.2645158103076	64.66140077	51.58253517	18.71344865	4.820243123
64.6780878256845	47.07738985454	24.5537908919869	71.99750065	50.82091856	33.04720741	11.82057255
62.461883816337	46.0624346657907	24.6230254011198	63.54041364	40.47906672	32.95919177	10.09103037
58.4392107455947	45.0254589584908	23.6396248291218	63.12520069	41.24941139	24.07122315	6.279661735
55.744719010273	44.3308654362997	22.9809174550999	58.48548965	38.49282405	23.12403661	11.79894595
55.7437767098454	44.3306225275382	22.9806870961668	58.14893689	37.55022655	17.10511358	9.288752836
50.2038557671642	43.6120882897257	22.246107917444	49.90577559	41.072269	23.3893886	2.801182703
49.9109608219244	43.6662952983544	22.1636711185911	51.65508094	43.85648581	22.32830057	1.762166358
47.6293972857372	44.0885516116695	21.5215132800053	47.65008175	45.51867646	25.16647853	10.88958897
45.3916717888788	44.5026946799307	20.891693831082	45.78512338	48.76667443	13.05604142	10.70444172
43.142460580289	44.9189634414482	20.2586416246247	43.11381093	45.00092033	20.21315796	0.098012743
39.1334346571303	40.1912626473947	21.8003772686005	37.51752459	33.09106605	16.01141602	9.30247437
39.1328980567527	40.1911390557228	21.8012120051657	38.90241804	39.45548462	22.15074575	0.84645279
38.4433198543836	44.6067697555563	22.9342469704259	40.57741767	42.47262	24.8981708	3.80870253
37.9419584780854	47.8171758374868	23.7580254547654	39.96945525	49.46230999	23.88525166	2.614076519
35.7664165848492	48.5949748785455	24.2227796454871	33.45872958	53.85918585	23.94292918	6.545746658
33.3399367899659	49.4624893735275	24.7411406804068	32.83493269	54.50530143	23.93617923	5.131563652
30.6752464871619	50.4151688517609	25.3103899300331	28.72359173	49.06807614	23.44175989	3.019170961
28.4525395616039	53.1821168205295	27.9896723610621	28.94274384	52.01860718	30.54475385	4.898024634
26.8385678029567	55.1912777439027	29.9351767866283	23.29263587	57.34435722	30.94445508	5.760491154
25.4381703143786	56.9345696545013	31.62323575951	22.06521443	57.50548607	32.39286042	6.030659205
23.9590013260548	58.7759206651275	33.4062470127877	24.05460087	58.82740751	33.73414623	0.345409995
23.1644783269548	59.2431722944879	33.00771572112	20.97945435	58.66863495	34.56781671	2.745603401
21.7196632284105	62.0750106689737	29.451737840886	21.30645349	61.8915326	27.89064267	1.625246019
22.0876995128386	66.2810348979872	33.0564468889406	25.20403775	63.98638021	32.83153178	4.126692706
22.4171033936755	70.0455570556104	36.2827733443595	21.2618816	68.31108552	38.60957073	3.123606085
22.746382170274	72.8270609355313	38.3402169763691	22.68191696	72.90808337	38.77088424	0.442938698
23.3989448689582	74.0009036009742	36.6373511510645	23.86908483	73.83689183	36.6939804	0.501137023
23.9973990908574	75.2239723289882	34.8893884802274	25.63863856	75.55318582	34.2564448	1.789599458
22.921788139569	75.6151330249152	34.4694102801734	25.39416892	74.01493111	32.17996221	4.846769394
22.4184325390876	75.7981851686398	34.2728723250918	24.67927032	81.21698222	36.79859251	7.738446369
22.4184325390876	75.7981851686398	34.2728723250918	27.46499326	78.56518576	33.59652638	6.680683032
21.4271284301821	76.158686136738	33.8858119720946	21.16552744	75.92926841	33.87335876	0.348170438
20.786597343999	79.3806612330337	32.8096890632356	18.46683587	77.29301103	30.42019724	4.716670657
20.786597343999	79.3806612330337	32.8096890632356	18.31523717	76.27495825	29.81755027	7.153261702
20.4660396604949	80.9931180474214	32.271136944372	22.96398221	79.24584246	32.40861489	5.253467184
19.9496888601219	83.5904462308748	31.40364288921	17.38954679	82.23173111	30.2609052	4.9464631
19.4362534845037	86.1731089708433	30.5410470550662	18.85500198	86.61471751	28.9549492	1.746017703
20.0509293781417	88.1257438288487	32.8125603972249	20.75129811	88.7330358	32.51930493	0.972274996
19.4907791182552	88.6424847748152	34.832816026573	20.16675465	86.45561332	33.59426088	5.662375247
19.1707763450121	88.9376886804744	35.9869481332308	22.46431132	85.87828698	39.40664672	5.64815455
16.7693769541335	91.1616387506121	38.3775851946293	14.30638295	91.72702037	37.41288443	2.704929464
17.0005514136743	91.550746276142	39.3487243501941	16.85080568	91.45389056	39.93862668	0.616270698
18.7118389144351	93.3126474665452	37.7523712048401	16.10416337	94.62212285	35.78598723	7.114799892
18.8840389871368	93.4899405923768	37.5917365219472	18.21730526	92.48725442	38.15120003	1.5701409
19.234910689231	93.851189803022	37.2644302485553	18.65944439	93.90622028	36.26618878	1.153549238
21.942779893675	95.8380888466016	36.6374861101231	22.00240146	99.12603644	39.9893956	7.885601786
24.5516672573073	97.7523599909468	36.0334589009082	25.64004891	98.33585155	37.39052093	1.834844509
24.9771631610076	98.3582257992685	33.7383276034375	25.35918107	97.93925835	33.70510702	0.894739291
25.3771256239116	98.927734446946	31.5809240275109	27.50072899	99.76767751	31.96071673	2.315046026
25.3755534107758	99.1507768337894	30.3685892956172	25.34553204	99.20543489	30.35671629	0.063480344
26.1539967080309	98.1671617393828	28.2899606666102	23.65267964	99.40598609	29.7230242	5.864138835
26.2212387609783	98.0821969251838	28.1104084172289	21.53298817	97.76613815	23.69582939	6.447332374
29.7389382967027	96.5798374027331	26.7022979336898	28.69202489	99.34571575	27.8214658	3.476487599
30.6362693729427	96.1965999916686	26.3431026156259	30.08845088	94.04600611	25.46859145	2.38535719
32.9825499529199	96.4391760613573	25.9748199541738	30.18341718	92.15484297	29.45540328	6.43104448
35.4384511694674	96.6930854499123	25.5893308613598	35.84999591	97.26233792	26.33021041	1.02094072
36.0071129420408	96.4693727497284	25.0680418454201	36.86677729	93.06343809	25.83290646	3.595056547
37.2103278214825	97.0649874230939	23.4239448990011	37.35558564	97.30806318	23.47070651	0.287005759
37.457619120471	96.4693338901449	22.0572276544579	36.31961338	94.1541845	22.11569666	11.14531248
37.6735302993732	95.9492660081668	20.8639404429137	39.84944538	96.227912	20.60442108	4.047622309
38.0054502911924	95.1497662044797	19.0295013031336	36.26720319	91.81523904	18.88940672	3.763004237
38.2414651941298	95.2291568757843	18.5646871963684	32.87814817	90.10176773	12.94837243	9.598818493
38.8193426434944	95.4235432528935	17.4265997619873	33.84742868	94.52834747	10.85109907	8.71001742
39.5741180877791	95.6774345631538	15.9401246413132	37.87107476	99.67477247	15.46291348	5.142647072
39.6763038814819	95.7118078090631	15.7388772179245	37.35140359	99.57591236	15.11952707	4.551929256
39.6767514618647	95.7119583661846	15.7379957394199	44.53236455	98.59505273	17.96036731	8.99567986
41.3362712592103	96.2701868871409	12.4696932897944	41.23951851	98.4925435	12.0504117	2.263631388
43.4304148714656	94.3969007241354	9.04256297723481	36.90788531	88.78292268	9.064555312	8.871911482
44.0102795945763	93.8781911140604	8.09359647206449	43.91518159	93.39792889	6.973666169	1.222268104
44.0108825180994	93.8784268793605	8.09435863867917	47.96746082	95.14523251	6.669541987	8.805162658
45.2238790632554	94.3527531504757	9.62772964326429	48.86252985	99.44183304	4.964951227	10.4064769
45.8632584536203	94.6027739154247	10.4359807690593	45.33430047	93.58613905	11.44191552	5.098588574
46.4047799716954	94.8145287390974	11.1205279813548	46.20732106	94.82215894	11.38854737	0.332990442
47.6568473511913	95.1214751896344	11.5888961256949	46.02083433	88.3362158	14.03418258	9.025977842

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
48.7446263645986	95.3881461453753	11.995807963657	50.67630959	98.08417141	16.59101162	8.634086059
50.0185815392482	95.7004582026504	12.4723638247885	49.03663551	90.65504513	13.8830876	8.507710049
50.6266577354103	95.8495289190411	12.6998303872226	54.10050901	92.28618361	12.05829408	9.480891031
51.4042497989988	96.0401567030018	12.9907086751284	54.90972966	93.30800556	12.19693664	7.380299806
52.2510039261726	96.2477397537296	13.3074588085676	52.2623599	99.83573023	14.38314162	3.745784047
54.0165449786713	95.5111706748858	13.6184329557077	54.09260921	96.04789718	12.52208915	7.918650854
55.4171133667573	94.9268648142312	13.865122441666	54.43632749	91.92787857	15.4166252	10.0796961
58.0746502265878	93.8181622618524	14.3332081673012	57.53422575	91.73216299	13.63995038	2.263638208
58.7549513092613	93.6564922246243	14.4846373546732	62.61309781	94.29391595	17.98130243	5.245785935
58.3325977213474	92.9262460165364	12.9809410896215	64.64609008	95.09261932	13.24961232	9.659748021
57.7150329699841	91.8584816572407	10.7822391717592	57.43254842	97.94119843	9.821238574	10.09429194
57.7147880087003	91.8580581211437	10.7813670415258	53.26472651	92.17526811	13.38443287	6.470026475
56.6859030190387	90.0791238428401	7.11824997978253	51.98537923	93.03310405	5.658677856	10.9895755
56.4814791242823	89.7256769095669	6.39044478137265	56.30399813	89.72916428	6.343295144	0.18367023
57.5410552928232	88.9840129695399	5.31378866619561	53.87450626	88.16447802	6.291517338	7.742268204
58.3522878746723	88.4161803703853	4.48947946733957	55.75342338	84.56592915	0.703415223	5.992730061
59.7940954138858	88.5497941948329	4.31994470302005	62.03157877	81.16617953	8.458189727	8.754951123
64.5307367985449	90.0559021932498	3.14423467301345	58.00620671	94.64720593	1.304858734	11.42342539
65.0771901691278	90.2296577632537	3.00859627478498	62.35255518	88.46202983	5.064300638	4.962229956
66.7443892082399	90.7597764214703	2.5947712342075	61.09603132	95.38804721	2.385400865	8.526033691
68.736549557446	91.3932230065451	2.1002858700668	70.07355989	96.61021246	6.954740599	7.658895206
70.2136008128701	91.8628803421887	1.73365839491433	71.17046416	92.96230041	3.31475723	4.264714687
72.4102329927763	92.5613425676438	1.18841936467397	73.04972269	93.68364053	0.740152131	1.367275869
73.4710469202764	88.1297295616732	2.4276478278686	67.89989075	88.12316705	3.528198384	7.944934507
74.0940900263643	85.5269301175796	3.15547837985136	77.11333094	85.3156461	2.683835286	3.063152598
71.9263447571671	77.9795643097556	5.97650153085878	74.46580568	79.0435318	1.384862598	7.178734541
69.9844067877288	71.2183842323523	8.50366740130954	65.55566867	66.58332744	7.127202217	6.556838353
70.9145250960225	71.4021606840862	9.31556059547743	70.36283848	70.39401036	9.239076068	6.760808749
72.9674601047331	71.8077876927004	11.1075519180554	68.36889636	72.61479797	11.90493723	6.100291297
73.136267429261	71.841141313819	11.2549025383187	73.75840634	73.11670598	12.48249331	1.876459737
74.7380522087127	65.6265458447121	8.77440492815797	72.70378804	66.70645397	9.083647724	3.620764964
76.1555931817522	60.1267787606325	6.57922431839374	75.75634139	60.02200009	5.726434896	0.947433566
79.7004220677353	54.3253623898417	8.16294930195199	79.86750899	54.35421653	8.27403967	0.202710806
78.9466292053027	50.5911466047984	7.22733646188701	78.92131522	50.41345477	7.556720976	0.375112442
78.593559819385	49.0007917279527	5.69391144465356	84.14082278	54.46253046	0.380513445	9.425227564
77.6383784251639	44.6983176540954	1.54545560824206	77.14427045	45.25079579	0.327384457	1.425858377
Route: 4 Length: 345.91072897385 Demand Met: 2994						
75.4709696986966	15.1866111298343	1.07823343808819	76.68650337	13.86956158	1.8774276	1.962359022
67.6851057640172	10.1070963037247	1.59861593331741	72.1570689	9.179080442	1.515121588	9.589007965
62.4544843967615	6.69462724848488	1.948214120491	63.24920239	4.015695007	1.646238652	2.810594924
42.5884787098743	6.36519042012831	4.25909938384416	42.34346606	5.769949569	4.366098536	0.652527155
36.888299261525	12.3824300423174	4.11062663300442	34.15723352	12.84614068	2.236297964	4.597761329
30.4131119193702	19.2177857528308	3.94196712991997	30.90434674	20.96780911	4.645040707	1.948898626
27.9787463658183	18.897359438784	2.99913683151277	24.09498187	20.3828805	2.129534364	10.45340098
24.2998203453248	18.413116165015	1.57428825634742	24.23492671	17.98856994	0.400117348	1.250251176
20.8387312647959	19.071023407573	3.30931976329936	21.65865806	17.99154884	8.745957007	8.718780186
18.578464589671	19.5006702338485	4.44238355376481	12.63680518	12.91935497	10.56277797	10.77386908
16.880125549187	28.3344206467259	1.82585049015627	16.76117492	28.31246812	1.562447455	0.289848796
17.0550818277367	34.1602549611479	2.93800561675698	9.320660383	27.08555662	0.10230943	10.8588123
17.4079280195645	45.909601893423	5.18096219932638	17.80089583	46.64512233	2.63462135	2.679415185
17.4126381990734	49.0181966838773	6.41655895582596	18.13426387	49.15791018	7.430088572	1.2520007
17.4121744395299	49.0190359049548	6.41627499267908	16.47526591	49.4455512	6.794569926	9.818184126
17.1316578973096	49.5266598301471	6.24451276828843	20.16713628	56.2637712	6.937664837	7.589009856
16.5281944071504	50.6186899129086	5.87500793313457	16.54761864	53.09785344	0.161381972	6.228334506
16.4730351080838	50.7185064038091	5.8412335314689	18.80954314	50.67936902	11.76647286	11.57690137
16.3010115236934	51.0298009532769	5.7359023748594	13.89109091	56.92730438	11.2581209	9.141496171
14.9414451774481	53.4900773456244	4.90343119275652	10.83705181	59.65376627	0.709551762	8.510330825
14.7006556778112	53.9258109215534	4.75599424350794	13.17908278	60.05355856	0.206865651	7.781969298
14.6999160584102	53.9262559799274	4.75649910604864	17.45311026	57.02027397	2.53786626	4.698442012
13.1720070734634	53.2601209245215	5.91268944611084	10.20301226	47.6234059	3.00365475	9.015245558
11.5640368016746	52.5590808191302	7.12946332741202	8.91589750200001	48.83105962	4.105846181	5.482065711
10.5044967807915	52.6513396381232	9.01389340519112	9.89102482200001	52.16610985	9.967821485	9.993987041
9.62083654577954	52.7282838110564	10.5855148769937	10.84189087	50.74783931	12.90312929	3.28397178
7.97280585114601	53.8377767874817	11.2026437724889	11.99216143	50.52822644	12.13005328	8.464820885
7.01893712290919	54.4799436271913	11.5598336511458	8.078510661	52.12465727	17.30721805	11.74516273
5.52389880649818	55.4864387042416	12.1196722960759	3.200690229	54.90401263	9.791910202	3.339909369
4.15327637243524	57.4093904645598	14.1230062105618	0.715064701000003	54.34039001	17.34040242	5.620649576
3.89476258754804	60.7702078714163	15.1876320324725	3.16457285600001	61.67055704	18.73530868	3.732266773
3.89489681475055	60.7709029493881	15.1869257395646	4.692804385	58.08052349	25.21182896	11.75765381
4.12749369575238	61.9753756834141	13.9630192805134	10.63863267	61.64507704	12.52958841	8.169031835
4.39513438662216	63.3613180867438	12.5547153037581	11.71156616	63.23151575	10.39694521	10.95254356
4.62002058284615	64.5258623104784	11.3713815679884	3.336609071	66.34370608	12.08281041	10.13002568
4.96071261494382	66.2900918186886	9.57868693298639	0.793870075000001	65.00803843	8.045595465	9.318627115
5.23711565403217	67.7214090350693	8.12427603961049	6.334374787	68.85467086	8.438723386	1.608457989
4.78267790371598	67.7895330725362	7.27468166268988	6.04179221699999	70.01715429	8.958731963	11.62482668
3.22361018555991	68.0232499046952	4.35992648536129	1.28261934699999	62.39268391	2.604217434	6.209124989
3.05692301003853	68.449351627318	3.92141809773308	2.781332517	68.35625636	3.710000307	5.523577876
2.8514549613448	68.9745887689033	3.38088779200086	2.885089549	70.78781924	5.964704064	11.83875801
2.60971868595485	69.5925382044261	2.74494571729457	2.881941531	70.78732912	3.789169139	7.680996283
2.31964165899517	70.334060919367	1.98183233562575	2.82031094	66.9400554	1.18723785	6.180554629

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.00045245118599	71.1500029774776	1.14213279072333	1.834626902	71.15202574	0.775939504	0.401994686
2.45962790447317	72.0240424880993	2.01007635769087	1.825477279	70.78130479	1.056192161	2.330446868
3.02831892220109	73.1065446646209	3.08502868068618	4.297539438	80.73294711	0.059971047	11.22405457
3.50898276670146	74.0214871997323	3.99358995896587	8.595205897	76.73972439	1.498449057	10.65699304
4.43076128805808	75.776090716097	5.735956146951	3.252339284	73.9521337	6.052632886	4.320781181
5.07254033096331	76.9977157508163	6.94906095324114	3.10003410199999	78.61964126	7.805263196	6.829391359
6.19186017180671	79.1283386959479	9.06482397526168	5.724809855	81.80721271	6.405774196	6.479054365
6.27361489164096	79.2839586303714	9.2193585539504	5.04273939700001	78.40053531	10.86923314	10.26257011
6.64233218123052	79.985811196243	9.91631614254972	9.360499311	76.63383999	11.96842635	9.675555003
6.64268147636385	79.98647607886	9.91697638797044	12.63857375	82.42671014	11.06948651	6.575237335
1.50505367078065	80.9039020810679	12.3428468793071	1.45195925500001	80.87244268	12.37991353	0.071990607
2.27611427423695	83.1550097099065	11.2787869563125	3.437419026	82.39656928	11.4164042	1.58437925
3.13578269839707	85.6648073078599	10.0924488175101	3.319354366	86.8534104	10.89284525	1.444683466
3.2415756155972	85.6678817240478	9.45276386391826	5.902742913	84.57417463	9.395938461	10.96205759
3.66476494911035	85.6801800870453	6.89391738590542	0.848777487999996	80.80421078	5.669295757	10.36784038
3.66492811378491	85.6801848287731	6.89293079845113	0.773453591000006	79.81662315	5.077053724	6.785233233
4.05730751805413	86.0826667785831	5.82629627250747	3.10551266100001	84.71082736	3.992777578	5.063715926
4.12271584685587	86.1497591704466	5.64849186893381	4.377655918	84.98459142	5.210127271	1.270737521
4.60875022775485	86.8828483078673	4.2854026465116	6.810206318	85.20186256	2.844617135	3.122176307
4.44647546230127	87.5535620796232	3.87412801472354	4.724328509	85.88211036	2.778795893	10.66842937
4.44627345932818	87.5543969979118	3.8736160515895	6.35930977699999	87.06467249	1.39262333	5.433004527
4.44585654649526	87.5561201810495	3.87255941382459	12.45480817	85.29988604	5.441763796	8.467366828
3.71387278162327	90.5815543429402	2.01739498573567	8.842438164	89.89183088	2.824200169	9.248878075
3.33581812639736	92.1441287888577	1.05924068646106	3.298576907	92.26869515	0.703140302	0.379092562
3.31783946749812	92.2618555521674	1.40071041211908	0.846436707999999	97.15575264	0.271481864	11.19775474
3.1700092993924	93.2298718364929	4.20846725913368	8.37640356200001	96.83801393	4.582503625	9.194583524
3.08418080016804	93.7918918969004	5.83862113106035	4.44010970700001	94.87692744	8.233710837	8.411496493
3.06233727068248	93.9349266235061	6.25349719566731	2.510162792	94.82470236	6.564520873	1.092397933
4.25045651879705	92.5860187172999	7.69587392553516	7.009024866	89.80852716	6.686928303	9.591229282
5.46127838136101	91.2113362399992	9.16581138161392	6.29169329299999	89.27097954	11.1353809	4.843225065
6.77949280655055	89.7147276653467	10.7661234427905	7.085383584	88.77850283	10.21283209	1.129697938
6.77988152774688	89.7145631801414	10.7670299969527	10.40564453	91.96900158	9.717112894	4.396700555
7.30731830794275	88.6897004909412	14.0085009027276	6.663988874	86.9326968	14.76370285	2.017737523
9.75759659146544	91.9550976445275	16.4980017488293	9.98481624199999	87.60870523	18.9809529	5.654212003
9.95327631075078	92.2158729085981	16.6968137854422	13.01348985	89.5505908	15.47048063	6.625491116
9.9537887430362	92.216555808523	16.6973344204827	6.625140742	98.72893978	20.20468371	8.11126017
9.95431487713108	92.2172303765658	16.6978522436861	8.327911253	95.97957355	16.39239366	8.978439052
9.95484101128089	92.2179049445961	16.6983700668493	3.212591442	94.51392157	23.83849287	10.08518593
13.8258729051329	95.0890782628755	17.874111273108	5.819691822	97.53170939	24.16806715	10.47278678
15.1195268513816	96.048592339759	18.267031553975	14.02380259	94.55773265	18.6627295	2.149671288
16.5141303864257	97.082981741691	18.6906134022555	11.51332542	99.95442641	21.54207323	9.875636287
17.801588131669	98.0379002503425	19.0816520409622	18.10270516	98.29192556	19.61359774	0.6619415
17.9031810722616	98.0251089735411	17.847161633558	18.56973911	98.93410982	17.86986814	1.127429706
18.1021851543479	97.8791654894594	14.4401172176769	17.81960057	98.01765152	13.9964983	0.543902723
20.138054213497	96.8479259937884	15.0609431216308	21.95406549	97.08230078	10.07565883	5.310921574
20.2482474740758	96.7904750964127	15.1023878188292	22.19955839	99.83998701	15.37683497	6.495340695
21.1595966807508	96.315329649006	15.4451546085328	23.23282295	99.37897746	14.24859303	9.140009252
22.0761329271595	95.8374799064611	15.7898721460225	23.10855555	93.46528062	15.33870171	6.046811031
23.9191180235487	94.876612241165	16.4830351355619	24.92385591	92.07997464	15.00916266	3.317074037
23.9196660116071	94.8769897520089	16.4837815902831	30.51609732	92.20951413	14.80192542	7.873323153
24.0174993188846	94.9443874508727	16.6170475264343	25.58817455	94.62259734	16.80660453	11.27075496
24.0180473068947	94.9447649617097	16.6177939811943	24.79158589	85.73273425	15.36547182	9.89839469
24.874078048713	95.5344873851388	17.7838562316404	30.46512782	92.10545477	16.97866967	8.699579279
25.4674133037039	95.9432379706214	18.5920817662705	27.03699297	98.99807723	18.13725322	9.045435578
26.2889856741182	96.5092218053141	19.7112059296739	27.32463884	98.08040747	18.9687539	2.022977234
26.6754807502382	96.3678669042162	21.2609352425569	31.65500689	99.46882276	25.89517482	7.475813284
23.8991167061981	93.7230476970265	21.5299429060746	22.62104276	94.03699994	18.3046068	3.483508579
22.9724484951876	92.6589338963906	22.0163267214403	17.22630202	94.08640458	22.99978352	10.84424377
21.8463824847726	91.3658471211254	22.6073691829958	20.03955091	90.83830295	21.35984013	2.258156755
22.1329837632942	90.4506465792797	24.2228551784572	21.63379999	90.72848541	25.0330528	0.991362215
23.4350287709674	88.9144949080184	24.3437820407141	19.16596982	83.58117432	33.35557023	11.91490763
25.1451636697518	86.8968791067674	24.5026100535809	28.94608169	87.05476962	32.15968695	8.550013673
25.6172612356588	85.8684631082463	23.8046976205947	31.67974116	78.20082263	20.94127433	10.5302733
26.1397021852995	84.7303792353298	23.032361426021	26.49994117	86.49656314	20.04082186	11.41565502
26.453121692547	84.0476270617475	22.5690263204982	21.51917751	80.74471553	21.88319617	9.9567065
26.7572431322249	83.3851297178588	22.1194366534121	18.15807888	79.40011164	23.44302335	9.804701845
26.7575982268262	83.3843561880917	22.1189117157744	20.11668251	80.56671914	21.763779	7.222669816
27.7067802982022	81.3304264305636	20.7238163440064	24.93956922	85.18138774	19.5490822	10.96633056
29.0921995309428	78.332525650499	18.6875453607302	33.71990859	84.56649705	17.88810749	11.87467854
29.0925566121086	78.3317529647712	18.6870205276071	29.05539546	78.84402949	14.28609887	4.430792212
30.7422134511654	74.3833843885471	20.1692777418664	28.17365085	71.94302821	19.49378883	4.360337135
32.2069929932069	70.8775101947024	21.4854180624382	31.96159565	70.60936436	21.8177247	0.492493397
40.8361307934745	67.8049370837341	17.878522887717	40.91327599	65.05437313	16.01674823	3.322312195
41.5080660000314	68.1899875552547	18.0171046064427	44.42598809	67.45202223	18.20113405	3.872665591
43.2001673695386	69.1596412187668	18.3660881034715	43.59103477	70.75648589	19.17067552	1.830314492
46.8756691673544	64.5123238108106	15.5626643477732	50.37372436	63.54183807	17.2232387	3.991959404
49.7119536697909	60.9261147902284	13.3993379713186	49.52719402	60.88674536	13.02441036	0.419829482
54.0159453144052	57.0130892512976	13.0058082312877	55.40337389	57.61168804	14.09596446	1.863254992
59.0503936862851	42.5498847719502	6.07693415325048	57.56166222	41.97700689	5.193477838	1.823459763
69.7546918470195	31.02791661544	2.97189665732469	75.19376171	39.75388964	3.378695446	11.99616742

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 5 Length: 331.669935050591 Demand Met: 2934						
69.8007459670637	23.0791670340672	4.49242114276316	70.71952594	19.54937922	9.466423791	6.168002999
68.0625220986361	23.6646904829391	5.15758066479281	64.88897514	21.58345165	8.959362969	5.371825022
63.5501960306301	25.184674628571	6.88429533606449	62.17589976	23.53474989	9.188656209	5.377142852
56.5469371733321	27.543733408967	9.56420579305177	55.07321291	28.85442279	12.55016086	3.578504928
53.0316207645178	28.7278732800464	10.9093985663571	50.20668952	26.40233109	10.32749181	3.704996422
52.7562627054507	29.7719886414034	11.4975179879445	54.00076983	32.50218762	13.15428984	8.205190824
52.3625599083619	31.2648490271797	12.3384022610529	56.1557774	36.1071959	13.13084437	6.201998603
48.1528520162859	30.9623666789839	13.8051405709442	47.52772375	30.54529654	17.6892221	5.345510096
44.5874122348504	30.706177265201	15.0474042274143	46.26887105	26.53209753	18.29584073	8.81744986
40.9379926533516	30.4439536066221	16.3189279640525	40.57036155	31.31828969	15.51939441	1.240512039
37.1981644121478	30.0589163755971	17.7417390807327	37.07046765	30.04479215	18.0646406	0.347521723
33.3417788920901	29.6955431246666	9.75766390842965	36.77121212	29.70512597	6.399428168	4.799880351
31.0007728747105	29.584521468671	8.56527603425044	31.17947294	31.40633137	5.155453447	3.870118229
29.6006909710027	29.0361313049911	8.78268434568826	23.31975826	27.34182644	2.882941415	8.782240679
29.5645788720136	28.7836962207959	10.9274675494758	24.70443529	26.12365999	11.74081492	8.158816457
29.5105804890287	28.4062303187304	14.13455949477	30.34406593	27.74432368	15.48974465	1.723178802
25.7483018337352	30.7878415404448	12.7688701344443	23.91492832	35.50451908	14.65205958	5.452232026
23.5339592960047	32.1895726501213	11.9650742651563	22.33900559	31.60235215	9.968662506	6.287046338
20.8554716414596	33.8851185777032	10.9927959133384	18.74305811	29.30240259	6.154559295	6.990859055
16.0614278531231	38.1463682677822	10.0961134258331	12.65054039	38.20990532	17.83269917	8.455350331
15.1291552243524	39.1687788261802	9.37510935785695	11.00474377	35.14184161	13.52979102	10.56540176
12.1901845476748	42.3919075096846	7.10215856213949	6.668915236	38.80565327	2.074648475	8.512380576
10.2143561278058	44.5587713396875	5.57408588794197	9.020444459	42.86210706	4.331128313	2.418478506
8.02662904905553	47.7107189081893	3.96216291796394	8.81169210500001	48.50504439	3.044600386	1.445405816
5.90326432828832	48.4909637622991	4.16838297864327	5.28300793299999	51.8957834	3.767703534	3.483971696
2.28308836009666	46.3612669005987	4.87152584360781	1.77561061599999	46.38397362	3.634697851	1.950063647
3.26365835788597	46.1668235917354	5.11170219456478	5.668356774	43.14782971	2.118277692	8.305775856
3.10366920848736	44.5657522585416	7.0893453064662	7.871697725	40.35198819	7.19843067	6.3641027
3.09536583279905	44.482657268945	7.19198422737565	9.954481978	42.50823893	15.05115407	10.6166074
3.08089406415675	44.3378328613159	7.37087131777599	7.974625907	40.8370263	13.38849506	8.509762243
3.0808165251314	44.3372032219542	7.3716443261678	0.224660494000005	41.43611847	14.21171956	9.809410917
3.08073898611138	44.33657358259	7.37241733455812	0.0942256310000005	39.91558536	7.02793547	5.346313369
4.43080965217484	44.9885033880262	9.57333088539363	0.0735544159999932	50.20291794	9.32702938	11.48330524
5.4252174078664	45.4686886624683	11.1944352899717	6.810990128	49.52757429	10.46442277	9.894324521
6.41134576423519	45.9448759332581	12.8020424440576	6.962926975	47.87740863	12.6680673	8.307462013
7.70980620880816	46.5718839008734	14.9188199282427	3.857750749	53.93522034	16.19502855	9.829595519
8.26354976160005	46.8392787386635	15.8215442962978	7.342191074	50.36568708	15.52547031	3.656790591
9.64086600180306	47.269567693651	17.9955747929485	10.30388261	47.84277995	17.55376223	0.981509885
10.890733179503	47.4883835656991	20.6663315889396	8.736047039	47.86465463	22.63362148	7.075947311
11.728203809684	47.6350006378548	22.4558660421881	8.013859219	41.41457221	25.49555223	9.523443187
12.230026668859	47.7228554183582	23.5281774324074	13.48749824	42.29987548	28.42807605	9.005353542
13.2360381355965	47.898979154513	25.677855420407	14.81228179	50.29125842	28.12065032	4.356482226
13.7864209249194	47.9953353857962	26.853931247094	12.24975114	50.92735248	27.57127396	3.387131358
13.7869013178141	47.9952993117726	26.8548075583011	10.71615729	46.62293177	28.86994808	5.678630364
13.7873817107074	47.9952632377421	26.8556838695085	22.68802089	46.28526246	22.76975049	10.38254064
14.7989269992669	47.9193034957272	28.7008995012917	24.77779172	44.04083387	26.11612996	11.013687
14.9974690926537	48.5658978133831	33.4576419285842	17.44262234	43.68368222	35.8944745	10.91295355
14.9975104160501	48.5660323917983	33.4586319695061	12.31993183	42.07287161	37.42873621	11.95610617
14.9975517394581	48.5661669702095	33.4596220104281	12.77181014	48.33401693	34.40572033	2.429592834
17.3548757160733	49.2810410989284	36.0852369215883	18.21468575	45.65080463	39.25800482	4.897381571
18.2509862008687	50.806050351353	36.3698662456535	22.00300591	49.77440842	32.73357505	6.521574248
18.8801946507437	51.8768432101171	36.5697201464161	23.68432498	51.4412716	36.97532542	4.840858032
18.8800611012649	51.8778275329849	36.5698353550468	20.37447933	52.92580791	35.47903396	2.126357542
16.5909250775873	53.5938057558191	38.2953369494865	18.10483235	51.48322234	38.87016683	8.264928029
15.2905758820762	54.568571290974	39.2755122592794	15.36448886	54.97389236	39.50883453	0.473484508
10.2092577341326	51.6915148595874	38.9111894804607	10.16802995	51.02082052	39.350114	0.802611588
8.90291553694227	52.0281808656337	38.0828325321214	9.26512226200001	48.10149258	36.29819804	9.899762573
7.15455502275259	52.4787623080511	36.9741899547847	7.88086425500001	53.63419396	36.66849242	2.73437995
4.79624606664493	53.0865375593907	35.478776567332	3.166581108	54.38581172	37.35766501	2.806090341
3.03600937436799	53.0932318792848	32.8822704539338	5.351054934	54.87903352	31.2051026	3.370669882
2.64813476749742	53.0756854395052	32.3640931300611	0.102323447000003	55.05645207	30.68754948	3.635297833
4.61703558384148	49.5407609152604	32.0126492387647	1.250751092	48.74029716	30.02493246	5.852672895
7.6126382705543	44.1625167121604	31.477941620901	2.885836634	40.60849192	26.29324057	7.864786769
8.69665273468536	42.9970797096977	31.6753703465515	9.755265232	43.18329059	30.87649008	1.339232837
8.99581931374841	40.6872881836878	33.2186140072321	14.50630809	38.16565664	31.09752118	6.420525444
8.99592638984649	40.6864614762041	33.2191663562574	6.302525489	40.0085763	32.06550398	3.025946417
9.17122766407861	39.3330035112594	34.1234537754105	12.97854061	40.66549102	35.96453487	4.434042673
9.13157617652865	37.4183709387412	35.2052777417808	9.832177112	38.08691559	39.13126485	4.043657799
8.15354674119013	30.1890880769984	34.0991941330288	2.51827574799999	30.45426362	34.97941135	5.70976178
8.11118123642844	25.9093812823118	33.3649467972386	17.16840861	23.65521269	38.43535721	10.62185038
8.1109666272866	25.9084467132883	33.3646630301237	10.79914705	20.42039499	35.93251466	9.255684285
8.11075201170885	25.9075121162346	33.3643792547076	10.62327399	24.29073933	35.14972626	10.64782213
7.92584195252694	25.10227506877	33.1198819325741	6.772905892	23.04434695	34.36872103	2.6690689
7.11894447116543	21.5884384093921	32.0529617603301	5.677247541	18.04924585	36.67897415	6.000363709
7.11891440185485	21.5879568634038	32.0520858554849	2.197761157	16.16441336	29.99258788	10.88783855
7.01542013100399	19.9305443301679	29.0373464533519	8.465864182	8.874062551	25.43796737	11.71772619
7.01542013100399	19.9305443301679	29.0373464533519	12.36712067	15.90584574	24.47249551	8.460729812
7.01542013100399	19.9305443301679	29.0373464533519	14.86812736	22.17705421	27.08627601	8.397529002
7.01488915380101	19.9301804982077	29.0365811498078	7.31997787899999	15.37807435	33.05725748	6.081166637

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
5.46285010191043	19.5362326644227	26.2960458029756	3.177857831	14.97802426	24.78576733	5.317837399
5.45294158379883	20.8627517791714	25.4351772092135	5.72255099500001	17.38650207	24.6119319	10.68361364
5.43703533000425	22.9922276116164	24.0532153178769	4.281409798	24.72152663	26.34546352	3.095213609
5.43707972348557	22.9929906268506	24.0525704636521	4.953508892	23.81507206	25.41914679	11.32693583
5.43707972348557	22.9929906268506	24.0525704636521	9.44237495500001	27.32019574	23.59921997	10.87002293
5.46898333279358	23.5413355625014	23.5891425635747	3.815111582	26.65111472	27.4138472	5.810017463
5.49201154467957	23.9371341452714	23.2546375939638	6.71940622700001	25.73868862	24.12156356	2.345987396
4.5551062102486	24.4643843833673	20.7494670376005	5.584406208	23.81184943	17.55438576	9.409363681
4.38111089324599	24.5623015037965	20.2842247886327	3.43019284899999	27.39779729	20.1502757	6.526989384
4.22704056906089	24.6490056908185	19.8722595395835	1.354188569	31.31594018	20.59719751	7.295671947
3.09639775906538	23.2504365276675	13.4618515409505	8.02660248300001	29.17059173	11.48261049	9.758103666
3.06015682820625	23.2056076487635	13.2563762472743	2.694391803	27.62826968	12.84474665	5.298497076
2.56786166813475	22.596654206555	10.4652093036987	0.438114408000004	29.42535326	2.454773911	10.7393682
2.81486094808551	19.3329709497969	10.3325752272432	0.867278095000003	18.04823486	8.201101929	3.160190534
6.67098018774941	14.5563310009556	13.6919475253835	10.89890727	16.02503912	12.34011368	4.675459945
7.65798919188661	11.9107849482613	15.6202064881298	8.67995437099999	15.22687294	13.91463376	10.6053774
8.92513657933777	8.51436530549813	18.0957546307662	8.98802709899999	7.925934732	19.26951737	1.314505506
10.9458120820844	8.51005328174957	8.49777756256365	3.082410661	9.043855976	8.462200359	9.949435792
10.946018097305	8.51005284212153	8.49679901387522	5.801300438	5.23076571	0.128009607	10.356567
14.2266735956172	10.1155483928343	8.99146290075829	14.9958336	14.5728326	1.422152891	8.817791313
14.2674508243856	10.1274727142216	9.01273637108614	18.20950886	6.619599382	5.445678785	6.369371766
19.0476651098546	12.9834783077646	13.2660064510045	20.19850768	8.627828216	19.22611956	7.471216408
23.7154005183604	19.6343093804841	13.6391876183019	23.64941173	19.80991504	13.65279264	0.188087651
27.6803333366686	18.6617690092636	13.4924777730142	28.82263126	20.36706254	14.69297653	2.386009522
33.4585571105683	17.2444547313747	13.2786728104603	35.53984032	15.99196501	21.54085765	8.611862088
34.3721190307113	17.0634835387166	12.7603265736743	35.85991513	20.90404301	13.98769394	8.748151694
37.9462504395269	16.3554693256408	10.7323988268819	36.57027062	15.62107689	13.23399254	9.745800746
40.0720510909916	15.9343608361145	9.52624000665031	35.62470684	10.73896033	9.362523366	6.976212454
40.0729082143338	15.934191045077	9.52575368311597	38.07401644	11.09458783	4.920078282	6.973490769
62.3541550440221	18.2031089385619	4.20992276377097	65.51501196	11.68636529	3.24100338	7.30737771
Route: 6 Length: 310.462358754047 Demand Met: 2239						
85.7618776209836	12.0166828170114	12.8171568161802	85.22979418	8.715884504	12.16207554	3.406980154
88.3040855591501	12.1895820677221	17.9885779727334	93.53556787	11.2495411	17.39352488	9.93311926
90.8802393208256	12.3647900464002	23.2290525440459	94.43184685	8.796264511	23.29859307	5.035188817
90.9638282065537	14.9731386635617	28.2868277144733	95.99475962	18.1472698	27.39786086	6.014618976
89.8275733663739	16.9311298830198	33.7968848519081	94.15587216	20.2227246	36.0994515	8.426061551
89.8273826212248	16.9314585725889	33.797809827289	90.81819821	18.2159484	35.33294835	2.233445753
83.8805360905468	13.2636188745666	33.1483878265408	83.75499038	5.857780347	33.63275215	7.422722871
72.1556792520444	20.8181973032323	30.8630426059568	71.29498477	19.86081824	30.17263192	1.460834206
64.2240347298414	32.0500713695548	31.4330757452066	59.48412304	31.97998889	33.72997467	5.267581898
60.6936536000919	37.0493938810519	31.6867943437558	61.01859213	37.82208646	31.82775528	0.850005209
55.0226712049509	36.2127180196431	30.9125123866822	53.48089128	34.57431179	29.79987824	2.509863553
54.7132732808058	41.2653507518393	34.1300207871238	57.48443808	43.25173204	37.88033317	5.068521277
51.0170855153831	42.6002660308047	31.8746940352317	51.12261026	42.05252276	30.83772297	1.177483398
46.9756788770669	44.9917628787694	31.4226407771036	45.94832838	45.50704308	38.19660802	7.19052718
43.295005101828	47.1697958052214	31.0109378845551	43.66555329	47.77139353	28.778171	2.714393217
39.8411095262028	49.2136332932843	30.6246014624935	39.67150404	49.44131071	30.57444188	0.288303678
40.4553804529136	46.6483142147675	31.2326971628858	42.25980634	46.86827481	24.73500352	6.991437475
41.088495496204	44.0042990300597	31.8594477037105	38.72818734	43.64397508	34.64285831	6.801536894
41.712339928667	41.3990002692988	32.4770209677269	39.91233765	41.2977364	28.26450372	9.100834641
42.3625664312425	38.6835248020219	33.1207111257491	44.94410764	36.28576006	32.88778098	3.530989553
42.3616314295995	38.683654343119	33.1210412636476	41.09480481	34.92509896	27.7383049	6.686212606
38.4834021126822	39.2603977495726	34.5488592160897	39.35568633	35.06788426	34.69629234	9.948736286
36.2368356145829	39.5944916376554	35.3759603494206	30.83636789	38.35208021	33.99399048	5.711258926
35.0120913349941	39.7766272045476	35.8268649723814	34.06373355	42.77086753	33.9464291	11.54083384
34.2321931162454	39.8926083419535	36.1139940834515	30.62796082	46.77730777	34.94066727	8.83821808
32.9233394015668	40.087252142165	36.5958646753263	31.52001616	50.89228775	38.01036066	10.98721573
30.9826086967572	39.0652740234989	37.1993198539482	30.41452332	39.55317391	35.96788826	2.75931255
28.4673797607901	37.7407683079241	37.9814106042744	31.80593192	45.60640645	39.41102857	10.76621751
28.4665266436414	37.7403190631158	37.9816758781577	22.79879511	41.59634367	39.45795983	7.012240784
28.2631384955041	33.4719514399365	38.2189277377399	27.42853428	33.27622768	38.61257115	0.943306484
30.9565805522717	27.9830783207502	37.1534950279119	26.37919279	28.3108891	38.48025156	11.05276225
32.8185933367114	24.1885465692891	36.4169472017212	34.82834577	24.45085722	36.05632865	2.058629996
30.4326352555761	14.1968017338454	35.880194882545	32.11403346	10.63014558	35.85165647	3.943215754
30.4316407244474	14.1967216915962	35.8801277925138	29.15811552	9.518746656	35.77137383	4.849447835
28.6513735845005	18.2658857934141	35.7810648146359	27.39065822	19.10906735	34.23380192	2.166651987
26.9354087244549	22.1880736672956	35.6855798813083	25.83818458	22.03803134	36.60516078	1.439459118
26.9013567790348	22.5064447863847	35.5949404550643	21.70527032	21.60018691	37.91508039	8.932392927
26.7780356507783	23.6594442650298	35.2666844794106	20.73212412	24.23741148	36.78766314	6.929326091
26.6078423333059	25.2506795214934	34.8136640441986	27.26619514	25.90196542	35.39277783	1.092233728
24.8279648864451	26.9666787922236	32.6487031552074	24.87958822	27.09583401	32.67332021	0.141251684
22.6578250592838	27.6910972487421	30.3008836156113	22.07359754	33.01769228	30.23180819	8.049766298
20.4085887150654	28.441919124401	27.8674914809141	18.39694528	22.72524013	21.81072027	8.568057279
19.3814095804936	30.657982662781	27.8940508263055	14.14878683	27.98719075	26.90047422	10.13344558
18.9035468397071	31.6889363767964	27.9064068473693	18.71921477	25.10440199	21.46380598	9.380442313
18.0777010038232	33.4706377714768	27.9277604581695	19.64225061	34.99214308	28.17560222	6.554722745
17.3427209294569	35.0563030848042	27.9467645863469	10.78091353	34.08373955	26.71276523	6.747292093
17.4625272159481	36.0694823678024	28.061649324037	23.06731773	35.0375678	21.55663613	8.814338039
17.4626439233783	36.070469210066	28.0617612245448	19.77510428	38.58926296	16.64922472	11.91376449
17.7367318454742	39.8081604019254	29.4604329993096	14.44281578	41.35822358	23.25943932	11.77700274

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
17.8586212048772	41.4703404438517	30.0824332066901	18.69463352	36.26547074	33.27071747	6.160741982
17.9930174569798	43.3030682573368	30.7682534767932	17.47416259	43.6041515	31.53434731	0.973016574
18.9583692470315	44.2320202639918	30.0320554896455	19.40209516	41.66020767	37.5577128	11.97444555
19.8971154068771	45.1353698012204	29.3161473282903	23.40792676	43.64379836	35.72280889	8.702120093
21.3540363181812	46.5373556026063	28.2050679193394	19.18169919	47.05766373	27.00382561	3.954790614
21.8853479131451	47.0486337141567	27.7998778364827	18.21138052	45.58660191	25.83715904	4.414503197
22.8991877268539	48.024245687262	27.0267011067778	22.81585575	48.67591425	26.59144604	0.788075572
24.2692462543113	47.0530948380689	27.5423310503221	26.12441872	44.96485891	27.03242338	2.839436564
25.6475755259517	46.076081273603	28.0610734657179	27.37711129	46.43616017	27.11673494	2.003178979
25.6686085568983	45.5369595309427	28.5962491801418	30.18073163	48.32029982	32.22769732	9.58620967
25.6978342128344	44.7878432238903	29.3398826123826	30.55507662	47.73107042	32.65818922	10.01719534
25.7276723166681	44.0230233652016	30.0991039569554	25.71821347	44.02373583	30.1225615	0.02530284
26.7569632355507	42.4690855022568	29.1596925955329	30.28185343	43.77834378	32.70178342	7.043480934
27.7462744497693	40.9755065913877	28.2567706117388	28.08331623	42.02257662	27.79667825	9.317039589
28.6728916512594	39.5765781923408	27.4110684426023	29.65914735	42.12761495	24.52937867	5.483604448
30.1062376938268	37.4126331514979	26.1028862404559	27.06311365	42.64274924	23.39166283	7.281813729
30.8074237962227	36.3540415824542	25.462929608808	32.06711817	41.12824267	27.14001544	9.236365321
31.5888482117363	35.1743125918162	24.7497407874847	31.80606468	35.45021175	24.23960074	0.619311075
32.4923352858827	32.7256525995117	24.4853898256291	28.59013959	24.83311171	20.75915805	10.05513054
33.2721062770181	30.6122921547663	24.257237216949	36.2315122	27.60710766	22.87055815	7.544747892
34.0128253687535	28.6047730556251	24.0405114492653	42.45831495	25.01806118	18.69304905	11.16727795
34.7548299770569	26.5937698084194	23.8234093607674	29.56587444	24.57869021	18.08116751	7.997446269
37.4608819463744	21.2769632942389	23.9425628198868	39.07927218	20.57348801	18.57850652	5.646872091
37.7258731174651	20.5981591512292	24.3013665660095	35.94447387	20.12395641	25.28688733	2.090335546
37.7264036070952	20.5973778098143	24.3016953308888	38.38951699	19.65672727	24.71703453	4.440566438
38.4682757205606	19.5046553368526	24.7614665969877	38.46066343	17.33665094	24.22591115	2.23318621
40.6454188338529	21.6808582207351	27.4219835036716	40.05041388	28.81118981	27.86495236	7.168813073
42.6162301615937	20.0496306328347	29.2849043042226	39.25918273	24.78783876	35.71196052	9.890531084
44.4429778727002	18.5376444401639	31.0116476560789	44.45005227	17.91363181	31.37577496	0.722516784
46.5338715243309	21.2075072250218	30.4435637613918	50.59311922	22.75724468	32.75181399	8.529458236
50.1972562117484	25.8852802479159	29.4482429074482	51.08696185	26.42044109	32.70824117	3.4213392
50.1978007742899	25.886018511185	29.4478448886244	48.88810081	29.6929228	28.59078684	11.17097838
50.4349736178065	26.2075541666561	29.2744943167118	51.99282443	27.99909333	30.19770488	9.260790549
52.4099361170437	28.8850178731989	27.830985024789	49.49892788	30.73465222	20.32700892	9.148611436
52.4627251300772	28.9565841023951	27.7924013069318	49.81718199	39.89953162	25.94554765	11.40867509
55.0406351601976	27.4252349121836	27.215989896178	55.9549233	32.80200534	27.96563646	9.08801586
56.1790119116212	26.7490074528372	26.96145241569	62.83458953	32.37480154	31.54745986	11.26631142
58.1782879488285	25.5613823183586	26.5144198950653	59.97712424	27.07719444	29.13491814	8.051501149
59.8915645468177	24.543648781054	26.1313355010356	60.71671796	14.8721563	28.06290831	10.90485749
61.6348758251823	23.5080741121407	25.7415353161841	63.04507341	24.29862677	23.57575014	4.664845393
62.7473225614747	22.8472502732159	25.4927949407171	67.26622281	20.02005982	35.0966755	10.98398776
64.606530587347	21.7684323131008	23.1745313569741	66.92261807	21.4897109	27.4812889	4.897969721
64.7876930110659	21.6633115748858	22.9486382080347	62.61153544	17.95816147	22.4620849	4.324411312
68.9394355275774	20.3822648681173	18.4984033306823	66.17419814	21.15751135	18.97034229	7.122166774
74.1695035092379	18.768495607965	12.8923089351595	77.03036191	15.51069798	15.03164451	4.834719524
Route: 7 Length: 351.366214521689 Demand Met: 2919						
84.5855241252844	31.3287854534635	1.06346369994719	86.50661976	33.33916758	0.489048022	4.865256989
90.1776977222532	45.144552893985	2.36038708666045	85.71414415	51.67250379	7.296357424	10.80797757
95.0857677958197	57.2702056629214	3.49865485550259	95.77662579	57.68215173	3.069360741	0.911744354
91.8098435149768	58.98365318658	7.20370442018553	87.34079917	59.37931572	10.08579475	11.8500657
88.4955534842093	60.7171676231919	10.9521454001822	90.50689197	55.43830225	17.11301088	10.39640446
85.9642057359498	62.0411699977404	13.8150836316162	83.55927983	59.64747077	24.27812457	10.99948591
83.8264069582244	63.1593295465963	16.2329204764008	85.16088414	60.47696067	19.97453885	4.793291165
83.3735105119347	63.4958238298465	16.4815632021817	76.04244622	64.45001766	13.22117777	10.41499903
81.2696189682137	65.058979122733	17.6366116324698	78.29263567	66.45988674	19.86750284	6.639910385
77.5444137863478	67.826742611026	19.6817704769968	83.77232341	73.14211564	19.82850896	8.533805631
77.5444137863478	67.826742611026	19.6817704769968	81.47694776	70.94126153	23.66230135	6.403879885
76.5600246938409	68.4099702672292	20.0715164314857	74.07680751	69.16329968	17.32839223	10.96743145
74.214008220349	69.7999304980257	21.0003670693578	73.05372772	69.26625594	20.0928079	1.566755571
73.4930889850957	70.8688837757907	22.0042736188095	78.83068399	69.67274441	24.24069079	11.30182844
72.2835029182706	72.6624147694382	23.6886667065242	67.69295238	75.24403656	20.54681948	11.35995088
71.1478645011453	74.3462988320215	25.2700849742647	67.45457311	72.85375456	29.93900874	11.61655168
68.9300133009814	77.6348493321997	28.3585243434296	60.79681015	75.33369853	28.93747546	8.472276725
68.9300133009814	77.6348493321997	28.3585243434296	70.77169737	73.88064127	33.24954023	8.726232409
68.986097047488	78.0427662107415	28.6479205108663	64.88497046	82.96772641	30.52764719	9.339812785
68.986097047488	78.0427662107415	28.6479205108663	69.80433177	81.60817435	25.92271927	4.561618689
68.986097047488	78.0427662107415	28.6479205108663	70.83372488	78.21085961	24.5182183	5.320597925
68.9867789324967	78.9845818507719	31.3794089334046	68.96890483	80.55619731	30.92710539	4.842060922
68.9869697957288	79.2482037967189	32.1439750212743	65.34735437	72.80394877	34.67473005	7.821760947
68.9979048783257	79.3696678307023	32.4329245259753	62.20174968	80.96664236	37.77358899	8.789809443
73.2727026127092	80.1123244327396	33.2648690411107	70.61748839	78.65460339	33.23222305	7.660924967
74.4606266056159	80.3187013547786	33.496058190291	72.09010058	81.417498	36.30236671	6.705862814
75.3670929691704	80.4761809073678	33.6724711477692	75.20998283	80.5662569	34.55930276	0.905134017
81.2403946742511	81.4447743737417	34.4108606763944	81.4352048	82.89764497	33.18556014	3.652744946
84.9283405750814	82.0529706660038	34.8745080038349	86.75397464	75.23932777	39.5614605	8.469131771
92.4427365820212	85.3524887802836	34.5284286856197	94.75890926	85.83537613	36.18471901	2.888102094
90.3693191444284	86.2421384188878	28.6825306941513	87.63411723	89.72076827	28.65831969	4.425243646
90.6390123377237	84.7632802181228	24.8966714503513	91.04765146	90.60180149	20.03455373	7.6089096
90.8560706923624	78.9737428259472	21.3520161731496	91.59995025	72.67875795	22.12004218	6.385143329
90.0911895110825	82.4807027265811	17.7345772039078	93.29522257	74.82458329	19.9847248	10.91349472

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
90.09103941784	82.4813908994054	17.733867351682	97.99058573	82.84537681	12.83735391	9.301137649
88.8925082812999	83.7828209163201	16.9097214315074	91.90328388	76.16243153	11.12653143	10.02897755
85.5374480525502	87.4259270105864	14.6026814898834	93.12739448	86.70709298	18.39915073	11.17874385
84.2397686505797	88.8350175833842	13.7103582538856	82.53992082	88.87907996	14.07314191	1.738688046
85.0310759825076	90.0390998627399	12.5004463287395	82.09017124	81.333147	13.10533341	9.364452955
85.9496699606051	91.436866170551	11.0959126383821	86.10921689	91.46882481	10.98097302	0.199217703
85.2222279575593	91.7517667295334	11.3380969899564	86.37403118	99.02923308	15.37465632	11.96387757
81.2504993169444	93.4710784558686	12.6603887043591	78.18108034	99.79242924	3.657350909	11.42083614
81.2497376702856	93.4712194667604	12.6610211680304	79.39161289	97.26593015	10.2457076	9.87516425
80.8283867300175	93.5492281698265	13.0109066275106	79.19703593	96.06011661	13.22486099	11.2419465
78.4061504765689	93.9976797626769	15.0223065801045	69.38304877	98.18671586	10.95698255	10.74668541
78.4063212941893	93.9843922272241	15.0829992899748	69.92952441	96.42807986	14.30332435	9.02685985
78.4066715230429	93.957150692047	15.2074288489272	75.38279951	84.8495864	16.86303573	9.738201242
79.3606059470922	95.9072290710452	18.7504593417101	80.84419352	99.98848979	20.3915349	4.64228932
76.6162152666607	86.730746853713	21.718369563245	76.68533256	86.49303137	21.67959601	0.250577812
72.4327857807103	89.7929695282231	24.9342356447151	72.48804708	89.57044348	25.63543235	0.737731979
71.8566800706026	90.3307915053209	24.9028145794083	72.91384846	91.54886288	27.04740893	4.973733961
70.6798738090797	91.4293959080803	24.838631032926	71.22771139	93.77569631	25.9346523	4.877275027
69.5433424085196	92.4904018230246	24.7766440967203	63.32241418	89.29380754	27.27800065	7.42798409
69.0777941588139	94.4907113667637	24.2573016789523	68.09186985	95.85522589	22.47153407	2.454162297
69.917828582902	94.6196529642937	26.0873182746942	66.92699784	97.50570073	24.16462464	6.78636185
69.917828582902	94.6196529642937	26.0873182746942	65.26732099	95.86741863	25.98441419	6.903660169
71.6061200048358	94.8787982873315	29.765264359649	69.82339194	93.15949799	27.73705762	3.201208435
72.9840504598089	95.0903045635304	32.7670884849828	76.48394754	93.81500316	33.05082675	3.73579719
72.1198534437394	95.8679128684272	34.5710253897612	74.57969734	99.83821951	39.01985633	6.450291742
68.8224280581731	94.2634530451522	34.3691593797965	66.67195124	95.92017704	38.76714707	9.763847817
67.4781605310446	93.609359931198	34.2868642889996	68.01446808	90.26524455	37.65674979	9.658401998
66.2431911226918	93.0084490487067	34.211260350296	64.96530116	93.98228963	34.40488013	1.618288248
65.6019576066163	89.9682696265388	33.7072016305114	66.59307852	88.41880362	32.58136924	2.156539854
64.1292749116495	89.9982733177458	34.6873092821606	61.4906739	91.40517217	33.71736683	5.140621126
61.8048565591396	90.0456298420195	36.2342685719876	63.88368354	92.98872817	38.82161587	4.684052733
61.6567757461314	90.0486467635982	36.3328201155599	62.03675317	91.42777069	38.34727303	2.470705606
56.6407623831554	88.1442101227356	36.3905346453275	56.15571936	89.41500769	36.83882342	1.432185748
54.3826946750564	87.2620793811095	36.4089678911171	51.44475874	86.59474587	38.70943792	4.908082369
51.8117736412124	86.2577301756823	36.4299550467653	49.19512952	89.44346883	37.79505672	4.342724929
49.1680639988755	82.5764454900497	35.6057804016715	45.3176187	83.7901857	37.67961833	4.538711056
47.927639633012	78.0875910152506	33.8439363636957	53.92763119	74.12654413	38.27376011	8.444710151
47.4618123578811	76.9116675997792	33.2635581269955	49.38151416	71.84627519	34.52041136	5.560857427
46.7091601522326	77.094290076122	32.5642924655417	46.03038143	83.79986665	30.96050312	6.928032766
46.7091601522326	77.094290076122	32.5642924655417	47.34853229	74.63427391	38.87043339	8.300992216
46.2772669836359	76.6985257014195	32.2375074834949	40.77647626	81.23711291	32.65865455	8.680043042
45.5886326109632	76.0674970779162	31.7164634212756	38.20769452	77.89743741	37.44950686	10.9290231
45.0183225793508	75.5448947088574	31.2849475586313	49.39322363	67.57061768	37.48715692	11.53351655
43.86128585082	74.4846465943248	30.4094944291158	41.14789047	74.75727523	32.931636	7.341258219
43.3431441407395	74.0098485546173	30.0174508831144	42.58773685	73.94634336	30.2774743	0.801427016
45.5016876010289	70.2079338079802	24.005665605301	45.59084573	70.21452412	23.93560611	0.113582292
43.1896403895175	68.5045830424415	24.1529946344991	42.13585343	68.94604524	25.50967647	4.750703238
40.7545464330536	66.710580249274	24.30816448866	39.73860453	66.92518954	24.34934694	1.039178085
41.6008472604999	65.2357465634655	24.3055585605618	41.95981534	64.94436816	23.77879253	2.929752986
42.7359862676618	63.2575596215134	24.3020632423104	45.68320409	63.6499192	24.04332627	2.984457028
42.3385773489158	61.7090357324084	24.4044934718194	41.10546356	60.73573959	25.88754111	2.160394708
42.0372794134896	60.5350131361045	24.4821515597042	41.72170476	60.36141703	24.46424235	0.360615737
45.7781751742693	59.2916247145378	25.0046982601803	40.32660467	53.626561	31.93108458	11.22803277
49.4339818616634	58.0765179615129	25.5153593003735	48.65047008	56.26343732	32.64491993	11.1175127
54.3770559801842	56.4335528760147	26.205832176996	56.36080227	54.43871329	23.33898219	4.01664825
54.8775435152573	56.683045114843	27.2547027851332	55.80484172	50.30189669	30.08035465	7.040116877
57.2952946375956	60.7268759047597	31.9556016805862	57.09480153	60.45993374	34.61199265	2.677287543
58.8445233436986	63.2114284949098	30.2189080173368	54.03625818	65.02303827	30.15017844	5.354401863
60.5937675042377	66.0167529065809	28.2579959601742	52.68458788	66.68600654	36.07142386	11.1378938
60.5937675042377	66.0167529065809	28.2579959601742	63.48323083	69.36201841	31.45080353	5.452872617
60.5937675042377	66.0167529065809	28.2579959601742	63.47892732	68.70647259	29.32775126	6.807486056
60.5937675042377	66.0167529065809	28.2579959601742	63.53725064	67.03413314	29.14142524	7.164195385
60.5937675042377	66.0167529065809	28.2579959601742	62.01287875	62.70691628	29.4740589	7.75530817
60.5937675042377	66.0167529065809	28.2579959601742	56.12304172	60.76926662	25.75259057	8.549372537
60.5937675042377	66.0167529065809	28.2579959601742	59.10597324	64.72617137	21.25191915	7.277653794
60.5937675042377	66.0167529065809	28.2579959601742	56.73611746	58.87824868	26.03485933	10.42122905
60.5937675042377	66.0167529065809	28.2579959601742	65.84999623	61.37790202	25.6974767	9.405960407
61.4380013375339	65.8548500564869	27.0819494060022	60.59756518	67.42291916	21.31629348	6.033901052
62.5219042639965	65.2090727907227	27.7310726044435	61.59665848	60.86573745	25.73038778	4.870665397
67.2562747737963	63.263739539317	30.8250794817369	67.87575086	63.89107621	33.2359079	2.566981804
68.3143491361921	61.9660058360639	29.5535591071713	72.84290598	65.67053988	28.7186167	5.910036243
68.7441177003191	61.1361204508305	28.8864347535418	74.85083054	64.74645556	30.78568814	10.29426937
69.934998273491	58.8365237237966	27.0378457705744	69.70404765	60.5822767	24.01827102	3.495543351
72.1231684978723	54.1258467512572	24.9024684589492	72.13050555	55.03070373	28.54528132	5.622701454
75.547302092914	46.7543967945634	21.5609472519252	78.85550393	52.04144231	24.20403351	8.272925398
76.949493841768	43.7357685706099	20.1925854955849	76.57028534	49.55513485	21.13053287	6.459051132
80.4749035818678	36.1462919467655	16.7522315239034	74.55729645	43.48740037	20.58508364	11.94062462
80.4749035818678	36.1462919467655	16.7522315239034	82.01891737	31.58538586	22.96295297	7.858683337
80.4752519106905	36.1455865209532	16.75161423835	84.85983095	39.85329756	21.28837281	7.318048431
81.1991617256345	34.4148491702369	15.2099503059975	88.13068149	33.9074779	16.96093724	7.167241247

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 8 Length: 315.123168671088 Demand Met: 2964						
70.8161974233138	36.1679008215115	7.98183578897095	74.78372311	42.05088328	3.322634156	8.48875153
70.8156266199014	36.1685264257021	7.98236758109311	70.24663893	43.40548551	1.656037041	10.39433718
63.8557205841403	43.7966049486993	14.4665838902063	66.65703205	47.7722791	14.44067044	4.863538053
57.6945957505687	46.4234171569181	18.6935653716965	59.28037529	42.02965748	18.78086606	8.171091803
55.7365807660752	47.2582221385128	20.0369063427225	52.03099226	42.50134863	22.51431543	7.192186477
53.403281099156	48.2530307864213	21.6377199510678	48.35826716	45.69665672	26.59304148	9.422444764
50.6406060513911	49.4309048122903	23.5331164029559	50.26037041	48.95030273	24.30726963	0.987355419
49.9292758560218	51.2102161805059	22.8423560614025	53.22205568	50.84724902	15.61737169	8.874987766
49.2675868281997	52.8653559583025	22.1998013549304	49.48945411	49.44119699	20.62289914	4.953096168
48.6528540422515	54.4030400583458	21.6028450562233	48.01348394	55.67625048	22.64155069	3.794373864
47.8507720001475	56.4093570821125	20.8239571724593	53.50308144	57.04941766	21.52167719	6.080321585
47.566714301502	57.119894972076	20.5481136408544	52.64945222	62.68533593	20.742851	7.539647236
43.6163949522518	58.3728399301624	18.9499149822396	46.15723029	56.4070148	19.959172	5.286178878
41.1165054504263	59.1657439283514	17.9385232888446	42.10911161	58.06602885	13.19335194	5.369736734
37.6725106688951	60.258095089349	16.5451706345988	36.65639834	59.2724504	14.55953297	2.438593171
36.7435381038651	61.8221685866515	17.6975228186214	36.99117209	62.09652931	16.1628835	3.164960791
36.0451211762237	62.9980648915147	18.5638802396256	38.18944723	65.54612606	17.9243242	4.457511574
35.6080416669685	63.7339579628796	19.106059362756	38.05290287	66.43336709	23.58284008	5.771110944
29.4875877149326	65.0109352230807	16.7514626976788	29.47881008	65.01108227	16.71360152	0.038865631
28.9040594239982	65.1744437200632	17.3819855459779	27.36103425	64.84526011	12.45761345	5.82414556
28.9033921739458	65.1746306866842	17.3827065320043	28.86030824	61.83789689	13.23528428	5.323228343
27.3784403579373	65.6019323904709	19.0304706024575	26.36749261	61.24478927	19.91950535	10.05967123
26.0145654177884	65.9840992739256	20.5041854414715	26.46280572	62.61127777	22.19141047	3.79783788
26.013880344198	65.9844203572229	20.504839337252	24.58618772	59.92581691	21.04332426	6.813403422
25.39906319775	66.2725769094103	21.0916762229921	24.68488711	59.85199485	22.75052505	7.587909595
24.7304689990269	66.5859380379741	21.7298427691 17	26.36495426	64.10386589	19.00754119	5.012038977
24.729783925848	66.5862591216881	21.7304966651242	21.61039636	65.83676525	18.75923326	4.44331993
24.0471974677661	66.9061782260065	22.3820186875353	26.03259253	67.05188068	24.42560707	2.852941681
22.8140548580813	67.4733934239316	23.5197283974709	24.00842436	69.26671548	26.32388978	3.536360214
19.4881676047757	67.0621080305008	23.3517183473833	20.16006997	73.55306832	21.43875646	7.784192094
18.214017738095	66.904544314417	23.2873536129514	14.01917911	69.22007201	23.43359605	9.959122763
16.5480214529684	66.6985241450404	23.2031944414635	14.51945543	70.49107423	24.26034768	7.364687094
14.8308154967467	66.4861712388892	23.1164482729973	14.11476256	66.58488992	23.55512122	0.845524181
16.4847766532904	65.0748414502987	19.1027299820284	16.63383213	64.77854357	18.98571058	0.351715097
16.3710409723163	65.4985821288547	18.9060192009754	16.73656026	65.26611785	12.28815231	7.348251841
16.3163783524428	65.7022365205753	18.8114778596126	12.00297966	63.9466553	16.56981835	5.950994709
15.7424002959648	67.8406837848484	17.8187585761944	8.93361225699999	64.19415642	15.31500377	8.119454693
15.4847168031006	68.8007254334441	17.3730840300681	8.01127751600001	61.69215045	17.84993877	10.57580758
15.4266445442378	69.0170830095232	17.2726455784685	10.36857839	64.9958121	20.62230905	11.82219863
15.3035074532656	69.4758502597708	17.0596746347407	11.73654707	68.82383733	18.16264782	7.948897757
15.1400686449219	70.0847682759097	16.7770000193885	13.50520564	67.72241024	17.09707449	9.360297306
14.7656928543703	71.4795664722	16.1295006611597	13.34199807	71.15108407	14.18117491	2.435319437
14.8776253530729	72.125823131493	16.2260621858836	9.088863996	70.57778186	13.84286783	9.588159879
14.9928363972017	72.7910089007773	16.3254520331863	13.78543979	72.75062985	12.01531817	9.733830208
15.1177537616727	73.5122353023191	16.4332152825633	14.09860615	77.68853822	13.45994873	11.70742841
15.2447302032426	74.2453500859347	16.5427548533207	18.79013692	77.54174683	13.67079469	11.83768723
15.3957186751075	75.1171014107188	16.6730090380257	16.80968797	72.84815948	15.34934359	5.35823493
15.5177537043072	75.8216863172574	16.7782857766724	15.50686687	76.44859369	16.39940441	0.73258615
15.5758684227796	75.7245811210005	17.0601734914713	18.15532249	77.80652015	16.99185344	5.054973135
15.6347421141321	75.6262077432302	17.345742634103	15.83973733	72.60736968	8.73861151	9.12349234
16.1253560683511	74.8064298575466	19.7254847264305	19.47269695	75.25893863	20.7798111	3.538510883
14.5821884301129	73.7044544707999	21.4828736071258	14.67447984	73.22055772	21.75092301	0.560824618
11.91186013249	75.7245695905473	21.8586284691399	10.28504553	75.43578797	21.16629174	2.70670664
9.13269206585493	77.8270224730862	22.2496987086291	9.01858207399999	78.03824041	22.65782791	0.473501375
8.3684564779234	77.9795038897725	21.02096140425	3.795442881	81.20966501	27.41200193	11.97973034
8.36793123952739	77.9796086854656	21.0201169266066	3.05949055799999	82.05603574	19.35294441	7.23908529
8.36740600091235	77.9797134807543	21.0192724490493	0.155166121999997	73.1143838	18.2350269	9.943054863
8.36690662299296	77.9798463470744	21.018416313409	5.863440787	76.06172049	20.11271942	5.891195528
8.36640724510349	77.9799792136998	21.0175601777987	3.765987951	77.28123402	18.22137656	9.204063574
8.36590786728486	77.9801120809537	21.0167040422445	3.380314451	80.99890539	17.02151813	11.39696855
8.3654084898558	77.9802449487657	21.0158479065497	10.77763243	89.00986935	18.62168793	11.5413795
5.22083963660931	76.0970977009535	17.146401050788	5.065657714	76.41830653	16.15003851	1.058298093
4.32018085151056	74.3768058453528	18.334754746697	1.009741561	74.32200243	17.21598932	6.745106086
2.62081765530493	71.1309587983271	20.5769407593959	2.544714587	74.45838234	20.47608884	3.751572119
1.73941098545406	69.4474392114734	21.7398926895789	0.299902086000003	68.51958527	21.52036301	1.726641853
2.46451953207804	69.4111492579333	22.436312952863	3.705228073	66.5975084	22.49684982	9.299418871
3.4494691338749	69.3618548789307	23.3822939046246	11.54525803	68.93314303	25.95468917	9.632544021
4.26655412912564	69.3209617298167	24.1670516448917	6.979895184	73.91637244	25.14533012	7.031194882
5.82483827713206	69.2429732897939	25.6636836412045	4.203561784	71.28689241	26.51244139	5.184520227
5.8255590380487	69.2429372172621	25.6643758857231	3.972668798	68.43095677	28.84137669	4.819982765
5.82627979900742	69.2429011447447	25.6650681301986	2.559418382	66.60707534	29.94444397	5.994415632
7.61084924198349	69.3838866259432	26.7688408575443	8.689838933	62.80875147	27.12937634	6.672826006
7.61169666710543	69.383967185426	26.7693656249523	2.76637406099999	66.09545945	29.36453565	9.314186257
7.61254409222857	69.3840477447842	26.7698903923774	3.702577787	67.55965669	35.63856131	9.862533299
11.9445015928821	69.9656495097325	28.1328966026788	8.88093920200001	67.16779099	33.76570468	7.575125342
11.9454477619456	69.9657765406192	28.1331943059825	9.89788954300001	67.94003152	30.38024953	3.836811672
11.9463939309962	69.9659035717061	28.133492009242	11.56644578	72.10851879	29.32762892	2.482161061
15.2086699836393	69.7676959063737	28.7789392722583	18.49430275	75.1491321	23.37172362	9.770365975
16.4551321756225	69.691963986327	29.0255541342601	17.24413003	73.14298035	27.78293034	6.329084859

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
20.3075371996875	69.4579015317869	29.787759507893	19.92687299	66.4828608	36.85195291	7.674542398
21.2998857906736	69.516771841706	29.7003361181313	21.52581462	69.05739134	31.57893426	1.947101759
21.3008762656017	69.5168388291719	29.7002158181032	25.66105506	62.27941228	31.77717439	9.39136023
21.9253188186443	69.5590709527542	29.6243728651406	22.14002238	72.37729838	30.29531679	10.56803504
21.9263092935662	69.5591379422425	29.6242525661888	22.95220857	73.2582761	29.61659281	8.329429805
21.9272997684999	69.5592049320796	29.6241322675307	24.84752889	78.21896812	35.91459865	11.0945574
24.7445429687956	68.5287835625739	28.3231795654871	24.37529212	73.10827156	29.72637521	9.946110191
28.6228581996749	67.1102695764084	26.5322427141215	28.77703399	67.75671878	24.26797752	2.359780417
30.8884887269863	65.6996138942509	27.3019955865622	32.14669335	66.5741861	28.83764483	2.169371802
31.8057047646756	62.7762947286403	26.0414145944557	31.78300706	62.74548174	25.97934086	0.072923073
32.3543697233452	62.4702717990071	26.591757580955	29.89833465	58.88393924	31.18403904	9.428399067
34.3989410447094	61.3298932744215	28.6425820747642	36.93641703	55.80482127	27.58013236	9.247821291
35.5635830508611	60.6803034459925	29.8107860501293	42.95157888	64.84132436	26.30910849	9.17378456
37.5049502639827	58.7803850647703	32.8347295771506	41.72708173	62.5487287	34.68501321	8.265204335
38.2353462988994	58.0655832242642	33.972420756875	39.00311055	58.98114927	34.60197054	3.475306118
40.2829652084483	56.0616816541915	37.1618656961056	35.39691212	60.01558524	36.77171252	7.016255469
40.5228868977824	55.8268823743427	37.5355763785806	37.67648628	59.01822185	34.10509713	8.663388767
40.6126250167759	55.7390601872784	37.6753557029734	39.86159624	55.58185516	39.85963663	2.315133001
42.2494244246649	54.9930194380151	37.0075740000964	41.84687745	52.15158968	38.57062516	3.267858024
48.2092918598391	53.120845213788	34.1856387961817	47.38308024	49.71863955	31.58389373	4.361961303
49.8321632797185	53.4275071754869	34.0845602254323	48.91348948	54.77748717	32.9330217	1.998111236
52.9272688281811	54.0123662871002	33.8917853505489	52.57887869	54.16196226	35.47497689	4.016092555
54.6462524347584	54.3371898531895	33.7847205518041	55.16481024	55.42346911	31.47512835	2.604442543
58.515646103522	53.9403900174286	36.1428737451063	58.50503897	53.8647284	36.33438611	0.206189664
66.5785058686125	56.250135459849	32.9658061858863	67.27809665	56.79217526	31.19414535	1.980408171
67.4858480951742	55.9596359342896	35.0185807856065	66.67873973	56.13517049	35.54640769	1.600074425
67.5947013469769	55.9247849056819	35.2648508354468	65.98277732	56.02257659	36.50214422	2.034393571
72.7346138346981	54.9111362313024	39.5142552798914	72.73426073	54.95021428	39.57914747	0.075751006
76.6768069228623	51.7038061589169	38.7130462997163	77.87000631	52.21112855	39.93820594	1.783848909
77.8981741290876	49.70751949532	37.4692989486259	71.61626861	44.97765672	39.11549021	11.56039904
79.5164771639401	47.0624535637416	35.8213423645242	79.30599483	40.28434635	35.54252376	6.78710395
82.0167117624412	50.8004440505474	33.8170887379349	83.91646182	55.69492785	39.74024442	10.80258547
83.4153552494216	52.891494255508	32.6958994251433	83.19197135	53.48639501	32.18766969	0.813698186
86.2944006917258	52.1670118643513	34.108951709912	86.51848331	50.71555717	36.90102142	3.154772102
89.8365077329665	53.4099987361538	31.7440928775935	91.19333201	55.09349477	31.72721103	2.162271031
88.5753693546822	43.6502579241262	25.7257641387711	88.60564442	53.67349247	30.97358927	11.4446079
87.6231450921191	36.2811523488322	21.1816168731859	87.56748283	36.27406643	21.13489416	0.073017187
91.9814640227429	31.2726984642803	21.9655282285298	94.17807015	30.5898166	23.81736257	2.95308255
85.7892637827229	25.4467988942608	10.6134139248103	87.03899122	21.09553754	1.216015821	10.64878101
Route: 9 Length: 264.713701700834 Demand Met: 2423						
70.6957754551193	34.7157458722871	1.0128412581225	63.76560063	37.45231942	9.842542758	11.55334525
64.3756455983505	44.7117885192422	1.7008393695005	55.55130491	39.21526309	7.425393497	11.86807905
64.3751625035494	44.7126637195217	1.70086474436062	57.35658457	43.71456461	3.914439364	10.0633535
64.3746794089298	44.7135389199072	1.70089011903424	63.59211348	50.34808715	9.20862338	9.725987624
59.7212366657126	53.1439661330359	1.94531063532099	62.81703196	55.94894639	0.04067048	5.494902887
59.7207535710279	53.1448413333945	1.94533600968674	59.77266019	58.01872841	1.019723189	6.553588622
58.4797979281302	55.3930234859329	2.01051687737103	61.56325619	58.635877	0.997422198	7.786489382
57.0305414618236	58.018574504777	2.08663862042259	59.0134746	66.34233581	2.610073656	8.63026105
55.5818682131602	60.6430688407135	2.16272944081792	53.04622082	62.56220406	2.597564218	11.46013038
53.8962667613574	63.6967951353014	2.25126520332875	54.15102156	63.89433124	1.875052021	0.495436049
52.7890132464935	65.2802425704678	2.54202795282324	52.45383187	66.17944394	1.57361944	1.363350544
52.4410507993873	65.3541009036196	3.69959665057853	50.29671492	64.07582579	3.765527546	2.617903286
51.6361996948496	65.5249382283831	6.37709965971964	50.86986196	67.11854893	6.466301231	4.50428609
51.4533654098475	65.5637465662638	6.98533560836972	53.70737401	57.8077763	9.994366281	11.42963583
51.1798662474347	65.6217994129173	7.89518699359351	44.98764045	56.96391467	9.231659535	10.72794423
51.1797668694373	65.6221344100152	7.8961239572844	47.89205446	67.3947139	7.919602812	3.735189713
51.8063889760272	65.705948603986	9.29447783298075	52.59359138	61.87082203	17.23711721	8.855134315
52.4317313173775	67.560946659752	7.90918440671793	56.20333441	63.09635143	9.893720293	7.090992634
53.2698477582111	70.0471097040955	6.05254315680638	56.84900895	69.27095699	14.65228976	9.651018813
53.5232863458923	70.7989028253323	5.49111166718196	53.60239056	70.80290226	5.406808424	0.11567415
51.3581223595932	73.4538757723323	6.70872226843446	51.17754367	73.39508539	6.606709632	0.21557261
51.1238367961239	73.9808088853588	7.01456565299839	57.82109764	79.24611201	0.587934441	11.76834886
50.5272717149619	75.3225472783315	7.79333965248952	53.90080059	74.55382457	8.588853077	11.74270355
50.1726445538176	76.1201416635543	8.25628057974106	53.08761619	83.0335557	12.88369987	11.99564131
48.5996387883082	79.6579999874895	10.3097291146251	51.49657531	83.11057243	16.78262105	7.887384084
48.5988223896771	79.6583659055741	10.3092823515666	46.11608956	79.13405595	12.05021293	3.077288175
48.5987281025746	79.6588425470309	10.3084083247569	47.14165764	77.84331314	10.33249494	3.855818645
48.3907070355077	80.710435639027	8.38008298770255	45.32225765	79.26748614	7.718311017	4.954739166
48.1154110370841	82.10211892926	5.82812843101708	44.47086767	80.17305261	3.885836986	4.558123438
48.466081194185	82.9047157639892	5.04974419641038	47.92908542	80.11129273	4.265931676	4.896396861
48.806738509722	83.6843956842329	4.29358553050381	49.55654528	80.81624315	0.169379697	5.359214828
49.3060256046431	84.8271396138061	3.18531567800254	51.18829335	82.80979047	5.597845952	7.761910446
49.7352702304931	85.8095737308532	2.232519477559	48.20934555	82.30314786	4.491594241	7.596162818
49.7932653479871	85.9423101524739	2.10378743222066	52.05342714	85.82620662	0.803032132	2.610320997
47.1548839045743	88.835899748414	1.68437737317328	49.59427698	92.51123595	3.551090207	5.147122326
45.2648171536385	90.9087911077966	1.383922834656	46.25821854	91.17761288	0.218810451	1.63636571
42.2664918688096	94.197142338968	0.907293750278341	44.01236363	95.54242778	0.007676566	10.44212715
39.8695242666327	96.8259669116809	0.526259664679568	39.47053756	98.01039691	0.046804559	1.338634383
39.1117441096889	92.3185475963234	3.37959272301766	42.23200248	88.95299773	4.136491045	4.651433464
38.8761428439113	90.9171476765554	4.26672138256742	35.55901251	90.85604615	4.893665446	4.28990011

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
38.432451091229	88.2779879749913	5.93738926745987	40.58416037	81.54961967	6.0287924	7.064640642
38.244281557381	87.1587214150018	6.64591912471489	38.21932161	86.88940242	6.390388464	0.372090901
38.2267170053241	87.0810534999778	6.78959102301206	38.00030199	82.20200968	0.019607641	9.151482372
37.8748522318004	85.5251550515579	9.66772737928906	36.17809574	80.13104248	5.688631409	8.234427368
37.8189797975489	85.2780946621752	10.1247453256339	38.25086273	84.70191635	10.62939488	0.879303979
30.047897165084	90.0369897379881	10.153090097656	29.03165996	90.53300961	6.710005169	3.624031953
29.1880769371406	90.5906379443681	10.8959427950377	31.03913924	88.81924735	11.29281098	5.700862296
25.3477410248082	93.0634752837791	14.2138504566361	25.24294214	93.18181598	14.28875041	0.174920924
28.7794820111352	86.7504667323923	12.510960030617	28.95022635	86.79829568	12.40202554	0.208105648
28.6419220509272	83.0112686567911	12.8462471305605	28.34961296	82.66841267	14.80317352	2.008122438
28.9538799348529	75.8988944869141	9.53370865111005	28.44331265	74.98671685	9.740464776	1.065596119
31.5285374111341	76.8332159029429	6.96832101157164	31.34183617	77.86791685	6.462154326	1.166905359
32.0661064417798	76.5213129746558	6.75100560851487	38.24583972	80.95791524	3.839199962	10.77332683
33.2281710205315	75.8470715143793	6.28123418671025	34.30971303	75.90183293	2.096267325	10.30780315
34.3125040743691	75.2179306821606	5.84288613273135	35.03662295	76.31902131	1.401481412	4.632798788
35.4132040931715	74.243192913753	6.31452956517814	36.44207057	76.13900165	9.824805701	11.50367704
36.3439348366857	73.4189734321872	6.71334223044544	38.19879917	73.45302115	2.159211899	11.60064907
37.264417754423	72.6038289178096	7.10776381226378	39.75179858	71.51477588	1.359571846	9.864345808
38.3658449660754	71.6284469661787	7.57971898950532	41.95376322	74.60739468	6.926728294	10.5272795
39.4400324075735	70.6771875439226	8.0400019983375	41.30767537	70.05965636	6.684179381	2.389077221
39.4300254581011	70.6527210915541	8.10505035378389	44.13660931	71.38940487	9.812814914	5.060740493
38.1548932648369	69.367640160726	10.8978579971168	44.96838238	64.05706864	11.93558957	9.942108139
38.154510139637	69.3672540462226	10.8986971220608	37.43465738	70.14594443	13.87115315	3.15595335
38.1408090126972	68.9630959401127	10.5664693798468	39.12047899	68.75765335	13.33882614	3.957947734
38.0368638013423	65.8968976811146	8.04598032930486	36.88863481	65.11756178	9.028914476	1.700574542
38.0168539918144	65.1243444718228	7.40197853231093	37.36735143	64.72519961	6.841621681	8.210035462
38.0053863409836	64.6815910765798	7.03289826758322	34.32584869	66.311045	4.144300462	8.8122254
37.985054022647	63.8965751140536	6.37850694680859	36.53251416	65.89826385	3.47943245	7.253690252
37.9648167080294	63.1152219057958	5.72716927074294	39.83687168	68.05987049	1.771904532	8.931405029
37.948374174752	62.4803854868349	5.19796837527275	38.87334077	61.97418169	4.472466865	1.279905437
36.816349127204	62.1839794732384	5.31468341233403	38.55825219	62.0328479	1.356643655	8.230604564
35.7562666457936	61.9064104441132	5.42398087445179	33.85806756	68.2147305	3.068667124	8.272925857
35.1266368527417	61.7415499538639	5.48889738901477	32.28903103	63.37386507	1.032108002	5.529867185
31.7911970943909	60.8682093235126	5.83278772182471	25.08011935	60.4806985	0.592321921	8.52356797
31.8962600154702	60.7392311040109	6.49973047356639	33.50828257	58.48410354	3.557102036	11.3670918
32.295009164254	60.2497152531186	9.0310036169793	28.38294287	59.7022254	11.36065683	6.876187581
32.458600501447	60.0488859951771	10.0694863836111	32.47933058	60.09950546	10.14811096	0.095780428
32.1148739017539	58.0291406135881	9.58780092556812	28.66025221	61.13181458	11.59083816	8.682831908
31.8599340890374	56.5311089855969	9.23053802291965	28.17203359	56.51587977	9.985576368	4.557563307
31.5390163673875	54.6453916211111	8.78081661542869	24.61643689	54.01115924	6.209992422	7.411713322
33.6602762024756	50.1058536777872	8.72565076757853	34.68773061	48.27076221	5.003934468	4.719701242
33.6606995225623	50.1049477644873	8.72563975859556	34.17044541	50.63731129	14.2756352	11.2605766
34.795895076431	47.6756069593551	8.69611754802862	30.33187934	43.75504148	14.96541955	8.637269115
35.7910603075803	46.4785981241711	8.2443043582532	34.31056081	43.95356429	5.695822859	3.881034988
42.4130583423658	45.2133932988144	10.2492147463427	47.22851165	47.89903616	20.36250944	11.51868038
44.2007050970862	43.3345510519731	7.10022749929715	40.81010844	38.77304558	7.861958026	5.734432078
44.8243674465833	42.6978794517163	6.01369096403656	41.57443341	43.13832473	6.475589725	5.186489261
46.4400018809533	41.0485437848897	3.1989534425482	43.74535734	43.87626012	1.779657186	7.961235625
48.2098135022445	39.2418149016459	0.115610550424502	48.20619517	39.24794213	0.08063613	0.03569097
49.259631780757	38.011352138596	0.979448344153971	51.33580352	40.30660727	1.042528676	4.986289138
51.0614311379077	35.8995134159657	2.46205004449949	50.32982697	35.43640834	3.785700884	1.581696088
56.5391012749226	32.8899546058941	1.99601581765089	54.69460289	37.32086801	4.721267047	6.733868048
60.9350504496807	30.4747188160636	1.62201404048234	58.09138733	33.97784367	3.040604697	4.941158085
65.1627667503938	28.151914593875	1.26232631207911	59.11600598	27.89604561	4.171146498	6.714910247

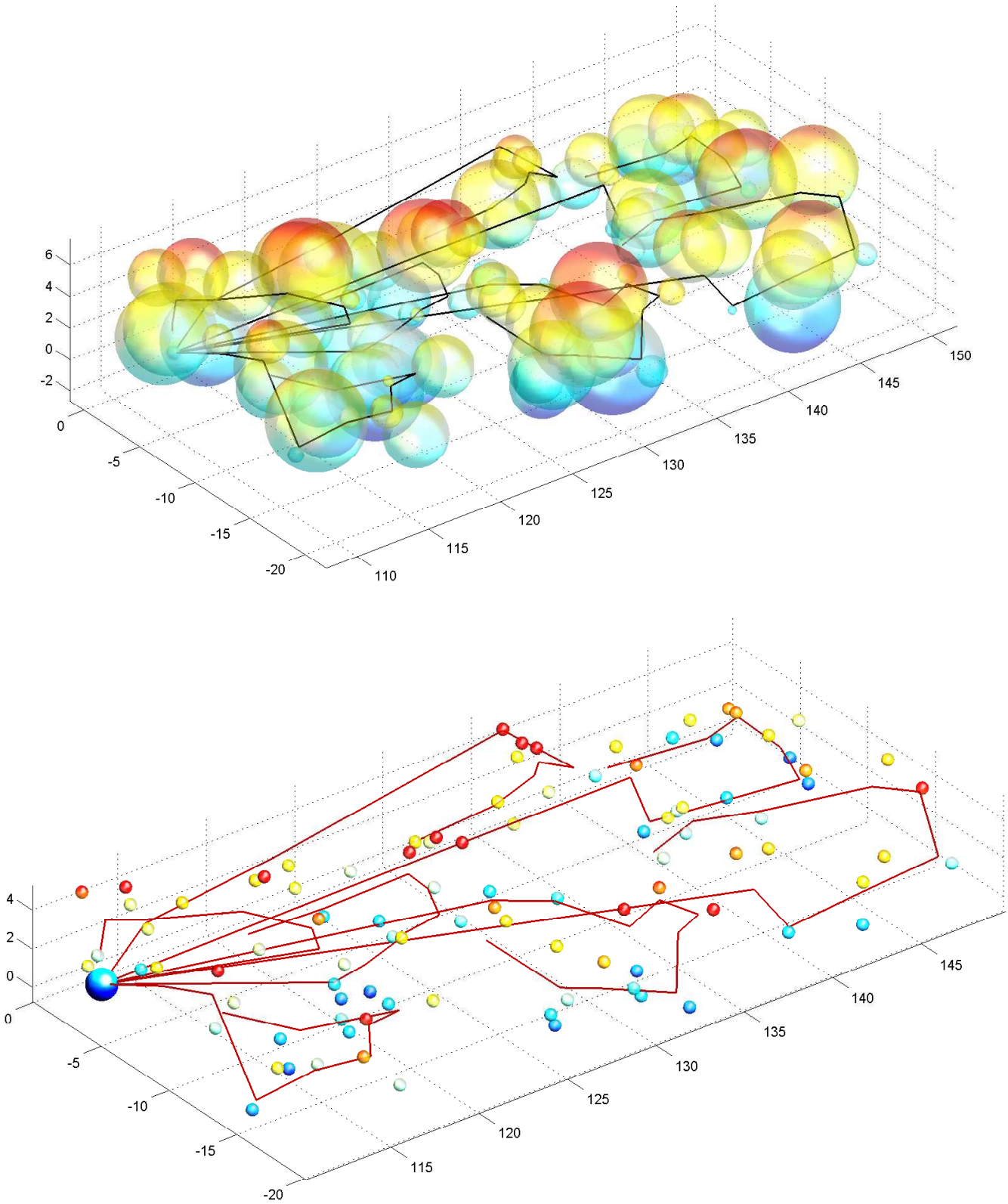


Figure O.98: $kroD100$, arbitrary radius, 3D, Euclidean, Length = 386.2939312

Table O-101: Solution for $kroD100$, arbitrary radius, 3D, Euclidean

Total distance: 386.29393120862 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 24.5177479311702 Demand Met: 353						
6.5168865060825	5.64581125962706	1.5340211042793	7.81	6.7	2.36	1.89
9.54117684165662	8.87965134707015	2.77551591131312	10.09	10.01	2.31	1.34
9.55040021395243	8.68356327309904	3.04107513142717	10.21	9.62	0.29	2.98
9.568704523429	8.29441532981358	3.56809251595532	9.81	8.48	4.05	0.57
8.82689514440932	6.56551621841418	3.49553645112302	9.31	5.12	4.87	2.65
8.15561388256147	5.0009935504426	3.42987871018178	10.17	3.33	3.55	2.62
6.8436936255228	4.1117910067633	3.32775689977009	6.34	2.94	3.58	1.98
4.76013572693225	2.69958248678849	3.16556967835072	3.87	1.99	4.81	2
4.62861372946539	2.61043857972886	3.1553318090073	4.59999999999999	2.67	2.69	0.47
3.07740035288484	1.53174330392193	3.19472560491102	2.64	0.36	4.24	1.63
2.44978808684871	2.00061899770397	2.13152374190562	0.469999999999999	3.63	2.67	2.62
2.53592161609066	1.90916242111695	1.57553029353361	2.02	2.33	2.08	2.61
2.53592161609066	1.90916242111695	1.57553029353361	3.66	3.39	1.25	2.53
Route: 2 Length: 43.2150315671767 Demand Met: 395						
2.4534412137775	6.53022340546489	2.26019010190624	2.40000000000001	6.19	3.07	0.88
2.21451400263881	10.538841439647	3.74466889598451	2.41	10.69	4.97	1.25
1.89028246254009	11.9183588397331	2.87167764675352	2.34999999999999	10.59	1.97	1.67
1.11801978478178	15.2041274367266	0.792365498002437	0.799999999999997	15.33	0.47	0.47
2.28819727928416	15.8821889945537	1.48204550410999	1.48999999999999	16.29	2.83	2.86
3.42110121075328	16.5386522245513	2.14975716680642	3.86	16.16	2.13	0.58
4.40148524183482	18.7822714598	3.46461962448618	3.94	19.44	3.99	0.96
4.87909195191692	18.7463279943177	3.35138516581128	5.70999999999999	19.82	2.08	1.86
5.65954478834686	17.5983689843557	4.1963132842479	5.55	17.53	4.5	0.33
9.0868423772753	15.3682197606043	2.73438647383368	10.82	15.61	2.72	1.75
8.07019744610979	14.2102101789695	2.20496164708857	8.11	12.95	0.83	2.74
6.87563686689165	12.8495457337479	1.58288599653841	7.78	12.82	1.55	1.85
6.08817760249814	11.9525900940587	1.17281113359753	4.64	13.02	0.19	2.05
5.33802831717878	9.6164155102262	0.906869114834259	5.55	11.21	0.58	1.68
4.78526183658658	7.89494614388367	0.710903026041447	4.01000000000001	9.8	2.35	2.63
Route: 3 Length: 55.1279760822735 Demand Met: 391						
5.81169431215388	0.896338883771539	1.75155022149361	5.47	0.25	2.56	1.09
12.7738778420165	1.27086591428335	2.8781536815743	12.72	2.46	3.03	1.2
25.7981864034196	1.22600788582694	4.88529860914621	25.81	1.21	4.92	0.04
27.1481501129656	1.84337719064869	3.81243149120823	26.56	1.28	3.27	1.2
28.7699852210363	2.58507947780253	2.52349794029428	29.95	2.64	1.7	1.44
26.3494305746962	3.36301552737476	4.00272002539902	25.92	2.48	4.76	1.24
26.1534288743303	3.4260080255567	4.12249841373632	25.97	3.49	4.95	0.85
25.8149658227522	3.52954643383499	3.58566062959731	26.58	3.6	2.5	1.33
23.6847051746153	3.79255913411306	3.14145361944324	23.47	3.88	3.22	2.49
23.2680549440953	3.84400087661276	3.05457269030288	23.34	5.23	2.71	1.43
18.8537831182057	3.37129050427911	2.39644707858905	19.62	3.89	2.49	0.93
Route: 4 Length: 80.696949137478 Demand Met: 400						
14.3294569428237	5.78192603939506	3.13459471123433	16.04	7.06	4.67	2.63
16.577985953383	6.58635830653864	3.7448595672077	17.66	6.92	4.8	1.93
18.3751160897855	7.22929838377017	4.23261192843468	18.19	8.14	4.91	1.15
29.0844419044257	6.35343669411752	3.63318600240511	29.44	6.32	4.14	0.62
30.233586062921	6.2815127505318	0.902449065143406	29.93	6.24	0.47	0.53
34.3350922088065	6.52432613224946	0.680759116267587	34.52	6.37	0.69	1.63
38.3371159599693	6.76125009353222	0.464446336937238	38.68	6.97	0.22	0.47
38.2360074796451	6.31336844430121	0.999652121426887	39.46	4.59	0.2	2.26
37.9367278068394	5.87978681347365	1.87473950091759	39.35	5.4	2.53	1.63
36.7607825537868	5.35436773040147	3.08114108042439	36.42	6.99	3.53	1.73
36.1752129852631	5.04263348082945	3.6790954517249	35.99	5.14	4.02	0.4
36.2754679935521	4.06540207373755	2.77852723466763	36	4.59	3.96	2
36.372606976471	3.11854353516048	1.90594883958392	35.03	3.01	2.97	2.47
36.443876961645	2.42384408802398	1.26574794649362	37.66	1.54	0.37	1.75
36.443876961645	2.42384408802398	1.26574794649362	35.38	1.25	1.14	1.59
30.5888802916525	2.67741498442898	1.92019162110645	30.62	3.29	3.3	1.51
Route: 5 Length: 83.4675337420464 Demand Met: 394						
27.4142579561423	15.098720416258	2.16226821352819	28.34	15.12	3.98	2.04
28.7907869631293	15.8502166939543	2.28309284749497	30.07	15.24	3.68	1.99
29.4200156527565	17.6292934099019	0.929050178971883	29.27	17.77	0.77	0.26
31.0923888371105	17.8007120162111	1.21777001905967	32.48	19.06	0.64	2.69
32.5570391065195	17.9508389493724	1.47062840675487	32.2	19.45	3.11	2.25
35.4270746089782	18.1078678105217	1.81420550937949	33.73	19.02	3.72	2.71
37.4091611435439	18.2163141378316	2.0514846153212	37.86	18.62	1.72	0.69
37.9569965083207	16.1408671648803	4.25824105235626	38.05	16.19	4.44	0.21
37.1520183021383	13.6658561838584	3.66977696961329	39.18	12.17	3.68	2.52
35.4192721914958	12.4393900437974	3.18408332832611	35.35	11.12	3.97	2.82
33.0304380386225	10.7485340278309	2.51448635558502	33.32	10.49	1.92	0.71
31.8253416022627	10.020068510812	2.35821505232015	30.23	8.71	2.76	2.25
31.8253416022627	10.020068510812	2.35821505232015	29.82	9.49	1.92	2.12
30.4401936153519	9.18276410872694	2.17859549527782	30.6	7.81	2.03	1.39
28.4978520021083	9.83656749590035	2.1373577490919	29.01	9.2	2.88	1.16

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
27.407493337827	10.2035885150923	2.11420839824005	27.4	11.01	2.19	0.81
Route: 6 Length: 37.0560209320126 Demand Met: 391						
9.98511031638679	9.36472451297335	1.09939955960078	9.97	9.42	1.03	0.09
11.2355451926644	10.0469056777795	1.90681991054999	11.09	11.96	0.79	2.22
11.6018954963282	10.1948784463467	2.17001495250461	11.79	9.69	0.13	2.24
12.6145669609112	10.6039068908151	2.89754286835708	12.64	10.9	3.18	0.41
14.2711275653542	9.08222578547215	2.06270360411276	13.93	8.59	1.72	0.69
16.601061239386	8.53245135456774	1.90452181261847	17.25	9.27	1.67	1.01
17.3058684924252	6.75744626493233	2.20068116987421	17.66	6.78	2.14	0.36
17.0915328479236	5.60401819953862	2.49852619780837	18.28	4.56	3.27	1.76
15.5333368684276	5.10488781892505	2.0954113380429	15.29	5.81	0.79	1.78
14.338763578248	4.72223513097885	1.78636792667871	15.41	3.54	2.28	1.67
13.248201629412	4.37289962414157	1.50423281245826	13.46	4.08	0.87	0.73
9.68121987188596	3.44508644565904	0.991674103256392	12.03	3.85	2.73	2.95
Route: 7 Length: 62.2126718164623 Demand Met: 395						
20.0909361301077	7.75958797265452	1.0642829368954	20.67	6.94	0.95	1.01
21.9833205628758	10.0097463201691	1.41223618189464	22.23	9.9	1.41	0.27
22.6447533547299	14.7076046505341	1.99570460378507	22.21	15.78	0.34	2.02
23.3354772297977	15.9822218666787	3.71545028167664	23.56	15.68	4.13	0.56
23.3347162242523	18.873808781776	4.2968076025402	23.74	19.44	4.67	0.79
22.3225671122893	18.6754259929443	3.60940838388303	20.28	17.36	4.94	2.77
21.7447846380701	19.3130036757115	0.987052604583337	22.14	19.77	0.32	0.9
20.964926235131	18.845220960778	1.10755244692554	20.5	18.33	0.82	2.94
20.1560268628168	18.3600186227052	1.23253954118638	19.94	18.52	1.49	1.09
18.6477874547548	17.4553310004545	1.46558514699994	17.87	19.02	3.83	2.94
18.5663403149225	17.3983456002769	1.46918626680477	16.46	18.17	1.97	2.5
17.8583623913217	16.9030009551865	1.50048892817838	17.68	15.78	3.21	2.13
17.3143923065856	16.5224062199886	1.52454011586222	16.23	17.23	0.85	1.46
17.2836041212729	16.4458472197518	1.55301008165665	16.32	17.42	0.34	1.83
15.9637853332877	13.1639388424881	2.77345201087017	16.99	12.94	3.45	1.36
15.8638894449814	12.9155341581072	2.86582615775656	16.77	12.38	3.99	1.54

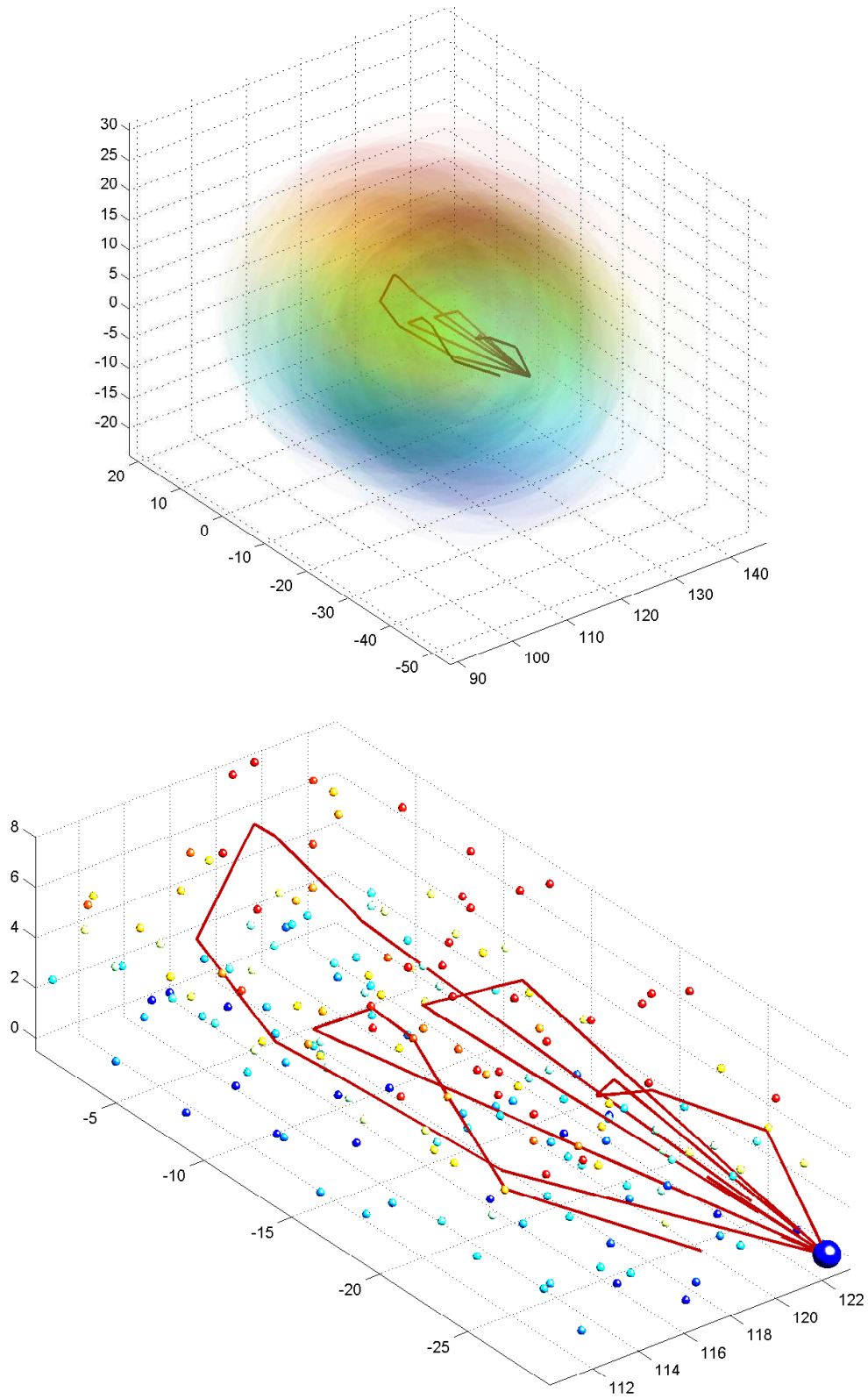


Figure O.99: $rat195$, arbitrary radius, 3D, Euclidean, Length = 194.9382562

Table O-102: Solution for *rat*195, arbitrary radius, 3D, Euclidean

Total distance: 194.938256167597 Total demand met: 11712 Depot: x 12.7 y 29 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 56.6356110306837 Demand Met: 1997						
10.1009006475485	20.4548117650487	0.681179526712967	4.7	1.1	0.2	20.1
9.75287881584065	19.3106030668698	0.772390103002081	6.59999999999999	1.6	1.4	18
9.2945382835382	17.8036940927505	0.892513335556167	12.6	10.9	4	9
8.89863414686064	16.5020603760887	0.996273055867591	8.3	8.9	1.9	9
8.50443926977788	15.2060462425765	1.09958482521155	11.7	11.5	2.9	9.1
8.10607619032636	13.8963281328651	1.20398900856552	9.8	10.8	3.4	8.1
7.71135779289055	12.5985928353006	1.30743797933661	5.59999999999999	10.5	0.4	25
7.31580356988901	11.2981095674508	1.41110597836558	4.7	8.7	1.2	4.1
6.85468435345393	9.78206495767681	1.53195746414291	5.40000000000001	7.2	1.4	3.1
6.78771901023605	9.56189957605396	1.54950793902339	10.3	9.2	3.3	4
6.63770619177262	9.06869505029507	1.58882375316554	7.40000000000001	3.2	3.2	9
6.54890329545748	8.77673333381453	1.61209748636205	5.3	2.5	6.5	9.1
6.47223057918768	8.52465262872827	1.63219210805354	4.2	3.4	5.8	10.1
6.3472252023989	8.11366621806722	1.66495388871171	6.40000000000001	3.2	0.3	5.1
5.89000283490087	9.25724315468068	2.48776030030078	1.7	1.2	4.1	10
5.62155628712364	9.92866540409583	2.97085025631249	2.59999999999999	5	2.8	9.1
5.48503728811464	10.2701184750466	3.21652657896888	12.5	3.4	2.8	10.1
5.05499516471116	11.3457138494098	3.99042008063295	8.5	6.5	2.8	24.1
4.65254379950771	12.3523009160796	4.7146619505167	2.40000000000001	11.2	0.3	8
4.2923363075503	13.2532301316322	5.36288272154954	0.599999999999994	8.4	0.5	8.1
3.90850796888965	14.2132384134378	6.05361102303896	2.40000000000001	15.3	3.6	3.1
3.54116394531211	15.1320170868641	6.71467453044309	3.5	15.1	6.8	0.1
3.51736758799829	16.5009184277081	6.64838261602026	4.40000000000001	16.9	6.4	1
3.5	17.5	6.6	3.5	17.5	6.6	0
2.40000000000001	20.9	6.2	2.40000000000001	20.9	6.2	0
1.5005204200301	23.691615648702	5.98768829935223	3.3	24.6	6.9	9.1
0.580161884145397	26.5480310407701	5.77044835695225	0.5	26.6	5.8	0.1
2.12778883353865	26.9218579667692	4.86075144139522	1.5	24.6	3.5	5
3.45528257828309	27.242512069991	4.0804489883764	0.599999999999994	24.9	2.3	4.1
5.27603526976546	27.6823120966193	3.01020841522056	3.3	28.4	2.5	7.1
6.85600597974229	28.0639516282817	2.08149974066502	4.3	28.8	2.1	4
7.77609166331116	28.2861969266756	1.54067229113083	7.3	28.6	0.6	1.1
Route: 2 Length: 62.7391072410964 Demand Met: 1998						
5.96926966272267	19.3084238542302	1.33677417803324	5.40000000000001	19.4	0.4	1.1
2.91127364303854	13.3887941397016	3.69112633994862	3.5	12.6	3.2	1.1
1.49455229933437	12.2833651653593	4.81400452849901	0.599999999999994	12.7	5.3	1.1
1.94368231495952	10.7144087793329	4.84206598678026	1.5	11.1	3.9	2
2.52790460153341	8.67353140611169	4.8785679542719	4.7	6.8	4	3
2.63592076081088	8.29619603156793	4.88531675940087	3.7	8.4	7.5	3.1
2.87869874799723	7.44809401286023	4.90048542793409	1.5	7.5	4.4	4
3.13810710332086	6.54189673880305	4.91669315488863	2.7	7.3	2.8	3
3.52279106702214	5.19807125055764	4.94072804937132	0.299999999999997	3.2	6.5	4.1
3.67472270200666	5.04006773443845	4.90071505957434	2.59999999999999	3.4	1.3	4.1
4.72959247916907	4.39778664029849	5.26332634527203	3.3	3.4	4	20.1
5.37608911900666	4.00415267796671	5.4855594426246	2.3	0.9	5.1	8
6.06452699347894	3.58498185576739	5.72220983142501	6.59999999999999	6.8	6.1	7.1
6.7652359977493	3.1583394807358	5.96307841896354	6.40000000000001	5.4	1.3	8
7.48865699809428	2.71786839839312	6.2117542508182	9.5	2.8	2.3	19
8.28737234544096	2.23155266579534	6.48631249969254	8.59999999999999	0.6	7.6	2
8.76590181458367	2.73144447460853	6.09836662032623	11.5	1.4	6.7	3.1
8.86074798846087	2.96830429669905	5.92875123186991	9.40000000000001	0.8	7.9	3
9.19125841918209	3.79368965198578	5.33769253435242	11.3	3.1	6.2	7
9.67254706447156	4.99561419226658	4.47699401695263	8.5	3.4	4.2	3.1
9.85451923044201	5.45005419158585	4.15156939831152	12.3	1.5	6	5
9.93992044682268	5.66332707713836	3.99884462207139	11.5	4.7	3.2	2
10.02660998221	6.1049949744086	3.75155069718442	10.3	5.4	1.9	2
10.5998819449095	10.639431620808	2.94055827336149	7.40000000000001	6.7	6.3	8
11.10148816924	14.6070103363389	2.23094944434323	12.7	14.8	0.7	9
11.4412811777286	17.2946873443739	1.75025342354339	12.5	16.9	0.1	2
11.8731534817059	21.3108347744608	1.1497332939694	10.4	2.5	2.2	19
12.2945002198485	25.229100873923	0.56384901970449	1.7	29.4	1	22
Route: 3 Length: 25.5627254917856 Demand Met: 1952						
11.5182594260831	27.1259422891916	4.54856580702263	11.6	27.1	4.6	0.1
9.66943149949127	26.7278294062523	5.70264306871055	11.4	29.4	4.3	25.1
7.23971361909263	26.2046319915831	7.21932405242803	6.7	26.7	7.9	1
7.23965193430665	26.2037429941763	7.21887031395929	2.3	28.7	7.3	13
7.21066599925214	25.7859998469823	7.00565697797616	2.59999999999999	23.5	7.4	8
7.18802032359857	25.4596320347316	6.83908100733664	3.40000000000001	22.5	7.6	5
7.18795863876014	25.4587430373147	6.838627268895	3.3	21.4	7.2	7
7.16520832674243	25.1308672204543	6.67128162312147	1.5	4.6	5.8	22
7.14844352108511	24.8892540912072	6.54796388158922	3.59999999999999	10.8	4.8	22
7.13190808038267	24.6509465501329	6.4263332898235	1.3	22.7	4.8	22.1
7.114943753961	24.4064579274514	6.30154791518811	0.5	20.7	6.8	19
7.09873426302723	24.1728479368712	6.18231492144818	11.7	22.5	7.9	14.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
7.08174782422388	23.9280406327553	6.05736689396678	11.5	9.5	4.3	21
7.06596939289241	23.7006430451218	5.94130467096238	7.7	12.7	4.4	23
7.04915203609605	23.4582725370566	5.8176003673948	5.3	17.4	7.6	8
7.03865611349474	23.3070060794611	5.74039496893324	6.59999999999999	19.2	7.9	8.1
7.03859442856367	23.3061170820205	5.7399412305506	1.5	21.3	4.6	6
7.51728365638783	22.9273546136476	5.55747512605174	1.7	12.5	1	18.1
7.51728365638783	22.9273546136476	5.55747512605174	4.40000000000001	13.1	0.1	16
8.88323691346737	21.8465451844604	5.03680293307387	9.40000000000001	9.5	1	13
8.88323691346737	21.8465451844604	5.03680293307387	7.3	11.2	0.4	18.1
8.88398826825615	21.8459506755836	5.0365165326956	0.299999999999997	19	1.4	19.1
8.92092998099898	21.8167205748273	5.02243514036708	0.299999999999997	16.4	1.1	19
8.96924689691771	21.7784898532956	5.00401776409185	11.6	13	7.6	12
8.97001360795706	21.7778831936571	5.0037255102653	12.3	9.3	7.2	13.1
9.03227561759749	21.8984368526817	4.92020187888964	8.7	17.3	3.1	13.1
9.03266639237279	21.8991934830637	4.91967765990865	8.7	15.4	1.1	17
9.03305716717408	21.8999501134832	4.91915344100122	11.4	16.9	4.3	15
9.03344995579802	21.900710643191	4.9186265204182	8.59999999999999	10.7	4.5	14
9.03344995579802	21.900710643191	4.9186265204182	10.3	12.6	5.4	10
9.0338407305599	21.9014672735312	4.91810230136691	10.4	15.1	4.9	18
9.0338407305599	21.9014672735312	4.91810230136691	11.7	15.3	3.7	18
9.034231505329	21.9022239039518	4.91757808243707	5.5	14.6	7.4	9.1
9.1020832756526	22.033600631665	4.82655586531062	8.2	13.4	6.9	18
9.1020832756526	22.033600631665	4.82655586531062	6.3	15.5	7.6	11
9.24715410543357	22.31449132726	4.63194534113016	0.299999999999997	4.8	1	20
9.85359566891802	23.4887025282225	3.81841231611694	5.40000000000001	1.2	0.3	23
10.6507411215097	25.0321605971108	2.74905263893411	8.7	24.9	3.7	12.1
11.1048324903248	25.9113865674478	2.13989530529765	3.59999999999999	7.3	0	22
11.6180646935422	26.905122879544	1.4514013525034	1.59999999999999	17.2	3.9	21.1
12.1559342961255	27.9465628972854	0.729856669480827	4.3	20.6	6.3	21.1
Route: 4 Length: 35.5750102148216 Demand Met: 1953						
12.266804343584	27.0029667532631	0.861740799983443	5.5	22.5	1.9	14.1
11.8354112523994	25.014243338054	1.71989582365511	9.3	18.5	2.6	9.1
11.4093510911175	23.0501047458594	2.56744223691343	11.5	20.6	7	14
10.8145497261578	20.3080687132218	3.75065955697045	6.40000000000001	16.8	1.7	6
10.6609532222948	19.5999883789645	4.05620365080549	9.3	15.6	1.2	5.1
10.1821212972575	17.3925718147136	5.00872704743486	9.8	5	1.1	13
9.77515663044531	15.5164635185709	5.81828745233457	12.6	13.4	7.7	4
9.76507850436983	15.512690118407	5.81718505585654	8.8	4.9	6.7	12
9.04627136053102	15.24355805155	5.73855826146703	12.5	6.8	4.3	14.1
8.76163070287529	15.1369843621764	5.70742281253153	10.7	6.5	4.1	12
8.53135237244426	15.0507647355369	5.68223379241978	1.5	3.2	3.6	14.1
7.79002744637341	14.7732016764337	5.60114388876746	5.40000000000001	13.2	5.7	3.1
7.64509777686955	14.7189378564468	5.58529074185093	7.5	4.4	2.9	14.1
7.49476389777509	14.6626506200598	5.56884645485872	7.7	9.3	3.2	10.1
7.34100634885119	14.6050815105564	5.55202766948135	0.299999999999997	1.2	2.6	18.1
7.19316410663305	14.5497271799563	5.53585593013481	3.40000000000001	1.1	2	18.1
7.03035690399403	14.4887697458833	5.51804724692498	6.3	12.4	6.5	4
6.86768048027496	14.427861277625	5.50025286931606	1.59999999999999	14.7	5.3	11
6.70954156036831	14.3686517178247	5.48295482663549	0.700000000000003	11.4	6.7	12.1
6.45700946559683	14.2740999525564	5.45533157732525	3.59999999999999	5.4	1.9	18.1
6.37617522540462	14.2438344125282	5.446489515295	1.3	9.5	6.3	7
6.49798374819842	14.5280653649022	5.34158008635263	2.5	9.4	1.9	11.1
6.56201328293494	14.6774734292394	5.28643368346401	7.5	0.7	4.6	14.1
6.84922197608952	15.3476531363198	5.03907086295424	2.7	13.4	6.1	5.1
7.11193276122815	15.9606688334862	4.81280723416716	2.5	16.5	6.9	10
7.18704720779407	16.1359427001652	4.74811378362423	9.59999999999999	12.8	7.5	5
7.41962723762165	16.6786505621031	4.5478007240598	0.700000000000003	15.2	6.3	7.1
8.04778821294859	18.1444165660484	4.00678760445139	2.5	19.5	4.2	6
8.33038427103688	18.8038330387852	3.76339748505163	3.7	18.6	2.9	17
8.6139048192221	19.4654067393684	3.51921113453949	0.599999999999994	7.5	5.5	17.1
8.85149178692826	20.0197979128593	3.31458577339109	4.3	11.2	3.3	10
9.73225450580151	22.074990931412	2.55601559103929	6.40000000000001	11.2	5.2	12
10.36741206225	23.5570829261997	2.00897656094779	1.59999999999999	18.8	1.3	10
11.6301546963549	26.5035971092531	0.921420411371759	0.599999999999994	22.9	2.8	14
Route: 5 Length: 10.7206712384536 Demand Met: 2000						
12.5343387195149	28.3950451073073	0.158602730003625	7.7	19.2	6.3	23
12.5343387195149	28.3950451073073	0.158602730003625	5.3	21.1	5.7	15.1
12.4012465587589	27.9090247651128	0.286024052114491	8.7	23	0.9	11
12.4012465587589	27.9090247651128	0.286024052114491	11.3	24.6	0.1	14.1
12.2119680610793	27.2178255112346	0.467237710956994	10.5	22.8	0.7	15.1
12.0585247936162	26.6574878476938	0.614143015141834	5.40000000000001	26.6	0.3	19.1
11.8860885550261	26.0277924641793	0.779232026445766	10.6	19.2	0.8	11
11.8860885550261	26.0277924641793	0.779232026445766	9.40000000000001	20.9	2.9	9.1
11.8425128134554	25.8686643927162	0.820951084184357	6.7	22.9	2.9	22
11.6352385009068	25.1117487861001	1.01939378261519	4.3	22.7	1.3	8
11.6241485916117	25.0712511306009	1.03001116549289	7.59999999999999	17.1	1.9	19.1
11.6241485916117	25.0712511306009	1.03001116549289	9.5	17.4	3.2	17
11.586025864186	24.9320361526414	1.06650955032676	11.7	6.5	2.6	20.1
11.586025864186	24.9320361526414	1.06650955032676	9.40000000000001	7.4	2	19
11.3274457591177	23.9877642098137	1.31407198819682	10.7	0.9	0.9	23.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
11.3274457591177	23.9877642098137	1.31407198819682	4.8	5	7.8	21.1
11.3274457591177	23.9877642098137	1.31407198819682	12.7	4.9	6.8	23
11.3274457591177	23.9877642098137	1.31407198819682	7.5	15.1	1.1	23.1
11.3274457591177	23.9877642098137	1.31407198819682	2.59999999999999	25.5	6.5	11
11.3274457591177	23.9877642098137	1.31407198819682	11.3	19.3	1.9	6.1
11.3274457591177	23.9877642098137	1.31407198819682	12.5	19.5	0.7	5.1
11.3274457591177	23.9877642098137	1.31407198819682	12.7	23	4.7	4.1
11.3274457591177	23.9877642098137	1.31407198819682	7.3	24.7	2.7	8
11.3274457591177	23.9877642098137	1.31407198819682	9.5	23.5	3.6	3.1
11.3274457591177	23.9877642098137	1.31407198819682	8.7	26.4	4.3	9.1
11.3274457591177	23.9877642098137	1.31407198819682	10.4	25.6	3.6	8.1
11.3274457591177	23.9877642098137	1.31407198819682	12.5	25.3	2.9	5
12.157218504438	27.0178933932961	0.519654475687202	1.59999999999999	27.4	1.8	19.1
12.157218504438	27.0178933932961	0.519654475687202	2.40000000000001	26.7	1.4	11
12.3832841015259	27.843430215649	0.30322116181048	10.4	29.1	7.1	17.1
Route: 6 Length: 3.7051309507559 Demand Met: 1812						
12.572666965488	28.664460144644	0.034414378114754	7.40000000000001	26.5	3.3	18
12.572666965488	28.664460144644	0.034414378114754	9.5	27.1	1	21
12.4507006632029	28.3430623938823	0.067378269096888	6.7	28.8	0.2	14.1
12.4507006632029	28.3430623938823	0.067378269096888	8.7	29.3	1.9	21
12.4434380401091	28.3239243973531	0.069341140966533	4.5	15.4	4.9	20.1
12.3397077494623	28.0505810280609	0.097376352535387	5.8	25.2	5.8	22.1
12.3397077494623	28.0505810280609	0.097376352535387	7.5	23.4	5.3	15.1
12.2804813542061	27.8945114903582	0.113383493712358	8.5	18.8	1.3	23
12.0562530646193	27.303639599802	0.17398574243027	5.40000000000001	4.6	2.8	24
12.0562530646193	27.303639599802	0.17398574243027	10.4	11.3	7	24
12.0562530646193	27.303639599802	0.17398574243027	4.40000000000001	18.9	6.5	24
12.0562530646193	27.303639599802	0.17398574243027	8.40000000000001	21.2	7.3	24
12.0562530646193	27.303639599802	0.17398574243027	4.7	24.8	2.4	24
12.0562530646193	27.303639599802	0.17398574243027	5.3	29.5	4.1	24
12.0457133982728	27.2758661556152	0.176834300998006	6.3	8.6	0.9	20
12.0457133982728	27.2758661556152	0.176834300998006	5.3	9.5	2	19.1
12.225442982189	27.749477949031	0.128258738207145	12.7	20.9	2.2	21
12.2563633564353	27.8309573254993	0.11990187923295	10.4	21.5	7.4	16
12.2563633564353	27.8309573254993	0.11990187923295	9.40000000000001	24.5	2.9	16.1
12.2663622627212	27.8573057993266	0.117199471529927	6.40000000000001	21.3	7.2	20
12.2667154413647	27.8582364729717	0.117104017812785	10.6	16.8	0	19.1
12.2667154413647	27.8582364729717	0.117104017812785	7.40000000000001	21.2	2.2	20.1
12.2670686200122	27.8591671466152	0.117008564094528	9.40000000000001	28.4	4.3	5.1
12.4472010087826	28.3338404200999	0.068324106717738	12.7	27.3	0.2	3.1
12.5208003003038	28.5277845306363	0.04843239268106	4.5	26.7	5.4	21.1
12.590653900668	28.7118582304817	0.029553026300136	6.5	24.8	0.7	19.1
12.590653900668	28.7118582304817	0.029553026300136	10.6	26.4	2.7	17
12.6216809702013	28.7936187585452	0.021167324567658	0.700000000000003	28.7	7.3	22.1
12.6216809702013	28.7936187585452	0.021167324567658	3.7	26.6	6.4	21.1

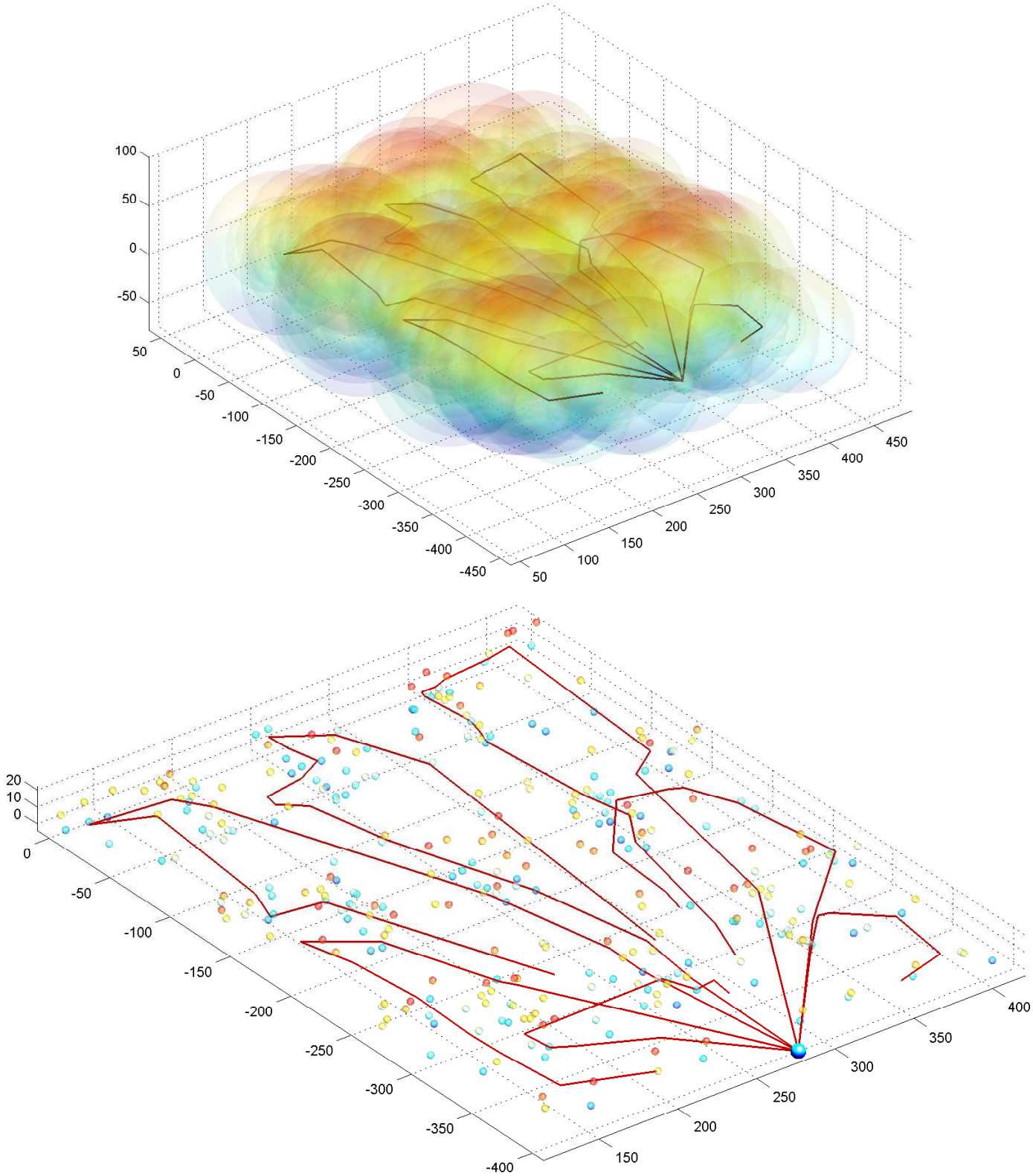


Figure O.100: *lin*318, arbitrary radius, 3D, Euclidean, Length = 4501.2766338

Table O-103: Solution for *lin*318, arbitrary radius, 3D, Euclidean

Total distance: 4501.27663380246 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 315.008096878909 Demand Met: 641						
181.447914524476	392.262823562552	5.43907205288191	181.1	393.8	14.3	9
193.782011731461	378.148263018116	5.7097909327468	184.3	387.5	3.8	61.5
207.409129455077	362.554029965112	6.00889008097586	191.3	329.2	9.3	60.6
225.448306237747	341.910843549614	6.40482882290396	222.8	339.4	15.5	9.8
227.10298949003	340.096525761504	6.31028566163439	227.6	331.6	9.8	65.9
234.727677326887	331.736251061416	5.8746363082903	234.6	331.6	5.2	0.7
241.984583147349	324.257336622208	6.64021325177788	234.6	297.7	7.7	68.2
251.883272718749	314.055820289191	7.68448867451287	249.6	303.2	7.3	11.1
251.935777890947	314.07682215802	7.69084443074998	252.8	260.7	8.8	64.9
251.935777890947	314.07682215802	7.69084443074998	224.4	280.4	17.9	71.8
251.936700559578	314.07719122189	7.69095611986548	248	280.4	9.5	61.5
251.936700559578	314.07719122189	7.69095611986548	236.2	280.4	11.1	68.9
254.812049103004	315.227319458886	8.0390171668121	293.7	273.1	6.2	71.8
257.414664408811	316.268355459123	8.35406376191939	286.6	254.4	15.7	68.8
257.415576168612	316.268751526294	8.35417250410039	290.6	273.1	10.7	54.5
258.240574067182	317.342486918422	8.47259195942607	283.5	260.7	2.6	62.8
259.911693975139	319.517450775941	8.71246292307853	293.7	329.2	1.4	38.2
259.911693975139	319.517450775941	8.71246292307853	231.5	331.6	8.7	33.6
259.911693975139	319.517450775941	8.71246292307853	234.6	315.8	11.2	30.3
259.911693975139	319.517450775941	8.71246292307853	227.6	315.8	6.5	32.6
267.29265906589	329.123783103652	9.7719196505821	263.8	339.4	8.3	73.1
267.29265906589	329.123783103652	9.7719196505821	263	329.2	0.8	67.9
272.579129862025	336.004130387351	10.5307353298107	280.3	303.2	11.5	54.2
278.733108442567	344.013539772035	11.4140732000068	278.7	273.1	18.4	72.9
278.733715394648	344.014329720771	11.4141603215636	294.5	339.4	13.8	16.6
276.465024894165	367.844775815291	10.9577065988773	286.6	387.5	8.3	29.3
274.759169203859	385.763155862685	10.6144980549139	283.5	393.8	11.4	11.9
260.061156239194	388.5139105068	9.13513839022288	252.8	393.8	15.4	64.1
245.463929950448	391.245804065592	7.66592362655959	301.6	393.8	0.9	56.6
245.463929950448	391.245804065592	7.66592362655959	255.9	387.5	4.9	12.9
245.463929950448	391.245804065592	7.66592362655959	211.8	393.8	13.7	37.7
245.463929950448	391.245804065592	7.66592362655959	215	387.5	7.3	42
Route: 2 Length: 602.637061898203 Demand Met: 884						
85.1726627437135	285.594865399475	12.6718693938353	63.8	280.4	12.2	22
83.538336301366	283.265486866953	12.9180422525227	81.1	285.1	18.2	6.1
79.1697976127596	276.198838234401	12.7983472522193	70.1	280.4	12.5	10
76.1413412804375	266.848614424763	12.7271201886245	66.9	280.4	18.4	41.3
73.9037894770792	259.940284855339	12.674493439937	67.7	331.6	4.4	72.5
73.9037894770792	259.940284855339	12.674493439937	21.3	273.1	15.8	71.9
73.9037894770792	259.940284855339	12.674493439937	48	260.7	17.4	54.8
73.9037894770792	259.940284855339	12.674493439937	89	260.7	3.7	48.3
73.9037894770792	259.940284855339	12.674493439937	119.7	260.7	11.7	67.1
66.6686150179009	237.602069877691	12.5043315816913	100	206.3	18	53.6
59.5767046655087	215.706192193705	12.3375395972613	67.7	164.6	2.1	53.4
59.5767046655087	215.706192193705	12.3375395972613	99.2	196.1	13.9	46.1
57.7944433463528	210.203564279043	12.2956255638439	70.1	147.3	17.8	74.2
56.6003105741009	206.516751109922	12.2675428221424	67.7	198.5	11.8	13.7
48.9037033953978	200.866873682894	12.3986175797182	70.9	198.5	18.8	76.6
43.8817911603392	197.180419738387	12.4841421712066	58.3	196.1	1.6	20.4
36.5448508151799	191.794564521863	12.6090956801288	63.8	182.7	4.6	81.7
36.5448508151799	191.794564521863	12.6090956801288	63.8	198.5	2.5	60.1
33.4960245689978	189.55650216638	12.6610197311549	52.8	148.8	15.5	54.4
33.4960245689978	189.55650216638	12.6610197311549	63.8	147.3	12.9	52
23.7932591738082	182.761764224554	12.8224270178518	14.2	170.1	13.5	15.9
26.050584176067	189.221440210655	12.3596863541838	6.3	140.2	17.5	53.1
26.050584176067	189.221440210655	12.3596863541838	21.3	140	9.6	51.1
26.050584176067	189.221440210655	12.3596863541838	27.6	196.1	18.7	35.6
26.050584176067	189.221440210655	12.3596863541838	28.3	206.3	15.8	25.7
26.050584176067	189.221440210655	12.3596863541838	44.9	170.1	19.9	42
34.2599529810022	212.71378945201	10.6768058344875	59.1	206.3	14.9	26
37.7758317412673	230.493870347092	9.02825019805993	17.3	260.7	14.5	36.9
37.7758317412673	230.493870347092	9.02825019805993	20.5	254.4	9	56.1
42.6318714709538	255.051233910597	6.7513044693572	51.2	254.4	2.7	9.5
41.9573734192842	264.660418169461	7.07757840139978	24.4	273.1	19.3	45.5
40.8990859055684	279.737171385293	7.5894994321314	9.40000000000001	273.3	14	39.2
40.8990859055684	279.737171385293	7.5894994321314	36.2	273.1	6.7	28.7
39.8345428022085	294.903052297857	8.104440972448	67.7	297.7	2.9	81
39.1920329271372	304.056488587748	8.41523955225671	28.3	339.4	12.9	44.9
39.1920329271372	304.056488587748	8.41523955225671	14.2	303.2	5.3	25.2
39.0280737363134	324.974440149864	9.28617065792588	70.9	331.6	19.3	81.8
39.0280737363134	324.974440149864	9.28617065792588	63.8	297.6	5.2	81.2
38.9981177650546	328.796436415943	9.44530269044009	27.6	329.2	2.8	13.2
39.7386649079329	364.967981036767	11.5500517950329	20.5	387.5	17.4	30.2
39.9824037470086	376.873329847375	12.2427987353766	17.3	393.8	14.6	28.4

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
66.3623609809684	385.258679025174	11.1689951120435	51.2	387.5	1.4	18.6
89.2385484567638	392.530288833974	10.2378135473222	89	393.8	11	1.5
Route: 3 Length: 337.326623133554 Demand Met: 946						
148.304785674558	387.227860034776	2.11184905471838	119.7	393.8	17.8	72
148.304785674558	387.227860034776	2.11184905471838	122.8	387.5	3.6	61.9
117.02303691728	360.003346785119	5.25839143272019	130.7	339.4	10.6	25.3
112.189963329015	357.749420774418	5.34110086616523	92.1	387.5	18.7	46.4
76.5144551839612	341.111984123508	5.95162357158191	48	393.8	19.4	61.4
73.7175443451089	339.371494403994	5.91382516484289	67.7	315.8	13.4	26.1
66.0358257312964	334.591237416254	5.8100118010478	59.1	339.4	4.8	8.5
64.3830349324384	326.687174631611	6.47808811711967	63.8	331.6	18.4	16.8
62.6778166512917	318.532390341259	7.16735621022698	76.4	288.2	6.4	37.9
62.5635106745162	317.985750299067	7.21355995055858	70.9	297.7	11.7	30.8
62.4944404511266	317.655439047372	7.24147889993804	6.3	273.3	11.2	71.7
62.4944404511266	317.655439047372	7.24147889993804	39.4	273.1	0.8	61.9
72.089536430461	317.411403795512	7.21904295289144	52.8	281.9	9	48.7
77.823925319042	317.265559163902	7.20563439442279	58.3	329.2	7.6	56.8
77.823925319042	317.265559163902	7.20563439442279	63.8	315.8	14.7	50.8
83.773025968512	317.114253681428	7.1917237913001	44.9	303.2	8.5	67.2
90.0299416019798	316.955119419918	7.177093436361	85.8	303.2	13.4	50.8
95.9283693152113	316.805102701066	7.16330132322292	92.1	254.4	16.6	70.4
101.24285570802	316.669937555833	7.1508746212839	70.9	315.8	15.2	68
101.24285570802	316.669937555833	7.1508746212839	136.2	295.3	3.1	62.2
105.191274098551	316.56951609112	7.14164215188396	99.2	329.2	7.7	46.6
114.778483634345	316.32568134128	7.11922466894574	60.6	288.2	12.5	62.7
114.778483634345	316.32568134128	7.11922466894574	84.3	283.5	16.3	54.6
124.679268540673	316.073871345583	7.09607396246005	116.5	303.2	9.1	28.2
127.893975430248	315.992110643945	7.08855710308641	100	339.4	3.8	61.5
127.893975430248	315.992110643945	7.08855710308641	129.9	329.2	5.1	48.2
134.139595766358	315.833263719702	7.0739531525149	136.2	315.8	9.7	6.4
138.821010362003	315.714199757903	7.06300672659382	142.5	331.6	14.7	70.4
138.821010362003	315.714199757903	7.06300672659382	142.5	315.8	4.2	63.6
143.384005100916	315.598147655836	7.05233721422817	148.8	315.8	8.4	45
151.719891024211	315.386138378745	7.03284564883353	231.5	315.8	7.2	80.7
151.719891024211	315.386138378745	7.03284564883353	136.2	331.6	10.8	42.4
151.719891024211	315.386138378745	7.03284564883353	148.8	331.6	0.2	79
151.719891024211	315.386138378745	7.03284564883353	222	285.1	1.9	76.7
151.719891024211	315.386138378745	7.03284564883353	142.5	295.3	13.4	23
151.719891024211	315.386138378745	7.03284564883353	127.6	286.7	5.8	75.6
152.557255751787	316.747018966072	6.83252897402534	148.8	295.3	14.4	39.6
152.557255751787	316.747018966072	6.83252897402534	161.4	295.3	10.8	52.8
160.379065395418	329.458981399465	4.96137432804987	161.4	315.8	7.1	25.4
160.379065395418	329.458981399465	4.96137432804987	155.1	315.8	5.4	37.1
161.542165929881	331.349246046614	4.68313424831222	161.4	331.6	4.6	0.3
172.408203359973	331.553388329627	6.32775108782122	192.1	339.4	1.6	44.1
172.408203359973	331.553388329627	6.32775108782122	178	303.2	1.5	29.3
172.409160147669	331.553611995764	6.32793691237112	208.7	303.2	16.2	47.1
171.838332742787	345.129749799539	5.16616309086779	222	329.2	14.2	53.4
Route: 4 Length: 589.287509293094 Demand Met: 949						
248.509692138392	314.126253178161	5.8067078465605	231.5	297.7	7.4	23.7
270.540328929089	293.882284967534	7.0143966550982	275.6	273.1	17.9	24
297.699497320844	268.925705625849	8.50322395002255	308.7	273.1	9.4	11.8
296.683645018734	259.109246159097	8.22644851952004	305.5	273.1	0.7	77.3
296.683645018734	259.109246159097	8.22644851952004	255.9	254.4	18.1	74.1
295.224073409472	245.004994838538	7.82877890865652	301.6	260.7	2.7	17.7
292.810809331573	221.684923733797	7.17127033706907	294.5	206.3	5.6	67.1
292.810809331573	221.684923733797	7.17127033706907	263	196.1	17.9	74.1
290.276126105007	197.19155418531	6.48067985768993	293.7	196.1	5.6	3.7
286.427429906846	190.215710518871	7.03536879749192	308.7	140	16.6	57.3
286.427429906846	190.215710518871	7.03536879749192	293.7	140	9.3	60.8
278.500027582974	175.847128978192	8.1778950388048	249.6	170.1	0.7	30.4
277.296197382503	173.665161892967	8.35139551875604	280.3	170.1	14.3	29.1
276.147115149766	171.58242694247	8.51700551763231	305.5	140	11.2	43.2
268.36414301171	168.058871217444	8.7757515080404	278.7	140	19.3	31.7
258.085606650767	165.128837511473	8.54538102497974	248	147.3	4.5	33
250.925569868387	163.08777351074	8.38490482641034	275.6	140	4.2	63.7
241.718234849612	160.463101613722	8.17854427969052	236.2	147.3	7.3	14.3
241.717378054154	160.46361638316	8.17857451160966	240.2	148.8	5.8	12
235.395668919723	168.219337924257	9.16704964066213	231.5	164.6	6.5	80.6
229.923510764834	174.932798527519	10.0226864905177	233.1	147.3	11.4	53.4
229.923510764834	174.932798527519	10.0226864905177	227.6	164.6	1.4	68.2
224.715115555123	181.322662881795	10.8370820051654	240.2	155.1	5.1	52.7
224.715115555123	181.322662881795	10.8370820051654	218.9	153.6	11.5	44.9
224.715115555123	181.322662881795	10.8370820051654	222.8	206.3	17	36.2
219.534049851074	187.678997049	11.6472060207813	208.7	170.1	15.4	55.8
219.534049851074	187.678997049	11.6472060207813	191.3	196.1	16.7	65.9
212.07491865533	196.830153705116	12.8135339163324	155.1	198.5	17.6	57.2
205.910580713083	204.39280629895	13.7774066487853	136.2	182.7	6.2	73.4
201.598455804554	209.683091683321	14.4516617196295	192.1	206.3	17	10.4
201.604065117366	210.641663233531	14.3825221003375	142.5	198.5	1.1	69.8

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
201.604065117366	210.641663233531	14.3825221003375	148.8	198.5	8.3	59.7
201.627175572607	214.591003580472	14.0976650563715	155.1	182.7	16.5	57.9
201.663285914825	220.761905988411	13.6525719403692	161.4	182.7	0.7	56.9
201.725668580049	231.422357845644	12.8836580265292	231.5	182.7	19.2	62.1
201.751904570607	235.905675848269	12.5602864607352	231.5	198.5	1.6	54.9
201.786734360051	241.857479760557	12.1309964953964	227.6	182.7	0.3	69
201.851176137424	252.869703179322	11.3367114232734	215	254.4	19.4	15.5
201.798843235775	253.355054800448	11.2673837060992	233.1	280.4	17.3	78.4
201.798843235775	253.355054800448	11.2673837060992	263.8	206.3	6.2	78
201.111773440027	259.727156469288	10.357191381222	211.8	260.7	3.2	12.9
199.293823250709	268.057651144215	9.76530802701096	184.3	254.4	16.9	21.5
Route: 5 Length: 894.331854194269 Demand Met: 946						
239.10846554556	281.474853529942	11.936259799401	240.2	281.9	12.5	1.3
259.502121838561	189.291744387956	6.49966466690534	290.6	140	0.4	58.6
270.60489960014	139.105130118277	3.53985660393548	252.8	127.6	3.3	21.2
292.042684612646	123.143253203216	2.21249291750154	301.6	127.6	0.4	10.7
291.487623663379	111.749395041624	3.49231050254774	286.6	121.3	15.1	53.2
290.711687657404	95.8215864475221	5.28140515144088	283.5	127.6	15	48.7
289.930057123017	79.7768836749412	7.08362983387441	294.5	73.2	1.3	59.4
289.149258191363	63.7492526093939	8.88393692384452	263.8	73.2	0.8	55.8
288.367396627276	47.6998083100419	10.6866943586588	233.1	14.2	19.1	77.3
288.367396627276	47.6998083100419	10.6866943586588	293.7	63	15.4	37
287.604951248696	32.0489225588927	12.4446835626289	290.6	6.9	18.4	35.4
287.604951248696	32.0489225588927	12.4446835626289	278.7	6.9	10.2	32.7
286.682339531157	13.1102682421654	14.5719719583412	293.7	6.9	18.6	10.2
280.894420515327	11.5345606420098	12.1505683325035	308.7	6.9	18.2	32.2
280.894420515327	11.5345606420098	12.1505683325035	305.5	6.9	5.7	29.6
275.276975623735	10.0052629369886	9.80048340497144	275.6	6.9	6.7	4.4
240.56317085735	20.1972225581312	15.1812024852118	240.2	22	17.8	3.2
234.873352471576	19.1721420574598	11.990673719325	240.2	15.7	7.9	16
234.873352471576	19.1721420574598	11.990673719325	236.2	14.2	3.3	10.1
224.532412811983	21.5164588684988	13.8092924537914	218.9	20.5	18.5	7.4
225.186644436937	22.582657689047	11.7346946001237	248	14.2	2	37.6
225.186644436937	22.582657689047	11.7346946001237	224.4	14.2	0.3	14.2
225.186644436937	22.582657689047	11.7346946001237	222	18.9	3.1	14.4
230.266062945856	37.5287620897424	8.70843999104778	208.7	37	3.4	62.2
233.11736667104	45.9186807399504	7.00966824278474	249.6	37	15.8	20.7
233.11736667104	45.9186807399504	7.00966824278474	222	63	7.9	20.4
234.233782926549	49.6232104340193	6.15920531041993	234.6	49.6	6	0.4
232.947024590413	54.6547634002477	6.23986151951	231.5	49.6	10.4	41.1
230.886932374786	62.7102447320072	6.36899080340718	227.6	65.4	13.5	8.3
231.294393343004	65.8767611324097	3.10016334559281	231.5	65.4	1.8	1.4
231.157216835793	69.2426228911561	3.4544495248532	227.6	31.5	14.9	39.6
231.157216835793	69.2426228911561	3.4544495248532	227.6	49.6	17.6	30.7
231.157216835793	69.2426228911561	3.4544495248532	234.6	65.4	4.6	24.2
230.637260043366	82.0006893841532	4.79734939307	222.8	73.2	10.5	62.4
230.317811471064	89.8389348216858	5.62239327816534	280.3	37	9.6	73
230.317811471064	89.8389348216858	5.62239327816534	263	63	0.7	43
229.868729800709	100.857964202275	6.78224312892746	234.6	31.5	11.8	69.7
229.366409527275	113.183336317856	8.07959801526113	255.9	121.3	14.5	72.9
228.881069459206	125.092049650444	9.33309658294244	215	121.3	10.5	69.7
228.389960124384	137.142294637218	10.6014914904691	211.8	127.6	10.4	53.8
227.794449115459	151.754208387672	12.1395232308208	222	152	14.6	6.3
229.899104598062	163.630680758538	12.3000788072158	234.6	164.6	0.1	25.4
230.745006137646	168.404060485793	12.3646095628542	224.4	147.3	2.3	27.7
233.221601026734	182.379353374802	12.5535403478772	234.6	182.7	13.3	1.6
228.214761541222	192.075418844239	8.90817206637651	227.6	198.5	10.4	71.7
225.229688225959	197.856205613601	6.73480633215984	222	196.1	3.2	5.1
217.523855862372	241.045034899912	5.29981471879389	234.6	198.5	10.6	64.9
209.791372240207	284.383246789689	3.85985899338434	218.9	286.7	3.7	9.4
200.259586558538	312.894477034254	2.95123522486398	227.6	297.7	4.1	31.3
Route: 6 Length: 881.804229453528 Demand Met: 947						
154.46675845498	295.754237799568	1.61250926959891	155.1	295.3	0.7	1.2
145.602672696345	280.388808484031	10.8196196924756	141.7	283.5	17.7	8.5
138.570227272869	240.238841480838	10.121913203835	130.7	206.3	18.1	42
131.497352865197	199.858054064781	9.4201956099971	136.2	198.5	8.4	5
127.524097857851	190.102663644304	9.70747500632852	129.9	196.1	10	31.1
121.717335489204	175.845529210542	10.1273230708728	136.2	162.2	1.7	53.2
121.717335489204	175.845529210542	10.1273230708728	142.5	182.7	2.1	52.7
115.885631759099	161.527157409853	10.5489744506557	155.1	162.2	15.7	51.3
115.885631759099	161.527157409853	10.5489744506557	148.8	182.7	9.2	49.8
110.062982586387	147.231016586039	10.9699713828687	127.6	153.6	18.6	25.7
104.315152323192	133.11857579292	11.3855586011362	116.5	170.1	13.6	39
98.4893762085768	118.814757321947	11.8067813660236	89	127.6	0.1	17.7
85.1707067111757	86.1139066175562	12.769764754691	59.1	73.2	9.3	29.3
78.6280946190355	70.0500662732775	13.2428169377304	67.7	65.4	8.4	19.9
70.4003426157906	49.8487627517127	13.8377102129055	70.9	49.6	14.9	1.2
67.9582841600026	44.6848802140905	13.3949183102354	63.8	49.6	2.8	33.5
65.1415234094326	38.7286666866144	12.884185754072	76.4	22	1.9	28.1
61.4003501683116	30.8177261696764	12.2058395974847	84.3	17.3	5.6	27.4

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
59.8057766466524	28.7212670647773	12.1382217483614	81.1	18.9	10.9	25.4
59.8051714585284	28.7204713960367	12.1381960853567	70.1	14.2	16.8	18.4
42.1374133347832	22.0240584156281	8.89919561511149	6.3	7.1	12	39.2
42.1374133347832	22.0240584156281	8.89919561511149	36.2	6.9	0.3	19.4
42.1374133347832	22.0240584156281	8.89919561511149	39.4	6.9	14.8	37.7
42.1374133347832	22.0240584156281	8.89919561511149	63.8	14.2	14.4	23.68
42.1374133347832	22.0240584156281	8.89919561511149	60.6	22	16.9	36.4
42.1374133347832	22.0240584156281	8.89919561511149	63.8	31.4	12.4	27.9
30.0158537728884	17.4297590331323	6.67697000251104	21.3	6.9	14.1	41
19.2590409383226	13.3527242011834	4.70494074553218	9.40000000000001	7.1	2.4	11.9
44.0463369167449	37.3784957493938	12.1422286931878	44.9	37	12.5	1
43.71225907166	70.309866065567	9.23928344689801	24.4	6.9	1.6	74.1
43.71225907166	70.309866065567	9.23928344689801	14.2	37	6.3	44.6
43.71225907166	70.309866065567	9.23928344689801	70.9	31.5	11.6	68.2
43.71225907166	70.309866065567	9.23928344689801	28.3	73.2	9.3	20.4
43.71225907166	70.309866065567	9.23928344689801	67.7	49.6	9.5	74
43.71225907166	70.309866065567	9.23928344689801	58.3	63	8.5	68.9
43.71225907166	70.309866065567	9.23928344689801	63.8	65.4	13.7	57.7
43.71225907166	70.309866065567	9.23928344689801	17.3	127.6	16.4	73.4
43.71225907166	70.309866065567	9.23928344689801	70.9	65.4	6.9	71.5
43.71225907166	70.309866065567	9.23928344689801	24.4	140	15.5	73
43.2076129746814	120.054779101429	4.85420114754088	51.2	121.3	6.2	8.2
41.6815781763906	125.725443626806	4.08730294223042	9.40000000000001	140.2	11.5	80.8
41.6815781763906	125.725443626806	4.08730294223042	20.5	121.3	8.4	76.9
38.0128551616623	139.358224640794	2.24361161155456	36.2	140	1.4	2.1
42.3889585035625	143.063958817737	4.2218942020302	39.4	140	3.5	4.5
50.6336064247729	150.045620658189	7.94900989434445	66.9	147.3	5	43.6
50.6336064247729	150.045620658189	7.94900989434445	81.1	152	7.1	42.7
58.7237290346211	156.896428730296	11.6062700527541	60.6	155.1	13.8	3.4
62.4694794055003	165.317827826677	11.2131103412217	48	127.6	5.5	40.8
62.4694794055003	165.317827826677	11.2131103412217	63.8	164.5	8.3	10.7
62.4694794055003	165.317827826677	11.2131103412217	70.9	164.6	8.4	21.9
62.4694794055003	165.317827826677	11.2131103412217	67.7	182.7	12.4	29.6
62.4694794055003	165.317827826677	11.2131103412217	76.4	155.1	3.4	19.1
62.4694794055003	165.317827826677	11.2131103412217	70.9	182.7	16.9	40.4
83.1019113393118	211.704778349342	9.04749777242446	84.3	150.4	4.3	61.5
83.1019113393118	211.704778349342	9.04749777242446	85.8	170.1	5	56
112.459159863084	277.70732834777	5.96611253948936	122.8	254.4	9.9	25.8
Route: 7 Length: 880.881258950899 Demand Met: 948						
158.580910535764	331.473084198683	11.9532673306522	155.1	331.6	14.3	4.2
165.656954558492	284.899061185159	10.1246293866639	240.2	288.2	11.3	74.7
165.656954558492	284.899061185159	10.1246293866639	173.2	285.1	12.1	7.8
160.245541541592	198.762189496163	1.93710551655392	161.4	198.5	1.4	1.3
152.305600591469	180.005475198741	3.11185681873248	142.5	162.2	2.7	56.6
152.305600591469	180.005475198741	3.11185681873248	148.8	162.2	5.3	66
143.824010388206	159.969212016503	4.3667423817169	173.2	152	19.2	43.5
135.342012896242	139.931990976637	5.62168073970525	141.7	150.4	15.8	56
126.885491681947	119.954954658053	6.87284804648693	122.8	121.3	7.8	4.4
121.554873858414	96.0365930446881	7.32917416844114	130.7	73.2	7.2	24.6
119.83961817741	88.3402817082799	7.4760086738802	148.8	65.4	6.2	68.2
119.83961817741	88.3402817082799	7.4760086738802	119.7	127.6	15.5	64
117.644053400214	78.4888478213174	7.66395953985923	142.5	65.4	2.7	66.7
115.869195300678	70.5251003863416	7.81589657377498	129.9	63	9.4	16
103.623431296921	57.7367905748446	7.19822595289994	27.6	63	3.4	76.3
103.623431296921	57.7367905748446	7.19822595289994	92.1	121.3	6.9	64.6
103.981278289647	55.686630225101	7.2135439236323	99.2	63	0.7	11.4
105.108553199188	49.2282992129093	7.2617978933161	52.8	15.7	13.8	64.3
105.108553199188	49.2282992129093	7.2617978933161	66.9	14.2	11.4	52
105.108553199188	49.2282992129093	7.2617978933161	67.7	31.5	4.3	48.5
105.108553199188	49.2282992129093	7.2617978933161	141.7	17.3	2	52.8
105.108553199188	49.2282992129093	7.2617978933161	85.8	37	14	59.3
105.108553199188	49.2282992129093	7.2617978933161	116.5	37	12.1	49.6
105.108553199188	49.2282992129093	7.2617978933161	155.1	49.6	5.1	57
105.108553199188	49.2282992129093	7.2617978933161	100	73.2	14.4	54.1
105.108553199188	49.2282992129093	7.2617978933161	136.2	65.4	3.7	54.2
105.108553199188	49.2282992129093	7.2617978933161	161.4	65.4	7.2	60
105.108553199188	49.2282992129093	7.2617978933161	155.1	65.4	8.7	62
132.58265745142	41.7905911400185	5.02800701892532	136.2	29.1	0.8	21.8
132.58265745142	41.7905911400185	5.02800701892532	136.2	49.6	6.3	8.7
132.620628074031	41.76606224804	5.02238059156213	142.5	49.6	0.1	28.5
139.120443606391	37.5672036635469	4.05924706203096	148.8	29.1	19.2	68.3
139.120443606391	37.5672036635469	4.05924706203096	148.8	49.6	18.9	66.7
147.867101449414	31.9168893694257	2.76317937880831	142.5	29.1	2.7	81.1
147.867101449414	31.9168893694257	2.76317937880831	161.4	29.1	11.5	80.6
152.930126322398	28.6461913989548	2.01294859235141	155.1	29.1	1.4	2.3
144.369713419491	14.9355889914169	6.30323375007022	127.6	20.5	16.5	20.4
144.74551722665	-1.29144742726517	5.18468599741852	141.7	-7.9	4.6	7.3
144.746291159667	-1.2908186383195	5.18476117818042	149.6	-7.9	5.2	8.2
170.031254287502	21.0985408346154	7.72080330797412	173.2	18.9	8.3	3.9
176.078648240446	37.3697153507951	7.7571965354799	231.5	31.5	11.2	56.7

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
176.078648240446	37.3697153507951	7.7571965354799	178	37	4.3	22.7
182.982930015661	55.9464397967749	7.79874607592728	191.3	63	18.3	18.3
189.523053217373	73.5433560014647	7.8381042749174	192.1	73.2	7.8	2.6
187.160883699247	99.4964543999628	8.06192206401579	161.4	49.6	13.6	79.4
187.160883699247	99.4964543999628	8.06192206401579	184.3	121.3	14.5	57.9
184.888856551718	124.4591606996	8.27719865740733	181.1	127.6	7.7	13.2
182.620228544123	149.38452068178	8.49215324222528	161.4	162.2	17.4	60.1
180.721262520628	170.248413520608	8.6720820160516	178	170.1	11.6	4
175.422750399529	279.385506081065	4.64896009216946	181.1	260.7	13.4	21.4

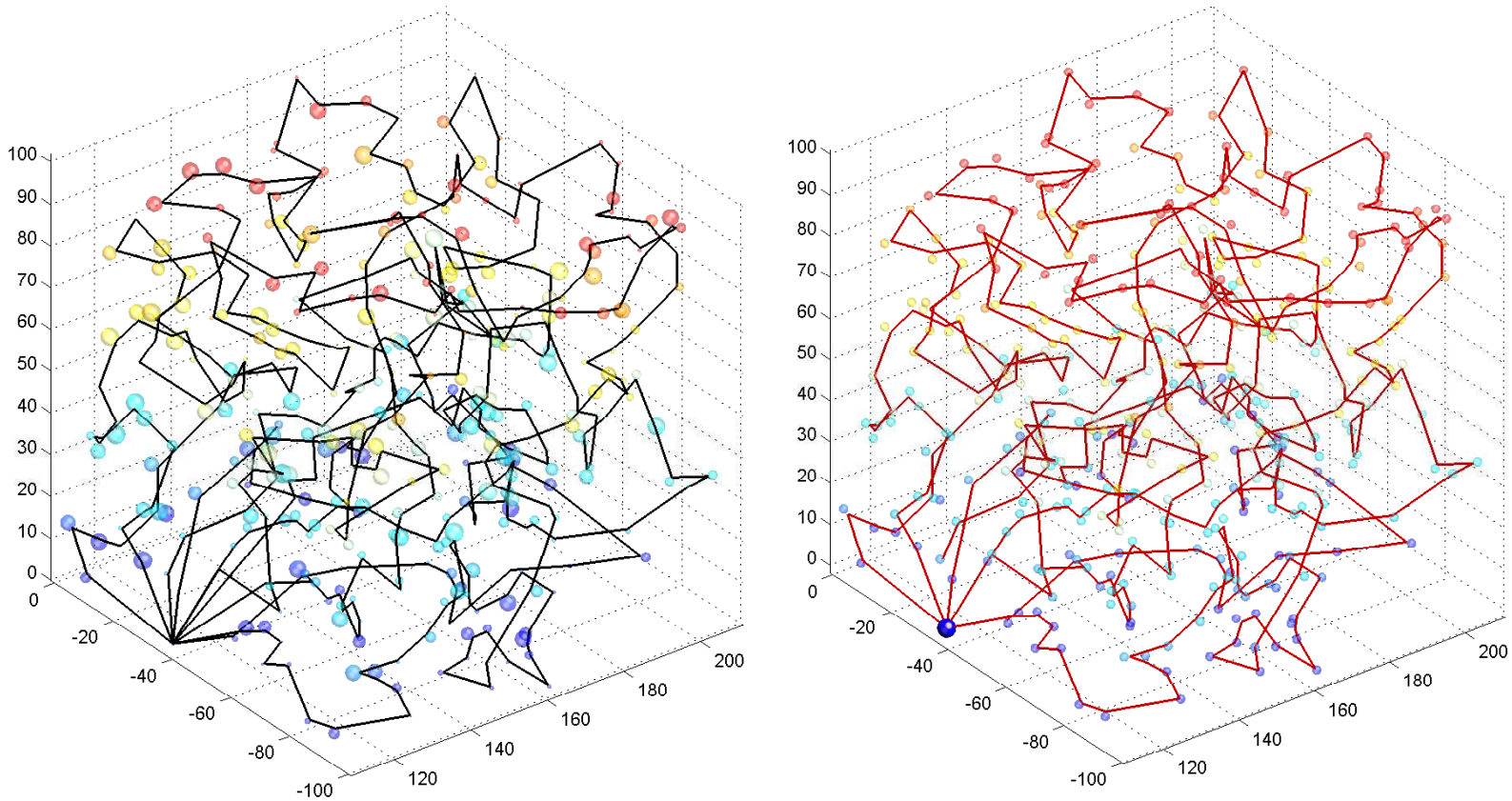


Figure O.101: $rd400$, arbitrary radius, 3D, Euclidean, Length = 3802.0007403

Table O-104: Solution for $rd400$, arbitrary radius, 3D, Euclidean

Total distance: 3802.000740253 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 525.640505901174 Demand Met: 475						
11.362847949799	37.8047687395012	14.2361801092632	11.4258	37.7412	14.2255	0.0901
13.9453976527652	41.3184202248984	22.2216802935489	13.4598	41.6191	22.5554	0.6615
17.7681779998746	41.3767040117058	24.2245220820874	17.5856	40.8861	25.0628	0.9883
25.0853725582492	43.1540383554598	24.8690351549125	26.2003	42.5604	24.4871	1.3196
23.5879973954538	49.756775047391	28.6064957473819	23.6126	49.4214	29.6987	1.1428
22.4397083833615	55.2865516819302	29.1014767215601	22.5447	55.6169	28.4034	0.7794
19.9816670512899	61.4366821127388	34.6021588211308	18.9042	62.1271	34.907	1.3155
25.6346473194713	60.962436950199	36.3092383502423	25.6513	60.6643	37.4717	1.2002
32.609632210681	61.5161450779886	33.9734217634086	32.641	61.5676	34.0062	0.0686
33.1983591095791	61.1178017598022	33.3828343960285	33.4192	59.483	33.0004	1.6934
37.3575288573234	68.3110489045333	30.2945224019456	35.9094	68.8825	29.2317	1.885
41.6309785869838	73.7807984047441	28.4567378296944	41.4131	74.8199	27.7293	1.287
46.3544417847727	72.0358870914926	31.2792315102313	46.3399	71.17	31.2162	0.8683
59.0705940122246	75.1245165701755	39.3633738215437	59.2712	76.4167	39.0582	1.3428
61.2298024117639	74.6213632424196	41.0936571915045	61.6789	74.8507	42.3385	1.3431
64.5111554730157	68.3300098699231	29.0792337422239	65.3011	67.1869	28.6409	1.457
60.9974865528607	72.7299672259129	26.5062488470175	60.356	72.3736	25.6911	1.0968
60.3315800534228	80.1178557410693	27.9707124998955	60.2539	80.1704	27.9583	0.0946
61.693683147509	80.6162801065064	28.5098472799429	61.8453	80.8454	29.5157	1.0427
66.8680748404656	81.2377519598276	23.6294011439346	66.7645	81.0279	23.2022	0.4871
80.5683556760008	87.926301200787	24.1162544003167	80.7777	87.9354	23.575	0.5804
91.2834025147641	94.6772790936947	33.4539153870091	91.0373	94.8618	33.7328	0.4152
95.6313639108143	95.9513956984163	35.1141095604644	96.3227	96.5824	35.4748	1.0031
92.3599514693516	87.8113775992832	32.2437727361181	91.8947	87.6684	31.3605	1.0085
94.2299729588973	79.5229596398316	39.9436055383027	95.4573	78.5053	38.9919	1.8568
93.7242885844188	73.7703186295303	48.7171226264652	94.2046	73.3577	49.4797	0.9912
84.1653565479802	75.5048367083795	43.5661668804149	84.0931	75.7357	43.6346	0.2514
80.2393704936007	73.6782141815019	40.1986567929735	78.9206	73.8168	40.4273	1.3456
82.1513144210974	71.4632199475044	36.2259780316546	82.5413	70.9361	35.9747	0.7022
77.9067029746535	77.7823343063539	34.6416978599867	77.5352	78.0347	33.1993	1.5107
76.4608587285607	80.7772036047285	37.7542890154797	75.9957	81.402	37.5418	0.8074
79.311461730798	79.3677633219045	47.7272105738284	79.6042	79.6519	48.0916	0.547
77.176277151753	75.5501166534305	47.7541518887042	76.2214	75.1456	46.9071	1.339
78.3251188279406	74.0172336112341	50.1050476089957	78.3667	74.2083	50.3369	0.3033
81.8007267326564	63.0128897944064	53.4271840371507	81.8209	62.9891	53.3907	0.048
81.6653080461578	58.8042845976937	59.7497461675046	82.834	58.4111	60.6469	1.5249
69.5318392871532	55.8553280127494	61.0567852137728	69.3672	55.5594	61.2856	0.4087
68.3932085888848	57.4573952909105	59.6297902868089	69.1414	57.6653	59.1832	0.8958
60.8622261632321	65.9920694876353	52.4552538297769	60.771	67.3196	52.7577	1.3646
56.4382682845143	62.2826884746493	45.4662470476731	56.0439	62.2937	45.4781	0.3947
58.0535762707073	60.6009177449999	42.376584504483	58.3448	60.9201	41.5011	0.9763
58.058450192878	54.9144076607511	45.2742088380917	57.8122	54.5104	45.2899	0.4734
64.1007857644686	58.1477090057601	48.2886366881586	64.2573	58.953	49.3124	1.3119
68.1072546105793	55.6817598141319	44.2455408003653	67.8108	54.6502	44.2592	1.0734
71.6991770134376	55.5767518625406	41.1160055558581	70.983	56.1077	39.9244	1.4882
79.8506465277977	54.3781011116471	37.4326133690229	80.6139	53.7748	37.9975	1.125
82.3724521039021	58.1734658920126	28.574579311004	82.7455	58.0479	28.4959	0.4014
81.565501130446	59.7577576177893	26.39139246991	81.8774	60.6902	25.477	1.3427
76.8250436758439	55.4447736391305	29.0679105064929	76.3859	55.8636	29.5918	0.8017
76.0938912516554	53.5036488696897	29.0505088214668	74.8357	53.7031	27.6754	1.8745
75.2677561330074	48.5232401481718	30.0899805640055	74.6616	49.1772	30.6996	1.123
74.7046693542082	45.1286219517919	30.7984763890453	73.064	44.6995	31.3834	1.7939
80.3886196578177	38.5439226651019	30.0340788713338	81.8496	38.8539	28.9342	1.8548
80.2835963593778	36.1809101704597	31.1691424182701	80.5435	37.2793	30.7227	1.6755
80.1347334543285	32.8314719163163	32.7780331556243	80.1207	32.7664	32.9471	0.1817
81.0612488392594	27.983928258484	20.981697532683	81.7106	28.112	19.2367	1.8663
76.1189938319604	23.3214238834653	27.4403090248737	76.419	22.7841	27.7958	0.7107
62.1688614347862	27.086852021703	30.2467726254181	62.0154	28.1819	31.0401	1.3609
50.0484164725945	21.023377485283	25.9298634118982	49.4045	19.961	26.5255	1.3777
47.503661554266	25.2692242865929	18.8728760566138	47.6331	25.3181	18.59	0.3149
37.983647613928	28.3385779257687	23.5278456262768	37.0272	27.4581	25.0096	1.9712
36.7485006913112	32.1189879179823	21.2467970613771	36.8488	32.2474	21.2512	0.163
Route: 2 Length: 1009.33246111888 Demand Met: 796						
1.92440655051033	7.00662273325788	3.58946816341407	2.00806	6.28968	2.6575	1.1788
1.02733118260505	2.9542124553417	13.4322108502962	0.219756000000004	2.58493	14.7832	1.6167
9.27273955583723	3.26975703134287	7.55144277808928	9.0496	1.67955	6.7742	1.784
12.7059711809759	4.28997943057571	5.62901678657787	12.7116	4.29147	5.5693	0.06
20.64819735847	6.68631930911151	12.4329690191227	21.4744	8.21886	12.0685	1.7788
23.9267924482544	2.37771315247918	19.6684235928488	23.1984	1.0131	19.9686	1.5757
36.9974540907885	6.17289176831271	31.2828121956512	37.2177	7.79249	31.0238	1.6549
41.803445408597	4.8538748669155	36.3467941012738	42.0178	3.44287	36.938	1.5448
49.4243179393502	16.3203674257382	40.7135084278803	49.4944	16.327	40.7382	0.0746
43.338014496841	21.9956459379239	39.5475258428451	42.987	22.9253	37.986	1.8509
38.0177578823623	22.8381111314524	48.7453637197121	38.2173	22.874	49.077	0.3887

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
31.2373388048419	22.7638437566	48.9583588917201	31.0765	22.0815	48.5077	0.8334
26.3600156356679	24.2971948017372	50.1740601129041	25.8125	25.1372	50.1121	1.0046
25.489576302762	17.8340033031811	52.3925985098723	25.7178	17.895	52.7372	0.4178
22.550154412627	3.16585989134129	55.825942931217	21.7245	2.01127	55.495	1.4575
26.747726737879	5.08898861100426	59.2323451998099	26.7979	6.90196	59.464	1.8284
31.6971755708002	1.50405535880649	62.6246161688549	33.1085	0.882753	62.284	1.5792
23.9028332831526	2.30714299233787	73.0793497495003	23.5387	4.13129	73.048	1.8604
19.6967356757857	0.259428625662439	79.4428913331135	19.7287	0.198716	79.5663	0.1412
12.3754493700218	3.18440366734048	75.9056930997883	10.9477	2.73525	75.6448	1.5193
17.8437184502095	10.4817359736163	74.558754621487	17.1854	11.1942	73.5432	1.4044
27.3127693389119	17.0331067352627	76.7306830556351	27.3595	17.3028	77.1892	0.534
35.8784485420715	17.530190993713	68.4527426610005	36.0033	17.5038	68.4307	0.1295
27.2586026592437	21.3657213708997	64.0715029489066	26.0672	21.3383	63.983	1.195
32.9871673459974	24.0687018362849	62.112672446889	34.4638	23.0393	61.4662	1.9126
33.1173771731461	31.0472492085006	62.6353829936747	31.6686	31.1822	62.9487	1.4884
34.6125507247048	38.7700670884709	62.9315703267564	34.4656	38.8185	62.9703	0.1595
37.9590396622019	45.7284832533085	62.7268751874999	38.1612	45.7549	62.3997	0.3855
38.3242054021144	48.6676706511319	64.4465620846999	38.5534	48.7846	64.7262	0.38
30.5270834810616	53.2140551174782	58.8787693503301	30.4468	53.5688	58.3124	0.6731
23.8983454954636	48.8245628975553	67.790904355946	24.4594	47.3987	68.2546	1.6009
18.0065315149484	50.6968166013858	71.7996266553018	17.8085	51.9553	71.4677	1.3165
13.5324428346551	49.6082884172307	75.8235869022415	13.2524	50.7626	76.4367	1.3367
7.50563031863247	42.6538257130174	79.6222474101282	7.21925	42.3799	79.403	0.4529
9.16584336071945	43.1361818886965	88.7112847017174	9.27453	43.3967	88.7547	0.2856
8.9884414704926	39.7158383476919	95.8567450869843	8.75416	38.928	96.5496	1.075
14.8321502185565	53.7531215805045	91.7374118371557	13.8308	54.4775	90.8096	1.5454
21.7474305274496	58.7206227773913	92.9406245931695	23.2085	58.8069	93.3912	1.5314
17.6246637736079	61.2077511413126	91.1125907194545	17.6011	61.1721	91.0121	0.1092
5.73166350604366	74.0661102103608	96.1021710898103	4.99968	74.2733	96.2118	0.7686
16.7820848276334	76.8850122306538	96.4571986158862	16.8354	77.4785	96.9485	0.7723
26.2080842609769	75.0823235169569	93.2079652221727	27.1361	73.6904	92.6772	1.7551
28.6599307809875	90.256248438064	95.0789234117294	28.4623	90.5817	94.8789	0.4301
32.4766194964613	90.5362131424793	98.7331688589024	32.5896	90.759	99.4978	0.8044
37.8593321873479	86.5343029817366	90.430896879767	37.7453	86.3505	90.2585	0.2766
50.9110025182842	91.044939694541	88.7320653245755	51.2472	90.6526	88.5593	0.5448
54.8843608304334	98.5594560940825	89.7728357634724	54.3707	99.6057	90.3024	1.2802
65.5213464280494	97.7300968843425	85.6647125859959	65.9332	98.9174	85.8003	1.264
75.0366165641477	92.4926964238348	80.9035522694729	75.6586	91.7899	79.8395	1.4188
75.0720978061884	92.8849021745629	81.7457561262341	75.4786	92.9344	80.494	1.7328
75.6855455831297	99.6658358212319	96.306809502935	75.6359	99.7073	96.3469	0.0761
85.9109941043699	96.1237778149777	98.3679683853873	86.1563	95.4019	99.9835	1.7864
87.072310918198	96.1570561336716	97.5310726448215	87.9339	96.7331	97.5762	1.0374
83.829800015617	88.1261835167764	90.278861117553	83.5669	88.2708	89.9554	0.4412
84.9354310429185	82.7152695229052	90.0425530265908	85.2864	82.465	90.0038	0.4328
75.8873758577494	81.5034558543541	90.8522322179286	74.5996	81.8744	91.5993	1.5343
79.6003229873852	76.7708032187321	84.4391505590007	80.8889	76.3527	85.0129	1.4712
79.6242702127121	74.7167527702502	79.7711559546386	80.9911	75.8316	78.9882	1.9298
77.6938245801516	69.1470833315941	71.9097057854474	78.2186	68.7569	71.4148	0.8201
66.0926871515197	69.4908081259382	71.4034853651665	65.9297	69.3415	71.7927	0.4476
61.3861658198011	70.9624579537643	67.7726759807804	60.9907	71.4945	66.9566	1.0514
59.996770589426	63.1095239952591	77.0704814094941	59.9164	61.9972	76.3491	1.3282
58.8550686468568	58.1822014558091	87.6301320559672	59.9164	58.75	88.5608	1.5215
54.2720882586222	52.6758446524293	91.7921870990287	54.0007	52.8659	92.5002	0.7817
52.6294556266448	45.8290018004396	88.9259765314505	53.4254	44.9898	88.3964	1.2721
31.7191749060058	43.964088576571	91.803196512035	31.4339	43.8079	91.7683	0.3271
41.8370710202633	57.6403544919038	97.6554383869447	41.7302	58.1199	97.2119	0.6619
43.5657290347204	58.7456951198492	99.4085118092641	43.5841	58.7522	99.5019	0.0954
48.1376376552705	62.8413170967133	87.3269230488296	48.6743	62.5481	86.8455	0.7783
43.8611867396445	68.7230410741135	86.8724158581521	43.1006	68.5786	87.3861	0.9291
43.0003071597773	81.2739111946145	81.1046257883258	43.0779	81.6476	81.3569	0.4575
40.865193237673	82.0972883479508	72.1880479089622	41.546	82.3742	71.0491	1.3555
29.9364318829247	79.7643350803431	74.8779394494914	29.8827	79.684	74.8634	0.0979
27.4091906033031	89.2400014386992	79.5259523937494	27.9893	89.6021	79.9213	0.7899
12.243086512612	97.2384185759616	79.2560586917095	12.7313	98.6134	79.0339	1.4759
3.85554369856274	98.9286801281089	79.493302137531	3.57801000000001	99.0366	79.8401	0.4571
0.923215365517578	96.997935472595	63.1366393606587	0.299018000000004	97.3272	63.0477	0.7113
3.35272671117779	93.3726409684111	52.7406803260287	3.24988	93.8751	52.5027	0.5654
3.99229339171049	92.2091762746249	50.4102388271712	4.28894	92.6489	49.3954	1.1451
3.62705393769285	88.9606452985271	51.477093142275	3.06059000000001	88.1315	51.3598	1.011
18.266045056655	95.7326622003745	60.6777742585872	18.064	96.3276	61.2807	0.8708
26.7373948380687	94.0476036440239	60.060250674872	27.8353	94.5623	59.9313	1.2194
20.568930042889	82.6461691563413	61.3525930011966	19.5225	82.1483	62.667	1.7523
22.8451428551261	77.813722424377	53.9829668194347	23.3293	78.9181	52.7226	1.7443
23.5677084712916	68.6163918481087	50.5395461559301	23.6206	68.344	50.228	0.4172
22.364472310571	70.3466436991611	58.2898004174527	23.7167	70.7298	59.5174	1.8661
17.7074838562999	70.2568307493582	59.312247830201	16.576	71.2313	59.4946	1.5967
14.0821457575223	70.1869134702899	60.1081953230182	14.0141	70.4084	60.1608	0.2376
2.83994506496747	61.8032116228934	61.1957854622191	1.5771	61.4642	62.0285	1.5502
6.7684171657019	60.0908209431861	55.3434566621594	8.30742000000001	60.1487	54.798	1.8807
11.1420656103181	58.1843815880664	48.8279298982416	10.4725	58.878	47.8708	1.3585

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
15.941523712542	55.378784680801	45.1495634196797	17.5187	55.1629	44.2721	1.8177
9.29568340730005	53.9425113848055	47.7462154147557	9.35554999999999	53.1101	48.6717	1.2462
4.2495770582869	55.4030856772659	46.8542788986507	3.30116	54.5758	46.8676	1.2586
2.56136244026625	66.6758528861384	44.7846806819011	2.55217	66.9796	45.1209	0.4532
0.789211702614978	70.5545185454972	31.2074646877966	0.194864999999993	71.2335	31.0366	0.9184
8.06707598608955	64.2564466141489	19.0903066132267	8.25408	64.3565	18.8288	0.3367
2.4626276434162	51.0343733340526	24.9817865050348	2.40393	50.9808	25.185	0.2182
Route: 3 Length: 845.013941259361 Demand Met: 798						
10.2217590413347	48.6530267783027	6.21791844152927	11.7937	48.0467	6.2423	1.685
11.4231097754355	55.198569876051	8.87238735178743	10.9638	55.5178	10.1729	1.4157
13.3197692892853	57.8931065581574	6.79472960267846	13.5318	57.9262	6.7229	0.2263
5.84770415341515	61.9863592099917	6.17907581548719	5.52590000000001	61.9092	6.1438	0.3328
8.7041303610108	66.1792798075921	6.61345898149597	9.17265	66.1356	6.7326	0.4854
1.68179563479653	82.9467145147552	3.77268854085663	1.02508	82.9527	3.7072	0.66
4.16418820612645	88.2767760959684	3.33430376243354	3.35356	88.986	2.7967	1.2038
16.7578080642033	97.2579536483598	6.12872582792092	16.854	97.4806	6.0907	0.2455
17.9408576631497	91.1036917235013	9.08826426447061	18.6101	90.3489	8.9268	1.0216
11.8672098820542	92.2988063122398	14.3606994121052	12.3803	91.1149	15.3598	1.6319
6.07946132598474	93.9829426505445	18.6576249179918	4.45068999999999	94.0863	19.178	1.713
15.1963787053289	95.0371930448889	18.7799239986848	15.2733	95.1553	18.4059	0.3997
22.8235640492045	94.9468256517123	22.2214632799016	23.1083	96.0553	21.9675	1.1723
29.8555466575952	92.9525579544921	26.0517441302603	29.5533	92.3189	26.5937	0.8869
32.0338656053419	92.9421489652409	26.641691181603	33.1283	92.3481	27.8161	1.7117
34.3415585760976	92.9311215932585	27.2666778808556	34.7487	93.2543	26.9859	0.5908
36.8728274428155	86.1969640690051	36.0372456162327	36.723	86.3354	38.0239	1.9971
38.7501352180378	82.2572082302158	32.3843019194583	38.4806	81.2568	32.7466	1.0976
44.204579619671	81.4217628361374	22.8696787187447	45.6946	80.9262	23.2292	1.6109
43.9507422733591	82.0894858128006	16.3530160217227	43.9629	81.9344	16.1851	0.2289
43.6283281578598	85.0386300020791	16.2685969672952	43.3068	85.4106	16.2891	0.4921
50.8707121035409	83.1806544019974	15.5410518700947	50.9984	83.4341	15.7476	0.351
54.1038895302053	81.6615761844934	14.6876525074691	54.169	81.8375	12.9059	1.7916
60.5888278400258	78.2298218716812	16.2644256958984	60.7208	77.8844	16.4053	0.3957
63.3855121704938	85.0963512369394	13.6496560965245	63.6977	85.2552	13.695	0.3532
55.0948587864063	87.8868740667583	8.55569138919351	54.7886	87.0165	7.4948	1.406
50.7139928310451	92.9761550884428	9.10466085673105	49.8328	92.6571	10.5815	1.7491
49.6066625805258	95.3908076533536	8.09527049474012	48.9418	95.7946	8.5835	0.9184
51.70401568402	98.6083874194304	1.8564659661901	51.8363	98.9629	1.5963	0.4592
49.2411646647658	88.5639383132581	3.6705924018545	48.934	88.5471	3.512	0.3461
49.9272746013667	80.1953912123532	6.64245077266574	50.5772	79.5094	6.7911	0.9566
45.7326314724286	80.9495412492978	7.03569221439068	45.1636	79.7971	7.5816	1.3964
40.5589112376693	85.5031156111825	6.09832005589512	40.7053	85.7824	6.0265	0.3234
33.2887260494138	87.0496391294671	5.95031211851054	32.7208	86.88	6.0296	0.598
40.0636287951218	94.1377300625207	3.42036405574813	40.4171	94.2218	3.0792	0.4984
34.8511758620369	99.7067644158022	13.4354506835945	34.7579	99.7518	13.4448	0.104
47.9593566950119	97.7678188866556	25.7741140961745	48.6626	98.7924	25.383	1.3028
57.4850991924357	93.6165423805761	37.2993484482907	58.0371	93.3465	37.2538	0.6162
54.8644553021227	95.0764550386362	41.8197645125567	54.8665	95.2849	41.9419	0.2416
51.4053016330429	89.1158980971185	43.0573049913801	50.0418	88.5256	42.3177	1.6597
48.6173962223622	84.3119752041624	44.054703703891	47.7087	83.4773	42.5429	1.9514
48.2636305420147	81.9248204156059	48.647276402933	48.3206	81.4332	48.7053	0.4983
46.4208361518022	87.8555327816829	55.8492958229213	44.9959	88.3516	56.7624	1.7636
53.6535664830447	89.4579004268853	55.9050719712628	53.7144	89.3849	55.8234	0.1253
59.812001748389	95.3567253781266	60.2596220711179	59.3326	96.8644	60.2925	1.5824
67.3619540958062	94.086548789687	63.9907296068665	68.3546	93.0491	63.4728	1.5264
68.4953892792641	97.3480112602151	68.5504507354677	68.0526	97.9535	69.9593	1.5961
73.9499446855317	96.6556175189997	62.6795658527451	74.1314	97.2935	62.187	0.8261
77.227166007646	90.2165249222013	61.8612195687369	77.8131	90.2453	61.6399	0.627
74.363487280515	82.3117958527053	63.4364039593927	73.8931	82.0767	63.5442	0.5368
82.5798995090064	79.8966935481281	62.4792543888867	82.6909	80.2719	62.172	0.4975
89.0982389634494	77.1699774664007	62.3050097953379	89.1084	77.1611	62.2997	0.0145
85.3523928710683	85.2502768785448	69.4973713061786	84.4594	85.6238	69.4005	0.9728
92.7098871123241	89.0699227721106	78.3418162535632	92.7385	89.9534	78.6648	0.9411
97.9758335967227	82.217962442283	81.487259797741	98.0879	82.1977	81.4504	0.1197
95.3595784822671	79.120989109128	85.2991614478964	95.1537	79.2325	85.4918	0.3032
96.8680213574236	73.8780961906799	85.2249828577055	98.0725	73.509	85.0617	1.2703
88.6436246827848	66.8338888375982	86.6006127871607	88.5712	66.6382	86.5414	0.2169
86.4127421511161	74.931858259047	92.3149481826051	86.1254	75.412	92.2501	0.5633
87.489874635593	74.0200029656067	93.82147659889	87.0562	74.7862	94.9506	1.4318
93.1882973863236	68.2850073058511	97.8295014691881	93.4248	68.5015	98.1606	0.4609
95.9342253123525	58.8049302503044	97.3262590953031	96.3481	58.4969	97.3507	0.5165
75.6902891749826	58.5148250091496	94.7566649076487	75.5117	58.1702	94.9268	0.4238
69.9546605080097	63.6508583154821	91.0874097594562	69.9395	64.1832	90.6048	0.7187
65.2984892724782	59.9633695188212	95.2711269300847	64.8783	60.379	95.6551	0.7048
64.0916437051652	52.9627283896557	96.3036636650504	62.6521	52.6724	96.4246	1.4735
70.0445477290213	43.999342450331	97.2041589481865	70.0979	43.9308	97.3335	0.1558
71.6729736252556	40.3133109112585	84.7578498169219	72.565	40.2263	84.1996	1.0559
56.7034355417782	37.4902737908914	80.2496142707384	55.717	37.8511	81.0117	1.2977
54.8031663789505	32.7260411417098	71.1439104712789	55.099	31.771	70.6981	1.0947
47.7122003134862	42.4596856060226	67.3792200078895	47.522	42.292	65.6102	1.7871
41.9311040405704	51.9585534684852	70.391429166399	41.6783	52.1535	70.8377	0.5487

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
44.0235813968642	55.514048570532	59.3215867480422	44.4217	55.3301	59.2126	0.4519
41.1087449778219	60.8437534738448	50.8745397655819	40.6271	60.1839	50.1596	1.0856
41.2894146185495	66.8140947765224	48.613489344091	42.1545	66.9856	47.2528	1.6215
34.9962760170883	79.8182008327294	53.7644838779713	34.9224	79.9328	54.0968	0.3592
33.8923201161317	83.2398747182251	46.5216798937301	34.4937	83.7515	46.1073	0.8917
26.7051068324018	81.4260775596037	43.5808882079225	25.7615	81.4539	44.2448	1.1541
26.3962203311835	79.930708651177	37.8584531658546	26.7929	78.8352	37.5421	1.2073
23.1892175176647	85.2336233925037	31.383527367788	23.3569	85.0798	30.5318	0.8816
16.7944079938641	94.1179131608018	34.7655761873958	16.7243	94.3593	34.7835	0.252
16.211166719362	81.8329405994456	36.8161020226841	16.5471	81.1813	37.3426	0.9026
9.67442165675918	83.4313188173859	29.0199392119682	8.89064000000001	83.8954	29.0611	0.9118
11.1206952667253	81.7360477419889	25.9386204333378	10.1219	82.045	24.5182	1.7637
16.9366199160062	77.51210414658	24.225228838481	17.2306	77.2747	24.7644	0.6584
20.6622125017511	75.0230250869848	17.4516582494685	20.7262	75.308	17.3361	0.3141
24.9470512417383	69.4876731260735	9.65496314240805	24.7619	69.8637	9.1655	0.6444
30.7570677441586	61.2785443236999	3.33129710484848	31.2678	61.1344	2.0752	1.3636
30.0680371478176	56.0437613601096	11.6089579547259	30.6696	55.2626	12.0174	1.0672
24.8100700707489	58.9133984677078	13.6863316192143	24.5176	59.5849	13.4915	0.7579
22.7337083020741	54.7595770921049	17.7125292121854	22.8193	53.7552	17.9075	1.0267
19.497154361042	60.3802759496968	20.2748055071131	19.6656	61.3862	20.5906	1.0677
12.5917320059948	53.6993697229358	19.282403893399	12.5872	53.6987	19.2898	0.0087
Route: 4 Length: 816.654944892725 Demand Met: 794						
4.49917708869366	22.0883969660656	12.6515347746032	5.81823	20.7452	12.0688	1.9707
0.937507366866925	20.0401941289118	21.1542208257054	0.659450000000007	19.6999	21.228	0.4456
3.37526361040825	24.951907252734	26.8144726601845	2.1823	25.6845	27.6693	1.6403
4.81449799118138	25.3246400782681	27.2354780674346	5.25835000000001	27.1001	26.8402	1.8723
15.7887188408881	17.9312901227556	33.6824693572855	15.6444	17.8995	34.8069	1.1341
17.0401477538269	17.2086538309361	33.2886931197642	17.2907	17.3232	33.1257	0.3201
15.9562755879835	9.36824822012283	36.3781917215775	14.8737	9.51072	37.7455	1.7498
17.6274141685905	2.282896304653	35.7471939900234	19.0116	0.977048	36.1157	1.9383
11.9907863430524	2.95193674200168	33.3386845643915	12.6307	2.70835	31.4638	1.996
8.58774717344451	3.39220654719937	32.3503608125348	8.57052	3.36732	32.2638	0.0917
5.4613028070366	4.73680053918149	34.2700471091649	4.96047	4.06059	34.5353	0.8823
3.10011332584784	9.62937318042585	35.9036460198616	2.19732	10.251	34.6682	1.6516
2.60915078630867	15.843405353035	43.9822356980943	2.68873000000001	16.3883	43.9305	0.5531
0.948227594732188	12.3646308572916	51.4585976179218	0.613562000000002	12.2624	51.4967	0.352
6.65659044571473	10.5759926052282	59.4717120324009	6.43447000000001	8.70233	59.8478	1.9239
10.7966110109796	12.7845914802326	64.0422528130529	10.9524	12.0779	65.6188	1.7347
14.8632587362792	18.8026608380204	61.6875285371295	15.6993	18.7479	59.9926	1.8907
15.374233900189	22.974095113002	64.5923986331739	15.3759	23.0999	65.044	0.4688
15.9654948064566	25.5047464889222	58.9056100256526	15.3897	25.3897	58.7078	0.6196
19.6754305249652	30.5676057623975	49.6293878908114	19.5262	30.4483	48.5255	1.1203
22.2248711015299	33.5165603303511	52.5395277380231	22.7183	34.3604	52.0641	1.087
23.0064454763849	32.9385000450967	59.0687953158314	23.2874	32.7742	59.4617	0.5102
17.4360003080577	36.0720414184767	56.8502101088113	17.6023	36.5196	56.7286	0.4927
9.94984100638692	36.507198884113	55.1794753603257	9.16001	37.8018	54.1714	1.821
2.39684389000587	24.0478154034044	62.0860060661423	2.38826	24.0295	62.08	0.0211
3.46515106000552	28.14652761035	68.8993475182781	3.44571000000001	28.2052	68.896	0.0619
5.3432648215333	26.9634885110459	73.2830658042577	4.056	25.9589	74.3875	1.9713
19.214662834202	29.1869382907565	80.8511543857144	19.247	29.2712	80.817	0.0965
27.2660557246179	25.8899194628146	88.2488242485132	27.4222	25.8428	88.2494	0.1631
20.3321037657714	27.2814865965919	94.1770322488963	20.3288	28.022	94.6827	0.8967
11.6163174030903	19.6146415742571	95.2289864845485	9.96077	19.2347	95.1963	1.6989
22.1965353832028	16.6607863113435	96.6004305706174	22.6997	14.9199	96.5597	1.8126
26.2228882698072	21.0609914572068	97.4880671694086	27.2482	20.2425	98.6789	1.7718
30.0768281009848	27.7930027147057	97.0837026183807	29.1053	29.2049	97.3043	1.728
44.1013128551251	30.3370457247037	94.7742871782387	44.5404	30.686	94.969	0.5937
42.6259523134519	23.8966967707811	88.8969235699259	42.4972	23.9973	88.7768	0.2028
42.6716933282484	19.3892919357889	86.2889955230344	41.7205	19.4188	86.0496	0.9813
43.7714087408146	14.0293622482692	83.4697432283717	43.8962	13.6901	83.4665	0.3615
40.6658911236872	19.6973886886542	80.2834656861806	39.9475	19.2268	79.8118	0.9798
38.1702069992606	30.7984681743035	76.7477851419496	37.7688	31.4408	76.6336	0.766
45.015607731838	25.142330962701	76.588741937911	46.0829	25.5503	78.1024	1.8965
47.553344537564	20.8922259138786	73.9614899486181	47.6864	20.3976	74.364	0.9045
50.6092430095957	15.7743172747235	70.7977942879741	50.9211	16.4053	69.6798	1.3211
55.9903335999023	3.32113757450429	67.5994133893545	56.3237	2.07366	66.7228	1.5607
55.7843506463413	16.2934948718764	85.5331383325924	55.9929	17.1432	85.8884	0.9443
51.6500217407397	6.31032805352154	87.5741062704702	51.1528	6.04103	87.327	0.6171
52.7242563077594	5.69299724098755	88.7421722939586	52.4925	5.37248	88.2454	0.635
61.4596197596231	0.673043157317514	98.2405440467562	61.5069	0.482106	98.5604	0.3755
64.4456503393416	4.25059696864063	92.810241815975	64.5769	3.66176	91.1441	1.772
68.4825333182831	15.0153384469403	96.8109852357626	68.0574	15.6194	97.6814	1.1416
75.130706700003	17.2002360943257	91.8456057394575	75.2455	17.3084	91.8789	0.1612
73.9298587945213	9.28316285613356	80.0305092756933	73.4709	7.6166	79.1313	1.9485
76.8324916725372	17.6224745277594	79.8624897855294	76.9072	18.2917	80.6948	1.0706
78.429485886211	18.9002814103204	73.6775281223762	77.5205	18.1054	72.6356	1.5949
82.8544566482134	22.6514554645748	70.7599946369207	82.6839	23.4883	70.1916	1.0259
95.3982281442193	16.7947463866578	73.9293727419169	96.7716	16.6523	73.2113	1.5563
91.2847957032408	13.7239021485357	83.5484574564228	90.4883	12.6216	83.5226	1.3602
93.1557896867093	19.7976065753078	96.569902862956	93.1464	19.8146	96.7782	0.2092

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
96.3021726235806	23.7934216978929	82.6261091473278	96.7473	23.5618	82.348	0.5737
90.3192362239724	30.8129201308367	78.0579063905166	89.036	30.7257	77.9388	1.2917
95.7472915679845	38.2267347260836	74.7548682241947	95.9404	38.2332	74.7444	0.1935
86.8452964465913	48.253864714657	70.9418208835233	86.8559	48.4797	70.9689	0.2277
79.45020296709	42.2010100033941	66.4110174915518	78.6058	43.2582	65.7281	1.5156
76.0478557591598	36.507315898082	64.6019564685541	74.7866	36.0265	64.8468	1.4465
75.6188092427362	35.7893253024346	64.3738284866256	74.0572	35.987	63.4666	1.8168
77.7542959337468	29.3294353821255	65.7838010323884	77.6794	29.1288	65.8649	0.229
84.601827559777	33.0591351324763	62.8350737776554	85.0689	32.1301	62.1612	1.2391
92.3035993697465	40.7752160981981	60.9250416949405	92.3029	41.017	61.4442	0.5727
95.1017608079784	43.1121702986638	59.2328601310911	96.3235	44.2629	60.2644	1.97
95.1719922773114	42.7719450557824	53.7734267422553	94.61	43.2995	53.8065	1.6034
95.3382045767079	41.9667583231845	40.8529720450812	96.1419	41.3034	39.8142	1.4714
92.3296348531306	44.2547574729134	41.0281555034111	92.0634	46.0336	40.4672	1.8841
91.3174749951867	43.1531561063951	41.7714165852199	91.3249	42.8902	41.6597	0.2858
87.387711356951	43.8296239384242	46.5992546674746	88.1955	43.6361	47.6404	1.3319
81.5517608601434	44.9464312962482	49.579775894637	81.1997	46.621	50.135	1.799
80.8054462694915	44.1944394453271	49.7519151249541	81.4209	43.6493	50.298	0.987
76.7287826562783	40.6289163098383	50.3720941153476	76.05	41.1841	50.3284	0.878
72.7773665853916	33.9005188566963	51.3918110730668	73.2088	32.0501	51.6558	1.9183
61.6245925412115	41.3237600042836	50.4348706030358	61.5258	41.6034	50.3406	0.3112
59.801656288342	36.6711570668866	52.6314246863986	60.6972	35.5066	52.4287	1.483
57.0001621960889	35.9836239123752	54.3655784934424	56.9788	35.9946	54.4126	0.0528
56.0864818915687	33.8630505645511	50.9793871508368	56.0389	33.1015	51.1098	0.7741
54.948773139873	35.3983819417711	44.7955757895625	55.5492	35.9315	44.2535	0.9688
49.1198721020225	32.8725664211577	42.5520040002262	49.1148	32.8614	42.5439	0.0147
45.5760511247467	41.2077977111433	47.9586036203423	46.2037	41.7062	48.7254	1.1092
33.991830226716	45.2653954939369	45.382266850184	33.2771	46.652	45.1216	1.5816
32.2443964253129	38.765549910181	45.6302480141701	32.7353	38.4372	45.6112	0.5909
25.9683429046045	33.9221541041401	46.0861986159355	25.7714	33.2927	46.3113	0.6969
23.1910954309283	40.5939801117159	42.3962551692904	23.6339	40.0124	41.5074	1.3495
20.4451752934692	47.1905520047073	38.7479336267827	20.5641	47.7219	38.8826	0.5609
14.7478494621956	44.2326138097101	31.6537731379845	15.6372	44.5891	30.235	1.712
3.04547621041539	38.5666304283277	26.9150230681425	2.57158	38.4711	27.3546	0.6534
0.972594394343858	35.7123841565053	17.3492633010949	0.642905999999996	35.395	17.4189	0.4629
Route: 5 Length: 605.358887080858 Demand Met: 434						
13.3747166435978	23.0387795899409	2.60094447288653	13.4	22.8874	2.3331	0.3087
26.4361220913913	13.1644068133839	16.3741177234811	25.6231	12.6549	17.499	1.4785
38.5047892576163	10.0588130372987	18.488437893815	38.2491	9.61738	19.3363	0.9895
48.0387011698586	7.6694983100628	20.0460554081964	48.6979	8.85907	21.303	1.8519
55.298936013469	1.69639913107683	17.7087412333399	56.1254	1.40532	17.903	0.8975
49.8747308968011	1.19682594412542	13.5809364942812	48.5894	0.54797	14.4264	1.6697
48.0330052351094	2.42049071531116	7.38972770479545	47.3917	2.23053	7.041	0.7543
57.411220238591	8.41151811203341	3.06433264459084	58.2097	7.56071	2.229	1.435
62.0158221413134	19.0921734505189	3.59667760191438	62.8285	19.7058	3.0557	1.1531
54.7771797864247	20.4615914350745	11.8285810817399	54.7387	20.4852	11.8363	0.0458
59.7339690484033	15.0773045594645	16.0060134689872	58.7637	13.9566	16.9818	1.7747
66.7116470840104	13.7096368215455	16.7635431893184	67.267	14.1516	17.4107	0.9605
70.7870446401252	5.44017484505479	9.24643243600813	70.1018	4.34543	9.0382	1.3082
73.9008384047488	5.96475883624584	7.55656220117329	74.5771	5.70821	6.0306	1.6887
78.4292418307729	12.3281952485232	22.6188394447911	79.2919	13.6517	22.466	1.5872
77.128496972725	10.0076432882069	31.6743079729561	77.911	9.90186	32.1435	0.9185
68.3238325233385	8.36166804644412	37.5693486133609	68.2389	8.47105	37.5341	0.1429
61.2698533151006	1.68180949603261	46.2346261259487	60.7013	1.36116	46.4176	0.6779
74.0773685466592	6.0436730329038	48.8859825155447	74.632	5.60444	48.5009	0.8055
79.5864048923059	15.7385011267218	56.2489984375726	80.035	15.8589	58.0701	1.8794
79.8678027090851	17.7752494241064	53.8105457171552	78.906	18.0381	53.555	1.0293
87.0255498818962	23.8094170382555	46.2115129555834	87.5589	25.1226	45.9834	1.4356
87.1202912966787	18.0558503881837	43.8268829865292	86.8707	18.0065	43.4379	0.4648
88.9861676894932	14.6316863025465	45.0707979621888	88.2698	14.9994	45.4757	0.9013
94.3644563504984	4.7618804663027	48.6561623753334	95.0473	3.39817	49.8314	1.9254
91.8895703971016	10.5720451916754	38.7492321597754	91.7898	10.5225	38.6828	0.1297
97.0750199388569	20.6794302672144	33.3644821111541	97.2905	22.0419	32.8941	1.4574
98.7376701251576	8.34807248562255	35.7128257585953	99.5164	7.77478	36.5945	1.3086
89.4177791593058	1.98458642536166	25.7155950402077	88.6343	0.494442	25.7719	1.6845
89.1320157479817	10.4118458027369	17.3144992187356	88.9914	10.7701	17.3091	0.3849
95.7657262508462	2.61847274568422	7.64422346708488	95.7659	2.55349	7.5519	0.1129
98.4307879014027	5.23896806892971	11.9337941358472	98.9579	4.73211	12.8251	1.1529
97.5189814497876	17.1554604153853	9.93014045800028	97.4766	17.1802	10.0021	0.0871
98.2208546544731	23.3870913104675	6.66641075122111	99.5853	23.4577	6.8435	1.3777
98.1304020755055	24.557914815885	6.01812385241447	98.8743	25.646	5.6301	1.374
90.3096393404108	21.3398980677796	5.70987900932868	90.11	20.7153	5.7932	0.661
80.0634159669295	36.8172566024549	1.99544777652564	80.0506	36.8529	1.8328	0.167
72.4752586376777	47.0212988435531	11.4552971060172	72.4782	47.1166	11.4083	0.1063
70.2214238858829	47.5024933932968	15.3781506998905	69.2786	47.5055	16.1011	1.1881
78.997849018474	48.4253668296842	13.0507479677135	79.5061	49.6701	11.7965	1.8387
85.1489868553894	43.1209546050746	17.0120117379912	85.2354	42.0312	17.7315	1.3087
89.7651019829107	48.7336259306428	13.711833415514	90.8764	48.3318	12.9357	1.4138
88.4502792195261	55.91197878382	14.5599095202223	88.4474	55.9131	14.5629	0.0043
97.1727893299849	70.9128270293659	4.07200957437656	97.9153	71.697	3.8476	1.103

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
85.3351500337736	62.5857827511598	1.98721530706364	85.3959	62.1638	1.7086	0.5093
66.9782091845229	66.2193557093975	9.05546027843812	66.9764	66.2314	9.0944	0.0408
51.8200764765573	64.9585638295088	0.94724557289828	51.793	64.9464	0.9013	0.0547
51.3992394896658	68.0588790812412	10.6743791741133	52.5118	68.1256	10.9937	1.1594
47.6452235781815	70.1210358010463	16.80364944959	47.6475	71.1843	17.3202	1.1821
45.2788770764602	66.306341226504	18.167570464844	45.2184	66.3382	18.5431	0.3817
37.3059640969646	49.5243409682949	12.414758007495	37.4105	49.4356	12.3771	0.1422
28.7193377149445	44.9138555364245	11.1498002247815	28.6889	43.6077	12.417	1.8201
12.3452998428785	43.1425800665399	1.81566143603071	12.2621	43.6923	1.4336	0.6746

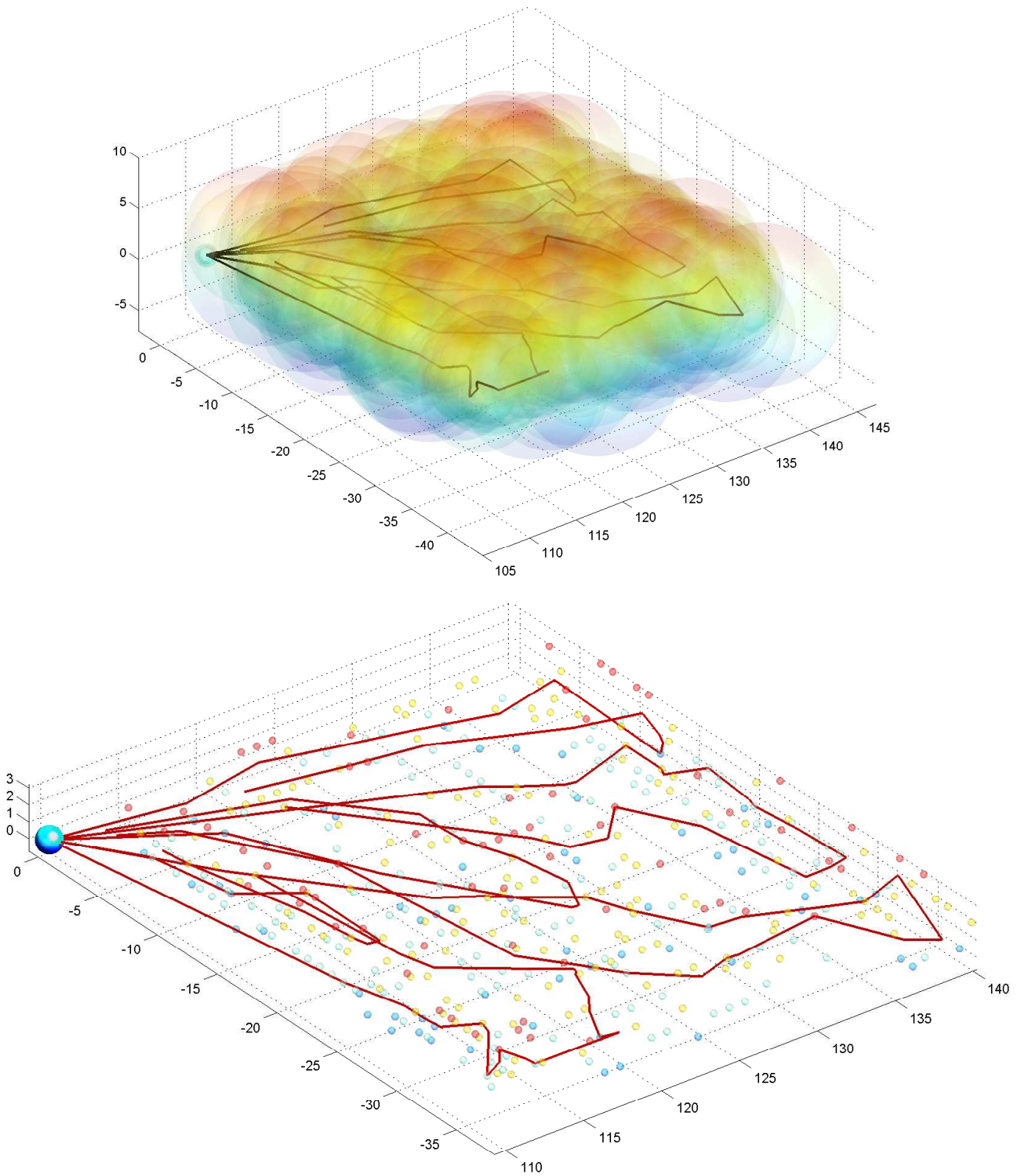


Figure O.102: *pcb*442, arbitrary radius, 3D, Euclidean, Length = 463.4611888

Table O-105: Solution for *pcb*442, arbitrary radius, 3D, Euclidean

Total distance: 463.461188827136 Total demand met: 1066 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 61.0981115490075 Demand Met: 171						
2.49999999986476	1.63333333333003	0	2	4	3	6
4.99999999987058	3.26666666669716	0	4	4	1	4
7.5	4.9	0	7.5	4.9	0	0
7.88165686392522	5.95765020101176	0.066701438719844	7	6	2	5
8.25653183961997	6.99650634468107	0.132217619185338	8	6	2	4
8.59625408817229	7.93794705671572	0.191590225945673	8.5	7	0	1
9.4963228298183	10.4322239374744	0.348893517878494	10	11	1	1
9.79487372710759	11.2595703214595	0.401070685278102	14	9.3	1	7
9.79487372710759	11.2595703214595	0.401070685278102	13	11.3	2	4
10.7015392018659	13.772128114369	0.559526875667936	8	15	1	3
10.7267052387331	13.8160209162337	0.56121821487704	10	15	2	2
10.8910644049235	14.1026844281709	0.57226433317024	11.5	13.5	2	2
10.8910644049235	14.1026844281709	0.57226433317024	11	15	1	1
11.2120215003883	14.6624748603874	0.593834960250989	9	15	1	5
11.2120215003883	14.6624748603874	0.593834960250989	12	18	0	6
11.621815380565	15.3772080593146	0.621376058126983	7	18	0	7
11.621815380565	15.3772080593146	0.621376058126983	10	16.3	0	5
12.0220075970892	16.0751947232255	0.648271855743724	12	17	1	6
12.0220075970892	16.0751947232255	0.648271855743724	15	18	3	7
12.4180755239488	16.765988096631	0.674890471637482	13	18	1	5
12.8244345551483	17.4747304782426	0.702200723187571	14	20	2	5
13.2318023481708	18.1852322688694	0.729578771426501	14	21	2	7
13.2318023481708	18.1852322688694	0.729578771426501	15	21	2	6
13.646109744069	18.9078376209684	0.757423210223411	15	19	0	3
14.0218030215249	19.5630949854185	0.782672502790858	9.5	22.2	2	7
14.0218030215249	19.5630949854185	0.782672502790858	12.2	22.1	3	5
14.4315546233149	20.2777544464854	0.810210759767176	13.5	21.4	1	3
14.8281321436107	20.9694366139507	0.836863623907849	12	24	2	5
14.8281321436107	20.9694366139507	0.836863623907849	13	24	1	5
15.274098730429	21.7472596635848	0.866835788621219	14	24	1	5
15.274098730429	21.7472596635848	0.866835788621219	15	24	1	4
15.9304616334826	22.892040930157	0.910948100342844	14	25	0	3
16.2664944819915	23.0782907385608	0.990583539278906	16	30	2	7
16.2664944819915	23.0782907385608	0.990583539278906	16	27	0	7
16.2674772911294	23.0781600834163	0.99071398249069	20	29	1	7
16.2674772911294	23.0781600834163	0.99071398249069	18.3	28	0	7
16.5969034454722	22.2637662664169	1.09280344461839	20	23	2	7
16.5969034454722	22.2637662664169	1.09280344461839	17	24	2	2
16.6677666841154	22.0885810782002	1.1147640261034	20	24	0	4
17.0411147987672	21.1656051957517	1.2304649430971	18	21	1	1
16.5476256926677	20.4877637832421	1.53167228178422	17	21	1	1
16.0359520219554	19.7849446127165	1.84397880067287	16	21	3	3
15.4491112973847	18.9788782975271	2.20216448391238	17	18	3	2
15.2037506387844	18.7297704693469	2.30259869092788	20	16	3	7
14.585336525474	18.1019118808055	2.55573597676372	16	18	3	4
14.585336525474	18.1019118808055	2.55573597676372	14	18	3	2
14.0195729621348	17.5275079262448	2.7873216563284	15.5	18.5	2	5
13.5	17	3	13.5	17	3	0
13.6084231888789	16.1036165566137	2.85240136928845	12	15	3	6
13.7427900396246	14.9927451505434	2.66948511872477	13	15	2	1
13.7427900396246	14.9927451505434	2.66948511872477	14	15	2	1
13.826625764198	14.3958218609017	2.58171273767734	17	15	2	6
13.9456096020964	13.5486385835039	2.45714180067076	18	15	3	6
14.0701795153104	12.6616815866687	2.32672248394576	16	15	1	5
14.0701795153104	12.6616815866687	2.32672248394576	15	15	0	7
14.078311047956	12.6037838204105	2.31820912083294	16	13	1	6
14.0784486779227	12.6028038738265	2.31806502820702	17	12	2	3
12.4733636803758	10.0881696990731	2.10668011588377	16.5	10.5	0	6
11.5786252751995	8.68641229814189	1.98884573319402	14.5	7.7	3	4
10.3147162364964	6.70628733684129	1.82239267668275	11	6	2	1
9.87642763464586	6.42132654916245	1.74495633248804	10	6	2	7
8.811489694508	5.72893904401783	1.55680427512674	9	6	2	1
7.7652797999083	5.04872792988301	1.37196108612245	13	3	2	6
7.7652797999083	5.04872792988301	1.37196108612245	8.5	5.2	1	4
6.96302435185412	4.52712784437453	1.2302194779754	8	3	2	2
6.7050860281487	4.35942493928978	1.18464720989665	9	3	1	6
6.7050860281487	4.35942493928978	1.18464720989665	10	3	3	4
3.86259869801474	2.51133382672322	0.682439689635323	6	4	1	3
2.37633925533602	1.54501714830875	0.41984901085885	4	5	1	4
Route: 2 Length: 103.739616448759 Demand Met: 182						
1.88916982089087	3.35017737404002	0.137157972667403	3	6	1	3
2.97997938737311	5.28457551494195	0.21635330095849	3	7	1	3
4.12941400382253	7.32293783799054	0.299805085811758	3	5	1	3
4.79472867207092	8.5027810827393	0.348108727421038	4	9	0	1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
9.12060197687975	15.2466172015914	0.803456459529785	10	18	0	3
10.8401328559958	17.9272862171368	0.984456805578505	11	18	0	1
12.2759558331421	20.2565631010899	1.65120858202252	11	21	3	2
12.6672110436189	20.6652692069311	1.6769410430894	13	21	2	4
13.4558087828222	21.4890404366266	1.72880633785637	13	22	1	1
16	24	2	16	24	2	0
16.352691593683	24.5083109770143	1.90708916017744	18	24	2	6
16.7855636127607	25.1321808369558	1.79305604609874	17.9	25.8	2	5
17.1892728587017	25.7140203498208	1.68670536593551	17.2	26.1	2	6
17.3980958804805	26.0149831637263	1.63169433806248	16.9	26.8	2	1
18.3010747860694	26.3676850835302	1.24415547700755	18.3	27	1	5
19.1102295333211	26.6837394768013	0.896883991186709	20	25	3	5
19.7978762035469	26.9523329871349	0.601760960020701	22.2	28.2	1	3
19.7978762035469	26.9523329871349	0.601760960020701	20	28	2	2
19.7978762035469	26.9523329871349	0.601760960020701	20	27	2	3
20.539030896706	27.241826672032	0.283673490916135	20	26	1	4
21.2	27.5	0	21.2	27.5	0	0
21.6300889599237	28.2893636322471	0.512916369660658	20	31	0	6
22.0577715860347	29.0743106794137	1.02296297923866	20	30	3	3
23.0883049740468	29.8410584413043	1.19220709551511	21.5	32.5	2	7
23.9364059887698	30.4720713259996	1.33149045552746	22	32	2	7
24.7266971703399	31.0600714163901	1.46127967130482	23.2	31.5	2	2
25.4110955723528	31.5692845409367	1.57367820818658	26	31	1	1
26.2667104370972	32.3397156859836	1.80324974818177	27	32	2	7
26.2667104370972	32.3397156859836	1.80324974818177	22.8	32.5	1	7
27	33	2	27	33	2	0
28.1577436085761	32.8278934143392	2.26241643971917	27	34	2	2
29.3886240298617	32.6449145651993	2.54141017594018	30	32	3	1
29.3996657108235	33.8664962402828	1.8373641713421	30	35	2	2
29.4099144074139	35.0003426343485	1.18388353213818	30	36	2	3
29.4099144074139	35.0003426343485	1.18388353213818	30	34	3	3
29.4217261597076	36.3071288840893	0.430730753917481	30	37	0	1
28.4293562832202	36.0224420950499	0.649143785839518	30	38	2	7
28.1094469630544	35.9306678769789	0.71955338519353	27	38	1	4
27.630387384305	35.7932373019524	0.824990746218733	26.2	36.5	2	3
27.4115794170961	35.7304666056047	0.873148714882574	27	37	0	6
27.4115794170961	35.7304666056047	0.873148714882574	26	34	2	7
27.3948619152892	35.7256707598941	0.876828110793335	27	36	0	1
25.186363535965	34.8584898289498	1.94376069502496	27	35	2	3
24.0858093567621	34.4263499247471	2.47544192280114	23	35	1	6
23	34	3	23	34	3	0
21.5477890415559	33.8474426110535	2.71204963570223	21	32	1	6
20.3655017263995	33.7232411987797	2.47762081692562	17	36	1	5
20.3655017263995	33.7232411987797	2.47762081692562	20	35	2	2
20.3655017263995	33.7232411987797	2.47762081692562	20.5	31.5	3	4
20.3655017263995	33.7232411987797	2.47762081692562	19	30	3	4
19.5160059182054	33.6340000813409	2.30917928608736	19	35.2	1	6
18.508829491958	33.5281944251347	2.1094722245565	18.3	34.5	2	1
17.9	33.3	2	17.9	33.3	2	0
16.9572026217409	33.3180293421717	1.71767092849975	17.2	34.1	2	1
16.2708232077405	33.3311551779973	1.51212858808874	15	36	1	3
15.5195695610343	32.229113227192	1.34270171802551	16	36	1	4
14.9927358167426	31.4562811690885	1.22388722712731	16	33	2	2
14	30	1	14	30	1	0
13.7057261482711	28.9744450376188	0.795227648674097	14	29	1	1
13.4761564015413	28.1743858695255	0.635479965607646	15	28	2	3
13.4761564015413	28.1743858695255	0.635479965607646	11	24	1	5
13.2768689704139	27.4798613877637	0.496804350407058	14	27	0	1
10.6728771018596	25.447373573784	1.03230598175569	12	27	0	3
10.6728771018596	25.447373573784	1.03230598175569	11.7	22.8	2	3
10.4547183197372	25.2770946552071	1.07716957710484	8	27	1	3
10.2581043505831	24.6922065656187	1.18660139453285	9.09999999999999	26	1	5
10.2581043505831	24.6922065656187	1.18660139453285	10	26	2	4
10.004498950144	23.937780166589	1.32775365134391	10	24	2	4
9.9686942140828	23.8312680964667	1.34768191135642	7.5	25.5	1	3
9.42723610484218	22.2205387845834	1.64904722320093	10	21	2	4
9.04699859664603	21.0894083791627	1.86068032815013	8.5	22.8	2	7
8.90592976292586	20.6697568734264	1.93919660766574	9	21	1	1
8.42076731856355	19.2264959032935	2.20922865746342	12	21	2	4
7	15	3	7	15	3	0
4.33082639964223	8.35347676172274	2.34570011493051	3	9	1	2
3.56699403552179	6.37194689004776	2.17892671112063	4	6	3	1
1.80621268342796	3.22655188366481	1.1033394115221	2	5	2	3
Route: 3 Length: 43.7930646492023 Demand Met: 163						
2	6	1	2	6	1	0
4	10	0	4	10	0	0
4.15995247455028	10.7997623730525	0.319904948569745	3	4	0	7
4.15995247455028	10.7997623730525	0.319904948569745	2	8	1	4
4.15995247455028	10.7997623730525	0.319904948569745	4	7	2	7
4.15995247455028	10.7997623730525	0.319904948569745	3	8	0	5

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
4.15995247455028	10.7997623730525	0.319904948569745	4	8	3	7
4.15995247455028	10.7997623730525	0.319904948569745	2	10	1	3
4.15995247455028	10.7997623730525	0.319904948569745	2	11	1	7
4.15995247455028	10.7997623730525	0.319904948569745	3	10	2	6
4.15995247455028	10.7997623730525	0.319904948569745	3	11	1	2
4.15995247455028	10.7997623730525	0.319904948569745	2	13	0	4
4.15995247455028	10.7997623730525	0.319904948569745	3	12	2	4
4.15995247455028	10.7997623730525	0.319904948569745	2	14	3	7
4.15995247455028	10.7997623730525	0.319904948569745	4	11	3	5
4.15995247455028	10.7997623730525	0.319904948569745	3	13	1	6
4.15995247455028	10.7997623730525	0.319904948569745	2	16	1	7
4.15995247455028	10.7997623730525	0.319904948569745	3	14	0	6
4.15995247455028	10.7997623730525	0.319904948569745	4	14	1	4
4.15995247455028	10.7997623730525	0.319904948569745	4	15	1	6
4.15995247455028	10.7997623730525	0.319904948569745	8	10.3	1	5
4.15995247455028	10.7997623730525	0.319904948569745	10.5	10.5	2	7
5	15	2	5	15	2	0
5.18942165644172	16.6167861580387	1.8182460384597	7	16	2	5
5.18942165644172	16.6167861580387	1.8182460384597	8	18	1	5
5.3794138498086	18.2384420248319	1.63594464007061	5	18.3	1	4
5.62479919545672	20.3328995945554	1.40049237870171	9	24	1	5
5.62382007073147	20.3326972184371	1.40051131752838	5.40000000000001	24.3	3	5
5.6228409460046	20.3324948423271	1.40053025636022	2	20	1	4
5.6228409460046	20.3324948423271	1.40053025636022	3	21	2	3
5.48332859412163	20.3036589162743	1.40322878989125	5.3	21	2	5
4.90580891992468	20.184290888785	1.41439953126085	4	21	3	2
4.90484175208941	20.1840430505039	1.41434329457534	2	24	0	5
4.90484175208941	20.1840430505039	1.41434329457534	3	23	1	5
4.87099883208145	20.1194737326302	1.42764111444743	3	22	0	5
4.87099883208145	20.1194737326302	1.42764111444743	4	24	1	4
4.59777826691597	19.5981929069407	1.5349970479046	7	21	1	3
4.59732157071699	19.597321570717	1.53517649641254	3	25	0	6
4.59732157071699	19.597321570717	1.53517649641254	2	21	1	3
4.59732157071699	19.597321570717	1.53517649641254	3	16	2	4
4.59732157071699	19.597321570717	1.53517649641254	3	19	2	2
4.59732157071699	19.597321570717	1.53517649641254	4	16	3	5
4.59732157071699	19.597321570717	1.53517649641254	4	18	1	3
4.59732157071699	19.597321570717	1.53517649641254	4	20	2	1
4.59732157071699	19.597321570717	1.53517649641254	4	19	1	1
4.59732157071699	19.597321570717	1.53517649641254	5.40000000000001	23.3	2	6
4.59732157071699	19.597321570717	1.53517649641254	7	24	2	6
4.59732157071699	19.597321570717	1.53517649641254	8	24	1	6
4.59732157071699	19.597321570717	1.53517649641254	8	21	2	6
4.59732157071699	19.597321570717	1.53517649641254	9	18	1	6
4.24891656636945	18.673563563773	1.74723820675599	3	20	3	4
4.03739012024538	18.112724168352	1.87598681960996	2	19	1	5
3.83107373872005	17.5656986984107	2.00156425100332	2	17	2	5
3.83107373872005	17.5656986984107	2.00156425100332	2	18	1	5
3.62341290856759	17.0151085709137	2.12796000041597	3	15	1	4
3.62341290856759	17.0151085709137	2.12796000041597	3	18	2	2
3.53093972473603	16.7699259796002	2.1842451273759	4	17	3	1
3.5305946991103	16.7690111816916	2.18445513238539	3	17	3	1
2.67760678581048	12.4394047834738	2.08165978892316	4	13	3	2
2	9	2	2	9	2	0
1.73409282011275	7.16954667054503	2.05102829431273	2	7	3	1
Route: 4 Length: 71.1338626302642 Demand Met: 183						
7.00707269924359	2.3445025773946	0.75516429065692	7	3	0	1
11.1108961354953	3.01230055428243	2.0062441227848	11	3	3	1
11.4913302992734	3.07340984150095	1.97963916013256	12	3	3	2
13.0931422414755	3.33070954569047	1.8676193874568	14	3	1	3
15.4097293821137	3.70282380231592	1.70561315090247	15.5	3	1	1
15.4451187158548	3.70987166067719	1.70446725918969	17.1	3.1	2	6
16.1134523878121	3.84297164902149	1.68282694133355	17.1	5.1	1	2
16.9050861709439	4.00062712680203	1.6571942531571	18	6	1	5
16.9050861709439	4.00062712680203	1.6571942531571	17.5	7.5	1	6
17.6474840303628	4.14847715100529	1.63315582026182	19	3	1	5
17.6474840303628	4.14847715100529	1.63315582026182	18	3	1	5
18.6016137490753	4.33849401141509	1.60226163578471	20	3	2	5
19.7987147423184	4.57689916717245	1.56350017565492	20	3.7	2	1
19.9412613163167	4.60857548303551	1.55729613927274	21	6	3	5
21.155183031702	4.87832993891981	1.50446280635643	22	4.7	1	1
22.0104128268894	5.06837681636362	1.46724076775414	23	6	0	2
22.4034315887093	5.1557123914116	1.45013546993741	23	3	0	6
22.4034315887093	5.1557123914116	1.45013546993741	22	6	1	3
23.0606092028554	5.30174865202086	1.4215332238022	24	6	2	5
23.7124494294525	5.44659885703861	1.39316327664197	22	3	1	4
23.7124494294525	5.44659885703861	1.39316327664197	21	3	2	4
24.482920767112	5.61781094630453	1.35963016545605	26	5	1	6
24.482920767112	5.61781094630453	1.35963016545605	20	6	1	5
24.5442080867562	5.63143005473397	1.35696277064993	24.5	7.1	0	2

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
25.9731215062681	5.59127294905418	1.62354503085353	25	3	2	3
26.8034928409444	5.56793682546466	1.77846152516536	26	4	1	2
28.1524391470585	5.53002706858218	2.030124868879	29	4	3	2
28.1530168167012	5.53078287464653	2.02981655900723	29	5	2	1
28.2034564956296	5.70745217904696	1.97438384254253	24	3	2	5
28.6318655113155	7.20799153169397	1.50356649768462	30	7	3	5
28.9690327052098	8.38894857467034	1.1330230369697	27	8	3	4
29.2907561080594	9.51581241183738	0.779452144537621	29.3	9.5	1	1
29.5368820923171	10.3778897688343	0.508962076049299	27.5	5.2	2	6
29.5368820923171	10.3778897688343	0.508962076049299	30	8	3	4
29.5368820923171	10.3778897688343	0.508962076049299	30	9	1	2
29.5368820923171	10.3778897688343	0.508962076049299	30	10	3	6
29.5368820923171	10.3778897688343	0.508962076049299	27	7	2	6
29.5368820923171	10.3778897688343	0.508962076049299	28	9	1	4
29.5368820923171	10.3778897688343	0.508962076049299	27	9	2	6
29.5368820923171	10.3778897688343	0.508962076049299	27	10	1	6
29.5368820923171	10.3778897688343	0.508962076049299	29	14	2	5
29.5368820923171	10.3778897688343	0.508962076049299	27	11	1	6
29.5368820923171	10.3778897688343	0.508962076049299	27	12	1	4
29.5368820923171	10.3778897688343	0.508962076049299	26	11	3	6
29.5368820923171	10.3778897688343	0.508962076049299	26	12	1	5
29.5368820923171	10.3778897688343	0.508962076049299	26	13	1	5
30	12	0	30	12	0	0
29.8857263540288	12.2541402409561	0.486165192136267	26	15	1	5
29.7718130414009	12.507479105878	0.970797392588523	29.5	17.5	1	5
29.7614573373695	12.4747687328799	1.02917345100642	30	18	1	6
29.7261176224953	12.3631418215018	1.22838668359885	27	15	1	7
29.7071819296097	12.3033299930988	1.3351289400012	30	15	1	4
29.701366840255	12.2849619741954	1.36790913821337	30	13	2	1
29.361376262674	11.30856983231	2.29505717911885	30	11	3	1
27.891856627014	10.711375407489	2.16556919461908	28	11.3	2	1
25.9913118880977	9.93901774559917	1.99810103765662	26	10	1	1
25.2557208256156	9.63548249279097	2.01326461972189	26	9	0	5
24.5014981588214	9.32425907103712	2.0288122328457	26	8	2	2
22.6337584326443	8.55355250858005	2.06731400272165	25.5	7.1	2	7
22.6337584326443	8.55355250858005	2.06731400272165	25	8	2	7
21.2094882168473	7.96583979815233	2.09667404656431	20	12	1	5
19.9057814191381	7.4278765317579	2.12354877855617	20	8	1	6
19.9057814191381	7.4278765317579	2.12354877855617	20	9	1	6
18.7857713701863	6.96571411472336	2.14663677162386	19	6	2	1
16.5428949799585	6.83545838562244	2.30016618212598	15.5	5	3	4
16.5428949799585	6.83545838562244	2.30016618212598	16	11	2	5
14.5400312757567	6.71914147195557	2.43726623985646	14	6	2	1
13.7397950775939	6.67266750617635	2.49204403200146	13.5	7.5	3	1
12.6573072857138	6.14696234109464	2.29570867102173	13	6	0	5
11.6773145952964	5.67103345919044	2.11796328939579	12	6	2	3
11.3941974239575	5.53353892787141	2.06661317394227	13	7	0	3
9.10191045003566	4.42030040822159	1.65085152637241	11	9	1	5
Route: 5 Length: 87.9367004499874 Demand Met: 184						
1.11014822257204	12.1010189970884	0.555074185539279	2	12	1	1
1.44091459674162	15.7805635097288	0.720457303535891	2	15	1	1
2	22	1	2	22	1	0
2.13601831241786	22.5233192000082	1.00168930090872	2	23	1	3
2.26459807938257	23.0180192129564	1.00328621757022	3	24	1	3
2.39884102990989	23.534507857349	1.00495346897976	4	25	2	4
2.53235934964042	24.048208547004	1.0066117206996	2	25	2	3
2.66664231358439	24.5648511442738	1.00827946903701	2	26	0	2
2.79982136694852	25.0772465374198	1.00993350711943	4	26	0	3
2.98250417417485	25.7801035298564	1.01220236480242	3	26	3	2
3.0994564565439	26.222080631391	0.909612511999439	3	27	0	6
3.31077088865092	27.0206639373868	0.724248737493295	4	27	0	1
3.21947665915801	27.5076159586732	0.842251715303435	3	28	0	1
3.20474286108124	27.5862042009845	0.861295987006723	2	27	1	6
3.11910455243024	28.0429882470309	0.97198836745106	4	28	2	6
2.97176675607223	28.8288696595088	1.16243084176419	2	29	1	1
2.97217091530565	28.8297230479535	1.16276005822309	2	28	2	4
3.09894101395317	29.0974000634343	1.26602332585531	4	29	2	3
3.24623278286815	29.4084089018142	1.38600295442387	3	29	2	2
3.40468484816505	29.7429828783372	1.51507343881344	2	30	3	3
3.55226323517373	30.0545969163656	1.63528653856658	2	31	3	3
3.70167874455595	30.3700900678428	1.75699610525437	3	30	2	2
3.84884569774144	30.6808353592121	1.87687406281437	3	31	2	3
4	31	2	4	31	2	0
4.0997284088202	31.1278880586115	1.77238353210239	7	30	2	5
4.20035087851421	31.2569226282103	1.54272649246254	5	31	1	1
4.05619771530424	31.4366318203385	1.50717046321465	4	30	0	5
3.69801491019263	31.8831620334434	1.41882305486066	5.2	32	2	3
3.62502431831092	31.9741560846517	1.40081959511633	8	30	0	5
3.33271487617463	32.3385649735337	1.32872014863477	4	32	1	4
3.19848631879137	32.5059016121773	1.29561206757679	3	32	2	1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.84751456181135	32.943442141384	1.20904329598434	4	33	1	4
2.63543356027181	33.20783388123	1.1567325580304	2	32	1	3
2.42475578630362	33.4704762804191	1.10476793303059	3	33	1	1
2.2126730539664	33.7348701767836	1.05245676913283	3	34	1	5
2	34	1	2	34	1	0
2.0000000013442	34.4033366633396	1.50145302215717	1.5	35	1	1
2.00000000324202	34.9944542858857	2.23636691716316	1.5	35.5	2	1
2.00000000340741	35.0463338086351	2.30086674034784	2	36	2	1
2	35	3	2	35	3	0
2.48450619263787	35.0164466126604	2.67840949028897	2	33	3	4
2.96703924841053	35.0328262454707	2.35812864790349	3	35	2	3
3.6890000235929	35.0573332726383	1.87892789008244	4	36	2	1
3.76504993689562	35.0154092876582	1.81281276438819	4	34	3	5
4.06794719645453	34.8484313202865	1.54948452184473	4	35	3	5
4.36682458335687	34.6836693853313	1.28965101245887	4.7	33.5	3	6
4.7	34.5	1	4.7	34.5	1	0
5.34169415012849	34.6090729818487	1.07271532188034	7	33	1	3
6.06953080656548	34.7327881729858	1.15519211687223	7	36	1	6
6.91697644480052	34.876834090942	1.25122272981791	8	36	0	2
7.25089248818581	34.9335920010075	1.28906133605982	6.2	37.1	3	3
7.93531357236917	35.0499275630278	1.36661837598037	8	33	2	4
8.68944892085045	35.1781129186351	1.45207527798021	6.2	36.5	2	3
9.44682339126467	35.3068488491488	1.53789923001395	10	36	2	1
9.4800655342072	35.1682229557456	1.44548196694398	9	36	0	5
9.57353837199352	34.7784239110973	1.18561593514873	11	36	1	6
9.60271627652493	34.6567466467164	1.10449775859067	13	36	2	6
9.69489262523909	34.2723542096415	0.848236134023943	12	36	1	4
9.77334185051247	33.9452064213335	0.630137609418652	12	33	1	4
9.8503566629628	33.6240404021115	0.416026931383488	11	33	1	4
9.92460358430158	33.3144170026041	0.209611333341819	14	36	0	7
10	33	0	10	33	0	0
9.67444792616419	32.5594824271669	1.40749323808242	9	33	2	1
9.82359564072658	32.3452281635894	1.47708230964062	15	30	2	7
10.2905824679682	31.6743904039331	1.69496818047322	14	33	1	4
10.3051318093547	31.5962953720701	1.72260587184598	13	33	2	6
10.3749446630377	31.22156796119	1.85522122833056	15	33	2	6
10.4643280220638	30.7417939243133	2.02501239645854	13	30	2	5
10.5588480953043	30.2344480642172	2.20456118301934	10	30	3	1
10.6706977561005	30.0948736594372	2.15244557450102	15	27	3	6
10.9595371329553	29.7344381981113	2.01786278042349	11	30	2	7
11.1105499573594	29.545993057395	1.94749935511692	12	30	2	1
11.2501587732564	29.0939618297121	1.79950326748491	14	28.2	1	3
10.6136376537722	28.6760173071262	1.81952310059706	13	27	2	7
10.1396665389909	28.3648043316949	1.83443041901885	15	28.6	2	6
10.1388309169057	28.3642556560257	1.83445670096361	9	30	2	2
8.64467313147512	27.2533675248099	1.87438568377777	9	27	3	6
7.97115859241031	26.7526176613246	1.89238428541003	11	27	2	5
7.66570883187087	26.5255194802574	1.90054694516629	8	26	0	2
6.54871346708916	25.6974816987032	1.93634661664531	10	27	1	5
6.19362378608574	25.4342508193821	1.94772723134221	7	27	1	2
5.52893302632209	24.9415101333631	1.96903055156502	4.7	25.5	2	1
4.98514644208356	22.8294470858795	1.98004527286326	4	23	2	1
4.76754345600065	20.4373965855247	1.98445295074007	4	22	1	2
4	12	2	4	12	2	0
Route: 6 Length: 95.7598330999152 Demand Met: 183						
9.86567915359009	5.46570887652689	0.630018305689673	11	7	1	2
19.3430345573844	10.716281575981	1.23523841335765	20	10	1	1
19.5556732581699	11.000188316286	1.29143930081705	20	11	1	1
20.5056287224551	12.268531089089	1.54251466974436	20	13	2	1
21.3161896184538	12.5064533153058	1.40191864549929	20	14	2	6
22.3537284534467	12.8109998963523	1.22195211156597	23.2	15	1	6
23.0572913385074	13.0175152228244	1.09991545150184	22.9	14	1	1
23.8132949869869	13.0188694404313	0.996055312187134	23.9	13	0	1
26.0704286849395	13.0428822589825	1.71899211725055	26	14	2	1
27	13	2	27	13	2	0
27	14.5000000020999	2.00000000257495	27	14	1	2
27	16	2	27	16	2	0
26.8039432606101	16.4095679485539	1.92882959642613	26	16	1	3
26.8039432606101	16.4095679485539	1.92882959642613	26	17	2	1
27.1578909951056	16.364210290956	1.82596623710737	27	18	1	3
27.6141458916811	16.3057421856425	1.69337063950959	27	19	3	5
27.6141458916811	16.3057421856425	1.69337063950959	26	18	2	5
27.6431061156292	16.3020309956398	1.6849543001518	27	17	2	1
30	16	1	30	16	1	0
29.8863064903211	17.1239491164438	1.02517688254773	30	17	1	2
29.7717644850373	18.2562862742674	1.0505416605175	30	19	0	5
29.6063616066924	19.8914228770407	1.08716933460561	30	20	2	1
29.5	20.5	1	29.5	20.5	1	0
29.5289536427731	21.4382063193941	1.05618089665528	30	21	0	6
29.5576336766221	22.3675466845146	1.11183088929054	30	22	3	4

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
29.5862098944985	23.2935230284751	1.16727944053781	30	23	1	5
29.5862098944985	23.2935230284751	1.16727944053781	28.5	22	1	6
29.6064311503636	23.9487673586009	1.20651624066772	29	24	2	1
29.7608567743666	25.1459873751264	1.12548493099162	30	25	1	4
29.8807177358657	26.0752369294685	1.06259063630957	30	26	1	1
30	27	1	30	27	1	0
29.8278305074203	27.3649023491779	1.16417278361106	28.5	27	1	2
29.6152383229656	27.8154780377532	1.36689075749137	30	28	3	6
29.3707707224364	28.3336116541308	1.60000363908332	30	29	2	1
29.3554300862884	28.337141665014	1.60014000434314	30	31	1	4
29.137325608515	28.3873293467988	1.60207876206151	30	30	0	7
29.137325608515	28.3873293467988	1.60207876206151	29	30	0	7
28.9047381018144	28.4408496958527	1.6041462610685	26	30	2	7
28.6932518494986	28.489514467878	1.60602618848383	27	30	3	6
28.4585854680496	28.5435131820985	1.60811216697775	30	33	2	5
28.4585854680496	28.5435131820985	1.60811216697775	28.5	33.5	2	5
28.1666474156089	28.6106905944767	1.61070724023654	27	31	3	3
27.5976410031114	27.9014342854898	1.06949657308317	27	29	1	3
27.5976410031114	27.9014342854898	1.06949657308317	26	29	0	5
27.3623110315853	27.6080996871636	0.845662380143831	27	28	0	1
27.1488973417771	26.8619996063767	0.927845016029954	27	27	1	7
27.1488973417771	26.8619996063767	0.927845016029954	26	27	2	6
26.985636058806	26.2912337069843	0.990714659520084	26	28	1	3
26.8396334294094	25.7808045319496	1.04693823607674	27	26	3	3
26.6956886826918	25.2775697702359	1.10236935068268	27	25	1	2
26.546803067243	24.7570615964757	1.1597031250777	26	25	1	1
26.3995223084559	24.2421640460003	1.21641889129728	26	26	1	7
26.3995223084559	24.2421640460003	1.21641889129728	26	23	3	6
26.2520181850928	23.726485606016	1.27322067211113	27.6	23.6	1	7
26.1060499667486	23.2161767322681	1.32943099743857	26	24	0	3
26.1060499667486	23.2161767322681	1.32943099743857	26	22	0	3
25.9582964811023	22.6996265155497	1.38632880417838	27	23	2	3
25.8130900653294	22.1919809247524	1.44224576997322	27	22	0	2
25.6631597337135	21.6678203953629	1.49998184976578	26	21	2	4
25.5472978502269	21.2627640895003	1.5445986454816	26	19	0	5
25.5470243698072	21.2618079945635	1.54470395897351	27	20	1	2
24.3585542146874	20.5630624085708	1.9942919379811	26	20	1	2
23.609152386682	20.1224613399757	2.27778416680302	27	21	1	4
23.609152386682	20.1224613399757	2.27778416680302	24	21	2	1
21.7	19	3	21.7	19	3	0
21.2454436635597	19.3798189868395	2.67028866853245	21.1	20	2	4
20.5733493734249	19.9414087210741	2.1827867120347	20	20	3	1
20.4451594397989	20.0518185088345	2.08013707405418	20	22	2	2
20.0978683929298	19.1927643579802	1.59751173334394	20	21	1	2
19.7935606562167	18.4400331063478	1.17461967637016	20	19	2	2
19.6112641436653	17.9891070687138	0.92128485174115	20	18	0	1
18.988014923524	17.0601590868703	0.997104768200333	20.6	16.5	1	2
18.4996528777894	16.3322593617669	1.05651530365523	20	17	0	3
18.4651718406313	16.2808656508437	1.06071001315832	20	15	1	2
17.3509540959805	15.1893013331694	1.17615995560293	18	18	2	3
15.1536030836232	13.0366251922499	1.40383901454121	18	12.3	2	3
9.40000000000001	7.4	2	9.40000000000001	7.4	2	0

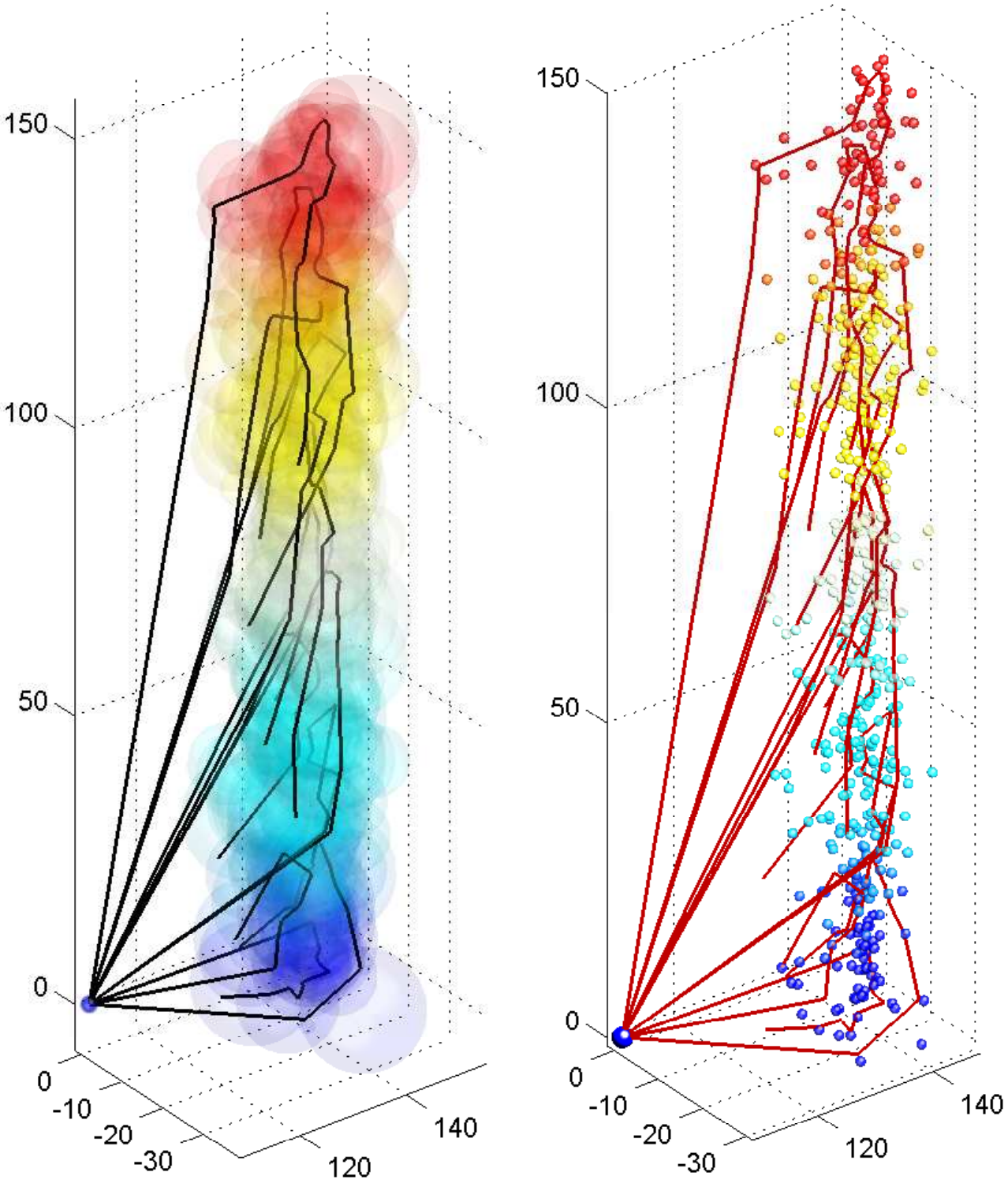


Figure O.103: $d493$, arbitrary radius, 3D, Euclidean, Length = 2359.3451722

Table O-106: Solution for $d493$, arbitrary radius, 3D, Euclidean

Total distance: 2359.34517215251 Total demand met: 11160 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 118.096003772083 Demand Met: 998						
20.4971618148053	26.5814094986453	2.32825114010673	20.117	27.617	1.782	1.231
30.6793876528146	27.0418513227447	7.67902322875822	31.42	27.173	7.305	0.84
30.3259335497869	26.6777321956879	10.2140290569629	28.118	18.092	12.931	9.723
30.3259335497869	26.6777321956879	10.2140290569629	25.959	27.744	8.296	5.865
30.3259335497869	26.6777321956879	10.2140290569629	29.07	29.713	2.284	9.61
29.2738146762343	25.5938669678664	17.7599240104695	29.007	26.157	18.195	0.76
29.6876497702191	23.9047257645605	18.5243305957872	27.864	18.854	16.375	5.87
30.4858819932103	20.6465996724801	19.9987681294133	28.689	18.156	16.722	4.491
31.2426244627911	18.7666414178477	21.3913638196846	35.992	16.314	18.057	6.3
31.1992303130078	18.1131510459779	22.2950346350595	33.833	10.282	23.21	9.452
31.1992303130078	18.1131510459779	22.2950346350595	32.944	17.965	22.768	2.152
31.0971206817449	16.5754408461638	24.4214376164088	33.515	18.219	27.24	4.061
31.0967223567085	16.5746109724943	24.4218283168799	31.102	17.775	23.735	2.111
30.8654717230799	16.0928207025234	24.6486533265446	29.705	13.393	23.437	8.359
30.8654717230799	16.0928207025234	24.6486533265446	33.062	12.126	22.872	4.87
30.8576842455117	16.0765961629561	24.6562917825715	30.594	9.52	26.782	7.585
30.8576842455117	16.0765961629561	24.6562917825715	33.96	10.536	22.989	7.536
30.8572856937806	16.0757658179841	24.656682705896	32.152	15.246	27.742	4.552
30.825227085994	16.0089745432967	24.6881277895318	33.322	14.401	29.372	5.546
30.800866108107	15.9894040870707	24.6793595990226	30.787	13.946	28.148	7.399
30.8001155052721	15.9888010882757	24.6790894364095	27.927	10.409	29.559	7.95
30.8001155052721	15.9888010882757	24.6790894364095	29.007	14.409	30.293	6.619
30.4064051932312	16.1374071482566	23.6970188759679	32.022	15.473	29.854	6.4
29.6121212537923	16.4372098244612	21.715757911104	29.515	16.505	21.691	0.121
31.0591044279961	15.1067472669357	19.8456263027169	35.293	11.552	21.184	5.688
31.0591462903224	15.1066620268773	19.8446308220902	31.242	15.473	19.727	0.426
30.7945960225427	14.4427449737379	19.2479003522129	31.61	13.901	20.326	7.404
30.5983837950527	13.9503294951448	18.805315969759	31.827	11.313	19.849	3.091
30.5480571262028	13.9267715212807	18.7228250171624	32.182	10.98	18.901	7.118
30.258296566059	13.79113424683	18.2478755500327	26.149	11.107	19.141	6.643
30.258296566059	13.79113424683	18.2478755500327	31.242	12.126	17.355	5.83
29.9227180026193	13.6340494958206	17.6978253277594	25.895	12.123	19.556	4.686
29.9227180026193	13.6340494958206	17.6978253277594	30.657	11.541	18.351	6.88
29.9225255784763	13.6339302790614	17.6968512844783	29.975	14.141	17.903	0.982
29.637775177874	13.4575127777727	16.2554573153686	29.975	12.061	16.621	7.414
29.6212669587779	13.4472850882207	16.1718934224372	31.372	12.353	15.396	3.954
29.0556930506961	13.0968829861136	13.308983272135	31.632	15.246	15.179	4.737
28.9642428417863	13.0402248849023	12.8460663240844	29.134	16.187	10.819	3.747
28.9642428417863	13.0402248849023	12.8460663240844	31.762	12.126	11.712	6.006
28.9133706260154	12.8587716213709	12.7308365147867	31.112	15.246	13.662	8.972
28.9133706260154	12.8587716213709	12.7308365147867	30.787	13.426	19.207	9.125
28.8481636579636	12.6261885817725	12.583137313682	30.787	11.313	10.711	9.249
28.8481636579636	12.6261885817725	12.583137313682	33.095	13.751	14.049	7.425
28.4434811837198	11.1827495716383	11.6664979125256	28.753	10.79	11.577	0.508
19.0264957895728	12.0364999602028	8.52880980606741	18.466	14.155	8.671	2.196
Route: 2 Length: 89.9474888521254 Demand Met: 757						
15.336876636265	5.18760686528856	3.39563403216363	22.149	11.742	1.36	9.67
29.3027385606989	9.91147657355564	6.48772031705726	29.451	10.155	5.592	0.94
29.7993095085203	10.072337992815	6.63175982337205	31.177	14.433	6.693	9.897
31.2606834631742	10.5457411757665	7.05565823524913	32.022	12.126	9.107	7.596
31.69553549771	10.6866089842241	7.1817950196628	34.087	8.758	8.639	5.137
32.6852276939072	11.0072142216235	7.46887375936383	35.166	10.726	7.803	5.004
32.6852276939072	11.0072142216235	7.46887375936383	34.135	13.686	10.417	4.602
33.6310465688804	11.3136063872667	7.74322569564612	33.647	11.313	7.765	0.027
33.6581273320692	11.6016513117443	6.92179929261462	33.452	11.541	6.941	4.46
33.6581273320692	11.6016513117443	6.92179929261462	34.135	12.386	7.828	5.584
33.6837349875357	11.8740282650797	6.14505405955815	32.997	11.541	6.26	0.865
33.6996809208133	12.0436376845587	5.66137376888344	31.015	13.036	5.79	5.03
33.6996809208133	12.0436376845587	5.66137376888344	33.322	12.841	4.069	4.98
33.7375085730835	12.4459933858076	4.51396399794081	32.542	12.126	4.969	1.441
33.7708253935824	12.8003687104634	3.50338143648348	34.135	12.906	3.426	0.387
33.0768365061607	13.0058971636956	2.46652006506144	33.127	11.313	0.11	2.902
32.6198071850351	13.6635646562415	2.54052186210537	31.567	11.313	0.396	7.667
32.6198071850351	13.6635646562415	2.54052186210537	31.399	13.754	2.704	6.233
32.4268718345121	13.9411997890699	2.57176176850033	30.787	13.166	3.014	1.867
31.9483382942551	15.7976880828936	2.58341504300446	31.892	15.246	4.139	6.832
31.9483382942551	15.7976880828936	2.58341504300446	32.932	15.246	4.376	6.384
31.833093192378	16.2447860964325	2.58622155328599	28.308	15.933	3.524	3.661
31.9154540643397	17.6729022234653	2.47777279476448	32.69	18.346	2.359	1.033
29.5858580361967	17.8670343808045	2.6782943094292	29.959	17.584	8.664	6.004
26.3895885186469	18.1386701585291	2.82727347989327	24.625	19.68	11.726	9.202
26.3885931531144	18.1387364277804	2.82720379601054	25.07	16.314	3.298	2.3
26.0945167435601	18.8149905062578	2.61327019249284	26.149	19.045	2.783	0.291
24.9309925188014	19.1299864006278	0.902476787359791	24.943	19.108	0.303	0.6

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
22.5962506375184	19.960475530017	4.00504737359182	23.355	23.553	9.247	6.4
20.974555022752	18.745086198942	3.25983606580759	20.117	22.728	3.645	7.823
20.1361763590148	18.1167585064468	2.87457930268407	20.117	18.283	2.485	0.424
14.6773253568609	13.2053649209451	2.09529047852141	20.434	13.012	7.24	7.723
Route: 3 Length: 98.2754799429464 Demand Met: 451						
16.1035960255322	24.8951256214598	11.9244022430863	16.37	26.982	10.968	2.311
17.63026586852	23.5633033157196	15.5976881016541	13.513	22.41	17.465	8.854
17.63026586852	23.5633033157196	15.5976881016541	20.942	25.649	17.701	8.469
17.93701944349	23.2957004424411	16.3357609229956	16.497	24.315	17.876	2.342
19.5060506274163	22.035240483342	17.8228352182782	19.482	21.966	17.833	0.074
22.4981194673729	22.5596930329362	19.5688913852761	22.974	25.141	19.537	2.625
23.3756832340309	22.0515243067896	20.1630528638674	26.022	21.902	22.93	6.288
24.4268669343728	21.4428179762872	20.8747649789385	28.626	22.791	23.223	9.57
25.9439067117093	20.5643495918433	21.9018884781981	28.245	21.331	19.247	3.596
26.7088514769721	20.1062626536867	22.4501701050846	26.975	20.061	22.417	0.272
25.2214948893029	19.6799068558589	23.9685152537924	28.816	12.25	22.231	9.823
25.2214948893029	19.6799068558589	23.9685152537924	28.181	12.441	28.249	9.321
24.7699373686842	19.5504663953334	24.4294808217047	25.832	22.918	24.535	6.514
22.307147335704	18.8444992927414	26.9435822540715	20.561	18.219	35.874	9.121
22.3066308872942	18.8443752803145	26.9427349631191	24.244	15.997	28.696	8.356
22.3066308872942	18.8443752803145	26.9427349631191	24.308	15.044	33.546	9.423
22.3061144385447	18.8442512674262	26.9418876724413	30.202	13.491	28.883	9.735
19.9590006900425	19.0886056506625	24.3186252222379	19.482	13.076	31.528	9.717
18.5200023612053	19.2384175551469	22.7103221407057	21.958	24.76	23.638	6.761
15.0818383517438	19.5963595183942	18.8676423132843	17.64	23.426	22.454	9.913
12.3867952541007	19.8769363019646	15.8555149475111	12.37	19.934	15.842	0.061
Route: 4 Length: 142.802199920767 Demand Met: 991						
24.7582075875969	18.1069758920121	25.2791574296246	30.15	16.06	32.059	8.901
28.5400555196082	20.8728397584397	29.1405812424154	28.689	21.013	29.015	0.24
28.8717315724327	20.9932220044221	30.5656253150113	31.293	23.68	29.18	6.085
29.2299972389108	21.1232549620847	32.1049114147021	29.261	22.283	32.908	1.411
30.0238852293434	17.3425495125466	33.142594270285	30.023	17.203	33.037	0.175
31.6947250067024	17.388526295696	41.140223307776	32.372	18.537	39.944	3.113
32.5228069349135	17.4113127517406	45.1039141948638	29.975	12.321	39.763	7.85
32.5228069349135	17.4113127517406	45.1039141948638	29.134	13.33	42.125	6.084
32.5228069349135	17.4113127517406	45.1039141948638	30.787	13.686	41.698	6.343
32.5228069349135	17.4113127517406	45.1039141948638	33.095	13.231	40.765	6.668
32.5228069349135	17.4113127517406	45.1039141948638	32.372	14.092	41.845	6.932
32.5228069349135	17.4113127517406	45.1039141948638	33.96	19.68	39.41	7.146
32.5228069349135	17.4113127517406	45.1039141948638	32.607	11.313	43.742	7.65
32.5228069349135	17.4113127517406	45.1039141948638	30.785	20.823	44.268	6.267
32.5228069349135	17.4113127517406	45.1039141948638	30.657	15.246	48.98	4.816
32.5228069349135	17.4113127517406	45.1039141948638	33.642	18.346	49.307	5.973
33.2503327523876	17.4784957416239	48.3823449555165	33.388	17.584	48.735	0.393
31.9352888446237	16.0477469951451	46.2338732302448	33.095	14.271	36.737	9.731
31.9352888446237	16.0477469951451	46.2338732302448	29.975	11.801	40.794	8.467
31.9352888446237	16.0477469951451	46.2338732302448	30.202	13.751	40.213	8.941
31.9352888446237	16.0477469951451	46.2338732302448	30.658	10.98	44.543	9.268
31.9352888446237	16.0477469951451	46.2338732302448	27.737	16.251	47.666	9.503
31.9352888446237	16.0477469951451	46.2338732302448	31.483	16.822	46.955	9.589
31.9352888446237	16.0477469951451	46.2338732302448	30.982	15.473	49.591	9.722
31.1578271279928	15.2018797188747	44.9636837164668	31.015	13.816	44.684	1.481
30.4392281033531	14.4200543913884	43.789662160379	33.322	13.361	37.986	9.946
30.4392281033531	14.4200543913884	43.789662160379	27.991	13.647	44.302	2.618
30.4395694214621	14.4198116220357	43.7887541047696	25.895	18.918	46.48	7.438
30.4395694214621	14.4198116220357	43.7887541047696	30.785	16.949	44.302	7.677
31.8370367147884	13.4258348881752	40.070880466923	31.015	13.296	40.037	5.495
32.3888134036219	13.0333726771101	38.6029132069976	33.095	13.491	38.538	0.844
32.3320232536451	12.2025527684536	37.1077615822014	33.642	10.155	35.22	3.353
32.3320232536451	12.2025527684536	37.1077615822014	34.135	14.726	38.301	3.323
32.2982432121161	11.7083625433187	36.2184119852568	32.217	11.541	36.145	0.2
33.320480230997	13.063973679777	35.6246826597485	32.436	13.231	35.38	5.906
34.1262211398392	14.1324845340569	35.1566973241658	31.567	14.661	34.796	2.638
35.3136949272812	15.707219894254	34.4669971744948	36.436	17.076	35.413	2.007
34.5183164604993	14.993317519591	30.3724662096852	34.087	11.615	26.904	4.861
34.5183164604993	14.993317519591	30.3724662096852	31.61	17.775	32.188	4.415
33.6274964484052	13.8920585401977	24.5873022083747	33.907	14.076	24.403	0.382
31.847169166836	12.4379124593045	22.2655286044389	32.867	11.313	21.273	1.814
30.2098115920246	12.4370976503488	21.7156702514875	30.202	12.451	21.726	0.019
29.4193814399154	12.1116849392737	21.1474865038934	28.372	10.218	25.305	4.687
Route: 5 Length: 148.437021693778 Demand Met: 998						
17.7325395448478	9.60879458614033	39.6005967831912	20.244	11.234	37.646	6.925
17.7325395448478	9.60879458614033	39.6005967831912	18.021	13.52	41.784	4.982
20.4255126076798	11.0680455193752	45.6145881849795	25.578	12.568	43.273	5.855
25.7315765320829	14.3212699913277	61.5157020659356	30.658	9.71	56.048	8.685
25.7315765320829	14.3212699913277	61.5157020659356	31.827	14.661	58.532	8.515
25.7315765320829	14.3212699913277	61.5157020659356	19.418	13.901	64.222	6.882
25.7315765320829	14.3212699913277	61.5157020659356	21.831	13.203	64.85	7.88
25.7315765320829	14.3212699913277	61.5157020659356	25.07	11.615	69.179	8.154
25.7386912557603	14.3366780137345	61.5202911980691	25.832	14.219	61.701	0.235

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
26.3482307115222	15.6567287759397	61.9134556746547	24.943	18.346	64.008	3.687
26.3491181353086	15.656681341422	61.9129971673048	27.356	20.632	65.916	8.262
27.1844384998685	15.6120318459838	61.4814102080924	30.594	17.076	65.103	5.185
27.5661129874555	15.4832347543603	60.9297491740361	31.762	15.473	67.554	7.919
28.598456103417	15.1348677684817	59.4376309181757	31.437	14.433	67.041	8.72
29.0391151798641	14.9861661696945	58.8007153064331	28.753	13.457	65.491	9.22
29.0391151798641	14.9861661696945	58.8007153064331	30.202	12.711	66.602	9.036
29.5362941801479	14.8183917705572	58.0821074680791	30.202	12.971	61.507	8.778
29.5362941801479	14.8183917705572	58.0821074680791	31.015	12.516	61.408	8.72
30.0655330322221	14.6397986861339	57.3171612635423	33.387	11.313	58.128	9.319
30.0655330322221	14.6397986861339	57.3171612635423	33.96	11.234	59.829	9.284
30.3843326317129	14.5322188965876	56.8563777362793	26.594	18.854	52.883	6.988
30.3843326317129	14.5322188965876	56.8563777362793	32.607	14.661	52.963	4.485
30.3843326317129	14.5322188965876	56.8563777362793	29.975	14.401	55.717	4.095
30.3843326317129	14.5322188965876	56.8563777362793	31.275	14.173	56.999	1.24
30.3843326317129	14.5322188965876	56.8563777362793	28.372	13.52	60.757	4.868
32.4823052700773	13.6717822979462	54.2957442213786	32.69	13.52	54.423	0.287
32.6307931844098	13.6761166471081	53.7415761436327	34.135	14.206	54.088	1.632
32.6307931844098	13.6761166471081	53.7415761436327	33.322	14.141	54.817	3.297
33.0756932733346	13.6396009574347	51.4740560409479	33.907	13.036	49.61	3.305
33.0756932733346	13.6396009574347	51.4740560409479	36.119	13.139	51.404	3.085
32.6800128474224	13.7318417289353	49.8115012832285	33.322	13.881	49.4	0.777
31.3797584584016	13.608492813395	48.7851770706078	33.095	12.971	48.557	2.042
29.1445521802214	13.3964494813795	47.0208712982476	25.07	17.076	49.249	5.925
28.8032795845332	13.3640745831906	46.7514960669542	28.499	12.949	46.85	0.524
26.7402677887836	16.9261608429726	41.8277721787542	26.34	17.203	39.025	3.101
26.65687401912	17.0701521659264	41.6287389511509	27.8	23.617	42.03	6.658
26.4228427683242	16.9127546892765	41.2235272439717	29.642	15.108	43.621	5.237
25.190431377571	16.0838976753138	39.0896775085056	26.149	20.886	38.979	5.887
23.3252291011576	14.8294578100859	35.8601865986245	27.419	15.044	35.984	7.778
23.3252291011576	14.8294578100859	35.8601865986245	24.371	14.346	43.342	7.57
22.6134005745573	14.3507182665611	34.627696278185	18.212	18.283	36.255	7.954
16.4337418540177	10.1945951814306	23.9279712043329	22.022	11.361	19.929	6.97
Route: 6 Length: 229.910004983754 Demand Met: 995						
31.1509694946047	14.2175264468895	64.4019394710627	34.849	11.996	64.173	7.912
31.1509694946047	14.2175264468895	64.4019394710627	32.055	9.837	66.681	5.02
32.3876840442376	14.7819717868329	66.9587399710374	31.991	17.203	67.188	2.464
32.9295109540618	14.5536529610694	67.887114524137	31.307	14.661	68.868	1.899
35.6334825463287	13.425273064708	72.4481060691922	37.452	12.758	72.01	1.986
34.1745022184181	13.6692531525758	83.9498972880935	34.135	13.166	82.509	1.621
34.1745022184181	13.6692531525758	83.9498972880935	35.42	12.949	84.367	1.498
32.7743473321201	14.2952868472451	87.1528380935181	34.135	12.646	86.486	4.083
31.294897612982	14.9567746668758	90.5371708152422	30.722	15.473	90.573	0.772
31.4206239057392	14.7622668017542	90.9273896346075	29.975	14.921	90.476	2.292
31.7985624298695	14.1775680709122	92.1004035758476	31.697	14.433	93.007	8.117
32.1619790138415	13.6153361888459	93.2283444928755	31.547	13.203	92.722	3.992
32.303094560649	13.3970203134948	93.6663262778201	32.737	11.541	92.508	5.142
32.303094560649	13.3970203134948	93.6663262778201	34.849	13.393	93.121	6.061
32.7188033918997	12.753889288057	94.9565650124047	33.322	12.321	95.076	0.752
32.1635061566866	12.9686380325711	95.4904040986585	33.322	12.581	100.045	6.265
30.9735032592934	13.4288447043802	96.6344221107407	29.197	12.441	103.553	7.211
30.9731007979514	13.4293664826937	96.6336699323976	32.817	17.775	101.585	7.615
30.972698334606	13.4298882594355	96.6329177540363	33.071	18.346	97.156	7.578
30.9722958720267	13.4304100361161	96.6321655752225	32.802	15.473	97.861	3.005
30.9722958720267	13.4304100361161	96.6321655752225	31.737	12.885	98.954	5.959
30.3375111282209	13.6926331601524	95.724058493733	30.202	13.231	95.497	0.532
29.4743539297896	15.1968252292976	94.5628567686547	25.705	12.123	93.472	8.029
29.4743539297896	15.1968252292976	94.5628567686547	32.412	12.353	94.929	7.931
28.7130087791355	16.5235927602447	93.5386224018568	24.943	18.791	91.664	4.875
28.7130087791355	16.5235927602447	93.5386224018568	29.515	14.028	97.711	5.055
28.2513059948153	17.3281853117161	92.9174952079085	32.542	15.473	89.387	5.858
28.2513059948153	17.3281853117161	92.9174952079085	27.546	22.537	91.326	5.492
28.2513059948153	17.3281853117161	92.9174952079085	30.202	14.791	95.605	5.659
27.2481076662289	18.867004612436	91.8624881822282	26.911	14.409	89.199	5.204
27.2481076662289	18.867004612436	91.8624881822282	25.832	16.949	91.413	3.416
25.9893105532283	20.7978870537711	90.5386823703991	25.895	20.759	90.426	0.152
26.2155575608902	22.6495262650749	90.9383399361299	26.149	23.172	91.657	0.891
27.4562387454966	23.2783686780632	85.6662794425461	28.054	22.918	87.821	3.972
28.1624252440662	23.6363011534955	82.665461648522	32.118	27.3	81.725	5.473
27.0328249528939	22.2922426916005	80.0851963692351	27.102	21.648	79.965	0.659
22.3817974142281	28.3076716201108	73.8836640960573	21.958	29.395	74.461	1.302
20.7431237232256	28.0746103821228	66.7146035591314	18.72	30.665	66.986	3.298
18.058497938574	26.8890220069289	52.4220081505392	17.069	27.046	52.438	1.002
18.8682778367316	26.0080344967436	45.7144111579634	17.069	27.744	45.218	2.549
20.2701761149293	24.5156851555342	36.3840174975289	20.561	24.696	36.269	0.361
Route: 7 Length: 180.758663925624 Demand Met: 985						
25.619208537043	26.0495784011807	32.5860960794907	25.705	26.22	32.496	0.211
28.1092790828793	25.5478212469689	43.0182022993433	26.086	29.903	39.661	5.939
28.1092790828793	25.5478212469689	43.0182022993433	29.261	23.045	43.901	3.259
28.1092790828793	25.5478212469689	43.0182022993433	33.642	26.22	42.336	5.615

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
28.3114835750167	24.9722041542632	51.0072137113879	28.753	24.379	51.035	0.74
27.6229761149882	25.6511574095071	57.4221634476096	28.499	25.141	57.61	1.031
27.3169590202076	25.9060411391915	59.1665391734742	27.102	25.966	59.543	2.428
26.8118261292224	26.3267697927302	62.045925898014	31.356	22.347	59.353	9.352
26.8118261292224	26.3267697927302	62.045925898014	28.88	27.3	58.991	4.959
26.6787846699249	26.4375809423759	62.8042962870218	18.974	24.125	61.119	8.219
26.6787846699249	26.4375809423759	62.8042962870218	26.086	24.95	59.469	5.746
26.6787846699249	26.4375809423759	62.8042962870218	25.07	27.744	59.542	6.389
26.6787846699249	26.4375809423759	62.8042962870218	22.022	28.443	62.892	5.071
26.6787846699249	26.4375809423759	62.8042962870218	22.466	28.887	64.369	7.763
26.6787846699249	26.4375809423759	62.8042962870218	27.546	26.982	70.094	8.192
26.1888537123972	27.3836231147209	69.322399221487	25.832	27.998	69.522	0.738
27.0618791045644	25.9211708229752	71.3055281863988	19.164	24.696	74.306	8.537
27.0618791045644	25.9211708229752	71.3055281863988	24.562	26.982	72.259	7.031
27.0622832930672	25.9206222782358	71.3062601224091	24.943	23.68	69.938	9.291
27.6832318962774	25.0779014057215	72.4307221826342	23.482	22.41	74.725	8.804
27.7933223892283	24.9284920156634	72.630082615847	19.863	21.331	75.529	9.178
29.1162344905159	23.8351182178328	74.1819448105319	31.356	26.03	76.034	3.642
29.2371660367274	22.1704627673467	74.6236485608957	28.816	21.902	78.963	4.368
29.2647528179777	21.9726128541183	74.5481650560309	26.911	22.601	75.564	7.439
29.5686353744987	19.7931948142958	73.7166756341932	33.062	15.473	78.089	7.07
29.3989465884998	19.5339331157663	73.1890982382397	27.737	18.664	80.683	7.927
28.9723469198099	18.8821460564173	71.8627622701618	30.785	16.251	71.611	3.205
28.8086681050269	18.8824615507094	71.626836226107	33.261	18.537	71.995	7.388
28.8086681050269	18.8824615507094	71.626836226107	32.477	14.433	75.823	7.82
28.38879909702	18.8832708486922	71.0216385799821	30.787	14.466	78.121	9.289
27.8063027516559	18.8843936147154	70.1820304850337	22.974	17.711	70.862	5.019
27.8063027516559	18.8843936147154	70.1820304850337	27.483	19.616	74.587	4.477
27.7139778224675	18.8918781948709	69.9631293668442	29.705	19.426	70.279	2.488
26.8583624793924	18.961241059107	67.9344773327657	29.261	19.172	68.315	3.212
23.3941576355657	19.2420765630028	59.7208959634295	25.197	18.918	59.354	4.006
22.0499054384575	19.3510521457267	56.5336927513853	24.244	21.077	52.586	4.835
22.0499054384575	19.3510521457267	56.5336927513853	24.308	16.441	56.035	3.717
21.9379411374989	19.3625129056175	56.2758664222877	18.466	17.838	58.207	4.44
19.828187929639	19.5784687215119	51.417622428058	20.117	21.775	51.546	2.22
18.1559865442065	19.7496364470676	47.5669529056285	12.052	18.854	46.124	6.347
18.1559865442065	19.7496364470676	47.5669529056285	19.609	18.156	48.051	3.821
18.1559865442065	19.7496364470676	47.5669529056285	17.64	22.918	47.209	3.23
18.1559865442065	19.7496364470676	47.5669529056285	17.323	23.934	50.146	5.56
Route: 8 Length: 183.759245530892 Demand Met: 1000						
23.2151587126192	10.4909671049196	54.3433551071264	22.276	13.393	54.239	3.052
23.3285898282302	10.5321180733506	54.6025173615439	22.085	10.853	55.182	1.409
29.040561037077	11.9029704276823	64.5453534852703	30.202	11.996	64.142	1.233
29.6555734607113	12.3246139718507	69.1944315056138	31.307	11.313	71.461	7.443
29.6555734607113	12.3246139718507	69.1944315056138	31.015	12.776	72.117	4.762
29.8912196481238	12.4861695597699	70.9757573299691	30.531	18.664	72.004	6.676
30.0130733663155	12.5697106914579	71.8968890380632	30.787	12.906	76.252	6.569
30.0132039838309	12.5698002409557	71.8978764184116	28.816	12.568	71.763	3.752
30.0133346013411	12.5698897904719	71.8988637987589	31.356	16.251	69.04	5.882
30.5437909952133	12.9335629548045	75.9087554304526	26.721	18.283	80.536	8.04
30.6912955512153	12.7872319179776	75.9829217224628	30.787	12.646	75.914	0.184
30.5955485585004	13.2658795188137	76.9048792400523	29.007	10.282	76.107	4.077
30.5955485585004	13.2658795188137	76.9048792400523	32.282	12.126	74.654	3.133
30.5955485585004	13.2658795188137	76.9048792400523	29.975	12.581	76.539	3.034
30.5955485585004	13.2658795188137	76.9048792400523	31.437	11.541	78.241	2.677
30.4956635622371	13.7652133665039	77.8666820243607	30.202	14.271	77.775	0.592
31.5050636461764	13.4967012203627	82.6416672156265	26.848	19.743	76.594	9.863
31.5050636461764	13.4967012203627	82.6416672156265	31.047	11.313	78.28	6.138
31.5050636461764	13.4967012203627	82.6416672156265	32.802	12.126	77.71	6.243
31.5050636461764	13.4967012203627	82.6416672156265	32.672	12.353	81.337	8.34
31.5050636461764	13.4967012203627	82.6416672156265	33.071	16.187	80.531	6.12
31.5050636461764	13.4967012203627	82.6416672156265	32.152	12.353	82.503	7.264
31.5050636461764	13.4967012203627	82.6416672156265	31.015	13.556	83.741	2.877
31.5050636461764	13.4967012203627	82.6416672156265	29.388	13.838	84.576	7.053
31.5050636461764	13.4967012203627	82.6416672156265	33.907	13.296	83.348	9.748
31.5050636461764	13.4967012203627	82.6416672156265	34.135	14.466	84.176	7.813
31.5050636461764	13.4967012203627	82.6416672156265	34.135	14.986	84.727	7.609
31.5050636461764	13.4967012203627	82.6416672156265	32.737	14.433	86.615	4.264
31.5050636461764	13.4967012203627	82.6416672156265	32.412	15.246	88.024	8.256
31.5050636461764	13.4967012203627	82.6416672156265	29.975	12.841	90.667	8.339
31.5050636461764	13.4967012203627	82.6416672156265	31.957	11.541	90.999	8.595
32.7520327288233	14.042251257752	77.9512030658204	32.835	14.173	77.958	0.155
32.8766016450639	13.5582984935614	75.6647519392855	32.087	14.661	75.705	1.421
32.8766016450639	13.5582984935614	75.6647519392855	32.835	12.613	75.794	0.955
33.3819635948228	12.9798451524854	67.1825204841011	34.087	18.918	64.082	9.955
33.3819635948228	12.9798451524854	67.1825204841011	35.484	11.425	66.484	2.932
33.3819635948228	12.9798451524854	67.1825204841011	29.197	13.52	74.598	8.532
33.3819635948228	12.9798451524854	67.1825204841011	31.502	12.126	74.715	9.301
33.3819635948228	12.9798451524854	67.1825204841011	32.182	16.632	75.383	9.605
33.7518469699413	12.5564648962084	60.974224800892	32.672	15.246	60.724	2.909

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
33.7518469699413	12.5564648962084	60.974224800892	33.095	14.011	61.011	2.901
33.8868284913652	12.4000559075421	58.7327124917425	36.944	13.012	57.936	3.218
31.0706272771394	11.3695359580922	53.8516674189831	32.944	10.536	54.126	3.833
27.4017554897002	10.0270020396897	47.4927721941496	28.626	10.091	52.872	7.98
Route: 9 Length: 268.34593513575 Demand Met: 999						
12.5809264020954	16.2483369233981	73.2886287117768	11.862	17.965	73.909	2.45
13.3357165599342	17.2231527613542	77.6855656909959	17.45	21.902	76.475	6.347
14.3534717531393	18.8098765671809	94.4144308952182	12.243	20.505	94.648	2.717
15.531495369181	18.6588812655182	99.854425580534	24.752	19.362	96.308	9.904
15.531495369181	18.6588812655182	99.854425580534	11.608	20.251	101.424	6.345
15.531495369181	18.6588812655182	99.854425580534	17.323	21.331	107.01	8.168
18.7120950357237	18.2511993734621	114.542092574737	25.197	12.441	114.729	9.295
18.7120950357237	18.2511993734621	114.542092574737	11.735	20.378	116.222	7.485
18.7120950357237	18.2511993734621	114.542092574737	20.561	23.553	119.319	7.372
19.9948677536745	18.0232849420288	118.956638211354	19.99	18.029	118.966	0.012
22.1872436039237	16.2349537005285	118.970247638615	22.149	14.282	119.226	1.97
25.2898249843197	18.4947482558933	118.371438669781	20.498	17.457	115.048	7.365
25.2898249843197	18.4947482558933	118.371438669781	27.229	15.362	116.263	4.245
25.290612585259	18.4953478230997	118.371296529267	26.911	24.76	115.286	7.931
25.290612585259	18.4953478230997	118.371296529267	26.276	20.188	119.025	3.614
25.9973532979907	19.0333578542266	118.243763314303	25.133	19.235	120.496	5.738
26.2296890363139	19.2102246158802	118.201837717528	27.102	18.664	121.623	5.391
27.840355847616	20.4363527843163	117.911188797464	27.927	21.458	117.97	1.027
29.1742755832945	19.0512468900832	117.483480793427	33.907	13.816	122.673	8.76
29.3031950947851	18.9173804093793	117.442144091789	29.578	18.791	116.421	1.065
29.4077967478089	18.7754014906284	117.604423121247	28.054	17.013	121.063	8.339
30.4501959070229	17.3605226615054	119.221601208129	28.88	25.331	116.966	8.431
30.4501959070229	17.3605226615054	119.221601208129	31.991	16.632	118.575	2.73
30.4501959070229	17.3605226615054	119.221601208129	30.594	16.251	121.669	2.691
30.8803598576314	16.8015909480666	118.699725010308	34.341	22.029	122.727	7.918
30.8809248451089	16.8008568335186	118.69903956513	33.322	13.621	122.895	7.179
31.3718210464252	16.1630121179731	118.103482566947	33.322	13.101	119.477	6.817
31.3718210464252	16.1630121179731	118.103482566947	34.135	13.946	120.705	7.157
31.8434631403608	15.5501847658891	117.531284934706	31.502	15.473	118.128	5.299
32.2863555007805	14.9747131995577	116.993966737359	32.217	14.433	117.304	0.628
33.0923652902821	14.53912821955	115.797419442094	33.907	12.516	116.73	2.372
33.0928855033388	14.5388803396032	115.796602169858	33.907	14.791	115.865	0.855
31.9875302725679	11.5624178848853	110.158401807746	32.347	11.313	110.138	0.438
30.8236483769303	10.8301564307084	107.879428369864	30.34	9.647	108.046	1.289
30.415170270973	11.3937302441097	106.039869700032	30.721	9.329	106.333	3.502
30.0385434193568	11.9133596392138	104.343750432313	31.177	11.541	103.36	1.55
27.7528443771461	13.323234025037	102.941709915373	28.753	13.838	102.669	1.257
24.0697079301826	15.5950822056925	100.682485605038	29.261	11.425	96.137	8.741
24.0697079301826	15.5950822056925	100.682485605038	18.148	16.505	99.59	6.09
24.0697079301826	15.5950822056925	100.682485605038	16.688	18.092	103.09	8.156
24.0697079301826	15.5950822056925	100.682485605038	30.202	14.011	102.151	8.617
24.0697079301826	15.5950822056925	100.682485605038	29.07	22.347	101.831	8.48
23.3562942335775	14.571784947339	98.6804941140474	22.212	10.091	100.44	4.948
15.6530754309886	9.76581508863958	66.1343445738295	17.323	12.504	65.716	3.533
Route: 10 Length: 249.276373485126 Demand Met: 993						
15.9851590738831	23.5201970699461	63.8743443742689	17.45	24.188	63.322	1.702
17.6464509145088	26.5065363824461	72.8463917926919	17.64	27.49	72.733	0.99
20.3202302903648	25.1675564925867	87.7716543999741	20.561	25.776	90.646	5.596
21.2471945595451	24.7033510445626	92.9460459799427	17.577	25.204	95.05	4.26
23.4245029373441	24.2158448828949	94.9160783427428	28.245	22.855	90.204	6.887
23.4245029373441	24.2158448828949	94.9160783427428	19.545	25.839	93.739	4.367
23.4245029373441	24.2158448828949	94.9160783427428	25.006	24.188	94.535	1.627
23.4245029373441	24.2158448828949	94.9160783427428	27.229	27.554	96.447	5.774
26.7947871898575	22.6658452792086	100.234105080073	25.832	23.68	109.484	9.355
27.6841051091501	22.2568475146507	101.637378394665	27.991	22.601	101.939	0.551
27.329238626918	19.7224858629104	102.092622675859	27.229	19.616	102.004	0.171
27.811411865946	19.5235254374457	102.77241685	24.879	20.632	106.077	4.555
30.9353294352043	18.2630475012786	105.084300497098	31.957	14.433	102.967	4.494
30.9353294352043	18.2630475012786	105.084300497098	31.293	15.806	105.367	3.238
30.9353294352043	18.2630475012786	105.084300497098	29.642	17.076	106.306	3.024
33.0015058901529	18.2075248530888	107.267604364793	32.309	19.553	108.506	9.666
34.6650257039329	18.1628227878038	109.025425590573	34.722	18.219	109.051	0.084
34.245615829027	16.4702153745362	109.604706307605	29.975	13.361	103.951	8.8
34.245615829027	16.4702153745362	109.604706307605	31.372	15.246	104.804	6.866
34.245615829027	16.4702153745362	109.604706307605	34.135	12.126	105.614	8.535
34.245615829027	16.4702153745362	109.604706307605	33.095	12.711	107.498	5.532
34.245615829027	16.4702153745362	109.604706307605	34.595	18.791	106.414	4.79
34.245615829027	16.4702153745362	109.604706307605	35.674	11.044	107.474	6.002
34.245615829027	16.4702153745362	109.604706307605	34.135	13.426	109.486	8.117
34.245615829027	16.4702153745362	109.604706307605	31.015	14.076	113.16	6.371
34.0403773846853	15.6419358554069	109.88817903109	32.932	12.353	108.278	3.826
34.0403773846853	15.6419358554069	109.88817903109	30.975	17.076	111.068	3.584
33.6964048887949	14.0566958657972	110.411278306136	33.452	15.246	111.765	2.23
33.4728937256994	13.026606085966	110.751188569665	30.982	12.126	111.418	5.546
33.4728937256994	13.026606085966	110.751188569665	35.103	10.155	111.634	3.418

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
33.4721181109777	13.0260124371692	110.751403052553	31.632	12.353	111.341	8.922
33.4721181109777	13.0260124371692	110.751403052553	29.975	13.101	114.777	5.333
34.3392287224607	12.0074997662741	108.641816571077	34.722	11.742	108.413	0.519
31.8166734717597	13.2825805810553	108.338910553528	32.477	11.541	107.287	3.772
31.8166734717597	13.2825805810553	108.338910553528	31.047	14.661	110.232	2.465
30.6853046951579	13.1890459476221	106.867683885424	29.388	11.804	105.494	6.15
30.6853046951579	13.1890459476221	106.867683885424	31.275	12.613	107.178	5.931
29.9040524149736	13.1244572357711	105.851747084885	29.578	13.203	105.988	0.362
28.1735907215618	11.6205195686853	96.374588697698	27.419	11.298	96.166	1.537
27.9973320797465	11.4673337550782	95.4092790839051	30.527	11.313	94.769	2.614
26.5722752878879	10.8270716923645	91.2901526058012	30.34	10.917	88.584	4.723
26.5722752878879	10.8270716923645	91.2901526058012	23.482	9.52	92.151	3.464
24.6813932093611	9.89880520792467	76.3499816587696	28.626	11.234	75.345	4.284
Route: 11 Length: 298.655481686034 Demand Met: 996						
22.0339196633772	10.9287478356999	85.5807718277287	29.975	13.621	83.535	8.631
25.1559297401113	12.6713226226249	102.82731033195	28.753	12.949	99.196	9.829
25.1559297401113	12.6713226226249	102.82731033195	27.292	16.632	106.393	9.708
25.4208038185486	12.8191642135021	104.290521031822	26.086	14.663	104.115	1.968
26.0449044549765	12.7095616589345	108.93553023379	26.022	12.631	109.182	1.625
27.5878572085431	12.4385939215352	120.419287762916	27.927	12.568	120.417	0.363
27.4373479276304	12.2261863552556	122.492337030353	32.087	11.313	118.866	9.723
27.4373479276304	12.2261863552556	122.492337030353	27.673	12.695	125.598	3.999
27.1334587075053	11.7973181868767	126.677995468445	24.371	15.235	126.557	7.737
27.1333866713116	11.7972165240367	126.678987675809	33.907	11.996	124.886	7.29
27.1333866713116	11.7972165240367	126.678987675809	26.594	11.933	126.917	0.605
31.4008368478199	9.99033159436597	130.669304110992	30.912	9.901	131.507	0.974
31.9092453048504	9.85367694169869	130.801189263454	35.992	13.647	125.389	9.144
31.9092453048504	9.85367694169869	130.801189263454	34.595	9.202	128.931	3.337
31.9092453048504	9.85367694169869	130.801189263454	32.347	14.661	129.857	7.755
31.9092453048504	9.85367694169869	130.801189263454	30.787	12.386	130.829	7.465
31.9092453048504	9.85367694169869	130.801189263454	34.976	10.282	131.121	4.446
31.9092453048504	9.85367694169869	130.801189263454	32.867	14.661	131.697	8.465
31.9092453048504	9.85367694169869	130.801189263454	35.547	11.234	131.369	6.26
31.2956895617807	9.8926791412223	135.244529573229	26.149	15.679	137.044	9.977
31.2956895617807	9.8926791412223	135.244529573229	29.388	8.313	137.407	3.288
31.2956895617807	9.8926791412223	135.244529573229	29.324	15.489	136.921	9.524
31.2956895617807	9.8926791412223	135.244529573229	29.007	12.949	137.787	8.697
31.2956895617807	9.8926791412223	135.244529573229	31.697	11.541	138.673	4.577
31.2956895617807	9.8926791412223	135.244529573229	33.907	12.776	139.011	9.552
31.2956895617807	9.8926791412223	135.244529573229	34.404	14.028	139.514	9.888
31.2956895617807	9.8926791412223	135.244529573229	34.785	12.504	141.232	9.071
32.9980315100825	11.5962082065698	135.32822727668	34.135	11.866	136.659	1.771
32.8693419729964	13.0215090076046	133.03926885892	34.595	11.996	135.081	4.778
32.712466358659	14.7589992279993	130.248950468064	36.436	18.918	131.64	5.753
32.7122299306689	14.7593163802224	130.248032036644	33.127	14.661	132.624	2.812
32.4761259840885	15.0760340994761	129.330858490594	30.462	15.473	131.052	6.788
32.0796173118039	15.6079259854928	127.790570789885	32.282	15.473	127.6	0.309
31.1134380738044	16.5114826796362	126.844838743418	33.515	18.029	124.645	3.593
31.1134380738044	16.5114826796362	126.844838743418	31.356	16.06	129.885	3.559
29.2774245281163	17.3554359488219	126.103347398117	28.943	16.886	125.854	0.628
28.2895297661436	18.8999103729763	125.904350182441	20.434	15.806	127.618	8.615
27.9787688015464	20.178686990828	125.671767873797	18.593	21.648	126.239	9.517
30.3294077585352	24.2199041788445	124.628735695134	32.245	24.887	125.449	2.188
29.5310393839511	24.8858139790638	123.686527592812	27.229	26.22	125.044	2.987
29.1705187798901	26.5166287505008	114.011953793689	30.277	30.475	112.299	7.266
29.1705187798901	26.5166287505008	114.011953793689	27.927	28.125	119.109	6.761
28.9673910814609	27.435468344206	108.561049055363	28.943	30.475	107.548	3.204
28.907600640721	25.9706162414204	107.168979686501	28.943	30.03	106.391	6.569
28.8705336749892	25.0624948349365	106.305977061709	28.753	23.998	106.929	1.239
28.9158325724298	24.5876292732585	104.42752353582	27.165	25.458	104.784	2.59
29.1109193800784	22.5425210255594	96.3375781644471	29.134	22.537	96.334	0.024
16.3274620256598	18.0655240556992	67.9312952751202	13.005	20.061	68.646	3.941
Route: 12 Length: 351.081273223628 Demand Met: 997						
10.9935593406735	14.7048880938743	124.775591086825	11.481	17.711	124.498	3.058
12.0069534501519	15.2534032743206	138.26914903977	13.576	14.79	138.325	1.637
11.6697015850338	15.5524713416785	141.42327725588	11.163	15.552	141.832	0.651
15.562163033824	15.9256027125558	141.84069069663	17.577	13.647	137.156	6.049
15.562163033824	15.9256027125558	141.84069069663	18.339	12.631	142.199	6.166
19.2815118815226	16.2821395779558	142.239540152864	18.466	18.664	140.644	8.295
25.338734458937	16.8627849804878	142.889094771145	28.372	14.663	135.085	8.657
25.338734458937	16.8627849804878	142.889094771145	24.879	19.934	139.42	4.656
27.0208844435418	17.1104565192456	143.743875626578	27.356	18.473	143.695	1.404
29.9428365185575	15.1335489854366	145.630390086209	29.975	14.661	145.197	0.642
31.4712900435692	14.343121013097	146.862712778427	33.769	15.679	145.826	3.318
31.4712900435692	14.343121013097	146.862712778427	29.975	13.881	149.391	2.974
32.291554721457	14.0605617220781	147.096065903679	31.892	12.353	146.679	3.015
32.291554721457	14.0605617220781	147.096065903679	30.787	14.206	147.62	3.808
34.0513145643718	13.4543713917866	147.596691479916	37.452	10.218	146.804	4.761
33.9590925996559	13.7370895023767	147.784364738087	33.907	13.556	148.567	0.805
33.6221835671816	15.2380363617967	147.540555140698	33.582	15.473	147.748	0.316

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
33.4874885004195	15.2633575530447	145.013090858721	32.944	15.933	144.54	2.412
33.3654403904992	15.2863012587178	142.722938183388	33.322	15.473	140.664	2.231
33.3654403904992	15.2863012587178	142.722938183388	33.907	14.336	141.111	1.948
33.2806295132379	15.4210287808144	142.779798821903	34.341	21.013	142.761	9.585
33.2806295132379	15.4210287808144	142.779798821903	31.991	14.092	145.487	3.28
31.7459755108143	19.1154569933251	143.123235085593	28.245	14.854	144.187	5.84
31.7459755108143	19.1154569933251	143.123235085593	33.515	20.315	142.968	2.143
28.8563791949768	22.0145258322204	143.591010752514	31.356	19.68	141.631	4.172
26.3426418952252	24.5365035142534	143.997941359212	34.468	20.442	147.277	9.777
23.4508957426001	27.4377291988826	144.466065055123	25.07	30.03	143.44	3.224
19.6816404906844	29.2305089950781	145.436570127936	18.529	30.03	146.971	2.079
19.6816653814068	29.2302999929597	145.435592529569	22.149	29.713	141.818	6.925
19.6816653814068	29.2302999929597	145.435592529569	19.037	28.189	146.557	3.611
19.97071582186	26.8032510363459	134.08319269769	25.895	29.903	127.854	9.341
19.97071582186	26.8032510363459	134.08319269769	20.434	18.537	132.408	8.447
19.97071582186	26.8032510363459	134.08319269769	18.974	29.967	133.455	3.376
19.97071582186	26.8032510363459	134.08319269769	18.72	29.967	135.012	7.58
19.97071582186	26.8032510363459	134.08319269769	26.149	27.49	136.669	8.339
21.0924548950754	24.6104916104657	132.254489931174	19.037	26.982	129.54	6.169
22.2916013658489	22.2664170810332	130.299594516948	25.451	17.965	131.595	5.492
21.1120843823113	23.1588834009349	127.362768005478	21.577	21.394	126.294	2.115
20.6758092042711	23.6902435106664	126.593586086458	18.974	24.569	127.812	2.27
19.5870553613006	25.5517912084213	122.78185450077	18.72	28.189	115.769	7.716
19.5870553613006	25.5517912084213	122.78185450077	18.91	22.474	122.979	4.101
19.5870553613006	25.5517912084213	122.78185450077	20.371	23.045	124.747	6.483
18.7868024109508	26.9200608108631	119.980165979242	17.64	27.998	119.961	1.574
22.447693600178	25.0189949637872	113.071375656868	24.308	23.998	113.458	2.157
20.8491132383875	26.040253597444	102.533455553572	22.276	28.125	102.29	2.538
19.7544895448593	25.8182679976623	98.28463294282	18.91	28.697	98.028	3.011

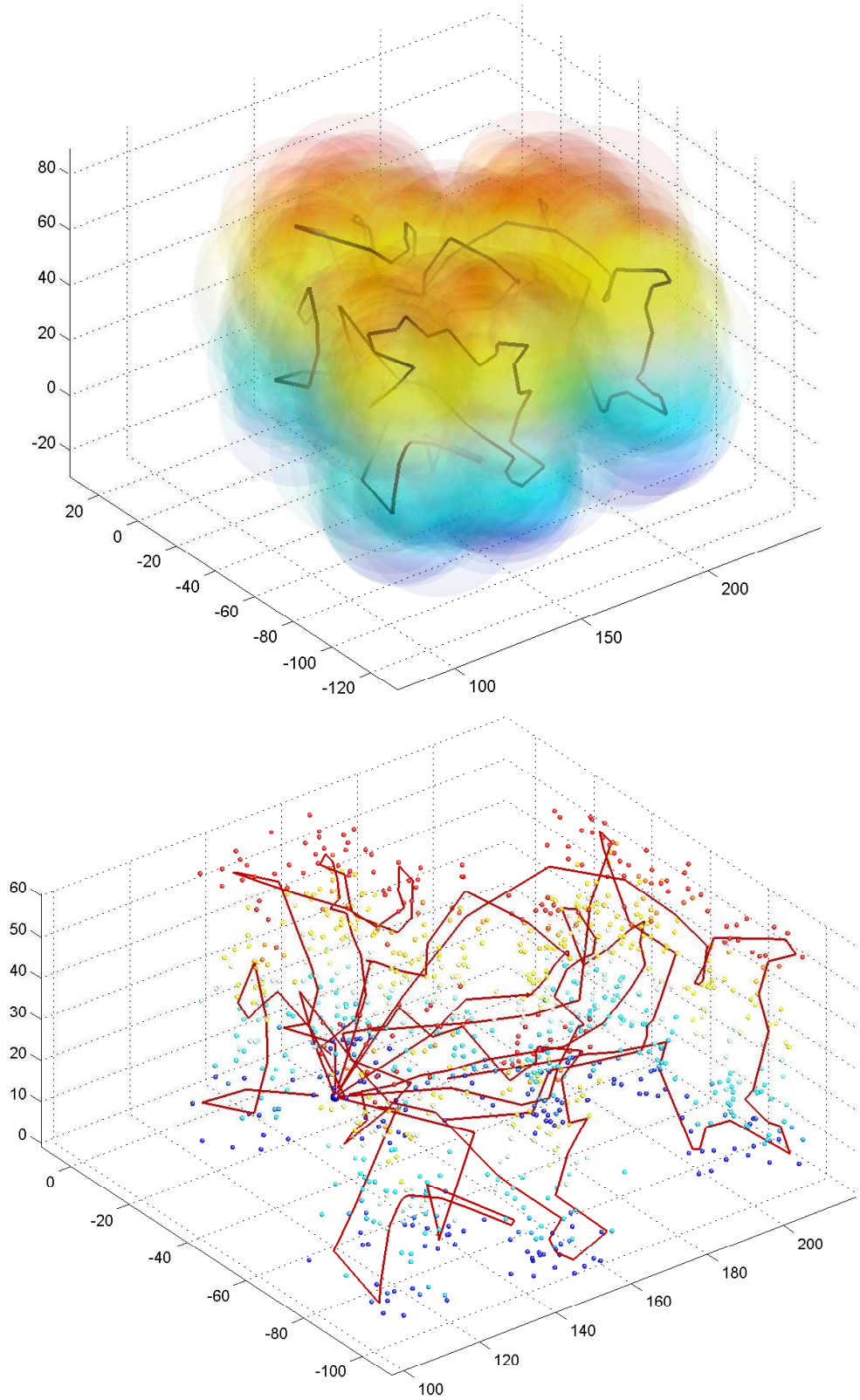


Figure O.104: $dsj1000$, arbitrary radius, 3D, Euclidean, Length = 2216.3550936

Table O-107: Solution for $dsj1000$, arbitrary radius, 3D, Euclidean

Total distance: 2216.35509362291 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 454.326023347315 Demand Met: 9986						
28.4594897562337	29.1438544711378	27.5364155269024	28.099	29.8348	27.0633	0.9117
25.0337825249537	31.1036196654462	35.9240856612697	17.7323	26.9057	35.8248	28.6742
21.5971394780906	33.0696411175677	44.3385314239504	21.3113	31.7798	46.1078	2.2081
19.526293766048	43.0420827794723	42.9427332379054	16.9754	26.2994	50.4148	25.4942
17.5440052409554	52.588064224238	41.6066250429326	26.4833	65.6457	42.68	15.8608
15.1449309939636	64.1411354911294	39.9895930272251	12.0097	66.7734	42.888	5.0159
15.5074760554976	64.4242180589623	39.4182553996723	11.4886	67.7219	43.0579	21.8599
16.4759909170366	65.1804541064531	37.8919652565884	12.73	75.2001	37.6748	18.6111
18.9621447869107	67.1216932176113	33.9740161808664	18.9682	67.082	33.9115	0.0743
20.5359325656626	70.5728932248224	34.1440991102064	24.4797	75.354	37.647	15.2855
23.5335573505089	77.1464610193225	34.4680593467083	24.3218	77.9732	38.2426	3.9436
23.8030338752292	77.8727233078699	33.9435846948294	26.2205	72.9044	33.175	6.2191
24.8518464014586	80.6993628935662	31.9023100322396	33.1881	90.5996	30.8927	12.9818
27.411853864145	87.5988024611174	26.9198390680712	32.8593	93.0881	38.0081	18.3654
28.0216533471778	89.2422645890034	25.7330033243558	26.1674	96.1159	30.3905	22.0166
28.9093777285325	91.6347585180157	24.0052500351166	29.5221	90.7635	22.4343	1.898
29.67431150041	96.2703282445407	22.9026185597689	29.1897	96.4145	23.036	0.5229
30.5959629203492	99.4476341000481	22.0158049853903	28.1717	107.4546	19.2451	16.9459
31.9798038088937	104.218294307788	20.6842724659438	33.1638	109.6815	28.6324	13.4189
33.1040262954161	108.093944682854	19.6025450006974	33.1686	108.6172	19.7963	0.5617
33.733390022888	103.786924219586	13.4844408473123	37.1983	106.347	12.5162	4.5493
33.8790690169208	102.789976787367	12.06828126557	31.6341	101.1443	12.133	2.7843
33.8795600436961	102.78970167216	12.0674547038189	35.2297	94.8683	9.4168	10.0169
35.647742379554	101.799014792062	9.09101443752719	40.2693	101.3043	8.6864	10.0221
37.015900160766	101.032455802988	6.78794878891276	35.7859	98.3251	5.4495	3.261
37.2194846756422	101.126454891431	6.65407490319912	30.1816	102.1772	4.0412	8.5674
38.0901835172638	101.528474175854	6.08151744455952	30.8807	93.5109	0.3364	15.6566
40.1151408899918	102.463438041145	4.74993830668089	33.9629	96.8355	4.449	13.8521
40.3941334972513	102.592254584215	4.56647729449247	47.7789	92.5461	5.4276	17.3786
40.394913035597	102.59261451316	4.56596468243402	40.5226	102.8002	1.3549	3.2203
44.3139532722302	104.123795154814	7.84458027289566	40.9527	105.6227	4.1926	16.0561
44.9684233789818	104.379498535343	8.39210104649694	45.465	105.2608	3.7217	13.9094
46.1363793157675	104.835822270606	9.3691970704395	42.9285	106.2179	5.6354	10.4101
47.2697484336452	105.278632795444	10.317358192394	48.0764	105.8084	10.3389	0.9653
44.0078218911548	102.032524630932	13.5905033215324	42.5793	100.4271	14.8388	3.5498
42.10262933762	100.136571372026	15.502248303467	53.9006	102.5381	21.0284	26.8445
39.5295352524024	97.5759553975431	18.0841920224381	38.2186	96.6747	17.5328	1.6837
40.3729657943421	97.6664150306283	20.7041620985354	40.9431	96.0349	18.7884	13.182
41.3367910482523	97.769787191815	23.6981173555728	42.9226	100.4615	26.2167	4.0129
42.558494023819	97.9008172820532	27.4931245003646	42.9721	90.3177	28.7365	7.6955
43.7603413516055	99.1561970753228	31.2325705814834	45.0704	101.2748	27.009	15.9718
43.8889984116824	99.2905847704637	31.632876170229	36.8108	99.4487	34.5912	12.3219
45.3530484890607	100.819846607594	36.1881448924093	46.0729	100.678	36.5278	0.8085
43.4634529141099	102.099166925602	37.224752152245	34.3074	104.3145	33.9426	24.0514
41.4723042425867	103.44724211726	38.3170701271047	46.5537	103.4177	45.8992	24.5733
39.5166628787735	104.771277641433	39.389909278543	39.3246	101.8921	42.5744	13.7336
37.538916856103	106.110278763674	40.474874761336	31.3011	106.2109	32.3658	16.9428
35.6083177993619	107.417359791739	41.5339760291279	35.3466	107.7036	41.395	0.412
35.8513872575599	106.554183887044	43.2107712629613	32.8361	107.2479	41.504	24.978
36.1275683390786	105.573423684443	45.1159843725127	39.1965	105.4524	44.823	4.0584
36.204700724051	105.299515087155	45.6480759548017	29.8552	101.3038	43.5974	17.7782
36.7512773028406	103.358540197886	49.4185906795981	39.196	99.7694	49.3378	4.3434
36.5032281219179	103.537680158448	50.042475857005	35.4006	103.6799	50.1937	1.122
37.2412591426247	103.688759340458	50.928490433802	26.6904	96.1713	46.6576	25.5008
37.862681414449	103.815968042293	51.6745148899983	26.55	96.735	54.3574	21.6617
38.103240877283	103.86521194407	51.9633092432202	26.9511	99.1097	54.9389	22.0884
38.1038754773128	103.86534185035	51.9640710877982	35.7224	107.36	58.7833	11.5177
41.2106965278397	104.501325944628	55.6938448643307	42.4716	105.6496	56.7244	1.9926
40.7392477374233	103.61974204489	55.5539998591167	44.7902	101.1589	57.6534	13.5802
40.4740180741246	103.123776827212	55.475325262689	43.0828	99.6317	56.4863	26.6664
40.2045097109273	102.619810670021	55.3953814841932	47.126	99.3914	58.8698	14.4896
39.2410858311966	100.818259782242	55.1096028048494	42.0978	97.503	57.9578	9.3352
38.5893808176395	99.5996064248353	54.916288728429	39.6285	91.4521	58.9959	19.1143
38.2812545895823	99.0234269383936	54.8248898041457	31.4281	94.9219	54.3744	25.0918
38.0130216137572	98.5218456887028	54.7453243426214	35.2228	101.4244	59.0123	27.011
37.7298777837771	97.9923819444745	54.6613358987522	30.7482	95.8761	57.2879	28.9897
36.4301211097328	95.5619068216906	54.2757914199895	35.4152	92.5489	58.019	4.9112
36.4298717716448	95.5616797655934	54.2748499976366	33.6244	92.4492	56.3457	13.8672
36.3583984265815	95.4965935794497	54.0049889898284	37.1788	95.0118	52.8478	2.6206
36.3581490886236	95.4963665233429	54.0040475674431	36.1694	94.3523	52.0418	28.0801
36.0775787056303	95.2408690865945	52.9447014987781	35.9551	95.9225	47.402	5.5858
36.0772505207884	95.2405133930612	52.9438264120282	32.4952	97.9758	48.1403	7.8091
36.076922335409	95.2401576995271	52.9429513254801	29.7849	97.5299	53.9895	6.777
36.3561805103351	94.9028187480559	52.4352825760827	44.0393	95.7757	50.8289	16.7138

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
36.6706896740264	94.5228972222084	51.8635303830967	42.8352	101.6931	44.9574	21.2677
38.6838307404784	92.0910582905962	48.2038029307797	42.0156	103.5929	44.0945	23.2765
38.6842472607797	92.0905551415338	48.2030457307668	41.599	92.4813	48.0171	2.9467
37.2910112430494	89.7469735615082	45.4728537640741	42.6808	88.2098	40.1619	26.1251
35.6323424915378	86.9569039052941	42.2225185357894	35.4073	87.2216	40.4202	1.8355
35.4969769983254	86.4222080677961	42.6069642692879	32.1756	91.0244	47.2823	9.1133
35.0054361680371	84.4806140167862	44.0029683097114	40.8939	84.3555	43.1765	20.2802
34.8125401941183	83.7186718683819	44.550803897473	27.1736	83.2653	40.5956	16.1862
34.0704821479268	80.7875308434411	46.6582911535726	31.105	77.2121	42.4385	19.85
33.8535863347754	79.9307889478234	47.2742876559887	29.376	80.5861	55.9809	14.4218
32.7062229234551	75.3986853107069	50.5328652963886	32.2488	71.8762	47.8257	10.0488
32.5423676062009	74.7514542162637	50.9982237627837	32.697	74.6737	51.2201	0.2814
31.0553364934181	73.8669126978435	50.4315848851768	35.1535	70.6086	57.9365	16.7445
29.4607257893368	72.9183788267974	49.823952383724	27.6433	72.5657	51.9251	2.8004
27.0821846883474	71.5035339324659	48.9176002062995	26.4587	69.6793	44.9112	4.4461
25.4787813005927	71.5081319966886	50.7918160464377	24.7401	75.4523	49.5075	27.8452
23.9843457626814	71.5124175732448	52.5386595326827	26.9783	71.0141	56.5271	24.9531
22.3194099891357	71.5171920938075	54.4848005092697	25.3366	76.538	54.326	21.2393
20.5428500405318	71.522286710217	56.5614188224884	24.1578	73.3792	57.4094	11.3579
18.242868694145	71.5288823453464	59.2498636551416	18.2654	71.5277	59.9496	0.7001
14.8761099031752	71.5499183200204	55.7921161485438	15.4332	72.9689	53.8868	2.4401
14.7671569824501	71.4925664301485	55.7812924935943	8.4928	63.9998	55.0759	9.7983
13.5678293251675	70.8612505615612	55.662148293601	15.3124	65.205	52.7286	17.4654
12.1791620689076	70.1302679375139	55.5241946258284	11.4442	66.9869	57.5373	21.9247
10.8247825848926	69.4173341037803	55.3896471922621	10.9416	69.7746	52.0032	20.3266
9.6392568151187	68.7932834287959	55.2718741095148	14.2076	63.0144	54.8035	24.0324
8.11740782838527	67.9921950709961	55.1206898389528	4.4426	63.6871	51.0243	23.1902
6.68223212073038	67.2367307900989	54.9781159072403	4.7342	63.0935	56.3188	4.7706
6.1700261974252	68.7419380518735	54.0538759139347	14.0233	68.3418	48.6515	20.9704
5.88185801619072	69.5887709735307	53.5338964545148	9.3844	71.5303	46.4336	26.9324
4.866566609112	72.5723834619393	51.7018736686974	5.2812	65.5492	44.5709	11.3895
4.82802439511083	72.6856465394797	51.6323269231241	4.0089	72.186	49.5614	2.2824
4.78241907020798	78.2417953277594	52.6559430287942	-4.2807	74.2616	57.1387	26.6495
4.73359083368004	84.1905935532986	53.7518974230276	-2.30370000000001	90.7079	58.2529	19.8948
4.73358276169999	84.1915769708257	53.7520785992147	-1.23350000000001	86.0108	56.7294	9.9154
4.66575689971836	92.454876973962	55.2744364685578	0.580200000000005	93.7511	50.7296	6.2472
4.66585022275555	92.4558282219126	55.2747304381945	1.1743	92.9818	59.2535	22.3694
4.76407043599023	93.456993532109	55.5841262541671	4.95789999999999	99.4405	59.5277	7.1688
4.76411194341695	93.4563452307307	55.5833660025927	-0.0468000000000046	93.7668	57.0052	20.328
4.76415345070262	93.4556969293926	55.5826057509762	-7.5489	96.9207	56.8305	21.6
5.12370754265139	87.8398291309206	48.9969734332613	2.1469	96.6722	44.5395	20.9499
5.12374904997108	87.8391808297064	48.996213181541	-3.26390000000001	94.8889	48.3647	23.5193
5.25805535869092	85.7414534960903	46.5362441253549	-4.1255	85.596	43.5867	25.3799
5.25809686604381	85.7408051949047	46.5354838736121	3.55029999999999	90.3653	48.0124	9.6646
5.38370561396871	83.778924828231	44.2348202320468	3.4538	93.5151	43.6356	19.9908
5.38374712131609	83.7782765268301	44.2340599804874	0.619299999999996	91.0377	37.0534	11.2677
6.14462180440934	77.2663629148061	37.8530639787472	0.309600000000003	68.1954	39.7657	12.3905
6.21176179342253	76.6917481632575	37.2900014671671	9.45780000000001	72.6847	40.961	17.4171
6.44342693015193	74.7090519193382	35.3471659825313	6.09139999999999	73.9114	36.5077	1.8676
6.49992536358511	74.2255124604324	34.8733477555144	8.8648	72.0358	37.3381	5.5515
6.66547597660008	72.8086545658062	33.4849748234153	7.0214	70.8048	31.3366	24.0693
6.82948843437202	71.4049609086812	32.1095014727123	6.67010000000001	63.5082	34.9077	29.6501
7.01013638898223	69.8588930642344	30.5945162735207	8.3117	72.2049	29.6247	15.4861
7.0853322912165	69.2153321373489	29.9638937033366	9.1707	70.0865	21.5855	9.3679
7.34972004869958	66.9525807864127	27.7466334348451	6.9842	66.7632	27.251	0.6443
8.76873305448436	66.4646884973545	28.3579496596577	7.6803	61.1857	24.6436	15.0459
10.4804120435254	65.8761702935038	29.0953475091561	10.7344	66.9849	31.9545	3.0771
12.6044200632579	64.5158635215298	28.5619644231064	10.4334	62.822	33.9682	8.2889
13.4879788937393	63.9499941635703	28.3400842123943	12.0444	66.3239	28.7604	13.9456
14.894030286214	63.0494979182986	27.9869951328519	14.7433	68.1941	29.0053	9.3958
16.1092002470768	62.2712504394352	27.6818404138686	12.5389	66.9051	22.2814	25.9958
17.609271558914	61.3105397596616	27.3051409916566	10.5042	66.7806	23.1982	12.8873
17.610095440503	61.3100121101661	27.3049340976326	11.6475	70.8021	30.9107	20.1612
17.6109193221479	61.3094844607981	27.304727203506	9.9143	75.8382	26.191	21.3192
17.7046807831699	61.2494355578153	27.2811817196695	17.9606	81.6588	21.6946	21.1617
17.7792993433686	61.2016465987864	27.2624434377736	22.0857	71.4539	26.9077	17.4147
17.780123225031	61.2011189493706	27.2622365438382	27.2709	73.9256	16.4296	19.9916
17.780948198022	61.2005906012113	27.2620293758642	23.9369	61.5866	18.0383	22.0202
17.7817720797229	61.2000629517889	27.2618224820991	26.4747	67.9787	32.7219	12.3016
38.1488737953447	33.0937232814825	12.8225099983975	45.4526	36.121	9.3446	8.6374
42.3204685987794	27.3369758505545	9.86504644834067	49.5432	29.0024	13.3417	8.1871
44.6381446332084	19.9277704308666	5.1098714465624	37.4272	33.8061	3.3013	15.7441
Route: 2 Length: 183.376019878437 Demand Met: 9880						
53.7869357577489	24.6885608407273	13.2741215394714	54.5895	27.7676	11.1642	3.8179
55.2570016613508	27.4975857217638	16.2049029352263	43.7884	36.8808	19.8614	16.446
56.2352377677897	29.3668145453993	18.1551530393232	50.3723	32.2399	19.4829	6.6627
57.3887198818402	30.5316643594977	19.4937802034809	66.7818	30.0369	13.8618	10.9633
57.3890640723129	30.5322253189862	19.4945331027908	70.1037	27.3839	19.7642	17.3373
57.3894082628579	30.5327862785159	19.495286002037	67.242	26.9141	23.9429	16.4624
57.389752453417	30.5333472379854	19.4960389013214	56.2795	36.0371	23.7369	11.477

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
57.6924009031749	31.0266017036426	20.1580669525722	50.3352	41.2014	16.9793	12.9522
57.6928136909633	31.0270677951565	20.1588494900744	72.9198	44.5581	6.5665	29.4271
57.6932264786587	31.0275338866926	20.1596320276125	76.5498	52.218	12.9878	29.3359
60.336509722835	34.0121475215953	25.1706051131283	62.5649	23.4331	22.9907	17.3284
60.9717565712348	34.729424571013	26.3748668462985	67.5765	27.7962	32.158	15.1317
61.1659546947862	34.9486997362294	26.7430156535531	58.8785	37.4935	28.0133	17.2077
61.765234864149	35.6253656852969	27.8790939783107	58.5931	27.1316	32.5338	12.8934
62.2765101998341	36.2026626293127	28.8483381763697	60.463	30.4795	30.5011	7.3122
62.6805485903811	36.6588749904995	29.6142891979853	69.5886	28.6002	31.4169	10.8714
62.6809613781237	36.6593410820224	29.6150717355063	62.464	33.4003	33.7046	5.2338
63.7549304560673	38.7308279507887	30.3685579330267	60.9493	37.7343	34.646	9.1697
64.2069539429398	39.6026972963699	30.6856931888815	63.5739	32.9982	33.2424	17.0906
64.6630883547332	40.4824958525584	31.0057126292942	65.4552	32.6167	36.7679	29.012
65.1196848471644	41.3631856770684	31.3260562611325	65.3289	43.5846	33.8262	21.6754
65.5871055517335	42.2647533964122	31.6539940543048	72.9378	43.4347	40.5471	22.409
66.1078811751058	43.2692328431654	32.0193651366675	67.7991	50.1342	31.512	7.0884
66.1822432817179	43.4126635343495	32.0715368630903	61.2083	54.3519	23.523	20.9342
66.3681089557512	43.7711638952432	32.2019384012861	70.6462	49.6735	6.8503	27.2687
66.4709901347596	43.9696025798266	32.2741188298294	75.4748	37.8532	8.3059	28.9661
67.3571316349831	45.6788049397218	32.8958270368772	89.0134	41.3658	15.8043	27.9234
67.3575368858647	45.6796562839665	32.8961601805399	63.8645	34.3723	36.4179	14.5693
67.3579421367519	45.6805076282052	32.8964933242111	66.0257	55.1875	22.0287	16.5761
67.5070109152764	45.9936688070645	33.0190379570106	67.5609	49.631	28.0783	13.5732
67.6846248519705	46.3667971731189	33.1650486420048	67.6648	48.1141	30.5928	12.6345
67.8591169086332	46.7333671455303	33.30849293032	93.3932	53.1876	39.0419	28.8804
68.0531804086393	47.1410524764219	33.4680262708011	88.0225	60.7529	26.1198	27.571
68.2404423047076	47.5344491126539	33.6219682325725	80.7698	50.729	27.0276	24.0359
68.4293995128309	47.931407232043	33.777303855789	68.022	53.7678	15.3935	25.621
68.618933462508	48.3295769599683	33.9331135990812	70.4096	46.4113	26.9931	21.9243
68.8063167517793	48.7232286165792	34.0871553534405	71.8327	48.0379	13.6369	28.84
69.0064182160871	49.1435984012008	34.2516523090732	73.2561	47.9132	17.0605	27.6156
69.2013720613718	49.5531541546767	34.4119175733691	76.0043	50.5809	30.4596	29.1787
69.3678466015537	49.9028810636444	34.5487709199831	70.0624	50.1219	34.6274	0.7325
68.8410760606993	50.1728644222908	34.6622747802983	73.8072	55.2741	29.1095	22.0263
68.3483632559816	50.4253923215145	34.7684401812329	67.4683	58.2291	37.5546	22.4924
67.7808360867815	50.7162644939188	34.8907259205742	66.949	50.6855	34.7495	0.8443
67.9328545870763	50.8221012908222	34.9867929655336	70.2011	52.705	34.7749	12.1835
68.1257798841462	50.9564178078719	35.1087107791962	73.2116	57.797	29.252	20.4365
68.2602528358015	51.0500392187385	35.1936900354914	81.1686	57.7423	31.0101	24.938
68.6477597328868	51.3198253874082	35.4385723521223	68.2826	55.0673	33.7791	4.1147
69.0684393606146	51.3866849181981	35.7851136350456	70.8564	51.5507	32.2844	19.1375
69.4097398157686	51.4409285441656	36.066265109188	69.1689	51.2673	37.9561	13.4858
69.6781751890353	51.4835915636406	36.2873928567433	69.1565	53.343	39.551	16.8114
70.0400685771724	51.5411080691273	36.5855080744218	69.8977	54.8286	42.1718	26.5823
70.0408346754471	51.541229826798	36.5861391596009	72.7013	43.6681	47.6828	23.6645
70.5934160687303	51.6290527933967	37.0413365403691	75.9853	41.4015	43.6031	28.8962
70.5941821670044	51.6291745510663	37.041967625549	72.4429	44.8985	35.9587	21.9495
71.0001005178391	51.6936880398799	37.3763490800383	70.6191	48.182	36.9413	10.2546
71.3092954189196	51.742829059711	37.6310531127636	93.2846	41.9379	42.3812	28.0563
71.5626413050756	51.7830938737388	37.8397506647106	90.014	39.915	40.6629	25.9424
71.8607717804825	51.8304764001138	38.0853402075312	74.8417	48.5823	43.578	11.9548
72.3003937595241	51.900346479673	38.4474855422577	70.5497	45.0925	44.08	13.3393
72.3011598577951	51.9004682373552	38.4481166274389	72.0385	47.603	37.589	19.8624
72.301925956062	51.9005899950414	38.4487477126239	93.0102	50.1223	20.798	27.268
73.0939278715271	52.1210290814767	39.7486289676066	89.3464	46.1786	22.3858	28.4968
73.0944428155412	52.1211724066136	39.7494741247328	92.1801	41.0349	29.4683	29.4376
73.4644198026885	52.2241486587277	40.3567026449551	88.4465	41.4478	32.5802	21.203
73.7839237972447	52.3130766863073	40.8810918488137	87.2346	40.5435	32.6709	24.2659
73.7844387412563	52.3132200114458	40.8819370059408	72.4926	42.7909	40.5929	23.9047
73.7849536852551	52.3133633365509	40.8827821630815	95.1396	47.3596	38.3213	26.132
73.7854686292682	52.3135066616119	40.8836273202209	77.9078	47.2474	41.2613	6.5423
74.199743916477	53.5478690265473	42.7140747048426	78.2967	50.1808	43.2865	11.8299
74.4396725330257	54.262753221087	43.7741830955338	93.3823	48.5086	44.2946	29.5211
74.6798158883166	54.9782772444145	44.8352402937404	74.3979	53.0985	48.6112	4.2274
74.9039903886297	55.6462209404552	45.8257401866255	78.0993	54.3894	50.2798	5.6239
74.1156632064277	56.8842492915543	45.5589611231138	72.0955	52.6394	50.8408	7.0709
73.8228167024634	57.3441500570388	45.4598584690051	73.7963	57.8273	45.2128	0.5433
73.1803856036452	56.3742989992017	46.3095076354333	90.2672	64.2791	51.3539	29.5547
72.5932014164348	55.4878518670542	47.0860898342245	68.5789	56.8701	42.2821	16.6688
72.0004421067144	54.5929882086229	47.8700454279457	70.1179	52.2878	46.5219	5.6226
71.4228738092958	53.7210577789329	48.6339101025827	72.0304	52.5053	58.0692	20.8079
70.8354365301988	52.8342285651776	49.4108270281024	77.4079	49.147	51.5989	24.2468
70.25691290979	51.9608559244921	50.1759551692715	73.2401	49.0047	54.3428	19.489
69.6753273904812	51.0828608643946	50.9451328334898	73.3859	52.8201	55.9097	15.2561
69.0996390870879	50.213768582018	51.7065111178783	69.2681	55.3133	57.276	27.1365
68.9424456873991	49.9764603548476	51.9144077178252	74.4488	50.3129	52.3971	5.5377
68.9290433957182	49.9562274809983	51.9321329595465	69.4154	51.8752	55.6067	4.1739
66.8182664310682	46.3780873887498	53.2965956576143	66.2863	51.2705	54.2569	7.8797
65.9892949747743	44.9728342281091	53.8324649834967	67.4955	46.0347	52.8305	3.4091
65.1132965885093	43.487862107453	54.3987337744106	65.7303	47.3671	58.4265	12.9967

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
64.2380139474149	42.0041033011686	54.9645398892766	66.7168	38.698	48.2341	29.069
63.4114715775592	40.6029678698819	55.498838988733	64.8516	39.5774	48.8657	16.3435
61.7097037353229	37.7181705409975	56.5989072478065	62.0243	36.102	59.234	3.1072
60.769354211765	37.4862578857734	55.4080064901473	61.1452	36.2851	50.8184	29.605
58.4594020278635	36.9165684981458	52.4825795757558	60.137	35.2014	51.7925	3.3879
58.4587894301508	36.9164174169099	52.4818037545763	55.089	27.0379	56.5554	20.8338
57.6797815415357	36.7242954633451	51.4952332727954	55.1607	27.7715	51.8295	18.2237
56.6304721313652	36.4655106979523	50.1663408362887	64.2784	38.8059	47.0778	29.0239
55.2413183187824	36.1229121837394	48.4070542224051	60.8351	33.4935	47.8851	6.3537
54.3765070200039	35.9096290587183	47.3118184565468	47.3356	31.1656	48.6863	22.3253
53.2664292003317	35.6358573512276	45.9059661825353	51.473	33.7115	46.7085	2.7502
52.4730341884284	36.397719259897	42.9152336026649	51.7623	34.8081	42.2217	20.8873
51.7175798094819	37.1231484669213	40.0675196810316	53.589	37.6567	38.7584	4.7875
51.5620181948302	37.2725273598134	39.4811242775987	51.6292	37.4529	39.3047	0.2611
50.9504468251387	36.5152797146746	39.5348345315974	48.325	36.101	31.2943	13.1633
50.4300533663358	35.8709285553883	39.5805372347399	50.1654	34.298	41.7388	3.7703
49.7101776845687	34.9795785159033	39.6437591374127	44.7872	36.1398	42.3342	5.7289
49.8437913197275	33.2618649309265	39.0459697807198	48.6326	32.1618	43.4727	29.9479
49.9273278185619	32.1879342732374	38.6722262636435	46.003	37.4534	46.4333	29.0578
49.9520234305858	31.8704517959284	38.5617377359251	45.9581	33.5048	45.1742	9.009
50.0576970517005	30.5119301620966	38.0889524130597	47.9603	31.0225	36.0363	3.9403
50.0577703183833	30.5109882588379	38.088624617018	51.0819	30.8837	36.7669	1.7131
49.9603432294825	27.8882413778157	37.5913205604784	47.9812	30.2306	39.2099	11.8841
49.9214482553028	26.8411848253206	37.3927861632634	55.4854	26.8201	32.387	10.8698
49.8854284541074	25.8715282130454	37.208927716493	59.5552	26.5288	41.5263	17.0515
49.745343944239	22.1004393703192	36.4938843407949	39.7266	17.3977	50.5452	17.8866
49.7454557083942	22.0995271110798	36.4934902699208	40.2323	12.6508	42.5989	15.4062
49.7455674725639	22.0986148518448	36.4930961990408	43.7175	13.3612	37.2361	11.2776
50.1397769324272	18.8809357811546	35.1031474595631	40.2335	17.1357	30.0024	11.2782
50.1929478809507	18.7912750029148	35.082536624197	44.7075	13.3055	33.9605	12.6011
50.1934482702149	18.7904312095988	35.0823426566119	47.5448	13.9665	39.1563	6.8471
52.1816672850646	17.5733652974481	33.6111509864286	52.4859	17.4578	33.7507	0.3541
51.8957539424798	17.4734907619998	32.4041720148037	51.539	18.7116	33.0294	3.3237
51.8955241816056	17.4734105025043	32.4032020826648	55.5686	2.3786	41.1094	17.8085
51.1688505999571	17.2195707005059	29.3355602426324	44.0031	6.0986	31.1209	17.8329
50.086722284064	16.8415643388142	24.7673714682596	49.9475	19.2284	25.6639	17.8419
49.8381840981432	16.7547456000196	23.7181711719778	51.6732	17.1776	23.9169	3.9198
49.0101991709408	16.4655159722174	20.2228449759643	49.9971	19.9155	18.5508	3.9588
44.9555910385057	10.2012698872902	12.2210175508248	44.5689	9.75	12.1988	0.5947
46.5489856383552	11.6499765109764	10.230105047985	47.1015	12.1757	10.5923	0.8443
Route: 3 Length: 248.254890353507 Demand Met: 9773						
48.6943998879727	14.5912641129305	0.904322666798672	46.7677	27.4481	8.8301	29.3514
50.2336404196062	17.1722612016521	1.79336284298614	50.8592	31.2824	4.4654	23.4486
51.7576645674694	19.7277434852658	2.67361427994285	53.915	28.4629	8.3577	20.5718
53.0460400505111	21.888090305048	3.41775890801607	54.8257	29.6059	7.5612	17.9639
57.8439855261566	29.9332807696786	6.18897381187158	64.2717	31.7627	18.8904	14.3523
57.8444766877839	29.9341043485367	6.18925749853055	61.5106	34.0654	15.2705	10.912
58.3507410773815	30.7830080047456	6.48166753202659	57.9508	29.6187	7.6435	14.7612
60.4479242932839	34.2995630156755	7.69296640508216	55.9275	34.3566	30.6301	23.3784
61.2693307882402	35.5001544271435	7.5761321742019	66.5887	34.1226	10.8677	18.4197
62.9874554621521	38.011414980113	7.33175176619741	62.6603	37.129	7.3175	12.7997
64.6970935331295	40.510271266871	7.08857851633934	67.8488	53.6384	2.957	21.5605
66.3721826547709	42.9586298581507	6.8503194061006	73.911	51.0144	2.5794	19.7234
69.2275899542238	47.1321754907005	6.4441757383123	68.7356	47.889	4.3235	2.3048
69.2300207727307	47.1346707762109	6.44539983462141	70.5527	57.3223	8.5137	18.2025
69.2306791048192	47.1353465677373	6.44573135336049	71.0505	50.768	8.8572	14.6692
69.756238272816	47.6748439395474	6.7103891419604	73.5268	49.2611	4.4383	16.8647
70.3795667451022	48.3147035288966	7.02428098345404	73.6611	50.4924	3.9757	19.7557
71.0054814356827	48.957217929148	7.33947517835991	72.1444	51.2772	8.2689	22.7706
71.6243008601944	49.5924488915844	7.65109638370368	80.8872	43.1227	9.5119	14.1296
72.3652761320395	50.3530753544257	8.02423205955701	82.0477	53.0979	5.7932	18.2605
73.3029614192532	51.3156287230375	8.49642573298852	76.2244	51.9684	6.7104	3.4858
73.2247907162225	51.5112949040516	8.84011055865054	77.6289	48.4559	5.3003	16.6228
73.2245968076282	51.5117802694492	8.840963095974	79.9479	46.2913	1.0177	20.0233
72.8831281825528	52.3664977021857	10.34226194741	80.8076	41.6004	10.0065	22.8911
72.4605320885909	53.424282279466	12.2002453179935	77.5882	39.4219	14.211	18.0454
72.4106293522594	53.5491919642682	12.4196473772092	70.7664	48.6137	12.8047	19.7705
72.2904222298878	53.8500779419292	12.9481492632538	72.0723	49.2863	13.9841	10.8405
72.2193248094867	54.0280392570524	13.2607357424139	71.8965	50.0142	14.8598	19.3441
72.1333797163319	54.2431652237444	13.6386014040756	73.2283	44.0709	14.6285	10.2788
71.697218971845	55.3349029792363	15.5562230281566	75.9022	40.5634	8.2476	19.0711
70.9831825937233	57.1221809106904	18.695550942253	70.694	53.8562	23.1583	5.7549
70.5917811447224	58.1018833379726	20.4163841266817	70.1344	58.5671	20.707	0.7142
73.0667070391968	56.4601747152288	21.0602048606712	71.2619	53.5794	21.4252	11.3066
75.5173488460439	54.8345746107821	21.6977084002288	75.5587	49.1352	25.3998	7.8556
77.9438252905671	53.225004273078	22.3289256196337	75.5201	48.6107	22.753	10.8007
80.90654037435	51.2597272871016	23.0996385549488	80.3964	49.7264	23.6683	1.7131
82.6190099154165	51.2890325503803	23.108476142708	83.5076	51.7826	22.7284	1.0852
81.9118573963547	49.8108591902502	24.2837311367574	91.9756	47.4725	20.0446	19.7423
81.3591066729647	48.6554346223137	25.2023774402637	93.6083	38.4774	26.0941	16.8124

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
80.3705615885354	46.589061431883	26.8452939450739	76.379	48.6237	27.9163	7.5959
79.5846569548175	44.9462711447397	28.1514313331407	74.5598	39.2546	26.0148	7.8873
80.7709525489107	45.3107368675332	30.790191851323	77.9223	44.6051	30.7678	3.0325
82.2741725673164	45.7725713214469	34.1339095856046	81.9079	40.1742	36.8216	6.2209
83.3022964718512	47.1450889941432	35.7462251056003	79.533	47.2684	42.1428	8.9398
84.3076875921172	48.487259014438	37.3228908153572	76.4125	46.981	46.4216	12.1404
84.8090177533044	48.9738132370083	37.6746407429463	80.0004	48.0282	43.1849	9.8035
85.9242199846345	50.0561465909186	38.4571037477581	85.9154	51.5363	38.6114	1.4882
86.3205407255641	49.6323114465636	38.6480212455134	90.3356	51.1932	37.7625	6.8103
86.915021708005	48.9965588678098	38.9343974304358	95.0304	53.2116	46.2852	22.3786
87.4804441286811	48.391882229442	39.2067753874821	99.5817	52.1789	51.8005	22.5087
88.0610053283725	47.7710158076117	39.4864460696069	96.5473	37.5774	41.1201	13.5522
88.6611977250463	47.1291553030277	39.7755735859953	94.4684	44.7163	40.2539	7.0613
88.9212728304739	46.8510245938265	39.9008581951719	89.352	47.1855	40.3099	0.6817
89.5993597670966	44.8708910223062	39.909389215373	90.4865	46.0315	39.3528	3.9724
90.1484033656578	43.2675867752967	39.9162967408978	90.4784	41.2284	44.1276	19.2596
90.6544105673356	41.789956408147	39.9226628247762	92.2396	41.0703	39.2658	23.428
91.2717340913798	39.9872627257064	39.9304293797294	91.8795	37.1845	41.8015	3.6728
93.0222244406755	34.8755218372777	39.9524523221131	101.1976	33.4905	53.5496	15.926
93.022289629464	34.8746196212331	39.9520259928617	98.5859	34.5756	44.3792	9.3554
93.0223548182521	34.8737174051896	39.9515996636078	95.0864	33.2234	41.4865	27.2565
93.1417242882107	33.2216379289306	39.1709331921977	88.2545	36.066	42.1212	15.726
93.2709006711584	31.4338302772572	38.3261303167522	92.7124	33.4453	33.5856	14.4155
93.4181635963869	29.3957039612973	37.3630429482697	92.942	26.4511	38.6789	3.2602
93.5505238315937	29.5236056594206	36.8670237302969	97.1838	29.5842	37.1942	15.6415
94.1629194107307	30.1153727697311	34.5720748311778	97.3283	27.0933	33.194	16.7318
94.7014139128653	30.635728143067	32.5540697941275	106.8535	30.7643	14.4546	22.1596
94.7016640890005	30.6359698920696	32.5531322604902	102.4997	24.4075	19.7902	22.2451
94.736994778655	30.6701104793716	32.42073069979	105.0575	26.2706	17.0665	21.5332
95.0901776342862	31.0113963945204	31.0971800121302	97.5011	28.0267	29.587	4.1233
94.9726809115926	31.7069198635594	30.391936488818	93.9312	28.9768	31.8553	14.5805
94.792032893015	32.7762683689855	29.3076436723299	90.6435	28.0536	25.8632	9.6928
94.720445436682	33.200031331492	28.8779585575301	98.9301	33.2654	27.8083	6.2044
94.6412308053364	33.6689434662423	28.4024933034164	100.6297	27.3107	24.1251	20.9684
94.554850552259	34.1802725991372	27.8840182722368	97.0499	25.7334	20.6225	22.9168
94.4756920402185	34.6488525361222	27.4088898336307	96.2133	40.5576	25.5914	17.1844
94.446414630548	34.8221605717968	27.233159820542	96.156	30.1327	19.1399	15.6026
94.2832384272596	35.7880844268449	26.2537370286788	91.9372	36.8319	23.3371	3.8859
96.4228292086966	36.4885302455687	27.4772879686623	87.5583	39.2312	23.679	14.1099
96.8697480650922	36.6348397396796	27.7328639374103	87.8413	47.1867	25.6907	18.3729
97.6412354997518	36.8874044596817	28.1740483839737	97.0063	39.6578	31.3742	6.2182
98.4035291227471	37.1369593694233	28.609975238965	96.6051	36.0943	31.9245	18.2734
98.9217514416407	37.3066117426131	28.9063269567214	93.6941	39.0671	28.969	9.1173
99.0818254957356	37.3590157841637	28.9978672464589	96.8865	41.9997	31.9305	5.9999
99.0826605124359	37.3592891467061	28.9983447608887	98.4033	39.6451	29.8224	2.523
105.618492340749	37.0042285493576	31.5299077867447	108.656	34.8419	30.8419	3.7915
105.210108225058	38.511888535081	32.7584535579617	98.7317	39.6579	27.3708	13.6077
103.583262539333	44.5178276703241	37.6525087121822	105.6501	47.8555	48.2801	11.3295
103.582777580301	44.5181350534188	37.6516899751245	103.8959	45.4099	37.4639	16.5891
102.922049271466	44.9369265555189	36.5362086552281	103.3956	43.6231	38.3961	9.5596
101.411704369674	45.8942332136404	33.9863534401363	99.7789	45.6905	34.3678	1.6891
101.372882716828	47.7301530574741	29.3319913034234	101.7941	49.0832	29.2585	1.419
100.860527571326	46.9115492893448	27.4548227775402	93.9129	43.6355	26.629	15.3805
100.860284865659	46.9111615118907	27.4539335516941	95.0864	47.4256	26.3676	15.4813
100.298167145075	46.0130507221196	25.3944447349373	95.46	44.379	21.4845	10.525
99.9349139589888	45.4326712146553	24.0635564762804	98.3613	42.0392	20.5386	22.2209
99.934671253322	45.4322834372018	24.062667250434	99.6903	41.4772	23.4888	20.1453
99.7026195280773	45.0615280764742	23.2124753499305	100.6036	46.802	22.0951	2.256
99.03817311429	43.9716668130568	21.1929295631986	101.377	48.1816	18.5975	20.458
98.4852839852348	43.0647878951304	19.5124555798776	104.1102	44.8822	12.643	24.3902
98.1340338131383	42.4886481970119	18.4448513456613	102.543	45.6081	13.7083	21.8293
97.6776058077929	41.7399900781865	17.0575652755073	94.3087	39.6383	18.4042	5.7437
97.2798763126464	41.0876124587432	15.8486898744052	98.0879	44.5657	15.6818	26.354
96.8225756136964	40.3375229004597	14.4587513045515	92.8093	39.7693	16.6418	4.7222
96.4454496425897	39.7189403053822	13.3124991033024	97.0806	39.3994	12.7921	0.8811
94.6315905575574	39.490202333197	12.743951817235	94.1971	38.0204	14.8005	3.1512
92.937636060828	39.2765850133917	12.2129881714474	97.9141	29.0493	9.3885	23.1555
91.2542610787875	39.0643018311263	11.6853406346045	93.4265	31.4744	1.0443	21.1215
89.6098687742725	38.8569345872057	11.1699120713684	89.1249	38.0318	13.3915	15.9201
87.922560626214	38.6441554111484	10.6410316990337	89.3668	41.343	14.5671	15.2017
87.0194787451595	38.5302716380309	10.3579640908949	85.9182	41.843	9.5066	3.5933
84.7494811816141	36.8674169494975	9.84831735886633	87.5726	32.8781	1.3636	19.8465
83.0635616372252	35.6324203743924	9.46980444848256	90.6179	26.4649	2.7134	21.9514
81.381657573774	34.4003652850824	9.09219307069426	92.634	40.1716	1.8791	17.8594
79.7327923973175	33.1925123633095	8.72199939197274	85.1876	33.113	2.1197	12.2337
78.5017433832126	32.290724777027	8.44561138245181	86.512	33.4131	7.017	8.2137
73.7270231849437	28.7930708663965	7.37361880284669	73.7989	28.6287	7.3132	0.1893
71.8015289533513	28.5419951305215	7.3503092069449	69.1853	30.9522	12.1629	13.139
69.6789584844043	28.2652215514225	7.32461384831991	67.4673	33.2544	9.192	16.5328
67.7083021733148	28.0082568954643	7.30075752307029	68.2062	28.5319	10.0866	2.9167

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
66.0115765214995	27.7870115506874	7.28021734219068	67.6588	29.7348	5.9837	2.8615
64.5297816157544	27.5937922026992	7.26227906359985	63.2951	31.2899	8.2512	4.0204
59.6696911057476	25.0226122118033	6.69919528185813	50.5738	30.8854	25.5173	21.7078
55.1817833693851	21.7389229492088	4.48631110395724	42.8212	36.4305	1.5446	19.4237
50.5892332263909	16.1655175973154	1.92783657092838	47.5893	27.8934	1.3329	19.7112
Route: 4 Length: 363.847642356503 Demand Met: 9790						
55.0539180788922	19.1400163044084	18.9476133786311	53.2794	21.4994	19.0176	2.9791
57.6460112628736	21.4864473785644	25.1447903957439	55.9782	19.9329	26.5423	2.6736
64.522677490488	27.7313977594933	39.1253447101274	63.453	34.6286	41.047	7.4277
66.9943989013094	29.9760578083519	44.1504587845897	68.3676	27.331	45.292	4.5622
67.3553886089102	30.3038856827761	44.8843661062073	54.7376	29.7596	56.3053	17.0277
70.7243681624653	31.9995540793872	47.1010759045088	67.8857	28.9512	53.8343	7.9175
81.146325429767	37.2758345659728	53.7953298195194	70.5469	25.0661	53.9959	16.1699
83.3221689641334	38.377389697971	55.1929224390833	85.065	35.2948	58.2863	4.702
91.265628078977	51.7911402160426	55.6192978136626	94.8477	58.3247	47.7413	10.8435
91.2661375184226	51.7919999832997	55.6193334747725	77.8264	55.5164	53.7679	14.0686
91.2666686688618	51.7928463670964	55.6193723808097	96.2485	47.1277	52.4491	17.9146
91.267199819315	51.7936927508857	55.6194112868166	102.6402	60.9181	59.3218	29.8857
91.2677309697757	51.7945391346707	55.6194501928128	91.1842	48.1207	54.4953	17.5671
91.3859414609748	51.9829065549493	55.6281089350898	97.7133	51.9341	48.5236	11.5332
91.9805186059752	52.9303601990094	55.671660810172	92.1982	53.9806	59.5699	4.0431
92.2581278382593	53.3175246988375	55.3872948702497	77.9705	58.8491	56.0075	15.3336
94.3390792511468	56.2196999143472	53.2556951906286	94.6583	60.3511	50.0221	8.4724
94.6663008966976	56.6760558025082	52.9205092745907	99.4285	63.8276	59.6975	13.2796
97.320862863788	60.3782101598422	50.2013378867394	103.9916	60.6173	50.4601	27.4308
98.3205906803974	61.7724691943821	49.1772775843397	100.6854	61.817	51.0639	3.0255
98.3409928087601	61.8105526527161	49.1436250317244	96.4356	62.0951	55.4366	20.9554
98.7971954111967	62.6621194105767	48.3911357698899	94.6788	63.8911	59.4837	17.5158
99.1118563307865	63.2494785177456	47.8721142592297	85.8477	60.7859	54.7762	18.5843
99.4833968027946	63.9430112513482	47.2592721632425	86.2321	62.729	51.1705	16.3953
99.6147417798976	64.1881851697196	47.0426235577666	92.1151	81.2598	42.8198	24.5532
100.140849186841	65.1702387808878	46.1748292075796	94.0795	80.8773	41.7611	27.9293
100.260294954386	65.3932011455943	45.9778079018231	97.816	74.8015	47.4482	15.0437
101.820432164873	68.305417258499	43.4044201335205	95.1558	61.2395	57.4763	27.409
101.857531536084	68.3746684684068	43.3432261123753	102.9023	68.4164	43.143	1.0646
98.208303013666	72.1998840419214	40.8735053417614	103.1106	83.2736	35.5168	15.1682
98.2075394351987	72.2006844442422	40.8729885680699	100.5649	91.4192	35.2273	20.5542
96.2070144706213	74.2976864432335	39.5190754562146	101.2985	78.2917	28.1682	13.0659
96.2061362697108	74.2981436760202	39.5192158176747	94.549	73.3405	36.7472	4.2829
94.3475811716561	75.265795070438	39.8162657392652	93.1133	78.1389	33.5399	7.0122
92.7832180853163	75.8119019727587	40.8452118321238	91.0116	75.887	40.3125	1.8515
93.4074071413354	76.1713473736325	42.2388365261856	94.4072	76.9857	34.4342	17.5737
94.072760924705	76.5544979105704	43.7243695940006	88.0687	81.4777	36.1559	18.8265
94.5639075056426	76.8373294555792	44.820950813873	92.6699	80.64	42.9825	12.8577
94.5643053929636	76.8375585828755	44.8218391754896	94.6945	78.572	44.5388	1.7622
97.0627264721309	76.8913233840861	50.8788798143283	97.9014	66.9835	57.8832	12.1626
98.5454850918841	81.3004549724652	52.2813967401126	96.1169	76.0362	57.1147	25.7488
98.791923545817	82.0332642947854	52.514498778037	99.1261	78.6323	53.6332	23.8719
99.2255106094661	83.3225789179728	52.9246216065424	97.4314	81.946	52.8698	7.1176
99.7012525964115	84.737245524303	53.3746181116104	96.2521	73.5638	59.9232	18.6663
100.191898869451	86.1962314374954	53.8387123429438	98.3726	88.4744	52.1576	13.4661
100.506371889037	87.1313485161053	54.1361671754807	94.9909	83.4209	53.4521	6.6825
101.173622769764	89.1154858683335	54.7673087081413	95.9325	86.7596	55.1395	20.5114
101.67402875523	90.603493257817	55.2406345205528	104.5599	87.8351	55.8078	14.6615
102.172198902909	92.0848523849489	55.7118454819617	101.0606	82.9382	56.7378	16.7992
102.68203539097	93.6009021642146	56.1940913351935	96.9343	84.943	57.6208	15.8069
102.839445161514	94.0689757950996	56.3429826073151	103.2876	94.1817	57.6589	1.3947
102.921626713526	97.504659377998	54.0871865677036	103.8628	98.4843	53.5771	1.4511
96.6212259322468	96.1916884858688	54.0398950689128	94.0924	96.5838	56.3482	3.4463
96.6594474699984	95.7853227065638	52.9910460521366	98.656	92.6213	53.0887	22.9191
96.7346037198657	94.9862726473382	50.9286605918953	100.6204	94.7646	50.8195	15.4911
96.8013099184878	94.2770621336951	49.0981551920402	98.9319	91.3958	49.6094	11.9055
96.8362077304731	93.9060336825121	48.1405134214926	96.5235	92.1962	47.4754	1.8611
96.9732487041496	92.4490346429493	44.3799309680567	97.0347	92.0258	44.3343	0.4301
96.9064996981287	92.8214347205442	43.8068909906632	98.2349	98.4363	43.0129	21.6189
96.8700297562165	93.0249047266348	43.493796737569	96.8345	90.0197	42.1774	11.1201
96.8699325490381	93.0254470565646	43.492962214345	91.1677	84.1211	45.979	16.3324
96.8191258303966	93.3089035554464	43.0567864174501	97.0865	83.6094	41.2641	9.8674
96.6409358834447	94.3030454184984	41.5270260741417	104.3617	84.8664	42.6246	23.8168
96.309508497091	96.1521164471492	38.6817223538639	101.602	92.3175	35.5214	24.3611
96.185914951341	96.8416588543296	37.6206719343087	94.4828	106.1237	38.6118	9.4889
96.2853490577414	96.3180321437701	36.2636418542163	98.8373	99.4165	35.0062	17.0801
96.5274472595871	95.0431266299713	32.9595989320109	98.853	91.6792	31.3431	14.5242
96.6101490416138	94.6076134564996	31.8309237401132	99.3434	90.9979	30.2293	16.5588
96.6315144723478	94.4951016460681	31.5393383263866	96.2545	87.1498	32.8659	21.7369
96.8701530002298	93.238415035667	28.2825114757216	93.4941	85.8189	27.3685	18.0194
97.0305175482028	92.393924467207	26.0939311873715	92.5654	91.5305	24.0262	28.4592
97.0724969503427	92.1728581160308	25.5210159827113	88.6062	92.2681	23.9863	22.8388
97.1242020503502	91.9005755794722	24.8153690749208	95.6122	103.8055	23.229	14.657
97.1505703109581	91.7617185018862	24.4555072903887	104.3693	90.8389	25.0156	29.9766

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
97.1506385125043	91.7613593478658	24.454576507418	101.583	94.8217	23.7006	5.6707
97.1507067140546	91.7610001938413	24.4536457244489	99.3782	93.0601	2.9898	23.8531
97.5065165614508	89.887281436146	19.5977193274445	98.1138	89.594	19.2781	0.7463
96.8580053250452	89.9655595118363	19.2946144503969	102.2936	85.0217	15.0829	21.6835
96.1944333973014	90.0456554941775	18.9844703887228	97.8831	81.9659	16.6355	26.0286
95.4425979196008	90.1364052366524	18.6330731407034	93.1284	88.6615	20.1351	29.2956
95.0316517658393	90.1860082130972	18.4410027322796	92.7178	89.1801	18.823	2.5518
95.5473220693826	91.0743891323327	17.5995426503772	92.4623	94.734	14.7003	13.3072
96.0954572781583	92.0186994148812	16.705107038447	102.4507	89.6037	15.6617	13.3753
96.1341079675441	92.0852856262616	16.6420376427556	102.0461	86.7072	16.2393	14.3206
96.288447382309	92.3511768165527	16.3901897582513	97.1852	78.7831	16.5303	16.1734
97.6296176814876	94.6617034597925	14.2016959769762	95.7576	96.9635	11.4638	15.3189
97.7051772763425	94.791875199331	14.0783993971076	95.0373	98.5247	13.5608	4.6173
99.5076397121734	94.8833776488465	12.8996803435469	95.504	96.351	10.2996	27.717
100.76662384715	94.9472902686486	12.0763685035344	101.8123	94.891	12.8509	1.3025
101.120560346921	95.0374865912905	10.8818457166741	105.6506	92.4297	8.9472	20.7058
101.264705491077	95.0742201652753	10.3953612963744	104.1034	98.3317	9.2012	13.8815
101.264988840703	95.0742923733724	10.3944050019742	102.0076	93.075	9.5996	14.2567
101.766547203719	95.2021082708819	8.70166399038654	108.1531	76.0691	2.761	21.0274
102.315467879826	95.3419938874571	6.84907666436041	107.2392	85.9448	2.4326	25.7344
102.874236285902	95.4843890423358	4.96325384329907	104.1728	96.9352	2.733	2.9606
101.872496518911	93.8642666125285	5.72095379187994	100.8882	91.1406	6.6906	9.708
101.303518855613	92.9440541699725	6.15131940601023	101.1477	85.2681	2.6541	21.9848
100.976487314229	92.4151432152006	6.39868094483154	100.0565	80.1054	0.0522	29.4827
99.9078018286149	90.6867490510619	7.20701753754287	99.0152	86.155	1.7016	11.2918
99.5464695358128	90.1023631483031	7.48032355060394	103.6911	80.62	5.0557	12.7759
99.0570578859071	89.3108335069731	7.8505066634703	107.981	80.0957	12.6444	26.4329
98.5654526144459	88.5157560910113	8.22234903790051	95.2026	90.5293	12.2607	13.6073
98.0580082018311	87.6950617851158	8.60617194274608	93.9684	87.8762	13.7783	12.1102
97.5559297680627	86.8830460223359	8.98593603869714	103.8313	82.5056	7.2236	18.7916
97.0582031841061	86.078068579213	9.36240849701309	98.9119	80.0767	11.0692	14.6996
96.5528122914462	85.2606955565773	9.74467811759199	97.3132	81.5365	12.7479	6.4549
95.8484248829996	84.1214836940705	10.2774654926594	96.8706	83.0827	11.4782	1.8883
94.336679787107	83.5600652703449	10.039809579969	96.9541	82.6989	20.5312	14.592
93.3648614374666	83.1991600432535	9.88703355991897	92.288	83.6157	17.9977	16.0638
92.7890724051206	82.9853285924005	9.7965158919924	98.5933	78.8152	8.2256	8.4088
92.0786306192662	82.721491069155	9.68482991735075	91.14	83.5499	11.0268	11.1932
90.8458859127057	82.2636853132435	9.4910346497234	88.6759	82.3658	11.13	2.7213
91.0492124158766	81.3903416560144	7.45377329747661	100.7126	88.5952	23.1233	21.6123
91.3462658374039	80.1144147213506	4.47740030360307	88.3633	87.3681	2.2205	27.6489
91.3463571843198	80.1140223610518	4.47648503908558	93.0994	86.3608	2.8092	27.9466
91.5045124898494	79.4347015986306	2.89182364514885	93.2494	81.8793	2.8544	4.3234
91.5046038367495	79.4343092383254	2.89090838063265	86.3374	85.7586	1.5055	11.3801
91.5257735219212	79.343379532026	2.67879536479353	91.86	79.7087	2.2114	0.6809
90.8603349048635	77.7132316714702	2.16490142198016	89.835	77.746	1.5427	1.1998
91.9556868528697	75.0410944553416	2.65379319728393	93.9524	73.145	3.1932	21.3513
92.8981003340484	72.7420544379849	3.07442348884428	94.6798	69.1984	4.5089	14.7127
93.8276951118608	70.4742857238285	3.48933240391667	93.0933	68.7697	14.1811	21.8016
94.8670645556825	67.9387192353538	3.95323732207875	92.0851	66.8651	17.5763	14.1856
95.7333108121867	65.8254909027866	4.33987167552282	95.9041	59.3009	4.8034	16.7412
96.6669015227509	63.547974084776	4.756564097553	98.8606	57.9963	4.7298	15.8873
97.6123634752507	61.2414971290044	5.17855501834435	93.2379	56.4517	4.9219	7.5848
98.5597489912962	58.9303276277898	5.60140447825783	96.8097	54.0588	2.5941	13.9289
99.515043648981	56.5998635521233	6.02778410770455	98.9521	56.5952	10.596	9.6017
100.441471973496	54.3398195329687	6.44127967747321	100.6388	53.8259	6.8403	11.1764
101.01482477961	52.9411117591104	6.69718599142026	100.3439	52.2486	6.1962	1.0866
105.97068374964	49.0169999065302	9.61566904935623	106.4442	49.0895	9.9061	0.5602
99.293041969259	39.81942299847	5.30837282490426	96.6284	43.246	1.131	6.0243
98.829794664455	39.0534886034447	5.0538629475667	95.8598	39.2349	3.852	9.5298
95.7740737979403	34.0011515911083	3.375037731919	96.3928	32.1668	2.4627	2.1401
91.1203354522974	35.7763369876294	4.96845437727697	91.1655	36.0648	5.0962	0.3187
82.9744779790398	34.0272349255536	5.48245052224395	79.7169	32.9378	5.3155	5.5373
73.400693621324	31.9715242687667	6.08654756205538	72.2401	34.2889	7.5435	2.9732
70.254545988419	29.5757925885384	5.35766579066547	71.5231	31.8286	8.0149	7.639
65.7267707542964	26.1279777251845	4.30869631819277	68.3701	31.308	4.6701	5.8267
Route: 5 Length: 251.094797496121 Demand Met: 9998						
53.2546855034557	10.0261852496152	4.19839206002314	57.2331	12.7874	5.1838	7.0243
59.4049186895965	8.0787927794074	8.41340206194201	59.4358	8.0877	8.3998	0.0349
59.4626787021411	7.39354905962439	9.69393292617369	58.0725	5.2013	11.1785	2.9904
63.6879899705259	11.0498258390405	10.3803480563174	61.9524	-0.333	11.9086	23.4378
67.4917158262147	14.3412932712206	10.9982752398219	62.4332	-0.684	2.8792	29.6949
71.0978310399809	17.4617628369371	11.5840999517643	66.7482	27.6121	12.1372	22.4893
75.7575789364258	21.493969419276	12.3410905970237	67.7055	32.9993	17.0949	14.8259
80.0990660405868	23.6180717174152	12.5106089529754	72.6191	32.6684	16.6889	20.9501
87.1766503617731	27.0808282898114	12.7869613451129	85.525	32.0217	10.845	5.5598
87.1776142449244	27.0810695171163	12.7870742107764	90.72	30.049	19.1921	25.9851
89.7526271834943	27.7255080803693	13.0885948477538	92.5592	25.4331	20.672	8.84
92.4576252262905	28.4024774899221	13.40533604592	97.1071	18.8552	9.2302	18.2973
96.1004150432675	29.3141444479582	13.831887827244	96.0238	29.4057	14.5945	0.7719
97.8445850739676	29.7277843168167	13.8767810328464	99.272	31.5703	11.7517	3.1541

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
98.1349566180095	29.4661095280077	14.3593653422101	102.0152	42.2262	11.91	18.485
100.759392563897	27.1010399930739	18.7210594064516	102.9211	31.879	13.8489	24.191
101.892300734224	26.080094295084	20.6039016270815	102.9016	24.8202	19.8795	1.7694
101.89248469157	26.0800269619589	20.6048822523644	103.4615	37.3033	20.8908	18.992
102.559465449925	25.8358947526544	24.1603709625357	99.0228	31.9463	24.4512	24.3368
102.909402900182	25.7078085930939	26.0257900149456	98.3241	22.4412	26.657	19.863
103.773258514837	25.3916151182981	30.630763511338	93.6487	25.1273	31.9089	25.1293
103.773442472173	25.3915477851475	30.6317441366211	97.4429	30.1528	28.42	27.9419
104.088876256499	25.276090832141	32.3132337818307	105.6149	29.5786	27.9356	12.2754
104.195431886076	25.2370887120741	32.8812523284151	104.9423	23.521	33.0938	1.8836
104.16959891946	26.1888607949639	35.2051516708652	95.8908	32.6754	36.0409	17.855
104.149392932696	26.9333138581838	37.0228503784017	98.5493	33.1624	37.7737	15.8362
104.126666262325	27.7706396498886	39.0673112865473	101.5683	27.6266	39.8262	8.8382
104.094036853817	28.9728140740414	42.0026074700474	100.384	25.6874	43.9589	21.4485
104.077436205484	29.5844369773488	43.4959799630782	106.1692	29.0085	43.7624	2.1859
104.074501325786	29.6534310252042	43.663583854773	103.0838	43.6629	35.7673	28.7382
104.048800202306	30.2576193317941	45.1313091768405	107.8221	37.3636	42.4217	23.6325
104.011107858468	31.1437002586028	47.2838226168219	105.5782	30.6326	47.1426	17.6401
103.976308369264	31.9617753903586	49.2711328252034	106.6895	31.0233	49.137	23.9388
103.94379509502	32.7261047171093	51.1278811100317	104.0844	32.9988	51.1923	0.3135
102.243632454811	30.8970480831933	53.6704349971364	102.211	28.3893	55.4005	3.0468
101.819803455487	31.6883905782678	53.4561622522612	101.7295	28.4449	56.1482	24.6989
101.401565677957	32.4692936759887	53.2447163136447	99.0428	19.6959	54.528	17.7192
101.401106448479	32.4701511170718	53.2444841432845	98.3827	22.3334	54.4737	15.4136
101.001590079156	33.21609876847	53.0425028539239	92.4351	33.0022	54.3205	23.0347
100.708493366918	33.7633474371627	52.8943238086255	91.0332	34.8187	52.6374	16.4532
99.7100950594191	35.6274837023587	52.3895693409102	95.1298	37.6897	58.9361	8.2516
99.7099522277036	35.6281986890997	52.388884948434	94.5355	44.3621	59.1041	13.4241
99.4632931877525	36.8629236122018	51.2069937103226	94.5838	45.9916	57.9488	12.3529
99.4631503559204	36.8636385986033	51.2063093175163	90.1236	40.724	54.2833	15.0486
99.4096088422886	37.131656770181	50.9497596433444	96.2582	32.5713	56.693	16.7348
99.3277079402419	37.5416358542926	50.5573234411936	100.5275	34.9543	58.1047	18.18
99.2404028038869	37.9786671593988	50.1389925795736	98.0763	43.3554	53.563	27.4576
99.1524528001579	38.4189272402049	49.7175712150681	102.9297	48.0592	51.9744	14.2478
99.0862224941779	38.7504628718538	49.4002219847046	101.161	45.7653	49.9947	23.4902
99.0336640598526	39.0135597351924	49.1483830267946	99.0651	51.1078	59.3413	22.694
98.4437831133033	41.9663834515471	46.321910119765	91.9732	45.8332	46.1527	12.7139
98.3567058787461	42.4022743104702	45.9046708930263	86.5983	36.2039	44.7429	13.6175
97.9968593135106	44.2035928664503	44.1804305450871	95.4289	57.3916	42.7453	14.9929
97.9967164815639	44.2043078530903	44.1797461525539	92.9131	56.6287	40.2251	15.0729
97.9965736500573	44.2050228397985	44.1790617599997	96.2085	41.8253	45.162	7.8844
97.9073671892678	44.6515724273559	43.7516199169203	100.8862	48.4618	50.2894	10.9264
97.8271884736062	45.0529301228291	43.3674361863239	98.9198	48.0008	44.9228	5.0724
97.7395340885101	45.4917104785346	42.947431187085	100.5945	52.9653	41.549	16.0066
97.6532020045128	45.9238707385359	42.5337630665086	106.6231	51.946	40.2003	20.5204
97.5658986972122	46.3608936919535	42.1154402697402	100.0845	45.3198	38.3951	20.4175
97.5657558655129	46.3616086786908	42.1147558772567	90.0385	42.8005	44.3862	21.625
97.3557826838973	47.4126917071034	41.1086484949192	89.2688	56.3248	44.4917	12.5008
97.3558998451533	47.413175663888	41.1077812815252	97.5519	44.8528	38.2336	3.8542
97.4606072756027	48.9906558226393	40.8163586477849	94.3452	48.7818	37.6589	4.4406
97.7213812115514	51.1832878495917	40.530039215468	98.1036	50.8139	41.2796	1.1045
97.8843413683323	52.5534849068709	40.3511153988772	97.9579	54.2407	46.7851	26.2321
98.0333163717328	53.8060933807944	40.1875466860906	97.7455	51.8526	39.6885	5.024
98.1699904510312	54.9552723117052	40.0374839946641	99.7259	57.0659	38.9488	5.4613
98.251323961772	55.6391403331924	39.9481828993108	93.9444	64.9	44.2206	23.8239
98.326187024638	56.2686022831741	39.8659861365761	99.3413	60.508	43.9191	18.4113
98.7875091890314	60.1474836642361	39.3594723791905	89.5631	83.3752	32.5568	25.9016
98.8447308117462	60.6286132772384	39.2966452433206	97.7624	79.6432	41.8331	23.8114
98.844847930566	60.629598034715	39.2965166513517	97.5653	74.5618	43.9951	26.0912
98.8449650501836	60.630582792014	39.2963880587503	94.4551	58.0456	35.6169	10.0481
98.944222466692	61.4651537586909	39.1874074019887	99.0429	61.6589	39.3422	0.2669
98.9438341310552	61.4651460905727	39.1864859158883	95.4724	61.7777	41.2303	4.4248
98.9434457946323	61.4651384225128	39.1855644301188	98.567	80.2017	48.301	23.8946
98.5472358301495	61.4573148595464	38.2453945818806	95.9481	74.251	38.8025	27.2231
98.5468474940678	61.4573071914414	38.2444730959676	89.95	80.2132	31.6802	25.9539
95.866314586314	61.4043771288364	31.8838141779488	97.7943	87.7833	36.2243	29.1465
95.3200469107092	61.3935906691433	30.5875711350252	98.4228	65.0226	33.0945	19.713
95.3196585747275	61.3935830011896	30.5866496490688	95.479	61.1306	33.7151	12.7416
94.8374913901178	61.3840623181251	29.4425110773669	98.2345	80.86	27.262	27.4352
94.837103054113	61.3840546502639	29.4415895914195	92.749	64.7326	27.0986	21.2415
93.1921928552565	61.3515754878549	25.5383674157472	91.1291	78.4897	13.7054	23.993
93.1205762052633	61.3501613841577	25.3684276439364	98.4258	65.8894	6.8362	20.8311
93.1201878678658	61.3501537157149	25.3675061585808	88.7937	67.447	23.6857	7.6628
93.2223881183216	60.5037644164167	24.4319416621933	87.1149	58.1702	24.9275	8.6573
93.4503373451244	58.6159606575833	22.3452391157324	98.2007	80.5294	17.4055	24.0186
93.4504180877148	58.6152919652241	22.3444999735519	101.778	67.1686	27.7348	23.9527
93.4504988312671	58.6146232737034	22.3437608307179	99.9754	58.6633	29.714	10.7282
93.4505795749159	58.6139545837452	22.343021686481	103.5291	67.906	8.9335	21.3267
93.4506603180851	58.6132858929505	22.3422825429484	96.0562	52.3857	26.7058	12.0834
93.4507410641092	58.6126172031436	22.3415433988341	87.5129	47.9594	27.6836	13.3149

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
94.0578907366334	57.8116966781727	20.2467546370975	98.7715	55.3698	27.9452	10.7015
94.0581520550556	57.8113519604826	20.2458530371882	102.8738	56.4102	20.1678	11.5644
94.472347763286	57.2649668026911	18.8167950370291	94.5987	62.0376	18.5629	22.0196
94.4726090807075	57.2646220856616	18.8158934365773	93.5538	62.1822	15.7085	5.8892
95.3692821464928	55.5414684006343	16.6375260301278	92.8209	56.9207	15.4027	12.3836
95.8856901368332	54.5490779919008	15.3829709305923	94.6877	57.1733	21.1304	13.9646
96.2450760751788	53.8584388789284	14.5098824177934	102.1595	55.9791	16.6639	15.0641
96.7686244206898	52.8523256389019	13.2379788588314	97.3108	57.82	10.7791	22.7988
97.3573574504188	51.7209453222102	11.8077159082466	99.5987	51.3246	10.6347	2.5606
96.4513807714888	51.3544573447324	11.706523766081	98.2152	53.7701	7.2972	29.4627
93.5621094175494	50.185682163587	11.3838092428739	103.8062	50.1176	9.3383	16.2282
91.6948257333885	49.4303234734548	11.1752448898462	95.7654	46.8722	1.8076	22.8599
91.3358825689748	49.2851227494976	11.1351531854547	92.412	50.9961	13.3675	8.4715
90.3322726762486	48.8791395220096	11.0230562869259	98.2004	50.3921	3.9008	18.7026
89.2468435510446	48.4400585499779	10.9018206039988	89.6611	52.1615	6.6683	14.4321
88.4747179573164	48.127716106309	10.8155788322609	94.5726	47.3613	8.9492	6.423
88.4314290257972	48.1102047497366	10.8107437145523	89.5287	45.4109	8.5583	3.6829
81.8412651394088	46.1676238231038	10.6211831305058	84.6532	51.7406	11.3965	13.6619
78.1268572863458	45.0727285170227	10.51434154926	77.8794	45.0468	10.8339	0.405
76.0501871041965	43.3259892557866	2.57092440518319	75.2757	50.6388	0.889	7.5436
75.4812180451555	42.674093333272	0.366707773071733	75.73	42.7229	0.0066	0.4404
66.5723011982888	38.698488904681	0.77706812498469	68.0366	38.8903	2.9918	3.4888
58.3360380025685	35.0230561966966	1.15644504342048	58.126	35.24	1.1949	0.3044
Route: 6 Length: 268.708289989391 Demand Met: 9379						
56.0359621576181	0.523488236639806	4.67708286866416	58.2864	0.0731	4.559	2.2981
53.5962318465684	-0.936375526252187	5.84260765806919	56.6752	3.9284	4.2715	9.6519
53.5962318465684	-0.936375526252187	5.84260765806919	58.2741	0.1622	8.0145	6.0785
49.9507898676206	-3.1177017806941	7.58413386371118	63.0749	1.8033	17.7213	22.3131
49.9507898676206	-3.1177017806941	7.58413386371118	64.6914	7.7788	3.6297	22.2178
49.9507898676206	-3.1177017806941	7.58413386371118	58.5415	3.6684	5.0311	22.039
49.9507898676206	-3.1177017806941	7.58413386371118	54.5841	1.3	6.274	17.8466
49.9507898676206	-3.1177017806941	7.58413386371118	58.6741	1.1796	4.0744	18.8015
46.6515145964608	-5.09189210247283	9.16028647711236	46.0937	-5.8176	9.1179	0.9163
47.5293127208695	-1.83260113189713	10.895575679212	48.4975	2.4432	11.2037	10.4173
48.4121869023202	1.44553785651407	12.6409001215907	48.302	2.6164	11.9932	1.3426
50.8256479473328	1.21827634604816	19.9119526695751	51.7765	0.7553	20.0441	1.0658
48.6136754130738	2.9478216729405	24.3790840085843	45.0418	3.8658	25.2247	10.1722
46.8642265083323	4.31571896558311	27.9121378538442	46.0043	6.8606	27.4465	2.7263
44.197926885463	1.80496814154222	38.7016744265737	42.4155	0.0668	38.5675	2.9443
43.0541708081853	0.727937423371891	43.330035866126	47.7278	5.7114	59.7593	28.1097
43.0541708081853	0.727937423371891	43.330035866126	30.7839	5.7178	56.2846	20.1469
43.0541708081853	0.727937423371891	43.330035866126	36.4279	-4.3699	52.432	20.2708
43.0541708081853	0.727937423371891	43.330035866126	53.289	-9.6645	34.2743	25.3042
43.0541708081853	0.727937423371891	43.330035866126	31.0065	-1.0714	59.1851	23.9753
43.0541708081853	0.727937423371891	43.330035866126	43.0131	-4.6452	57.9101	20.9992
41.808429163799	-0.445128958247167	48.37109474301	56.514	2.6652	55.8183	22.7885
41.808429163799	-0.445128958247167	48.37109474301	49.309	3.6922	59.7251	20.878
41.808429163799	-0.445128958247167	48.37109474301	54.4331	-6.2551	57.3764	16.56
34.8885879686542	0.11519061571741	52.3455340758851	33.4349	0.0139	45.2628	13.2105
29.9265666778548	0.51697984220775	55.195491337757	31.1391	0.2266	57.7289	2.8236
28.8982172249327	0.610429491976574	55.6150351873524	27.3755	-1.0984	56.1861	2.359
28.8978347277898	0.611335801077394	55.615214908663	22.4229	-2.1641	56.3911	7.0873
29.9945617286893	6.28894377379518	56.1352412124221	27.6562	5.4902	56.4427	8.29
30.8075134779719	10.4974855017929	56.5207120780191	33.7832	8.5886	57.2507	17.2676
31.576591332172	14.4788980250302	56.8853796367312	36.7928	9.6586	58.8057	12.2244
32.303014839597	18.2394946429737	57.2298221022001	19.4476	21.0876	59.2618	13.323
33.314214542929	21.8783675548444	57.5223851174653	22.0389	18.6688	59.3708	16.6692
34.4235532436869	25.8703994963643	57.8433418369371	18.7218	26.0511	59.401	18.3773
35.8431777040554	30.9790148931157	58.2540711202384	35.5392	31.6783	58.7469	0.9079
40.2816970442232	30.3348033846568	54.1564306853479	40.9959	37.9409	51.1587	12.8365
40.2816970442232	30.3348033846568	54.1564306853479	47.4903	33.2139	54.5514	11.8665
44.6091454335207	29.7067127360947	50.1613309332494	44.6028	29.9319	49.9927	0.2814
48.3620604149775	26.7278030358324	48.5905608098424	48.493	25.186	47.2334	2.0582
50.9062645285918	28.4772407213213	50.939412619307	56.8778	27.618	56.4108	8.9898
51.9163900927904	29.1718203842072	51.8719775634037	52.7074	28.2489	52.4902	1.3637
52.0389177755968	29.2560724837567	51.9850971733128	53.8796	31.7093	51.2249	3.1598
51.930394702658	27.4399644478031	55.4917340417952	47.4152	28.2569	57.2588	4.917
53.4615127570055	25.631032756499	57.7833210937388	50.1386	26.6573	56.0437	9.4164
54.3663448431186	24.5620236416711	59.1375612350228	54.2786	24.4277	59.9569	0.8349
60.2935052681233	21.5171551732488	52.1991246475615	63.3795	20.1125	53.5518	3.6505
60.242114458262	21.4405900550771	49.4295027881654	58.9981	26.6128	49.6223	10.0374
60.1251711779864	21.2663604586762	43.1270288891699	61.643	23.6955	42.1255	3.0344
58.4904808500367	18.6607613150459	38.9911312922435	64.4232	44.0581	27.3148	28.7966
58.4904808500367	18.6607613150459	38.9911312922435	46.9054	30.8841	31.5685	23.9447
58.4904808500367	18.6607613150459	38.9911312922435	46.4115	30.3033	33.5708	28.1751
58.4904808500367	18.6607613150459	38.9911312922435	52.5136	31.162	22.8965	28.7958
58.4904808500367	18.6607613150459	38.9911312922435	54.3132	33.4794	38.814	25.0485
58.4904808500367	18.6607613150459	38.9911312922435	58.4334	33.3219	33.0094	26.7455
58.4904808500367	18.6607613150459	38.9911312922435	61.1622	34.1592	24.5106	28.1161
58.4904808500367	18.6607613150459	38.9911312922435	46.684	28.1154	34.4272	27.5206

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
58.4904808500367	18.6607613150459	38.9911312922435	45.985	27.4123	27.7797	25.7471
58.4904808500367	18.6607613150459	38.9911312922435	58.6228	31.6703	20.587	25.6598
58.4904808500367	18.6607613150459	38.9911312922435	64.9829	35.6055	23.509	27.8112
58.4904808500367	18.6607613150459	38.9911312922435	47.7428	26.438	23.4687	28.0445
58.4904808500367	18.6607613150459	38.9911312922435	60.1802	30.671	38.4138	27.7411
58.4904808500367	18.6607613150459	38.9911312922435	65.211	38.9167	43.4098	22.6036
58.4904808500367	18.6607613150459	38.9911312922435	54.6523	25.2022	31.3259	28.2307
58.4904808500367	18.6607613150459	38.9911312922435	64.1748	30.2745	31.4674	28.016
58.4904808500367	18.6607613150459	38.9911312922435	63.132	27.7543	33.1939	11.7407
58.4904808500367	18.6607613150459	38.9911312922435	62.9268	27.0211	37.7555	28.5574
58.4904808500367	18.6607613150459	38.9911312922435	63.8119	26.0212	34.0563	22.8759
58.4904808500367	18.6607613150459	38.9911312922435	45.9242	19.9	29.6168	25.1738
58.4904808500367	18.6607613150459	38.9911312922435	49.1449	22.3659	43.2644	23.3416
58.4904808500367	18.6607613150459	38.9911312922435	47.2412	18.0641	21.8927	26.9311
58.4904808500367	18.6607613150459	38.9911312922435	52.1655	19.1446	41.5432	15.5087
58.4904808500367	18.6607613150459	38.9911312922435	50.8742	24.2729	53.2264	23.767
58.4904808500367	18.6607613150459	38.9911312922435	51.9742	12.9315	39.5168	19.8738
58.4904808500367	18.6607613150459	38.9911312922435	49.0558	10.279	28.6803	25.3924
58.4904808500367	18.6607613150459	38.9911312922435	48.9393	11.7496	40.9103	17.8826
58.4904808500367	18.6607613150459	38.9911312922435	46.3909	8.819	37.7186	24.8054
58.4904808500367	18.6607613150459	38.9911312922435	54.3108	6.5803	34.1725	23.4136
58.4904808500367	18.6607613150459	38.9911312922435	53.4617	5.8056	38.0578	21.7012
58.4904808500367	18.6607613150459	38.9911312922435	61.565	4.5717	36.954	20.8967
58.4904808500367	18.6607613150459	38.9911312922435	57.7618	2.6586	23.6599	24.3155
58.4904808500367	18.6607613150459	38.9911312922435	52.0607	4.6851	47.5572	25.9984
58.4904808500367	18.6607613150459	38.9911312922435	63.4243	4.3429	39.6925	22.7299
58.4904808500367	18.6607613150459	38.9911312922435	50.9668	1.717	44.4164	23.9816
58.4904808500367	18.6607613150459	38.9911312922435	55.7669	1.6852	42.4618	24.4965
58.4904808500367	18.6607613150459	38.9911312922435	54.6465	1.327	47.163	23.7327
58.4904808500367	18.6607613150459	38.9911312922435	60.4167	1.4088	44.4464	18.4179
58.4904808500367	18.6607613150459	38.9911312922435	59.6709	-1.5476	33.1451	26.9171
58.4904808500367	18.6607613150459	38.9911312922435	58.2987	1.8222	52.9601	22.9315
58.4904808500367	18.6607613150459	38.9911312922435	57.7878	-4.3732	24.6962	27.1183
50.5899742012604	14.5811752756867	43.8673972004987	48.2378	10.888	40.0435	5.8133
49.7208709521948	14.461502559266	45.1043206862787	46.213	15.3079	43.6977	3.873
49.3361128442184	14.137914091748	46.954474126287	47.2642	16.1804	48.1934	3.1622
50.1540647731695	12.4066764316619	48.5971917685458	47.6091	10.2274	48.878	11.8474
50.1540647731695	12.4066764316619	48.5971917685458	46.8369	6.4403	54.1626	14.1993
50.8803907528503	10.8693699592677	50.0558942118941	53.7123	16.59	54.3027	19.1512
50.8803907528503	10.8693699592677	50.0558942118941	45.9074	18.6439	58.1761	15.0199
51.4883664187347	9.58255807264116	51.2769101186714	52.0827	15.9727	59.9151	11.4211
51.4883664187347	9.58255807264116	51.2769101186714	51.2901	7.6487	52.6277	4.2708
51.4883664187347	9.58255807264116	51.2769101186714	58.6318	9.4344	53.4701	7.474
49.4339167751656	7.50800213453777	52.3647934216442	50.5069	12.3029	52.6774	19.1593
49.4339167751656	7.50800213453777	52.3647934216442	49.2438	-0.5725	42.7886	17.8927
47.7925369884165	5.85055827625543	53.2339460878958	44.2937	4.7268	51.9613	3.889
47.7929452171956	5.85016776706505	53.2347712253608	45.5397	7.2979	57.1732	4.7628
50.6841392099798	3.58218165847932	53.1058530351121	44.3097	5.4051	59.4302	11.9467
51.6245602918637	2.84447191216055	53.0639196924169	51.8363	2.0767	53.9783	1.2126
51.9312744319328	2.85356918150503	52.666851886684	54.7597	1.1902	50.9644	4.007
53.3808428999224	2.89656398253616	50.7902609355219	56.6229	3.2945	52.4352	3.6572
53.7028096721116	2.87020610041127	49.6783143475649	60.4719	1.0667	55.1539	17.5347
54.8051870208972	2.77995972785485	45.8711372395579	57.3839	0.9502	46.0215	3.1655
54.76495727894	2.99273865108827	44.8380216348902	53.965	12.2967	46.7771	9.8572
54.76495727894	2.99273865108827	44.8380216348902	55.3647	9.0137	38.8085	9.4748
54.76495727894	2.99273865108827	44.8380216348902	50.2911	5.2466	39.9878	6.9728
54.76495727894	2.99273865108827	44.8380216348902	49.5265	1.5006	43.2383	5.684
54.6328979145565	3.69121261675543	41.4466873789832	55.5508	6.709	40.6861	3.2447
53.6772490868123	1.71540447383314	38.6344564791178	52.8937	1.339	38.4463	0.8894
55.6697229441934	1.68152202902628	37.4253425852817	53.412	-4.2453	38.3008	16.6165
58.0482271503988	1.6410750769945	35.9819698461693	62.5325	1.766	39.3982	5.6387
59.6593528487632	1.46041202085805	30.3285692941008	52.2056	3.4977	49.7426	20.8953
59.6593528487632	1.46041202085805	30.3285692941008	62.7821	-0.0838	27.7653	4.3251
59.6593528487632	1.46041202085805	30.3285692941008	53.5826	-3.7128	29.3577	20.6553
59.6593528487632	1.46041202085805	30.3285692941008	58.3955	-2.2935	14.9348	20.2689
59.6593528487632	1.46041202085805	30.3285692941008	53.8048	-5.0553	19.1679	14.1877
59.470680710651	4.76263090503634	26.7341307302833	60.5785	6.8128	27.9807	2.6428
58.6110224892213	6.87057746229397	22.3406907006125	60.2628	6.0605	25.9406	10.0471
58.6110224892213	6.87057746229397	22.3406907006125	58.0726	3.0503	30.5544	10.1594
58.0089009194518	8.34702479554399	19.2634386711213	61.7542	11.527	18.9198	4.9252
54.2357052735315	9.60203141932667	12.5829809003496	53.4554	15.0784	17.1477	7.1719
48.0209747548968	11.6691195449936	1.57977597720113	55.8132	15.4408	3.6174	11.5975
48.0209747548968	11.6691195449936	1.57977597720113	42.7704	10.2739	1.2183	5.5443
Route: 7 Length: 287.428826647546 Demand Met: 9962						
50.6642846213288	33.1098704640613	3.82319393195215	73.6395	46.5004	2.2066	26.6417
50.7740195771742	33.7661218779314	3.94185549517224	73.6428	45.1426	7.6389	25.8084
51.3277692203007	37.0777279873891	4.540651002957	70.916	53.3608	4.8842	25.4746
52.0530547954384	41.4151763204669	5.32493664022019	66.9624	36.7077	4.2616	25.6742
52.789009702994	45.816431860539	6.12075966692363	72.7757	56.7077	5.4576	24.2193
53.6975519560415	51.2498182638014	7.10320949885489	69.9782	57.1009	12.9468	18.2604

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
48.4262345689371	55.7633603348766	6.03475513910129	31.4455	71.7336	19.6874	27.0146
44.9075688512067	58.77620231994	5.321549245082	33.839	67.1668	7.1332	20.2124
40.9234960904026	62.1875473346421	4.51400889797712	31.4906	71.3219	1.4719	26.6563
36.8687345320608	65.6594196372916	3.69214061438369	26.6151	77.1467	3.8306	15.3985
33.5492539542682	68.501710794994	3.01930813496566	31.0449	71.9995	0.0029	23.5272
30.2488982568101	71.327626218262	2.35035205888176	31.4187	76.5703	2.7936	26.413
26.3481679690523	74.6676093776742	1.55970477141388	25.4767	75.481	0.001	1.9623
26.064180492586	74.7839948370636	4.10950466826678	23.4089	84.0628	5.796	9.7975
26.0868405499288	74.3463635807924	5.06464492145663	23.527	73.6169	0.5641	21.6834
26.1044568922292	74.0061406534242	5.80718927015552	22.9431	70.0987	4.2047	5.5998
26.1254276168249	73.6011346321918	6.69112422095759	24.5076	73.115	4.3052	8.9241
26.1586909968725	72.9587218751874	8.09320489211286	23.796	77.2181	9.3562	18.2059
26.1674028495716	72.790470939936	8.46041645749477	21.3934	72.6127	7.7423	27.5896
26.1706645125792	72.7274789635449	8.5978979097829	22.8228	67.5784	3.2098	16.2582
26.1948008001447	72.2613395120252	9.61525813948666	22.1344	71.2137	11.8857	6.3651
26.2106999819805	71.9542817046439	10.2854189775271	24.5354	72.6275	12.2334	5.9717
26.2325517693287	71.5322620800565	11.2064866567077	28.241	67.9653	9.5896	4.4101
26.277578586769	70.662666120872	13.1044000836519	25.7737	68.9159	14.4865	2.2837
27.3538316196951	73.0810831799714	12.739117172172	21.1184	76.9048	10.6601	8.7289
28.2220560241826	75.0320450655277	12.4444396519978	29.3468	93.7461	14.2413	24.255
28.8710086312553	76.4902875574637	12.2241835219628	31.6916	96.8159	17.5787	27.5118
30.7008065795516	80.601973023234	11.6031455560407	32.6009	89.9531	17.4409	11.1863
31.05835345076	81.4054060874759	11.4817932368635	33.517	80.8699	6.7304	7.8126
31.9071151754783	83.3126335208072	11.1937213141056	48.9533	90.4759	7.3728	19.0092
32.2161138909628	84.0069754039657	11.0888463461334	43.1057	91.7939	5.1823	21.808
32.6618204487713	85.0085093996894	10.937572377923	35.7306	102.2767	4.1846	20.2694
33.2163926686798	86.2546721479186	10.7493491215412	35.5571	102.295	9.2843	22.4132
33.7984940624591	87.5626948300082	10.5517824004435	35.0473	98.5367	9.9491	21.3919
34.7399488160561	89.678209687238	10.2322502309953	37.9917	90.5379	9.9912	3.3721
34.7391386827211	89.6787940628731	10.2322034432129	40.065	98.6098	6.7408	21.6771
34.3765481333928	89.9403424753795	10.2112626852448	51.1106	98.2963	5.5983	24.3822
33.7948969665743	90.359906481589	10.1776704830774	41.6896	94.8028	3.024	26.2925
33.2090119817808	90.7825244939803	10.1438337701344	37.3296	94.7968	3.7833	26.3816
33.0915502569141	90.8672534811537	10.1370499857223	34.7819	91.1147	8.0437	26.8877
33.0907401236091	90.8678378568344	10.1370031979892	34.0458	95.0903	5.2592	23.4922
33.0899299903087	90.8684222325225	10.1369564102687	35.7481	97.1257	4.802	23.4808
33.0891198570178	90.869006608225	10.1369096225651	39.7333	98.7582	4.2197	18.7088
33.0883097237309	90.8695909839343	10.1368628348756	37.0706	93.0168	1.0492	27.7874
33.0874995904491	90.8701753596516	10.1368160471988	33.2241	90.2072	6.3544	24.6184
33.0866894572302	90.8707597354554	10.1367692595126	33.0573	97.9271	5.3628	8.5196
26.1967113440982	88.603353616565	14.6483082830559	28.2891	98.27	21.6276	21.2566
25.8597720334024	88.4924710826981	14.8689352340761	34.0464	97.1856	33.2284	23.2445
24.9216357018972	88.183742101946	15.483224375416	32.2034	92.5655	35.5696	28.0393
24.1382433353857	87.9259374914948	15.9961875742777	29.7064	94.0211	29.3487	26.0785
24.1374367416291	87.925672051557	15.9967157297012	42.2565	98.7398	22.9258	24.1013
24.1366301478458	87.9254066116276	15.997243885088	38.189	100.3805	31.8594	26.8425
24.1358235540777	87.9251411717013	15.9977720404998	31.7064	96.988	25.1942	27.9597
24.1350169603042	87.9248757317784	15.9983001959048	34.0163	93.2553	22.3961	18.0121
24.1342103665423	87.9246102918648	15.998828351332	33.8351	99.3235	37.4512	26.1581
18.3147273188525	85.9278352209699	19.5327488917388	34.9317	80.2335	16.9208	24.9565
18.313907120685	85.9275537953895	19.5332469626261	31.7515	71.3679	39.9054	28.4179
13.2208630720022	85.0202482629939	21.3754971448827	22.8762	75.7017	33.805	22.7687
12.2911045351422	84.8546154506561	21.7118083415788	13.7649	76.0563	18.1156	11.1171
11.2789439114086	84.6743030022921	22.0779259074177	18.7356	77.2891	30.4652	27.8207
10.9335019580532	84.6127638638427	22.2028787631631	8.0472	76.1743	13.1381	21.0495
10.9325745107837	84.612598642711	22.203214238259	6.65640000000001	74.2265	20.3804	11.3789
6.50421317167657	89.4571103949931	25.7773583311094	7.8142	89.6258	27.2865	2.0055
6.50358490038185	89.4577540130795	25.7777954019722	8.0611	104.093	26.141	29.9646
5.86385612650868	90.1131093375302	26.2228369004225	3.11839999999999	98.924	29.022	10.2515
5.5276504805954	90.4575274117612	26.4567258161739	3.5924	94.7451	26.9481	6.9732
5.1320970167035	90.8627429619163	26.7319013716329	-0.735100000000003	89.6931	26.6301	28.3044
4.53533267733911	91.4740842888256	27.1470537782609	21.5395	100.4343	27.1149	29.9057
3.93559028763193	92.0884763650531	27.5642779692751	3.5998	89.8159	36.4775	20.0402
3.34871203823377	92.6896900305449	27.9725529771381	1.20229999999999	90.7259	43.7677	19.1166
2.82615186262973	93.2250145541048	28.3360837101821	-1.86190000000001	98.5581	36.524	15.9681
1.18175581240835	94.9095774154737	29.480044875371	1.64530000000001	95.7178	31.8751	2.5699
0.899526982197045	95.0254150542783	29.3093732321566	3.1448	100.72	31.1491	20.6463
0.163400702570058	95.3275497765933	28.8642171470403	-0.311599999999999	97.6012	28.6474	20.2615
-0.572429556586116	95.6295629908903	28.419240082222	-3.1358	95.2162	31.8855	4.3309
-1.5250309151306	96.0687624228119	27.6781324345249	-0.338999999999999	97.1979	25.6607	24.9263
-2.24190168634419	96.3992776214412	27.1204191742878	-2.5612	92.1356	23.79	25.3912
-3.18553209110551	96.8343409464179	26.3862907787341	-12.8049	93.8535	15.5008	19.948
-3.95879997494508	97.1908581410076	25.7847015480357	-5.5457	98.4014	26.4862	2.1156
-3.43911340675123	95.6245170382811	20.8252910293919	9.17	97.1621	20.3835	26.9226
-3.43901397910537	95.6242173622595	20.8243421835532	6.3198	96.0864	20.0555	13.0595
-3.13074665336124	94.6950962778041	17.8825233970917	0.613799999999998	95.4238	16.9249	17.1272
-2.9838029328058	94.2522062547062	16.4802281504822	1.4019	97.5847	15.4849	8.9245
-2.68943897738141	93.3649900494168	13.6710906635574	3.81100000000001	100.5395	9.9764	22.995
-2.67181959770352	93.3118850527028	13.5029476029325	5.8502	91.8647	13.1882	18.0105
-2.59500767752532	93.0803731431308	12.7699257156326	4.77370000000001	93.7785	6.1602	12.9549

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
-2.53618011948355	92.9030662816919	12.2085298837371	8.1477	101.1634	5.5645	26.7278
-2.51685233847843	92.844812141925	12.024083369736	-0.171000000000006	97.1566	2.8672	11.053
-2.51675291084766	92.8445124659096	12.023134523894	3.0162	107.1796	11.3112	15.3823
-2.2297039562217	91.9793428098553	9.28380167524007	-6.68600000000001	94.6391	7.4364	5.5087
-1.77388232727537	91.2691316648452	7.66777124385922	-2.1508	94.1499	7.6254	24.1365
-1.1503587850421	90.2976257260323	5.45718497913676	-1.9602	93.9224	5.6614	23.076
-0.806534469834276	89.7619164303331	4.23822009610643	2.57040000000001	90.3092	4.6781	25.529
-0.355881534273507	89.0597585626157	2.64051438423674	2.55330000000001	99.1767	7.9857	13.4676
-0.206471033385057	88.8269635724413	2.11080746350453	-0.100899999999996	90.0487	0.1507	2.3121
1.25401562461386	81.6530921502634	2.53652458724642	2.7376	84.0979	3.4333	22.8219
2.46318812257432	75.7136701386221	2.88898590427625	1.76609999999999	66.5446	12.6159	26.4568
4.13034308235248	67.5246530260952	3.37494408100015	0.483800000000002	63.8626	0.7436	5.7993
4.42834258769609	67.3768587232769	3.55747901016942	10.0835	69.723	3.7551	14.2892
7.39584195972698	65.9051130020216	5.37517430782562	12.0877	66.3858	4.5331	4.791
7.50903082535859	65.8489764278124	5.44450638697616	9.00020000000001	73.0359	5.8372	24.3533
8.22611773600087	65.4933336377442	5.88374684869659	7.5677	74.3816	13.1566	29.6105
8.96010931417588	65.1293069048119	6.33334198545242	15.0856	70.6386	28.9208	28.271
9.69378633037628	64.7654361903387	6.78274443213638	22.6268	64.3936	19.9605	24.3192
10.4875014971764	64.3717892906347	7.26892227553802	16.7224	69.1113	14.1768	26.0784
10.6559670120117	64.2882380021716	7.37211319949562	14.5018	68.1646	16.8217	28.3495
10.6567524027465	64.2878484838438	7.3725942783519	9.6606	65.5604	9.552	2.866
12.9363508272341	63.157270683813	8.76892676258895	9.15690000000001	61.6426	15.1483	9.3858
12.9371362179898	63.1568811655232	8.76940784144182	12.0587	67.8257	18.5408	15.0634
12.9379216087609	63.156491647257	8.76988892028883	13.2613	67.7948	17.1077	9.5466
19.0935969201243	58.0283724537653	9.02044208233929	14.2239	63.9607	10.3191	12.6801
20.2328448629924	57.0792971002632	9.06681264830816	15.1112	64.361	7.2726	9.0815
34.6688237650665	45.0530894963511	9.65439670629898	44.3651	39.5082	4.2576	12.4052
43.6475920950888	37.5731297855718	10.0198572933198	45.4903	38.3462	11.2293	2.3358
44.2609289477931	32.93873467619	8.01820444876169	45.6407	35.658	2.8521	25.0567
44.7316587732101	29.3818831399429	6.48195608458593	44.1303	30.8739	2.5661	4.2334
Route: 8 Length: 159.318603554087 Demand Met: 7654						
46.8008867907312	14.1241736196189	1.06858217653117	47.4524	12.1509	5.76	13.8821
46.4689452062963	16.3096276150717	2.15062159926972	46.503	16.5426	2.0548	0.2542
46.1247233186321	16.0071442001851	3.18735559858862	44.2621	15.3855	4.7212	17.5289
45.4425206887539	15.407661726575	5.24202645339113	49.3862	17.5735	5.4967	29.4535
45.3185985784743	15.2987657236089	5.61525743346419	49.1677	19.2175	6.1526	29.9217
45.2827400737284	15.2672552202186	5.723256764624	54.0368	23.8586	2.2143	14.1498
45.0926745830614	15.100235999092	6.2956996466119	46.7163	23.0055	0.3229	28.4765
44.3788104746503	14.4729310660995	8.44572904612939	63.3607	23.5913	11.9128	24.1094
44.2053643283042	14.3205160853654	8.9681172094833	52.0306	12.0787	8.641	25.2448
43.9893195094697	14.1306677833475	9.61880453242249	47.0712	4.3382	9.7807	28.9099
43.6395066116732	13.8232715047541	10.6723764791318	51.545	-0.7619	6.4521	25.0267
43.6025193850373	13.7907691670839	10.7837751616257	58.8992	5.3006	6.9433	25.2792
42.7543520581793	13.045446354622	13.3382976749815	44.5228	11.8645	13.3212	25.0082
42.4830091480518	12.8070051444726	14.1555320032884	53.9046	16.3668	14.1276	12.2702
41.6592889682392	12.0831653421409	16.6364233065753	46.6598	16.011	21.0885	13.039
41.3488147605985	11.8103378729265	17.571513279366	43.984	9.2005	15.6271	7.1984
41.2388585084866	11.7137144656608	17.9026807429169	45.8725	14.3747	21.2711	19.0119
41.0620484475756	11.5583436998212	18.4351991542579	44.3034	16.6265	25.3299	9.4533
41.0178353713511	11.519491728989	18.5683605547341	48.0446	14.6778	22.9405	8.8581
40.0958113160581	10.8581348930791	20.0850992988383	40.715	18.8306	21.9165	23.0792
40.0010339096345	10.7901521961426	20.2410090688559	43.7231	10.6871	23.6231	24.1762
39.760163272185	10.6173785814283	20.6372436336438	53.1154	7.9184	18.71	19.9574
39.7596765120609	10.6170294342153	20.6380443588184	48.7027	4.8736	15.3944	25.6148
39.7591897519045	10.6166802869756	20.6388450839616	41.1669	5.3004	18.6447	27.2131
38.8046894645967	9.93202857616896	22.2090072279803	52.3173	10.0275	11.1526	24.0147
38.1755371964936	9.48074494451601	23.2439686462212	56.047	-0.6998	19.4659	25.6513
38.1755371964936	9.48074494451601	23.2439686462212	39.9467	-2.3317	18.5214	24.6235
37.7748443947227	9.19333258811743	23.9031121790354	32.3564	-1.4633	20.5286	25.6089
36.7475087770734	8.45643649721336	25.5930896084072	43.7681	7.8375	35.3656	19.4193
36.3593154190638	8.17798982065879	26.2316716491629	36.4235	4.5159	28.6582	16.6099
36.133681072176	8.01614484815977	26.6028424643916	50.0191	-2.6033	31.7826	29.6269
35.4430562880918	7.52076740478858	27.7389273217068	36.2059	6.8965	29.7476	2.2375
34.5879471250695	7.53337997361751	27.4016795922585	33.6792	4.7017	30.2163	13.2435
33.2036074091791	7.55379856434527	26.8557079128328	51.32	11.9016	40.4537	29.8963
32.7486311812798	7.56050933777847	26.6762692248608	43.4311	0.4843	45.1031	25.8563
32.2079186875937	7.56848470769634	26.463016938957	29.2732	5.6917	40.0529	15.7976
31.6566789571778	7.57661536146575	26.2456128410769	28.6989	1.5656	37.4478	19.8786
31.1183460197009	7.58455566015174	26.0332990851166	24.5208	1.7631	30.0851	29.7307
30.7320835246359	7.59025297178709	25.8809605792314	22.6294	-1.9579	25.7184	16.8768
30.7311533471611	7.59026669175115	25.880593725544	31.7997	5.4917	35.1341	9.7028
30.7302231697126	7.5902804118342	25.8802268717951	29.9497	8.0977	27.1858	1.6035
28.4916146716619	7.34059876068067	24.0775872844118	29.2451	9.0499	23.6495	5.6713
27.9826698800374	7.28383397628499	23.6677594758871	28.1449	5.3771	22.529	15.5333
27.9225460769378	7.27712811356707	23.6193447844359	26.4488	5.1021	19.0029	9.3497
27.9217701290761	7.27704156885231	23.6187199525158	26.246	7.8923	16.6585	7.1855
26.0819081197716	6.29662903868313	27.5594101947222	31.1128	-2.8096	30.5667	18.9309
25.946278588076	6.22435574389119	27.8499069033083	24.8641	0.1355	28.7608	6.251
25.1648846589879	7.92974025710406	30.0650978071962	27.2842	5.8331	28.3822	18.4271
24.5905116633251	9.18330444762438	31.6934015499074	29.4417	11.4808	30.7206	11.6626

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
23.5086415566963	11.5444774637049	34.7604219826277	29.6205	6.6839	35.8272	7.8815
22.9546257214915	12.7536129432824	36.3310158837628	19.6468	14.5775	38.07	7.1553
22.5582422004381	13.6187169860032	37.4547337024239	25.9081	14.4892	36.1934	15.0463
21.9464892567023	14.953862904768	39.1890074451604	25.8989	0.7413	53.4706	22.2466
21.4392562326397	16.0608946302798	40.6269746051361	20.7311	19.0512	39.2565	27.1888
20.7784102568982	17.5031849550775	42.500422303387	38.0686	7.3443	51.7798	25.6467
20.1603043313578	18.8521955316769	44.2527050719718	21.4132	25.3225	51.4824	11.064
19.4583425379457	20.3842210833	46.2427130451434	19.4151	20.4264	46.5071	0.2712
19.4765287240259	20.9094166337474	44.6566091143968	22.5923	19.795	49.1879	27.7634
19.4765287240259	20.9094166337474	44.6566091143968	22.0744	6.6433	40.1203	29.8611
19.4988574074661	21.5542401091589	42.709225893675	23.1689	25.59	48.8728	25.7524
19.4988574074661	21.5542401091589	42.709225893675	21.7951	21.835	45.5134	24.0928
19.5188199881411	22.1307339732719	40.9681998325819	19.3676	20.9011	45.1036	22.1053
19.5188199881411	22.1307339732719	40.9681998325819	27.9452	7.0873	43.7392	24.5101
19.5415615795392	22.7874838385847	38.984798441862	21.1889	21.267	39.0474	20.9082
19.5534018133894	23.1294165272096	37.9521528561188	17.3215	22.815	38.4524	26.1071
19.5923105911635	24.2530638356668	34.5587082872864	19.5225	24.6717	34.6116	0.4277
20.0306509594171	23.9221097570703	28.5306432434556	18.4916	22.031	28.1174	8.3539
20.030723376096	23.922055081334	28.5296473687705	23.1615	20.5337	28.672	18.9562
20.1569110009848	23.8267814791737	26.7943125509554	19.0397	19.3917	26.8913	27.4702
20.3439981325036	23.6855279109063	24.2214893126039	18.1963	16.0602	36.4885	17.912
20.344070549184	23.6854732351806	24.2204934379183	23.1228	16.7524	24.3445	13.0518
20.3941946410228	23.64762874264	23.5311853441152	20.8129	26.0745	22.3222	16.1762
20.4059758517436	23.6387337357029	23.3691696764105	22.8581	29.0039	22.5241	5.9592
20.3701340213916	23.2857305502767	22.1306001380457	18.7531	32.536	21.0115	27.0946
20.3676046432624	23.2608188595971	22.0431934052466	20.5322	21.5891	20.6595	28.8292
20.3403398708112	22.9922892214983	21.1010135893346	17.2669	18.1061	25.0094	10.6475
20.2350538109296	21.9553286873717	17.4626693744979	21.6596	11.213	17.563	23.4533
20.1927270370771	21.5384537503488	15.999995357983	24.5729	19.8583	16.0395	11.2071
20.1415106843065	21.0340254030513	14.2301257502038	20.5046	21.2685	13.3595	15.1676
20.0983587388871	20.6090221249194	12.738932472548	31.9656	14.6164	16.7619	14.4873
20.0983309200203	20.6087481371981	12.7379711417832	41.9974	13.5778	7.3366	24.1613
20.098303101148	20.608474149499	12.7370098110123	19.8821	27.2321	11.7559	8.0149
19.9976843100496	19.6174812637786	9.25994909065746	25.2224	21.1268	9.0297	20.0558
19.9923166107064	19.5646148935279	9.07445877831138	24.0847	21.2619	9.4135	18.4856
19.9922887917941	19.5643409059879	9.07349744749628	15.0509	21.8739	10.7741	20.7664
19.9922609728463	19.5640669197657	9.07253611630662	19.6457	23.2311	5.559	5.0904
20.1258724485696	16.0357929048355	7.89984503186611	21.2889	20.2133	0.1771	12.2867
20.1670099194722	14.9494767137104	7.53878653953896	23.3217	16.9506	6.2856	12.0877
20.2042745303328	13.9654305427648	7.21171955250604	27.0312	22.0371	1.4535	12.0381
20.241461329401	12.9834397561818	6.88533564896379	7.8039	17.6061	5.7787	13.3149
20.4288513419584	8.0350407575127	5.24063822986856	16.9397	16.157	0.3423	23.6795
20.5195851789542	5.6390394344928	4.44428008757114	23.9142	5.5856	8.3806	20.6816
20.6137665407666	3.15200122595646	3.61766412578092	22.4003	2.9895	12.1851	21.9707
20.7028054532604	0.800758872306913	2.83618285848948	19.4163	-0.8394	2.2943	2.1538
24.8519683127738	1.82832913159147	3.16760487814277	26.7943	-2.6353	5.1743	24.1177
30.4112845005195	3.20513412296878	3.61166548635843	31.0707	1.7474	5.3999	2.3995
32.1075022647494	4.09403738841064	3.24521114931616	28.0443	7.2557	0.5495	23.7219
35.0989523086952	5.6617075495369	2.59893204606163	44.8479	-0.9391	15.0769	19.1888
38.1092930362318	7.2392776391434	1.94857151892863	42.4139	3.5597	1.814	13.287
41.1045398817578	8.80893731890731	1.30147216158218	52.3291	3.6705	6.1162	19.2214
44.114179229353	10.3861396608813	0.651263368983488	46.5714	10.174	4.4604	27.098

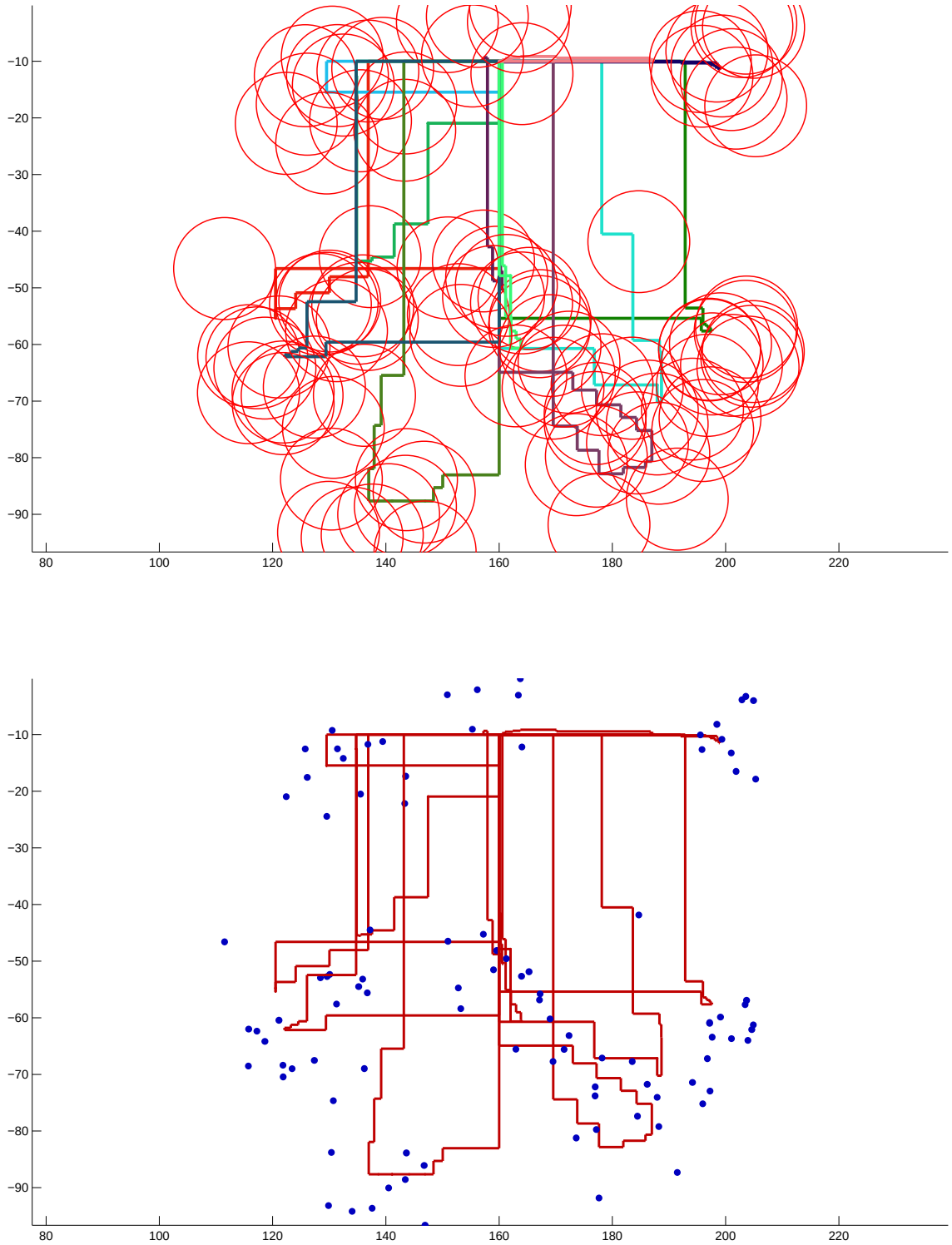


Figure O.105: *team*1_100, Equal Radius, 2D, Manhattan, Length = 1628.0615550

Table O-108: Solution for *team*1_100, Equal Radius, 2D, Manhattan

Total distance: 1628.06155498709			
Total demand met: 543			
Depot: x 50 y 10			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 170.442129202491 Demand Met: 46			
82.8544339325464	53.5805070389697	87.173	60.998
85.987790911148	56.4151394978565	91.043	63.691
86.6205227886809	56.8735879202344	89.091	59.886
87.1607693142088	56.9867326222572	94.894	61.262
87.1607693142088	56.9867326222572	93.456	57.69
87.2373259796024	57.3180683052866	94.619	62.103
87.5800709339164	57.6409936673291	93.946	64.003
85.7049676587725	55.3811517218032	93.694	56.925
Route: 2 Length: 169.72165339537 Demand Met: 46			
26.892006384894	48.0466646061039	26.732	55.612
20.0383147185087	50.8770855147943	18.45	52.954
14.0682472927442	53.6860349219746	11.123	60.442
10.5270013088492	55.3878280065342	8.64100000000001	64.188
10.5270013899156	54.7787449625379	5.777	62.003
10.5270013899156	54.7787449625379	7.235	62.367
10.527001500845	46.5990447914973	1.527	46.599
Route: 3 Length: 177.790623808569 Demand Met: 46			
68.1274976913776	40.5135649696905	74.679	41.865
73.6126162700888	59.2792165112864	73.523	67.727
78.3153870650302	61.158856663861	87.18	60.86
78.6449629777147	63.491417935116	87.633	63.432
78.6773129890383	70.2179987507514	87.252	72.952
78.2132278635329	70.2179989152462	78.214	79.218
77.9050007848065	67.1465385140247	84.146	71.427
77.9050007848065	67.1465385140247	86.785	67.217
66.8077492635192	60.711110026421	68.193	67.124
Route: 4 Length: 71.842266710392 Demand Met: 46			
19.5279385029123	15.4490718581083	12.414	20.962
19.5279385029123	15.4490718581083	19.569	24.449
19.5279385029123	15.4490718581083	16.123	17.568
19.5279385029123	15.4490718581083	25.542	20.506
19.5279385029123	15.4490718581083	22.494	14.202
19.5279385029123	15.4490718581083	21.459	12.53
Route: 5 Length: 80.906140461693 Demand Met: 39			
82.0345381563334	10.3023940978333	88.457	8.185
87.2440216861529	10.6076211512527	92.889	3.855
88.1060367820201	11.0557369121663	91.007	13.249
88.9534750417942	11.4995951890523	95.317	17.864
88.806735470715	11.019826918086	89.359	10.839
88.6607797257939	10.5413219061874	93.574	3.255
88.4931131743743	10.2458356850196	94.926	4.006
86.5623425772458	10.1250831666549	91.857	16.502
Route: 6 Length: 121.469993471141 Demand Met: 46			
24.7720014740938	12.5488248130668	15.772	12.549
24.7720014740938	12.5488248130668	20.541	9.26
24.7720014740938	12.5488248130668	26.839	11.732
24.7720014740938	12.5488248130668	29.447	11.243
24.8410567074079	45.4453037342809	19.619	52.734
25.2010016104828	45.5069982096641	25.201	54.507
25.558867221449	45.2806273652294	20.103	52.347
27.5542896266012	44.560064439567	25.923	53.185
31.4633263257152	38.7237430157441	27.219	44.51
37.453324438916	20.9444643233929	33.341	22.178
37.453324438916	20.9444643233929	33.5	17.352
Route: 7 Length: 89.3882907436034 Demand Met: 45			
47.2320655888036	9.34486107288128	40.868	2.981
47.947429738832	42.749895303733	40.978	46.49
48.8453585046563	48.7643687392407	42.804	54.74
50.4236042288373	50.1148599755928	57.243	55.792
50.7769855527486	50.4940864807379	57.142	56.857
50.5212122955585	46.9553583416543	55.281	51.871
50.2596738235748	41.62146326588	49.571	48.14
50.2596738235748	41.62146326588	47.232	45.27
Route: 8 Length: 201.332114315668 Demand Met: 46			
33.175026616684	65.4538257927592	26.213	68.977
29.1717455672658	74.2935178302162	20.735	74.659
27.932878318812	81.925241355787	20.393	83.793
26.9699435518901	87.6360007097241	19.881	93.181
28.682598804566	87.6359988671427	24.053	94.189
31.1122405103217	87.6359970123495	27.59	93.644
31.1122405103217	87.6359970123495	30.503	90.056
34.1165441520519	87.6359951503227	36.762	86.092
36.9282339919551	87.6359932875841	36.924	96.636
38.4161555278458	85.276314911786	33.626	83.869
40.0448086353502	83.0286155156885	33.443	88.578
Route: 9 Length: 199.593946315208 Demand Met: 46			
59.5573059472042	74.404082081078	63.631	81.224
63.8018352311932	78.6627594542729	67.179	79.746
67.6429995156618	82.8289866611395	67.643	91.829
71.9310140265749	81.7056800387156	74.447	77.382
75.853764404123	80.6430226875515	81.476	87.316
76.9679864964644	75.193906455767	85.968	75.194
74.2680327713957	72.8971803158785	76.154	71.763
71.4935213609934	70.6607352752768	77.919	74.057
67.1966341201733	68.0479125089237	66.957	73.797
63.0219782697982	64.9134142303087	66.971	72.201
Route: 10 Length: 180.136143647104 Demand Met: 46			
24.7454712796586	52.459857585339	21.299	57.593
16.0698538945679	60.6192222778323	13.454	69.007
14.5373967642421	61.2397986320924	11.844	68.394
13.2305186986413	61.7787106297531	11.878	70.444
12.1028839702262	62.1709557937782	5.739	68.535
19.4275279371201	59.5827972334446	17.374	67.529
Route: 11 Length: 109.252444377423 Demand Met: 46			
50.5732936099728	46.1091550037786	49.02	51.541
51.1488023066238	55.1053178412479	43.243	58.404
52.0864936461828	57.6305578054995	52.975	65.56
52.9995281594003	59.0276366452358	59.007	60.213
53.8516719952599	60.4102235758426	62.352	63.144
53.9617916720404	60.6644302572454	61.493	65.592
53.9617916665608	60.6644305166713	59.534	67.732
52.0141510145898	47.8748037474918	53.958	52.681
52.0141510145898	47.8748037474918	51.29	49.58
Route: 12 Length: 56.1858085384308 Demand Met: 45			
50.5145005921223	9.74659043602772	45.293	9.057
51.040338837553	9.49359079746101	46.154	2.083
52.4071587070998	9.31945167940639	53.405	3.041
53.7550280980291	9.14800138755299	53.754	0.148
60.1197728563806	9.43570078450612	54.032	12.197
76.745865706899	9.72028741030428	85.554	10.061
77.2409056567684	9.99999965272329	85.841	12.653

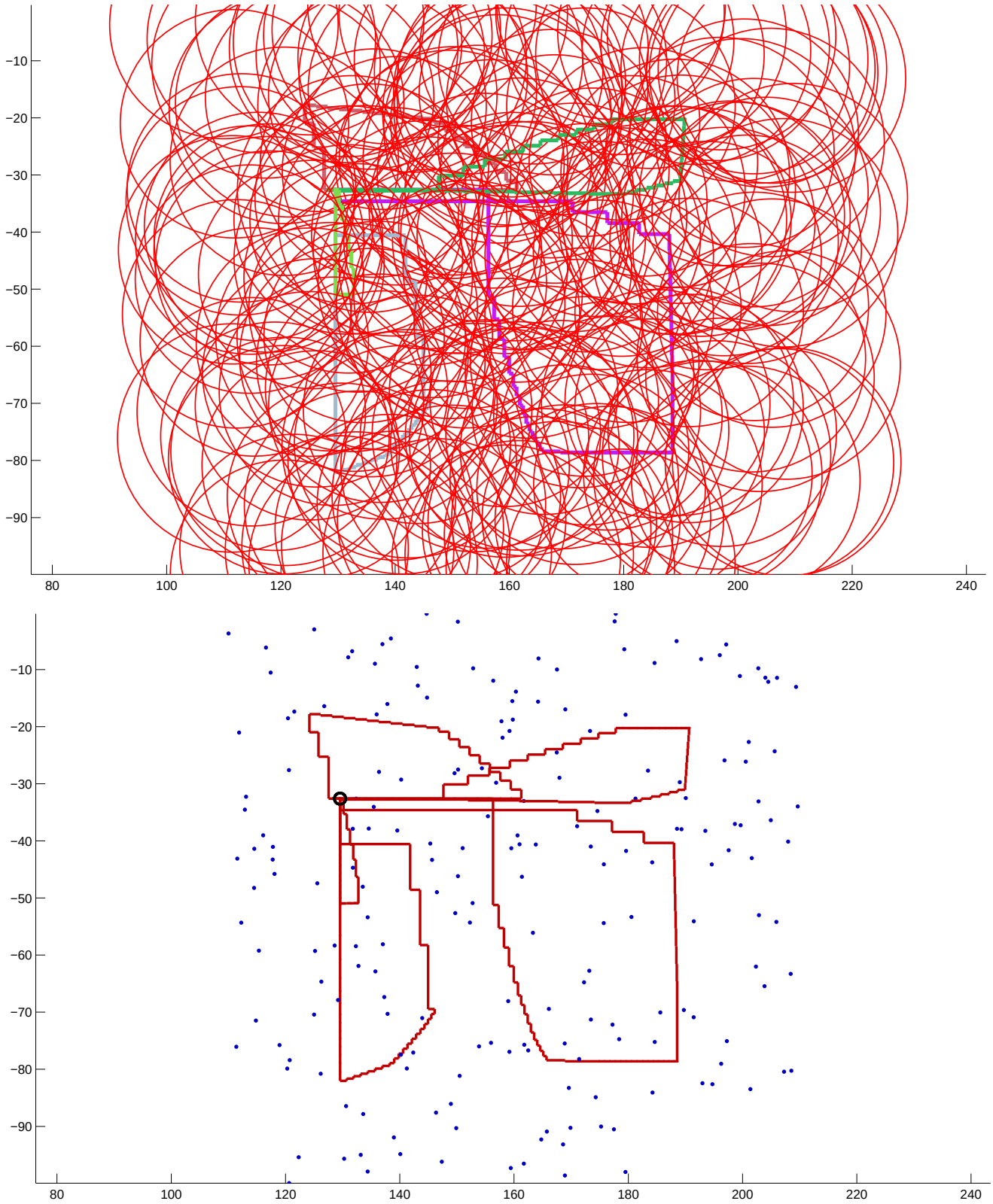


Figure O.106: *team*2_200, Equal Radius, 2D, Manhattan, Length = 640.1980808

Table O-109: Solution for *team*2_200, Equal Radius, 2D, Manhattan

Total distance: 640.198080814187 Total demand met: 617 Depot: x 19.5535 y 32.6157			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 103.8018831456 Demand Met: 120			
17.5360876850835	25.2633154396734	7.39533	10.545265
15.7738831933754	20.9880111075268	6.5851	6.152225
14.1662625863859	17.82154160844	0.024124999999998	3.6794065
16.1447253533458	18.0479145963412	15.031135	2.9821155
18.1617109027991	18.2765649603832	21.673354	6.8005655
20.1788776099055	18.5063802054119	20.9699	7.87089
22.2214625614768	18.7373568579567	25.662895	8.989655
24.2722713202864	18.9695112622386	26.97316	5.55935
26.3302892082765	19.203768849703	28.448025	4.56492
28.3989822331166	19.4406740795204	32.973595	9.54291
30.4686079244333	19.6788499171262	33.169445	12.82499
32.5593084914142	19.9177546164366	34.77264	14.924575
34.6767271795543	20.157129141046	34.695715	0.250565
36.8306810388548	20.8934706890786	40.16046	1.62977
38.6235509826712	22.2094977761145	42.845635	9.79738
40.4173809745634	23.5810887043948	46.358401	11.954405
42.2000881705038	25.0093182230095	47.801417	19.06334
43.9877161950643	26.4618276654331	49.796921	18.777515
45.7776878348965	27.9483782658818	49.216563	20.76273
47.586920404675	29.4669550251045	47.997827	21.94091
49.4344741178248	31.0207247220026	57.48649	24.517395
51.273045767626	32.6128884367268	71.273045	32.62062
49.5002530999344	32.6130758794626	64.595135	34.78327
47.6052742531226	32.613263324323	61.04328	37.44322
45.6153664500703	32.6134507622802	53.824634	40.64213
43.6067102427002	32.613638211765	49.52113	41.29678
41.60077522719	32.6138256747873	50.608737	39.047145
39.56965350335	32.614013155039	51.719243	33.03008
37.4753507210201	32.6142005864486	45.420784	35.70231
35.3714983925794	32.6143880697784	46.870011	29.816545
33.207926784467	32.6145755358109	44.38625	27.294685
30.9771862854127	32.6147629863768	40.19826	27.52955
28.7108612060125	32.6149504413938	39.58443	28.150345
26.3784118468508	32.6151378886541	30.249755	29.28668
24.0701338245639	32.6153253580346	26.379295	27.934205
21.7998271995311	32.6155127964397	22.373755	32.6144
Route: 2 Length: 210.091281170388 Demand Met: 120			
46.3121750232976	51.2403357090232	65.705495	54.4013975
47.3068046090746	55.2637356850485	63.17424	62.764205
48.2252859718145	58.6913626528103	62.26967	64.78212
49.1161622089209	61.9444578198477	63.457115	71.302795
49.9597967203328	64.7855861369458	67.24276	72.18951
50.6823382135474	67.0652245132348	68.40623	74.741575
51.2535022234357	68.7291206864604	58.86286	75.490835
51.8239493314133	70.3747207538138	61.393495	78.21387
52.3911617455609	71.989739499414	59.609455	83.27302
52.9563447380773	73.5493964110514	59.88564	90.256965
53.5090824709411	74.860577964646	58.59379	93.155945
54.0446128306511	75.845430616509	55.7501	90.920415
54.5821118409516	76.791505179443	54.766852	92.295455
55.122983567997	77.6981951784047	51.725585	96.536445
55.6814223328492	78.4292256261736	49.437672	97.29667
58.9162999292608	78.6093198829448	58.9163	98.60932
64.9274414838211	78.6093197781869	69.51155	98.000325
65.8519346689603	78.6093196704139	67.48261	90.51293
66.7814450348613	78.6093195617828	65.23767	90.033385
67.7225040281593	78.6093194539137	64.30468	84.91
68.6779640109354	78.6093193464441	74.234205	84.088705
69.6338898163728	78.609319239263	74.635475	75.231085
70.5924533191707	78.6093191317207	75.60926	70.05143
71.552619374084	78.6093190236102	79.72973	69.6285
72.5064190112898	78.6093189149116	81.449	70.90379
73.453486039771	78.6093188061379	87.254685	75.06877
74.3760080523882	78.6093186966991	86.26193	79.048
75.2866899878653	78.6093185871961	82.980165	82.460215
76.1966680881311	78.6093184788249	84.72455	82.62255
77.1044069306522	78.6093183708489	91.37176	83.481715
77.9844677491975	78.6093182634301	97.272905	80.426715
78.6055207022493	78.6093181545764	98.53739	80.25874
78.5509592633463	64.5844813219056	98.425325	63.29758
78.4835120007195	61.5758677859065	93.854515	65.44994
78.4158781706388	58.4783078003423	92.344515	62.02096
78.3481373796758	55.3284656947059	95.92709	54.202926
78.27990594876	52.2989140216433	92.878595	53.021252
78.2114909254057	49.2903930967727	81.466395	54.091358
78.143179920819	46.2534941464402	84.61874	44.121625
78.0749268657269	43.282265476225	91.6164	43.026115
78.0065587877155	40.3491360905468	97.982935	40.137435
72.7078139336516	38.4288357132772	83.48933	38.25693
67.1436659656549	36.5222609018691	79.319755	37.96047
61.0322443492123	34.6152519997013	78.52122	37.890255
Route: 3 Length: 2.74057358346117 Demand Met: 35			
19.3909393481578	32.6157000104875	24.567885	37.86062
19.2243414180711	32.6156999707297	29.577285	38.20107
19.0548298077259	32.6156999612209	27.827995	16.04415
18.8802508722376	32.6156999167354	25.954135	17.869355
18.704859303431	32.6156998782217	16.776285	16.423415
18.5295603078142	32.6156998356569	11.54701	17.37734
18.3550489508375	32.6156997934413	10.44323	18.54025
18.1832134704545	32.6156997483024	1.87583499999999	21.036865
18.8608041452719	32.6156998994954	10.613375	27.61233
Route: 4 Length: 131.947755883149 Demand Met: 120			
19.5534999691786	51.2217783453232	27.294235	67.36467
19.5534999668405	56.5473110023362	27.85894	70.297015
19.553499964445	60.7344683625601	33.93752	71.055425
19.5534999622282	64.0043693963482	32.35548	77.08328
19.5534999602469	66.3025865574147	30.1948	77.47401
19.5534999584103	68.4323464866182	31.22881	79.877355
19.5534999565825	70.3703039297239	23.602775	87.83846
19.5534999546871	71.8543392923856	20.60172	86.45345
19.5534999526088	73.2487654272325	16.17437	80.77798
19.553499950385	74.6328839295781	10.737535	78.399525
19.5534999480745	76.0207287950159	1.401765	76.07236
19.5534999449193	77.4334473794953	4.81189000000001	71.48163
19.553499941509	78.9304749581746	8.96414	75.77293
19.5534999380722	80.4700377482869	10.302265	79.88844
19.553499934672	82.0390687051834	10.636965	99.941455
20.6939042057405	81.6360577272624	12.30828	95.415795
21.9118136010359	81.2168856051757	20.26183	95.676245
23.1516992359495	80.7864420584268	23.159665	94.99055
24.4053054397715	80.3474044869044	24.384515	97.907795
25.677524374319	79.881043237777	28.966505	91.93771
26.9517050499095	79.4110506702125	30.09705	94.85711
28.2212879914114	78.9293186558981	37.353615	96.195315
29.0262387327691	78.1090816494308	39.89323	90.309885
29.8028706659129	77.2556466856837	36.34587	87.597465
30.5769894987828	76.3932546401087	38.950185	86.058925
31.3448273682126	75.5215569064978	40.48646	81.157135
32.1084568134075	74.6504465823394	43.88264	75.9979
32.863557983458	73.7870798639852	45.96408	75.36881
33.606513741486	72.9305339699609	49.200624	76.95068
34.3204587501644	72.0717076529004	52.486843	76.711165
34.9401262611626	71.1865413821511	51.801592	75.702955
35.5264505873462	70.307926175801	48.983044	68.08194
36.104009171063	69.448614716221	56.10401	69.44853
34.9542243429727	58.2581417139404	53.302235	56.10093
33.5516215013016	48.5822483821488	51.37375	46.298003
31.8035496358878	40.5638551108042	50.972003	40.60627
Route: 5 Length: 148.517770679932 Demand Met: 120			
37.6301530071329	30.111441069796	49.707097	15.54357
41.9146556737	28.5651971657054	50.337118	13.87323
45.6883480207782	27.2058612509209	54.207021	15.63022
49.2645543260568	25.9211428553488	54.294115	8.069135
52.3942154337528	24.8993797104494	57.51838	10.00522
55.4438349764338	23.9422785670906	58.979255	16.987345
58.5451336097418	22.9990895945326	63.31789	20.756115
61.6802877041282	22.0604822582955	69.52818	17.90893
64.7674624664476	21.1303267903551	69.299455	6.449115
67.7947811429983	20.2453924737723	67.794775	0.2453923
69.0305881498818	20.2453924778336	67.61759	1.570395
70.3184056846366	20.2453924685943	74.60069	8.85595
71.6218214342737	20.2453924884892	78.44886	5.02628
72.9226363938435	20.2453924905982	82.741185	8.18936
74.2047973349554	20.2453925022272	86.016245	7.495035
75.4225049513476	20.2453925163979	87.144585	5.62369
76.4899664003854	20.2453925125356	89.544625	11.14329
77.5179487519796	20.2453925248912	92.761655	9.792985
78.4181063213279	20.2453925302516	93.997115	11.43328
79.2413926817869	20.2453925373345	94.4971	12.154995
80.0152933275118	20.2453925474625	96.04228	11.46233
80.7153758702918	20.2453925539156	99.37313	13.042045
80.6287111430299	21.4555753575306	95.62369	24.314785

Solution x	Solution y	Original x	Original y
80.5418050048263	22.65456448879	91.09643	22.6866
80.4550457343045	23.859037389249	90.572985	26.136825
80.3684017232129	25.0611432033281	86.845365	25.906095
80.2820463791779	26.2664233486062	73.44882	27.71684
80.1962704791426	27.4735854900667	79.01289	29.7258
80.1107931993867	28.6808817310829	80.066985	32.520545
80.0256364394014	29.884288753233	92.788305	33.10169
79.9406711487741	31.0801182620816	99.67714	33.98061
78.6302905480994	31.4639246717036	94.955665	36.40187
77.1504044045336	31.8444410130307	89.661665	37.28143
75.6179388372238	32.2235730043068	88.660005	37.051535
74.018052918623	32.6014754297838	87.57797	41.66484
72.2701953072479	32.9733841055412	74.17807	43.76639
70.5547454636578	33.3424019303449	70.55475	53.342402
64.0846788914822	33.1982429708712	69.610075	41.75992
57.7251141628581	33.0537764276293	65.72564	44.111465
50.8889416016758	32.9084541585546	63.437195	41.00367
41.9272947315718	32.7623311818445	57.95186	28.956245
Route: 6 Length: 43.0988163516568 Demand Met: 102			
20.142601643268	35.2989201724471	25.46019	34.06066
20.7209753178655	37.9991218745174	35.347265	40.483415
21.2929690207253	40.6640528821931	35.65863	43.345715
21.8572232162611	43.2864803141869	41.00732	41.27668
22.3172898349631	46.3194303073354	40.184205	46.1874365
22.7533346533758	50.908435172479	42.753335	50.906813
22.6621013541134	50.9132045542839	42.291825	54.317701
22.3851668755337	50.9179393464203	39.724355	52.657318
22.1011256868749	50.9226737125997	36.49954	48.989475
21.8143921982613	50.927409184236	23.528225	48.047471
21.5299346619628	50.932148230915	24.393135	53.387308
21.2469832412394	50.9368884814252	27.03592	58.11764
20.9639625233416	50.9416276779175	25.726765	62.875185
20.6806586730357	50.9463627818185	22.77816	61.91876
20.3978413484343	50.9510942196534	22.32618	58.45293
20.1154644555462	50.9558251503609	18.601355	58.3359
19.8344170865969	50.9605557824743	19.19225	67.891335
19.5535018471336	50.9652735224526	14.99811	70.439575
19.5535017373231	50.0222804712872	16.28216	64.658715
19.5535016275166	49.0356569095524	15.17562	59.299125
19.5535015177151	48.0316909054965	5.35044999999999	59.245825
19.5535014079317	46.9205049212973	2.26291999999999	54.336059
19.5535012981711	45.6107299372397	4.493385	48.2428075
19.5535011884259	44.2998686642046	1.56824	43.114435
19.5535010786988	43.0393959941924	4.535275	41.40327
19.5535009689859	41.8090852632458	2.888575	34.539165
19.5535008592894	40.7040344029308	3.09506	32.271765
19.5535007496104	39.7201769295571	6.09162499999999	39.029145
19.5535006399438	38.7461515255186	7.79806000000001	41.063165
19.5535005302935	37.7728617155917	7.76846999999999	43.27595
19.5535004206714	36.7905971853361	8.071465	45.7971455
19.5535003110876	35.7829235883593	15.566305	47.445917
19.5535002015162	34.7485029037746	21.800035	44.699325
19.5535000919146	33.6943214215811	21.779985	37.899125

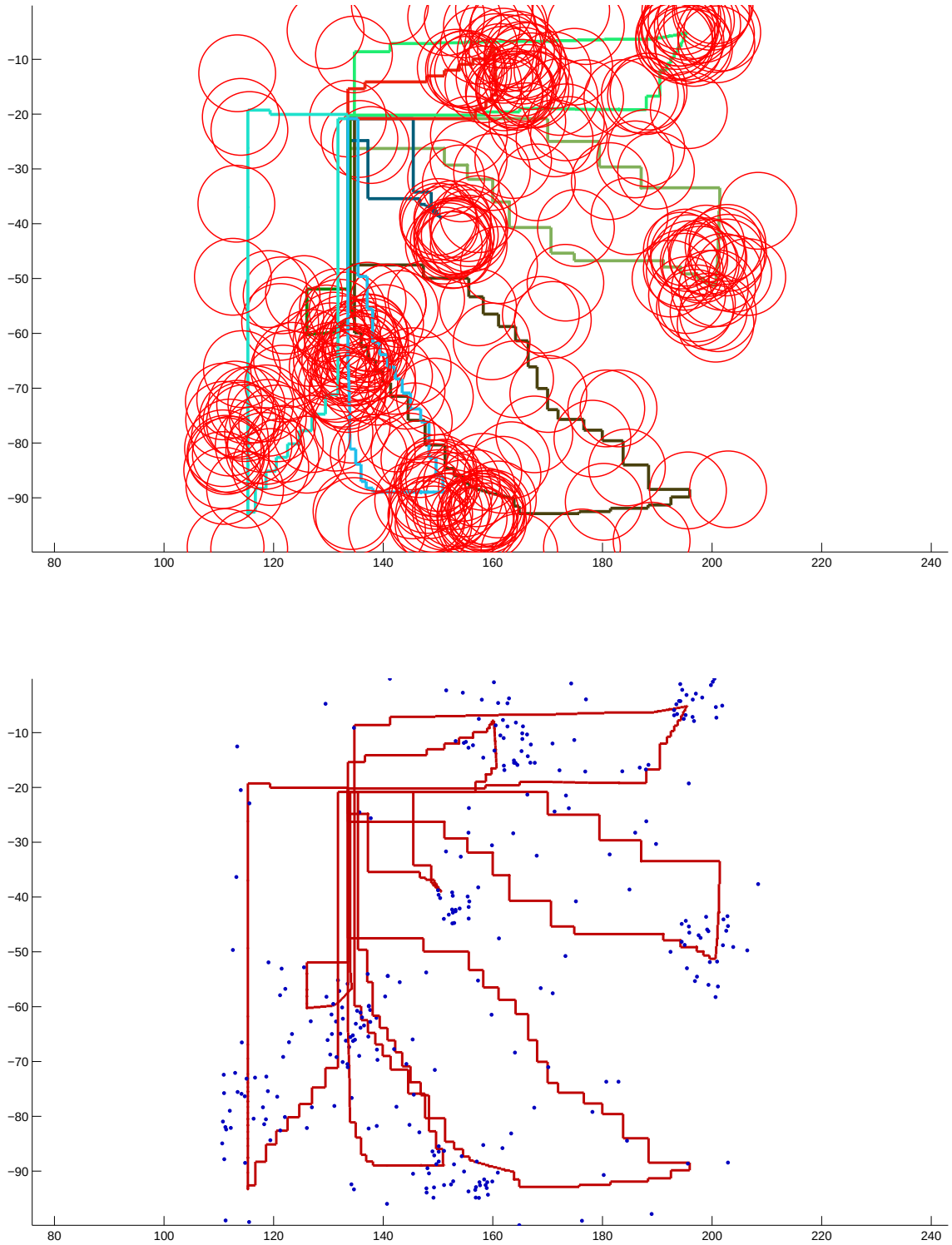


Figure O.107: *team*3_300, Equal Radius, 2D, Manhattan, Length = 1223.2121977

Table O-110: Solution for *team*3_300, Equal Radius, 2D, Manhattan

Total distance: 1223.21219773295 Total demand met: 9490 Depot: x 23.55 y 20.83			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 196.579979412291 Demand Met: 1297			
60.0123037049011	24.9783047117339	63.88	23.81
69.4511622069479	29.6477673861884	71.33	32.23
77.0734445782217	33.4408011448987	74.93	38.63
77.0734445782217	33.4408011448987	79.79	30.32
77.0734445782217	33.4408011448987	75.98	28.26
91.4099949022353	37.6399918800614	98.41	37.64
91.2636906257188	42.8047022326096	92.92	45.3
91.2636906257188	42.8047022326096	92.82	43.5
91.2636906257188	42.8047022326096	92.09	44.08
91.2636906257188	42.8047022326096	85.78	45.37
91.2636906257188	42.8047022326096	85.21	44.35
91.1311846983296	45.0924307706956	88.92	43.62
91.0000510006117	47.5608477020961	96.43	49.73
91.0000510006117	47.5608477020961	93.86	49.11
90.8793560652844	48.9757418766884	92	48.8
90.7603754598786	50.4123719369164	91.08	56.32
90.6511660080887	51.25999480391	90.65	58.26
89.5413780225347	50.6621222317965	89.36	56.03
88.408887204459	49.9321457973412	90.93	51.78
88.408887204459	49.9321457973412	89.59	51.88
87.1907748623302	49.1570946517103	86.88	55.34
87.1907748623302	49.1570946517103	87.26	54.53
87.1907748623302	49.1570946517103	92.59	46.16
87.1907748623302	49.1570946517103	85.43	53
87.1907748623302	49.1570946517103	89.33	46.23
87.1907748623302	49.1570946517103	87.92	47.46
87.1907748623302	49.1570946517103	89.11	45.94
87.1907748623302	49.1570946517103	87.56	46.99
84.2346345543203	47.8997328838247	85.85	46.49
84.2346345543203	47.8997328838247	84.47	44.91
81.08862613995	46.7607909198357	85.02	48.75
81.08862613995	46.7607909198357	84.47	48.16
81.08862613995	46.7607909198357	82.42	49.99
64.8607778385646	45.3718517480216	63.26	50.77
60.6125318608037	40.6935880559351	65.16	40.78
53.0045943187374	36.0173430438273	58.02	32.46
53.0045943187374	36.0173430438273	47.34	38.25
49.9806777149234	31.8966874840598	53.73	28.37
49.9806777149234	31.8966874840598	49.85	30.56
45.3429870939276	29.2961654524582	44.15	32.64
45.3429870939276	29.2961654524582	45.57	28.26
41.1629351506586	26.2793819989007	41.47	31.69
41.1629351506586	26.2793819989007	45.63	23.76
Route: 2 Length: 268.839987634688 Demand Met: 1295			
24.7612031609601	59.9182326965351	24.86	66.05
25.9639363543061	62.4575197748148	24.47	65.24
27.2017493207596	64.7784447562596	23.78	67.37
28.5510908291543	66.8937418905921	28.86	67.84
29.8983605167541	68.9873854301951	27.28	65.47
31.3529898571819	71.4848523328793	25.62	68.98
34.5394284577026	75.860327826748	35.58	76.06
37.6336435602687	80.3519704642054	34.79	81.57
41.2772947155954	84.6537596242158	44.75	90.08
42.9362037362697	86.0055072794232	44.33	87.3
44.5566116120908	87.3424920850969	46.8	93.43
45.7358785966406	88.0758217150071	46.89	94.85
46.4575695609894	88.2977063658709	47.08	88.26
47.1774421992168	88.5201395531919	47.48	94.9
47.8858403875107	88.7204095902818	47.67	92.59
48.5973332981881	88.9185187321441	47.56	92.03
49.3177418489336	89.1152462741696	49.11	94.31
49.3177418489336	89.1152462741696	48.89	93.1
50.0452391816191	89.3050353519596	49.91	91.9
50.7735844136036	89.4939258621565	50.91	90.3
51.50071108422	89.6827976491039	48.68	92.55
52.2494844456914	89.8702346727177	51.75	85.81
52.2494844456914	89.8702346727177	48.25	85.26
53.1164040601369	90.0706066833583	53.35	83.14
53.8770048152265	91.515573868433	48.98	92.03
53.8770048152265	91.515573868433	48.42	91.53
54.8299975410972	92.8799971246338	54.83	99.88
65.7506642810609	92.5159596422334	66.26	99.07
71.4749736993787	91.9077879600675	70.23	90.73
78.323569176514	91.3085840407272	78.98	97.83
82.4892096739191	89.8607032682389	85.6	88.65
85.9199966927103	88.4600091808619	92.92	88.46
78.4184244110814	84.0092644599019	74.49	84.46
73.7615101408169	79.5858304339555	72.93	73.7
69.9673954962822	77.672989308025	68.17	79.21
66.6018887890123	75.7082068615374	70.7	73.7
61.9062959148974	73.9262790852057	57.57	78.44
59.9843284101562	70.06221030378	60.12	71.05
58.0780481208855	66.1173561346436	54.05	68.39
56.4604430669096	61.3655389255422	60.94	57.56
54.1540908453654	58.7480409722042	58.75	56.63
51.0316422241113	56.4912762613679	49.78	61.48
48.2592755524573	53.3193613540758	47.3	55.25
45.6172374282757	49.9345869998475	51.12	47.54
37.331349449125	47.524844371101	37.85	53.76
Route: 3 Length: 155.700985695903 Demand Met: 1273			
24.736134699995	8.62286480464116	19.48	4.75
31.2470560273933	7.113369669411	31.22	0.18
39.5118385992819	6.98174722093965	41.49	2.29
45.0299717891991	6.8514262090462	44.53	2.72
51.0671292919109	6.72231034923748	48	4
61.4919333296813	6.59401670710956	64.87	11.36
65.3921115939248	6.46232334186016	64.3	1.03
70.341461284628	6.33346757370947	67	3.94
79.4079747345851	6.20525794815266	85.34	3.13
80.1272410839562	6.08467859259122	83.08	5.9
80.1272410839562	6.08467859259122	83.08	6.85
80.8365775475675	5.96392568223005	83.63	6.61
81.5320227074881	5.84298448501555	83.5	4.83
82.2205683814217	5.72217692062631	84.22	4.25
82.2205683814217	5.72217692062631	83.98	4.24
82.8944275108574	5.60181769288023	84.21	1.15
83.5587410255773	5.48289425252527	84.57	2.19
84.2211770176508	5.36470497426857	87.06	2.89
84.8629676434835	5.24712021916151	86.49	3.97
85.5002490614275	5.12974944948305	90.45	0.18
85.41144485978	5.2841862244121	89.81	1.33
85.3197570211462	5.44366576879626	88.21	3.61
85.2277846814638	5.60358471691662	90.14	0.74
85.0838737012478	6.09905333992342	91.86	5.09
84.7485440075227	6.87842764670575	90.71	5.35
84.3485667524554	7.76266706748477	90.79	7.27
83.7261927783386	8.72432330198072	85.18	6.81
83.1008682073803	9.71875029590702	84.85	7.49
82.4696771388881	10.757525225687	86.46	7.15
81.7711905584574	12.0094969953507	86.71	7.9
80.4698306502963	16.7185807142227	85.76	19.27
78.0099993790408	19.1899963422752	78.01	26.19
73.0049777122306	19.1498355624502	78.41	15.88
73.0049777122306	19.1498355624502	77.94	16.73
73.0049777122306	19.1498355624502	76.81	16.4
73.0049777122306	19.1498355624502	73.63	17.07
73.0049777122306	19.1498355624502	66.87	17.1
67.3952320533851	19.1100904896512	62.16	16.88
64.9831623069715	19.0706389078321	63.35	21.49
62.786734257233	19.0308118272108	61.27	24.41
60.8900036017752	18.9900031062684	60.89	11.99
54.8902873688344	19.5966134173644	56.31	21.31
48.64708828805	20.1933553944883	52.12	16.84
Route: 4 Length: 70.5009991462143 Demand Met: 622			
35.4870930974597	34.2202856789327	40	38.77
38.7547246326535	37.4599944500721	43.21	42.61
39.190280448762	37.8595313137496	43.21	42.35
39.190280448762	37.8595313137496	42.56	42.28
39.5720031643508	38.2060890969538	42.72	42.84
39.5720031643508	38.2060890969538	41.97	43.22
39.9285516728352	38.5162780806259	42.95	44.74
39.9285516728352	38.5162780806259	42.62	44.81
40.1197316443337	38.6342686766868	45.6	41.81
40.2971781414808	38.7491633830306	42.59	39.16
40.4740841720079	38.8644817229122	42.69	39.78
40.6504466125617	38.9800529605455	45.6	43.93
40.3492380585931	38.5250588330767	41.07	43.98
40.0477579359976	38.029887332026	45.71	40.8
39.7085309508226	37.4875751267094	43.96	42.1
39.3366555447929	36.8450940391759	45.42	39.91
37.7399970239782	36.4805395428137	40.4	40.19
36.6729391877443	35.4257247080874	40.11	39.6

Solution x	Solution y	Original x	Original y
27.2144805731612	24.8298888148729	27.74	25.63
27.2144805731612	24.8298888148729	25.65	24.53
27.2144805731612	24.8298888148729	23.55	20.83
Route: 5 Length: 95.2709354016065 Demand Met: 1211			
23.9664702973324	53.8088618358089	30.83	54.42
24.1074077901981	55.6269794349188	27.62	60.61
24.2452676385432	56.7089501385486	28.77	62.05
24.2452679132743	56.7089503044594	30.85	54.39
24.0834355038638	56.9224762588815	30.36	58.14
23.906403206879	57.1315919299349	26.15	61.96
23.7274169636079	57.3344698613148	25.01	63.12
23.5466850417153	57.5266687261206	21.75	55.19
23.3669604893979	57.7204905166433	21.99	57.15
23.1879401537038	57.914900829441	23.5	55.84
23.0089525143463	58.1106579325227	27.36	59.94
22.8270042000961	58.3051266173173	27.4	59.84
22.6417047855777	58.498554524893	25.84	61.09
22.4545737390763	58.6905086401018	22.65	62.2
22.2674958605655	58.8807128240724	25.24	60.77
22.0789506574999	59.0701590570452	22.51	60.15
21.8903900037078	59.2594792744264	21.39	62.71
21.7022697329392	59.447182636275	27.64	62.78
21.4031564785039	59.6036005261892	22.17	64.94
21.1023336420468	59.7563209372238	23.19	66.22
20.7291786156226	59.8754038848008	26.5	63.44
19.6501153278163	59.9823235073441	20.64	65
18.5377282324874	60.0877488396161	19.86	66.11
17.2954744326545	60.1892754575179	16.79	62.67
16.0700009915223	60.2902007790512	12.82	66.49
16.0700010062629	59.4351345286111	13.36	65
16.0700010226823	58.1121233467948	11.18	57.92
16.0700010226823	58.1121233467948	12.14	56.76
16.0700010387443	56.8983332756828	20.56	61.44
16.0700010387443	56.8983332756828	20.88	59.51
16.0700010387443	56.8983332756828	19.65	58.2
16.0700010516699	53.9733214814384	11.46	53.07
16.0700010516699	53.9733214814384	15.54	52.83
16.0700010663693	51.9200010636413	9.06999999999999	51.92
Route: 6 Length: 80.2399869721875 Demand Met: 1222			
46.8313247511719	18.9550815699739	52.03	16.04
48.7460695497824	17.6131103129065	54.15	15.54
48.7460695497824	17.6131103129065	54.5	15.91
49.7647130619825	16.5295109447188	53.85	15.08
49.7647130619825	16.5295109447188	53.87	15.51
50.6599964701487	15.5099994116519	57.66	15.51
50.618424165366	14.6848031175865	56.85	15.49
50.5757691073444	13.8093831013747	56.94	12.18
50.5757691073444	13.8093831013747	56.38	14.32
50.5306819950702	13.0690470688768	50.3	13.28
50.5306819950702	13.0690470688768	48.26	14.58
50.4856251340067	12.3177760222526	55.24	13.37
50.4402655151582	11.5515102126449	51.98	10.99
50.4402655151582	11.5515102126449	51.38	10.51
50.3948228695786	10.8006575379265	55.4	11.17
50.3490356869399	10.0443447697753	56.26	10.34
50.3490356869399	10.0443447697753	55.38	10.13
50.3020655176203	9.2772539841131	51.86	7.7
50.3020655176203	9.2772539841131	50.52	8.68
50.2550326970206	8.52931567869218	50.97	4.59
50.2079579025333	7.82000298405494	50.21	0.82
49.8171018350288	8.44077036759616	52.96	3.75
49.8171018350288	8.44077036759616	52.67	4.65
49.402380563855	9.1625980509327	54.22	8.18
49.402380563855	9.1625980509327	52.67	8.88
48.96230797702	9.90001119389009	55.5	8.86
46.3881936705449	10.917581476719	47.45	7.49
46.3881936705449	10.917581476719	46.38	12.31
43.8345846828366	11.9806611454968	44.72	11.87
43.8345846828366	11.9806611454968	45.57	12.76
41.1637762562581	13.0375319387688	45.09	11.7
37.9441777518693	14.1260052497296	43.23	11.54
26.6635690376174	15.3670204179807	24.66	9.13
Route: 7 Length: 184.583754302363 Demand Met: 1281			
21.7330341846025	71.1810223654594	24.25	76.66
19.4489090981838	74.7490342297267	21.1	78.12
16.9994078373971	77.7665528125003	16.07	82.14
14.6763946023501	80.170730227097	12.07	80.14
12.5473194680794	82.6276059081043	11.23	82.6
10.4955351406163	85.1407394378807	8.28999999999999	81.45
8.60946033863827	88.2989034897871	9.41	84.38

Solution x	Solution y	Original x	Original y
6.67138997907172	92.6137561463888	5.54000000000001	99.29
5.29900472836083	93.3069702019094	1.23999999999999	99.01
5.29900511044416	90.2840089350097	4.8	88.51
5.29900549266256	87.5686722026144	1.01000000000001	87.83
5.29900549266256	87.5686722026144	0.620000000000005	84.95
5.2990058756135	85.3991621540168	0.760000000000005	80.97
5.299006259159	84.0840701510318	1.36	82.41
5.29900664302852	82.8369014131889	1.20999999999999	81.97
5.29900702724987	81.6269135269695	2.19	82.13
5.29900702724987	81.6269135269695	2.01000000000001	79.01
5.29900741210375	80.4947235102329	6.36	80.44
5.29900741210375	80.4947235102329	8.59999999999999	80.56
5.29900779698653	79.3820931448718	8.06	78.36
5.29900818185644	78.2967116530788	0.969999999999999	75.78
5.29900856725754	77.2860954797034	3.44	75.58
5.29900856725754	77.2860954797034	4.15000000000001	75.92
5.29900895323998	76.3285915659157	0.909999999999997	72.43
5.29900933999004	75.4984015867979	4.75	76.37
5.29900933999004	75.4984015867979	5.06999999999999	73.15
5.29900972734458	74.691885565998	8.95	75.43
5.29901011471016	73.8828136987523	6.62000000000001	72.96
5.2990105023013	73.0860262671976	8.67	72.77
5.29901088997617	72.2974198797758	10.66	76.44
5.29901127548312	69.4875816760721	11.74	69.17
5.29901166050234	66.9406470596834	2.98999999999999	72.09
5.29901204862625	61.7902647644892	4.20999999999999	66.53
5.29901243830754	49.3380379544124	2.56999999999999	49.67
5.29901282949884	36.9763678327392	3.20999999999999	36.35
5.29901322218419	26.1835002996221	5.58	22.9
5.29901361574318	19.2660883223668	3.36	12.54
9.35616515487777	20.0494137067024	4.01000000000001	20.5
Route: 8 Length: 171.4955691677 Demand Met: 1289			
25.3903046550551	49.627039780285	27.18	54.04
27.0670213195548	55.5107639018954	33.01	55.55
28.0698012366466	61.6601289636238	24.49	66.27
29.3571203758883	63.8818088001895	25.86	63.85
30.7903445771689	66.1540341403431	31.99	67.74
32.1892693519868	68.3263718179352	35.37	65.99
33.4597705029392	70.8814865167123	28.95	69.72
34.9859068649054	73.7814147140421	32.42	78.27
34.9859068649054	73.7814147140421	34.24	70.46
36.827279392892	76.171224529673	39.42	71.54
38.3508802869339	82.7440655335792	41.11	86.33
39.6352086981205	85.9626921083072	39.7	88.73
40.8860927486274	88.7091789438428	45.57	93.71
40.9737928711464	88.7977791603717	42.37	92.45
41.0610672511582	88.8885424253492	42.78	91.87
41.1477864778795	88.9799981059703	46.92	92.94
40.171790825797	88.9799977156717	41.11	92.55
39.1753521976573	88.9799973255202	42.93	88.78
38.0756477264868	88.9799969344409	40.14	88.25
38.0756477264868	88.9799969344409	39.31	87.14
36.9103074828934	88.9799965416423	39.18	94.86
36.9103074828934	88.9799965416423	39.28	92.99
36.9103074828934	88.9799965416423	37.93	93.92
36.9103074828934	88.9799965416423	37.88	93.16
36.9103074828934	88.9799965416423	38.36	90.43
36.9103074828934	88.9799965416423	38.08	89.48
36.9103074828934	88.9799965416423	40.13	86.48
36.9103074828934	88.9799965416423	35.46	90.5
36.9103074828934	88.9799965416423	40.14	85.47
36.9103074828934	88.9799965416423	38.99	86.42
36.9103074828934	88.9799965416423	36.6	82.94
30.687884571346	88.9799961446413	30.69	95.98
28.1279949895672	88.2470205561914	24.67	93.34
26.8957378591625	87.0218124651069	24.2	92.42
25.9510637853138	83.8738895683929	27.35	82.24
24.9862284489875	81.1107957915251	28.82	81.78
23.9328600735922	78.3260590970795	16.99	78.36
23.868855041623	73.0596355822007	20.35	68.75
23.8049460302045	70.7625102207148	21.49	69.2
23.8049460302045	70.7625102207148	22.6	70.1
23.7412026147267	68.7661143086168	23.47	70.49
23.677511611125	66.6769920254492	24.03	65.56
23.6138512447688	64.6996638554674	23.52	71.05

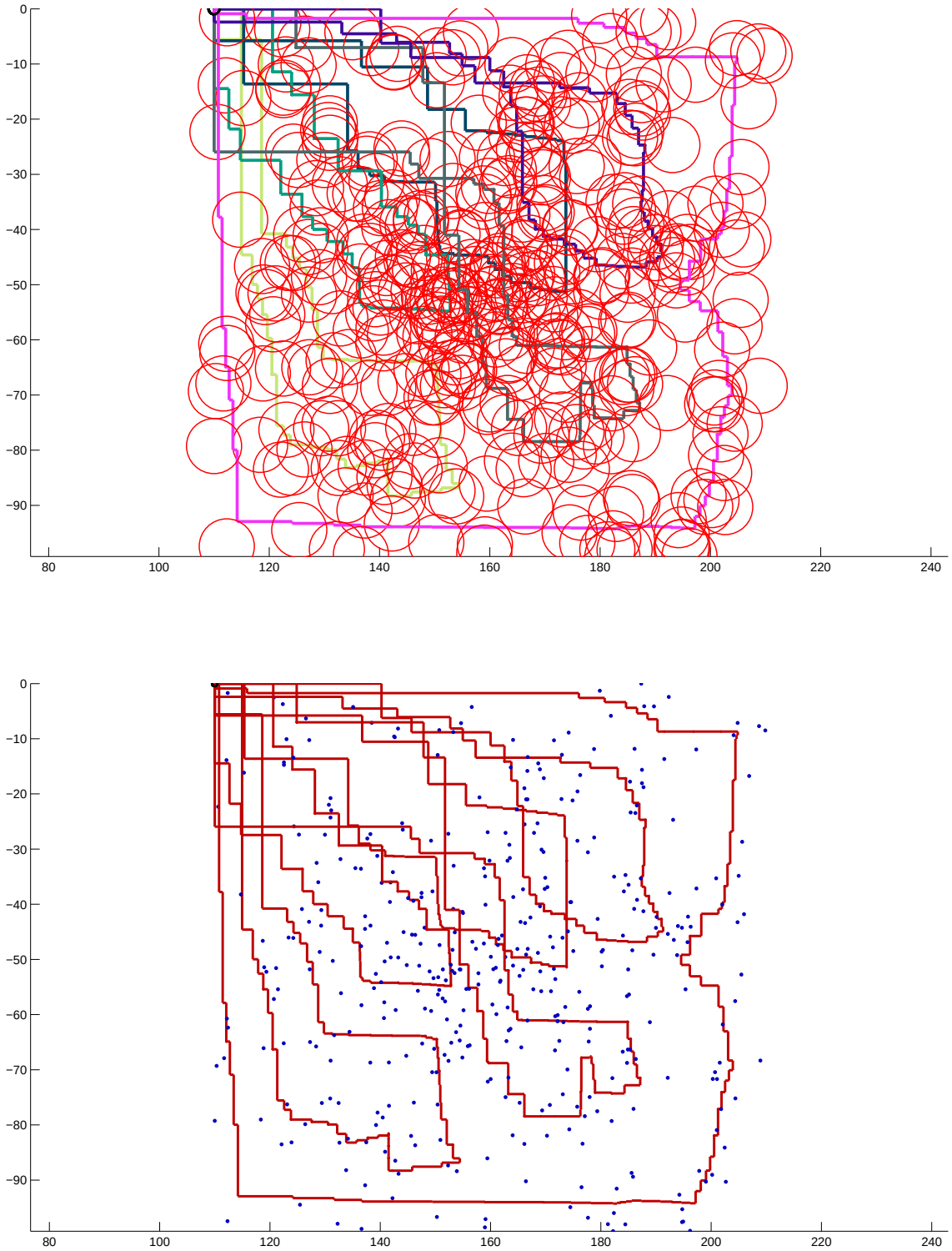


Figure O.108: *team*4_400, Equal Radius, 2D, Manhattan, Length = 1674.5997332

Table O-111: Solution for *team*4_400, Equal Radius, 2D, Manhattan

Total distance: 1674.59973315034 Total demand met: 2245 Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 268.797047234271 Demand Met: 373			
4.94896680997316	44.5994383005822	8.7059	46.626875
6.89859886146925	49.9701706681444	11.134375	51.580675
7.85743562734525	52.5737023536421	8.9679	51.422725
8.7938530216218	55.4024353432414	11.458875	55.406825
8.7938530216218	55.4024353432414	9.352575	52.2461
9.65265972207915	59.7040814587281	10.71515	57.182775
10.4892865847779	66.2889112545986	12.50315	65.202575
10.4892865847779	66.2889112545986	8.8531	66.09375
11.3170453954962	75.5561399130508	8.347775	79.0334
12.5721936176515	77.246357347731	13.11545	76.27845
13.8099927862857	79.0194692787534	13.92855	83.165725
13.8099927862857	79.0194692787534	12.1212	83.525275
17.5810709929544	79.4522338016805	16.4015	79.860725
17.5810709929544	79.4522338016805	19.41455	76.0326
20.5472277973051	79.9245815644913	22.467675	76.02705
20.5472277973051	79.9245815644913	20.9401	75.2051
22.200904567348	81.6106085455795	22.609375	83.218325
23.8315724629912	83.2042688740402	23.831575	88.204275
25.7075931370707	82.7677326318117	24.1584	82.49565
27.7370220488962	82.3306341579907	27.4824	83.15295
27.7370220488962	82.3306341579907	29.23795	80.022375
29.6155200102659	81.902267418858	29.5312	77.759375
31.5168816997779	81.5267819363916	31.60195	76.5275
31.5168938725168	82.5157906968715	30.46345	78.65395
31.5169060457318	83.8289462423357	36.3513	83.686975
31.5169060457318	83.8289462423357	35.60905	81.995775
31.5169179644084	85.996132549901	32.733925	86.47665
31.5169179644084	85.996132549901	30.896	84.86835
31.5169298794187	88.2863244062054	27.27955	90.9405
32.2240472044936	88.2863433394254	32.22375	93.28635
35.8041723288684	87.5684372815416	33.324025	88.862275
41.1704615609999	86.831221092108	43.9034	88.387225
44.4346933400614	86.0536996582961	49.4347	86.0537
43.1754284179264	83.5682810533997	42.31835	87.347525
43.1754284179264	83.5682810533997	40.913925	82.729825
42.0720531829774	78.9976027672527	40.4153	76.30845
41.0430880792524	75.9450271775452	36.110325	75.95995
40.8855958831137	72.7434832170326	39.430175	70.428325
40.7293057383098	70.183614380528	42.3891	68.379025
40.7293057383098	70.183614380528	40.205375	70.4585
40.5723470481039	67.9391306323541	41.683175	67.299925
40.5723470481039	67.9391306323541	39.7753	66.19835
40.4154506329836	65.9898495669144	44.4217	64.703925
40.4154506329836	65.9898495669144	42.88515	65.09985
40.2491694836092	64.4437683726985	44.541975	62.0002
40.2491694836092	64.4437683726985	42.114525	60.87195
39.4539354156245	64.1622491622673	43.7645	63.186425
38.2165987744599	63.8886856788403	37.615325	65.262725
38.2165987744599	63.8886856788403	38.122975	58.912025
37.3492545212175	63.8343636654852	39.243575	59.34405
32.0977428219394	63.7855923595864	34.7277	67.482525
32.0977428219394	63.7855923595864	31.583525	68.6781
28.2509757612738	63.7253108771488	28.20205	68.6988
28.2509757612738	63.7253108771488	30.688625	60.637275
24.250266265677	63.5687108502057	24.44465	63.1281
24.250266265677	63.5687108502057	21.668825	63.73225
21.2105524695592	63.4122604201315	21.0091	68.35155
21.2105524695592	63.4122604201315	18.3822	65.772725
19.7926461907924	61.390891437358	17.272875	64.973225
18.7429997608288	54.5245600487569	17.219275	51.795125
17.750249811828	50.456063180086	19.028925	48.6519
16.7246348349457	47.09640407745	19.292975	43.870425
15.4745475888367	45.1825640686214	14.24105	46.110125
14.2702709610166	43.1975498566021	13.3837	46.032275
13.1094184533868	40.7767989888408	17.095675	43.177
8.59745016965491	5.57299263482728	10.7326	2.49095
Route: 2 Length: 230.462566964169 Demand Met: 375			
5.36446966548567	13.6184744243271	2.12502499999999	13.8908
24.1932499947358	25.7325999786358	28.216025	27.287675
26.0989954647871	29.0176683449175	25.49855	33.45475
26.0989954647871	29.0176683449175	27.65685	28.081275
28.2077263702147	30.2293063703567	26.51415	33.575825
30.8903952667437	31.2236292389486	31.8731	36.0461
30.8903952667437	31.2236292389486	30.2641	36.115
32.4442586067185	31.3114601496349	32.29465	34.1886
32.4442586067185	31.3114601496349	29.46595	31.229925
34.4214890567327	31.3982518379593	34.098725	26.483975
39.9258981902684	31.5395693204201	42.344525	27.231625
40.164734922621	34.8680718783895	43.312375	33.022625
40.3958061981591	39.9652139329529	44.89855	41.381
40.5794900181273	41.7787259956557	43.5222	45.0811
40.5794900181273	41.7787259956557	43.242475	40.8624
40.7500306964449	42.8586705042118	38.0514	44.25295
40.9235125002335	43.8822181469189	36.34605	45.558575
41.2895225023153	44.3606744204865	37.32375	47.164775
43.5904770800354	44.6331270696253	43.10885	48.272275
43.5904770800354	44.6331270696253	40.7628	47.39015
48.329344186026	44.8813863433112	49.0937	40.0849
49.766279949243	46.0435836429245	51.464375	46.273425
49.766279949243	46.0435836429245	52.0729	45.66175
50.9927345133742	47.2362852984144	51.332325	47.3944
50.9927345133742	47.2362852984144	48.801425	47.111675
52.3328718989624	48.4519631537235	50.075475	49.526025
53.8376104827906	49.6281834217132	50.9611	51.5263
53.8376104827906	49.6281834217132	50.5204	51.7746
57.3650553781737	50.5582508985297	57.767975	55.4125
57.3650553781737	50.5582508985297	59.0369	52.162425
57.3650553781737	50.5582508985297	61.33205	47.81805
57.3650553781737	50.5582508985297	55.262125	52.9866
57.3650553781737	50.5582508985297	55.9361	51.897075
57.3650553781737	50.5582508985297	58.59885	48.807625
57.3650553781737	50.5582508985297	56.4549	49.1402
57.3650553781737	50.5582508985297	54.099275	51.121125
57.3650553781737	50.5582508985297	56.7604	48.090675
57.3650553781737	50.5582508985297	54.870925	48.098925
57.3650553781737	50.5582508985297	52.703075	49.56845
59.2895098970498	50.9080648576902	61.751375	53.5726
59.2895098970498	50.9080648576902	61.491825	51.7088
60.6600267296194	51.2396288518113	60.964225	55.767775
60.6600267296194	51.2396288518113	59.205025	55.76
63.7923698663723	51.4389136157122	66.095725	55.876775
63.7923698375094	32.1328593745606	67.6691	30.587025
63.7923698375094	32.1328593745606	59.92645	35.207
63.7923698375094	32.1328593745606	65.757275	28.49595
63.7923698375094	32.1328593745606	59.6161	30.5374
63.7923698375094	32.1328593745606	59.25755	30.092125
63.7923698095552	27.9017509116808	68.792375	27.90175
63.4461645148612	23.8785497083491	65.789175	19.559925
62.1220279033671	23.6333814553469	64.881075	21.1972
60.4330698785565	23.3960992422452	62.8697	20.929125
58.3179276117725	23.1652489744851	57.8987	27.066925
58.3179276117725	23.1652489744851	58.5251	25.335175
56.3754100127144	22.9172374065907	56.707375	20.9848
56.3754100127144	22.9172374065907	56.46315	20.9863
54.4527247905538	22.6757841855358	56.18475	25.5187
54.4527247905538	22.6757841855358	54.7913	22.79115
52.2173134307009	22.4270009387251	52.727475	27.05645
49.332680532302	22.098479414292	49.48335	26.949275
45.555953075102	18.2145252166679	47.99765	20.639375
38.7118454342296	10.5450374023812	40.718225	8.45085
26.7133117987256	5.78729917466346	28.471925	7.124375
Route: 3 Length: 195.172664340341 Demand Met: 372			
10.5943493666937	11.4123840783315	12.5519	14.734025
10.5943493666937	11.4123840783315	13.011825	10.0758
14.0612665234581	15.5822276671866	14.259	13.428825
14.0612665234581	15.5822276671866	12.54795	14.295525
18.1541244899496	23.5119625273937	20.995625	24.282225
18.1541244899496	23.5119625273937	21.1268	22.989225
18.1541244899496	23.5119625273937	20.686175	21.9667
18.1541244899496	23.5119625273937	20.9892	20.7572
18.1541244899496	23.5119625273937	14.358825	25.883825
22.4880962587937	29.3396656105516	22.793175	31.8095
22.4880962587937	29.3396656105516	19.9845	27.40155
30.329867143593	35.9023945620458	31.7652	39.5927
33.1781885278094	37.6567470458727	36.0198	39.389875
33.1781885278094	37.6567470458727	35.05695	38.887125
35.217205319018	39.2160267019433	37.4906	38.735475
37.0290084728429	40.836266895971	39.47365	37.672175
37.0290084728429	40.836266895971	37.4986	37.94785
38.4109330401431	44.5948003420936	35.77655	45.5234
38.4109330401431	44.5948003420936	34.241775	45.041325
42.4131945383415	47.7850291162573	47.35915	48.071

Solution x	Solution y	Original x	Original y
42.5178649558262	48.8611583731265	43.054225	52.07985
42.5178649558262	48.8611583731265	46.718325	46.79505
42.6127684954144	50.7374248413615	42.80595	50.969325
42.6127684954144	50.7374248413615	41.3638	51.811825
42.7081650991609	52.5436795256311	44.413025	51.821425
42.7081650991609	52.5436795256311	43.47965	52.4779
42.8029196517559	54.5327053164745	47.802925	54.5327
42.8029196458079	54.7834125184146	45.110025	59.219325
42.8029196458079	54.7834125184146	41.765825	57.606275
41.4987581783818	54.6921970196833	41.323875	57.06515
41.4987581783818	54.6921970196833	40.468775	56.35765
40.2798095247472	54.5999387024915	40.703325	55.537825
39.0538025151577	54.5074640175789	41.89655	53.797625
39.0538025151577	54.5074640175789	40.529725	53.231175
37.5505361078342	54.4155352206618	39.658325	53.39295
35.879336935503	54.3238836444499	36.8297	55.690525
35.879336935503	54.3238836444499	38.966475	52.166125
33.253063750327	54.2328905032876	32.800625	59.186225
33.253063750327	54.2328905032876	30.732825	57.781
33.253063750327	54.2328905032876	37.074525	51.14655
33.253063750327	54.2328905032876	34.822	51.041775
33.253063750327	54.2328905032876	30.1798	54.1346
33.253063750327	54.2328905032876	28.87265	55.2137
33.253063750327	54.2328905032876	33.276075	49.648225
33.253063750327	54.2328905032876	29.2116	52.625
33.253063750327	54.2328905032876	31.916925	49.63125
33.253063750327	54.2328905032876	30.804475	50.3614
28.244766735649	53.8817022031449	26.5978	58.30075
26.7959856553376	53.2755328309131	22.891175	56.122525
26.3807151939556	50.3287188104215	21.4066	50.274675
26.3256619860309	48.5701850925024	26.549225	47.5983
26.2705826795644	46.9270973031742	31.24645	46.9846
25.0329176731067	44.4274721210833	28.231575	43.86655
25.0329176731067	44.4274721210833	27.251975	44.47235
23.3736240597628	42.1764183824848	27.2689	42.18555
20.4676677663697	39.9637822837754	19.322625	41.061025
17.8568609095307	37.6501724507243	15.806625	40.87695
15.9175620068734	33.5954741375804	18.77905	36.01655
15.9175620068734	33.5954741375804	18.476575	32.50015
12.0900794770399	27.4456638894609	15.2685	27.387025
4.76444544413054	21.7734791056999	0.610974999999996	22.331075
2.66507006177108	14.4535576868187	5.29819999999999	16.16745
Route: 4 Length: 324.616645124158 Demand Met: 375			
14.8492412080124	7.02666205292564	17.13825	10.254625
14.8492412080124	7.02666205292564	16.533825	6.314025
14.8492412080124	7.02666205292564	12.34295	3.720825
37.850287400971	13.3898754250108	40.4237	12.94705
41.7515093362348	41.014844412412	45.015525	41.584025
44.3948613472086	50.9035423342205	47.81055	52.508825
44.3948613472086	50.9035423342205	44.549375	51.8385
45.9878437024958	55.1223049578908	46.119125	55.3112
45.9878437024958	55.1223049578908	45.616825	55.349625
47.6240701005168	59.3568756075839	51.0767	59.931625
47.6240701005168	59.3568756075839	50.342	58.1772
48.6873274444324	64.3654231931063	52.902425	64.80215
49.3716745343146	68.4015552737047	53.249925	71.4317
49.3716745343146	68.4015552737047	50.03295	71.692275
49.5082705314186	68.5951544408908	49.5023	72.1454
49.5082705314186	68.5951544408908	44.898775	67.784675
49.6730386569808	68.7909937871148	46.228875	65.56925
49.6730386569808	68.7909937871148	45.884675	65.715725
53.2057519629229	74.4030216614751	55.289875	75.9977
53.2057519629229	74.4030216614751	52.726325	74.9715
56.1365572473525	78.4510681542623	56.13655	83.451075
56.1365572473525	78.4510681542623	54.01775	81.8894
59.1135245302264	78.4433391541175	60.77085	76.3761
59.1135245302264	78.4433391541175	59.360575	77.3659
61.6409469333209	78.4355857253263	60.2356	81.956375
66.2246970840572	78.4278941414167	66.686275	83.4025
66.301853288121	77.2354704382877	64.2971	80.8087
66.3795377555006	73.9607726421873	65.721375	76.70655
66.3795377555006	73.9607726421873	63.106325	74.44845
66.4575780213201	67.8004243677618	63.9561	69.944325
66.4575780213201	67.8004243677618	61.692525	66.479075
68.0338636340846	67.5789814343655	68.033375	62.578975
68.330646359616	68.9441414060113	67.8084	64.88
68.6342750582516	71.8049132379713	67.97015	74.943825
68.9404111061907	74.1409868482447	69.349625	77.516575
68.9404111061907	74.1409868482447	67.096325	78.407125
71.9651251169232	74.2858182007574	75.94035	77.0935

Solution x	Solution y	Original x	Original y
71.9651251169232	74.2858182007574	71.96685	79.285825
74.2833008067393	72.8036719354254	72.106325	71.513625
77.1504176414249	71.4598840738797	82.150425	71.4598
77.1504176414249	71.4598840738797	76.3481	68.05155
76.5505654035182	69.016932182224	74.758025	68.76505
75.9735613378436	66.6835007855898	73.97555	66.71955
75.4206206074437	64.3981301288019	75.320425	66.338125
75.4206206074437	64.3981301288019	74.919425	66.332825
74.8773332844654	61.3096010653651	78.897475	61.3791
74.8773332844654	61.3096010653651	75.12385	56.355025
74.8773332844654	61.3096010653651	74.7548	56.66355
69.246897712582	61.2536276101864	67.662425	58.9604
69.246897712582	61.2536276101864	68.048425	58.486425
66.1462531982695	61.1978127968153	63.23165	61.378
64.024098236429	61.1419523430495	61.732525	60.28975
62.2798621809479	61.0860859057455	62.1796	60.091575
62.2798621809479	61.0860859057455	63.564825	58.6141
60.4030546732265	61.0302627043012	62.481725	64.778425
60.4030546732265	61.0302627043012	62.138225	61.218175
55.7212292543479	60.9734669662336	55.5813	65.9389
55.7212292543479	60.9734669662336	53.6353	62.58645
54.8528702225581	59.466152121341	56.708375	61.084725
54.8528702225581	59.466152121341	53.3194	62.871025
54.0400310826064	56.3670817715406	53.1029	58.71345
53.2555852502906	51.9729590087459	51.731775	54.063975
53.2555852502906	51.9729590087459	51.8225	53.851
52.5414041531099	39.2619077730592	55.894525	37.29925
51.6699350985427	35.1491356962038	53.08505	32.116125
50.7419767988856	32.7494168765003	53.51985	31.610925
50.7419767988856	32.7494168765003	53.429725	29.230175
48.9364114755672	31.7661384811449	48.825175	33.4678
48.9364114755672	31.7661384811449	49.821325	32.088775
47.0927153613313	30.7288166026217	49.014675	34.9475
37.1219744800957	28.145084264051	33.989075	25.3104
35.5551114057542	25.9294293621701	39.217825	28.48755
Route: 5 Length: 257.623374783871 Demand Met: 375			
30.2276182740819	6.23575787074392	32.5307	9.603625
35.6623935033393	8.82631234167493	32.636425	9.71905
49.9943003216152	11.2210749337416	54.0981	10.209075
52.5236035639 51	14.1462744577167	56.7601	13.3255
52.523603563951	14.1462744577167	53.686425	15.19815
53.7776341453173	17.5849017581047	56.680125	15.845675
54.8726728595209	22.1831987900952	56.145325	18.970525
55.9107533369872	35.0957110485875	54.125425	38.6935
57.0918112177223	38.2821749872443	57.24125	42.40615
58.2612815601495	39.9152545275365	55.460475	43.213925
58.2612815601495	39.9152545275365	60.313175	36.907775
59.7021054455841	41.2379165060458	60.81405	45.86495
59.7021054455841	41.2379165060458	56.281125	43.406775
61.0648227001143	41.7317861320764	58.980725	40.369175
61.0648227001143	41.7317861320764	59.82755	37.21565
63.4991528837561	42.6623777120487	64.627025	39.598675
63.4991528837561	42.6623777120487	64.48255	39.62755
65.5604267931735	43.8759146606942	69.4258	42.661825
65.5604267931735	43.8759146606942	64.04505	44.910675
66.9856186456702	45.1907632123231	63.06625	46.073225
69.285431337073	46.4176307539148	70.20275	51.264575
69.285431337073	46.4176307539148	65.024675	48.473875
71.1793683710573	46.5490295832505	74.018375	45.692475
71.1793683710573	46.5490295832505	70.38585	48.289775
72.8570193561213	46.6800387450487	70.163125	48.595475
74.9757507785778	46.8097967873309	74.97575	51.8098
74.9757507785778	46.8097967873309	75.70595	48.354275
78.3654063152412	45.8631093083051	82.166	45.384
80.3279214266952	44.9424022603286	84.710775	44.260425
81.3063716500251	44.0864697831462	86.306375	44.08645
81.0111826181852	42.6809726844934	85.82305	42.253575
81.0111826181852	42.6809726844934	83.98185	43.958725
80.2517130280407	41.3934886292765	80.003925	44.278875
80.2517130280407	41.3934886292765	80.128375	42.2928
79.5027715167215	39.8776886475209	82.455325	37.974875
79.5027715167215	39.8776886475209	77.736325	41.257125
78.7002365285209	38.4909858094372	76.046775	40.829925
78.7002365285209	38.4909858094372	76.5757	39.19325
78.0117049333053	36.8180448266949	74.186175	37.664625
77.4199780015012	34.9981247008058	74.4851	34.7013
77.4199780015012	34.9981247008058	72.419975	34.998125
77.6402400182291	33.0589314259847	77.267275	35.3236
77.6402400182291	33.0589314259847	75.0516	36.4713
77.8713018906916	26.1806345075367	75.41995	23.365625

Solution x	Solution y	Original x	Original y
77.8713018906916	26.1806345075367	76.538875	22.08605
78.1154969560807	24.6902747347683	83.1155	24.690275
78.1154969560807	24.6902747347683	76.27055	23.463675
76.9667829140093	21.6244665199114	77.750225	18.79385
75.7873589627259	19.3119066561722	77.472675	18.057475
74.5452602365306	17.1828866294655	77.464	15.628175
74.5452602365306	17.1828866294655	75.3053	17.780525
73.0593981958362	15.2691652762459	76.1173	11.832075
68.0816948048983	14.3127927163849	68.784175	11.8632
62.6535626421627	13.4212796914629	66.273425	16.5814
62.6535626421627	13.4212796914629	59.666825	17.15215
62.6535626421627	13.4212796914629	62.944875	12.9098
62.6535626421627	13.4212796914629	58.962525	15.549225
62.6535626421627	13.4212796914629	58.66755	14.455925
62.6535626421627	13.4212796914629	64.181275	8.885925
62.6535626421627	13.4212796914629	61.5062	10.2838
47.303729889758	10.3144375564841	43.2503	8.7931
44.9712548546538	8.13962327876768	44.6523	7.1683
42.6958666970145	6.07107679788887	46.59205	4.24755
33.0913850018613	4.5196597227577	33.240325	8.160175
23.1633904153365	2.40345981975859	25.090375	4.2535
Route: 6 Length: 397.927434703526 Demand Met: 375			
0.777984985781856	37.7790192668722	4.729125	38.22055
1.43723604077599	57.8622119702353	2.20627500000001	60.72485
2.08596727389326	64.8831313616859	1.692025	67.9044
2.08596727389326	64.8831313616859	2.404275	62.37445
2.73688337353845	70.8932704562834	0.331024999999997	69.303175
3.42233741666509	79.9454088699684	0.00154999999999461	79.256375
4.18384526608882	92.9189298087886	2.307925	97.449675
14.1527193738218	93.2542034105483	15.45105	94.471525
21.6543759665826	93.5870576892153	22.27635	97.920025
26.6616840931308	93.8759790139889	26.6212	98.85125
39.4618161084285	93.9289491296478	40.290225	96.689525
49.0202143495215	93.9816989907504	48.99045	98.5583
49.0202143495215	93.9816989907504	49.100125	97.070175
59.5936096024406	94.0325025384809	64.46975	94.91155
59.5936096024406	94.0325025384809	56.428075	90.20545
64.5930361368811	94.1065727691887	66.508125	91.303225
68.2365588276693	94.1812441417303	67.679475	96.828325
72.2220733136476	94.2554906217106	72.222075	99.2555
72.9266586121539	94.1274140299966	72.374675	95.981125
73.6405235426524	93.9984803692926	74.44305	98.0205
73.6405235426524	93.9984803692926	71.306475	97.9771
74.5844831324538	93.8521714389727	72.88955	91.55335
75.5896716794234	93.7075841569768	75.589675	88.707575
77.3539667715712	93.8004231002284	75.8385	89.39705
80.7948639159001	93.903019420951	84.25115	92.664475
82.997171470958	94.0063758093714	84.730325	97.611875
82.997171470958	94.0063758093714	84.77555	95.283075
84.6109277512505	94.1057993266734	84.9479	97.513325
86.1929741903383	94.2032148566597	86.192975	99.203225
87.1829295309404	92.0040404751083	89.0595	90.291
88.1218429047507	90.0519670981123	87.858275	88.334025
89.072241530362	88.2723166628015	92.685275	90.310575
89.8159830053694	85.7501378869962	90.195175	89.03695
90.5532028170953	81.8909641466901	92.480625	84.1266
90.5532028170953	81.8909641466901	91.03755	80.9252
91.2534727486532	77.1255112818601	94.404	75.185075
91.2534727486532	77.1255112818601	91.825175	77.123475
91.8788793974436	74.0369744311783	91.08095	71.69145
91.8788793974436	74.0369744311783	90.314475	71.662575
92.5396108250524	71.9621038673748	90.725625	70.444425
93.2263243485843	70.0744662687493	91.5733	68.725
93.9376408330854	68.3222748978574	98.93765	68.322275
93.0721796008051	63.0291850652268	92.124775	61.791725
92.2313371622793	58.5773205204789	94.377175	57.5521
91.3537368996392	54.7363421422846	95.486225	52.746525
88.1595363879164	53.0514228802515	85.3769	55.416
86.1541476872737	50.9829852202605	83.835575	49.221375
84.5563323306829	49.1562993443447	79.556325	49.1563
86.1870992584194	45.7477217779963	85.726975	46.8848
86.1870992584194	45.7477217779963	83.247325	46.458225
88.2227321856838	41.7308858659611	87.349525	37.1432
91.318118374834	40.8318481666253	95.9689	41.808
91.9549275461984	39.6783391689878	94.807975	43.25145
92.4517253096097	36.7251671349779	92.049975	40.056175
92.4517253096097	36.7251671349779	90.921925	35.308625
92.9645813685479	32.6704063878584	94.997925	34.851
93.4597324838718	26.8038115181611	95.640625	28.68455
93.9381128233941	17.492167537569	96.9141	16.74635

Solution x	Solution y	Original x	Original y
94.3934372302063	10.0447612736714	98.6909	7.723575
94.6119394219526	9.36618016207425	94.09005	9.358875
94.8312875279669	8.6877992606007	99.82775	8.49955
91.767643941481	8.68778980599125	94.81355	7.137025
86.8194743776812	8.68778035205777	87.3023	11.937375
81.5208702774839	8.687770897341	81.52085	13.687775
80.2698843401196	6.45777112187641	82.33615	2.420325
78.4612344835028	5.40450793039927	79.6523	4.144625
76.5684054028911	4.38439617239517	77.882675	4.11235
74.5759937870591	3.37092880795957	77.335225	0.00945
70.6912829993596	2.59565274901922	71.829525	5.85575
66.0117482804161	1.72834994118945	69.817575	1.306825
5.8416236774188	0.877538082148115	2.34935	1.70725

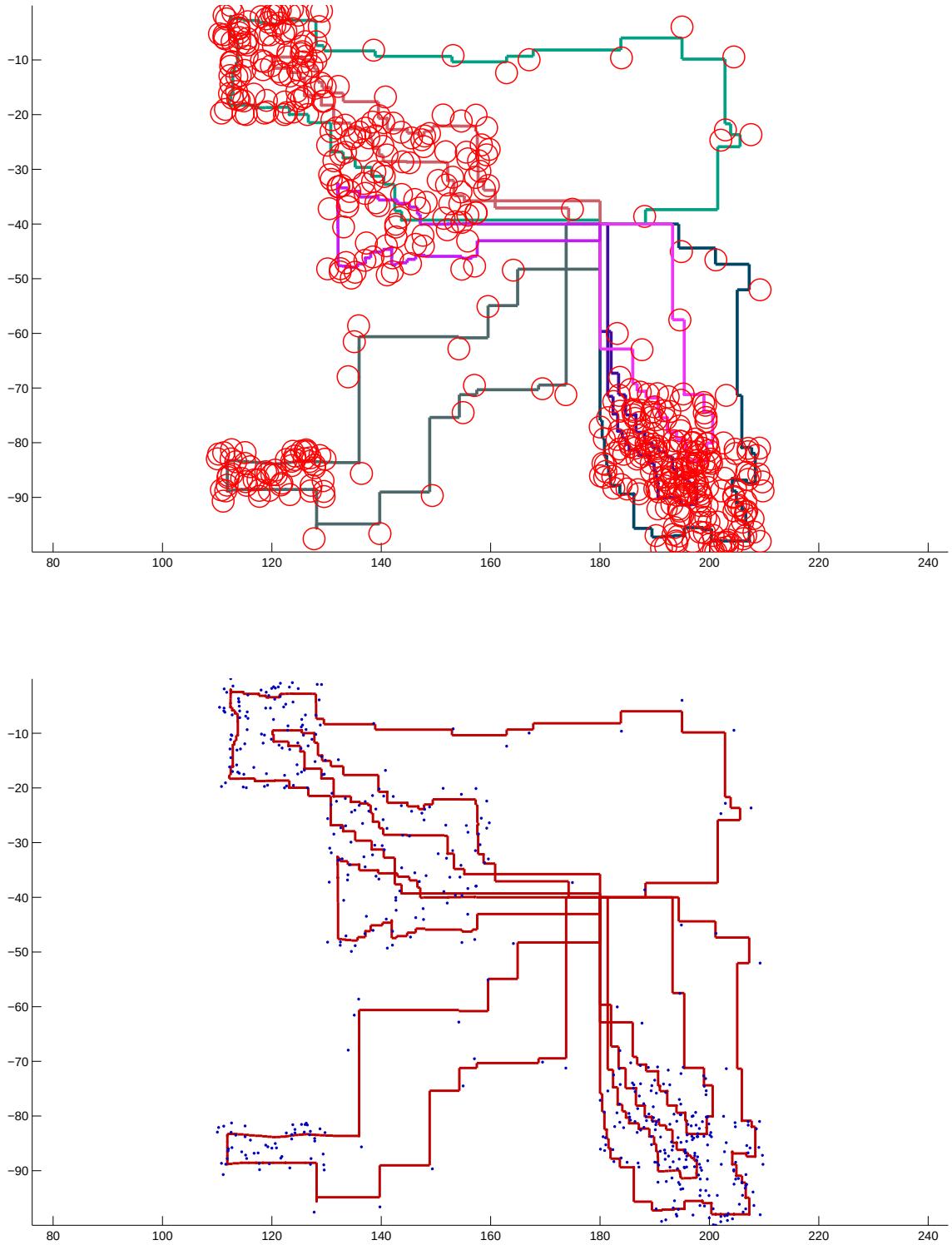


Figure O.109: *team*5_499, Equal Radius, 2D, Manhattan, Length = 1300.8542954

Table O-112: Solution for *team*5_499, Equal Radius, 2D, Manhattan

Total distance: 1300.85429540812			
Total demand met: 9744			
Depot: x 70 y 40			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 188.473132277547 Demand Met: 1567			
84.3804215327974	44.4000692800215	84.8772	45.0654
91.1003216812789	47.3575390566082	91.1956	46.5873
97.2738776374631	52.0431016449886	99.2739	52.0431
95.0930231438091	71.3466787787794	93.093	71.3467
95.9259194124916	80.8590650539123	97.0848	81.6578
95.9259194124916	80.8590650539123	94.7529	81.9671
95.9259194124916	80.8590650539123	94.6937	81.204
97.7215502733788	81.9497179066046	98.6006	82.3388
97.7215502733788	81.9497179066046	99.1691	80.9928
97.7215502733788	81.9497179066046	97.0965	81.0307
98.3806450173715	87.4100894628153	99.7949	88.8243
98.3806450173715	87.4100894628153	99.7041	87.1751
98.3806450173715	87.4100894628153	99.0472	85.7396
96.7615441796455	86.8474695936223	97.0785	86.7219
96.7615441796455	86.8474695936223	97.4362	85.8361
96.7615441796455	86.8474695936223	96.8293	85.3988
94.183919841811	86.5389513723016	92.7639	86.5161
94.183919841811	86.5389513723016	93.0738	84.8753
94.1839226788529	88.8248631630572	94.7976	88.4491
94.1839226788529	88.8248631630572	92.1839	88.8237
94.9318838653631	90.9114920432736	94.509	92.4532
94.9318838653631	90.9114920432736	94.8083	91.5304
94.9318838653631	90.9114920432736	94.4683	90.0421
94.9318838653631	90.9114920432736	94.4375	89.8165
95.9686679647839	92.1709992813522	96.5452	93.172
95.9686679647839	92.1709992813522	96.6676	92.6743
95.9686679647839	92.1709992813522	96.809	92.5136
95.9686679647839	92.1709992813522	95.9324	92.1458
95.9686679647839	92.1709992813522	96.671	90.7145
95.9686679647839	92.1709992813522	95.3031	91.4204
96.6435169608678	94.9326493617911	97.9735	93.9042
96.6435169608678	94.9326493617911	95.4796	96.129
96.6435169608678	94.9326493617911	96.0605	94.495
97.2937523460164	97.9648081872732	99.292	98.0492
97.2937523460164	97.9648081872732	98.1513	96.345
97.2937523460164	97.9648081872732	96.6476	96.9796
94.4991092219079	97.9648629262924	96.1791	97.5552
94.4991092219079	97.9648629262924	94.2258	98.7848
94.4991092219079	97.9648629262924	93.3103	99.0843
94.4991092219079	97.9648629262924	93.255	98.1789
94.4991092219079	97.9648629262924	93.4254	97.8126
92.0812692208543	97.9649177440777	92.8113	98.2407
92.0812692208543	97.9649177440777	92.093	98.3621
92.0812692208543	97.9649177440777	90.6972	96.9626
91.1620231284087	97.9649723118859	92.0809	99.3222
91.1620231284087	97.9649723118859	91.162	99.965
91.1620231284087	97.9649723118859	90.7381	99.8897
91.1620231284087	97.9649723118859	89.983	98.6224
90.3562443354657	95.9187593211595	91.4519	94.5103
90.3562443354657	95.9187593211595	89.0976	96.4455
90.3562443354657	95.9187593211595	89.931	94.5372
88.6899761275107	95.5320504461135	88.2817	96.351
88.6899761275107	95.5320504461135	89.3359	93.6392
88.6899761275107	95.5320504461135	88.2673	94.5543
88.6899761275107	95.5320504461135	88.3602	93.5594
85.4386536788026	96.9644266264878	86.994	98.105
85.4386536788026	96.9644266264878	84.0572	98.2927
85.4386536788026	96.9644266264878	83.9295	97.9734
85.4386536788026	96.9644266264878	84.3334	97.0716
83.4602194883335	97.1048110353996	83.3686	96.8014
83.4602194883335	97.1048110353996	83.6163	95.496
81.2521557220105	97.2611741672566	82.0258	98.9707
81.2521557220105	97.2611741672566	81.2522	99.2612
79.4925009918559	95.6592926966205	80.252	96.9762
76.1694129925725	89.3698838021331	77.1151	89.3423
76.1694129925725	89.3698838021331	76.9521	88.589
76.1694129925725	89.3698838021331	74.9451	88.4605
73.6111422613468	87.8041974984269	73.8575	87.669
73.6111422613468	87.8041974984269	72.5273	88.3137
71.9151459783371	85.9823498525814	72.3356	86.155
71.9151459783371	85.9823498525814	70.8501	86.3243
71.9151459783371	85.9823498525814	71.0504	85.2637
71.9151459783371	85.9823498525814	70.0787	86.0551
71.5521924407169	84.1169289389784	70.5598	83.7819
71.2122506538664	82.4605657766423	71.008	83.9726
71.2122506538664	82.4605657766423	72.6803	81.9225
70.8036729356027	79.2203020053162	70.8021	79.2974
70.3951874038869	75.8981451126862	70.0314	77.1275
Route: 2 Length: 275.88986663796 Demand Met: 1586			
78.3147490807364	37.3866061949292	78.1743	38.6355
91.5197136779131	25.8809230353446	92.0943	24.688
95.612788006681	23.6667999716678	97.6128	23.6668
93.8856990543047	21.6821146012478	92.9329	22.8145
92.8542208460709	9.85390831958346	94.4757	9.4701
84.9978995538022	5.98911038405345	84.9979	3.9891
73.8139673208367	8.17881937768131	73.9225	9.6395
57.7850437580135	9.32785062301804	57.0413	9.9678
52.9148015919865	10.3624920797194	52.9148	12.3625
42.9160675250834	9.350435070547	43.1416	9.2079
28.880450796266	8.35800970733072	28.6149	8.2266
19.5039536737264	7.38290274590998	18.047	6.7045
18.1214510738284	6.61895685368753	16.1355	6.6685
18.0867309688411	4.52225507116717	18.6523	3.9117
18.0519844766087	2.79924016423317	19.0824	1.094
17.4573602807466	2.77778699249094	18.2952	1.0836
13.7484033467173	2.75770627365847	13.7484	0.7577
13.7484033467173	2.75770627365847	13.2084	1.5682
13.7484033467173	2.75770627365847	14.8098	1.8409
13.1596756570126	2.78484096783984	13.8628	4.3052
12.4172169413009	2.81141057383899	11.5168	3.287
11.7582474757265	2.83790627083489	11.5459	0.8736
11.7582474757265	2.83790627083489	11.169	1.5527
11.5156176484029	2.95433042154643	9.9632	1.8111
11.5156176484029	2.95433042154643	10.31	1.5005
11.4073732940154	3.17405795820961	10.6256	1.7583
11.3024879148104	3.4174372048301	12.5256	4.7007
11.3024879148104	3.4174372048301	12.1595	5.1953
9.30901451864592	3.46159479291619	8.8668	5.4121
9.30901451864592	3.46159479291619	9.7281	5.4172
8.8473568625873	3.15558066044351	9.42529999999999	3.1222
8.8473568625873	3.15558066044351	10.526	3.779
7.59523276521345	2.79505192502283	8.02670000000001	2.1019
7.59523276521345	2.79505192502283	8.95990000000001	2.5066
4.74007449435011	2.45521497312112	3.8933	3.6617
4.74007449435011	2.45521497312112	5.6082	3.0104
2.47737966856992	2.05200603472938	2.4773	0.052
2.47737966856992	2.05200603472938	2.87569999999999	1.3778
2.46338018990147	2.74879594064982	1.2646	1.8964
2.46338018990147	2.74879594064982	1.729	2.5191
2.44944063349448	3.71159061990239	3.9473	4.1638
2.43539800624416	4.53495138467389	3.9756	4.3104
2.43539800624416	4.53495138467389	4.0211	5.0495
2.42110612230852	5.2547996670325	0.421099999999996	5.2548
2.42110612230852	5.2547996670325	1.2522	5.4022
2.75363053841529	5.82686524318971	1.2192	5.9144
2.75363053841529	5.82686524318971	1.4037	6.1535
3.24252323307954	6.35654496432174	2.7247	6.6491
3.24252323307954	6.35654496432174	4.1027	5.9391
3.7089149078996	6.89315212834554	5.49809999999999	6.1028
3.7089149078996	6.89315212834554	5.6246	7.277
3.73865697207448	7.82677208946855	4.1301	7.1548
3.73865697207448	7.82677208946855	5.20059999999999	6.8919
3.76764087319637	10.3899105339458	5.4781	9.3534
3.76764087319637	10.3899105339458	5.0355	11.9367
3.47398777628253	11.3911781429691	4.24299999999999	12.8676
3.10536529078966	11.9750966667017	2.5621	10.2967
3.10536529078966	11.9750966667017	2.67230000000001	10.4123
3.10536529078966	11.9750966667017	2.4532	11.1564
3.10536529078966	11.9750966667017	2.3396	12.8751
3.10536529078966	11.9750966667017	3.6086	13.0876
2.84066162243442	16.0714119497398	2.4914	14.471
2.84066162243442	16.0714119497398	2.2625	16.1551
2.84066162243442	16.0714119497398	3.5607	15.7968
2.84066162243442	16.0714119497398	2.785	16.9995
2.84066162243442	16.0714119497398	3.76260000000001	17.1174
2.84066162243442	16.0714119497398	4.024	17.3232
2.47511361844322	17.6420050540948	1.5116	19.0597
2.1970371927487	18.3255011086611	0.782799999999995	19.7397
4.11891147606659	18.3039385160459	4.753	19.8404
5.33947094088079	18.2821090102735	4.8686	17.5054
6.69300746358462	18.2603063447379	6.693	16.2603
6.90464322196777	18.752896625741	5.3173	19.9696

Solution x	Solution y	Original x	Original y
6.90464322196777	18.752896625741	8.65000000000001	19.7295
8.85124682064841	18.7066965234843	9.20950000000001	19.5087
10.5643318923423	18.6607078156987	9.00749999999999	17.4052
10.5643318923423	18.6607078156987	12.3192	17.7013
13.1823007179478	19.9612678869198	12.295	19.9912
13.1823007179478	19.9612678869198	12.6858	19.6571
13.1823007179478	19.9612678869198	13.9396	19.5452
16.6476909970988	21.4637656248812	16.5052	19.9903
20.7674568566744	26.8118002269744	20.1974	25.6106
20.7674568566744	26.8118002269744	21.333	28.4534
23.0328519883057	27.9299943828968	22.5985	27.2784
23.0328519883057	27.9299943828968	23.4789	26.9268
25.220832574388	29.6553994627872	24.4655	29.9184
28.2588574751262	31.2602132450497	28.8128	30.4765
28.2588574751262	31.2602132450497	28.4031	32.2444
30.4466441182463	32.763969992498	30.555	31.3009
32.4752322055517	37.6466293204356	33.3877	38.8388
33.7144642510941	39.2963295086674	32.6554	40.5505
33.7144642510941	39.2963295086674	32.6566	40.0511
Route: 3 Length: 250.454700444807 Demand Met: 1432			
63.8113288114727	69.4467757197124	63.7544	71.2264
58.7503563975353	70.3133960587517	59.4827	70.1321
47.4608008034202	71.2026099345928	47.0351	69.5204
44.2764868601516	75.3705105614878	44.9743	74.4953
38.8502782298189	89.015321312423	39.3354	89.658
29.7143178620781	94.8447217735271	29.7505	96.621
18.1664533563861	95.6148224690894	17.7167	97.5636
18.1664529123075	90.9767169174135	19.5543	89.8549
18.1664524680169	89.925123067425	19.4915	88.9148
18.16645202355	89.2154497279845	17.0519	88.8308
18.1664515791669	88.5445045699771	19.3715	86.9483
16.1470117317399	88.5445042961735	17.1642	87.7833
12.4955411072968	88.5445040224312	13.2856	89.4879
12.4955411072968	88.5445040224312	11.6247	87.7046
12.4955411072968	88.5445040224312	11.8372	87.4011
10.2157332371556	88.544503748777	9.52200000000001	88.7288
8.36736543932143	88.544503475127	7.74030000000001	89.8119
8.36736543932143	88.544503475127	7.6764	88.6806
7.12357603344766	88.5445032014616	6.7503	86.812
7.12357603344766	88.5445032014616	7.47969999999999	86.7529
5.75206768053161	88.5445029281184	5.387	87.7604
4.48420150539641	88.5445026548061	4.4842	86.5445
4.04927602633896	88.6365351224077	5.1953	87.1361
2.7892161597035	88.744880767498	1.5647	88.8122
1.85549330629004	88.8531043313731	1.0919	90.7016
1.85549319340839	88.1150616716458	0.775099999999995	88.6342
1.85549308062879	87.3114164331189	1.82250000000001	87.776
1.85549296786388	86.465820908972	1.983	86.3665
1.85549285510878	85.6318298015675	2.0599	86.005
1.85549274236163	84.763240010762	2.696	85.7661
1.85549262960426	83.6831244276053	0.0289999999999964	82.9455
1.85549251918187	83.4778290686628	2.5389	82.9669
1.85549240875469	83.2761026560544	0.247299999999996	82.0871
2.19944826813214	83.2761025742738	1.19329999999999	81.8445
2.62500010868588	83.2761024926088	2.625	81.2761
3.69689017748919	83.3592780697585	3.3964	83.4982
4.81871464668971	83.442351002025	5.1015	81.8103
5.80234983088988	83.5304345280994	5.09099999999999	83.7862
6.9024871855557	83.6182553803432	6.0677	84.3942
8.23883262124018	83.7050198752233	8.87560000000001	85.3213
9.15255996099503	83.7859213971734	9.2565	85.6186
9.99660029620259	83.8575973562593	9.9966	85.8576
10.8255543621166	83.8387735599471	10.8331	85.8288
11.5745692562612	83.7659645468166	10.6041	85.0219
12.5866444604658	83.690721566111	12.6448	83.0865
12.5866444604658	83.690721566111	14.2245	83.0966
13.115012524337	83.617713970369	13.617	84.1913
13.6229538489451	83.544231502974	13.6279	83.3943
14.130794294283	83.4708428001962	13.8296	81.5783
14.8456050338498	83.4132454678355	14.2132	82.4414
15.6314318291524	83.3562622713034	15.4215	81.5375
15.6314318291524	83.3562622713034	16.072	81.5553
16.277297910401	83.3093025836351	16.2773	81.3093
16.7622202821443	83.3593519885764	16.4864	81.6235
17.2895569520063	83.4125805660041	15.9151	82.9337
17.2895569520063	83.4125805660041	17.0206	82.7787
17.9661446725718	83.4664755314333	16.887	83.4344
17.9661446725718	83.4664755314333	17.8246	84.0918
18.7601221541572	83.5201192617692	17.8311	84.5721
19.7426471421001	83.5730158110964	18.7876	82.3448

Solution x	Solution y	Original x	Original y
21.1659312690256	83.6271253883473	19.7188	83.0222
25.9463016753213	83.681976294327	26.3736	85.6358
25.9463021656246	67.9458002308233	23.9463	67.9458
25.9463052627986	62.6641036483965	25.0595	61.5431
25.9463083710951	60.6188476562423	25.8602	58.6207
44.1820998804776	60.8240975674016	44.1821	62.8241
49.5292370720318	54.9299704466923	49.5234	55.0957
54.9291781398357	48.2554153246914	54.1532	48.4548
Route: 4 Length: 138.617556856727 Demand Met: 1573			
71.4134104057623	71.5225441120799	72.5026	72.4828
72.3784885641436	74.7318066232786	73.6863	74.2382
72.3784885641436	74.7318066232786	71.4242	75.4202
73.2202518778253	77.897930032919	73.1002	79.4037
73.2202518778253	77.897930032919	73.5352	77.8165
74.0613946709834	79.1437338906149	75.2812	79.5319
74.7395760032554	80.2692701891912	75.5773	80.7384
74.7395760032554	80.2692701891912	75.4182	80.175
75.3197487258416	81.3253127090641	74.3211	82.1244
75.3197487258416	81.3253127090641	73.6161	81.1388
77.0812135623742	82.305684058387	78.0272	82.0721
77.0812135623742	82.305684058387	77.4302	82.5606
77.0812135623742	82.305684058387	76.7822	82.9894
77.0812135623742	82.305684058387	76.3867	80.9989
79.014514264604	83.7198082604074	79.415	85.235
79.014514264604	83.7198082604074	79.3747	83.7664
79.014514264604	83.7198082604074	80.1131	82.5047
79.8815499396903	85.0954530824692	81.0134	86.425
79.8815499396903	85.0954530824692	81.0772	83.8409
80.2852026620196	86.3624643952015	81.9044	86.793
80.2852026620196	86.3624643952015	81.7913	86.2239
80.5555492116444	87.4573636225008	82.5335	87.3296
80.5555492116444	87.4573636225008	81.9035	87.9149
80.5555492116444	87.4573636225008	80.7173	88.9602
80.5555492116444	87.4573636225008	80.4141	88.4668
80.5555492116444	87.4573636225008	80.026	88.4312
80.5964527006222	90.0963946839227	80.5965	92.0964
81.829244284839	90.0563854745276	82.1226	91.9552
82.5314589088945	90.0123680046011	83.1514	91.319
83.1490809686771	89.9679521082411	82.7904	89.3622
83.787943671571	89.9236172014347	83.3685	88.3604
84.4798952646657	89.879905224114	84.4799	87.8799
84.5590732960062	90.2038422096516	85.8291	89.3215
84.5590732960062	90.2038422096516	85.3838	89.3565
84.6347718320994	90.5847228899723	85.4655	89.4614
84.6347718320994	90.5847228899723	84.1657	89.6201
84.7098198300274	91.0454635222677	84.5701	92.5098
84.7098198300274	91.0454635222677	84.3608	92.148
84.7850047049474	91.3952944763041	84.785	93.3953
85.3324438761754	91.3530839718705	85.1326	93.3031
86.818060631012	91.286500382312	88.3323	91.5035
87.6453387022125	91.219548033596	89.5983	91.5249
87.6582554105622	90.4204009737987	88.0059	90.774
87.6582554105622	90.4204009737987	88.5666	89.9178
87.6711633992632	89.6588924912905	88.3919	89.421
87.6840708580831	88.9234145132914	87.2864	89.2526
87.6969944922507	88.1653966704701	89.697	88.1654
87.6969944922507	88.1653966704701	88.176	88.8141
87.1879720225572	87.6854163817269	87.6085	88.0524
87.1879720225572	87.6854163817269	87.8356	87.4643
86.6383361054584	87.1907198256036	87.314	87.2617
86.0573627001167	86.6916301210318	87.3294	86.7915
85.3566495184833	86.1858716665203	85.7193	87.9646
85.3566495184833	86.1858716665203	85.8774	87.324
85.3566495184833	86.1858716665203	85.6153	86.7737
85.3566495184833	86.1858716665203	85.5265	86.4226
85.3566495184833	86.1858716665203	85.5459	86.1581
85.3566495184833	86.1858716665203	85.8335	84.6274
84.0130944978899	84.8955919851136	83.1803	86.2205
84.0130944978899	84.8955919851136	83.3441	85.5151
84.0130944978899	84.8955919851136	84.2824	83.9445
84.0130944978899	84.8955919851136	83.0689	84.7397
83.2405656596183	82.4827997961602	84.0326	80.947
82.0854954099592	81.6959524766148	82.7718	81.5009
80.7773665127852	80.9307419952905	80.7551	80.6861
79.4809517112374	80.1874159466806	80.2014	81.5949
79.4809517112374	80.1874159466806	80.3025	81.1115
79.4809517112374	80.1874159466806	79.6279	80.9538
79.4809517112374	80.1874159466806	79.7775	80.296
79.4809517112374	80.1874159466806	78.4966	80.8407
79.4809517112374	80.1874159466806	78.9268	79.6337

Solution x	Solution y	Original x	Original y
79.4809517112374	80.1874159466806	78.4301	80.0876
78.1855116459348	78.0913513899808	79.7296	78.3022
78.1855116459348	78.0913513899808	77.9819	77.7483
78.1855116459348	78.0913513899808	76.8895	78.6378
76.567193258263	74.9328185854102	77.1908	76.3248
76.567193258263	74.9328185854102	76.4126	75.548
76.567193258263	74.9328185854102	77.4087	74.0915
76.567193258263	74.9328185854102	76.1087	74.9228
76.567193258263	74.9328185854102	76.1847	74.2911
76.567193258263	74.9328185854102	75.9291	73.9471
74.6777672098388	71.2275292515749	73.5126	71.3248
73.389576688609	67.2829390652731	73.6361	68.0431
72.0334148987855	59.6568426981194	73.1545	60.0435
Route: 5 Length: 127.749712430875 Demand Met: 1070			
83.2600437422653	57.5053753201377	84.5964	57.5663
85.3987861498894	71.1868366912174	84.8025	72.2361
85.3987861498894	71.1868366912174	85.22	71.0885
89.0120477978689	74.3869411211766	89.379	76.0987
89.0120477978689	74.3869411211766	89.4099	75.3847
89.0120477978689	74.3869411211766	89.0638	74.5581
89.0120477978689	74.3869411211766	89.2994	73.1482
89.0120477978689	74.3869411211766	88.9513	72.6403
90.5908721795145	80.0432993178748	92.5909	80.0433
90.5908721795145	80.0432993178748	89.9071	81.4441
90.5908721795145	80.0432993178748	89.7033	80.1502
89.5131136757954	82.1137073418888	87.8518	83.2273
89.5131136757954	82.1137073418888	88.1669	82.2879
89.5131136757954	82.1137073418888	88.7272	81.0174
89.5131136757954	82.1137073418888	89.4354	80.1567
89.5131136757954	82.1137073418888	87.5661	81.6563
89.5131016125924	83.2839840359232	89.6546	85.279
89.5131016125924	83.2839840359232	90.3741	83.7882
89.5131016125924	83.2839840359232	90.1019	83.486
89.5131016125924	83.2839840359232	90.256	83.0105
89.5131016125924	83.2839840359232	89	83.7031
85.9999377623843	83.2413553791711	87.8874	83.7559
85.9999377623843	83.2413553791711	87.7484	83.7546
85.9999377623843	83.2413553791711	86.8895	84.3247
85.9999377623843	83.2413553791711	87.1273	84.0324
85.9999377623843	83.2413553791711	86.7862	83.711
85.9999377623843	83.2413553791711	84.7929	84.8117
85.9999377623843	83.2413553791711	85.9222	83.4369
85.8180161233494	80.8960982580186	86.675	81.8002
85.8180161233494	80.8960982580186	86.0867	81.533
85.8180161233494	80.8960982580186	87.0156	79.966
85.8180161233494	80.8960982580186	86.8222	80.0693
85.5897185105208	79.4083328658845	87.485	79.3312
85.5897185105208	79.4083328658845	84.7887	79.7551
85.5897185105208	79.4083328658845	84.6626	79.7388
83.9807143984257	78.0853787646685	83.5177	79.6473
83.9807143984257	78.0853787646685	84.7658	77.8153
83.9807143984257	78.0853787646685	84.4928	76.9707
82.2852600257032	75.4599856412487	82.0065	75.6791
82.2852600257032	75.4599856412487	82.7574	74.2926
82.2852600257032	75.4599856412487	81.6179	74.1421
80.9421887243165	74.5358496388318	80.2922	75.8098
80.9421887243165	74.5358496388318	79.3483	75.3688
80.9421887243165	74.5358496388318	79.4655	74.4467
80.9421887243165	74.5358496388318	79.9937	73.4457
80.6226778480037	71.8069199971838	82.4808	71.6064
80.6226778480037	71.8069199971838	80.5183	71.0301
78.4252154351574	70.5871574148472	78.8402	71.1237
78.4252154351574	70.5871574148472	77.364	70.7565
76.7976956138014	69.1787945736426	75.6074	70.2776
75.9763052080156	62.8686261675987	77.6803	63.0066
Route: 6 Length: 184.815341860173 Demand Met: 1609			
64.2638451119707	37.0830053521953	64.954	37.309
50.8205781482422	33.8333782171663	49.5874	32.9921
48.70355815051	32.1249046930139	47.2249	31.4694
48.70355815051	32.1249046930139	48.8851	33.6728
47.7154475580508	28.6324281358256	45.8434	28.1097
47.7154475580508	28.6324281358256	48.0614	30.3792
47.552705176949	26.8833519433285	45.5527	26.8832
47.552705176949	26.8833519433285	48.2875	25.5427
47.552705176949	26.8833519433285	47.7847	28.4345
47.552705176949	26.8833519433285	49.2766	27.3707
47.744594516881	26.3766957407104	49.7446	26.3767
47.5508575813215	23.0775668097669	49.2796	22.4102
47.2552118512089	22.10745675116	47.312	20.115
44.4321397098961	22.0936557398807	44.6412	21.1681

Solution x	Solution y	Original x	Original y
41.315002110956	22.0800050095292	41.315	20.08
39.4161208135109	23.033114034394	38.8284	23.4703
37.8149005516014	23.8689950198456	37.8149	25.869
36.7654265257271	23.3765223545277	37.9243	23.9119
36.7654265257271	23.3765223545277	37.4163	24.6203
34.7538991295561	22.7315372084101	33.6715	23.2449
34.7538991295561	22.7315372084101	35.5448	24.2684
31.0751620093895	20.7214456899208	29.6006	20.2054
31.0751620093895	20.7214456899208	30.4469	21.4825
31.0751620093895	20.7214456899208	32.1965	21.571
29.462970832185	17.6359843722619	30.7692	16.7931
23.0496846460965	16.0454245749848	22.1476	14.8515
20.7784415772099	15.0548961337881	19.7672	14.9362
19.1837605670949	14.0836242629338	17.8934	15.1905
19.1837605670949	14.0836242629338	19.0819	14.2893
18.413682994321	11.7434326722588	17.3372	11.1211
17.7640435489539	9.97984786280624	18.8587	8.5087
17.7640435489539	9.97984786280624	18.0288	10.2093
15.4594999591509	9.47520423878726	15.4595	7.4752
15.4594999591509	9.47520423878726	15.5961	8.5134
15.4594999591509	9.47520423878726	15.3812	8.8682
15.4594999591509	9.47520423878726	16.2452	9.322
15.4594999591509	9.47520423878726	15.7685	10.3669
13.6508700558613	9.477553924173	12.8565	9.4609
12.1857343937944	9.47990643392365	12.9432	8.6486
10.3090030563724	9.48226403861406	10.2894	7.4847
10.0980041813745	10.1575977018873	8.098	10.1576
10.0980041813745	10.1575977018873	8.6382	10.3371
10.3074308794975	11.5224607462905	8.40090000000001	11.7989
10.3074308794975	11.5224607462905	9.9074	11.0867
13.0384547262545	12.3146283213656	11.3126	12.1774
13.0384547262545	12.3146283213656	11.8636	12.6991
13.0384547262545	12.3146283213656	13.2666	12.9678
13.0384547262545	12.3146283213656	14.7479	11.7757
15.2046300257784	13.3247657262731	15.3264	12.7877
15.2046300257784	13.3247657262731	16.6256	12.3206
15.9547779349581	16.4837825260218	14.5843	15.7568
15.9547779349581	16.4837825260218	14.7151	17.4542
15.9547779349581	16.4837825260218	15.42	17.0914
15.9547779349581	16.4837825260218	15.9493	16.7531
19.06526544971	18.2749199951086	19.3111	17.5672
19.06526544971	18.2749199951086	19.5822	17.4941
21.2836616775536	21.5487800446748	20.9805	20.9752
21.2836616775536	21.5487800446748	20.821	23.0825
21.2836616775536	21.5487800446748	21.8127	22.4456
24.4379340397938	22.5646931616663	23.4201	21.9457
24.4379340397938	22.5646931616663	24.5672	24.4137
24.4379340397938	22.5646931616663	25.1657	24.0751
26.1937071015982	22.854423579363	25.9644	23.203
26.1937071015982	22.854423579363	27.0718	22.4926
27.6462925557325	23.1457743714459	28.392	21.3903
27.6462925557325	23.1457743714459	29.0027	23.8765
28.0596512500293	24.5988554246868	27.7157	24.2487
28.4819258451183	26.1748788690138	26.5855	26.5008
28.4819258451183	26.1748788690138	30.3241	25.8121
29.6028061445242	27.3812392263399	31.0534	27.3935
30.3607783488596	28.5846545599351	30.1704	30.5441
34.750557591711	28.6740481020198	33.916	28.6484
34.750557591711	28.6740481020198	35.1494	28.8106
41.5397997853043	28.763437184012	41.7938	26.8087
42.1360071404557	32.0147286323509	40.4113	32.0356
42.1360071404557	32.0147286323509	43.0635	31.4686
42.1360071404557	32.0147286323509	41.9344	32.8635
43.2788335887864	34.8305865258109	42.5333	36.3249
45.1877266033093	35.7682927346315	44.5785	34.1629
45.1877266033093	35.7682927346315	44.3864	36.3116
Route: 7 Length: 134.853984900035 Demand Met: 907			
47.3754042159191	39.9401060427891	47.3754	37.9401
47.0623922882592	39.9497143557317	45.8348	38.3992
47.0623922882592	39.9497143557317	47.2998	37.9687
44.6635996662894	39.9927607980721	44.7486	39.7162
42.1888946327687	40.0358590034642	41.4412	38.9568
42.1888946327687	40.0358590034642	42.0622	41.0674
42.1888946327687	40.0358590034642	43.5486	39.6053
37.6461012082435	40.079194182573	37.6461	42.0792
37.1224506994268	38.2291435546041	36.9556	37.1182
36.6080583520069	36.9140913310997	38.1953	36.049
35.1335893993035	36.2283482133738	36.1356	35.5262
32.9505260883752	35.6097377666912	33.7228	34.609
29.4055709918878	35.0684482087002	29.0396	36.1372

Solution x	Solution y	Original x	Original y
29.4055709918878	35.0684482087002	29.5705	36.67
25.9532407842931	34.0412021149011	24.2607	34.0424
25.9532407842931	34.0412021149011	26.8183	32.6012
25.9532407842931	34.0412021149011	27.0476	34.4285
23.8806822369104	33.412126583086	22.8416	32.9746
22.4385700182917	32.8174469010458	20.8616	31.8567
21.9819117991583	32.4257225306751	20.5677	31.0115
22.0110404210858	33.9640836866534	22.0871	33.226
22.0110404210858	33.9640836866534	22.2385	33.2025
22.040143330892	36.4071469721763	20.4824	37.2243
22.040143330892	36.4071469721763	23.8984	35.8981
22.040143330892	36.4071469721763	23.8226	36.8408
22.0658985180827	40.9150494087469	23.1185	40.5549
22.0915283951772	47.6423044132986	20.1897	48.2132
22.8107071954717	47.7285417706783	22.5313	48.1754
23.5517096532047	47.8142852519713	22.4944	48.7727
23.5517096532047	47.8142852519713	23.5397	47.0618
24.532300174654	47.8987942334957	24.5323	49.8988
25.6596217742152	47.2828950306034	25.2216	48.8368
27.1037716465468	46.2050739254843	27.0169	46.6583
27.1037716465468	46.2050739254843	28.4876	46.0461
28.0531321878475	45.1238053695401	27.2789	43.4795
30.2154180931252	44.6514387654534	30.9136	43.9894
31.9024746788693	44.2067825855567	32.7117	42.3778
31.9024749065921	45.8934515219354	32.0569	46.2162
31.9024751334394	47.4652392912402	31.0932	49.2942
32.7910588286364	47.1040081683254	32.0319	48.7602
34.7189567525017	46.4538999932931	35.3466	47.2689
36.3020012249306	45.7274058868292	36.302	43.7274
38.027105281641	45.9120533542163	37.7223	44.0563
44.7377068922439	46.2656935877171	44.7377	48.2657
46.6347854959951	45.900600928656	47.084	47.7144
47.5324111604799	43.0642999934	45.8095	43.1051

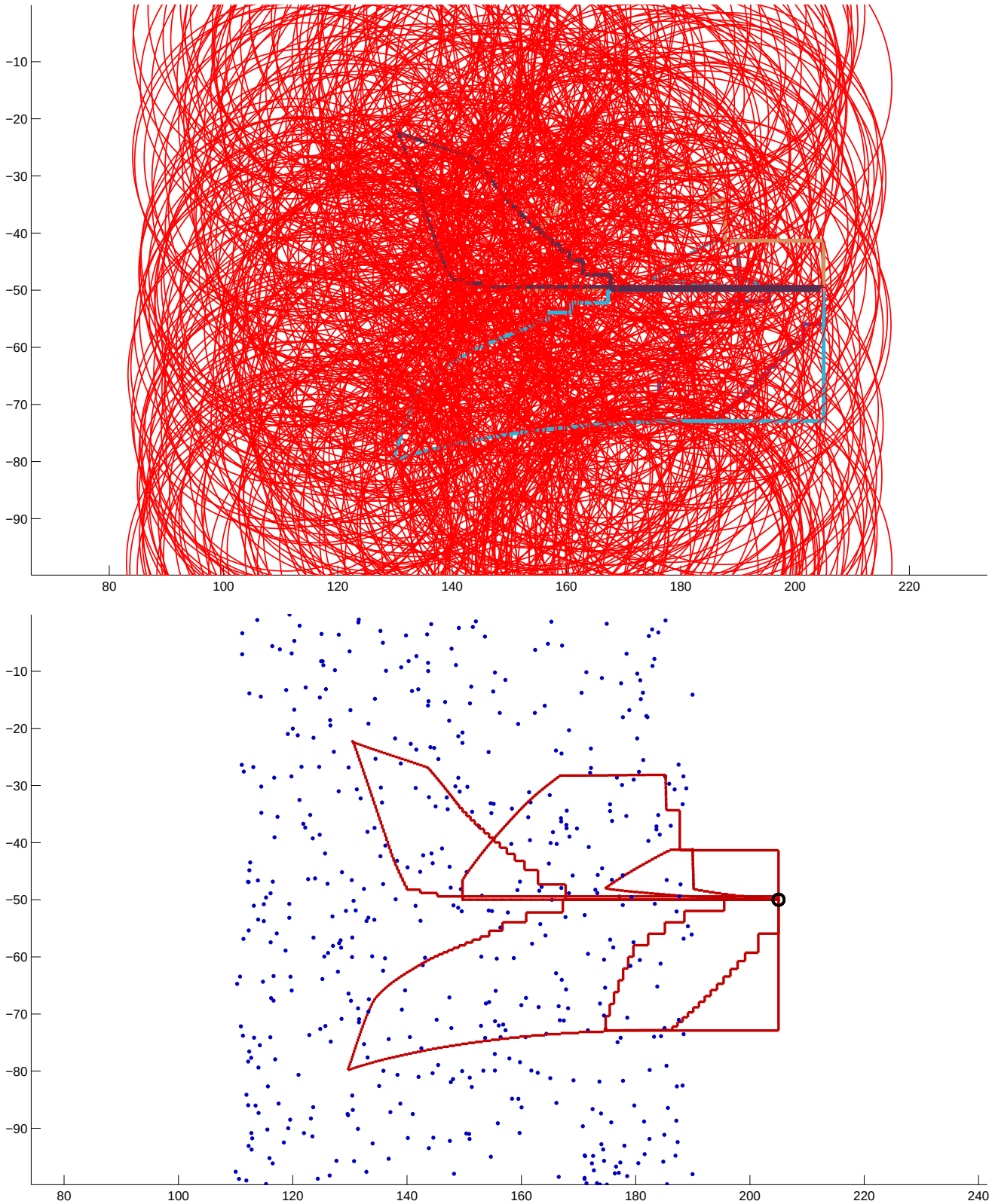


Figure O.110: *team*6_500, Equal Radius, 2D, Manhattan, Length = 754.3073449

Table O-113: Solution for *team*6_500, Equal Radius, 2D, Manhattan

Total distance: 754.307344949657			
Total demand met: 25539			
Depot: x 95 y 50			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 106.245491589797 Demand Met: 5000			
85.4962100139981	51.9636443569753	67.1669184	49.4371849
78.5198075156638	53.9472606743896	53.3341085	54.2742297
75.1151044243896	55.942307748254	54.2235528	56.265496
72.1921903115221	57.9515878232153	51.8847181	57.7017397
69.6060762275806	59.9811221373458	43.0002757	59.9692573
68.6830583907558	62.0158875011805	45.6990417	60.3070344
67.8176454535077	64.0901159587372	45.5118999	65.9532613
66.9959569203203	66.1670886674517	44.3710695	67.9205927
66.2159474241605	68.2476462540384	43.8195847	68.1613988
65.4711816927512	70.3522970882002	42.9598051	72.0704928
64.7594155579471	72.4638349738887	37.7594155	72.4638416
64.759415725025	72.4718657662004	43.6827488	74.1878852
64.7594158921025	72.4798983207454	46.3729602	74.0499355
64.7594160591825	72.4879316337724	46.0567355	72.019762
64.7594162262634	72.4959656190243	45.412979	71.2677197
64.7594163933442	72.5040002785051	46.8228713	71.844353
64.7594165604239	72.5120354387898	47.2434466	72.8348775
64.7594167275015	72.5200709484447	50.7478618	74.0551131
64.7594168945759	72.5281065800414	54.3749565	73.471727
64.7594170616456	72.5361422992382	53.0250996	68.7918887
64.7594172287119	72.5441786943016	50.0180258	68.4527432
64.7594173957754	72.5522159339754	50.8238583	67.1806384
64.7594175628365	72.56025420216	56.0822206	62.8731122
64.7594177298951	72.5682939515955	57.0800315	64.0172849
64.7594178969519	72.5763350652912	57.8283627	65.6998258
64.7594180640073	72.584377339328	58.1838222	68.9986011
64.7594182310619	72.5924203810701	56.5346421	68.6367247
64.7594183981156	72.6004643116191	56.7397866	71.0931061
64.7594185651686	72.6085088869412	57.43771	71.1535593
64.759418732221	72.6165541646422	61.6425082	72.8564323
64.7594188992738	72.6245999016452	67.3900644	74.174693
64.7594190663301	72.6326456957092	66.8428254	74.9418962
64.7594192333885	72.6406916044135	67.7945884	81.6777909
64.7594194004492	72.648736456255	63.6802314	81.8267454
64.7594195675104	72.6567805669305	59.1397084	81.6064397
64.7594197345715	72.6648242101635	55.0653569	81.234009
64.7594199016319	72.6728675639162	52.878421	80.2956919
64.7594200686915	72.6809108141343	51.7496653	79.9144917
64.7594202357498	72.6889540646698	49.7783583	78.4397036
64.7594204028065	72.6969975531451	47.9098314	77.7959758
64.7594205698612	72.7050413804856	45.3765455	76.9954785
64.7594207369126	72.7130855855058	45.3945603	79.9114427
64.7594209039598	72.7211296070376	43.3709663	79.9295648
64.7594210709991	72.7291729547383	39.6568849	80.0063838
64.7594212377104	72.7371961016507	40.9923031	81.1407106
64.759421404396	72.7452127485777	41.3355343	82.7796974
64.7594215710373	72.75321994193	48.3895216	84.8378656
64.7594217376774	72.7612262498054	49.4827685	84.8462228
64.7594219043157	72.7692319162477	50.0446513	86.3510967
64.7594220709515	72.7772367041015	56.1389342	85.561632
64.7594222375853	72.785241253421	62.4719528	86.6470186
64.7594224042184	72.7932454522323	63.9530194	87.4245185
64.7594225708517	72.8012492143415	65.7364961	88.9695394
64.7594227374868	72.809252238745	60.774398	89.648206
64.7594229041214	72.8172545871983	61.0866811	94.7582572
64.7594230707563	72.8252543750331	61.1689993	94.8861498
64.7594232373914	72.8332515786716	62.5782193	94.8345715
64.7594234040267	72.8412463793757	62.3573907	96.159986
64.7594235706621	72.8492376441958	62.6982725	97.3778678
64.7594237372983	72.8572234379854	61.0630253	98.699805
64.7594239039363	72.8651967372597	61.0701287	98.8683739
64.7594240705796	72.8731558362359	61.4066356	99.633296
64.7594242712408	72.8821613528456	63.7965883	99.8649883
65.3433148318792	72.877405192639	64.9776601	99.8572829
66.0523128744354	72.8722840120617	64.4754864	95.6952093
66.7687493905966	72.8671611478221	64.3381393	93.722702
67.4930854810881	72.8620374113859	64.0121883	92.7907393
68.2263398609322	72.8569130636563	68.0410206	93.0677269
68.9654221634952	72.8517879889438	67.3268965	96.007007
69.7130940291243	72.8466610163871	66.5761879	96.7049476
70.4737988548689	72.84153147961	66.3729212	97.9005203
71.2582724485406	72.8363974569438	67.0620012	97.8077872
72.0679023786361	72.831258564563	68.523768	98.3881808
72.9086323446945	72.8261129420277	70.4834315	96.1070737
73.7632188915021	72.8209642426133	71.5874534	94.5399994
74.6300702273287	72.8158134416544	74.8496365	95.8479299
75.5051850478372	72.8106596591808	75.4923392	99.8090463
76.4295650108094	72.1752979025322	79.9522127	98.0359405
77.3275295543952	71.3888375069529	76.9820609	94.8106777
78.2358600112357	70.5607960233028	77.3466754	92.4222135
79.1557030744933	69.703956963635	75.0360354	91.1497098
80.0934899456614	68.8171978706911	72.4289329	91.88372
81.0698858842108	67.858746241453	71.4909917	88.8238404
82.0838311768887	66.8510516514903	69.765468	86.0199863
83.1450367366089	65.7975789067876	75.6464183	86.4517504
84.2390659092146	64.6988672874065	77.1265753	88.6843079
85.3954249725826	63.4334837586302	77.2293497	82.6694496
86.5908019248995	62.1187695256174	78.2121151	82.5216358
87.8344955042547	60.7312291472527	75.4040099	79.0607348
89.1468040606783	59.2701182541297	72.4566884	79.8068651
91.452563808019	55.9294091271106	73.2290706	73.9762718
Route: 2 Length: 78.4901423057623 Demand Met: 4996			
92.0816356897006	49.9231234060003	74.3685871	61.179785
89.5886097918616	49.8460996730527	73.7932186	65.1929118
87.3828283090934	49.7688520203378	77.5651358	71.0148631
85.3840338172939	49.6912375236881	78.4106856	73.5257917
83.5707451996028	49.6129702884246	74.4567732	73.8913977
82.0549311711172	49.5332741049482	75.0689318	72.4744486
80.6240625831498	49.4531065179886	68.5426632	70.6500378
79.3153896982739	49.3724179415858	64.4543682	70.2655389
78.2002437297694	49.2906924891894	63.772212	68.1836695
77.1575241244188	49.2085770324653	64.6626599	65.39963
76.1507563044364	49.1262988230498	69.1126526	61.5737532
75.1623588076263	49.0439618188796	70.748982	60.565778
74.188164084305	48.9615743736512	69.6306367	57.4599551
73.2274078191216	48.8791682802379	65.5436157	56.992435
72.2828953046712	48.7967452312195	66.0988248	58.3515559
71.3526366303287	48.7142835651111	64.4880133	60.4854675
70.4374155426162	48.6317486614159	61.6781701	59.473286
69.5388512889196	48.5491471386667	48.6878693	60.2173135
68.7043044299367	48.4662888960944	46.3458684	54.8708712
67.9200542953532	48.3833337798911	47.6524078	52.2249928
67.1640041357653	48.3003634463803	44.8729194	51.9811136
66.443926979843	48.2173588235467	44.2906965	51.8898251
65.7553846748092	48.1343150999395	39.5709227	52.0192185
65.2482526601202	48.0508257186779	38.9617732	51.3997809
64.8517085020912	47.9669410702722	38.128444	50.990683
64.6481266059469	47.8813158205243	37.6481264	47.8813096
65.0607729974983	47.5602701678079	39.4220046	48.156385
65.5070894687155	47.2390883272775	40.4352515	45.1450838
65.9817598116418	46.9193457249969	43.0965371	49.287121
66.4697626205688	46.5991257491835	49.7681271	46.8278362
66.9623553965659	46.2790838822841	48.2549784	40.2375649
67.4611603724019	45.9602944661861	51.2078647	35.5791539
67.9649564250438	45.6434116726541	51.6262531	32.9510025
68.4740917597672	45.329095141618	54.9748886	31.6899499
68.9865404902397	45.0170770658633	62.0390375	27.7696953
69.5024897562127	44.7077201425362	62.1748486	23.5386262
70.0233636610144	44.403351742605	62.1996928	26.9322785
70.5469469861929	44.1016166488396	66.7264937	28.6241638
71.0743967184916	43.801678989684	67.6344777	29.9025036
71.6051465422941	43.503196272087	69.6772126	28.9703915
72.1390592350251	43.20622550713	70.5957341	27.6007009
72.6750480558108	42.9109369017707	71.3343578	25.5495623
73.2119365508605	42.6176961515854	70.2766166	21.7580017
73.7478922195566	42.3278960902637	72.0757838	18.033427
74.2816355670706	42.0458538048368	71.8742878	17.8343061
74.8127340476385	41.7710485817119	67.7860652	18.0440513
75.34663346366	41.5038267617786	68.9038468	16.8104734
75.9370320872657	41.2477609115815	70.9135058	14.8761766
79.9544858039077	41.1068022411719	79.9570853	14.106802
79.9599469272098	41.3025459774589	77.5184606	26.3492827
79.9654088583151	41.4989823827587	78.3681704	28.4149174
79.9708715825818	41.6959932712205	75.1791401	28.4357222
79.9763354346971	41.893629326513	75.8801773	29.7113355
79.9818003589364	42.0918352999934	76.8303918	30.6898889
79.9872662975558	42.2905854113928	78.8734057	30.5074156
79.9927331275811	42.4899458302125	78.2442809	33.2914556
79.9982010152939	42.6898011625176	76.1612584	37.0439506
80.0036701913706	42.8899792520216	74.2228108	38.6099587
80.0091408117429	43.0903999358798	72.24704	39.7077335
80.0146130434591	43.2910089111617	73.6393721	37.6930766

Solution x	Solution y	Original x	Original y
80.0200868079615	43.4918965583639	73.6483802	37.1698351
80.0255621443233	43.6930849691801	73.9542296	35.1681427
80.0310390708794	43.894673047536	68.3855742	35.3493495
80.0365180979379	44.0967281427642	65.5339196	33.299582
80.0419997355923	44.2995103293921	65.5247054	34.4819771
80.0474839607124	44.502933280644	65.884583	36.2103636
80.0529706364062	44.706856390346	61.8021468	40.7857588
80.0584604763874	44.9110503660667	58.429274	38.9397266
80.0639550782284	45.1159282330165	59.7400431	37.5401839
80.0694540533258	45.3215857583103	57.9145816	37.4787407
80.074958886869	45.528407286425	57.8811625	36.8910334
80.0804701045634	45.7366472164815	57.9600279	34.4089577
80.08598937241	45.9475974024684	56.9481598	35.7189477
80.0915183922128	46.1617169537424	56.98499	36.3050676
80.0970573134771	46.3787111460067	55.5353048	38.1752447
80.1026102266081	46.5998990489592	56.2067364	40.2417677
80.1081736304212	46.8227972642954	55.1300701	40.0588307
80.1137535609987	47.0493401333979	54.8328865	43.6672378
80.1193492509477	47.2773737893347	58.9987357	45.7674431
80.1249518486937	47.5057423643501	58.3317264	48.8464518
80.1305623319437	47.7340963206255	57.0032853	47.929495
80.1361828051775	47.9625654521456	53.5581269	47.7413894
80.1418571881819	48.1914904323781	53.1446811	48.4277704
80.8965316998818	48.3557509851129	55.3536754	50.0230289
81.7877854426621	48.519753387581	57.7424662	53.0431767
82.7804361755988	48.6832971364066	61.0935569	52.6920317
83.8372180756039	48.8466670792134	63.3053921	48.8331121
84.9513691037129	49.0101627477442	62.9728444	48.2610974
86.1492674709804	49.1738644564272	63.3830619	45.6708392
87.4708121656956	49.33803722822	64.136723	44.5156078
88.984326014065	49.5028794856613	65.8501112	46.5185477
90.7202537221677	49.668142447596	67.7343836	45.7338412
92.7535737562465	49.8338844349934	75.4422908	46.5496079
Route: 3 Length: 154.37778352618 Demand Met: 5000			
71.478102850199	49.9998542433358	49.3212736	48.3119567
62.1565877471548	49.9997080189142	37.4597811	44.2188485
58.5586648194491	49.9995618472461	36.1244237	41.0242921
55.9084827006617	49.9994157355882	34.2887402	41.9043439
53.7009377315833	49.9992697358968	34.4981613	43.6098189
51.7009910798304	49.9991238749711	32.8302989	42.2309887
49.8708260414208	49.9989781317585	30.0937988	44.3308943
48.1881598847588	49.9988324601556	28.2512087	43.1796715
46.6351197511916	49.998686835441	28.018456	49.9258106
45.1660492557355	49.9985412182486	31.5095969	51.0684653
43.7471022578757	49.9983956028118	32.3710377	53.6854
42.3693808959645	49.9982499889215	33.1471098	60.1558513
41.0280608435458	49.9981043674114	32.7632095	61.4478694
39.7191565266033	49.9979587345594	32.5068688	76.0167984
39.718634834696	49.9674168998302	30.51178	74.0433946
39.7181145796807	49.9367294295777	29.1113171	69.2428114
39.7175947009398	49.9060097091383	29.6716712	65.8677857
39.7170751322655	49.8752729425439	23.3330747	67.4297538
39.7165565235661	49.8445127017993	25.824676	62.4300357
39.7160382645563	49.8137461088126	26.1534967	60.2417469
39.7155203155168	49.7829762274724	23.9069485	59.9121563
39.7150027194705	49.7522040290762	20.3908302	60.0437447
39.7144856750219	49.7214321011399	17.9198509	62.5969087
39.7139710387325	49.6906316607342	16.1987878	59.3187745
39.7134591633952	49.6598037869225	15.5276897	59.9411898
39.7129575225281	49.6287846987687	13.6466825	56.641223
39.7124489808966	49.4028975741492	17.0586402	58.0717087
39.7119384125773	49.1752020279714	18.474215	58.4012448
39.7114267990982	48.9463017900086	18.1200543	57.6122523
39.7109143155572	48.716207408571	18.3784185	57.1026507
39.710401220304	48.4850821857406	20.4303529	56.6155569
39.7098879085196	48.2533755056986	22.9209187	53.7233909
39.7093745656117	48.0215229366175	24.284459	53.5118781
39.7088611389498	47.7895496215326	23.2467308	53.1536864
39.7083476561438	47.5574447161814	21.0216738	51.8703093
39.7078341487504	47.3252468302812	20.6501388	50.1791373
39.7073206742967	47.093075758705	19.3270801	51.9549025
39.7068071640322	46.8606814958347	16.954408	52.9270638
39.7062935898994	46.6273378985536	16.0956015	47.1989931
39.7057803125813	46.3942350043416	12.7057803	46.3942459
39.9468364090643	45.9506891045473	13.919931	46.2670929
40.2404389835309	45.5012436159992	15.6671545	41.9038059
40.5512439021853	45.058564583058	18.6253841	45.1799856
40.8678174301758	44.6168414518087	20.3277951	46.570702
41.1890166015846	44.1752710112662	22.4746551	48.1041051
41.5139842949924	43.7332831194778	25.8175111	47.2716024

Solution x	Solution y	Original x	Original y
41.8417130926656	43.2911845056188	25.3533813	42.3962835
42.1724846219155	42.8500809680365	26.2175773	40.5220972
42.5062575505148	42.4103235145023	23.0786229	38.1227731
42.8447698444616	41.9728867761524	24.3319298	37.4283803
43.187667684933	41.5376840284443	25.6408756	32.9849766
43.5350966777289	41.1060357275184	31.5115819	30.4349931
43.885373685983	40.677604137999	33.8398153	32.0377234
44.2380456061397	40.2515799427321	35.0133629	33.6653342
44.5929944949432	39.8274247321107	37.130172	34.1670861
44.9500275887149	39.4048902716405	36.9545772	32.1019086
45.3093050164673	38.9842700457493	39.21475	31.0795566
45.6706357211488	38.5656175648887	38.4714341	30.1541626
46.0342127164155	38.1490255973609	38.9767874	28.6595996
46.4000771067499	37.7346594444485	40.565033	30.2350611
46.768053969016	37.3220190555174	41.3950957	34.602479
47.1380947723662	36.9102825303779	42.5831476	37.1399223
47.5101555592722	36.4990225081932	44.7688336	34.8472485
47.8839695073683	36.0884022972076	45.1705924	33.2150554
48.2593923428787	35.6784672105111	44.6441662	33.1239716
48.6364238181226	35.2690517056836	44.272376	24.1529526
49.0152511397734	34.8617995422215	39.7157151	22.5518047
49.3970701663476	34.457313530851	39.7052051	20.7340789
49.7822404662199	34.056084057205	38.9701661	21.3778805
50.1711051863307	33.657773696982	34.7673517	23.4200763
50.5652455584811	33.2621716372455	37.3849664	18.6565566
50.9646946621368	32.8707613940969	36.6688954	15.3802855
51.3719755426985	32.4868816695565	41.0252369	15.6288565
51.78412199523	32.1075451150891	41.2499501	12.693222
52.202571314471	31.7352505839358	45.092729	13.545129
52.6251025898963	31.3673897565326	45.3795945	10.2393952
53.053084133475	31.0069752777446	47.2237184	11.5265695
53.4853239746616	30.6513664989309	46.2315326	17.3070005
53.9215203984334	30.2979290271441	49.4509792	19.23293
54.3608150264536	29.9461773950038	52.3761166	17.3066951
54.8027171265443	29.5964519436264	54.100404	16.0525172
55.2469808772308	29.2490110129667	52.4413086	6.2567644
55.6961241204696	28.9101036218115	54.6678163	5.1970784
56.1496038381852	28.5807919299151	57.1362338	5.5136309
56.6062367006659	28.2589255539957	55.2537104	1.3428502
61.988295363801	28.2280628570751	64.943613	1.686391
65.2142052196184	28.1971982868862	68.4102584	6.9403941
68.5274172305576	28.1663757499514	72.320279	3.8462993
71.8457475086586	28.1357074955443	72.8917692	2.6849909
75.2338886593934	28.1053279243285	75.2339764	1.1053279
75.2417432281545	28.4544246168668	73.9903157	3.2090585
75.2495965656897	28.824045221792	73.292725	7.8305571
75.25745264923	29.1999681304901	72.9487249	9.0752285
75.2653123323899	29.5815379066573	70.2907843	10.4186099
75.2731784396511	29.9683679025616	70.8086056	11.5809577
75.2810514170851	30.3598993997168	71.2868972	13.7571779
75.2889320862839	30.7551268086248	67.4654721	12.1137109
75.2968241256442	31.1558508937188	64.1033853	11.196525
75.304734784416	31.5661105520586	61.3811866	10.1841347
75.3127317238636	32.0075158768203	60.5482992	13.7850738
75.3207649260556	32.4624695929659	58.3586123	20.3359236
75.3288237854868	32.9234651984375	57.0336699	24.3925592
75.3369099317948	33.3885824637695	56.0727891	23.8686819
75.3450333198194	33.8588566361999	51.358437	31.183912
75.3532187910396	34.3315110952246	48.3601763	34.0464698
77.7269230502422	41.3370383944644	51.5218465	39.5765057
Route: 4 Length: 210.1662210012 Demand Met: 4999			
57.2671013888956	52.2305094520881	37.415218	67.1119326
50.8430333423581	53.920593679493	35.1926471	70.9963316
46.7102822323583	55.4334920552246	35.4564008	78.9241199
44.3730563877813	56.4154758599993	37.6570142	81.9317057
42.8487624609262	56.9845459160103	38.0621359	81.3957333
41.4727743454396	57.4939799369023	34.482979	80.365325
40.2180362670084	57.967225500462	32.0336769	81.0046037
39.0847173585518	58.4013455083642	28.3264783	80.6515072
38.0827329438989	58.798261312881	25.8819635	79.9487476
37.184535898734	59.1673422258197	26.7897314	74.395765
36.3199818983634	59.5307721995952	23.1076735	77.6165558
35.5087994075976	59.881712065706	22.4809106	75.2843669
34.7333107218592	60.2259881805448	16.6661596	74.8364156
34.0260396826764	60.5601546900181	12.9149435	73.6813943
33.4250204623041	60.8789899653375	14.8230271	72.6203252
32.8588633693573	61.1934592335036	15.7168362	72.1075902
32.3166209378063	61.5053447709798	18.5593029	70.8497614
31.7888265906514	61.8163545493689	21.5799527	71.4486566
31.2708743025613	62.1260778942373	21.6218153	70.9164832

Solution x	Solution y	Original x	Original y
30.7619133599719	62.434707376577	23.2409835	69.6045703
30.2601761454578	62.7427953624639	21.4467307	69.0185063
29.7667594285828	63.0507036290123	20.1950128	67.681815
29.2822394738337	63.3591493021095	19.7736057	66.4248411
28.8065244374244	63.6687893982633	15.1928212	63.8863652
28.3422906570381	63.9810744120573	9.6122245	63.4753738
27.8957883380029	64.296304146683	9.81425009999999	65.891213
27.4647591560317	64.6127779341906	6.6484375	67.6725429
27.0545801496932	64.929008210476	6.2196931	67.2192158
26.6631365366229	65.245452926037	4.8021518	64.3437535
26.2917999927318	65.5644997374845	6.65024940000001	63.3598676
25.9332828018698	65.8867123616079	8.7488745	58.9072962
25.5842402819696	66.2143188424202	6.14577610000001	57.4553139
25.2482200312207	66.5498831356384	7.20936620000001	55.909681
24.9227572452153	66.8941993331959	4.9451086	53.7479899
24.6164222958728	67.2572983721084	3.9504558	53.4738105
24.3342505613949	67.6507691356703	2.2999767	55.3764405
24.0776180778163	68.0792773048079	1.389212	56.8496436
23.843926725284	68.5332118605602	0.795030699999998	63.4582891
23.6214280686371	68.9968501436615	0.2763329	64.7359652
23.4096848277919	69.4683187770137	0.933565799999997	72.1659561
23.2054479262842	69.94364578932	1.295681	73.7881021
23.0077291556532	70.4224771167953	3.24432779999999	74.1558976
22.8144087504694	70.9050926823491	6.0949397	74.0865476
22.6242036770585	71.392460144276	4.2645198	75.4568775
22.4375481295465	71.8833147327139	2.4095765	76.567725
22.2550885277455	72.3762327476777	2.73342340000001	77.6753662
22.076395365702	72.8703395727855	2.2118306	78.338365
21.9014248179754	73.3647037787507	4.0094679	79.3774545
21.7292752674855	73.8593643223963	6.9413921	77.9428724
21.559246253406	74.3559115171953	11.0262565	80.6460603
21.3914864987663	74.8541047393906	5.6520223	82.6769432
21.2260903073824	75.3505564007004	1.90777989999999	84.1438746
21.0637159873284	75.8409164178211	2.2068367	85.97283
20.9041134507908	76.3231095780173	3.4980922	86.0326352
20.7465338381166	76.7992612620238	4.0389978	87.3302987
20.5907372313503	77.2686777774784	5.5712407	90.2337915
20.4367022526032	77.7288941086486	2.7731053	90.8551563
20.2845098545408	78.1760755359948	2.92961390000001	91.7761922
20.1337994847531	78.6101389141068	2.2885744	93.0945686
19.9845543273707	79.0282012536934	2.8109458	93.7321232
19.8360894509425	79.4320626149478	0.0137857999999937	97.6201473
19.6964681024618	79.7795786030617	0.604558600000004	98.8714353
20.0422603892394	79.6371707171884	1.8947773	99.155621
20.4377778683865	79.4934957188	5.3401207	99.7769332
20.8586193193453	79.3506635807863	6.5131248	96.1438685
21.296888369883	79.2078127727849	5.93926279999999	95.2323551
21.7560730331203	79.0642454196918	8.45094570000001	92.4898096
22.2297566459814	78.9198838635191	9.22639889999999	90.0124515
22.7170816488245	78.7745898304727	9.5621792	88.5032381
23.2185801413977	78.6283249244478	7.5281123	85.6801168
23.7383156503727	78.4811532719223	13.5790401	86.3111074
24.2698243644359	78.3331286886262	13.1891897	88.2938542
24.8152729362271	78.1842804062726	11.9839899	90.8471274
25.379980504382	78.0345062486781	13.4475731	91.4293541
25.9642530970378	77.8837524790461	14.3875276	98.8261078
26.5935348533806	77.7295363909766	16.4819632	98.2716229
27.2585047234302	77.5724826444224	17.6447354	95.7025091
27.951222375548	77.4136555241305	20.7475398	95.759314
28.6659793277013	77.2531470373587	22.9057445	97.6296948
29.4025858338505	77.0902672991108	26.8042407	95.3391438
30.1500109733979	76.9256839615662	23.9936704	92.6751712
30.916685672366	76.7595928713289	21.4283979	90.119601
31.7105362637359	76.5921572083943	19.6994488	87.7215703
32.5388422611409	76.4235812135931	19.6070156	87.5155962
33.4077069187182	76.2538467829008	20.5127244	86.7993916
34.3196438054113	76.0831205714066	20.4274735	84.2677658
35.2800432961955	75.9118656705495	25.1363027	82.596723
36.2769133210365	75.7403529512762	27.0999394	87.1794445
37.3126105082604	75.5681101075973	28.8394854	85.6978668
38.3871431002904	75.3953470604603	31.00496	87.5127119
39.5019125944442	75.2217932182789	30.1525293	91.7059859
40.6826351237694	75.0463913378825	34.617789	91.6565199
41.9166898583094	74.8691521718572	33.8269693	93.4852631
43.2382571649989	74.6891636149967	38.2308224	97.9753907
44.6809147753173	74.5023033478417	37.489488	92.2138591
46.2327788649488	74.3131414138333	40.3910959	90.932739
47.8917667079841	74.1223954522739	40.8799687	90.9919823
49.6992247654983	73.9300355974686	40.9379615	91.8870672
51.7439621707671	73.7352959451397	44.680977	94.9895485

Solution x	Solution y	Original x	Original y
54.1309087689928	73.5353526275024	45.8972803	89.1189208
56.8812490290425	73.3338357152859	49.7030604	90.8227548
60.051663479724	73.1297054098267	56.5514993	98.5201232
64.393203878085	72.8923919092424	63.2522018	99.6147456
Route: 5 Length: 204.532194919238 Demand Met: 5000			
57.7536127407351	47.3092150544076	32.3078962	45.114069
52.9135937125333	44.773576237157	35.4889656	25.3753347
50.5527427330244	43.1832424847042	34.0986738	23.3047286
48.8684763349079	41.968289051388	31.6418617	23.7354033
47.4695455578974	40.9043327962726	30.6527015	22.708305
46.2514202050536	39.9457624851707	27.922577	21.764341
45.2768683338014	39.1369364340128	28.9097869	26.1468646
44.3453660064826	38.3489439020959	24.4888337	25.329984
43.4834141058038	37.5931497753223	25.434095	30.36432
42.6519889997663	36.8477346219761	21.8832831	32.2702186
41.8587875730112	36.1108631677559	21.2205961	30.6755865
41.1013490282552	35.382842401963	18.0420031	31.0087706
40.3942007306343	34.6646789117558	19.7989907	26.8559855
39.7190050803785	33.9577117466572	17.2034005	24.1027648
39.0977468503527	33.2756651978233	16.5956207	19.4929376
38.6250333085362	32.7079676482171	16.5565287	18.5575743
38.2251494852918	32.2065570045021	20.1050057	16.8211128
37.8389459350992	31.7201045888906	23.260163	19.1726271
37.4587224829301	31.2393795021572	24.4057133	14.819481
37.0842976346513	30.7675236296274	30.8819888	13.4626957
36.7117705268425	30.3025762972822	31.9710737	13.1659452
36.34052423074	29.8439647596727	33.6742877	16.0147514
35.9698520778091	29.3894875889444	33.7699504	15.2531662
35.6001231730855	28.9391662873915	33.7088519	9.9711832
35.2319339737125	28.4959261601289	33.6893922	8.5224136
34.8654752306003	28.0605378118308	38.5584867	8.9239146
34.4994802200292	27.6319565018913	37.7928549	6.0601138
34.1339791531235	27.213157382824	43.6411268	3.9331303
33.7622896207865	26.8192419205125	42.0438698	1.2746098
33.237642719231	26.6195468250595	41.5241877	2.2495139
32.6950317243606	26.4287338660703	39.0651937	2.4238303
32.1460612529401	26.242572573484	34.237799	1.769458
31.5975785659292	26.0604284805171	33.5301093	3.5426558
31.0508630562073	25.8803266039763	29.8399494	3.731908
30.5081364937429	25.7020251828287	31.6461166	7.3585956
29.9679742321531	25.5246042938968	30.2787157	8.2280249
29.4306164860996	25.3479236339322	28.9980611	9.3107142
28.8962111236525	25.1718694377703	26.3324067	9.9110212
28.3653455379072	24.9964252836249	25.7941467	5.022901
27.8384450410443	24.8221513417316	25.3620642	2.9418291
27.3157974747485	24.6495305412422	21.5694811	0.9567502
26.8025866629583	24.4800553315512	21.5004558	1.4444458
26.2965868797432	24.3129397087314	18.0605132	3.6100683
25.7980843599972	24.1473930467279	19.95828	6.5164086
25.3039295943525	23.9827284912951	17.3929381	9.8303298
24.8142475648257	23.8187462486434	15.3634563	8.946465
24.3297214940412	23.655559747785	15.2275578	8.2482088
23.8501886144448	23.4932293452849	14.9649191	8.2569823
23.3754035665501	23.3317611400073	15.0419936	3.4632806
22.9065237660018	23.1716573471923	11.2137447	2.0282324
22.4495036498649	23.0138967005332	9.4518233	0.0818322
22.0392697486795	22.8657755417682	10.2956976	4.6843351
21.6346043832199	22.7187469524238	9.8269964	6.8843491
21.2344236419235	22.572521433903	7.7653349	6.167634
20.839667818728	22.4271976438275	6.43216459999999	5.6038094
20.4510472795191	22.2828553103306	3.796854	1.0310825
20.4510472513124	22.2828552890687	1.18933079999999	3.3623299
20.6509280326875	22.8327794196615	1.16963010000001	7.0254341
20.8546555392693	23.4074200268996	2.4227502	13.8762399
21.0600395608417	23.989378571128	4.41833269999999	14.4467589
21.2668138114582	24.5777569504446	8.8711802	13.2955279
21.4746880192715	25.1723806683601	12.2844966	12.8434228
21.6835222348157	25.7733383903283	15.820225	13.1438067
21.8931011342431	26.380431476263	14.7546051	14.610274
22.1034221387353	26.9934537460408	10.2638739	16.7343669
22.3147488497146	27.6124958923559	10.0346396	20.0550826
22.5270518469892	28.2362351009092	9.1420339	20.9818632
22.7404157756428	28.8648006110444	10.881307	21.222109
22.9547096453753	29.4982201668529	13.6477983	21.6503409
23.1697037910151	30.1362913586916	14.6392528	26.7492086
23.3852084055847	30.7769977676091	11.5512784	26.7283657
23.6015016148684	31.421007099632	9.78612250000001	28.4044715
23.8187631093089	32.0681517584571	6.7702019	28.6398243
24.0374421835897	32.7192423059628	3.1062568	26.7803784
24.2587781855669	33.378456867265	1.0903939	26.3844516

Solution x	Solution y	Original x	Original y
24.4850525379075	34.0526292013978	1.44105020000001	27.5670412
24.7161612828855	34.7407204998048	4.4919615	30.1971308
24.9498375900373	35.4357207217889	4.5207011	34.7763494
25.1860774267433	36.133931887771	7.3492035	35.5012058
25.4241963471531	36.8351089025399	11.1949114	32.5347928
25.6636713977892	37.5412987378192	13.0553452	35.1491327
25.9042816302999	38.2513539275685	11.8541821	36.7134083
26.1461835282377	38.9649400612401	12.1928408	37.3702852
26.3894012568802	39.6821371542583	14.7299938	38.6202015
26.6337766798351	40.4026135215809	13.5198617	39.2703319
26.8796855817085	41.1265651554941	6.820668	39.0713932
27.1286985777454	41.8555297287687	2.57466789999999	43.4683609
27.3859861967734	42.5836917256325	2.4253981	44.8523436
27.6539881630387	43.3081778921043	2.1729785	46.8604253
27.9390127558738	44.0207673912965	2.27936	46.9159446
28.2453729219181	44.7232581962495	3.9184302	46.6238898
28.5629284498945	45.4245817036226	6.5220454	46.8393292
28.8868050140096	46.127281192074	6.1363219	48.8674613
29.2188886758093	46.8292448541018	5.3360715	49.6056788
29.5629111052844	47.5291241690607	4.944301	50.787374
29.9230886761042	48.223880504184	3.2029124	51.042154
32.3470646160684	48.8205683272602	9.41537220000001	53.1681384
35.3033596891609	49.4136909335213	9.4077401	50.7341371
Route: 6 Length: 0.495511607479955 Demand Met: 544			
94.9511992282071	50.0000000929895	79.80288	56.0883078
94.9023648957019	50.0000000982782	78.4065879	56.8222853
94.852509206032	50.000000107681	79.155929	54.6404138
94.8022761534118	50.0000001160534	77.1618533	52.0527053
94.7522443164196	50.0000001201596	67.7686962	50.942416
94.8031285033007	50.0000001172783	69.2934493	49.5142976
94.8530175186983	50.0000001116504	73.3690079	50.7128517
94.9023133190749	50.0000001079385	77.6409989	49.4044045
94.9508300677709	50.0000001036283	77.8566059	47.3210428

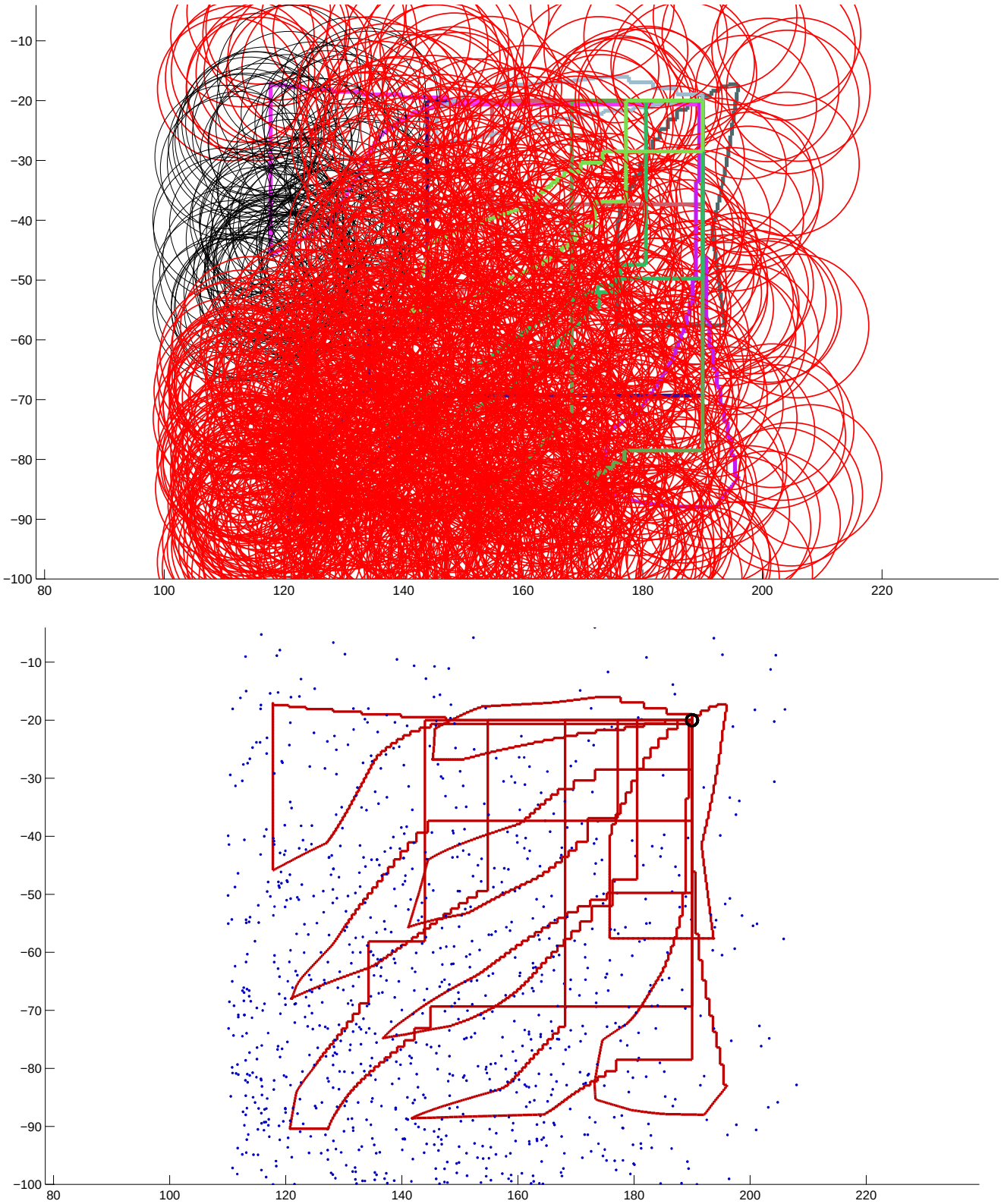


Figure O.111: *bonus*1000, Equal Radius, 2D, Manhattan, Length = 1752.0928165

Table O-114: Solution for *bonus*1000, Equal Radius, 2D, Manhattan

Total distance: 1752.09281652829 Total demand met: 25289 Depot: x 80 y 20			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 125.104205476362 Demand Met: 2337			
77.4889730835947	21.534548608097	67.26622281	20.02005982
75.7246286007396	23.1253681718026	66.92261807	21.4897109
74.1983676303512	24.7588908650914	66.17419814	21.15751135
72.8390748902625	26.4834887749759	64.88897514	21.58345165
71.6303569019333	28.3737546852922	63.04507341	24.29862677
70.5537932597476	30.4403623513868	62.83458953	32.37480154
69.5473571179027	32.4575343620728	63.76560063	37.45231942
68.5857989362211	34.3551041935314	61.01859213	37.82208646
67.6809613130764	36.1665454992154	58.14893689	37.55022655
66.858828951141	37.9257228292979	56.1557774	36.1071959
66.1603245695503	39.7452937869603	54.69460289	37.32086801
65.798103824897	45.1618089745197	53.79810347	45.16180718
65.7981039319382	45.6180639941816	57.35658457	43.71456461
65.7981040393838	46.0779990794546	57.48443808	43.25173204
65.7981041470252	46.5434493579999	57.56166222	41.97700689
65.7981042546519	47.0196255043304	59.28037529	42.02965748
65.7981043621561	47.5046998019207	63.12520069	41.24941139
65.7981044693762	47.9987731375627	63.54041364	40.47906672
65.7981045762563	48.5061573198427	63.41360315	44.69674786
65.7981046828569	49.0188067815875	64.47235297	44.07915445
65.798104789233	49.5385789955663	66.65703205	47.7722791
65.7981048954786	50.0611824134066	67.10787364	49.80646667
65.7981050017383	50.5850303812031	64.75792457	49.92103542
65.7981051079594	51.1107029072538	63.59211348	50.34808715
65.7981052141102	51.6384285124106	64.66140077	51.58253517
65.7981053202571	52.1674471853181	68.52022941	55.69012612
65.7981054267808	52.6931742061937	67.27809665	56.79217526
65.7981055335868	53.2150248947152	66.67873973	56.13517049
65.7981056405603	53.7348036454019	62.81703196	55.94894639
65.7981057474361	54.2533556423069	61.56325619	58.635877
65.7981058541191	54.7671648637593	61.59665848	60.86573745
65.7981059606025	55.2723665277276	62.01287875	62.70691628
65.7981060669203	55.7648774288242	61.64088805	64.72462094
65.7981061730374	56.2333613372162	59.10597324	64.72617137
65.7981062788189	56.6655778936931	57.97334153	65.39941546
65.7981063848007	56.9499969785499	59.0134746	66.34233581
65.7981064902026	57.1881075399321	60.59756518	67.42291916
65.7981065951877	57.3998852656481	63.47892732	68.70647259
65.7981067000731	57.587411916675	63.48323083	69.36201841
66.5564553332282	57.587409030729	63.53725064	67.03413314
67.3455804746321	57.5874061432962	65.55566867	66.58332744
68.1532050918372	57.5874032557621	65.09617026	64.32634731
68.9819343395646	57.5874003669695	65.33791464	63.72798066
69.8351055957063	57.5873974779911	67.87575086	63.89107621
70.7050356494242	57.5873945911984	69.70404765	60.5822767
71.586830223908	57.587391703674	70.94365949	58.14560753
72.479447863727	57.587388814199	71.85259834	57.85616299
73.3831027398663	57.5873859269449	72.13050555	55.03070373
74.3007030535329	57.5873830372526	72.73426073	54.95021428
75.2341822941228	57.5873801515631	71.99750065	50.82091856
76.1982814657873	57.5873772625711	77.87000631	52.21112855
77.1653582315501	57.5873743736433	78.85550393	52.04144231
78.1357392960515	57.5873714843939	83.19197135	53.48639501
79.0904641649285	57.5873685944346	84.14082278	54.46253046
80.0321997560818	57.5873657038176	83.91646182	55.69492785
80.9696982236772	57.5873628106015	83.55927983	59.64747077
81.9091365881803	57.5873599211136	85.16088414	60.47696067
82.846931004256	57.5873570333968	87.34079917	59.37931572
83.7769997520098	57.5873541655557	95.77662579	57.68215173
83.5999317066716	56.1882120665172	91.19333201	55.09349477
83.4216536923997	54.8069510614568	90.50689197	55.43830225
83.2423939704554	53.4223644818256	88.60564442	53.67349247
83.0627147624677	52.0406993564658	85.71414415	51.67250379
82.883113004641	50.6681865222474	86.51848331	50.71555717
82.7033478276883	49.3015050614703	78.92131522	50.41345477
82.5244716030317	47.9320054941393	76.57028534	49.55513485
82.3469031149023	46.5523820069372	77.77449926	46.72256252
82.1701582141	45.1789017266538	77.14427045	45.25079579
81.9943315042399	43.8126375421576	71.61626861	44.97765672
81.8238391385099	42.4123376291407	70.24663893	43.40548551
81.6792238097939	40.746758550069	69.67922342	40.74675918
81.9526431896669	39.5508233138714	73.13866372	41.71405139
82.2332012384926	38.3304782149081	74.55729645	43.48740037
82.5203014352399	37.0357964615126	74.78372311	42.05088328
82.8143053620543	35.6590571258363	75.19376171	39.75388964
83.1146362678615	34.2201438901734	79.30599483	40.28434635
83.4177723511158	32.7062165825326	84.85983095	39.85329756
83.720619090674	31.091511830574	87.56748283	36.27406643
84.0224598503792	29.4073464010885	88.13068149	33.9074779
84.32351079144	27.6615980210221	86.50661976	33.33916758
84.6248110112854	25.8275775252408	94.17807015	30.5898166
84.9124912625814	23.6647620679709	94.15587216	20.2227246
85.1926391859814	21.6904964590766	95.99475962	18.1472698
85.4466878875298	20.115951518172	90.81819821	18.2159484
85.7002799062938	18.5741882170215	93.53556787	11.2495411
85.9465655294177	17.2815468252303	94.43184685	8.796264511
84.3065427920628	17.6257426997356	83.75499038	5.857780347
82.9147669314847	18.3633914127136	85.22979418	8.715884504
81.4936729381978	19.18546161203	87.03899122	21.09553754
Route: 2 Length: 279.262574914814 Demand Met: 3000			
33.964462108331	58.1200607923726	27.36103425	64.84526011
24.251050580586	68.7886119810924	15.50686687	76.44859369
22.6885136411099	70.5850150700951	14.09860615	77.68853822
21.5609752029571	71.9284329223115	14.92906226	79.42060964
20.5383000088892	73.1361205673032	12.87616068	80.54131267
19.6467684064253	74.1894699192805	12.63857375	82.42671014
18.8580035447702	75.096757082896	10.82142722	82.89323555
18.1934005006372	75.8573840118239	10.08146406	81.46406963
17.5705741249552	76.5871928543762	9.701793671	81.23141394
16.9764956256076	77.3000904026865	7.992357197	82.08091397
16.4241427705649	77.986177460373	7.936374341	83.63932008
15.9065035563876	78.6419862646104	6.810206318	85.20186256
15.4538679249537	79.22646405419	6.663988874	86.9326968
15.106823973481	79.6640841980905	6.35930977699999	87.06467249
14.8005500950054	80.0491845532673	5.793118726	87.72031575
14.5810362708627	80.3203103437635	5.333729823	86.89695613
14.3766800019086	80.5755240463946	4.724328509	85.88211036
14.1817843588306	80.8231563504119	4.377655918	84.98459142
13.9934988124924	81.0668052724532	5.902742913	84.57417463
13.8077638952967	81.3092464358822	5.912402555	83.10767778
13.6241297326082	81.5514284002013	5.779054124	82.01317499
13.4424549472196	81.7938862023525	5.724809855	81.80721271
13.2626276032724	82.0367829033164	4.961462551	81.51420623
13.0849340481415	82.2803355769038	4.297539438	80.73294711
12.909737580218	82.525078060192	3.795442881	81.20966501
12.7372461499117	82.7709588238068	3.380314451	80.99890539
12.5677092516834	83.0183355956221	3.437419026	82.39656928
12.4006651700626	83.2664583793953	3.05949055799999	82.05603574
12.2362907982904	83.5156917019533	3.10003410199999	78.61964126
12.0756425280117	83.7698306612505	1.696022601	79.3379408
11.9236334095394	84.0350906656706	0.773453591000006	79.81662315
11.8223428827589	84.4403664181738	0.848777487999996	80.80421078
11.7267911926556	84.8842007964548	1.45195925500001	80.87244268
11.6335140803795	85.3516167635419	1.83782096500001	81.06813079
11.5417769262811	85.8401117300332	0.539457489	84.81338557
11.4522679874157	86.3377199488002	3.10551266100001	84.71082736
11.3632847898712	86.8408676926377	3.319354366	86.8534104
11.2747664425653	87.3464352446067	2.643010323	87.48230483
11.1868002452742	87.8542680370252	3.115821998	88.00026043
11.0992944718767	88.3643662450328	2.88784862599999	89.80188387
11.0122773839344	88.8743022280934	3.553988961	91.38716753
10.9256708918155	89.3824848968228	3.298576907	92.26869515
10.8395018011432	89.8881010646198	1.72500424899999	93.73701725
10.7541584645893	90.3854459219964	0.846436707999999	97.15575264
10.7556666951862	90.3854459103541	1.662890125	98.21483308
11.003441877323	90.3854458983422	2.510162792	94.82470236
11.2568955361291	90.3854458862814	3.212591442	94.51392157
11.5151919118783	90.385445874173	4.44010970700001	94.87692744
11.7773346456651	90.3854458620823	5.231683223	94.88567828
12.042913459836	90.3854458499729	8.327911253	95.97957355
12.3104110726823	90.3854458377927	8.37640356200001	96.83801393
12.5801393305584	90.3854458256233	5.819691822	97.53170939
12.8560276196408	90.3854458134392	6.625140742	98.72893978
13.1397934721345	90.3854458013053	7.810086676	100
13.4346608137309	90.3854457892621	11.51332542	99.95442641
13.7319550974311	90.3854457775215	11.04946885	95.30278919
14.0310422218504	90.3854457655452	14.02380259	94.55773265
14.3308278868941	90.3854457535166	16.10416337	94.62212285
14.6306250635589	90.3854457414804	17.22630202	94.08640458
14.9301201500258	90.3854457292742	17.25875189	95.69940805
15.2292953987447	90.3854457170196	17.81960057	98.01765152
15.5275898894017	90.3854457049172	18.10270516	98.29192556

Solution x	Solution y	Original x	Original y
15.8249349751148	90.3854456927973	18.56973911	98.93410982
16.1209348392357	90.3854456807688	22.00240146	99.12603644
16.4098100288517	90.3854456686909	22.19955839	99.83998701
16.6879926829493	90.3854456566459	23.23282295	99.37897746
16.9545864892727	90.385445644545	23.65267964	99.40598609
17.2087149083456	90.3854456325782	25.34553204	99.20543489
17.2087149232586	90.3854445111864	25.64004891	98.33585155
17.2087149381632	90.3854433937344	25.35918107	97.93925835
17.2087149530644	90.3854422778344	22.06521104	97.80973943
17.2087149679657	90.385441162479	21.53298817	97.76613815
17.2087149828637	90.3854400476108	21.95406549	97.08230078
17.2087149977602	90.385438932982	20.42707279	96.69258649
17.2087150126565	90.3854378187501	19.55892343	94.48515334
17.2087150275525	90.385436704465	18.65944439	93.90622028
17.2087150424484	90.3854355903095	18.21730526	92.48725442
17.2087150573456	90.3854344760818	16.85080568	91.45389056
17.2087150722415	90.3854333616588	14.30638295	91.72702037
17.2087150871387	90.3854322474562	13.01348985	89.5505908
17.208715102038	90.3854311328415	12.48771043	90.90107319
17.2087151169368	90.3854300181538	10.40564453	91.96900158
17.2087151318417	90.3854289034661	10.35439985	93.61856888
17.2087151467426	90.3854277890859	8.980893435	92.30918249
17.2087151616523	90.3854266746766	7.17818211399999	91.76838261
17.2087151765594	90.3854255604136	6.256438132	90.66257931
17.2087151914709	90.3854244464878	5.209294544	90.50333801
17.396696281606	89.8598047872908	5.838459994	89.46110654
17.6112386631583	89.3405943663319	6.29169329299999	89.27097954
17.8462803155376	88.8238416462584	6.57919393199999	89.24907689
18.1044434960318	88.3051428358716	7.085383584	88.77850283
18.3825321015144	87.7856165978294	7.009024866	89.80852716
18.7222412724773	87.2328776035986	8.842438164	89.89183088
19.0796362801152	86.6713486999252	9.577914639	89.11916471
19.4525587591285	86.1038470421222	10.77763243	89.00986935
19.8379191884268	85.5308091819546	9.98481624199999	87.60870523
20.2441796116714	84.9520854242051	9.940095688	86.998178
20.681317149223	84.3653483960099	9.921883095	86.8721598
21.1778629225898	83.7599251194266	11.28159713	86.83718755
21.7156829954396	83.1409694392037	12.03430063	87.78817585
22.3153522187535	82.4903854817654	12.45480817	85.29988604
22.9722095696227	81.8270973182071	15.06397637	86.4956065
23.6659679927048	81.1488964999346	15.25088212	86.85170355
24.4232799747986	80.4388013308267	16.23739593	85.87006787
25.2443110384909	79.7013463750504	18.85500198	86.61471751
26.1171021342396	78.930737154427	20.16675465	86.45561332
27.0484095931546	78.1167207053846	20.47481611	85.68176763
28.0669466061694	77.2424212596239	22.46431132	85.87828698
29.189200191241	76.2709043929482	24.79158589	85.73273425
30.4212848821845	75.1475037683998	24.93956922	85.18138774
32.1706883746961	73.0535550447594	24.67927032	81.21698222
34.9301897077026	69.3291889569785	25.63863856	75.55318582
Route: 3 Length: 201.975024373944 Demand Met: 2991			
37.5887014812078	19.4733802271559	32.11403346	10.63014558
29.8677417694479	18.9863863256742	29.15811552	9.518746656
23.0647187174684	18.522583682667	20.19850768	8.627828216
18.1420893241719	18.0895537014069	18.20950886	6.619599382
13.5130071747131	17.7303374147746	8.98802709899999	7.925934732
10.5197919444251	17.3946686788159	8.465864182	8.874062551
7.7813228413542	17.0662848897589	5.801300438	5.23076571
7.78132282241071	17.5050807619416	3.082410661	9.043855976
7.78132280349197	17.9613721346899	3.177857831	14.97802426
7.78132278459026	18.4209581030147	2.197761157	16.16441336
7.78132276570321	18.8831614949897	0.867278095000003	18.04823486
7.78132274683394	19.3466459089806	5.677247541	18.04924585
7.78132272797112	19.8115314563923	5.72255099500001	17.38650207
7.78132270911657	20.2789722001645	7.31997787899999	15.37807435
7.78132269026841	20.7518123194951	8.67995437099999	15.22687294
7.78132267142514	21.2312733774041	12.63680518	12.91935497
7.78132265258468	21.7310304849914	14.9958336	14.5728326
7.78132263374754	22.2534860720227	12.36712067	15.90584574
7.78132261490848	22.7883452060409	10.89890727	16.02503912
7.7813225960745	23.3363762463594	10.79914705	20.42039499
7.78132257724641	23.8893504461556	10.62327399	24.29073933
7.78132255841302	24.4429546209274	9.44237495500001	27.32019574
7.78132253958846	24.9940808323615	9.320660383	27.08555662
7.78132252076414	25.5438427501326	6.71940622700001	25.73868862
7.7813225019431	26.0946204953975	6.772905892	23.04434695
7.78132248312625	26.6505412922886	5.584406208	23.81184943
7.78132246431201	27.2116255175774	4.953508892	23.81507206
7.78132244550108	27.7790443580589	4.281409798	24.72152663
7.7813224266953	28.3525826406214	3.815111582	26.65111472

Solution x	Solution y	Original x	Original y
7.78132240789058	28.9302941557506	3.43019284899999	27.39779729
7.78132238909198	29.5120779238401	2.694391803	27.62826968
7.78132237029493	30.0988121185892	0.438114408000004	29.42535326
7.78132235150255	30.689005358463	1.354188569	31.31594018
7.78132233271562	31.2800247580055	2.51827574799999	30.45426362
7.7813223139311	31.8744848837678	8.02660248300001	29.17059173
7.78132229514829	32.4748971217196	10.78091353	34.08373955
7.7813222763651	33.0749389666074	11.00474377	35.14184161
7.78132225757875	33.6738396667641	9.832177112	38.08691559
7.78132223879979	34.2675386139537	12.65054039	38.20990532
7.78132222001128	34.8560255857464	14.50630809	38.16565664
7.78132220122478	35.4395086238436	14.44281578	41.35822358
7.7813221824353	36.0083749663047	12.97854061	40.66549102
7.78132216364517	36.5706098198735	13.48749824	42.29987548
7.78132214485089	37.1223774663061	12.31993183	42.07287161
7.78132212605814	37.6677536983852	9.954481978	42.50823893
7.78132210726336	38.2082051503095	9.755265232	43.18329059
7.78132208847003	38.743638917465	9.020444459	42.86210706
7.78132206967392	39.2758014481506	8.013859219	41.41457221
7.78132205088285	39.8074695949334	7.974625907	40.8370263
7.78132203208807	40.3399672865777	7.871697725	40.35198819
7.78132201329865	40.8744669000757	6.668915236	38.80565327
7.78132199450408	41.4133784214672	6.302525489	40.0085763
7.78132197571641	41.9559969405488	5.668356774	43.14782971
7.78132195692928	42.4993633407818	2.885836634	40.60849192
7.78132193813893	43.0475917674564	0.0942256310000005	39.91558536
7.78132191935802	43.6048780980651	0.224660494000005	41.43611847
7.78132190057919	44.1689936187877	1.77561061599999	46.38397362
7.78132188180126	44.7318047234424	1.250751092	48.74029716
7.78132186302788	45.288953297821	0.0735544159999932	50.20291794
7.78132184425704	45.8351189209881	0.102323447000003	55.05645207
8.01836886831532	45.7004327456309	0.715064701000003	54.34039001
8.27112469315686	45.5603845007002	3.166581108	54.38581172
8.52864950188956	45.4183937136232	3.200690229	54.90401263
8.79575690699605	45.2724003940675	3.684518627	54.75346427
9.07207022338002	45.1227064432766	3.857750749	53.93522034
9.35519017175929	44.9706960566451	5.351054934	54.87903352
9.64638110679665	44.8148213481246	5.28300793299999	51.8957834
9.9411012485243	44.6580688165586	7.88086425500001	53.63419396
10.2384320647189	44.4997435159445	8.078510661	52.12465727
10.5379078059494	44.340508674238	9.89102482200001	52.16610985
10.8386413677263	44.1803333165554	10.16802995	51.02082052
11.140564222189	44.0194931379663	10.84189087	50.74783931
11.4435001964307	43.8580063449572	7.342191074	50.36568708
11.7497875856215	43.6957728432364	6.810990128	49.52757429
12.0600219234279	43.5328956352036	6.962926975	47.87740863
12.3739465333924	43.3696784184311	8.736047039	47.86465463
12.6906185536978	43.2061512496036	8.81169210500001	48.50504439
13.0104189670381	43.0421584196123	8.91589750200001	48.83105962
13.3337432599599	42.8775795293786	9.26512226200001	48.10149258
13.6604931554276	42.7125432714025	9.19676513100001	46.15569372
13.9906904830544	42.5473393558774	10.71615729	46.62293177
14.3236985448603	42.3819117235109	10.20301226	47.6234059
14.660464289652	42.216030254893	10.30388261	47.84277995
15.0014653959139	42.0495901055229	12.77181014	48.33401693
15.345200940079	41.8825425769185	11.99216143	50.52822644
15.6944244823068	41.7137051003516	12.24975114	50.92735248
16.0506737234668	41.5423552135524	14.81228179	50.29125842
16.4098717338293	41.3694445916582	16.47526591	49.4455512
16.7705485566507	41.1953805923279	16.54761864	53.09785344
17.1471355160536	40.7521118380982	18.10483235	51.48322234
17.5227326482818	40.2574948803783	18.80954314	50.67936902
17.8970143840614	39.7131767632325	18.13426387	49.15791018
18.2727373284869	39.1392184148452	19.18169919	47.05766373
18.649268951496	38.5482995745601	17.80089583	46.64512233
19.0284386857579	37.9380130019148	18.21468575	45.65080463
19.4101775293601	37.309738991189	18.21138052	45.58660191
19.795114056751	36.6570727291907	17.44262234	43.68368222
20.1841408136626	35.9869485714603	17.47416259	43.6041515
20.5781057126873	35.2929536058932	17.93093151	43.30092715
20.9773189301878	34.5688037569724	19.40209516	41.66020767
21.3800174211078	33.8226821269145	19.77510428	38.58926296
21.7858278773461	33.0663730266674	18.69463352	36.26547074
22.1958705679723	32.3045720549417	19.64225061	34.99214308
22.6096621935837	31.5388461154304	23.06731773	35.0375678
23.0249178730078	30.7668025150168	23.91492832	35.50451908
23.4413501154509	29.9835055515404	22.07359754	33.01769228
23.8608950369546	29.1946739977821	22.33900559	31.60235215
24.2838760850137	28.4020119241682	18.74305811	29.30240259
24.7142811716028	27.60915905728	16.76117492	28.31246812

Solution x	Solution y	Original x	Original y
25.1579872162641	26.8158379718964	14.14878683	27.98719075
25.6798915512667	26.0033609868211	14.86812736	22.17705421
26.4266420998798	25.3059813739267	17.16840861	23.65521269
27.2445054225294	24.6199560493152	18.39694528	22.72524013
28.1373505558703	23.9449474232914	18.71921477	25.10440199
29.1416031409637	23.2663631750728	20.73212412	24.23741148
30.2428095794351	22.5863577381275	21.70527032	21.60018691
31.4634084019973	21.9118557360732	21.65865806	17.99154884
33.0621730635788	21.2696817967989	23.64941173	19.80991504
34.9759227858731	20.6350707248872	24.09498187	20.3828805
Route: 4 Length: 233.96380844257 Demand Met: 3000			
44.8007976748839	49.4488423807928	39.00311055	58.98114927
42.9144220152024	50.5393739127818	37.67648628	59.01822185
41.2916876706346	51.5231455131388	36.65639834	59.2724504
39.8163887460726	52.4477847079088	34.15128455	57.37934974
38.4569923362424	53.3513831106436	33.50828257	58.48410354
37.1850169412276	54.2349898104668	32.47933058	60.09950546
35.9890169230041	55.0937470812446	31.78300706	62.74548174
34.865950109411	55.9093433020765	32.28903103	63.37386507
33.7845527187616	56.6939228458862	32.14669335	66.5741861
32.7461165854635	57.4043755087098	29.47881008	65.01108227
31.7507000128062	58.0885742633198	28.77703399	67.75671878
30.8107722656541	58.7146734502387	26.6523776	66.91672378
29.9192485744052	59.3121211704119	26.03259253	67.05188068
29.0651112427623	59.8886600695009	24.66562586	67.58605744
28.2497671501807	60.4447418863676	24.34494447	68.89894191
27.4701982808488	60.976504424557	24.00842436	69.26671548
26.718770388158	61.4886195200918	23.39691794	71.43920824
26.0078626534939	61.9589503761444	24.37529212	73.10827156
25.3349177058406	62.3511209915546	25.39416892	74.01493111
24.6674260551934	62.6255564294769	23.86908483	73.83689183
24.0198214493971	62.8719297853389	22.95220857	73.2582761
23.3864342458023	63.1077499525213	22.68191696	72.90808337
22.7626681302278	63.3368992734413	22.14002238	72.37729838
22.1470183259655	63.5616738118268	21.60880813	73.64895737
21.5399883123618	63.7792972873429	20.16006997	73.55306832
20.9451361149417	63.9911373057375	19.17901123	72.48982593
20.3609924878225	64.1998806856451	17.24413003	73.14298035
19.7937038537564	64.404565010902	16.80968797	72.84815948
19.240168824604	64.6061609399467	15.83973733	72.60736968
18.7001962369383	64.8051459154562	14.67447984	73.22055772
18.1767651678976	65.0008432757598	13.78543979	72.75062985
17.6683552822506	65.1940147087074	13.34199807	71.15108407
17.1709704554229	65.3859498191096	14.51945543	70.49107423
16.6803728193993	65.5770934094426	14.01917911	69.22007201
16.1959634573941	65.7678118003258	11.73654707	68.82383733
15.720069186723	65.9581526560297	11.54525803	68.93314303
15.2518706371081	66.1481009753378	9.964092428	69.02740379
14.7928993578379	66.3376040010978	9.89788954300001	67.94003152
14.3418122672654	66.5269193451535	8.88093920200001	67.16779099
13.8991120323748	66.7161868343971	9.088863996	70.57778186
13.4641727647267	66.9047614227556	11.56644578	72.10851879
13.0333556862813	67.0924644382377	10.28504553	75.43578797
12.6093221074769	67.2777740088226	8.675234817	76.17385221
12.1958173593203	67.4597915082926	8.595205897	76.73972439
11.7921829327445	67.6382838422602	9.360499311	76.63383999
11.394370546171	67.814312836006	9.01858207399999	78.03824041
11.0041311910235	67.9860354074074	5.04273939700001	78.40053531
11.0041311904433	67.9860354056499	3.765987951	77.28123402
11.0041311898536	67.9860354038461	5.065657714	76.41830653
11.0041311892551	67.986035402024	5.863440787	76.06172049
11.0041311886497	67.9860354002326	6.979895184	73.91637244
11.00413118804	67.9860353983876	3.252339284	73.9521337
11.0041311874241	67.9860353965385	2.544714587	74.45838234
11.0041311868008	67.9860353946935	1.009741561	74.32200243
11.0041311861226	67.9860353927278	0.155166121999997	73.1143838
11.0515749497283	67.8537045169726	1.834626902	71.15202574
11.0993330756155	67.7207367635714	1.825477279	70.78130479
11.1473961102055	67.5871929730815	2.881941531	70.78732912
11.1956682199184	67.4532492974186	2.885089549	70.78781924
11.2441526978277	67.3188706811826	4.203561784	71.28689241
11.2928022285647	67.1841007471796	5.020361565	69.58798476
11.3415911696453	67.0492343754932	6.04179221699999	70.01715429
11.3905063304601	66.9142530458969	6.334374787	68.85467086
11.4395354581089	66.7792737829065	3.972668798	68.43095677
11.4887065143598	66.6442692283182	3.702577787	67.55965669
11.538021005194	66.5093333806838	3.705228073	66.5975084
11.5874741206194	66.3745822824196	3.336609071	66.34370608
11.6370738049961	66.2400412335531	2.76637406099999	66.09545945
11.6868437877316	66.1057401043494	2.559418382	66.60707534

Solution x	Solution y	Original x	Original y
11.7367868070996	65.9715661872833	2.82031094	66.9400554
11.7868708703872	65.8374408115201	2.781332517	68.35625636
11.8370768312904	65.7030148919185	1.09685186199999	69.20060768
11.8887808764197	65.5646854628782	0.299902086000003	68.51958527
12.0715615991785	65.2296821813657	0.793870075000001	65.00803843
12.2726128980977	64.9014290998823	1.28261934699999	62.39268391
12.4946809041081	64.5936291580503	3.16457285600001	61.67055704
12.7235999877217	64.2922614270586	3.390983182	60.32064994
12.961188204154	63.9993587316076	4.692804385	58.08052349
13.2072070339416	63.716990317475	8.07711459799999	60.52651503
13.4557310361697	63.437184018921	8.01127751600001	61.69215045
13.7068882675228	63.15911945161	8.689838933	62.80875147
13.9604882625124	62.8820847806493	8.93361225699999	64.19415642
14.2166272969682	62.6053078601894	10.36857839	64.9958121
14.4748458486095	62.3283150197181	11.17807544	66.07771318
14.7350103651483	62.0504443523911	11.71156616	63.23151575
14.9969296799002	61.772968039837	12.00297966	63.9466553
15.2606507668461	61.4954758933522	14.06057656	63.93249207
15.5255014179462	61.2178650318077	14.35540419	64.70998039
15.791508030514	60.9396383147057	16.63383213	64.77854357
16.0578440104116	60.660570577088	16.73656026	65.26611785
16.3245773663903	60.3802296267169	15.77830732	66.19409337
16.5922843657133	60.0978056874836	14.52745655	66.82146945
16.8618534105164	59.8123493210278	14.11476256	66.58488992
17.1337825144982	59.5236427174444	13.50520564	67.72241024
17.4094615434722	59.2286962695129	16.29427026	68.63097998
17.687147531462	58.9246649493656	20.75020952	68.82018849
17.9618868044457	58.6051939618033	21.52581462	69.05739134
18.2303037127568	58.2537136856399	21.2618816	68.31108552
18.4957411097951	57.8791799969358	21.61039636	65.83676525
18.7600781499742	57.4955135745941	19.92687299	66.4828608
19.0244945732188	57.0991455547024	18.97844246	66.0992932
19.2898585761276	56.6894393230957	19.29354577	63.34226321
19.5561059608069	56.2737166653795	17.25601024	61.69443137
19.8242752482299	55.853844851732	16.07158763	60.00636388
20.0949649958263	55.4312555762665	13.17908278	60.05355856
20.3709714757018	55.0032550306034	10.63863267	61.64507704
20.8275889997563	54.2867568619437	10.83705181	59.65376627
21.3869172800683	53.4526240375058	11.86612062	56.83051802
21.9951573683476	52.5913473843074	13.89109091	56.92730438
22.6391829076908	51.7038563606608	13.21771043	55.16074821
23.3463687860672	50.7859935562567	15.36448886	54.97389236
24.0999593880748	49.8413980140914	17.45311026	57.02027397
24.9101019139637	48.8215250250516	20.16713628	56.2637712
25.7579034922001	47.7362431407145	20.53092136	55.63617906
26.6588906931805	46.5507098024774	20.37447933	52.92580791
27.6226295412412	45.2881096953693	20.72246404	50.29048837
28.6590154946749	43.9687813125608	22.00300591	49.77440842
29.784632158442	42.5658748651342	22.81585575	48.67591425
31.034262993987	41.0437792233974	22.68802089	46.28526246
32.5062946845441	39.3677954070243	23.73647568	45.21539639
34.4830636973491	37.337046107096	26.12441872	44.96485891
Route: 5 Length: 181.581563922058 Demand Met: 2992			
79.4418005838393	33.4963283400205	82.01891737	31.58538586
78.8871381349748	49.8362186052294	75.75634139	60.02200009
78.3528087121054	53.7811009849564	76.04244622	64.45001766
77.8370341458391	55.7642024803546	74.85083054	64.74645556
77.3338395450189	57.4370146610951	72.84290598	65.67053988
76.8461592419306	58.9067842687059	72.70378804	66.70645397
76.3705415257482	60.2482960064811	73.05372772	69.26625594
75.9061198088384	61.434941867852	74.07680751	69.16329968
75.447166826234	62.5550786042286	73.75840634	73.11670598
74.9972322000795	63.4679272320786	70.77169737	73.88064127
74.5760775606932	64.1625465799977	70.36283848	70.39401036
74.1617580765561	64.8407172385018	69.12634406	69.4594231
73.7544385992582	65.5094589493364	68.36889636	72.61479797
73.3567488671573	66.1537830867859	66.81087893	72.19337817
72.9699032884765	66.7792804400455	65.34735437	72.80394877
72.5977008599787	67.3809749498822	67.45457311	72.85375456
72.2317894208916	67.9727209723581	67.69295238	75.24403656
71.8723388492086	68.5470508730021	68.84275879	76.03221479
71.5171916717975	69.1064648032214	70.83372488	78.21085961
71.1641948015032	69.6425073584607	70.61748839	78.65460339
70.8131397599867	70.1579493840016	74.46580568	79.0435318
70.4582293399449	70.6506912757572	75.20998283	80.5662569
70.0894003102001	71.0927284507462	72.09010058	81.417498
69.717283322063	71.5040863406661	69.80433177	81.60817435
69.346528572956	71.8945666616558	68.96890483	80.55619731
68.9777168028871	72.2756384727466	69.09548968	84.07624055
68.6083729086172	72.5182175726511	64.88497046	82.96772641

Solution x	Solution y	Original x	Original y
68.2547796330126	72.7447656796256	63.68037897	79.29990004
67.9066233139826	72.969435266985	62.20174968	80.96664236
67.5680201155556	73.1897866073843	62.03157877	81.16617953
67.2377814039244	73.4061821295472	61.67834468	82.51967341
66.920178672668	73.6148629243888	61.30013954	82.69641043
66.6143229530507	73.8163687557546	60.70093329	80.64454551
66.3142137831907	74.015692370875	60.79681015	75.33369853
66.0174087595654	74.2150199519811	61.63608438	74.03409399
65.7230909271379	74.4146504488977	61.14896118	72.70410502
65.4313268099566	74.6148686335329	59.09181099	73.44789922
65.1431827854446	74.815613370303	58.20433528	69.50520456
64.8604681188385	75.0184166526938	56.84900895	69.27095699
64.5864744392744	75.224579814766	53.60239056	70.80290226
64.4877377073276	75.6779662332045	55.72002047	71.91921816
64.3898298898972	76.1417222843026	55.90538334	73.56581582
64.2925790076127	76.6117428378813	53.92763119	74.12654413
64.1972240439617	77.0962292216188	53.90080059	74.55382457
64.1035916768329	77.595003688669	55.58088554	76.52999392
64.0105391058671	78.0972417114349	56.76810138	74.93595817
63.9179278800866	78.6061800778411	57.06276587	74.98770524
63.8257250355892	79.1224754478358	58.81674593	76.2826012
63.733765052305	79.6436839608444	58.21523833	76.77458472
63.6420745775748	80.1700163707883	57.82109764	79.24611201
63.5506469261347	80.6986990682582	58.40265516	82.89286098
63.4594087065083	81.2254651821853	56.64479831	82.24679775
63.3684810062518	81.7515520829983	55.73082902	81.05870461
63.2779555485119	82.2794315502884	53.61605765	80.93460352
63.1882934117772	82.8097919934496	51.18829335	82.80979047
63.2068772284926	83.0908271881345	51.49657531	83.11057243
63.2254111127705	83.3692594786394	51.91564321	83.24154723
63.2439311201675	83.6493402400799	53.08761619	83.0335557
63.2624187717955	83.9312737178481	55.99099974	83.60147673
63.2809064064748	84.2140889690171	55.75342338	84.56592915
63.2993902222432	84.4974498412796	55.11001594	85.68607737
63.3178563666477	84.7808786727262	52.83415121	85.50123146
63.336169365157	85.0644073388507	52.05342714	85.82620662
63.3541939586638	85.344959333088	51.44475874	86.59474587
63.574204053401	85.4356278836154	53.87450626	88.16447802
63.8002532096085	85.5263535265074	53.27314218	89.6748569
64.0744341844158	85.6154043248125	54.48965648	89.30641789
64.3601929796523	85.7044297244226	56.15571936	89.41500769
64.6526120949229	85.7933935596357	56.30399813	89.72916428
64.9526619362761	85.8822675212143	62.35255518	88.46202983
65.2546196008216	85.9711259269018	63.32241418	89.29380754
65.5583363613247	86.0599427889397	66.59307852	88.41880362
65.8626703650438	86.1487539675342	67.89989075	88.12316705
66.1672801807391	86.2375772923145	68.01446808	90.26524455
66.47219867856	86.3263335660129	68.11557125	90.29313921
66.7775654371331	86.415033897079	72.48804708	89.57044348
67.0809775902089	86.5036775496257	72.91384846	91.54886288
67.3817587308129	86.5921464446731	73.04972269	93.68364053
67.6788739723331	86.6802524049127	71.22771139	93.77569631
67.974687766725	86.7680944570908	71.17046416	92.96230041
68.2696886246327	86.8557587283715	69.82339194	93.15949799
68.564865224985	86.9432654226367	64.96530116	93.98228963
68.8632970529815	87.0305613571359	63.88368354	92.98872817
69.1658451155606	87.117710938061	62.61309781	94.29391595
69.4764838271074	87.2045045384295	61.09603132	95.38804721
69.9887753109715	87.284445162192	64.64609008	95.09261932
70.5205700035966	87.3640682735308	65.26732099	95.86741863
71.0780357023951	87.4432298174621	66.67195124	95.92017704
71.6560074422236	87.5220031255935	66.92699784	97.50570073
72.2950588626558	87.5995635306332	68.09186985	95.85522589
72.9599291125545	87.6768081230689	69.92952441	96.42807986
73.646928253654	87.7537270290547	70.07355989	96.61021246
74.3650832631731	87.830295311815	69.38304877	98.18671586
75.3514701369106	87.9045609308143	74.57969734	99.83821951
78.0725147069811	87.947789962781	78.18108034	99.79242924
80.8442032601574	87.988489720348	80.84419352	99.98848979
82.0530302574204	87.8921157772458	86.37403118	99.02923308
82.2978897494913	87.5776244864599	79.39161289	97.26593015
82.5457214540424	87.2508140167416	79.19703593	96.06011661
82.7962883754582	86.9151398642271	76.48394754	93.81500316
83.0515299915823	86.57271425936	76.68533256	86.49303137
83.3098752882406	86.2316616563188	77.11333094	85.3156461
83.5714245138282	85.8924672807439	75.38279951	84.8495864
83.8383010678747	85.5552402960378	81.4352048	82.89764497
84.1071203734454	85.2202499992537	82.09017124	81.333147
84.3776976102312	84.8879278526691	82.53992082	88.87907996
84.6499063483657	84.5540432371303	86.10921689	91.46882481

Solution x	Solution y	Original x	Original y
84.9221623147386	84.2156759278108	87.63411723	89.72076827
85.1942182257393	83.8740822924166	91.04765146	90.60180149
85.4636290856047	83.5306581535512	93.12739448	86.70709298
85.7297644537543	83.1865777050013	94.75890926	85.83537613
85.9905856524584	82.8453853030651	97.99058573	82.84537681
85.4143791231781	79.332376349886	93.29522257	74.82458329
84.8176177480735	76.3958484249729	91.59995025	72.67875795
84.2110270990218	73.7180709506389	91.90328388	76.16243153
83.5917512177535	70.9261112566511	86.75397464	75.23932777
82.9744967618741	67.9811681532441	83.77232341	73.14211564
82.3620584535317	64.8259985465527	81.47694776	70.94126153
81.7545389097386	61.348118731849	78.83068399	69.67274441
81.1587156524329	56.8309896127872	78.29263567	66.45988674
80.5831485050642	46.0882970863724	79.86750899	54.35421653
Route: 6 Length: 233.499166704279 Demand Met: 3000			
58.1225190470117	72.8526072855201	49.55654528	80.81624315
56.9825668680221	73.9856277109259	50.20394782	81.95454381
55.9953058224804	74.9668805218451	49.21219028	82.18677234
55.1013351214395	75.8722088055368	48.20934555	82.30314786
54.2750720051527	76.7308077353493	49.77274656	84.13753559
53.4842909346552	77.5504850788142	46.93472918	83.75304242
52.7393421388019	78.3379476000715	45.3176187	83.7901857
52.0413614485984	79.0981197442207	46.03038143	83.79986665
51.3701990975099	79.8448800590144	46.02083433	88.3362158
50.7372242005034	80.5349262395552	48.45592928	88.4082341
50.117019170689	81.2002354814428	49.19512952	89.44346883
49.5051377604018	81.8406114934378	49.03663551	90.65504513
48.9002995037589	82.4523180590593	49.59427698	92.51123595
48.2969760500891	83.0158393796543	48.69087386	94.64188777
47.6860576378956	83.3779488656046	47.96746082	95.14523251
47.0633632953457	83.602639476315	46.20732106	94.82215894
46.4598305137701	83.8084978762804	45.01212749	95.47966426
45.9291942335026	83.9641903955961	44.01236363	95.54242778
45.4645681575777	84.0925700096034	43.04035221	95.37042711
45.0369532244246	84.2105468016947	41.14116704	94.61634345
44.635181511855	84.3243599462499	39.86881125	93.47781189
44.2488988881554	84.4364061831635	42.53215273	92.92397176
43.8670058426953	84.5476325973735	43.91518159	93.39792889
43.4869658906058	84.6579545988397	45.33430047	93.58613905
43.1057301058401	84.7672887818087	46.25821854	91.17761288
42.7229072265233	84.876221975485	45.13861135	90.47060332
42.3396478357772	84.9849004764661	42.23200248	88.95299773
41.9584013111624	85.0935239787244	40.16683897	89.097423
41.5803868404974	85.2020809889359	40.55838899	87.88304878
41.2047860204319	85.3106656209554	39.57638463	86.69599702
40.8319152833052	85.4193594189823	38.21932161	86.88940242
40.4624125625414	85.5281459036334	36.90788531	88.78292268
40.097100942861	85.6368901300405	36.43143728	90.48214242
39.7362936413185	85.7454549212194	35.55901251	90.85604615
39.3805574071399	85.8538100745897	36.26720319	91.81523904
39.0289291219585	85.9618930906687	37.64776281	91.60925844
38.679761735947	86.0697724934739	36.79414467	92.2553405
38.3335961858506	86.1773950641438	36.86677729	93.06343809
37.9901995668512	86.2846812644449	36.31961338	94.1541845
37.6500580084956	86.3914602971481	35.60188133	93.1465045
37.3132431685039	86.4979273433705	34.28587406	93.01320732
36.9805843022577	86.6040993798226	33.84742868	94.52834747
36.6530014655898	86.7097021312022	31.89808649	95.62749105
36.3362525386027	86.8140128243992	30.08845088	94.04600611
36.0295701127935	86.9175749462842	30.51609732	92.20951413
35.0780357023951	87.0209130729268	30.46512782	92.10545477
35.4324876240991	87.124061368941	30.18341718	92.15484297
35.1415631484674	87.2270266021398	29.03165996	90.53300961
34.8559304839841	87.3299593647638	33.91919319	90.52236574
34.5732567274166	87.4329197675417	32.87814817	90.10176773
34.2938222117685	87.5359394544964	32.33676606	89.56266763
34.0177351318634	87.6390494447073	31.03913924	88.81924735
33.7451746920451	87.7422827570734	30.78074407	88.67743671
33.4761226696355	87.8456373449838	28.94608169	87.05476962
33.2110076237106	87.9491920004923	28.95022635	86.79829568
32.9496647094022	88.0529439487123	26.49994117	86.49656314
32.6935303436948	88.1569351565481	24.68088332	89.71453351
32.4449212626984	88.2609214755865	23.92476676	88.85275247
32.2046471683051	88.3649803189674	21.4032788	88.65695382
31.9948467161156	88.4691641188678	20.75129811	88.7330358
31.8238847130447	88.5734679481714	20.03955091	90.83830295
31.8238847156086	88.5734679587196	21.61123904	90.19731465
31.8238847180998	88.5734679692398	21.63379999	90.72848541
31.82388472057	88.573467979729	22.62104276	94.03699994
31.8238847230579	88.5734679903377	23.10855555	93.46528062

Solution x	Solution y	Original x	Original y
31.8238847255727	88.5734680010024	24.92385591	92.07997464
31.8238847280803	88.573468011618	25.24294214	93.18181598
31.8238847305808	88.5734680222412	25.58817455	94.62259734
31.8238847330755	88.5734680329155	26.20322759	94.45704722
31.8238847355589	88.5734680435384	27.32463884	98.08040747
31.8238847380243	88.5734680542395	27.03699297	98.99807723
31.8238847403654	88.5734680651844	27.50072899	99.76767751
32.4719251107364	88.5509465333243	28.69202489	99.34571575
33.3477614781089	88.5282382057971	31.65500689	99.46882276
34.3385646156684	88.5054378343907	37.35140359	99.57591236
35.1828942742978	88.4824333127285	37.87107476	99.67477247
35.9082897809692	88.4591937386684	36.49499514	99.8776323
36.6273392471668	88.4357541449698	35.92075185	99.04269187
37.3701085236347	88.4122483391164	35.84999591	97.26233792
38.1328743974161	88.388713846493	37.35558564	97.30806318
38.9104350536707	88.3651486863256	37.83606476	96.13365876
39.7024304240848	88.3415647716558	39.84944538	96.227912
40.5021235981874	88.3179607502515	39.44288188	96.38027853
41.3178317630698	88.2943366612063	39.47053756	98.01039691
42.1703723864861	88.2706689400249	41.23951851	98.4925435
43.0542389519598	88.2469481669293	43.63164404	99.67485887
43.9154760536008	88.2230271399825	45.34071838	99.2752365
44.7402590678826	88.1990030707813	44.53236455	98.59505273
45.5835222605795	88.1749258401718	44.56970667	97.22856143
46.4506675314304	88.1508192645637	47.31578899	98.13704672
47.3220888293098	88.1266680698942	48.39934621	99.02729511
48.1820767810568	88.1024442135293	48.86252985	99.44183304
49.0299441159169	88.0780824890565	48.82360524	98.37839062
49.8998407865568	88.0536804909152	50.67630959	98.08417141
50.7783214928867	88.029246092733	52.60387814	98.51053443
51.6431381061705	88.0048171720576	52.71570498	99.46690315
52.469712116018	87.9803616645603	52.2623599	99.83573023
53.3815524472046	87.9542022233335	53.69991452	99.81161169
54.2077905723048	87.9255393509937	54.29998953	99.89190946
54.7525195589677	87.6345859927357	57.58318464	98.55697919
55.2856039125768	87.3076785382139	57.43254842	97.94119843
55.8132713320732	86.9533846204571	57.84005051	97.24933499
56.3370359485774	86.5753675133093	58.00620671	94.64720593
56.8614988446205	86.1890981286994	54.09260921	96.04789718
57.4035872547368	85.779395815233	54.90972966	93.30800556
57.9560068089065	85.3615219416294	51.98537923	93.03310405
58.5372756417893	84.9283360368257	51.95218378	92.57992082
59.1587134230875	84.4754175904713	53.29556121	92.47449182
59.8185759542986	84.0017066159993	53.26472651	92.17526811
60.5413847903191	83.4956914726782	54.10050901	92.28618361
61.3666657625325	82.9320761060484	54.43632749	91.92787857
62.4627989305545	82.2269274509701	57.53422575	91.73216299
63.7265673176746	81.4124971724516	62.03675317	91.42777069
65.0646630783523	80.4850875441949	61.4906739	91.40517217
66.928291274763	78.4964962656226	59.01602486	86.99268685
Route: 7 Length: 110.962347040659 Demand Met: 1973			
75.3613824449761	20.5645392078024	70.71952594	19.54937922
71.729576734508	21.1268076598948	71.29498477	19.86081824
68.4082525103551	21.6933312362501	75.00767938	29.50135545
63.4446768084936	22.2161225617792	59.48412304	31.97998889
60.2055123211522	22.6907058648585	58.09138733	33.97784367
58.0346510559931	23.0553956649648	55.9549233	32.80200534
56.1112498279431	23.4022760669635	54.00076983	32.50218762
54.3580947099871	23.7372173733417	53.48089128	34.57431179
52.7418660995022	24.0426297051075	50.32982697	35.43640834
51.5937549767649	24.2763002435115	51.19858704	31.0981292
50.4734029014915	24.5077396341573	49.49892788	30.73465222
49.3832853749156	24.7374217981286	48.88810081	29.6929228
48.3167118629853	24.9660414165667	47.52772375	30.54529654
47.2747134497528	25.1933209499948	46.26887105	26.53209753
46.2555757172858	25.4207935248005	42.45831495	25.01806118
45.2737252472321	25.6489656307742	39.25918273	24.78783876
44.3428557035706	25.8779856309283	40.05041388	28.81118981
43.447740692905	26.1065037921132	40.57036155	31.31828969
42.5805793261803	26.3336311892703	44.21687698	34.39769027
41.7139671968514	26.5573772974612	44.94410764	36.28576006
40.810081729966	26.7730455747607	40.81010844	38.77304558
40.4033014651184	26.773045576921	41.09480481	34.92509896
39.997237648642	26.7730455788696	39.35568633	35.06788426
39.5939242296034	26.7730455809338	37.51752459	33.09106605
39.1949111401293	26.773045583091	37.07046765	30.04479215
38.7996207464377	26.7730455850829	36.77121212	29.70512597
38.4077535055302	26.773045587202	36.2315122	27.60710766
38.0193643207994	26.7730455894255	34.82834577	24.45085722
37.6355222861815	26.7730455913352	29.56587444	24.57869021

Solution x	Solution y	Original x	Original y
37.2642862482119	26.7730455932758	28.59013959	24.83311171
36.9068356386249	26.7730455951451	27.26619514	25.90196542
36.5664739703986	26.7730455969986	30.34406593	27.74432368
36.232546403643	26.7730455987301	31.17947294	31.40633137
35.9043609032713	26.7730456004832	31.80606468	35.45021175
35.5831210982936	26.7730456025402	27.42853428	33.27622768
35.2761770591196	26.7730456044445	25.99458773	34.37910238
35.2813378150229	26.7142236889297	25.40396983	32.32053998
35.2865110476066	26.6542463019675	26.37919279	28.3108891
35.2916795197881	26.5950993115453	23.31975826	27.34182644
35.3848590439799	25.5768327927217	24.87958822	27.09583401
35.4796286897492	24.4694431858213	24.70443529	26.12365999
35.5765632299062	22.8408810163876	25.83818458	22.03803134
35.6742574721976	21.3605862453048	24.23492671	17.98856994
36.1463896370487	21.0835137981821	27.39065822	19.10906735
36.6438661703451	20.8087742647005	28.82263126	20.36706254
37.1617971273092	20.5349610764996	30.90434674	20.96780911
37.6954974909528	20.2615661110013	35.85991513	20.90404301
38.2369944732538	19.9886310074831	35.94447387	20.12395641
38.7865042117944	19.7162804877762	39.07927218	20.57348801
39.3402228104431	19.4443639061552	38.38951699	19.65672727
39.8994326571846	19.1729590339458	38.46066343	17.33665094
40.4646446729253	18.9026549750463	36.57027062	15.62107689
41.0411091259265	18.6340554820171	35.53984032	15.99196501
41.6336705967692	18.3669809539844	34.15723352	12.84614068
42.2639005580466	18.1046093742686	35.62470684	10.73896033
42.943106794584	17.8495165405858	38.07401644	11.09458783
43.6501401554723	17.5983510829352	42.34346606	5.769949569
45.343256890308	17.502878120893	44.45005227	17.91363181
47.1002030610047	17.4074436928105	50.59311922	22.75724468
48.8403198902167	17.311678777143	50.20668952	26.40233109
50.5938535991955	17.2149867381219	51.08696185	26.42044109
52.3973482720491	17.1173438612366	51.99282443	27.99909333
54.3279969110288	17.0170930824911	55.07321291	28.85442279
55.8916448561735	16.8863677700955	59.11600598	27.89604561
57.156374339738	16.7454081254123	59.97712424	27.07719444
58.3630937715028	16.599954734701	62.17589976	23.53474989
59.5560995328465	16.4533955211175	62.61153544	17.95816147
60.7587937461923	16.3069239228929	60.71671796	14.8721563
62.0003953564632	16.1608947984206	65.51501196	11.68636529
63.249132317817	16.0156950249955	63.24920239	4.015695007
67.6957186143831	16.9359037409207	72.1570689	9.179080442
71.7220194053572	17.9323969621887	76.68650337	13.86956158
75.6138136849295	18.9573475897498	77.03036191	15.51069798
Route: 8 Length: 216.374078015273 Demand Met: 2999			
70.5183875813168	47.4404597002518	65.98277732	56.02257659
66.2871400363319	52.0201663941468	65.84999623	61.37790202
62.7234782525369	54.6787230142765	56.20333441	63.09635143
60.7083366233918	56.3388122765201	54.15102156	63.89433124
59.2043150652732	57.6840546822805	54.03625818	65.02303827
57.9178864379996	58.8711787699174	52.45383187	66.17944394
56.8039038725472	59.9282883377301	52.68458788	66.68600654
55.7810912109629	60.9122973940524	50.86986196	67.11854893
54.8450807982265	61.8409840739591	47.89205446	67.3947139
54.017865546935	62.7175051831288	49.39322363	67.57061768
53.2426917531492	63.5712348320085	49.38151416	71.84627519
52.5244032119778	64.3478530586899	51.17754367	73.39508539
51.8364326971878	65.0519527808295	51.91696279	73.69595809
51.1655098492546	65.7064455344674	51.90516717	74.10528304
50.5067835470017	66.3217955830842	52.24575767	74.98560476
49.8519602045593	66.8966284185007	52.40986372	76.90026657
49.1803600143677	67.3942290835022	50.78444002	76.12504454
48.51330103711	67.8647228449042	47.34853229	74.63427391
47.8689622181245	68.3256385801055	47.14165764	77.84331314
47.2475472826966	68.7549859770437	49.13669956	77.10708156
46.6288340999274	69.1673453163436	49.62844822	78.65994225
45.9952238103201	69.5481776175545	47.92908542	80.11129273
45.3464527679876	69.8781959778755	46.11608956	79.13405595
44.7079459050321	70.1941957302162	45.32225765	79.26748614
44.0802317412088	70.4986795316451	43.12816365	79.63219046
43.4745058849689	70.7923179413385	44.56064253	79.77318093
42.8751371998611	71.0764534332117	44.47086767	80.17305261
42.2783343363208	71.3509334428007	44.66930475	80.79724102
41.6754966812413	71.6135645748391	45.13867401	81.86371268
41.0275992795994	71.8509501952272	41.14833132	82.10595877
40.3956212441263	72.0754775387923	40.58416037	81.54961967
39.7767609291776	72.2934236862593	40.77647626	81.23711291
39.1643270545072	72.5066916491032	38.78697828	81.20736169
38.5667484781358	72.7161778713491	38.25086273	84.70191635
38.0643665988183	72.7991928152287	38.00030199	82.20200968

Solution x	Solution y	Original x	Original y
37.5716016899096	72.8821003949902	38.24583972	80.95791524
37.0845199987397	72.964908327671	36.17809574	80.13104248
36.6077022330989	73.0476571854833	38.20769452	77.89743741
36.1340983751167	73.1303902718386	35.96077646	77.38727187
35.6675766116535	73.213158314763	36.44207057	76.13900165
35.2058967669386	73.2959879217166	35.03662295	76.31902131
34.7505495910134	73.3788681501783	34.30971303	75.90183293
34.3016819650136	73.4618230445867	32.43971284	75.52883521
33.8614963334768	73.5449050379304	31.34183617	77.86791685
33.4310697033137	73.6279737320258	31.67974116	78.20082263
33.0087600589617	73.7110304722926	31.54519137	79.16359507
32.5941810338396	73.7940524542902	32.56942546	80.98884638
32.1850697746943	73.8768974630669	32.77989789	83.25231939
31.7802780767112	73.9591347273984	33.71990859	84.56649705
31.3743733111449	74.0395600611777	34.03327785	85.06694553
30.9700291721912	74.1169346652959	32.21271953	85.45061531
30.5759755484676	74.1912593614028	31.92346769	85.96439053
30.1442856461738	74.2576768559986	30.96168192	84.99460949
29.7175785260405	74.32301342542	29.49613778	81.77737157
29.29607840368	74.3882705517713	28.34961296	82.66841267
28.8802022067943	74.4533142158921	25.47356848	81.94258519
28.4728535584578	74.518159146154	23.53960858	80.471438
28.0747807839958	74.5828801063062	21.51917751	80.74471553
27.6885074771232	74.6473579954569	20.11668251	80.56671914
27.3156744462291	74.7115172397187	19.29153506	80.52426775
26.9559916110458	74.7752978992787	19.16596982	83.58117432
26.6496964913051	74.8367354989416	18.16441332	83.32201509
26.7003015030901	74.7769168666983	17.38954679	82.23173111
26.7669744898944	74.695146951395	17.20155001	81.69531761
26.9451403496464	74.4889040621966	18.15807888	79.40011164
27.1297024464281	74.2793806380549	16.93400358	77.9224885
27.3406044818931	74.0598989831218	18.15532249	77.80652015
27.560362006	73.8373441379548	18.79013692	77.54174683
27.7871769160625	73.6123913385742	18.46683587	77.29301103
28.0262126944478	73.3835599468523	18.31523717	76.27495825
28.2822172937573	73.1512575251036	18.49430275	75.1491321
28.5565173681339	72.9171278819634	19.47269695	75.25893863
28.8440637662351	72.6817614565212	21.04749508	76.84597788
29.1415325164392	72.4440559332991	21.16552744	75.92926841
29.4500426148971	72.2048153374192	22.95922483	75.83051285
29.7662934681605	71.9646125174196	22.96398221	79.24584246
30.1004317698237	71.7157827190542	24.57644237	79.57543571
30.4481162037134	71.4588219723432	24.84752889	78.21896812
30.8080579471641	71.1968595895861	27.46499326	78.56518576
31.1759392711949	70.9299521223224	29.05539546	78.84402949
31.5505584176405	70.6570512937412	29.7776223	79.3796747
31.9324534379176	70.3754517253562	29.81370195	76.77877617
32.321122519654	70.090062731308	28.44331265	74.98671685
32.7193327515219	69.8025407756467	29.09610379	74.18683092
33.1266879723909	69.5132997670819	28.17365085	71.94302821
33.5459632857784	69.2241047453755	30.01509861	69.93828769
33.9748207581098	68.9362843605484	31.96159565	70.60936436
34.4111985284565	68.6488525776169	33.57300136	70.51852673
34.8535484895407	68.3614509417862	33.85806756	68.2147305
35.3025901225397	68.0755397996733	34.32584869	66.311045
35.7587879119506	67.7922109917844	36.53251416	65.89826385
36.219230778755	67.5112906299898	36.88863481	65.11756178
36.6842876323137	67.233114249398	37.36735143	64.72519961
37.1540820864272	66.9577610746071	38.18944723	65.54612606
37.62791892251	66.6844424795571	38.05290287	66.43336709
38.1071750271723	66.4125066022391	39.73860453	66.92518954
38.5892123483289	66.1414193606077	39.83687168	68.05987049
39.0746571056741	65.8703704339196	39.12047899	68.75765335
39.5662785020631	65.5989283332808	38.57181853	69.29967661
40.0668381284514	65.3266979049821	37.43465738	70.14594443
40.5818929567349	65.0528349113004	39.75179858	71.51477588
41.1067319464225	64.7753467101647	38.19879917	73.45302115
41.6557098503819	64.4878678190177	40.76978451	74.94346594
42.2242169353144	64.1731478123794	41.14789047	74.75727523
42.8181139538997	63.8209661223835	41.95376322	74.60739468
43.4396352331106	63.4107389747798	42.58773685	73.94634336
44.0879473972926	62.9393252371382	44.13660931	71.38940487
44.7498092241675	62.4448414953246	45.59084573	70.21452412
45.4201502115095	61.9304533513656	43.59103477	70.75648589
46.1204734244292	61.3816070277826	41.30767537	70.05965636
46.8991055571598	60.7772246727852	42.13585343	68.94604524
47.7586610468211	60.122345470894	44.42598809	67.45202223
48.6757247754221	59.4335558137519	44.96838238	64.05706864
49.6509387570394	58.7326883320329	45.68320409	63.6499192
50.6966446538373	58.0168700280435	50.29671492	64.07582579

Solution x	Solution y	Original x	Original y
51.7776485039921	57.2780420793085	50.37372436	63.54183807
52.9102831313099	56.5127401078058	49.52719402	60.88674536
54.1279261461182	55.7349198845753	52.59359138	61.87082203
55.415748053359	54.9292813824441	52.64945222	62.68533593
56.8301604745115	54.0646088060692	53.04622082	62.56220406
58.4737316999042	53.0979383907413	56.12304172	60.76926662
60.3100290090622	52.0638869047162	57.09480153	60.45993374
62.4467085882263	50.9430834849715	56.73611746	58.87824868
65.3161666107487	49.7587038539438	59.77266019	58.01872841
Route: 9 Length: 169.370047638327 Demand Met: 2997			
67.1883512707479	36.8889476886887	63.21772914	46.4808445
62.0108203723353	40.9526733016531	55.80484172	50.30189669
60.0569895484182	42.4520096218701	53.22205568	50.84724902
58.723527410911	43.5530021370596	54.43373891	52.12894009
57.5683366231842	44.514592952278	58.50503897	53.8647284
56.45061589691	45.3595346363247	56.36080227	54.43871329
55.3838222622519	46.1242568529166	55.16481024	55.42346911
54.3637889540249	46.8176645275314	55.40337389	57.61168804
53.3440509364695	47.3702373772495	53.70737401	57.8077763
52.3518293646997	47.8547767053467	53.50308144	57.04941766
51.3732681347602	48.3117581946587	52.57887869	54.16196226
50.4124805879276	48.7615689083939	48.91348948	54.77748717
49.4899058682263	49.2041756978766	48.65047008	56.26343732
48.5977316527438	49.6369627188542	48.01348394	55.67625048
47.730755418994	50.0633272154343	46.15723029	56.4070148
46.8941347041314	50.4827789593184	45.47068469	56.96814934
46.0847038187033	50.8953527577321	44.98764045	56.96391467
45.2982409341093	51.3023921828412	42.10911161	58.06602885
44.5471583763987	51.7017546298568	43.40294282	59.60424206
43.8178287789352	52.0909387192705	41.72170476	60.36141703
43.1159206714569	52.4685517263827	41.10546356	60.73573959
42.4387817160783	52.8353776259024	41.72708173	62.5487287
41.7805555360338	53.1830771082815	42.95157888	64.84132436
41.0270033170691	53.3976672228373	41.95981534	64.94436816
40.2214878329588	53.5727143886108	40.91327599	65.05437313
39.3920555324669	53.7282418170327	38.87334077	61.97418169
38.585527722581	53.8821364095536	38.55825219	62.0328479
37.7962247923797	54.0345012290247	36.99117209	62.09652931
37.0274732349415	54.1854230754296	35.39691212	60.01558524
36.2793213764087	54.3357885727568	29.89833465	58.88393924
35.5770172742758	54.4857374759481	28.38294287	59.7022254
34.9272025737894	54.6348376213898	28.66025221	61.13181458
34.3188130172698	54.7826154393371	28.86030824	61.83789689
33.7415340196607	54.9289199382298	26.36749261	61.24478927
33.2111766942822	55.0733509259445	25.84588775	61.17671521
32.7176976437625	55.2160993415842	25.66105506	62.27941228
32.2640135351271	55.3560581311772	26.46280572	62.61127777
31.8289766730221	55.4938834257013	26.36495426	64.10386589
31.4266199655367	55.626865879902	25.20403775	63.98638021
31.0684497235218	55.7534735426853	22.58317288	64.23875961
31.1226125339203	55.6052424534308	21.30645349	61.8915326
31.1843978833926	55.3981120699582	21.56136042	60.00845368
31.2498317616498	55.1826631678126	22.84438078	60.01413405
31.3173194900783	54.9634176071984	25.08011935	60.4806985
31.3857466727982	54.7417416907236	24.68488711	59.85199485
31.4549923869356	54.5176614912558	24.58618772	59.92581691
31.5249685527836	54.290531216009	24.05460087	58.82740751
31.595653045189	54.0608512343301	20.97945435	58.66863495
31.6730775845627	53.8020607883795	22.06521443	57.50548607
31.7523078054228	53.5373161860369	23.29263587	57.34435722
31.8324936734409	53.2690880799899	25.6524776	56.5792119
31.9130465787035	52.9994343505377	28.17203359	56.51587977
31.9937340683768	52.7285626019656	27.13020332	56.00735022
32.0747219063534	52.4565166926301	26.97467166	54.66512134
32.1560719615957	52.1840020374831	24.61643689	54.01115924
32.2380882598658	51.9109764659786	23.68432498	51.4412716
32.3209772101657	51.6391769797872	28.94274384	52.01860718
32.4043257478401	51.3680731752494	31.12121771	52.61678334
32.4881702049758	51.0972352110925	32.83493269	54.50530143
32.5725898928689	50.8256040487098	33.45872958	53.85918585
32.4396352333866	50.553359088433	37.58124673	53.7047325
32.7432169968709	50.2800196587868	36.93641703	55.80482127
32.8290333145099	50.0037830675893	39.86159624	55.58185516
32.9137535849991	49.7226180246666	40.32660467	53.626561
32.9974583235919	49.4386146450322	40.92420024	52.54921675
33.0799619351503	49.15239690588	41.84687745	52.15158968
33.1609624619685	48.8631121841956	39.96945525	49.46230999
33.2413437508426	48.5746087981483	39.67150404	49.44131071
33.3209126235773	48.2866851566731	35.40868681	49.33377596
33.4001046970473	47.9993822191624	34.68773061	48.27076221

Solution x	Solution y	Original x	Original y
33.478973270931	47.7130465658656	34.17044541	50.63731129
33.5575361663839	47.4261739030012	33.45977848	51.47641849
33.6358357169157	47.1379614828304	31.52001616	50.89228775
33.7140459482176	46.8485081744445	28.72359173	49.06807614
33.7923357467811	46.55859608184	30.18073163	48.32029982
33.8706187906067	46.2685777644357	30.55507662	47.73107042
33.9488499844743	45.9785780419672	30.62796082	46.77730777
34.0270074934504	45.6889165668331	27.37711129	46.43616017
34.1051737146313	45.3994893428806	26.567735	46.7768569
34.1833144490313	45.1096173236282	25.73174612	44.02606181
34.2613934265993	44.8216609754241	25.71821347	44.02373583
34.3392450994738	44.5352825759083	24.77779172	44.04083387
34.4170107350969	44.2503786850886	23.40792676	43.64379836
34.5007031690898	43.9691195054213	22.79879511	41.59634367
34.820884138623	43.7776889811316	27.06311365	42.64274924
35.150238386528	43.5869117699277	28.08331623	42.02257662
35.4875020595086	43.3969013100142	28.54401437	40.13690379
35.8337249618134	43.2084172371636	29.90863496	38.4851443
36.1879708005835	43.0219962799304	30.83636789	38.35208021
36.5494308991697	42.8374721134786	30.41452332	39.55317391
36.9194886478051	42.6543299372121	32.06711817	41.12824267
37.2957412972891	42.4718820878948	29.65914735	42.12761495
37.685169429754	42.2898285570824	30.28185343	43.77834378
38.0882606777222	42.1074931787979	30.33187934	43.75504148
38.5080326461699	41.924748984491	31.80593192	45.60640645
38.9429905941564	41.7408310616009	34.31056081	43.95356429
39.387438526026	41.5564861071716	34.06373355	42.77086753
39.8434859026587	41.3721159486451	35.17250587	39.36136713
40.310647322052	41.188778545544	38.78467609	39.06908374
40.7836606495146	41.0064823531762	38.90241804	39.45548462
41.2634458005483	40.825070700157	39.91233765	41.2977364
41.7493941637946	40.6439992764519	40.57741767	42.47262
42.2414877024353	40.4628968655818	38.72818734	43.64397508
42.7449117286457	40.2813765146785	39.58652985	43.55288071
43.2595507943901	40.0994378309976	41.57443341	43.13832473
43.7827271893076	39.9171806726601	43.74535734	43.87626012
44.3114166854531	39.7343161092253	43.11381093	45.00092033
44.8488123797001	39.5503846254046	42.25980634	46.86827481
45.4011788691636	39.3642044062525	43.66555329	47.77139353
45.9679114382264	39.1747786496345	45.78512338	48.76667443
46.5443394939518	38.9800736130066	45.94832838	45.50704308
47.1309595153192	38.7836519868452	47.65008175	45.51867646
47.7248205477506	38.5853747038072	48.35826716	45.69665672
48.326029783293	38.3849275156666	47.22851165	47.89903616
48.9453360875971	38.1788136078343	47.38308024	49.71863955
49.6763447745112	37.8915880493786	49.48945411	49.44119699
50.4429072873055	37.4701845749821	50.26037041	48.95030273
51.2449822065992	36.7676943008871	51.65508094	43.85648581
52.0633878923663	36.0368895541721	52.03099226	42.50134863
52.9016823343598	35.2814230229913	51.12261026	42.05252276
53.7763394324282	34.4949422260487	51.33580352	40.30660727
54.6973907758808	33.6834554643965	49.90577559	41.072269
55.7162802927218	32.8135856741924	49.81718199	39.89953162
56.8821639889005	31.8717433058603	48.20619517	39.24794213
59.6305144176724	30.3772248055894	55.55130491	39.21526309
63.2880012750892	28.5019894499277	58.48548965	38.49282405

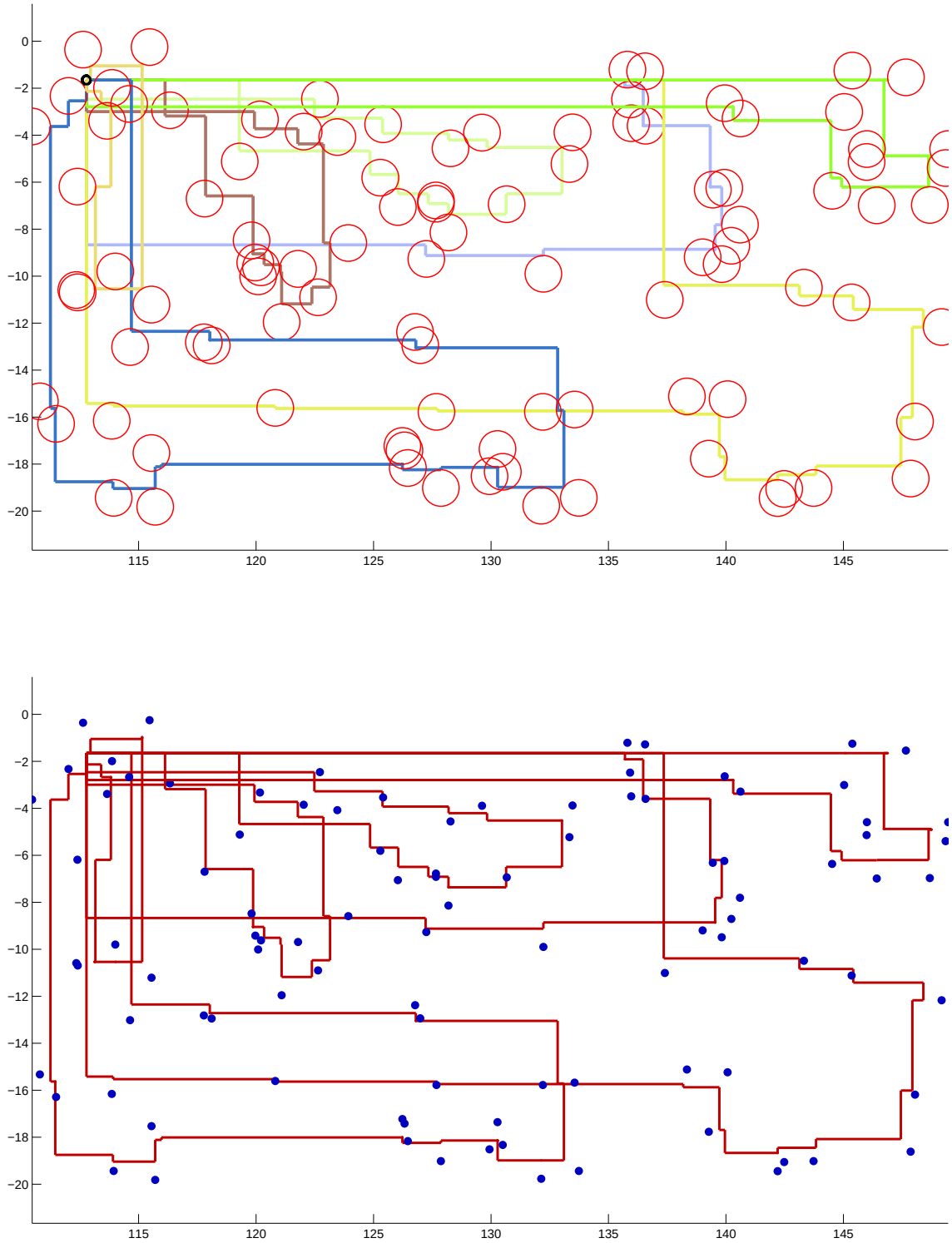


Figure O.112: $kroD100$, $r = 0.7798$, Equal Radius, 2D, Manhattan, Length = 453.3184420

Table O-115: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 2D, Manhattan

Total distance: 453.318441962213 Total demand met: 2719 Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 69.0207353574623 Demand Met: 400			
25.7023920098604	1.91093407455862	25.92	2.48
25.7023920098604	1.91093407455862	25.81	1.21
26.480504263724	3.59195083510988	25.97	3.49
26.480504263724	3.59195083510988	26.58	3.6
29.3287405368869	6.19862101887039	29.44	6.32
29.3287405368869	6.19862101887039	29.93	6.24
29.8201818213953	7.81000086565007	30.6	7.81
29.542327477458	8.8542037851054	29.01	9.2
29.542327477458	8.8542037851054	29.82	9.49
29.542327477458	8.8542037851054	30.23	8.71
22.2299994852557	9.12018585733583	22.23	9.9
17.2173059945428	8.66584372798624	17.25	9.27
Route: 2 Length: 105.280705518456 Demand Met: 399			
27.3540336934096	10.387366157835	27.4	11.01
33.1239252643425	10.8393807347246	33.32	10.49
35.418728080463	11.4211560908233	35.35	11.12
38.4001754070419	12.1700086430879	39.18	12.17
37.9346776894477	16.0146525447831	38.05	16.19
37.4473988334484	18.0781334535416	37.86	18.62
33.8324390651706	18.4493049834873	33.73	19.02
32.2000005757221	18.6701773521862	32.48	19.06
32.2000005757221	18.6701773521862	32.2	19.45
29.9551712328483	17.6928578578324	29.27	17.77
29.7177989364774	15.8756724695017	30.07	15.24
28.1815886099352	15.7394311053653	28.34	15.12
17.7183848741993	15.6346902515847	17.68	15.78
10.8164795933469	15.5282548381062	10.82	15.61
3.91801356825091	15.4210264015276	3.86	16.16
Route: 3 Length: 51.9039111163597 Demand Met: 394			
9.2846558227974	4.66610011278226	9.31	5.12
14.8531833849707	5.67302627556934	15.29	5.81
16.0554229763145	6.49406567551454	16.04	7.06
17.331985610876	6.91159435620145	17.66	6.78
18.1900000393759	7.36019990860063	18.19	8.14
18.1900000393759	7.36019990860063	17.66	6.92
20.6458635838099	6.49476530069179	20.67	6.94
23.0217556495792	4.51809500432514	23.34	5.23
23.0217556495792	4.51809500432514	23.47	3.88
19.8323050373266	4.20511242811298	19.62	3.89
18.194327577442	3.9262731133126	18.28	4.56
15.3807195640941	3.27550563569059	15.41	3.54
12.480165244887	2.4616568050956	12.72	2.46
Route: 4 Length: 39.8007799379511 Demand Met: 399			
6.1286137633566	3.18214038494928	6.34	2.94
7.85138455764401	6.58394062745017	7.81	6.7
9.87465272754236	9.04926927524122	10.21	9.62
9.87465272754236	9.04926927524122	9.97	9.42
9.87465272754236	9.04926927524122	9.81	8.48
10.3435663354744	9.51012230696864	10.09	10.01
11.0385382188055	9.8026493373476	11.79	9.69
11.0899521431349	11.1801952334941	11.09	11.96
12.3779235980589	10.4669413528994	12.64	10.9
13.1501947354814	8.58999987516455	13.93	8.59
12.8663171872444	4.36938172571434	13.46	4.08
11.7797327395551	3.72493483741281	12.03	3.85
9.93190319046555	2.99511878811757	10.17	3.33
Route: 5 Length: 81.3811211842438 Demand Met: 399			
26.4906539808604	1.65000196476768	26.56	1.28
35.0801976840493	1.65000344187161	35.38	1.25
36.8879960052462	1.65000477878754	37.66	1.54
36.7245649196056	4.87826511746257	35.99	5.14
36.7245649196056	4.87826511746257	36	4.59
38.7469311429378	4.90563292629762	39.35	5.4
38.7469311429378	4.90563292629762	39.46	4.59
38.6249554076195	6.20045008189313	38.68	6.97
36.4202151512459	6.21019836354345	36.42	6.99
34.919232091962	5.82132064388637	34.52	6.37
34.467562320344	3.37400124242685	35.03	3.01
30.3080873629002	2.79240485509724	29.95	2.64
30.3080873629002	2.79240485509724	30.62	3.29
Route: 6 Length: 80.6483083280723 Demand Met: 398			
4.69567835901898	12.3490110895595	4.64	13.02
8.03197735204013	12.7177382952131	8.11	12.95
8.03197735204013	12.7177382952131	7.78	12.82
16.8004428956197	13.046554333866	16.77	12.38
16.8004428956197	13.046554333866	16.99	12.94
22.8378515374854	15.7133118714251	22.21	15.78
22.8378515374854	15.7133118714251	23.56	15.68
23.1029949850742	18.9901938580159	23.74	19.44
22.139972547829	18.9901922917963	22.14	19.77
20.2800001080461	18.1398084764361	20.28	17.36
20.2800001080461	18.1398084764361	19.94	18.52
20.2800001080461	18.1398084764361	20.5	18.33
17.870001939389	18.2401929249013	17.87	19.02
16.2299924918058	18.0098074933052	16.23	17.23
16.2299924918058	18.0098074933052	16.32	17.42
16.2299924918058	18.0098074933052	16.46	18.17
5.97482474655784	18.1143052989496	5.55	17.53
5.70999900935814	19.0401936076128	5.70999999999999	19.82
3.90831759221689	18.7524566238983	3.94	19.44
1.45194832249413	15.6306455236779	0.799999999999997	15.33
1.45194832249413	15.6306455236779	1.48999999999999	16.29
1.24980524182682	3.62999863859429	0.469999999999999	3.63
2.01508138032149	2.53586883134823	2.02	2.33
Route: 7 Length: 25.282880519668 Demand Met: 330			
2.95147409269263	1.04696050355799	2.64	0.36
5.15238407486804	0.962186323975088	5.47	0.25
5.15238413088767	10.5391864089651	5.55	11.21
4.02693589995766	10.5391844984772	4.01000000000001	9.8
3.1281432068639	10.5391825968037	2.34999999999999	10.59
3.1281432068639	10.5391825968037	2.41	10.69
3.163021828298	6.19164103999773	2.40000000000001	6.19
3.82019925082018	2.67001406048622	4.59999999999999	2.67
3.82019925082018	2.67001406048622	3.66	3.39
3.40594070668985	2.13121195430065	3.87	1.99

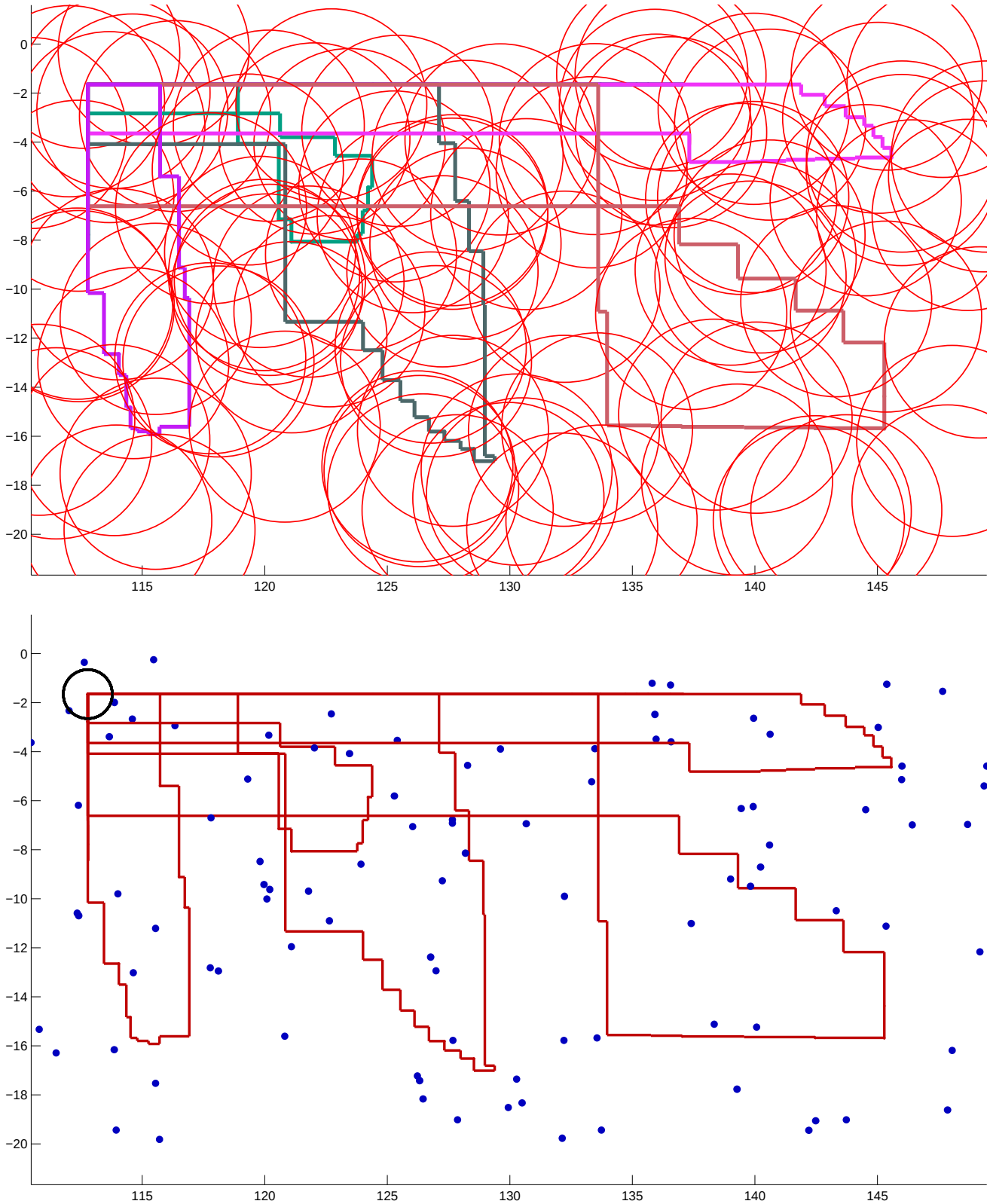


Figure O.113: $kroD100$, $r = 3.899$, Equal Radius, 2D, Manhattan, Length = 363.9952647

Table O-116: Solution for $kroD100$, $r = 3.899$, Equal Radius, 2D, Manhattan

Total distance: 363.995264669544 Total demand met: 2719 Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 13.6319561781554 Demand Met: 368			
2.78284023840357	2.77182009868895	2.64	0.36
2.78284023840357	2.77182009868895	3.87	1.99
2.78284023840357	2.77182009868895	2.02	2.33
2.78284023840357	2.77182009868895	3.66	3.39
2.78284023840357	2.77182009868895	4.59999999999999	2.67
2.78284023840357	2.77182009868895	5.47	0.25
2.78284023840357	2.77182009868895	0.469999999999999	3.63
2.78284023840357	2.77182009868895	6.34	2.94
2.78284023840357	2.77182009868895	2.40000000000001	6.19
2.78570620296199	6.97351405939049	2.34999999999999	10.59
2.78856475254771	7.77506747975812	2.41	10.69
2.79142109762041	8.45455699145728	5.55	11.21
2.78569386754985	6.81527634808078	4.01000000000001	9.8
Route: 2 Length: 36.0239951046498 Demand Met: 384			
8.90468738819827	4.06401480188634	10.17	3.33
8.90468738819827	4.06401480188634	12.03	3.85
10.5732211458734	7.14666237820557	11.79	9.69
10.5732211458734	7.14666237820557	13.93	8.59
11.0900008133742	8.06099879407912	11.09	11.96
11.0900008133742	8.06099879407912	12.64	10.9
13.7743029715647	7.73892449809355	17.25	9.27
13.9984214223826	6.78962957342864	16.04	7.06
14.2164399264982	5.85240370126067	17.66	6.78
14.2164399264982	5.85240370126067	17.66	6.92
14.3809987582458	4.5599771174698	18.28	4.56
12.8663901200759	3.79749263329351	15.29	5.81
10.6233732644715	2.82744505728483	13.46	4.08
Route: 3 Length: 63.931957829665 Demand Met: 400			
17.1128730010681	4.04458801526352	19.62	3.89
17.7723968361685	6.40109077924706	20.67	6.94
18.3320418636494	8.45016739577045	18.19	8.14
18.9174803716158	10.6459197069671	22.23	9.9
18.9814024472452	16.8092818160875	22.21	15.78
19.3829602465373	17.0130186682952	22.14	19.77
18.5341171288445	16.5183839348741	20.28	17.36
18.5341171288445	16.5183839348741	20.5	18.33
17.9909201985493	16.1899653878913	19.94	18.52
17.3280537926796	15.8099900041881	16.46	18.17
17.3280537926796	15.8099900041881	17.87	19.02
16.7003531836335	15.2218402691118	16.32	17.42
16.1099425407367	14.5601589607348	16.23	17.23
15.5344510230352	13.7137385423103	17.68	15.78
14.8038834676516	12.48861990476	16.77	12.38
14.0090691508297	11.3339943948559	16.99	12.94
10.8402510485168	4.08371832443162	12.72	2.46
Route: 4 Length: 48.6053680238528 Demand Met: 390			
14.4167143430235	1.65000008713207	15.41	3.54
22.5333412611964	1.65000018076791	25.81	1.21
23.2231247940919	1.65000032154018	23.34	5.23
25.6463880502166	1.65000046199357	26.58	3.6
26.5506881466429	1.65000055563575	29.95	2.64
27.0826833628247	1.65000064910172	30.62	3.29
25.1782325236579	1.6500004853792	25.97	3.49
24.7144208150106	1.65000036824644	26.56	1.28
23.7036197379726	1.65000027454185	25.92	2.48
21.2901003714596	1.65000015782403	23.47	3.88
Route: 5 Length: 71.8844077407298 Demand Met: 400			
31.8867306975861	2.06775307745949	35.38	1.25
32.8459023519629	2.53032788526197	35.03	3.01
33.7016911418977	2.98703619116186	34.52	6.37
34.4566997671772	3.32910687898042	37.66	1.54
34.8339231712696	3.78846889051545	35.99	5.14
35.2048105518136	4.2344090042033	36.42	6.99
35.5611998010528	4.63006685421179	38.68	6.97
35.561204819679	4.63007356770678	39.46	4.59
35.561204819679	4.63007356770678	39.35	5.4
34.088452463772	4.67571980300195	36	4.59
32.4555458280084	4.72138826461872	29.93	6.24
31.2710670709332	4.76663772291582	30.6	7.81
30.2299842541457	4.81099905068591	30.23	8.71
27.323211440355	3.64558018475816	29.44	6.32
Route: 6 Length: 93.0935839303877 Demand Met: 391			
23.6038323370745	10.9154666124828	27.4	11.01
23.9671472737379	15.5575318572622	23.74	19.44
25.7590723544005	15.5858663368458	28.34	15.12
27.034373934157	15.6144456790294	23.56	15.68
27.034373934157	15.6144456790294	30.07	15.24
29.556099337493	15.6430076290481	29.27	17.77
32.4601757360483	15.6713048519598	32.48	19.06
32.4601757360483	15.6713048519598	32.2	19.45
32.4601757360483	15.6713048519598	33.73	19.02
35.2810049010002	15.6957870641937	37.86	18.62
35.2810011590139	14.3733709578512	38.05	16.19
35.2809971273352	12.1735402496164	39.18	12.17
33.6121100595067	10.8726824779438	35.35	11.12
31.6625822866332	9.56891555140078	33.32	10.49
29.3079418032436	8.17038419665767	29.82	9.49
26.9085039598698	6.61341026838368	29.01	9.2
Route: 7 Length: 36.8239958621035 Demand Met: 386			
5.73165990853153	5.39696889355216	9.31	5.12
5.73165990853153	5.39696889355216	7.81	6.7
6.50468370918131	9.11421802196662	10.21	9.62
6.50468370918131	9.11421802196662	10.09	10.01
6.73845341460247	10.3563447853621	9.81	8.48
6.73845341460247	10.3563447853621	9.97	9.42
6.92099896716715	15.6100002386259	10.82	15.61
5.70974308522075	15.9209989638846	5.70999999999999	19.82
5.25594403907328	15.8006163286841	5.55	17.53
4.79828325775318	15.6788736299058	3.94	19.44
4.52292835147253	14.8316670652447	0.799999999999997	15.33
4.52292835147253	14.8316670652447	1.48999999999999	16.29
4.35323808918477	13.5019793833637	8.11	12.95
4.04896013340705	12.6460328693832	3.86	16.16
4.04896013340705	12.6460328693832	7.78	12.82
3.44035331964544	10.1563674694611	4.64	13.02

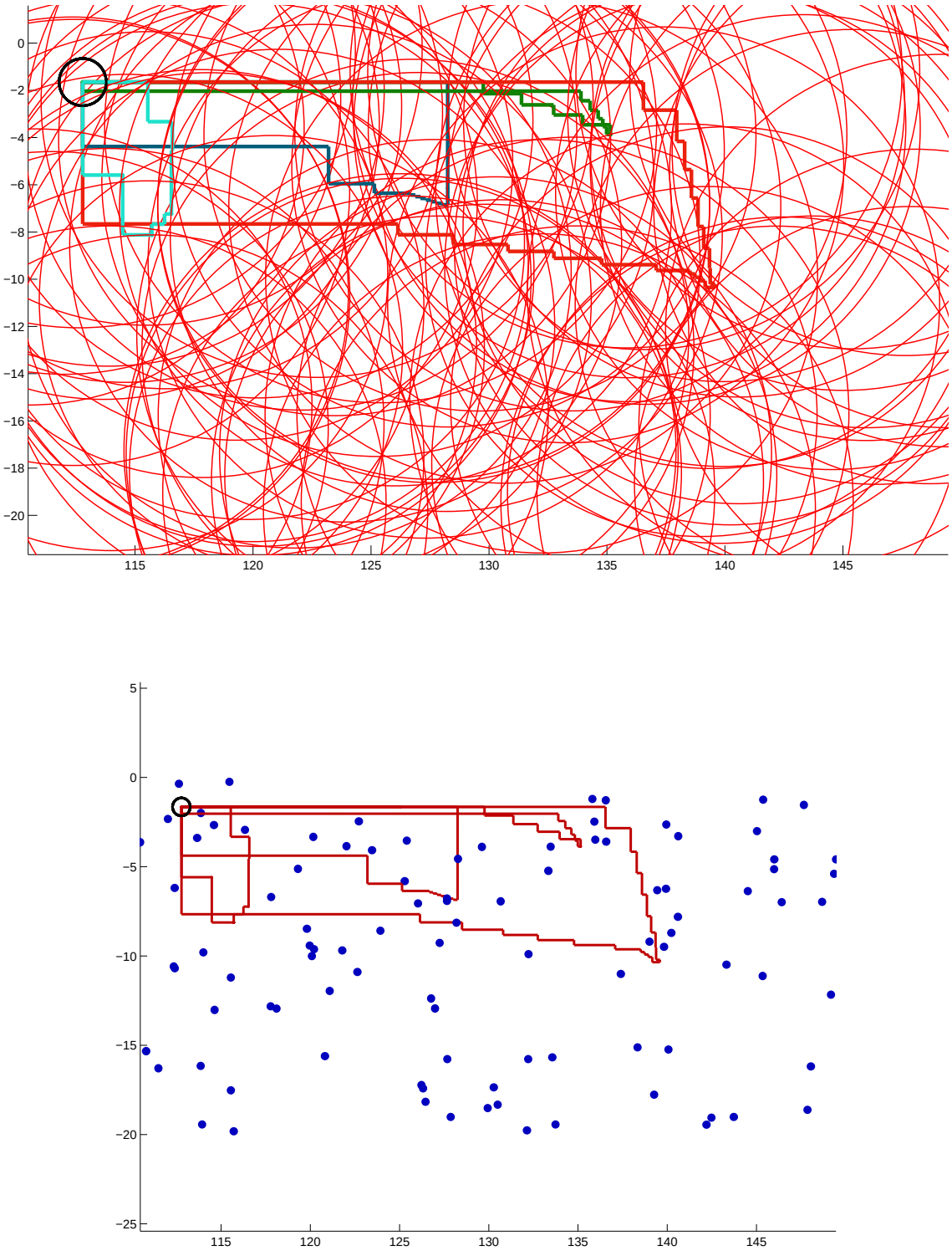


Figure O.114: $kroD100$, $r = 11.697$, Equal Radius, 2D, Manhattan, Length = 210.0868092

Table O-117: Solution for $kroD100$, $r = 11.697$, Equal Radius, 2D, Manhattan

Total distance: 210.086809238435 Total demand met: 2719 Depot: x 2.78 y 1.65			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 0 Demand Met: 368			
2.78	1.65	2.64	0.36
2.78	1.65	3.87	1.99
2.78	1.65	2.02	2.33
2.78	1.65	3.66	3.39
2.78	1.65	4.59999999999999	2.67
2.78	1.65	5.47	0.25
2.78	1.65	0.469999999999999	3.63
2.78	1.65	6.34	2.94
2.78	1.65	2.40000000000001	6.19
2.78	1.65	10.17	3.33
2.78	1.65	2.34999999999999	10.59
2.78	1.65	4.01000000000001	9.8
2.78	1.65	2.41	10.69
2.78	1.65	9.31	5.12
Route: 2 Length: 3.4685144461192 Demand Met: 367			
4.51425697437222	1.65000024868738	7.81	6.7
4.51425697437222	1.65000024868738	12.72	2.46
4.51425697437222	1.65000024868738	12.03	3.85
4.51425697437222	1.65000024868738	13.46	4.08
4.51425697437222	1.65000024868738	9.81	8.48
4.51425697437222	1.65000024868738	15.41	3.54
4.51425697437222	1.65000024868738	9.97	9.42
4.51425697437222	1.65000024868738	10.21	9.62
4.51425697437222	1.65000024868738	10.09	10.01
4.51425697437222	1.65000024868738	15.29	5.81
4.51425697437222	1.65000024868738	11.79	9.69
4.51425697437222	1.65000024868738	13.93	8.59
Route: 3 Length: 24.5333739645062 Demand Met: 397			
11.4464282421346	1.65000001720904	20.67	6.94
15.046686965044	1.65000000114144	19.62	3.89
15.046686965044	1.65000000114144	23.47	3.88
15.046686965044	1.65000000114144	25.81	1.21
15.046686965044	1.65000000114144	25.92	2.48
15.046686965044	1.65000000114144	23.34	5.23
15.046686965044	1.65000000114144	26.56	1.28
15.046686965044	1.65000000114144	25.97	3.49
15.046686965044	1.65000000114144	26.58	3.6
Route: 4 Length: 41.3477059776527 Demand Met: 399			
18.2529992962409	2.63997345390665	29.95	2.64
18.2529989027788	5.73530120011909	29.44	6.32
18.2529989027788	5.73530120011909	29.93	6.24
18.2529985374499	6.14541791969068	29.01	9.2
18.2529981730797	6.51396160167148	22.21	15.78
18.2529978092472	6.85085369258542	20.5	18.33
18.0074015034912	6.78703112070539	16.46	18.17
17.7772255168591	6.71514587851329	17.25	9.27
17.5491734418225	6.6443089507229	16.77	12.38
17.3234073082768	6.5739112057476	17.68	15.78
17.0991829628782	6.50253482439361	16.99	12.94
16.8776685098365	6.43148412049864	16.23	17.23
16.6621409943721	6.35659065789754	20.28	17.36
15.1407166883103	5.95133010727925	16.32	17.42
13.2019431840917	4.37883751659571	22.23	9.9
Route: 5 Length: 49.1693343704965 Demand Met: 399			
19.7599159297106	2.13765100098305	30.62	3.29
21.3758320618302	2.61277404634134	27.4	11.01
22.740956049471	3.04321987142119	30.23	8.71
23.9695744492362	3.45842447046145	30.6	7.81
25.1475932668482	3.86707357690358	28.34	15.12
25.1475934375554	3.86707344410859	29.82	9.49
25.1475936083447	3.86707331715946	36.42	6.99
24.9866995642213	3.53801509897565	34.52	6.37
24.8227427787424	3.2035715152532	35.99	5.14
24.6262993415669	2.84725271105816	36	4.59
24.2874071128761	2.44138374695911	35.03	3.01
23.8965491570405	2.03244387987013	35.38	1.25
Route: 6 Length: 71.0158877354922 Demand Met: 394			
26.5422921747274	2.83808007173499	37.66	1.54
27.9531132822935	4.16096641881428	39.46	4.59
28.2911460259192	5.35913025933757	39.35	5.4
28.5815372313191	6.56472517360607	38.68	6.97
28.8597226694733	7.76862537029086	39.18	12.17
Solution x	Solution y	Original x	Original y
29.1004796954004	8.68499036661826	29.27	17.77
29.3437874351994	9.52642566018482	30.07	15.24
29.3752354135188	10.209448960744	32.2	19.45
29.5888300988278	10.3491137689183	37.86	18.62
29.1614229874103	10.0666620050336	33.73	19.02
28.9451997048638	9.91990780000911	33.32	10.49
28.7300360083991	9.77365768915971	35.35	11.12
28.5157079122612	9.62772122072872	38.05	16.19
27.0851075484478	9.38617418053754	32.48	19.06
24.7770647236499	9.11265561722322	23.74	19.44
22.7478597279853	8.82168177494964	23.56	15.68
20.8058503473834	8.52770265312041	22.14	19.77
18.499975901367	8.11637375924829	19.94	18.52
16.1421147134458	7.65977147531218	17.87	19.02
Route: 7 Length: 20.5519927441681 Demand Met: 395			
5.54253978649774	3.32493574487619	16.04	7.06
6.58299817199662	4.5585333079257	18.28	4.56
6.54290648142725	7.23336998060676	17.66	6.92
6.54290648142725	7.23336998060676	18.19	8.14
6.25342264808204	7.66760654082364	17.66	6.78
5.71022925193698	8.12299820008741	5.55	11.21
5.71022925193698	8.12299820008741	4.64	13.02
5.71022925193698	8.12299820008741	3.86	16.16
5.71022925193698	8.12299820008741	0.799999999999997	15.33
5.71022925193698	8.12299820008741	1.48999999999999	16.29
5.71022925193698	8.12299820008741	7.78	12.82
5.71022925193698	8.12299820008741	8.11	12.95
5.71022925193698	8.12299820008741	5.55	17.53
5.71022925193698	8.12299820008741	3.94	19.44
5.71022925193698	8.12299820008741	5.70999999999999	19.82
5.71022925193698	8.12299820008741	10.82	15.61
4.47657078769977	5.58729743540765	11.09	11.96
4.47657078769977	5.58729743540765	12.64	10.9

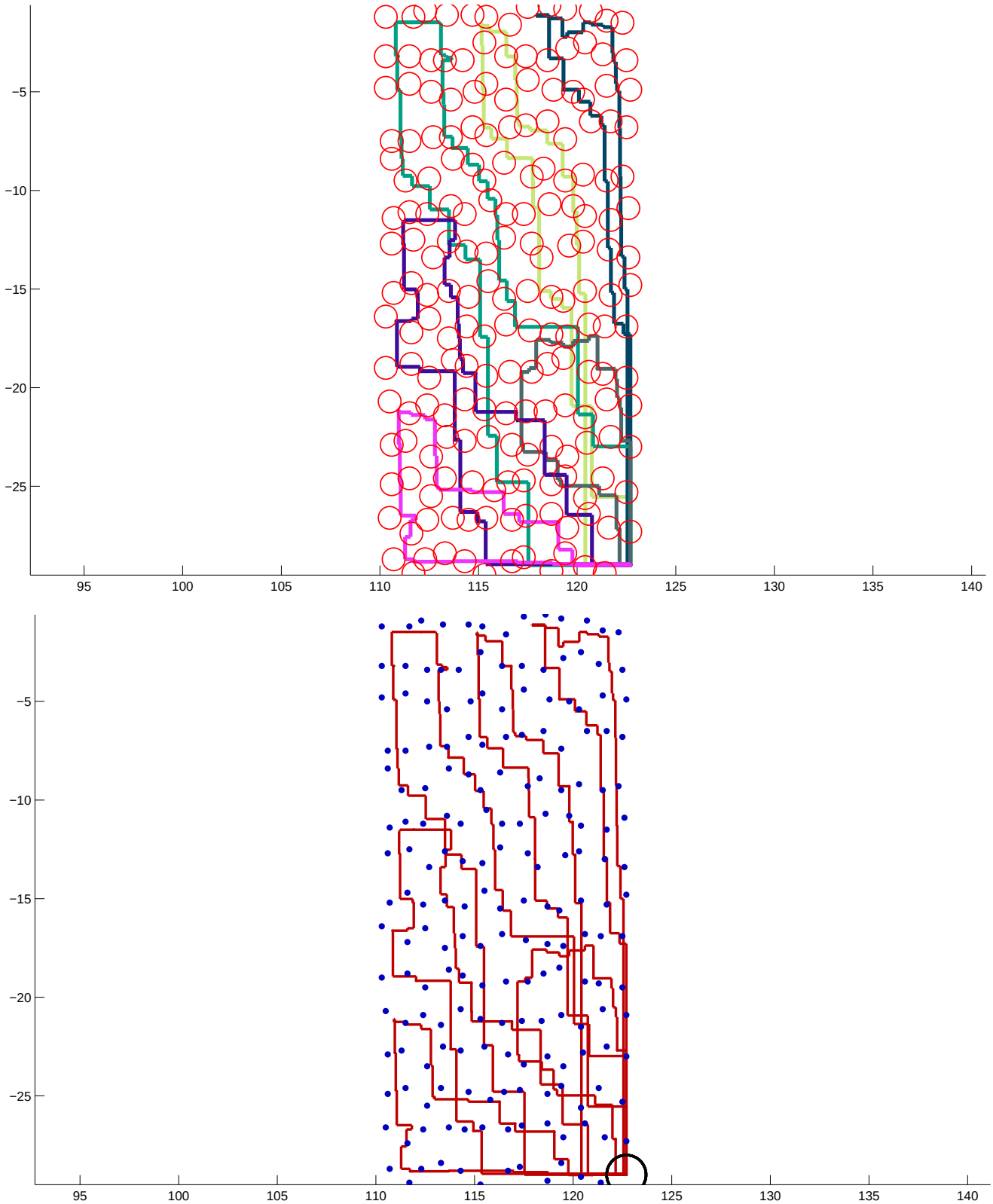


Figure O.115: $rat195$, $r = 0.578$, Equal Radius, 2D, Manhattan, Length = 353.6018368

Table O-118: Solution for $rat195$, $r = 0.578$, Equal Radius, 2D, Manhattan

Total distance: 353.60183684324 Total demand met: 11712 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 70.1651641401889 Demand Met: 1974			
10.417522996689	15.2264015759747	10.4	15.1
10.1026149802508	12.7748496121251	9.59999999999999	12.8
10.1026149802508	12.7748496121251	10.3	12.6
9.97927073003714	11.120235095415	9.8	10.8
9.97927073003714	11.120235095415	10.4	11.3
9.80475961982867	9.30486303957196	9.40000000000001	9.5
9.80475961982867	9.30486303957196	10.3	9.2
9.26302648509257	7.63258280121908	9.40000000000001	7.4
8.48456001409791	6.96042576993616	8.5	6.5
7.61773642713723	6.76239688842198	7.40000000000001	6.7
7.06541489953717	6.5722973124037	6.59999999999999	6.8
6.96451238026117	5.40347130143259	6.40000000000001	5.4
6.93873749514795	4.40146749680924	7.5	4.4
6.86151929551686	3.20690888684134	6.40000000000001	3.2
6.86151929551686	3.20690888684134	7.40000000000001	3.2
6.40782342374435	1.94971421434236	6.59999999999999	1.6
5.55548724981348	1.65846330974474	5.40000000000001	1.2
5.1088300840938	1.50858784581176	4.7	1.1
5.15878369953023	2.66089141421532	5.3	2.5
5.20796360525935	4.85595517971762	4.8	5
5.20796360525935	4.85595517971762	5.40000000000001	4.6
5.26286312862838	6.81326514495148	4.7	6.8
5.64704287454913	7.37477759718913	5.40000000000001	7.2
6.44517494054719	8.35946761780647	6.3	8.6
7.73289056872271	8.89619326179164	8.3	8.9
7.74898566349329	9.54805414636301	7.7	9.3
7.76521056506435	10.8686369203071	7.3	11.2
8.05951860174861	10.8934184746943	8.59999999999999	10.7
8.06731770228576	12.9942513220155	8.2	13.4
8.06731770228576	12.9942513220155	7.7	12.7
8.07508961397619	15.0992279758661	7.5	15.1
8.67033691188695	15.5025043023215	8.7	15.4
9.2330628496773	15.9541125416555	9.3	15.6
9.71658461716453	20.9303425722309	9.40000000000001	20.9
10.7421730397779	25.5416951470328	10.4	25.6
Route: 2 Length: 66.8531448918356 Demand Met: 1990			
12.5543630934929	15.0087793657087	12.7	14.8
12.3994390624004	13.3530739260237	12.6	13.4
12.2347273583195	11.3174709643376	11.7	11.5
12.2347273583195	11.3174709643376	12.6	10.9
12.2036574836049	9.26214582592424	12.3	9.3
12.1724365680217	6.84763718340621	12.5	6.8
12.140372267399	4.95082102123974	12.7	4.9
12.0236742462867	4.59304982923406	11.5	4.7
11.9648503263605	3.47780348385086	12.5	3.4
11.8395774419072	3.0380911343573	11.3	3.1
11.7870644184078	1.71821300361338	12.3	1.5
11.3095568214176	1.59468426225044	11.5	1.4
10.6999816751021	1.4780036770518	10.7	0.9
10.3095407886839	1.98138011035306	10.4	2.5
9.49999609450207	2.2219963952416	9.5	2.8
9.25433178451046	1.2761739694995	9.40000000000001	0.8
8.60193307180495	1.15227606734804	8.59999999999999	0.6
7.90868404078739	1.1087362314846	7.5	0.7
8.57682754209412	3.30676286934108	8.5	3.4
9.30765906582367	4.89089621072014	8.8	4.9
9.30765906582367	4.89089621072014	9.8	5
10.0912027033542	5.50426481346695	10.3	5.4
10.6696455115782	6.21711249353096	10.7	6.5
11.2305262110957	6.69366718967661	11.7	6.5
11.3950572023501	9.53388816632302	11.5	9.5
11.5549679670076	12.9125716089735	11.6	13
11.7132876101203	15.1859071059344	11.7	15.3
11.8728054977335	16.7549098266025	11.4	16.9
12.3498639562919	17.2855714219739	12.5	16.9
Route: 3 Length: 79.8064533941878 Demand Met: 1994			
7.53011169449725	24.7895708855396	7.3	24.7
5.92970321147371	22.4361365457558	5.5	22.5
5.47836546066992	17.429011600121	5.3	17.4
5.08184627478727	13.5001162367898	5.40000000000001	13.2
4.33868847903011	12.7635026490057	4.40000000000001	13.1
3.50384082177303	10.9648593823033	3.59999999999999	10.8
2.5302702279529	9.78148845373777	2.5	9.4
1.62725199171358	9.25779681638837	1.3	9.5
1.15941824132146	8.3950020616841	0.599999999999994	8.4
1.096624009631	7.43141500815978	1.5	7.5
1.096624009631	7.43141500815978	0.599999999999994	7.5
1.04035834914663	4.91904231206126	1.5	4.6
0.8780033909064	4.79999885401586	0.299999999999997	4.8
0.878003287843896	3.20040051356731	0.299999999999997	3.2
0.921996728255309	3.19994203262463	1.5	3.2
0.806756490276214	1.47800320989724	0.299999999999997	1.2
1.60669809143739	1.47800329439557	1.7	1.2
2.30000001915222	1.47800337898109	2.3	0.9
3.03279437383875	1.53207111210645	3.40000000000001	1.1
3.09342500143698	3.13579074091281	2.59999999999999	3.4
3.35444295090502	3.2694487502353	3.3	3.4
3.62199651884463	3.39973496075338	4.2	3.4
3.1780035619887	4.99999995899109	2.59999999999999	5
3.22232300228217	5.64108386500809	3.59999999999999	5.4
3.26397328510807	7.27057380937557	2.7	7.3
3.67856003139993	7.84825558935896	3.7	8.4
3.67856003139993	7.84825558935896	3.59999999999999	7.3
4.45633311596092	8.69369408278804	4.7	8.7
5.02724261934863	9.53336637089012	5.3	9.5
5.4617186378034	10.4263325129595	5.59999999999999	10.5
5.85652767490619	11.2327220019073	6.40000000000001	11.2
5.95547234213534	12.513548348165	6.3	12.4
6.04657646472829	14.5691120492926	5.5	14.6
6.43067647230242	15.6107947252159	6.3	15.5
6.85049705834601	16.9172873246554	6.40000000000001	16.8
10.0439071342059	21.3559432781692	10.4	21.5
10.807983713133	22.9812442499522	10.5	22.8
Route: 4 Length: 34.9719945224324 Demand Met: 1900			
12.1550075294794	27.1873770038959	11.6	27.1
12.1550075294794	27.1873770038959	12.7	27.3
11.9928381686582	25.4526594761481	12.5	25.3
11.1137976948229	24.9777072895721	11.3	24.6
9.18567769565726	24.680327918682	8.7	24.9
9.01042334471764	23.6708757174524	9.5	23.5
8.41310749952737	23.2580259387179	8.7	23
7.25673771470396	22.9407697231748	6.7	22.9
7.25673771470396	22.9407697231748	7.5	23.4
7.17800057107884	19.2000000850539	6.59999999999999	19.2
7.5672151406398	19.0070369462218	7.7	19.2
7.92199942818439	18.7999997174222	8.5	18.8
7.92199935749531	17.5800010925045	7.59999999999999	17.1
8.65150384265902	17.7264589443863	8.7	17.3
9.30000034051747	17.9219994239184	9.3	18.5
9.79526711710093	17.628468565237	9.5	17.4
10.5999999844417	17.3780005698079	10.6	16.8
11.0340211438715	19.0396399585773	10.6	19.2
11.0340211438715	19.0396399585773	11.3	19.3
11.9464232635757	19.5442440369868	12.5	19.5
12.0247192361265	20.5094390371078	11.5	20.6
12.1658247795279	21.0017755166749	12.7	20.9
12.2342082741341	22.6910662207212	11.7	22.5
12.2342082741341	22.6910662207212	12.7	23
Route: 5 Length: 61.2711426486414 Demand Met: 1993			
10.7495562592856	26.4472129004938	10.6	26.4
9.46637789179596	24.4203701153933	9.40000000000001	24.5
8.35340417597932	21.6486294959939	8.40000000000001	21.2
6.89694759051841	21.2278415581003	6.40000000000001	21.3
6.89694759051841	21.2278415581003	7.40000000000001	21.2
4.8577081627284	20.7398185068528	4.3	20.6
4.8577081627284	20.7398185068528	5.3	21.1
4.84332822196802	19.2598862864516	4.40000000000001	18.9
4.84332822196802	19.2598862864516	5.40000000000001	19.4
4.21475670342869	18.550828202124	3.7	18.6
4.05515036453473	17.5136858419571	3.5	17.5
4.00384906160519	16.754084942434	4.40000000000001	16.9
3.94809128463075	15.4257336509048	4.5	15.4
3.59879481737555	14.7796829981398	3.5	15.1
3.27800013624628	13.399999866778	2.7	13.4
3.53283336227094	12.5187187145891	3.5	12.6
3.81032383565345	11.5070853342397	4.3	11.2
1.91032385041369	11.5070853447397	2.40000000000001	11.2
1.91032385041369	11.5070853447397	1.5	11.1
1.21242584953457	11.5897253733614	0.700000000000003	11.4
1.17800012735729	12.7000325628491	1.7	12.5
1.17800012735729	12.7000325628491	0.599999999999994	12.7
1.22359763162144	15.0147617746544	0.700000000000003	15.2

Solution x	Solution y	Original x	Original y
1.86340992593887	15.1767415918574	2.40000000000001	15.3
1.86340992593887	15.1767415918574	1.59999999999999	14.7
1.92199985810741	16.5000053267443	2.5	16.5
1.59999931523846	16.6219998575438	1.59999999999999	17.2
0.83366677159691	16.6219998662439	0.299999999999997	16.4
0.862693952852155	18.9386794617168	0.299999999999997	19
2.03927691722868	19.1647427887279	2.5	19.5
2.03927691722868	19.1647427887279	1.59999999999999	18.8
3.79439222406405	22.6393150940865	4.3	22.7
3.79439222406405	22.6393150940865	3.40000000000001	22.5
4.0788077428808	26.3023918024028	3.7	26.6
4.94331878943075	26.7764820616409	5.40000000000001	26.6
4.94331878943075	26.7764820616409	4.5	26.7
5.36269606881388	28.9482953460473	5.3	29.5
Route: 6 Length: 40.5339372459542 Demand Met: 1861			
10.9713127728724	29.0122905105962	10.4	29.1
10.9713127728724	29.0122905105962	11.4	29.4
9.75796550679263	28.2123568821677	9.40000000000001	28.4
9.04681794322308	26.8130030467068	8.7	26.4
9.04681794322308	26.8130030467068	9.5	27.1
7.06098888223767	26.4029576819171	6.7	26.7
7.06098888223767	26.4029576819171	7.40000000000001	26.5
6.27471106529495	25.2956800276036	5.8	25.2
6.27471106529495	25.2956800276036	6.5	24.8
4.68239507605395	25.1726525628752	4.7	24.8
2.96878034338124	25.0627120689079	3.3	24.6
2.96878034338124	25.0627120689079	2.59999999999999	25.5
2.87653454867591	23.456934180934	2.59999999999999	23.5
2.78868687009646	21.6116773113688	3.3	21.4
2.29270005307357	21.3857152647115	2.40000000000001	20.9
1.57367024870757	21.2479696113838	1.5	21.3
0.908709148576861	21.1087126109646	0.5	20.7
0.958325098021859	22.8126269694189	1.3	22.7
0.958325098021859	22.8126269694189	0.599999999999994	22.9
1.00813760994114	24.709445907629	1.5	24.6
1.00813760994114	24.709445907629	0.599999999999994	24.9
1.05444620451816	26.4873640857832	0.5	26.6
1.82199462739595	26.6999995880387	2.40000000000001	26.7
1.55221557429593	27.564933528922	1.59999999999999	27.4
1.27800570945017	28.6999966584362	0.700000000000003	28.7
1.73525068137269	28.8230702693563	2.3	28.7
1.73525068137269	28.8230702693563	1.7	29.4
3.72201629610939	28.7949593153798	4.3	28.8
3.72201629610939	28.7949593153798	3.3	28.4
6.9974204109793	28.8656888993073	6.7	28.8
6.9974204109793	28.8656888993073	7.3	28.6
8.74805664704138	28.94135502773	8.7	29.3

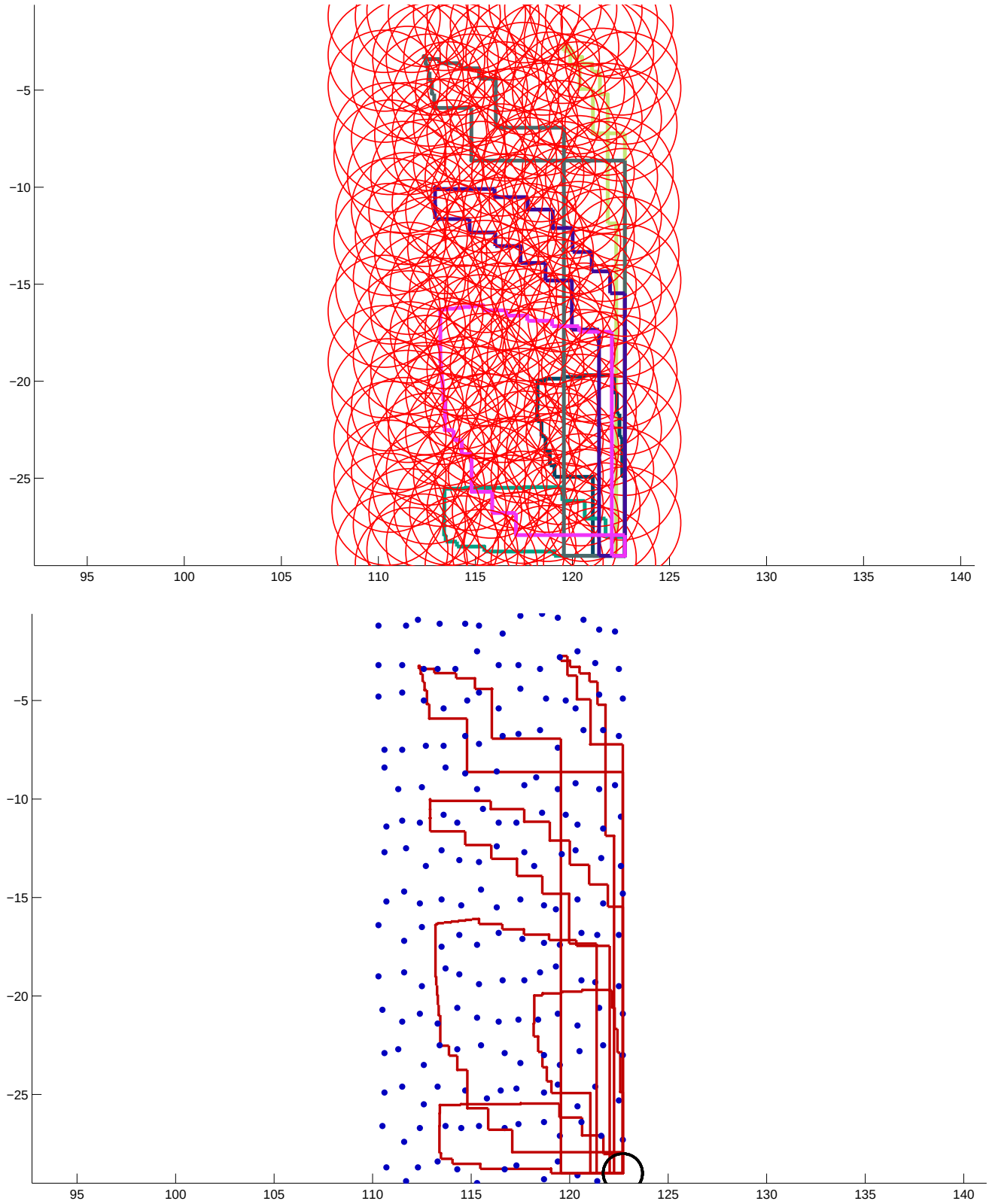


Figure O.116: $rat195$, $r = 2.89$, Equal Radius, 2D, Manhattan, Length = 286.7876088

Table O-119: Solution for $rat195$, $r = 2.89$, Equal Radius, 2D, Manhattan

Total distance: 286.78760878985 Total demand met: 11712 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 58.8258453806592 Demand Met: 1984			
12.2542549365403	11.869236812946	12.6	10.9
12.2542549365403	11.869236812946	11.7	11.5
11.8172748689582	5.21769800457791	11.3	3.1
11.8172748689582	5.21769800457791	11.5	4.7
11.4136259462804	4.04378989658551	11.5	1.4
11.0055778367966	3.62527650671883	12.3	1.5
11.0055778367966	3.62527650671883	12.5	3.4
10.4985276057521	3.2967696486732	10.4	2.5
10.4985276057521	3.2967696486732	9.5	2.8
10.0177344163456	2.98586441580845	9.40000000000001	0.8
10.0177344163456	2.98586441580845	10.7	0.9
9.54355357051689	2.74352373915353	7.5	0.7
9.54355357051689	2.74352373915353	8.59999999999999	0.6
9.88868498599885	3.73414667615144	7.40000000000001	3.2
10.3709378784644	4.93650097583709	8.5	3.4
10.3709378784644	4.93650097583709	8.8	4.9
11.0577212105754	7.2225136600651	12.7	4.9
11.0577212105754	7.2225136600651	10.3	5.4
11.0577212105754	7.2225136600651	8.5	6.5
11.0577212105754	7.2225136600651	10.7	6.5
11.0577212105754	7.2225136600651	11.7	6.5
11.0577212105754	7.2225136600651	12.5	6.8
11.0577212105754	7.2225136600651	9.40000000000001	7.4
11.0577212105754	7.2225136600651	10.3	9.2
11.0577212105754	7.2225136600651	9.40000000000001	9.5
11.0577212105754	7.2225136600651	12.3	9.3
11.0577212105754	7.2225136600651	11.5	9.5
Route: 2 Length: 27.6727083589638 Demand Met: 1933			
11.0511450773747	24.9287256659689	10.5	22.8
11.0511450773747	24.9287256659689	11.7	22.5
9.07383657399356	24.3366749422466	6.5	24.8
9.07383657399356	24.3366749422466	8.7	23
8.83878061665888	23.6221115268287	7.5	23.4
8.83878061665888	23.6221115268287	7.3	24.7
8.61477440150017	22.8370593117476	6.7	22.9
8.40179643137452	22.0544255327254	9.40000000000001	20.9
8.40179643137452	22.0544255327254	10.4	21.5
8.17399681481214	21.403714737143	5.3	21.1
8.17399681481214	21.403714737143	5.5	22.5
8.20313157574755	19.9724464662523	5.40000000000001	19.4
8.20313157574755	19.9724464662523	6.59999999999999	19.2
8.63221285555524	19.8671854275892	9.5	17.4
8.63221285555524	19.8671854275892	8.5	18.8
8.63221285555524	19.8671854275892	7.7	19.2
8.63221285555524	19.8671854275892	6.40000000000001	21.3
8.63221285555524	19.8671854275892	7.40000000000001	21.2
8.63221285555524	19.8671854275892	8.40000000000001	21.2
9.61969604165861	19.7774563992407	9.3	18.5
10.6450439245015	19.689649005706	10.6	16.8
10.6450439245015	19.689649005706	11.4	16.9
12.0217744162501	19.7178695116165	12.5	16.9
12.0217744162501	19.7178695116165	12.5	19.5
12.1528897222467	20.5732881084448	10.6	19.2
12.1528897222467	20.5732881084448	11.3	19.3
12.2887423504571	21.6714294132796	11.5	20.6
12.4264619383181	22.8785532466997	12.7	20.9
12.5656308686635	24.8716168897847	12.7	23
12.5656308686635	24.8716168897847	12.5	25.3
Route: 3 Length: 25.6974645773095 Demand Met: 1875			
9.05481785828835	28.7732839642724	6.7	28.8
9.05481785828835	28.7732839642724	7.3	28.6
9.05481785828835	28.7732839642724	8.7	29.3
9.05481785828835	28.7732839642724	9.40000000000001	28.4
9.05481785828835	28.7732839642724	10.4	29.1
9.05481785828835	28.7732839642724	11.4	29.4
5.46325660593669	28.5202064686848	3.3	28.4
5.46325660593669	28.5202064686848	4.3	28.8
4.05171652657995	28.2672344097426	1.7	29.4
3.46913718286193	27.9822964002723	0.700000000000003	28.7
3.46913718286193	27.9822964002723	2.3	28.7
3.39000080123662	26.5999995797741	0.5	26.6
3.39000080123662	26.5999995797741	1.59999999999999	27.4
3.40072869303762	25.9567617489016	2.59999999999999	23.5
3.40072869303762	25.9567617489016	3.3	24.6
3.41166524597556	25.5358433943053	0.599999999999994	24.9
3.41166524597556	25.5358433943053	1.5	24.6
4.4794696295904	25.4911282392919	2.59999999999999	25.5
4.4794696295904	25.4911282392919	4.3	22.7
7.51333093113747	25.4612669101086	4.7	24.8
7.51333093113747	25.4612669101086	5.8	25.2
7.51333093113747	25.4612669101086	6.7	26.7
7.51333093113747	25.4612669101086	9.5	23.5
7.51333093113747	25.4612669101086	7.40000000000001	26.5
7.51333093113747	25.4612669101086	8.7	24.9
7.51333093113747	25.4612669101086	9.40000000000001	24.5
7.51333093113747	25.4612669101086	8.7	26.4
7.51333093113747	25.4612669101086	10.4	25.6
7.51333093113747	25.4612669101086	9.5	27.1
9.47995645411861	26.1715293834546	11.3	24.6
10.6330364195594	27.0748479187696	10.6	26.4
10.6330364195594	27.0748479187696	11.6	27.1
11.7090347249146	28.0184417834343	12.7	27.3
Route: 4 Length: 72.2258428124677 Demand Met: 1956			
9.55826619092012	6.93450270136162	9.8	5
6.04966490430397	4.41259635669614	6.59999999999999	1.6
6.04966490430397	4.41259635669614	6.40000000000001	3.2
6.04966490430397	4.41259635669614	5.40000000000001	4.6
6.04966490430397	4.41259635669614	3.59999999999999	5.4
6.04966490430397	4.41259635669614	4.8	5
6.04966490430397	4.41259635669614	7.5	4.4
6.04966490430397	4.41259635669614	6.40000000000001	5.4
6.04966490430397	4.41259635669614	4.7	6.8
6.04966490430397	4.41259635669614	6.59999999999999	6.8
6.04966490430397	4.41259635669614	5.40000000000001	7.2
6.04966490430397	4.41259635669614	7.40000000000001	6.7
5.19023037027492	3.87719480953872	5.40000000000001	1.2
5.19023037027492	3.87719480953872	5.3	2.5
4.23917584846423	3.60941641429735	4.7	1.1
3.13204644563426	3.39669685578192	2.3	0.9
3.13204644563426	3.39669685578192	3.40000000000001	1.1
2.34352974425111	3.24354884951505	0.299999999999997	1.2
2.34352974425111	3.24354884951505	1.7	1.2
2.44359272231274	3.64277239494441	3.3	3.4
2.44359272231274	3.64277239494441	4.2	3.4
2.54100553801722	4.05256006371967	2.59999999999999	3.4
2.6387856245827	4.47321496824836	0.299999999999997	3.2
2.6387856245827	4.47321496824836	1.5	3.2
2.75702410377124	5.17529704122807	1.5	4.6
2.75702410377124	5.17529704122807	2.59999999999999	5
2.87655230381274	5.91698954049099	0.299999999999997	4.8
2.87655230381274	5.91698954049099	0.599999999999994	7.5
4.79152326521512	8.63137159537229	3.59999999999999	7.3
4.79152326521512	8.63137159537229	3.7	8.4
Route: 5 Length: 57.5257492901194 Demand Met: 2000			
11.3714754374743	17.3398618108755	11.7	15.3
9.9726477517367	14.8087897878917	10.3	12.6
9.9726477517367	14.8087897878917	9.59999999999999	12.8
8.61197903802641	13.9040183878377	8.2	13.4
7.3241139850266	13.038158468415	7.3	11.2
7.3241139850266	13.038158468415	7.7	12.7
6.02329315698823	12.3386697191181	6.3	12.4
4.70085870760153	11.6432084311384	6.40000000000001	11.2
2.92009983880614	10.9768523216904	4.7	8.7
2.92009983880614	10.9768523216904	0.700000000000003	11.4
2.92009983880614	10.9768523216904	1.5	11.1
2.92009983880614	10.9768523216904	5.3	9.5
2.92009983880614	10.9768523216904	2.40000000000001	11.2
2.92009983880614	10.9768523216904	3.59999999999999	10.8
2.92009983880614	10.9768523216904	0.599999999999994	12.7
2.92009983880614	10.9768523216904	1.7	12.5
2.92009983880614	10.9768523216904	5.59999999999999	10.5
2.92009983880614	10.9768523216904	4.3	11.2
2.92009983880614	10.9768523216904	3.5	12.6
2.92009983880614	10.9768523216904	2.7	13.4
2.92009983880614	10.9768523216904	4.40000000000001	13.1
2.92009982195	10.5233932890442	1.3	9.5
2.92009982195	10.5233932890442	2.5	9.4
2.92009980232386	10.0170255526164	1.5	7.5
2.92009980232386	10.0170255526164	2.7	7.3
2.92009980888987	10.0933196693093	0.599999999999994	8.4
5.9947150133228	10.5139933331113	6.3	8.6
5.9947150133228	10.5139933331113	7.7	9.3

Solution x	Solution y	Original x	Original y
7.69254068929477	11.1508829576195	8.3	8.9
7.69254068929477	11.1508829576195	8.59999999999999	10.7
8.98916415809742	12.1107033330379	9.8	10.8
8.98916415809742	12.1107033330379	10.4	11.3
10.0067066234977	13.3401040286569	10.4	15.1
10.9911898598123	14.3374241295246	11.6	13
11.9386092454767	15.4662716406161	12.6	13.4
Route: 6 Length: 44.8399983703305 Demand Met: 1964			
12.0299517428152	17.4549949682384	12.7	14.8
10.3378372591308	17.1625908783335	9.3	15.6
8.95199317744914	16.8845738109463	8.7	15.4
8.95199317744914	16.8845738109463	8.7	17.3
7.67751078826346	16.6170107232953	6.40000000000001	16.8
7.67751078826346	16.6170107232953	7.59999999999999	17.1
6.58274413955418	16.349015538926	7.5	15.1
5.39969979096077	16.0900004055433	5.40000000000001	13.2
5.39969979096077	16.0900004055433	5.5	14.6
5.04599767074562	16.1327690603408	4.5	15.4
4.69591484887272	16.1756935805987	3.5	15.1
4.69591484887272	16.1756935805987	6.3	15.5
4.33737948507438	16.2190170078291	4.40000000000001	16.9
4.33737948507438	16.2190170078291	5.3	17.4
3.96727632013949	16.2621402016686	2.5	16.5
3.96727632013949	16.2621402016686	3.5	17.5
3.61782929610347	16.3050842046623	2.40000000000001	15.3
3.28098893156884	16.3481748179653	0.700000000000003	15.2
3.28098893156884	16.3481748179653	1.59999999999999	14.7
3.19000040929149	16.3999976199153	0.299999999999997	16.4
3.19000040929149	16.3999976199153	1.59999999999999	17.2
3.19000043315279	19.000000159077	0.299999999999997	19
3.19000043315279	19.000000159077	1.59999999999999	18.8
3.23032607835891	19.4603206830018	4.40000000000001	18.9
3.27049178597883	19.9349517406731	2.5	19.5
3.27049178597883	19.9349517406731	3.7	18.6
3.31070735697563	20.4555303401775	2.40000000000001	20.9
3.35104643396554	20.9730666451693	0.5	20.7
3.35104643396554	20.9730666451693	1.5	21.3
3.43244982851557	22.5229126038131	0.599999999999994	22.9
3.43244982851557	22.5229126038131	1.3	22.7
3.87391614338989	23.0253649483287	4.3	20.6
4.29726026494743	23.7478190442816	3.3	21.4
4.29726026494743	23.7478190442816	3.40000000000001	22.5
4.8060447992093	25.7005617368938	2.40000000000001	26.7
4.8060447992093	25.7005617368938	3.7	26.6
5.86545201465789	26.7893687616908	4.5	26.7
7.08825590365694	27.9263552829771	5.40000000000001	26.6
7.08825590365694	27.9263552829771	5.3	29.5

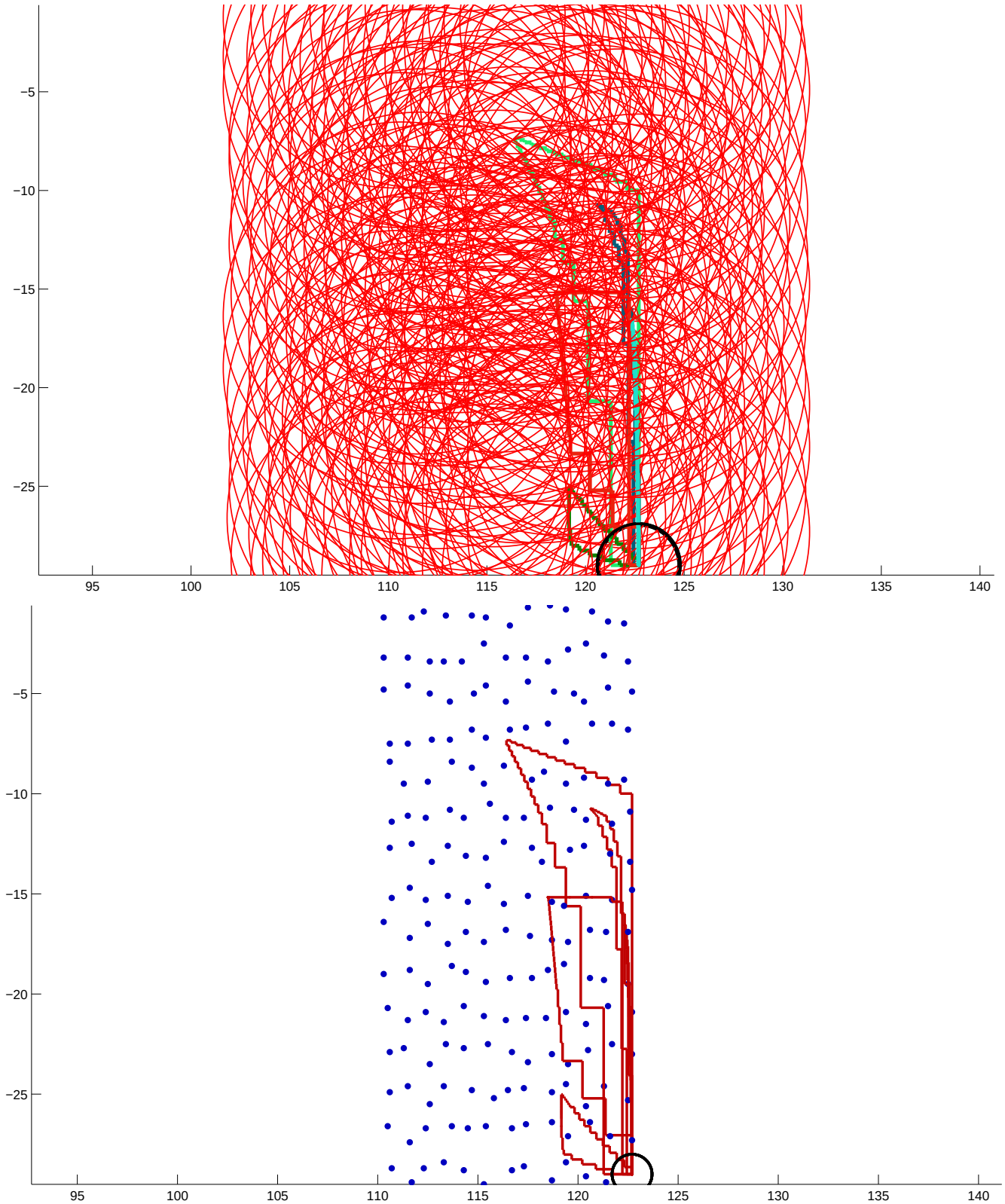


Figure O.117: $rat195$, $r = 8.67$, Equal Radius, 2D, Manhattan, Length = 175.8845855

Table O-120: Solution for $rat195$, $r = 8.67$, Equal Radius, 2D, Manhattan

Total distance: 175.884585530221 Total demand met: 11712 Depot: x 12.7 y 29			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 2.70053135409398E-9 Demand Met: 951			
12.6999999999876	29.0000000001891	10.4	29.1
12.7000000000373	29.0000000002516	9.40000000000001	28.4
12.7000000001444	29.0000000003356	9.5	27.1
12.7000000002672	29.0000000004185	10.6	26.4
12.7000000003738	29.0000000005026	10.4	25.6
12.700000000484	29.000000000566	11.3	24.6
12.7000000005628	29.0000000005989	9.40000000000001	24.5
12.7000000006435	29.0000000006066	8.7	24.9
12.7000000006929	29.0000000005813	8.7	26.4
12.7000000007312	29.0000000005467	6.7	26.7
12.7000000007154	29.0000000004804	6.7	28.8
12.7000000006661	29.0000000004036	4.3	28.8
12.7000000004458	29.0000000003491	7.3	28.6
12.7000000002294	29.0000000002386	8.7	29.3
12.7000000000892	29.000000000191	11.4	29.4
Route: 2 Length: 2.7763380039311 Demand Met: 1057			
12.6999999914483	28.8860663575833	12.7	23
12.6999999871924	28.7549287364333	11.7	22.5
12.6999999831507	28.6197570059939	10.5	22.8
12.699999978917	28.4798546840269	9.5	23.5
12.6999999744497	28.3370666413699	8.7	23
12.6999999698696	28.1981833900866	7.5	23.4
12.699999965247	28.0655311359437	6.7	22.9
12.699999960562	27.9417077407617	8.40000000000001	21.2
12.6999999558111	27.8276639412203	9.40000000000001	20.9
12.6999999510359	27.7195380828136	10.4	21.5
12.6999999461317	27.6118310519027	10.6	19.2
12.6999999587074	27.7132236990321	11.3	19.3
12.6999999708849	27.9124718402542	12.5	19.5
12.6999999831606	28.3221152375378	12.7	20.9
Route: 3 Length: 55.8775350572658 Demand Met: 1999			
11.2820234131206	20.6831015528511	5.3	17.4
10.1395506211064	15.6149788119527	3.59999999999999	10.8
9.39529076050316	13.6769313192198	2.5	9.4
8.85192583384654	12.46034009316	1.3	9.5
8.43777207774136	11.5155815000134	0.599999999999994	8.4
8.19845729762052	10.9576665556399	0.599999999999994	7.5
8.01238150537455	10.5397247776322	1.5	7.5
7.83268104044359	10.1386797675982	2.59999999999999	5
7.65837188895605	9.76379021236426	3.59999999999999	5.4
7.48742274322707	9.40056302121844	4.2	3.4
7.32005098472463	9.05614150011244	3.3	3.4
7.15696679835794	8.72914296291857	2.59999999999999	3.4
6.99864557517776	8.41816327610944	1.5	3.2
6.84808841404555	8.13121846416231	1.5	4.6
6.70171643183401	7.85131091704083	0.299999999999997	4.8
6.56149153893071	7.58003968254472	0.299999999999997	3.2
6.43100873468126	7.33022373668586	0.299999999999997	1.2
6.65375259090356	7.44132525338055	1.7	1.2
6.92006622106842	7.56399214060622	2.3	0.9
7.26391733174412	7.70564206118592	3.40000000000001	1.1
7.64024043361844	7.85624886794423	4.7	1.1
8.03714144812648	8.01376561119086	5.40000000000001	1.2
8.45342504504578	8.17790021409652	5.3	2.5
8.88649827311204	8.34607223181524	6.59999999999999	1.6
9.33776765828598	8.5203955924894	7.5	0.7
9.82558935980174	8.71288354686416	8.59999999999999	0.6
10.3539777956508	8.93798339886303	9.40000000000001	0.8
10.9195785547385	9.20486732450376	10.7	0.9
11.5070733637807	9.55534811366779	11.5	1.4
12.1091675157777	9.98926340905428	12.3	1.5
Route: 4 Length: 40.585049736028 Demand Met: 1994			
12.4370100266219	22.7419763993309	11.5	20.6
12.1788516793936	17.7705550268942	10.4	15.1
11.9239839604862	13.6555963326797	10.3	5.4
11.6839177846451	12.7948267721184	9.8	5
11.4513931059505	12.1493660392021	8.8	4.9
11.225241461144	11.597376557363	7.5	4.4
11.0094507558891	11.140668586599	5.40000000000001	4.6
10.935497428846	11.0606082921715	4.8	5
10.8780277080077	10.9993078523574	4.7	6.8
10.8209139825327	10.9384209838173	4.7	8.7
10.763879794892	10.8774398454833	3.7	8.4
10.7072649031075	10.8165518377237	3.59999999999999	7.3
10.6513649596721	10.7561104101487	2.7	7.3
10.6513649738794	10.7561103437341	5.40000000000001	7.2
10.6513649881678	10.7561102784041	6.59999999999999	6.8
10.6513650025073	10.7561102196521	6.40000000000001	5.4
10.6513650169084	10.7561101723138	6.40000000000001	3.2
10.7940476197203	10.8330425827421	7.40000000000001	3.2
10.9434150306448	10.914398998739	8.5	3.4
11.0955873397073	10.9978515419206	9.5	2.8
11.2519121796825	11.0871160370707	10.4	2.5
11.4309062183283	11.3906695171927	11.3	3.1
11.6111422063246	11.7735202767954	12.5	3.4
11.788842294552	12.3930805459	12.7	4.9
11.9666939268964	13.1250617077017	11.5	4.7
12.1478041346887	15.9904078431278	11.7	11.5
12.3306544962056	19.5112731514869	11.7	15.3
12.5144858973114	24.0467635777019	12.5	25.3
Route: 5 Length: 15.028809904981 Demand Met: 1998			
11.7358336775065	28.7506796107197	5.3	29.5
10.8890531020611	28.5047021105556	3.3	28.4
10.210740357449	28.260882601104	2.3	28.7
9.68742490089196	28.0183242691397	1.7	29.4
9.28951051427914	27.7745240228571	0.700000000000003	28.7
9.22923576621619	27.1733959083922	1.59999999999999	27.4
9.17000010404007	26.6000122635	0.5	26.6
9.17000012115675	26.1797505624314	0.599999999999994	24.9
9.17000013712564	26.0973844201622	1.5	24.6
9.17000015312712	26.0157576538074	3.3	24.6
9.17000016913693	25.9344711881739	3.40000000000001	22.5
9.17000018515164	25.8539666341385	4.3	22.7
9.1700002011651	25.7739818344928	5.5	22.5
9.17000021717291	25.6944070553418	5.3	21.1
9.17000023317873	25.615523026303	6.40000000000001	21.3
9.17000024918087	25.537142052851	7.40000000000001	21.2
9.17000026517741	25.4591787382954	7.7	19.2
9.17000028117221	25.3820753047141	8.5	18.8
9.17000029716236	25.3058542697181	9.3	18.5
9.17000031314953	25.2305123608631	9.5	17.4
9.17000032913356	25.1569665340363	8.7	17.3
9.17000034511555	25.085172057755	7.59999999999999	17.1
9.17000036110139	25.0155949434694	6.40000000000001	16.8
9.24074698083159	25.1157671224674	6.59999999999999	19.2
9.31186513340785	25.2171565763231	5.40000000000001	19.4
9.38357779469574	25.3201304893632	4.40000000000001	18.9
9.45719533295409	25.4281865050934	4.3	20.6
9.53159430984755	25.537918129301	3.3	21.4
9.60724261453316	25.6497097833725	2.40000000000001	20.9
9.82800899134921	25.9575765906866	2.59999999999999	23.5
10.065686205087	26.2764047290137	2.59999999999999	25.5
10.3218992865708	26.5999502741862	2.40000000000001	26.7
10.6146471357341	26.9254003128746	4.5	26.7
10.9202406987742	27.2534512779855	4.7	24.8
11.2435124152919	27.5892509724128	5.8	25.2
11.5816854298136	27.9314042313309	6.5	24.8
11.9354597243854	28.2810027134123	7.3	24.7
12.3051020727031	28.6381807285736	7.40000000000001	26.5
Route: 6 Length: 36.0451349748947 Demand Met: 1995			
12.2146312457071	15.3944267704518	12.5	6.8
11.6999976318243	15.1700003485684	11.7	6.5
10.6999987680653	15.1700001005368	10.7	6.5
9.59019440278759	15.1699998980561	9.40000000000001	7.4
8.50831084695221	15.1699997116201	8.5	6.5
8.50820079137309	15.1699997148467	7.40000000000001	6.7
8.50809104915679	15.1699997048291	6.3	8.6
8.50798131489526	15.1699997031746	5.3	9.5
8.50787158873261	15.1699997022323	5.59999999999999	10.5
8.50776186668371	15.1699997018075	4.3	11.2
8.5076521507588	15.1699997045477	2.40000000000001	11.2
8.50754245097012	15.1699997083516	1.5	11.1
8.50743281397177	15.1699997105738	0.700000000000003	11.4
8.52948999088238	15.3867412547588	0.599999999999994	12.7
8.55192563983476	15.6168177017526	1.7	12.5
8.57444772169823	15.8523748841295	3.5	12.6
8.59697974492623	16.091213932204	2.7	13.4
8.6195494033208	16.3334135393893	1.59999999999999	14.7
8.64220302496835	16.5787837272699	0.700000000000003	15.2
8.6650843461061	16.8296401989153	0.299999999999997	16.4
8.68845897947135	17.0846701079058	1.59999999999999	17.2
8.71192406923475	17.3407236746808	2.5	16.5

Solution x	Solution y	Original x	Original y
8.73545225481128	17.5987527062163	2.40000000000001	15.3
8.7590530632593	17.8607891275569	3.5	15.1
8.78270612670161	18.1266602638141	4.5	15.4
8.80640178615562	18.3959119463594	4.40000000000001	16.9
8.83014175626322	18.6674858088981	3.5	17.5
8.85393300701904	18.941308974674	3.7	18.6
8.87776884404721	19.2165703553833	2.5	19.5
8.90166485480508	19.4926132105565	1.59999999999999	18.8
8.92565180640578	19.7712349645564	0.299999999999997	19
8.99449352470327	20.6532906223043	0.5	20.7
9.07142262502754	21.5361625415569	1.5	21.3
9.1498725636074	22.4379456539575	1.3	22.7
9.23057356589952	23.34524666333	0.599999999999994	22.9
10.2240363167575	25.2094085181853	3.7	26.6
11.3751478039618	27.0521862336444	5.40000000000001	26.6
Route: 7 Length: 25.5717178504195 Demand Met: 1718			
12.6654822817836	24.3122092652878	12.5	16.9
12.6314024349507	22.0925638052409	12.7	14.8
12.5974565263129	20.5932126632333	12.6	13.4
12.5636883469483	19.4295359882329	11.6	13
12.5301624755989	18.416729327389	12.6	10.9
12.4967380121358	17.6038245983976	12.3	9.3
12.4632544234971	17.2886717257299	11.5	9.5
12.4298884156655	17.0139068104331	10.3	9.2
12.3967630211001	16.7904933107833	9.40000000000001	9.5
12.363852352862	16.5888774165982	7.7	9.3
12.3462213358248	16.5679198271424	8.3	8.9
12.3462213278218	16.5679198419199	8.59999999999999	10.7
12.3462213198199	16.5679198592149	9.8	10.8
12.3462213118215	16.5679198757013	10.4	11.3
12.3462213038293	16.5679198911255	10.3	12.6
12.346221295843	16.5679199079438	9.59999999999999	12.8
12.3462212878588	16.5679199243147	8.2	13.4
12.3462212798731	16.5679199422188	7.7	12.7
12.3462212718792	16.5679199609601	7.3	11.2
12.3462212638532	16.5679199776019	6.40000000000001	11.2
12.346221255764	16.5679199929564	6.3	12.4
12.3462212476479	16.5679200080452	4.40000000000001	13.1
12.3771657178325	17.1331891260452	5.40000000000001	13.2
12.4084558289146	17.792581171487	5.5	14.6
12.4400310414632	18.5258679597938	6.3	15.5
12.471831153873	19.3154119692961	7.5	15.1
12.5038320921922	20.1860477061037	8.7	15.4
12.5360001388298	21.1559247725692	9.3	15.6
12.5683561215984	22.2845780364659	10.6	16.8
12.6008875427297	23.5887178705977	11.4	16.9
12.6335727661206	25.3050598703771	11.6	27.1
12.6665090397649	27.0644228426305	12.7	27.3

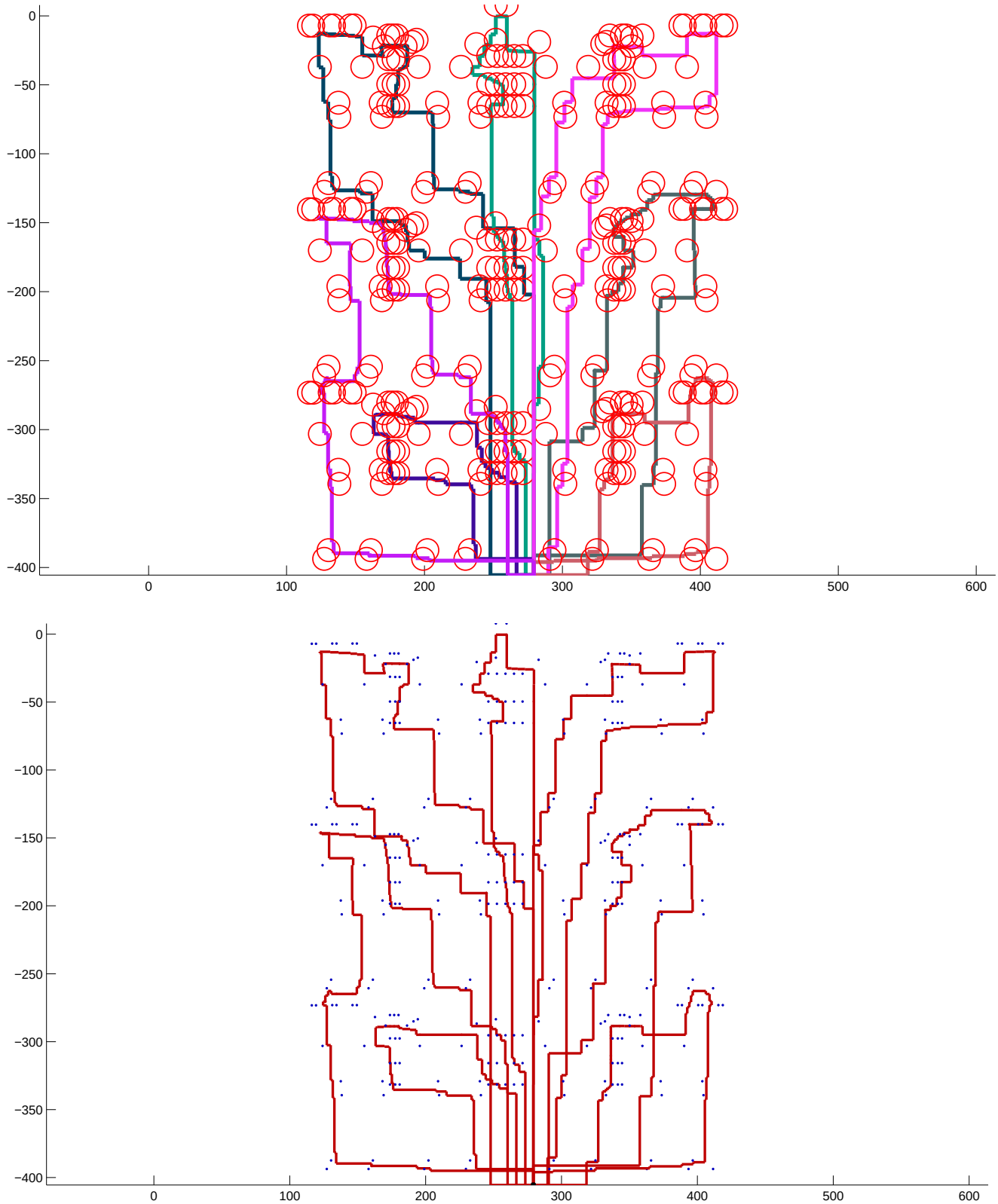


Figure O.118: $lin318$, $r = 8.268$, Equal Radius, 2D, Manhattan, Length = 5906.1839702

Table O-121: Solution for $lin318$, $r = 8.268$, Equal Radius, 2D, Manhattan

Total distance: 5906.18397015052 Total demand met: 6261 Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 1138.23909199866 Demand Met: 944			
137.855933195591	207.601006401908	130.7	206.3
134.771816590687	190.622992110372	136.2	198.5
134.771816590687	190.622992110372	129.9	196.1
134.771816590687	190.622992110372	136.2	182.7
115.747501342409	176.008911679004	116.5	170.1
90.1440140800966	170.126788236869	85.8	170.1
78.8096375747137	164.259089086627	70.9	164.6
77.7376053685643	156.686595316967	81.1	152
76.6032281848183	151.865260606238	84.3	150.4
72.2830747551215	148.873757847015	76.4	155.1
72.2830747551215	148.873757847015	70.1	147.3
52.3383085169784	128.762338497287	51.2	121.3
43.3235730645729	126.536579597532	48	127.6
24.4575765736896	124.248898030784	17.3	127.6
23.1030203048257	115.928058121202	20.5	121.3
21.8263422095541	75.2071834966644	28.3	73.2
20.2026242335668	62.2101414163333	27.6	63
16.633501601734	37.2948020836303	14.2	37
13.3375675620396	13.9671561443094	9.40000000000001	7.1
12.1463771053202	12.9463672876354	6.3	7.1
19.8424172231193	13.3661624877553	21.3	6.9
25.9249735859761	13.8157481015631	24.4	6.9
34.707641780237	14.3172074897568	36.2	6.9
39.5645023644456	14.957000778487	39.4	6.9
44.8999925737156	28.731980918368	44.9	37
59.9090944534123	28.7319795685489	67.7	31.5
59.4941803158596	26.7387454157599	63.8	31.4
59.0706732784439	24.0700473940269	60.6	22
58.6462125648402	21.5465327768212	52.8	15.7
65.1535540938374	21.6322496169446	66.9	14.2
65.1535540938374	21.6322496169446	63.8	14.2
70.7301163327157	21.7252721892545	76.4	22
70.7301163327157	21.7252721892545	70.1	14.2
75.0102618719384	21.8218262433837	81.1	18.9
77.465520474629	21.9192122624729	84.3	17.3
77.5319801671955	36.9999943000832	85.8	37
73.4644857446348	38.7622271830118	70.9	31.5
70.9164887150349	49.3810956921895	70.9	49.6
70.9164887150349	49.3810956921895	67.7	49.6
70.9164887150349	49.3810956921895	63.8	49.6
69.3961863439458	58.8196857799291	70.9	65.4
69.3961863439458	58.8196857799291	67.7	65.4
67.9057388519702	61.0756811093124	63.8	65.4
66.5680198050269	63.0000003810207	58.3	63
66.6823860015544	70.0069072052802	59.1	73.2
95.4247187134923	70.2677603914563	99.2	63
95.9199259909331	78.0904416026847	100	73.2
96.395503124346	116.827426126109	92.1	121.3
96.8904498432536	125.713460950467	89	127.6
114.693423298332	127.384318047867	119.7	127.6
123.0050506265	129.048899000227	122.8	121.3
132.492540101258	153.987181945739	127.6	153.6
155.441597665289	181.981026597246	161.4	182.7
162.166836022489	202.080449519489	161.4	198.5
Route: 2 Length: 930.598031954068 Demand Met: 934			
163.369850229803	322.215019422021	161.4	315.8
158.951431898303	316.98964023697	155.1	315.8
155.25916246414	312.136078633316	148.8	315.8
153.67551296414	205.327124776053	155.1	198.5
151.969784249185	201.072492490995	148.8	198.5
150.362897141382	197.277123745499	142.5	198.5
149.742846409185	187.149354336889	155.1	182.7
149.054071484508	182.877543929652	148.8	182.7
148.366194022318	178.645264979968	142.5	182.7
147.761693313504	168.020572730621	148.8	162.2
147.150176276662	163.078275498085	155.1	162.2
144.372620552959	160.226842838218	142.5	162.2
141.727875941095	157.232430818824	136.2	162.2
140.228574675407	145.438799551108	141.7	150.4
138.67954341698	73.8322048088507	130.7	73.2
138.080520836557	64.1996208085346	129.9	63
140.21445372966	64.1996173030053	136.2	65.4
142.528621508077	64.1996138010317	142.5	65.4
144.824640736687	64.1996102983581	148.8	65.4
146.919591742574	64.199606792328	155.1	65.4
146.865962604419	49.7344692055056	155.1	49.6
143.662100545598	47.638699155115	148.8	49.6
139.333636168124	45.3999114741996	142.5	49.6
133.915111911388	42.8275590312217	136.2	49.6
124.768010936092	37.000004562287	116.5	37
130.038687874217	29.0118419080325	136.2	29.1
133.361645995511	20.9569647095097	127.6	20.5
137.987882855105	13.4460144368106	141.7	17.3
141.700006788082	0.368011135912393	141.7	-7.9
149.600256155311	0.368011507354375	149.6	-7.9
149.730460323894	25.1643019542462	142.5	29.1
153.180181893266	25.4078245406291	148.8	29.1
157.800806178966	25.648608306849	155.1	29.1
163.239527165896	25.8877837066899	161.4	29.1
169.319838582325	26.1257672234265	173.2	18.9
169.731988921178	37.0000000722246	178	37
169.668005322816	49.6000046352574	161.4	49.6
169.668008265194	65.4000130957941	161.4	65.4
169.66801238978	162.199843297849	161.4	162.2
173.320132229767	173.930226899839	178	170.1
176.031983544659	254.399520487761	184.3	254.4
176.031983544659	254.399520487761	181.1	260.7
172.813742013851	281.601677105559	173.2	285.1
169.57765614627	295.37887503969	161.4	295.3
169.429138078516	331.715891193678	161.4	331.6
Route: 3 Length: 847.640997775321 Demand Met: 949			
180.621263889905	308.568333094863	178	303.2
204.592022592637	298.758886089701	208.7	303.2
213.346220301134	257.296299772749	215	254.4
213.346220301134	257.296299772749	211.8	260.7
222.270426596782	203.02808850436	222	196.1
222.270426596782	203.02808850436	227.6	198.5
226.170891638503	200.063833899672	222.8	206.3
226.170891638503	200.063833899672	231.5	198.5
230.624890008896	194.011790129261	234.6	198.5
234.041450963724	182.514999706109	227.6	182.7
234.041450963724	182.514999706109	231.5	182.7
234.041450963724	182.514999706109	234.6	182.7
241.331937261678	170.100000332279	249.6	170.1
234.196404950785	160.290777125218	227.6	164.6
234.196404950785	160.290777125218	231.5	164.6
234.196404950785	160.290777125218	234.6	164.6
234.196404950785	160.290777125218	240.2	155.1
227.168058351416	153.599593226567	218.9	153.6
228.833947587863	151.175733204927	222	152
231.208128171032	148.61957928766	224.4	147.3
235.492684112706	146.279024593379	233.1	147.3
240.192812061015	143.88723102186	236.2	147.3
240.192812061015	143.88723102186	240.2	148.8
246.449448309354	140.668552537661	248	147.3
251.45829356223	133.604267057019	252.8	127.6
255.900004264659	129.56805966063	255.9	121.3
278.293547972243	129.568061397778	283.5	127.6
286.599993414937	129.568063138903	286.6	121.3
295.83380205566	132.122017582014	301.6	127.6
298.667494490152	137.263491699853	293.7	140
298.667494490152	137.263491699853	305.5	140
300.431933644971	139.994070882243	308.7	140
291.762701246227	139.999837075377	290.6	140
283.868063107978	140.00560805809	275.6	140
284.476092573828	144.460764365996	278.7	140
285.189698504898	170.064637251882	280.3	170.1
285.938902030798	195.240053528518	293.7	196.1
286.460809101036	204.368051978378	294.5	206.3
263.000046848006	204.368064003036	263	196.1
261.170490361817	211.990414830192	263.8	206.3
259.17768593685	258.609700812946	255.9	254.4
259.17768593685	258.609700812946	252.8	260.7
257.763086795158	326.090089028225	263	329.2
256.136330918036	340.150747448199	263.8	339.4
247.628787096224	391.226150731773	252.8	393.8
Route: 4 Length: 465.927846573194 Demand Met: 753			
156.799441609902	338.187033660758	155.1	331.6
150.204124081161	334.527619194578	148.8	331.6
144.224607327373	331.24710887514	142.5	331.6
138.804102069771	327.938937559417	136.2	331.6
134.2711870894	324.00886186976	129.9	329.2

Solution x	Solution y	Original x	Original y
131.499785933617	313.125651994556	136.2	315.8
128.073431641309	294.95223758248	127.6	286.7
127.971766608541	294.947160354691	136.2	295.3
116.480269280606	294.94212879606	116.5	303.2
85.7990585616346	294.937346944525	85.8	303.2
83.0987075354044	291.371489036344	84.3	283.5
78.5965270172142	290.681490896617	81.1	285.1
72.7592363542813	290.041375794032	70.9	297.7
70.0999899050564	288.668038271066	70.1	280.4
70.0999899050564	288.668038271066	76.4	288.2
66.8999953340535	288.668037573914	66.9	280.4
63.7999346860383	288.668038077413	63.8	280.4
59.2345943278811	289.157931395927	60.6	288.2
54.3686918478692	289.650064894487	52.8	281.9
53.1680391394895	303.199949848438	44.9	303.2
59.8249967258228	303.686992652104	63.8	297.6
63.0137615653198	304.242962514899	67.7	297.7
63.6572117452801	315.236367034466	70.9	315.8
63.6572117452801	315.236367034466	67.7	315.8
64.174934753158	323.812529988748	63.8	315.8
64.174934753158	323.812529988748	63.8	331.6
64.174934753158	323.812529988748	58.3	329.2
65.1754583658919	330.223798321818	70.9	331.6
65.1754583658919	330.223798321818	67.7	331.6
66.0648543001531	335.441645552355	59.1	339.4
97.6993107651754	336.679169207223	99.2	329.2
105.365192592564	339.732265403633	100	339.4
123.856715195161	342.850213556786	130.7	339.4
125.472219020942	383.130199951392	122.8	387.5
127.202953553677	393.835334725775	119.7	393.8
Route: 5 Length: 1067.06592879487 Demand Met: 949			
179.724264973544	385.266537256272	184.3	387.5
186.183778658268	341.386246779099	192.1	339.4
189.998613579897	324.719790350314	191.3	329.2
193.608019456287	210.875744836016	192.1	206.3
197.471039022213	194.809442674224	191.3	196.1
204.481072935246	168.948783798369	208.7	170.1
209.799796316729	131.550559869918	211.8	127.6
214.579948918133	117.108153939796	215	121.3
219.274858697733	78.5406868885447	222.8	73.2
222.824846834234	70.9303668575386	222	63
228.197288986966	69.9618018923196	227.6	65.4
233.785916058911	69.038392278948	231.5	65.4
240.268488599481	68.1462021986958	234.6	65.4
260.453000228713	67.2919491245671	263.8	73.2
268.149868955134	66.322376751209	263	63
292.768947810888	65.4029503498775	294.5	73.2
296.621504971023	57.4618800209814	293.7	63
301.552559183634	13.7813239532389	305.5	6.9
302.853628859533	12.7463590751726	308.7	6.9
295.176222807054	12.9182122312532	293.7	6.9
288.88094572966	13.0932887648372	290.6	6.9
280.793148653831	13.2721981967104	275.6	6.9
280.54212043557	14.5391255989555	278.7	6.9
280.299922103312	28.731991824261	280.3	37
249.600011704274	28.7319922187372	249.6	37
247.788916437036	22.4177178545187	248	14.2
243.619355727658	22.3382829809783	240.2	22
239.947507853369	22.2588353822923	240.2	15.7
236.200263362048	22.1802228592469	236.2	14.2
232.48586391084	22.1083219685925	233.1	14.2
227.023158934274	22.040855683038	218.9	20.5
227.023159740749	22.0408532789417	224.4	14.2
227.130269357916	24.1635517404307	222	18.9
227.237181910985	28.027491359901	231.5	31.5
227.343880415535	31.2643621526178	227.6	31.5
227.450625722249	34.4794967781881	234.6	31.5
227.557713664281	45.268008129175	234.6	49.6
225.559813214485	45.2680078146557	231.5	49.6
221.842477177116	45.2680075003671	227.6	49.6
208.700000019518	45.2680071859042	208.7	37
197.104572591851	62.4353445851868	191.3	63
191.453979741016	77.2928179859377	192.1	73.2
185.592073246211	117.011581321475	184.3	121.3
180.188732685021	130.956169415203	181.1	127.6
174.53439909078	155.380357646138	173.2	152
Route: 6 Length: 560.91372587921 Demand Met: 782			
208.357330291799	388.616478036894	211.8	393.8
216.981806311185	343.28448215157	222.8	339.4
220.274479392027	336.573386459764	222	329.2

Solution x	Solution y	Original x	Original y
222.781301859761	334.774884797235	227.6	331.6
224.854059999444	333.136317907127	231.5	331.6
226.331991918103	331.600023425684	234.6	331.6
226.331993375183	315.799919320256	234.6	315.8
226.331994411625	313.182051687742	227.6	315.8
226.331995447642	310.3888504008	231.5	315.8
226.331996480946	297.699904134419	234.6	297.7
226.33199739924	295.344375162904	231.5	297.7
226.331998316676	292.777993610096	227.6	297.7
226.331999234122	289.705140264414	218.9	286.7
226.33200017257	288.439112318022	224.4	280.4
228.40196603289	288.465130917662	222	285.1
232.911910999429	288.491053981394	233.1	280.4
236.287102966377	288.518134159963	236.2	280.4
240.053984842851	288.548485271869	240.2	281.9
243.753002358386	288.579068039982	240.2	288.2
248.033121960695	288.609635349252	248	280.4
249.599980061515	294.931991874	249.6	303.2
280.300010295746	294.931991501973	280.3	303.2
281.373032100278	279.217989288497	278.7	273.1
282.531298460436	274.596590107538	275.6	273.1
284.10416086502	270.874929238467	290.6	273.1
285.327071400034	266.021438663369	283.5	260.7
286.599964190617	262.668008033418	286.6	254.4
296.221591507328	264.976925041321	301.6	260.7
298.897835232516	270.083885363344	305.5	273.1
300.431991417045	273.100010094269	308.7	273.1
298.912335583692	278.154571381633	293.7	273.1
297.721463168053	326.263702636562	293.7	329.2
296.60377297985	342.740388840847	294.5	339.4
295.515177363815	388.806041512601	301.6	393.8
286.890626801006	390.282458038802	286.6	387.5
278.574009266285	391.825468706975	283.5	393.8
254.853349690809	393.301117720759	255.9	387.5
214.871742826509	395.067844083429	215	387.5
183.731774299205	396.085606056296	181.1	393.8
Route: 7 Length: 895.798347175191 Demand Met: 950			
150.284092251533	316.449085223102	142.5	315.8
148.645972371088	299.210257053183	155.1	295.3
145.509171924863	294.977834503825	148.8	295.3
142.058944851279	290.703038707743	141.7	283.5
138.74213875224	288.525353800974	142.5	295.3
123.576733531089	262.095079824173	122.8	254.4
114.742888032899	260.099349327579	119.7	260.7
96.6096302673523	258.077651999809	89	260.7
95.7452328035608	249.336701909262	92.1	254.4
94.9261485207215	210.64456339003	100	206.3
94.0265158794413	202.351039215524	99.2	196.1
72.6028061045997	201.639509229176	70.9	198.5
72.6028061045997	201.639509229176	67.7	198.5
65.2377527318696	200.964560453261	59.1	206.3
64.6057402334509	196.614857474694	63.8	198.5
63.9763863069278	191.965653990447	58.3	196.1
63.4023315400489	182.251280615912	70.9	182.7
63.4023315400489	182.251280615912	67.7	182.7
63.4023315400489	182.251280615912	63.8	182.7
62.6741010753162	169.186363269924	67.7	164.6
61.8789029410187	163.723110972701	63.8	164.5
61.0740722539687	158.074312459454	60.6	155.1
60.2719234981259	153.14775859459	63.8	147.3
59.4120721669914	150.232975286892	66.9	147.3
49.9863507733178	148.916937349789	52.8	148.8
37.8244243570766	147.603077527758	39.4	140
37.8244243570766	147.603077527758	36.2	140
26.3839338559981	147.026462503022	24.4	140
19.9659300515872	146.519810973375	21.3	140
12.1463697633147	146.046361292401	6.3	140.2
13.5057246401687	147.079816990892	9.40000000000001	140.2
18.969723381711	164.948387749332	14.2	170.1
36.6319608644951	170.09880369982	44.9	170.1
35.8680092864345	196.099996171001	27.6	196.1
36.4093252127147	206.647339136577	28.3	206.3
42.9319881715516	254.39999927072	51.2	254.4
41.3788966005555	259.844372060595	48	260.7
39.3999964487636	264.831988067186	39.4	273.1
36.1999942072486	264.831988725686	36.2	273.1
24.400002222325	264.831988164111	24.4	273.1
20.5000023235003	262.668011815755	20.5	254.4
18.2872628871256	266.046063443186	17.3	260.7
16.1463057433495	270.513700267948	21.3	273.1

Solution x	Solution y	Original x	Original y
16.1463057433495	270.513700267948	9.40000000000001	273.3
14.5680120162321	273.300001878706	6.3	273.3
17.2565647078405	302.60812735226	14.2	303.2
20.1624053907126	328.303498545835	27.6	329.2
21.6730524473446	341.414861445811	28.3	339.4
22.8791316107799	381.739987439441	20.5	387.5
24.1497449939853	389.716473752213	17.3	393.8
50.1585884183153	391.469942400056	51.2	387.5
50.1585884183153	391.469942400056	48	393.8
83.6083927663487	393.288694721111	89	393.8
93.5481843911708	395.088558545896	92.1	387.5

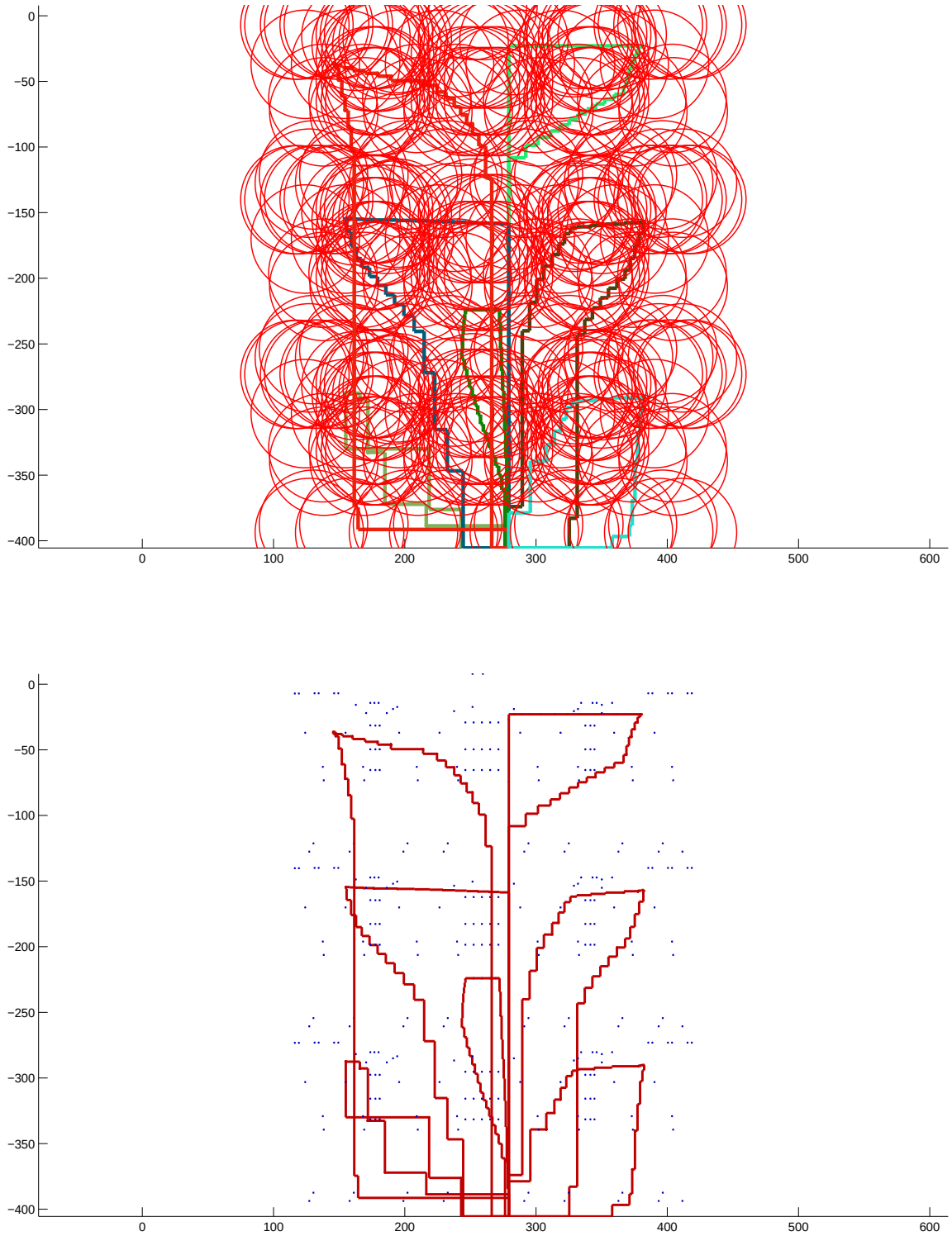


Figure O.119: $lin318$, $r = 41.34$, Equal Radius, 2D, Manhattan, Length = 4783.5822620

Table O-122: Solution for *lin*318, $r = 41.34$, Equal Radius, 2D, Manhattan

Total distance: 4783.58226199434 Total demand met: 6261 Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 484.166883940972 Demand Met: 880			
132.933040549638	376.218274697474	122.8	387.5
132.933040549638	376.218274697474	119.7	393.8
108.515699140759	330.01403696974	129.9	329.2
108.515699140759	330.01403696974	136.2	331.6
45.0712372369203	287.645320792594	20.5	254.4
45.0712372369203	287.645320792594	17.3	260.7
45.0712372369203	287.645320792594	6.3	273.3
45.0712372369203	287.645320792594	9.40000000000001	273.3
45.0712372369203	287.645320792594	21.3	273.1
45.0712372369203	287.645320792594	24.4	273.1
45.0712372369203	287.645320792594	36.2	273.1
45.0712372369203	287.645320792594	39.4	273.1
45.0712372369203	287.645320792594	14.2	303.2
45.0712372369203	287.645320792594	44.9	303.2
55.780297154448	292.700405014821	51.2	254.4
55.780297154448	292.700405014821	48	260.7
55.780297154448	292.700405014821	52.8	281.9
55.780297154448	292.700405014821	63.8	280.4
55.780297154448	292.700405014821	66.9	280.4
55.780297154448	292.700405014821	60.6	288.2
55.780297154448	292.700405014821	70.1	280.4
55.780297154448	292.700405014821	63.8	297.6
55.780297154448	292.700405014821	76.4	288.2
55.780297154448	292.700405014821	67.7	297.7
55.780297154448	292.700405014821	81.1	285.1
55.780297154448	292.700405014821	84.3	283.5
55.780297154448	292.700405014821	70.9	297.7
55.780297154448	292.700405014821	63.8	315.8
55.780297154448	292.700405014821	67.7	315.8
55.780297154448	292.700405014821	70.9	315.8
55.780297154448	292.700405014821	85.8	303.2
61.9278913892526	332.644764878685	27.6	329.2
61.9278913892526	332.644764878685	28.3	339.4
61.9278913892526	332.644764878685	58.3	329.2
61.9278913892526	332.644764878685	63.8	331.6
61.9278913892526	332.644764878685	59.1	339.4
61.9278913892526	332.644764878685	67.7	331.6
61.9278913892526	332.644764878685	70.9	331.6
74.8623178109184	372.177187814568	51.2	387.5
74.8623178109184	372.177187814568	48	393.8
106.395808472046	388.688153782697	92.1	387.5
106.395808472046	388.688153782697	89	393.8
Route: 2 Length: 703.472812788193 Demand Met: 895			
215.304932804728	382.841494483872	252.8	393.8
221.334703625187	243.114687360116	222.8	206.3
227.096816140954	231.335910724961	227.6	198.5
232.889746174355	222.518315912617	222	196.1
238.966603283197	214.849493593369	234.6	198.5
245.158670086316	207.608509931526	231.5	198.5
251.623133318089	200.620265420068	263	196.1
251.623133318089	200.620265420068	263.8	206.3
257.874555742731	193.749510038998	294.5	206.3
261.732864901321	184.871323621378	293.7	196.1
265.183294958571	175.111107735716	280.3	170.1
268.585591302378	165.647943542396	290.6	140
271.77320870299	158.073874104138	308.7	140
271.77320870299	158.073874104138	293.7	140
272.369467365232	156.833060971135	301.6	127.6
270.311559333435	157.283118949183	305.5	140
267.597749943501	157.745764534772	286.6	121.3
267.597749943501	157.745764534772	283.5	127.6
267.597749943501	157.745764534772	255.9	121.3
267.597749943501	157.745764534772	252.8	127.6
267.597749943501	157.745764534772	248	147.3
267.597749943501	157.745764534772	240.2	148.8
267.597749943501	157.745764534772	236.2	147.3
267.597749943501	157.745764534772	233.1	147.3
267.597749943501	157.745764534772	240.2	155.1
267.597749943501	157.745764534772	249.6	170.1
267.597749943501	157.745764534772	234.6	164.6
267.597749943501	157.745764534772	231.5	164.6
256.957290216802	158.742328112851	278.7	140
256.957290216802	158.742328112851	275.6	140
242.923128083951	159.760476378478	218.9	153.6
231.464314496751	160.782062462692	224.4	147.3
231.464314496751	160.782062462692	222	152
221.014144635832	161.812207344278	215	121.3
216.173122559272	166.074238242196	211.8	127.6
211.633562978713	173.901858141217	208.7	170.1
207.142900415977	181.884606338903	227.6	164.6
207.142900415977	181.884606338903	227.6	182.7
202.280683510967	190.703072581239	234.6	182.7
202.280683510967	190.703072581239	231.5	182.7
195.988266159116	200.911764904385	178	170.1
190.536747786185	218.361936954545	191.3	196.1
185.117881788605	240.016945677469	192.1	206.3
179.512238188636	373.985668315713	215	387.5
Route: 3 Length: 967.790090181569 Demand Met: 942			
169.299999705044	74.2854144012524	161.4	49.6
169.299999820968	26.886697106342	149.6	-7.9
169.299999955795	22.8772048940352	141.7	-7.9
173.425388685477	22.8772050676647	141.7	17.3
173.425388685477	22.8772050676647	142.5	29.1
178.894981606314	22.8772052515624	148.8	29.1
185.263227282025	22.8772054370987	155.1	29.1
185.263227282025	22.8772054370987	161.4	29.1
193.865322059349	22.8772056237952	173.2	18.9
193.865322059349	22.8772056237952	178	37
204.33159861602	22.8772058107896	218.9	20.5
204.33159861602	22.8772058107896	208.7	37
214.224709712688	22.8772059966234	224.4	14.2
214.224709712688	22.8772059966234	222	18.9
223.72878245038	22.8772061814133	236.2	14.2
223.72878245038	22.8772061814133	233.1	14.2
232.73790486244	22.8772063644615	234.6	31.5
241.822909854796	22.8772065463219	240.2	15.7
251.09221820451	22.8772067273943	248	14.2
251.09221820451	22.8772067273943	240.2	22
261.188812523708	22.8772069067614	278.7	6.9
270.572249689863	22.8772070813455	308.7	6.9
269.476870884247	24.9847936142644	305.5	6.9
267.410559650452	29.0895886764301	293.7	6.9
267.410559650452	29.0895886764301	290.6	6.9
265.10392846026	34.3122039829451	275.6	6.9
265.10392846026	34.3122039829451	280.3	37
262.742538745195	40.1390559299703	231.5	31.5
262.742538745195	40.1390559299703	227.6	31.5
260.783751771014	46.8455295796661	249.6	37
258.849614032575	53.7583409347467	293.7	63
258.849614032575	53.7583409347467	263	63
256.667822292023	59.8664531298774	294.5	73.2
249.581170715489	63.520887059776	263.8	73.2
242.301282153569	67.1257586261045	234.6	49.6
235.336932290823	70.8442726651447	234.6	65.4
235.336932290823	70.8442726651447	231.5	65.4
228.649500745254	74.6330444905982	231.5	49.6
221.984961047448	78.6493347309176	227.6	49.6
215.224378167784	83.0638708143899	227.6	65.4
208.260028844328	87.6714733996334	222.8	73.2
201.033384334173	92.4474023516069	222	63
191.497492104644	98.6850225666749	191.3	63
182.174824791276	108.096153216056	192.1	73.2
Route: 4 Length: 750.366912087678 Demand Met: 947			
134.501454974013	346.74570318894	100	339.4
122.438035567118	315.299030757791	99.2	329.2
112.840058591326	271.993503063235	89	260.7
104.758060158454	240.463844629842	100	206.3
97.1397125082004	228.680200060798	99.2	196.1
89.291836011276	220.10635407033	70.9	198.5
82.2364122196389	212.568382169273	67.7	198.5
75.594314321103	205.50384576736	63.8	198.5
69.2485081836582	198.699669099803	59.1	206.3
63.1697100725724	191.845785445185	58.3	196.1
57.2383308209483	185.053871281165	28.3	206.3
52.8953333267451	175.918096108224	27.6	196.1
49.0870729120708	164.370620297274	21.3	140
45.703429170094	155.858079941537	9.40000000000001	140.2
45.0712260166493	154.545317939512	20.5	121.3
45.0712260166493	154.545317939512	17.3	127.6
45.0712270845984	154.545322358061	6.3	140.2
48.0301087227959	154.796886592705	14.2	170.1
52.5211251204938	155.050627704516	24.4	140

Solution x	Solution y	Original x	Original y
52.5211251204938	155.050627704516	36.2	140
58.7223988647801	155.320553734282	39.4	140
58.7223988647801	155.320553734282	44.9	170.1
66.482203540496	155.600528673281	51.2	121.3
66.482203540496	155.600528673281	48	127.6
66.482203540496	155.600528673281	52.8	148.8
66.482203540496	155.600528673281	63.8	147.3
66.482203540496	155.600528673281	66.9	147.3
66.482203540496	155.600528673281	60.6	155.1
66.482203540496	155.600528673281	70.1	147.3
66.482203540496	155.600528673281	63.8	164.5
66.482203540496	155.600528673281	76.4	155.1
66.482203540496	155.600528673281	67.7	164.6
66.482203540496	155.600528673281	81.1	152
66.482203540496	155.600528673281	84.3	150.4
66.482203540496	155.600528673281	70.9	164.6
66.482203540496	155.600528673281	63.8	182.7
66.482203540496	155.600528673281	67.7	182.7
66.482203540496	155.600528673281	70.9	182.7
66.482203540496	155.600528673281	85.8	170.1
84.2637251225626	155.928222586793	92.1	121.3
84.2637251225626	155.928222586793	89	127.6
97.5520947425653	156.266709862341	116.5	170.1
108.918289408796	156.603122953911	119.7	127.6
119.164792940134	156.94228626796	127.6	153.6
119.164792940134	156.94228626796	136.2	162.2
128.401790034365	157.280480923818	142.5	162.2
137.144842226504	157.618152046451	141.7	150.4
145.880603218886	157.956945503981	148.8	162.2
145.880603218886	157.956945503981	155.1	162.2
154.471088557748	158.293520144387	173.2	152
154.471088557748	158.293520144387	161.4	162.2
162.350923993713	158.610891480594	181.1	127.6
168.576215460197	158.88703359868	184.3	121.3
Route: 5 Length: 434.639976623894 Demand Met: 714			
166.375042766229	361.220409820014	142.5	331.6
163.885122918052	350.124054748166	155.1	315.8
161.473801306491	342.872605091362	155.1	331.6
159.085532124842	335.99883609287	148.8	331.6
156.726804780882	329.350938560203	148.8	315.8
154.392801993092	323.069210891172	136.2	315.8
152.108858101756	317.030435155275	142.5	315.8
149.84894998125	311.108070932517	130.7	339.4
147.707556666457	303.804756422991	148.8	295.3
145.569535043553	296.809131014511	142.5	295.3
143.441107235511	289.971117368881	127.6	286.7
143.441107235511	289.971117368881	136.2	295.3
141.359726317623	283.358414292874	141.7	283.5
139.281991902712	276.854402911841	116.5	303.2
137.307888322144	269.022988064405	119.7	260.7
135.364162932385	261.568887107868	122.8	254.4
133.440006597536	254.400006067474	92.1	254.4
133.990845638305	242.630064193565	130.7	206.3
134.544106884923	235.565194679353	142.5	198.5
135.093659175793	231.078595624116	129.9	196.1
135.646465439068	227.430643192224	136.2	198.5
136.200098629141	224.040005963232	136.2	182.7
142.499997452862	224.040005351273	142.5	182.7
148.799993846533	224.040005109144	148.8	182.7
155.099937562235	224.040005090517	155.1	182.7
157.176802017962	224.040005315904	148.8	198.5
159.281963857977	224.040005542647	155.1	198.5
161.40490525521	224.04000583991	161.4	182.7
162.195972383389	234.291896313352	161.4	198.5
162.989242897944	252.551369031841	184.3	254.4
162.989242897944	252.551369031841	181.1	260.7
163.774479848724	270.773661982	155.1	295.3
164.563909540211	285.742308981131	161.4	295.3
165.355350381832	300.467979114346	173.2	285.1
166.146129337787	317.4407220087	178	303.2
166.935214434513	337.404533989004	161.4	315.8
167.727341037568	364.537974767355	184.3	387.5
168.514152766646	384.641683846893	181.1	393.8
Route: 6 Length: 1005.87280041754 Demand Met: 942			
156.223778530457	123.40008149364	122.8	121.3
151.582325072834	99.3858150701252	161.4	65.4
146.449994743804	90.4705131087434	130.7	73.2
141.639409712654	82.3845533349655	129.9	63
141.639409712654	82.3845533349655	136.2	65.4
137.151163584064	75.6049714713805	142.5	65.4

Solution x	Solution y	Original x	Original y
137.151163584064	75.6049714713805	148.8	65.4
132.552345795077	69.3755001728866	155.1	65.4
127.642660380216	63.2779457368824	148.8	49.6
127.642660380216	63.2779457368824	155.1	49.6
121.357529155809	58.0456374974755	142.5	49.6
114.521155985794	52.9706131587008	127.6	20.5
114.521155985794	52.9706131587008	136.2	29.1
103.99424853594	49.4617607811769	116.5	37
103.99424853594	49.4617607811769	136.2	49.6
79.4100317978488	46.0191373523543	63.8	14.2
79.4100317978488	46.0191373523543	66.9	14.2
79.4100317978488	46.0191373523543	70.1	14.2
79.4100317978488	46.0191373523543	76.4	22
79.4100317978488	46.0191373523543	67.7	31.5
79.4100317978488	46.0191373523543	81.1	18.9
79.4100317978488	46.0191373523543	84.3	17.3
79.4100317978488	46.0191373523543	70.9	31.5
79.4100317978488	46.0191373523543	67.7	49.6
79.4100317978488	46.0191373523543	70.9	49.6
79.4100317978488	46.0191373523543	85.8	37
79.4100317978488	46.0191373523543	99.2	63
79.4100317978488	46.0191373523543	100	73.2
69.3010466517698	43.8644937116655	63.8	31.4
69.3010466517698	43.8644937116655	63.8	49.6
59.8111938564399	41.7313932277662	60.6	22
50.154380355665	39.657814156669	39.4	6.9
50.154380355665	39.657814156669	52.8	15.7
42.5298584109411	37.904916902394	36.2	6.9
35.535419126616	36.3281806646118	6.3	7.1
35.535419126616	36.3281806646118	9.40000000000001	7.1
37.3450817510294	39.5838846612969	21.3	6.9
37.3450817510294	39.5838846612969	24.4	6.9
39.5980297703711	48.9359675885203	14.2	37
39.5980297703711	48.9359675885203	44.9	37
42.0116697651535	60.9333100008458	27.6	63
42.0116697651535	60.9333100008458	28.3	73.2
44.5332679676881	72.0424791262226	67.7	65.4
44.5332679676881	72.0424791262226	70.9	65.4
46.895313254261	84.5036801753745	58.3	63
46.895313254261	84.5036801753745	63.8	65.4
49.1913587067076	102.462509745029	59.1	73.2
51.4803905669221	374.539599452897	20.5	387.5
54.4354774998536	391.384781060951	17.3	393.8
Route: 7 Length: 437.27278595449 Demand Met: 941			
248.006918812144	396.752933976024	283.5	393.8
261.17082868582	388.372766784837	301.6	393.8
263.3020770665	369.664694534774	286.6	387.5
263.3020770665	369.664694534774	255.9	387.5
265.388705100192	340.270603955399	293.7	329.2
265.388705100192	340.270603955399	294.5	339.4
265.388705100192	340.270603955399	263	329.2
265.388705100192	340.270603955399	263.8	339.4
267.34304281086	320.023420422892	280.3	303.2
269.280769373979	302.572211470226	290.6	273.1
271.045597135299	294.248865505535	305.5	273.1
272.368578823144	289.932185845899	301.6	260.7
271.635943980983	290.277941595712	308.7	273.1
271.635943980983	290.277941595712	293.7	273.1
269.736235688217	290.671118632926	278.7	273.1
269.736235688217	290.671118632926	275.6	273.1
267.825705211825	291.069166932828	286.6	254.4
267.825705211825	291.069166932828	283.5	260.7
267.825705211825	291.069166932828	255.9	254.4
267.825705211825	291.069166932828	252.8	260.7
267.825705211825	291.069166932828	248	280.4
267.825705211825	291.069166932828	240.2	281.9
267.825705211825	291.069166932828	236.2	280.4
267.825705211825	291.069166932828	233.1	280.4
267.825705211825	291.069166932828	240.2	288.2
267.825705211825	291.069166932828	249.6	303.2
267.825705211825	291.069166932828	234.6	297.7
267.825705211825	291.069166932828	231.5	297.7
247.831965715773	292.189559707825	218.9	286.7
234.27028489075	293.315238915769	224.4	280.4
234.27028489075	293.315238915769	222	285.1
222.352730303348	294.447780280675	215	254.4
217.501461311668	298.589111155175	211.8	260.7
213.070867014352	307.481117612998	208.7	303.2
208.679560439021	316.530407626855	227.6	297.7
208.679560439021	316.530407626855	227.6	315.8

Solution x	Solution y	Original x	Original y
203.927856527853	326.745457316447	234.6	315.8
203.927856527853	326.745457316447	231.5	315.8
197.851837693934	339.244994748322	234.6	331.6
197.851837693934	339.244994748322	231.5	331.6
197.851837693934	339.244994748322	227.6	331.6
197.851837693934	339.244994748322	222	329.2
197.851837693934	339.244994748322	222.8	339.4
197.851837693934	339.244994748322	191.3	329.2
197.851837693934	339.244994748322	192.1	339.4
197.851837693934	339.244994748322	161.4	331.6
185.631707407618	378.749508996341	211.8	393.8

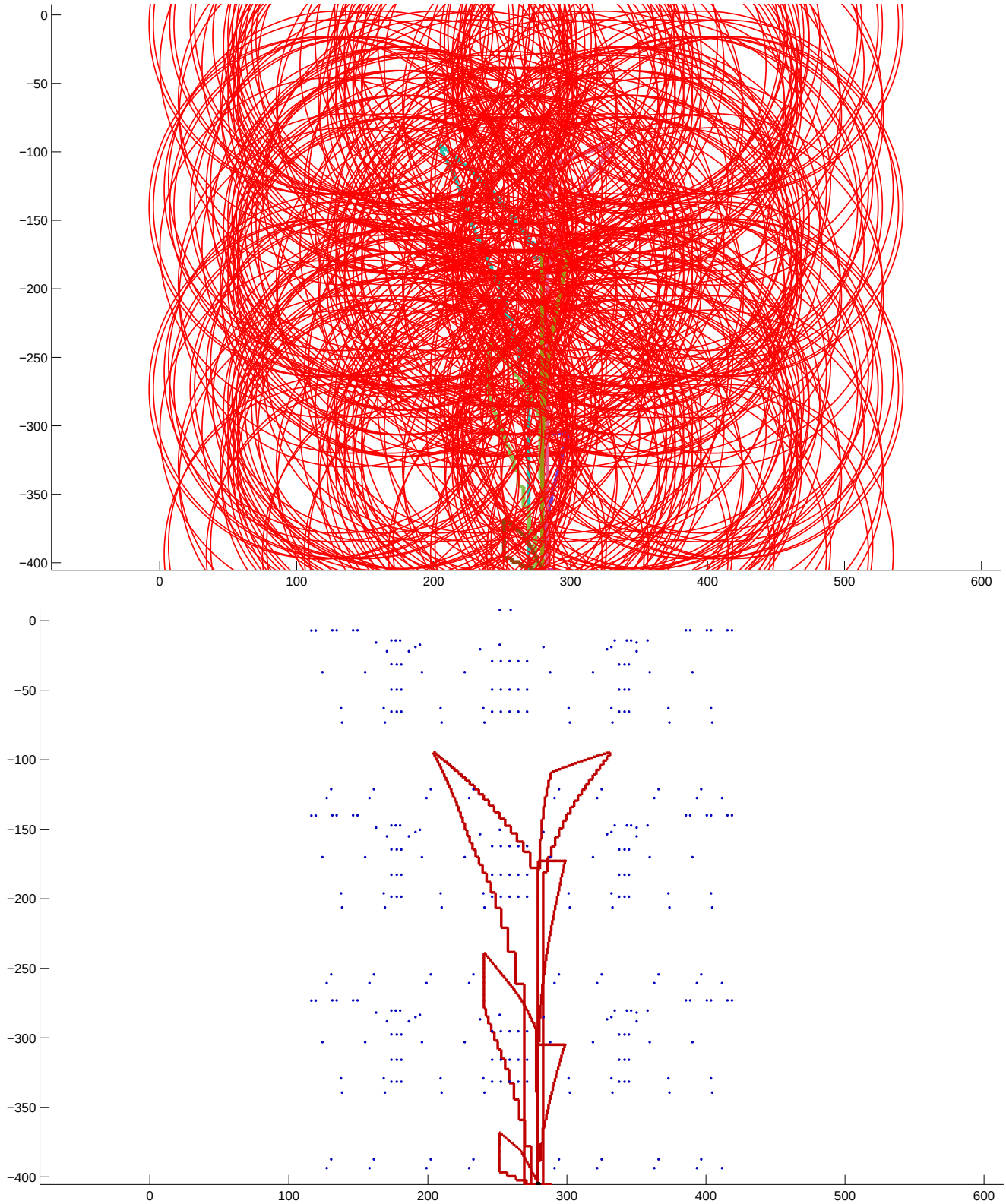


Figure O.120: $lin318$, $r = 124.02$, Equal Radius, 2D, Manhattan, Length = 2800.8566057

Table O-123: Solution for *lin*318, $r = 124.02$, Equal Radius, 2D, Manhattan

Total distance: 2800.85660569294 Total demand met: 6261 Depot: x 169.3 y 405.5			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 17.6662395455102 Demand Met: 564			
169.770694136397	405.500000054599	89	393.8
170.238476600176	405.500000042945	119.7	393.8
170.728192763461	405.500000030566	122.8	387.5
171.223262431243	405.5000000295	161.4	331.6
171.71658640163	405.500000018949	155.1	315.8
172.21230875565	405.500000005164	148.8	315.8
172.713865703551	405.499999993079	161.4	315.8
173.223150832194	405.499999984434	178	303.2
173.738181271358	405.499999966856	191.3	329.2
174.256637058541	405.499999951917	192.1	339.4
174.773167259972	405.499999941967	222.8	339.4
175.27556294867	405.499999931018	222	329.2
175.767840253206	405.499999918069	227.6	331.6
176.251233815838	405.499999905469	231.5	331.6
176.727721169449	405.499999892799	234.6	331.6
177.199304776581	405.499999871552	255.9	387.5
177.66607181292	405.499999861781	286.6	387.5
178.13311952562	405.499999849508	301.6	393.8
176.878055732466	405.49999987986	283.5	393.8
175.60280234517	405.499999909222	252.8	393.8
174.327209554347	405.499999937942	211.8	393.8
173.053415773465	405.499999971715	215	387.5
171.782604465976	405.500000001538	184.3	387.5
170.555050251165	405.500000042044	181.1	393.8
Route: 2 Length: 772.018466565211 Demand Met: 950			
159.334937629455	261.293894908368	85.8	170.1
152.972507431299	238.333724089492	63.8	182.7
147.543981887866	220.846954458636	63.8	164.5
142.776629384426	206.660830435119	52.8	148.8
138.674434145902	195.485386608173	51.2	121.3
135.300686703175	187.915938192534	48	127.6
132.231703540153	181.439602234685	39.4	140
129.390927328792	175.508251953477	36.2	140
126.738471113293	169.951151319025	24.4	140
124.319177449612	164.74966595187	21.3	140
122.095390327687	159.807759859214	14.2	170.1
120.05796760098	154.920249311877	6.3	140.2
118.253486558988	150.278568318467	9.40000000000001	140.2
116.592322691353	145.797916286108	17.3	127.6
115.019650059185	141.467172208035	20.5	121.3
113.516510214544	137.278211616558	28.3	73.2
112.089545229487	133.46763835751	27.6	63
110.742040108293	130.070171490793	58.3	63
109.415569593288	126.839050076573	59.1	73.2
108.107494872863	123.726685578617	63.8	65.4
106.816008875226	120.731573336268	70.9	65.4
105.540436921933	117.842300661523	67.7	65.4
104.283687923655	115.052549817072	63.8	49.6
103.04772535987	112.375495232901	67.7	49.6
101.833530331051	109.80124434837	70.9	49.6
100.642511744776	107.323584547014	70.9	31.5
99.4749480072206	104.954300309213	67.7	31.5
98.3297471176093	102.682306160899	63.8	31.4
97.2033558573494	100.496837099469	44.9	37
96.0888094297599	98.3856993912081	14.2	37
94.9819965197819	96.3521953896054	9.40000000000001	7.1
93.9942697722203	94.7964969451743	6.3	7.1
95.7989663113345	96.3720158929135	21.3	6.9
97.6878444555154	98.0034952794454	24.4	6.9
99.7129842467627	99.7354528803399	36.2	6.9
101.851974149949	101.561414541173	39.4	6.9
104.137375508096	103.523962730401	52.8	15.7
106.518381356092	105.581433890923	60.6	22
108.985643603263	107.730348438033	63.8	14.2
111.563691238354	110.015536134448	66.9	14.2
114.270482162986	112.472483385477	70.1	14.2
117.131144587385	115.155719962666	76.4	22
120.123203224692	118.035195912501	81.1	18.9
123.279007599867	121.208688941246	84.3	17.3
126.666993534849	124.902952934775	85.8	37
130.221049544539	128.89112726218	116.5	37
133.858600520857	133.196035996563	99.2	63
137.629006901312	137.721554785925	100	73.2
141.552803056437	142.469810988994	130.7	73.2
145.562215442761	147.485406264878	129.9	63
149.710418786199	152.937361217834	136.2	65.4
154.039150062591	158.88977349504	136.2	49.6
158.65812868886	166.257682438427	142.5	49.6
163.622909783787	177.723565459332	142.5	65.4
Route: 3 Length: 240.085087195481 Demand Met: 950			
169.300000688018	372.699511578942	142.5	295.3
169.300001482715	349.477676425329	119.7	260.7
169.300002264047	333.022325112346	122.8	254.4
169.300003046694	319.329776744311	130.7	206.3
169.300003828214	312.42827101455	129.9	196.1
169.300004604428	309.700801808591	136.2	198.5
169.300005375878	307.266697019683	142.5	198.5
169.300006143999	305.013983169289	148.8	182.7
170.483342277897	305.013983491341	148.8	198.5
171.69805391903	305.013983778509	155.1	198.5
172.933251588814	305.013984042557	161.4	198.5
174.180033547204	305.013984308056	191.3	196.1
175.41000274727	305.013984574885	222	196.1
176.578352164684	305.013984840307	231.5	198.5
177.680256138231	305.013985109475	234.6	198.5
178.709219118995	305.013985360682	222.8	206.3
179.730280984323	305.013985615264	192.1	206.3
180.758372463194	305.013985838758	184.3	254.4
181.794720468731	305.0139861072	215	254.4
182.83463839758	305.013986363034	211.8	260.7
183.883462340807	305.013986631139	252.8	260.7
184.938129276668	305.01398689117	255.9	254.4
185.99820254836	305.013987151778	286.6	254.4
187.040160970359	305.013987396521	283.5	260.7
188.07347762474	305.013987650815	301.6	260.7
188.85652676703	305.013987885629	308.7	273.1
188.263269628711	307.016028362348	305.5	273.1
187.522838709088	309.524519401383	293.7	273.1
186.770490516887	312.113040075468	290.6	273.1
186.00701822725	314.784391302161	278.7	273.1
185.238407403645	317.520290482645	275.6	273.1
184.461252630066	320.325441857021	248	280.4
183.6834474683	323.177714247478	240.2	281.9
182.904328343393	326.077508265744	236.2	280.4
182.123312000175	329.030449002467	233.1	280.4
181.340789205206	332.040747257695	224.4	280.4
180.560548776202	335.113460901135	222	285.1
179.784411760681	338.247801378678	218.9	286.7
179.014717430107	341.450846245264	227.6	297.7
178.25108838953	344.712495498471	231.5	297.7
177.493641772851	348.049421387978	234.6	297.7
176.740870353931	351.487512427317	249.6	303.2
175.988505893658	355.051238609255	280.3	303.2
175.211012868386	359.050345583518	293.7	329.2
174.242268363905	364.609153011526	294.5	339.4
172.630752638658	375.887177082093	263.8	339.4
171.067108328475	388.518467510186	263	329.2
Route: 4 Length: 725.218465218636 Demand Met: 950			
172.946208766404	180.751943742239	222.8	73.2
175.867918234828	170.126334596786	222	63
178.716653818875	162.322972204665	227.6	65.4
181.519933865583	155.560757002025	231.5	65.4
184.288534066038	149.458101609703	234.6	65.4
187.04330511255	143.81583423478	234.6	49.6
189.772493066824	138.735496181384	231.5	49.6
192.495531107931	133.997749796227	227.6	49.6
195.219803780116	129.496376658141	227.6	31.5
197.927747154886	125.34265599016	231.5	31.5
200.617929967626	121.443858889528	234.6	31.5
203.291040357712	117.742726041241	249.6	37
205.93607755949	114.192920470555	263	63
208.559283423207	110.711913899306	263.8	73.2
211.172900430745	107.275056170792	294.5	73.2
213.737908587875	103.890625894325	293.7	63
216.256788108659	100.571849672308	280.3	37
218.744394768576	97.3528471312738	293.7	6.9
221.003876630347	94.5946440210292	308.7	6.9
220.163745643109	95.0236483414936	305.5	6.9
218.02214199275	95.6963114066791	290.6	6.9
215.76967793373	96.3993582395373	278.7	6.9
213.464999911087	97.1253324835346	275.6	6.9
211.108791643106	97.8708378665322	248	14.2

Solution x	Solution y	Original x	Original y
208.75430418328	98.6274417665052	240.2	15.7
206.406351222313	99.3938681123191	240.2	22
204.066699031067	100.169401525294	236.2	14.2
201.734632823657	100.95548630404	233.1	14.2
199.41195952908	101.752937002151	224.4	14.2
197.10299161129	102.562264267626	222	18.9
194.809510794265	103.383929104923	218.9	20.5
192.531126858487	104.218785625916	208.7	37
190.268398885933	105.065665023542	178	37
188.024100315957	105.921601374526	173.2	18.9
185.797202191358	106.788445123486	161.4	29.1
183.588019543985	107.662536243624	155.1	29.1
181.398569127337	108.542393091417	149.6	-7.9
179.32522596003	109.449783360986	141.7	-7.9
178.028537451037	114.469628674175	141.7	17.3
176.752558246086	119.983760965855	127.6	20.5
175.503910512896	126.43340123365	136.2	29.1
174.268681408908	133.781495488508	142.5	29.1
173.038237041376	142.724142180426	148.8	29.1
171.817598357197	157.327660891898	148.8	49.6
170.61255184333	178.587728240106	148.8	65.4
Route: 5 Length: 410.392269244427 Demand Met: 950			
164.194476634038	377.919679767123	70.9	315.8
159.701977619019	359.130690062242	67.7	297.7
155.609042711054	344.449122825482	63.8	280.4
151.882366244662	332.671231973431	52.8	281.9
148.471485829196	322.535549645612	51.2	254.4
145.552689452506	315.070474636761	48	260.7
142.823451010145	308.347086781903	39.4	273.1
140.246703458378	302.009426163771	36.2	273.1
137.796484779727	295.945801246324	24.4	273.1
135.553607482777	290.204772961816	21.3	273.1
133.480944948307	284.687761793275	14.2	303.2
131.715736009785	278.85846676908	9.40000000000001	273.3
130.320001453829	273.300111448557	6.3	273.3
130.32000177772	268.871631008078	17.3	260.7
130.32000209909	264.52498821408	20.5	254.4
130.320002418433	260.251155816754	28.3	206.3
130.320002733978	256.312526546564	27.6	196.1
130.320003042363	252.858519370723	44.9	170.1
130.320003347499	249.886222935057	60.6	155.1
130.320003650463	247.239494679699	63.8	147.3
130.320003950677	245.019329560281	66.9	147.3
130.320004249063	242.962262136141	70.1	147.3
130.320004545902	241.002926936592	89	127.6
130.320004842527	239.283863923957	92.1	121.3
131.473465647846	240.676990429555	84.3	150.4
132.637320441359	242.090513884885	81.1	152
133.813260340969	243.528330464901	76.4	155.1
135.003627279859	244.994311774146	70.9	164.6
136.208996301714	246.485287488303	67.7	164.6
137.433600208031	248.008779384235	67.7	182.7
138.672695042586	249.551640123485	70.9	182.7
139.926346782577	251.114957176391	70.9	198.5
141.193303535523	252.693969678907	67.7	198.5
142.475687322135	254.290225256289	63.8	198.5
143.776695868166	255.90619274166	58.3	196.1
145.104143490625	257.549131042204	59.1	206.3
146.455992137386	259.213198748197	100	206.3
147.81711452089	260.891947190548	99.2	196.1
149.188629776976	262.588747336415	116.5	170.1
150.569302597148	264.320028059987	127.6	153.6
151.962767985754	266.144924676267	141.7	150.4
153.364491092271	268.126304684488	148.8	162.2
154.769067833724	270.180073676871	161.4	162.2
156.172210864684	272.323586532944	155.1	162.2
157.578439113501	274.584817133134	142.5	162.2
158.997706891404	277.026849115868	136.2	162.2
160.443291121082	279.81004860794	136.2	182.7
161.904112214208	282.715264488363	142.5	182.7
163.381154926553	285.76798207295	155.1	182.7
164.873078124193	288.992851158711	161.4	182.7
166.378505504666	292.425140547959	178	170.1
167.834319910083	339.391015514276	240.2	288.2
Route: 6 Length: 504.985602394601 Demand Met: 950			
169.300001961621	262.974040051117	173.2	152
169.300004030146	225.204313626295	119.7	127.6
169.300006112255	202.24215015793	122.8	121.3
169.300008193898	183.125087188501	155.1	65.4
169.300010273289	172.804386207593	155.1	49.6

Solution x	Solution y	Original x	Original y
170.561755168145	172.804386680036	161.4	49.6
171.979957390612	172.804387026146	161.4	65.4
173.426640535216	172.804387491305	191.3	63
174.886212878	172.804387864556	192.1	73.2
176.353966492732	172.804388094937	184.3	121.3
177.829926462012	172.804388496256	181.1	127.6
179.311626453158	172.804388937191	211.8	127.6
180.784995956517	172.804389380723	215	121.3
182.253998135122	172.804389809139	252.8	127.6
183.707620409634	172.804390252967	255.9	121.3
185.152654454131	172.80439069766	286.6	121.3
186.550714097278	172.80439109243	283.5	127.6
187.927173252315	172.804391523022	301.6	127.6
189.097187404893	172.804391905074	308.7	140
188.46681751316	175.451020768178	305.5	140
187.799720286364	178.431452496869	293.7	140
187.12384420184	181.505720850923	290.6	140
186.440189490172	184.680642907673	278.7	140
185.753503830177	187.933800964803	275.6	140
185.063875601592	191.272256067332	280.3	170.1
184.371654707762	194.658650169628	293.7	196.1
183.67213039664	198.064420820285	294.5	206.3
182.965844673095	201.466866985102	263.8	206.3
182.260534488086	204.875938227162	263	196.1
181.555024299024	208.307042023584	249.6	170.1
180.848207485306	211.792305292638	248	147.3
180.138338793129	215.383310910328	240.2	155.1
179.425848996487	219.070420367134	240.2	148.8
178.709552429481	222.8877419502	236.2	147.3
177.989384640864	226.85832708583	233.1	147.3
177.265676434705	231.006938408814	224.4	147.3
176.541003878085	235.352258453993	222	152
175.817474994099	239.905995989078	218.9	153.6
175.097610865183	244.709259640715	208.7	170.1
174.385238506681	249.697944211252	227.6	164.6
173.678737631282	255.035614687717	231.5	164.6
172.975960070518	260.950831373524	234.6	164.6
172.269517129338	268.135044962308	234.6	182.7
171.555838776943	276.257670774995	231.5	182.7
170.830538539776	286.132091780588	227.6	182.7
170.105326543398	303.292698872596	227.6	198.5
Route: 7 Length: 130.490475529073 Demand Met: 947			
160.899236829978	402.472626062122	92.1	387.5
153.440463590943	399.548476773715	51.2	387.5
147.033159765051	396.661867403829	48	393.8
141.320003220446	393.799999194979	17.3	393.8
141.320003043146	387.605353542391	20.5	387.5
141.320002872707	381.530458126776	28.3	339.4
141.32000272858	377.519589332403	27.6	329.2
141.320002921904	376.786873358449	58.3	329.2
141.320003087229	376.05795667861	59.1	339.4
141.320003245545	375.329146038333	63.8	331.6
141.320003409782	374.600664144237	67.7	331.6
141.320003585678	373.871665652299	70.9	331.6
141.320003773669	373.141714275048	67.7	315.8
141.320003968153	372.413844656806	63.8	315.8
141.320004166041	371.688187790363	44.9	303.2
141.320004366384	370.978052456269	63.8	297.6
141.320004566897	370.273777758583	60.6	288.2
141.320004767727	369.581286590883	66.9	280.4
141.320004969029	368.902783389427	70.1	280.4
141.320005170071	368.234759506884	92.1	254.4
142.213679887203	368.994879937268	89	260.7
143.131044159672	369.78983160002	84.3	283.5
144.058591823785	370.592203354497	81.1	285.1
144.998652666918	371.403544639208	76.4	288.2
145.954552013186	372.225294412816	70.9	297.7
146.928891392173	373.056156061573	85.8	303.2
147.917673422755	373.89399206563	116.5	303.2
148.917332413956	374.739437558372	127.6	286.7
149.925251217085	375.595735096011	141.7	283.5
150.938429571373	376.464259846682	136.2	295.3
151.959236572245	377.342277176755	148.8	295.3
152.984357690745	378.229482366629	155.1	295.3
154.011825097345	379.125276643867	161.4	295.3
155.039772482026	380.029178501923	173.2	285.1
156.063694389114	380.94521868355	181.1	260.7
157.00046878859	382.481196983832	208.7	303.2
157.919867185558	384.036934932504	227.6	315.8
158.812891345969	385.599895249273	231.5	315.8

Solution x	Solution y	Original x	Original y
159.683483752816	387.165979942415	234.6	315.8
160.544060265389	388.729969752081	142.5	315.8
161.402572616943	390.30898532747	136.2	315.8
162.258004013907	391.907195368415	129.9	329.2
163.110802780025	393.519914877935	99.2	329.2
163.970264636318	395.16111208985	100	339.4
164.839224721931	396.826876360861	130.7	339.4
165.715324608521	398.514593514553	136.2	331.6
166.599572310002	400.231599465922	142.5	331.6
167.489991042766	401.969839900714	148.8	331.6
168.384143635667	403.716623080136	155.1	331.6

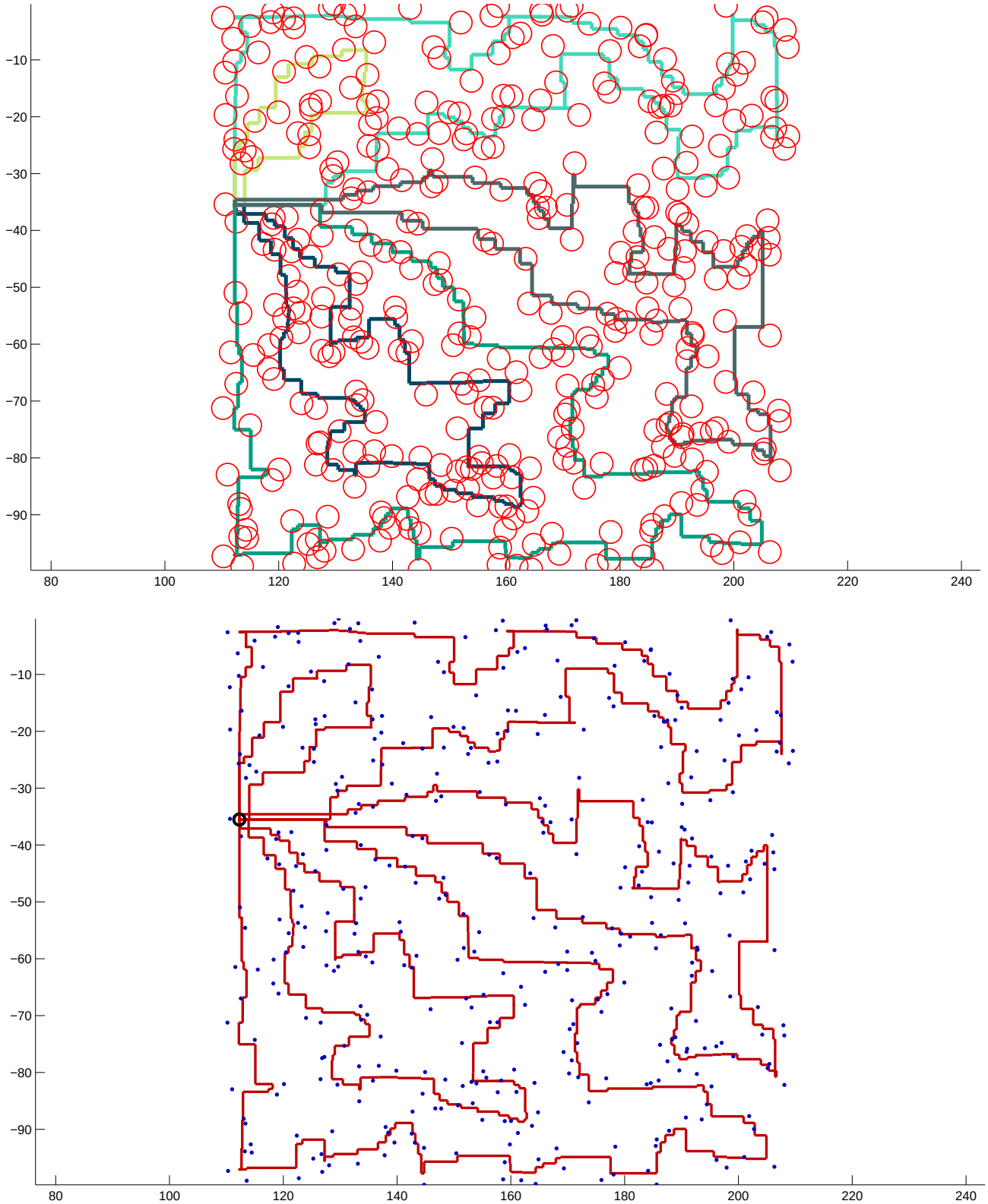


Figure O.121: $rd400$, $r = 1.9910618$, Equal Radius, 2D, Manhattan, Length = 1490.8853253

Table O-124: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 2D, Manhattan

Total distance: 1490.88532530283 Total demand met: 3297 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 374.122072705116 Demand Met: 787			
18.2580311568823	31.602443625711	19.5262	30.4483
19.6141443847838	30.4578613821515	19.247	29.2712
21.1403342360051	29.5739475517356	20.3288	28.022
27.1290518752683	29.0857854154647	29.1053	29.2049
27.1689049738612	26.7078184036806	27.4222	25.8428
27.2086667812546	24.9351478780946	25.8125	25.1372
27.2490161635536	22.9323609367674	26.0672	21.3383
32.6755238621979	22.9027183759346	31.0765	22.0815
32.6755238621979	22.9027183759346	34.4638	23.0393
36.2262322130744	22.8734666153177	38.2173	22.874
36.226238954646	19.4823496905817	36.0033	17.5038
39.1382517792605	20.1104530574409	39.9475	19.2268
41.082495981889	20.8335316470338	41.7205	19.4188
42.4422757527024	21.9612140216605	42.987	22.9253
43.6332963412595	22.893429906772	42.4972	23.9973
46.0828994119775	23.5592289513462	46.0829	25.5503
47.4004108898723	23.3989505019018	47.6331	25.3181
48.0877156548306	21.347667079145	47.6864	20.3976
48.8120666343301	19.847868241152	49.4045	19.961
49.4944016550559	18.3180710373366	49.4944	16.327
50.9968690149318	18.3637279615333	50.9211	16.4053
54.7387079924732	18.4941294779915	55.9929	17.1432
54.7387079924732	18.4941294779915	54.7387	20.4852
61.2485539817066	18.4941321524967	62.8285	19.7058
60.2971814163351	13.9161469205952	58.7637	13.9566
59.6175998172528	8.96861066081506	58.2097	7.56071
67.0623381296724	9.79503152503465	68.2389	8.47105
68.1328161347317	13.1929570724018	67.267	14.1516
69.5086590725697	15.0905402532615	68.0574	15.6194
74.1027132269243	16.4939933036723	75.2455	17.3084
75.9821523849918	17.5591742560547	77.5205	18.1054
76.8224534343444	18.4120408236558	76.9072	18.2917
77.6572754392213	19.2780271851175	78.906	18.0381
78.1565288900317	22.2654601994096	76.419	22.7841
80.6928257183795	23.4883025382106	82.6839	23.4883
80.2434410573227	27.3918137697502	81.7106	28.112
79.6704742705119	29.1288064538024	77.6794	29.1288
80.1207021459477	30.7753256114624	80.1207	32.7664
84.9041070094453	30.3613681246252	85.0689	32.1301
87.9107809873707	29.414396391274	89.036	30.7257
88.9050728646433	25.4149022500584	87.5589	25.1226
90.4716216155924	22.4365601144008	90.11	20.7153
93.1464003704134	21.8056755345484	93.1464	19.8146
97.5942248349358	23.4576849501049	99.5853	23.4577
97.5942248349358	23.4576849501049	97.2905	22.0419
97.5942248349358	23.4576849501049	96.7473	23.5618
97.5942292464323	24.1209412038197	98.8743	25.646
97.5649903017426	16.7727736077235	97.4766	17.1802
97.5649903017426	16.7727736077235	96.7716	16.6523
97.5359118611048	7.78999055915538	99.5164	7.77478
97.1599441627462	5.11024123497989	98.9579	4.73211
95.5593553475548	3.8739112049752	95.7659	2.55349
93.7933002327146	3.02292819135444	95.0473	3.39817
89.7987230594287	2.10952627978589	88.6343	0.494442
89.7987250310137	10.5224966274341	91.7898	10.5225
89.2991908226282	11.6089646679745	88.9914	10.7701
88.8133386892831	12.9018262531946	90.4883	12.6216
87.8701773678042	14.5496344957265	88.2698	14.9994
86.8706987564398	16.015425361694	86.8707	18.0065
81.127959808299	14.8363887944725	80.035	15.8589
79.2356697682896	12.8958060948162	79.2919	13.6517
77.3195791916798	10.3405541282768	77.911	9.90186
74.9925109219905	8.17899506357117	73.4709	7.6166
74.0545794535112	6.73997752393265	74.5771	5.70821
73.0156037753306	5.64254774829878	74.632	5.60444
69.5899449274188	4.56490246171825	70.1018	4.34543
65.0213400260313	3.52475030648741	64.5769	3.66176
61.5218960370858	2.46249721046823	61.5069	0.482106
59.7191008811707	2.43358393686797	60.7013	1.36116
55.8817617301034	2.40493195506064	56.1254	1.40532
55.8817617301034	2.40493195506064	56.3237	2.07366
49.3774137928253	2.37648410727299	47.3917	2.23053
49.3774144987829	2.37646552862036	48.5894	0.54797
50.5014289906506	5.37247924194549	52.4925	5.37248
49.6475968599855	6.72347198720617	51.1528	6.04103
47.5984871307276	9.08413584391842	48.6979	8.85907
43.8961999936813	11.6990294396581	43.8962	13.6901
39.9822616472417	9.67911713424726	38.2491	9.61738
39.2087701209472	7.79248699359512	37.2177	7.79249
40.0267297166918	3.44287605743333	42.0178	3.44287
33.0972996429703	2.81791551439727	33.1085	0.882753
24.4850247593897	2.67063576423947	23.5387	4.13129
23.0217527572577	2.50158432830564	23.1984	1.0131
21.4305521371355	2.34511231899178	21.7245	2.01127
19.728700003351	2.18978527743637	19.7287	0.198716
18.0506548552371	2.29673802561379	19.0116	0.977048
12.7791929745911	2.41030438148884	12.6307	2.70835
12.7791929745911	2.41030438148884	12.7116	4.29147
9.48295282456212	2.49808671997736	9.0496	1.67955
9.48295282456212	2.49808671997736	8.57052	3.36732
9.48295282456212	2.49808671997736	10.9477	2.73525
2.21082493200353	2.58494774358889	0.219756000000004	2.58493
3.46381307197058	5.16654022041858	2.00806	6.28968
3.46381307197058	5.16654022041858	4.96047	4.06059
4.44340094930027	8.70232930879966	6.43447000000001	8.70233
3.39417975604985	10.4481867421245	2.19732	10.251
2.56800309821907	12.3264043061781	0.613562000000002	12.2624
2.4703157703883	16.2918535115744	2.68873000000001	16.3883
2.37236535472582	20.041322938449	0.659450000000007	19.6999
Route: 2 Length: 102.202920825945 Demand Met: 216			
4.02413941369471	29.371844968547	3.44571000000001	28.2052
6.42257017478097	27.2385023868358	5.25835000000001	27.1001
13.7028913057736	25.2366820539821	15.3897	25.3897
14.6337724409987	22.7981953158563	13.4	22.8874
14.6337724409987	22.7981953158563	15.3759	23.0999
15.7869848589526	19.7280183130594	15.6444	17.8995
15.7869848589526	19.7280183130594	15.6993	18.7479
17.2907190894443	19.3142695999276	17.2907	17.3232
25.4867379184803	19.3142696272632	27.2482	20.2425
25.4355205005565	17.3017896075563	25.7178	17.895
25.4355205005565	17.3017896075563	27.3595	17.3028
24.6907695761508	14.9198996643634	22.6997	14.9199
25.0470848699044	12.1376643864852	25.6231	12.6549
25.3899999911599	8.30985794785253	26.7979	6.90196
21.0931057938487	9.36518066503578	21.4744	8.21886
15.9105553860954	10.6939949283308	14.8737	9.51072
15.9105553860954	10.6939949283308	17.1854	11.1942
11.7280996761518	13.0238957237557	10.9524	12.0779
9.48286561407033	18.3935503128826	9.96077	19.2347
6.57806446382388	21.1291880570037	5.81823	20.7452
4.53489624550986	24.469788235257	4.056	25.9589
3.0768486152437	25.5657545568281	2.38826	24.0295
3.0768486152437	25.5657545568281	2.1823	25.6845
Route: 3 Length: 259.690529677819 Demand Met: 745			
3.89973216140419	38.6867443366503	2.57158	38.4711
6.56341276890456	41.7929479097653	7.21925	42.3799
8.63775969119816	44.1887247613383	9.27453	43.3967
10.3203568703534	47.8235602483458	11.7937	48.0467
11.2761237775357	50.7520873304873	13.2524	50.7626
11.3260972483855	53.0023914327988	9.35554999999999	53.1101
11.5887545631062	53.7379790642222	12.5872	53.6987
11.8397350225296	54.4775008389809	13.8308	54.4775
11.7165869996759	56.0362156215759	10.9638	55.5178
11.5952469698741	57.8442203216863	13.5318	57.9262
10.9265624999657	59.0077462578663	10.4725	58.878
10.2825741683346	60.1982822846312	8.30742000000001	60.1487
10.2451452255445	64.3564996757817	8.25408	64.3565
10.9270820725862	66.2872831524032	9.17265	66.1356
13.9715004801308	68.6995228787139	14.0141	70.4084
16.8224200401955	69.4619653286777	16.576	71.2313
22.5899489226826	69.8530469392758	23.6206	68.344
23.4976057141632	70.6748667815624	23.7167	70.7298
24.3820379576248	71.4930128171723	24.7619	69.8637
25.1450343067665	73.690399888714	27.1361	73.6904
21.5376702181842	75.3022192891817	20.7262	75.308
19.0588249416259	76.9205417981664	17.2306	77.2747
18.6967376151702	77.8720052215521	16.8354	77.4785
18.5381658578976	81.1812991414342	16.5471	81.1813
20.4728514769002	82.1349804442631	19.5225	82.1483
23.3568970206202	83.0887339499456	23.3569	85.0798
23.568036670582	80.8839680330953	23.3293	78.9181
25.2804028298946	80.8551563227785	25.7615	81.4539

Solution x	Solution y	Original x	Original y
26.7929004621142	80.8262659007577	26.7929	78.8352
30.1103985722247	80.9631309313846	29.8827	79.684
34.2129340714549	81.1063553263222	34.9224	79.9328
36.4895344428506	81.2572399051868	38.4806	81.2568
36.4847661392654	83.7515054924247	34.4937	83.7515
37.4705414691405	84.9172248742116	36.723	86.3354
38.8748359789016	85.6146633304893	37.7453	86.3505
41.2341640559362	86.2321827777416	40.7053	85.7824
44.1778630036528	86.8792345753774	44.9959	88.3516
44.1778630036528	86.8792345753774	43.3068	85.4106
47.8944513451389	87.5531147190882	48.934	88.5471
49.6519882777657	88.1171033372606	50.0418	88.5256
51.2471989544721	88.6615332104984	51.2472	90.6526
52.3787514377278	88.2045605415961	53.7144	89.3849
52.79753326122	87.0164988274725	54.7886	87.0165
52.5232003702812	82.7669200341402	54.169	81.8375
51.4933145949692	82.1948231421071	50.9984	83.4341
50.5771989252809	81.5004663054122	50.5772	79.5094
47.7348962491114	81.5004662609065	47.7087	83.4773
47.7348962491114	81.5004662609065	48.3206	81.4332
45.8459294428321	81.5004662143959	45.1636	79.7971
45.0468507295818	81.5004661688307	45.6946	80.9262
44.1764161936044	81.5004661233078	43.9629	81.9344
43.3351153952886	81.5004660777322	41.546	82.3742
43.3641068328693	80.1186913165627	43.0779	81.6476
43.393197069929	74.8300070019486	41.4131	74.8199
45.9003034015832	72.1636966976119	46.3399	71.17
48.0475534776841	70.4041248769808	47.6475	71.1843
50.5207343516405	68.125601982406	52.5118	68.1256
50.520735739944	66.4779636322874	51.793	64.9464
45.8905973113631	66.6252207382192	45.2184	66.3382
42.7997363296001	66.7736515908237	43.1006	68.5786
42.7997363296001	66.7736515908237	42.1545	66.9856
35.9094002717638	66.8914343352761	35.9094	68.8825
32.9490485583514	61.5704911487483	31.2678	61.1344
32.9490485583514	61.5704911487483	32.641	61.5676
32.1927204806855	59.2703186579294	33.4192	59.483
31.2453489365617	56.7000197241608	30.6696	55.2626
30.4467992538692	55.5598651632747	30.4468	53.5688
25.8683201544759	58.8347410119337	25.6513	60.6643
23.564353512422	59.2954507487357	23.2085	58.8069
23.564353512422	59.2954507487357	24.5176	59.5849
20.4015638080105	59.7586831597256	19.6656	61.3862
19.2165320369646	60.0577114464747	17.6011	61.1721
19.1291441086299	60.1487823147821	18.9042	62.1271
19.1291419234243	55.6324148321262	17.5187	55.1629
19.1291397409001	53.4453504816082	17.8085	51.9553
22.4683152743138	53.6273006999518	22.5447	55.6169
22.4683218822616	52.3514865269278	22.8193	53.7552
22.4683284885953	49.6922795088155	23.6126	49.4214
22.4683350919691	47.3987003358735	24.4594	47.3987
20.0465107551321	46.3905127158748	20.5641	47.7219
16.3466317131215	44.7890114777201	15.6372	44.5891
13.7169097051047	43.2659113446411	12.2621	43.6923
12.5305015002263	41.3499848205498	13.4598	41.6191
11.0683321156846	39.2495747075596	11.4258	37.7412
9.29833339389586	38.236192622912	8.75416	38.928
7.77257039678354	37.092611944537	9.16001	37.8018
2.47312814701402	36.0203648654606	0.642905999999996	35.395
Route: 4 Length: 385.488984835065 Demand Met: 786			
17.2487467750294	39.3830201177182	17.5856	40.8861
22.943903067498	40.710305681061	23.6339	40.0124
26.3517457468143	42.2955100841382	26.2003	42.5604
30.0299490634475	43.7988107623776	28.6889	43.6077
30.0299490634475	43.7988107623776	31.4339	43.8079
33.3163515605173	45.4191662337599	33.2771	46.652
36.7257904097145	46.5527765251318	38.1612	45.7549
37.8480718989426	48.3806472221196	38.5534	48.7846
38.8478745550676	50.0186630496423	37.4105	49.4356
40.8630541277795	52.4775264602544	41.6783	52.1535
42.45059930911	55.3208294098826	44.4217	55.3301
42.5120238924299	57.7501210943549	41.7302	58.1199
42.573961729599	59.8719459055377	40.6271	60.1839
44.3663802272359	60.1896674550425	43.5841	58.7522
48.689973158923	60.5815395481034	48.6743	62.5481
55.8049696062861	60.6475427941166	56.0439	62.2937
59.8373190277247	60.710629944841	59.9164	61.9972
59.8373190277247	60.710629944841	58.3448	60.9201
59.8373190277247	60.710629944841	59.9164	58.75
64.0830035301046	60.8761485007165	64.2573	58.953

Solution x	Solution y	Original x	Original y
65.5366204256253	61.8465290720311	64.8783	60.379
67.9484232426321	64.1831996434775	69.9395	64.1832
66.9049735775251	65.590146749113	66.9764	66.2314
65.8417201807633	66.8292372185718	65.3011	67.1869
64.8559095385779	67.9925399241396	65.9297	69.3415
62.1364833765472	68.584950766721	60.771	67.3196
61.6283960652924	73.0909008332289	61.6789	74.8507
61.6283960652924	73.0909008332289	60.356	72.3736
61.6283960652924	73.0909008332289	60.9907	71.4945
61.2622771277437	76.4166996032004	59.2712	76.4167
61.653523516196	78.2558800166342	60.7208	77.8844
62.072984298478	80.3716444276229	61.8453	80.8454
62.072984298478	80.3716444276229	60.2539	80.1704
63.697703238154	83.2641214665357	63.6977	85.2552
66.9865258347249	82.8220969593122	66.7645	81.0279
75.013072973534	82.5211623472854	75.9957	81.402
75.013072973534	82.5211623472854	74.5996	81.8744
75.013072973534	82.5211623472854	73.8931	82.0767
82.6908955767221	82.2629802031732	82.6909	80.2719
83.8943277908556	83.3777965991096	85.2864	82.465
84.5728861686022	85.5668414782342	84.4594	85.6238
85.2597652895965	87.7267119215011	83.5669	88.2708
90.9214088544754	88.8632088742074	91.8947	87.6684
92.8592264507476	91.0403806916647	92.7385	89.9534
94.9147893780703	95.1744924320621	96.3227	96.5824
91.247384929069	94.9965062037352	91.0373	94.8618
87.9775967543376	94.81891249875	87.9339	96.7331
85.6711947030839	93.8302874093751	86.1563	95.4019
80.7777005269162	89.9264809211225	80.7777	87.9354
78.6705381662108	90.9860045890389	77.8131	90.2453
77.1483638484049	92.2841919761417	75.6586	91.7899
76.3259078113797	94.0324474778039	75.4786	92.9344
75.635896592997	97.7162183284018	75.6359	99.7073
73.2376210739293	97.7162166080145	74.1314	97.2935
69.3059066801523	97.7162148875192	68.0526	97.9535
67.5211394428072	97.7162131657782	65.9332	98.9174
67.5211389302857	94.8573430262008	68.3546	93.0491
58.7296215320267	95.0778903131077	58.0371	93.3465
57.9052806852716	95.9849024714333	59.3326	96.8644
55.6757757399424	96.6494171315531	54.8665	95.2849
54.3706997432195	97.6146203450104	54.3707	99.6057
52.049763493865	97.5172294767696	51.8363	98.9629
50.0586156609007	97.4153540527652	48.6626	98.7924
49.9447093219061	95.9945355239601	48.9418	95.7946
49.8327872776367	94.6481783983946	49.8328	92.6571
40.6159369157568	95.6768596504909	40.4171	94.2218
34.757903559014	97.7607217100605	34.7579	99.7518
34.252358252462	94.3566842211958	34.7487	93.2543
33.718425907834	92.4852469852858	33.1283	92.3481
33.2082043258216	90.6895820859372	32.5896	90.759
32.7207972590621	88.8710765046579	32.7208	86.88
29.6664705489415	89.861762053435	27.9893	89.6021
28.8245170263987	91.0196708550642	28.4623	90.5817
28.0181863434324	92.2761529047638	29.5533	92.3189
26.6424849230352	93.5162086531571	27.8353	94.5623
23.0335234504543	94.3474210726876	23.1083	96.0553
18.827459969841	94.8152785344692	18.064	96.3276
17.2643767813634	95.1552974195738	15.2733	95.1553
17.2643790679916	95.5322731759667	16.854	97.4806
17.2643908180325	93.8995478138021	16.7243	94.3593
17.2644025703707	91.8163750562551	18.6101	90.3489
13.3589037641141	92.5709291449566	12.3803	91.1149
12.2777857617696	96.7684551404026	12.7313	98.6134
3.57801203073457	97.0455228881216	3.57801000000001	99.0366
2.27006880792965	97.0455159519408	0.299018000000004	97.3272
2.64971796525157	93.4979000189731	3.24988	93.8751
2.64971796525157	93.4979000189731	4.45068999999999	94.0863
2.64971796525157	93.4979000189731	4.28894	92.6489
2.7879336549375	88.5408921860856	3.35356	88.986
2.7879336549375	88.5408921860856	3.06059000000001	88.1315
2.92344796604603	83.4067672934936	1.02508	82.9527
7.41334108820618	82.8850245109119	8.89064000000001	83.8954
8.13082502938506	82.0449982616957	10.1219	82.045
5.09294833392888	75.0406149680786	4.99968	74.2733
2.18593861791848	71.2335000220906	0.194864999999993	71.2335
2.85306612094553	66.8100887023253	2.55217	66.9796
3.53482729567511	61.9091340060835	5.52590000000001	61.9092
3.03765243018957	60.4965660980616	1.5771	61.4642
2.68977958431594	52.8115317534198	3.30116	54.5758
2.68977958431594	52.8115317534198	2.40393	50.9808

Solution x	Solution y	Original x	Original y
Route: 5 Length: 369.380817258884 Demand Met: 763			
17.5544581442545	36.8579209098662	17.6023	36.5196
31.6503178576233	38.2972936236893	32.7353	38.4372
35.2900467394048	39.6840089154718	34.4656	38.8185
45.0537925296263	41.5316721517859	46.2037	41.7062
48.0491206161806	43.2656899701343	47.522	42.292
52.4141338695021	45.8439801166366	53.4254	44.9898
54.5361039882254	51.4306059099425	54.0007	52.8659
57.9926931867998	52.9390115233079	57.8122	54.5104
62.5500813874407	53.740525899052	62.6521	52.6724
66.7839447633797	54.7035638511002	67.8108	54.6502
69.1389670497853	55.6765540590743	69.1414	57.6653
70.773242054397	55.6840182534259	70.983	56.1077
70.773242054397	55.6840182534259	69.3672	55.5594
74.822610833749	55.6914711888798	74.8357	53.7031
75.511702088267	56.1791347630545	75.5117	58.1702
77.4291050711586	55.9720235103649	76.3859	55.8636
80.613899139906	55.7658653056378	80.6139	53.7748
81.758477133106	58.1212200470665	82.834	58.4111
81.758477133106	58.1212200470665	82.7455	58.0479
82.5446902151806	60.2773130032205	81.8774	60.6902
83.4048343992241	62.1638000461151	85.3959	62.1638
82.483990551569	64.1668170234596	81.8209	62.9891
81.6706636358833	69.3294658588382	82.5413	70.9361
79.6398073813968	69.9293687961531	78.2186	68.7569
79.1456425696904	72.4885616483109	78.9206	73.8168
78.6714133500831	73.8591542508736	78.3667	74.2083
78.2124656840404	75.1455999377024	76.2214	75.1456
78.7490910087145	76.8596245757448	77.5352	78.0347
79.6042018168972	77.6608341276929	79.6042	79.6519
81.0570555129378	77.2980057255183	80.8889	76.3527
82.5839396312884	76.9513943648352	84.0931	75.7357
82.5839396312884	76.9513943648352	80.9911	75.8316
85.4702143593055	76.8613060171588	86.1254	75.412
87.0561980611337	76.7772660055004	87.0562	74.7862
89.8010714627342	77.6691485894919	89.1084	77.1611
93.9523041148763	78.6488194027847	95.4573	78.5053
95.2962755174252	79.6817137983634	95.1537	79.2325
96.6800034001978	80.7898033150639	98.0879	82.1977
96.44435325363	74.1286305687738	98.0725	73.509
96.131929981283	72.3079777369539	97.9153	71.697
94.2887354101325	71.6114070624693	94.2046	73.3577
92.5967523370799	68.8178797548601	93.4248	68.5015
90.4227995883798	66.4127388757619	88.5712	66.6382
90.1374828327289	56.965697872921	88.4474	55.9131
95.0754004466657	56.9656981537457	96.3481	58.4969
95.0754004104162	44.2249658867489	96.3235	44.2629
95.0754004104162	44.2249658867489	94.61	43.2995
95.0754003740414	40.0265537295948	95.9404	38.2332
94.472738029129	41.1006869150255	96.1419	41.3034
93.2347935985617	42.0900680414875	92.3029	41.017
92.3063041069734	43.4788759087379	91.3249	42.8902
91.5285297977995	45.1294514786863	92.0634	46.0336
90.6855066836077	46.3898114308678	90.8764	48.3318
86.8559003953608	46.4886346141744	86.8559	48.4797
86.386659475951	43.8394911741725	88.1955	43.6361
84.6027352029602	42.0015957779197	85.2354	42.0312
82.4525637871877	40.1669117828535	81.8496	38.8539
80.9055590049499	39.1209273381305	80.5435	37.2793
80.0506006338563	38.8439650260512	80.0506	36.8529
79.8815039019625	43.2577211131783	81.4209	43.6493
79.8815039019625	43.2577211131783	78.6058	43.2582
79.7041432359273	46.0297205927954	81.1997	46.621
79.5060998398952	47.6790348095897	79.5061	49.6701
74.8070775545261	47.5951282701038	74.6616	49.1772
71.2696649033507	47.5054979335458	69.2786	47.5055
71.6775050862742	45.7023540030925	73.064	44.6995
71.6775050862742	45.7023540030925	72.4782	47.1166
71.9758675697156	43.8205396017507	70.0979	43.9308
74.0589350479271	41.184099935537	76.05	41.1841
73.6086650564602	39.407001998313	72.565	40.2263
73.2044596511315	36.6502202893073	74.7866	36.0265
72.5903360461912	35.217870511066	74.0572	35.987
71.5391188678375	32.2896887815563	73.2088	32.0501
62.0154005940063	30.1729644656457	62.0154	28.1819
61.7647560376616	35.2942386159013	60.6972	35.5066
61.5258007554234	39.6123353880912	61.5258	41.6034
57.4314822714367	37.9925713016686	55.717	37.8511
56.5847199032014	36.5375277227835	56.9788	35.9946
55.6951414384191	35.2404110652322	55.5492	35.9315

Solution x	Solution y	Original x	Original y
54.8240199515047	33.7368814853391	56.0389	33.1015
53.6379654558335	32.5308648478366	55.099	31.771
49.0313775407521	31.6683988247275	49.1148	32.8614
44.0939253489594	30.5680120238892	44.5404	30.686
37.0272003457293	29.4491640105141	37.0272	27.4581
36.364270731155	30.6513020715788	37.7688	31.4408
35.3307831558504	31.529692518377	36.8488	32.2474
31.4062176190223	32.2071139837295	31.6686	31.1822
26.5972939576241	32.9850948260655	25.7714	33.2927
23.6992933948354	33.7333965377328	23.2874	32.7742
21.3276411469699	34.5957259234658	22.7183	34.3604

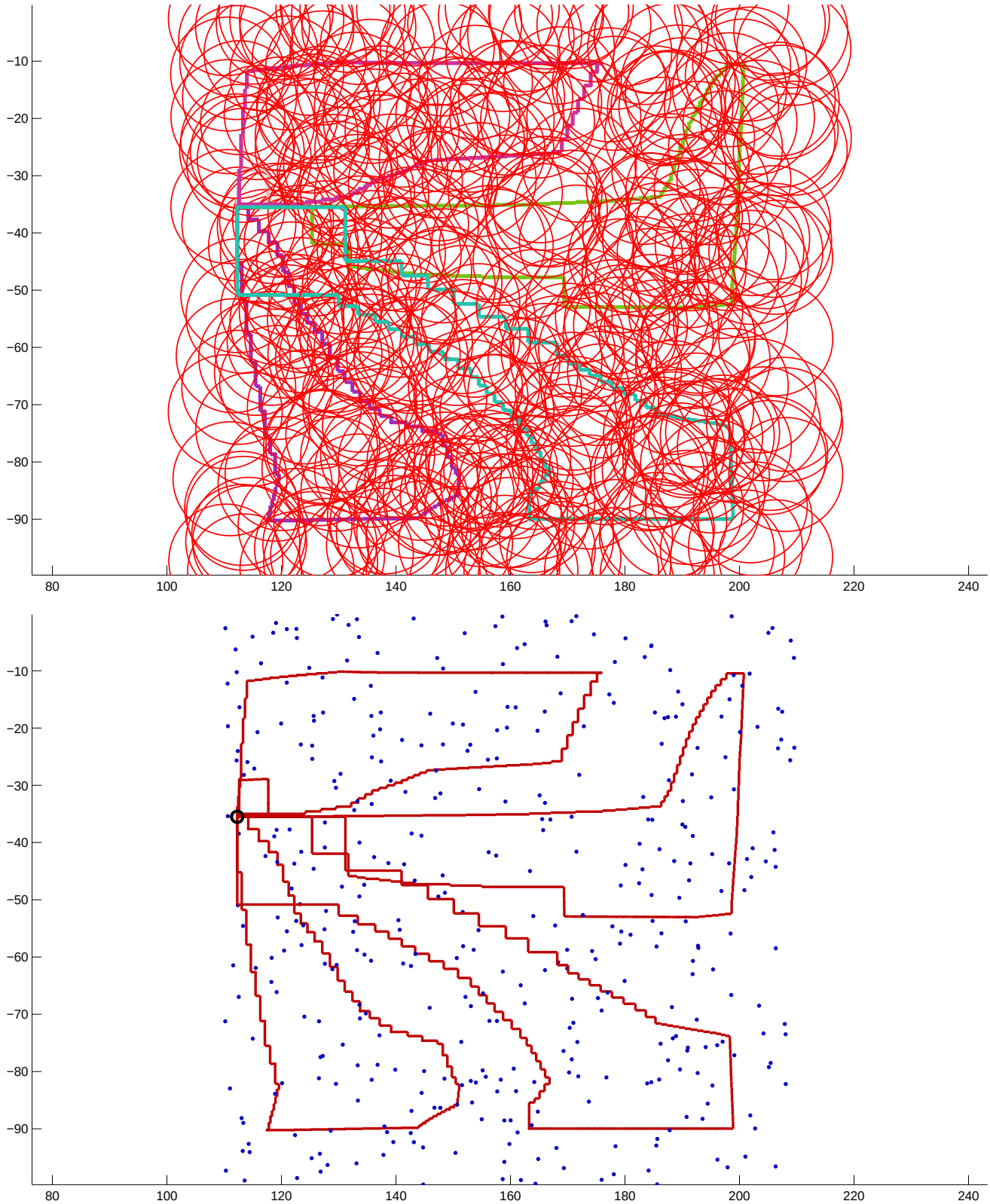


Figure O.122: $rd400$, $r = 9.955309$, Equal Radius, 2D, Manhattan, Length = 944.8476090

Table O-125: Solution for $rd400$, $r = 9.955309$, Equal Radius, 2D, Manhattan

Total distance: 944.847609040612 Total demand met: 3297 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 191.535761107521 Demand Met: 794			
4.214019623246	37.6457970939867	2.57158	38.4711
4.214019623246	37.6457970939867	8.75416	38.928
6.05846054455728	39.7500297242654	7.21925	42.3799
6.05846054455728	39.7500297242654	9.27453	43.3967
7.80375690189865	41.6796551106902	11.4258	37.7412
7.80375690189865	41.6796551106902	13.4598	41.6191
9.31040926219215	43.8848432739046	15.6372	44.5891
9.31040926219215	43.8848432739046	17.5856	40.8861
10.2814838078114	46.8465701470665	9.35554999999999	53.1101
11.271009750547	49.2670484873004	11.7937	48.0467
11.271009750547	49.2670484873004	12.2621	43.6923
12.2521628743426	52.3813746071011	8.30742000000001	60.1487
13.3779512646993	54.1232095853191	10.4725	58.878
13.3779512646993	54.1232095853191	13.5318	57.9262
14.5461878341539	55.6564506473348	10.9638	55.5178
14.5461878341539	55.6564506473348	12.5872	53.6987
15.7900170184481	57.2745705761509	13.2524	50.7626
15.7900170184481	57.2745705761509	13.8308	54.4775
17.1309799526522	59.379335123092	17.5187	55.1629
18.4672570232634	61.7271359047575	17.6011	61.1721
19.8215055056298	64.1553605666986	23.7167	70.7298
21.0540446380872	66.0503944823144	16.576	71.2313
22.4053997863513	67.7295038119132	23.6206	68.344
23.7419740710865	69.4278402536	14.0141	70.4084
23.7419740710865	69.4278402536	20.7262	75.308
23.7419740710865	69.4278402536	26.7929	78.8352
23.7419740710865	69.4278402536	27.1361	73.6904
23.7419740710865	69.4278402536	18.9042	62.1271
23.7419740710865	69.4278402536	19.6656	61.3862
23.7419740710865	69.4278402536	24.5176	59.5849
25.4280906691528	70.6856585161449	24.7619	69.8637
27.1427670255482	71.9797830970321	23.3293	78.9181
29.1588187132141	73.0810114978015	25.7615	81.4539
29.1588187132141	73.0810114978015	29.8827	79.684
32.0509376842447	73.8163888623881	35.9094	68.8825
34.6144242411216	74.6107002066417	34.4937	83.7515
34.6144242411216	74.6107002066417	34.9224	79.9328
37.2618730873528	75.1795667363905	42.1545	66.9856
38.1768065272099	77.1315043273511	45.1636	79.7971
38.1768065272099	77.1315043273511	41.4131	74.8199
38.988255343379	79.1182694847157	41.546	82.3742
38.988255343379	79.1182694847157	43.0779	81.6476
39.7711908374255	81.0057523897446	44.9959	88.3516
40.4393996083732	82.1907967143639	48.3206	81.4332
41.043090862875	83.4340545127158	50.9984	83.4341
40.8976912636165	84.6141047771642	47.7087	83.4773
40.7492496588691	85.8459278939325	48.934	88.5471
40.7492496588691	85.8459278939325	50.0418	88.5256
40.0888558466928	86.2182212007862	43.9629	81.9344
40.0888558466928	86.2182212007862	45.6946	80.9262
39.3640320589146	86.6230578376967	40.4171	94.2218
39.3640320589146	86.6230578376967	40.7053	85.7824
38.6269106307817	87.0029683875686	38.4806	81.2568
37.8973726718937	87.3987315996095	37.7453	86.3505
37.1706530735375	87.7977275150647	36.723	86.3354
36.4463368714086	88.2009479804119	32.7208	86.88
35.7422141212961	88.6099721760732	27.9893	89.6021
35.1116000752922	89.0198108561371	29.5533	92.3189
35.1116000752922	89.0198108561371	28.4623	90.5817
34.5480067195406	89.4268296396215	34.7487	93.2543
33.9809089759625	89.8301081116686	34.7579	99.7518
30.9383240417198	89.8862834208292	33.1283	92.3481
30.9383240417198	89.8862834208292	32.5896	90.759
27.5895356020027	89.9430407414307	27.8353	94.5623
24.2320485039946	89.9996209388808	23.3569	85.0798
21.0265187689451	90.0577291271915	18.064	96.3276
21.0265187689451	90.0577291271915	23.1083	96.0553
18.0899213274529	90.1147690173871	18.6101	90.3489
15.1672089762557	90.1726560643946	15.2733	95.1553
15.1672089762557	90.1726560643946	16.7243	94.3593
12.2186138287798	90.2309272308269	12.7313	98.6134
12.2186138287798	90.2309272308269	16.854	97.4806
7.33846002210534	90.2877088278167	0.299018000000004	97.3272
7.51922655129141	90.079171568988	3.57801000000001	99.0366
7.78934420988821	89.0380426463734	3.24988	93.8751
7.78934420988821	89.0380426463734	4.45068999999999	94.0863
8.0709958704312	87.8933472424392	3.35356	88.986
8.0709958704312	87.8933472424392	3.06059000000001	88.1315
8.36566445157379	86.7918633568633	4.28894	92.6489
8.66750270604565	85.6159161292926	12.3803	91.1149
8.96332213890568	84.3906211980072	8.89064000000001	83.8954
9.26027486153356	83.203425743957	1.02508	82.9527
9.26027486153356	83.203425743957	16.5471	81.1813
9.56719088517417	82.1479925016562	19.5225	82.1483
8.89373546427616	78.661927018773	16.8354	77.4785
8.89373546427616	78.661927018773	17.2306	77.2747
8.01291746414122	75.5155640619741	10.1219	82.045
7.11110147767603	71.2009430108632	0.194864999999993	71.2335
7.11110147767603	71.2009430108632	4.99968	74.2733
6.30367983908955	66.7883525432453	9.17265	66.1356
5.47986801812794	62.657721070291	2.55217	66.9796
5.47986801812794	62.657721070291	8.25408	64.3565
4.66253910092207	57.8639666405707	1.5771	61.4642
4.66253910092207	57.8639666405707	5.52590000000001	61.9092
3.86418211828838	51.7748989560896	3.30116	54.5758
3.07121699256207	45.2150987385968	2.40393	50.9808
Route: 2 Length: 262.218283394201 Demand Met: 793			
15.3436341440404	41.9615054840485	20.5641	47.7219
21.6837425083658	45.8742212086243	22.5447	55.6169
23.2004264288949	46.1157831982281	23.6126	49.4214
24.7061575879762	46.3559879317011	17.8085	51.9553
27.0845213489293	46.5861783480698	33.2771	46.652
29.1342873562721	46.8168308333703	28.6889	43.6077
31.224138625533	47.049683924127	31.4339	43.8079
33.3308598417092	47.2846772691284	24.4594	47.3987
39.462999682231	47.5198333413588	41.6783	52.1535
44.9734655723366	47.7527172611978	38.1612	45.7549
59.3458705413932	47.9878188460493	69.2786	47.5055
59.3602682301415	49.7810038673033	62.6521	52.6724
59.3745795449578	51.3906324048308	57.8122	54.5104
59.3888337986568	52.9197820777357	56.0439	62.2937
60.2677349261472	52.9254132902087	58.3448	60.9201
61.2013311081186	52.9312405823392	59.9164	58.75
62.1631857624306	52.9370833311943	59.9164	61.9972
63.4916891182201	52.9431169860863	64.2573	58.953
64.8321256868322	52.9491439114886	69.1414	57.6653
66.0917453058736	52.9551592784457	69.3672	55.5594
67.3245665554999	52.9611680427719	67.8108	54.6502
68.5764895620633	52.9671743414002	70.0979	43.9308
69.7489889533955	52.9732133744774	70.983	56.1077
70.9260474580248	52.9792368055577	72.4782	47.1166
72.1005967326504	52.9852754698458	73.064	44.6995
73.2693705067113	52.9913378140073	74.6616	49.1772
74.4441411893139	52.9974112000921	74.8357	53.7031
75.6399642348813	53.0034818374083	75.5117	58.1702
76.867526729147	53.0095361514324	76.3859	55.8636
78.1359416245408	53.0155851450827	79.5061	49.6701
79.4192072900557	53.0216504761078	81.8774	60.6902
80.6030943386697	53.0277169717598	80.6139	53.7748
81.8208951315566	53.0337907685427	81.8209	62.9891
82.9127775273342	52.9283791793001	82.7455	58.0479
84.0362862662052	52.8225536047382	82.834	58.4111
85.2162843127573	52.7161710733275	85.3959	62.1638
86.3764761178157	52.5958139361365	88.1955	43.6361
87.4540322874733	52.4819427292563	88.4474	55.9131
88.54646410229	52.3678302555571	96.3481	58.4969
88.6370954847229	50.0049206679187	94.61	43.2995
88.7256881750905	48.7278818096087	90.8764	48.3318
88.8142322083756	47.4781094359231	86.8559	48.4797
88.9031405139412	46.2337832052126	81.1997	46.621
88.993557630581	45.0014484189697	92.0634	46.0336
89.083815218385	43.770297549625	96.3235	44.2629
89.173061856277	42.5401908349996	96.1419	41.3034
89.2614509861441	41.3633549745436	92.3029	41.017
89.3497618451175	40.2073534075454	91.3249	42.8902
89.4380469719242	39.0279293823174	81.4209	43.6493
89.5304323599146	37.1962819038784	95.9404	38.2332
89.6219477051766	35.3320179003281	85.2354	42.0312
89.7143171460537	32.6409219349512	85.0689	32.1301
89.8073722457104	30.0636670392314	89.036	30.7257
89.9007210610513	27.5135086575498	87.5589	25.1226
89.9946005635869	25.1599538695376	99.5853	23.4577

Solution x	Solution y	Original x	Original y
90.072895890356	24.0526445035356	96.7473	23.5618
90.1507783926897	22.9671930744178	97.2905	22.0419
90.228159402342	21.9129247718285	98.8743	25.646
90.301731727015	20.184285563451	93.1464	19.8146
90.3754365153418	18.4872991300164	90.11	20.7153
90.4494957854168	16.7539436120577	97.4766	17.1802
90.5230804945513	15.0109571626395	96.7716	16.6523
90.5963356813295	13.201540414534	91.7898	10.5225
90.6698224943929	11.4743611763745	95.0473	3.39817
90.7419946381177	10.718414194306	95.7659	2.55349
90.8082520702498	10.449751141692	98.9579	4.73211
90.3670187736609	10.4497511585483	99.5164	7.77478
89.4922775269153	10.4497511762344	88.9914	10.7701
88.6344135607134	10.4497511939294	88.6343	0.494442
87.6950663311514	11.4879248445323	90.4883	12.6216
86.7500540914829	12.5198755586758	88.2698	14.9994
85.8088304219986	13.5348875548463	77.911	9.90186
85.0743902690291	14.7046762445784	80.035	15.8589
84.3783873041592	15.8652396981934	78.906	18.0381
83.7215370961058	16.9984356794839	86.8707	18.0065
83.0565752824995	18.1267098709741	79.2919	13.6517
82.4183831295477	19.3389710364758	77.5205	18.1054
81.8070666455603	20.5814342220539	76.9072	18.2917
81.2212323013504	21.8779943911592	75.2455	17.3084
80.6764537757207	23.3578641664124	76.419	22.7841
80.1481764397073	24.8685746922727	82.6839	23.4883
79.616992019641	26.4284325274283	77.6794	29.1288
79.0952500595912	27.9478393629953	81.7106	28.112
78.5716867017556	29.4859794795546	80.1207	32.7664
78.0489881750565	30.9712943672744	81.8496	38.8539
77.4836596572202	31.9375740957566	80.5435	37.2793
76.9110583077312	32.8472487488019	80.0506	36.8529
76.3331420022984	33.7282157070645	78.6058	43.2582
74.3819265691133	33.9050295141149	76.05	41.1841
72.3883978211622	34.0781631135347	74.7866	36.0265
70.3934627268035	34.2512429208471	74.0572	35.987
68.3329334935951	34.4242615065716	73.2088	32.0501
66.1065402903376	34.5985025282567	72.565	40.2263
61.35171225817	34.7674431261653	61.5258	41.6034
57.0670902397666	34.9341934708186	55.717	37.8511
53.2949516073118	35.1007927761425	53.4254	44.9898
47.4539278025695	35.1693669632327	47.522	42.292
42.2008413793562	35.2375880262373	46.2037	41.7062
34.650791616224	35.3054182891858	34.4656	38.8185
27.9445044794334	35.3732395405447	32.7353	38.4372
18.9388761450781	35.4409932882131	23.6339	40.0124
Route: 3 Length: 23.9885322491506 Demand Met: 119			
7.69846932645606	35.5084995807639	17.6023	36.5196
7.69846921838439	33.1319880032173	9.16001	37.8018
7.69846911018307	30.5364761481256	13.4	22.8874
7.69846900179783	29.1585633237559	15.3759	23.0999
7.69846890477729	29.0422272732336	15.3897	25.3897
7.69846880599834	28.9295532018807	9.96077	19.2347
6.46696606216304	28.98298271115	5.81823	20.7452
5.26214194887831	29.0345105512528	2.38826	24.0295
4.10527552465614	29.0836338327513	3.44571000000001	28.2052
2.95843455104755	29.1304803852881	0.659450000000007	19.6999
2.79168944779437	30.4234286673942	4.056	25.9589
2.62348673547555	31.891245487413	2.1823	25.6845
2.4537617783684	33.6840394245838	0.642905999999996	35.395
Route: 4 Length: 177.894382519632 Demand Met: 791			
2.62109921834826	28.8236766698862	5.25835000000001	27.1001
2.95668686563586	22.7263402691552	2.68873000000001	16.3883
3.29268479824381	18.3029101647053	0.613562000000002	12.2624
3.63204901632979	14.836861189425	2.19732	10.251
3.97286408816493	11.7497849005877	0.219756000000004	2.58493
5.31024289283998	11.5739378439905	2.00806	6.28968
6.70912997914348	11.3996052125689	6.43447000000001	8.70233
8.11510510513125	11.2256207815526	4.96047	4.06059
8.11510510513125	11.2256207815526	8.57052	3.36732
9.61634004616238	11.0582608150519	9.0496	1.67955
11.1935230828547	10.9033666992459	10.9524	12.0779
12.7803035931488	10.747993539185	10.9477	2.73525
12.7803035931488	10.747993539185	12.6307	2.70835
14.4778161819031	10.5990571836401	12.7116	4.29147
14.4778161819031	10.5990571836401	14.8737	9.51072
16.2373801153822	10.4515807478193	15.6444	17.8995
16.2373801153822	10.4515807478193	15.6993	18.7479
18.0570611617841	10.2980784012593	19.0116	0.977048
19.729577765775	10.1540258588946	19.7287	0.198716

Solution x	Solution y	Original x	Original y
21.0724048176953	10.1917742865018	21.7245	2.01127
22.4193208276917	10.2297468020065	23.1984	1.0131
23.7459310207238	10.2682749901273	17.2907	17.3232
23.7459310207238	10.2682749901273	25.7178	17.895
26.687498941431	10.3059167396948	27.2482	20.2425
26.7844745102149	10.3109886068581	27.3595	17.3028
26.8813236571074	10.3160569959267	25.6231	12.6549
26.9782730366515	10.3211246674963	21.4744	8.21886
26.9782730366515	10.3211246674963	22.6997	14.9199
27.0762943408716	10.3261911705297	17.1854	11.1942
29.6689223537601	10.3312382056549	23.5387	4.13129
33.8897300419702	10.3362882336704	33.1085	0.882753
33.8897300419702	10.3362882336704	26.7979	6.90196
46.8411866139994	10.3413522685895	48.5894	0.54797
46.8411866139994	10.3413522685895	47.3917	2.23053
46.8411866139994	10.3413522685895	42.0178	3.44287
46.8411866139994	10.3413522685895	52.4925	5.37248
46.8411866139994	10.3413522685895	51.1528	6.04103
46.8411866139994	10.3413522685895	37.2177	7.79249
46.8411866139994	10.3413522685895	38.2491	9.61738
46.8411866139994	10.3413522685895	48.6979	8.85907
46.8411866139994	10.3413522685895	43.8962	13.6901
46.8411866139994	10.3413522685895	49.4944	16.327
46.8411866139994	10.3413522685895	50.9211	16.4053
46.8411866139994	10.3413522685895	49.4045	19.961
52.7535606651752	10.3413522480092	58.2097	7.56071
52.7535606651752	10.3413522480092	58.7637	13.9566
56.4573161999755	10.3413522273394	56.1254	1.40532
56.4573161999755	10.3413522273394	56.3237	2.07366
60.7259477011197	10.3413522069337	61.5069	0.482106
60.7259477011197	10.3413522069337	60.7013	1.36116
62.5492713823053	10.341352187131	64.5769	3.66176
64.3327183708972	10.341352167379	70.1018	4.34543
65.8758669977676	10.3413521476464	74.632	5.60444
65.8300994547071	10.4268720240603	74.5771	5.70821
65.1172113328065	11.8688958811027	73.4709	7.6166
65.1172113328065	11.8688958811027	68.2389	8.47105
64.0078292849326	14.2562207235533	67.267	14.1516
64.0078292849326	14.2562207235533	68.0574	15.6194
62.8569154872172	16.6235162972438	55.9929	17.1432
61.8155259696156	18.9800761295349	54.7387	20.4852
60.8731851378067	21.2590351130531	62.8285	19.7058
59.9278964793868	23.6217639004899	62.0154	28.1819
58.9753588698251	25.8145589516132	60.6972	35.5066
57.1254079972235	26.1184453796838	56.9788	35.9946
55.4988105829732	26.2596385458856	56.0389	33.1015
53.8843556910287	26.3993919344469	55.5492	35.9315
51.6269875925432	26.5216801439012	55.099	31.771
49.226144791852	26.6432560480132	47.6864	20.3976
49.226144791852	26.6432560480132	47.6331	25.3181
47.0584312607983	26.7661876568548	49.1148	32.8614
44.825645330355	26.8881762415615	46.0829	25.5503
44.825645330355	26.8881762415615	44.5404	30.686
42.6364452114265	27.0099176772729	38.2173	22.874
42.6364452114265	27.0099176772729	42.4972	23.9973
40.6885207470154	27.1326226812787	41.7205	19.4188
40.6885207470154	27.1326226812787	42.987	22.9253
38.6610243866877	27.2575747933995	39.9475	19.2268
36.5639227979981	27.384656932124	36.0033	17.5038
35.3146826399885	27.8015397368363	31.0765	22.0815
34.1472262745294	28.2311544609925	27.4222	25.8428
33.0866972493942	28.6667408955849	34.4638	23.0393
32.0188279893596	29.1128885656981	29.1053	29.2049
30.9786314582135	29.5596971406088	37.0272	27.4581
30.9786314582135	29.5596971406088	37.7688	31.4408
29.7760755662883	30.0078317214681	36.8488	32.2474
28.4314104255642	30.4507366913615	31.6686	31.1822
27.0561590746135	30.8934275320535	26.0672	21.3383
25.8318710515147	31.5769986767773	25.8125	25.1372
24.6155778547471	32.2960793661095	25.7714	33.2927
23.3948921345512	33.0146627392904	23.2874	32.7742
23.3948921345512	33.0146627392904	22.7183	34.3604
22.1924022160069	33.7356193599325	26.2003	42.5604
19.5351854475433	34.1508982832883	19.5262	30.4483
16.9077703179377	34.5719452656244	19.247	29.2712
14.1605658474042	35.0028869876091	20.3288	28.022
Route: 5 Length: 289.210649770108 Demand Met: 800			
21.1648945887667	44.9169669140001	22.8193	53.7552
30.9840169318719	47.4525120659545	38.5534	48.7846
35.5796152530092	49.8835123381337	37.4105	49.4356

Solution x	Solution y	Original x	Original y
40.1037586446075	52.394059251757	41.7302	58.1199
44.4764113512338	54.6267277238156	43.5841	58.7522
49.1917181743827	56.7461452768548	54.0007	52.8659
53.0964967931508	59.1484868852636	48.6743	62.5481
58.1568819718917	61.4245228630064	65.3011	67.1869
60.0661231628704	62.8601130283503	60.9907	71.4945
61.9108888957309	63.9044327932838	60.771	67.3196
63.8286145345967	64.9296129661103	64.8783	60.379
65.7550174042645	66.0157612600452	65.9297	69.3415
67.7156606312008	67.0803052853071	66.9764	66.2314
69.7476562056269	68.1649147804367	69.9395	64.1832
71.8319082135251	69.3090623892519	78.2186	68.7569
73.6447288935994	70.4766809401317	78.3667	74.2083
75.3204016650184	71.597877043179	75.9957	81.402
76.3337414488191	71.7850187557749	76.2214	75.1456
77.3614329938499	71.9716966451891	77.5352	78.0347
78.3998741062388	72.1562339747044	79.6042	79.6519
79.4256422072988	72.3364468708935	78.9206	73.8168
80.4694274280269	72.5169628223034	80.9911	75.8316
81.520740908916	72.69695998362	80.8889	76.3527
82.591894877741	72.8763423484182	82.5413	70.9361
83.6796425135552	73.0570038514489	82.6909	80.2719
84.8048940506004	73.2340755179601	84.0931	75.7357
85.9563182265073	73.4110314384727	93.4248	68.5015
86.7726980722247	73.5941845686649	94.2046	73.3577
87.5125800956729	73.7775160690947	88.5712	66.6382
88.2530987242353	73.964634801604	97.9153	71.697
88.3133578198459	74.6743014017767	98.0725	73.509
88.3632860675593	76.1057363402188	87.0562	74.7862
88.4133686288895	77.5931767183356	86.1254	75.412
88.4636452545585	79.1671226063483	95.1537	79.2325
88.5139421195047	80.7733385891904	98.0879	82.1977
88.5604011319138	81.7380403009638	95.4573	78.5053
88.606535731324	82.7898165195028	89.1084	77.1611
88.6527606623756	83.9448009749066	85.2864	82.465
88.6991833048973	85.1385675975455	84.4594	85.6238
88.7458199790003	86.3449111171884	83.5669	88.2708
88.7927354197348	87.53874707783	91.8947	87.6684
88.839648279588	88.7495497004133	92.7385	89.9534
88.8865727155496	89.9633212932702	96.3227	96.5824
87.3733748337695	89.9633211385783	87.9339	96.7331
85.8668798536702	89.9633209836164	86.1563	95.4019
84.3778808397635	89.9633208286364	91.0373	94.8618
82.3747490745436	89.9633206735522	80.7777	87.9354
80.4772800839122	89.9633205186256	77.8131	90.2453
78.6998690158901	89.9633203637888	75.4786	92.9344
77.0512006411994	89.963320208974	75.6586	91.7899
75.4644657233644	89.9633200542069	75.6359	99.7073
73.7733985464973	89.9633198996746	74.1314	97.2935
72.0900264247911	89.9633197450744	74.5996	81.8744
70.2109357984402	89.9633195906206	73.8931	82.0767
67.7675227634704	89.9633194363126	63.6977	85.2552
65.6773675845557	89.963319282136	59.3326	96.8644
64.6702340740803	89.9633191279128	68.3546	93.0491
63.6444923437808	89.9633189737178	68.0526	97.9535
62.3091843950286	89.9633188194305	65.9332	98.9174
55.8598563471123	89.9633186649934	54.3707	99.6057
54.3409169979658	89.9633185103951	51.8363	98.9629
53.2621115537372	89.9633183557454	48.6626	98.7924
53.2621112672218	89.4199233865457	51.2472	90.6526
53.2621109801315	88.8790571603234	49.8328	92.6571
53.2621106927742	88.332363532378	54.8665	95.2849
53.2621104051702	87.7576601437034	48.9418	95.7946
53.2621101181446	86.9755277279389	53.7144	89.3849
53.2621098310688	86.1904885678313	54.7886	87.0165
53.2621095438582	85.410063062317	43.3068	85.4106
54.227143975187	84.7121044876227	58.0371	93.3465
55.0840542911006	83.4391814560007	54.169	81.8375
55.9554482768426	82.2092361959093	60.2539	80.1704
56.8091904200922	81.0279256255807	66.7645	81.0279
56.0525975859947	79.6182297262003	61.8453	80.8454
55.2619649984627	78.2028203886608	50.5772	79.5094
54.5044930969383	76.7911473269468	61.6789	74.8507
53.6823890539332	75.4635228346475	59.2712	76.4167
52.826122282622	74.1376919934252	60.7208	77.8844
51.7274601693472	72.5598374668874	60.356	72.3736
50.2258317507395	71.0244278150076	52.5118	68.1256
48.7049711449488	69.5695183885192	47.6475	71.1843
47.2227076083113	68.111724109692	43.1006	68.5786
45.8337331937833	66.6695440375048	46.3399	71.17

Solution x	Solution y	Original x	Original y
44.4517378873633	65.1596323324029	45.2184	66.3382
43.0746844582685	63.6527860160322	51.793	64.9464
40.8495421999313	62.0659307702015	44.4217	55.3301
38.3430800954198	60.7390188112977	40.6271	60.1839
35.7755150061861	59.4340988046273	33.4192	59.483
33.3600657049703	58.1440286975421	32.641	61.5676
31.0138423752	56.8232611259449	30.6696	55.2626
28.7153045895656	55.5386989064412	30.4468	53.5688
26.3857512640769	54.2946686917707	31.2678	61.1344
23.3339535564365	52.7715276667413	25.6513	60.6643
19.9783523409534	50.8343636686882	23.2085	58.8069

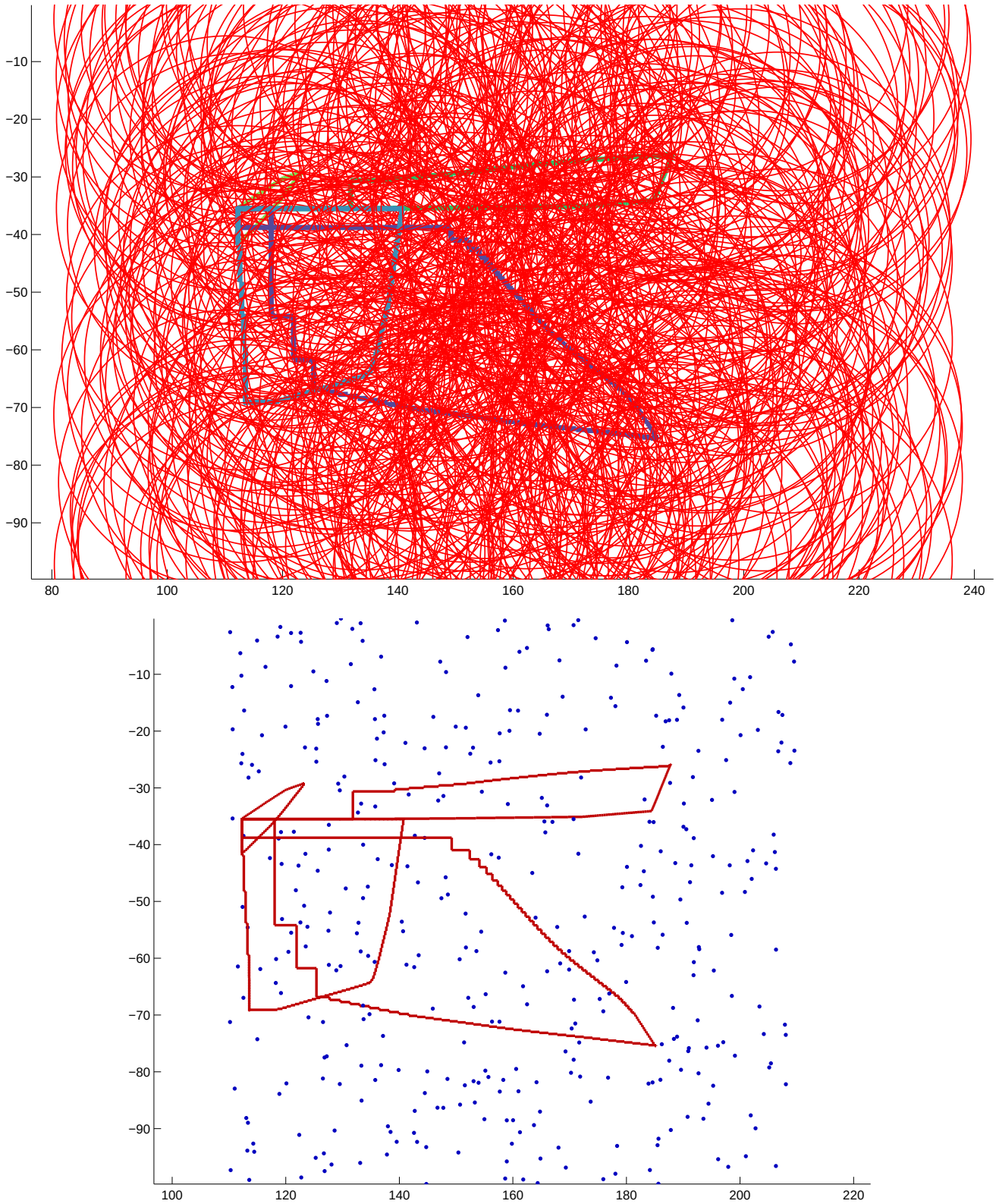


Figure O.123: $rd400$, $r = 29.865927$, Equal Radius, 2D, Manhattan, Length = 566.4932202

Table O-126: Solution for $rd400$, $r = 29.865927$, Equal Radius, 2D, Manhattan

Total distance: 566.493220235225 Total demand met: 3297 Depot: x 2.28315 y 35.5085			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 2.3279369543161E-9 Demand Met: 97			
2.28314999993363	35.5085000006456	2.57158	38.4711
2.28314999992116	35.5085000006952	9.16001	37.8018
2.28314999992969	35.5085000008647	5.81823	20.7452
2.28314999994709	35.5085000010365	2.68873000000001	16.3883
2.28314999995742	35.5085000010315	0.659450000000007	19.6999
2.28314999995693	35.5085000009309	2.38826	24.0295
2.28314999994745	35.5085000008794	2.1823	25.6845
2.28314999993125	35.5085000008303	4.056	25.9589
2.28314999991503	35.508500000727	5.25835000000001	27.1001
2.28314999990877	35.5085000006487	3.44571000000001	28.2052
2.28314999992862	35.5085000005979	0.642905999999996	35.395
Route: 2 Length: 170.428680041865 Demand Met: 800			
21.8157877466515	30.6188070637688	23.1984	1.0131
29.231484177654	30.2330561390326	33.1085	0.882753
31.7158348577088	30.0032033587827	37.2177	7.79249
34.2813777863646	29.7764497020334	38.2491	9.61738
36.9300306505985	29.5521891345663	42.0178	3.44287
39.5556450779395	29.3343969108711	47.3917	2.23053
41.8410118874893	29.1275044305363	48.5894	0.54797
43.3790101641526	28.9532995649714	52.4925	5.37248
44.8780846169999	28.7815417990003	51.1528	6.04103
46.3745261014972	28.6118848082429	48.6979	8.85907
47.9013656314246	28.4435535249955	49.4944	16.327
49.4624767430896	28.2752758555033	50.9211	16.4053
51.0613506666426	28.1070028147066	54.7387	20.4852
52.6869206275856	27.9381379322585	55.9929	17.1432
54.3452328673806	27.7692619373049	58.7637	13.9566
56.0308787405818	27.6007619543784	58.2097	7.56071
57.758719212821	27.4334942652475	56.3237	2.07366
59.5744221863785	27.2690953685938	56.1254	1.40532
61.5279512773545	27.1078573994976	60.7013	1.36116
63.5806943024025	26.9493742136753	61.5069	0.482106
65.783011743582	26.7941489016818	64.5769	3.66176
68.1127261965695	26.6403711229852	70.1018	4.34543
70.5295410692517	26.487808797747	74.5771	5.70821
73.0136000954776	26.3361767566276	74.632	5.60444
75.6261345219949	26.1854750984294	88.6343	0.494442
77.3960715069564	26.042357987434	95.7659	2.55349
77.6207199333292	25.945905844375	95.0473	3.39817
77.8396445851563	25.8506545642238	98.9579	4.73211
77.7479968705032	26.0588739921546	99.5164	7.77478
77.6559727338756	26.2751274841616	91.7898	10.5225
77.5641236910599	26.4928882393885	88.9914	10.7701
77.4726080884127	26.7121352986536	90.4883	12.6216
77.3810961424799	26.9326627503507	88.2698	14.9994
77.289805100234	27.1540960748151	86.8707	18.0065
77.1988376849528	27.3760260815308	90.11	20.7153
77.1079157701826	27.5980952477153	93.1464	19.8146
77.0169540966173	27.8206976177076	96.7716	16.6523
76.9256308239567	28.0449808497986	97.4766	17.1802
76.833932275998	28.2710849450216	97.2905	22.0419
76.7420346672072	28.4978900137554	96.7473	23.5618
76.6501353697007	28.7252815872479	99.5853	23.4577
76.5576520684876	28.9535564360423	98.8743	25.646
76.4645163489203	29.1823600108996	87.5589	25.1226
76.3718508272626	29.4121277529764	89.036	30.7257
76.2789154798007	29.6419230726819	85.0689	32.1301
76.1859692754293	29.8718156477037	80.1207	32.7664
76.0935210239369	30.1020361161983	80.0506	36.8529
76.0015282239213	30.3320590439517	80.5435	37.2793
75.9100415241399	30.5620223160576	81.8496	38.8539
75.8190791154262	30.7918236708385	85.2354	42.0312
75.7284232986942	31.0208794927696	88.1955	43.6361
75.637836791891	31.2488881188946	91.3249	42.8902
75.546977569403	31.4760533731111	92.3029	41.017
75.4559259223981	31.7029849676814	95.9404	38.2332
75.3641395843529	31.9302443012114	96.1419	41.3034
75.2717336301196	32.1571505978741	96.3235	44.2629
75.1787874663584	32.3827036932898	94.61	43.2995
75.0855413864788	32.6075873721103	92.0634	46.0336
74.9922171797317	32.8314387738387	90.8764	48.3318
74.8987561909177	33.0538044272233	86.8559	48.4797
74.8055584668767	33.2752966012246	88.4474	55.9131
74.7121554629422	33.49152423255	82.7455	58.0479
74.6189977813417	33.7034969668392	82.834	58.4111
74.5259618196167	33.9112872072282	81.8774	60.6902
74.4331417192369	34.1119487956045	81.8209	62.9891
74.0027776914808	34.1454982697244	80.6139	53.7748
73.5741791460396	34.1789410656477	76.3859	55.8636
73.149818813809	34.2122613032882	75.5117	58.1702
72.7292022934787	34.245398263389	74.8357	53.7031
72.3129205301439	34.2784642148783	74.6616	49.1772
71.901420710208	34.3115391354504	79.5061	49.6701
71.4909142339343	34.3445678864858	81.1997	46.621
71.0804731316596	34.3775785284818	81.4209	43.6493
70.6699451079978	34.4106017295493	78.6058	43.2582
70.2608087235045	34.4436516863995	76.05	41.1841
69.8539091324683	34.4767630225459	73.064	44.6995
69.4501307847773	34.5098784341727	72.4782	47.1166
69.0488974705981	34.542936800795	69.2786	47.5055
68.6517535477534	34.5759241386936	70.0979	43.9308
68.2584004316734	34.608875010995	72.565	40.2263
67.8677833767863	34.6418137017513	74.7866	36.0265
67.4788926238172	34.6747652125782	74.0572	35.987
67.0921755903602	34.7076979487805	73.2088	32.0501
66.7085322722339	34.7406400116105	77.6794	29.1288
66.325548189565	34.7735940541795	81.7106	28.112
65.9401923321116	34.8065288826608	82.6839	23.4883
65.5509568821801	34.8394814572694	76.419	22.7841
65.1630480864371	34.8724621018956	75.2455	17.3084
64.7761591921941	34.9055352704215	76.9072	18.2917
64.3887581973034	34.9386712801488	77.5205	18.1054
64.0001664283684	34.9718615096198	78.906	18.0381
63.60875099905	35.0050899336532	80.035	15.8589
63.2108895099636	35.0383761640263	79.2919	13.6517
62.80312366014	35.0717548213256	77.911	9.90186
62.2656615896423	35.106241768103	73.4709	7.6166
59.7111205685298	35.1454754204132	68.2389	8.47105
56.7211509749613	35.1854904763761	67.267	14.1516
53.6485243747081	35.2259007494997	68.0574	15.6194
50.306826446747	35.2667637801883	62.8285	19.7058
46.9256906883168	35.3080180656722	62.0154	28.1819
43.5072131150666	35.3495011432352	61.5258	41.6034
39.936927403107	35.3908476874405	57.8122	54.5104
35.2941741052512	35.4310074519204	54.0007	52.8659
29.1569909908122	35.4703324101332	53.4254	44.9898
Route: 3 Length: 45.8906462812624 Demand Met: 800			
2.28315015600776	36.7979321281703	2.40393	50.9808
2.28315031677174	38.0150976958281	3.30116	54.5758
2.28315047804378	39.2061116551872	5.52590000000001	61.9092
2.28315063913429	40.342112370618	1.5771	61.4642
2.28315080017371	41.4406709482245	0.194864999999993	71.2335
2.59053539547588	41.1534459288417	2.55217	66.9796
2.89919904168589	40.8618657186812	9.17265	66.1356
3.20777646878459	40.5642893869693	8.25408	64.3565
3.5171671473732	40.2618140435838	8.30742000000001	60.1487
3.82795344457548	39.9566457341705	10.4725	58.878
4.13974451070747	39.6492379731626	13.5318	57.9262
4.45158599396441	39.3397110764818	13.8308	54.4775
4.76356928430462	39.0292846885208	12.5872	53.6987
5.07607097023534	38.7182288035823	10.9638	55.5178
5.38951365969271	38.4059500011852	9.35554999999999	53.1101
5.70473959349997	38.0932168822646	11.7937	48.0467
6.02142234963026	37.7812804403098	13.2524	50.7626
6.33919887890687	37.4695343799886	17.8085	51.9553
6.65645104535633	37.1571707152307	17.5187	55.1629
6.97337376002187	36.8426930486293	17.6011	61.1721
7.28804263538962	36.518895063269	18.9042	62.1271
7.59685587083902	36.1757217020586	22.5447	55.6169
7.90323161708548	35.8272447346026	22.8193	53.7552
8.20792709274927	35.474868991778	23.6126	49.4214
8.51182320985743	35.1209009254804	20.5641	47.7219
8.8169886881532	34.766361740123	24.4594	47.3987
9.12191810605503	34.4104275332932	33.2771	46.652
9.41741311639882	34.0482804057368	34.4656	38.8185
9.70694346441172	33.6861855624574	32.7353	38.4372
9.99323420745628	33.3244876249041	31.4339	43.8079
10.276298417027	32.9597090983313	26.2003	42.5604
10.5592574577275	32.5932401595073	23.6339	40.0124
10.8430803492305	32.2261664502808	22.7183	34.3604
11.1282829627105	31.8603075558692	23.2874	32.7742
11.4148797877585	31.4959010382241	25.7714	33.2927

Solution x	Solution y	Original x	Original y
11.7023556050878	31.1323409578602	29.1053	29.2049
11.9899357026817	30.7706081731935	31.6686	31.1822
12.2767242962805	30.4094151553863	36.8488	32.2474
12.5589308326156	30.0472274405964	37.7688	31.4408
12.8360659165623	29.6840747301816	37.0272	27.4581
13.1097604022464	29.3219593664479	42.4972	23.9973
13.1097603527166	29.3219592954689	38.2173	22.874
13.109760302874	29.3219592317241	36.0033	17.5038
13.109760252909	29.3219591517401	34.4638	23.0393
13.1097602027585	29.321959081238	31.0765	22.0815
13.1097601525636	29.3219590046114	27.4222	25.8428
13.1097601024032	29.3219589340114	25.8125	25.1372
13.1097600522999	29.3219588677433	26.0672	21.3383
13.1097600022173	29.3219587983345	27.2482	20.2425
13.1097599520744	29.3219587317774	27.3595	17.3028
13.1097599018462	29.3219586594374	25.7178	17.895
13.1097598515915	29.3219585928903	22.6997	14.9199
13.1097598014292	29.3219585268458	25.6231	12.6549
13.1097597512012	29.3219584699252	26.7979	6.90196
13.1097597008998	29.3219583943538	21.4744	8.21886
13.1097596506742	29.3219583359536	23.5387	4.13129
13.1097596004629	29.3219582726653	21.7245	2.01127
13.1097595503126	29.3219582098396	19.7287	0.198716
12.7351358421484	29.4451719767158	19.0116	0.977048
12.3523735936759	29.5729084698861	12.7116	4.29147
11.9717546217802	29.7020391844273	12.6307	2.70835
11.5929295627046	29.8334117711705	10.9477	2.73525
11.2168183883098	29.9672463032218	9.0496	1.67955
10.8462459833165	30.1060180452339	8.57052	3.36732
10.4792641221313	30.2473584590424	4.96047	4.06059
10.1180707627181	30.3913077861431	0.219756000000004	2.58493
9.81641193911683	30.5687034088584	2.00806	6.28968
9.51882789255996	30.748786108046	0.613562000000002	12.2624
9.22415760317384	30.9294448651523	2.19732	10.251
8.93205841133059	31.1112665352691	6.43447000000001	8.70233
8.64162256168612	31.2948328759986	10.9524	12.0779
8.35207333870292	31.4793292384358	14.8737	9.51072
8.06271893879739	31.6658922844949	17.1854	11.1942
7.77319200035549	31.8543099770527	17.2907	17.3232
7.48376419917824	32.0431635486528	15.6444	17.8995
7.19456116348823	32.2326394833642	15.6993	18.7479
6.9053947294296	32.4229083724491	9.96077	19.2347
6.61714802136332	32.6142577571916	13.4	22.8874
6.32929193079693	32.8062323450427	15.3759	23.0999
6.04151012703234	32.9990613506597	15.3897	25.3897
5.75392916363086	33.1926323133309	20.3288	28.022
5.46540470760854	33.3866590682761	19.247	29.2712
5.17632281349648	33.5812710934487	19.5262	30.4483
4.88665964793975	33.7765079416236	17.6023	36.5196
4.5967811502143	33.9714502662983	17.5856	40.8861
4.30646926049475	34.1652932255914	15.6372	44.5891
4.01588641264468	34.3575363669129	13.4598	41.6191
3.72544546660059	34.5493433913394	12.2621	43.6923
3.43493680802416	34.740723593892	9.27453	43.3967
3.14497983697666	34.9321862384854	7.21925	42.3799
2.85744138522442	35.1241281333336	8.75416	38.928
2.57385611945499	35.3165963648164	11.4258	37.7412
Route: 4 Length: 225.753301916833 Demand Met: 800			
8.04599430911003	54.1731998151182	27.1361	73.6904
11.9080618987208	61.7568147225683	23.3569	85.0798
15.4072964195144	66.8410273896952	18.064	96.3276
17.7284786136124	67.3383937057154	23.1083	96.0553
19.6043770072643	67.721998641124	27.8353	94.5623
21.3236540861904	68.0812533793814	27.9893	89.6021
23.0380715631987	68.4369767033232	28.4623	90.5817
24.7557523270889	68.7886042438675	29.5533	92.3189
26.4772939587159	69.1345209609716	32.5896	90.759
28.2003338932411	69.4767146141532	33.1283	92.3481
29.9307393815536	69.8143709581215	34.7487	93.2543
31.66820509965	70.1470233891207	34.7579	99.7518
33.1390505870827	70.3393084572012	40.4171	94.2218
34.597176912129	70.529752586871	44.9959	88.3516
36.0477625742911	70.7200184976562	48.934	88.5471
37.4749015698338	70.9097792565789	50.0418	88.5256
38.8830975233929	71.0990150039327	50.9984	83.4341
40.2872604228662	71.2886946270342	54.169	81.8375
41.6803285522715	71.4788825393699	54.7886	87.0165
43.0578490056871	71.6687645828693	53.7144	89.3849
44.4289565842311	71.8581196155617	51.2472	90.6526
45.8104645254919	72.0470497890177	49.8328	92.6571

Solution x	Solution y	Original x	Original y
47.2118639861108	72.2353654147983	48.9418	95.7946
48.6416813258582	72.4223326695802	48.6626	98.7924
50.1109360239881	72.606258810825	51.8363	98.9629
51.6064079766264	72.7871553621832	54.3707	99.6057
53.1170314299822	72.9644345809243	54.8665	95.2849
54.6598431487066	73.1410023491939	58.0371	93.3465
56.2294146835131	73.317282245541	59.3326	96.8644
57.8244355170207	73.4923935730448	65.9332	98.9174
59.3885573681886	73.6644495233546	68.0526	97.9535
60.9297265847596	73.8343880138816	68.3546	93.0491
62.4848196173164	74.0041474534192	74.1314	97.2935
63.9884208983866	74.1716896011352	75.6359	99.7073
65.3876841929791	74.334239529554	75.4786	92.9344
66.7880974791146	74.4963021551905	75.6586	91.7899
68.1983520221314	74.6581030947202	77.8131	90.2453
69.6175874526664	74.8197974548677	80.7777	87.9354
71.0429098396269	74.9816716526095	83.5669	88.2708
72.4690185483386	75.1437157280453	86.1563	95.4019
73.8609145028418	75.3044240126055	87.9339	96.7331
75.2049351742206	75.463365784196	96.3227	96.5824
74.9686440466091	75.1023021939599	91.0373	94.8618
74.7300552422979	74.7339186942436	92.7385	89.9534
74.4890382530565	74.3620384473459	91.8947	87.6684
74.2460897338219	73.9879603848529	84.4594	85.6238
74.0041613752508	73.6139019291391	85.2864	82.465
73.7617259499794	73.2400825282098	82.6909	80.2719
73.5192646061611	72.8669855154268	79.6042	79.6519
73.2777605602471	72.4946492068815	80.8889	76.3527
73.0368698322263	72.1237148688583	80.9911	75.8316
72.7970926868073	71.7542040130629	84.0931	75.7357
72.5578100792522	71.3857945525925	86.1254	75.412
72.3189356369967	71.0184419696712	87.0562	74.7862
72.0808636425887	70.6523859695956	89.1084	77.1611
71.8434397718109	70.2866291565132	95.4573	78.5053
71.6020327809281	69.9188792612231	95.1537	79.2325
71.3572253350046	69.5488638288257	98.0879	82.1977
70.8601228435999	68.9608329704321	98.0725	73.509
70.3378269729562	68.3699174833616	97.9153	71.697
69.7829837826223	67.7772516134352	94.2046	73.3577
69.2148960827338	67.182147647233	93.4248	68.5015
68.6349588182472	66.5890274554493	96.3481	58.4969
67.9309181164987	66.0285664635878	85.3959	62.1638
67.2275755346751	65.4733239385668	88.5712	66.6382
66.5130152658902	64.9194943804756	82.5413	70.9361
65.7976445224784	64.3652822687244	78.2186	68.7569
65.0863094884401	63.81264908407	78.9206	73.8168
64.3752251285742	63.258323329481	78.3667	74.2083
63.663889145409	62.7020477371894	76.2214	75.1456
62.9543837642946	62.1436408522272	77.5352	78.0347
62.2409615828444	61.5789496663153	75.9957	81.402
61.5204961226225	61.0012337364843	74.5996	81.8744
60.7925077367656	60.4077399435485	73.8931	82.0767
60.0535505842988	59.7938511035256	66.7645	81.0279
59.3186996958953	59.1682286615674	63.6977	85.2552
58.5854827077814	58.5031775045884	61.8453	80.8454
57.8587949254923	57.8220098533951	60.2539	80.1704
57.1393278225875	57.1239171260138	60.7208	77.8844
56.4255761928916	56.4122635940623	59.2712	76.4167
55.7188204732238	55.6884098057095	61.6789	74.8507
55.0152291232702	54.9522124239294	60.356	72.3736
54.3163987243506	54.206805578409	60.9907	71.4945
53.620653651921	53.4511457878993	60.771	67.3196
52.9284106496828	52.6900451735335	59.9164	61.9972
52.2405637409395	51.9287025252375	58.3448	60.9201
51.5581956900836	51.1676724832772	59.9164	58.75
50.8797915829182	50.4083003314509	64.2573	58.953
50.2002092632238	49.6487419888769	64.8783	60.379
49.5180566482882	48.8860500165998	65.3011	67.1869
48.8249262618868	48.0986190312222	65.9297	69.3415
48.0966362638968	47.2389929909752	66.9764	66.2314
47.3334351349137	46.3178296832301	69.9395	64.1832
46.3764977213339	45.1599974979356	69.1414	57.6653
45.3633065586491	43.951288600999	70.983	56.1077
44.0948757392417	42.5788066661426	69.3672	55.5594
42.3974225357364	40.9644363016987	67.8108	54.6502
39.229579877171	38.7761452389401	62.6521	52.6724
Route: 5 Length: 124.420591992936 Demand Met: 800			
16.7826705458486	35.5085801506458	42.987	22.9253
19.5170473403126	35.5086602645644	41.7205	19.4188
21.7984939794483	35.5087403782252	39.9475	19.2268

Solution x	Solution y	Original x	Original y
23.9729892637741	35.50882050074	43.8962	13.6901
24.9463627837822	35.5089006403612	49.4045	19.961
25.7351985159935	35.5089807935325	47.6864	20.3976
26.4925941173048	35.5090609450911	47.6331	25.3181
27.2377876733576	35.509141101694	46.0829	25.5503
27.9767277798334	35.5092212553915	44.5404	30.686
28.7139301107495	35.5093014126962	49.1148	32.8614
29.444896104629	35.5093815727028	55.099	31.771
30.150285930073	35.5094617309822	56.0389	33.1015
30.8312730554517	35.5095418895885	60.6972	35.5066
30.674451382577	36.5846319441529	56.9788	35.9946
30.5162319259207	37.6653212069596	55.5492	35.9315
30.357053153217	38.7543286731845	55.717	37.8511
30.1967186959343	39.8500029993466	47.522	42.292
30.036351153289	40.947950901518	46.2037	41.7062
29.8759681017188	42.0502355672731	38.1612	45.7549
29.7158945557183	43.1550199239507	38.5534	48.7846
29.5560571889529	44.2607277310037	37.4105	49.4356
29.3964867170168	45.3680952232193	41.6783	52.1535
29.236985506725	46.4750430204209	44.4217	55.3301
29.0773906143048	47.5781471712649	43.5841	58.7522
28.9177242223204	48.6745234145605	41.7302	58.1199
28.7581202903078	49.7679104028228	40.6271	60.1839
28.5986520873458	50.8577002368595	48.6743	62.5481
28.438695577545	51.933564161826	56.0439	62.2937
28.2610530545741	52.7949577453336	51.793	64.9464
28.0817217769993	53.6365267721723	52.5118	68.1256
27.8978148982733	54.4234668371929	47.6475	71.1843
27.7127226601265	55.1901578042798	46.3399	71.17
27.5268647255303	55.9436719046812	45.2184	66.3382
27.3407290205784	56.6941306095733	42.1545	66.9856
27.154552321937	57.4427750782374	43.1006	68.5786
26.9681913042218	58.1885909264707	35.9094	68.8825
26.7820894701225	58.933621505469	41.4131	74.8199
26.5957392004829	59.6714799105504	38.4806	81.2568
26.4090501706499	60.3918660514572	41.546	82.3742
26.2212252814473	61.0838874309289	43.0779	81.6476
26.0321308504437	61.7523669183149	43.9629	81.9344
25.8414087432695	62.3962116914495	45.6946	80.9262
25.6486757370901	63.0179632658214	45.1636	79.7971
25.4547668229726	63.6280691557707	50.5772	79.5094
25.1798780422819	64.0135351643062	48.3206	81.4332
24.8874744433803	64.3759483420967	47.7087	83.4773
24.2351366760497	64.6059977893092	43.3068	85.4106
23.541149423895	64.8306273292231	40.7053	85.7824
22.8248228676904	65.0522459935247	37.7453	86.3505
22.0953425222641	65.2717530610653	36.723	86.3354
21.3540309109262	65.4893858015038	32.7208	86.88
20.6075452300591	65.7056467997458	34.4937	83.7515
19.8557369311325	65.9210686765856	34.9224	79.9328
19.0998987912394	66.1361084675622	29.8827	79.684
18.3439063519123	66.3509472878838	26.7929	78.8352
17.5892380211937	66.5656839405646	25.7615	81.4539
16.8355441407083	66.7801228869283	23.3293	78.9181
16.0839556368205	66.9944755825305	20.7262	75.308
15.3353518791256	67.2089723517163	17.2306	77.2747
14.590560048859	67.4235597145945	16.8354	77.4785
13.8493701941339	67.638252595588	16.5471	81.1813
13.1114428701037	67.8528699981929	19.5225	82.1483
12.3751296494392	68.067336874156	18.6101	90.3489
11.6384499832696	68.2805967482729	12.3803	91.1149
10.9054704623875	68.4927678789333	15.2733	95.1553
10.1696098951959	68.701534665333	16.7243	94.3593
9.42880124333567	68.907686387026	16.854	97.4806
8.52081407378063	69.0868828538984	12.7313	98.6134
3.57820285783245	69.1706729410164	3.57801000000001	99.0366
3.57708800843236	68.7907747052702	0.299018000000004	97.3272
3.57597319288476	68.3774898962203	3.24988	93.8751
3.57485838347962	67.9559418113092	4.45068999999999	94.0863
3.57374357612494	67.5238247844163	4.28894	92.6489
3.57262877316798	67.0834622720543	3.35356	88.986
3.57151397942113	66.6390468117615	3.06059000000001	88.1315
3.57039919586651	66.1907807778839	1.02508	82.9527
3.56928442740774	65.7409940892658	8.89064000000001	83.8954
3.56816966059341	65.288920022673	10.1219	82.045
3.56705489476869	64.8349813145542	4.99968	74.2733
3.56594014116968	64.381152817714	14.0141	70.4084
3.56482538862929	63.9278035379985	16.576	71.2313
3.56371063447241	63.4745640755239	23.7167	70.7298
3.56259586037936	63.0207406177989	24.7619	69.8637

Solution x	Solution y	Original x	Original y
3.56148106292704	62.5662422740814	23.6206	68.344
3.56036624774646	62.1115424511873	19.6656	61.3862
3.55925142835781	61.6581809231919	23.2085	58.8069
3.55813659489894	61.2066221215029	24.5176	59.5849
3.55702174402104	60.7565924761139	25.6513	60.6643
3.55590687350008	60.3076914923758	31.2678	61.1344
3.55479189914152	59.8591754890752	32.641	61.5676
3.55367663212513	59.4070391868937	33.4192	59.483
3.2507138154167	53.8003824717541	30.6696	55.2626
2.93885848346972	48.2171487305047	30.4468	53.5688
2.61426133461012	41.8741224582502	28.6889	43.6077

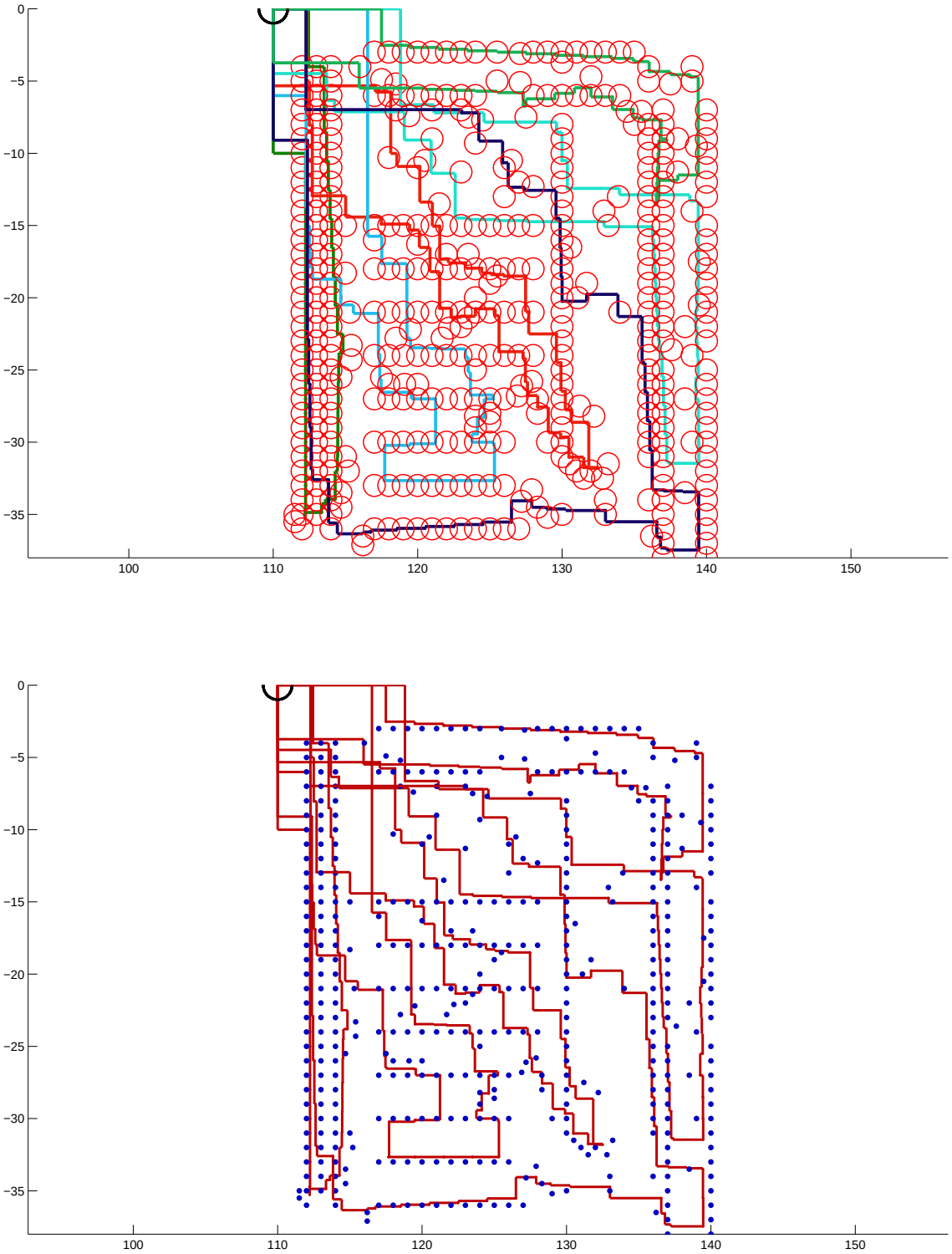


Figure O.124: $pcb442$, $r = 0.76$, Equal Radius, 2D, Manhattan, Length = 647.7184586

Table O-127: Solution for *pcb*442, $r = 0.76$, Equal Radius, 2D, Manhattan

Total distance: 647.718458614654			
Total demand met: 1100			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 80.2537018142995 Demand Met: 184			
2.44366395510151	4.00697893751349	2	4
2.44366395510151	4.00697893751349	3	4
3.53278643816459	8.49513308480291	4	8
3.53278643816459	8.49513308480291	4	9
3.69134117623135	10.4987547111235	4	10
3.69134117623135	10.4987547111235	4	11
3.81869479767904	12.4989204642159	4	12
3.81869479767904	12.4989204642159	4	13
3.93567497068833	14.4988533558351	4	14
3.93567497068833	14.4988533558351	4	15
4.04976099610325	16.4987255751114	4	16
4.04976099610325	16.4987255751114	4	17
4.16628148927816	18.4986322314105	4	18
4.16628148927816	18.4986322314105	4	19
4.29215769712167	20.4987548832501	4	20
4.29215769712167	20.4987548832501	4	21
4.44448255614073	22.4942325291566	4	22
4.44448255614073	22.4942325291566	4	23
4.82763579137891	23.7999999763787	5.40000000000001	23.3
4.82763579137891	23.7999999763787	5.40000000000001	24.3
4.55130845753223	24.5021305817036	4	24
4.55130845753223	24.5021305817036	4	25
4.5266263180153	25.8398510635206	4	26
4.5266263180153	25.8398510635206	4.7	25.5
4.50248709115672	27.5008909455344	4	27
4.50248709115672	27.5008909455344	4	28
4.48243413752093	29.4970008948897	4	29
4.48243413752093	29.4970008948897	4	30
4.46454805839717	30.9303899873318	4	31
4.46454805839717	30.9303899873318	5	31
4.4465574478419	32.0016698811118	5.2	32
4.28347259357228	33.9443823211099	4.7	33.5
4.28347259357228	33.9443823211099	4.7	34.5
3.61861055296455	34.252131551992	3	34
3.61861055296455	34.252131551992	4	34
3.3436934580637	34.8653253272628	3	35
3.3436934580637	34.8653253272628	4	35
2.21052228035806	35.2697374242585	1.5	35.5
2.21052228035806	35.2697374242585	2	36
2.21052222102706	34.7302612155686	2	34
2.21052222102706	34.7302612155686	1.5	35
2.21052222102706	34.7302612155686	2	35
2.23999960635723	32.9999999177123	2	33
2.23999960635723	32.9999999177123	3	33
2.23999970718613	31.000000083682	2	31
2.23999970718613	31.000000083682	3	31
2.23999977143031	30.0000005712496	2	30
2.23999977143031	30.0000005712496	3	30
2.23999981688377	28.0000000528816	2	28
2.23999981688377	28.0000000528816	3	28
2.23999984861076	26.9999999677287	2	27
2.23999984861076	26.9999999677287	3	27
2.23999987368364	25.0000001049605	2	25
2.23999987368364	25.0000001049605	3	25
2.23999989000065	24.0000000257628	2	24
2.23999989000065	24.0000000257628	3	24
2.2399998985876	21.9999997702518	2	22
2.2399998985876	21.9999997702518	3	22
2.23999990934439	21.000000036734	2	21
2.23999990934439	21.000000036734	3	21
2.23999991253937	19.9999999730988	2	20
2.23999991253937	19.9999999730988	3	20
2.23999990799446	19.0000000334787	2	19
2.23999990799446	19.0000000334787	3	19
2.23999989595151	16.0000000106537	2	16
2.23999989595151	16.0000000106537	3	16
2.23999987425459	11.9999999494176	2	12
2.23999987425459	11.9999999494176	3	12
2.23999983295612	11.0000000560383	2	11
2.23999983295612	11.0000000560383	3	11
2.23999976117641	9.99999994167958	2	10
2.23999976117641	9.99999994167958	3	10
Route: 2 Length: 109.786682941151 Demand Met: 184			
2.29704470127922	4.98327102076323	2	5
2.29704470127922	4.98327102076323	3	5
2.49866137509633	8.03659602272646	2	8
2.49866137509633	8.03659602272646	3	8
2.69997709470718	12.9380606398191	2	13
2.69997709470718	12.9380606398191	3	13
5.01107434501448	14.4109297461433	5	15
7.48585402456114	14.894628848579	7	15
7.48585402456114	14.894628848579	8	15
9.44051378479145	15.3077754042883	9	15
9.44051378479145	15.3077754042883	10	15
10.1157446520796	16.5172245718457	10	16.3
10.8540301349803	18.1904631566703	11	18
11.5201802009363	20.7275435869667	11	21
11.5201802009363	20.7275435869667	12	21
12.3256197193011	21.3504505571493	13	21
12.3256197193011	21.3504505571493	12.2	22.1
13.051084489852	21.2728969987542	13.5	21.4
13.051084489852	21.2728969987542	13	22
14.0000000377222	20.7600033136879	14	20
14.0000000377222	20.7600033136879	14	21
15.3600640251006	21.2417385692599	15	21
15.3600640251006	21.2417385692599	16	21
15.6301011840391	23.732555549723	15	24
15.6301011840391	23.732555549723	16	24
17.305482479074	24.1612690606568	17	24
17.305482479074	24.1612690606568	18	24
17.4569431179485	25.7924465680762	17.2	26.1
17.4569431179485	25.7924465680762	17.9	25.8
17.6021920212236	26.7688303234094	16.9	26.8
18.3089068841039	27.5665094440496	18.3	27
18.3089068841039	27.5665094440496	18.3	28
19.0441253588114	29.3407077607849	19	30
19.8989246841934	29.6478454547208	20	29
19.8989246841934	29.6478454547208	20	30
20.4739280023807	31.0336955194333	20	31
20.4739280023807	31.0336955194333	20.5	31.5
21.4982342681426	31.755391442923	21	32
21.4982342681426	31.755391442923	21.5	32.5
21.4982342681426	31.755391442923	22	32
22.5020672739949	31.8008269531188	23.2	31.5
22.5020672739949	31.8008269531188	22.8	32.5
21.8492674019715	28.6163739584703	22.2	28.2
20.6314497866538	27.7655152795196	20	28
20.6314497866538	27.7655152795196	21.2	27.5
20.2191185566333	26.4750524776752	20	26
20.2191185566333	26.4750524776752	20	27
19.9238083374248	24.4973721243692	20	24
19.9238083374248	24.4973721243692	20	25
19.6054792932507	22.5052443626332	20	22
19.6054792932507	22.5052443626332	20	23
17.6914162781106	20.9667880078006	17	21
17.6914162781106	20.9667880078006	18	21
17.4729066578727	18.4994724962181	17	18
17.4729066578727	18.4994724962181	18	18
15.9202295113724	18.3910083166571	15.5	18.5
15.9202295113724	18.3910083166571	16	18
15.0474105475457	18.2866160385545	15	19
14.4259511533807	17.947805314712	14	18
14.4259511533807	17.947805314712	15	18
13.3028936246065	17.5865327782668	13.5	17
13.3028936246065	17.5865327782668	13	18
12.1222720625396	17.3228296911947	12	17
12.1222720625396	17.3228296911947	12	18
11.5282796477228	15.0431764944779	11	15
11.5282796477228	15.0431764944779	12	15
11.0155403163706	13.3787130650125	11.5	13.5
10.1474101058295	10.9107687027063	10.5	10.5
10.1474101058295	10.9107687027063	10	11
8.55793603591854	10.0084629476659	8	10.3
8.13131257573473	5.75727497180081	8.5	5.2
8.13131257573473	5.75727497180081	8	6
7.06784586686061	5.32525864358059	7.5	4.9
7.06784586686061	5.32525864358059	7	6
Route: 3 Length: 122.520882719819 Demand Met: 183			
8.81410977520279	6.63086831411131	9	6
8.81410977520279	6.63086831411131	8.5	7
11.1376845140544	7.19717418966215	11	7
14.5924678886578	7.83701435239818	14.5	7.7

Solution x	Solution y	Original x	Original y
19.6143159967032	8.53686982212014	20	8
19.6143159967032	8.53686982212014	20	9
19.9904669942605	10.4986784820472	20	10
19.9904669942605	10.4986784820472	20	11
20.3621424433984	12.4290970838025	20	12
20.3621424433984	12.4290970838025	20	13
23.9712143580653	12.8725908910173	23.9	13
28.844826605263	13.2933575388034	29	14
29.370747097381	13.390933175888	30	13
29.4276351638846	15.5000000632228	30	15
29.4276351638846	15.5000000632228	30	16
29.4276352653891	17.499999731752	29.5	17.5
29.4276352653891	17.499999731752	30	17
29.4276352653891	17.499999731752	30	18
29.4276350058936	19.500000277401	30	19
29.4276350058936	19.500000277401	30	20
29.347769970302	20.8572927846719	29.5	20.5
29.347769970302	20.8572927846719	30	21
29.2600010923497	21.9999963006657	28.5	22
29.2600010923497	21.9999963006657	30	22
29.3256452378923	23.0170469871596	30	23
29.3750080024487	24.127874786555	29	24
29.4276176184233	25.4999968956294	30	25
29.4276176184233	25.4999968956294	30	26
29.2600025117664	26.9999993925457	28.5	27
29.2600025117664	26.9999993925457	30	27
29.4401940243972	28.499713519421	30	28
29.4401940243972	28.499713519421	30	29
29.4514030316403	30.0015474820182	29	30
29.4514030316403	30.0015474820182	30	30
29.4625904090914	31.4626016711219	30	31
29.4625904090914	31.4626016711219	30	32
27.3705521993922	31.3733165944372	27	31
27.3705521993922	31.3733165944372	27	32
27.2435677585239	29.4947800757999	27	29
27.2435677585239	29.4947800757999	27	30
27.1311014045812	27.4977048658796	27	27
27.1311014045812	27.4977048658796	27	28
27.0245022845289	25.5054397737946	27	25
27.0245022845289	25.5054397737946	27	26
26.9189867496166	23.7284347244481	27.6	23.6
26.7289993708052	22.9786608336298	26	23
26.7289993708052	22.9786608336298	27	23
26.6622642112811	21.9960528634187	26	22
26.6622642112811	21.9960528634187	27	22
26.6044849744711	20.9981887052547	26	21
26.6044849744711	20.9981887052547	27	21
26.5500938688728	19.9985281991955	26	20
26.5500938688728	19.9985281991955	27	20
26.497019265475	18.9987235526309	26	19
26.497019265475	18.9987235526309	27	19
26.4439225243124	17.9992143589752	26	18
26.4439225243124	17.9992143589752	27	18
26.3894582708178	17.0011724782059	26	17
26.3894582708178	17.0011724782059	27	17
26.3315121050634	16.0115533061992	26	16
26.3315121050634	16.0115533061992	27	16
26.2641989959894	15.0836404912518	26	15
26.2641989959894	15.0836404912518	27	15
22.9134720078002	14.7344489169924	22.9	14
22.9134720078002	14.7344489169924	23.2	15
17.5184913856529	14.6644453413755	17	15
17.5184913856529	14.6644453413755	18	15
15.5002172187145	14.5853138193829	15	15
15.5002172187145	14.5853138193829	16	15
13.50352625414	14.483206583817	13	15
13.50352625414	14.483206583817	14	15
12.6011965282952	11.3837612083835	13	11.3
10.9312916664088	9.07986883595094	11	9
9.07627827489857	7.12393976999933	9.40000000000001	7.4
4.23563293737689	6.35053409811446	4	6
4.23563293737689	6.35053409811446	4	7
3.67989767648656	4.47939504734517	4	4
3.67989767648656	4.47939504734517	4	5
Route: 4 Length: 106.041135403587 Demand Met: 182			
6.53166389397562	15.7430721041929	7	16
7.51726489588518	17.6364246498119	7	18
7.51726489588518	17.6364246498119	8	18
9.24259062774405	18.0118080985898	9	18
9.24259062774405	18.0118080985898	10	18

Solution x	Solution y	Original x	Original y
9.25078545110055	20.9937567513297	9	21
9.25078545110055	20.9937567513297	10	21
9.25757754824687	22.7877217484092	8.5	22.8
9.25757754824687	22.7877217484092	9.5	22.2
9.50409723808602	23.4571106648764	9	24
9.50409723808602	23.4571106648764	10	24
10.8176375488636	23.5018201743199	11	24
11.7282772767359	23.5448135136561	11.7	22.8
11.7282772767359	23.5448135136561	12	24
13.3043031820862	24.094911958938	13	24
13.3043031820862	24.094911958938	14	24
13.4937507948411	25.153394664569	14	25
13.6544946704433	26.7249331962593	13	27
13.6544946704433	26.7249331962593	14	27
15.2399961749306	26.9999998861634	15	27
15.2399961749306	26.9999998861634	16	27
14.6158149607296	28.2528912427798	14	28.2
14.6158149607296	28.2528912427798	15	28
14.6158149607296	28.2528912427798	15	28.6
14.1319309077848	29.4222706362331	14	29
14.1319309077848	29.4222706362331	14	30
13.7600038853159	30.0000286583309	13	30
15.2766592770058	30.1713826168411	15	30
15.2766592770058	30.1713826168411	16	30
15.3202123972562	32.6601539227737	15	33
15.3202123972562	32.6601539227737	16	33
13.495529300562	32.6601539176139	13	33
13.495529300562	32.6601539176139	14	33
11.4995273613079	32.6601539106792	11	33
11.4995273613079	32.6601539106792	12	33
9.50348975613964	32.6601539020571	9	33
9.50348975613964	32.6601539020571	10	33
7.67978728466402	32.6601538915473	7	33
7.67978728466402	32.6601538915473	8	33
7.71643473955518	30.217211545234	7	30
7.71643473955518	30.217211545234	8	30
9.49734263872283	30.1062586246097	9	30
9.49734263872283	30.1062586246097	10	30
11.2399961775921	29.9999579782552	11	30
11.2399961775921	29.9999579782552	12	30
11.2399963768127	26.9999983830472	11	27
11.2399963768127	26.9999983830472	12	27
9.56165888238581	26.5840373533885	9.09999999999999	26
9.56165888238581	26.5840373533885	10	26
9.42802450374222	26.5448560113632	9	27
9.42802450374222	26.5448560113632	10	27
7.54034098772421	26.4890710669635	7	27
7.54034098772421	26.4890710669635	8	27
7.46337917522898	25.6957024989215	7.5	25.5
7.46337917522898	25.6957024989215	8	26
7.37605360799012	23.9460628810562	7	24
7.37605360799012	23.9460628810562	8	24
7.27639921647918	21.0859290483802	7	21
7.27639921647918	21.0859290483802	8	21
5.54816062575902	20.4943013213788	5.3	21
4.67012972280982	18.7069922578179	5	18.3
2.72135953356731	17.9673024596609	2	18
2.72135953356731	17.9673024596609	3	18
2.60331001563841	16.9044181615937	2	17
2.60331001563841	16.9044181615937	3	17
2.49962378189109	15.0707057260036	2	15
2.49962378189109	15.0707057260036	3	15
2.39598901044567	13.8437211426776	2	14
2.39598901044567	13.8437211426776	3	14
2.27674858834652	6.00267235141078	2	6
2.27674858834652	6.00267235141078	3	6
Route: 5 Length: 139.37039134822 Demand Met: 184			
2.2678940371941	6.97705058367119	2	7
2.2678940371941	6.97705058367119	3	7
13.0522373144375	7.1961703686577	13	7
13.0522373144375	7.1961703686577	13.5	7.5
14.2308091294379	9.14868177732153	14	9.3
15.8831668687708	10.6540284247662	16.5	10.5
15.8831668687708	10.6540284247662	16	11
16.2671899500971	12.3513437343324	16	13
17.4091671773805	12.5636309579988	17	12
17.4091671773805	12.5636309579988	18	12.3
19.578184588838	14.5006115896803	20	14
19.578184588838	14.5006115896803	20	15
19.8652642182309	16.4993592818211	20	16

Solution x	Solution y	Original x	Original y
19.8652642182309	16.4993592818211	20	17
19.8652642182309	16.4993592818211	20.6	16.5
19.9330397793889	18.4899530086452	20	18
19.9330397793889	18.4899530086452	20	19
19.9999914008562	20.2399997196427	20	20
19.9999914008562	20.2399997196427	20	21
21.7000004006009	19.7600003128603	21.7	19
21.7000004006009	19.7600003128603	21.1	20
23.8705734173329	21.2988013756417	24	21
25.540462901657	24.4960699503624	26	24
25.540462901657	24.4960699503624	26	25
25.7432134895842	26.498960327162	26	26
25.7432134895842	26.498960327162	26	27
25.9111078820779	28.4990288153934	26	28
25.9111078820779	28.4990288153934	26	29
26.0715293538308	30.5139615308951	26	30
26.0715293538308	30.5139615308951	26	31
26.2388020199042	33.3012411011365	26	34
27.0847700684278	33.3726556808564	27	33
27.0847700684278	33.3726556808564	27	34
28.3530653595288	33.4373760860122	28.5	33.5
29.4385243044702	33.5018721372904	30	33
29.4385243044702	33.5018721372904	30	34
29.4523017676578	35.4996227129197	30	35
29.4523017676578	35.4996227129197	30	36
29.4625972865128	37.4625997257123	30	37
29.4625972865128	37.4625997257123	30	38
27.2250102764537	37.3250788293912	27	38
26.8138744233285	36.5769978156455	26.2	36.5
26.8138744233285	36.5769978156455	27	37
26.5602009694179	35.5091432030407	27	35
26.5602009694179	35.5091432030407	27	36
23.0055270600393	34.7252449977965	23	34
23.0055270600393	34.7252449977965	23	35
20.2507401963819	34.6179275855668	20	35
18.8876810132818	34.5038212139865	18.3	34.5
18.8876810132818	34.5038212139865	19	35.2
17.9000005861949	34.0600003812282	17.9	33.3
17.9000005861949	34.0600003812282	17.2	34.1
16.4959879074818	35.526837139671	16	36
16.4959879074818	35.526837139671	17	36
14.4991485987853	35.6961072228585	14	36
14.4991485987853	35.6961072228585	15	36
12.4992910954652	35.8337389157472	12	36
12.4992910954652	35.8337389157472	13	36
10.4998125142069	35.9612219441359	10	36
10.4998125142069	35.9612219441359	11	36
8.5079672822216	36.0869301716351	8	36
8.5079672822216	36.0869301716351	9	36
6.74845119229268	36.2177408011797	6.2	36.5
6.74845119229268	36.2177408011797	7	36
6.20000348673263	36.3399996363306	6.2	37.1
4.43712424763586	35.5911025063591	4	36
3.82815242843692	32.5961782035138	4	32
3.82815242843692	32.5961782035138	4	33
2.72553897201311	31.9192684583472	2	32
2.72553897201311	31.9192684583472	3	32
2.62685544511446	28.9943852401627	2	29
2.62685544511446	28.9943852401627	3	29
2.53992347895694	25.9938301072379	2	26
2.53992347895694	25.9938301072379	3	26
2.45546377261246	22.9200558186667	2	23
2.45546377261246	22.9200558186667	3	23
2.36822606649564	9.09304459561811	2	9
2.36822606649564	9.09304459561811	3	9
Route: 6 Length: 89.7456643875782 Demand Met: 183			
7.49442272308737	2.52576966114202	7	3
7.49442272308737	2.52576966114202	8	3
9.49841496785734	2.67540647739781	9	3
9.49841496785734	2.67540647739781	10	3
11.4984103560284	2.79359350985982	11	3
11.4984103560284	2.79359350985982	12	3
13.4983796074053	2.90087348226796	13	3
13.4983796074053	2.90087348226796	14	3
15.501544005328	3.00408516049962	15.5	3
17.5504579406882	3.10733755341092	17.1	3.1
17.5504579406882	3.10733755341092	18	3
19.5919612011891	3.21265124790769	19	3
19.5919612011891	3.21265124790769	20	3
19.5919612011891	3.21265124790769	20	3.7

Solution x	Solution y	Original x	Original y
21.4986410874929	3.31093025929505	21	3
21.4986410874929	3.31093025929505	22	3
23.493160778307	3.42885717965667	23	3
23.493160778307	3.42885717965667	24	3
24.9439151504402	3.65270454194023	25	3
26.0274672372631	4.33837184639839	26	4
26.0274672372631	4.33837184639839	26	5
27.4875239487133	4.55939622628977	27.5	5.2
28.8989046915405	4.70054125550854	29	4
28.8989046915405	4.70054125550854	29	5
29.4276359933764	7.50000004378038	30	7
29.4276359933764	7.50000004378038	30	8
29.4276360049452	9.50000002984798	29.3	9.5
29.4276360049452	9.50000002984798	30	9
29.4276360049452	9.50000002984798	30	10
29.4276359835746	11.5000000276068	30	11
29.4276359835746	11.5000000276068	30	12
28.0155123485203	11.8713626524005	28	11.3
26.6995559276185	12.9326058074638	26	13
26.6995559276185	12.9326058074638	27	13
26.5374312326679	13.4626284182489	26	14
26.5374312326679	13.4626284182489	27	14
26.5737596946481	12.0561609360622	26	12
26.5737596946481	12.0561609360622	27	12
26.6117010925304	11.0041951957598	26	11
26.6117010925304	11.0041951957598	27	11
26.6532940295381	10.0206252176472	26	10
26.6532940295381	10.0206252176472	27	10
26.7056162259618	9.16121382653406	26	9
26.7056162259618	9.16121382653406	27	9
27.2399996341631	9.00000289603905	28	9
26.849281242871	7.6899084176754	27	7
26.849281242871	7.6899084176754	27	8
25.5080281633514	7.54673916216455	25	8
25.5080281633514	7.54673916216455	26	8
24.9159952238603	6.97176483664978	24.5	7.1
24.9159952238603	6.97176483664978	25.5	7.1
23.4908774325886	6.0963256431239	23	6
23.4908774325886	6.0963256431239	24	6
21.9999998329512	5.46000037806832	22	4.7
21.9999998329512	5.46000037806832	22	6
20.8583315427785	5.84737600925754	21	6
19.4840657568182	6.22495118601132	19	6
19.4840657568182	6.22495118601132	20	6
17.5000124750192	6.73999974716813	17.5	7.5
17.3106836025987	5.79933500410832	17.1	5.1
17.3106836025987	5.79933500410832	18	6
15.5107767949466	5.7015757416268	15.5	5
13.9955337786462	5.63778282667651	14	6
12.4945675128773	5.57206747449267	12	6
12.4945675128773	5.57206747449267	13	6
10.4973557492338	5.48583634891843	10	6
10.4973557492338	5.48583634891843	11	6
5.94842816617036	3.73520340040915	6	4

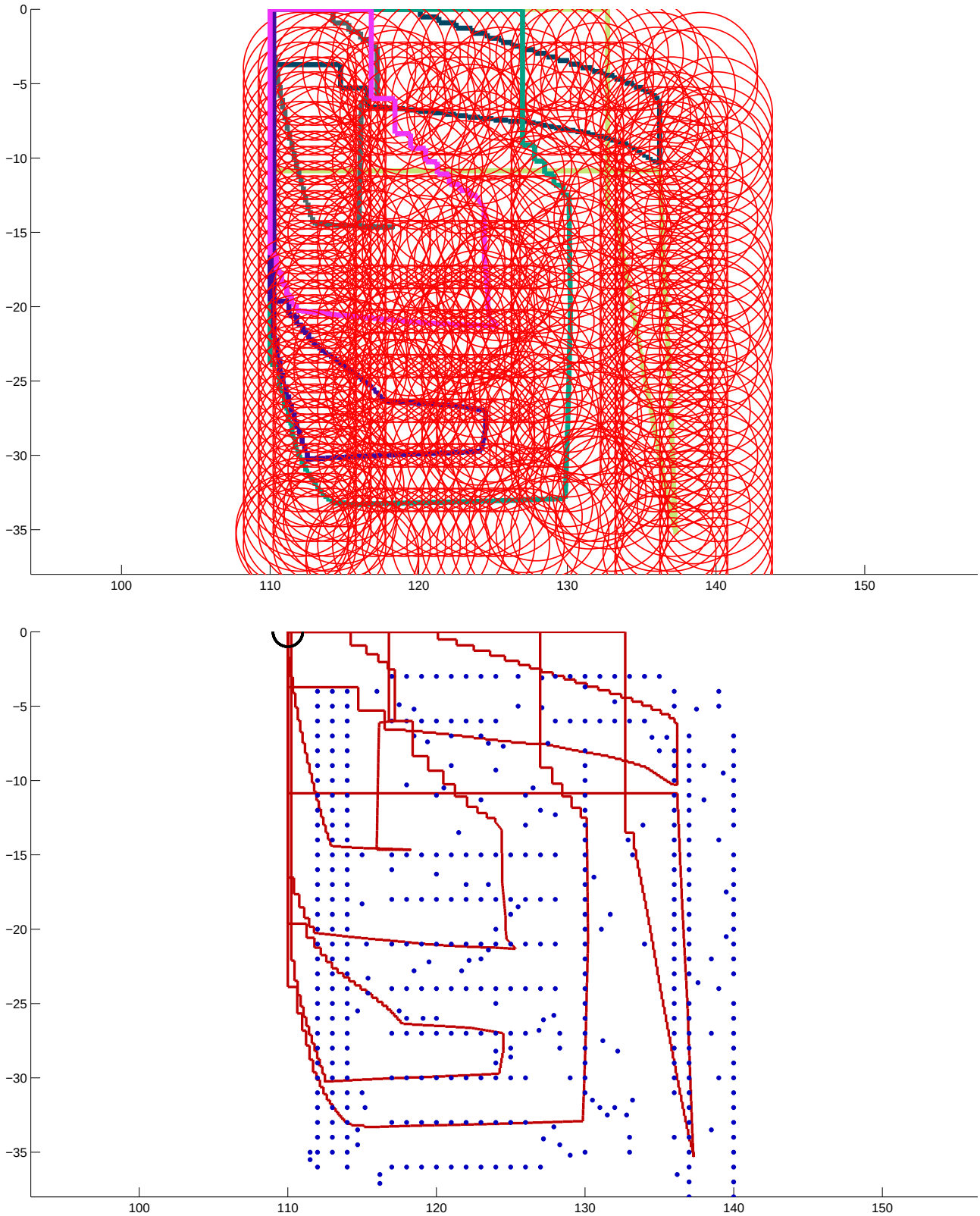


Figure O.125: *pcb*442, $r = 3.8$, Equal Radius, 2D, Manhattan, Length = 516.0989123

Table O-128: Solution for *pcb*442, $r = 3.8$, Equal Radius, 2D, Manhattan

Total distance: 516.098912326682			
Total demand met: 1100			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 125.251976598142 Demand Met: 184			
22.7037341080853	13.5073507049842	26	15
23.2842137696131	14.6332149501864	27	15
23.4297728896983	15.3399005066478	27	16
23.5457946075708	15.907437255971	26	16
23.6602649875509	16.4761264681	27	17
23.7675690627827	17.0149329227989	26	17
23.8739275466871	17.5572400750194	26	18
23.9794558243013	18.095172319908	27	18
24.0821446595589	18.640166839288	27	19
24.182508259465	19.1780072889064	26	19
24.282413409086	19.7223227746241	26	20
24.3819265745003	20.2663789631842	27	20
24.4800523635621	20.8211998744499	27	21
24.5770031405066	21.3764603351253	26	21
24.673746499686	21.9419523638821	26	22
24.770332241167	22.511467013155	26	23
24.8667947849605	23.0787507022704	26	24
24.9631549169033	23.6372010973781	26	25
25.0594206295519	24.1794924439834	27	25
25.1550957454536	24.712661152378	27	26
25.25016546273	25.2280963235712	26	26
25.3452915289484	25.7392756554424	26	27
25.4404875850952	26.2398594004533	27	27
25.535364507348	26.735377537006	28.5	27
25.6280653292741	27.2289369348255	27	28
25.7205589131048	27.7180506085257	26	28
25.8132634220884	28.2091703281601	26	29
25.9062061291636	28.6970785375028	27	29
25.9990795602087	29.1867882950536	27	30
26.0919050164125	29.672620635135	26	30
26.1850633652075	30.1604975816764	26	31
26.2785897712679	30.645087029528	27	31
26.3721904067811	31.1316517881838	27	32
26.46589204756	31.6146915400864	27	33
26.5597150332522	32.0875412817897	28.5	33.5
26.6528214367482	32.5436951785624	26	34
26.7465010584533	32.989520977617	27	34
26.8404285337415	33.4316385392516	27	35
26.9346358028107	33.8631150887201	27	36
27.0291466163209	34.2725869288993	26.2	36.5
27.1241984864477	34.6551878070034	27	37
27.2194581594286	35.0111625327192	27	38
27.3130006287386	35.3129876703323	30	38
27.2856411270626	34.9112030423894	30	37
27.2580163547082	34.369968431984	30	36
27.2301620665054	33.7385836655205	30	35
27.2021098651071	33.0456279429288	30	34
27.1738733253044	32.3114217886605	30	33
27.1454575188824	31.5523558885467	30	32
27.116862460928	30.7828387091663	30	31
27.0880841835547	30.0163217774992	30	30
27.0591143718419	29.2658721328	29	30
27.0300860224044	28.5020229482075	30	29
27.0008340862878	27.7138670616164	30	28
26.9713538478247	26.9155671808023	30	27
26.9416354831936	26.1212269118396	30	26
26.9116640719782	25.3453417249369	30	25
26.881417435038	24.6031816222761	30	23
26.8506521980759	24.0306306448583	29	24
26.8198176090268	23.4634521269825	27.6	23.6
26.7889844354977	22.8993040218324	27	23
26.7581663491178	22.3386002664434	27	22
26.7273629837234	21.7866055315269	28.5	22
26.6965188107828	21.2356260734274	30	22
26.6651536990732	20.6365025386161	30	21
26.6332910443265	20.0169124157551	29.5	20.5
26.6012294079465	19.3840006813979	30	20
26.5684797503467	18.6905751860928	30	19
26.5350231874701	17.9676641486509	30	18
26.5007757319262	17.2499595154378	29.5	17.5
26.4662619434418	16.5247125982438	30	17
26.4304856357164	15.7057706898797	30	16
26.39321796222	14.814783864354	30	15
26.3540102194625	13.8674686153034	29	14
26.31460082497	12.9203566026534	30	13
26.2711644374596	11.9315533415986	30	12
26.2185951918082	10.858932111333	30	11
Route: 2 Length: 72.9703292014717 Demand Met: 184			
10.0991755310772	0.5111716187482	12	3
11.3538496961122	0.902126634362496	13	3
12.5107504880108	1.26524162813022	14	3
13.6101453273313	1.61186826487212	15.5	3
14.612170733414	1.94580599295427	15.5	5
15.5404009621503	2.23022380956153	17.1	5.1
16.2953929005898	2.47488832471655	17.1	3.1
17.0591385433672	2.71779586359761	18	3
17.8277090146927	2.96007855541252	19	3
18.5926764019282	3.20248711277774	20	3.7
19.3432914600965	3.44339072907796	20	3
20.1109265239168	3.68591836946345	21	3
20.8877458786667	3.93098241937677	22	3
21.6641425994004	4.17972350593852	23	3
22.4278858784865	4.43369593833868	24	3
23.1627595009773	4.69525629315103	25	3
23.845855465774	4.96860316491237	26	4
24.4774902101806	5.2488723078759	26	5
25.1008161559854	5.53081343535876	27.5	5.2
25.6714878852438	5.81574214600261	29	5
26.0221251093912	6.12773194334054	29	4
26.1999997638116	6.99998411688881	30	7
26.199999769751	7.99998931579911	30	8
26.1999997688425	8.99998330993228	30	9
26.1999997732464	9.99920730062263	30	10
26.1999997347575	10.0315727562672	29.3	9.5
26.1999996962527	10.0636615066024	28	9
26.1999996577644	10.0956668642601	27	9
26.1999996193174	10.1276212613604	27	10
26.1999995809048	10.1594850141568	27	11
26.19999954253	10.1912052839498	28	11.3
26.1999995041834	10.2227493580464	27	12
26.1999994658817	10.2541149506119	27	13
26.1999994276836	10.285164826581	27	14
25.9666457675833	10.2369572168043	26	14
25.7291099767694	10.0958333845724	26	13
25.4940494949629	9.94725204272363	26	12
25.2608698778407	9.79554573527192	26	11
25.0290903229208	9.6425482490697	26	10
24.7981197504226	9.48948440279575	26	9
24.5671159745484	9.33748380352712	26	8
24.3346068843483	9.18801553107036	27	8
24.0852013600594	9.04236431079219	27	7
23.6976943774972	8.91554922413587	25.5	7.1
23.2940107690768	8.7915717438334	25	8
22.8818872540012	8.66844466823709	24.5	7.1
22.4587268142721	8.54720211740577	24	6
22.008029278086	8.43080788639565	23	6
21.5515936224899	8.31755425640022	22	4.7
21.0495794919909	8.22731135683113	22	6
20.543306088875	8.13856043320328	21	6
20.0452719333729	8.05105269024364	20	6
19.5642952196468	7.96465595142218	19	6
19.1071121331433	7.87930770689197	18	6
18.6797390240626	7.79500473265745	17.5	7.5
18.2752457333044	7.71086410130443	20	8
17.8611554929739	7.62664016059748	20	9
17.4209200934727	7.54162670388727	20	10
16.0113215430625	7.44581310402698	14	9.3
15.0312115706252	7.34838946280659	14.5	7.7
14.1298311933297	7.25091200121295	13.5	7.5
13.2959579801666	7.15342909931551	13	7
12.5069360493325	7.0561304496521	13	6
11.7324457052743	6.95948484031557	14	6
10.8570132644901	6.86371189488016	12	6
9.96752916267312	6.76850426933293	11	7
9.07009018036374	6.67328603723922	11	9
7.9318771323928	6.57701287121144	8	10.3
6.51940767216055	5.29315637934437	8.5	7
4.73872193427304	3.72497732950177	7	6
Route: 3 Length: 106.999999055935 Demand Met: 184			
16.9778514465725	9.13195264532012	20	11
17.7894998883542	10.2065307454544	20	12
18.4637269903369	11.0727030185281	20	13

Solution x	Solution y	Original x	Original y
19.0927245718354	11.8278267914846	20	14
19.7095676504971	12.4942135721677	22.9	14
20.1119963207343	13.0136513018355	23.9	13
20.120095395528	13.8677636551014	23.2	15
20.1280989397941	14.602281447869	20	15
20.1361131041704	15.3341166893737	20	16
20.1441261773185	16.0553922751781	20.6	16.5
20.1521235881038	16.772607268	20	17
20.1601157017231	17.4924474175263	20	18
20.1681012839203	18.207142216025	20	19
20.1760812795253	18.9085472155448	20	20
20.1840598683808	19.5881714330136	21.1	20
20.1920316624235	20.2656805177935	21.7	19
20.1999997604339	21.0000017124975	24	21
20.1842045062651	21.6222470422869	20	21
20.1684181741051	22.2678751819004	20	22
20.152631602756	22.9296579983676	20	23
20.1368410668969	23.5999614858838	20	24
20.1210462191304	24.2707048874876	20	25
20.1052485096883	24.9333053984762	20	26
20.0894510596552	25.5786410937278	20	27
20.073659662644	26.1969540900489	21.2	27.5
20.0578574415712	26.7900460029673	22.2	28.2
20.0420111314633	27.3410982810871	20	28
20.0261754254226	27.8890723750595	20	29
20.010342000856	28.4248952839482	20	30
19.9945046990179	28.9382527008626	19	30
19.978691071372	29.4411534456826	20	31
19.9628818653054	29.9248577994214	20.5	31.5
19.9470740009414	30.3898106428905	21	32
19.9312634493353	30.8349425079616	21.5	32.5
19.9154429878126	31.2572978821763	22	32
19.8996131875442	31.674135127772	23.2	31.5
19.8836893338851	32.105605688719	22.8	32.5
19.8677711269042	32.534477476425	23	34
19.8521794040872	32.9139179381979	23	35
19.1757438991187	32.936157097989	20	35
18.4935464523999	32.9583724266662	19	35.2
17.8163320674983	32.9805451091809	18.3	34.5
17.1477810882154	33.0027108841239	17.9	33.3
16.4820377505971	33.0249103261482	17.2	34.1
15.8185007866724	33.0471141736484	17	36
15.0654876844164	33.0690918070776	16	36
14.250372648417	33.0908769968946	15	36
13.3947032187247	33.1124887696687	14	36
12.5161194337687	33.1339369842686	13	36
11.6295327623448	33.155226815855	12	36
10.7480588882284	33.1763614009779	11	36
9.88370707752014	33.1973433440815	10	36
9.04775269832209	33.2181757704148	9	36
8.25078136057313	33.2388633384324	8	36
7.50249410727064	33.2594132050188	7	36
6.811455616345	33.2798340659334	6.2	36.5
6.19998905935945	33.2999997675338	6.2	37.1
5.14050971743372	33.1964271589048	4	36
4.27236001459515	33.089117447934	2	36
3.98505578117746	32.9292869388583	1.5	35.5
3.77475086985167	32.7297383429263	1.5	35
3.58248556852138	32.5144400601831	2	35
3.39838611526758	32.2857063398026	3	35
3.21656465716777	32.0432691043223	4	35
3.03164925231468	31.7756215719851	4	34
2.84458605546442	31.4968133025585	4.7	34.5
2.62898984796806	31.0922904163297	4.7	33.5
2.39583935083465	30.6168604103484	3	32
2.16178851112379	30.1324251975028	2	32
1.92950177278914	29.6283069248467	2	33
1.69729636690724	28.7798650405507	2	31
1.46476372454738	27.8216233633478	3	29
1.22687710222355	26.8207874164731	4	28
0.963258012887977	25.6624074837262	4	27
0.635468825054446	23.881853993323	4	25
Route: 4 Length: 48.1585546894596 Demand Met: 180			
4.2298041720727	0.913626892248642	7	3
5.29001858826288	1.50205902451922	8	3
6.08711768176502	2.0297942425709	9	3
6.72420497592177	2.52574924143398	10	3
7.19999995485074	2.99998951021688	11	3
7.19999995552152	6.00000551617614	11	6
7.07422060974994	6.01450673505566	10	6

Solution x	Solution y	Original x	Original y
6.94444778558751	6.02891492678485	9	6
6.8131965700952	6.04326482476923	8	6
6.68139979241619	6.05756883255778	8.5	5.2
6.54821972384153	6.07182763095477	7.5	4.9
6.41448629504747	6.08604319623783	6	4
6.28124181560243	6.10018448019589	4	4
6.15232246078631	6.11416634840148	3	4
6.14328341855472	6.41565572937976	3	5
6.13424785830929	6.75146418814418	4	5
6.12520515574154	7.10559479642641	4	6
6.1161586590849	7.47053885075095	3	6
6.10713153711323	7.89111382403816	3	7
6.09811642044947	8.34117006416709	4	7
6.08910324556992	8.81521775613463	4	8
6.08009317593297	9.30472725271692	4	9
6.07108677572978	9.80181459976284	4	10
6.06208409360904	10.2985673767062	3	10
6.05310038336371	10.8092426315865	3	11
6.04413779459745	11.317584542038	4	11
6.0351829403902	11.8355525989611	4	12
6.02623576295039	12.3551797318759	4	13
6.01729607240723	12.8678442929399	4	14
6.00836344020819	13.3638087677618	3	14
5.99946325389688	13.8433416068256	3	15
5.99060697372236	14.2839539529444	3	16
5.98184027296749	14.6444472184534	3	17
6.1722945718119	14.6444472077586	4	17
6.37702153137032	14.6444471983169	4	16
6.59200042463451	14.6444471889579	4	15
6.81836667150463	14.6444471789547	5	15
7.05139091960476	14.6444471683177	7	16
7.28606279502569	14.6444471589693	7	15
7.52311511402235	14.6444471489874	8	15
7.76090374225771	14.6444471390136	9	15
7.99744941790914	14.6444471291587	11	15
8.21667044372236	14.6444471192078	12	15
8.216670403701	14.6444470993444	10	15
8.21667036367792	14.6444470787701	10	16.3
8.2166703236597	14.6444470581167	10	18
7.74904405692712	14.6165182966291	9	18
7.06207894697447	14.5874198810278	8	18
6.18964014622576	14.5574903544894	7	18
5.08989379856632	14.5267177217764	5	18.3
4.29944310548339	14.4771840815646	4	18
3.58934895092644	14.4251579786539	3	18
3.02010727840948	14.3683138246673	2	18
2.85931668046199	13.9723888228922	2	17
2.70170484912229	13.50438891032	2	16
2.54567987180647	12.9952148531374	2	15
2.39074688062533	12.4590499754955	2	14
2.2366522852419	11.9054893784589	2	13
2.08321987418746	11.3420631023175	3	13
1.92898975922635	10.753958182393	3	12
1.77388426566993	10.148941648562	2	12
1.61894570749043	9.51057940826806	2	11
1.46403175177626	8.84696734166282	2	10
1.30900261684044	8.16534970370636	2	9
1.15371216212307	7.47232216748874	3	9
0.995820266720202	6.73268571890914	3	8
0.835023564410505	5.95097029997223	2	8
0.672769229082789	5.08458307192453	2	7
0.508818454708717	4.12228740742049	2	6
0.342803300516536	3.03680799986615	2	5
0.173984524263147	1.75728604842279	2	4
Route: 5 Length: 89.4660761431454 Demand Met: 184			
0.237994482296131	22.1082223440679	2	25
0.454038203886739	23.4677380711305	2	26
0.661820007555249	24.4354171603978	2	27
0.863696895947513	25.2070756757983	3	27
1.05751287400297	25.9000867093348	3	28
1.24416890763847	26.513242342134	2	28
1.4297441614161	27.108267817781	2	29
1.61445095692571	27.6752796465725	2	30
1.79844216016824	28.2017980121777	4	29
1.97765722070802	28.72266382674	4	30
2.15261640960867	29.2289717981193	3	30
2.3266891197556	29.7346908184583	3	31
2.49999993886151	30.2330382262646	3	34
2.50000005483531	30.2330382239364	2	34
3.10249294099006	30.200906035398	3	33

Solution x	Solution y	Original x	Original y
3.72490906105277	30.1684166250748	4	33
4.35120911658697	30.1355881614824	4	32
4.9971133031594	30.1026519634494	4	31
5.67856861405866	30.0696916085808	5	31
6.39156000905597	30.0367088249238	5.2	32
7.17423163829848	30.0035957210713	7	33
7.9976109176462	29.9701039430188	8	33
8.8498734624898	29.9362219067631	9	33
9.71815242470629	29.9019272576252	10	33
10.5882057830341	29.8671849198941	11	33
11.4436137561316	29.8319452235244	12	33
12.2643706457005	29.7961373079863	13	33
13.0246208899605	29.7596512034238	14	33
13.6880012316182	29.722281266113	15	33
14.1889910940471	29.6833885752732	16	33
14.2508657073803	29.3439652679942	16	30
14.3129716645891	29.0043467006157	15	30
14.3752059746578	28.6642023165561	15	28.6
14.4375487423994	28.3289468944346	15	28
14.4999998453081	27.9998093060065	18.3	28
14.4999998383202	26.9999548651016	18.3	27
14.4068391670435	26.9656975794647	17.9	25.8
14.2396074759501	26.9348003616456	17.2	26.1
14.0622147974528	26.9040373447458	16.9	26.8
13.8765255069471	26.873318941654	16	27
13.6870907214352	26.8426329649782	15	27
13.4963978062459	26.8119819125159	14	27
13.3060522525962	26.781365289141	13	27
13.1174034310803	26.7507819184038	12	27
12.9319275026075	26.7202323262121	11	27
12.7517510579417	26.6897158828517	14	28.2
12.5701016519048	26.6591478210977	14	29
12.384976957833	26.6284049394416	14	30
11.914675390748	26.5905236145001	13	30
11.2999392599196	26.55053648699	12	30
10.592050852106	26.5087611225349	11	30
9.83486798530009	26.4650723325262	10	30
9.07416197731219	26.4190598542726	9	30
8.36473871340041	26.3698308288606	8	30
7.78425739202845	26.314744361475	7	30
7.57335887982418	26.0898912209736	7	27
7.36490218410876	25.8641798116657	8	27
7.15626744546002	25.6369232090851	9	27
6.94310065981364	25.4060729321599	10	27
6.68858832834862	25.1531995040596	10	26
6.37321308606761	24.889219844339	9.09999999999999	26
6.02693768689747	24.6184209145392	8	26
5.66515901742498	24.341929470724	7.5	25.5
5.28998819109786	24.0615730894553	7	24
4.90425898519902	23.7835909098113	5.40000000000001	23.3
4.51868307866474	23.5093557971658	5.40000000000001	24.3
4.12992239334359	23.2342047624828	4.7	25.5
3.73829682277314	22.9483678562522	4	26
3.34510752763765	22.6287425172154	3	26
2.96795274128056	22.2094205850769	3	25
2.59353579555842	21.7412443359119	3	24
2.21788086803015	21.2412950623092	4	24
1.78980182031177	20.5753495674697	4	23
1.26459024537026	19.6246390854084	4	22
Route: 6 Length: 73.251976638528 Demand Met: 184			
6.80509654058724	5.9993139779326	9.40000000000001	7.4
8.39748129285884	8.35664411886392	10	11
9.44291198122188	9.33527028381635	10.5	10.5
10.4654935776509	10.2541764300075	13	11.3
11.2461364668215	11.079718392099	11.5	13.5
12.0588498794291	11.7711362650878	13	15
12.7570993915298	12.1815410173519	14	15
13.3893078417228	12.5216941896368	15	15
13.9574746941883	12.823858747019	17	15
14.0293139872388	12.9102536638202	16	15
14.1003110635388	12.9949353626571	16	13
14.170994623195	13.0799076616186	16	11
14.2410387272805	13.1670276959512	16.5	10.5
14.3080969852006	13.2552754708866	17	12
14.3738347517281	13.3426258646417	18	12.3
14.3973344605785	14.8749389482711	18	15
14.4199541177135	16.9060975872371	18	18
14.4385978975016	17.1024911500198	17	18
14.4573070453483	17.2952225453815	16	18
14.4760153023523	17.4870362348975	15.5	18.5

Solution x	Solution y	Original x	Original y
14.4947093504218	17.6772418175524	15	19
14.5133811460659	17.8650716572653	15	18
14.5320246545878	18.0535957679402	14	18
14.5506558692296	18.2432901436071	13	18
14.5692935044571	18.4348132143006	13.5	17
14.5879152992268	18.6319679513452	12	17
14.606621453565	18.8446380704567	12	18
14.6253701864592	19.065356918608	11	18
14.6501052451034	20.1256165881008	11	21
14.6808414673501	20.4040470420434	12	21
14.7116613446556	20.6808106316338	11.7	22.8
14.7645894499209	20.7344544163337	12.2	22.1
14.8180529957751	20.7903568877983	13	22
14.8718244962262	20.8470858434455	13	21
14.926001010358	20.9042213701051	13.5	21.4
14.9805065094125	20.961682356817	14	20
15.0353458304709	21.0195610778147	14	21
15.0905646915822	21.0777318070334	15	21
15.1460780390341	21.1361610419446	16	21
15.2018263152678	21.1948466592114	17	21
15.2577076344985	21.2537938361453	18	21
15.3129933740268	21.3129949452372	18	24
15.0712862670031	21.2964225985288	17	24
14.7922849767599	21.2796710500134	16	24
14.5042769414505	21.262849989626	15	24
14.2226438196055	21.2459883854846	14	24
13.9573259573596	21.2290894635153	14	25
12.9567458444532	21.1874351546268	13	24
12.0487570186221	21.1453385325075	12	24
11.2240061322248	21.1027806641541	11	24
10.4805663791518	21.059723946259	10	24
9.82120203092425	21.0161027568823	9	24
9.25279512637306	20.971790120891	8	24
8.7902515288703	20.9264705362081	8.5	22.8
8.34309584028334	20.8810022950208	9.5	22.2
7.88817191957826	20.8354634347045	10	21
7.40272184096851	20.7899908005493	9	21
6.90019335279636	20.7445846751657	8	21
6.39069267696101	20.6992394417703	7	21
5.8823907582433	20.6539487967196	5.3	21
5.39266104652785	20.6087091254612	4	21
4.93271609201244	20.5635152581241	4	20
4.49160018514942	20.5184802930624	4	19
4.06314518183135	20.4737311925799	3	19
3.65395392976714	20.4292830594666	3	20
3.25591969789664	20.3850105261471	3	21
2.86468911181065	20.3408495209495	3	22
2.47615187772944	20.2967760738189	3	23
2.08061450061139	20.2528563122243	2	24
1.76073230557763	19.8325767735871	2	23
1.43773543829836	19.2495087045873	2	22
1.10876297655636	18.5263629024573	2	21
0.769895377408133	17.6444641861576	2	20
0.412911469062607	16.5282643693877	2	19

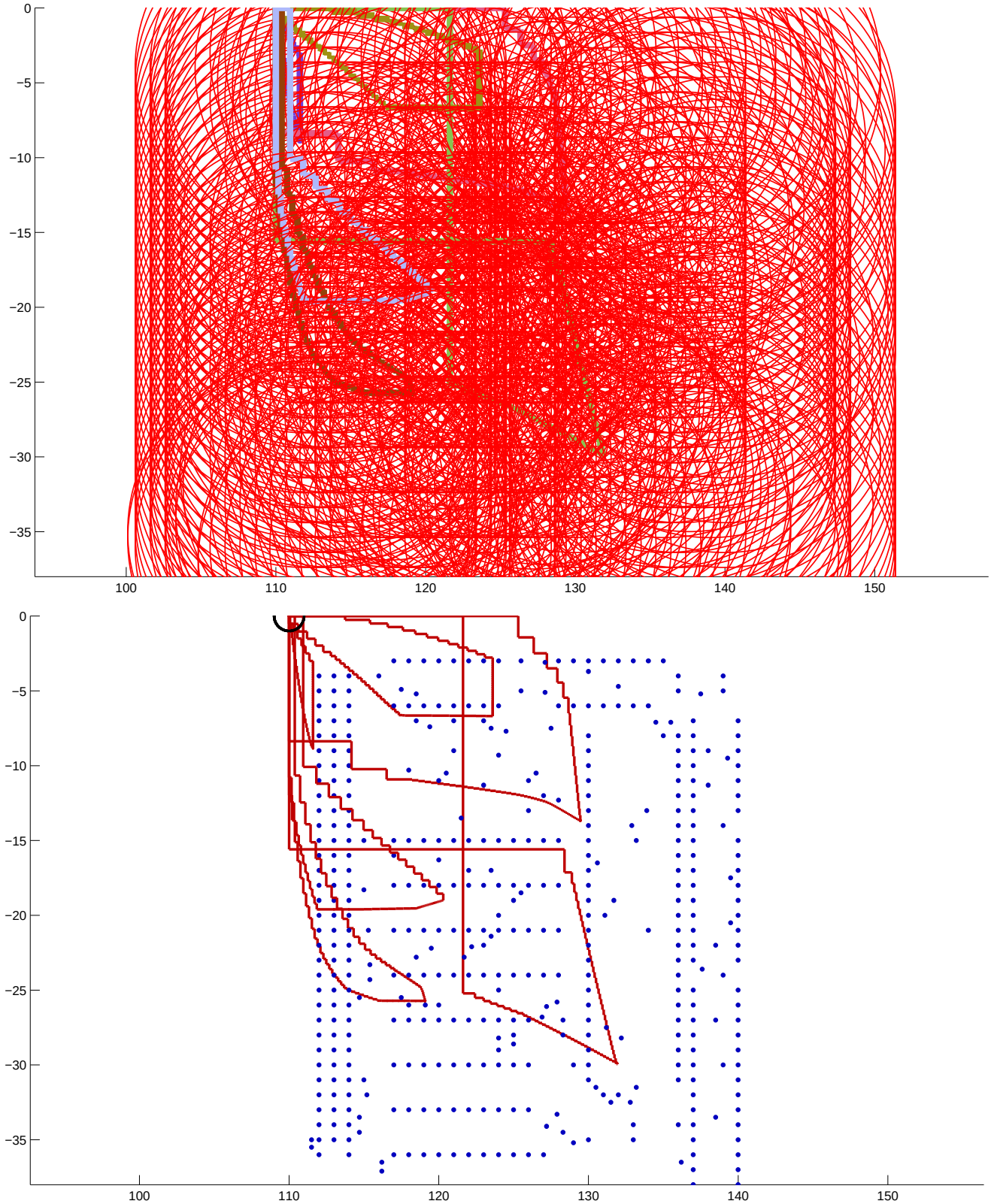


Figure O.126: *pcb*442, $r = 11.4$, Equal Radius, 2D, Manhattan, Length = 360.8789007

Table O-129: Solution for *pcb*442, $r = 11.4$, Equal Radius, 2D, Manhattan

Total distance: 360.878900727224			
Total demand met: 1100			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 20.9109893225868 Demand Met: 180			
0.0639529710734195	0.495411207651555	2	4
0.127069330700309	0.983016203735536	2	5
0.190588593020578	1.46506602086518	2	6
0.254338745497137	1.94174321932741	2	7
0.318161602602771	2.41247355221199	2	8
0.382026617297413	2.87637240954952	2	9
0.44595372206976	3.33236817053533	2	10
0.509967373687488	3.7792056297665	2	11
0.574082303662578	4.21539376820442	2	12
0.63830309160079	4.63910661258845	2	13
0.702626908653471	5.04801661699823	2	14
0.76704069552224	5.43899789186835	3	14
0.831445425066846	5.81564069715341	3	15
0.89580209429586	6.17413586904632	2	15
0.960260009829469	6.52035916966051	2	16
1.02479706656443	6.85027057191915	3	16
1.08929441747227	7.1671587885371	3	17
1.15369530978712	7.46528696060762	2	17
1.21818677758191	7.75124919204947	2	18
1.28273620982364	8.01773193323077	3	18
1.3471998684459	8.26966006403698	3	19
1.41135100740384	8.48839605002449	2	19
1.47558168175482	8.69172048155139	2	20
1.53896817202669	8.78842240554117	3	20
1.59999970609707	8.85549467901379	4	20
1.59999971318832	8.73115543297548	4	19
1.59999972027911	8.60120944564821	5	18.3
1.59999972738366	8.46717183417183	4	18
1.59999973447921	8.33013227096995	4	17
1.59999974155575	8.19128086156839	4	16
1.59999974860371	8.05123632824883	7	16
1.59999975568284	7.90874762214215	8	15
1.59999976281817	7.76404966950008	7	15
1.59999976998985	7.617470414887	5	15
1.59999977715469	7.46940128455977	4	15
1.59999978430383	7.31981120708225	4	14
1.59999979144686	7.16912184378904	4	13
1.59999979858846	7.01766792667013	3	13
1.59999980571128	6.86541522216226	3	12
1.59999981281663	6.71262739080257	4	12
1.59999981992894	6.5591284477357	4	11
1.59999982704664	6.40517227953337	3	11
1.59999983415025	6.2507283167661	3	10
1.5999998412339	6.09602178506181	4	10
1.59999984832723	5.94091019823709	4	9
1.59999985542717	5.78561411813767	3	9
1.59999986251034	5.630099886287	3	8
1.59999986957571	5.47456502942104	4	8
1.59999987664841	5.31889467750949	4	7
1.59999988372576	5.16328459865773	3	7
1.59999989078645	5.00769734046119	3	6
1.59999989782972	4.8523096076639	4	6
1.59999990487988	4.69703558994242	4	5
1.59999991193511	4.54205730560363	3	5
1.5999999189723	4.38734900923563	3	4
1.59999992598014	4.23310666618285	4	4
1.59999993296621	4.07929408419312	6	4
1.59999993995604	3.92584217273882	7.5	4.9
1.5999999469682	3.77242740217878	8.5	5.2
1.59999995400911	3.6188570190865	8	6
1.59999996104399	3.46485943517114	9	6
1.59999996808619	3.31027920366787	10	6
1.59999997515781	3.15493333258699	11	3
1.59999998227958	3.0000028821284	13	3
1.35958317630089	2.49659623114642	12	3
1.09641504441124	1.99946702006309	10	3
0.827351956586966	1.5042777771827	9	3
0.554983361358893	1.00821825543402	8	3
0.280691312496216	0.508431966151122	7	3
Route: 2 Length: 66.2428711151053 Demand Met: 184			
15.3066287725402	1.42186491356652	26	4
16.3418041097348	2.48661696893587	26	5
17.2174738863128	3.49038255579237	27.5	5.2
17.9165505789329	4.44541257457512	29	4
18.3184331842104	5.45412808356301	29	5
18.6632459303499	6.49488931062362	30	7
18.7649670496858	7.30270255028763	30	8
18.8468699430402	8.03472540143101	30	9
18.9192038545106	8.70582550970062	29.3	9.5
18.9902411783077	9.37083315839001	30	10
19.0572352436683	10.0204286506389	30	11
19.1210401302274	10.6474243976015	30	12
19.1821399672552	11.2458104448882	30	13
19.2407847405563	11.809999736328	29	14
19.298963162091	12.3628888281427	30	15
19.3546324027238	12.8649268258725	30	16
19.4075055819678	13.3061430316804	30	17
19.4563531296597	13.6650823229397	30	18
19.4563531316214	13.6650823358709	27	18
19.4563531335845	13.6650823487851	27	19
19.4563531355485	13.6650823617307	27	20
19.4563531375137	13.6650823747069	27	21
19.4563531394809	13.6650823877268	27	22
19.4563531414512	13.665082401025	26	22
19.4563531434242	13.6650824141284	26	23
19.3589534485019	13.607244884077	24	21
19.2616105138683	13.5493063367915	26	21
19.1631764330692	13.4909147751051	26	20
19.0640658021624	13.4322533616888	26	19
18.9644925888601	13.3734282133845	26	18
18.8645737228408	13.3145123740673	26	17
18.7643933440212	13.2555631400328	26	16
18.664054663959	13.1966292309418	27	16
18.5630729600922	13.1376265508038	27	17
18.4612205804134	13.078392780743	27	15
18.3586851378354	13.0190800582473	26	15
18.2558697826097	12.9596790374589	26	14
18.1527728123226	12.9002116098461	27	14
18.0487838213133	12.8406010518691	27	13
17.9439265215763	12.7808956979252	27	12
17.838157397638	12.7211525065656	28	11.3
17.7295327044678	12.661452066692	27	11
17.6196463946154	12.6017848897799	27	10
17.5081036942572	12.5422551391756	28	9
17.3832931229524	12.483822798167	27	9
17.2550203006821	12.425688644317	27	8
17.1199182936785	12.3681867430567	27	7
16.9351501372472	12.3139946815999	25.5	7.1
16.7447756916545	12.2601545072811	24.5	7.1
16.5514619149069	12.2065622630084	25	8
16.3543217233466	12.1531656085848	26	8
16.1450232761055	12.1001765654829	26	9
15.9243611261159	12.0474521014292	26	10
15.6914201760193	11.9949085997078	26	11
15.4431486378615	11.9424811421633	26	12
15.1715673027675	11.8900900430092	26	13
14.8461641581906	11.8375589359272	23.9	13
14.5108388738317	11.785042882216	22.9	14
14.1681162711259	11.7325006743125	23.2	15
13.8095661165916	11.6798111132882	20.6	16.5
13.4462823207642	11.6269830337241	20	16
13.0794908701348	11.5740685260624	20	17
12.7054305735685	11.5209656483302	20	18
12.3155048619155	11.4674845525562	18	18
11.9205064102372	11.4137707416712	17	18
11.5223397539174	11.3598493194095	16	18
11.1226343059865	11.3057476315468	15.5	18.5
10.720477870771	11.2514180799512	15	19
10.3147045271116	11.1968007762752	14	20
9.9042855980185	11.1417287560024	13	21
9.48545501600195	11.085812486911	12	21
9.06234847304944	11.029083218458	11	21
8.63845852642754	10.9714915651167	10	21
8.21671278265747	10.9129232656433	9.5	22.2
6.51462882808339	10.230276937886	9	21
4.16839004147624	8.36412863083203	9	18
Route: 3 Length: 103.755930648503 Demand Met: 184			
11.6193228534599	25.2141313957484	15	36
12.416440660432	25.5175488388772	16	36
12.9926886168344	25.728818895608	17	36
13.4535652836871	25.8986493162634	17.2	34.1
13.9087717538843	26.0647778685619	17.9	33.3

Solution x	Solution y	Original x	Original y
14.3600056677654	26.2288237361317	18.3	34.5
14.8034340047015	26.3895735398921	19	35.2
15.2332117152796	26.5457037979504	20	35
15.6481699728149	26.6978143719188	23	35
15.914888519137	26.8230936034496	23	34
16.1678258686586	26.9456353928305	22.8	32.5
16.4155056415074	27.0674102118854	23.2	31.5
16.6585998349098	27.1888522555723	22	32
16.8996000724386	27.310022497971	21.5	32.5
17.1390908312967	27.4308357739195	21	32
17.3778844242909	27.5514645030575	20.5	31.5
17.6165253301943	27.6720060922394	20	31
17.8554519876654	27.7925079595342	20	30
18.0948467406143	27.9130619273055	21.2	27.5
18.3343084376244	28.0339096777222	22.2	28.2
18.5736894302761	28.1547877871478	26	29
18.8091977212679	28.275330460448	27	29
19.0395157883227	28.3954274011484	27	30
19.2653008228799	28.5148185300557	26	30
19.489147285246	28.6334947436067	26	31
19.7111655619896	28.751301791635	27	31
19.9301726089772	28.8680658777962	27	32
20.1463530031235	28.983672690331	27	33
20.3597137777279	29.0980017665032	28.5	33.5
20.5655332460726	29.210307831866	26	34
20.7703618193104	29.3213717616167	27	34
20.9730272411021	29.4309435396154	27	35
21.1731296833006	29.5387104284145	27	36
21.3699019840647	29.6440540899818	26.2	36.5
21.5647457634409	29.7469558738895	27	37
21.7556473725181	29.8461458568449	27	38
21.9389821308356	29.9389831934161	30	38
21.8810608228358	29.7873421236918	30	37
21.813508421663	29.5575966754673	30	36
21.7414446232685	29.2863257174433	30	35
21.666529239506	28.9915789011192	30	34
21.5895792533259	28.6814386713858	30	33
21.5110687925207	28.3601290934001	30	32
21.4312973483926	28.0303002342282	30	31
21.3504610127372	27.6938955735907	30	30
21.2686806264824	27.3525034546153	29	30
21.1863083543407	27.0069086125189	30	29
21.1030577870945	26.6565682258375	30	28
21.0190417302815	26.3030433589893	30	25
20.9343918423197	25.9522690312841	30	26
20.8490339307865	25.6015228434338	30	27
20.7627471261225	25.2473408679726	28.5	27
20.6759344749321	24.8909672993394	27	27
20.5887613553813	24.5329368312346	27	28
20.5011065830915	24.1705639388356	26	28
20.4131482031411	23.8039275424982	26	27
20.3249664170615	23.434185688198	26	26
20.2366748135995	23.0623994044929	27	26
20.1480646175761	22.6869208223951	27	25
20.0591834195013	22.3089569022565	26	25
19.9702882909932	21.9285241243667	26	24
19.8814425114212	21.5467634003346	27	23
19.7924266348079	21.1642910038926	27.6	23.6
19.7030066311799	20.7785115502936	29	24
19.6119282085863	20.3810572001496	28.5	22
19.5200460250663	19.9813465651439	30	22
19.4235551064475	19.5652073085695	30	23
19.3105425655386	19.0363226930435	30	21
19.1871001953722	18.4678991584196	29.5	20.5
19.0571282439379	17.8747431356943	30	20
18.8871553932046	17.1270394825741	30	19
18.3982551774737	15.5917076275437	29.5	17.5
Route: 4 Length: 40.5725830255146 Demand Met: 184			
3.73790593446546	0.250321748111054	14	3
5.40614640857591	0.493627691855004	15.5	3
6.584647057886	0.732698224906935	15.5	5
7.60178387235777	0.96691457941761	17.1	5.1
8.43004890904867	1.19488607419234	17.1	3.1
9.21383129491184	1.42199772687658	18	3
9.95551888104657	1.64851024073034	19	3
10.6529684361744	1.87449100794022	20	3
11.30310044044	2.09999673947866	20	3.7
11.927023505629	2.32480396356097	21	3
12.5216428055924	2.54963435310444	22	3
13.08153701286	2.77464161599281	23	3

Solution x	Solution y	Original x	Original y
13.5999999919513	3.00001371205081	25	3
13.5999999864276	3.1509368446116	24	3
13.599999980904	3.30221924818732	24	6
13.599999975377	3.45126396475883	23	6
13.5999999698479	3.59943864360205	22	4.7
13.5999999643179	3.7476538647859	22	6
13.5999999587865	3.89548292235184	21	6
13.5999999532545	4.04312952386962	20	6
13.5999999477228	4.19074870435273	19	6
13.5999999421918	4.33847977775511	18	6
13.5999999366622	4.48644843422196	17.5	7.5
13.5999999311344	4.63437852074803	20	8
13.5999999256061	4.7820333856679	20	9
13.5999999200771	4.92917606149785	20	10
13.5999999145474	5.07550726872245	20	11
13.5999999090168	5.22061776439452	20	12
13.5999999034847	5.36387998548922	20	13
13.5999998979503	5.50413617430994	20	14
13.5999998924115	5.63831483679598	20	15
13.5999998867222	5.71130096175576	18	15
13.5999998810312	5.78307345454633	17	15
13.5999998753404	5.85400248029192	18	12.3
13.5999998696488	5.92477435370385	17	12
13.5999998639576	5.99547475636077	16.5	10.5
13.5999998582673	6.06626839419632	16	11
13.5999998525782	6.13710873706712	16	13
13.5999998468897	6.20776797192977	16	15
13.5999998412004	6.27785200396174	15	15
13.5999998355114	6.34744787930469	14	15
13.5999998298236	6.4166240547122	13	15
13.5999998241378	6.48543085402858	12	15
13.5999998184548	6.5538931102935	12	17
13.5999998127741	6.62073046290872	13.5	17
13.5999998070934	6.68629152080595	15	18
13.1452902756505	6.67900227920743	14	18
12.4814963213403	6.67125743772678	13	18
11.6588053763564	6.663152486422	12	18
10.7002050765162	6.65465274001295	11	18
9.53995774327737	6.64564701304184	10	18
7.73966468340393	6.63578957397815	7	18
7.56673979098923	6.61590688361523	8	18
7.33037121066192	6.42002925656978	10	16.3
7.0922102221739	6.2146554091875	9	15
6.85495023567414	6.00506608765604	10	15
6.61699562190653	5.78943995473974	11	15
6.37501563154653	5.56329832634022	11.5	13.5
6.13054545800925	5.33121718381839	13	11.3
5.88245079205441	5.09551030649924	14	9.3
5.6292011939797	4.85756038673962	14.5	7.7
5.36917339694858	4.61834568408466	13.5	7.5
5.10490112176154	4.37822840498546	13	7
4.83707011886999	4.13745410933433	14	6
4.56121901972024	3.89603134305671	13	6
4.27997518958206	3.65407768979521	12	6
3.99511222643474	3.41169428869335	11	6
3.70798656871419	3.16900539508719	11	7
3.41721005892562	2.92485058100539	11	9
3.11735968821337	2.67461659427994	10.5	10.5
2.78888943791023	2.40112495501474	10	11
2.28458839404384	1.97579348438994	8	10.3
1.75599934952362	1.51367713607098	9.40000000000001	7.4
1.19845010151519	1.02971148355904	8.5	7
0.613652364744254	0.523278537326266	7	6
Route: 5 Length: 69.5965268022477 Demand Met: 184			
0.380618891955379	10.6554681820598	3	21
0.736135256696286	12.4589827582529	3	22
1.08874584448725	13.9131411718929	4	23
1.43672465381617	15.1170174358222	3	23
1.78538944704735	16.2162057818057	3	25
2.13521342429316	17.1865616945447	3	26
2.4877087729533	18.0527907615065	3	27
2.84422754849527	18.830029954659	4	27
3.20398981110387	19.5560755258614	4	28
3.56765188597598	20.2325963976347	4	29
3.93590824217429	20.8597138755418	4	30
4.30965579014659	21.4359526470523	4	32
4.69162163918821	21.8974114723151	5.2	32
5.07700789259305	22.3073310761213	7	33
5.44706813908988	22.6216319441166	8	33
5.80289306029987	22.8903111548628	9	33

Solution x	Solution y	Original x	Original y
6.14326913518953	23.1282508113528	10	33
6.46564827764605	23.3415667044661	11	33
6.76551753992382	23.5323935465296	12	33
7.03374423573617	23.6992981845421	13	33
7.24493528858135	23.8319618455781	14	30
7.45189572860248	23.9628501847204	15	30
7.65258502179364	24.0918595409156	15	28.6
7.85009030121313	24.2205170167267	15	28
8.04535962234212	24.3494046546711	16	27
8.23775624597208	24.4789616726506	16.9	26.8
8.42625692773906	24.6092914543557	17.2	26.1
8.61134609239744	24.7406298016118	17.9	25.8
8.79236424692574	24.8729675442314	20	25
8.86067098095383	25.0027054752881	20	24
8.91093417756649	25.1406317346051	20	26
8.95376970928517	25.2721908237557	20	27
8.98858450248515	25.3883805988667	18.3	27
9.02304853947865	25.5047269598793	18.3	28
9.05700436578526	25.6208865733348	20	28
9.08368029521702	25.7145830819594	20	29
9.08368029419563	25.7145830859544	19	30
9.08368029316188	25.7145830899495	16	30
9.08368029212653	25.7145830938636	16	33
9.083680291088	25.7145830979117	15	33
9.0836802900497	25.714583101961	14	33
9.08368028901266	25.7145831059068	14	36
8.8010946297848	25.7131640765486	13	36
8.45492262817146	25.7117819103802	12	36
8.07899234812055	25.7104212340425	11	36
7.69164345885646	25.7090766225938	10	36
7.30540869308643	25.7077458404865	9	36
6.92724256627128	25.706427971159	8	36
6.55774034092286	25.7051227613016	7	36
6.19289218211748	25.7038303264901	6.2	37.1
5.88174077118472	25.6106322581853	6.2	36.5
5.58403596976174	25.5134884811385	4	36
5.28603404255074	25.4126520872238	4	35
4.99008391226309	25.3100802041098	3	35
4.69860558249184	25.2054158575968	2	35
4.41484069647595	25.0980391060682	1.5	35
4.14081745241775	24.9872748568395	1.5	35.5
3.88157792536714	24.8688902912632	2	36
3.67792087921893	24.6416601773765	2	34
3.4772556341385	24.4058603630392	3	34
3.2787281541934	24.1598518607458	4	34
3.08130288959973	23.8999729884447	4.7	34.5
2.88300668172312	23.596847043247	4.7	33.5
2.68449792951685	23.268233759309	4	33
2.48639293234517	22.9154436370446	3	33
2.28947214173976	22.5263828815643	2	33
2.09493869874144	22.0670987800967	2	32
1.90239239967249	21.5532362160071	3	32
1.71006436845732	20.9012727152302	3	30
1.51866369772183	20.1829518645612	3	29
1.32812583275785	19.3949981500279	3	28
1.13830338162779	18.5304953113124	2	28
0.949336967440587	17.5154054131923	2	26
0.761038508385425	16.3859379669577	2	25
0.572924197402727	15.1090019728882	2	24
0.384727666196198	13.6379401536982	2	23
0.196100283052019	11.9693902888923	2	22
Route: 6 Length: 59.7999998132665 Demand Met: 184			
0.94335028758637	10.0811143605524	2	21
1.82272655247145	11.1985360008516	5.3	21
2.6559341759627	12.0991336543124	7	21
3.45489648013316	12.8985857853955	8	21
4.2329095943353	13.6432317413569	8.5	22.8
4.97589564346823	14.3031133408288	11.7	22.8
5.59144567013981	14.8326009549086	12.2	22.1
6.17664461238209	15.3331259222168	13	22
6.73841153765164	15.8136620148892	13.5	21.4
7.28664304497171	16.2837993268439	14	21
7.82545706615321	16.7475878055555	15	21
8.35348795213149	17.2057927299671	16	21
8.86903442145821	17.6590681345983	17	21
9.36993535472322	18.1079744401019	18	21
9.85337877375312	18.5530093626626	20	19
10.2999999373131	18.9995538618435	21.7	19
10.2499008486356	19.0153856060789	21.1	20
10.1985933148495	19.0312115964416	20	20

Solution x	Solution y	Original x	Original y
10.1469743550102	19.0470392380349	20	21
10.0949789532391	19.0628621124924	20	22
10.0425014975697	19.0786716295534	20	23
9.98944735729476	19.0944576121919	18	24
9.93621566197143	19.1102256976454	17	24
9.88288681552852	19.1259815740113	16	24
9.82950942644342	19.1417287250234	15	24
9.77611631309679	19.157469293053	14	25
9.72272033543892	19.17319994165	14	24
9.66932208836847	19.1889256261296	13	24
9.61594008581358	19.2046476893559	12	24
9.56258950772946	19.2203670060793	11	24
9.50928431599721	19.2360842177372	10	24
9.45603893740889	19.2517998413277	9	24
9.40286914138352	19.2675143502091	8	24
9.34979199468897	19.2832281833261	7	24
9.29682499396772	19.2989413624405	7.5	25.5
9.24396103208724	19.3146475159404	8	26
9.19119283199862	19.3303438309881	7	27
9.13854984661329	19.3460231976164	8	27
9.08600777343383	19.3616870930716	9	27
9.03354467125372	19.3773365105314	9.09999999999999	26
8.98115714139171	19.3929784617745	10	26
8.92882621902817	19.4086129678459	10	27
8.87654437213141	19.4242347384978	11	27
8.82428493025188	19.4398431938298	12	27
8.77201755180062	19.4554373204705	13	27
8.71970421696803	19.4710151500988	15	27
8.66719302660888	19.4865657261991	14	27
8.61457483597663	19.5020965487407	14	28.2
8.56172207779433	19.5175849164863	14	29
8.50827343587972	19.5329653068612	13	30
8.10484762069981	19.5427815621422	12	30
7.63879894969568	19.5524598625768	11	30
7.13625008632964	19.5620536939777	10	30
6.61160626583299	19.5715919302065	9	30
6.07522843606287	19.5810905206439	8	30
5.53556890824294	19.5905585377793	7	30
4.99999999983277	19.5999999598638	5	31
3.99999988158059	19.5999999693201	4	31
3.00000198765895	19.5999999659106	3	31
1.99999679133229	19.5999999595069	2	31
1.84906680721323	19.212974392955	2	30
1.69824091521166	18.749671227489	2	29
1.54765350120292	18.2351606656933	2	27
1.39741548904344	17.6995920299386	4	26
1.24705457711913	17.1432472627013	4.7	25.5
1.09627218039782	16.5604055985069	4	25
0.945220536013451	15.9493585721996	3	24
0.794171789471733	15.3151266478405	4	24
0.642615091481503	14.6396299792265	5.40000000000001	24.3
0.487087988617759	13.7453073563946	5.40000000000001	23.3
0.327449130132806	12.4606275492482	4	22
0.166316815715348	10.7863016566801	4	21

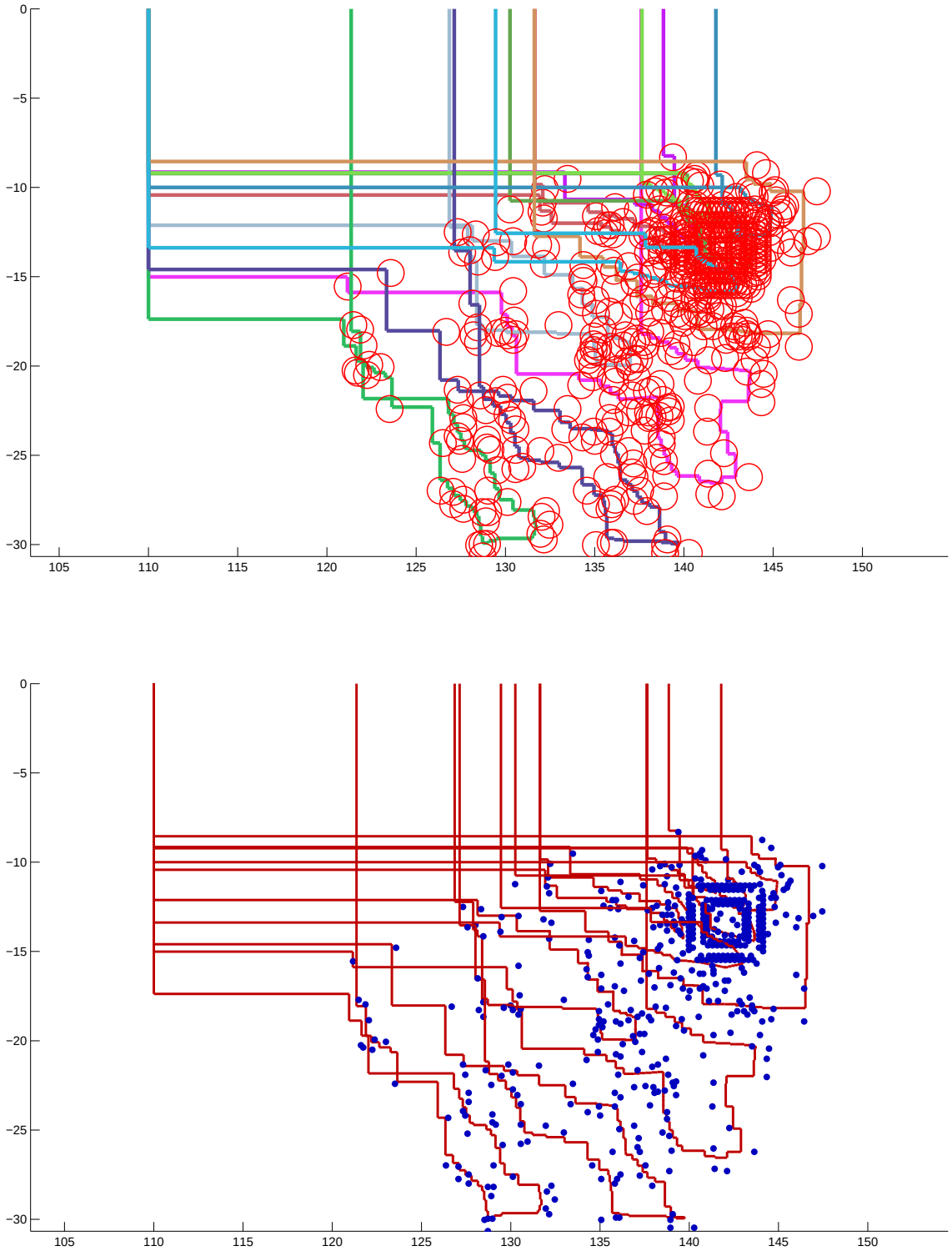


Figure O.127: $d493$, $r = 0.74904$, Equal Radius, 2D, Manhattan, Length = 1101.6571312

Table O-130: Solution for $d493$, $r = 0.74904$, Equal Radius, 2D, Manhattan

Total distance: 1101.65713121852 Total demand met: 10514 Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 122.447841218591 Demand Met: 984			
27.6067779393034	18.2160303098679	27.864	18.854
28.1321860003241	18.4310178307509	28.118	18.092
28.6651029986414	18.6674050435548	28.689	18.156
29.1892883132329	18.9749149841503	29.578	18.791
29.5931217549454	19.3119231731479	29.261	19.172
30.0839098062639	19.671816012553	29.705	19.426
30.7836904080333	20.0911493113565	30.785	20.823
31.4769485443204	20.1398129588091	31.356	19.68
32.293665922186	20.1902842380824	32.309	19.553
33.0806424748882	20.247447102307	33.515	20.315
33.5937615815642	20.3042624126525	33.96	19.68
33.7189545141375	20.4420004426291	34.468	20.442
33.6713906675726	21.085633221248	34.341	21.013
33.6141499780104	21.9764883381655	34.341	22.029
32.0809827446957	22.399916107105	31.356	22.347
32.0420455116919	23.6799999936191	31.293	23.68
32.4545125402432	24.920075996351	32.245	24.887
32.8929541191686	26.2199991530601	33.642	26.22
32.117999941451	26.5509541917761	32.118	27.3
31.4425601536099	26.4635076996942	31.42	27.173
30.8605321255509	26.1595368999283	31.356	26.03
29.5986684289682	25.8755382019125	29.007	26.157
29.3109705553873	25.4274571832309	28.88	25.331
29.0700296451187	25.0075245789168	28.499	25.141
28.8934148826431	24.5158807542822	28.753	24.379
28.7215437202546	24.0592219577243	28.753	23.998
28.5490447678439	23.617001011618	27.8	23.617
28.5490437809904	23.3397834852946	28.245	22.855
28.5490427974939	23.1326342699989	29.261	23.045
28.5490418113514	22.9620973644533	28.054	22.918
28.5490408273574	22.7941016016263	27.991	22.601
28.5490398459013	22.6396389856774	28.626	22.791
28.5490388642119	22.4815762339299	29.134	22.537
28.549037880024	22.3201323908222	29.07	22.347
28.5490368929719	22.1576392757878	29.261	22.283
28.5490358341051	21.9518413557334	28.816	21.902
28.5490347648565	21.7488518687194	28.689	21.013
28.2206923882457	21.7703596215495	28.245	21.331
27.887758360095	21.7919694963403	27.927	21.458
27.5498756242145	21.8136575857365	27.546	22.537
27.2230972082215	21.8327694384598	27.102	21.648
26.9109986139214	21.8519551646243	26.911	22.601
26.3270695484236	21.5354502301406	26.022	21.902
25.8831033154344	21.1392772450441	26.149	20.886
25.3596258527036	20.7901236874388	25.895	20.759
24.11201736928	20.4476424923373	24.244	21.077
20.6193826540794	18.2915408374015	19.99	18.029
20.3721475335819	17.8071368981372	20.561	18.219
20.1068200979721	17.1151888219133	20.498	17.457
19.7789056464029	15.8787710672394	20.434	15.806
11.1483953261505	15.010243200025	11.163	15.552
Route: 2 Length: 87.8673817023686 Demand Met: 867			
21.6482569333627	9.84335067269645	22.212	10.091
22.0949147653133	10.8601877368059	22.022	11.361
24.6396949953211	11.3878673593137	25.07	11.615
25.4462127806985	11.5854003919065	25.705	12.123
26.2040257896594	11.7575923362453	26.149	11.107
27.2148738028053	12.1759464652655	26.594	11.933
27.2148738028053	12.1759464652655	27.673	12.695
28.3551142870787	12.3685227430737	28.816	12.25
28.882909322164	12.5706688698936	29.197	12.441
29.2986896726151	12.7816032291669	29.975	12.581
29.3985053937739	13.1776057396431	29.578	13.203
29.4962946464362	13.5685455428309	29.705	13.393
29.591606297061	14.0027523621637	30.202	14.271
29.591606297061	14.0027523621637	30.202	14.011
29.6723461127764	14.261344738408	30.202	14.791
29.6531360130813	14.2513389303273	29.975	14.921
29.6531360130813	14.2513389303273	29.975	14.661
29.573889588354	14.1497538997029	29.515	14.028
29.4763907487461	14.0402111656275	29.007	14.409
29.4763907487461	14.0402111656275	29.975	14.401
29.3756865333952	13.886068371535	29.975	14.141
29.3756865333952	13.886068371535	29.975	13.881
29.1647433876218	13.6914837406895	28.753	13.838
29.1647433876218	13.6914837406895	29.388	13.838
28.9731467754554	13.4780601235318	29.197	13.52
28.9731467754554	13.4780601235318	29.134	13.33
28.762340984571	13.2716537668701	28.372	13.52
28.762340984571	13.2716537668701	28.753	13.457
28.5821392482758	13.0294657760541	28.499	12.949
28.5821392482758	13.0294657760541	28.816	12.568
28.3871138548309	12.8422855430435	28.753	12.949
28.3871138548309	12.8422855430435	29.007	12.949
27.7904164677713	12.6274179748949	27.927	12.568
27.7904164677713	12.6274179748949	28.181	12.441
26.4674798061613	12.4307337147226	26.022	12.631
25.9091132097082	12.2153018833137	25.895	12.123
25.3640692594724	12.0054281862955	25.197	12.441
25.3640692594724	12.0054281862955	25.578	12.568
22.5787269554599	11.3209479314752	22.149	11.742
21.9303348252643	10.4280481272377	22.085	10.853
Route: 3 Length: 89.0298299204029 Demand Met: 943			
28.855064431721	8.23990850058769	29.388	8.313
29.4649409372152	11.0053913734683	29.261	11.425
30.2351767997515	11.9708204625772	30.787	12.386
30.4126904685747	12.1983032863439	30.787	12.646
30.5606348268977	12.3731951144676	31.015	12.776
30.5606348268977	12.3731951144676	31.015	12.516
30.6695046320463	12.5097863563777	31.372	12.353
30.7142183020417	12.7320251712626	31.275	12.613
30.756097318753	12.9670699772051	30.787	12.906
30.7979574309255	13.2030013164409	31.547	13.203
30.7967109959659	13.2993407553929	30.787	13.166
30.7967109959659	13.2993407553929	31.015	13.036
30.7954680481908	13.4024572450454	31.015	13.296
30.7942272174899	13.5078692366567	30.787	13.426
30.7942272174899	13.5078692366567	31.015	13.556
30.7929892248392	13.6151310621102	31.275	14.173
30.7918015553351	13.6359192227283	31.399	13.754
30.7906225700187	13.6565208648213	31.015	13.816
30.7894440114306	13.6770251780553	31.015	14.076
30.7882657689412	13.6972165932875	30.787	14.206
30.7870869842773	13.7169575292759	30.787	14.466
30.6831807052938	13.6229454252912	30.787	13.946
30.5776079828775	13.5247964767791	30.787	13.686
30.4690244019621	13.4246731921139	30.202	13.751
30.3652996551781	13.3190524649437	29.975	13.621
30.2691773824482	13.2064952480554	29.975	13.361
30.1767055466377	13.0912772602471	30.202	13.491
30.083935655781	12.9670909859865	30.202	13.231
29.9898995455169	12.837329883346	29.975	13.101
29.8961187543266	12.7016881579737	30.202	12.971
29.7978736310519	12.5574112576683	30.202	12.711
29.6925455376822	12.4072267484195	29.975	12.841
29.5798149695221	12.2313779355223	30.202	12.451
29.4021788063443	12.0093208812525	29.975	12.321
29.0556712219133	11.6741233839156	29.388	11.804
28.6364730083577	11.3143824655498	28.626	11.234
28.2246184381834	10.9685708648022	28.753	10.79
27.2483060194705	10.6746932343995	27.419	11.298
23.3274708042294	9.1468763178786	23.482	9.52
Route: 4 Length: 96.1319045627255 Demand Met: 1000			
20.2578678418206	10.7478883812627	20.244	11.234
29.7338539861425	11.4243885127675	29.975	11.801
31.7153670392568	11.89850392089	32.282	12.126
32.0764978024251	12.2284128261885	32.152	12.353
32.4273056901788	12.5434393982623	32.412	12.353
32.7812087265243	12.8826635612573	32.69	13.52
32.7812087265243	12.8826635612573	33.095	13.491
33.0049928852801	12.9875487689073	33.322	12.841
33.2082951943445	13.0948868920246	33.907	13.036
33.2869252866392	13.2114913293237	33.322	13.361
33.2869252866392	13.2114913293237	33.322	13.101
33.3652931668538	13.3277310476748	33.907	13.296
33.4366385781109	13.4451077067018	34.135	13.426
33.4821027146828	13.5657019024738	33.907	13.816
33.4821027146828	13.5657019024738	33.907	13.556
33.5247899094251	13.6800369626716	33.095	13.751
33.5247899094251	13.6800369626716	33.322	13.621
33.56928889456	13.7942118849007	33.322	13.881
33.61441378007	13.9072542965967	34.135	13.946

Solution x	Solution y	Original x	Original y
33.61441378007	13.9072542965967	34.135	13.686
33.6549533314566	14.0280518102595	34.404	14.028
33.6549539404392	14.1328320911731	34.135	14.466
33.6549539404392	14.1328320911731	34.135	14.206
33.6549545493107	14.2246249181834	33.907	14.076
33.654955158273	14.3179341443495	33.907	14.336
33.6549557672756	14.4109965140872	34.135	14.986
33.5702911816504	14.3776209129983	34.135	14.726
33.4540791644092	14.3420595607364	33.907	14.791
33.2856467375383	14.3032923679198	33.095	14.271
33.2856467375383	14.3032923679198	33.322	14.401
33.1226336026406	14.2644706686829	33.095	14.011
33.1226336026406	14.2644706686829	33.322	14.141
32.9550483680823	14.2263377931562	32.835	14.173
32.7915404811698	14.1883111101297	32.867	14.661
32.7915404811698	14.1883111101297	32.737	14.433
32.6267298621867	14.1485798604888	32.607	14.661
32.4635689233405	14.1071143486666	32.347	14.661
32.3092002263493	14.062960668337	32.087	14.661
32.1767132628067	14.0127595520677	32.217	14.433
32.1767132628067	14.0127595520677	32.477	14.433
32.031582138507	13.9584440484613	31.991	14.092
32.031582138507	13.9584440484613	32.372	14.092
31.8776736386814	13.9031995743811	31.957	14.433
31.7198711154613	13.8440595208153	31.61	13.901
31.5655784052345	13.7847227379549	31.697	14.433
31.3937411307964	13.7106831360672	31.437	14.433
31.1917021709911	12.8673670991136	31.737	12.885
30.9126771706703	11.9561228206891	31.502	12.126
30.186224222329	9.22076209802456	30.721	9.329
Route: 5 Length: 93.9351288554167 Demand Met: 965			
16.8552720884194	12.2222092015027	17.323	12.504
17.891930952477	13.787752439172	18.466	14.155
18.129877069418	14.1575934154727	18.021	13.52
18.393943530817	17.6596382370034	18.466	17.838
18.393943530817	17.6596382370034	18.212	18.283
18.7138588924904	17.9983925111736	18.466	18.664
20.1202482498801	18.1055968827473	20.434	18.537
20.1202482498801	18.1055968827473	20.117	18.283
20.1202482498801	18.1055968827473	19.609	18.156
22.879917736239	18.2016401473727	22.974	17.711
24.8061915949812	18.3063747297335	25.451	17.965
24.8821678209069	18.6496785699659	24.943	18.791
24.9578195684218	18.9772430444596	24.943	18.346
24.9578195684218	18.9772430444596	24.943	19.108
24.9578195684218	18.9772430444596	24.752	19.362
24.9578195684218	18.9772430444596	25.197	18.918
24.9578195684218	18.9772430444596	25.133	19.235
25.0331646876758	19.5398113555658	24.625	19.68
25.0331646876758	19.5398113555658	24.879	19.934
25.1134595796635	19.9282794264023	24.879	20.632
26.427391383483	19.9540777849799	26.276	20.188
26.427391383483	19.9540777849799	26.975	20.061
26.9879543167789	19.9796101109294	27.356	20.632
26.9879542403769	19.67390781505	27.483	19.616
26.987954163473	19.3773596819875	26.848	19.743
26.987954163473	19.3773596819875	27.229	19.616
26.9879540861244	18.9918066902682	27.102	18.664
26.9879540085177	18.6644276087717	27.737	18.664
26.775058809364	18.5617374387285	27.356	18.473
26.462879171237	18.4509589885717	26.721	18.283
26.462879171237	18.4509589885717	26.594	18.854
26.0935378008728	18.3348155291196	25.895	18.918
26.0935378008728	18.3348155291196	26.149	19.045
25.744796715082	17.2577288145447	25.832	16.949
25.744796715082	17.2577288145447	26.34	17.203
24.8639108830602	16.5752183159191	24.308	16.441
24.8639108830602	16.5752183159191	25.07	17.076
24.8639108830602	16.5752183159191	25.07	16.314
24.3121271878579	15.6588636446942	24.244	15.997
24.3121271878579	15.6588636446942	24.371	15.235
23.7678646592114	14.892612595445	24.308	15.044
22.1799650701492	13.8611861644416	22.149	14.282
22.1799650701492	13.8611861644416	22.276	13.393
20.3362710563698	12.9948934459767	20.434	13.012
18.1427279478762	12.1208432459038	18.339	12.631
Route: 6 Length: 103.265835182489 Demand Met: 989			
11.3558134437022	18.0613152155792	11.862	17.965
11.8811956651647	19.7249097468575	11.608	20.251
12.1857332245014	20.0812146020015	11.735	20.378

Solution x	Solution y	Original x	Original y
12.6358861330546	20.3688048582748	12.243	20.505
13.2674550195029	20.6414318282951	13.005	20.061
13.646743423121	22.2996299880325	13.513	22.41
15.9101294455618	24.311528154334	16.497	24.315
16.3413150936221	26.3990573766039	16.37	26.982
16.7575700579176	26.8514830963929	17.069	27.046
17.1062217245524	27.2536930549951	17.069	27.744
17.4654920486723	27.5433855194481	17.64	27.49
17.8008753516411	27.8419670908714	17.64	27.998
18.1603709052761	28.1277761565168	18.72	28.189
18.3949992639174	28.4068717564705	19.037	28.189
18.5092111515464	28.9107222517527	18.91	28.697
18.6146871776218	29.5337141241256	18.529	30.03
18.719995346597	29.9159587911829	18.72	30.665
19.0605509742754	29.7883956621273	18.72	29.967
19.4910757342439	29.6563752268158	18.974	29.967
21.5147750385048	29.5031847753324	22.149	29.713
21.6180932942669	29.2103014594762	21.958	29.395
21.7169588000619	28.8869991861938	22.466	28.887
21.6486402556591	28.4668389686447	22.022	28.443
21.5774419015196	28.064294554211	22.276	28.125
20.4220364821788	27.4891122303848	20.117	27.617
19.6488776726575	26.8662461972456	19.037	26.982
19.4015200928681	26.0027344573972	19.545	25.839
19.1462703389482	25.2806698321749	19.164	24.696
18.8910549746207	24.971755244391	18.974	24.569
18.6286810141133	24.7170464275511	18.974	24.125
17.9098270035224	24.5958427085286	17.577	25.204
17.6982197495338	24.1649681528351	17.45	24.188
17.5016611954958	23.7314931644898	17.323	23.934
17.3149284278501	23.2460937864722	17.64	23.426
17.1105203651902	22.6920270614942	17.64	22.918
16.8123366072486	21.8302870817547	17.45	21.902
12.0255430067646	19.7126130205102	12.37	19.934
11.6404409342365	18.875215269984	12.052	18.854
10.9409887670123	17.3767950920892	11.481	17.711
Route: 7 Length: 86.4070060977741 Demand Met: 856			
27.648134525661	9.79682738485845	27.927	10.409
28.1406301034154	10.0184822743485	28.372	10.218
28.5579245478163	10.2262004974689	28.626	10.091
28.9646824847147	10.442359171077	29.007	10.282
29.3683462794354	10.6697673991638	29.451	10.155
29.7489929440069	10.9903773805435	30.34	10.917
29.9652970542894	11.3362250653409	29.975	12.061
30.1624066018039	11.3864342837033	30.202	11.996
30.3536277192517	11.4309817322954	30.527	11.313
30.5383203202881	11.4758725471818	30.787	11.313
30.7129130590949	11.5212615147493	30.657	11.541
30.8910032932357	11.5666479226243	31.047	11.313
31.0636709522234	11.6128055413572	30.982	12.126
31.2443937839955	11.6565821687536	31.242	12.126
31.4274530908433	11.6987423061604	32.022	12.126
31.4477854749004	11.7172320781724	31.762	12.126
31.4679589605881	11.735544088299	31.892	12.353
31.4679589507557	11.6992972496148	31.632	12.353
31.4679589402513	11.6583333423305	31.697	11.541
31.4679589296381	11.6178510414133	31.177	11.541
31.4679589296381	11.6178510414133	31.307	11.313
31.4679589188852	11.5788881148213	31.567	11.313
31.4679589081258	11.5408313134714	32.217	11.541
31.4603539468834	11.4085902205292	32.087	11.313
31.4525880461538	11.2837324714696	31.957	11.541
31.4447572137923	11.1426672918134	31.827	11.313
31.4369042073927	10.994435648685	32.182	10.98
31.2429938478884	10.8720120764445	31.437	11.541
30.9635940534751	10.5770851026171	30.658	10.98
30.7310932445076	10.1716247628643	30.912	9.901
30.4829186804156	9.8302589825305	30.658	9.71
30.2190400930162	9.50955217049873	30.594	9.52
29.899119848191	9.18716744915054	30.34	9.647
Route: 8 Length: 119.385377698345 Demand Met: 998			
17.1349758613306	13.53576353069	17.577	13.647
18.0184072918374	16.5779027148535	18.148	16.505
18.5476557944456	21.1671224304447	18.593	21.648
18.7777199018573	21.8651367988863	18.91	22.474
19.2906659668732	22.231785622062	19.482	21.966
19.7238830683525	22.703421035099	20.117	22.728
20.0379127206425	23.1765154017178	20.371	23.045
20.2981951840976	23.7459538904075	20.561	23.553
20.530483963601	24.509746179881	20.561	24.696

Solution x	Solution y	Original x	Original y
20.7637730696463	25.1432934036024	20.561	25.776
21.2207622751968	25.2788445295877	20.942	25.649
21.9814785632035	25.3987563780852	21.958	24.76
23.0109486711161	25.6846010264776	22.974	25.141
24.2950390661193	26.6562627010598	24.562	26.982
24.962327380865	27.2324064231171	25.07	27.744
25.4691170262821	27.521793333748	26.149	27.49
25.5434658084003	27.9098842971995	25.959	27.744
25.6118831397915	28.4222126570576	25.832	27.998
25.6777487001111	29.6475223472374	25.07	30.03
26.0905461245738	29.7305597156656	25.895	29.903
26.6076247992761	29.8083460252302	26.086	29.903
28.7283701010256	29.8798719652348	28.943	30.03
29.747459637624	29.9452292115485	30.277	30.475
29.2575419903902	29.8223209937089	28.943	30.475
28.9652563503446	29.2855066279466	29.07	29.713
28.6320425654616	27.8975592482589	28.88	27.3
28.0842255910057	27.6688292166257	27.927	28.125
27.6558145428452	27.3582432132527	27.229	27.554
27.3877776099245	26.9973449873968	27.546	26.982
27.1072258636974	26.6465018730446	27.229	26.22
26.8127537186744	26.3915405528416	27.102	25.966
26.4442400148199	26.1975786102916	25.705	26.22
26.426129349171	25.463724887728	27.165	25.458
26.3151463445449	24.8943875441969	26.911	24.76
26.1479764110774	24.4895900053521	26.086	24.95
25.9871639347261	23.7862112484477	26.149	23.172
25.7827638812504	23.6329030571642	25.832	22.918
25.489440870126	23.5929806331081	25.832	23.68
25.1070432038395	23.5527613812434	24.943	23.68
24.7666309746555	23.5122140461755	24.308	23.998
24.7666309746555	23.5122140461755	25.006	24.188
23.6210972651862	23.1507173563273	23.355	23.553
23.0563157355606	22.493357105642	23.482	22.41
21.5859551695845	21.9340118405485	21.577	21.394
20.3640906221415	21.6777443741092	20.117	21.775
19.6171681406726	21.4152473496579	19.863	21.331
17.3559207371505	20.7832570502605	17.323	21.331
16.3330517600225	18.0291592368686	16.688	18.092
13.3408508766982	14.5973373105687	13.576	14.79
Route: 9 Length: 95.6371830415324 Demand Met: 926			
31.7870110432233	9.31006781875066	32.055	9.837
32.1488904985062	10.922298394469	32.477	11.541
32.1488904985062	10.922298394469	32.347	11.313
32.4844538520598	11.0981240724224	32.737	11.541
32.4844538520598	11.0981240724224	33.127	11.313
32.626348464097	11.2273692440206	32.607	11.313
32.626348464097	11.2273692440206	32.867	11.313
32.7636918642657	11.3537409725288	32.997	11.541
32.8962438286583	11.4767487786906	33.387	11.313
33.0143364265708	11.6046480008697	33.647	11.313
33.0875201472091	11.7924652388591	33.452	11.541
33.1579523951331	11.995998899583	33.907	11.996
33.1177401852972	12.1336006680505	32.802	12.126
33.1177401852972	12.1336006680505	33.062	12.126
33.0782444130434	12.2716245645245	32.672	12.353
33.0782444130434	12.2716245645245	32.932	12.353
33.0398340487189	12.406187547114	32.542	12.126
33.0398340487189	12.406187547114	33.322	12.321
33.0026254950356	12.554442235373	32.835	12.613
32.9656560592795	12.7013429714683	32.436	13.231
33.1796389962567	12.6951553868813	33.095	13.231
33.1796389962567	12.6951553868813	33.095	12.971
33.4092983720205	12.6889269957184	33.095	12.711
33.6610019595191	12.6826975190211	33.322	12.581
33.6610019595191	12.6826975190211	33.907	12.516
33.9235728385384	12.6764769094767	33.907	12.776
33.9235728385384	12.6764769094767	34.135	12.646
34.1735710380221	12.6702553441912	34.135	13.166
34.1735710380221	12.6702553441912	34.135	12.906
34.4298603201227	12.664002068221	34.135	12.386
34.7152636715984	12.6577607017972	34.849	13.393
34.7511398407719	12.6127237973041	34.785	12.504
34.7870019884803	12.5678990585021	35.42	12.949
34.8044030126214	12.2901144608627	34.135	12.126
34.8232009557699	12.073924485343	34.595	11.996
34.8232009557699	12.073924485343	34.849	11.996
34.8420878901099	11.8648125249272	34.135	11.866
34.8635543963779	11.6554288537483	34.722	11.742
34.8635543963779	11.6554288537483	35.293	11.552

Solution x	Solution y	Original x	Original y
34.8848108993666	11.449089975745	35.484	11.425
34.9053609793483	11.2456106704856	35.547	11.234
34.9249522134444	11.0444813142903	35.674	11.044
34.6489673730039	10.9762544014043	35.166	10.726
34.2289586328362	10.9106721907698	34.087	11.615
33.9899802377199	10.7528564765625	33.96	10.536
33.7535119305507	10.6006071241466	33.96	11.234
33.4445642766094	10.3195247255694	32.944	10.536
33.2122451059627	9.99759003825115	33.833	10.282
Route: 10 Length: 109.743805186864 Demand Met: 994			
21.6228199770556	12.7341694665029	21.831	13.203
24.1768913477782	13.8922933728859	24.371	14.346
25.4747509467196	14.4560128725865	25.832	14.219
26.2194257404046	15.1852699895767	26.149	15.679
26.2194257404046	15.1852699895767	26.086	14.663
27.3846561118598	16.0986279959384	27.292	16.632
27.3846561118598	16.0986279959384	27.737	16.251
28.2612015244144	16.4885621586696	28.054	17.013
28.2612015244144	16.4885621586696	28.308	15.933
29.6778267810489	16.8951495598475	28.943	16.886
29.6778267810489	16.8951495598475	29.959	17.584
29.6778267810489	16.8951495598475	29.642	17.076
29.6778267810489	16.8951495598475	30.023	17.203
29.6778267810489	16.8951495598475	29.515	16.505
30.2403370022561	16.9127212732536	30.594	17.076
30.2403370022561	16.9127212732536	30.785	16.949
30.5188651290735	16.9301885342688	30.975	17.076
30.7456834724502	16.9475736226863	31.483	16.822
30.7486493955618	17.9473659635042	30.531	18.664
31.1603892058218	17.9482654695057	31.102	17.775
31.5796646632048	17.9491641989205	31.61	17.775
31.9940781652695	17.9500616904835	31.991	17.203
32.6564099983943	18.0078774827011	32.372	18.537
32.6564099983943	18.0078774827011	32.944	17.965
32.6564099983943	18.0078774827011	32.69	18.346
32.6564099983943	18.0078774827011	32.817	17.775
32.6564099983943	18.0078774827011	33.071	18.346
33.1485781776591	18.0604936348959	33.388	17.584
33.5443276161472	18.1161256529224	33.515	18.029
33.5443276161472	18.1161256529224	33.515	18.219
33.5443276161472	18.1161256529224	33.261	18.537
33.5443276161472	18.1161256529224	33.642	18.346
34.0870016108034	18.16895124067	34.087	18.918
34.7514337581335	18.1689510731841	34.722	18.219
34.7514337581335	18.1689510731841	34.595	18.791
36.4360090504907	18.1689509011922	36.436	18.918
36.5073425781206	16.5732517398433	36.436	17.076
36.5073425781206	16.5732517398433	35.992	16.314
36.5882931549698	13.4422678043554	35.992	13.647
36.5882931549698	13.4422678043554	36.119	13.139
36.5882931549698	13.4422678043554	36.944	13.012
36.7029511990461	12.7580006568239	37.452	12.758
36.7029513527618	10.2179978811311	37.452	10.218
34.8326957598888	9.81260368459014	34.976	10.282
34.8326957598888	9.81260368459014	35.103	10.155
34.8326957598888	9.81260368459014	34.595	9.202
33.9020143150932	9.55997013321901	33.642	10.155
33.4940072731678	8.54873692617261	34.087	8.758
Route: 11 Length: 97.8058377520072 Demand Met: 992			
19.4489285404925	12.5663605144236	19.482	13.076
27.8434338426977	13.3557066419493	27.991	13.647
30.6980475297209	13.9329581754854	31.177	14.433
31.0051134019884	14.1432621827374	31.047	14.661
31.2922359243291	14.2967916118888	31.307	14.661
31.5758896887606	14.4338701560331	31.567	14.661
31.8618199169642	14.5640042076172	31.827	14.661
32.1540394409425	14.6917540910604	32.152	15.246
32.4411911317791	14.7939971634476	33.127	14.661
32.5272041633107	14.9109188189292	32.412	15.246
32.6148931575408	15.0196626439333	32.672	15.246
32.701866019662	15.1240957806271	32.802	15.473
32.7872403866047	15.2212528706466	33.452	15.246
32.8445539565643	15.314668073306	32.932	15.246
32.9014938860994	15.4092795841928	33.582	15.473
32.9418352653946	15.4982059667224	33.322	15.473
32.980975368246	15.5876873973796	33.062	15.473
33.0199594226393	15.6790531343844	33.769	15.679
32.8717300948732	15.7276207429171	33.071	16.187
32.7072843966279	15.7651248893946	32.944	15.933
32.5298483920118	15.800957461463	32.542	15.473

Solution x	Solution y	Original x	Original y
32.3530250330289	15.8394584071668	32.282	15.473
32.1822032679526	15.8829594533643	32.182	16.632
31.9909593757519	15.8829594441135	31.991	16.632
31.9038054588091	15.8624717946872	32.022	15.473
31.815123416221	15.8422336240243	31.892	15.246
31.7246205878485	15.8227478712664	31.762	15.473
31.6337031332041	15.8034587435677	31.502	15.473
31.5446335889945	15.7843592373131	31.632	15.246
31.4538662598304	15.7657535339059	31.372	15.246
31.3651152240059	15.7475828153419	31.356	16.06
31.2766414282104	15.7292432531036	31.293	15.806
31.1882247838276	15.7108667653689	31.242	15.473
31.0994682095743	15.6925963226768	31.356	16.251
30.9968436873354	15.6732880655378	31.112	15.246
30.8921838642851	15.6542797776939	30.982	15.473
30.7865887638972	15.6353512780004	30.722	15.473
30.6826554412864	15.6164929546921	30.657	15.246
30.5799308925411	15.5978495084016	30.785	16.251
30.4308282746298	15.5757492860578	30.594	16.251
30.1567005209849	15.5470782276591	30.15	16.06
29.8818354185773	15.5174040812103	30.462	15.473
29.2715207793825	15.4877886218701	29.134	16.187
29.1319969277153	15.3450246446425	29.324	15.489
28.9855189452178	15.197389679335	29.642	15.108
28.4909296237478	15.0614298707074	28.372	14.663
28.0578851861666	14.9399679537046	28.245	14.854
27.5657582253032	14.820577131611	27.419	15.044
27.131906897159	14.6952651048806	27.229	15.362
26.4393450715532	14.1633425298549	26.911	14.409
19.3757524170887	13.3798282689414	19.418	13.901

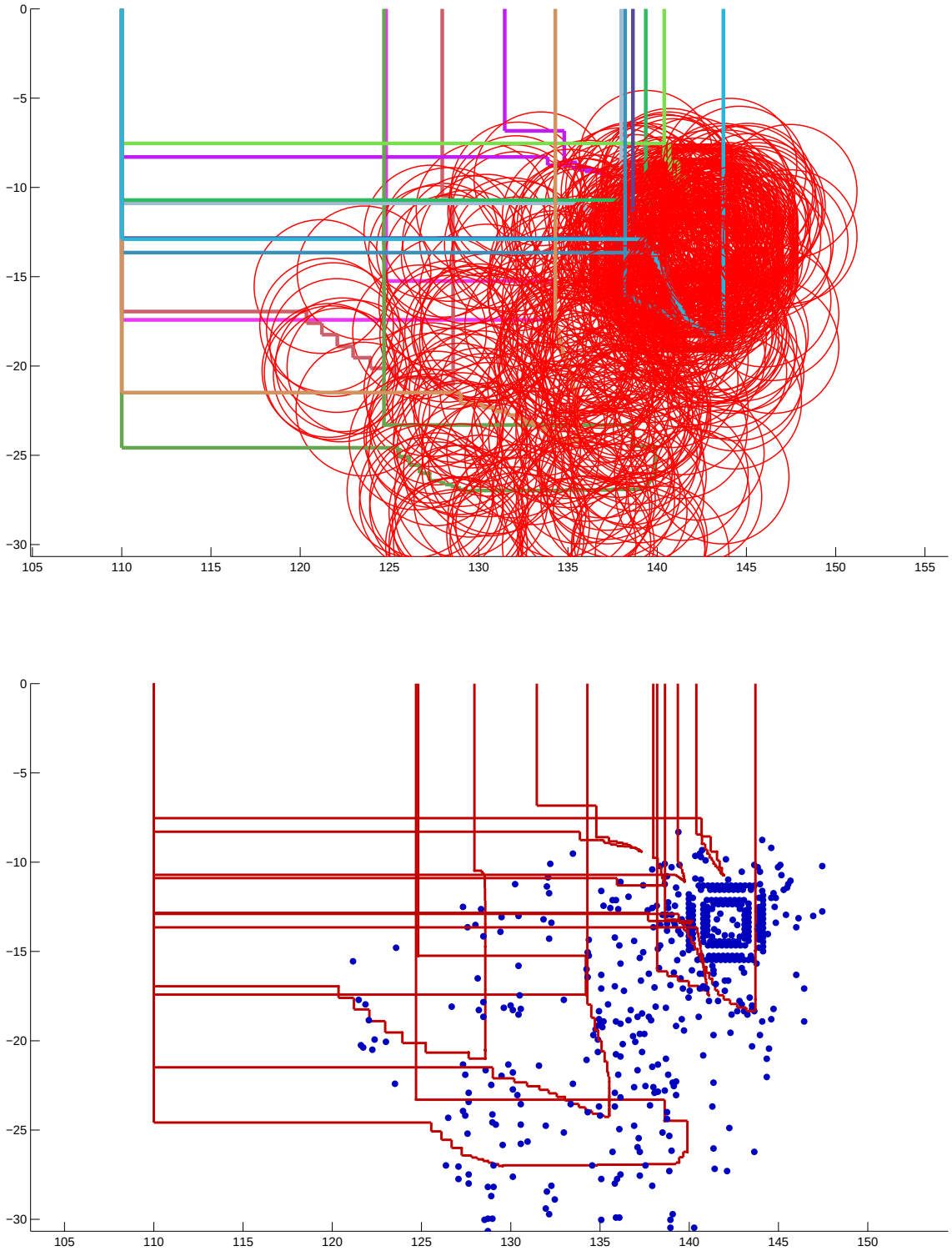


Figure O.128: $d493$, $r = 3.7452$, Equal Radius, 2D, Manhattan, Length = 984.4375342

Table O-131: Solution for $d493$, $r = 3.7452$, Equal Radius, 2D, Manhattan

Total distance: 984.437534245903			
Total demand met: 10514			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 83.244250621491 Demand Met: 962			
14.8115728957813	15.237553971256	11.163	15.552
14.8115728957813	15.237553971256	13.576	14.79
14.8115728957813	15.237553971256	17.577	13.647
14.8115728957813	15.237553971256	18.021	13.52
14.8115728957813	15.237553971256	18.148	16.505
14.8115728957813	15.237553971256	16.688	18.092
24.2056977318436	17.4164275789019	20.498	17.457
24.2056977318436	17.4164275789019	24.371	14.346
24.2056977318436	17.4164275789019	24.308	15.044
24.2056977318436	17.4164275789019	24.371	15.235
24.2056977318436	17.4164275789019	25.832	14.219
24.2056977318436	17.4164275789019	24.244	15.997
24.2056977318436	17.4164275789019	22.974	17.711
24.2056977318436	17.4164275789019	24.308	16.441
24.2056977318436	17.4164275789019	26.086	14.663
24.2056977318436	17.4164275789019	25.07	16.314
24.2056977318436	17.4164275789019	26.149	15.679
24.2056977318436	17.4164275789019	25.07	17.076
24.2056977318436	17.4164275789019	27.229	15.362
24.2056977318436	17.4164275789019	25.832	16.949
24.2056977318436	17.4164275789019	24.943	18.346
24.2056977318436	17.4164275789019	25.451	17.965
24.2056977318436	17.4164275789019	26.34	17.203
24.2056977318436	17.4164275789019	24.943	18.791
24.2056977318436	17.4164275789019	27.292	16.632
24.2056977318436	17.4164275789019	27.737	16.251
24.2056977318436	17.4164275789019	24.943	19.108
24.2056977318436	17.4164275789019	24.752	19.362
24.2056977318436	17.4164275789019	25.197	18.918
24.2056977318436	17.4164275789019	24.625	19.68
24.2056977318436	17.4164275789019	25.133	19.235
24.2056977318436	17.4164275789019	24.879	19.934
24.2056977318436	17.4164275789019	25.895	18.918
24.2056977318436	17.4164275789019	26.721	18.283
24.2056977318436	17.4164275789019	26.149	19.045
24.2056977318436	17.4164275789019	24.244	21.077
24.2056977318436	17.4164275789019	26.594	18.854
24.2056977318436	17.4164275789019	24.879	20.632
24.2056977318436	17.4164275789019	27.102	18.664
24.2056977318436	17.4164275789019	27.356	18.473
24.2056977318436	17.4164275789019	27.737	18.664
24.2056977318436	17.4164275789019	26.276	20.188
24.2056977318436	17.4164275789019	26.848	19.743
24.2056977318436	17.4164275789019	25.895	20.759
24.2056977318436	17.4164275789019	27.229	19.616
Route: 2 Length: 79.1376139374028 Demand Met: 984			
17.9606024472068	10.4771931176259	18.466	14.155
17.9606024472068	10.4771931176259	20.434	13.012
18.3903209158348	10.5752370851782	20.244	11.234
18.3903209158348	10.5752370851782	22.022	11.361
18.4655446743766	10.655096451806	22.085	10.853
18.5295401787538	10.7342357850663	22.212	10.091
18.5432109204254	11.4583236523735	17.323	12.504
18.5569426176754	12.1570658286168	18.339	12.631
18.5707180423525	12.8476373840513	22.149	11.742
18.5707180423525	12.8476373840513	22.276	13.393
18.5707174153304	13.4676979236509	19.482	13.076
18.5707167884858	14.0976854810669	19.418	13.901
18.5707161618246	14.7338708686654	21.831	13.203
18.5707161618246	14.7338708686654	22.149	14.282
18.5707155316229	17.1340392823096	20.434	15.806
18.5707149015401	20.5326218336334	18.466	17.838
18.5707149015401	20.5326218336334	18.212	18.283
18.5707149015401	20.5326218336334	18.466	18.664
18.5707149015401	20.5326218336334	19.609	18.156
18.5707149015401	20.5326218336334	20.117	18.283
18.5707149015401	20.5326218336334	20.434	18.537
18.5707149015401	20.5326218336334	18.593	21.648
18.5707149015401	20.5326218336334	19.863	21.331
18.5707149015401	20.5326218336334	18.91	22.474
18.5707149015401	20.5326218336334	19.482	21.966
18.5707149015401	20.5326218336334	20.117	21.775
18.5707149015401	20.5326218336334	21.577	21.394
18.5707149015401	20.5326218336334	20.371	23.045
18.5707149015401	20.5326218336334	20.561	23.553
18.5707142716938	20.9980889263489	20.561	18.219
18.5707142716938	20.9980889263489	18.974	24.125
18.5707142716938	20.9980889263489	18.974	24.569
18.5707142716938	20.9980889263489	19.164	24.696
17.6408336369662	20.6644261980313	19.99	18.029
17.6408336369662	20.6644261980313	17.323	21.331
17.6408336369662	20.6644261980313	17.45	21.902
17.6408336369662	20.6644261980313	17.64	22.918
17.6408336369662	20.6644261980313	17.64	23.426
17.6408336369662	20.6644261980313	17.323	23.934
17.6408336369662	20.6644261980313	17.45	24.188
15.2335878200305	20.1300427142745	13.005	20.061
15.2335878200305	20.1300427142745	13.513	22.41
13.9277728084129	19.5339797762005	11.735	20.378
13.9277728084129	19.5339797762005	12.243	20.505
12.9636167501739	18.904346876975	11.608	20.251
12.0794135877355	18.2473966394957	11.862	17.965
11.2140127358612	17.5988152516606	11.481	17.711
10.3492892495895	16.9497250582348	12.052	18.854
10.3492892495895	16.9497250582348	12.37	19.934
Route: 3 Length: 73.4789721879327 Demand Met: 856			
21.4588525546616	6.83048630191125	23.482	9.52
24.7921976114133	8.59834161183425	26.149	11.107
24.7921976114133	8.59834161183425	25.895	12.123
25.4984134643453	8.83744092535908	27.927	10.409
25.9926204360896	8.91058598898306	29.007	10.282
25.9926204360896	8.91058598898306	28.753	10.79
26.296668273631	8.98054997796369	28.372	10.218
26.296668273631	8.98054997796369	28.626	10.091
26.5735189424353	9.04964626752106	29.388	8.313
26.5735189424353	9.04964626752106	29.451	10.155
26.720820553411	9.17940598710148	27.673	12.695
26.720820553411	9.17940598710148	27.927	12.568
26.9346793768171	9.23133587449199	30.34	9.647
27.1119107598016	9.28308214146679	30.721	9.329
27.1119107598016	9.28308214146679	30.594	9.52
27.1977020170694	9.30861810396307	28.626	11.234
27.1977020170694	9.30861810396307	29.261	11.425
27.2097033692587	9.33468935762804	28.181	12.441
27.2097033692587	9.33468935762804	28.816	12.568
27.2722055877024	9.36696463150014	29.388	11.804
27.2722055877024	9.36696463150014	29.975	11.801
27.3083842465812	9.39993286621305	28.499	12.949
27.3264284950751	9.41305759889119	30.34	10.917
27.3264284950751	9.41305759889119	29.975	12.061
27.3174095456355	9.40649589572619	29.197	12.441
27.2945863011324	9.37920339692333	30.912	9.901
27.2945863011324	9.37920339692333	30.658	10.98
27.1212760989142	9.24908088114752	28.816	12.25
27.0419322827975	9.18621143940887	30.658	9.71
26.805782649538	9.11854837124772	26.594	11.933
26.3155012362644	9.10240297181073	26.022	12.631
25.9426956517597	9.01376569866266	25.705	12.123
25.5814130543293	8.92141459240908	25.578	12.568
25.2265971507873	8.76899494155438	27.419	11.298
24.9340774099612	8.76305500632974	25.197	12.441
23.8692208895807	8.29577957305833	25.07	11.615
Route: 4 Length: 113.820766309489 Demand Met: 993			
14.6943423008633	23.301756886022	16.497	24.315
14.6943423008633	23.301756886022	17.577	25.204
28.6197522635974	24.4812600524859	31.356	22.347
28.6197522635974	24.4812600524859	28.88	25.331
28.6197522635974	24.4812600524859	27.546	26.982
28.6197522635974	24.4812600524859	27.229	27.554
28.6197522635974	24.4812600524859	31.293	23.68
28.6197522635974	24.4812600524859	29.007	26.157
28.6197522635974	24.4812600524859	28.88	27.3
29.8967962274619	26.2196016523021	32.245	24.887
29.8967962274619	26.2196016523021	31.356	26.03
29.8967962274619	26.2196016523021	31.42	27.173
29.8967962274619	26.2196016523021	32.118	27.3
29.8967962274619	26.2196016523021	33.642	26.22
29.6626271056668	26.5233221413994	27.927	28.125
29.4354862834833	26.8191411313723	29.07	29.713
29.4354862834833	26.8191411313723	28.943	30.475
29.2548216910195	26.9054646343353	30.277	30.475

Solution x	Solution y	Original x	Original y
27.438105696106	26.9429850139563	26.086	29.903
27.438105696106	26.9429850139563	28.943	30.03
24.8261935114426	26.9787215025902	25.07	30.03
24.8261935114426	26.9787215025902	25.895	29.903
19.5529035831538	27.0135869272827	20.561	25.776
19.5529035831538	27.0135869272827	18.72	30.665
19.5529035831538	27.0135869272827	22.276	28.125
19.5529035831538	27.0135869272827	22.022	28.443
19.5529035831538	27.0135869272827	21.958	29.395
19.5529035831538	27.0135869272827	22.466	28.887
19.5529035831538	27.0135869272827	22.149	29.713
19.2854268308575	26.9204884036839	19.545	25.839
19.2854268308575	26.9204884036839	19.037	26.982
19.0050421851462	26.8279875535093	18.72	28.189
18.7231222732213	26.7351015801239	19.037	28.189
18.7231222732213	26.7351015801239	18.91	28.697
18.4377229701536	26.6408821169135	20.117	27.617
18.4377229701536	26.6408821169135	18.974	29.967
18.1317213849283	26.5390581702043	18.72	29.967
17.8073256489152	26.4245137768408	18.529	30.03
17.2504288615744	26.0041034289673	17.64	27.49
17.2504288615744	26.0041034289673	17.64	27.998
16.684333424927	25.5485609440525	17.069	27.046
16.1160352362123	25.0777223535023	16.37	26.982
15.5469373562434	24.5807454499224	17.069	27.744
Route: 5 Length: 79.8012526408715 Demand Met: 981			
27.9814295715252	9.76056054959085	31.047	11.313
27.9814295715252	9.76056054959085	31.307	11.313
28.2283946233908	10.2464188745463	31.567	11.313
28.4263427225909	10.665317987777	31.827	11.313
28.4263427225909	10.665317987777	32.087	11.313
28.4861788390894	10.879966343135	30.657	11.541
28.4861788390894	10.879966343135	31.177	11.541
28.5450443618666	11.0911686634892	31.437	11.541
28.5450443618666	11.0911686634892	31.697	11.541
28.6018270476802	11.2984827667563	31.957	11.541
28.6018270476802	11.2984827667563	32.347	11.313
28.5553346481192	11.298496601905	30.787	11.313
28.5086823775912	11.2985104346617	30.527	11.313
28.4619107675773	11.298524247091	30.982	12.126
28.4148466727486	11.298538079663	31.242	12.126
28.3672981500769	11.298551623484	29.515	14.028
28.3672981500769	11.298551623484	31.502	12.126
28.3185242583022	11.2985657033175	31.015	12.516
28.269260233652	11.2985795084362	30.787	12.386
28.269260233652	11.2985795084362	30.787	12.646
28.2191306234944	11.2985932992662	30.202	12.451
28.1688223345047	11.298607104678	30.202	11.996
28.1183417884004	11.2986208867907	29.975	12.321
28.0677143632224	11.298634670457	29.975	12.581
28.0677143632224	11.298634670457	29.975	12.841
28.0166394713626	11.2986484532803	30.202	12.711
28.0166394713626	11.2986484532803	30.202	12.971
27.9648882021165	11.2986622205901	29.975	13.101
27.9648882021165	11.2986622205901	29.975	13.361
27.9124437553349	11.2986759864442	30.202	13.231
27.9124437553349	11.2986759864442	29.975	13.621
27.8589605694962	11.2986897370902	29.578	13.203
27.8589605694962	11.2986897370902	29.705	13.393
27.8049344703533	11.2987034728041	29.197	13.52
27.8049344703533	11.2987034728041	29.388	13.838
27.7503992706341	11.2987172172471	29.007	12.949
27.7503992706341	11.2987172172471	29.134	13.33
27.6956209506597	11.2987309431191	28.753	12.949
27.6408193042757	11.2987446495642	27.991	13.647
27.6408193042757	11.2987446495642	28.372	13.52
27.5860159748475	11.2987583749606	28.753	13.457
27.5860159748475	11.2987583749606	28.753	13.838
27.5309509888761	11.2987720554271	28.245	14.854
27.5309509888761	11.2987720554271	29.007	14.409
27.4750723506598	11.2987856818812	28.372	14.663
27.4189968262273	11.2987992727555	27.419	15.044
25.9531305144772	10.894261466408	26.911	14.409
Route: 6 Length: 81.6216569962275 Demand Met: 994			
29.3587395053786	9.9994075461902	32.737	11.541
29.4452847033197	10.1916725707527	32.055	9.837
29.5303644327004	10.3858138642282	32.944	10.536
29.6099516489748	10.5793234549021	32.607	11.313
29.6099516489748	10.5793234549021	32.867	11.313
29.6837019910733	10.7653254861238	33.127	11.313

Solution x	Solution y	Original x	Original y
29.6837019910733	10.7653254861238	33.387	11.313
29.6877306763478	10.7903191044794	32.997	11.541
29.6917621791631	10.8152539520084	30.787	12.906
29.6957938950678	10.8401075950621	31.275	12.613
29.6998258926016	10.8648965137625	31.762	12.126
29.6998258926016	10.8648965137625	32.022	12.126
29.7038458456603	10.8895795141928	32.542	12.126
29.7038458456603	10.8895795141928	32.802	12.126
29.7078620834024	10.91406498699	30.787	13.686
29.7078620834024	10.91406498699	30.787	13.946
29.7118733864658	10.9381796710356	30.787	14.206
29.715890995538	10.9618113211616	31.015	13.816
29.715890995538	10.9618113211616	31.015	14.076
29.7198995314262	10.9848901524366	30.202	14.011
29.7198995314262	10.9848901524366	30.202	14.271
29.7239012574528	11.0074921083157	32.282	12.126
29.7279020469898	11.030053685473	30.202	13.751
29.7319054262433	11.0525169187772	30.202	13.491
29.7359120983163	11.0749144588333	29.975	14.401
29.7359120983163	11.0749144588333	30.202	14.791
29.7359127451704	11.0749138652099	29.975	14.141
29.7359133921325	11.0749132690082	29.975	13.881
29.7359140392805	11.0749127550127	33.452	11.541
29.7359140392805	11.0749127550127	32.672	12.353
29.6937216815963	11.0432518110073	32.217	11.541
29.6513019295714	11.0115280127307	32.477	11.541
29.6084800217644	10.9797263462316	32.412	12.353
29.5650756677012	10.9477297783815	30.787	13.166
29.5650756677012	10.9477297783815	30.787	13.426
29.5213327701981	10.9153043307458	31.372	12.353
29.5213327701981	10.9153043307458	31.632	12.353
29.4770971902209	10.882613118803	31.892	12.353
29.4770971902209	10.882613118803	32.152	12.353
29.4317707625803	10.8495096526326	31.015	12.776
29.386317057855	10.8162122429197	31.015	13.296
29.386317057855	10.8162122429197	31.015	13.556
29.339809694069	10.7819299390512	31.015	13.036
29.2928661160765	10.7472404722956	31.737	12.885
29.2928661160765	10.7472404722956	31.547	13.203
29.2410308335349	10.7103713106048	31.399	13.754
Route: 7 Length: 85.3369487311519 Demand Met: 976			
30.3967833817299	8.45187039573741	33.642	10.155
30.7145118372244	8.97371247063093	33.833	10.282
30.7145118372244	8.97371247063093	33.96	10.536
30.8898860798572	9.29822367121642	33.96	11.234
31.0167317817297	9.52085968938694	32.182	10.98
31.0167317817297	9.52085968938694	33.647	11.313
31.1372792806024	9.72748235580052	33.062	12.126
31.1372792806024	9.72748235580052	32.932	12.353
31.251685548044	9.90886638841061	33.322	12.321
31.363058202178	10.0796841043431	33.322	12.581
31.363058202178	10.0796841043431	33.322	12.841
31.4670784452449	10.2269159532007	32.835	12.613
31.4670784452449	10.2269159532007	33.095	12.711
31.5685480477437	10.3647896642316	33.095	12.971
31.6687844504596	10.4975381533313	33.095	13.751
31.7642176185588	10.6108926940107	33.322	13.621
31.7642176185588	10.6108926940107	32.835	14.173
31.7998789617718	10.6263392981932	31.991	14.092
31.7998789617718	10.6263392981932	32.372	14.092
31.8354003105789	10.6417111232293	35.293	11.552
31.8354003105789	10.6417111232293	35.484	11.425
31.8533741706852	10.6558294667307	34.722	11.742
31.8533741706852	10.6558294667307	34.849	11.996
31.8712633904079	10.669921486417	33.907	11.996
31.8712633904079	10.669921486417	34.135	12.126
31.8891041437441	10.6840014317253	34.595	11.996
31.8891041437441	10.6840014317253	34.135	12.646
31.9068491978381	10.6980669030395	33.907	12.776
31.9246103417769	10.7121253018638	33.322	13.101
31.9246103417769	10.7121253018638	33.322	13.361
31.9423087551352	10.7261640215486	32.217	14.433
31.9423087551352	10.7261640215486	32.477	14.433
31.9423090200239	10.7261633531636	32.436	13.231
31.9423090200239	10.7261633531636	32.69	13.52
31.942309284956	10.7261626652459	33.095	13.231
31.942309284956	10.7261626652459	33.095	13.491
31.9423095498556	10.7261619820387	33.907	13.036
31.9423095498556	10.7261619820387	34.135	12.906
31.942309814542	10.7261613022065	33.907	12.516

Solution x	Solution y	Original x	Original y
31.9423100792745	10.726160614916	34.135	12.386
31.9423103440273	10.726159967177	35.674	11.044
31.9423103440273	10.726159967177	35.547	11.234
31.8248611433177	10.335573409178	34.087	11.615
31.8248611433177	10.335573409178	34.135	11.866
31.701969275285	9.90696876690622	35.166	10.726
31.5526323433705	9.40974164055319	34.976	10.282
31.5526323433705	9.40974164055319	35.103	10.155
31.204926661332	8.55779971219657	34.595	9.202
30.6898942556506	7.53335364576283	34.087	8.758
Route: 8 Length: 87.2391942136438 Demand Met: 960			
28.64121463657	13.2270574237798	28.943	16.886
29.3973967789581	13.3670186777088	29.642	17.076
29.7079587134068	13.4128044249843	29.515	16.505
30.0222317193526	13.4577990784502	30.785	16.251
30.0222317193526	13.4577990784502	30.023	17.203
30.0267599152706	13.4491959758526	30.15	16.06
30.0267599152706	13.4491959758526	30.594	16.251
30.0318880388509	13.440671101416	29.324	15.489
30.0318880388509	13.440671101416	30.462	15.473
30.0372072458426	13.4321813041631	29.642	15.108
30.0425535211823	13.4237022520683	29.975	14.661
30.0425535211823	13.4237022520683	29.975	14.921
30.0479985603892	13.4152413229439	30.657	15.246
30.0479985603892	13.4152413229439	30.722	15.473
30.0537216465659	13.4068252834636	30.982	15.473
30.0537216465659	13.4068252834636	31.242	15.473
30.0598623865951	13.3984770611385	31.502	15.473
30.0598623865951	13.3984770611385	31.293	15.806
30.0665665815631	13.3902314071841	31.112	15.246
30.0665665815631	13.3902314071841	31.372	15.246
30.0735444695398	13.3820482637452	31.632	15.246
30.0735444695398	13.3820482637452	31.892	15.246
30.0809692770322	13.3739687896099	31.437	14.433
30.0809692770322	13.3739687896099	31.567	14.661
30.0885720680662	13.3659333965017	31.047	14.661
30.0885720680662	13.3659333965017	31.307	14.661
30.096287937898	13.3579429635368	30.787	14.466
30.096287937898	13.3579429635368	31.177	14.433
30.1040762299532	13.3499922880004	31.275	14.173
30.1119042053678	13.3420607502073	31.61	13.901
30.1119042053678	13.3420607502073	31.697	14.433
30.1198493088578	13.3341803399094	31.957	14.433
30.1278740292557	13.3263376154699	31.827	14.661
30.1278740292557	13.3263376154699	32.087	14.661
30.1360638894666	13.3185941568885	32.347	14.661
30.1443765501933	13.3109124783148	32.737	14.433
30.1528609441888	13.3032989288472	33.095	14.011
30.1528609441888	13.3032989288472	33.322	13.881
30.1617980283718	13.2957986180741	33.907	13.296
27.6882868219239	12.8399873792068	28.308	15.933
27.6882868219239	12.8399873792068	29.134	16.187
Route: 9 Length: 97.1035670738281 Demand Met: 844			
28.2043394905587	16.1138541826198	29.705	19.426
28.7783593719827	16.3880442130825	28.054	17.013
29.3663041036129	16.6591714163366	28.689	18.156
29.9752408919335	16.9251960777022	30.531	18.664
29.9752408919335	16.9251960777022	31.356	19.68
30.5259523741804	17.1634206108363	32.309	19.553
31.0289307965427	17.3878375971351	34.087	18.918
31.0289307965427	17.3878375971351	33.96	19.68
31.0958324814318	17.4559510554823	33.515	20.315
31.0958322412604	17.4559502871445	34.722	18.219
31.0958322412604	17.4559502871445	34.595	18.791
31.0630647995444	17.2834823902069	33.261	18.537
31.0630647995444	17.2834823902069	33.642	18.346
31.0300172800912	17.1062370206887	33.515	18.029
31.0300172800912	17.1062370206887	33.515	18.219
30.9966504732532	16.9245836392883	33.388	17.584
30.9632726055209	16.741902144679	32.944	17.965
30.9632726055209	16.741902144679	33.071	18.346
30.9296937393909	16.5531333722067	32.372	18.537
30.9296937393909	16.5531333722067	32.69	18.346
30.8960036047371	16.3554923674448	31.991	17.203
30.8960036047371	16.3554923674448	32.817	17.775
30.8622444549526	16.1536329241787	31.102	17.775
30.8622444549526	16.1536329241787	31.61	17.775
30.8285264705353	15.9461308576391	31.991	16.632
30.7948739849758	15.7378432506602	32.182	16.632
30.7612644337911	15.5282046857083	32.944	15.933

Solution x	Solution y	Original x	Original y
30.7612644337911	15.5282046857083	33.071	16.187
30.7274399210572	15.3166026900972	33.062	15.473
30.7274399210572	15.3166026900972	33.322	15.473
30.6933521091569	15.1051292707881	33.452	15.246
30.6933521091569	15.1051292707881	33.582	15.473
30.658800002848	14.8925209162536	33.769	15.679
30.623866066823	14.6746813803814	33.907	14.791
30.623866066823	14.6746813803814	34.135	14.986
30.5867724803865	14.450945476874	33.907	14.336
30.5490185605836	14.2288121857678	33.907	14.076
30.5104697389426	14.0086764664593	34.135	14.466
30.5104697389426	14.0086764664593	34.135	14.726
30.4526479212596	13.6522009904317	34.135	14.206
Route: 10 Length: 99.5639394785037 Demand Met: 991			
24.2946298338156	17.9780264483185	27.864	18.854
24.510447333025	18.7147962737592	27.483	19.616
24.7105975559101	19.391931307947	26.149	20.886
24.7105975559101	19.391931307947	27.356	20.632
24.8993666018676	19.9929028838679	26.975	20.061
25.0853724610625	20.5968728780395	27.102	21.648
25.0853724610625	20.5968728780395	27.927	21.458
25.2596032244537	21.1560714399849	28.245	21.331
25.2596032244537	21.1560714399849	28.689	21.013
25.4054385488518	21.7324051728844	28.816	21.902
25.4054385488518	21.7324051728844	29.07	22.347
25.4605769253497	22.0070497735462	26.022	21.902
25.5157982365781	22.2829931790563	29.261	22.283
25.5157982386878	22.6634907547803	25.832	22.918
25.5157982409071	23.0450252977795	29.261	23.045
25.5157972314143	23.153772469699	28.626	22.791
25.5157972314143	23.153772469699	29.134	22.537
25.515796219917	23.2725928566168	28.753	23.998
25.5157952084414	23.3897594297198	28.753	24.379
25.5157952084414	23.3897594297198	28.499	25.141
25.5157941996561	23.4975099314327	28.245	22.855
25.5157931911995	23.6061004448337	27.991	22.601
25.5157931911995	23.6061004448337	28.054	22.918
25.5157921830598	23.7165885997621	27.546	22.537
25.5157911751647	23.8281516615289	26.149	23.172
25.5157911751647	23.8281516615289	26.911	22.601
25.5157901675115	23.9411772561938	27.8	23.617
25.5157901675115	23.9411772561938	26.911	24.76
25.5157891602277	24.0544335802752	27.165	25.458
25.5157891602277	24.0544335802752	27.102	25.966
25.5157883690169	24.1656207404306	27.229	26.22
25.5157883690169	24.1656207404306	26.149	27.49
25.5157872962288	24.2661714983448	25.832	27.998
25.2384408669506	24.1870176377592	25.959	27.744
24.9074474686053	24.0862928418358	25.07	27.744
24.5470132435898	23.9139276196781	24.562	26.982
24.1904184856246	23.7299732250727	25.705	26.22
23.8165353432236	23.5376421275059	26.086	24.95
23.4196831865362	23.3417339317886	23.355	23.553
23.0279155022738	23.1460850547582	25.006	24.188
23.0279155022738	23.1460850547582	25.832	23.68
22.5746437352551	22.9473356136024	23.482	22.41
22.1197334771465	22.7499954920236	24.943	23.68
21.5983327968705	22.5493945626619	22.974	25.141
21.5983327968705	22.5493945626619	24.308	23.998
20.9123111330873	22.3309277046463	21.958	24.76
20.1983369641352	22.103882544439	20.942	25.649
18.9956334192524	21.4861357255389	20.561	24.696
Route: 11 Length: 104.089372055361 Demand Met: 973			
33.7067992076255	10.2180002371569	37.452	10.218
33.7067991935255	12.7580063457561	37.452	12.758
33.7067989282104	13.734590301524	36.119	13.139
33.7067989282104	13.734590301524	36.944	13.012
33.7067986640199	14.9768894854666	34.785	12.504
33.7067986640199	14.9768894854666	34.135	13.166
33.7067986640199	14.9768894854666	33.095	14.271
33.7067986640199	14.9768894854666	33.907	13.556
33.7067986640199	14.9768894854666	33.322	14.141
33.7067986640199	14.9768894854666	34.135	13.426
33.7067986640199	14.9768894854666	33.907	13.816
33.7067986640199	14.9768894854666	33.322	14.401
33.7067986640199	14.9768894854666	34.135	13.686
33.7067986640199	14.9768894854666	34.135	13.946
33.7067986640199	14.9768894854666	34.849	13.393
33.7067986640199	14.9768894854666	35.42	12.949
33.7067986640199	14.9768894854666	34.404	14.028

Solution x	Solution y	Original x	Original y
33.7067986640199	14.9768894854666	35.992	13.647
33.7067986640199	14.9768894854666	35.992	16.314
33.7067986640199	14.9768894854666	36.436	17.076
33.7067984824255	17.6834302650479	36.436	18.918
33.7067984824255	17.6834302650479	34.341	21.013
33.7067981372459	18.3378868200549	34.341	22.029
33.2024948220435	18.1446598577361	34.468	20.442
32.682996909984	17.9439803520519	30.785	20.823
32.2849384805638	17.699877409663	29.578	18.791
31.9294605454486	17.4496154509504	29.261	19.172
31.6196116290771	17.1830022290958	28.118	18.092
31.4512176682541	16.8575653412841	31.483	16.822
31.283533436779	16.533345659229	29.959	17.584
31.283533436779	16.533345659229	30.594	17.076
31.1192098302166	16.2036210330479	30.785	16.949
31.1192098302166	16.2036210330479	30.975	17.076
30.9563538441666	15.8689633664301	31.356	16.06
30.9563538441666	15.8689633664301	31.356	16.251
30.7936996510475	15.5339108685256	31.762	15.473
30.7936996510475	15.5339108685256	32.022	15.473
30.6296526277616	15.201366110914	32.282	15.473
30.4644082373098	14.8683544877365	32.152	15.246
30.4644082373098	14.8683544877365	32.412	15.246
30.2952031877693	14.5329347307643	32.672	15.246
30.2952031877693	14.5329347307643	32.542	15.473
30.1179335973105	14.1863056704606	32.802	15.473
29.93234751014	13.8229701339333	33.127	14.661
29.93234751014	13.8229701339333	32.932	15.246
29.6966650417912	13.3930942657296	32.867	14.661
29.4067937688487	12.8951647586896	32.607	14.661

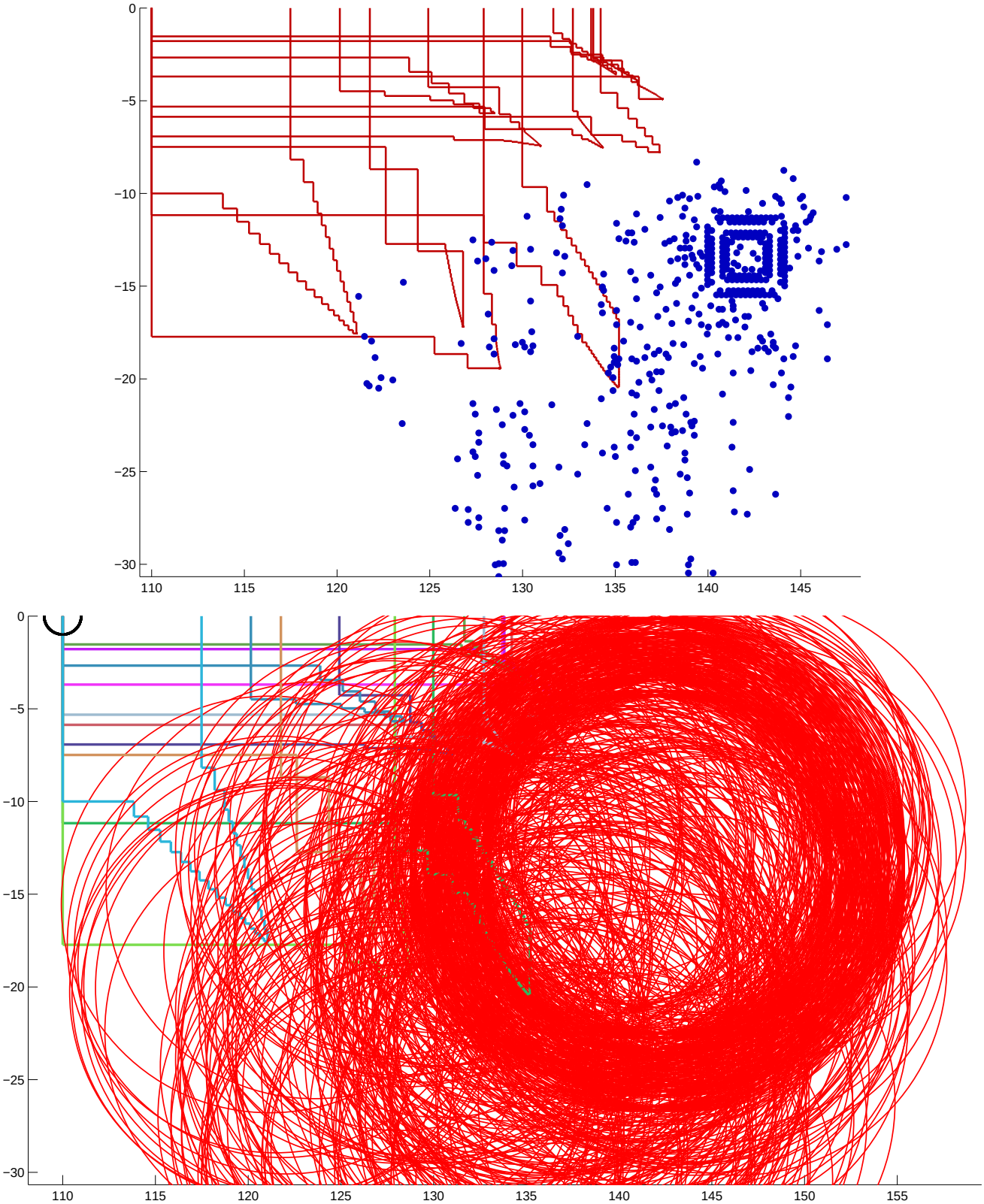


Figure O.129: $d493$, $r = 11.2356$, Equal Radius, 2D, Manhattan, Length = 714.5315086

Table O-132: Solution for $d493$, $r = 11.2356$, Equal Radius, 2D, Manhattan

Total distance: 714.531508580154			
Total demand met: 10514			
Depot: x 0 y 0			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 64.9154239081479 Demand Met: 1000			
23.701612045598	2.83067057025793	29.975	11.801
25.3706527230682	3.70878290879976	31.015	13.296
25.8702656269902	3.99620407940394	30.787	13.946
26.2115886002518	4.1810112435774	31.275	14.173
26.3578358807843	4.25629166125071	31.399	13.754
26.498754503127	4.32865504464484	31.61	13.901
26.6334223731619	4.39768852352711	31.991	14.092
26.7546010982948	4.46004151049382	32.372	14.092
26.8560602134001	4.51308271726598	32.69	13.52
26.9546884340293	4.56483595727312	33.095	13.491
27.0498563786751	4.61510678072515	33.095	13.751
27.1406697556006	4.66344031793379	33.095	14.011
27.2251998878343	4.70886330911565	33.095	14.271
27.245531024871	4.72131956959942	32.835	14.173
27.2657046561546	4.73366018986703	32.737	14.433
27.285410253139	4.74569754045753	32.477	14.433
27.3049314384897	4.75760252203295	32.217	14.433
27.324334174549	4.76941632483122	31.957	14.433
27.343649081865	4.78115946657592	31.697	14.433
27.362894288852	4.79284511948355	31.437	14.433
27.3820822070807	4.80448297306123	31.177	14.433
27.4012221951985	4.81608076642483	31.047	14.661
27.420310122508	4.82763397042557	31.307	14.661
27.4393405718739	4.83914087727203	31.567	14.661
27.4583057174944	4.85059831735808	31.827	14.661
27.4771935898304	4.86200057273737	32.087	14.661
27.4959845584665	4.87333728902478	32.347	14.661
27.5146431657331	4.8845889147216	32.607	14.661
27.5330929275054	4.89571483429239	32.867	14.661
27.5510952483064	4.90661669469996	33.127	14.661
27.5510952488472	4.90661669396302	33.322	14.401
27.5510952493809	4.90661669322102	33.322	14.141
27.5510952499131	4.90661669247719	33.322	13.881
27.5510952504442	4.90661669173207	33.322	13.621
27.5510952509747	4.90661669098602	33.322	13.361
27.5510952515046	4.90661669023913	33.322	13.101
27.5510952520337	4.9066166894915	33.095	13.231
27.5510952525624	4.90661668874312	33.095	12.971
27.5510952530906	4.90661668799404	33.322	12.841
27.5510952536185	4.90661668724426	33.907	12.776
27.5510952541455	4.90661668649343	33.907	12.516
27.5510952546718	4.90661668574166	34.135	12.646
27.5510952551975	4.90661668498867	34.135	12.386
27.5510952557223	4.90661668423444	34.135	12.126
27.5510952562467	4.90661668347911	34.722	11.742
27.5510952567702	4.90661668272249	35.293	11.552
27.5510952572929	4.90661668196441	35.484	11.425
27.5510952578145	4.90661668120476	35.547	11.234
27.5510952583351	4.90661668044367	35.674	11.044
27.5510952588546	4.90661667968108	35.166	10.726
27.551095259374	4.90661667891814	37.452	10.218
26.2738856855865	3.69231082773701	35.103	10.155
Route: 2 Length: 70.3104340870154 Demand Met: 1000			
24.2085503018323	4.57651361830309	32.282	12.126
25.1141156712175	5.39611472735782	33.322	12.581
25.7012126984343	5.96720781150203	34.595	11.996
26.1716055547709	6.4568683254233	34.849	11.996
26.5996803779742	6.91536906403826	34.785	12.504
27.0041185975995	7.3540016348002	35.42	12.949
27.3834018423221	7.77181494475852	37.452	12.758
27.3834017453731	7.77181495204063	36.944	13.012
27.3834016483433	7.77181495929867	36.119	13.139
27.3834015512838	7.77181496654708	35.992	13.647
27.3834014541829	7.77181497378175	34.849	13.393
27.3834013570666	7.77181498100917	34.404	14.028
27.3834012599362	7.77181498822939	34.135	13.946
27.3834011627929	7.77181499544278	34.135	13.686
27.3834010656417	7.77181500265198	34.135	13.426
27.3834009684755	7.77181500985414	34.135	13.166
27.3834008712988	7.771815017053	34.135	12.906
27.3834007741091	7.77181502424851	33.907	13.036
27.3834006769119	7.77181503144414	33.907	13.296
27.3834005797	7.77181503863548	33.907	13.556
27.3834004824766	7.77181504582354	33.907	13.816
27.3834003852385	7.77181505300702	33.907	14.076
27.3834002879814	7.77181506018431	33.907	14.336
27.3834001907051	7.7718150673552	34.135	14.206
27.383400093401	7.77181507451873	34.135	14.466
27.3833999960699	7.77181508167445	34.135	14.726
27.3833998987039	7.77181508881871	34.135	14.986
27.3833998012938	7.77181509595109	33.907	14.791
27.3833997038494	7.77181510307334	33.769	15.679
27.3833996063638	7.77181511018443	33.582	15.473
27.3833995088324	7.77181511728357	33.452	15.246
27.3833994112639	7.77181512437244	33.322	15.473
27.383399313655	7.77181513144858	33.062	15.473
27.3833992160106	7.77181513851153	32.802	15.473
27.3833991183344	7.77181514556465	32.542	15.473
27.3833990206294	7.77181515260766	32.672	15.246
27.3833989228848	7.77181515963886	32.932	15.246
27.3833988251052	7.77181516665963	32.944	15.933
27.3833987272543	7.7718151736593	33.071	16.187
27.3833986292491	7.77181518061662	31.991	16.632
27.383398531165	7.77181518755574	30.975	17.076
27.3833984330536	7.77181519448793	31.102	17.775
27.3833983336146	7.77181520118557	29.578	18.791
26.768815752272	7.50231081633225	29.959	17.584
26.1126876643494	7.20180883976032	30.023	17.203
25.3670250635273	6.84707981259948	29.642	17.076
23.6990663695753	5.86740450975135	29.642	15.108
Route: 3 Length: 60.2229241508327 Demand Met: 999			
23.812499293539	2.64830728647905	29.197	12.441
24.3651236652695	2.92636791304326	29.975	12.581
24.5826503390057	3.04453708983982	30.202	12.451
24.773635414056	3.14876230987325	30.202	11.996
24.9581677754966	3.24921569150088	30.982	12.126
25.131318603412	3.34412956595645	30.787	12.386
25.29619248426	3.4345412292872	30.787	12.646
25.4529224134968	3.5203712574399	30.787	12.906
25.601371246364	3.60141362930246	30.787	13.426
25.7310902232018	3.6712086463589	30.787	13.686
25.7638652160686	3.68895171770826	30.787	13.166
25.7962654934665	3.70641809198582	31.015	13.036
25.8283320263031	3.72366195396996	31.015	12.776
25.8601792990447	3.74076325617712	31.015	12.516
25.8918616925477	3.75775677514649	31.275	12.613
25.9233453589276	3.77463050267479	31.372	12.353
25.9546648857386	3.79140653513438	31.242	12.126
25.9858562060763	3.80810285328074	31.502	12.126
26.0169075470257	3.8247188192618	31.632	12.353
26.0477940719162	3.84124688620845	31.892	12.353
26.0784974700296	3.85768542524407	32.022	12.126
26.1090427323654	3.87405026902879	32.152	12.353
26.1393958826472	3.89033179492894	32.412	12.353
26.1695266203296	3.90652474639427	32.436	13.231
26.1713554859196	3.90781500460466	33.095	12.711
26.1734610267389	3.90925734352832	32.835	12.613
26.1755810631394	3.91070388300867	32.932	12.353
26.1777097019223	3.91215300704188	32.672	12.353
26.1798431197666	3.91360406614484	32.542	12.126
26.1819789945295	3.91505658610151	32.802	12.126
26.1841185087	3.91651102500985	33.062	12.126
26.1862634257274	3.91796793120658	33.322	12.321
26.1884183971042	3.9194283817822	33.907	11.996
26.1905738021682	3.92088827324814	34.135	11.866
26.1643381145118	3.88805792923501	34.087	11.615
26.1373386723942	3.85392809612139	33.452	11.541
26.1100887714942	3.81941629771651	33.387	11.313
26.0826038987325	3.78460234854905	33.647	11.313
26.0548256587228	3.74940975815926	33.96	11.234
26.0266843527178	3.71369559018841	33.96	10.536
25.998236810747	3.67779940935498	33.833	10.282
25.9692744433601	3.64171857264884	34.976	10.282
25.7251884803378	3.4554121770666	34.595	9.202
25.4593325920806	3.26100547191101	33.642	10.155
25.1608932397825	3.05155842370111	32.944	10.536
24.8101052057945	2.81691677788872	32.182	10.98
24.3025415692713	2.50812884154893	31.047	11.313
22.63962609847	1.78336413328255	28.753	10.79
Route: 4 Length: 57.2969238581581 Demand Met: 1000			
21.6577019586785	1.35407729159545	28.372	10.218
22.1469137822747	1.6649816960135	28.626	10.091

Solution x	Solution y	Original x	Original y
22.5483721940132	1.9225669139479	29.007	10.282
22.8975089827794	2.14769299701308	29.451	10.155
23.2163118274208	2.35427699111633	30.34	9.647
23.5121115465283	2.54855777862772	30.594	9.52
23.7922934493005	2.73427583353049	30.721	9.329
24.0619067109907	2.91400562114285	30.658	9.71
24.3228869102762	3.08831012590091	30.912	9.901
24.5758529305141	3.25758851442246	32.055	9.837
24.8177683063229	3.42128928904972	34.087	8.758
25.039925684408	3.57918249266521	33.127	11.313
25.0460555217187	3.58754092164744	32.867	11.313
25.0523685588268	3.59609337025225	32.997	11.541
25.0165832100575	3.5703407849296	32.737	11.541
24.9760181901697	3.54222752157957	32.477	11.541
24.9328154100293	3.51271419895244	32.607	11.313
24.8870704128215	3.48190823617035	32.347	11.313
24.8394450828692	3.45008641201441	32.087	11.313
24.7903420834678	3.41742839875573	32.217	11.541
24.7379409503262	3.38310916194772	31.957	11.541
24.683123679107	3.34751460016681	31.697	11.541
24.6263750219932	3.31086170314562	31.827	11.313
24.5676451612488	3.27317993891244	31.567	11.313
24.5072354241065	3.23460881500471	31.307	11.313
24.4453644311308	3.19525174134095	31.437	11.541
24.3805098000565	3.15437711458029	31.177	11.541
24.3130916482369	3.11217174748664	30.657	11.541
24.2440066578309	3.06904298598442	30.527	11.313
24.1735779995647	3.02518553252862	30.787	11.313
24.1010654671516	2.9802598689003	30.658	10.98
24.0271447181092	2.93465265509739	30.34	10.917
23.9522910196991	2.88856786069912	29.975	12.321
23.7865590277932	2.78892761990135	29.975	12.061
23.4970858118652	2.61931507823627	29.388	11.804
23.1255241474586	2.40200546521488	29.261	11.425
22.5910572709587	2.09764398194017	28.626	11.234
21.5077202275177	1.52712720583779	27.927	10.409
Route: 5 Length: 63.7309241856859 Demand Met: 1000			
22.7135215389566	5.56662960990526	31.762	12.126
22.9715436156148	5.90733504153781	31.737	12.885
23.0611021959037	6.02307023561596	31.547	13.203
23.1375337772556	6.12073087775205	31.015	13.556
23.2109530407675	6.21377223702687	31.015	13.816
23.2811756496364	6.30180345440612	31.015	14.076
23.3477735766534	6.38412925513772	30.787	14.206
23.4123813927253	6.46321174925017	30.787	14.466
23.474676231244	6.53853557840621	30.202	14.011
23.53633844585	6.61276720143318	30.202	14.271
23.5973265999607	6.68582552679454	29.975	14.401
23.6577482464436	6.75785331239047	29.975	14.661
23.7175702288873	6.82876977642021	29.975	14.921
23.7767541369623	6.89847953877698	30.202	14.791
23.8353366464957	6.96709057497438	30.657	15.246
23.8926813872155	7.0335874816178	30.462	15.473
23.9489584879836	7.09817278426585	30.722	15.473
24.0040234336998	7.1607046484179	30.982	15.473
24.0576579303935	7.22095756588637	31.112	15.246
24.1103472878543	7.27973684608528	31.372	15.246
24.1619133159378	7.33687350303644	31.632	15.246
24.2120685188381	7.39208792720176	31.892	15.246
24.2602862213328	7.44484875618829	32.152	15.246
24.3053002820269	7.49381324529182	32.412	15.246
24.3372805101096	7.52818158273334	32.282	15.473
24.3328773547784	7.52478079756558	32.022	15.473
24.3284594207475	7.52138164520767	31.762	15.473
24.3240369501501	7.51797878748384	31.502	15.473
24.3196112463232	7.51457093181591	31.242	15.473
24.3151803769607	7.51115682206705	31.293	15.806
24.3107448295304	7.50773640880577	31.356	16.06
24.3062995832458	7.50429604645732	31.356	16.251
24.1818984805496	7.43103617944703	30.785	16.251
24.0464166836832	7.35234697932865	30.594	16.251
23.8950538901747	7.26596373877185	30.15	16.06
23.7352695314765	7.1752180399259	29.515	16.505
23.5602853323639	7.07571728371716	28.943	16.886
23.1994243627611	6.85489863354981	29.134	16.187
22.6835697381182	6.53603535230786	29.324	15.489
17.9547089103918	5.32019454314846	20.434	15.806
Route: 6 Length: 91.3041698492424 Demand Met: 1000			
19.9820701176428	9.65396805928705	28.054	17.013
21.3212928062158	10.983316629686	30.594	17.076

Solution x	Solution y	Original x	Original y
21.7183600035908	11.5056709088379	30.785	16.949
22.0662816616172	11.9762471131647	31.483	16.822
22.3743544205426	12.4087017140852	32.182	16.632
22.6453523596803	12.8088851065951	31.991	17.203
22.8987831079174	13.1911927883026	31.61	17.775
23.142826691183	13.5624617159668	32.817	17.775
23.3675669631022	13.9142458412271	32.944	17.965
23.5788397298997	14.2523054566594	32.69	18.346
23.7824123563172	14.5818916908262	33.071	18.346
23.9784881136146	14.9039986802239	33.261	18.537
24.1679066307383	15.2196265252556	33.388	17.584
24.3527938265268	15.5329065886185	33.515	18.029
24.5334482725114	15.8437519622066	33.515	18.219
24.7105819117605	16.1527607305625	33.642	18.346
24.8845138973468	16.4603666077133	34.722	18.219
25.0528243237395	16.7660064794175	35.992	16.314
25.2003998649656	17.0766569622486	36.436	17.076
25.2003998670747	18.9180198932675	36.436	18.918
25.2003998684914	19.0580225253865	34.595	18.791
25.2003998698664	19.1984481396932	34.087	18.918
25.2003998712146	19.3392571511464	33.96	19.68
25.2003998725398	19.4803112572763	33.515	20.315
25.2003998738486	19.6215179567647	34.468	20.442
25.2003998751303	19.762821335845	34.341	21.013
25.2003998763885	19.9041105688998	34.341	22.029
25.200399877623	20.0451160658923	33.642	26.22
25.2003998788255	20.1826253012738	32.118	27.3
25.2003998800187	20.3178471568263	31.42	27.173
25.2003998812088	20.4516850434124	30.277	30.475
25.0836488790185	20.3222189890246	28.943	30.475
24.9641202224872	20.1827265907125	28.943	30.03
24.8426236073145	20.0359425113132	29.07	29.713
24.7191128022659	19.8817271457504	25.895	29.903
24.595457085814	19.7226238957942	25.07	30.03
24.4718418917014	19.5566054256688	26.086	29.903
24.3476634258504	19.381147982435	27.927	28.125
24.2229304544442	19.2020376296875	27.229	27.554
24.0979302427583	19.0202208140093	27.546	26.982
23.9726306228766	18.8359730497596	28.88	27.3
23.8462104436819	18.6468062771328	29.007	26.157
23.7190341038974	18.454615257317	28.88	25.331
23.591291800056	18.2602167412897	31.356	26.03
23.4494743996302	18.0305310562171	32.245	24.887
23.2174777013881	17.5775844574791	31.293	23.68
22.9756927978187	17.0957153408483	31.356	22.347
22.72485469009	16.5916753148125	30.785	20.823
22.4684161746154	16.0770051492333	31.356	19.68
22.2031509638954	15.550053925266	32.309	19.553
21.8774677361164	14.9360886418631	32.372	18.537
21.0128130089346	13.9216193148864	30.531	18.664
19.677886145551	12.6536218077397	28.118	18.092
17.9097026133524	11.1663219929633	25.133	19.235
Route: 7 Length: 76.5056927518982 Demand Met: 1000			
17.9075653105529	15.4142756170481	28.689	18.156
18.3500038531703	17.0679824947902	29.261	19.172
18.5672729604383	18.0103110256848	29.705	19.426
18.5888815309279	18.165497492222	28.689	21.013
18.6103780505721	18.318707135292	28.245	21.331
18.6317866296722	18.4706260587566	27.927	21.458
18.6531285608625	18.62161312795	28.816	21.902
18.674295700425	18.7695094617024	29.261	22.283
18.6941543586103	18.8973852184304	29.07	22.347
18.7137291175749	19.0208758979783	29.134	22.537
18.7329531727828	19.1391267807412	29.261	23.045
18.7394765482321	19.1601102389397	28.626	22.791
18.7459855800223	19.1810227824107	28.245	22.855
18.7524847306831	19.2018923013051	28.054	22.918
18.758975107103	19.2227264967631	27.991	22.601
18.7654574415924	19.2435355532074	27.546	22.537
18.7719332911523	19.2643285044868	26.911	22.601
18.7784403986953	19.2851108641365	26.149	23.172
18.7848702807051	19.3058827109887	25.832	23.68
18.7913319303307	19.326642015716	26.086	24.95
18.7977874185487	19.347372393246	26.911	24.76
18.8042348079742	19.3680646313054	27.8	23.617
18.8106723479837	19.3887253087183	28.753	23.998
18.8170772297001	19.4092283230558	28.753	24.379
18.8234459493132	19.4294004266359	28.499	25.141
18.8177854868327	19.4294003969498	27.165	25.458
18.8121204569103	19.4294003672202	27.102	25.966

Solution x	Solution y	Original x	Original y
18.8064476933279	19.4294003374036	27.229	26.22
18.8007564654968	19.4294003074307	25.705	26.22
18.7950632318492	19.4294002774505	26.149	27.49
18.7893460292813	19.4294002473523	25.959	27.744
18.7835959397933	19.4294002171896	25.832	27.998
18.7776614414288	19.4294001877468	25.07	27.744
18.7717137602481	19.4294001582896	24.562	26.982
18.7657603280601	19.4294001288426	22.276	28.125
18.7598038706519	19.4294000994088	22.022	28.443
18.7538439843087	19.4294000700011	22.466	28.887
18.7478770369689	19.4294000406411	21.958	29.395
18.7418999249332	19.4294000113379	22.149	29.713
18.7358736254924	19.4293999817423	18.974	29.967
18.7298436159743	19.4293999522375	18.72	29.967
18.7238108281584	19.4293999228532	18.529	30.03
18.7177796684862	19.4293998936553	18.72	30.665
17.0339427652479	18.6622195877045	18.91	28.697
15.2501168826367	17.7262281904236	20.117	27.617
Route: 8 Length: 56.7875870731407 Demand Met: 998			
14.9165253502928	4.26920900024789	19.418	13.901
18.7408603474356	5.72421266900116	25.832	14.219
19.3486726294742	6.1557962547337	26.086	14.663
19.8262496295568	6.49820899065065	26.149	15.679
20.108615209772	6.6960221458625	27.229	15.362
20.1482782291668	6.7280022454364	27.419	15.044
20.1871203435298	6.7593840856	27.991	13.647
20.2255249555813	6.7905274504777	27.673	12.695
20.2637187281883	6.82155091776211	27.927	12.568
20.3017076493619	6.85246625093407	28.181	12.441
20.3394879721822	6.88328163065682	28.816	12.25
20.3770008012973	6.91399158351389	28.816	12.568
20.4142285290903	6.9445834020474	29.007	12.949
20.451075678025	6.97500867810779	28.753	12.949
20.4876401086697	7.00530486190041	28.499	12.949
20.5239853907489	7.03549536007692	28.372	13.52
20.5600870156295	7.06555142256958	28.753	13.457
20.5958835126196	7.09544837435553	29.197	13.52
20.6311585358048	7.12507810257167	29.134	13.33
20.6660794335235	7.15453155040348	29.578	13.203
20.7004450848769	7.18372088246103	29.705	13.393
20.7339182093688	7.2124632995346	29.975	13.361
20.7653277206373	7.24015851663615	29.975	13.101
20.7960212185495	7.26750288778832	29.975	12.841
20.8262916995741	7.29465388641642	30.202	12.711
20.8560320438374	7.32157061860672	30.202	12.971
20.8850680786939	7.34815370295582	30.202	13.231
20.9130477892035	7.37419546342582	30.202	13.491
20.9390375995122	7.39911339318235	30.202	13.751
20.9474501378025	7.40944636988675	29.975	13.621
20.9557890558979	7.41973071462034	29.975	13.881
20.9639361398378	7.42985730375157	29.975	14.141
20.9639361442791	7.4298573126656	29.515	14.028
20.9639361486884	7.42985732158106	29.388	13.838
20.9639361530751	7.42985733049387	28.753	13.838
20.9639361574515	7.42985733940256	29.007	14.409
20.9639361618046	7.42985734830724	28.372	14.663
20.9639361661446	7.42985735720619	28.245	14.854
20.9639361704712	7.42985736609917	28.308	15.933
20.9408860215173	7.41829591132582	27.737	16.251
20.9167921988681	7.40640647448699	27.292	16.632
20.883098241 57	7.39170636984705	26.34	17.203
20.6246061258565	7.3491960304759	25.832	16.949
20.3361743274604	7.30513893230511	25.07	16.314
20.0387474417133	7.2605647869627	24.244	15.997
19.7362637008232	7.21564766314476	24.308	16.441
19.4228303586459	7.17003670994303	22.974	17.711
19.9873016039523	7.11789539985786	20.561	18.219
16.2971079248679	6.9244134161805	16.688	18.092
Route: 9 Length: 48.2846592109082 Demand Met: 518			
10.1461830775562	4.48843032760772	11.163	15.552
12.5746568226257	4.7433605038867	13.576	14.79
15.0223946634919	4.98084821322798	21.831	13.203
16.2822563938433	5.19489827954778	22.276	13.393
17.3410076066667	5.39870387228351	22.149	14.282
18.2896930634801	5.5928104317849	24.308	15.044
18.4662068058134	5.67612279964067	24.371	15.235
18.466206781254	5.67612242426156	24.371	14.346
18.4662067564498	5.67612204824641	25.197	12.441
18.4662067314264	5.67612167207105	25.578	12.568
18.4662067061859	5.67612129574246	26.022	12.631

Solution x	Solution y	Original x	Original y
18.4662066806505	5.67612091917488	25.895	12.123
18.4662066550396	5.67612054250002	25.705	12.123
18.4662066294345	5.67612016572706	25.07	11.615
18.4662066039233	5.67611978890776	26.149	11.107
18.4662065786018	5.67611941202555	26.594	11.933
18.4662065535253	5.67611903489698	27.419	11.298
18.466206529237	5.6761186576652	29.388	8.313
17.6758050003792	5.14842115009762	23.482	9.52
16.8629067316593	4.61172351521923	22.212	10.091
16.0255655265854	4.06014680086898	22.149	11.742
15.0977133853361	3.44834767754446	22.022	11.361
13.8861504714199	2.67182594832115	20.244	11.234
Route: 10 Length: 67.9456955732537 Demand Met: 1000			
11.7669428299741	8.69432352080351	20.434	13.012
14.3527699182465	13.113093005167	19.99	18.029
16.7930987544437	17.1797486537304	19.037	28.189
16.7930987750203	17.1797486494979	18.72	28.189
16.793098795159	17.1797486450048	17.64	27.998
16.7930988151631	17.1797486403535	17.069	27.744
16.7930988350874	17.1797486356064	17.64	27.49
16.7930988549762	17.1797486308	19.037	26.982
16.7930988748676	17.1797486259623	19.545	25.839
16.7930988947626	17.1797486211183	20.561	25.776
16.793098914667	17.1797486162687	20.942	25.649
16.7930989345652	17.1797486114143	20.561	24.696
16.7930989544215	17.179748606562	21.958	24.76
16.7930989742466	17.1797486017049	22.974	25.141
16.7930989940746	17.1797485968249	23.355	23.553
16.7930990138614	17.1797485919395	23.482	22.41
16.7930990335842	17.1797485870516	24.308	23.998
16.7930990533066	17.1797485821465	25.006	24.188
16.7930990730677	17.1797485772207	24.943	23.68
16.7930990928798	17.1797485722797	25.832	22.918
16.793099112763	17.1797485673209	26.022	21.902
16.7930991328964	17.1797485623598	27.102	21.648
16.7903471044284	17.1628659588664	27.356	20.632
16.7876246714233	17.1463914470811	26.975	20.061
16.7848634076282	17.129962896211	26.848	19.743
16.7820724880833	17.1135431902505	27.229	19.616
16.7792305926283	17.097228742966	27.483	19.616
16.7762442672195	17.0813284968519	27.864	18.854
16.7460086493624	16.9509535240697	27.737	18.664
16.7123375675077	16.812798372709	27.356	18.473
16.6772821538802	16.6717359526565	27.102	18.664
16.641172411582	16.528076817497	26.721	18.283
16.6044082956223	16.3832106986937	26.594	18.854
16.5669432993886	16.236318129964	25.895	18.918
16.5290223767613	16.088210410778	26.149	19.045
16.4905306616532	15.9381488060074	26.276	20.188
16.4508829548693	15.7805496204357	26.149	20.886
16.4086575429292	15.599346822643	25.895	20.759
16.3647637649417	15.3998374326555	24.244	21.077
16.3203731990509	15.1947369707236	24.879	20.632
16.2753453208473	14.9817573936278	24.879	19.934
16.2297529440031	14.7626238549139	24.625	19.68
16.1836616794415	14.5381000321406	24.752	19.362
16.1370485399798	14.3077726103052	24.943	19.108
16.0898424743516	14.0704792403545	25.197	18.918
16.0418712530649	13.8232616142337	24.943	18.791
15.9931198974462	13.5666569330372	24.943	18.346
15.9433981147927	13.3007603949362	25.451	17.965
15.8917452033973	13.0172919484759	25.07	17.076
15.8385236167195	12.723173251023	26.911	14.409
12.6243500318634	7.48787128555653	22.085	10.853
Route: 11 Length: 57.2270739318708 Demand Met: 999			
7.48347057712003	8.17342614878543	17.323	12.504
8.19438213766978	9.39180004155368	18.339	12.631
8.72263786872367	10.4359625562385	19.482	13.076
8.95124165304269	11.0849130129466	18.021	13.52
9.17110135079095	11.7217364149677	17.577	13.647
9.38576780007456	12.3553419847875	18.466	14.155
9.59374170470392	12.9848711626913	18.148	16.505
9.79581687500038	13.5969278925129	18.466	17.838
9.99091910402954	14.1819778698941	18.212	18.283
10.1811836059266	14.7500697895035	18.466	18.664
10.3668107592294	15.3048276314024	19.609	18.156
10.5460002440254	15.8501416916843	20.117	18.283
10.7180537788484	16.388949733333	20.498	17.457
10.8835534097591	16.9389772202956	20.434	18.537
11.0436725346962	17.500971368228	21.577	21.394

Solution x	Solution y	Original x	Original y
11.0461003784799	17.5071600385104	19.863	21.331
11.0485298590806	17.5133534939206	20.117	21.775
11.0509762557154	17.5195006749573	19.482	21.966
11.0534283892406	17.5256154947022	18.593	21.648
11.0558826358666	17.5317218330242	18.91	22.474
11.0583409513782	17.5377994303992	20.117	22.728
11.0608410087894	17.5438899861738	20.371	23.045
11.0634088505433	17.5501281153921	20.561	23.553
11.0634088417324	17.5501281143605	18.974	24.125
11.0634088329597	17.5501281132687	18.974	24.569
11.0634088242558	17.550128112138	19.164	24.696
11.0634088156386	17.5501281109684	17.577	25.204
11.0634088070178	17.5501281097359	17.069	27.046
10.8566897284171	17.3674945306849	16.37	26.982
10.6142661872308	17.1133814905251	16.497	24.315
10.3670650868011	16.8536667512163	17.45	24.188
10.1079556508634	16.5802930901004	17.323	23.934
9.83347770449196	16.2889424728121	17.64	23.426
9.52968417115079	15.9653306762234	17.64	22.918
9.17837553273672	15.5927363064593	17.45	21.902
8.78644667281634	15.1858697954193	17.323	21.331
8.33106387752032	14.7315256480942	13.513	22.41
7.85941880633382	14.2528786936404	13.005	20.061
7.37751386319775	13.7633331409561	12.37	19.934
6.88462599224762	13.2606080841932	12.243	20.505
6.37279029203202	12.7311427368351	11.735	20.378
5.83624293016693	12.1633184095824	11.608	20.251
5.25560941951667	11.5262994657811	12.052	18.854
4.60601702883505	10.8107889206529	11.862	17.965
3.84324907039777	10.0020348682711	11.481	17.711

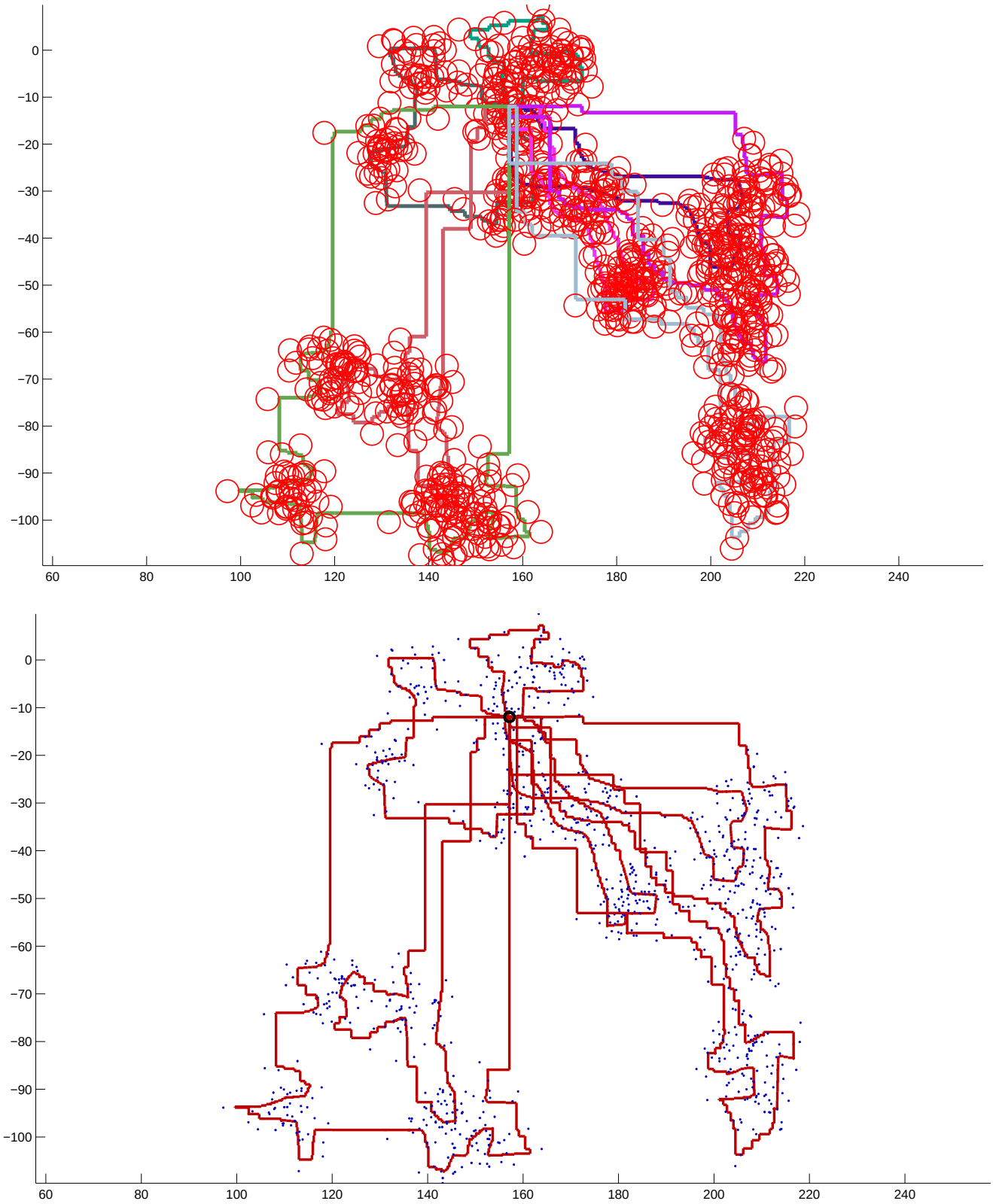


Figure O.130: $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Manhattan, Length = 1803.0378859

Table O-133: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 2D, Manhattan

Total distance: 1803.03788589256			
Total demand met: 76422			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 98.3224992271327 Demand Met: 7187			
46.8388628949911	10.8434262378173	47.1015	12.1757
46.8388628949911	10.8434262378173	47.4524	12.1509
46.8388628949911	10.8434262378173	48.2378	10.888
46.8388628949911	10.8434262378173	47.6091	10.2274
46.8388628949911	10.8434262378173	48.9393	11.7496
46.8388628949911	10.8434262378173	46.5714	10.174
46.8388628949911	10.8434262378173	46.3909	8.819
46.1732433430754	9.14965400386774	44.5689	9.75
46.1732433430754	9.14965400386774	43.984	9.2005
45.8320358216038	6.94546535306596	44.0031	6.0986
45.8320358216038	6.94546535306596	44.3097	5.4051
45.5912084416535	6.23207587797329	43.7681	7.8375
45.5912084416535	6.23207587797329	47.7278	5.7114
45.5912084416535	6.23207587797329	47.0712	4.3382
45.5912084416535	6.23207587797329	44.2937	4.7268
45.5912084416535	6.23207587797329	45.0418	3.8658
45.721565719665	5.59838703975903	45.5397	7.2979
45.721565719665	5.59838703975903	46.0043	6.8606
45.8518808719688	4.70097126070813	46.8369	6.4403
45.9796788010335	3.07745639438803	48.302	2.6164
46.0682797172269	2.443201202553	48.4975	2.4432
43.4997029137971	1.6019860201108	42.4139	3.5597
43.4997029137971	1.6019860201108	43.4311	0.4843
43.4997029137971	1.6019860201108	42.4155	0.0668
42.7367818960203	-0.672389529159243	44.8479	-0.9391
40.6488060450988	-2.49869056682293	39.9467	-2.3317
38.8571201254689	-4.36989965603518	36.4279	-4.3699
42.9193668350293	-5.27740062386972	43.0131	-4.6452
46.9441406363492	-6.23630893310187	46.0937	-5.8176
53.2890000423419	-7.23527965821499	53.289	-9.6645
54.2972561837414	-5.7810745366518	53.8048	-5.0553
54.2972561837414	-5.7810745366518	54.4331	-6.2551
55.3585795868178	-4.37319856113161	57.7878	-4.3732
52.3206932193124	-2.59815489261331	51.545	-0.7619
52.3206932193124	-2.59815489261331	50.0191	-2.6033
52.3206932193124	-2.59815489261331	53.5826	-3.7128
52.3206932193124	-2.59815489261331	53.412	-4.2453
51.8362850343461	-0.352519894336526	51.8363	2.0767
51.6630393907952	-0.352518021418453	52.8937	1.339
51.6630393907952	-0.352518021418453	49.2438	-0.5725
51.7485330525301	0.591487106494604	49.5265	1.5006
51.7485330525301	0.591487106494604	50.9668	1.717
54.162444250893	0.763054673441486	51.7765	0.7553
54.162444250893	0.763054673441486	55.5686	2.3786
54.162444250893	0.763054673441486	54.5841	1.3
54.162444250893	0.763054673441486	54.6465	1.327
54.162444250893	0.763054673441486	54.7597	1.1902
54.162444250893	0.763054673441486	55.7669	1.6852
54.162444250893	0.763054673441486	56.047	-0.6998
56.4310348437675	1.2969300264631	58.0726	3.0503
56.4310348437675	1.2969300264631	57.7618	2.6586
56.4310348437675	1.2969300264631	58.2987	1.8222
56.5536764373194	1.39859991081698	56.514	2.6652
56.5536764373194	1.39859991081698	57.3839	0.9502
56.6752114579081	1.49917957893021	56.6752	3.9284
56.6752114579081	1.49917957893021	56.6229	3.2945
57.7711993695394	1.41078947675117	58.5415	3.6684
58.0655360759036	1.13463413687356	60.4167	1.4088
58.1923340969886	0.812153936409684	58.2864	0.0731
58.1923340969886	0.812153936409684	60.4719	1.0667
58.2940277827857	0.475888549057435	58.6741	1.1796
58.2940277827857	0.475888549057435	58.2741	0.1622
58.3955093162538	0.135720436416783	58.3955	-2.2935
59.7092463125971	0.48395181428336	59.6709	-1.5476
61.0553606691125	0.938289445160388	61.9524	-0.333
61.0553606691125	0.938289445160388	62.4332	-0.684
61.7148135772115	1.71574830623039	62.5325	1.766
61.7148135772115	1.71574830623039	62.7821	-0.0838
62.2060220147932	3.44885325787091	63.4243	4.3429
62.2060220147932	3.44885325787091	63.0749	1.8033
62.6142063648006	6.51928445404769	64.6914	7.7788
60.1130950165588	6.51928426971234	58.0725	5.2013
60.1130950165588	6.51928426971234	59.4358	8.0877
60.1130950165588	6.51928426971234	58.8992	5.3006
60.1130950165588	6.51928426971234	60.2628	6.0605
60.1130950165588	6.51928426971234	60.5785	6.8128
60.1130950165588	6.51928426971234	61.565	4.5717
55.1517281268916	6.59383328733589	53.1154	7.9184
55.1517281268916	6.59383328733589	55.3647	9.0137
55.1517281268916	6.59383328733589	54.3108	6.5803
55.1517281268916	6.59383328733589	55.5508	6.709
52.7666208255959	6.01512053644881	53.4617	5.8056
52.7666208255959	6.01512053644881	52.3291	3.6705
52.2056003631129	5.92692036976108	52.2056	3.4977
51.2363250031003	5.94826298954744	52.0607	4.6851
50.1329644803401	5.96970681629209	48.7027	4.8736
50.1329644803401	5.96970681629209	49.309	3.6922
50.0771591160995	7.17005009295404	51.2901	7.6487
50.0771591160995	7.17005009295404	50.2911	5.2466
50.0207424091034	9.72529188099046	52.3173	10.0275
49.9556985644868	11.1098697597026	52.0306	12.0787
49.8822572514793	11.7386611940605	51.9742	12.9315
48.8252176582787	11.851283194957	49.0558	10.279
48.8252176582787	11.851283194957	50.5069	12.3029
Route: 2 Length: 157.841574131829 Demand Met: 9541			
46.7575750540428	12.6372167712886	47.5448	13.9665
46.7575750540428	12.6372167712886	45.8725	14.3747
46.4312182356218	13.0910829752906	46.213	15.3079
46.1467194643903	13.3612320284268	43.7175	13.3612
46.2412883786103	14.3827397451604	44.2621	15.3855
46.3497958746012	14.9252803939679	48.0446	14.6778
46.45494429278	15.4833431014044	47.2642	16.1804
46.5592076077385	16.0180552932119	46.6598	16.011
46.6634951604671	16.5537018848032	44.3034	16.6265
47.1612698321571	17.0365389672993	45.9074	18.6439
47.8022740836692	17.4177181862831	46.503	16.5426
47.8022740836692	17.4177181862831	47.2412	18.0641
48.6001326439089	17.8105981296192	49.3862	17.5735
48.6001326439089	17.8105981296192	49.1677	19.2175
49.3104596161891	18.175494787298	49.9475	19.2284
49.9837754897483	18.5232662510125	49.9971	19.9155
50.6591516008258	18.8484413677731	51.539	18.7116
50.6591516008258	18.8484413677731	52.1655	19.1446
51.1946225675424	19.1704242963989	51.6732	17.1776
51.6802136776096	19.5902926280574	52.4859	17.4578
52.0234603910607	22.9925084010285	53.2794	21.4994
52.0234603910607	22.9925084010285	54.0368	23.8586
52.2230803634594	25.2022305305269	54.6523	25.2022
52.2103712091073	25.5405734473308	50.8742	24.2729
52.2103712091073	25.5405734473308	54.2786	24.4277
52.197067156902	29.4863849199507	52.5136	31.162
52.1837417624749	31.1092425926628	53.8796	31.7093
52.1703358124757	32.3519743152994	54.3132	33.4794
51.762299230357	32.3788804869864	51.7623	34.8081
51.2105008795239	32.3770858385391	51.473	33.7115
50.6436204984042	32.3752869030244	50.1654	34.298
50.1247585039861	32.3734807768849	50.8592	31.2824
50.1247585039861	32.3734807768849	50.3723	32.2399
49.5690259899259	32.3716759269138	50.5738	30.8854
49.5690259899259	32.3716759269138	51.0819	30.8837
48.3211532072698	32.3698821645474	47.9812	30.2306
48.3211532072698	32.3698821645474	47.9603	31.0225
47.4007466659572	32.3681028005707	46.4115	30.3033
46.9394346970941	32.3663479208111	46.9054	30.8841
46.9394346970941	32.3663479208111	47.3356	31.1656
46.4709491846545	32.3646012506479	48.6326	32.1618
46.4709491846545	32.3646012506479	47.4903	33.2139
45.3431649640353	32.3628548691813	44.1303	30.8739
44.6027940524854	32.3611194563803	44.6028	29.9319
44.5563327723431	33.5333099371299	45.9581	33.5048
44.5094627562182	34.9200276348335	45.6407	35.658
44.5094627562182	34.9200276348335	45.4526	36.121
44.4619426235906	35.7802438743057	44.7872	36.1398
44.4143540445684	36.6239642835157	46.003	37.4534
44.4143540445684	36.6239642835157	45.4903	38.3462
44.3651177451723	37.0789803888264	44.3651	39.5082
42.9805463736994	36.2812147228126	43.7884	36.8808
41.3729791003038	35.4123971717285	42.8212	36.4305
37.724778215391	34.2583319680352	37.4272	33.8061
34.5081743737581	33.178065754812	35.5392	31.6783
21.1493231033654	32.4172238680803	18.7531	32.536
21.0604411700732	30.6548315039207	21.3113	31.7798

Solution x	Solution y	Original x	Original y
20.9711405859325	28.379007223352	22.8581	29.0039
20.9711405859325	28.379007223352	19.8821	27.2321
20.8783990737504	26.2375236392581	23.1689	25.59
20.4192006803401	25.9119629777766	21.4132	25.3225
19.9284572522985	25.5951730994261	20.8129	26.0745
19.4095889575599	25.27339423196	19.6457	23.2311
19.4095889575599	25.27339423196	19.5225	24.6717
18.8590223092248	25.0182181957615	17.7323	26.9057
18.4573541103391	24.6675831913859	18.7218	26.0511
18.0490013388195	24.2907651855116	16.9754	26.2994
17.7661135754604	22.9761671924469	18.4916	22.031
17.7661135754604	22.9761671924469	17.3215	22.815
17.4801193210911	21.8738963195891	15.0509	21.8739
18.5401683601787	21.6202859688266	19.4476	21.0876
18.5401683601787	21.6202859688266	19.3676	20.9011
19.4102078259553	21.3756574705145	19.4151	20.4264
20.2758517792536	21.1371416211077	20.7311	19.0512
20.2758517792536	21.1371416211077	19.0397	19.3917
21.4330050033693	20.9668394024399	22.5923	19.795
21.4330050033693	20.9668394024399	22.0389	18.6688
21.8105080977095	20.8830926742925	21.7951	21.835
22.1872269752713	20.7986514404507	20.5046	21.2685
22.1872269752713	20.7986514404507	20.5322	21.5891
22.6933044884743	20.7123982766628	21.2889	20.2133
22.6933044884743	20.7123982766628	21.1889	21.267
23.3522586405592	20.6260344367206	24.0847	21.2619
23.9752243205312	20.539165582633	23.1615	20.5337
24.6349721345127	20.4523033719748	24.5729	19.8583
25.298874802275	20.3658597445105	27.0312	22.0371
25.3790665636748	19.2822336194658	25.2224	21.1268
25.4595362247186	17.097363417285	23.1228	16.7524
25.6035504614977	16.3488548214221	25.9081	14.4892
25.6035504614977	16.3488548214221	23.3217	16.9506
27.0699784161846	9.67612471551168	29.2451	9.0499
27.520480657031	8.09770031153466	29.9497	8.0977
27.135014744309	7.4647162655832	28.0443	7.2557
27.135014744309	7.4647162655832	27.9452	7.0873
26.7169073544406	6.85670748619254	28.1449	5.3771
26.1794678942075	6.39711280731693	27.6562	5.4902
26.1794678942075	6.39711280731693	27.2842	5.8331
25.4608246165612	5.98438487100777	26.246	7.8923
25.4608246165612	5.98438487100777	26.4488	5.1021
24.4397942082065	5.44425626195576	23.9142	5.5856
23.4715493110649	4.89935700599355	22.0744	6.6433
22.9729574352532	3.18205437777525	22.4003	2.9895
22.4918388588248	1.5165510115258	24.5208	1.7631
21.8017572572946	-0.380379468640646	19.4163	-0.8394
22.7494971726921	-0.380379642211819	22.4229	-2.1641
23.8331690405903	-0.3803798151318	22.6294	-1.9579
26.1956166126412	-0.380379987296454	26.7943	-2.6353
26.8091560208789	-0.380380157750293	27.3755	-1.0984
26.8091560208789	-0.380380157750293	24.8641	0.1355
27.7774583142384	-0.380380328099049	28.6989	1.5656
27.7774583142384	-0.380380328099049	25.8989	0.7413
30.2544384607542	-0.38038049840238	31.0707	1.7474
30.2544384607542	-0.38038049840238	31.0065	-1.0714
31.112810145615	-0.380380668767479	31.1128	-2.8096
31.2251546761966	0.0239549826541676	31.1391	0.2266
31.3376182997684	0.425433918741332	32.3564	-1.4633
31.4442018435769	1.13810136489244	33.4349	0.0139
31.5335759595171	4.13310528775355	33.6792	4.7017
31.5335759595171	4.13310528775355	31.7997	5.4917
31.6138373890654	5.2693553561328	29.2732	5.6917
31.7761085769667	5.74002586044156	30.7839	5.7178
31.941542665891	6.21031478468658	29.6205	6.6839
33.8716638661441	6.51360393045946	33.7832	8.5886
35.9308529376017	6.76011696208033	36.4235	4.5159
36.9634762137012	7.30587526374846	36.7928	9.6586
36.9634762137012	7.30587526374846	36.2059	6.8965
38.7148288402611	7.46597541637861	38.0686	7.3443
40.7040521874949	7.62643986743996	41.1669	5.3004
41.2780807730102	10.6845692330533	40.2323	12.6508
42.2408427822493	11.2780411509111	41.9974	13.5778
43.5718578173871	11.502788199721	43.7231	10.6871
43.5718578173871	11.502788199721	42.7704	10.2739
45.129971030541	11.7416753704898	44.5228	11.8645
45.129971030541	11.7416753704898	44.7075	13.3055
Route: 3 Length: 174.008139333742 Demand Met: 9998			
50.1980188311444	12.7555245850069	51.32	11.9016
52.3129466833121	13.623062657159	53.965	12.2967

Solution x	Solution y	Original x	Original y
53.2358286735746	15.1444706956993	53.4554	15.0784
54.1453889422755	16.6845265049996	52.0827	15.9727
61.1911326784142	19.8377497097615	63.3795	20.1125
61.9782905091997	22.0125201006936	63.3607	23.5913
62.5463035570063	22.9898890423852	62.5649	23.4331
63.1145686512777	23.9308044214746	61.643	23.6955
63.7605600272503	24.9041024623627	62.9268	27.0211
64.8408725054804	25.2881080602256	63.8119	26.0212
66.0953000118	25.6596531908647	67.242	26.9141
67.0992943320816	26.0034254166605	66.7482	27.6121
68.168039043766	26.3188168415655	67.5765	27.7962
69.3566379716316	26.6131855116502	69.5886	28.6002
70.4618573720159	26.8666761512944	68.3676	27.331
88.5743319677144	27.1086438139632	90.6179	26.4649
89.7086513636467	27.3667955705873	90.6435	28.0536
90.7201600977896	27.6197784575148	90.72	30.049
92.1157467741396	27.6052868771135	93.9312	28.9768
92.6055875032849	27.589754884372	92.942	26.4511
93.0871841853593	27.5733703695695	92.5592	25.4331
93.6487003440067	27.5565215975242	93.6487	25.1273
95.7053651169016	27.7042341679143	97.0499	25.7334
95.9360830554156	28.5349135804136	96.0238	29.4057
96.1664662568779	29.3086936251738	96.156	30.1327
96.3970462791341	30.0360605029265	97.4429	30.1528
96.6216453882401	30.7575174093633	97.1838	29.5842
96.8427782062584	31.5702996950738	99.272	31.5703
96.7403694627777	31.9020565858972	99.0228	31.9463
96.6124451054651	32.2293869917669	96.3928	32.1668
96.4849405782165	32.5575022976562	98.5493	33.1624
96.3374742107609	32.8591840178501	96.2582	32.5713
96.1900959679657	33.1633954325083	95.8908	32.6754
96.0432914744555	33.4720742032861	95.0864	33.2234
95.8988194050418	33.7834459187001	96.6051	36.0943
93.9833479564998	33.8248735859306	93.4265	31.4744
93.8008825763985	34.1367491633172	92.7124	33.4453
93.6258966154436	34.4575170707147	92.4351	33.0022
93.4624216451545	34.8187004615207	91.0332	34.8187
93.5016258843773	35.8009704697164	91.1655	36.0648
93.5498079469353	36.4155524022469	91.9372	36.8319
93.5986348573823	37.0033049009287	91.8795	37.1845
93.6482262955899	37.5800306548274	94.1971	38.0204
93.6976880806109	38.1433418168951	93.6083	38.4774
93.7471630107418	38.6974423466209	93.6941	39.0671
93.7966420253888	39.2414662270389	92.1801	41.0349
94.1107385945644	39.2919254832123	92.634	40.1716
94.4640983013837	39.3419987091015	92.8093	39.7693
94.8687994368216	39.3918889672235	95.1298	37.6897
94.8687994368216	39.3918889672235	94.3087	39.6383
95.2769416168789	39.4424652618638	96.5473	37.5774
95.5819243621881	39.4963145898121	95.8598	39.2349
95.5819243621881	39.4963145898121	97.0806	39.3994
95.8620776014112	39.5502577127764	97.0063	39.6578
96.1303987961511	39.6041555056106	98.4033	39.6451
96.302478129305	39.6579036963157	98.7317	39.6579
96.2417027927563	40.7906403121202	96.2133	40.5576
96.2417027927563	40.7906403121202	96.8865	41.9997
96.1806537369179	41.7776527619798	96.6284	43.246
96.1193700235169	42.5874472373412	96.2085	41.8253
96.1193700235169	42.5874472373412	98.0763	43.3554
96.0551675854757	43.2731355745686	98.0879	44.5657
95.7608808349929	43.3775882691768	97.5519	44.8528
95.1273299985499	43.4684464575426	93.2846	41.9379
95.0414509040047	43.8914751829797	93.9129	43.6355
94.9565690489696	44.3207602283873	94.5355	44.3621
94.8719998049313	44.7498189113848	94.4684	44.7163
94.8719998049313	44.7498189113848	95.46	44.379
94.7873584277347	45.1869470058379	95.0864	47.4256
94.7013129859204	45.45286543748	94.5838	45.9916
94.6153859827924	45.7152387191156	94.5726	47.3613
94.6153859827924	45.7152387191156	95.1396	47.3596
94.5288859636009	45.9425036148252	96.2485	47.1277
94.4378140384042	46.1499308908712	95.7654	46.8722
94.345197957982	46.3525781164716	94.3452	48.7818
93.3759841516095	46.3034820472105	93.3823	48.5086
92.4202909717577	46.2515920874877	91.1842	48.1207
91.8698085716338	46.1963442780984	91.9732	45.8332
91.8698085716338	46.1963442780984	91.9756	47.4725
91.31518028291	46.1407120033686	90.4865	46.0315
90.7869609586257	46.0851165516155	89.5287	45.4109
90.7869609586257	46.0851165516155	89.3464	46.1786

Solution x	Solution y	Original x	Original y
90.3474029703044	46.029765062797	89.352	47.1855
89.9356986437579	45.9738727787285	87.8413	47.1867
89.9045113223416	44.0483469205238	90.0385	42.8005
89.8733107270754	42.5539070930107	90.4784	41.2284
89.8420308974596	41.3959005888818	92.2396	41.0703
89.3871225885457	41.1977223294461	90.1236	40.724
88.9162829936836	41.0016643781267	89.0134	41.3658
88.9162829936836	41.0016643781267	89.3668	41.343
88.4352262863064	40.8032713423481	88.4465	41.4478
87.9547890343009	40.6024743144256	85.9182	41.843
87.8206179454118	40.0224574821971	87.5583	39.2312
87.8206179454118	40.0224574821971	87.2346	40.5435
87.6880599563624	39.4521719576285	90.014	39.915
87.3627159948038	38.284015659051	89.1249	38.0318
86.9970292876434	37.1775821906857	88.2545	36.066
86.6004673646812	36.2660496222251	86.5983	36.2039
86.2045352108735	35.3601095215511	85.065	35.2948
85.828869905191	34.461462332589	86.512	33.4131
85.441487551043	33.6579795020836	87.5726	32.8781
84.489864355761	33.1038669294082	85.1876	33.113
83.4741372782268	32.5499758183387	85.525	32.0217
78.8651395373191	32.0500809169084	79.7169	32.9378
70.4653756089954	31.5221062794192	68.3701	31.308
69.3340404338809	31.0158772364097	69.1853	30.9522
68.224815742962	30.5115337953968	68.2062	28.5319
67.1261767107192	30.1131931751812	67.8857	28.9512
65.8975844545539	29.7379624995452	67.6588	29.7348
63.8447945657684	29.3630640528918	64.1748	30.2745
61.6475735928097	28.9743982217563	63.132	27.7543
51.6432909035736	28.6255794177445	49.5432	29.0024
50.5642444553599	28.2581027265653	50.1386	26.6573
49.5641269388211	27.9231928391547	47.4152	28.2569
49.0559684407018	27.5707122259489	47.5893	27.8934
48.5972089130747	27.2125670715758	46.684	28.1154
48.2508872713293	26.8060445680791	45.985	27.4123
48.0814748396369	26.2004426951393	47.7428	26.438
47.9129903550641	25.5872688444725	46.7677	27.4481
47.7584752989846	24.2690916835306	48.493	25.186
47.6020078915931	22.7395337525088	49.1449	22.3659
47.4396020723797	21.3397912583932	46.7163	23.0055
47.2809862944045	18.7121203250906	45.9242	19.9
Route: 4 Length: 149.356113654548 Demand Met: 9817			
53.7620041725238	15.1398975571653	55.8132	15.4408
54.6608582431892	17.3628055529471	53.9046	16.3668
55.6721634769588	20.6879523060361	55.9782	19.9329
56.6580926516802	25.5231984394836	56.8778	27.618
57.5334209546732	26.3025750322912	58.9981	26.6128
58.2483698212352	27.051726260647	58.5931	27.1316
58.950231269838	27.7996341990133	59.5552	26.5288
59.6123098883294	28.6934998924983	57.9508	29.6187
60.5876730767972	29.4205925616326	60.1802	30.671
61.6400814075459	30.0615481079771	60.463	30.4795
62.9488760238347	30.6813952274535	63.2951	31.2899
62.9488760238347	30.6813952274535	64.2717	31.7627
63.8773741755186	31.2060797642647	63.5739	32.9982
64.8874993075207	31.633989122795	65.4552	32.6167
65.8300584146897	32.0399926142772	66.7818	30.0369
66.4016775904868	33.053469764903	67.7055	32.9993
66.9146259838717	34.0884544903443	67.4673	33.2544
67.4110477213374	35.2725322652396	66.5887	34.1226
67.9466273363042	36.8244077810103	66.9624	36.7077
68.5258575210785	38.4349680682554	66.7168	38.698
69.325260169291	39.9092182298371	68.0366	38.8903
70.3547224043342	42.0532406342062	72.4926	42.7909
70.6865668927613	42.8908927637605	72.7013	43.6681
70.9235162662364	43.4875991745522	72.9378	43.4347
71.124060575811	44.090541071254	73.2283	44.0709
71.124060575811	44.090541071254	72.9198	44.5581
71.2787896641632	44.6507558326757	70.5497	45.0925
71.436100295685	45.195523236152	70.4096	46.4113
71.5989864674809	45.6768911841928	72.4429	44.8985
71.5989864674809	45.6768911841928	73.6428	45.1426
71.7382340707828	46.2653115327291	73.6395	46.5004
71.8674954094018	46.8301177687265	70.6191	48.182
72.0028270270041	47.2965419953055	72.0385	47.603
72.1382888789086	47.75627937007	73.2561	47.9132
72.1382888789086	47.75627937007	73.2401	49.0047
72.2672498794635	48.1613181308903	70.7664	48.6137
72.2672498794635	48.1613181308903	70.6462	49.6735
72.4288301252943	48.4323341796027	71.8327	48.0379

Solution x	Solution y	Original x	Original y
72.4288301252943	48.4323341796027	72.0723	49.2863
72.5940067651537	48.6991885724275	71.8965	50.0142
72.7626573518358	48.9502082068142	72.1444	51.2772
73.5636260323923	49.0000723450727	74.4488	50.3129
73.5636260323923	49.0000723450727	73.911	51.0144
74.2241462577437	49.0475541647548	73.5268	49.2611
74.2241462577437	49.0475541647548	73.6611	50.4924
75.0065727128007	49.0944303981394	75.5587	49.1352
75.0065727128007	49.0944303981394	75.2757	50.6388
75.7317336227627	49.1406715413577	74.8417	48.5823
75.7317336227627	49.1406715413577	75.5201	48.6107
76.5595866298914	49.1871908304657	76.379	48.6237
76.5595866298914	49.1871908304657	77.4079	49.147
77.323038697333	49.2338128649016	77.9078	47.2474
77.323038697333	49.2338128649016	77.6289	48.4559
77.9342113692003	49.2824683636674	80.0004	48.0282
77.9671772009947	49.7264008295881	80.3964	49.7264
77.8814622919072	50.3930599044791	78.2967	50.1808
77.7953136289698	51.0817694394862	76.0043	50.5809
77.7132673531899	51.8503793094995	76.2244	51.9684
77.7132673531899	51.8503793094995	76.5498	52.218
77.6348029355343	52.5863114336134	78.0993	54.3894
77.5550067236584	53.107722212573	77.8264	55.5164
74.6519954122372	53.1157662127721	73.3859	52.8201
74.6519954122372	53.1157662127721	74.3979	53.0985
72.8439056442485	53.123826371232	72.0304	52.5053
72.8439056442485	53.123826371232	72.0955	52.6394
71.5992142604009	53.1319010501204	71.0505	50.768
71.5616738071902	53.379110244968	70.1179	52.2878
71.5616738071902	53.379110244968	70.2011	52.705
71.5256847838818	53.6590409600277	70.8564	51.5507
71.4905234337113	54.1351090394406	70.916	53.3608
71.4905234337113	54.1351090394406	71.2619	53.5794
71.4555395596151	54.6557031196852	70.694	53.8562
71.4207327572482	55.2121085310591	69.8977	54.8286
71.4207327572482	55.2121085310591	69.9782	57.1009
71.390532955746	55.357154634341	73.8072	55.2741
70.9271639028796	55.5246228642201	72.7757	56.7077
69.1545791964255	55.6667940673143	68.5789	56.8701
67.6331836574615	55.8054796262791	67.4683	58.2291
67.633182809625	55.0205025998791	66.0257	55.1875
67.633182809625	55.0205025998791	69.2681	55.3133
67.6331819647017	54.1566163562391	69.1565	53.343
67.6331819647017	54.1566163562391	68.2826	55.0673
67.6331811187672	53.3251440057166	68.022	53.7678
67.6331802726189	52.4540163901242	66.2863	51.2705
67.6331802726189	52.4540163901242	67.8488	53.6384
67.6331794268393	51.6602661181376	66.949	50.6855
67.6331794268393	51.6602661181376	69.1689	51.2673
67.6331785806077	50.9953026142245	69.4154	51.8752
67.6331777308272	50.1218977424868	70.0624	50.1219
67.3036915277834	49.1485775047112	67.5609	49.631
67.3036915277834	49.1485775047112	67.7991	50.1342
66.963643547355	47.947625088687	67.6648	48.1141
66.963643547355	47.947625088687	68.7356	47.889
66.5432244605226	46.7590636285567	65.7303	47.3671
66.1425633526633	45.4603225838313	67.4955	46.0347
65.6956019040994	43.9643746577918	64.4232	44.0581
65.2859135802986	42.4606250749829	65.3289	43.5846
64.8761799078229	40.5217428457243	65.211	38.9167
64.4550430566401	39.3594440703112	64.8516	39.5774
64.0268206937482	38.1771150169692	62.6603	37.129
64.0268206937482	38.1771150169692	64.2784	38.8059
63.6450469538705	37.1926498208639	64.9829	35.6055
63.1469298584066	36.6183575592539	63.453	34.6286
62.6183898678759	36.2140075828236	63.8645	34.3723
61.5610278290966	35.953845498146	61.1452	36.2851
61.5610278290966	35.953845498146	62.0243	36.102
60.5138979956938	35.6908000910002	60.9493	37.7343
59.2150515388427	35.3478680248012	58.8785	37.4935
58.1877023576643	34.7579487624574	58.126	35.24
57.1795060984433	34.150276820873	56.2795	36.0371
56.4654386751309	32.9284397082967	55.9275	34.3566
55.8024723526853	31.147239148732	54.7376	29.7596
55.2340935004814	30.0158276457974	54.8257	29.6059
54.6828219150321	28.9476179370523	52.7074	28.2489
54.6828219150321	28.9476179370523	53.915	28.4629
54.3234821859047	28.1856955041897	55.1607	27.7715
53.9516729446032	27.4557824664852	55.4854	26.8201
53.5336349700511	26.792493466555	55.089	27.0379

Solution x	Solution y	Original x	Original y
53.0602577903497	26.1172566737739	54.5895	27.7676
51.7934680649337	16.843518302319	53.7123	16.59
Route: 5 Length: 275.182841954151 Demand Met: 9993			
42.007764084474	16.455818814003	40.2335	17.1357
40.3643200153329	19.0752000760329	39.7266	17.3977
40.181203281125	19.2991823119119	40.715	18.8306
39.0011583692249	38.0154624995848	40.9959	37.9409
33.0345351279782	69.4530144400239	33.839	67.1668
33.0345351279782	69.4530144400239	35.1535	70.6086
33.0345351279782	69.4530144400239	31.7515	71.3679
33.0345351279782	69.4530144400239	31.4906	71.3219
32.7590537378481	71.4958480963366	32.2488	71.8762
32.7590537378481	71.4958480963366	31.4455	71.7336
32.4995754377124	73.2981448161903	31.0449	71.9995
32.4995754377124	73.2981448161903	32.697	74.6737
32.2625819167835	75.8508278407399	31.4187	76.5703
32.0309574462219	77.9594041093523	31.105	77.2121
31.8052281925247	80.5860989949695	29.376	80.5861
32.6309141789055	81.2340794089555	33.517	80.8699
33.3959370476564	81.89980146214	34.9317	80.2335
33.7973643909029	86.3140784367049	35.4073	87.2216
34.1456771367475	88.6757152672376	32.6009	89.9531
34.1456771367475	88.6757152672376	33.2241	90.2072
34.5978759278495	89.5849525040836	33.1881	90.5996
35.1146989676353	90.361541263852	34.7819	91.1147
35.6404946308973	91.0955502820675	37.9917	90.5379
35.6404946308973	91.0955502820675	37.0706	93.0168
35.6649742625387	92.181160506393	35.4152	92.5489
35.6649742625387	92.181160506393	33.6244	92.4492
35.6898435522337	93.1430096624839	34.0163	93.2553
35.7148801849976	94.0891159814396	36.1694	94.3523
35.7148801849976	94.0891159814396	35.2297	94.8683
35.7399076528542	94.946805050475	37.3296	94.7968
35.7399076528542	94.946805050475	37.1788	95.0118
35.7646465856838	95.815180118436	35.9551	95.9225
35.7893703386949	96.6746832954524	38.2186	96.6747
35.7893703386949	96.6746832954524	35.7481	97.1257
35.3830419959246	96.7194366754654	35.7859	98.3251
34.963965595256	96.7635976064826	35.0473	98.5367
34.5419343663194	96.807057224589	34.0458	95.0903
34.5419343663194	96.807057224589	33.0573	97.9271
34.1863272159885	96.850691347122	33.9629	96.8355
34.1863272159885	96.850691347122	34.0464	97.1856
33.8350983298319	96.894270279377	33.8351	99.3235
32.991212233319	96.3214099120935	32.4952	97.9758
32.2098762762184	95.6222990008307	31.7064	96.988
31.4710539323305	94.8089166220716	30.7482	95.8761
31.4710539323305	94.8089166220716	31.6916	96.8159
30.7463033705458	92.701072700086	32.1756	91.0244
30.7463033705458	92.701072700086	29.5221	90.7635
30.7463033705458	92.701072700086	32.2034	92.5655
30.7463033705458	92.701072700086	32.8593	93.0881
30.7463033705458	92.701072700086	30.8807	93.5109
30.7463033705458	92.701072700086	29.3468	93.7461
30.7463033705458	92.701072700086	29.7064	94.0211
30.7463033705458	92.701072700086	31.4281	94.9219
27.730980650465	85.2382984724047	27.1736	83.2653
25.803443161353	83.9359538749702	23.4089	84.0628
25.706663542932	78.9952881294159	26.6151	77.1467
25.6072530654212	77.7647841092095	24.3218	77.9732
25.5094443103629	76.494446038622	25.4767	75.481
25.4117064388202	75.3865395368406	27.2709	73.9256
25.2656976972119	75.1128987506875	26.2205	72.9044
25.2656976972119	75.1128987506875	24.5076	73.115
24.5354004937707	75.0567275160933	24.5354	72.6275
24.5354004937707	75.0567275160933	24.1578	73.3792
24.0298316898853	75.332268818846	25.3366	76.538
24.0298316898853	75.332268818846	22.8762	75.7017
23.4942663808106	75.5895127176108	24.4797	75.354
23.4942663808106	75.5895127176108	24.7401	75.4523
22.875052084479	75.8512895245973	23.527	73.6169
22.875052084479	75.8512895245973	23.796	77.2181
21.1561813789935	76.9426890105797	21.1184	76.9048
19.4620899065752	78.0460962273334	18.7356	77.2891
17.96059946886	79.2295721420628	17.9606	81.6588
14.0000909153894	77.475430767728	13.7649	76.0563
10.4764272975389	76.1742999158668	8.0472	76.1743
11.5554811347508	74.8913168985968	12.73	75.2001
11.5554811347508	74.8913168985968	9.9143	75.8382
13.0039727763485	72.9689011902013	15.4332	72.9689

Solution x	Solution y	Original x	Original y
12.8354276492914	71.2858549840925	15.0856	70.6386
12.2086415944743	70.687611687783	11.6475	70.8021
11.5999269328651	70.0865017598517	9.1707	70.0865
11.7975214283777	69.3041618771641	10.9416	69.7746
11.7975214283777	69.3041618771641	10.0835	69.723
12.0131996787991	68.4324662065531	10.5042	66.7806
12.0131996787991	68.4324662065531	10.7344	66.9849
12.3064841355513	68.0334070672695	14.0233	68.3418
12.5746146860781	67.6249268360908	11.4886	67.7219
12.851890671959	67.2148630553016	12.5389	66.9051
12.851890671959	67.2148630553016	11.4442	66.9869
13.1474344783675	66.8151601221426	13.2613	67.7948
13.1474344783675	66.8151601221426	12.0587	67.8257
13.4562851248403	66.3713463504601	12.0877	66.3858
13.4562851248403	66.3713463504601	12.0097	66.7734
13.8072045970917	65.9160953550411	12.0444	66.3239
14.2076016451147	65.4436266361769	14.2076	63.0144
14.8999367480133	65.864625549913	14.2239	63.9607
15.7044281951081	66.4243488433373	15.1112	64.361
15.7044281951081	66.4243488433373	15.3124	65.205
16.7725770265536	67.7983084778701	18.9682	67.082
16.7725770265536	67.7983084778701	16.7224	69.1113
16.7725770265536	67.7983084778701	14.7433	68.1941
16.7725770265536	67.7983084778701	14.5018	68.1646
18.6714058600919	69.4568657452115	18.2654	71.5277
21.3934239127195	70.1834726609759	21.3934	72.6127
22.109568639654	70.0963798763915	22.1344	71.2137
22.109568639654	70.0963798763915	22.0857	71.4539
22.8228013873649	70.0076271521955	22.8228	67.5784
23.749297922205	70.2075707521538	22.9431	70.0987
24.7544685839539	70.4080883901292	25.7737	68.9159
24.7544685839539	70.4080883901292	26.4587	69.6793
25.3852732428171	70.6294269496456	26.9783	71.0141
25.9255793902794	70.8479740522302	27.6433	72.5657
25.8426710197602	68.007363774223	28.241	67.9653
25.8426710197602	68.007363774223	26.4747	67.9787
25.4683815426316	66.1076452584448	26.4833	65.6457
25.0560269354987	64.3935994783359	22.6268	64.3936
25.9600759768339	60.9374671973834	23.9369	61.5866
29.460935270058	30.2557954439168	28.099	29.8348
Route: 6 Length: 242.373083773766 Demand Met: 9994			
58.6317980412249	11.863622859262	58.6318	9.4344
62.586740014439	13.3035372711289	61.7542	11.527
95.2474162658058	17.9489417413683	97.1071	18.8552
96.7717258229693	19.8848752760781	99.0428	19.6959
97.1763525988046	22.627875524666	98.3241	22.4412
97.1763525988046	22.627875524666	98.3827	22.3334
97.5407847946442	25.8972012228519	97.3283	27.0933
97.5407847946442	25.8972012228519	97.5011	28.0267
97.9140967118682	26.6200752581202	97.9141	29.0493
100.527878413834	26.5117725900972	101.7295	28.4449
101.241727829884	26.3904414953237	100.6297	27.3107
101.241727829884	26.3904414953237	101.5683	27.6266
101.975124516179	26.2673190990939	100.384	25.6874
102.918269363067	26.1450924202683	102.4997	24.4075
102.918269363067	26.1450924202683	102.9016	24.8202
102.918269363067	26.1450924202683	102.211	28.3893
102.918269363067	26.1450924202683	105.0575	26.2706
104.942324134086	25.950225035468	104.9423	23.521
105.100079638673	28.850292098425	106.1692	29.0085
105.254821782547	31.6056723516974	102.9211	31.879
105.254821782547	31.6056723516974	104.0844	32.9988
105.254821782547	31.6056723516974	105.6149	29.5786
105.254821782547	31.6056723516974	105.5782	30.6326
105.254821782547	31.6056723516974	106.6895	31.0233
105.254821782547	31.6056723516974	106.8535	30.7643
106.226775258004	34.841842179543	108.656	34.8419
106.226777461148	35.5316387179186	107.8221	37.3636
103.875340518068	35.3936800380832	103.4615	37.3033
101.943300366964	35.2471388173566	100.5275	34.9543
101.943300366964	35.2471388173566	101.1976	33.4905
100.820015009686	35.108414903167	98.5859	34.5756
100.647843172399	34.9830996942555	98.9301	33.2654
100.687838469858	39.9344781181983	99.6903	41.4772
100.728173765755	41.9565550217531	98.3613	42.0392
101.220160402245	43.2714740199943	102.0152	42.2262
101.680974630677	44.8821938248814	103.0838	43.6629
101.680974630677	44.8821938248814	103.3956	43.6231
101.680974630677	44.8821938248814	104.1102	44.8822
101.680974630677	44.8821938248814	103.8959	45.4099

Solution x	Solution y	Original x	Original y
101.568250740618	45.7186911295052	101.161	45.7653
101.455843476325	46.5570230289318	99.7789	45.6905
101.455843476325	46.5570230289318	100.0845	45.3198
101.349025214149	48.0008595085985	98.9198	48.0008
101.948698820554	48.0152372304606	100.8862	48.4618
102.607914290948	48.0294441261127	100.6036	46.802
102.607914290948	48.0294441261127	102.543	45.6081
102.607914290948	48.0294441261127	101.377	48.1816
102.607914290948	48.0294441261127	101.7941	49.0832
102.607914290948	48.0294441261127	102.9297	48.0592
102.607914290948	48.0294441261127	103.8062	50.1176
103.613038902375	48.6167486347888	105.6501	47.8555
104.099869573174	49.3734728596234	106.4442	49.0895
104.193874330281	51.9459953027024	106.6231	51.946
101.959229123886	52.0661073415614	100.3439	52.2486
100.499408044095	52.1857571647183	99.0651	51.1078
100.499408044095	52.1857571647183	99.5987	51.3246
99.6040952298654	52.3100197677722	98.2004	50.3921
99.6040952298654	52.3100197677722	98.1036	50.8139
99.4404154583968	52.8288310815837	97.7455	51.8526
99.2883882799858	53.4332938616349	97.7133	51.9341
99.2883882799858	53.4332938616349	99.5817	52.1789
99.1512272298434	54.705627422167	96.8097	54.0588
99.1512272298434	54.705627422167	98.2152	53.7701
99.1512272298434	54.705627422167	97.9579	54.2407
99.1512272298434	54.705627422167	100.5945	52.9653
99.1512272298434	54.705627422167	98.7715	55.3698
99.1512272298434	54.705627422167	100.6388	53.8259
99.1512272298434	54.705627422167	98.9521	56.5952
99.1512272298434	54.705627422167	99.7259	57.0659
99.7985981861082	56.5152550003662	98.8606	57.9963
99.7985981861082	56.5152550003662	99.9754	58.6633
100.506566955444	57.069779088691	102.1595	55.9791
101.043570306241	57.7328285282827	102.8738	56.4102
101.345413801316	59.5938153868747	102.6402	60.9181
101.621901807993	60.8051172153098	103.9916	60.6173
101.70318389481	66.303757744149	102.9023	68.4164
101.703185972897	66.3037587212167	103.5291	67.906
100.717185552845	65.8638802287387	101.778	67.1686
99.484303560387	65.3683118714073	98.4258	65.8894
99.484303560387	65.3683118714073	97.9014	66.9835
99.0141678231863	64.0015742189522	99.4285	63.8276
99.0141678231863	64.0015742189522	98.4228	65.0226
98.5516149321155	62.4262304610687	99.3413	60.508
98.5516149321155	62.4262304610687	100.6854	61.817
96.9124208043354	61.8355258574228	94.5987	62.0376
96.9124208043354	61.8355258574228	96.4356	62.0951
96.9124208043354	61.8355258574228	99.0429	61.6589
96.5361693954521	61.1755600930999	95.4724	61.7777
96.1774828758298	60.483924213741	94.6583	60.3511
95.8459986364262	59.803345548492	95.9041	59.3009
95.8459986364262	59.803345548492	95.479	61.1306
95.519582873699	59.0594540589369	97.3108	57.82
95.519582873699	59.0594540589369	95.1558	61.2395
95.1015986833883	57.7223792494649	94.4551	58.0456
95.1015986833883	57.7223792494649	94.8477	58.3247
94.6989351422386	56.2120270325913	94.6877	57.1733
94.6989351422386	56.2120270325913	95.4289	57.3916
94.2808003991301	53.7531580395412	96.0562	52.3857
93.460051964561	52.9989952160388	95.0304	53.2116
92.431217464329	52.2267412672346	92.1982	53.9806
92.431217464329	52.2267412672346	93.3932	53.1876
91.3182612667757	51.019033474315	93.0102	50.1223
91.3182612667757	51.019033474315	92.412	50.9961
88.5769245762305	50.0724495483445	87.5129	47.9594
88.5769245762305	50.0724495483445	90.3356	51.1932
88.5769245762305	50.0724495483445	89.6611	52.1615
85.6025275540299	49.5457675430998	85.9154	51.5363
81.5695813142131	48.7887088862311	80.7698	50.729
79.7322095069637	47.1478020589653	79.9479	46.2913
79.7322095069637	47.1478020589653	79.533	47.2684
77.8862596033372	45.6989559771614	77.8794	45.0468
77.8862596033372	45.6989559771614	76.4125	46.981
76.8095027906677	43.3239200345031	75.73	42.7229
76.8095027906677	43.3239200345031	77.9223	44.6051
75.6540174552827	39.6335908154423	75.4748	37.8532
75.6540174552827	39.6335908154423	74.5598	39.2546
75.6540174552827	39.6335908154423	75.9022	40.5634
75.6540174552827	39.6335908154423	77.5882	39.4219
75.6540174552827	39.6335908154423	75.9853	41.4015

Solution x	Solution y	Original x	Original y
73.428329278069	35.936759286164	72.2401	34.2889
72.2114250645578	34.6661384423533	72.6191	32.6684
70.7713598753452	33.9593746712175	71.5231	31.8286
64.1420471955587	33.6189381515031	62.464	33.4003
61.9130490475213	33.2829324939412	60.8351	33.4935
61.9130490475213	33.2829324939412	61.1622	34.1592
60.3927375533802	32.9324998130716	61.5106	34.0654
60.3927375533802	32.9324998130716	60.137	35.2014
58.9553724740635	31.7252682963336	58.4334	33.3219
57.6859881521826	29.9254766725282	58.6228	31.6703
55.7855489924373	14.162461926565	57.2331	12.7874
Route: 7 Length: 373.470503652142 Demand Met: 9949			
31.0179091957144	12.7232788877604	31.9656	14.6164
31.0179091957144	12.7232788877604	29.4417	11.4808
22.2628722986552	13.2726494802249	21.6596	11.213
19.9393089942538	14.6389056924707	19.6468	14.5775
17.754992472542	16.0133742747492	18.1963	16.0602
17.754992472542	16.0133742747492	16.9397	16.157
15.7519785311128	17.3375033800772	17.2669	18.1061
9.95024340277388	18.4173507195348	7.8039	17.6061
9.55560033900893	59.6941036359818	9.15690000000001	61.6426
9.18198257200245	61.0688467962255	7.6803	61.1857
8.84108843373559	62.4271292725908	10.4334	62.822
8.45746340632651	63.6599754828768	9.6606	65.5604
7.6851078843808	64.0112845052942	8.4928	63.9998
7.6851078843808	64.0112845052942	6.67010000000001	63.5082
6.92902264186814	64.3706300288731	6.9842	66.7632
5.76935601857831	64.4302221006099	4.4426	63.6871
4.8546947718587	64.4901641924033	4.7342	63.0935
3.95605837677969	64.5508459326201	5.2812	65.5492
2.7809916445499	64.6109855304901	0.483800000000002	63.8626
2.7598185926052	66.4264374679531	1.76609999999999	66.5446
2.73882293498363	68.1953611145288	0.309600000000003	68.1954
4.48020137357906	70.197283925963	4.0089	72.186
6.67585873579904	70.9949134569074	7.0214	70.8048
6.67585873579904	70.9949134569074	8.3117	72.2049
6.97584199947248	71.5326211855175	9.3844	71.5303
7.00187733239291	72.1032347191007	8.8648	72.0358
7.0285767373112	72.684743805574	9.45780000000001	72.6847
6.79220712292637	73.0227722481968	9.00020000000001	73.0359
6.16080142925196	73.3584621559121	7.5677	74.3816
5.30428874919807	73.6670495842491	6.65640000000001	74.2265
4.16199438569876	73.965450193238	6.09139999999999	73.9114
-1.85147695266623	74.2615711854889	-4.2807	74.2616
-1.77591346822044	85.2109640867846	-4.1255	85.596
-0.0931867272605444	85.6997256725388	-1.23350000000001	86.0108
2.10623524847679	86.1835112560046	2.7376	84.0979
3.29674094730186	88.2810814623588	3.55029999999999	90.3653
4.31240187598968	88.976173228822	3.5998	89.8159
5.38497630201647	89.6257917420017	7.8142	89.6258
4.9324804745348	90.6434486983652	5.8502	91.8647
4.42334388337301	91.4444213203826	4.77370000000001	93.7785
3.17984364442367	91.5745215947402	3.4538	93.5151
1.75594984663715	91.6946764504711	2.57040000000001	90.3092
1.75594984663715	91.6946764504711	1.20229999999999	90.7259
0.198087093522545	91.8207179831126	-0.100899999999996	90.0487
0.198087093522545	91.8207179831126	-0.735100000000003	89.6931
-0.215226720570001	92.080190824799	0.619299999999996	91.0377
-0.649189615087565	92.3511057765316	1.1743	92.9818
-0.649189615087565	92.3511057765316	0.580200000000005	93.7511
-1.32101567809652	92.5882249903436	-0.0468000000000046	93.7668
-2.14063157312701	92.8122721648362	-2.30370000000001	90.7079
-2.14063157312701	92.8122721648362	-2.5612	92.1356
-2.87756077983722	93.11366421125	-1.9602	93.9224
-2.87756077983722	93.11366421125	-2.1508	94.1499
-3.78170050875066	93.3937877382827	-3.1358	95.2162
-4.89780287089732	93.6375521714885	-3.26390000000001	94.8889
-10.3756762711636	93.8534761365197	-12.8049	93.8535
-7.49965410954918	95.1988488994776	-6.68600000000001	94.6391
-7.49965410954918	95.1988488994776	-7.5489	96.9207
-5.29984797707552	96.1809233885709	-5.5457	98.4014
-0.683412380949974	96.5180906249778	1.4019	97.5847
-0.683412380949974	96.5180906249778	-0.171000000000006	97.1566
-0.683412380949974	96.5180906249778	-0.338999999999999	97.1979
-0.683412380949974	96.5180906249778	-0.311599999999999	97.6012
-0.683412380949974	96.5180906249778	-1.86190000000001	98.5581
0.385523556688085	96.6148516220342	0.613799999999998	95.4238
1.4131735672407	96.7132423651256	1.64530000000001	95.7178
2.40140485889205	96.8130406669508	3.5924	94.7451
2.55465624301164	97.9904459843182	2.1469	96.6722

Solution x	Solution y	Original x	Original y
2.70926469843458	99.6128757131219	3.11839999999999	98.924
2.70926469843458	99.6128757131219	2.55330000000001	99.1767
2.86311790726444	101.762747835503	3.1448	100.72
3.01615297341074	104.750375533837	3.0162	107.1796
5.74890227201618	103.827563279216	8.0611	104.093
5.94005713285175	101.147269245191	8.1477	101.1634
5.94005713285175	101.147269245191	3.81100000000001	100.5395
6.12685272303997	99.7284013746315	4.95789999999999	99.4405
6.31977846506085	98.5156241415108	6.3198	96.0864
9.95609135064869	98.5203003607731	9.17	97.1621
21.151339926127	98.525004772541	21.5395	100.4343
25.9443734693303	98.5297016464519	28.2891	98.27
25.9443734693303	98.5297016464519	26.9511	99.1097
26.1107006334538	98.5344355174473	26.55	96.735
26.2731101241973	98.5391995952123	26.6904	96.1713
26.2731101241973	98.5391995952123	26.1674	96.1159
28.5724919011876	98.6691871139575	29.1897	96.4145
29.0456272345246	99.3278790450456	29.7849	97.5299
29.4625683993097	100.965499565055	29.8552	101.3038
29.4625683993097	100.965499565055	30.1816	102.1772
29.8548002289759	102.279935179088	31.6341	101.1443
30.1437056777435	106.318114553463	28.1717	107.4546
31.7722964442073	106.788573388597	31.3011	106.2109
31.7722964442073	106.788573388597	32.8361	107.2479
33.163812441708	107.252274882848	33.1638	109.6815
33.6420292451477	106.865447659246	33.1686	108.6172
34.1764302805723	106.308757512968	35.7224	107.36
34.1764302805723	106.308757512968	35.3466	107.7036
34.5405992006711	105.284559814311	35.4006	103.6799
34.8772495370824	104.557260951635	34.3074	104.3145
35.2227687799081	103.853622882274	35.2228	101.4244
35.8325019820866	103.875173000891	35.7306	102.2767
36.4557355957531	103.896563300718	35.5571	102.295
37.1983027520928	103.917774752295	37.1983	106.347
38.0405489898944	103.531345538273	39.1965	105.4524
38.4437401676831	101.848624866246	40.2693	101.3043
38.4437401676831	101.848624866246	39.3246	101.8921
38.7624053925681	100.494755965352	36.8108	99.4487
38.7624053925681	100.494755965352	38.189	100.3805
39.457733256351	99.8716519756752	39.196	99.7694
40.1711676045399	99.2630376790406	40.065	98.6098
40.1711676045399	99.2630376790406	39.7333	98.7582
40.9307579636462	98.7259128306152	42.0978	97.503
40.9307579636462	98.7259128306152	42.2565	98.7398
41.4684969669714	98.2923392908686	40.9431	96.0349
43.6436723338317	98.172491977762	44.0393	95.7757
43.6436736551131	99.4261373518227	43.0828	99.6317
43.6436749757241	100.678198369454	46.0729	100.678
43.6436749757241	100.678198369454	45.0704	101.2748
43.4347583374542	101.199865018646	44.7902	101.1589
43.2165461115558	101.726193508758	42.5793	100.4271
43.2165461115558	101.726193508758	42.9226	100.4615
43.0049937455311	102.382024203278	42.8352	101.6931
42.794189082433	103.06859484241	40.5226	102.8002
42.794189082433	103.06859484241	42.0156	103.5929
42.6704202050536	103.90497710911	40.9527	105.6227
43.1960605023514	103.832633138691	42.4716	105.6496
43.1960605023514	103.832633138691	42.9285	106.2179
45.7302521677563	103.665511855521	46.5537	103.4177
45.7302521677563	103.665511855521	45.465	105.2608
48.1495306000314	103.487397995184	48.0764	105.8084
51.4713747923573	102.538092860291	53.9006	102.5381
50.4298324394495	99.8480614653231	51.1106	98.2963
49.1116305698223	98.5370037848875	47.126	99.3914
48.5979473071741	92.8282387611365	48.9533	90.4759
46.3713386017344	92.7189982937751	47.7789	92.5461
42.5922151084669	92.610305847588	41.6896	94.8028
42.3178958206668	92.0400462231014	41.599	92.4813
42.057724341673	91.4521122713983	39.6285	91.4521
42.339403651296	90.1183980777194	42.9721	90.3177
42.339403651296	90.1183980777194	43.1057	91.7939
42.599153402812	85.91873759039	40.8939	84.3555
42.599153402812	85.91873759039	42.6808	88.2098
Route: 8 Length: 332.483130165254 Demand Met: 9943			
48.7193702403727	34.3775296264261	48.325	36.101
50.5308193445254	37.063636451365	51.6292	37.4529
52.0057825666171	39.4686207908042	53.589	37.6567
52.0057825666171	39.4686207908042	50.3352	41.2014
61.300091822739	53.0467819768287	61.2083	54.3519
71.8103883945197	57.2560885995929	70.5527	57.3223

Solution x	Solution y	Original x	Original y
71.8103883945197	57.2560885995929	70.1344	58.5671
71.8103883945197	57.2560885995929	73.2116	57.797
71.8103883945197	57.2560885995929	73.7963	57.8273
79.5023210098927	58.2316475945431	77.9705	58.8491
79.5023210098927	58.2316475945431	81.1686	57.7423
85.2732789734716	59.1961761364905	87.1149	58.1702
86.4237603738862	60.7356089136394	88.0225	60.7529
87.3148978338007	62.2710948671552	85.8477	60.7859
87.3148978338007	62.2710948671552	86.2321	62.729
89.4814153609106	68.069880011107	88.7937	67.447
92.0694646228013	77.4349449624227	91.0116	75.887
92.0694646228013	77.4349449624227	89.835	77.746
92.0694646228013	77.4349449624227	91.1291	78.4897
92.0694646228013	77.4349449624227	94.4072	76.9857
92.0694646228013	77.4349449624227	93.1133	78.1389
92.0694646228013	77.4349449624227	91.86	79.7087
92.2652741143132	78.5720000461932	94.6945	78.572
91.9315330091451	80.302723232124	94.0795	80.8773
91.3285713069333	81.3710308226384	92.6699	80.64
91.3285713069333	81.3710308226384	93.2494	81.8793
90.2478695368008	82.4128662692194	89.95	80.2132
90.2478695368008	82.4128662692194	88.0687	81.4777
90.2478695368008	82.4128662692194	88.6759	82.3658
90.2478695368008	82.4128662692194	92.1151	81.2598
90.2478695368008	82.4128662692194	89.5631	83.3752
90.2478695368008	82.4128662692194	91.14	83.5499
90.2478695368008	82.4128662692194	91.1677	84.1211
90.2478695368008	82.4128662692194	92.288	83.6157
88.7666258612798	85.758597706645	86.3374	85.7586
89.9636905081115	86.2902264955849	88.3633	87.3681
92.7177995705766	86.7508736347159	93.9684	87.8762
92.7177995705766	86.7508736347159	92.7178	89.1801
93.3753791847528	86.5689388759423	93.0994	86.3608
93.3753791847528	86.5689388759423	93.1284	88.6615
94.1022939338182	86.3580527497656	93.4941	85.8189
94.1022939338182	86.3580527497656	95.9325	86.7596
94.6843418083968	86.1449723374182	96.2545	87.1498
95.1693652544147	85.9228418720804	96.9343	84.943
95.5576751582917	85.7136518388225	94.9909	83.4209
96.2923937286925	85.6063798675832	97.0865	83.6094
96.8706007362778	85.5119262569793	96.8706	83.0827
98.3264412314084	88.3559646369426	99.0152	86.155
98.3264412314084	88.3559646369426	97.7943	87.7833
98.3264412314084	88.3559646369426	98.3726	88.4744
98.3264412314084	88.3559646369426	96.8345	90.0197
98.3264412314084	88.3559646369426	98.1138	89.594
98.3264412314084	88.3559646369426	100.7126	88.5952
98.3931448555687	90.0512747303248	99.3434	90.9979
98.3931448555687	90.0512747303248	98.9319	91.3958
98.4589732728877	91.1405984893548	100.8882	91.1406
98.4589732728877	91.1405984893548	100.5649	91.4192
98.0331975689048	91.4036248389339	98.853	91.6792
97.591382857782	91.6647414547335	98.656	92.6213
97.591382857782	91.6647414547335	99.3782	93.0601
96.0867865913134	91.8628302869201	96.5235	92.1962
96.0867865913134	91.8628302869201	97.0347	92.0258
94.1696211481078	92.0589957109594	95.2026	90.5293
91.0354262377734	92.2681019559536	88.6062	92.2681
91.9257449032484	93.2718516116235	92.5654	91.5305
92.7214428070088	94.8617327016631	92.4623	94.734
93.5318568475721	96.4868868010972	94.0924	96.5838
93.5318568475721	96.4868868010972	95.504	96.351
94.0837776819872	98.2021189389874	95.7576	96.9635
94.0837776819872	98.2021189389874	95.0373	98.5247
94.4828007759139	103.694472884589	94.4828	106.1237
96.118511922043	102.419379601796	95.6122	103.8055
97.9806997625538	100.688613386033	98.8373	99.4165
99.4973838279139	99.3963486444173	98.2349	98.4363
101.671030362182	98.3244513181308	103.8628	98.4843
102.282232141194	97.1451527107964	104.1728	96.9352
102.282232141194	97.1451527107964	104.1034	98.3317
102.617699819803	94.0987548974902	101.602	92.3175
102.617699819803	94.0987548974902	102.0076	93.075
102.617699819803	94.0987548974902	100.6204	94.7646
102.617699819803	94.0987548974902	101.583	94.8217
102.617699819803	94.0987548974902	101.8123	94.891
102.617699819803	94.0987548974902	103.2876	94.1817
103.236887031358	92.4230856734266	105.6506	92.4297
103.276796587229	90.4975674645169	104.3693	90.8389
103.31646203679	88.415900352061	104.5599	87.8351

Solution x	Solution y	Original x	Original y
103.31646203679	88.415900352061	102.4507	89.6037
103.356016976611	85.8635685225347	101.1477	85.2681
103.356016976611	85.8635685225347	102.0461	86.7072
103.399052095189	84.6206228760538	102.2936	85.0217
103.442344613267	83.3032138807605	101.0606	82.9382
103.442344613267	83.3032138807605	103.1106	83.2736
103.691103618099	83.0492265117906	103.6911	80.62
104.555204586908	83.2209397397335	103.8313	82.5056
105.488798878664	83.4062235061107	104.3617	84.8664
106.679362593726	83.5809630307223	107.2392	85.9448
106.679363740103	80.5064203125289	107.981	80.0957
106.679364884231	78.0002256941818	108.1531	76.0691
100.411223116717	78.625288904453	98.5933	78.8152
100.411223116717	78.625288904453	99.1261	78.6323
100.411223116717	78.625288904453	98.9119	80.0767
100.411223116717	78.625288904453	101.2985	78.2917
100.411223116717	78.625288904453	100.0565	80.1054
99.5613148509567	79.0582099991802	98.567	80.2017
98.807109728538	79.4562104752082	97.7624	79.6432
98.807109728538	79.4562104752082	98.2007	80.5294
98.1489996466876	79.8252168090496	98.2345	80.86
98.1489996466876	79.8252168090496	97.8831	81.9659
97.5394907062077	80.0657812737666	97.3132	81.5365
97.5394907062077	80.0657812737666	97.4314	81.946
96.9541000991288	80.2696738231723	96.9541	82.6989
96.5352994611134	76.5052760660536	95.9481	74.251
96.5352994611134	76.5052760660536	97.5653	74.5618
96.5352994611134	76.5052760660536	96.1169	76.0362
96.5352994611134	76.5052760660536	97.816	74.8015
96.5352994611134	76.5052760660536	97.1852	78.7831
95.2120822182336	71.4898600376491	94.6798	69.1984
95.2120822182336	71.4898600376491	93.9524	73.145
95.2120822182336	71.4898600376491	94.549	73.3405
95.2120822182336	71.4898600376491	96.2521	73.5638
94.2085219374114	68.9496636497226	93.0933	68.7697
93.3205074513843	66.5439144709305	92.0851	66.8651
92.5405337183954	63.8922669974824	90.2672	64.2791
92.5405337183954	63.8922669974824	93.5538	62.1822
92.5405337183954	63.8922669974824	92.749	64.7326
92.5405337183954	63.8922669974824	94.6788	63.8911
92.5405337183954	63.8922669974824	93.9444	64.9
92.0816970403793	58.7806409384899	92.8209	56.9207
91.5749054569149	57.4097432828384	92.9131	56.6287
91.0108396971576	56.2324081210136	93.2379	56.4517
88.5083663744553	54.8351781299609	89.2688	56.3248
84.8005485865749	52.6576089400336	83.5076	51.7826
84.8005485865749	52.6576089400336	84.6532	51.7406
82.7570266669041	51.2150957591691	82.0477	53.0979
81.3301582540764	44.1508558773924	80.8872	43.1227
80.0017445386023	40.2994588104492	81.9079	40.1742
80.0017445386023	40.2994588104492	80.8076	41.6004
74.515899104194	30.1024441325914	73.7989	28.6287
71.2267105777532	27.1867245947473	70.1037	27.3839
68.9222036753721	24.0717073833415	70.5469	25.0661

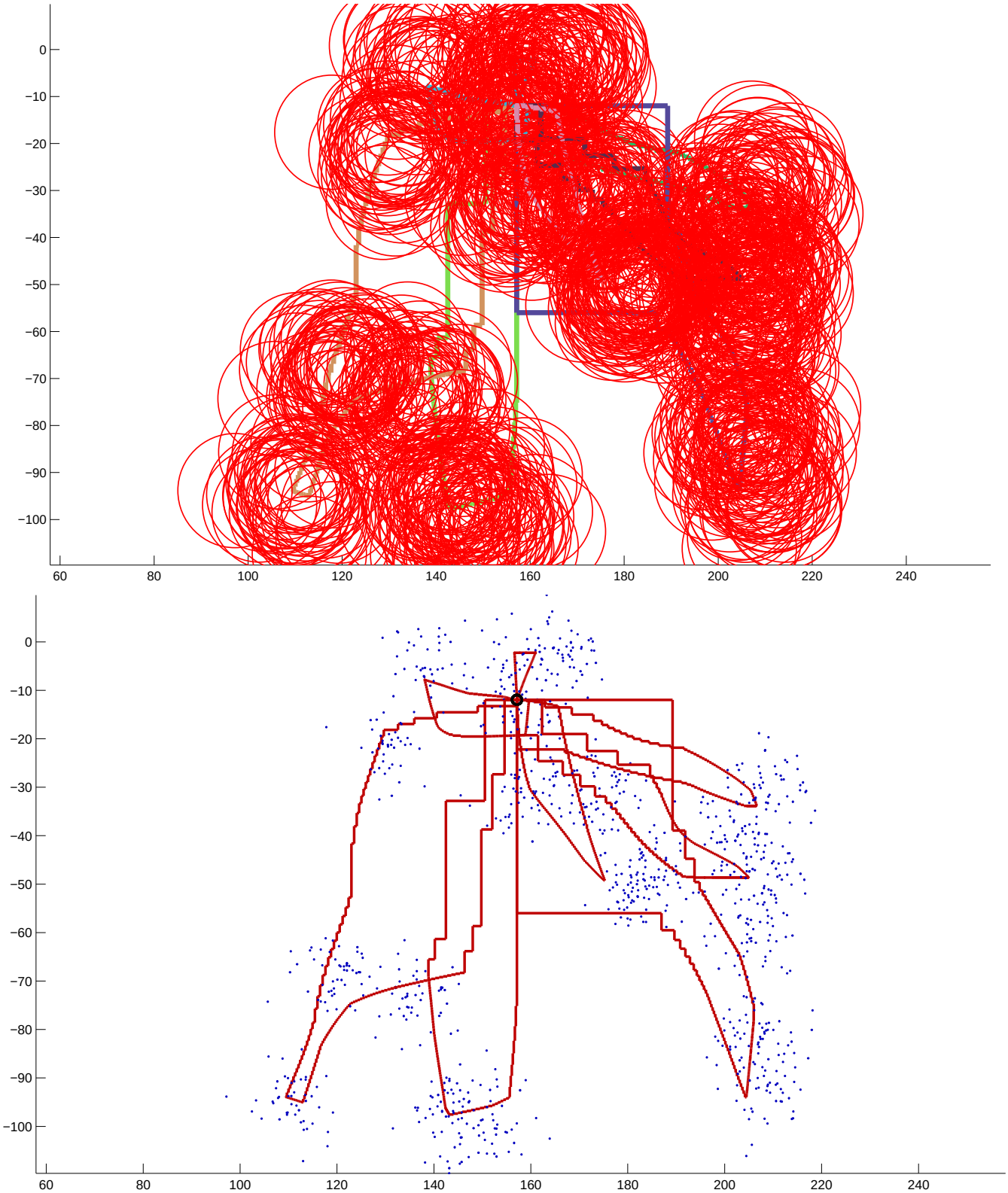


Figure O.131: $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Manhattan, Length = 1248.2888837

Table O-134: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 2D, Manhattan

Total distance: 1248.28888366572			
Total demand met: 76422			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 142.603515530128 Demand Met: 9998			
52.9140687242669	13.5180698876101	55.9782	19.9329
58.4376164298437	14.9923987415141	63.3607	23.5913
62.9018627671168	16.2910620813163	70.5469	25.0661
64.6709636676462	17.1467846839978	70.1037	27.3839
65.951956903461	17.7753998416915	68.3676	27.331
67.2089823229561	18.3672561024594	67.5765	27.7962
68.4783144362658	18.9313098988542	67.242	26.9141
69.7795464977905	19.4802427115192	66.7482	27.6121
71.1410999099975	20.0125145198796	66.7818	30.0369
72.7072183421648	20.4961909728463	67.8857	28.9512
74.4392111340108	20.961401926581	68.2062	28.5319
76.4407846701609	21.4108807162876	69.5886	28.6002
78.8739375469687	21.845661743247	73.7989	28.6287
81.6414906495146	22.2721740168021	90.72	30.049
82.3158837810322	22.5751874548424	90.6435	28.0536
82.9552104012784	22.873100668219	90.6179	26.4649
83.5777325755312	23.1691267989299	92.942	26.4511
84.1672625234539	23.4624313928819	92.5592	25.4331
84.7402889233976	23.7548581459524	93.6487	25.1273
85.2945735633708	24.046706290952	93.9312	28.9768
85.8248357755473	24.3344016627169	93.4265	31.4744
86.3304897043289	24.6145367994629	92.4351	33.0022
86.819194479717	24.8864481448476	92.7124	33.4453
87.2925452144755	25.1503621225417	95.0864	33.2234
87.728347663192	25.4012218704847	95.8908	32.6754
88.1385192044968	25.6438567060027	96.2582	32.5713
88.5300819656128	25.8804056311696	96.3928	32.1668
88.9101813812764	26.1131824760224	96.156	30.1327
89.2852645216676	26.3446800132438	96.0238	29.4057
89.6568494484557	26.5754034506076	97.1838	29.5842
90.0236268349949	26.8052530703203	97.4429	30.1528
90.3857476425707	27.0341070059465	97.9141	29.0493
90.7436350582391	27.2624620178736	97.5011	28.0267
91.0987167486393	27.4907491701111	97.3283	27.0933
91.4516709136721	27.719285361047	97.0499	25.7334
91.8030424337018	27.9484677420313	97.1071	18.8552
92.1468642213848	28.1848408307052	99.0428	19.6959
92.4774482186859	28.4307030188659	98.3827	22.3334
92.805077642062	28.6793451408398	98.3241	22.4412
93.1302029051874	28.9307769648589	100.384	25.6874
93.4520166331288	29.183631577297	100.6297	27.3107
93.771004973226	29.4372811618613	101.5683	27.6266
94.0863923914678	29.6917773797205	101.7295	28.4449
94.3985821934801	29.9468750478874	102.211	28.3893
94.7073859457468	30.2027422815272	102.9016	24.8202
95.0096730177675	30.4624425063493	102.4997	24.4075
95.3067713899574	30.7263198713309	104.9423	23.521
95.497764804918	31.1437084472032	105.0575	26.2706
95.6837216535203	31.5761465405049	106.1692	29.0085
95.8640908348137	32.0176428180056	105.6149	29.5786
96.0413592648821	32.4651571254565	105.5782	30.6326
96.2161063028518	32.9168626645741	106.8535	30.7643
96.3855026225623	33.3771590447563	106.6895	31.0233
96.5508477950175	33.8455098638141	108.656	34.8419
96.491976588719	33.8455098667565	107.8221	37.3636
96.4261307343137	33.8455098707978	103.4615	37.3033
96.3601372423875	33.8455098755782	104.0844	32.9988
96.2939934165278	33.8455098798927	102.9211	31.879
96.2277671456738	33.845509883991	99.272	31.5703
96.1615766635142	33.8455098881094	99.0228	31.9463
96.0954239457745	33.8455098920939	98.5493	33.1624
96.029308563946	33.8455098962575	98.9301	33.2654
95.9632090313457	33.8455099004666	101.1976	33.4905
95.8970516996911	33.8455099044008	100.5275	34.9543
95.8308468115911	33.845509908531	98.5859	34.5756
95.7646431955172	33.8455099124193	96.6051	36.0943
95.6984861857102	33.8455099155013	96.5473	37.5774
95.632380006421	33.8455099187015	95.1298	37.6897
95.5663594884557	33.845509921894	94.1971	38.0204
95.5004479602227	33.8455099250842	93.6083	38.4774
95.4346577322219	33.8455099282824	93.6941	39.0671
95.3689823686952	33.8455099315002	94.3087	39.6383
95.3034007981377	33.8455099348521	95.8598	39.2349
95.2378719706056	33.8455099381331	97.0806	39.3994
95.1723630795092	33.8455099414082	98.4033	39.6451
95.1068435421854	33.8455099446756	98.7317	39.6579
95.0413117675582	33.8455099478762	97.0063	39.6578
94.9758025965438	33.8455099510105	96.2133	40.5576
94.9103356850624	33.8455099541345	96.2085	41.8253
94.8449153528661	33.8455099573901	96.8865	41.9997
94.7795377659888	33.8455099605152	96.6284	43.246
94.7142161840347	33.8455099636367	95.46	44.379
94.6489547972532	33.8455099668906	94.5355	44.3621
94.583802574679	33.8455099700467	94.5838	45.9916
93.9648487681738	33.6527306096186	94.4684	44.7163
93.3482236162276	33.4517620540937	93.9129	43.6355
92.7362931428551	33.2460156011791	93.2846	41.9379
92.128786906327	33.0377908993108	92.2396	41.0703
91.526492167373	32.8275857506084	92.1801	41.0349
90.9277887062623	32.6152222697174	92.634	40.1716
90.3302233946453	32.4010554290318	92.8093	39.7693
89.7319717522932	32.1850996546395	90.014	39.915
89.1378140060737	31.9672121428235	90.1236	40.724
88.5456618788072	31.7464206903581	90.4784	41.2284
87.9514156952462	31.5213215772588	89.3668	41.343
87.3563890060089	31.2910581374176	89.0134	41.3658
86.7587756543997	31.0544329367404	88.4465	41.4478
86.1570614094956	30.8094907455983	85.9182	41.843
85.5622224892795	30.5504824231819	87.2346	40.5435
84.9647999829472	30.2837137650611	87.5583	39.2312
84.3635705258505	30.0116463233456	89.1249	38.0318
83.7512962379366	29.7346515641402	91.8795	37.1845
83.0742307835749	29.4458429244618	91.9372	36.8319
82.2078525344787	29.1324987073666	91.1655	36.0648
81.1126393232976	28.7994881286258	91.0332	34.8187
79.1376534165478	28.4369441779562	79.7169	32.9378
77.1994170643371	28.0724407196183	72.6191	32.6684
75.3871812167722	27.7053753734739	71.5231	31.8286
73.668047885402	27.3363058368337	68.3701	31.308
72.0574182406175	26.9649907795515	67.7055	32.9993
70.5368940150947	26.5893619140426	67.4673	33.2544
69.0802647815077	26.2088556186019	65.4552	32.6167
67.6886505491837	25.8234998412263	64.2717	31.7627
66.3516910377847	25.4339105891063	64.1748	30.2745
65.0509735504159	25.0414758515214	63.2951	31.2899
63.7830891544577	24.6445569796823	63.5739	32.9982
62.5347132388063	24.2388567349776	63.8645	34.3723
61.2772147818406	23.8119218355887	63.453	34.6286
59.962183269919	23.3404790306999	62.464	33.4003
58.6064034053493	22.8383634709983	61.5106	34.0654
57.020454167017	22.1900511623672	60.8351	33.4935
Route: 2 Length: 207.659435967394 Demand Met: 9996			
40.5086736375861	32.8264483032687	47.3356	31.1656
32.4644422095452	61.3166278433114	22.8228	67.5784
30.1972261558965	65.5132335009502	18.9682	67.082
28.8684909641051	69.1112996202503	16.7224	69.1113
28.9197553762366	69.637341128414	18.2654	71.5277
28.9718218395714	70.1583140466628	21.3934	72.6127
29.0240222222286	70.6764860662993	22.0857	71.4539
29.0763085798461	71.1950572489348	22.1344	71.2137
29.1286771217674	71.7152419269689	22.9431	70.0987
29.1811131711444	72.2393483205287	23.527	73.6169
29.2336070124296	72.7633560258956	24.1578	73.3792
29.2861542919786	73.2883078411125	24.5076	73.115
29.3387575260435	73.8151870710498	24.5354	72.6275
29.391425000042	74.3452913907356	26.2205	72.9044
29.4441443231374	74.8788118489391	27.2709	73.9256
29.4969111915353	75.4151660668112	26.6151	77.1467
29.5497347837786	75.9512747221481	25.3366	76.538
29.6026306824001	76.4884567021279	25.4767	75.481
29.655599555497	77.0287139072777	24.7401	75.4523
29.7086534405583	77.5729672121019	24.4797	75.354
29.7617988951909	78.1223283527086	24.3218	77.9732
29.815034722121	78.6737904973263	23.796	77.2181
29.8683728692286	79.2294797621838	22.8762	75.7017
29.9218493427479	79.7944350899276	21.1184	76.9048
29.9755493101175	80.3702310727756	18.7356	77.2891
30.0308000813676	81.0088400251873	17.9606	81.6588
30.1080951087263	81.5416811894955	23.4089	84.0628
30.1856422632229	82.072213107252	27.1736	83.2653
30.2633127602371	82.6032814913249	29.376	80.5861
30.3410651098055	83.1386240378028	33.517	80.8699

Solution x	Solution y	Original x	Original y
30.418792961414	83.6788315531171	35.4073	87.2216
30.4964101772412	84.2158863395029	34.7819	91.1147
30.5738913549	84.7414926008012	33.1881	90.5996
30.6513352901757	85.2606795869938	33.2241	90.2072
30.7287495879786	85.7755160654309	32.6009	89.9531
30.8061590356226	86.2874902923223	32.1756	91.0244
30.8835726401424	86.7958438339121	29.5221	90.7635
30.9610659653318	87.3018103942296	29.3468	93.7461
31.0386415544558	87.8008241608943	29.7064	94.0211
31.1162901256609	88.293695154983	30.8807	93.5109
31.1939841133905	88.7826087472973	32.2034	92.5655
31.2716973094261	89.2696104777522	32.8593	93.0881
31.3494160528145	89.7546319884539	34.0163	93.2553
31.4271129183421	90.237948027948	33.6244	92.4492
31.5048096818895	90.7210587177091	35.4152	92.5489
31.5824589332467	91.2042101547764	37.0706	93.0168
31.6600033970809	91.6872021673423	37.9917	90.5379
31.7374104548859	92.1735928868749	39.6285	91.4521
31.8145751446427	92.6632098796403	41.599	92.4813
31.8911995165446	93.15560847597	41.6896	94.8028
31.9672583630128	93.6456612072838	40.9431	96.0349
32.0429293862308	94.1326856559398	44.0393	95.7757
32.0942484707263	94.4750898482986	42.0978	97.503
32.1452407558327	94.8133667208077	42.2565	98.7398
32.1958054300026	95.1441272027037	43.0828	99.6317
32.2447698040769	95.445494800613	42.9226	100.4615
32.2921597460072	95.7184219598357	42.5793	100.4271
32.3389524417161	95.9820035875389	42.8352	101.6931
32.383263786774	96.2054018201595	42.0156	103.5929
32.3994937756289	96.2338345486201	40.5226	102.8002
32.4157109335913	96.2622466100066	39.3246	101.8921
32.4319207949865	96.2906546736328	40.2693	101.3043
32.4481191775017	96.319050394489	40.065	98.6098
32.4643083901816	96.3474472906353	39.7333	98.7582
32.4804892510915	96.3758447043535	39.196	99.7694
32.4966625579796	96.4042387843433	38.189	100.3805
32.5128299624528	96.432628653197	36.8108	99.4487
32.5289937764735	96.4610189234604	33.8351	99.3235
32.5451572439265	96.4894121763586	35.0473	98.5367
32.5613192146342	96.5178089769208	35.7859	98.3251
32.5774790616331	96.546209009789	35.7481	97.1257
32.5936374682329	96.5746156771695	35.9551	95.9225
32.6097947763004	96.6030325254697	38.2186	96.6747
32.6259478331434	96.6314561744377	37.1788	95.0118
32.6420987154969	96.659893023006	37.3296	94.7968
32.6582471987852	96.6883441345212	36.1694	94.3523
32.6743949516421	96.7168113700559	35.2297	94.8683
32.6905431296869	96.745293303925	34.0458	95.0903
32.7066930541215	96.77378984919	33.9629	96.8355
32.7228447001749	96.8022959877826	34.0464	97.1856
32.7389979467325	96.8308109938656	33.0573	97.9271
32.7551536812583	96.8593331238093	32.4952	97.9758
32.7713123930061	96.887862440534	31.7064	96.988
32.7874749913103	96.916402328853	31.6916	96.8159
32.8036415153398	96.9449533980901	31.4281	94.9219
32.8198124218329	96.9735224532915	30.7482	95.8761
32.8359884014343	97.0021063588963	29.1897	96.4145
32.8521711051357	97.030703717987	29.7849	97.5299
32.8683600368428	97.0593102113044	28.2891	98.27
32.8845567041827	97.0879234651689	26.6904	96.1713
32.9007633539636	97.1165524364082	26.1674	96.1159
32.9169811742149	97.1451979643892	26.55	96.735
32.9332114005896	97.1738569588482	26.9511	99.1097
32.9494553358947	97.202519770283	21.5395	100.4343
32.9671708888045	97.2303519708995	29.8552	101.3038
32.9848943421015	97.258179117966	30.1816	102.1772
33.0026257536352	97.2859985429736	31.6341	101.1443
33.020363859791	97.3138144321736	35.2228	101.4244
33.0381019501826	97.3416238483081	35.7306	102.2767
33.0558381577033	97.3694222325319	35.5571	102.295
33.0735728369724	97.3972096139408	35.4006	103.6799
33.0913047229279	97.4249784727205	34.3074	104.3145
33.1090354755363	97.4527267369332	31.3011	106.2109
33.1267646037223	97.4804483499681	28.1717	107.4546
33.1455799244563	97.5079682635847	32.8361	107.2479
33.1643800899097	97.535408947802	33.1638	109.6815
34.0393996921298	97.3635304053621	33.1686	108.6172
34.9552184796523	97.1816359919735	35.3466	107.7036
35.8607788833755	96.9947675703712	35.7224	107.36
36.7705333377283	96.8032178937214	37.1983	106.347

Solution x	Solution y	Original x	Original y
37.682314529842	96.6086059534079	39.1965	105.4524
38.5904007220031	96.4116064106225	40.9527	105.6227
39.4865996359216	96.2115137427415	42.4716	105.6496
40.3633974245738	96.0075553291444	42.9285	106.2179
41.2178924035866	95.7974439429105	45.465	105.2608
42.0375151252779	95.5818293248326	48.0764	105.8084
42.6099612435635	95.31516197527	46.5537	103.4177
43.1752205072761	95.044214328233	45.0704	101.2748
43.740687871268	94.7714385337444	44.7902	101.1589
44.3077643849631	94.4967494036391	46.0729	100.678
44.8752644896368	94.2202069834632	47.126	99.3914
45.4427263383211	93.942359573675	53.9006	102.5381
45.6519209049763	91.8464541777104	51.1106	98.2963
45.8598371966654	89.5571275441798	48.9533	90.4759
46.0676855839662	87.2876576641828	47.7789	92.5461
46.275623007397	84.9216551268635	43.1057	91.7939
46.4848270172076	82.3379750602785	42.9721	90.3177
46.6956062998114	79.3159030153143	42.6808	88.2098
46.9086645170195	75.1583134281771	40.8939	84.3555
Route: 3 Length: 261.780035181488 Demand Met: 10000			
79.2416132197119	38.9259275549141	90.0385	42.8005
81.8422058507431	44.760024610816	91.9756	47.4725
83.7789783079114	49.5772917616628	92.8209	56.9207
84.8172795874325	51.3128648741304	94.4551	58.0456
85.4884947673216	52.3678469220701	94.8477	58.3247
86.0848499256047	53.3026962391436	95.4289	57.3916
86.6470745713591	54.1993870730213	97.3108	57.82
87.137556310004	55.0303107124616	95.9041	59.3009
87.610180717294	55.8349973603653	94.6583	60.3511
88.0747149397666	56.6224693092677	95.1558	61.2395
88.5311613070025	57.3926497713668	95.479	61.1306
88.9810076185508	58.1513510200939	95.4724	61.7777
89.4255816967665	58.9002271207475	94.5987	62.0376
89.8674673995755	59.6427623218149	93.5538	62.1822
90.3085386093214	60.3815191877954	92.749	64.7326
90.7497425190404	61.1120430639661	93.9444	64.9
91.190411512927	61.8357940745821	94.6788	63.8911
91.6305064916198	62.5570923686165	96.4356	62.0951
92.0688077563376	63.2813475538653	99.0429	61.6589
92.5019403963421	64.0121816749816	99.3413	60.508
92.9296678610939	64.7562740388014	103.9916	60.6173
93.2561872083198	65.6938162558729	102.6402	60.9181
93.5702094626681	66.698787082863	100.6854	61.817
93.8803875244137	67.744456245164	99.4285	63.8276
94.1888987168531	68.8171224555398	98.4228	65.0226
94.496645904313	69.9146887037831	98.4258	65.8894
94.8037629799741	71.0395754753042	97.9014	66.9835
95.1106943783165	72.1923796804669	101.778	67.1686
95.4145374901646	73.3973278977726	102.9023	68.4164
95.7142083964967	74.667812899963	103.5291	67.906
96.0070087728398	76.0690560903112	108.1531	76.0691
95.9905463866931	78.265393609448	107.981	80.0957
95.9714028378963	78.4737400395604	103.6911	80.62
95.9522433627361	78.6814977985392	103.8313	82.5056
95.9330604552258	78.8877597036563	103.1106	83.2736
95.9138583147067	79.0925891637978	101.0606	82.9382
95.8946507611585	79.2966959905931	100.0565	80.1054
95.8754425019185	79.5008293968284	101.2985	78.2917
95.8562291867451	79.7053632678453	99.1261	78.6323
95.8370169268062	79.9102494512389	98.5933	78.8152
95.817806454855	80.115486690382	97.1852	78.7831
95.7986008531541	80.3211124478617	97.7624	79.6432
95.7793987768837	80.5270212401063	98.9119	80.0767
95.7601975827031	80.733178100073	98.567	80.2017
95.7409982561555	80.9396011342303	98.2007	80.5294
95.7218016616411	81.1462740807803	98.2345	80.86
95.7026076541064	81.3531801892842	97.8831	81.9659
95.6834169246146	81.5601757734745	97.4314	81.946
95.664230392183	81.7673039104292	97.3132	81.5365
95.6450482387378	81.9746679901486	96.9541	82.6989
95.6258711483306	82.1821192848299	96.8706	83.0827
95.6066992706409	82.3896344646072	97.0865	83.6094
95.5875322213777	82.5971657771648	96.9343	84.943
95.5683704196712	82.8045291723787	99.0152	86.155
95.5492095719124	83.0114928634971	97.7943	87.7833
95.5300517189041	83.2177683594243	96.2545	87.1498
95.5108993109951	83.4235889449258	95.9325	86.7596
95.4917520900962	83.6290780729819	93.4941	85.8189
95.4726134740913	83.8344378897729	93.0994	86.3608
95.4534836181697	84.0396055235824	93.9684	87.8762

Solution x	Solution y	Original x	Original y
95.4343606062681	84.2443418577174	93.1284	88.6615
95.4152460395423	84.4485088593642	92.7178	89.1801
95.3961409922139	84.6520265375734	95.2026	90.5293
95.3770405430102	84.854642637229	96.5235	92.1962
95.3579416598947	85.05578178576	97.0347	92.0258
95.3388434914011	85.2556142909298	96.8345	90.0197
95.3197476283694	85.4548610560079	98.1138	89.594
95.3006518329506	85.6536296147302	98.3726	88.4744
95.2815563698815	85.8521748456466	100.7126	88.5952
95.2624557876177	86.0504282347816	102.4507	89.6037
95.2433427150951	86.2480202474258	102.0461	86.7072
95.2242212326329	86.4457404274177	101.1477	85.2681
95.2050945840693	86.6439047316727	102.2936	85.0217
95.1859584840655	86.8426520881075	104.3617	84.8664
95.1667977477456	87.0423378949226	107.2392	85.9448
95.1376112923802	87.3743192937318	104.5599	87.8351
95.10836655958	87.7065226580363	104.3693	90.8389
95.079055963454	88.0357129716838	105.6506	92.4297
95.0494858677374	88.34860302235 32	102.0076	93.075
95.0198852671417	88.6587620011388	101.602	92.3175
94.9902610128631	88.9673521170093	100.8882	91.1406
94.96062052875	89.2754452895773	100.5649	91.4192
94.9309651624139	89.5830650389032	99.3434	90.9979
94.9013019534759	89.8906231199012	98.9319	91.3958
94.8716326575945	90.1980774604801	98.853	91.6792
94.841957691074	90.5054263493839	98.656	92.6213
94.8122781388474	90.812392082529	99.3782	93.0601
94.7825906605843	91.118858987468	100.6204	94.7646
94.7528857549085	91.4238671136833	101.583	94.8217
94.7231554435456	91.7273344277429	101.8123	94.891
94.693398430727	92.0293612565517	103.2876	94.1817
94.6635951106929	92.3301992020567	104.1728	96.9352
94.6336843796479	92.6245085973089	104.1034	98.3317
94.6036171434318	92.9061273001171	103.8628	98.4843
94.5734205250268	93.1790421405257	98.2349	98.4363
94.5432191670949	93.450183656354	98.8373	99.4165
94.5130060564355	93.7189028119471	95.6122	103.8055
94.4827895779414	93.9776088179042	94.4828	106.1237
94.2039106233664	93.2735581411296	95.0373	98.5247
93.9256505868137	92.5602311744223	95.7576	96.9635
93.6476990407068	91.8398045122513	95.504	96.351
93.3700389247854	91.1117217124236	94.0924	96.5838
93.0930175029028	90.3726875684262	92.4623	94.734
92.817070140229	89.6262959939089	92.5654	91.5305
92.5420252899037	88.8787328289382	88.6062	92.2681
92.2690947469986	88.1254344466252	88.3633	87.3681
91.9981122636669	87.3767178215721	86.3374	85.7586
91.7298533209259	86.635089499049	88.0687	81.4777
91.4636543639998	85.910076216977	88.6759	82.3658
91.1990463598621	85.1954192209502	89.5631	83.3752
90.9356351174919	84.4867695601516	91.14	83.5499
90.6729308141537	83.7822887596009	91.1677	84.1211
90.4108790845539	83.0796205572072	92.288	83.6157
90.1491346499407	82.3783774599078	94.9909	83.4209
89.8867169225941	81.6772149061866	93.2494	81.8793
89.6242003248459	80.9780612783726	94.0795	80.8773
89.3611889202418	80.2814687740156	92.6699	80.64
89.0980706755333	79.5865234942056	92.1151	81.2598
88.8348986131814	78.8906198422085	91.86	79.7087
88.5716648840784	78.1954392104815	89.95	80.2132
88.3088290356771	77.4987771306073	89.835	77.746
88.0463711231948	76.8039628565378	91.0116	75.887
87.7838871070653	76.1131624340347	91.1291	78.4897
87.5212428301321	75.4198302577708	93.1133	78.1389
87.2574786304158	74.7221271443775	94.6945	78.572
86.9908982478289	74.0132808790248	94.4072	76.9857
86.721765354459	73.2969674796148	96.1169	76.0362
86.4463151583608	72.5680583036052	97.816	74.8015
86.1315360261279	71.7892220254523	97.5653	74.5618
85.7319553980713	70.897080857131	95.9481	74.251
85.305060618351	69.9615990983114	96.2521	73.5638
84.792677442598	68.8988429299088	94.549	73.3405
84.2381104220722	67.7533677121855	93.9524	73.145
83.6127405575559	66.4351646973879	94.6798	69.1984
82.8250242023939	64.9615898325091	93.0933	68.7697
81.9014855720905	63.3231815038558	92.0851	66.8651
80.8159484914129	61.5220264365417	88.7937	67.447
79.6345688216387	59.5060608274056	90.2672	64.2791
76.9604809512111	56.0019071775174	86.2321	62.729
Route: 4 Length: 28.0819105734579 Demand Met: 6740			

Solution x	Solution y	Original x	Original y
47.1968274636496	11.7789297728067	48.2378	10.888
47.2632079150222	11.5917486377789	49.0558	10.279
47.3297496064848	11.4048239690817	47.6091	10.2274
47.3961252510793	11.2181863694618	46.5714	10.174
47.4622065011102	11.0318257958485	46.3909	8.819
47.5281414480401	10.8459796715107	44.5689	9.75
47.5941438429574	10.6604038026022	42.7704	10.2739
47.6604328909669	10.4749298857238	43.7231	10.6871
47.7271375407851	10.2893940627254	43.984	9.2005
47.7942375189785	10.1040397846885	43.7681	7.8375
47.8616640775264	9.91910473330409	45.5397	7.2979
47.9292028134844	9.73460330770902	46.0043	6.8606
47.9967516313216	9.55055931423099	46.8369	6.4403
48.0642355825973	9.36699370857833	47.7278	5.7114
48.13162906362	9.18400719023689	47.0712	4.3382
48.1990417940712	9.00188662955027	48.7027	4.8736
48.266435541049	8.82041920274787	50.2911	5.2466
48.3338064566493	8.63946614405985	49.309	3.6922
48.4012369495989	8.45933608388199	48.302	2.6164
48.4687815050079	8.28026793054649	48.4975	2.4432
48.5364469425213	8.10224629750281	49.5265	1.5006
48.6042017107946	7.92552852679986	49.2438	-0.5725
48.6720554142551	7.75106320020716	50.0191	-2.6033
48.7399214514857	7.58162372274604	51.545	-0.7619
48.8077771813611	7.4142994858582	51.7765	0.7553
48.8756546975765	7.24821184409138	52.8937	1.339
48.9435045537382	7.08315840367532	50.9668	1.717
49.0114426582757	6.9188827499216	51.8363	2.0767
49.0794331627764	6.75526576855974	52.2056	3.4977
49.1474742578458	6.59200248076853	52.3291	3.6705
49.2155742416975	6.42902640434958	52.0607	4.6851
49.2837736639738	6.26615247945037	53.4617	5.8056
49.351996344944	6.10319464956482	54.3108	6.5803
49.4201937511414	5.94000732074272	55.5508	6.709
49.4882750846903	5.77653080204733	58.0725	5.2013
49.5559563092459	5.61303125962221	58.8992	5.3006
49.6231273712093	5.44945848346275	58.5415	3.6684
49.6899185186288	5.28623023229792	58.0726	3.0503
49.756422733222	5.12343248026099	57.7618	2.6586
49.8226898208842	4.96109290056235	56.6752	3.9284
49.888836768373	4.79884826275626	56.6229	3.2945
49.9548758665782	4.63678722558643	56.514	2.6652
50.0208232761793	4.47499722906148	55.5686	2.3786
50.0867479115413	4.31347723193009	55.7669	1.6852
50.1526413275156	4.15232756077381	54.6465	1.327
50.2185764631305	3.99155148006789	54.5841	1.3
50.2845706432261	3.83112107091923	54.7597	1.1902
50.3506317428544	3.67102905038448	56.047	-0.6998
50.4166760807738	3.51164553785886	57.3839	0.9502
50.4826234060342	3.35265534534932	58.2741	0.1622
50.5483969673948	3.194252666442	58.2864	0.0731
50.6140270083275	3.03640612974951	58.2987	1.8222
50.6795561283406	2.8787180009729	58.6741	1.1796
50.744973032501	2.7212941203152	60.4719	1.0667
50.8100222925786	2.56427922319712	60.4167	1.4088
50.8747639836687	2.40751742709222	62.5325	1.766
50.937089961293	2.25170868284582	63.0749	1.8033
50.9370899438247	2.2517086526158	62.7821	-0.0838
50.9370899260401	2.25170862282929	62.4332	-0.684
50.9370899082874	2.25170859216994	61.9524	-0.333
50.9370898905942	2.25170856177967	59.6709	-1.5476
50.9370898729097	2.25170853087571	58.3955	-2.2935
50.9370898551174	2.25170850304933	57.7878	-4.3732
50.9370898372931	2.25170847372444	53.412	-4.2453
50.9370898195632	2.25170844250215	53.5826	-3.7128
50.9370898018895	2.25170841219231	53.8048	-5.0553
50.9370897841454	2.25170838324297	54.4331	-6.2551
50.9370897660438	2.25170836745328	53.289	-9.6645
48.9976572295234	2.25170835193487	46.0937	-5.8176
47.7041762444202	2.25170834865876	43.0131	-4.6452
46.610326328286	2.25170834627806	36.4279	-4.3699
46.6404167064512	2.78734326144106	39.9467	-2.3317
46.6706598259439	3.33558795869842	44.8479	-0.9391
46.700940604538	3.89037331290765	43.4311	0.4843
46.7312486554126	4.45045603420988	42.4155	0.0668
46.7615892535558	5.01894275607642	42.4139	3.5597
46.7919415951393	5.58961446965607	45.0418	3.8658
46.8221998696414	6.16258695990337	44.2937	4.7268
46.8524209617606	6.73784977540339	44.3097	5.4051
46.8826369928441	7.3155311053824	44.0031	6.0986

Solution x	Solution y	Original x	Original y
46.9129034296432	7.89577345929739	41.1669	5.3004
46.9433101745662	8.4825005123739	38.0686	7.3443
46.9739315656839	9.07394629374477	36.7928	9.6586
47.0048008217923	9.66325955140799	40.2323	12.6508
47.0357782378711	10.245869989623	41.9974	13.5778
47.0667876484759	10.8223668521878	44.7075	13.3055
47.0978388375054	11.395267637321	44.5228	11.8645
Route: 5 Length: 261.710236908228 Demand Met: 9999			
44.5754328134004	27.3289940373168	48.6326	32.1618
42.0451347508174	38.7237886732668	37.4272	33.8061
39.7752110052789	58.6516544911838	33.839	67.1668
38.0034793068802	63.8423881172436	35.1535	70.6086
36.3268833977989	68.312216631091	34.9317	80.2335
35.3643161597626	68.4923296315626	31.105	77.2121
34.4636404106956	68.6716641635848	31.4187	76.5703
33.597848872916	68.849268624348	32.697	74.6737
32.7473173857568	69.0260544388289	32.2488	71.8762
31.9095357835401	69.202756964431	31.7515	71.3679
31.0829082161596	69.3794501924041	31.4906	71.3219
30.2651904942244	69.5561073341094	31.4455	71.7336
29.4533954575159	69.732636760414	31.0449	71.9995
28.6457915371262	69.9089962049974	27.6433	72.5657
27.8511240620403	70.0851482270782	26.9783	71.0141
27.0682958629471	70.2613640544552	26.4587	69.6793
26.2960614972993	70.4378547721522	25.7737	68.9159
25.5339056508415	70.6147504935207	26.4747	67.9787
24.777111957169	70.792202623818	28.241	67.9653
24.016427076405	70.9702388152286	26.4833	65.6457
23.2543811861949	71.1493987463479	23.9369	61.5866
22.4958515855785	71.3324852570623	22.6268	64.3936
21.7440405927352	71.5172953765435	15.1112	64.361
21.0480983519932	71.7055514250376	15.3124	65.205
20.3847413063725	71.8961777499816	14.7433	68.1941
19.7434209584451	72.087865417992	14.5018	68.1646
19.1211329883646	72.2806527539061	14.0233	68.3418
18.5161410513064	72.4745457073634	13.2613	67.7948
17.9288755032708	72.6698450689753	12.5389	66.9051
17.3606203187052	72.8671227705192	12.0877	66.3858
16.8111964372574	73.0668736056221	12.0444	66.3239
16.2776991377541	73.2692133061836	12.0097	66.7734
15.7569230404951	73.4739020158995	12.0587	67.8257
15.2457096596565	73.6804066457403	11.4886	67.7219
14.7440803258197	73.8889390395558	11.4442	66.9869
14.2514383641309	74.1000852301941	10.7344	66.9849
13.768189272387	74.3141487684901	10.5042	66.7806
13.2937659233718	74.5315690724321	9.6606	65.5604
12.8322561908306	74.7551821415656	5.2812	65.5492
12.5305379906787	75.0784628303402	6.9842	66.7632
12.2373890143904	75.4165493420994	7.0214	70.8048
11.9481803540794	75.7592220658472	8.3117	72.2049
11.6613909311421	76.1050499266952	8.8648	72.0358
11.3765688742979	76.4544624310819	9.00020000000001	73.0359
11.0934182518686	76.8069113847455	9.45780000000001	72.6847
10.8116098554364	77.1630097077716	9.3844	71.5303
10.5311434630395	77.5245321464481	9.1707	70.0865
10.2521804260572	77.8949564682494	10.0835	69.723
9.97401238591465	78.2767204389914	10.9416	69.7746
9.69585309322054	78.6720271572454	11.6475	70.8021
9.41715052286177	79.0797127990662	15.0856	70.6386
9.13215997800566	79.512833106687	15.4332	72.9689
8.84240969283093	79.9613232454361	13.7649	76.0563
8.55069727569321	80.4166430728699	12.73	75.2001
8.257320938134	80.8814670921565	9.9143	75.8382
7.96388070408739	81.3550431457942	8.0472	76.1743
7.67114580196187	81.837942892116	7.5677	74.3816
7.37919571912656	82.3376023119782	6.65640000000001	74.2265
7.08844918073635	82.8592925598467	6.09139999999999	73.9114
6.7992388118582	83.4133985413316	4.0089	72.186
6.52348279302416	84.2795283674044	2.7376	84.0979
6.24976940914749	85.1555806398452	2.57040000000001	90.3092
5.97827054110225	86.0142631687345	3.55029999999999	90.3653
5.70826429564724	86.8632294466103	3.5998	89.8159
5.43958382592595	87.7103657008459	7.8142	89.6258
5.17054325254375	88.5598910274257	5.8502	91.8647
4.90177521431878	89.406632408049	4.77370000000001	93.7785
4.6335737376416	90.2457783059742	3.4538	93.5151
4.36635823235184	91.0828275803098	3.5924	94.7451
4.09998727016497	91.9163870056793	6.3198	96.0864
3.83331048412425	92.743769320686	9.17	97.1621
3.56459929448235	93.5604602147474	8.1477	101.1634

Solution x	Solution y	Original x	Original y
3.2932396197487	94.3397266752439	8.0611	104.093
3.01610705735401	95.0335092334379	3.0162	107.1796
2.78498398960919	94.9599131811767	3.1448	100.72
2.55414560043664	94.8862603736712	3.81100000000001	100.5395
2.32325135793543	94.8125520393478	4.95789999999999	99.4405
2.09185736141679	94.7387986629317	3.11839999999999	98.924
1.86050633862286	94.6650144849482	2.55330000000001	99.1767
1.62926500871221	94.5911988864052	1.4019	97.5847
1.39842677906987	94.5173689769962	2.1469	96.6722
1.16770810642971	94.4435306976867	1.64530000000001	95.7178
0.937187415332744	94.3696933989836	0.613799999999998	95.4238
0.707074300692042	94.2958628623277	-0.171000000000006	97.1566
0.47747257727292	94.2220336704546	-0.338999999999999	97.1979
0.248341218751293	94.1482093175299	-0.311599999999999	97.6012
0.01956867110529	94.0743917717393	-1.86190000000001	98.5581
-0.208536194013163	94.000600580616	-5.5457	98.4014
-0.434870762039168	93.9269321200743	-7.5489	96.9207
-0.658809220676261	93.8534627787388	-12.8049	93.8535
-0.330653620378456	93.0221182015802	-6.68600000000001	94.6391
0.00187100553547737	92.1920285689729	-3.26390000000001	94.8889
0.336599686579163	91.3601814595117	-3.1358	95.2162
0.673839882398312	90.5213644846206	-2.5612	92.1356
1.01346950341228	89.6855661829345	-2.30370000000001	90.7079
1.3556325360893	88.8550967990574	-2.1508	94.1499
1.70087326587554	88.0097742565867	-1.9602	93.9224
2.04961824141157	87.1439981992939	-0.0468000000000046	93.7668
2.40066000033451	86.2529953972589	0.580200000000005	93.7511
2.75396894573603	85.3247658149731	1.1743	92.9818
3.10938828959277	84.3543504461823	1.20229999999999	90.7259
3.4670638537755	83.3566851262818	0.619299999999996	91.0377
3.82843310468169	82.3055774863558	-0.100899999999996	90.0487
4.19532776547778	81.1843922956349	-0.735100000000003	89.6931
4.57212125883831	79.913331521861	-1.23350000000001	86.0108
4.95728180437659	78.5714967864795	-4.1255	85.596
5.44139608602688	75.7213884304581	-4.2807	74.2616
5.96198697468915	73.1364727559755	0.309600000000003	68.1954
6.49671977474992	70.8553515731412	1.76609999999999	66.5446
7.04273876915464	68.766131525288	0.483800000000002	63.8626
7.60876247471693	66.888329696152	4.4426	63.6871
8.18323448039638	65.103233094006	4.7342	63.0935
8.76691540480229	63.38098732685	6.67010000000001	63.5082
9.35737598048456	61.6849423520395	8.4928	63.9998
9.95268875107026	59.9842039776692	7.6803	61.1857
10.5558596419361	58.2945450715452	9.15690000000001	61.6426
11.1657335518364	56.5839371189933	10.4334	62.822
11.7815607284892	54.7855821029412	14.2076	63.0144
12.3932366700158	52.7628435867369	14.2239	63.9607
12.9845762467968	41.6188392820712	18.7531	32.536
13.5426503394208	38.0409752210753	21.3113	31.7798
14.0744468274032	35.3238183339259	22.8581	29.0039
14.562665238608	33.3352888689038	21.4132	25.3225
15.0275044536607	31.7826731281681	20.8129	26.0745
15.4856079278339	30.3382349304464	19.8821	27.2321
15.9415199210859	28.9356918538637	17.7323	26.9057
16.398663434834	27.558624704415	16.9754	26.2994
16.8583208290983	26.1992544310356	18.7218	26.0511
17.3191544568081	24.8481754816112	19.5225	24.6717
17.780694062604	23.5056675572611	19.6457	23.2311
18.2430826116611	22.1725489027156	18.4916	22.031
18.7078822326634	20.8476219397648	17.3215	22.815
19.1770278819093	19.5141033587308	15.0509	21.8739
19.6553378294594	18.1666734640446	7.8039	17.6061
22.5992138346187	16.9591086383844	16.9397	16.157
25.9496304362277	15.7623267941863	17.2669	18.1061
30.5935259594085	14.5402475008842	22.0389	18.6688
39.0339177801476	13.255220274242	43.7175	13.3612
Route: 6 Length: 66.7883712076653 Demand Met: 9702			
46.9452780972126	11.924378556428	47.1015	12.1757
46.7638336792763	11.8828058733908	47.4524	12.1509
46.5828965902541	11.8412193080996	47.5448	13.9665
46.4027020720654	11.7996114082575	48.0446	14.6778
46.2232157937984	11.7579861198872	45.8725	14.3747
46.0447176606991	11.7163569806446	46.213	15.3079
45.8669500539766	11.6747183831466	44.2621	15.3855
45.6901627020018	11.6330693121526	44.3034	16.6265
45.5142190752993	11.5913921586205	46.503	16.5426
45.3386101779973	11.5496864396563	46.6598	16.011
45.1633024698333	11.5079573576929	47.2642	16.1804
44.9881656258294	11.4661987620902	49.3862	17.5735
44.8125741902852	11.4243727838319	49.1677	19.2175

Solution x	Solution y	Original x	Original y
44.6362442529095	11.3824227637788	49.9475	19.2284
44.4585953611235	11.3403247023952	49.9971	19.9155
44.2788879636876	11.298012649396	49.1449	22.3659
43.9008468474325	11.24039609033	46.7163	23.0055
42.9388529886438	11.148375687716	45.9242	19.9
41.9661139963275	11.0556356578799	45.9074	18.6439
40.9774285414182	10.9623690406967	40.715	18.8306
40.0086389233642	10.8686065290307	40.2335	17.1357
39.0533928603897	10.7745241731044	39.7266	17.3977
38.1069865337253	10.6800534332362	31.9656	14.6164
37.2096893189741	10.5853745575302	25.9081	14.4892
36.8362841417956	10.4857901568983	29.4417	11.4808
36.4718609880501	10.3861902979774	29.2451	9.0499
36.1155212698113	10.2867571261492	29.9497	8.0977
35.7653478846123	10.1875270044006	29.6205	6.6839
35.4214469022126	10.0885919202379	27.9452	7.0873
35.0856320656471	9.98992003031659	28.0443	7.2557
34.7566771781388	9.89145560088202	26.246	7.8923
34.4370101610478	9.79316093828758	26.4488	5.1021
34.1266314430668	9.69533596427345	27.2842	5.8331
33.8222277143302	9.5977943829225	27.6562	5.4902
33.5228115181284	9.50052932860956	28.1449	5.3771
33.2274261853966	9.40351495081915	29.2732	5.6917
32.9348298451825	9.30669217816807	30.7839	5.7178
32.6439285311159	9.21003506814686	31.7997	5.4917
32.3540615920297	9.11353870567247	33.7832	8.5886
32.0641084290087	9.01700524330868	36.2059	6.8965
31.7726110283902	8.92049347671729	36.4235	4.5159
31.4790810891409	8.82418089424918	33.6792	4.7017
31.1853101061723	8.72806347720229	33.4349	0.0139
30.8905351363183	8.63269148151167	32.3564	-1.4633
30.5948072722058	8.53856171999256	31.1128	-2.8096
30.2984416695115	8.44756212683996	31.0065	-1.0714
30.0022002140392	8.35741414429464	31.1391	0.2266
29.7059181013031	8.26778051502142	31.0707	1.7474
29.4096008403423	8.17845538513275	28.6989	1.5656
29.1144489321603	8.0894271237682	27.3755	-1.0984
28.8214306040904	8.00112453552842	26.7943	-2.6353
28.5321248434828	7.91446403567709	22.6294	-1.9579
28.2608782335659	7.8305513893513	22.4229	-2.1641
28.0048833540548	7.74918281747014	19.4163	-0.8394
28.1172906554283	8.1917258099928	24.8641	0.1355
28.2301311802057	8.64736887250702	25.8989	0.7413
28.3432562086794	9.1158451274158	24.5208	1.7631
28.4568220746621	9.59734669904628	22.4003	2.9895
28.5711599958778	10.0935909909454	23.9142	5.5856
28.6859159164428	10.5973331801739	22.0744	6.6433
28.8013494184846	11.10923615983	21.6596	11.213
28.9174741689406	11.6217611874193	19.6468	14.5775
29.0351222241665	12.1257917307315	18.1963	16.0602
29.1597190651827	12.5883544267799	23.1228	16.7524
29.2850289592842	13.0456838809073	23.3217	16.9506
29.4110363205056	13.4984874979786	24.5729	19.8583
29.5376744600685	13.942422380874	25.2224	21.1268
29.6649019424936	14.3759036183745	27.0312	22.0371
29.7924673470732	14.7994796908265	24.0847	21.2619
29.9208859286102	15.2141903910945	23.1615	20.5337
30.0503618563109	15.6220874451353	22.5923	19.795
30.1810403378319	16.025048905999	21.2889	20.2133
30.3137277873294	16.4207545783858	20.7311	19.0512
30.4487243457209	16.8121320616357	19.0397	19.3917
30.5972579627837	17.1818396877164	19.4151	20.4264
30.7600978466405	17.5299606913611	19.3676	20.9011
30.9612258100584	17.8409097863976	19.4476	21.0876
31.270308499601	18.1111017794038	20.5046	21.2685
31.6120297803767	18.3754619033158	20.5322	21.5891
32.0208444876948	18.6311486035827	21.1889	21.267
32.4852715363052	18.8830418373446	21.7951	21.835
33.019001185139	19.1310492315355	23.1689	25.59
33.8735309476009	19.3547546120281	28.099	29.8348
35.5385898168547	19.5322096279249	35.5392	31.6783
40.1866832621385	19.5102870347602	44.1303	30.8739
41.1163443085839	19.4866512180453	44.6028	29.9319
41.9887947960625	19.4628458221523	46.4115	30.3033
42.6954582864559	19.4386457869472	46.684	28.1154
43.3883060320139	19.4143791779364	45.985	27.4123
44.0791136199619	19.3900712956129	46.7677	27.4481
44.767402803444	19.3657234400814	47.7428	26.438
45.453722691945	19.3413519911806	48.493	25.186
46.1394149755086	19.3169738893594	50.8742	24.2729

Solution x	Solution y	Original x	Original y
46.8190314891687	19.2925960939045	49.5432	29.0024
47.4905756948004	19.2681415532342	52.7074	28.2489
48.1339157685599	19.2436101856073	53.915	28.4629
48.7344174508561	19.2189805285779	54.7376	29.7596
48.7881545340249	19.137151912567	54.8257	29.6059
48.8331900197388	18.9639979957118	54.5895	27.7676
48.8780657177898	18.7868347317584	55.1607	27.7715
48.9226982577694	18.603689184702	56.8778	27.618
48.9638986653088	18.2774932253169	55.4854	26.8201
49.0049152342451	17.9340755753975	55.089	27.0379
49.0457370619397	17.5663200442388	54.6523	25.2022
49.0864813680097	17.1883604275123	54.2786	24.4277
49.1271729314399	16.8018732948657	54.0368	23.8586
49.1678242609323	16.407360254677	53.2794	21.4994
49.2084707848355	16.0090511852689	52.1655	19.1446
49.2491405467306	15.6093400578538	51.539	18.7116
49.2898472112867	15.2082528977848	51.6732	17.1776
49.330591645325	14.8067018324056	52.4859	17.4578
49.3713583465686	14.4039609537336	52.0827	15.9727
49.412160564459	14.0009371986147	53.7123	16.59
49.4529604009259	13.5965090397376	53.9046	16.3668
49.4937571845109	13.1904133760449	53.4554	15.0784
49.5345718190521	12.7835137424613	55.8132	15.4408
49.5753436967818	12.3745657199551	57.2331	12.7874
49.6160421474327	11.9659075115215	61.7542	11.527
49.3931140667909	11.9659068590757	58.6318	9.4344
49.1658779023454	11.9659062022303	53.1154	7.9184
48.9390724636395	11.9659055396451	51.2901	7.6487
48.7133198498921	11.9659048598165	52.3173	10.0275
48.4883172681181	11.9659041840966	53.965	12.2967
48.2633031301751	11.9659035170535	51.9742	12.9315
48.0382106754125	11.9659028606391	52.0306	12.0787
47.8122062509001	11.96590219963	51.32	11.9016
47.5859442295017	11.9659015348598	50.5069	12.3029
47.3618340386508	11.9659008751427	48.9393	11.7496
Route: 7 Length: 168.96170943229 Demand Met: 9996			
52.3015834924108	19.0175922250593	47.4152	28.2569
61.6076098051177	22.5371116533723	67.6588	29.7348
67.9013690313455	25.3446582878408	69.1853	30.9522
74.6149923038508	27.9485173207581	85.525	32.0217
75.3201929124908	29.1083879911202	85.1876	33.113
75.9638198569025	30.1853967337318	86.512	33.4131
76.5223383834402	31.1806277089084	87.5726	32.8781
77.0000477658714	32.1322896918548	88.2545	36.066
77.2714787430206	32.752672279077	86.5983	36.2039
77.5353087963853	33.357451094113	85.065	35.2948
77.7963075450625	33.9586663171063	81.9079	40.1742
78.0564697788627	34.5460852543337	80.8076	41.6004
78.3165011384625	35.1181551909944	80.8872	43.1227
78.576282015317	35.6706289401817	77.9223	44.6051
78.8377500225605	36.1996689632102	77.8794	45.0468
79.1010356835402	36.7077598836588	79.9479	46.2913
79.3646416932912	37.1896266828912	80.0004	48.0282
79.6282308063896	37.6219818672457	79.533	47.2684
79.892796298973	38.0349720121958	77.9078	47.2474
80.1598907758351	38.4323937292145	76.4125	46.981
80.4309582356098	38.8169040433287	76.379	48.6237
80.7089832779993	39.176650379381	74.8417	48.5823
81.0016473480154	39.5064178265874	75.5201	48.6107
81.3051289681792	39.8190353426287	75.5587	49.1352
81.6239451643165	40.1116448096466	77.4079	49.147
81.9503072594613	40.3948709858263	77.6289	48.4559
82.2830614450329	40.6724072801951	78.2967	50.1808
82.6250194316573	40.93937275393	80.3964	49.7264
82.9713872670193	41.2009137579457	80.7698	50.729
83.323149353154	41.4551160239362	82.0477	53.0979
83.6912281173764	41.6612075158011	83.5076	51.7826
84.0619647258718	41.8616759464514	84.6532	51.7406
84.4338987885522	42.0574948720721	85.9154	51.5363
84.8056732417724	42.2495847852103	87.5129	47.9594
85.1774040416535	42.4407710758279	87.8413	47.1867
85.5493880940455	42.631360761299	89.352	47.1855
85.9206103512403	42.821360356395	89.3464	46.1786
86.2916956084928	43.0110854579615	89.5287	45.4109
86.6629400261887	43.2007366047267	90.4865	46.0315
87.0338348583864	43.3901985165206	91.9732	45.8332
87.4033084067897	43.5795115910679	91.1842	48.1207
87.7722057797135	43.7681850187309	93.3823	48.5086
88.1381325937779	43.9560087079502	94.3452	48.7818
88.5000733194653	44.142869874316	94.5726	47.3613

Solution x	Solution y	Original x	Original y
88.8591523796372	44.3292890998823	95.0864	47.4256
89.2152512154999	44.515278250525	95.1396	47.3596
89.5689364619949	44.7009069318508	95.7654	46.8722
89.9200386781569	44.886305985238	96.2485	47.1277
90.2684277207834	45.0714384814004	97.5519	44.8528
90.6130024836852	45.2568276045837	98.0879	44.5657
90.9535473344119	45.4425775007676	98.0763	43.3554
91.2905888598166	45.6290043706148	98.3613	42.0392
91.6238200759145	45.8165307010071	99.6903	41.4772
91.9504516431667	46.0057043675678	102.0152	42.2262
92.258380512382	46.1977162294441	103.0838	43.6629
92.5410495180621	46.3924951581763	103.3956	43.6231
92.8003614681364	46.5906633356404	104.1102	44.8822
93.0309364614679	46.7919733309379	103.8959	45.4099
93.2494078521685	46.9948449114517	102.543	45.6081
93.4642051496779	47.1985277433009	101.161	45.7653
93.677333236997	47.4028725839342	100.0845	45.3198
93.8895801360787	47.6080129598155	99.7789	45.6905
94.1012191205735	47.8139006988764	100.6036	46.802
94.3120072146794	48.0203364734633	100.8862	48.4618
94.5218786667964	48.2269371868623	101.7941	49.0832
94.7303804510007	48.4335702478734	103.8062	50.1176
94.9356447687506	48.6398097325992	106.6231	51.946
94.8661130210477	48.6398097380361	106.4442	49.0895
94.7933432054162	48.6398097438231	105.6501	47.8555
94.720032119527	48.6398097493883	102.9297	48.0592
94.6465306360562	48.6398097547491	101.377	48.1816
94.5729468782464	48.6398097601867	98.9198	48.0008
94.4994159098189	48.6398097654856	98.2004	50.3921
94.4259614161486	48.6398097711272	98.1036	50.8139
94.352572421448	48.6398097765567	97.7133	51.9341
94.2792534252954	48.6398097820938	97.7455	51.8526
94.2059983301239	48.639809787887	99.0651	51.1078
94.1327413720548	48.6398097934276	99.5987	51.3246
94.0594528809328	48.6398097989528	99.5817	52.1789
93.9861323010856	48.6398098045386	100.3439	52.2486
93.9127344586385	48.6398098101912	100.5945	52.9653
93.83923450214	48.6398098157155	100.6388	53.8259
93.7656083217498	48.6398098209773	102.1595	55.9791
93.6909866663395	48.6398098268056	102.8738	56.4102
93.5424099389352	48.6398098321703	99.7259	57.0659
93.3919905084227	48.6398098376106	99.9754	58.6633
93.1246040642253	48.6398098429239	98.8606	57.9963
92.8457172128045	48.6398098485528	98.9521	56.5952
92.5611008583714	48.6398098538444	98.7715	55.3698
92.2727507231575	48.6398098593493	98.2152	53.7701
91.9821873934509	48.6398098644798	97.9579	54.2407
91.6890551011977	48.6398098697001	96.8097	54.0588
91.3943509934235	48.6398098753155	96.0562	52.3857
91.0987940830251	48.6398098802492	95.0304	53.2116
90.8027545089567	48.6398098851294	94.6877	57.1733
90.5044079995441	48.639809890154	93.2379	56.4517
90.2056277834263	48.6398098956701	92.9131	56.6287
89.906351004595	48.6398099011195	92.1982	53.9806
89.6074548523225	48.639809906446	93.3932	53.1876
89.3081198870852	48.6398099122274	93.0102	50.1223
89.0086155064374	48.6398099174587	92.412	50.9961
88.7092115961919	48.6398099224718	90.3356	51.1932
88.4107709880246	48.6398099276858	89.6611	52.1615
88.1135278894787	48.6398099325549	89.2688	56.3248
87.8181730267534	48.6398099376705	87.1149	58.1702
87.5265990234961	48.6398099429207	88.0225	60.7529
85.8477106372081	48.6398099473945	85.8477	60.7859
83.868328222825	48.5248330821902	81.1686	57.7423
81.9934620414202	48.4268086442424	77.9705	58.8491
81.0821646378269	47.832356423726	77.8264	55.5164
80.1902550595688	47.2181067900135	78.0993	54.3894
79.3176810038298	46.5866425671878	76.5498	52.218
78.4672622292906	45.9436253842649	76.2244	51.9684
77.6362226097104	45.2872436422139	76.0043	50.5809
76.8208160210362	44.6201862136216	75.2757	50.6388
76.0206683909089	43.9390400172395	74.4488	50.3129
75.2357643274535	43.2412927463314	73.911	51.0144
74.4657986273457	42.5159553241544	73.6611	50.4924
73.7081595400209	41.7589689922562	73.5268	49.2611
72.9597862424666	40.9728643482264	73.2401	49.0047
72.2187207436455	40.1489286323528	73.2561	47.9132
71.4818409777745	39.2865463407317	73.6395	46.5004
70.7449105777349	38.3875677226344	73.6428	45.1426
70.005389606533	37.452759533262	75.73	42.7229

Solution x	Solution y	Original x	Original y
69.2500599974188	36.48654245335	75.9853	41.4015
68.470251122702	35.4851783097361	75.9022	40.5634
67.6536080289192	34.4365369764425	77.5882	39.4219
66.6388059067666	33.2342504586016	74.5598	39.2546
65.5190284368597	31.9090421189675	75.4748	37.8532
63.2477492234367	29.819961113767	72.2401	34.2889
60.2062417358147	27.4375836902321	66.5887	34.1226
56.5956423002817	24.6124774689126	61.1622	34.1592
51.4883653130316	19.252570286389	50.1386	26.6573
Route: 8 Length: 110.703668865063 Demand Met: 9991			
48.9979773029562	12.1959936410717	55.3647	9.0137
50.6348736462918	12.4261127685917	59.4358	8.0877
52.0935277131995	12.6594329907217	60.5785	6.8128
53.3597910956997	12.8980431689794	60.2628	6.0605
54.5323023224166	13.1419260429216	61.565	4.5717
55.5403560701343	13.3979681007626	63.4243	4.3429
55.8069457388281	14.5894796317983	64.6914	7.7788
56.0618265518295	16.0273723356336	63.3795	20.1125
56.3142357050764	17.405363483332	62.5649	23.4331
56.564459721467	18.6911036730679	61.643	23.6955
56.8138825670505	19.9270221786798	63.8119	26.0212
57.0597625437112	21.074682946238	63.132	27.7543
57.3030479066738	22.1436877845724	62.9268	27.0211
57.5448928307703	23.1776157711537	59.5552	26.5288
57.7875318611709	24.1982104889757	58.9981	26.6128
58.0312550260174	25.2120961077271	58.5931	27.1316
58.2762852307806	26.222414157641	57.9508	29.6187
58.5229440305145	27.2203778859802	60.463	30.4795
58.7701727483589	28.206684635441	60.1802	30.671
59.0181959834884	29.186581747836	58.6228	31.6703
59.2677280635391	30.1603434619958	58.4334	33.3219
59.5189110567264	31.1241422232801	58.126	35.24
59.77202967611	32.0721433863117	60.137	35.2014
60.0263687266379	33.011030950341	61.1452	36.2851
60.2816894752178	33.9401788732236	62.0243	36.102
60.5379139860755	34.8657555794974	64.9829	35.6055
60.7938745697349	35.7945756866896	66.9624	36.7077
61.0486129712964	36.725384011209	66.7168	38.698
61.3026835783412	37.6522466050758	68.0366	38.8903
61.5555125107248	38.5794353066723	72.4926	42.7909
61.77458326505	39.3226758762294	72.7013	43.6681
61.96641594114	39.9316571536939	72.9378	43.4347
62.1444887354988	40.4905400948889	73.2283	44.0709
62.3081944404581	40.9961856330536	72.9198	44.5581
62.4654666247379	41.4781293942376	72.4429	44.8985
62.6194333927828	41.9479784868748	70.5497	45.0925
62.7724776975087	42.4135556015099	70.4096	46.4113
62.9246446539339	42.8730519959414	70.6191	48.182
63.0756125902684	43.3217638611539	70.7664	48.6137
63.2254080703944	43.7603215143506	71.8327	48.0379
63.3736573934785	44.1908247223466	72.0385	47.603
63.5205498469934	44.6164010986519	72.0723	49.2863
63.6658394897668	45.0330151645009	71.8965	50.0142
63.8097135540479	45.4407918277287	70.6462	49.6735
63.9530672522999	45.8445926755199	70.0624	50.1219
64.0961424654051	46.2450332103172	71.0505	50.768
64.2386557979881	46.641079053862	70.8564	51.5507
64.38069454417	47.0323323361417	72.1444	51.2772
64.5218685938329	47.4191379920631	72.0304	52.5053
64.66215743088	47.7997411213442	72.0955	52.6394
64.801651832038	48.1751080071224	73.3859	52.8201
64.9396494534635	48.5434091358419	74.3979	53.0985
65.0750786797451	48.9005945882629	73.8072	55.2741
65.2077178245198	49.2387166080117	73.7963	57.8273
65.0675318499994	49.1105561099528	73.2116	57.797
64.9012139603321	48.9565493000624	72.7757	56.7077
64.7294637098958	48.7975356546311	70.5527	57.3223
64.5558191285876	48.635129037725	69.9782	57.1009
64.3808142703768	48.4696663567539	70.1344	58.5671
64.1962642894138	48.2873041118682	67.4683	58.2291
64.010982566326	48.0993567471793	68.5789	56.8701
63.8246965027939	47.9075052709424	69.2681	55.3133
63.6374187973292	47.7131998785494	69.8977	54.8286
63.448571055974	47.5162294094231	70.694	53.8562
63.2574988416405	47.3167641771061	71.2619	53.5794
63.0629088247005	47.1139848384007	70.916	53.3608
62.8650090180011	46.9080640822341	70.2011	52.705
62.6648978633347	46.7000841839532	70.1179	52.2878
62.4624959153316	46.490180201566	69.4154	51.8752
62.2584281380348	46.2787949156347	69.1689	51.2673

Solution x	Solution y	Original x	Original y
62.0528321909733	46.0662241545198	69.1565	53.343
61.8438059360114	45.8492175659616	67.8488	53.6384
61.6325710601305	45.6278939875452	68.022	53.7678
61.4178893757568	45.4003742251822	68.2826	55.0673
61.1616481899862	45.0929130798771	66.0257	55.1875
60.8972734041314	44.7526778440513	61.2083	54.3519
60.6349755323776	44.399322071063	66.2863	51.2705
60.37072172389	44.0389251514746	66.949	50.6855
60.1032560151685	43.6702558767187	67.7991	50.1342
59.8298050218137	43.2901262909013	67.5609	49.631
59.5501943171463	42.8982434247537	67.6648	48.1141
59.2647270388868	42.497982314231	68.7356	47.889
58.9627479884186	42.0774059570976	67.4955	46.0347
58.6538779503928	41.6505649806883	65.7303	47.3671
58.3401861157769	41.213912987886	65.3289	43.5846
58.0235380822408	40.7757749654277	64.4232	44.0581
57.7044429786024	40.3345408673894	64.8516	39.5774
57.3820559497848	39.8965680958778	65.211	38.9167
57.0547893239311	39.4621128765864	64.2784	38.8059
56.7235445604412	39.0302062465897	62.6603	37.129
56.3898690985841	38.6022521070038	60.9493	37.7343
56.0551700391589	38.1764452350156	58.8785	37.4935
55.7207766261616	37.7523436679242	56.2795	36.0371
55.388214178621	37.330968164272	55.9275	34.3566
55.0571976636132	36.9136652824345	54.3132	33.4794
54.7285106117413	36.5009528626993	53.8796	31.7093
54.4020667263459	36.0946010423322	52.5136	31.162
54.0785719239785	35.6948530306901	51.0819	30.8837
53.7587992149775	35.3016617129248	50.5738	30.8854
53.4427332601644	34.9144386994288	50.8592	31.2824
53.1297663338469	34.5320711353004	50.3723	32.2399
52.8198943277122	34.1531101242475	50.1654	34.298
52.5129548389614	33.7752204774187	51.473	33.7115
52.2080299930464	33.3985233956989	51.7623	34.8081
51.9048649755478	33.0215879524601	51.6292	37.4529
51.6034069062504	32.6410924641894	53.589	37.6567
51.3026203199305	32.2557338671537	50.3352	41.2014
51.0040792823092	31.855210545036	48.325	36.101
50.7081502337267	31.4510394295557	46.003	37.4534
50.4163556839199	31.0393033918374	45.4903	38.3462
50.1293131553584	30.6150684110952	44.3651	39.5082
49.8518143212703	30.1566974666874	40.9959	37.9409
49.6268714082615	29.4725550741331	42.8212	36.4305
49.4067116482751	28.7461028454468	43.7884	36.8808
49.190660086915	27.959576569453	44.7872	36.1398
48.9774573776244	27.1175471651671	45.4526	36.121
48.7670407531306	26.1945741124867	45.6407	35.658
48.5595950729439	25.1542184994638	45.9581	33.5048
48.3544343555946	24.0306774266284	47.4903	33.2139
48.1508740572471	22.7822398005381	46.9054	30.8841
47.9482321903197	21.4320055638989	47.9603	31.0225
47.7451927882396	19.8611664373835	47.9812	30.2306
47.5416938793614	17.7865474570553	47.5893	27.8934
47.3399042616856	14.9392377995151	47.2412	18.0641

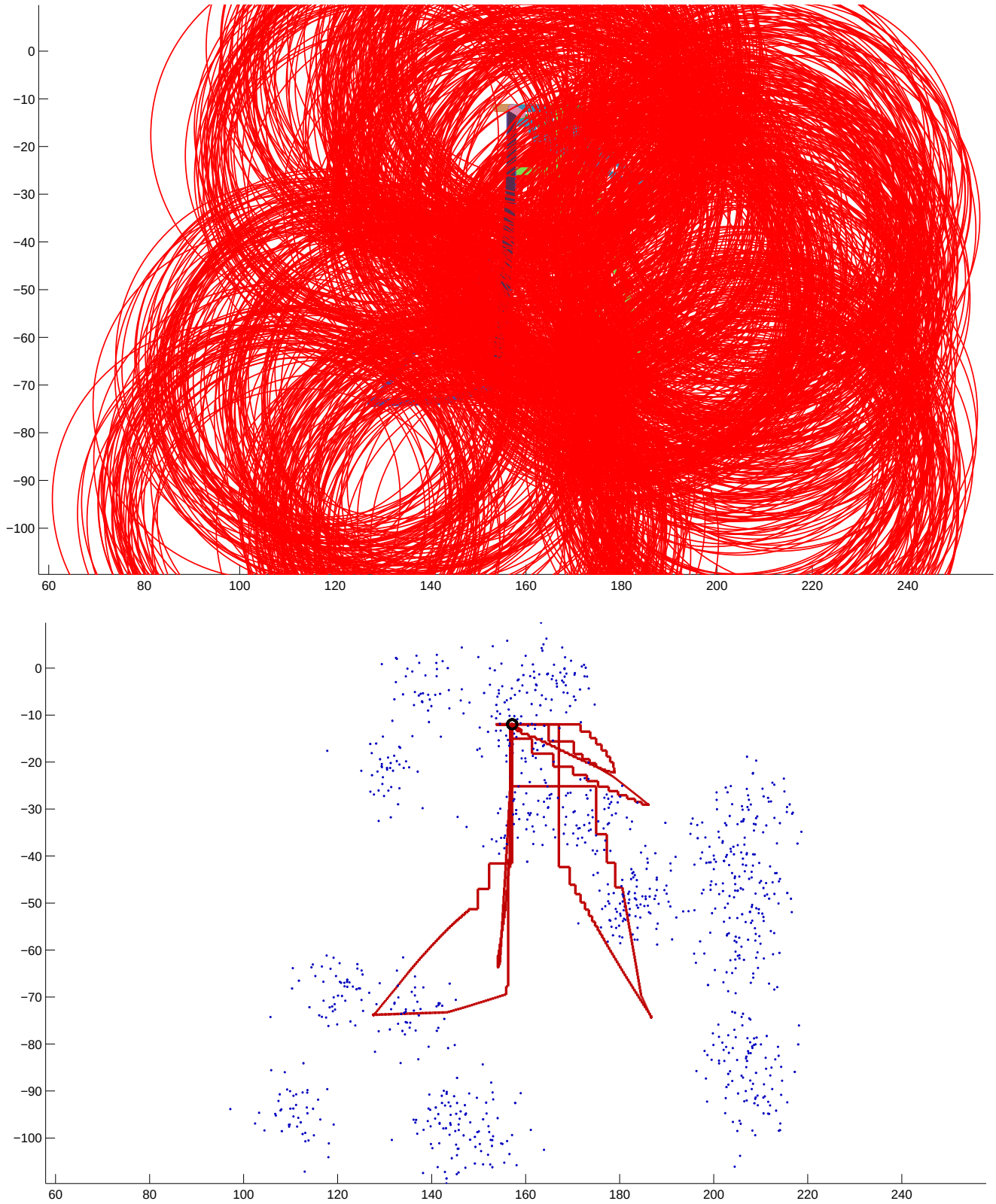


Figure O.132: $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Manhattan, Length = 644.7273071

Table O-135: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 2D, Manhattan

Total distance: 644.727307052363			
Total demand met: 76422			
Depot: x 47.1287 y 11.9659			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 63.8191831544292 Demand Met: 10000			
61.6852150959178	13.5101564628528	97.1071	18.8552
63.7425095409544	14.9152607630559	99.0428	19.6959
65.003550091179	16.243262094332	98.3827	22.3334
66.1371156757733	17.5412786912588	98.3241	22.4412
67.2053364996393	18.8255184032574	102.4997	24.4075
67.9822400039479	20.0282673907231	102.9016	24.8202
68.652354020393	21.1943880315692	104.9423	23.521
68.8528134916529	22.1513494956996	105.0575	26.2706
68.8528122949618	22.151349810122	102.211	28.3893
68.8528110980398	22.1513501326026	101.7295	28.4449
68.8528099009495	22.1513504579	101.5683	27.6266
68.8528087037279	22.1513507858794	100.384	25.6874
68.8528075064328	22.1513511060555	97.0499	25.7334
68.8528063091051	22.1513514249212	97.3283	27.0933
68.8528051117455	22.151351745018	97.5011	28.0267
68.8528039143481	22.1513520650935	97.9141	29.0493
68.852802716907	22.1513523857728	97.1838	29.5842
68.8528015194252	22.1513527081392	96.0238	29.4057
68.852800321908	22.151353028932	96.156	30.1327
68.8527991243513	22.151353352458	97.4429	30.1528
68.8527979267437	22.1513536726015	99.272	31.5703
68.8527967290435	22.1513539940798	99.0228	31.9463
68.8527955312529	22.1513543143165	96.3928	32.1668
68.8527943334123	22.1513546358372	96.2582	32.5713
68.8527931355249	22.1513549579613	95.8908	32.6754
68.8527919375939	22.1513552786916	95.0864	33.2234
68.8527907396279	22.1513555992306	92.7124	33.4453
68.8527895416332	22.1513559228849	92.4351	33.0022
68.8527883436176	22.1513562502212	93.4265	31.4744
68.8527871455785	22.151356580112	93.9312	28.9768
68.852785947523	22.1513569139673	93.6487	25.1273
68.8527847494502	22.15135723478	92.5592	25.4331
68.8527835513666	22.1513575543548	92.942	26.4511
68.8527823532721	22.1513578748688	90.6179	26.4649
68.8527811551684	22.151358192412	90.6435	28.0536
68.852779957059	22.1513585090172	90.72	30.049
68.8527787589473	22.151358821722	87.5726	32.8781
68.8527775608317	22.1513591418303	86.512	33.4131
68.8527763627148	22.1513594667196	85.525	32.0217
68.8527751645951	22.1513597859313	85.1876	33.113
68.8527739664729	22.1513601028165	85.065	35.2948
68.8527727683435	22.1513604238188	86.5983	36.2039
68.8527715702058	22.1513607473262	88.2545	36.066
68.8527703720569	22.1513610741701	91.0332	34.8187
68.8527691738918	22.1513613936109	91.1655	36.0648
68.8527679757041	22.1513617146353	91.9372	36.8319
68.8527667774858	22.1513620361376	91.8795	37.1845
68.8527655792347	22.1513623549657	89.1249	38.0318
68.8527643809567	22.151362674012	90.014	39.915
68.8527631826456	22.1513629976333	87.5583	39.2312
68.8527619843121	22.1513633174215	87.2346	40.5435
68.8527607859547	22.151363639095	88.4465	41.4478
68.8527595875704	22.1513639608708	85.9182	41.843
68.8527583891694	22.1513642859574	81.9079	40.1742
68.8527571907586	22.1513646067175	80.8076	41.6004
68.8527559923444	22.1513649270086	80.8872	43.1227
68.8527547939244	22.1513652459728	77.9223	44.6051
68.8527535955014	22.1513655684795	77.8794	45.0468
68.8527523970723	22.1513658918939	79.9479	46.2913
68.8527511986387	22.1513662146698	79.533	47.2684
68.8527500001968	22.1513665386805	77.9078	47.2474
68.8527488017521	22.1513668632989	76.4125	46.981
68.8527476033017	22.1513671856918	76.379	48.6237
68.8527464048493	22.151367510196	74.8417	48.5823
68.8527452063897	22.1513678358149	75.5201	48.6107
68.8527440079266	22.1513681604703	75.5587	49.1352
68.8527428094572	22.1513684869531	77.4079	49.147
68.8527416109797	22.1513688138915	77.6289	48.4559
68.8527404124951	22.151369137396	78.2967	50.1808
68.8527392139937	22.1513694537592	76.2244	51.9684
68.8527380154733	22.1513697752616	75.2757	50.6388
68.852736816942	22.1513701018552	74.4488	50.3129
68.8527356184052	22.1513704205184	73.911	51.0144
68.8527344198605	22.1513707411232	73.6611	50.4924
68.8527332213136	22.1513710628449	73.5268	49.2611
68.852732022765	22.1513713902592	73.2401	49.0047
68.8527308242183	22.1513717165332	72.0723	49.2863
68.8527296256721	22.1513720352414	71.8965	50.0142
68.8527284271276	22.1513723533704	72.1444	51.2772
68.852727228584	22.1513726734646	71.0505	50.768
68.8527260300421	22.151372992082	70.8564	51.5507
68.8527248315015	22.1513733105224	70.1179	52.2878
68.8527236329588	22.1513736297931	70.2011	52.705
68.8527224344178	22.1513739482155	70.694	53.8562
68.8527212358696	22.151374268767	70.916	53.3608
68.8527200373153	22.1513745883723	71.2619	53.5794
68.852718838753	22.1513749099477	72.0304	52.5053
68.8527176401848	22.1513752294936	72.0955	52.6394
68.8527164416073	22.151375549522	73.3859	52.8201
68.8527152430173	22.1513758692645	74.3979	53.0985
68.8527140444097	22.1513761856421	73.8072	55.2741
68.8527128457478	22.1513765019081	73.7963	57.8273
68.852711639507	22.1513768192365	73.2116	57.797
68.8527104320449	22.1513771376269	72.7757	56.7077
68.8527092244303	22.1513774530325	70.5527	57.3223
68.8527080166906	22.1513777702122	69.9782	57.1009
68.8527068088655	22.1513780855617	70.1344	58.5671
67.9472547951423	21.9362732648265	67.4683	58.2291
67.0585501483555	21.6098691327314	68.5789	56.8701
66.1682496806101	21.2563256525709	69.2681	55.3133
65.276001667005	20.887424766204	69.8977	54.8286
64.3765577163651	20.501349835149	61.2083	54.3519
63.4940596454977	20.0988060549845	65.7303	47.3671
62.617789560789	19.69257941788	67.4955	46.0347
61.7456800296813	19.2829711016661	67.6648	48.1141
60.8758087125523	18.8679926059233	71.8327	48.0379
59.9993568193233	18.4455011689633	72.0385	47.603
59.1140217431945	18.0145982739365	73.2561	47.9132
58.2077824794848	17.5704694663909	73.6395	46.5004
57.2795821011343	17.1138947489297	73.6428	45.1426
56.3294319845888	16.6457242310924	72.4429	44.8985
55.35693822924	16.1650443598775	73.2283	44.0709
54.350537862696	15.6688916426373	75.9853	41.4015
53.2866063519913	15.1550384983421	75.9022	40.5634
52.1414336550656	14.6192836363715	77.5882	39.4219
50.6056860102087	14.0151060328447	72.6191	32.6684
49.0252568942541	13.4042146693737	18.7531	32.536
48.0405311574763	12.6960922803546	16.9754	26.2994
Route: 2 Length: 183.842912770229 Demand Met: 10000			
57.0563304205717	42.3449476150193	86.2321	62.729
59.3728367300125	46.1127363807485	90.2672	64.2791
60.5818244893225	48.1075105245361	88.7937	67.447
61.6716036476388	49.8652007598362	92.0851	66.8651
62.6188499726555	51.4089356545552	93.0933	68.7697
63.4409545624646	52.7596994205571	94.6798	69.1984
64.1485194282509	53.9444365826021	93.9524	73.145
64.7614066258162	54.9584537249611	94.549	73.3405
65.3231926605173	55.8847996166972	96.2521	73.5638
65.8091688413597	56.692105834281	95.9481	74.251
66.2643387659948	57.4489809818067	97.5653	74.5618
66.6642705745883	58.1214862766318	97.816	74.8015
67.033257617904	58.746830551627	96.1169	76.0362
67.3916667968205	59.3537125438244	94.4072	76.9857
67.7445970267463	59.9495690248265	94.6945	78.572
68.0912957063354	60.5324044558853	93.1133	78.1389
68.4348629136331	61.1080301294675	91.1291	78.4897
68.7767973241907	61.6786444777793	91.0116	75.887
69.1177355017362	62.2466316259823	89.835	77.746
69.4580019506831	62.8117367661224	89.95	80.2132
69.7973907908829	63.372875888511	91.86	79.7087
70.1354415290804	63.9301551153137	92.1151	81.2598
70.4720243488875	64.4829219904626	92.6699	80.64
70.8072570307399	65.0319313994863	94.0795	80.8773
71.1407315694917	65.5769355351369	93.2494	81.8793
71.4728658776999	66.1181578412104	94.9909	83.4209
71.802780940844	66.6541539484029	92.288	83.6157
72.1317283533532	67.1865803826697	91.1677	84.1211
72.4600434133519	67.7158638828537	91.14	83.5499
72.7878431493957	68.2425896446249	89.5631	83.3752
73.1155159686912	68.7673637021808	88.6759	82.3658
73.4432800922602	69.2908501916259	88.0687	81.4777
73.7712543087267	69.8135491273507	86.3374	85.7586

Solution x	Solution y	Original x	Original y
74.0995545815459	70.3345977721438	88.3633	87.3681
74.4278388007199	70.8534835486845	88.6062	92.2681
74.7558215689089	71.368242730819	92.5654	91.5305
75.0828739739709	71.8788139505452	92.4623	94.734
75.408768852591	72.3834408611992	94.0924	96.5838
75.732749817087	72.8799126094588	95.504	96.351
76.0546671251622	73.3687034761123	95.7576	96.9635
76.374584283631	73.8500136972097	95.0373	98.5247
76.6926288079478	74.3234275059722	94.4828	106.1237
76.6926288175295	74.3234275107322	95.6122	103.8055
76.6926288271111	74.3234275154827	98.8373	99.4165
76.6926288366938	74.3234275200589	98.2349	98.4363
76.6926288462727	74.3234275246845	103.8628	98.4843
76.6926288558669	74.3234275292476	104.1034	98.3317
76.6590943915892	74.250941192967	104.1728	96.9352
76.6253258526008	74.1774968987959	103.2876	94.1817
76.5915076030724	74.1038589625923	101.8123	94.891
76.5576548971149	74.0300450346004	101.583	94.8217
76.5237640323792	73.9560481601939	100.6204	94.7646
76.4898426926338	73.8818858461181	99.3782	93.0601
76.4559091670423	73.8076042605416	98.656	92.6213
76.4219682128576	73.733212368444	98.853	91.6792
76.3880199145241	73.6587160314569	98.9319	91.3958
76.3540651972026	73.5841168540091	99.3434	90.9979
76.3201042339501	73.5094157863168	100.5649	91.4192
76.2861285270681	73.4345940163613	100.8882	91.1406
76.2521400022073	73.3596520600027	101.602	92.3175
76.2181294349854	73.2845513425537	102.0076	93.075
76.1840923799938	73.2092518621063	105.6506	92.4297
76.149914236805	73.1333492899692	104.3693	90.8389
76.1156983473799	73.0572170467693	102.4507	89.6037
76.0814755028798	72.9809604532601	100.7126	88.5952
76.047254705069	72.9046221559729	98.3726	88.4744
76.0130402068869	72.8282247198404	98.1138	89.594
75.9788230974467	72.7517567048277	96.8345	90.0197
75.9446017442241	72.6752220003244	97.0347	92.0258
75.9103640930376	72.5985876557376	96.5235	92.1962
75.8761065045424	72.5218517778234	95.2026	90.5293
75.8418351922403	72.4450461570563	92.7178	89.1801
75.8075623227672	72.3681977546506	93.1284	88.6615
75.7732861825534	72.2913079513671	93.9684	87.8762
75.7390053120217	72.2143794798501	93.4941	85.8189
75.7047268187411	72.1374342416721	93.0994	86.3608
75.670454724285	72.0604677552434	95.9325	86.7596
75.6361779604551	71.9834614811955	96.2545	87.1498
75.601898096503	71.9064078278288	97.7943	87.7833
75.567607757729	71.829284535113	99.0152	86.155
75.5333031142027	71.7521013011389	96.9343	84.943
75.4990000031536	71.6748853860215	97.0865	83.6094
75.4646988566227	71.5976483353814	96.8706	83.0827
75.4304013253654	71.5203940678116	96.9541	82.6989
75.396106933101	71.4431232435902	97.3132	81.5365
75.3618144827018	71.3658450675663	97.4314	81.946
75.3275223143096	71.2885504092454	97.8831	81.9659
75.2932272049592	71.2112328068376	98.2345	80.86
75.2589282433474	71.1339019861548	98.2007	80.5294
75.2246260921774	71.0565596457326	98.567	80.2017
75.1903190765648	70.9792059776357	100.0565	80.1054
75.1559957936093	70.9018309656354	98.9119	80.0767
75.1216654311937	70.8244411872126	97.7624	79.6432
75.0873375658034	70.747049214308	97.1852	78.7831
75.0530187107672	70.6696709356349	98.5933	78.8152
75.0187020537484	70.5923009774232	99.1261	78.6323
74.9843874469157	70.5149405904216	101.2985	78.2917
74.9500629754	70.4375843657601	103.6911	80.62
74.915705165076	70.3601685712456	103.8313	82.5056
74.8813101725903	70.2826506191244	103.1106	83.2736
74.8468879983681	70.2050303874823	101.0606	82.9382
74.8124624262622	70.1273459162623	101.1477	85.2681
74.7780301306352	70.0495583541911	102.2936	85.0217
74.7435827803216	69.9716671907643	102.0461	86.7072
74.7091234669177	69.89368942612	104.5599	87.8351
74.6746709696543	69.8158593278475	104.3617	84.8664
74.6402169225291	69.7382527189771	107.2392	85.9448
74.521913995341	69.0625546843212	107.981	80.0957
74.4009350718976	68.3528205620828	108.1531	76.0691
74.2781303960109	67.6271986481039	103.5291	67.906
74.1550390681705	66.9036980891106	102.9023	68.4164
74.0316639521242	66.1812777507082	101.778	67.1686
73.9080424312482	65.460203658481	97.9014	66.9835

Solution x	Solution y	Original x	Original y
73.7843269186354	64.7403571989363	98.4258	65.8894
73.6604697820043	64.0217567346799	98.4228	65.0226
73.5364523321585	63.3044012787074	99.4285	63.8276
73.4121977540003	62.5884031935904	94.6788	63.8911
73.2878855493925	61.8736617495898	93.9444	64.9
73.1635196443501	61.159444010864	92.749	64.7326
73.0391358123974	60.4456113403945	93.5538	62.1822
72.9147185760454	59.7329016055271	94.5987	62.0376
72.7902373105209	59.0210212571935	96.4356	62.0951
72.6656109009298	58.3094598879628	95.4724	61.7777
72.5408862849987	57.5981773061677	95.1558	61.2395
72.4160810174462	56.8871723693969	95.479	61.1306
72.2911854842779	56.1761701958644	95.9041	59.3009
72.1661994989963	55.4657299857077	97.3108	57.82
72.0410668232102	54.7561484883093	98.8606	57.9963
71.9156945230418	54.0467854757505	98.9521	56.5952
71.7900953612423	53.3380863931094	99.7259	57.0659
71.6642083875447	52.629234970806	99.9754	58.6633
71.5379842022124	51.9185762740708	99.3413	60.508
71.4114226029052	51.2043783364576	99.0429	61.6589
71.2844776291937	50.4850511950293	100.6854	61.817
71.156831361373	49.757274716588	102.6402	60.9181
71.0278326509064	49.0151988925793	103.9916	60.6173
70.8958810889474	48.2386968467947	102.8738	56.4102
70.7624785598317	47.4530584619765	102.1595	55.9791
70.6275332818918	46.6591555728706	106.6231	51.946
69.0388881198474	41.4163736313893	100.3439	52.2486
67.2617714139946	35.3401646952812	98.1036	50.8139
64.9969833511324	25.1464286353315	100.6297	27.3107
Route: 3 Length: 182.683416749717 Demand Met: 10000			
46.7102876432286	42.4655757204472	76.0043	50.5809
46.2880423840255	67.7189756905128	53.9006	102.5381
45.8438268985501	69.4977885965849	48.0764	105.8084
45.3277325702019	69.6693176000301	45.465	105.2608
44.8146568255702	69.8320654048531	46.5537	103.4177
44.3034655434315	69.992212846912	46.0729	100.678
43.7945743850061	70.1512150609055	45.0704	101.2748
43.2879016651207	70.3090458585143	44.7902	101.1589
42.7831857791287	70.4658047791529	44.0393	95.7757
42.2807921163756	70.6222162232596	42.0978	97.503
41.7810318706739	70.7781571494312	42.2565	98.7398
41.2836557952711	70.9335179189206	43.0828	99.6317
40.7882066759464	71.0882150746402	42.9226	100.4615
40.2945323221589	71.242176199573	42.5793	100.4271
39.8025908944774	71.3954460786706	42.8352	101.6931
39.3119320374471	71.5478514170117	40.2693	101.3043
38.823387862245	71.6995376457804	39.3246	101.8921
38.3370916225817	71.8504574448566	40.5226	102.8002
37.8523210340482	72.0004583403378	42.0156	103.5929
37.3680245469619	72.1493347450004	42.9285	106.2179
36.8806638408097	72.2952308920604	42.4716	105.6496
36.3915152461408	72.4390866407811	40.9527	105.6227
35.9017027223347	72.5811988791049	39.1965	105.4524
35.4123560194123	72.7218690031898	37.1983	106.347
34.9242147846977	72.8607337311254	35.7224	107.36
34.43785837395	72.9969652698203	35.3466	107.7036
33.9530752113962	73.1303194774246	33.1686	108.6172
33.4723348002265	73.2587356856573	33.1638	109.6815
33.0780677821407	73.2718743825177	32.8361	107.2479
32.6855032383569	73.2849122728731	28.1717	107.4546
32.2974570035545	73.297840375691	31.3011	106.2109
31.9112744678645	73.3107216046507	34.3074	104.3145
31.5258770361646	73.3235771693628	35.4006	103.6799
31.1409431585501	73.336410879098	35.5571	102.295
30.7565072057517	73.3492284786572	35.7306	102.2767
30.3724401607253	73.3620301335001	35.2228	101.4244
29.9888718148451	73.3748185970557	38.189	100.3805
29.6051505071346	73.3875942917024	36.8108	99.4487
29.2216169240887	73.4003598260771	35.0473	98.5367
28.8386107975359	73.4131173270889	35.7859	98.3251
28.4559218349589	73.4258664999365	35.7481	97.1257
28.0735650645561	73.438608644767	34.0464	97.1856
27.6917529265098	73.4513441887263	33.9629	96.8355
27.3104328455709	73.4640733009999	34.0458	95.0903
26.9296054533064	73.4767974235355	31.4281	94.9219
26.549591310746	73.4895174068655	30.8807	93.5109
26.1704403892122	73.5022344718906	29.5221	90.7635
25.7923332137404	73.5149508692824	29.3468	93.7461
25.4151753521467	73.5276645732815	29.7064	94.0211
25.0388875177557	73.5403752819912	30.7482	95.8761

Solution x	Solution y	Original x	Original y
24.6632406475621	73.5530812116815	31.6916	96.8159
24.2880272713671	73.5657814152501	31.7064	96.988
23.9132206557811	73.5784761795882	32.4952	97.9758
23.5385962109113	73.591164596099	33.0573	97.9271
23.1640576548756	73.6038469187726	33.8351	99.3235
22.7892572547279	73.6165214757336	31.6341	101.1443
22.4143480312151	73.629187177148	30.1816	102.1772
22.03944011071	73.6418433849902	29.8552	101.3038
21.6647309243346	73.6544918845316	29.7849	97.5299
21.2906424050219	73.6671367442702	29.1897	96.4145
20.9173211889068	73.6797789430021	26.6904	96.1713
20.5450178392611	73.6924191566686	26.1674	96.1159
20.1737918510074	73.7050575492263	26.55	96.735
19.8036188815989	73.7176936941224	28.2891	98.27
19.4343694192363	73.7303261183613	26.9511	99.1097
19.0660808196414	73.7429543951039	21.5395	100.4343
18.699003271917	73.7555783863787	9.17	97.1621
18.3343413859518	73.7682010092221	8.1477	101.1634
17.9725889454345	73.780818323984	8.0611	104.093
17.614517436415	73.7934254084205	3.0162	107.1796
17.6145174072871	73.79342541063	3.1448	100.72
17.6145173781642	73.7934254123606	3.81100000000001	100.5395
17.6145173490404	73.7934254142087	4.95789999999999	99.4405
17.6145173199143	73.7934254159264	3.11839999999999	98.924
17.6145172907901	73.793425417627	2.55330000000001	99.1767
17.6145172616615	73.7934254195046	1.4019	97.5847
17.6145172325401	73.7934254212753	-0.171000000000006	97.1566
17.614517203419	73.7934254230594	-0.338999999999999	97.1979
17.6145171742966	73.7934254249599	-0.311599999999999	97.6012
17.6145171451761	73.7934254266569	-1.86190000000001	98.5581
17.6145171160563	73.7934254284431	-5.5457	98.4014
17.6145170869354	73.7934254304495	-7.5489	96.9207
17.6145170578149	73.7934254326733	-12.8049	93.8535
17.8397809175883	73.515657381219	-6.68600000000001	94.6391
18.0674493579498	73.2350078618476	-3.26390000000001	94.8889
18.2967328631542	72.9523419662194	-3.1358	95.2162
18.52783313804	72.6673294691786	-2.1508	94.1499
18.7605295656188	72.3804431676262	-1.9602	93.9224
18.9948927866383	72.0916253176834	-2.5612	92.1356
19.2309547605553	71.8011828958463	-2.30370000000001	90.7079
19.4686400749954	71.5094211725487	-0.735100000000003	89.6931
19.7077330373943	71.2166517045782	-0.100899999999996	90.0487
19.9482603293002	70.9227842407679	0.619299999999996	91.0377
20.1902874934828	70.6275896667035	1.20229999999999	90.7259
20.4338048325337	70.3311093770581	1.1743	92.9818
20.6791721201354	70.0325168134067	0.580200000000005	93.7511
20.926872734829	69.731000962817	-0.0468000000000046	93.7668
21.1774200833761	69.4258564937498	0.613799999999998	95.4238
21.4317657341106	69.1148771858682	1.64530000000001	95.7178
21.6899389981102	68.7976525042406	2.1469	96.6722
21.9533406206384	68.4707211361276	6.3198	96.0864
22.2193267283611	68.1389334397704	3.5924	94.7451
22.4888020060935	67.8013329091484	3.4538	93.5151
22.7616156412892	67.4586273422472	4.77370000000001	93.7785
23.0376500677655	67.1106242708869	5.8502	91.8647
23.316211613788	66.7590573507712	7.8142	89.6258
23.5967192503023	66.4052309601664	3.5998	89.8159
23.8803567382546	66.0474860837575	3.55029999999999	90.3653
24.1676796485566	65.6845503797404	2.57040000000001	90.3092
24.4598755974764	65.314390420471	2.7376	84.0979
24.7549104664063	64.9418826143088	-1.23350000000001	86.0108
25.0572532702719	64.561209030055	-4.1255	85.596
25.4201670087555	64.1142437468092	-4.2807	74.2616
25.7909852437222	63.6647805559578	0.309600000000003	68.1954
26.1659875815316	63.2156453771127	1.76609999999999	66.5446
26.5448397029571	62.7670671007252	0.483800000000002	63.8626
26.9282078305691	62.3194236621311	4.4426	63.6871
27.3150189465214	61.8726411979036	4.7342	63.0935
27.7053727908585	61.4267329999141	5.2812	65.5492
28.0993419660605	60.9812070344106	6.9842	66.7632
28.4967001121884	60.5358364964159	6.67010000000001	63.5082
28.8976521178901	60.0911103017335	8.4928	63.9998
29.3019382092129	59.6469185899052	9.6606	65.5604
29.7094992230637	59.2029592559068	10.0835	69.723
30.1205818356957	58.7584144144391	9.1707	70.0865
30.5357084670205	58.3130195625164	9.3844	71.5303
30.9552332016287	57.866281380239	9.45780000000001	72.6847
31.3796312453154	57.4176550972622	9.00020000000001	73.0359
31.8096159259642	56.9666556160122	8.8648	72.0358
32.2455370490902	56.5133534444122	8.3117	72.2049

Solution x	Solution y	Original x	Original y
32.6883793219804	56.0571590844648	7.0214	70.8048
33.1395400060394	55.5978657890545	4.0089	72.186
33.6104170395561	55.129116738106	6.09139999999999	73.9114
34.1004550720356	54.6497498483395	6.65640000000001	74.2265
34.6139825848873	54.1569718330053	7.5677	74.3816
35.1536297926204	53.6491764362841	8.0472	76.1743
35.7573588289516	53.0987615229177	9.9143	75.8382
36.4071835250431	52.5192151707441	12.73	75.2001
37.0861057131393	51.9225908516183	13.7649	76.0563
37.8039537041071	51.3006790922876	17.9606	81.6588
39.8337338704427	47.0101250781178	14.5018	68.1646
42.2197524324745	41.5923388601998	14.2076	63.0144
Route: 4 Length: 91.9283114884517 Demand Met: 10000			
54.8894833109988	15.594805748812	75.73	42.7229
60.2406719762715	18.2970318988051	80.0004	48.0282
62.0771704057815	19.3626274249366	80.3964	49.7264
63.5997685165831	20.246298455171	80.7698	50.729
64.952078886522	21.0225879607712	82.0477	53.0979
65.2885903032981	21.2117437323454	83.5076	51.7826
65.6074038795665	21.391593045401	84.6532	51.7406
65.9025737385206	21.5595781191078	85.9154	51.5363
66.1641622211811	21.7115173613856	87.5129	47.9594
66.4222643598999	21.8615650214892	87.8413	47.1867
66.6777970204108	22.0101652210413	89.352	47.1855
66.9296490261955	22.1571196094999	89.3464	46.1786
67.1791897705175	22.3029870543715	89.5287	45.4109
67.426976244681	22.448037748887	90.4865	46.0315
67.6723864795196	22.5921189380279	91.9732	45.8332
67.9145660364312	22.7350872620187	91.9756	47.4725
68.1519620453569	22.8762915695197	91.1842	48.1207
68.3858366485948	23.0160019561013	93.3823	48.5086
68.6053576530028	23.150542949206	94.3452	48.7818
68.7358278091402	23.2466276624518	94.5726	47.3613
68.8636936281824	23.3413950538393	95.0864	47.4256
68.9879760266097	23.4343614650327	95.1396	47.3596
69.109605036711	23.5259567063597	96.2485	47.1277
69.2245325411239	23.6142231448556	95.7654	46.8722
69.3376209880209	23.7015088390847	94.5838	45.9916
69.4501615917317	23.7884623905508	94.4684	44.7163
69.562353420919	23.8752059148785	94.5355	44.3621
69.6742346498795	23.961758509867	95.46	44.379
69.7857094098761	24.0480803869945	97.5519	44.8528
69.8961163898065	24.1338911092636	98.0879	44.5657
70.0053638702468	24.2191594085029	98.0763	43.3554
70.113934186039	24.3041120802202	98.3613	42.0392
70.2219900087544	24.3888345692743	99.6903	41.4772
70.3293315823056	24.473273712078	98.7317	39.6579
70.4363264942419	24.5575671640082	98.4033	39.6451
70.5430214261492	24.6417241920613	97.0063	39.6578
70.6495237173202	24.7257690574824	97.0806	39.3994
70.7558385850772	24.8097084896281	95.8598	39.2349
70.8620258323512	24.8935601537462	96.2133	40.5576
70.9680358307247	24.9773093885148	96.2085	41.8253
71.0738239915246	25.060945354551	96.8865	41.9997
71.1793236097992	25.1444671164525	96.6284	43.246
71.2845057629592	25.2278662560808	93.9129	43.6355
71.3895300275915	25.3111782921466	93.2846	41.9379
71.4944594267251	25.3944349449927	90.0385	42.8005
71.5993976350735	25.4776463984962	89.0134	41.3658
71.7043843052385	25.5608313379417	89.3668	41.343
71.809412847386	25.6439920319186	90.1236	40.724
71.9144613668439	25.7271330232604	90.4784	41.2284
72.019517067468	25.8102490585018	92.1801	41.0349
72.1245505400841	25.8933373524157	92.2396	41.0703
72.2295881195781	25.9763967639849	92.634	40.1716
72.3346539423673	26.0594338968817	92.8093	39.7693
72.4397732104007	26.1424503813219	94.3087	39.6383
72.5449380367271	26.2254412785471	93.6941	39.0671
72.6501788043537	26.3084105754767	93.6083	38.4774
72.7555076496569	26.3913608292289	94.1971	38.0204
72.8609202564176	26.4742917442247	95.1298	37.6897
72.9664009881572	26.5572008095817	96.5473	37.5774
73.071913591956	26.6400821492715	96.6051	36.0943
73.1774615331707	26.7229527647281	98.5859	34.5756
73.2829796143403	26.8058297201177	98.5493	33.1624
73.3884702246499	26.8887331110231	98.9301	33.2654
73.493920293877	26.9716633928073	100.5275	34.9543
73.599258298401	27.0545979466876	101.1976	33.4905
73.7044614059703	27.1375610174659	102.9211	31.879
73.8094386126885	27.2205784714195	104.0844	32.9988

Solution x	Solution y	Original x	Original y
73.9141152785815	27.3036352516147	105.5782	30.6326
74.0183864085477	27.3867708383616	105.6149	29.5786
74.122278593776	27.4700092702742	106.1692	29.0085
74.2257575427696	27.5533647735835	106.8535	30.7643
74.3287505383382	27.6368096010551	106.6895	31.0233
74.4312925976656	27.7203505521205	108.656	34.8419
74.5328485879177	27.8038581597219	107.8221	37.3636
74.6334762403834	27.887280956406	103.4615	37.3033
74.7339385756446	27.9707354446971	102.0152	42.2262
74.8342629967204	28.0541278819528	103.0838	43.6629
74.9343209401023	28.1373949585711	103.3956	43.6231
75.0340798374845	28.2205340833868	104.1102	44.8822
75.1333534070526	28.3034609194284	103.8959	45.4099
75.2321535965687	28.3861665687395	102.543	45.6081
75.3306687646372	28.4687083409524	101.161	45.7653
75.4290217918982	28.5511245699119	100.0845	45.3198
75.5272993576658	28.6334584141616	99.7789	45.6905
75.6255230199741	28.7157156341198	100.6036	46.802
75.7236311403135	28.7978613251324	100.8862	48.4618
75.8215584578205	28.879833077457	101.7941	49.0832
75.919201299472	28.9615780309972	103.8062	50.1176
76.015989957221	29.0427656711584	106.4442	49.0895
76.0159899505677	29.0427656750348	105.6501	47.8555
76.0159899439083	29.0427656784005	102.9297	48.0592
76.0159899371936	29.0427656819694	101.377	48.1816
76.0159899304826	29.042765685515	98.9198	48.0008
76.015989923778	29.042765688635	98.2004	50.3921
76.015989917133	29.0427656917697	97.7133	51.9341
76.0159899103628	29.0427656956088	97.7455	51.8526
76.0159899036952	29.0427656993966	99.0651	51.1078
76.0159898969573	29.0427657030857	99.5987	51.3246
76.0159898902577	29.0427657064407	99.5817	52.1789
76.0159898834978	29.0427657100953	100.5945	52.9653
76.0159898767529	29.042765713361	100.6388	53.8259
76.0159898699338	29.0427657166195	98.7715	55.3698
76.0159898631251	29.0427657203649	98.2152	53.7701
76.015989856271	29.042765723855	97.9579	54.2407
76.0159898493859	29.0427657272668	96.8097	54.0588
76.0159898425344	29.0427657309555	96.0562	52.3857
76.0159898355916	29.0427657342602	95.0304	53.2116
76.0159898286546	29.0427657376637	93.3932	53.1876
76.0159898217054	29.0427657409012	92.1982	53.9806
76.0159898147875	29.0427657447177	92.412	50.9961
76.0159898077612	29.04276574856	93.0102	50.1223
76.0159898007927	29.0427657515282	90.3356	51.1932
76.0159897937555	29.0427657548997	89.6611	52.1615
76.0159897867855	29.0427657576791	89.2688	56.3248
76.0159897797577	29.0427657613952	93.2379	56.4517
76.0159897727485	29.0427657649488	92.9131	56.6287
76.0159897657065	29.0427657684832	92.8209	56.9207
76.0159897585533	29.042765772584	94.6877	57.1733
76.0159897515551	29.0427657761177	95.4289	57.3916
76.015989744409	29.0427657797908	94.4551	58.0456
76.0159897372344	29.0427657835822	94.8477	58.3247
76.0159897299919	29.0427657870049	94.6583	60.3511
74.7045327639033	28.4676052697424	88.0225	60.7529
73.2524965994806	27.823758029663	85.8477	60.7859
71.5773377111034	27.0578207481258	87.1149	58.1702
69.6541978510322	26.1862856755946	81.1686	57.7423
67.6498499474344	25.2421203888812	77.9705	58.8491
65.402394349406	24.0635875002863	77.8264	55.5164
63.0112571926582	22.7375713025009	78.0993	54.3894
60.0788920657693	20.9940519748411	76.5498	52.218
55.879792569703	18.2043388869392	72.9198	44.5581
51.3387069841946	15.0215814820167	31.0707	1.7474
Route: 5 Length: 6.65138740722698 Demand Met: 10000			
47.0519581743231	11.9659000241993	47.2412	18.0641
46.9835541211157	11.9659000288203	43.7175	13.3612
46.9186055915269	11.9659000330745	36.7928	9.6586
46.8572043247992	11.9659000365419	33.7832	8.5886
46.7994057421033	11.9659000405212	38.0686	7.3443
46.7436069103324	11.9659000438063	36.2059	6.8965
46.6891144485388	11.9659000481883	36.4235	4.5159
46.6351987766134	11.9659000511303	33.6792	4.7017
46.5816875054487	11.9659000538492	31.7997	5.4917
46.528350260821	11.9659000569144	30.7839	5.7178
46.4749631707749	11.9659000600892	29.2732	5.6917
46.4214403231193	11.9659000634082	28.1449	5.3771
46.367738067664	11.9659000665869	27.6562	5.4902
46.3138417099621	11.9659000696448	27.2842	5.8331

Solution x	Solution y	Original x	Original y
46.2597701353833	11.9659000732029	26.4488	5.1021
46.2055598170211	11.9659000751513	26.246	7.8923
46.1512515931989	11.965900078796	28.0443	7.2557
46.096765518528	11.9659000821198	27.9452	7.0873
46.0420766645607	11.9659000856662	29.6205	6.6839
45.987015713304	11.965900088322	29.9497	8.0977
45.9314876047432	11.9659000911465	29.2451	9.0499
45.8754939015838	11.9659000934686	29.4417	11.4808
45.8189421770041	11.9659000957268	31.9656	14.6164
45.7614831012274	11.9659000987895	25.9081	14.4892
45.7036389042151	11.9659001011666	23.3217	16.9506
45.6455899448725	11.9659001045336	23.1228	16.7524
45.587306929356	11.9659001072168	22.0389	18.6688
45.5288438022756	11.965900110354	20.7311	19.0512
45.4703285641723	11.96590011351	19.0397	19.3917
45.4119621043872	11.965900116542	19.4151	20.4264
45.3536742858127	11.9659001197201	19.3676	20.9011
45.2954670103714	11.9659001229807	19.4476	21.0876
45.2373327805622	11.965900126274	20.5046	21.2685
45.1791384914859	11.9659001294918	20.5322	21.5891
45.1208852787936	11.9659001327629	21.7951	21.835
45.062420587537	11.9659001361914	21.1889	21.267
45.0038287569991	11.9659001397728	21.2889	20.2133
44.9451118838942	11.9659001432278	22.5923	19.795
44.8861466700283	11.9659001463254	23.1615	20.5337
44.82690138819	11.9659001498522	24.5729	19.8583
44.7672830056926	11.9659001527176	24.0847	21.2619
44.7074089552991	11.9659001560748	25.2224	21.1268
44.647243103972	11.9659001591779	27.0312	22.0371
44.5866351957765	11.9659001605981	28.099	29.8348
44.5250493880947	11.9659001631963	21.3113	31.7798
44.4637604882689	11.9659001670503	22.8581	29.0039
44.4024870883108	11.9659001710569	23.1689	25.59
44.3412125871472	11.9659001742616	21.4132	25.3225
44.2801307937686	11.9659001772631	20.8129	26.0745
44.219263373222	11.9659001801541	19.8821	27.2321
44.1586835411889	11.9659001833388	17.7323	26.9057
44.0986793833502	11.9659001867573	18.7218	26.0511
44.0390337697206	11.9659001902895	19.5225	24.6717
43.9795815671578	11.9659001938265	19.6457	23.2311
43.9202594260801	11.9659001970062	17.3215	22.815
43.8613089113581	11.9659002003295	15.0509	21.8739
43.8030065008297	11.9659002044431	7.8039	17.6061
43.8459808227713	11.9659002021333	17.2669	18.1061
43.8889829364297	11.9659002002378	16.9397	16.157
43.9320740277616	11.9659001978135	18.1963	16.0602
43.9751760101333	11.9659001958568	19.6468	14.5775
44.0182135265371	11.9659001946523	21.6596	11.213
44.0610932637981	11.9659001940923	22.0744	6.6433
44.1038490565851	11.9659001921745	23.9142	5.5856
44.1463777310316	11.9659001909105	22.4003	2.9895
44.1888397507441	11.9659001892127	24.5208	1.7631
44.2310952359971	11.965900187406	25.8989	0.7413
44.273043199274	11.9659001852383	24.8641	0.1355
44.3147749682123	11.9659001830631	19.4163	-0.8394
44.3567629498237	11.9659001816334	22.4229	-2.1641
44.398793008008	11.9659001790766	22.6294	-1.9579
44.4409082484176	11.9659001773688	26.7943	-2.6353
44.4828656715235	11.9659001739481	27.3755	-1.0984
44.5247158118574	11.9659001699915	28.6989	1.5656
44.5664468313317	11.9659001685091	31.1391	0.2266
44.607970081766	11.9659001663658	33.4349	0.0139
44.6491845954686	11.9659001648371	32.3564	-1.4633
44.6902910631833	11.9659001620713	31.0065	-1.0714
44.7314907271659	11.9659001608446	31.1128	-2.8096
44.7729001824551	11.9659001599669	36.4279	-4.3699
44.8143289062237	11.9659001563375	39.9467	-2.3317
44.8557140456601	11.9659001558944	43.0131	-4.6452
44.8971634876653	11.9659001547485	46.0937	-5.8176
44.9388874816884	11.9659001485804	44.8479	-0.9391
44.9808152432934	11.9659001451936	43.4311	0.4843
45.0230000457925	11.9659001430154	42.4155	0.0668
45.0655025391401	11.9659001385963	42.4139	3.5597
45.1083138827829	11.9659001362284	45.0418	3.8658
45.1513846619254	11.9659001333436	44.2937	4.7268
45.1948047198421	11.9659001306167	44.3097	5.4051
45.2386494103849	11.9659001287191	50.2911	5.2466
45.282912021089	11.9659001270959	49.309	3.6922
45.3275547747226	11.965900125227	48.302	2.6164
45.3725732952439	11.9659001229672	48.4975	2.4432

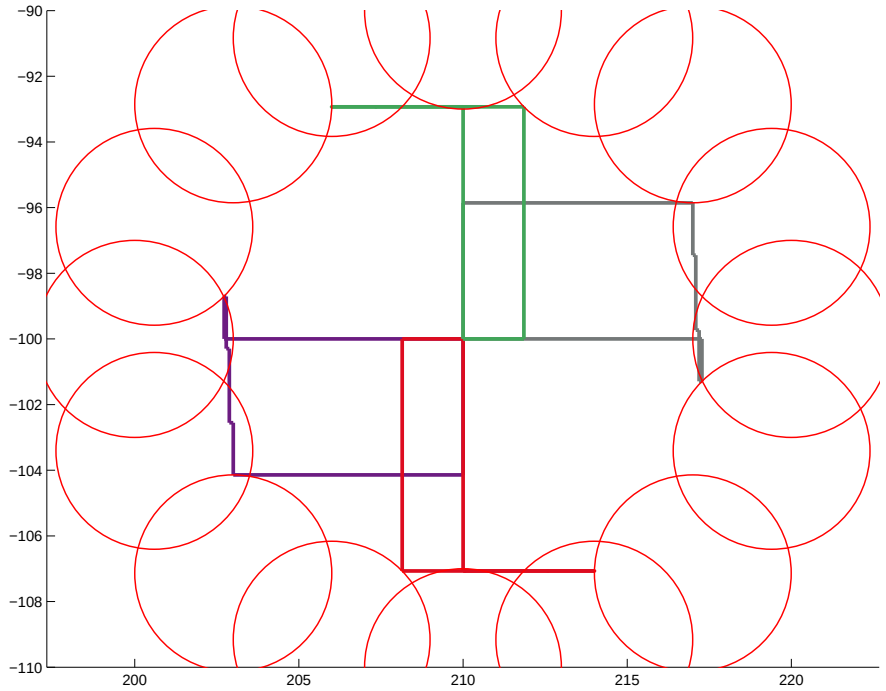
Solution x	Solution y	Original x	Original y
45.4179299692906	11.9659001211976	49.5265	1.5006
45.4635475876459	11.9659001200973	49.2438	-0.5725
45.5094451619872	11.9659001191922	50.0191	-2.6033
45.5555924561456	11.965900115657	51.545	-0.7619
45.6019578448023	11.965900113597	56.047	-0.6998
45.6483355465895	11.965900110272	57.3839	0.9502
45.6947029840267	11.9659001085038	58.2741	0.1622
45.7409060700899	11.9659001061914	58.2864	0.0731
45.7867870580112	11.9659001031563	58.6741	1.1796
45.8322104575847	11.9659001003941	58.2987	1.8222
45.8771185672864	11.9659000974851	57.7618	2.6586
45.9215315209041	11.9659000949539	58.0726	3.0503
45.9653679641062	11.9659000922736	58.5415	3.6684
46.0085310963569	11.9659000890829	58.8992	5.3006
46.0509247086895	11.9659000867248	58.0725	5.2013
46.0926667543544	11.9659000849525	56.6752	3.9284
46.1339875667862	11.9659000829846	56.6229	3.2945
46.1748844091169	11.9659000809999	56.514	2.6652
46.2153810572999	11.965900078771	55.5686	2.3786
46.2556417405686	11.9659000768712	55.7669	1.6852
46.2956553085807	11.9659000746836	54.6465	1.327
46.3355973716213	11.9659000724003	54.5841	1.3
46.3754817271333	11.96590006992	52.8937	1.339
46.4154936539352	11.9659000678935	51.7765	0.7553
46.4557207814851	11.9659000649442	50.9668	1.717
46.4962272652596	11.9659000625074	51.8363	2.0767
46.5369298718047	11.9659000594144	52.2056	3.4977
46.5778018590205	11.9659000564752	52.0607	4.6851
46.6188810329833	11.9659000537038	53.4617	5.8056
46.660066555903	11.9659000510881	54.3108	6.5803
46.7013374331713	11.9659000488138	55.5508	6.709
46.742657783628	11.9659000454124	55.3647	9.0137
46.7841912898162	11.9659000431715	58.6318	9.4344
46.8256913429182	11.9659000415489	59.4358	8.0877
46.8672709235512	11.9659000399678	60.5785	6.8128
46.909025677032	11.9659000380483	60.2628	6.0605
46.9513270870643	11.9659000366877	61.565	4.5717
46.9942887545553	11.965900033025	64.6914	7.7788
47.0376483641402	11.9659000288424	61.7542	11.527
47.0815237058319	11.9659000257788	57.2331	12.7874
Route: 6 Length: 6.25428242528869E-9 Demand Met: 6422			
47.1286999998315	11.965900000611	46.3909	8.819
47.1286999997481	11.9659000005352	46.5714	10.174
47.1286999996926	11.9659000004789	47.6091	10.2274
47.1286999996374	11.9659000004026	48.2378	10.888
47.1286999995851	11.965900000355	49.0558	10.279
47.1286999995332	11.9659000002887	48.9393	11.7496
47.1286999995042	11.9659000002424	50.5069	12.3029
47.1286999995018	11.9659000002009	51.32	11.9016
47.1286999995243	11.9659000001514	52.0306	12.0787
47.1286999995527	11.9659000000833	51.9742	12.9315
47.1286999995754	11.9659000000449	53.965	12.2967
47.1286999995846	11.9659000000221	52.3173	10.0275
47.1286999995844	11.9659000000038	53.1154	7.9184
47.1286999995761	11.9658999999483	51.2901	7.6487
47.1286999995612	11.9658999999278	48.7027	4.8736
47.1286999995469	11.9658999998943	47.0712	4.3382
47.1286999995324	11.9658999998307	47.7278	5.7114
47.1286999995166	11.9658999997788	46.8369	6.4403
47.1286999995019	11.9658999997414	46.0043	6.8606
47.1286999994877	11.9658999996982	45.5397	7.2979
47.1286999994755	11.9658999996803	44.0031	6.0986
47.1286999994655	11.9658999996158	43.7681	7.8375
47.1286999994566	11.9658999995683	43.984	9.2005
47.1286999994484	11.9658999995345	44.5689	9.75
47.1286999994396	11.9658999994823	42.7704	10.2739
47.1286999994355	11.965899999452	43.7231	10.6871
47.1286999994323	11.9658999993914	44.5228	11.8645
47.1286999994302	11.9658999993669	44.7075	13.3055
47.1286999994331	11.9658999993072	41.9974	13.5778
47.1286999994368	11.9658999992912	40.2323	12.6508
47.1286999994415	11.9658999992243	40.2335	17.1357
47.1286999994478	11.9658999992121	39.7266	17.3977
47.1286999994595	11.9658999991701	40.715	18.8306
47.1286999994765	11.9658999991678	45.9074	18.6439
47.1286999994925	11.9658999991517	45.9242	19.9
47.1286999995085	11.9658999991088	46.7163	23.0055
47.1286999995283	11.9658999991029	49.1449	22.3659
47.1286999995519	11.9658999990819	50.8742	24.2729
47.1286999995777	11.965899999057	50.1386	26.6573

Solution x	Solution y	Original x	Original y
47.1286999995998	11.9658999990498	48.493	25.186
47.1286999996258	11.96589999902	47.7428	26.438
47.1286999996506	11.9658999990088	47.5893	27.8934
47.1286999996736	11.9658999990028	46.684	28.1154
47.1286999996936	11.9658999989996	46.7677	27.4481
47.1286999997126	11.96589999899	45.985	27.4123
47.1286999997319	11.9658999989662	44.6028	29.9319
47.1286999997505	11.9658999989647	44.1303	30.8739
47.1286999997695	11.9658999989615	45.9581	33.5048
47.1286999997841	11.9658999989685	47.4903	33.2139
47.1286999997976	11.9658999989917	47.3356	31.1656
47.1286999998075	11.965899999008	46.9054	30.8841
47.1286999998183	11.965899999027	46.4115	30.3033
47.1286999998303	11.9658999990436	47.9812	30.2306
47.1286999998422	11.965899999072	49.5432	29.0024
47.1286999998522	11.9658999991033	52.7074	28.2489
47.1286999998616	11.9658999991609	54.6523	25.2022
47.1286999998683	11.9658999991857	54.2786	24.4277
47.1286999998771	11.9658999992024	54.0368	23.8586
47.1286999998865	11.965899999258	53.2794	21.4994
47.1286999998948	11.9658999992857	55.9782	19.9329
47.128699999905	11.9658999993629	55.8132	15.4408
47.1286999999186	11.9658999994139	53.4554	15.0784
47.1286999999313	11.9658999994436	53.9046	16.3668
47.1286999999457	11.9658999994807	53.7123	16.59
47.1286999999622	11.9658999995276	52.0827	15.9727
47.1286999999798	11.9658999995648	51.6732	17.1776
47.1287000000036	11.9658999995958	52.4859	17.4578
47.1287000000274	11.9658999996334	52.1655	19.1446
47.1287000000489	11.965899999682	51.539	18.7116
47.128700000065	11.9658999997281	49.9971	19.9155
47.1287000000751	11.965899999778	49.9475	19.2284
47.1287000000693	11.965899999809	49.1677	19.2175
47.128700000038	11.9658999998772	49.3862	17.5735
47.128699999988	11.9658999999247	47.2642	16.1804
47.1286999999243	11.9658999999663	46.6598	16.011
47.1286999998704	11.9659000000149	46.503	16.5426
47.128699999832	11.9659000000535	44.3034	16.6265
47.1286999998244	11.965900000108	44.2621	15.3855
47.1286999998408	11.9659000001726	46.213	15.3079
47.1286999998754	11.9659000002375	45.8725	14.3747
47.1286999999118	11.9659000002918	48.0446	14.6778
47.1286999999388	11.9659000003648	47.5448	13.9665
47.1286999999449	11.9659000004403	47.4524	12.1509
47.1286999999639	11.9659000005743	47.1015	12.1757
Route: 7 Length: 109.418789475281 Demand Met: 10000			
47.027139318254	18.4109767211928	72.4926	42.7909
46.9233926983154	21.4532562818143	72.9378	43.4347
46.8181455271035	23.9248343992638	72.7013	43.6681
46.7121225530294	26.1642249301756	70.5497	45.0925
46.6058624840585	28.2810207073229	70.4096	46.4113
46.4994163040408	30.3019960105815	68.7356	47.889
46.3929175594623	32.2559420599429	70.6191	48.182
46.2861819169442	34.150331315756	70.7664	48.6137
46.1791989962812	35.9995617378574	70.6462	49.6735
46.0719663558256	37.8112822555086	70.0624	50.1219
45.9645294659458	39.5963303318828	67.7991	50.1342
45.8570422010785	41.3676882139153	67.5609	49.631
45.7495113495072	43.1331442664447	66.949	50.6855
45.6419583263631	44.8954147802292	66.2863	51.2705
45.5344265968722	46.6585613803806	69.1689	51.2673
45.4268182805526	48.42572408365	69.4154	51.8752
45.3191755406189	50.2009199617046	69.1565	53.343
45.2115562252905	51.9861868055468	67.8488	53.6384
45.1040269511328	53.7884464195519	68.022	53.7678
44.996621338609	55.6150757778589	68.2826	55.0673
44.8893859206184	57.4700885165134	66.0257	55.1875
44.7822804468171	59.3605220478322	48.9533	90.4759
44.6755166242233	61.0768630249293	47.7789	92.5461
44.5690961967163	62.639194492838	51.1106	98.2963
44.4582142715245	63.150121474725	47.126	99.3914
44.3444387402921	63.3315246273702	40.065	98.6098
44.2312387552879	63.5029305469011	39.7333	98.7582
44.1185728754448	63.6651647895331	39.196	99.7694
44.1185728417067	63.6352381861105	38.2186	96.6747
44.1185728080827	63.6053089507878	40.9431	96.0349
44.1185727745164	63.575379591039	41.6896	94.8028
44.1185727409923	63.5454545538607	41.599	92.4813
44.118572707501	63.5155373285235	43.1057	91.7939
44.1185726739884	63.4856236037494	42.9721	90.3177

Solution x	Solution y	Original x	Original y
44.1185726404489	63.4557120019875	42.6808	88.2098
44.1185726068734	63.4258020133564	40.8939	84.3555
44.1185725732998	63.3958951338172	39.6285	91.4521
44.1185725397143	63.3659876054227	37.9917	90.5379
44.1185725061462	63.3360812105587	37.0706	93.0168
44.1185724725775	63.3061801866093	37.1788	95.0118
44.1185724390026	63.2762966135005	37.3296	94.7968
44.1185724054103	63.2464325463539	36.1694	94.3523
44.1185723718183	63.2165926150799	35.9551	95.9225
44.1185723382127	63.1868266670052	35.2297	94.8683
44.1185723046079	63.157112669429	35.4152	92.5489
44.1185722710141	63.1274228217321	33.6244	92.4492
44.1185722374506	63.0977648228098	34.0163	93.2553
44.1185722038991	63.0681494545956	32.8593	93.0881
44.1185721703743	63.0385867355154	32.2034	92.5655
44.118572136879	63.009076847081	32.1756	91.0244
44.118572103423	62.9796034251379	32.6009	89.9531
44.1185720699959	62.9501596164409	33.2241	90.2072
44.1185720365913	62.920746928394	33.1881	90.5996
44.1185720032044	62.8913697318536	34.7819	91.1147
44.1185719698196	62.8620290694576	35.4073	87.2216
44.1185719364265	62.8327077437584	34.9317	80.2335
44.1185719030397	62.8033973576693	33.517	80.8699
44.1185718696573	62.774098279197	29.376	80.5861
44.1185718363101	62.7448117708869	27.1736	83.2653
44.1185718029931	62.7155431268989	23.4089	84.0628
44.1185717697244	62.686307108438	24.3218	77.9732
44.1185717364997	62.6570842871281	23.796	77.2181
44.1185717033115	62.6278742491149	18.7356	77.2891
44.1185716702103	62.5986875587328	21.1184	76.9048
44.1185716371677	62.5695167864102	22.8762	75.7017
44.1185716041683	62.5403580565573	24.4797	75.354
44.1185715712071	62.5112097956661	24.7401	75.4523
44.1185715382773	62.4820719804207	25.4767	75.481
44.1185715053759	62.4529441717983	25.3366	76.538
44.1185714725177	62.4238273801965	26.6151	77.1467
44.1185714396914	62.3947212635936	31.105	77.2121
44.1185714068578	62.3656233132443	31.4187	76.5703
44.118571374013	62.3365331329033	32.697	74.6737
44.1185713411422	62.3074494970173	32.2488	71.8762
44.1185713082468	62.2783718228295	31.0449	71.9995
44.1185712753411	62.2493003497443	31.4455	71.7336
44.1185712424057	62.220234788655	31.4906	71.3219
44.1185712094368	62.1911750399339	31.7515	71.3679
44.1185711764103	62.1621211356641	35.1535	70.6086
44.1185711431847	62.1330728859557	33.839	67.1668
44.1185711097839	62.1040302147131	28.241	67.9653
44.1185710763473	62.0749944761654	26.4833	65.6457
44.1185710428969	62.0459658659218	26.4747	67.9787
44.1185710094023	62.0169454464322	25.7737	68.9159
44.1185709758795	61.9879343377131	26.4587	69.6793
44.1185709422971	61.9589333449847	26.9783	71.0141
44.1185709086407	61.929943815345	27.6433	72.5657
44.1185708748724	61.9009675771242	27.2709	73.9256
44.1185708409899	61.8720072569612	26.2205	72.9044
44.1185708070242	61.8430632159538	24.5354	72.6275
44.118570773016	61.8141371218834	24.5076	73.115
44.1185707389748	61.7852308985954	24.1578	73.3792
44.1185707049146	61.7563465187904	23.527	73.6169
44.1185706708782	61.7274863662554	22.9431	70.0987
44.1185706369147	61.6986456680029	22.1344	71.2137
44.1185706030689	61.6698278345685	22.0857	71.4539
44.118570569378	61.6410342530415	21.3934	72.6127
44.1185705358782	61.6122696131978	18.2654	71.5277
44.118570502571	61.5835388190841	15.4332	72.9689
44.1185704694669	61.5548649322831	15.0856	70.6386
44.1185704365525	61.526238131505	11.6475	70.8021
44.1185704038521	61.4976325403698	10.9416	69.7746
44.1185703713938	61.4690228657495	11.4886	67.7219
44.1185703391183	61.4404778829376	12.0587	67.8257
44.1185703070168	61.4119903780152	13.2613	67.7948
44.1185702750462	61.3835498038598	12.5389	66.9051
44.1185702431724	61.3551576835627	12.0877	66.3858
44.1185702113546	61.3268153049805	12.0444	66.3239
44.1185701795321	61.2985225146524	12.0097	66.7734
44.1185701476421	61.2702809721759	11.4442	66.9869
44.1185701156432	61.242091481892	10.7344	66.9849
44.1185700836437	61.2139325576737	10.5042	66.7806
44.1185700518926	61.1857454314651	7.6803	61.1857
44.3004558574189	59.9275693953212	9.15690000000001	61.6426

Solution x	Solution y	Original x	Original y
44.4900654887529	58.6409580763986	10.4334	62.822
44.6848310507978	57.3229914665715	14.2239	63.9607
44.8817289195273	55.9873353936587	15.1112	64.361
45.0806985449126	54.6296422048399	15.3124	65.205
45.2821067654062	53.2379589880873	14.7433	68.1941
45.4876308057532	51.7388503182509	14.0233	68.3418
45.7007550334432	49.7132659261742	16.7224	69.1113
45.9205324827364	47.2039516869606	18.9682	67.082
46.145059887928	44.2485044873628	22.8228	67.5784
46.3746077235867	40.6071271305616	22.6268	64.3936
46.6116783561487	35.5850127193604	23.9369	61.5866
46.8637954899818	23.3340862850301	18.4916	22.031
Route: 8 Length: 6.38330600077444 Demand Met: 10000			
47.1576461940647	11.9836113884671	41.1669	5.3004
47.1856121992998	12.0012861319187	52.3291	3.6705
47.2137322620064	12.0189617997113	54.7597	1.1902
47.2417124594016	12.036640785615	53.5826	-3.7128
47.2695708858442	12.0543290372154	53.412	-4.2453
47.2974679625334	12.0720405621991	53.8048	-5.0553
47.3255420646204	12.0897915901315	53.289	-9.6645
47.3538224841373	12.1075942147213	54.4331	-6.2551
47.3823217545236	12.1254532941116	57.7878	-4.3732
47.4109574735472	12.1433635560768	58.3955	-2.2935
47.4396296907863	12.1613074687486	59.6709	-1.5476
47.4682508090742	12.1792702951008	60.4167	1.4088
47.4967737550749	12.1972327457826	60.4719	1.0667
47.5252166143089	12.2151945077671	61.9524	-0.333
47.5535780517182	12.2331620412556	62.4332	-0.684
47.5818811791662	12.2511409792676	62.7821	-0.0838
47.6101454807965	12.2691347558842	62.5325	1.766
47.638392965469	12.2871438446103	63.0749	1.8033
47.6666309332591	12.3051740560879	63.4243	4.3429
47.6948663203112	12.3232231076695	63.3795	20.1125
47.723092259851	12.3412572925767	62.5649	23.4331
47.7513193636641	12.3592758336333	61.643	23.6955
47.7795585040592	12.3772824754898	63.3607	23.5913
47.8077972017667	12.3952808334671	63.8119	26.0212
47.8360264906704	12.4132663876556	63.132	27.7543
47.8642446408942	12.4312356912051	62.9268	27.0211
47.8924491481119	12.4491923559549	59.5552	26.5288
47.9206638860571	12.4671405588151	58.9981	26.6128
47.9488920788736	12.4850811356189	58.5931	27.1316
47.9771375797637	12.5030137752901	56.8778	27.618
48.0054126267957	12.520939060659	55.4854	26.8201
48.0337280430975	12.5388603770668	55.089	27.0379
48.0620872662849	12.556778475458	55.1607	27.7715
48.0904878423237	12.5746928111954	54.5895	27.7676
48.1189324216274	12.5926045826797	53.915	28.4629
48.1474253889787	12.6105133206276	54.7376	29.7596
48.1759553684981	12.6284165279533	54.8257	29.6059
48.2045238038181	12.6463154249855	57.9508	29.6187
48.2330937451907	12.6642095450631	60.463	30.4795
48.2616339257807	12.6820959978935	60.1802	30.671
48.2901596399678	12.6999753370963	58.6228	31.6703
48.3186973287991	12.7178464613411	58.4334	33.3219
48.3472502789404	12.7357054240672	58.126	35.24
48.3758245323835	12.7535477382884	60.137	35.2014
48.4044011594173	12.7713730262185	60.8351	33.4935
48.4329834511366	12.789186483966	61.1622	34.1592
48.4615713710581	12.8069868320262	61.5106	34.0654
48.4901660593669	12.8247745687845	62.464	33.4003
48.5187611865617	12.8425510537847	63.5739	32.9982
48.5473461573936	12.8603165797681	63.453	34.6286
48.5759235129819	12.8780674880564	63.8645	34.3723
48.6044929254357	12.8958043954634	64.9829	35.6055
48.6330362647749	12.9135240548338	65.4552	32.6167
48.6615601759709	12.9312340170506	64.2717	31.7627
48.6900871331815	12.9489373909224	63.2951	31.2899
48.7186339937724	12.9666359868991	64.1748	30.2745
48.7471957276999	12.9843317164373	66.7818	30.0369
48.7757389617843	13.0020244867243	67.6588	29.7348
48.8042566418917	13.0197148568162	67.8857	28.9512
48.8327538933405	13.037404581139	68.2062	28.5319
48.86123235163	13.0550947789769	67.5765	27.7962
48.8897099898433	13.0727876692732	66.7482	27.6121
48.9182073370847	13.0904846048832	67.242	26.9141
48.9467284043861	13.108187473049	68.3676	27.331
48.9752686377147	13.1258959798205	70.5469	25.0661
49.0038030189547	13.143614956004	70.1037	27.3839
49.0323477097958	13.1613398074697	69.5886	28.6002

Solution x	Solution y	Original x	Original y
49.0609199518502	13.1790678585673	73.7989	28.6287
49.0894564227949	13.1967964621846	79.7169	32.9378
49.0894564454991	13.1967964970715	75.4748	37.8532
49.0894564681502	13.196796532237	74.5598	39.2546
49.0511535474025	13.173240853207	72.2401	34.2889
49.0127713073837	13.1496598143256	71.5231	31.8286
48.9743304543243	13.1260722412019	69.1853	30.9522
48.9358953695772	13.1024881006777	68.3701	31.308
48.897470165903	13.0789088002954	67.7055	32.9993
48.8590511215453	13.0553295423599	67.4673	33.2544
48.8206254242799	13.0317487343221	66.5887	34.1226
48.7821998051347	13.0081623811569	66.9624	36.7077
48.7437353212249	12.9845570470279	68.0366	38.8903
48.7051534360701	12.9609131073716	66.7168	38.698
48.666493706907	12.9372346476082	65.211	38.9167
48.627792210864	12.9135226549639	64.8516	39.5774
48.5890439089744	12.8897718603648	65.3289	43.5846
48.5500981725961	12.8659102213204	64.4232	44.0581
48.5109744373786	12.8419386347914	64.2784	38.8059
48.4718085021847	12.8179334114129	62.6603	37.129
48.4326562478543	12.7939068134582	62.0243	36.102
48.3935354620825	12.7698640377432	61.1452	36.2851
48.3544625716301	12.7458034930261	60.9493	37.7343
48.3154288045693	12.7217146376659	58.8785	37.4935
48.2764635400041	12.6975996219897	56.2795	36.0371
48.237598427003	12.6734680246583	55.9275	34.3566
48.1988281859381	12.6493273708026	54.3132	33.4794
48.1601608904971	12.6251830303798	53.8796	31.7093
48.1215921278919	12.6010421629344	52.5136	31.162
48.0831232497349	12.5769072927438	51.0819	30.8837
48.0447543355568	12.5527790493029	50.5738	30.8854
48.0064771620583	12.5286560417752	50.8592	31.2824
47.9682772544169	12.5045349157497	50.3723	32.2399
47.9301451064234	12.4804106630484	50.1654	34.298
47.8920669822297	12.4562752844856	51.473	33.7115
47.8540139366657	12.4321271126567	51.7623	34.8081
47.8159538793794	12.4079604169335	51.6292	37.4529
47.7778441401504	12.3837636829671	53.589	37.6567
47.7395537595052	12.3595326326591	50.3352	41.2014
47.7010839324945	12.3352465874952	48.325	36.101
47.6624683879414	12.3109316973702	45.6407	35.658
47.6237807268428	12.2865907529162	45.4526	36.121
47.5850249943134	12.2622213328807	44.7872	36.1398
47.5462491259368	12.2378227517326	46.003	37.4534
47.5074672588906	12.2133848717993	45.4903	38.3462
47.468820712722	12.1888976240629	44.3651	39.5082
47.4305101514421	12.1643464391284	43.7884	36.8808
47.3927344469095	12.1397474692048	42.8212	36.4305
47.3555295648337	12.1150989142471	40.9959	37.9409
47.3186548398292	12.0903815665302	37.4272	33.8061
47.2814876033769	12.0656178570687	35.5392	31.6783
47.2437736777015	12.0408142809917	48.6326	32.1618
47.2057479385669	12.0159506273814	47.9603	31.0225
47.1680304980148	11.9910192459234	47.4152	28.2569



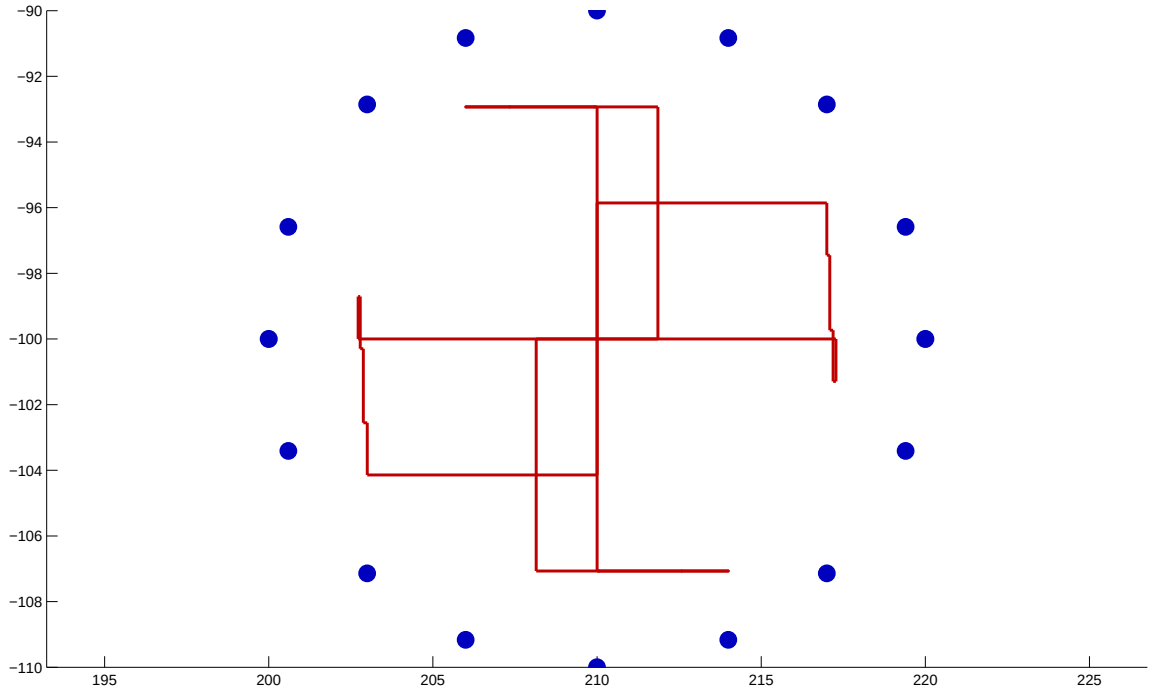


Figure O.133: *concentricCircles*1, Equal Radius, 2D, Manhattan, Length = 102.5368446

Table O-136: Solution for *concentricCircles*1, Equal Radius, 2D, Manhattan

Total distance: 102.536844608964 Total demand met: 192 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 25.4210639430281 Demand Met: 48			
92.7213114627359	98.7095849466683	90.6	96.5882555782
92.788560742304	100.295949288379	90	100
92.8811057519884	102.554029478081	90.6	103.4117444218
92.9996914283453	104.141428380918	93	107.1414284285
Route: 2 Length: 25.847357242657 Demand Met: 48			
98.1468867430209	107.069708410235	96	109.1651513899
100.057108521032	107.069704230607	100	110
102.578393205039	107.069700021571	104	109.1651513899
104.000856954115	107.069695805049	107	107.1414284285
Route: 3 Length: 25.4210641395428 Demand Met: 48			
107.278644143674	101.290459545788	109.4	103.4117444218
107.189135604632	99.7330249921336	110	100
107.091016429758	97.4484404863968	109.4	96.5882555782
107.000003935321	95.85857161969	107	92.8585715715
Route: 4 Length: 25.8473592837361 Demand Met: 48			
101.853272505589	92.9304541249206	104	90.8348486101
99.9159937713289	92.9304549723025	100	90
97.3419981421539	92.9304557786669	96	90.8348486101
95.9991387388004	92.9304565875026	93	92.8585715715

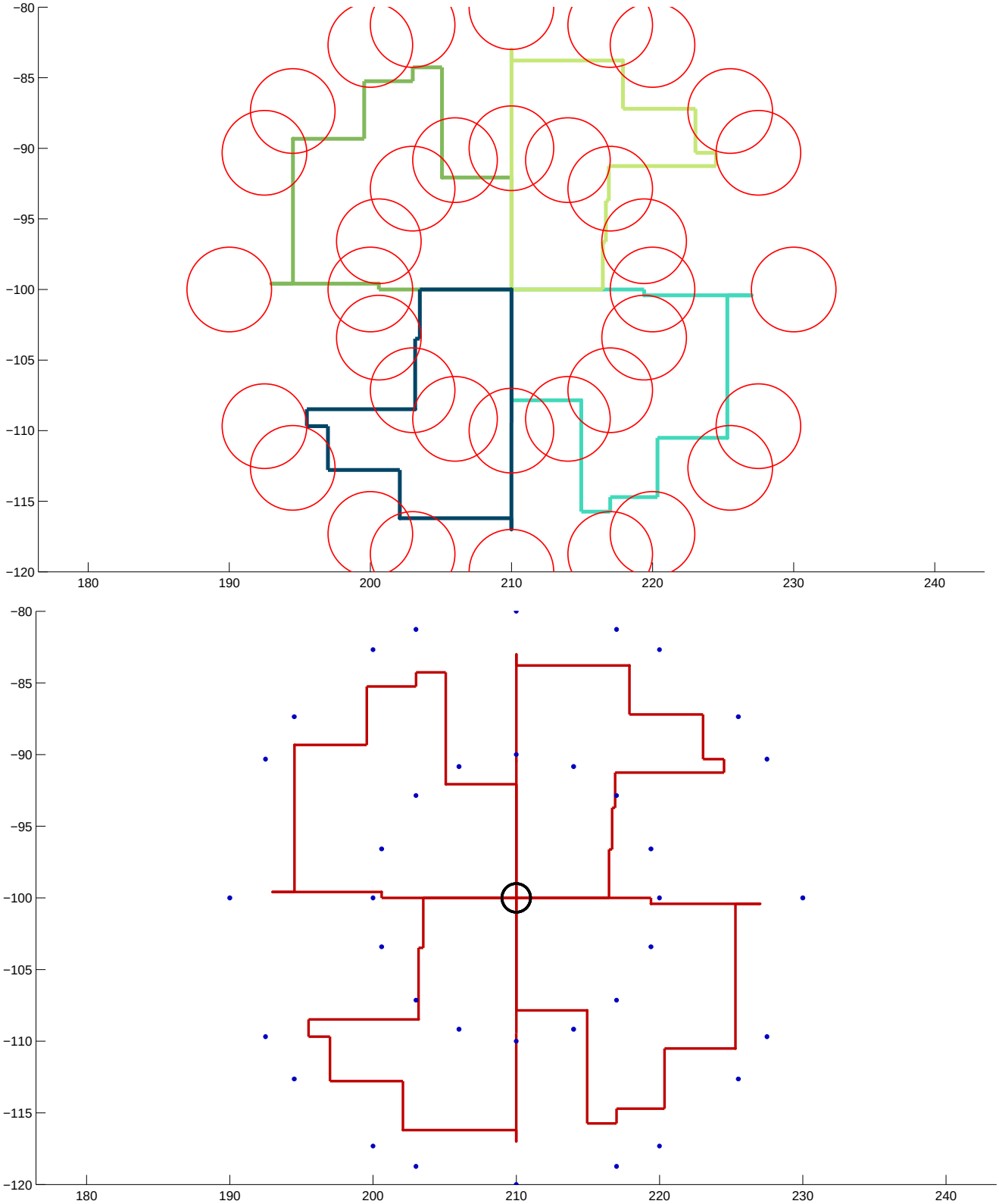


Figure O.134: *concentricCircles*2, Equal Radius, 2D, Manhattan, Length = 257.0534862

Table O-137: Solution for *concentricCircles*2, Equal Radius, 2D, Manhattan

Total distance: 257.053486227215 Total demand met: 352 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 65.5267662468484 Demand Met: 88			
90.6000001187773	99.5882558839671	90.6	96.5882555782
90.6000001187773	99.5882558839671	90	100
82.9716104967197	99.5882555368175	80	100
84.51649995761	89.3287283921496	84.5	87.3607753402
84.51649995761	89.3287283921496	82.5	90.3175416345
89.5646848383119	85.244877026331	90	82.6794919243
93.0000225718809	84.2650063798561	93	81.2650060048
95.075313733112	92.0673618119513	93	92.8585715715
95.075313733112	92.0673618119513	96	90.8348486101
Route: 2 Length: 65.5267632358849 Demand Met: 88			
109.400032999174	100.411743493859	109.4	103.4117444218
109.400032999174	100.411743493859	110	100
117.02838876815	100.411744001302	120	100
115.299329998795	110.508715410834	115.5	112.6392246598
115.299329998795	110.508715410834	117.5	109.6824583655
110.344849643005	114.709118529613	110	117.3205080757
106.999984313829	115.734992849793	107	118.7349939952
104.945764584361	107.846508470351	107	107.1414284285
104.945764584361	107.846508470351	104	109.1651513899
Route: 3 Length: 62.9999785151774 Demand Met: 88			
106.471368177788	96.6161143830497	109.4	96.5882555782
106.68737672649	93.7097425224249	107	92.8585715715
106.902116761507	91.2559543800429	104	90.8348486101
114.499993551302	90.3175730546173	117.5	90.3175416345
113.035836379639	87.1986669253832	115.5	87.3607753402
107.896260918255	83.781356293467	110	82.6794919243
107.896260918255	83.781356293467	107	81.2650060048
100.000695575781	83.0000042937137	100	80
100.000347277216	90.4514850569562	100	90
Route: 4 Length: 62.999978229304 Demand Met: 88			
93.5046079329272	103.483549648329	90.6	103.4117444218
93.1783133429068	108.478374182076	93	107.1414284285
93.1783133429068	108.478374182076	96	109.1651513899
85.5000050049043	109.682458229422	82.5	109.6824583655
86.9953104041104	112.786437819988	84.5	112.6392246598
92.0839710952274	116.20621713047	90	117.3205080757
92.0839710952274	116.20621713047	93	118.7349939952
99.9981871780909	116.999994119556	100	120
99.9990932864871	109.442305127991	100	110

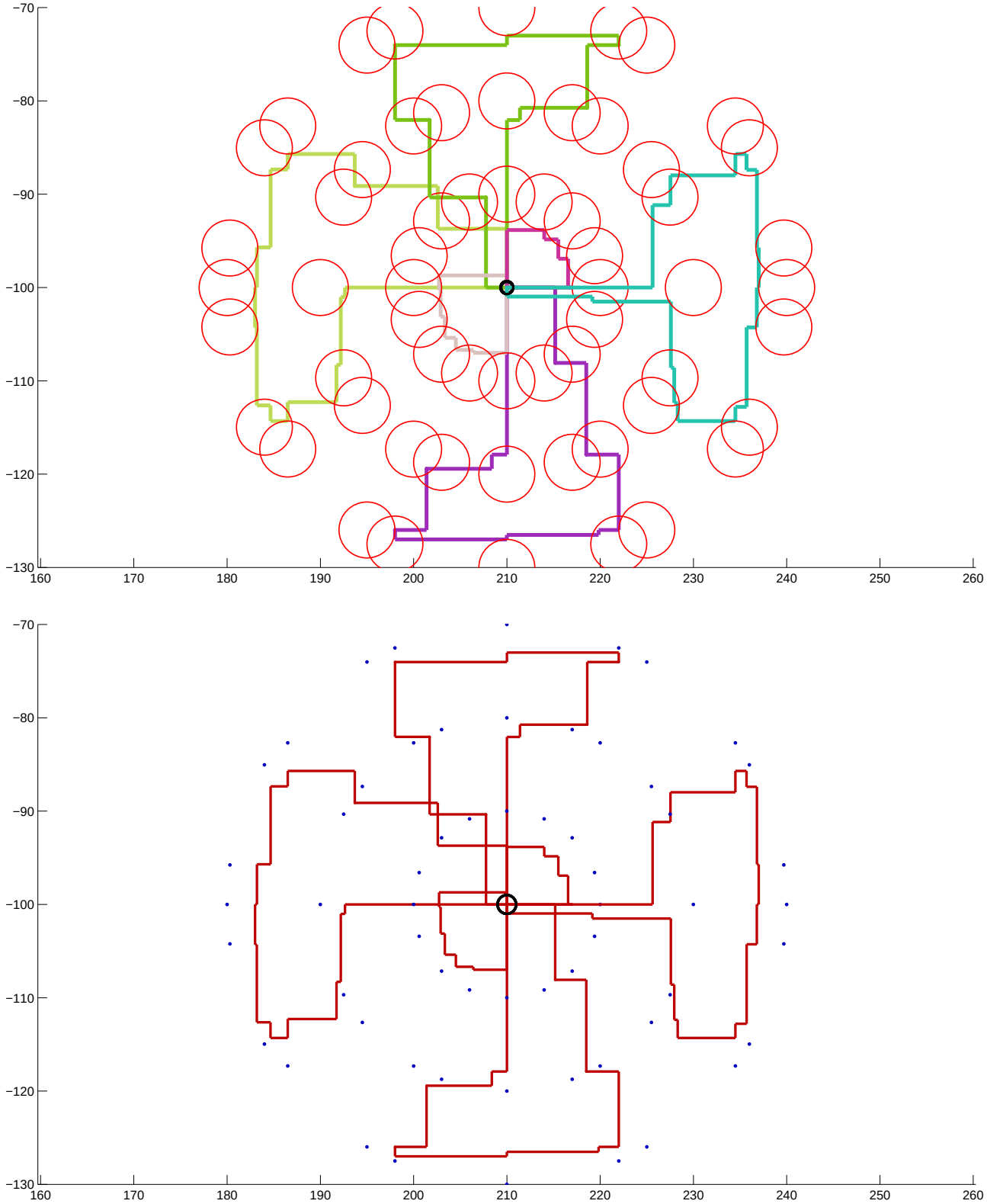


Figure O.135: *concentricCircles*3, Equal Radius, 2D, Manhattan, Length = 483.9745010

Table O-138: Solution for *concentricCircles*3, Equal Radius, 2D, Manhattan

Total distance: 483.974501022847 Total demand met: 448 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 111.2531075633 Demand Met: 80			
82.6478037627323	101.018782820082	80	100
82.1900516680629	108.291956651452	82.5	109.6824583655
81.7295025024691	112.280001015295	84.5	112.6392246598
76.5000068474409	114.313279477701	76.5	117.3132896932
74.6526171354174	112.63650261919	74	114.9666295471
73.193478865463	104.301388690712	70.3	104.2320207939
73.0000083343565	100.000000054302	70	100
73.1997164560166	95.6918914000018	70.3	95.7679792061
74.6695984675874	87.3441801977513	74	85.0333704529
76.4999892221636	85.686717361695	76.5	82.6867103068
83.6944761673768	89.1099148092799	84.5	87.3607753402
83.6944761673768	89.1099148092799	82.5	90.3175416345
92.5941439839527	93.7050902344922	93	92.8585715715
Route: 2 Length: 101.999905845443 Demand Met: 84			
105.172104588991	108.081561012506	104	109.1651513899
105.172104588991	108.081561012506	107	107.1414284285
108.508480683376	117.902094363236	110	117.3205080757
108.508480683376	117.902094363236	107	118.7349939952
111.999982720131	125.979138507758	115	125.9807621135
109.826108754045	126.508377768144	112	127.4954541697
99.9999999076441	126.999984113626	100	130
88.0000139110361	125.98076136587	85	125.9807621135
88.0000139110361	125.98076136587	88	127.4954541697
91.3908623353079	119.429002550934	90	117.3205080757
91.3908623353079	119.429002550934	93	118.7349939952
98.3802957989741	117.907471755046	100	120
Route: 3 Length: 101.999987084104 Demand Met: 84			
97.7598320042277	90.3386966120219	100	90
97.7598320042277	90.3386966120219	96	90.8348486101
91.7131266582694	82.0382562323632	90	82.6794919243
91.7131266582694	82.0382562323632	93	81.2650060048
88.0000017139731	74.0194733860176	85	74.0192378865
88.0000017139731	74.0194733860176	88	72.5045458303
100.000082668484	73.0000020082236	100	70
111.999997264249	74.0193631679594	115	74.0192378865
111.999997264249	74.0193631679594	112	72.5045458303
108.61084894402	80.7360536798174	110	82.6794919243
108.61084894402	80.7360536798174	107	81.2650060048
101.397790413911	82.0506375298964	100	80
Route: 4 Length: 31.1381435112065 Demand Met: 72			
99.9978387033192	106.999985590036	100	110
96.4002027797423	106.678067847251	96	109.1651513899
94.5325507644388	105.380927755601	93	107.1414284285
93.3509919156793	103.125733295658	90.6	103.4117444218
92.8975702786648	100.26746988797	90	100
92.7213142173624	98.7095996170702	90.6	96.5882555782
Route: 5 Length: 26.3302618766783 Demand Met: 48			
106.99998964671	99.9986248560128	110	100
106.562184443093	96.9128523003303	109.4	96.5882555782
105.515632647157	94.8448404358108	107	92.8585715715
104.000394147446	93.8348587083707	104	90.8348486101
Route: 6 Length: 111.253095142115 Demand Met: 80			
115.619018440929	91.1700442511953	117.5	90.3175416345
117.535328412515	87.9742028779377	115.5	87.3607753402
124.500607992214	85.6867199908168	124.5	82.6867103068
125.691746015447	87.3914103733724	126	85.0333704529
126.811448638212	95.7055629452745	129.7	95.7679792061
126.999988439829	99.9999839907175	130	100
126.80162387306	104.269203951338	129.7	104.2320207939
125.7101297584	112.79275797358	126	114.9666295471
124.499986885094	114.313279122046	124.5	117.3132896932
118.312543435089	112.360717714324	115.5	112.6392246598
117.949060744389	108.595369416797	117.5	109.6824583655
117.588465531256	101.510080523197	120	100
109.168086922917	100.966810175369	109.4	103.4117444218

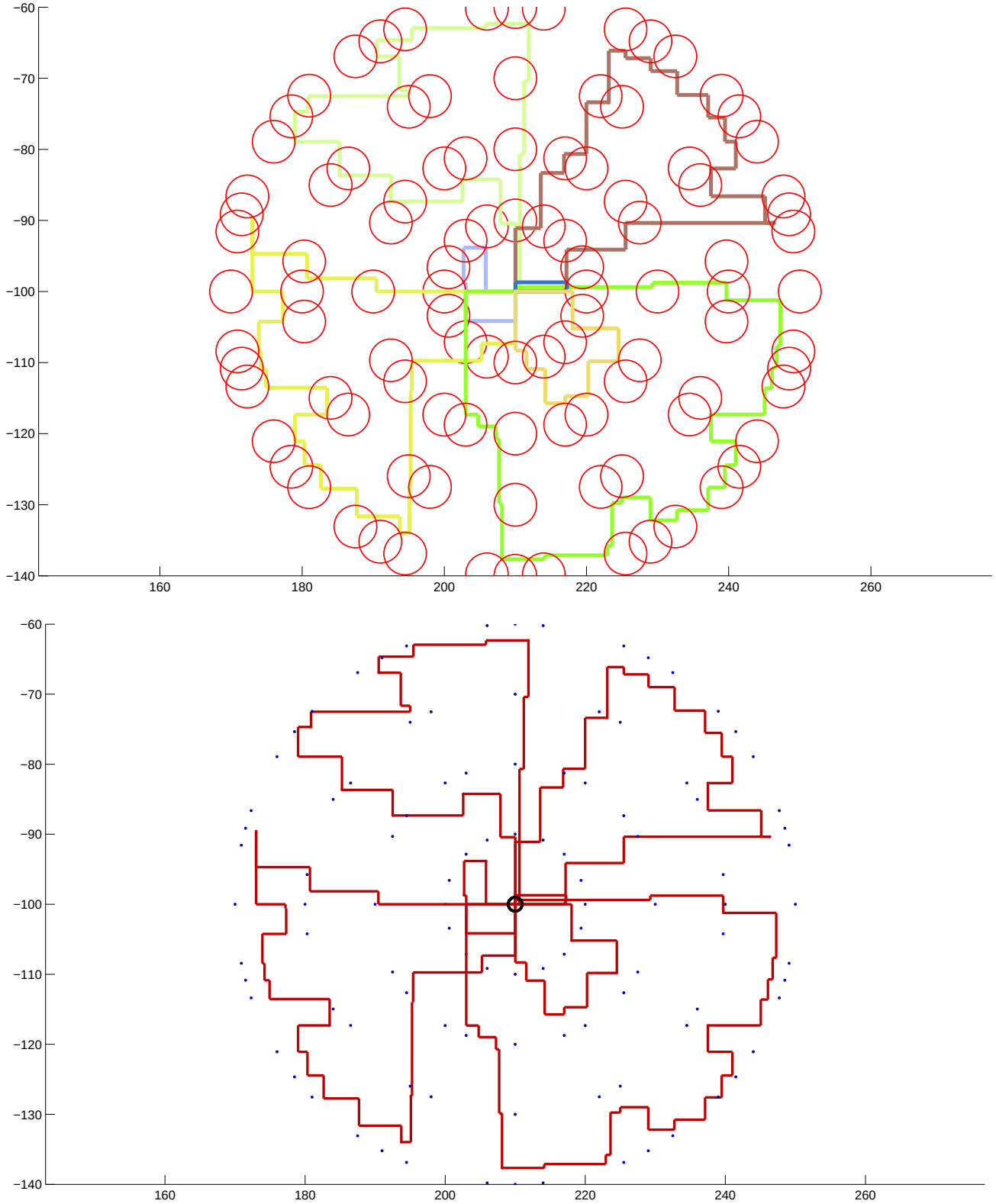


Figure O.136: *concentricCircles*4, Equal Radius, 2D, Manhattan, Length = 774.9603927

Table O-139: Solution for *concentricCircles*4, Equal Radius, 2D, Manhattan

Total distance: 774.960392695861 Total demand met: 536 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 35.1968522877031 Demand Met: 72			
95.838151124647	93.8306284324531	93	92.8585715715
95.8381027613866	93.8304972693203	96	90.8348486101
92.7124880926194	98.7183962601106	90	100
92.7124880926194	98.7183962601106	90.6	96.5882555782
92.9996645700232	104.141411505791	93	107.1414284285
92.9996645700232	104.141411505791	90.6	103.4117444218
Route: 2 Length: 178.64840925337 Demand Met: 90			
80.4620246725584	98.1485705943217	80	100
70.6955543224452	94.692885530883	70.3	95.7679792061
63.0000079250022	89.5489480200375	62.3	86.6317540418
63.0000059877887	91.154766618011	61.5	89.1487327929
63.0000059877887	91.154766618011	60.9	91.5625833337
63.000004066407	100.000862865808	60	100
67.1896387481538	100.593986311892	70	100
67.2999942556298	104.232008669081	70.3	104.2320207939
63.900005173695	108.437568246841	60.9	108.4374166663
64.2140095313295	110.855307574599	61.5	110.8512672071
64.9308596424846	113.542378549497	62.3	113.3682459582
73.4999934349459	117.313323085563	74	114.9666295471
73.4999934349459	117.313323085563	76.5	117.3132896932
69.0000067278878	121.07131681491	66	121.0713075057
70.3357353488034	124.436803451592	68.5	124.6525860712
72.643057723434	127.726755711642	71	127.5499546279
77.704038732448	131.617077008481	77.5	133.0718913883
83.7379476338973	133.973180924137	81	135.1994318136
83.7379476338973	133.973180924137	84.5	136.874788135
85.1047814913245	127.379551627199	85	125.9807621135
85.1047814913245	127.379551627199	88	127.4954541697
85.2633394857083	114.003211670842	84.5	112.6392246598
85.4249827333092	109.739450415662	82.5	109.6824583655
95.2400593532672	107.329911064973	96	109.1651513899
Route: 3 Length: 156.281827404226 Demand Met: 90			
100.603275128108	80.6853504312686	100	80
101.219641914033	70.3816582964314	100	70
101.878661115747	62.3218077964883	104	60.2005025157
101.878661115747	62.3218077964883	100	60
95.8256540358693	62.9332483289068	96	60.2005025157
85.4600620648466	64.6295313563163	84.5	63.125211865
80.5000019929121	66.9281098333828	81	64.8005681864
80.5000019929121	66.9281098333828	77.5	66.9281086117
83.655493287131	71.6459143434418	85	74.0192378865
84.9999978496643	72.5045355660163	88	72.5045458303
70.8449833495209	74.692831388297	68.5	75.3474139288
70.8449833495209	74.692831388297	71	72.4500453721
69.0000019879616	78.9286927390064	66	78.9286924943
75.2609231911779	83.6627101678327	74	85.0333704529
75.2609231911779	83.6627101678327	76.5	82.6867103068
82.4999785527427	87.3175393843596	84.5	87.3607753402
82.4999785527427	87.3175393843596	82.5	90.3175416345
92.5661558422518	84.2334728702958	93	81.2650060048
92.5661558422518	84.2334728702958	90	82.6794919243
97.8862384240406	90.4139262549958	100	90
Route: 4 Length: 147.452012308502 Demand Met: 90			
107.193966836665	94.115947205658	107	92.8585715715
115.499999644572	90.3607804500358	115.5	87.3607753402
119.374900062133	90.3607801083681	117.5	90.3175416345
136.351235860105	90.3607798730865	139.1	91.5625833337
136.351235860105	90.3607798730865	138.5	89.1487327929
135.112849429399	86.593648889639	137.7	86.6317540418
127.500005077685	82.6856300942588	126	85.0333704529
127.500005077685	82.6856300942588	124.5	82.6867103068
130.999994457067	78.9286941223441	134	78.9286924943
129.481085188189	75.5288586680042	131.5	75.3474139288
127.11223928446	72.3361705906488	129	72.4500453721
122.752509890195	68.9944455118346	122.5	66.9281086117
119.028056817953	67.1766528227447	119	64.8005681864
115.499999942008	66.1252190852357	115.5	63.125211865
113.137083855483	73.3745799074824	115	74.0192378865
113.137083855483	73.3745799074824	112	72.5045458303
109.981053506673	80.6462665338558	110	82.6794919243
106.847494279263	83.3251936951179	107	81.2650060048
103.571356161311	91.096711755816	104	90.8348486101

Solution x	Solution y	Original x	Original y
Route: 5 Length: 179.768004703258 Demand Met: 90			
93.0000062939852	117.320507468125	90	117.3205080757
94.780460972898	118.977925602948	93	118.7349939952
97.2575654441106	120.712029073344	100	120
97.715658631891	129.856955756567	100	130
98.1118316138439	137.668719531912	96	139.7994974843
98.1118316138439	137.668719531912	100	140
104.144486909451	137.109225431315	104	139.7994974843
112.922914062301	135.797636808174	115.5	136.874788135
113.60199900638	129.749388603537	112	127.4954541697
115.000001379762	128.980770697735	115	125.9807621135
119.000000057431	132.199423058004	119	135.1994318136
122.716476436054	130.764316002127	122.5	133.0718913883
127.11105925233	127.575756513369	129	127.5499546279
129.475732632912	124.440267291031	131.5	124.6525860712
130.999990852885	121.071307747997	134	121.0713075057
127.50000825729	117.313297309692	124.5	117.3132896932
127.50000825729	117.313297309692	126	114.9666295471
135.056282649766	113.604827587638	137.7	113.3682459582
136.072449588898	110.723979709661	138.5	110.8512672071
136.755890391482	107.645211229609	139.1	108.4374166663
137.264641215482	101.232016483205	140	100
129.70311688873	101.232015971735	129.7	104.2320207939
129.700988250216	99.9999662295832	130	100
129.698858962072	98.7679870576442	129.7	95.7679792061
119.285735011961	99.3911888847345	120	100
Route: 6 Length: 17.1379608688824 Demand Met: 24			
107.089878990017	99.6173114455298	110	100
107.283418372614	98.714437938173	109.4	96.5882555782
Route: 7 Length: 60.4753258699195 Demand Met: 80			
108.049776084505	105.180863859835	109.4	103.4117444218
108.049776084505	105.180863859835	107	107.1414284285
114.502585711144	109.809874476462	115.5	112.6392246598
114.502687869871	109.809910196332	117.5	109.6824583655
110.25869978604	114.704446837343	110	117.3205080757
107.000002320513	115.734975065088	107	118.7349939952
104.195138175481	110.902573166056	104	109.1651513899
101.570054246886	108.308099168725	100	110

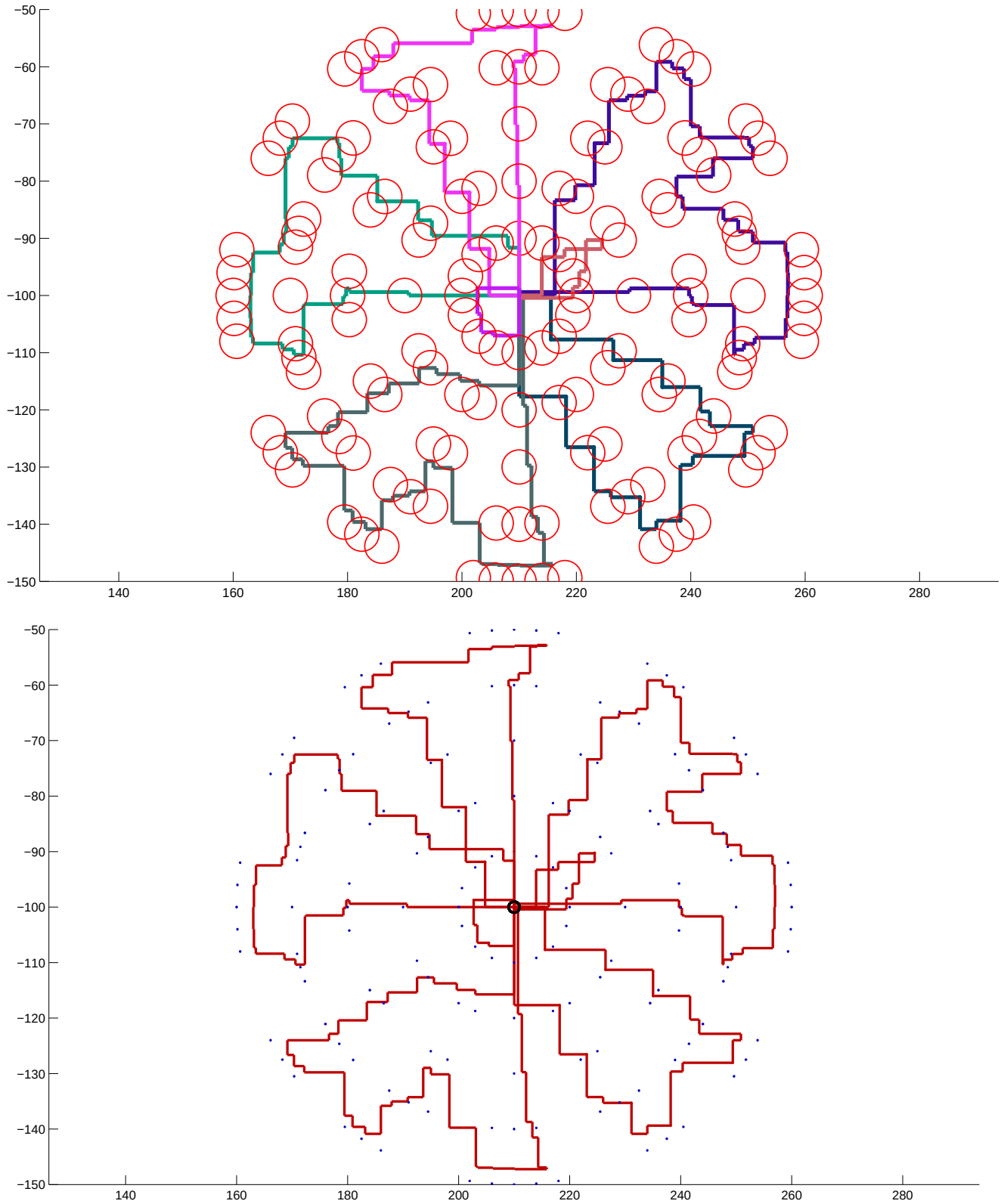
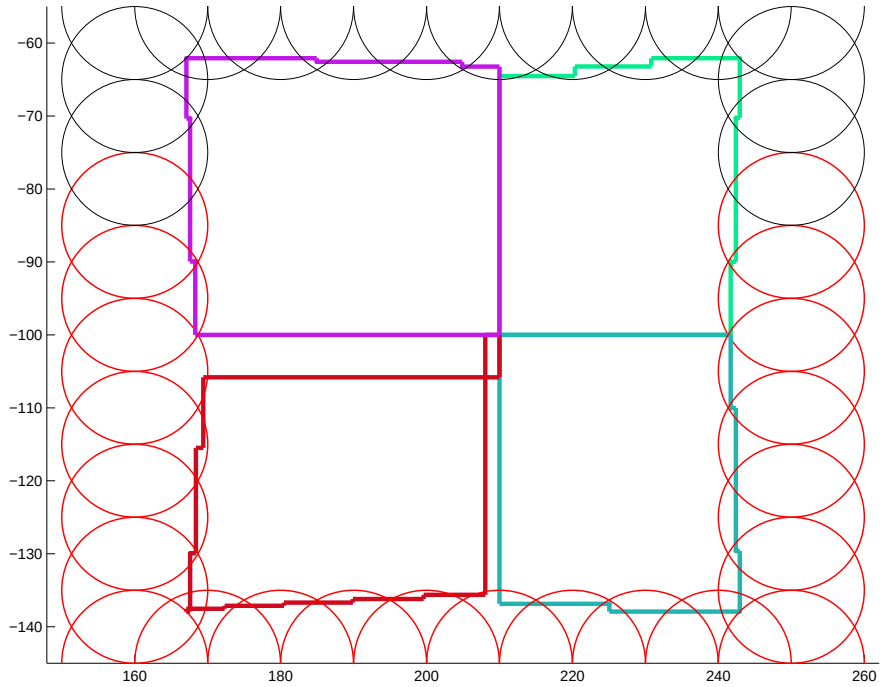


Figure O.137: *concentricCircles*5, Equal Radius, 2D, Manhattan, Length = 1023.2680182

Table O-140: Solution for *concentricCircles*5, Equal Radius, 2D, Manhattan

Total distance: 1023.26801823671 Total demand met: 580 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 163.4536131596 Demand Met: 90			
105.556121948699	107.706579419612	107	107.1414284285
105.556121948699	107.706579419612	104	109.1651513899
116.459369128331	111.307991082626	115.5	112.6392246598
116.459369128331	111.307991082626	117.5	109.6824583655
125.030539686371	116.009928752299	124.5	117.3132896932
125.030539686371	116.009928752299	126	114.9666295471
131.684542450582	120.277929547949	134	121.0713075057
133.337629725514	122.84262766178	131.5	124.6525860712
140.863403399097	123.99995767256	143.8634243989	124
139.391554170901	128.056306453515	139.6200706713	130.5
139.391554170901	128.056306453515	141.7582327212	127.5
130.363256955431	129.625514200311	129	127.5499546279
128.1920138237	139.389473344494	130.5	139.6200706713
128.1920138237	139.389473344494	127.5	141.7582327212
123.999997427523	140.863403180703	124	143.8634243989
121.126910029341	135.293621494835	122.5	133.0718913883
121.126910029341	135.293621494835	119	135.1994318136
116.026116075743	134.228247946715	115.5	136.874788135
113.078912035989	126.531891561301	115	125.9807621135
113.078912035989	126.531891561301	112	127.4954541697
108.190686346286	117.671187233532	110	117.3205080757
108.190686346286	117.671187233532	107	118.7349939952
Route: 2 Length: 172.527301181525 Demand Met: 84			
80.7131260159632	99.3916476926339	80	100
70.3000023570131	98.7679863460172	70.3	95.7679792061
69.7620585328674	100.126726650587	70	100
69.2230758157178	101.495267840857	70.3	104.2320207939
62.4392988153568	101.692689367578	60	100
62.299994780481	110.368238064013	62.3	113.3682459582
60.5926728863651	109.435988237679	61.5	110.8512672071
58.6236465480643	108.385313618917	60.9	108.4374166663
53.4574948685645	107.329977270965	50.644149283	108
53.1115025771264	103.974075661979	50.1602568225	104
53.000007040697	100.000000036077	50	100
53.1135414328177	96.0141206220483	50.1602568225	96
53.4915434045958	92.4888744708895	50.644149283	92
58.1561488912549	91.0633065232274	60.9	91.5625833337
58.8448689355817	88.9681067477343	61.5	89.1487327929
59.2999935002298	86.6312559626189	62.3	86.6317540418
59.1365815994867	76.0000026506186	56.1365756011	76
59.7262708676582	74.0007680560262	58.2417672788	72.5
60.3799312221131	72.5000059872797	60.3799293287	69.5
68.218079851703	73.303564477343	71	72.4500453721
68.5600274020834	76.007878787871	68.5	75.3474139288
68.9027015249469	79.0408609807654	66	78.9286924943
75.2074155231902	83.5338326715366	74	85.0333704529
75.2074155231902	83.5338326715366	76.5	82.6867103068
82.3371428409901	86.8455764566899	84.5	87.3607753402
84.7374660522899	89.5647633512778	82.5	90.3175416345
98.0308218182899	91.6376722904337	100	90
Route: 3 Length: 217.823569980813 Demand Met: 89			
100.682894085663	119.283093434072	100	120
101.386903545846	129.747882069848	100	130
102.149206453811	138.728800990969	100	140
103.278018066814	141.527617162752	104	139.7994974843
104.321258949591	146.931095806636	104	149.8397431775
105.87784820977	147.235348883723	108	149.355850717
100.111148298849	147.123915442533	100	150
96.1697555734934	146.976418390702	96	149.8397431775
93.430958189041	146.774186127101	92	149.355850717
93.0953545445595	139.75712277255	96	139.7994974843
88.3201701170921	130.139306879338	88	127.4954541697
85.0000002870266	128.9807692049	85	125.9807621135
83.6225600908356	134.244408281225	84.5	136.874788135
80.8137946428722	135.025963946895	81	135.1994318136
77.9237627784089	135.802954707778	77.5	133.0718913883
75.9999999285581	140.863416486154	76	143.8634243989
73.147367261719	139.608771776238	72.5	141.7582327212
70.8785595607252	137.590632900045	69.5	139.6200706713
69.4223332353718	129.774737019638	71	127.5499546279
62.18106258077	128.662875621329	60.3799293287	130.5
60.3351423940929	126.641454725166	58.2417672788	127.5
59.1365820148693	124.000000371774	56.1365756011	124
66.6339069368714	122.830093892529	68.5	124.6525860712
68.336373095462	120.41105022912	66	121.0713075057
73.446749245434	117.108218808475	74	114.9666295471
77.2022840431734	115.383398427445	76.5	117.3132896932
82.4999997864434	112.682464521998	82.5	109.6824583655
85.5536156323918	113.743266461156	84.5	112.6392246598
89.6626310163404	114.932163299832	90	117.3205080757
93.0000002419265	115.734987152527	93	118.7349939952
Route: 4 Length: 225.654090438051 Demand Met: 89			
106.231960957454	83.3472427437642	107	81.2650060048
109.813276822118	80.7115687155155	110	82.6794919243
113.183620576511	73.3747789351375	115	74.0192378865
113.183620576511	73.3747789351375	112	72.5045458303
115.694377994279	65.8538493018098	115.5	63.125211865
118.884910948195	65.0736436864665	119	64.8005681864
122.034015032469	64.305252325219	122.5	66.9281086117
123.999999767673	59.1365852492667	124	56.1365756011
126.743666701697	60.2896923515222	127.5	58.2417672788
128.822968273583	62.1666912146661	130.5	60.3799293287
130.015088373224	70.3962102822548	129	72.4500453721
131.584933119278	72.3794020781978	131.5	75.3474139288
139.386380804434	72.4563185796799	139.6200706713	69.5
140.20102914075	73.887054550666	141.7582327212	72.5
140.863412503756	76.0000004375475	143.8634243989	76
133.892513379766	79.2085887938737	134	78.9286924943
127.500010380606	82.6867099316742	124.5	82.6867103068
128.567630668982	84.8285632438747	126	85.0333704529
135.711342855353	86.7714141682601	137.7	86.6317540418
138.305887871323	88.8031183774785	138.5	89.1487327929
140.850344163458	90.7461498257442	139.1	91.5625833337
146.539320411855	92.361833733997	149.355850717	92
146.902771749593	96.0088006044395	149.8397431775	96
146.999986257991	100.000000018059	150	100
146.908756205352	103.968194809757	149.8397431775	104
146.599027716782	107.398139876193	149.355850717	108
141.181279623686	108.450006658224	139.1	108.4374166663
139.290802091794	109.489208803468	138.5	110.8512672071
137.699924413649	110.368232779193	137.7	113.3682459582
137.563668886128	101.673079285158	140	100
130.701905262508	101.488636938165	129.7	104.2320207939
130.198278203285	100.11367653305	130	100
129.699990364415	98.7679906920414	129.7	95.7679792061
119.294592762332	99.3930455805162	120	100
Route: 5 Length: 163.226378423364 Demand Met: 80			
94.7729568197797	91.8577102240146	93	92.8585715715
94.7729568197797	91.8577102240146	96	90.8348486101
91.3034167935106	81.9832303714518	90	82.6794919243
91.3034167935106	81.9832303714518	93	81.2650060048
86.9759450528614	73.4788872094519	85	74.0192378865
86.9759450528614	73.4788872094519	88	72.5045458303
84.2910895001131	65.8742939838434	84.5	63.125211865
80.8464917645023	65.0384341562157	81	64.8005681864
77.2957808619489	64.2124580580914	77.5	66.9281086117
72.5000052846761	60.3799296105963	69.5	60.3799293287
74.5202734994605	58.1561369031812	72.5	58.2417672788
78.0044285246661	55.8935874630691	76	56.1365756011
91.7593435393001	53.4948016011899	92	50.644149283
95.9880538696805	53.0747577959775	96	50.1602568225
100.078665281332	52.8920813934854	100	50
105.878311071798	52.7651104592619	108	50.644149283
104.168478956679	53.0681441532249	104	50.1602568225
102.857430291084	57.8623892989678	104	60.2005025157
100.813351031896	59.0771103118485	100	60
99.0000061161777	60.2004967362745	96	60.2005025157
99.3370035471012	70.1235014314842	100	70
99.6702574289629	80.6971567253869	100	80
Route: 6 Length: 49.4450089576693 Demand Met: 76			
103.952165541977	93.2749971112132	104	90.8348486101
107.942040258456	91.8846873203195	107	92.8585715715
114.499984085205	90.1892119478757	115.5	87.3607753402
114.499986160163	90.3175590447557	117.5	90.3175416345
111.667665376322	95.7763182273487	109.4	96.5882555782
110.502744699365	98.5016143824406	110	100
109.400082695913	100.411730266548	109.4	103.4117444218
Route: 7 Length: 31.1380560956919 Demand Met: 72			
99.9945935745884	106.999953186407	100	110
95.4219261267156	106.43293477746	93	107.1414284285
95.4219261267156	106.43293477746	96	109.1651513899
93.3532960055994	103.223470459748	90.6	103.4117444218

Solution x	Solution y	Original x	Original y
92.7123137027026	98.7186114358585	90.6	96.5882555782
92.7123137027026	98.7186114358585	90	100



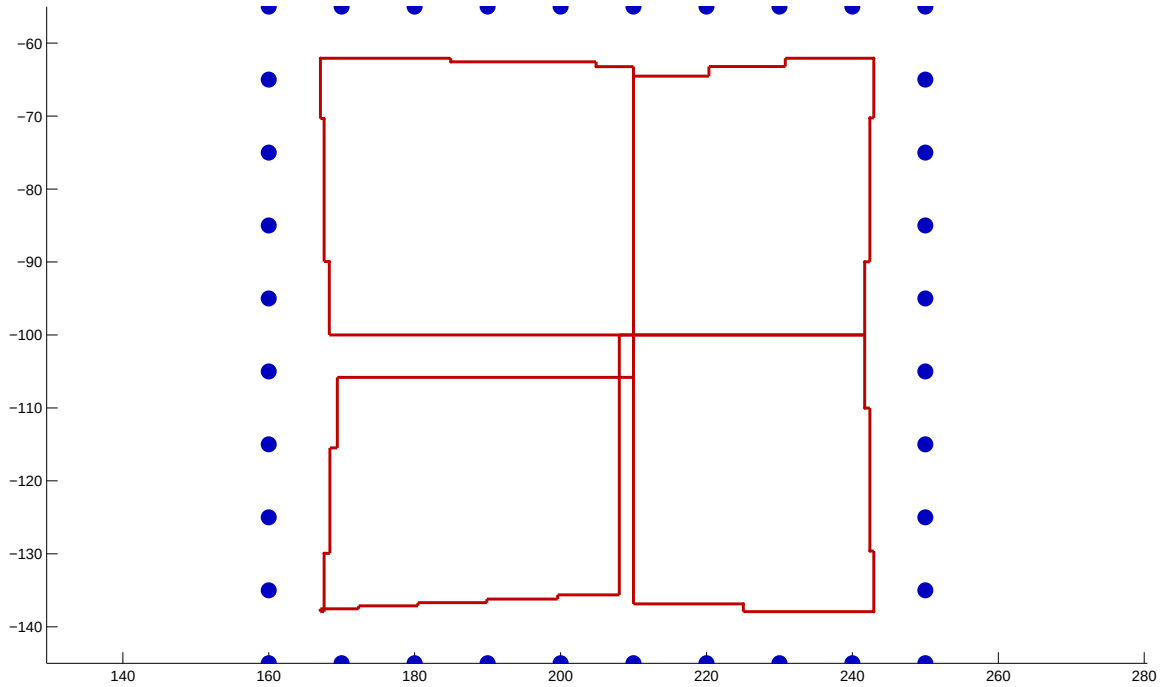
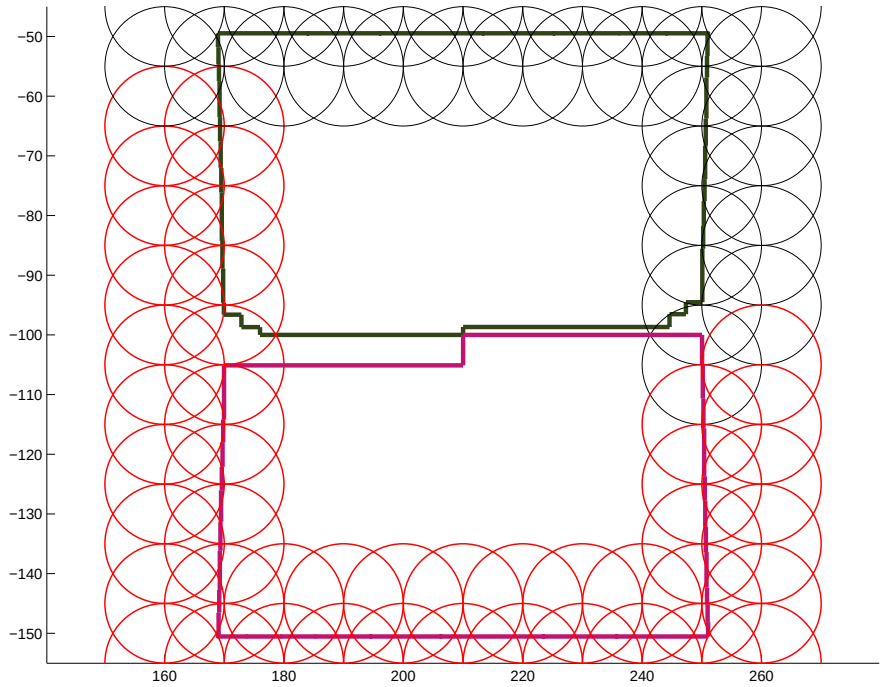


Figure O.138: *bubbles*1, Equal Radius, 2D, Manhattan, Length = 606.8627792

Table O-141: Solution for *bubbles*1, Equal Radius, 2D, Manhattan

Total distance: 606.862779166624 Total demand met: 432 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 141.715685258772 Demand Met: 96			
131.690333930424	89.9754650082433	140	85
131.690333930424	89.9754650082433	140	95
132.394733584933	70.2507597019436	140	65
132.394733584933	70.2507597019436	140	75
132.929284271374	62.0714416419875	140	55
132.929284271374	62.0714416419875	130	55
120.79681966306	63.2018865231954	120	55
110.343548636003	64.528297280424	110	55
Route: 2 Length: 141.715685655991 Demand Met: 96			
131.67681708759	110.021674888302	140	115
131.67681708759	110.021674888302	140	105
132.388841981113	129.617679201004	140	135
132.388841981113	129.617679201004	140	125
132.931268499877	137.926574328118	140	145
132.931268499877	137.926574328118	130	145
115.048991529323	136.868287777756	120	145
115.048991529323	136.868287777756	110	145
Route: 3 Length: 161.715709360289 Demand Met: 120			
98.0591097121698	135.626717992349	100	145
89.6054255127318	136.202806861707	90	145
79.8985667292312	136.693088523634	80	145
70.4508371309212	137.134034282045	70	145
62.3185683171031	137.543577625763	60	145
57.0710694490749	137.92892412922	50	145
57.5893678725754	129.939639228638	50	135
57.5893678725754	129.939639228638	50	125
58.3902000848178	115.482362171799	50	115
59.3936152053981	105.813855679451	50	105
Route: 4 Length: 161.715698891571 Demand Met: 120			
58.2955572710493	89.9441901333627	50	85
58.2955572710493	89.9441901333627	50	95
57.5866603059729	70.332135876613	50	65
57.5866603059729	70.332135876613	50	75
57.0733719913026	62.0687785629118	50	55
57.0733719913026	62.0687785629118	60	55
74.9444077450943	62.5621434352697	70	55
74.9444077450943	62.5621434352697	80	55
94.872972967741	63.2292252215344	100	55
94.872972967741	63.2292252215344	90	55



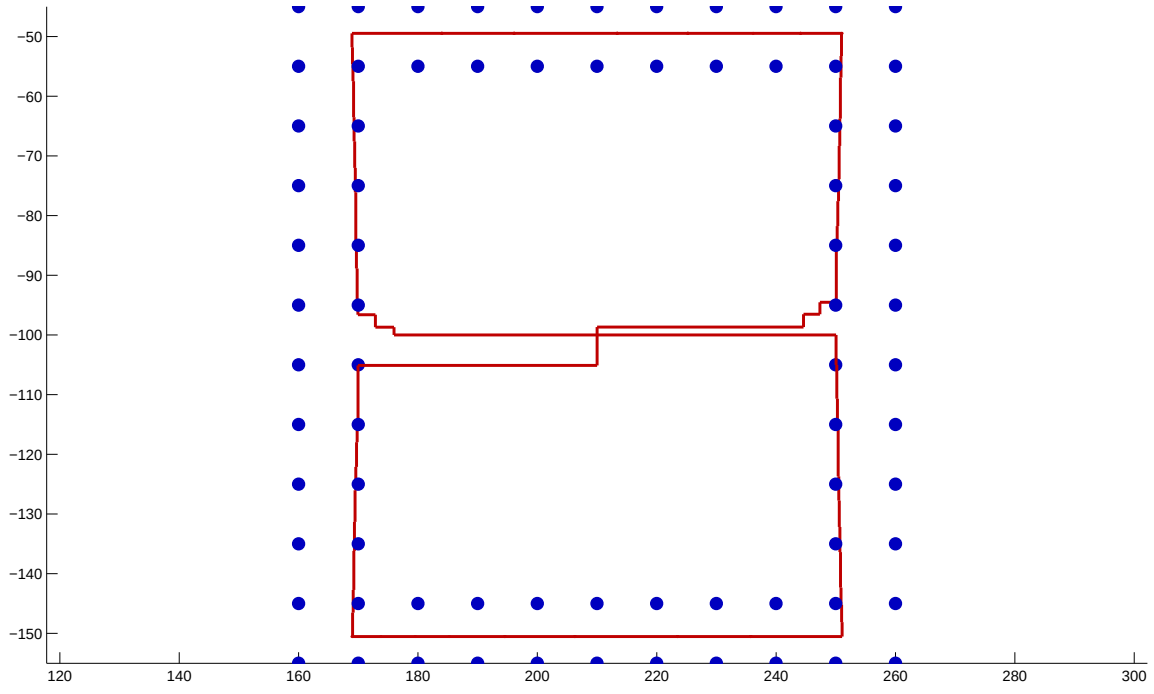


Figure O.139: *bubbles*2, Equal Radius, 2D, Manhattan, Length = 530.5572421

Table O-142: Solution for *bubbles*2, Equal Radius, 2D, Manhattan

Total distance: 530.557242072316			
Total demand met: 752			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 265.278632287122 Demand Met: 396			
65.9807510985597	98.6927329024172	60	105
62.8689285588963	96.6038158832759	60	95
59.9437590912362	94.6207034325171	50	95
59.8206682663513	88.8708879084915	60	85
59.6971340505277	84.2534879951175	50	85
59.5900930143288	76.1172157866415	50	75
59.4927198271384	72.0181574369882	60	75
59.3952752495629	67.5679533680132	60	65
59.2978079628575	63.521874181824	50	65
59.2050828709213	57.4944162228247	50	55
59.1175338312054	54.6531626716016	60	55
59.0303173098487	51.8061963556676	60	45
58.9438152822567	49.4730523672425	50	45
73.9990109227565	49.4730523577307	80	55
73.9990109227565	49.4730523577307	70	55
73.9990109227565	49.4730523577307	70	45
86.0983605909969	49.4730523481202	90	55
86.0983605909969	49.4730523481202	90	45
86.0983605909969	49.4730523481202	80	45
103.378144528219	49.4730523391358	100	55
103.378144528219	49.4730523391358	100	45
103.378144528219	49.4730523391358	110	45
115.212332965357	49.473052331157	110	55
115.212332965357	49.473052331157	120	55
115.212332965357	49.473052331157	120	45
126.172757297724	49.4730523234185	130	55
134.085533064102	49.473052315414	130	45
134.085533064102	49.473052315414	140	45
141.056183735873	49.473052310055	150	45
140.961916912013	53.2753148039446	140	55
140.867552527796	56.8909127503896	150	55
140.769220045922	63.7658095977949	150	65
140.665558770998	68.3349444268948	140	65
140.562233669053	73.8995930400991	150	75
140.449767644685	77.5813170234013	140	75
140.338045073812	81.7518858051839	140	85
140.227212441803	85.5506838423128	150	85
140.08301644828	94.5208322090258	150	95
137.331362494376	96.5379448328111	140	95
134.587480419886	98.6799313716163	140	105
Route: 2 Length: 265.278609785193 Demand Met: 356			
140.037711782754	105.019499462152	150	105
140.159640725488	110.681830825402	140	115
140.281572935851	115.642389131017	150	115
140.390196212427	123.684272499196	150	125
140.489593160183	127.744335189096	140	125
140.589041694574	132.172252080088	140	135
140.688545927467	136.379336493365	150	135
140.784119223017	142.335903358948	150	145
140.874597806997	145.19507529019	140	145
140.965143952461	148.106768033893	140	155
141.055805026593	150.527692216881	150	155
125.733178899234	150.527692202736	120	145
125.733178899234	150.527692202736	130	145
125.733178899234	150.527692202736	130	155
113.483579073675	150.527692225208	110	145
113.483579073675	150.527692225208	110	155
113.483579073675	150.527692225208	120	155
96.2934079878287	150.527692213184	100	145
96.2934079878287	150.527692213184	100	155
96.2934079878287	150.527692213184	90	155
84.5511146803284	150.527692200246	90	145
84.5511146803284	150.527692200246	80	145
84.5511146803284	150.527692200246	80	155
75.2670702527175	150.527692187287	70	145
69.5553673710313	150.527692174579	70	155
63.7853071547233	150.527692161604	60	155
58.9441923733482	150.527692148315	50	155
59.0447076130964	146.523748943901	60	145
59.1451937654115	142.719327818146	50	145
59.2500263529164	136.165236068144	50	135
59.3589413245177	131.324974316443	60	135
59.4678374820201	126.023693074213	50	125
59.5832716255898	122.102092621427	60	125
59.6987219651302	117.976554553278	60	115
59.8142046576505	114.179231347605	50	115
59.9587822169134	105.111708299854	50	105

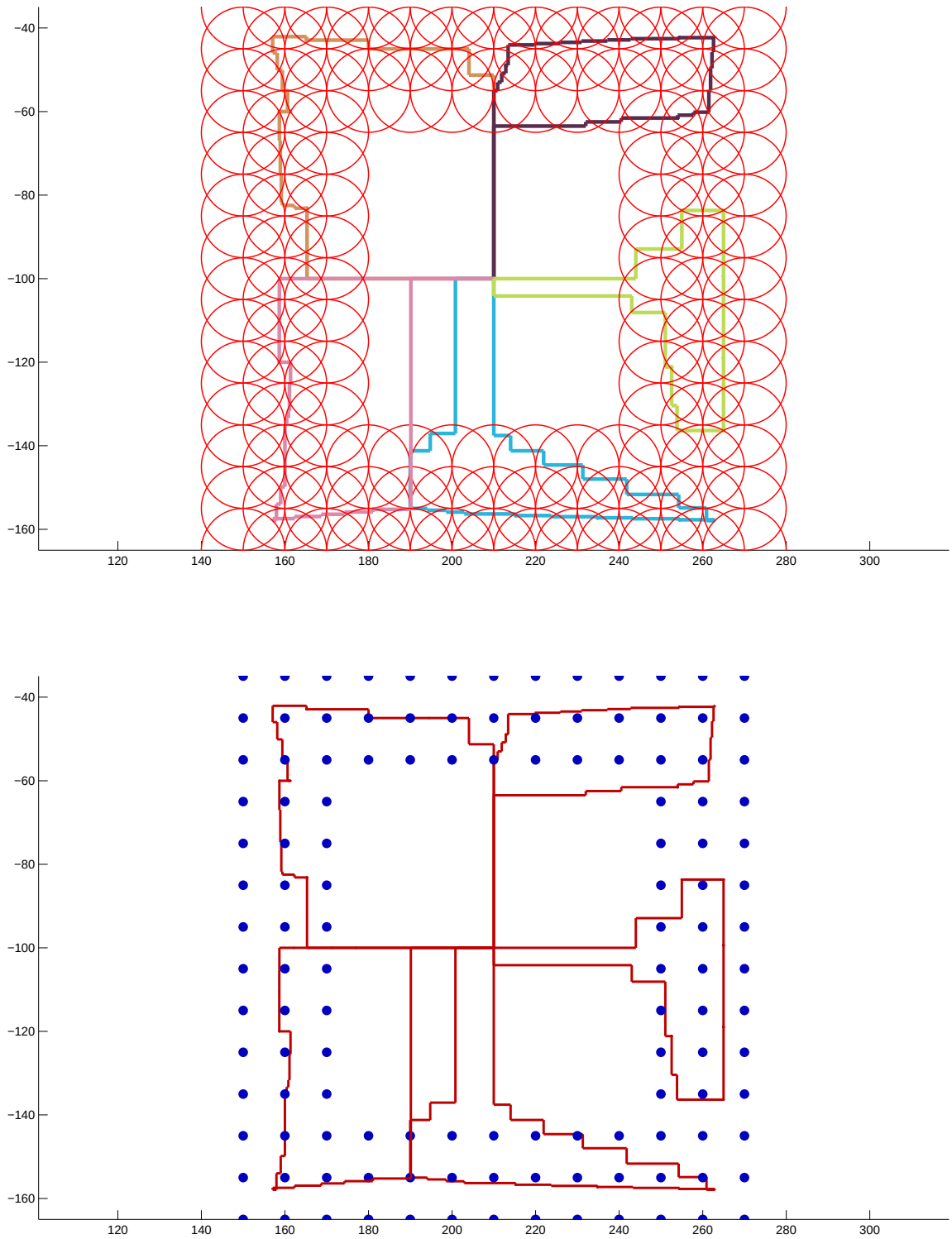


Figure O.140: *bubbles*3, Equal Radius, 2D, Manhattan, Length = 1152.9396798

Table O-143: Solution for *bubbles*3, Equal Radius, 2D, Manhattan

Total distance: 1152.93967977946			
Total demand met: 1052			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 227.074675843081 Demand Met: 210			
55.2989093594595	83.1581064706432	50	75
55.2989093594595	83.1581064706432	60	75
55.2989093594595	83.1581064706432	60	85
52.2780126672916	82.4596283728893	50	85
49.3766143953224	81.755900489012	40	85
49.1256983682738	74.6493284595878	40	75
48.8929050810007	66.9588778335084	50	65
48.6595815551161	60.0011746882086	40	55
48.6595815551161	60.0011746882086	40	65
51.3390617257236	60.0011749186424	60	65
50.6205814660763	55.0414473741727	50	55
50.6205814660763	55.0414473741727	60	55
49.3904016828284	50.0980557734249	50	45
48.1491723107115	45.9640857170801	40	45
47.0710787535585	42.0710637259425	40	35
55.169769395686	42.8959634052846	50	35
55.169769395686	42.8959634052846	60	35
55.169769395686	42.8959634052846	60	45
69.9963360019674	44.9999957634817	70	45
69.9963360019674	44.9999957634817	70	55
70.0074639861011	44.9999977499733	70	35
79.9905781020813	44.9999996713522	80	35
80.0120955905789	45.0000018036024	80	55
84.5746844315302	45.0000034726079	80	45
90.0000015938863	45.0000051418227	90	35
94.0547440584519	51.2711201702458	90	45
Route: 2 Length: 261.715691396415 Demand Met: 210			
90.8017395409556	137.051325864369	90	145
84.7755955643692	141.218717260195	80	145
80.0000059387908	144.999897411955	70	145
80.0000058981171	154.997019981687	70	155
84.0631505841219	155.439644242424	80	155
88.5970251469067	155.882906428559	90	155
92.9420541095077	156.328132273889	90	165
105.238059767763	156.707427362131	110	165
105.238059767763	156.707427362131	100	165
105.238059767763	156.707427362131	100	155
113.722540239166	156.974523033355	110	155
124.812053768171	157.242787697106	130	165
124.812053768171	157.242787697106	120	165
124.812053768171	157.242787697106	120	155
133.343241709107	157.47737373024	130	155
144.474738501732	157.712802557878	150	165
144.474738501732	157.712802557878	140	165
144.474738501732	157.712802557878	140	155
152.929001192593	157.928850403731	160	165
150.91998871976	154.887262914801	160	155
144.246538484394	151.662879877611	150	155
131.790213114249	147.973950698332	130	145
121.30808927438	144.597176040194	120	145
111.934805695987	141.219076573374	110	145
104.009095977757	137.542745410082	100	145
Route: 3 Length: 221.715703646683 Demand Met: 212			
100.000004926872	55.0004197159403	90	55
100.927238339971	52.9714728491298	100	55
101.881669028397	50.8241015637884	100	45
102.862621602317	48.939844460845	110	45
102.862621602317	48.939844460845	110	55
103.434339728409	44.0427813896822	100	35
109.776182471219	43.7191507219811	110	35
115.929960083467	43.4240033076371	120	45
121.000000127133	43.1275879412166	120	35
127.186871254927	42.8480979849809	130	45
132.74923493324	42.5668839949743	130	35
144.425324444449	42.2997613678905	150	35
144.425324444449	42.2997613678905	140	35
144.425324444449	42.2997613678905	140	45
152.929292519659	42.0714406963169	160	35
152.592878076106	45.7697847584999	160	45
152.233882744942	49.6649442521102	150	45
151.881606074022	54.9688043231006	160	55
151.48653131898	60.1653800446664	160	65
147.787426343524	60.8629905993897	150	65
143.993394873023	61.5375549850009	150	55
143.993394873023	61.5375549850009	140	55
143.993394873023	61.5375549850009	140	65
130.494718933963	62.4781372507725	130	55
122.017095550233	63.4748376501747	120	55
Route: 4 Length: 227.074669472011 Demand Met: 208			
80.1456958128956	155.211536130597	80	165
71.0427814703768	155.864700437935	70	165
64.2802521270575	156.400987881841	60	155
58.683485342382	156.942829657414	60	165
52.3106217861036	157.449311976208	50	165
47.0710735809658	157.928927679301	40	165
47.9718309814109	153.966418322829	40	155
48.9904707472683	149.839293129126	50	155
49.9999949303967	145.00391809079	60	145
49.9999974244255	144.997040294254	50	145
49.9999999183981	144.990162921173	40	145
50.0000046168924	135.000016231341	40	135
50.4057625642532	133.344679655579	50	135
50.8116030291559	131.673189248761	60	135
51.0836368237402	125.431591612948	50	125
51.0836368237402	125.431591612948	60	125
51.3380390760459	119.997053051954	60	115
48.6585587196857	119.997053333265	40	125
48.6587422815147	115.204348467679	40	115
48.6589258634325	110.556742949558	50	115
48.6591094102781	105.190098582257	40	105
48.6592928733488	100.001592162219	40	95
52.1904570977346	100.001273716726	50	95
55.940779689423	100.000955274318	50	105
61.2975666659489	100.000636820457	60	95
66.9262870588796	100.000318386345	60	105
Route: 5 Length: 215.358939421267 Demand Met: 212			
134.002059415477	92.895482744922	140	95
144.999999298598	83.660260969234	150	75
144.999999298598	83.660260969234	140	75
144.999999298598	83.660260969234	140	85
154.99998469451	83.6602561906282	160	75
154.99998469451	83.6602561906282	160	85
154.99998469451	83.6602561906282	150	85
154.999984801264	99.3687323788058	160	105
154.999984801264	99.3687323788058	160	95
154.999984801264	99.3687323788058	150	95
154.999984868846	118.945215809793	160	125
154.999984868846	118.945215809793	160	115
154.999984868846	118.945215809793	150	115
154.999984889059	136.339741012203	160	145
154.999984889059	136.339741012203	160	135
144.999999367441	136.339735615323	150	145
144.999999367441	136.339735615323	140	145
144.999999367441	136.339735615323	140	135
143.859829816997	130.383584561046	150	135
142.574226109592	121.149107488283	150	125
142.574226109592	121.149107488283	140	125
142.574226109592	121.149107488283	140	115
141.04837580163	108.114953407643	150	105
133.015598606988	104.142362193362	140	105

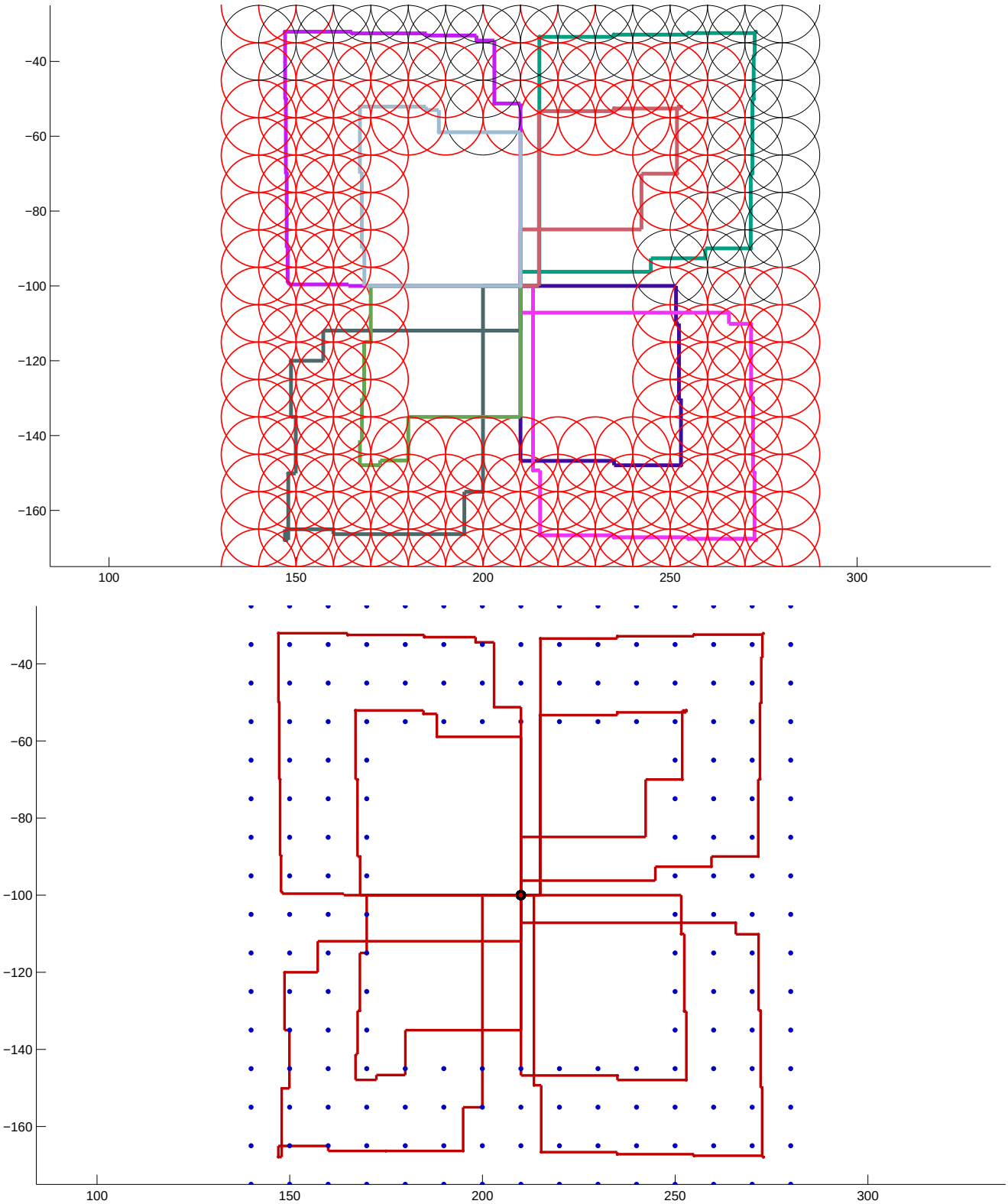


Figure O.141: *bubbles*4, Equal Radius, 2D, Manhattan, Length = 1778.8584587

Table O-144: Solution for *bubbles*4, Equal Radius, 2D, Manhattan

Total distance: 1778.8584587217			
Total demand met: 1284			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 261.715692445872 Demand Met: 170			
105.048889068182	33.4256193974311	110	25
105.048889068182	33.4256193974311	100	25
105.048889068182	33.4256193974311	110	35
105.048889068182	33.4256193974311	100	35
124.972126939344	32.8328334491117	130	25
124.972126939344	32.8328334491117	120	25
124.972126939344	32.8328334491117	130	35
124.972126939344	32.8328334491117	120	35
144.914671632126	32.4190745082017	150	25
144.914671632126	32.4190745082017	140	25
144.914671632126	32.4190745082017	150	35
144.914671632126	32.4190745082017	140	35
162.928923227467	32.0710770045312	170	25
162.928923227467	32.0710770045312	160	25
162.641384373456	38.1644887023625	170	35
162.641384373456	38.1644887023625	160	35
162.347528050777	50.0466625232991	170	45
162.347528050777	50.0466625232991	170	55
162.347528050777	50.0466625232991	160	45
162.347528050777	50.0466625232991	160	55
162.005892818152	69.9215172270295	170	65
162.005892818152	69.9215172270295	170	75
162.005892818152	69.9215172270295	160	65
162.005892818152	69.9215172270295	160	75
161.558112519443	89.9733113735863	170	85
161.558112519443	89.9733113735863	170	95
161.558112519443	89.9733113735863	160	85
161.558112519443	89.9733113735863	160	95
149.414515910413	92.6329625733612	150	85
149.414515910413	92.6329625733612	150	95
134.871435207212	96.2252206621439	140	95
Route: 2 Length: 266.848598475435 Demand Met: 142			
89.9999821564775	155.009234293388	90	165
89.9999821564775	155.009234293388	80	155
89.9999821564775	155.009234293388	90	155
89.9999821564775	155.009234293388	100	155
84.9999971605078	166.341069328963	80	175
84.9999971605078	166.341069328963	90	175
84.9999971605078	166.341069328963	80	165
65.0000014559207	166.341080385381	60	175
65.0000014559207	166.341080385381	70	175
65.0000014559207	166.341080385381	70	165
49.9998355382443	165.056329103708	50	175
49.9998355382443	165.056329103708	40	165
49.9998355382443	165.056329103708	50	165
49.9998355382443	165.056329103708	60	165
37.067090806579	167.925287358908	30	175
37.067090806579	167.925287358908	40	175
37.067090806579	167.925287358908	30	165
37.9358011336477	150.102109443521	30	155
37.9358011336477	150.102109443521	30	145
37.9358011336477	150.102109443521	40	155
39.9409444516042	135.000178242755	30	135
39.9409444516042	135.000178242755	40	145
39.9409444516042	135.000178242755	40	135
39.9409444516042	135.000178242755	40	125
38.6595930478892	120.000000423191	30	125
38.6595930478892	120.000000423191	30	115
47.2865728200979	111.950815512767	40	115
Route: 3 Length: 181.715689089978 Demand Met: 160			
141.59744502248	110.049343797944	150	115
141.59744502248	110.049343797944	150	105
141.59744502248	110.049343797944	140	115
141.59744502248	110.049343797944	140	105
142.366431560955	130.082285614083	150	135
142.366431560955	130.082285614083	150	125
142.366431560955	130.082285614083	140	135
142.366431560955	130.082285614083	140	125
142.926184253031	147.931660291958	150	155
142.926184253031	147.931660291958	140	155
142.926184253031	147.931660291958	150	145
142.926184253031	147.931660291958	140	145
Route: 4 Length: 261.715726511223 Demand Met: 170			
103.373082122775	149.293718332883	110	155
103.373082122775	149.293718332883	110	145
103.373082122775	149.293718332883	100	145
105.261263571329	166.643151059667	110	175
105.261263571329	166.643151059667	100	175
105.261263571329	166.643151059667	110	165
105.261263571329	166.643151059667	100	165
124.983507110392	167.174736653192	130	175
124.983507110392	167.174736653192	120	175
124.983507110392	167.174736653192	130	165
124.983507110392	167.174736653192	120	165
144.925923400354	167.58107350601	150	175
144.925923400354	167.58107350601	140	175
144.925923400354	167.58107350601	150	165
144.925923400354	167.58107350601	140	165
162.928933193866	167.928930061745	170	175
162.928933193866	167.928930061745	160	175
162.928933193866	167.928930061745	170	165
162.928933193866	167.928930061745	160	165
162.585550422408	149.926794200431	170	155
162.585550422408	149.926794200431	170	145
162.585550422408	149.926794200431	160	155
162.585550422408	149.926794200431	160	145
162.182927983378	129.987230561492	170	135
162.182927983378	129.987230561492	170	125
162.182927983378	129.987230561492	160	135
162.182927983378	129.987230561492	160	125
161.655614771777	110.14582207918	170	115
161.655614771777	110.14582207918	170	105
155.739717089124	107.144285746399	160	115
155.739717089124	107.144285746399	160	105
Route: 5 Length: 181.715670597542 Demand Met: 168			
104.955254901368	53.2842167222765	110	45
104.955254901368	53.2842167222765	100	45
104.955254901368	53.2842167222765	110	55
104.955254901368	53.2842167222765	100	55
124.996904833056	52.5906002241303	130	45
124.996904833056	52.5906002241303	120	45
124.996904833056	52.5906002241303	130	55
124.996904833056	52.5906002241303	120	55
142.929425766084	52.0715904673127	150	45
142.929425766084	52.0715904673127	140	45
142.929425766084	52.0715904673127	150	55
142.929425766084	52.0715904673127	140	55
141.832458497202	69.9933157850281	150	65
141.832458497202	69.9933157850281	150	75
141.832458497202	69.9933157850281	140	65
141.832458497202	69.9933157850281	140	75
132.353504604543	84.8912954243616	140	85
Route: 6 Length: 261.715696330353 Demand Met: 166			
54.0420198854417	99.610440473197	50	105
38.0513897540295	99.2121738331426	30	105
38.0513897540295	99.2121738331426	40	105
37.7552206922492	89.8058365883325	30	85
37.7552206922492	89.8058365883325	30	95
37.7552206922492	89.8058365883325	40	85
37.7552206922492	89.8058365883325	40	95
37.5046730967029	69.9627375020886	30	65
37.5046730967029	69.9627375020886	30	75
37.5046730967029	69.9627375020886	40	65
37.5046730967029	69.9627375020886	40	75
37.2797786563262	50.025675315117	30	45
37.2797786563262	50.025675315117	30	55
37.2797786563262	50.025675315117	40	45
37.2797786563262	50.025675315117	40	55
37.0723955815226	32.0697562533007	30	25
37.0723955815226	32.0697562533007	40	25
37.0723955815226	32.0697562533007	30	35
37.0723955815226	32.0697562533007	40	35
55.0181776050207	32.5158549897351	50	25
55.0181776050207	32.5158549897351	60	25
55.0181776050207	32.5158549897351	50	35
55.0181776050207	32.5158549897351	60	35
74.9354505834076	33.0830282641899	70	25
74.9354505834076	33.0830282641899	80	25
125.040395852887	146.768812396906	130	155
125.040395852887	146.768812396906	120	155
125.040395852887	146.768812396906	130	145
125.040395852887	146.768812396906	120	145

Solution x	Solution y	Original x	Original y
74.9354505834076	33.0830282641899	70	35
74.9354505834076	33.0830282641899	80	35
88.23326637012	34.422415915016	90	25
88.23326637012	34.422415915016	90	35
93.0327959655129	51.2287109930625	90	45
93.0327959655129	51.2287109930625	90	55
Route: 7 Length: 181.715684958117 Demand Met: 152			
59.9927466327426	114.999999869906	50	115
59.9927466327426	114.999999869906	60	125
59.9927466327426	114.999999869906	60	115
59.9927466327426	114.999999869906	60	105
58.2086416192205	129.99484391755	50	135
58.2086416192205	129.99484391755	50	125
57.6121641268323	141.247557772421	50	145
57.0711177135047	147.928960192563	50	155
62.4799329172292	146.661914200247	60	155
69.9999949335745	145.004143933943	70	155
69.9999949335745	145.004143933943	60	145
69.9999949335745	145.004143933943	70	145
69.9999949335745	145.004143933943	80	145
70.0000026685186	135.011343782906	60	135
89.997520015669	135.002392870496	90	145
Route: 8 Length: 181.71570031318 Demand Met: 156			
58.2579868448722	89.9919891571978	50	85
58.2579868448722	89.9919891571978	50	95
58.2579868448722	89.9919891571978	60	85
58.2579868448722	89.9919891571978	60	95
57.5846944572124	70.0129977907784	50	65
57.5846944572124	70.0129977907784	50	75
57.5846944572124	70.0129977907784	60	65
57.5846944572124	70.0129977907784	60	75
57.0715937162873	52.0705561271229	50	45
57.0715937162873	52.0705561271229	60	45
57.0715937162873	52.0705561271229	50	55
57.0715937162873	52.0705561271229	60	55
74.7227312589533	52.9889126295861	70	45
74.7227312589533	52.9889126295861	80	45
78.1876982840098	58.9174863178154	70	55
78.1876982840098	58.9174863178154	80	55

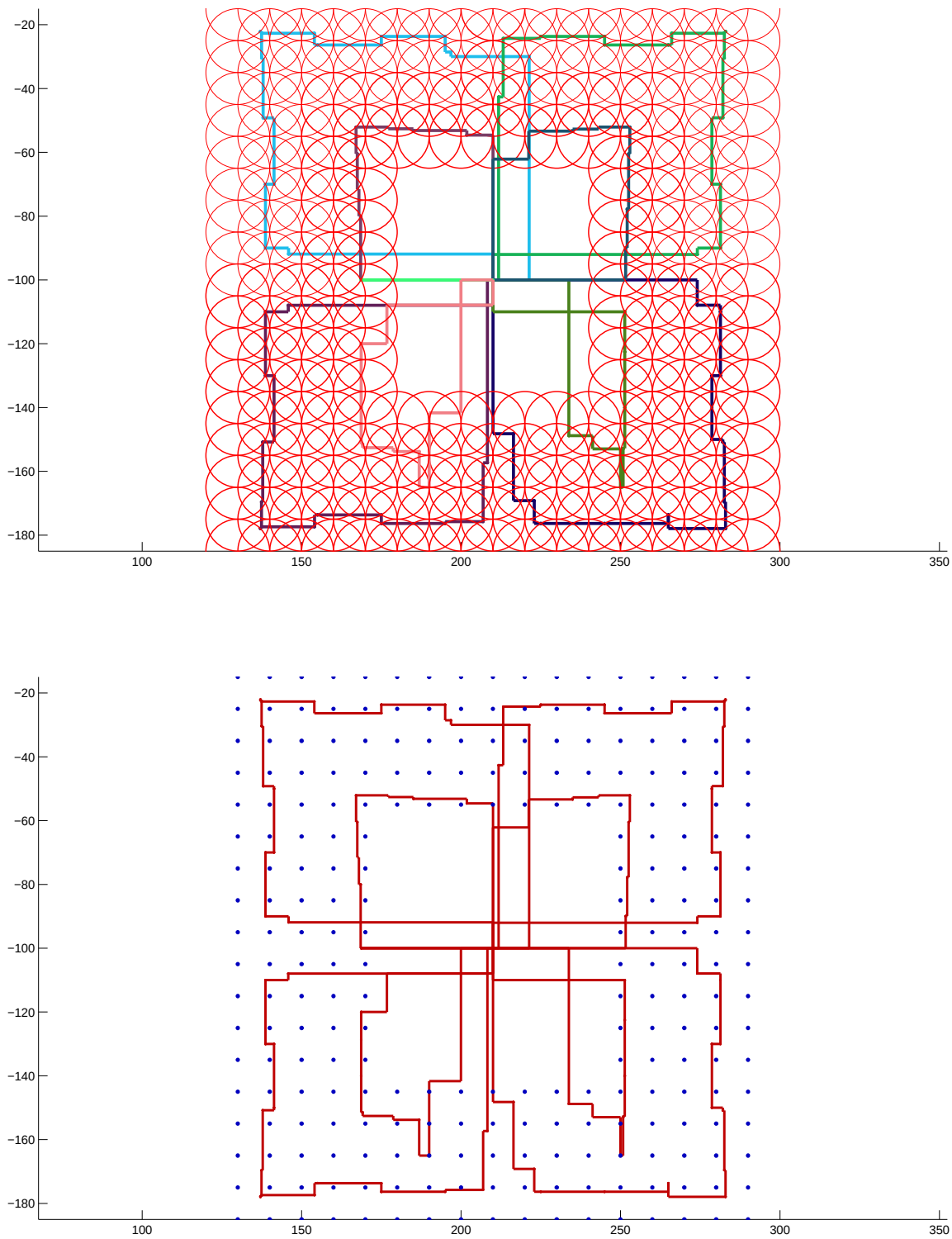


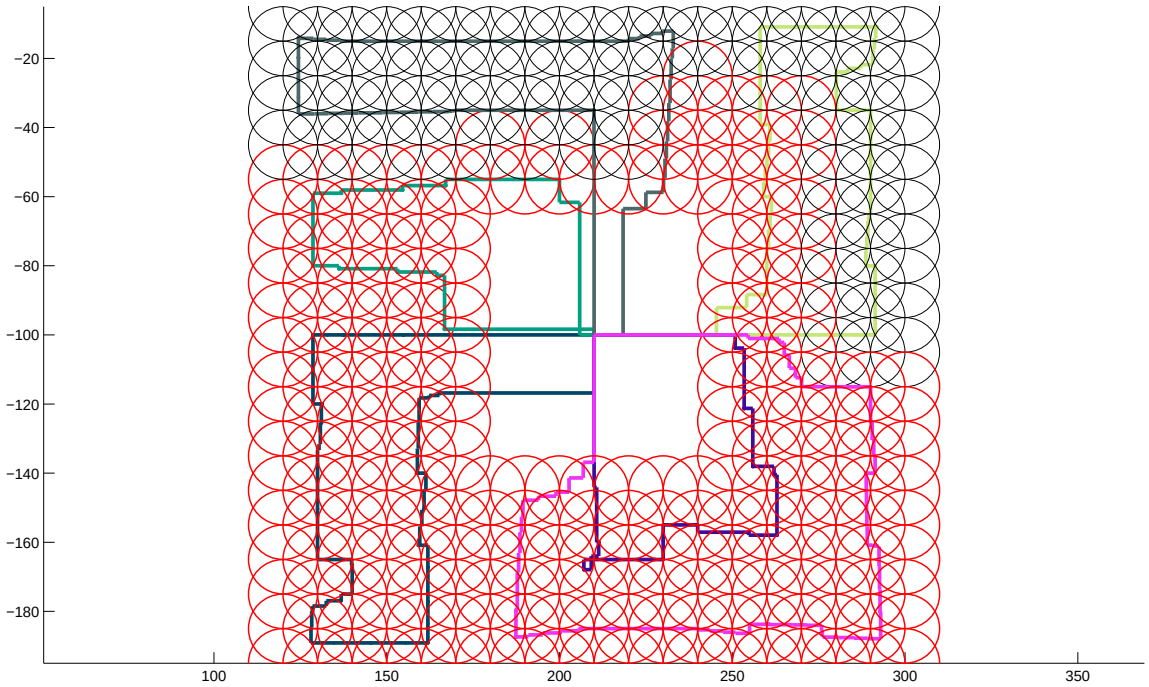
Figure O.142: *bubbles*5, Equal Radius, 2D, Manhattan, Length = 2143.8837484

Table O-145: Solution for *bubbles*5, Equal Radius, 2D, Manhattan

Total distance: 2143.88374837429			
Total demand met: 1416			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 335.113132325961 Demand Met: 176			
111.339740116211	29.9999995085532	120	25
111.339740116211	29.9999995085532	120	35
111.339740116211	29.9999995085532	110	35
86.8165884326824	28.5370333645145	80	25
86.8165884326824	28.5370333645145	80	35
86.8165884326824	28.5370333645145	90	35
85.0000002883944	23.660258820459	80	15
85.0000002883944	23.660258820459	90	15
85.0000002883944	23.660258820459	90	25
65.000001092049	23.6602583283758	60	15
65.000001092049	23.6602583283758	70	15
65.000001092049	23.6602583283758	70	25
64.9999979338777	26.3397420518998	60	25
64.9999979338777	26.3397420518998	60	35
64.9999979338777	26.3397420518998	70	35
45.0000009680576	26.3397417991957	40	25
45.0000009680576	26.3397417991957	40	35
45.0000009680576	26.3397417991957	50	35
43.9894536380481	22.6837894282196	40	15
43.9894536380481	22.6837894282196	50	15
43.9894536380481	22.6837894282196	50	25
27.0713313242177	22.0708097033736	20	15
27.0713313242177	22.0708097033736	30	15
27.0713313242177	22.0708097033736	30	25
27.4516946309649	30.3948970773668	20	25
27.4516946309649	30.3948970773668	20	35
27.4516946309649	30.3948970773668	30	35
27.9137257686803	49.1989333693845	20	45
27.9137257686803	49.1989333693845	20	55
27.9137257686803	49.1989333693845	30	55
31.3397412863465	50.000000058479	30	45
31.3397412863465	50.000000058479	40	45
31.3397412863465	50.000000058479	40	55
31.3397416668691	69.9999983996306	30	65
31.3397416668691	69.9999983996306	40	65
31.3397416668691	69.9999983996306	40	75
28.6602583160317	70.0000010478878	20	65
28.6602583160317	70.0000010478878	20	75
28.6602583160317	70.0000010478878	30	75
28.6602588384399	89.9999998272784	20	85
28.6602588384399	89.9999998272784	20	95
28.6602588384399	89.9999998272784	30	95
35.9045151215051	91.9038534300026	30	85
35.9045151215051	91.9038534300026	40	85
35.9045151215051	91.9038534300026	40	95
Route: 2 Length: 312.433606692619 Demand Met: 176			
164.061318044028	107.923216354993	170	115
164.061318044028	107.923216354993	160	115
164.061318044028	107.923216354993	160	105
171.339738113371	109.999999792054	180	115
171.339738113371	109.999999792054	180	105
171.339738113371	109.999999792054	170	105
171.339738275772	129.999997651997	180	135
171.339738275772	129.999997651997	180	125
171.339738275772	129.999997651997	170	125
168.660261409125	130.000001868194	170	135
168.660261409125	130.000001868194	160	135
168.660261409125	130.000001868194	160	125
168.660262071332	149.999999538965	170	155
168.660262071332	149.999999538965	160	155
168.660262071332	149.999999538965	160	145
172.065047738592	150.844128468551	180	155
172.065047738592	150.844128468551	180	145
172.065047738592	150.844128468551	170	145
172.535985720293	169.557012164585	180	175
172.535985720293	169.557012164585	180	165
172.535985720293	169.557012164585	170	165
172.927799172431	177.930050974219	180	185
172.927799172431	177.930050974219	170	185
172.927799172431	177.930050974219	170	175
155.000001355927	173.660262639106	160	175
155.000001355927	173.660262639106	160	165
155.000001355927	173.660262639106	150	165
154.999996312717	176.33973811675	160	185
154.999996312717	176.33973811675	150	185
154.999996312717	176.33973811675	150	175
134.999999383871	176.33973897212	140	185
134.999999383871	176.33973897212	130	185
134.999999383871	176.33973897212	130	175
114.999999801815	176.339738010858	120	185
114.999999801815	176.339738010858	110	185
114.999999801815	176.339738010858	110	175
112.945612822417	169.192240036794	120	175
112.945612822417	169.192240036794	120	165
112.945612822417	169.192240036794	110	165
106.425659566158	148.216278561027	110	155
106.425659566158	148.216278561027	110	145
106.425659566158	148.216278561027	100	145
Route: 3 Length: 312.433693266052 Demand Met: 172			
101.773054727375	42.6157180057411	100	35
101.773054727375	42.6157180057411	110	45
101.773054727375	42.6157180057411	100	45
103.200588742889	24.2603805678103	100	15
103.200588742889	24.2603805678103	100	25
114.999999992432	23.6602542768055	120	15
114.999999992432	23.6602542768055	110	15
114.999999992432	23.6602542768055	110	25
134.999999903102	23.6602542700895	140	15
134.999999903102	23.6602542700895	130	15
134.999999903102	23.6602542700895	130	25
135.000000038714	26.339745701345	140	25
135.000000038714	26.339745701345	140	35
135.000000038714	26.339745701345	130	35
154.999999990938	26.3397456676299	160	25
154.999999990938	26.3397456676299	160	35
154.999999990938	26.3397456676299	150	35
156.028936371146	22.6707132374372	160	15
156.028936371146	22.6707132374372	150	15
156.028936371146	22.6707132374372	150	25
172.928887059575	22.0710231254491	180	15
172.928887059575	22.0710231254491	170	15
172.928887059575	22.0710231254491	170	25
172.546997856103	30.4398404179615	180	25
172.546997856103	30.4398404179615	180	35
172.546997856103	30.4398404179615	170	35
172.090319180867	49.1688547065484	180	45
172.090319180867	49.1688547065484	180	55
172.090319180867	49.1688547065484	170	55
168.660254358849	49.9999999939892	170	45
168.660254358849	49.9999999939892	160	45
168.660254358849	49.9999999939892	160	55
168.66025434606	69.9999999196673	170	65
168.66025434606	69.9999999196673	160	65
168.66025434606	69.9999999196673	160	75
171.339745613704	70.0000000510131	180	65
171.339745613704	70.0000000510131	180	75
171.339745613704	70.0000000510131	170	75
171.339745588024	89.9999999930152	180	85
171.339745588024	89.9999999930152	180	95
171.339745588024	89.9999999930152	170	95
164.084261393617	92.0185065084489	170	85
164.084261393617	92.0185065084489	160	85
164.084261393617	92.0185065084489	160	95
Route: 4 Length: 312.433612483029 Demand Met: 172			
98.2505945400352	157.291162168003	100	165
98.2505945400352	157.291162168003	90	155
98.2505945400352	157.291162168003	100	155
96.9036545379804	175.768969820443	100	185
96.9036545379804	175.768969820443	100	175
84.9999999790096	176.339735693592	80	185
84.9999999790096	176.339735693592	90	185
84.9999999790096	176.339735693592	90	175
65.0000016431076	176.339736832904	60	185
65.0000016431076	176.339736832904	70	185
65.0000016431076	176.339736832904	70	175
64.9999981359431	173.660262415656	60	175
64.9999981359431	173.660262415656	60	165
64.9999981359431	173.660262415656	70	165
44.9999997038761	173.660262963286	40	175
44.9999997038761	173.660262963286	40	165
44.9999997038761	173.660262963286	50	165
44.0392347156539	177.390669268327	40	185

Solution x	Solution y	Original x	Original y
44.0392347156539	177.390669268327	50	185
44.0392347156539	177.390669268327	50	175
27.0712031214738	177.929055829484	20	185
27.0712031214738	177.929055829484	30	185
27.0712031214738	177.929055829484	30	175
27.4137146694224	169.582023803004	20	175
27.4137146694224	169.582023803004	20	165
27.4137146694224	169.582023803004	30	165
27.8114297183454	150.806781213932	20	155
27.8114297183454	150.806781213932	20	145
27.8114297183454	150.806781213932	30	145
31.3397382926824	149.999999722928	30	155
31.3397382926824	149.999999722928	40	155
31.3397382926824	149.999999722928	40	145
31.3397390069315	130.000000420587	30	135
31.3397390069315	130.000000420587	40	135
31.3397390069315	130.000000420587	40	125
28.6602598906762	129.999997593571	20	135
28.6602598906762	129.999997593571	20	125
28.6602598906762	129.999997593571	30	125
28.6602600842045	109.999999451535	20	115
28.6602600842045	109.999999451535	20	105
28.6602600842045	109.999999451535	30	105
35.8238496288448	107.954351458523	30	115
35.8238496288448	107.954351458523	40	115
35.8238496288448	107.954351458523	40	105
Route: 5 Length: 212.679372286926 Demand Met: 176			
123.785269376203	148.826904299178	130	155
123.785269376203	148.826904299178	120	155
123.785269376203	148.826904299178	120	145
131.247708145989	152.948202567774	130	145
139.995828628541	164.999968655096	140	175
139.995828628541	164.999968655096	140	165
139.995828628541	164.999968655096	130	165
140.83124706432	152.795416778255	150	155
140.83124706432	152.795416778255	140	155
140.83124706432	152.795416778255	140	145
141.339714556316	139.999999176527	150	145
141.339714556316	139.999999176527	150	135
141.339714556316	139.999999176527	140	135
141.339716083087	122.538639391927	150	125
141.339716083087	122.538639391927	140	125
141.339716083087	122.538639391927	140	115
141.339717488367	109.999999005928	150	115
141.339717488367	109.999999005928	150	105
141.339717488367	109.999999005928	140	105
Route: 6 Length: 181.715722951003 Demand Met: 168			
58.5004484210724	80.0298167505534	50	75
58.5004484210724	80.0298167505534	50	85
58.5004484210724	80.0298167505534	60	85
57.9790164963385	71.5698822178158	60	75
57.4570749282344	60.4375503214673	50	55
57.4570749282344	60.4375503214673	50	65
57.4570749282344	60.4375503214673	60	65
57.0705336979152	52.071604826583	50	45
57.0705336979152	52.071604826583	60	45
57.0705336979152	52.071604826583	60	55
67.1597880265909	52.6247901766007	70	55
75.0568976984067	53.1747643966406	70	45
75.0568976984067	53.1747643966406	80	45
75.0568976984067	53.1747643966406	80	55
91.7960754452217	54.602924220202	90	45
91.7960754452217	54.602924220202	90	55
91.7960754452217	54.602924220202	100	55
Route: 7 Length: 181.715674773967 Demand Met: 172			
141.599245069073	89.9549674448498	150	85
141.599245069073	89.9549674448498	150	95
141.599245069073	89.9549674448498	140	95
142.080136867857	77.7684844220292	150	75
142.080136867857	77.7684844220292	140	75
142.080136867857	77.7684844220292	140	85
142.541415335238	60.4838697034439	150	55
142.541415335238	60.4838697034439	150	65
142.541415335238	60.4838697034439	140	65
142.930667130425	52.0728297434411	150	45
142.930667130425	52.0728297434411	140	45
142.930667130425	52.0728297434411	140	55
133.12005437731	52.7154220891103	130	55
124.969992678219	53.3549190283282	130	45
124.969992678219	53.3549190283282	120	45

Solution x	Solution y	Original x	Original y
124.969992678219	53.3549190283282	120	55
111.219077277959	62.1238300468902	110	55
Route: 8 Length: 82.6794835336288 Demand Met: 28			
58.6602588727934	99.9999993603922	50	105
58.6602588727934	99.9999993603922	50	95
58.6602588727934	99.9999993603922	60	95
Route: 9 Length: 212.679450061106 Demand Met: 176			
89.9614362329096	141.652805634565	90	145
80.0010063618917	164.999988448668	80	175
80.0010063618917	164.999988448668	80	165
80.0010063618917	164.999988448668	90	165
76.8730167973255	153.806582280776	70	155
76.8730167973255	153.806582280776	80	155
76.8730167973255	153.806582280776	80	145
68.7421148446087	152.57632146131	70	145
59.1594455510305	151.478867653981	50	155
59.1594455510305	151.478867653981	60	155
59.1594455510305	151.478867653981	60	145
58.660264293124	139.999999674478	50	145
58.660264293124	139.999999674478	50	135
58.660264293124	139.999999674478	60	135
58.6602638548787	128.707841206588	60	125
58.6602634181155	119.999999764999	50	125
58.6602634181155	119.999999764999	50	115
58.6602634181155	119.999999764999	60	115
66.7538712188314	107.887755013149	60	105



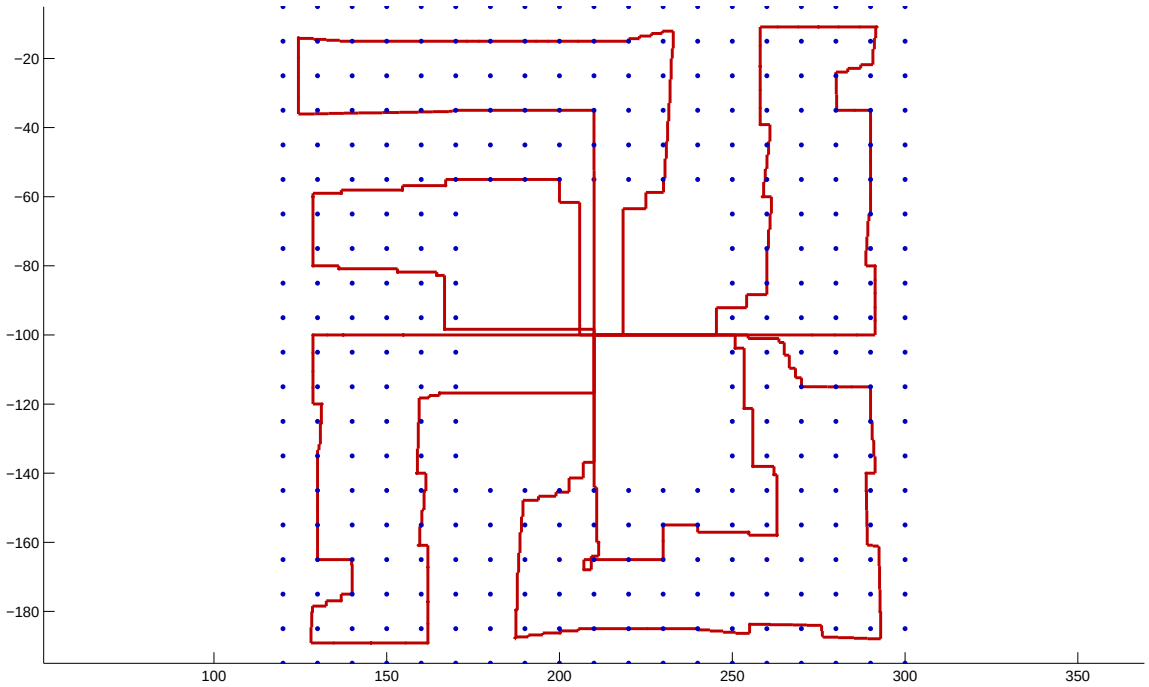


Figure O.143: *bubbles*6, Equal Radius, 2D, Manhattan, Length = 2066.6931725

Table O-146: Solution for *bubbles*6, Equal Radius, 2D, Manhattan

Total distance: 2066.69317253711			
Total demand met: 1490			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 378.379699135806 Demand Met: 240			
135.40651059534	92.123364036028	140	85
144.13972725122	88.3481661824462	150	85
149.999993222212	84.9999829573507	160	85
149.999999423988	75.0093760324583	160	75
150.000002539639	75.0024924518255	150	75
150.00000565544	74.9956090721495	140	75
150.463989517058	69.5319501302352	150	65
150.928706569245	64.8449373061742	160	65
151.33973031226	59.9999886131859	160	55
148.660256301348	59.9999889851839	140	65
149.070396371462	55.7423592822324	140	55
149.554684207762	51.9293547427219	150	55
150.038397587387	47.8488697774495	150	45
150.52259040816	44.02886659726	160	45
150.889680511906	39.1233761862382	160	35
148.09107114182	39.1233759067934	140	45
148.09107180133	34.2773401281224	140	35
148.091072461285	29.1460666998923	150	35
148.09107312122	22.2906330075436	150	15
148.09107312122	22.2906330075436	150	25
148.09107312122	22.2906330075436	140	25
148.091073781638	16.2493482658412	140	15
148.091074442519	10.8766189118099	140	5
153.115054160368	10.8766175066764	150	5
159.100215936742	10.8766161020267	160	15
164.945868144949	10.8766146973116	170	5
164.945868144949	10.8766146973116	160	5
170.758176939611	10.8766132935811	170	15
176.834143530043	10.876611889766	180	5
181.908917188918	10.8766104863481	190	5
181.51961582363	14.1173826017337	180	15
181.131711667907	17.3081361104731	190	15
180.691155606955	21.7851996858662	190	25
177.155427844308	22.8681403946119	180	25
173.416367034213	23.9372328476494	170	25
170.000007714278	25.0000054225519	160	25
170.099524182198	30.3920819918934	170	35
170.199218710079	35.0024397087655	170	45
175.420393092373	35.0040857284903	180	35
179.999993519605	35.005731944799	190	35
179.999993702845	44.9999905386455	190	45
179.999993600784	49.6080253475756	180	45
179.999993498581	54.9957490171217	190	55
179.999992803422	55.0049463303736	180	55
179.999992108285	55.0141444038267	170	55
179.999991621838	60.3677675987067	180	65
179.999991135499	64.999990242594	190	65
179.534761421231	67.0688572647102	170	65
179.235415479257	71.5098626190798	180	75
178.935721599097	75.5798970295664	170	75
178.662331102444	80.0035813503708	170	85
181.341803881183	80.0035810053405	190	75
181.341580548481	84.1214494120005	190	85
181.341357352803	87.9241002878364	180	85
181.341134154382	92.014986670242	180	95
181.340910954015	95.8422097824487	190	95
181.340687886087	99.9984493776284	190	105
176.055400667959	99.9988369562621	180	105
169.613786581257	99.9992245785762	170	105
163.161833884179	99.9996122302046	170	95
Route: 2 Length: 378.379703816294 Demand Met: 256			
44.8026470355803	100.000382836885	40	105
44.8026470355803	100.000382836885	40	95
44.8026470355803	100.000382836885	50	95
27.4266409235241	100.000765863283	20	105
27.4266409235241	100.000765863283	30	105
27.4266409235241	100.000765863283	30	95
22.8283207716636	100.001148868756	20	95
18.6593195013407	100.001531886377	10	95
18.6590983792064	105.195306393164	10	105
18.658877255616	110.557821714974	20	115
18.6586561340117	115.209857895878	10	115
18.6584350649366	119.99684901178	10	125
21.3379194626964	119.9968484028	30	115
21.0870112247904	125.500710497607	20	125
21.0870112247904	125.500710497607	30	125
20.8217701764346	131.620436753078	30	135
20.4105232647449	133.320756434854	20	135
20.0000074647534	135.000008321072	10	135
20.0000065431968	144.996812767805	10	145
20.0000066269105	145.004308031135	20	145
20.0000067143692	145.011803746148	30	145
20.0000065684824	150.360384465898	20	155
20.0000064082028	155.000008409383	10	155
20.0000067333889	164.994950402863	10	165
29.7679898461703	164.996698406919	30	155
29.8538882734432	166.372961545448	20	165
29.8538882734432	166.372961545448	30	165
29.9999906159634	174.999997273832	40	175
26.8380233685677	176.93852650072	30	185
26.8380233685677	176.93852650072	30	175
22.5286770370886	178.450886193189	20	175
18.5203624373652	180.021340260142	10	185
18.5203624373652	180.021340260142	10	175
18.3059171443943	184.573727838648	20	185
18.0910958947606	189.123404961674	10	195
24.6559199078368	189.123403377465	20	195
35.4825950384527	189.123401792206	30	195
35.4825950384527	189.123401792206	40	195
35.4825950384527	189.123401792206	40	185
45.4867211271401	189.123400205229	50	195
51.9089085046144	189.123398618137	60	195
51.9089092574986	183.572608063688	60	185
51.9089100101367	177.210918475621	50	185
51.9089100101367	177.210918475621	50	175
51.9089100101367	177.210918475621	60	175
51.9089107625939	167.219267738531	50	165
51.9089107625939	167.219267738531	60	165
51.9089115142907	160.876603041542	60	155
49.1103114245276	160.876602693704	40	165
49.5499481611546	155.39458970567	40	155
50.1879125685472	150.634377102148	50	155
50.8271586018207	145.176369978013	50	145
50.8271586018207	145.176369978013	60	145
51.3394039826283	139.99942386633	60	135
48.6599310499511	139.999424299451	40	145
48.6599310499511	139.999424299451	40	135
48.8963262019757	132.91388209974	50	135
49.132477449722	125.279452412967	40	125
49.3861481177813	118.231706827752	40	115
52.2643646587057	117.507475869159	50	115
55.2630888636745	116.791422408356	50	125
55.2630888636745	116.791422408356	60	125
55.2630888636745	116.791422408356	60	115
Route: 3 Length: 252.679430005151 Demand Met: 228			
95.8572235434583	61.6340811661784	100	55
90.0000069198709	55.0000163203925	90	45
90.0000069198709	55.0000163203925	90	55
70.0000166988038	55.0000149134709	70	45
70.0000166988038	55.0000149134709	70	55
70.0000166988038	55.0000149134709	80	55
57.046144584398	56.7912963997936	50	55
57.046144584398	56.7912963997936	60	55
57.046144584398	56.7912963997936	60	65
44.5645908523354	58.072519059572	40	55
44.5645908523354	58.072519059572	40	65
44.5645908523354	58.072519059572	50	65
26.8788243469058	59.0171867549179	20	55
26.8788243469058	59.0171867549179	30	55
26.8788243469058	59.0171867549179	30	65
18.6602700839535	59.9999994439314	10	55
18.6602700839535	59.9999994439314	10	65
18.6602700839535	59.9999994439314	20	65
18.660271130689	79.999999584273	10	75
18.660271130689	79.999999584273	10	85
18.660271130689	79.999999584273	20	85
26.1699133768414	80.8308858713549	20	75
26.1699133768414	80.8308858713549	30	75
26.1699133768414	80.8308858713549	30	85
43.1425100534569	81.7898894656502	40	75
43.1425100534569	81.7898894656502	40	85
43.1425100534569	81.7898894656502	50	85

Solution x	Solution y	Original x	Original y
54.4960239235689	82.7794325352631	50	75
54.4960239235689	82.7794325352631	60	75
54.4960239235689	82.7794325352631	60	85
56.7419302926078	98.3509610345936	50	105
56.7419302926078	98.3509610345936	60	105
56.7419302926078	98.3509610345936	60	95
Route: 4 Length: 396.994324911698 Demand Met: 257			
108.417323439012	63.4501867022402	110	55
114.991489094823	58.735697879883	120	55
120.120104706246	54.6798298799768	130	55
120.52328728542	48.9800459425344	120	45
120.927624745455	44.0298787136873	130	45
121.288892286114	38.1572123301588	120	35
121.651478339971	32.9105003841455	130	35
121.992872467439	26.0761497883202	130	25
122.320633029553	19.9883555848916	130	15
122.62256053582	17.0699144724739	120	25
122.928929202588	12.0710737703063	130	5
119.753300120464	12.7564958061243	120	5
116.558140694043	13.5073868922385	120	15
113.15463329142	14.2543666515283	110	15
110.000321146436	14.999992072538	110	25
109.989387090939	14.9999920752295	110	5
100.000054300521	14.9999921853163	100	5
95.3574202015026	14.9999922836748	100	15
90.0000365285654	14.999992486845	90	5
86.7192911155126	14.999992532844	90	15
83.2379776379739	14.9999926657111	80	15
79.9999079920717	14.9999928206214	80	5
70.0000896025152	14.9999929568932	70	5
66.724529305504	14.9999931043411	70	15
63.2438267198997	14.9999932646804	60	15
59.99991609106	14.9999934610139	60	5
50.0109269989867	14.9999936895605	50	5
50.0043554837895	14.9999938374626	50	15
49.9977843612973	14.999994026723	50	25
40.0023647995783	14.9999940149233	40	25
39.9957191800609	14.9999937551538	40	15
39.9890729298298	14.9999933813641	40	5
30.0094779404335	14.999993237485	30	5
29.999578405593	14.9999930719284	30	25
26.4216663019011	14.7302807002571	30	15
22.5352066218931	14.4605604797537	20	15
18.8607501833966	14.1907594243528	20	5
14.4721445782461	13.9442727359641	10	5
14.4721445789012	19.8042403800529	10	15
14.4721445789012	19.8042403800529	10	25
14.4721445797231	25.4401078847322	20	25
14.472144580451	31.2302352185747	10	35
14.4721445814221	36.0557269976573	10	45
19.0948993546283	35.9757769276851	20	45
23.1844953301506	35.8941527289742	20	35
27.6385282058815	35.8125645475848	30	35
31.8393964628038	35.7310066130032	30	45
38.7634430498302	35.6464016385773	40	45
43.6362140022796	35.5585762091392	40	35
49.1327489384829	35.4707839016506	50	45
53.3479929657072	35.3782914360156	50	35
57.9739992489341	35.2858344991698	60	45
58.9888129264382	35.1428836012889	60	35
60.000009047939	34.9999983196682	60	25
70.0000001923672	34.9999975513697	70	25
79.9999405504588	34.9999966866028	80	25
80.0000028699488	34.9999973622381	70	35
80.0000028699488	34.9999973622381	80	35
80.0000028699488	34.9999973622381	80	45
89.9999999095915	34.9999976441574	90	25
89.9999999095915	34.9999976441574	90	35
99.9966374015797	34.9999983906769	100	25
99.9983165004651	35.002370121434	100	35
99.9999965490683	35.0047419726964	110	35
99.9999978030741	44.999998324402	110	45
99.9999986739282	52.3423791160723	100	45
Route: 5 Length: 256.110754405087 Demand Met: 254			
140.820904390939	103.83548319842	150	105
140.820904390939	103.83548319842	140	105
140.820904390939	103.83548319842	140	95
143.438400512617	121.268304168126	150	125
143.438400512617	121.268304168126	140	125
143.438400512617	121.268304168126	140	115

Solution x	Solution y	Original x	Original y
145.944629380934	138.045273921544	150	145
145.944629380934	138.045273921544	140	145
145.944629380934	138.045273921544	140	135
152.068824846023	140.418616160169	160	145
152.068824846023	140.418616160169	160	135
152.068824846023	140.418616160169	150	135
152.928917662083	157.928914346013	160	165
152.928917662083	157.928914346013	160	155
152.928917662083	157.928914346013	150	155
144.77261060946	157.099559383523	150	165
144.77261060946	157.099559383523	140	165
144.77261060946	157.099559383523	140	155
130.000002455354	155.000018791077	130	155
130.000002455354	155.000018791077	130	145
120.007782283791	155.000014976077	120	145
120.00438318248	159.598265414528	120	155
120.00097954428	164.999828621051	130	165
120.00097954428	164.999828621051	120	165
97.0710749861107	167.928911189044	90	175
97.0710749861107	167.928911189044	90	165
99.2140356270792	164.013746584893	100	165
101.339723967592	159.999999400887	110	165
101.339723967592	159.999999400887	110	155
101.339723967592	159.999999400887	100	155
100.760899358672	144.092839402302	110	145
Route: 6 Length: 404.149260263076 Demand Met: 255			
144.59331735688	101.02834663622	150	95
153.510849015998	102.177336905306	160	95
155.03744855037	105.858444094776	160	105
156.492593239114	109.641096580856	150	115
158.271806609073	112.371163041826	160	115
160.025348417552	115.00112041149	160	125
167.574032134924	115.005390314869	170	115
174.533214029865	115.009660714789	180	115
180.000000625867	115.013932051058	190	115
180.000005087984	124.98542064305	190	125
180.000008613257	125.002716655439	180	125
180.000008613257	125.002716655439	170	125
180.463323116961	130.445334362674	180	135
180.927476245703	135.160307918162	190	135
181.339724178974	140.000017449683	190	145
178.660255115176	140.000017069991	170	135
178.752525416628	145.201943050444	180	145
178.752525416628	145.201943050444	170	145
178.846462030704	150.723139008031	180	155
178.940323596788	155.536744324265	170	155
179.03642146174	160.847309709523	170	165
180.662841943624	161.07511404756	180	165
182.301922708117	161.30228116425	190	155
182.462408186756	166.913806458405	190	165
182.620321781329	173.654525642685	180	175
182.778629217913	180.137002746492	190	185
182.778629217913	180.137002746492	190	175
182.928923255364	187.928924277972	190	195
179.11719157261	187.769008348097	180	195
175.189551286365	187.607209169415	180	185
170.629787853735	187.445936798376	170	195
166.274112282367	187.28234340549	160	195
166.053237704936	185.652031108358	170	185
165.831156815764	184.03325241775	170	175
161.589030082428	183.938218154803	160	185
157.52989429213	183.843135110815	160	175
150.757193739192	183.750855115673	150	185
150.757193739192	183.750855115673	150	175
145.00002787044	183.660249200552	140	175
145.000028226269	186.339717514061	150	195
140.95127825994	186.023550246166	140	195
137.327768258236	185.681812666561	140	185
133.512626849469	185.340672100682	130	185
130.000843507687	185.00000921643	130	175
129.982980703566	185.00000878883	130	195
120.016325466524	185.000008246048	120	195
119.997368877776	185.00000758842	120	175
115.370997489421	185.000007461895	120	185
110.002338644588	185.000007335267	110	185
110.002338644588	185.000007335267	110	175
109.983911660671	185.000007853922	110	195
100.016427061827	185.000008258601	100	195
99.999176941862	185.000008544842	100	175
95.4559784509134	185.625883007226	100	185

Solution x	Solution y	Original x	Original y
90.2102315556463	186.254047919325	90	195
90.2102315556463	186.254047919325	90	185
85.1778230742657	186.818799880947	80	185
80.9995449962804	187.388393222121	80	195
77.0710724915308	187.928924312171	70	195
77.4001313612031	179.64480067245	70	185
77.4001313612031	179.64480067245	70	175
77.4001313612031	179.64480067245	80	175
77.7747654801593	168.739820980023	70	165
78.1738567144781	163.077426545119	80	165
78.5714114161104	157.096989657089	70	155
79.005555339406	152.599432535135	80	155
79.4387116175681	147.846530365159	70	145
83.9113946850576	146.659405173673	80	145
88.9896838297397	145.486828928627	90	155
92.7677538215985	141.375818950719	90	145
96.863399741543	136.846850748912	100	145

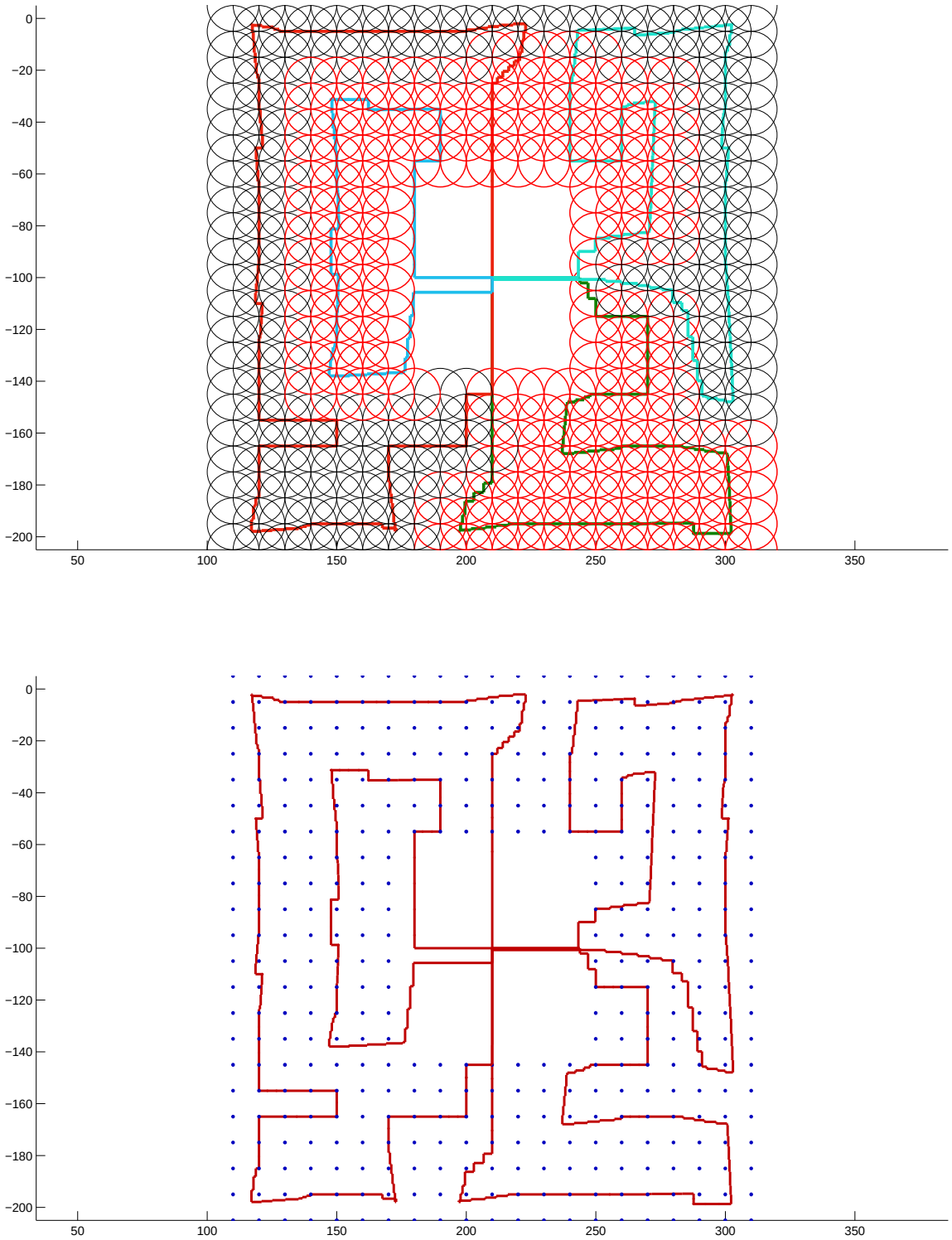


Figure O.144: *bubbles*7, Equal Radius, 2D, Manhattan, Length = 2160.6461876

Table O-147: Solution for *bubbles*7, Equal Radius, 2D, Manhattan

Total distance: 2160.6461875155			
Total demand met: 1818			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 485.804882153907 Demand Met: 427			
133.85304382143	102.032529236612	140	95
137.008406715967	108.066826571695	140	105
139.999998467821	115.000300391094	140	125
143.246109781682	115.001508456195	140	115
146.739265913468	115.00271653078	150	115
150.033477696514	115.003924617499	150	125
159.728458604834	115.005041954104	160	125
159.864165595997	115.005885886783	160	115
159.999993922431	115.006729840748	170	115
159.999993869003	124.99999215136	170	125
159.999993696313	130.370358497566	160	135
159.999993724858	135.000009523811	170	135
159.999993422745	144.993491306041	170	145
156.734582938672	144.994935949242	160	145
153.237686044706	144.996380580635	150	145
149.982353995208	144.997825187864	150	135
140.004779099703	144.99956377919	140	135
137.763284964016	146.079788803816	140	145
135.468328326225	147.168091435034	140	155
132.157859515402	148.037022979587	130	145
129.007463081359	148.919589569601	120	145
128.594468315623	153.332310357732	120	155
128.212449929584	157.034184351361	130	155
127.829099423414	160.926534311336	130	165
127.443792085148	164.466467042654	120	165
127.071074918971	167.928927053886	120	175
131.632215549973	167.439338588127	130	175
136.78880105102	166.925852136094	140	165
141.515741183615	166.415859312639	140	175
147.17978852518	165.852914927702	150	175
149.999999751153	165.000008742602	150	155
153.239831142952	165.000008602802	150	165
156.721497487922	165.000008462987	160	165
159.998600198267	165.000008383332	160	155
160.015003821824	165.000008739324	160	175
169.984594310789	165.000009038202	170	175
170.000524794234	165.000009267997	170	155
173.752118513507	165.667931641539	170	165
177.912067524364	166.338703494456	180	165
181.900514306421	167.013790902586	180	175
186.484209122278	167.634812441469	190	165
190.63127906381	168.263234764153	200	165
190.877913059602	172.491116136758	190	175
191.124926591228	176.519689832005	200	175
191.357095807064	181.602741692998	190	185
191.589748111775	186.232348117064	200	185
191.81360427599	191.599275710042	200	195
192.027052130027	195.128204585701	190	195
192.240933526772	198.691503935094	200	205
187.555166415922	198.691502237186	190	205
182.329655173236	198.691500539407	180	205
177.759060944962	198.691498841844	170	205
177.759059647467	196.694478681505	180	195
177.759058349749	194.745685853694	180	185
173.387105608066	194.779156081534	170	195
169.399112315167	194.812619413734	170	185
161.546461724013	194.848136541311	160	185
160.771691510939	194.924036793054	160	195
159.999943544163	194.999989916024	160	205
150.002025420773	194.9999917287	150	205
149.98582584926	194.999992885645	150	185
145.368247824243	194.999994156624	150	195
140.01358250131	194.999995427606	140	185
140.00173344451	194.999996903589	140	195
139.989883908368	194.999998379576	140	205
130.01096326658	194.999999581199	130	205
130.000631071089	195.000000558034	130	195
129.990302189735	195.000001534873	130	185
120.008316913097	195.000002763934	120	185
119.996911986024	195.00000433945	120	195
119.98550543596	195.000005914969	120	205
110.014316138558	195.00000727178	110	205
109.998909528026	195.000008486732	110	185
105.998135787591	195.610701480058	110	195
101.557387615705	196.223451512948	100	195
97.3118143331341	196.839296893317	100	205
91.8134204937548	197.39924919518	90	205
87.071075403323	197.928927169544	80	205
87.8116315858011	194.771012580181	90	195
88.5465213291909	191.620200605294	80	195
89.5056495808099	186.306610141666	80	185
92.9311887865475	182.88090913607	90	185
96.6914917395636	179.324903747339	100	185
99.9999919807225	174.999999803302	110	175
99.9999934312505	170.362480092591	100	175
99.9999948817795	164.999989796803	110	165
99.9999960599894	155.000016349605	110	155
99.9999970657013	150.35457818019	100	155
99.9999980714213	144.999986855428	110	145
99.9999989717808	137.344806454523	100	145
Route: 2 Length: 697.580727028767 Demand Met: 485			
100.000000473233	62.7270238264904	100	55
100.000001068198	55.0000133573137	110	55
100.000001714338	49.6149717383337	100	45
100.000002283106	44.9999701441576	110	45
100.000002815021	35.0094004620482	110	35
100.000003190445	35.0031293577417	100	35
100.000003572857	34.9968584028835	90	35
100.000004603731	25.0000038451181	90	25
102.010330000157	22.7498763119778	100	25
104.078763454326	20.433436929972	100	15
106.369748367359	18.3718296235036	110	15
108.536534394619	16.4059017856099	110	25
110.572215462057	13.261725856118	120	15
111.479234333969	8.36372103331521	120	5
112.200398589943	5.21166607608839	110	5
112.928927780679	2.07107018819722	120	-5
108.06408119378	2.60016722304557	110	-5
102.577657662889	3.16010735208566	100	-5
98.3255758411487	3.7753021674881	100	5
93.9356495183661	4.38821666907185	90	5
90.0006306661679	4.99999628353045	90	15
89.9904491787079	4.99999663557044	90	-5
80.0089389611537	4.99999709050515	80	-5
79.9978521507207	4.99999767074615	80	15
75.3680501501224	4.99999785823728	80	5
70.0039342223503	4.99999808240455	70	15
69.9976628659687	4.9999980906565	70	5
69.9913917122437	4.99999815249351	70	-5
60.0074790607547	4.99999827442619	60	-5
59.9967170883239	4.9999985533687	60	15
55.3704759758226	4.99999861342138	60	5
50.0037946667994	4.999998677087	50	15
49.9972416436873	4.99999853488083	50	5
49.9906883685056	4.99999837074733	50	-5
40.0063414912888	4.99999823192157	40	-5
40.0000727349696	4.99999841391891	40	5
39.993805175197	4.99999842213332	40	15
30.0021269462799	4.99999854533462	30	15
29.9910266198772	4.99999828626328	30	-5
25.3765932784254	4.99999812964321	30	5
20.0000015573143	4.99999729462243	20	15
17.8009547167488	4.15595506689941	20	5
15.5419773127692	3.30899305294858	20	-5
11.1670161971468	2.67050054925815	10	-5
7.07106942471671	2.0710713874116	0	-5
7.4233498900626	5.382463135094	10	5
7.77394305004401	8.71653409624129	0	5
8.14520108271338	13.2176858275735	0	15
8.53676087040506	17.1610147395523	10	15
8.92711673039251	21.307448254413	0	25
9.46391661262018	23.16987299414	10	25
9.99999693781835	25.0000137900666	20	25
9.99999994347729	34.9932129800024	20	35
10.0000014687289	34.9981163469417	10	35
10.0000029968171	35.0030198303959	0	35
10.4625777219839	40.4592710309416	10	45
10.925892808206	45.1800937255087	20	45
11.3397426353067	49.9999977297431	20	55
8.66025997778189	49.9999975280653	0	45
8.9407072715785	54.3536977814109	0	55
9.24039335560874	58.4218633948041	10	55

Solution x	Solution y	Original x	Original y
9.53969866966688	62.8814023204658	0	65
9.99999566804135	65.0000014676859	20	65
9.99999586501942	69.6064633051675	10	65
9.999996062675	74.9909054993889	0	75
9.99999631509679	75.0017349523961	20	75
9.99999627825271	79.6008807190909	10	75
9.99999623394444	84.9982197154202	10	85
9.99999623394444	84.9982197154202	20	85
9.99999588173846	85.008995245113	0	85
9.99999558970623	94.9905230780442	0	95
9.99999536795184	95.0005756928824	20	95
9.65844342742263	98.5005687541498	10	95
9.31675539168025	102.305793172572	10	105
8.97474496688025	105.925083313463	0	105
8.66026041165432	110.000001441631	0	115
11.3397412278455	110.000001218163	20	105
11.1213536395905	114.141854883641	20	115
10.8909934069519	117.943918913174	10	115
10.6609905134618	122.053160439968	20	125
10.3303136453851	123.533031609158	10	125
10.0000043256798	125.000002495326	0	125
10.000004132274	130.356750360912	10	135
10.0000039285514	134.989935020452	20	135
10.0000034796684	135.00246141164	0	135
10.0000033996163	140.356369893119	10	145
10.0000032545707	145.000002444443	0	145
10.0000033058669	154.995554852392	0	155
13.2366101635408	154.996773629108	10	155
16.7199322518123	154.997992043902	20	155
20.0052407062375	154.999210369568	20	145
29.9994107839637	155.001269144123	30	165
29.9994107839637	155.001269144123	30	155
39.9999946691072	155.002712113584	50	155
39.9999944454792	159.563692691783	40	155
39.9999942217909	164.9981664513	50	165
39.8742792011485	165.001162279929	40	165
39.7486211103486	165.00415841973	40	175
30.0242264248603	165.005660577822	30	175
24.5888776002256	165.007068101691	20	165
19.9484802282277	165.008476114806	20	175
10.3855927457214	165.009826710341	10	175
10.1928879485937	165.010970416887	10	165
9.99999713401979	165.012114898102	0	165
9.99999615702538	174.999961996498	0	175
9.9999951916587	180.366349411877	10	185
9.99999422097389	184.999997524074	20	185
8.74447722230951	188.121232274431	0	185
7.8625601868489	193.336515927493	0	195
7.07107398310694	197.928928537014	0	205
10.9798825377689	197.59263544894	10	205
15.1285911899155	197.245578830255	10	195
20.1571654927096	196.900927369878	20	205
25.2510893227665	196.540405056426	30	205
26.7309646903371	196.024130270176	20	195
28.3768396276754	195.511357688594	30	195
30.0000096791798	195.000006472805	30	185
39.9985518489187	195.000006180299	40	185
40.0057985214192	195.000006176642	40	195
40.013046495924	195.000006483863	40	205
49.9868515379725	195.00000642062	50	205
49.9937992914965	195.0000065765	50	195
50.0007473133177	195.000006456296	50	185
57.6153625353558	196.654082460603	60	205
62.9289288759534	197.928925086097	70	205
62.4765353270909	194.448309165273	70	195
62.0036458695311	190.923475121148	60	195
61.5339485616331	187.032876197012	60	185
61.0663984097225	183.375485408188	70	185
60.532506303953	178.931815609238	60	175
60.0000064077262	174.999999648238	50	175
60.0026804944291	169.558010200791	60	165
60.005354533598	165.000003860891	60	155
69.9938262126436	165.000002357367	70	155
70.0013009222678	165.000001387885	70	165
70.0087757163748	165.000000299098	70	175
79.9999614440313	164.999999042443	80	175
83.2478297641546	164.99999744476	80	165
86.7353780896941	164.999995982546	90	165
89.9962073732602	164.999994480187	90	175
89.9999958601539	164.994948056728	100	165

Solution x	Solution y	Original x	Original y
89.9999986731369	155.000024464197	80	155
90.0000020045201	149.942352642991	90	155
90.0000020045201	149.942352642991	90	145
90.0000051880295	144.999993972687	80	145
Route: 3 Length: 605.865021430701 Demand Met: 450			
133.273066994806	89.9191912344299	140	85
139.80127367008	84.7613865663974	140	75
145.578231519975	84.0320565915609	150	85
150.560599576417	83.3002016682284	150	75
155.889484171244	82.6379936709564	160	85
160.548462356608	81.9692547615566	170	85
160.788579598692	77.5398280532998	160	75
161.029017613248	73.4025220801146	170	75
161.253911039096	68.0816315769674	160	65
161.479244319622	63.2715186056347	170	65
161.69559876891	57.3502520149121	170	55
161.904256526509	52.8243126763049	160	55
162.113432056053	48.0404202524518	160	45
162.323202004809	43.6679777366925	170	45
162.528645333198	38.932650410176	170	35
162.728473157541	35.4812545985341	160	35
162.92893178453	32.0710751066526	170	25
158.800873617514	32.6568530899394	160	25
154.314450457421	33.2837209597244	150	25
152.127274005679	34.1499143983792	150	35
149.999701840605	35.0142454665668	140	35
149.998619894266	40.3611796780215	150	45
149.997537889866	45.0024186809101	140	45
149.996564712388	50.3847055904529	150	55
149.995591437877	54.999995610275	150	65
140.000001537382	54.9999950499601	140	65
136.761128682011	54.9985034135643	140	55
133.260588972036	54.9970119737497	130	55
130.00000369172	54.9955209427436	120	55
130.000003577683	45.0000022575525	120	45
130.000003628506	40.3737216790963	130	45
130.000003680077	35.0000024646351	120	35
130.000003930876	31.7333447185255	130	35
130.000004182288	28.2549849473983	130	25
130.000004436275	25.0000001825929	120	25
130.800706377253	22.3947695976831	140	25
131.344985887936	17.7989132428766	130	15
131.891947932885	13.5281232528859	140	15
132.402291418425	8.76251132931167	130	5
132.916860002591	4.49667181066091	130	-5
138.562677381461	4.3180235462125	140	-5
142.530274933541	4.15237713683577	140	5
146.766476339175	3.98658465399387	150	5
150.712569893417	3.82062764272579	150	-5
155.000001756655	3.66026098586495	160	-5
155.000001577214	6.33974109715095	150	15
159.458660971526	6.03300912173384	160	15
163.666555675621	5.6990492390764	160	5
168.373830058391	5.36561353920918	170	15
170.68191088062	4.74422776046691	170	5
173.021967414817	4.12259667566629	170	-5
177.902485079252	3.67751216237692	180	-5
181.732456749396	3.27439730214123	180	5
185.75941444801	2.86981890213007	190	5
189.385752988816	2.46295890256201	190	-5
192.928927978185	2.07107218009249	200	-5
192.329104255245	6.15160176387116	200	5
191.688822176027	10.5731278324391	200	15
190.842106867208	12.8152782223923	190	15
190.000005037843	15.0000930986073	180	15
190.000002363341	24.9902706983725	200	25
189.999998935243	25.009507180625	180	25
189.999996415029	29.6455113285074	190	25
189.999993838298	34.9997778361823	200	35
189.674112223806	36.476710475437	190	35
189.348301291228	37.9770620982797	180	35
189.114848677068	42.0462820333789	190	45
188.881181966899	45.8545708758503	180	45
188.660256162669	49.9999917737164	180	55
191.339733861087	49.9999916082009	200	45
191.067774679433	54.3707235642899	200	55
190.770330681038	58.4298933862383	190	55
190.47382209751	62.8964408162892	200	65
190.000005954155	65.0000005393833	180	65
190.000005815917	69.6065787148796	190	65

Solution x	Solution y	Original x	Original y
190.000005676538	74.9852353666146	200	75
190.000005447793	74.9940112162719	190	75
190.00000052402	75.0027866953595	180	75
190.00000532543	80.38258688542	190	85
190.000005401353	84.9983428031986	180	85
190.000005775567	85.0133728293168	200	85
190.000006091574	94.9862040417191	200	95
190.000006387738	95.0005778735253	180	95
190.304112247141	98.7785224930451	190	95
190.608627067168	102.972348354304	190	105
190.913684515819	106.999578774841	200	105
191.187894852865	113.085112826054	200	115
191.444014081838	117.621145230166	190	115
191.700886297542	122.565435136403	190	125
191.958601615487	127.204130136856	200	125
192.207206972	132.980063958129	200	135
192.448729584353	137.832144419525	190	135
192.691398705637	143.208896638139	200	145
192.928926664097	147.928926628232	200	155
189.956175886124	147.23909938729	190	145
187.003940804228	146.555896320925	190	155
182.822791823357	145.722217936452	180	155
181.002417243218	139.818096222496	180	145
179.214264241307	131.975129044699	180	135
177.41798143117	122.866134373407	180	125
175.576994062962	112.781273608681	180	105
173.215949341577	109.631968582827	180	115
169.616583662279	104.711967629302	170	95
165.457401112346	103.889831965308	170	105
160.736270546636	103.063680269272	160	105
156.166838070336	102.231393147303	160	95
149.908669466942	101.474205534071	150	105
143.761229245898	100.706025706562	150	95
Route: 4 Length: 371.395556902122 Demand Met: 456			
70.0000049686023	94.9999994361031	60	95
70.0000041732059	85.0000000189379	60	85
70.0000037122068	75.0000000763039	60	75
70.0000040052416	65.0000000745664	60	65
70.0000043444134	55.0043282641931	60	55
73.1231213366769	55.0020811218093	70	55
76.7596923395389	54.9998342173385	80	55
79.9999955578537	54.9975875272525	90	55
79.9999953060295	45.0000011068029	90	45
79.9986099950231	41.7416198771999	80	45
79.9972248358739	38.2485614227711	80	35
79.995839925318	35.0000026909132	80	25
70.0000023167824	35.0000029680217	70	25
69.3102115604434	35.0688650027371	70	35
68.6202478741774	35.1378399656422	70	45
63.7636750754675	35.1773978438202	60	35
59.4352832499865	35.2169875555094	60	45
52.240944246545	35.2543210791333	50	45
52.2409431479497	33.3029294963348	50	35
52.240942051762	31.3084943782428	60	25
48.5002781513977	31.3084929359814	50	25
44.5369458076944	31.3084914947579	40	35
41.1090453987048	31.3084900535392	40	25
37.7590626905528	31.3084886125826	30	25
38.161873640336	36.5356249940719	30	35
38.5880011100331	42.4673030103042	30	45
39.0594465925016	46.6666564161765	40	45
39.5299739088578	51.0496074735612	40	55
39.9999965900079	54.9970583598207	50	55
39.9999991784806	55.00859134555	30	55
40.0000032826768	64.9999795789059	30	65
40.1857421929429	66.1014536009203	40	65
40.3715465198348	67.2115647844039	50	65
40.4906991126275	71.7299987289805	40	75
40.6099053930789	75.8860265023433	50	75
40.7224274307723	81.2681445989923	50	85
37.7916911171689	81.2681449076005	30	75
37.7916911161473	84.6635280923845	30	85
37.791691115167	88.0757548135262	40	85
37.7916911142036	91.7707412952208	40	95
37.7916911132281	95.2226324394255	30	95
37.7916911124671	98.7318544423848	30	105
40.7224270564199	98.7318547492473	50	95
40.6035448872302	103.630480573263	50	105
40.4753866150323	106.952364532296	40	105
40.3472962837743	110.448838642429	40	115

Solution x	Solution y	Original x	Original y
40.2192709416614	113.615784334377	50	115
40.0000030851076	115.00002140875	30	115
39.9999963728226	125.000004688379	50	125
39.311375431211	126.851231352688	40	125
38.621788056949	128.753892334305	30	125
38.0973387621472	131.928617568738	40	135
37.5702620595246	134.921673305006	30	135
37.0710717068119	137.928927852416	30	145
44.9336429006658	137.57428064351	40	145
44.9336429006658	137.57428064351	50	145
51.7066434963666	137.145633624288	50	135
59.0887235942585	136.71958103786	60	145
65.5183514786233	136.260507061161	70	145
66.3818130914669	130.94751984766	60	135
67.3171081706236	123.394185882457	60	125
68.3443110692914	114.668455213143	60	115
69.5685736531617	105.695315162255	60	105

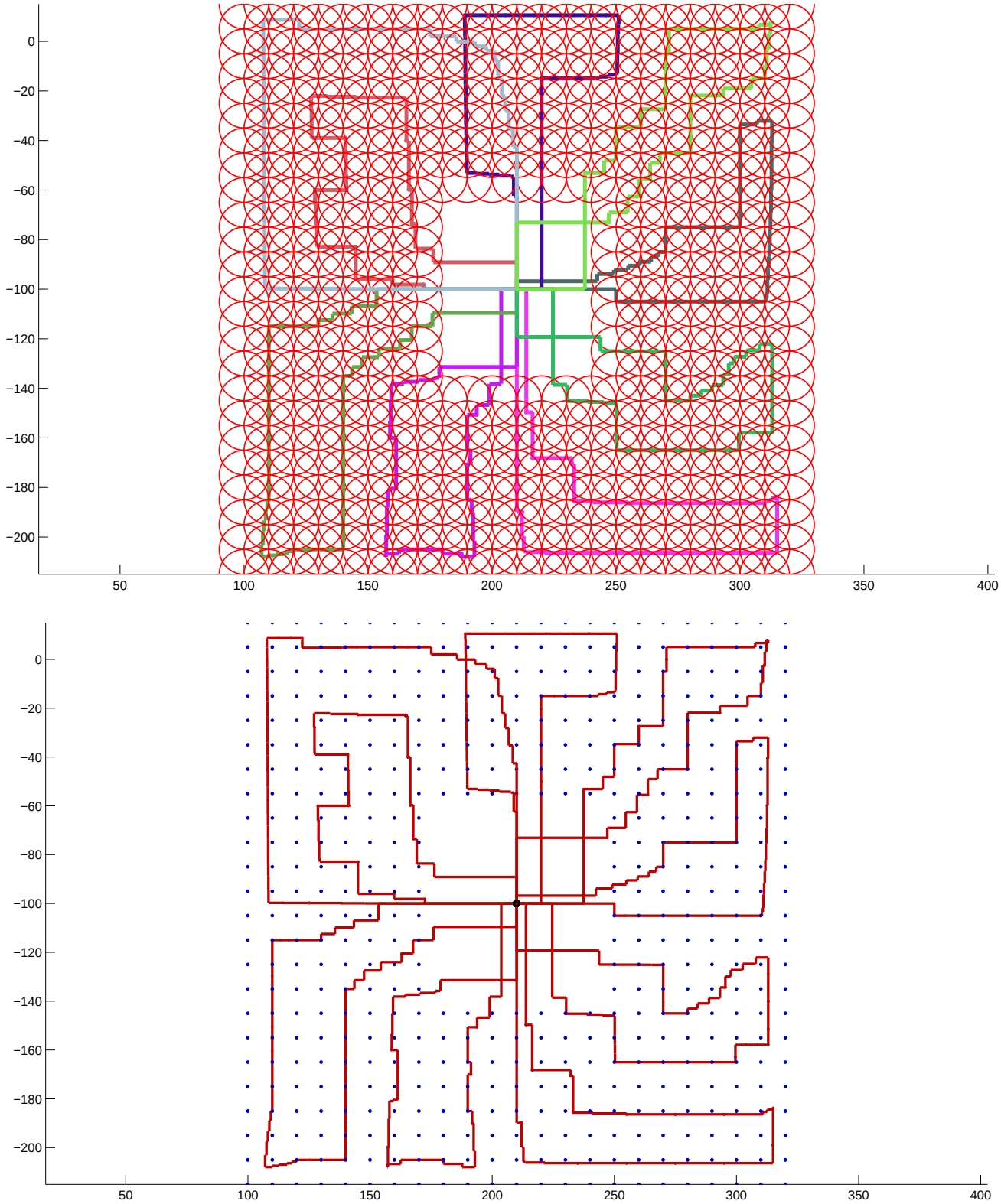


Figure O.145: *bubbles*8, Equal Radius, 2D, Manhattan, Length = 3461.2963461

Table O-148: Solution for *bubbles*8, Equal Radius, 2D, Manhattan

Total distance: 3461.29634610208			
Total demand met: 2538			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 351.715673160074 Demand Met: 273			
140.00000650126	104.999988513744	140	115
144.586451495427	104.999989165737	140	105
149.999981069415	104.999989821599	150	105
149.999981069415	104.999989821599	150	115
159.999996311454	104.999990115012	160	115
169.993196152192	104.999990251868	170	115
169.998136193277	104.99998987969	160	105
169.998136193277	104.99998987969	170	105
170.017277685981	104.999989516575	170	95
179.980231477265	104.99998917618	180	95
179.99206178703	104.999988956189	180	105
180.003896297236	104.999988703244	180	115
189.997205053228	104.999988104405	190	105
189.997205053228	104.999988104405	190	115
190.018102489629	104.999987088466	190	95
199.999963271429	104.999986179458	200	115
200.400525322017	103.436501029524	200	105
200.801682289631	101.855988952716	210	105
201.068094732307	96.2793269850672	210	95
201.315981730869	91.7604882474839	200	95
201.564605778326	86.8178177745636	200	85
201.814203099266	82.1655687400442	210	85
202.05274770405	75.4789267943342	210	75
202.284744050157	69.1908294094605	200	75
202.518093923814	59.9172321087058	200	65
202.518093923814	59.9172321087058	210	65
202.518093923814	59.9172321087058	210	55
202.731484195271	40.4570006938452	200	45
202.731484195271	40.4570006938452	210	45
202.731484195271	40.4570006938452	210	35
202.928927618268	32.0710812900996	210	25
196.804713662706	33.5419509616745	200	35
190.000008900314	35.0000561291185	180	35
189.999998332439	41.8503499470505	190	45
189.999998332439	41.8503499470505	190	35
189.99998768279	55.0047506880988	190	65
189.99998768279	55.0047506880988	180	55
189.99998768279	55.0047506880988	190	55
189.99998768279	55.0047506880988	200	55
189.99559313804	68.1267487994251	190	75
189.99119636342	74.9999925441852	190	85
180.007826273369	74.9999961913299	180	85
179.982202757952	74.9999992916429	170	75
179.982202757952	74.9999992916429	180	75
179.982202757952	74.9999992916429	180	65
170.000000760402	75.0000026303746	170	65
160.006543609485	75.0000061902942	160	65
160.003651893718	79.5972630382091	160	75
160.000761065871	84.9928499187344	170	85
157.150176226637	86.9390084368262	160	85
154.162999957784	88.9335455969889	160	95
149.575345112615	90.5202748387635	150	85
144.942952015187	92.2329777697163	150	95
139.163027709946	93.8848831883826	140	85
132.468461163752	96.7946199522302	140	95
Route: 2 Length: 345.278615058939 Demand Met: 289			
109.999999081206	55.0000042578744	120	55
110.000000749056	49.9995805145724	110	55
110.000000749056	49.9995805145724	110	45
110.000002851427	44.999972544575	120	45
110.000004430137	35.0000000911393	110	35
110.000004430137	35.0000000911393	120	35
110.000006147146	25.0000474082911	120	25
110.00000764468	20.391364076361	110	25
110.000011152607	15.0056855631046	100	15
110.003262583739	15.0028430870906	110	15
110.00651654843	15.0000026300268	110	5
115.339539918445	15.0000006179908	120	15
120.000033958944	14.999998569842	120	5
129.987888929283	14.999996643163	130	5
130.001671492706	14.9999949753356	130	25
133.296773964608	14.2531830002923	130	15
136.922518498322	13.504346691633	140	15
140.327231357547	12.7506344342066	150	15
140.518881024508	4.91858559046205	140	5
140.710648897671	-2.99426290112304	150	-5
140.883121314345	-6.68421270168131	140	-5
141.055729173125	-10.5278477789173	150	-15
135.95534714576	-10.5278477783802	140	-15
129.52322811924	-10.5278477778087	130	-5
129.52322811924	-10.5278477778087	130	-15
123.15582448554	-10.5278477771581	120	-15
117.840980145413	-10.5278477764344	120	-5
112.041665282767	-10.527847775703	110	-5
106.876160526596	-10.5278477749702	110	-15
100.991150719665	-10.5278477741608	100	-15
95.4304577280743	-10.5278477732852	100	-5
87.7346361125707	-10.527847772399	90	-15
78.9442694225729	-10.5278477719903	70	-15
79.0032773936026	-8.11880269889806	80	-15
79.0623154464145	-5.15499961443956	80	-5
79.1213858632094	-2.1979812975373	70	-5
79.1825783784676	5.23158087507602	70	5
79.244989468349	13.1335984305515	70	15
79.3091961451761	17.4473692605616	80	15
79.3733960930394	22.0729031368084	80	25
79.4375789238237	26.3551395663663	70	25
79.5041581025892	33.6331834128412	70	35
79.5738678272797	37.6135174340254	80	35
79.6435366646287	41.8878577245255	80	45
79.7131324172664	45.8525346159483	70	45
79.7886870227634	53.083376406739	70	55
83.9584176323515	53.4441269487399	80	55
88.8413617959852	53.8042631504446	90	45
92.9988609211458	54.1965431811397	90	55
97.6442601030289	54.5887760174588	100	45
98.8284651656466	62.3832558088687	100	55
Route: 3 Length: 428.038273240702 Demand Met: 293			
103.8220606846	149.683776856058	100	145
103.8220606846	149.683776856058	100	155
103.8220606846	149.683776856058	110	145
103.8220606846	149.683776856058	110	155
106.387301797927	168.205882859698	100	165
106.387301797927	168.205882859698	100	175
106.387301797927	168.205882859698	110	165
106.387301797927	168.205882859698	110	175
122.131117120684	170.55871019973	120	165
122.131117120684	170.55871019973	120	175
122.131117120684	170.55871019973	130	165
122.131117120684	170.55871019973	130	175
123.141680619767	185.633140839242	120	185
123.141680619767	185.633140839242	120	195
131.233976566128	186.00481431802	130	185
131.233976566128	186.00481431802	130	195
144.999999459355	186.339711968545	140	185
144.999999459355	186.339711968545	140	195
144.999999459355	186.339711968545	150	185
144.999999459355	186.339711968545	150	195
164.999999435213	186.339712531504	160	185
164.999999435213	186.339712531504	160	195
164.999999435213	186.339712531504	170	185
164.999999435213	186.339712531504	170	195
185.000001307515	186.339709487979	180	185
185.000001307515	186.339709487979	180	195
185.000001307515	186.339709487979	190	185
185.000001307515	186.339709487979	190	195
200.760503282643	185.326287300784	200	185
200.760503282643	185.326287300784	210	185
202.582544887041	184.358919330695	200	175
204.999954274654	183.660262303317	210	175
204.999952997501	199.03344620886	200	195
204.999952997501	199.03344620886	210	195
204.999952997501	199.03344620886	200	205
204.999952997501	199.03344620886	210	205
204.999951615683	206.33973211751	210	215
197.427258192679	206.339729499991	200	215
184.999998128915	206.339726880412	180	205
184.999998128915	206.339726880412	180	215
184.999998128915	206.339726880412	190	205
184.999998128915	206.339726880412	190	215
164.999999341113	206.339723560627	160	205
164.999999341113	206.339723560627	160	215

Solution x	Solution y	Original x	Original y
164.999999341113	206.339723560627	170	205
164.999999341113	206.339723560627	170	215
144.999999598807	206.339719100341	140	205
144.999999598807	206.339719100341	140	215
144.999999598807	206.339719100341	150	205
144.999999598807	206.339719100341	150	215
125.000000306407	206.339713100647	120	205
125.000000306407	206.339713100647	120	215
125.000000306407	206.339713100647	130	205
125.000000306407	206.339713100647	130	215
111.303687384535	206.060373820919	110	205
111.303687384535	206.060373820919	110	215
103.537160989395	205.755844317262	100	215
102.791648157212	199.586923007199	100	205
102.061735047688	189.824228730471	100	185
102.061735047688	189.824228730471	100	195
102.061735047688	189.824228730471	110	185
102.061735047688	189.824228730471	110	195
Route: 4 Length: 347.0746258896 Demand Met: 256			
62.4522319376928	98.1636045689826	60	105
62.4522319376928	98.1636045689826	60	95
49.8275940563329	96.0856333120986	50	105
49.8275940563329	96.0856333120986	50	95
35.0385126168089	82.9079982385448	40	85
35.0385126168089	82.9079982385448	30	85
35.0385126168089	82.9079982385448	40	75
35.0385126168089	82.9079982385448	30	75
19.4481911556947	82.0006338143687	20	85
19.4481911556947	82.0006338143687	10	85
19.1681756178373	74.6176326075456	20	75
19.1681756178373	74.6176326075456	10	75
18.9068601607073	65.9579163447736	20	65
18.9068601607073	65.9579163447736	10	65
18.6602894357738	59.999961893195	20	55
18.6602894357738	59.999961893195	10	55
31.3397532258196	59.9999621210738	40	65
31.3397532258196	59.9999621210738	30	65
31.2167820793136	54.3114856900138	40	55
31.2167820793136	54.3114856900138	30	55
31.0863510494594	45.4768316479032	40	45
31.0863510494594	45.4768316479032	30	45
30.9515170120609	38.959456500726	40	35
30.9515170120609	38.959456500726	30	35
17.4895963117642	38.6260359265529	20	45
17.4895963117642	38.6260359265529	10	45
17.4895963117642	38.6260359265529	20	35
17.4895963117642	38.6260359265529	10	35
17.277321137226	27.8344006418921	20	25
17.277321137226	27.8344006418921	10	25
17.0710975945593	22.0710534785653	10	15
23.6704009803554	22.3820482554024	20	15
35.1027800916713	22.7083601269552	40	25
35.1027800916713	22.7083601269552	40	15
35.1027800916713	22.7083601269552	30	25
35.1027800916713	22.7083601269552	30	15
54.5735365329404	23.1325373530005	60	25
54.5735365329404	23.1325373530005	60	15
54.5735365329404	23.1325373530005	50	25
54.5735365329404	23.1325373530005	50	15
55.4947470972439	40.0581413238756	60	45
55.4947470972439	40.0581413238756	60	35
55.4947470972439	40.0581413238756	50	45
55.4947470972439	40.0581413238756	50	35
56.4681314815289	59.7738309195229	60	65
56.4681314815289	59.7738309195229	50	65
56.4681314815289	59.7738309195229	60	55
56.4681314815289	59.7738309195229	50	55
57.6881822683386	73.6105260433951	60	75
57.6881822683386	73.6105260433951	50	75
59.1362297158565	83.6416302901237	50	85
66.3120919276937	89.1434448879817	60	85
Route: 5 Length: 341.469723923399 Demand Met: 284			
93.7233344710454	138.200167986592	90	145
88.9767117610525	146.754721737086	90	155
83.8098666697828	150.676166962024	80	145
83.8098666697828	150.676166962024	80	155
80.0000103098992	155.0000024239	70	155
80.0000106404759	164.999998712001	70	165
81.3397333316615	169.99999970848	90	165
81.3397333316615	169.99999970848	90	175

Solution x	Solution y	Original x	Original y
81.3397333316615	169.99999970848	80	165
81.3397333316615	169.99999970848	80	175
80.00001111391	175.000001967527	70	175
80.0000114115222	184.999998441945	70	185
81.7904524011645	190.070138250227	90	185
81.7904524011645	190.070138250227	90	195
81.7904524011645	190.070138250227	80	185
81.7904524011645	190.070138250227	80	195
82.3834461769367	201.423185412559	90	205
82.9289235903233	207.928921799605	90	215
77.6893296196086	206.635607086182	80	205
77.6893296196086	206.635607086182	80	215
70.0008272922554	205.000011918468	70	195
70.0008272922554	205.000011918468	70	205
69.9857648475582	205.000012207324	70	215
60.0142623967311	205.000012056988	60	215
59.9993519418544	205.00001161506	60	195
59.9993519418544	205.00001161506	60	205
52.5356214945268	206.673766489048	50	215
47.0710684194585	207.928914971812	40	215
47.3362638970885	199.770600333259	50	195
47.3362638970885	199.770600333259	50	205
47.3362638970885	199.770600333259	40	195
47.3362638970885	199.770600333259	40	205
47.6269751301055	188.124301746418	40	185
47.9286576413141	180.933315818109	40	175
49.6414165593982	180.465392168483	50	175
49.6414165593982	180.465392168483	50	185
51.3400325566892	179.99999315853	60	175
51.3400325566892	179.99999315853	60	185
51.3405932556138	167.158478323848	60	165
51.3411539741286	160.002458574263	60	155
49.999185904604	160.002459148161	50	165
48.6616857070233	160.002459744928	40	165
48.8960797939326	153.761562868605	50	155
48.8960797939326	153.761562868605	40	155
49.1442774493651	145.412397175497	50	145
49.1442774493651	145.412397175497	40	145
49.4118812370974	138.132536770588	40	135
54.4610792479129	137.380728821539	50	135
60.4576394520032	136.638068713284	60	145
66.7824257188323	135.806760127999	70	145
68.7618253334958	131.412274852173	60	135
Route: 6 Length: 421.715710942623 Demand Met: 281			
43.4426606673096	106.895177671039	40	115
33.4227313312115	109.852171392836	30	115
25.6619809362746	112.488433313013	20	115
19.9989669825633	115.000306674858	20	125
10.0148193831268	115.001547522509	10	125
6.74391450430863	115.002579914451	10	115
3.26258133452119	115.003612313603	0	115
2.31840400033434E-6	115.00464460239	-10	115
1.80996812559897E-6	124.999988937669	-10	125
1.34908789561905E-6	129.591758614147	0	125
8.77532485787924E-7	134.994537107357	-10	135
5.11385493950911E-7	135.000894709557	0	135
1.90964485113909E-7	135.007252089214	10	135
-1.97606013330187E-7	144.994545064742	-10	145
-6.64049821352819E-7	145.000876684577	0	145
-1.06222347540097E-6	145.007209230804	10	145
-1.44438192251073E-6	150.34394330013	0	155
-1.86249785372183E-6	154.994862862026	10	155
-2.34627427175838E-6	155.007017285873	-10	155
-2.76302829149699E-6	160.343728607005	0	165
-3.21171974348999E-6	164.996074336624	10	165
-3.72935917880568E-6	165.00858153825	-10	165
-4.11923980436768E-6	174.980686098769	-10	175
-4.5105083472663E-6	175.00130478858	10	175
-5.20653415492234E-6	179.581015733952	0	175
-5.71609855626321E-6	184.989756818339	-10	185
-6.15646138157899E-6	185.000462129321	10	185
-0.611932091698677	188.892694995526	0	185
-1.22529695460179	193.261582918206	0	195
-1.84138435283968	197.52054038546	-10	195
-2.40089006678438	203.043754901076	-10	205
-2.92892763522848	207.928927569115	-10	215
-0.108656188930368	207.426705210926	0	205
2.70817125851886	206.92915142859	0	215
6.03412690256974	206.388793391225	10	215
8.03759132445246	205.692404188464	10	205

Solution x	Solution y	Original x	Original y
10.0000046367668	205.000013102272	10	195
15.3935765584505	205.000010254082	20	205
20.0000709060498	205.000008242672	20	215
29.984418702068	205.000008509641	30	215
29.985405925507	201.687914638434	30	205
29.9863928312551	198.181317241309	30	195
29.9873795973707	194.936929095491	20	195
29.988386808288	189.532796436689	30	185
29.9893939108085	184.948270745342	20	185
29.9904263874978	175.043247981478	20	175
29.9914881775458	170.376269637012	30	175
29.9925498888796	165.03346402405	20	165
29.9936515910087	161.718863620894	30	165
29.9947532418419	158.216919026635	30	155
29.9958548563944	154.965244413135	20	155
29.997038898643	145.013542583382	20	145
29.9983559721019	140.355615889743	30	145
29.9996730526532	135.001169482342	20	135
33.5909954713235	131.381848930624	30	135
37.5510443440768	127.436588541779	30	125
44.3922795003784	123.99582536509	40	125
52.9544106142585	120.508404075107	60	125
52.9544106142585	120.508404075107	50	125
57.6270447171216	115.005989610851	50	115
65.9981575836148	109.59404809783	60	115
Route: 7 Length: 422.373534082642 Demand Met: 293			
46.3253841076939	99.946719197559	40	105
37.8545204183753	99.8932065533455	40	95
28.1397491486212	99.839807008214	30	105
28.1397491486212	99.839807008214	30	95
15.1577312235279	99.7864041067981	20	105
15.1577312235279	99.7864041067981	20	95
15.1577312235279	99.7864041067981	10	105
15.1577312235279	99.7864041067981	10	95
4.25133811043864	99.7329512724752	0	105
4.25133811043864	99.7329512724752	0	95
-1.54251697855764	99.6794634903815	-10	105
-1.57666163046164	94.3716491743102	-10	95
-1.6106068459589	88.7503147111941	0	85
-1.64456257368025	83.8493537126125	-10	85
-1.67833187229004	78.4266345737041	0	75
-1.71211381290689	73.6089029852031	-10	75
-1.74572041988137	68.1764818567322	0	65
-1.77934063465891	63.3007738160711	-10	65
-1.81279210070846	57.6291889226154	0	55
-1.8462573052786	52.4556927887164	-10	55
-1.87954374700306	45.5620588365252	0	45
-1.87954374700306	45.5620588365252	-10	45
-1.91270294997447	39.2987880853661	0	35
-1.94587843189201	34.0259964795317	-10	35
-1.97891830168786	28.3300495145281	0	25
-2.01197340380303	23.2538299373651	-10	25
-2.04489173570535	17.3582597366199	-10	15
-2.07766510545713	12.6068459911278	0	15
-2.1104521015762	7.52686223342407	-10	5
-2.14309499359092	3.36435974592364	0	5
-2.17574928603297	-0.960952927593034	0	-5
-2.20841610040284	-4.82978369499138	-10	-5
-2.24095360429352	-8.69149214374082	-10	-15
2.39565036065544	-8.69149146037314	0	-15
7.61430613846606	-8.69149077655464	10	-15
12.2409552099965	-8.69149009268147	20	-15
12.2409557267977	-6.70259189364109	10	-5
12.2409562443717	-4.74567551626746	10	5
20.0826652327439	-4.80493587088291	20	5
20.0826652327439	-4.80493587088291	20	-5
28.7577263453068	-4.87169416386174	30	5
30.0000022025107	-4.99999651717909	30	-15
34.6088668222481	-4.99999665610813	30	-5
39.998748270341	-4.99999680955394	40	-15
40.0045138415604	-4.99999675435713	40	-5
40.0102805153808	-4.99999670383542	40	5
49.9913663381575	-4.9999966645608	50	5
49.9964816176746	-4.99999665836258	50	-5
50.0015967493034	-4.99999665437771	50	-15
55.3662134279679	-4.99999644236549	60	-5
59.9999999897743	-4.99999627819756	60	-15
65.0265496990062	-2.00065285184741	60	5
75.5996174004465	0.106469438030093	80	5
83.057670644502	2.03133734259825	90	5

Solution x	Solution y	Original x	Original y
87.6508030189164	3.83217281392086	90	-5
91.0233977381267	7.68655120388879	100	5
92.4731412266778	14.9179768662733	90	15
93.9567119665896	22.1205112145724	100	25
95.3295691668379	28.1459248242335	90	25
96.7968862147887	35.3147231819146	90	35
98.4265907468015	42.6098844116734	100	35
Route: 8 Length: 381.734265806969 Demand Met: 284			
114.557501264479	138.554520707039	120	145
120.275798283688	145.122467708198	120	155
129.072700726783	145.544632767939	130	145
129.072700726783	145.544632767939	130	155
135.091217721713	145.893247671826	140	145
140.089522891524	146.242866152331	150	145
140.135862348495	154.302589178337	150	155
140.177827460863	157.802626729692	140	155
140.219829502986	161.53588331146	140	165
140.261898561404	165.003829502759	140	175
150.000872410938	165.004958216298	150	165
150.000872410938	165.004958216298	150	175
159.999520593299	165.006031761994	160	165
159.999520593299	165.006031761994	160	175
169.999016689914	165.007061531241	170	165
169.999016689914	165.007061531241	170	175
179.997699677205	165.008055823785	180	175
189.574960150389	165.009019672322	190	175
189.574974049082	162.865849294173	180	165
189.574974049082	162.865849294173	190	165
189.574987954261	157.884416258286	180	155
193.781747845201	157.884369457094	190	155
198.548780186245	157.88432266262	200	165
202.973859119797	157.884275857625	210	165
202.973906293908	151.539268820523	200	155
202.973906293908	151.539268820523	210	155
202.973953454684	139.974080015118	200	135
202.973953454684	139.974080015118	210	135
202.973953454684	139.974080015118	200	145
202.973953454684	139.974080015118	210	145
202.974000575587	128.840841853804	210	125
202.974047681392	122.115919935909	210	115
197.88048422118	124.694852583849	200	125
192.552009013068	127.261188772701	190	125
187.668789617948	129.925329231149	180	125
185.43605416359	134.362605171313	180	135
185.43605416359	134.362605171313	190	135
183.274629366563	138.688738730052	190	145
178.752634012414	140.889996204652	180	145
174.093604308672	142.971797485804	170	145
169.999993330276	144.99998535154	170	155
160.003347144178	144.99998548568	160	155
160.002706455939	140.389271967877	160	145
160.002065766065	134.992813728994	160	135
160.002065766065	134.992813728994	170	135
160.00137119698	125.148811895778	170	125
155.300547077946	125.106500134933	160	125
149.790224961325	125.064194618852	150	125
149.790224961325	125.064194618852	150	135
140.032176489978	125.013129480705	140	135
133.734905511559	119.247468992722	140	125
Route: 9 Length: 421.895923997136 Demand Met: 285			
127.453044029479	53.141490133887	130	55
127.453044029479	53.141490133887	130	45
135.274101076934	48.0937112228659	140	55
139.985088185523	34.9999983976248	140	45
139.985088185523	34.9999983976248	140	25
139.993822872067	34.7144040959535	130	35
139.993822872067	34.7144040959535	140	35
149.988588644256	27.3945272304278	150	35
149.988588644256	27.3945272304278	150	25
159.99187395235	4.99999966223245	150	5
159.99187395235	4.99999966223245	160	15
159.99187395235	4.99999966223245	160	5
159.99187395235	4.99999966223245	160	-5
161.339733290913	-6.74922358001595E-7	170	5
161.339733290913	-6.74922358001595E-7	170	-5
161.339740356809	-5.09013703215904	160	-15
170.017995396737	-5.06410551584676	170	-15
179.320649444909	-5.03712846527334	180	-15
180.000019209294	-5.00001493222299	180	5
189.99708002141	-5.00001594693152	180	-5

Solution x	Solution y	Original x	Original y
189.99708002141	-5.00001594693152	190	5
189.99708002141	-5.00001594693152	190	-5
189.99708002141	-5.00001594693152	190	-15
197.658646688605	-6.66466379747286	200	-15
202.928915520189	-7.92892437844342	210	-15
202.282527908131	-3.13845690043052	210	-5
201.580873822343	2.47537363124541	200	5
201.580873822343	2.47537363124541	210	5
201.580873822343	2.47537363124541	200	-5
200.787896189922	9.57858724745274	200	15
199.999998688143	14.9999812907357	190	15
199.999998688143	14.9999812907357	210	15
194.52055840549	19.0096191054132	200	25
183.225834764893	21.8527057584793	180	25
183.225834764893	21.8527057584793	190	25
183.225834764893	21.8527057584793	180	15
170.013679970001	25.0000015417873	170	35
170.013679970001	25.0000015417873	170	15
170.000006197536	25.0117978514798	160	25
170.000006197536	25.0117978514798	170	25
169.999999717773	34.9999993936879	160	35
169.999994225329	45.0015836668793	170	55
169.999994225329	45.0015836668793	170	45
169.999988725197	45.0075650932455	160	45
169.999988725197	45.0075650932455	180	45
157.676282997342	49.0514618853512	150	45
153.748141400094	55.5737091514622	150	55
153.748141400094	55.5737091514622	160	55
149.252848898276	62.601437237036	150	65
144.666569478874	69.0442503151916	150	75
137.11073747536	73.0956621960099	140	75
137.11073747536	73.0956621960099	140	65

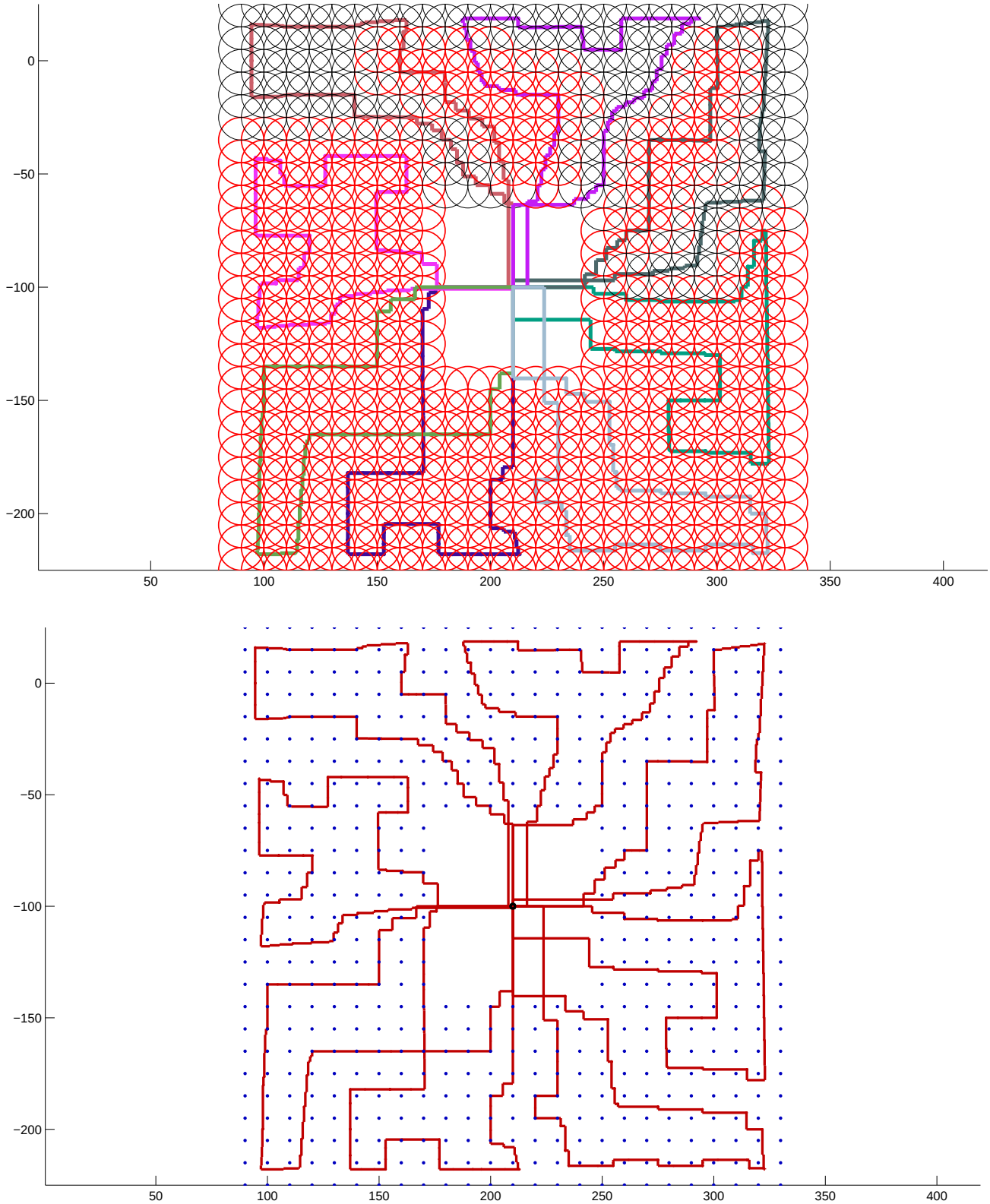


Figure O.146: *bubbles*9, Equal Radius, 2D, Manhattan, Length = 3817.2175358

Table O-149: Solution for *bubbles*9, Equal Radius, 2D, Manhattan

Total distance: 3817.21753576749			
Total demand met: 3714			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 489.753910734807 Demand Met: 466			
135.50467582844	102.931387200258	140	105
149.921350797355	105.684694184386	150	105
149.921350797355	105.684694184386	150	115
164.999999545976	106.33972014452	160	105
164.999999545976	106.33972014452	160	115
164.999999545976	106.33972014452	170	105
164.999999545976	106.33972014452	170	115
184.999999462417	106.339718908432	180	105
184.999999462417	106.339718908432	180	115
184.999999462417	106.339718908432	190	105
184.999999462417	106.339718908432	190	115
198.163072595456	105.710273147839	200	115
200.865202989966	99.7664887487993	200	105
203.644226071148	90.9647273232436	200	95
203.644226071148	90.9647273232436	200	85
203.644226071148	90.9647273232436	210	95
206.359080716433	79.5468287664683	200	75
206.359080716433	79.5468287664683	210	75
210.000004688498	75.0000241029251	210	85
210.000004688498	75.0000241029251	210	65
211.552103048468	80.0151508996659	220	85
211.552103048468	80.0151508996659	220	75
211.770674493652	99.9831270699929	220	105
211.770674493652	99.9831270699929	220	95
211.935025733152	109.997236998787	210	105
211.935025733152	109.997236998787	210	115
212.100502100667	119.969291288414	220	115
212.100502100667	119.969291288414	220	125
212.247538077167	129.924948180236	210	125
212.247538077167	129.924948180236	210	135
212.395414650918	139.942252260825	220	135
212.395414650918	139.942252260825	220	145
212.532780104725	149.843947996353	210	145
212.532780104725	149.843947996353	210	155
212.670936998263	159.948957049905	220	155
212.670936998263	159.948957049905	220	165
212.802267721182	171.408918065172	220	175
212.931541508689	177.926281295861	220	185
204.897901243936	173.15054780433	200	165
204.897901243936	173.15054780433	200	175
204.897901243936	173.15054780433	210	165
204.897901243936	173.15054780433	210	175
184.973229922737	172.453223457382	180	165
184.973229922737	172.453223457382	180	175
184.973229922737	172.453223457382	190	165
184.973229922737	172.453223457382	190	175
169.119903390079	171.873694386189	160	175
169.119903390079	171.873694386189	170	175
168.882200122359	163.97917007859	160	165
168.882200122359	163.97917007859	170	165
168.660282131739	149.999999653798	160	145
168.660282131739	149.999999653798	160	155
173.94913769339	149.999997082165	170	145
173.94913769339	149.999997082165	170	155
184.613968058228	149.999994488698	180	145
184.613968058228	149.999994488698	180	155
184.613968058228	149.999994488698	190	145
184.613968058228	149.999994488698	190	155
191.339718652998	149.999991876732	200	155
191.339717926322	143.560014999981	200	145
191.339717154766	129.999998967467	200	125
191.339717154766	129.999998967467	200	135
184.394928240673	129.20628708541	180	125
184.394928240673	129.20628708541	180	135
184.394928240673	129.20628708541	190	125
184.394928240673	129.20628708541	190	135
164.919829593019	128.348454620937	160	125
164.919829593019	128.348454620937	160	135
164.919829593019	128.348454620937	170	125
164.919829593019	128.348454620937	170	135
145.002951944684	127.274383699402	140	125
145.002951944684	127.274383699402	140	135
145.002951944684	127.274383699402	150	125
145.002951944684	127.274383699402	150	135
134.181277960021	114.35349348048	140	115
Route: 2 Length: 468.82873590766 Demand Met: 461			
131.681407090111	94.2752612907523	140	95
136.627196055788	88.0807014890859	140	85
141.106693006252	82.6837939394913	140	75
145.977075800895	79.2906015329501	150	85
149.99866149017	74.9991064122523	150	65
153.23958847813	74.9956886631226	150	75
156.730955244153	74.9922710605493	160	75
159.999995870265	74.9888525813898	170	75
159.999998534455	64.9999987358784	170	65
160.000000915201	55.009059650115	160	65
160.000000915201	55.009059650115	160	55
160.000000915201	55.009059650115	170	55
160.000003014234	45.0000023548145	150	45
160.000003014234	45.0000023548145	160	45
160.000005446464	35.008393952674	150	35
164.963728597273	35.0042000570484	160	35
164.963728597273	35.0042000570484	170	35
170.000000785013	35.0000097194891	170	45
170.000000785013	35.0000097194891	170	25
179.708786381223	35.2728230427995	180	45
179.708786381223	35.2728230427995	180	35
187.071113163318	35.4385237212568	190	45
187.071114412556	30.7062546032753	190	35
187.071115658142	25.062600595955	180	25
187.071115658142	25.062600595955	190	25
187.071116900802	19.5036273905485	180	15
187.071118142155	15.7495619237377	190	15
187.071119382816	12.071030061465	180	5
190.438549337541	12.071028716153	200	15
190.371231197563	5.81833214834056	200	5
190.299473636106	1.53109902418408	190	5
190.227753989856	-3.19193086850263	200	-5
190.113859289235	-4.09792418151932	190	-5
190.000009657053	-5.00000341059519	180	-5
190.000009649229	-14.9999933396224	180	-15
193.687034861341	-15.5230377805623	190	-15
197.774180176074	-16.0467692637071	200	-15
201.686421661416	-16.5718225473631	200	-25
206.332505847886	-17.0507400805273	210	-25
209.630682504993	-17.4887167136888	210	-15
212.928913327105	-17.9289351718865	220	-25
212.588071065683	-12.3903841589366	220	-15
212.234350242914	-5.38808496541159	210	-5
212.234350242914	-5.38808496541159	220	-5
211.868969397033	1.28128553458588	210	5
211.505779160761	6.98752479410179	220	5
211.114779032597	14.8191485102144	220	15
210.683748851606	22.3441914288916	220	25
210.000016470635	24.999999855383	210	35
210.000016470635	24.999999855383	210	15
209.384946955243	27.4334745344747	200	25
209.384946955243	27.4334745344747	210	25
209.003115561903	34.2266612112169	200	35
208.660270122896	40.000005614321	200	45
211.339735543173	40.0000052698398	220	35
211.195900280925	43.7486522189744	210	45
211.052277840162	47.4073277292304	220	45
210.900688054644	53.2963287122335	220	55
210.740319634574	57.4048599105893	210	55
210.580117570664	61.8020480400731	220	65
200.630082269725	62.2324217613512	200	65
200.630082269725	62.2324217613512	200	55
192.10733684314	62.6759797103334	190	55
185.572108030571	63.1431733679733	180	55
184.891746219311	66.8042908885836	190	65
184.193551334944	70.6872756687893	180	65
183.517414844121	75.8889530445418	180	75
183.517414844121	75.8889530445418	190	75
182.824031231505	81.6040869441276	190	85
182.074203202861	85.9726997172367	180	85
181.33218125077	90.4807077609213	190	95
175.78753133502	91.6770481099168	180	95
169.006311839478	92.8377901442718	170	85
161.642600200207	94.1835396849619	160	95
161.642600200207	94.1835396849619	160	85
161.642600200207	94.1835396849619	170	95

Solution x	Solution y	Original x	Original y
144.925867741676	97.0068295091369	150	95
Route: 3 Length: 435.185496821657 Demand Met: 462			
65.7337914590953	102.30150427892	60	105
65.7337914590953	102.30150427892	60	95
62.7641230514088	109.554019035614	60	115
60.000008619255	115.000001098793	50	115
60.0000081249972	124.99999751676	50	125
60.0000085540121	130.402065400114	60	125
60.0000090071105	137.344433807486	60	135
60.0000094658153	144.999988776977	50	145
60.1108918857236	145.911897381665	60	145
60.2218975438495	146.82888326028	70	145
60.2762858733111	156.901249512221	60	155
60.3306774514497	168.387400181721	60	175
60.3850820058311	175.073894534945	70	175
60.4379654298201	182.072933844299	70	185
54.2821243711967	182.072935117012	60	185
44.8839904733138	182.072936394302	50	175
44.8839904733138	182.072936394302	40	175
44.8839904733138	182.072936394302	50	185
44.8839904733138	182.072936394302	40	185
33.7469250448833	182.072937666806	30	175
27.0692105106439	182.072938826868	20	175
27.0692092749766	188.300927627968	30	185
27.0692092749766	188.300927627968	20	185
27.0692080044129	199.952969359974	30	195
27.0692080044129	199.952969359974	20	195
27.0692080044129	199.952969359974	30	205
27.0692080044129	199.952969359974	20	205
27.0692067372381	211.688485402938	30	215
27.0692067372381	211.688485402938	20	215
27.0692054461456	217.927052761521	20	225
32.070422927112	217.927051563569	30	225
37.883676534609	217.927050254667	40	225
42.9307983258671	217.927048854044	50	225
42.9307996751894	213.384328623703	50	215
42.9307996751894	213.384328623703	40	215
42.9308009969347	208.30930938061	50	205
42.9308009969347	208.30930938061	40	205
42.9308032281217	204.560893032404	40	195
50.3223017785294	204.561049448938	50	195
59.7327028759854	204.561208915601	60	195
67.0709046205604	204.56136856587	70	195
67.071423269329	208.328009797854	70	205
67.071423269329	208.328009797854	60	205
67.07194399542	213.384166299538	70	215
67.07194399542	213.384166299538	60	215
67.0724657906708	217.930453031683	60	225
73.2123363482159	217.930971725451	70	225
82.040208335007	217.931490094025	90	215
82.040208335007	217.931490094025	80	215
85.8999396863217	217.932008643976	90	225
85.8999396863217	217.932008643976	80	225
96.4959934961167	217.93252696943	100	225
102.924802385851	217.933045170278	110	225
102.244015668896	214.733986991377	110	215
101.505035170728	211.488597909874	100	215
100.771894944155	207.993360004103	110	205
95.8704305135426	206.483759600561	100	205
90.0000120020801	204.999991821367	80	205
90.0000113921629	200.391259895643	90	205
90.0000107330944	194.999998983247	90	195
90.0000107330944	194.999998983247	80	195
90.0000110239323	189.583760960103	90	185
90.0000113105527	184.999998215555	80	185
95.4628760854417	179.475352571304	100	175
99.9999893291618	174.999996262492	110	175
99.9999928606665	164.999999094983	100	165
99.9999928606665	164.999999094983	110	165
99.9999954937247	154.999998766624	100	155
99.9999954937247	154.999998766624	110	155
99.9999977542953	144.999976053231	100	145
99.9999977542953	144.999976053231	110	145
Route: 4 Length: 477.559093292002 Demand Met: 466			
66.3583460098438	89.7567175515732	60	85
59.7932525661291	84.7415756570783	60	75
50.5853249169007	84.1453854693816	50	85
50.5853249169007	84.1453854693816	50	75
43.1105353274763	83.6575319689581	40	85
43.1105353274763	83.6575319689581	40	75

Solution x	Solution y	Original x	Original y
39.7964374773173	83.2431710385644	30	85
39.7098777429588	74.9040369351684	30	75
39.6324296301663	65.219888893423	30	65
39.5614706261215	57.9288971197345	30	55
43.1324707532449	57.928896139594	40	65
43.1324707532449	57.928896139594	40	55
48.4362830122982	57.9288951603108	50	65
48.4362830122982	57.9288951603108	50	55
52.9289582737343	57.9288941797352	60	65
52.9289591080395	52.9371712824481	60	55
52.9289599424926	46.7671156425026	60	45
52.9289599424926	46.7671156425026	50	45
52.9289607746805	42.0711077331164	60	35
46.6752549294579	42.0711085721557	50	35
34.97893080728	42.0711094174284	40	45
34.97893080728	42.0711094174284	40	35
34.97893080728	42.0711094174284	30	45
34.97893080728	42.0711094174284	30	35
23.081139819647	42.0711102741754	20	45
23.081139819647	42.0711102741754	20	35
17.0710348064364	42.0711111334228	10	35
17.0710338610893	46.3471033467772	10	45
17.0710329236634	51.3076708898283	20	55
17.0710319856361	55.4385510690126	20	65
9.90271107130516	55.3007933188459	10	65
9.90271107130516	55.3007933188459	10	55
0.688164249136207	55.1276124144585	0	65
-1.03694940324608	50.1146548212975	0	55
-2.7848114138005	44.0859967518327	0	45
-2.7848114138005	44.0859967518327	0	35
-8.7955945640372	43.3758108674138	-10	45
-8.7955945640372	43.3758108674138	-10	35
-13.6915662528779	42.7591113334637	-20	35
-13.6915643612056	48.9116043659454	-20	45
-13.691562462208	58.6795799016709	-20	65
-13.691562462208	58.6795799016709	-20	55
-13.6915605440333	62.5091105179256	-10	65
-13.6915605440333	62.5091105179256	-10	55
-13.6915586251918	71.3659750972224	-20	75
-13.6915566974042	77.2408958896419	-20	85
-4.9544213720674	77.2408974045436	0	85
-4.9544213720674	77.2408974045436	0	75
-4.9544213720674	77.2408974045436	-10	85
-4.9544213720674	77.2408974045436	-10	75
6.09988275976257	77.2408989038029	10	85
6.09988275976257	77.2408989038029	10	75
10.2543070316299	77.2409003965107	20	75
10.0783986059746	84.9428955680773	20	85
7.76312763976136	91.398869248044	10	95
5.33274465563213	96.9025968065511	10	105
-4.67816552903034	98.3069498075564	0	105
-4.67816552903034	98.3069498075564	0	95
-4.67816552903034	98.3069498075564	-10	105
-4.67816552903034	98.3069498075564	-10	95
-11.3464676386333	99.3842241561982	-20	95
-11.9237859081718	105.597220959876	-20	105
-12.4467701920223	112.792204779555	-20	115
-12.9289298030669	117.928921407435	-20	125
-8.97306587311562	117.512214018939	-10	125
-4.55452298471582	117.070760106162	-10	115
1.37772588849418	116.633430860811	0	115
1.37772588849418	116.633430860811	0	125
9.85147192405412	116.150971154906	10	115
9.85147192405412	116.150971154906	10	125
17.678887276464	115.582717444001	20	125
19.6499608881999	111.766152993113	20	115
21.6138572389845	107.64750987989	20	105
23.6235465504863	103.884712243424	20	95
30.4385751790558	103.001914343978	30	105
30.4385751790558	103.001914343978	30	95
37.6751903533704	102.218220737645	40	105
44.0855613185929	101.424656726324	40	95
54.7732633648403	100.693940341257	50	95
Route: 5 Length: 476.994243664307 Demand Met: 467			
97.9510994673876	52.5294651987855	100	45
95.7801582351784	44.5176149384163	90	45
93.8105242297049	36.2434435901218	100	35
93.8105242297049	36.2434435901218	90	35
91.730195749656	29.0601676191598	100	25
86.4297255674663	25.522359010881	90	25

Solution x	Solution y	Original x	Original y
80.502595561599	22.0263743001448	80	25
74.7234862874763	18.3139896259478	70	15
69.9835892023916	14.9290159073295	60	15
69.9208558777938	9.58897284240775	70	5
69.8581291441599	4.99858613973073	70	-5
60.0181048127515	4.99764117125836	60	-5
56.7406047124803	4.99678753696432	60	5
53.2582994353642	4.99593388104261	50	5
50.0000042927276	4.99508018732602	40	5
50.0000056310425	-0.387836170485663	50	-5
50.0000067115631	-5.00000180513925	40	-5
51.6247236734592	-12.7111084767054	60	-15
51.6247236734592	-12.7111084767054	50	-15
52.9289245171962	-17.9289286462536	60	-25
47.5004764063668	-17.4689676374434	50	-25
40.7299792325839	-16.984076019363	40	-25
34.4763101560321	-16.4694001249809	30	-25
32.432883597485	-15.7312122267174	40	-15
32.432883597485	-15.7312122267174	30	-15
29.9999958677666	-15.0000077549754	30	-5
20.0024032013488	-15.0000070974345	20	-5
19.9928366721983	-15.0000072506167	20	-15
19.9928366721983	-15.0000072506167	10	-15
19.9856674642449	-15.0000074167981	20	-25
10.0127005925794	-15.0000072423361	10	-25
9.99852940445751	-15.0000072021926	10	-5
6.33566159535803E-6	-15.0000078187752	0	-5
-1.70939490169873	-15.3237531141744	0	-15
-1.70939490169873	-15.3237531141744	-10	-15
-3.10974813898592	-15.647843416142	0	-25
-9.56943092241937	-15.8579412284953	-10	-25
-15.5278763618496	-16.0557139122624	-20	-25
-15.5278763613215	-9.72101722846666	-20	-15
-15.5278763608392	-0.0117785327484086	-10	5
-15.5278763608392	-0.0117785327484086	-10	-5
-15.5278763608392	-0.0117785327484086	-20	5
-15.5278763608392	-0.0117785327484086	-20	-5
-15.5278763601132	9.72843689639413	-20	15
-15.5278763590722	16.0557135967897	-20	25
-9.58129606293346	15.8532930400148	-10	25
-9.58129606293346	15.8532930400148	-10	15
-3.03640106974248	15.6383147072854	0	25
-1.50906983504416	15.3191043147156	0	15
7.84855816959862E-6	15.000027371396	0	5
9.97897137331643	15.0000280417598	10	25
9.99075076642892	15.0000266602219	10	15
10.0025292845853	15.0000252602121	10	5
19.9999995253207	15.0000247485909	20	5
29.9925988552235	15.0000246970052	30	5
29.9940127339644	15.2865166187576	30	15
29.9940127339644	15.2865166187576	20	15
29.9957657815706	24.7310706979964	20	25
34.9564404626994	24.8044206781949	30	25
40.9651661782694	24.8778031976574	50	25
40.9651661782694	24.8778031976574	40	25
40.9651661782694	24.8778031976574	40	15
49.9720805802669	24.9748595358712	50	15
57.4725796375214	27.8140234354222	60	25
64.2512908975212	30.802857087273	70	25
68.475244805279	34.9267463152415	70	35
72.5801393390695	39.052805552928	80	35
75.2236697471	45.0261428163518	80	45
75.2236697471	45.0261428163518	70	45
77.921553934834	51.0577126377383	70	55
83.4766281457877	54.9118708303567	80	55
89.8003252259053	58.7681436692302	90	55
96.1338374124401	63.0042272446526	100	55
Route: 6 Length: 514.747011684379 Demand Met: 462			
106.316473949498	62.0995743659571	110	55
110.807549566446	55.0224950562993	120	55
112.526091343192	47.967468577415	110	45
114.304516234042	41.7684114834417	110	35
116.346960774599	38.038784024136	120	45
118.189181521173	31.9359369100207	120	35
119.999992077343	25.0000007228213	130	25
119.999992274576	20.4096992988049	120	25
119.999992491021	15.0027089818546	130	15
119.989233048446	15.0000026958138	120	5
110.010354215749	14.999996983071	110	5
110.003846242299	14.9999929505962	110	25

Solution x	Solution y	Original x	Original y
110.003846242299	14.9999929505962	110	15
110.000000916415	14.9907639622714	100	15
110.000000916415	14.9907639622714	120	15
101.218251220837	12.9013857523332	100	5
93.7282624470867	11.2187381879937	90	15
87.6837742185573	9.45273880868932	80	15
86.1048322236387	5.1274873150217	90	5
84.4595669865756	0.827922666154528	80	5
82.9159850291868	-4.2865221639417	90	-5
81.1479619785629	-9.1900381232104	80	-5
81.1479619785629	-9.1900381232104	80	-15
79.4372052301252	-13.6045548573538	70	-15
78.6081714066218	-16.6887007509234	80	-25
77.7590768966128	-18.6915247391594	70	-25
85.9195693005215	-18.6915230036557	90	-25
91.5019638899545	-18.6915212667801	90	-15
97.4585161942235	-18.6915195301877	100	-15
97.4585161942235	-18.6915195301877	100	-25
102.240928268685	-18.6915177939976	110	-25
102.240929615776	-14.7456850472717	100	-5
110.034506042689	-14.786721443986	110	-5
118.396558874611	-14.8301277480396	120	-5
119.10856505055	-14.9151008920205	110	-15
119.10856505055	-14.9151008920205	120	-15
120.000005752842	-14.9999924392128	120	-25
125.371489060707	-14.9999923631426	130	-15
129.999997223667	-14.9999922879576	130	-25
130.535098256931	-9.5698889453137	130	-5
131.071566999075	-4.91637262654998	130	5
139.533707956965	-4.85356529283872	140	5
143.43865864169	-4.79962294740156	140	-5
147.759057972234	-4.74568364228035	150	5
147.759059236232	-8.58366922648629	150	-5
147.759060504212	-12.8772938852303	140	-15
147.759061772608	-16.6008036562376	150	-15
147.759061772608	-16.6008036562376	150	-25
147.759063041791	-18.6915057254202	140	-25
156.719867557022	-18.6915074037508	160	-25
163.483895208485	-18.6915090815468	160	-15
171.877799082144	-18.691510759413	170	-25
182.240929321934	-18.6915124370279	190	-25
178.609607726572	-16.3669420912541	180	-25
174.589674814782	-11.9662952224747	170	-15
171.148001995808	-7.02158878039725	170	-5
167.82521204297	-2.3495117565883	160	-5
165.574440344244	3.66898516166196	160	5
165.574440344244	3.66898516166196	170	5
163.424592906179	9.05927461512729	160	15
161.444370414413	13.082073460792	170	15
157.877627603314	16.436647133545	160	25
153.496677190465	18.347644326226	150	15
149.621030522135	20.3538526167941	150	25
145.754289408318	22.2392671630786	140	15
143.749081827573	26.509706694823	140	25
141.848092429371	30.9963945378775	140	35
140.000007025709	35.0000041425732	130	35
140.000001364306	44.9999814922208	130	45
139.999996750767	49.5892655300012	140	45
139.999992307051	54.999996560624	150	55
136.651974053186	57.9231527649858	140	55
133.055325130176	61.0411191785194	140	65
126.948682265121	63.6296178656165	130	55
Route: 7 Length: 461.71568752456 Demand Met: 465			
56.697159014314	105.287892407176	50	105
45.9770720078585	110.711411694501	40	115
40.000008662672	115.000009336635	30	115
40.0000017774335	124.99999950836	30	125
39.9999960897563	134.99999902754	40	125
39.9999960897563	134.99999902754	40	145
39.9999904008683	135.002199831384	50	135
35.3971311834699	135.004597629868	40	135
29.9721274963018	135.00699569432	30	135
29.9721274963018	135.00699569432	30	145
20.0004739388318	135.009202428974	20	135
20.0004739388318	135.009202428974	20	145
9.99691477279345	135.011284109766	10	135
9.99691477279345	135.011284109766	10	145
0.0545611581497667	135.013274014529	0	135
0.0545611581497667	135.013274014529	0	145
-5.42268368947464	135.015191435144	-10	135

Solution x	Solution y	Original x	Original y
-10.0000040559639	135.017109028476	-20	135
-10.0000065124849	145.000001421983	-20	145
-10.0000088646539	154.993565332339	0	155
-10.0064651706576	154.996782470499	-10	155
-10.0129241812086	154.999999848685	-10	145
-10.0129241812086	154.999999848685	-10	165
-10.6319383792001	157.596389416145	-20	155
-11.0418862137053	165.777606946561	-20	165
-11.414508719225	176.432455774857	-10	175
-11.414508719225	176.432455774857	-10	185
-11.7926824523339	180.165013284611	-20	175
-11.7926824523339	180.165013284611	-20	185
-12.0526864886464	199.841211308292	-10	195
-12.0526864886464	199.841211308292	-10	205
-12.0526864886464	199.841211308292	-20	195
-12.0526864886464	199.841211308292	-20	205
-12.2724489285074	207.870512982846	-10	215
-12.4936430408969	212.410047445054	-20	215
-12.7095867897463	216.184074398793	-10	225
-12.9288915104509	217.928952251829	-20	225
-2.778362351276	217.512842366067	0	225
4.06274741063041	217.076024309828	10	225
4.64380273663983	211.818445974446	10	215
4.64380273663983	211.818445974446	0	215
5.22225616079619	204.350780570112	10	205
5.22225616079619	204.350780570112	0	205
5.80329425891692	196.650645888436	0	195
6.40203634175154	189.897546020857	10	185
6.40203634175154	189.897546020857	10	195
6.97950940972288	183.297342647319	0	185
7.58475747629342	175.895397416882	10	175
7.58475747629342	175.895397416882	0	175
8.2238393911777	169.661773544739	0	165
9.11333161759093	167.286246587164	10	165
10.0000446507455	165.000010810592	10	155
20.0000002286218	165.000007454702	20	155
20.0000002286218	165.000007454702	20	165
29.9999996325414	165.000004747746	30	155
29.9999996325414	165.000004747746	30	165
39.9999703602025	165.000002336821	40	155
39.9999703602025	165.000002336821	40	165
45.3743415672093	165.000000111715	50	165
50.0000878749034	164.9999978866	50	155
69.9999996162638	164.999995775476	70	155
69.9999996162638	164.999995775476	80	165
69.9999996162638	164.999995775476	70	165
69.9999996162638	164.999995775476	60	165
80.0000013170183	164.99999375335	80	175
89.9903908703282	164.999991513359	90	175
89.9931300834494	160.433545775779	90	165
89.9958685424319	154.985715954555	90	155
89.9958685424319	154.985715954555	80	155
89.9991632655262	145.00124606944	80	145
94.079230000928	138.066055482627	90	145
Route: 8 Length: 492.433356138119 Demand Met: 465			
113.711157615731	151.080198980889	120	155
119.99998192989	164.99979073039	130	165
119.999983092795	169.565928610126	120	165
119.999984265759	174.99996495838	120	175
119.999984265759	174.99996495838	130	175
119.999983041019	184.993105533768	120	185
119.999983041019	184.993105533768	130	185
110.00001724712	185.005409940065	100	185
110.00001724712	185.005409940065	110	185
110.000018060367	190.405448156433	110	195
110.000018869571	194.99991216961	100	195
121.447663360759	198.511552475395	120	195
121.447663360759	198.511552475395	130	195
123.506167464186	209.49136806894	120	205
123.506167464186	209.49136806894	130	205
123.506167464186	209.49136806894	120	215
123.506167464186	209.49136806894	130	215
124.999999487752	216.339721769219	120	225
124.999999487752	216.339721769219	130	225
138.090063245251	216.339722144471	140	225
144.999994803494	216.339722506377	150	225
144.999998534953	215.001883260507	140	215
144.999998534953	215.001883260507	150	215
145.000002301337	213.660277511751	140	205
151.870973979287	213.660277847809	150	205

Solution x	Solution y	Original x	Original y
164.999991627566	213.660278176055	160	205
164.999991627566	213.660278176055	170	205
164.999991627566	213.660278176055	160	215
164.999991627566	213.660278176055	170	215
164.999997667052	216.339717541939	160	225
171.985962605537	216.33971966972	170	225
184.999991764128	216.339721807097	180	225
184.999991764128	216.339721807097	190	225
184.99999567198	214.999533237567	180	215
184.99999567198	214.999533237567	190	215
184.99999956959	213.660281504446	180	205
191.839442280304	213.660281746996	190	205
204.999999378628	213.660281982292	200	205
204.999999378628	213.660281982292	210	205
204.999999378628	213.660281982292	200	215
204.999999378628	213.660281982292	210	215
205.940009765263	217.411192832169	200	225
205.940009765263	217.411192832169	210	225
212.929001100194	217.928824652949	220	225
212.38335847046	211.320697121892	220	215
211.789079128934	200.011613416013	220	195
211.789079128934	200.011613416013	220	205
204.674727141728	192.526612718973	200	185
204.674727141728	192.526612718973	200	195
204.674727141728	192.526612718973	210	185
204.674727141728	192.526612718973	210	195
184.905931172514	191.079452520766	180	185
184.905931172514	191.079452520766	190	185
184.905931172514	191.079452520766	180	195
184.905931172514	191.079452520766	190	195
165.04045824881	189.83956108956	160	185
165.04045824881	189.83956108956	170	185
165.04045824881	189.83956108956	160	195
165.04045824881	189.83956108956	170	195
147.108811232256	188.584915096628	140	195
147.108811232256	188.584915096628	150	195
145.630408678633	181.625095561177	140	185
145.630408678633	181.625095561177	150	185
144.1940408329	169.646005849458	140	165
144.1940408329	169.646005849458	150	165
144.1940408329	169.646005849458	140	175
144.1940408329	169.646005849458	150	175
142.571138700348	150.659285194972	140	145
142.571138700348	150.659285194972	150	145
142.571138700348	150.659285194972	140	155
142.571138700348	150.659285194972	150	155
131.689017446784	147.094416364858	130	155
123.498163116494	140.283027740447	120	145
123.498163116494	140.283027740447	130	145

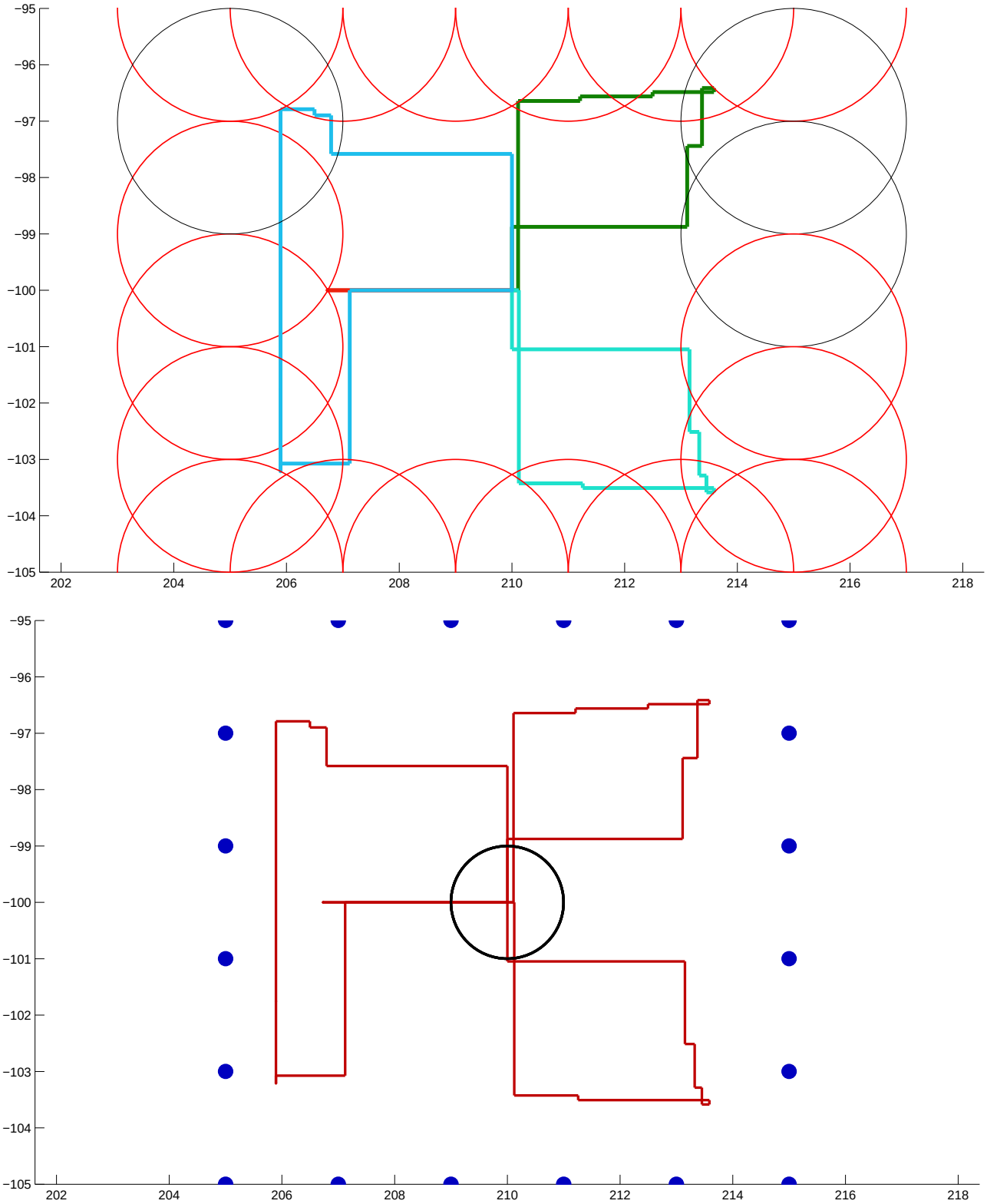


Figure O.147: $rotatingDiamonds1$, Equal Radius, 2D, Manhattan, Length = 56.2779117

Table O-150: Solution for $rotatingDiamonds1$, Equal Radius, 2D, Manhattan

Total distance: 56.2779116912506 Total demand met: 20 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 14.3431438362418 Demand Met: 6			
100.109916446012	96.6414749340327	99	95
101.21005378246	96.5610949549103	101	95
102.496693931743	96.4851628656247	103	95
103.585536908035	96.4139649899145	105	95
103.373943617442	97.4402412286431	105	97
103.11101878101	98.8749568247152	105	99
Route: 2 Length: 6.53589772061446 Demand Met: 2			
96.7320512783675	100.000000037551	95	101
96.73205126939	99.9999999078534	95	99
Route: 3 Length: 14.3431457276538 Demand Met: 6			
100.123342230496	103.424719349833	99	105
101.257245247036	103.507244537864	101	105
103.585753619949	103.585819243878	105	105
103.4523047845	103.285686166411	103	105
103.325065275837	102.513479026942	105	103
103.152485131692	101.048617209412	105	101
Route: 4 Length: 21.0557244067405 Demand Met: 6			
97.1216420684872	103.073711882627	97	105
95.8942033155075	103.211032530436	95	105
95.8942032859448	101.754653297942	95	103
95.8942032594552	96.7889670676102	95	95
96.4975984347772	96.8970924425914	97	95
96.7907589798112	97.5814363284915	95	97

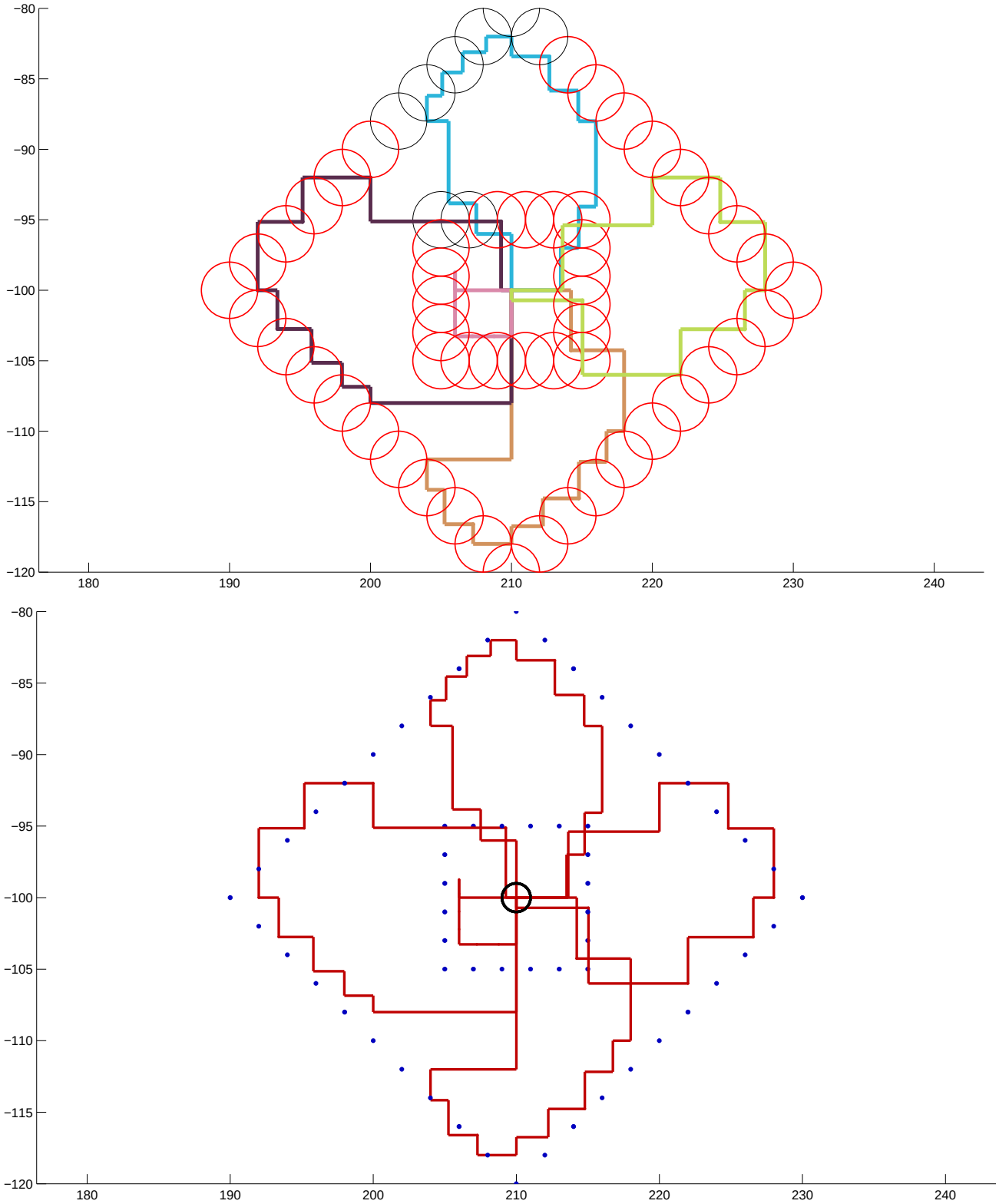


Figure O.148: $rotatingDiamonds2$, Equal Radius, 2D, Manhattan, Length = 273.0716361

Table O-151: Solution for *rotatingDiamonds*2, Equal Radius, 2D, Manhattan

Total distance: 273.071636122489 Total demand met: 60 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 63.9999513527366 Demand Met: 13			
104.223686405578	104.262656871958	105	105
104.223686405578	104.262656871958	103	105
104.223686405578	104.262656871958	105	103
107.999991596492	110.00011490327	110	110
106.752682734029	112.175447804701	108	112
104.79219981147	114.765445322387	104	116
104.79219981147	114.765445322387	106	114
102.235416569185	116.742716960064	102	118
100.000000939895	117.999991180373	100	120
97.2834831256285	116.597791555877	96	116
97.2834831256285	116.597791555877	98	118
95.2540670992225	114.161083509411	94	114
94.0000071004965	112.000003751297	92	112
Route: 2 Length: 59.9999902987892 Demand Met: 13			
103.511898778281	96.996668923631	105	97
104.776403114641	94.0659665219586	105	95
105.999998167743	88.000002054032	108	88
104.74695079232	85.8329545503066	106	86
102.690596491623	83.4071841730926	104	84
102.690596491623	83.4071841730926	102	82
100.00000015557	82.0000015636139	100	80
98.209276597509	83.1092633324961	98	82
96.5385386269922	84.5511439982809	96	84
95.0884721310109	86.2002905382415	94	86
94.0000014547341	87.9999994940056	92	88
95.540599148767	93.8298435062506	95	95
97.5088893603583	96.0047897190048	97	95
Route: 3 Length: 67.9999547369126 Demand Met: 13			
99.2663689293807	95.1197797817284	99	95
99.2663689293807	95.1197797817284	101	95
89.9989996859713	92.0000063425673	90	90
89.9989996859713	92.0000063425673	88	92
85.1855963950341	95.1466328341497	86	94
85.1855963950341	95.1466328341497	84	96
82.0000072339402	99.9993649688056	82	98
82.0000072339402	99.9993649688056	80	100
83.394632650979	102.750915598759	82	102
83.394632650979	102.750915598759	84	104
85.8147686846968	105.143161809263	86	106
87.9758203060582	106.853826614568	88	108
90.000016728282	107.999990944964	90	110
Route: 4 Length: 17.0717883053328 Demand Met: 8			
96.0000035038001	99.7370734512071	95	99
96.0000033749943	98.7320512554116	95	97
96.0000036342713	100.969059448244	95	101
96.0000037657355	102.215782659169	95	103
96.000003898142	103.267948783072	95	105
97.2430331087877	103.267948217926	97	105
98.7710642573434	103.267947653377	99	105
99.999998761704	103.267947091902	101	105
Route: 5 Length: 63.9999514287175 Demand Met: 13			
103.631202297781	95.3882847660659	103	95
110.001233933721	92.0000066328068	112	92
110.001233933721	92.0000066328068	110	90
114.817716001392	95.1652223725497	116	96
114.817716001392	95.1652223725497	114	94
117.999990920917	99.9991117706556	120	100
117.999990920917	99.9991117706556	118	98
116.570818336428	102.764382210299	116	104
116.570818336428	102.764382210299	118	102
112.001136314118	105.999991426249	112	108
112.001136314118	105.999991426249	114	106
105.041468611257	100.715627553824	105	101
105.041468611257	100.715627553824	105	99

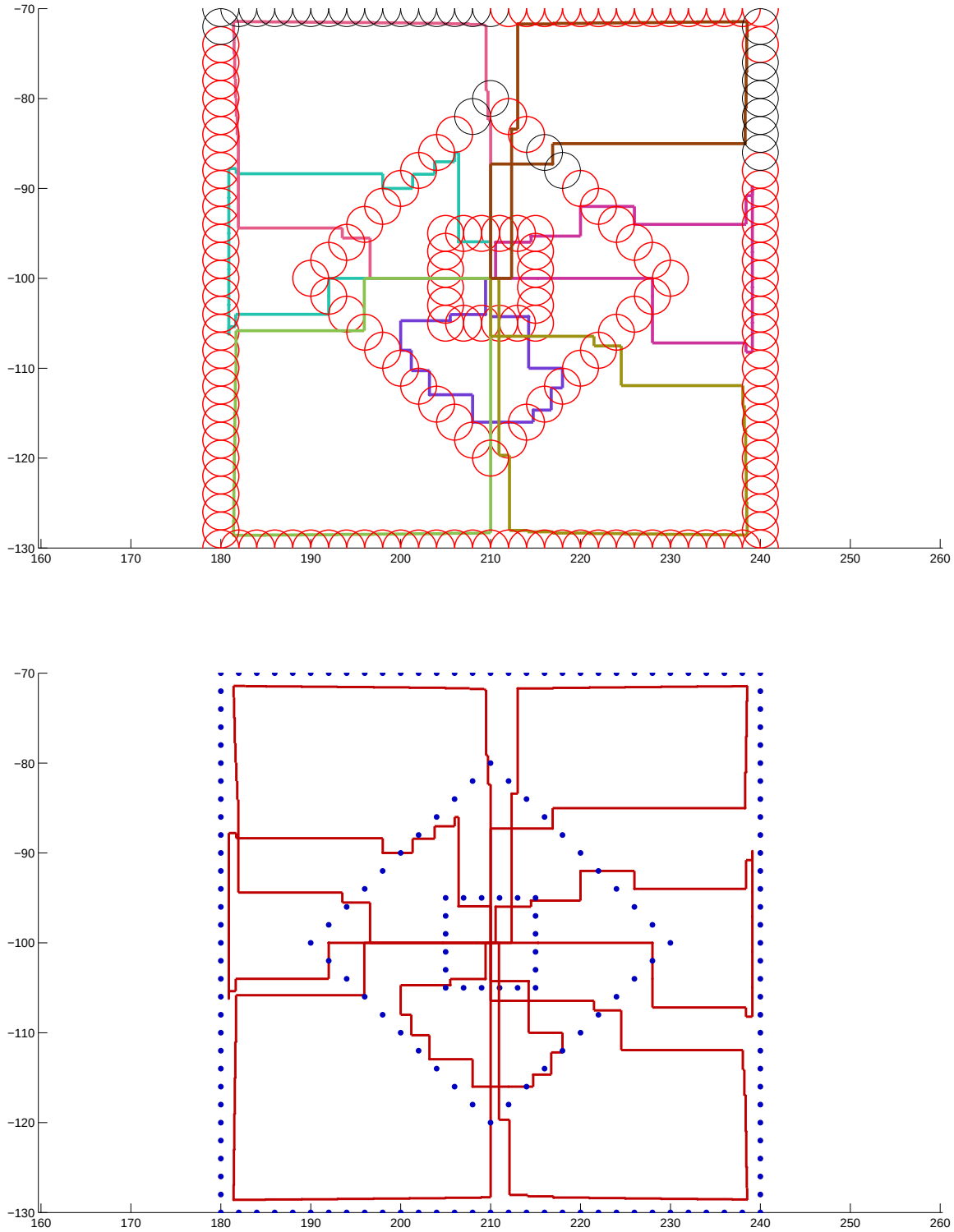
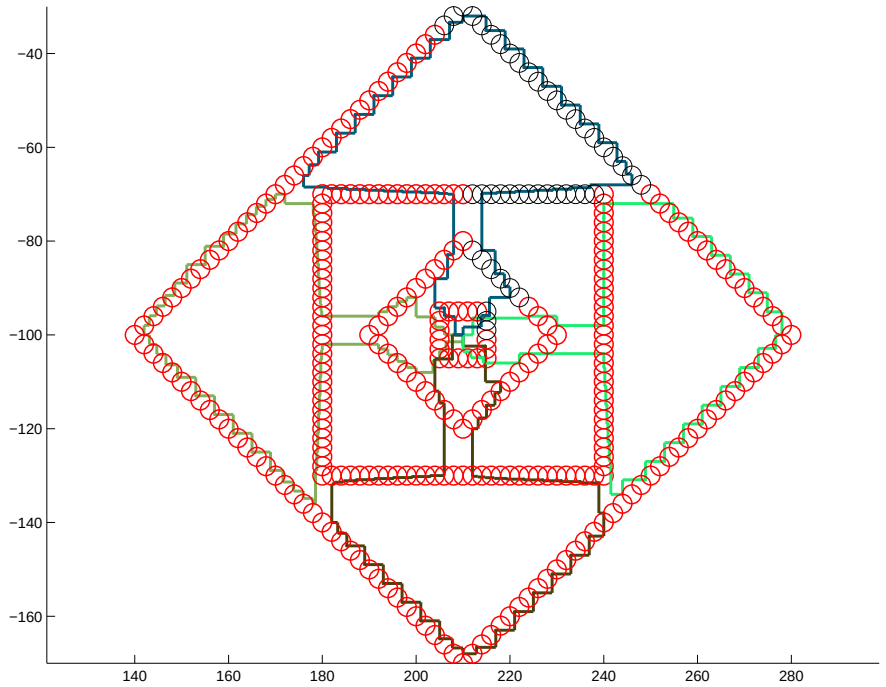


Figure O.149: $rotatingDiamonds3$, Equal Radius, 2D, Manhattan, Length = 727.4837613

Table O-152: Solution for *rotatingDiamonds*3, Equal Radius, 2D, Manhattan

Total distance: 727.483761305393			
Total demand met: 180			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 99.0556451017929 Demand Met: 27			
100.553355462156	95.9828009098599	99	95
100.553355462156	95.9828009098599	101	95
104.505679128498	95.3062483356954	105	97
104.505679128498	95.3062483356954	103	95
104.505679128498	95.3062483356954	105	95
110.001091037284	92.0000084999082	112	92
110.001091037284	92.0000084999082	110	90
115.998905307855	93.9999919819891	116	96
115.998905307855	93.9999919819891	114	94
128.40986631336	90.7965578272068	130	90
129.105564534811	89.7888626699884	130	88
129.105564531492	92.0465246113627	130	92
129.105564526522	94.3568329189361	130	94
129.105564520439	97.0949154035015	130	98
129.105564520439	97.0949154035015	130	96
129.105564511963	100.99264184527	130	100
129.105564511963	100.99264184527	130	102
129.10556450164	104.949219816748	130	104
129.10556450164	104.949219816748	130	106
129.105564489218	108.211137203993	130	110
128.40045149575	107.183965523578	130	108
118.000008201063	103.99999186755	116	104
118.000002735445	101.984232579472	118	102
117.999997273158	100.000009193502	118	98
117.99999181093	100.000006281	120	100
105.267992683251	100.000003306224	105	101
105.267992683251	100.000003306224	105	99
Route: 2 Length: 103.055694629785 Demand Met: 26			
94.68415629149	100.000002018137	95	99
94.68415629149	100.000002018137	95	101
82.0000031355917	100.000003781719	82	98
82.0000031355917	100.000003781719	80	100
81.9999998747755	101.984975979226	82	102
81.9999966145502	104.000000972321	84	104
71.6608278863114	105.374551256074	70	106
70.8944297892277	106.211142419631	70	108
70.8944297914151	102.933126859586	70	102
70.8944297914151	102.933126859586	70	104
70.894429793796	98.9860151273522	70	100
70.894429793796	98.9860151273522	70	98
70.8944297992417	95.0015140654223	70	96
70.8944297992417	95.0015140654223	70	94
70.8944298034215	91.0569299276572	70	92
70.8944298034215	91.0569299276572	70	90
70.8944298098004	87.7888572537246	70	86
71.7124562001796	88.3643641732709	70	88
88.0004043041489	89.9999963544497	90	90
88.0004043041489	89.9999963544497	88	92
91.3253434930576	88.4167228240088	92	88
93.7737633908051	87.0277273446553	94	86
96.000002610557	86.0000044162358	96	84
96.447006288449	95.9330344496833	97	95
96.447006288449	95.9330344496833	95	97
96.447006288449	95.9330344496833	95	95
Route: 3 Length: 67.9999345819371 Demand Met: 19			
99.4409719107341	104.026900202202	99	105
99.4409719107341	104.026900202202	101	105
95.5045255475642	104.705320366907	95	103
95.5045255475642	104.705320366907	97	105
95.5045255475642	104.705320366907	95	105
90.0000096469541	108.00000121652	88	108
91.1811460648034	110.275373102933	90	110
93.2023314637396	112.949136387337	92	112
93.2023314637396	112.949136387337	94	114
97.9986574064299	115.999988985765	96	116
97.9986574064299	115.999988985765	98	118
101.999999559678	115.999988623395	102	118
104.737316211066	114.658758783917	104	116
104.737316211066	114.658758783917	106	114
106.746929454135	112.187687457406	108	112
107.999987952157	110.000145556216	110	110
104.233765051868	104.26092500867	103	105
104.233765051868	104.26092500867	105	103
104.233765051868	104.26092500867	105	105
Route: 4 Length: 114.343132770046 Demand Met: 27			
86.5971561790444	95.5105756630846	86	94
83.5107613133304	94.3990420236114	84	96
71.9440013993192	84.0675199556017	70	84
71.825804476862	82.0057915070609	70	82
71.725877461371	79.9542482934055	70	80
71.6345664456792	77.7865219200037	70	78
71.5488246075945	75.0101148576421	70	76
71.5488246075945	75.0101148576421	70	74
71.4799019614384	72.6948223522816	70	72
71.4142136380413	71.4142199769359	70	70
72.7243130941654	71.4436282249237	72	70
75.0338508274751	71.4735690901274	76	70
75.0338508274751	71.4735690901274	74	70
78.9994185812071	71.505252176007	80	70
78.9994185812071	71.505252176007	78	70
82.999348966297	71.5391691267499	84	70
82.999348966297	71.5391691267499	82	70
86.9999004308735	71.5761911951616	88	70
86.9999004308735	71.5761911951616	86	70
91.0004461652488	71.6180192889651	92	70
91.0004461652488	71.6180192889651	90	70
94.9998692977672	71.6689981363415	96	70
94.9998692977672	71.6689981363415	94	70
97.6720789478124	71.7513759471691	98	70
99.2893720351614	71.8441373593481	100	70
99.50201007354	79.1380717934835	100	80
99.7117033883964	82.3820148330149	98	82
Route: 5 Length: 114.343122508977 Demand Met: 27			
85.9597919288014	105.826188914404	86	106
71.6903844696764	111.005834028772	70	110
71.6903844696764	111.005834028772	70	112
71.6108078870132	114.995636680357	70	114
71.6108078870132	114.995636680357	70	116
71.5517410706073	118.992867165599	70	118
71.5517410706073	118.992867165599	70	120
71.5014024823286	122.994429085871	70	122
71.5014024823286	122.994429085871	70	124
71.4561960439865	126.930453654279	70	126
71.4561960439865	126.930453654279	70	128
71.4146756744772	128.586236928966	72	130
71.4146756744772	128.586236928966	70	130
75.0034778193541	128.555918981576	76	130
75.0034778193541	128.555918981576	74	130
78.9998937129945	128.524000563666	80	130
78.9998937129945	128.524000563666	78	130
82.9975666073848	128.490066746625	84	130
82.9975666073848	128.490066746625	82	130
86.9957685693327	128.453415963001	88	130
86.9957685693327	128.453415963001	86	130
90.9956823020034	128.412782510419	92	130
90.9956823020034	128.412782510419	90	130
94.9979261873499	128.365387240559	96	130
94.9979261873499	128.365387240559	94	130
98.9878262341496	128.301445496557	100	130
98.9878262341496	128.301445496557	98	130
Route: 6 Length: 114.343114068896 Demand Met: 27			
100.93490504328	119.682961908426	100	120
102.097142580921	128.044666811541	102	130
104.12949780361	128.208290872328	104	130
107.003108392001	128.33806991068	106	130
107.003108392001	128.33806991068	108	130
110.999438833404	128.397244076664	110	130
110.999438833404	128.397244076664	112	130
114.997083741069	128.443410690231	114	130
114.997083741069	128.443410690231	116	130
118.993535736845	128.483434148674	118	130
118.993535736845	128.483434148674	120	130
122.988380272048	128.519704290616	122	130
122.988380272048	128.519704290616	124	130
126.924448780561	128.553386105185	126	130
126.924448780561	128.553386105185	128	130
128.586114359093	128.585442675355	130	130
128.537596819683	127.275897811229	130	128
128.488424713282	124.973047863144	130	124
128.488424713282	124.973047863144	130	126
128.43211778805	120.995904639291	130	120
128.43211778805	120.995904639291	130	122

Solution x	Solution y	Original x	Original y
128.361350977764	117.002068433401	130	116
128.361350977764	117.002068433401	130	118
128.224443954497	114.115910923275	130	114
128.053821106516	111.929923437267	130	112
114.52818979433	107.516092849661	114	106
111.499773903086	106.444668451989	112	108
Route: 7 Length: 114.34311764396 Demand Met: 27			
102.332773696063	83.4015407009975	104	84
102.332773696063	83.4015407009975	102	82
103.01114152743	71.6995733234674	102	70
103.01114152743	71.6995733234674	104	70
107.000254608781	71.6335771881903	106	70
107.000254608781	71.6335771881903	108	70
110.997458896444	71.5851662435017	110	70
110.997458896444	71.5851662435017	112	70
114.993655328756	71.5442413146644	114	70
114.993655328756	71.5442413146644	116	70
118.990867825033	71.5078101934217	118	70
118.990867825033	71.5078101934217	120	70
122.992823390906	71.4744945059616	122	70
122.992823390906	71.4744945059616	124	70
126.920351906015	71.4434575502711	126	70
126.920351906015	71.4434575502711	128	70
128.585448902031	71.4138900800513	130	70
128.533012960718	73.0697519010284	130	74
128.533012960718	73.0697519010284	130	72
128.47442431616	77.001116023821	130	78
128.47442431616	77.001116023821	130	76
128.4057520503	80.9985883925951	130	82
128.4057520503	80.9985883925951	130	80
128.312919282641	85.0088739203429	130	86
128.312919282641	85.0088739203429	130	84
106.906768144684	87.2763382502971	108	88
106.906768144684	87.2763382502971	106	86



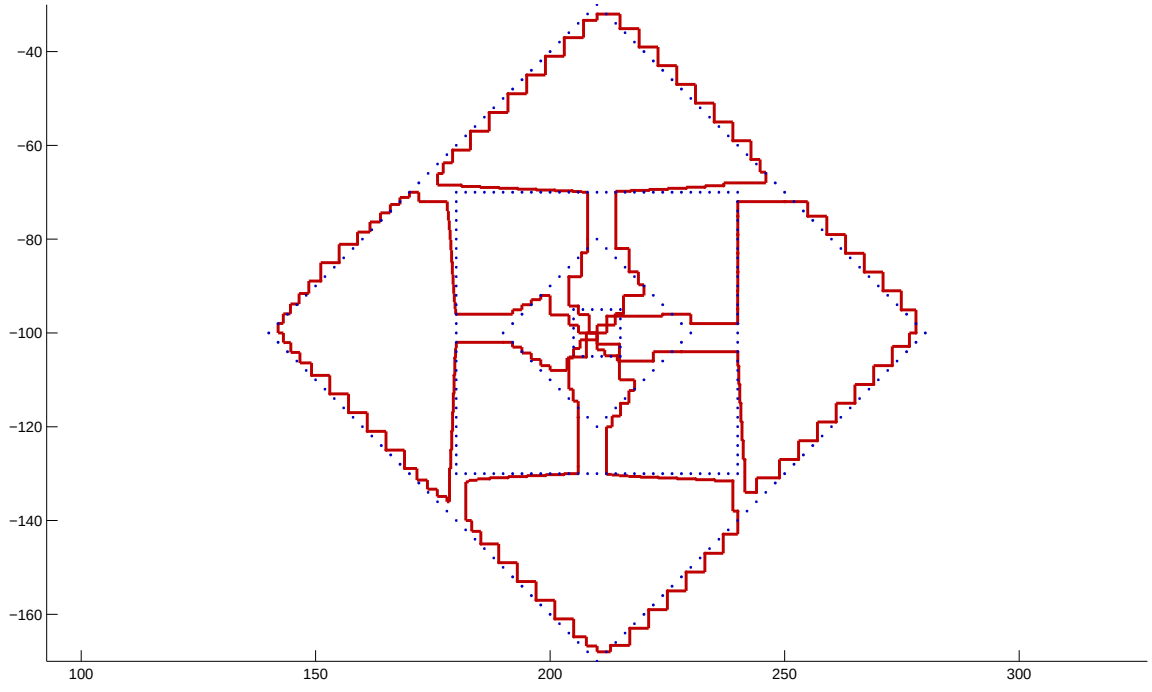


Figure O.150: *rotatingDiamonds*4, Equal Radius, 2D, Manhattan, Length = 1119.9988904

Table O-153: Solution for *rotatingDiamonds*4, Equal Radius, 2D, Manhattan

Total distance: 1119.99889035316			
Total demand met: 320			
Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 287.99995255541 Demand Met: 82			
96.0437080561244	98.3455970023912	95	99
94.015219936334	96.1523002169786	95	97
89.9998424653292	92.0000033336629	90	90
87.9881302952072	92.9019363354802	88	92
85.9815032182284	93.9672236162673	86	94
83.9832865897856	95.0499308828501	84	96
81.9999823882138	95.9999966149918	82	98
69.9999944769463	95.9999967402354	70	98
69.8604511999268	94.9024267496904	70	96
69.72099982623	93.3953752367726	70	94
69.5809946140216	91.6294897727194	70	92
69.4399236830398	89.6813442594965	70	90
69.2972380732461	87.5415537851127	70	88
69.1522145288866	84.983220053293	70	84
69.1522145288866	84.983220053293	70	86
68.9980999083814	82.351351313836	70	82
68.8393653192047	80.1378652509114	70	80
68.6743087840852	78.0583298146072	70	78
68.4997457490284	76.028317259529	70	76
68.3087832789833	74.0122862408137	70	74
68.0786228668222	71.9976756662366	70	72
61.9999985967247	70.0000028449515	62	68
60.0090069696662	71.1063925605279	60	70
57.9712065561454	72.6093022680728	58	72
55.9160001131627	74.3794465152765	56	74
53.8098879304323	76.3383831872693	54	76
51.5734988091022	78.4962535514765	52	78
48.9360914260493	81.0849103304229	50	80
48.9360914260493	81.0849103304229	48	82
45.0074452880887	85.0057638911959	46	84
45.0074452880887	85.0057638911959	44	86
41.0928570071302	88.9399657600792	42	88
41.0928570071302	88.9399657600792	40	90
38.5471396770639	91.5773697438385	38	92
36.4623341298122	93.8106549793037	36	94
34.6385952013179	95.9130220455134	34	96
33.1113054075083	97.9640493825235	32	98
32.0000031410244	100.000000072008	30	100
33.1268364347627	102.043346896981	32	102
34.7018494692874	104.145471453368	34	104
36.646784649634	106.38483327578	36	106
39.1151189194997	109.041686552669	38	108
39.1151189194997	109.041686552669	40	110
43.0215925265349	112.988854557874	42	112
43.0215925265349	112.988854557874	44	114
47.0127656743867	116.98661266131	46	116
47.0127656743867	116.98661266131	48	118
51.0097384329208	120.984252385807	50	120
51.0097384329208	120.984252385807	52	122
55.0068065846652	124.976729546372	54	124
55.0068065846652	124.976729546372	56	126
58.9556956665644	128.891836770619	58	128
58.9556956665644	128.891836770619	60	130
61.606600944854	131.366475775026	62	132
63.8359189421332	133.302298539783	64	134
65.9386892863311	134.859383198726	66	136
68.0000005257704	135.999995848761	68	138
68.54628668531	129.017328334714	70	130
68.54628668531	129.017328334714	70	128
68.801125673614	124.994021420189	70	126
68.801125673614	124.994021420189	70	124
69.0067773224178	120.992749973992	70	122
69.0067773224178	120.992749973992	70	120
69.1904677536954	116.993841261783	70	118
69.1904677536954	116.993841261783	70	116
69.36174571141	112.998309023412	70	114
69.36174571141	112.998309023412	70	112
69.5254292029341	109.024077705306	70	110
69.5254292029341	109.024077705306	70	108
69.6845816119668	105.293430512725	70	106
69.6845816119668	105.293430512725	70	104
69.8416427408519	103.24497177236	70	102
69.9999656775622	102.000003322302	70	100
79.9999888353373	102.000003429652	80	100
81.9854371663189	103.012835373741	82	102
83.979528207767	104.292821863332	84	104
85.9802215215876	105.659865841052	86	106
87.986775886693	106.960691577356	88	108
90.0000005620973	107.99999633065	90	110
93.5981433735699	105.337758310991	95	105
94.9921732577823	103.300023053075	95	103
96.3938187986226	101.459943635498	95	101
Route: 2 Length: 267.99964256008 Demand Met: 76			
97.7340260167797	105.116904354097	97	105
97.7340260167797	105.116904354097	99	105
94.00002205469	112.000000040742	92	112
94.9110025214801	114.536893487777	94	114
95.9999753368256	117.999494500307	96	116
95.9999753368256	117.999494500307	98	118
95.9999754924644	128.462894649682	96	130
95.9999756404977	129.999983914982	98	130
92.8987990770191	130.206208317469	92	130
92.8987990770191	130.206208317469	94	130
88.9899323490549	130.414930524176	88	130
88.9899323490549	130.414930524176	90	130
85.0006050986484	130.630372600519	84	130
85.0006050986484	130.630372600519	86	130
81.0103488934658	130.858321611261	80	130
81.0103488934658	130.858321611261	82	130
77.0961046907743	131.109533236468	76	130
77.0961046907743	131.109533236468	78	130
74.4824645286053	131.414673012233	74	130
72.6553666179195	131.768320899904	72	130
72.0000240559996	139.999999259357	70	140
73.2644345165975	142.29710216781	72	142
75.2114046945191	144.993661246761	74	144
75.2114046945191	144.993661246761	76	146
79.0222030106105	148.98777110795	78	148
79.0222030106105	148.98777110795	80	150
83.0072420237149	152.990280984561	82	152
83.0072420237149	152.990280984561	84	154
87.004195265628	156.98744440246	86	156
87.004195265628	156.98744440246	88	158
91.0070689906552	160.973508030414	90	160
91.0070689906552	160.973508030414	92	162
95.0073991897835	164.790657985385	94	164
95.0073991897835	164.790657985385	96	166
97.713479564335	166.749308911235	98	168
100.000000222513	167.999968527475	100	170
102.867940585446	166.615114669464	102	168
102.867940585446	166.615114669464	104	166
106.97642342505	162.958253010405	106	164
106.97642342505	162.958253010405	108	162
110.991437335971	158.984911074434	110	160
110.991437335971	158.984911074434	112	158
114.991668523883	154.989124982162	114	156
114.991668523883	154.989124982162	116	154
118.988938619562	150.98987655373	118	152
118.988938619562	150.98987655373	120	150
122.978943236232	146.984363903668	122	148
122.978943236232	146.984363903668	124	146
126.895962715077	142.914424316718	126	144
126.895962715077	142.914424316718	128	142
129.999970254981	138.000766574067	130	140
129.999970254981	138.000766574067	132	138
128.962053134246	131.550310892013	130	130
128.962053134246	131.550310892013	128	130
124.990739618041	131.291467775319	126	130
124.990739618041	131.291467775319	124	130
120.992914407672	131.090626265557	122	130
120.992914407672	131.090626265557	120	130
116.997560482624	130.913314087034	118	130
116.997560482624	130.913314087034	116	130
113.013009585675	130.749173031333	114	130
113.013009585675	130.749173031333	112	130
109.181929793273	130.593385456019	110	130
109.181929793273	130.593385456019	108	130
106.674751921192	130.443340821459	106	130
104.715927944487	130.294814575102	104	130
103.130092319373	130.147195845668	102	130
102.000024352349	129.999977872836	100	130
102.00002359691	120.000001160439	100	120

Solution x	Solution y	Original x	Original y
103.222404021725	117.7136572828	102	118
105.004381822369	115.002761504772	104	116
105.004381822369	115.002761504772	106	114
106.795255665386	112.285876325208	108	112
107.999976564685	109.999999434112	110	110
104.773751310336	102.379704810466	105	103
104.773751310336	102.379704810466	105	101
Route: 3 Length: 267.999578924888 Demand Met: 77			
102.091247001842	96.4336725462036	103	95
102.091247001842	96.4336725462036	101	95
114.001312746312	96.0000273062833	116	96
114.001312746312	96.0000273062833	114	94
119.998437369617	97.999972289975	120	100
119.998437369617	97.999972289975	118	98
129.995404536116	97.9999738164542	130	98
129.995404536116	97.9999738164542	130	100
129.996623378024	94.8926158818424	130	94
129.996623378024	94.8926158818424	130	96
129.997840612136	90.9860194796381	130	90
129.997840612136	90.9860194796381	130	92
129.999057669411	86.9974567274506	130	86
129.999057669411	86.9974567274506	130	88
130.000274840093	83.0029360792639	130	82
130.000274840093	83.0029360792639	130	84
130.001492250882	79.0141732440388	130	78
130.001492250882	79.0141732440388	130	80
130.002710018392	75.1014809449632	130	74
130.002710018392	75.1014809449632	130	76
130.003928335729	72.0000241625375	130	70
130.003928335729	72.0000241625375	130	72
140.00174156949	72.0000280036117	142	72
140.00174156949	72.0000280036117	140	70
144.912013857233	75.1022299262594	146	76
144.912013857233	75.1022299262594	144	74
148.983828721858	79.0165793079357	150	80
148.983828721858	79.0165793079357	148	78
152.988886373389	83.006891922799	154	84
152.988886373389	83.006891922799	152	82
156.986380094351	87.0051047905922	158	88
156.986380094351	87.0051047905922	156	86
160.974623976107	91.0097274132007	162	92
160.974623976107	91.0097274132007	160	90
164.88384278256	95.0799664849367	166	96
164.88384278256	95.0799664849367	164	94
167.999961285481	99.9990266160486	170	100
167.999961285481	99.9990266160486	168	98
166.605220747906	102.86150940684	166	104
166.605220747906	102.86150940684	168	102
162.955200729402	106.976188531137	162	108
162.955200729402	106.976188531137	164	106
158.984398206307	110.991622391155	158	112
158.984398206307	110.991622391155	160	110
154.99000883258	114.99267898273	154	116
154.99000883258	114.99267898273	156	114
150.991846124418	118.991652185794	150	120
150.991846124418	118.991652185794	152	118
146.991761871508	122.988551224327	146	124
146.991761871508	122.988551224327	148	122
142.9853557812	126.97743681522	142	128
142.9853557812	126.97743681522	144	126
138.910751619688	130.886620636025	138	132
138.910751619688	130.886620636025	140	130
134.000966065227	133.999963342156	134	136
134.000966065227	133.999963342156	136	134
131.504704403256	127.010398403082	130	128
131.504704403256	127.010398403082	130	126
131.165646209306	122.995722550619	130	124
131.165646209306	122.995722550619	130	122
130.897793385701	118.996214159567	130	120
130.897793385701	118.996214159567	130	118
130.658126192175	114.998706404422	130	116
130.658126192175	114.998706404422	130	114
130.433017772398	111.007855555006	130	112
130.433017772398	111.007855555006	130	110
130.215438461154	107.097310608679	130	108
130.215438461154	107.097310608679	130	106
129.999971601638	104.000030319377	130	104
129.999971601638	104.000030319377	130	102
117.998705182261	104.000028745328	116	104
117.998705182261	104.000028745328	118	102

Solution x	Solution y	Original x	Original y
112.00100336933	105.9999712325	112	108
112.00100336933	105.9999712325	114	106
104.335926683571	104.852393667305	105	105
104.335926683571	104.852393667305	103	105
101.646009830736	103.600980514007	101	105
Route: 4 Length: 295.999716312778 Demand Met: 85			
98.3345375164133	96.0887907975173	99	95
96.0153055781896	94.2574501743595	95	95
96.0153055781896	94.2574501743595	97	95
94.0000201091979	87.9982884691724	94	86
94.0000201091979	87.9982884691724	92	88
96.7006317773493	82.9187735065563	98	82
96.7006317773493	82.9187735065563	96	84
97.9999798243889	79.9999954258879	100	80
97.999980454389	70.0000299221265	100	70
96.7836854469722	69.8407947977357	98	70
94.7310176753996	69.6809720799099	94	70
94.7310176753996	69.6809720799099	96	70
90.9672756128646	69.5179117957131	90	70
90.9672756128646	69.5179117957131	92	70
86.9880417178321	69.3494493202327	86	70
86.9880417178321	69.3494493202327	88	70
82.9961943862658	69.1722780702516	82	70
82.9961943862658	69.1722780702516	84	70
79.0032332382523	68.9808413568918	78	70
79.0032332382523	68.9808413568918	80	70
75.0097801142333	68.7633336392994	74	70
75.0097801142333	68.7633336392994	76	70
71.006308324029	68.4805848706755	70	70
71.006308324029	68.4805848706755	72	70
66.0000168114553	65.9999982422457	64	66
67.2062628362355	63.7232218812547	66	64
69.1869869644794	61.007189602546	70	60
69.1869869644794	61.007189602546	68	62
73.0228215003363	56.999625539362	74	56
73.0228215003363	56.999625539362	72	58
77.009687625474	52.9980247657414	78	52
77.009687625474	52.9980247657414	76	54
81.0040245557083	49.0012658823551	82	48
81.0040245557083	49.0012658823551	80	50
85.0004820822687	45.0059009546486	86	44
85.0004820822687	45.0059009546486	84	46
88.9993167169876	41.0126596075681	90	40
88.9993167169876	41.0126596075681	88	42
93.0130684317626	37.0361036516992	94	36
93.0130684317626	37.0361036516992	92	38
97.1311130317235	33.3472993570992	98	32
97.1311130317235	33.3472993570992	96	34
100.001139018215	32.0000182592639	102	32
100.001139018215	32.0000182592639	100	30
104.916018627123	35.104529116144	106	36
104.916018627123	35.104529116144	104	34
108.988149900715	39.0235103331738	110	40
108.988149900715	39.0235103331738	108	38
112.991680759011	43.0137988518408	114	44
112.991680759011	43.0137988518408	112	42
116.989357969995	47.0092347752676	118	48
116.989357969995	47.0092347752676	116	46
120.985312759492	51.0062747010274	122	52
120.985312759492	51.0062747010274	120	50
124.979611173278	55.0039960281246	126	56
124.979611173278	55.0039960281246	124	54
128.969603895234	59.0044189239906	130	60
128.969603895234	59.0044189239906	128	58
132.814026048185	63.0132984575195	134	64
132.814026048185	63.0132984575195	132	62
134.759927290274	65.7183816424291	136	66
135.99997555649	67.9999965581414	138	68
127.024361307281	68.6148167861715	128	70
127.024361307281	68.6148167861715	126	70
122.994036302634	68.9167348466166	124	70
122.994036302634	68.9167348466166	122	70
118.996940178956	69.1632635667334	120	70
118.996940178956	69.1632635667334	118	70
115.000920341468	69.3857087207661	116	70
115.000920341468	69.3857087207661	114	70
111.006415612735	69.5955353925496	112	70
111.006415612735	69.5955353925496	110	70
107.079300096093	69.798905204835	108	70
107.079300096093	69.798905204835	106	70

Solution x	Solution y	Original x	Original y
104.000019864844	70.0000317272775	104	70
104.000019864844	70.0000317272775	102	70
104.000020360172	82.0016799618149	104	84
104.000020360172	82.0016799618149	102	82
106.84651298413	86.9674664987784	108	88
106.84651298413	86.9674664987784	106	86
108.815091383696	89.7218090478024	110	90
109.999977190271	91.999998655599	112	92
105.650688943768	95.8488805918731	105	95
105.650688943768	95.8488805918731	105	97
103.883479475962	98.3170221316436	105	99

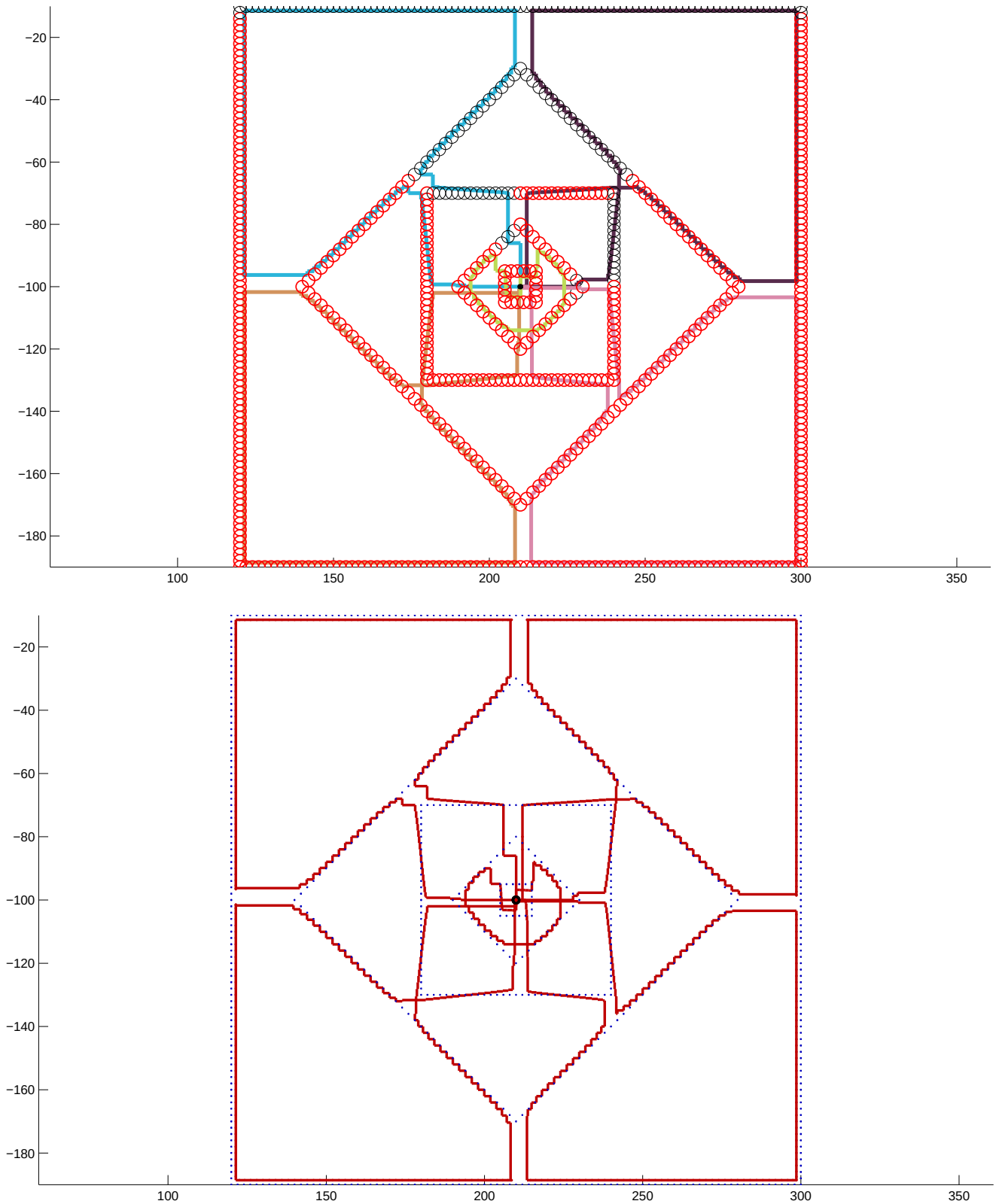


Figure O.151: *rotatingDiamonds*5, Equal Radius, 2D, Manhattan, Length = 2029.8139163

Table O-154: Solution for *rotatingDiamonds*5, Equal Radius, 2D, Manhattan

Total distance: 2029.81391629613 Total demand met: 680 Depot: x 100 y 100			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 476.6853006 Demand Met: 159			
99.58891952	117.4785102	98	118
99.27509692	120.8328631	100	120
98.94656574	128.3999678	100	130
97.54045061	128.6698262	98	130
95.79323596	128.9139671	96	130
93.90281789	129.1454524	94	130
91.95203777	129.3692933	92	130
89.97492083	129.588357	90	130
87.9856681	129.8046203	88	130
85.99032013	130.0196447	86	130
83.99127795	130.2348233	84	130
81.98890614	130.4515563	82	130
79.9816257	130.6714259	80	130
77.96440632	130.8964458	78	130
75.9234681	131.1295294	76	130
73.81681473	131.3756213	74	130
71.4671913	131.6456544	72	130
64.00000045	131.9999921	64	134
62.00107599	130.9131012	62	132
60.00092059	129.4299372	60	130
58.0006596	127.7078524	58	128
56.00041358	125.8499622	56	126
54.00016034	123.9212679	54	124
51.99986667	121.9577125	52	122
49.999491	119.9776479	50	120
47.99895765	117.990289	48	118
45.99811354	116.0006951	46	116
43.99665022	114.0126869	44	114
41.99395296	112.0310649	42	112
39.98880206	110.0642659	40	110
37.97877368	108.1285788	38	108
35.95899738	106.2549497	36	106
33.9193288	104.4982541	34	104
31.83617093	102.9464829	32	102
29.63154567	101.7377752	30	100
11.40988763	101.4185325	10	100
11.40995488	102.6103788	10	102
11.41002214	104.2462397	10	104
11.41008941	106.0977274	10	106
11.41015669	108.0407079	10	108
11.41022397	110.0188164	10	110
11.41029126	112.0098963	10	112
11.41035857	114.0057912	10	114
11.41042588	116.0035747	10	116
11.4104932	118.0021942	10	118
11.41056053	120.0012501	10	120
11.41062787	122.000569	10	122
11.41069522	124.0000603	10	124
11.41076258	125.9996694	10	126
11.41082996	127.9993608	10	128
11.41089734	129.9991109	10	130
11.41096474	131.9989037	10	132
11.41103215	133.9987279	10	134
11.41109957	135.9985755	10	136
11.411167	137.9984408	10	138
11.41123444	139.9983191	10	140
11.4113019	141.9982069	10	142
11.41136937	143.9981009	10	144
11.41143686	145.9979984	10	146
11.41150436	147.9978966	10	148
11.41157187	149.997793	10	150
11.4116394	151.9976845	10	152
11.41170695	153.9975681	10	154
11.41177451	155.9974401	10	156
11.41184208	157.9972957	10	158
11.41190968	159.9971292	10	160
11.41197729	161.9969321	10	162
11.41204491	163.9966918	10	164
11.41211256	165.9963874	10	166
11.41218022	167.9959827	10	168
11.41224791	169.9954119	10	170
11.41231561	171.9945514	10	172
11.41238333	173.9931627	10	174
11.41245107	175.9907615	10	176
11.41251884	177.9862831	10	178
11.41258663	179.9771429	10	180
11.41265444	181.9564733	10	182
11.41272228	183.9049706	10	184
11.41279014	185.7684167	10	186
11.41285804	187.4118456	10	188
11.412926	188.5845018	10	190
12.58169418	188.5845698	12	190
14.22328543	188.5846377	14	190
16.08877136	188.5847056	16	190
18.03970567	188.5847735	18	190
20.02053253	188.5848413	20	190
22.01205485	188.5849091	22	190
24.00777564	188.5849768	24	190
26.00537141	188.5850445	26	190
28.00390984	188.5851122	28	190
30.00296279	188.5851799	30	190
32.00231267	188.5852475	32	190
34.00184257	188.5853152	34	190
36.00148764	188.5853827	36	190
38.00121049	188.5854503	38	190
40.00098835	188.5855179	40	190
42.00080632	188.5855854	42	190
44.00065398	188.5856529	44	190
46.00052355	188.5857204	46	190
48.00040897	188.5857878	48	190
50.00030531	188.5858553	50	190
52.00020842	188.5859227	52	190
54.00011467	188.5859901	54	190
56.00002072	188.5860575	56	190
57.99992334	188.5861248	58	190
59.99981929	188.5861922	60	190
61.99970507	188.5862595	62	190
63.99957674	188.5863268	64	190
65.99942956	188.5863941	66	190
67.99925754	188.5864614	68	190
69.99905275	188.5865287	70	190
71.99880426	188.5865959	72	190
73.9984969	188.5866632	74	190
75.99810989	188.5867304	76	190
77.9976158	188.5867976	78	190
79.99698007	188.5868648	80	190
81.99615755	188.586932	82	190
83.99506876	188.5869992	84	190
85.99349233	188.5870663	86	190
87.99067369	188.5871335	88	190
89.98407151	188.5872006	90	190
91.96568386	188.5872677	92	190
93.91228265	188.5873348	94	190
95.76389008	188.587402	96	190
97.39318925	188.5874691	98	190
98.58355016	188.5875362	100	190
98.24284624	170.3706825	100	170
97.05119843	168.157839	98	168
95.50926572	166.0748737	96	166
93.75525349	164.0363717	94	164
91.87981684	162.0175415	92	162
89.94090161	160.008044	90	160
87.97111402	158.0031057	88	158
85.98720665	156.0004484	86	156
83.99754078	153.9989674	84	154
82.00668744	151.9981171	82	152
80.01824558	149.9976175	80	150
78.03716518	147.9973105	78	148
76.07279842	145.9970905	76	146
74.14396627	143.9968776	74	144
72.287082	141.9966211	72	142
70.56650709	139.9963433	70	140
69.08373864	137.9963365	68	138
68.00000804	135.9999996	66	136
68.36461183	130.4959113	70	130
68.64766922	128.1744913	70	128
68.90658893	126.0728369	70	126
69.1525222	124.0327325	70	124
69.39055656	122.0152571	70	122
69.62373001	120.0072106	70	120
69.85419192	118.003389	70	118
70.08369355	116.0015243	70	116

Solution x	Solution y	Original x	Original y
70.31386579	114.0005301	70	114
70.54643947	111.9998503	70	112
70.78350077	109.9992818	70	110
71.02791345	107.9989925	70	108
71.28429657	105.999159	70	106
71.56213169	103.9998354	70	104
71.89161633	102.0041851	70	102
Route: 2 Length: 472.6861911 Demand Met: 160			
82.52848786	99.58994648	82	98
79.1598547	99.27644842	80	100
71.6150517	98.94865517	70	100
71.34795014	97.52915495	70	98
71.10549303	95.77944183	70	96
70.87531229	93.89058327	70	94
70.65268297	91.94111228	70	92
70.43487313	89.96487769	70	90
70.21998266	87.97680339	70	88
70.00651551	85.98351077	70	86
69.79315212	83.98796456	70	84
69.57858585	81.99148956	70	82
69.36136239	79.99461173	70	80
69.13966045	77.99736611	70	78
68.91089227	75.99927876	70	76
68.67077239	73.99901023	70	74
68.4104115	71.99383784	70	72
68.10092246	69.98276666	70	70
64.00000007	68.00000785	64	66
61.99980621	69.0953648	62	68
59.99795697	70.57722021	60	70
57.996359	72.29326421	58	72
55.99525882	74.14419725	56	74
53.99453326	76.0674094	54	76
51.99402658	78.02717983	52	78
49.99357904	80.00430041	50	80
47.99298559	81.98839672	48	82
45.9919149	83.9730686	46	84
43.98975596	85.95256895	44	86
41.9853196	87.91864829	42	88
39.97623758	89.85605096	40	90
37.95768641	91.73468365	38	92
35.91938985	93.49697922	36	94
33.83668612	95.04470011	34	96
31.62274882	96.23164517	32	98
11.41256978	96.58414688	10	98
11.41259843	95.39851219	10	96
11.41262712	93.76119647	10	94
11.41265574	91.90152752	10	92
11.4126844	89.95349986	10	90
11.41271304	87.97359719	10	88
11.4127417	85.98212949	10	86
11.41277043	83.98618558	10	84
11.41279901	81.98833664	10	82
11.41282764	79.98959678	10	80
11.41285639	77.99040819	10	78
11.41288506	75.99098059	10	76
11.4129137	73.99141949	10	74
11.41294238	71.99178052	10	72
11.41297101	69.99209461	10	70
11.41299973	67.99238006	10	68
11.41302835	65.99264848	10	66
11.41305708	63.99290771	10	64
11.41308565	61.99316333	10	62
11.41311433	59.99341946	10	60
11.41314302	57.99367929	10	58
11.41317168	55.99394535	10	56
11.41320039	53.99421977	10	54
11.41322905	51.99450448	10	52
11.4132578	49.99480137	10	50
11.41328652	47.99511241	10	48
11.41331512	45.99543993	10	46
11.41334385	43.99578679	10	44
11.41337252	41.99615675	10	42
11.41340119	39.99655497	10	40
11.41342991	37.9969888	10	38
11.41345855	35.99746925	10	36
11.41348728	33.99801383	10	34
11.41351599	31.99865238	10	32
11.41354472	29.99944015	10	30
11.41357338	28.00048765	10	28
11.41360212	26.00203176	10	26

Solution x	Solution y	Original x	Original y
11.41363079	24.00460927	10	24
11.41365953	22.00949388	10	22
11.41368827	20.01982803	10	20
11.41371698	18.04360897	10	18
11.41374565	16.10152481	10	16
11.41377439	14.24646638	10	14
11.4138031	12.60406062	10	12
11.41383184	11.4146122	10	10
12.60375954	11.4145836	12	10
14.24508176	11.41455494	14	10
16.10013548	11.41452631	16	10
18.04274031	11.41449775	18	10
20.01937725	11.41446913	20	10
22.00926005	11.41444051	22	10
24.00445547	11.41441191	24	10
26.00188774	11.4143833	26	10
28.0003237	11.4143547	28	10
29.99924654	11.41432612	30	10
31.99842787	11.41429745	32	10
33.99776017	11.41426889	34	10
35.99718897	11.41424028	36	10
37.99668438	11.41421164	38	10
39.9962287	11.41418311	40	10
41.99581074	11.41415456	42	10
43.995423	11.41412592	44	10
45.99506027	11.4140973	46	10
47.99471873	11.41406879	48	10
49.99439552	11.41404016	50	10
51.99408833	11.41401163	52	10
53.99379521	11.41398295	54	10
55.99351439	11.41395447	56	10
57.99324409	11.41392588	58	10
59.99298242	11.41389732	60	10
61.99272724	11.41386872	62	10
63.992476	11.41384011	64	10
65.99222549	11.41381156	66	10
67.99197167	11.41378297	68	10
69.9917092	11.41375442	70	10
71.99143078	11.41372582	72	10
73.99112599	11.41369723	74	10
75.99077894	11.41366872	76	10
77.99036332	11.41364017	78	10
79.98983217	11.4136116	80	10
81.98909557	11.413583	82	10
83.98797046	11.41355445	84	10
85.98605707	11.41352585	86	10
87.98239818	11.41349738	88	10
89.97445436	11.41346883	90	10
91.95495437	11.41344028	92	10
93.90266105	11.41341169	94	10
95.75906418	11.41338313	96	10
97.39101272	11.41335461	98	10
98.58485454	11.4133261	100	10
98.21965695	29.62250059	100	30
97.03224588	31.83951924	98	32
95.48938651	33.92133667	96	34
93.7308648	35.95890587	94	36
91.85387679	37.97710411	92	38
89.91666713	39.98601619	90	40
87.94987417	41.99033731	88	42
85.96886957	43.9923763	86	44
83.98157411	45.99329527	84	46
81.99274815	47.9936852	82	48
80.00658034	49.99384681	80	50
78.02889481	51.99392508	78	52
76.06999716	53.99395755	76	54
74.14923459	55.99385271	74	56
72.30222461	57.99328754	72	58
70.59019628	59.99152272	70	60
69.1084832	61.98779188	68	62
68.00000225	64.00000009	66	64
71.90790225	68.06555898	72	70
73.97999877	68.27531544	74	70
75.99297946	68.45149579	76	70
77.99409232	68.61308649	78	70
79.99139867	68.76599959	80	70
81.98594633	68.91305058	82	70
83.97593259	69.05587457	84	70
85.95653622	69.1955421	86	70
87.91778971	69.3328156	88	70

Solution x	Solution y	Original x	Original y
89.8402564	69.46827508	90	70
91.6880391	69.60238534	92	70
93.40038426	69.7355299	94	70
94.88540672	69.86802473	96	70
95.99999508	70.0001382	98	70
96.00000428	81.99997409	98	82
96.00001137	84.00111264	96	84
96.00001855	86.00000569	94	86
Route: 3 Length: 472.6857598 Demand Met: 160			
101.9999958	84.0000129	104	84
102.0000106	82.00200779	102	82
102.0000254	79.99991173	100	80
102.0000426	70.00031211	100	70
103.12114	69.88435857	102	70
104.6041995	69.7678532	104	70
106.3120992	69.65077118	106	70
108.155425	69.53295835	108	70
110.0746639	69.41419899	110	70
112.0342989	69.29422653	112	70
114.0148212	69.1727158	114	70
116.0061294	69.04926165	116	70
118.0034374	68.92334073	118	70
120.0053323	68.7942446	120	70
122.0138264	68.66095429	122	70
124.037989	68.52187758	124	70
126.1104499	68.37419306	126	70
128.3863242	68.21158027	128	70
135.9999998	68.0000088	136	66
137.9888004	69.12178124	138	68
139.9911032	70.60294637	140	70
141.9929245	72.31189809	142	72
143.9937965	74.15808006	144	74
145.9941344	76.07947996	146	76
147.9942873	78.03925624	148	78
149.9944664	80.01763248	150	80
151.9948185	82.00434759	152	82
153.9955204	83.99368035	154	84
155.996886	85.98136948	156	86
157.9995309	87.96224089	158	88
160.0046834	89.92740208	160	90
162.014822	91.85982328	162	92
164.0350379	93.72733818	164	94
166.0761983	95.47397788	166	96
168.1641714	97.0139364	168	98
170.3874671	98.2195985	170	100
188.5886359	98.58284987	190	100
188.5885699	97.37380014	190	98
188.5885039	95.74606557	190	96
188.5884379	93.90108774	190	94
188.588372	91.96027952	190	92
188.588306	89.98227287	190	90
188.58824	87.99065746	190	88
188.588174	85.99411962	190	86
188.5881079	83.99575068	190	84
188.5880419	81.99664675	190	82
188.5879759	79.99720721	190	80
188.5879098	77.99758936	190	78
188.5878437	75.99786457	190	76
188.5877777	73.99807104	190	74
188.5877116	71.99823184	190	72
188.5876455	69.99836159	190	70
188.5875794	67.99846974	190	68
188.5875132	65.99856245	190	66
188.5874471	63.99864392	190	64
188.5873809	61.99871712	190	62
188.5873148	59.99878437	190	60
188.5872486	57.99884761	190	58
188.5871824	55.99890853	190	56
188.5871162	53.99896875	190	54
188.58705	51.99902984	190	52
188.5869838	49.99909346	190	50
188.5869175	47.99916142	190	48
188.5868513	45.99923577	190	46
188.586785	43.99931898	190	44
188.5867187	41.99941412	190	42
188.5866524	39.99952523	190	40
188.5865861	37.99965801	190	38
188.5865198	35.99982118	190	36
188.5864534	34.00002936	190	34
188.5863871	32.00030921	190	32

Solution x	Solution y	Original x	Original y
188.5863207	30.00071243	190	30
188.5862543	28.00134473	190	28
188.5861879	26.00243331	190	26
188.5861215	24.00449319	190	24
188.586055	22.00875779	190	22
188.5859885	20.01833227	190	20
188.5859221	18.04133714	190	18
188.5858555	16.0993513	190	16
188.585789	14.24808328	190	14
188.5857224	12.61316258	190	12
188.5856558	11.41404791	190	10
187.3842695	11.41397991	188	10
185.7472177	11.41391196	186	10
183.8957874	11.41384404	184	10
181.9543899	11.41377614	182	10
179.9778528	11.41370826	180	10
177.9876126	11.4136404	178	10
175.9918896	11.41357255	176	10
173.9938912	11.41350473	174	10
171.994908	11.41343693	172	10
169.9954776	11.41336914	170	10
167.9958322	11.41330138	168	10
165.9960762	11.41323363	166	10
163.9962584	11.41316589	164	10
161.9964033	11.41309817	162	10
159.9965238	11.41303047	160	10
157.9966275	11.41296279	158	10
155.9967194	11.41289512	156	10
153.9968028	11.41282746	154	10
151.9968803	11.41275982	152	10
149.9969539	11.4126922	150	10
147.9970253	11.41262459	148	10
145.9970959	11.41255699	146	10
143.9971672	11.41248941	144	10
141.9972405	11.41242184	142	10
139.9973175	11.41235429	140	10
137.9974	11.41228674	138	10
135.9974898	11.41221922	136	10
133.9975897	11.4121517	134	10
131.9977029	11.4120842	132	10
129.9978347	11.41201671	130	10
127.9979936	11.41194923	128	10
125.9981947	11.41188176	126	10
123.9984649	11.41181431	124	10
121.9988519	11.41174687	122	10
119.9994466	11.41167944	120	10
118.0004455	11.41161202	118	10
116.0023288	11.41154461	116	10
114.0063436	11.41147721	114	10
112.0157823	11.41140982	112	10
110.0393692	11.41134245	110	10
108.0999514	11.41127508	108	10
106.25417	11.41120772	106	10
104.6231391	11.41114038	104	10
103.4175154	11.41107304	102	10
103.7675255	31.60059807	102	32
104.9835323	33.82565947	104	34
106.5261087	35.91367432	106	36
108.2715666	37.9555971	108	38
110.1365678	39.97648996	110	40
112.0666229	41.98701215	112	42
114.0298492	43.99232125	114	44
116.008783	45.99500247	116	46
117.9936644	47.9963631	118	48
119.9778874	49.99706695	120	50
121.954651	51.99745322	122	52
123.9135079	53.99769865	124	54
125.8354166	55.99790448	126	56
127.6850602	57.99815239	128	58
129.4009162	59.9985505	130	60
130.8874984	61.99924125	132	62
131.9999914	64.00000023	134	64
131.63477	69.49327334	130	70
131.351282	71.81609238	130	72
131.0919835	73.91988039	130	74
130.8456984	75.9613756	130	76
130.6073353	77.97962974	130	78
130.3738635	79.98805006	130	80
130.1431484	81.99193462	130	82
129.9134623	83.99348424	130	84

Solution x	Solution y	Original x	Original y
129.6832103	85.99350051	130	86
129.4507149	87.99191666	130	88
129.2139645	89.98768266	130	90
128.9701915	91.97780309	130	92
128.7149359	93.95415274	130	94
128.4392388	95.89224541	130	96
128.1171269	97.70570005	130	98
119.4710448	98.68464118	118	98
117.999966	99.99997186	118	102
Route: 4 Length: 468.6850954 Demand Met: 159			
103.0577443	101.10643	105	101
103.2062931	102.9916339	105	103
103.329261	104.8448681	105	105
103.4410419	106.4648448	103	105
103.5547295	117.9900536	102	118
103.676057	128.9967779	102	130
104.8599468	129.2121879	104	130
106.4294372	129.4194313	106	130
108.2092238	129.6225616	108	130
110.0994308	129.8233675	110	130
112.0452285	130.0231404	112	130
114.0184206	130.2230181	114	130
116.0048529	130.4241381	116	130
117.9970439	130.6277718	118	130
119.9896608	130.8355031	120	130
121.9751362	131.0495472	122	130
123.9349256	131.2734571	124	130
125.8129202	131.5141776	126	130
127.4212559	131.7920172	128	130
127.9999914	139.9999994	130	140
126.9379613	141.9868499	128	142
125.4665191	143.9925158	126	144
123.7485135	145.9965459	124	146
121.889148	147.9987298	122	148
119.9550359	150.0000598	120	150
117.9842059	152.001313	118	152
115.9975192	154.0030498	116	154
114.0077806	156.0058307	114	156
112.0266923	158.01055	112	158
110.0721988	160.0190079	110	160
108.179008	162.0350504	108	162
106.4119064	164.0671215	106	164
104.8724902	166.1353383	104	166
103.7004853	168.3085234	102	168
103.4185009	188.589491	102	190
104.5550053	188.5894021	104	190
106.1807745	188.5893132	106	190
108.0545903	188.5892242	108	190
110.0207953	188.5891353	110	190
112.0132668	188.5890464	112	190
114.0113832	188.5889575	114	190
116.0101024	188.5888686	116	190
118.0086654	188.5887797	118	190
120.0071818	188.5886908	120	190
122.0058039	188.5886018	122	190
124.0046049	188.5885129	124	190
126.0036	188.5884239	126	190
128.0027749	188.588335	128	190
130.0021034	188.588246	130	190
132.0015564	188.5881571	132	190
134.0011064	188.5880681	134	190
136.0007296	188.5879791	136	190
138.0004072	188.5878901	138	190
140.0001243	188.5878011	140	190
141.9998697	188.5877121	142	190
143.9996349	188.5876231	144	190
145.9994128	188.5875341	146	190
147.9991972	188.587445	148	190
149.9989824	188.587356	150	190
151.9987624	188.587267	152	190
153.9985307	188.5871779	154	190
155.9982796	188.5870888	156	190
157.9979996	188.5869998	158	190
159.9976788	188.5869107	160	190
161.9973016	188.5868216	162	190
163.9968468	188.5867325	164	190
165.9962851	188.5866434	166	190
167.9955747	188.5865543	168	190
169.9946547	188.5864652	170	190
171.9934345	188.586376	172	190

Solution x	Solution y	Original x	Original y
173.9917743	188.5862869	174	190
175.9894372	188.5861977	176	190
177.9859274	188.5861085	178	190
179.9798686	188.5860194	180	190
181.9666579	188.5859302	182	190
183.9302196	188.585841	184	190
185.8164861	188.5857517	186	190
187.4673657	188.5856625	188	190
188.5860117	188.5855732	190	190
188.5861022	187.4656015	190	188
188.5861925	185.8168006	190	186
188.5862829	183.9314167	190	184
188.5863732	181.9675252	190	182
188.5864635	179.9801549	190	180
188.5865539	177.9857391	190	178
188.5866442	175.9889495	190	176
188.5867345	173.9911323	190	174
188.5868248	171.9927338	190	172
188.5869151	169.9939502	190	170
188.5870054	167.9948943	190	168
188.5870957	165.9956409	190	166
188.587186	163.996242	190	164
188.5872763	161.9967347	190	162
188.5873665	159.9971462	190	160
188.5874568	157.9974969	190	158
188.5875471	155.9978022	190	156
188.5876373	153.9980743	190	154
188.5877276	151.9983231	190	152
188.5878179	149.9985565	190	150
188.5879081	147.9987813	190	148
188.5879984	145.9990036	190	146
188.5880886	143.9992293	190	144
188.5881789	141.999464	190	142
188.5882691	139.9997145	190	140
188.5883594	137.9999887	190	138
188.5884496	136.0002973	190	136
188.5885398	134.0006543	190	134
188.5886301	132.0010781	190	132
188.5887203	130.0015918	190	130
188.5888105	128.002222	190	128
188.5889007	126.0029945	190	126
188.5889909	124.0039263	190	124
188.5890811	122.0050117	190	122
188.5891713	120.006201	190	120
188.5892616	118.0073733	190	118
188.5893518	116.0083235	190	116
188.589442	114.0088837	190	114
188.5895322	112.0097064	190	112
188.5896224	110.0155831	190	110
188.5897126	108.0469017	190	108
188.5898028	106.1711469	190	106
188.589893	104.5487557	190	104
188.5899832	103.4184081	190	102
168.2975249	103.7451018	168	102
166.1460218	104.9013593	166	104
164.0742725	106.4277957	164	106
162.038911	108.1938767	162	108
160.0212945	110.08975	160	110
158.012371	112.0451894	158	112
156.0077713	114.0252567	156	114
154.0053826	116.0147968	154	116
152.0041643	118.0076133	152	118
150.0035856	120.0010914	150	120
148.0033604	121.9937056	148	122
146.0033177	123.9835313	146	124
144.0033316	125.9666158	144	126
142.0032694	127.9342475	142	128
140.0029295	129.8679128	140	130
138.0019507	131.7305748	138	132
135.9997394	133.4545599	136	134
133.9959818	134.931348	134	136
132.0000055	135.9999911	132	138
131.6496552	130.4615186	130	130
131.3870903	128.1437074	130	128
131.149255	126.0489913	130	126
130.9246095	124.0149804	130	124
130.7080923	122.0023123	130	122
130.4968012	119.9980135	130	120
130.2887816	117.9972226	130	118
130.0825407	115.998078	130	116

Solution x	Solution y	Original x	Original y
129.8768011	114.0000687	130	114
129.6703419	112.003632	130	112
129.4618599	110.0105156	130	110
129.2498004	108.0251815	130	108
129.032083	106.058495	130	106
128.805531	104.1373988	130	104
128.5643009	102.3317297	130	102
128.2925724	100.8302718	130	100
119.5807185	100.4097382	120	100
Route: 5 Length: 139.0715695 Demand Met: 42			
100.0000002	103.2679329	101	105
98.77564252	103.2278073	99	105
97.1040188	103.1847227	97	105
95.68490785	103.1388423	95	105
95.57507741	102.0352221	95	103
95.46659362	100.6052905	95	101
95.35893797	99.02503396	95	99
95.25188493	97.4472355	95	97
95.14528407	96.01588758	95	95
95.03904341	94.88759222	97	95
91.99999974	90.00001288	92	88
90.05194108	91.09794278	90	90
88.20002553	92.63315264	88	92
86.49096158	94.50781472	86	94
85.02497521	96.80171939	84	96
84.00001309	101.9999998	82	102
85.09096801	103.9805479	84	104
86.56357687	105.9343905	86	106
88.27131383	107.8517246	88	108
90.1179493	109.6999902	90	110
92.04275317	111.4183279	92	112
94.01264372	112.9013191	94	114
96.00000966	113.9999856	96	116
103.9999941	113.9999853	104	116
105.9588537	112.9204197	106	114
107.8867462	111.4571923	108	112
109.7419964	109.7480398	110	110
111.4548643	107.8982296	112	108
112.9208737	105.9758787	114	106
113.9999854	103.9999996	116	104
113.9999858	96.00000056	116	96
112.9302286	94.05693282	114	94
111.4723255	92.21399756	112	92
109.7715157	90.51564479	110	90
107.9298293	89.06459815	108	88
106.0000006	88.00001345	106	86
105.4875331	94.07957312	105	95
105.0000033	96.9999863	105	99
104.0181389	96.92812551	105	97
102.815952	96.85658362	103	95
101.2218429	96.79246959	101	95
100	96.7320667	99	95

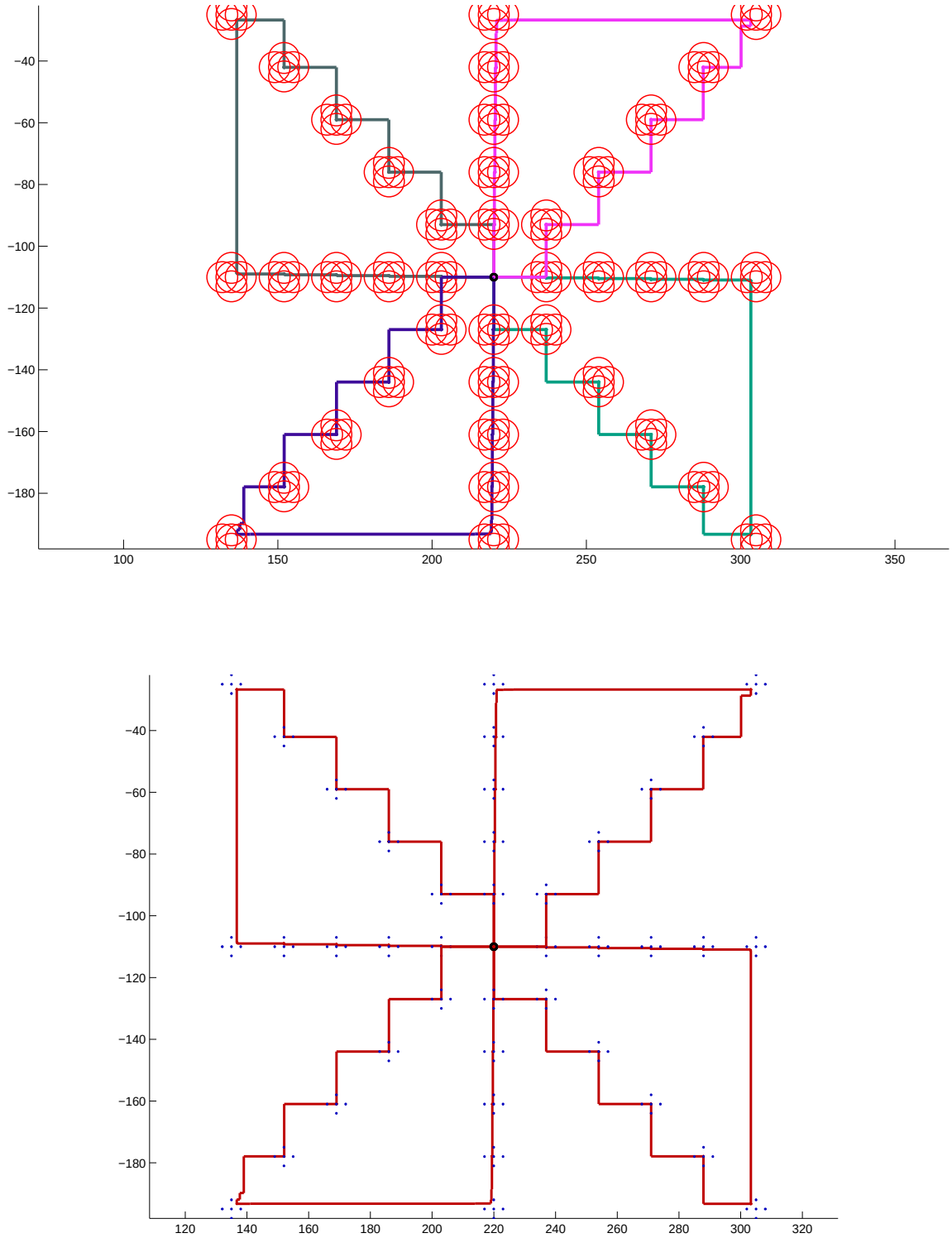


Figure O.152: *chaoSingleDep*, Equal Radius, 2D, Manhattan, Length = 1332.7745235

Table O-155: Solution for *chaoSingleDep*, Equal Radius, 2D, Manhattan

Total distance: 1332.77452350258			
Total demand met: 1080			
Depot: x 110 y 110			
Solution x	Solution y	Original x	Original y
Route: 1 Length: 333.193474525576 Demand Met: 270			
126.984329516176	110.221585083184	130	110
126.984329516176	110.221585083184	127	107
126.984329516176	110.221585083184	127	113
126.984329516176	110.221585083184	127	110
126.984329516176	110.221585083184	124	110
143.982380125669	110.446587755858	147	110
143.982380125669	110.446587755858	144	107
143.982380125669	110.446587755858	144	113
143.982380125669	110.446587755858	144	110
143.982380125669	110.446587755858	141	110
160.979356500614	110.678774220503	164	110
160.979356500614	110.678774220503	161	107
160.979356500614	110.678774220503	161	113
160.979356500614	110.678774220503	161	110
160.979356500614	110.678774220503	158	110
177.958258955412	110.923586521746	181	110
177.958258955412	110.923586521746	178	107
177.958258955412	110.923586521746	178	113
177.958258955412	110.923586521746	178	110
177.958258955412	110.923586521746	175	110
193.201545024423	111.19129662556	198	110
193.201545024423	111.19129662556	195	113
193.201545024423	111.19129662556	195	107
193.201545024423	111.19129662556	195	110
193.201545024423	111.19129662556	192	110
193.298371129403	193.298366133385	198	195
193.298371129403	193.298366133385	195	198
193.298371129403	193.298366133385	195	195
193.298371129403	193.298366133385	195	192
193.298371129403	193.298366133385	192	195
177.952532201197	177.928729586557	181	178
177.952532201197	177.928729586557	178	181
177.952532201197	177.928729586557	178	178
177.952532201197	177.928729586557	178	175
177.952532201197	177.928729586557	175	178
160.983284232276	160.977300438408	164	161
160.983284232276	160.977300438408	161	164
160.983284232276	160.977300438408	161	161
160.983284232276	160.977300438408	161	158
160.983284232276	160.977300438408	158	161
143.984336852246	143.983281453661	147	144
143.984336852246	143.983281453661	144	147
143.984336852246	143.983281453661	144	144
143.984336852246	143.983281453661	144	141
143.984336852246	143.983281453661	141	144
126.985177754117	126.984499864025	130	127
126.985177754117	126.984499864025	127	130
126.985177754117	126.984499864025	127	127
126.985177754117	126.984499864025	127	124
126.985177754117	126.984499864025	124	127
Route: 2 Length: 333.193741832265 Demand Met: 270			
92.9711041669743	109.749539739299	93	107
92.9711041669743	109.749539739299	93	113
92.9711041669743	109.749539739299	90	110
92.9711041669743	109.749539739299	93	110
92.9711041669743	109.749539739299	96	110
75.9826438850192	109.499227875484	76	107
75.9826438850192	109.499227875484	76	113
75.9826438850192	109.499227875484	73	110
75.9826438850192	109.499227875484	76	110
75.9826438850192	109.499227875484	79	110
58.9899377620317	109.241978710042	59	107
58.9899377620317	109.241978710042	59	113
58.9899377620317	109.241978710042	56	110
58.9899377620317	109.241978710042	59	110
58.9899377620317	109.241978710042	62	110
42.0066793454642	108.970806919169	42	113
42.0066793454642	108.970806919169	42	107
42.0066793454642	108.970806919169	39	110
42.0066793454642	108.970806919169	42	110
42.0066793454642	108.970806919169	45	110
26.7887724240614	108.67759492014	25	107
26.7887724240614	108.67759492014	25	113
26.7887724240614	108.67759492014	22	110
26.7887724240614	108.67759492014	25	110
26.7887724240614	108.67759492014	28	110
26.7015645190941	26.7015645647735	25	22
26.7015645190941	26.7015645647735	22	25
26.7015645190941	26.7015645647735	25	25
26.7015645190941	26.7015645647735	28	25
26.7015645190941	26.7015645647735	25	28
42.0129850516524	42.0315141723423	42	39
42.0129850516524	42.0315141723423	39	42
42.0129850516524	42.0315141723423	42	42
42.0129850516524	42.0315141723423	45	42
42.0129850516524	42.0315141723423	42	45
58.9904945483746	58.996281357683	59	56
58.9904945483746	58.996281357683	56	59
58.9904945483746	58.996281357683	59	59
58.9904945483746	58.996281357683	62	59
58.9904945483746	58.996281357683	59	62
75.9826558631542	75.9854286417542	76	73
75.9826558631542	75.9854286417542	73	76
75.9826558631542	75.9854286417542	76	76
75.9826558631542	75.9854286417542	79	76
75.9826558631542	75.9854286417542	76	79
92.9713134983248	92.9727090508403	93	90
92.9713134983248	92.9727090508403	90	93
92.9713134983248	92.9727090508403	93	93
92.9713134983248	92.9727090508403	96	93
92.9713134983248	92.9727090508403	93	96
Route: 3 Length: 333.193690861365 Demand Met: 270			
92.9829940837642	126.978810925773	93	130
92.9829940837642	126.978810925773	90	127
92.9829940837642	126.978810925773	93	127
92.9829940837642	126.978810925773	96	127
92.9829940837642	126.978810925773	93	124
75.9945548802179	143.983593781325	76	147
75.9945548802179	143.983593781325	73	144
75.9945548802179	143.983593781325	76	144
75.9945548802179	143.983593781325	79	144
75.9945548802179	143.983593781325	76	141
59.0127116067924	160.979918815887	59	164
59.0127116067924	160.979918815887	56	161
59.0127116067924	160.979918815887	59	161
59.0127116067924	160.979918815887	62	161
59.0127116067924	160.979918815887	59	158
42.0680025263627	177.908134137087	42	181
42.0680025263627	177.908134137087	39	178
42.0680025263627	177.908134137087	42	178
42.0680025263627	177.908134137087	45	178
42.0680025263627	177.908134137087	42	175
28.9599155944634	189.780546018315	25	192
27.6938325977443	191.8912356705	25	195
26.7015792654255	193.298422925482	25	198
26.7015774947998	193.298421523527	22	195
31.0141672424973	193.251479326782	28	195
103.890579885697	193.203294493424	107	195
108.856857703852	193.155031955669	110	198
109.054916531813	192.327572193425	113	195
109.054916531813	192.327572193425	110	195
109.217068795534	188.588548245376	110	192
109.378374449063	177.846281562021	113	178
109.378374449063	177.846281562021	110	181
109.378374449063	177.846281562021	107	178
109.378374449063	177.846281562021	110	178
109.378374449063	177.846281562021	110	175
109.536265608915	160.988803698876	113	161
109.536265608915	160.988803698876	110	164
109.536265608915	160.988803698876	107	161
109.536265608915	160.988803698876	110	161
109.536265608915	160.988803698876	110	158
109.691673900713	143.98915633408	113	144
109.691673900713	143.98915633408	110	147
109.691673900713	143.98915633408	107	144
109.691673900713	143.98915633408	110	144
109.691673900713	143.98915633408	110	141
109.845681471304	126.980767163648	113	127
109.845681471304	126.980767163648	110	130
109.845681471304	126.980767163648	107	127
109.845681471304	126.980767163648	110	127
109.845681471304	126.980767163648	110	124

Solution x	Solution y	Original x	Original y
Route: 4 Length: 333.193616283375 Demand Met: 270			
126.96876570589	92.9792272064974	130	93
126.96876570589	92.9792272064974	127	90
126.96876570589	92.9792272064974	127	93
126.96876570589	92.9792272064974	127	96
126.96876570589	92.9792272064974	124	93
143.96390876586	75.9905587013631	147	76
143.96390876586	75.9905587013631	144	73
143.96390876586	75.9905587013631	144	76
143.96390876586	75.9905587013631	144	79
143.96390876586	75.9905587013631	141	76
160.95081359985	59.0027965859638	164	59
160.95081359985	59.0027965859638	161	56
160.95081359985	59.0027965859638	161	59
160.95081359985	59.0027965859638	161	62
160.95081359985	59.0027965859638	158	59
177.882868318166	42.057548973795	181	42
177.882868318166	42.057548973795	178	39
177.882868318166	42.057548973795	178	42
177.882868318166	42.057548973795	178	45
177.882868318166	42.057548973795	175	42
190.123834002049	28.6889555661695	192	25
193.298400785236	26.7015964214911	195	22
193.298400785236	26.7015964214911	195	28
193.298404563179	26.7015994857554	198	25
193.298404563179	26.7015994857554	195	25
116.383621554676	26.7529725304601	113	25
113.169312950684	26.8049548773154	110	25
111.091042917013	26.8577823549037	110	22
111.091042917013	26.8577823549037	107	25
110.898205503944	30.9988045041328	110	28
110.707517874196	42.1011951337907	113	42
110.707517874196	42.1011951337907	110	39
110.707517874196	42.1011951337907	107	42
110.707517874196	42.1011951337907	110	42
110.707517874196	42.1011951337907	110	45
110.524712619857	59.0025648239394	113	59
110.524712619857	59.0025648239394	110	56
110.524712619857	59.0025648239394	107	59
110.524712619857	59.0025648239394	110	59
110.524712619857	59.0025648239394	110	62
110.346874463988	75.9898044529781	113	76
110.346874463988	75.9898044529781	110	73
110.346874463988	75.9898044529781	107	76
110.346874463988	75.9898044529781	110	76
110.346874463988	75.9898044529781	110	79
110.172553130607	92.9798238053418	113	93
110.172553130607	92.9798238053418	110	90
110.172553130607	92.9798238053418	107	93
110.172553130607	92.9798238053418	110	93
110.172553130607	92.9798238053418	110	96

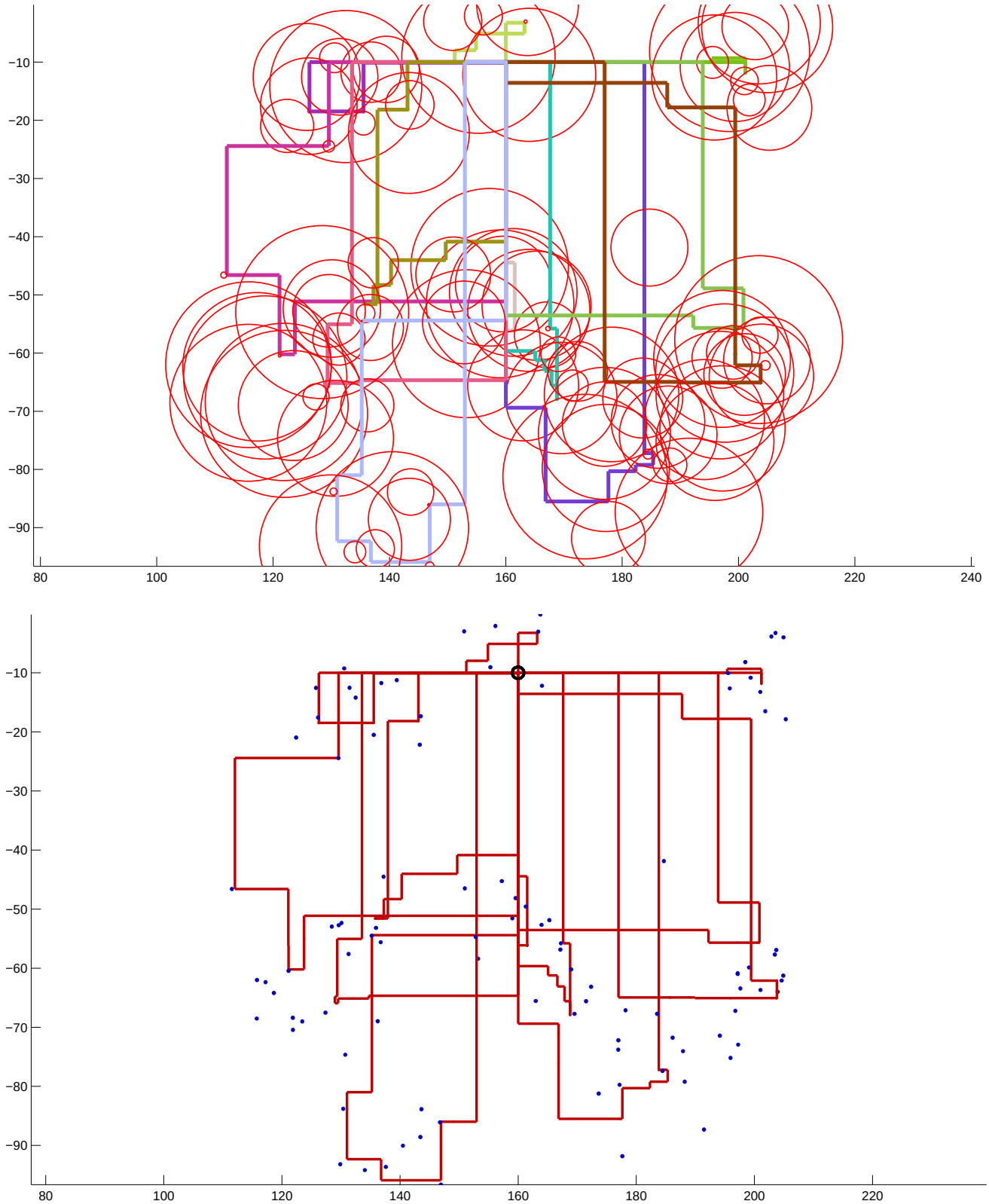


Figure O.153: *team*1_100, arbitrary radius, 2D, Manhattan, Length = 1755.0629673

Table O-156: Solution for *team*1_100, arbitrary radius, 2D, Manhattan

Total distance: 1755.06296727634				
Total demand met: 543				
Depot: x 50 y 10				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 50.2000449306875 Demand Met: 45				
34.8679977371918	10	22.494	14.202	13.068
41.2151716335898	7.96993504235431	40.868	2.981	5.001
42.7928808844171	7.96993504235431	45.293	9.057	13.174
44.8863760428311	5.10272755446771	46.154	2.083	3.275
53.2070100037713	3.23898980123574	53.405	3.041	0.28
50	8.04293812515337	53.754	0.148	8.742
50	9.999	54.032	12.197	11.442
Route: 2 Length: 84.4715056250111 Demand Met: 44				
27.2703971321345	10	29.447	11.243	5.69
20.9055618581586	10	20.541	9.26	2.556
20.9055618581586	10.001	21.459	12.53	6.577
16.2472471874228	18.4829999999283	15.772	12.549	9.192
16.2472471874228	18.4829999999283	16.123	17.568	8.298
16.2472471874228	18.4829999999283	12.414	20.962	4.565
25.5420000122131	18.4829999999283	25.542	20.506	2.023
25.5420000122131	10.1137361400961	26.839	11.732	5.19
Route: 3 Length: 87.4162691014913 Demand Met: 46				
76.1650782356276	10	88.457	8.185	13.747
84.5401307658028	10	85.554	10.061	2.745
91.1818398340096	11.8542183565725	95.317	17.864	7.295
91.1818398340328	10.8824497612695	91.007	13.249	2.373
91.1818398340328	10.1817651450196	93.574	3.255	10.497
91.1818398340096	9.32792363985967	92.889	3.855	5.733
85.39396562875	9.99999038582053	94.926	4.006	11.26
81.8421833867273	9.99999038582053	89.359	10.839	9.385
Route: 4 Length: 95.342921772005 Demand Met: 42				
50	44.4362302873514	49.571	48.14	8.233
51.5362815921429	56.1351792938596	47.232	45.27	13.543
51.5362815921429	56.1351792938596	51.29	49.58	10.97
51.5362815921429	56.1351792938596	49.02	51.541	12.697
51.5362815921429	56.1351792938596	53.958	52.681	10.486
51.5362815921429	56.1351792938596	55.281	51.871	9.377
51.5362815921429	56.1351792938596	57.142	56.857	5.652
51.5362815921429	56.1351792938596	43.243	58.404	12.71
51.5362815921429	56.1351792938596	52.975	65.56	9.534
Route: 5 Length: 196.30799999975 Demand Met: 46				
19.5889268061032	24.4125150320237	19.569	24.449	0.997
2.048	46.5989999999997	1.527	46.599	0.521
11.0950579406866	56.1658414054948	5.739	68.535	13.479
11.1229999941545	60.2019999998752	11.123	60.442	0.24
13.7434155088788	55.0090987405723	11.844	68.394	13.519
13.7434155088787	51.1240809488594	8.641	64.188	14.025
Route: 6 Length: 133.485049478723 Demand Met: 46				
57.6229097655474	55.7837150281672	57.243	55.792	0.38
58.8019999999999	67.9405247393614	63.631	81.224	14.134
58.8019999999999	65.5920000002154	61.493	65.592	2.691
57.8544684307535	63.0845869340268	62.352	63.144	5.122
56.6350468166646	61.222994164931	59.007	60.213	2.987
55.0640116147276	59.6360355114953	59.534	67.732	9.572
Route: 7 Length: 201.631999999996 Demand Met: 46				
73.8253143387237	41.3087837309339	74.679	41.865	6.615
73.8253143387237	77.1991395723191	81.476	87.316	12.684
73.8253143387237	77.200139572319	74.447	77.382	0.86
75.312	79.2179999882955	78.214	79.218	2.902
72.3130562012225	80.2978905714639	77.919	74.057	8.389
67.643000012759	85.5039999999979	67.643	91.829	6.325
56.8449891956422	76.1922126160583	67.179	79.746	10.928
56.8449891956421	70.9843006741089	66.957	73.797	11.351
56.8449891956421	69.389796727591	68.193	67.124	11.572
Route: 8 Length: 173.954524250695 Demand Met: 45				
23.5531062795638	55.036035390513	21.299	57.593	4.473
19.3626441112283	64.7839030731549	20.735	74.659	9.97
18.9628689839539	65.2006227812716	7.235	62.367	12.76
18.9628689839539	65.2016227812716	11.878	70.444	14.354
18.9628689839539	65.9401311093016	17.374	67.529	2.247
19.5150673169458	65.1394434149382	5.777	62.003	14.244
22.06865350791	65.1394434149382	13.454	69.007	9.443
24.7155237924347	64.6550743865786	26.213	68.977	4.574
Route: 9 Length: 173.069921396386 Demand Met: 46				
83.8554624719424	48.8814305089684	93.456	57.69	14.427
90.8569606981925	55.6780000000002	93.694	56.925	3.099
90.7535963054851	55.6780000000002	94.894	61.262	7.46
90.6526524517195	55.6780000000002	93.946	64.003	8.979
88.811985627082	55.6780000000002	89.091	59.886	4.603
87.1800014801902	55.6780000000002	87.18	60.86	5.182
82.2177818704945	53.5327517274668	87.633	63.432	11.884
Route: 10 Length: 131.672730721957 Demand Met: 45				
33.100168658378	18.1706431608397	33.5	17.352	4.16
33.100168658378	18.1706431608397	33.341	22.178	10.381
27.945530686437	51.5819999999948	26.732	55.612	5.676
25.9230000057999	51.5819999999948	25.923	53.185	1.603
25.7456346390162	51.5819999999948	19.619	52.734	6.234
27.2500754319661	50.5852524431658	18.45	52.954	14.862
27.2500754319661	48.2976935481894	20.103	52.347	8.385
30.2709753644668	44.0298082779171	27.219	44.51	4.337
39.6868523454923	40.8534477623324	40.978	46.49	6.437
Route: 11 Length: 197.728 Demand Met: 46				
66.9931088175669	64.9570337383319	66.971	72.201	7.244
75.6416302213802	64.9570337383318	73.523	67.727	6.866
75.6426302213802	64.9570337383318	76.154	71.763	8.051
78.9992920322322	64.9570337383318	84.146	71.427	10.315
79.9222647387493	65.0609999999997	87.252	72.952	10.77
85.9679982920856	65.0609999999997	85.968	75.194	10.133
93.803	65.0609999999997	86.785	67.217	10.959
93.803	62.103999998163	87.173	60.998	11.762
93.803	62.102999998163	94.619	62.103	0.816
89.4347117398225	60.1514805745722	91.043	63.691	7.01
89.4347117398225	17.7890775363616	91.857	16.502	2.743
77.7500445587981	13.5709083970014	85.841	12.653	10.749
Route: 12 Length: 229.781999999639 Demand Met: 46				
42.9639393974016	51.6593166584938	42.804	54.74	7.11
42.9639393974016	85.985266607621	30.503	90.056	13.109
39.0813466808488	85.985266607621	33.443	88.578	7.057
36.9249999973359	85.985266607621	33.626	83.869	3.982
36.9239999973359	85.985266607621	36.762	86.092	0.194
36.9239999973359	95.8989999998211	36.924	96.636	0.737
26.7986815410406	92.3241430278575	27.59	93.644	3.286
23.9635714058489	92.3241430278576	24.053	94.189	1.867
21.0080000000017	83.792999908905	20.393	83.793	0.615
21.0080000000082	80.9889777313203	19.881	93.181	12.244
25.2447630917084	54.3995611490661	25.201	54.507	0.116

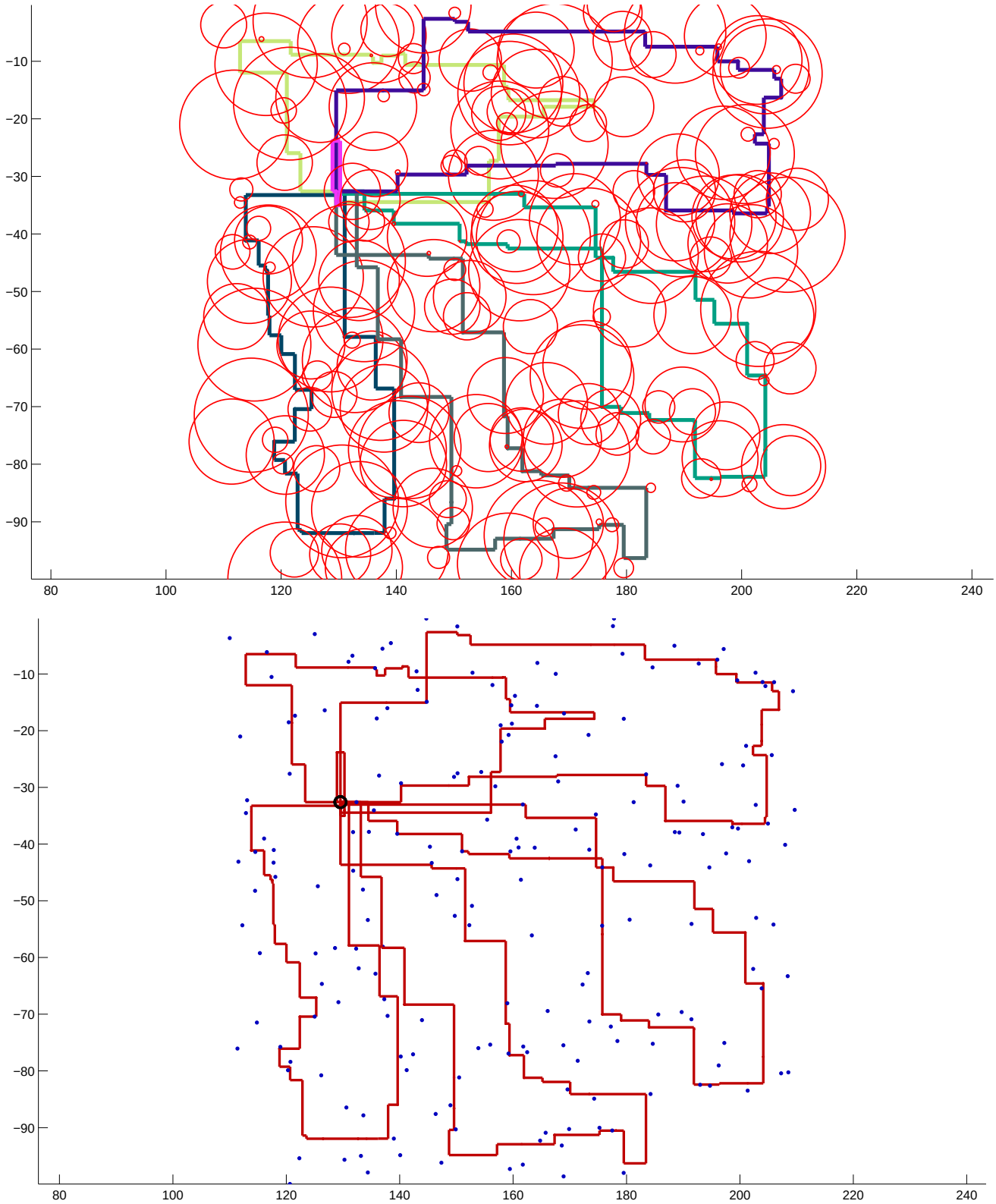


Figure O.154: *team*2_200, arbitrary radius, 2D, Manhattan, Length = 1121.1911403

Table O-157: Solution for *team*2_200, arbitrary radius, 2D, Manhattan

Total distance: 1121.19114027856 Total demand met: 617 Depot: x 19.5535 y 32.6157				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 182.104555292642 Demand Met: 120				
13.3399515144872	25.9676759046649	10.613375	27.61233	4.807428
10.9817821955149	18.6279796807331	1.875835	21.036865	9.501742
10.9817821955149	18.6279796807331	10.44323	18.54025	2.209906
10.9817821955149	11.9885110212253	7.39533	10.545265	8.903739
2.85595330830841	6.51123480841898	0.024125	3.6794065	4.00481
6.77468875885779	6.51123480841898	6.5851	6.152225	0.405995
11.6672884133902	8.87494832436938	15.031135	2.9821155	9.903269
20.8801454619055	8.87494832436938	20.9699	7.87089	1.008062
25.6655028805229	9.19674358004289	25.662895	8.989655	0.207105
25.954135	10.265936	26.97316	5.55935	8.204253
25.954135	10.265936	25.954135	17.869355	7.603419
27.4245218495946	9.02206245404546	21.673354	6.8005655	8.80316
30.5179929872003	8.67782526746602	28.448025	4.56492	4.604428
30.5179929872003	8.67782526746602	32.973595	9.54291	2.603527
31.5526432681842	10.6511709549761	33.169445	12.82499	2.709158
46.3584010108791	10.6511709549761	46.358401	11.954405	1.303234
48.1927006568785	10.6019939703337	54.294115	8.069135	6.606257
48.1927006568785	10.6019939703337	42.845635	9.79738	5.407265
48.7320946660743	14.4488977529378	47.801417	19.06334	4.70736
49.4701447352822	16.7689379986175	49.796921	18.777515	4.003148
64.3216449999999	17.90893	69.52818	17.90893	5.206535
64.3216449999999	17.90893	63.31789	20.756115	3.203825
55.5803512979039	19.6293132941047	57.51838	10.00522	10.000856
55.5803512979039	19.6293132941047	58.979255	16.987345	4.304944
55.5803512979039	19.6293132941047	54.207021	15.63022	7.700153
55.5803512979039	19.6293132941047	50.337118	13.87323	8.600173
55.5803512979039	19.6293132941047	49.707097	15.54357	9.000518
55.5803512979039	19.6293132941047	57.48649	24.517395	9.301244
55.5803512979039	19.6293132941047	47.997827	21.94091	8.509285
49.9016049182656	19.6293132941046	49.216563	20.76273	1.803198
47.7890946544988	27.2925255740818	46.870011	29.816545	7.806658
46.0878937781268	34.4605330458719	53.824634	40.64213	9.902994
46.0878937781268	34.4605330458719	45.420784	35.70231	1.409626
Route: 2 Length: 183.237216833455 Demand Met: 120				
21.0462976445379	57.8827471633569	22.32618	58.45293	1.401145
21.0462976445379	57.8837471633569	24.393135	53.387308	8.804674
21.0462976445379	57.8847471633569	18.601355	58.3359	9.106551
26.4299836584951	58.068211904299	27.03592	58.11764	0.607949
26.4299836584951	66.8491015269639	25.726765	62.875185	6.002164
29.6369058557716	85.9624973434501	30.09705	94.85711	8.906507
29.6369058557716	85.9624973434501	31.22881	79.877355	7.509507
29.6369058557716	85.9624973434501	30.1948	77.47401	8.506801
27.9639481772449	91.9453588262578	28.966505	91.93771	1.002586
26.1894049625989	91.9498142098874	23.602775	87.83846	8.306271
24.1622326669788	91.9498142098874	20.60172	86.45345	9.802386
22.6479490449655	91.9498142098874	24.384515	97.907795	6.707286
22.6479490449655	91.9498142098874	23.159665	94.99055	6.103619
16.4829735114493	91.9498142098874	10.636965	99.941455	9.901623
16.4829735114493	91.9498142098874	20.26183	95.676245	5.307169
13.5532323674799	91.4038894677614	12.30828	95.415795	4.20063
12.8511539244227	81.6169070667186	16.17437	80.77798	4.001447
10.6710306035953	79.255488035234	10.302265	79.88844	1.80828
8.80285699999999	76.07236	1.401765	76.07236	7.401092
8.80285699999999	76.07236	10.737535	78.399525	6.808137
8.80285699999999	76.07236	8.96414	75.77293	2.204212
12.3777079607857	70.4229416498215	4.81189	71.48163	9.90886
12.3777079607857	70.4229416498215	14.99811	70.439575	3.802058
15.2772118825081	67.065760150968	19.19225	67.891335	4.001137
15.2772118825081	67.065760150968	16.28216	64.658715	2.608407
12.3821445036869	60.857196741397	15.17562	59.299125	5.903506
10.0278848913911	57.5994321861931	5.35045	59.245825	9.802178
7.97052892843408	54.1819896084796	2.26292	54.336059	5.709688
7.71936010991227	46.9642992367024	7.79806	41.063165	5.901659
7.55024387526574	46.3594086111942	4.493385	48.2428075	7.3014
7.55024387526574	46.3594086111942	7.76847	43.27595	8.308131
7.22649746731791	46.0978246904773	15.566305	47.445917	8.70734
7.22649746731791	45.4798720002979	8.071465	45.7971455	0.90257
6.09162500210029	41.131713	6.091625	39.029145	2.102568
3.82676653143946	41.131713	1.56824	43.114435	3.00535
3.82676653143946	41.131713	4.535275	41.40327	1.201293
3.84954068991244	34.2491768397243	2.888575	34.539165	1.003767
3.84954068991244	33.2489363544866	3.09506	32.271765	2.008496

Solution x	Solution y	Original x	Original y	Radius
Route: 3 Length: 248.713465542048 Demand Met: 118				
24.4716875578254	35.9235663854535	24.567885	37.86062	3.403033
29.5640486024601	38.2145777908484	29.577285	38.20107	0.303974
40.9909871511327	41.2715889031308	41.00732	41.27668	0.107583
42.1299861657276	41.7553064565508	35.347265	40.483415	6.900943
49.3427591574201	42.536491428573	49.52113	41.29678	2.009713
56.3734358592876	42.536491428573	63.437195	41.00367	9.004095
56.3734358592876	42.536491428573	61.04328	37.44322	7.908259
56.3734358592876	42.536491428573	51.37375	46.298003	8.802177
56.3734358592876	42.536491428573	50.972003	40.60627	8.001002
56.3734358592876	42.536491428573	50.608737	39.047145	7.509385
65.7285616760963	55.9048238840525	70.55475	53.342402	6.30295
65.7295616760962	55.9048238840525	65.705495	54.4013975	1.503619
65.7295616760962	70.0348943809292	62.26967	64.78212	9.008592
65.7295616760962	70.0348943809292	63.17424	62.764205	7.706659
65.7305616760963	70.0348943809292	63.457115	71.302795	5.306378
69.042861562063	71.0911014453618	67.24276	72.18951	5.208708
69.0438615620629	71.0911014453618	68.40623	74.741575	3.705743
73.9486665428357	72.3081740394177	74.635475	75.231085	3.002518
73.9486665428357	72.3081740394177	75.60926	70.05143	2.801868
81.8777913352726	72.6355173277477	79.72973	69.6285	6.503827
81.8787913352726	72.6355173277477	87.254685	75.06877	5.900928
81.8787913352726	72.6355173277477	81.449	70.90379	4.00725
81.8787913352726	82.414115999801	86.26193	79.048	6.603528
84.7245499311715	82.414115999801	84.72455	82.62255	0.208434
86.3759331307024	82.1776150043257	82.980165	82.460215	3.407507
91.3716537817892	82.1776150043257	91.37176	83.481715	1.3041
94.1118167712227	77.5115343751348	98.53739	80.25874	5.208919
94.1118167712227	77.5115343751348	97.272905	80.426715	7.307128
94.1118167712227	64.5860504590431	98.425325	63.29758	4.501834
94.1118167712227	64.5860504590431	93.854515	65.44994	0.901393
94.1118167712227	64.5860504590431	92.344515	62.02096	3.309346
90.9506721207377	55.5927922997703	95.92709	54.202926	6.608684
90.9506721207377	55.5927922997703	92.878595	53.021252	10.006179
85.2524131606684	51.4490809939457	81.466395	54.091358	6.706774
81.9757596032025	46.5668192626598	84.61874	44.121625	3.6006
67.6719974050299	44.1400540572678	69.610075	41.75992	4.204327
67.6719974050299	44.1400540572678	65.72564	44.111465	4.10252
64.623131946156	35.386875059225	64.595135	34.78327	0.604254
52.2271597699641	33.0329714381195	51.719243	33.03008	0.507925
Route: 4 Length: 245.469427332704 Demand Met: 120				
23.1426419705831	45.7864032367189	23.528225	48.047471	7.005381
26.7953398652624	58.2919221535513	22.77816	61.91876	9.100277
30.83494987768	68.3060687892282	32.35548	77.08328	8.907943
30.83494987768	68.3060687892282	33.93752	71.055425	5.201316
30.83494987768	68.3060687892282	27.85894	70.297015	7.608202
30.83494987768	68.3060687892282	27.294235	67.36467	8.501742
39.580254	81.1571350856366	40.48646	81.157135	0.906206
39.5802540000013	86.5953606905278	36.34587	87.597465	6.900084
39.5802539999804	86.596360690528	38.950185	86.058925	3.201927
39.5802539999805	90.4021858688411	39.89323	90.309885	2.808165
38.7040411669049	94.8448888332584	37.353615	96.195315	1.909791
47.168450973341	92.9390474119769	54.766852	92.295455	9.502154
51.5078805531641	92.9390474119769	51.725585	96.536445	3.603979
54.8449314717429	92.9390474119769	49.437672	97.29667	8.8097
57.3175461363212	91.2743624332098	58.9163	98.60932	7.507171
57.3175461363212	91.2743624332098	59.88564	90.256965	6.102678
57.3175461363212	91.2743624332098	55.7501	90.920415	1.606912
65.237669930378	90.5411080000006	65.23767	90.033385	0.507723
68.1496409937458	90.5411080000004	58.59379	93.155945	9.907152
68.150640993751	90.5411080000215	67.48261	90.51293	1.203441
69.5115495778061	96.292996	69.51155	98.000325	1.707329
73.4309239999973	84.0887050167466	74.234205	84.088705	0.803281
63.4259087089207	84.0887050167466	61.393495	78.21387	9.209541
63.4249087089207	84.0887050167466	64.30468	84.91	1.203546
60.0560044297484	81.9402960357404	59.609455	83.27302	1.405546
55.1821118659496	81.2093900701768	58.86286	75.490835	6.800719
51.8960393819212	81.2093900701769	51.801592	75.702955	5.507245
51.8960393819212	77.2200850687117	43.88264	75.9979	8.106066
49.3498668508831	77.2200850687117	45.96408	75.36881	5.908922
49.3498668508831	77.2190850687117	49.200624	76.95068	0.307107
49.3498668508831	71.6622296835146	56.10401	69.44853	7.107666
48.7073544882721	71.6622296835146	52.486843	76.711165	6.306844
48.7073544882721	71.6622296835146	48.983044	68.08194	6.601797
48.7073544882721	57.0994787568684	53.302235	56.10093	4.70213
41.5521077066254	57.0994787568684	42.291825	54.317701	4.104253
41.5511077066255	57.0994787568684	42.753335	50.906813	6.308285
41.5511077066255	57.0994787568684	39.724355	52.657318	4.803105
41.5511077066255	44.2896514815831	36.49954	48.989475	8.009904
39.9961763983742	44.2896514815831	40.184205	46.1874365	1.907077

Solution x	Solution y	Original x	Original y	Radius
35.6387495637047	43.6506173708364	35.65863	43.345715	0.305492
Route: 5 Length: 236.628560379202 Demand Met: 120				
30.2391912816275	29.6952614623975	30.249755	29.28668	0.408718
30.2401912816275	29.6952614623975	26.379295	27.934205	5.600223
38.6596310818917	29.6952614623975	39.58443	28.150345	1.800561
42.2088275518215	28.1396125496586	44.38625	27.294685	2.501465
42.2088275518215	28.1396125496586	40.19826	27.52955	2.101085
57.6987926330284	27.8219424163072	57.95186	28.956245	2.906543
73.4488206321388	27.8219424163072	73.44882	27.71684	0.105102
73.4488206321388	29.7423853704577	71.273045	32.62062	3.608079
76.8605555559902	35.9115356592586	74.17807	43.76639	8.300269
76.8605555559902	35.9115356592586	78.52122	37.890255	6.801958
76.8605555559902	35.9115356592586	79.01289	29.7258	7.100822
76.8605555559902	35.9115356592586	80.066985	32.520545	5.404485
88.6955852159271	36.419283605973	97.982935	40.137435	10.003975
88.6955852159271	36.419283605973	91.6164	43.026115	8.109517
88.6955852159271	36.419283605973	94.955665	36.40187	7.002314
88.6955852159271	36.419283605973	87.57797	41.66484	6.902275
88.6955852159271	36.419283605973	89.661665	37.28143	7.609892
88.6955852159271	36.419283605973	88.660005	37.051535	7.30023
88.6955852159271	36.419283605973	83.48933	38.25693	8.302552
88.6955852159271	36.419283605973	79.319755	37.96047	9.501655
90.3637657591125	36.419283605973	92.788305	33.10169	4.109114
94.419155828491	35.2348203145641	99.67714	33.98061	5.405501
94.7228879999807	24.3147862645641	95.62369	24.314785	0.900802
92.3017890000448	22.6865986317573	91.09643	22.6866	1.205359
93.8461575013394	21.8315280546671	86.845365	25.906095	8.100197
93.8461575013394	21.8305280546671	90.572985	26.136825	8.602133
93.8461575013394	18.9459456791345	94.4971	12.154995	9.50306
93.8461575013394	16.3135193396197	93.997115	11.43328	7.703152
96.8719929999984	16.3135193396197	92.761655	9.792985	7.707934
96.8719929999984	13.0420443911813	99.37313	13.042045	2.501137
95.6693012573799	11.5035191039587	96.04228	11.46233	0.702338
89.3653055410508	10.0363697193007	87.144585	5.62369	7.10022
89.3653055410508	10.0363697193007	89.544625	11.14329	1.801549
85.7722587136143	8.74380967058213	78.44886	5.02628	8.808511
85.772258713615	7.48818122522922	86.016245	7.495035	0.503562
82.6430126304972	7.48818122522799	82.741185	8.18936	0.708018
73.2423001225888	5.09078542390764	74.60069	8.85595	4.00271
73.2423001225888	4.85097950753446	69.299455	6.449115	5.10428
67.8610500471133	4.85097950753446	67.794775	0.2453923	4.606064
63.7114701283876	4.85097950753446	67.61759	1.570395	5.100981
42.477765724283	3.16330197489013	34.695715	0.250565	8.309293
40.1604599493333	2.63835300000011	40.16046	1.62977	1.008583
34.7389741226618	15.0571705392359	34.77264	14.924575	1.100481
27.6583428281054	15.0571705392358	27.827995	16.04415	1.001454
Route: 6 Length: 25.0379148985079 Demand Met: 19				
18.932626754643	23.8247610356058	11.54701	17.37734	9.803906
18.933626754643	23.8247610356058	16.776285	16.423415	7.709348
20.259521	34.0606599996816	25.46019	34.06066	5.200669
20.259521	34.0606599996816	22.373755	32.6144	4.900414
20.259521	35.0168242395028	21.800035	44.699325	9.804285
20.259521	35.0168242395028	21.779985	37.899125	3.504901

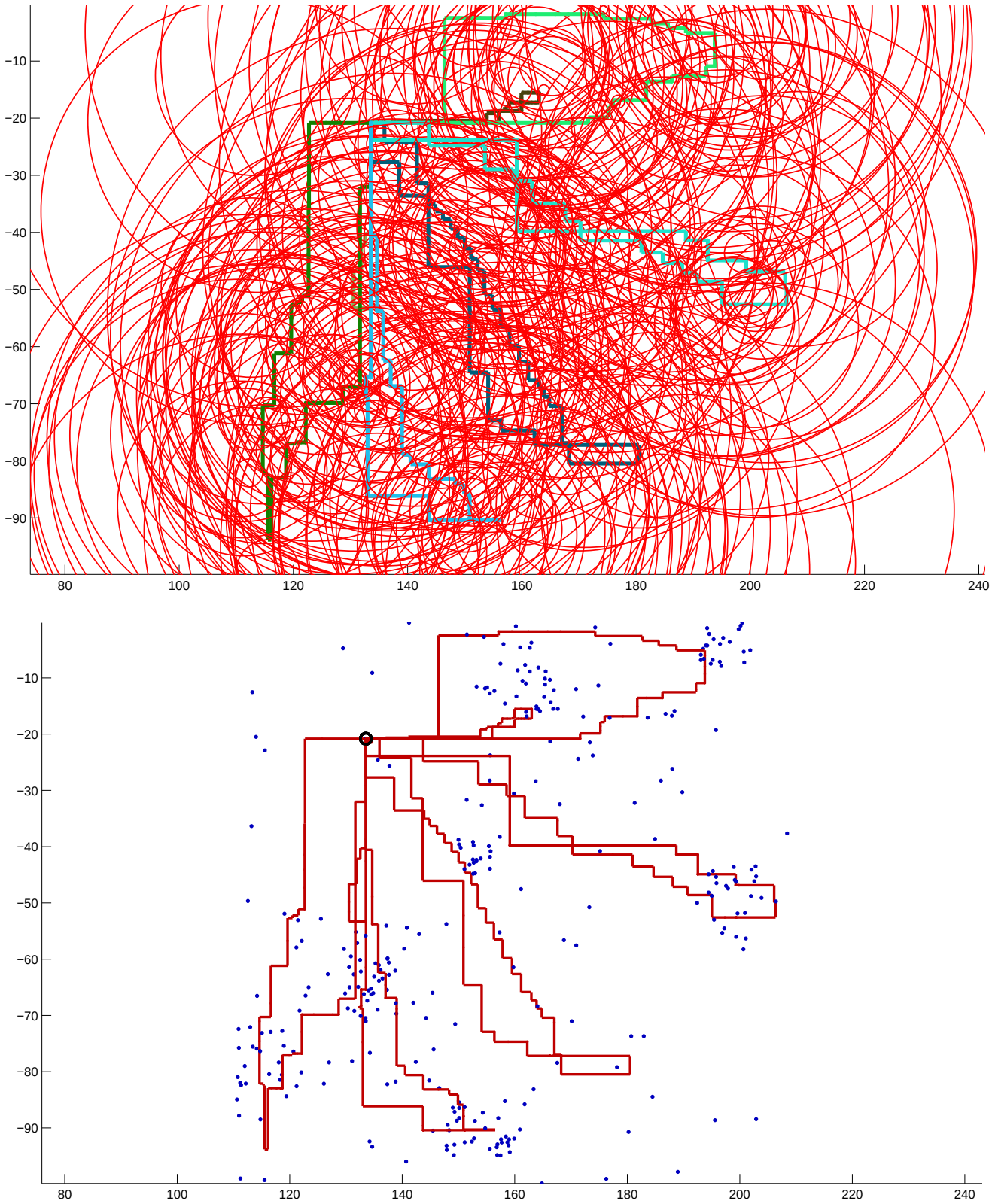


Figure O.155: *team*3_300, arbitrary radius, 2D, Manhattan, Length = 1095.8086429

Table O-158: Solution for *team*3_300, arbitrary radius, 2D, Manhattan

Total distance: 1095.80864294969 Total demand met: 9490 Depot: x 23.55 y 20.83				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 70.9767711872398 Demand Met: 1300				
23.55	27.1180295670878	45.71	40.8	34.61
23.55	27.6243777777544	42.95	44.74	47.83
23.55	38.6644597395906	24.49	66.27	27.9
23.55	40.2490539254302	15.54	52.83	26.09
22.5509844659322	40.6137924212154	21.39	62.71	35.55
22.5509844659322	42.1467887196049	25.86	63.85	38.15
21.8600959586488	43.2295901799773	24.47	65.24	32.36
21.8600959586488	45.0928049177081	4.15	75.92	36
21.8600959586488	46.6626192381397	24.86	66.05	20.4
20.5303367413197	46.6626192381397	28.77	62.05	31.17
20.5303367413197	48.102327292359	27.62	60.61	40.48
20.5303367413197	49.8554715035117	8.67	72.77	28.82
20.5303367413197	51.6011404771161	1.36	82.41	36.76
20.5303367413197	53.2987223349395	4.21	66.53	21.01
20.7669569237928	53.2987223349395	39.42	71.54	47.2
21.0037067441328	53.2987223349395	21.99	57.15	10.23
21.249741248459	53.2987223349395	19.65	58.2	41.68
21.5003157344123	53.2987223349395	28.95	69.72	21.24
21.7419404204193	53.2987223349395	34.24	70.46	46.56
21.9898386804648	53.2987223349395	20.88	59.51	36.31
22.2407858645204	53.2987223349395	22.51	60.15	23.44
22.4935249199831	53.2987223349395	22.65	62.2	11.7
22.7521303669855	53.2987223349395	25.84	61.09	17.04
23.0146079762846	53.2987223349395	27.36	59.94	22.06
23.2789785387557	53.2987223349395	30.36	58.14	13.13
23.55	53.2987223349395	27.28	65.47	12.73
23.55	53.2977223349395	27.64	62.78	15.95
23.55	53.2967223349395	24.2	92.42	40.35
23.55	53.2957223349395	11.18	57.92	14
23.55	53.2947223349395	35.37	65.99	42.77
23.55	53.2937223349395	6.36	80.44	34.29
23.55	53.2927223349395	2.01	79.01	42.13
23.55	53.2917223349395	10.66	76.44	43.81
23.55	53.2907223349395	8.29	81.45	44.4
23.55	53.2897223349395	8.60	80.56	41.43
23.55	53.2887223349395	21.75	55.19	18.06
23.55	53.2877223349395	30.83	54.42	13.2
Route: 2 Length: 69.5350362144422 Demand Met: 1225				
27.0368304312784	20.6335698986291	19.48	4.75	45.94
31.0840733927458	20.4413867053128	40.11	39.6	36.03
43.8382293209385	20.2454769636536	45.6	41.81	23.25
43.8382293209385	19.9419902285603	45.57	28.26	48.56
43.8382293209385	19.6829565311967	45.63	23.76	13.71
43.8382293209385	19.4054160678398	52.67	4.65	26.24
43.8382293209385	19.1401728212022	56.85	15.49	20.36
45.088998892038	18.719285626425	49.85	30.56	44.85
49.1750421978754	18.719285626425	79.79	30.32	35.55
49.9241619492375	18.719285626425	51.38	10.51	13.35
49.9241619492374	17.762947745688	57.66	15.51	35.11
49.9241619492375	17.4798485388125	60.89	11.99	21.62
50.1544079881334	17.2456972229803	55.4	11.17	24.33
50.6325931016144	17.2456972229803	54.22	8.18	10.41
51.1690770340978	17.2456972229803	56.26	10.34	24.93
51.703793750429	17.2456972229803	55.5	8.86	30.33
52.4016532589745	17.2456972229803	52.67	8.88	8.37
53.0076089882258	15.5210908810048	55.38	10.13	5.89
53.0086089882258	15.5210908810048	53.85	15.08	0.95
51.0782285833278	15.5210908810048	52.12	16.84	26.81
50.1683462418211	15.5210908810048	67	3.94	32.81
49.9241619492375	16.3545689167955	50.97	4.59	36.43
49.9241619492374	16.6334382394894	50.21	0.82	29.59
49.9241619492374	16.91473910078	47.45	7.49	16.55
49.9241619492374	17.1981123803124	56.31	21.31	24.49
49.3916197631941	17.2456972229803	52.96	3.75	34.45
48.6212485289307	17.2456972229803	55.24	13.37	7.67
47.797192512811	17.2456972229803	83.5	4.83	37.8
47.797192512811	17.2466972229803	5.58	22.9	47.89
47.684166808415	18.0323059156843	48.26	14.58	3.5
47.0309539545202	18.719285626425	62.16	16.88	21
45.9646131494417	20.5991554971634	84.57	2.19	42.77
45.9646131494417	20.83	78.41	15.88	33.29
35.2493323444039	20.83	41.47	31.69	27.11
29.940710993387	20.83	46.38	12.31	40.75
26.1528135673892	20.83	42.59	39.16	36.88
Route: 3 Length: 158.61999999991 Demand Met: 1275				
24.3309807592047	20.83	27.74	25.63	7.06
29.8798753924798	20.83	45.57	12.76	29.32
61.6189413736279	20.83	63.35	21.49	4.65
61.6189413736279	19.8691487628421	63.88	23.81	9.81
65.218841480331	19.3787869189886	92.09	44.08	37.36
65.218841480331	18.6149193854839	75.98	28.26	25
65.218841480331	17.8676065020127	76.81	16.4	34.4
65.975495544149	16.8090595614692	66.87	17.1	1.15
69.2293383640091	16.8090595614692	85.34	3.13	40.46
71.7838964542626	16.8090595614692	86.46	7.15	18.46
71.7838964542626	15.087300822823	87.06	2.89	20.41
71.7838964542626	13.5506942217446	89.81	1.33	26.05
73.4021802026576	13.5506942217446	83.08	5.9	14.32
76.2548610762934	13.5506942217446	77.94	16.73	14.1
76.2548610762933	13.0441902121842	90.14	0.74	21.22
76.2548610762935	12.5546319955749	90.71	5.35	17.99
82.2215112390966	12.0746696930783	85.76	19.27	9.99
82.2215112390966	10.9188431375806	83.63	6.61	7.21
83.7899999999989	10.9188431375806	84.85	7.49	13.74
83.789999999999	9.30553220887251	86.71	7.9	17.03
83.789999999999	7.95774747393172	90.79	7.27	30.18
83.789999999999	6.9942566419492	88.21	3.61	26.68
83.79	6.0380093409264	83.98	4.24	15.73
83.79	5.08999999977195	91.86	5.09	8.07
78.7291906176464	4.22616851840369	86.49	3.97	35.89
75.5806485784117	3.38421677965748	90.45	0.18	30.09
72.6660932290397	2.56248591616949	84.21	1.15	11.63
64.3000000005101	1.76000000004527	64.3	1.03	0.73
58.1101180502092	1.76000000004527	56.94	12.18	13.04
55.8556106415953	1.76000000004527	51.86	7.7	17.94
52.4391185153553	1.76000000004527	54.5	15.91	18.5
49.4911089913571	1.76000000004527	50.3	13.28	17.44
47.1310369175383	1.76000000004527	31.22	0.18	17.31
47.1310369175383	2.43507087658302	48	4	1.79
42.663281153805	2.43507087658302	51.98	10.99	14.06
41.2269221634868	2.43507087658302	44.72	11.87	20.59
38.9201217838612	2.43507087658302	41.49	2.29	8.71
36.4407583494885	20.83	56.38	14.32	21.79
33.5678043922096	20.83	71.33	32.23	42.89
Route: 4 Length: 213.187671016432 Demand Met: 1296				
25.951653491442	24.2255771971244	25.65	24.53	2.83
31.6334942190424	31.4037077292822	41.07	43.98	16.59
33.6444408552907	46.0516298321736	23.78	67.37	23.49
40.8749060600492	52.2237212078045	47.3	55.25	13.14
40.8749060600493	57.8896805910129	37.88	93.16	38.09
40.8749060600493	64.5415323044494	37.93	93.92	38.41
44.1141118922308	72.9246123287716	48.68	92.55	20.63
46.3739545058854	72.9246123287715	48.89	93.1	36.74
46.3739545058855	74.6857149705635	47.08	88.26	25.21
48.8343934070205	74.6857149705635	48.42	91.53	30.91
52.2203615207487	74.6857149705635	66.26	99.07	34.13
52.2203615207488	77.2055763125344	70.23	90.73	37.84
56.2276095814229	77.2055763125343	92.92	88.46	39.57
56.227609581423	77.2065763125343	57.57	78.44	7.54
56.2813891641183	77.2065763125343	53.35	83.14	7.08
56.2823891641184	77.2065763125343	35.46	90.5	36.39
56.2823891641184	77.2075767840372	45.57	93.71	20.17
70.5019177517692	80.4719177564462	74.49	84.46	5.64
58.244413317395	76.9032935002143	78.98	97.83	29.46
57.0284491735401	76.9032935002143	60.12	71.05	24.74
57.0284491735401	76.9022935002143	27.18	54.04	49.76
57.0284491735401	76.9012935002143	68.17	79.21	25.07
57.0284491735401	76.9002935002143	54.83	99.88	28.66
57.0284491735401	76.8992935002143	70.7	73.7	18.06
57.0284491735401	76.8982935002143	72.93	73.7	16.22
57.0284491735401	71.2499687512608	47.67	92.59	35.3
57.0284491735402	70.4052818268852	47.48	94.9	26.29
54.8126740310928	68.7684491996807	44.33	87.3	27.93
53.8684801529602	67.2835734092409	40.14	85.47	26.51
52.9509667113057	65.859009040493	85.6	88.65	40.1
51.1314109141047	62.6450885433018	54.05	68.39	14.97
49.5020767395461	59.8254177517079	49.78	61.48	3.32
47.8341273607552	56.5023096058269	58.75	56.63	26.43
46.2916612491925	53.5204616251947	37.85	53.76	19.4
44.8603030982674	50.9296604184391	51.75	85.81	36.53
43.4471314585567	46.7053521829544	42.62	44.81	3.21
42.2491091320468	44.6560824572566	42.56	42.28	38.94

Solution x	Solution y	Original x	Original y	Radius
41.1115084048357	42.7965560740943	41.97	43.22	4.65
40.0150864396147	40.9390400479058	45.42	39.91	7.33
38.7778770353407	39.3498572841673	42.69	39.78	10.22
37.5294644987045	37.7129195571792	44.15	32.64	10.23
36.1680552395684	36.3092668152385	45.6	43.93	19.94
34.8615544505058	35.0428923883671	43.96	42.1	13.34
33.8862436046034	33.5753144503288	43.21	42.61	13.5
28.5507489311213	27.6889479634086	53.73	28.37	48.55
Route: 5 Length: 183.779999999997 Demand Met: 1299				
15.7029747739073	20.83	3.36	12.54	17.51
12.7185788487099	35.9270748133821	13.36	65	29.08
12.6581127954987	41.4126930914772	2.57	49.67	15.72
12.6581127954987	44.0775284336182	25.24	60.77	37.65
12.6581127954987	47.2891106312737	25.01	63.12	28.84
12.6581127954987	51.103313283982	11.74	69.17	18.09
12.6571127954987	51.103313283982	12.82	66.49	17.6
11.52308792887	52.2085474195278	9.07	51.92	2.47
10.4915117793986	52.6910134247285	11.46	53.07	1.04
9.61201710505189	56.7580422870074	12.14	56.76	5.34
9.61201710505189	61.1957273840801	36.6	82.94	44.77
6.65320023551219	67.8455639204974	2.99	72.09	6.04
6.65320023551219	70.2946967318725	28.82	81.78	43.64
4.63	71.0590024867763	6.62	72.96	3.81
4.63	74.5801937964026	5.07	73.15	4.26
4.63	82.1299999750141	2.19	82.13	2.44
5.3315049874127	82.466746157687	11.23	82.6	5.9
5.54000000659796	93.7999999999985	5.54	99.29	5.49
6.15430487511816	82.9206717783399	1.21	81.97	14.68
6.76932056686839	82.9206717783399	0.91	72.43	18.26
7.60645872198702	82.92067177834	9.41	84.38	2.32
7.73093906647374	82.9206717783399	38.36	90.43	47.27
8.37785269914464	82.9206717783399	39.7	88.73	41.5
8.37885269914465	82.9206717783399	1.01	87.83	21.8
8.71416784466855	82.9206717783399	0.97	75.78	17.69
8.71416784466855	82.9196717783399	38.08	89.48	35.64
8.71416784466857	76.9996959941059	0.76	80.97	8.89
9.89500162641188	76.9996959941059	4.75	76.37	18.12
10.4399510716959	76.7931234595631	48.98	92.03	41.59
10.9416966046509	76.7931234595631	42.78	91.87	35.26
11.3106196883649	76.7931234595631	12.07	80.14	6.18
12.1574389733516	76.7931234595631	8.06	78.36	4.56
12.1574389733516	72.9395597296812	16.99	78.36	10.94
12.1574389733516	69.8521439335343	21.1	78.12	28.48
12.1574389733516	69.8511439335343	21.49	69.2	28.99
14.2602054438776	69.8511439335343	26.5	63.44	28.82
17.6664143127421	69.8511439335343	26.15	61.96	39.04
18.6811495399619	69.8511439335343	49.91	91.9	43.61
18.6811495399619	67.0381979618324	16.79	62.67	4.76
21.6627525296314	32.0178394209627	33.01	55.55	36.48
Route: 6 Length: 3.24916455526137 Demand Met: 496				
23.7314898853488	20.9339362242197	44.53	2.72	49.48
23.8736471806557	21.0345690650133	24.66	9.13	37.86
24.0136897465321	21.1340558313295	45.09	11.7	48.9
24.1849349976484	21.2330432400586	23.55	20.83	11.78
24.5643107336778	21.4342715439529	40.4	40.19	32.32
24.5703107336778	21.4342715439529	58.02	32.46	35.22
24.5693107336778	21.4342715439529	73.63	17.07	49.78
24.5683107336777	21.4342715439529	53.87	15.51	48.76
24.5673107336778	21.4342715439529	43.23	11.54	40.96
24.5663107336778	21.4342715439529	52.03	16.04	40.73
24.5653107336778	21.4342715439529	3.21	36.35	37.4
24.5633107336778	21.4342715439529	30.85	54.39	33.55
24.3613799542766	21.3305247944612	4.01	20.5	30.01
Route: 7 Length: 209.10 Demand Met: 1299				
33.7336854042714	24.8379148089664	54.15	15.54	39.45
43.5354750546252	28.9483700159009	51.12	47.54	20.96
48.5237977698619	30.9980401580086	42.72	42.84	48.6
51.7801606653041	34.9284340320812	85.18	6.81	43.66
57.598899322873	35.3626449129581	84.22	4.25	43.87
57.598899322873	38.0815184253523	48.25	85.26	49.96
60.2708162048504	41.4197655360123	78.01	26.19	23.38
67.420842663432	41.4197655360123	84.47	48.16	27.36
70.9277677688628	43.5219245692971	85.02	48.75	30.39
74.6650945655018	45.3614946882047	82.42	49.99	11.64
78.0792494369295	47.1250901147731	85.43	53	9.41
80.6760459140962	48.6066899586904	86.88	55.34	10.88
85.0334301360065	52.5799999999978	87.26	54.53	10.31
87.342104865177	52.5799999999979	89.59	51.88	4.09
89.3600031200289	52.5799999999986	89.36	56.03	3.45
89.3610031200292	52.579999999998	91.08	56.32	17.84

Solution x	Solution y	Original x	Original y	Radius
89.3620031200289	52.5799999999978	92	48.8	13.39
96.349999999773	49.7300000303599	96.43	49.73	0.08
96.1090346711052	49.73000003036	90.93	51.78	5.57
96.1090346711052	49.72900003036	87.92	47.46	19.28
96.1090346711052	46.8564793793957	89.33	46.23	10.42
89.8393003015254	46.8564793793957	92.59	46.16	30.13
89.8393003015254	46.8554793793957	92.92	45.3	44.4
89.2805886120562	46.8554793793957	93.86	49.11	7.68
89.2805886120562	46.8544793793957	87.56	46.99	41.58
89.2805886120562	44.9057625383597	92.82	43.5	36.84
85.7077710705873	44.9057625383597	88.92	43.62	3.46
82.5563206098526	44.9057625383597	90.65	58.26	31.68
82.5563206098527	44.9047625383598	85.21	44.35	35.25
82.5563206098529	44.9037625383598	84.47	44.91	21.75
82.5563206098526	41.3967374180334	85.78	45.37	33.83
82.5553206098526	41.3967374180334	89.11	45.94	8.83
80.7030640278053	41.3967374180334	83.08	6.85	42.38
78.722849358184	41.3967374180334	85.85	46.49	8.76
78.722849358184	39.7693109100015	98.41	37.64	22.32
65.8762070918352	39.7693109100016	60.94	57.56	37.6
65.8762070918339	39.7683109100016	65.16	40.78	37.77
58.7633096644448	39.7683109100016	32.42	78.27	49.72
55.5613673856708	39.7683109100016	63.26	50.77	14.97
49.105075057753	39.7683109100016	74.93	38.63	25.85
49.104075057753	39.7683109100016	43.21	42.35	16.43
49.1040750577529	23.8687839262993	40	38.77	18.88
49.1040750577529	23.8677839262993	47.34	38.25	14.49
34.5724497726108	23.8677839262993	64.87	11.36	35.55
Route: 8 Length: 187.359999976863 Demand Met: 1300				
23.55	29.130721747021	27.4	59.84	47.68
23.55	32.1459919876396	50.52	8.68	38.38
23.55	42.5459060243955	23.5	55.84	18.38
23.55	61.4602902147612	24.03	65.56	12.46
23.55	65.401935596206	20.64	65	4.42
23.55	65.402935596206	25.62	68.98	43.08
23.55	65.403935596206	22.17	64.94	3.52
22.6985333705737	65.403935596206	3.44	75.58	32.57
22.6985333705737	65.4049355962061	16.07	82.14	24.27
22.6985333705737	65.4059355962057	31.99	67.74	46.93
22.6985333705737	66.7039160128199	19.86	66.11	2.9
22.6985333705737	68.3408470137234	22.6	70.1	3.11
22.6985333705737	68.3418470137234	23.52	71.05	2.83
22.42000001157	68.7500007388807	20.35	68.75	2.07
22.9877403715138	74.7863974650681	24.25	76.66	7.23
22.9877403715138	86.1516742849202	4.8	88.51	18.34
33.6996234030014	89.6226590604851	24.67	93.34	18.16
33.6996234030014	90.3999999999921	30.69	95.98	13.17
33.7006234030014	90.3999999999922	39.18	94.86	14.97
33.7016234030012	90.3999999999922	42.37	92.45	18.71
37.9454908570622	90.3999999999998	40.14	88.25	7.74
41.1100003299745	90.3999999999998	41.11	92.55	2.15
41.1110003299701	90.3999999999998	46.92	92.94	12.72
41.1120003299751	90.3999999999921	47.56	92.03	9.48
46.53	90.2999999869601	50.91	90.3	4.38
40.865080834325	87.9111459259256	42.93	88.78	12.51
40.8650808343255	87.9101459259254	38.99	86.42	12.82
40.8650808343251	86.8598206086411	39.31	87.14	5.32
40.8650808343253	85.8861227359081	40.13	86.48	6.39
39.8984351771758	85.1866455378562	41.11	86.33	3.31
39.8984351771762	84.061804795011	44.75	90.08	11.27
38.3270233635554	83.1756320343638	39.28	92.99	15.28
36.4353409458167	83.1756320343638	49.11	94.31	17.31
33.734618701991	80.5953842714881	35.58	76.06	8.78
30.5175426673728	78.9319683419935	27.35	82.24	4.58
29.0071607546528	68.8190013852341	28.86	67.84	0.99
29.0071607546529	66.893414134277	0.62	84.95	36.73
27.0303278833294	66.893414134277	1.24	99.01	41.19
27.0303278833295	64.5944228200134	46.8	93.43	39.27
27.0303278833294	62.4682111199096	46.89	94.85	49.64
25.731340838325	61.7867521224883	23.19	66.22	5.11
25.731340838325	53.7657795106393	8.95	75.43	30.95
24.6551288647119	53.7657795106392	20.56	61.44	30.47
24.6551288647117	48.8990738511973	34.79	81.57	35.28
24.6551288647119	40.5534492705985	23.47	70.49	29.96
23.55	25.9968662565248	61.27	24.41	39.95

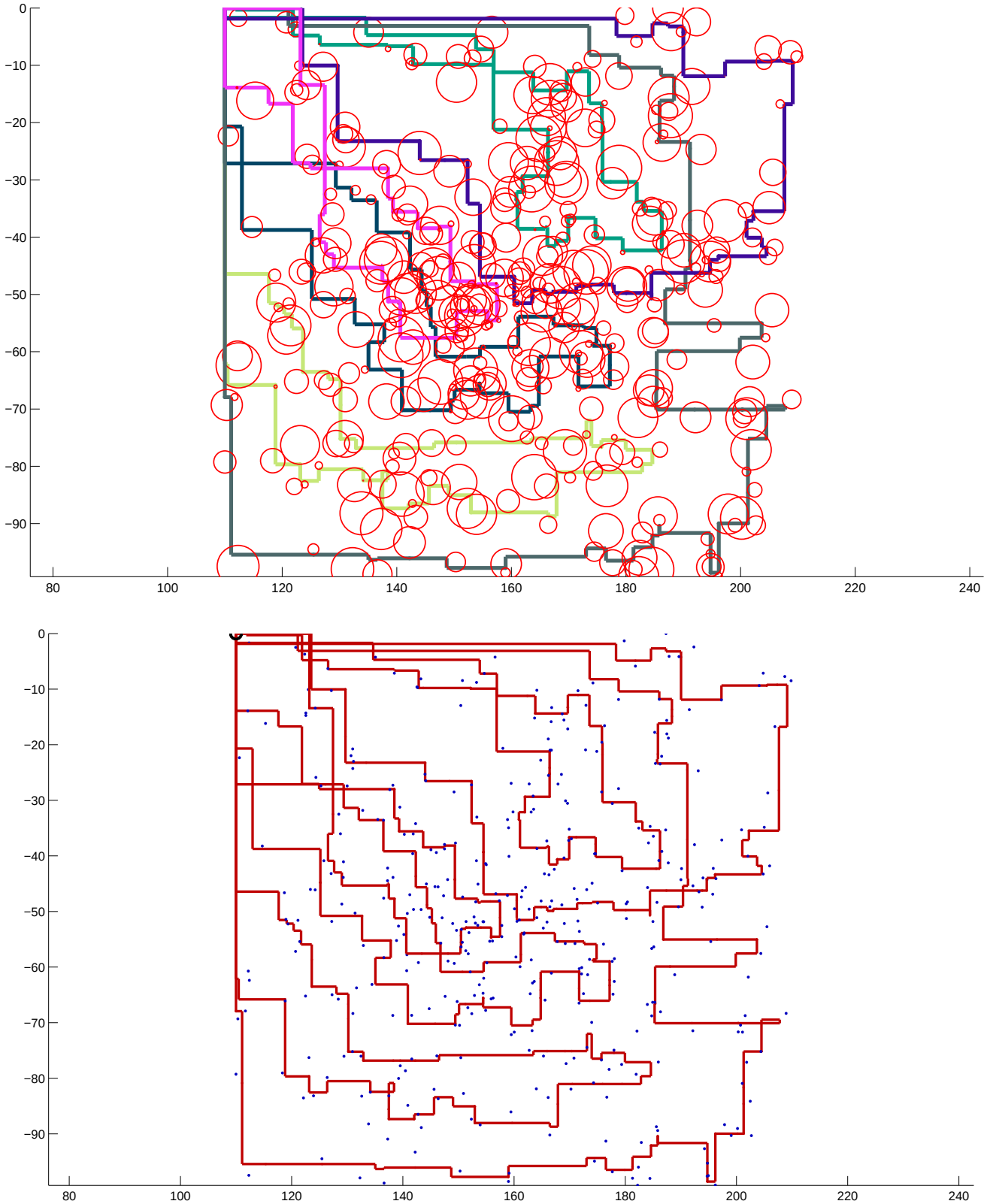


Figure O.156: *team*4_400, arbitrary radius, 2D, Manhattan, Length = 1942.8053448

Table O-159: Solution for *team*4_400, arbitrary radius, 2D, Manhattan

Total distance: 1942.80534479826				
Total demand met: 2245				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 355.700983342336 Demand Met: 373				
0	62.1089673257671	2.206275	60.72485	2.6045019
0.485463861846284	65.8114155970545	2.404275	62.37445	3.9363141
8.83590094156196	65.8114155970545	8.8531	66.09375	0.2828521
8.83590094156196	79.6633909612343	8.347775	79.0334	2.1293776
13.1458311900705	79.6633909612343	13.11545	76.27845	3.3850773
13.1458311900705	82.5412502999236	12.1212	83.525275	1.4206244
13.9285499944151	82.5412502999237	13.92855	83.165725	0.6244747
16.4015000143234	80.5069855	16.4015	79.860725	0.6462605
24.1573999995668	82.4355620996035	22.609375	83.218325	2.9452111
24.1583999995668	82.4355620996035	24.1584	82.49565	0.0600879
28.412425148804	80.8479000765793	29.23795	80.022375	1.1674686
27.47939006027	85.5614011199704	30.896	84.86835	3.8695341
27.47939006027	85.5624011199704	27.4824	83.15295	2.409453
27.47939006027	87.3328118601275	23.831575	88.204275	3.750467
27.48039006027	87.3328118601275	27.27955	90.9405	3.6132742
32.0598366888602	87.3328118601275	33.324025	88.862275	2.0476207
32.0598366888602	86.4919225067494	32.733925	86.47665	0.6742613
35.6090524318873	83.3984699001401	35.60905	81.995775	1.4026949
39.0296811644862	85.0477211818629	36.3513	83.686975	3.004223
42.9378285082855	85.0477211818629	40.913925	82.729825	3.0771461
42.9378285082855	88.0462204394102	42.31835	87.347525	3.5183382
42.9388285082855	88.0462204394102	43.9034	88.387225	3.5077797
49.6668574787356	88.0462204394101	49.4347	86.0537	2.0059997
56.4280749276768	88.7103565999992	56.428075	90.20545	1.4950934
57.8780642893523	84.6536335199749	56.13655	83.451075	2.1163693
57.8780642893523	81.0267559380494	54.01775	81.8894	3.9555254
60.481275822754	81.0267559380494	60.2356	81.956375	0.9615343
65.9121039575993	81.0267559381308	64.2971	80.8087	1.6296583
69.4283815958343	81.0267559380494	66.686275	83.4025	3.6281274
72.81040470869	79.6136845229871	71.96685	79.285825	0.9050284
74.6081772999998	77.0935000576945	75.94035	77.0935	1.3321727
69.9535059237871	75.4213476003743	69.349625	77.516575	2.180516
67.9701498497874	75.4213476003744	67.97015	74.943825	0.4775226
65.7213750008414	76.6374750999998	65.721375	76.70655	0.0690749
65.7213748693923	76.4656229893574	67.096325	78.407125	2.3790582
63.9561002898937	71.9906780000071	63.9561	69.944325	2.046353
63.1059580110412	75.0997353966038	63.106325	74.44845	0.6512855
60.3632579177407	75.0997353966038	60.77085	76.3761	1.6799218
59.1659820379589	75.0997353966038	59.360575	77.3659	3.7611478
55.9383214072444	75.0997353966038	55.289875	75.9977	1.1076205
53.4930931733408	75.8282276130245	52.726325	74.9715	1.1497459
40.4189205434548	75.8282276130245	40.4153	76.30845	1.7018987
36.5124886031818	76.8172043999999	36.110325	75.95995	2.3419359
32.2331044567651	76.8172044	31.60195	76.5275	2.2545249
29.5312000005917	76.8172044	29.5312	77.759375	0.9421706
28.2814617452411	76.8172044	30.46345	78.65395	2.8521408
22.8902785454954	76.8172043999999	22.467675	76.02705	1.6009174
22.8902785454954	75.2135290931269	20.9401	75.2051	3.2102784
20.1876954603149	75.2135290931269	19.41455	76.0326	2.3028676
20.1876954603149	69.2866138041545	21.0091	68.35155	2.1296062
20.1876954603149	66.6611118338385	18.3822	65.772725	2.0122239
20.1876954603149	64.7978059577541	21.668825	63.73225	1.824597
18.0588810391003	63.5175919436854	17.272875	64.973225	1.6542893
13.616151837391	63.5175919436854	12.50315	65.202575	2.0894727
13.616151837391	58.6412364052755	10.71515	57.182775	3.2469865
13.616151837391	55.9291799300879	11.458875	55.406825	3.5619902
11.6955804592378	53.4501472823174	8.9679	51.422725	3.3986294
10.3511772589003	52.1737255012707	11.134375	51.580675	0.9823989
9.10072946488039	51.5294488110745	9.352575	52.2461	0.7596151
7.675641894099	46.4254040666584	8.7059	46.626875	1.0497725
Route: 2 Length: 315.924473579464 Demand Met: 375				
0	20.6737156539396	0.610975	22.331075	1.7663891
2.97319643633908	38.7333195745887	4.729125	38.22055	1.829267
15.161255308292	44.8013974317834	13.3837	46.032275	2.1621199
15.162255308292	44.8013974317834	14.24105	46.110125	1.6004334
15.162255308292	50.7918428469968	17.219275	51.795125	2.288647
22.650331166811	50.7918428469968	21.4066	50.274675	1.3469706
22.650331166811	55.2137000009198	22.891175	56.122525	3.1174634
27.8148829001875	55.2137000009199	28.87265	55.2137	1.0577671
27.8148829001874	58.3280910338763	30.732825	57.781	3.9919808
26.546563779705	58.3280910338762	26.5978	58.30075	0.0580748
25.0699343000013	63.128100001373	24.44465	63.1281	0.6252843
30.9018648745953	70.2114745996086	28.20205	68.6988	3.0947027
30.9018648745954	70.2124745996085	31.583525	68.6781	2.5702207
35.824417733091	70.2124745996074	34.7277	67.482525	2.9420086
39.4301749983112	70.2124745996075	39.430175	70.428325	0.2158504
39.430174998311	68.5014527433508	41.683175	67.299925	2.7312469
39.430174998311	68.5014527433508	40.205375	70.4585	2.1049867
40.0951657063658	67.4927531740893	37.615325	65.262725	3.9137176
40.0951657063659	66.6407787323227	39.7753	66.19835	0.5459462
41.2598863926088	66.6407787323212	44.898775	67.784675	3.8144474
41.2598863926088	66.6407787323212	42.3891	68.379025	3.3982575
44.4216998874685	65.5662877999993	44.4217	64.703925	0.8623628
44.42169988747	65.5672877999992	42.88515	65.09985	2.6385081
44.4216998874703	65.5672877999993	46.228875	65.56925	2.8726006
44.4216998874684	67.2354168417265	45.884675	65.715725	2.1094453
49.5023000378489	70.4778531998649	49.5023	72.1454	1.6675468
53.3425766870128	69.4431518128799	50.03295	71.692275	4.0015227
53.954639135167	69.4431518127845	53.249925	71.4317	2.1097265
54.794510402261	65.5434439387119	55.5813	65.9389	1.399502
54.794510402261	65.5424439384782	52.902425	64.80215	2.0317535
54.7945104022582	64.1284584322027	53.6353	62.58645	1.9291342
54.7945104022556	62.0145040605449	53.1029	58.71345	3.7092457
54.7945104022556	62.0145040605449	53.3194	62.871025	3.2245451
54.7945104022591	60.8220610819496	56.708375	61.084725	3.5527238
61.7091983012216	60.8220610819497	62.138225	61.218175	1.1077798
61.710198301221	60.8220610819497	61.732525	60.28975	0.5327791
61.7101983012251	60.8230610819468	63.23165	61.378	3.0992482
61.7101983012255	63.834870988407	62.1796	60.091575	3.7726122
61.7101983012301	66.0577093719803	61.692525	66.479075	0.4217361
63.6273759487508	66.0577093719328	62.481725	64.778425	1.7172899
67.1806812999704	63.2994878120009	67.8084	64.88	1.7006027
67.1806812999704	62.3252239281479	68.033375	62.578975	2.4747025
67.1806812999703	58.9604000095612	67.662425	58.9604	0.4817437
67.1806812999544	58.959400009561	68.048425	58.486425	1.6060654
64.1574111	58.6140999880505	63.564825	58.6141	0.5925861
64.8416254999998	55.8767750539509	66.095725	55.876775	1.2540995
62.603588495843	55.3849015035812	61.751375	53.5726	2.857714
60.9162571072162	55.3849015035812	60.964225	55.767775	0.3858666
57.9552097132779	55.3849015035812	57.767975	55.4125	0.1892578
57.3454859451431	53.8700515999979	59.205025	55.76	2.6513752
51.8234999999943	53.8700515999999	51.731775	54.063975	1.2006342
51.8225	53.8700515999998	51.8225	53.851	0.0190516
51.2098254087267	57.7433886062018	50.342	58.1772	0.970213
51.2098254087295	59.1330006387599	51.0767	59.931625	0.8096439
44.7752280115005	59.1330006386924	45.110025	59.219325	0.3457469
44.529533978345	60.850994039749	44.541975	62.0002	1.1492733
42.1145249999792	60.8627557999903	42.114525	60.87195	0.0091942
40.7200224925384	60.8627557999902	43.7645	63.186425	3.8299193
36.7704486401371	55.6826811463847	36.8297	55.690525	0.0597683
35.9323798972305	52.1495405472657	33.276075	49.648225	3.6486347
35.2137574859504	51.4728481194414	34.822	51.041775	1.4877525
35.2137574859504	49.4160052703519	31.916925	49.63125	3.3038515
34.3447968536334	48.8060826781863	37.32375	47.164775	3.8061293
34.3447968536334	48.8060826781863	37.074525	51.14655	3.5957201
34.3447968536334	45.6405571160945	35.77655	45.5234	1.4365385
32.3223630861239	43.671726769898	34.241775	45.041325	2.3579528
32.3223630861239	39.1668320687291	31.7652	39.5927	0.7012804
26.4918336602873	33.5713851975812	26.51415	33.575825	0.0227537
26.3291122917392	33.5670766779335	25.49855	33.45475	0.8372327
22.0845350425378	31.360094353275	22.793175	31.8095	0.8390697
19.3568411853325	27.1221747843863	19.9845	27.40155	0.687027
16.0749861674801	27.1221747843863	14.358825	25.883825	2.1162985
Route: 3 Length: 265.202820237613 Demand Met: 374				
1.84325084112945	0.28018819872496	2.34935	1.70725	1.5141472
11.8721855724593	4.79500452913343	12.34295	3.720825	1.2923936
16.5687356141078	6.41454533188671	16.533825	6.314025	0.10641
28.469674522785	6.65961044858466	28.471925	7.124375	0.46477
32.8580835855695	9.79019622042694	33.240325	8.160175	1.9941137
32.8590835855695	9.79019622042694	32.5307	9.603625	0.3776832
33.6787419809268	9.79019622042694	32.636425	9.71905	1.0447423
42.1825532324615	9.79019622042694	43.2503	8.7931	1.4609189
42.1825532324615	9.90712315391185	40.718225	8.45085	2.0651849
42.1835532324615	9.90712315391185	40.4237	12.94705	3.5125829
46.8755470790203	21.2165872033753	47.99765	20.639375	1.2618593
56.3897633192018	21.2165872033753	56.145325	18.970525	3.3151033
56.3907633192018	21.2165872033753	56.707375	20.9848	0.3923879
56.3917633192017	21.2165872033753	56.46315	20.9863	3.1469731
56.3927633192017	21.2165872033753	54.7913	22.79115	3.9863921
56.3927633192018	24.1526442428362	56.18475	25.5187	1.3818024
56.3927633192017	25.209544875306	58.5251	25.335175	2.8927993
56.3927633192017	25.210544875306	57.8987	27.066925	3.9092312

Solution x	Solution y	Original x	Original y	Radius
56.3927633192017	29.3741198881413	59.6161	30.5374	3.7763801
56.3927633192017	29.3751198881413	59.25755	30.092125	2.9531507
53.3488082558943	29.3751198881413	53.429725	29.230175	2.9604889
51.9522336	29.3751198881413	49.48335	26.949275	3.4612295
51.9522336	29.3761198881413	52.727475	27.05645	2.9182147
51.9522336	32.1151250000008	53.51985	31.610925	3.9899375
51.9522336	32.1161250000008	53.08505	32.116125	1.1328164
51.9512336	32.1161250000008	49.821325	32.088775	2.6868713
50.8772220003961	33.4678000250034	48.825175	33.4678	2.052047
50.8772220003961	33.468800024998	49.014675	34.9475	2.6167984
51.0627157187351	38.5353551323945	49.0937	40.0849	2.5088011
54.1254254357012	38.5470588000002	54.125425	38.6935	0.1464412
55.8945250000348	38.2523614	55.894525	37.29925	0.9531114
56.2811250000241	41.5404539	56.281125	43.406775	1.8663211
57.7779906460414	40.6291111790818	55.460475	43.213925	3.4716194
57.7779906460414	40.6281111790818	57.24125	42.40615	2.5354041
57.7789906460415	40.6281111790818	58.980725	40.369175	1.2293142
59.9254500000004	36.6394328000001	59.82755	37.21565	1.095882
59.9264500000004	36.6394328	59.92645	35.207	1.4324328
61.1882458428644	36.6394328000001	60.313175	36.907775	0.9152904
64.6692503309519	37.8671549545384	64.48255	39.62755	1.7702677
64.6692503309519	40.1886197902492	64.627025	39.598675	0.591454
69.4258000000024	42.294824	69.4258	42.661825	0.367001
75.5545463622678	42.294824	77.736325	41.257125	2.4159837
76.2532912999999	42.152703572493	76.046775	40.829925	1.3388025
76.2532913	39.1932499999906	76.5757	39.19325	0.3224087
76.2532912999937	35.7876954618337	77.267275	35.3236	1.527158
76.2532912999938	35.4014953019979	74.186175	37.664625	3.0650817
73.0761708192684	33.9784775594273	75.0516	36.4713	3.1806421
73.0761708192684	33.8082156733812	74.4851	34.7013	1.668137
71.8908202819879	33.8082156733811	72.419975	34.998125	1.302263
71.8908202819879	30.3458255658689	68.792375	27.90175	3.9463741
67.3110647924654	30.3458255658689	67.6691	30.587025	2.7503569
65.908739884545	28.5075653055033	65.757275	28.49595	0.1519096
65.9087398845423	21.8080457536939	65.789175	19.559925	2.251298
65.9087398845411	20.8052511871263	64.881075	21.1972	1.4515751
65.9087398845411	19.6737926798478	62.8697	20.929125	3.2881032
65.7992370074747	16.6272698339526	66.273425	16.5814	0.4764014
63.5505112064168	11.0442293	62.944875	12.9098	2.4896628
61.5061999987455	11.0442293	61.5062	10.2838	0.7604293
59.6678240890016	13.288132957059	58.66755	14.455925	1.8727735
59.6668240890016	13.2881329570589	58.962525	15.549225	2.3682429
59.6668240890017	14.3862643000002	59.666825	17.15215	2.7658857
53.8242624728244	14.3862643000002	56.680125	15.845675	3.207153
53.8232624728243	14.3862642999969	53.686425	15.19815	3.2492576
53.8232624728243	11.2078113603106	56.7601	13.3255	3.6207209
52.4049591693272	11.2078113603106	54.0981	10.209075	1.9657569
46.9027286977121	7.2041732095977	44.6523	7.1683	2.2507146
43.8359818828164	4.71749155665123	46.59205	4.24755	2.7958463
24.673594643054	1.6843126759982	25.090375	4.2535	2.6027734
Route: 4 Length: 464.416742113434 Demand Met: 375				
11.0932727134435	3.12849656748631	10.7326	2.49095	1.8617797
63.5887727834586	8.21671359551337	64.181275	8.885925	1.4590044
68.8170555535171	10.4014426101233	68.784175	11.8632	2.318307
76.1158374383658	11.7844214388584	76.1173	11.832075	0.047676
78.3857287	13.687775	81.52085	13.687775	3.1351213
78.3857287	14.9006921411371	77.464	15.628175	3.5672263
78.3857286999848	16.1631517983092	77.750225	18.79385	3.8375488
75.8794914055222	17.9786984092105	77.472675	18.057475	1.59513
75.879491405539	17.9796984092098	75.3053	17.780525	0.815641
75.8794914055428	21.6872337082897	76.538875	22.08605	0.7706109
75.8794914055427	22.6050579604866	76.27055	23.463675	3.2776576
75.7264042	23.365625	75.41995	23.365625	0.3064542
81.17018077584	24.5222210431456	83.1155	24.690275	2.6366931
81.17018077584	37.0229296217633	82.455325	37.974875	2.6754574
81.1701807758399	44.0719703470811	80.003925	44.278875	3.7953033
81.1701807758399	44.0719703470811	80.128375	42.2928	2.9296913
81.1701807758399	44.0719703470811	84.710775	44.260425	3.5456061
81.270077	45.384	82.166	45.384	0.895923
80.3838952504424	49.1094767977783	79.556325	49.1563	0.8288938
76.8360041478989	55.032165529039	75.12385	56.355025	2.2591934
76.8360041478807	55.033165529039	74.7548	56.66355	2.6437784
86.505088820187	55.033165529039	85.3769	55.416	1.1913741
93.6688753999707	55.033165529039	95.486225	52.746525	2.9208705
93.6688753999707	57.5521	94.377175	57.5521	0.7082996
89.8732262789445	59.8919994684549	92.124775	61.791725	2.9459173
78.0482193366277	59.8919994684499	78.897475	61.3791	1.7125137
75.3623051834532	66.4249217195836	75.320425	66.338125	0.0963723
75.3623051834543	66.5879037592418	73.97555	66.71955	2.6718873
75.3623051834543	66.5879037592418	76.3481	68.05155	1.7646676

Solution x	Solution y	Original x	Original y	Radius
75.3623051834484	66.588903759258	74.919425	66.332825	3.2122786
75.3623051834484	66.588903759258	74.758025	68.76505	2.7316723
75.2792620167449	70.0926515999999	72.106325	71.513625	3.4765924
81.981480957394	70.0926515999999	82.150425	71.4598	2.6881218
90.314475	70.0926515999998	90.725625	70.444425	2.1020018
90.314475	70.0926515999998	90.314475	71.662575	1.5699234
90.3154750000002	70.0926515999998	91.5733	68.725	2.6135119
94.3605522162426	70.0926515999998	91.08095	71.69145	3.6485541
97.7924321608359	69.4674928391641	98.93765	68.322275	1.6195826
94.5030558211449	75.1798676788769	94.404	75.185075	0.0991926
94.5030558211517	75.180867678877	91.825175	77.123475	3.5229343
91.2895111546783	81.6449619428828	91.03755	80.9252	0.7625888
91.2895111546817	84.5897920637574	92.480625	84.1266	1.2780059
91.2895111546826	89.9614134089003	90.195175	89.03695	3.7016857
91.2895111546833	89.9624134089009	92.685275	90.310575	1.653919
90.2155203006844	89.9624134089007	89.0595	90.291	1.201812
86.1929749999997	89.9624134088949	87.858275	88.334025	3.4946441
86.192975	98.569051699787	86.192975	99.203225	0.6341733
84.771949965464	98.5690517000002	84.9479	97.513325	1.6436369
84.7719499654678	95.2081050730635	84.730325	97.611875	2.4041303
84.7709499654634	95.2081050730634	84.77555	95.283075	0.7763126
84.7709499654619	91.6464398673643	84.25115	92.664475	1.1430606
75.8385	90.3800210001088	75.8385	89.39705	0.982971
75.8384999999961	92.0862326934222	75.589675	88.707575	3.3878078
74.6222847721289	92.0862326933923	72.88955	91.55335	1.8128248
74.6222847721288	93.9244481885507	72.374675	95.981125	3.0465832
74.6222847721289	94.1137043778432	74.44305	98.0205	3.9109049
71.306475	95.8827799147095	72.222075	99.2555	3.494791
71.306475	96.4612828999875	71.306475	97.9771	1.5158171
69.9112494361598	96.4612828999876	67.679475	96.828325	2.2617553
66.508125	94.3338300001731	66.508125	91.303225	3.030605
63.0292761526842	95.7786355797191	64.46975	94.91155	1.6813097
48.9904500000003	97.7314511	48.99045	98.5583	0.8268489
48.9904499999988	97.7304511	49.100125	97.070175	2.680503
38.7096260140728	96.0571395000589	40.290225	96.689525	1.7024114
32.2237501383969	96.0571395000589	32.22375	93.28635	2.7707895
26.621200138541	96.3169741999748	26.6212	98.85125	2.5342758
25.0382834215373	95.4206538119695	22.27635	97.920025	3.7249339
15.4811570535909	95.4206538119695	15.45105	94.471525	0.9496062
5.34454268076061	95.4206538119694	2.307925	97.449675	3.6521191
1.09522384137729	80.8690710482064	0.00155	79.256375	1.9485664
1.09522384137729	67.9375202365575	1.692025	67.9044	0.5973869
0	67.9375202365575	0.331025	69.303175	2.7183647
Route: 5 Length: 324.285639348234 Demand Met: 373				
13.5289181454538	10.0361743566875	13.011825	10.0758	0.8489863
19.6701475762957	10.0361743566876	17.13825	10.254625	2.541304
19.6701475762951	18.5384145093232	20.9892	20.7572	2.581261
19.6701475762945	23.2415074467573	20.686175	21.9667	1.6301674
23.4129701400725	23.2415074467573	20.995625	24.282225	3.5058599
23.4129701400725	23.2415074467573	21.1268	22.989225	2.3000479
34.0072226435418	23.2415074467567	33.989075	25.3104	3.7659631
34.0072226435418	26.5596302758264	34.098725	26.483975	0.1187202
38.3674452272219	26.5596302758264	39.217825	28.48755	2.7558001
42.3565664194335	26.5596302758264	42.344525	27.231625	0.6721026
42.3565664194328	34.1582544920441	43.312375	33.022625	3.1742295
44.4958680854988	39.3121258514265	44.89855	41.381	2.1076985
44.4968680854988	39.3121258514265	45.015525	41.584025	2.3336041
44.4968680854988	39.3131258514265	43.242475	40.8624	1.9934273
44.4968680854988	46.9123686038569	43.5222	45.0811	3.7775081
50.4948490208341	46.9123686038569	52.0729	45.66175	2.0135272
50.4948490208341	47.9844081535747	51.332325	47.3944	2.0193416
50.4948490208341	47.9844081535747	51.464375	46.273425	1.9665818
50.4948490208341	49.6264470865877	50.075475	49.526025	1.2581756
50.4948490208344	51.1984687667961	50.9611	51.5263	0.5699678
50.5203999989266	51.5248184999655	50.5204	51.7746	0.2497815
53.6223509939388	49.2011810000034	52.703075	49.56845	0.9899267
54.8709249968359	49.2011810000246	54.099275	51.121125	2.2154275
54.8709249968359	49.2011810000246	54.870925	48.098925	1.102256
55.9575370950835	49.8862956507619	55.9361	51.897075	2.2731123
57.0145201387782	49.8862956507619	55.262125	52.9866	3.5612885
57.0145201387782	49.8862956507619	59.0369	52.162425	3.0447964
57.0145201387782	49.542981211327	56.4549	49.1402	1.0924331
57.6651119092067	49.542981211327	56.7604	48.090675	3.4617573
61.3318658464128	49.542981211327	63.06625	46.073225	3.8790845
61.3318658464129	48.4901526747739	61.33205	47.81805	0.6721027
62.2999157857442	48.4901526747739	58.59885	48.807625	3.714657
62.2999157857442	48.4901526747739	60.81405	45.86495	3.5607331
62.2999157857442	48.4901526747739	61.491825	51.7088	3.6794322
64.045049926833	48.2793695000207	64.04505	44.910675	3.3686945
64.045049926833	48.2793695000207	65.024675	48.473875	1.4488497

Solution x	Solution y	Original x	Original y	Radius
67.8743125108467	49.7428213226319	70.38585	48.289775	2.9015796
70.0670627236312	49.7428213226319	70.163125	48.595475	3.4643229
70.0670627236312	49.7428213226319	70.20275	51.264575	1.88246
74.4381609388952	50.7064380352151	74.97575	51.8098	1.2273588
74.4381609388952	46.2350915360998	74.018375	45.692475	0.6860415
77.4087446911146	46.2350915360998	75.70595	48.354275	2.7185379
82.9465622283901	46.2350915360998	83.247325	46.458225	0.4748225
83.8443315775531	46.2350915360998	83.835575	49.221375	3.0061312
84.6953520714697	46.2350915360998	85.726975	46.8848	1.2191665
84.6559469000254	43.9587249687774	83.98185	43.958725	0.6740969
86.1679301605695	43.3333015069535	86.306375	44.08645	1.9276333
86.1689301605696	43.3333015069535	85.82305	42.253575	2.2900333
94.5240440999983	41.8090000001337	94.807975	43.25145	1.5111964
94.5240440999998	41.8080000001337	95.9689	41.808	1.4448559
93.7043393009152	40.1075592109704	92.049975	40.056175	1.6551621
91.0449396000045	37.1432000151863	87.349525	37.1432	3.6954146
92.2416971096061	35.4678506693308	94.997925	34.851	2.8244109
92.2416971096061	35.4668506693308	90.921925	35.308625	1.329223
97.6387143985554	28.1912153847481	95.640625	28.68455	2.2964659
97.6387143985554	16.7925245999343	96.9141	16.74635	0.7260841
99.107996543229	9.21930345660448	99.82775	8.49955	1.0178851
97.320115771569	9.21930345660449	98.6909	7.723575	2.0288551
95.4558994259368	9.3486498017378	94.09005	9.358875	1.3658877
95.45489942595	9.3486498017378	94.81355	7.137025	2.3027404
87.3022998630404	11.9104919301323	87.3023	11.937375	0.026883
80.0216445574513	4.23830125142054	79.6523	4.144625	0.8742129
80.0216445574513	3.21170134920011	82.33615	2.420325	2.4460605
77.3352249995982	2.68095270000011	77.335225	0.00945	2.6715027
74.6238508662649	4.8690759999996	77.882675	4.11235	3.3455297
71.8295249989711	4.8690759999996	71.829525	5.85575	0.986674
68.3462079512052	1.86203795336221	69.817575	1.306825	1.5726355
Route: 6 Length: 217.274686177176 Demand Met: 375				
13.1846690846656	13.4286789970427	12.54795	14.295525	1.0755618
13.1856690846659	13.4286789970427	14.259	13.428825	2.5476741
17.4384218999999	32.5001500025596	18.476575	32.50015	1.0381531
17.4384218999999	36.0246132665883	18.77905	36.01655	2.0153111
16.5495742000001	40.8769500681446	15.806625	40.87695	0.7429492
16.646549864234	40.8769500681447	19.322625	41.061025	2.6823985
17.6357409967257	42.9734369650916	17.095675	43.177	3.0748926
19.0289250769029	45.3178372999993	19.028925	48.6519	3.3340627
19.0289250769029	45.3178372999993	19.292975	43.870425	2.0965358
27.2689000915763	44.9597888000001	27.2689	42.18555	2.7742388
27.4788569514705	45.6944592857926	27.251975	44.47235	3.7272714
27.4788569514705	47.6839103133919	28.231575	43.86655	3.8908642
28.4878444255496	47.6839103133919	31.24645	46.9846	2.8458636
28.4878444255496	47.6839103133919	26.549225	47.5983	1.9405088
28.4878444255496	51.2060054645389	30.804475	50.3614	3.2757758
28.4878444255496	51.2060054645389	29.2116	52.625	2.2691686
30.6124603566924	54.0759213128857	30.1798	54.1346	1.5141057
30.6124603566917	57.5654092999614	30.688625	60.637275	3.9031621
33.4032685400481	57.5654092999614	32.800625	59.186225	2.9956219
38.1229750019828	57.5654092999614	39.243575	59.34405	2.5403868
38.1229750019828	57.5654092999614	38.122975	58.912025	1.3466157
40.3725016811043	56.3260753543402	41.765825	57.606275	1.8921573
40.4488487647724	56.3260753543402	41.323875	57.06515	1.1453823
40.4488487647724	55.5412815805937	40.703325	55.537825	0.2543153
40.4488487647724	54.3149285192567	40.468775	56.35765	2.0428185
40.4488487647724	53.1139651405476	39.658325	53.39295	0.8383044
41.3638002968347	52.8940716	41.3638	51.811825	1.0822466
41.3638002968347	52.8940716	40.529725	53.231175	3.1574837
41.3648002968347	52.8940716	38.966475	52.166125	3.6894736
43.4545291088804	52.8940715999999	43.47965	52.4779	0.5165632
44.0153760321207	52.8940715999999	41.89655	53.797625	3.5360134
45.877498501832	53.0339866786643	44.413025	51.821425	1.9013123
45.877498501832	54.4271888049797	43.054225	52.07985	3.6716308
45.877498501832	54.7179222730544	46.119125	55.3112	0.6405949
45.877498501832	54.5356053978916	45.616825	55.349625	0.8547389
47.4913308960202	54.4271888049798	47.802925	54.5327	0.3289734
47.4913308960202	51.0927806405805	47.81055	52.508825	1.4515793
47.4913308960202	48.1959376000023	46.718325	46.79505	2.1962207
47.3591498921793	48.1959376000023	47.35915	48.071	0.1249376
45.7252701252503	48.1959376000023	48.801425	47.111675	3.261649
44.0076307055569	48.4056123814062	44.549375	51.8385	3.4753711
44.0076307055569	48.4056123814062	42.80595	50.969325	2.8313705
43.4809139061384	47.6932203501486	43.10885	48.272275	0.6882847
43.4809139061384	47.6932203501486	40.7628	47.39015	2.9963842
39.3668571000125	44.2529499943039	38.0514	44.25295	1.3154571
39.3668571000111	44.2519499943039	36.34605	45.558575	3.6813731
39.3668571000111	38.1521964618803	37.4986	37.94785	3.3389816
39.3668571000111	38.1511964618803	39.47365	37.672175	0.4907813

Solution x	Solution y	Original x	Original y	Radius
37.5685537995006	38.1511964618803	36.0198	39.389875	1.9831699
37.4906000000733	38.4513777000282	37.4906	38.735475	0.2840973
33.6479960765131	38.4513777000283	35.05695	38.887125	2.3714259
33.6479960765131	35.5696472401991	31.8731	36.0461	1.8377332
29.3345463953108	35.5696472401991	30.2641	36.115	1.0777196
29.3345463953108	33.2619032404073	32.29465	34.1886	3.1017705
29.3345463953108	33.2619032404073	29.46595	31.229925	2.0362226
28.4700441197589	27.9920696037931	27.65685	28.081275	0.8146082
28.4690441197589	27.9920696037931	28.216025	27.287675	2.41843
14.9492344089772	27.0569113564612	15.2685	27.387025	1.686213
11.8513250424572	16.7030233452327	12.5519	14.734025	2.0899186
7.61244388651208	13.9014222228383	5.2982	16.16745	3.2389206
2.12750978659253	13.9014222228383	2.125025	13.8908	0.1492663

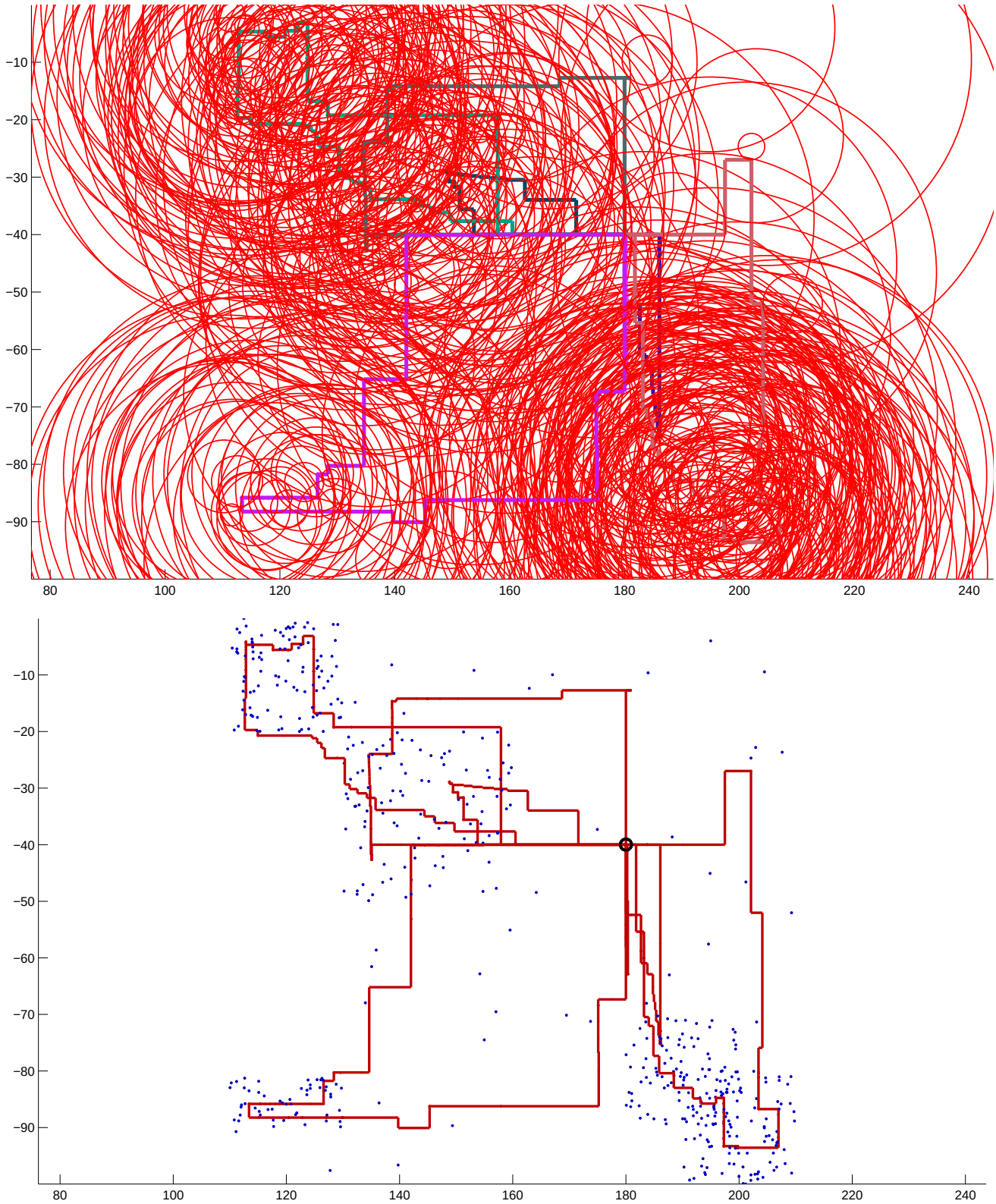


Figure O.157: *team*5_499, arbitrary radius, 2D, Manhattan, Length = 1001.3131650

Table O-160: Solution for *team*5_499, arbitrary radius, 2D, Manhattan

Total distance: 1001.31316501947 Total demand met: 9744 Depot: x 70 y 40				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 84.5682558416971 Demand Met: 676				
61.5827384488102	33.9630346406527	97.6128	23.6668	38.6763
52.6526382094354	30.4840037663977	52.9148	12.3625	18.1234
49.0521347357055	30.1576441856704	49.7446	26.3767	17.8751
46.6371225884536	29.9777822001271	49.2766	27.3707	19.0778
44.681982024917	29.8034979178907	37.6461	42.0792	22.0605
42.8634409648766	29.6170761982401	32.1965	21.571	23.9954
41.35140107865	29.4393995038013	31.0534	27.3935	17.9341
41.35140107865	29.4393995038013	30.3241	25.8121	12.6672
40.3266740519699	29.4393995038013	35.5448	24.2684	19.4434
39.5439106115533	29.4393995038013	30.555	31.3009	18.8032
39.5439106115533	29.4393995038013	30.1704	30.5441	13.1238
39.4240025883007	29.2295739743101	45.8434	28.1097	15.1991
39.4240025883007	29.2295739743101	40.4113	32.0356	16.7439
38.8165668371808	28.9023052419706	29.6006	20.2054	12.7079
38.8155668371808	28.9023052419706	37.8149	25.869	3.1941
38.8145668371809	28.9023052419706	33.916	28.6484	11.305
38.8135668371808	28.9023052419706	23.4201	21.9457	16.8924
38.8135668371808	29.2295739743101	27.0718	22.4926	16.8129
39.4240025883007	30.748453358574	20.1974	25.6106	21.4356
39.4250025883007	30.748453358574	36.302	43.7274	22.8064
40.3132331802838	30.748453358574	22.5985	27.2784	18.0514
40.3132331802838	31.6854205099069	27.0476	34.4285	22.5144
40.3132331802838	31.6864205099069	23.8226	36.8408	22.7865
41.3012953911453	31.6864205099069	37.9243	23.9119	11.4323
41.3012953911453	35.5961737754273	36.9556	37.1182	17.3813
41.3022953911453	35.5961737754273	28.392	21.3903	19.1959
41.3032953911453	35.5961737754273	30.9136	43.9894	22.4068
42.9813160536596	35.5961737754273	29.5705	36.67	21.5656
43.7772474633169	37.0537122551705	44.5785	34.1629	2.9998
43.7772474633169	40	47.084	47.7144	24.8395
Route: 2 Length: 211.388214757443 Demand Met: 1624				
47.9150775212651	31.0212575571006	47.2249	31.4694	0.8229
47.9150775212651	19.242274985547	49.2796	22.4102	3.4493
46.5268934723772	19.242274985547	47.312	20.115	1.1739
43.9270515257732	19.242274985547	44.6412	21.1681	2.8359
25.3887267643244	19.242274985547	43.1416	9.2079	35.1675
21.4987654944507	19.242274985547	30.7692	16.7931	37.8932
21.4987654944507	19.241274985547	41.315	20.08	34.9881
18.351921143466	19.241274985547	1.5116	19.0597	16.8413
18.351921143466	19.240274985547	19.5822	17.4941	10.5093
18.351921143466	19.239274985547	19.0819	14.2893	6.4132
18.351921143466	16.7712884756096	15.9493	16.7531	36.5644
14.8107998769205	15.6645806571938	12.9432	8.6486	15.3773
14.8097998769204	15.6645806571938	12.1595	5.1953	17.8764
14.8097998769205	15.6635806571938	14.5843	15.7568	0.244
14.8097998769204	15.6625806571938	16.6256	12.3206	7.479
14.8097998769205	9.35663992738622	11.8636	12.6991	36.7112
14.8097998769204	9.35563992738622	11.3126	12.1774	11.447
14.8097998769204	9.35463992738622	9.9074	11.0867	12.9373
14.8097998769204	9.35363992738609	12.8565	9.4609	9.659
14.8097998769204	9.35263992738622	15.5961	8.5134	9.1422
14.8097998769204	9.35163992738622	15.4595	7.4752	3.0314
14.8097998769204	9.35063992738623	15.3812	8.8682	15.4856
14.8097998769204	9.35063992738623	12.5256	4.7007	23.5883
14.8097998769204	5.45910764740452	18.8587	8.5087	16.8623
14.8097998769204	5.45810764740452	18.2952	1.0836	19.3439
14.8097998769204	5.45710764740452	16.1355	6.6685	36.4875
14.8097998769205	5.45610764740452	13.8628	4.3052	36.3913
14.8097998769205	5.45510764740451	10.6256	1.7583	24.4015
14.8097998769205	5.45510764740451	8.0267	2.1019	25.3395
14.8097998769205	5.45410764740452	18.047	6.7045	18.9999
14.8097998769205	5.45310764740452	18.6523	3.9117	19.4015
14.8097998769205	3.11910000022376	14.8098	1.8409	1.2782
12.9461065393764	4.52678127855771	13.2084	1.5682	22.8241
12.9451065393764	4.52678127855771	5.6082	3.0104	11.8319
12.9451065393764	4.52778127855771	19.0824	1.094	39.3681
10.9340031747064	4.52778127855771	9.4253	3.1222	2.062
10.9340031747064	5.58359999999922	0.4211	5.2548	12.1971
10.2923999993303	5.58359999999922	11.169	1.5527	37.2188
10.2913999993303	5.58359999999922	10.31	1.5005	14.7461
10.2913999993303	5.58459999999931	9.9632	1.8111	39.4027
10.2903999993303	5.58459999999931	10.526	3.779	20.82
10.2893999993303	5.5846	10.2894	7.4847	1.9001
9.37833885352069	5.58459999999993	9.7281	5.4172	13.7083
7.63380821170607	5.58459999999924	8.8668	5.4121	1.245
7.63380821170607	5.58359999999924	2.8757	1.3778	25.9254
7.63380821170607	4.67988295837674	8.9599	2.5066	22.9145
5.08157309599615	4.67988295837675	3.9756	4.3104	39.2995
4.20590276175255	4.67988295837673	5.6246	7.277	11.7089
4.20590276175255	4.67888295837673	4.0211	5.0495	26.717
4.20590276175255	4.67788295837673	1.729	2.5191	7.1357
4.20590276175255	4.67688295837673	3.9473	4.1638	2.4396
2.837	4.14229262105925	3.8933	3.6617	1.7453
2.837	4.14129262105925	1.2646	1.8964	2.7408
2.837	5.08541691620668	5.2006	6.8919	22.5304
2.837	5.61642426953685	1.2522	5.4022	7.2247
2.837	6.15836010207151	1.4037	6.1535	1.4597
2.837	6.71616217099089	2.7247	6.6491	8.9474
2.837	7.25708318213592	4.1301	7.1548	37.1524
2.837	7.25808318217559	5.4981	6.1028	36.5373
2.837	7.85660537249661	5.4781	9.3534	25.1036
2.837	8.47705842996842	1.2192	5.9144	28.8322
2.837	9.11494042236512	2.6723	10.4123	24.6134
2.837	9.11594042236513	2.4914	14.471	5.3662
2.837	9.11594042236513	4.1027	5.9391	6.8207
2.837	9.11694042236513	5.0355	11.9367	6.6489
2.837	11.798900003311	8.4009	11.7989	5.5639
2.837	11.798900003311	8.098	10.1576	7.8091
2.837	13.1080178186937	6.693	16.2603	35.4947
2.837	13.1090178186937	4.8686	17.5054	8.1304
2.837	13.1090178186937	4.243	12.8676	6.736
2.83699999997266	14.161326602333	2.3396	12.8751	24.3453
2.63010000000524	14.9199414515687	2.785	16.9995	3.817
2.63010000000591	16.0675926638817	4.024	17.3232	37.3677
2.6301000000058	17.1284534006685	2.2625	16.1551	18.392
2.6301	18.346315791155	4.753	19.8404	29.0972
2.6301	19.7396999991967	0.7828	19.7397	1.8473
4.9495380150515	20.7159384866636	2.5621	10.2967	12.6169
4.94953801505146	20.7169384866636	3.5607	15.7968	5.1124
9.71324511251534	20.7169384866636	5.3173	19.9696	36.3373
14.5267238661534	21.1791731756582	16.5052	19.9903	2.3082
15.4324191528744	22.0127391489277	20.821	23.0825	38.9893
16.1921275160724	22.926010687722	21.333	28.4534	38.4741
16.7844602417324	24.7225885845561	17.8934	15.1905	13.0517
18.9841309109806	24.7225885845562	15.7685	10.3669	18.5804
18.9851309109806	24.7225885845525	35.3466	47.2689	39.4146
20.3112009167704	29.3430007251118	20.5677	31.0115	1.6881
21.1804722626426	30.1841226458618	32.6566	40.0511	38.6421
22.5478760094334	30.917983670359	22.2385	33.2025	37.3358
24.2183128233144	31.7246935004052	28.8128	30.4765	39.1387
25.7570359560223	33.8715358689804	43.5486	39.6053	27.6035
33.0041008576875	33.8715358689804	33.7228	34.609	1.4413
34.3921820592461	35.0010865071042	36.1356	35.5262	3.41
36.2270642125023	36.156931908789	41.9344	32.8635	35.1115
39.690808005988	37.6665750386736	44.7486	39.7162	12.5268
50.4771948415913	40	48.8851	33.6728	37.4425
Route: 3 Length: 152.579892165407 Demand Met: 1620				
43.5872837238917	40	41.4412	38.9568	5.527
38.3027339441301	40	42.5333	36.3249	34.2929
35.0939979811743	40	25.2216	48.8368	29.4028
32.2737352219279	40	64.954	37.309	38.0588
30.186797376954	40	32.6554	40.5505	13.7264
28.0166129918388	40	45.8095	43.1051	19.6777
28.0166129918388	40	32.7117	42.3778	10.9453
26.7421495536277	40	28.4876	46.0461	21.3519
26.7421495536277	40	24.5323	49.8988	23.3971
25.0604999538234	42.6662999999999	23.5397	47.0618	4.6924
25.0594999539854	42.6662999999999	25.0595	61.5431	18.8768
25.0584999539853	42.6662999999999	20.8616	31.8567	16.439
25.0584999539853	41.7529035710139	22.4944	48.7727	18.9786
25.0584999539853	41.7529035710139	22.5313	48.1754	10.3014
25.0584999539853	41.7519035710139	27.2789	43.4795	3.5918
25.0574999539853	41.7519035710139	31.0932	49.2942	14.8063
25.0574999539853	41.7519035710139	32.0569	46.2162	8.3019
24.9361501065187	39.5312474847861	20.1897	48.2132	9.8947
24.9361501065187	39.5312474847861	23.1185	40.5549	4.3029
24.9361501065187	37.1911075448846	29.0396	36.1372	26.8002
24.9361501065187	37.1911075448846	23.8984	35.8981	7.2024
24.9361501065187	37.1901075448846	28.4031	32.2444	13.356
24.9361501065187	34.218377628301	26.8183	32.6012	9.1398
24.9361501065187	34.218377628301	22.8416	32.9746	3.8923
24.9361501065187	33.1329323702397	24.2607	34.0424	1.9949

Solution x	Solution y	Original x	Original y	Radius
24.8056361941515	33.1329323702397	22.0871	33.226	33.6947
24.8056361941515	31.2995237083625	24.4655	29.9184	29.8304
24.8056361941515	31.2995237083625	25.1657	24.0751	31.1219
24.8046361941515	31.2995237083625	20.4824	37.2243	26.8839
24.8036361941515	31.2995237083625	15.3264	12.7877	21.1927
24.8036361941515	29.433237344955	15.42	17.0914	16.8786
24.6875205435424	27.9783750878734	23.4789	26.9268	12.6384
24.6619218639532	27.2108556573235	30.4469	21.4825	31.6307
24.6619218639532	27.2108556573235	25.9644	23.203	29.8543
24.6382029355148	26.514778125156	24.5672	24.4137	9.9276
24.6382029355148	26.514778125156	21.8127	22.4456	26.3083
24.6133008985663	25.9057126814927	20.9805	20.9752	15.7265
24.5890174286112	25.1777922206333	12.295	19.9912	28.6871
24.5647135244238	24.5588523577312	9.2095	19.5087	29.1422
24.5404153738549	23.9647	9.0075	17.4052	24.0927
24.5404153738549	23.9647	3.7626	17.1174	21.877
26.5854999997268	23.9647	26.5855	26.5008	2.5361
28.6962409648128	23.8669257638223	12.6858	19.6571	29.725
28.6972409648128	23.8669257638223	45.8348	38.3992	22.4696
28.6972409648128	23.8669257638223	33.6715	23.2449	5.013
28.6972409648128	23.8669257638223	27.7157	24.2487	7.9151
28.6972409648128	23.8669257638223	22.1476	14.8515	12.414
28.6972409648128	23.8669257638223	19.7672	14.9362	14.1421
28.6972409648128	20.4445774693356	8.6500	19.7295	27.9816
28.6972409648128	20.4445774693356	13.2666	12.9678	29.5528
28.6972409648128	18.4645634869721	19.3111	17.5672	32.0992
28.6972409648128	18.4645634869721	12.3192	17.7013	29.1964
28.6972409648128	17.5685661442289	3.6086	13.0876	29.6311
28.6972409648128	17.5685661442289	2.4532	11.1564	29.4831
28.6972409648128	16.0975454249657	14.7479	11.7757	30.4615
28.6560066518672	14.6837728133673	13.7484	0.7577	20.4003
28.6560066518672	14.6827728133673	2.4773	0.052	34.0937
28.6560066518672	14.6817728133673	16.2452	9.322	31.0488
28.6560066518672	14.6817728133673	11.5168	3.287	27.8697
28.6560066518672	14.6807728133673	11.5459	0.8736	30.4629
28.6560066518672	14.6797728133673	13.9396	19.5452	16.1224
28.6560066518672	14.6797728133673	14.7151	17.4542	14.2143
29.4397092867152	14.1893233619	28.6149	8.2266	6.0195
32.9701387254265	14.1893233619	17.3372	11.1211	21.5037
34.9190619039272	14.1893233619	8.6382	10.3371	27.1817
34.9190619039272	14.1883233619	47.2998	37.9687	27.2808
34.9190619039272	14.1883233619	44.3864	36.3116	25.6737
34.9190619039272	14.1873233619	41.7938	26.8087	25.8964
34.9190619039272	14.1863233619	57.0413	9.9678	25.5663
34.9200619039269	14.1863233619	35.1494	28.8106	32.8637
34.9200619039269	14.1863233619	37.4163	24.6203	31.2894
34.9210619039268	14.1863233619	38.8284	23.4703	29.4494
34.9210619039268	14.1863233619	29.0027	23.8765	31.6897
37.13439058394	14.1863233619	49.5874	32.9921	32.9977
37.13439058394	14.1863233619	45.5527	26.8832	29.6166
40.3058715819074	14.1863233619	18.0288	10.2093	31.7011
58.7001720798511	12.7195864016968	94.4757	9.4701	35.9228
70.8424135453094	12.7195864016968	73.9225	9.6395	4.3559
70.8424135453094	12.7205864016968	84.9979	3.9891	21.6131
Route: 4 Length: 82.4572379922052 Demand Met: 1622				
73.7610844788511	40	73.1545	60.0435	34.4744
73.7620844788511	40	49.5234	55.0957	33.4236
73.7620844788512	40.001	84.8772	45.0654	32.4975
76.0747499473624	57.5195204218089	88.9513	72.6403	19.8606
76.0747499473624	72.9179801497766	89.0638	74.5581	18.603
76.0747499473624	72.9189801497766	88.0059	90.774	31.4291
76.0747499473624	72.9199801497766	88.2817	96.351	29.8948
76.0747499473624	72.9209801497766	92.093	98.3621	32.0505
76.0747499473624	72.9219801497766	85.1326	93.3031	30.9423
76.0747499473624	72.9229801497766	81.7913	86.2239	19.3521
76.0747499473624	72.9239801497766	81.0134	86.425	31.9429
76.0747499473624	72.9249801497766	81.9035	87.9149	16.8426
76.0747499473624	72.9259801497766	80.7551	80.6861	19.901
76.0747499473624	75.1508690487348	84.3608	92.148	27.0972
76.0747499473624	75.1518690487348	82.1226	91.9552	29.2899
76.0747499473624	75.1528690487348	82.5335	87.3296	23.2737
76.0747499473624	75.1528690487348	87.1273	84.0324	22.6844
76.0747499473624	75.1538690487348	87.314	87.2617	16.5203
76.0747499473671	75.1518690487348	85.8291	89.3215	27.9965
76.0747499473672	75.1508690487348	89.4099	75.3847	13.3372
76.0747499473672	75.1498690487348	82.7904	89.3622	32.2308
76.0747499473624	75.1498690487347	94.8083	91.5304	29.5468
76.0747499473624	75.1488690487348	95.3031	91.4204	25.4609
76.0747499473624	75.1478690487348	88.176	88.8141	24.7619
76.0747499473624	75.1468690487348	87.8356	87.4643	27.6715

Solution x	Solution y	Original x	Original y	Radius
76.0747499473624	75.1458690487348	84.7929	84.8117	17.1593
76.0747499473624	75.1448690487348	83.3441	85.5151	31.408
76.0747499473625	75.1438690487348	80.2014	81.5949	32.3848
76.0747499473624	75.1428690487348	76.3867	80.9989	33.1367
76.0747499473624	75.1418690487348	87.485	79.3312	14.9303
76.0747499473624	75.1408690487348	94.6937	81.204	23.1601
76.0747499473624	75.1398690487348	86.7862	83.711	21.1375
76.0747499473624	75.1388690487348	85.5459	86.1581	23.0206
76.0747499473624	75.1378690487347	80.3025	81.1115	15.7523
76.0747499473624	75.1368690487347	80.1131	82.5047	19.9521
76.0747499473624	75.1358690487347	92.5909	80.0433	19.5797
76.0747499473624	74.6343821137792	72.5273	88.3137	14.2003
76.0747499473624	74.6333821137792	89.9071	81.4441	15.7904
76.0747499473624	74.6323821137792	96.671	90.7145	32.754
76.0747499473624	74.6313821137792	78.0272	82.0721	8.7342
76.0747499473624	74.6303821137792	93.0738	84.8753	27.0049
76.0747499473624	74.6293821137792	92.1839	88.8237	30.3052
76.0747499473624	74.6283821137792	95.9324	92.1458	31.1565
76.0747499473624	74.6273821137792	75.5773	80.7384	16.9072
76.0344586726306	74.6273821137792	73.1002	79.4037	12.7865
76.0344586726306	74.6263821137792	70.5598	83.7819	31.7327
76.0344586726306	74.6253821137791	71.008	83.9726	10.613
76.0344586726306	74.1120674634049	80.7173	88.9602	17.7309
76.0344586726306	74.1110674634049	80.4141	88.4668	26.3631
76.0344586726306	74.1100674634049	79.7296	78.3022	15.676
76.0344586726306	74.1090674634049	80.2922	75.8098	14.5911
76.0344586726307	74.1080674634049	79.4655	74.4467	12.4177
76.0344586726306	74.1070674634049	79.9937	73.4457	4.0141
76.0344586726306	74.1060674634049	88.7272	81.0174	30.12
76.0344586726306	73.7824361263715	74.3211	82.1244	8.5161
76.0032408736603	73.7824361263715	84.4799	87.8799	17.7516
76.0032408736603	73.7814361263715	85.8335	84.6274	15.0275
76.0032408736603	73.7804361263715	87.0156	79.966	12.6359
76.0032408736603	73.7794361263715	81.9044	86.793	18.7468
76.0032408736603	73.7784361263715	82.7574	74.2926	14.8137
76.0032408736603	73.7774361263715	82.7718	81.5009	13.2622
76.0032408736603	73.7764361263715	83.0689	84.7397	17.7189
76.0032408736603	73.7754361263715	80.252	96.9762	27.7656
76.0032408736603	73.7744361263715	84.785	93.3953	25.851
76.0032408736603	73.7734361263715	88.5666	89.9178	22.668
76.0032408736603	73.7724361263715	87.2864	89.2526	24.3141
76.0032408736603	73.7714361263715	85.7193	87.9646	30.5682
76.0032408736603	73.7704361263715	85.5265	86.4226	27.3567
76.0032408736603	73.7694361263715	96.8293	85.3988	25.2212
76.0032408736603	73.7684361263715	99.1691	80.9928	24.2662
75.7624210382859	71.2443389773557	94.7976	88.4491	36.0251
75.5571223031168	71.2443389773557	86.675	81.8002	31.4898
75.3535505695612	69.1836939858724	79.415	85.235	23.8334
75.1569544203793	67.7929504481542	78.4966	80.8407	27.0644
74.9589239231386	66.4415957965573	71.4242	75.4202	25.4968
74.7623158579826	65.147314849915	86.8895	84.3247	31.0852
74.7623158579826	62.9045625056177	79.6279	80.9538	23.4026
74.2827318756237	62.9045625056177	77.6803	63.0066	3.3991
73.7845708699082	60.9558307773794	73.6863	74.2382	25.5224
72.662439663571	58.7813934337195	76.1847	74.2911	17.8739
72.661439663571	58.7813934337195	89.379	76.0987	38.3025
72.661439663571	55.8156038496775	79.3483	75.3688	27.2443
72.661439663571	52.4033563075667	79.7775	80.296	29.6152
70.9464816184094	52.4033563075667	70.8501	86.3243	34.4665
70	46.2145646389095	75.2812	79.5319	38.4796
Route: 5 Length: 46.3850913139984 Demand Met: 982				
70.2201448800325	41.2691967382691	70.0314	77.1275	35.8588
70.2201448800325	49.8371944000772	77.4302	82.5606	33.5083
70.3341728718868	52.4474125033398	76.9521	88.589	36.7425
70.3341728718868	62.8543727851122	84.4928	76.9707	35.8799
70.3341728718868	62.8553727851122	90.1019	83.486	37.2389
70.3341728718868	62.8563727851122	78.9268	79.6337	28.7763
70.3341728718868	62.8573727851122	81.0772	83.8409	24.7807
70.3341728718868	62.8583727851122	81.6179	74.1421	15.9576
70.3331728718868	62.8583727851122	85.6153	86.7737	37.7006
70.3101567200001	62.8583727851122	71.0504	85.2637	27.4246
70.3091567200001	62.8583727851122	76.1087	74.9228	26.6713
70.3081567200001	62.8583727851123	89.7033	80.1502	26.8819
70.3071567200001	62.8583727851123	80.5183	71.0301	20.9716
70.3061567200001	62.8583727851123	76.4126	75.548	18.6216
70.3051567200001	62.8583727851122	82.4808	71.6064	18.1512
70.3041567200001	62.8583727851123	75.4182	80.175	23.5169
70.3031567200001	62.8583727851123	84.0326	80.947	25.7062
70.3021567200001	62.8583727851123	82.0065	75.6791	28.4662
70.3011567200001	62.8583727851123	87.5661	81.6563	27.3837

Solution x	Solution y	Original x	Original y	Radius
70.3001567200001	62.8583727851122	86.8222	80.0693	26.0963
70.2991567200001	62.8583727851122	73.8575	87.669	25.5244
70.2981567200001	62.8583727851122	84.7887	79.7551	24.4915
70.2971567200001	62.8583727851123	77.9819	77.7483	19.944
70.2961567200001	62.8583727851123	83.5177	79.6473	24.9276
70.2951567200001	62.8583727851122	84.6626	79.7388	28.8542
70.2941567200001	62.8583727851122	76.8895	78.6378	24.9962
70.2931567200001	62.8583727851122	59.4827	70.1321	13.0297
70.2921567200001	62.8583727851122	94.4683	90.0421	36.408
70.2921567200001	61.7356944488227	85.22	71.0885	39.2361
70.2921567200001	61.7346944488227	80.026	88.4312	31.2606
70.2921567200002	61.1496173530501	89.697	88.1654	35.3374
70.2921567200001	60.5576607529624	84.8025	72.2361	24.0623
70.2921567200001	59.975554958633	80.5965	92.0964	36.4049
70.2921567200001	58.8023114226595	97.0848	81.6578	37.2835
70.2921567200001	58.8013114226595	78.4301	80.0876	24.8331
70.2921567200001	58.2045500119887	84.7658	77.8153	28.1634
70	57.6047497706753	70.8021	79.2974	26.617
70	56.4236899697699	88.1669	82.2879	36.2685
70	56.4226899697699	83.1514	91.319	39.4372
70	55.9060535239273	75.9291	73.9471	36.4707
70	55.3121053718191	72.5026	72.4828	37.2859
70	54.1455473071595	94.7529	81.9671	38.2984
70	54.1445473071595	73.5352	77.8165	36.1475
70	53.5537043565964	73.6161	81.1388	38.2238
70	52.8212335960736	77.1151	89.3423	37.2077
70	51.3315528736031	54.1532	48.4548	21.9974
70	49.4930742830598	44.7377	48.2657	29.7234
70	47.872582446366	72.3356	86.155	38.7669
Route: 6 Length: 190.387199999992 Demand Met: 1622				
71.8007250985273	55.3664687184602	84.5964	57.5663	31.6899
73.183618381551	70.4611893290649	77.4087	74.0915	5.5705
74.0276382131297	72.0283571371344	77.1908	76.3248	8.3165
74.8623657574113	73.4820702208533	78.8402	71.1237	4.6244
74.8623657574113	77.3306331295937	93.093	71.3467	21.4346
75.8773201458021	80.3848181673566	72.6803	81.9225	4.2531
78.4679223161265	80.3848181673566	76.7822	82.9894	3.1025
78.4679223161265	82.9695591341313	79.3747	83.7664	2.2827
81.8329618775496	83.9016287838108	74.9451	88.4605	8.2599
81.8329618775496	84.8447049433246	83.3685	88.3604	8.2767
83.1803000000002	85.7595	83.1803	86.2205	0.461
84.5496284874259	85.7595000000001	84.2824	83.9445	9.6857
85.9222	84.7597000000006	85.9222	83.4369	1.3228
85.9232000000002	84.7597000000103	87.8518	83.2273	10.2812
87.018721299888	84.7597000000101	90.256	83.0105	8.936
87.3185309789522	84.7597000001071	90.3741	83.7882	6.0655
87.3185309789521	84.7607000001071	89.6546	85.279	10.469
87.3185309789521	85.7406065838923	86.0867	81.533	7.8826
87.3195309789521	85.7406065838923	89	83.7031	2.6411
87.320530978952	85.7406065838922	85.3838	89.3565	14.2439
87.3215309789519	85.7406065838923	85.4655	89.4614	13.9477
87.3225309789519	85.7406065838924	87.7484	83.7546	5.1562
87.3225309789519	88.9490057356034	85.8774	87.324	11.0712
87.3235309789517	88.9490057356034	87.3294	86.7915	10.1629
87.3245309789519	88.9490057356035	87.6085	88.0524	0.9405
87.3245309789519	89.7393168967114	88.3919	89.421	7.2563
87.3245309789518	90.76101505894	88.3323	91.5035	13.825
87.3245309789519	91.8818058663821	89.983	98.6224	7.2459
87.324530978952	91.8828058663822	89.5983	91.5249	17.2739
87.3245309789519	91.8838058663822	91.162	99.965	25.8943
87.3245309789519	91.8848058663821	96.6476	96.9796	23.7398
87.3245309789519	91.8858058663821	99.292	98.0492	20.4892
87.3245309789519	93.271220744717	96.6676	92.6743	10.3882
87.3245309789519	93.272220744717	89.3359	93.6392	11.0562
87.3245309789519	93.273220744717	83.3686	96.8014	13.9298
87.3245309789519	93.2742207447171	84.3334	97.0716	13.2701
87.3245309789518	93.275220744717	84.5701	92.5098	11.4862
87.3245309789518	93.2762207447661	84.1657	89.6201	13.6552
88.3684703933237	93.2762207447662	88.3602	93.5594	0.2833
88.3694703933234	93.2762207447662	88.2673	94.5543	14.161
89.7561541919019	93.2762207447662	83.6163	95.496	6.5288
89.757154191902	93.2762207447662	83.9295	97.9734	22.5699
89.7581541919019	93.2762207447662	84.0572	98.2927	11.5023
89.7581541919019	93.5535000000003	81.2522	99.2612	19.7395
89.7591541919019	93.5535000000003	82.0258	98.9707	16.4132
89.7601541919019	93.5535000000003	94.2258	98.7848	33.585
89.7611541919019	93.5535000000003	96.1791	97.5552	14.7422
89.7621541919019	93.5535000000002	89.931	94.5372	17.4038
89.7631541919018	93.5535000000003	91.4519	94.5103	21.3367
89.7641541919018	93.5535000000003	90.6972	96.9626	12.1171

Solution x	Solution y	Original x	Original y	Radius
89.7651541919019	93.5535000000002	89.0976	96.4455	23.7594
89.7661541919019	93.5535000000003	86.994	98.105	12.5626
89.7671541919019	93.5535000000002	92.0809	99.3222	13.6093
89.7681541919019	93.5535000000002	93.3103	99.0843	24.3725
89.7691541919018	93.5535000000002	92.8113	98.2407	11.443
89.7701541919018	93.5535000000002	93.4254	97.8126	10.7468
95.4796000000001	93.5535000000002	95.4796	96.129	2.5755
96.9563	91.7529300818575	94.509	92.4532	10.0411
96.9563000000001	91.7519300818576	96.809	92.5136	11.7087
96.9563000000001	91.7509300818575	96.0605	94.495	12.9494
96.9563	87.677077009801	96.5452	93.172	16.1374
96.9563	87.676077009801	98.1513	96.345	8.7509
96.9563	87.6750770098011	94.4375	89.8165	6.7853
96.9563	86.7218999999999	97.0785	86.7219	0.1222
96.9563000000001	86.7208999999999	98.6006	82.3388	4.9458
93.4373	86.7209	99.0472	85.7396	19.7408
93.4373	81.1108857174761	92.7639	86.5161	5.447
93.4373000000001	81.1098857174761	99.7041	87.1751	20.8453
93.4373000000001	81.1088857174761	97.0965	81.0307	20.0164
93.4373000000001	81.1078857174761	97.9735	93.9042	16.4454
93.4373	81.1068857174761	99.7949	88.8243	10.9809
93.4373	80.4488777630767	97.4362	85.8361	6.7092
93.4373	80.1566999999997	89.4354	80.1567	4.0019
93.4373	75.895359593107	89.2994	73.1482	4.9668
94.1158999999886	52.0431000551277	99.2739	52.0431	5.158
92.0952999476514	26.9945999999934	92.9329	22.8145	15.1532
92.0942999476514	26.9946000000015	92.0943	24.688	2.3066
87.4877755145435	40	78.1743	38.6355	9.4129
80.0475221040201	40	91.1956	46.5873	33.1213
Route: 7 Length: 233.547272948725 Demand Met: 1598				
50.5843713144181	40	48.0614	30.3792	10.3406
47.1750861555943	40	42.0622	41.0674	34.7982
44.9322196598344	40.0916958581831	38.1953	36.049	32.0805
42.8424588404068	40.0916958581832	47.3754	37.9401	18.8601
39.8156057876471	40.0916958581832	37.7223	44.0563	29.1657
36.8613504922289	40.0916958581832	23.9463	67.9458	30.7026
36.8603504922289	40.0916958581832	44.1821	62.8241	34.6478
34.4450701668682	40.0916958581832	27.0169	46.6583	30.8141
34.4440701668682	40.0916958581832	33.3877	38.8388	13.1359
32.0093346608437	46.6580211076421	32.0319	48.7602	2.1023
32.0093346608437	53.1160756990737	15.4215	81.5375	38.9838
32.0083346608437	53.1160756990737	17.1642	87.7833	37.7116
32.0073346608437	53.1160756990736	48.2875	25.5427	34.7388
32.0063346608437	53.1160756990736	47.7847	28.4345	34.5556
32.0063346608437	65.1874345722767	43.0635	31.4686	35.4855
24.6314134810856	80.2618244335478	25.8602	58.6207	28.7536
23.3382398289035	80.2618244335468	17.8246	84.0918	15.5287
19.5834929603922	80.2618244335448	17.0519	88.8308	13.9972
19.5834929603925	80.2628244335466	8.8756	85.3213	16.0341
19.5834929603922	80.2638244335465	10.8331	85.8288	11.4013
18.3880880788071	80.2638244335475	19.7188	83.0222	29.297
18.3880880788071	81.7319886176021	13.617	84.1913	7.3733
17.4137802521423	81.7319886176022	18.7876	82.3448	1.5043
16.5686954407014	81.7319886176022	17.8311	84.5721	18.6031
16.5686954407014	85.8083971830263	19.4915	88.9148	6.4477
16.5676954407014	85.8083971830263	17.0206	82.7787	29.1615
14.2421195855654	85.8083971830263	14.2245	83.0966	3.3966
14.2421195855654	85.8083971830263	11.6247	87.7046	3.2321
10.4729217026515	85.8083971830263	13.6279	83.3943	17.0874
9.51616635680347	85.8083971830263	13.8296	81.5783	24.0124
9.51516635680348	85.8083971830263	7.7403	89.8119	8.6997
8.70779628333267	85.8083971830263	16.4864	81.6235	21.8233
8.01876917690292	85.8083971830263	9.5220	88.7288	27.8783
7.0838823050054	85.8083971830264	10.6041	85.0219	25.6845
6.26819768580756	85.8083971830264	5.1015	81.8103	31.1473
5.35630495552705	85.8083971830263	0.2473	82.0871	6.3206
5.35530495552706	85.8083971830263	5.091	83.7862	25.4049
5.35430495552706	85.8083971830264	3.3964	83.4982	22.6969
5.35330495552705	85.8083971830264	6.0677	84.3942	37.1993
5.35230495552705	85.8083971830264	5.387	87.7604	6.3922
5.35130495552706	85.8083971830263	2.625	81.2761	30.3022
5.35030495552705	85.8083971830263	1.1933	81.8445	20.336
5.35030495552705	85.8093971830263	1.983	86.3665	17.6822
5.35030495552705	85.8103971830263	2.696	85.7661	16.7328
5.35030495552705	85.8113971830263	2.5389	82.9669	4.4555
3.39126352326937	85.8113971830263	0.029	82.9455	21.0457
3.39126352326937	85.8123971830263	2.0599	86.005	20.2991
3.39126352326937	88.2300160896486	1.5647	88.8122	1.9171
5.09761355047473	88.2300160896487	1.8225	87.776	36.7171
5.09861355047472	88.2300160896487	9.9966	85.8576	5.4423

Solution x	Solution y	Original x	Original y	Radius
5.09861355047472	88.2300160896487	4.4842	86.5445	5.1195
10.4278762931947	88.2300160896487	9.2565	85.6186	2.8621
10.4288762931947	88.2300160896487	1.0919	90.7016	28.434
12.8030849661488	88.2300160896487	7.6764	88.6806	9.6476
12.8040849661488	88.2300160896487	6.7503	86.812	32.5272
12.8050849661488	88.2300160896487	7.4797	86.7529	25.8983
17.0285986452126	88.2300160896487	13.2856	89.4879	21.8166
17.0295986452126	88.2300160896488	19.3715	86.9483	2.6697
17.0305986452126	88.2300160896488	16.072	81.5553	6.7432
19.9147534177764	88.2300160896487	16.2773	81.3093	7.8184
19.9157534177763	88.2300160896488	15.9151	82.9337	11.014
19.9167534177763	88.2300160896487	14.2132	82.4414	14.4019
19.9177534177763	88.2300160896488	17.7167	97.5636	31.3797
19.9187534177763	88.2300160896488	19.5543	89.8549	33.619
19.9197534177763	88.2300160896488	26.3736	85.6358	33.6814
29.7504983671777	90.0653999976514	29.7505	96.621	6.5556
35.3027459991718	86.2316968908076	39.3354	89.658	8.4792
35.3027459991718	86.2306968908076	0.7751	88.6342	34.6112
35.3027459991718	86.2296968908076	5.1953	87.1361	37.283
35.3027459991718	86.2286968908076	11.8372	87.4011	35.7247
47.8851908993561	86.2286968908076	12.6448	83.0865	35.3802
47.8861908993561	86.2286968908076	16.887	83.4344	34.5743
65.197399999977	86.0550991031688	70.0787	86.0551	4.8813
65.197399999977	79.9420984751134	93.255	98.1789	39.9406
65.197399999977	76.6103834500752	90.7381	99.8897	39.8736
65.0979000000007	76.6103834500752	44.9743	74.4953	27.6089
65.0979000000007	74.1940752004527	47.0351	69.5204	24.0774
65.0979	71.2264	63.7544	71.2264	1.3435
65.0979000000007	68.4163662582641	75.6074	70.2776	26.094
65.0979000000006	68.4153662582641	77.364	70.7565	18.9213
65.0979000000006	68.4143662582642	73.5126	71.3248	18.5601
65.0979000000006	67.3506963816079	87.8874	83.7559	28.0801
67.6169941968729	67.3506963816079	73.6361	68.0431	6.0588

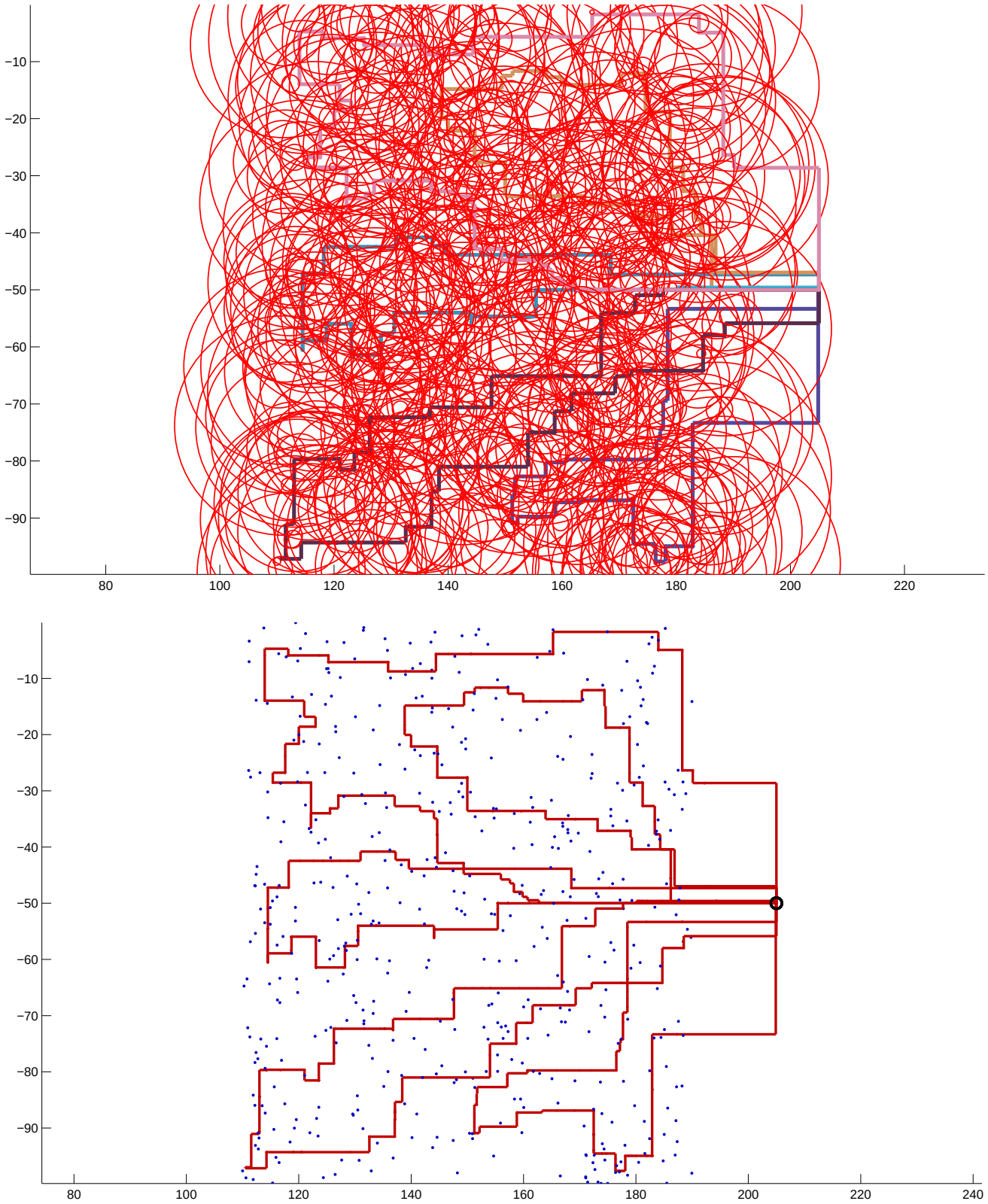


Figure O.158: *team*6_500, arbitrary radius, 2D, Manhattan, Length = 1311.1238318

Table O-161: Solution for *team*6_500, arbitrary radius, 2D, Manhattan

Total distance: 1311.12383183882 Total demand met: 25539 Depot: x 95 y 50				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 210.784055324618 Demand Met: 4971				
94.8843593920292	73.3306598961363	77.2293497	82.6694496	19.9727905
77.2983065646744	73.3306598961363	74.4567732	73.8913977	9.1604579
77.2973065646744	73.3306598961363	77.5651358	71.0148631	2.331233
72.8812226886289	80.534616022939	71.4909917	88.8238404	8.4049975
72.8812226886289	83.1830081974508	75.4040099	79.0607348	12.6702712
72.8802226886289	83.1830081974508	72.4566884	79.8068651	3.4026054
72.8792226886288	83.1830081974508	78.2121151	82.5216358	10.3605913
72.8782226886289	83.1830081974508	75.6464183	86.4517504	11.7494177
72.8782226886289	94.9488512244223	69.765468	86.0199863	10.8561261
72.8772226886289	94.9488512244223	77.3466754	92.4222135	14.6923437
72.8762226886289	94.9488512244223	76.9820609	94.8106777	5.1618551
72.8762226886289	94.9498512244223	74.8496365	95.8479299	2.1681576
72.8752226886289	94.9498512244223	75.4923392	99.8090463	10.3077719
72.8742226886289	94.9498512244223	75.0360354	91.1497098	11.023678
72.8732226886289	94.9498512244223	72.4289329	91.88372	10.9387068
71.9182557111117	94.9498512244222	71.5874534	94.5399994	16.9233519
69.9671949314906	94.9498512244222	63.2522018	99.6147456	18.4401179
69.329271904467	94.9498512244222	68.523768	98.3881808	8.1618794
68.7203927962902	94.9498512244223	64.3381393	93.722702	16.872102
68.1127709325152	94.9498512244222	61.0866811	94.7582572	17.8354325
68.1127709325152	97.6337965999995	67.0620012	97.8077872	8.2792999
66.9382704015598	97.6337965999994	66.5761879	96.7049476	4.0776062
66.3729212000003	97.6337965999994	66.3729212	97.9005203	0.2667237
66.3662807449303	96.5391114577233	70.4834315	96.1070737	17.0458905
66.3662807449303	95.4707573346574	67.3268965	96.007007	10.9024154
66.3662807449303	94.532602269391	68.0410206	93.0677269	2.2249974
64.6999716215724	94.5326022693911	61.1689993	94.8861498	3.5486281
63.9663202376184	94.532602269391	56.5514993	98.5201232	8.4190197
62.7217510571216	94.5326022693911	63.7965883	99.8649883	5.4396338
62.475117020577	93.9979315980916	62.3573907	96.159986	5.0891887
62.475117020577	93.9969315980915	64.0121883	92.7907393	9.0477095
62.4751170205767	91.1195927919169	64.4754864	95.6952093	6.985863
62.4751170205767	91.118592791917	61.0630253	98.699805	11.0127062
62.4751170205767	91.1175927919169	79.9522127	98.0359405	18.7966063
62.4751170205767	91.1165927919171	62.6982725	97.3778678	9.4559017
62.4751170205767	91.1155927919171	61.0701287	98.8683739	7.9054547
62.4751170205767	86.8982351000001	65.7364961	88.9695394	13.1578882
62.4751170205767	86.8972351000001	64.9776601	99.8572829	14.8646935
62.4751170205767	86.8962351	62.5782193	94.8345715	11.8936571
62.4751170205767	86.8952351	60.774398	89.648206	12.5083419
62.4741170205766	86.8952351	63.9530194	87.4245185	11.3124411
62.4719527999258	86.8952351	62.4719528	86.6470186	0.2482165
59.0519598199552	86.8952351	61.4066356	99.633296	16.0904388
55.8465993866072	86.8952351	50.0446513	86.3510967	11.408718
53.3081049316328	87.2485912966535	56.1389342	85.561632	4.4417673
48.8019766102974	87.2485912966535	48.3895216	84.8378656	2.445755
48.8019766102975	89.7505258776604	49.7030604	90.8227548	1.4005809
42.1738625422588	90.8891783808358	40.8799687	90.9919823	1.5621823
41.8466299230612	90.8891783808359	40.3910959	90.932739	16.8734606
41.8466299230612	90.8901783808359	40.9379615	91.8870672	1.5042087
41.2494719030899	90.8901783808359	38.2308224	97.9753907	7.7014595
41.2494719030899	90.8891783808358	37.489488	92.2138591	7.9102312
41.2494719030899	90.8881783808359	34.617789	91.6565199	17.1587159
41.2494719030899	90.8871783808358	33.8269693	93.4852631	7.8640695
41.2494719030899	90.8861783808358	45.8972803	89.1189208	14.0274616
41.2494719030899	90.8851783808359	44.680977	94.9895485	12.4233676
41.2494719030899	85.8487447289519	31.00496	87.5127119	15.7467648
41.6547324910057	85.8487447289519	27.0999394	87.1794445	15.3093219
41.6547324910057	84.53147520628	34.482979	80.365325	8.2940253
41.6547324910057	83.9089712258574	37.6570142	81.9317057	6.23332
41.7604927247158	83.4983022938881	35.4564008	78.9241199	15.1810796
41.7604927247158	83.094246063782	38.0621359	81.3957333	6.4246672
41.7604927247158	82.7092933787153	25.1363027	82.596723	16.9876139
47.107891744031	82.3468237779846	44.3710695	67.9205927	17.6190773
47.107891744031	81.9881250537462	46.0567355	72.019762	17.1499692
47.107891744031	81.6318912558378	45.3765455	76.9954785	19.7202249
47.107891744031	81.2911539521583	41.3355343	82.7796974	5.9611972
47.107891744031	80.9409607547068	39.6568849	80.0063838	8.4281529
47.107891744031	80.596374307144	43.3709663	79.9295648	6.4309473
47.107891744031	80.2602406337629	47.9098314	77.7959758	9.5350991
50.7050281488417	79.7427391745334	49.7783583	78.4397036	1.598943
50.7050281488417	79.7417391745334	49.4827685	84.8462228	10.3517087
52.6387855428762	79.7417391745334	55.0653569	81.234009	5.9096312
55.896720941019	79.7417391745334	40.9923031	81.1407106	14.9699296

Solution x	Solution y	Original x	Original y	Radius
59.9223678684691	79.7417391745334	59.1397084	81.6064397	2.5044765
61.9497439765572	79.7417391745334	45.412979	71.2677197	19.9703759
66.5152492501813	79.7417391745334	67.7945884	81.6777909	7.7525837
66.5152492501813	77.0772568967593	51.7496653	79.9144917	15.0357032
66.5152492501813	76.3159270854183	61.6425082	72.8564323	8.9988257
67.1547948861653	75.5804300801524	56.7397866	71.0931061	12.7871715
67.1547948861653	74.8808850416507	77.1265753	88.6843079	19.9105474
67.2801559519744	74.18587986347	67.3900644	74.174693	0.1104763
67.6992283418061	74.1986395480334	57.43771	71.1535593	13.3451357
67.6992283418061	71.1953620160078	52.878421	80.2956919	17.8391178
67.6992283418061	69.4470152234148	68.5426632	70.6500378	3.2232857
68.4863414057762	68.5010407059062	63.6802314	81.8267454	19.0132656
68.4863414057762	66.967165691428	66.8428254	74.9418962	11.9134957
68.4863414057762	65.7271980235079	73.7932186	65.1929118	5.5307734
68.4863414057762	64.2069291847575	70.748982	60.565778	4.327335
68.4863414057762	63.4428685737084	69.6306367	57.4599551	8.6491765
68.4863414057762	63.4418685737084	64.6626599	65.39963	5.0684212
68.4863414057762	54.3402264928799	58.429274	38.9397266	18.6397178
68.4863414057762	53.3321250217176	56.2067364	40.2417677	19.6165059
71.8598649369179	53.3321250217176	63.3830619	45.6708392	11.4259131
78.2356096629138	53.3321250217176	79.80288	56.0883078	5.2865846
78.2356096629138	53.3311250217176	79.155929	54.6404138	1.6003827
Route: 2 Length: 235.76993152937 Demand Met: 4937				
57.0266788543873	50	57.0032853	47.929495	2.0977627
55.0754835145455	50	50.8238583	67.1806384	19.5280512
53.4147945647355	50	39.4220046	48.156385	18.6805968
51.0159335159126	50	51.8847181	57.7017397	17.2459771
51.0159335159126	50.001	54.2235528	56.265496	13.6774223
51.0159335159126	50.002	38.128444	50.990683	14.1351688
47.2651932201676	50.002	38.9617732	51.3997809	12.7914782
47.2651932201677	50.0030000000001	44.7688336	34.8472485	19.5683767
47.2651932201677	50.0040000000001	31.5095969	51.0684653	15.7915136
47.2651932201676	50.0050000000001	32.3710377	53.6854	15.9945905
47.2651932201676	50.006	32.7632095	61.4478694	19.7763438
45.8870559664597	50.0060000000001	49.3212736	48.3119567	3.8293124
45.4162089166295	50.0060000000001	45.5118999	65.9532613	17.6961201
45.4152089166295	50.0060000000001	48.6878693	60.2173135	11.2892676
45.4142089166295	50.006	44.8729194	51.9811136	2.0479424
45.4142089166295	50.0070000000001	44.2906965	51.8898251	3.7343282
45.4142089166295	51.0129961125272	36.1244237	41.0242921	15.4858909
45.4132089166295	51.0129961125272	43.0965371	49.287121	2.8888775
45.4132089166295	54.6662720619392	43.0002757	59.9692573	5.8261393
34.0822391188542	54.6662720619392	20.3908302	60.0437447	17.1200275
34.0822391188543	56.1937639561443	33.1471098	60.1558513	4.0709462
34.0822391188543	53.9980691700686	37.6481264	47.8813096	7.0802754
23.7879711090054	53.9980691700155	23.0786229	38.1227731	15.8911359
23.7879711090054	53.9990691700686	28.018456	49.9258106	6.3626175
23.7879711090054	54.0000691700686	21.0216738	51.8703093	6.5542883
23.7879711090054	54.0010691700686	9.4153722	53.1681384	17.5248196
23.7879711090054	54.0020691700686	13.919931	46.2670929	15.1163989
23.7879711090054	54.0030691700686	6.6502494	63.3598676	19.9843888
23.7879711090054	54.0040691700686	24.284459	53.5118781	0.6991082
20.5680395260613	54.0040691700686	23.2467308	53.1536864	11.4161743
20.5680395260613	55.0010133531623	22.9209187	53.7233909	7.2787759
20.5680395260613	55.0020133531623	9.6122245	63.4753738	15.5818673
20.5680395260613	56.0590378175838	9.4077401	50.7341371	15.2153276
20.5680395260613	56.6196884621539	20.4303529	56.6155569	0.1377486
20.5680395260613	57.5947060245266	18.3784185	57.1026507	10.6506348
18.2292882493608	57.9343061488711	20.1950128	67.681815	11.7719782
18.2292882493608	58.599674445967	18.474215	58.4012448	5.4896057
18.2292882493608	59.3045657944037	23.9069485	59.9121563	8.0586758
18.2292882493608	61.4216785999992	25.824676	62.4300357	7.6620297
18.2282882493608	61.4216785999991	6.1363219	48.8674613	18.2256529
17.9198508999939	61.4216785999991	17.9198509	62.5969087	1.1752301
17.906075662964	61.4216785999991	15.1928212	63.8863652	3.6655736
17.0087771742638	61.4216785999992	23.2409835	69.6045703	11.4000663
13.0500895726055	61.4216785999995	19.7736057	66.4248411	8.3807699
13.0500895726055	61.4206785999995	16.1987878	59.3187745	8.6880066
13.0490895726055	61.4206785999995	12.9149435	73.6813943	16.8344008
13.0480895726055	61.4206785999995	15.5276897	59.9411898	6.7609848
13.0480895726055	61.4196785999995	6.6484375	67.6725429	18.7895827
13.0470895726054	61.4196785999994	13.6466825	56.641223	16.9874359
13.0470895726055	61.4186785999995	9.8142501	65.891213	15.3270767
13.0470895726055	55.9539532790907	18.5593029	70.8497614	16.4543343
13.0470895726055	55.9529532790907	19.3270801	51.9549025	14.5767542
8.70009499998706	55.9529532790907	3.2029124	51.042154	12.1504864
8.69909499998705	55.9529532790907	4.8021518	64.3437535	13.9826688
8.69909499998705	55.9519532790907	2.1729785	46.8604253	11.1913394
8.69909499998705	56.0490334443682	1.295681	73.7881021	19.2219951
8.69909499998705	56.0500334443682	7.2093662	55.909681	8.5307974

Solution x	Solution y	Original x	Original y	Radius
8.69909499998705	58.4228860741297	6.1457761	57.4553139	10.5969023
8.69909499998705	58.4238860741297	3.2443278	74.1558976	17.4562068
8.69909499998705	58.4248860741297	6.2196931	67.2192158	9.1371587
8.69909499998705	58.9072961940781	8.7488745	58.9072962	0.0497795
4.49276627747736	60.5185316348152	1.389212	56.8496436	9.3148689
4.49276627747736	60.5195316348152	0.2763329	64.7359652	5.9629374
4.49276627747736	54.5324856942777	2.2999767	55.3764405	4.3558776
4.49376627747736	54.5324856942777	6.820668	39.0713932	16.2462105
4.49476627747735	54.5324856942777	4.9451086	53.7479899	0.9055154
4.49692887374593	50.9325500620743	4.5207011	34.7763494	18.0479256
4.49792887374592	50.9325500620743	2.5746679	43.4683609	9.7340669
4.49892887374592	50.9325500620743	5.3360715	49.6056788	1.5688834
4.49892887374592	47.2222782153298	4.944301	50.787374	6.1768296
4.49992887374593	47.2222782153298	2.27936	46.9159446	4.2205505
6.18536513043117	47.2222782153298	3.9184302	46.6238898	2.4013658
6.18636513043116	47.2222782153298	6.5220454	46.8393292	1.8896117
6.18736513043116	47.2222782153298	0.7950307	63.4582891	17.1080484
8.20770764916179	47.2222782153298	12.7057803	46.3942459	11.1678278
8.20770764916179	42.4637708090257	2.4253981	44.8523436	11.7215543
10.2520748394353	42.4637708093388	3.9504558	53.4738105	13.2039761
12.626040563432	42.4637708093388	16.0956015	47.1989931	14.2319044
14.2591167159819	42.4637708093388	20.3277951	46.570702	10.9961913
15.8651280817855	42.4637708093388	24.3319298	37.4283803	13.053577
17.3742387893032	42.4637708093388	18.1200543	57.6122523	15.16683
18.9070282053367	42.4637708093388	21.8832831	32.2702186	16.0376904
20.4883060842122	42.4637708093388	25.8175111	47.2716024	14.9058581
21.0008968571286	40.8072197000042	25.3533813	42.3962835	16.55549
23.8397659441167	40.8072197000042	17.2034005	24.1027648	19.2446407
26.2175772999648	40.8072197000042	26.2175773	40.5220972	0.2851225
26.8728038398998	40.8072197000042	16.954408	52.9270638	16.3581023
26.8738038398998	40.8072197000042	11.8541821	36.7134083	16.0938551
27.2439440085417	42.2859571882649	35.0133629	33.6653342	15.142596
27.6514656448689	42.2859571882649	24.4888337	25.329984	19.8782132
28.0689238335603	42.2859571882649	28.2512087	43.1796715	0.9121146
28.4539193994406	42.2859571882649	30.0937988	44.3308943	9.1718387
28.8439223446342	42.2859571882649	20.6501388	50.1791373	16.3804834
29.592124048773	42.2859571882649	22.4746551	48.1041051	15.816336
29.592124048773	43.0842106608877	15.6671545	41.9038059	18.2677056
29.592124048773	43.870879873166	17.0586402	58.0717087	18.9407433
36.9181534400651	43.870879873166	32.3078962	45.114069	14.2581658
48.4208639613374	43.870879873166	54.8328865	43.6672378	6.4152555
58.5029729654037	43.8708798731659	55.1300701	40.0588307	5.0900091
58.5029729654037	47.303910027192	57.9145816	37.4787407	9.8427718
58.5039729654037	47.303910027192	55.5353048	38.1752447	10.1702798
65.2665649317961	47.303910027192	58.9987357	45.7674431	9.2369593
65.266564931796	47.304910027192	62.9728444	48.2610974	5.9042331
Route: 3 Length: 212.9848976 Demand Met: 4947				
76.2003459989316	50	67.1669184	49.4371849	15.5982026
76.2003459989316	49.999	67.7686962	50.942416	9.9071922
76.2003459989315	45.5754239350762	67.6344777	29.9025036	17.8609779
76.1993459989316	45.5754239350762	75.1791401	28.4357222	18.0653964
76.1983459989316	45.5754239350762	77.1618533	52.0527053	6.548551
76.1973459989316	40.4093599709864	78.8734057	30.5074156	17.7741551
76.1963459989316	40.4093599709864	75.8801773	29.7113355	15.8480612
74.317167017338	37.728717417242	78.2442809	33.2914556	5.9254971
73.3599067943847	35.5143772759931	74.2228108	38.6099587	8.4402478
73.3599067943501	32.6915300032717	68.3855742	35.3493495	5.6398572
71.2009344680428	32.6915300032717	73.6483802	37.1698351	9.29445
71.2009344680423	28.542008626514	76.8303918	30.6898889	15.6982902
71.2009344680424	28.5410086265135	71.3343578	25.5495623	6.1682291
68.8568365426095	26.8598768484438	70.5957341	27.6007009	1.8901283
68.8568365426095	20.7153025598208	72.0757838	18.033427	4.1897587
68.8568365426095	18.7536841873624	58.3586123	20.3359236	10.6167883
68.8558365426095	18.7536841873624	71.8742878	17.8343061	6.5081686
67.1422115261835	18.7536841873624	70.2766166	21.7580017	9.1846004
64.6063024797621	18.7536841873624	68.4102584	6.9403941	16.8109375
64.6063024797621	18.7526841873624	70.8086056	11.5809577	15.5821047
64.6063024797621	14.9298391181886	70.9135058	14.8761766	6.3074316
64.3884745670721	12.0862716	73.292725	7.8305571	14.0833606
64.3884745670719	12.0852716	64.1033853	11.196525	1.9674937
64.3874745670728	12.0852716	67.4654721	12.1137109	14.0781794
63.370083287414	12.0852716	70.2907843	10.4186099	7.1185577
61.3811869810851	12.0852716	61.3811866	10.1841347	1.9011369
60.3856525616616	14.0747425	60.5482992	13.7850738	0.6493638
58.5541172269088	14.0747425	57.1362338	5.5136309	10.1201436
57.0336699005795	14.0747425	57.0336699	24.3925592	10.3178167
53.0092662841752	14.0747425	54.100404	16.0525172	18.9251989
49.9423459762078	14.0747425	49.4509792	19.23293	5.5356339
49.9423459762071	12.7152372091082	33.6742877	16.0147514	19.9827348
47.2257183981903	11.6430700000113	52.3761166	17.3066951	10.3802999

Solution x	Solution y	Original x	Original y	Radius
47.2247183981904	11.64307	33.6893922	8.5224136	19.9918892
47.2237183981904	11.64307	47.2237184	11.5265695	0.1165005
45.433005422502	11.64307	45.3795945	10.2393952	17.2768189
43.9137196851109	11.6430700000113	43.6411268	3.9331303	18.3321607
42.3446317816539	11.6430700000113	42.0438698	1.2746098	18.5219549
42.3436317816539	11.6430700000113	45.092729	13.545129	9.6124868
41.3054514690029	12.4848156216948	41.2499501	12.693222	15.4469364
40.3272586941814	12.4848156216948	39.7052051	20.7340789	9.9402181
39.4104906738405	14.8214636459261	41.0252369	15.6288565	2.3078897
37.0225497170333	14.8214636459261	37.3849664	18.6565566	3.8521791
37.0215497170333	14.8214636459261	36.6688954	15.3802855	16.9765386
35.8416038494933	14.8214636459262	33.7088519	9.9711832	13.226048
34.7174832601796	14.8214636459262	31.6461166	7.3585956	12.8469017
33.6426264336282	14.8214636459261	33.7699504	15.2531662	0.4500872
33.6416264336282	14.8214636459262	30.8819888	13.4626957	3.5848945
32.3382238963347	14.8214636459261	19.95828	6.5164086	19.0088103
31.7512303064983	14.8214636459261	30.2787157	8.2280249	8.4927039
31.2464805598318	14.8214636459261	26.3324067	9.9110212	19.0585155
30.7546354581866	14.8214636459262	31.9710737	13.1659452	6.1525799
30.2595667481105	14.8214636459262	24.4057133	14.819481	14.1480218
29.7814957892933	14.8214636459261	34.0986738	23.3047286	16.797077
28.8539520999998	18.2300201085593	27.922577	21.764341	14.2606988
28.8539520999998	19.1726254401082	23.260163	19.1726271	5.5937891
28.8539520999998	20.0400141297927	30.6527015	22.708305	3.2179614
29.98371037173	22.1034768111981	28.9097869	26.1468646	4.1835746
29.98371037173	22.1044768111981	31.6418617	23.7354033	2.3258089
34.6471626790526	22.1044768111981	16.5565287	18.5575743	18.4350632
34.6471626790526	22.9773773009347	34.7673517	23.4200763	8.3957645
34.6471626790526	22.9783773009353	38.9701661	21.3778805	5.0370217
34.6471626790526	27.6557942562578	44.272376	24.1529526	13.4087757
34.6471626790526	27.6567942562578	39.7157151	22.5518047	19.2813071
38.2015140756295	27.6567942562578	38.9767874	28.6595996	1.2675438
40.0009908191404	27.6567942562578	39.21475	31.0795566	8.3251067
40.0019908191404	27.6567942562578	37.130172	34.1670861	7.7958056
40.0029908191404	27.6567942562578	41.3950957	34.602479	10.330203
40.0029908191404	27.6577942562578	40.565033	30.2350611	16.7047972
40.0039908191404	27.6577942562577	35.4889656	25.3753347	17.6050983
40.0039908191404	33.5745382337995	42.5831476	37.1399223	8.4151487
44.5045687381985	33.5745382337995	44.6441662	33.1239716	11.3823841
44.5045687381985	33.5755382337995	45.1705924	33.2150554	5.0012449
44.5045687381985	33.5765382337995	36.9545772	32.1019086	17.1509479
49.5776555770314	33.5765382337995	48.3601763	34.0464698	2.951746
49.5776555770314	33.5775382337995	51.6262531	32.9510025	3.6157759
49.5776555770314	33.5785382337995	51.358437	31.183912	5.9744983
51.565390755992	33.5785382337995	51.2078647	35.5791539	4.4951633
53.9227453750163	33.5785382337995	59.7400431	37.5401839	7.0381524
53.9227453750163	35.0346762890199	62.1996928	26.9322785	11.912547
57.362060559083	35.0346762890199	56.9481598	35.7189477	0.7997132
57.362060559083	35.0356762890199	56.0727891	23.8686819	15.5553362
59.2540286370997	35.0356762890199	54.9748886	31.6899499	11.8489378
59.2550286370997	35.0356762890199	66.7264937	28.6241638	9.8453178
63.1729061708865	35.0356762890199	62.0390375	27.7696953	7.3539199
63.1729061708866	37.1194479048196	65.5247054	34.4819771	3.6959394
63.1729061708866	37.1204479048196	65.5339196	33.299582	4.4914809
64.9491571796268	37.1204479048196	65.884583	36.2103636	2.551361
69.0397147228301	37.1204479048196	57.8811625	36.8910334	11.1609103
69.0397147228301	38.277175991641	57.9600279	34.4089577	11.7355261
69.2603069885215	40.4093599709864	78.4065879	56.8222853	18.7893207
69.2613069885215	40.4093599709864	72.24704	39.7077335	3.7506664
70.0075921579183	40.4093599709864	73.6393721	37.6930766	4.535198
76.1953459989316	40.4093599709864	76.1612584	37.0439506	3.365582
76.1983459989316	40.4093599709864	78.3681704	28.4149174	15.9637623
76.8776055124298	44.2094520355799	65.5436157	56.992435	17.084027
76.8776055124298	46.9668738440218	73.9542296	35.1681427	17.0431609
83.1109741404926	46.9668738440218	77.8566059	47.3210428	13.3824609
Route: 4 Length: 50.6699456616223 Demand Met: 746				
74.2030618081746	50	58.3317264	48.8464518	16.6689028
71.7839508655381	50	63.3053921	48.8331121	9.0739339
70.7912462466746	50	61.8021468	40.7857588	13.1222565
70.0638987604434	49.6011284087455	69.2934493	49.5142976	0.775327
70.3119518163375	49.6011284087455	64.136723	44.5156078	8.3082067
70.5933568906602	49.6011284087455	65.8501112	46.5185477	5.7590293
71.0103396996963	49.6011284087455	69.1126526	61.5737532	13.1055803
72.0100393859963	49.6011284087455	61.6781701	59.473286	14.5751959
74.6162455086841	49.6011284087455	66.0988248	58.3515559	17.5072809
77.6409988971711	49.6011284087455	77.6409989	49.4044045	0.1967239
77.8868166226115	49.6011284087455	67.7343836	45.7338412	10.9613064
84.3530858495434	49.6011284087455	73.3690079	50.7128517	17.0196572
84.3530858495434	49.6021284087455	75.4422908	46.5496079	15.4085245
Route: 5 Length: 287.555657605321 Demand Met: 4960				

Solution x	Solution y	Original x	Original y	Radius
67.7178072283195	50.9448654109097	64.4880133	60.4854675	17.3914578
62.7541664302067	54.0718582302321	61.0935569	52.6920317	2.1590612
58.2258733202185	54.0718582302321	48.2549784	40.2375649	18.4484604
58.2258733202186	54.0728582302321	57.7424662	53.0431767	1.1375089
56.8325575049517	65.1390870858925	58.1838222	68.9986011	5.0984315
54.4397455981324	65.1390870858925	57.8283627	65.6998258	5.6799674
52.4826894626951	65.1390870858925	56.5346421	68.6367247	7.6638079
49.2263797635438	65.1390870858925	50.0180258	68.4527432	3.7667027
44.0892377604043	65.1390870858925	43.8195847	68.1613988	3.0343172
44.0882377604043	65.1390870858925	32.5068688	76.0167984	18.6744309
42.834651399367	65.1390870858925	42.9598051	72.0704928	12.5037762
42.5006870965354	65.1390870858925	43.6827488	74.1878852	13.0248043
41.0412089003952	65.1390870858925	46.3729602	74.0499355	10.9997053
39.5502498300062	65.1390870858925	30.51178	74.0433946	12.6878142
37.6101864484087	65.9774427553091	29.1113171	69.2428114	9.8595935
37.6091864484087	65.9774427553091	37.415218	67.1119326	1.1509522
37.6091864484088	70.5937114066904	37.7594155	72.4638416	1.8761545
34.5984772599565	70.5937114066904	35.1926471	70.9963316	1.4121083
31.5773208066654	70.5937114066904	21.5799527	71.4486566	10.0338577
26.7897314007684	72.5325796	26.7897314	74.395765	1.8631854
26.7887314007684	72.5325796	26.1534967	60.2417469	15.8350837
26.7877314007684	72.5325796	29.6716712	65.8677857	16.7115843
26.7877314007684	72.3253975000018	28.8394854	85.6978668	18.7042447
25.2695072895268	72.3253975000018	16.6661596	74.8364156	8.962299
25.2685072895268	72.3253975000018	23.1076735	77.6165558	6.3711973
25.2675072895268	72.3253975000019	22.4809106	75.2843669	6.1954617
25.2665072895268	72.3253975000018	23.3330747	67.4297538	6.4618896
24.5238455660338	72.3253975000018	21.4467307	69.0185063	4.517097
21.6218152271776	72.3253975000018	21.6218153	70.9164832	1.4089143
17.6604764652925	72.3253975000019	15.7168362	72.1075902	1.9558061
16.2611542995011	72.3253975000018	14.8230271	72.6203252	2.4779351
16.2611542995011	74.5509684039091	9.2263989	90.0124515	19.4614621
16.2611542995011	74.5519684039091	5.5712407	90.2337915	18.9787731
16.2611542995011	78.5328223367436	7.5281123	85.6801168	14.3445898
16.2611542995011	78.5338223367436	4.0389978	87.3302987	15.0585227
13.5810400910932	78.5338223367436	6.5131248	96.1438685	18.9754882
13.5810400910932	81.5343943994814	8.4509457	92.4898096	15.3075709
13.5800400910932	81.5343943994814	17.6447354	95.7025091	18.1912178
13.5790400910932	81.5343943994814	13.5790401	86.3111074	4.776713
11.0210997509125	79.6322394	11.0262565	80.6460603	8.6895387
11.0200997509125	79.6322394	6.9413921	77.9428724	8.4884288
6.74384838368368	79.6322394	6.0949397	74.0865476	7.6811646
6.74384838368368	79.6312394	2.7334234	77.6753662	7.9974461
4.26451980021827	79.6312394	4.2645198	75.4568775	4.1743619
4.26451980021827	79.6659870189415	4.0094679	79.3774545	4.1542009
4.26451980021827	79.6669870189419	2.4095765	76.567725	13.9285738
4.26451980021828	79.6679870189423	2.2118306	78.338365	2.7310978
4.26451980021827	79.6689870189423	5.6520223	82.6769432	11.1746738
4.26451980021828	79.6699870189423	0.9335658	72.1659561	13.4077909
3.00919258779598	84.4126907964397	1.9077799	84.1438746	1.1337425
3.00919258779598	84.4136907964398	2.2068367	85.97283	4.2948267
3.00819258779599	84.4136907964397	2.7731053	90.8551563	11.768651
3.00719258779598	84.4136907964397	3.4980922	86.0326352	13.3409157
3.00719258779598	90.6173073543584	2.9296139	91.7761922	1.1614786
3.00719258779598	91.042677528929	2.2885744	93.0945686	2.1740904
1.54499155159144	96.9721226898761	0.6045586	98.8714353	2.1193873
0.483220698425171	97.1507124015791	0.0137858	97.6201473	0.6638812
4.25860693900574	94.2923273880086	1.8947773	99.155621	13.566985
4.25860693900574	94.2913273880087	2.8109458	93.7321232	1.5519124
9.08034078438135	94.2913273880087	5.9392628	95.2323551	4.2724995
9.08034078438135	94.2903273880087	9.5621792	88.5032381	5.8071138
10.5245477422388	94.2903273880087	13.1891897	88.2938542	7.7896989
10.5255477422387	94.2903273880087	14.3875276	98.8261078	6.6290931
10.5265477422387	94.2903273880087	16.4819632	98.2716229	9.7324435
10.5275477422372	94.2903273880087	11.9839899	90.8471274	12.6071325
10.5285477422387	94.2903273880087	13.4475731	91.4293541	11.6363893
10.5295477422387	94.2903273880087	19.6070156	87.5155962	13.0351264
19.1613470147781	94.2903273880086	20.7475398	95.759314	2.1619272
22.5760463812814	91.5355039008398	5.3401207	99.7769332	19.3172668
22.576046381281	91.5345039008398	23.9936704	92.6751712	7.0508341
22.5770463812814	91.5345039008398	22.9057445	97.6296948	8.6251096
27.0825311222132	91.5345039008398	26.8042407	95.3391438	3.8148041
27.0825311222132	88.5455124825553	30.1525293	91.7059859	6.8413479
27.0825311222132	88.5445124825553	21.4283979	90.119601	12.23519
27.0825311222132	88.5435124825553	19.6994488	87.7215703	12.92719
27.0825311222132	88.5425124825553	20.5127244	86.7993916	6.7971193
27.1201215273377	86.8972120435431	25.8819635	79.9487476	9.3875474
27.1201215273368	85.3524530520356	20.4274735	84.2677658	6.7799767
28.4073113499618	81.0128907776118	28.3264783	80.6515072	7.0901709
34.7315749724077	81.0128907776127	32.0336769	81.0046037	2.6979108

Solution x	Solution y	Original x	Original y	Radius
44.0244175169105	77.0316258550902	45.3945603	79.9114427	10.2225307
44.0244175169135	74.9839541683578	46.8228713	71.844353	6.908088
48.6833767477654	74.9839541683553	47.2434466	72.8348775	7.3999265
48.6833767477641	71.2744680666847	50.7478618	74.0551131	4.9191824
50.5380005476505	71.2744680666847	54.3749565	73.471727	4.4215583
51.6197963524542	68.1527678233807	53.0250996	68.7918887	1.5438111
58.2258733202186	68.1527678233807	45.6990417	60.3070344	16.3509992
59.2771347879381	65.1390870858925	56.0822206	62.8731122	7.9532835
62.1493653504554	64.1718974518191	57.0800315	64.0172849	9.5428133
67.330335834942	64.1718974518414	64.4543682	70.2655389	6.7382235
74.6911979453478	64.1718974518419	63.772212	68.1836695	14.1434905
74.6911979453478	60.4614800870696	74.3685871	61.179785	0.787426
74.6911979453478	57.9793291193853	75.0689318	72.4744486	14.9698309
78.509906178002	57.9793291193852	78.4106856	73.5257917	15.5467792
78.5099061780019	55.8624283613282	73.2290706	73.9762718	18.8679238
Route: 6 Length: 313.359344117889 Demand Met: 4978				
58.3172053565201	50	47.6524078	52.2249928	17.0127082
58.3172053565202	49.9314277157626	53.1446811	48.4277704	14.7395753
52.7377215895153	49.9314277157626	56.98499	36.3050676	14.2729457
52.7377215895153	49.4657297841581	53.3341085	54.2742297	4.845343
50.7164951307074	48.8771211958185	46.3458684	54.8708712	8.2955698
49.8353907549393	47.9911323287631	53.5581269	47.7413894	13.1857928
48.2733497800538	47.9296699336041	39.5709227	52.0192185	18.7792196
48.2733497800538	46.466998070761	51.5218465	39.5765057	17.6859637
47.5764500771515	45.7818675464229	49.7681271	46.8278362	2.4284766
45.982235979545	44.7770184354575	55.3536754	50.0230289	10.7398558
39.3408641991709	42.8542015468402	40.4352515	45.1450838	4.3768484
39.3398641991717	42.8542015468526	37.4597811	44.2188485	8.3563058
34.6471094702514	37.818174372646	18.6253841	45.1799856	17.6321283
34.6461094702514	37.818174372646	34.4981613	43.6098189	7.4849006
34.6451094702514	37.818174372646	34.2887402	41.9043439	4.1016802
34.6441094702514	37.818174372646	32.8302989	42.2309887	9.1323516
34.6441094702514	34.9431581042159	38.4714341	30.1541626	8.9883187
34.0497480779234	33.6114625731276	31.5115819	30.4349931	4.1547529
31.5862936160927	32.7375606645699	33.8398153	32.0377234	2.359689
27.0604503187499	30.8611358	18.0420031	31.0087706	9.8590332
24.9413176696101	30.8611358	25.434095	30.36432	1.6710488
24.091601539465	30.8611358	25.6408756	32.9849766	2.7008855
21.2205961	30.8611358000001	21.2205961	30.6755865	0.1855493
21.2195960981929	30.8611358000001	10.2638739	16.7343669	18.8298176
17.0385933813441	30.8611358000001	10.881307	21.222109	15.2562401
17.0375933813441	30.8611358000001	14.6392528	26.7492086	14.0759419
17.0365933813441	30.8611358000001	19.7989907	26.8559855	13.3335104
17.0365933813441	33.1221637121204	6.7702019	28.6398243	18.6590849
15.5621102597508	33.1221637121203	14.7299938	38.6202015	5.5606508
15.5621102597508	33.9837730972545	7.3492035	35.5012058	9.3339917
15.5611102597508	33.9837730972545	13.0553452	35.1491327	12.3752896
15.5601102597508	33.9837730972545	13.5198617	39.2703319	5.6665967
12.1928408	36.5561982999266	12.1928408	37.3702852	0.8140869
12.1928408	32.0298894416149	11.1949114	32.5347928	2.918689
12.1928408	28.5341297244487	8.8711802	13.2955279	15.7653907
12.1918408	28.5341297244487	11.5512784	26.7283657	1.9160125
10.3753649719278	28.5341297244487	12.2844966	12.8434228	16.9324181
10.3743649719278	28.5341297244487	9.7861225	28.4044715	0.6023624
5.38056990001166	28.5341297244487	1.0903939	26.3844516	6.0462866
5.38056990001165	26.7803784	3.1062568	26.7803784	2.2743131
7.58898371987686	26.7803784	1.4410502	27.5670412	9.0702473
7.58898371987686	23.7995081651979	4.4919615	30.1971308	9.6799472
7.58898371987686	21.6337538392071	14.7546051	14.610274	12.5838102
10.018695611075	21.6337538392071	7.7653349	6.167634	19.726704
10.018695611075	20.5929174743079	4.4183327	14.4467589	11.646626
10.018695611075	19.6246027776014	10.0346396	20.0550826	2.640927
10.018695611075	18.5774508925977	16.5956207	19.4929376	6.6403358
13.0003627	18.5774508925943	13.6477983	21.6503409	10.1300266
13.0003627	16.8211128	20.1050057	16.8211128	7.104643
10.974136734898	13.9552131994442	15.820225	13.1438067	7.149623
3.94906879999999	13.9552131994441	9.1420339	20.9818632	15.7590069
3.94906879999999	13.9542131994442	1.1696301	7.0254341	16.3262783
3.94906879999999	13.8762399	2.4227502	13.8762399	1.5263186
3.94906879999999	5.89240171416185	9.4518233	0.0818322	12.2091392
3.94906879999999	4.71460254087271	3.796854	1.0310825	3.6866637
8.13971511067389	5.89240171416185	6.4321646	5.6038094	10.5758755
8.13971511067389	5.89340171416185	1.1893308	3.3623299	7.3969025
8.13971511067389	5.89440171416185	10.2956976	4.6843351	13.6376992
8.14071511067388	5.89440171416185	9.8269964	6.8843491	6.8651251
13.675814385965	5.89440171416185	14.9649191	8.2569823	11.1052011
15.2840588169071	5.89440171416185	15.3634563	8.946465	13.8278483
15.2840588169071	7.10486875215375	15.2275578	8.2482088	10.0059049
15.2840588169071	7.10586875215375	15.0419936	3.4632806	4.5348945
15.2840588169071	7.10686875215375	17.3929381	9.8303298	5.6745961

Solution x	Solution y	Original x	Original y	Radius
25.9021681388863	7.10686875215375	21.5694811	0.9567502	13.3401903
25.9031681388863	7.10686875215375	18.0605132	3.6100683	8.5868999
25.9031681388863	8.75391939999851	21.5004558	1.4444458	10.4654737
25.9041681388863	8.75391939999852	25.7941467	5.022901	13.154074
28.9970611018304	8.75391939999784	29.8399494	3.731908	5.1894117
28.9980611	8.7539194	28.9980611	9.3107142	0.5567948
29.8612656690046	8.75391939999827	11.2137447	2.0282324	19.8233424
32.7005159282135	8.7539193999989	25.3620642	2.9418291	9.3612642
34.4102569232344	5.66249943361864	37.7928549	6.0601138	3.405887
34.4102569232344	5.66149943361864	34.237799	1.769458	3.8958604
36.6081599202756	5.66149943361864	33.5301093	3.5426558	3.7368294
40.6487226110729	5.66149943361864	41.5241877	2.2495139	5.9346817
40.6497226110729	5.66149943361865	38.5584867	8.9239146	8.3130054
40.6507226110729	5.66149943361865	39.0651937	2.4238303	9.0370307
40.6517226110729	5.66149943361865	52.4413086	6.2567644	17.7872557
55.2527105032038	5.66149943361865	46.2315326	17.3070005	18.9782971
55.2537105032038	5.66149943361865	54.6678163	5.1970784	9.6677205
55.2537105032038	1.72543130011195	55.2537104	1.3428502	0.3825811
73.9861148271904	4.92844058826617	72.320279	3.8462993	12.1872623
73.9871148271904	4.92844058826617	64.943613	1.686391	14.0946653
73.9881148271904	4.92844058826617	75.2339764	1.1053279	16.7841753
73.9891148271904	4.92844058826617	72.8917692	2.6849909	5.1292918
73.9901148271905	4.92844058826617	73.9903157	3.2090585	1.7193821
78.2439057571005	4.92844058826617	72.9487249	9.0752285	6.7256814
78.2439057571005	26.3554432285608	77.5184606	26.3492827	1.1896541
78.2439057571005	26.3564432285608	79.9570853	14.106802	15.0949781
80.1204571685129	26.3564432285608	71.2868972	13.7571779	15.5198317
80.1204571685129	28.6194123823974	69.6772126	28.9703915	10.4491408
80.7591697057026	28.6194123823974	62.1748486	23.5386262	19.2663276
82.2220757267194	28.6194123823973	67.7860652	18.0440513	17.8951575
82.2220757267195	28.6204123823974	68.9038468	16.8104734	18.4978064

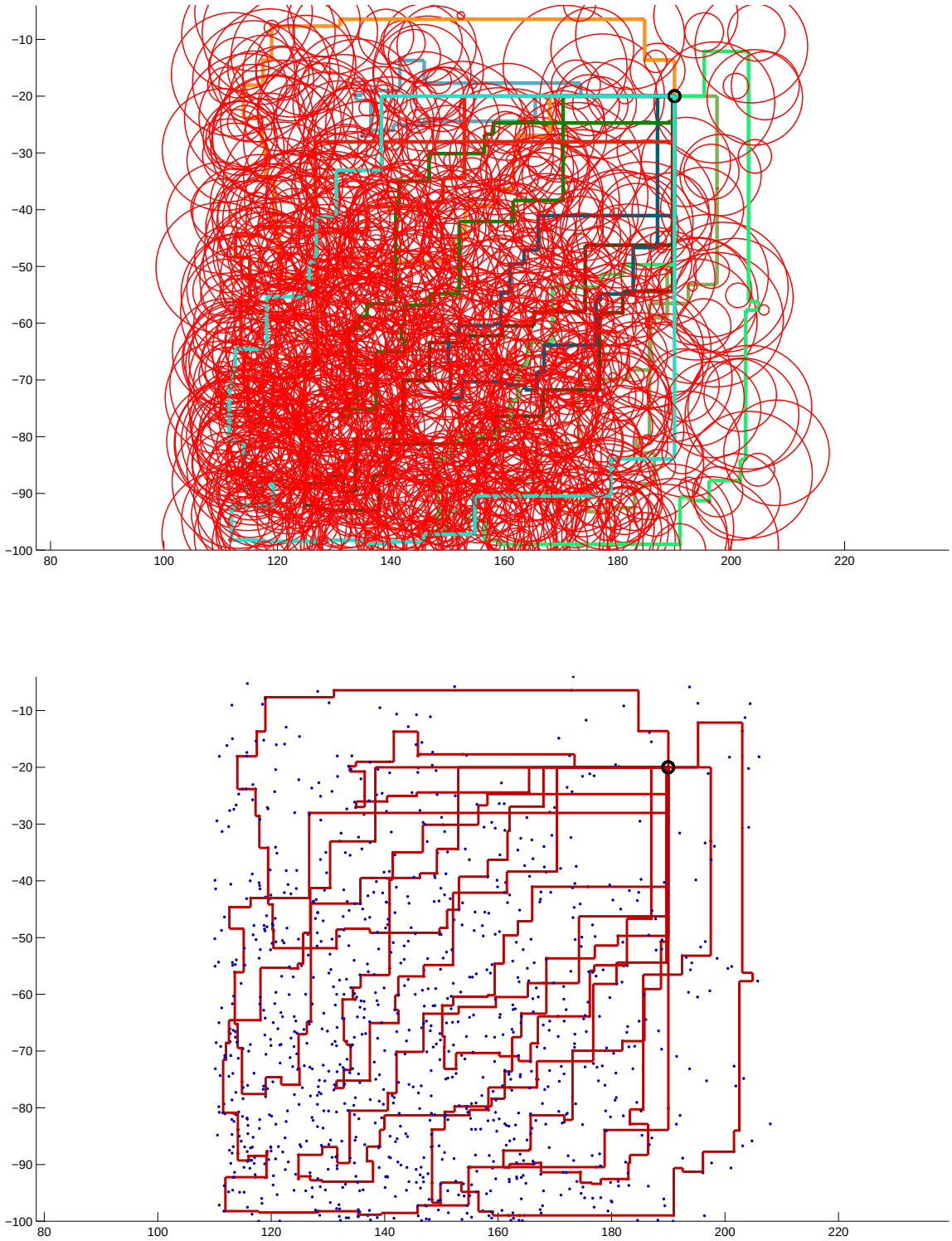


Figure O.159: *bonus*1000, arbitrary radius, 2D, Manhattan, Length = 2230.8979714

Table O-162: Solution for *bonus*1000, arbitrary radius, 2D, Manhattan

Total distance: 2230.89797138153 Total demand met: 25289 Depot: x 80 y 20				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 142.530366092975 Demand Met: 1695				
55.4638878457287	24.4284993593409	60.71671796	14.8721563	10.90485749
55.4638878457287	24.4284993593409	59.97712424	27.07719444	8.051501149
55.4638878457287	24.4284993593409	59.11600598	27.89604561	6.714910247
55.4638878457287	24.4284993593409	50.59311922	22.75724468	8.529458236
55.4638878457287	24.4284993593409	51.99282443	27.99909333	9.260790549
55.4638878457287	24.4284993593409	55.9549233	32.80200534	9.08801586
55.4638878457287	24.4284993593409	54.00076983	32.50218762	8.205190824
55.4638878457287	24.4284993593409	49.49892788	30.73465222	9.148611436
35.6284408901024	25.0432674028559	39.07927218	20.57348801	5.646872091
35.6284408901024	25.0432674028559	34.82834577	24.45085722	2.058629996
35.6284408901024	25.0432674028559	36.77121212	29.70512597	4.799880351
30.4183227700955	26.0227455942422	30.34406593	27.74432368	1.723178802
30.4183227700955	26.0227455942422	25.40396983	32.32053998	11.43146897
30.4183227700955	26.0227455942422	25.99458773	34.37910238	11.0175516
24.9794682436249	26.9959539863751	24.87958822	27.09583401	0.141251684
24.9794682436249	26.9959539863751	22.33900559	31.60235215	6.287046338
24.9794682436249	26.9959539863751	18.74305811	29.30240259	6.990859055
24.9794682436249	26.9959539863751	22.07359754	33.01769228	8.049766298
24.9794682436249	26.9959539863751	23.06731773	35.0375678	8.814338039
26.46640724631	25.1581147349242	27.26619514	25.90196542	1.092233728
26.46640724631	20.7428947317892	28.82263126	20.36706254	2.386009522
26.46640724631	20.7428947317892	27.39065822	19.10906735	2.166651987
26.46640724631	20.7428947317892	25.83818458	22.03803134	1.439459118
23.8374993810033	19.80991504	23.64941173	19.80991504	0.188087651
23.8374993810033	19.80991504	21.70527032	21.60018691	8.932392927
23.8374993810033	19.80991504	21.65865806	17.99154884	8.718780186
23.8374993810033	19.80991504	24.70443529	26.12365999	8.158816457
23.8374993810033	19.80991504	20.73212412	24.23741148	6.929326091
23.8374993810033	19.80991504	23.31975826	27.34182644	8.782240679
23.8374993810033	19.80991504	18.39694528	22.72524013	8.568057279
23.8374993810033	19.80991504	18.71921477	25.10440199	9.380442313
23.8374993810033	19.80991504	17.16840861	23.65521269	10.62185038
24.9426276267867	19.0192432226015	24.23492671	17.98856994	1.250251176
30.8683351183615	19.0192432226015	30.90434674	20.96780911	1.948898626
30.8683351183615	19.0192432226015	29.56587444	24.57869021	7.997446269
30.8683351183615	19.0192432226015	28.59013959	24.83311171	10.05513054
30.8683351183615	19.0192432226015	24.09498187	20.3828805	10.45340098
30.8683351183615	19.0192432226015	26.37919279	28.3108891	11.05276225
31.607256857349	13.7042993093631	38.07401644	11.09458783	6.973490769
31.607256857349	13.7042993093631	34.15723352	12.84614068	4.597761329
31.607256857349	13.7042993093631	32.11403346	10.63014558	3.943215754
31.607256857349	13.7042993093631	29.15811552	9.518746656	4.849447835
35.870750071255	18.034921346539	38.38951699	19.65672727	4.440566438
35.870750071255	18.034921346539	35.94447387	20.12395641	2.090335546
35.870750071255	17.7108325987587	35.62470684	10.73896033	6.976212454
36.2590484012557	17.7108325987452	38.46066343	17.33665094	2.23318621
36.2590484012557	17.7108325987452	35.85991513	20.90404301	8.748151694
36.2590484012557	17.7108325987452	35.53984032	15.99196501	8.611862088
43.7565805809143	17.7108325987587	44.45005227	17.91363181	0.722516784
43.7565805809143	17.7108325987587	42.45831495	25.01806118	11.16727795
43.7565805809143	17.7108325987587	39.25918273	24.78783876	9.890531084
43.7565805809143	17.7108325987587	36.57027062	15.62107689	9.745800746
63.4799243045167	20	66.92261807	21.4897109	4.897969721
63.4799243045167	20	62.61153544	17.95816147	4.324411312
63.4799243045167	20	63.04507341	24.29862677	4.664845393
72.7491735524842	20	71.29498477	19.86081824	1.460834206
72.7491735524842	20	70.71952594	19.54937922	6.168002999
72.7491735524842	20	67.26622281	20.02005982	10.98398776
72.7491735524842	20	66.17419814	21.15751135	7.122166774
75.2357365315513	20	77.03036191	15.51069798	4.834719524
Route: 2 Length: 244.2639190285 Demand Met: 2967				
59.7558294242525	20	64.88897514	21.58345165	5.371825022
58.0022934999618	26.9251298151684	62.17589976	23.53474989	5.377142852
58.0022934999618	26.9251298151684	59.48412304	31.97998889	5.267581898
58.0022934999618	26.9251298151684	55.07321291	28.85442279	3.578504928
52.0108729727411	31.1801875137423	51.19858704	31.0981292	0.816420237
52.0108729727411	31.1801875137423	47.52772375	30.54529654	5.345510096
52.0108729727411	31.1801875137423	49.81718199	39.89953162	11.40867509
51.6563672672359	36.2978335280482	53.48089128	34.57431179	2.509863553
51.6563672672359	36.2978335280482	50.32982697	35.43640834	1.581696088
48.1807299574969	39.2729827724457	48.20619517	39.24794213	0.03569097
48.1807299574969	39.2729827724457	48.35826716	45.69665672	9.422444764
48.1807299574969	39.2729827724457	47.65008175	45.51867646	10.88958897
48.1807299574969	39.2729827724457	43.74535734	43.87626012	7.961235625

Solution x	Solution y	Original x	Original y	Radius
48.1807299574969	39.2729827724457	47.22851165	47.89903616	11.51868038
48.1807299574969	39.2729827724457	39.91233765	41.2977364	9.100834641
48.1807299574969	39.2729827724457	45.78512338	48.76667443	10.70444172
43.098679636736	45.097766735094	43.11381093	45.00092033	0.098012743
43.098679636736	45.097766735094	40.57741767	42.47262	3.80870253
43.098679636736	45.097766735094	42.25980634	46.86827481	6.991437475
43.098679636736	45.097766735094	40.32660467	53.626561	11.22803277
43.098679636736	45.097766735094	34.17044541	50.63731129	11.2605766
41.0017681738544	48.2931016778208	41.57443341	43.13832473	5.186489261
41.0017681738544	48.2931016778208	43.66555329	47.77139353	2.714393217
41.0017681738544	48.2931016778208	39.96945525	49.46230999	2.614076519
39.6715040227276	49.1530070316497	39.67150404	49.44131071	0.288303678
39.6715040227276	49.1530070316497	40.92420024	52.54921675	7.535927257
39.6715040227276	49.1530070316497	44.98764045	56.96391467	10.72794423
39.6715040227276	49.1530070316497	35.40868681	49.33377596	6.467074744
39.6715040227276	49.1530070316497	37.58124673	53.7047325	6.278048118
39.6715040227276	49.1530070316497	30.55507662	47.73107042	10.01719534
39.6715040227276	49.1530070316497	33.45977848	51.47641849	7.198818879
39.6715040227276	49.1530070316497	36.93641703	55.80482127	9.247821291
39.6715040227276	49.1530070316497	31.52001616	50.89228775	10.98721573
39.6715040227276	49.1530070316497	33.50828257	58.48410354	11.3670918
27.3771112926592	48.439339149	27.37711129	46.43616017	2.003178979
22.835277671954	48.5715108414301	27.06311365	42.64274924	7.281813729
22.835277671954	48.5715108414301	22.79879511	41.59634367	7.012240784
22.835277671954	48.5715108414301	22.81585575	48.67591425	0.788075572
22.835277671954	48.5715108414301	23.68432498	51.4412716	4.840858032
22.835277671954	48.5715108414301	22.00300591	49.77440842	6.521574248
22.835277671954	48.5715108414301	19.18169919	47.05766373	3.954790614
22.835277671954	48.5715108414301	20.72246404	50.29048837	3.507005939
21.5050773385297	51.8682369846618	30.18073163	48.32029982	9.58620967
21.5050773385297	51.8682369846618	23.40792676	43.64379836	8.702120093
21.5050773385297	51.8682369846618	27.13020332	56.00735022	9.113612959
21.5050773385297	51.8682369846618	20.37447933	52.92580791	2.126357542
21.5050773385297	51.8682369846618	23.29263587	57.34435722	5.760491154
21.5050773385297	51.8682369846618	20.53092136	55.63617906	5.894866268
21.5050773385297	51.8682369846618	22.06521443	57.50548607	6.030659205
21.5050773385297	51.8682369846618	20.16713628	56.2637712	7.589009856
21.5050773385297	51.8682369846618	16.54761864	53.09785344	6.228334506
21.5050773385297	51.8682369846618	13.89109091	56.92730438	9.141496171
10.3913959532434	51.7917245281535	10.16802995	51.02082052	0.802611588
10.3913959532434	51.7917245281535	4.692804385	58.08052349	11.75765381
10.3913959532434	48.820380619553	18.10483235	51.48322234	8.264928029
10.3913959532434	48.820380619553	12.77181014	48.33401693	2.429592834
10.3913959532434	48.820380619553	10.71615729	46.62293177	5.678630364
10.3913959532434	48.820380619553	10.30388261	47.84277995	0.981509885
10.3913959532434	48.820380619553	12.24975114	50.92735248	3.387131358
10.3913959532434	48.820380619553	8.736047039	47.86465463	7.075947311
10.3913959532434	48.820380619553	10.84189087	50.74783931	3.28397178
10.3913959532434	48.820380619553	8.915897502	48.83105962	5.482065711
10.3913959532434	48.820380619553	7.342191074	50.36568708	3.656790591
10.2562141958251	48.4545082440744	8.811692105	48.50504439	1.445405816
10.2562141958251	48.4545082440744	6.962926975	47.87740863	8.307462013
10.2562141958251	48.4545082440744	9.891024822	52.16610985	9.993987041
10.2562141958251	48.4545082440744	8.078510661	52.12465727	11.74516273
10.2562141958251	48.4545082440744	3.857750749	53.93522034	9.829595519
10.2562141958251	48.4545082440744	0.073554416	50.20291794	11.48330524
10.2562141958251	48.4545082440744	3.684518627	54.75346427	10.66155854
10.2562141958251	44.1654443512132	12.97854061	40.66549102	4.434042673
10.2562141958251	44.1654443512132	9.755265232	43.18329059	1.339232837
10.2562141958251	44.1654443512132	9.020444459	42.86210706	2.418478506
9.46442576308559	34.1904120464436	4.953508892	23.81507206	11.32693583
9.46442576308559	34.1904120464436	14.50630809	38.16565664	6.420525444
9.46442576308559	34.1904120464436	12.65054039	38.20990532	8.455350331
9.46442576308559	34.1904120464436	9.832177112	38.08691559	4.043657799
9.46442576308559	34.1904120464436	0.438114408	29.42535326	10.7393682
9.46442576308559	34.1904120464436	6.668915236	38.80565327	8.512380576
9.46442576308559	34.1904120464436	7.871697725	40.35198819	6.3641027
9.46442576308559	34.1904120464436	9.954481978	42.50823893	10.6166074
9.46442576308559	34.1904120464436	7.974625907	40.8370263	8.509762243
9.46442576308559	34.1904120464436	8.013859219	41.41457221	9.523443187
7.90840499513878	28.5706802574997	10.79914705	20.42039499	9.255684285
7.90840499513878	28.5706802574997	10.78091353	34.08373955	6.747292093
7.90840499513878	28.5706802574997	2.694391803	27.62826968	5.298497076
7.90840499513878	28.5706802574997	2.518275748	30.45426362	5.70976178
7.90840499513878	28.5706802574997	1.354188569	31.31594018	7.295671947
7.248506905204	23.8402309691906	14.86812736	22.17705421	8.397529002
7.248506905204	23.8402309691906	6.772905892	23.04434695	2.6690689
7.248506905204	23.8402309691906	5.677247541	18.04924585	6.000363709
7.248506905204	23.8402309691906	6.719406227	25.73868862	2.345987396
7.248506905204	23.8402309691906	4.281409798	24.72152663	3.095213609

Solution x	Solution y	Original x	Original y	Radius
7.248506905204	23.8402309691906	3.815111582	26.65111472	5.810017463
7.248506905204	23.8402309691906	3.430192849	27.39779729	6.526989384
4.02746862906149	18.048234860347	12.63680518	12.91935497	10.77386908
4.02746862906149	18.048234860347	8.679954371	15.22687294	10.6053774
4.02746862906149	18.048234860347	5.722550995	17.38650207	10.68361364
4.02746862906149	18.048234860347	5.584406208	23.81184943	9.409363681
4.02746862906149	18.048234860347	0.867278095	18.04823486	3.160190534
4.02746862906149	18.048234860347	3.082410661	9.043855976	9.949435792
7.46557448885299	13.6829302760278	14.9958336	14.5728326	8.817791313
7.46557448885299	13.6829302760278	12.36712067	15.90584574	8.460729812
7.46557448885299	13.6829302760278	10.89890727	16.02503912	4.675459945
7.46557448885299	13.6829302760278	7.319977879	15.37807435	6.081166637
7.46557448885299	13.6829302760278	3.177857831	14.97802426	5.317837399
8.97245589469421	7.64179702976013	8.465864182	8.874062551	11.71772619
8.97345589469421	7.64179702976002	2.197761157	16.16441336	10.88783855
8.97345589469421	7.64179702976002	8.988027099	7.925934732	1.314505506
8.97345589469421	7.64179702976002	5.801300438	5.23076571	10.356567
21.0709620744146	6.42247672400001	20.19850768	8.627828216	7.471216408
21.0709620744146	6.42247672400001	18.20950886	6.619599382	6.369371766
42.343466060018	6.42247672400001	42.34346606	5.769949569	0.652527155
62.9644697132842	6.42247672400001	65.51501196	11.68636529	7.30737771
62.9644697132842	6.42247672400001	63.24920239	4.015695007	2.810594924
74.7417038032522	13.6076310999058	76.68650337	13.86956158	1.962359022
74.7417038032522	13.6076310999058	72.1570689	9.179080442	9.589007965
Route: 3 Length: 229.481688643696 Demand Met: 2967				
87.4944656429195	33.0259603870365	82.01891737	31.58538586	7.858683337
87.4944656429195	33.0259603870365	86.50661976	33.33916758	4.865256989
87.4944656429195	33.0259603870365	88.13068149	33.9074779	7.167241247
87.4944656429195	33.0259603870365	84.85983095	39.85329756	7.318048431
87.4944656429195	36.2740664530717	87.56748283	36.27406643	0.073017187
87.4944656429195	53.1996933000986	86.51848331	50.71555717	3.154772102
82.43045518639	53.1996933000986	83.19197135	53.48639501	0.813698186
82.43045518639	53.1996933000986	90.50689197	55.43830225	10.39640446
82.4304551863901	56.5373670460642	85.16088414	60.47696067	4.793291165
75.5809985247429	72.6703217590473	81.47694776	70.94126153	6.403879885
75.5809985247429	72.6703217590473	73.75840634	73.11670598	1.876459737
75.5809985247429	80.264298554994	75.20998283	80.5662569	0.905134017
75.5809985247429	80.264298554994	68.84275879	76.03221479	10.79538264
75.5809985247429	80.264298554994	67.69295238	75.24403656	11.35995088
75.5809985247429	80.264298554994	75.38279951	84.8495864	9.738201242
73.2348604565709	82.8468689504775	82.09017124	81.333147	9.364452955
73.2348604565709	82.8468689504775	70.83372488	78.21085961	5.320597925
73.2348604565709	82.8468689504775	72.09010058	81.417498	6.705862814
73.2348604565709	82.8468689504775	68.96890483	80.55619731	4.842060922
73.2348604565709	82.8468689504775	69.80433177	81.60817435	4.561618689
73.2348604565709	82.8468689504775	64.88497046	82.96772641	9.339812785
73.2348604565709	82.8468689504775	67.89989075	88.12316705	7.944934507
73.2348604565709	82.8468689504775	68.11557125	90.29313921	9.036263761
76.4347547479999	86.49303137	76.68533256	86.49303137	0.250577812
76.4347547479999	86.49303137	79.19703593	96.06011661	11.2419465
76.4347547479943	88.3026911599645	77.11333094	85.3156461	3.063152598
73.2256600398532	89.5836946797984	72.48804708	89.57044348	0.737731979
73.2256600398532	89.5836946797984	72.91384846	91.54886288	4.973733961
73.2256600398532	89.5836946797984	69.92952441	96.42807986	9.02685985
73.2256600398532	89.5836946797984	69.38304877	98.18671586	10.74668541
73.2256600398532	89.5836946797984	66.67195124	95.92017704	9.763847817
72.9670220057494	92.555076403653	76.48394754	93.81500316	3.73579719
72.9670220057494	92.555076403653	73.04972269	93.68364053	1.367275869
72.9670220057494	92.555076403653	69.82339194	93.15949799	3.201208435
68.09186985	93.4010635929951	71.17046416	92.96230041	4.264714687
68.09186985	93.4010635929951	68.09186985	95.85522589	2.454162297
66.3840739384234	93.2038677284456	71.22771139	93.77569631	4.877275027
66.3840739384234	93.2038677284456	64.96530116	93.98228963	1.618288248
66.3840739384234	93.2038677284456	63.88368354	92.98872817	4.684052733
64.5062525782208	91.3505770094484	70.07355989	96.61021246	7.658895206
64.5062525782208	91.3505770094484	62.03675317	91.42777069	2.470705606
64.5062525782208	91.3505770094484	61.4906739	91.40517217	5.140621126
64.5062525782208	91.3505770094484	66.92699784	97.50570073	6.78636185
64.5062525782208	91.3505770094484	65.26732099	95.86741863	6.903660169
64.5062525782208	91.3505770094484	62.61309781	94.29391595	5.245785935
57.5538559998528	89.7254427928432	62.35255518	88.46202983	4.962229956
57.5538559998528	89.7254427928432	59.01602486	86.99268685	4.144714535
57.5538559998528	89.7254427928432	56.15571936	89.41500769	1.432185748
57.5538559998528	89.7254427928432	57.53422575	91.73216299	2.263638208
56.3211944595611	89.9120277252875	56.30399813	89.72916428	0.18367023
56.3211944595611	89.9120277252875	61.09603132	95.38804721	8.526033691
56.3211944595611	89.9120277252875	54.90972966	93.30800556	7.380299806
56.3211944595611	89.9120277252875	53.26472651	92.17526811	6.470026475
56.3211944595611	89.9120277252875	53.29556121	92.47449182	6.766260463
56.3211944595611	89.9120277252875	57.84005051	97.24933499	10.98084378

Solution x	Solution y	Original x	Original y	Radius
56.3211944595611	89.9120277252875	57.43254842	97.94119843	10.09429194
56.3211944595611	89.9120277252875	49.03663551	90.65504513	8.507710049
56.3211944595611	89.9120277252875	54.09260921	96.04789718	7.918650854
51.95218378	90.5153029959649	51.95218378	92.57992082	2.064617824
51.95218378	90.5153029959649	47.96746082	95.14523251	8.805162658
51.95218378	90.5153029959649	50.67630959	98.08417141	8.634086059
51.95218378	90.5153029959649	48.86252985	99.44183304	10.4064769
51.95218378	90.5153029959649	47.31578899	98.13704672	11.87713881
50.9405991276172	87.5433103352546	50.20394782	81.95454381	5.63710621
50.9405991276172	87.5433103352546	52.05342714	85.82620662	2.610320997
50.9405991276172	87.5433103352546	51.44475874	86.59474587	4.908082369
50.9405991276172	87.5433103352546	49.19512952	89.44346883	4.342724929
50.9405991276172	87.5433103352546	49.59427698	92.51123595	5.147122326
55.6201731655616	87.2832627255539	55.11001594	85.68607737	1.677066237
55.6201731655616	87.2832627255539	58.00620671	94.64720593	11.42342539
55.6201731655616	87.2832627255539	54.43632749	91.92787857	10.0796961
55.6201731655616	87.2832627255539	54.10050901	92.28618361	9.480891031
55.6201731655616	87.2832627255539	51.98537923	93.03310405	10.9895755
55.73082902	81.3239725330002	55.73082902	81.05870461	0.265267923
55.73082902	81.3239725330002	56.64479831	82.24679775	3.64219376
55.73082902	81.3239725330002	53.61605765	80.93460352	4.795394132
55.73082902	81.3239725330002	55.75342338	84.56592915	5.992730061
55.73082902	81.3239725330002	51.49657531	83.11057243	7.887384084
55.73082902	81.3239725330002	51.18829335	82.80979047	7.761910446
55.73082902	81.3239725330002	52.83415121	85.50123146	6.270496768
55.73082902	81.3239725330002	53.87450626	88.16447802	7.742268204
55.73082902	81.3239725330002	54.48965648	89.30641789	9.13140765
55.73082902	81.3239725330002	53.27314218	89.6748569	11.35118685
58.5342405275532	81.3239725330002	60.70093329	80.64454551	3.209176581
58.5342405275532	81.3239725330002	61.30013954	82.69641043	3.087682485
61.67834468	82.120132252	61.67834468	82.51967341	0.399541158
61.67834468	82.120132252	58.40265516	82.89286098	3.789211097
61.67834468	82.120132252	63.32241418	89.29380754	7.42798409
63.1236714557771	78.0824065741617	70.77169737	73.88064127	8.726232409
63.1236714557771	78.0824065741617	65.34735437	72.80394877	7.821760947
63.1236714557771	78.0824065741617	70.61748839	78.65460339	7.660924967
63.1236714557771	78.0824065741617	59.09181099	73.44789922	8.247004523
63.1236714557771	78.0824065741617	60.79681015	75.33369853	8.472276725
63.1236714557771	78.0824065741617	63.68037897	79.29990004	1.33873582
63.1236714557771	78.0824065741617	58.81674593	76.2826012	7.335997979
63.1236714557771	69.935716027003	61.14896118	72.70410502	3.400508534
63.1236714557771	69.935716027003	57.06276587	74.98770524	9.477514768
63.1236714557771	69.935716027003	56.76810138	74.93595817	10.01955077
63.1236714557771	69.935716027003	57.82109764	79.24611201	11.76834886
68.9058400563294	69.935716027003	65.09617026	64.32634731	6.924546531
68.9058400563294	69.935716027003	70.36283848	70.39401036	6.760808749
68.9058400563294	69.935716027003	69.12634406	69.4594231	0.727966519
68.9058400563294	69.935716027003	63.47892732	68.70647259	6.807486056
68.9058400563294	69.935716027003	63.48323083	69.36201841	5.452872617
71.8978418598101	68.2473492000218	78.29263567	66.45988674	6.639910385
71.8978418598101	68.2473492000218	72.84290598	65.67053988	5.910036243
71.8978418598101	68.2473492000218	72.70378804	66.70645397	3.620764964
71.8978418598101	68.2473492000218	73.05372772	69.26625594	1.566755571
71.8978418598101	68.2473492000218	65.55566867	66.58332744	6.556838353
71.8978418598101	68.2473492000218	68.36889636	72.61479797	6.100291297
75.7858735191549	59.0750269038268	75.75634139	60.02200009	0.947433566
75.7858735191549	59.0750269038268	78.83068399	69.67274441	11.30182844
75.7858735191549	59.0750269038268	74.07680751	69.16329968	10.96743145
78.7136608766098	53.7828676830627	77.87000631	52.21112855	1.783848909
78.7136608766098	50.7258471799821	78.92131522	50.41345477	0.375112442
78.7136608766098	50.7258471799821	85.71414415	51.67250379	10.80797757
78.7136608766098	50.7258471799821	84.14082278	54.46253046	9.425227564
78.7136608766098	50.7258471799821	83.91646182	55.69492785	10.80258547
78.7136608766098	50.7258471799821	88.60564442	53.67349247	11.4446079
78.7136608766098	50.7258471799821	83.55927983	59.64747077	10.99948591
Route: 4 Length: 285.137980212504 Demand Met: 2957				
79.6711383924997	54.404518474086	79.86750899	54.35421653	0.202710806
79.6711383924997	54.404518474086	87.34079917	59.37931572	11.8500657
70.8696927983826	58.1808809837551	70.94365949	58.14560753	0.08194644
70.8696927983826	58.1808809837551	69.70404765	60.5822767	3.495543351
70.8696927983826	58.1808809837551	65.84999623	61.37790202	9.405960407
66.7618830754406	71.7761683252729	66.81087893	72.19337817	0.774597684
56.8271718556476	76.4218843353836	58.21523833	76.77458472	1.432175303
56.8271718556476	76.4218843353836	55.99099974	83.60147673	11.10984141
52.0783316242478	76.4218843353836	55.58088554	76.52999392	3.50422197
52.0783316242478	76.4218843353836	52.24575767	74.98560476	1.544515511
52.0783316242478	76.4218843353836	52.40986372	76.90026657	0.582033584
48.282423595723	80.353642381467	51.91564321	83.24154723	4.641150631
48.282423595723	80.353642381467	46.11608956	79.13405595	3.077288175
48.282423595723	80.353642381467	49.77274656	84.13753559	4.242971999

Solution x	Solution y	Original x	Original y	Radius
48.282423595723	80.353642381467	44.47086767	80.17305261	4.558123438
48.282423595723	80.353642381467	45.3176187	83.7901857	4.538711056
44.9738406477539	81.3251228254229	44.66930475	80.79724102	1.096402137
44.9738406477539	81.3251228254229	45.13867401	81.86371268	0.563248674
39.0482017316346	81.3251228254229	38.78697828	81.20736169	1.751750667
39.0482017316346	81.3251228254229	40.16683897	89.097423	10.1742901
39.0482017316346	81.3251228254229	34.03327785	85.06694553	9.82794583
39.0482017316346	81.3251228254229	32.21271953	85.45061531	9.951664756
32.7059581060637	81.3251228254228	35.96077646	77.38727187	5.108866084
32.7059581060637	81.3251228254228	32.56942546	80.98884638	0.362936649
32.7059581060637	81.3251228254228	32.77989789	83.25231939	4.247864371
29.9539295657348	81.9330219322075	29.49613778	81.77737157	0.723751207
29.9539295657348	81.9330219322075	30.96168192	84.99460949	5.800733164
29.9539295657348	81.9330219322075	31.92346769	85.96439053	5.672562244
29.9539295657348	81.9330219322075	25.47356848	81.94258519	6.220239291
29.9539295657348	81.9330219322075	24.67927032	81.21698222	7.738446369
29.9539295657348	81.9330219322075	28.94608169	87.05476962	8.550013673
29.9539295657348	81.9330219322075	26.49994117	86.49656314	11.41565502
29.9539295657348	81.9330219322075	24.93956922	85.18138774	10.96633056
29.9539295657348	81.9330219322075	24.79158589	85.73273425	9.89839469
29.9539295657348	83.8761891205746	28.34961296	82.66841267	2.008122438
29.1565392097491	86.825553057569	28.95022635	86.79829568	0.208105648
29.1565392097491	86.825553057569	30.46512782	92.10545477	8.699579279
29.1565392097491	86.825553057569	30.51609732	92.20951413	7.873323153
29.1565392097491	86.825553057569	30.18341718	92.15484297	6.43104448
29.1565392097491	86.825553057569	24.68088332	89.71453351	5.772547732
29.1565392097491	86.825553057569	26.20322759	94.45704722	10.10698797
29.1565392097491	86.825553057569	21.61123904	90.19731465	9.443600344
29.1565392097491	86.825553057569	25.58817455	94.62259734	11.27075496
26.8795189677838	89.4007280721457	31.03913924	88.81924735	5.700862296
26.8795189677838	89.4007280721457	29.03165996	90.53300961	3.624031953
26.8795189677838	89.4007280721457	22.46431132	85.87828698	5.64815455
26.8795189677838	89.4007280721457	23.92476676	88.85275247	4.755388035
26.8795189677838	89.4007280721457	24.92385591	92.07997464	3.317074037
27.9413185735653	93.0068950559979	30.08845088	94.04600611	2.38535719
27.9413185735653	93.0068950559979	27.03699297	98.99807723	9.045435578
25.2429421403235	93.0068950559907	25.24294214	93.18181598	0.174920924
25.2429421403235	93.0068950559907	23.10855555	93.46528062	6.046811031
25.2429421403235	93.0068950559907	22.62104276	94.03699994	3.483508579
25.2429421403235	93.0068950559907	19.55892343	94.48515334	8.137719702
25.2429421403235	93.0068950559907	21.95406549	97.08230078	5.310921574
25.2429421403235	93.0068950559907	22.06521104	97.80973943	10.44097889
25.2429421403235	93.0068950559907	23.23282295	99.37897746	9.140009252
25.2429421403235	93.0068950559907	21.53298817	97.76613815	6.447332374
25.2429421403235	93.0068950559907	17.22630202	94.08640458	10.84424377
25.2429421403235	93.0068950559907	22.00240146	99.12603644	7.885601786
18.8749495257912	92.7729800667441	20.03955091	90.83830295	2.258156755
18.8749495257912	92.7729800667441	18.21730526	92.48725442	1.5701409
18.8749495257912	92.7729800667441	18.65944439	93.90622028	1.153549238
17.5657404147092	92.7729800667441	17.25875189	95.69940805	3.398739413
16.850805661251	92.070161258098	16.85080568	91.45389056	0.616270698
16.850805661251	92.070161258098	12.03430063	87.78817585	9.339380238
16.850805661251	92.070161258098	13.01348985	89.5505908	6.625491116
16.850805661251	92.070161258098	16.10416337	94.62212285	7.114799892
16.850805661251	92.070161258098	8.842438164	89.89183088	9.248878075
16.850805661251	92.070161258098	8.980893435	92.30918249	10.59560796
16.850805661251	92.070161258098	11.04946885	95.30278919	11.15137795
14.8190108072513	92.5605520027706	14.30638295	91.72702037	2.704929464
14.8190108072513	92.5605520027706	14.02380259	94.55773265	2.149671288
14.8190108072513	88.2953945694104	20.16675465	86.45561332	5.662375247
14.8190108072513	88.2953945694104	15.06397637	86.4956065	2.769631739
14.8190108072513	88.2953945694104	9.921883095	86.8721598	5.099750684
14.8190108072513	88.2953945694104	9.98481624199999	87.60870523	5.654212003
14.8190108072513	88.2953945694104	12.48771043	90.90107319	3.496358466
19.0013979044687	86.9082076879856	17.38954679	82.23173111	4.9464631
19.0013979044687	86.9082076879856	18.16441332	83.32201509	4.389263708
19.0013979044687	86.9082076879856	20.47481611	85.68176763	4.269604774
19.0013979044687	86.9082076879856	21.4032788	88.65695382	2.971051139
19.0013979044687	86.9082076879856	18.85500198	86.61471751	1.746017703
21.6337999883544	88.3249805295175	20.75129811	88.7330358	0.972274996
21.6337999883544	88.3249805295175	15.25088212	86.85170355	8.312417494
21.6337999883544	88.3249805295175	10.77763243	89.00986935	11.5413795
21.6337999883544	89.7371231950368	21.63379999	90.72848541	0.991362215
23.8231535628126	80.5060899862701	23.53960858	80.471438	0.285654541
23.8231535628126	80.5060899862701	16.23739593	85.87006787	9.998633909
30.5695024631013	77.4149415673368	35.03662295	76.31902131	4.632798788
30.5695024631013	77.4149415673368	32.43971284	75.52883521	2.656140818
30.5695024631013	77.4149415673368	31.34183617	77.86791685	1.166905359
30.5695024631013	77.4149415673368	29.81370195	76.77877617	0.987897175
30.5695024631013	77.4149415673368	31.54519137	79.16359507	3.505835342

Solution x	Solution y	Original x	Original y	Radius
30.5695024631013	77.4149415673368	29.7776223	79.3796747	3.220365403
30.5695024631013	77.4149415673368	29.05539546	78.84402949	4.430792212
32.104435454932	70.138040114414	31.96159565	70.60936436	0.492493397
32.104435454932	70.138040114414	31.67974116	78.20082263	10.5302733
32.104435454932	70.138040114414	24.84752889	78.21896812	11.0945574
36.8294974292023	63.4180157958732	36.99117209	62.09652931	3.164960791
36.8294974292023	63.4180157958732	36.88863481	65.11756178	1.700574542
43.0589269516954	62.2285982463268	45.68320409	63.6499192	2.984457028
43.0589269516954	62.2285982463268	41.95981534	64.94436816	2.929752986
49.5927418747096	62.2285982463268	50.29671492	64.07582579	2.617903286
49.5927418747096	60.4720644288221	49.52719402	60.88674536	0.419829482
49.5927418747096	60.4720644288221	43.40294282	59.60424206	9.536160415
49.5927418747096	60.4720644288221	42.95157888	64.84132436	9.17378456
55.2381707812669	58.0268782577863	55.16481024	55.42346911	2.604442543
55.2381707812669	58.0268782577863	55.40337389	57.61168804	1.863254992
58.0421570887233	58.0268782577864	62.81703196	55.94894639	5.494902887
58.0421570887233	58.0268782577864	56.36080227	54.43871329	4.01664825
58.0421570887233	58.0268782577864	61.59665848	60.86573745	4.870665397
58.0421570887233	58.0268782577864	57.09480153	60.45993374	2.677287543
64.2559453010829	46.2557492531226	63.21772914	46.4808445	2.251010045
79.6711383924997	29.7219014158817	75.00767938	29.50135545	5.124594895
Route: 5 Length: 295.074345867493 Demand Met: 2881				
85.22979418	12.1228646580006	85.22979418	8.715884504	3.406980154
85.22979418	12.1228646580006	83.75499038	5.857780347	7.422722871
93.0477173370959	13.6374742683179	87.03899122	21.09553754	10.64878101
93.0477173370959	13.6374742683179	94.15587216	20.2227246	8.426061551
93.0477173370959	13.6374742683179	95.99475962	18.1472698	6.014618976
93.0477173370959	13.6374742683179	93.53556787	11.2495411	9.93311926
93.0477173370959	13.6374742683179	94.43184685	8.796264511	5.035188817
93.0477173370959	18.0835686677635	90.81819821	18.2159484	2.233445753
93.0477173370959	30.6655210226969	94.17807015	30.5898166	2.95308255
93.0477173370959	56.2055519043924	91.19333201	55.09349477	2.162271031
94.8648814359991	57.6821517300001	95.77662579	57.68215173	0.911744354
92.5257373113524	71.946852205714	91.59995025	72.67875795	6.385143329
92.5257373113524	71.946852205714	91.90328388	76.16243153	10.02897755
92.5257373113524	71.946852205714	93.29522257	74.82458329	10.91349472
92.5257373113528	84.0039622627388	94.75890926	85.83537613	2.888102094
92.5257373113528	84.0039622627388	97.99058573	82.84537681	9.301137649
91.5865014317593	87.7304315024763	87.63411723	89.72076827	4.425243646
91.5865014317593	87.7304315024763	93.12739448	86.70709298	11.17874385
86.1092168929378	91.269607107	86.10921689	91.46882481	0.199217703
86.1092168929378	91.269607107	79.39161289	97.26593015	9.87516425
86.1092168929378	91.269607107	91.04765146	90.60180149	7.6089096
86.1092168929378	91.269607107	86.37403118	99.02923308	11.96387757
82.5399208205953	90.6177680063763	82.53992082	88.87907996	1.738688046
80.9701830979257	98.9609931270897	80.84419352	99.98848979	4.64228932
80.9701830979257	98.9609931270897	78.18108034	99.79242924	11.42083614
80.9701830979257	98.9619931270897	74.57969734	99.83821951	6.450291742
54.624110420271	98.9619931270898	52.60387814	98.51053443	2.070061212
54.624110420271	98.9619931270898	48.82360524	98.37839062	7.220914682
53.8235172182008	98.9619931270898	54.29998953	99.89190946	1.044878103
53.8235172182008	98.9619931270898	53.69991452	99.81161169	0.858562362
51.8669482742782	98.9619931270898	57.58318464	98.55697919	7.09566511
51.8669482742782	98.9619931270898	52.71570498	99.46690315	5.481309266
51.8669482742782	98.9619931270898	52.2623599	99.83573023	3.745784047
49.0518995377981	98.2838861825181	48.39934621	99.02729511	0.989182834
49.0518995377981	98.2838861825181	44.53236455	98.59505273	8.99567986
46.5403104991784	94.821341713604	48.69087386	94.64188777	2.380405111
46.5403104991784	94.821341713604	46.20732106	94.82215894	0.332990442
43.5288082718883	93.1842796409179	48.45592928	88.4082341	6.862006444
43.5288082718883	93.1842796409179	45.13861135	90.47060332	6.162353189
43.5288082718883	93.1842796409179	42.23200248	88.95299773	4.651433464
43.5288082718883	93.1842796409179	43.91518159	93.39792889	1.222268104
43.5288082718883	93.1842796409179	42.53215273	92.92397176	1.03008857
43.5288082718883	93.1842796409179	39.86881125	93.47781189	5.895861926
43.5288082718883	93.1842796409179	45.34071838	99.2752365	6.545950484
39.8303506924599	96.7210263189521	36.79414467	92.2553405	5.623371076
39.8303506924599	96.7210263189521	39.44288188	96.38027853	1.997947716
39.8303506924599	96.7210263189521	41.23951851	98.4925435	2.263631388
39.8303506924599	96.7210263189521	39.47053756	98.01039691	1.338634383
39.8303506924599	96.7210263189521	37.87107476	99.67477247	5.142647072
39.8303506924599	96.7210263189521	37.35140359	99.57591236	4.551929256
39.8303506924599	96.7210263189521	35.92075185	99.04269187	5.09129157
38.3554227499999	96.13365876	37.83606476	96.13365876	0.51935799
38.3554227499999	96.13365876	34.28587406	93.01320732	5.515074689
38.3554227499999	96.13365876	33.84742868	94.52834747	8.71001742
38.3554227499999	96.13365876	31.89808649	95.62749105	8.151929048
38.3554227499999	93.2106976312897	35.55901251	90.85604615	4.28990011
38.3554227499999	93.2106976312897	36.26720319	91.81523904	3.763004237
38.3554227499999	93.2106976312897	36.86677729	93.06343809	3.595056547

Solution x	Solution y	Original x	Original y	Radius
38.3554227499999	93.2106976312897	39.84944538	96.227912	4.047622309
38.3554227499999	86.7981957433931	38.21932161	86.88940242	0.372090901
38.3554227499999	86.7981957433931	37.64776281	91.60925844	7.287109974
38.3554227499999	86.7981957433931	33.91919319	90.52236574	7.193036058
38.3554227499999	86.7981957433931	32.33676606	89.56266763	6.977995049
38.3554227499999	86.7981957433931	35.60188133	93.1465045	7.692381008
38.3554227499999	86.7981957433931	30.78074407	88.67743671	9.308222123
38.3554227499999	83.8288512380508	38.25086273	84.70191635	0.879303979
38.3554227499999	83.8288512380508	40.55838899	87.88304878	7.94496914
38.3554227499999	83.8288512380508	36.90788531	88.78292268	8.871911482
38.3554227499999	83.8288512380508	36.43143728	90.48214242	6.954373264
38.3554227499999	83.8288512380508	32.87814817	90.10176773	9.598818493
38.3554227499999	83.8288512380508	36.31961338	94.1541845	11.14531248
40.5794942995865	80.7012350737638	45.32225765	79.26748614	4.954739166
40.5794942995865	80.7012350737638	41.14833132	82.10595877	1.515527703
42.3406971491442	79.7418891854166	43.12816365	79.63219046	0.795070626
42.3406971491442	79.7418891854166	36.17809574	80.13104248	8.234427368
42.3406971491442	79.7418891854166	33.71990859	84.56649705	11.87467854
44.2906668492284	79.7418891854166	44.56064253	79.77318093	0.271783078
44.2906668492284	79.7418891854166	46.93472918	83.75304242	7.122281837
44.2906668492284	79.7418891854166	46.03038143	83.79986665	6.928032766
44.2906668492284	79.7418891854166	40.58416037	81.54961967	7.064640642
44.2906668492284	79.7418891854166	46.02083433	88.3362158	9.025977842
44.2906668492284	79.7418891854166	38.00030199	82.20200968	9.151482372
44.2906668492284	79.7418891854166	39.57638463	86.69599702	10.21132869
48.8595511147183	78.3919473313804	49.13669956	77.10708156	1.314416719
48.8595511147183	78.3919473313804	49.62844822	78.65994225	3.895592856
48.8595511147183	78.3919473313804	47.14165764	77.84331314	3.855818645
48.8595511147183	78.3919473313804	49.55654528	80.81624315	5.359214828
48.8595511147183	78.3919473313804	47.92908542	80.11129273	4.896396861
48.8595511147183	78.3919473313804	48.20934555	82.30314786	7.596162818
51.1764398548906	73.6106551740016	51.17754367	73.39508539	0.21557261
51.1764398548906	73.6106551740016	41.95376322	74.60739468	10.5272795
51.1764398548906	73.6106551740016	49.21219028	82.18677234	11.80432558
52.4570640636795	67.542790652597	52.45383187	66.17944394	1.363350544
54.0885950509791	63.4028438956866	54.15102156	63.89433124	0.495436049
54.0885950509791	63.4028438956866	49.39322363	67.57061768	11.53351655
54.0885950509791	63.4028438956866	44.96838238	64.05706864	9.942108139
54.0885950509791	63.4028438956866	53.90080059	74.55382457	11.74270355
58.5042766035175	53.658540145393	58.50503897	53.8647284	0.206189664
58.5042766035175	53.658540145393	61.56325619	58.635877	7.786489382
58.5042766035175	53.658540145393	54.43373891	52.12894009	7.548403707
58.5042766035175	53.658540145393	59.77266019	58.01872841	6.553588622
58.5042766035175	53.658540145393	56.73611746	58.87824868	10.42122905
58.5042766035175	53.658540145393	53.70737401	57.8077763	11.42963583
58.5042766035175	53.658540145393	56.12304172	60.76926662	8.549372537
58.5042766035175	53.658540145393	48.65047008	56.26343732	11.1175127
58.5042766035175	53.658540145393	53.04622082	62.56220406	11.46013038
67.0439893606583	51.3899211543199	64.75792457	49.92103542	4.153788299
71.1188625696338	49.7077559939574	74.78372311	42.05088328	8.48875153
71.1188625696338	49.7077559939574	78.85550393	52.04144231	8.272925398
71.1188625696338	49.7077559939574	66.65703205	47.7722791	4.863538053
71.1188625696338	49.7077559939574	72.13050555	55.03070373	5.622701454
Route: 6 Length: 188.960352470954 Demand Met: 2892				
77.0062760003747	46.6699609118705	79.30599483	40.28434635	6.78710395
77.0062760003747	46.6699609118705	77.14427045	45.25079579	1.425858377
77.0062760003747	46.6699609118705	73.13866372	41.71405139	6.333819835
77.0062760003747	46.6699609118705	77.77449926	46.72256252	0.900649502
77.0062760003747	46.6699609118705	76.57028534	49.55513485	6.459051132
72.7100792992258	54.8766178643212	72.73426073	54.95021428	0.075751006
72.7100792992258	54.8766178643212	71.85259834	57.85616299	6.145303146
72.7100792992258	54.8766178643212	68.52022941	55.69012612	6.004927032
72.7100792992258	54.8766178643212	76.04244622	64.45001766	10.41499903
72.7100792992258	54.8766178643212	74.85083054	64.74645556	10.29426937
66.9342099824446	55.8333094581334	64.66140077	51.58253517	4.820243123
66.9342099824446	55.8333094581334	66.67873973	56.13517049	1.600074425
66.9342099824446	55.8333094581334	67.27809665	56.79217526	1.980408171
66.9342099824446	55.8333094581334	65.98277732	56.02257659	2.034393571
66.169718129449	63.8805427742283	67.87575086	63.89107621	2.566981804
66.169718129449	63.8805427742283	65.33791464	63.72798066	0.84567857
60.5519413072269	63.8805427742283	61.64088805	64.72462094	1.377778269
60.5519413072269	63.8805427742283	67.45457311	72.85375456	11.61655168
60.5519413072269	63.8805427742283	59.0134746	66.34233581	8.63026105
60.5519413072269	63.8805427742283	57.97334153	65.39941546	9.414607276
60.5519413072269	63.8805427742283	58.20433528	69.50520456	8.582697416
60.5519413072269	63.8805427742283	56.84900895	69.27095699	9.651018813
60.5519413072269	63.8805427742283	52.68458788	66.68600654	11.1378938
57.0019659411544	68.6260004687758	62.01287875	62.70691628	7.75530817
57.0019659411544	68.6260004687758	63.53725064	67.03413314	7.164195385
57.0019659411544	68.6260004687758	59.10597324	64.72617137	7.277653794

Solution x	Solution y	Original x	Original y	Radius
57.0019659411544	68.6260004687758	60.59756518	67.42291916	6.033901052
57.0019659411544	68.6260004687758	56.20333441	63.09635143	7.090992634
57.0019659411544	68.6260004687758	52.64945222	62.68533593	7.539647236
57.0019659411544	68.6260004687758	54.03625818	65.02303827	5.354401863
57.0019659411544	68.6260004687758	61.63608438	74.03409399	7.121975094
57.0019659411544	68.6260004687758	55.90538334	73.56581582	5.910476566
55.7200204184488	71.755221721	55.72002047	71.91921816	0.163996439
55.7200204184488	71.755221721	50.78444002	76.12504454	8.918500215
55.7200204184488	71.755221721	53.08761619	83.0335557	11.99564131
53.6018752066586	70.9185752663629	53.60239056	70.80290226	0.11567415
50.2006473068531	70.3310451584857	52.59359138	61.87082203	8.855134315
50.2006473068531	70.3310451584857	50.86986196	67.11854893	4.50428609
50.2006473068531	70.3310451584857	47.89205446	67.3947139	3.735189713
50.2006473068531	70.3310451584857	53.92763119	74.12654413	8.444710151
50.2006473068531	70.3310451584857	51.91696279	73.69595809	5.533020939
50.2006473068531	70.3310451584857	51.90516717	74.10528304	4.497348507
50.2006473068531	70.3310451584857	49.38151416	71.84627519	5.560857427
50.2006473068531	70.3310451584857	47.34853229	74.63427391	8.300992216
45.5908456859561	70.3281064120011	45.59084573	70.21452412	0.113582292
45.5908456859561	70.3281064120011	42.13585343	68.94604524	4.750703238
45.5908456859561	70.3281064120011	44.13660931	71.38940487	5.060740493
45.5908456859561	70.3281064120011	39.75179858	71.51477588	9.864345808
45.5908456859561	70.3281064120011	41.14789047	74.75727523	7.341258219
45.5908456859561	70.3281064120011	40.76978451	74.94346594	8.186468819
45.5908456859561	70.3281064120011	38.19879917	73.45302115	11.60064907
45.5908456859561	70.3281064120011	38.20769452	77.89743741	10.9290231
45.5908456859561	70.3281064120011	36.44207057	76.13900165	11.50367704
42.5877367919571	72.287317137029	43.59103477	70.75648589	1.830314492
42.5877367919571	73.1449163440554	42.58773685	73.94634336	0.801427016
42.5877367919571	73.1449163440554	40.77647626	81.23711291	8.680043042
42.5877367919571	73.1449163440554	34.30971303	75.90183293	10.30780315
42.5877367919571	73.1449163440554	38.24583972	80.95791524	10.77332683
40.4919317095772	69.3629276861863	38.18944723	65.54612606	4.457511574
40.4919317095772	69.3629276861863	41.30767537	70.05965636	2.389077221
40.4919317095772	69.3629276861863	39.12047899	68.75765335	3.957947734
40.4919317095772	69.3629276861863	37.43465738	70.14594443	3.15595335
40.553322499	67.4520222484584	44.42598809	67.45202223	3.872665591
40.553322499	67.4520222484584	40.91327599	65.05437313	3.322312195
40.553322499	67.4520222484584	39.73860453	66.92518954	1.039178085
40.153246207	61.9741816908701	38.87334077	61.97418169	1.279905437
40.153246207	61.9741816908701	36.53251416	65.89826385	7.253690252
40.153246207	61.9741816908701	34.32584869	66.311045	8.8122254
40.153246207	61.9741816908701	33.57300136	70.51852673	11.82127081
42.0766800875748	60.4249483339782	41.72170476	60.36141703	0.360615737
42.0766800875748	60.4249483339782	41.10546356	60.73573959	2.160394708
42.0766800875748	60.4249483339782	41.72708173	62.5487287	8.265204335
42.0766800875748	60.4249483339782	38.55825219	62.0328479	8.230604564
42.0766800875748	60.4249483339782	37.36735143	64.72519961	8.210035462
42.0766800875748	60.4249483339782	39.83687168	68.05987049	8.931405029
42.0766800875748	60.4249483339782	38.57181853	69.29967661	10.842735
48.2723138903903	60.1493178872998	53.50308144	57.04941766	6.080321585
48.2723138903903	60.1493178872998	46.15723029	56.4070148	5.286178878
48.2723138903903	60.1493178872998	45.47068469	56.96814934	4.238980951
48.2723138903903	60.1493178872998	50.37372436	63.54183807	3.991959404
49.4071961434258	54.581081114246	52.57887869	54.16196226	4.016092555
49.4071961434258	54.581081114246	48.91348948	54.77748717	1.998111236
49.4071961434258	54.581081114246	48.01348394	55.67625048	3.794373864
50.9881599257637	49.6175306851915	52.03099226	42.50134863	7.192186477
50.9881599257637	49.6175306851915	55.80484172	50.30189669	7.040116877
50.9881599257637	49.6175306851915	50.26037041	48.95030273	0.987355419
50.9881599257637	49.6175306851915	45.94832838	45.50704308	7.19052718
50.9881599257637	49.6175306851915	49.48945411	49.44119699	4.953096168
50.9881599257637	49.6175306851915	47.38308024	49.71863955	4.361961303
53.4887609246438	47.1228704224607	53.79810347	45.16180718	1.985311525
53.4887609246438	47.1228704224607	53.22205568	50.84724902	8.874987766
55.9900362987591	41.0523461571018	56.1557774	36.1071959	6.201998603
55.9900362987591	41.0523461571018	57.56166222	41.97700689	1.823459763
55.9900362987591	41.0523461571018	57.48443808	43.25173204	5.068521277
55.9900362987591	41.0523461571018	51.33580352	40.30660727	4.986289138
65.8413818097759	41.0523461571018	75.19376171	39.75388964	11.99616742
65.8413818097759	41.0523461571018	74.55729645	43.48740037	11.94062462
65.8413818097759	41.0523461571018	62.83458953	32.37480154	11.26631142
65.8413818097759	41.0523461571018	70.24663893	43.40548551	10.39433718
65.8413818097759	41.0523461571018	71.61626861	44.97765672	11.56039904
65.8413818097759	41.0523461571018	63.76560063	37.45231942	11.55334525
65.8413818097759	41.0523461571018	63.54041364	40.47906672	10.09103037
65.8413818097759	41.0523461571018	63.12520069	41.24941139	6.279661735
65.8413818097759	41.0523461571018	71.99750065	50.82091856	11.82057255
65.8413818097759	41.0523461571018	58.14893689	37.55022655	9.288752836
65.8413818097759	41.0523461571018	64.47235297	44.07915445	7.777532307

Solution x	Solution y	Original x	Original y	Radius
65.8413818097759	41.0523461571018	58.48548965	38.49282405	11.79894595
65.8413818097759	41.0523461571018	63.41360315	44.69674786	7.070238855
65.8413818097759	41.0523461571018	67.10787364	49.80646667	8.845260172
65.8413818097759	41.0523461571018	59.28037529	42.02965748	8.171091803
65.8413818097759	41.0523461571018	55.55130491	39.21526309	11.86807905
65.8413818097759	41.0523461571018	57.35658457	43.71456461	10.0633535
65.8413818097759	41.0523461571018	63.59211348	50.34808715	9.725987624
70.6526539626514	41.0523461571018	69.67922342	40.74675918	1.020269779
Route: 7 Length: 235.560722510829 Demand Met: 2977				
60.364601227227	38.3650457166825	58.09138733	33.97784367	4.941158085
60.364601227227	38.3650457166825	61.01859213	37.82208646	0.850005209
51.5515448602343	42.0973637126305	54.69460289	37.32086801	6.733868048
51.5515448602343	42.0973637126305	51.12261026	42.05252276	1.177483398
51.5515448602343	42.0973637126305	49.90577559	41.072269	2.801182703
51.5515448602343	42.0973637126305	51.65508094	43.85648581	1.762166358
42.0524420867664	54.8335001052099	41.84687745	52.15158968	3.267858024
42.0524420867664	54.8335001052099	39.86159624	55.58185516	2.315133001
36.8802407465818	56.8441523889099	42.10911161	58.06602885	5.369736734
36.8802407465818	56.8441523889099	39.00311055	58.98114927	3.475306118
36.8802407465818	56.8441523889099	32.83493269	54.50530143	5.131563652
36.8802407465818	56.8441523889099	36.65639834	59.2724504	2.438593171
36.8802407465818	56.8441523889099	34.15128455	57.37934974	3.806785854
32.4000339014017	60.1532262860989	32.47933058	60.09950546	0.095780428
32.4000339014017	60.1532262860989	29.89833465	58.88393924	9.428399067
32.4000339014017	60.1532262860989	32.28903103	63.37386507	5.529867185
32.4000339014017	60.1532262860989	28.86030824	61.83789689	5.323228343
32.4000339014017	60.1532262860989	26.36749261	61.24478927	10.05967123
32.4000339014017	60.1532262860989	25.66105506	62.27941228	9.39136023
32.4000339014017	60.1532262860989	22.84438078	60.01413405	9.832099483
32.4000339014017	60.1532262860989	21.56136042	60.00845368	11.66584778
32.4000339014017	60.1532262860989	30.01509861	69.93828769	10.72586107
31.855930133	62.7454817400089	31.78300706	62.74548174	0.072923073
31.855930133	62.7454817400089	33.85806756	68.2147305	8.272925857
31.855930133	62.7454817400089	27.36103425	64.84526011	5.82414556
31.855930133	62.7454817400089	26.6523776	66.91672378	7.970867369
32.450057800262	65.0499479010086	38.05290287	66.43336709	5.771110944
32.450057800262	65.0499479010086	32.14669335	66.5741861	2.169371802
29.4788100799191	65.0499479010086	29.47881008	65.01108227	0.038865631
29.4788100799191	65.0499479010086	24.37529212	73.10827156	9.946110191
29.4788100799191	65.0499479010086	22.14002238	72.37729838	10.56803504
27.4008390272081	66.6411440117403	28.77703399	67.75671878	2.359780417
27.4008390272081	75.2075128677675	28.44331265	74.98671685	1.065596119
27.4008390272081	75.2075128677675	25.39416892	74.01493111	4.846769394
27.4008390272081	75.2075128677675	27.46499326	78.56518576	6.680683032
27.4008390272081	75.2075128677675	24.57644237	79.57543571	7.621327433
27.3945381804282	75.2075128677675	28.17365085	71.94302821	4.360337135
27.3945381804282	75.2075128677675	29.09610379	74.18683092	3.584248474
27.3945381804282	75.2075128677675	25.63863856	75.55318582	1.789599458
21.4907373163958	76.0530568725607	21.16552744	75.92926841	0.348170438
21.4907373163958	76.0530568725607	19.47269695	75.25893863	3.538510883
21.4907373163958	76.0530568725607	22.96398221	79.24584246	5.253467184
21.4907373163958	76.0530568725607	18.46683587	77.29301103	4.716670657
21.4907373163958	76.0530568725607	18.15532249	77.80652015	5.054973135
21.4907373163958	76.0530568725607	20.11668251	80.56671914	7.222669816
21.4907373163958	76.0530568725607	14.92906226	79.42060964	9.914113666
21.4907373163958	76.0530568725607	12.87616068	80.54131267	11.25097601
21.3745185991627	76.5189543608555	21.04749508	76.84597788	0.462481096
21.3745185991627	76.5189543608555	19.29153506	80.52426775	5.162100755
21.3745185991627	76.5189543608555	17.20155001	81.69531761	7.066943728
22.7898272013804	73.3376762819424	22.68191696	72.90808337	0.442938698
22.7898272013804	73.3376762819424	17.24413003	73.14298035	6.329084859
23.9129271884903	73.3376762819233	23.86908483	73.83689183	0.501137023
23.9129271884903	73.3376762819233	18.31523717	76.27495825	7.153261702
23.9129271884903	73.3376762819233	21.51917751	80.74471553	9.9567065
23.9129271884903	73.3376762819233	18.15807888	79.40011164	9.804701845
23.9129271884903	73.3376762819233	14.09860615	77.68853822	11.70742841
23.9129271884903	73.3376762819233	19.16596982	83.58117432	11.91490763
24.0006214938096	69.0544714877464	26.03259253	67.05188068	2.852941681
24.0006214938096	69.0544714877464	23.39691794	71.43920824	2.45996491
24.179559875992	68.8989419099988	24.34494447	68.89894191	0.165384594
24.179559875992	68.8989419099988	24.00842436	69.26671548	3.536360214
24.179559875992	68.8989419099988	22.95220857	73.2582761	8.329429805
24.179559875992	68.8989419099988	21.60880813	73.64895737	8.789616797
24.179559875992	68.8989419099988	22.95922483	75.83051285	9.548150341
24.179559875992	68.8989419099988	20.16006997	73.55306832	7.784192094
24.179559875992	68.8989419099988	18.49430275	75.1491321	9.770365975
24.179559875992	68.8989419099988	18.79013692	77.54174683	11.83768723
23.308990866621	68.276414528669	21.2618816	68.31108552	3.123606085
23.308990866621	68.2754145286691	21.52581462	69.05739134	1.947101759
23.308990866621	68.2754145286691	14.01917911	69.22007201	9.959122763

Solution x	Solution y	Original x	Original y	Radius
23.308990866621	68.2754145286691	15.83973733	72.60736968	9.12349234
22.8230306654242	64.2960759341513	22.58317288	64.23875961	0.246610864
22.8230306654242	64.2960759341513	21.61039636	65.83676525	4.44331993
22.8230306654242	64.2960759341513	19.92687299	66.4828608	7.674542398
22.8230306654242	64.2960759341513	20.75020952	68.82081849	6.986664743
22.8230306654242	64.2960759341513	16.73656026	65.26611785	7.348251841
22.8230306654242	64.2960759341513	14.35540419	64.70998039	9.721773775
22.8230306654242	64.2960759341513	14.52745655	66.82146945	9.209129847
22.8230306654242	64.2960759341513	19.17901123	72.48982593	10.20159412
22.5888471918629	60.8930883022219	20.97945435	58.66863495	2.745603401
22.5888471918629	60.8930883022219	21.30645349	61.8915326	1.625246019
24.8510960073318	60.8930883022219	25.84588775	61.17671521	1.034434548
24.8510960073318	60.8930883022219	26.46280572	62.61127777	3.79783788
24.8510960073318	60.8930883022219	26.36495426	64.10386589	5.012038977
24.8510960073318	60.8930883022219	25.20403775	63.98638021	4.126692706
24.8510960073318	60.8930883022219	24.66562586	67.58605744	8.251747258
24.4000108650016	58.82740751	24.05460087	58.82740751	0.345409995
24.4000108650016	58.82740751	18.97844246	66.0992932	9.320379407
25.7762871761031	56.6061174727975	25.6524776	56.5792119	0.126699333
25.7762871761031	56.6061174727975	24.58618772	59.92581691	6.813403422
25.7762871761031	56.6061174727975	19.29354577	63.34226321	9.732805781
30.8567049789621	55.4378090570986	30.62796082	46.77730777	8.83821808
30.8567049789621	55.4378090570986	33.45872958	53.85918585	6.545746658
30.8567049789621	55.4378090570986	37.67648628	59.01822185	8.663388767
30.8567049789621	55.4378090570986	28.94274384	52.01860718	4.898024634
30.8567049789621	55.4378090570986	35.39691212	60.01558524	7.016255469
30.8567049789621	55.4378090570986	28.17203359	56.51587977	4.557563307
30.8567049789621	55.4378090570986	24.61643689	54.01115924	7.411713322
30.8567049789621	55.4378090570986	28.38294287	59.7022254	6.876187581
30.8567049789621	55.4378090570986	28.66025221	61.13181458	8.682831908
30.8567049789621	55.4378090570986	24.68488711	59.85199485	7.587909595
30.8567049789621	55.4378090570986	25.08011935	60.4806985	8.52356797
30.8567049789621	50.6838824122093	34.68773061	48.27076221	4.719701242
30.8567049789621	50.6838824122093	28.72359173	49.06807614	3.019170961
30.8567049789621	50.6838824122093	31.12121771	52.61678334	1.950915934
30.8567049789621	44.0633029269519	30.83636789	38.35208021	5.711258926
30.8567049789621	44.0633029269519	34.31056081	43.95356429	3.881034988
30.8567049789621	44.0633029269519	28.54401437	40.13690379	5.278992328
30.8567049789621	44.0633029269519	29.65914735	42.12761495	5.483604448
30.8567049789621	44.0633029269519	26.567735	46.7768569	5.167125033
30.8567049789621	39.8227062856118	30.41452332	39.55317391	2.75931255
30.8567049789621	39.8227062856118	30.28185343	43.77834378	7.043480934
31.4152003383041	34.9698251619163	31.17947294	31.40633137	3.870118229
31.4152003383041	34.9698251619163	31.80606468	35.45021175	0.619311075
36.7308053346039	30.1182826899127	37.07046765	30.04479215	0.347521723
40.2559520739254	30.118282689913	40.57036155	31.31828969	1.240512039
40.2559520739254	30.118282689913	36.2315122	27.60710766	7.544747892
40.2559520739254	30.118282689913	37.51752459	33.09106605	9.30247437
40.2559520739254	30.118282689913	39.35568633	35.06788426	9.948736286
46.5134686868815	26.6974892930892	50.20668952	26.40233109	3.704996422
48.1206321777876	24.715609662202	51.08696185	26.42044109	3.4213392
48.1206321777876	24.715609662202	46.26887105	26.53209753	8.81744986
48.1206321777876	24.715609662202	48.88810081	29.6929228	11.17097838
Route: 8 Length: 276.017201411684 Demand Met: 2991				
42.9735830968994	34.3758256762892	40.05041388	28.81118981	7.168813073
42.9735830968994	34.3758256762892	44.21687698	34.39769027	3.557457265
42.9735830968994	34.3758256762892	44.94410764	36.28576006	3.530989553
42.9735830968994	34.3758256762892	41.09480481	34.92509896	6.686212606
42.9735830968994	34.3758256762892	40.81010844	38.77304558	5.734432078
39.1968818940778	38.6619020065226	38.90241804	39.45548462	0.84645279
39.1968818940778	38.6619020065226	39.58652985	43.55288071	5.227108341
39.1968818940778	38.6619020065226	38.72818734	43.64397508	6.801536894
39.1968818940778	38.6619020065226	34.06373355	42.77086753	11.54083384
39.1968818940778	38.6619020065226	32.06711817	41.12824267	9.236365321
39.1968818940778	38.6619020065226	31.80593192	45.60640645	10.76621751
36.2122877884331	39.4998974571802	38.78467609	39.06908374	2.608214338
36.2122877884331	39.4998974571802	35.17250587	39.36136713	1.66175135
27.8321489874478	39.4998974571802	29.90863496	38.4851443	2.311172422
27.8321489874478	39.4998974571802	30.33187934	43.75504148	8.637269115
27.8321489874478	39.4998974571802	28.08331623	42.02257662	9.317039589
27.8321489874478	39.4998974571802	24.77779172	44.04083387	11.013687
25.7181133911894	43.6531238313542	25.73174612	44.02606181	0.711901016
25.7181133911894	43.6531238313542	26.12441872	44.96485891	2.839436564
25.7181133911894	43.6531238313542	19.40209516	41.66020767	11.97444555
25.7181133911894	43.6531238313542	22.68802089	46.28526246	10.38254064
25.7181133911894	43.6531238313542	17.44262234	43.68368222	10.91295355
25.7181133911894	43.6531238313542	26.97467166	54.66512134	11.66012717
25.7181133911894	43.6531238313542	18.80954314	50.67936902	11.57690137
25.7181133911894	43.9984331740623	25.71821347	44.02373583	0.02530284
25.7181133911894	43.9984331740623	14.44281578	41.35822358	11.77700274

Solution x	Solution y	Original x	Original y	Radius
16.9840053684655	64.8114405686513	16.63383213	64.77854357	0.351715097
16.9840053684655	64.8114405686513	14.06057656	63.93249207	5.381459732
16.9840053684655	64.8114405686513	12.00297966	63.9466553	5.950994709
16.9840053684655	64.8114405686513	13.50520564	67.72241024	9.360297306
16.9840053684655	64.8114405686513	8.933612257	64.19415642	8.119454693
16.9840053684655	64.8114405686513	14.51945543	70.49107423	7.364687094
16.9840053684655	64.8114405686513	11.73654707	68.82383733	7.948897757
16.9840053684655	64.8114405686513	11.54525803	68.93314303	9.632544021
16.9840053684655	64.8114405686513	13.78543979	72.75062985	9.733830208
16.9840053684655	64.8114405686513	9.964092428	69.02740379	10.49120227
16.2942692937916	67.0258913780003	16.29427026	68.63097998	1.605088602
15.6389314388071	67.0258913780003	15.77830732	66.19409337	0.843394073
15.6389314388071	67.0258913780003	9.088863996	70.57778186	9.588159879
15.6389314388071	67.0258913780003	6.041792217	70.01715429	11.62482668
14.8361701110399	67.0258913780003	14.11476256	66.58488992	0.845524181
14.8361701110399	67.0258913780003	8.880939202	67.16779099	7.575125342
14.8361701110399	72.9184155627853	13.34199807	71.15108407	2.435319437
14.8361701110399	72.9184155627853	14.67447984	73.22055772	0.560824618
14.9888502360521	75.9305770549082	15.50686687	76.44859369	0.73258615
14.9888502360521	75.9305770549082	16.93400358	77.9224885	2.955652193
14.9888502360521	75.9305770549082	9.360499311	76.63383999	9.675555003
14.9888502360521	75.9305770549082	8.595205897	76.73972439	10.65699304
14.9888502360521	75.9305770549082	10.82142722	82.89323555	9.472743412
11.7406065208939	74.5845623213385	16.80968797	72.84815948	5.35823493
11.7406065208939	74.5845623213385	11.56644578	72.10851879	2.482161061
11.7406065208939	74.5845623213385	10.28504553	75.43578797	2.70670664
11.7406065208939	74.5845623213385	8.675234817	76.17385221	4.360484441
9.01858207378726	77.5647390349995	9.018582074	78.03824041	0.473501375
9.01858207378726	77.5647390349995	12.63857375	82.42671014	6.575237335
9.01858207378726	77.5647390349995	5.863440787	76.06172049	5.891195528
9.01858207378726	77.5647390349995	10.08146406	81.46406963	5.184740001
9.01858207378726	77.5647390349995	9.701793671	81.23141394	8.243525166
9.01858207378726	77.5647390349995	5.042739397	78.40053531	10.26257011
9.01858207378726	77.5647390349995	3.765987951	77.28123402	9.204063574
9.01858207378726	77.5647390349995	3.100034102	78.61964126	6.829391359
9.01858207378726	77.5647390349995	7.936374341	83.63932008	7.056138248
9.01858207378726	77.5647390349995	5.724809855	81.80721271	6.479054365
9.01858207378726	77.5647390349995	5.779054124	82.01317499	10.01915756
9.01858207378726	77.5647390349995	4.297539438	80.73294711	11.22405457
9.01858207378726	77.5647390349995	4.961462551	81.51420623	9.226598726
9.01858207378726	77.5647390349995	3.795442881	81.20966501	11.97973034
9.01858207378726	77.5647390349995	3.380314451	80.99890539	11.39696855
9.01858207378726	77.5647390349995	5.902742913	84.57417463	10.96205759
9.01858207378726	77.5647390349995	0.848777488	80.80421078	10.36784038
9.01858207378726	77.5647390349995	4.724328509	85.88211036	10.66842937
4.84718805907255	75.382803819466	5.065657714	76.41830653	1.058298093
4.84718805907255	75.382803819466	1.696022601	79.3379408	6.739019376
4.84718805907255	75.382803819466	3.059490558	82.05603574	7.23908529
4.84718805907255	75.382803819466	0.773453591	79.81662315	6.785233233
4.84718805907255	75.381803819466	2.544714587	74.45838234	3.751572119
4.84718805907255	69.4673802027183	6.334374787	68.85467086	1.608457989
4.84718805907255	69.4673802027183	3.705228073	66.5975084	9.299418871
4.84718805907255	69.4673802027183	3.336609071	66.34370608	10.13002568
4.84718805907255	69.4673802027183	2.766374061	66.09545945	9.314186257
4.84718805907255	69.4673802027183	3.702577787	67.55965669	9.862533299
4.84718805907255	69.4673802027183	6.979895184	73.91637244	7.031194882
4.84718805907255	69.4673802027183	4.203561784	71.28689241	5.184520227
4.84718805907255	69.4673802027183	2.885089549	70.78781924	11.83875801
4.84718805907255	69.4673802027183	2.881941531	70.78732912	7.680996283
4.84718805907255	69.4673802027183	0.155166122	73.1143838	9.943054863
4.0860081555758	65.2872920667244	8.689838933	62.80875147	6.672826006
4.0860081555758	65.2872920667244	3.164572856	61.67055704	3.732266773
4.0860081555758	65.2872920667244	1.282619347	62.39268391	6.209124989
4.0860081555758	65.2872920667244	2.559418382	66.60707534	5.994415632
4.0860081555758	65.2872920667244	2.82031094	66.9400554	6.180554629
4.0860081555758	65.2872920667244	3.972668798	68.43095677	4.819982765
4.0860081555758	65.2872920667244	2.781332517	68.35625636	5.523577876
4.0860081555758	65.2872920667244	1.096851862	69.20060768	4.924336954
3.57989794472027	56.1156338048407	9.265122262	48.10149258	9.899762573
3.57989794472027	56.1156338048407	6.810990128	49.52757429	9.894324521
3.57989794472027	56.1156338048407	5.351054934	54.87903352	3.370669882
3.57989794472027	56.1156338048407	3.166581108	54.38581172	2.806090341
3.57989794472027	56.1156338048407	3.200690229	54.90401263	3.339909369
3.57989794472027	56.1156338048407	0.715064701	54.34039001	5.620649576
3.57989794472027	56.1156338048407	0.102323447	55.05645207	3.635297833
3.57989794472027	56.1156338048407	3.390983182	60.32064994	8.156128877
3.57989794472027	56.1156338048407	0.793870075	65.00803843	9.318627115
5.14648430500026	53.6341927852841	7.880864255	53.63419396	2.73437995
5.14648430500026	48.414487653031	5.283007933	51.8957834	3.483971696
2.62141954801919	44.6268864059245	0.094225631	39.91558536	5.346313369

Solution x	Solution y	Original x	Original y	Radius
2.62141954801919	44.6268864059245	1.775610616	46.38397362	1.950063647
5.41411895757756	44.6268864059245	1.250751092	48.74029716	5.852672895
6.37940323263979	43.033545974408	6.302525489	40.0085763	3.025946417
6.37940323263979	43.033545974408	5.668356774	43.14782971	8.305775856
6.37940323263979	43.033545974408	2.885836634	40.60849192	7.864786769
6.37940323263979	43.033545974408	0.224660494	41.43611847	9.809410917
16.6860188293556	43.033545974408	17.47416259	43.6041515	0.973016574
16.6860188293556	43.033545974408	18.21138052	45.58660191	4.414503197
16.6860188293556	43.033545974408	13.48749824	42.29987548	9.005353542
16.6860188293556	43.033545974408	12.31993183	42.07287161	11.95610617
16.6860188293556	43.033545974408	16.47526591	49.4455512	9.818184126
16.6860188293556	43.033545974408	9.196765131	46.15569372	11.9809647
16.6860188293558	28.032532615675	16.76117492	28.31246812	0.289848796
16.6860188293558	28.032532615675	10.62327399	24.29073933	10.64782213
16.6860188293558	28.032532615675	14.14878683	27.98719075	10.13344558
16.6860188293558	28.032532615675	9.320660383	27.08555662	10.8588123
16.6860188293558	28.032532615675	9.442374955	27.32019574	10.87002293
16.6860188293558	28.032532615675	8.026602483	29.17059173	9.758103666
16.6860188293558	28.032532615675	11.00474377	35.14184161	10.56540176
Route: 9 Length: 333.871395142897 Demand Met: 2962				
28.3439295409958	33.0484588520552	27.42853428	33.27622768	0.943306484
28.3439295409958	33.0484588520552	23.91492832	35.50451908	5.452232026
28.3439295409958	33.0484588520552	19.77510428	38.58926296	11.91376449
20.3802726349062	41.2582450462623	19.64225061	34.99214308	6.554722745
20.3802726349062	41.2582450462623	18.69463352	36.26547074	6.160741982
20.3802726349062	41.2582450462623	23.73647568	45.21539639	5.188751838
20.3802726349062	41.2582450462623	17.93093151	43.30092715	5.511425972
20.3802726349062	41.2582450462623	18.21468575	45.65080463	4.897381571
16.8822703251685	49.1621429726477	17.80089583	46.64512233	2.679415185
16.8822703251685	49.1621429726477	18.13426387	49.15791018	1.2520007
15.6162806890074	54.5729080034957	14.81228179	50.29125842	4.356482226
15.6162806890074	54.5729080034957	15.36448886	54.97389236	0.473484508
14.6880833357628	55.4280752791122	10.20301226	47.6234059	9.015245558
14.6880833357628	55.4280752791122	11.99216143	50.52822644	8.464820885
14.6880833357628	55.4280752791122	17.45311026	57.02027397	4.698442012
14.6880833357628	55.4280752791122	16.07158763	60.00636388	7.250262131
14.6880833357628	55.4280752791122	17.25601024	61.69443137	6.772109512
14.6880833357628	55.4280752791122	11.86612062	56.83051802	3.1512409
14.6880833357628	55.4280752791122	13.17908278	60.05355856	7.781969298
14.6880833357628	55.4280752791122	10.83705181	59.65376627	8.510330825
14.6880833357628	55.4280752791122	10.63863267	61.64507704	8.169031835
13.2177104299981	55.329775749	13.21771043	55.16074821	0.169027539
13.2177104299981	55.329775749	11.71156616	63.23151575	10.95254356
13.2177104299981	55.329775749	8.011277516	61.69215045	10.57580758
13.2177104299981	55.329775749	10.36857839	64.9958121	11.82219863
8.11003530962408	64.5452265113736	8.077114598	60.52651503	4.01884632
8.11003530962408	64.5452265113736	11.17807544	66.07771318	3.944211846
8.11003530962408	64.5452265113736	9.897889543	67.94003152	3.836811672
2.56086870501683	68.5699291875498	5.020361565	69.58798476	2.661868193
2.56086870501683	68.5699291875498	1.825477279	70.78130479	2.330446868
2.02580984092118	68.5699291875498	0.299902086	68.51958527	1.726641853
2.02580984092118	71.5056481537854	1.834626902	71.15202574	0.401994686
2.02580984092118	71.5056481537854	3.252339284	73.9521337	4.320781181
2.02580984092118	71.5056481537854	1.009741561	74.32200243	6.745106086
1.52394987236987	80.8724436087715	1.451959255	80.87244268	0.071990607
4.11633081368032	83.8281196257531	12.45480817	85.29988604	8.467366828
4.11633081368032	83.8281196257531	7.992357197	82.08091397	4.51998708
4.11633081368032	83.8281196257531	5.912402555	83.10767778	4.777473299
4.11633081368032	83.8281196257531	6.810206318	85.20186256	3.122176307
4.11633081368032	83.8281196257531	3.437419026	82.39656928	1.58437925
4.11633081368032	83.8281196257531	1.837820965	81.06813079	5.360711684
4.11633081368032	83.8281196257531	4.377655918	84.98459142	1.270737521
4.11633081368032	83.8281196257531	6.359309777	87.06467249	5.433004527
4.11633081368032	83.8281196257531	5.333729823	86.89695613	7.779774892
4.11633081368032	83.8281196257531	3.105512661	84.71082736	5.063715926
4.11633081368032	83.8281196257531	0.539457489	84.81338557	5.520424731
4.11633081368032	83.8281196257531	5.209294544	90.50333801	7.245222646
4.11633081368032	88.0574227942473	5.793118726	87.72031575	2.544917974
4.11633081368032	88.0574227942473	3.319354366	86.8534104	1.444683466
4.11633081368032	88.0574227942473	2.643010323	87.48230483	1.581592217
4.11633081368032	89.275300615	2.887848626	89.80188387	3.077223153
5.83845999399954	89.275300615	5.838459994	89.46110654	0.185805925
5.83845999399954	89.275300615	0.846436708	97.15575264	11.19775474
6.02009674680622	88.4653732446499	6.663988874	86.9326968	2.017737523
6.02009674680622	88.4653732446499	7.085383584	88.77850283	1.129697938
6.02009674680622	88.4653732446499	6.579193932	89.24907689	0.979496385
9.29125416693942	87.6470195506781	9.940095688	86.998178	0.917600499
9.29125416693942	87.6470195506781	9.577914639	89.11916471	4.320583214
9.29125416693942	87.6470195506781	7.009024866	89.80852716	9.591229282
9.29125416693942	87.6470195506781	6.256438132	90.66257931	10.99795307

Solution x	Solution y	Original x	Original y	Radius
9.29125416693942	87.6470195506781	3.115821998	88.00026043	11.67905671
9.16983146341514	92.2240601959088	10.35439985	93.61856888	1.829714932
9.16983146341514	92.2240601959088	8.327911253	95.97957355	8.978439052
9.16983146341514	92.2240601959088	11.51332542	99.95442641	9.875636287
9.16983146341514	92.2240601959088	8.376403562	96.83801393	9.194583524
9.16983146341514	92.2240601959088	4.440109707	94.87692744	8.411496493
9.16983146341514	92.2240601959088	3.212591442	94.51392157	10.08518593
9.16983146341514	92.2240601959088	5.819691822	97.53170939	10.47278678
7.25311751211734	92.2240601959089	11.28159713	86.83718755	7.508047868
7.25311751211734	92.2240601959089	10.40564453	91.96900158	4.396700555
7.25311751211734	92.2240601959089	6.291693293	89.27097954	4.843225065
7.25311751211734	92.2240601959089	7.178182114	91.76838261	1.609117439
7.25311751211734	92.2240601959089	5.231683223	94.88567828	5.753061171
7.25311751211734	92.2240601959089	1.725004249	93.73701725	6.881927737
3.54940806500197	92.2240601959088	3.553988961	91.38716753	0.836905203
3.54940806500197	92.2240601959088	3.298576907	92.26869515	0.379092562
1.91652390200323	94.8878026014834	2.510162792	94.82470236	1.092397933
1.91652390200323	98.2148330800137	1.662890125	98.21483308	0.253633777
1.91752390200324	98.2148330800137	6.625140742	98.72893978	8.11126017
7.81008667606329	98.4404888729993	7.810086676	100	1.559511127
18.3227967297437	98.2241068345502	20.42707279	96.69258649	2.602601065
18.3227967297437	98.2241068345502	18.10270516	98.29192556	0.6619415
18.3227967297437	98.2241068345502	17.81960057	98.01765152	0.543902723
18.3227967297437	98.2241068345502	18.56973911	98.93410982	1.127429706
25.34553204	99.141954545999	25.34553204	99.20543489	0.063480344
25.34553204	99.141954545999	23.65267964	99.40598609	5.864138835
25.34553204	99.141954545999	22.19955839	99.83998701	6.495340695
25.4455899820614	98.8298154221608	28.69202489	99.34571575	3.476487599
25.4455899820614	98.8298154221608	27.32463884	98.08040747	2.022977234
25.4455899820614	98.8298154221608	25.35918107	97.93925835	0.894739291
25.4455899820614	98.8298154221608	25.64004891	98.33585155	1.834844509
29.453904770981	98.5248812792817	27.50072899	99.76767751	2.315046026
35.7897411902302	98.5248812792816	36.49499514	99.8776323	1.525555131
35.7897411902302	97.2032999321568	35.84999591	97.26233792	1.02094072
37.0883835299774	97.2032999321569	37.35558564	97.30806318	0.287005759
37.0883835299774	97.2032999321569	31.65500689	99.46882276	7.475813284
44.5992820830341	97.2032999321569	44.56970667	97.22856143	0.038895351
44.7928427498595	90.4493502003754	46.25821854	91.17761288	1.63636571
44.7928427498595	90.4493502003754	45.33430047	93.58613905	5.098588574
44.7928427498595	90.4493502003754	45.01212749	95.47966426	8.619068903
44.7928427498595	90.4493502003754	44.01236363	95.54242778	10.44212715
44.7928427498595	90.4493502003754	43.04035221	95.37042711	9.4350131
44.7928427498595	90.4493502003754	41.14116704	94.61634345	11.9580341
44.7928427498595	90.4493502003754	43.63164404	99.67485887	11.34349589
67.3194012628742	90.4493502003753	66.59307852	88.41880362	2.156539854
67.3194012628742	90.4493502003753	64.64609008	95.09261932	9.659748021
68.7870026490655	83.9132094252817	69.09548968	84.07624055	0.956524245
68.7870026490655	83.9132094252817	62.20174968	80.96664236	8.789809443
68.7870026490655	83.9132094252817	62.03157877	81.16617953	8.754951123
68.7870026490655	83.9132094252817	68.01446808	90.26524455	9.658401998
80	80.0900029756875	83.77232341	73.14211564	8.533805631
80	80.0900029756875	86.75397464	75.23932777	8.469131771
80	80.0900029756875	81.4352048	82.89764497	3.652744946
80	80.0900029756875	74.46580568	79.0435318	7.178734541

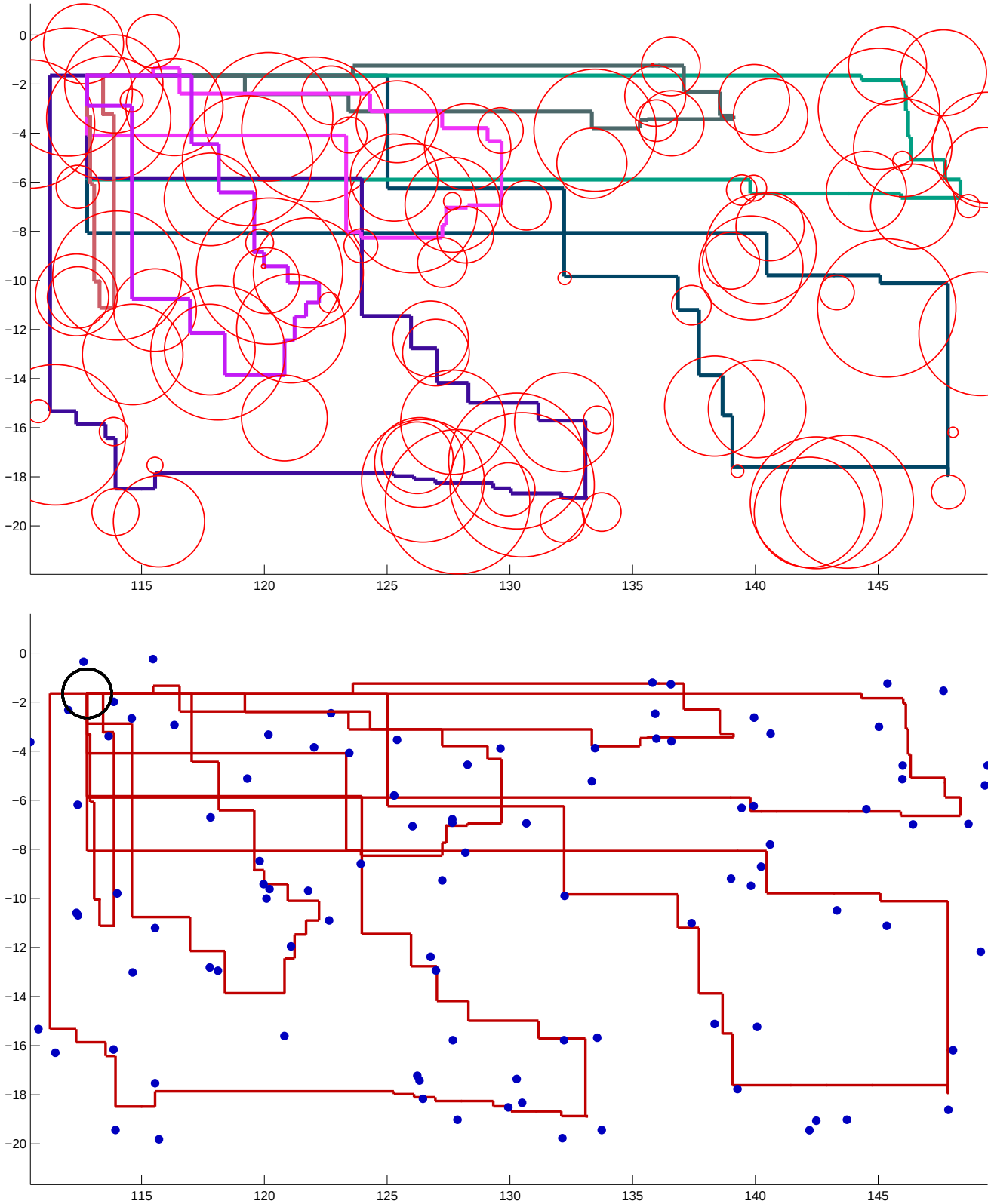
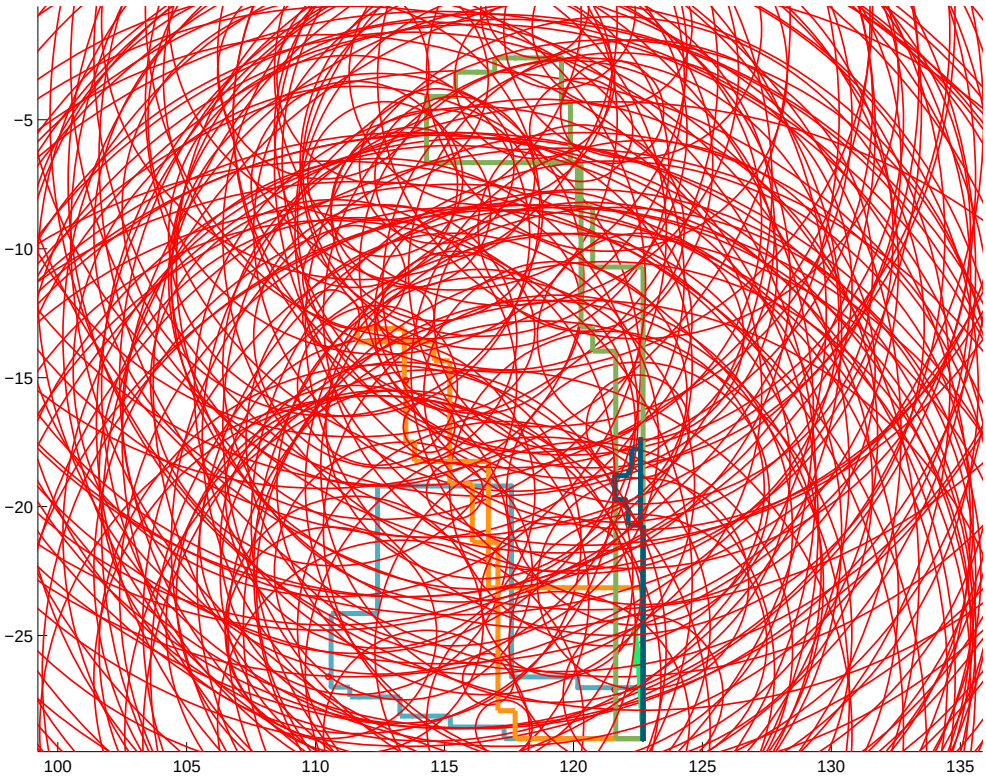


Figure O.160: $kroD100$, arbitrary radius, 2D, Manhattan, Length = 433.1199688

Table O-163: Solution for $kroD100$, arbitrary radius, 2D, Manhattan

Total distance: 433.119968803099				
Total demand met: 2719				
Depot: x 2.78 y 1.65				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 102.68057983192 Demand Met: 400				
15.0189673711693	6.24864294303592	16.04	7.06	2.63
22.2094690914099	9.83828786848902	22.23	9.9	0.27
26.8408228965424	11.1993246621545	27.4	11.01	0.81
27.7030591088826	13.8707778582907	28.34	15.12	2.04
28.6618193794647	15.5010793510405	30.07	15.24	1.99
29.0637634045586	17.6116760703466	29.27	17.77	0.26
31.4461621001248	17.6116760703466	32.2	19.45	2.25
32.907729951856	17.6116760703466	32.48	19.06	2.69
34.7528935810996	17.6116760703466	33.73	19.02	2.71
37.8399999999813	17.9302899159787	37.86	18.62	0.69
37.8399999999813	16.1899999895166	38.05	16.19	0.21
37.8399999999813	10.1198241994269	39.18	12.17	2.52
35.0836016631764	9.78960534046473	35.35	11.12	2.82
33.2036070410007	9.78960534046473	33.32	10.49	0.71
30.4579855983806	8.07020748861852	29.82	9.49	2.12
29.2729997741977	8.07020748861852	29.01	9.2	1.16
Route: 2 Length: 81.1106392462332 Demand Met: 400				
34.3216320249732	1.84794790490593	35.38	1.25	1.59
36.0195120877455	2.06506897326649	37.66	1.54	1.75
36.1248150011005	3.09088666212444	35.03	3.01	2.47
36.2172615535089	4.13746830396579	36	4.59	2
36.3227864794585	5.08586303492199	35.99	5.14	0.4
37.7240272786001	5.28548886993738	39.35	5.4	1.63
37.7240272786001	5.88509627586005	39.46	4.59	2.26
38.3476598128065	6.63765981031012	38.68	6.97	0.47
35.9229933713034	6.46002508963452	36.42	6.99	1.73
33.8076710954351	6.46002508963452	34.52	6.37	1.63
30.8683487465024	6.46002508963453	30.6	7.81	1.39
30.240625883663	6.46002508963453	30.23	8.71	2.25
29.7920177299441	5.88939189293911	29.93	6.24	0.53
28.9939320012919	5.88939189293911	29.44	6.32	0.62
Route: 3 Length: 57.7599999682464 Demand Met: 396				
9.20547434771905	2.40849612818159	10.17	3.33	2.62
13.4308728357113	3.11864926873304	12.03	3.85	2.95
23.34	3.79999999999847	23.34	5.23	1.43
25.2965478569919	3.46829559284043	23.47	3.88	2.49
25.5919031568983	3.46829559284043	25.97	3.49	0.85
25.5919031568983	3.43193803439932	26.58	3.6	1.33
29.1099999999819	3.29000000093734	30.62	3.29	1.51
28.54864151763	2.30864761350988	29.95	2.64	1.44
27.0842250652093	1.25000001585721	26.56	1.28	1.2
26.0771631894534	1.25000001585721	25.92	2.48	1.24
25.8100000317003	1.25000001585721	25.81	1.21	0.04
13.6053812738024	1.65	12.72	2.46	1.2
Route: 4 Length: 79.5255425713372 Demand Met: 399				
1.27000000000004	15.3299999502845	0.80	15.33	0.47
2.33623492245522	15.8629956430466	1.49	16.29	2.86
3.53360886082419	16.4185211287558	3.86	16.16	0.58
3.93999986208422	18.4799999999999	3.94	19.44	0.96
4.99975312101904	18.4799999999999	5.71	19.82	1.86
5.55000006207391	17.86	5.55	17.53	0.33
15.2787824443434	17.9730487877568	16.23	17.23	1.46
16.0990780403457	18.1028877872499	16.32	17.42	1.83
16.964759075494	18.2595121021168	16.46	18.17	2.5
18.0279127049989	18.2595121021166	17.87	19.02	2.94
19.3254186959751	18.4731750299901	19.94	18.52	1.09
20.0403987775557	18.679753618017	20.28	17.36	2.77
21.0746362911175	18.679753618017	20.5	18.33	2.94
22.0950650142105	18.8711216862631	22.14	19.77	0.9
23.1813864298609	18.8813848558076	23.74	19.44	0.79
23.0780825336201	15.7125423449266	23.56	15.68	0.56
21.1641770301972	14.9820839925488	22.21	15.78	2.02
18.3141020931668	14.1778530067042	17.68	15.78	2.13
17.0288283114862	12.7638723074693	16.99	12.94	1.36
15.9766159395215	11.4503105481346	16.77	12.38	1.54
13.969695016516	5.83718869729324	15.29	5.81	1.78
Route: 5 Length: 47.60 Demand Met: 400				
5.47000000030233	1.34	5.47	0.25	1.09
6.54441710346813	2.38809642151397	6.34	2.94	1.98
14.3053131918642	3.11067772982337	15.41	3.54	1.67
17.243460917181	3.79181635788086	18.28	4.56	1.76
19.0905012368953	4.32417403462247	19.62	3.89	0.93
19.6599999999999	6.94000001103014	20.67	6.94	1.01
18.2758706646039	7.03658381186762	17.66	6.92	1.93
17.4074831738246	7.03658381186762	17.66	6.78	0.36
17.4074831738246	7.73153101224478	18.19	8.14	1.15
17.2500000010684	8.25999999999999	17.25	9.27	1.01
13.9356372067571	8.02846154677824	13.93	8.59	0.69
13.3314870359141	4.09010146203263	13.46	4.08	0.73
Route: 6 Length: 21.1232071853651 Demand Met: 335				
3.26461546981916	1.65	2.64	0.36	1.63
3.43125300753646	3.22607802390882	3.66	3.39	2.53
3.43125300753646	3.22607802390882	3.87	1.99	2
3.87251614533385	11.1190874473487	4.64	13.02	2.05
3.87251614533385	11.1180874473487	5.55	11.21	1.68
3.87251614533385	11.1180874473487	4.01	9.8	2.63
3.2866848575938	10.0427190530727	2.41	10.69	1.25
3.2866848575938	10.0427190530727	2.35	10.59	1.67
3.06899376169932	6.06951387746152	2.40	6.19	0.88
2.90560767970891	3.32514842316184	0.47	3.63	2.62
2.90560767970891	3.32514842316184	2.02	2.33	2.61
Route: 7 Length: 43.319999999997 Demand Met: 389				
7.03894455305306	4.44123181448295	9.31	5.12	2.65
8.14571483495683	6.4118287555503	7.81	6.7	1.89
9.59257159416059	8.84775540534542	10.09	10.01	1.34
9.59257159416059	8.84775540534542	9.81	8.48	0.57
9.98363697380287	9.42039798936466	9.97	9.42	0.09
10.95322006604	10.1004339785984	10.21	9.62	2.98
12.2299999999994	10.8999999836731	12.64	10.9	0.41
11.7006936874086	11.472526129393	11.79	9.69	2.24
11.2340100278035	12.4429957025397	11.09	11.96	2.22
10.8200000001234	13.8599999999991	10.82	15.61	1.75
8.39423085503114	12.1454358325365	7.78	12.82	1.85
6.97505051658959	10.7608563913986	8.11	12.95	2.74
4.6092712525837	2.8812530387118	4.60	2.67	0.47



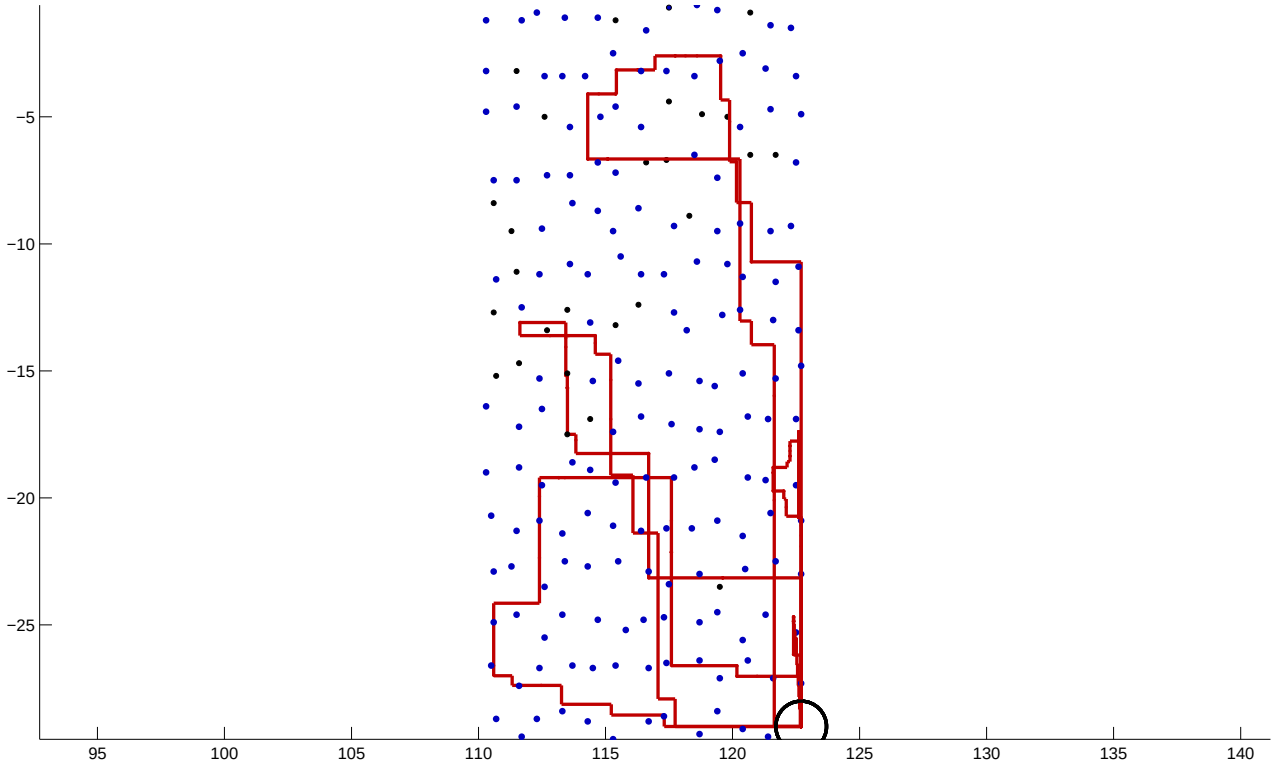


Figure O.161: $rat195$, arbitrary radius, 2D, Manhattan, Length = 201.9965695

Table O-164: Solution for *rat*195, arbitrary radius, 2D, Manhattan

Total distance: 201.996569467903 Total demand met: 11712 Depot: x 12.7 y 29				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 43.7999999999993 Demand Met: 1969				
7.30910399095646	28.546166108541	4.3	28.8	4
5.22435040250961	28.1266621186614	5.40	26.6	19.1
3.26880546490972	27.3793603308639	0.60	24.9	4.1
2.46748428048549	27.3793603308639	1.5	24.6	5
1.70225309743468	27.3793603308639	3.3	21.4	7
1.32682734641313	27.001299430411	2.60	23.5	8
0.600000000000378	26.9832667285015	1.5	21.3	6
0.600000000000378	26.5999999702402	0.5	26.6	0.1
0.600000000000378	24.1451986576462	4.3	22.7	8
2.40000000000001	22.3588024083103	3.40	22.5	5
2.40000000000001	20.9	2.40	20.9	0
2.40000000000001	19.9426154440259	4.3	11.2	10
2.40000000000001	19.2	2.40	11.2	8
3.15908608369257	19.2	6.60	1.6	18
3.16008608369258	19.2	2.5	9.4	11.1
3.39721005306198	19.2	3.40	1.1	18.1
7.59458537727298	19.2	7.7	9.3	10.1
7.59458537727298	20.8953162290807	12.5	19.5	5.1
7.59458537727298	22.1365003349279	11.3	19.3	6.1
7.59458537727298	22.1365003349279	2.5	19.5	6
7.59458537727298	22.1375003349279	6.5	24.8	19.1
7.59458537727299	26.60129787805	5.8	25.2	22.1
7.59458537727299	26.60229787805	6.7	26.7	1
10.1686437584677	26.60229787805	3.3	28.4	7.1
10.1686437584677	27.0223243800745	5.40	4.6	24
10.1696437584677	27.0223243800745	6.3	8.6	20
10.9664874882431	27.0223243800745	3.60	7.3	22
11.660980140288	27.0223243800745	5.3	9.5	19.1
11.661980140288	27.0223243800745	4.40	13.1	16
11.662980140288	27.0223243800745	11.6	27.1	0.1
Route: 2 Length: 53.9555705273497 Demand Met: 1971				
7.73844684922862	27.9114180974709	7.3	28.6	1.1
7.06823173989368	21.3827487544716	0.60	7.5	17.1
6.07876035176102	19.1065515621097	5.40	19.4	1.1
5.20510972744404	16.9033659084764	0.30	1.2	18.1
5.20510972744401	15.3543094574202	2.40	15.3	3.1
5.20510972744404	14.3441548409352	7.5	0.7	14.1
4.59638185715124	13.9044055507464	2.7	13.4	5.1
4.59638185715124	13.6114252794586	7.40	6.7	8
4.59638185715124	13.6114252794586	6.60	6.8	7.1
3.54963400807854	13.6114252794586	5.40	13.2	3.1
2.81047702420639	13.6114252794707	6.3	12.4	4
1.62726813851127	13.095946597826	1.5	11.1	2
1.62626813851128	13.095946597826	0.60	12.7	1.1
3.43704182316401	13.6981968256963	3.5	12.6	1.1
3.43704182316401	14.0614215764567	2.60	5	9.1
3.43704182316401	15.1776934229487	3.5	15.1	0.1
3.43804182316401	15.1776934229487	9.8	5	13
3.49599999999999	15.1776934229488	10.7	6.5	12
3.497	15.1776934229487	8.3	8.9	9
3.497	15.6661506584294	1.3	9.5	7
3.498	15.6661506584294	1.5	3.2	14.1
3.49900000000001	15.6661506584294	0.60	8.4	8.1
3.5	15.6661506584294	8.8	4.9	12
3.5	17.5	3.5	17.5	0
3.83296091113431	17.7236908835834	4.40	16.9	1
3.83296091113431	18.2514874999905	0.70	15.2	7.1
6.69820718761389	18.2514874999905	7.5	4.4	14.1
6.69820718761389	23.1467759822819	11.7	6.5	20.1
6.69920718761389	23.1467759822819	1.60	14.7	11
9.61285430650511	23.1467759822819	9.5	23.5	3.1
9.6138543065051	23.1467759822819	10.7	0.9	23.1
9.61485430650511	23.1467759822819	5.40	1.2	23
Route: 3 Length: 69.5999999943698 Demand Met: 1997				
11.6406802776112	20.0925697321793	12.7	23	4.1
11.6406802776112	15.9758126937233	12.5	16.9	2
11.6406802776112	13.9716564834709	9.60	12.8	5
10.7422038305272	13.0345218841406	6.40	16.8	6
10.2911671328392	6.66013153653442	0.70	11.4	12.1
5.08627077457257	6.66013153653442	2.60	3.4	4.1
5.08627077457257	6.65913153653442	1.5	7.5	4
5.08627077457257	6.65813153653442	3.7	8.4	3.1
5.08627077457257	6.65813153653442	2.7	7.3	3
4.30200000280489	6.65813153653442	4.7	8.7	4.1
4.3010000028049	6.65813153653442	1.7	1.2	10
4.30000000280489	4.09999999838104	0.30	3.2	4.1
4.3010000028049	4.09999999838104	2.3	0.9	8
4.73485243351315	4.09999999838104	4.2	3.4	10.1
5.40000249263751	4.09999999838104	5.40	7.2	3.1
5.40000249263751	4.09999999838104	4.7	6.8	3
5.42938569678684	3.15603255052129	12.5	3.4	10.1
5.42938569678684	3.15603255052129	7.40	3.2	9
6.26974438775045	3.15603255052129	6.40	3.2	5.1
6.26974438775045	3.15603255052129	5.3	2.5	9.1
6.94534882200732	2.60000000001024	6.40	5.4	8
7.74362078623595	2.60000000001024	12.3	1.5	5
7.74362078623595	2.60000000001024	9.40	0.8	3
8.14423946861685	2.60000000001024	8.5	3.4	3.1
8.59999969708861	2.60000000001024	8.60	0.6	2
9.53285396565495	2.60000000001024	11.5	1.4	3.1
9.53285396565495	4.33897856078077	11.5	4.7	2
9.88096071207991	5.18704051032639	10.3	5.4	2
9.88096071207991	6.76738987132322	11.3	3.1	7
10.1535454278601	6.76738987132319	10.3	9.2	4
10.1535454278601	8.37450163300601	9.8	10.8	8.1
10.7422038305272	10.7081651590418	8.7	17.3	13.1
10.7422038305272	10.7081651590418	9.3	15.6	5.1
Route: 4 Length: 0.00800035761035645 Demand Met: 1824				
12.7000000017896	28.9999999805934	8.7	29.3	21
12.699999986556	28.9999999739125	0.70	28.7	22.1
12.6999999765207	28.9999999588554	10.4	25.6	8.1
12.6999999859452	28.998999949431	11.7	15.3	18
12.6999999889678	28.9989999934152	7.40	26.5	18
12.6999999859452	28.999999949431	1.60	27.4	19.1
12.6999999859452	28.999999949431	1.3	22.7	22.1
12.700999967688	28.9999999676881	8.5	6.5	24.1
12.7010000017896	28.9999999805934	9.5	27.1	21
12.7009999942515	28.9999999989165	0.30	16.4	19
12.7019999760148	29.0000000171532	12.5	25.3	5
12.7019999604057	29.0000000327623	8.7	15.4	17
12.7010000005084	29.0000000419556	5.3	21.1	15.1
12.7009999953225	29.0000000327046	0.5	20.7	19
12.7009999914133	29.0000000287954	6.7	22.9	22
12.7009999914133	29.0000000287954	6.40	21.3	20
12.7009999676053	29.0000000255627	4.7	24.8	24
12.7009999760148	29.0000000171532	6.7	28.8	14.1
12.6999999953225	29.0000000327046	11.4	29.4	25.1
12.6999999953225	29.0000000327046	5.3	29.5	24
12.7000000005084	29.0000000419556	9.40	28.4	5.1
12.7000000005084	29.0000000419556	4.40	18.9	24
12.7000000005084	29.0010000419556	8.7	26.4	9.1
12.6999999914133	29.0010000287954	10.4	15.1	18
12.6999999905962	29.0010000265212	5.60	10.5	25
12.6999999862467	29.0009999742218	3.7	18.6	17
12.6999999862467	29.0009999742218	4.5	15.4	20.1
12.6999999859452	29.000999949431	4.5	26.7	21.1
12.6999999864122	29.0000000416149	0.60	22.9	14
12.6999999914133	29.0000000287954	1.60	17.2	21.1
12.6999999914133	29.0000000257041	4.3	20.6	21.1
12.6999999760148	29.0000000171532	3.7	26.6	21.1
12.6999999889678	28.9999999934152	7.3	24.7	8
12.6999999889678	28.9999999934152	8.7	24.9	12.1
12.6999999942515	28.9999999989165	0.30	19	19.1
Route: 5 Length: 9.23299858857985 Demand Met: 1981				
12.6691651136185	28.3146028455245	8.5	18.8	23
12.6691651136185	28.3146028455245	9.5	17.4	17
12.6415565736733	27.8382835530782	7.7	12.7	23
12.6145211791177	27.3863289592743	7.60	17.1	19.1
12.6145211791177	27.3863289592743	7.5	15.1	23.1
12.5877569117746	26.9730694505457	10.6	16.8	19.1
12.561048576639	26.5778420694537	12.7	20.9	21
12.561048576639	26.5778420694537	8.40	21.2	24
12.534383850672	26.2134797458941	8.2	13.4	18
12.5077245455433	25.8786962482269	10.5	22.8	15.1
12.5077245455433	25.8786962482269	10.4	21.5	16
12.5077245455433	25.5440891197512	9.40	20.9	9.1
12.5077245455433	25.5440891197512	9.3	18.5	9.1
12.4539081445467	25.2445724628304	7.40	21.2	20.1
12.4266655299009	24.9610310885324	7.7	19.2	23
12.3995945032945	24.6839062024156	4.8	5	21.1
12.3995945032945	24.6849062024156	12.7	27.3	3.1
12.3995945032945	24.6859062024156	3.3	24.6	9.1

Solution x	Solution y	Original x	Original y	Radius
12.3995945032945	24.8536179002084	7.5	23.4	15.1
12.3995945032945	24.8536179002084	5.5	22.5	14.1
12.3995945032945	24.8546179002084	6.6	19.2	8.1
12.3995945032945	24.8556179002084	11.5	20.6	14
12.3995945032945	24.8556179002084	10.6	19.2	11
12.3995945032945	26.1607278739408	2.6	25.5	11
12.3995945032945	26.1617278739408	9.4	7.4	19
12.3995945032945	26.1868588298016	2.4	26.7	11
12.699	26.1868588298016	10.4	11.3	24
12.699	26.1868588298016	11.5	9.5	21
12.7	26.1868588298016	1.7	29.4	22
12.7	26.1878588298016	3.6	10.8	22
Route: 6 Length: 25.3999999999941 Demand Met: 1970				
12.7	21.9095069550385	9.4	9.5	13
12.7	21.4805077566061	7.3	11.2	18.1
12.7	21.0924116445864	12.7	4.9	23
12.7	20.7197761053565	1.7	12.5	18.1
12.1146661253558	20.3697367616646	11.7	22.5	14.1
12.1146661253558	20.043695617452	1.5	4.6	22
12.0172613680234	19.7297833458967	0.3	4.8	20
12.0162613680234	19.7297833458967	4.7	1.1	20.1
11.6	19.7297833458967	6.4	11.2	12
11.6	19.0083062374408	5.5	14.6	9.1
11.6	19.0083062374408	8.6	10.7	14
11.6	18.7999999975952	1.6	18.8	10
11.6	18.7999999975952	2.5	16.5	10
12.1443178451714	18.5733854681298	12.5	6.8	14.1
12.2614376288165	18.3561668512149	5.3	17.4	8
12.2614376288165	18.3561668512149	6.3	15.5	11
12.2614376288165	18.1497509404138	10.3	12.6	10
12.2614376288165	17.9510503396916	12.6	10.9	9
12.2614376288165	17.9510503396916	12.3	9.3	13.1
12.2614376288165	17.764956125531	11.7	11.5	9.1
12.5999999799772	17.764956125531	11.6	13	12
12.5999999799772	17.400000000003	12.7	14.8	9
12.5999999799772	17.400000000003	12.6	13.4	4
12.6009999799772	17.400000000003	11.4	16.9	15
12.6009999799772	17.401000000003	10.4	29.1	17.1
12.6009999799772	17.401000000003	10.6	26.4	17
12.6009999799772	18.7723037281499	8.7	23	11
12.6009999799772	18.7733037281499	11.3	24.6	14.1
12.6009999799772	18.7733037281499	9.4	24.5	16.1
12.6009999799772	18.7743037281499	3.6	5.4	18.1
12.6009999799772	20.7667163094353	3.3	3.4	20.1
12.6009999799772	20.7677163094353	10.4	2.5	19
12.6009999799772	20.7687163094353	9.5	2.8	19
12.6009999799772	20.7697163094353	2.3	28.7	13

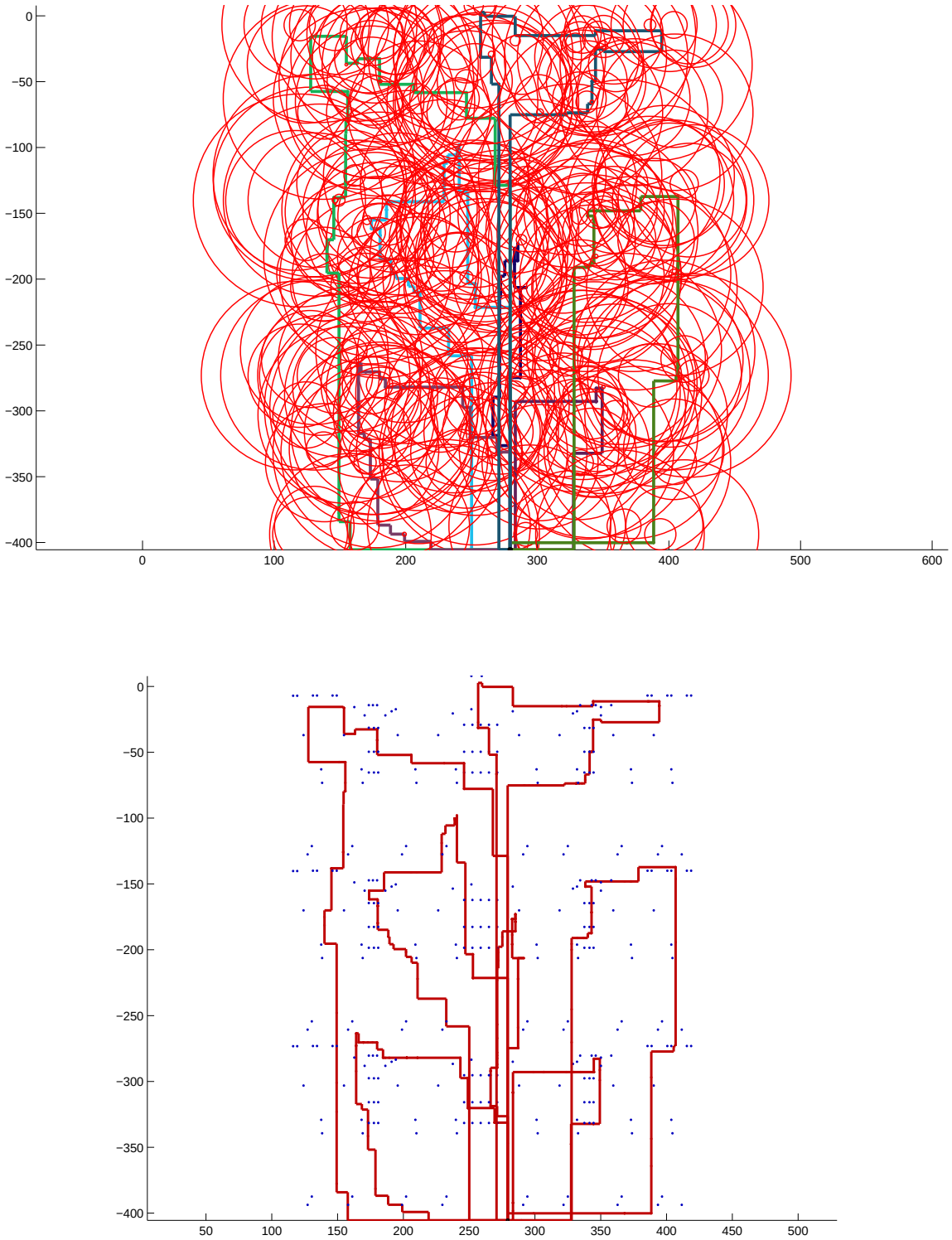


Figure O.162: *lin*318, arbitrary radius, 2D, Manhattan, Length = 5272.3096775

Table O-165: Solution for *lin*318, arbitrary radius, 2D, Manhattan

Total distance: 5272.30967748824				
Total demand met: 6261				
Depot: x 169.3 y 405.5				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 825.999999999787 Demand Met: 935				
140.044939831439	258.200124872804	119.7	260.7	67.1
122.618889712425	237.143973194481	122.8	254.4	25.8
100.825546362306	222.08722708583	127.6	286.7	75.6
100.825546362306	209.840775134794	70.9	182.7	40.4
96.2531410873687	205.397026995181	70.1	147.3	74.2
92.0466029444653	201.645352491353	67.7	164.6	53.4
92.0466029444653	199.534575286181	67.7	182.7	29.6
82.5414311630232	195.768177811878	99.2	196.1	46.1
79.4619451434917	190.132403086004	59.1	206.3	26
78.5477334906838	190.132403086004	67.7	198.5	13.7
78.5477334906837	184.814973334387	63.8	198.5	60.1
70.4856537748249	179.739381366216	58.3	196.1	20.4
70.4856537748249	179.738381366216	20.5	121.3	76.9
70.4856537748249	166.745590606301	17.3	127.6	73.4
70.4856537748249	166.744590606301	24.4	140	73
70.4856537748249	166.743590606301	70.9	164.6	21.9
70.4856537748249	161.666944794157	9.4	140.2	80.8
70.4517988676151	161.666944794157	48	127.6	40.8
64.000000000105	161.666944794157	21.3	140	51.1
64.0000000001051	155.10199987604	76.4	155.1	19.1
64.0000000001051	155.10099987604	63.8	164.5	10.7
64.0000000001051	155.09999987604	60.6	155.1	3.4
75.3512318350025	147.327692668963	52.8	148.8	54.4
75.3512318350025	147.326692668963	66.9	147.3	43.6
75.3512318350025	147.326692668963	63.8	147.3	52
75.3512318350024	141.173844365171	44.9	170.1	42
95.8144682231652	141.173844365171	85.8	170.1	56
95.8144682231652	141.173844365171	81.1	152	42.7
100.359610439824	141.173844365171	89	127.6	17.7
119.108779569465	127.863916037742	142.5	65.4	66.7
119.108779569465	126.797650031132	148.8	65.4	68.2
119.108779569465	118.905236601833	122.8	121.3	4.4
119.108779569465	111.960789795727	161.4	49.6	79.4
121.982394796301	109.307695959567	148.8	49.6	66.7
121.982394796301	105.550492794878	84.3	150.4	61.5
129.041930998847	104.115510000168	142.5	29.1	81.1
129.041930998848	101.761708347223	92.1	121.3	64.6
129.041930998847	100.294940969797	119.7	127.6	64
129.041930998847	100.294940969797	155.1	65.4	62
129.041930998847	100.294940969797	161.4	65.4	60
129.041930998847	100.294940969797	155.1	49.6	57
129.041930998847	100.294940969797	136.2	65.4	54.2
129.042930998847	100.294940969797	161.4	29.1	80.6
130.700000000217	97.8000000000031	130.7	73.2	24.6
130.700000000217	128.08765004946	127.6	153.6	25.7
130.700000000217	133.777004528894	116.5	170.1	39
137.139095409066	203.411018212537	136.2	198.5	5
142.831283202499	203.411018212537	63.8	182.7	81.7
142.831283202499	221.391345169546	70.9	198.5	76.6
142.831283202499	221.392345169546	92.1	254.4	70.4
142.831283202499	221.393345169546	100	206.3	53.6
142.832283202499	221.393345169546	129.9	196.1	31.1
Route: 2 Length: 520.886291500933 Demand Met: 919				
169.3	347.066969582862	129.9	329.2	48.2
169.3	326.444120530352	136.2	331.6	42.4
161.272044911001	318.723235283807	161.4	315.8	25.4
156.300000000041	318.723235283806	231.5	315.8	80.7
156.300000000041	295.30000005611	155.1	295.3	1.2
156.300000000041	292.142285906866	161.4	295.3	52.8
156.300000000041	292.141285906866	142.5	295.3	23
156.300000000041	289.595333991549	222	285.1	76.7
161.33170389828	289.595333991546	178	303.2	29.3
161.33170389828	287.048998398542	155.1	315.8	37.1
161.33170389828	282.415787962024	142.5	331.6	70.4
161.33170389828	280.27639102823	148.8	315.8	45
161.33170389828	278.122588017757	191.3	329.2	60.6
161.33170389828	267.167750691191	142.5	315.8	63.6
161.33170389828	256.67941229389	148.8	331.6	79
161.33170389828	223.187563698001	148.8	162.2	66
161.33170389828	214.10398380027	161.4	162.2	60.1
162.14259045691	208.132433332809	155.1	182.7	57.9
162.14259045691	201.959758767162	231.5	164.6	80.6
162.14259045691	197.687570194657	161.4	198.5	1.3
165.250293229439	195.984080296353	142.5	162.2	56.6
165.250293229439	190.29582456936	227.6	198.5	71.7
165.250293229439	186.007333699902	148.8	182.7	49.8
175.170572875312	186.007333699902	142.5	182.7	52.7
175.170572875312	178.736671289658	155.1	198.5	57.2
175.170572875312	178.735671289658	161.4	182.7	56.9
175.170572875312	178.734671289658	136.2	162.2	53.2
175.170572875312	172.928427124805	141.7	150.4	56
175.171572875312	172.928427124805	178	170.1	4
175.171572875312	176.691750807245	227.6	182.7	69
175.171572875312	176.692750807245	184.3	121.3	57.9
172.7	176.692750807245	173.2	152	43.5
172.7	176.693750807245	231.5	182.7	62.1
172.7	176.694750807245	155.1	162.2	51.3
172.7	176.695750807245	208.7	170.1	55.8
172.7	176.696750807245	215	121.3	69.7
172.7	188.695453600568	227.6	164.6	68.2
172.7	195.8475749089	191.3	196.1	65.9
172.7	195.8485749089	234.6	198.5	64.9
172.7	206.300000000033	130.7	206.3	42
181.7	206.300000000033	192.1	206.3	10.4
177.200838381256	206.600064660332	231.5	198.5	54.9
177.200838381256	222.149152165115	148.8	198.5	59.7
177.199838381256	222.149152165116	136.2	182.7	73.4
177.199838381256	259.06369553053	142.5	198.5	69.8
177.199838381256	274.693784885716	184.3	254.4	21.5
177.198838381256	274.693784885716	181.1	260.7	21.4
177.197838381256	274.693784885716	136.2	295.3	62.2
169.3	274.693784885716	148.8	295.3	39.6
Route: 3 Length: 1121.34171721491 Demand Met: 949				
47.7682708032852	384.158914200228	20.5	387.5	30.2
39.3085287801511	377.658569371189	17.3	393.8	28.4
39.3085287801511	323.104890993233	27.6	329.2	13.2
39.3085287801511	301.054823434697	14.2	303.2	25.2
39.3085287801511	247.959915031578	9.4	273.3	39.2
39.3085287801511	195.352141605462	28.3	206.3	25.7
30.1000000001453	181.43523277657	6.3	140.2	53.1
30.1	175.096712239671	27.6	196.1	35.6
30.1000000000001	170.099999999769	14.2	170.1	15.9
35.3255968119042	138.090701944523	36.2	140	2.1
35.3255968119042	138.089701944503	39.4	140	4.5
35.3255968119042	138.088701944503	27.6	63	76.3
44.3561999854185	125.818901743501	70.9	65.4	71.5
44.3561999854185	125.817901743501	58.3	63	68.9
44.3561999854185	125.816901743501	51.2	121.3	8.2
44.3561999854185	89.4532079196473	70.9	31.5	68.2
44.5776388525648	79.6287102951211	85.8	37	59.3
45.8999999999803	79.6287102951201	52.8	15.7	64.3
45.8999999999803	73.1999999999982	100	73.2	54.1
45.8999999999803	57.4630682645447	59.1	73.2	29.3
45.8999999999803	57.4620682645445	67.7	31.5	48.5
41.2808884698597	57.4620682645444	66.9	14.2	52
41.2798884698597	57.4620682645399	28.3	73.2	20.4
17.8145706094875	15.5145707827524	9.4	7.1	11.9
44.4066513881252	16.2936456307643	6.3	7.1	39.2
44.8990000911613	16.2936456307643	36.2	6.9	19.4
44.9000000911613	16.2936456307643	39.4	6.9	37.7
44.9000000911613	35.9999999997162	44.9	37	1
53.2454222072581	35.9999999997162	14.2	37	44.6
53.2454222072581	32.6000000000004	21.3	6.9	41
70.0990000599315	32.6000000000004	63.8	14.2	23.68
70.1000000599315	32.6000000000004	70.1	14.2	18.4
70.1000000599315	40.7323096617203	81.1	18.9	25.4
70.1000000599315	40.7333096617203	84.3	17.3	27.4
70.1000000599315	49.3846672566082	76.4	22	28.1
70.1000000599315	49.3856672566082	70.9	49.6	1.2
70.1000000599315	49.3866672566082	67.7	65.4	19.9
70.1010000599315	49.3866672566082	63.8	31.4	27.9
70.1010000599315	49.3876672566082	60.6	22	36.4
70.1010000599315	52.0154048002095	24.4	6.9	74.1
96.1506282127724	52.0154048002095	99.2	63	11.4
96.1506282127724	58.2998192067025	63.8	49.6	33.5
121.061482976801	58.2998192067025	63.8	65.4	57.7
136.143912829538	58.2998192067025	136.2	49.6	8.7
136.143912829538	77.7313798599157	129.9	63	16
136.143912829538	77.7323798599157	67.7	49.6	74
158.010427030715	128.659169383117	211.8	127.6	53.8
167.942562551244	128.659169383117	181.1	127.6	13.2
Route: 4 Length: 385.323044737832 Demand Met: 659				

Solution x	Solution y	Original x	Original y	Radius
173.272768376739	398.24234680274	181.1	393.8	9
173.272768376739	392.278926768501	122.8	387.5	61.9
173.272768376739	392.278926768501	215	387.5	42
173.272768376739	308.46017676742	236.2	280.4	68.9
173.272768376739	308.45917676742	240.2	288.2	74.7
173.272768376739	308.45817676742	224.4	280.4	71.8
173.272768376739	308.45717676742	233.1	280.4	78.4
173.272768376739	292.899660554367	173.2	285.1	7.8
188.830646964945	292.899660554367	234.6	297.7	68.2
196.670293548003	292.899660554367	227.6	297.7	31.3
196.671293548003	292.899660554367	248	280.4	61.5
213.892986352296	292.899660554367	252.8	260.7	64.9
219.556754188516	292.899660554367	278.7	273.1	72.9
219.557754188517	292.899660554367	218.9	286.7	9.4
224.683962429586	292.899660554367	293.7	273.1	71.8
234.711878653111	292.899660554367	283.5	260.7	62.8
234.711878653112	292.898660554367	305.5	273.1	77.3
234.712878653111	292.898660554367	280.3	303.2	54.2
234.713878653111	292.898660554367	222	329.2	53.4
234.714878653111	292.898660554367	227.6	331.6	65.9
234.715878653111	292.898660554367	263	329.2	67.9
234.716878653111	292.898660554367	263.8	339.4	73.1
234.716878653111	282.819239263414	208.7	303.2	47.1
234.717878653111	282.819239263414	231.5	297.7	23.7
239.280761632329	282.819239263414	240.2	281.9	1.3
239.280761632329	291.446274100269	290.6	273.1	54.5
239.280761632329	299.110584453593	249.6	303.2	11.1
239.280761632329	332.290027094082	227.6	315.8	32.6
234.483206180071	332.290027094081	234.6	315.8	30.3
234.482206180071	332.290027094081	234.6	331.6	0.7
217.488619419101	347.635850674026	222.8	339.4	9.8
217.488619419101	347.636850674025	231.5	331.6	33.6
217.488619419101	405.5	211.8	393.8	37.7
179.664781150285	405.5	119.7	393.8	72
Route: 5 Length: 801.175016253925 Demand Met: 939				
217.897205775656	270.272057153762	211.8	260.7	12.9
217.897205775656	245.220538722958	215	254.4	15.5
217.897205775656	199.993103646238	240.2	155.1	52.7
217.897205775656	195.525658321172	233.1	147.3	53.4
217.897205775656	191.001452763899	218.9	153.6	44.9
222.121721326179	191.001452763899	222	196.1	5.1
226.842554163926	191.001452763899	255.9	254.4	74.1
230.127651069752	189.492723763723	249.6	170.1	30.4
230.128651069752	189.492723763723	255.9	121.3	72.9
230.128651069752	187.359581923835	294.5	206.3	67.1
232.999999999995	187.359581923835	275.6	140	63.7
232.999999999995	182.7	234.6	182.7	1.6
232.999999999995	171.566730646254	222.8	206.3	36.2
232.999999999996	171.565730646254	263.8	206.3	78
232.999999999996	152.000999999976	263	196.1	74.1
228.635810896464	152.000999999976	234.6	164.6	25.4
228.634810896464	152.000999999976	236.2	147.3	14.3
228.634810896464	152.000999999976	240.2	148.8	12
228.300000000029	152.000999999976	224.4	147.3	27.7
228.3	151.999999999976	222	152	6.3
228.30000000003	148.11439569522	248	147.3	33
258.147858061097	148.11439569522	252.8	127.6	21.2
263.066728391725	148.11439569522	278.7	140	31.7
263.066728391725	148.11439569522	290.6	140	58.6
263.067728391725	148.11439569522	308.7	140	57.3
263.068728391725	148.11439569522	293.7	140	60.8
263.068728391725	148.11339569522	305.5	140	43.2
268.602169719786	137.212491872228	283.5	127.6	48.7
296.899999999193	137.212491872228	301.6	127.6	10.7
296.899999999194	146.199163193959	280.3	170.1	29.1
296.899999999194	146.200163193959	286.6	121.3	53.2
296.899999999193	194.241581415271	286.6	254.4	68.8
296.899999999193	194.242581415271	293.7	196.1	3.7
296.899999999193	273.0999992662	308.7	273.1	11.8
295.380955979248	277.271466183411	301.6	260.7	17.7
278.408412277745	296.935117379157	275.6	273.1	24
278.408412277745	343.476862099331	294.5	339.4	16.6
278.408412277745	364.205818729642	293.7	329.2	38.2
278.408412277745	400.219859016754	283.5	393.8	11.9
278.408412277745	400.220859016754	286.6	387.5	29.3
258.04336922025	400.220859016754	301.6	393.8	56.6
258.04236922025	400.220859016754	255.9	387.5	12.9
189.0223975875	400.220859016754	252.8	393.8	64.1
Route: 6 Length: 514.510294345882 Demand Met: 929				
109.163270167925	399.186500010714	48	393.8	61.4

Solution x	Solution y	Original x	Original y	Radius
89.1179033086541	393.666247129068	89	393.8	1.5
78.3965478264701	386.822105873527	92.1	387.5	46.4
68.8125537215511	381.520204735488	51.2	387.5	18.6
68.8125537215511	351.838417754269	28.3	339.4	44.9
63.1180324747108	341.482570669021	59.1	339.4	8.5
63.1180324747108	330.745046003832	100	339.4	61.5
63.1180324747108	321.363437937893	67.7	315.8	26.1
58.4771590555609	317.219882322641	63.8	331.6	16.8
54.0975080837247	292.255160328887	63.8	315.8	50.8
54.0975080837247	272.883039963532	89	260.7	48.3
54.0975080837247	272.883039963532	36.2	273.1	28.7
54.0975080837247	263.447344743335	51.2	254.4	9.5
54.0975080837247	263.448344743335	17.3	260.7	36.9
56.0216898733363	270.399227364039	24.4	273.1	45.5
56.0216898733363	270.400227364039	85.8	303.2	50.8
59.61322093675	270.400227364039	67.7	331.6	72.5
59.61422093675	270.400227364039	66.9	280.4	41.3
59.61522093675	270.400227364039	48	260.7	54.8
62.9422876190842	270.400227364039	20.5	254.4	56.1
66.5194113826872	270.400227364039	63.8	280.4	22
70.0325668546591	270.400227364039	70.1	280.4	10
70.0325668546591	275.733946374906	6.3	273.3	71.7
74.5375766049966	281.991862658822	58.3	329.2	56.8
74.5375766049966	281.992862658821	70.9	297.7	30.8
76.2414166232795	281.992862658821	81.1	285.1	6.1
79.3068534118341	281.992862658822	52.8	281.9	48.7
92.6449291481633	281.992862658822	44.9	303.2	67.2
92.6459291481633	281.992862658822	39.4	273.1	61.9
92.6469291481633	281.992862658822	70.9	315.8	68
92.6479291481633	281.992862658822	21.3	273.1	71.9
92.6489291481633	281.992862658822	60.6	288.2	62.7
100.673115744448	281.992862658822	76.4	288.2	37.9
100.674115744448	281.992862658822	84.3	283.5	54.6
133.334682490495	281.992862658822	141.7	283.5	8.5
133.334682490495	297.476452731873	99.2	329.2	46.6
138.989696416289	297.476452731873	70.9	331.6	81.8
138.990696416289	297.476452731873	67.7	297.7	81
138.990696416289	320.21101265901	63.8	297.6	81.2
138.990696416289	320.21201265901	116.5	303.2	28.2
138.990696416289	320.21201265901	130.7	339.4	25.3
140.836177768026	320.21201265901	136.2	315.8	6.4
159.290443997542	331.314840851343	184.3	387.5	61.5
159.290443997542	331.315840851343	192.1	339.4	44.1
159.290443997542	331.316840851343	155.1	331.6	4.2
161.51113957192	331.316840851343	161.4	331.6	0.3
Route: 7 Length: 1103.07331343497 Demand Met: 931				
160.800671680631	66.5240219948425	141.7	17.3	52.8
160.800671680631	66.5230219948425	222.8	73.2	62.4
160.800671680631	51.8156247121743	116.5	37	49.6
160.800671680631	51.8146247121742	178	37	22.7
155.090637420918	31.3999809438614	155.1	29.1	2.3
146.861879502738	31.3999809438614	142.5	49.6	28.5
146.861879502738	31.3999809438614	136.2	29.1	21.8
146.861879502738	27.218630665693	127.6	20.5	20.4
146.861879502738	-2.73812049727198	141.7	-7.9	7.3
149.852530924658	0.296110549040411	149.6	-7.9	8.2
173.200000000001	14.9999999999646	173.2	18.9	3.9
210.408511601692	14.9999999999642	248	14.2	37.6
213.949242482245	14.9999999999642	218.9	20.5	7.4
234.231107881136	11.302	224.4	14.2	14.2
234.231107881136	11.3009999999999	236.2	14.2	10.1
234.231107881136	11.2999999999999	222	18.9	14.4
275.599999301991	11.2999999999999	275.6	6.9	4.4
276.228853797639	11.2999999999999	305.5	6.9	29.6
276.802037682636	11.2999999999999	308.7	6.9	32.2
284.497826343738	11.2999999999999	293.7	6.9	10.2
284.497826343738	14.647172341506	290.6	6.9	35.4
284.497826343738	14.648172341506	294.5	73.2	59.4
284.497826343738	14.648172341506	278.7	6.9	32.7
284.497826343738	27.1625893792534	293.7	63	37
240.200000003971	25.2000000000047	240.2	22	3.2
234.200203477299	25.2000000000047	240.2	15.7	16
234.200203477299	49.5872430240276	234.6	49.6	0.4
233.166761942398	49.5872430240276	249.6	37	20.7
233.165761942398	49.5872430240276	234.6	65.4	24.2
231.537033787881	49.5872430240276	231.5	49.6	41.1
231.537033787881	66.7995100923377	231.5	65.4	1.4
228.186252396904	71.0956602183513	227.6	31.5	39.6
228.186252396904	73.6792697822486	227.6	65.4	8.3
225.764865881382	73.6792697822486	222	63	20.4

Solution x	Solution y	Original x	Original y	Radius
223.58475745572	73.6792697822486	227.6	49.6	30.7
221.349230621265	73.6792697822486	231.5	31.5	56.7
221.348230621265	73.6792697822487	280.3	37	73
221.347230621265	73.6792697822487	263	63	43
212.408154070934	75.1401683136252	263.8	73.2	55.8
193.830822612172	75.1401683136252	192.1	73.2	2.6
190.965413288832	75.1401683136252	148.8	29.1	68.3
188.223854902181	75.1401683136251	191.3	63	18.3
185.543865948681	75.1401683136252	233.1	14.2	77.3
181.837049236976	75.1401683136251	208.7	37	62.2
181.836049236975	75.1401683136251	234.6	31.5	69.7

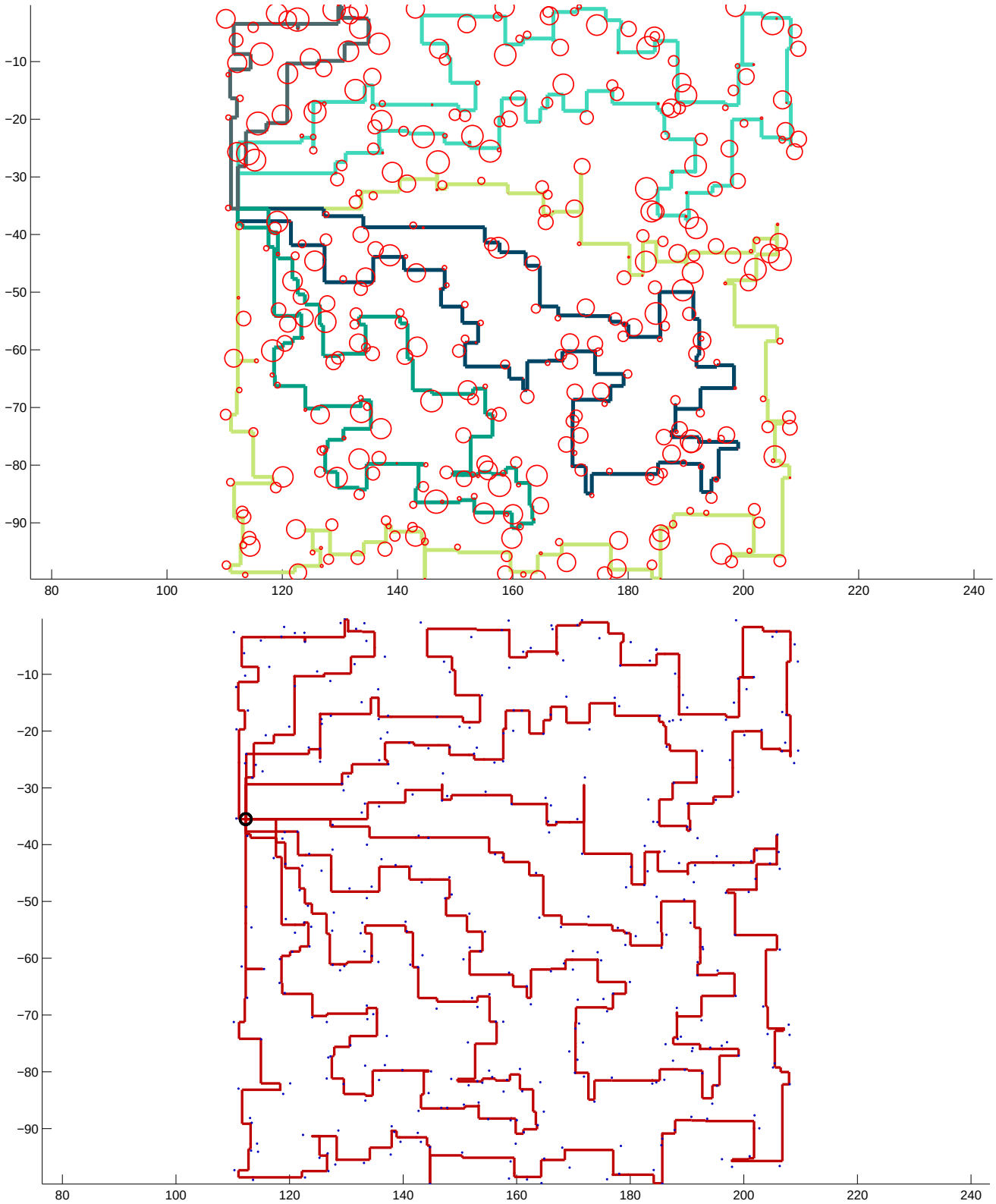


Figure O.163: $rd400$, arbitrary radius, 2D, Manhattan, Length = 1714.3281950

Table O-166: Solution for $rd400$, arbitrary radius, 2D, Manhattan

Total distance: 1714.32819504423				
Total demand met: 3297				
Depot: x 2.28315 y 35.5085				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 432.275417666801 Demand Met: 782				
2.36784308232087	24.0241746372726	2.38826	24.0295	0.0211
13.3999999632907	23.1961	13.4	22.8874	0.3087
15.3896993753871	24.7700999999999	15.3897	25.3897	0.6196
15.3896993753417	23.5684968600414	15.3759	23.0999	0.4688
15.3896993753438	17.0036877662925	15.6993	18.7479	1.8907
15.390699375342	17.0036877663138	15.6444	17.8995	1.1341
17.3100892373619	17.0036877663146	17.2907	17.3232	0.3201
24.3327757820982	14.1334	22.6997	14.9199	1.8126
25.6231000265292	14.1334	25.6231	12.6549	1.4785
25.6782904224422	17.4790723220639	25.7178	17.895	0.4178
27.8635675237926	17.4790723220639	27.3595	17.3028	0.534
35.8761827629946	17.4790723220638	36.0033	17.5038	0.1295
40.528028681462	18.4375	39.9475	19.2268	0.9798
41.7204999981288	18.4374999998774	41.7205	19.4188	0.9813
43.5346999999999	13.6900999996471	43.8962	13.6901	0.3615
39.1727559314304	9.26245751503109	38.2491	9.61738	0.9895
38.606855740168	6.89307889290524	37.2177	7.79249	1.6549
34.2251631518268	1.99941590602258	33.1085	0.882753	1.5792
42.9540863396548	2.21414101015352	42.0178	3.44287	1.5448
46.6375780662136	2.21414101015352	47.3917	2.23053	0.7543
48.6979000226912	2.21414101015352	48.5894	0.54797	1.6697
48.6979000226912	7.00717	48.6979	8.85907	1.8519
51.7689873152852	6.00748000000066	51.1528	6.04103	0.6171
52.4925000488173	6.00748000000066	52.4925	5.37248	0.635
57.1950017718886	6.546011766106	58.2097	7.56071	1.435
57.0229000000001	3.46897496444349	56.3237	2.07366	1.5607
57.0229000000001	1.40532005667145	56.1254	1.40532	0.8975
61.1549713305571	0.857605999950559	60.7013	1.36116	0.6779
61.5069000218639	0.857605999950561	61.5069	0.482106	0.3755
66.1389034916294	2.82502282970356	64.5769	3.66176	1.772
68.7935999999995	4.34543	70.1018	4.34543	1.3082
68.3399454823012	8.37000436404355	68.2389	8.47105	0.1429
71.673948661138	8.37000436404528	73.4709	7.6166	1.9485
74.6320001613693	6.40994000000142	74.632	5.60444	0.8055
76.1130956696221	6.40994000000142	74.5771	5.70821	1.6887
78.5886195816601	10.5219196362858	77.911	9.90186	0.9185
78.5886195816601	12.2288154322314	79.2919	13.6517	1.5872
78.5886195816601	17.0589533510895	80.035	15.8589	1.8794
78.5886195816601	17.0589533510895	78.906	18.0381	1.0293
86.8707000026051	17.5417	86.8707	18.0065	0.4648
89.1667514849947	14.9109707995517	88.2698	14.9994	0.9013
89.1667514849947	12.9435527333125	90.4883	12.6216	1.3602
89.1667514849941	10.5224999831397	88.9914	10.7701	0.3849
91.6601000000193	10.5224999831397	91.7898	10.5225	0.1297
89.8254214756449	1.68556327028468	88.6343	0.494442	1.6845
93.3768421660039	2.44070666397996	95.0473	3.39817	1.9254
95.7607488045202	2.44070666397996	95.7659	2.55349	0.1129
98.2077999999085	3.85659392369831	98.9579	4.73211	1.1529
98.2077999999084	7.77477998842717	99.5164	7.77478	1.3086
97.5637000000477	15.3126555397184	96.7716	16.6523	1.5563
97.5637000000477	17.180199998738	97.4766	17.1802	0.0871
98.2075999999999	24.4445895330904	98.8743	25.646	1.374
98.2075999999999	23.4577000471527	99.5853	23.4577	1.3777
96.3459927548275	23.151819287073	97.2905	22.0419	1.4574
96.3459927548275	23.151819287073	96.7473	23.5618	0.5737
93.1463999810795	20.0238000000001	93.1464	19.8146	0.2092
90.1065696161797	20.05430890137	90.11	20.7153	0.661
88.0375127441748	26.4760685815022	87.5589	25.1226	1.4356
88.0375127441748	31.5451584125841	89.036	30.7257	1.2917
84.646884633046	32.7663415871884	85.0689	32.1301	1.2391
80.3024000000002	32.7664000133567	80.1207	32.7664	0.1817
80.302400000005	35.6212375645045	80.5435	37.2793	1.6755
80.5380583105178	37.5423583739926	81.8496	38.8539	1.8548
79.9948941567663	36.6954647465476	80.0506	36.8529	0.167
76.0400880065988	36.6954647465476	74.7866	36.0265	1.4465
75.4530952122302	36.6954647465476	74.0572	35.987	1.8168
75.1271	32.0501000972483	73.2088	32.0501	1.9183
77.4555050116336	29.0807163834026	77.6794	29.1288	0.229
81.658	29.0807163834043	81.7106	28.112	1.8663
81.658	23.4883000869791	82.6839	23.4883	1.0259
76.986490210375	22.3562573289999	76.419	22.7841	0.7107
76.2872433641231	19.1167278796046	77.5205	18.1054	1.5949
75.8399235764541	18.3759935095001	76.9072	18.2917	1.0706
75.0857998934955	17.2864610851874	75.2455	17.3084	0.1612
67.2669999486098	15.1121000000071	67.267	14.1516	0.9605
67.2659999486112	15.1121000000071	68.0574	15.6194	1.1416
62.8284999282079	18.5527	62.8285	19.7058	1.1531
58.7637000178839	15.7313	58.7637	13.9566	1.7747
56.0190035864366	18.0871391361765	55.9929	17.1432	0.9443
54.7387000028961	20.4393999999996	54.7387	20.4852	0.0458
52.2421948187342	16.4016	50.9211	16.4053	1.3211
49.4943999999988	16.4016	49.4944	16.327	0.0746
48.0797738043784	19.5826380084706	49.4045	19.961	1.3777
48.0787738042631	19.5826380084706	47.6864	20.3976	0.9045
47.63309984439	25.0032	47.6331	25.3181	0.3149
44.2670272511629	25.0032	46.0829	25.5503	1.8965
42.5082975683078	24.1997961332412	42.4972	23.9973	0.2028
41.6448038830509	24.1997961332412	42.987	22.9253	1.8509
38.1578164439674	22.4898717457548	38.2173	22.874	0.3887
36.2957845411341	22.4898717457554	34.4638	23.0393	1.9126
31.9071862945847	22.0143000000127	31.0765	22.0815	0.8334
27.2481997211698	22.0143	27.2482	20.2425	1.7718
27.0526181853139	22.0143000000127	26.0672	21.3383	1.195
26.8171000000002	25.1372000974816	25.8125	25.1372	1.0046
27.2590999998508	25.8428000080159	27.4222	25.8428	0.1631
21.0046118295607	27.4326365628738	20.3288	28.022	0.8967
19.2342366062482	29.3667134492751	19.5262	30.4483	1.1203
19.2332366062482	29.3667134492751	19.247	29.2712	0.0965
Route: 2 Length: 495.353556252707 Demand Met: 799				
23.7396911355882	34.7323262670773	22.7183	34.3604	1.087
23.7396911355878	32.5958032367765	23.2874	32.7742	0.5102
25.7692759923386	32.5958032367765	25.7714	33.2927	0.6969
30.3748528054629	30.377171160671	29.1053	29.2049	1.728
30.416696198552	30.3771711606713	31.6686	31.1822	1.4884
36.8624253397156	29.4224010846967	37.0272	27.4581	1.9712
36.8624253397146	32.0849704764425	36.8488	32.2474	0.163
38.5176676718922	31.2797000000159	37.7688	31.4408	0.766
44.5404000000264	31.2797000000156	44.5404	30.686	0.5937
49.1148000001325	32.8466999999998	49.1148	32.8614	0.0147
55.3079364099356	32.8466999999998	56.0389	33.1015	0.7741
55.3079364099356	32.8455760404007	55.099	31.771	1.0947
55.3079364099356	36.5533999999765	55.5492	35.9315	0.9688
55.7169999998405	36.5533999999795	55.717	37.8511	1.2977
56.9764099232915	36.0473458769984	56.9788	35.9946	0.0528
59.316300692842	36.0473458769983	60.6972	35.5066	1.483
61.8370000000006	29.531056125139	62.0154	28.1819	1.3609
61.8370000000006	41.603399999999	61.5258	41.6034	0.3112
70.2534674350298	43.9393095921312	70.0979	43.9308	0.1558
70.2534674350298	47.010299999999	69.2786	47.5055	1.1881
72.4782000000125	47.0102999999986	72.4782	47.1166	0.1063
72.5650000000089	41.2822000000726	72.565	40.2263	1.0559
75.1774976275186	41.2822000000725	76.05	41.1841	0.878
74.857900000116	44.6995000000083	73.064	44.6995	1.7939
80.1214000000004	45.1809756564555	81.1997	46.621	1.799
80.1214000000004	43.2581999969365	78.6058	43.2582	1.5156
80.573830458336	43.1427013505883	81.4209	43.6493	0.987
84.5445596149311	43.1427013505883	85.2354	42.0312	1.3087
89.4326400012662	43.1427013504871	88.1955	43.6361	1.3319
91.4587831879076	43.1427013504871	91.3249	42.8902	0.2858
91.8159988506101	40.7154829014336	92.3029	41.017	0.5727
95.8035748377612	38.370025162125	95.9404	38.2332	0.1935
95.8035748377614	39.871424425911	96.1419	41.3034	1.4714
95.803574837761	43.457372279119	96.3235	44.2629	1.97
95.802574837761	43.4573722791183	94.61	43.2995	1.6034
92.2269953537028	47.9105841156086	92.0634	46.0336	1.8841
92.2259953537028	47.9105841156086	90.8764	48.3318	1.4138
87.0836000002685	48.4797000004527	86.8559	48.4797	0.2277
88.4460742211835	55.9171905147023	88.4474	55.9131	0.0043
95.8315999999924	58.4969000001561	96.3481	58.4969	0.5165
93.8857000003715	68.5015000000334	93.4248	68.5015	0.4609
94.2045999998019	72.3664999999992	94.2046	73.3577	0.9912
97.0387278409617	72.3664999999992	97.9153	71.697	1.103
97.0387278409615	72.7767897213314	98.0725	73.509	1.2703
95.4569000000018	79.2325000005421	95.1537	79.2325	0.3032
96.4948178597028	80.0451905580585	95.4573	78.5053	1.8568
97.9681999999975	82.1977000009613	98.0879	82.1977	0.1197
96.7917830525747	95.6957373246904	96.3227	96.5824	1.0031
87.9427000000155	95.6957373246904	87.9339	96.7331	1.0374
87.9427000000156	95.4019000000232	86.1563	95.4019	1.7864
90.8639966711952	95.2150632847318	91.0373	94.8618	0.4152
91.7974	89.9533999998563	92.7385	89.9534	0.9411
91.7973999999907	88.6721952780126	91.8947	87.6684	1.0085

Solution x	Solution y	Original x	Original y	Radius
83.2386461438377	88.5655996708183	83.5669	88.2708	0.4412
80.7777000001128	88.5158	80.7777	87.9354	0.5804
77.9141041742826	90.8641110832722	77.8131	90.2453	0.627
75.6567182521953	90.8641110832723	75.6586	91.7899	1.4188
75.635900000102	91.2087544541336	75.4786	92.9344	1.7328
75.6359000001019	99.6311999999992	75.6359	99.7073	0.0761
74.131400000037	98.1196000000403	74.1314	97.2935	0.8261
69.6400337781409	98.1196000000403	68.0526	97.9535	1.5961
66.9136137698259	98.1196000000404	65.9332	98.9174	1.264
67.0075130113304	93.7669116779251	68.3546	93.0491	1.5264
58.4876068934795	93.7669116779252	58.0371	93.3465	0.6162
58.4876068934773	95.5265000000003	59.3326	96.8644	1.5824
54.86650000004	95.5265000000006	54.8665	95.2849	0.2416
54.3191425327837	98.5036999999958	54.3707	99.6057	1.2802
51.8362999999874	98.5037	51.8363	98.9629	0.4592
49.5797106909153	97.867091499764	48.6626	98.7924	1.3028
49.5797106909153	95.1338969574114	48.9418	95.7946	0.9184
40.4171000000008	94.7202	40.4171	94.2218	0.4984
34.7579000002592	99.6477999999933	34.7579	99.7518	0.104
34.7270006535555	92.9804688364821	34.7487	93.2543	0.5908
34.2175354793836	91.5377886141823	33.1283	92.3481	1.7117
32.3882355184742	91.5377886141822	32.5896	90.759	0.8044
29.3735900087028	91.5377886141821	29.5533	92.3189	0.8869
28.8483050776919	90.3920000000005	28.4623	90.5817	0.4301
27.989299999916	90.3920000000005	27.9893	89.6021	0.7899
27.9892999999289	93.3526635421837	27.8353	94.5623	1.2194
24.1347097886202	95.4889341855079	23.1083	96.0553	1.1723
18.2983763887291	95.488934185483	18.064	96.3276	0.8708
18.2983763887266	91.3217797203189	18.6101	90.3489	1.0216
13.9990335763865	91.3217797203199	12.3803	91.1149	1.6319
15.2732999998436	94.7555999999791	15.2733	95.1553	0.3997
16.6084999999742	94.5831176936571	16.7243	94.3593	0.252
16.608499999976	97.4806000000105	16.854	97.4806	0.2455
12.179882789765	98.5794999999894	12.7313	98.6134	1.4759
3.57801000109201	98.5794999999997	3.57801	99.0366	0.4571
1.0103180000044	97.3271999999395	0.299018	97.3272	0.7113
2.77592925305858	94.4462242149456	4.45069	94.0863	1.713
2.77592925305858	93.566801687527	3.24988	93.8751	0.5654
3.14383999999998	92.6489000000002	4.28894	92.6489	1.1451
3.14383999999905	89.1400665920898	3.35356	88.986	1.2038
3.14383999998715	89.139066592088	3.06059	88.1315	1.011
1.65324498290478	83.1552061832445	1.02508	82.9527	0.66
8.35819999999634	83.1552061832416	8.89064	83.8954	0.9118
8.35819999999998	82.0450000000065	10.1219	82.045	1.7637
4.96218737018933	74.1855290433177	4.99968	74.2733	0.7686
1.113265	71.23349999987	0.194865	71.2335	0.9184
2.11058413396265	67.0815419585894	2.55217	66.9796	0.4532
2.28314999999994	61.9091999999837	1.5771	61.4642	1.5502
5.19310000000002	61.909199999977	5.5259	61.9092	0.3328
2.28314999999994	53.8357124376806	3.30116	54.5758	1.2586
2.28314999999979	50.7990764968422	2.40393	50.9808	0.2182
Route: 3 Length: 369.121011835613 Demand Met: 754				
17.2005972619858	36.8048861725943	17.6023	36.5196	0.4927
24.0748308414619	38.7369666449995	23.6339	40.0124	1.3495
32.2260821992195	38.7369666449995	32.7353	38.4372	0.5909
34.3285140341889	38.7369666449996	34.4656	38.8185	0.1595
45.1420566291765	41.3848933035444	46.2037	41.7062	1.1092
47.689749889709	43.0580147454802	47.522	42.292	1.7871
52.2230962969533	45.4053769671726	53.4254	44.9898	1.2721
54.6821470022811	52.4829053876541	54.0007	52.8659	0.7817
57.8741016141901	54.0410645654112	57.8122	54.5104	0.4734
62.5020631368504	54.1382414613103	62.6521	52.6724	1.4735
66.8410541364284	55.110396175652	67.8108	54.6502	1.0734
68.9588703339431	55.5767946491153	69.3672	55.5594	0.4087
70.0335213090163	57.2536622399398	70.983	56.1077	1.4882
70.0335213090163	57.7464	69.1414	57.6653	0.8958
75.5116999970878	57.7464	75.5117	58.1702	0.4238
75.5841999999997	55.8635999918319	76.3859	55.8636	0.8017
75.5841999999997	55.4216744092157	74.8357	53.7031	1.8745
75.4556829323061	49.9712788982373	74.6616	49.1772	1.123
81.3199657506165	49.9712788982373	79.5061	49.6701	1.8387
81.3199657506165	54.6506402570141	80.6139	53.7748	1.125
82.3441	58.0479001575468	82.7455	58.0479	0.4014
82.3441	59.8551630180155	82.834	58.4111	1.5249
82.3441	60.9834627621412	81.8774	60.6902	1.3427
81.8548412535997	62.9551590026062	81.8209	62.9891	0.048
85.3959000028443	62.6731	85.3959	62.1638	0.5093
88.354299999983	66.638198992688	88.5712	66.6382	0.2169
82.5412998697625	70.2338999999981	82.5413	70.9361	0.7022
78.2185998435701	69.5770000000199	78.2186	68.7569	0.8201

Solution x	Solution y	Original x	Original y	Radius
78.2184661454299	73.9426915829778	78.9206	73.8168	1.3456
78.2184661454288	73.9436915829778	78.3667	74.2083	0.3033
77.5604000000004	75.1456000039424	76.2214	75.1456	1.339
82.3073120325344	75.9621404706555	80.8889	76.3527	1.4712
82.3073120325344	75.9631404706554	80.9911	75.8316	1.9298
83.9859888786912	75.9631404706554	84.0931	75.7357	0.2514
86.2408090701182	75.9631404706554	87.0562	74.7862	1.4318
86.2418090701182	75.9631404706555	86.1254	75.412	0.5633
89.0938999999996	77.1611000003773	89.1084	77.1611	0.0145
85.7107890160634	82.3800894408032	85.2864	82.465	0.4328
84.4593999574647	84.6509999999972	84.4594	85.6238	0.9728
82.6847013740373	79.7744386175429	82.6909	80.2719	0.4975
80.1407321518797	79.5454000000034	79.6042	79.6519	0.547
77.5351998479141	79.5454000000034	77.5352	78.0347	1.5107
75.199996260428	81.538931803682	75.9957	81.402	0.8074
73.8931322596768	81.538931803682	74.5996	81.8744	1.5343
73.8931004559898	81.539899999995	73.8931	82.0767	0.5368
66.7644995948949	81.5150000000048	66.7645	81.0279	0.4871
63.6977004759998	84.9019999999963	63.6977	85.2552	0.3532
62.64003197346	80.1704004589925	61.8453	80.8454	1.0427
60.3485	80.1704000000746	60.2539	80.1704	0.0946
60.3484999999999	77.7503432955798	60.7208	77.8844	0.3957
60.3485	75.6151162239667	59.2712	76.4167	1.3428
60.3485	75.0349646195013	61.6789	74.8507	1.3431
60.3485	71.2768256430787	60.356	72.3736	1.0968
60.4418151431838	71.2768256430787	60.9907	71.4945	1.0514
60.4418151431838	68.6439000000162	60.771	67.3196	1.3646
65.3010990020691	68.6439000000162	65.3011	67.1869	1.457
65.929698445378	68.8939000000026	65.9297	69.3415	0.4476
66.9423657297793	66.2539013095647	66.9764	66.2314	0.0408
69.2207999999912	64.183199745341	69.9395	64.1832	0.7187
64.2573004957755	60.2659000000007	64.8783	60.379	0.7048
64.2573004957224	60.2649000000007	64.2573	58.953	1.3119
59.7748364453939	60.2649000000007	59.9164	58.75	1.5215
58.5948868476141	61.8640901653861	59.9164	61.9972	1.3282
58.593886847614	61.8640901653861	58.3448	60.9201	0.9763
55.976884142251	61.9688149195468	56.0439	62.2937	0.3947
52.5117968859757	66.9661999998953	52.5118	68.1256	1.1594
51.7882135044569	65.000890179626	51.793	64.9464	0.0547
49.3759646665609	62.8848752747754	48.6743	62.5481	0.7783
41.7127000000281	60.1839000433782	40.6271	60.1839	1.0856
41.7127000000281	58.7815686179664	41.7302	58.1199	0.6619
43.6748669779081	58.7815686179692	43.5841	58.7522	0.0954
43.9697999999663	55.3301000410208	44.4217	55.3301	0.4519
41.2459687096063	52.4913777076792	41.6783	52.1535	0.5487
37.5527	49.4356000236483	37.4105	49.4356	0.1422
38.1734	48.7846000377138	38.5534	48.7846	0.38
38.1734	46.1402069036495	38.1612	45.7549	0.3855
34.7736047231893	46.1402069036495	33.2771	46.652	1.5816
31.1148451457825	43.8800000000018	31.4339	43.8079	0.3271
30.4885157145343	43.8800000000018	28.6889	43.6077	1.8201
26.200300036499	43.8800000000017	26.2003	42.5604	1.3196
25.7968067446815	48.2785999995911	24.4594	47.3987	1.6009
23.6126000785675	48.2785999995911	23.6126	49.4214	1.1428
20.4955878079807	48.2785999995911	20.5641	47.7219	0.5609
17.3362686710648	44.3790770226711	15.6372	44.5891	1.712
17.3362686710648	41.8424319394496	17.5856	40.8861	0.9883
12.8371403057675	41.8424319394496	13.4598	41.6191	0.6615
11.5052820145281	37.6987662944517	11.4258	37.7412	0.0901
Route: 4 Length: 289.765540576737 Demand Met: 687				
7.61302524073439	42.1561602632828	7.21925	42.3799	0.4529
8.60126196483247	54.1020999999998	9.35555	53.1101	1.2462
10.9638001508048	54.1021	10.9638	55.5178	1.4157
12.5871999990915	54.1020999999998	13.8308	54.4775	1.5454
12.5871999990916	53.7074000011602	12.5872	53.6987	0.0087
13.3054999999645	57.9262000056951	13.5318	57.9262	0.2263
11.8300428194511	58.8270123214921	10.4725	58.878	1.3585
10.1007067721899	59.5819945715023	8.30742	60.1487	1.8807
8.59078000001503	64.356499999572	8.25408	64.3565	0.3367
8.71098900312902	66.2855409349611	9.17265	66.1356	0.4854
14.0141012182 62	70.1707999999987	14.0141	70.4084	0.2376
16.5763342212929	69.7481637241386	16.576	71.2313	1.5967
23.6205999985118	69.7481637241386	23.7167	70.7298	1.8661
23.6205999985118	68.7612000000034	23.6206	68.344	0.4172
25.3809999999986	69.6849080818326	24.7619	69.8637	0.6444
25.3809999999911	73.6903992159845	27.1361	73.6904	1.7551
20.6051998170965	75.5978581821121	20.7262	75.308	0.3141
17.8732696684293	77.1316396725804	17.2306	77.2747	0.6584
17.6050875089478	77.4150300971344	16.8354	77.4785	0.7723
17.4497000000002	81.1813008814421	16.5471	81.1813	0.9026

Solution x	Solution y	Original x	Original y	Radius
19.5574785119567	83.9002508536775	19.5225	82.1483	1.7523
23.3569003452332	84.1982	23.3569	85.0798	0.8816
24.6449522005066	81.7459065434991	25.7615	81.4539	1.1541
24.6449522005065	79.7819000000004	23.3293	78.9181	1.7443
26.1289933339305	79.7819000000003	26.7929	78.8352	1.2073
29.882699982027	79.7819000000002	29.8827	79.684	0.0979
34.5631999999299	79.9328005563963	34.9224	79.9328	0.3592
33.6394758044873	84.0072927164924	34.4937	83.7515	0.8917
33.1436499881989	86.4571502778958	32.7208	86.88	0.598
37.8476720485626	86.4571502778958	37.7453	86.3505	0.2766
37.8486720485628	86.4571502778959	36.723	86.3354	1.9971
40.8659911975942	86.0630526305183	40.7053	85.7824	0.3234
43.3068007863664	85.9027000000193	43.3068	85.4106	0.4921
43.3068007863664	88.2226165211941	44.9959	88.3516	1.7636
49.054398015023	88.2226165211938	48.934	88.5471	0.3461
49.0553980150231	88.2226165211939	50.0418	88.5256	1.6597
49.8327988172453	90.908	49.8328	92.6571	1.7491
51.1872012489317	90.1111139061152	51.2472	90.6526	0.5448
53.5891	89.3849000022894	53.7144	89.3849	0.1253
53.3826000000004	87.0164990068906	54.7886	87.0165	1.406
52.8912437623794	83.0933541146255	54.169	81.8375	1.7916
51.0826213844595	83.0933541146255	50.9984	83.4341	0.351
50.5772	80.4660000000111	50.5772	79.5094	0.9566
48.8102014705862	81.5258999999998	48.3206	81.4332	0.4983
47.7086998761151	81.5259	47.7087	83.4773	1.9514
46.2618119827976	81.1935000000003	45.6946	80.9262	1.6109
45.1635999499412	81.1935	45.1636	79.7971	1.3964
43.9629000079708	81.7054999999981	43.9629	81.9344	0.2289
42.9436945322374	81.7054999999981	43.0779	81.6476	0.4575
41.3174880252498	81.7054999999981	41.546	82.3742	1.3555
39.578200000005	81.2568	38.4806	81.2568	1.0976
42.6815924810018	75.0373760346668	41.4131	74.8199	1.287
46.4653999999989	72.0291825417222	46.3399	71.17	0.8683
46.4653999999999	71.1842999903044	47.6475	71.1843	1.1821
45.2184	66.7199	45.2184	66.3382	0.3817
43.1006005953175	67.6495	43.1006	68.5786	0.9291
40.675142355614	67.6495	42.1545	66.9856	1.6215
35.9687938711594	66.9984359437459	35.9094	68.8825	1.885
32.6550205132238	61.5812847854515	32.641	61.5676	0.0686
31.7265600876351	60.5694292033017	31.2678	61.1344	1.3636
31.7265600876352	59.4322684805355	33.4192	59.483	1.6934
31.7265600876351	55.4100829249317	30.6696	55.2626	1.0672
30.446800002871	54.2419000000039	30.4468	53.5688	0.6731
23.7233110618771	54.2419000000038	22.8193	53.7552	1.0267
23.3241000000003	55.6169001535394	22.5447	55.6169	0.7794
24.4511000000001	59.7019593276426	23.2085	58.8069	1.5314
24.4511000000001	59.7029593276425	24.5176	59.5849	0.7579
24.4511000000001	60.6642999877674	25.6513	60.6643	1.2002
20.1135512843768	61.0629	19.6656	61.3862	1.0677
18.9117518561801	61.0629	18.9042	62.1271	1.3155
17.6011000000013	61.0629	17.6011	61.1721	0.1092
17.0924344000344	55.7045191116402	17.5187	55.1629	1.8177
16.5069100443521	52.1528748905012	17.8085	51.9553	1.3165
13.9329189834943	50.3893807309008	13.2524	50.7626	1.3367
12.7007892089368	47.7217640151226	11.7937	48.0467	1.685
11.7624844835698	44.1455874317072	12.2621	43.6923	0.6746
9.23987959516251	43.3079552057149	9.27453	43.3967	0.2856
9.23987959516273	39.6210476048572	9.16001	37.8018	1.821
7.6871269616087	38.7973650315519	8.75416	38.928	1.075
3.12726307863794	38.1273735446373	2.57158	38.4711	0.6534
Route: 5 Length: 127.812668712375 Demand Met: 275				
1.10504999999476	35.3685550899197	0.642906	35.395	0.4629
1.10504999999476	25.5677458348008	2.1823	25.6845	1.6403
1.10504999999984	19.6999000000399	0.65945	19.6999	0.4456
2.13563000000001	16.3882999999301	2.68873	16.3883	0.5531
0.965562000000105	12.2624000000624	0.613562	12.2624	0.352
0.965562000000105	11.3512521481173	2.19732	10.251	1.6516
4.51056999999996	8.70232999990927	6.43447	8.70233	1.9239
1.57978718917967	5.19143054648831	2.00806	6.28968	1.1788
1.57978718917967	3.45902045456124	0.219756	2.58493	1.6167
5.60589037804435	3.45902045456124	4.96047	4.06059	0.8823
8.57052064606592	3.45902045456124	8.57052	3.36732	0.0917
9.04959747969821	3.46354553985285	9.0496	1.67955	1.784
12.2810634525726	3.46354553985285	10.9477	2.73525	1.5193
12.7115999999895	4.23146999992391	12.7116	4.29147	0.06
12.7115999999895	3.46354553985285	12.6307	2.70835	1.996
19.7287000000355	0.339916000000795	19.7287	0.198716	0.1412
20.3206233001659	2.40654612508543	19.0116	0.977048	1.9383
20.3216233001659	2.40654612508543	21.7245	2.01127	1.4575
22.7902618594288	2.53502435737011	23.1984	1.0131	1.5757

Solution x	Solution y	Original x	Original y	Radius
24.9695	5.32036506911913	23.5387	4.13129	1.8604
24.9695	6.90196000074273	26.7979	6.90196	1.8284
20.8183080976216	9.87224224728388	21.4744	8.21886	1.7788
16.0668706459257	10.3449465372021	17.1854	11.1942	1.4044
16.0658706459257	10.3449465372021	14.8737	9.51072	1.7498
10.8745772155668	10.3449465372021	10.9524	12.0779	1.7347
10.8745772155668	20.6669072415612	9.96077	19.2347	1.6989
7.23996560339965	22.1098707896149	5.81823	20.7452	1.9707
3.70706761456013	27.8990726419036	4.056	25.9589	1.9713
3.7070676145583	28.148446436355	5.25835	27.1001	1.8723
3.47042119207147	28.148446436355	3.44571	28.2052	0.0619

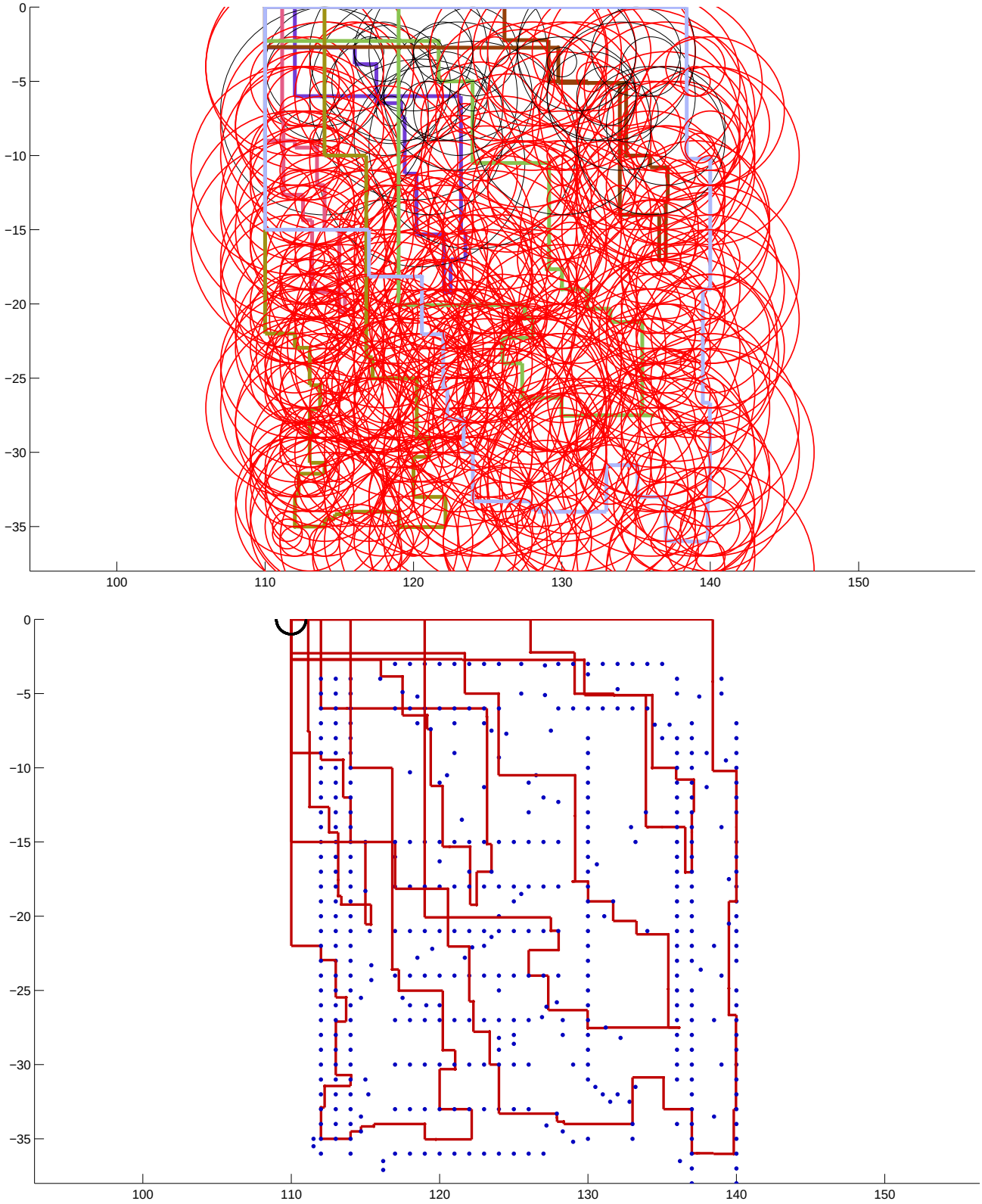


Figure O.164: *pcb*442, arbitrary radius, 2D, Manhattan, Length = 560.6561086

Table O-167: Solution for *pcb*442, arbitrary radius, 2D, Manhattan

Total distance: 560.656108632743				
Total demand met: 1066				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 65.4606079858306 Demand Met: 160				
2	6	2	6	0
3.7639320225002	6	2	5	3
3.7639320225002	6	3	5	3
3.7639320225002	6	3	6	3
3.7639320225002	6	6	4	3
3.7639320225002	6	4	6	1
9.99999999999994	6	11	6	1
13.1829648926753	6.55158619752578	13.5	7.5	1
13.1829648926753	6.55158619752578	14.5	7.7	4
13.1829648926753	6.55158619752578	16.5	10.5	6
13.2005831511049	15.1428571428571	9	15	5
13.2005831511049	15.1428571428571	13	11.3	4
13.2005831511049	15.1428571428571	16	11	5
13.2005831511049	15.1428571428571	14	15	1
13.2005831511049	15.1428571428571	16	15	5
13.2005831511049	15.1428571428571	13	18	5
13.2005831511049	15.1428571428571	15.5	18.5	5
13.2005831511049	15.1428571428571	16	18	4
13.2005831511049	15.1428571428571	14	20	5
13.5	17	13.5	17	0
12.5	19.2303039929153	8	18	5
12.5	19.2303039929153	10	16.3	5
12.5	19.2303039929153	10	21	4
12.5	19.2303039929153	14	18	2
12.5	19.2303039929153	12	21	4
12.5	19.2303039929153	15	19	3
12.5	19.2303039929153	13	21	4
12.5	19.2303039929153	12.2	22.1	5
12.5	19.2303039929153	13.5	21.4	3
12.5	19.2303039929153	11	24	5
12.5	19.2303039929153	12	24	5
12.5	19.2303039929153	13	24	5
12.5	19.2303039929153	14	24	5
12.0523791323368	15.3193973875442	13	15	1
12.0523791323368	15.3193973875442	16	13	6
12.0523791323368	15.3193973875442	12	17	6
12.0523791323368	15.3193973875442	15	15	7
12.0523791323368	15.3193973875442	12	18	6
12.0523791323368	15.3193973875442	17	15	6
12.0523791323368	15.3193973875442	15	18	7
10.6694621343983	15.3193973875442	8	15	3
10.6694621343983	15.3193973875442	11.5	13.5	2
10.6694621343983	15.3193973875442	10	15	2
10.6694621343983	15.3193973875442	11	15	1
10.6694621343983	15.3193973875442	10	18	3
10.202279472601	11.2205941097898	10	11	1
10.202279472601	11.2205941097898	12	15	6
9.40000000000001	7.4	9.4	7.4	0
9.15694594736162	6.47246714317831	3	4	7
9.15694594736162	6.47246714317831	4	7	7
9.15694594736162	6.47246714317831	9	3	6
9.15694594736162	6.47246714317831	10	3	4
9.15694594736162	6.47246714317831	9	6	1
9.15694594736162	6.47246714317831	8.5	7	1
9.15694594736162	6.47246714317831	12	6	3
9.15694594736162	6.47246714317831	11	7	2
9.15694594736162	6.47246714317831	13	6	5
9.15694594736162	6.47246714317831	11	9	5
9.15694594736162	6.47246714317831	10.5	10.5	7
9.15694594736162	6.47246714317831	14	9.3	7
7.5	4.9	7.5	4.9	0
7.5	3.84615934654094	4	4	4
7.5	3.84615934654094	4	5	4
7.5	3.84615934654094	8	3	2
7.5	3.84615934654094	8.5	5.2	4
7.5	3.84615934654094	8	6	4
6.03847271810201	2.72529054227078	7	3	1
6.03847271810201	2.72529054227078	10	6	7
Route: 2 Length: 51.8620689654041 Demand Met: 172				
1.1479844360899	7.52351645519396	2	7	1
1.1479844360899	7.52351645519396	3	8	5
1.1479844360899	7.52351645519396	4	8	7
1.1479844360899	7.52351645519396	2	11	7
1.23431753984192	12.6432187577064	2	12	1
1.23431753984192	12.6432187577064	2	14	7
1.23431753984192	12.6432187577064	4	14	4
1.23431753984192	12.6432187577064	2	16	7
2.55125780120447	14.3567037271945	4	13	2
2.55125780120447	14.3567037271945	2	15	1
3.16495805273041	17.5501862832734	3	17	1
3.16495805273041	17.5501862832734	4	17	1
3.16495805273041	18.6333825320513	3	15	4
3.16495805273041	18.6333825320513	3	16	4
3.16495805273041	18.6333825320513	3	18	2
3.16495805273041	18.6333825320513	4	18	3
3.16495805273041	18.6333825320513	3	19	2
3.16495805273041	18.6333825320513	2	20	4
3.16495805273041	18.6333825320513	4	19	1
3.16495805273041	18.6333825320513	3	20	4
3.16495805273041	18.6333825320513	2	21	3
3.16495805273041	18.6333825320513	5	18.3	4
3.16495805273041	18.6333825320513	3	21	3
3.38116656576231	19.2144777656427	4	20	1
3.38116656576231	19.2144777656427	7	18	7
3.38116656576231	19.2144777656427	3	22	5
3.38116656576231	19.2144777656427	5.4	23.3	6
3.38116656576231	19.2144777656427	8	21	6
3.38116656576231	19.2144777656427	8.5	22.8	7
3.38116656576231	19.2144777656427	9.5	22.2	7
5.37931034486533	20.5517241378367	2	17	5
5.37931034486533	20.5517241378367	4	16	5
5.37931034486533	20.5517241378367	2	18	5
5.37931034486533	20.5517241378367	2	19	5
5.37931034486533	20.5517241378367	7	16	5
5.37931034486533	20.5517241378367	4	21	2
5.37931034486533	20.5517241378367	4	22	2
5.37931034486533	20.5517241378367	3	23	5
5.37931034486533	20.5517241378367	2	24	5
5.37931034486533	20.5517241378367	5.3	21	5
5.37931034486533	20.5517241378367	7	21	3
5.37931034486533	20.5517241378367	4	24	4
5.37931034486533	20.5517241378367	5.4	24.3	5
5.37931034486533	20.5517241378367	9	24	5
5	15	5	15	0
4	12	4	12	0
3.49610424974711	9.46316655594522	2	4	6
3.49610424974711	9.46316655594522	3	7	3
3.49610424974711	9.46316655594522	2	8	4
3.49610424974711	9.46316655594522	3	9	2
3.49610424974711	9.46316655594522	2	10	3
3.49610424974711	9.46316655594522	7	6	5
3.49610424974711	9.46316655594522	4	9	1
3.49610424974711	9.46316655594522	3	10	6
3.49610424974711	9.46316655594522	3	11	2
3.49610424974711	9.46316655594522	4	11	5
3.49610424974711	9.46316655594522	3	12	4
3.49610424974711	9.46316655594522	2	13	4
3.49610424974711	9.46316655594522	3	13	6
3.49610424974711	9.46316655594522	3	14	6
3.49610424974711	9.46316655594522	8	10.3	5
3.49610424974711	9.46316655594522	4	15	6
2	9	2	9	0
Route: 3 Length: 111.701268211007 Demand Met: 184				
8.99518007894994	20.0794453899971	9	21	1
17.5029206964531	20.9793738941452	18	15	6
17.5029206964531	20.9793738941452	15	21	6
17.5029206964531	20.9793738941452	16	21	3
17.5029206964531	20.9793738941452	17	21	1
17.5029206964531	20.9793738941452	18	21	1
17.5029206964531	20.9793738941452	15	24	4
17.5029206964531	20.9793738941452	21.1	20	4
17.5029206964531	20.9793738941452	18	24	6
17.5029206964531	20.9793738941452	17.2	26.1	6
17.5029206964531	20.9793738941452	17.9	25.8	5
17.5029206964531	20.9793738941452	20	24	4
17.5029206964531	20.9793738941452	20	25	5
18.0196155385847	22.2794233078771	17	24	2
18.0196155385847	22.2794233078771	20	22	2
16	24	16	24	0
17.3234684301487	26.3307949152704	16.9	26.8	1
19.9796022858628	27.5339961902287	13	27	7
19.9796022858628	27.5339961902287	15	27	6

Solution x	Solution y	Original x	Original y	Radius
19.9796022858628	27.5339961902287	18.3	27	5
19.9796022858628	27.5339961902287	20	26	4
19.9796022858628	27.5339961902287	20	27	3
19.9796022858628	27.5339961902287	20	28	2
19.9796022858628	27.5339961902287	20	29	7
19.9796022858628	27.5339961902287	19	30	4
19.9796022858628	27.5339961902287	20	30	3
19.9796022858628	27.5339961902287	22.2	28.2	3
19.9796022858628	27.5339961902287	20	31	6
19.9796022858628	27.5339961902287	20.5	31.5	4
19.9796022858628	27.5339961902287	26	26	7
19.9796022858628	27.5339961902287	21	32	6
19.9796022858628	27.5339961902287	21.5	32.5	7
19.9796022858628	27.5339961902287	22	32	7
19.9796022858628	27.5339961902287	22.8	32.5	7
19.9796022858628	27.5339961902287	26	30	7
21.2	27.5	21.2	27.5	0
26.1339745962156	27.5	27	28	1
26.1339745962156	27.5	26	29	5
26.1339745962156	27.5	27	30	6
26.1339745962156	27.5	29	30	7
26.1339745962156	27.5	27	32	7
26.1339745962156	27.5	30	30	7
25.4174273752508	24.9072847381401	26	22	3
25.4174273752508	24.9072847381401	27	23	3
25.4174273752508	24.9072847381401	26	24	3
25.4174273752508	24.9072847381401	26	25	1
25.4174273752508	24.9072847381401	27	25	2
25.4174273752508	24.9072847381401	27	26	3
25.4174273752508	21.222891609013	26	20	2
25.4174273752508	21.222891609013	27	20	2
25.4174273752508	21.222891609013	27	22	2
23.2695572354809	20.317026085592	24	21	1
21.7	19	21.7	19	0
20.0085129294008	19	18	18	3
20.0085129294008	19	20	17	3
20.0085129294008	19	20	19	2
20.0085129294008	19	20	20	1
20.0085129294008	19	20	21	2
20.0085129294008	17.6602243577744	20	18	1
20.0085129294008	17.6602243577744	20	23	7
18.9709268157393	17.6602243577744	17	18	2
18.9709268157393	17.6602243577744	20.6	16.5	2
19.1339745962139	13.2381267057147	17	12	3
19.1339745962139	13.2381267057147	18	12.3	3
19.1339745962139	13.2381267057147	20	13	1
19.1339745962139	13.2381267057147	20	15	2
19.1339745962139	10.5	20	10	1
19.1339745962139	10.5	20	11	1
13.974643126294	5.00032153721506	14	3	3
13.974643126294	5.00032153721506	14	6	1
13.974643126294	5.00032153721506	13	7	3
11.6959880260614	2.28194661230574	11	3	1
11.6959880260614	2.28194661230574	13	3	6
Route: 4 Length: 103.967462528342 Demand Met: 183				
4	10	4	10	0
6.81039629482441	23.5862004631846	9	18	6
6.81039629482441	23.5862004631846	3	25	6
6.81039629482441	23.5862004631846	4	25	4
6.81039629482441	23.5862004631846	2	27	6
6.81039629482441	23.5862004631846	3	27	6
6.81039629482441	23.5862004631846	7	24	6
6.81039629482441	23.5862004631846	8	24	6
6.81039629482441	23.5862004631846	4	28	6
6.81039629482441	23.5862004631846	7.5	25.5	3
6.81039629482441	23.5862004631846	10	24	4
6.81039629482441	23.5862004631846	9.1	26	5
6.81039629482441	23.5862004631846	10	26	4
6.81039629482441	23.5862004631846	9	27	6
6.81039629482441	23.5862004631846	10	27	5
7.2497863704243	25.0156596035553	8	26	2
7.2497863704243	25.0156596035553	7	27	2
10.2149406962527	29.0233728691649	8	27	3
10.2149406962527	29.0233728691649	9	30	2
10.2149406962527	29.0233728691649	10	30	1
11.0467457811221	30.302169479252	7	30	5
11.0467457811221	30.302169479252	11	27	5
11.0467457811221	30.302169479252	8	30	5
11.0467457811221	30.302169479252	12	30	1
11.0467457811221	30.302169479252	13	30	5

Solution x	Solution y	Original x	Original y	Radius
11.0467457811221	30.302169479252	11	33	4
11.0467457811221	30.302169479252	12	33	4
11.0467457811221	30.302169479252	14	33	4
10	33	10	33	0
12.1605458270998	35.0317541634481	15	36	3
9.75	35.0317541634481	8	33	4
9.75	35.0317541634481	8	36	2
9.75	35.0317541634481	10	36	1
9.75	35.0317541634481	12	36	4
8.99999999999621	34	9	33	1
8.99999999999621	34	9	36	5
8.99999999999621	34	13	33	6
8.99999999999621	34	11	36	6
8.99999999999621	34	14	36	7
5.5663194024655	34.167688812505	3	35	3
5.5663194024655	34.167688812505	7	33	3
5.5663194024655	34.167688812505	6.2	36.5	3
5.5663194024655	34.167688812505	6.2	37.1	3
4.7	34.5	4.7	34.5	0
3.99982249024694	35	4	36	1
3.99982249024694	35	7	36	6
2	35	2	35	0
2	34.9999999999999	1.5	35	1
2	34.9999999999999	1.5	35.5	1
2	34.9999999999999	2	36	1
2	34	2	34	0
2.00650012118076	32.8861668291483	3	33	1
2.00650012118076	32.8861668291483	3	34	5
2.00650012118076	32.8861668291483	4	34	5
2.00650012118076	32.8861668291483	4.7	33.5	6
2.00650012118076	32.8861668291483	4	35	5
2.25295490249836	31.4388180390537	2	28	4
2.25295490249836	31.4388180390537	2	30	3
2.25295490249836	31.4388180390537	4	29	3
2.25295490249836	31.4388180390537	3	30	2
2.25295490249836	31.4388180390537	2	31	3
2.25295490249836	31.4388180390537	3	31	3
2.25295490249836	31.4388180390537	2	32	3
2.25295490249836	31.4388180390537	3	32	1
2.25295490249836	31.4388180390537	2	33	4
2.25295490249836	31.4388180390537	4	32	4
2.25295490249836	31.4388180390537	4	33	4
2.25295490249836	31.4388180390537	5.2	32	3
4	31	4	31	0
4.04428108611692	30.7057189138831	3	29	2
4.04428108611692	30.7057189138831	5	31	1
3	28.9999999977502	2	29	1
3	28.9999999977502	4	30	5
3.00526921649953	27.1025215507405	4	27	1
3.00526921649953	27.1025215507405	3	28	1
3.70040440638392	25.4715632411054	2	23	3
3.70040440638392	25.4715632411054	3	24	3
3.70040440638392	25.4715632411054	2	25	3
3.70040440638392	25.4715632411054	2	26	2
3.70040440638392	25.4715632411054	3	26	2
3.70040440638392	25.4715632411054	4	26	3
3.70040440638392	25.4715632411054	4.7	25.5	1
3.00103815671208	22.9544452455301	4	23	1
2	22	2	22	0
Route: 5 Length: 88.3534652222479 Demand Met: 183				
16.1326330830165	2.22554794630194	15.5	3	1
16.1326330830165	2.22554794630194	17.1	3.1	6
16.1326330830165	2.22554794630194	15.5	5	4
16.1326330830165	2.22554794630194	18	3	5
16.1326330830165	2.22554794630194	19	3	5
16.1326330830165	2.22554794630194	18	6	5
16.1326330830165	2.22554794630194	17.5	7.5	6
19.0977323482073	5.00478726489565	17.1	5.1	2
19.0977323482073	5.00478726489565	19	6	1
21.7637149680887	5.1068823086752	22	4.7	1
21.7637149680887	5.1068823086752	24	3	5
21.7637149680887	5.1068823086752	20	9	6
21.7637149680887	5.1068823086752	26	5	6
21.7637149680887	5.1068823086752	25.5	7.1	7
21.7637149680887	5.1068823086752	25	8	7
23.8999627015016	13.9913626426249	22.9	14	1
24.0311491929364	13.9913626426249	20	12	5
24.0311491929364	13.9913626426249	23.9	13	1
24.0311491929364	13.9913626426249	26	13	5
24.0311491929364	13.9913626426249	26	15	5

Solution x	Solution y	Original x	Original y	Radius
24.0311491929364	13.9913626426249	26	16	3
24.0311491929364	13.9913626426249	29	14	5
24.0311491929364	13.9913626426249	26	18	5
25.000037302667	13.9913626426249	26	14	1
26.5588466157542	17.0392310771695	20	16	7
26.5588466157542	17.0392310771695	27	15	7
26.5588466157542	17.0392310771695	26	17	1
26.5588466157542	17.0392310771695	27	17	1
26.5588466157542	17.0392310771695	30	15	4
26.5588466157542	17.0392310771695	27	18	3
26.5588466157542	17.0392310771695	26	19	5
26.5588466157542	17.0392310771695	27	19	5
26.5588466157542	17.0392310771695	29.5	17.5	5
26.5588466157542	17.0392310771695	26	21	4
26.5588466157542	17.0392310771695	30	18	6
26.5588466157542	17.0392310771695	27	21	4
26.5588466157542	17.0392310771695	30	19	5
26.5588466157542	17.0392310771695	26	23	6
26.5588466157542	17.0392310771695	28.5	22	6
26.5588466157542	17.0392310771695	30	21	6
26.5588466157542	17.0392310771695	27.6	23.6	7
27	16	27	16	0
27	14.3332968344892	27	14	2
27	13	27	13	0
27.1375015339545	10.7939403236088	30	8	4
27.1375015339545	10.7939403236088	28	11.3	1
25.9430876470558	9.99919008202886	26	8	2
25.9430876470558	9.99919008202886	26	10	1
24.3342234379287	9.99919008202886	27.5	5.2	6
24.3342234379287	9.99919008202886	27	7	6
24.3342234379287	9.99919008202886	20	14	6
24.3342234379287	9.99919008202886	27	9	6
24.3342234379287	9.99919008202886	28	9	4
24.3342234379287	9.99919008202886	27	10	6
24.3342234379287	9.99919008202886	26	11	6
24.3342234379287	9.99919008202886	27	11	6
24.3342234379287	9.99919008202886	26	12	5
24.3342234379287	9.99919008202886	23.2	15	6
24.3342234379287	9.99919008202886	27	12	4
24.3342234379287	9.99919008202886	30	10	6
24.3342234379287	5.1068823086752	20	3	5
24.3342234379287	5.1068823086752	22	3	4
24.3342234379287	5.1068823086752	20	6	5
24.3342234379287	5.1068823086752	21	6	5
24.3342234379287	5.1068823086752	25	3	3
24.3342234379287	5.1068823086752	22	6	3
24.3342234379287	5.1068823086752	23	6	2
24.3342234379287	5.1068823086752	26	4	2
24.3342234379287	5.1068823086752	24	6	5
24.3342234379287	5.1068823086752	24.5	7.1	2
24.3342234379287	5.1068823086752	27	8	4
24.3342234379287	5.1068823086752	26	9	5
19.7567541393674	2.73003460591007	20	3.7	1
19.7567541393674	2.73003460591007	21	3	4
19.7567541393674	2.73003460591007	23	3	6
19.7567541393674	2.73003460591007	20	8	6
11.5245496139574	2.68562963187258	12	3	2
Route: 6 Length: 139.311235719912 Demand Met: 184				
28.4097054529951	4.19208172636832	29	4	2
28.4107054529951	4.19208172636832	29	5	1
28.4107054529951	4.19208172636832	30	7	5
28.4107054529951	10.2141428428613	30	9	2
30	10.2141428428613	29.3	9.5	1
30	10.2141428428613	30	11	1
30	12	30	12	0
30	14	30	13	1
30	16	30	16	0
30	19	30	17	2
29.9788360356834	19	30	20	1
29.9788360356834	19	30	22	4
29.9788360356834	19	30	23	5
29.5	20.5	29.5	20.5	0
29.5	24.8660254037848	29	24	1
29.5	24.8660254037848	26	27	6
29.5	24.8660254037848	27	27	7
29.5	24.8660254037848	30	25	4
29.5	24.8660254037848	30	28	6
29.5	26.6559086863562	28.5	27	2
29.5	26.6559086863562	30	26	1
30	27	30	27	0

Solution x	Solution y	Original x	Original y	Radius
29.9728751081586	28.0003679475694	30	29	1
29.9728751081586	28.0003679475694	30	31	4
29.9728751081586	31.0003679475478	30	32	1
29.9728751081586	33.0001226291325	26	34	7
29.9728751081586	33.0001226291325	28.5	33.5	5
29.9728751081586	33.0001226291325	30	33	5
29.9728751081586	33.0001226291325	27	37	6
29.9728751081586	33.0001226291325	30	36	3
29.9728751081586	33.0001226291325	30	38	7
29.8227809555965	36.0158285666052	27	35	3
29.8227809555965	36.0158285666052	30	34	3
29.8227809555965	36.0158285666052	30	35	2
29.8227809555965	36.0158285666052	30	37	1
28.467074750127	35.9686729694215	26.2	36.5	3
27.4909890854674	35.9686729694215	27	38	4
27.3525999708866	35.9686729694215	27	34	2
27.3525999708866	35.9686729694215	27	36	1
27	33	27	33	0
25.0949062404546	30.8602107066494	26	28	3
25.0949062404546	30.8602107066494	23.2	31.5	2
25.0949062404546	30.8602107066494	27	29	3
25.0949062404546	30.8602107066494	26	31	1
25.0949062404546	30.8602107066494	27	31	3
23	34	23	34	0
18.3690305867616	33.8424427560243	13	36	6
18.3690305867616	33.8424427560243	16	36	4
18.3690305867616	33.8424427560243	17	36	5
18.3690305867616	33.8424427560243	19	35.2	6
18.3690305867616	33.8424427560243	20	35	2
18.3690305867616	33.8424427560243	23	35	6
17.9115017574245	33.5883545116393	16	33	2
17.9115017574245	33.5883545116393	17.2	34.1	1
17.9115017574245	33.5883545116393	18.3	34.5	1
17.9	33.3	17.9	33.3	0
14	30	14	30	0
13.999	30	14	29	1
13.999	30	15	33	6
13.3767273010075	27.7820045670462	14	27	1
13.3767273010075	27.7820045670462	11	30	7
13.3767273010075	27.7820045670462	16	27	7
13.3767273010075	27.7820045670462	15	28	3
13.3767273010075	27.7820045670462	15	28.6	6
13.3767273010075	27.7820045670462	15	30	7
13.3767273010075	27.7820045670462	16	30	7
13.3767273010075	27.7820045670462	18.3	28	7
12.2772896916038	25.7439321683909	11.7	22.8	3
12.2772896916038	25.7439321683909	14	25	3
12.2772896916038	25.7439321683909	12	27	3
12.2772896916038	25.7439321683909	14	28.2	3
12.0007257156305	22.0380907421303	11	21	2
12.0007257156305	22.0380907421303	13	22	1
10.564445089917	18.1526924481787	11	18	1
10.564445089917	18.1526924481787	14	21	7
7	15	7	15	0

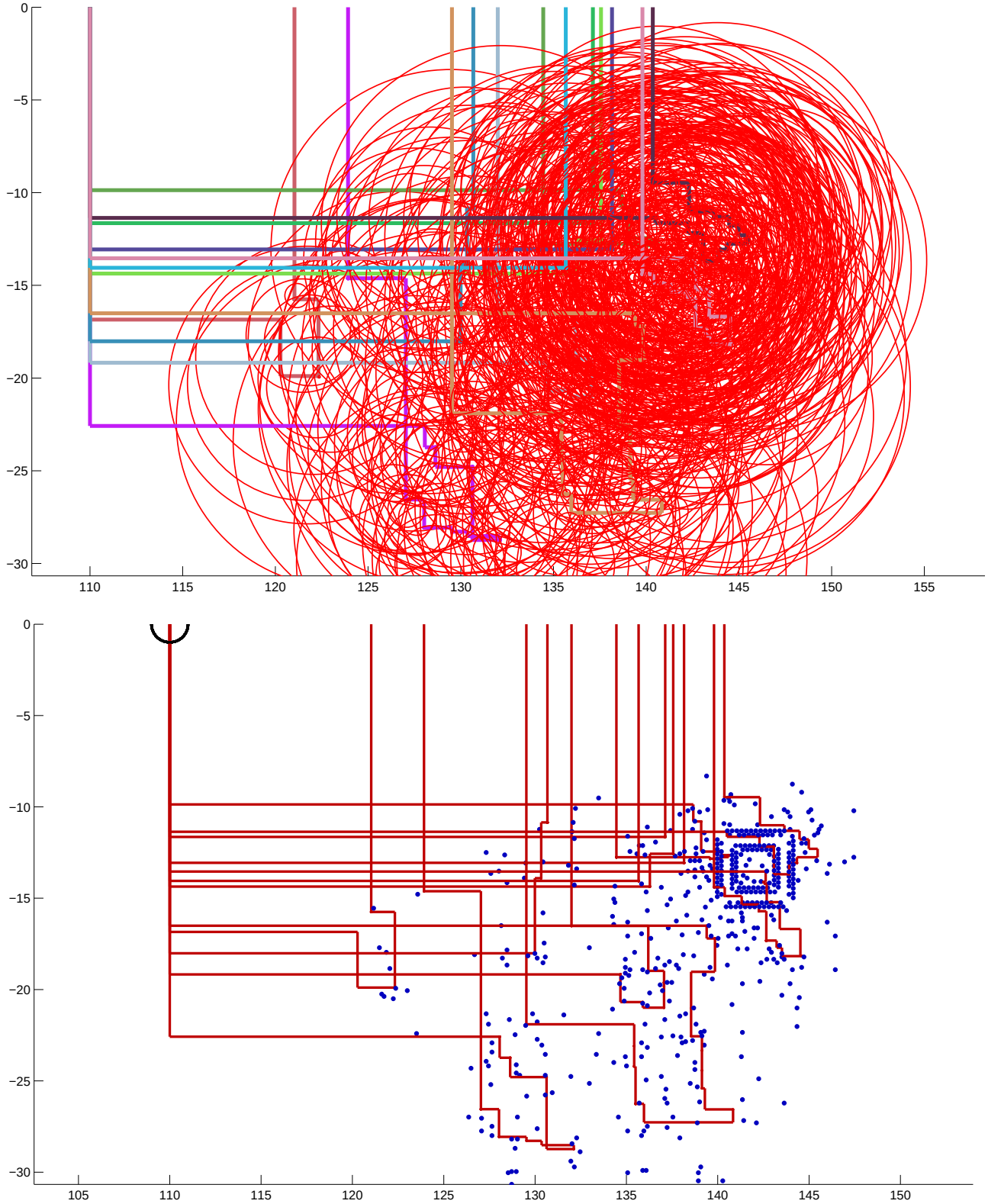


Figure O.165: $d493$, arbitrary radius, 2D, Manhattan, Length = 1072.8180884

Table O-168: Solution for $d493$, arbitrary radius, 2D, Manhattan

Total distance: 1072.81808840153				
Total demand met: 11160				
Depot: x 0 y 0				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 64.4354659453905 Demand Met: 474				
11.0300446352253	15.7503480415	11.163	15.552	0.651
11.0300446352253	15.7503480415	11.481	17.711	3.058
11.0300446352253	15.7503480415	12.052	18.854	6.347
11.0300446352253	15.7503480415	11.608	20.251	6.345
11.0300446352253	15.7503480415	19.482	13.076	9.717
11.0300446352253	15.7503480415	11.735	20.378	7.485
11.0300446352253	15.7503480415	16.688	18.092	8.156
11.0300446352253	15.7503480415	13.513	22.41	8.854
12.326866486348	19.8908664863472	12.37	19.934	0.061
12.326866486348	19.8908664863472	12.243	20.505	2.717
12.326866486348	19.8908664863472	13.005	20.061	3.941
12.326866486348	19.8908664863472	20.561	18.219	9.121
12.326866486348	19.8908664863472	17.323	21.331	8.168
12.326866486348	19.8908664863472	20.434	18.537	8.447
12.326866486348	19.8908664863472	17.45	21.902	6.347
12.326866486348	19.8908664863472	18.593	21.648	9.517
12.326866486348	19.8908664863472	19.863	21.331	9.178
12.326866486348	19.8908664863472	17.64	23.426	9.913
12.326866486348	19.8908664863472	18.974	24.125	8.219
12.326866486348	19.8908664863472	19.164	24.696	8.537
10.2779080283707	16.8467390420489	11.862	17.965	2.45
Route: 2 Length: 101.705498607369 Demand Met: 966				
13.9214231798443	14.6208240028775	13.576	14.79	1.637
13.9214231798443	14.6208240028775	17.577	13.647	6.049
13.9214231798443	14.6208240028775	18.212	18.283	7.954
13.9214231798443	14.6208240028775	20.434	15.806	8.615
13.9214231798443	14.6208240028775	18.466	18.664	8.295
17.0351729008369	26.5518135635815	17.069	27.046	1.002
17.0351729008369	26.5518135635815	17.069	27.744	2.549
17.0351729008369	26.5518135635815	19.037	28.189	3.611
17.0351729008369	26.5518135635815	18.72	29.967	7.58
17.0351729008369	26.5518135635815	22.466	28.887	7.763
17.0351729008369	26.5518135635815	22.149	29.713	6.925
18.0281213871916	28.0654240900364	16.37	26.982	2.311
18.0281213871916	28.0654240900364	17.64	27.49	0.99
18.0281213871916	28.0654240900364	17.64	27.998	1.574
18.0281213871916	28.0654240900364	18.529	30.03	2.079
19.5294922113346	28.2815606976399	20.117	27.617	1.231
19.5294922113346	28.2815606976399	18.91	28.697	3.011
20.3599544557365	28.520126146493	18.72	30.665	3.298
22.1173370286537	28.735412275031	18.974	29.967	3.376
22.1173370286537	28.735412275031	22.276	28.125	2.538
22.1173370286537	28.735412275031	21.958	29.395	1.302
22.1173370286537	28.735412275031	25.07	30.03	3.224
20.6276137529086	24.7963620038695	20.561	24.696	0.361
20.6276137529086	24.7963620038695	22.022	28.443	5.071
20.6276137529086	24.7963620038695	24.562	26.982	7.031
20.6276137529086	24.7963620038695	25.07	27.744	6.389
20.6276137529086	24.7963620038695	26.149	27.49	8.339
20.6276137529086	24.7963620038695	27.546	26.982	8.192
20.6276137529086	24.7963620038695	25.895	29.903	9.341
18.6333563976525	23.7351226670935	17.45	24.188	1.702
18.6333563976525	23.7351226670935	19.037	26.982	6.169
18.6333563976525	23.7351226670935	21.958	24.76	6.761
18.6333563976525	23.7351226670935	18.72	28.189	7.716
18.0599957342635	22.5802436611899	18.148	16.505	6.09
18.0599957342635	22.5802436611899	17.64	22.918	3.23
18.0599957342635	22.5802436611899	18.91	22.474	4.101
18.0599957342635	22.5802436611899	16.497	24.315	2.342
18.0599957342635	22.5802436611899	17.323	23.934	5.56
18.0599957342635	22.5802436611899	20.117	21.775	2.22
18.0599957342635	22.5802436611899	17.577	25.204	4.26
18.0599957342635	22.5802436611899	18.974	24.569	2.27
18.0599957342635	22.5802436611899	19.545	25.839	4.367
18.0599957342635	22.5802436611899	20.561	25.776	5.596
Route: 3 Length: 86.888 Demand Met: 996				
24.449709910907	12.7604080144497	18.339	12.631	6.166
24.449709910907	12.7604080144497	22.212	10.091	4.948
24.449709910907	12.7604080144497	23.482	9.52	3.464
24.449709910907	12.7604080144497	25.578	12.568	5.855
24.449709910907	12.7604080144497	25.895	12.123	4.686
24.449709910907	12.7604080144497	26.022	12.631	1.625
24.449709910907	12.7604080144497	24.308	16.441	3.717
24.449709910907	12.7604080144497	25.07	17.076	5.925
24.449709910907	12.7604080144497	27.673	12.695	3.999
24.449709910907	12.7604080144497	26.911	14.409	5.204
24.449709910907	12.7604080144497	25.451	17.965	5.492
24.449709910907	12.7604080144497	27.229	15.362	4.245
24.449709910907	12.7604080144497	28.372	13.52	4.868
24.449709910907	12.7604080144497	28.245	14.854	5.84
24.449709910907	12.7604080144497	29.134	13.33	6.084
29.578000000492	12.841	29.578	13.203	0.362
29.578000000492	12.841	29.975	14.921	2.292
29.578000000492	12.841	31.547	13.203	3.992
29.578000000492	12.841	31.047	14.661	2.465
29.578000000492	12.841	32.477	11.541	3.772
29.578000000492	12.841	32.932	12.353	3.826
29.578000000492	12.841	33.062	12.126	4.87
29.578000000492	12.841	33.322	12.841	4.98
29.578000000492	12.841	32.607	14.661	4.485
29.578000000492	12.841	32.737	14.433	4.264
29.578000000492	12.841	34.135	12.386	5.584
29.578000000492	12.841	34.849	13.393	6.061
29.578000000492	12.841	33.261	18.537	7.388
30.2232553248387	12.7551456838512	30.202	13.231	0.532
30.603	12.6459999505131	30.787	12.646	0.184
30.603	12.6459999505131	31.015	13.816	1.481
30.603	12.6459999505131	33.095	14.011	2.901
30.603	12.6459999505131	33.322	14.141	3.297
30.603	12.6459999505131	35.166	10.726	5.004
30.20582523845	12.4502695864648	30.202	12.451	0.019
30.20582523845	12.4502695864648	32.944	10.536	3.833
30.20582523845	12.4502695864648	31.567	14.661	2.638
30.20582523845	12.4502695864648	33.452	11.541	4.46
30.20582523845	12.4502695864648	34.087	11.615	4.861
30.20582523845	12.4502695864648	34.135	12.646	4.083
30.20582523845	12.4502695864648	34.595	11.996	4.778
30.20582523845	12.4502695864648	34.135	13.686	4.602
30.20582523845	12.4502695864648	35.293	11.552	5.688
30.20582523845	12.4502695864648	35.547	11.234	6.26
30.20582523845	12.4502695864648	35.674	11.044	6.002
29.0915494743194	10.8030456419093	28.753	10.79	0.508
29.0915494743194	10.8030456419093	30.721	9.329	3.502
29.0915494743194	10.8030456419093	32.055	9.837	5.02
28.6640276746898	9.86796577299958	29.451	10.155	0.94
Route: 4 Length: 96.0969410659591 Demand Met: 942				
21.9928840806238	16.520675347507	18.021	13.52	4.982
21.9928840806238	16.520675347507	18.466	17.838	4.44
21.9928840806238	16.520675347507	24.943	18.346	3.687
21.9928840806238	16.520675347507	25.197	18.918	4.006
21.9928840806238	16.520675347507	24.879	19.934	4.656
26.196350412706	18.9790589979296	26.149	19.045	0.291
26.196350412706	18.9790589979296	28.245	21.331	3.596
26.196350412706	18.9790589979296	28.816	21.902	4.368
26.196350412706	18.9790589979296	30.785	20.823	6.267
26.196350412706	18.9790589979296	33.071	18.346	7.578
26.196350412706	18.9790589979296	34.468	20.442	9.777
26.196350412706	18.9790589979296	34.341	21.013	9.585
27.0579999999998	19.6160000001224	27.229	19.616	0.171
27.0579999999998	19.6160000001224	29.261	19.172	3.212
27.0579999999998	19.6160000001224	31.293	23.68	6.085
27.0579999999998	19.6160000001224	33.96	19.68	7.146
27.0579999999998	19.6160000001224	34.341	22.029	7.918
27.0579999999998	19.8241087954777	27.356	18.473	1.404
27.0579999999998	19.8241087954777	26.975	20.061	0.272
27.0579999999998	20.9904705329797	27.102	21.648	0.659
27.0579999999998	20.9904705329797	29.261	23.045	3.259
27.0579999999998	20.9904705329797	29.07	29.713	9.61
25.895432092171	20.6903310318801	25.895	20.759	0.152
25.895432092171	20.6903310318801	26.086	24.95	5.746
25.895432092171	20.6903310318801	28.054	22.918	3.972
24.670736759909	19.1719366757201	24.943	19.108	0.6
24.670736759909	19.1719366757201	24.244	21.077	4.835
24.670736759909	19.1719366757201	24.879	20.632	4.555
24.670736759909	19.1719366757201	26.276	20.188	3.614
24.670736759909	19.1719366757201	23.355	23.553	6.4
24.670736759909	19.1719366757201	26.149	20.886	5.887
24.670736759909	19.1719366757201	27.483	19.616	4.477
24.670736759909	19.1719366757201	26.022	21.902	6.288
24.670736759909	19.1719366757201	25.832	22.918	6.514
24.670736759909	19.1719366757201	26.911	22.601	7.439
24.670736759909	19.1719366757201	27.546	22.537	5.492

Solution x	Solution y	Original x	Original y	Radius
24.670736759909	19.1719366757201	28.245	22.855	6.887
24.670736759909	19.1719366757201	27.8	23.617	6.658
24.670736759909	19.1719366757201	26.911	24.76	7.931
24.670736759909	19.1719366757201	28.626	22.791	9.57
24.670736759909	19.1719366757201	29.07	22.347	8.48
24.670736759909	19.1719366757201	28.88	25.331	8.431
24.670736759909	19.1719366757201	31.356	22.347	9.352
Route: 5 Length: 77.5477318524311 Demand Met: 891				
27.1270386315481	11.6468272946675	20.244	11.234	6.925
27.1270386315481	11.6468272946675	26.149	11.107	6.643
27.1270386315481	11.6468272946675	26.594	11.933	0.605
27.1270386315481	11.6468272946675	27.419	11.298	1.537
27.1270386315481	11.6468272946675	27.991	13.647	2.618
27.1270386315481	11.6468272946675	28.816	12.568	3.752
27.1270386315481	11.6468272946675	29.388	11.804	6.15
27.1270386315481	11.6468272946675	29.975	12.581	3.034
27.1270386315481	11.6468272946675	29.515	14.028	5.055
27.1270386315481	11.6468272946675	29.975	13.101	5.333
27.1270386315481	11.6468272946675	30.657	11.541	6.88
27.1270386315481	11.6468272946675	31.047	11.313	6.138
27.1270386315481	11.6468272946675	29.975	14.401	4.095
27.1270386315481	11.6468272946675	29.642	15.108	5.237
27.1270386315481	11.6468272946675	30.982	12.126	5.546
27.1270386315481	11.6468272946675	30.787	12.906	6.569
27.1270386315481	11.6468272946675	31.242	12.126	5.83
27.1270386315481	11.6468272946675	31.015	12.776	4.762
27.1270386315481	11.6468272946675	30.202	14.791	5.659
27.1270386315481	11.6468272946675	31.015	13.036	5.03
27.1270386315481	11.6468272946675	30.787	13.686	6.343
27.1270386315481	11.6468272946675	31.275	12.613	5.931
27.1270386315481	11.6468272946675	31.697	11.541	4.577
27.1270386315481	11.6468272946675	31.015	13.296	5.495
27.1270386315481	11.6468272946675	31.762	12.126	6.006
27.1270386315481	11.6468272946675	31.015	14.076	6.371
27.1270386315481	11.6468272946675	30.462	15.473	6.788
27.1270386315481	11.6468272946675	31.737	12.885	5.959
27.1270386315481	11.6468272946675	31.399	13.754	6.233
27.1270386315481	11.6468272946675	31.372	15.246	6.866
27.1270386315481	11.6468272946675	32.802	12.126	6.243
27.1270386315481	11.6468272946675	32.436	13.231	5.906
27.1270386315481	11.6468272946675	31.892	15.246	6.832
27.1270386315481	11.6468272946675	32.022	15.473	6.4
27.1270386315481	11.6468272946675	33.322	12.581	6.265
27.1270386315481	11.6468272946675	33.095	13.231	6.668
27.1270386315481	11.6468272946675	33.322	13.101	6.817
Route: 6 Length: 83.8538645298666 Demand Met: 974				
27.563999996304	12.5679999995583	27.927	12.568	0.363
27.563999996304	12.5679999995583	30.787	14.206	3.808
27.563999996304	12.5679999995583	33.322	13.361	9.946
27.563999996304	12.5679999995583	33.907	11.996	7.29
27.563999996304	12.5679999995583	32.867	14.661	8.465
27.563999996304	12.5679999995583	33.095	14.271	9.731
27.563999996304	12.5679999995583	34.135	12.126	8.535
27.563999996304	12.5679999995583	32.182	16.632	9.605
27.563999996304	12.5679999995583	33.907	12.776	9.552
27.563999996304	12.5679999995583	33.907	13.816	8.76
27.563999996304	12.5679999995583	34.135	13.426	8.117
27.563999996304	12.5679999995583	34.849	11.996	7.912
27.563999996304	12.5679999995583	34.785	12.504	9.071
27.563999996304	12.5679999995583	34.135	14.466	7.813
27.563999996304	12.5679999995583	34.404	14.028	9.888
27.563999996304	12.5679999995583	34.135	14.986	7.609
27.563999996304	12.5679999995583	32.817	17.775	7.615
27.563999996304	12.5679999995583	32.309	19.553	9.666
27.563999996304	12.5679999995583	35.992	13.647	9.144
27.563999996304	12.5679999995583	34.087	18.918	9.955
26.2844796350968	14.3629322686293	19.418	13.901	6.882
26.2844796350968	14.3629322686293	22.974	17.711	5.019
26.2844796350968	14.3629322686293	25.07	16.314	2.3
26.2844796350968	14.3629322686293	26.086	14.663	1.968
26.2844796350968	14.3629322686293	28.372	10.218	4.687
26.2844796350968	14.3629322686293	25.832	16.949	3.416
26.2844796350968	14.3629322686293	24.943	18.791	4.875
26.2844796350968	14.3629322686293	26.34	17.203	3.101
26.2844796350968	14.3629322686293	29.007	14.409	6.619
26.2844796350968	14.3629322686293	28.308	15.933	3.661
26.2844796350968	14.3629322686293	27.102	18.664	5.391
26.2844796350968	14.3629322686293	29.134	16.187	3.747
26.2844796350968	14.3629322686293	27.864	18.854	5.87
26.2844796350968	14.3629322686293	28.689	18.156	4.491

Solution x	Solution y	Original x	Original y	Radius
26.2844796350968	14.3629322686293	30.657	15.246	4.816
26.2844796350968	14.3629322686293	29.959	17.584	6.004
26.2844796350968	14.3629322686293	30.594	17.076	5.185
26.2844796350968	14.3629322686293	31.356	16.251	5.882
26.2844796350968	14.3629322686293	30.531	18.664	6.676
Route: 7 Length: 82.442499763296 Demand Met: 966				
28.1568220439053	13.0644278377427	20.434	13.012	7.723
28.1568220439053	13.0644278377427	22.022	11.361	6.97
28.1568220439053	13.0644278377427	28.626	11.234	4.284
28.1568220439053	13.0644278377427	29.007	10.282	4.077
28.1568220439053	13.0644278377427	28.499	12.949	0.524
28.1568220439053	13.0644278377427	29.197	12.441	7.211
28.1568220439053	13.0644278377427	28.753	13.838	1.257
28.1568220439053	13.0644278377427	30.594	9.52	7.585
28.1568220439053	13.0644278377427	30.34	10.917	4.723
28.1568220439053	13.0644278377427	29.975	12.061	7.414
28.1568220439053	13.0644278377427	29.388	13.838	7.053
28.1568220439053	13.0644278377427	29.975	13.881	2.974
28.1568220439053	13.0644278377427	30.787	12.386	7.465
28.1568220439053	13.0644278377427	31.307	11.313	7.443
28.1568220439053	13.0644278377427	31.567	11.313	7.667
28.1568220439053	13.0644278377427	31.372	12.353	3.954
28.1568220439053	13.0644278377427	30.787	13.946	7.399
28.1568220439053	13.0644278377427	32.182	10.98	7.118
28.1568220439053	13.0644278377427	32.022	12.126	7.596
28.1568220439053	13.0644278377427	32.152	12.353	7.264
28.1568220439053	13.0644278377427	32.607	11.313	7.65
28.1568220439053	13.0644278377427	31.61	13.901	7.404
28.1568220439053	13.0644278377427	32.737	11.541	5.142
28.1568220439053	13.0644278377427	31.957	14.433	4.494
28.1568220439053	13.0644278377427	31.502	15.473	5.299
28.1568220439053	13.0644278377427	31.632	15.246	4.737
28.1568220439053	13.0644278377427	30.785	16.949	7.677
28.1568220439053	13.0644278377427	32.372	14.092	6.932
28.1568220439053	13.0644278377427	33.095	12.711	5.532
28.1568220439053	13.0644278377427	33.96	10.536	7.536
28.1568220439053	13.0644278377427	32.152	15.246	4.552
28.1568220439053	13.0644278377427	33.095	13.751	7.425
28.1568220439053	13.0644278377427	33.322	13.621	7.179
28.1568220439053	13.0644278377427	32.542	15.473	5.858
28.1568220439053	13.0644278377427	32.932	15.246	6.384
28.1568220439053	13.0644278377427	33.322	14.401	5.546
28.1568220439053	13.0644278377427	33.062	15.473	7.07
28.1568220439053	13.0644278377427	33.071	16.187	6.12
28.1568220439053	13.0644278377427	34.135	13.946	7.157
Route: 8 Length: 77.3859999999981 Demand Met: 993				
20.6759999999996	10.8530000001686	22.085	10.853	1.409
20.6759999999996	10.8530000001686	22.149	11.742	9.67
20.6759999999996	10.8530000001686	21.831	13.203	7.88
20.6759999999996	10.8530000001686	25.07	11.615	8.154
20.6759999999996	10.8530000001686	25.197	12.441	9.295
20.6759999999996	10.8530000001686	24.371	14.346	7.57
20.6759999999996	10.8530000001686	25.705	12.123	8.029
20.6759999999996	10.8530000001686	24.308	15.044	9.423
20.6759999999996	10.8530000001686	24.371	15.235	7.737
20.6759999999996	10.8530000001686	24.244	15.997	8.356
20.6759999999996	10.8530000001686	27.927	10.409	7.95
20.6759999999996	10.8530000001686	26.149	15.679	9.977
20.6759999999996	10.8530000001686	28.181	12.441	9.321
20.6759999999996	10.8530000001686	28.816	12.25	9.823
20.6759999999996	10.8530000001686	29.261	11.425	8.741
20.6759999999996	10.8530000001686	28.753	12.949	9.829
20.6759999999996	10.8530000001686	28.753	13.457	9.22
20.6759999999996	10.8530000001686	29.007	12.949	8.697
20.6759999999996	10.8530000001686	27.292	16.632	9.708
20.6759999999996	10.8530000001686	27.737	16.251	9.503
20.3365903862434	13.906489695383	17.323	12.504	3.533
20.3365903862434	13.906489695383	18.466	14.155	2.196
20.3365903862434	13.906489695383	22.276	13.393	3.052
20.3365903862434	13.906489695383	22.149	14.282	1.97
19.9899999998821	18.0169999999994	19.99	18.029	0.012
19.9899999998821	18.0169999999994	20.498	17.457	7.365
19.9899999998821	18.0169999999994	20.117	18.283	0.424
19.9899999998821	18.0169999999994	20.117	22.728	7.823
19.9899999998821	18.0169999999994	20.371	23.045	6.483
19.9899999998821	18.0169999999994	20.561	23.553	7.372
19.9899999998821	18.0169999999994	24.752	19.362	9.904
19.9899999998821	18.0169999999994	24.625	19.68	9.202
19.9899999998821	18.0169999999994	25.133	19.235	5.738
19.9899999998821	18.0169999999994	25.895	18.918	7.438

Solution x	Solution y	Original x	Original y	Radius
19.9899999998821	18.0169999999994	26.721	18.283	8.04
19.9899999998821	18.0169999999994	23.482	22.41	8.804
19.9899999998821	18.0169999999994	26.594	18.854	6.988
19.9899999998821	18.0169999999994	28.054	17.013	8.339
19.9899999998821	18.0169999999994	20.942	25.649	8.469
19.9899999998821	18.0169999999994	26.848	19.743	9.863
19.9899999998821	18.0169999999994	27.737	18.664	7.927
19.9899999998821	18.0169999999994	28.118	18.092	9.723
19.9899999998821	18.0169999999994	27.356	20.632	8.262
19.9899999998821	18.0169999999994	24.943	23.68	9.291
19.9899999998821	18.0169999999994	25.832	23.68	9.355
Route: 9 Length: 118.838120994361 Demand Met: 986				
19.5248202127547	21.9056474575545	19.609	18.156	3.821
19.5248202127547	21.9056474575545	19.482	21.966	0.074
19.5248202127547	21.9056474575545	21.577	21.394	2.115
25.4275176953325	23.0960923749705	26.149	23.172	0.891
25.4275176953325	23.0960923749705	25.959	27.744	5.865
25.4275176953325	23.0960923749705	27.229	27.554	5.774
25.4275176953325	23.0960923749705	27.927	28.125	6.761
25.4275176953325	24.207792671112	22.974	25.141	2.625
25.4275176953325	24.207792671112	24.308	23.998	2.157
25.4275176953325	24.207792671112	25.006	24.188	1.627
25.4275176953325	24.207792671112	27.165	25.458	2.59
25.4275176953325	24.207792671112	27.102	25.966	2.428
25.4974024050417	26.2577395344404	25.705	26.22	0.211
25.4974024050417	26.2577395344404	27.229	26.22	2.987
25.4974024050417	26.2577395344404	26.086	29.903	5.939
25.4974024050417	26.2577395344404	28.88	27.3	4.959
25.4974024050417	26.2577395344404	28.943	30.03	6.569
25.4974024050417	26.2577395344404	30.277	30.475	7.266
25.9589448791259	27.2709999999997	25.832	27.998	0.738
28.943	27.2709999999997	31.356	26.03	3.642
28.943	27.2709999999997	28.943	30.475	3.204
30.8406066939166	26.5648031594406	32.245	24.887	2.188
30.8406066939166	26.5648031594406	31.42	27.173	0.84
29.2969100361578	25.4076862129908	33.642	26.22	5.615
29.1339994427732	25.4076862129908	28.499	25.141	1.031
29.1339994427732	25.4076862129908	29.007	26.157	0.76
29.1339994427732	24.4296999414622	28.753	24.379	0.74
29.1339994427732	24.4296999414622	32.118	27.3	5.473
29.1339994427732	23.3379142703451	29.261	22.283	1.411
29.1339994427732	23.3379142703451	28.753	23.998	1.239
29.1339994427732	22.5610002496281	29.134	22.537	0.024
28.5405461967368	22.5610002496281	27.991	22.601	0.551
28.5405461967368	21.0199304400323	27.927	21.458	1.027
28.5405461967368	21.0199304400323	28.689	21.013	0.24
28.5405461967368	19.0316545375158	29.578	18.791	1.065
29.8480000000011	17.2030000007931	30.023	17.203	0.175
29.8480000000011	17.2030000007931	29.705	19.426	2.488
29.8480000000011	17.2030000007931	31.991	16.632	2.73
29.8480000000011	17.2030000007931	31.356	19.68	4.172
29.8480000000011	17.2030000007931	32.372	18.537	3.113
29.8480000000011	17.2030000007931	33.515	18.219	4.061
29.3940016300999	16.5056280975346	28.943	16.886	0.628
29.3940016300999	16.5056280975346	29.515	16.505	0.121
Route: 10 Length: 79.4373196256846 Demand Met: 993				
25.6658299064198	14.0528299064226	25.832	14.219	0.235
25.6658299064198	14.0528299064226	28.626	10.091	7.98
25.6658299064198	14.0528299064226	27.419	15.044	7.778
25.6658299064198	14.0528299064226	28.372	14.663	8.657
25.6658299064198	14.0528299064226	30.658	9.71	8.685
25.6658299064198	14.0528299064226	29.197	13.52	8.532
25.6658299064198	14.0528299064226	29.975	11.801	8.467
25.6658299064198	14.0528299064226	29.975	12.321	7.85
25.6658299064198	14.0528299064226	30.658	10.98	9.268
25.6658299064198	14.0528299064226	29.705	13.393	8.359
25.6658299064198	14.0528299064226	29.975	12.841	8.339
25.6658299064198	14.0528299064226	30.202	12.711	9.036
25.6658299064198	14.0528299064226	30.787	11.313	9.249
25.6658299064198	14.0528299064226	29.975	13.361	8.8
25.6658299064198	14.0528299064226	30.202	12.971	8.778
25.6658299064198	14.0528299064226	29.975	13.621	8.631
25.6658299064198	14.0528299064226	30.202	13.491	9.735
25.6658299064198	14.0528299064226	29.324	15.489	9.524
25.6658299064198	14.0528299064226	30.202	13.751	8.941
25.6658299064198	14.0528299064226	30.202	14.011	8.617
25.6658299064198	14.0528299064226	31.015	12.516	8.72
25.6658299064198	14.0528299064226	30.787	13.426	9.125
25.6658299064198	14.0528299064226	31.502	12.126	9.301
25.6658299064198	14.0528299064226	31.632	12.353	8.922

Solution x	Solution y	Original x	Original y	Radius
25.6658299064198	14.0528299064226	31.957	11.541	8.595
25.6658299064198	14.0528299064226	30.787	14.466	9.289
25.6658299064198	14.0528299064226	32.087	11.313	9.723
25.6658299064198	14.0528299064226	30.15	16.06	8.901
25.6658299064198	14.0528299064226	31.177	14.433	9.897
25.6658299064198	14.0528299064226	31.437	14.433	8.72
25.6658299064198	14.0528299064226	30.982	15.473	9.722
25.6658299064198	14.0528299064226	31.112	15.246	8.972
25.6658299064198	14.0528299064226	32.412	12.353	7.931
25.6658299064198	14.0528299064226	31.697	14.433	8.117
25.6658299064198	14.0528299064226	32.672	12.353	8.34
25.6658299064198	14.0528299064226	31.827	14.661	8.515
25.6658299064198	14.0528299064226	33.387	11.313	9.319
25.6658299064198	14.0528299064226	31.762	15.473	7.919
25.6658299064198	14.0528299064226	33.833	10.282	9.452
25.6658299064198	14.0528299064226	32.347	14.661	7.755
25.6658299064198	14.0528299064226	32.477	14.433	7.82
25.6658299064198	14.0528299064226	31.483	16.822	9.589
25.6658299064198	14.0528299064226	33.96	11.234	9.284
25.6658299064198	14.0528299064226	32.412	15.246	8.256
25.6658299064198	14.0528299064226	33.907	13.296	9.748
Route: 11 Length: 98.320 Demand Met: 989				
30.3580904545218	9.46976704590388	30.34	9.647	1.289
30.3580904545218	9.46976704590388	30.912	9.901	0.974
32.3121470119915	11.0074159000118	32.347	11.313	0.438
33.6464393668551	11.3136263136577	33.647	11.313	0.027
33.6464393668551	11.3136263136577	34.595	9.202	3.337
33.6464393668551	11.3136263136577	34.135	11.866	1.771
33.6464393668551	11.3136263136577	35.484	11.425	2.932
33.6464393668551	11.3136263136577	37.452	10.218	4.761
34.4769404642284	11.7819818551798	34.722	11.742	0.519
34.9831270430149	12.2969155571608	35.42	12.949	1.498
35.466	12.7580004074706	37.452	12.758	1.986
34.3334414581585	13.0739449058973	34.135	12.906	0.387
34.3334414581585	13.0739449058973	34.135	13.166	1.621
34.3334414581585	13.0739449058973	36.119	13.139	3.085
34.3334414581585	13.0739449058973	36.944	13.012	3.218
33.9069999654468	13.694	33.907	13.556	0.805
33.9069999654468	13.694	33.907	14.076	0.382
33.073525351369	12.1806661167742	32.997	11.541	0.865
33.073525351369	12.1806661167742	33.322	12.321	0.752
32.2838777311629	11.6387042563227	32.217	11.541	0.2
32.2838777311629	11.6387042563227	32.542	12.126	1.441
32.2838777311629	11.6387042563227	32.867	11.313	1.814
32.2838777311629	11.6387042563227	33.642	10.155	3.353
32.2838777311629	11.6387042563227	34.087	8.758	5.137
32.2838777311629	11.6387042563227	33.095	12.971	2.042
32.2838777311629	11.6387042563227	33.907	12.516	2.372
32.2838777311629	11.6387042563227	33.907	13.036	3.305
32.2838777311629	11.6387042563227	34.976	10.282	4.446
32.2838777311629	11.6387042563227	35.103	10.155	3.418
32.2838777311629	11.6387042563227	35.992	16.314	6.3
30.5004303933065	11.3624869091346	29.388	8.313	3.288
30.5004303933065	11.3624869091346	30.202	11.996	1.233
30.5004303933065	11.3624869091346	30.527	11.313	2.614
30.5004303933065	11.3624869091346	31.177	11.541	1.55
30.5004303933065	11.3624869091346	30.787	13.166	1.867
30.5004303933065	11.3624869091346	31.437	11.541	2.677
30.5004303933065	11.3624869091346	31.827	11.313	3.091
30.5004303933065	11.3624869091346	31.015	13.556	2.877
30.5004303933065	11.3624869091346	31.892	12.353	3.015
30.5004303933065	11.3624869091346	32.282	12.126	3.133
30.5004303933065	11.3624869091346	31.991	14.092	3.28
30.5004303933065	11.3624869091346	33.127	11.313	2.902
Route: 12 Length: 105.866646017169 Demand Met: 990				
29.7987453437307	14.3975957813769	30.202	14.271	0.592
29.7987453437307	14.3975957813769	31.307	14.661	1.899
29.7987453437307	14.3975957813769	30.594	16.251	2.691
29.7987453437307	14.3975957813769	30.785	16.251	3.205
29.7987453437307	14.3975957813769	31.293	15.806	3.238
29.7987453437307	14.3975957813769	31.356	16.06	3.559
29.7987453437307	14.3975957813769	30.975	17.076	3.584
29.7987453437307	14.3975957813769	31.61	17.775	4.415
29.7987453437307	14.3975957813769	33.642	18.346	5.973
30.3863135058348	14.88442929272	29.975	14.141	0.982
30.3863135058348	14.88442929272	29.975	14.661	0.642
30.3863135058348	14.88442929272	30.722	15.473	0.772
31.3090861750849	15.341901057495	31.242	15.473	0.426
31.3090861750849	15.341901057495	33.769	15.679	3.318
32.2498560207891	15.7100641462885	32.282	15.473	0.309

Solution x	Solution y	Original x	Original y	Radius
32.2498560207891	15.7100641462885	33.515	18.029	3.593
32.2498560207891	15.7100641462885	34.595	18.791	4.79
32.2498560207891	15.7100641462885	36.436	18.918	5.753
32.6563324381747	17.31761115903	29.642	17.076	3.024
32.6563324381747	17.31761115903	31.102	17.775	2.111
32.6563324381747	17.31761115903	32.672	15.246	2.909
32.6563324381747	17.31761115903	33.127	14.661	2.812
32.6563324381747	17.31761115903	32.802	15.473	3.005
32.6563324381747	17.31761115903	31.991	17.203	2.464
32.6563324381747	17.31761115903	32.944	15.933	2.412
32.6563324381747	17.31761115903	33.322	15.473	2.231
32.6563324381747	17.31761115903	33.452	15.246	2.23
32.6563324381747	17.31761115903	32.69	18.346	1.033
32.6563324381747	17.31761115903	32.944	17.965	2.152
33.2216734104073	17.7132327841366	33.388	17.584	0.393
33.5149985322155	18.1720000000005	33.515	20.315	2.143
34.6523796006543	18.1720000000005	34.722	18.219	0.084
34.5240789453343	16.6847127120377	36.436	17.076	2.007
33.393786899466	15.2191657454413	32.087	14.661	1.421
33.393786899466	15.2191657454413	33.582	15.473	0.316
33.393786899466	15.2191657454413	33.907	14.791	0.855
32.6839805666814	14.2079017300448	32.835	14.173	0.155
32.6839805666814	14.2079017300448	33.907	14.336	1.948
32.6839805666814	14.2079017300448	34.135	14.206	1.632
32.6839805666814	14.2079017300448	34.135	14.726	3.323
32.512978110272	14.1022172444209	31.275	14.173	1.24
32.512978110272	14.1022172444209	32.217	14.433	0.628
32.512978110272	14.1022172444209	33.095	13.491	0.844
32.6219215182016	13.5439256471891	32.835	12.613	0.955
32.6219215182016	13.5439256471891	32.69	13.52	0.287
32.6219215182016	13.5439256471891	33.322	13.881	0.777

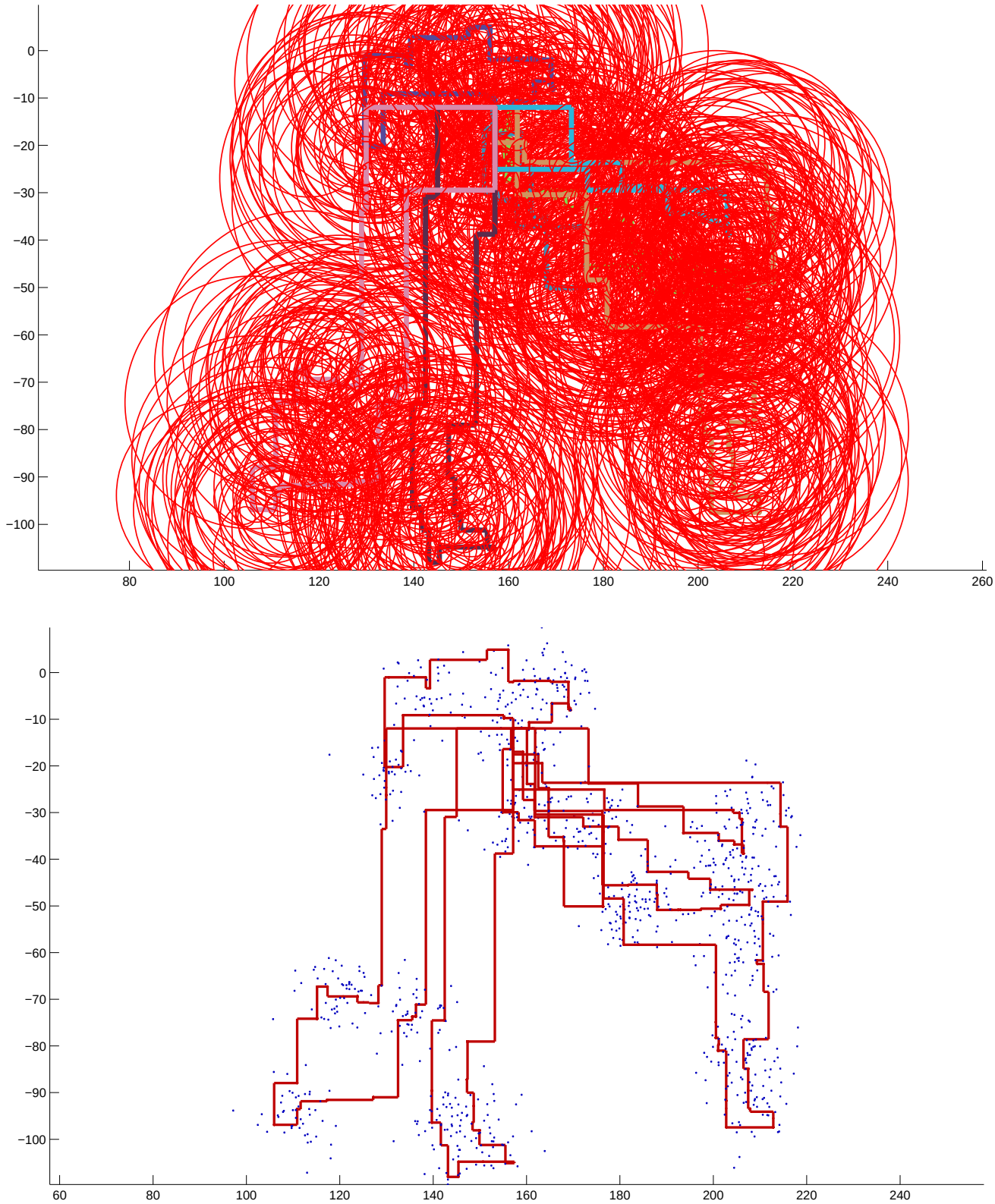


Figure O.166: $dsj1000$, arbitrary radius, 2D, Manhattan, Length = 1429.9365464

Table O-169: Solution for $dsj1000$, arbitrary radius, 2D, Manhattan

Total distance: 1429.93654641569 Total demand met: 76422 Depot: x 47.1287 y 11.9659				
Solution x	Solution y	Original x	Original y	Radius
Route: 1 Length: 0.00200000032910097 Demand Met: 9861				
47.1286999999177	11.9669000000823	47.1015	12.1757	0.8443
47.1286999999177	11.9669000000823	47.4524	12.1509	13.8821
47.1286999999177	11.9669000000823	48.9393	11.7496	17.8826
47.1286999999177	11.9669000000823	48.2378	10.888	5.8133
47.1286999999177	11.9669000000823	47.6091	10.2274	11.8474
47.1286999999177	11.9669000000823	46.5714	10.174	27.098
47.1286999999177	11.9669000000823	47.5448	13.9665	6.8471
47.1286999999177	11.9669000000823	44.5228	11.8645	25.0082
47.1286999999177	11.9669000000823	49.0558	10.279	25.3924
47.1286999999177	11.9669000000823	48.0446	14.6778	8.8581
47.1286999999177	11.9669000000823	45.8725	14.3747	19.0119
47.1286999999177	11.9669000000823	50.5069	12.3029	19.1593
47.1286999999177	11.9669000000823	44.7075	13.3055	12.6011
47.1286999999177	11.9669000000823	46.3909	8.819	24.8054
47.1286999999177	11.9669000000823	51.32	11.9016	29.8963
47.1286999999177	11.9669000000823	46.6598	16.011	13.039
47.1286999999177	11.9669000000823	43.7231	10.6871	24.1762
47.1286999999177	11.9669000000823	43.7175	13.3612	11.2776
47.1286999999177	11.9669000000823	52.0306	12.0787	25.2448
47.1286999999177	11.9669000000823	51.9742	12.9315	19.8738
47.1286999999177	11.9669000000823	46.8369	6.4403	14.1993
47.1286999999177	11.9669000000823	43.984	9.2005	7.1984
47.1286999999177	11.9669000000823	47.2412	18.0641	26.9311
47.1286999999177	11.9669000000823	44.2621	15.3855	17.5289
47.1286999999177	11.9669000000823	41.9974	13.5778	24.1613
47.1286999999177	11.9669000000823	47.7278	5.7114	28.1097
47.1286999999177	11.9669000000823	52.3173	10.0275	24.0147
47.1286999999177	11.9669000000823	53.965	12.2967	9.8572
47.1286999999177	11.9669000000823	44.3034	16.6265	9.4533
47.1286999999177	11.9669000000823	43.7681	7.8375	19.4193
47.1286999999177	11.9669000000823	40.2323	12.6508	15.4062
47.1286999999177	11.9669000000823	47.0712	4.3382	28.9099
47.1286999999177	11.9669000000823	49.3862	17.5735	29.4535
47.1286999999177	11.9669000000823	45.9074	18.6439	15.0199
47.1286999999177	11.9669000000823	48.7027	4.8736	25.6148
47.1286999999177	11.9669000000823	52.0827	15.9727	11.4211
47.1286999999177	11.9669000000823	44.0031	6.0986	17.8329
47.1286999999177	11.9669000000823	45.9242	19.9	25.1738
47.1286999999177	11.9669000000823	49.1677	19.2175	29.9217
47.1286999999177	11.9669000000823	44.3097	5.4051	11.9467
47.1286999999177	11.9669000000823	53.1154	7.9184	19.9574
47.1286999999177	11.9669000000823	49.9475	19.2284	17.8419
47.1286999999177	11.9669000000823	45.0418	3.8658	10.1722
47.1286999999177	11.9669000000823	49.309	3.6922	20.878
47.1286999999177	11.9669000000823	53.9046	16.3668	12.2702
47.1286999999177	11.9669000000823	53.7123	16.59	19.1512
47.1286999999177	11.9669000000823	46.7163	23.0055	28.4765
47.1286999999177	11.9669000000823	40.2335	17.1357	11.2782
47.1286999999177	11.9669000000823	55.8132	15.4408	11.5975
47.1286999999177	11.9669000000823	52.0607	4.6851	25.9984
47.1286999999177	11.9669000000823	52.1655	19.1446	15.5087
47.1286999999177	11.9669000000823	49.1449	22.3659	23.3416
47.1286999999177	11.9669000000823	53.4617	5.8056	21.7012
47.1286999999177	11.9669000000823	54.3108	6.5803	23.4136
47.1286999999177	11.9669000000823	41.1669	5.3004	27.2131
47.1286999999177	11.9669000000823	36.7928	9.6586	12.2244
47.1286999999177	11.9669000000823	39.7266	17.3977	17.8866
47.1286999999177	11.9669000000823	42.4139	3.5597	13.287
47.1286999999177	11.9669000000823	40.715	18.8306	23.0792
47.1286999999177	11.9669000000823	52.3291	3.6705	19.2214
47.1286999999177	11.9669000000823	52.2056	3.4977	20.8953
47.1286999999177	11.9669000000823	38.0686	7.3443	25.6467
47.1286999999177	11.9669000000823	50.9668	1.717	23.9816
47.1286999999177	11.9669000000823	49.2438	-0.5725	17.8927
47.1286999999177	11.9669000000823	47.7428	26.438	28.0445
47.1286999999177	11.9669000000823	43.4311	0.4843	25.8563
47.1286999999177	11.9669000000823	44.8479	-0.9391	19.1888
47.1286999999177	11.9669000000823	46.7677	27.4481	29.3514
47.1286999999177	11.9669000000823	50.8742	24.2729	23.767
47.1286999999177	11.9669000000823	47.5893	27.8934	19.7112
47.1286999999177	11.9669000000823	45.985	27.4123	25.7471
47.1286999999177	11.9669000000823	46.684	28.1154	27.5206
47.1286999999177	11.9669000000823	33.7832	8.5886	17.2676
47.1286999999177	11.9669000000823	51.545	-0.7619	25.0267
47.1286999999177	11.9669000000823	50.0191	-2.6033	29.6269
47.1286999999177	11.9669000000823	55.5686	2.3786	17.8085
47.1286999999177	11.9669000000823	54.5841	1.3	17.8466
47.1286999999177	11.9669000000823	36.4235	4.5159	16.6099
47.1286999999177	11.9669000000823	54.6465	1.327	23.7327
47.1286999999177	11.9669000000823	58.8992	5.3006	25.2792
47.1286999999177	11.9669000000823	56.514	2.6652	22.7885
47.1286999999177	11.9669000000823	55.7669	1.6852	24.4965
47.1286999999177	11.9669000000823	46.4115	30.3033	28.1751
47.1286999999177	11.9669000000823	46.9054	30.8841	23.9447
47.1286999999177	11.9669000000823	47.3356	31.1656	22.3253
47.1286999999177	11.9669000000823	58.5415	3.6684	22.039
47.1286999999177	11.9669000000823	57.7618	2.6586	24.3155
47.1286999999177	11.9669000000823	43.0131	-4.6452	20.9992
47.1286999999177	11.9669000000823	54.6523	25.2022	28.2307
47.1286999999177	11.9669000000823	58.2987	1.8222	22.9315
47.1286999999177	11.9669000000823	39.9467	-2.3317	24.6235
47.1286999999177	11.9669000000823	56.047	-0.6998	25.6513
47.1286999999177	11.9669000000823	48.6326	32.1618	29.9479
47.1286999999177	11.9669000000823	64.6914	7.7788	22.2178
47.1286999999177	11.9669000000823	61.565	4.5717	20.8967
47.1286999999177	11.9669000000823	53.5826	-3.7128	20.6553
47.1286999999177	11.9669000000823	58.6741	1.1796	18.8015
47.1286999999177	11.9669000000823	50.5738	30.8854	21.7078
47.1286999999177	11.9669000000823	30.7839	5.7178	20.1469
47.1286999999177	11.9669000000823	55.089	27.0379	20.8338
47.1286999999177	11.9669000000823	50.8592	31.2824	23.4486
47.1286999999177	11.9669000000823	53.915	28.4629	20.5718
47.1286999999177	11.9669000000823	28.0443	7.2557	23.7219
47.1286999999177	11.9669000000823	60.4167	1.4088	18.4179
47.1286999999177	11.9669000000823	63.4243	4.3429	22.7299
47.1286999999177	11.9669000000823	27.9452	7.0873	24.5101
47.1286999999177	11.9669000000823	52.5136	31.162	28.7958
47.1286999999177	11.9669000000823	45.6407	35.658	25.0567
47.1286999999177	11.9669000000823	58.3955	-2.2935	20.2689
47.1286999999177	11.9669000000823	59.6709	-1.5476	26.9171
47.1286999999177	11.9669000000823	63.0749	1.8033	22.3131
47.1286999999177	11.9669000000823	46.003	37.4534	29.0578
47.1286999999177	11.9669000000823	57.7878	-4.3732	27.1183
47.1286999999177	11.9669000000823	61.9524	-0.333	23.4378
47.1286999999177	11.9669000000823	53.289	-9.6645	25.3042
47.1286999999177	11.9669000000823	63.3607	23.5913	24.1094
47.1286999999177	11.9669000000823	62.4332	-0.684	29.6949
47.1286999999177	11.9669000000823	32.3564	-1.4633	25.6089
47.1286999999177	11.9669000000823	54.3132	33.4794	25.0485
47.1286999999177	11.9669000000823	31.0065	-1.0714	23.9753
47.1286999999177	11.9669000000823	22.0744	6.6433	29.8611
47.1286999999177	11.9669000000823	63.8119	26.0212	22.8759
47.1286999999177	11.9669000000823	62.9268	27.0211	28.5574
47.1286999999177	11.9669000000823	58.6228	31.6703	25.6598
47.1286999999177	11.9669000000823	60.1802	30.671	27.7411
47.1286999999177	11.9669000000823	22.5923	19.795	27.7634
47.1286999999177	11.9669000000823	58.4334	33.3219	26.7455
47.1286999999177	11.9669000000823	24.5208	1.7631	29.7307
47.1286999999177	11.9669000000823	64.1748	30.2745	28.016
47.1286999999177	11.9669000000823	61.1622	34.1592	28.1161
47.1286999999177	11.9669000000823	61.1452	36.2851	29.605
47.1286999999177	11.9669000000823	65.4552	32.6167	29.012
Route: 2 Length: 180.378963216184 Demand Met: 9839				
50.0783833230882	23.8734654446935	49.9971	19.9155	3.9588
50.0783833230882	23.8734654446935	48.493	25.186	2.0582
51.7277679300161	30.9731257849161	50.1654	34.298	3.7703
51.7277679300161	30.9731257849161	51.473	33.7115	2.7502
62.1374871504234	32.9968622399353	62.0243	36.102	3.1072
62.1374871504234	32.9968622399353	80.8076	41.6004	22.8911
69.690507641704	35.818441449755	68.3701	31.308	5.8267
69.690507641704	35.818441449755	72.2401	34.2889	2.9732
69.690507641704	35.818441449755	68.0366	38.8903	3.4888
75.9476551652041	42.706608888296	75.73	42.7229	0.4404
75.9476551652041	42.706608888296	80.8872	43.1227	14.1296
75.9476551652041	42.706608888296	90.4784	41.2284	19.2596
75.9476551652041	42.706608888296	90.0385	42.8005	21.625
75.9476551652041	42.706608888296	87.8413	47.1867	18.3729
75.9476551652041	42.706608888296	84.6532	51.7406	13.6619
75.9476551652041	42.706608888296	91.9756	47.4725	19.7423
75.9476551652041	42.706608888296	98.0763	43.3554	27.4576
75.9476551652041	42.706608888296	95.1396	47.3596	26.132
75.9476551652041	42.706608888296	95.7654	46.8722	22.8599

Solution x	Solution y	Original x	Original y	Radius
75.9476551652041	42.706608888296	98.0879	44.5657	26.354
75.9476551652041	42.706608888296	103.0838	43.6629	28.7382
75.9476551652041	42.706608888296	98.2152	53.7701	29.4627
75.9476551652041	42.706608888296	97.9579	54.2407	26.2321
75.9476551652041	42.706608888296	95.1558	61.2395	27.409
84.645892070242	44.1795492881594	85.9182	41.843	3.5933
89.352	46.5038	89.352	47.1855	0.6817
89.352	46.5038	90.3356	51.1932	6.8103
89.352	46.5038	94.5726	47.3613	6.423
89.352	46.5038	92.412	50.9961	8.4715
89.352	46.5038	96.0562	52.3857	12.0834
89.352	46.5038	97.7133	51.9341	11.5332
89.352	46.5038	96.8097	54.0588	13.9289
89.352	46.5038	98.8606	57.9963	15.8873
89.352	46.5038	99.3413	60.508	18.4113
91.2762753763849	46.5037999999995	89.5287	45.4109	3.6829
91.2762753763849	46.5037999999995	97.3108	57.82	22.7988
91.2762753763849	46.5037999999995	103.9916	60.6173	27.4308
94.258055616084	46.5037999999995	90.4865	46.0315	3.9724
94.258055616084	46.5037999999995	97.5519	44.8528	3.8542
98.298494001633	46.5037999999995	99.7789	45.6905	1.6891
98.298494001633	46.5037999999995	98.9198	48.0008	5.0724
98.298494001633	46.5037999999995	105.6501	47.8555	11.3295
98.298494001633	46.5037999999995	100.6388	53.8259	11.1764
98.298494001633	46.5037999999995	102.1595	55.9791	15.0641
97.6855610515165	49.7915675259233	94.3452	48.7818	4.4406
97.6855610515165	49.7915675259233	98.1036	50.8139	1.1045
97.6855610515165	49.7915675259233	99.5987	51.3246	2.5606
93.1637185625238	49.7915675259233	97.7455	51.8526	5.024
93.1637185625238	49.7915675259233	98.7715	55.3698	10.7015
91.5840680807855	50.5825519495835	92.1982	53.9806	4.0431
91.5840680807855	50.5825519495835	93.2379	56.4517	7.5848
91.5840680807855	50.5825519495835	94.4551	58.0456	10.0481
91.5840680807855	50.5825519495835	94.8477	58.3247	10.8435
91.5840680807855	50.5825519495835	95.479	61.1306	12.7416
91.5840680807855	50.5825519495835	98.4228	65.0226	19.713
91.5840680807855	50.5825519495835	97.5653	74.5618	26.0912
87.2408811929784	50.8596621004844	85.9154	51.5363	1.4882
87.2408811929784	50.8596621004844	94.6788	63.8911	17.5158
87.2408811929784	50.8596621004844	98.4258	65.8894	20.8311
87.2408811929784	50.8596621004844	101.778	67.1686	23.9527
82.9367719403904	50.8596621004844	83.5076	51.7826	1.0852
82.9367719403904	50.8596621004844	92.9131	56.6287	15.0729
82.9367719403904	50.8596621004844	94.6877	57.1733	13.9646
82.9367719403904	50.8596621004844	95.4289	57.3916	14.9929
82.9367719403904	50.8596621004844	95.9041	59.3009	16.7412
82.9367719403904	50.8596621004844	96.4356	62.0951	20.9554
82.9367719403904	50.8596621004844	93.0933	68.7697	21.8016
82.9367719403904	50.8596621004844	95.9481	74.251	27.2231
82.4775646757275	50.8596621004844	70.5497	45.0925	13.3393
82.4775646757275	50.8596621004844	78.0993	54.3894	5.6239
82.4775646757275	50.8596621004844	87.5129	47.9594	13.3149
82.4775646757275	50.8596621004844	91.9732	45.8332	12.7139
82.4775646757275	50.8596621004844	87.1149	58.1702	8.6573
82.4775646757275	50.8596621004844	89.2688	56.3248	12.5008
82.4775646757275	50.8596621004844	92.8209	56.9207	12.3836
81.078375640179	50.8596621004844	67.5609	49.631	13.5732
81.078375640179	50.8596621004844	69.1689	51.2673	13.4858
81.078375640179	50.8596621004844	80.3964	49.7264	1.7131
77.9837772454864	50.8596621004844	74.3979	53.0985	4.2274
77.9837772454864	50.8596621004844	76.2244	51.9684	3.4858
77.9837772454863	47.6369767782163	65.7303	47.3671	12.9967
77.9837772454863	47.6369767782163	67.6648	48.1141	12.6345
77.9837772454863	47.6369767782163	73.2283	44.0709	10.2788
77.9837772454863	47.6369767782163	70.6191	48.182	10.2546
77.9837772454863	47.6369767782163	72.0723	49.2863	10.8405
77.9837772454863	47.6369767782163	77.9223	44.6051	3.0325
77.9837772454863	47.6369767782163	70.2011	52.705	12.1835
77.9837772454863	47.6369767782163	76.4125	46.981	12.1404
77.9837772454863	47.6369767782163	74.8417	48.5823	11.9548
77.9837772454863	47.6369767782163	75.5201	48.6107	10.8007
77.9837772454863	47.6369767782163	75.5587	49.1352	7.8556
77.9837772454863	47.6369767782163	74.4488	50.3129	5.5377
77.9837772454863	47.6369767782163	71.2619	53.5794	11.3066
77.9837772454863	47.6369767782163	76.379	48.6237	7.5959
77.9837772454863	47.6369767782163	77.9078	47.2474	6.5423
77.9837772454863	47.6369767782163	75.2757	50.6388	7.5436
77.9837772454863	47.6369767782163	79.533	47.2684	8.9398
77.9837772454863	47.6369767782163	80.0004	48.0282	9.8035
77.9837772454863	47.6369767782163	78.2967	50.1808	11.8299

Solution x	Solution y	Original x	Original y	Radius
77.8794000117319	45.4518000000069	77.8794	45.0468	0.405
77.8794000117319	45.4518000000069	89.6611	52.1615	14.4321
77.8794000117319	45.4518000000069	85.8477	60.7859	18.5843
77.8794000117319	45.4518000000069	95.0304	53.2116	22.3786
77.8794000117319	45.4518000000069	99.0651	51.1078	22.694
77.8794000117319	45.4518000000069	102.6402	60.9181	29.8857
71.7344180833613	45.5777255059811	74.5598	39.2546	7.8873
71.7344180833613	45.5777255059811	66.2863	51.2705	7.8797
71.7344180833613	45.5777255059811	67.7991	50.1342	7.0884
71.7344180833613	45.5777255059811	72.0955	52.6394	7.0709
66.2473539333867	29.649665218256	63.2951	31.2899	4.0204
66.2473539333867	29.649665218256	68.2062	28.5319	2.9167
66.2473539333867	29.649665218256	67.6588	29.7348	2.8615
51.7277679300161	27.300217388449	52.7074	28.2489	1.3637
51.7277679300161	27.300217388449	63.8645	34.3723	14.5693
51.7277679300161	27.300217388449	65.3289	43.5846	21.6754
49.2391180405356	16.9947422370029	46.213	15.3079	3.873
49.2391180405356	16.9947422370029	47.2642	16.1804	3.1622
49.2391180405356	16.9947422370029	51.539	18.7116	3.3237
Route: 3 Length: 143.721468877949 Demand Met: 7024				
50.5325672240731	10.6794030814039	53.4554	15.0784	7.1719
50.5325672240731	10.6794030814039	50.2911	5.2466	6.9728
50.5325672240731	10.6794030814039	57.2331	12.7874	7.0243
55.4308492510374	6.60278973614303	51.2901	7.6487	4.2708
55.4308492510374	6.60278973614303	55.5508	6.709	3.2447
55.4308492510374	6.60278973614303	58.0725	5.2013	2.9904
55.4308492510374	6.60278973614303	56.6229	3.2945	3.6572
59.0073227093064	7.43893686571843	61.7542	11.527	4.9252
59.0073227093064	7.43893686571843	60.5785	6.8128	2.6428
59.4111219733323	8.06302197334028	59.4358	8.0877	0.0349
59.4111219733323	8.06302197334028	56.6752	3.9284	9.6519
59.4111219733323	8.06302197334028	60.2628	6.0605	10.0471
59.4111219733323	8.06302197334028	58.0726	3.0503	10.1594
59.4111219733323	8.06302197334028	60.4719	1.0667	17.5347
59.4111219733323	8.06302197334028	54.4331	-6.2551	16.56
58.9748072519228	1.96827503284814	58.6318	9.4344	7.474
58.9748072519228	1.96827503284814	58.2741	0.1622	6.0785
58.9748072519228	1.96827503284814	58.2864	0.0731	2.2981
58.9748072519228	1.96827503284814	62.5325	1.766	5.6387
58.9748072519228	1.96827503284814	62.7821	-0.0838	4.3251
55.0131027818991	1.76635233008824	49.5265	1.5006	5.684
55.0131027818991	1.76635233008824	54.7597	1.1902	4.007
55.0131027818991	1.76635233008824	57.3839	0.9502	3.1655
52.1136984961757	1.76635233008824	51.8363	2.0767	1.2126
52.1136984961757	1.76635233008824	51.7765	0.7553	1.0658
52.1136984961757	1.76635233008824	52.8937	1.339	0.8894
47.0947459177336	2.02893737066502	44.2937	4.7268	3.889
47.0947459177336	2.02893737066502	48.302	2.6164	1.3426
46.0937000000017	-4.90129999999999	46.0937	-5.8176	0.9163
46.0937000000017	-4.90129999999999	53.8048	-5.0553	14.1877
41.5037746834229	-2.7327820111549	42.4155	0.0668	2.9443
29.3112891504131	3.37898625648672	29.2451	9.0499	5.6713
29.3112891504131	3.37898625648672	31.0707	1.7474	2.3995
28.4272655530831	1.01315635050279	31.1391	0.2266	2.8236
28.4272655530831	1.01315635050279	27.3755	-1.0984	2.359
23.9785515758891	1.01315635050279	22.4229	-2.1641	7.0873
20.5146027088063	1.01315635050279	24.8641	0.1355	6.251
20.5146027088063	1.01315635050279	19.4163	-0.8394	2.1538
19.6068673590577	20.2346326409421	19.4151	20.4264	0.2712
19.6068673590577	20.2346326409421	19.4476	21.0876	13.323
19.6068673590577	20.2346326409421	20.8129	26.0745	16.1762
19.6068673590577	20.2346326409421	18.7218	26.0511	18.3773
19.6068673590577	20.2346326409421	7.8039	17.6061	13.3149
23.547126425262	9.13400000000001	19.6468	14.5775	7.1553
23.547126425262	9.13400000000001	20.5046	21.2685	15.1676
23.547126425262	9.13400000000001	15.0509	21.8739	20.7664
29.087275757259	9.13400000000001	29.9497	8.0977	1.6035
29.087275757259	9.13400000000001	29.6205	6.6839	7.8815
29.087275757259	9.13400000000001	26.246	7.8923	7.1855
29.087275757259	9.13400000000001	27.6562	5.4902	8.29
29.087275757259	9.13400000000001	26.4488	5.1021	9.3497
29.087275757259	9.13400000000001	23.1228	16.7524	13.0518
29.087275757259	9.13400000000001	25.2224	21.1268	20.0558
29.087275757259	9.13400000000001	22.0389	18.6688	16.6692
29.087275757259	9.13400000000001	24.0847	21.2619	18.4856
29.087275757259	9.13400000000001	23.1615	20.5337	18.9562
29.087275757259	9.13400000000001	18.1963	16.0602	17.912
29.087275757259	9.13400000000001	21.1889	21.267	20.9082
29.087275757259	9.13400000000001	19.3676	20.9011	22.1053
29.087275757259	9.13400000000001	22.6294	-1.9579	16.8768

Solution x	Solution y	Original x	Original y	Radius
29.087275757259	9.13400000000001	17.3215	22.815	26.1071
29.087275757259	9.13400000000001	16.9754	26.2994	25.4942
36.2059000000019	9.13400000000001	36.2059	6.8965	2.2375
36.2059000000019	9.13400000000001	29.4417	11.4808	11.6626
36.2059000000019	9.13400000000001	31.7997	5.4917	9.7028
36.2059000000019	9.13400000000001	25.9081	14.4892	15.0463
36.2059000000019	9.13400000000001	29.2732	5.6917	15.7976
36.2059000000019	9.13400000000001	28.1449	5.3771	15.5333
36.2059000000019	9.13400000000001	33.4349	0.0139	13.2105
36.2059000000019	9.13400000000001	21.6596	11.213	23.4533
36.2059000000019	9.13400000000001	23.9142	5.5856	20.6816
36.2059000000019	9.13400000000001	31.1128	-2.8096	18.9309
36.2059000000019	9.13400000000001	22.4003	2.9895	21.9707
36.2059000000019	9.13400000000001	16.9397	16.157	23.6795
36.2059000000019	9.13400000000001	21.7951	21.835	24.0928
36.2059000000019	9.13400000000001	19.0397	19.3917	27.4702
45.1635999923203	9.45404080078059	46.0043	6.8606	2.7263
45.1635999923203	9.45404080078059	53.412	-4.2453	16.6165
45.1635999923203	9.74990442701263	44.5689	9.75	0.5947
45.1635999923203	9.74990442701263	42.7704	10.2739	5.5443
45.1635999923203	9.74990442701263	45.5397	7.2979	4.7628
45.1635999923203	9.74990442701263	48.4975	2.4432	10.4173
45.1635999923203	9.74990442701263	31.9656	14.6164	14.4873
45.1635999923203	9.74990442701263	33.6792	4.7017	13.2435
45.1635999923203	9.74990442701263	27.2842	5.8331	18.4271
45.1635999923203	9.74990442701263	36.4279	-4.3699	20.2708
45.1635999923203	9.74990442701263	28.6989	1.5656	19.8786
45.1635999923203	9.74990442701263	25.8989	0.7413	22.2466
45.1635999923203	9.74990442701263	20.7311	19.0512	27.1888
45.1635999923203	9.74990442701263	26.7943	-2.6353	24.1177
45.1635999923203	9.74990442701263	20.5322	21.5891	28.8292
Route: 4 Length: 119.18075897857 6 Demand Met: 9947				
46.6991758846869	16.3809439976691	46.503	16.5426	0.2542
46.6991758846869	16.3809439976691	54.0368	23.8586	14.1498
46.6991758846869	16.3809439976691	55.1607	27.7715	18.2237
46.6991758846869	16.3809439976691	54.8257	29.6059	17.9639
46.6991758846869	16.3809439976691	54.7376	29.7596	17.0277
46.6991758846869	16.3809439976691	59.5552	26.5288	17.0515
46.6991758846869	16.3809439976691	51.7623	34.8081	20.8873
46.6991758846869	16.3809439976691	55.9275	34.3566	23.3784
46.6991758846869	16.3809439976691	23.1689	25.59	25.7524
46.6991758846869	16.3809439976691	64.9829	35.6055	27.8112
46.6991758846869	16.3809439976691	64.2784	38.8059	29.0239
44.8842000000002	29.9318999999619	44.6028	29.9319	0.2814
44.8842000000002	29.9318999999619	47.4903	33.2139	11.8665
44.8842000000002	29.9318999999619	48.325	36.101	13.1633
44.8842000000002	29.9318999999619	43.7884	36.8808	16.446
44.8842000000002	29.9318999999619	44.3651	39.5082	12.4052
44.8842000000002	29.9318999999619	37.4272	33.8061	15.7441
44.8842000000002	29.9318999999619	40.9959	37.9409	12.8365
44.8842000000002	29.9318999999619	50.3352	41.2014	12.9522
44.8842000000002	29.9318999999619	17.7323	26.9057	28.6742
44.8842000000002	29.9318999999619	18.7531	32.536	27.0946
48.2986451584783	31.6132065668538	50.1386	26.6573	9.4164
48.2986451584783	31.6132065668538	49.5432	29.0024	8.1871
48.2986451584783	31.6132065668538	44.1303	30.8739	4.2334
48.2986451584783	31.6132065668538	45.9581	33.5048	9.009
48.2986451584783	31.6132065668538	50.3723	32.2399	6.6627
48.2986451584783	31.6132065668538	45.4526	36.121	8.6374
48.2986451584783	31.6132065668538	44.7872	36.1398	5.7289
51.7588695918826	37.2262747433163	51.6292	37.4529	0.2611
51.7588695918826	37.2262747433163	62.6603	37.129	12.7997
51.7588695918826	37.2262747433163	64.8516	39.5774	16.3435
51.7588695918826	37.2262747433163	72.4926	42.7909	23.9047
51.7588695918826	37.2262747433163	61.2083	54.3519	20.9342
51.7588695918826	37.2262747433163	72.7013	43.6681	23.6645
51.7588695918826	37.2262747433163	72.9378	43.4347	22.409
51.7588695918826	37.2262747433163	70.4096	46.4113	21.9243
51.7588695918826	37.2262747433163	73.6428	45.1426	25.8084
51.7588695918826	37.2262747433163	71.8327	48.0379	28.84
51.7588695918826	37.2262747433163	73.6395	46.5004	26.6417
51.7588695918826	37.2262747433163	70.6462	49.6735	27.2687
51.7588695918826	37.2262747433163	73.2561	47.9132	27.6156
51.7588695918826	37.2262747433163	68.022	53.7678	25.621
51.7588695918826	37.2262747433163	70.916	53.3608	25.4746
51.7588695918826	37.2262747433163	69.2681	55.3133	27.1365
51.7588695918826	37.2262747433163	69.8977	54.8286	26.5823
51.7588695918826	37.2262747433163	76.0043	50.5809	29.1787
51.7588695918826	37.2262747433163	76.5498	52.218	29.3359
66.3519897446442	50.0884897446442	66.949	50.6855	0.8443

Solution x	Solution y	Original x	Original y	Radius
66.3519897446442	50.0884897446442	66.0257	55.1875	16.5761
66.3519897446442	50.0884897446442	69.4154	51.8752	4.1739
66.3519897446442	50.0884897446442	71.0505	50.768	14.6692
66.3519897446442	50.0884897446442	71.8965	50.0142	19.3441
66.3519897446442	50.0884897446442	73.2401	49.0047	19.489
66.3519897446442	50.0884897446442	70.1179	52.2878	5.6226
66.3519897446442	50.0884897446442	70.8564	51.5507	19.1375
66.3519897446442	50.0884897446442	69.1565	53.343	16.8114
66.3519897446442	50.0884897446442	73.5268	49.2611	16.8647
66.3519897446442	50.0884897446442	73.6611	50.4924	19.7557
66.3519897446442	50.0884897446442	72.0304	52.5053	20.8079
66.3519897446442	50.0884897446442	70.694	53.8562	5.7549
66.3519897446442	50.0884897446442	73.911	51.0144	19.7234
66.3519897446442	50.0884897446442	68.5789	56.8701	16.6688
66.3519897446442	50.0884897446442	67.4683	58.2291	22.4924
66.3519897446442	50.0884897446442	77.6289	48.4559	16.6228
66.3519897446442	50.0884897446442	73.3859	52.8201	15.2561
66.3519897446442	50.0884897446442	69.9782	57.1009	18.2604
66.3519897446442	50.0884897446442	70.5527	57.3223	18.2025
66.3519897446442	50.0884897446442	73.8072	55.2741	22.0263
66.3519897446442	50.0884897446442	72.7757	56.7077	24.2193
66.3519897446442	50.0884897446442	73.2116	57.797	20.4365
66.3519897446442	50.0884897446442	77.8264	55.5164	14.0686
66.3519897446442	50.0884897446442	82.0477	53.0979	18.2605
66.3519897446442	50.0884897446442	77.9705	58.8491	15.3336
66.3519897446442	50.0884897446442	81.1686	57.7423	24.938
66.3519897446442	50.0884897446442	93.0102	50.1223	27.268
66.3519897446442	50.0884897446442	93.3932	53.1876	28.8804
66.3519897446442	50.0884897446442	88.0225	60.7529	27.571
66.3519897446442	50.0884897446442	90.2672	64.2791	29.5547
58.0035675456686	36.1384024013625	47.9812	30.2306	11.8841
58.0035675456686	36.1384024013625	56.8778	27.618	8.9898
58.0035675456686	36.1384024013625	58.9981	26.6128	10.0374
58.0035675456686	36.1384024013625	63.132	27.7543	11.7407
58.0035675456686	36.1384024013625	60.463	30.4795	7.3122
58.0035675456686	36.1384024013625	53.589	37.6567	4.7875
58.0035675456686	36.1384024013625	56.2795	36.0371	11.477
58.0035675456686	36.1384024013625	60.8351	33.4935	6.3537
58.0035675456686	36.1384024013625	60.137	35.2014	3.3879
58.0035675456686	36.1384024013625	61.5106	34.0654	10.912
58.0035675456686	36.1384024013625	62.464	33.4003	5.2338
58.0035675456686	36.1384024013625	63.453	34.6286	7.4277
58.0035675456686	36.1384024013625	60.9493	37.7343	9.1697
57.9016395737366	35.2671485772041	58.126	35.24	0.3044
57.9016395737366	35.2671485772041	66.7818	30.0369	10.9633
57.9016395737366	35.2671485772041	69.1853	30.9522	13.139
57.9016395737366	35.2671485772041	67.7055	32.9993	14.8259
57.9016395737366	35.2671485772041	67.4673	33.2544	16.5328
57.9016395737366	35.2671485772041	75.9022	40.5634	19.0711
57.9016395737366	35.2671485772041	72.4429	44.8985	21.9495
57.9016395737366	35.2671485772041	70.7664	48.6137	19.7705
57.9016395737366	35.2671485772041	72.0385	47.603	19.8624
57.9016395737366	35.2671485772041	67.8488	53.6384	21.5605
57.9016395737366	35.2671485772041	72.1444	51.2772	22.7706
57.9016395737366	35.2671485772041	77.4079	49.147	24.2468
54.7323315105729	24.7611961058202	54.2786	24.4277	0.8349
54.7323315105729	24.7611961058202	42.8212	36.4305	19.4237
54.7323315105729	24.7611961058202	67.242	26.9141	16.4624
54.7323315105729	24.7611961058202	67.5765	27.7962	15.1317
54.7323315105729	24.7611961058202	64.2717	31.7627	14.3523
54.7323315105729	24.7611961058202	58.8785	37.4935	17.2077
54.7323315105729	24.7611961058202	63.5739	32.9982	17.0906
54.7323315105729	24.7611961058202	70.1037	27.3839	17.3373
54.7323315105729	24.7611961058202	66.5887	34.1226	18.4197
54.7323315105729	24.7611961058202	65.211	38.9167	22.6036
54.7323315105729	24.7611961058202	72.6191	32.6684	20.9501
54.7323315105729	24.7611961058202	64.4232	44.0581	28.7966
54.7323315105729	24.7611961058202	75.4748	37.8532	28.9661
54.7323315105729	24.7611961058202	75.9853	41.4015	28.8962
54.7323315105729	24.7611961058202	72.9198	44.5581	29.4271
52.5156264141485	17.5246456167452	52.4859	17.4578	0.3541
52.5156264141485	17.5246456167452	55.3647	9.0137	9.4748
52.5156264141485	17.5246456167452	55.4854	26.8201	10.8698
52.5156264141485	17.5246456167452	58.5931	27.1316	12.8934
52.5156264141485	17.5246456167452	62.5649	23.4331	17.3284
52.5156264141485	17.5246456167452	57.9508	29.6187	14.7612
52.5156264141485	17.5246456167452	66.7482	27.6121	22.4893
52.5156264141485	17.5246456167452	66.9624	36.7077	25.6742
52.5156264141485	17.5246456167452	66.7168	38.698	29.069
Route: 5 Length: 306.598054974466 Demand Met: 9982				

Solution x	Solution y	Original x	Original y	Radius
51.8350649794913	30.4113564426012	47.4152	28.2569	4.917
51.8350649794913	30.4113564426012	47.9603	31.0225	3.9403
51.8350649794913	30.4113564426012	51.0819	30.8837	1.7131
51.8350649794913	30.4113564426012	54.5895	27.7676	3.8179
51.8350649794913	30.4113564426012	53.8796	31.7093	3.1598
66.4912524794106	48.4134113336155	67.4955	46.0347	3.4091
66.4912524794106	48.4134113336155	68.7356	47.889	2.3048
70.7936491199909	50.1646898880648	70.0624	50.1219	0.7325
70.7936491199909	58.3269607809698	68.2826	55.0673	4.1147
70.7936491199909	58.3269607809698	70.1344	58.5671	0.7142
74.0096400899159	58.3269607809699	73.7963	57.8273	0.5433
74.0096400899159	58.3269607809699	86.2321	62.729	16.3953
74.0096400899159	58.3269607809699	94.5987	62.0376	22.0196
74.0096400899159	58.3269607809699	92.749	64.7326	21.2415
74.0096400899159	58.3269607809699	93.9444	64.9	23.8239
90.5613432983283	74.9031344549302	88.7937	67.447	7.6628
90.5613432983283	74.9031344549302	91.0116	75.887	1.8515
90.5613432983283	74.9031344549302	94.549	73.3405	4.2829
90.5613432983283	74.9031344549302	93.1133	78.1389	7.0122
90.5613432983283	78.2640239448248	89.835	77.746	1.1998
90.5613432983283	78.2640239448248	88.0687	81.4777	18.8265
90.5613432983283	78.2640239448248	91.1677	84.1211	16.3324
90.5613432983283	78.2640239448248	88.3633	87.3681	27.6489
90.5613432983283	78.2640239448248	92.288	83.6157	16.0638
90.5613432983283	78.2640239448248	97.1852	78.7831	16.1734
90.5613432983283	78.2640239448248	98.9119	80.0767	14.6996
90.5613432983283	78.2640239448248	93.4941	85.8189	18.0194
90.5613432983283	78.2640239448248	96.9541	82.6989	14.592
90.5613432983283	78.2640239448248	88.6062	92.2681	22.8388
90.5613432983283	78.2640239448248	96.9343	84.943	15.8069
90.5613432983283	78.2640239448248	95.9325	86.7596	20.5114
90.5613432983283	78.2640239448248	96.2545	87.1498	21.7369
90.5613432983283	78.2640239448248	101.0606	82.9382	16.7992
90.5613432983283	78.2640239448248	92.5654	91.5305	28.4592
90.5613432983283	78.2640239448248	103.8313	82.5056	18.7916
90.5613432983283	78.2640239448248	101.1477	85.2681	21.9848
90.5613432983283	78.2640239448248	102.2936	85.0217	21.6835
90.5613432983283	78.2640239448248	104.3617	84.8664	23.8168
90.5613432983283	78.2640239448248	100.7126	88.5952	21.6123
90.5613432983283	78.2640239448248	98.656	92.6213	22.9191
90.5613432983283	78.2640239448248	95.504	96.351	27.717
90.5613432983283	78.2640239448248	100.5649	91.4192	20.5542
90.5613432983283	78.2640239448248	99.3782	93.0601	23.8531
90.5613432983283	78.2640239448248	107.2392	85.9448	25.7344
90.5613432983283	78.2640239448248	101.602	92.3175	24.3611
91.1790999999999	79.7087000000127	91.86	79.7087	0.6809
91.1790999999999	79.7087000000127	103.1106	83.2736	15.1682
91.1790999999999	79.7087000000127	102.0461	86.7072	14.3206
91.1790999999999	79.7087000000127	99.3434	90.9979	16.5588
91.1790999999999	79.7087000000127	98.2349	98.4363	21.6189
91.1790999999999	79.7087000000127	105.6506	92.4297	20.7058
91.0364935347594	81.0118901603606	92.0851	66.8651	14.1856
91.0364935347594	81.0118901603606	88.6759	82.3658	2.7213
91.0364935347594	81.0118901603606	86.3374	85.7586	11.3801
91.0364935347594	81.0118901603606	92.6699	80.64	12.8577
91.0364935347594	81.0118901603606	91.14	83.5499	11.1932
91.0364935347594	81.0118901603606	93.2494	81.8793	4.3234
91.0364935347594	81.0118901603606	98.5933	78.8152	8.4088
91.0364935347594	81.0118901603606	94.9909	83.4209	6.6825
91.0364935347594	81.0118901603606	97.3132	81.5365	6.4549
91.0364935347594	81.0118901603606	97.4314	81.946	7.1176
91.0364935347594	81.0118901603606	101.2985	78.2917	13.0659
91.0364935347594	81.0118901603606	97.0865	83.6094	9.8674
91.0364935347594	81.0118901603606	93.9684	87.8762	12.1102
91.0364935347594	81.0118901603606	103.6911	80.62	12.7759
91.0364935347594	81.0118901603606	99.0152	86.155	11.2918
91.0364935347594	81.0118901603606	95.2026	90.5293	13.6073
91.0364935347594	81.0118901603606	98.3726	88.4744	13.4661
91.0364935347594	81.0118901603606	96.8345	90.0197	11.1201
92.7707604181145	91.7313503668031	92.7178	89.1801	2.5518
92.7707604181145	91.7313503668031	92.4623	94.734	13.3072
92.7707604181145	91.7313503668031	95.7576	96.9635	15.3189
92.7707604181145	91.7313503668031	98.8373	99.4165	17.0801
92.7707604181144	93.4009942400463	94.0924	96.5838	3.4463
92.7707604181144	97.4572173498195	95.0373	98.5247	4.6173
92.7707604181145	97.4582173498194	94.4828	106.1237	9.4889
102.836717349819	97.4582173498195	101.583	94.8217	5.6707
102.836717349819	97.4582173498195	104.1728	96.9352	2.9606
102.836717349819	97.4582173498195	103.8628	98.4843	1.4511
102.836717349819	95.5015079124502	103.2876	94.1817	1.3947

Solution x	Solution y	Original x	Original y	Radius
102.836717349819	94.0865900650708	101.8123	94.891	1.3025
97.8996327185532	93.4491772348434	96.5235	92.1962	1.8611
97.8996327185532	93.4491772348434	95.6122	103.8055	14.657
97.4648000000106	92.0258019842792	97.0347	92.0258	0.4301
97.4648000000099	89.5731557888221	98.1138	89.594	0.7463
97.4648000000099	89.5731557888221	100.8882	91.1406	9.708
97.4648000000099	89.5731557888221	104.1034	98.3317	13.8815
97.4648000000093	84.8750736357102	96.8706	83.0827	1.8883
97.4648000000093	84.8750736357102	98.9319	91.3958	11.9055
97.4648000000093	84.8750736357102	98.853	91.6792	14.5242
97.4648000000093	84.8750736357102	102.4507	89.6037	13.3753
97.4648000000093	84.8750736357102	104.5599	87.8351	14.6615
97.4648000000093	84.8750736357102	102.0076	93.075	14.2567
97.4648000000093	84.8750736357102	100.6204	94.7646	15.4911
96.4567000000158	78.5719999963246	94.6945	78.572	1.7622
101.8377	68.4164	102.9023	68.4164	1.0646
100.768020769403	62.426849728546	94.6583	60.3511	8.4724
100.768020769403	62.426849728546	99.7259	57.0659	5.4613
100.768020769403	62.426849728546	100.6854	61.817	3.0255
99.437916174103	62.426849728546	93.5538	62.1822	5.8892
99.437916174103	62.426849728546	95.4724	61.7777	4.4248
99.3098	61.6589	99.0429	61.6589	0.2669
99.3098	61.6589	94.6798	69.1984	14.7127
99.3098	61.6589	97.9014	66.9835	12.1626
99.3098	61.6589	93.9524	73.145	21.3513
99.3098	61.6589	91.1291	78.4897	23.993
99.3098	61.6589	96.2521	73.5638	18.6663
99.3098	61.6589	89.95	80.2132	25.9539
99.3098	61.6589	94.4072	76.9857	17.5737
99.3098	61.6589	97.816	74.8015	15.0437
99.3098	61.6589	89.5631	83.3752	25.9016
99.3098	61.6589	92.1151	81.2598	24.5532
99.3098	61.6589	94.0795	80.8773	27.9293
99.3098	61.6589	97.7624	79.6432	23.8114
99.3098	61.6589	99.1261	78.6323	23.8719
99.3098	61.6589	98.2007	80.5294	24.0186
99.3098	61.6589	98.567	80.2017	23.8946
99.3098	61.6589	98.2345	80.86	27.4352
99.3098	61.6589	93.0994	86.3608	27.9466
99.3098	61.6589	97.8831	81.9659	26.0286
99.3098	61.6589	93.1284	88.6615	29.2956
99.3098	61.6589	108.1531	76.0691	21.0274
99.3098	61.6589	97.7943	87.7833	29.1465
99.3098	61.6589	107.981	80.0957	26.4329
99.3098	61.6589	104.3693	90.8389	29.9766
100.6036	52.7175503142637	100.3439	52.2486	1.0866
100.6036	52.7175503142637	98.9521	56.5952	9.6017
100.6036	52.7175503142637	99.9754	58.6633	10.7282
100.6036	52.7175503142637	102.8738	56.4102	11.5644
100.6036	52.7175503142637	99.4285	63.8276	13.2796
100.6036	52.7175503142637	103.5291	67.906	21.3267
100.6036	52.7175503142637	96.1169	76.0362	25.7488
100.6036	52.7175503142637	100.0565	80.1054	29.4827
100.6036	49.058	100.6036	46.802	2.256
100.6036	49.058	101.7941	49.0832	1.419
105.884886322364	49.0580000000048	106.4442	49.0895	0.5602
105.884886322364	33.0245254359557	108.656	34.8419	3.7915
104.396843278367	33.0245254359557	104.0844	32.9988	0.3135
104.396843278367	30.2879180169099	102.211	28.3893	3.0468
104.396843278367	30.2879180169099	106.1692	29.0085	2.1859
104.396843278367	23.609664936957	104.9423	23.521	1.8836
101.611103498206	23.609664936957	102.9016	24.8202	1.7694
53.3533300128122	19.4247715611575	51.6732	17.1776	3.9198
53.3533300128122	19.4247715611575	53.2794	21.4994	2.9791
53.3533300128122	19.4247715611575	55.9782	19.9329	2.6736
Route: 6 Length: 152.278672860384 Demand Met: 9966				
63.2662544907416	23.7612430307776	63.3795	20.1125	3.6505
63.2662544907416	23.7612430307776	61.643	23.6955	3.0344
73.8583967370414	28.6870870218719	73.7989	28.6287	0.1893
73.8583967370414	28.6870870218719	71.5231	31.8286	7.639
73.8583967370414	28.6870870218719	77.5882	39.4219	18.0454
73.8583967370414	28.6870870218719	90.6179	26.4649	21.9514
73.8583967370414	28.6870870218719	93.6487	25.1273	25.1293
73.8583967370414	28.6870870218719	87.5726	32.8781	19.8465
73.8583967370414	28.6870870218719	90.72	30.049	25.9851
73.8583967370414	28.6870870218719	93.4265	31.4744	21.1215
73.8583967370414	28.6870870218719	92.4351	33.0022	23.0347
73.8583967370414	28.6870870218719	79.9479	46.2913	20.0233
73.8583967370414	28.6870870218719	97.4429	30.1528	27.9419
73.8583967370414	28.6870870218719	87.2346	40.5435	24.2659

Solution x	Solution y	Original x	Original y	Radius
73.8583967370414	28.6870870218719	95.0864	33.2234	27.2565
73.8583967370414	28.6870870218719	88.4465	41.4478	21.203
73.8583967370414	28.6870870218719	90.014	39.915	25.9424
73.8583967370414	28.6870870218719	89.0134	41.3658	27.9234
73.8583967370414	28.6870870218719	80.7698	50.729	24.0359
73.8583967370414	28.6870870218719	92.1801	41.0349	29.4376
73.8583967370414	28.6870870218719	92.2396	41.0703	23.428
73.8583967370414	28.6870870218719	93.2846	41.9379	28.0563
73.8583967370414	28.6870870218719	89.3464	46.1786	28.4968
73.8583967370414	28.6870870218719	93.3823	48.5086	29.5211
83.6074465885895	34.3752175978255	70.5469	25.0661	16.1699
83.6074465885895	34.3752175978255	79.7169	32.9378	5.5373
83.6074465885895	34.3752175978255	85.525	32.0217	5.5598
83.6074465885895	34.3752175978255	85.1876	33.113	12.2337
83.6074465885895	34.3752175978255	90.6435	28.0536	9.6928
83.6074465885895	34.3752175978255	86.512	33.4131	8.2137
83.6074465885895	34.3752175978255	85.065	35.2948	4.702
83.6074465885895	34.3752175978255	81.9079	40.1742	6.2209
83.6074465885895	34.3752175978255	86.5983	36.2039	13.6175
83.6074465885895	34.3752175978255	93.9312	28.9768	14.5805
83.6074465885895	34.3752175978255	88.2545	36.066	15.726
83.6074465885895	34.3752175978255	92.7124	33.4453	14.4155
83.6074465885895	34.3752175978255	96.156	30.1327	15.6026
83.6074465885895	34.3752175978255	97.1838	29.5842	15.6415
83.6074465885895	34.3752175978255	87.5583	39.2312	14.1099
83.6074465885895	34.3752175978255	89.1249	38.0318	15.9201
83.6074465885895	34.3752175978255	89.3668	41.343	15.2017
83.6074465885895	34.3752175978255	90.1236	40.724	15.0486
83.6074465885895	34.3752175978255	98.5493	33.1624	15.8362
83.6074465885895	34.3752175978255	96.5473	37.5774	13.5522
83.6074465885895	34.3752175978255	93.9129	43.6355	15.3805
91.1713561489535	36.0130795919293	91.1655	36.0648	0.3187
91.1713561489535	36.0130795919293	91.8795	37.1845	3.6728
91.1713561489535	36.0130795919293	98.2004	50.3921	18.7026
91.1713561489535	36.0130795919293	99.5817	52.1789	22.5087
94.5000309615626	36.8228757430614	97.1071	18.8552	18.2973
94.5000309615626	36.8228757430614	99.0428	19.6959	17.7192
94.5000309615626	36.8228757430614	98.3827	22.3334	15.4136
94.5000309615626	36.8228757430614	97.3283	27.0933	16.7318
94.5000309615626	36.8228757430614	91.0332	34.8187	16.4532
94.5000309615626	36.8228757430614	95.8908	32.6754	17.855
94.5000309615626	36.8228757430614	91.9372	36.8319	3.8859
94.5000309615626	36.8228757430614	96.2582	32.5713	16.7348
94.5000309615626	36.8228757430614	93.6083	38.4774	16.8124
94.5000309615626	36.8228757430614	98.9301	33.2654	6.2044
94.5000309615626	36.8228757430614	94.1971	38.0204	3.1512
94.5000309615626	36.8228757430614	92.8093	39.7693	4.7222
94.5000309615626	36.8228757430614	96.6051	36.0943	18.2734
94.5000309615626	36.8228757430614	93.6941	39.0671	9.1173
94.5000309615626	36.8228757430614	92.634	40.1716	17.8594
94.5000309615626	36.8228757430614	95.1298	37.6897	8.2516
94.5000309615626	36.8228757430614	98.5859	34.5756	9.3554
94.5000309615626	36.8228757430614	94.3087	39.6383	5.7437
94.5000309615626	36.8228757430614	101.1976	33.4905	15.926
94.5000309615626	36.8228757430614	95.8598	39.2349	9.5298
94.5000309615626	36.8228757430614	100.5275	34.9543	18.18
94.5000309615626	36.8228757430614	105.5782	30.6326	17.6401
94.5000309615626	36.8228757430614	97.0063	39.6578	6.2182
94.5000309615626	36.8228757430614	96.2133	40.5576	17.1844
94.5000309615626	36.8228757430614	96.2085	41.8253	7.8844
94.5000309615626	36.8228757430614	98.7317	39.6579	13.6077
94.5000309615626	36.8228757430614	96.8865	41.9997	5.9999
94.5000309615626	36.8228757430614	94.5355	44.3621	13.4241
94.5000309615626	36.8228757430614	91.1842	48.1207	17.5671
94.5000309615626	36.8228757430614	95.46	44.379	10.525
94.5000309615626	36.8228757430614	94.5838	45.9916	12.3529
94.5000309615626	36.8228757430614	95.0864	47.4256	15.4813
94.5000309615626	36.8228757430614	96.2485	47.1277	17.9146
94.5000309615626	36.8228757430614	103.8959	45.4099	16.5891
94.5000309615626	36.8228757430614	102.9297	48.0592	14.2478
94.5000309615626	36.8228757430614	103.8062	50.1176	16.2282
96.4575682148425	38.7763682153498	97.0806	39.3994	0.8811
96.4575682148425	38.7763682153498	98.4033	39.6451	2.523
96.4575682148425	38.7763682153498	94.4684	44.7163	7.0613
96.4575682148425	38.7763682153498	96.6284	43.246	6.0243
96.4575682148425	38.7763682153498	103.3956	43.6231	9.5596
96.4575682148425	38.7763682153498	100.8862	48.4618	10.9264
96.4575682148425	38.7763682153498	100.5945	52.9653	16.0066
96.4575682148425	38.7763682153498	106.6231	51.946	20.5204
96.12288577431	31.3930250621212	92.5592	25.4331	8.84

Solution x	Solution y	Original x	Original y	Radius
96.12288577431	31.3930250621212	97.5011	28.0267	4.1233
96.12288577431	31.3930250621212	96.3928	32.1668	2.1401
96.12288577431	31.3930250621212	101.5683	27.6266	8.8382
96.12288577431	31.3930250621212	99.272	31.5703	3.1541
95.6006908405036	30.0513068843733	96.0238	29.4057	0.7719
95.6006908405036	30.0513068843733	105.6149	29.5786	12.2754
95.6006908405036	30.0513068843733	102.0152	42.2262	18.485
95.6006908405036	30.0513068843733	100.0845	45.3198	20.4175
95.6006908405036	30.0513068843733	101.161	45.7653	23.4902
95.6006908405036	30.0513068843733	102.543	45.6081	21.8293
95.6006908405036	30.0513068843733	104.1102	44.8822	24.3902
95.6006908405036	30.0513068843733	101.377	48.1816	20.458
94.2083266264161	29.4553171884252	92.942	26.4511	3.2602
94.2083266264161	29.4553171884252	98.3241	22.4412	19.863
94.2083266264161	29.4553171884252	97.0499	25.7334	22.9168
94.2083266264161	29.4553171884252	100.384	25.6874	21.4485
94.2083266264161	29.4553171884252	102.4997	24.4075	22.2451
94.2083266264161	29.4553171884252	97.9141	29.0493	23.1555
94.2083266264161	29.4553171884252	100.6297	27.3107	20.9684
94.2083266264161	29.4553171884252	101.7295	28.4449	24.6989
94.2083266264161	29.4553171884252	99.0228	31.9463	24.3368
94.2083266264161	29.4553171884252	105.0575	26.2706	21.5332
94.2083266264161	29.4553171884252	102.9211	31.879	24.191
94.2083266264161	29.4553171884252	106.8535	30.7643	22.1596
94.2083266264161	29.4553171884252	106.6895	31.0233	23.9388
94.2083266264161	29.4553171884252	98.3613	42.0392	22.2209
94.2083266264161	29.4553171884252	103.4615	37.3033	18.992
94.2083266264161	29.4553171884252	99.6903	41.4772	20.1453
94.2083266264161	29.4553171884252	107.8221	37.3636	23.6325
66.6503053444855	25.054609077626	68.3676	27.331	4.5622
66.6503053444855	25.054609077626	67.8857	28.9512	7.9175
66.6503053444855	25.054609077626	69.5886	28.6002	10.8714
Route: 7 Length: 248.446555118697 Demand Met: 9820				
35.0223021464008	30.931909338919	35.5392	31.6783	0.9079
32.4626500884016	74.5179242671857	32.697	74.6737	0.2814
32.4626500884016	74.5179242671857	24.7401	75.4523	27.8452
32.4626500884016	74.5179242671857	21.3934	72.6127	27.5896
32.4626500884016	74.5179242671857	14.5018	68.1646	28.3495
32.4626500884016	74.5179242671857	15.0856	70.6386	28.271
32.4626500884016	74.5179242671857	6.6701	63.5082	29.6501
32.4626500884016	74.5179242671857	18.7356	77.2891	27.8207
32.4626500884016	74.5179242671857	30.7482	95.8761	28.9897
32.4626500884016	74.5179242671857	7.5677	74.3816	29.6105
32.4626500884016	74.5179242671857	21.5395	100.4343	29.9057
29.7126	89.5846711340567	29.5221	90.7635	1.898
29.7126	89.5846711340567	8.1477	101.1634	26.7278
29.7126	89.5846711340567	8.0611	104.093	29.9646
29.7126000000001	96.4145	29.1897	96.4145	0.5229
29.7126000000001	96.4145	29.7849	97.5299	6.777
29.7126000000001	96.4145	30.1816	102.1772	8.5674
31.6324127911604	101.295077373338	31.6341	101.1443	2.7843
33.1686	108.0555	37.1983	106.347	4.5493
33.1686	108.0555	33.1686	108.6172	0.5617
35.4005999682075	108.0555	35.3466	107.7036	0.412
35.4005999682075	104.8019	39.1965	105.4524	4.0584
35.4005999682075	104.8019	35.4006	103.6799	1.122
40.6683087117684	104.8019	40.5226	102.8002	3.2203
40.6683087117684	104.8019	42.4716	105.6496	1.9926
47.3938297725651	105.125829875676	48.0764	105.8084	0.9653
45.4740652783114	101.221202748612	46.0729	100.678	0.8085
39.9131060005097	98.0834938902358	31.7515	71.3679	28.4179
39.9131060005097	98.0834938902358	31.4187	76.5703	26.413
39.9131060005097	98.0834938902358	34.9317	80.2335	24.9565
39.9131060005097	98.0834938902358	42.6808	88.2098	26.1251
39.9131060005097	98.0834938902358	47.126	99.3914	14.4896
39.9131060005097	98.0834938902358	41.6896	94.8028	26.2925
39.9131060005097	98.0834938902358	51.1106	98.2963	24.3822
39.9131060005097	98.0834938902358	42.0978	97.503	9.3352
39.9131060005097	98.0834938902358	37.0706	93.0168	27.7874
39.9131060005097	98.0834938902358	45.0704	101.2748	15.9718
39.9131060005097	98.0834938902358	34.7819	91.1147	26.8877
39.9131060005097	98.0834938902358	44.7902	101.1589	13.5802
39.9131060005097	98.0834938902358	42.2565	98.7398	24.1013
39.9131060005097	98.0834938902358	43.0828	99.6317	26.6664
39.9131060005097	98.0834938902358	46.5537	103.4177	24.5733
39.9131060005097	98.0834938902358	33.2241	90.2072	24.6184
39.9131060005097	98.0834938902358	37.3296	94.7968	26.3816
39.9131060005097	98.0834938902358	42.9226	100.4615	4.0129
39.9131060005097	98.0834938902358	42.5793	100.4271	3.5498
39.9131060005097	98.0834938902358	36.1694	94.3523	28.0801

Solution x	Solution y	Original x	Original y	Radius
39.9131060005097	98.0834938902358	42.8352	101.6931	21.2677
39.9131060005097	98.0834938902358	39.7333	98.7582	18.7088
39.9131060005097	98.0834938902358	45.465	105.2608	13.9094
39.9131060005097	98.0834938902358	35.9551	95.9225	5.5858
39.9131060005097	98.0834938902358	32.2034	92.5655	28.0393
39.9131060005097	98.0834938902358	39.196	99.7694	4.3434
39.9131060005097	98.0834938902358	40.2693	101.3043	10.0221
39.9131060005097	98.0834938902358	34.0458	95.0903	23.4922
39.9131060005097	98.0834938902358	35.7481	97.1257	23.4808
39.9131060005097	98.0834938902358	42.0156	103.5929	23.2765
39.9131060005097	98.0834938902358	53.9006	102.5381	26.8445
39.9131060005097	98.0834938902358	38.189	100.3805	26.8425
39.9131060005097	98.0834938902358	39.3246	101.8921	13.7336
39.9131060005097	98.0834938902358	34.0464	97.1856	23.2445
39.9131060005097	98.0834938902358	42.9285	106.2179	10.4101
39.9131060005097	98.0834938902358	31.4281	94.9219	25.0918
39.9131060005097	98.0834938902358	29.7064	94.0211	26.0785
39.9131060005097	98.0834938902358	29.3468	93.7461	24.255
39.9131060005097	98.0834938902358	40.9527	105.6227	16.0561
39.9131060005097	98.0834938902358	33.0573	97.9271	8.5196
39.9131060005097	98.0834938902358	31.6916	96.8159	27.5118
39.9131060005097	98.0834938902358	31.7064	96.988	27.9597
39.9131060005097	98.0834938902358	32.4952	97.9758	7.8091
39.9131060005097	98.0834938902358	33.8351	99.3235	26.1581
39.9131060005097	98.0834938902358	35.2228	101.4244	27.011
39.9131060005097	98.0834938902358	35.7306	102.2767	20.2694
39.9131060005097	98.0834938902358	35.5571	102.295	22.4132
39.9131060005097	98.0834938902358	26.6904	96.1713	25.5008
39.9131060005097	98.0834938902358	34.3074	104.3145	24.0514
39.9131060005097	98.0834938902358	29.8552	101.3038	17.7782
39.9131060005097	98.0834938902358	35.7224	107.36	11.5177
39.9131060005097	98.0834938902358	26.9511	99.1097	22.0884
39.9131060005097	98.0834938902358	32.8361	107.2479	24.978
39.9131060005097	98.0834938902358	31.3011	106.2109	16.9428
39.9131060005097	98.0834938902358	33.1638	109.6815	13.4189
39.9131060005097	98.0834938902358	28.1717	107.4546	16.9459
38.4343341593548	96.4224919205905	35.4152	92.5489	4.9112
38.4343341593548	96.4224919205905	38.2186	96.6747	1.6837
38.4343341593548	96.4224919205905	35.7859	98.3251	3.261
38.6769520704621	92.8616640197023	41.599	92.4813	2.9467
38.6769520704621	92.8616640197023	37.1788	95.0118	2.6206
38.6769520704621	90.020197756275	37.9917	90.5379	3.3721
37.2428	87.2215999999994	35.1535	70.6086	16.7445
37.2428	87.2215999999994	42.9721	90.3177	7.6955
37.2428	87.2215999999994	33.517	80.8699	7.8126
37.2428	87.2215999999994	44.0393	95.7757	16.7138
37.2428	87.2215999999994	35.4073	87.2216	1.8355
37.2428	87.2215999999994	40.9431	96.0349	13.182
37.2428	87.2215999999994	32.6009	89.9531	11.1863
37.2428	87.2215999999994	33.1881	90.5996	12.9818
37.2428	87.2215999999994	33.6244	92.4492	13.8672
37.2428	87.2215999999994	32.1756	91.0244	9.1133
37.2428	87.2215999999994	35.2297	94.8683	10.0169
37.2428	87.2215999999994	30.8807	93.5109	15.6566
37.2428	87.2215999999994	36.8108	99.4487	12.3219
37.2428	87.2215999999994	33.9629	96.8355	13.8521
37.3571978115034	79.044687372075	23.9369	61.5866	22.0202
37.3571978115034	79.044687372075	32.2488	71.8762	10.0488
37.3571978115034	79.044687372075	40.8939	84.3555	20.2802
37.3571978115034	79.044687372075	48.9533	90.4759	19.0092
37.3571978115034	79.044687372075	47.7789	92.5461	17.3786
37.3571978115034	79.044687372075	31.105	77.2121	19.85
37.3571978115034	79.044687372075	27.2709	73.9256	19.9916
37.3571978115034	79.044687372075	43.1057	91.7939	21.808
37.3571978115034	79.044687372075	23.527	73.6169	21.6834
37.3571978115034	79.044687372075	26.6151	77.1467	15.3985
37.3571978115034	79.044687372075	25.3366	76.538	21.2393
37.3571978115034	79.044687372075	29.376	80.5861	14.4218
37.3571978115034	79.044687372075	39.6285	91.4521	19.1143
37.3571978115034	79.044687372075	23.796	77.2181	18.2059
37.3571978115034	79.044687372075	27.1736	83.2653	16.1862
37.3571978115034	79.044687372075	40.065	98.6098	21.6771
37.3571978115034	79.044687372075	34.0163	93.2553	18.0121
37.3571978115034	79.044687372075	32.8593	93.0881	18.3654
37.3571978115034	79.044687372075	35.0473	98.5367	21.3919
37.3571978115034	79.044687372075	17.9606	81.6588	21.1617
37.3571978115034	79.044687372075	26.1674	96.1159	22.0166
37.3571978115034	79.044687372075	28.2891	98.27	21.2566
37.3571978115034	79.044687372075	26.55	96.735	21.6617
43.1966049498413	38.787702725787	45.4903	38.3462	2.3358

Solution x	Solution y	Original x	Original y	Radius
Route: 8 Length: 279.330072389101 Demand Met: 9983				
19.9479295222321	24.6276885058928	19.5225	24.6717	0.4277
19.9479295222321	26.2576221381123	23.3217	16.9506	12.0877
19.9479295222321	26.2576221381123	27.0312	22.0371	12.0381
19.9479295222321	26.2576221381123	24.5729	19.8583	11.2071
19.9479295222321	26.2576221381123	17.2669	18.1061	10.6475
19.9479295222321	26.2576221381123	18.4916	22.031	8.3539
19.9479295222321	26.2576221381123	19.6457	23.2311	5.0904
19.9479295222321	26.2576221381123	21.4132	25.3225	11.064
19.9479295222321	26.2576221381123	22.8581	29.0039	5.9592
19.9479295222321	26.2576221381123	19.8821	27.2321	8.0149
19.9479295222321	33.5167302088314	21.3113	31.7798	2.2081
18.9723787581134	67.007817603269	18.9682	67.082	0.0743
18.9723787581134	67.007817603269	22.1344	71.2137	6.3651
18.2653996349165	70.8275999999997	18.2654	71.5277	0.7001
18.2653996349165	70.8275999999997	-0.7351	89.6931	28.3044
16.2668938166712	70.67600042436	15.4332	72.9689	2.4401
13.7502651013878	69.3992524481573	33.839	67.1668	20.2124
13.7502651013878	69.3992524481573	26.4833	65.6457	15.8608
13.7502651013878	69.3992524481573	22.8228	67.5784	16.2582
13.7502651013878	69.3992524481573	24.1578	73.3792	11.3579
13.7502651013878	69.3992524481573	15.1112	64.361	9.0815
13.7502651013878	69.3992524481573	22.0857	71.4539	17.4147
13.7502651013878	69.3992524481573	14.2239	63.9607	12.6801
13.7502651013878	69.3992524481573	15.3124	65.205	17.4654
13.7502651013878	69.3992524481573	24.4797	75.354	15.2855
13.7502651013878	69.3992524481573	10.4334	62.822	8.2889
13.7502651013878	69.3992524481573	9.1569	61.6426	9.3858
13.7502651013878	69.3992524481573	14.7433	68.1941	9.3958
13.7502651013878	69.3992524481573	7.6803	61.1857	15.0459
13.7502651013878	69.3992524481573	12.0444	66.3239	13.9456
13.7502651013878	69.3992524481573	12.0877	66.3858	4.791
13.7502651013878	69.3992524481573	13.2613	67.7948	9.5466
13.7502651013878	69.3992524481573	12.0097	66.7734	5.0159
13.7502651013878	69.3992524481573	8.4928	63.9998	9.7983
13.7502651013878	69.3992524481573	12.0587	67.8257	15.0634
13.7502651013878	69.3992524481573	10.5042	66.7806	12.8873
13.7502651013878	69.3992524481573	11.6475	70.8021	20.1612
13.7502651013878	69.3992524481573	10.0835	69.723	14.2892
13.7502651013878	69.3992524481573	5.2812	65.5492	11.3895
13.7502651013878	69.3992524481573	9.1707	70.0865	9.3679
13.7502651013878	69.3992524481573	13.7649	76.0563	11.1171
13.7502651013878	69.3992524481573	12.73	75.2001	18.6111
13.7502651013878	69.3992524481573	8.8648	72.0358	5.5515
13.7502651013878	69.3992524481573	9.4578	72.6847	17.4171
13.7502651013878	69.3992524481573	8.3117	72.2049	15.4861
13.7502651013878	69.3992524481573	6.6564	74.2265	11.3789
10.7213072639405	69.3992524481573	10.7344	66.9849	3.0771
7.36821529910145	67.2805535928792	9.6606	65.5604	2.866
7.36821529910145	67.2805535928792	6.9842	66.7632	0.6443
5.13554757356793	67.3257091524531	31.4906	71.3219	26.6563
5.13554757356793	67.3257091524531	22.6268	64.3936	24.3192
5.13554757356793	67.3257091524531	26.9783	71.0141	24.9531
5.13554757356793	67.3257091524531	14.2076	63.0144	24.0324
5.13554757356793	67.3257091524531	16.7224	69.1113	26.0784
5.13554757356793	67.3257091524531	22.8762	75.7017	22.7687
5.13554757356793	67.3257091524531	14.0233	68.3418	20.9704
5.13554757356793	67.3257091524531	12.5389	66.9051	25.9958
5.13554757356793	67.3257091524531	11.4442	66.9869	21.9247
5.13554757356793	67.3257091524531	11.4886	67.7219	21.8599
5.13554757356793	67.3257091524531	4.7342	63.0935	4.7706
5.13554757356793	67.3257091524531	10.9416	69.7746	20.3266
5.13554757356793	67.3257091524531	4.4426	63.6871	23.1902
5.13554757356793	67.3257091524531	0.4838	63.8626	5.7993
5.13554757356793	67.3257091524531	7.0214	70.8048	24.0693
5.13554757356793	67.3257091524531	9.0002	73.0359	24.3533
5.13554757356793	67.3257091524531	1.7661	66.5446	26.4568
5.13554757356793	67.3257091524531	9.9143	75.8382	21.3192
5.13554757356793	67.3257091524531	0.3096	68.1954	12.3905
5.13554757356793	67.3257091524531	8.0472	76.1743	21.0495
5.13554757356793	67.3257091524531	-4.2807	74.2616	26.6495
5.13554757356793	67.3257091524531	2.7376	84.0979	22.8219
5.13554757356793	67.3257091524531	2.5704	90.3092	25.529
5.13554757356793	67.3257091524531	-4.1255	85.596	25.3799
5.13554757356793	74.1709471038225	31.4455	71.7336	27.0146
5.13554757356793	74.1709471038225	9.3844	71.5303	26.9324
5.13554757356793	74.1709471038225	6.0914	73.9114	1.8676
5.13554757356793	74.1709471038225	4.0089	72.186	2.2824
5.13554757356793	74.1709471038225	5.8502	91.8647	18.0105
5.13554757356793	74.1709471038225	3.5998	89.8159	20.0402

Solution x	Solution y	Original x	Original y	Radius
5.13554757356793	74.1709471038225	9.17	97.1621	26.9226
5.13554757356793	74.1709471038225	1.2023	90.7259	19.1166
5.13554757356793	74.1709471038225	3.4538	93.5151	19.9908
5.13554757356793	74.1709471038225	1.1743	92.9818	22.3694
5.13554757356793	74.1709471038225	-2.3037	90.7079	19.8948
5.13554757356793	74.1709471038225	-0.0468	93.7668	20.328
5.13554757356793	74.1709471038225	-2.5612	92.1356	25.3912
5.13554757356793	74.1709471038225	-1.9602	93.9224	23.076
5.13554757356793	74.1709471038225	-2.1508	94.1499	24.1365
5.13554757356793	74.1709471038225	-0.339	97.1979	24.9263
5.13554757356793	74.1709471038225	-3.2639	94.8889	23.5193
0.864078303737827	87.947599506612	-0.1009	90.0487	2.3121
0.864078303737827	87.947599506612	-0.1710	97.1566	11.053
0.864078303737827	87.947599506612	-12.8049	93.8535	19.948
-4.04974489369228	96.9054448937379	3.1184	98.924	10.2515
-4.04974489369228	96.9054448937379	-6.6860	94.6391	5.5087
-4.04974489369228	96.9054448937379	-5.5457	98.4014	2.1156
0.864078303737827	93.5555771152705	-1.2335	86.0108	9.9154
0.864078303737827	93.5555771152705	3.5924	94.7451	6.9732
0.864078303737827	93.5555771152705	0.5802	93.7511	6.2472
0.864078303737827	93.5555771152705	1.6453	95.7178	2.5699
0.864078303737827	93.5555771152705	4.9579	99.4405	7.1688
0.864078303737827	93.5555771152705	1.4019	97.5847	8.9245
0.864078303737827	93.5555771152705	-3.1358	95.2162	4.3309
1.61810112014297	91.8609684419219	3.0162	107.1796	15.3823
7.29270992518421	91.562311903364	7.8142	89.6258	2.0055
7.29270992518421	91.562311903364	3.5503	90.3653	9.6646
7.29270992518421	91.562311903364	0.6193	91.0377	11.2677
7.29270992518421	91.562311903364	2.5533	99.1767	13.4676
7.29270992518421	91.562311903364	-1.8619	98.5581	15.9681
7.29270992518421	91.562311903364	-7.5489	96.9207	21.6
17.1573282596677	90.9906687633259	31.0449	71.9995	23.5272
17.1573282596677	90.9906687633259	23.4089	84.0628	9.7975
17.1573282596677	90.9906687633259	4.7737	93.7785	12.9549
17.1573282596677	90.9906687633259	6.3198	96.0864	13.0595
17.1573282596677	90.9906687633259	2.1469	96.6722	20.9499
17.1573282596677	90.9906687633259	0.6138	95.4238	17.1272
17.1573282596677	90.9906687633259	3.8110	100.5395	22.995
17.1573282596677	90.9906687633259	3.1448	100.72	20.6463
17.1573282596677	90.9906687633259	-0.3116	97.6012	20.2615
22.4755503992778	74.4884699714562	26.4747	67.9787	12.3016
22.4755503992778	74.4884699714562	24.5076	73.115	8.9241
22.4755503992778	74.4884699714562	24.3218	77.9732	3.9436
22.4755503992778	74.4884699714562	21.1184	76.9048	8.7289
25.5228901533668	73.6881746797319	26.4587	69.6793	4.4461
25.5228901533668	73.6881746797319	27.6433	72.5657	2.8004
25.5228901533668	73.6881746797319	25.4767	75.481	1.9623
26.3006717388801	73.6881746797319	26.2205	72.9044	6.2191
26.3006717388801	73.6881746797319	22.9431	70.0987	5.5998
26.3006717388801	73.6881746797319	24.5354	72.6275	5.9717
26.3006717388803	71.1379680629599	28.241	67.9653	4.4101
26.3006717388803	71.1379680629599	25.7737	68.9159	2.2837
28.4382232449081	29.4646851476587	21.2889	20.2133	12.2867
28.4382232449081	29.4646851476587	28.099	29.8348	0.9117

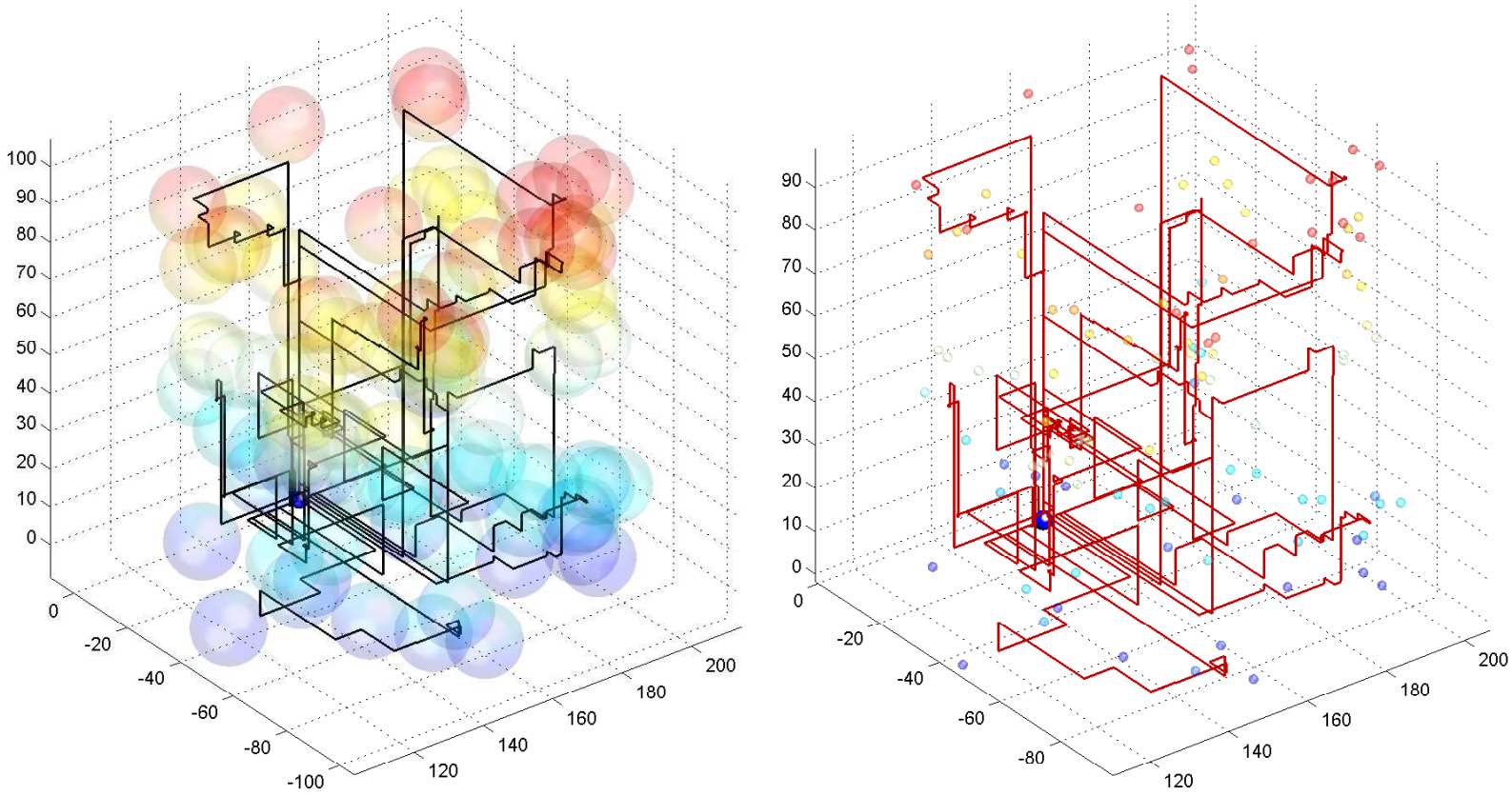


Figure O.167: *team*1_100, Equal Radius, 3D, Manhattan, Length = 3271.6988366

Table O-170: Solution for *team*1_100, Equal Radius, 3D, Manhattan

Total distance: 3271.69883659779 Total demand met: 543 Depot: x 50 y 10 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 255.028618078818 Demand Met: 44					
50.0000000351879	8.45988580458852	7.0689059749635	53.405	3.041	5.972
50.0000000822063	7.09017613601743	14.9406842986483	46.154	2.083	10.72
50.0000001291804	5.93195992878974	87.5251171887488	53.754	0.148	93.309
22.3433373125354	11.3685746985764	86.3523734320777	15.772	12.549	91.264
19.5690184557334	15.4489996274974	84.9230041470016	19.569	24.449	84.923
19.5278480935336	15.448999743803	80.1469988998041	12.414	20.962	80.147
28.8385380516557	13.341250997772	76.9667323272196	26.839	11.732	76.118
40.0011276323811	11.297823452521	73.862224606909	40.868	2.981	76.025
45.0257259269713	10.6454603094678	58.5867469201636	45.293	9.057	63.281
Route: 2 Length: 304.683078562354 Demand Met: 46					
35.0317676217774	20.9133542518061	16.6140295195947	33.5	17.352	15.52
22.1810441508763	48.2168683725596	44.6837737224511	18.45	52.954	46.14
17.7972735036846	53.3759019699939	57.2833385737852	20.103	52.347	63.856
10.935375128572	63.3388717926553	59.9380426170934	5.739	68.535	65.134
13.7679992862523	62.0766106085585	56.0940005682559	11.844	68.394	54.009
17.8297349360048	60.2921826119065	53.173126093125	17.374	67.529	56.063
23.1407183533881	53.8923603018796	47.5268202549834	25.201	54.507	48.664
27.4219783440402	48.2664710258359	42.1639887795992	25.923	53.185	46.671
33.5836958483039	15.9271060283516	24.7520768744926	29.447	11.243	26.345
Route: 3 Length: 143.330406606357 Demand Met: 46					
46.6028703294215	10.8463636536934	9.45975856782848	54.032	12.197	7.44
27.2279576702455	11.6597720041996	36.4473416594142	20.541	9.26	39.729
24.3331848364421	12.5336741262205	42.1172729556698	22.494	14.202	49.345
24.3331848364421	12.5336741262205	42.1172729556698	21.459	12.53	50.646
24.3331807946823	13.8810989592825	42.1172730501516	25.542	20.506	48.088
24.3331687062554	13.8810983528151	4.44300248896044	16.123	17.568	4.443
Route: 4 Length: 389.14702319837 Demand Met: 46					
36.3785999763688	25.1172380494408	43.6394329605886	33.341	22.178	45.103
27.1845373757995	52.203974109503	75.337396913324	19.619	52.734	79.19
26.9727256503706	56.7696608671116	75.9556326204099	26.732	55.612	72.392
26.7487284815233	61.6194485224213	76.5918487262995	21.299	57.593	80.779
26.5198929038573	71.0210528664176	77.1933004687394	26.213	68.977	77.227
26.2889875320004	83.069189391444	77.8013976472152	33.626	83.869	72.958
25.832483804647	86.0334622688595	83.8624569033082	33.443	88.578	84.328
25.832483804647	86.0334622688595	83.8624569033082	30.503	90.056	84.685
25.0771873565273	87.9848157106634	91.6658832450487	19.881	93.181	96.862
27.1133809194222	86.6595922738673	60.6921556827691	20.393	83.793	60.447
30.0659445270027	85.4419010774578	37.0761034043108	27.59	93.644	36.826
40.8835630579768	53.1848929843828	22.8810018634426	42.804	54.74	25.734
Route: 5 Length: 247.744748498423 Demand Met: 46					
40.680624852365	82.1091231653331	4.51868173221167	36.762	86.092	10.176
36.9239993349942	87.6485495751048	6.75081037334487	36.924	96.636	7.226
24.1510953926697	87.4401157785838	6.75081606626432	24.053	94.189	12.551
17.9429510186723	75.0716433614689	6.75082163651613	20.735	74.659	7.978
10.5270037531105	64.1873443390561	6.75082720635283	8.64100000000001	64.188	15.551
10.5270025322459	46.5990063922427	0.0500662691253062	1.527	46.599	0.05
28.0028883508471	38.8302884228575	0.0249964269555054	27.219	44.51	3.327
Route: 6 Length: 269.424486462336 Demand Met: 45					
73.3053496264064	40.5578044476764	3.07452351680716	74.679	41.865	10.639
85.6459927810825	55.3653603625765	4.72474123348529	93.694	56.925	1.612
86.3982088815909	58.32234169003	13.0883277166202	94.894	61.262	13.169
86.4181217142038	58.3786252689551	42.903008177777	87.173	60.998	48.592
86.437924761456	58.4349639592735	49.8393161405459	94.619	62.103	50.624
86.4379274350067	58.4349708053116	49.8393449908497	91.043	63.691	55.511
82.0122238693156	56.1442691673014	44.6856601025481	87.18	60.86	47.333
60.1601363783203	52.7298500670985	30.6441569119872	59.007	60.213	31.626
Route: 7 Length: 205.021149007566 Demand Met: 41					
87.9202256923924	10.1364746829924	13.3609885761157	93.574	3.255	13.429
88.3999501024329	10.3409995422187	23.017099354657	92.889	3.855	22.202
88.847428326802	10.5547074174017	36.8432249188068	94.926	4.006	36.794
89.0279692613411	11.4259723807355	62.0566306829683	91.857	16.502	66.492
89.0279692613411	11.4259723807355	62.0566306829683	91.007	13.249	70.645
89.0279702229729	11.4259735978417	59.2093438383321	95.317	17.864	59.209
85.5342433304122	10.9438323281893	57.2628752788503	85.554	10.061	65.642
81.6560870018002	10.473151576587	25.4217110946768	89.359	10.839	25.32
Route: 8 Length: 209.916379126407 Demand Met: 46					
53.9617905459667	60.6644078870995	32.3249977387516	61.493	65.592	32.325
53.9617917848709	60.6644121958745	45.2349952110147	59.534	67.732	45.235
53.9575739142141	56.585716376999	47.8616335151729	57.243	55.792	50.963
53.9533559689284	52.6809772097408	50.3319855824581	55.281	51.871	55.993
53.9533559689284	52.6809772097408	50.3319855824581	53.958	52.681	59.332
53.9533559689284	52.6809772097408	50.3319855824581	57.142	56.857	57.493
51.7911358660724	45.6227562410803	47.5337955231216	49.571	48.14	55.073
Route: 9 Length: 244.093464889485 Demand Met: 45					

Solution x	Solution y	Solution z	Original x	Original y	Original z
55.098846609161	47.0814978903212	8.60450457003074	51.29	49.58	11.489
61.8461809143474	67.5247818006008	15.3724568422544	66.971	72.201	17.644
65.4607735306071	73.3491784875947	20.0352169301917	66.957	73.797	28.023
68.480996173769	78.6804964255332	21.9359995644192	67.179	79.746	30.609
78.251992372071	81.3749613390898	22.4197787335819	81.476	87.316	28.362
78.2519921572967	77.2484071740117	20.9179568344627	78.214	79.218	18.292
78.2519919427539	72.9520103637698	19.4789871433931	87.252	72.952	19.479
77.9219190180864	72.1410987533378	4.23342361006224	85.968	75.194	1.985
76.2209451894994	68.8549717947752	2.92283162804385	84.146	71.427	3.869
66.5400542345158	61.5352542222387	1.51086155370082	68.193	67.124	4.172
Route: 10 Length: 370.416032946929 Demand Met: 46					
52.8912670373071	45.1644533740019	84.1834859472741	47.232	45.27	89.834
61.6807908197713	77.6682372688031	88.3685622698935	63.631	81.224	94.784
67.6429863016766	85.4649908696218	90.8240494333767	67.643	91.829	97.188
68.3266974403343	78.8316371153958	86.83418217233	74.447	77.382	91.404
68.9189761704659	74.0569969216492	76.9260616309428	77.919	74.057	76.926
62.2680740491184	65.391193593632	76.0211107632205	62.352	63.144	84.329
55.4300593350578	61.9937363123811	74.2339588208227	52.975	65.56	80.551
50.9716810760777	56.761207258245	71.5579454790411	43.243	58.404	75.054
Route: 11 Length: 366.420777942826 Demand Met: 46					
79.9697199597845	10.0000073487986	92.7753968121286	85.841	12.653	93.498
79.9697199597845	10.0000073487986	92.7753968121286	88.457	8.185	95.157
79.9697185737515	63.1325665981469	92.7754020223866	87.633	63.432	97.407
79.9697174278532	65.4889917225159	92.7754077763788	76.154	71.763	97.979
80.3137156099801	65.0449528349885	92.50031774119	73.523	67.727	97.567
84.9459869405869	64.0032114063383	91.7622992009078	93.946	64.003	91.762
84.8361694741688	59.9839615920591	77.2434511515623	93.456	57.69	77.108
84.0502803366637	59.5807237308678	73.1334651947047	89.091	59.886	77.014
83.1958669477549	59.172337663621	67.3445860331527	86.785	67.217	67.68
Route: 12 Length: 266.472671277923 Demand Met: 46					
44.2695279877249	48.8619461508935	18.5942629221528	49.02	51.541	23.534
14.0490571921985	59.3094844533368	23.6039080873882	5.777	62.003	23.29
13.1390880741813	61.5327835456692	28.7980018977144	11.878	70.444	28.798
13.1390828321367	61.532780411704	43.5759904144145	13.454	69.007	48.213
13.1390776166304	61.5327778930028	44.8426297099228	7.235	62.367	51.584
15.4560958363581	58.3692939482334	43.286265757764	11.123	60.442	50.101
37.8384024564899	42.8646513921148	24.2174026194681	40.978	46.49	25.743

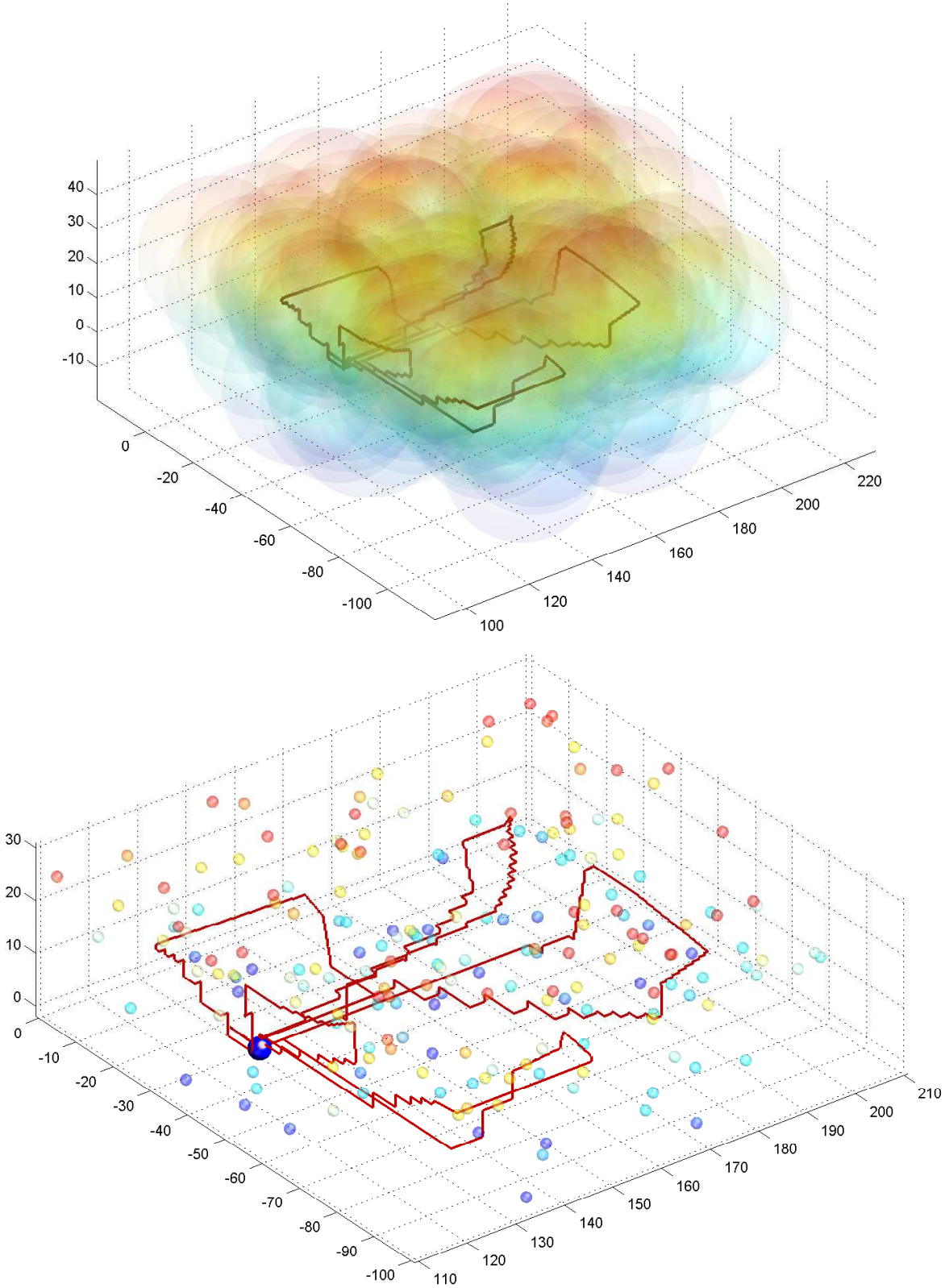


Figure O.168: *team*2_200, Equal Radius, 3D, Manhattan, Length = 855.2410020

Table O-171: Solution for *team*2_200, Equal Radius, 3D, Manhattan

Total distance: 855.241002003161 Total demand met: 617 Depot: x 19.5535 y 32.6157 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 84.7594734384844 Demand Met: 105					
17.700302525915	33.0376960763277	7.58681064165148	8.071465	45.7971455	5.631658
17.700302525915	33.0376960763277	7.58681064165148	15.566305	47.445917	16.822861
16.0362391801694	33.4349084231797	13.5295652623871	3.09506	32.271765	28.722779
15.9948794568749	36.2922073900583	13.5659493933235	35.347265	40.483415	12.676508
15.9948794568749	36.2922073900583	13.5659493933235	25.46019	34.06066	24.177315
15.9506483502861	37.801716036566	13.6023417173929	26.379295	27.934205	23.031473
15.9506483502861	37.801716036566	13.6023417173929	22.373755	32.6144	28.047693
15.9062308377431	39.5530392800837	13.6385671466022	7.79806000000001	41.063165	21.758433
15.9062308377431	39.5530392800837	13.6385671466022	6.09162499999999	39.029145	21.745986
15.8618937030576	41.3345210105634	13.6747386576399	7.76846999999999	43.27595	27.165517
15.817592359036	43.1144325520779	13.7108088094744	1.56824	43.114435	27.74491
16.4375991132367	45.5504664976415	13.7108041315308	4.535275	41.40327	15.496926
17.0703314648356	48.0908752411388	13.7107994534991	4.493385	48.2428075	1.749018
17.0703314648356	48.0908752411388	13.7107994534991	2.26291999999999	54.336059	8.412226
17.7719028880524	50.5328679726968	13.7107947786671	5.35044999999999	59.245825	2.02242
18.5992399422177	52.3378014592951	13.7107901098657	19.19225	67.891335	25.986874
19.3842857596435	52.7579579435636	13.7107853851817	22.77816	61.91876	23.535116
20.165573581492	53.1749536930594	13.7107806589957	22.32618	58.45293	10.978007
20.9475410639928	53.5919852704474	13.7107759331419	27.294235	67.36467	25.05905
21.6578007642951	53.9718906371908	13.7107711938461	27.85894	70.297015	5.978866
22.3204783539738	54.3181475327241	13.7107664581139	42.291825	54.317701	14.78098
22.3204785472799	54.5488650053216	8.94313734666315	39.724355	52.657318	1.123019
22.320478740406	54.7817415283977	6.36544175283805	33.93752	71.055425	5.905417
22.3204681337005	54.7817263053155	6.36543908813238	36.49954	48.989475	3.669737
22.3204575219315	54.7817110897948	6.36543642382816	16.28216	64.658715	7.376906
22.3204575219315	54.7817110897948	6.36543642382816	25.726765	62.875185	13.655865
22.3204469117408	54.7816958651819	6.36543375946482	27.03592	58.11764	25.51317
21.8463785967285	52.421169592834	5.55168469926186	24.393135	53.387308	3.209069
21.3725431059913	50.0926875923344	4.74262184227026	15.17562	59.299125	20.231796
20.9221816983046	46.5275597155752	3.72366731769987	21.800035	44.699325	19.798588
20.9221816983046	46.5275597155752	3.72366731769987	18.601355	58.3359	16.263038
20.477012372396	42.1933242680125	2.53588402989655	23.528225	48.047471	10.497692
20.0316623656142	37.7670598651955	1.3287989011919	29.577285	38.20107	12.365171
20.0316623656142	37.7670598651955	1.3287989011919	35.65863	43.345715	7.513468
Route: 2 Length: 187.892130342959 Demand Met: 120					
36.4381309197672	33.897218918731	6.57407656612099	40.184205	46.1874365	21.269314
41.9074420957217	34.6793407764969	7.96962016340789	42.753335	50.906813	15.568394
47.5603433274268	35.3946143423159	9.26358447496928	51.37375	46.298003	11.79476
53.3022337091626	36.1009292267073	10.5547017988734	53.302235	56.10093	10.554691
59.7560706041393	35.7424908842789	11.2271890524707	69.610075	41.75992	4.719164
65.9556755177742	35.3827508276934	11.9098196823368	70.55475	53.342402	18.770686
67.473029832076	34.4111531394767	12.3814570911498	64.595135	34.78327	9.989898
67.473029832076	34.4111531394767	12.3814570911498	65.72564	44.111465	7.622314
69.0739838754616	33.431107223377	12.8591806678645	63.437195	41.00367	26.99622
70.8101808804827	32.4094950334137	13.3182778636682	74.17807	43.76639	28.605582
72.2995406530111	30.6960771539742	13.6908846000527	71.273045	32.62062	26.349189
73.8226600880122	28.9871776203964	14.0589398174534	78.52122	37.890255	25.630233
75.3301376623243	27.1802121727229	14.421229186222	80.066985	32.520545	19.480329
76.841017518166	25.3581168178063	14.7828620824617	95.62369	24.314785	12.804988
77.8661138109972	23.6180186530531	15.1493155311135	90.572985	26.136825	24.857885
78.8395239238978	21.8582415400969	15.5099602619664	86.016245	7.495035	26.90563
79.5258619642081	21.1891476445002	15.7988820088632	87.144585	5.62369	21.911356
80.1858694545402	20.5862126507898	16.083712247992	69.52818	17.90893	23.466902
80.1858694545402	20.5862126507898	16.083712247992	69.299455	6.449115	15.081267
80.9188916169278	20.0285940446611	16.368631248928	96.04228	11.46233	26.220597
80.9540614458602	19.9709869288877	16.4155550580225	99.37313	13.042045	19.983146
80.9540621554122	19.9709849882602	16.4155587776202	92.761655	9.792985	28.945088
80.6443947707136	19.9709852482485	15.9628718416274	93.997115	11.43328	4.127594
80.2299875212494	19.9709855082724	15.6289965459382	89.544625	11.14329	6.653118
79.8109893600066	19.9709857683939	15.2993477532854	94.4971	12.154995	26.111766
71.0964385168388	19.970986028906	14.6169089822674	67.794775	0.2453923	14.617193
71.0964367411125	20.0294816800562	14.4533846186752	82.741185	8.18936	9.780027
71.0964349651673	20.0877358382203	14.2905540160167	67.61759	1.570395	20.822479
71.0964331878001	20.7993360105564	10.9846482217525	78.44886	5.02628	2.732259
71.0964314101257	21.7233618851317	8.92563094159586	74.60069	8.85595	6.459838
71.0964296327914	22.6865672816254	6.91311157231679	91.09643	22.6866	6.913126
68.7111291603406	23.9528790845524	6.05198733333833	86.845365	25.906095	9.026374
65.0989107420299	25.2007743810969	5.17066934546261	73.44882	27.71684	3.250298
61.4376852937247	26.4501992443389	4.29528542186178	79.01289	29.7258	2.755744
53.8967452830061	27.6661288198478	3.43376238527633	61.04328	37.44322	1.978623
46.0369401530699	28.8559951682917	2.57801757944718	50.972003	40.60627	2.976184
37.9938677526358	30.0120794317712	1.72434725083465	41.00732	41.27668	4.938398
29.9901504205478	31.1395789473568	0.866344505210897	33.169445	12.82499	1.129185
Route: 3 Length: 16.7280918242387 Demand Met: 35					

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.5534998343612	31.0781037633409	0.108423744864723	24.567885	37.86062	12.401465
19.5534998221672	28.7560130606453	0.168709327228832	27.827995	16.04415	0.143676
19.5534997599393	27.2103812367238	0.252155920474245	30.249755	29.28668	9.627144
19.5534997599393	27.2103812367238	0.252155920474245	25.954135	17.869355	4.361083
19.5534996099723	26.8957350333384	0.315701456904435	10.613375	27.61233	15.443404
19.5534994973131	24.6672820277413	0.415626736249877	10.44323	18.54025	17.132759
19.5534996343096	24.667281376876	0.415626786308522	20.9699	7.87089	11.180156
19.5534996970834	25.8295618419777	0.334854739382468	16.776285	16.423415	15.502152
19.55349972218	29.4893450471028	0.213247800386728	21.779985	37.899125	15.006029
19.5534998843849	30.9639606660384	0.0854356978848259	2.888575	34.539165	0.815621
Route: 4 Length: 127.302458206135 Demand Met: 120					
17.9118833556876	26.191323805692	4.31318943526402	1.87583499999999	21.036865	8.472142
16.4864102806808	20.8607093982907	8.25489565387276	6.5851	6.152225	13.546134
15.2351947924696	17.8719360742622	11.5584545272026	15.031135	2.9821155	24.523433
13.9992306211816	16.9850151506832	12.5690775687112	11.54701	17.37734	26.244082
12.7760573276802	16.1003582775531	13.5477865658063	7.39533	10.545265	21.25087
11.571106267308	15.2264219409365	14.515167407853	0.024124999999998	3.6794065	26.062187
15.6208720068139	15.3177737976448	14.4366293672936	21.673354	6.8005655	13.961641
19.5354812939281	15.4093306460279	14.3581075343369	25.662895	8.989655	21.265898
23.3193052553311	15.5010802328249	14.2795158805734	32.973595	9.54291	20.606347
26.8495015018031	15.593027488184	14.2008557982063	26.97316	5.55935	2.320922
30.4318229953588	15.6853177719172	14.1224988247402	28.448025	4.56492	10.374303
34.1391657393953	15.7778640557692	14.0442383487588	34.695715	0.250565	26.535311
36.56116901514	15.9248492375047	13.9395353767966	34.77264	14.924575	26.641448
39.0401974892133	16.0719366783508	13.8345180638286	40.16046	1.62977	24.917947
41.5065715738659	16.2213746840693	13.7285673475901	57.51838	10.00522	23.910843
41.6113840786738	16.5381588639421	13.4667462217023	42.845635	9.79738	11.955362
41.7162198366612	16.8560167053147	13.2052987668578	46.358401	11.954405	18.491997
41.8210531812009	17.1747447344974	12.943546014749	49.707097	15.54357	19.872896
41.9258399084483	17.4938816735112	12.681187803468	54.207021	15.63022	20.585643
42.0304280761675	17.8135276139716	12.4175449383422	49.796921	18.777515	27.389734
42.1347537554515	18.1326812071943	12.149589511187	54.294115	8.069135	15.776464
42.2387098479435	18.4545122705787	11.881047996778	46.870011	29.816545	8.525673
42.3426246917419	18.7740901242973	11.6132498549703	44.38625	27.294685	26.050788
42.4465075684161	19.0899567355185	11.3411604884911	47.997827	21.94091	22.00424
42.5503389774987	19.4053300438414	11.0677227450771	40.19826	27.52955	29.10549
42.6584430889332	19.6191052289899	9.68994853385643	39.58443	28.150345	20.548662
42.7667007276812	19.8320085480802	8.26154473397329	45.420784	35.70231	13.427579
42.8748848312296	20.0418566682206	6.79322293618954	51.719243	33.03008	9.909651
42.982770108195	20.2497699815368	5.30645541623809	49.216563	20.76273	2.277188
43.0905884142139	20.4577083401525	3.83445992687403	47.801417	19.06334	7.814097
43.1983508830549	20.6657762611296	2.35534015287912	50.608737	39.047145	0.30438
43.2582291474143	20.7112218666708	2.04188055973022	57.95186	28.956245	5.320699
43.3178899034592	20.7566612256519	1.72684848879909	63.31789	20.756115	1.726904
43.2927284095434	24.130151413745	1.70898477448738	58.979255	16.987345	1.276103
43.267478124555	28.2250568247426	1.69112655162344	57.48649	24.517395	4.703245
43.2423309644863	32.5828879799807	1.67326346618575	53.824634	40.64213	16.603226
Route: 5 Length: 249.02266483611 Demand Met: 119					
75.1239616684611	35.959976789469	1.30704039967616	81.466395	54.091358	0.343064
80.6086427613317	37.3370406541342	2.65460023721555	92.878595	53.021252	1.55944
80.8926456065138	37.539944471498	4.92774481219689	91.6164	43.026115	2.808093
81.1756372122338	37.7425886654311	7.23827773454357	94.955665	36.40187	7.771411
81.4565384010862	37.9455444413667	9.55511798076916	87.57797	41.66484	5.551613
81.7372801558962	38.1484865710566	11.9247046590304	88.660005	37.051535	6.873362
82.0177568243727	38.3517056024056	14.3636932149495	99.67714	33.98061	22.565216
82.1167337489171	38.6473234834653	14.6326144850209	92.788305	33.10169	27.022649
82.2152576714324	38.9456117148028	14.8986421621653	84.61874	44.121625	19.170305
82.3138656656612	39.2433885908253	15.1644250536153	89.661665	37.28143	20.914346
82.4124541981206	39.541412024394	15.429744357946	79.319755	37.96047	22.926601
82.5112545713475	39.8394539251268	15.6944636388589	83.48933	38.25693	16.203282
82.6102019063784	40.137403300036	15.9593454992189	97.982935	40.137435	28.75306
82.4138412743914	52.4349520587004	15.9593451649392	98.425325	63.29758	13.439936
82.1996078987835	54.8938389931174	15.9593448321488	92.344515	62.02096	28.826016
81.9827485892681	57.1422702227933	15.9593444990155	95.92709	54.202926	8.883113
81.7639613480683	59.4939528191178	15.9593441659877	93.854515	65.44994	7.938496
81.543604485758	61.7665224424786	15.9593438330811	79.72973	69.6285	5.76607
81.3238573422732	63.9806597934102	15.9593435002847	75.60926	70.05143	9.458663
81.1049973947059	66.1738291498134	15.9593431675505	86.26193	79.048	11.651774
80.8858174973502	68.2220472471237	15.9593428348749	84.72455	82.62255	16.621981
80.6664339590648	70.1121521723006	15.959342502187	81.449	70.90379	9.10693
80.4473931820956	72.0250041981846	15.9593421695543	87.254685	75.06877	11.123991
80.2282232200629	73.9475907000704	15.9593418369603	98.53739	80.25874	11.354076
79.2703976827155	74.5118649060673	15.959341506609	97.272905	80.426715	12.650593
77.6906259838941	75.0394965430076	15.9593411764559	91.37176	83.481715	13.123111
75.9506108770509	75.5593752288147	15.9593408463484	82.980165	82.460215	28.432538
74.121797461102	76.074230377688	15.9593405160056	74.635475	75.231085	23.616275
72.3176965561275	76.5913607448844	15.9593401856172	64.30468	84.91	26.009678
70.6336518432208	77.1034259199294	15.9593398551026	74.234205	84.088705	29.630347
68.9245487738704	77.610662088013	15.9593395243436	59.609455	83.27302	29.920795
67.4105521038616	78.1109838333715	15.9593391936019	59.88564	90.256965	29.954013

Solution x	Solution y	Solution z	Original x	Original y	Original z
67.4105513937506	78.1109842260674	14.0184605361583	67.48261	90.51293	17.817861
67.4105506843733	78.1109846194662	12.0546397114037	65.23767	90.033385	6.608827
67.410549974795	78.1109850124575	10.147617896028	69.51155	98.000325	10.150379
65.8063786674035	75.7363582187382	9.8132848332897	68.40623	74.741575	8.582781
64.2087149047125	73.4123007828182	9.4793265492553	67.24276	72.18951	20.816233
62.6104020735085	71.1436480158192	9.14326524936603	63.17424	62.764205	21.920947
61.022775216933	69.0442773194833	8.80310182895804	63.457115	71.302795	28.410692
58.3195088056307	64.9460399879397	7.65717487345362	58.86286	75.490835	22.793064
55.6023838026853	57.4997003138028	6.25749215859009	62.26967	64.78212	6.975531
52.8392370180212	49.6343828426652	4.85959045292789	65.705495	54.4013975	3.082521
49.8427063486535	41.2415247303391	3.47545116434438	49.52113	41.29678	9.327678
46.902683972783	33.1813422687263	2.0785553691246	50.337118	13.87323	4.749218
Route: 6 Length: 189.536183355234 Demand Met: 118					
24.384356606554	77.9077944478627	0.110196159841525	24.384515	97.907795	0.111537
30.7962029178084	77.9077944382565	5.06720978772499	36.34587	87.597465	1.344209
36.8961358006024	77.9077944286705	10.400570985205	37.353615	96.195315	18.415189
38.902557117216	77.9077944188782	10.5759742179669	43.88264	75.9979	6.534575
40.9027983423977	77.9077944093389	10.7516347616391	52.486843	76.711165	9.36826
42.8170019129932	77.9077944000487	10.9274091666655	51.801592	75.702955	19.859805
44.6706823629951	77.9077943909382	11.1024767731425	45.96408	75.36881	19.356846
46.5455638397035	77.9077943819314	11.2771866582712	49.437672	97.29667	7.39626
46.7844748034762	77.9077943698418	12.6192530978673	38.950185	86.058925	28.399966
47.0376235906887	77.9077943577459	13.3777181142537	48.983044	68.08194	24.712405
47.2904695582467	77.9077943457253	14.1163375961035	56.10401	69.44853	29.951816
47.290469536592	78.8708976659794	13.9749218181951	49.200624	76.95068	27.905495
47.2904695149469	79.8474864678768	13.8328938591722	61.393495	78.21387	27.829379
47.2904694938318	81.7023943418086	13.5183202636423	58.59379	93.155945	12.405414
47.2904694730631	83.3949503423458	13.2048594589096	54.766852	92.295455	6.553331
47.2904694524123	85.0402766211043	12.8936313727659	51.725585	96.536445	28.40681
47.2904694318302	85.5304844211294	11.9844527304902	58.9163	98.60932	2.300231
43.8125077436866	85.5304844205034	11.9844526810605	55.7501	90.920415	19.617278
39.7275324658886	85.5304844199501	11.9844526315112	40.48646	81.157135	14.786912
35.7732716594241	85.530484419438	11.9844525819323	39.89323	90.309885	11.775799
31.7959034250757	85.5304844189806	11.9844525323433	32.35548	77.08328	26.131092
27.8653408266856	85.5304844185319	11.9844524827007	30.09705	94.85711	4.685105
23.8835113155779	85.530484418154	11.9844524330849	28.966505	91.93771	20.861988
19.5535011565888	85.5304844178325	11.9844523834196	10.636965	99.941455	22.606097
19.553501078714	84.5579462393719	11.8999696889831	12.30828	95.415795	18.734286
19.5535010004379	83.5599206106763	11.8153742681202	23.602775	87.83846	18.275699
19.5535009221051	82.5649009780119	11.7307428590038	20.60172	86.45345	23.44328
19.5535008437112	81.5712388850394	11.6459646579085	16.17437	80.77798	18.674423
19.5535007651973	80.5896911169253	11.5611476912018	10.302265	79.88844	24.724981
19.5535006864764	79.6223511358984	11.4759866135435	14.99811	70.439575	28.594361
19.553500607875	79.4274500189756	11.2469011805459	8.96414	75.77293	21.604208
19.553500529057	79.2335706100265	11.0160572382357	4.81189000000001	71.48163	19.467897
19.5535004502425	79.0431714274947	10.7801093144032	20.26183	95.676245	17.846167
19.5535003715533	78.8475139892142	10.5406276749338	23.159665	94.99055	21.634541
19.5535002927306	76.0566008258487	9.40699157487904	10.737535	78.399525	25.651463
19.553500213947	73.1419115267786	7.92993429900952	1.401765	76.07236	14.516115
19.5535001355991	69.090586375447	5.55736246089527	31.22881	79.877355	13.445056
19.5535000572775	63.0516994123299	2.69758098130039	30.1948	77.47401	0.923346

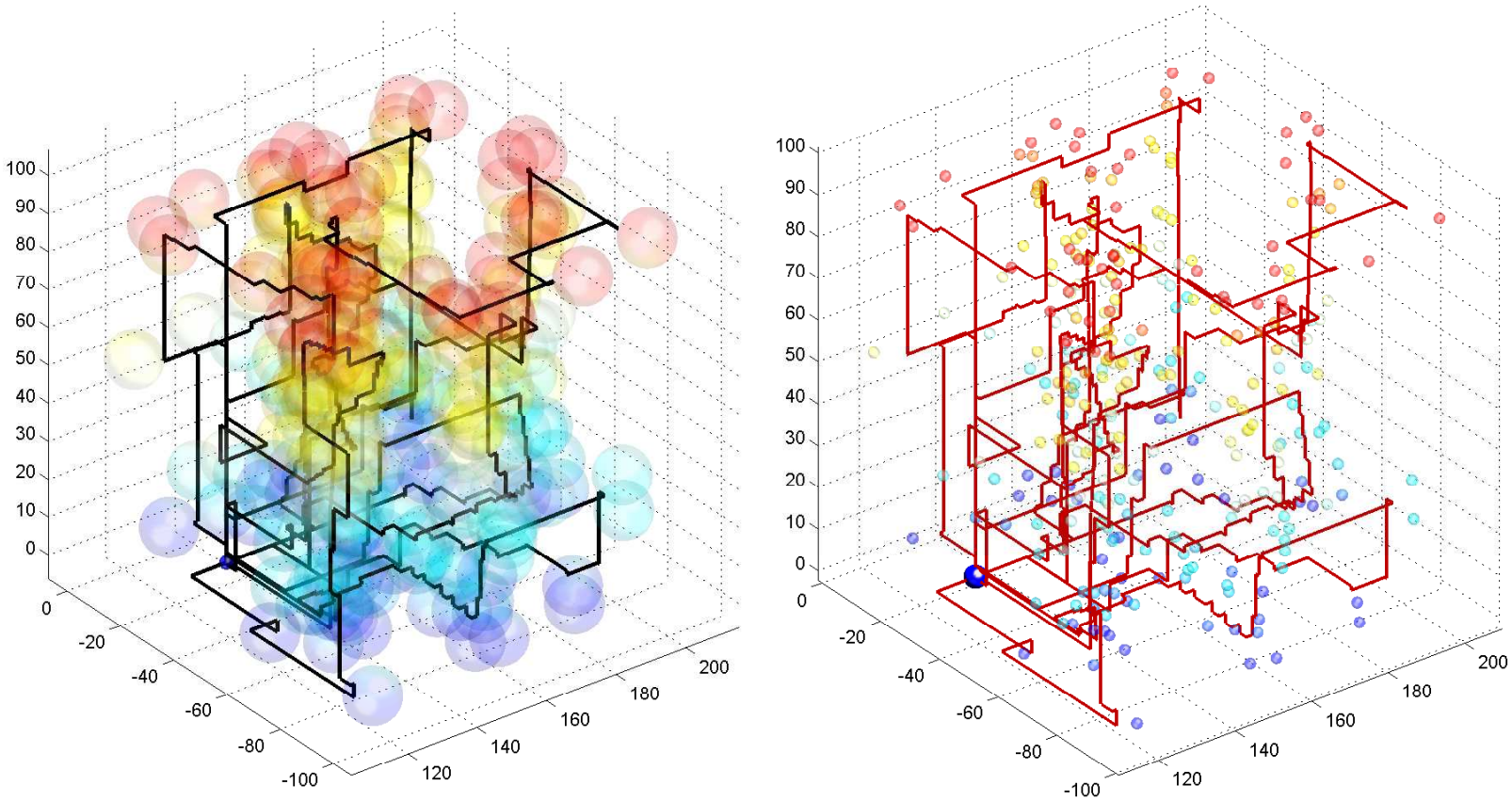


Figure O.169: *team*3_300, Equal Radius, 3D, Manhattan, Length = 2955.1944331

Table O-172: Solution for *team*3_300, Equal Radius, 3D, Manhattan

Total distance: 2955.19443309386 Total demand met: 9490 Depot: x 23.55 y 20.83 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 286.501284842964 Demand Met: 1192					
48.0515502211748	17.9108275741715	5.39041319030421	54.15	15.54	5.27
49.5526694032125	16.2304951893049	11.225273706761	48.26	14.58	6.53
51.1387534394655	14.6627493644236	30.4199986530419	51.86	7.7	30.42
51.1387534394655	14.6627493644236	30.4199986530419	53.85	15.08	32.9
51.1387683374305	14.6627483202813	38.2199257826409	55.4	11.17	38.22
51.1387683374305	14.6627483202813	38.2199257826409	44.72	11.87	38.22
55.9024650738724	14.6627473718325	39.6119047473223	56.31	21.31	38.26
59.3750625725579	14.662746417972	41.896940746034	56.38	14.32	39.64
63.6979379016813	14.6627454642424	44.4121940362309	66.87	17.1	39.83
66.3148083231997	14.6627445092314	50.3849429664764	64.87	11.36	51.75
69.2004200050457	14.6627435549083	55.6797275777644	73.63	17.07	53.58
71.2522081879417	14.6627425994954	64.3799998980826	77.94	16.73	64.38
66.8562645136901	10.7001250597696	65.767110710629	67	3.94	64.95
61.5655211685297	10.2240073786942	67.8223026601831	60.89	11.99	66.92
56.6892759267102	9.74333119267553	69.961223500516	55.38	10.13	64.28
52.8837729024029	9.25979049854217	74.2887742532607	52.96	3.75	74.52
52.8837729024029	9.25979049854217	74.2887742532607	50.52	8.68	79.3
50.0482917951287	8.81838102548038	76.8113201620155	46.38	12.31	81.64
50.0482917951287	8.81838102548038	76.8113201620155	45.57	12.76	80.46
50.0482917951287	8.81838102548038	76.8113201620155	52.67	4.65	71.84
50.0250095288381	8.73814584992841	79.961918303151	48	4	84.7
50.0250095288381	8.73814584992841	79.961918303151	50.97	4.59	83.57
50.025009197435	10.0919980752188	67.1648772812012	43.23	11.54	68.02
50.025009197435	10.0919980752188	67.1648772812012	53.87	15.51	67.82
50.025009197435	10.0919980752188	67.1648772812012	51.38	10.51	60.31
50.2586563379878	10.0920014491253	54.1699995578063	56.94	12.18	54.17
50.2586563379878	10.0920014491253	54.1699995578063	52.03	16.04	55.64
50.2586540187677	10.0920020803169	52.0320212286595	51.98	10.99	46.43
50.2586540187677	10.0920020803169	52.0320212286595	52.12	16.84	52.03
48.0531461262957	8.71560694154574	51.5245225029412	52.67	8.88	54.93
44.5960256217074	7.32053028128662	50.9868581325605	44.53	2.72	56.05
41.4899973865067	6.83098912600919	48.8172407420824	41.49	2.29	43.49
31.2199996851628	6.83098744055186	48.8172393762527	31.22	0.18	51
24.7518728216397	8.51148475372368	4.78802008701446	19.48	4.75	3.34
Route: 2 Length: 361.702912389128 Demand Met: 1266					
49.2886789908711	7.58665918985894	1.5983328893436	50.21	0.82	0.76
51.3258504968545	7.27561160937704	6.29205992422534	47.45	7.49	9.86
53.9758086306972	6.96462540741266	9.43206165533873	56.26	10.34	5.55
53.9758086306972	6.96462540741266	9.43206165533873	54.22	8.18	8.6
56.171180111927	6.64235017867017	15.5424117410138	55.5	8.86	22.02
64.3000008627902	6.1765614376617	15.8552112982363	64.3	1.03	20.6
78.4099912632522	8.90122345986767	15.8552002489616	78.41	15.88	16.4
87.4928179856361	7.26986188726417	9.01484638128685	90.79	7.27	2.84
87.4928176447916	7.17027186522217	10.9883637716475	85.34	3.13	7.91
87.4928173025779	7.0720937082514	13.5525398072779	89.81	1.33	12.56
87.4928169546321	6.97809607421095	16.6808206873523	91.86	5.09	13.18
87.4928165906288	6.88491218760468	23.5663615132819	84.22	4.25	20.41
87.4928165906288	6.88491218760468	23.5663615132819	84.85	7.49	23.97
87.492816227834	6.79223397920935	40.9715763928294	90.71	5.35	36.18
87.492816227834	6.79223397920935	40.9715763928294	86.46	7.15	36.07
87.492816227834	6.79223397920935	40.9715763928294	85.18	6.81	41.52
87.492816227834	6.79223397920935	40.9715763928294	83.08	6.85	43.86
87.492816227834	6.79223397920935	40.9715763928294	86.71	7.9	46.76
87.4928158606007	6.69955581152806	55.5123713882168	83.98	4.24	58.09
87.4928158606007	6.69955581152806	55.5123713882168	83.5	4.83	59.12
87.4928158606007	6.69955581152806	55.5123713882168	83.63	6.61	58.86
87.4928158606007	6.69955581152806	55.5123713882168	83.08	5.9	51.4
87.4928154985877	6.60826368202408	64.8524372955972	90.14	0.74	66.47
87.4928151250891	6.52470077700312	67.2799991819309	90.45	0.18	67.28
87.0083221393124	7.01096548170118	73.7216148523398	84.21	1.15	74
87.0083221393124	7.01096548170118	73.7216148523398	84.57	2.19	72.59
86.6086798520255	7.86979291922275	81.1459646741619	86.49	3.97	82.84
86.2092953187359	8.79727163047801	86.9964400290648	88.21	3.61	89.96
86.2092953187359	8.79727163047801	86.9964400290648	87.06	2.89	85.23
85.7600233289356	16.0658414973492	90.4363703705241	85.76	19.27	96.66
62.1597141863615	16.0658414444699	86.6025037526353	63.35	21.49	87.32
62.1597141863615	16.0658414444699	86.6025037526353	62.16	16.88	79.65
62.1597141863615	16.0658414444699	86.6025037526353	57.66	15.51	81.33
49.7202381151052	16.0658404377958	89.2044443693331	45.09	11.7	92.12
49.7202381151052	16.0658404377958	89.2044443693331	50.3	13.28	95.6
49.7202381151052	16.0658404377958	89.2044443693331	54.5	15.91	93.18
49.7202381151052	16.0658404377958	89.2044443693331	55.24	13.37	88.36
24.6600180741697	16.0658458963952	89.2044007752886	24.66	9.13	90.15
Route: 3 Length: 258.903438314954 Demand Met: 789					

Solution x	Solution y	Solution z	Original x	Original y	Original z
74.2638705472588	21.8760707755759	2.54964685931202	76.81	16.4	5.21
76.6245176873742	29.0193713026294	3.81386189254684	75.98	28.26	8.37
79.1844323798845	37.8698003254075	4.89518291106349	74.93	38.63	8.7
86.4598710589758	44.657578389519	5.77328138878471	92.92	45.3	3.79
86.8212167497672	46.9708494940016	8.50383057281933	87.92	47.46	7.48
87.1811790477409	49.2688518146331	11.2313048934429	89.33	46.23	11.31
87.5372745738972	51.9901449367078	13.0900067162378	90.65	58.26	13.09
87.537274741567	51.2274322503673	19.0959015851976	91.08	56.32	19.58
87.5372749003892	49.8285128556594	24.1991287286674	89.11	45.94	22.79
87.5372749003892	49.8285128556594	24.1991287286674	85.21	44.35	20.93
87.5372749003892	49.8285128556594	24.1991287286674	86.88	55.34	28.08
87.5372750250579	48.8268787454076	29.0711640347161	90.93	51.78	26.41
87.5372750250579	48.8268787454076	29.0711640347161	85.02	48.75	32.58
87.5372751268568	47.7098888374439	34.3042971641548	92.82	43.5	36.14
63.2600001353308	47.7098884831989	34.3042990939122	63.26	50.77	40.6
48.7989353755669	45.4551113752325	21.1065576125263	45.6	43.93	17.79
48.7989353755669	45.4551113752325	21.1065576125263	42.95	44.74	22.67
46.9434071782599	43.6469814981288	7.36520097082651	42.59	39.16	5.9
46.9434071782599	43.6469814981288	7.36520097082651	45.6	41.81	1.51
46.9434071782599	43.6469814981288	7.36520097082651	45.71	40.8	10.89
46.9434071782599	43.6469814981288	7.36520097082651	43.21	42.35	12.25
46.2361415955395	42.918450045449	2.73264285721497	51.12	47.54	2.22
Route: 4 Length: 411.805440693078 Demand Met: 1278					
13.3964937313677	53.1776135369522	3.23681954715592	11.46	53.07	0.5
5.54000250812285	92.2899923186143	6.96000076158678	5.54000000000001	99.29	6.96
4.4885555787515	88.3811856686922	29.1872942849737	0.620000000000005	84.95	30.66
3.55354349376341	85.8377065306959	40.5699999893562	2.01000000000001	79.01	40.57
3.55354190950716	87.3656534355718	51.5990935288971	4.8	88.51	50.28
3.55354190950716	87.3656534355718	51.5990935288971	9.41	84.38	51.54
3.55354032326011	92.4512585570011	68.7059129167488	1.23999999999999	99.01	69.5
3.55354066133884	87.321926905606	68.7059163959166	1.01000000000001	87.83	68.27
3.55354099966645	82.1300043498126	68.7059198745769	2.19	82.13	61.84
3.55354144709298	78.8590764652504	68.7882351169055	3.44	75.58	64.88
3.55354189467266	76.408432302857	68.8711007473939	0.909999999999997	72.43	63.78
3.55354235138361	76.3083461029415	75.3578766682456	1.20999999999999	81.97	77.86
3.55354235138361	76.3083461029415	75.3578766682456	5.06999999999999	73.15	76.92
3.55354235138361	76.3083461029415	75.3578766682456	2.98999999999999	72.09	73.38
3.55354235138361	76.3083461029415	75.3578766682456	6.62000000000001	72.96	75.87
3.55354280863598	76.204051255687	77.7831407838387	6.36	80.44	74.53
3.5535432657777	76.097782813776	81.6819344910773	1.36	82.41	81.26
3.5535432657777	76.097782813776	81.6819344910773	8.06	78.36	80.59
3.55354372304818	75.9801030263133	88.1497567672003	0.760000000000005	80.97	91.36
3.55354418104012	75.8550434306965	90.1046327175921	0.969999999999999	75.78	96.61
5.66459057557431	75.8550094479305	88.7335565236023	4.75	76.37	88.59
7.83825580266034	75.8549754655612	87.3760084660466	10.66	76.44	91.14
9.7257559123065	75.8549414832979	85.827504112861	8.28999999999999	81.45	86.91
11.9003204571912	75.8549074828929	84.1617299434079	11.23	82.6	85.27
16.6992453622906	75.8548733756026	79.548895341113	16.07	82.14	77.28
26.4437586514414	75.8548391868565	77.851845070974 7	27.35	82.24	75.13
26.444009323067	75.8541440128408	77.8517603485981	24.25	76.66	84.45
26.7851700206872	74.9636543909015	75.8345804377836	32.42	78.27	77.18
27.0426633503529	73.0419968266362	71.7328979642205	28.95	69.72	73.23
27.298089749694	71.3599992751295	67.2100009448052	34.24	70.46	67.21
22.3431674554074	71.3599960466248	64.7630849937937	23.47	70.49	67.86
16.990015280893	71.3599928182883	62.0099939176293	16.99	78.36	62.01
16.0731833611047	70.8374768467127	51.077350943835	20.35	68.75	46.32
13.5976095433973	70.3949366575531	49.9533540347957	11.74	69.17	44.25
11.6506740301749	69.9650882508529	49.1188583421352	8.95	75.43	49.37
10.1930099804325	69.4720264696559	48.2768687207056	8.67	72.77	42.39
9.57000614240643	49.6700001433019	48.0599900686484	2.56999999999999	49.67	48.06
10.0292772877435	36.3008680670622	38.2541924120991	3.20999999999999	36.35	38.54
Route: 5 Length: 328.556199695851 Demand Met: 1225					
24.1078053673733	59.2804377130952	29.1099892811069	24.49	66.27	29.11
24.107922824945	59.2804442738054	32.7799900745122	23.19	66.22	32.78
24.3496240954512	59.280448877109	35.5225425099306	22.17	64.94	33.7
24.3496240954512	59.280448877109	35.5225425099306	25.01	63.12	37.19
24.5986386559959	59.2804534745312	39.1823414211683	25.24	60.77	36.77
24.8471551120444	59.2804580716562	43.4002966532312	22.51	60.15	43.07
24.8471551120444	59.2804580716562	43.4002966532312	23.5	55.84	45.92
25.0988868358848	59.2804626695788	47.0355612156821	19.65	58.2	51.17
29.3785559865525	59.280467279056	47.3636132218857	30.36	58.14	54.2
29.3785614254624	60.434129436752	47.3636132477753	30.85	54.39	47.15
29.3785668663239	62.4560552463564	47.3636132736591	35.37	65.99	46.58
28.859995368338	62.4560550659824	47.3636137822182	28.86	67.84	42.89
27.6858411617662	62.3741341227768	49.8048887518539	28.77	62.05	46.68
26.4934266480209	62.2922583602333	52.5756156768334	21.39	62.71	50.33
25.4923470207172	62.210331965915	56.0366119397014	23.78	67.37	54.34
24.5491365043797	62.1274562555146	60.4344860189866	25.86	63.85	60.16
23.5936754361462	62.044484632535	64.9812693265973	27.62	60.61	68.71
23.5936754361462	62.044484632535	64.9812693265973	25.84	61.09	65.42

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.4673070307489	61.9619190934613	67.8903539589217	27.28	65.47	69.94
20.7712966971822	61.878130080852	70.0314657451381	26.15	61.96	69.66
18.5063873507481	61.794362853797	72.2445790356599	13.36	65	72.75
17.0896237800504	61.7098802838604	74.3697620748201	12.14	56.76	74.37
20.1231773735886	61.8428905848704	74.3740130572536	21.99	57.15	79.17
20.5407184162755	63.2038686569249	74.3779882089293	26.5	63.44	75.23
20.9144481824798	64.5529856162311	74.3819609536044	23.52	71.05	74.38
20.9144490749757	64.552984568082	83.2759993921859	21.49	69.2	86.43
20.9144490749757	64.552984568082	83.2759993921859	24.03	65.56	79.56
20.9144499673629	64.5529835194361	91.5750479220017	24.86	66.05	97.16
20.3808269523183	64.2659761646059	91.4234861742876	20.88	59.51	94.7
19.8419241736381	63.9928744171378	91.26924990427	22.6	70.1	92.91
17.5174811516923	62.2817383543485	91.0927027288433	12.82	66.49	92.89
16.429015553668	55.2169956635415	90.9101162992833	21.75	55.19	94.83
12.7442628572483	48.6417040349731	90.7111367886034	9.06999999999999	51.92	93.4
10.2446837516718	26.3015196656518	90.5083490363576	5.58	22.9	91.06
8.5169911449815	20.6342536388582	90.3041178842409	4.01000000000001	20.5	95.59
8.30974606617202	17.4897556402676	56.9500000118357	3.36	12.54	56.95
Route: 6 Length: 377.920995359446 Demand Met: 1208					
36.9355878264006	48.9873992259844	6.34732460211608	37.85	53.76	4.29
47.2999987256226	55.2499996453224	16.2199938488334	47.3	55.25	23.22
51.4500166709263	61.2798999439466	14.873373660415	49.78	61.48	16.59
56.0838557855155	67.3778441480579	13.4840477199717	54.05	68.39	12.29
61.4884142709333	73.1591818113778	12.133934660758	60.12	71.05	6.63
70.2299986994043	88.0130716131343	11.1612338734203	70.23	90.73	4.71
74.4899980697356	88.0130732109825	11.1612343236196	74.49	84.46	5.13
78.9361513968375	88.6500024406925	30.2468119433224	85.6	88.65	32.39
78.9360458355955	90.8591556835363	30.2468129143633	78.98	97.83	29.61
52.6351815336358	90.8591547867302	30.2468143565693	50.91	90.3	36.65
49.1231611328583	90.8591538894622	30.2468157961159	49.11	94.31	36.24
45.5700120556878	90.8591530102542	30.2468172411361	45.57	93.71	36.64
45.297593142005	90.1871037006073	28.5801599049423	49.91	91.9	29.51
45.297593142005	90.1871037006073	28.5801599049423	48.89	93.1	33.02
44.9932127636615	89.3721256576827	24.2122190753911	38.99	86.42	22.62
44.9932127636615	89.3721256576827	24.2122190753911	46.89	94.85	27.74
44.7970359215623	88.5355926748761	14.0409649125124	42.78	91.87	12.41
44.7970359215623	88.5355926748761	14.0409649125124	41.11	86.33	11.14
44.6057421354381	87.7038174902447	9.25290774737736	44.33	87.3	2.27
44.6057421354381	87.7038174902447	9.25290774737736	47.56	92.03	4.61
43.0196379317018	85.4313220431127	11.4251729257458	48.25	85.26	10.69
40.9581898024612	83.2214184424953	13.7158697957717	36.6	82.94	12.12
39.2335794858461	81.0673680153186	16.2086960322678	40.14	85.47	20.22
37.3936686808988	77.2980948659709	17.9022182453565	39.42	71.54	17.38
35.1887714891217	75.4789347447271	19.6828379125528	35.58	76.06	26.53
31.9899965282341	72.6897550190728	20.0202510650165	31.99	67.74	24.97
21.8723528682632	73.8703498301073	19.0751083235298	21.1	78.12	20.54
13.095366635862	74.9507010309979	18.1060570083021	12.07	80.14	22.08
8.982254822995	75.5941853105518	16.2988063058185	8.59999999999999	80.56	11.38
8.98224867839694	74.2751838593249	16.2988475816882	4.15000000000001	75.92	20.91
8.98224255108499	66.5299934591446	16.2988886305854	4.20999999999999	66.53	21.42
14.4466224258699	65.9169470974993	15.4297061704679	19.86	66.11	18.19
16.7501250948786	65.3042135055185	14.4523709980398	16.79	62.67	10.23
19.0512427013961	64.7149497683072	13.5583942125856	20.56	61.44	16.14
21.2133423898129	64.1473585505609	12.6252276832168	27.64	62.78	13.86
21.9409194800814	63.6365328826949	11.5099300983821	27.36	59.94	13.4
22.3052839925264	63.2898021257891	9.10336823094208	20.64	65	8.49
22.3052839925264	63.2898021257891	9.10336823094208	22.65	62.2	11.71
22.6723780587713	62.9427936609904	6.53815542298086	24.47	65.24	5.9
23.0365425888712	62.5926407108511	4.03623760905857	25.62	68.98	3.75
23.2977687319947	56.1741060225412	2.11286371904172	27.4	59.84	3.43
Route: 7 Length: 422.992170138093 Demand Met: 1289					
23.0499504134022	25.1467249203433	18.2011388962349	23.55	20.83	14.19
23.0499504134022	25.1467249203433	18.2011388962349	27.74	25.63	13.28
23.0499504134022	25.1467249203433	18.2011388962349	25.65	24.53	24.47
20.1117965947349	49.9922783203837	24.584416333374	15.54	52.83	23.01
18.180007893	57.9200007234655	34.0499968755807	11.18	57.92	34.05
23.7840154604992	79.3877549460164	35.5161437645027	28.82	81.78	35.71
26.7872826739195	87.8376520405384	36.9710979087081	24.2	92.42	34.13
26.7872826739195	87.8376520405384	36.9710979087081	24.67	93.34	35.07
36.25447961238	89.5083085531783	39.1200929993139	40.13	86.48	38.33
41.3567690512223	91.4130503987294	41.3680787297005	37.93	93.92	46.64
41.3567690512223	91.4130503987294	41.3680787297005	38.36	90.43	43.39
41.3567690512223	91.4130503987294	41.3680787297005	47.08	88.26	42.71
45.7304484035248	93.1711680928513	41.9735001433712	46.8	93.43	44.07
49.8802439313757	94.930243461461	42.5699979898801	54.83	99.88	42.57
48.1608735667996	93.7474744004761	48.6900458170729	48.42	91.53	51.1
46.4391997688694	92.6155095852943	53.755640334862	47.67	92.59	55.65
44.6544831136309	91.4891252635788	58.3136001761502	39.28	92.99	62.54
44.6544831136309	91.4891252635788	58.3136001761502	42.93	88.78	59.49
44.6544831136309	91.4891252635788	58.3136001761502	39.31	87.14	57.08

Solution x	Solution y	Solution z	Original x	Original y	Original z
44.6544831136309	91.4891252635788	58.3136001761502	39.7	88.73	54.48
44.6544822683989	91.4891223747571	67.5589967555796	41.11	92.55	72.93
44.6544822683989	91.4891223747571	67.5589967555796	37.88	93.16	68.12
44.6544822683989	91.4891223747571	67.5589967555796	39.18	94.86	64.79
44.6544822683989	91.4891223747571	67.5589967555796	38.08	89.48	68.3
44.6544822683989	91.4891223747571	67.5589967555796	48.68	92.55	68.87
44.6544834938686	91.4891174158689	84.9333947928036	42.37	92.45	91.48
44.6544834938686	91.4891174158689	84.9333947928036	47.48	94.9	89.56
44.6544834938686	91.4891174158689	84.9333947928036	48.98	92.03	89.79
44.6544834938686	91.4891174158689	84.9333947928036	40.14	88.25	82.87
44.6544834938686	91.4891174158689	84.9333947928036	44.75	90.08	82.93
44.6544834938686	91.4891174158689	84.9333947928036	46.92	92.94	79.18
53.1220842541585	85.373699485462	77.3652998248766	51.75	85.81	80.64
63.8354048275629	79.1259688972316	65.0152655504566	68.17	79.21	59.57
63.999173684072	57.184675940873	64.8807333887459	58.75	56.63	68.13
63.999173684072	57.184675940873	64.8807333887459	60.94	57.56	60.13
64.1732380192245	42.3944570060589	64.7463010695976	65.16	40.78	60.78
64.3467110115594	32.244870143423	64.6133218551167	71.33	32.23	64.13
58.0201481052305	32.2445196949913	64.6133106268507	58.02	32.46	71.61
57.4497137369514	26.5805128697472	63.5843852155173	61.27	24.41	67.08
56.8495234483155	22.4900091677481	62.4495903807893	56.85	15.49	62.45
49.8499988965446	23.5599912009937	58.4099991413793	53.73	28.37	56.21
49.8499988965446	23.5599912009937	58.4099991413793	49.85	30.56	58.41
41.9190111483852	22.2217689183854	43.2989264939581	45.63	23.76	45.59
Route: 8 Length: 506.811991660348 Demand Met: 1243					
37.012683277616	34.525315376287	33.9252881609491	40.4	40.19	35.32
38.5550094172012	35.5005441932445	37.454013691449	40.11	39.6	39.05
40.0329376013052	36.4064852230378	40.6648381489999	42.56	42.28	42.23
41.0700629968973	36.9799957564628	42.7599968038069	41.07	43.98	42.76
41.2668805826412	36.6329232272581	53.5653207162345	42.72	42.84	54.45
41.4595511901592	36.2070003895287	59.8626301363331	42.69	39.78	60.49
41.6515845512428	35.7708948231291	65.920558145542	45.42	39.91	67.31
41.8390953120824	35.3032217422011	70.6621677178097	44.15	32.64	73.77
42.0250876845743	34.8474703554986	74.3561346256361	41.47	31.69	75.83
42.2113960313519	34.4016489231334	77.8200089810489	45.57	28.26	77.82
42.2113958357848	37.1851321216536	78.7070383296462	41.97	43.22	75.7
42.2113956400316	37.9100521953533	80.3136027226962	42.62	44.81	79.79
42.211395443812	38.0826341262564	83.9082926811786	43.21	42.61	80.16
42.2113952471082	38.2500041245554	92.5358110229107	47.34	38.25	97.3
40.0944350505096	39.5788032606238	92.5358113615037	40	38.77	99.41
38.3162576203234	44.2113477245195	92.5358116910764	43.96	42.1	91.03
33.63170109252	54.0400032059121	92.5358120210597	27.18	54.04	89.82
33.8496140216233	55.445759646326	92.7086060224032	30.83	54.42	86.59
34.1667160661596	59.8796801638612	93.0534567786642	33.01	55.55	89.21
34.4898385138002	78.5949101966307	93.4168403559065	34.79	81.57	97.09
34.8139040992393	87.3960230787623	93.7707742664634	35.46	90.5	93.34
35.1399212275052	93.7506991312583	94.1256858329933	30.69	95.98	98.88
61.5407472058579	94.3504733577067	94.289351379947	66.26	99.07	96.4
59.7161787651592	83.1399992931273	94.2893516160145	53.35	83.14	97.2
59.7161801478135	79.6647547576658	94.2893501080361	57.57	78.44	87.74
70.6999916309131	79.6647519972163	94.3264165945023	70.7	73.7	97.99
73.5727847040012	79.914454295249	94.3264163928123	72.93	73.7	97.12
88.1821849547057	83.722187293956	94.3264161817195	92.92	88.46	92.3
87.896383834793	56.7195752464498	94.3264200288312	87.26	54.53	99.96
87.6133082672947	49.9900040173368	94.3264238781763	82.42	49.99	99.02
88.7897000723651	49.6153056033545	94.0187187323976	92.09	44.08	96.66
89.0112460537062	49.5090066177131	89.3156368045872	85.78	45.37	88.36
89.2373827021008	49.4038429860768	85.223508536432	89.59	51.88	82.73
89.4634238008675	49.2983063936858	81.7487205337069	96.43	49.73	81.64
89.4979158449257	49.1711925750674	80.2560279921268	89.36	56.03	81.08
89.5324946426854	48.9351522537793	75.7714942037878	88.92	43.62	77.06
89.5670934582572	48.7071877900098	70.4101106700651	92.59	46.16	69.75
89.6016340683427	48.4813421216859	65.438234235711	84.47	48.16	64.66
89.6363203782287	48.2559312821667	60.9775817366006	85.85	46.49	60.83
89.6710847044616	48.0320102901965	56.6091396690686	93.86	49.11	54.34
89.70573704144	47.8068505465449	53.0545482010627	92	48.8	50.4
89.7403487835234	47.5808583412248	49.9731356961045	85.43	53	49.96
89.7788521789418	46.1893487849866	46.9370267127685	87.56	46.99	46.13
89.8174071389707	44.7812779092612	44.0152115427218	84.47	44.91	39.53
91.5001744765192	37.6399988508495	43.959997749726	98.41	37.64	42.84
79.7899955991549	30.3199938339534	43.9599953217139	79.79	30.32	50.96
73.5459286761323	27.0255446479766	30.1673636283713	78.01	26.19	31.01
60.4049258699312	23.9161064366977	12.8677476374723	63.88	23.81	11.61

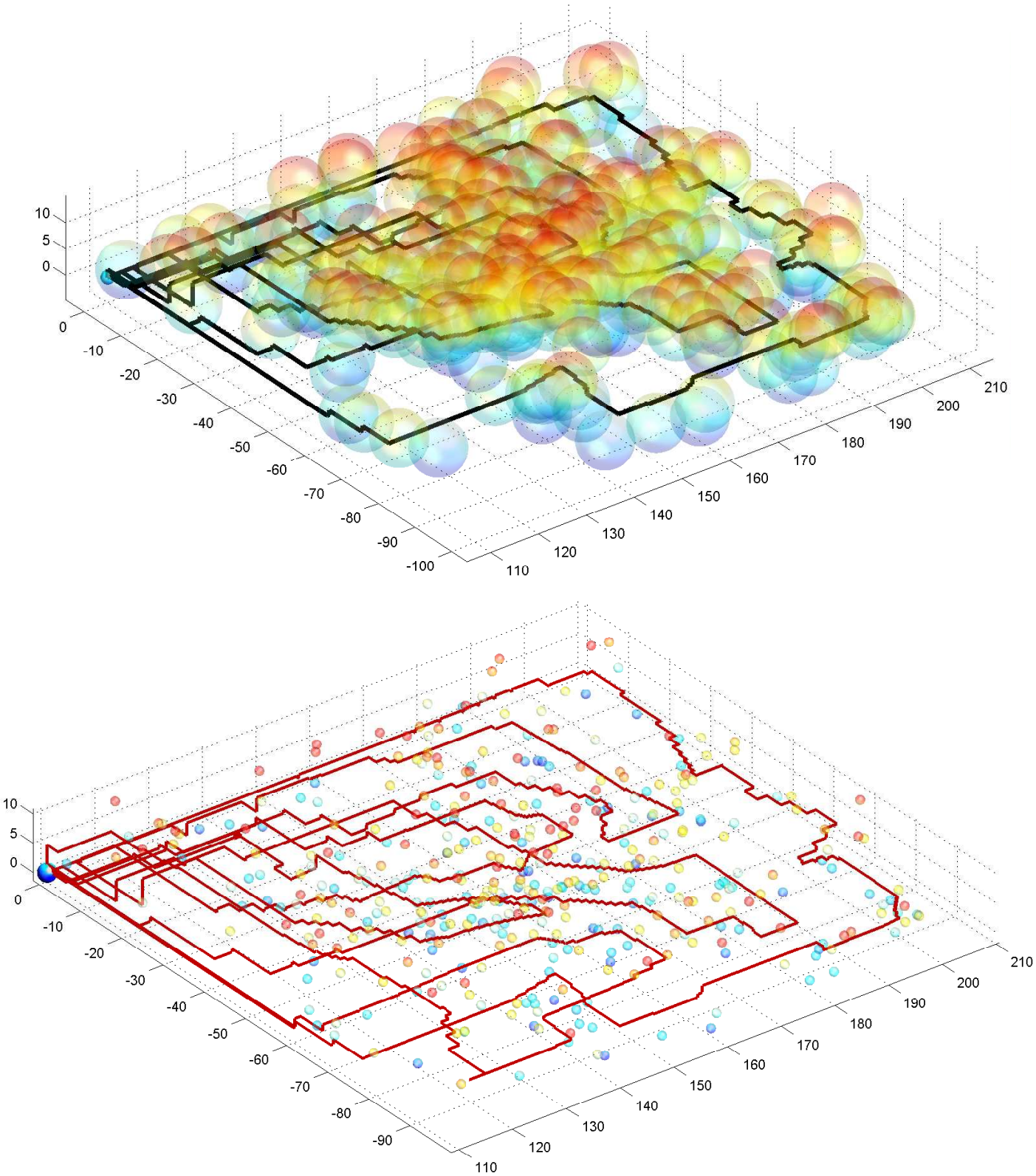


Figure O.170: *team*4_400, Equal Radius, 3D, Manhattan, Length = 1828.9714122

Table O-173: Solution for *team*4_400, Equal Radius, 3D, Manhattan

Total distance: 1828.97141215696 Total demand met: 2245 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 429.12332789994 Demand Met: 374					
5.74106567192597	0.649387370699035	0.617745242484496	2.34935	1.70725	1.418964
45.8402310807735	1.27967357747885	1.22218999617674	46.59205	4.24755	0.914106
67.0334197035521	1.8722181510391	1.83064691761758	69.817575	1.306825	4.894499
71.2428965278689	2.47896877433642	2.36954174066102	71.829525	5.85575	2.05089
75.1407756356916	3.03849116917977	2.91241336215945	77.335225	0.00945	1.073545
77.5852610742681	3.67579160981729	3.49836106759352	77.882675	4.11235	4.515775
80.0185348763128	4.30926895026147	4.07646827315043	79.6523	4.144625	8.31435
82.6871725335946	4.94801049436898	4.55683945728657	82.33615	2.420325	8.700274
87.6246494471121	7.59819220398271	4.80583796286387	87.3023	11.937375	5.783418
94.0900476802406	8.66931025229479	5.04765474004638	94.09005	9.358875	9.999877
94.9816213837397	8.66931103853945	5.04765482106992	99.82775	8.49955	3.828547
94.9537559736519	8.73055368367505	5.09041940922205	98.6909	7.723575	8.237085
94.8345556389193	8.84174708263447	5.11223822152723	94.81355	7.137025	0.426722
94.7167464838967	16.7572486268479	5.15928723240687	96.9141	16.74635	0.695888
93.7182588108636	26.8694721814559	5.31566193068342	95.640625	28.68455	2.397586
92.5941916987477	31.7579331398997	5.47623650279728	94.997925	34.851	5.629957
91.2740696661697	34.4092448926848	5.63656197151793	90.921925	35.308625	2.502062
89.9892211629108	36.8618502906137	5.79992510835706	87.349525	37.1432	9.692858
89.2445724516507	39.0333200704123	5.94397209957479	92.049975	40.056175	5.962344
88.4477466998694	41.0679699872082	6.08798616552557	86.306375	44.08645	5.63357
87.7185554305597	42.6376345697309	6.23239360357783	85.82305	42.253575	5.699647
87.0185202956084	44.2425455601851	6.37701183672592	83.247325	46.458225	8.799584
90.5314238875995	44.242545537962	6.37701179748313	94.807975	43.25145	7.382414
91.8251907986199	44.2425455157512	6.37701175822539	95.9689	41.808	7.756384
91.5481731663649	52.2449731896487	6.37701065623165	95.486225	52.746525	3.57388
89.7112631290907	55.4159999985727	6.37700955611976	85.3769	55.416	3.88436
91.4616147487422	58.8836898039604	6.37700958279672	94.377175	57.5521	6.223661
93.014678738429	63.1510038966532	6.37700960947382	92.124775	61.791725	6.696503
94.6498352246763	68.3222742027854	6.37700963614917	98.93765	68.322275	8.948906
91.8248060926576	69.3534707557635	5.44376721372702	91.5733	68.725	1.37953
89.1888294458452	70.4436487339585	4.71284574454407	91.08095	71.69145	1.548548
85.68595979841	71.4598000590602	4.06793084874899	82.150425	71.4598	0.532397
87.724162765466	72.3111582700311	4.63815199461453	90.725625	70.444425	7.760216
88.7300895413022	73.6801622843364	5.03924947766138	90.314475	71.662575	4.957094
89.698638204531	75.1850752386975	5.44064466375926	94.404	75.185075	7.131673
89.6986378596239	77.719299845219	5.44064471053849	91.825175	77.123475	9.251483
89.6986375147038	80.8970859087416	5.4406447572337	91.03755	80.9252	1.385966
89.6986371697566	84.1265991586122	5.44064480396638	92.480625	84.1266	1.286063
89.5804274053941	89.880097488035	5.44064490163938	92.685275	90.310575	1.584168
88.8794820155634	90.6612570821688	5.44064499909709	89.0595	90.291	3.16566
88.178175721256	91.4524034990472	5.440645096571	90.195175	89.03695	6.180904
87.4366243234156	92.3151366510182	5.44064519403708	87.858275	88.334025	4.100051
86.6796041597046	93.5434578137232	5.44064529151291	84.25115	92.664475	5.874601
85.9675417777008	94.8291932406133	5.44064538898707	86.192975	99.203225	7.750239
84.9330617095534	94.9635003012933	5.44064548584743	84.9479	97.513325	6.355392
83.9038469429395	95.0963263188081	5.44064558270302	84.77555	95.283075	3.666391
82.8550110867844	95.2290439141482	5.44064567957298	84.730325	97.611875	9.216212
76.0747302796261	95.346065584994	5.44064577625106	74.44305	98.0205	8.628544
73.2438558586398	95.4590643852124	5.44064587287857	71.306475	97.9771	2.882666
71.2542716515831	95.5699535385103	5.44064596956541	67.679475	96.828325	2.179153
71.2542715621659	95.5699538440899	6.11074078997898	72.222075	99.2555	9.348041
71.198859212049	94.7623550244725	6.11074067659807	72.374675	95.981125	5.386278
71.143190906628	93.9363007009607	6.11074056322074	72.88955	91.55335	2.086078
66.6022731783265	93.8983192655562	6.11074045031291	66.508125	91.303225	8.984758
62.310960347635	93.8606443946699	6.11074033736787	64.46975	94.91155	5.12346
56.4280800583131	93.8229308873444	6.11074022442419	56.428075	90.20545	9.562383
49.954227983024	93.8229307797907	4.95495460137594	48.99045	98.5583	3.927321
49.1001292057994	93.8229306715831	4.40514007660095	49.100125	97.070175	0.603113
40.9571016340893	93.5615515022315	4.40513999162762	40.290225	96.689525	2.280132
34.8122034043299	93.2863524863802	4.4051399066763	32.22375	93.28635	0.1273
34.8122033917051	84.868350755468	4.97635811723117	30.896	84.86835	8.084952
35.1961872866494	83.624533142398	4.97635813448447	32.733925	86.47665	2.244896
35.6348449092059	80.4371427246947	4.97635815177365	35.60905	81.995775	1.580638
36.0733309443003	76.3084491161015	4.97635816908414	40.4153	76.30845	7.455735
34.5790921956619	76.2354106993233	4.41777577825743	36.110325	75.95995	0.32151
32.6667417019888	76.1626784607928	3.96537863108237	31.60195	76.5275	2.478681
30.8542037514543	76.0899908064956	3.52061322216824	30.46345	78.65395	2.876347
29.0870775005709	76.0169542529012	3.07983037931649	29.23795	80.022375	0.178216
26.1666796174897	75.8866099846232	2.93745566275917	29.5312	77.759375	2.944562
20.0704341887611	75.7545944310714	2.79509211109693	22.467675	76.02705	4.2329
8.9690662789753	75.6224571582218	2.65182774028876	8.347775	79.0334	0.64524
1.20671174697064	75.48672946504	2.51104823755231	0.00154999999999461	79.256375	5.511897
0.807043868081294	68.3244109683512	1.70863858309769	0.331024999999997	69.303175	3.842333
0.409636998271367	59.7443177529753	0.864726137785457	2.404275	62.37445	1.602613

Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 2 Length: 231.101648899541 Demand Met: 375					
5.3008315406135	16.1680562114227	4.48742572421014	5.29819999999999	16.16745	9.485319
15.253294241116	40.3040332982588	4.49430927281462	15.806625	40.87695	9.361797
16.6165008805123	41.7138627980823	4.50088055973907	17.095675	43.177	5.934841
17.9619239493404	43.0613300040124	4.50744621563238	19.292975	43.870425	8.142944
19.1786829562384	44.3390066838935	4.51399566206623	19.322625	41.061025	7.646061
20.374908107266	47.2536145622694	4.52052412425597	19.028925	48.6519	8.742576
22.0538350046941	48.9825742953219	4.52702406926744	21.4066	50.274675	5.660638
23.7967418686126	50.6371920109588	4.53352167213493	26.549225	47.5983	5.827804
25.0219928357301	53.7361542719225	4.5400139283072	22.891175	56.122525	6.014662
26.4300611046014	56.0265535583451	4.54650174324545	26.5978	58.30075	8.947543
27.4661141461894	56.2861277135177	4.55273142615575	28.87265	55.2137	3.915468
28.4673068472932	56.5481267477534	4.55896210139872	29.2116	52.625	7.111098
29.3257046515505	56.8947574847562	4.56517540621813	32.800625	59.186225	6.71386
29.8789575691113	57.1980321751233	4.5713787495717	30.732825	57.781	6.904491
30.4257780457867	57.5004904577913	4.5775791954174	30.688625	60.637275	0.70091
30.5530713259829	57.5154322993866	4.58925881166756	30.1798	54.1346	0.93414
34.0428247914596	57.8806832916414	4.65289484580497	36.8297	55.690525	7.310631
35.8036797405931	58.2813506246815	4.71546387770997	38.122975	58.912025	4.096565
37.3747567025146	58.6801483296	4.77809908196295	39.243575	59.34405	2.988695
38.8149012088969	59.0766718367561	4.84093778771315	41.323875	57.06515	2.903463
40.0252410193452	59.492126712864	4.90415238868525	41.765825	57.606275	4.678763
41.1667114385436	59.9192430029441	4.96739711263208	40.468775	56.35765	3.688499
42.3765322944076	60.3894554678354	5.03092224865712	45.110025	59.219325	7.835164
43.3530715076429	60.8787579249077	5.09373266865086	42.114525	60.87195	6.966651
44.3694065462386	61.3692378662675	5.15636050307473	43.7645	63.186425	9.005722
45.4266112671979	61.8205643233985	5.21776839009711	45.884675	65.715725	8.319043
45.4266113435506	61.0515384394358	5.21776835922208	46.228875	65.56925	6.129679
45.4266114193161	58.177200025494	5.21776832833386	50.342	58.1772	6.133715
44.7804296360352	57.5551136879005	5.2177681756807	44.541975	62.0002	4.336081
44.1431546012162	56.5551011302477	5.21776802302328	46.119125	55.3112	3.945632
43.4793652968435	55.6096283412419	5.2177678703663	41.89655	53.797625	8.251962
42.855647989609	54.7594529785684	5.21776771771966	40.703325	55.537825	6.299364
42.2587345117345	53.8980024504458	5.21776756507499	42.80595	50.969325	5.199786
41.6571724520283	53.1143798965761	5.21776741243089	41.3638	51.811825	0.610596
41.090754389804	52.5215051460596	5.2177672596851	40.529725	53.231175	6.058478
40.5304711392501	51.9251706245409	5.21776710693997	43.054225	52.07985	5.94327
39.9460016338361	51.3296952142458	5.21776695419519	44.549375	51.8385	4.639375
38.7627363770657	50.7023489528448	5.21776680144406	38.966475	52.166125	2.317575
37.5790165361028	50.0547108195616	5.21776664868801	37.32375	47.164775	1.301487
36.5629176592439	49.7214105819099	5.21776649576452	37.074525	51.14655	9.462196
35.4819481766423	49.3679419132304	5.21776634286945	34.822	51.041775	1.965488
34.4492325382057	49.004680030407	5.21776618996639	30.804475	50.3614	3.667235
33.6730029649812	48.6273263975842	5.21776603705734	31.916925	49.63125	4.365548
32.9292257711913	48.246759297087	5.21776588414624	33.276075	49.648225	0.482877
31.8795187165666	46.9845997210857	5.21776573070641	31.24645	46.9846	0.258005
31.8795182113494	45.558574921079	5.21776569858921	36.34605	45.558575	2.970524
31.4273018966855	43.1032336061546	5.21776566845791	34.241775	45.041325	3.482667
30.9421022038577	39.7652628780972	5.21776563832891	31.7652	39.5927	8.134315
30.4512321526057	36.568926442277	5.21776560818762	32.29465	34.1886	4.533526
29.9452304973862	34.1157190317063	5.21776557804514	29.46595	31.229925	1.232208
29.5525179510939	33.8479075041372	5.21776554796659	30.2641	36.115	4.866777
29.1573908549153	33.5758236081366	5.21776551788018	26.51415	33.575825	9.461971
29.1573907986694	27.2476624486066	3.01089595759336	34.098725	26.483975	3.010898
27.6742543587112	27.2476620450094	2.90487916478066	27.65685	28.081275	4.203862
26.2013736430323	27.2476616414105	2.79852478442321	28.216025	27.287675	5.4487
24.5505444564251	27.2476612378064	2.69165837223697	19.9845	27.40155	0.660019
24.5505444762817	25.5294084279047	2.69165835432503	20.995625	24.282225	3.380339
24.5505444959922	24.0268900267651	2.69165833641064	20.686175	21.9667	1.804567
24.5505445156598	22.9892226417685	2.69165831850423	21.1268	22.989225	6.335554
26.3464686357565	11.1872576977301	1.75585856311252	28.471925	7.124375	1.494169
27.6364247733838	9.71905000328457	0.854222932925702	32.636425	9.71905	0.854223
12.6045660720487	4.50474776825946	0.437566769863362	12.34295	3.720825	3.558355
Route: 3 Length: 330.411931430295 Demand Met: 375					
2.94531469375188	12.9224909792824	3.58256015385183	2.12502499999999	13.8908	8.215003
13.649683171474	15.6468680348869	4.17469894998397	14.259	13.428825	7.786985
20.9892002787452	20.7572000661382	4.68396630016726	20.9892	20.7572	9.683969
48.524077391085	26.6922131026754	4.68396585330871	52.727475	27.05645	3.021539
50.1999483521417	31.0776829501476	4.68396540649106	49.821325	32.088775	0.505787
51.992980932612	34.3198194883697	4.68396495969267	53.08505	32.116125	1.177184
53.5596123125637	42.0460908677356	4.68396451293449	55.460475	43.213925	0.442759
54.4286601367066	44.3026216370525	4.68396406623217	56.281125	43.406775	0.357518
55.0357870782303	49.4597444336236	4.68396361949073	54.099275	51.121125	0.198175
55.8674260970737	50.4937084984371	4.68396317276668	55.9361	51.897075	1.720125
56.7006500760027	51.4768247446899	4.68396272607477	55.262125	52.9866	2.328913
57.5758613298543	52.4142243160755	4.68396227939976	57.767975	55.4125	2.368927
58.4474671957008	53.2340839752293	4.6839618327544	59.205025	55.76	1.820366
59.2916791593872	53.9716171353831	4.68396138614188	59.0369	52.162425	0.980631
60.1533869358349	54.7864592563329	4.68396093953775	61.751375	53.5726	3.689653
60.9877911845695	55.6272092005888	4.68396049293269	60.964225	55.767775	5.605242

Solution x	Solution y	Solution z	Original x	Original y	Original z
61.8268120013026	56.4692504386366	4.68396004630739	66.095725	55.876775	6.205798
62.3916636458574	57.3790532162966	4.68395959963322	62.1796	60.091575	6.795975
62.9612151925728	58.2012306453397	4.6839591528861	62.138225	61.218175	0.933898
63.7002315137245	58.5756688967887	4.68395870614308	63.564825	58.6141	2.885043
64.4440262029308	58.9506026959463	4.68395825940753	61.732525	60.28975	3.358698
65.2535845757566	59.3191946686903	4.68395781267726	63.23165	61.378	8.16167
66.2820144539893	59.6569691108264	4.68395736578251	67.662425	58.9604	5.24713
67.2816209393763	59.9971173668562	4.6839569188732	68.048425	58.486425	8.31929
68.241190080023	60.3489092984897	4.68395647190454	67.8084	64.88	6.618444
70.1860164520515	60.4703086083297	4.68395602512966	68.033375	62.578975	2.177441
72.8117180617482	60.5901281830911	4.68395557836674	74.7548	56.66355	6.610021
73.8841353276056	60.7269879668519	4.68395513149791	75.12385	56.355025	6.655597
74.2713354551063	61.3791017036462	4.68395468465474	78.897475	61.3791	6.581026
74.2713352891187	66.9707402347358	4.60440501208058	73.97555	66.71955	2.504
74.2713352891187	66.9707402347358	4.60440501208058	74.919425	66.332825	2.561604
74.2713352891187	66.9707402347358	4.60440501208058	75.320425	66.338125	2.101527
74.2713352891187	66.9707402347358	4.60440501208058	74.758025	68.76505	2.771423
74.2713352891187	66.9707402347358	4.60440501208058	76.3481	68.05155	4.299693
74.2713351222767	72.0224820831887	4.52644191494428	72.106325	71.513625	4.730422
74.271334955353	77.6456473776068	4.44844130477286	75.94035	77.0935	8.244154
74.2713347881662	85.2971609802778	4.36865023638663	75.589675	88.707575	0.958209
74.2052639607983	85.2709482828971	4.40427409663318	75.8385	89.39705	2.129044
67.5012747223486	83.4025027533439	4.85684647963913	66.686275	83.4025	9.789982
67.5012738519048	80.8087004958978	4.45580740038758	64.2971	80.8087	0.617407
67.6927256767624	79.2858340112618	4.72966231187343	71.96685	79.285825	7.324255
67.4746006492364	78.5116795750884	4.72966215342536	67.97015	74.943825	1.28227
66.7324045298937	78.4682743467941	4.72966199373418	65.721375	76.70655	7.829144
66.0189475464472	78.4250798218074	4.72966183397069	69.349625	77.516575	1.446757
64.1937521457145	78.3823642398553	4.7296616742218	67.096325	78.407125	5.545343
61.9218302073914	78.3396581437305	4.72966151444297	60.77085	76.3761	8.633151
60.2653319034564	78.2974171841349	4.72966135457167	60.2356	81.956375	8.121308
59.0238633871033	76.0052206251099	4.72966119524772	55.289875	75.9977	8.05121
59.0144439199084	74.7174587184976	4.72966103582069	59.360575	77.3659	4.085186
59.0050266611827	73.2863409871783	4.72966087638687	63.106325	74.44845	6.994666
58.9954752561187	69.9519173824646	4.72966071689571	63.9561	69.944325	5.325084
58.6043491013868	67.9008965573854	4.72966055740547	61.692525	66.479075	4.622593
58.1942046619027	66.1071181640665	4.72966039789559	62.481725	64.778425	2.883198
56.8730271441942	65.1858521396284	4.72966023840446	55.5813	65.9389	1.049446
55.6825845566627	64.2307749129404	4.7296600789332	52.902425	64.80215	1.303032
54.8053850103801	63.2229202466426	4.72965991946544	53.6353	62.58645	0.328338
54.0429902233961	62.3036326272439	4.72965975999222	56.708375	61.084725	7.280884
53.1855127879804	61.443748992378	4.72965960042559	53.1029	58.71345	6.825055
52.3351172414068	60.6633851059626	4.72965944079841	51.0767	59.931625	7.815468
51.5255605945165	59.904049082383	4.72965928109138	53.3194	62.871025	8.033264
50.1173716482052	57.667805333495	4.72965912092802	51.731775	54.063975	3.386729
48.4556561049019	56.2698679167055	4.72965896076627	47.802925	54.5327	5.178486
46.8556907133008	54.9635713598488	4.72965880058076	47.81055	52.508825	5.320082
45.1911771488118	53.7819294856454	4.72965864036314	45.616825	55.349625	8.112205
43.479649459526	52.4779001300548	4.72965848000629	43.47965	52.4779	9.729662
41.6972316321298	51.3494844042565	4.11533559859523	39.658325	53.39295	5.48876
40.1401490543453	50.1239803811307	3.48082580378853	44.413025	51.821425	3.225875
16.460717074892	48.3826556490848	2.86026023216221	14.24105	46.110125	0.966331
9.67069564242487	46.9248175532099	2.27262379736272	8.9679	51.422725	2.23495
5.54098211874924	37.6255083685836	1.68585615921775	4.729125	38.22055	5.844342
2.2963959035233	22.0422685139487	0.948282864386272	0.610974999999996	22.331075	4.829551
Route: 4 Length: 234.941044640289 Demand Met: 373					
12.6884129681326	24.6397677368934	0.603506027145086	14.358825	25.883825	4.414924
14.9913833888087	27.2897667109683	1.04724479711232	15.2685	27.387025	1.441223
17.3084174654018	30.1016443590124	1.4892784407767	18.476575	32.50015	2.42942
19.4413450050049	32.4188335168191	1.92411498688347	18.77905	36.01655	4.45503
22.2553536191145	33.4862909350971	2.29775311054625	22.793175	31.8095	6.267813
24.7462317513543	34.862614935659	2.61884970762708	25.49855	33.45475	4.180424
27.1583736180335	36.3800676263488	2.93517203434006	31.8731	36.0461	3.846108
27.5904098422008	38.4300328299498	3.21798513709042	27.2689	42.18555	1.296271
28.0308629975711	39.5828706888201	3.51767190332877	27.251975	44.47235	3.840979
29.5842905011555	39.6779924197007	3.76568562357962	28.231575	43.86655	5.176578
32.5819537267953	39.7664603899401	3.99729637149799	35.05695	38.887125	3.774047
34.969271707694	39.8552382304686	4.22953793908116	36.0198	39.389875	2.90819
37.2612964298522	39.9441784391027	4.46405075896182	37.4986	37.94785	9.024015
37.8470564543339	40.4896640423193	4.50359034507525	37.4906	38.735475	3.373994
38.443298082292	41.057303580731	4.54318692084594	39.47365	37.672175	3.042346
39.0223622270683	41.7180603312355	4.58292587978326	43.242475	40.8624	6.853519
39.2636045208353	42.7904959113508	4.62085123489874	38.0514	44.25295	8.429467
39.5133086209003	43.7139520777517	4.65831206605896	35.77655	45.5234	7.314779
41.1910801093487	44.0833249047855	4.69282707786461	40.7628	47.39015	6.093812
43.0172767080431	44.4309453008032	4.72726592022172	43.10885	48.272275	1.575949
44.1910745132836	44.5036203221824	4.77653737286212	43.5222	45.0811	1.214529
45.4531524255295	44.5762143734093	4.82626638779383	45.015525	41.584025	2.803346
45.4531524255295	44.5762143734093	4.82626638779383	44.89855	41.381	7.163397
46.9191175857313	44.6509715589237	4.87588008777546	46.718325	46.79505	7.837302

Solution x	Solution y	Solution z	Original x	Original y	Original z
48.4626595042089	44.7252595350317	4.92512764618547	49.0937	40.0849	6.606023
48.8971835492035	45.9871221116996	4.96533602681959	47.35915	48.071	7.780887
49.3567134995281	46.9809874220902	5.00528979949706	48.801425	47.111675	0.180447
49.8966879349648	47.927427599558	5.04936582458928	51.332325	47.3944	1.206534
50.403126036366	49.0456733974875	5.09405244109483	50.5204	51.7746	0.922891
50.7678906657771	49.1116679368195	5.61460523685535	52.703075	49.56845	2.111726
51.1143832233873	49.1775289680401	6.28339967667118	50.075475	49.526025	6.785114
51.4659908855984	49.2433396107457	6.94101591810121	50.9611	51.5263	9.096967
51.8224527025678	49.3086619564913	7.53702417346051	51.8225	53.851	9.626807
52.7959651348581	49.2328368445114	7.53702419806513	51.464375	46.273425	9.764247
53.8922426680207	49.1582423311129	7.53702422252738	52.0729	45.66175	8.843258
55.2614186811919	49.085305719439	7.53702424690617	54.870925	48.098925	4.394617
56.706529931691	49.0127773366933	7.53702427139119	56.4549	49.1402	6.740043
58.207844736236	48.9404377374679	7.53702429589791	56.7604	48.090675	9.498427
58.207844736236	48.9404377374679	7.53702429589791	58.59885	48.807625	9.719414
59.9471039455306	48.8687041370404	7.53702432024783	61.491825	51.7088	3.765748
60.1792456590074	48.7326955342356	7.53702434721108	60.81405	45.86495	6.053591
60.1792456590074	48.7326955342356	7.53702434721108	61.33205	47.81805	9.220678
60.4091993070886	48.6007020940617	7.53702437414686	63.06625	46.073225	9.963062
60.6248359628195	48.4740154749616	7.53702440083356	65.024675	48.473875	9.912197
60.4966859462592	41.0709290412819	7.38909869780713	64.48255	39.62755	9.929967
60.2656025200885	40.3901095793112	7.17945558282607	64.627025	39.598675	9.161247
59.8642009467874	39.8580153561962	6.92319724509021	57.24125	42.40615	5.476964
59.4915485733389	39.2731577754102	6.67380999452724	58.980725	40.369175	5.096252
59.1231376717532	38.6769554017528	6.42771211698525	54.125425	38.6935	6.380106
59.1187819093157	37.9127300998838	6.26467354266648	55.894525	37.29925	9.136585
59.1144295339038	37.2028372209605	6.09176594490036	59.82755	37.21565	1.143092
58.8137832710148	35.6707683689938	6.09096192604702	60.313175	36.907775	7.157937
58.5098890604858	34.0325875838164	6.09015757514686	59.92645	35.207	4.720771
58.2029907981855	32.2831660321978	6.08935338839042	59.6161	30.5374	8.744708
57.8909055731489	30.8589044648043	6.08854810583568	57.8987	27.066925	9.346556
57.1885501494155	30.8576296089918	6.08685329451392	59.25755	30.092125	1.789844
54.6937445265631	30.8563615277403	6.08520683598939	53.429725	29.230175	5.838259
52.6001899109974	30.8550946129889	6.08356047090864	53.51985	31.610925	8.734185
50.3816945158793	30.8538263342952	6.08191160835994	49.48335	26.949275	8.082485
50.3816945158793	30.8538263342952	6.08191160835994	48.825175	33.4678	4.421401
49.0121346223958	30.8525603893722	6.08025947260942	49.014675	34.9475	8.94848
43.3593282500501	30.3192087903207	5.79922257691552	43.312375	33.022625	9.818329
38.729573921914	27.1431580986472	5.01837529911636	39.217825	28.48755	6.718496
34.1112270013753	23.4664422349848	4.1929571636215	33.989075	25.3104	7.891632
29.97689105328	11.5719049135856	2.97856999549121	32.5307	9.603625	5.102178
16.4855578882142	7.42832162867058	1.47006243205112	17.13825	10.254625	1.09375
Route: 5 Length: 280.171794994721 Demand Met: 375					
23.0632940666716	3.81680337735448	2.13967842744798	25.090375	4.2535	0.574579
33.2355738637966	7.47039523424615	4.5245580910071	33.240325	8.160175	9.454403
42.8097508277324	7.92533960633771	4.59646604981379	43.2503	8.7931	9.432262
44.8247316380292	8.26340264906733	4.65184797353326	44.6523	7.1683	9.495828
53.5672158346785	10.0264498356702	4.68769897811384	54.0981	10.209075	9.589747
55.1773869913905	11.3581962335942	4.71863415435194	58.66755	14.455925	4.659081
55.9992257370979	12.1342908638996	4.74956338412357	56.7601	13.3255	9.545614
55.9992566577035	12.1343106421829	4.74956833323736	53.686425	15.19815	7.953267
57.5588183604917	12.1343212276608	4.74957234719108	56.680125	15.845675	6.62366
59.3274964632993	12.134331818211	4.74957636153382	58.962525	15.549225	6.884037
61.1950669579625	12.134342412137	4.74958037623154	62.944875	12.9098	8.420704
62.7231343250481	12.1343530063036	4.74958439158569	61.5062	10.2838	8.047741
64.4695320524579	12.1343635957549	4.7495884075041	64.181275	8.885925	4.857898
66.2734386070214	12.1343741796687	4.74959242345466	66.273425	16.5814	2.463993
68.7841738179832	12.1343761625952	4.78372461992912	68.784175	11.8632	9.776368
73.3895765117139	13.028790311998	4.71720745150514	76.1173	11.832075	5.793623
76.6103549170175	13.9606090290459	4.65052958961137	81.52085	13.687775	5.204149
76.7695914056231	15.4865301815405	4.58075940955368	77.464	15.628175	3.533669
76.9285054439183	17.0068774859259	4.51110415489467	75.3053	17.780525	0.662947
77.0907095001465	18.3978665000915	4.44283409529018	77.472675	18.057475	0.141489
77.2522044150801	19.8512675666436	4.37620509797376	77.750225	18.79385	0.265085
77.4128290460735	21.51658919752	4.31095865180568	76.538875	22.08605	1.37194
77.5743464014871	23.1311280991114	4.24613158819715	75.41995	23.365625	8.701179
77.9045023936922	24.1654895353894	4.13536512774655	76.27055	23.463675	8.429053
78.2725442671674	25.3478851176616	4.01493681869151	83.1155	24.690275	4.773978
78.3985006629579	32.9768628947568	3.88129155958521	74.4851	34.7013	1.961771
78.5371874989904	35.1823395221488	3.75378804753414	77.267275	35.3236	0.141297
78.6772459593167	37.3695890045856	3.62933058834779	74.186175	37.664625	1.593253
79.118970499613	38.6864702364062	3.53145239167227	82.455325	37.974875	2.274181
79.5313569257779	40.0754429065185	3.43412817025468	77.736325	41.257125	4.306668
79.9550680382945	41.4113528398781	3.33659071165959	80.128375	42.2928	0.877447
80.379772084729	42.7109449542795	3.23973803947746	83.98185	43.958725	1.112514
80.7431498606572	43.8223482739374	3.14477860117162	84.710775	44.260425	5.70064
80.9998427891944	44.7944892938843	3.04348069545565	80.003925	44.278875	7.256115
81.2634525272819	45.827107668473	2.93792693292077	82.166	45.384	5.835084
81.5252830720201	46.884787233008	2.8312545375283	85.726975	46.8848	0.120938
80.3297092616405	46.9100292053924	2.83125468985826	83.835575	49.221375	2.182226

Solution x	Solution y	Solution z	Original x	Original y	Original z
78.1585759152338	46.9350330905321	2.83125484220415	79.556325	49.1563	6.397826
74.8856633048724	46.9598681084752	2.83125499446185	70.163125	48.595475	2.681471
74.885656933806	46.9598863855904	2.83125514735696	74.97575	51.8098	4.043794
73.5316027867885	46.9598853915927	2.83125506896833	75.70595	48.354275	5.510084
71.9493341194008	46.9598843975246	2.83125499055614	74.018375	45.692475	4.261669
70.2027470699927	46.9598834034926	2.83125491213607	70.20275	51.264575	0.287703
68.4808685280462	44.9106742619525	2.83125489382108	64.04505	44.910675	0.523975
69.5136456003419	44.0341400618357	3.67510944911962	70.38585	48.289775	4.820236
70.5053040527013	42.5382009478617	4.41808264631717	69.4258	42.661825	9.2188
72.7651125174161	40.835390272001	4.6300949354939	76.046775	40.829925	8.304908
73.0401509457831	39.1932499346698	4.75341728953636	76.5757	39.19325	8.28894
71.9935337028675	36.7195621333591	4.73770406991669	75.0516	36.4713	6.125794
70.789788821376	34.3485457432686	4.72197665884779	72.419975	34.998125	8.679512
69.3368164323796	31.6139219028379	4.70616501784654	68.792375	27.90175	4.368368
67.954691986786	29.8071993792801	4.69035574832466	67.6691	30.587025	1.957775
66.6051918926335	27.919599596048	4.67456494580333	65.757275	28.49595	9.473031
65.7891743394438	23.0247964511583	4.65808169702484	65.789175	19.559925	1.053267
63.9652274164421	23.0247958792132	4.65808117136117	64.881075	21.1972	7.607995
62.012363212466	23.0247953073744	4.65808064562584	62.8697	20.929125	3.670375
59.9896548224953	23.0247947355888	4.65808011989984	58.5251	25.335175	8.213376
58.4927678988691	23.0247941636663	4.65807959400624	56.18475	25.5187	0.990177
58.4927672528033	22.4453042324403	4.6580795033036	56.707375	20.9848	8.081779
58.4927666054388	21.896065015789	4.65807941252715	59.666825	17.15215	3.601254
57.1343381353111	21.8960651152245	4.6580794564302	56.46315	20.9863	9.377425
56.1453244898333	21.8960652151161	4.65807949993029	56.145325	18.970525	8.712859
52.5272840341956	22.0079089870798	4.05768082229839	54.7913	22.79115	2.590985
47.6822271337902	22.1192923991769	3.47376841018927	47.99765	20.639375	7.512605
42.3445250596898	22.2316229249258	2.73500501509647	42.344525	27.231625	2.735005
39.632359827564	14.7495554495843	2.15160521210054	40.4237	12.94705	3.760655
36.7836874135371	9.46917441001014	1.55239486861227	40.718225	8.45085	2.325605
16.5983546417518	5.62047352729811	0.931721434990601	16.533825	6.314025	5.413684
Route: 6 Length: 323.221664292178 Demand Met: 373					
1.25906538854383	58.3559519353479	1.31106134304561	2.20627500000001	60.72485	3.544594
2.41621352344831	63.7583972446551	2.38823221747916	1.692025	67.9044	4.763979
8.97950435401127	64.0218650651915	2.71633645775915	8.8531	66.09375	2.882202
16.0038320574599	64.2791662915527	3.04397054864178	18.3822	65.772725	3.391578
19.7666355046879	64.531631350718	3.37008171945243	21.0091	68.35155	4.610936
22.1168483734295	64.7575281242658	3.67929000468367	21.668825	63.73225	4.392072
24.6339154225106	64.9853149231169	3.98679280601352	24.44465	63.1281	8.275156
28.0054054285371	65.2585656293101	4.19124398552664	28.20205	68.6988	5.301267
31.4130741218854	65.5165488645189	4.39303904557355	31.583525	68.6781	7.867205
34.4814321649231	65.7169916938557	4.55451691392468	34.7277	67.482525	7.589491
37.5960413732476	65.9133615766892	4.7114535977371	37.615325	65.262725	9.608735
40.7315287361704	66.2378085620143	4.76315495495608	44.4217	64.703925	2.042243
41.0647590999788	66.7603273504447	4.81990375824804	42.88515	65.09985	8.113938
41.3744296883409	67.3634697840041	4.87583928546923	39.7753	66.19835	5.821872
41.6927586841295	67.9889325044146	4.93174267571113	41.683175	67.299925	9.367966
42.016955942902	68.6918647286867	4.9853969064161	42.3891	68.379025	5.906332
42.3425157732743	69.4056253588416	5.03902912474671	44.898775	67.784675	2.145396
42.6447767916567	70.2264781687818	5.09341867691442	39.430175	70.428325	1.436461
44.0638690347966	70.9520132620259	5.15673810721924	40.205375	70.4585	3.559151
48.8459611620967	71.7167210936232	5.22076222479103	49.5023	72.1454	0.362105
49.7795385501983	72.2327616111979	5.32884300548658	50.03295	71.692275	1.548117
50.7036524715827	72.7631281810551	5.44037663193289	53.249925	71.4317	1.507319
50.9500178708341	76.4306975188047	5.63030096271097	52.726325	74.9715	6.042198
51.1919234074817	83.4510291269039	5.81989354721057	56.13655	83.451075	6.561985
50.6681604977324	83.9407268650322	5.81989401035575	54.01775	81.8894	8.14471
47.7776273909217	84.8010851898744	5.81989447568362	49.4347	86.0537	7.963635
43.9386909069424	85.621812549913	5.81989494118461	43.9034	88.387225	9.898098
41.5170762165564	85.7720218452647	5.81989541496749	42.31835	87.347525	7.738111
38.9838367947173	85.921519248211	5.8198958889248	40.913925	82.729825	6.876661
35.0628903253978	86.0779298611174	5.81989636309244	33.324025	88.862275	2.512368
33.6046729911851	86.2198899522624	5.81989683643285	36.3513	83.686975	3.385766
29.0851030420042	86.372418979772	5.81989730921562	27.4824	83.15295	4.645899
26.3727677793962	86.5330963527247	5.81989778185946	24.1584	82.49565	6.916419
25.8057990237991	86.8175418475177	5.81989825514326	22.609375	83.218325	5.878629
25.5954496490074	89.9475024372686	5.8198987285035	23.831575	88.204275	5.345531
25.388642826655	94.228943256125	5.81989920185235	26.6212	98.85125	4.844028
25.0385751895213	94.359779056563	5.81989967589467	27.27955	90.9405	3.131217
22.2761718072233	94.6172005495719	5.81990014642427	22.27635	97.920025	9.573749
14.958724439058	94.6172008042559	5.81990021797308	15.45105	94.471525	3.135131
5.97346477635382	94.6172010591406	5.8199002897178	2.307925	97.449675	7.701639
9.00003086689698	85.5360272812119	5.819899286573	12.1212	83.525275	6.555356
11.1927327014332	82.1454845559275	5.81989828360676	13.92855	83.165725	6.067072
12.9815803591863	78.5000672127385	5.81989728065131	13.11545	76.27845	9.886291
14.5692599863681	77.4400610804958	5.81989628143278	16.4015	79.860725	3.65876
15.81482189361	76.1599880656623	5.81989528113724	19.41455	76.0326	9.16761
15.9552721661029	75.2051264745047	5.81989429616155	20.9401	75.2051	6.209147
15.4405778825719	66.6353937244751	5.75405668707272	17.272875	64.973225	8.378801
14.8907787184347	62.8542469489093	5.68762907821917	12.50315	65.202575	6.796126

Solution x	Solution y	Solution z	Original x	Original y	Original z
14.3873636062432	55.2528678606507	5.62096265606425	17.219275	51.795125	6.528901
13.5677248320951	54.3203992539181	5.5534075524827	10.71515	57.182775	5.281599
12.8996012152252	53.1221132882259	5.48592299102159	11.458875	55.406825	8.437123
12.2924573466929	51.5689404385585	5.41751848247984	11.134375	51.580675	9.341968
11.7311892251645	50.0591456573403	5.34769921712083	9.352575	52.2461	8.408063
11.2820758451264	46.5577997149218	5.27572560331049	8.7059	46.626875	9.397095
11.0558773913727	43.0752311410707	5.18343178544644	13.3837	46.032275	5.26473
10.8209092447335	17.4709065142917	5.0909014830903	12.54795	14.295525	6.980367
10.5787441549406	14.5847673783392	4.99687899919282	12.5519	14.734025	9.438961
10.2173367978534	9.85782890165559	4.8668981168213	13.011825	10.0758	8.49229
9.74238239338538	2.60171366664363	4.72100290131767	10.7326	2.49095	9.542224

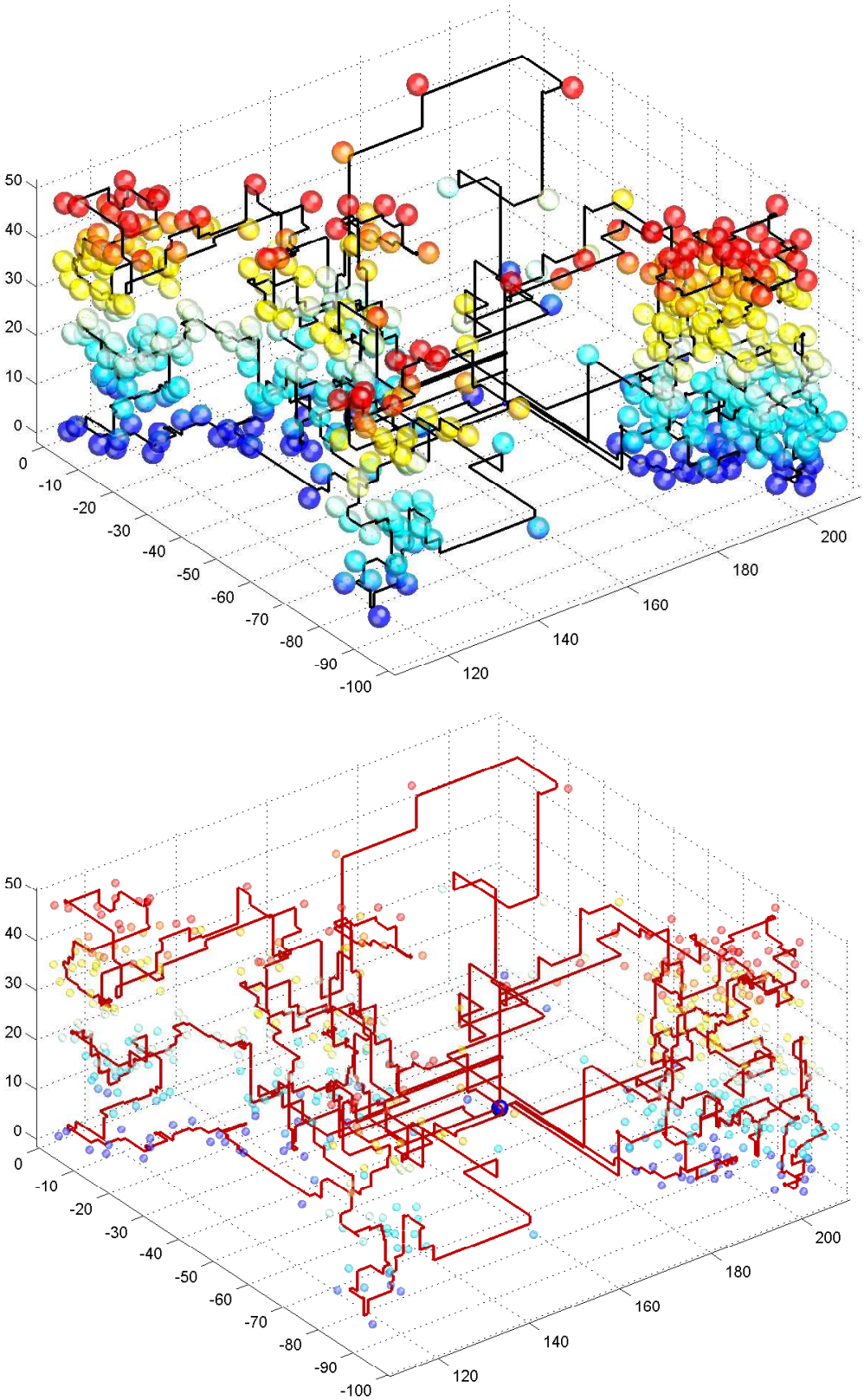


Figure O.171: *team*5_499, Equal Radius, 3D, Manhattan, Length = 3155.4176578

Table O-174: Solution for *team*5_499, Equal Radius, 3D, Manhattan

Total distance: 3155.41765775118 Total demand met: 9744 Depot: x 70 y 40 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 480.720445796743 Demand Met: 1620					
64.5147329070953	36.8852161070373	0.891542495592272	64.954	37.309	2.2557
43.6802813381028	31.4174207986347	1.52455104703717	43.0635	31.4686	2.6925
38.6271915702161	25.4624218886212	2.05762399433844	37.9243	23.9119	1.2026
37.9647446141962	25.1433146470687	6.10073261034888	38.8284	23.4703	6.171
33.6685023838933	24.9641148928421	8.94178485676488	33.6715	23.2449	9.8871
28.9310243946609	24.8899010889539	9.15551517633122	27.7157	24.2487	8.5851
27.3016389752732	24.8169280444546	9.37906192821775	26.5855	26.5008	8.649
27.0957092525866	24.5647713042617	15.8870888590928	25.1657	24.0751	15.8892
27.0717978942215	24.4926017408246	21.0531996721378	27.0718	22.4926	21.0532
25.0779393606947	25.5591778630504	22.4703770632253	24.5672	24.4137	22.4773
23.4788999799389	26.9267924799885	23.8997982314842	23.4789	26.9268	25.8998
21.3330007422209	26.9463106661272	23.8997961002463	21.333	28.4534	22.585
20.76839901567	24.928011877309	23.8997981919358	20.1974	25.6106	23.6453
20.2358473867918	22.1805534380568	23.8998002835753	20.821	23.0825	24.0822
19.6678974479231	16.6168819512349	23.8998023751041	19.7672	14.9362	24.0245
19.0818995424465	15.7501432157875	23.899804466411	19.0819	14.2893	25.2658
16.6418051600453	18.24026222139	23.5760025410733	16.5052	19.9903	24.3242
15.3670201732349	18.3987871569545	22.2580076096853	15.42	17.0914	20.8872
13.9395998964204	18.6326623285282	21.8908858032201	13.9396	19.5452	20.1112
12.0215394168582	18.6326623110124	21.9989823613618	12.6858	19.6571	22.2672
9.20950002056658	18.6326622933976	22.1062666068164	9.20950000000001	19.5087	23.9042
6.69299983513142	17.6745130937406	20.5084162868353	6.693	16.2603	19.0942
5.94886570644491	17.8212025523874	21.2177385834344	4.8686	17.5054	20.7421
5.31729921762667	17.9695983844085	21.986503148603	5.3173	19.9696	21.9865
3.04285788717529	17.862822733864	22.0806355897105	1.5116	19.0597	21.7588
2.95759241705545	16.096747974291	22.1992001931275	2.785	16.9995	21.2146
2.87266012084369	12.9912410070133	22.3219298730877	2.3396	12.8751	20.4499
2.79964066471229	11.7306618037488	22.9156306547295	3.6086	13.0876	23.3357
2.7246980857736	6.64910059433052	23.4539984243201	2.7247	6.6491	25.454
2.42110155356322	5.25479594071854	22.7353984617907	0.421099999999996	5.2548	22.7354
3.74656227511909	5.13724809762524	22.3416441585385	4.0211	5.0495	22.5141
5.00090084117434	5.01985635512587	21.944067610405	5.20059999999999	6.8919	22.4547
5.62868407356245	4.37554439864875	20.2181077975989	3.9473	4.1638	20.7291
7.90196719546387	3.78459776248074	15.7132751457178	8.02670000000001	2.1019	15.008
9.68903143824338	3.47310617901875	14.5479298281203	11.5168	3.287	14.9558
10.0227483229037	3.18326311691972	11.2310001908672	8.95990000000001	2.5066	9.8186
10.7306410231888	2.95892263684627	10.8156887264575	10.31	1.5005	9.6337
12.594810048071	2.82404389306892	10.6062122701247	13.8628	4.3052	10.5937
12.7927694244185	2.34691521170376	10.3973497571535	13.7484	0.7577	11.0651
12.8834632964553	2.26597339495311	7.57379552870158	11.169	1.5527	6.9406
13.208399438776	2.20229613518205	7.28432052615809	13.2084	1.5682	5.3875
15.1838138875015	2.20229589821758	8.22490248730117	14.8098	1.8409	8.2695
17.4175615966983	2.20229566127577	9.15760032922479	19.0824	1.094	9.1576
17.3240002750648	2.53737253494814	12.9770372992426	18.2952	1.0836	13.7585
17.2108891466549	7.57059382661128	13.5565630942767	16.2452	9.322	13.5564
17.2108412359695	7.57062272224687	18.3517746023589	18.8587	8.5087	18.9878
15.459484455678	7.57064507371123	18.3518791552464	15.4595	7.4752	20.3496
13.8483818903834	9.57840053211606	18.3518808406043	12.8565	9.4609	19.9198
13.3349078991693	12.6990999901086	18.3518825252937	11.8636	12.6991	19.7066
14.1645807656394	15.531458494071	12.2868003382405	14.7151	17.4542	12.2868
14.164581094143	14.4459209801511	10.9839701564328	14.5843	15.7568	10.6354
14.1645814226069	12.7877007465144	9.83723851905358	15.3264	12.7877	8.2093
11.3416758305056	12.376191530155	9.88517114696884	11.3126	12.1774	8.305
8.63820002408255	11.9812397612617	9.9344240979739	8.6382	10.3371	11.0732
3.56069999487235	14.2169242439309	9.93442380570502	3.5607	15.7968	11.1608
2.75593819573727	14.2169243857585	5.42300047207863	2.2625	16.1551	5.423
2.75593738743669	6.05970522892387	3.7613004029324	1.2522	5.4022	3.551
2.75593657963283	3.73264921908791	2.32955076712078	1.729	2.5191	1.116
3.6223462117042	9.51900545043232	2.48001178984742	2.5621	10.2967	1.629
4.91638332272457	11.7172728117388	2.6375433645693	4.24299999999999	12.8676	1.4876
7.79160357589548	12.5677022056116	2.81510812724899	8.40090000000001	11.7989	4.4087
8.64999995736848	18.3152857676127	2.94478490866273	8.65000000000001	19.7295	4.359
9.9517186823159	16.7396244326644	2.21897606593064	9.00749999999999	17.4052	0.9316
14.7478999593605	13.1899147496877	1.75471455179622	14.7479	11.7757	0.3405
15.9492945387789	16.7531086477389	2.92359882811072	15.9493	16.7531	4.9236
19.5142234659732	17.6477553844731	2.92360038781302	19.5822	17.4941	4.8723
21.2436865404539	19.9479887348055	2.92360194571382	20.9805	20.9752	1.6334
23.4692147187001	21.0331538918388	2.92360350399971	23.4201	21.9457	1.1934
27.6599199765071	21.2611155903246	2.92360506453405	28.392	21.3903	1.2616
28.6921933638433	21.4825005545249	2.9236066263199	30.4469	21.4825	3.8833
23.4046876452946	23.0131019528723	2.92360644291454	21.8127	22.4456	3.4445
22.7015370240476	27.1804008343949	2.92360625946324	22.5985	27.2784	2.308
22.0081728870122	31.0600465060616	2.92360607604698	20.5677	31.0115	4.2467
21.8800986991423	48.2131999412097	2.92360589231709	20.1897	48.2132	1.8547

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.036349551072	50.088244452579	6.40376186082307	22.4944	48.7727	6.2361
24.4459853075879	57.2064845928807	10.5470000958964	25.8602	58.6207	10.547
24.0409060752266	49.6068964105787	12.7302575480115	25.2216	48.8368	12.0716
23.5488789992704	47.2241232364596	17.4089626219392	22.5313	48.1754	17.677
23.118499624298	40.554900031772	20.8958981127103	23.1185	40.5549	22.8959
22.8342717643637	38.0295848745207	18.7637443818232	23.8226	36.8408	17.9115
22.4824018108492	37.224298859103	17.8496990157598	20.4824	37.2243	17.8497
22.5914527479537	32.7127081488644	15.5924084904778	20.8616	31.8567	15.5881
30.1703999603429	32.5090492360248	13.6821024728051	30.1704	30.5441	13.3093
33.7227952678396	34.6090002095931	13.6821018514828	33.7228	34.609	11.6821
36.135595297486	35.5262015351021	15.2007980855997	36.1356	35.5262	17.2008
36.302002758733	41.727398020934	11.7601999684654	36.302	43.7274	11.7602
42.320818095792	40.9139437074596	10.7091462359897	42.0622	41.0674	12.3472
Route: 2 Length: 291.141771257316 Demand Met: 648					
49.1222375741438	34.7139208403117	4.84937749189914	48.8851	33.6728	5.7706
40.4113000215473	32.7319193502827	6.90132750519484	40.4113	32.0356	8.7762
30.5550010141939	32.7319190546283	3.6300084486242	30.555	31.3009	2.2328
29.7208356750412	33.0007025212033	3.63000870710263	28.4031	32.2444	2.4033
29.5705026091194	34.8043285697966	3.63000896661467	29.5705	36.67	2.9094
28.7001848608828	34.4116978866226	7.62950868863054	27.0476	34.4285	7.3345
28.2325146707291	34.0154150175836	18.9499000240882	26.8183	32.6012	18.9499
29.0396007729505	34.1371981459613	21.354199803606	29.0396	36.1372	21.3542
30.5689677480441	26.6334018847308	22.5115007317395	30.3241	25.8121	22.3846
32.196500510451	22.9852148890801	23.6991852095341	32.1965	21.571	25.1134
35.3782107196815	23.1021379872019	23.0864758395119	35.5448	24.2684	24.4525
37.4163000267062	23.2060846549013	19.1611143697711	37.4163	24.6203	17.7469
41.3265180962724	22.0340955876737	19.9666237624509	41.315	20.08	19.8292
46.4874436113651	21.9371181303541	22.1433001360219	47.312	20.115	22.1433
46.4874438846967	21.9371194117273	25.9788022673672	44.6412	21.1681	25.9788
47.4870343290739	22.8887643081932	31.3839507468738	49.2796	22.4102	31.3443
47.7640834624643	26.3767003178127	39.2303988295041	49.7446	26.3767	39.5089
43.9149166193723	32.863499075231	39.2304003227141	41.9344	32.8635	38.9519
44.1464832510346	34.5539553613376	40.1438760076975	44.5785	34.1629	40.8334
44.3744624186099	36.4851595239811	40.9679629693238	42.5333	36.3249	41.241
45.0122324112837	40.2923522788735	41.598103911878	44.7486	39.7162	41.5468
45.669784770179	46.3001847061751	42.2331997406677	47.084	47.7144	42.2332
44.8184041258273	43.1039251759023	46.960061830309	45.8095	43.1051	48.3862
43.0023793746475	39.7773626945331	47.8613236055999	43.5486	39.6053	49.4906
38.1953004509755	37.4632142039529	48.3319838776782	38.1953	36.049	49.7462
35.387702204733	38.8387997306733	47.9844004656348	33.3877	38.8388	47.9844
36.7559522913263	40.8953426042882	39.3913143564373	37.6461	42.0792	39.3984
37.7222981149436	42.0562978956042	30.8827010195908	37.7223	44.0563	30.8827
38.095310577786	38.6566189172271	29.345229185515	36.9556	37.1182	29.5204
43.8347979384166	38.3991992691503	25.1619000549214	45.8348	38.3992	25.1619
43.8347973854875	38.2340314669983	23.5358999945969	44.3864	36.3116	23.5359
43.4412020314204	38.9568024722735	21.6839998653088	41.4412	38.9568	21.684
46.5361154223354	39.2204854472962	16.0519903063949	47.3754	37.9401	16.076
48.1173451079195	39.5208614817389	10.2909842569919	47.2998	37.9687	10.4015
Route: 3 Length: 390.935600344322 Demand Met: 1558					
73.6360944024793	68.0430964246498	1.2935941239683	73.6361	68.0431	3.2936
74.5331217720952	73.324734718592	1.29360915438719	73.6863	74.2382	1.6716
75.6347991233684	75.7641105491491	1.2936241786848	76.4126	75.548	2.1999
76.5580876311664	78.6014592701193	1.29363919345684	75.2812	79.5319	0.6498
79.1712704672896	79.7755121524062	1.2936542320556	80.7551	80.6861	0.4798
79.1712777648102	79.7755259542194	3.12416149686793	78.9268	79.6337	5.1041
79.1905220660082	81.6231921849324	3.07599365332544	77.4302	82.5606	3.0237
86.0648695970029	81.6566425393555	3.03012007328866	86.8222	80.0693	3.9589
86.134402846907	82.5488452992687	2.86670482971147	86.0867	81.533	3.6186
86.2039583118312	83.7109997010803	2.69878495662509	86.7862	83.711	0.7854
86.2039605144334	84.0171744783452	3.26984924746937	87.7484	83.7546	3.1863
86.2039627045275	84.3356505474941	3.85326795400908	84.2824	83.9445	3.7257
86.2039649221762	85.4395633765554	4.89784466740845	85.8335	84.6274	4.9143
86.2039671397055	86.7904237395694	5.9372515985461	87.314	87.2617	7.5328
81.7912997786795	86.7904260994187	4.74789673861518	81.7913	86.2239	2.8298
77.1151008745342	87.3422884090522	7.08940108679479	77.1151	89.3423	7.0894
74.9267739929177	86.8108220853858	13.0333819619602	74.9451	88.4605	13.7746
72.6803024506931	83.9203041580825	14.1919791074902	72.6803	81.9225	14.2859
72.0788059010952	83.9734940008229	14.1919994251351	71.008	83.9726	12.5028
72.0787742465434	85.0679629492092	19.5688048058264	70.8501	86.3243	19.985
72.0787427136453	85.5740471835918	21.4545575892466	72.3356	86.155	20.9164
72.0787111778286	86.0550944717985	23.7512004624385	70.0787	86.0551	23.7512
72.5272335239613	86.3136885184313	27.5857996872507	72.5273	88.3137	27.5858
72.5525060441545	83.7811340653783	30.433374671618	70.5598	83.7819	30.4468
73.5807063815483	81.1388051685048	31.9427020728505	73.6161	81.1388	33.9424
73.5807620198598	80.7385190062712	31.9426845932969	75.5773	80.7384	32.0605
72.9096654492832	80.7250085227035	29.959507896539	73.1002	79.4037	30.5501
72.2163735589621	80.7115688777966	26.791302943587	70.8021	79.2974	26.7913
74.6555811092644	80.8534353873289	26.230251669529	75.4182	80.175	27.0139
76.3867005837023	80.9989099439732	25.6080111714034	76.3867	80.9989	23.608
79.6629793385074	82.4266766747615	29.4445998642855	81.0772	83.8409	29.4446

Solution x	Solution y	Solution z	Original x	Original y	Original z
79.442157657144	81.6529281302835	31.3392237546045	79.7775	80.296	30.6811
79.2145660920649	81.0871667471925	34.8285501995716	80.2014	81.5949	36.2605
78.9288738054298	80.3471833513333	35.4844735868356	78.4301	80.0876	35.2889
78.6496764741136	79.6335375503517	36.1545034343004	77.9819	77.7483	36.1545
78.6496749152597	80.654505915383	39.9346873615766	78.0272	82.0721	40.7931
78.6496733585803	81.1414576960809	41.0389023019012	80.1131	82.5047	41.0389
78.5014402453202	81.1414595683983	44.5486700004498	78.4966	80.8407	46.208
78.3530781302004	81.1414614413047	45.4055446870859	79.6279	80.9538	46.8845
76.784563964785	81.1414633145418	45.5300335217817	76.7822	82.9894	44.8431
75.2600985208647	81.1414651532448	45.8785727799824	74.3211	82.1244	47.3456
75.2600999376399	79.7899766988504	42.8487293928396	76.8895	78.6378	42.7161
73.5352054146169	79.789976204192	42.8487095418185	73.5352	77.8165	42.524
73.0305026971631	85.2636976099472	42.8487028642779	71.0504	85.2637	43.1302
73.9106532961504	86.3556206933817	41.6643949616662	73.8575	87.669	40.179
81.9043949728379	86.3909775076436	41.6329906757099	81.9044	86.793	39.6738
82.3045395373358	86.3909814961784	42.4529987195699	81.9035	87.9149	41.5399
82.7750655781753	86.3909854717307	46.8397813442771	82.5335	87.3296	48.5022
83.3911308240249	86.3909894299442	47.0983549700958	83.1803	86.2205	46.5816
84.0208523453322	86.3909933882366	47.3622540430709	84.4799	87.8799	46.3607
84.4848658431289	86.3909973354243	47.7547983111103	85.7193	87.9646	47.7548
84.4848646847065	84.7396999147736	48.3097214843276	83.0689	84.7397	49.7222
87.265641433595	83.0373866026861	48.3097202919981	86.675	81.8002	49.155
97.6743229122217	82.1954557915365	48.3097190961962	99.1691	80.9928	48.8748
96.4306680071408	82.1954603917337	45.1011344811632	94.6937	81.204	45.1011
96.4306662405159	86.7219000649576	44.9753858747328	97.0785	86.7219	43.0832
95.4864800761382	91.3704942046332	46.5494851148649	95.9324	92.1458	48.2362
90.5677219274478	91.9586183408825	46.7710256782807	89.5983	91.5249	48.4013
90.286557207376	98.1667624683795	46.8659820776637	89.983	98.6224	48.7896
90.2865511875335	98.1667659073848	45.0985067200103	91.162	99.965	45.0985
83.8571231437263	98.1667653127326	44.6730978798276	82.0258	98.9707	44.6731
84.6419282776324	92.8214942130334	43.1039955019254	84.5701	92.5098	41.6265
85.4655018855796	89.5657679760727	42.2865880365867	85.4655	89.4614	40.2893
87.8371717034817	89.5657489823876	43.0725555705235	88.3323	91.5035	43.0727
87.8372446594568	88.879951211169	43.3544609803069	87.2864	89.2526	43.6381
87.837317657953	88.1653968755529	43.632041216781	89.697	88.1654	44.368
87.8371036609397	84.6369950357956	43.6320423465662	89	83.7031	44.7227
87.8368906955825	83.9136590193443	43.6320434686818	87.8874	83.7559	45.2883
87.8366781336575	83.2272959678285	43.6320445873876	87.8518	83.2273	45.632
86.7762566238161	79.7550908524073	43.5730446065369	84.7887	79.7551	43.3502
86.7762483460022	72.5581037651346	43.5729673907073	84.8025	72.2361	43.599
88.1442762787025	72.5580969815781	41.2353316896236	89.2994	73.1482	41.8171
89.0637060181758	72.558090190986	37.2181837737417	89.0638	74.5581	37.2181
89.1955893921062	46.5873009063718	37.0514896133239	91.1956	46.5873	37.0515
84.5540150892569	44.2429822232226	27.775053626933	84.8772	45.0654	27.1944
78.1353991108343	40.4713802201016	23.2566435910331	78.1743	38.6355	23.4376
Route: 4 Length: 649.921691858847 Demand Met: 1570					
49.7003750385409	29.1601958142372	5.51756193134517	49.2766	27.3707	5.7576
48.4757322509949	28.8577947758072	7.13054520899744	47.7847	28.4345	6.8217
47.4251152292883	28.5632023216573	8.92165972007453	45.8434	28.1097	8.3609
46.9669159399111	28.2974136837498	17.5651926273167	45.5527	26.8832	17.5652
47.3586863036243	31.1568765591675	17.6273324695859	47.2249	31.4694	15.6819
48.1731784863852	31.5778917705035	18.1971002202214	49.5874	32.9921	18.1971
47.869384995698	29.7963703747859	21.2942363275323	48.0614	30.3792	22.0976
47.5613980622501	27.3479291890631	23.269596827419	48.2875	25.5427	23.29
41.7244996381385	27.218194243339	24.9652835555188	41.7938	26.8087	24.3703
35.5630979913881	27.0895627369431	27.0595289628346	35.1494	28.8106	26.783
33.8226285112417	26.9268995438193	32.4702195888159	33.916	28.6484	33.3227
29.0800156252703	25.0371099695073	32.7920653373883	29.0027	23.8765	31.3376
25.9644012949751	24.6172144869329	33.8976849925286	25.9644	23.203	35.3119
24.4654980858092	29.9183999317253	32.3851016077078	24.4655	29.9184	30.3851
23.8983967680957	34.1382352602557	32.3851015389132	23.8984	35.8981	31.4349
23.7449468460848	33.7944638013337	33.2364003424314	22.2385	33.2025	32.4261
23.624531704293	33.5193440359711	41.3467566161797	24.2607	34.0424	42.9391
23.624531704293	33.5193440359711	41.3467566161797	22.8416	32.9746	42.6888
23.5013264732403	33.2260016011127	41.7292967923581	22.0871	33.226	43.1435
28.8127994735166	30.4764993673171	40.3516017730222	28.8128	30.4765	38.3516
31.5528857357675	27.8445300295976	42.2417756137379	31.0534	27.3935	41.3669
35.8148981115511	25.8690001197697	45.9363978959448	37.8149	25.869	45.9364
30.1850258332414	20.2054011863023	47.8800915116723	29.6006	20.2054	49.7928
30.1850254524659	16.8515076570955	40.5883931569779	30.7692	16.7931	38.6765
22.1476004250879	16.851501654117	41.0167058232773	22.1476	14.8515	41.0167
19.3110993482514	17.1345293955154	43.6436600169463	19.3111	17.5672	45.5963
17.8933933118168	17.1345300920361	43.64365648902	17.8934	15.1905	44.1135
12.5672823317657	18.1535705332235	41.7648581760012	12.295	19.9912	41.8654
11.0258562709496	18.4174534825158	38.3467619519155	12.3192	17.7013	37.8038
1.9919646938793	18.7024703529484	36.3878656800887	0.782799999999995	19.7397	35.1787
3.13035403640743	18.7024692046235	42.4580120383029	4.753	19.8404	42.7266
3.13035476477079	16.3589653111351	42.4580175141226	2.4914	14.471	42.2927
3.13035715387615	16.3589650994046	47.5798256338955	4.024	17.3232	48.8138
3.13035954194848	16.3589648869914	48.1703314971043	3.76260000000001	17.1174	49.9096

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.13035972903883	5.91440035515535	48.1703301099032	1.2192	5.9144	48.7598
3.17568242916953	2.37498367206718	47.4252484146488	1.2646	1.8964	47.5137
10.8668014320791	2.20379703931385	44.5306907343731	11.5459	0.8736	43.2005
10.8668014183118	5.41239898724124	44.5735873624614	8.8668	5.4121	44.5737
11.716886666223	5.43160326491583	46.1400635134191	12.1595	5.1953	46.5778
12.5213113377361	5.45080365077137	47.5770763761859	12.5256	4.7007	49.4275
13.2666002221484	11.553570551659	47.5847999218992	13.2666	12.9678	48.999
14.9488811749059	10.1860414289517	46.665769224574	15.7685	10.3669	47.703
16.0597630370902	8.66706710189749	45.2937994554148	16.1355	6.6685	45.2938
16.05976784004	9.17536086791927	41.9460245896375	15.3812	8.8682	40.3179
16.0597726432168	9.85867524208364	41.4498160759585	18.0288	10.2093	41.4498
12.9526482042202	9.85867615253337	41.438565449015	12.9432	8.6486	42.1679
9.90740031016814	9.85867706305226	41.4272959840304	9.9074	11.0867	39.8487
7.47763329071581	9.85867744112691	41.4272950670841	8.098	10.1576	40.7441
3.94077476501522	9.85867781914871	41.4272941503016	2.4532	11.1564	41.7483
3.94077549273474	9.35340321397423	40.4487120713907	5.4781	9.3534	39.1694
3.94077532683409	7.63503536053828	40.448711733547	4.1301	7.1548	40.2018
3.94077516094342	6.10279946327447	40.4487113957192	5.49809999999999	6.1028	41.7036
3.91474864738856	4.04438853843452	39.1726165699465	5.6082	3.0104	39.1925
3.7994889817287	3.99068862807236	36.7978925720007	4.1027	5.9391	36.7092
3.7994889817287	3.99068862807236	36.7978925720007	3.9756	4.3104	38.409
3.60274225982015	2.98881201507637	35.4552762112958	3.8933	3.6617	34.8265
3.40370132035072	1.82450853569134	34.3258003480498	2.4773	0.052	34.3258
3.40370136215509	2.56484772354609	32.5123882551713	2.87569999999999	1.3778	31.3806
3.4037014044535	6.15349980711082	31.8541864276311	1.4037	6.1535	31.8542
3.60147023714067	9.67848092366587	31.724455982701	2.67230000000001	10.4123	33.2768
5.03550184125501	9.93669853479845	30.2057010471224	5.0355	11.9367	30.2057
6.53718699298713	8.29829652729123	28.5307797537753	5.6246	7.277	28.7239
9.08131228563863	7.18417176852173	26.6732129632197	10.2894	7.4847	25.4008
9.72809993164611	5.41720110717492	26.1163014203393	9.7281	5.4172	24.1163
10.1633048595603	4.07402822118514	26.4213881361137	10.526	3.779	24.6321
10.5117757294344	3.35362257294411	31.1565686824075	9.9632	1.8111	30.9688
10.5117757294344	3.35362257294411	31.1565686824075	10.6256	1.7583	32.3574
10.5117782543972	3.35363490554851	31.1565681754252	9.42529999999999	3.1222	32.8197
16.7450954062068	3.98698597351329	31.1565671114309	18.6523	3.9117	30.6336
16.7961047096521	6.70450056230486	31.156566048081	18.047	6.7045	32.7171
16.7961060999693	8.72824577716466	31.1219122554736	15.5961	8.5134	30.9972
16.7961074908424	10.9115355730091	31.0872673158538	16.6256	12.3206	29.6782
18.4963159397544	10.3386637816138	33.2091413600256	17.3372	11.1211	33.7282
28.614900007191	9.64081297919809	34.5080835476358	28.6149	8.2266	35.9223
42.9835173546268	10.2677522338936	26.3449345043373	43.1416	9.2079	26.5197
52.91479996519	11.0010027363054	14.86353658802	52.9148	12.3625	13.3985
57.5978195016674	11.0010002294447	41.5406759266343	57.0413	9.9678	41.9779
73.9225000188655	11.0009977224327	48.1825629724979	73.9225	9.6395	49.6476
96.1985848118582	22.2525839264279	47.1592988445284	97.6128	23.6668	47.1593
92.7052909865963	21.2821140019766	25.9806685115508	92.9329	22.8145	25.5988
86.412115038932	5.40331540823825	22.327099946267	84.9979	3.9891	22.3271
92.4756975332363	9.47010081394493	4.12160136594183	94.4757	9.4701	4.1216
91.4031301814731	24.6932322378251	3.66538458061579	92.0943	24.688	5.2999
Route: 5 Length: 462.769739902874 Demand Met: 1487					
73.1544926787125	60.0434981493365	15.8913885889323	73.1545	60.0435	17.8914
74.9863321032651	69.9503026122546	15.2750802149202	75.6074	70.2776	13.8577
76.1846872900788	74.2911149663641	14.7823126503426	76.1847	74.2911	12.7823
77.2898543405478	74.5989119314294	14.9449886685704	77.4087	74.0915	13.1093
78.0405017585795	75.2880538442748	18.5184992996976	77.1908	76.3248	19.088
79.000585769313	75.8476992596633	20.6189006304356	79.3483	75.3688	19.5443
79.8896929988165	76.4487425903348	25.4647600103319	79.7296	78.3022	25.4406
81.0040897591449	76.6861678886722	31.3724796760284	80.2922	75.8098	32.7263
84.4927745081255	76.9707114004698	32.1361858232361	84.4928	76.9707	34.1362
84.7089824466163	79.1277509158388	31.6409775680878	84.0326	80.947	31.8699
85.6330426136367	79.2307630326113	30.8168507538433	84.6626	79.7388	29.6454
87.48499887015	79.3312641636542	30.2250144413794	87.485	79.3312	28.225
88.8418096533139	81.5962418431393	30.9795024289383	90.256	83.0105	30.9795
88.6372522367495	81.0307980707347	37.807078379081	87.0156	79.966	38.2934
89.7033005232921	81.0307999720547	37.80708169721	89.7033	80.1502	39.6028
90.7874212202839	81.395625989977	37.3602788978269	89.9071	81.4441	38.6007
92.80271593891	81.7593923300112	36.7257148256378	92.5909	80.0433	37.2966
97.1261029220997	83.0084604595059	35.6058123352116	98.6006	82.3388	36.0882
98.0133214195945	85.6247697881199	34.0337855385716	99.0472	85.7396	32.4859
98.2898742904197	87.1750903841717	33.8135247172326	99.7041	87.1751	32.3993
94.4683004171959	88.0420836069032	37.1599953350818	94.4683	90.0421	37.16
92.3270506538246	86.636469852818	39.2711126393105	92.7639	86.5161	40.1878
89.6546002916385	85.2789704459316	40.7331845970325	89.6546	85.279	42.7332
87.9061924804932	85.1839531080377	39.4482985398451	87.3294	86.7915	39.9582
86.9526939763687	85.0756784015927	36.8685423672052	85.9222	83.4369	36.366
86.952695441197	86.4353576929963	36.8685398755179	85.5459	86.1581	36.8243
86.9526969090404	88.0524027502035	36.8685373848698	87.6085	88.0524	34.9791
86.952697801953	89.9177953088784	36.8685365652102	88.5666	89.9178	38.0498
85.1325974281843	91.3063460456671	36.4094784878716	85.1326	93.3031	36.2953
80.7906437687325	91.3062985371855	36.4094581318171	80.5965	92.0964	38.2365

Solution x	Solution y	Solution z	Original x	Original y	Original z
80.7904461693381	89.361252816844	35.5786613456193	82.7904	89.3622	35.5781
80.3561841823141	88.5069717773714	33.925066104746	80.4141	88.4668	31.9981
79.8889044376543	87.8864748488242	33.7726882840765	80.026	88.4312	32.9439
79.414998899685	87.2350142970822	33.6242079771345	79.415	85.235	33.6242
79.3506688490493	87.372825117806	30.852722356232	81.0134	86.425	30.4534
79.1758535286557	88.1001159851036	30.5144167287926	80.7173	88.9602	30.7691
78.9521144087913	88.5890089260097	30.1520037245684	76.9521	88.589	30.1519
80.2662140582435	95.1405460569745	30.1249865934923	80.252	96.9762	30.8948
87.1238699280421	95.1523121890419	29.3007455980837	88.2817	96.351	29.2562
88.0842336761958	95.1638013823476	28.4841305909726	89.0976	96.4455	27.3307
88.0842291989119	93.5608600070416	28.4841418088842	88.2673	94.5543	28.7709
88.0842247139363	90.8900534476166	28.4841530300114	88.3919	89.421	29.806
87.006650318718	91.0504389253552	27.3364411424964	88.0059	90.774	26.7084
85.443381210818	91.2128499002817	26.3887333584117	85.3838	89.3565	26.2565
84.0758464410434	91.5252136138244	25.5944005944778	82.1226	91.9552	25.5944
84.0758555456347	91.5252181230025	23.6438126169587	83.1514	91.319	24.221
84.0758646572864	91.5252226325352	20.8623150172183	84.785	93.3953	20.8615
84.0758657398903	85.9721743753266	20.8200445235538	83.3441	85.5151	19.0157
84.9413119089544	85.9721706400401	21.2052522201589	84.7929	84.8117	21.5385
85.8594779075164	85.9721669229784	21.5694070114654	85.5265	86.4226	22.7788
86.8895320671138	85.9721632052707	21.8814141123335	86.8895	84.3247	23.0154
88.1760013785399	87.0152991156878	21.8814138058444	88.176	88.8141	22.7557
88.8781389030806	86.3225715092898	20.8752708373742	87.8356	87.4643	21.4217
90.1019053828909	84.9447062545874	19.4062964147882	90.1019	83.486	18.038
93.0115375703073	84.9447067165161	19.4062965691161	93.0738	84.8753	19.4127
95.8231554501973	84.9447071792259	19.406296726205	97.4362	85.8361	18.6294
95.7693049449364	84.1438842286711	22.5641833782307	96.8293	85.3988	23.0282
95.7131992161111	81.6423125567861	24.1332474249548	97.0965	81.0307	25.4066
93.7898226011113	81.5178804878733	24.1949825855982	94.7529	81.9671	23.1963
88.4076248339393	81.3907035673743	24.2579606004281	88.1669	82.2879	22.5207
87.9946935986057	79.774742481882	24.716953200729	88.7272	81.0174	24.4065
87.5387335586084	73.4568914251367	25.2004415528394	88.9513	72.6403	24.2874
82.6127721572608	72.7212926186878	26.5210943560286	82.4808	71.6064	25.4475
78.7782220282415	72.1707234236369	29.6110004497861	77.364	70.7565	29.611
79.2496462326832	72.4566293787444	37.4509589588576	80.5183	71.0301	37.6084
79.4654943763443	73.8811519442183	39.3640131272764	79.4655	74.4467	41.2824
81.1304404026724	73.8811612340342	39.3640146236981	82.7574	74.2926	38.276
81.1304392862636	73.8811642990796	41.5159082432853	82.0065	75.6791	41.5159
81.1304343537228	73.8811619172095	47.6998322197533	81.6179	74.1421	49.6219
77.3167808354746	73.8811570837316	47.6998283577552	76.1087	74.9228	48.9063
77.3167768287681	70.7629486906164	45.9707920627892	78.8402	71.1237	45.9036
77.3167728119434	64.5737442196324	44.3273584860394	77.6803	63.0066	43.1391
72.5025905319703	71.4925597014087	44.3273621744724	72.5026	72.4828	42.5897
64.0829415766044	71.492572955855	44.3273742171563	63.7544	71.2264	45.6612
59.4826690682037	71.4925862007894	44.3273862548656	59.4827	70.1321	42.8614
45.9134063700458	73.246674890145	47.9689762191476	44.9743	74.4953	49.2176
45.9134100561652	62.8240996346847	32.2852000951423	44.1821	62.8241	31.2839
49.5234032992068	55.0956997651111	32.2851922251837	49.5234	55.0957	34.2852
54.842849004854	48.3039782012123	25.3599202461225	54.1532	48.4548	25.954
Route: 6 Length: 526.428566998473 Demand Met: 1532					
46.7377064316465	48.2657006055744	7.7581984563414	44.7377	48.2657	7.7582
46.7377009621399	69.5204000147876	11.3627257149412	47.0351	69.5204	13.3405
39.3353999166307	88.6815429810149	9.79904372827032	39.3354	89.658	8.0536
18.1593310775763	88.6815425128485	12.9102984670415	17.1642	87.7833	12.5892
15.1158529101494	88.6815420430937	17.2258041965191	13.2856	89.4879	17.2258
16.0851760984943	84.6655063930235	17.2857367518409	17.8311	84.5721	16.3475
16.1269593268866	84.0918029624221	17.5074190971461	17.8246	84.0918	18.5648
15.4215119364588	83.4088387418309	17.5074180445696	15.4215	81.5375	18.2132
15.3617587087201	83.5000851617961	14.4772287607915	13.6279	83.3943	14.3913
15.3053610880696	83.5919881108276	11.9223201195883	13.617	84.1913	11.8486
15.2524801370225	83.6803623209901	9.69772678173094	17.0206	82.7787	9.6966
13.2364986671766	84.2967123614387	7.45535984557359	12.6448	83.0865	6.5696
11.9081972836315	85.221362941305	6.23426554840551	10.8331	85.8288	6.1261
10.9094669683582	86.0428715388272	5.04288959182867	11.6247	87.7046	5.4339
5.38700128829234	86.3619074384324	2.37917495010553	5.387	87.7604	0.9494
4.4842055676459	86.3618703905433	6.18484743976795	4.4842	86.5445	8.1765
4.01950842195666	82.6706104692074	6.18485041232283	2.625	81.2761	5.8521
4.83588831759879	84.1288404297902	10.2660416803855	3.3964	83.4982	10.9781
7.74029798347325	87.8118902703674	11.7653007501543	7.74030000000001	89.8119	11.7653
9.18987893376274	86.4361195124626	16.3432997306217	10.6041	85.0219	16.3433
8.83617986649875	86.6017639044351	17.5300167943426	9.9966	85.8576	17.8499
8.42853002401841	86.7739535745538	18.5863031037256	8.87560000000001	85.3213	18.2881
7.99050116050014	86.9656659920485	19.8035085993015	9.2565	85.6186	20.1316
5.18847264939933	87.2822916127648	20.5599773539242	5.1953	87.1361	22.5444
1.64498573689777	88.7795865691576	20.5918242086701	1.0919	90.7016	20.5918
1.64498373020656	83.806537370356	20.754383873193	2.5389	82.9669	19.2333
1.64498168520619	83.5176673901786	22.6092004291666	0.247299999999996	82.0871	22.6092
4.05990318318371	83.5176697787578	26.7595957138105	5.1015	81.8103	26.7596
4.05990812820301	86.0049768692468	27.783004998492	2.0599	86.005	27.783
6.21561030140262	86.2520180100921	30.6292340768817	6.0677	84.3942	30.725

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.52199517447576	86.728789986224	32.8262998766851	9.52200000000001	88.7288	32.8263
9.95357630045733	86.728788809063	35.0447986051265	11.8372	87.4011	35.0448
6.84629946262643	85.8114246123698	35.4311657168724	7.47969999999999	86.7529	34.8532
6.84629946262643	85.8114246123698	35.4311657168724	6.7503	86.812	36.4409
1.8702329904133	83.7264655203869	35.7944823998727	1.19329999999999	81.8445	35.7922
1.8702306590956	83.7264671244274	44.909505842133	0.0289999999999964	82.9455	44.9095
3.09098987671474	83.7862177760749	45.0916983870111	5.09099999999999	83.7862	45.0917
2.70209101190453	85.1584264083678	45.5289011767234	2.696	85.7661	44.4643
2.3123783322974	86.3196777252741	46.0221586502212	1.983	86.3665	46.2259
1.92980964638294	87.479512939374	46.5081766216818	0.775099999999995	88.6342	47.6629
1.97501241232975	87.4645288590716	43.6931766262987	1.82250000000001	87.776	42.1327
2.02041108092965	87.4495121940045	42.7790134776753	1.5647	88.8122	41.3941
7.69489919359043	87.0499232170844	42.7640329109683	7.6764	88.6806	43.7076
14.0930628743943	83.3223050959585	42.7487821904342	15.9151	82.9337	42.2853
14.0930628743943	83.3223050959585	42.7487821904342	14.2245	83.0966	40.7659
14.0930755497496	83.3222981294603	46.5712835379002	13.8296	81.5783	47.5142
16.0719986958088	83.3222986013246	46.5712864319773	16.072	81.5553	45.6344
17.3607980412326	83.5620587545158	47.6436813856381	18.7876	82.3448	48.1119
17.5554525022228	86.948303743192	48.0441385004973	19.3715	86.9483	48.882
17.5554546556564	87.6358120043689	48.0441443969194	17.0519	88.8308	49.5668
26.3735980718955	87.6358105494649	40.2837020497087	26.3736	85.6358	40.2837
28.0528715816488	95.5635955112401	38.9958002012926	29.7505	96.621	38.9958
17.7213444220633	95.5635944262162	38.0164968652666	17.7167	97.5636	38.0165
17.7202593807638	89.3076146423123	35.2146608257764	19.4915	88.9148	34.46
17.7202593807638	89.3076146423123	35.2146608257764	19.5543	89.8549	35.5989
17.7191648108019	83.0308676401743	34.7804004445885	19.7188	83.0222	34.7895
17.0737221758573	82.6034510848282	28.0622035353733	16.887	83.4344	26.4901
16.4864013589981	82.0324512968508	27.3073529528599	16.4864	81.6235	25.3496
16.4864013589981	82.0324512968508	27.3073529528599	16.2773	81.3093	25.7994
16.1709529334339	82.0324478116368	28.7174015393782	14.2132	82.4414	28.7174
22.9823159382538	68.1742440172417	30.7817261848716	23.9463	67.9458	29.6197
25.0594974913538	61.5430999977978	41.0508912363559	25.0595	61.5431	43.0509
25.2384342467177	50.1828790109295	34.3694647629281	24.5323	49.8988	32.6923
25.4416427450607	47.3920539618664	33.8048091019852	23.5397	47.0618	33.8948
27.1476717509246	46.5070975295215	33.1690574927259	27.0169	46.6583	34.9486
29.2069204206353	45.5233471955234	29.2403068272806	28.4876	46.0461	28.1502
32.7116975134116	44.3760861662324	27.4438586690209	32.7117	42.3778	27.3609
33.348313951527	47.2688024197049	27.4438390372388	35.3466	47.2689	27.5268
32.1926010027389	47.2814679331214	25.0171705661607	32.0569	46.2162	23.8838
31.0932064258742	47.2941924272032	23.7875995499927	31.0932	49.2942	23.7876
30.9217653668194	47.1514793852383	21.7496113529628	32.0319	48.7602	21.6234
30.1880713769916	44.8185048029948	20.7834275316241	30.9136	43.9894	21.9238
29.2789071090689	43.4794997784325	19.1306990428543	27.2789	43.4795	19.1307
32.1138426010238	41.810618710708	15.4650377991051	32.6554	40.5505	15.9859
34.029737299846	40.7971042995201	7.01983263065718	32.6566	40.0511	6.9534
Route: 7 Length: 353.499841592602 Demand Met: 1329					
72.0996190405343	71.3248367935576	8.9673353997443	73.5126	71.3248	10.3828
71.4456619777304	75.7133154085694	8.85244517619341	70.0314	77.1275	8.8524
72.695935154243	75.5724729807123	8.80309225238386	71.4242	75.4202	7.9198
75.9291034823061	75.4332079443701	8.7544788051957	75.9291	73.9471	7.416
79.9936929095837	75.4331942921953	8.75446405076074	79.9937	73.4457	8.9779
80.7647319514769	79.7002306795435	8.50490517309606	80.3025	81.1115	9.6723
82.7717969050462	80.0866731943317	8.04252216618123	82.7718	81.5009	6.6283
83.7472040286815	79.7250306985078	12.0032073036866	83.5177	79.6473	12.5117
84.7657947104789	79.3652937587989	15.0108453675027	84.7658	77.8153	16.2748
85.5992949942321	81.6562999710569	15.0108381025984	87.5661	81.6563	15.3738
85.5292460887632	83.5524748989728	14.0960249705001	87.1273	84.0324	13.0404
81.0587140239783	83.7664122166348	14.009261451003	79.3747	83.7664	12.9303
83.3684908225931	88.2062295643211	14.0092640727457	83.3685	88.3604	12.0152
84.2196980512236	88.206288479959	15.0080004026974	85.6153	86.7737	15.008
84.2197582721273	88.377061468584	15.921236847035	85.8774	87.324	15.9329
84.2198174036349	89.6200960486427	16.7613157727728	84.1657	89.6201	18.7606
85.3340910835413	90.0583747975898	16.5746175018449	85.8291	89.3215	18.2752
85.7755335018732	91.9331704862668	15.4588971932875	84.3608	92.148	16.0712
86.3601827818007	93.559398420601	13.9637017066075	88.3602	93.5594	13.9637
83.6163050317199	95.4959946657639	11.4544168134052	83.6163	95.496	9.4544
83.4076017931157	96.5921929381866	13.3279448553989	84.0572	98.2927	13.228
83.1706273345223	96.9997983401136	15.5957173915994	83.3686	96.8014	16.23
82.9321387809029	97.4133646955868	17.4252093409696	84.3334	97.0716	17.1577
82.6664248284706	97.8469729843172	19.5951990047847	81.2522	99.2612	19.5952
84.6623143937162	97.7891763471672	20.4482896370847	83.9295	97.9734	19.8967
87.4737309289553	97.7312624600153	21.3847813256575	86.994	98.105	22.6387
92.1769601528139	97.6729888862045	22.084058702431	93.4254	97.8126	20.9017
93.1879547678025	97.6143368699483	23.4996000376911	93.255	98.1789	24.6576
94.1790812072105	97.5551748872402	24.497401927054	96.1791	97.5552	24.4974
93.4746916962075	97.2189864904217	27.5844921582808	93.3103	99.0843	27.6346
92.866122528218	94.510302342382	30.1840694621413	91.4519	94.5103	31.5983
95.0273549590427	93.7633007046164	28.4044731124686	96.6676	92.6743	28.4611
95.1191875474751	93.6427319166635	23.6591294701491	94.509	92.4532	22.8398
95.213371226752	93.5305575009406	21.9425135758192	96.5452	93.172	22.7505

Solution x	Solution y	Solution z	Original x	Original y	Original z
95.3031283210595	93.4204179855657	17.8619017501228	95.3031	91.4204	17.8619
96.331885534411	94.3259134554505	15.1131290698877	97.9735	93.9042	14.8216
96.8387868707588	95.5746932368536	13.2538639031721	96.6476	96.9796	12.6166
97.362927927241	96.3449981233473	11.9706802679479	98.1513	96.345	10.1326
97.362942278551	98.0489605860836	11.9706750156833	99.292	98.0492	12.4987
94.5132804657535	98.0638322062068	11.7141140815212	94.2258	98.7848	13.3192
92.7659815446832	98.0785605991374	11.3308871253447	92.0809	99.3222	11.7562
91.6170790818199	98.0931842425556	10.9243972672108	90.7381	99.8897	10.9244
91.6170789115137	97.4471863792671	10.2335558315456	90.6972	96.9626	11.6096
91.6170787595954	96.9032073434484	8.50445641661966	92.8113	98.2407	8.6156
91.6170786033266	95.6129362328035	6.44950438161789	89.931	94.5372	6.4495
94.4020976511436	95.6129330663901	5.581602623068	96.0605	94.495	5.5816
93.8439124245324	95.9903286758907	4.15032290339114	95.4796	96.129	4.4906
92.093005563897	96.3620818925172	2.07251141709463	92.093	98.3621	2.0725
91.3300046708393	93.6392004028438	1.39857247869182	89.3359	93.6392	1.2449
95.1398705081865	92.5136006638237	1.39855262134686	96.809	92.5136	0.2967
94.7976318116621	89.9138218889193	1.39855743842251	94.7976	88.4491	0.0367
93.8607163576912	89.9138173907543	5.05949998795322	92.1839	88.8237	5.0595
94.3344589398103	89.9138397418987	8.78507252098762	94.4375	89.8165	9.7901
94.8083107777579	89.9138620956195	10.8229426742518	94.8083	91.5304	12.0006
96.5361194769092	89.427658095642	10.8229398887669	96.671	90.7145	10.1968
98.1406292075639	88.8242936558461	10.8229371030382	99.7949	88.8243	9.6989
97.0847940992399	81.8010227341675	11.6405178558807	97.0848	81.6578	13.6354
90.6000906970955	81.8010003634584	8.5160239815468	90.3741	83.7882	8.516
90.5999021219885	79.7074533864855	7.4095958381733	89.4354	80.1567	8.4369
90.5997145174052	76.0987005233446	5.25817209578221	89.379	76.0987	3.6739
90.5997203138693	75.384701854647	10.106297419081	89.4099	75.3847	11.7139
91.4552697588649	71.3467005229264	10.1063010336841	93.093	71.3467	11.2543
86.9680367940138	70.3926946418123	8.1506014502858	85.22	71.0885	8.0711
86.5964132951226	57.5663002910928	6.56829882898832	84.5964	57.5663	6.5683
97.2738855315682	52.0430997416166	4.34079863235189	99.2739	52.0431	4.3408

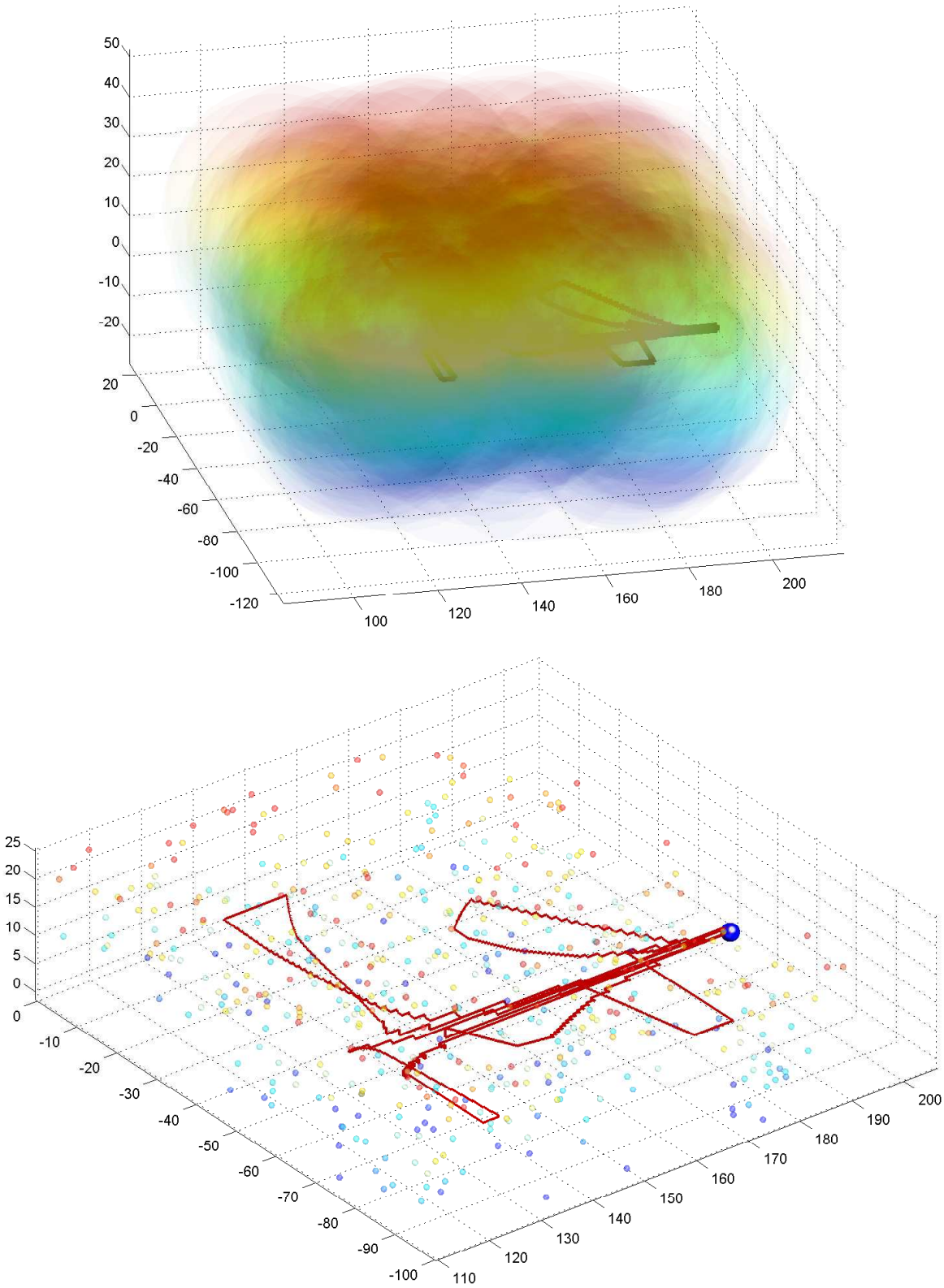


Figure O.172: *team*6_500, Equal Radius, 3D, Manhattan, Length = 913.6296009

Table O-175: Solution for *team6_500*, Equal Radius, 3D, Manhattan

Total distance: 913.629600895872 Total demand met: 25539 Depot: x 95 y 50 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 250.652958199476 Demand Met: 5000					
67.4972345696806	48.4166210138417	0.471362149181783	51.5218465	39.5765057	8.1668107
53.8221812326978	46.8967200347542	0.940033769235129	34.2887402	41.9043439	6.835982
45.453117187843	45.4223352334115	1.40675129556067	24.3319298	37.4283803	9.9719727
40.5913738327931	44.0315169253993	1.86727034205815	15.6671545	41.9038059	9.4975475
38.622790547687	42.7093018916979	2.31000817953202	13.5198617	39.2703319	6.7423337
37.2263191465456	41.4517007470139	2.74641454928225	14.7299938	38.6202015	11.4606651
35.9953451458107	40.2280645018089	3.17702810418259	12.1928408	37.3702852	11.5867049
34.969393476675	39.0471148163157	3.59829184364406	11.8541821	36.7134083	15.5034658
34.1676742201442	37.916782786986	3.99720545053617	13.0553452	35.1491327	19.4677587
33.5317610251816	36.850179629684	4.36277466380825	18.0420031	31.0087706	14.9562459
32.9090602163564	35.8053419755766	4.72646372161918	21.2205961	30.6755865	15.8621351
32.2954277042764	34.7781720925416	5.0887239740063	25.434095	30.36432	15.4263508
31.6878540109309	33.765938940048	5.45006918840028	24.4888337	25.329984	1.2423959
31.0860290076131	32.7713606495095	5.8121600196173	19.7989907	26.8559855	1.6393695
30.4913554512109	31.7921225116787	6.17504655426368	10.2638739	16.7343669	2.745395
29.9429224435956	30.9076944475535	6.5411833793964	10.0346396	20.0550826	11.5771729
29.4132679978551	30.0540050246877	6.90578506239381	10.881307	21.222109	11.4410052
28.8953822848062	29.2191027486553	7.26958098142659	16.5956207	19.4929376	15.3111277
28.3838983102898	28.3993098392143	7.63235674623679	16.5565287	18.5575743	19.3585299
27.8791364186978	27.5955736959568	7.99318683750462	14.7546051	14.610274	24.9337615
27.3934133935937	26.8396235786203	8.34309251862707	13.6477983	21.6503409	20.9429038
26.9143918031648	26.0931906650089	8.69102308222926	9.1420339	20.9818632	21.7425538
26.4469538585176	25.3585243218632	9.03544083609545	9.78612250000001	28.4044715	22.2738758
25.9883359016431	24.6250036771584	9.3770618446604	4.4919615	30.1971308	23.0431363
25.5771708421595	23.8602857133595	9.70180124008706	1.44105020000001	27.5670412	20.5926225
25.2848222801839	23.0017796151233	9.98601871345314	1.0903939	26.3844516	18.4073439
25.0103609314843	22.1265809376235	10.264484103085	3.1062568	26.7803784	17.2167375
24.7411760886425	21.2471704446531	10.5415775235076	2.4227502	13.8762399	13.6085461
24.4773704796052	20.3918270524759	10.8181129295824	4.41833269999999	14.4467589	21.446539
24.2179598011284	19.5552617864836	11.0925222187159	8.8711802	13.2955279	17.3948906
23.9603064516126	18.7299146498087	11.3665413339506	12.2844966	12.8434228	15.9512599
23.703908205917	17.9140321935297	11.6404225551104	9.8269964	6.8843491	16.4620329
23.4490820050059	17.112987891712	11.9140177510564	6.43216459999999	5.6038094	17.9548593
23.1964505132148	16.3308455214662	12.1869422563392	1.16963010000001	7.0254341	24.7260216
23.1964505095632	16.3308454120271	12.1869423362312	1.18933079999999	3.3623299	20.9336159
23.7411862688454	16.3308454139136	12.1869423393586	9.4518233	0.0818322	21.8708164
24.3022055666419	16.3308454158079	12.1869423945534	11.2137447	2.0282324	10.133715
24.8723581795887	16.3308454177112	12.1869424036749	3.796854	1.0310825	8.8837938
25.5520119248662	16.3308454195992	12.1869424186562	7.7653349	6.167634	7.7136991
26.2513129739552	16.3308454214987	12.1869424194101	10.2956976	4.6843351	8.4372721
26.968077159178	16.3308454234058	12.1869424207406	15.3634563	8.946465	9.6121679
27.6954980891437	16.3308454253192	12.1869424370092	15.820225	13.1438067	8.0447276
28.4337314082843	16.3308454272408	12.1869424254212	20.1050057	16.8211128	11.4177964
29.1805461640188	16.3308454291692	12.1869424170561	24.4057133	14.819481	14.2616378
29.9344240352077	16.3308454311056	12.1869424279179	33.7699504	15.2531662	14.0155756
30.6913252613383	16.3308454330521	12.1869424488347	36.6688954	15.3802855	11.2906359
31.4505070432064	16.3308454350078	12.1869424403931	41.2499501	12.693222	14.1376671
32.2100545667181	16.3308454369712	12.1869424290297	45.092729	13.545129	18.3076608
32.9674681013186	16.3308454389418	12.186942435642	46.2315326	17.3070005	18.3576471
33.7227383795091	16.3308454409172	12.1869424202744	52.3761166	17.3066951	24.8659343
34.4556861479739	16.3308454428973	12.1869424367054	52.4413086	6.2567644	20.6204114
35.1727516336718	16.3308454448791	12.1869424336838	57.1362338	5.5136309	23.5708492
34.9993637474816	16.6140436197592	12.0950786116842	55.2537104	1.3428502	19.4907476
34.8136735468547	16.9236612666211	12.0021542269684	41.5241877	2.2495139	17.9679654
34.6280030062181	17.2355728982783	11.9091960081124	43.6411268	3.9331303	13.8180098
34.4422531209392	17.5495753099522	11.8162504707141	42.0438698	1.2746098	8.4709115
34.2564335876018	17.8663204585811	11.7233735745764	37.7928549	6.0601138	4.720283
34.0707919000749	18.1849365357982	11.6305856289607	33.6893922	8.5224136	7.0176775
33.8854938682174	18.5051207978099	11.537861266608	31.9710737	13.1659452	6.9350237
33.7005827629806	18.8265064304284	11.445196632128	28.9980611	9.3107142	10.3932004
33.5161739375771	19.1494716659622	11.3525686744636	29.8399494	3.731908	9.1569031
33.3322650374385	19.4749240212843	11.2599863493597	30.2787157	8.2280249	1.312123
33.1488131427285	19.8023821493819	11.1675089086859	26.3324067	9.9110212	1.9657306
32.9659615763406	20.1317096039323	11.0751273047023	17.3929381	9.8303298	1.4719335
32.7843854323576	20.4638545285626	10.9829009487121	18.0605132	3.6100683	1.3230623
32.6050010350073	20.8042824041225	10.8909906854936	21.5004558	1.4444458	11.8706015
32.4267523141199	21.1507701483363	10.7990828355434	21.5694811	0.9567502	13.1824134
32.2497350790235	21.5047680169456	10.707143098612	15.0419936	3.4632806	14.5409941
32.076079322284	21.8734922372828	10.6150446381498	14.9649191	8.2569823	17.1672819
31.904021676219	22.2480900590474	10.5228341937177	15.2275578	8.2482088	20.735321
31.7339642634286	22.6309652772292	10.4303605055562	19.95828	6.5164086	22.2907726
31.5651133829032	23.0218112976835	10.3376491495394	25.7941467	5.022901	22.6635913
31.3969025698691	23.4207298524401	10.2447292298625	25.3620642	2.9418291	18.8013171
31.2293688932214	23.82990113084	10.1516523775483	33.5301093	3.5426558	21.7233363

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.0618676254307	24.2510162468445	10.0583292490532	34.237799	1.769458	21.0926833
30.8940844845571	24.698973766274	9.96450708518885	39.0651937	2.4238303	22.4127866
30.713296251038	25.6893961792555	9.86447688871338	38.5584867	8.9239146	23.1054293
30.5320976202065	26.7323114342033	9.76417085816884	33.7088519	9.9711832	22.3346661
30.3509705932586	27.8213195041329	9.66367277496404	31.6461166	7.3585956	24.5416178
30.1698602355135	29.102358886766	9.56232912568424	30.8819888	13.4626957	23.5805357
29.9889881439744	30.449951665277	9.46077031378014	33.6742877	16.0147514	17.7329183
29.8082614638896	31.848472121961	9.35914191720775	38.9701661	21.3778805	18.3750053
29.6274008894722	33.2911672419508	9.25743861142822	28.9097869	26.1468646	19.859402
29.4469648852606	34.7696504128826	9.15566568797954	25.6408756	32.9849766	23.8146293
29.2671128381483	36.2754098791553	9.05376881090979	21.8832831	32.2702186	24.0783885
29.087994814815	37.817668181366	8.95172128259834	23.0786229	38.1227731	23.1605385
28.9096344482771	39.3849444085745	8.84954868460377	12.7057803	46.3942459	23.5548248
28.7329951598051	40.9305804435726	8.74703217692944	9.4077401	50.7341371	22.0830838
28.560548293634	42.3465246972615	8.64370250664644	9.41537220000001	53.1681384	17.4096726
28.3900381129546	43.7152908488529	8.54013247843472	4.944301	50.787374	18.9241415
28.2369487574923	44.7936868519829	8.43381743978853	6.1363219	48.8674613	19.7646406
28.0866555188053	45.8573202503832	8.32681817734176	6.5220454	46.8393292	9.3610404
27.9371650971452	46.9318275619831	8.21982291371307	4.9451086	53.7479899	10.2966488
27.7892519762364	47.9919335603991	8.11277795919066	3.9504558	53.4738105	7.1081084
27.6434357654494	49.0402876628234	8.00580892987695	2.2999767	55.3764405	4.437231
27.5059191041744	49.9999994470299	7.89949620730874	1.389212	56.8496436	7.9005554
27.9994218310036	49.9999995219091	6.61194036998162	2.27936	46.9159446	7.984275
28.5639405999493	49.9999995967847	5.30798210165459	2.4253981	44.8523436	2.2881323
31.0785287297778	49.9999996716831	4.22249253338138	5.3360715	49.6056788	2.051856
36.9583452609891	49.9999997465907	3.16113981322883	13.919931	46.2670929	1.9535236
47.4344653405965	49.9999998214996	2.1059185101156	32.3710377	53.6854	0.0060466
61.980195397002	49.9999998964111	1.05515871452896	43.0965371	49.287121	4.5164689
Route: 2 Length: 239.666367001282 Demand Met: 4999					
38.6157765175119	51.7952200436678	0.762799267062714	13.6466825	56.641223	0.3772494
33.5641837347548	53.3934999489018	1.52326172453765	8.7488745	58.9072962	5.1240813
31.1217453189472	54.9153385369607	2.26786685584115	9.6122245	63.4753738	1.8891309
29.0661878509634	56.39578699914	3.0142790503904	6.2196931	67.2192158	1.3051514
27.5514966039717	57.7468606541217	3.76912208969208	6.6484375	67.6725429	4.7357573
26.201967829012	59.0701821295075	4.52388345444426	9.81425009999999	65.891213	10.4751695
24.9179317987566	60.4058902601983	5.27433360429036	6.65024940000001	63.3598676	12.1766222
23.7024098520086	61.7635663656308	6.01850247859894	4.8021518	64.3437535	14.9149548
22.5578755350107	63.1415838013732	6.75244582424246	0.795030699999998	63.4582891	12.408302
21.4991207951487	64.5513992951983	7.47827295536509	0.2763329	64.7359652	24.1588067
21.4863385965771	65.5680952900224	7.4934014678673	3.24432779999999	74.1558976	22.7592184
21.4738504402373	66.5227033686052	7.50846693473296	2.73342340000001	77.6753662	22.8134911
21.4617517203756	67.1547084410472	7.52357698697119	2.2118306	78.338365	17.5236695
21.4496673115769	67.772253179708	7.53867606614091	4.2645198	75.4568775	14.9212902
21.4376003373816	68.389976787611	7.55377103392647	0.933565799999997	72.1659561	13.9038289
21.4255522113231	69.010344066341	7.56886522069137	1.295681	73.7881021	0.4861457
21.4135234847008	69.6323591530139	7.58396714293149	2.4095765	76.567725	8.2487866
21.4015096553786	70.2554643851225	7.59907270173676	5.6520223	82.6769432	10.5413091
21.3895043879019	70.8751572247808	7.61417973714222	7.5281123	85.6801168	11.1420674
21.3775032907579	71.488963042041	7.62928736505625	9.5621792	88.5032381	1.7950294
21.3655043646158	72.0929550586527	7.64440601839806	9.22639889999999	90.0124515	4.4717238
21.3535089894166	72.6855509335982	7.65953333505532	11.9839899	90.8471274	5.5312557
21.3415152331956	73.2694835322188	7.67466722328093	13.5790401	86.3111074	8.8070912
21.3295238445601	73.852082850573	7.68980275478278	19.6994488	87.7215703	8.9292535
21.3175337125852	74.4328540148267	7.70493918947334	20.5127244	86.7993916	9.2772764
21.3055451785004	75.0129107893579	7.72007585112615	20.4274735	84.2677658	10.0950289
21.2935574117328	75.5942888118204	7.73521180317928	23.1076735	77.6165558	13.9842376
21.2815689062967	76.1799917887219	7.75034432730881	15.7168362	72.1075902	13.3837018
21.269582666612	76.7727840943977	7.76547468622332	14.8230271	72.6203252	11.2037362
21.2575985297923	77.3733128988829	7.78060510802646	12.9149435	73.6813943	7.0579
21.2456169317937	77.9816342103456	7.79573858220778	6.0949397	74.0865476	5.2825592
21.2336428471544	78.5983748893978	7.81087726279647	6.9413921	77.9428724	3.7844258
21.2216743550985	79.2214686424296	7.82602337915657	4.0094679	79.3774545	3.2513282
21.2097134600343	79.8505740926944	7.84117822678763	1.90777989999999	84.1438746	3.0185488
21.1977618121551	80.4822331264437	7.85634362573467	2.2068367	85.97283	4.4333903
21.1858185971749	81.1158954046193	7.87151861614138	2.2885744	93.0945686	4.7870646
21.1738840297882	81.7408042320776	7.88670593108569	2.8109458	93.7321232	7.4419786
21.1619570992773	82.3591960159357	7.90190218577297	2.7731053	90.8551563	10.3958831
21.1500376917303	82.9772431244309	7.91710322756663	0.0137857999999937	97.6201473	12.5524591
21.1381938327475	83.4938851016506	7.93229618357537	0.604558600000004	98.8714353	15.0611354
21.1266955917124	83.8258232939661	7.94731017057631	1.8947773	99.155621	15.7943163
21.1152783926182	84.1393678274261	7.96232825416588	5.3401207	99.7769332	23.3119522
21.2194753611212	84.1393669115686	7.96232786147266	6.5131248	96.1438685	22.6159881
21.3243058422144	84.1393659956381	7.96232747515754	5.93926279999999	95.2323551	18.983803
21.4295752101341	84.1393650796687	7.96232708096801	8.45094570000001	92.4898096	19.3229772
21.5351299598544	84.1393641636886	7.96232668438135	5.5712407	90.2337915	20.7281907
21.6411448034825	84.1393632476937	7.96232628626163	2.92961390000001	91.7761922	24.0474062
21.7494630104233	84.1393623314234	7.9623258928046	4.0389978	87.3302987	23.4710958
21.8586440795757	84.1393614151241	7.9623255090444	3.4980922	86.0326352	18.0570339
21.9684106048388	84.1393604988253	7.96232511372914	11.0262565	80.6460603	18.6716382
22.0784538460705	84.1393595825507	7.96232471531283	13.1891897	88.2938542	23.4034575

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.1887389360035	84.1393586662718	7.96232432967955	13.4475731	91.4293541	19.9118277
22.2992520064593	84.13935774998	7.96232394418255	14.3875276	98.8261078	17.7695633
22.4099679272501	84.1393568336002	7.96232354105545	16.4819632	98.2716229	22.9610856
22.5208634684818	84.1393559170792	7.96232314472388	17.6447354	95.7025091	24.4008135
22.6319319663606	84.1393550004682	7.96232275704824	19.6070156	87.5155962	19.7643343
22.743145958564	84.1393540838609	7.96232236720205	30.1525293	91.7059859	19.8161573
22.8542345488049	84.1393531672335	7.96232198498453	31.00496	87.5127119	14.2496673
22.9652471853645	84.1393522506091	7.96232159068265	27.0999394	87.1794445	14.318048
23.0762944663815	84.139351333991	7.96232119905573	26.8042407	95.3391438	15.0909578
23.1873552854044	84.1393504173383	7.96232080842639	23.9936704	92.6751712	13.4234383
23.2985335536688	84.1393495006719	7.96232042062218	21.4283979	90.119601	10.9146393
23.4099072666976	84.1393485840011	7.96232003036584	20.7475398	95.759314	10.8106372
23.5214989131447	84.1393476672929	7.96231968333692	22.9057445	97.6296948	0.3244356
23.6332353456718	84.1393467505104	7.9623192964085	38.2308224	97.9753907	0.1604725
23.7447662425874	84.1393458335819	7.96231888126944	34.617789	91.6565199	3.2534463
23.8562420425786	84.1393449166276	7.96231846796346	33.8269693	93.4852631	8.3635932
23.9676983093062	84.1393439996448	7.96231806956325	37.489488	92.2138591	10.0537289
24.0790335081006	84.1393430826285	7.96231765301522	40.8799687	90.9919823	19.2349904
24.1899714720546	84.1393421655368	7.96231725988172	44.680977	94.9895485	20.4805113
24.2833112772215	84.1393412240968	7.96231685785964	45.8972803	89.1189208	23.3584238
24.2833115453994	82.2218117218384	7.78180405889753	40.9379615	91.8870672	23.915222
24.2833118134395	80.0293985436944	7.59829567284088	40.3910959	90.932739	23.935083
24.2833120813285	77.2271286542811	7.41113752589347	35.4564008	78.9241199	21.2236154
24.2833123492124	74.5237753302242	7.22339762918234	32.5068688	76.0167984	20.6942387
24.283312617097	71.9141091124244	7.03520102734598	26.7897314	74.395765	23.1412606
24.2833128849871	69.377848221101	6.84640913178364	22.4809106	75.2843669	23.7038192
24.2833131528862	66.8591502818317	6.65690852160487	16.6661596	74.8364156	22.1285239
24.2833134208045	64.3152153560002	6.46672032271478	19.7736057	66.4248411	22.4431961
24.2833136887374	61.8505297157266	6.27593430020805	15.1928212	63.8863652	20.6093336
24.283313956702	59.4664571110897	6.08462106260048	6.14577610000001	57.4553139	19.7085867
24.2833142247439	57.2082227785761	5.89229771825497	7.20936620000001	55.909681	20.1638147
24.283314492867	55.0578755026643	5.69899032721	3.2029124	51.042154	21.6188315
24.2833147644382	53.7226530535997	5.44435293067983	3.9184302	46.6238898	20.1933306
24.2833150362773	52.5670630952246	5.17772550149463	2.1729785	46.8604253	18.9044886
24.2833153114295	51.6732840113536	4.86918958020183	2.57466789999999	43.4683609	15.573931
24.2833155868608	50.8398140187864	4.55287270528852	6.820668	39.0713932	12.1631417
24.283315862394	50.0361850262238	4.23489971577696	4.5207011	34.7763494	11.5308277
24.2833161383315	49.3517097690374	3.90747507237088	7.3492035	35.5012058	13.5793477
24.2833164143745	48.6945713784332	3.57607898335454	11.1949114	32.5347928	13.765914
24.2833166904812	48.0597499443523	3.24115112752155	11.5512784	26.7283657	10.5788887
24.2833169667494	47.5081266094587	2.89679273677157	6.7702019	28.6398243	6.655852
24.2833172460188	47.0399212880883	2.55270243508627	14.6392528	26.7492086	4.8139494
24.283317525502	46.5869524402244	2.20828140643195	17.2034005	24.1027648	4.0750954
24.283317805161	46.1532341883327	1.86356558556394	23.260163	19.1726271	1.8635456
27.9945196084012	46.6440933360618	1.50871882945423	27.922577	21.764341	5.4511195
31.9145621508304	47.1752482502453	1.15137371925106	34.0986738	23.3047286	4.238405
35.8685380842353	47.737150602275	0.792657475520549	30.6527015	22.708305	8.3283902
50.860436696865	48.8524710640857	0.39872996099081	32.3078962	45.114069	10.6720814
Route: 3 Length: 136.68797284688 Demand Met: 4906					
88.2263986301236	49.2619116752715	0.234245867288298	75.0689318	72.4744486	0.4051745
86.6099840694007	47.5224042081004	0.467818288564686	78.4065879	56.8222853	10.2773712
85.0567028829377	45.7842545933344	0.700863886342191	78.8734057	30.5074156	10.2492504
83.5622895987732	44.1505014146926	0.933209748788965	75.1791401	28.4357222	11.5456464
82.1365437159287	42.6245791879976	1.16460881635884	70.5957341	27.6007009	14.8208364
80.8097336773064	41.2257682939722	1.39395935049701	67.6344777	29.9025036	14.033884
79.5555077490458	39.8932432866972	1.62206864267587	68.3855742	35.3493495	17.8360025
78.3519990174413	38.5917974914062	1.84880344119921	65.5247054	34.4819771	22.2818751
77.2432367649953	37.3372130561261	2.07109881667017	73.9542296	35.1681427	22.8323041
76.1593575423171	36.1045569959176	2.29138179730431	78.2442809	33.2914556	24.7068001
75.0860393613378	34.89739798689	2.50886531266951	76.8303918	30.6898889	19.4810071
74.0259914918441	33.7117958942554	2.72533460851457	75.8801773	29.7113355	20.1473913
72.9782742903436	32.5466413417339	2.94075138801738	78.3681704	28.4149174	19.0447715
71.9371813712919	31.400723907641	3.15525609250459	77.5184606	26.3492827	20.0048231
70.9015645266222	30.2756982111269	3.3687468763124	71.3343578	25.5495623	21.1336705
69.8794952784011	29.170169946547	3.58121299771199	70.2766166	21.7580017	19.3250026
68.8706666892693	28.0869431130941	3.79289039841623	68.9038468	16.8104734	21.7337542
67.8751402667218	27.0395388106949	4.00315066097041	71.2868972	13.7571779	21.261272
66.8845371589565	26.0336876001773	4.21186794456754	67.4654721	12.1137109	23.8276929
65.9044272172566	25.0846907404558	4.41778401400927	60.5482992	13.7850738	16.8556106
64.9436118602999	24.1564203913788	4.62317094878721	64.943613	1.686391	19.5930668
64.7905250106374	24.2465116371873	4.62317093987309	73.292725	7.8305571	19.3842603
64.6370710514756	24.3367909581618	4.62317093028854	70.8086056	11.5809577	17.5154997
64.4836844514682	24.4271735596508	4.62317092258229	70.2907843	10.4186099	14.6666305
64.3303972794204	24.5177039207094	4.62317091247844	79.9570853	14.106802	16.0131314
64.176415086017	24.6084458038355	4.62317090285894	71.8742878	17.8343061	13.6189325
64.0224973515523	24.6992954606634	4.62317089471919	67.7860652	18.0440513	10.7235759
63.868782332192	24.7902368385401	4.62317088695231	72.0757838	18.033427	9.5185824
63.7151204315427	24.8812533048594	4.62317088566349	70.9135058	14.8761766	3.8438809
63.5615451010517	24.9723695831765	4.62317088221781	72.9487249	9.0752285	0.6396625
63.4078733154517	25.0636968000861	4.62317085758011	73.9903157	3.2090585	6.7443046

Solution x	Solution y	Solution z	Original x	Original y	Original z
63.2533663159091	25.1558196249343	4.62317084638028	75.2339764	1.1053279	6.9329867
62.8249974700343	25.452939945205	4.62317083196876	72.8917692	2.6849909	9.1068195
62.386056616108	25.7647617720436	4.62317082520347	72.320279	3.8462993	6.5608426
61.9412120456543	26.0859131678775	4.62317081735161	68.4102584	6.9403941	4.658299
61.4960282688483	26.4112309694346	4.62317079990495	64.1033853	11.196525	7.8712992
61.0523391369173	26.7391556292366	4.62317079731654	61.3811866	10.1841347	3.2294003
60.6107219019825	27.0700570387499	4.62317079096504	54.100404	16.0525172	0.8678853
60.1727583196957	27.4028773553791	4.62317076676435	54.6678163	5.1970784	7.0182008
59.7400650689281	27.7441369568414	4.62317074835834	47.2237184	11.5265695	11.522225
59.3146397894239	28.0905408035422	4.62317075004569	45.3795945	10.2393952	3.6711995
58.8981132575741	28.4441439611599	4.62317073375793	41.0252369	15.6288565	6.5265879
58.4908757196767	28.8026854531611	4.62317073015704	39.7052051	20.7340789	2.9027737
58.0911418756151	29.1639727827651	4.62317071500809	37.3849664	18.6565566	4.7787046
57.7034684502033	29.5309616780044	4.62317070443969	34.7673517	23.4200763	4.8203284
57.3301242128684	29.9023503802889	4.62317068662338	31.6418617	23.7354033	9.0609597
57.122764135656	30.4350161216329	4.62317067121174	31.5115819	30.4349931	13.1711147
57.1248513018965	30.7233011490164	4.6202815202419	33.8398153	32.0377234	11.3609992
57.1269405438797	31.0116466574812	4.61739211234898	35.4889656	25.3753347	12.2670294
57.1290310444913	31.3024158582227	4.61450252403061	39.7157151	22.5518047	13.0027284
57.1311222968581	31.5954791887477	4.61161285089099	44.272376	24.1529526	16.7575015
57.1332145021946	31.8903119329068	4.60872305394827	49.4509792	19.23293	17.9552005
57.135307638508	32.1879092679551	4.60583306228118	57.0336699	24.3925592	19.6603049
57.1374006160223	32.4871128249362	4.6029428147913	62.1996928	26.9322785	20.2466983
57.1394899937414	32.7874192686035	4.60005217057564	51.358437	31.183912	20.2786449
57.14157925549	33.0886095787197	4.59716116260775	39.21475	31.0795566	21.1487172
57.143669230035	33.3915474128195	4.59426961500526	37.130172	34.1670861	22.6509329
57.1457933576256	33.6738635809889	4.59133011686346	35.0133629	33.6653342	20.0549291
57.4778910236975	33.9737568928032	4.4690194496762	36.9545772	32.1019086	19.1323386
57.8295785424087	34.2759023013626	4.34512763498925	40.565033	30.2350611	14.624538
58.1866637322698	34.5796391123798	4.22101152091038	44.6441662	33.1239716	16.5654644
58.5476108448033	34.8844153652124	4.09667388829754	44.7688336	34.8472485	18.3927145
58.9130170631571	35.1900287901746	3.9720101009209	48.2549784	40.2375649	15.7273532
59.2815401955623	35.4957417301152	3.84715211000991	56.2067364	40.2417677	14.7422616
59.6515429157448	35.8016585565647	3.72214951361027	55.5353048	38.1752447	17.6684542
60.0233113465205	36.1080540524198	3.59690374944498	58.429274	38.9397266	17.4146787
60.3962084768243	36.4148441747126	3.47139711582294	56.98499	36.3050676	16.2652139
60.7705115234485	36.7223832912609	3.34567455315967	56.9481598	35.7189477	11.6860928
61.1461510670589	37.0307401174783	3.21986824623735	51.2078647	35.5791539	12.2358489
61.5245841162504	37.3400629986403	3.09395331963972	48.3601763	34.0464698	9.5017871
61.9067962348908	37.6506332293457	2.96798029916606	41.3950957	34.602479	9.5059407
62.2978448148368	37.9628384399824	2.84184118555123	42.5831476	37.1399223	7.4293369
62.6964067018564	38.2761243591519	2.7156398143643	38.9767874	28.6595996	7.54261
63.1569595469542	38.6039370388803	2.58850474079658	38.4714341	30.1541626	2.0837059
63.7170137665849	38.9471679014461	2.46157614588047	45.1705924	33.2150554	0.7183829
64.2909110161824	39.2926974746306	2.3347764740265	51.6262531	32.9510025	3.9807244
64.8733004445024	39.6401824514167	2.20801917604947	57.9600279	34.4089577	5.7051211
65.4615588363824	39.989272208625	2.08127663514308	57.8811625	36.8910334	2.4827855
66.0560977843829	40.3396975408073	1.95460011710754	59.7400431	37.5401839	2.8523374
66.6565925260207	40.6913843683169	1.82798317043524	57.9145816	37.4787407	0.4915272
67.2642703018623	41.0444733926905	1.70145729827103	65.884583	36.2103636	0.6036001
67.8762373288879	41.399147116195	1.57502032475754	65.5339196	33.299582	2.2513726
68.4932723371263	41.756153959383	1.44863006697565	66.7264937	28.6241638	4.754423
69.115737857829	42.1166215570449	1.32222108619886	69.6772126	28.9703915	6.8785128
69.7431380977125	42.4807296520928	1.19573001504148	62.0390375	27.7696953	8.7011853
70.3799198642484	42.8491776806531	1.06908045999307	62.1748486	23.5386262	9.8971034
71.0308676159299	43.2264241661035	0.942074733701698	58.3586123	20.3359236	6.4801103
72.1165060997704	43.8659669703007	0.810816208445441	56.0727891	23.8686819	7.47443
74.0343454959186	44.793557162757	0.676897022735719	54.9748886	31.6899499	9.1125802
76.4332474010425	45.7890769145069	0.542337418492053	55.1300701	40.0588307	9.3430467
79.4734465032047	46.8170956516656	0.407264913845417	61.8021468	40.7857588	11.6604123
83.1003448512038	47.8726027087095	0.27173658442938	61.0935569	52.6920317	4.4207174
88.0667336181901	48.9266180890129	0.13602853575863	67.1669184	49.4371849	3.0262948
Route: 4 Length: 4.07503967555228 Demand Met: 657					
94.5435579672318	49.9999997765334	9.77514943656388E-7	77.8566059	47.3210428	1.4302369
94.0761094166146	49.9999995837522	1.46359653285799E-6	73.6483802	37.1698351	8.0638871
93.632315563943	49.9999993910757	2.00217725065954E-6	73.6393721	37.6930766	12.5724621
93.2835854619303	49.9999991978693	2.56188497971266E-6	76.1612584	37.0439506	15.0269683
92.9624842874373	49.9999990047498	3.12996322904269E-6	74.2228108	38.6099587	15.750928
93.0386602566479	49.9999991706675	2.65381919106744E-6	72.24704	39.7077335	13.756154
93.426375592818	49.9999993308682	2.20795097050086E-6	75.4422908	46.5496079	10.6773392
93.8224969085907	49.9999994909888	1.72110700447092E-6	73.3690079	50.7128517	12.3210863
94.2220394301205	49.9999996505148	1.30404086817748E-6	77.1618533	52.0527053	6.1051205
94.6119723997318	49.9999998098972	8.24718597414176E-7	77.6409989	49.4044045	6.2831565
Route: 5 Length: 151.182426796527 Demand Met: 4997					
80.2684359978156	51.5280857879796	0.294628025989105	64.4543682	70.2655389	2.1929672
73.4263836465178	52.900385101344	0.588457771797501	61.6425082	72.8564323	6.6704147
68.3747566788483	54.1758132450758	0.880671499899542	54.3749565	73.471727	7.5546522
64.7065033718186	55.3382610090516	1.1704687671348	47.2434466	72.8348775	10.3871125
62.928365652696	56.2252557781185	1.44861988146137	46.8228713	71.844353	9.3127449
61.3304079306687	57.0835557599848	1.724973806317	44.3710695	67.9205927	10.1383529

Solution x	Solution y	Solution z	Original x	Original y	Original z
59.8434614927354	57.9346587623372	2.00013911342755	45.412979	71.2677197	7.8505587
58.431096992262	58.7785011327509	2.27469484560008	46.0567355	72.019762	4.0391076
57.0706552310766	59.6185331933094	2.54922215067883	43.6827488	74.1878852	3.8851851
55.7662931803137	60.4507589777878	2.82374730251426	42.9598051	72.0704928	1.9046969
54.5052415023842	61.2813368389281	3.09851833890926	45.5118999	65.9532613	1.4856264
53.2726371758094	62.1176297629547	3.37355123620857	50.0180258	68.4527432	3.6702061
52.0601094700578	62.9588779737832	3.64872308638872	49.4827685	84.8462228	4.1362821
50.8709363699921	63.7755462891191	3.92397046969502	48.3895216	84.8378656	6.8593636
49.7030604620779	64.5734910702426	4.19893881605243	49.7030604	90.8227548	10.5216088
49.0150823456602	64.4595828302498	4.19893882330747	50.0446513	86.3510967	14.724494
48.3299598211124	64.3448083174562	4.19893883422292	47.9098314	77.7959758	13.7573709
47.6497809794823	64.2300024912819	4.19893884672454	45.3765455	76.9954785	11.855076
46.9753026406901	64.1151948694117	4.19893885793321	43.3709663	79.9295648	12.3122786
46.3073925093856	64.000283607419	4.19893887078656	40.9923031	81.1407106	10.4646561
45.6471040788989	63.8852181829229	4.19893888718042	39.6568849	80.0063838	5.1586736
44.9940993787152	63.7700633020151	4.19893889850861	37.6570142	81.9317057	5.2409906
44.3497485602135	63.6547091307145	4.19893891244134	34.482979	80.365325	2.7097027
43.7152669498653	63.5391967938383	4.19893892740799	28.8394854	85.6978668	0.4508897
43.5055946691315	63.2870929486798	4.19893893620531	25.1363027	82.596723	1.6788626
43.3271273121952	62.9659271513744	4.19893893808531	25.8819635	79.9487476	10.2285525
43.1518247309787	62.6366182889647	4.19893894934482	28.3264783	80.6515072	10.7169993
42.9784630047653	62.3013730065702	4.19893895974214	32.0336769	81.0046037	12.2328895
42.8062506374375	61.9618373422568	4.19893897162002	38.0621359	81.3957333	12.1235509
42.6345513408082	61.6192540280599	4.19893897996898	41.3355343	82.7796974	17.0555529
42.4631916924888	61.2661572840204	4.19893899190578	45.3945603	79.9114427	16.0984045
42.2918147205324	60.9091539756904	4.19893900241193	46.3729602	74.0499355	16.6434815
42.1204976715551	60.5514225406348	4.1989390108986	50.8238583	67.1806384	20.6239323
41.9490430628891	60.1939900891447	4.19893902168619	43.8195847	68.1613988	20.4285954
41.7777775119486	59.8367825267082	4.19893903073356	37.7594155	72.4638416	24.7804303
41.6072414525675	59.4743815651764	4.19893904831401	35.1926471	70.9963316	12.3857242
41.4371958650803	59.1119129207645	4.19893906507308	30.51178	74.0433946	6.2558417
41.2678702361259	58.7482543947169	4.19893908019466	29.1113171	69.2428114	2.3178943
41.0992226246846	58.3845514675307	4.19893909181076	37.415218	67.1119326	2.4786359
40.9309317921177	58.0213164108917	4.19893909972063	33.1471098	60.1558513	4.4414558
40.7630908965817	57.6593580205197	4.19893911123323	43.0002757	59.9692573	5.0791111
40.5954542803528	57.2984966676296	4.19893911690208	45.6990417	60.3070344	11.94067
40.4278986299497	56.9384252771329	4.19893912785278	44.2906965	51.8898251	11.3116798
40.2604742145721	56.580225255644	4.19893913810216	31.5095969	51.0684653	11.523883
40.0935295949879	56.2241001450259	4.19893914688328	30.0937988	44.3308943	14.5383671
39.9272197331643	55.8714300452667	4.19893915879089	32.8302989	42.2309887	13.616708
39.7614014519391	55.5222887300127	4.19893916866537	37.4597811	44.2188485	16.422469
39.5958620584911	55.1760508814329	4.19893917769954	36.1244237	41.0242921	19.6707957
39.4307033639174	54.8342673525156	4.19893918720742	26.2175773	40.5220972	21.9150058
39.2709574986084	54.5176064439589	4.19893919906784	25.8175111	47.2716024	20.9185995
39.1122587794756	54.203814974816	4.19893921144559	28.018456	49.9258106	18.7011667
38.9541734846634	53.8916881755899	4.19893922424896	23.2467308	53.1536864	15.3512789
38.7968931611651	53.5807269508858	4.19893923731021	21.0216738	51.8703093	12.3795264
38.6405002988765	53.2710281217245	4.19893924797699	20.6501388	50.1791373	13.3126618
38.4850480693831	52.9628019486947	4.19893925774882	20.3277951	46.570702	14.9318681
38.3307311103075	52.6568342762806	4.19893926631723	18.6253841	45.1799856	19.5247549
38.1812169499519	52.3586812087928	4.19893927797263	16.0956015	47.1989931	18.8482809
38.1812169520064	52.3586811852116	4.1989392744155	16.954408	52.9270638	19.3144339
38.1812169541029	52.3586811616352	4.19893926968923	19.3270801	51.9549025	21.8491926
38.1812169562182	52.3586811380739	4.19893926513944	22.9209187	53.7233909	24.603033
38.181216958325	52.3586811145103	4.19893926213526	20.4303529	56.6155569	23.1754411
38.1812169604347	52.358681090949	4.19893925939834	18.474215	58.4012448	21.6380189
38.1823959583787	52.3574790020073	4.08187541657529	18.1200543	57.6122523	16.2352309
38.1835750474028	52.3562769098612	3.96428943695023	17.0586402	58.0717087	14.4615884
38.1847542420386	52.3550748154739	3.84621737151961	16.1987878	59.3187745	15.8426137
38.1859337215851	52.3538726768003	3.72657378747202	20.3908302	60.0437447	17.3381089
38.1871132832093	52.3526705430083	3.60637948695413	26.1534967	60.2417469	15.9637624
38.1882928691028	52.3514684316494	3.48597255373539	25.824676	62.4300357	22.6279041
38.1894725255109	52.3502663087549	3.36428764223512	32.7632095	61.4478694	17.2734289
38.1906521585587	52.3490642160539	3.24237466820441	29.6716712	65.8677857	16.615982
38.1918317973912	52.3478621196347	3.12014624625273	20.1950128	67.681815	12.2807597
38.1930115872933	52.3466599372236	2.99716748513134	21.5799527	71.4486566	7.5717836
38.1941915534693	52.3454575793275	2.87373168916847	23.2409835	69.6045703	6.9223743
38.1953715771925	52.344255157699	2.75018641933082	23.3330747	67.4297538	2.1722534
38.1965516415248	52.3430526976858	2.62671202674273	21.4467307	69.0185063	0.8942161
38.1977317767071	52.3418501711152	2.50336753149998	21.6218153	70.9164832	0.5487705
38.19891201415	52.3406475249377	2.38020957252494	18.5593029	70.8497614	1.5511613
38.8164472412321	52.3126650351839	2.3554672448241	18.3784185	57.1026507	1.60641
39.4519455143424	52.2846870616307	2.33072782561472	15.5276897	59.9411898	0.034091
40.1526793456032	52.256694326494	2.30599545681833	17.9198509	62.5969087	8.2401641
40.9285099529498	52.2286739772889	2.28124498776813	23.9069485	59.9121563	8.8002389
41.7261193747102	52.2006611948164	2.25648946597315	24.284459	53.5118781	4.6981631
42.5439173056039	52.1726580232774	2.23173366997133	22.4746551	48.1041051	9.2672876
43.3966172579458	52.1446688199622	2.20697130524116	25.3533813	42.3962835	8.9845466
44.2839948911889	52.1167013041711	2.18220311884011	28.2512087	43.1796715	6.8189779
45.1974534060474	52.0887512595812	2.15743364082897	34.4981613	43.6098189	6.3838863

Solution x	Solution y	Solution z	Original x	Original y	Original z
46.1279765907168	52.0608157382378	2.13266476365615	37.6481264	47.8813096	6.5793036
47.0729848865483	52.0328903827427	2.10789731417354	40.4352515	45.1450838	11.9573703
48.0325281347937	52.004976622872	2.08312682949014	39.4220046	48.156385	14.5273965
49.0099286407253	51.9770716706688	2.05835027356443	38.9617732	51.3997809	16.210445
50.0089957600646	51.949172160974	2.03356457856272	39.5709227	52.0192185	20.9490324
51.0400938993113	51.9212777561127	2.00875694705725	44.8729194	51.9811136	24.4648411
52.1016816840709	51.8933887482072	1.98391174657291	47.6524078	52.2249928	24.4877735
53.188902632527	51.8655057784658	1.95903126139137	46.3458684	54.8708712	24.5219613
54.3167169476939	51.8376237663475	1.93410709280249	51.8847181	57.7017397	23.1071854
55.4658180509722	51.8097415910025	1.90915388256991	56.0822206	62.8731122	23.9833277
56.6264206420628	51.7818361958857	1.88414157470783	56.5346421	68.6367247	22.9662555
57.9814953709252	51.7240803338441	1.82406544691739	57.43771	71.1535593	20.5447257
61.0715640481658	51.4106417947854	1.49155492111728	56.7397866	71.0931061	18.3430984
65.0316513048693	51.0704070636598	1.13196353516101	58.1838222	68.9986011	16.3418061
69.7277340817959	50.7229055220278	0.764493478304558	57.8283627	65.6998258	15.4827548
76.023772659763	50.3705018792702	0.390072100606389	63.772212	68.1836695	14.3458559
Route: 6 Length: 131.364836376155 Demand Met: 4980					
90.0486711868513	50.1353294145099	0.588236201415164	79.80288	56.0883078	18.4129389
85.953275854428	50.2694180243391	1.16429237525464	79.155929	54.6404138	23.5670664
82.4212833561207	50.403444610757	1.71628409227353	67.7686962	50.942416	23.8888342
80.9649138948063	50.537310593266	2.13449716069734	65.8501112	46.5185477	18.4012114
79.6144281685643	50.6715375183299	2.54597875206046	63.3830619	45.6708392	19.4411223
78.387506093127	50.8064183737498	2.94774399367408	62.9728444	48.2610974	18.088966
77.2260730710137	50.9418165356444	3.34462677251669	58.3317264	48.8464518	15.1551224
76.1386161048264	51.0776162094608	3.73740606180713	55.3536754	50.0230289	15.6187386
75.1467971888137	51.2136826379744	4.12397660201214	57.7424662	53.0431767	19.7584506
74.2141923568284	51.3497535334013	4.50356553742938	57.0032853	47.929495	24.4820709
73.5789525404153	51.4876751926926	4.81600935687743	54.8328865	43.6672378	22.5503676
73.4517599789908	51.7063979507329	4.92623846210884	49.7681271	46.8278362	16.9025729
73.4132522695633	53.3340930012987	4.98100832076096	49.3212736	48.3119567	9.5488066
73.3749105032913	55.098361511731	5.03572631018259	53.3341085	54.2742297	9.8426206
73.3366845550079	56.9011247618247	5.09043580755001	54.2235528	56.265496	3.5115961
73.2985610613334	58.7449139522586	5.1451696995131	53.0250996	68.7918887	2.0307378
73.2605684377157	60.5332255520644	5.19994893706975	68.5426632	70.6500378	2.313903
73.2225807389908	62.3362367246806	5.2547608363357	74.4567732	73.8913977	2.9219836
73.1845310047833	64.1517928383304	5.30959854405646	75.4040099	79.0607348	6.3376777
73.1464325048384	65.9538736208468	5.36444943377334	77.2293497	82.6694496	0.4080071
73.1082983617146	67.7137896741796	5.41936155743061	78.2121151	82.5216358	9.4131561
73.0701501699755	69.4516297740878	5.47427655514682	72.4566884	79.8068651	12.2176684
73.0320249877942	71.195918716204	5.52918449369449	67.7945884	81.6777909	13.5506647
72.993936516446	72.944527447498	5.58408017831072	69.765468	86.0199863	16.8900143
72.9558783627189	74.6777970872684	5.6389399103054	75.6464183	86.4517504	17.8073467
72.9178326655193	76.4034121504409	5.69375908488015	75.0360354	91.1497098	19.4705099
72.8797947253951	78.0887558186624	5.74851300036958	77.3466754	92.4222135	24.9773835
72.8417346910265	79.650141560981	5.80304148235321	75.4923392	99.8090463	23.5616918
72.5569573891546	79.6563697046106	5.80953131897723	79.9522127	98.0359405	21.2412381
72.269928712386	79.6626408737351	5.8160219584416	76.9820609	94.8106777	15.132467
71.9828625977517	79.66891225981	5.82251227823473	70.4834315	96.1070737	18.6164445
71.696739588947	79.675184376055	5.8290011962559	68.0410206	93.0677269	14.2384361
71.4118861944266	79.6814582220394	5.83549003758351	64.0121883	92.7907393	13.624016
71.1287495351945	79.6877345445541	5.84197892824399	62.5782193	94.8345715	12.3846974
70.847464396702	79.6940129514863	5.84846810392644	64.4754864	95.6952093	9.6236824
70.5676272732796	79.7002926303015	5.8549582120936	66.3729212	97.9005203	11.9390694
70.2889825522818	79.7065715082049	5.86144832522292	66.5761879	96.7049476	8.0800553
70.0114118955154	79.7128501614164	5.8679395347407	67.3268965	96.007007	6.0328841
69.7347666670729	79.7191287735119	5.87443242707499	67.0620012	97.8077872	5.6584534
69.4590321318614	79.7254060467274	5.88092713707253	68.523768	98.3881808	6.8534875
69.1839898677032	79.7316811597962	5.88742313819857	74.8496365	95.8479299	7.1137605
68.9087466406951	79.7379539258097	5.89392027554333	77.1265753	88.6843079	7.3792466
68.6332911583004	79.7442280978851	5.90041823814478	71.4909917	88.8238404	7.979611
68.3583493006386	79.7505046296055	5.90691688366276	71.5874534	94.5399994	3.1033191
68.0836296064883	79.7567801316718	5.91341854649362	72.4289329	91.88372	3.0217722
67.8090670946779	79.7630560004178	5.91992339833267	65.7364961	88.9695394	1.2659879
67.5354668443834	79.7693350761937	5.92643200843649	61.0866811	94.7582572	1.1597592
67.2632743645171	79.7756145257376	5.93294515800676	61.1689993	94.8861498	0.1686343
66.9924045003318	79.7818940142152	5.9394638806994	63.2522018	99.6147456	0.7669575
66.7225631805324	79.7881626574487	5.9459905283361	61.0701287	98.8683739	3.7920781
66.4540033025929	79.7944250118401	5.95252200017553	62.3573907	96.159986	6.7572642
66.1864718540524	79.8006863879118	5.95905673849779	63.7965883	99.8649883	6.5257645
65.919677469246	79.8069399053424	5.96559587851414	61.4066356	99.633296	10.2157007
65.6540358265538	79.8131852588678	5.97213798847045	56.5514993	98.5201232	15.0548231
65.3907804361716	79.8194156066758	5.97868219845176	62.6982725	97.3778678	18.7400798
65.1284464956366	79.8256376292392	5.98522481999132	61.0630253	98.699805	24.8594975
65.1284464229311	79.0732310017533	5.85147652002429	64.9776601	99.8572829	20.7305349
65.1284463503216	78.2151638727396	5.71582365792008	64.3381393	93.722702	21.2607142
65.1284462777332	77.3401853616691	5.57960891262778	60.774398	89.648206	21.5223541
65.1284462051651	76.4579888290198	5.44293100094183	63.9530194	87.4245185	17.4311618
65.1284461326131	75.5753598344772	5.3060715656292	62.4719528	86.6470186	17.4140053
65.1284460600903	74.6914721690223	5.16902878324094	56.1389342	85.561632	20.0765614
65.1284459876219	73.8016342633924	5.03158500240596	49.7783583	78.4397036	19.1457188

Solution x	Solution y	Solution z	Original x	Original y	Original z
65.1284459152208	72.9148363902009	4.89370393185498	50.7478618	74.0551131	24.8207298
65.1284458429284	72.034267421375	4.75422775156994	51.7496653	79.9144917	22.4057667
65.1284457707101	71.1429814833794	4.6137829253658	52.878421	80.2956919	22.1921533
65.1284456985531	70.2385751419816	4.47241876152169	55.0653569	81.234009	22.9552522
65.1284456264637	69.3116580578709	4.32992908586238	59.1397084	81.6064397	24.1713239
65.1284455544393	68.3523695642572	4.18604902949333	63.6802314	81.8267454	23.9676687
65.1284454824674	67.3557157173125	4.0408108481379	67.3900644	74.174693	20.6721334
65.1284454105205	66.3613221752747	3.8951670937514	66.8428254	74.9418962	18.8280244
65.1284453385868	65.3673158466762	3.74920152911184	73.2290706	73.9762718	17.115174
65.1284452666874	64.3724427030348	3.60294240847811	78.4106856	73.5257917	13.7197973
65.128445194924	63.3725582932151	3.45648606871403	77.5651358	71.0148631	15.8380209
65.1284451232535	62.3705638476512	3.30972311292201	73.7932186	65.1929118	21.2635249
65.1284450515975	61.3751658302199	3.16235978256676	74.3685871	61.179785	20.6768635
65.1284449799402	60.3915429727691	3.01442571498707	70.748982	60.565778	20.2126548
65.128444908249	59.4189715627455	2.86602474707824	69.1126526	61.5737532	13.3447692
65.1284448364854	58.4554200688178	2.71749459377538	69.6306367	57.4599551	14.1507992
65.1284447646173	57.5035223259925	2.56879519880928	66.0988248	58.3515559	13.6719306
65.1284446926259	56.561278848915	2.41993903113269	65.5436157	56.992435	13.1266946
65.1284446204951	55.628735281967	2.27093108488378	64.4880133	60.4854675	12.6069191
65.1284445482065	54.7021292357542	2.12176350904337	61.6781701	59.473286	10.2741841
65.1284444758618	53.7813816265589	1.97249245354355	64.6626599	65.39963	6.8345581
65.1284444037996	52.8571996872104	1.82316665845599	57.0800315	64.0172849	6.0370203
65.1284443323153	51.9260299956532	1.67381405512445	48.6878693	60.2173135	5.6974781
65.1284442611533	50.9906758930044	1.5244204742468	38.128444	50.990683	1.5244057
67.5822758561978	50.8657409433631	1.33433642941388	53.1446811	48.4277704	1.8438372
70.2150552787541	50.7412665217054	1.144399549514	53.5581269	47.7413894	5.6200486
73.1167286745731	50.617258177894	0.954373391106316	58.9987357	45.7674431	3.4982849
76.2883166197402	50.4936547069465	0.764359558257734	63.3053921	48.8331121	7.8682203
79.7686263954314	50.3702423405317	0.57413609970261	64.136723	44.5156078	8.6797357
83.75326449718	50.2469389575782	0.383493199199066	67.7343836	45.7338412	11.9249335
88.5408356403501	50.1239329332397	0.192090066816593	69.2934493	49.5142976	7.1641629

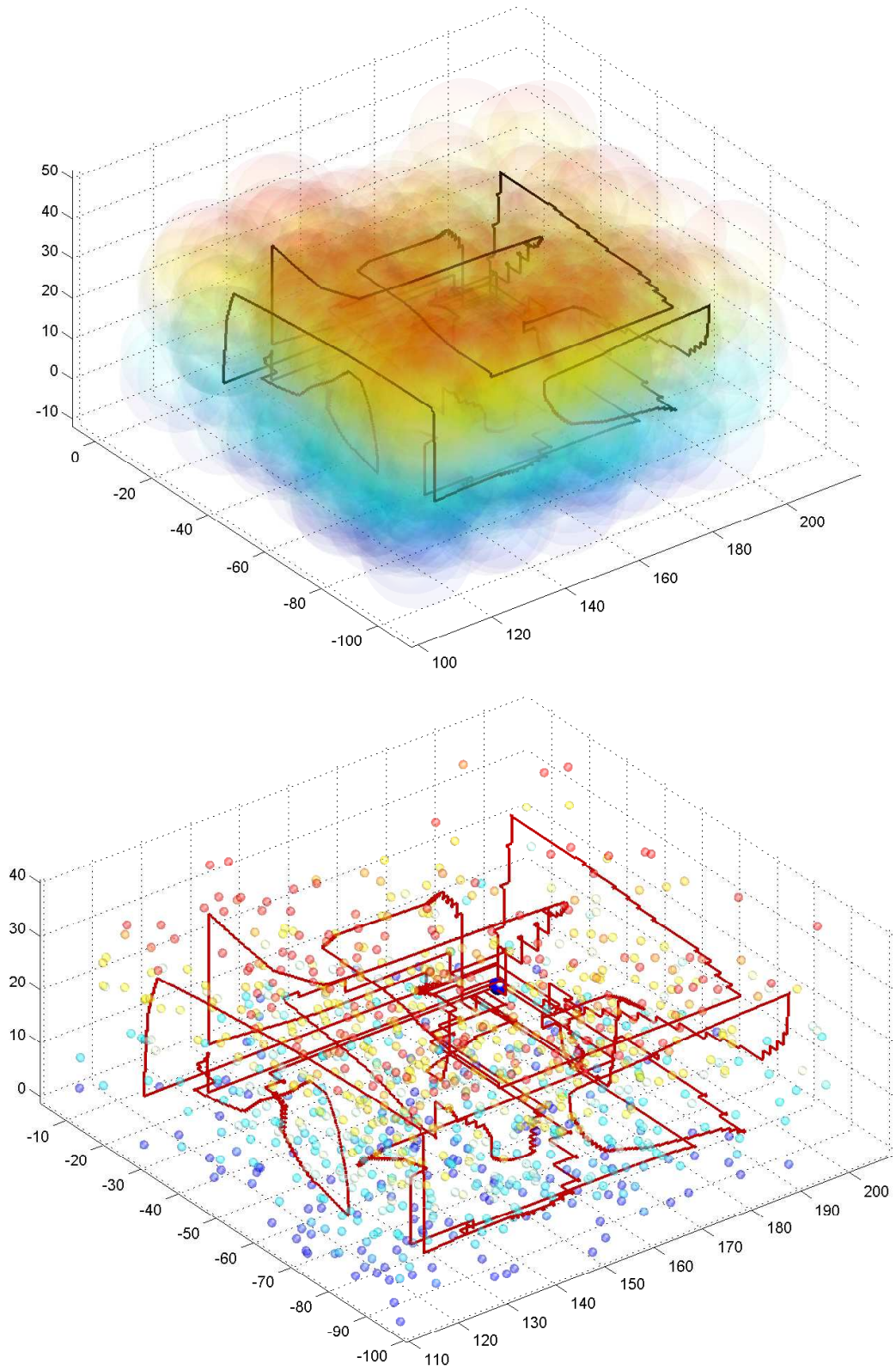


Figure O.173: *bonus*1000, Equal Radius, 3D, Manhattan, Length = 2495.8164297

Table O-176: Solution for *bonus*1000, Equal Radius, 3D, Manhattan

Total distance: 2495.81642974937 Total demand met: 25289 Depot: x 80 y 20 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 249.662260413569 Demand Met: 2988					
77.1822937444178	25.8672100851507	0.284769157419316	87.03899122	21.09553754	1.216015821
61.6900036486429	56.7476635146116	0.565943666627152	54.15102156	63.89433124	1.875052021
59.019984191749	58.8351806719494	0.843414175183861	50.29671492	64.07582579	3.765527546
57.2385665999919	60.6175650285722	1.11642679400761	53.04622082	62.56220406	2.597564218
55.5658762592	62.4238926005535	1.38906047037893	52.45383187	66.17944394	1.57361944
53.9757372843821	64.212238899598	1.66187019307057	50.86986196	67.11854893	6.466301231
52.4685624630263	65.988267062802	1.93243770562583	47.89205446	67.3947139	7.919602812
51.0704788446283	67.7838789225824	2.19966746404981	53.60239056	70.80290226	5.406808424
51.0704788446283	67.7838789225824	2.19966746404981	51.17754367	73.39508539	6.606709632
49.6837214656362	69.4865626324321	2.46354841756097	53.90080059	74.55382457	8.588853077
49.6837214656362	69.4865626324321	2.46354841756097	47.14165764	77.84331314	10.33249494
48.7445339386367	70.0413930745312	2.66493865110266	49.55654528	80.81624315	0.169379697
48.7445339386367	70.0413930745312	2.66493865110266	47.92908542	80.11129273	4.265931676
47.8128647579066	70.4609971715348	2.86930115308832	48.20934555	82.30314786	4.491594241
45.9315389200351	70.5197173072464	3.01303546753185	44.47086767	80.17305261	3.885836986
45.9315389200351	70.5197173072464	3.01303546753185	45.32225765	79.26748614	7.718311017
44.2549489151072	70.5774657925428	3.15513554682025	40.58416037	81.54961967	6.0287924
43.8175652107935	70.6229644188892	3.2750499623231	38.24583972	80.95791524	3.839199962
43.4916348748831	70.6660293430408	3.39392817603011	35.03662295	76.31902131	1.401481412
43.4916348748831	70.6660293430408	3.39392817603011	36.44207057	76.13900165	9.824805701
43.2035155964629	70.708636120235	3.51073950044064	33.85806756	68.2147305	3.068667124
43.2035155964629	70.708636120235	3.51073950044064	34.30971303	75.90183293	2.096267325
42.9399008065632	70.7511686612266	3.62810683526022	34.32584869	66.311045	4.144300462
42.6850169588892	70.793846457845	3.74543019573987	36.53251416	65.89826385	3.47943245
42.4340658032213	70.8366378351667	3.8628320667054	38.87334077	61.97418169	4.472466865
42.4340658032213	70.8366378351667	3.8628320667054	37.36735143	64.72519961	6.841621681
42.1901016400637	70.8798203846868	3.97978432656744	38.55825219	62.0328479	1.356643655
41.9499814892019	70.9232934800776	4.09731799087889	43.40294282	59.60424206	0.51389979
41.2139761093758	71.2437279731656	4.6200944836875	39.83687168	68.05987049	1.771904532
40.4872773050206	71.5675417133777	5.14820236094285	39.75179858	71.51477588	1.359571846
40.4872773050206	71.5675417133777	5.14820236094285	38.19879917	73.45302115	2.159211899
39.7787973103608	71.8928762772123	5.68878699662203	41.30767537	70.05965636	6.684179381
39.7787973103608	71.8928762772123	5.68878699662203	41.95376322	74.60739468	6.926728294
39.0687059286231	72.2207659850098	6.22746571064582	31.34183617	77.86791685	6.462154326
39.0687059286231	72.2207659850098	6.22746571064582	28.44331265	74.98671685	9.740464776
38.6485852047441	72.5233816434907	6.69661095873212	38.00030199	82.20200968	0.019607641
38.6485852047441	72.5233816434907	6.69661095873212	36.17809574	80.13104248	5.688631409
38.2508965963836	72.7019152701931	10.6293725145304	38.25086273	84.70191635	10.62939488
38.2508965963836	72.7019152701931	10.6293725145304	29.05539546	78.84402949	14.28609887
37.8399242704053	72.6820661059103	11.4442324366829	46.11608956	79.13405595	12.05021293
37.3813335395973	72.6621421045293	12.3091330086035	36.88863481	65.11756178	9.028914476
37.3813335395973	72.6621421045293	12.3091330086035	39.12047899	68.75765335	13.33882614
36.9272884834753	72.6423443514694	13.2080391880631	44.96838238	64.05706864	11.93558957
36.9272884834753	72.6423443514694	13.2080391880631	44.13660931	71.38940487	9.812814914
35.1709321108771	72.6230967377972	14.4685518402988	40.91327599	65.05437313	16.01674823
35.1709321108771	72.6230967377972	14.4685518402988	37.43465738	70.14594443	13.87115315
33.1297326751584	72.6039191444376	15.7227208064573	38.18944723	65.54612606	17.9243242
33.1297326751584	72.6039191444376	15.7227208064573	29.47881008	65.01108227	16.71360152
31.0876507188904	72.5848384031141	16.9441993466369	26.36495426	64.10386589	19.00754119
31.0876507188904	72.5848384031141	16.9441993466369	21.61039636	65.83676525	18.75923326
30.5737534870412	72.5661042477285	17.8696130339863	31.96159565	70.60936436	21.8177247
30.0593416237575	72.547381183086	18.7789751509577	38.05290287	66.43336709	23.58284008
30.0593416237575	72.547381183086	18.7789751509577	32.14669335	66.5741861	28.83764483
28.974265805963	72.529260931745	18.9914468663709	19.47269695	75.25893863	20.7798111
28.974265805963	72.529260931745	18.9914468663709	18.49430275	75.1491321	23.37172362
28.5195145628358	72.51104974889	19.1859268167181	21.51917751	80.74471553	21.88319617
28.5195145628358	72.51104974889	19.1859268167181	20.11668251	80.56671914	21.763779
28.4403447047951	72.4891901628094	19.3010683267778	32.56942546	80.98884638	22.4278796
28.3608089491065	72.4672247294625	19.4156383045309	31.67974116	78.20082263	20.94127433
28.2811689591015	72.4452417735441	19.530171227174	31.54519137	79.16359507	27.34637643
28.2009628382774	72.4231230801272	19.6421931470096	29.09610379	74.18683092	25.64666307
28.2009628382774	72.4231230801272	19.6421931470096	32.43971284	75.52883521	28.48064207
28.1202642378643	72.4009654625054	19.7519727778161	29.7776223	79.3796747	28.90759999
28.1202642378643	72.4009654625054	19.7519727778161	22.95220857	73.2582761	29.61659281
28.0391609144497	72.3788723006384	19.8454275291951	22.14002238	72.37729838	30.29531679
28.0391609252614	72.086500570238	19.8454246776813	28.17365085	71.94302821	19.49378883
28.0391609252614	72.086500570238	19.8454246776813	19.17901123	72.48982593	17.20855307
28.0391609362865	71.7957669517643	19.8454218263219	30.01509861	69.93828769	21.72402497
28.0391609362865	71.7957669517643	19.8454218263219	28.77703399	67.75671878	24.26797752
28.0391609473053	71.5098093079139	19.8454189749194	26.36749261	61.24478927	19.91950535
28.0391609583518	71.2400826751119	19.8454161235401	24.58618772	59.92581691	21.04332426
28.0391609583518	71.2400826751119	19.8454161235401	26.46280572	62.61127777	22.19141047
28.0391609694816	71.121034084982	19.8454132715875	24.00842436	69.26671548	26.32388978
28.0391609694816	71.121034084982	19.8454132715875	24.37529212	73.10827156	29.72637521

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.0391609809103	71.0013972586337	19.8454104341498	24.68488711	59.85199485	22.75052505
28.0391609809103	71.0013972586337	19.8454104341498	26.03259253	67.05188068	24.42560707
28.039161000718	71.001396546546	18.1104322503506	16.80968797	72.84815948	15.34934359
28.039161000718	71.001396546546	18.1104322503506	20.16006997	73.55306832	21.43875646
28.0391610208949	71.0013958342864	16.99680082149	24.57644237	79.57543571	13.43961074
28.0391610208949	71.0013958342864	16.99680082149	18.15532249	77.80652015	16.99185344
28.0391610651772	71.0013946700825	12.9639382301637	23.39691794	71.43920824	1.906907845
28.0391610651772	71.0013946700825	12.9639382301637	26.6523776	66.91672378	14.68008016
28.4205795270326	66.694122118214	12.9770365179986	28.17203359	56.51587977	9.985576368
28.803848867935	64.7139981461889	12.9901864667253	28.86030824	61.83789689	13.23528428
29.1880529789004	62.8551057061735	13.0033475353593	28.66025221	61.13181458	11.59083816
29.5736783099541	61.0735747306119	13.0165286723367	28.38294287	59.7022254	11.36065683
29.9613370603635	59.3541822305032	13.029734943777	34.15128455	57.37934974	2.952751483
30.3300290549681	57.8612749995212	13.0430836283782	32.47933058	60.09950546	10.14811096
30.6980547621343	56.365746629701	13.0564673778627	36.99117209	62.09652931	16.1628835
31.0577103976724	54.7347969111645	13.0698304467057	32.83493269	54.50530143	23.93617923
31.0577103976724	54.7347969111645	13.0698304467057	26.97467166	54.66512134	21.38913798
31.418848386686	53.2036979714671	13.0830171077457	33.45872958	53.85918585	23.94292918
31.7726593867331	51.6620361671716	13.0960923395298	33.45977848	51.47641849	1.316430254
32.0674726031217	50.3086317971472	13.1098877962355	31.12121771	52.61678334	1.82071962
32.368903249464	48.6297982297521	13.123920143064	27.13020332	56.00735022	18.32075531
32.6806609787115	46.4397839442238	13.1378913065004	28.72359173	49.06807614	23.44175989
33.012184339234	43.5780076479088	13.1517089259859	26.567735	46.7768569	17.70634543
33.3514510008949	40.5368174931888	13.1654944437243	30.33187934	43.75504148	14.96541955
33.6935977788974	37.400929144701	13.1792803331132	35.17250587	39.36136713	13.28284014
34.0356454069158	34.241916834078	13.1930793897455	37.51752459	33.09106605	16.01141602
34.3760310826654	31.2125085627228	13.2068675985563	40.57036155	31.31828969	15.51939441
34.7120344723179	28.2278248955733	13.2206491274456	31.17947294	31.40633137	5.155453447
35.0534228092841	24.8989069492968	13.2345261346311	30.34406593	27.74432368	15.48974465
35.3990036753699	21.3974548717276	13.2483988188154	38.38951699	19.65672727	24.71703453
35.4853123509297	21.2179614657239	13.2581177420917	24.70443529	26.12365999	11.74081492
35.6343392156127	20.927290229381	13.2679243651885	29.56587444	24.57869021	18.08116751
35.6343392156127	20.927290229381	13.2679243651885	28.59013959	24.83311171	20.75915805
35.7902470397924	20.6260614319456	13.2775881797648	35.53984032	15.99196501	21.54085765
35.7902470397924	20.6260614319456	13.2775881797648	36.2315122	27.60710766	22.87055815
35.9444723028687	20.123919581623	13.2868865520098	35.94447387	20.12395641	25.28688733
39.2323939988464	20.0935581387516	12.276703951736	37.07046765	30.04479215	18.0646406
48.6667710608103	20.0624844256339	9.83474210300485	46.26887105	26.53209753	18.29584073
70.1758060339561	20.0313583863259	4.48875712837915	76.68650337	13.86956158	1.8774276
Route: 2 Length: 358.639227406493 Demand Met: 2881					
68.3770254145815	25.1187386130407	0.593686539169038	59.11600598	27.89604561	4.171146498
63.8437600095563	29.4210351015826	1.17019807605647	64.88897514	21.58345165	8.959362969
58.8856696832581	67.0613876834402	1.68777722731734	58.21523833	76.77458472	1.682398914
54.2683574730222	74.5997335546534	2.20574790011458	57.82109764	79.24611201	0.587934441
49.3685222398107	81.5354949842558	2.72636188652548	46.25821854	91.17761288	0.218810451
45.602004920603	84.8139053996003	3.25945432172618	44.01236363	95.54242778	0.007676566
42.6252893189162	86.1727417763409	3.8330540456044	42.23200248	88.95299773	4.136491045
39.7119230771362	87.5319900687704	4.40689598368821	39.47053756	98.01039691	0.046804559
36.9183750800115	88.3988801664848	5.04675366344361	35.55901251	90.85604615	4.893665446
34.2071987270748	89.2669308503432	5.68772801258254	26.20322759	94.45704722	0.043122659
32.5171179384134	90.0484385124935	6.39906233085343	33.84742868	94.52834747	10.85109907
30.8198540708271	90.8223731908996	7.09935177353612	30.51609732	92.20951413	14.80192542
29.1417138841807	91.5979721401364	7.77614279840396	24.92385591	92.07997464	15.00916266
27.5597543090243	92.3788581741361	8.42997113821451	27.32463884	98.08040747	18.9687539
26.7742307332788	92.4421168568715	8.46612057532819	22.06521104	97.80973943	1.986453498
26.0214743228679	92.5051538118784	8.50238012016663	25.24294214	93.18181598	14.28875041
25.2732416046472	92.5682157778706	8.53861419830789	23.23282295	99.37897746	14.24859303
24.5374572666472	92.6310770565047	8.57480895306646	27.03699297	98.99807723	18.13725322
23.6200534697255	92.6914760926514	8.60979715112132	25.58817455	94.62259734	16.80660453
22.6930284604672	92.7518584337834	8.64472257364198	22.62104276	94.03699994	18.3046068
21.7707920142188	92.81223023065	8.67953802927686	23.10855555	93.46528062	15.33870171
20.8456956329694	92.8726321747086	8.71432011695817	22.19955839	99.83998701	15.37683497
19.9110993463708	92.9327951656024	8.74903361735903	18.56973911	98.93410982	17.86986814
19.0115471746926	92.9924944498313	8.78351229175589	21.95406549	97.08230078	10.07565883
18.1027050002665	93.0521684136509	8.81799869347984	18.10270516	98.29192556	19.61359774
14.9628244056066	93.0521684158417	8.62763957876169	17.81960057	98.01765152	13.9964983
11.6610208604295	93.0521684178478	8.43631184779317	4.44010970700001	94.87692744	8.233710837
8.82016686743953	93.0521684199916	8.24520350878669	0.846436707999999	97.15575264	0.271481864
8.83079908021799	93.0272552215304	10.3175537110154	2.510162792	94.82470236	6.564520873
8.84143647131151	93.0023439216263	12.5058253221197	3.319354366	86.8534104	10.89284525
8.85207918210845	92.9774691282435	14.7660418646439	2.88784862599999	89.80188387	16.96831616
8.86272660472498	92.9526143882152	16.9671827252356	1.72500424899999	93.73701725	20.97210735
8.87337966732517	92.9277643044117	19.0422025095156	3.212591442	94.51392157	23.83849287
8.88403650211468	92.9029162390295	21.0048684863608	8.327911253	95.97957355	16.39239366
8.89469365760118	92.8780674206096	23.0720966751004	11.51332542	99.95442641	21.54207323
8.90534880141828	92.8532005809765	25.2017707271311	6.625140742	98.72893978	20.20468371
8.91600535519387	92.828318712996	27.5307622905742	5.819691822	97.53170939	24.16806715
8.92666382279317	92.8034308948631	30.1027270067063	1.662890125	98.21483308	37.96621421
8.9454070060071	92.6858143888798	30.1244442748436	7.810086676	100	26.21604958
8.96415376740555	92.5675955746966	30.146178021557	11.04946885	95.30278919	26.87229799

Solution x	Solution y	Solution z	Original x	Original y	Original z
8.98289737097427	92.4493517445055	30.1679220989117	10.35439985	93.61856888	31.55963283
9.00163932615806	92.3311856833707	30.1896645427139	5.231683223	94.88567828	37.04813984
9.0203918140799	92.2128761117301	30.2113731912413	16.10416337	94.62212285	35.78598723
9.03911534916813	92.0943389647853	30.2330456840066	14.30638295	91.72702037	37.41288443
9.05782064511023	91.9759505637467	30.2546821683713	9.940095688	86.998178	38.16021851
9.07652300865642	91.8583365649205	30.2762795391521	2.643010323	87.48230483	39.26134045
9.09566387102953	91.7512501598627	30.2972140375021	3.115821998	88.00026043	26.66042774
9.11482152368541	91.6445479485139	30.3181606723919	0.539457489	84.81338557	26.32883597
9.13419923505512	91.543130807771	30.3392227688215	3.795442881	81.20966501	27.41200193
9.17897423471584	91.5280706888014	30.3711824442958	5.912402555	83.10767778	28.97692543
9.22381338617113	91.5130306363081	30.4031599882743	5.209294544	90.50333801	29.97691556
9.26869514288809	91.4979934760952	30.4351448028067	3.553988961	91.38716753	22.96960314
9.31369646403432	91.4829574239395	30.4672089672743	12.48771043	90.90107319	36.2773466
9.35866470041833	91.467923078539	30.4992403126631	18.21730526	92.48725442	38.15120003
9.40181923788766	91.4529472652509	30.530512404445	16.85080568	91.45389056	39.93862668
9.4018192603406	90.3461354438525	30.5305124065558	20.75129811	88.7330358	32.51930493
9.40181928101229	89.3995087017052	30.5305124052195	12.03430063	87.78817585	32.36153594
9.4018193016839	88.4708923924523	30.5305124038718	16.23739593	85.87006787	34.99641701
9.40181932235191	87.573103942448	30.5305124025068	10.82142722	82.89323555	36.78865334
9.40181934301833	86.7112087432479	30.5305124011177	9.701793671	81.23141394	32.23008983
9.40181936368602	85.8776495587819	30.5305123997198	7.992357197	82.08091397	36.27596397
9.40181938435536	85.0677974211023	30.5305123983018	7.936374341	83.63932008	31.96057141
9.40181940502595	84.269304011018	30.5305123968756	5.838459994	89.46110654	32.98505569
9.40181942569595	83.4621692994477	30.5305123954532	5.333729823	86.89695613	31.50319232
9.40181944636781	82.6542230476864	30.5305123940271	5.779054124	82.01317499	31.17715184
9.40181946704219	81.8558925178088	30.5305123925932	10.08146406	81.46406963	37.62633094
9.40181948771779	81.068130810659	30.5305123911413	1.83782096500001	81.06813079	39.8464095
9.43049799687563	77.3108768222141	30.42448642134	1.696022601	79.3379408	35.04130759
9.45923343491448	73.4021687549179	30.3180516522878	8.675234817	76.17385221	29.29611493
9.48797257118093	69.4796671552874	30.2117140078852	1.09685186199999	69.20060768	38.65184391
9.51826937535499	66.2113452327406	30.080545795138	8.07711459799999	60.52651503	33.72017469
9.54857493539726	63.3414095492125	29.9491284883917	3.390983182	60.32064994	30.61068338
9.57891337728915	60.6694248911258	29.8177418050965	0.102323447000003	55.05645207	30.68754948
9.6094618573342	58.7466269271772	29.6860842259748	3.166581108	54.38581172	37.35766501
9.64014144505001	57.1471344157575	29.551618654949	5.351054934	54.87903352	31.2051026
9.67084155119937	55.5912584754083	29.4171108731943	3.684518627	54.75346427	34.67646632
9.70158092685007	54.0662071034558	29.2820740866264	15.36448886	54.97389236	39.50883453
9.73191217150196	52.3338339512231	29.1283357187567	7.88086425500001	53.63419396	36.66849242
9.76225482480426	50.597807590732	28.9735786653149	10.16802995	51.02082052	39.350114
9.79259220293952	48.8656167903068	28.8152268940061	12.77181014	48.33401693	34.40572033
9.82291608986819	47.1614588659183	28.6562918955784	9.26512226200001	48.10149258	36.29819804
9.85324358641998	45.4588251781912	28.4962930260103	10.71615729	46.62293177	28.86994808
9.8835694409666	43.7609053453856	28.3363818834292	1.250751092	48.74029716	30.02493246
9.9139924695005	41.8739140684953	28.1760593667383	9.755265232	43.18329059	30.87649008
9.94441695412465	39.988300715738	28.0155885343604	6.302525489	40.0085763	32.06550398
9.97485773080064	38.1211741836626	27.8547640276849	8.013859219	41.41457221	25.49555223
10.005307072482	36.2213149204642	27.6943084216613	2.885836634	40.60849192	26.29324057
10.0358043757223	34.2136502471146	27.5342230582988	2.51827574799999	30.45426362	34.97941135
10.0665087872752	32.5948439187775	27.3684309109329	1.354188569	31.31594018	20.59719751
10.0974154352621	31.0681599960678	27.2073363581588	3.43019284899999	27.39779729	20.1502757
10.1284130385278	29.6655100207424	27.0489311995963	9.44237495500001	27.32019574	23.59921997
10.1594141106994	28.2893711474814	26.890995995425	6.71940622700001	25.73868862	24.12156356
10.1904316661248	26.9413675336675	26.7334749614748	4.953508892	23.81507206	25.41914679
10.2214771136034	25.6275292606392	26.5762301294883	4.281409798	24.72152663	26.34546352
10.2525539154223	24.3271525396608	26.4191337403851	3.815111582	26.65111472	27.4138472
10.2836680386736	23.0106422565303	26.2620302198103	6.772905892	23.04434695	34.36872103
10.3148096588099	21.6988869364647	26.1035558816508	10.79914705	20.42039499	35.93251466
10.345944555337	20.4176092176608	25.9424782536277	5.677247541	18.04924585	36.67897415
10.3794845181734	19.9099469223227	24.8789597336058	7.31997787899999	15.37807435	33.05725748
10.4130658561977	19.4157435278122	23.7057368186783	2.197761157	16.16441336	29.99258788
10.4468319046995	18.9376658640276	22.3351868400599	5.72255099500001	17.38650207	24.6119319
10.4806320729115	18.461821147504	20.9527461928096	12.36712067	15.90584574	24.47249551
10.5144258718747	17.9890425300541	19.5484873881337	3.177857831	14.97802426	24.78576733
10.5483170296308	17.523263389206	18.0462566923628	8.465864182	8.874062551	25.43796737
10.5823859056037	17.1366003354152	14.6382353486561	8.98802709899999	7.925934732	19.26951737
10.6165222747948	16.7691201438279	10.2769611935777	0.867278095000003	18.04823486	8.201101929
10.6508335949904	16.40005999035	6.39289071322709	3.082410661	9.043855976	8.462200359
10.6853571987932	16.0483820020628	1.83860455904373	5.801300438	5.23076571	0.128009607
41.2564186533187	16.031960648845	1.74260258104942	42.34346606	5.769949569	4.366098536
63.2492023179906	16.0156954405546	1.64623640616068	63.24920239	4.015695007	1.646238652
68.1252859855874	17.2501869413952	1.10031981288933	65.51501196	11.68636529	3.24100338
73.6137532649265	18.5339259102877	0.55169932645707	72.1570689	9.179080442	1.515121588
Route: 3 Length: 298.504794553932 Demand Met: 2924					
81.4047931371221	33.3459303447465	1.01664847948835	86.50661976	33.33916758	0.489048022
82.5574885659302	48.1046764818402	2.03487334608178	84.14082278	54.46253046	0.380513445
83.7766243609647	57.6821520144624	3.06935894460568	95.77662579	57.68215173	3.069360741
81.6567822870902	73.3368496741053	3.58679100335321	74.46580568	79.0435318	1.384862598
79.9273826528892	81.0458707463763	4.11278783263708	77.11333094	85.3156461	2.683835286
78.282970933947	87.8915317954359	4.64233942126392	78.18108034	99.79242924	3.657350909
76.7789862283884	88.0143721109187	5.48325338075859	79.39161289	97.26593015	10.2457076

Solution x	Solution y	Solution z	Original x	Original y	Original z
75.1054586214049	88.1337218960053	6.23760214279047	75.38279951	84.8495864	16.86303573
73.4537872836978	88.2550522413426	6.82828359817123	79.19703593	96.06011661	13.22486099
73.4537872836978	88.2550522413426	6.82828359817123	69.92952441	96.42807986	14.30332435
70.964127036642	88.3601363325869	7.17824469181405	70.07355989	96.61021246	6.954740599
68.6003145948595	88.4645051167117	7.52931378481825	69.38304877	98.18671586	10.95698255
66.1969272422559	88.5669381269345	7.87302973754102	64.64609008	95.09261932	13.24961232
63.940394973094	88.6689229047135	8.21107790045702	62.61309781	94.29391595	17.98130243
61.9981276500999	88.7684884280418	8.50483038008011	61.09603132	95.38804721	2.385400865
60.1257199446447	88.8673122946001	8.80476693930108	58.00620671	94.64720593	1.304858734
60.1257199446447	88.8673122946001	8.80476693930108	56.30399813	89.72916428	6.343295144
58.4637095961935	88.9653409778881	9.11556133763691	52.05342714	85.82620662	0.803032132
58.4637095961935	88.9653409778881	9.11556133763691	53.87450626	88.16447802	6.291517338
57.2443351698637	89.0644787109713	9.45138068777864	55.73082902	81.05870461	7.770192012
57.2443351698637	89.0644787109713	9.45138068777864	51.18829335	82.80979047	5.597845952
56.1606158411738	89.1654206208147	9.79464489246813	53.08761619	83.0335557	12.88369987
56.1606158411738	89.1654206208147	9.79464489246813	51.49657531	83.11057243	16.78262105
55.2019968014554	89.2679233796924	10.1221971740542	49.77274656	84.13753559	18.23448828
54.3760547309627	89.3719953021533	10.4269350288514	55.99099974	83.60147673	17.9737132
53.541093801843	89.4769817414226	10.7233665930892	57.53422575	91.73216299	13.63995038
53.541093801843	89.4769817414226	10.7233665930892	53.26472651	92.17526811	13.38443287
52.7002649536869	89.5817950417908	11.0179117322924	54.10050901	92.28618361	12.05829408
51.8608003299663	89.6866290463839	11.3124779536895	54.90972966	93.30800556	12.19693664
51.8608003299663	89.6866290463839	11.3124779536895	54.43632749	91.92787857	15.4166252
51.011239595252	89.7915869092485	11.605257639643	57.43254842	97.94119843	9.821238574
51.011239595252	89.7915869092485	11.605257639643	54.09260921	96.04789718	12.52208915
50.0451597084118	89.894652509401	11.9010547317256	52.2623599	99.83573023	14.38314162
50.0451597084118	89.894652509401	11.9010547317256	50.67630959	98.08417141	16.59101162
49.0437499367598	89.9949601226943	12.1878220858396	48.86252985	99.44183304	4.964951227
48.1047610366448	90.0748045789361	12.8878695409447	49.59427698	92.51123595	3.551090207
48.1047610366448	90.0748045789361	12.8878695409447	51.98537923	93.03310405	5.658677856
47.1263066512121	90.1545959649652	13.701810199041	47.96746082	95.14523251	6.669541987
47.1263066512121	90.1545959649652	13.701810199041	43.91518159	93.39792889	6.973666169
46.1805203142443	90.234109820531	14.6115780373506	45.33430047	93.58613905	11.44191552
46.1805203142443	90.234109820531	14.6115780373506	46.20732106	94.82215894	11.38854737
45.2499847918443	90.3134707000703	15.5550636986606	41.23951851	98.4925435	12.0504117
44.3723829145974	90.3921294497249	16.5469850412801	49.03663551	90.65504513	13.8830876
44.3723829145974	90.3921294497249	16.5469850412801	46.02083433	88.3362158	14.03418258
43.4748232983705	90.4712986516174	17.5725411929532	37.87107476	99.67477247	15.46291348
43.4748232983705	90.4712986516174	17.5725411929532	37.35140359	99.57591236	15.11952707
42.8267293993342	90.5471334184982	18.8509940735669	44.53236455	98.59505273	17.96036731
42.8267293993342	90.5471334184982	18.8509940735669	45.34071838	99.2752365	24.31073394
42.1535772956122	90.6216563560834	19.9397110900279	39.84944538	96.227912	20.60442108
41.4896276608345	90.6961251625179	21.0269567730754	37.35558564	97.30806318	23.47070651
40.8433329277533	90.7703347684475	22.0920435844182	30.08845088	94.04600611	25.46859145
40.5513685826994	90.8419459093086	22.7239394014772	30.46512782	92.10545477	16.97866967
40.3451727501458	90.9129367231072	24.3284876116283	35.84999591	97.26233792	26.33021041
40.1403199688877	90.9835711258329	25.8951659282333	31.65500689	99.46882276	25.89517482
40.2157216108309	90.6414707836222	25.9272318787362	33.71990859	84.56649705	17.88810749
40.2157216108309	90.6414707836222	25.9272318787362	36.26720319	91.81523904	18.88940672
40.5710090428063	90.5727490962169	25.9867344721451	38.78697828	81.20736169	22.75217398
40.5710090428063	90.5727490962169	25.9867344721451	40.55838899	87.88304878	23.6255072
40.9306422027844	90.5050187518807	26.0464230407947	40.16683897	89.097423	24.82067356
40.9306422027844	90.5050187518807	26.0464230407947	41.14116704	94.61634345	23.98672915
41.2910554219958	90.4371133700887	26.1061050232626	36.43143728	90.48214242	22.55722277
41.2910554219958	90.4371133700887	26.1061050232626	33.91919319	90.52236574	22.93790886
41.6640917570268	90.3693811292374	26.1660182336269	36.31961338	94.1541845	22.11569666
41.6640917570268	90.3693811292374	26.1660182336269	36.86677729	93.06343809	25.83290646
42.0473628985347	90.3014780432329	26.2260986971671	39.86881125	93.47781189	29.627917
42.0473628985347	90.3014780432329	26.2260986971671	31.89808649	95.62749105	29.09944527
44.0834631879168	90.2287038677337	26.2841951121438	45.13861135	90.47060332	31.83589749
44.0834631879168	90.2287038677337	26.2841951121438	37.64776281	91.60925844	32.09349115
46.4986864242067	90.1561408424035	26.3420771088259	48.69087386	94.64188777	30.6210566
46.4986864242067	90.1561408424035	26.3420771088259	44.56970667	97.22856143	30.36827838
49.0215700804959	90.0831137657261	26.3997649481223	47.31578899	98.13704672	24.13193979
51.7060641889321	90.0096980206255	26.457602853913	53.29556121	92.47449182	25.90682802
51.7060641889321	90.0096980206255	26.457602853913	51.95218378	92.57992082	30.72068519
54.4280085674928	89.9363401526201	26.5154234722414	57.58318464	98.55697919	27.3972425
54.4280085674928	89.9363401526201	26.5154234722414	54.48965648	89.30641789	34.42411824
56.9069390204626	89.8625887716071	26.572907320965	58.40265516	82.89286098	16.95320583
56.9069390204626	89.8625887716071	26.572907320965	59.01602486	86.99268685	19.95901958
57.4519512853222	89.8117246580731	26.687809887225	51.91564321	83.24154723	26.19545671
57.4519512853222	89.8117246580731	26.687809887225	55.11001594	85.68607737	27.25029831
58.0237739041303	89.7611012515839	26.8028818181099	53.61605765	80.93460352	33.38542247
58.0237739041303	89.7611012515839	26.8028818181099	52.83415121	85.50123146	31.48102764
59.2750851520692	89.7144753610409	26.9027791913149	53.27314218	89.6748569	31.66096453
60.6210058295263	89.6678229110981	27.0023623669157	56.15571936	89.41500769	36.83882342
62.2350814525748	89.6211741789705	27.0996970103784	61.4906739	91.40517217	33.71736683
62.2350814525748	89.6211741789705	27.0996970103784	62.03675317	91.42777069	38.34727303
63.9371308803649	89.574301319505	27.1923786727344	64.96530116	93.98228963	34.40488013
65.6256684735349	89.5272630504802	27.2843956642319	66.59307852	88.41880362	32.58136924

Solution x	Solution y	Solution z	Original x	Original y	Original z
67.3232652285119	89.480319314763	27.3761045145665	68.11557125	90.29313921	19.6765572
67.3232652285119	89.480319314763	27.3761045145665	68.09186985	95.85522589	22.47153407
69.0303539981105	89.4332512162908	27.4689592206843	66.92699784	97.50570073	24.16462464
70.8352580839425	89.3858409566728	27.5620509857029	72.48804708	89.57044348	25.63543235
70.8352580839425	89.3858409566728	27.5620509857029	63.32241418	89.29380754	27.27800065
72.898000193345	89.3385700845589	27.6551598937251	69.82339194	93.15949799	27.73705762
72.898000193345	89.3385700845589	27.6551598937251	65.26732099	95.86741863	25.98441419
76.0885937976926	89.290834057887	27.7482956481088	71.22771139	93.77569631	25.9346523
79.8544495112031	89.2429715461777	27.8414770539008	76.68533256	86.49303137	21.67959601
79.8544495112031	89.2429715461777	27.8414770539008	81.4352048	82.89764497	33.18556014
84.1620334883173	89.1956456129685	27.9345792312173	91.04765146	90.60180149	20.03455373
84.1620334883173	89.1956456129685	27.9345792312173	87.63411723	89.72076827	28.65831969
86.6034115116945	89.1480705108118	28.0291102473616	94.75890926	85.83537613	36.18471901
86.2998421406521	89.1480704531855	23.6986488367314	93.12739448	86.70709298	18.39915073
85.9905852152294	89.148070397484	20.3915342676266	80.84419352	99.98848979	20.3915349
85.9905849488233	88.2350940719742	17.9436099854086	86.37403118	99.02923308	15.37465632
85.9905846823734	86.4623112184423	16.1320137137259	86.10921689	91.46882481	10.98097302
85.9905844156474	84.6119095851942	14.4573378798333	82.09017124	81.333147	13.10533341
85.9905844156474	84.6119095851942	14.4573378798333	82.53992082	88.87907996	14.07314191
85.9905841491474	82.8454100757758	12.8373609868751	97.99058573	82.84537681	12.83735391
85.674791189517	76.9742016461354	12.4765030744877	93.29522257	74.82458329	19.9847248
85.3370305576969	72.784002591977	12.0845089345648	91.59995025	72.67875795	22.12004218
84.840715697296	69.0732556633287	11.0499088849453	91.90328388	76.16243153	11.12653143
84.3145582081225	62.610960013825	10.018556526749	87.34079917	59.37931572	10.08579475
83.7880983412276	57.2321059769373	8.99235151247205	90.50689197	55.43830225	17.11301088
83.2167490435112	53.0275843525483	7.72682759046355	85.71414415	51.67250379	7.296357424
82.6440506245966	49.0645711975057	6.47099853290812	78.92131522	50.41345477	7.556720976
82.082484565956	45.1093345079528	5.21140573049059	77.77449926	46.72256252	10.92269156
81.5369496890781	41.0907604123352	3.88507069913833	77.14427045	45.25079579	0.327384457
81.0112320384467	36.7138703000193	2.60911452007629	74.78372311	42.05088328	3.322634156
80.5128405018331	31.5379720614994	1.33018048592736	75.19376171	39.75388964	3.378695446
Route: 4 Length: 174.350563720543 Demand Met: 1635					
72.0634033177434	24.4636013428747	3.03685170718456	62.17589976	23.53474989	9.188656209
70.9589275171632	31.7057715291023	4.24418561517969	63.76560063	37.45231942	9.842542758
70.0341223309226	35.5962951222452	5.30154223734072	69.67922342	40.74675918	12.58912096
69.1263564772219	39.0997394179205	6.28979792851651	73.13866372	41.71405139	17.04301109
64.2596639103822	40.0114555591537	6.5808754415586	64.47235297	44.07915445	14.05919317
59.6866243466064	40.9108725224617	6.86701791525246	59.28037529	42.02965748	18.78086606
58.3194317833743	41.3087507299763	6.92126030040825	55.55130491	39.21526309	7.425393497
57.0035950031177	41.7097587501377	6.97549164470555	57.56166222	41.97700689	5.193477838
57.0035950031177	41.7097587501377	6.97549164470555	57.35658457	43.71456461	3.914439364
55.7231146640079	42.1121688095609	7.0298197284112	63.41360315	44.69674786	5.219771375
54.3394504281501	42.5128077373732	7.08419917752375	54.69460289	37.32086801	4.721267047
52.9736696390473	42.9195671048621	7.13863390121031	53.79810347	45.16180718	4.496135918
52.9736696390473	42.9195671048621	7.13863390121031	54.43373891	52.12894009	7.9067999
51.6056898177256	43.3110629097343	7.19309707058549	50.32982697	35.43640834	3.785700884
51.6056898177256	43.3110629097343	7.19309707058549	51.33580352	40.30660727	1.042528676
50.30097137159	43.719945356318	7.24784601891548	48.20619517	39.24794213	0.08063613
49.0459529970891	44.1375924889623	7.30284571875353	40.81010844	38.77304558	7.861958026
47.9541328976688	44.56981296916	7.35784409444718	43.74535734	43.87626012	1.779657186
47.9541328976688	44.56981296916	7.35784409444718	41.57443341	43.13832473	6.475589725
46.9551523315107	45.0079675802634	7.41304676329422	40.92420024	52.54921675	3.399585878
46.0611036162985	45.4232131075248	7.46854241128538	34.31056081	43.95356429	5.695822859
45.9969555687528	47.2958195954479	7.53153342755774	34.68773061	48.27076221	5.003934468
45.9357479886019	48.9483625061469	7.59527625141445	35.40868681	49.33377596	1.880059691
45.9118905792088	49.5656112788848	8.35052365757305	37.58124673	53.7047325	1.291628295
45.8883770549927	50.0624348670429	9.89475598564102	45.47068469	56.96814934	6.687113785
45.8648491407338	50.5493290469821	11.5086110637409	44.98764045	56.96391467	9.231659535
45.8413136197865	51.0288931661061	13.1706335138856	34.17044541	50.63731129	14.2756352
45.818322095998	51.5226648351234	14.5595236315511	42.10911161	58.06602885	13.19335194
45.818322095998	51.5226648351234	14.5595236315511	36.65639834	59.2724504	14.55953297
45.818322473687	51.5226646958409	16.388207217977	53.22205568	50.84724902	15.61737169
45.818322473687	51.5226646958409	16.388207217977	45.78512338	48.76667443	13.05604142
45.8183228513119	51.5226645553701	18.3718169199299	46.15723029	56.4070148	19.959172
45.8183228513119	51.5226645553701	18.3718169199299	39.96945525	49.46230999	23.88525166
45.8183232290395	51.5226644134006	20.1921456697512	47.38308024	49.71863955	31.58389373
45.8183236065073	51.5226642710565	20.8631709379257	41.72170476	60.36141703	24.46424235
45.8183236065073	51.5226642710565	20.8631709379257	36.93641703	55.80482127	27.58013236
45.8183239860325	51.5226641317961	21.0683201215422	56.36080227	54.43871329	23.33898219
45.8183239860325	51.5226641317961	21.0683201215422	53.50308144	57.04941766	21.52167719
45.8183243644405	51.5226639917476	21.2703360490855	50.26037041	48.95030273	24.30726963
45.8183243644405	51.5226639917476	21.2703360490855	47.65008175	45.51867646	25.16647853
45.8183247428923	51.5226638501079	21.4709387743258	40.32660467	53.626561	31.93108458
46.6529019209082	51.5226636669948	21.4709389477733	48.01348394	55.67625048	22.64155069
47.4898286492015	51.5226634841309	21.4709391211463	48.91348948	54.77748717	32.9330217
47.4898291222398	50.9827008248384	21.470938723791	47.22851165	47.89903616	20.36250944
47.4898291222398	50.9827008248384	21.470938723791	43.11381093	45.00092033	20.21315796
47.4898295955693	50.4611514856939	21.4709383263916	42.25980634	46.86827481	24.73500352
47.4898300691171	49.9478282366508	21.4709379290006	43.66555329	47.77139353	28.778171
47.4898305426728	49.441311658054	21.470937531668	39.67150404	49.44131071	30.57444188

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.5885515702318	45.7977072850236	21.0170652273536	39.91233765	41.2977364	28.26450372
47.6910819000526	44.1054182655039	20.4693630690775	40.57741767	42.47262	24.8981708
47.7943465049971	42.4677929984637	19.9115990179824	38.78467609	39.06908374	12.83761672
47.9878064439011	42.0344896287379	19.7257617852843	39.58652985	43.55288071	14.45846769
48.1860772392197	41.5989494645179	19.542640181708	48.35826716	45.69665672	26.59304148
48.3844291445229	41.1586295572925	19.3578217110577	51.12261026	42.05252276	30.83772297
48.5670864353695	40.6909853555368	19.0763134674073	51.65508094	43.85648581	22.32830057
48.7493230045205	40.2212416493403	18.7938214200404	49.81718199	39.89953162	25.94554765
48.931452793604	39.7538788185191	18.5080261564132	49.90577559	41.072269	23.3893886
49.1135085087706	39.2868827238382	18.220731733544	58.48548965	38.49282405	23.12403661
49.1135085087706	39.2868827238382	18.220731733544	52.03099226	42.50134863	22.51431543
49.2898119740524	38.8231684393051	17.9251815733127	58.14893689	37.55022655	17.10511358
49.4637219137556	38.3636450715903	17.6310621131438	49.48945411	49.44119699	20.62289914
49.6369708768677	37.6990104117675	17.3217603775233	38.90241804	39.45548462	22.15074575
50.8173787969642	36.1653656357256	16.2900048170778	49.49892788	30.73465222	20.32700892
52.0227695587434	34.7430162756417	15.2362463479183	44.21687698	34.39769027	11.89272829
53.3483283403064	33.3473188564911	14.2205294132582	47.52772375	30.54529654	17.6892221
54.7657089700321	32.0039252798015	13.1869248888146	51.19858704	31.0981292	6.058142298
56.2649204495007	30.6874464976426	12.2147553701541	50.20668952	26.40233109	10.32749181
57.8961936929949	29.4333564266658	11.2603600058136	56.1557774	36.1071959	13.13084437
59.5890632657585	28.1180805071604	10.3008317788594	54.00076983	32.50218762	13.15428984
61.4360466834587	26.7604076472818	9.33042844614169	55.07321291	28.85442279	12.55016086
63.4768499462423	25.3909598686135	8.34967352373085	58.09138733	33.97784367	3.040604697
67.7477300009514	22.2694739095404	7.57137384552955	66.17419814	21.15751135	18.97034229
Route: 5 Length: 235.015814381514 Demand Met: 2956					
74.3048915753181	54.1433407206868	0.721568918010105	62.81703196	55.94894639	0.04067048
73.511794017755	57.8918274385405	1.47619255501596	61.56325619	58.635877	0.997422198
73.4711900720644	58.4564671428952	4.59493936452476	70.94365949	58.14560753	5.076539278
73.4306489792744	59.0253942534818	7.71481404663534	75.75634139	60.02200009	5.726434896
73.3901323082727	59.5966521171076	10.9482102055158	79.86750899	54.35421653	8.27403967
73.3901323082727	59.5966521171076	10.9482102055158	71.85259834	57.85616299	9.805797889
73.3496215428938	60.1924974818474	14.5934109296419	76.04244622	64.45001766	13.22117777
73.3091153890018	60.7844624033995	18.3977618643647	83.55927983	59.64747077	24.27812457
73.2647538834923	61.488072730327	19.0486707632328	85.16088414	60.47696067	19.97453885
73.1690359457017	64.1666548074166	19.4537013987767	81.47694776	70.94126153	23.66230135
73.0690610511978	65.4775442122237	19.8231316887859	74.85083054	64.74645556	30.78568814
72.9686564169789	66.8560739463238	20.1521539836276	72.84290598	65.67053988	28.7186167
72.8683847913326	68.2788906481018	20.4741218901743	83.77232341	73.14211564	19.82850896
72.4021943529043	68.5152790387947	20.852315319016	67.69295238	75.24403656	20.54681948
71.9461476521149	68.749404599388	21.2315679197271	73.05372772	69.26625594	20.0928079
71.491594186836	68.9840068352645	21.6121783753482	74.07680751	69.16329968	17.32839223
71.0367941675322	69.2191671332886	21.9965072134094	78.29263567	66.45988674	19.86750284
70.5730235748276	69.4560537103885	22.3838524557033	78.83068399	69.67274441	24.24069079
70.0964377216978	69.6933413243071	22.769591763379	73.75840634	73.11670598	12.48249331
69.5810963578432	69.9227087444199	23.2440923377064	69.70404765	60.5822767	24.01827102
69.0687324088686	70.1580046031071	23.7180912177736	65.84999623	61.37790202	25.6974767
68.5686764819773	70.3996126083422	24.1885198408962	70.77169737	73.88064127	33.24954023
68.0639123122878	70.6391455127422	24.6343990692366	70.83372488	78.21085961	24.5182183
67.5566059721372	70.8760772960465	25.0814974911149	69.80433177	81.60817435	25.92271927
67.0363951916154	71.0984437326345	25.5253664165113	68.96890483	80.55619731	30.92710539
66.5040848915673	71.3087943020575	25.9416537425058	70.61748839	78.65460339	33.23222305
65.9355561690268	71.5100324504553	26.3228022699066	68.84275879	76.03221479	29.69910657
65.3652063634542	71.7106964365512	26.7020684442245	67.45457311	72.85375456	29.93900874
64.7952287344754	71.9115942884072	27.0800781349715	65.34735437	72.80394877	34.67473005
64.2274359376868	72.1126466691018	27.4517128017997	63.48323083	69.36201841	31.45080353
63.6641312249352	72.3146723371175	27.8215372246412	63.47892732	68.70647259	29.32775126
63.1042904099388	72.517822013576	28.1912378089184	67.87575086	63.89107621	33.2359079
62.5024888070264	72.7319899216	28.5435326281229	62.01287875	62.70691628	29.4740589
61.9074960651909	72.953296011675	28.8951142371612	62.20174968	80.96664236	37.77358899
61.176676435836	73.0298028627312	28.9759249097663	60.79681015	75.33369853	28.93747546
60.4521060406932	73.1063301320497	29.0567858225377	60.70093329	80.64454551	19.95511414
59.7178857345542	73.177486380787	29.1464737399509	61.30013954	82.69641043	22.92622968
58.9467915947696	73.2464562666931	29.2387226866702	59.09181099	73.44789922	33.41304482
58.1810969480629	73.3155104179864	29.330868635073	64.88497046	82.96772641	30.52764719
54.9519758201785	73.3784792493279	29.4215977353043	56.64479831	82.24679775	31.938846
51.6100162782382	73.4411262658217	29.5121705487958	46.03038143	83.79986665	30.96050312
50.8439750598019	73.4973651153223	29.6007682852297	49.38151416	71.84627519	34.52041136
50.0871339545431	73.5536855020631	29.6892399607204	47.34853229	74.63427391	38.87043339
49.3519337808898	73.6099937150257	29.7769654784427	49.39322363	67.57061768	37.48715692
48.6202782228299	73.6665553864488	29.8640435533394	52.68458788	66.68600654	36.07142386
47.8597723668946	73.7234668606314	29.9505053503206	39.73860453	66.92518954	24.34934694
47.7735657974927	73.8342826265234	30.1726798189602	38.57181853	69.29967661	29.47346952
47.6883925116096	73.9460621894957	30.3957837622021	50.20394782	81.95454381	24.2461412
47.6883925116096	73.9460621894957	30.3957837622021	46.93472918	83.75304242	25.57195373
47.6031636772855	74.0538067366373	30.6306097078258	41.14833132	82.10595877	30.01446557
47.5187538810621	74.1603298743948	30.8663311891967	45.3176187	83.7901857	37.67961833
47.5187538732537	74.1603298720246	30.8663311896158	38.20769452	77.89743741	37.44950686
47.5187538836963	74.1603298264307	30.5251835066547	40.76978451	74.94346594	30.5932008
47.5187538941414	74.1603297808409	30.1847075683255	40.77647626	81.23711291	32.65865455
47.5187539045876	74.1603297352468	29.8411921681297	41.14789047	74.75727523	32.931636

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.5187539150334	74.1603296896525	29.4961389907655	42.58773685	73.94634336	30.2774743
47.5187539254821	74.1603296440632	29.1512691530563	43.12816365	79.63219046	23.15451647
47.5187539254821	74.1603296440632	29.1512691530563	44.66930475	80.79724102	25.59577081
47.5187539359291	74.1603295984669	28.8172116099807	44.56064253	79.77318093	20.51948675
47.5187539463781	74.1603295528698	28.4983901322194	45.13867401	81.86371268	20.6390675
47.5187539568279	74.1603295072657	28.2051125803966	35.96077646	77.38727187	28.20511129
47.9756937785887	73.8425782711902	28.0028581660916	45.59084573	70.21452412	23.93560611
47.9756937785887	73.8425782711902	28.0028581660916	49.13669956	77.10708156	27.62901252
48.4369575922481	73.5272833752352	27.8018273411911	42.95157888	64.84132436	26.30910849
48.4369575922481	73.5272833752352	27.8018273411911	42.13585343	68.94604524	25.50967647
48.9311836662393	73.2302096499512	27.6028025419583	41.95981534	64.94436816	23.77879253
49.5249553658426	72.9652478105557	27.4108543277353	45.68320409	63.6499192	24.04332627
50.1482332377046	72.712499448288	27.2213524161174	52.40986372	76.90026657	30.53428803
50.770291937985	72.4589237747974	27.0313853594835	49.21219028	82.18677234	33.0110742
51.4366378437925	72.1618188698789	26.8280222922599	53.92763119	74.12654413	38.27376011
51.9190894895468	71.8194223102672	26.3895354906327	55.58088554	76.52999392	28.31600672
52.3991926113997	71.4752619119191	25.9500869508603	55.90538334	73.56581582	30.52666899
52.8772120608767	71.1310562521966	25.506945736072	56.76810138	74.93595817	28.17323894
53.3526982219375	70.7856277344375	25.0620519709311	58.20433528	69.50520456	29.55764241
53.8239987682765	70.4422962992885	24.6130118811185	63.53725064	67.03413314	29.14142524
54.2309945367197	70.1141192922441	24.1287106369754	61.59665848	60.86573745	25.73038778
54.2309945367197	70.1141192922441	24.1287106369754	56.12304172	60.76926662	25.75259057
54.4205055234383	69.9651354270459	23.436754388914	56.73611746	58.87824868	26.03485933
54.4205055234383	69.9651354270459	23.436754388914	54.03625818	65.02303827	30.15017844
54.6056242555613	69.8315128325398	22.6245091092708	52.64945222	62.68533593	20.742851
54.7915296537876	69.6989123523231	21.824291930887	52.59359138	61.87082203	17.23711721
54.978527474917	69.5678416416579	21.0566605291129	60.59756518	67.42291916	21.31629348
55.164682650721	69.4370546465702	20.2907018090315	43.59103477	70.75648589	19.17067552
55.3904097376362	69.3046455889594	19.5777303605263	44.42598809	67.45202223	18.20113405
55.635260502206	69.173418473141	18.8882581694818	49.62844822	78.65994225	20.1083463
55.894744274517	69.0360508095073	18.1780030054838	49.52719402	60.88674536	13.02441036
55.894744274517	69.0360508095073	18.1780030054838	50.37372436	63.54183807	17.2232387
56.1842588527113	68.9075286894186	17.5905475176803	51.91696279	73.69595809	14.416915
56.1842588527113	68.9075286894186	17.5905475176803	52.24575767	74.98560476	14.55357765
56.4797765484262	68.7781048948786	17.0194955010556	51.90516717	74.10528304	22.83711571
56.4797765484262	68.7781048948786	17.0194955010556	50.78444002	76.12504454	23.00978791
56.7956515373446	68.6447346797209	16.3681301327046	56.84900895	69.27095699	14.65228976
57.1123789901497	68.5115105555293	15.7212366965173	55.72002047	71.91921816	21.5952445
57.1123789901497	68.5115105555293	15.7212366965173	57.06276587	74.98770524	20.67544591
57.4316656260967	68.3773579385655	15.0445692155791	57.97334153	65.39941546	18.27090119
57.7515637724404	68.2436384977334	14.3624715478922	59.0134746	66.34233581	2.610073656
57.9768687617237	68.1386908137608	14.2904414350217	56.20333441	63.09635143	9.893720293
58.2031737477926	68.034183319718	14.2185908397785	53.70737401	57.8077763	9.994366281
58.6009021185576	67.9620119113116	14.1548542596327	55.40337389	57.61168804	14.09596446
59.0115698313576	67.8910319035627	14.0911378395967	59.10597324	64.72617137	21.25191915
59.4236503407214	67.8202023511445	14.0272133649977	58.81674593	76.2826012	22.48412381
60.109333833667	67.1947161913718	13.7168016900612	61.14896118	72.70410502	7.635652533
60.7957348124834	66.5565791204284	13.4111827557034	66.81087893	72.19337817	6.977880898
61.4390442254063	65.8812911677027	13.1158947670903	65.55566867	66.58332744	7.127202217
62.0755685145398	65.208766135469	12.8241389546333	61.64088805	64.72462094	13.53456764
62.716847757816	64.541616054251	12.5324031014779	65.33791464	63.72798066	4.706052333
63.3541213182499	63.8819451663499	12.2458725873932	65.09617026	64.32634731	13.59892336
63.9925479032578	63.2257348622433	11.9591137870015	68.36889636	72.61479797	11.90493723
64.6060505019604	62.5009780099789	11.6726199774723	70.36283848	70.39401036	9.239076068
65.1937815556602	61.7196929689092	11.3890814369356	72.70378804	66.70645397	9.083647724
65.7590243828713	60.9127392016622	11.1076353132335	69.12634406	69.4594231	3.844630021
66.2413714882098	58.6475927514623	10.8711530541257	59.77266019	58.01872841	1.019723189
67.053682728177	56.796945741332	10.6888088226253	68.52022941	55.69012612	11.12241046
67.8683534402655	54.9934477903047	10.506499450552	66.65703205	47.7722791	14.44067044
68.6956805008369	53.3791602309737	10.3232911694182	67.10787364	49.80646667	13.82525922
69.5351088443606	51.8295612429849	10.1396081613456	63.59211348	50.34808715	9.20862338
70.405282691224	50.3177471693613	9.95622196608494	63.21772914	46.4808445	18.00555738
71.6380265849055	49.136372686393	9.75993528518992	64.66140077	51.58253517	18.71344865
74.7476892394304	47.6841537246661	9.53734349963475	76.57028534	49.55513485	21.13053287
76.0389838400979	42.9505258617753	8.91733554184453	74.55729645	43.48740037	20.58508364
77.7536287678678	36.5970478465138	3.99245575442927	70.24663893	43.40548551	1.656037041
Route: 6 Length: 297.43786102723 Demand Met: 2993					
33.2280227852856	24.1536297347324	0.671264554840356	23.31975826	27.34182644	2.882941415
29.149498415907	27.3508276494988	1.32078843749993	18.74305811	29.30240259	6.154559295
28.1260404928716	29.6006868890478	1.85459125899265	25.40396983	32.32053998	7.877867709
27.1203114179492	31.7996324451012	2.37937322967413	25.99458773	34.37910238	4.84512326
26.1218504791618	33.9747077108996	2.90193247940095	29.90863496	38.4851443	12.83287597
24.8724673801507	35.4185373391782	3.3121558454105	22.33900559	31.60235215	9.968662506
23.6536721150587	36.9328501543533	3.71541239421515	23.91492832	35.50451908	14.65205958
22.4276187253428	38.5560610615056	4.07996803345099	28.54401437	40.13690379	8.087159098
21.1463721854818	40.1713397562501	4.44169562631494	25.73174612	44.02606181	8.459085063
19.8226701334659	41.7463308864622	4.80077419270048	23.73647568	45.21539639	11.53681715
18.4467676725516	43.2750370378096	5.1539101485785	17.93093151	43.30092715	17.11460176
17.805084918008	44.7605986655843	5.17783645341156	17.80089583	46.64512233	2.63462135
17.1641710871844	46.2450586595178	5.20176434959165	18.13426387	49.15791018	7.430088572

Solution x	Solution y	Solution z	Original x	Original y	Original z
16.5225204287148	47.7189042425774	5.22569033613454	11.99216143	50.52822644	12.13005328
15.8956390636567	49.1615795748069	5.24959908216486	16.47526591	49.4455512	6.794569926
15.268925194486	50.6173847695609	5.27350439679743	10.20301226	47.6234059	3.00365475
14.6528630990852	52.1237875310937	5.29740800258248	8.81169210500001	48.50504439	3.044600386
14.0500770899721	53.699586231975	5.32130866748607	5.28300793299999	51.8957834	3.767703534
13.4741499118193	55.3394622456772	5.34520116181881	9.89102482200001	52.16610985	9.967821485
12.9053457262714	57.0516006435727	5.36908041651975	10.84189087	50.74783931	12.90312929
12.3455565151218	59.0621740537466	5.39291089070729	3.200690229	54.90401263	9.791910202
11.8429850827391	61.5805882976981	5.41667912770052	0.793870075000001	65.00803843	8.045595465
11.5830256384239	62.6176318300621	5.44015497149837	1.28261934699999	62.39268391	2.604217434
11.3351755078599	63.6721417239396	5.46360022805514	10.63863267	61.64507704	12.52958841
11.0877861814811	64.7520690097393	5.48702384292556	3.336609071	66.34370608	12.08281041
10.846998067104	65.8185346172638	5.51039707076849	2.82031094	66.9400554	1.18723785
10.6104470070822	66.8859974265319	5.53372704369794	1.825477279	70.78130479	1.056192161
10.3824843376955	67.8854363666844	5.55688093783849	2.781332517	68.35625636	3.710000307
10.1571435759049	68.8925658793924	5.58000154648848	1.834626902	71.15202574	0.775939504
9.93678994298543	69.8835126667741	5.60297336754596	2.881941531	70.78732912	3.789169139
9.71854259876505	70.8800565120351	5.62589995610573	2.885089549	70.78781924	5.964704064
9.50215890727958	71.8883034683968	5.64879242929466	0.773453591000006	79.81662315	5.077053724
9.33407552397395	72.3189451134519	5.66928827062974	0.848777487999996	80.80421078	5.669295757
9.34495201865794	72.2438943813302	7.87930825967419	6.04179221699999	70.01715429	8.958731963
9.35583093764173	72.1689343815172	10.0873669969455	3.437419026	82.39656928	11.4164042
9.36690321707525	72.06129478155	10.9872623358636	1.45195925500001	80.87244268	12.37991353
9.37827588367522	71.9085471770885	11.641062847863	6.334374787	68.85467086	8.438723386
9.38965099460836	71.7563234223586	12.30290930369	3.252339284	73.9521337	6.052632886
9.40103275320119	71.603901049313	12.9923891481973	3.10003410199999	78.61964126	7.805263196
9.41242834125701	71.4485063483708	13.747711579114	3.380314451	80.99890539	17.02151813
9.42390210422285	71.2613031532251	14.3259677835926	5.863440787	76.06172049	20.11271942
9.43537934842944	71.0731981250915	14.8917625438758	5.04273939700001	78.40053531	10.86923314
9.44686190347394	70.8828769606573	15.4728622406762	9.088863996	70.57778186	13.84286783
9.45834501810233	70.6928991570213	16.057392082684	8.93361225699999	64.19415642	15.31500377
9.46982868857026	70.504402501887	16.6447385076722	12.00297966	63.9466553	16.56981835
9.48131065157115	70.3174391799991	17.2337685237057	5.065657714	76.41830653	16.15003851
9.49279604468983	70.1294810915009	17.8268133758376	3.765987951	77.28123402	18.22137656
9.50428776076713	69.9395657356727	18.4203529327541	0.155166121999997	73.1143838	18.2350269
9.51579283429643	69.7486779424415	19.0165355048365	0.299902086000003	68.51958527	21.52036301
9.52730994167268	69.5585487564039	19.6052434186194	4.203561784	71.28689241	26.51244139
9.53883252694529	69.3682156388454	20.1756491444272	2.76637406099999	66.09545945	29.36453565
9.55051645914871	69.1979086788251	20.4607656976668	3.705228073	66.5975084	22.49684982
9.56220472299688	69.0282405682514	20.7453592990701	10.36857839	64.9958121	20.62230905
9.57389267391291	68.8592672195543	21.0303336852336	2.544714587	74.45838234	20.47608884
9.58558849111324	68.6892034734173	21.3160656844972	11.73654707	68.82383733	18.16264782
9.59728331995558	68.5193520855857	21.6031654805511	1.009741561	74.32200243	17.21598932
9.60901209096208	68.344580421442	21.9025231162004	13.50520564	67.72241024	17.09707449
9.62073826817868	68.1701547358195	22.2044021739057	14.51945543	70.49107423	24.26034768
9.63246110559183	67.9956535366986	22.5057769546634	11.54525803	68.93314303	25.95468917
9.64418301676368	67.8212936583133	22.8062505612081	5.020361565	69.58798476	32.44258164
9.65591692943711	67.6460844028343	23.089646043735	9.964092428	69.02740379	34.44916177
9.66764819374833	67.4689461604239	23.3334886763646	11.56644578	72.10851879	29.32762892
9.67937793210406	67.2911271652922	23.5753148553347	6.979895184	73.91637244	25.14533012
9.69111012154184	67.1123360442582	23.8168348448056	9.89788954300001	67.94003152	30.38024953
9.70284240107929	66.9336607837608	24.0566427985793	14.11476256	66.58488992	23.55512122
9.71457225934681	66.7552875409631	24.296801378454	14.01917911	69.22007201	23.43359605
9.72629970267883	66.5768225432851	24.5374047137102	3.972668798	68.43095677	28.84137669
9.73803236441755	66.3982557016577	24.7768020636613	2.559418382	66.60707534	29.94444397
9.74977343501038	66.2198749302628	25.0140967704875	14.52745655	66.82146945	34.730647
9.76150262992361	66.0413275378837	25.2399156601878	18.97844246	66.0992932	30.20753751
9.77321352648923	65.8629553878885	25.4619133201776	3.702577787	67.55965669	35.63856131
9.7871764236651	65.2515494199709	25.501148501311	8.88093920200001	67.16779099	33.76570468
9.80114160756258	64.6404230003757	25.5402696639309	11.17807544	66.07771318	32.92555185
9.81510517180945	64.0309916530306	25.5793152977992	14.35540419	64.70998039	34.26175056
9.82905643343778	63.4248507709722	25.6182135916102	19.29354577	63.34226321	29.80733532
9.84297625795003	62.8250362536193	25.6570311293414	21.30645349	61.8915326	27.89064267
9.85671710563624	62.2608185715679	25.6956159344701	14.06057656	63.93249207	34.35643485
9.87044737238423	61.6944346521095	25.7340580434253	17.25601024	61.69443137	35.1920429
9.87044728637616	60.9837873341754	25.1738228376607	8.689838933	62.80875147	27.12937634
9.87044720037439	60.274657304702	24.6127406517666	4.692804385	58.08052349	25.21182896
9.87044711438546	59.5760544871985	24.0523496082509	11.86612062	56.83051802	27.8782456
9.87044702839682	58.8884373988651	23.488019220316	12.24975114	50.92735248	27.57127396
9.87044694240164	58.2397990389023	22.9128123318061	13.21771043	55.16074821	22.9111302
9.87044685640239	57.6004696466081	22.3391450628355	20.53092136	55.63617906	20.16527215
9.87044677034459	56.984438295266	21.7843164981646	16.07158763	60.00636388	16.82852088
9.87044668426925	56.3631578038372	21.2420376702753	16.63383213	64.77854357	18.98571058
9.87044659814751	55.6516674389148	20.7176265734892	8.01127751600001	61.69215045	17.84993877
9.87044651203229	54.9269561762362	20.1987723744853	3.16457285600001	61.67055704	18.73530868
9.87044642595876	54.1662165026814	19.6854931912041	3.857750749	53.93522034	16.19502855
9.8704463399007	53.4112440591337	19.1783450126091	0.715064701000003	54.34039001	17.34040242
9.87044625389143	52.6564366009409	18.676944577738	7.342191074	50.36568708	15.52547031
9.87044616788972	51.9117405309728	18.179866281031	8.078510661	52.12465727	17.30721805
9.87044608189521	51.1709168320695	17.684563586167	6.810990128	49.52757429	10.46442277

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.87044599591287	50.4404792595577	17.2016379298676	6.962926975	47.87740863	12.6680673
9.8704459099387	49.7207054600211	16.7246488131194	10.30388261	47.84277995	17.55376223
9.87044582396865	49.0083685280765	16.2477995031654	8.736047039	47.86465463	22.63362148
9.87044573800222	48.3029961997626	15.7640677349825	14.44281578	41.35822358	23.25943932
9.87044565200006	47.6915062081557	15.2219216206963	9.19676513100001	46.15569372	17.99642834
9.87044556600392	47.0848200069323	14.6776229392157	9.954481978	42.50823893	15.05115407
9.8704454800089	46.4876488950609	14.1339050580454	7.974625907	40.8370263	13.38849506
9.8704453940191	45.9024567535952	13.5922623331287	12.65054039	38.20990532	17.83269917
9.87044530802476	45.342352111515	13.0399509351115	8.91589750200001	48.83105962	4.105846181
9.87044522203793	44.7729305084318	12.5160136801301	9.020444459	42.86210706	4.331128313
9.87044513605456	44.2100239664741	12.0088131043875	0.0735544159999932	50.20291794	9.32702938
9.87044505070101	43.1747421669309	11.5813309543359	1.77561061599999	46.38397362	3.634697851
9.87044496568767	41.519819630866	11.2739058719382	5.668356774	43.14782971	2.118277692
9.87044488070688	39.8272182200993	10.9777345646513	6.668915236	38.80565327	2.074648475
9.87044479574459	38.1859818073069	10.6891711795272	0.0942256310000005	39.91558536	7.02793547
9.87044471087771	36.4828394199724	10.405757671533	0.224660494000005	41.43611847	14.21171956
9.87044462626466	33.6064067641142	10.1073638205632	7.871697725	40.35198819	7.19843067
9.87044454166475	30.3851565380808	9.81071968696194	0.438114408000004	29.42535326	2.454773911
12.0691472837752	30.385156168795	9.81071970844074	11.00474377	35.14184161	13.52979102
14.3045021848596	30.3851557993272	9.81071972991363	19.77510428	38.58926296	16.64922472
14.3045027408822	29.0036419652805	9.81071973340476	8.02660248300001	29.17059173	11.48261049
14.3045032974646	27.6282784300279	9.81071973689363	2.694391803	27.62826968	12.84474665
14.5539708396321	25.2105447529667	9.81071973695422	5.584406208	23.81184943	17.55438576
15.3635834631247	24.0067510766774	9.81071973648499	8.67995437099999	15.22687294	13.91463376
17.1700613954419	23.4247283942584	9.81071973579277	18.71921477	25.10440199	21.46380598
18.3969474402897	22.7252398492238	9.81071973438958	18.39694528	22.72524013	21.81072027
18.9836645030157	22.1079587425192	5.62063616391818	16.76117492	28.31246812	1.562447455
19.5742644514837	21.476863522638	1.87261909281791	9.320660383	27.08555662	0.10230943
Route: 7 Length: 247.739346365291 Demand Met: 2933					
79.0459490086835	23.3709439405924	8.87916809558333	77.03036191	15.51069798	15.03164451
78.1294911438474	28.7725715430366	14.0474641091647	75.00767938	29.50135545	13.77877729
77.23120207176	34.259393698276	19.4178724310677	84.85983095	39.85329756	21.28837281
76.2689434647532	38.3825584905603	24.3884140416705	79.30599483	40.28434635	35.54252376
74.9460262445047	40.7428793822785	25.1584147771183	63.12520069	41.24941139	24.07122315
74.6934282993436	42.5961428530313	26.167887024982	78.85550393	52.04144231	24.20403351
74.4370320881696	44.0219741982959	27.2191749646064	72.13050555	55.03070373	28.54528132
74.1867550189747	44.9097325693728	28.2206326110948	71.99750065	50.82091856	33.04720741
73.9379043602355	45.7713918657017	29.1939884608383	71.61626861	44.97765672	39.11549021
73.6915152861947	46.6478245174867	30.0479886538349	83.19197135	53.48639501	32.18766969
72.9619224616873	46.9707894017189	30.606402536162	77.87000631	52.21112855	39.93820594
71.2587757941758	47.2258431186839	30.9126198694793	72.73426073	54.95021428	39.57914747
68.8758608324452	47.4358002055736	31.1500297063005	65.98277732	56.02257659	36.50214422
66.8450741784666	47.6399236347725	31.382830514049	66.67873973	56.13517049	35.54640769
64.8684217737135	47.840856337856	31.6136917272423	67.27809665	56.79217526	31.19414535
62.8301994460699	48.03876489557	31.8450315538057	63.54041364	40.47906672	32.95919177
60.8146343594569	48.2387412147704	32.07630471289	57.48443808	43.25173204	37.88033317
58.9342108090407	48.4404006785636	32.3057396651719	58.50503897	53.8647284	36.33438611
57.094801369006	48.6411604772613	32.5343446654564	57.09480153	60.45993374	34.61199265
54.4651453593945	48.5742775733838	32.5343448331534	55.80484172	50.30189669	30.08035465
51.8598517581081	48.5073977861634	32.5343450009496	55.16481024	55.42346911	31.47512835
49.1510375991888	48.4403612045114	32.5343451687878	48.65047008	56.26343732	32.64491993
46.5283659026028	48.373136835466	32.53434533665	52.57887869	54.16196226	35.47497689
43.4639690049436	48.3057461261128	32.5343455044813	39.86159624	55.58185516	39.85963663
41.1668788597652	48.2376662579169	32.5343456721336	45.94832838	45.50704308	38.19660802
41.1668788597652	48.2376662579169	32.5343456721336	41.84687745	52.15158968	38.57062516
38.7107697040512	48.1696132804204	32.534345839686	31.80593192	45.60640645	39.41102857
38.7107697040512	48.1696132804204	32.534345839686	31.52001616	50.89228775	38.01036066
37.0105032373019	48.1016149621814	32.5343460071138	34.06373355	42.77086753	33.9464291
37.0105032373019	48.1016149621814	32.5343460071138	30.28185343	43.77834378	32.70178342
35.4949851871907	48.0339227422914	32.534346174574	30.41452332	39.55317391	35.96788826
35.4949851871907	48.0339227422914	32.534346174574	30.62796082	46.77730777	34.94066727
34.2053660904345	47.9668683469957	32.5343463419663	30.83636789	38.35208021	33.99399048
32.9992135108444	47.9004068006999	32.534346509342	32.06711817	41.12824267	27.14001544
32.9992135108444	47.9004068006999	32.534346509342	28.08331623	42.02257662	27.79667825
31.8734955196818	47.8344267102892	32.5343466768742	29.65914735	42.12761495	24.52937867
31.8734955196818	47.8344267102892	32.5343466768742	27.06311365	42.64274924	23.39166283
31.0223501867128	47.7698856704633	32.5343468446256	30.55507662	47.73107042	32.65818922
30.1758139125018	47.7053688179082	32.5343470123735	30.18073163	48.32029982	32.22769732
29.3324896716124	47.6408629320497	32.5343471801138	29.89833465	58.88393924	31.18403904
28.4764601195982	47.5747399193845	32.534347347796	28.94274384	52.01860718	30.54475385
27.6221013635766	47.5085599819381	32.5343475154865	24.77779172	44.04083387	26.11612996
26.78387597534	47.442502211097	32.5343476832537	26.12441872	44.96485891	27.03242338
26.78387597534	47.442502211097	32.5343476832537	27.37711129	46.43616017	27.11673494
25.9517916249297	47.376578007729	32.5343478511764	25.71821347	44.02373583	30.1225615
25.1231525794689	47.3107400326649	32.5343480191325	23.29263587	57.34435722	30.94445508
25.1231525794689	47.3107400326649	32.5343480191325	22.06521443	57.50548607	32.39286042
24.3552881335681	47.2436037286869	32.5343481870484	24.05460087	58.82740751	33.73414623
23.6064188799099	47.1725875684403	32.5343483549046	20.97945435	58.66863495	34.56781671
23.3711339059866	46.6750226472142	32.5343485222821	14.81228179	50.29125842	28.12065032
23.1423276588459	46.1664668825855	32.5343486897271	22.81585575	48.67591425	26.59144604

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.9137627303654	45.6563523139068	32.5343488572712	22.68802089	46.28526246	22.76975049
22.6854568165403	45.1463405246482	32.5343490249631	19.18169919	47.05766373	27.00382561
22.4582458102205	44.6354629726261	32.5343491927507	22.00300591	49.77440842	32.73357505
22.4582458102205	44.6354629726261	32.5343491927507	20.37447933	52.92580791	35.47903396
22.2322456452737	44.1039414918501	32.5343493605612	18.10483235	51.48322234	38.87016683
22.009757974472	43.5433642518116	32.5343495283674	23.68432498	51.4412716	36.97532542
21.7866013913333	42.9664617823208	32.534349696207	23.40792676	43.64379836	35.72280889
21.5632295650916	42.3911532336762	32.5343498640624	22.79879511	41.59634367	39.45795983
21.5632295650916	42.3911532336762	32.5343498640624	18.21468575	45.65080463	39.25800482
21.340778819835	41.8181569877446	32.5343500319317	19.40209516	41.66020767	37.5577128
21.340778819835	41.8181569877446	32.5343500319317	12.31993183	42.07287161	37.42873621
21.1245684979165	41.2559999256804	32.5343501998694	18.69463352	36.26547074	33.27071747
21.1245684979165	41.2559999256804	32.5343501998694	14.50630809	38.16565664	31.09752118
20.9108547316736	40.7115241684038	32.5343503678869	22.07359754	33.01769228	30.23180819
20.6969201969433	40.1835639704021	32.5343505359515	18.21138052	45.58660191	25.83715904
20.4839371185396	39.6566032545885	32.5343507040829	17.47416259	43.6041515	31.53434731
20.4839371185396	39.6566032545885	32.5343507040829	17.44262234	43.68368222	35.8944745
20.2724386107168	39.1301046516144	32.5343508722621	13.48749824	42.29987548	28.42807605
20.0631653609647	38.6095136983667	32.5343510404612	12.97854061	40.66549102	35.96453487
19.8561856706907	38.0869148453883	32.5343512087648	9.832177112	38.08691559	39.13126485
20.0658444798452	36.4115302758928	32.5343510152248	19.64225061	34.99214308	28.17560222
20.2756542065311	34.7366802175274	32.534350821515	23.06731773	35.0375678	21.55663613
20.4816647349203	33.0303593679869	32.5343506274014	10.78091353	34.08373955	26.71276523
20.703599040069	31.1646362120061	32.5343504330803	27.42853428	33.27622768	38.61257115
20.9225691994966	29.2408651588384	32.5343502393917	26.37919279	28.3108891	38.48025156
21.1398256946663	27.3549435850126	32.5343500461445	10.62327399	24.29073933	35.14972626
21.3748970733344	25.815521959349	32.53434985309	14.86812736	22.17705421	27.08627601
21.3748970733344	25.815521959349	32.53434985309	14.14878683	27.98719075	26.90047422
21.6172324500291	24.3199748162177	32.5343496596933	20.73212412	24.23741148	36.78766314
21.6172324500291	24.3199748162177	32.5343496596933	17.16840861	23.65521269	38.43535721
21.861126926161	22.8516693475547	32.5343494670582	24.87958822	27.09583401	32.67332021
22.1043328802438	21.3488109518692	32.5343492746299	21.70527032	21.60018691	37.91508039
22.3476557630535	19.8510009994041	32.5343490824766	27.39065822	19.10906735	34.23380192
22.3476557630535	19.8510009994041	32.5343490824766	25.83818458	22.03803134	36.60516078
22.5889883552274	18.3508409804217	32.5343488903048	29.15811552	9.518746656	35.77137383
22.8140441676482	17.4496532281961	32.5343486968972	32.11403346	10.63014558	35.85165647
22.8140441812968	17.4496531676289	24.3399633081511	20.19850768	8.627828216	19.22611956
22.8140441949598	17.4496531070114	19.8327966619433	28.82263126	20.36706254	14.69297653
22.8140442085969	17.4496530464239	16.0050074310712	23.64941173	19.80991504	13.65279264
22.8140442223237	17.4496529858793	12.3401140614649	10.89890727	16.02503912	12.34011368
22.8140443120157	17.4496529346276	9.56204471927538	14.9958336	14.5728326	1.422152891
22.8140444039238	17.4496528835332	8.70200364505532	12.63680518	12.91935497	10.56277797
22.8140444967434	17.4496528326898	7.79263592689231	18.20950886	6.619599382	5.445678785
24.535333681467	17.6604113398817	7.79263569686818	24.09498187	20.3828805	2.129534364
26.2734489417093	17.8706650820837	7.79263546672207	24.23492671	17.98856994	0.400117348
28.0626716492204	18.0809648946187	7.79263523643888	36.57027062	15.62107689	13.23399254
29.5282700412367	18.2929265531548	7.7926350061771	21.65865806	17.99154884	8.745957007
31.1246780226032	18.5050727272306	7.79263477590559	34.15723352	12.84614068	2.236297964
32.6766416070523	18.719133785441	7.79263454553827	30.90434674	20.96780911	4.645040707
34.2588737137391	18.9329169728654	7.79263431512125	35.62470684	10.73896033	9.362523366
35.8287806788732	19.149461906616	7.7926340847303	35.85991513	20.90404301	13.98769394
37.4112003506819	19.3657398078649	7.79263385444052	36.77121212	29.70512597	6.399428168
39.0305083291856	19.5752505092733	7.79263362416119	38.07401644	11.09458783	4.920078282
40.6841445939644	19.7879470248454	7.79263339388036	39.07927218	20.57348801	18.57850652
42.4583143809662	19.9999989011126	7.7926331636868	42.45831495	25.01806118	18.69304905
65.3607896903293	19.9999994418319	4.13163171335944	70.71952594	19.54937922	9.466423791
Route: 8 Length: 331.697580731804 Demand Met: 2986					
72.2036195845035	20.5561790669878	16.6777059920405	62.61153544	17.95816147	22.4620849
70.7620028916829	21.1588378176271	19.3508864994623	71.29498477	19.86081824	30.17263192
69.3176882409962	21.7761661236854	20.8694763048645	66.92261807	21.4897109	27.4812889
67.9260566322697	22.3960801808999	22.311056895485	63.04507341	24.29862677	23.57575014
66.6000562385045	23.0140424347244	23.7500696699278	67.26622281	20.02005982	35.0966755
65.1234244181092	23.8219179190061	24.2253411773044	60.71671796	14.8721563	28.06290831
63.835432936511	24.7686277782705	24.685780289291	59.97712424	27.07719444	29.13491814
62.5993713415693	25.7079088444732	25.1421971047144	62.83458953	32.37480154	31.54745986
61.3758836204928	26.5920464223425	25.5867077691639	59.48412304	31.97998889	33.72997467
60.2054838727794	27.4252830109453	26.012211331261	61.01859213	37.82208646	31.82775528
57.5480867962269	27.5751791841569	26.1972226977661	55.9549233	32.80200534	27.96563646
55.0256607998807	27.7246030971993	26.3821316139026	53.48089128	34.57431179	29.79987824
52.6356939863164	27.8731519360561	26.5664548535753	51.99282443	27.99909333	30.19770488
50.3139741622403	28.0217954492711	26.7504303247124	51.08696185	26.42044109	32.70824117
48.0156939817184	28.1707213294601	26.9335146304927	50.59311922	22.75724468	32.75181399
45.6496711791379	28.3206066766873	27.1153332590053	48.88810081	29.6929228	28.59078684
43.2435757286211	28.4704471246054	27.2971020988493	44.45005227	17.91363181	31.37577496
40.5641232966999	28.6300250252197	27.4740207827678	38.46066343	17.33665094	24.22591115
39.7648321164981	29.2076368587847	27.7032498999766	40.05041388	28.81118981	27.86495236
38.9690664714181	29.787281434537	27.9327703100776	41.09480481	34.92509896	27.7383049
38.1702297964609	30.3598113923645	28.162659564288	44.94410764	36.28576006	32.88778098
37.3087918571438	30.9074892181679	28.3895406239641	39.35568633	35.06788426	34.69629234
36.4409631455258	31.4478686840623	28.6145824204568	39.25918273	24.78783876	35.71196052

Solution x	Solution y	Solution z	Original x	Original y	Original z
35.5467544851008	32.0166652902497	28.8352752738881	34.82834577	24.45085722	36.05632865
34.6675110750528	32.6282018764995	29.0507008005251	27.26619514	25.90196542	35.39277783
34.2972412933121	38.0284284506988	29.219845956332	31.80606468	35.45021175	24.23960074
33.9294538812646	44.0929058425641	29.3899571817935	38.72818734	43.64397508	34.64285831
33.5584580667857	50.6107421424565	29.5593795288688	39.00311055	58.98114927	34.60197054
33.1625814817038	52.9876182659671	29.7246167126801	37.67648628	59.01822185	34.10509713
32.7614854654505	55.1413989199088	29.889046152468	35.39691212	60.01558524	36.77171252
32.3575064635357	57.1461153713427	30.0520983145965	41.10546356	60.73573959	25.88754111
31.931483126512	58.9860944063465	30.2169841274347	41.72708173	62.5487287	34.68501321
31.4192480526481	60.4788914141114	30.377688071387	31.78300706	62.74548174	25.97934086
30.9078411932661	61.9693905645163	30.539122179171	25.66105506	62.27941228	31.77717439
30.4046401439504	63.4809026413198	30.700589617974	25.20403775	63.98638021	32.83153178
29.9094176670421	65.012306069621	30.8619569382921	19.92687299	66.4828608	36.85195291
29.5924105073065	66.2564432728227	31.0083343862832	21.2618816	68.31108552	38.60957073
29.3146250717248	67.3619723717499	31.1470393280988	21.52581462	69.05739134	31.57893426
29.0411858415384	68.4666862137775	31.2858331007468	29.81370195	76.77877617	33.99746475
28.7674247290065	69.4969877043623	31.4242949544319	25.39416892	74.01493111	32.17996221
28.495112330878	70.5135247062125	31.562817292584	25.63863856	75.55318582	34.2564448
28.2241240705058	71.5115180477868	31.701174704454	21.16552744	75.92926841	33.87335876
28.2241240705058	71.5115180477868	31.701174704454	22.96398221	79.24584246	32.40861489
27.9612543215064	72.4189601843408	31.8393044993146	18.46683587	77.29301103	30.42019724
27.7112852407701	73.2541042341995	31.9781151357816	17.24413003	73.14298035	27.78293034
27.7112852407701	73.2541042341995	31.9781151357816	18.31523717	76.27495825	29.81755027
27.4883226212888	74.0799266401473	32.120568753874	33.57300136	70.51852673	38.6296637
27.2621495259826	74.9435288512743	32.2616955978085	22.68191696	72.90808337	38.77088424
27.037809668845	75.8290817603239	32.4020089553477	23.86908483	73.83689183	36.6939804
26.8144313118548	76.7329265702822	32.5420402390414	24.84752889	78.21896812	35.91459865
26.5916436039625	77.64053037552	32.6819163187187	24.67927032	81.21698222	36.79859251
26.5916436039625	77.64053037552	32.6819163187187	25.47356848	81.94258519	37.44485814
26.3699014443776	78.5298210410263	32.8211169427372	27.46499326	78.56518576	33.59652638
26.3699014443776	78.5298210410263	32.8211169427372	29.49613778	81.77737157	38.35679407
26.1472574793971	79.42061004053	32.9598710253907	14.92906226	79.42060964	37.22040132
26.1472574938916	81.24779895373	32.9598711859544	22.46431132	85.87828698	39.40664672
26.1472575084018	82.9683146917098	32.9598713464849	17.38954679	82.23173111	30.2609052
26.1472575229506	84.7670735144603	32.9598715070187	19.16596982	83.58117432	33.35557023
26.1472575375599	86.6552353994738	32.9598716675762	20.16675465	86.45561332	33.59426088
26.1472575522022	88.6181643018823	32.9598718281307	18.65944439	93.90622028	36.26618878
26.1472575668224	90.3279688230278	32.9598719885843	22.00240146	99.12603644	39.9893956
26.1664160250706	90.326078698601	31.888247873826	21.53298817	97.76613815	23.69582939
26.1664160250706	90.326078698601	31.888247873826	23.65267964	99.40598609	29.7230242
27.0523330253955	90.3239061202835	31.8769744266677	28.69202489	99.34571575	27.8214658
27.0523330253955	90.3239061202835	31.8769744266677	27.50072899	99.76767751	31.96071673
27.9218106618542	90.3217340174199	31.8656713079415	25.34553204	99.20543489	30.35671629
28.8176796810944	90.3195618504014	31.8543584350449	25.35918107	97.93925835	33.70510702
28.8176796810944	90.3195618504014	31.8543584350449	25.64004891	98.33585155	37.39052093
29.7980552371769	90.3173897575864	31.8430648794414	28.94608169	87.05476962	32.15968695
30.787684134285	90.3152172561539	31.8317661885748	31.92346769	85.96439053	34.03343791
30.787684134285	90.3152172561539	31.8317661885748	30.78074407	88.67743671	34.14412331
31.7821711721033	90.3130443026581	31.8204672667328	34.03327785	85.06694553	30.01520061
31.7821711721033	90.3130443026581	31.8204672667328	30.96168192	84.99460949	29.50639116
32.7796248438845	90.3108706755365	31.809150032625	32.77989789	83.25231939	22.10896744
32.7796248438845	90.3108706755365	31.809150032625	32.21271953	85.45061531	28.67707968
33.6727121073245	90.3096330115939	31.8075602727799	30.18341718	92.15484297	29.45540328
33.6727121073245	90.3096330115939	31.8075602727799	32.33676606	89.56266763	36.70990188
34.5958347091436	90.3083953433471	31.8059705711923	34.28587406	93.01320732	33.5082721
35.5255180748365	90.3071575964559	31.8043808711428	35.60188133	93.1465045	36.33325574
36.4605620701278	90.3059197600865	31.8027909730998	37.83606476	96.13365876	36.97541326
37.392527943923	90.3046815051963	31.8012006849708	36.79414467	92.2553405	34.07762876
38.3330357961183	90.3034433278922	31.7996104286637	42.53215273	92.92397176	36.17653823
39.257377704994	90.302205095284	31.7980199821908	45.01212749	95.47966426	34.75016178
39.257377704994	90.302205095284	31.7980199821908	43.63164404	99.67485887	36.08960829
40.0459015231251	90.3009640926482	31.7964283956542	39.57638463	86.69599702	34.69521123
40.8405557772276	90.2997235740181	31.7948368564987	36.49499514	99.8776323	35.60714208
41.7500809623897	90.298480135435	31.7932441528673	39.44288188	96.38027853	38.94704805
41.7500809623897	90.298480135435	31.7932441528673	35.92075185	99.04269187	36.73360907
43.3041578876109	90.2972310290119	31.7916478339857	43.04035221	95.37042711	39.63020675
44.8867273709416	90.2959813584125	31.7900507246245	48.45592928	88.4082341	31.5542414
46.4456828777405	90.2947321309603	31.7884538813086	51.44475874	86.59474587	38.70943792
47.8954757391128	90.2934833707294	31.7868566175432	49.19512952	89.44346883	37.79505672
49.3470524175294	90.2922348518336	31.7852590993116	48.82360524	98.37839062	35.9745595
50.8298714029933	90.2909854064046	31.7836612151474	52.71570498	99.46690315	35.19170787
52.2672125425839	90.2897345727826	31.782062951212	52.60387814	98.51053443	27.61605738
53.7161258507689	90.2884826041936	31.7804655379649	54.29998953	99.89190946	28.80232628
55.1640252249807	90.2872288200673	31.7788689357042	48.39934621	99.02729511	30.05026749
57.3932511858166	90.2859713381949	31.7772732936153	53.69991452	99.81161169	33.42740223
60.1003673657997	90.2847113539442	31.7756775227652	57.84005051	97.24933499	35.2604133
63.0667548728423	90.2834500834643	31.7740815881083	66.67195124	95.92017704	38.76714707
65.6884457888724	90.2821872677247	31.7724850058442	63.88368354	92.98872817	38.82161587
68.5181798336651	90.2809238059474	31.7708880106198	68.01446808	90.26524455	37.65674979
71.5032884409119	90.2796602163551	31.7692907892768	72.91384846	91.54886288	27.04740893

Solution x	Solution y	Solution z	Original x	Original y	Original z
74.573788692344	90.278396178466	31.7676940596886	74.57969734	99.83821951	39.01985633
75.8235846361297	86.2568167595481	31.5172192947719	76.48394754	93.81500316	33.05082675
77.0761214753327	81.6081041072202	31.2664474581114	72.09010058	81.417498	36.30236671
78.3928973553586	77.2735931658552	31.0141200627295	75.20998283	80.5662569	34.55930276
79.7536376240764	72.8179020050554	30.7609538474584	86.75397464	75.23932777	39.5614605
80.6151298870534	60.2413440485639	30.4670566014104	83.91646182	55.69492785	39.74024442
81.4320294561381	55.1975314288786	30.153752275189	86.51848331	50.71555717	36.90102142
82.2197626427562	51.3749728429276	29.8330556688005	91.19333201	55.09349477	31.72721103
82.9427882157027	46.7486247780811	29.5098340748066	88.60564442	53.67349247	30.97358927
83.6435010581274	40.0657734429084	29.1853388433671	82.01891737	31.58538586	22.96295297
84.366920848958	36.9260748360325	28.8732782463251	87.56748283	36.27406643	21.13489416
85.0843465786739	33.9074750167526	28.5678259488945	88.13068149	33.9074779	16.96093724
85.0843490558377	28.6832761367619	28.5678253159649	94.17807015	30.5898166	23.81736257
85.0843515309501	22.1195473924294	28.5678246834733	95.99475962	18.1472698	27.39786086
85.0843539941932	20.333553153416	28.5678240512681	94.15587216	20.2227246	36.0994515
85.0843564517438	18.4849058010885	28.5678234171357	90.81819821	18.2159484	35.33294835
85.0843589089345	16.6549694906823	28.5678227825859	83.75499038	5.857780347	33.63275215
85.3631762492552	16.6549692155685	23.2985926229204	94.43184685	8.796264511	23.29859307
84.1813284234574	17.5071554239626	16.7802376209726	93.53556787	11.2495411	17.39352488
82.2836922251307	18.5951008510004	9.69134497782797	85.22979418	8.715884504	12.16207554
Route: 9 Length: 302.768981148997 Demand Met: 2993					
75.1981616969745	49.6309698168537	0.375832294063656	64.75792457	49.92103542	3.951957012
73.0497236362215	81.6836403364293	0.740021360534641	73.04972269	93.68364053	0.740152131
71.0796604223254	81.6836406710822	0.950047574848668	71.17046416	92.96230041	3.31475723
69.1235221746378	81.683641005112	1.15458349207546	69.09548968	84.07624055	12.89569188
67.3543253296532	81.6836413395136	1.20046708021216	63.68037897	79.29990004	5.705664659
65.6692551431739	81.6836416739421	1.24630104625145	67.89989075	88.12316705	3.528198384
63.9727857521921	81.6836420083378	1.29210825398288	62.35255518	88.46202983	5.064300638
62.3316161848808	81.6836423426981	1.33786353435905	62.03157877	81.16617953	8.458189727
60.7188693201854	81.6836426770983	1.38352934965558	61.67834468	82.51967341	13.24261796
56.1991530893195	81.6836430115652	1.42065381229175	61.63608438	74.03409399	0.746346368
50.3181712934068	81.6836433462217	1.45780917105398	55.75342338	84.56592915	0.703415223
43.4452179743326	81.6836436808746	1.49497864076192	38.21932161	86.88940242	6.390388464
38.3735956925133	81.6836440155015	1.53209149897878	36.90788531	88.78292268	9.064555312
33.9037279594202	81.6836443500683	1.56904425118652	23.53960858	80.471438	3.12432842
31.3251339940008	81.683644684676	1.60597215880331	22.95922483	75.83051285	0.740171728
29.3420001332274	81.6836450194246	1.64294653043469	21.60880813	73.64895737	1.318444959
27.9827401889734	81.6836453547069	1.68002919256263	19.29153506	80.52426775	7.949521468
26.8648253067897	81.6836456900309	1.71695110623194	21.04749508	76.84597788	0.391094884
25.7941229164524	81.6836460254238	1.75390545201523	16.93400358	77.9224885	0.924123088
24.8216651965396	81.6836463609836	1.79090792161114	12.87616068	80.54131267	1.790579055
24.8216651686058	83.606477350328	3.84681211252979	28.95022635	86.79829568	12.40202554
24.8216651407083	85.4147371165563	5.39027541541224	32.87814817	90.10176773	12.94837243
23.9390651392319	85.4147371722429	5.39027544612145	31.03913924	88.81924735	11.29281098
22.9925775134135	85.4147372279292	5.39027547682771	29.03165996	90.53300961	6.710005169
22.0116608795918	85.4147372836073	5.39027550753267	19.55892343	94.48515334	9.227774263
21.0643095970221	85.4147373392723	5.39027553823496	20.42707279	96.69258649	1.544902576
20.2896386535707	85.4147373946175	5.39027556899477	20.47481611	85.68176763	4.096992025
19.5171805706521	85.4147374499634	5.39027559975522	23.92476676	88.85275247	0.073261016
18.7304581821129	85.414737505301	5.39027563051712	24.68088332	89.71453351	6.983081462
17.9233995815445	85.4147375606416	5.39027566127965	21.4032788	88.65695382	8.541884
17.1083146782497	85.4147376159798	5.39027569204106	17.25875189	95.69940805	8.290437664
16.2941103514882	85.414737671307	5.39027572280117	10.40564453	91.96900158	9.717112894
15.5234173313365	85.4147377266244	5.39027575355799	7.085383584	88.77850283	10.21283209
14.8182321304841	85.4147377819279	5.39027578430922	6.29169329299999	89.27097954	11.1353809
14.1991656297565	85.4147378372467	5.39027581505837	6.35930977699999	87.06467249	1.39262333
13.6048897844887	85.4147378925481	5.39027584580677	4.724328509	85.88211036	2.778795893
13.0386459474704	85.4147379478616	5.3902758765594	4.377655918	84.98459142	5.210127271
12.4937301522449	85.4147380031586	5.39027590730912	5.724809855	81.80721271	6.405774196
11.9619501946023	85.4147380584903	5.39027593806492	3.298576907	92.26869515	0.703140302
11.9619501855119	85.4147380634023	5.39034035717401	8.37640356200001	96.83801393	4.582503625
11.9619501763688	85.4147380685236	5.69977565027649	8.842438164	89.89183088	2.824200169
11.961950167225	85.414738073636	6.01081955439807	13.01348985	89.5505908	15.47048063
11.9619501580826	85.4147380787481	6.30982393236522	7.009024866	89.80852716	6.686928303
11.961950148942	85.4147380838587	6.60894562235625	15.25088212	86.85170355	0.622562014
11.9619501398015	85.4147380889703	6.91124735869931	18.16441332	83.32201509	7.61422766
11.9619501306604	85.4147380940818	7.21353395128738	17.20155001	81.69531761	4.530646889
11.9619501215187	85.4147380991952	7.51740428131584	6.810206318	85.20186256	2.844617135
11.9619501123793	85.4147381043104	7.82383010327157	4.297539438	80.73294711	0.059971047
11.961950103315	85.4147381094687	8.45876206041356	8.595205897	76.73972439	1.498449057
11.9619500942589	85.4147381146464	9.34504423436358	3.10551266100001	84.71082736	3.992777578
11.9619500852084	85.4147381198244	10.3178390546392	5.902742913	84.57417463	9.395938461
11.9619500761597	85.4147381250032	11.2978965347892	12.45480817	85.29988604	5.441763796
11.961950067112	85.4147381301846	12.3176406066371	12.63857375	82.42671014	11.06948651
11.961950058064	85.4147381353652	13.3493649483833	3.05949055799999	82.05603574	19.35294441
11.9619500490266	85.41473814055	14.1749760522078	4.961462551	81.51420623	19.50536364
11.9619500399923	85.4147381457363	14.9641504634364	5.793118726	87.72031575	18.95737877
11.9619500309601	85.4147381509242	15.7401475066527	6.663988874	86.9326968	14.76370285
11.9619500219283	85.4147381561098	16.52108574965	10.77763243	89.00986935	18.62168793
11.9619500128977	85.4147381612995	17.2988893707272	7.17818211399999	91.76838261	25.47562666

Solution x	Solution y	Solution z	Original x	Original y	Original z
11.9619500023383	85.4147381606978	17.9317024155373	6.256438132	90.66257931	27.09179537
12.2480276616569	85.3066822486612	17.8946744927652	11.28159713	86.83718755	19.13922705
12.534688804849	85.1986834825422	17.8576443520119	9.98481624199999	87.60870523	18.9809529
12.8224579783743	85.0906978250054	17.8206108725456	9.921883095	86.8721598	22.00737941
13.1115843146495	84.9827404145278	17.7835549639064	6.57919393199999	89.24907689	23.95110219
13.4074735196611	84.8743265210262	17.7464042081922	8.980893435	92.30918249	24.9496481
13.7162500332689	84.7633031068684	17.7089579345242	14.02380259	94.55773265	18.6627295
14.0250124172528	84.6510919568303	17.671494123564	9.577914639	89.11916471	27.81169318
14.7999704756389	84.5095859562664	17.62717409381	20.03955091	90.83830295	21.35984013
15.5508012456222	84.3672434876097	17.5827921402466	26.49994117	86.49656314	20.04082186
16.1157013841935	84.2234454159569	17.5382278743607	18.85500198	86.61471751	28.9549492
16.2859248629495	83.937190959619	17.3660852713036	17.22630202	94.08640458	22.99978352
16.454297568596	83.5744533169845	17.1805556482424	21.63379999	90.72848541	25.0330528
16.6020154535609	82.9381717604498	16.936559155324	24.93956922	85.18138774	19.5490822
16.7483255775682	82.2984309808353	16.691410156015	24.79158589	85.73273425	15.36547182
16.8933703202691	81.6515294270665	16.4470081087247	28.34961296	82.66841267	14.80317352
17.0259237795959	80.9850446531946	16.2083258739911	15.06397637	86.4956065	14.41870487
17.1586957333379	80.3105899926763	15.970259241401	21.61123904	90.19731465	15.12916055
17.2900039073447	79.5396176519719	15.733212079059	18.15807888	79.40011164	23.44302335
17.4212754654762	78.7752149904012	15.4936057209881	15.50686687	76.44859369	16.39940441
17.5527346981538	78.0221079363416	15.2539485910521	9.360499311	76.63383999	11.96842635
17.6853958597423	77.2814118195924	15.0159620842993	18.79013692	77.54174683	13.67079469
17.8180488947124	76.5455688140753	14.7783953311874	9.01858207399999	78.03824041	22.65782791
18.0064637344093	75.5285948964078	14.3204272302923	10.28504553	75.43578797	21.16629174
18.198933902902	74.5240845157436	13.8412388137058	14.67447984	73.22055772	21.75092301
18.3925634872526	73.5401359507158	13.3477812344051	14.09860615	77.68853822	13.45994873
18.5871115343605	72.5452708528535	12.8549137893938	13.34199807	71.15108407	14.18117491
18.7827214602424	71.5663437060584	12.3612596030591	13.78543979	72.75062985	12.01531817
18.9793311727699	70.5913470767878	11.8686953532199	15.83973733	72.60736968	8.73861151
19.1766294315093	69.6167555642991	11.3801386167823	16.73656026	65.26611785	12.28815231
19.3745128456473	68.6689497415129	10.8912991488547	16.29427026	68.63097998	5.127480774
19.5731873071847	67.7296468797586	10.4102200765755	20.75020952	68.82081849	3.659175109
19.7717986768858	66.7930760105827	9.93830639246725	24.34494447	68.89894191	6.614252607
19.9697394392531	65.8552502419527	9.4706446403966	24.66562586	67.58605744	10.297776
20.1670772224122	64.9185942254678	9.00275589086454	13.89109091	56.92730438	11.2581209
20.3681954664421	64.0808078177569	8.52807877597701	27.36103425	64.84526011	12.45761345
20.5676718140069	63.2458085820728	8.04788817351507	22.58317288	64.23875961	11.9213097
20.7670000385141	62.4139150215375	7.5644184986702	11.71156616	63.23151575	10.39694521
20.9700408778309	61.5824355423305	7.0748954187169	15.77830732	66.19409337	0.808180704
21.1752304157275	60.7266570319532	6.59954105576141	18.80954314	50.67936902	11.76647286
21.3855458820925	60.1251312552542	6.0601929485923	20.72246404	50.29048837	10.84675569
21.5966801818057	59.5949358295467	5.488766726551	21.56136042	60.00845368	9.387366518
21.8079836037969	59.0666056246359	4.91269418648969	25.84588775	61.17671521	8.212138725
22.0186385487233	58.5378333891691	4.33199978378952	13.17908278	60.05355856	0.206865651
22.2337230693275	58.0066758135954	3.76682795135071	10.83705181	59.65376627	0.709551762
23.1642687594248	57.2781736964198	3.40109525128018	22.84438078	60.01413405	11.39370551
24.1000015967666	56.5435009594594	3.02766325483544	17.45311026	57.02027397	2.53786626
25.0703668306647	55.811757404647	2.65479217528889	25.6524776	56.5792119	5.011755882
26.0419854604249	55.082792960798	2.28088531061608	24.61643689	54.01115924	6.209992422
27.0226026307029	54.3604696362108	1.90489657515896	16.54761864	53.09785344	0.161381972
28.2227669665977	53.6535607210082	1.53337145829247	20.16713628	56.2637712	6.937664837
29.5888294186712	52.9348782137845	1.15272051527563	33.50828257	58.48410354	3.557102036
30.9165244797479	52.2047658392946	0.770291569328339	32.28903103	63.37386507	1.032108002
32.172220614735	51.2439704976171	0.386863366819385	25.08011935	60.4806985	0.592321921

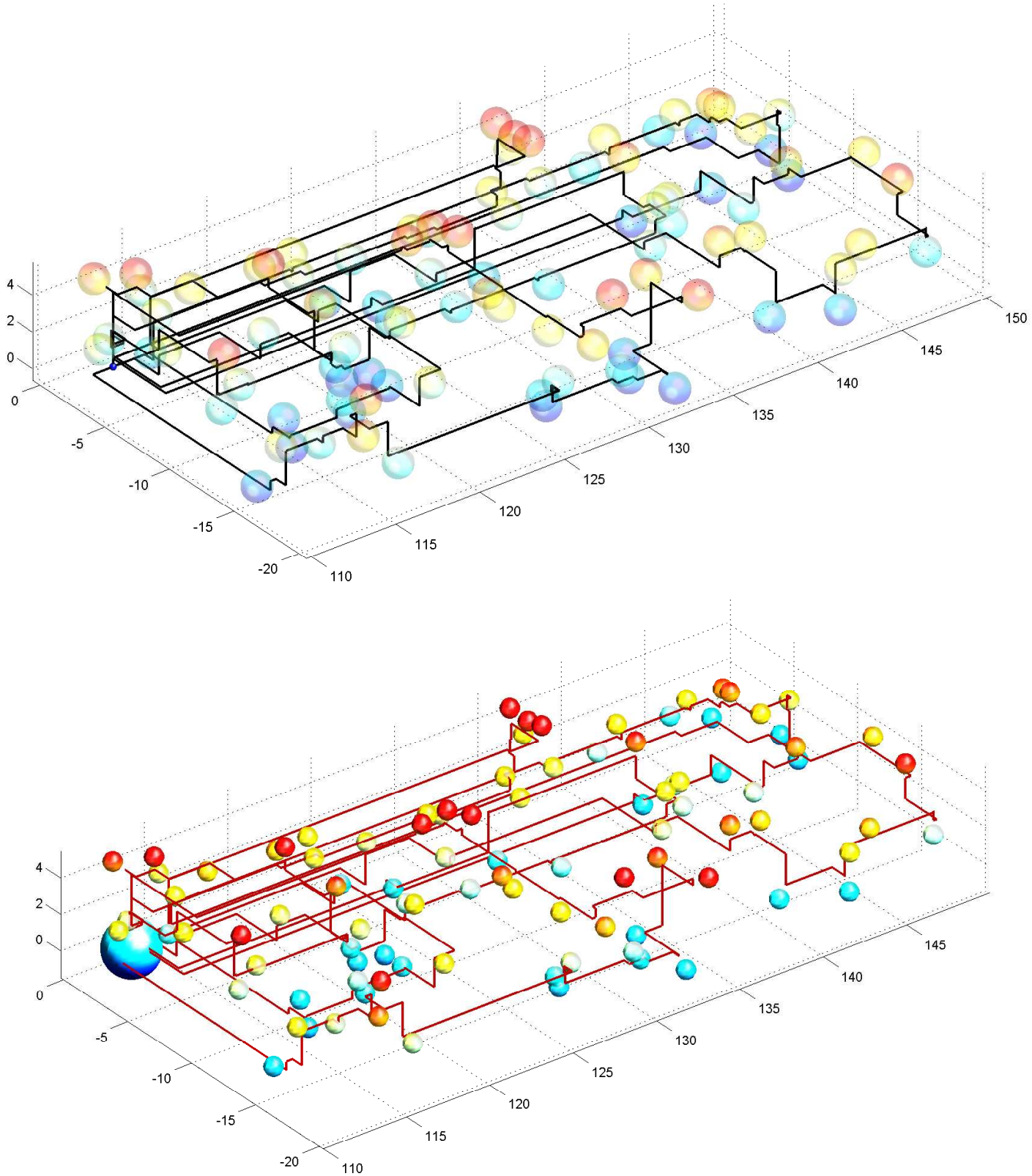


Figure O.174: $kroD100$, $r = 0.7798$, Equal Radius, 3D, Manhattan, Length = 545.1508056

Table O-177: Solution for $kroD100$, $r = 0.7798$, Equal Radius, 3D, Manhattan

Total distance: 545.150805573889 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 102.820302783128 Demand Met: 397					
1.57980656084793	15.3300016620438	0.470000495995939	0.799999999999997	15.33	0.47
1.93628804487027	16.0802836531447	2.34795508037926	1.48999999999999	16.29	2.83
3.7873958003145	16.5083676442103	2.69032117500554	3.86	16.16	2.13
4.98649180975788	17.5300001508653	3.96096594878695	5.55	17.53	4.5
4.6088873091571	19.0401940354398	3.96094293278758	3.94	19.44	3.99
5.71000266760714	19.0401930906756	2.08000281457835	5.70999999999999	19.82	2.08
15.8776143081023	18.3913009548716	1.67877219229815	16.46	18.17	1.97
16.2313845129073	18.009769520501	0.842387763435259	16.23	17.23	0.85
16.2313845129073	18.009769520501	0.842387763435259	16.32	17.42	0.34
19.7814539054469	18.4064627010231	0.82822093637563	19.94	18.52	1.49
20.7175311123542	18.7361411071842	0.813369940778642	20.5	18.33	0.82
22.139991977707	19.15423937484	0.798477825393153	22.14	19.77	0.32
22.2100331871496	16.4107894870698	0.798481427334347	22.21	15.78	0.34
23.2878760168684	16.4107873917574	4.12999787513971	23.56	15.68	4.13
23.2878788494875	18.8305248141504	4.49047544610476	23.74	19.44	4.67
20.280000802033	17.9972057309542	4.49047762457904	20.28	17.36	4.94
17.870008474003	18.2567429672206	3.9898117441548	17.87	19.02	3.83
17.6800032273089	15.7799999470779	3.98980775894112	17.68	15.78	3.21
17.5519318713878	12.9411020684809	3.99008368576527	16.99	12.94	3.45
17.5498076333305	12.3799938434752	3.9904464808605	16.77	12.38	3.99
17.6385785037245	8.14000006953421	4.35860719445964	18.19	8.14	4.91
17.2995591686423	7.15778381280332	4.24013045478231	17.66	6.92	4.8
15.9547267515787	6.75331890561452	4.03808142353454	16.04	7.06	4.67
Route: 2 Length: 75.7502824399025 Demand Met: 399					
13.0035990947048	4.15556374892188	0.616423942240152	13.46	4.08	0.87
14.0489025698559	8.32719895183091	1.0897340341081	13.93	8.59	1.72
17.285823451532	8.82224178307953	1.26403652162322	17.25	9.27	1.67
22.2300004616357	9.12019493119975	1.40998895435534	22.23	9.9	1.41
29.1334704644686	9.1201795069629	1.91972605814528	29.82	9.49	1.92
29.1334886187827	9.12014947578578	2.11418547971079	29.01	9.2	2.88
29.8016503314148	8.71665611517202	2.11418806456822	30.23	8.71	2.76
29.8247521197376	7.81000009218088	2.11419057384336	30.6	7.81	2.03
29.439998121368	6.31999945030211	3.36019416901394	29.44	6.32	4.14
20.6747270430142	6.21153772314332	1.08246980355399	20.67	6.94	0.95
15.2266634098842	5.34038078129462	0.592584346932265	15.29	5.81	0.79
Route: 3 Length: 117.420147932982 Demand Met: 399					
15.2942857691682	3.61372983756991	1.67790614915212	15.41	3.54	2.28
17.9127531518547	6.84377217184609	2.12286754973009	17.66	6.78	2.14
27.0360434210941	11.005876720829	2.56637148328707	27.4	11.01	2.19
28.3399999981097	15.1200008744154	3.20019973206146	28.34	15.12	3.98
29.58548169179	15.391466516322	3.12227120344297	30.07	15.24	3.68
29.6847866815168	17.7423723817394	1.40170070967845	29.27	17.77	0.77
32.4536230171312	18.7208696415768	1.34170034203082	32.48	19.06	0.64
32.4536236883632	18.7208696441079	2.99985290319061	32.2	19.45	3.11
33.7300004013821	18.7208696234328	2.99985449605691	33.73	19.02	3.72
37.8600038710665	18.6200100158579	2.4998003441298	37.86	18.62	1.72
38.0499686985043	16.1900021818613	3.66019966334787	38.05	16.19	4.44
38.4004511170775	12.170000020541	3.66019869762559	39.18	12.17	3.68
35.4397837133965	11.1792965741417	3.339128104152	35.35	11.12	3.97
34.0161361481179	10.3551510055189	1.94808438198352	33.32	10.49	1.92
33.8320828564392	6.49634344382555	0.867228232262269	34.52	6.37	0.69
29.8139031523411	5.71266168605675	0.438808821456728	29.93	6.24	0.47
Route: 4 Length: 61.2331073320131 Demand Met: 390					
5.46999890387 21	1.02980561741155	2.56000859231601	5.47	0.25	2.56
25.7801921897562	1.28001037033956	3.26999968448914	26.56	1.28	3.27
25.7801907557063	1.3549229477303	4.16272811940471	25.81	1.21	4.92
25.7801892543102	2.45232521596235	4.178358690253	25.92	2.48	4.76
25.7801877371077	3.48999973160339	4.19364581410214	25.97	3.49	4.95
23.9696160754697	3.9533561421191	3.39252927918294	23.47	3.88	3.22
23.3399996519555	4.45252127955978	2.77022019269622	23.34	5.23	2.71
19.8069082768194	4.25088174717555	2.77021412541888	19.62	3.89	2.49
18.1959612609898	4.0708527805751	2.77020805920281	18.28	4.56	3.27
12.2944301586274	3.70981653631618	2.77020197452217	12.03	3.85	2.73
10.1699980957019	3.32999940628988	2.77019588751961	10.17	3.33	3.55
Route: 5 Length: 57.6786677352555 Demand Met: 398					
4.89328689612157	11.1548807361198	0.282113402840987	5.55	11.21	0.58
5.00290506201094	12.403077772418	0.412223427814008	4.64	13.02	0.19
7.71472125082192	12.4683925159962	0.907551540029977	7.78	12.82	1.55
8.44894682239969	12.5183613840142	0.993002208229495	8.11	12.95	0.83
10.7392975445179	12.5659681536792	1.08152541673328	11.09	11.96	0.79
10.8198022407771	14.8330143790532	2.65376132758042	10.82	15.61	2.72
12.0645252508836	10.8999988690358	2.65376515142614	12.64	10.9	3.18
11.7899546745443	9.68998537995869	0.909803952466406	11.79	9.69	0.13
10.3333547960503	9.46889951680033	0.988706571479521	10.21	9.62	0.29

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.99879579236142	9.04471487955404	1.47005420262732	9.97	9.42	1.03
9.67699747402556	8.20654869883014	3.60929036073142	9.81	8.48	4.05
9.31000264984887	5.12000076372065	4.0901962968344	9.31	5.12	4.87
6.35556024315767	3.1062840370127	4.0901947634821	6.34	2.94	3.58
3.90934645335879	1.9991143641143	4.09019322018042	3.87	1.99	4.81
2.78000121395282	1.11236325810323	4.09019145307253	2.64	0.36	4.24
Route: 6 Length: 88.3131411649863 Demand Met: 398					
4.65690597206371	2.29610524771002	2.07233713502516	4.59999999999999	2.67	2.69
12.722951529334	2.53394272027393	2.27582284322008	12.72	2.46	3.03
26.5575219533652	2.87623275803958	2.33171238533366	26.58	3.6	2.5
29.9201598610832	2.9657958878056	2.38236108435249	29.95	2.64	1.7
30.8973516261252	3.29076470118098	2.7434152595583	30.62	3.29	3.3
34.8095008016165	3.61868062900587	2.97707970681882	35.03	3.01	2.97
35.8458604589191	4.57232939071666	3.21013160880723	36	4.59	3.96
35.9900017687278	5.14000060840256	3.24018983513249	35.99	5.14	4.02
36.4200042560298	6.26604278368975	3.24018915133132	36.42	6.99	3.53
38.7985842845457	5.95140362263563	2.52999967301676	39.35	5.4	2.53
38.7286570916246	6.23315730176082	0.47060008581717	38.68	6.97	0.22
38.7286469136257	4.58999766625187	0.470598918613726	39.46	4.59	0.2
37.5258220825972	2.13531303089124	0.470597948926009	37.66	1.54	0.37
35.380030480934	1.65000261873045	0.470596978900165	35.38	1.25	1.14
Route: 7 Length: 41.9351561856214 Demand Met: 338					
4.03562653167855	3.54461130854963	1.04263642856816	3.66	3.39	1.25
7.62102065625308	6.70407766535489	1.84867829739625	7.81	6.7	2.36
9.31019444276147	10.0099958540293	2.30999812106722	10.09	10.01	2.31
4.33380619688671	10.0573698103673	2.40557384593004	4.01000000000001	9.8	2.35
2.59825798948167	10.105336358296	2.50154160391952	2.34999999999999	10.59	1.97
2.40994019989178	10.1388122283679	4.41837636808388	2.41	10.69	4.97
1.95527893268444	6.26321098416794	3.35423152300502	2.40000000000001	6.19	3.07
1.24980494640256	3.63000015326748	2.66999989571888	0.469999999999999	3.63	2.67
2.01427106299248	2.5231631572631	1.71247556068369	2.02	2.33	2.08

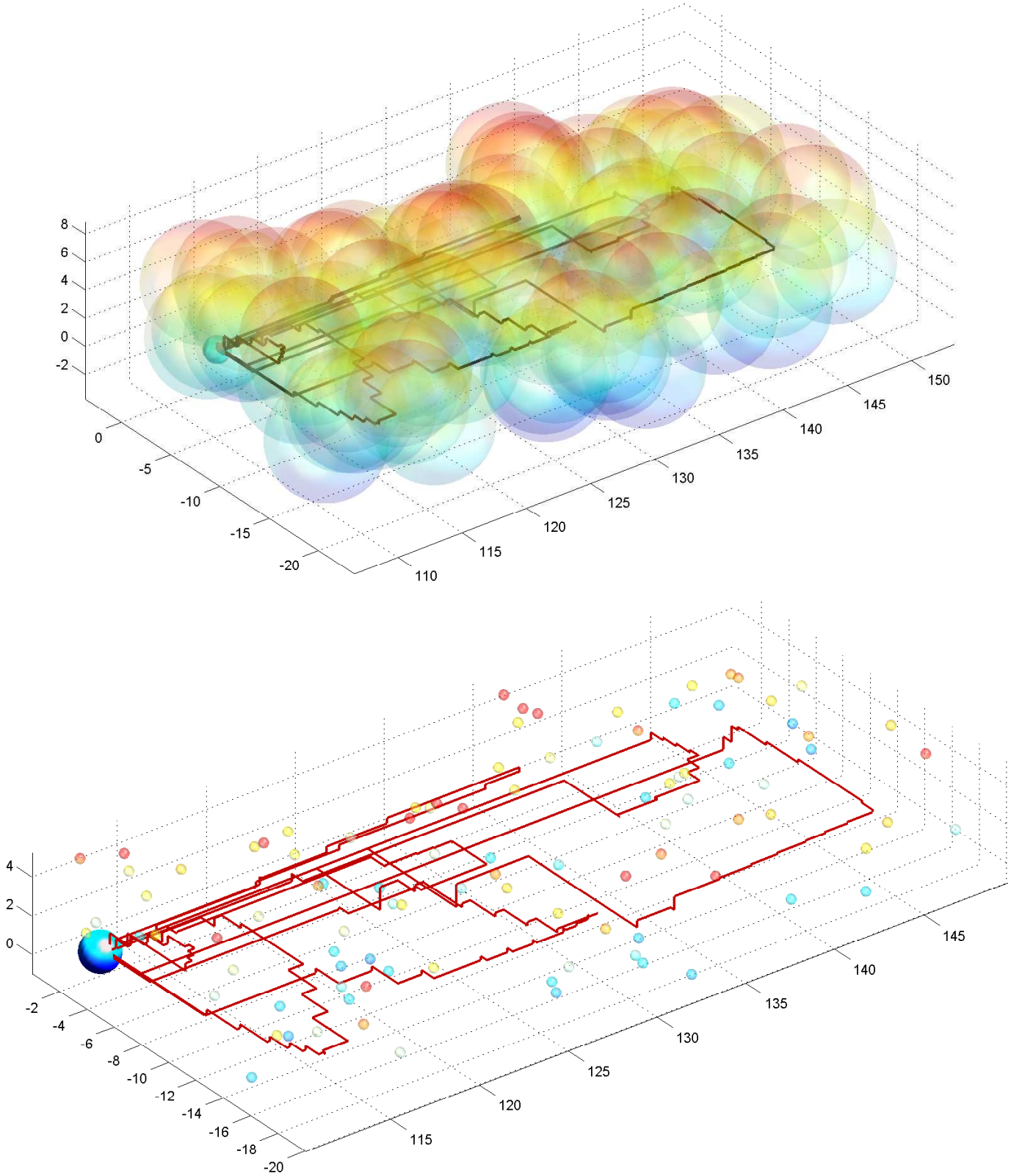


Figure O.175: $kroD100$, $r = 3.899$, Equal Radius, 3D, Manhattan, Length = 400.0946377

Table O-178: Solution for $kroD100$, $r = 3.899$, Equal Radius, 3D, Manhattan

Total distance: 400.094637689879 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 75.0364630115503 Demand Met: 399					
33.7625503348974	1.65000610097962	0.370001176417978	37.66	1.54	0.37
33.762550247222	2.53137206859322	0.510529046101427	35.38	1.25	1.14
33.7625501576259	3.49097056336138	0.650406743704716	35.03	3.01	2.97
33.7625500672618	4.50369403229386	0.786993944111088	36	4.59	3.96
33.7625499777673	5.13948374544308	0.819894434571244	35.99	5.14	4.02
33.0992077237865	6.0535120689062	0.819895004009304	34.52	6.37	0.69
32.4179987703266	6.96294383039813	0.819894600877069	33.32	10.49	1.92
29.8715742181338	7.16704112588575	0.819894465229138	29.82	9.49	1.92
27.6114858371966	7.36578616686842	0.819894313962711	27.4	11.01	2.19
27.6114841313772	7.10373943328848	0.819892151258242	29.01	9.2	2.88
27.6114824185964	6.82398803123599	0.819890121776481	30.23	8.71	2.76
27.611480699255	6.44631210911706	0.819888189488555	30.6	7.81	2.03
27.6114789716665	6.03283563865502	0.819886518587875	29.93	6.24	0.47
27.6114772387668	5.6192818901811	0.819883747153574	29.44	6.32	4.14
27.6114754970147	3.2899797166006	0.819881779946189	30.62	3.29	3.3
12.9140726141077	2.46794177598918	0.423791241367533	12.72	2.46	3.03
Route: 2 Length: 19.3071541021593 Demand Met: 348					
2.7800000651572	2.35612396108793	1.28230527431773	2.64	0.36	4.24
2.7800001324136	3.64369697700553	1.8692695352519	3.87	1.99	4.81
2.78000019967158	7.91032248807731	2.26099752868946	2.41	10.69	4.97
3.14433177649667	7.53677071817033	2.26099715984741	2.34999999999999	10.59	1.97
3.52784810696595	7.10349918295505	2.26099675485998	4.01000000000001	9.8	2.35
3.91225703431287	6.69999917759128	2.2609963525817	7.81	6.7	2.36
3.65698762648135	5.46198305614505	1.85079399948264	2.40000000000001	6.19	3.07
3.41049215517135	4.28673396940186	1.42828736420481	0.469999999999999	3.63	2.67
3.19759121139738	3.35544608263548	0.9675493565537	2.02	2.33	2.08
2.99238231926533	2.51596620635495	0.490693652319285	3.66	3.39	1.25
Route: 3 Length: 99.5193464373885 Demand Met: 400					
17.8101106712956	8.17124051504608	1.18716076608865	18.19	8.14	4.91
21.8551524018538	16.1437865341535	1.54664525464946	22.14	19.77	0.32
23.7400000012817	16.399546261354	2.22912887050563	23.74	19.44	4.67
26.3325907448891	16.3113090289824	2.22912850488678	28.34	15.12	3.98
28.1709997377205	16.2239927592612	2.22912810542161	30.07	15.24	3.68
29.7028022003305	16.1372856471046	2.22912829590437	29.27	17.77	0.77
31.3702488071294	16.0500536085326	2.22912797103737	32.48	19.06	0.64
32.521995958109	15.9569586600026	2.22912687894082	32.2	19.45	3.11
33.8671155484417	15.8545303198248	2.22912634413831	33.73	19.02	3.72
35.3221386034823	15.7449462613434	2.22912635081634	37.86	18.62	1.72
35.4498488493895	14.8116520876651	2.22912536966246	38.05	16.19	4.44
35.5609978896738	12.1699999691925	2.22912499926703	39.18	12.17	3.68
35.5609978895724	10.0801342308018	2.06297478923833	35.35	11.12	3.97
35.5609978894677	7.74814646751949	1.89397803770692	36.42	6.99	3.53
35.5609978891672	5.6709713545824	1.72263716682015	39.35	5.4	2.53
35.5609978751251	5.19253678132403	0.877319400680499	38.68	6.97	0.22
35.5609978586926	4.5898510270766	0.200023965002601	39.46	4.59	0.2
Route: 4 Length: 49.9975290617038 Demand Met: 395					
5.90602018643412	1.70283567673046	0.308604973386138	4.59999999999999	2.67	2.69
11.4633369355543	1.75542206934944	0.598529943532498	12.03	3.85	2.73
16.0878791165876	1.80760012839101	0.870060082135906	15.41	3.54	2.28
24.271722141301	1.85964074045413	1.13544708129189	26.58	3.6	2.5
26.1327284669586	1.9109978736209	1.38503345879828	29.95	2.64	1.7
26.0935186729201	1.91099820948696	1.3850341425936	26.56	1.28	3.27
26.054109475946	1.9109985454556	1.38503495741599	25.81	1.21	4.92
26.014663883762	1.91099888170055	1.38503591401022	25.92	2.48	4.76
25.9700485954069	1.91099921785731	1.38503684603605	25.97	3.49	4.95
18.6970359690535	1.91099914783209	1.10589139986787	18.28	4.56	3.27
15.2899997948035	1.91099907796645	0.790005839455632	15.29	5.81	0.79
11.6561780076714	1.78235190656776	0.398957918395509	13.46	4.08	0.87
Route: 5 Length: 66.8525286594501 Demand Met: 399					
14.9515629922564	6.28969898294148	1.17221878727142	16.04	7.06	4.67
15.9522352108384	7.53127104493863	1.48923474627997	17.66	6.92	4.8
16.4273061519335	10.3692207718549	1.67604112572776	16.77	12.38	3.99
16.9039273331183	12.1775913267211	1.85445578213935	16.99	12.94	3.45
17.3866874401587	13.9448932954824	2.03047433846726	17.68	15.78	3.21
17.8699606909864	15.4760125913268	2.20446744869814	17.87	19.02	3.83
19.1531497242463	15.4760123195531	2.20446744131302	20.28	17.36	4.94
20.1757842593798	15.4760120472997	2.20446747163329	23.56	15.68	4.13
19.7152762388681	15.3255897840939	1.98102825883589	22.21	15.78	0.34
19.1991817078508	15.1748564703809	1.76561557041873	20.5	18.33	0.82
18.58593365485	15.0048671664118	1.55991271749767	19.94	18.52	1.49
17.0870418229186	14.71613750509	1.3552900610958	16.46	18.17	1.97
15.9492191844649	14.3359269518739	1.14383190581253	16.32	17.42	0.34
14.7934666121802	13.8935408962	0.936888507687337	16.23	17.23	0.85
12.1589558674613	13.0021263473667	0.73102091450553	10.82	15.61	2.72

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.8186939383811	11.0892180682504	0.502839626946303	12.64	10.9	3.18
8.95858126396982	9.38370246766881	0.254571928709495	11.09	11.96	0.79
Route: 6 Length: 43.0447805587478 Demand Met: 378					
5.45118589996942	2.69006439625447	0.532388653783007	6.34	2.94	3.58
7.64058570119356	3.69832401233054	0.962837512310987	10.17	3.33	3.55
8.03640894167344	5.12001810112992	1.1848722085648	9.31	5.12	4.87
8.03640894596627	6.95785084563475	1.18487221015662	9.81	8.48	4.05
8.03640895026754	7.78972563327315	1.1848722124294	10.09	10.01	2.31
8.03640895454653	8.43564408241547	1.1848722148716	9.97	9.42	1.03
8.03640895884433	9.06684018184701	1.18487221710618	10.21	9.62	0.29
8.03640896312163	9.68999723997421	1.18487221870143	11.79	9.69	0.13
7.1784586986401	11.7762608736356	1.19674039498354	8.11	12.95	0.83
6.31256665887341	13.7550270294743	1.2085004957647	7.78	12.82	1.55
5.40333969619891	16.392797729653	1.22024179003298	5.70999999999999	19.82	2.08
3.9399986881901	16.6829914883744	1.23298982787787	3.94	19.44	3.99
3.85943263881958	16.5076675655863	1.18352903247204	5.55	17.53	4.5
3.6686374612118	15.575233710987	0.999133425811338	3.86	16.16	2.13
3.4760628291675	14.6693246522796	0.812602117027302	1.48999999999999	16.29	2.83
3.296809763906	13.4240577047481	0.609142181600924	0.799999999999997	15.33	0.47
3.13186499020803	11.4391196568929	0.406857144972451	4.64	13.02	0.19
2.96471812555754	9.22555379409955	0.20528462602048	5.55	11.21	0.58
Route: 7 Length: 46.3368358588798 Demand Met: 400					
6.48300242599386	2.41951794567997	0.0725017313704806	5.47	0.25	2.56
17.4016984629006	3.48437734877641	0.142956552694348	17.66	6.78	2.14
19.1445697399728	3.63135861671682	0.199648238915476	20.67	6.94	0.95
19.9923984316027	3.75537880081906	0.25545421368107	19.62	3.89	2.49
20.8739695805018	3.87942268861226	0.310905152497449	23.47	3.88	3.22
20.8739694559836	5.17180465623986	0.31090500371093	23.34	5.23	2.71
20.8739693296206	6.41354316228357	0.310905037867969	22.23	9.9	1.41
17.1738847449658	5.96826210847225	0.21180816135651	17.25	9.27	1.67
13.42058825826	5.29856046859751	0.109264879829129	13.93	8.59	1.72

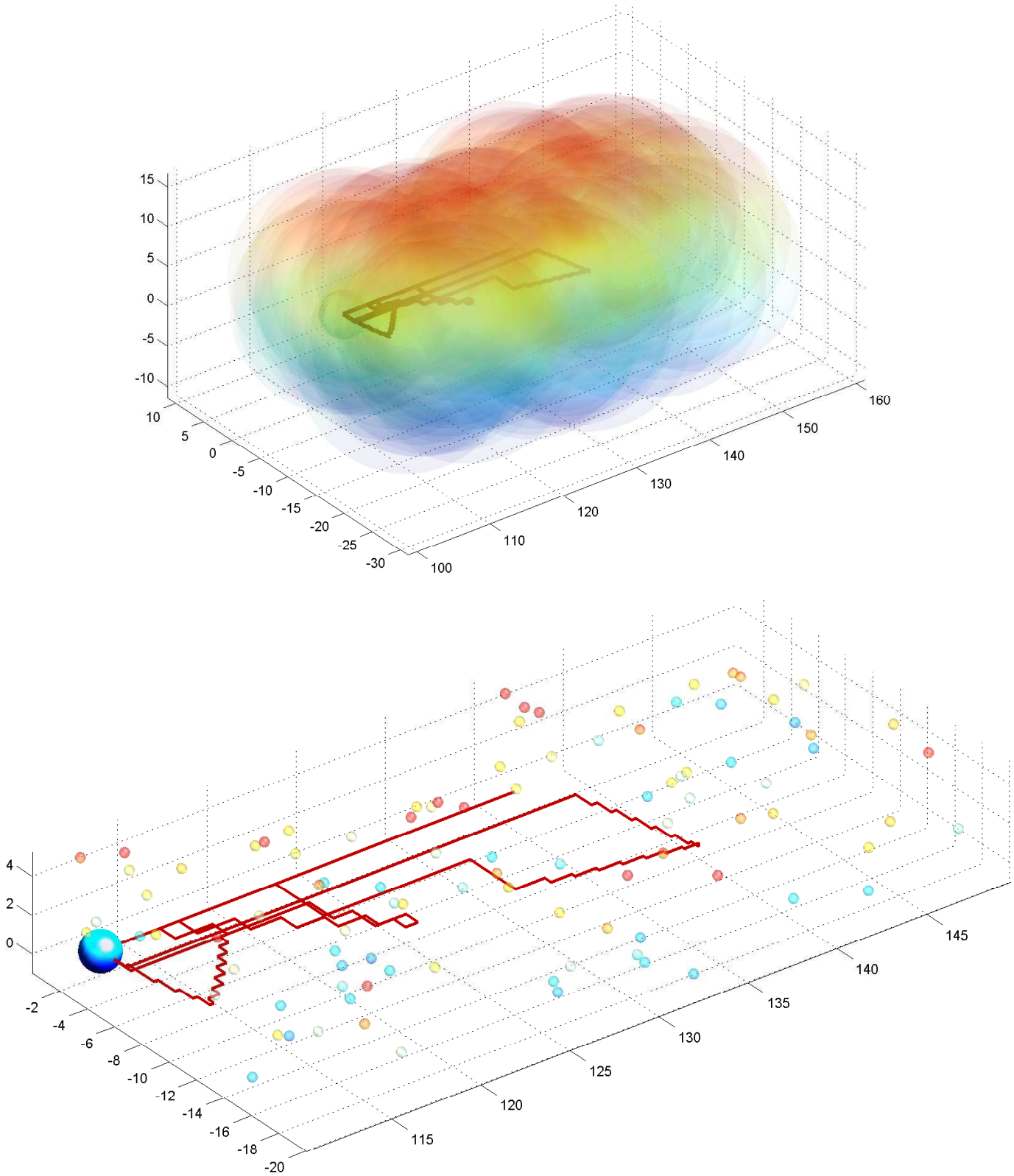


Figure O.176: $kroD100$, $r = 11.697$, Equal Radius, 3D, Manhattan, Length = 216.3612509

Table O-179: Solution for $kroD100$, $r = 11.697$, Equal Radius, 3D, Manhattan

Total distance: 216.36125086362 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 46.3787423830527 Demand Met: 399					
10.5697453279205	1.64999999695723	3.25862048455861E-7	12.72	2.46	3.03
19.9695309899043	1.65000002729023	3.79807698180912E-7	30.62	3.29	3.3
21.0282341500371	1.65000001483257	3.59675979666463E-7	29.44	6.32	4.14
21.8884734043079	1.65000000476087	4.63688841989551E-7	29.93	6.24	0.47
22.6880521819782	1.64999999575648	4.17358677395896E-7	30.6	7.81	2.03
23.3969170643906	1.64999998923155	3.96643139666253E-7	30.23	8.71	2.76
24.0450479136419	1.64999998574162	3.89673115108735E-7	29.01	9.2	2.88
24.673927540641	1.64999998456139	4.05796519942214E-7	27.4	11.01	2.19
25.2965583351532	1.64999998693856	4.19529976980471E-7	29.82	9.49	1.92
25.9065170717201	1.64999999114138	4.35419783784141E-7	33.32	10.49	1.92
25.9152638010817	1.64999999478214	4.76254999881576E-7	34.52	6.37	0.69
25.9250106139819	1.64999999620104	3.84741627001972E-7	35.99	5.14	4.02
25.9357359736229	1.64999999200078	3.85958806248254E-7	36	4.59	3.96
25.9466696735066	1.64999998229691	4.0543287127548E-7	35.03	3.01	2.97
25.9578044984609	1.64999997146458	4.60272204350076E-7	35.38	1.25	1.14
25.9693704238403	1.64999996041187	5.00464475194917E-7	37.66	1.54	0.37
Route: 2 Length: 2.30102514819919E-9 Demand Met: 329					
2.77999999996581	1.64999999995755	6.18426199139321E-10	3.66	3.39	1.25
2.77999999994451	1.64999999992387	5.10812725451615E-10	4.59999999999999	2.67	2.69
2.77999999995154	1.64999999989636	4.84702056269271E-10	5.47	0.25	2.56
2.77999999996877	1.6499999998741	4.25421475824805E-10	6.34	2.94	3.58
2.77999999998696	1.64999999985376	3.59754892542696E-10	3.87	1.99	4.81
2.7800000000038	1.64999999983259	3.5426594990895E-10	2.64	0.36	4.24
2.78000000001506	1.64999999981392	3.38232553076523E-10	2.41	10.69	4.97
2.78000000000759	1.64999999982109	4.66890526240604E-10	2.34999999999999	10.59	1.97
2.77999999998146	1.64999999985235	4.96141794315008E-10	4.01000000000001	9.8	2.35
2.77999999995595	1.64999999990044	5.02705432836592E-10	2.40000000000001	6.19	3.07
2.77999999997705	1.64999999994882	5.69631453117836E-10	2.02	2.33	2.08
Route: 3 Length: 71.3755251028334 Demand Met: 400					
12.594230367458	5.20776291792301	1.80843599650871E-7	18.19	8.14	4.91
20.7766058466917	8.51841523155565	2.85036346525658E-7	22.14	19.77	0.32
22.4197515256097	8.98444335151027	2.43333406757529E-7	23.74	19.44	4.67
23.5817248472991	9.21607467572057	2.73859546595645E-7	28.34	15.12	3.98
24.7621076698049	9.44466511307729	3.01312352846139E-7	30.07	15.24	3.68
25.9146672357728	9.66959368549576	3.69002025379928E-7	29.27	17.77	0.77
27.0604124346458	9.88781724429209	4.01448064124565E-7	32.48	19.06	0.64
28.0307255680313	10.0873628525807	3.80588234705215E-7	32.2	19.45	3.11
28.9032782270772	10.2704027703367	3.95896924132444E-7	33.73	19.02	3.72
29.6789026656902	10.4388593501743	4.56518787217419E-7	37.86	18.62	1.72
29.5217836555092	9.98075459264652	3.85455155793579E-7	38.05	16.19	4.44
29.3151319906738	9.06382587471963	3.66948775365472E-7	39.18	12.17	3.68
29.0797116314337	7.95176176308723	3.28641188929169E-7	35.35	11.12	3.97
28.842013778479	6.81229272142316	3.07058790838255E-7	36.42	6.99	3.53
28.6009154249984	5.70196706418002	3.00543783637863E-7	39.35	5.4	2.53
28.3163494596829	4.66125829237486	3.17014430706308E-7	38.68	6.97	0.22
27.9955728725089	3.51902615001489	2.9194036343938E-7	39.46	4.59	0.2
Route: 4 Length: 31.2792360315382 Demand Met: 398					
18.4196179746168	1.65000000047266	3.21041611073269E-8	29.95	2.64	1.7
18.0211085342529	1.65000000001005	2.82368333159866E-8	26.58	3.6	2.5
17.6238639928136	1.64999999959959	2.51805527540228E-8	26.56	1.28	3.27
17.1917129654125	1.64999999916408	2.13269473192668E-8	25.81	1.21	4.92
16.7049443795946	1.64999999868619	2.02472687504951E-8	25.92	2.48	4.76
16.1098230915057	1.64999999823255	1.91054905229748E-8	25.97	3.49	4.95
14.8154468221701	1.64999999811658	2.09405754958425E-8	23.47	3.88	3.22
13.2383406014999	1.64999999806861	2.45910865004362E-8	20.67	6.94	0.95
11.4460740930147	1.64999999815164	2.21192113514235E-8	17.66	6.78	2.14
9.61195646885662	1.64999999833178	2.32777370712256E-8	17.25	9.27	1.67
Route: 5 Length: 24.4113349679653 Demand Met: 400					
6.10398189071495	2.78544117986577	2.41161719927163E-7	15.41	3.54	2.28
8.19110181493169	3.89000139060952	3.36285411961512E-7	19.62	3.89	2.49
7.75742504154837	4.53525007427277	3.47105324038921E-7	18.28	4.56	3.27
7.18534954066033	5.21186180139424	3.92246100489047E-7	15.29	5.81	0.79
6.59026300639209	5.90871347469468	4.01028261265424E-7	13.93	8.59	1.72
5.97531725945363	6.61177672297637	4.05997861108176E-7	12.64	10.9	3.18
5.33848470415009	7.30846434125187	4.32864387889254E-7	10.82	15.61	2.72
4.64464541643019	7.92462620756917	4.34506043589522E-7	5.55	17.53	4.5
3.95136809598335	8.4445652096312	4.59419748466416E-7	3.94	19.44	3.99
3.95135390056572	8.44456311597243	4.27114359879965E-7	5.70999999999999	19.82	2.08
3.70684244973211	7.52061848609564	3.68066388034549E-7	3.86	16.16	2.13
3.46553790377889	6.52576062640136	3.0649704285679E-7	1.48999999999999	16.29	2.83
3.23291101163883	5.25526441578598	2.79214482645784E-7	0.799999999999997	15.33	0.47
3.01189973444006	3.39379375509797	1.91118136427804E-7	0.469999999999999	3.63	2.67
Route: 6 Length: 4.23143032612741 Demand Met: 397					
2.79151330236678	2.08479640004655	8.81790640505642E-10	5.55	11.21	0.58

Solution x	Solution y	Solution z	Original x	Original y	Original z
2.80312920782016	2.60986265299466	9.47528278061327E-10	4.64	13.02	0.19
2.81471381960964	3.03533119565997	9.12608655312397E-10	7.78	12.82	1.55
2.82627394919288	3.38397022483219	1.00604680142169E-9	8.11	12.95	0.83
2.83780451396483	3.70791064780671	1.06953557121869E-9	11.09	11.96	0.79
2.83254127703854	3.53622313763729	1.08684439226181E-9	11.79	9.69	0.13
2.82727484195159	3.3581796112807	1.0279901374588E-9	10.21	9.62	0.29
2.82201077368998	3.17735933361492	9.80637793190908E-10	9.97	9.42	1.03
2.81674914764952	2.99378249062486	8.99110119689794E-10	10.09	10.01	2.31
2.81148915659293	2.80288120116368	7.81337661237558E-10	9.81	8.48	4.05
2.80623071244462	2.60788879985562	8.05565392170138E-10	7.81	6.7	2.36
2.80097545037405	2.41352987606866	6.87244039454526E-10	9.31	5.12	4.87
2.79572436467376	2.22052322960356	7.55697726617655E-10	10.17	3.33	3.55
2.79048138856564	2.03319195708667	7.57589546651616E-10	12.03	3.85	2.73
2.78524377649073	1.85158189921447	8.33423996482452E-10	13.46	4.08	0.87
Route: 7 Length: 38.6849820498018 Demand Met: 396					
7.17178155151342	3.00011896472086	1.49866078658079E-7	16.04	7.06	4.67
9.26990238682193	4.16364268163843	1.81812849220364E-7	17.66	6.92	4.8
10.9759282705077	5.30094951936939	2.21962746849158E-7	16.77	12.38	3.99
12.5267091204306	6.32913924191042	2.58432185873403E-7	16.99	12.94	3.45
14.0563575174339	7.31458264603295	2.95045715859033E-7	17.68	15.78	3.21
15.5607295906044	8.21175397958647	3.24315738708947E-7	17.87	19.02	3.83
15.5607304136885	8.21175414989287	3.6439000972166E-7	16.46	18.17	1.97
15.560731236824	8.21175432016726	4.00869049954622E-7	16.23	17.23	0.85
15.5607320600258	8.21175449042859	4.32593257215785E-7	16.32	17.42	0.34
15.5607328833046	8.21175466068405	4.56631399359253E-7	20.5	18.33	0.82
15.560733705695	8.21175483076381	4.72443096199982E-7	19.94	18.52	1.49
15.5607345275465	8.21175500071381	4.64055737836588E-7	20.28	17.36	4.94
15.5607353487562	8.21175517053661	4.9722075878833E-7	23.56	15.68	4.13
14.8539180453148	7.30548157542742	4.46013288524227E-7	22.21	15.78	0.34
13.8449509281892	5.6357074590892	3.36594812466728E-7	22.23	9.9	1.41
12.7817687567952	3.87964302622719	2.30870572437425E-7	23.34	5.23	2.71

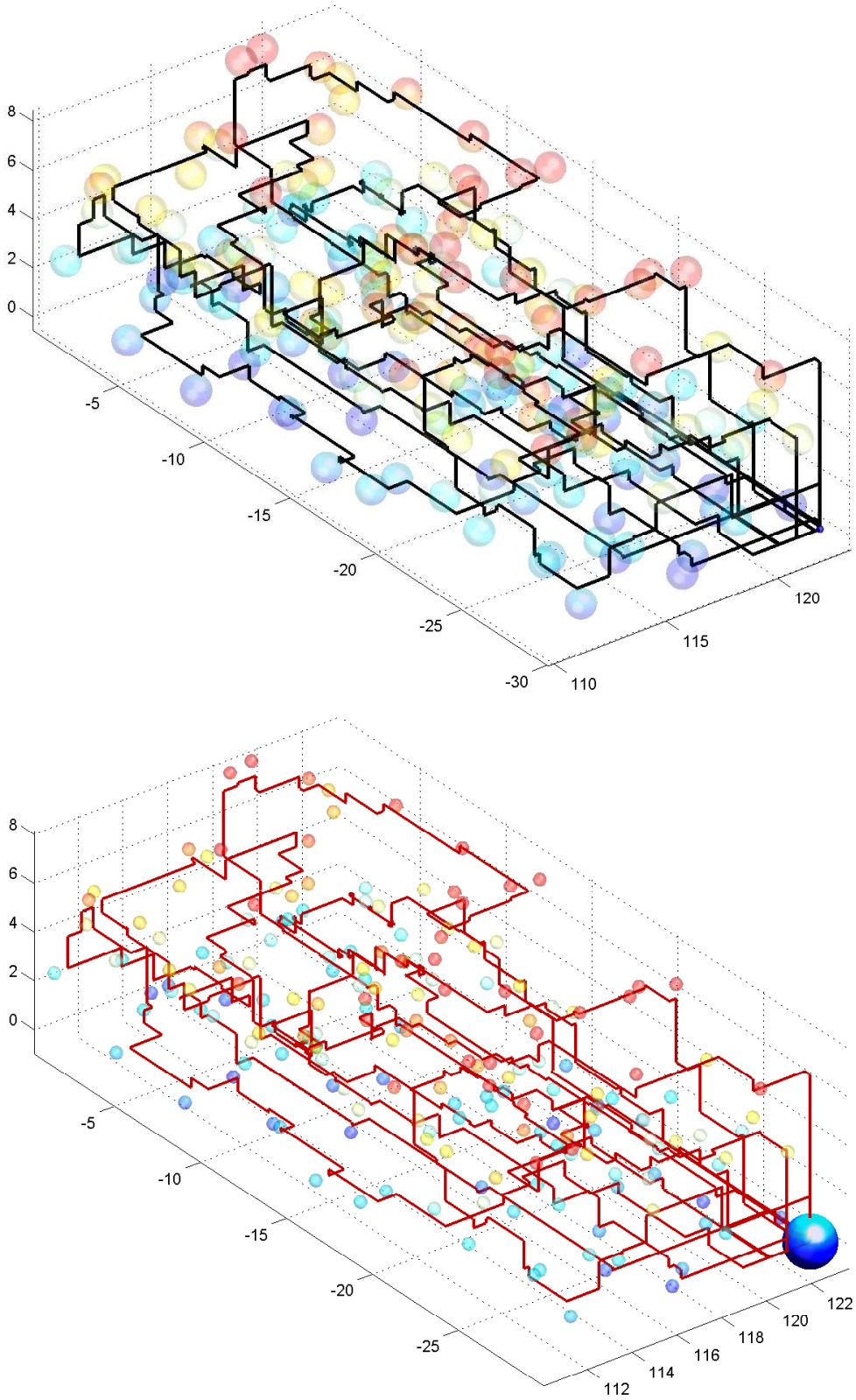


Figure O.177: $rat195$, $r = 0.578$, Equal Radius, 3D, Manhattan, Length = 549.4883869

Table O-180: Solution for $rat195$, $r = 0.578$, Equal Radius, 3D, Manhattan

Total distance: 549.488386921308 Total demand met: 11712 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 91.6276506445177 Demand Met: 1980					
12.5122792672128	27.177954057245	0.53722341813766	12.7	27.3	0.2
12.299840161443	20.9573093040891	1.8893215656506	12.7	20.9	2.2
11.7041925340496	19.2790302066044	2.21460048476365	11.3	19.3	1.9
11.497055642536	16.932171029827	3.80149189871882	11.4	16.9	4.3
11.3167591611166	15.4217642228997	4.03535985258919	11.7	15.3	3.7
10.8225886176503	14.8617569952309	4.86843760102494	10.4	15.1	4.9
10.5914949689635	12.7967260645344	5.60299940703663	10.3	12.6	5.4
10.4000012412031	11.8756597993614	6.94802740126982	10.4	11.3	7
8.7319713243246	13.1791263346044	6.94802804044083	8.2	13.4	6.9
9.63395568810519	13.1791263816044	7.12942945042863	9.59999999999999	12.8	7.5
11.4633806407663	13.1791264285033	7.23233828664434	11.6	13	7.6
12.2223089349788	13.1791264753956	7.32230985801472	12.6	13.4	7.7
12.1804247068907	9.28271582968872	7.05475814238717	12.3	9.3	7.2
12.1381746538062	4.90977096372175	6.7670499224586	12.7	4.9	6.8
11.8533799395283	3.10000002771459	6.3669007767397	11.3	3.1	6.2
11.8533802816989	1.50000079680483	6.36690060351188	12.3	1.5	6
11.1755477385818	1.2728973536766	6.82536376475406	11.5	1.4	6.7
9.40000014558527	1.02496314412304	7.36757462133066	9.40000000000001	0.8	7.9
8.61164877156148	1.02496309621542	7.25304126085253	8.59999999999999	0.6	7.6
7.97800012971915	1.02496305271459	4.59999986274597	7.5	0.7	4.6
7.9780004907601	3.1634733757416	4.18812227492255	8.5	3.4	4.2
7.97800085222504	3.19999551261116	3.2000000483497	7.40000000000001	3.2	3.2
8.01912093097123	4.42091199111212	3.06956297481057	7.5	4.4	2.9
8.08331257470392	6.52277502203437	2.97445172452036	8.5	6.5	2.8
8.14108961643692	9.15173015228455	2.88545184739075	7.7	9.3	3.2
8.48169519665063	9.34583400363964	1.9655538604384	8.3	8.9	1.9
9.00985926937229	9.72114150157087	1.28296817941864	9.40000000000001	9.5	1
9.17075309172441	15.196126451594	1.06720571623478	8.7	15.4	1.1
9.58270981711959	15.7403109768556	0.839165756052933	9.3	15.6	1.2
10.6631978452914	16.6591126802504	0.432343062880172	10.6	16.8	0
12.2117804283163	17.2414252165438	0.204290152588548	12.5	16.9	0.1
Route: 2 Length: 108.619478990544 Demand Met: 1995					
9.70068546202376	27.0151537636366	0.719825757939744	9.5	27.1	1
8.6480933968808	23.1506724880355	1.1565177392977	8.7	23	0.9
7.39999998158562	21.6087082728049	1.79129166112433	7.40000000000001	21.2	2.2
5.51764284457082	22.0221155840669	1.66632595370133	5.5	22.5	1.9
4.29999943949352	22.1241628589356	1.34996550198621	4.3	22.7	1.3
1.71064606668918	19.2676008209752	1.34996484130368	1.59999999999999	18.8	1.3
0.875830919457854	19.0000000211733	1.34996418084978	0.299999999999997	19	1.4
0.877279202831744	16.3998578710203	1.1021456778999	0.299999999999997	16.4	1.1
1.5778116923516	12.6885935581685	0.971637328084151	1.7	12.5	1
2.19510307803716	11.2000000354307	0.840464553551391	2.40000000000001	11.2	0.3
2.19510314703325	9.40000004319923	1.40895766174251	2.5	9.4	1.9
0.877960621167503	8.39999984677884	1.00677661576339	0.599999999999994	8.4	0.5
0.877960644743567	4.79999964080926	1.0067912644455	0.299999999999997	4.8	1
2.34194391867317	3.73323709170451	1.5229948686641	2.59999999999999	3.4	1.3
2.74624439485488	3.39999980162751	3.8343517164392	3.3	3.4	4
2.02835955293992	3.19999923501494	3.83435185349194	1.5	3.2	3.6
2.0283596602283	1.21317000578156	4.69723370032327	2.3	0.9	5.1
1.50991285715638	1.21317022097602	3.90453465309983	1.7	1.2	4.1
0.877850441942002	1.21317043621945	2.59999996363923	0.299999999999997	1.2	2.6
3.27152211224126	1.21317068863579	1.82924859488142	3.40000000000001	1.1	2
4.69999991480701	1.2131709411873	0.766812977143272	4.7	1.1	0.2
5.41027349845992	1.35340860990089	0.81957775871558	5.40000000000001	1.2	0.3
6.25559071996442	1.59999995223624	0.93581589260333	6.59999999999999	1.6	1.4
6.25559055191354	3.19999999336322	0.859670032583895	6.40000000000001	3.2	0.3
6.18052446815985	4.88033951813025	1.32060939864134	6.40000000000001	5.4	1.3
5.37901224184425	4.92062627008042	2.34088688417738	5.40000000000001	4.6	2.8
3.00870700921629	4.99999895499942	2.39129080081406	2.59999999999999	5	2.8
3.40845802497668	5.66646049864061	1.71610280002853	3.59999999999999	5.4	1.9
3.72722602676882	7.33341461935132	0.509345254808518	3.59999999999999	7.3	0
4.44664648297605	13.10725902484	0.379544991954772	4.40000000000001	13.1	0.1
5.20901577137012	19.404502680658	0.260590101325729	5.40000000000001	19.4	0.4
5.75850126706763	26.5379154394616	0.136843762626348	5.40000000000001	26.6	0.3
Route: 3 Length: 80.8539751368657 Demand Met: 1921					
10.9056640587934	26.5550036863852	2.42263236479134	10.6	26.4	2.7
10.3670915582023	25.6240280570427	3.0509750652622	10.4	25.6	3.6
9.46723634962572	24.9932641250938	3.12682102007498	9.40000000000001	24.5	2.9
9.04862179422476	24.8999979578859	3.23896605453978	8.7	24.9	3.7
9.04862218721108	23.4999996438948	3.23896399620288	9.5	23.5	3.6
9.04862209353924	20.9059563612596	3.17830540556199	9.40000000000001	20.9	2.9
9.04862199888959	18.5000007013217	3.12047829384548	9.3	18.5	2.6
8.96662077740334	17.4673583342642	3.27796222816091	9.5	17.4	3.2
8.60085978507132	17.010556344156	3.48951398390042	8.7	17.3	3.1

Solution x	Solution y	Solution z	Original x	Original y	Original z
8.10871085521654	12.7000000398818	3.99129063260827	7.7	12.7	4.4
8.62146829187753	10.7731252461721	3.94419905823205	8.59999999999999	10.7	4.5
9.47450964171695	10.4450298968282	3.50528351283381	9.8	10.8	3.4
9.77909548846053	9.18243263366561	3.16484909466135	10.3	9.2	3.3
9.87389052951512	7.4009278337844	2.20038094104048	9.40000000000001	7.4	2
10.0242792246828	5.6469096211228	1.82931477974345	10.3	5.4	1.9
10.1585150792478	4.86580011423298	1.43162983214625	9.8	5	1.1
10.3662896766392	1.23371022206556	1.23371001051172	10.7	0.9	0.9
10.2325451204498	2.25771114177028	1.90441184354562	10.4	2.5	2.2
10.0780029576968	2.80000011877436	2.29999995433005	9.5	2.8	2.3
11.9219968332408	3.40000075448069	2.80000109972681	12.5	3.4	2.8
11.7273909445997	4.73756900762055	2.93469746361131	11.5	4.7	3.2
11.5460029287562	6.26336870806645	3.05866561285786	11.7	6.5	2.6
11.270956249435	6.50000009175968	4.0100187044633	10.7	6.5	4.1
12.0000003645708	6.80000050601478	4.01002038971469	12.5	6.8	4.3
11.9999995998729	9.49999994539247	4.01002015830725	11.5	9.5	4.3
12.0631052747544	10.8850802851929	3.84588539827542	12.6	10.9	4
12.0917437988267	11.7037248852156	2.79264681276422	11.7	11.5	2.9
12.1219962258843	14.8000002007522	0.700005005645211	12.7	14.8	0.7
12.0216513888439	19.5014336785392	0.487633514337616	12.5	19.5	0.7
11.8780048131073	24.6000000690373	0.0999965566598327	11.3	24.6	0.1
Route: 4 Length: 75.3341345824204 Demand Met: 1835					
11.6788583443273	28.9489702260753	4.10566495256676	11.4	29.4	4.3
11.5999994823181	27.5373670733015	4.22211309906445	11.6	27.1	4.6
9.40000015483889	27.8272682068138	4.22211075573016	9.40000000000001	28.4	4.3
8.64019318441024	26.6926292013661	3.95895697489563	8.7	26.4	4.3
7.69325957562236	26.2176222972292	3.54953110181296	7.40000000000001	26.5	3.3
7.30003770140615	24.6999933834782	3.27781384239732	7.3	24.7	2.7
6.92199651885099	23.2774695621544	3.27725581842275	6.7	22.9	2.9
6.92199680615167	23.4000018395736	5.29999863497806	7.5	23.4	5.3
5.7777495932956	25.0938107727016	5.47511499888611	5.8	25.2	5.8
4.55559061671998	26.262585835886	5.62873960272498	4.5	26.7	5.4
3.69895773967087	26.540870852841	5.82542813068149	3.7	26.6	6.4
1.07710065399721	26.5939578806698	5.82921240678663	0.5	26.6	5.8
1.07689573050637	28.3221698445074	7.07800386182447	0.700000000000003	28.7	7.3
2.20468102744465	28.2083585540957	7.07800358720113	2.3	28.7	7.3
2.59999875792417	25.5000004996942	7.07800331170323	2.59999999999999	25.5	6.5
2.80713457288797	24.587488475164	7.11363778597929	3.3	24.6	6.9
2.89566216043264	23.5168135589513	7.15298160402478	2.59999999999999	23.5	7.4
2.99128899448131	22.500000024288	7.19129111115477	3.40000000000001	22.5	7.6
2.83549942804812	21.536732852712	7.00836103360474	3.3	21.4	7.2
2.39999739033749	21.0964586475017	6.74359059646266	2.40000000000001	20.9	6.2
0.916810855020586	21.0964515106903	6.74358822873282	0.5	20.7	6.8
0.921997144820622	21.3000008631304	4.60000091362958	1.5	21.3	4.6
0.92199640247685	22.6105293795681	4.42447553697403	1.3	22.7	4.8
0.92199565966753	23.1153594188645	3.11731377371377	0.599999999999994	22.9	2.8
0.92199491751731	24.7638927474354	2.76030620628585	0.599999999999994	24.9	2.3
1.49999903587619	24.7638935638508	2.94571974147006	1.5	24.6	3.5
1.60001530489554	26.8219977293235	1.80000449030441	1.59999999999999	27.4	1.8
1.83501946448445	26.8220024432026	1.40018016782653	2.40000000000001	26.7	1.4
1.83502004747554	29.0025759696257	1.39738146190209	1.7	29.4	1
3.29999980692864	28.9780036539703	2.50000090729204	3.3	28.4	2.5
4.299736732949	29.0274646228252	2.59985993675598	4.3	28.8	2.1
5.30000007340497	29.091291611312	3.6912875203096	5.3	29.5	4.1
8.72183118637308	29.0461553391417	1.884454913112	8.7	29.3	1.9
Route: 5 Length: 85.5465692338217 Demand Met: 1989					
12.4753799931385	25.4034145036436	2.79829149204661	12.5	25.3	2.9
12.2489610177651	23.179270844794	4.72144152353356	12.7	23	4.7
11.7000001308711	22.4999999252321	7.32199660558154	11.7	22.5	7.9
11.3981214734357	21.1036625577508	7.20892957676649	11.5	20.6	7
10.3734696190181	21.0207002560565	7.13597770008924	10.4	21.5	7.4
8.49031097164925	20.775005717593	7.0257266064785	8.40000000000001	21.2	7.3
7.69999993874342	19.2002597146919	6.87800280804903	7.7	19.2	6.3
6.60000012634741	19.1997592823482	7.32199719086696	6.59999999999999	19.2	7.9
5.80675267053455	17.3999999755362	7.32199240866417	5.3	17.4	7.6
5.80675016078381	15.5028030164828	7.30451754716912	6.3	15.5	7.6
5.80674765735762	14.5507817907629	7.01935846309211	5.5	14.6	7.4
5.80674515501971	13.1999987290586	6.11066424283101	5.40000000000001	13.2	5.7
5.87279212709502	12.3999999971404	6.11066697500581	6.3	12.4	6.5
5.84747040132336	11.3378258391902	5.21716664505901	6.40000000000001	11.2	5.2
3.96308903298146	11.249725381619	4.79999981842467	3.59999999999999	10.8	4.8
3.96308970014114	11.2497277871155	3.76701729345802	4.3	11.2	3.3
3.4961948532506	12.5931620153039	3.77520456599438	3.5	12.6	3.2
2.69999989887057	13.0193831129354	5.66500863826365	2.7	13.4	6.1
0.914404726114782	13.0193828352329	5.66500807363491	0.599999999999994	12.7	5.3
0.914404981879571	15.1999963756741	5.76323441352285	0.700000000000003	15.2	6.3
1.63068402370111	15.2427019571213	5.44282163872282	1.59999999999999	14.7	5.3
4.09128973113938	15.3999989378766	5.30870870050383	4.5	15.4	4.9
3.49353487759176	15.4907139188635	6.40087509247197	3.5	15.1	6.8
2.90871152815565	16.4999999853599	6.49129244379705	2.5	16.5	6.9

Solution x	Solution y	Solution z	Original x	Original y	Original z
3.93709127183301	17.2021382111173	6.44225439796945	4.40000000000001	16.9	6.4
3.93709127183301	17.2021382111173	6.44225439796945	3.5	17.5	6.6
4.31029362189322	18.8648333471061	6.38776647806908	4.40000000000001	18.9	6.5
4.66293861200529	20.3858620211207	6.3326921926113	4.3	20.6	6.3
5.3000000836455	21.1000000075922	6.27800295209663	5.3	21.1	5.7
6.20935201664017	21.6410658110073	6.94210464676416	6.40000000000001	21.3	7.2
6.7000003522887	26.6999999456244	7.32199640825889	6.7	26.7	7.9
10.3765428967869	28.6919607488794	6.8257106440196	10.4	29.1	7.1
Route: 6 Length: 107.506578333138 Demand Met: 1992					
10.8381226050512	22.8415574541258	0.447745802111523	10.5	22.8	0.7
10.2713010595831	19.4544425855629	0.762732139260327	10.6	19.2	0.8
8.64080163762343	18.600583760591	1.06568646923	8.5	18.8	1.3
7.59998726965802	17.0999011310629	1.32199840072132	7.59999999999999	17.1	1.9
6.83726553729149	16.8000007412957	1.32199911048146	6.40000000000001	16.8	1.7
6.92199888240408	15.1000003697418	1.09998820487515	7.5	15.1	1.1
6.92199963609629	11.2000008555484	0.837265736177284	7.3	11.2	0.4
5.70070709331434	10.4794891456341	0.930858277599257	5.59999999999999	10.5	0.4
5.2999882289246	9.50000046476842	1.42199871696715	5.3	9.5	2
5.27272977252098	8.69999929087746	1.27788498365503	4.7	8.7	1.2
5.86263402245135	8.60000209807593	1.27788423320783	6.3	8.6	0.9
5.33285231363544	7.49347792139078	1.74464391309149	5.40000000000001	7.2	1.4
4.69999901725647	7.05002959020088	3.47887559700155	4.7	6.8	4
2.70000022926146	7.05002956334505	3.32115277327764	2.7	7.3	2.8
1.61308055587669	7.04240266211513	4.40184712200746	1.5	7.5	4.4
0.938651236982608	7.03461755134743	5.4930352778734	0.599999999999994	7.5	5.5
0.928865546899743	4.60388402325724	5.808620386012	1.5	4.6	5.8
0.858195482769617	3.24121860471307	6.35576337701197	0.299999999999997	3.2	6.5
4.19999900920894	3.24121702260626	6.35576373129517	4.2	3.4	5.8
5.0495774205878	3.02093565963608	6.49999829927337	5.3	2.5	6.5
5.04957745028635	4.95257732047526	7.28082020181924	4.8	5	7.8
8.22439507803566	4.95257854509632	6.69999785336242	8.8	4.9	6.7
7.39551364371171	6.40717566840742	6.68887003244143	7.40000000000001	6.7	6.3
6.59999875581251	6.80000375856034	6.67800132969965	6.59999999999999	6.8	6.1
3.70000066753494	8.39999869791362	6.92199867407815	3.7	8.4	7.5
1.54489642612361	9.52652562831726	6.7755993399625	1.3	9.5	6.3
1.27800134578112	11.4000028584986	6.70000523975816	0.700000000000003	11.4	6.7
1.57570960031475	11.5447133914348	4.20127035801587	1.5	11.1	3.9
2.02817619284392	15.2841177794826	3.99947629371343	2.40000000000001	15.3	3.6
2.13635752513179	17.1983562636617	3.91751887251435	1.59999999999999	17.2	3.9
2.55039332446448	19.0784305565721	3.8368563061824	2.5	19.5	4.2
3.69957063290879	19.1550785399647	2.91388162520613	3.7	18.6	2.9
4.77554424209556	24.4205933469025	2.23322284863602	4.7	24.8	2.4
6.3088164266196	25.0552815288724	1.04035475917024	6.5	24.8	0.7
6.93392655227534	28.2789378499026	0.643255062421803	7.3	28.6	0.6
7.18384855489245	28.6924686731368	0.286018339192731	6.7	28.8	0.2

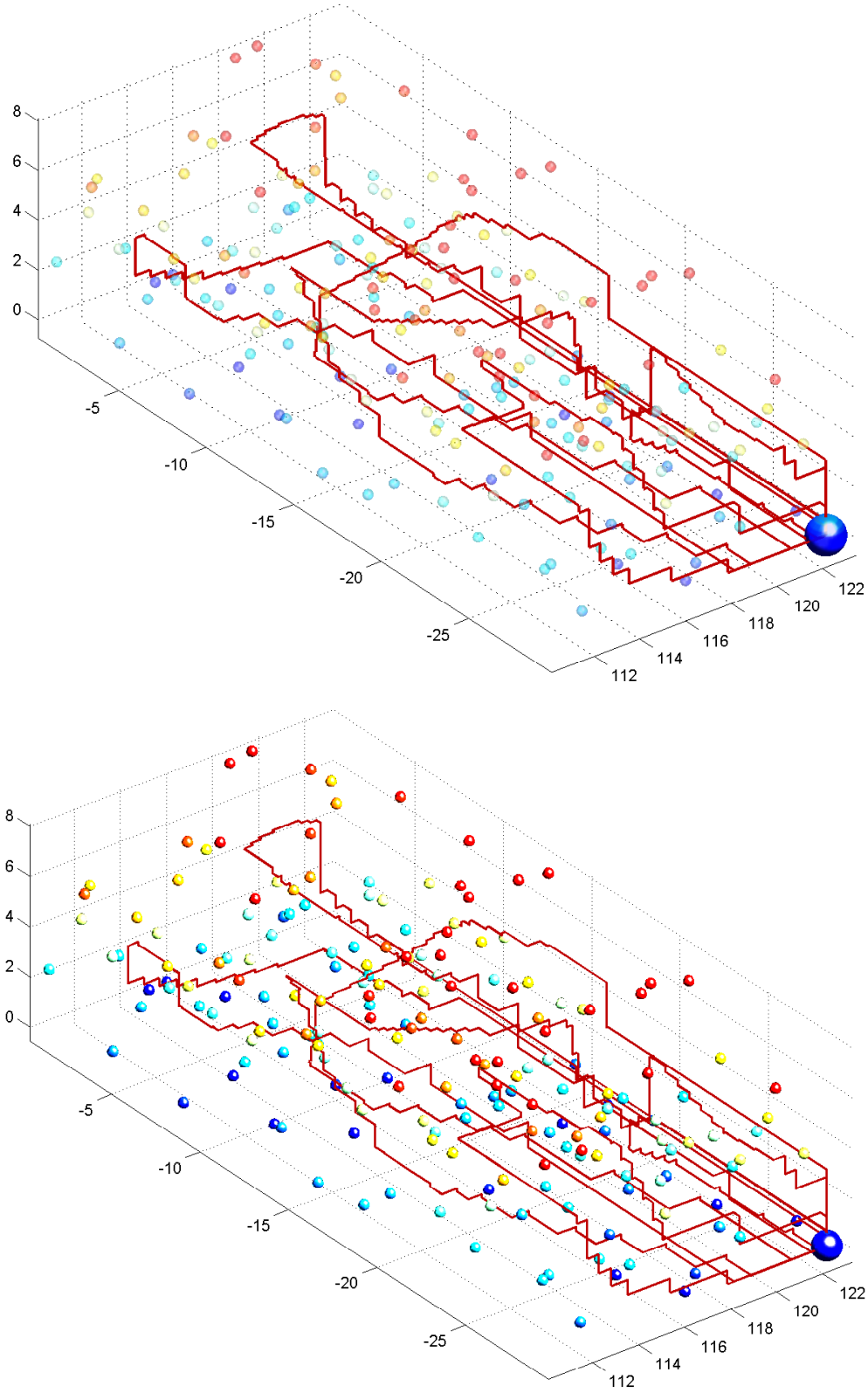


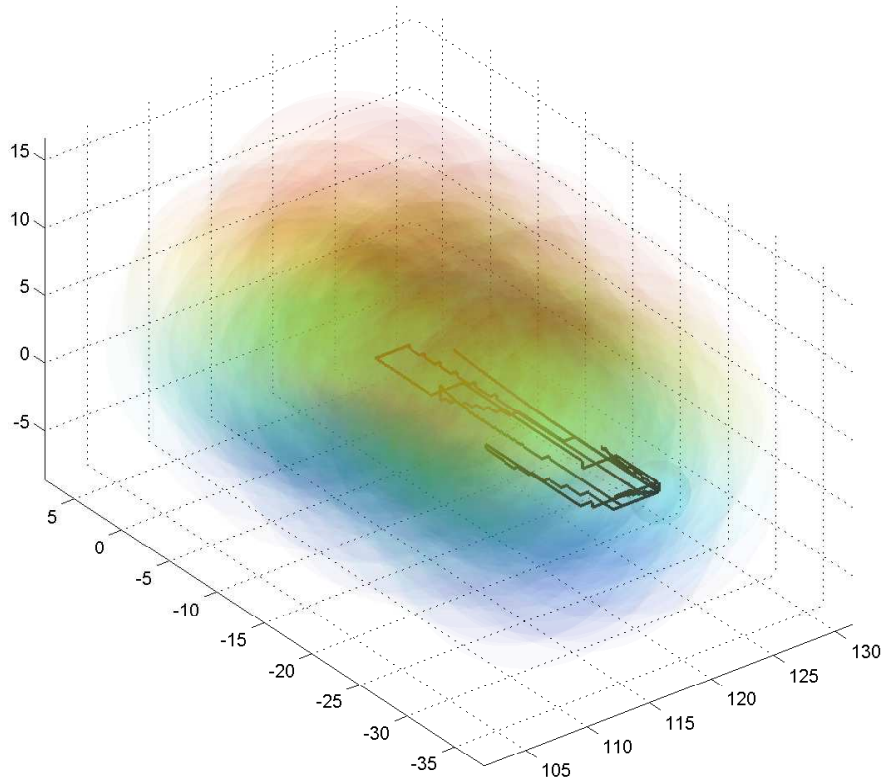
Figure O.178: $rat195$, $r = 2.89$, Equal Radius, 3D, Manhattan, Length = 369.7159543

Table O-181: Solution for $rat195$, $r = 2.89$, Equal Radius, 3D, Manhattan

Total distance: 369.715954279881 Total demand met: 11712 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 31.6906069450291 Demand Met: 1920					
12.3315669520953	27.5817326808375	0.172412235624787	12.7	27.3	0.2
11.9646188495188	26.3758416737829	0.344214077662339	9.5	27.1	1
11.7342721639872	24.2016570729489	0.505083111659002	11.3	24.6	0.1
11.507670660902	22.0468459670664	0.667240249340262	12.5	19.5	0.7
11.1876548738893	21.7989951520027	0.829677231413308	12.7	20.9	2.2
10.83801892791	21.5642151556024	0.986263597088273	10.6	19.2	0.8
10.4996043144131	21.361640657042	1.14466910308093	11.3	19.3	1.9
10.1424215906535	21.1779307843762	1.29999898594994	8.5	18.8	1.3
10.1424216638043	21.2168598338688	2.36337075459555	9.3	18.5	2.6
10.142421736593	21.694502644532	2.70401144537722	8.7	23	0.9
10.142421736593	21.694502644532	2.70401144537722	7.40000000000001	21.2	2.2
10.1424218096699	22.3170327535645	5.36309617558155	8.40000000000001	21.2	7.3
10.1424218096699	22.3170327535645	5.36309617558155	7.5	23.4	5.3
10.1424219382864	22.5000055371223	5.46565111842164	11.7	22.5	7.9
10.1424219382864	22.5000055371223	5.46565111842164	10.4	21.5	7.4
10.1424212588402	22.5624243608014	5.40111453533766	11.5	20.6	7
10.1424205833034	23.2073207672763	5.14892895500208	12.7	23	4.7
10.1424205833034	23.2073207672763	5.14892895500208	9.5	23.5	3.6
10.1424199077869	23.9060111682821	4.9368599306361	9.40000000000001	24.5	2.9
10.1424192324213	24.5583255267488	4.74934523345502	8.7	24.9	3.7
10.1424185573476	25.2074540434866	4.56775992919727	10.4	25.6	3.6
10.142417882995	25.8594189778478	4.38949295323255	8.7	26.4	4.3
10.1424172091638	26.4999990182884	4.21173025894431	7.40000000000001	26.5	3.3
10.2287087534966	27.2152376297874	4.21173018279517	10.6	26.4	2.7
10.315036249246	28.0380142794741	4.21173010674347	11.6	27.1	4.6
10.400557605844	28.9999992900612	4.21173003059291	10.4	29.1	7.1
10.8874575638062	28.9999995127847	3.48780169449997	11.4	29.4	4.3
11.3652195369681	28.9999997356739	2.72674447380183	9.40000000000001	28.4	4.3
Route: 2 Length: 67.0793208439903 Demand Met: 1975					
9.39938852198489	27.6369916370877	0.177062160607573	7.3	28.6	0.6
8.0567187647173	25.9834189725328	0.350792144201752	6.5	24.8	0.7
7.0229442473087	24.7632057315476	0.523209080594538	7.3	24.7	2.7
5.93779145127718	23.6285732846046	0.684949288215763	4.7	24.8	2.4
5.15016925895728	22.0016540459996	0.835711558125494	4.3	22.7	1.3
4.41396584482091	20.3140666917096	0.985615919368681	3.7	18.6	2.9
3.83304497838307	19.6428907078635	1.11708081873056	5.40000000000001	19.4	0.4
3.18610500909656	19.0000108519486	1.24999903934444	0.299999999999997	19	1.4
3.18610500701401	17.7914760259498	1.2499997785821	1.59999999999999	18.8	1.3
3.18610500498205	16.3999986201787	1.25000051808426	0.299999999999997	16.4	1.1
3.19990909793449	15.8595232333037	2.1432230051722	1.59999999999999	17.2	3.9
3.21396940366807	14.7286886335364	2.54094117540241	2.40000000000001	15.3	3.6
3.22806529295909	13.5477190178026	2.92328543214528	1.7	12.5	1
3.24236359036458	12.890157244504	3.62460380865805	1.5	11.1	3.9
3.25676052615506	12.4301438196058	4.27806755405423	3.59999999999999	10.8	4.8
3.27113715987534	12.010163622653	4.91169211181884	0.599999999999994	12.7	5.3
3.28603853824869	11.4099975091065	5.42711037651393	0.700000000000003	11.4	6.7
3.37578015975936	10.8593064635376	5.46192178096705	1.3	9.5	6.3
3.47571634733602	10.4695612011587	5.49532662813585	3.7	8.4	7.5
3.47571650448597	15.1999969730059	5.49532601158495	0.700000000000003	15.2	6.3
3.7035947629538	15.3669270188734	5.48179550625355	1.59999999999999	14.7	5.3
3.95131856276761	15.5452937564242	5.46826722391541	2.7	13.4	6.1
4.22643453178866	15.755004316217	5.45470510432972	2.5	16.5	6.9
4.5391843308403	15.9627534334377	5.44112465987245	3.5	15.1	6.8
4.86639161469536	16.1789557287677	5.42752820952265	5.5	14.6	7.4
5.16916651604905	16.4340178635812	5.41381573579147	4.5	15.4	4.9
5.47846535064552	16.6990343373626	5.40011612833741	3.5	17.5	6.6
5.85831212750077	16.9517306811973	5.38640968297851	5.3	17.4	7.6
6.26069374575513	17.200885077561	5.37270915420433	6.3	15.5	7.6
6.65473398066497	17.8387597779577	5.35850244216929	6.59999999999999	19.2	7.9
7.886879065991	17.8652780070227	5.10010954332786	7.7	19.2	6.3
9.19404663570958	17.8917834260658	4.83235263463908	11.4	16.9	4.3
9.92951139450052	17.9185838327714	4.57687260171122	10.4	15.1	4.9
10.1048595305718	18.0115555803091	3.48508153470645	9.5	17.4	3.2
10.2827456195927	18.1055118163991	2.44687739666556	8.7	17.3	3.1
10.468589668648	18.2006944496155	1.32701093695603	9.3	15.6	1.2
11.3604098668984	19.1114141831422	0.601028884294408	10.6	16.8	0
Route: 3 Length: 75.2894384566076 Demand Met: 1993					
12.0130514912273	24.3847830023484	1.17066589935854	12.5	25.3	2.9
11.3032234771438	17.6494259613845	2.06153435404374	12.5	16.9	0.1
10.4271616095719	14.4972458137285	3.80969187009175	10.3	12.6	5.4
9.58896623629826	13.3641219661098	4.72668689427046	9.59999999999999	12.8	7.5
8.76873429454211	12.9010871076682	4.86629305467748	8.2	13.4	6.9
8.0186193291273	12.4218041752184	4.99980846905486	5.40000000000001	13.2	5.7
7.85150041918047	11.0392539100473	5.11389011516777	6.3	12.4	6.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.6966054389727	7.95742060795819	5.22307005399569	7.40000000000001	6.7	6.3
7.54267396419247	5.85314354306142	5.3312725237171	7.5	4.4	2.9
7.39078997451968	5.56648049792606	5.56701750039274	8.8	4.9	6.7
7.23502506141084	5.28847177031644	5.79660381834737	6.59999999999999	6.8	6.1
7.0811775095202	4.9999993314414	6.02564675312965	4.8	5	7.8
7.08117750305476	3.40000573784597	6.0256467627784	4.2	3.4	5.8
7.46220289950472	3.25432814278659	6.02564677711938	5.3	2.5	6.5
7.91669497985441	3.1132067672815	6.02564679145054	7.5	0.7	4.6
8.60118569924376	3.01818175390545	6.025646805774	8.59999999999999	0.6	7.6
9.40000787303191	2.99975008825941	6.02564681961799	9.40000000000001	0.8	7.9
9.73338034788254	3.1695385667822	6.02415428664758	11.5	1.4	6.7
10.0027201351935	3.36012152987992	6.02266014753815	11.3	3.1	6.2
10.2656466374093	3.55153346485316	6.0211599896	12.7	4.9	6.8
10.2661336839385	3.55239884719558	5.95597820556717	12.3	1.5	6
10.2664963196857	3.55539764491338	4.36428239983251	12.5	3.4	2.8
10.2668586712467	3.55839929391141	3.78776628703073	8.5	3.4	4.2
10.2672194894131	3.56140699148423	3.20011399385603	7.40000000000001	3.2	3.2
10.5871259483427	4.01418410113593	2.71050082737676	11.5	4.7	3.2
10.9012391669193	4.45366342968615	2.21275582190074	9.5	2.8	2.3
11.2431422724861	4.95016908665058	1.71470550120698	10.4	2.5	2.2
11.6500318286975	6.38573247203145	1.14469620136452	9.8	5	1.1
12.1778989714718	15.4968171712229	0.574386548490974	12.7	14.8	0.7
Route: 4 Length: 51.2418508009981 Demand Met: 1874					
8.4243158334846	28.9555581941632	0.509437852990597	6.7	28.8	0.2
5.97286349512365	28.9113622162982	1.02735522323438	5.40000000000001	26.6	0.3
4.15847832877938	28.8682808996865	1.60113174383755	1.7	29.4	1
3.48805600493584	28.8248766957202	2.26512724235874	1.59999999999999	27.4	1.8
2.96481468543429	28.7821011974993	2.9816101820214	2.40000000000001	26.7	1.4
2.50497220042931	28.7410218322866	4.51044113087011	2.3	28.7	7.3
2.09871088584254	28.7000024540454	4.77102595779828	0.700000000000003	28.7	7.3
2.09871088627182	26.7174903403052	4.77102575269263	0.5	26.6	5.8
2.09871088671412	24.9000004117416	4.77102554756945	0.599999999999994	24.9	2.3
2.09871088671412	24.9000004117416	4.77102554756945	1.5	24.6	3.5
2.09871092421079	23.8592934766871	4.77102552922837	0.599999999999994	22.9	2.8
2.09871096175499	23.1682499006044	4.77102551094821	1.5	21.3	4.6
2.09871099931181	22.5801256381281	4.77102549267053	1.3	22.7	4.8
2.09871103687652	21.9959501844506	4.77102547439371	0.5	20.7	6.8
2.61797660644072	21.9959501287739	4.74371936892786	2.40000000000001	20.9	6.2
3.14342637498918	21.9959500731211	4.71630517683487	3.3	21.4	7.2
3.65402676412199	21.9959500174838	4.68835254617971	4.3	20.6	6.3
3.65402676412199	21.9959500174838	4.68835254617971	2.5	19.5	4.2
4.80913235860893	21.9959499619592	4.66056824396873	5.5	22.5	1.9
4.80913241477305	21.9959496911931	4.88982772932467	6.40000000000001	21.3	7.2
4.80913241477305	21.9959496911931	4.88982772932467	6.7	22.9	2.9
4.80913196465399	20.81874076602	5.2147289779033	5.3	21.1	5.7
4.80913151452907	19.6275349625986	5.53671217463043	4.40000000000001	16.9	6.4
4.80913143505006	20.601901064671	5.53671221027737	4.40000000000001	18.9	6.5
4.80913135557776	21.878757415894	5.53671224590756	3.40000000000001	22.5	7.6
4.80913127615241	22.8846275693815	5.53671228148345	5.8	25.2	5.8
4.80913119671031	23.5000000041262	5.53671231704791	2.59999999999999	23.5	7.4
5.04121378608171	25.0109966922526	5.45717713296137	2.59999999999999	25.5	6.5
5.04121378608171	25.0109966922526	5.45717713296137	3.3	24.6	6.9
5.43132549197077	26.282579362502	5.37236847816163	6.7	26.7	7.9
5.56143815840538	26.6913578856709	4.8654838057471	3.7	26.6	6.4
5.69909401841885	27.1086927707302	4.24775263632264	4.5	26.7	5.4
5.83928713661375	27.5385199045848	3.58215933237258	5.3	29.5	4.1
5.98125987224849	27.9267788414242	2.8833963565101	4.3	28.8	2.1
6.12803984611185	28.3021843970603	2.23741579119902	3.3	28.4	2.5
9.1899020452781	28.650956883664	1.1515019781503	8.7	29.3	1.9
Route: 5 Length: 63.7796993943002 Demand Met: 1955					
11.1708340549168	23.8499265657274	0.130024939824214	10.5	22.8	0.7
9.80355622466359	20.7690217378699	0.258736787018902	9.40000000000001	20.9	2.9
8.78356600204944	17.0641544119644	0.366131817691157	7.5	15.1	1.1
8.10692234166659	16.0485146697678	0.471004659453349	7.59999999999999	17.1	1.9
7.46638010460904	14.8759954822495	0.574024705150508	8.7	15.4	1.1
6.76028060412825	13.6485015593257	0.676605710800398	7.3	11.2	0.4
5.9330284180157	13.1157503807889	0.780392175598707	4.40000000000001	13.1	0.1
5.23014933621801	12.5999773318094	0.885116199288114	3.5	12.6	3.2
5.23014907536196	11.792035017356	0.885116362098736	4.3	11.2	3.3
5.23014881548073	11.2000005484561	0.885116523253389	2.40000000000001	11.2	0.3
5.23358920285976	9.52723444746134	0.987942949546042	2.5	9.4	1.9
5.24170332703875	9.45377003918409	0.99963418724862	3.59999999999999	7.3	0
5.33751022023696	9.44716491006159	1.52573237702335	5.40000000000001	7.2	1.4
5.43312765130777	9.44058043931005	2.03480650786653	4.7	8.7	1.2
5.52907132143839	9.43396561857933	3.20604391648015	4.7	6.8	4
6.29583398787291	9.42871435718207	3.29666341757451	6.3	8.6	0.9
7.06109077550686	9.42335741792317	3.3963047680767	7.7	9.3	3.2
7.78926309454867	9.41791963892383	3.49612080674083	8.3	8.9	1.9
8.47848528423368	9.41242182624184	3.59805352412643	8.59999999999999	10.7	4.5
9.16347963424498	9.40687007934656	3.69894305568667	9.40000000000001	9.5	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.77562617657932	9.40128327936826	3.83096122525867	10.3	9.2	3.3
9.77562617657932	9.40128327936826	3.83096122525867	9.8	10.8	3.4
10.3771723817796	9.39565324297499	3.9652823947874	12.6	10.9	4
10.6999999246369	9.39000069311163	4.09999985586028	10.7	6.5	4.1
11.4985316722139	9.44494230177082	4.26860775673376	12.5	6.8	4.3
11.6194725139914	9.7542665035166	4.41417704103057	11.5	9.5	4.3
11.7409721598733	10.0662151408067	4.56013511761116	12.3	9.3	7.2
11.8464812397893	10.8722349614474	4.63953584864603	11.7	11.5	2.9
11.9525832608754	11.6108510125202	4.7202873636449	10.4	11.3	7
12.0980714215482	12.9253084916983	4.78310737572874	11.6	13	7.6
12.600063554932	13.3999968662085	4.80999920574245	12.6	13.4	7.7
12.6496717654868	16.6435652454258	3.02487948681826	11.7	15.3	3.7
Route: 6 Length: 80.6350378389556 Demand Met: 1995					
8.67641937564115	17.3881201963752	1.03194740959156	6.40000000000001	16.8	1.7
7.57837947885206	13.3089574428759	1.86659787192644	7.7	12.7	4.4
6.43644411956919	11.2575220600021	2.32370308632376	6.40000000000001	11.2	5.2
5.58744888471898	10.2445116602601	2.36466006265801	5.59999999999999	10.5	0.4
4.73740775293308	9.19901477004218	2.40599065020122	5.3	9.5	2
3.85852049875963	8.13799790368144	2.44736801253691	3.59999999999999	5.4	1.9
3.16286595270203	7.89415909084426	2.48979472709361	2.7	7.3	2.8
2.48322693208721	7.65384508688663	2.53218913445952	0.599999999999994	8.4	0.5
2.38807680635949	5.96580381196409	2.60340463043033	0.299999999999997	4.8	1
2.35263845006079	5.87018454659049	3.90908009430689	0.599999999999994	7.5	5.5
2.32651615961969	5.1250932406482	4.0141300795236	1.5	7.5	4.4
2.30056409541635	3.61814782065906	4.11827949514875	2.3	0.9	5.1
2.30056409541635	3.61814782065906	4.11827949514875	1.7	1.2	4.1
1.88261322989607	3.61814771287948	4.11827982786641	0.299999999999997	3.2	6.5
1.88261322989607	3.61814771287948	4.11827982786641	1.5	4.6	5.8
1.88261326507826	3.61814767849253	2.6000064831612	0.299999999999997	1.2	2.6
2.54275163600551	3.63181965216204	2.33319827706061	1.5	3.2	3.6
2.54275163600551	3.63181965216204	2.33319827706061	3.3	3.4	4
3.21256068193428	3.64551174153779	2.0445890712829	2.59999999999999	3.4	1.3
3.21256068193428	3.64551174153779	2.0445890712829	2.59999999999999	5	2.8
3.94059394182146	3.65918616509969	1.75600064395732	3.40000000000001	1.1	2
4.81799349668549	3.67302662541938	1.46024973527706	4.7	1.1	0.2
4.81799349668549	3.67302662541938	1.46024973527706	5.40000000000001	1.2	0.3
5.6293115105409	3.69000768096096	1.36202765516602	5.40000000000001	4.6	2.8
6.46370825745711	3.70695596477249	1.26249335077194	6.40000000000001	3.2	0.3
7.30876841772398	3.72390043267645	1.16367099377472	6.59999999999999	1.6	1.4
8.26590279618002	3.74090991166521	1.06450300593047	6.40000000000001	5.4	1.3
10.3115394140046	3.7577955950295	0.964774734822391	10.7	0.9	0.9
10.4217417744439	5.10167245542691	0.877697860695949	10.3	5.4	1.9
10.5322129587903	6.39990778835133	0.790078756088028	8.5	6.5	2.8
10.9482119274343	7.2721864632355	0.579994929784742	11.7	6.5	2.6
11.345409229001	8.26454345823907	0.352732189753083	9.40000000000001	7.4	2



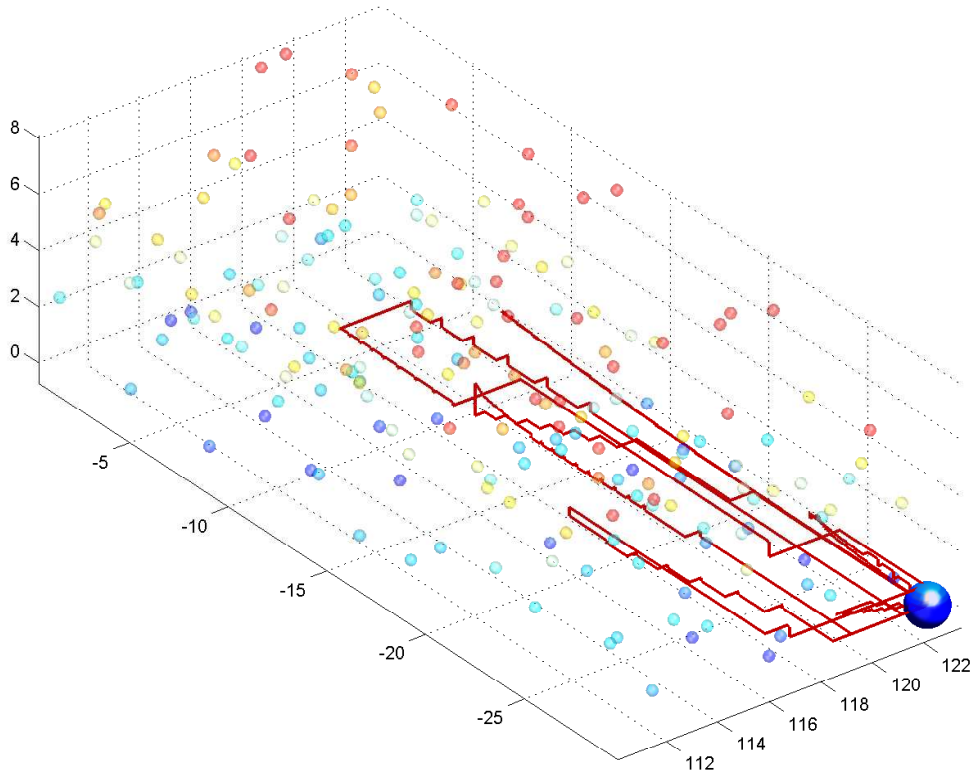


Figure O.179: $rat195$, $r = 8.67$, Equal Radius, 3D, Manhattan, Length = 208.3938064

Table O-182: Solution for $rat195$, $r = 8.67$, Equal Radius, 3D, Manhattan

Total distance: 208.393806403075 Total demand met: 11712 Depot: x 12.7 y 29 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 59.9565102157533 Demand Met: 1999					
11.7316440549308	13.2141037629509	0.358411192620396	4.7	8.7	1.2
11.2217149152373	11.6611170002936	0.703342429074157	8.5	6.5	2.8
10.7302291593491	10.3262570731629	1.04544290861384	6.59999999999999	6.8	6.1
10.272831204261	9.18740103887046	1.37278306775652	7.40000000000001	6.7	6.3
9.8317392417418	8.13315718112293	1.69305701690455	8.8	4.9	6.7
9.40000004533989	7.15919502704622	2.00682269169997	9.40000000000001	0.8	7.9
8.98504101763795	7.15919502413582	2.00682269522529	8.59999999999999	0.6	7.6
8.64095084123062	7.15919502122621	2.0068227008105	7.5	0.7	4.6
8.30353161919246	7.15919501832077	2.00682270807868	6.59999999999999	1.6	1.4
7.97209523720085	7.15919501541904	2.00682271328584	5.40000000000001	1.2	0.3
7.64904429262028	7.15919501251975	2.00682271683267	4.7	1.1	0.2
7.33542076922716	7.15919500962211	2.00682271714015	3.40000000000001	1.1	2
7.03394262038118	7.15919500672543	2.00682271718631	2.3	0.9	5.1
6.79213413182944	7.15919500381674	2.00682272146222	1.7	1.2	4.1
6.56937284287571	7.159195000904	2.00682272639039	0.299999999999997	1.2	2.6
6.56937281491138	7.15919499940518	2.00682273221103	0.299999999999997	4.8	1
6.56937278695023	7.15919499790404	2.00682273499603	2.59999999999999	3.4	1.3
6.5693727589921	7.15919499640195	2.00682273627983	2.59999999999999	5	2.8
6.56937273103654	7.15919499489976	2.00682273793746	1.5	7.5	4.4
6.56937270308205	7.15919499339607	2.00682274013363	0.599999999999994	7.5	5.5
6.56937267512595	7.15919499188932	2.00682274292125	1.5	4.6	5.8
6.56937264716927	7.15919499037969	2.00682274542562	0.299999999999997	3.2	6.5
6.66276416604156	7.56590449785973	1.91304113001715	1.5	3.2	3.6
6.75717408165771	7.99303161926924	1.81902167309203	3.3	3.4	4
6.85214446035103	8.43837746080141	1.72479944272429	4.2	3.4	5.8
6.94769689886564	8.91258370192067	1.62993506058194	5.3	2.5	6.5
7.0443823244715	9.53672417800533	1.53205313588934	4.8	5	7.8
7.14230141717587	10.2948618508178	1.43106279131283	3.7	8.4	7.5
7.24108673883194	11.0986728600769	1.32875785097229	1.3	9.5	6.3
7.34069942137395	11.9681400278054	1.22438833034583	0.700000000000003	11.4	6.7
9.95976694139004	24.5547193417698	0.665616660832555	10.4	29.1	7.1
Route: 2 Length: 7.73454442854478 Demand Met: 1720					
12.3871092985479	28.6813724636351	1.56403912043857E-7	11.3	24.6	0.1
12.0658438702855	28.3710740733033	1.73934347813542E-7	8.7	23	0.9
11.7490840181312	28.0718162683046	2.10420648016907E-7	10.5	22.8	0.7
11.4341874767306	27.7813732189959	2.37847373796285E-7	10.6	19.2	0.8
11.2999944347337	27.7592495330509	2.60948617381018E-7	11.3	19.3	1.9
11.2219900987819	27.7592497922783	2.76906334306659E-7	12.5	19.5	0.7
11.1432401079828	27.7592500519778	2.66599352372054E-7	12.7	20.9	2.2
11.0643275082983	27.7592503119653	2.53795130689127E-7	12.7	23	4.7
10.9851950817132	27.7592505718821	2.71108811844556E-7	12.5	25.3	2.9
10.9058585195574	27.7592508314955	2.67399949294145E-7	10.4	25.6	3.6
10.8265952535998	27.7592510909987	2.78042445955862E-7	10.6	26.4	2.7
10.7473843129781	27.7592513504496	2.68675703907206E-7	11.6	27.1	4.6
10.6680774123905	27.7592516098846	2.75763214929725E-7	11.4	29.4	4.3
10.5890338674369	27.7592518694289	2.76000045928981E-7	9.40000000000001	28.4	4.3
10.5102056583312	27.7592521289233	2.75991524745223E-7	8.7	26.4	4.3
10.4316283078947	27.7592523884224	2.84771441982912E-7	7.40000000000001	26.5	3.3
10.3533806491242	27.7592526479326	2.84353854240749E-7	5.3	29.5	4.1
10.2758144156441	27.7592529073495	3.01126618751368E-7	4.3	28.8	2.1
10.1988952902414	27.7592531667016	2.99236514678114E-7	3.3	28.4	2.5
10.1230655764834	27.759253425998	3.1719561732757E-7	1.7	29.4	1
10.0734786083754	27.7592536851163	3.08135408744192E-7	1.59999999999999	27.4	1.8
10.3172753061032	27.8923877282532	2.88891596866847E-7	2.40000000000001	26.7	1.4
10.5942333782541	28.0272063330832	2.79936518410295E-7	5.40000000000001	26.6	0.3
10.8778930489728	28.1629109294674	2.5013230775528E-7	6.5	24.8	0.7
11.1680714460977	28.3002692063631	2.39799952339581E-7	6.7	28.8	0.2
11.4641788926058	28.4382739673859	2.11770455393889E-7	7.3	28.6	0.6
11.7661958813741	28.5771261408477	1.76556067543743E-7	8.7	29.3	1.9
12.0730872784752	28.7166923429771	1.60500855272971E-7	9.5	27.1	1
12.3845353019776	28.8574919824087	1.50828226352928E-7	12.7	27.3	0.2
Route: 3 Length: 34.5637979188297 Demand Met: 1999					
9.03457389197419	26.4320161368484	0.117207949190449	1.5	24.6	3.5
8.35352670282441	25.091883168619	0.228062552240075	0.599999999999994	24.9	2.3
7.8412325636195	23.8672400367823	0.337830707766487	0.599999999999994	22.9	2.8
7.39969652593697	22.7574624811258	0.446747225734843	1.3	22.7	4.8
6.99966067763354	21.7053661703937	0.554360932508756	1.5	21.3	4.6
6.62240726303746	20.7002672419731	0.661186704918805	0.5	20.7	6.8
6.62240697764783	20.4771100529695	0.661186989083259	2.40000000000001	20.9	6.2
6.62240669220854	20.2544497171759	0.661187271094663	4.3	20.6	6.3
6.62240640673564	20.0321446891604	0.661187551659236	4.40000000000001	18.9	6.5
6.62240612123266	19.8123968009354	0.661187846505371	3.7	18.6	2.9
6.62240583571398	19.5950501088847	0.661188136870281	1.59999999999999	18.8	1.3
6.62240555018448	19.3798391993096	0.661188418039297	0.299999999999997	19	1.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
6.62240526465484	19.1665122259675	0.661188700053891	0.299999999999997	16.4	1.1
6.62240497913096	18.9576020925741	0.661188980580489	1.7	12.5	1
6.62240469365132	18.7637121939828	0.661189266849478	2.40000000000001	11.2	0.3
6.62240467929546	18.7637121944533	0.712176850143671	7.3	11.2	0.4
6.62240466493508	18.7637121949202	0.763312805030502	5.59999999999999	10.5	0.4
6.62240465057781	18.7637121954015	0.814918574536973	4.40000000000001	13.1	0.1
6.62240463622462	18.7637121958897	0.866680526716577	3.5	12.6	3.2
6.62240462187525	18.7637121963771	0.918110915503078	4.3	11.2	3.3
6.62240460753631	18.7637121969161	0.96801526846293	6.40000000000001	11.2	5.2
6.622404594622	18.9306176562801	0.968015281443998	6.3	12.4	6.5
6.62240458170496	19.2364663999373	0.968015300017493	5.40000000000001	13.2	5.7
6.62240456879073	19.5750930128917	0.968015312387031	5.5	14.6	7.4
6.6224045558809	19.980476065466	0.968015328753296	6.3	15.5	7.6
6.62240454297188	20.4492364077647	0.968015345513598	5.3	17.4	7.6
6.6224045300673	20.9542743482467	0.968015362145717	6.59999999999999	19.2	7.9
6.62240451716235	21.4866181408984	0.968015382828321	7.7	19.2	6.3
6.62240450424839	22.0435821662223	0.968015401074965	5.3	21.1	5.7
6.62240449133402	22.6178619044132	0.968015413192314	6.40000000000001	21.3	7.2
6.62240447841083	23.2149624887565	0.968015428467886	3.3	21.4	7.2
6.6224044655067	23.8529862823742	0.968015444028463	3.40000000000001	22.5	7.6
6.62240445262817	24.5361257841938	0.968015460806734	2.59999999999999	23.5	7.4
6.62240443978482	25.271004150161	0.968015478752687	3.3	24.6	6.9
6.6224044269715	26.0457826112119	0.968015496024106	2.59999999999999	25.5	6.5
6.62240441417713	26.8644768781443	0.968015512939383	3.7	26.6	6.4
6.62240440138335	27.7249085521782	0.968015529728463	0.5	26.6	5.8
6.62240438851052	28.6999967010287	0.968015541908185	0.700000000000003	28.7	7.3
7.47204746623297	28.8458528127648	0.622017642697426	2.3	28.7	7.3
Route: 4 Length: 44.3135594122201 Demand Met: 2000					
12.6999999895454	20.3119498850044	0.0591609158473112	10.4	15.1	4.9
12.6999999856749	17.1627486507416	0.118492251524957	10.3	12.6	5.4
12.6999999795124	15.1736565749418	0.178051171884464	10.4	11.3	7
12.6999999733162	14.0040850758176	0.237340242629651	8.2	13.4	6.9
12.6999999671563	12.9552834038201	0.295472413156677	9.59999999999999	12.8	7.5
12.6999999610139	11.9710463559056	0.352610571697779	11.6	13	7.6
12.6999999548464	10.9969645168304	0.40904932987204	12.6	13.4	7.7
12.6999999486668	9.97143424402219	0.464523956750904	12.3	9.3	7.2
12.6999999424785	8.99855337979897	0.51960437181191	12.7	4.9	6.8
12.6999999362976	8.16820619588987	0.574238085248149	11.3	3.1	6.2
12.6999999301212	7.47170054867658	0.628480184907797	11.5	1.4	6.7
12.6999999329291	7.72994909007317	0.601403020862623	12.3	1.5	6
12.6999999357164	8.01357363469358	0.57418905023745	10.7	0.9	0.9
12.6999999384923	8.32407122865386	0.546965228720659	10.4	2.5	2.2
12.6999999412737	8.64816543063363	0.519740645328808	9.5	2.8	2.3
12.6999999440663	8.99148981808508	0.492507884965136	12.5	3.4	2.8
12.6999999468679	9.35004520473227	0.465264859624886	11.5	4.7	3.2
12.6999999496828	9.72243762795515	0.438009470690693	11.7	6.5	2.6
12.6999999525117	10.1059105444854	0.41074458714105	12.5	6.8	4.3
12.6999999553378	10.5034192939006	0.383461784974896	10.7	6.5	4.1
12.6999999581578	10.918710573147	0.356156198395219	10.3	5.4	1.9
12.6999999609755	11.3607599552841	0.32884697066449	9.8	5	1.1
12.6999999637955	11.8511841705593	0.301537138444262	9.40000000000001	7.4	2
12.6999999666221	12.3705705215487	0.274227897775006	9.40000000000001	9.5	1
12.6999999694582	12.9101310799527	0.24692237587174	10.3	9.2	3.3
12.6999999723067	13.478631611149	0.219602805633542	11.5	9.5	4.3
12.6999999751721	14.0843647308425	0.192255169732862	12.6	10.9	4
12.6999999780587	14.7219953992	0.1648828834557	11.7	11.5	2.9
12.6999999809405	15.3951419760762	0.137500553049204	9.8	10.8	3.4
12.6999999837777	16.141630843608	0.110102315595201	8.59999999999999	10.7	4.5
12.6999999865895	17.2793714608494	0.0826430847555866	7.7	12.7	4.4
12.6999999895503	19.1704656531004	0.0551283460669438	7.5	15.1	1.1
12.699999992533	21.7179891802193	0.0276152856004543	8.7	15.4	1.1
Route: 5 Length: 14.5428992964139 Demand Met: 1996					
12.6999351237536	28.1591640979338	0.0430925694303674	9.40000000000001	24.5	2.9
12.699870268643	27.3825950354039	0.0861026356995875	9.5	23.5	3.6
12.6998054117097	26.6595093928461	0.129028225991412	9.40000000000001	20.9	2.9
12.6997405518401	26.0164385837508	0.171846989583068	7.40000000000001	21.2	2.2
12.6996756869613	25.4374562349826	0.214577990971705	6.7	22.9	2.9
12.6996108177297	24.8870500278323	0.2572218717929	5.5	22.5	1.9
12.6995459397901	24.3711725425037	0.299774465310563	4.3	22.7	1.3
12.6994809209651	24.0440455932756	0.34120555671266	5.40000000000001	19.4	0.4
12.6994155199606	23.9567791229024	0.382488035283195	8.5	18.8	1.3
12.6993501161032	23.8704391671251	0.42375649396538	9.3	18.5	2.6
12.6992847098282	23.7850089087905	0.46496930525022	9.5	17.4	3.2
12.699219299978	23.7012405750974	0.506048186370419	8.7	17.3	3.1
12.699153884368	23.6196844527489	0.546941720200627	7.59999999999999	17.1	1.9
12.6990884533645	23.5427867916176	0.587606598753977	9.3	15.6	1.2
12.6990227446641	23.5184331425443	0.625014313898307	10.6	16.8	0
12.6989570340957	23.4941789750656	0.662455352295854	12.5	16.9	0.1
12.6988913226332	23.4700001462752	0.699924404614396	12.7	14.8	0.7
12.3873968151628	23.4758336340644	0.903746451880471	11.7	15.3	3.7

Solution x	Solution y	Solution z	Original x	Original y	Original z
12.3365798259127	23.7889066146971	0.919564132382604	11.4	16.9	4.3
12.2858970748113	24.1301485267805	0.93535760202848	11.5	20.6	7
12.2353036483723	24.484636320734	0.951116558949236	11.7	22.5	7.9
12.1847717122624	24.8499995511282	0.966832322467823	10.4	21.5	7.4
12.1344009913684	25.2331012280058	0.982501012706228	8.40000000000001	21.2	7.3
12.0850275696003	25.7031646148163	0.99802080808754	7.5	23.4	5.3
12.0359303837086	26.1910731922779	1.01352095998634	5.8	25.2	5.8
11.9875266239097	26.6997313899463	1.02897641839187	6.7	26.7	7.9
11.9875266448663	26.7005285873885	1.02897635714345	4.5	26.7	5.4
12.1540337239196	27.2161084970796	0.777145942629806	4.7	24.8	2.4
12.3324458276174	27.7788063635419	0.520446083733697	7.3	24.7	2.7
12.5143275055526	28.3701926014406	0.261980994443688	8.7	24.9	3.7
Route: 6 Length: 47.2824951313132 Demand Met: 1998					
9.75468667012987	21.3423084438427	0.201273333717813	2.5	19.5	4.2
9.16382030195977	19.2999032603608	0.377457427237376	1.59999999999999	17.2	3.9
8.99742272792381	18.728512919756	0.508840833667938	2.40000000000001	15.3	3.6
8.84146881447589	18.2258848176355	0.637659320870084	4.5	15.4	4.9
8.68858471038044	17.7490296621323	0.765268368553246	4.40000000000001	16.9	6.4
8.5388068870429	17.2871494690356	0.890909534089786	3.5	17.5	6.6
8.39341783188229	16.8323314121504	1.01375167897532	2.5	16.5	6.9
8.26271568504502	16.3975755202582	1.12674746883225	3.5	15.1	6.8
8.13487257166064	15.9785760378467	1.23768180035177	2.7	13.4	6.1
8.0105405338947	15.5838641421393	1.34673843975073	1.59999999999999	14.7	5.3
7.88957046195898	15.199893484314	1.45448900974283	0.700000000000003	15.2	6.3
7.92805184481838	14.2607043193971	1.45448900684688	0.599999999999994	12.7	5.3
7.96905242621676	13.9114470406512	1.45448900456777	1.5	11.1	3.9
8.01041063204462	13.5696565889543	1.45448900052643	3.59999999999999	10.8	4.8
8.0519624514743	13.2346575771099	1.45448899756594	4.7	6.8	4
8.09377564048628	12.923536831554	1.454488995301	2.7	7.3	2.8
8.13607371807917	12.6379405635876	1.454488993249	2.5	9.4	1.9
8.17868247748294	12.3595826115714	1.45448899172182	0.599999999999994	8.4	0.5
8.23226701048601	12.199850329039	1.45448898942031	3.59999999999999	7.3	0
8.28627851988105	12.0433198726521	1.45448898283458	3.59999999999999	5.4	1.9
8.34118742734293	11.8971810814125	1.4544889784993	5.40000000000001	4.6	2.8
8.39653089354796	11.7584001916418	1.45448897522892	7.5	4.4	2.9
8.45198976971564	11.6236709821273	1.45448897060328	8.5	3.4	4.2
8.45199008051344	11.6236710560212	1.44223489213203	7.40000000000001	3.2	3.2
8.45199039521965	11.6236711312957	0.299961410997735	6.40000000000001	3.2	0.3
8.83114372726168	12.1323263100199	0.262643000890902	6.40000000000001	5.4	1.3
9.22365277422755	12.7001130588049	0.22531615616321	5.40000000000001	7.2	1.4
9.63404419351914	13.3208823915933	0.187981614373909	6.3	8.6	0.9
10.0591642626672	13.9864239750328	0.150652533006721	8.3	8.9	1.9
10.495770670973	14.7049407467766	0.113298206039088	7.7	9.3	3.2
10.9520249337977	15.5093902584069	0.0758451827903208	5.3	9.5	2
11.7716847703784	20.2021070529068	0.0379916521339663	6.40000000000001	16.8	1.7

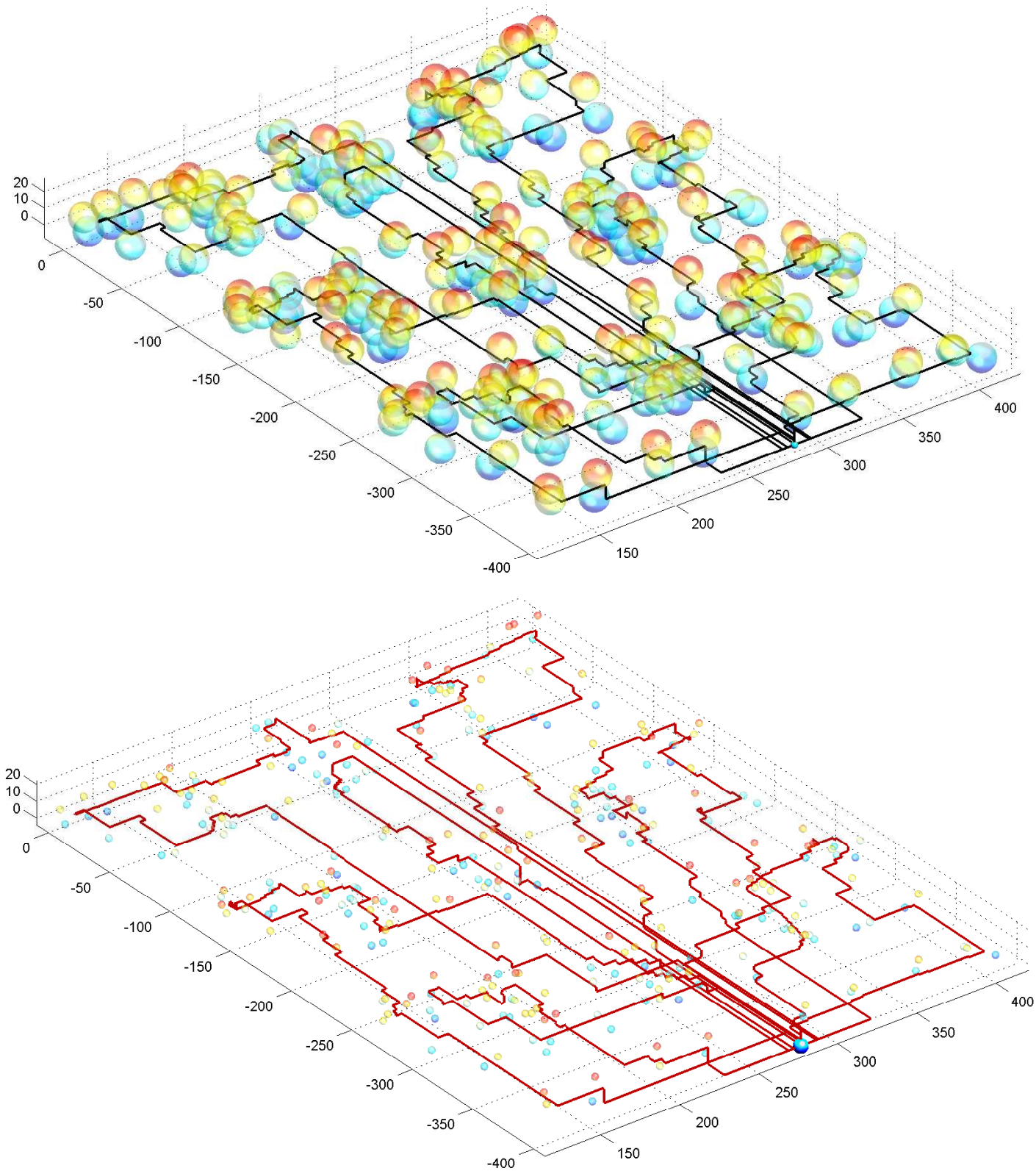


Figure O.180: $lin318$, $r = 8.268$, Equal Radius, 3D, Manhattan, Length = 6358.5401123

Table O-183: Solution for *lin*318, $r = 8.268$, Equal Radius, 3D, Manhattan

Total distance: 6358.54011234675 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 629.703618250444 Demand Met: 840					
180.512802428702	385.222292795299	2.23622939701443	184.3	387.5	3.8
188.071189212466	344.093939475034	4.38592624952734	192.1	339.4	1.6
192.45000713609	336.805020369776	6.89138842215178	191.3	329.2	9.3
221.709799577491	336.079022161282	8.14004103152872	222.8	339.4	15.5
224.227538729278	333.058390755193	8.45630479821627	222	329.2	14.2
227.409730140478	330.941702763	8.75313863645015	234.6	331.6	5.2
228.078132922536	328.194838487554	9.11146344482336	231.5	331.6	8.7
228.728566079926	325.095553063102	9.47040378390952	227.6	331.6	9.8
229.38910229053	319.45404572038	9.8283744658907	231.5	315.8	7.2
230.038800133667	314.990611706456	10.1906165625845	227.6	315.8	6.5
230.699871317937	310.35628091296	10.5583931482577	234.6	315.8	11.2
231.322983941525	298.355721478509	10.9241118331359	231.5	297.7	7.4
231.322983941525	298.355721478509	10.9241118331359	234.6	297.7	7.7
231.931967764667	288.200000205461	11.2999696934999	240.2	288.2	11.3
231.218116572326	280.399981198964	13.2230751313597	224.4	280.4	17.9
234.914377938344	279.051913264717	13.2230721563934	233.1	280.4	17.3
238.944618624001	277.675681262105	13.2230691799053	236.2	280.4	11.1
243.527983675147	276.242835679019	13.2230662033479	240.2	281.9	12.5
250.452365152837	274.50105742662	13.2230632262469	248	280.4	9.5
271.420204466244	271.602385659257	13.2230602494277	275.6	273.1	17.9
278.818843492148	268.390287584152	13.2230572697942	278.7	273.1	18.4
286.600216303522	262.288289511804	13.2230542857256	286.6	254.4	15.7
287.005052263648	262.745593319838	9.74213934513345	283.5	260.7	2.6
298.89166524237	264.004475015602	9.55021545241354	301.6	260.7	2.7
300.431964945027	273.099990805762	9.39994228988974	308.7	273.1	9.4
300.086885987499	274.156632516678	6.75974898137457	305.5	273.1	0.7
294.515396220577	276.539448372159	6.4666440334293	293.7	273.1	6.2
289.179416942851	279.125177302664	6.17375921729072	290.6	273.1	10.7
279.76225281155	303.356364832358	5.85709902171715	280.3	303.2	11.5
269.780047876808	329.199999005416	5.53195239473935	263	329.2	0.8
270.210777124942	335.222139545753	5.53195573010233	263.8	339.4	8.3
291.84823472775	335.869057638786	5.53195904956421	293.7	329.2	1.4
294.500102035833	339.400004050585	5.53196237666502	294.5	339.4	13.8
294.751242857183	393.795912224345	5.53195945852208	301.6	393.8	0.9
284.353377175392	393.799270517009	6.16812805151322	283.5	393.8	11.4
284.353377175392	393.799270517009	6.16812805151322	286.6	387.5	8.3
259.079659629427	393.802623941455	6.63721918608742	255.9	387.5	4.9
252.799962173589	393.80598220957	7.13196186451945	252.8	393.8	15.4
217.441726955592	394.444224946007	6.90594726259851	215	387.5	7.3
209.740101075739	395.22035186516	6.67901408290703	211.8	393.8	13.7
181.202636926417	396.039850144598	6.43599294861633	181.1	393.8	14.3
Route: 2 Length: 597.729672668079 Demand Met: 867					
121.029767844049	391.924094177559	10.036222209766	122.8	387.5	3.6
121.029767844049	391.924094177559	10.036222209766	119.7	393.8	17.8
94.2859794240819	389.065920185822	11.2625176450023	89	393.8	11
89.4487536995184	384.087317234833	12.5016191062842	92.1	387.5	18.7
74.2082628193858	335.288956137088	13.3785833799529	70.9	331.6	19.3
70.8161505412561	331.599996237716	14.0257411686913	63.8	331.6	18.4
71.5469140060051	317.145499831003	14.0257368622518	63.8	315.8	14.7
73.8242233594853	312.547364291329	14.0257325511206	70.9	315.8	15.2
73.8242233594853	312.547364291329	14.0257325511206	67.7	315.8	13.4
77.8689125382854	301.21271618212	14.0257282386332	85.8	303.2	13.4
77.8689125382854	301.21271618212	14.0257282386332	70.9	297.7	11.7
78.260148883571	288.668008660796	14.0257239319781	84.3	283.5	16.3
78.260148883571	288.668008660796	14.0257239319781	81.1	285.1	18.2
70.0999711458369	288.668030577398	12.5001035899754	70.1	280.4	12.5
69.0295989981123	291.489476079694	8.19358250914349	67.7	297.7	2.9
69.0295989981123	291.489476079694	8.19358250914349	76.4	288.2	6.4
67.1942055071872	291.081966550086	8.79241969624792	63.8	297.6	5.2
67.1942055071872	291.081966550086	8.79241969624792	60.6	288.2	12.5
66.8999174388539	280.400004274747	10.1319633054852	63.8	280.4	12.2
66.8999174388539	280.400004274747	10.1319633054852	66.9	280.4	18.4
56.386509242759	275.965424682524	9.33602158257832	52.8	281.9	9
51.2000029249082	260.246379572032	8.54638705768003	51.2	254.4	2.7
48.0000008312097	260.700035414887	9.13196536003448	48	260.7	17.4
44.4422389221279	273.100003161115	7.35257536207537	39.4	273.1	0.8
44.4422389221279	273.100003161115	7.35257536207537	36.2	273.1	6.7
50.3519775278083	303.129004655342	7.74276005043653	44.9	303.2	8.5
61.2043173017243	332.377846977857	8.13126519370256	67.7	331.6	4.4
61.2043173017243	332.377846977857	8.13126519370256	59.1	339.4	4.8
61.2043173017243	332.377846977857	8.13126519370256	58.3	329.2	7.6
99.8969270984439	333.215665020853	8.65139043037172	100	339.4	3.8
99.8969270984439	333.215665020853	8.65139043037172	99.2	329.2	7.7
136.65090705298	333.811313668856	9.29086416167422	130.7	339.4	10.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
136.65090705298	333.811313668856	9.29086416167422	142.5	331.6	14.7
136.65090705298	333.811313668856	9.29086416167422	136.2	331.6	10.8
136.650914714966	333.811325987969	6.33341106365314	129.9	329.2	5.1
147.33941384958	333.811544123781	6.33335202777599	148.8	331.6	0.2
155.099989816222	333.811762393999	6.33329306191973	155.1	331.6	14.3
161.840058546714	338.37164220368	3.37103035128402	161.4	331.6	4.6
Route: 3 Length: 846.275338569596 Demand Met: 768					
164.89549305248	203.081356574703	0.350988663297048	161.4	198.5	1.4
161.399999110491	190.968033751765	0.700017974562552	161.4	182.7	0.7
155.13953267774	192.417198170513	12.0001478076037	155.1	198.5	17.6
155.139264497414	180.401137530198	12.0001240286357	155.1	182.7	16.5
155.138996407022	162.199975907681	12.0001002525178	161.4	162.2	17.4
155.138996407022	162.199975907681	12.0001002525178	155.1	162.2	15.7
155.129970285813	66.7133765521304	12.000074907888	161.4	65.4	7.2
155.120901758851	61.5136369555958	12.0000495757684	155.1	65.4	8.7
155.111841660592	54.5699765847622	12.0000242442179	161.4	49.6	13.6
155.102460194793	54.155251125106	11.9999989102957	155.1	49.6	5.1
148.799998270744	54.1552386023902	11.9999944453961	148.8	49.6	18.9
142.50001375137	54.1552353138355	7.00000859530889	142.5	49.6	0.1
141.667391383799	55.3367861546707	7.47328827542316	136.2	49.6	6.3
141.138427294433	63.541769540407	7.98112217697135	148.8	65.4	6.2
138.859116290425	65.6013530878999	8.60098885041759	142.5	65.4	2.7
135.915461031973	67.677165889623	9.28839615002145	136.2	65.4	3.7
132.930046854448	69.9226531568363	10.0226651951821	129.9	63	9.4
130.844907246589	78.3791397021433	10.7713666669037	130.7	73.2	7.2
128.77327919842	118.987250348168	11.5584937402245	122.8	121.3	7.8
127.385975022874	127.600000904088	12.4526896659873	119.7	127.6	15.5
134.139850110697	150.399992805523	12.4526916841003	141.7	150.4	15.8
128.584521918225	156.355424486374	12.4526806539362	127.6	153.6	18.6
123.636704413799	166.086096350102	12.4526696192119	116.5	170.1	13.6
136.199997696581	166.086095230265	8.99784966301097	136.2	162.2	1.7
140.123199718071	166.086127685442	8.99788347116067	142.5	162.2	2.7
142.508461370953	166.086160201509	8.99791715650313	148.8	162.2	5.3
142.508480805638	182.666424543984	9.1294491133738	142.5	182.7	2.1
142.508480805638	182.666424543984	9.1294491133738	148.8	182.7	9.2
142.508480805638	182.666424543984	9.1294491133738	136.2	182.7	6.2
142.508500246469	198.632219189623	9.26467538322429	142.5	198.5	1.1
142.508500246469	198.632219189623	9.26467538322429	148.8	198.5	8.3
142.508500246469	198.632219189623	9.26467538322429	136.2	198.5	8.4
142.508519697732	283.499999634092	9.47158715263966	141.7	283.5	17.7
143.364382625867	312.559698356453	8.32117920653615	136.2	315.8	9.7
146.932203477544	314.868203715432	6.86552208326277	142.5	315.8	4.2
151.428790144786	317.118492538395	5.48006687367491	148.8	315.8	8.4
156.545662148819	319.441207466792	4.03463319927902	155.1	315.8	5.4
162.076697304344	321.982604053165	2.55981326307391	161.4	315.8	7.1
Route: 4 Length: 922.412105805276 Demand Met: 945					
213.87913820775	285.757709860691	2.14645159769967	222	285.1	1.9
214.264269224337	281.329933506204	4.73139708596024	218.9	286.7	3.7
214.629047408715	263.710227114792	7.55849137071983	211.8	260.7	3.2
215.00000700185	254.399999591393	11.1319826352059	215	254.4	19.4
219.935862973645	208.674201712778	10.6861160061284	222.8	206.3	17
223.121705705737	199.906300240229	10.1844972449638	222	196.1	3.2
231.445685051062	198.499996264995	9.86783780508304	231.5	198.5	1.6
231.445878819049	195.514015487072	10.2232308103738	227.6	198.5	10.4
231.446072588617	192.17547489537	10.578171439579	234.6	198.5	10.6
231.446264445668	182.700003372891	10.9321587456175	231.5	182.7	19.2
231.446354069819	180.828935167974	7.13110511834078	227.6	182.7	0.3
231.446354069819	180.828935167974	7.13110511834078	234.6	182.7	13.3
231.446444128899	169.905916924722	6.44103261999364	227.6	164.6	1.4
234.600062363481	169.905851194091	6.44096454488556	234.6	164.6	0.1
236.939886690707	169.905818349528	6.44093422111697	231.5	164.6	6.5
243.6532036159	169.905785558743	6.44090389691176	249.6	170.1	0.7
240.328953393559	160.462272613318	7.52569052616541	240.2	155.1	5.1
236.943727670007	155.219147292105	8.65851673272849	240.2	148.8	5.8
227.053809414879	153.600000422145	10.1305246656182	218.9	153.6	11.5
227.053809414879	153.600000422145	10.1305246656182	222	152	14.6
227.053831618126	147.300018108793	10.1305312195867	224.4	147.3	2.3
233.136663937273	145.752610451296	10.3450788827378	233.1	147.3	11.4
239.225502911777	144.175377013146	10.5592179027347	236.2	147.3	7.3
247.3644954717	142.48589012069	10.7751930305597	248	147.3	4.5
252.572325663489	130.29566762653	11.0258820629477	252.8	127.6	3.3
255.90000179919	129.55268492818	13.9967411982443	255.9	121.3	14.5
278.699979853635	133.656835152222	13.9967599214403	278.7	140	19.3
282.725865383089	131.492848174524	13.9967491223101	283.5	127.6	15
286.600002046461	129.494077533278	13.9967383212431	286.6	121.3	15.1
301.599988351923	129.494081422576	8.44814012104648	301.6	127.6	0.4
302.853627942067	139.997161604918	10.7536303939299	308.7	140	16.6
298.708934496176	139.999914701801	9.66857506957065	293.7	140	9.3
298.708934496176	139.999914701801	9.66857506957065	305.5	140	11.2
290.601092747775	140.002677123469	8.53700839450334	290.6	140	0.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
282.806947171866	140.005449198862	8.25215754343846	275.6	140	4.2
284.641507463276	169.913482393699	8.25215822490191	280.3	170.1	14.3
286.965097610816	194.098039237315	8.25215890385846	293.7	196.1	5.6
288.441195614809	201.338441081841	8.25215958389369	294.5	206.3	5.6
262.999766390982	201.338435555038	11.5032117693263	263	196.1	17.9
260.026421293534	209.736313786639	10.9957204306271	263.8	206.3	6.2
255.709220310549	253.353051740986	10.520066868144	255.9	254.4	18.1
251.169152760525	265.142136679599	9.90339266145403	252.8	260.7	8.8
246.212187203386	296.86776037275	9.2915670440598	249.6	303.2	7.3
227.493100772893	300.114924727818	8.70966482427562	227.6	297.7	4.1
208.598769469766	303.733765731638	8.14738413716345	208.7	303.2	16.2
180.127183065641	309.418284414237	3.60518668721148	178	303.2	1.5
Route: 5 Length: 992.613431602602 Demand Met: 950					
161.623242604803	299.660444635288	4.3656813245758	161.4	295.3	10.8
154.936769835519	296.963171814836	5.62853598124318	155.1	295.3	0.7
148.16723947034	294.414998883035	7.00589348476499	148.8	295.3	14.4
139.726663043228	291.576770063714	7.93889108543875	136.2	295.3	3.1
139.726663043228	291.576770063714	7.93889108543875	142.5	295.3	13.4
132.089351477955	283.143316416606	8.83586494889173	127.6	286.7	5.8
127.688992702092	260.761186574784	9.78636150134501	119.7	260.7	11.7
127.5267966498	250.37464341684	10.1765285295062	122.8	254.4	9.9
127.367165502678	206.473546432427	10.567363221909	130.7	206.3	18.1
126.202444127813	203.281448146684	10.6336254395154	129.9	196.1	10
100.515080598202	202.753501471217	10.7003213403943	100	206.3	18
95.398618893607	201.581497617012	10.7590634978058	99.2	196.1	13.9
70.9000042475689	200.653444903895	10.8173560869774	70.9	198.5	18.8
63.5506541858669	200.653443353766	10.8173537124702	59.1	206.3	14.9
63.5506520515415	196.100003182226	7.98675041042785	63.8	198.5	2.5
63.5506520515415	196.100003182226	7.98675041042785	67.7	198.5	11.8
63.5506520515415	196.100003182226	7.98675041042785	58.3	196.1	1.6
66.6249825262279	186.792467932231	8.33179247657776	63.8	182.7	4.6
66.6249825262279	186.792467932231	8.33179247657776	67.7	182.7	12.4
70.0266753691895	182.700021588901	8.67824660524641	70.9	182.7	16.9
70.0266810560914	171.872544242785	8.67824553770987	70.9	164.6	8.4
70.0266867471908	169.035442157876	8.67824447016112	67.7	164.6	2.1
70.0266867471908	169.035442157876	8.67824447016112	63.8	164.5	8.3
78.4721658884382	169.035439358384	8.67824446072516	85.8	170.1	5
78.0602672170087	152.764607256685	9.01084980229039	84.3	150.4	4.3
78.0602672170087	152.764607256685	9.01084980229039	81.1	152	7.1
74.1015020688966	151.625381736098	9.7897929862329	76.4	155.1	3.4
66.58317887457	150.187480689395	10.8967873988732	66.9	147.3	5
66.58317887457	150.187480689395	10.8967873988732	60.6	155.1	13.8
66.58317887457	150.187480689395	10.8967873988732	70.1	147.3	17.8
66.58317887457	150.187480689395	10.8967873988732	63.8	147.3	12.9
55.6353426267351	145.542924217113	9.38471068090872	52.8	148.8	15.5
51.199999896373	129.533196491697	6.95788571684145	51.2	121.3	6.2
46.0325330853349	131.230854512866	6.95788108635738	48	127.6	5.5
40.2209065946602	133.024438241491	6.9578764557894	39.4	140	3.5
36.1999808646031	133.878727436829	6.95787182438496	36.2	140	1.4
20.4999992672312	129.568005445634	8.39999858693125	20.5	121.3	8.4
18.6328579037741	132.523029228944	11.3474125565607	17.3	127.6	16.4
16.9150287260288	138.442152020719	13.2954004656782	21.3	140	9.6
16.9150287260288	138.442152020719	13.2954004656782	24.4	140	15.5
16.9150287260288	138.442152020719	13.2954004656782	9.40000000000001	140.2	11.5
14.2256388137202	140.20000024256	15.1453947856891	6.3	140.2	17.5
19.0486895542569	165.106541744466	15.1453957618499	14.2	170.1	13.5
38.1358540775553	170.100001068643	15.1453967380966	44.9	170.1	19.9
32.252394998589	194.75203295544	14.8475836173534	27.6	196.1	18.7
28.271992301976	210.259713016786	14.5436314520029	28.3	206.3	15.8
24.2809661942153	252.555706239947	14.238498127079	20.5	254.4	9
21.3169709785054	267.743917630565	13.9442911299426	21.3	273.1	15.8
21.3169709785054	267.743917630565	13.9442911299426	24.4	273.1	19.3
21.3169709785054	267.743917630565	13.9442911299426	17.3	260.7	14.5
16.3775327702574	270.946336269903	12.6369644810317	9.40000000000001	273.3	14
14.5680072310047	273.299999818025	11.1999926831783	6.3	273.3	11.2
18.271216040243	303.005539296752	10.883657710356	14.2	303.2	5.3
24.8055200243103	329.199999164031	10.5814421598736	27.6	329.2	2.8
24.8055208060706	342.883402058945	10.7674182058781	28.3	339.4	12.9
24.8055215813617	386.286790496911	10.9537492172264	20.5	387.5	17.4
24.8055223741757	393.796637786757	11.1319882759729	17.3	393.8	14.6
47.9999987147513	393.801554592949	11.1319904582941	48	393.8	19.4
52.9997767246646	394.947300975639	3.17419397826113	51.2	387.5	1.4
Route: 6 Length: 1232.1645688508 Demand Met: 946					
169.963077748368	285.099301674809	5.53431433623687	173.2	285.1	12.1
170.581279908917	170.10000000998	7.9499986301185	178	170.1	11.6
170.581280084008	37.000000954926	7.94999999178717	178	37	4.3
170.581276444683	26.7423331385259	8.30000612880129	173.2	18.9	8.3
162.549619064467	26.7423323016866	8.73514586751011	161.4	29.1	11.5
155.186111693047	26.7423314648118	9.16544485407129	155.1	29.1	1.4
148.80000576931	26.7423306275436	11.2752729864996	148.8	29.1	19.2

Solution x	Solution y	Solution z	Original x	Original y	Original z
148.388144692491	-0.346594781461476	8.27580327460795	149.6	-7.9	5.2
141.700001479263	-0.417227709122203	8.11681962342662	141.7	-7.9	4.6
140.505429815252	15.0987756871683	8.1168195189782	141.7	17.3	2
139.274389686821	24.095987246655	8.11681941466909	142.5	29.1	2.7
136.199998743566	25.2497980066866	8.11681931109753	136.2	29.1	0.8
127.599999814495	25.249798957455	9.7324813626847	127.6	20.5	16.5
116.185740137764	29.2919878564388	9.73248174543094	116.5	37	12.1
85.8000015503832	29.9184614218197	9.73248212755499	85.8	37	14
84.29999807793	24.7816779537294	9.11914638413954	84.3	17.3	5.6
78.5187346321971	24.78168004906	9.1191459965298	76.4	22	1.9
76.4721001631197	24.7816821451382	9.11914561005036	81.1	18.9	10.9
71.8135502210664	24.7816842414392	9.11914522351336	70.9	31.5	11.6
67.6999324442149	24.7816863377333	9.11914483691488	67.7	31.5	4.3
66.2045970636194	24.1899727673564	9.67270183886641	63.8	31.4	12.4
65.2787706750929	21.9999980120517	10.0831826205464	60.6	22	16.9
65.2787700880597	14.2000036124203	10.0831825759551	70.1	14.2	16.8
62.3577228925126	13.4716719547977	9.66972322618251	66.9	14.2	11.4
58.9057827203438	12.7393291108763	9.25285208834098	63.8	14.2	14.4
51.1391911180054	11.98113571547	8.80479592188421	52.8	15.7	13.8
40.8233304634919	11.1795009604266	8.33680869530079	39.4	6.9	14.8
36.1999996536265	10.5564244207779	7.71555488901305	36.2	6.9	0.3
26.1063045417907	10.5564243944341	7.93834882868339	24.4	6.9	1.6
20.3879288369273	10.5564243682727	8.17583894275429	21.3	6.9	14.1
13.7154221652954	10.556424342199	8.40471034370273	9.40000000000001	7.1	2.4
13.1184117644874	10.5564243178745	8.85003406812324	6.3	7.1	12
18.5752447926548	31.9463221259457	8.85003420606357	14.2	37	6.3
37.4812638745635	37.000000494895	8.85003434409195	44.9	37	12.5
33.8174834061417	62.9999954206395	8.85002618033722	27.6	63	3.4
33.8174798760879	67.0587595866277	8.8500236410435	28.3	73.2	9.3
55.7186765201076	66.0647469032088	8.85001767959347	59.1	73.2	9.3
58.5921450172061	63.2163594346905	8.85001171802771	58.3	63	8.5
61.4852787933002	60.3732237575372	8.85000575646988	63.8	65.4	13.7
63.8000014667764	55.2353702789898	8.84999979440373	63.8	49.6	2.8
70.8999960991761	55.2353701733644	8.85000004322187	70.9	49.6	14.9
71.8423877504258	56.2984848199018	8.59605346477009	67.7	49.6	9.5
73.3756311663307	60.0780704975361	8.33627443026101	67.7	65.4	8.4
77.0661490934918	61.6742770360894	8.07623303455871	70.9	65.4	6.9
94.9951002916788	63.0000059762028	7.81889862139936	99.2	63	0.7
94.9951005255457	73.2000003710193	7.81889968216297	100	73.2	14.4
94.506858233169	116.375943955323	7.24629391186375	92.1	121.3	6.9
94.0122861121411	127.600002191869	6.67547662061535	89	127.6	0.1
94.0122873462521	254.399999486112	8.55617735303167	92.1	254.4	16.6
96.2394871080429	262.477725657114	5.50161675586337	89	260.7	3.7
118.048132170996	304.01362688793	3.15107907746748	116.5	303.2	9.1
Route: 7 Length: 1137.64137659995 Demand Met: 945					
179.145169505709	263.056044617959	6.57411320304102	181.1	260.7	13.4
184.337273767704	254.339777003603	8.65548480564965	184.3	254.4	16.9
192.099991438277	206.300001369815	8.73196270852938	192.1	206.3	17
192.896553902559	196.019188964998	8.63640494456089	191.3	196.1	16.7
205.851652132287	169.839089518141	8.40622482315056	208.7	170.1	15.4
210.529694095281	131.533395244127	8.15600688889982	211.8	127.6	10.4
214.921453945257	117.337499348274	7.90418198146182	215	121.3	10.5
219.306357714882	78.190679750968	7.65043350660471	222.8	73.2	10.5
222.554709085489	71.0635082856533	7.39223315205586	222	63	7.9
227.628969334741	70.4793697974456	7.12691016453603	227.6	65.4	13.5
232.893191248895	70.1567786061906	6.64499898499733	231.5	65.4	1.8
239.419548810744	69.8463740362229	6.19446113546951	234.6	65.4	4.6
262.999994636974	69.5453923085282	5.75155860839983	263	63	0.7
267.845114488467	69.5453922150235	5.75155633555125	263.8	73.2	0.8
288.568055760383	69.5453921128008	5.75155407130451	294.5	73.2	1.3
288.568046256033	62.5989730532908	9.0922774580322	293.7	63	15.4
288.568036744843	37.0000000224192	9.60000263925247	280.3	37	9.6
302.348663429419	12.6145929271017	10.4474214199169	305.5	6.9	5.7
303.926437676638	11.6735516680215	13.4264505793427	308.7	6.9	18.2
295.091896865781	11.9182457863135	12.9638725294003	293.7	6.9	18.6
289.903231658908	12.1809096489483	12.4211766607827	290.6	6.9	18.4
280.53565269944	12.4976903162471	11.486912816878	278.7	6.9	10.2
273.263342141073	12.8237505273402	10.5727197164585	275.6	6.9	6.7
248.992505011359	13.1776126145323	9.78113086233413	248	14.2	2
241.507332413181	13.5200473891716	9.2826150762462	240.2	15.7	7.9
234.628806896253	13.8602740581173	8.78696516258717	236.2	14.2	3.3
226.448948520731	14.1998405915012	8.31012914655903	224.4	14.2	0.3
226.448942225281	14.2723723338885	8.31064101978953	222	18.9	3.1
226.44893609148	14.2729349706354	14.1889507084121	233.1	14.2	19.1
225.955160930122	20.499997380831	14.188960438359	218.9	20.5	18.5
229.378524623918	24.5910347046478	14.188951593938	227.6	31.5	14.9
233.553626422734	26.74678571957	14.1889427482185	231.5	31.5	11.2
238.335444189134	28.5973272112209	14.1889339040143	240.2	22	17.8
241.490448479528	36.9999928048785	14.1889250490514	249.6	37	15.8
237.198728927113	38.6448110584556	12.9452131405071	234.6	31.5	11.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
234.59999066556	43.7076007076014	11.8000003957265	234.6	49.6	6
231.131855232719	43.7076008711965	11.8000001486536	231.5	49.6	10.4
227.599990820376	43.7076010292005	11.7999999022542	227.6	49.6	17.6
208.700008506526	42.8461521512627	9.24661031416164	208.7	37	3.4
192.050738998111	62.9464036517709	10.1592048771114	191.3	63	18.3
188.324045685036	76.6004537599486	10.3521479962234	192.1	73.2	7.8
183.651726735662	117.461937421498	10.5465058363709	184.3	121.3	14.5
178.781844968444	130.377335749851	10.7385594747356	181.1	127.6	7.7
173.200002133714	152.000001438887	10.9319666542687	173.2	152	19.2

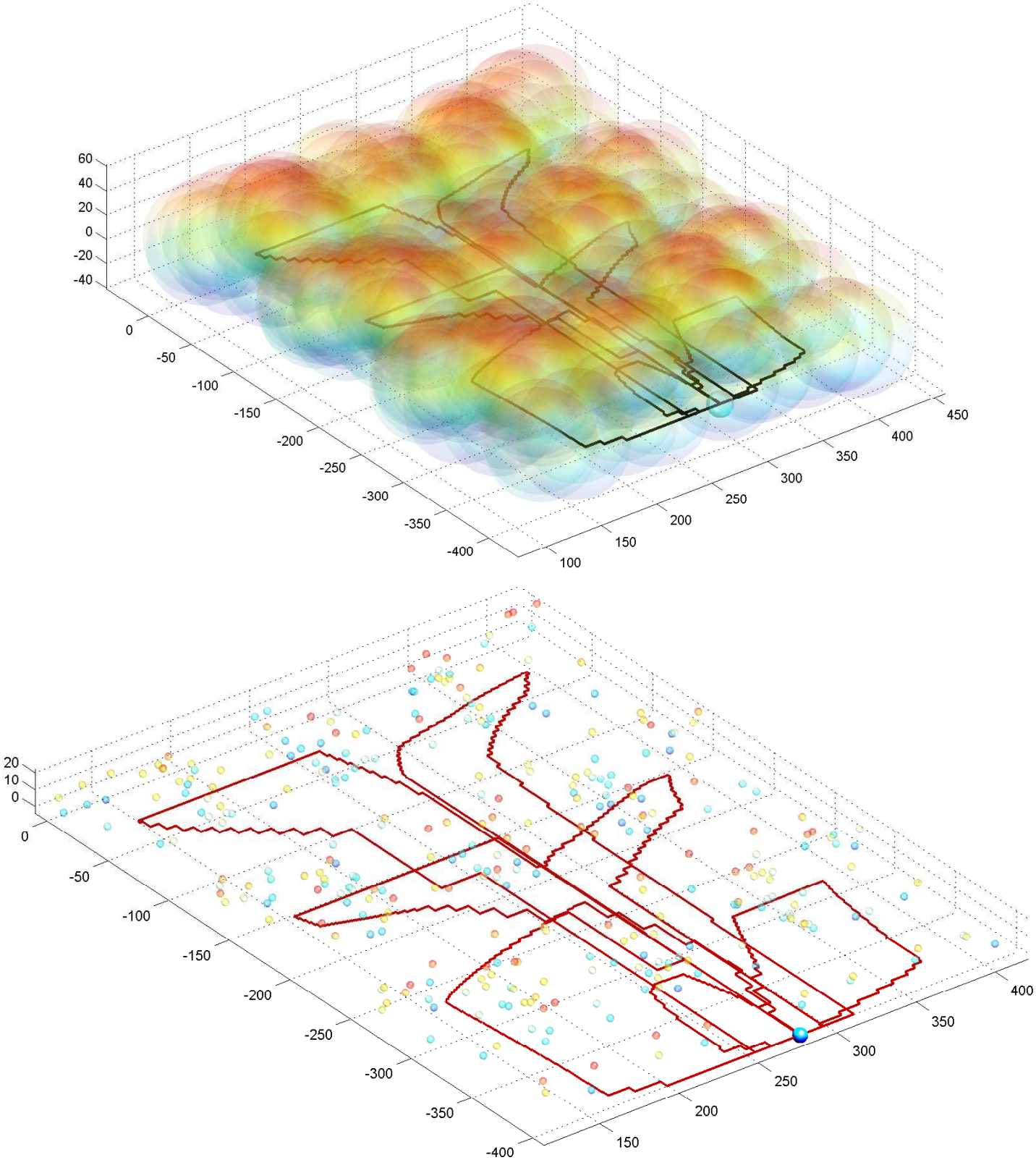


Figure O.181: $lin318$, $r = 41.34$, Equal Radius, 3D, Manhattan, Length = 4748.9697891

Table O-184: Solution for $lin318$, $r = 41.34$, Equal Radius, 3D, Manhattan

Total distance: 4748.96978909543 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 615.674865342589 Demand Met: 938					
85.2042051506162	400.20379759689	0.089507360430602	51.2	387.5	1.4
69.0098142077263	395.516975473469	0.178959394735024	48	393.8	19.4
55.7782066942909	390.946352041051	0.268304076708802	17.3	393.8	14.6
55.222336036422	379.553794472697	0.353056478539102	20.5	387.5	17.4
54.7001896268516	363.389514086571	0.437412762465726	28.3	339.4	12.9
54.1924721531732	354.591874215741	0.521606281454957	27.6	329.2	2.8
53.6959808251841	348.275454379921	0.605782277381891	58.3	329.2	7.6
53.1994973307857	342.421145985131	0.68994709782411	59.1	339.4	4.8
52.7030468345395	336.726331266711	0.774114611583549	67.7	331.6	4.4
52.2057331154434	331.214184497938	0.858283764244519	70.9	331.6	19.3
51.7064034052832	325.810076056904	0.942379994699465	63.8	331.6	18.4
51.2061128855481	320.439619094918	1.02641898897841	63.8	315.8	14.7
50.7048588641169	315.230961347453	1.11041873038554	67.7	315.8	13.4
50.2020223066114	310.117661445817	1.1943832915009	70.9	315.8	15.2
49.6966575441337	305.025522994536	1.27829990316291	85.8	303.2	13.4
49.1707887145597	300.132951941209	1.36204472287118	70.9	297.7	11.7
48.6421186425164	295.357240207403	1.4457601134117	67.7	297.7	2.9
48.1113951242137	290.643542969606	1.5294819048321	63.8	297.6	5.2
47.579134310886	285.951007593114	1.61320389607108	44.9	303.2	8.5
47.0475915357851	281.183487580714	1.69691507312444	14.2	303.2	5.3
46.5525690772127	273.30000024942	1.78053242947966	6.3	273.3	11.2
47.8557762925477	271.97087650434	1.78053259849878	9.40000000000001	273.3	14
49.7181004599518	270.630745518908	1.78053279835984	17.3	260.7	14.5
51.7459934239777	269.316511078739	1.78053312698134	20.5	254.4	9
53.9383695293605	268.034610917353	1.78053323927901	21.3	273.1	15.8
56.3586699521423	266.747485890635	1.78053340538123	24.4	273.1	19.3
59.1268634679238	265.449227089783	1.78053388621997	36.2	273.1	6.7
61.9965795375794	264.150514943282	1.78053428191579	39.4	273.1	0.8
64.9729287647949	262.850477250439	1.780534420797	51.2	254.4	2.7
68.008852953157	261.561510240958	1.78053432268586	48	260.7	17.4
71.1571005681934	260.279058111294	1.78053474311569	52.8	281.9	9
74.443127391401	258.979623112106	1.78053490120054	60.6	288.2	12.5
77.9032039023992	257.636385450028	1.78053512133325	63.8	280.4	12.2
81.4916417642406	256.274398675676	1.78053523088408	66.9	280.4	18.4
85.2724320812267	254.88078946608	1.78053556664491	70.1	280.4	12.5
89.2545337958189	253.456528717455	1.78053594773237	76.4	288.2	6.4
93.6572257078418	251.911139636169	1.78053591745544	81.1	285.1	18.2
98.9793617633474	250.103606409698	1.7805361748666	84.3	283.5	16.3
106.166413284008	247.885765305862	1.78053636191734	92.1	254.4	16.6
113.797452646636	245.667702816404	1.78053688310875	89	260.7	3.7
122.633985013123	243.412328090517	1.78053692743607	119.7	260.7	11.7
131.731888561659	241.121757632417	1.78053718441873	122.8	254.4	9.9
141.341633334444	238.816594683001	1.78053758565249	142.5	198.5	1.1
150.686162832412	237.524391103024	1.78053781824788	161.4	198.5	1.4
155.100000170223	236.6934586886	1.78053766660017	155.1	198.5	17.6
162.830276547471	255.375961190325	1.78053765536583	184.3	254.4	16.9
170.078890114203	275.582983695104	1.78053762346902	181.1	260.7	13.4
177.214946508705	301.005140524805	1.7805375419472	208.7	303.2	16.2
182.993013242821	327.340150422502	1.78053753020092	222	329.2	14.2
183.802922490471	339.400001071337	1.78053740992409	222.8	339.4	15.5
178.522717001027	353.95662387196	1.19060934822382	155.1	331.6	14.3
173.96148601552	379.109873756817	0.595597815774717	184.3	387.5	3.8
Route: 2 Length: 250.338440451432 Demand Met: 585					
151.016214792965	400.451487156494	1.88912053999957E-5	122.8	387.5	3.6
138.972489171398	395.79783657738	2.70655979406342E-5	119.7	393.8	17.8
128.77165504287	391.307518341152	3.82964221685711E-5	92.1	387.5	18.7
128.771654436605	391.307508435227	4.06263865500023E-5	89	393.8	11
130.231715167616	354.239084014272	4.15319887139276E-5	100	339.4	3.8
131.785029313471	341.316362832964	4.12982074280421E-5	99.2	329.2	7.7
133.49934575633	331.880010604196	4.1374077092371E-5	116.5	303.2	9.1
135.311026064212	325.573096121063	4.20905343716527E-5	127.6	286.7	5.8
137.426497272072	323.940786479914	4.29646185864385E-5	136.2	295.3	3.1
139.559365320597	322.371148826442	4.21252157707386E-5	142.5	295.3	13.4
141.699992710193	320.859168536079	4.20571806500902E-5	141.7	283.5	17.7
147.703563666538	321.176591148971	3.98133737746775E-5	148.8	295.3	14.4
154.046180378767	321.493803852622	3.75947542110566E-5	161.4	295.3	10.8
159.280992308362	321.810679766324	3.4795486463679E-5	173.2	285.1	12.1
160.102593632444	324.69017730701	3.37171399209524E-5	178	303.2	1.5
160.917756758395	327.72172207649	3.02669138747547E-5	161.4	315.8	7.1
161.734339814819	330.834414640431	2.78269380586949E-5	155.1	315.8	5.4
162.554025768715	334.048124183582	2.47609771477642E-5	148.8	315.8	8.4
163.379665462711	337.41041920855	2.19136374752793E-5	136.2	315.8	9.7
164.236474615507	341.333411340196	1.99483609932827E-5	129.9	329.2	5.1
165.142774802883	345.763535439963	1.66843131736982E-5	130.7	339.4	10.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
166.101237622105	350.555506585965	1.39765785007739E-5	136.2	331.6	10.8
167.115731851526	356.583551621142	1.09391965068539E-5	142.5	331.6	14.7
168.198749923383	367.129956663066	9.59815061918334E-6	161.4	331.6	4.6
Route: 3 Length: 1011.16498296278 Demand Met: 950					
140.961261301444	179.212632015796	3.30981633567262E-6	136.2	162.2	1.7
116.25841217383	105.083016928317	2.57801822556303E-6	100	73.2	14.4
104.476199072693	94.8794032562297	3.61324173780986E-6	99.2	63	0.7
93.6131858452714	86.9229154808733	3.62461327796382E-6	70.9	65.4	6.9
84.7299237608011	80.0264222860583	3.95717281520547E-6	67.7	65.4	8.4
76.616316338315	73.5672612441238	4.14384986413552E-6	63.8	65.4	13.7
68.9859491958279	67.3584272762837	4.75100812735718E-6	58.3	63	8.5
61.6946779367319	61.30641003967	5.13372021515579E-6	59.1	73.2	9.3
54.5688410958923	55.1851085861043	5.51417574001789E-6	28.3	73.2	9.3
48.5044923740689	48.5474640325559	6.19115771627321E-6	27.6	63	3.4
42.8611595705053	41.7129198541314	6.41274753832022E-6	14.2	37	6.3
37.7608686868948	35.1232750172589	6.99188923647398E-6	9.40000000000001	7.1	2.4
36.1058849853451	33.1116340866787	6.95807107575774E-6	6.3	7.1	12
38.6614975214457	33.1116348364108	6.76073344862971E-6	21.3	6.9	14.1
41.3452418967948	33.1116355860744	7.19569685969645E-6	24.4	6.9	1.6
44.1365489967752	33.1116363357345	7.15579089671792E-6	36.2	6.9	0.3
46.9846630777164	33.1116370854289	6.36713798485289E-6	39.4	6.9	14.8
49.9032796839928	33.1116378351943	6.29004860996929E-6	52.8	15.7	13.8
52.8400771731775	33.1116385850389	6.0688372371942E-6	60.6	22	16.9
55.7779415199251	33.1116393349821	6.02405231120429E-6	63.8	14.2	14.4
58.7083500533268	33.111640085027	6.01124214938409E-6	66.9	14.2	11.4
61.6306536942832	33.1116408351689	5.69579947296006E-6	70.1	14.2	16.8
64.5364160348368	33.1116415853898	5.79566687264332E-6	81.1	18.9	10.9
67.3949441603587	33.1116423356642	5.90880929962623E-6	84.3	17.3	5.6
70.206694301527	33.1116430859811	5.97487726849977E-6	76.4	22	1.9
73.020265946483	33.1116438363376	5.71289557882437E-6	67.7	31.5	4.3
75.8684239397236	33.1116445866991	5.25926395766874E-6	70.9	31.5	11.6
78.7534035845725	33.1116453370629	5.09485578703561E-6	63.8	31.4	12.4
81.7157065892653	33.1116460874334	4.95270358413791E-6	44.9	37	12.5
86.1729328092625	33.1116468376927	5.30164798817623E-6	63.8	49.6	2.8
90.9797396016822	33.1116475878448	4.85105958603071E-6	67.7	49.6	9.5
96.2746497532336	33.1116483379007	4.51933856027154E-6	70.9	49.6	14.9
102.495806900573	33.1116490878643	4.42977395920252E-6	85.8	37	14
109.182072791549	33.1116498378226	4.41419538788068E-6	116.5	37	12.1
115.894585957726	33.1116505877708	4.13115492392535E-6	127.6	20.5	16.5
122.49599156954	33.1116513377168	4.7564785958798E-6	136.2	29.1	0.8
129.023732005702	33.1116520876038	4.52616520618676E-6	142.5	29.1	2.7
135.488315734962	33.1116528373593	4.42999564853608E-6	141.7	17.3	2
142.011547806992	33.1116535868515	4.14007075733025E-6	141.7	-7.9	4.6
149.599972218566	33.1116543436373	3.99691384700418E-6	149.6	-7.9	5.2
151.326658424642	39.0269818654528	4.10147745100176E-6	155.1	29.1	1.4
153.060994383031	45.1374836331323	3.14486589303442E-6	148.8	29.1	19.2
154.814231199978	51.6664099310101	3.01846792893912E-6	148.8	49.6	18.9
156.587752097732	58.3310169656657	3.45280818692117E-6	155.1	49.6	5.1
158.375308304191	65.2507469751262	3.57568415410014E-6	142.5	49.6	0.1
160.199094767913	72.6731664465281	3.05131175792894E-6	136.2	49.6	6.3
162.119938529419	81.7829419859757	2.75640296365509E-6	129.9	63	9.4
164.404823139072	97.7849890131531	2.7959274362388E-6	148.8	65.4	6.2
166.834977828259	191.765768555334	3.23603873653155E-6	161.4	182.7	0.7
Route: 4 Length: 437.522479946747 Demand Met: 938					
183.472238910001	402.291657550551	1.53787022583174E-6	181.1	393.8	14.3
198.217481816622	399.147715040213	1.6445247084107E-6	211.8	393.8	13.7
212.305640227567	396.065526070028	1.87365706949549E-6	215	387.5	7.3
226.816511563507	393.062552861685	2.06120099477403E-6	255.9	387.5	4.9
238.307420000758	390.140354868894	1.76337552915129E-6	252.8	393.8	15.4
249.331669036425	387.242094933132	1.96218636006051E-6	283.5	393.8	11.4
256.445008772902	384.2888064904	2.09720507626798E-6	286.6	387.5	8.3
262.643020105483	381.344052095291	2.49287582931856E-6	301.6	393.8	0.9
263.594343762692	353.297161245238	2.33707254437832E-6	293.7	329.2	1.4
264.478926679424	344.335229688129	1.9574206788775E-6	294.5	339.4	13.8
265.343905517591	335.987094961201	2.11675659755883E-6	263.8	339.4	8.3
266.211855378221	327.790284336449	2.42377021919538E-6	263	329.2	0.8
267.083566308282	319.786209342837	2.13809754967542E-6	249.6	303.2	7.3
267.964959088409	312.52360993512	2.09393178352002E-6	280.3	303.2	11.5
268.845745739758	305.636071727278	1.92038631752212E-6	275.6	273.1	17.9
269.717855141859	301.034671027585	1.95239875466768E-6	278.7	273.1	18.4
270.584312845923	297.091577733878	2.20096775649381E-6	290.6	273.1	10.7
271.438436392826	293.528944500548	2.38722549994463E-6	293.7	273.1	6.2
272.281611229124	290.203042875093	2.34717290226172E-6	308.7	273.1	9.4
272.356937208614	290.036300964447	2.70099112498201E-6	305.5	273.1	0.7
272.431965982037	289.870731122256	2.62224282465695E-6	301.6	260.7	2.7
272.4011810583	289.882016018486	2.56282699950816E-6	283.5	260.7	2.6
272.370414149337	289.893313450369	2.12938418542308E-6	286.6	254.4	15.7
261.878798584437	290.007290696271	2.00414515205694E-6	255.9	254.4	18.1
254.89119412708	290.124795402976	2.20910822434917E-6	252.8	260.7	8.8
248.111584783181	290.242721746075	2.18143883756738E-6	248	280.4	9.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
241.465101057262	290.361007464856	2.05943684505883E-6	240.2	281.9	12.5
234.969681110309	290.479609192386	2.05772064987286E-6	236.2	280.4	11.1
228.575973327658	290.598520283108	1.87199459134035E-6	233.1	280.4	17.3
222.211821579477	290.717772754341	1.8179536880325E-6	224.4	280.4	17.9
215.916911313993	290.837389546252	1.71190790609899E-6	215	254.4	19.4
214.175105299073	294.082186863779	2.11106467418176E-6	211.8	260.7	3.2
212.441357010536	297.718147744219	2.11492760371357E-6	218.9	286.7	3.7
210.709208078692	301.463062208612	2.15011589688174E-6	222	285.1	1.9
208.970997776894	305.367593591292	2.06427465343495E-6	227.6	297.7	4.1
207.216597997995	309.384282674865	1.9226069554179E-6	231.5	297.7	7.4
205.424235214268	313.58639671914	1.88276529655695E-6	234.6	297.7	7.7
203.538302982715	318.18778634989	1.77546282742469E-6	234.6	315.8	11.2
201.554045573717	322.915759492013	1.85821157572263E-6	231.5	315.8	7.2
199.482490636059	327.869843016993	1.84145840620431E-6	227.6	315.8	6.5
197.327102139454	333.192558880939	1.8933147813982E-6	234.6	331.6	5.2
194.784945044381	338.756898742313	1.73583450191472E-6	231.5	331.6	8.7
191.523200951342	345.154202660661	1.66223771458363E-6	227.6	331.6	9.8
184.505072362731	356.215997502704	1.59475359851058E-6	191.3	329.2	9.3
177.380823404735	370.863201926271	1.85286135945262E-6	192.1	339.4	1.6
Route: 5 Length: 971.014079331871 Demand Met: 950					
203.394138147604	287.475736394337	1.18863934517321E-6	240.2	288.2	11.3
205.648901927864	186.647509983752	8.20494562958629E-7	208.7	170.1	15.4
207.943211178513	145.977727383638	8.93915363064934E-7	211.8	127.6	10.4
210.242583762242	121.116682805177	9.03950940767118E-7	215	121.3	10.5
212.562311954559	98.7393758251165	9.20011544280897E-7	192.1	73.2	7.8
215.125240733417	87.6565418272682	7.53755081461804E-7	191.3	63	18.3
218.9765756126	83.1370749848537	9.69066960010423E-7	222	63	7.9
222.924595584143	79.0275129883906	9.36815226282306E-7	222.8	73.2	10.5
226.992976997329	75.0369771238084	8.98189014719719E-7	227.6	65.4	13.5
231.171664069714	71.194165983029	8.41718673427749E-7	227.6	49.6	17.6
235.563928439894	67.7076112948259	9.76844752642592E-7	231.5	49.6	10.4
240.167259611907	64.411958970013	1.08351147076746E-6	234.6	49.6	6
245.017545465942	61.2448070821594	1.13634286691422E-6	234.6	65.4	4.6
250.211071470203	58.0786414823559	1.21704249522736E-6	231.5	65.4	1.8
256.064667501519	54.8840610178797	1.30224278649393E-6	263	63	0.7
262.036047119041	51.6610049302762	1.31956571891578E-6	263.8	73.2	0.8
268.272025263228	48.2788087708198	1.36418078966472E-6	294.5	73.2	1.3
272.485899175821	43.6968718526605	1.05608889811037E-6	293.7	63	15.4
276.276446538026	38.4139099316773	1.00274183978399E-6	290.6	6.9	18.4
279.471600128724	35.5052290918209	1.01793619933233E-6	293.7	6.9	18.6
282.447406683443	33.1403704200428	1.05615304590856E-6	308.7	6.9	18.2
278.08693754855	33.9531252998526	1.28721020331568E-6	305.5	6.9	5.7
272.79341474648	34.8130905099601	1.21689938481495E-6	275.6	6.9	6.7
267.646929778875	35.6939174185454	1.14178909171869E-6	278.7	6.9	10.2
262.319897448902	36.6047068064324	1.15890762941717E-6	280.3	37	9.6
256.798873007242	37.513170693226	1.00868045649349E-6	249.6	37	15.8
251.637516235762	38.4205159456919	1.0530871179526E-6	234.6	31.5	11.8
246.978566368472	39.3309143234863	1.05552903306716E-6	231.5	31.5	11.2
242.698979584283	40.2448870895142	9.84321950170397E-7	227.6	31.5	14.9
238.750780815452	41.1636800267098	9.1573512861487E-7	218.9	20.5	18.5
235.360337429056	42.1104162600907	9.13684992553954E-7	233.1	14.2	19.1
232.101918420047	43.097145629591	9.3526981714831E-7	240.2	22	17.8
228.832618579419	44.1040378607199	1.09916543777899E-6	240.2	15.7	7.9
225.478595876748	45.1478066313213	1.24213519825389E-6	248	14.2	2
220.498329250735	46.3705367841123	1.18886200084489E-6	236.2	14.2	3.3
214.644275692667	47.7186761904696	1.24936020995392E-6	224.4	14.2	0.3
208.371083391564	49.1974611987265	1.16941305350338E-6	222	18.9	3.1
201.44478940806	50.7906371630166	1.1490165903183E-6	208.7	37	3.4
194.560038525038	52.4059504004594	1.09237023337982E-6	178	37	4.3
188.455828153184	54.0541485911315	9.95031378181466E-7	173.2	18.9	8.3
184.631565873017	56.5961610733007	9.27515557691549E-7	161.4	29.1	11.5
181.812662267796	60.0642235715766	8.96362749358559E-7	161.4	49.6	13.6
179.191640475705	63.7051345993565	1.01168545540986E-6	161.4	65.4	7.2
176.715646037007	67.3934140710198	9.73413015969982E-7	155.1	65.4	8.7
174.39089878223	71.1746110728403	1.08629510719993E-6	142.5	65.4	2.7
172.292192666512	75.0730599621138	1.05377257852979E-6	136.2	65.4	3.7
170.615736712274	79.1020955932016	9.75460210383972E-7	130.7	73.2	7.2
169.988431778602	278.401799793973	1.3864765122662E-6	155.1	295.3	0.7
Route: 6 Length: 756.197403528216 Demand Met: 950					
169.28519298342	210.813124594337	2.97729817333447E-6	155.1	182.7	16.5
169.270401109879	189.445574923995	2.16663310936838E-6	155.1	162.2	15.7
169.255601341942	177.123694413373	2.52153523661036E-6	161.4	162.2	17.4
169.240859178436	166.377084512702	2.8685128583561E-6	173.2	152	19.2
169.226158006904	156.95419364455	3.45395158518613E-6	184.3	121.3	14.5
161.490372409053	156.94785610828	4.30419483876676E-6	181.1	127.6	7.7
151.994243549974	156.941570327955	4.94677926354825E-6	148.8	162.2	5.3
143.020600049334	156.935306973237	5.60231360680063E-6	142.5	162.2	2.7
134.411011221604	156.929052037448	5.32476726533559E-6	141.7	150.4	15.8
125.836909881315	156.922813133907	5.68223260444256E-6	127.6	153.6	18.6
117.503869680861	156.916595887657	6.23746534955671E-6	119.7	127.6	15.5

Solution x	Solution y	Solution z	Original x	Original y	Original z
109.314970121904	156.910395290832	7.09719996905278E-6	122.8	121.3	7.8
93.9680682499514	156.904162609681	7.5853804446524E-6	92.1	121.3	6.9
80.7160647786059	156.897945949717	8.53708534265252E-6	89	127.6	0.1
67.2967449077277	156.891762130481	8.5497602100304E-6	51.2	121.3	6.2
61.557049049567	156.88558642464	9.08839106017467E-6	48	127.6	5.5
56.4423956752005	156.879433369782	9.72045786795661E-6	39.4	140	3.5
51.7210566068005	156.873300664766	1.03484413145338E-5	36.2	140	1.4
47.3091454309937	156.867180993766	1.00597234080624E-5	24.4	140	15.5
43.4129366666693	156.861063357893	1.08125601343545E-5	21.3	140	9.6
39.8463718147377	156.854941442715	1.1321491328431E-5	20.5	121.3	8.4
39.8463716467377	156.854941744552	1.11192962037876E-5	17.3	127.6	16.4
39.8463714801468	156.854942045006	1.12515450823025E-5	6.3	140.2	17.5
40.7347259436416	159.630223493901	1.12111906318546E-5	9.40000000000001	140.2	11.5
41.6900634727095	162.929533503125	1.08917195191793E-5	14.2	170.1	13.5
42.6819126195278	166.212051132476	1.0358103395447E-5	44.9	170.1	19.9
43.6873622320227	169.538061142541	1.01531262970411E-5	27.6	196.1	18.7
44.7355953266426	172.405748623016	1.0001922646552E-5	28.3	206.3	15.8
46.9994566100083	173.151925749633	9.77596512541368E-6	59.1	206.3	14.9
49.0818429724271	173.845327294642	1.02300190931714E-5	58.3	196.1	1.6
51.1485503882249	174.53330632859	9.8881254118055E-6	63.8	198.5	2.5
53.1809585684727	175.214507985811	9.04161345260945E-6	67.7	198.5	11.8
55.1650200154812	175.888293224624	8.44655735221522E-6	70.9	198.5	18.8
57.0780801414434	176.551972321975	8.19670693630314E-6	70.9	182.7	16.9
58.9675191954808	177.215225231891	8.10417111551942E-6	67.7	182.7	12.4
60.8497152802611	177.877897460991	8.24888621053788E-6	63.8	182.7	4.6
62.737892692044	178.539611334328	8.08543787655935E-6	67.7	164.6	2.1
64.6295688353594	179.205970470739	7.40303489266125E-6	70.9	164.6	8.4
66.5245424120814	179.878064559485	7.11135163555809E-6	63.8	164.5	8.3
68.4424495013425	180.557337550077	6.5250099368086E-6	60.6	155.1	13.8
70.4064422840834	181.252226823062	6.14301969648068E-6	52.8	148.8	15.5
73.035582692321	182.080836326957	5.9760118560348E-6	63.8	147.3	12.9
75.9003279640453	182.989852058822	5.48871183525534E-6	70.1	147.3	17.8
79.2845291344073	184.245888089755	5.82566101314796E-6	66.9	147.3	5
83.5191492854757	185.843541802139	5.67453537314577E-6	76.4	155.1	3.4
87.935679412719	187.53357503643	5.1537382930178E-6	81.1	152	7.1
92.6957942031466	189.472705073281	5.03891778436127E-6	84.3	150.4	4.3
100.043105746986	195.075909881074	4.76033303442591E-6	85.8	170.1	5
108.267309300035	201.587326348256	4.05021732774458E-6	116.5	170.1	13.6
116.013554434357	211.169430262533	3.78615762741674E-6	99.2	196.1	13.9
124.755914754039	222.362568795248	3.34566632176347E-6	100	206.3	18
137.1969700218	237.439087847726	3.09867301240274E-6	130.7	206.3	18.1
152.18293904804	310.299000278932	4.01925472459652E-6	142.5	315.8	4.2
Route: 7 Length: 707.057537531803 Demand Met: 950					
184.210787824218	228.404754233856	2.05747525683364E-7	191.3	196.1	16.7
191.740849787461	224.138714387536	7.90403191786027E-8	192.1	206.3	17
199.574981347201	219.702596117642	1.19370817230902E-7	222.8	206.3	17
206.233412682837	215.575487385132	1.7654078732221E-7	227.6	198.5	10.4
212.286124962756	211.801411826207	2.12598578741563E-7	234.6	198.5	10.6
217.858865020894	208.280711178445	2.88127132819227E-7	231.5	198.5	1.6
223.359582219676	204.89571331511	3.12370509902848E-7	222	196.1	3.2
229.057704391297	201.614246753054	3.61556615757763E-7	227.6	182.7	0.3
234.980408627406	198.497038037941	3.4110009039523E-7	234.6	182.7	13.3
241.120015003519	195.508897506751	3.57665058459133E-7	231.5	182.7	19.2
247.831154134833	192.636823838812	4.03799205628275E-7	263	196.1	17.9
254.283445095621	189.777748334433	4.84200981532013E-7	263.8	206.3	6.2
260.708950984937	186.868801008174	5.29481127387044E-7	294.5	206.3	5.6
263.126127151514	181.803988469892	5.62159058858924E-7	293.7	196.1	5.6
265.297499378871	176.08290852614	5.54239626637809E-7	280.3	170.1	14.3
267.449779194677	170.608408128795	5.69530314464828E-7	278.7	140	19.3
269.487424107902	167.082329727429	6.58861203817196E-7	275.6	140	4.2
271.530393171664	163.864811766517	7.17757274060205E-7	290.6	140	0.4
273.523733099736	160.906192264947	7.09723749992008E-7	293.7	140	9.3
275.466739043392	158.137971326216	7.21629263011891E-7	308.7	140	16.6
275.466738977963	158.137971321688	7.38220691687275E-7	305.5	140	11.2
275.466738913603	158.137971317267	7.85216727194893E-7	301.6	127.6	0.4
275.466738872598	158.137971319989	7.16386104215871E-7	283.5	127.6	15
275.466738829844	158.137971322403	7.15201721845915E-7	286.6	121.3	15.1
261.978864534074	158.93073616638	6.87784343256226E-7	255.9	121.3	14.5
256.692112139782	160.401732000509	7.08614649624906E-7	252.8	127.6	3.3
251.764471042738	161.973658052101	6.81489964904358E-7	248	147.3	4.5
247.012578270042	163.570664809938	6.82207335955809E-7	249.6	170.1	0.7
242.335011081295	165.163686687421	6.57693810524051E-7	234.6	164.6	0.1
237.837120381867	166.761799401375	6.25683462374127E-7	227.6	164.6	1.4
233.528826152188	168.367076081194	5.78934333361758E-7	231.5	164.6	6.5
229.320017605484	169.980859035976	5.62262037817618E-7	240.2	155.1	5.1
225.078931692559	171.621701717202	5.34974041954683E-7	240.2	148.8	5.8
220.685346373227	173.322288860875	5.04363519837625E-7	236.2	147.3	7.3
216.049944384966	175.11524018874	4.65051826381568E-7	233.1	147.3	11.4
210.88836855955	177.069417492656	4.78355005384401E-7	224.4	147.3	2.3
205.37561559454	179.190616386741	4.06923540197113E-7	222	152	14.6

Solution x	Solution y	Solution z	Original x	Original y	Original z
198.97673294359	181.556531390323	3.93590212866002E-7	218.9	153.6	11.5
189.988505719916	184.321732670737	3.65832491411311E-7	178	170.1	11.6
181.987838916275	187.192872523534	3.48950173645335E-7	148.8	182.7	9.2
176.683199542653	190.181176280951	3.54886239506413E-7	142.5	182.7	2.1
172.686042195287	193.380640375881	3.12602018937014E-7	136.2	182.7	6.2
169.914582655701	197.10298992107	2.76715155678176E-7	129.9	196.1	10
169.762326465785	208.694652657582	2.6054612334292E-7	136.2	198.5	8.4
169.609633125918	225.081304041132	2.39378607602703E-7	148.8	198.5	8.3
169.458001219218	319.263762679385	2.90034961381025E-7	148.8	331.6	0.2

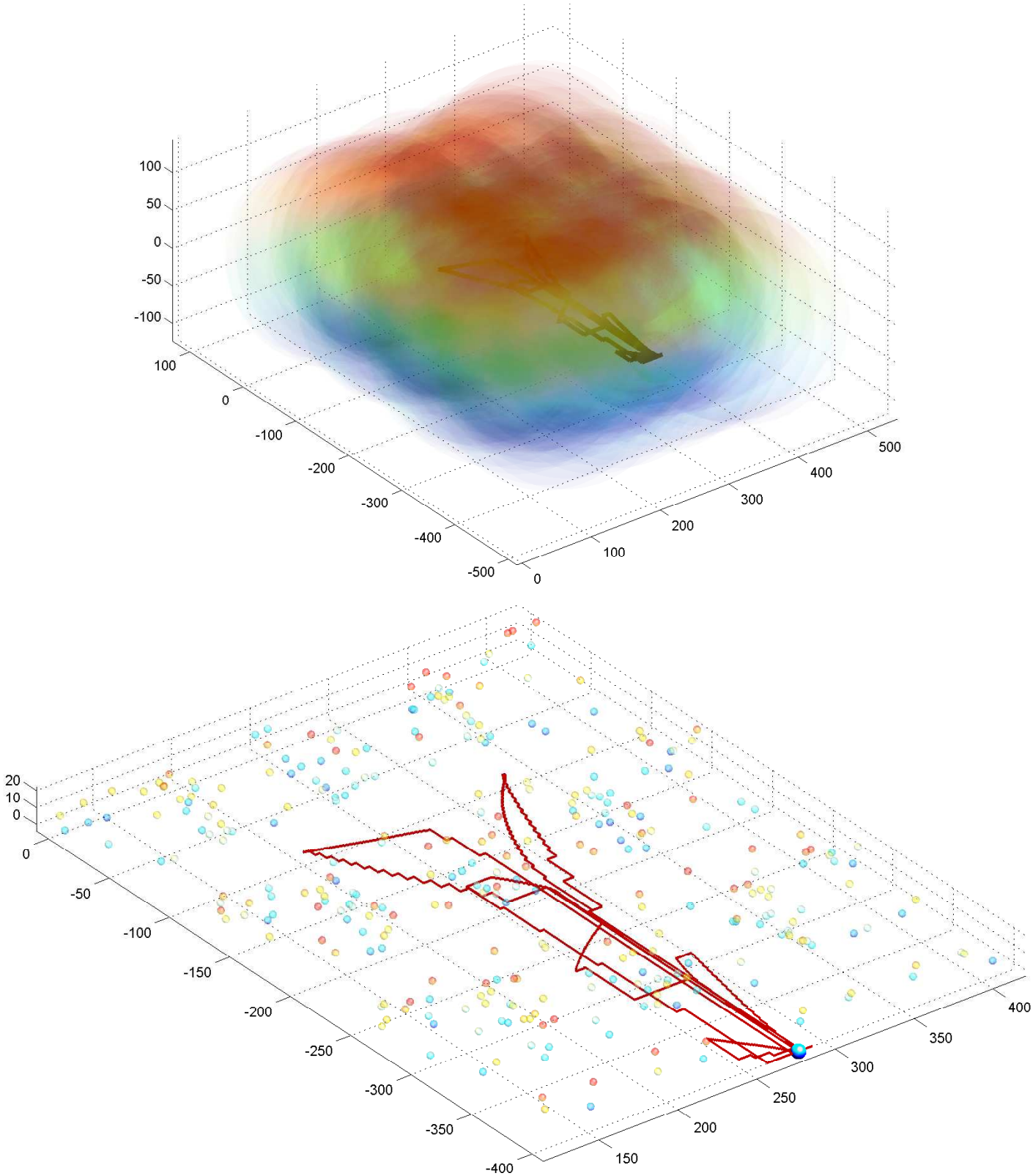


Figure O.182: $lin318$, $r = 124.02$, Equal Radius, 3D, Manhattan, Length = 2848.7983832

Table O-185: Solution for *lin*318, $r = 124.02$, Equal Radius, 3D, Manhattan

Total distance: 2848.79838322875 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 729.016191843658 Demand Met: 950					
171.385801428133	229.753071986509	4.72684575925086E-8	63.8	182.7	4.6
173.456570523765	189.121543068353	5.0255636097063E-8	192.1	73.2	7.8
175.512396798024	176.215592146476	5.04905415255052E-8	191.3	63	18.3
177.536682994767	168.037994459528	5.82035255547453E-8	222	63	7.9
179.521123626078	161.873929235692	6.1210641888465E-8	222.8	73.2	10.5
181.517550438197	156.307229689781	6.38884927184335E-8	227.6	65.4	13.5
183.514139073652	151.278107403578	7.15225212388759E-8	231.5	65.4	1.8
185.503415752895	146.605119224086	7.42164871780915E-8	234.6	65.4	4.6
187.479125875967	142.191636024306	7.70195214272462E-8	234.6	49.6	6
189.432396356401	138.117866142168	7.90560932273365E-8	231.5	49.6	10.4
191.373341797446	134.279062530845	8.03592001830111E-8	227.6	49.6	17.6
193.30943909448	130.623869680517	8.44574543634735E-8	227.6	31.5	14.9
195.234804735194	127.244364871884	8.93147245051296E-8	231.5	31.5	11.2
197.152743829423	124.072841488781	9.28396559629618E-8	234.6	31.5	11.8
199.065950728555	121.068793795953	9.58277581730727E-8	249.6	37	15.8
200.973459011791	118.203956142111	9.83068275672849E-8	240.2	22	17.8
202.87279198643	115.508456030416	1.01198423863025E-7	233.1	14.2	19.1
204.768382695807	112.982912692643	1.04594420236026E-7	218.9	20.5	18.5
206.677042812772	110.550429693279	1.12783325789678E-7	208.7	37	3.4
208.605096243091	108.173152052405	1.16625557211592E-7	222	18.9	3.1
210.547939937022	105.866556768008	1.21211414239042E-7	224.4	14.2	0.3
212.503957185801	103.629010726547	1.24124397871128E-7	236.2	14.2	3.3
214.467984377889	101.453229113161	1.26285129908865E-7	240.2	15.7	7.9
216.439366761403	99.3284215846241	1.32135113517506E-7	248	14.2	2
218.414346757111	97.2489340091091	1.34978833443711E-7	275.6	6.9	6.7
220.357942025927	95.2401170097608	1.40091557909727E-7	305.5	6.9	5.7
221.953969712237	93.6458739313144	1.39603614002226E-7	308.7	6.9	18.2
220.326142355749	96.4704396960251	1.33816442371426E-7	293.7	6.9	18.6
218.630345737911	99.6706017339246	1.28265540411121E-7	290.6	6.9	18.4
216.818585411488	103.604009991973	1.25071053957981E-7	278.7	6.9	10.2
214.945191597484	108.197880756471	1.20009119086717E-7	280.3	37	9.6
213.054173351557	113.048388798734	1.17848017566757E-7	263	63	0.7
211.161995663654	118.046639941024	1.12905368609972E-7	263.8	73.2	0.8
209.268306230499	123.188317008818	1.07987304431845E-7	294.5	73.2	1.3
207.342340869343	128.580732813064	9.79892149644002E-8	293.7	63	15.4
205.352630717243	134.541258117883	9.36734494416669E-8	286.6	121.3	15.1
203.342292733315	140.631324294615	8.8514639173809E-8	283.5	127.6	15
201.315010292344	146.873587214592	8.93298590654013E-8	301.6	127.6	0.4
199.234612959846	153.378240408058	8.25962445105688E-8	290.6	140	0.4
197.127859993108	160.128426373863	7.50324318232742E-8	293.7	140	9.3
194.977389746838	167.25139368515	6.89300065914722E-8	305.5	140	11.2
192.656391035214	175.177617895676	6.28709955208251E-8	308.7	140	16.6
186.453826312791	197.39879901729	5.43456479817905E-8	278.7	140	19.3
179.602403520984	229.853785185279	5.22457384022346E-8	280.3	170.1	14.3
Route: 2 Length: 258.734924054983 Demand Met: 950					
170.336450171959	393.072547322566	1.34939604379269E-6	208.7	303.2	16.2
171.336611031653	383.026120876204	1.54281165976045E-6	218.9	286.7	3.7
172.335942752941	374.802697950171	1.64655004653014E-6	222	285.1	1.9
173.326902392012	367.639387046307	1.72528400810279E-6	227.6	297.7	4.1
174.31672965141	361.026904511313	1.77715209304097E-6	231.5	297.7	7.4
175.310466743087	354.820911557049	1.85973742361512E-6	234.6	297.7	7.7
176.308234335215	348.928582030548	1.92755318551008E-6	234.6	315.8	11.2
177.309255382489	343.216985318717	2.04960394967202E-6	249.6	303.2	7.3
178.309061339812	337.722165559333	2.24977007690086E-6	263	329.2	0.8
179.302933007228	332.367740981242	2.26079620802011E-6	263.8	339.4	8.3
180.292050932163	327.113368759318	2.31712741083356E-6	294.5	339.4	13.8
181.24856842153	321.875193436973	2.52407458845028E-6	293.7	329.2	1.4
182.183684662716	316.700713759502	2.45038235391348E-6	280.3	303.2	11.5
183.11228695613	311.668662698183	2.43524740994872E-6	278.7	273.1	18.4
184.033393624731	306.873161646339	2.51959477282071E-6	275.6	273.1	17.9
184.95011555065	302.25246402863	2.68552193460891E-6	290.6	273.1	10.7
185.853979918451	297.829797116332	2.81844718585944E-6	293.7	273.1	6.2
186.743775181966	293.576328094028	2.88389213665141E-6	308.7	273.1	9.4
186.313971483082	293.576327481315	2.96800448040813E-6	305.5	273.1	0.7
185.870742693415	293.576326867376	2.91827473120065E-6	301.6	260.7	2.7
185.414011571883	293.576326252429	2.89071140002761E-6	283.5	260.7	2.6
184.95543196761	293.576325638781	2.74650038534219E-6	286.6	254.4	15.7
184.493237847917	293.576325026497	2.68749967347048E-6	255.9	254.4	18.1
184.031102888742	293.576324415779	2.76832587076115E-6	252.8	260.7	8.8
183.568822788517	293.576323806033	2.76863183046316E-6	248	280.4	9.5
183.105778874767	293.576323195037	2.74348246875888E-6	240.2	288.2	11.3
182.641699449418	293.576322581347	2.71682674224394E-6	240.2	281.9	12.5
182.176317378616	293.576321965196	2.71647301985922E-6	236.2	280.4	11.1
181.709651214282	293.576321346668	2.64819122719473E-6	233.1	280.4	17.3

Solution x	Solution y	Solution z	Original x	Original y	Original z
181.241822752269	293.576320726235	2.62702002373771E-6	224.4	280.4	17.9
180.774070222558	293.576320105801	2.57310885842799E-6	215	254.4	19.4
180.307433673721	293.576319487305	2.7189138478434E-6	211.8	260.7	3.2
179.842792769982	293.576318872659	2.58673334485593E-6	181.1	260.7	13.4
179.380625115442	293.576318262047	2.54431569146618E-6	184.3	254.4	16.9
178.920454464925	293.576317655088	2.49835045451618E-6	192.1	206.3	17
178.46079077117	293.576317050343	2.48328562690858E-6	191.3	196.1	16.7
178.000526776593	293.576316446501	2.48653014978117E-6	178	170.1	11.6
177.29861549538	295.697317701421	2.39419684078257E-6	148.8	182.7	9.2
176.600861806153	297.990170224594	2.35311827623264E-6	142.5	182.7	2.1
175.91101963262	300.65332823539	2.27502202676533E-6	142.5	198.5	1.1
175.22264909025	303.458469804712	2.18430210452425E-6	161.4	198.5	1.4
174.532335043313	306.411018990572	1.93483117527649E-6	155.1	198.5	17.6
173.84504113447	309.594162931751	1.9063710823275E-6	148.8	198.5	8.3
173.167465871036	313.153658608033	1.7952191058157E-6	136.2	198.5	8.4
172.510201217235	318.511573610455	1.6166460312661E-6	130.7	206.3	18.1
171.872611733726	330.24706233449	1.62165864026065E-6	122.8	254.4	9.9
171.237062289089	343.734172136402	1.50857113112579E-6	119.7	260.7	11.7
170.5998249434	360.318540616765	1.4783024226972E-6	161.4	295.3	10.8
169.964465091013	379.537767201565	1.4738749598564E-6	155.1	295.3	0.7
Route: 3 Length: 17.672801459957 Demand Met: 571					
170.808930025237	405.499999936578	3.13645273308794E-7	181.1	393.8	14.3
172.281574164833	405.49999992724	3.22955216347509E-7	211.8	393.8	13.7
173.760702588455	405.499999906403	3.38430751867236E-7	215	387.5	7.3
175.232927135938	405.499999885601	3.30069809706401E-7	252.8	393.8	15.4
176.701267883961	405.499999864833	3.47878284401304E-7	283.5	393.8	11.4
178.136400106407	405.499999844119	3.83824456662296E-7	301.6	393.8	0.9
177.656678249827	405.499999850921	3.55449714106726E-7	286.6	387.5	8.3
177.177252131155	405.499999857751	3.56676096657793E-7	255.9	387.5	4.9
176.702257911657	405.499999864601	3.33884514702731E-7	234.6	331.6	5.2
176.227499623038	405.499999870929	3.24200655654749E-7	231.5	331.6	8.7
175.752499674261	405.499999877785	3.22928713103465E-7	231.5	315.8	7.2
175.275346462091	405.499999884634	3.23285831882458E-7	227.6	315.8	6.5
174.795828310291	405.499999892452	3.19291729056204E-7	227.6	331.6	9.8
174.312595476197	405.499999900348	3.07211777794691E-7	222	329.2	14.2
173.822063140744	405.499999907431	3.06838884966965E-7	222.8	339.4	15.5
173.311964727335	405.499999911932	3.33033369770419E-7	192.1	339.4	1.6
172.793890005332	405.499999914837	3.00562092547807E-7	130.7	339.4	10.6
172.281988477565	405.49999991798	2.98174526847106E-7	136.2	331.6	10.8
171.780017576692	405.49999992432	3.08895607759041E-7	129.9	329.2	5.1
171.286244132038	405.499999930163	3.28509031533031E-7	122.8	387.5	3.6
170.79926616257	405.499999938598	2.9719633687364E-7	119.7	393.8	17.8
170.308204809295	405.499999945088	2.89651694629356E-7	92.1	387.5	18.7
169.820673408223	405.499999951354	3.07044913938626E-7	89	393.8	11
Route: 4 Length: 773.664377621658 Demand Met: 950					
165.627327920237	151.363601975762	2.98884060612181E-7	178	37	4.3
161.960231979139	128.746617854905	2.85865354499038E-7	173.2	18.9	8.3
158.286915378937	114.974378287737	2.93804689022181E-7	149.6	-7.9	5.2
155.711992993361	114.055297017086	3.02034138144336E-7	141.7	-7.9	4.6
153.562876826527	113.382572774817	3.18513954766786E-7	141.7	17.3	2
151.452608882558	112.738431250499	3.29914982444279E-7	136.2	29.1	0.8
149.374113704896	112.109940512136	3.35091499437112E-7	142.5	29.1	2.7
147.31923138734	111.490856695445	3.48784709558458E-7	155.1	29.1	1.4
145.278112068396	110.879021674132	3.36736633244072E-7	161.4	29.1	11.5
143.240403613414	110.275779977802	3.2862759269392E-7	148.8	29.1	19.2
141.209378265052	109.68275728654	3.37695198027177E-7	127.6	20.5	16.5
139.198662606003	109.100291624444	3.54298308025136E-7	116.5	37	12.1
137.212325954241	108.525982995197	3.60302522040001E-7	100	73.2	14.4
135.255539545655	107.955139688489	3.95649479401072E-7	99.2	63	0.7
133.328215054429	107.386133802719	3.87011326097308E-7	70.9	65.4	6.9
131.444436751188	106.817256622319	3.92019018136125E-7	67.7	65.4	8.4
129.603260388855	106.247623325729	3.89805663303378E-7	63.8	65.4	13.7
127.803340140325	105.676536619493	4.07130613666595E-7	59.1	73.2	9.3
126.04096852266	105.102591230532	4.15736778336395E-7	58.3	63	8.5
124.313544718962	104.52728114747	4.35002021959008E-7	63.8	49.6	2.8
122.614312729293	103.952267015182	4.30142492291452E-7	67.7	49.6	9.5
120.934020864868	103.377436751036	4.28831299359445E-7	70.9	49.6	14.9
119.264269103919	102.802864213777	4.39386241168904E-7	85.8	37	14
117.592711854562	102.229871630112	4.51171246140802E-7	81.1	18.9	10.9
115.926598038599	101.661004289859	4.70405467467572E-7	84.3	17.3	5.6
114.261687885511	101.09684149811	4.86145083300471E-7	76.4	22	1.9
112.602750646691	100.538116291502	4.89357020683201E-7	67.7	31.5	4.3
110.953869502964	99.9861772127805	4.83693824548936E-7	70.9	31.5	11.6
109.31484254881	99.4433174394817	4.89820536131447E-7	63.8	31.4	12.4
107.69295511981	98.9121356269135	4.96623798085238E-7	44.9	37	12.5
106.098631775288	98.3955354538116	4.97443792824015E-7	60.6	22	16.9
104.531001406354	97.8946283075379	5.06488305518 36E-7	70.1	14.2	16.8
102.994321741525	97.4105776691468	5.24370122434448E-7	66.9	14.2	11.4
101.496919509921	96.9433579100029	5.27059413002462E-7	63.8	14.2	14.4
100.046628784486	96.4918087928715	5.356140064805E-7	52.8	15.7	13.8

Solution x	Solution y	Solution z	Original x	Original y	Original z
98.6446682875126	96.0524993650618	5.40242155011583E-7	39.4	6.9	14.8
97.2977549368841	95.6245957254798	5.76991837419882E-7	36.2	6.9	0.3
95.9991442401297	95.2038055494444	5.81575960723058E-7	24.4	6.9	1.6
94.7622452575028	94.791374031555	5.65651561146296E-7	21.3	6.9	14.1
93.5833722457932	94.3844396006531	5.76829933152112E-7	6.3	7.1	12
94.1344984558556	95.0352457534042	5.73830007510878E-7	9.40000000000001	7.1	2.4
96.6874445691786	100.472290914947	5.47514602544652E-7	14.2	37	6.3
99.3574227950051	106.422434355206	5.36412201768144E-7	27.6	63	3.4
102.120474965542	112.745929546003	5.0385342831305E-7	28.3	73.2	9.3
104.990620971859	119.466768751595	4.90549055598422E-7	20.5	121.3	8.4
107.9972848857	126.382542221691	4.5403552917378E-7	17.3	127.6	16.4
111.168962557751	133.483214774833	4.31553317525868E-7	6.3	140.2	17.5
114.652112709891	140.698285015289	4.21134345174323E-7	9.40000000000001	140.2	11.5
118.511295313288	148.1799209864	4.03994249609241E-7	21.3	140	9.6
122.690840652297	156.093274875821	3.71188960457403E-7	24.4	140	15.5
127.297813230817	164.69977201709	3.79848501097513E-7	36.2	140	1.4
132.325553375383	174.195926800758	3.53863228497175E-7	39.4	140	3.5
137.91595506906	184.747527421597	3.26463336364213E-7	48	127.6	5.5
144.254185751869	197.175301483262	3.02620151160227E-7	51.2	121.3	6.2
Route: 5 Length: 532.938879306955 Demand Met: 950					
149.656298793248	336.499710578772	2.45540832111146E-8	28.3	339.4	12.9
144.857777968793	274.981378020865	2.60461519019373E-8	24.4	273.1	19.3
142.150970579293	230.200695721914	2.8927175321769E-8	28.3	206.3	15.8
139.729232518294	200.443041136489	3.18786845809882E-8	27.6	196.1	18.7
137.465646701889	172.171411676708	3.62728371783305E-8	14.2	170.1	13.5
137.883394766234	172.171411589711	3.60510625796451E-8	44.9	170.1	19.9
138.305525933683	172.171411502736	3.74133435343538E-8	52.8	148.8	15.5
138.730389393065	172.171411415758	3.88473324619554E-8	60.6	155.1	13.8
139.155811772129	172.171411328804	3.99324875388629E-8	63.8	147.3	12.9
139.580778720338	172.171411241849	4.0414448676529E-8	70.1	147.3	17.8
140.004903314107	172.17141115489	4.31579536552817E-8	66.9	147.3	5
140.428887641454	172.171411067925	4.49256560841604E-8	67.7	164.6	2.1
140.853084146551	172.171410980976	4.49575736638508E-8	63.8	164.5	8.3
141.278361395708	172.171410893998	4.60925235756804E-8	70.9	164.6	8.4
141.705190819446	172.171410807025	4.68220662241947E-8	67.7	182.7	12.4
142.134283432673	172.171410720056	4.73059316163926E-8	70.9	182.7	16.9
142.565979674706	172.17141063308	4.99514243301746E-8	85.8	170.1	5
143.000130382692	172.17141054613	5.09008231119878E-8	76.4	155.1	3.4
143.436285496749	172.171410459116	5.14774995963307E-8	81.1	152	7.1
143.874264971667	172.171410372166	5.29049231090539E-8	84.3	150.4	4.3
144.313899023242	172.171410285144	5.44212497288754E-8	89	127.6	0.1
144.754929226202	172.171410198189	5.43382441264839E-8	92.1	121.3	6.9
145.197247315615	172.171410111198	5.45906999604995E-8	119.7	127.6	15.5
145.640692963104	172.171410024205	5.66423494774426E-8	122.8	121.3	7.8
146.085221183307	172.171409937196	5.73705136730496E-8	130.7	73.2	7.2
146.530248566489	172.171409850202	5.79750718543437E-8	129.9	63	9.4
146.9763532174	172.171409763171	5.99610245899385E-8	136.2	65.4	3.7
147.42317956645	172.171409676153	6.12346013895149E-8	142.5	65.4	2.7
147.870587952229	172.171409589122	6.25325071723637E-8	142.5	49.6	0.1
148.320308248294	172.17140950207	6.25713028057362E-8	136.2	49.6	6.3
148.799707246545	172.171409414884	6.25016838284864E-8	148.8	49.6	18.9
151.706608305073	172.375725794719	6.10618116070327E-8	161.4	49.6	13.6
153.070109714804	173.001268290047	6.02747718403407E-8	155.1	49.6	5.1
154.421928725964	174.789906902245	5.82369494850354E-8	148.8	65.4	6.2
155.781017204574	176.660138956644	5.60832944529466E-8	155.1	65.4	8.7
157.146086195644	178.634364127141	5.44428644388972E-8	161.4	65.4	7.2
158.514977783458	180.749102642808	5.34625854697879E-8	215	121.3	10.5
159.877864283037	182.897038884174	5.16043741072281E-8	211.8	127.6	10.4
161.237025000915	185.072344428316	5.01001693464786E-8	233.1	147.3	11.4
162.585630441109	187.2640193299	4.89194746933208E-8	236.2	147.3	7.3
163.925366134533	189.474226436397	4.73304027082122E-8	240.2	148.8	5.8
165.257004734393	191.706011003676	4.57451108104578E-8	248	147.3	4.5
166.578378088006	193.967046078162	4.39042793232147E-8	252.8	127.6	3.3
167.878002297414	196.306589517487	4.02859967607583E-8	255.9	121.3	14.5
169.130541093562	198.839731214994	4.04775448714645E-8	275.6	140	4.2
170.232235946342	201.885533304752	3.9590531741851E-8	293.7	196.1	5.6
170.606495707183	206.299998761422	3.82777756158248E-8	294.5	206.3	5.6
170.346836721335	222.143548318764	3.22270636843314E-8	263	196.1	17.9
170.086391709816	239.916450557376	2.93003949991544E-8	234.6	182.7	13.3
169.824726591909	260.792756032955	2.65347352979006E-8	136.2	162.2	1.7
169.565365128428	292.775928923047	2.42922197912776E-8	161.4	182.7	0.7
Route: 6 Length: 133.90298755214 Demand Met: 940					
168.479297483867	404.662382836818	2.74351712903353E-6	184.3	387.5	3.8
167.672162798265	403.537197704802	2.66262031800579E-6	191.3	329.2	9.3
166.866716608395	402.340960370207	2.83217370622424E-6	161.4	331.6	4.6
166.069426749539	401.132833305846	3.02032891852377E-6	148.8	331.6	0.2
165.283666951586	399.933927585941	2.8955637958461E-6	155.1	331.6	14.3
164.506400288343	398.746555782275	2.9973295028185E-6	142.5	331.6	14.7
163.734989260699	397.577221766444	3.16435094305234E-6	136.2	315.8	9.7
162.96736316938	396.432616003458	3.3939012951123E-6	142.5	315.8	4.2

Solution x	Solution y	Solution z	Original x	Original y	Original z
162.200435628614	395.302378755781	3.45218683150961E-6	148.8	315.8	8.4
161.432399807648	394.179551797762	3.63905425615485E-6	155.1	315.8	5.4
160.661467940237	393.060904660547	3.74241078304749E-6	161.4	315.8	7.1
159.885059582222	391.945202729392	3.96892939136251E-6	178	303.2	1.5
159.096666004231	390.837460349369	3.86546996367088E-6	173.2	285.1	12.1
158.294772747012	389.75600348552	3.86537452357061E-6	141.7	283.5	17.7
157.490259130307	388.706030182168	4.07191127749229E-6	148.8	295.3	14.4
156.67692018631	387.667756666007	4.20714650317677E-6	142.5	295.3	13.4
155.85427863117	386.639954524958	4.50194690415628E-6	136.2	295.3	3.1
155.02175285106	385.620515892416	4.55449837488686E-6	127.6	286.7	5.8
154.180481453157	384.61354209962	4.64759264673376E-6	116.5	303.2	9.1
153.330359312623	383.606067935549	4.83654402216871E-6	99.2	329.2	7.7
152.47378290548	382.580961651795	5.05988491283915E-6	100	339.4	3.8
151.606955293416	381.527455060267	5.13467836071868E-6	59.1	339.4	4.8
150.746948356646	380.443355187345	5.19514982499913E-6	58.3	329.2	7.6
149.896138694701	379.343415909933	5.39748376127136E-6	67.7	331.6	4.4
149.04742579598	378.225280206952	5.29338956312131E-6	70.9	331.6	19.3
148.20101404117	377.09470764286	5.43301447919475E-6	63.8	331.6	18.4
147.362681527028	375.962326240205	5.58786950932699E-6	63.8	315.8	14.7
146.535679326874	374.850035904623	5.74162763200547E-6	67.7	315.8	13.4
145.721111678618	373.769069699965	5.84759210653374E-6	70.9	315.8	15.2
144.921796737143	372.733264109775	5.99503955811542E-6	85.8	303.2	13.4
144.137772503407	371.747999070925	6.13017095929536E-6	70.9	297.7	11.7
143.36920018396	370.805179904869	6.40831792964036E-6	67.7	297.7	2.9
142.616402445483	369.899740635542	6.49937076957485E-6	63.8	297.6	5.2
141.878836721745	369.022566822726	6.60807607744118E-6	76.4	288.2	6.4
141.151157581678	368.161023315394	6.75188786658509E-6	89	260.7	3.7
140.457626463215	367.390889341543	6.68105722922974E-6	92.1	254.4	16.6
140.457626752036	367.544613524063	6.40115298722321E-6	84.3	283.5	16.3
140.457627036938	367.699768795534	6.04630497491598E-6	81.1	285.1	18.2
140.457627312127	367.854785752245	5.69494605429099E-6	66.9	280.4	18.4
140.457627570732	368.007586824802	5.45531410978128E-6	70.1	280.4	12.5
140.457627815384	368.157661340462	5.12677544861617E-6	63.8	280.4	12.2
140.457628043734	368.303858529676	4.80766608745853E-6	60.6	288.2	12.5
140.457628273581	368.446695384206	4.51963244074705E-6	52.8	281.9	9
140.457627539101	371.699619774734	4.34750901945335E-6	44.9	303.2	8.5
140.457626859566	375.496274782578	4.27539315239756E-6	27.6	329.2	2.8
140.457626262109	384.429957502087	3.94511737056291E-6	20.5	387.5	17.4
140.457625857953	393.81451431275	3.79618997214948E-6	17.3	393.8	14.6
147.886056375002	397.583288858598	3.23579767780302E-6	48	393.8	19.4
156.928254130411	401.427533692579	3.03032844328754E-6	51.2	387.5	1.4
Route: 7 Length: 402.868221389404 Demand Met: 950					
169.299999858878	304.627606609104	1.9469206335998E-7	222	196.1	3.2
169.299999729864	292.886068845743	2.09603072676146E-7	231.5	198.5	1.6
169.299999600803	283.858121074887	2.21162281377474E-7	263.8	206.3	6.2
169.299999471417	279.817121364342	2.23167830881721E-7	234.6	198.5	10.6
169.299999342037	276.024783627913	2.35312498375606E-7	227.6	198.5	10.4
169.29999921267	272.403825665934	2.40347361568638E-7	222.8	206.3	17
169.299999083313	268.893736581659	2.48994865614804E-7	231.5	182.7	19.2
169.299998953945	265.595559753076	2.85559522694712E-7	227.6	182.7	0.3
169.299998824568	262.43526106276	2.94562383373886E-7	227.6	164.6	1.4
169.299998695168	259.5452947405	3.00740211400807E-7	231.5	164.6	6.5
169.299998565749	256.87145228005	3.22827389709346E-7	234.6	164.6	0.1
169.299998436285	254.368175315442	3.37405040795602E-7	249.6	170.1	0.7
169.299998306747	252.062392187368	3.40886614935698E-7	240.2	155.1	5.1
169.299998176857	250.187716542059	3.54523848500321E-7	224.4	147.3	2.3
169.299998046935	248.458680716761	3.51709303458847E-7	222	152	14.6
169.299997917013	246.790431745959	3.67874037010552E-7	218.9	153.6	11.5
169.299997787092	245.162529791541	3.76470694618547E-7	208.7	170.1	15.4
169.299997657159	243.552649776274	3.84065216962881E-7	184.3	121.3	14.5
167.746321911425	244.443476275829	3.84490689953054E-7	181.1	127.6	7.7
166.174256595409	245.408716348033	3.66378003491263E-7	173.2	152	19.2
164.605072247554	246.384564192555	3.6161416971936E-7	161.4	162.2	17.4
163.041110199412	247.368597317456	3.57584625021445E-7	155.1	182.7	16.5
161.482926981937	248.358462555505	3.49769251783982E-7	155.1	162.2	15.7
159.929969686296	249.35662784665	3.54948028302715E-7	148.8	162.2	5.3
158.383383967522	250.363232798445	3.51166562495564E-7	142.5	162.2	2.7
156.844438912118	251.378686474352	3.27607722283574E-7	141.7	150.4	15.8
155.314908041602	252.409217545013	3.1720119864076E-7	127.6	153.6	18.6
153.799798637184	253.45566908288	3.16768989705452E-7	116.5	170.1	13.6
152.298328258803	254.511672784279	3.22177086786724E-7	136.2	182.7	6.2
150.807318647412	255.574620797804	3.11923741946885E-7	129.9	196.1	10
149.330498008689	256.64414717908	2.98319463354346E-7	99.2	196.1	13.9
147.869503059006	257.71992471433	2.88543816395759E-7	100	206.3	18
146.423715858999	258.801561743207	2.78285497756769E-7	70.9	198.5	18.8
145.000430963847	259.891615452192	2.79151180393455E-7	67.7	198.5	11.8
143.598539404979	260.990316880752	2.83763114339308E-7	63.8	198.5	2.5
142.21781655353	262.097898256229	2.77755106026234E-7	58.3	196.1	1.6
140.862569438036	263.215454240281	2.56493507322375E-7	59.1	206.3	14.9
139.524284225339	264.339247292645	2.5340681020225E-7	48	260.7	17.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
138.197375081833	265.462168580096	2.64172200559187E-7	51.2	254.4	2.7
136.880203277293	266.586558181015	2.62368899939247E-7	39.4	273.1	0.8
135.582709018555	267.710783378824	2.47632513605822E-7	36.2	273.1	6.7
134.314714140902	268.835222086178	2.34671119869745E-7	20.5	254.4	9
133.106103271944	269.960718170075	2.2240291741582E-7	17.3	260.7	14.5
131.956665932096	271.081588447931	2.16357506133136E-7	21.3	273.1	15.8
130.827175182227	272.197551859398	2.11410096540021E-7	9.40000000000001	273.3	14
129.81323994316	273.300003384792	2.08089403486156E-7	6.3	273.3	11.2
135.636101609244	313.848056169967	1.98674115381436E-7	14.2	303.2	5.3

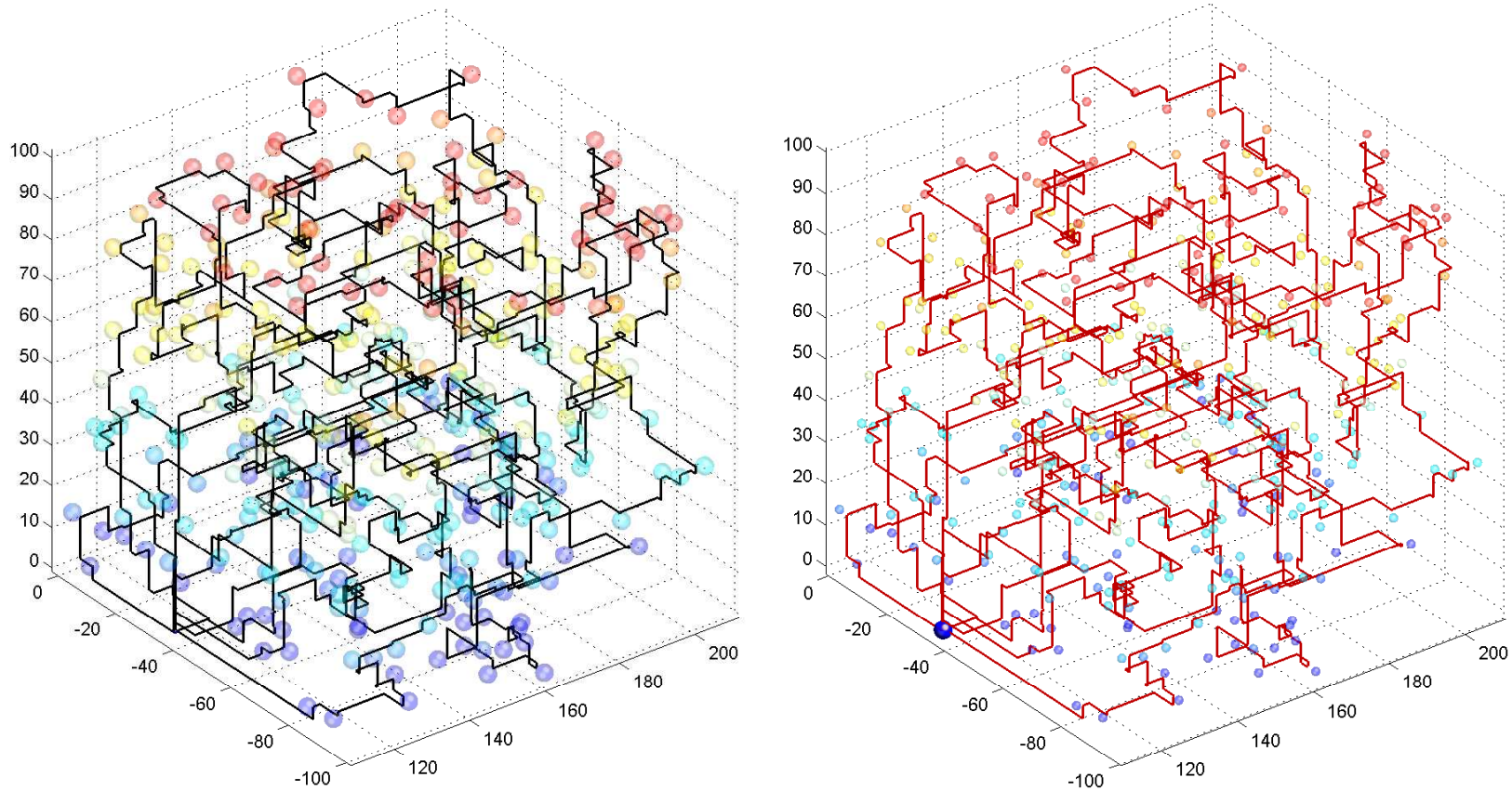


Figure O.183: $rd400$, $r = 1.9910618$, Equal Radius, 3D, Manhattan, Length = 4860.1287308

Table O-186: Solution for $rd400$, $r = 1.9910618$, Equal Radius, 3D, Manhattan

Total distance: 4860.12873077882 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 903.725651154026 Demand Met: 706					
2.73338016315192	82.8059906203537	3.01756168361837	1.02508	82.9527	3.7072
4.48045792599355	88.9978162936924	4.01036012601283	3.35356	88.986	2.7967
16.8539985699487	95.4895345653892	6.09070008010244	16.854	97.4806	6.0907
17.2022043989884	91.7567959284573	8.92680009419232	18.6101	90.3489	8.9268
12.2791536128494	92.6071683574948	15.0993362934561	12.3803	91.1149	15.3598
6.44163207408354	94.0641486141308	19.1779987194239	4.45068999999999	94.0863	19.178
15.2565276168601	94.0641915550384	19.8264132772339	15.2733	95.1553	18.4059
23.1082998984101	94.0642344698112	21.9675003838184	23.1083	96.0553	21.9675
29.4417802867474	93.8918311858297	25.6249053147841	29.5533	92.3189	26.5937
33.1283000431538	93.755995608228	26.4082035870176	33.1283	92.3481	27.8161
35.316418445857	94.5935091188836	25.9813114741608	34.7487	93.2543	26.9859
46.9596580533945	97.7607350031363	25.3829993142097	48.6626	98.7924	25.383
34.757904525732	97.7607344794098	13.4448000921662	34.7579	99.7518	13.4448
34.5001427937202	87.7734653036787	6.02997119903541	32.7208	86.88	6.0296
40.7052986209873	87.7734653162039	6.02567986128506	40.7053	85.7824	6.0265
41.8937982407325	94.0133726965252	3.89063746977551	40.4171	94.2218	3.0792
50.6867577932012	97.8133573317313	2.74584260702622	51.8363	98.9629	1.5963
50.407682002785	95.6272275388343	7.57895798844363	48.9418	95.7946	8.5835
50.1929026083667	92.6570998266089	8.62326894152894	49.8328	92.6571	10.5815
50.1929002953118	88.5471002999447	5.0545667719672	48.934	88.5471	3.512
52.8197970933604	87.0164996167056	7.1978868152436	54.7886	87.0165	7.4948
50.5771996965767	81.458467223428	7.19788981113943	50.5772	79.5094	6.7911
46.0632647123834	81.45846846914	8.00138886078628	45.1636	79.7971	7.5816
45.6946000467532	81.45846972376	21.3105988765847	45.6946	80.9262	23.2292
45.1245984714768	82.4771099308441	17.3619513172594	43.9629	81.9344	16.1851
44.7146962545506	84.002704495046	16.2891002854442	43.3068	85.4106	16.2891
50.4262798485819	83.7242825734642	15.2317873511247	50.9984	83.4341	15.7476
54.1690000263055	83.4493390786601	14.0747955113447	54.169	81.8375	12.9059
62.3156545565486	83.8731551758427	14.0747967880274	63.6977	85.2552	13.695
62.0499674399891	79.3668493262256	16.4053002909391	60.7208	77.8844	16.4053
62.0499719619936	80.8453544161459	27.5351818531804	61.8453	80.8454	29.5157
62.0593341531077	80.8659591745649	27.4994347561155	60.2539	80.1704	27.9583
66.7645002073912	81.0279042643697	25.1932658263749	66.7645	81.0279	23.2022
80.7592546094988	87.5928029175882	25.4553257302836	80.7777	87.9354	23.575
90.6918952449972	88.81298283719	30.9566225583814	91.8947	87.6684	31.3605
92.0504322642945	93.6757076588111	33.4696699498246	91.0373	94.8618	33.7328
94.9148030089172	95.1745025162087	35.4748000525717	96.3227	96.5824	35.4748
94.5716333182676	79.0939047713328	39.5507443928714	95.4573	78.5053	38.9919
94.204598953839	73.7446364378167	47.5265929614943	94.2046	73.3577	49.4797
84.0931012066379	73.7446343198996	43.634600071487	84.0931	75.7357	43.6346
80.9103574267972	73.7446205093087	40.4272999214242	78.9206	73.8168	40.4273
81.1334054081325	72.3439981599656	35.9746998690105	82.5413	70.9361	35.9747
77.53520169812	78.0346997181463	35.1903661358417	77.5352	78.0347	33.1993
77.40359590288	79.9941029634074	37.5418002074851	75.9957	81.402	37.5418
77.9000884878268	79.2799754057994	47.236746644804	79.6042	79.6519	48.0916
78.039132079488	75.1973541219768	47.6063037553952	76.2214	75.1456	46.9071
79.0325268384701	72.9563685545648	50.4825651588882	78.3667	74.2083	50.3369
80.2488199728674	63.2391522587457	53.7429898926329	81.8209	62.9891	53.3907
80.9145574462826	58.4111005420503	60.1176692967557	82.834	58.4111	60.6469
69.3672002175954	57.1719396690106	60.1176705725816	69.3672	55.5594	61.2856
67.958026306439	58.0100359490829	58.1822717407164	69.1414	57.6653	59.1832
64.2573000157414	58.9530006092162	51.30346556076	64.2573	58.953	49.3124
60.7710000023401	65.911705579249	51.3498022606522	60.771	67.3196	52.7577
58.3448008431887	61.7109945128233	43.328345766654	58.3448	60.9201	41.5011
57.3901531863456	61.7109941827482	44.1318467725342	56.0439	62.2937	45.4781
57.9997244431501	56.0149184555458	44.0352620692065	57.8122	54.5104	45.2899
67.5836568688237	55.9284576021262	43.0927070289427	67.8108	54.6502	44.2592
71.7453143761346	55.8472858359893	40.3246417613533	70.983	56.1077	39.9244
80.6139009116122	55.7658657037879	37.9974999332453	80.6139	53.7748	37.9975
80.7544379433353	58.047894129532	28.4959109738816	82.7455	58.0479	28.4959
80.7544524060085	59.5275883034296	26.6396115591678	81.8774	60.6902	25.477
77.2935847393815	56.0174592047471	28.1075838548736	76.3859	55.8636	29.5918
76.1079706733329	53.3976987869578	28.7424788824315	74.8357	53.7031	27.6754
75.4343969850917	49.1310191906159	29.6964029744291	74.6616	49.1772	30.6996
74.8359884061005	44.6994999651966	30.4754363839732	73.064	44.6995	31.3834
80.5890717248827	38.8539001716826	30.4754363314502	81.8496	38.8539	28.9342
80.589072140335	36.4258956034957	30.7434813253182	80.5435	37.2793	30.7227
80.5890725555739	32.7663999851396	31.0119079987046	80.1207	32.7664	32.9471
80.5890750661383	28.1119998956814	20.8818511204741	81.7106	28.112	19.2367
80.5890719978938	13.6517001156763	20.9554753702895	79.2919	13.6517	22.466
87.9357341128362	10.7700999139463	18.9972677278307	88.9914	10.7701	17.3091
87.935733489117	2.35893808531614	25.7718999485827	88.6343	0.494442	25.7719
77.9110000003772	9.90186006619308	30.1524350038111	77.911	9.90186	32.1435
76.4190060945269	22.7841011499771	29.7868649774706	76.419	22.7841	27.7958

Solution x	Solution y	Solution z	Original x	Original y	Original z
62.0154000060762	26.6347263873615	29.7868671597797	62.0154	28.1819	31.0401
49.4045004342107	21.952064332923	26.5254998574186	49.4045	19.961	26.5255
47.6330995813092	25.3180999407374	20.5810642774744	47.6331	25.3181	18.59
37.0785602066106	27.4705910051307	23.0263686162355	37.0272	27.4581	25.0096
36.2194646227475	32.303579325784	23.0516239551028	36.8488	32.2474	21.2512
26.2003003470582	41.1527119383944	23.078998133255	26.2003	42.5604	24.4871
17.587072277849	40.8635689293423	23.0734215570625	17.5856	40.8861	25.0628
13.5671762516923	40.1277199686512	21.6335374250668	13.4598	41.6191	22.5554
10.3890101893626	37.7919059235273	13.9086262122934	11.4258	37.7412	14.2255
Route: 2 Length: 1308.4592366184 Demand Met: 784					
2.47383259599258	34.8075345944131	17.3937116867943	0.642905999999996	35.395	17.4189
3.30318953958604	27.1572697431908	26.7482359143905	5.25835000000001	27.1001	26.8402
3.39261513104276	24.8648080163379	28.4759090039353	2.1823	25.6845	27.6693
3.48663734282569	10.2681818653024	33.1763040052714	2.19732	10.251	34.6682
5.37531335953594	5.1636668788331	33.2611569486945	4.96047	4.06059	34.5353
8.75315975709059	3.941093561662	33.3406867868014	8.57052	3.36732	32.2638
12.6399164691336	2.87842395123599	33.421796536711	12.6307	2.70835	31.4638
17.6037056117812	2.38494466498328	36.1157011869902	19.0116	0.977048	36.1157
16.0892207971939	9.51071990045444	36.168525400931	14.8737	9.51072	37.7455
16.0892235986211	15.9587600498931	34.8068999937245	15.6444	17.8995	34.8069
17.7061729059432	15.5640729306808	33.6456173407822	17.2907	17.3232	33.1257
37.2176998531117	7.79249096685984	33.0148651377714	37.2177	7.79249	31.0238
42.0178007949742	5.43393532860368	36.9380003250536	42.0178	3.44287	36.938
66.8310009509305	7.06315622937992	37.5340973498664	68.2389	8.47105	37.5341
62.1091949567466	2.76905778500624	46.4175984189583	60.7013	1.36116	46.4176
74.6319993593007	3.61445788178378	48.4352184528781	74.632	5.60444	48.5009
93.6441751777202	3.61446266314313	48.4354026714016	95.0473	3.39817	49.8314
93.2309465074448	9.14865660991366	38.6828015961427	91.7898	10.5225	38.6828
98.0752682413196	9.14863927536658	36.5945009102938	99.5164	7.77478	36.5945
97.2905033739513	22.0419017297675	34.885167476827	97.2905	22.0419	32.8941
87.9065114993593	23.2508396854172	45.4002802352621	87.5589	25.1226	45.9834
87.9065077046563	16.9555900526225	45.4002819199721	88.2698	14.9994	45.4757
86.8707028570884	17.6697524005225	45.4002832127686	86.8707	18.0065	43.4379
80.862700793706	17.6697658501831	53.5549998276131	78.906	18.0381	53.555
80.8627081122003	17.6697686750234	58.0701019875773	80.035	15.8589	58.0701
81.2760005934347	22.0804042301506	70.1916003219447	82.6839	23.4883	70.1916
78.3606375036368	19.3975304043951	73.0486329218096	77.5205	18.1054	72.6356
76.9072012060682	18.2917014087013	78.7037320849709	76.9072	18.2917	80.6948
73.0480640882304	7.89468587474363	77.5521646785034	73.4709	7.6166	79.1313
56.3236999271955	3.48155662245489	68.1306967989937	56.3237	2.07366	66.7228
51.4738390697505	15.7393127745777	70.399725819657	50.9211	16.4053	69.6798
48.2893929467987	20.4714269363012	73.7525946135226	47.6864	20.3976	74.364
45.8689107287375	25.5264191451399	76.2503525025709	46.0829	25.5503	78.1024
39.1766967497869	30.0329030897488	76.6335997792323	37.7688	31.4408	76.6336
42.4972003708789	25.9883672557465	88.7767996804146	42.4972	23.9973	88.7768
43.1325035989272	30.6860003959355	93.5611013972701	44.5404	30.686	94.969
32.8417947110734	43.8079000013883	93.1762001238739	31.4339	43.8079	91.7683
40.6535334298579	57.0581141528308	96.5239074028185	41.7302	58.1199	97.2119
42.176201724104	58.752205890931	98.0940020245766	43.5841	58.7522	99.5019
23.7910581432029	59.0453658650898	94.2114120412239	23.2085	58.8069	93.3912
17.6011006307465	59.34225926799	91.7969782740233	17.6011	61.1721	91.0121
13.8308002866251	56.2064983926608	91.7969777057756	13.8308	54.4775	90.8096
6.9352422341923	74.2733014979094	95.7449463531491	4.99968	74.2733	96.2118
16.8354003058726	75.892366515622	95.744948951534	16.8354	77.4785	96.9485
27.1360983552744	75.0982881566122	94.08510801411	27.1361	73.6904	92.6772
28.7794444444874	88.8212801095726	95.281124239519	28.4623	90.5817	94.8789
32.5896000353211	89.3511031123372	98.0898991650638	32.5896	90.759	99.4978
37.745301089449	88.3415690922068	90.2585090023587	37.7453	86.3505	90.2585
50.7904611783462	91.1034290177094	90.0663637398177	51.2472	90.6526	88.5593
54.3855684766815	97.6729844470953	89.8957012400255	54.3707	99.6057	90.3024
65.9332000286993	97.7162323298163	87.3882412062261	65.9332	98.9174	85.8003
75.6358998742582	97.716229573739	96.346902985893	75.6359	99.7073	96.3469
85.9428283942595	96.7330984721193	97.5762034502304	87.9339	96.7331	97.5762
85.9428213384571	95.4018990570311	98.0039058920222	86.1563	95.4019	99.9835
84.948252204922	88.2707945449619	91.389345177835	83.5669	88.2708	89.9554
84.9482093396948	83.8543742730437	91.3893035622878	85.2864	82.465	90.0038
74.5996014075965	83.8543641726754	91.3892956012031	74.5996	81.8744	91.5993
74.2780413575206	91.2787112350328	80.8654128860062	75.6586	91.7899	79.8395
73.78993303225	93.109382950984	79.7669970562715	75.4786	92.9344	80.494
68.2038623882623	95.9681843729597	69.9593069665023	68.0526	97.9535	69.9593
68.203851512778	95.0344543073057	63.4728084180689	68.3546	93.0491	63.4728
60.4821312158989	95.714854134139	61.4420556724024	59.3326	96.8644	60.2925
73.941741759551	95.4885750712452	61.547985425539	74.1314	97.2935	62.187
75.82203063921	90.2453004788156	61.6397833823626	77.8131	90.2453	61.6399
75.7498620689334	82.0768602629982	62.8253190787231	73.8931	82.0767	63.5442
82.4421364255957	80.2916550893946	62.8253200640474	82.6909	80.2719	62.172
87.7504471840905	78.519055796797	62.8253210503051	89.1084	77.1611	62.2997
86.450469734695	85.6237950268655	69.4005005989245	84.4594	85.6238	69.4005
92.7384991250964	87.9623293631466	78.664800022083	92.7385	89.9534	78.6648
96.0968293260237	82.1976998331553	81.4503998238126	98.0879	82.1977	81.4504

Solution x	Solution y	Solution z	Original x	Original y	Original z
96.0907309078938	78.9784056334873	84.1307767720447	95.1537	79.2325	85.4918
96.0846465043294	73.5072650799768	85.0657691550072	98.0725	73.509	85.0617
90.5622698626273	66.6382001422833	86.5414004934886	88.5712	66.6382	86.5414
95.1985528353937	59.6464482575582	96.2011600700095	96.3481	58.4969	97.3507
93.408985853599	68.4964331378485	96.1776415369757	93.4248	68.5015	98.1606
87.5440968684833	73.1497137846358	94.5739492348735	87.0562	74.7862	94.9506
85.5679318249157	73.8961481890391	91.8275718540668	86.1254	75.412	92.2501
80.8888982986725	74.3616302326615	85.0128999842611	80.8889	76.3527	85.0129
80.2940215504108	74.0751307122011	78.9744039085063	80.9911	75.8316	78.9882
78.2186011517226	70.7479685080798	71.4147884789011	78.2186	68.7569	71.4148
66.0763245498846	70.747967702559	70.7134021782717	65.9297	69.3415	71.7927
60.9906993407963	70.7479669039612	68.8024170523854	60.9907	71.4945	66.9566
59.8822695442607	63.9796431878706	76.3505424354767	59.9164	61.9972	76.3491
48.6742999146654	63.9560103294071	85.4376145575559	48.6743	62.5481	86.8455
43.1652553204704	68.5867599525529	85.4072959652256	43.1006	68.5786	87.3861
42.4386627159954	80.1933130324488	81.0867651527398	43.0779	81.6476	81.3569
41.5459998065371	81.675066541055	72.9133866832025	41.546	82.3742	71.0491
29.8826985394473	81.6750676101466	74.8634004884675	29.8827	79.684	74.8634
27.7971365460947	89.5947542579525	78.0208043782553	27.9893	89.6021	79.9213
12.7798961060854	96.9973997444336	78.2418030323829	12.7313	98.6134	79.0339
3.57801018252765	97.6287028595797	78.4322005967805	3.57801000000001	99.0366	79.8401
2.29008553112843	97.3271938341582	63.0477001291434	0.299018000000004	97.3272	63.0477
2.29590085521039	94.5323949375985	53.1713518933065	3.24988	93.8751	52.5027
2.30171744890296	92.6488983185638	49.5190594440673	4.28894	92.6489	49.3954
2.30171231500894	88.131492517185	49.5190319163916	3.06059000000001	88.1315	51.3598
2.30170635984554	68.9548500588318	45.1208976035642	2.55217	66.9796	45.1209
1.60276463423158	69.8256069062951	31.036600675505	0.194864999999993	71.2335	31.0366
1.9472630808884	51.0473201810977	24.4785802720133	2.40393	50.9808	25.185
Route: 3 Length: 901.868085880227 Demand Met: 566					
1.87747567669726	7.26397890502332	3.45539566618503	2.00806	6.28968	2.6575
1.46690235215537	3.50882956366432	13.5360530441037	0.219756000000004	2.58493	14.7832
9.04959886712754	3.50883176414827	7.56037154206002	9.0496	1.67955	6.7742
12.7116001677405	4.29146987415136	7.56036494345908	12.7116	4.29147	5.5693
21.4743955916875	6.22779486887477	12.0685014304302	21.4744	8.21886	12.0685
23.1984001077823	2.57502988352926	18.733806127216	23.1984	1.0131	19.9686
25.6230999362897	11.0929773073131	18.73380307746	25.6231	12.6549	17.499
38.1424345145631	9.949510494278	19.0248123059871	38.2491	9.61738	19.3363
48.6978997420632	8.85906818579815	19.3119341355113	48.6979	8.85907	21.303
54.3872308581676	2.37645956285325	17.9029986143007	56.1254	1.40532	17.903
49.3774139509144	2.37645999826407	14.4263992510623	48.5894	0.54797	14.4264
49.3774097265543	2.37647257704391	7.04100081446412	47.3917	2.23053	7.041
58.2096994228311	7.56071073747262	4.22006542682313	58.2097	7.56071	2.229
61.2651333180654	19.3002284662356	4.22006314985215	62.8285	19.7058	3.0557
56.3387600147392	19.3002306777377	11.8362993706734	54.7387	20.4852	11.8363
58.8734312849901	14.664835674249	15.2049290785249	58.7637	13.9566	16.9818
67.2669998661325	14.1516008246195	15.4196334600523	67.267	14.1516	17.4107
70.1972327378541	6.15349052190605	9.466165119779	70.1018	4.34543	9.0382
74.5771010561533	5.70820957624067	8.02166665409893	74.5771	5.70821	6.0306
95.765899119159	4.48834610801837	8.02166911015679	95.7659	2.55349	7.5519
98.0267057856091	4.73211138704764	11.0652052815915	98.9579	4.73211	12.8251
98.0267055634456	16.7449218150664	9.36380652035509	97.4766	17.1802	10.0021
98.0267053413068	22.6552292583769	7.13380541581242	99.5853	23.4577	6.8435
98.0267051116623	23.8460190123397	5.70758635333712	98.8743	25.646	5.6301
90.1099998807666	22.7045253830955	5.7075679287337	90.11	20.7153	5.7932
80.0505999025669	36.8528999607732	3.82386740752435	80.0506	36.8529	1.8328
79.5060997495422	47.6790322368077	11.7964997397694	79.5061	49.6701	11.7965
73.187953432714	47.5912562831003	12.807709008407	72.4782	47.1166	11.4083
71.2696672767352	47.5054944234802	16.1010971483165	69.2786	47.5055	16.1011
85.2353996274987	43.4390979736952	16.3236026286848	85.2354	42.0312	17.7315
88.8853316931424	48.3317992533207	12.9356152847684	90.8764	48.3318	12.9357
88.1208624038518	55.9009333803056	12.6802017862737	88.4474	55.9131	14.5629
86.8037964367233	62.1638000587728	3.11649971880962	85.3959	62.1638	1.7086
96.5073994047293	70.2891029552143	3.84760122583024	97.9153	71.697	3.8476
66.976401229453	68.2224678091954	9.09440048735391	66.9764	66.2314	9.0944
65.2735174902662	68.3093823947895	27.0191794934783	65.3011	67.1869	28.6409
61.7501145016013	72.3627065050186	27.0876374485663	60.356	72.3736	25.6911
61.6792711458569	74.8507252284546	40.3474317292384	61.6789	74.8507	42.3385
59.6680532497353	77.5082409983201	39.7710457199777	59.2712	76.4167	39.0582
58.0371004041338	93.2937990321267	39.2441716213287	58.0371	93.3465	37.2538
54.8665000447737	93.2938307347864	41.9419023504026	54.8665	95.2849	41.9419
51.3035610292088	88.462778134302	42.2431164828687	50.0418	88.5256	42.3177
49.6997633594748	83.4772906295478	42.5430054502676	47.7087	83.4773	42.5429
49.6997437104125	82.8692769083769	48.7053000112124	48.3206	81.4332	48.7053
51.7233306543826	89.3848995450058	55.8233993778513	53.7144	89.3849	55.8234
44.860199460289	90.0373407192105	57.1317835298769	44.9959	88.3516	56.7624
28.0366044052321	93.4335002179414	59.2369446291363	27.8353	94.5623	59.9313
19.4053811347352	94.9862171112611	60.6759314366624	18.064	96.3276	61.2807
19.5224924659038	82.1483011502308	60.6759317923703	19.5225	82.1483	62.667
23.3293002069254	80.9091679769232	52.7225991053374	23.3293	78.9181	52.7226
34.6683002013988	81.094122999138	52.5601524471739	34.9224	79.9328	54.0968

Solution x	Solution y	Solution z	Original x	Original y	Original z
35.5418514900161	82.9928359062308	46.0031226274858	34.4937	83.7515	46.1073
36.7229995719835	84.3443318575932	38.0239005231192	36.723	86.3354	38.0239
37.0727005580242	81.2567973839305	34.1544957802921	38.4806	81.2568	32.7466
26.7929023350401	80.8262676066521	37.5421004483692	26.7929	78.8352	37.5421
25.7615009986326	81.4539031730748	42.253732155908	25.7615	81.4539	44.2448
18.3310074277632	81.9080864232489	37.398249157352	16.5471	81.1813	37.3426
18.1321984781832	92.9514027811525	34.7834999605819	16.7243	94.3593	34.7835
21.3658323268226	85.0798011792177	30.5318007808701	23.3569	85.0798	30.5318
10.8817074299963	83.8954001546114	29.0611001324097	8.89064000000001	83.8954	29.0611
11.7012854267653	81.6936453259896	25.0721012512109	10.1219	82.045	24.5182
16.9454019014599	77.5567408040156	23.3857136434709	17.2306	77.2747	24.7644
20.5371293492288	74.5754280956246	17.2851783354105	20.7262	75.308	17.3361
23.7503002002316	69.863699977487	10.880438054639	24.7619	69.8637	9.1655
23.7502995125695	61.4221792734647	13.4915007443338	24.5176	59.5849	13.4915
19.665600142022	61.422223924762	18.5998595686914	19.6656	61.3862	20.5906
9.65554482291581	63.5306169604003	17.9053077202184	8.25408	64.3565	18.8288
9.17264708620397	64.1445336916576	6.73260112941227	9.17265	66.1356	6.7326
5.59494606722393	61.033524361434	4.98709529029118	5.52590000000001	61.9092	6.1438
Route: 4 Length: 909.811899626794 Demand Met: 611					
11.4089229388721	22.8874046714197	2.33310294853286	13.4	22.8874	2.3331
6.32574318663073	21.2004327693631	12.0320065486021	5.81823	20.7452	12.0688
2.6447835699921	19.6854499693342	21.2306226274254	0.659450000000007	19.6999	21.228
2.62471325563624	16.18284004251	43.3829732485258	2.68873000000001	16.3883	43.9305
2.60464208413768	12.2624035163274	51.4967000853579	0.613562000000002	12.2624	51.4967
6.43447161009448	10.6934081456053	59.8477983672163	6.43447000000001	8.70233	59.8478
10.9261402563068	10.6933956254452	65.7650049231777	10.9524	12.0779	65.6188
15.2583295597821	10.6933830775631	73.5431956533662	17.1854	11.1942	73.5432
12.938784607651	2.73525897321182	75.6447998449226	10.9477	2.73525	75.6448
19.728698613567	1.6066230893924	78.1583860962994	19.7287	0.198716	79.5663
22.2441358189122	2.61850585237766	73.0479970243434	23.5387	4.13129	73.048
22.2441466365966	2.61851363238685	57.3186304746916	21.7245	2.01127	55.495
26.7979008310478	4.91087753439927	59.4640026937291	26.7979	6.90196	59.464
33.1084917894341	2.83062677724814	61.8714456200173	33.1085	0.882753	62.284
34.0910616254237	21.1258620574287	61.8714626346275	34.4638	23.0393	61.4662
34.0910801876025	18.0586292218541	68.43070064762	36.0033	17.5038	68.4307
29.2015560279689	18.0586140948653	77.1891983221734	27.3595	17.3028	77.1892
39.0762396821777	18.0586201728153	80.1545172610079	39.9475	19.2268	79.8118
41.7204991563726	18.0586262330872	84.5955138758948	41.7205	19.4188	86.0496
43.8962041446987	15.3301563590866	84.5955054258124	43.8962	13.6901	83.4665
54.5849766012043	15.7352937467622	85.8883918362803	55.9929	17.1432	85.8884
53.1438913128353	6.04103287339745	87.3270072234839	52.4925	5.37248	88.2454
53.1438913128353	6.04103287339745	87.3270072234839	51.1528	6.04103	87.327
62.5858058011565	3.66176147232149	91.1441012499048	64.5769	3.66176	91.1441
62.5857601268209	1.66543390459711	97.3770745830596	61.5069	0.482106	98.5604
68.156365515622	14.8037955595591	96.3205947634185	68.0574	15.6194	97.6814
75.2455014707502	17.3083956711971	93.8699974189237	75.2455	17.3084	91.8789
91.9968588655726	18.6650247474263	95.6286242402868	93.1464	19.8146	96.7782
91.8961979607452	14.02954121995	83.5226003774207	90.4883	12.6216	83.5226
95.8690655628032	16.652302548011	74.9860969429025	96.7716	16.6523	73.2113
95.8690652043459	23.5618001031325	80.5610514601294	96.7473	23.5618	82.348
91.0270982812949	30.7256995237539	77.9387995853336	89.036	30.7257	77.9388
94.010778993371	38.1435356591799	74.6549137253805	95.9404	38.2332	74.7444
94.2052779961241	40.9022532670756	61.7116300880567	92.3029	41.017	61.4442
95.3868849462249	42.5058505931064	60.2643962501015	96.3235	44.2629	60.2644
95.3868867379362	42.5058230137659	53.4846779307053	94.61	43.2995	53.8065
95.3868885332933	42.5057954234472	41.2101446604349	96.1419	41.3034	39.8142
92.1403621982993	44.3021493996471	41.3778957248235	92.0634	46.0336	40.4672
90.7874293573034	44.4017281914731	42.4934940783013	91.3249	42.8902	41.6597
87.5193511436897	44.5146110851382	47.1213757716565	88.1955	43.6361	47.6404
81.1997010295782	44.629907210967	50.1349924739725	81.1997	46.621	50.135
81.1997010295782	44.629907210967	50.1349924739725	81.4209	43.6493	50.298
76.9319004932397	40.6560373284805	50.8640211911159	76.05	41.1841	50.3284
74.5557598885081	33.5164351130766	51.6558068991801	73.2088	32.0501	51.6558
74.5558113167785	34.0593525734571	63.4665822596459	74.0572	35.987	63.4666
74.7866339129712	34.0593609134052	64.5388873044079	74.7866	36.0265	64.8468
77.6794012408821	30.6141433589417	64.5389263144784	77.6794	29.1288	65.8649
85.0688898337037	32.1301054742701	64.1522941588783	85.0689	32.1301	62.1612
85.7063410405407	47.3301356013719	69.8193396816679	86.8559	48.4797	70.9689
78.605800235146	43.2582066161217	67.7191945518297	78.6058	43.2582	65.7281
72.5650020281902	42.2173967896889	84.1995997919745	72.565	40.2263	84.1996
70.0978946868469	43.9308120433783	95.3424025388803	70.0979	43.9308	97.3335
64.323430118995	52.6723996685497	95.3424105410191	62.6521	52.6724	96.4246
64.8784213286069	58.4126491716674	95.3421917800709	64.8783	60.379	95.6551
73.5354177945429	58.4126825796263	94.9267822525716	75.5117	58.1702	94.9268
69.9394983878966	62.1920988978348	90.6049416325581	69.9395	64.1832	90.6048
59.916401526654	58.7499982572075	90.551898020092	59.9164	58.75	88.5608
54.5489054541612	52.8659160421118	90.5860582940196	54.0007	52.8659	92.5002
54.5488947417635	45.0588077655132	87.6467488734305	53.4254	44.9898	88.3964
54.5488840798952	38.1935779976708	80.7895172807518	55.717	37.8511	81.0117
54.5488734004591	33.6845804145615	70.6982905578801	55.099	31.771	70.6981

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.5220004291197	42.2920000176178	67.60128867189	47.522	42.292	65.6102
41.6783011424268	50.745583904493	69.4297891246243	41.6783	52.1535	70.8377
39.3144137963192	48.4324132958437	65.8369285707283	38.5534	48.7846	64.7262
37.7122265658031	45.4780309030075	64.096877526831	38.1612	45.7549	62.3997
34.5987999401553	38.9517234407458	63.5100334620919	34.4656	38.8185	62.9703
31.6685981067628	33.1732847007851	62.9486862710993	31.6686	31.1822	62.9487
25.0186888094791	33.1733055071347	59.2787978662743	23.2874	32.7742	59.4617
24.3168201837881	33.1733263324196	52.0641007240047	22.7183	34.3604	52.0641
24.3660696858686	33.1732763808479	47.7167152335933	25.7714	33.2927	46.3113
19.526202496912	32.4393816131729	48.5255099749667	19.5262	30.4483	48.5255
17.6022943053409	36.4795775854177	54.7379194915296	17.6023	36.5196	56.7286
9.22059136393076	36.4797992133284	53.1004413573952	9.16001	37.8018	54.1714
2.57160495828585	36.4800207770552	27.3546000095101	2.57158	38.4711	27.3546
Route: 5 Length: 836.263857499378 Demand Met: 630					
10.8029596010172	47.9111169952003	5.07939341518859	11.7937	48.0467	6.2423
12.9548663263001	56.0205495292716	6.72290005168748	13.5318	57.9262	6.7229
12.9548683939484	55.5177996713569	10.172900280816	10.9638	55.5178	10.1729
13.6130939279221	54.7092617774746	18.0999153043194	12.5872	53.6987	19.2898
21.1716715251302	54.3229328556308	18.6903043465961	22.8193	53.7552	17.9075
21.4544389882288	54.0551084190092	28.1636271294085	22.5447	55.6169	28.4034
21.6215306633889	49.4213998293032	29.6986981051024	23.6126	49.4214	29.6987
17.2683993532477	45.7308286365782	30.2350005988724	15.6372	44.5891	30.235
20.5641007187368	45.7308305949156	38.8825991680372	20.5641	47.7219	38.8826
24.0561748123427	41.5423508111484	41.6972244009396	23.6339	40.0124	41.5074
32.7352972025856	40.4131630072941	45.3663957880644	32.7353	38.4372	45.6112
33.2771021738804	44.6760364975937	45.3664028390884	33.2771	46.652	45.1216
46.2041386145112	42.8338485429565	48.2102062116503	46.2037	41.7062	48.7254
59.5347284040357	41.6033995015197	50.3405988742475	61.5258	41.6034	50.3406
59.2132803331528	36.5024515511885	51.8465074627409	60.6972	35.5066	52.4287
56.9787994908602	35.9946006090615	52.4215287042231	56.9788	35.9946	54.4126
55.9457370924463	34.779252028884	50.5995561080352	56.0389	33.1015	51.1098
54.8463849619242	34.2832196738684	44.5958464054867	55.5492	35.9315	44.2535
50.5637191268096	32.0700636146818	42.6059334981639	49.1148	32.8614	42.5439
49.4944003127083	18.3180696395492	40.7382007773871	49.4944	16.327	40.7382
42.9870000976468	22.9252830654146	39.977069289772	42.987	22.9253	37.986
38.0770237191444	22.9984165681874	47.4831776376063	38.2173	22.874	49.077
31.2735189515695	23.0717825843471	48.7576842849132	31.0765	22.0815	48.5077
25.8125208774401	23.146130721517	50.1121008038838	25.8125	25.1372	50.1121
25.7177863905916	19.8860692750871	52.7372008015064	25.7178	17.895	52.7372
24.8266879916508	20.9247797245639	62.7573050928176	26.0672	21.3383	63.983
15.5131107473289	21.6953500075392	63.6394459787001	15.3759	23.0999	65.044
15.5131015549457	20.6533631982004	60.5393155795465	15.6993	18.7479	59.9926
15.3896701981098	24.6087284995696	60.5393133820165	15.3897	25.3897	58.7078
4.29321410859522	24.6087305254254	62.0800004849727	2.38826	24.0295	62.08
4.58311146351785	26.6718565709513	68.8798512364115	3.44571000000001	28.2052	68.896
5.50565188597487	26.9458208889562	74.4201433700167	4.056	25.9589	74.3875
19.2469961185017	27.2801287869154	80.8170005874861	19.247	29.2712	80.817
20.3288004423561	27.2801280205844	92.8349997859172	20.3288	28.022	94.6827
27.422195959758	27.2506634740488	89.6573377894876	27.4222	25.8428	88.2494
27.7665810887781	27.8661822626637	96.687826896343	29.1053	29.2049	97.3043
27.2482018345486	20.2425007359147	96.6878272324924	27.2482	20.2425	98.6789
22.6996998021555	16.910972553559	96.5597010818028	22.6997	14.9199	96.5597
11.3310617801739	19.8172705760643	95.8439672992943	9.96077	19.2347	95.1963
10.0333351793231	38.6922043882124	95.2563078196549	8.75416	38.928	96.5496
9.60188660515566	41.6905272490965	88.6800595988787	9.27453	43.3967	88.7547
9.21032157795713	42.3798992134713	79.4030000576601	7.21925	42.3799	79.403
13.2987591619671	49.0773612968372	76.246973870712	13.2524	50.7626	76.4367
17.8085014632626	49.9642283539977	71.4677011669453	17.8085	51.9553	71.4677
24.4593998202463	49.3897712070076	68.2545957383033	24.4594	47.3987	68.2546
30.5656516932256	53.2356949130092	60.0281309233733	30.4468	53.5688	58.3124
42.4306281511535	55.330100002851	59.2126009336251	44.4217	55.3301	59.2126
42.280464378843	60.2498013050543	50.8096664805673	40.6271	60.1839	50.1596
42.1545008186375	66.9855994873689	49.2438718113381	42.1545	66.9856	47.2528
24.9544908535693	68.0625177987869	51.0971356880521	23.6206	68.344	50.228
23.4343161379794	69.0040202407812	58.8017469056005	23.7167	70.7298	59.5174
16.5759999594691	69.2402280417729	59.4945992403501	16.576	71.2313	59.4946
13.7197616967513	68.6493739435555	60.0728444435503	14.0141	70.4084	60.1608
2.98500005285615	61.4642000442142	60.6205999644503	1.5771	61.4642	62.0285
6.9631330056724	60.1662003678383	54.7413594888472	8.30742000000001	60.1487	54.798
8.53917962665398	58.8779983525592	48.3468599353459	10.4725	58.878	47.8708
8.53917854759268	54.8968212834592	48.3468543607052	9.35554999999999	53.1101	48.6717
5.26617956627572	54.8968262878742	46.8675995465993	3.30116	54.5758	46.8676
16.6362185545853	56.3433568996044	43.7616733780602	17.5187	55.1629	44.2721
19.0178878581422	60.5663120534111	36.0200256567462	18.9042	62.1271	34.907
25.6278459724025	60.8328548357249	35.6367250491075	25.6513	60.6643	37.4717
31.4139332800837	61.1121228824621	34.1924975798949	32.641	61.5676	34.0062
33.4894716703619	61.3834386197909	32.83986836232	33.4192	59.483	33.0004
36.4184026473852	68.6165468412628	30.4629004850625	35.9094	68.8825	29.2317
41.413100041188	73.4120200259964	29.1372204855996	41.4131	74.8199	27.7293
46.3247718665832	71.1700005254041	29.2251858021716	46.3399	71.17	31.2162

Solution x	Solution y	Solution z	Original x	Original y	Original z
46.3248753617939	70.7529109125043	18.6975995250123	47.6475	71.1843	17.3202
46.3249770061529	67.9934219947178	18.5417544249933	45.2184	66.3382	18.5431
50.5251254636156	67.99335077198	10.993700560865	52.5118	68.1256	10.9937
50.5251299912097	64.9463998540893	2.43650982729358	51.793	64.9464	0.9013
32.9071005062321	61.0770696872306	3.01091613187972	31.2678	61.1344	2.0752
32.5346581646063	55.2626000234722	11.3203233609613	30.6696	55.2626	12.0174
35.7230216702825	49.435600049763	11.3203245478781	37.4105	49.4356	12.3771
28.5923939083446	44.0962751337562	10.6877632133427	28.6889	43.6077	12.417
12.368559899871	42.4175919266023	2.3093870701222	12.2621	43.6923	1.4336

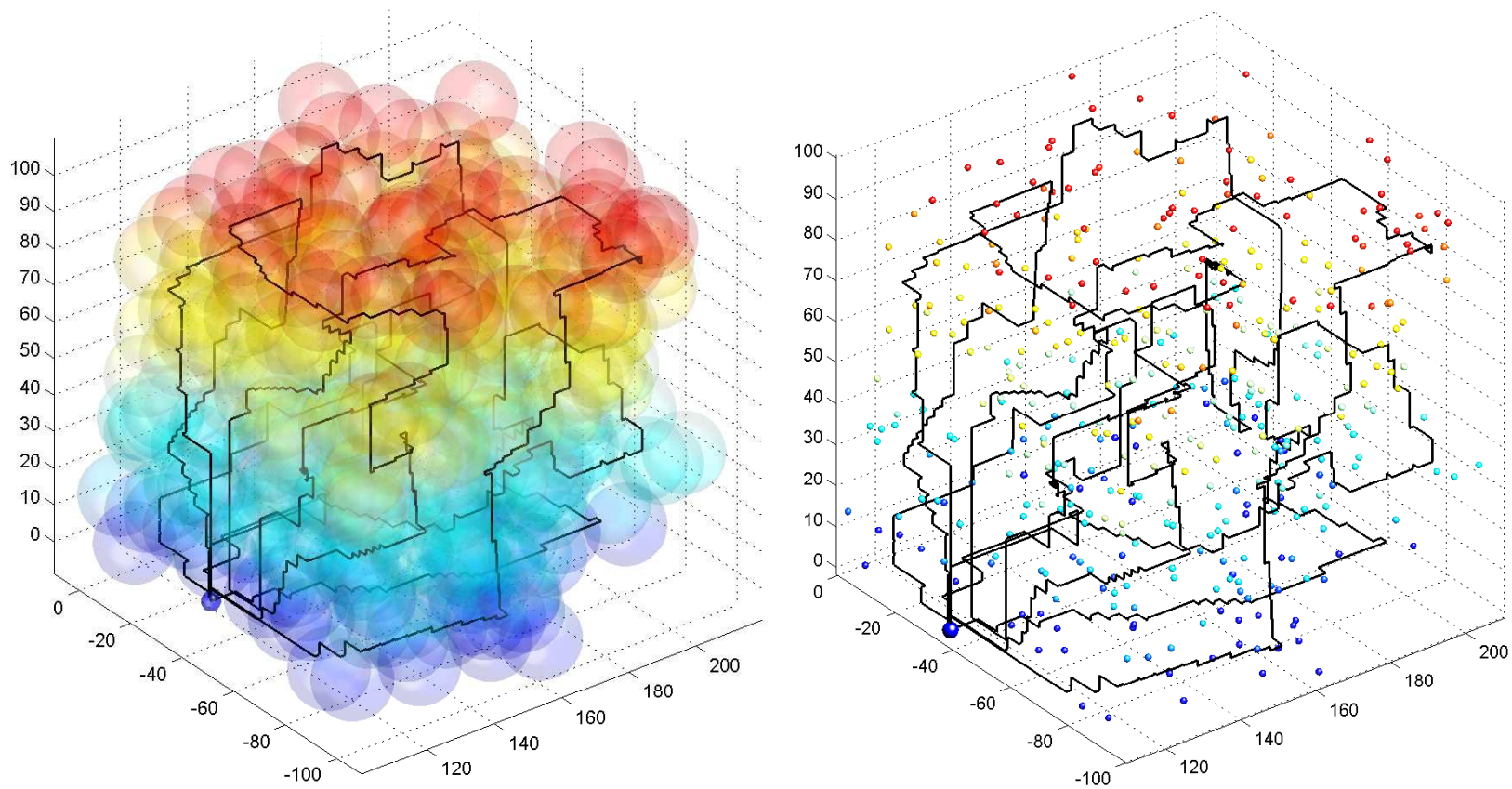


Figure O.184: $rd400$, $r = 9.955309$, Equal Radius, 3D, Manhattan, Length = 2611.1434156

Table O-187: Solution for $rd400$, $r = 9.955309$, Equal Radius, 3D, Manhattan

Total distance: 2611.14341560369 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 301.412062441384 Demand Met: 284					
4.54756696000089	22.2949920737301	3.69207007886848	13.4	22.8874	2.3331
4.54756696000089	22.2949920737301	3.69207007886848	5.81823	20.7452	12.0688
5.8001645323574	11.0756037409561	5.96234603862881	2.00806	6.28968	2.6575
5.8001645323574	11.0756037409561	5.96234603862881	12.7116	4.29147	5.5693
6.3185722709373	10.3231468139556	8.99846323838146	9.0496	1.67955	6.7742
6.80917179819826	9.77895348147971	14.7543760255584	0.219756000000004	2.58493	14.7832
28.2950947214996	9.53026359994236	19.2005786686646	23.1984	1.0131	19.9686
28.2950947214996	9.53026359994236	19.2005786686646	21.4744	8.21886	12.0685
28.2950947214996	9.53026359994236	19.2005786686646	25.6231	12.6549	17.499
28.2950947214996	9.53026359994236	19.2005786686646	38.2491	9.61738	19.3363
38.8474609539348	9.53026376766295	22.0757736549315	48.6979	8.85907	21.303
38.8474609539348	9.53026376766295	22.0757736549315	37.2177	7.79249	31.0238
38.9773816164861	9.5302639375987	29.6711072643917	42.0178	3.44287	36.938
38.97738301231	18.8804908076538	29.6711070951343	37.0272	27.4581	25.0096
44.84212909839	18.8774304596418	29.8351482714968	42.987	22.9253	37.986
58.6461885487313	18.874356850949	29.9886387089098	62.0154	28.1819	31.0401
58.6549973357884	18.808215657344	30.0117114155932	49.4045	19.961	26.5255
59.0120157775919	15.6839125824081	38.5804815038312	49.4944	16.327	40.7382
60.7013023748869	9.22521022838431	40.3130963443857	60.7013	1.36116	46.4176
70.2779076982181	9.22521261194613	40.3130956906753	74.632	5.60444	48.5009
70.2779076982181	9.22521261194613	40.3130956906753	68.2389	8.47105	37.5341
70.2779096029906	11.1576453350166	25.8771466322409	79.2919	13.6517	22.466
70.2779096029906	11.1576453350166	25.8771466322409	77.911	9.90186	32.1435
70.2779096029906	11.1576453350166	25.8771466322409	67.267	14.1516	17.4107
66.2824212033727	11.1576487463613	6.81173305865986	74.5771	5.70821	6.0306
66.2824212033727	11.1576487463613	6.81173305865986	70.1018	4.34543	9.0382
66.2824212033727	11.1576487463613	6.81173305865986	58.2097	7.56071	2.229
66.2824212033727	11.1576487463613	6.81173305865986	62.8285	19.7058	3.0557
56.1253911386449	8.44484621692457	10.8635886539544	56.1254	1.40532	17.903
56.1253911386449	8.44484621692457	10.8635886539544	58.7637	13.9566	16.9818
50.1135862229939	9.12838344401402	10.4126019902478	47.3917	2.23053	7.041
50.1135862229939	9.12838344401402	10.4126019902478	48.5894	0.54797	14.4264
47.9487573862244	18.3440940604503	9.85120856829323	54.7387	20.4852	11.8363
45.2472963989179	25.3280793188416	9.28130589417016	47.6331	25.3181	18.59
12.966607066427	32.5661131345832	6.96573181521886	11.4258	37.7412	14.2255
Route: 2 Length: 575.051980220595 Demand Met: 775					
8.9791400720149	34.0599348136688	46.5049400930648	9.16001	37.8018	54.1714
15.3896997282543	32.4292031552744	51.6683680892711	15.3897	25.3897	58.7078
17.0566772879232	33.3859738530867	51.6256665386448	17.6023	36.5196	56.7286
18.7145490642268	34.3207589436427	51.5829260587087	22.7183	34.3604	52.0641
20.3085360170168	35.2567252864422	51.5401863224166	23.2874	32.7742	59.4617
21.7355655725144	36.2527950539486	51.4971907994886	19.5262	30.4483	48.5255
23.2177589073451	37.3169764602127	51.4542283175832	25.7714	33.2927	46.3113
24.6441445742585	38.437203145406	51.4113211125023	32.7353	38.4372	45.6112
24.6441461715433	40.012400633171	51.4113188717827	23.6339	40.0124	41.5074
27.6082637258732	43.5317199372899	52.3290774962108	33.2771	46.652	45.1216
28.5924123332332	45.0560437970753	56.855241717189	30.4468	53.5688	58.3124
29.5341708252163	46.1967258111793	60.7634301948056	34.4656	38.8185	62.9703
30.3420434888839	47.8514919847986	63.7651172403056	38.1612	45.7549	62.3997
31.071425571476	49.6275807547984	67.045930576609	38.5534	48.7846	64.7262
31.7473101812043	51.4580459151389	70.8376995625949	41.6783	52.1535	70.8377
28.3336453773982	51.4580481146232	72.5302710903152	24.4594	47.3987	68.2546
25.3464164082372	51.4580503142985	74.3810522714695	17.8085	51.9553	71.4677
23.1833898638614	51.4580525139465	76.4367005350506	13.2524	50.7626	76.4367
28.8541213305699	52.0019214635122	87.144318546235	31.4339	43.8079	91.7683
30.357540214572	55.282186839515	88.1842226009752	23.2085	58.8069	93.3912
38.7447019594687	57.0064098156869	88.9240878901857	41.7302	58.1199	97.2119
43.3703099764979	58.6269303581013	89.549672846156	43.5841	58.7522	99.5019
43.3703174665419	58.6269431030388	87.3861020877272	43.1006	68.5786	87.3861
48.3770252749916	58.626942428025	86.6917896384589	48.6743	62.5481	86.8455
53.4227094000224	58.6269417529825	85.9993085816107	59.9164	58.75	88.5608
57.1406429866814	58.6269410779609	85.2958731334212	59.9164	61.9972	76.3491
57.1406438554022	51.1991881525113	85.2958731606284	53.4254	44.9898	88.3964
57.1406447242469	46.7239414240452	85.2958731878386	55.717	37.8511	81.0117
59.0560535358324	47.1929771666725	86.9888009444485	54.0007	52.8659	92.5002
63.0227309985792	47.6058131441478	88.1253964523964	62.6521	52.6724	96.4246
68.1076299815907	47.9309573053783	88.637686795338	70.0979	43.9308	97.3335
69.7663226122074	48.3768668045811	88.906577620525	72.565	40.2263	84.1996
70.533887119091	55.610813361108	89.3001789417666	64.8783	60.379	95.6551
73.5196785891172	56.653677021431	89.5775134043916	75.5117	58.1702	94.9268
76.3941915746184	57.6852783161113	89.8518545857735	69.9395	64.1832	90.6048
89.500591233328	58.4969009533935	90.1243690501871	96.3481	58.4969	97.3507
89.5005899643897	65.4564357123172	90.1243667288371	93.4248	68.5015	98.1606
89.5005886948867	68.2213193332363	90.124364404396	88.5712	66.6382	86.5414

Solution x	Solution y	Solution z	Original x	Original y	Original z
89.5005874253892	71.104983180865	90.1243620800952	87.0562	74.7862	94.9506
89.5005874253892	71.104983180865	90.1243620800952	86.1254	75.412	92.2501
89.5005861559518	73.5089980634304	90.1243597553666	98.0725	73.509	85.0617
86.6325950167898	76.8301524399898	90.1243586899985	80.8889	76.3527	85.0129
84.3095393665426	80.2465619148159	90.1243576247202	74.5996	81.8744	91.5993
84.3095406884842	80.2465628650865	88.705406554203	85.2864	82.465	90.0038
84.3095420104267	80.2465638153704	87.2709693024968	80.9911	75.8316	78.9882
87.5790944105722	81.2041353665481	87.2709689100739	95.1537	79.2325	85.4918
90.0114391509335	82.1977018403734	87.2709685176286	98.0879	82.1977	81.4504
89.2718604038421	88.7154964678143	87.7186067475565	92.7385	89.9534	78.6648
87.7481163094018	91.2175709254068	89.7444160200265	87.9339	96.7331	97.5762
86.1562987982285	92.2615478477541	90.5364670984276	86.1563	95.4019	99.9835
77.5786927486843	92.2615481240715	90.2574693720049	75.6359	99.7073	96.3469
77.5786927486843	92.2615481240715	90.2574693720049	83.5669	88.2708	89.9554
75.6585916846148	92.2615483974645	89.7836302913501	75.6586	91.7899	79.8395
72.8764369012095	92.2615486724964	89.7836196660743	75.4786	92.9344	80.494
61.0716352452858	92.261548947583	89.7836090491165	54.3707	99.6057	90.3024
61.0716345700082	92.2615488784899	88.5593019695428	51.2472	90.6526	88.5593
62.6995150820155	92.2615490072857	82.0359127517456	65.9332	98.9174	85.8003
64.1968275522116	92.2615491357069	69.1535554502642	68.0526	97.9535	69.9593
64.1968275522116	92.2615491357069	69.1535554502642	68.3546	93.0491	63.4728
65.5414231745519	92.2615492641518	62.1870003633159	74.1314	97.2935	62.187
61.2608545530013	92.0104875796107	58.4566292918159	59.3326	96.8644	60.2925
57.3045868192924	91.7572930446868	54.5568240168128	53.7144	89.3849	55.8234
53.7492829505205	91.5054460804363	50.5681831077903	54.8665	95.2849	41.9419
49.0101817291788	91.2372237997328	49.3652714491447	48.3206	81.4332	48.7053
46.6344063540578	91.0849183233883	48.3928808836366	44.9959	88.3516	56.7624
44.5317296315193	90.9345485951668	47.1121627796036	47.7087	83.4773	42.5429
41.5325574729956	90.7915782708921	46.1072916456076	34.4937	83.7515	46.1073
43.4866158820894	90.8106429760256	27.1766404922497	48.6626	98.7924	25.383
43.4866158820894	90.8106429760256	27.1766404922497	34.7487	93.2543	26.9859
44.7769355480166	90.8293610809565	23.2097343688694	45.6946	80.9262	23.2292
45.0748549374114	90.8681103116981	17.7918700519407	43.3068	85.4106	16.2891
45.3743586755625	90.9069152318851	12.7651282921352	49.8328	92.6571	10.5815
45.6709542071606	90.945703778743	8.16147105143121	54.7886	87.0165	7.4948
45.6873191662694	92.4479213674286	7.94435211489139	48.934	88.5471	3.512
45.7036791406673	94.0750430917509	7.72883907344862	51.8363	98.9629	1.5963
42.5405710668873	94.0750424504946	8.68118475231667	48.9418	95.7946	8.5835
38.6091944044416	94.0750418100202	9.6352662210785	40.4171	94.2218	3.0792
38.6091944044416	94.0750418100202	9.6352662210785	40.7053	85.7824	6.0265
32.0483571217223	94.0750411693895	10.8528610329584	34.7579	99.7518	13.4448
32.0483571217223	94.0750411693895	10.8528610329584	32.7208	86.88	6.0296
23.108300372821	94.0750405292879	12.2111283374367	23.1083	96.0553	21.9675
19.6563724733934	93.3205860154045	11.8391827317061	16.854	97.4806	6.0907
16.6250335990036	92.5358768484162	11.4775631269032	18.6101	90.3489	8.9268
13.4830680148349	91.7622021158009	11.1181427797001	15.2733	95.1553	18.4059
9.96527511660261	90.9516751676563	10.7410592699017	12.3803	91.1149	15.3598
6.20443887389092	90.1429879089483	10.3591926087859	4.45068999999999	94.0863	19.178
4.86057100832063	84.0336076867847	6.61725061398302	3.35356	88.986	2.7967
3.54324119345142	75.7714426324029	3.33718980194535	1.02508	82.9527	3.7072
Route: 3 Length: 515.985275621083 Demand Met: 762					
3.02054839149983	33.6725414435553	12.5796315815352	0.642905999999996	35.395	17.4189
3.76792816097813	31.7926426112315	21.1157056613961	2.57158	38.4711	27.3546
4.5518172982066	26.2889641876463	23.4202503688928	0.659450000000007	19.6999	21.228
5.37994441528627	22.9798312547262	25.9920754716971	2.1823	25.6845	27.6693
6.22613654520175	19.4494968257074	28.5142778559484	5.25835000000001	27.1001	26.8402
7.08494236214514	13.0020148350789	31.2835945252757	4.96047	4.06059	34.5353
8.5120972534489	12.521634056672	32.2199094712801	8.57052	3.36732	32.2638
9.93451198807841	12.1167964231371	33.1577390800433	2.19732	10.251	34.6682
11.7305313869885	11.7175151784309	34.0742299555071	15.6444	17.8995	34.8069
13.3695879622816	11.3051547832149	34.9842878624694	17.2907	17.3232	33.1257
14.8768034672695	10.8791094541353	35.9165831856405	12.6307	2.70835	31.4638
17.1539824572176	10.5559924631431	37.4740030324159	14.8737	9.51072	37.7455
19.5279036457707	10.2338280586847	39.0215626292921	19.0116	0.977048	36.1157
22.7043904104212	10.019835095598	51.3514123479779	21.7245	2.01127	55.495
26.6141542942206	9.82040644592797	54.9785102693318	26.7979	6.90196	59.464
30.6573438430581	9.62222487553939	58.194787548645	33.1085	0.882753	62.284
30.6573439884382	20.4453479039597	58.194787567988	31.0765	22.0815	48.5077
30.6573441337315	21.9269290486395	58.194787587798	25.7178	17.895	52.7372
30.6573441337315	21.9269290486395	58.194787587798	25.8125	25.1372	50.1121
34.6093595152582	21.9269293159542	58.2701351674662	38.2173	22.874	49.077
34.7814215437641	21.9269295808555	60.6663659858509	34.4638	23.0393	61.4662
34.9535674445582	21.9269298456928	63.0837783622148	31.6686	31.1822	62.9487
35.1651866467347	21.9269301081157	65.8907239750782	26.0672	21.3383	63.983
35.4019145663723	21.9269303705209	70.0053412563198	36.0033	17.5038	68.4307
35.6388146041482	21.9269306329862	74.6263648639959	27.3595	17.3028	77.1892
36.9392399523226	21.9269308961862	75.3848054942355	37.7688	31.4408	76.6336
38.0719997587296	21.9269311584766	76.0548432855322	47.6864	20.3976	74.364
38.0719997587296	21.9269311584766	76.0548432855322	46.0829	25.5503	78.1024
38.188491514097	21.9269314215287	79.6540060680804	39.9475	19.2268	79.8118

Solution x	Solution y	Solution z	Original x	Original y	Original z
38.304885247207	21.9269316846386	83.4664999510137	43.8962	13.6901	83.4665
38.3048856580169	22.4882139574058	86.1034793258905	41.7205	19.4188	86.0496
38.3048860687788	23.0598590973434	88.8571362919999	42.4972	23.9973	88.7768
38.3048864794732	23.6298423835025	91.7383327488195	44.5404	30.686	94.969
32.9437585064334	23.6298368801608	91.7383327757605	29.1053	29.2049	97.3043
30.0913853183876	23.6298313840639	91.7383328024915	27.4222	25.8428	88.2494
27.4706975757682	23.6298258902837	91.7383328292603	27.2482	20.2425	98.6789
24.8850184865397	23.62982039452	91.7383328557595	20.3288	28.022	94.6827
22.6997014354184	23.629814901648	91.7383328826309	22.6997	14.9199	96.5597
16.6896455068592	24.6069884995533	91.0747120846902	9.96077	19.2347	95.1963
15.859714996005	29.7725863461954	89.7858673437059	19.247	29.2712	80.817
14.6687741122292	37.0162886665768	89.2519830303583	8.75416	38.928	96.5496
13.9985340300396	39.8370830725179	88.2462365814299	9.27453	43.3967	88.7547
13.3509368425397	42.3799036301799	87.2458702398675	7.21925	42.3799	79.403
13.3509370507435	52.6395073135639	88.4435175150545	13.8308	54.4775	90.8096
13.35093725897	62.1629835432683	89.6173660928876	17.6011	61.1721	91.0121
13.3509374671947	74.2733043546147	90.7928794364751	4.99968	74.2733	96.2118
18.0297161274743	76.9049066874169	90.7928797956046	16.8354	77.4785	96.9485
24.1028100516372	79.5747236428387	90.7928801546508	27.1361	73.6904	92.6772
28.1170720248332	83.3724791460338	90.7928805136678	28.4623	90.5817	94.8789
32.5896014628531	85.9286181225007	90.7928808725743	32.5896	90.759	99.4978
33.3523430694731	85.9286181369971	86.4695430739299	37.7453	86.3505	90.2585
34.0900700646892	85.9286181514234	81.3568995563442	43.0779	81.6476	81.3569
34.0900691879239	85.9286200415904	76.6063828154311	41.546	82.3742	71.0491
28.697676114872	87.0288148373054	76.606381614492	29.8827	79.684	74.8634
22.8466091309612	88.3695030695559	76.6063804136916	27.9893	89.6021	79.9213
13.433024879422	89.7117298801309	76.6063792124325	12.7313	98.6134	79.0339
7.54018233350484	90.4953803323115	76.6063780100598	3.57801000000001	99.0366	79.8401
7.54018136388436	90.4953807522738	63.0476998173272	0.299018000000004	97.3272	63.0477
7.54018300630072	90.4953782424199	59.8839625612283	3.24988	93.8751	52.5027
7.54018465096345	90.4953757302338	58.5550909280563	4.28894	92.6489	49.3954
8.92142390387201	89.54193705026	58.55509036861	3.06059000000001	88.1315	51.3598
16.0945984892124	88.6922962436762	58.5550898105763	18.064	96.3276	61.2807
21.4065626109194	87.6874576702295	58.5550892520299	27.8353	94.5623	59.9313
22.5267639071696	83.8805536345693	58.5550886929292	19.5225	82.1483	62.667
23.7166978049884	80.6384908297077	58.5550881335971	23.7167	70.7298	59.5174
25.7070452278214	80.767572061176	53.5052706384754	23.3293	78.9181	52.7226
25.7070452278214	80.767572061176	53.5052706384754	34.9224	79.9328	54.0968
26.570490353119	80.8981705009943	47.195512783947	25.7615	81.4539	44.2448
27.4420040595705	81.0288230608692	42.017769200951	26.7929	78.8352	37.5421
28.3224554359297	81.1597773259425	37.928230019371	36.723	86.3354	38.0239
28.5252899865023	81.2568635306108	32.7465750866844	38.4806	81.2568	32.7466
28.5252897225034	84.4830554235628	32.4409284166998	29.5533	92.3189	26.5937
28.5252894579184	84.7266232156053	32.2695911664377	33.1283	92.3481	27.8161
22.6139968431016	84.7266233288591	32.2695908915439	23.3569	85.0798	30.5318
16.724283116504	84.7266234420817	32.269590616698	16.7243	94.3593	34.7835
16.3218390230108	82.6350433626592	30.8818348516883	16.5471	81.1813	37.3426
15.9198928185542	80.7025832394196	29.3100226289975	8.89064000000001	83.8954	29.0611
15.5393898956886	78.589027414014	27.7696801361459	10.1219	82.045	24.5182
15.1705548036385	76.2991065771642	26.3571787474309	17.2306	77.2747	24.7644
14.8004300123826	74.0408640193618	24.9790498473198	20.7262	75.308	17.3361
14.0879915525396	68.3392423743749	24.568510789802	19.6656	61.3862	20.5906
6.4505647842262	67.7829752382259	24.2671231382237	0.194864999999993	71.2335	31.0366
6.11055533970817	64.0376838998106	21.0931186290433	8.25408	64.3565	18.8288
5.76939266460852	60.4305649060001	18.1427931775539	12.5872	53.6987	19.2898
5.29511795550046	59.5499622158114	13.1947659615503	10.9638	55.5178	10.1729
4.80212986260223	58.7204519237426	9.27862919285895	13.5318	57.9262	6.7229
4.20577426612083	57.9189743339495	6.55023221902388	9.17265	66.1356	6.7326
3.27538286102472	54.1801435448608	3.66998210707978	5.52590000000001	61.9092	6.1438
Route: 4 Length: 551.918599238713 Demand Met: 724					
9.69802206558538	41.9373160673104	1.37813073725197	12.2621	43.6923	1.4336
16.3891567240833	48.0202310647556	2.75638562113886	11.7937	48.0467	6.2423
25.4112839738705	54.1837802926953	4.08456361725518	30.6696	55.2626	12.0174
27.3059158397297	58.2403710113724	4.81031047368557	24.5176	59.5849	13.4915
29.71514921223	61.6027121866724	5.39156485533875	31.2678	61.1344	2.0752
32.0772965254239	65.0325096089708	5.97995292325194	24.7619	69.8637	9.1655
44.4433697985007	66.9814659197966	6.52234948454106	51.793	64.9464	0.9013
46.3237043681636	69.580880695453	7.18706811020618	52.5118	68.1256	10.9937
47.9718419786593	72.343983907212	7.83214394982441	45.1636	79.7971	7.5816
47.9718419786593	72.343983907212	7.83214394982441	47.6475	71.1843	17.3202
49.8516180512657	75.0593220501656	8.26166141157725	50.5772	79.5094	6.7911
49.8516180512657	75.0593220501656	8.26166141157725	54.169	81.8375	12.9059
51.2282895477988	76.4761917589448	8.6586398678486	50.9984	83.4341	15.7476
58.2810723648007	76.5395100359446	8.71515690527415	60.7208	77.8844	16.4053
63.6977000819568	76.6027185367474	8.77130387293635	63.6977	85.2552	13.695
70.949811652453	73.6970821502666	8.77130370863728	66.9764	66.2314	9.0944
89.2628224763639	71.6969990929551	8.77130354424908	97.9153	71.697	3.8476
87.1165584903318	62.6900195179976	8.96786754758906	85.3959	62.1638	1.7086
85.0801437209284	54.4149245441511	9.16805962868381	90.8764	48.3318	12.9357
81.0119486826694	51.8173371020036	9.36222615842981	88.4474	55.9131	14.5629

Solution x	Solution y	Solution z	Original x	Original y	Original z
81.0119486826694	51.8173371020036	9.36222615842981	72.4782	47.1166	11.4083
80.5300963330457	47.9227785528785	9.11749923695127	79.5061	49.6701	11.7965
80.0506008085735	43.8923675658418	8.87226798012466	80.0506	36.8529	1.8328
78.952804082422	45.8680125153919	15.6862710193114	85.2354	42.0312	17.7315
77.7444100822395	48.1028779202896	21.2997383015492	69.2786	47.5055	16.1011
77.7444100822395	48.1028779202896	21.2997383015492	74.6616	49.1772	30.6996
77.7353558665907	50.6303215657441	26.5402027173515	74.8357	53.7031	27.6754
77.7353558665907	50.6303215657441	26.5402027173515	73.064	44.6995	31.3834
77.7263247387289	55.0886190395724	29.4158163741191	81.8774	60.6902	25.477
77.7263247387289	55.0886190395724	29.4158163741191	76.3859	55.8636	29.5918
77.7172909303385	58.2633557470101	32.9559308120609	80.6139	53.7748	37.9975
77.7082579286001	62.2350259820821	35.8509167053024	82.5413	70.9361	35.9747
77.7082579286001	62.2350259820821	35.8509167053024	82.7455	58.0479	28.4959
67.9778403596553	62.2402212094725	36.6263141047494	65.3011	67.1869	28.6409
65.9872188573284	62.2453862744525	45.9642007383976	70.983	56.1077	39.9244
65.9872188573284	62.2453862744525	45.9642007383976	60.771	67.3196	52.7577
65.9872188573284	62.2453862744525	45.9642007383976	67.8108	54.6502	44.2592
65.9872188573284	62.2453862744525	45.9642007383976	64.2573	58.953	49.3124
65.9872188573284	62.2453862744525	45.9642007383976	58.3448	60.9201	41.5011
65.9872188573284	62.2453862744525	45.9642007383976	56.0439	62.2937	45.4781
66.9878726536762	65.0989329056318	62.8490363584826	65.9297	69.3415	71.7927
66.9878726536762	65.0989329056318	62.8490363584826	60.9907	71.4945	66.9566
66.9878726536762	65.0989329056318	62.8490363584826	69.3672	55.5594	61.2856
66.9878726536762	65.0989329056318	62.8490363584826	69.1414	57.6653	59.1832
77.3471507360634	65.3505469842151	61.9331267581553	81.8209	62.9891	53.3907
77.5214426477282	66.5212874917999	61.8502444768231	78.2186	68.7569	71.4148
77.5214426477282	66.5212874917999	61.8502444768231	82.834	58.4111	60.6469
77.6662760621572	75.5676167223082	61.7452046447913	73.8931	82.0767	63.5442
77.8130590959722	80.2899884068724	61.6399399419492	77.8131	90.2453	61.6399
83.2819343159672	80.1460727046931	61.3055033245679	84.4594	85.6238	69.4005
83.2819343159672	80.1460727046931	61.3055033245679	82.6909	80.2719	62.172
85.0186150710193	79.96111104531	56.8367346869489	89.1084	77.1611	62.2997
86.6066382885344	79.7772092368633	49.8909266943306	94.2046	73.3577	49.4797
86.6066382885344	79.7772092368633	49.8909266943306	84.0931	75.7357	43.6346
86.6066382885344	79.7772092368633	49.8909266943306	79.6042	79.6519	48.0916
86.6066382885344	79.7772092368633	49.8909266943306	78.3667	74.2083	50.3369
88.1307335591401	83.1005226006172	41.0429903702707	95.4573	78.5053	38.9919
89.2832307816976	89.5429322602269	35.4747992090691	96.3227	96.5824	35.4748
89.2832307816976	89.5429322602269	35.4747992090691	91.0373	94.8618	33.7328
85.4605711117263	87.6235811889307	34.1887666765293	91.8947	87.6684	31.3605
80.0839119923859	85.7124811951396	32.9569486132551	80.7777	87.9354	23.575
70.3955966863507	81.0278541100193	32.4716852738394	66.7645	81.0279	23.2022
70.3955964560643	79.9595834276996	35.9290866738247	75.9957	81.402	37.5418
70.3955964560643	79.9595834276996	35.9290866738247	77.5352	78.0347	33.1993
70.3955962267582	78.9157208338086	39.768863344454	78.9206	73.8168	40.4273
70.3955962267582	78.9157208338086	39.768863344454	76.2214	75.1456	46.9071
70.3955962267582	78.9157208338086	39.768863344454	61.6789	74.8507	42.3385
63.054293499393	81.0359263619864	38.755208648323	59.2712	76.4167	39.0582
57.2683624213269	83.4328627065181	37.7406886088297	58.0371	93.3465	37.2538
57.2683624213269	83.4328627065181	37.7406886088297	50.0418	88.5256	42.3177
55.2694631414269	80.2595113612486	31.5284592426657	61.8453	80.8454	29.5157
55.2694631414269	80.2595113612486	31.5284592426657	60.2539	80.1704	27.9583
52.6993545577668	77.0951444801903	27.0152883877006	60.356	72.3736	25.6911
44.5183949169741	75.0338760906861	23.3392882751728	43.9629	81.9344	16.1851
44.5183949169741	75.0338760906861	23.3392882751728	45.2184	66.3382	18.5431
41.6454578883715	71.0160331461563	23.5853612340385	41.4131	74.8199	27.7293
41.6454578883715	71.0160331461563	23.5853612340385	46.3399	71.17	31.2162
37.0250700319671	66.488924056816	23.8190828160365	35.9094	68.8825	29.2317
32.6410005865033	61.5676001216623	24.0508893828776	32.641	61.5676	34.0062
31.1009167901479	58.0413045237418	24.0508876494287	33.4192	59.483	33.0004
29.2568737995523	53.4531379748358	24.050885911809	23.6126	49.4214	29.6987
27.8580178170283	50.5351780771791	24.0508841706654	22.8193	53.7552	17.9075
27.8580178170283	50.5351780771791	24.0508841706654	22.5447	55.6169	28.4034
26.7877448111931	44.5473508955311	24.0508824281046	17.5856	40.8861	25.0628
26.7877448111931	44.5473508955311	24.0508824281046	26.2003	42.5604	24.4871
29.3488817121709	44.5473506757274	15.5745263079021	37.4105	49.4356	12.3771
29.3488813769019	40.2496114835804	15.5745257164096	28.6889	43.6077	12.417
29.3488810412911	35.5085011941552	15.5745251252761	36.8488	32.2474	21.2512
Route: 5 Length: 666.775498081913 Demand Met: 752					
9.04463859299111	45.8813705020985	24.9186925291619	2.40393	50.9808	25.185
9.04463859299111	45.8813705020985	24.9186925291619	13.4598	41.6191	22.5554
9.04463859299111	45.8813705020985	24.9186925291619	15.6372	44.5891	30.235
14.0290811876135	54.5136475239848	32.8139774586079	18.9042	62.1271	34.907
16.4768072160613	56.7994684662672	37.4716985082059	25.6513	60.6643	37.4717
16.476805467514	56.7994689330119	38.8826019694442	17.5187	55.1629	44.2721
16.476805467514	56.7994689330119	38.8826019694442	20.5641	47.7219	38.8826
13.8438003315763	57.9419656782935	42.2742578734633	9.35554999999999	53.1101	48.6717
12.0318847647224	59.3874646236905	44.1593328723606	10.4725	58.878	47.8708
10.2580445419665	60.8460804021924	45.9721323417429	2.55217	66.9796	45.1209
10.2580445419665	60.8460804021924	45.9721323417429	3.30116	54.5758	46.8676

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.0374783257947	61.1547355867891	51.463541179915	8.30742000000001	60.1487	54.798
9.81746105865011	61.4641928968951	56.4423835910098	1.5771	61.4642	62.0285
13.4746407371677	61.6168826693387	56.4423830052082	14.0141	70.4084	60.1608
16.5760006724939	61.7554243982617	56.442382418705	16.576	71.2313	59.4946
24.5857855260701	61.014032473251	55.1511689489862	23.6206	68.344	50.228
34.8991136151079	60.1505196005873	54.0509578738039	40.6271	60.1839	50.1596
41.3217228146209	59.2885124798351	52.9995376182643	42.1545	66.9856	47.2528
45.5807150049172	56.8393829268097	52.3368891713353	44.4217	55.3301	59.2126
50.1461876988486	54.510391674694	51.6413168605226	57.8122	54.5104	45.2899
50.1461905343285	36.7705617348575	51.6413133927381	56.0389	33.1015	51.1098
50.1461905343285	36.7705617348575	51.6413133927381	49.1148	32.8614	42.5439
50.1461905343285	36.7705617348575	51.6413133927381	55.5492	35.9315	44.2535
50.1461905343285	36.7705617348575	51.6413133927381	46.2037	41.7062	48.7254
55.0204750700621	36.7705613860957	62.0895883572946	55.099	31.771	70.6981
55.0204750700621	36.7705613860957	62.0895883572946	47.522	42.292	65.6102
55.0204750700621	36.7705613860957	62.0895883572946	56.9788	35.9946	54.4126
66.5992782492736	36.7705699447457	57.412503779457	73.2088	32.0501	51.6558
66.5992782492736	36.7705699447457	57.412503779457	60.6972	35.5066	52.4287
66.5992782492736	36.7705699447457	57.412503779457	61.5258	41.6034	50.3406
72.6150782368179	36.7705719350893	57.6555860295331	74.0572	35.987	63.4666
72.6150782368179	36.7705719350893	57.6555860295331	76.05	41.1841	50.3284
75.5556959698193	36.7705739241534	57.9188685096423	74.7866	36.0265	64.8468
78.6057991166222	36.7705759132374	58.1770075339975	78.6058	43.2582	65.7281
80.0013230613504	30.2551918693395	57.1511732711518	85.0689	32.1301	62.1612
80.0013230613504	30.2551918693395	57.1511732711518	77.6794	29.1288	65.8649
81.4463028818236	24.3663241736914	55.5556544449338	80.035	15.8589	58.0701
82.9951002554705	22.0179761753842	53.7550079987125	78.906	18.0381	53.555
84.6392953854302	19.839820459536	51.9702403317654	87.5589	25.1226	45.9834
86.1453159845776	16.9890099927806	50.5168050888751	86.8707	18.0065	43.4379
87.6430006697668	14.0483286438015	49.2201876416803	88.2698	14.9994	45.4757
89.1414191174071	11.0625593226052	47.9655976706743	95.0473	3.39817	49.8314
89.523861105019	10.7153277211565	41.8874649307688	91.7898	10.5225	38.6828
89.9048709417401	10.368372795295	36.5944926336066	99.5164	7.77478	36.5945
89.904879661519	10.3683405755833	25.771900885032	88.6343	0.494442	25.7719
90.5883526078341	10.3683398518115	19.9577435228914	88.9914	10.7701	17.3091
91.2781964351332	10.3683391280771	14.6582903000155	98.9579	4.73211	12.8251
91.7073621338276	10.3683384054655	12.1956770595185	95.7659	2.55349	7.5519
91.7073625435167	17.6096907275426	12.1956768227864	97.4766	17.1802	10.0021
91.7073625435167	17.6096907275426	12.1956768227864	90.11	20.7153	5.7932
91.7073629541945	23.4927531144608	12.1956765865459	98.8743	25.646	5.6301
91.4871913370529	23.4927545301378	12.5175389024597	99.5853	23.4577	6.8435
88.5237989929275	23.4927559457012	19.8155480841081	81.7106	28.112	19.2367
86.3490580310847	23.4927573607558	27.7957994818682	76.419	22.7841	27.7958
87.441476587244	23.4927599140858	32.8940983339511	97.2905	22.0419	32.8941
87.4414752862068	29.8770968010726	34.197472931839	80.1207	32.7664	32.9471
87.4414739854247	34.9741619906088	35.5367554209204	81.8496	38.8539	28.9342
87.4414739854247	34.9741619906088	35.5367554209204	80.5435	37.2793	30.7227
87.4414726854322	37.1144394012448	39.5723991226874	96.1419	41.3034	39.8142
87.4414726854322	37.1144394012448	39.5723991226874	91.3249	42.8902	41.6597
87.4414713841051	38.1669609732163	42.9516872430474	92.0634	46.0336	40.4672
87.441470082013	38.8654492134806	50.1349997390923	81.4209	43.6493	50.298
87.441470082013	38.8654492134806	50.1349997390923	81.1997	46.621	50.135
87.7339020671001	38.8347193547268	53.9469039256717	94.61	43.2995	53.8065
87.7339020671001	38.8347193547268	53.9469039256717	88.1955	43.6361	47.6404
88.0168516249935	38.8037842917687	60.2830318254802	96.3235	44.2629	60.2644
88.0518370334799	38.7441999595212	69.4071982584117	86.8559	48.4797	70.9689
88.0890363219134	37.8608612398957	69.77765075672	95.9404	38.2332	74.7444
88.0890363219134	37.8608612398957	69.77765075672	92.3029	41.017	61.4442
88.1242630585242	21.3282630581489	74.7820330856184	96.7716	16.6523	73.2113
88.1242630585242	21.3282630581489	74.7820330856184	89.036	30.7257	77.9388
88.1242630585242	21.3282630581489	74.7820330856184	82.6839	23.4883	70.1916
88.124263271643	20.6008031556487	81.8317148306976	96.7473	23.5618	82.348
88.1242634840427	19.8145984274548	88.182478600371	93.1464	19.8146	96.7782
84.1934541422768	17.9474946208167	85.0013248804427	90.4883	12.6216	83.5226
76.8554869892155	16.3829632603449	82.4181984270017	75.2455	17.3084	91.8789
76.8554869892155	16.3829632603449	82.4181984270017	73.4709	7.6166	79.1313
76.8554869892155	16.3829632603449	82.4181984270017	76.9072	18.2917	80.6948
76.8554869892155	16.3829632603449	82.4181984270017	77.5205	18.1054	72.6356
69.7055100925241	13.8049660622746	88.5753336450337	68.0574	15.6194	97.6814
65.4904934218654	10.313882667917	90.0545247227459	64.5769	3.66176	91.1441
61.5068998731858	7.52157293350657	91.5209276451405	61.5069	0.482106	98.5604
56.5002625236029	7.72415172267419	85.2117036866704	52.4925	5.37248	88.2454
56.5002625236029	7.72415172267419	85.2117036866704	51.1528	6.04103	87.327
56.5002625236029	7.72415172267419	85.2117036866704	55.9929	17.1432	85.8884
53.3315597713788	7.90843084277813	74.1242116822386	56.3237	2.07366	66.7228
53.3315597713788	7.90843084277813	74.1242116822386	50.9211	16.4053	69.6798
29.3371567434301	8.06370471704599	73.9339638538056	23.5387	4.13129	73.048
19.9142716508038	8.2200716460485	73.7441577452699	19.7287	0.198716	79.5663
15.7931450093402	9.81042325110544	72.8415538005589	17.1854	11.1942	73.5432
11.5479573998826	11.383599991781	71.9383737382468	10.9477	2.73525	75.6448

Solution x	Solution y	Solution z	Original x	Original y	Original z
7.86103323522941	17.7847720449844	70.8395166097973	4.056	25.9589	74.3875
6.44027953925662	18.7109495203721	68.895999234784	3.44571000000001	28.2052	68.896
6.44027866034698	18.7109474913593	65.0440007359269	10.9524	12.0779	65.6188
6.44027866034698	18.7109474913593	65.0440007359269	15.3759	23.0999	65.044
6.4373908035634	18.6843022134238	62.0049583010381	2.38826	24.0295	62.08
6.4373908035634	18.6843022134238	62.0049583010381	15.6993	18.7479	59.9926
6.43446449633191	18.6576418911932	59.8478041493962	6.43447000000001	8.70233	59.8478
4.82692114864821	20.4261673171405	50.9658422090392	0.613562000000002	12.2624	51.4967
3.54002219242307	24.2499469975235	40.5372921079276	2.68873000000001	16.3883	43.9305

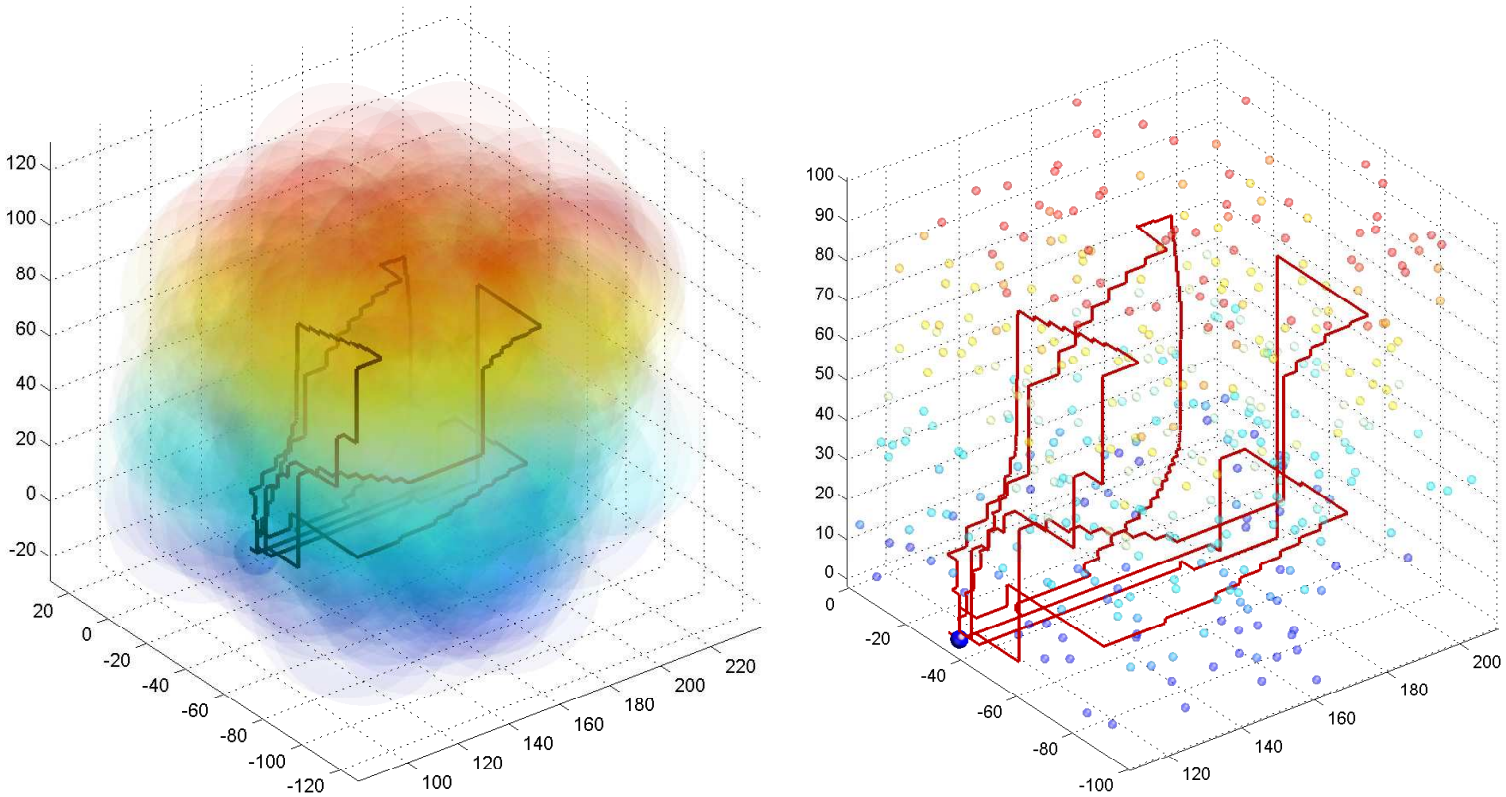


Figure O.185: $rd400$, $r = 29.865927$, Equal Radius, 3D, Manhattan, Length = 1310.0943498

Table O-188: Solution for $rd400$, $r = 29.865927$, Equal Radius, 3D, Manhattan

Total distance: 1310.09434977427 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 395.664036791877 Demand Met: 800					
4.72710499033293	36.7612366413722	22.7068029082009	2.19732	10.251	34.6682
7.43050541513762	39.2046181694856	27.2229885133229	23.6126	49.4214	29.6987
7.43050541513762	39.2046181694856	27.2229885133229	20.5641	47.7219	38.8826
9.94994610673717	41.5691325865626	31.568165629351	2.68873000000001	16.3883	43.9305
9.94994610673717	41.5691325865626	31.568165629351	17.2907	17.3232	33.1257
12.9786036028681	52.6678722804809	34.3472976640797	10.4725	58.878	47.8708
12.9786036028681	52.6678722804809	34.3472976640797	30.4468	53.5688	58.3124
13.8080620164692	59.9544812954362	34.9885934377907	1.5771	61.4642	62.0285
13.8080620164692	59.9544812954362	34.9885934377907	8.30742000000001	60.1487	54.798
16.6038768321722	64.1220971304033	35.286683602352	14.0141	70.4084	60.1608
19.4662468165761	68.1115799405811	35.5802288210049	16.576	71.2313	59.4946
19.4662468165761	68.1115799405811	35.5802288210049	23.7167	70.7298	59.5174
22.340311550755	72.0853669254635	35.8671442815365	23.3293	78.9181	52.7226
22.340311550755	72.0853669254635	35.8671442815365	23.6206	68.344	50.228
25.2336339126413	76.1526746621996	36.1520338664387	25.7615	81.4539	44.2448
25.2336339126413	76.1526746621996	36.1520338664387	34.4937	83.7515	46.1073
28.0977934650205	80.2070920418438	36.4354684145854	0.194864999999993	71.2335	31.0366
28.0977934650205	80.2070920418438	36.4354684145854	4.28894	92.6489	49.3954
28.0977934650205	80.2070920418438	36.4354684145854	48.6626	98.7924	25.383
28.0977934650205	80.2070920418438	36.4354684145854	17.5187	55.1629	44.2721
28.0977934650205	80.2070920418438	36.4354684145854	40.6271	60.1839	50.1596
57.0681971550945	80.2949579032175	67.6795720353348	54.3707	99.6057	90.3024
57.0681971550945	80.2949579032175	67.6795720353348	79.6042	79.6519	48.0916
57.0681971550945	80.2949579032175	67.6795720353348	54.8665	95.2849	41.9419
57.0681971550945	80.2949579032175	67.6795720353348	76.2214	75.1456	46.9071
57.0681971550945	80.2949579032175	67.6795720353348	53.7144	89.3849	55.8234
57.0681971550945	80.2949579032175	67.6795720353348	44.9959	88.3516	56.7624
57.0681971550945	80.2949579032175	67.6795720353348	59.2712	76.4167	39.0582
57.0681971550945	80.2949579032175	67.6795720353348	50.0418	88.5256	42.3177
57.0681971550945	80.2949579032175	67.6795720353348	61.6789	74.8507	42.3385
57.0681971550945	80.2949579032175	67.6795720353348	47.7087	83.4773	42.5429
57.0681971550945	80.2949579032175	67.6795720353348	60.771	67.3196	52.7577
57.0681971550945	80.2949579032175	67.6795720353348	48.3206	81.4332	48.7053
57.0681971550945	80.2949579032175	67.6795720353348	42.1545	66.9856	47.2528
57.0681971550945	80.2949579032175	67.6795720353348	64.2573	58.953	49.3124
57.0681971550945	80.2949579032175	67.6795720353348	56.0439	62.2937	45.4781
57.0681971550945	80.2949579032175	67.6795720353348	44.4217	55.3301	59.2126
60.6142583285961	80.2935149751776	70.3017390547516	51.2472	90.6526	88.5593
60.6142583285961	80.2935149751776	70.3017390547516	59.9164	58.75	88.5608
64.618998567867	80.2920831443233	72.297606866698	74.5996	81.8744	91.5993
64.618998567867	80.2920831443233	72.297606866698	69.9395	64.1832	90.6048
68.3944609683711	80.2906578422726	74.1078105029162	64.8783	60.379	95.6551
75.5118337011887	80.2892619583994	74.8588979217957	75.5117	58.1702	94.9268
75.8739614097885	80.2892619577133	74.8588979257333	59.9164	61.9972	76.3491
76.2401719397049	80.2892619570297	74.8588979296783	65.9297	69.3415	71.7927
76.2401719397049	80.2892619570297	74.8588979296783	60.9907	71.4945	66.9566
76.6103713903877	80.2892619563456	74.8588979336452	69.3672	55.5594	61.2856
76.9936331414049	80.2892619556636	74.858897937737	82.834	58.4111	60.6469
76.9936331414049	80.2892619556636	74.858897937737	69.1414	57.6653	59.1832
77.3822964979955	80.2892619549868	74.8588979419288	89.1084	77.1611	62.2997
77.3822964979955	80.2892619549868	74.8588979419288	78.3667	74.2083	50.3369
77.769272653811	80.28926195431	74.858897946173	84.4594	85.6238	69.4005
77.769272653811	80.28926195431	74.858897946173	82.6909	80.2719	62.172
78.1558914358826	80.2892619536342	74.8588979504349	77.8131	90.2453	61.6399
78.1558914358826	80.2892619536342	74.8588979504349	73.8931	82.0767	63.5442
78.5441989782744	80.2892619529586	74.8588979547213	74.1314	97.2935	62.187
78.9337649206558	80.289261952282	74.8588979590162	68.3546	93.0491	63.4728
78.9337649206558	80.289261952282	74.8588979590162	59.3326	96.8644	60.2925
79.4320912055692	80.2892619516033	74.8588979635739	75.4786	92.9344	80.494
79.4320912055692	80.2892619516033	74.8588979635739	68.0526	97.9535	69.9593
79.9366371432304	80.289261950923	74.8588979681357	75.6359	99.7073	96.3469
79.9366371432304	80.289261950923	74.8588979681357	65.9332	98.9174	85.8003
80.4698124525145	80.2892619502408	74.8588979726249	87.9339	96.7331	97.5762
80.4698124525145	80.2892619502408	74.8588979726249	86.1563	95.4019	99.9835
80.4698124579454	78.2864575652756	74.858897968407	83.5669	88.2708	89.9554
80.4698124633792	76.2651717626129	74.85889796419	85.2864	82.465	90.0038
80.4698124633792	76.2651717626129	74.85889796419	86.1254	75.412	92.2501
80.4698124688127	74.263375748416	74.8588979599682	87.0562	74.7862	94.9506
80.4698124688127	74.263375748416	74.8588979599682	80.8889	76.3527	85.0129
80.4698124742464	72.29011905832	74.8588979557422	93.4248	68.5015	98.1606
80.4698124796807	70.3874550982753	74.8588979515011	88.5712	66.6382	86.5414
80.4698124851151	68.5133036796058	74.8588979472594	98.0725	73.509	85.0617
80.469812490549	66.6341483292441	74.8588979430148	98.0879	82.1977	81.4504
80.469812490549	66.6341483292441	74.8588979430148	95.1537	79.2325	85.4918

Solution x	Solution y	Solution z	Original x	Original y	Original z
80.4698124959837	64.6111763069866	74.8588979387647	92.7385	89.9534	78.6648
80.4698124959837	64.6111763069866	74.8588979387647	75.6586	91.7899	79.8395
80.4698125014194	59.4359979832233	74.858897934502	80.9911	75.8316	78.9882
80.4698125014194	59.4359979832233	74.858897934502	78.2186	68.7569	71.4148
80.4698125068559	53.863869903891	74.8588979302423	96.3481	58.4969	97.3507
80.4698125068559	53.863869903891	74.8588979302423	86.8559	48.4797	70.9689
80.4698125122925	47.4559488134614	74.8588979259434	96.7473	23.5618	82.348
80.469812511537	47.4559488141805	70.7319827414082	95.9404	38.2332	74.7444
80.4698125107788	47.4559488148997	66.6153492069611	85.0689	32.1301	62.1612
80.4698125100218	47.4559488156213	62.6391637314866	78.6058	43.2582	65.7281
80.4698125100218	47.4559488156213	62.6391637314866	81.4209	43.6493	50.298
80.4698125092675	47.45594881635	58.8961203996089	92.3029	41.017	61.4442
80.4698125092675	47.45594881635	58.8961203996089	96.3235	44.2629	60.2644
80.4698125085103	47.4559488170741	55.2170776753758	94.61	43.2995	53.8065
80.4698125085103	47.4559488170741	55.2170776753758	88.1955	43.6361	47.6404
80.4698125077524	47.4559488178	51.7192568945693	91.3249	42.8902	41.6597
80.469812506994	47.455948818527	48.3634503028599	92.0634	46.0336	40.4672
80.469812506994	47.455948818527	48.3634503028599	81.1997	46.621	50.135
80.4698125062364	47.4559488192567	45.138540287165	94.2046	73.3577	49.4797
80.469812505436	47.4559488199322	33.9748458591899	82.5413	70.9361	35.9747
80.469812505436	47.4559488199322	33.9748458591899	78.9206	73.8168	40.4273
80.4698125046349	47.4559488205985	19.2435893501573	81.8774	60.6902	25.477
80.4698125038333	47.4559488212651	3.84759168202054	97.9153	71.697	3.8476
57.6799315003196	42.6483629910556	1.9592772608646	66.9764	66.2314	9.0944
Route: 2 Length: 288.816335134837 Demand Met: 796					
6.69180620125529	51.0897656199402	33.5435136346806	2.55217	66.9796	45.1209
6.69180620125529	51.0897656199402	33.5435136346806	3.30116	54.5758	46.8676
6.69180620125529	51.0897656199402	33.5435136346806	9.35554999999999	53.1101	48.6717
11.3749290684664	64.7818059904077	51.4727976750302	34.9224	79.9328	54.0968
14.2050472760899	71.155210675874	66.7386268542232	41.546	82.3742	71.0491
14.205047400386	71.1552109821294	66.7386276501403	3.24988	93.8751	52.5027
14.205047400386	71.1552109821294	66.7386276501403	3.06059000000001	88.1315	51.3598
14.2050475248579	71.1552112882188	66.7386284464934	18.064	96.3276	61.2807
14.2050476493211	71.1552115941585	66.738629242982	0.299018000000004	97.3272	63.0477
14.2050479578787	71.1552116752689	69.0003761044105	27.9893	89.6021	79.9213
14.2050479578787	71.1552116752689	69.0003761044105	29.8827	79.684	74.8634
14.2050482662301	71.155211756377	71.1374131655229	27.8353	94.5623	59.9313
14.2050482662301	71.155211756377	71.1374131655229	19.5225	82.1483	62.667
14.2050485747818	71.1552118375658	74.9529385463037	12.7313	98.6134	79.0339
14.2050488833947	71.1552119186817	78.548650770464	3.57801000000001	99.0366	79.8401
17.8052867763287	71.1552119639678	78.5486529553124	37.7453	86.3505	90.2585
17.8052867763287	71.1552119639678	78.5486529553124	43.0779	81.6476	81.3569
19.8681577311046	71.1552120092139	78.5486551402747	4.99968	74.2733	96.2118
19.8681577311046	71.1552120092139	78.5486551402747	16.8354	77.4785	96.9485
22.0782963969701	71.1552120544916	78.5486573250394	27.1361	73.6904	92.6772
22.0782963969701	71.1552120544916	78.5486573250394	23.2085	58.8069	93.3912
24.2951071867909	71.1552120999787	78.5486595120199	32.5896	90.759	99.4978
24.2951071867909	71.1552120999787	78.5486595120199	28.4623	90.5817	94.8789
24.2951071894777	63.1641258161201	78.0578270145589	43.5841	58.7522	99.5019
24.2951071928415	59.0277163725217	77.1502728137708	41.7302	58.1199	97.2119
24.2951071928415	59.0277163725217	77.1502728137708	43.1006	68.5786	87.3861
24.2951071962067	54.6774006105269	76.1917406983989	48.6743	62.5481	86.8455
24.2951071995989	49.5187928774787	75.192102159324	17.6011	61.1721	91.0121
24.295107202965	44.0508712387177	74.1788413279596	8.75416	38.928	96.5496
24.295107202965	44.0508712387177	74.1788413279596	13.8308	54.4775	90.8096
24.2951072063138	39.0653344905781	73.0231042521911	13.2524	50.7626	76.4367
24.2951072063138	39.0653344905781	73.0231042521911	17.8085	51.9553	71.4677
24.2951072096519	33.6713146127398	71.8843740393788	24.4594	47.3987	68.2546
24.2951072129128	28.0101216833987	70.7579369510316	9.96077	19.2347	95.1963
24.2951072129128	28.0101216833987	70.7579369510316	10.9477	2.73525	75.6448
24.2951072129128	28.0101216833987	70.7579369510316	19.7287	0.198716	79.5663
24.2951072129128	28.0101216833987	70.7579369510316	22.6997	14.9199	96.5597
24.2951072129128	28.0101216833987	70.7579369510316	27.2482	20.2425	98.6789
24.2951072129128	28.0101216833987	70.7579369510316	20.3288	28.022	94.6827
24.2951072129128	28.0101216833987	70.7579369510316	23.5387	4.13129	73.048
24.2951072129128	28.0101216833987	70.7579369510316	17.1854	11.1942	73.5432
24.2951072129128	28.0101216833987	70.7579369510316	4.056	25.9589	74.3875
24.2951072129128	28.0101216833987	70.7579369510316	10.9524	12.0779	65.6188
24.2951072129128	28.0101216833987	70.7579369510316	29.1053	29.2049	97.3043
24.2951072129128	28.0101216833987	70.7579369510316	3.44571000000001	28.2052	68.896
24.2951072129128	28.0101216833987	70.7579369510316	9.27453	43.3967	88.7547
24.2951072129128	28.0101216833987	70.7579369510316	2.38826	24.0295	62.08
24.2951072129128	28.0101216833987	70.7579369510316	27.4222	25.8428	88.2494
24.2951072129128	28.0101216833987	70.7579369510316	27.3595	17.3028	77.1892
24.2951072129128	28.0101216833987	70.7579369510316	19.247	29.2712	80.817
24.2951072129128	28.0101216833987	70.7579369510316	7.21925	42.3799	79.403
24.2951072129128	28.0101216833987	70.7579369510316	33.1085	0.882753	62.284
24.2951072129128	28.0101216833987	70.7579369510316	15.3759	23.0999	65.044
24.2951072129128	28.0101216833987	70.7579369510316	26.7979	6.90196	59.464
24.2951072129128	28.0101216833987	70.7579369510316	15.6993	18.7479	59.9926

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.2951072129128	28.0101216833987	70.7579369510316	15.3897	25.3897	58.7078
24.2951072129128	28.0101216833987	70.7579369510316	26.0672	21.3383	63.983
24.2951072129128	28.0101216833987	70.7579369510316	31.4339	43.8079	91.7683
24.2951072129128	28.0101216833987	70.7579369510316	36.0033	17.5038	68.4307
24.2951072129128	28.0101216833987	70.7579369510316	25.7178	17.895	52.7372
24.2951072129128	28.0101216833987	70.7579369510316	37.7688	31.4408	76.6336
24.2951072129128	28.0101216833987	70.7579369510316	9.16001	37.8018	54.1714
24.2951072129128	28.0101216833987	70.7579369510316	34.4638	23.0393	61.4662
24.2951072129128	28.0101216833987	70.7579369510316	23.2874	32.7742	59.4617
24.2951072129128	28.0101216833987	70.7579369510316	17.6023	36.5196	56.7286
24.2951072129128	28.0101216833987	70.7579369510316	31.6686	31.1822	62.9487
24.2951072129128	28.0101216833987	70.7579369510316	25.8125	25.1372	50.1121
24.2951072129128	28.0101216833987	70.7579369510316	31.0765	22.0815	48.5077
24.2951072129128	28.0101216833987	70.7579369510316	22.7183	34.3604	52.0641
24.2951072129128	28.0101216833987	70.7579369510316	34.4656	38.8185	62.9703
24.2951072129128	28.0101216833987	70.7579369510316	38.2173	22.874	49.077
24.2951072129128	28.0101216833987	70.7579369510316	41.6783	52.1535	70.8377
24.2951072129128	28.0101216833987	70.7579369510316	32.7353	38.4372	45.6112
24.2951072129128	28.0101216833987	70.7579369510316	38.1612	45.7549	62.3997
24.2951072129128	28.0101216833987	70.7579369510316	38.5534	48.7846	64.7262
24.2951072129128	28.0101216833987	70.7579369510316	47.522	42.292	65.6102
24.2951072161426	27.6486084203788	54.287137962489	6.43447000000001	8.70233	59.8478
24.2951072161426	27.6486084203788	54.287137962489	0.613562000000002	12.2624	51.4967
24.2951072194791	27.3076612640591	39.8278954620856	21.7245	2.01127	55.495
24.2951072194791	27.3076612640591	39.8278954620856	42.0178	3.44287	36.938
23.8945432344475	27.6713810345862	37.7136828798377	38.2491	9.61738	19.3363
23.4155662692675	28.1183954611762	36.7528814483217	37.2177	7.79249	31.0238
23.4155662692675	28.1183954611762	36.7528814483217	42.987	22.9253	37.986
22.9256547397658	28.5767401838361	35.8090703494025	49.1148	32.8614	42.5439
22.9256547397658	28.5767401838361	35.8090703494025	46.2037	41.7062	48.7254
21.3013870639425	28.9176813199051	32.0407869298524	33.2771	46.652	45.1216
19.6160956914168	29.2517179428849	27.8662248623073	23.1984	1.0131	19.9686
19.6160956914168	29.2517179428849	27.8662248623073	19.0116	0.977048	36.1157
17.5070445068094	30.1465530834437	24.8961889983775	25.7714	33.2927	46.3113
15.3515555301023	31.0359096588058	21.608405744015	23.6339	40.0124	41.5074
13.146491309311	31.9122713684481	17.9560647738782	37.0272	27.4581	25.0096
13.146491309311	31.9122713684481	17.9560647738782	36.8488	32.2474	21.2512
10.3681609909189	32.8010533805281	14.0972068500628	2.1823	25.6845	27.6693
10.3681609909189	32.8010533805281	14.0972068500628	5.25835000000001	27.1001	26.8402
7.74308713829905	33.7119103593071	9.94274847154676	15.6372	44.5891	30.235
5.02521395084779	34.607872428315	5.03366831349521	11.4258	37.7412	14.2255
Route: 3 Length: 336.852573406302 Demand Met: 794					
19.7193920025463	33.1134631735214	1.8731417065494	12.2621	43.6923	1.4336
40.3674724933047	30.6943931304851	3.75187782920384	47.3917	2.23053	7.041
44.6628579399024	29.8207597046152	5.37930976293453	54.7387	20.4852	11.8363
44.6628579399024	29.8207597046152	5.37930976293453	47.6331	25.3181	18.59
48.9720989422676	28.9585244975905	6.97718861966432	48.5894	0.54797	14.4264
53.5425965865319	28.3648970285902	8.29142898175368	69.2786	47.5055	16.1011
53.5425965865319	28.3648970285902	8.29142898175368	49.4045	19.961	26.5255
57.6584796732576	27.7594212853458	9.5456096513732	72.4782	47.1166	11.4083
61.436081669395	27.1414377142712	10.7980665425397	80.0506	36.8529	1.8328
61.436081669395	27.1414377142712	10.7980665425397	79.5061	49.6701	11.7965
63.643964213987	26.4263014007659	12.0636224163804	81.7106	28.112	19.2367
63.643964213987	26.4263014007659	12.0636224163804	85.2354	42.0312	17.7315
65.499666624742	25.6844346492903	13.2926241240456	80.1207	32.7664	32.9471
65.499666624742	25.6844346492903	13.2926241240456	80.5435	37.2793	30.7227
67.1773304601778	24.9220029933871	14.4108232261968	81.8496	38.8539	28.9342
67.1773304601778	24.9220029933871	14.4108232261968	73.064	44.6995	31.3834
68.7595103490266	24.1094186765071	15.4418114885842	76.419	22.7841	27.7958
70.3415011392856	23.2993545756485	16.4657670383131	79.2919	13.6517	22.466
70.3415011392856	23.2993545756485	16.4657670383131	77.911	9.90186	32.1435
71.9097640203272	22.5083425218958	17.4702511645554	88.6343	0.494442	25.7719
73.186761054731	21.8263619946011	18.4080425045018	91.7898	10.5225	38.6828
73.5936215113035	21.4272037554414	18.752571931596	97.2905	22.0419	32.8941
73.5936215113035	21.4272037554414	18.752571931596	86.8707	18.0065	43.4379
73.9751710433247	21.0312181948205	19.0757069696382	97.4766	17.1802	10.0021
73.9751710433247	21.0312181948205	19.0757069696382	99.5853	23.4577	6.8435
74.3288877177054	20.6348327319457	19.4109338807257	98.8743	25.646	5.6301
74.6630699262266	20.2332604032852	19.757642208497	90.11	20.7153	5.7932
74.6630699262266	20.2332604032852	19.757642208497	88.9914	10.7701	17.3091
74.9958468271873	19.8337647037498	20.1063556465474	95.7659	2.55349	7.5519
74.9958468271873	19.8337647037498	20.1063556465474	98.9579	4.73211	12.8251
75.1482050293019	19.6505610597341	21.454531536887	74.5771	5.70821	6.0306
75.1482050293019	19.6505610597341	21.454531536887	70.1018	4.34543	9.0382
75.3009599461763	19.4684385606106	22.8705100593902	58.2097	7.56071	2.229
75.3009599461763	19.4684385606106	22.8705100593902	62.8285	19.7058	3.0557
75.4606845955171	19.2922011021684	25.8677025653232	48.6979	8.85907	21.303
75.6275644136987	19.1191762003219	29.4217847749587	56.1254	1.40532	17.903
75.7983193138855	18.9498820409144	34.672913189298	67.267	14.1516	17.4107
75.7983193138855	18.9498820409144	34.672913189298	58.7637	13.9566	16.9818

Solution x	Solution y	Solution z	Original x	Original y	Original z
75.9704421944756	18.7810108020515	42.3041346896865	68.2389	8.47105	37.5341
75.9704421944756	18.7810108020515	42.3041346896865	62.0154	28.1819	31.0401
76.143896416205	18.6121824273496	51.7024575669072	96.7716	16.6523	73.2113
76.143896416205	18.6121824273496	51.7024575669072	99.5164	7.77478	36.5945
76.143896416205	18.6121824273496	51.7024575669072	95.0473	3.39817	49.8314
76.143896416205	18.6121824273496	51.7024575669072	88.2698	14.9994	45.4757
76.143896416205	18.6121824273496	51.7024575669072	80.035	15.8589	58.0701
76.143896416205	18.6121824273496	51.7024575669072	56.3237	2.07366	66.7228
76.143896416205	18.6121824273496	51.7024575669072	74.632	5.60444	48.5009
76.143896416205	18.6121824273496	51.7024575669072	87.5589	25.1226	45.9834
76.143896416205	18.6121824273496	51.7024575669072	78.906	18.0381	53.555
76.143896416205	18.6121824273496	51.7024575669072	60.7013	1.36116	46.4176
76.143896416205	18.6121824273496	51.7024575669072	49.4944	16.327	40.7382
76.143896416205	18.6121824273496	51.7024575669072	60.6972	35.5066	52.4287
76.143896416205	18.6121824273496	51.7024575669072	56.9788	35.9946	54.4126
76.143896416205	18.6121824273496	51.7024575669072	56.0389	33.1015	51.1098
76.143896416205	18.6121824273496	51.7024575669072	55.5492	35.9315	44.2535
76.143896416205	18.6121824273496	51.7024575669072	61.5258	41.6034	50.3406
75.7077519170505	18.6443202396393	55.8123532567065	74.7866	36.0265	64.8468
75.7077519170505	18.6443202396393	55.8123532567065	74.0572	35.987	63.4666
75.2738557395066	18.6764179869859	59.7931497668703	82.6839	23.4883	70.1916
75.2738557395066	18.6764179869859	59.7931497668703	77.6794	29.1288	65.8649
74.8406003563276	18.7085167371284	63.7341232439054	89.036	30.7257	77.9388
74.4035770967847	18.7405517459805	67.4003373183758	73.4709	7.6166	79.1313
74.4035770967847	18.7405517459805	67.4003373183758	77.5205	18.1054	72.6356
73.9687236572547	18.7726598334204	71.0333575616625	75.2455	17.3084	91.8789
73.9687236572547	18.7726598334204	71.0333575616625	76.9072	18.2917	80.6948
73.5353275051172	18.8047840107174	74.4111995955758	93.1464	19.8146	96.7782
73.5353275051172	18.8047840107174	74.4111995955758	90.4883	12.6216	83.5226
68.6662112344424	18.8368679053775	74.7879712943769	68.0574	15.6194	97.6814
63.9345178620728	18.868941409149	75.1604871032221	61.5069	0.482106	98.5604
63.9345178620728	18.868941409149	75.1604871032221	64.5769	3.66176	91.1441
63.7170522837397	20.84745494754	75.1847901469831	52.4925	5.37248	88.2454
63.7170522837397	20.84745494754	75.1847901469831	51.1528	6.04103	87.327
63.5027116794831	23.0413923356437	75.2090857077895	55.9929	17.1432	85.8884
63.2890911350903	25.270935864318	75.2333787763074	55.717	37.8511	81.0117
63.2890911350903	25.270935864318	75.2333787763074	55.099	31.771	70.6981
63.0769938309584	27.4600257988613	75.257699741472	72.565	40.2263	84.1996
62.8645578277528	29.6053269482184	75.2820094182798	70.0979	43.9308	97.3335
62.652200821004	31.5539526168667	75.3062483291635	62.6521	52.6724	96.4246
56.668728056282	31.3187076012471	73.4314692754807	54.0007	52.8659	92.5002
51.5659510703612	31.0723684763985	70.7699404853958	44.5404	30.686	94.969
51.5659510703612	31.0723684763985	70.7699404853958	53.4254	44.9898	88.3964
46.9218111550807	30.8250098036793	67.5660784785059	42.4972	23.9973	88.7768
42.4928665432141	30.5784195260079	64.0882737769715	43.8962	13.6901	83.4665
42.4928665432141	30.5784195260079	64.0882737769715	41.7205	19.4188	86.0496
38.1814634716817	30.3354729606208	59.360733165837	39.9475	19.2268	79.8118
38.1814634716817	30.3354729606208	59.360733165837	46.0829	25.5503	78.1024
33.7747031389715	30.0939312661673	53.4028417695322	47.6864	20.3976	74.364
33.7747031389715	30.0939312661673	53.4028417695322	50.9211	16.4053	69.6798
25.6351469996422	29.8568459037707	30.9560896088759	21.4744	8.21886	12.0685
25.6351469996422	29.8568459037707	30.9560896088759	25.6231	12.6549	17.499
19.8658275121217	29.6335240716999	27.2705796012392	14.8737	9.51072	37.7455
19.8658275121217	29.6335240716999	27.2705796012392	15.6444	17.8995	34.8069
14.5834331619762	29.4123100754465	23.360716982556	19.5262	30.4483	48.5255
9.04959901495332	29.1909782317348	18.3972337298247	9.0496	1.67955	6.7742
9.04959901495332	29.1909782317348	18.3972337298247	0.219756000000004	2.58493	14.7832
8.42391371652907	29.190978233742	18.3972337240253	8.57052	3.36732	32.2638
8.42391371652907	29.190978233742	18.3972337240253	12.6307	2.70835	31.4638
6.69857643344392	29.190978235641	18.3972337182037	13.4	22.8874	2.3331
4.96046985053884	29.1909782375327	18.3972337123849	4.96047	4.06059	34.5353
3.78236560988762	32.7236140414067	11.4431388805683	28.6889	43.6077	12.417
3.78236560988762	32.7236140414067	11.4431388805683	26.2003	42.5604	24.4871
Route: 4 Length: 7.58138623707346 Demand Met: 108					
2.28315039218361	35.4671302154555	1.52974998002264E-7	11.7937	48.0467	6.2423
2.28315039218361	35.4671302154555	1.52974998002264E-7	12.5872	53.6987	19.2898
2.28315086759227	35.4532553683364	3.80825607493307E-7	17.5856	40.8861	25.0628
2.28315135199517	31.7178088505002	6.17041727934975E-7	12.7116	4.29147	5.5693
2.28315099318289	32.8616469690699	4.43975434194499E-7	2.00806	6.28968	2.6575
2.28315063464325	35.1597836628648	2.71024443776469E-7	2.40393	50.9808	25.185
2.28315063464325	35.1597836628648	2.71024443776469E-7	13.4598	41.6191	22.5554
2.28315027568891	35.3319403773843	9.89739064038986E-8	0.642905999999996	35.395	17.4189
2.28315027568891	35.3319403773843	9.89739064038986E-8	2.57158	38.4711	27.3546
Route: 5 Length: 281.180018204183 Demand Met: 799					
71.2128314379938	39.0135577738779	23.0848046204685	73.2088	32.0501	51.6558
71.2128314379938	39.0135577738779	23.0848046204685	76.05	41.1841	50.3284
78.1603588108671	59.1728600809071	24.0061804290978	81.8209	62.9891	53.3907
78.2345332140103	59.2410305546668	24.0173193195337	85.3959	62.1638	1.7086
78.2345332140103	59.2410305546668	24.0173193195337	95.4573	78.5053	38.9919
78.2345332140103	59.2410305546668	24.0173193195337	88.4474	55.9131	14.5629

Solution x	Solution y	Solution z	Original x	Original y	Original z
78.2345332140103	59.2410305546668	24.0173193195337	90.8764	48.3318	12.9357
78.2345332140103	59.2410305546668	24.0173193195337	84.0931	75.7357	43.6346
78.2345332140103	59.2410305546668	24.0173193195337	96.1419	41.3034	39.8142
78.2345332140103	59.2410305546668	24.0173193195337	82.7455	58.0479	28.4959
78.2345332140103	59.2410305546668	24.0173193195337	76.3859	55.8636	29.5918
78.2345332140103	59.2410305546668	24.0173193195337	74.8357	53.7031	27.6754
78.2345332140103	59.2410305546668	24.0173193195337	80.6139	53.7748	37.9975
78.2345332140103	59.2410305546668	24.0173193195337	74.6616	49.1772	30.6996
78.2345332140103	59.2410305546668	24.0173193195337	70.983	56.1077	39.9244
78.2345332140103	59.2410305546668	24.0173193195337	67.8108	54.6502	44.2592
78.2345332140103	59.2410305546668	24.0173193195337	58.3448	60.9201	41.5011
78.2345332140103	59.2410305546668	24.0173193195337	57.8122	54.5104	45.2899
78.2035143486286	65.668905595498	23.9701863717878	77.5352	78.0347	33.1993
78.2035143486286	65.668905595498	23.9701863717878	75.9957	81.402	37.5418
78.1726749093096	71.221901851763	23.9230039075768	91.8947	87.6684	31.3605
78.1726749093096	71.221901851763	23.9230039075768	80.7777	87.9354	23.575
78.1435409626763	75.9385041038644	23.8761213597385	96.3227	96.5824	35.4748
78.1435409626763	75.9385041038644	23.8761213597385	91.0373	94.8618	33.7328
70.5462005959317	75.965427928812	22.4874226321524	58.0371	93.3465	37.2538
70.5462005959317	75.965427928812	22.4874226321524	61.8453	80.8454	29.5157
64.8352418455121	75.9925967679294	21.0279293706433	60.2539	80.1704	27.9583
64.8352418455121	75.9925967679294	21.0279293706433	60.356	72.3736	25.6911
59.4431967241071	76.0198299775952	19.5584774974831	65.3011	67.1869	28.6409
53.9873356498228	76.0472415734764	18.0777468846399	66.7645	81.0279	23.2022
48.2837260900311	76.0747483785563	16.5921598601669	63.6977	85.2552	13.695
48.2837260900311	76.0747483785563	16.5921598601669	60.7208	77.8844	16.4053
41.8248079080986	76.1025669060169	15.119553359845	51.8363	98.9629	1.5963
27.709063444759	76.1298065685476	13.8313934302463	3.35356	88.986	2.7967
27.709063444759	76.1298065685476	13.8313934302463	1.02508	82.9527	3.7072
27.709063444759	76.1298065685476	13.8313934302463	16.854	97.4806	6.0907
27.709063444759	76.1298065685476	13.8313934302463	4.45068999999999	94.0863	19.178
27.709063444759	76.1298065685476	13.8313934302463	12.3803	91.1149	15.3598
27.709063444759	76.1298065685476	13.8313934302463	18.6101	90.3489	8.9268
27.709063444759	76.1298065685476	13.8313934302463	15.2733	95.1553	18.4059
27.709063444759	76.1298065685476	13.8313934302463	34.7579	99.7518	13.4448
27.709063444759	76.1298065685476	13.8313934302463	23.1083	96.0553	21.9675
27.709063444759	76.1298065685476	13.8313934302463	40.4171	94.2218	3.0792
27.709063444759	76.1298065685476	13.8313934302463	5.52590000000001	61.9092	6.1438
27.709063444759	76.1298065685476	13.8313934302463	9.17265	66.1356	6.7326
27.709063444759	76.1298065685476	13.8313934302463	32.7208	86.88	6.0296
27.709063444759	76.1298065685476	13.8313934302463	10.1219	82.045	24.5182
27.709063444759	76.1298065685476	13.8313934302463	8.89064000000001	83.8954	29.0611
27.709063444759	76.1298065685476	13.8313934302463	16.7243	94.3593	34.7835
27.709063444759	76.1298065685476	13.8313934302463	40.7053	85.7824	6.0265
27.709063444759	76.1298065685476	13.8313934302463	48.9418	95.7946	8.5835
27.709063444759	76.1298065685476	13.8313934302463	13.5318	57.9262	6.7229
27.709063444759	76.1298065685476	13.8313934302463	8.25408	64.3565	18.8288
27.709063444759	76.1298065685476	13.8313934302463	20.7262	75.308	17.3361
27.709063444759	76.1298065685476	13.8313934302463	54.7886	87.0165	7.4948
27.709063444759	76.1298065685476	13.8313934302463	29.5533	92.3189	26.5937
27.709063444759	76.1298065685476	13.8313934302463	48.934	88.5471	3.512
27.709063444759	76.1298065685476	13.8313934302463	24.7619	69.8637	9.1655
27.709063444759	76.1298065685476	13.8313934302463	17.2306	77.2747	24.7644
27.709063444759	76.1298065685476	13.8313934302463	10.9638	55.5178	10.1729
27.709063444759	76.1298065685476	13.8313934302463	49.8328	92.6571	10.5815
27.709063444759	76.1298065685476	13.8313934302463	34.7487	93.2543	26.9859
27.709063444759	76.1298065685476	13.8313934302463	33.1283	92.3481	27.8161
27.709063444759	76.1298065685476	13.8313934302463	23.3569	85.0798	30.5318
27.709063444759	76.1298065685476	13.8313934302463	31.2678	61.1344	2.0752
27.709063444759	76.1298065685476	13.8313934302463	16.5471	81.1813	37.3426
27.709063444759	76.1298065685476	13.8313934302463	45.1636	79.7971	7.5816
27.709063444759	76.1298065685476	13.8313934302463	43.3068	85.4106	16.2891
27.709063444759	76.1298065685476	13.8313934302463	50.5772	79.5094	6.7911
27.709063444759	76.1298065685476	13.8313934302463	54.169	81.8375	12.9059
27.709063444759	76.1298065685476	13.8313934302463	43.9629	81.9344	16.1851
27.709063444759	76.1298065685476	13.8313934302463	24.5176	59.5849	13.4915
27.709063444759	76.1298065685476	13.8313934302463	19.6656	61.3862	20.5906
27.709063444759	76.1298065685476	13.8313934302463	50.9984	83.4341	15.7476
27.709063444759	76.1298065685476	13.8313934302463	51.793	64.9464	0.9013
27.709063444759	76.1298065685476	13.8313934302463	26.7929	78.8352	37.5421
27.709063444759	76.1298065685476	13.8313934302463	22.8193	53.7552	17.9075
27.709063444759	76.1298065685476	13.8313934302463	30.6696	55.2626	12.0174
27.709063444759	76.1298065685476	13.8313934302463	45.6946	80.9262	23.2292
27.709063444759	76.1298065685476	13.8313934302463	52.5118	68.1256	10.9937
27.709063444759	76.1298065685476	13.8313934302463	36.723	86.3354	38.0239
27.709063444759	76.1298065685476	13.8313934302463	38.4806	81.2568	32.7466
27.709063444759	76.1298065685476	13.8313934302463	18.9042	62.1271	34.907
27.709063444759	76.1298065685476	13.8313934302463	47.6475	71.1843	17.3202
27.709063444759	76.1298065685476	13.8313934302463	41.4131	74.8199	27.7293
27.709063444759	76.1298065685476	13.8313934302463	22.5447	55.6169	28.4034

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.709063444759	76.1298065685476	13.8313934302463	35.9094	68.8825	29.2317
27.709063444759	76.1298065685476	13.8313934302463	45.2184	66.3382	18.5431
27.709063444759	76.1298065685476	13.8313934302463	37.4105	49.4356	12.3771
27.709063444759	76.1298065685476	13.8313934302463	25.6513	60.6643	37.4717
27.709063444759	76.1298065685476	13.8313934302463	32.641	61.5676	34.0062
27.709063444759	76.1298065685476	13.8313934302463	46.3399	71.17	31.2162
27.709063444759	76.1298065685476	13.8313934302463	33.4192	59.483	33.0004
10.8429790603548	41.6078134092607	8.37195972962542	5.81823	20.7452	12.0688
10.8429790603548	41.6078134092607	8.37195972962542	0.659450000000007	19.6999	21.228

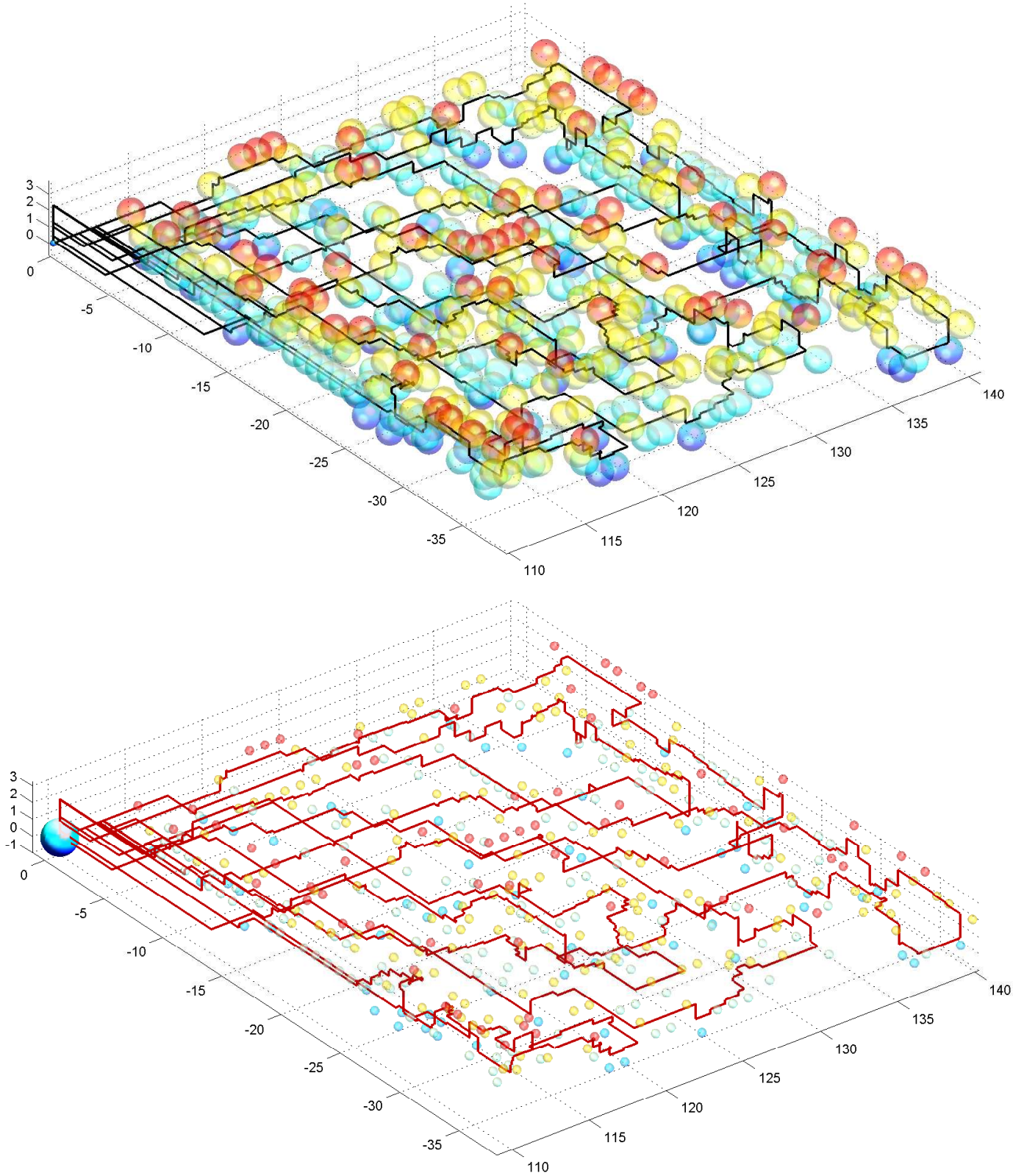


Figure O.186: *pcb*442, $r = 0.76$, Equal Radius, 3D, Manhattan, Length = 770.7649826

Table O-189: Solution for $pcb442$, $r = 0.76$, Equal Radius, 3D, Manhattan

Total distance: 770.764982629419 Total demand met: 1100 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 138.033110433722 Demand Met: 184					
6.9989055498192	2.35031583291298	0.252415123310186	7	3	0
13.7885282347789	2.5922917718036	0.648988801295654	14	3	1
15.4718729264785	2.79224292218822	0.954143110379509	15.5	3	1
17.0925669009225	2.98452497644178	1.25506691383978	17.1	3.1	2
18.0096177120073	3.0608897483186	1.27365121280549	18	3	1
18.9396501381239	3.13761751262719	1.29232709911009	19	3	1
19.8200861957717	3.21523700608532	1.31110948024052	20	3	2
20.0000013061499	3.34999974909931	1.32538637495357	20	3.7	2
21.0000000137078	3.35000034699522	1.3253863727402	21	3	2
21.9999995052572	3.93999739887253	1.0000004561507	22	4.7	1
22.2600712449743	3.64553144287156	0.810471911917252	22	3	1
23.0000000611615	3.5373987174172	0.537407384455485	23	3	0
23.9997275667177	3.55171627309175	1.48625830984744	24	3	2
24.9914442979232	3.57895683701336	1.51722036092795	25	3	2
25.6438754201117	4.02269107471132	1.53367481359243	26	4	1
26.0172690239739	4.48192725976997	1.55060408259256	26	5	1
27.4697376536055	4.50019891473876	1.88743793870627	27.5	5.2	2
28.5837622079444	4.51697597973728	2.15269729214455	29	5	2
29.0014032047822	4.53329091351508	2.46306645994353	29	4	3
29.4529663699738	6.99410431188154	2.47850924918585	30	7	3
29.4719895056168	8.02773024779457	2.48739112457929	30	8	3
29.4884482434027	9.92353227845028	2.49569295202516	30	10	3
29.5036697687463	10.7085832928524	2.50367588081524	30	11	3
28.4773162370129	10.7085831191441	1.99999965811814	28	11.3	2
28.4773158744683	9.59141711768967	1.00019453583298	28	9	1
29.0361684265625	9.59141816721725	0.999635333085559	29.3	9.5	1
29.5226880560752	9.59141921675378	0.999076145678622	30	9	1
29.5226894239674	11.9999984654581	0.591421712554629	30	12	0
29.5226854982199	12.9999417280275	1.41767349308335	30	13	2
29.5226815584055	14.0000000171901	1.44826722743608	29	14	2
29.5756659820456	15.035752723355	1.25375982004117	30	15	1
29.626856567108	16.1373429335814	1.07241073939196	30	16	1
29.6768594683119	17.5035778289185	0.89383970607158	29.5	17.5	1
29.6768594683119	17.5035778289185	0.89383970607158	30	18	1
29.6768594683119	17.5035778289185	0.89383970607158	30	17	1
29.7235193639638	19.0022034575777	0.693708060961849	30	19	0
29.7546977277017	20.7193274980994	0.662310610318294	30	21	0
29.7546979977836	20.7193276575728	1.25529264787505	29.5	20.5	1
29.7546982680727	20.7193278171899	1.99999916542065	30	20	2
29.7546982373661	21.9999995726388	2.28067200858807	30	22	3
29.7546969091748	22.2806725049218	1.00000217700365	30	23	1
28.4406825384176	22.2806726644595	0.849213901728756	28.5	22	1
27.0154231388441	22.2806728237289	0.695070966768448	27	22	0
26.2400022173414	22.2806729834877	0.664249105727638	26	22	0
26.2400019239674	22.9999481268612	2.27888666685973	26	23	3
26.2400023619537	23.0020447398329	1.99998251270545	27	23	2
26.2400027247982	23.9999999125596	0.721113115349679	26	24	0
26.3077027072081	24.6001928795645	0.90427966877272	26	25	1
26.3777941238632	25.0285408996897	1.0828462558909	27	25	1
26.4402595001782	25.4735088239556	1.26957677812633	26	26	1
26.5612114286647	25.5612117607141	2.56121163633129	27	26	3
20.4861961014441	24.9176996944259	2.46497311197441	20	25	3
20.3152238796876	23.2088363765806	2.21898775735544	20	23	2
20.1558055853849	22.0649087694889	1.98961573272494	20	22	2
19.999997999657	21.0006792353766	1.76000247736682	20	21	1
18.0000005624275	21.0003270274755	1.76000245250103	18	21	1
17.0000005357122	21.0000227251192	1.76000274585198	17	21	1
16.5374036523531	20.999724683362	2.46259738423892	16	21	3
16.9406200672664	18.3416752576621	2.37844121350287	17	18	3
17.2788883667374	18.0001833241094	2.24000439753654	18	18	2
16.0000343495892	17.9995554389955	2.24000403144485	16	18	3
15.4993513048759	17.998918988146	2.24000368078518	15.5	18.5	2
14.9999911616995	17.9982824191176	2.24000331178162	15	18	3
13.9999930682488	17.9975364925246	2.24000289757862	14	18	3
13.5000856952151	16.9999960726094	2.24000283065502	13.5	17	3
13.4002831740685	15.3512489595522	2.24000255760598	14	15	2
12.7664226169323	15.1724799267319	2.24000229061671	13	15	2
12.0000002872896	14.9999981290118	2.240002020452	12	15	3
11.5000000063948	14.2600023461892	1.99999964065313	11.5	13.5	2
10.9999996779655	14.4276337046745	1.50000031459289	11	15	1
9.99999999938578	14.4276339004075	1.49999999292747	10	15	2
9.00000000035314	14.4276338966661	1.49999941749799	9	15	1
7.99999812396074	14.4276337825652	1.49999899299107	8	15	1
5.00000021846675	14.4276335783788	1.49999867048265	5	15	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
4.02184223494238	14.2903321913442	1.0335599731221	4	15	1
3.17800643277998	13.7856686631309	0.617868727361555	3	14	0
2.67480145642496	12.8096402362446	0.425652477034074	3	13	1
Route: 2 Length: 117.245559727413 Demand Met: 181					
1.66051657641545	12.9667403454724	0.213867941186945	2	13	0
2.63506688915197	21.6562494039882	0.440897097788045	3	22	0
3.03646156398686	22.3208033200079	0.822735324661989	3	23	1
3.48294454879965	22.4885244485021	1.08686930433455	4	22	1
3.62878047284634	23.089301289059	1.42000365964075	4	23	2
3.7391491825886	23.9732599274337	1.57559976681761	4	24	1
3.84048739795534	24.800945586729	1.79311948101995	4	25	2
3.93999774414561	25.4999995232744	2.00000013084568	4.7	25.5	2
3.00000005314018	25.6757811398355	2.3126241355348	3	26	3
2.34773999651627	25.6757811818475	1.9999990820009	2	25	2
2.34773952433271	26.0000002441184	0.675781505486656	2	26	0
2.34773999558365	27.0865352489838	0.840727809517851	2	27	1
2.34774046688507	28.3242188317459	1.00000113946238	2	29	1
2.55208191975737	28.3242188744715	1.71038162264972	2	28	2
3.31262402341775	28.3242189169163	1.99999875081302	4	28	2
3.26513769084039	28.9508714652456	2.07027778880302	4	29	2
2.96099258617576	29.3074767891386	2.14812171289844	3	29	2
2.65045574269541	29.7161319656995	2.22696767268348	3	30	2
2.27302439348098	30.0594859510571	2.30817711658973	2	30	3
2.18770244326031	31.0590723531654	2.33715146540686	2	31	3
2.11052194104283	32.6004333371413	2.36302631227774	2	33	3
2.11052119232903	32.6004331485105	1.45262465048768	2	32	1
2.11052084299604	33.9035616428346	1.45262461227878	2	34	1
2.11052049356039	34.9999995327406	1.45262457397931	1.5	35	1
2.1452680420638	35.2692639251356	1.92063226802613	2	36	2
2.18811070188373	35.3011935062042	2.11399153775862	1.5	35.5	2
2.25189398721051	35.3310256877142	2.37339260360717	2	35	3
3.062855977479	35.3983721639129	2.39873968000058	3	35	2
3.96680279992445	35.4698308306138	2.42463558127674	4	35	3
4.45931950680463	36.0102014117571	2.44336856070684	4	36	2
6.19999986897682	36.5625949740634	2.46259842663512	6.2	37.1	3
6.63469766355955	36.3768683512419	1.89224518857868	6.2	36.5	2
7.243964828542	36.1848057846488	1.26284094244425	7	36	1
8.00614435018366	36.001833503841	0.749240478505315	8	36	0
8.99759576849642	35.819683775656	0.720758314866645	9	36	0
9.99999966432969	33.2897154572749	0.702615980302847	10	33	0
10.2973839472603	33.2897153311111	1.00000007584151	11	33	1
9.00000011680876	33.2897160747754	1.29738450264705	9	33	2
7.99999992809182	33.2897176395176	1.29738512941673	8	33	2
6.84079786796484	33.4968784250193	1.29738524485956	7	33	1
4.70018517106071	33.8005958585011	1.29738536043798	4.7	34.5	1
4.69981220011061	33.7882240596283	2.29677099454243	4.7	33.5	3
4.00991763446095	33.7882239322342	2.28046991462017	4	34	3
3.51659965870721	33.7882237344874	1.51563588010547	3	34	1
3.53246299288783	33.0727969904969	1.51567552543398	3	33	1
3.55301064888174	32.7788479980039	1.51571531025313	4	33	1
3.57196701580615	32.0930681856104	1.51575514471185	4	32	1
3.57196701580615	32.0930681856104	1.51575514471185	3	32	2
4.61421078461417	31.9999991873102	1.51579442741543	5.2	32	2
4.53692233238262	31.2651571000678	1.51579361212362	5	31	1
4.05283728497226	31.1306675147319	1.51579279703826	4	31	2
3.585786969997	30.9999974139638	1.51579198135364	3	31	2
3.58578633486682	29.9611384579784	0.595747957767809	4	30	0
3.58578569528336	28.0000003099334	0.484209169802223	3	28	0
3.58578556828699	27.097287672255	0.484208432844503	4	27	0
3.58578543941617	26.4142133341047	0.484207696008788	4	26	0
3.00000065271769	26.4142132045001	0.484207938692524	3	27	0
2.77536524125097	25.0926224121044	0.509926095873091	3	25	0
2.52198908787081	24.0511295276904	0.536379337859655	2	24	0
2.48358545696442	23.7278496333421	0.603793353924593	3	24	1
2.43919460594425	22.912794571376	0.66094111578924	2	23	1
2.39645085602905	21.9666364010655	0.715994028396858	2	22	1
2.35478055458313	20.9777258729639	0.769772427229337	2	21	1
2.31388878270224	19.9653104506391	0.822708380139063	2	20	1
2.27358951040516	18.9158600567731	0.875082594700791	2	19	1
2.23375694942276	17.763005463639	0.927096779149991	2	18	1
2.19432974026746	16.1115676371665	0.978896615476526	2	16	1
2.15519031664545	14.7218943432417	1.03064565420563	2	15	1
2.11630148998584	12.3393243676522	1.08248803109373	2	12	1
2.07760995646248	11.1151776945965	1.13459229452684	2	11	1
2.03902267836486	10.0370186233381	1.18704788279101	2	10	1
2.00048430968366	8.99999997175498	1.23999863129531	2	9	2
2.000170300937	7.80163321324737	1.23999865094268	2	8	1
1.99985629069718	6.19642467690836	1.23999867059606	2	6	1
1.99954227952655	4.99999985552496	1.23999869026212	2	5	2
Route: 3 Length: 138.274791831388 Demand Met: 183					

Solution x	Solution y	Solution z	Original x	Original y	Original z
2.47445918262318	8.75734623088426	0.751916447574091	3	9	1
2.99934247363024	9.99999993703646	1.23999792313449	3	10	2
3.00002107026096	10.9990869807674	1.23999790429303	3	11	1
3.00069966971142	12.0000001880041	1.23999788549435	3	12	2
3.36862005434806	13.9175985677707	1.148081736784	4	14	1
3.57193037295268	15.1602519174451	1.06024140239638	3	15	1
3.85062687182695	17.4967326938273	0.973494451397267	4	18	1
4.11084809485371	18.2713991662298	0.886441164624908	4	19	1
5.25042682429242	18.3204038030377	0.770279082922195	5	18.3	1
6.91995600881677	18.3694850033783	0.650806465147999	7	18	0
7.11877447609562	21.0939096002871	0.628796099416153	7	21	1
7.32367140223498	25.1045650587144	0.606567391569163	7.5	25.5	1
7.51353211323776	25.9999999836466	0.583912595282233	8	26	0
7.51353219827236	26.8160036720967	0.583912735006363	7	27	1
7.51353228393359	27.287109606714	0.583912874448932	8	27	1
7.51353236907464	29.9994685065901	0.583913013559371	8	30	0
7.51353124637778	30.0002378701446	1.43974014840872	7	30	2
8.95352247552015	30.4070558464244	1.43973793459809	9	30	2
9.99999994491843	35.4864738732807	1.43973571856205	10	36	2
10.9996277875239	35.4864789438226	1.43973103339062	11	36	1
11.9996586375351	35.4864840092231	1.43972635150673	12	36	1
12.9999999937206	35.4864890698789	1.43972167272634	13	36	2
14.0000000088063	35.4864915168049	0.560281776364118	14	36	0
14.9954393474173	35.424821564494	0.760190036337873	15	36	1
15.9817919506227	35.3563994270989	0.936945410637785	16	36	1
16.9146312423427	35.2760446971123	1.10791490347292	17	36	1
17.325253350958	34.3048647344799	1.3522518037884	17.2	34.1	2
17.9000006690907	33.8568173221241	1.48273693125543	17.9	33.3	2
18.4119798033652	34.2592043187166	1.48273393621718	18.3	34.5	2
19.0000003080824	34.6129926146881	1.48273093987161	19	35.2	1
20.1245785194835	34.6129918401323	1.4827314719186	20	35	2
22.558637354272	34.612991064669	1.48273200349437	23	35	1
22.5586379894399	33.9999998865056	2.3812862274595	23	34	3
22.5584473331076	32.5001913142327	1.72049841514532	22.8	32.5	1
22.5582170340509	31.7954847141078	1.72013052969012	23.2	31.5	2
22.0240143680216	31.7949915057064	1.71892130039143	22	32	2
21.4998796307266	31.7944980430214	1.71771052212703	21.5	32.5	2
20.8669338597722	31.5087170276011	1.1871006569751	21	32	1
20.1203430819888	31.1203426323531	0.740703473955742	20	31	0
20.1203418635473	31.1203414126887	2.46211023958533	20.5	31.5	3
19.8524368683999	30.3587560985336	2.46211099495624	20	30	3
19.5369194254623	29.9999997784908	2.46211174868797	19	30	3
19.5369201629564	29.0004776641314	1.58153775980883	20	29	1
19.5369208982902	28.0100431086912	1.51056850955566	20	28	2
19.5369216331853	27.0629482983403	1.42750781142587	20	27	2
19.5369223665155	26.6026316539697	1.00000009428987	20	26	1
18.753501629456	26.9488809889599	0.675881739765706	18.3	27	1
18.2999997371757	27.2871240753433	0.26346493511889	18.3	28	0
16.1217895094246	26.9363577874305	0.26346464283767	16	27	0
14.4378622547156	26.5773045878968	0.263464350692451	14	27	0
13.999999840921	25.7128758020594	0.263464058948142	14	25	0
12.4652932488616	26.4599131517617	0.263464688389216	12	27	0
12.4652931592601	26.4599130737039	1.99999748849285	13	27	2
12.2984273316707	24.2668346214883	2.09933902312472	12	24	2
12.1414767550558	23.0128486572374	2.20022863316691	11.7	22.8	2
12.0015016908125	22.1590301327547	2.30508962201267	12.2	22.1	3
11.8014057084845	21.6126444118831	2.36393069988845	12	21	2
10.9999999740053	21.5374029789933	2.4625963191198	11	21	3
10.0667693210656	21.6497833336451	2.27410994572201	10	21	2
9.42650703814847	21.8737636161768	2.13550048850244	9.5	22.2	2
8.74999360959279	22.0822898530258	2.0000011264005	8.5	22.8	2
8.74999325074452	21.0792872797191	1.92961182723697	8	21	2
8.74999289797108	20.9999956331159	1.71770517492842	9	21	1
8.74999211343635	18.0000016099995	1.71770482710703	9	18	1
8.00668439036407	17.867195711915	1.74065854372096	8	18	1
7.42769650723314	16.1779658163478	1.99055017334588	7	16	2
6.99999841606342	14.9999997236569	2.23999761655413	7	15	3
4.00123961049053	13.0000004074375	2.2399984996048	4	13	3
4.00041425185711	11.9990970815518	2.23999863090687	4	12	2
3.99958893038168	10.9999978836599	2.23999876224994	4	11	3
3.998685812974	8.00000115549194	2.23999878148997	4	8	3
3.5308506095772	7.36626590510459	2.23999831936513	4	7	2
1.99999990355558	6.99999855221637	2.23999785743938	2	7	3
Route: 4 Length: 151.930973239885 Demand Met: 184					
2.80904035111898	6.91577531058994	0.306054472257349	3	7	1
3.25997712903359	7.95429965025248	0.405671035261886	3	8	0
3.80502258911162	8.92740513985684	0.51158395885623	4	9	0
4.26040113083094	9.78986082728828	0.629342480738047	4	10	0
7.77504173013722	10.1601419525417	0.887956360770161	8	10.3	1
9.72796314678099	10.5121231290208	1.13918123939968	10	11	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.6638729776013	10.7725176131076	1.41001825662667	10.5	10.5	2
13.0347338596622	11.1341452833148	1.57620875297836	13	11.3	2
15.7198415742488	11.4685506045859	1.72783497124676	16	11	2
16.664133865299	12.0131043313931	1.86548137497737	17	12	2
17.3605287549561	12.5623824384074	2.00031993104119	18	12.3	2
17.573673783288	14.6452697413794	2.13523969013949	17	15	2
18.1031415923883	15.0970408260288	2.28352994850752	18	15	3
19.6605164375504	16.0443399541898	2.34782834750321	20	16	3
19.8348981721101	18.6202133125248	2.38712610518924	20	19	2
20.0000009327129	19.4999999838414	2.42763405232975	20	20	3
21.6999985769301	19.5000000697225	2.42763405213244	21.7	19	3
21.810195367685	19.9396849115867	2.16586815462077	21.1	20	2
23.9890046143565	20.2719291775914	1.99428802231831	24	21	2
25.7306701693186	20.3619172844621	1.82112835294229	26	21	2
26.1012922252506	20.4239821882485	1.59186283523207	26	20	1
26.9179781996023	20.5232068341262	1.5152465756107	27	20	1
27.3013048691668	21.2867533964625	1.46949974148902	27	21	1
27.8711619978228	23.2753128521628	1.4263880220448	27.6	23.6	1
28.7807569836203	24.0597467139239	1.38511144205755	29	24	2
29.3202329475598	25.00000010253	1.33988278032115	30	25	1
29.3202326602831	25.9999999869789	1.33988247695742	30	26	1
29.1797673533574	26.9999996010658	1.33988247910613	28.5	27	1
29.4354985869552	27.1923668392586	1.44272917410497	30	27	1
29.5000016048421	28.0000000286706	2.42763164433318	30	28	3
29.5000005674397	28.9990134140976	1.72461842363703	30	29	2
29.4999995279688	29.9999996185909	0.572367424193601	29	30	0
29.6399673138332	30.1764043726494	0.628364254131504	30	30	0
29.7006999458377	31.0556914452595	1.31904468853926	30	31	1
29.7600093310572	32.0000000480119	2.27888375146452	30	32	3
29.7600098358779	32.9985446944302	2.27888353679947	30	33	2
29.7600103646368	34.0000000155002	2.27888332465693	30	34	3
29.7600106127666	35.027427956715	2.18451017671502	30	35	2
29.7600108582124	36.0916144446574	2.09185076777706	30	36	2
29.7600110800847	37.2788828330217	1.99999882764057	30	38	2
29.7600109042169	37.2788811544073	0.665007641031355	30	37	0
27.0002689145624	37.2788824403195	0.759999446627273	27	38	1
26.9996939579695	36.9999907467126	0.760000117297788	27	37	0
26.999088779243	36.0000913107185	0.760001476314185	27	36	0
26.7658466526635	35.9967144211806	1.94400282860492	26.2	36.5	2
26.7629258532143	34.9965776885717	1.97187978678096	27	35	2
26.7600026265728	34.0000003651357	1.99972667130003	26	34	2
27.208838915454	33.7579559021167	2.00000122995462	27	34	2
27.7399973079105	33.4999997399362	2.00027578841247	28.5	33.5	2
27.5104487323386	32.8238160017486	2.09997414021795	27	33	2
27.3222487983295	31.9590327584756	2.20158785306802	27	32	2
27.1468323119431	31.0598212153943	2.30573452425308	27	31	3
26.9999996074956	30.4276317174257	2.37172061854265	27	30	3
26.5926793446827	30.4276319877536	1.92107529030268	26	30	2
26.4999990056204	30.4276322606206	1.00000050908606	26	31	1
26.4999991316446	29.3969360153172	0.803566637789336	27	29	1
26.4999992627887	28.9999991575127	0.572367220160875	26	29	0
26.4999996455509	28.0000003224906	0.572366433788715	27	28	0
26.4613390358375	27.7562165494102	0.815008854902795	26	28	1
26.4239279484075	27.4816412734004	1.04060173867985	27	27	1
25.9999998145111	27.4399974515067	1.38031796167648	26	27	2
22.2000001290795	27.4399977793304	1.00000006594852	22.2	28.2	1
21.2199928666504	27.2060528944738	0.672246711136422	21.2	27.5	0
20.4418690113297	23.9902982494552	0.589556188358314	20	24	0
20.3144938353185	18.2181919437132	0.541647578084078	20	18	0
20.2034880860907	17.1964831113277	0.497932208789461	20	17	0
20.0973231160351	16.471390587987	0.456068112665179	20.6	16.5	1
16.2122830982404	15.3017401402663	0.38449394410475	16	15	1
15.7093248665946	14.9999997103081	0.272874725178905	15	15	0
15.7788872339796	12.9999999733492	0.272874562986965	16	13	1
15.7788883717804	10.5000000571255	0.240000526459818	16.5	10.5	0
14.0000042645973	9.29999841317223	0.24000020528001	14	9.3	1
13.2768613706212	7.4057663501825	0.239999835177182	13	7	0
12.7468018615841	6.61404555736615	0.239999465394816	13	6	0
8.84590954947133	6.42228766103104	0.239999095652726	8.5	7	0
8.49999913030868	5.20000018646745	0.239998726043808	8.5	5.2	1
7.20314858971825	4.41136932789394	0.118191787263057	7.5	4.9	0
Route: 5 Length: 111.768938558183 Demand Met: 184					
2.57057186971042	4.6529810042488	0.643748369435125	3	5	1
3.07306028739295	5.31818242247697	0.989719847628463	3	6	1
3.69434555910854	5.52087895904122	1.33085605126539	4	5	1
4.00000018193181	5.99999966721955	2.23999866556591	4	6	3
6.63902538383806	6.14791795535344	2.16194916665414	7	6	2
7.81083909867314	6.30038449659441	2.08518849942404	8	6	2
8.74341411788146	6.46178810957764	2.00904599638643	9	6	2
9.4000199499462	6.64835736539633	1.93304257822983	9.40000000000001	7.4	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.0706744258508	6.6650749836724	1.81854131903604	10	6	2
10.9999996052568	6.68285707901614	1.69066821678723	11	7	1
11.2083349295757	6.68285712512654	1.81679872046541	11	6	2
12.0864223280477	6.68285717223379	1.91016036516584	12	6	2
13.6663710323691	6.68285721993346	2.00000049844083	14	6	2
13.6663714372676	7.49999965431478	2.2584321227348	13.5	7.5	3
14.5091815854352	7.68348578867355	2.24492563528585	14.5	7.7	3
17.4831280053055	7.82419007534621	1.64700603097883	17.5	7.5	1
19.4971797758456	8.10744503340214	1.53474920600947	20	8	1
19.5826990103156	9.02324596621317	1.48682436291141	20	9	1
19.6593466134042	10.0052287093986	1.4423153769293	20	10	1
19.7322624664608	10.9982383496318	1.39948743702316	20	11	1
19.8031311429926	11.9926596466775	1.35774022303996	20	12	1
19.8728068221681	12.9845944596488	1.31677014496868	20	13	2
19.9390025676956	13.9136997356872	1.26730372041064	20	14	2
20.0000025769059	14.2399984195941	1.00036140048995	20	15	1
22.4234540956296	14.2399983614765	0.999965091961224	22.9	14	1
23.2000000052992	14.2399983459525	0.999568750461391	23.2	15	1
23.90000007968	13.5609847355521	0.512736917628838	23.9	13	0
25.9846393808293	13.57711086068	0.512738152151941	26	13	1
26.4167502346182	14.9999991783215	0.512739372618398	27	15	1
26.4167506931495	15.2979009060604	0.512739686584355	26	15	1
26.4167511416497	16.1544725049318	0.512739999894502	26	16	1
26.4167515798021	17.9999961078989	0.512740312505436	27	18	1
26.416752002589	18.6244761903988	0.512740604765278	26	19	0
26.532790930627	18.6244766565687	2.53277269714135	27	19	3
26.5302154697792	17.9521160600701	2.34493031844717	26	18	2
26.5276502718654	17.2001793127412	2.18982305780054	26	17	2
26.5250928479899	16.6684246037301	2.04578887034723	27	17	2
26.5225285763825	15.7771025702777	1.90409054905409	27	16	2
26.5199586410527	14.3705468912374	1.75917241645455	26	14	2
26.5174048465311	13.9954143643191	1.5854213600952	27	14	1
26.5132346960705	13.0095612446773	1.58035973731748	27	13	2
26.5090378987479	12.0593232509848	1.57526510131205	27	12	1
26.5000000602406	12.0000037310476	1.57236616803255	26	12	1
26.4999999902052	11.0002709540016	1.57236617182901	27	11	1
26.318486586466	10.9998398445818	2.30994973457633	26	11	3
26.3184865466437	10.1194063550397	1.2916813311188	26	10	1
26.3184865067207	9.35541802302443	0.591478998176416	26	9	0
26.597362076282	9.35541812773684	1.000000268673	27	10	1
26.5973622163422	8.77302724090735	1.77291542544254	27	9	2
26.5973623562008	8.00000007435972	2.35541794669692	27	8	3
26.5107510669835	7.54309087731426	2.10375744092979	27	7	2
25.9223625514937	7.46664419498425	1.93880090606781	26	8	2
25.2828526045451	7.38384825769878	1.77036806984834	25	8	2
25.0429851005503	7.23491235666645	1.51130775112716	25.5	7.1	2
24.4999997316746	7.09999773373888	0.760001898377528	24.5	7.1	0
23.9999983527911	6.00040160239668	1.23999827839948	24	6	2
23.0000000077669	6.00018979110884	0.760001796501341	23	6	0
21.9969512405334	6.00005149551337	1.36787572685664	22	6	1
21.0000000084543	5.99991319432371	2.23999825991115	21	6	3
20.0000000172293	5.99973950725741	1.76000184534637	20	6	1
18.9975879128246	5.99954210358301	1.76000122729773	19	6	2
17.9999994410081	5.99934427660204	1.7600005875912	18	6	1
17.09999944433	5.10000170361218	1.76000067665289	17.1	5.1	1
15.4999999363171	4.99999797491649	2.23999848633885	15.5	5	3
13.1738330293927	3.51645844223661	2.23999870895804	13	3	2
12.000000064458	3.00063746949098	2.23999893173035	12	3	3
11.0000000054702	3.00009519186498	2.23999888797861	11	3	3
9.99999994181593	2.99958709574251	2.2399987451862	10	3	3
8.64615056850033	2.80879013156455	1.81537639442431	8	3	2
8.43618703697075	2.56156276493803	0.979091214330201	9	3	1
Route: 6 Length: 113.511608838829 Demand Met: 184					
2.83371504404202	3.4167336968994	0.147666903937324	3	4	0
4.04996478476554	3.93109448531385	0.305475102077493	4	4	1
6.04370070668554	4.34597751701235	0.395985116728288	6	4	1
10.462591113031	9.00000001042346	0.462604542099499	11	9	1
10.4529675957055	16.1496885504116	0.453159810198186	10	16.3	0
10.4443568725144	17.5723836308961	0.444177531280224	10	18	0
11.1079687823501	17.5723813459614	0.471465364581072	11	18	0
11.9999998910422	17.5723790730151	0.500015298184087	12	17	1
12.3939496448557	17.9667053385465	0.500014782745112	12	18	0
13.1616191873483	18.3468872647353	0.500014267364592	13	18	1
14.4276461370428	19.000000042232	0.500013751916102	15	19	0
14.427643973453	19.9992266852719	1.40094381490374	14	20	2
14.427641810843	20.9980886156512	1.4999948451954	15	21	2
13.9982913117464	20.9991056089181	1.4999973356758	14	21	2
13.5723657112131	21.0001225438575	1.49999982593911	13	21	2
13.5723656738751	21.4810688386345	1.49999985997132	13.5	21.4	1
13.5723656366042	22.0000035090169	1.49999989408552	13	22	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
13.5723656708326	23.999316440267	1.49999998869846	13	24	1
14.1708247337722	23.9995351955323	1.57652854373355	14	24	1
15.0070926882495	23.9997538969854	1.66321245500447	15	24	1
15.871126917559	23.9999725598044	1.77815409714632	16	24	2
16.6534791266399	24.0001911987981	1.88994996868738	17	24	2
17.2399980616165	24.000409827699	1.99999952407775	18	24	2
17.1714958861712	25.7044109159483	2.05691782708971	17.9	25.8	2
16.8076815834395	26.1526654407708	2.11695281055289	17.2	26.1	2
16.348710541874	26.6195365186958	2.17758003681989	16.9	26.8	2
15.0000009313859	27.0000000838484	2.23999790373427	15	27	3
14.8616111971513	27.5799431047702	2.02293529318569	15	28	2
14.7193260718875	28.0090902577808	1.80726588724465	15	28.6	2
14.5374031942818	28.2000005153635	1.5374020912482	14	28.2	1
14.53740315018	29.0000001128618	1.53740204699757	14	29	1
14.5374032545034	29.9999986365751	1.53740215085363	14	30	1
14.9725443242071	30.1082350423341	1.57217508422881	15	30	2
15.4004854058791	30.2184734966247	1.60623791300506	16	30	2
15.4385820470697	32.6469831933745	1.62879563625957	16	33	2
14.8156742990453	32.6469830586833	1.62879546578557	15	33	2
13.9879444966682	32.6469829238501	1.62879529524518	14	33	1
13.0654624634722	32.6469827883698	1.62879512557749	13	33	2
12.2399982431283	32.646982652725	1.62879495584838	12	33	1
12.2399979222485	30.0000017592475	1.99999921104906	13	30	2
11.707345172217	29.9345812543139	2.13242926538999	12	30	2
11.0536893847194	29.8689768515042	2.26764764938157	11	30	2
10.4257853531378	29.8028151406414	2.40863604494095	10	30	3
10.3953283775227	27.1331168392176	2.42815944966478	11	27	2
9.5374024689404	27.0000000106985	2.46259735975984	9	27	3
9.57239349424627	26.8719571720035	1.6057836368315	10	27	1
9.59245947109174	26.0108737667071	1.57276405388452	9.09999999999999	26	1
9.88351515777951	25.5611598931894	1.5611698590272	10	26	2
10.1534167612865	24.4309091728314	1.5493915771875	10	24	2
10.4625957125865	24.0000016259346	1.53740066078138	11	24	1
9.06873766130811	23.9737340029011	1.6208968587887	9	24	1
7.99314567091615	23.9474238867963	1.71987136366809	8	24	1
6.84126670500135	23.9207695775245	2.03997253362656	7	24	2
5.43740260121643	23.894052273394	2.36414527337905	5.40000000000001	24.3	3
5.1979037987164	23.0124118634122	2.38038220189447	5.40000000000001	23.3	2
4.93578171574916	21.4545930668999	2.39679333326256	5.3	21	2
4.16063569598558	21.1885462273834	2.41395509680034	4	21	3
3.61840494810397	20.9610035252494	2.430571257174	3	21	2
3.5959232787401	20.3118497727562	2.46379976400901	4	20	2
3.5723653798826	19.9999995600143	2.49999974326094	3	20	3
3.57236509586397	19.0000000772947	2.50000009123324	3	19	2
3.57236488595058	18.0000000683218	2.50000054378631	3	18	2
3.57236490578747	17.0918376145503	2.51167292203341	4	17	3
3.57236492533487	16.4085641716902	2.52270989245313	4	16	3
3.00000014432128	16.4085641679482	2.52270979327756	3	17	3
2.6695313986928	16.3751571644365	2.43015402087342	3	16	2
2.10687080853238	16.3431896218868	2.34973973185708	2	17	2
1.96380197941873	13.9386136748255	2.31518813009398	2	14	3
1.81838365586508	4.00492301954281	2.27575920639956	2	4	3

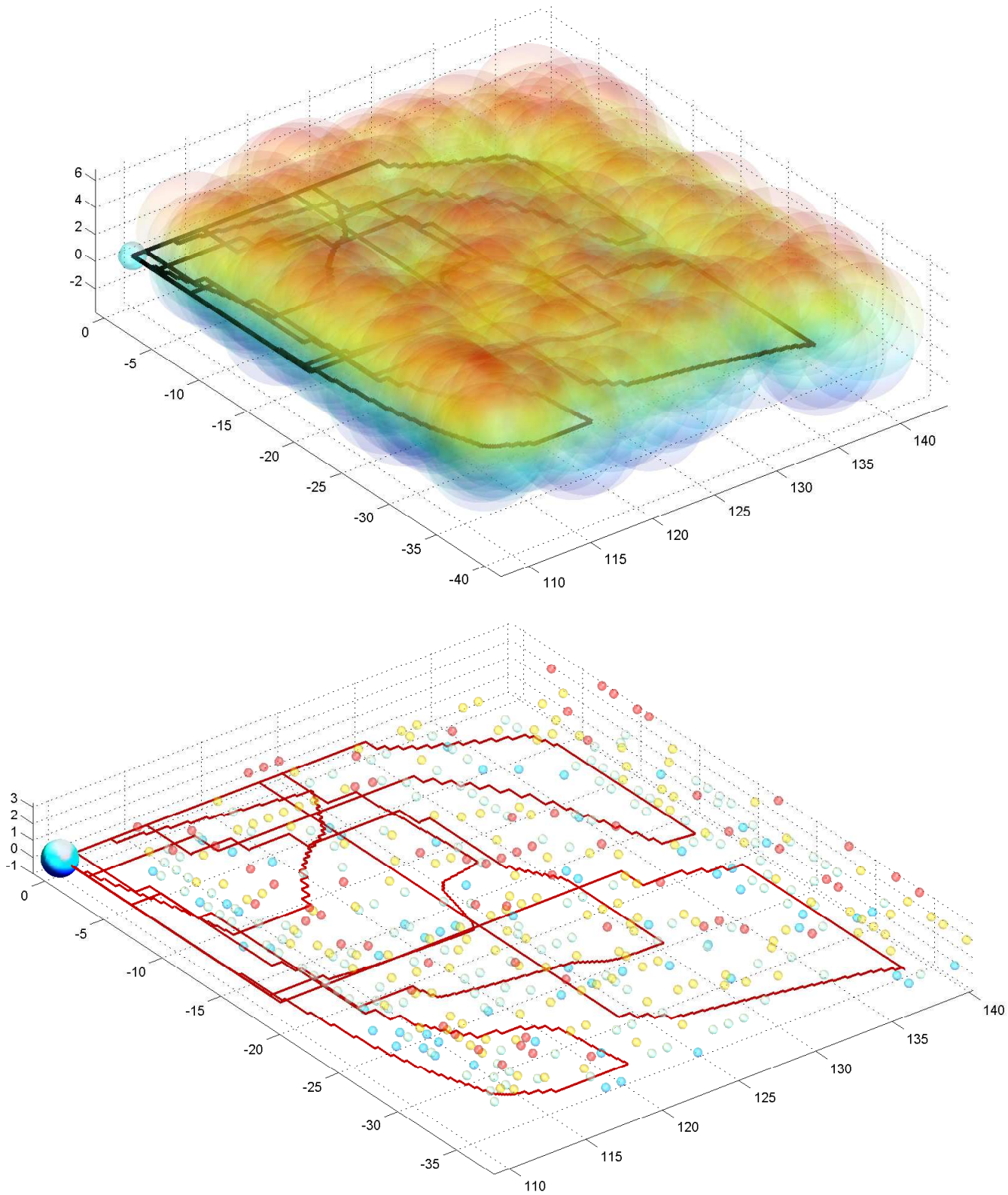


Figure O.187: *pcb*442, $r = 3.8$, Equal Radius, 3D, Manhattan, Length = 528.1612118

Table O-190: Solution for $pcb442$, $r = 3.8$, Equal Radius, 3D, Manhattan

Total distance: 528.161211805445 Total demand met: 1100 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 126.861072105504 Demand Met: 182					
12.9847431877892	30.6357854658565	7.92410732586291E-8	15	33	2
13.6845872522175	31.2495035489436	1.59889879114417E-7	14	33	1
14.382678721662	31.8377879795873	2.40537552542719E-7	16	33	2
15.023025303313	32.4014550425357	3.21182442419854E-7	15	36	1
15.6773467363104	32.5545920254277	4.01813827544117E-7	16	36	1
16.283198855963	32.6797412289543	4.82440418281271E-7	17.2	34.1	2
16.8708488788106	32.8037154137749	5.63065297498611E-7	17.9	33.3	2
17.4432186435195	32.9276599182999	6.43688848001034E-7	17	36	1
18.0471838561873	33.0452272526086	7.2431112663196E-7	19	35.2	1
18.6329769887156	33.1611254543388	8.04932954068249E-7	18.3	34.5	2
19.2340268459722	33.2762656446922	8.85553584240029E-7	20	35	2
19.8194379248155	33.3899818477964	9.66172743588345E-7	20.5	31.5	3
20.3307961116626	33.5145696159759	1.04678825607607E-6	20	31	0
20.8543531576252	33.6423267737721	1.12740446578385E-6	21	32	1
21.3818069033048	33.7719366405023	1.20802061331915E-6	21.5	32.5	2
21.9134557011492	33.9033975543412	1.28863589576866E-6	22	32	2
22.449765355379	34.0380957589026	1.36925017546474E-6	23	34	3
22.9756738728586	34.1734523051998	1.44986233419075E-6	23	35	1
23.5078929121092	34.3087217794704	1.53047450179855E-6	22.8	32.5	1
24.0598169982108	34.4464559603248	1.61108667029453E-6	23.2	31.5	2
24.8147945961753	34.622585038035	1.69169750918741E-6	26	34	2
25.5399942825836	34.800925061951	1.77230759579317E-6	27	35	2
26.22629878176	34.9798075857959	1.85291685284028E-6	27	32	2
26.761077677967	35.2327725004894	1.93352721211681E-6	27	38	1
27.2943059947857	35.4710259028409	2.01413745948287E-6	30	35	2
27.715195228437	35.7153387295681	2.09474687729028E-6	30	38	2
27.7140272279501	35.5195765671008	2.04545344040241E-6	27	37	0
27.7128595755755	35.3222559865355	1.99616138374381E-6	30	37	0
27.7116901073309	35.119174319261	1.94687253873838E-6	30	36	2
27.710519555305	34.9122080899407	1.89758156299291E-6	27	36	0
27.7093493115977	34.7046187903008	1.84829162108713E-6	26.2	36.5	2
27.7081803366184	34.4898549174978	1.79899950936147E-6	27	34	2
27.7070116627371	34.2779258052227	1.74970668798125E-6	27	33	2
27.7058432871288	34.0712198702274	1.70041326885695E-6	30	33	2
27.7046741317039	33.8719720836845	1.65111891625713E-6	28.5	33.5	2
27.7035048903344	33.6749132246801	1.60182361153005E-6	30	34	3
27.7022927003115	32.2654197021442	1.55282988956174E-6	30	32	3
27.701058020607	31.7684851110668	1.50400144782736E-6	30	31	1
27.6998226965278	31.2963926055186	1.45517275296214E-6	26	31	1
27.6985878998095	30.8354771488915	1.40634400924711E-6	27	31	3
27.697353484111	30.3783643139203	1.35751330265776E-6	30	30	0
27.6961183519122	29.9335248565174	1.3086835970455E-6	29	30	0
27.6948829935156	29.4941044123142	1.25985460464051E-6	27	30	3
27.69364800996	29.0495773501413	1.21102363781489E-6	26	30	2
27.6924136705671	28.5952749335698	1.1621917233029E-6	30	29	2
27.6911782878634	28.1382282584848	1.11335779529043E-6	30	28	3
27.6899214320836	27.8140767249185	1.06470046112861E-6	27	28	0
27.6899214320836	27.8140767249185	1.06470046112861E-6	27	29	1
27.6886650578294	27.4885520714318	1.01604372204633E-6	26	28	1
27.6886650578294	27.4885520714318	1.01604372204633E-6	26	29	0
27.6874097303322	27.1556321115	9.67387662420549E-7	26	27	2
27.6861549957685	26.8269485534598	9.18730630239395E-7	26	26	1
27.6849007723285	26.5059698823685	8.70073503911328E-7	26	25	1
27.6836471193102	26.197618755288	8.21416233698358E-7	27	26	3
27.6836471193102	26.197618755288	8.21416233698358E-7	27	27	1
27.682393990459	25.8926877980678	7.72756558298227E-7	30	26	1
27.6811398661814	25.5893234180281	7.24096372195504E-7	30	25	1
27.6798846267586	25.2921958162588	6.75435615882236E-7	27	25	1
27.6786295858113	24.9981485186799	6.26774786738338E-7	27.6	23.6	1
27.6773745946687	24.7117071294618	5.78113834137639E-7	28.5	22	1
27.6761190262543	24.4485261786898	5.29452294451005E-7	30	27	1
27.6748542426758	24.0842534738872	4.80785959489083E-7	28.5	27	1
27.6735885792052	23.6610656443553	4.32118858917363E-7	29	24	2
27.6723222498169	23.23828201316	3.83450161400845E-7	30	23	1
27.6710540144847	22.8232146397129	3.3478066896464E-7	26	23	3
27.6697867687902	22.4075254060792	2.86108480906933E-7	27	23	2
27.6685196187672	21.9905515811109	2.37435095584715E-7	30	22	3
26.6892141270185	21.5276872779837	1.89663238003845E-7	27	22	0
25.7251505364476	21.0628710474385	1.41891819183115E-7	26	22	0
24.7736022901	20.5918496257964	9.41208107008151E-8	26	24	0
22.2704282073792	18.7422139269513	4.63501255154597E-8	24	21	2
Route: 2 Length: 72.6076035008186 Demand Met: 184					
14.5039927701196	3.91440630179432	0.0405715247292226	17.1	5.1	1
16.3291756401844	5.88794032740124	0.0809320596983714	20	6	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
16.3600129340082	6.50491893484359	0.112028296790443	18	6	1
16.391051956822	7.13562263619739	0.14308495533226	17.5	7.5	1
16.4222053720357	7.76324752140937	0.174111883790915	19	6	2
16.4524138082474	9.18091994361301	0.204404210853832	20	10	1
16.4789697210666	9.7053183270945	0.233793623251431	20	9	1
16.5040001465517	10.4605124804358	0.262755175032823	16.5	10.5	0
16.52907669018	11.2252220323109	0.29172909089219	20	11	1
16.5534874982424	12.0789076980261	0.320512620905692	20	12	1
16.577333822807	12.9996905106854	0.349134039558817	20	13	2
16.5773338049393	13.3561593143437	0.349134068753381	16	13	1
16.5773338049393	13.3561593143437	0.349134068753381	16	11	2
16.5773337871144	13.7560896595911	0.349134097943148	20	15	1
16.5773337694115	14.0000001226874	0.349134127028326	20	14	2
16.2390530528635	14.0857070667494	0.349134129904181	18	15	3
15.8628840774708	14.1704425233544	0.349134132770414	18	12.3	2
15.4324315816225	14.2575208127375	0.349134135635024	17	15	2
15.4324315816225	14.2575208127375	0.349134135635024	17	12	2
14.9414316720893	14.3468982126656	0.349134138495822	16	15	1
14.9414316720893	14.3468982126656	0.349134138495822	15	15	0
14.4491966992373	14.43603117994	0.349134141363701	14	15	2
14.4491966992373	14.43603117994	0.349134141363701	13	15	2
13.9932374691888	14.5248752060436	0.349134144228223	13	11.3	2
13.7713366605939	14.7843212506702	0.349134147037858	11.5	13.5	2
13.5628908222292	15.0558674013583	0.349134149846107	12	15	3
13.3629239658242	15.3293999298982	0.349134152647117	10	15	2
13.283312247312	15.6770862770636	0.349134155401516	11	15	1
13.2047344051841	16.0331577333965	0.349134158158151	10	16.3	0
13.1288991260319	16.387267323888	0.349134160921833	10	18	0
13.0580219361901	16.6924606443321	0.349134163693606	11	18	0
12.9879221896388	16.9913536609162	0.349134166471048	13	18	1
12.9879221896388	16.9913536609162	0.349134166471048	12	18	0
12.9182325768442	17.2858552477127	0.349134169254925	12	17	1
12.8488187129855	17.5833598537837	0.34913417204055	15	18	3
12.7772159016245	17.875048317019	0.349134174817098	15	19	0
12.7772159016245	17.875048317019	0.349134174817098	15.5	18.5	2
12.7032741492316	18.156682266006	0.349134177596398	14	18	3
12.7032741492316	18.156682266006	0.349134177596398	13.5	17	3
12.6285505838857	18.4550722378592	0.349134180364705	14	20	2
12.5534992263954	18.7450960601215	0.349134183130887	15	21	2
12.5534992263954	18.7450960601215	0.349134183130887	14	21	2
12.4639440941466	18.9095478635103	0.349134185879769	13	21	2
12.3748895592418	19.0702839228018	0.349134188626962	12	21	2
12.2866612944592	19.2282652399758	0.349134191373395	13.5	21.4	1
12.2866612944592	19.2282652399758	0.349134191373395	13	22	1
12.2000029767464	19.3773335687958	0.349134194114312	12.2	22.1	3
11.6999990337313	19.377333733488	0.349134188119266	11.7	22.8	2
11.6999990337313	19.377333733488	0.349134188119266	11	21	3
10.5781897851248	19.3170867188088	0.33334224482652	10	21	2
9.49398679228567	19.2565507660745	0.317526449225641	9	21	1
9.49398679228567	19.2565507660745	0.317526449225641	9	18	1
8.49952790450445	19.1960889046615	0.301698263765203	8	18	1
8.49952790450445	19.1960889046615	0.301698263765203	7	18	0
7.62799470900168	19.1362253571177	0.28587130063107	7	16	2
6.93852954970181	19.0810836104446	0.269859755920908	8	21	2
6.93852954970181	19.0810836104446	0.269859755920908	5.3	21	2
6.30288247796679	19.024988039449	0.253769937219298	4	20	2
6.30288247796679	19.024988039449	0.253769937219298	4	19	1
5.80962236092515	18.9687525555088	0.237625789487974	3	19	2
5.41363995440094	18.9125964818628	0.221412092742408	7	21	1
4.99654109130617	18.8560384106045	0.205184104100789	3	20	3
4.99654109130617	18.8560384106045	0.205184104100789	3	18	2
4.71238025294079	18.7982973709049	0.188606462952846	4	22	1
4.44055489187943	18.7381397593037	0.171992258248963	2	19	1
4.44055489187943	18.7381397593037	0.171992258248963	2	18	1
4.19543991831023	18.6783505718356	0.155352451255146	5	18.3	1
4.19543991831023	18.6783505718356	0.155352451255146	4	18	1
3.94975511619872	18.6189659201662	0.138700593842763	3	17	3
3.71666852746081	18.5608849070726	0.121892274501606	4	21	3
3.31004186380079	18.0379329296551	0.0983814889666172	3	21	2
2.91983810420757	16.7302449898153	0.0745574731825949	3	16	2
2.53004116628473	15.5406941573954	0.0506806647945002	4	17	3
2.53004116628473	15.5406941573954	0.0506806647945002	4	16	3
1.90406270320565	6.08733606985623	0.0257797459731455	4	6	3
Route: 3 Length: 91.3352383489249 Demand Met: 184					
19.9521731516592	0.959958424010064	2.9258429457002E-8	23	3	0
20.4678873117744	1.39226271002811	6.12819714973512E-8	19	3	1
21.0192545562078	1.80478476493828	9.33017618720555E-8	20	3	2
21.6043412036625	2.20298017431857	1.25313423637863E-7	20	3.7	2
22.2673286112724	2.57831527605738	1.57317131765922E-7	21	3	2
22.9880796647947	2.95022132313274	1.89315051635219E-7	22	3	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.7542467115553	3.32236299365098	2.21311968751081E-7	24	3	2
24.5344062383868	3.69772157356876	2.53303961805784E-7	25	3	2
25.3216258164136	4.07991212978512	2.85291156920664E-7	26	5	1
26.1144584872419	4.45620551746362	3.17277845773845E-7	26	4	1
26.9452739552637	4.83614293843827	3.49264593246801E-7	29	4	3
27.1905412548913	5.51834670162745	3.81103773428038E-7	29	5	2
27.428040530054	6.23358327960926	4.1293355312888E-7	27.5	5.2	2
27.6676180662823	6.99985395977328	4.44760468454319E-7	30	7	3
27.6676181105266	7.1538456314812	4.41197956391193E-7	27	8	3
27.6676181105266	7.1538456314812	4.41197956391193E-7	27	7	2
27.6676181546928	7.30563418028644	4.37626177962613E-7	26	8	2
27.6676181546928	7.30563418028644	4.37626177962613E-7	25.5	7.1	2
27.6676181987646	7.45689897506068	4.34051025344218E-7	26	10	1
27.6676181987646	7.45689897506068	4.34051025344218E-7	27	10	1
27.6676182428211	7.59650102829011	4.30476478463504E-7	26	9	0
27.6676182428211	7.59650102829011	4.30476478463504E-7	27	9	2
27.6676182868268	7.73289388132073	4.26902792227679E-7	28	9	1
27.6676183308267	7.86826342552442	4.23329336918243E-7	29.3	9.5	1
27.6676183308267	7.86826342552442	4.23329336918243E-7	30	9	1
27.6676183749064	8.00000897412537	4.19754512925863E-7	30	8	3
27.6676184220385	10.0000000075475	4.13824306377819E-7	30	10	3
27.6676184703032	11.0000023231996	4.05979801776368E-7	30	11	3
27.667618519904	11.3768183387906	3.9636173188029E-7	27	11	1
27.6676185694655	11.7583506406125	3.86744166469555E-7	28	11.3	2
27.6676186189993	12.1463597474844	3.77124195871659E-7	30	13	2
27.667618668575	12.5170988807874	3.67496023834235E-7	30	12	0
27.6676187181649	12.8952889969843	3.57871670075838E-7	29	14	2
27.6676187677776	13.2624959714929	3.48242909176122E-7	27	14	1
27.6676187677776	13.2624959714929	3.48242909176122E-7	27	13	2
27.6676188174107	13.6313036507547	3.3861167292315E-7	26	13	1
27.6676188174107	13.6313036507547	3.3861167292315E-7	26	12	1
27.6676188670309	14.0280667140292	3.28980732433593E-7	27	12	1
27.6676189166428	14.4508621708726	3.19349776845002E-7	26	14	2
27.6676189662567	14.8839649098695	3.09716313928732E-7	30	15	1
27.6676190159242	15.3190460683714	3.00081723914047E-7	27	15	1
27.6676190655812	15.7609248539403	2.9044697846814E-7	27	16	2
27.6676191152152	16.2042523780123	2.80809466346454E-7	30	16	1
27.6676191648727	16.6565154205219	2.71170878640703E-7	30	17	1
27.6676192145576	17.1090930862345	2.61531018175276E-7	30	18	1
27.6676192642703	17.5516143446752	2.5188946572996E-7	29.5	20.5	1
27.6676193142063	17.8171350032234	2.42236463776635E-7	30	20	2
27.6676193645696	17.9088693341065	2.32564477897768E-7	30	19	0
27.6676194150719	17.9999993146301	2.22894898982418E-7	30	21	0
27.4169446537556	17.9691651161972	2.13239339963422E-7	29.5	17.5	1
27.1593933743606	17.9383705610233	2.03582698254934E-7	26	17	2
27.1593933743606	17.9383705610233	2.03582698254934E-7	27	17	2
26.9123355772289	17.9077128834161	1.93919952096167E-7	27	18	1
26.9123355772289	17.9077128834161	1.93919952096167E-7	27	19	3
26.6686551287439	17.8769607990931	1.84247741508159E-7	26	19	0
26.4287111619202	17.8461897574956	1.74577181155655E-7	26	18	2
26.1921220664788	17.8154353962864	1.64903447341658E-7	27	20	1
26.1921220664788	17.8154353962864	1.64903447341658E-7	27	21	1
25.941354036445	17.7836163264233	1.55213278674182E-7	26	21	2
25.6380243383004	17.0599084235974	1.45382967886576E-7	26	20	1
25.3328508088035	16.0208112042454	1.35546505575235E-7	26	16	1
25.0278965953731	15.0129456459675	1.25709089360271E-7	26	15	1
24.7217119602525	14.0294636361875	1.15870527395145E-7	22.9	14	1
24.4281441837313	13.0677327887173	1.06031159852193E-7	23.2	15	1
24.1449221332715	11.9691718914028	9.61901971407997E-8	23.9	13	0
23.8650084127943	10.8313186674971	8.6350809169744E-8	26	11	3
23.3614958290847	9.51157719366185	7.64724035207109E-8	25	8	2
22.8187317754443	8.45784441197471	6.65843362668284E-8	24.5	7.1	0
22.2553069481906	7.50206335457949	5.66979618810137E-8	24	6	2
21.6319501839606	6.69360097037349	4.68005758591516E-8	22	6	1
21.0152026084128	5.91096266845901	3.69012749246167E-8	22	4.7	1
20.3909516265702	5.17128649699327	2.69992410650843E-8	21	6	3
19.7504316333039	4.36183641001736	1.70782996633534E-8	23	6	0
6.96949946913074	2.39108589980703	7.16028036862326E-9	6	4	1
Route: 4 Length: 53.7580786519568 Demand Met: 182					
3.31692312610002	0.556783606310077	0.0353492364953425	4	4	1
5.02514557712583	0.861240384268759	0.0701897246630514	7	3	0
6.36755644613339	1.14975393627096	0.105041070704073	8	3	2
7.46804257606568	1.42279171344742	0.13965624193303	9	3	1
8.48341917891199	1.68942560532644	0.174219057891679	10	3	3
9.2591971800426	1.93800049546978	0.208105516612632	7.5	4.9	0
10.3422103169938	2.15473141530282	0.242046280814129	11	3	3
11.3752807913846	2.36809788507605	0.275714918857098	12	3	3
12.3713571084581	2.57928214140755	0.309142069299594	13	3	2
13.3541508418669	2.78975812154834	0.342489350611537	15.5	3	1
14.2516160429033	2.99989502991795	0.375804939106898	18	3	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
14.0662270871028	3.4354357909722	0.375804992522843	14	3	1
13.8813630735703	3.87472442384245	0.375805045908109	17.1	3.1	2
13.5975057049144	4.42570727107914	0.375805099280287	15.5	5	3
13.2916189944539	4.95406623768874	0.375805152647519	14	6	2
12.9838224905173	5.46961219196156	0.375805206013905	13	6	0
12.9838224905173	5.46961219196156	0.375805206013905	12	6	2
12.6830986724732	5.97654127441633	0.375805259381031	13	7	0
12.3826110999465	6.47509306089462	0.375805312749642	14	9.3	1
12.3826110999465	6.47509306089462	0.375805312749642	11	9	1
12.0741063868171	6.8541066782817	0.37580536611826	14.5	7.7	3
11.5571747358456	7.17758900931411	0.375805419470614	13.5	7.5	3
10.9594038006106	7.49721417219105	0.37580547281825	9	6	2
10.4235735450798	7.83193546132847	0.375805526164317	8	6	2
10.0005713694687	8.21437224683888	0.375805579507073	11	7	1
10.0005713694687	8.21437224683888	0.375805579507073	11	6	2
9.55794093503013	8.63917874805665	0.375805632848769	9.40000000000001	7.4	2
9.1192138833061	9.07692922918949	0.375805686189741	10	6	2
8.62029019349613	9.86860038006845	0.375805739525299	10.5	10.5	2
8.09206243856163	10.641689209329	0.375805792859794	8	10.3	1
7.56775995229104	11.4299440366367	0.375805846194865	10	11	1
7.00000010766303	12.2516173835433	0.375805899531771	7	15	3
6.77634682226345	12.2516173266034	0.375805510479935	8	15	1
6.54670382652014	12.2516172696421	0.375805121422919	9	15	1
5.93038547450699	12.2516172125808	0.375804732295951	5	15	2
5.37006126521658	12.2516171555099	0.375804343142159	4	15	1
4.85636226456326	12.25161709843	0.375803953982217	4	12	2
4.85636226456326	12.25161709843	0.375803953982217	3	12	2
4.38384106823946	12.2516170413547	0.375803564804231	4	11	3
4.38384106823946	12.2516170413547	0.375803564804231	3	11	1
3.93554953188473	12.2516169842856	0.375803175598071	4	13	3
3.487551733776	12.2516169272178	0.375802786370702	2	14	3
3.487551733776	12.2516169272178	0.375802786370702	2	13	0
3.11053597575433	12.2516168701494	0.375802397075177	2	15	1
2.7492509528842	12.2516168130813	0.375802007773228	4	14	1
2.7492509528842	12.2516168130813	0.375802007773228	3	15	1
2.37762907924834	12.2516167560199	0.375801618462859	3	14	0
2.37762907924834	12.2516167560199	0.375801618462859	3	13	1
2.00000315552671	12.2516166989675	0.375801229154812	2	16	1
1.92364614215327	11.5796121200608	0.353214944859227	2	12	1
1.92364614215327	11.5796121200608	0.353214944859227	2	11	1
1.84732113944021	10.9206922740157	0.330609838413899	2	10	1
1.77099456539597	10.281373793522	0.307994206058492	2	9	2
1.69463142838835	9.67190930814131	0.285336527101284	3	10	2
1.69463142838835	9.67190930814131	0.285336527101284	3	9	1
1.61760420155692	9.07398895183823	0.26262245140379	4	9	0
1.53978109826734	8.48096283045956	0.239919814171843	4	10	0
1.46072370278706	7.84262254131196	0.217230836424019	4	8	3
1.46072370278706	7.84262254131196	0.217230836424019	4	7	2
1.30540941947352	7.08593374817213	0.190529176685259	2	7	3
1.30540941947352	7.08593374817213	0.190529176685259	2	5	2
1.14753736814551	6.4251336544555	0.163561332693338	2	8	1
1.14753736814551	6.4251336544555	0.163561332693338	2	6	1
0.988038878548366	5.74393677963112	0.136548529700918	3	8	0
0.823580758994709	4.9480871548682	0.109549916538804	3	5	1
0.655824211288348	4.15399369075776	0.082518559604174	4	5	1
0.454205803666468	3.16561621421275	0.0552899169351022	2	4	3
0.239940093198456	2.00003845192935	0.0276448795414144	3	4	0
Route: 5 Length: 93.2532054875565 Demand Met: 184					
5.64885840660392	3.85819220632355	0.0906086320474673	7	6	2
8.19504400160122	5.45711922688331	0.179048132945089	8.5	5.2	1
10.7672451005989	7.12366187364901	0.267264106373857	8.5	7	0
16.6967372961452	8.8367896439479	0.355660947099224	20	8	1
17.3501039503661	15.3980432538666	0.442425980894779	20	16	3
17.5259884198213	16.016166319773	0.508549109539609	17	18	3
17.7055493924445	16.5224589823958	0.572867729697619	20	17	0
17.8792595612808	17.027798693156	0.637394821986297	20	18	0
18.0483927655638	17.5217237380785	0.702139877350356	20	19	2
18.2123392815285	17.9840221688782	0.766379914818425	18	18	2
18.3776000683852	18.4533809332321	0.83042236028264	20.6	16.5	1
18.5366923696709	19.0000287871056	0.894414667114306	21.7	19	3
18.5366923950056	19.2495751136609	0.894414734773434	21.1	20	2
18.5366924202668	19.494686532088	0.894414802432609	20	20	3
18.5366924455057	19.7383975341875	0.894414870093371	16	18	3
18.5366924703467	20.4067591532316	0.89441493831736	16	21	3
18.5366924951655	21.0348976350333	0.894415006606478	17	21	1
18.5366924951655	21.0348976350333	0.894415006606478	18	21	1
18.536692520011	21.693532820421	0.894415074922251	20	21	1
18.5366925448446	22.3915595494175	0.894415143252329	20	22	2
18.5366925696706	23.1269704131973	0.894415211589308	20	25	3
18.5366925944975	23.7098501843949	0.894415279964151	20	26	1

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.5366926193326	24.217873231403	0.894415348356548	17.9	25.8	2
18.5366926441859	24.707204446683	0.894415416759267	18	24	2
18.5366926690567	25.2173245745432	0.894415485171442	20	23	2
18.5366926690567	25.2173245745432	0.894415485171442	20	24	0
18.5366926939351	25.8946206155648	0.894415553630453	20	27	2
18.536692718847	26.5510295888326	0.894415622101524	18.3	27	1
18.536692718847	26.5510295888326	0.894415622101524	18.3	28	0
18.5366927438029	27.1954943093703	0.894415690605081	20	30	3
18.5366924940941	27.195493404696	0.89441121662899	21.2	27.5	0
18.5366924940941	27.195493404696	0.89441121662899	22.2	28.2	1
18.3076091501482	27.1455434669717	0.871031867682232	20	28	2
18.3076091501482	27.1455434669717	0.871031867682232	20	29	1
18.0669808799567	27.0945345108742	0.84761035289875	19	30	3
16.7685032144332	27.01417996405	0.821490848876989	16	30	2
15.9853937249067	26.929493188444	0.795232741588014	14	29	1
15.9853937249067	26.929493188444	0.795232741588014	14	30	1
15.7137303466885	26.818093609954	0.768843959165316	14	28.2	1
15.4510336441496	26.7060636160013	0.742454749581959	14	27	0
15.4510336441496	26.7060636160013	0.742454749581959	12	27	0
15.2596358509909	26.5938713967855	0.716276624018152	15	30	2
15.0772774265586	26.4229084731002	0.689474700854338	15	28.6	2
14.8958654661258	26.2471772519812	0.662605813320556	16	27	0
14.7131847319847	26.0715093908165	0.635760774412621	13	24	1
14.7131847319847	26.0715093908165	0.635760774412621	14	25	0
14.5387273751527	25.9061196470524	0.608937023192935	13	27	2
14.3685937787377	25.7397091944094	0.582055436219419	15	27	3
14.3685937787377	25.7397091944094	0.582055436219419	15	28	2
14.1961148537684	25.5646377592485	0.554939940193291	17.2	26.1	2
14.1961148537684	25.5646377592485	0.554939940193291	16.9	26.8	2
13.9645339647695	25.3775595114345	0.52739379816006	16	24	2
13.9645339647695	25.3775595114345	0.52739379816006	17	24	2
13.3411091612589	25.2286391499661	0.498971970773828	15	24	1
12.6761328476883	25.0825154924006	0.470533903006791	14	24	1
11.9818904959988	24.9386154241918	0.44208122771923	12	24	2
11.3000974338818	24.7966821122746	0.413573733170904	11	24	1
11.3000974338818	24.7966821122746	0.413573733170904	10	24	2
10.6887585310062	24.6581774398561	0.38498762010315	9	24	1
10.1250407714315	24.5211812363718	0.35638370260066	10	26	2
9.57153729448142	24.3829745323618	0.327711127675134	10	27	1
9.00833114840725	24.2402354523433	0.298997706858748	8	27	1
8.49762473544318	24.0902488164714	0.270227372391842	9.09999999999999	26	1
7.97940272204306	23.9381794637611	0.241431754175386	8	24	1
7.97940272204306	23.9381794637611	0.241431754175386	7	24	2
7.48740918016448	23.7878205505092	0.212556927734106	5.40000000000001	23.3	2
7.04924467168469	23.6396890701708	0.183567514781937	5.40000000000001	24.3	3
7.04924467168469	23.6396890701708	0.183567514781937	4	24	1
6.74040748726254	23.4896072083282	0.154066516338425	4	26	0
6.61473044863628	23.0775933806663	0.124780425192211	8	26	0
6.61473044863628	23.0775933806663	0.124780425192211	7.5	25.5	1
6.48222266807649	22.3817515027559	0.0954673079665271	8.5	22.8	2
6.34548209824764	21.690620135907	0.0660163863764218	9.5	22.2	2
2.83025008765829	17.8953053344715	0.0330677038319047	2	20	1
Route: 6 Length: 90.3460137106846 Demand Met: 184					
1.01918467984292	5.12186564226428	3.00512676076892E-7	3	6	1
1.93260251380333	9.23870750964874	6.05391485386519E-7	3	7	1
2.7904499219446	22.3510113822473	9.10251486629932E-7	4	23	2
2.7904499219446	22.3510113822473	9.10251486629932E-7	4	25	2
3.43367329236548	23.6166483992326	1.21492652294108E-6	3	24	1
4.08656050442764	24.8903590025314	1.51959384364631E-6	7	27	1
4.08656050442764	24.8903590025314	1.51959384364631E-6	4.7	25.5	2
4.29592673137874	25.2101781475019	1.82403592763336E-6	3	22	0
4.29592673137874	25.2101781475019	1.82403592763336E-6	3	23	1
4.52346501573292	25.6556255815732	2.12847078895351E-6	3	25	0
4.52346501573292	25.6556255815732	2.12847078895351E-6	2	24	0
4.76901138287289	26.152272172086	2.43291626933484E-6	3	27	0
4.76901138287289	26.152272172086	2.43291626933484E-6	2	26	0
5.03466696812131	26.6519429486028	2.7373687698784E-6	3	26	3
5.03466696812131	26.6519429486028	2.7373687698784E-6	4	28	2
5.43638775584419	27.2516285921302	3.04163264974733E-6	4	27	0
5.849056557314	27.863249656329	3.3458997048541E-6	4	29	2
5.849056557314	27.863249656329	3.3458997048541E-6	3	29	2
7.10670298882046	28.3049123152862	3.6499851008287E-6	8	30	0
7.10670298882046	28.3049123152862	3.6499851008287E-6	7	30	2
8.33947772764492	28.7182742928934	3.95405033426499E-6	10	30	3
8.33947772764492	28.7182742928934	3.95405033426499E-6	9	30	2
8.93365959302338	29.0408657516127	4.25795098202286E-6	11	27	2
8.93365959302338	29.0408657516127	4.25795098202286E-6	9	27	3
9.38180834090723	29.6336157085274	4.56167298334975E-6	11	30	2
9.8107578423564	30.2257849561893	4.86536863597564E-6	13	30	2
9.91144441471327	31.1135488281939	5.16874020650704E-6	12	30	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
10.0100431992566	32.1445126025574	5.47208074674899E-6	13	33	2
10.0919318418179	32.7845752277276	5.77529408030131E-6	12	33	1
10.0919318418179	32.7845752277276	5.77529408030131E-6	11	33	1
10.1730367752244	33.4391793324369	6.07849812706007E-6	10	36	2
10.2543527628732	33.9732536834323	6.38164482236192E-6	12	36	1
10.2543527628732	33.9732536834323	6.38164482236192E-6	11	36	1
10.3344344030671	34.4422529431667	6.68476869414292E-6	13	36	2
10.4053911320794	34.7676070227365	6.98778436802883E-6	14	36	0
9.50958522344534	34.7676070607796	7.29133295251927E-6	9	36	0
9.50958522344534	34.7676070607796	7.29133295251927E-6	8	36	0
8.70890593998738	34.7676071011842	7.59491802426737E-6	10	33	0
8.70890593998738	34.7676071011842	7.59491802426737E-6	9	33	2
7.86529511873034	34.7676071399647	7.89849579607704E-6	8	33	2
7.02583480668636	34.7676071787853	8.20206130480727E-6	7	36	1
6.20000001157706	34.7676072176426	8.5056202738798E-6	6.2	37.1	3
5.64973428101757	34.4348937232192	8.20277322510776E-6	6.2	36.5	2
5.06493422961115	34.0854203181226	7.89990081884184E-6	7	33	1
4.42659563280992	33.7467227572222	7.59702463692946E-6	5	31	1
4.42659563280992	33.7467227572222	7.59702463692946E-6	4	30	0
4.04686967395517	33.6684064250119	7.29416800204774E-6	2	33	3
3.79193938879587	33.5928188467307	6.99120135383424E-6	2	35	3
3.66250583901785	33.4953775630617	6.68796037395225E-6	4.7	33.5	3
3.66250583901785	33.4953775630617	6.68796037395225E-6	4	34	3
3.53048939995091	33.3979528714487	6.38465748625805E-6	2	34	1
3.39973967957202	33.3005161744557	6.08134920554448E-6	1.5	35	1
3.39973967957202	33.3005161744557	6.08134920554448E-6	1.5	35.5	2
3.27894400615745	33.1965459511488	5.77794215939065E-6	2	36	2
3.1676459224804	33.0730627862803	5.47433347630744E-6	3	35	2
3.1676459224804	33.0730627862803	5.47433347630744E-6	4	36	2
3.05181835153135	32.9240202315525	5.17056887439082E-6	4.7	34.5	1
3.05181835153135	32.9240202315525	5.17056887439082E-6	4	35	3
2.89600076341922	32.4186126387373	4.8664629712647E-6	3	33	1
2.89600076341922	32.4186126387373	4.8664629712647E-6	3	34	1
2.74017785727483	31.9010133250728	4.56234213785933E-6	4	32	1
2.74017785727483	31.9010133250728	4.56234213785933E-6	4	33	1
2.58172793629201	31.3817102280302	4.25820911864605E-6	5.2	32	2
2.58172793629201	31.3817102280302	4.25820911864605E-6	4	31	2
2.4095265048565	30.8555820727421	3.95401901887027E-6	3	32	2
2.23641532435626	30.317236068429	3.64980397904446E-6	2	32	1
2.06377287995467	29.7611628766293	3.34557953074466E-6	3	30	2
2.06377287995467	29.7611628766293	3.34557953074466E-6	3	31	2
1.88801061604768	29.1907930118455	3.04130765460542E-6	2	31	3
1.71153342996588	28.4398235909117	2.73690508034718E-6	2	30	3
1.53355788744612	27.5076224919223	2.4324007270593E-6	2	27	1
1.35512545076209	26.6116848329403	2.1278873942876E-6	2	28	2
1.35512545076209	26.6116848329403	2.1278873942876E-6	2	29	1
1.17411980800388	25.4978620552405	1.823326158501E-6	3	28	0
0.986482984459741	23.9407508519043	1.51877015230895E-6	2	25	2
0.796727210789967	22.2629854551194	1.21418296039622E-6	2	23	1
0.605141031289776	20.5434371952534	9.09585409658575E-7	2	22	1
0.410816231353991	18.6142226382413	6.04973123152774E-7	2	21	1
0.210369391552248	15.1967560741924	3.00332631653077E-7	2	17	2

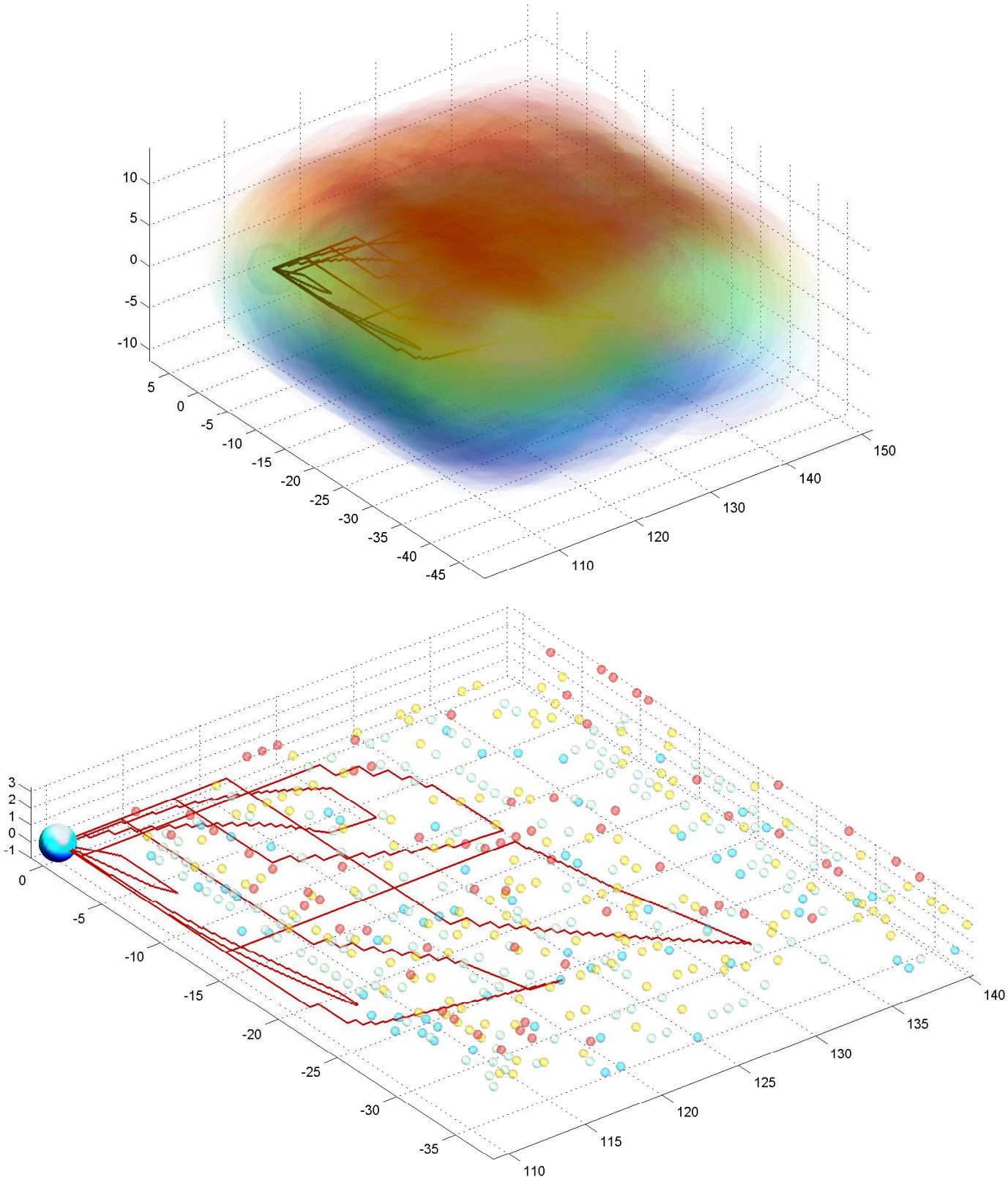


Figure O.188: *pcb*442, $r = 11.4$, Equal Radius, 3D, Manhattan, Length = 360.6260348

Table O-191: Solution for $pcb442$, $r = 11.4$, Equal Radius, 3D, Manhattan

Total distance: 360.626034832628 Total demand met: 1100 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 19.2809973026678 Demand Met: 180					
0.0761974108214076	0.448030027119326	7.8082198484708E-9	2	4	3
0.15018155769539	0.882335918231719	9.04777941457269E-9	2	5	2
0.224680201221616	1.31879321486234	1.04345119211757E-8	2	6	1
0.299574518269381	1.75667379039034	1.12334035407002E-8	3	6	1
0.374595886682656	2.19597962696466	1.20434808792425E-8	3	7	1
0.449751566642959	2.63498573030072	1.16763043678247E-8	2	7	3
0.525197045232574	3.07504373499313	1.30236372797299E-8	4	7	2
0.600768391637331	3.5175365737217	1.32432163013618E-8	4	6	3
0.676481659261853	3.96656008587718	1.40767859591051E-8	4	8	3
0.752311861768078	4.41870169625618	1.4968760453371E-8	4	11	3
0.82813880828239	4.86452631267317	1.63052344959169E-8	4	12	2
0.903948927578128	5.30261186226874	1.66011400182242E-8	4	13	3
0.979691091669281	5.72846061943857	1.73517573642812E-8	2	14	3
1.05571672372416	6.14175522612401	1.82984294383459E-8	4	16	3
1.13113950407427	6.49682131021079	1.91213000988455E-8	4	17	3
1.20269536712907	6.67303460792609	1.9864412337256E-8	3	17	3
1.27392209931966	6.83355648076187	2.11225934521053E-8	3	16	2
1.34518519991005	6.99105096817224	2.24553033945085E-8	3	15	1
1.41656090660155	7.14756029898352	2.31980106235596E-8	2	15	1
1.48819235067677	7.30333132683293	2.40356516911788E-8	2	16	1
1.56006531288091	7.45740943513461	2.42383624282638E-8	2	17	2
1.63215248602236	7.60806905396088	2.57055727814759E-8	2	18	1
1.7044314252701	7.75267382123635	2.65415582845208E-8	2	19	1
1.77680962193992	7.86368890616707	2.73805564887653E-8	4	19	1
1.77680962525392	7.76969372461353	2.73742042367076E-8	4	18	1
1.77680962856677	7.6731919591619	2.75148401840397E-8	5	18.3	1
1.77680963187859	7.56647366119955	2.67245710006137E-8	5	15	2
1.77680963518938	7.4593311307733	2.73822067242691E-8	4	15	1
1.77680963850091	7.35175498968914	2.73674700679294E-8	4	14	1
1.77680964181198	7.24396806713832	2.73399383132755E-8	3	13	1
1.77680964512379	7.1362064440696	2.81729377604734E-8	3	14	0
1.77680964843563	7.02794656510157	2.81414713754202E-8	2	13	0
1.77680965174841	6.91945450523991	2.74306746206321E-8	2	12	1
1.77680965506197	6.81091269567114	2.7435918426022E-8	2	11	1
1.77680965837575	6.70250914146446	2.74751386086791E-8	2	10	1
1.77680966169154	6.59439381769799	2.75971228091976E-8	3	11	1
1.77680966500687	6.48618805421311	2.70166395921478E-8	3	10	2
1.77680966832246	6.37806672049288	2.70106195188191E-8	2	9	2
1.7768096716396	6.27024640048017	2.76116214337208E-8	2	8	1
1.77680967495748	6.16287584867486	2.84220185164941E-8	3	8	0
1.77680967827723	6.05589457830751	2.78106284667956E-8	3	9	1
1.77680968159694	5.94912344618509	2.86312076269724E-8	4	9	0
1.77680968491789	5.84257750167096	2.87382384556167E-8	4	10	0
1.77680968823971	5.73614813478676	2.8288537734511E-8	8	10.3	1
1.77680969156057	5.62950145451516	2.84989969401295E-8	10	11	1
1.77680969487947	5.52177600474848	2.79335061748043E-8	10.5	10.5	2
1.77680969819512	5.41287331709031	2.8586216060944E-8	11	9	1
1.77680970150914	5.30343927582729	2.85642069997039E-8	11	7	1
1.77680970482237	5.19416562587969	2.94736253181327E-8	13	7	0
1.77680970816448	4.18600582549551	2.94951316703873E-8	13	6	0
1.77680971148826	3.0000976525605	2.85120336229738E-8	13	3	2
1.69085598286264	2.84114833696958	2.64756394585675E-8	12	3	3
1.60143885395125	2.68385211057128	2.5375673118333E-8	11	3	3
1.51069061990242	2.52774517960881	2.427027112617E-8	10	3	3
1.41930942318723	2.37268625527663	2.36292354571788E-8	8	3	2
1.32804574146344	2.21870608599201	2.32133956501457E-8	9	3	1
1.23652663430421	2.0657042737255	2.27484520110011E-8	7	3	0
1.14525478035046	1.91377232238126	2.17911217958999E-8	7.5	4.9	0
1.05397761459984	1.76217448299134	2.00905851954758E-8	8.5	5.2	1
0.96229562390468	1.6105091623661	1.98322354094671E-8	8.5	7	0
0.869871269003539	1.45731115461945	1.75117591538765E-8	9.40000000000001	7.4	2
0.774833817200999	1.29884908692807	1.63828506316577E-8	9	6	2
0.678581389366627	1.13864565337277	1.53059449559123E-8	8	6	2
0.581629703829933	0.977143045141782	1.41921336904716E-8	7	6	2
0.484271074255901	0.814527934810991	1.3596705983332E-8	6	4	1
0.386896086972371	0.652075726535395	1.24850920713016E-8	4	4	1
0.289939487417371	0.490031445624142	1.14517746396814E-8	4	5	1
0.193625418197541	0.328093893005471	1.03635695580806E-8	3	5	1
0.0983017646150302	0.166223798238164	9.94644722140947E-9	3	4	0
Route: 2 Length: 45.1667051136199 Demand Met: 184					
1.65593840468519	0.552062394574172	1.54947983332931E-8	10	6	2
2.87854704743489	1.05546208509834	1.63080198234411E-8	11	6	2
3.94027149497289	1.54160413865743	1.63879096959363E-8	12	6	2
4.90498933037436	2.01777912675813	1.65861795409228E-8	14	6	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
5.72276372741759	2.4785299809678	1.55451065353418E-8	13.5	7.5	3
6.47362936924407	2.92334664583142	1.56318087363161E-8	14.5	7.7	3
7.16215587771117	3.35326817391786	1.55271866475459E-8	15.5	5	3
7.81671335980705	3.78616587224582	1.79998362881406E-8	17.1	5.1	1
8.42615994094732	4.22277826594991	1.81470021232144E-8	18	6	1
8.98545921130845	4.66025342302326	1.81421278000471E-8	17.5	7.5	1
9.52141287357635	5.09701129793483	1.8513416577548E-8	20	8	1
9.94435221995093	5.51419251550713	1.85534325680692E-8	20	9	1
10.3138833582771	5.91651346327369	1.85999091684153E-8	20	10	1
10.6483333765388	6.30441817989715	1.8652926314644E-8	20	11	1
10.9562258493215	6.67697775759025	1.87123081474283E-8	20	12	1
11.2424406416984	7.03257937197739	1.75536580826474E-8	20	14	2
11.2777586764479	7.07591909789755	1.74437264632843E-8	20	13	2
11.3129909377652	7.11899213147639	1.70820779743508E-8	18	12.3	2
11.3483459838756	7.1619738311916	1.69083040901796E-8	17	12	2
11.3837310947661	7.20492762167241	1.66739901885649E-8	16	11	2
11.4190904167531	7.24798526913168	1.94427567379307E-8	16.5	10.5	0
11.454254509885	7.29115598094664	1.74984080558716E-8	14	9.3	1
11.4893912500397	7.33460965541396	1.6310123029939E-8	13	11.3	2
11.5244954337181	7.37819576221084	1.63504214611976E-8	11.5	13.5	2
11.5596116434228	7.42175919684216	1.77037140502989E-8	11	15	1
11.5947141362955	7.46515997717412	1.63364237693031E-8	10	15	2
11.6298703506203	7.50843100736253	1.74700236499348E-8	9	15	1
11.6651382996676	7.55161345435358	1.7361127646609E-8	8	15	1
11.7005620789583	7.59472819528914	1.49721657294322E-8	7	15	3
11.7361994083419	7.63775048375076	1.61332600612241E-8	7	16	2
11.7720811435017	7.68054931662407	1.90819022805044E-8	7	18	0
11.9096567843992	7.69576015069378	1.7704122612372E-8	8	18	1
12.0532298078975	7.7105759190114	1.77994401440174E-8	9	18	1
12.200879772975	7.72509177064362	1.91561824181008E-8	10	16.3	0
12.3505460171781	7.7395655698559	1.93885867361132E-8	10	18	0
12.5037558972579	7.75383856920626	1.9505312920387E-8	11	18	0
12.659924985309	7.76794628170763	1.96285672160457E-8	12	18	0
12.8185062235898	7.78189679446455	1.79858439253167E-8	12	17	1
12.9792938393903	7.795770653334	1.53834314176038E-8	12	15	3
13.1422920481051	7.80964242771627	1.65846216759746E-8	13	15	2
13.3071683073717	7.82349605853819	1.66983742388993E-8	14	15	2
13.4736027272523	7.83731708306558	1.96198950419557E-8	15	15	0
13.6412427283206	7.85109962159548	1.80153438833486E-8	16	13	1
13.8100966320594	7.86490148475342	1.82403390169839E-8	16	15	1
13.9800463762754	7.878675176331	1.70691105694232E-8	17	15	2
14.1507108032874	7.8924274719228	1.60623088163447E-8	18	15	3
14.3215170886536	7.906169980356	1.64290732129757E-8	20	16	3
14.4882673511087	7.91982183296812	2.06620729414908E-8	20	17	0
14.6500115143017	7.93334098874795	2.07759658366058E-8	20	18	0
14.6500115151372	7.93334095410218	1.90903399754916E-8	20.6	16.5	1
14.6500115159665	7.93334091944308	1.88379782883885E-8	20	15	1
14.6500115167974	7.93334088483027	1.93579907659114E-8	23.2	15	1
14.6500115171759	7.93334084978348	1.9212169632965E-8	22.9	14	1
14.6500115175682	7.93334081469171	2.08861994366316E-8	23.9	13	0
14.6500115179777	7.93334077954538	2.09049737520672E-8	26	9	0
14.648678821329	6.89839221516061	2.04219485766544E-8	24.5	7.1	0
14.6473443118972	5.90566387322793	2.00702068298142E-8	23	6	0
14.6460120971645	4.95129172787559	1.73995253760495E-8	24	6	2
14.6446769711367	4.01135475020613	1.89643323267319E-8	26	4	1
14.3785395591407	3.78612203924199	1.73767524813684E-8	25	3	2
14.0655422840556	3.56552611320628	1.72385572483336E-8	24	3	2
13.7304658871334	3.34786189052909	1.98842400322974E-8	23	3	0
13.3837065018524	3.13276982053391	1.81922068520635E-8	22	3	1
13.0295111933087	2.92026522711891	1.82999677633688E-8	22	4.7	1
12.6630076742371	2.70824317603702	1.8408881530263E-8	22	6	1
12.2720888778064	2.49369520032738	1.8067048301873E-8	20	6	1
11.8743807528245	2.27836277531321	1.66695457437527E-8	19	6	2
11.4728108964452	2.06223801303686	1.58197295263562E-8	21	6	3
10.9919755138286	1.83732814802955	1.67519758065282E-8	21	3	2
10.4486067870041	1.61285966993616	1.66443623328405E-8	20	3.7	2
9.84852822394029	1.38754050349577	1.66083307107101E-8	20	3	2
9.11320122095378	1.16096537161072	1.77128445244534E-8	19	3	1
8.24816978377913	0.933509795940505	1.75717076444926E-8	18	3	1
7.22002768106986	0.705101964514258	1.61883555449549E-8	17.1	3.1	2
5.82981827644218	0.474645188222116	1.72277818677458E-8	15.5	3	1
3.96829067674793	0.242803726801567	1.70022147472082E-8	14	3	1
Route: 3 Length: 104.256024672595 Demand Met: 184					
10.9717892432052	18.988988628557	1.36407722450826E-7	18.3	27	1
12.047567691437	20.0527411718772	1.13262640155654E-7	20	27	2
12.7560854569102	20.7962354659438	1.30484258065167E-7	20	28	2
13.3565201885851	21.4236660353469	1.66293693482089E-7	21.2	27.5	0
13.8999880257906	22.006924578436	1.73978463635649E-7	22.2	28.2	1
14.3699560470937	22.5299108645117	1.88962117064762E-7	20	29	1
14.8290905381992	23.0370956485785	1.88948293455837E-7	19	30	3

Solution x	Solution y	Solution z	Original x	Original y	Original z
15.2825050423716	23.5268671533186	2.05946040665594E-7	20	30	3
15.7286117125531	24.002738978332	2.24043525065554E-7	20.5	31.5	3
16.162227859242	24.4532151680184	2.66519149860756E-7	20	31	0
16.5942556101557	24.8958564702316	2.74331126703942E-7	21	32	1
17.0208522949244	25.3254950091006	2.82407249585503E-7	21.5	32.5	2
17.4410309307518	25.7408809481281	2.98494153838647E-7	22	32	2
17.8570637477727	26.1482873048176	3.15247500992655E-7	23.2	31.5	2
18.2675348847926	26.5503046375761	3.41440355100531E-7	22.8	32.5	1
18.6752291632643	26.9466128435618	3.60919278463712E-7	23	35	1
19.0753446308987	27.3243567383784	3.58270234812608E-7	23	34	3
19.4729772309851	27.6937098941123	3.85538450942136E-7	26	34	2
19.8563490711556	28.050899678197	4.02749385841616E-7	27	34	2
20.2229853292526	28.3963934260632	4.2009087941608E-7	27	35	2
20.5737706027566	28.7281493507595	4.37234071171133E-7	26.2	36.5	2
20.9122592600255	29.0432580421159	4.66201184323722E-7	27	38	1
21.2134143189993	29.3084768984436	4.91307952543707E-7	27	36	0
21.5090274023127	29.5691196632158	5.08906984109103E-7	27	37	0
21.7984953503182	29.8237507884148	5.28892512008383E-7	30	37	0
22.0638590498868	30.0641527136987	5.24065503881843E-7	30	38	2
22.0175911092387	29.8557868405701	5.13730629592146E-7	30	36	2
21.9702718923872	29.6398941056126	5.04664503964136E-7	30	35	2
21.9221684422426	29.4184681645217	4.86991330816977E-7	30	34	3
21.8733349886355	29.1922920657869	4.76999966636527E-7	30	32	3
21.8240884160089	28.9646590270842	4.78701673856108E-7	30	33	2
21.7741917710984	28.7337545942294	4.69710718320471E-7	28.5	33.5	2
21.7238111285238	28.5001592735165	4.5964259776099E-7	27	33	2
21.6730561553675	28.2652560283978	4.50626620462913E-7	27	32	2
21.6218918932394	28.0297008137868	4.33447929992781E-7	27	31	3
21.5702975241223	27.7939652907567	4.24551462430145E-7	27	30	3
21.5182861930359	27.5586339210406	4.23726392639878E-7	26	30	2
21.4659609206667	27.3239200694978	4.26275066800486E-7	26	31	1
21.4132736780772	27.0888822151355	4.17222459248023E-7	27	29	1
21.3602463905738	26.8545942719608	4.19039080767902E-7	27	28	0
21.3068847780907	26.6214562995975	3.99208381907101E-7	26	28	1
21.2533197420714	26.3896280656243	4.03194484022151E-7	26	29	0
21.1996923524935	26.1587357162621	4.00211336071266E-7	29	30	0
21.1457189068852	25.9264742957253	3.93610852356119E-7	30	30	0
21.0912958905272	25.6911386073119	3.75570666122371E-7	30	31	1
21.0359654155606	25.4456482067887	3.55846525579295E-7	30	29	2
20.9801553390584	25.1973449954602	3.38733265436986E-7	30	28	3
20.9236358064323	24.9467609657642	3.25963632974435E-7	27	26	3
20.866886273044	24.697578415594	3.14557397018689E-7	26	23	3
20.8099894621462	24.4514921645678	3.15270789030819E-7	27	23	2
20.7528748686763	24.2083503107385	3.10366582212396E-7	29	24	2
20.6952674184211	23.9671959490752	3.09541309917449E-7	27.6	23.6	1
20.6374980329976	23.7284067594296	3.01183515460934E-7	28.5	22	1
20.5794012063117	23.4929587507443	3.01848890771339E-7	27	22	0
20.5211423830157	23.2605633574556	2.9472243134876E-7	26	24	0
20.4627567694839	23.0296375682021	2.77388526370714E-7	26	25	1
20.404237453971	22.7994680335599	2.70579345595934E-7	27	25	1
20.3454871349121	22.5698278533158	2.62540398310307E-7	26	26	1
20.2866169084596	22.3400359651114	2.46560196259793E-7	26	27	2
20.2276030824042	22.1084720250584	2.48830891891316E-7	27	27	1
20.1683823578129	21.8743307379742	2.42627576696464E-7	28.5	27	1
20.10850359486	21.6338663587499	2.3648574831725E-7	30	27	1
20.0367197656797	21.2601735380717	2.2750686134998E-7	30	26	1
19.9589357844406	20.8052617867448	2.18545407548731E-7	30	25	1
19.8761154479996	20.2826959475096	2.08663891498873E-7	30	23	1
19.7901548599053	19.7371072084566	1.82873240106574E-7	30	22	3
19.6986067121196	19.1544499752657	1.81094719664543E-7	30	20	2
19.6032771158651	18.5716447738529	1.81846935731755E-7	29.5	20.5	1
19.505229876874	17.9811384063655	1.85403813190987E-7	30	21	0
19.3984783023717	17.3144892566454	1.75574141891843E-7	30	19	0
19.2845822730638	16.6224174316143	1.56370843384934E-7	30	18	1
19.1604658526467	15.9039883620861	1.47362618108104E-7	29.5	17.5	1
19.028765447834	15.1689619062898	1.39562029488616E-7	30	17	1
18.8509394979405	14.2355600388447	1.30777799256521E-7	30	16	1
Route: 4 Length: 49.6404019902551 Demand Met: 184					
0.107423422815089	4.28762048070312	6.38006820707915E-8	3	12	2
0.21416771869437	7.80237584891758	7.20304811352435E-8	3	18	2
0.319923481190187	9.33227035705719	7.83721176844665E-8	3	19	2
0.425292981915049	10.5264159916202	8.06782143314422E-8	3	20	3
0.530258121710162	11.5024108684476	8.72734418067012E-8	4	21	3
0.634308972723275	12.2824263602419	9.76262626295465E-8	5.3	21	2
0.737575658325085	12.9827473234716	1.02622236042293E-7	4	20	2
0.840814384639231	13.6698651021941	1.08734738546445E-7	3	21	2
0.944149924566403	14.343327610596	1.25503024861473E-7	3	22	0
1.0475905306689	15.0021227339162	1.26063840255597E-7	4	22	1
1.15105756075904	15.6510647212457	1.27673331462574E-7	4	23	2
1.25452926054859	16.2865207668387	1.34108114835385E-7	5.40000000000001	23.3	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
1.35783052033788	16.9086310377398	1.36285825291793E-7	5.40000000000001	24.3	3
1.46089140786465	17.5113290545806	1.46744731921444E-7	7	24	2
1.56355678642231	18.101378684459	1.57936625555521E-7	8	24	1
1.66572096685431	18.6815628107095	1.64197414775913E-7	9	24	1
1.76718207645362	19.2521844806974	1.70893628137492E-7	11	24	1
1.86654007137763	19.7976634577314	1.71329368470197E-7	11.7	22.8	2
1.96349253626147	20.3327480821009	1.72714367252524E-7	12.2	22.1	3
2.05662453120141	20.866115207053	1.88279605239927E-7	13	22	1
2.14394426498818	21.4000013475806	1.94070517878231E-7	13.5	21.4	1
2.14394418194567	21.4510249481742	1.88907208098499E-7	12	21	2
2.14394409895475	21.5021203068492	1.84951240100872E-7	11	21	3
2.14394401599813	21.5533119405652	1.89540321215986E-7	10	21	2
2.14394393305621	21.6046251424327	1.9476572887811E-7	9	21	1
2.14394385011214	21.6560727858449	1.9473967327599E-7	7	21	1
2.14394376712715	21.7076709059368	1.90959783097355E-7	8	21	2
2.14394368411934	21.7594200329003	1.92804082033149E-7	8.5	22.8	2
2.14394360111034	21.8112550978027	1.93555893091002E-7	9.5	22.2	2
2.14394351810647	21.8632014103067	1.95449780804324E-7	10	24	2
2.14394343512529	21.9151642670836	1.97333907436814E-7	10	26	2
2.14394335217226	21.9669839152215	2.02817243888376E-7	9.09999999999999	26	1
2.14394326922543	22.0187609586174	2.02614893751729E-7	7.5	25.5	1
2.14394318624613	22.0705917666504	2.04134082082419E-7	7	27	1
2.14394310324046	22.1224112765709	2.05213387616254E-7	8	27	1
2.14394302022916	22.1742020004727	2.11211579781434E-7	8	26	0
2.14394293720194	22.2260473016715	2.14896363814887E-7	8	30	0
2.14394285415702	22.2772753491925	2.14174699308955E-7	4	30	0
2.14394277105538	22.3283997856867	2.09880059998113E-7	5	31	1
2.14394268793052	22.3792124674444	2.05074252690451E-7	4	31	2
2.14394260477803	22.429793109141	2.05529245178582E-7	3	31	2
2.1439425215883	22.4802084605183	2.0694445268532E-7	3	32	2
2.1439424383782	22.530234534936	2.13205799681759E-7	4	32	1
2.14394235515297	22.5799256477457	2.14692523314852E-7	4	33	1
2.14394227191585	22.6284496141966	2.15122406999058E-7	3	33	1
2.14394218867258	22.6762564880486	2.16703957889308E-7	3	34	1
2.07402822156982	22.6570990439535	2.11713347297859E-7	2	34	1
2.00230406771644	22.4103616369751	1.96397522245206E-7	2	33	3
1.93066165429076	22.1098543970399	1.90397374311146E-7	2	31	3
1.85914867933575	21.8027113621578	1.85073846026285E-7	2	30	3
1.78777241232446	21.4914091855096	1.85057011492518E-7	3	30	2
1.7164598217895	21.1750618155479	1.79700540670069E-7	3	29	2
1.6452268623581	20.8556020726041	1.75270059799004E-7	4	29	2
1.57398779324713	20.5312901613083	1.69928338067393E-7	4	28	2
1.50276019769112	20.2039987233777	1.64714045070014E-7	2	28	2
1.43164521243202	19.8734693218504	1.65733350598885E-7	2	29	1
1.36060959939938	19.5344377675418	1.59662667087446E-7	2	27	1
1.28968035106367	19.1930221221331	1.61080471627884E-7	3	27	0
1.21879459711755	18.8480695631123	1.57108095422132E-7	3	28	0
1.14789926946236	18.4928767407062	1.5198462754995E-7	4	27	0
1.07694258642753	18.1297483004855	1.46570116044131E-7	4	26	0
1.00595285388896	17.7613488597909	1.40865841657956E-7	3	25	0
0.935008832072512	17.3902010385694	1.35202281370539E-7	2	24	0
0.864164630864451	17.017978357537	1.31863018282274E-7	2	26	0
0.793376733632599	16.6355723311671	1.15859117855166E-7	2	25	2
0.722659031174615	16.2454857438138	1.07720797615229E-7	3	26	3
0.651754630503049	15.8171666763749	1.07454022568731E-7	4.7	25.5	2
0.580245724167341	15.3240560191692	1.02249675393296E-7	4	25	2
0.508380991916539	14.768663035389	1.018427280286E-7	4	24	1
0.436308055382	14.1699769732776	9.68392228628545E-8	3	24	1
0.364050440828692	13.4989485904995	9.15212741148252E-8	3	23	1
0.291643597874085	12.7615716779965	8.65346869716177E-8	2	23	1
0.219095867515819	11.871002428297	8.12335709809986E-8	2	22	1
0.146448608740556	10.7838521697298	7.59473586242621E-8	2	21	1
0.0736801728105974	9.36845245886888	7.0667578455641E-8	2	20	1
Route: 5 Length: 78.2560245581705 Demand Met: 184					
4.11162923290166	16.3180971595965	7.70687194062702E-8	12	24	2
5.01387422907474	17.423057641578	8.81158950249983E-8	13	24	1
5.79921739648431	18.3944574288196	9.49754035417527E-8	15	24	1
6.41848541481929	19.2124198917881	1.00282502302207E-7	14	24	1
7.01679867394031	20.0164939364283	1.13293681991422E-7	14	25	0
7.60116388482471	20.810655997445	1.20625362143301E-7	14	27	0
8.17187537747708	21.5851620737354	1.27615919609525E-7	16	27	0
8.71858916571166	22.3366302412836	1.35669218082057E-7	18.3	28	0
9.10169885188893	22.8996459992295	1.34235703441732E-7	20	26	1
9.18052295939677	23.1152964533503	1.28557816836405E-7	20	25	3
9.21611362958592	23.2524560637207	1.38736030663722E-7	17.9	25.8	2
9.25160943014828	23.3896331603633	1.44393437651047E-7	17.2	26.1	2
9.28704516729016	23.5269149001031	1.5053364776918E-7	16.9	26.8	2
9.3224278708836	23.6642288642247	1.58105507352957E-7	16	30	2
9.35773862902401	23.8006738539022	1.63445166734277E-7	15	30	2
9.3930160072436	23.9366587338756	1.68305112069334E-7	15	28.6	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
9.42827570022077	24.0726234630585	1.73738552433633E-7	15	28	2
9.4635220043579	24.2087014099416	1.73985652551778E-7	15	27	3
9.49875660073519	24.3450327028953	1.83801345698953E-7	13	27	2
9.53399997635688	24.4817032047013	1.88763511488332E-7	11	27	2
9.56926383852358	24.6187470629826	1.89048737553321E-7	9	27	3
9.60455801065709	24.7561736880311	2.05569596900546E-7	10	27	1
9.63987773914037	24.8940105257038	2.18874779633893E-7	12	27	0
9.67521401200713	25.0322670860548	2.2002742916527E-7	14	28.2	1
9.71055354511549	25.1708188049643	2.26469916597694E-7	14	29	1
9.74589561479382	25.3095944206642	2.330801684991E-7	14	30	1
9.78123813023264	25.4484764439137	2.32635867902786E-7	13	30	2
9.81658946203432	25.5875125282646	2.38036246713591E-7	12	30	2
9.85195698661319	25.726746915846	2.43455222204147E-7	11	30	2
9.88734686555469	25.8662100583677	2.43977808622731E-7	10	30	3
9.92276451867454	26.0059044211145	2.54347705563873E-7	9	30	2
9.95821522612464	26.1458614804161	2.59463114105074E-7	7	30	2
9.99371102544394	26.2860723205959	2.66183365127404E-7	5.2	32	2
10.0292758411395	26.4261157966572	2.68063189423629E-7	4.7	33.5	3
10.0649459512138	26.565163387242	2.74082402995646E-7	4	34	3
10.1007759809105	26.702366873225	2.80676927033596E-7	4	35	3
10.1368961448764	26.8350961248221	2.88793208014226E-7	6.2	37.1	3
10.2697991588426	26.8516381405656	2.99293718697413E-7	6.2	36.5	2
10.4053076692279	26.8681082283835	3.10926434821113E-7	7	36	1
10.542147400601	26.8845504803377	3.24134255436093E-7	8	36	0
10.6799950041052	26.9009710099631	3.30289447347809E-7	9	36	0
10.8186311028112	26.9173727656177	3.2344343559032E-7	10	36	2
10.9578903471831	26.9337549714692	3.35751291657971E-7	11	36	1
11.0975912396843	26.9501201759379	3.42032807409964E-7	12	36	1
11.2375627017043	26.966468220773	3.42188068103155E-7	13	36	2
11.3775856420249	26.9827960955239	3.61890061029158E-7	14	36	0
11.5174704253027	26.9991042882247	3.60897592699416E-7	15	36	1
11.6568867281547	27.0153882297674	3.6725843344243E-7	16	36	1
11.7953538281604	27.0316408900933	3.73638851414171E-7	17	36	1
11.9319954229383	27.0478478081642	3.79936343719578E-7	19	35.2	1
12.0640324246438	27.0639794591109	3.79827646668218E-7	20	35	2
11.5958951961889	26.9477094982006	3.64975520028565E-7	18.3	34.5	2
11.1012474363003	26.8297210476258	3.50609511201583E-7	17.2	34.1	2
10.5913669223961	26.7107641832581	3.36854125038144E-7	17.9	33.3	2
10.0537668215436	26.5906454512555	3.22145433884202E-7	16	33	2
9.50550292022659	26.4700556510523	3.08161785866901E-7	15	33	2
8.94859348576558	26.3490390234974	3.00182472656729E-7	14	33	1
8.38551541519867	26.2276717017281	2.80229588867087E-7	13	33	2
7.81707368273572	26.1059303375225	2.72253286581758E-7	12	33	1
7.2451662022837	25.9838683883985	2.58291215970985E-7	11	33	1
6.67094894030745	25.8614914070971	2.51205642953778E-7	10	33	0
6.09560125261898	25.738811603705	2.2461238202709E-7	9	33	2
5.51963599779918	25.615774199392	2.1074836098478E-7	8	33	2
4.94401451729678	25.4923697369153	2.02693483331018E-7	7	33	1
4.36988074557499	25.3686239988696	1.89642483050534E-7	4.7	34.5	1
3.80066377614261	25.2438280294013	1.71365575951654E-7	4	36	2
3.23414495174329	25.1107486885834	1.5676131148723E-7	3	35	2
2.67458036512782	24.9750648795573	1.38022532070181E-7	2	35	3
2.12556034903426	24.8352084185891	1.30343527970922E-7	2	36	2
1.59566162847715	24.4801944886199	1.16307125708204E-7	1.5	35.5	2
1.07332583070372	23.8579758736146	1.08187078851074E-7	1.5	35	1
0.542296964422732	21.3828456135163	9.23022511756244E-8	2	32	1
Route: 6 Length: 64.0258811953194 Demand Met: 184					
7.54497778326001	8.36165803045905	2.92983131089386E-8	13	18	1
8.70270028120675	9.0937833754191	2.53419276674549E-8	13.5	17	3
9.79244918798324	9.77302408330058	2.57369254796913E-8	14	18	3
10.8367038357004	10.4043016838946	2.80676495378884E-8	14	20	2
11.8323087796519	10.9600471330162	2.8208933855467E-8	13	21	2
12.8333395132443	11.4541102792881	2.85017591750147E-8	14	21	2
13.8483990881473	11.9158835453699	2.87968298096075E-8	15	21	2
14.8831196862866	12.3573612665593	2.72250577637578E-8	16	21	3
15.9416358477187	12.7828161884255	2.98780200580495E-8	16	24	2
16.7617403361087	12.8001739053006	3.0186532384846E-8	17	24	2
17.4058807320481	12.8140964102084	3.05137604073025E-8	18	24	2
17.7898466710606	12.8257530099567	3.60686662759235E-8	20	24	0
17.8558851651069	12.832659386253	3.09720444846562E-8	20	23	2
17.9220716108443	12.8395692165717	3.08676710858435E-8	20	22	2
17.9883188141624	12.8464765577958	3.30022587036183E-8	20	21	1
18.054617365483	12.8533817557698	3.26392708416279E-8	18	21	1
18.1210652313326	12.860284545093	3.25331850348221E-8	17	21	1
18.1876984955186	12.8671835585307	3.42411858866853E-8	15	19	0
18.2546057997376	12.8740826158718	2.97727211773235E-8	15.5	18.5	2
18.3217458701653	12.8809809651246	2.7887740117194E-8	15	18	3
18.3891436011664	12.8878787421405	2.82042407206973E-8	16	18	3
18.4567518355143	12.8947751757401	2.8527173512316E-8	17	18	3
18.5245359068555	12.9016699601126	3.07127727694478E-8	18	18	2

Solution x	Solution y	Solution z	Original x	Original y	Original z
18.592472738345	12.9085634859341	3.14950927560176E-8	20	19	2
18.6604893420487	12.9154537432533	2.99173219531212E-8	20	20	3
18.7285905927484	12.9223400683253	3.02312095357138E-8	21.7	19	3
18.7967309723839	12.9292244095498	3.23462110429773E-8	21.1	20	2
18.864957062326	12.9361075541074	3.34208181129725E-8	24	21	2
18.9329378328711	12.942985751562	3.40879395821503E-8	26	21	2
18.9993641321221	12.9498497800424	3.68673500616978E-8	27	21	1
19.0154216592385	12.9550855875688	3.67435859516263E-8	27	20	1
19.0314103934899	12.9603241654749	3.65495154142081E-8	26	20	1
19.0473750079894	12.9655655110414	3.99713915300026E-8	26	22	0
19.0473749991559	12.9312756782227	3.92649450731142E-8	26	19	0
19.0473749903228	12.8969221707013	3.67542174473101E-8	27	18	1
19.0473749814895	12.8625081574729	3.27268914190881E-8	27	19	3
19.0473749726539	12.8278995746451	3.43809194447431E-8	26	18	2
19.0473749638183	12.7932405615138	3.43030492899743E-8	26	17	2
19.0473749549828	12.7585578284462	3.47002604428326E-8	27	17	2
19.0473749461463	12.7238232805353	3.46283801633263E-8	27	16	2
19.0473749373089	12.6890653120371	3.67356793873341E-8	26	16	1
19.0473749284713	12.6542985874392	3.66558872144651E-8	26	15	1
19.0473749196335	12.6195384138106	3.7074073588883E-8	27	15	1
19.0473749107947	12.5847715291353	3.70043409247955E-8	27	14	1
19.047374901955	12.5500137768767	3.45673374368971E-8	26	14	2
19.0473748931146	12.5152685224032	3.67510235577129E-8	26	13	1
19.0473748842737	12.4805470375232	3.66948835761605E-8	26	12	1
19.0473748754324	12.4458588074316	3.71114428077135E-8	27	12	1
19.0473748665898	12.4111978314835	3.70614845479622E-8	27	11	1
19.0473748577461	12.3765753322682	3.70198307564351E-8	27	10	1
19.047374848901	12.3420029019739	3.68269450490288E-8	26	10	1
19.0473748400555	12.3074772562166	3.2972597097114E-8	26	11	3
19.0473748312091	12.2729813620661	3.29675771126858E-8	27	8	3
19.047374822361	12.238572202547	3.48569280106403E-8	27	7	2
19.0473748135111	12.2042771317907	3.45573560878165E-8	25.5	7.1	2
19.047374804661	12.1700663210552	3.46383313143406E-8	25	8	2
19.0473747958113	12.1359201012319	3.50210971333809E-8	26	8	2
19.0473747869615	12.1018429610058	3.55384432992878E-8	27	9	2
19.047374778111	12.0678211006828	3.81684941430649E-8	28	9	1
19.0473747692598	12.033863877559	3.8762445697671E-8	29.3	9.5	1
19.0473747604058	12.0000001695875	3.90552425955093E-8	30	9	1
19.0473747374254	12.0000000821192	4.2050292137219E-8	30	12	0
19.0473747144407	11.9999999946422	3.97421562325917E-8	30	15	1
19.0429119738051	11.7118057488712	3.64274335140635E-8	29	14	2
19.0384383535617	11.4192757392456	3.60909986341085E-8	30	13	2
19.0338957171505	11.0962538054511	3.4710520679937E-8	27	13	2
19.0293482695282	10.7739300198686	3.42497745720038E-8	28	11.3	2
19.0247944316513	10.4540806163	3.23413722469468E-8	30	11	3
19.0193214415694	9.69115834286049	3.16938475464212E-8	30	10	3
19.0130166404016	8.09989989624356	3.0916421422944E-8	30	8	3
19.0052936347125	6.9781838497329	3.0274366125127E-8	30	7	3
18.6073974139068	5.59830855585913	2.9154584524349E-8	29	4	3
18.1003559274764	4.41390777330242	3.06294332119705E-8	29	5	2
17.148526201318	3.1832009268754	2.96775422015116E-8	27.5	5.2	2
15.6321588780155	1.83452076307267	3.085375155365E-8	26	5	1

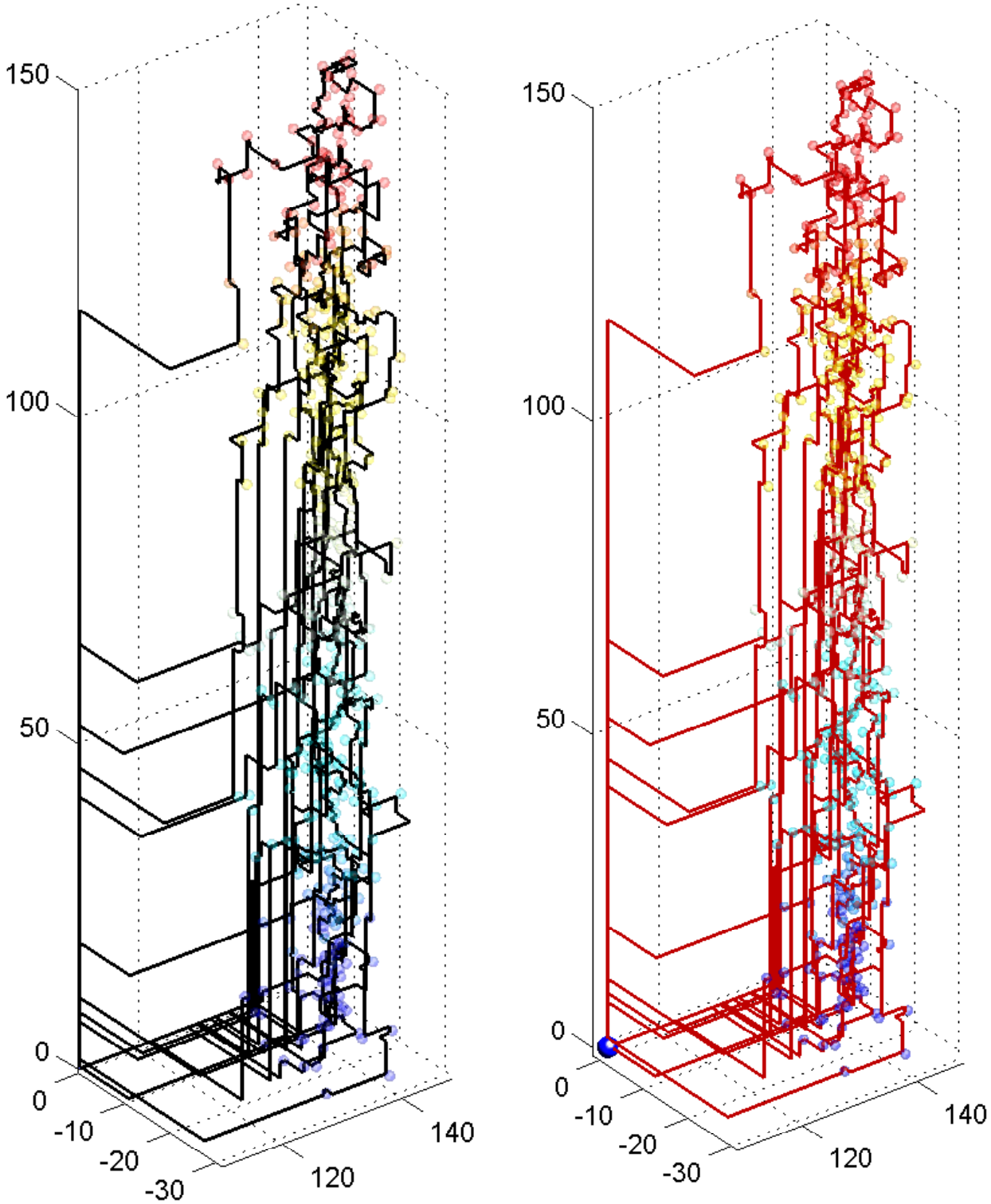


Figure O.189: $d493$, $r = 0.74904$, Equal Radius, 3D, Manhattan, Length = 3784.3865609

Table O-192: Solution for $d493$, $r = 0.74904$, Equal Radius, 3D, Manhattan

Total distance: 3784.38656086244 Total demand met: 10514 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 480.839767472499 Demand Met: 1000					
24.8289250719604	12.5679952651516	43.2729503638971	25.578	12.568	43.273
24.8289065742858	13.753179528651	43.3420480266798	24.371	14.346	43.342
25.8584890107205	13.7166202458512	61.711925869668	25.832	14.219	61.701
26.9370844539735	13.6792759839627	89.1705027089828	26.911	14.409	89.199
29.9749730664461	13.5900854538654	90.6670025718373	29.975	12.841	90.667
30.1064248201787	14.1225234181191	97.316388951721	29.515	14.028	97.711
32.335611217793	15.5756870478053	97.5167587494377	32.802	15.473	97.861
32.9619227656098	17.8852855911797	97.6881944234707	33.071	18.346	97.156
33.3263824610744	18.0739204986444	101.604170444728	32.817	17.775	101.585
34.0336706535583	18.2949828838742	106.413992707983	34.595	18.791	106.414
34.0337179403744	18.295037370207	108.765301010709	34.722	18.219	109.051
32.3090028199311	18.8502221562899	108.765308783884	32.309	19.553	108.506
31.536229878183	17.0759987858998	110.57185713721	30.975	17.076	111.068
31.5362265639332	15.1151888582639	110.571863638045	31.047	14.661	110.232
32.8629370911184	15.1151897890174	111.921823507433	33.452	15.246	111.765
33.2316914235129	15.1151907150943	115.864998332429	33.907	14.791	115.865
32.2597929517307	15.1650792881846	117.297622956346	32.217	14.433	117.304
31.7975776584505	15.9786586424523	118.447058750226	31.502	15.473	118.128
31.7975776584505	15.9786586424523	118.447058750226	31.991	16.632	118.575
31.3430952704521	16.2510180675412	121.668998404762	30.594	16.251	121.669
33.5149841703183	18.0290015030277	123.895903346886	33.515	18.029	124.645
33.8113076462257	22.0289996715626	123.256690554877	34.341	22.029	122.727
32.0682320470053	24.7568442955268	124.946198346694	32.245	24.887	125.449
27.4418827704068	26.339534472162	125.563168013068	27.229	26.22	125.044
26.0220181969167	29.1647490845059	127.854003299257	25.895	29.903	127.854
26.0219887068449	28.2282551568986	136.669022680434	26.149	27.49	136.669
25.0699964699314	29.712394879618	142.761557428913	25.07	30.03	143.44
22.1489998500988	29.7123968265057	142.567103196961	22.149	29.713	141.818
18.9698027453556	29.7123986142725	146.455266251204	18.529	30.03	146.971
18.9698183054138	28.9281124322113	146.455228422393	19.037	28.189	146.557
18.9698267827297	29.2607860959092	135.01200792909	18.72	29.967	135.012
19.020240895882	29.2299985536529	133.446555873801	18.974	29.967	133.455
19.0770770764927	26.9574899984309	129.793932424927	19.037	26.982	129.54
19.134063756858	24.5494044292791	127.941762067593	18.974	24.569	127.812
19.1915901088651	22.0167439163655	126.447956684974	18.593	21.648	126.239
21.0472956280639	21.9236787270621	126.293985783412	21.577	21.394	126.294
20.3645476881595	22.3480141089897	124.737107902353	20.371	23.045	124.747
19.6590953724521	22.4740245120749	122.978998261656	18.91	22.474	122.979
19.9074776878333	23.5530038728796	119.685129805482	20.561	23.553	119.319
18.1324799956972	27.5055532218318	119.685132732634	17.64	27.998	119.961
18.7699705206851	27.4566236807167	115.774669862961	18.72	28.189	115.769
24.0196726617728	24.3691549044049	113.356682099235	24.308	23.998	113.458
25.561749089435	23.2814549635567	109.409974021561	25.832	23.68	109.484
26.4799112414196	19.6160211610602	102.004000390726	27.229	19.616	102.004
25.5010869271825	19.3619864792378	96.3080025136087	24.752	19.362	96.308
25.6038029701062	18.7220353179517	91.8916549266953	24.943	18.791	91.664
25.8319506277559	17.6980854365741	91.4129952928366	25.832	16.949	91.413
25.8950610496276	20.0099146869504	90.4259949674062	25.895	20.759	90.426
26.9879170203661	18.6639978395243	80.6829992997802	26.721	18.283	80.536
26.9879170203661	18.6639978395243	80.6829992997802	27.737	18.664	80.683
22.9961140874185	17.3370608387997	70.9162083849811	22.974	17.711	70.862
19.4183544752466	13.9017415529963	64.9703562313533	19.418	13.901	64.222
17.3222140327995	12.5028388024222	64.9676528806408	17.323	12.504	65.716
Route: 2 Length: 392.431966908798 Demand Met: 999					
22.7797327898499	9.40447268597495	92.140143625692	23.482	9.52	92.151
22.9187469723781	10.1635445091615	100.415730132512	22.212	10.091	100.44
28.9230367591294	12.0299652392851	103.207442074576	29.197	12.441	103.553
29.9747984032749	12.6119144393721	103.951002595792	29.975	13.361	103.951
29.9870328125045	12.5990327337999	105.832291989504	29.578	13.203	105.988
30.0194663436006	11.7926092269848	105.881500939052	29.388	11.804	105.494
30.720930044642	10.0780869459668	106.333004453945	30.721	9.329	106.333
30.7530246359283	10.1077631817132	107.634063037682	30.34	9.647	108.046
31.3028738989073	12.0628948056259	107.66736968116	31.275	12.613	107.178
32.4374523047834	12.1190018257547	107.734567323565	32.477	11.541	107.287
32.9552531581196	12.4044686643747	108.000107833009	33.095	12.711	107.498
33.3844734546942	12.6319172819714	108.437837874082	32.932	12.353	108.278
34.1349984243222	12.8963139419616	108.956314331589	34.135	13.426	109.486
34.6484402685111	11.9077965503346	108.47287407911	34.722	11.742	108.413
35.14433254586	11.0440054041896	108.003703361529	35.674	11.044	107.474
35.1029663575615	10.684686177378	111.104314369845	35.103	10.155	111.634
32.3470046272569	11.3130015395141	110.887088824016	32.347	11.313	110.138
31.7379244159988	11.9823290054421	111.370366005342	31.632	12.353	111.341
31.1770565232674	12.4825558599549	111.864551246491	30.982	12.126	111.418
30.7459534282631	13.4786431026413	113.187372551208	31.015	14.076	113.16

Solution x	Solution y	Solution z	Original x	Original y	Original z
29.8522324262799	13.7544383758351	114.766447585107	29.975	13.101	114.777
27.9780903847812	15.3620033096524	116.26298630564	27.229	15.362	116.263
28.8289119128881	18.7910195755041	116.419211179949	29.578	18.791	116.421
27.9270039549673	21.4580002574695	117.220908877331	27.927	21.458	117.97
27.440685507516	24.7599969890008	115.815688852138	26.911	24.76	115.286
28.1309119303054	25.3310170161519	116.966002313791	28.88	25.331	116.966
28.1309227856864	28.1250004409875	118.388199193183	27.927	28.125	119.109
29.7473085046041	29.9453176786712	112.299000163076	30.277	30.475	112.299
29.0402504639891	29.8079398493102	107.639781538086	28.943	30.475	107.548
28.5399913428545	29.5187682556662	106.284218026946	28.943	30.03	106.391
22.3628338070321	28.6281058509525	102.282366190917	22.276	28.125	102.29
19.1732362063096	28.1407743880015	98.0596529389806	18.91	28.697	98.028
18.2693354180164	25.4900047431162	95.0500009616472	17.577	25.204	95.05
19.2276496225044	25.4900009807369	93.5543592272155	19.545	25.839	93.739
19.8686648953389	25.4899971995939	90.6459991030542	20.561	25.776	90.646
18.1990771575159	24.1880048465936	63.322002646161	17.45	24.188	63.322
18.4693193412046	23.6986825846972	61.0942896416358	18.974	24.125	61.119
18.6506335377765	18.4752933493651	58.1538587589857	18.466	17.838	58.207
18.8599253926124	18.15598994233	48.051000287454	19.609	18.156	48.051
17.5634318285063	13.4314981437114	41.6981679916511	18.021	13.52	41.784
Route: 3 Length: 498.327945688509 Demand Met: 994					
25.1586875320635	11.9469929827992	93.436977059436	25.705	12.123	93.472
25.9061279500899	13.9357909702506	104.114999238453	26.086	14.663	104.115
25.906162262439	13.1275933388219	109.191002902411	26.022	12.631	109.182
25.9061965380523	12.6822916445256	114.729000338366	25.197	12.441	114.729
27.1866183404748	12.6821696138267	120.417000288195	27.927	12.568	120.417
26.5939859049957	12.682136337037	126.916971789064	26.594	11.933	126.917
24.3359148511996	15.0376513552466	127.169241502418	24.371	15.235	126.557
21.1173677020372	15.8836532561718	127.775501132708	20.434	15.806	127.618
20.961823349259	18.0092477471399	132.344026467441	20.434	18.537	132.408
25.4509179149354	17.9636045703259	132.344112589987	25.451	17.965	131.595
26.1719076865154	15.7528064051098	136.310278626505	26.149	15.679	137.044
28.8479425571894	15.4889818398074	136.342562899721	29.324	15.489	136.921
28.8478931698349	14.6629885473375	135.663570283449	28.372	14.663	135.085
29.1021195465198	12.8842611473225	137.134860835794	29.007	12.949	137.787
29.388019375092	9.06214406238245	137.407007884418	29.388	8.313	137.407
31.6970002644679	11.5409715398631	137.923856237229	31.697	11.541	138.673
34.1349486507733	11.8660095240188	137.408141799065	34.135	11.866	136.659
34.2146624558273	12.6337883530132	138.708543189047	33.907	12.776	139.011
34.2975890675473	13.2864503175975	139.514003548918	34.404	14.028	139.514
34.2976562267106	13.0729625055873	141.231966134217	34.785	12.504	141.232
33.7948363913548	14.311091153947	141.303823361941	33.907	14.336	141.111
33.2495836086309	15.516758950991	141.376696026618	33.322	15.473	140.664
32.1051479997823	19.6799819847824	141.631019632011	31.356	19.68	141.631
33.2464730213634	20.1328903631783	142.432274788792	33.515	20.315	142.968
33.8113508847176	20.483190184241	142.761014195454	34.341	21.013	142.761
33.7931663683675	20.3517570348676	146.990138276106	34.468	20.442	147.277
33.5819919846525	15.7030327939435	147.03503760222	33.582	15.473	147.748
33.3052991793207	15.7030104336743	146.012368126533	33.769	15.679	145.826
32.9440156184559	15.7029880941602	145.252965649471	32.944	15.933	144.54
32.704211221917	14.0893421630587	145.595966893467	31.991	14.092	145.487
32.6411520825154	12.3530006755227	146.678965010463	31.892	12.353	146.679
36.9222675710975	10.7477298233315	146.804025585663	37.452	10.218	146.804
33.878907716541	13.1725689210954	148.126886168411	33.907	13.556	148.567
30.0380112303376	13.8809902327391	148.64450164628	29.975	13.881	149.391
30.0378830540392	14.2060908673759	147.619948694036	30.787	14.206	147.62
29.4886369821486	14.7646616101752	145.401281828147	29.975	14.661	145.197
28.2697704565023	15.402433324457	144.260321728541	28.245	14.854	144.187
27.1281123535312	18.2199904263283	143.301261935212	27.356	18.473	143.695
24.8789985543278	19.4042722817914	139.949725745707	24.879	19.934	139.42
18.9816580503217	18.3734253090578	140.725847593678	18.466	18.664	140.644
18.3389996644385	13.1607249540917	141.669270746553	18.339	12.631	142.199
17.576989219035	13.6470134073345	137.905143139257	17.577	13.647	137.156
13.6880387921919	14.683767090925	138.780771698247	13.576	14.79	138.325
11.4490112989768	15.5520048448764	141.139600623282	11.163	15.552	141.832
11.4490010922427	17.681874396298	124.5609467974	11.481	17.711	124.498
11.4489908821188	19.6856169085287	116.221999397064	11.735	20.378	116.222
Route: 4 Length: 392.402403694221 Demand Met: 997					
18.1464994656803	17.9071551179345	35.6695770993873	18.212	18.283	36.255
19.8119421684223	18.2190071485086	35.8740045177466	20.561	18.219	35.874
19.8119419365535	24.6959985074344	36.2690119899458	20.561	24.696	36.269
17.731786672234	27.3949972544648	45.2179998806755	17.069	27.744	45.218
17.7317866728485	27.3950038656107	52.4380006082656	17.069	27.046	52.438
18.3890538425871	29.9930120550136	66.9859998782247	18.72	30.665	66.986
18.3890540137366	27.4899987599091	72.7329887788695	17.64	27.49	72.733
18.4149379862615	24.6960000689884	74.3060004195275	19.164	24.696	74.306
18.0690139709798	21.9019400814181	76.0531997123817	17.45	21.902	76.475
19.8630014962106	21.8660825454589	76.0531953622013	19.863	21.331	75.529
27.1019994526515	21.8660873817642	79.2483879073987	27.102	21.648	79.965
28.8627555263635	22.3943351451067	78.6205882806575	28.816	21.902	78.963

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.3559939333444	26.0299973943431	76.7830626667027	31.356	26.03	76.034
31.5883334363129	26.7703306323193	81.7250000776017	32.118	27.3	81.725
28.3397988207079	23.558608803998	87.7908440585448	28.054	22.918	87.821
28.0027933246899	23.404635617465	90.0900298780299	28.245	22.855	90.204
27.5459981009825	23.2860643647758	91.3259991645252	27.546	22.537	91.326
26.3690748790243	23.5998277215369	92.0119260347872	26.149	23.172	91.657
25.7550647696307	24.1880033248544	94.5349998263709	25.006	24.188	94.535
27.2290000115929	26.8049349019355	96.4470256781714	27.229	27.554	96.447
28.5734244366517	22.9729021751134	96.5344957676717	29.134	22.537	96.334
28.6034183769132	22.9330048245205	101.830998054762	29.07	22.347	101.831
28.6034089249152	22.9954953287082	102.04951068002	27.991	22.601	101.939
28.6033995811034	23.9979993921705	106.195024023726	28.753	23.998	106.929
27.1649999783427	24.9283228292992	105.313663079455	27.165	25.458	104.784
25.4935808383898	20.632000032794	105.648758196118	24.879	20.632	106.077
27.2919996182689	16.716842023829	105.648753134481	27.292	16.632	106.393
29.6419870528934	16.7167588953085	105.648708815381	29.642	17.076	106.306
30.6954832729759	15.8729565047488	105.18707696188	31.293	15.806	105.367
30.9808538300054	15.1879353282883	104.470383715261	31.372	15.246	104.804
31.2079339462398	14.433001142059	102.967002054296	31.957	14.433	102.967
30.1616277450912	14.0063576472835	102.51705167492	30.202	14.011	102.151
29.0523717828252	13.5780621749314	102.149824154394	28.753	13.838	102.669
28.6185997409435	12.6662754919524	99.184783624557	28.753	12.949	99.196
28.1680646902757	11.2980134971817	96.1660017382999	27.419	11.298	96.166
29.165849539101	11.2267432047813	95.6454165713987	29.261	11.425	96.137
30.0198456412105	11.1533277216176	94.512877002635	30.527	11.313	94.769
30.4035700505472	11.0774826713567	88.5179015247421	30.34	10.917	88.584
30.796951042146	11.0025698329367	78.7527847088314	31.047	11.313	78.28
31.0933592196021	10.9216103436114	78.1344299067657	31.437	11.541	78.241
31.2187980159712	10.6776900696915	71.4756710514488	31.307	11.313	71.461
31.3390712366979	10.0573141411	66.6810001000551	32.055	9.837	66.681
31.3216774158265	10.0573086335969	56.0479998826915	30.658	9.71	56.048
32.3678454958255	10.0573187762926	54.1260001288941	32.944	10.536	54.126
28.5508796126523	9.52117082444008	52.6600119791119	28.626	10.091	52.872
Route: 5 Length: 440.276077036244 Demand Met: 998					
28.2028926537759	10.661690403392	11.5779444794101	28.753	10.79	11.577
28.9979987233484	13.3466012058119	23.4405161903618	29.705	13.393	23.437
29.1123394137483	14.5783294349211	43.6209990018384	29.642	15.108	43.621
28.7400600009594	13.6470097164728	44.3020049409097	27.991	13.647	44.302
28.8628153802821	13.4450382237751	46.9473337443823	28.499	12.949	46.85
29.0070268477984	13.294659898396	60.7291422347606	28.372	13.52	60.757
29.2989734367804	13.1099759893011	65.3925029912539	28.753	13.457	65.491
30.2534578741451	12.8560447278112	66.9744057207486	30.202	12.711	66.602
31.2815675747854	12.6145365155626	74.3469646364556	31.502	12.126	74.715
31.8157534413257	12.4517210806625	74.9680130497273	32.282	12.126	74.654
32.0827165281871	12.3178818885665	77.713591948745	32.802	12.126	77.71
32.0984359871263	12.2750783743399	90.997058399872	31.957	11.541	90.999
32.5729217805618	12.2718744997875	92.5080009775494	32.737	11.541	92.508
32.5729342187511	12.3209994273014	95.0759952134311	33.322	12.321	95.076
32.4485453576799	12.3718401466514	95.5416706692961	32.412	12.353	94.929
32.3264479671907	12.4227749775883	98.9539691257497	31.737	12.885	98.954
32.5898374875389	12.4227623130476	100.045002448322	33.322	12.581	100.045
31.7975598188008	11.960532337741	103.359999623765	31.177	11.541	103.36
33.4044361129966	11.9605384425274	105.614002653215	34.135	12.126	105.614
33.4044366814112	11.9605404746729	116.729757618134	33.907	12.516	116.73
32.6166591183731	11.842686326319	118.86599814573	32.087	11.313	118.866
33.2931919006942	12.6921687731119	119.661329392896	33.322	13.101	119.477
33.9540641702779	13.2191101605336	120.705002430061	34.135	13.946	120.705
33.9540761939092	13.2190790962071	122.396609395437	33.907	13.816	122.673
33.9540882218117	13.2190474936344	122.895033799902	33.322	13.621	122.895
33.9541398405909	12.7435866620346	124.88599789925	33.907	11.996	124.886
35.487499018536	13.8446834929497	125.702026509226	35.992	13.647	125.389
35.9063267264277	18.3883236990489	131.639981262036	36.436	18.918	131.64
33.6160727611717	14.6610065579844	131.697037262675	32.867	14.661	131.697
33.7525656593495	14.3506981780827	132.667405061299	33.127	14.661	132.624
34.5949964510762	11.9960024192242	134.33192657623	34.595	11.996	135.081
34.7979272227328	11.2340010988872	131.369006845281	35.547	11.234	131.369
34.6992001706448	10.4126632003916	130.725871583375	34.976	10.282	131.121
34.5949940775205	9.73167275906854	129.46067561615	34.595	9.202	128.931
31.1469727243822	9.90101316356798	130.795735687325	30.912	9.901	131.507
31.1469615800306	12.4260842222382	130.795727695013	30.787	12.386	130.829
31.146950442426	15.3109120517895	130.795719700995	30.462	15.473	131.052
31.3560033118711	15.3109279067089	129.885100976629	31.356	16.06	129.885
31.6878459086353	15.0168431920917	129.856869281304	32.347	14.661	129.857
31.6878430853474	15.0168366460617	127.600000096921	32.282	15.473	127.6
28.197217429683	13.2193348940475	125.704661429	27.673	12.695	125.598
28.2089687743301	16.8859947856057	125.704647369902	28.943	16.886	125.854
27.790586960234	17.3264831948805	121.569128125408	28.054	17.013	121.063
26.9617800208014	18.4604341628998	121.158070755096	27.102	18.664	121.623
25.8820697237853	19.2349913493808	120.49599740806	25.133	19.235	120.496
25.882073711193	19.5576103739733	119.117395618408	26.276	20.188	119.025

Solution x	Solution y	Solution z	Original x	Original y	Original z
22.149000366229	15.0231518152634	119.117374787448	22.149	14.282	119.226
20.3871081955844	17.5886391992416	118.642203426663	19.99	18.029	118.966
20.0315472874641	17.9367715897553	115.016291905269	20.498	17.457	115.048
17.4370859864585	20.5906713805865	107.010000353512	17.323	21.331	107.01
17.4370666496977	18.092005721381	103.090001271828	16.688	18.092	103.09
17.7155307665039	16.9374769996434	100.022475078385	18.148	16.505	99.59
11.9906054441528	19.7999408062016	100.964370162849	11.608	20.251	101.424
11.990622898762	19.7997731996447	94.6479900783017	12.243	20.505	94.648
11.9906392410155	18.7029337989179	73.9090026866153	11.862	17.965	73.909
12.4753348997459	19.5313312100646	68.6459997730592	13.005	20.061	68.646
11.6123180953842	18.4831619365639	46.1145865665468	12.052	18.854	46.124
Route: 6 Length: 320.191337263899 Demand Met: 1000					
20.1499855500189	10.5638835938714	37.6393595057634	20.244	11.234	37.646
22.0849634487344	10.8530199395357	54.432927530471	22.085	10.853	55.182
22.2748426381375	12.6694649454544	54.4329388799023	22.276	13.393	54.239
22.3127583769428	12.6394466407425	64.847187748659	21.831	13.203	64.85
25.0700013656062	12.3640788024584	69.1789962397451	25.07	11.615	69.179
28.6181503728119	12.5698827847296	71.3038916200263	28.816	12.568	71.763
30.2659211348327	12.7760141821572	72.1170044236715	31.015	12.776	72.117
30.265914003687	13.6742303342983	77.4791843888631	30.202	14.271	77.775
30.265906868263	13.9278728715926	78.1210113713923	30.787	14.466	78.121
30.1866661526473	13.927883203457	83.1777463634904	29.975	13.621	83.535
30.1083465127641	13.927893586441	84.3912171396827	29.388	13.838	84.576
31.0150007300555	13.9279157377683	84.3912299321553	31.015	13.556	83.741
31.9913653919345	14.4241085816679	86.6129670205486	32.737	14.433	86.615
32.0019566713136	14.7451859989754	88.0185829354053	32.412	15.246	88.024
32.0123615452254	14.9432737761547	89.3869994299093	32.542	15.473	89.387
30.9905187459544	14.8850249140728	90.2949072777719	30.722	15.473	90.573
30.693204137187	14.8025528959692	90.5810693156048	29.975	14.921	90.476
30.6539902694433	14.6838932790943	95.0324134137842	30.202	14.791	95.605
30.63447266032	13.6634813786655	95.0644998486506	30.202	13.231	95.497
31.6969953119601	13.6839160796212	93.0070362335508	31.697	14.433	93.007
32.0551807048358	13.555681056177	92.9735344992639	31.547	13.203	92.722
34.1262154847111	13.4486388328457	92.9416236542548	34.849	13.393	93.121
34.1342272026733	13.3950829435068	86.4860018171476	34.135	12.646	86.486
34.1360257927402	14.2369185058508	84.7270109216035	34.135	14.986	84.727
34.3636872857844	13.9458562488141	84.52118147016	34.135	14.466	84.176
34.6709179385012	12.9490881496477	84.3669893474017	35.42	12.949	84.367
34.1460789498778	12.9272723404488	83.5401938556047	33.907	13.296	83.348
33.7082341492519	12.9051713808235	82.879915597574	34.135	13.166	82.509
32.6816985236257	12.8826639094432	82.5029974120812	32.152	12.353	82.503
32.7349227813465	13.0510585806968	81.3744371653721	32.672	12.353	81.337
32.7895984312842	15.4927833469706	80.5309983745435	33.071	16.187	80.531
32.7896012532348	15.2277150609399	78.5555750945257	33.062	15.473	78.089
32.789604068716	14.9207043023699	77.9579955529898	32.835	14.173	77.958
32.7896053147222	14.9207212494236	76.1590614275071	32.477	14.433	75.823
32.78960659112	14.9207384081297	75.7049987855119	32.087	14.661	75.705
32.87578399279	16.6257334712723	75.2214155751182	32.182	16.632	75.383
33.1118554660827	18.125975120795	71.8747002191294	33.261	18.537	71.995
33.3379212443811	18.9180020528316	64.0820002448404	34.087	18.918	64.082
31.3559994181246	21.5979222598915	59.3529999234981	31.356	22.347	59.353
26.9637627098914	19.0649402167281	52.9656083133683	26.594	18.854	52.883
25.5996171405998	17.605735417449	49.2490001347984	25.07	17.076	49.249
25.6095484910913	18.9516790857282	46.3012231199147	25.895	18.918	46.48
25.6194456527063	20.3562039449113	38.9790184442655	26.149	20.886	38.979
25.6053970533995	17.204596858493	38.9000254059822	26.34	17.203	39.025
24.0023609977625	15.1082398371333	33.7463481278023	24.308	15.044	33.546
20.1132621051626	13.3041693865738	31.4483025938219	19.482	13.076	31.528
19.8191344086095	12.7157538675164	7.25780463421736	20.434	13.012	7.24
Route: 7 Length: 197.836343091887 Demand Met: 997					
21.9030496634529	11.5982766115678	1.44490769376288	22.149	11.742	1.36
25.0680621740546	15.7169190186087	3.11890922624336	25.07	16.314	3.298
28.177015731237	16.1954370596503	3.98708151879412	28.308	15.933	3.524
29.8830384848504	16.8388044309242	8.6639997296466	29.959	17.584	8.664
29.8830533679214	16.1870010614806	10.8190012652687	29.134	16.187	10.819
30.5833707060676	15.591084143349	13.5841308405471	31.112	15.246	13.662
30.8829427153398	15.2459968680931	15.1789978723906	31.632	15.246	15.179
30.8340662665705	12.6890533854823	15.6236696736246	31.372	12.353	15.396
30.6927978239538	12.2714906988441	16.6204318689755	29.975	12.061	16.621
30.6905618273552	12.2639995654185	17.3660445693677	31.242	12.126	17.355
30.6883207012817	12.2565482348438	18.1316913547125	30.657	11.541	18.351
30.6882916966176	14.1409702913387	18.1316950991574	29.975	14.141	17.903
30.8475298197402	14.1646995254306	19.1812734935719	30.787	13.426	19.207
31.2420000334304	14.7391279878812	19.5769372568516	31.242	15.473	19.727
31.6099978287419	13.9009969960271	19.5769435204521	31.61	13.901	20.326
31.8892619182841	11.8387062157427	19.5769401814963	31.827	11.313	19.849
32.1820106012512	11.3027956854018	19.5769368384086	32.182	10.98	18.901
33.0655936886222	11.3027929774353	20.7258265063628	32.867	11.313	21.273
34.5866140877527	11.3027902723864	21.1840014048509	35.293	11.552	21.184
34.1386455726275	11.1317534180484	22.7112416516452	33.96	10.536	22.989

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.8330097983438	11.0286064648432	23.1494530162607	33.833	10.282	23.21
33.7577686960961	12.1260006529921	23.1494721254734	33.062	12.126	22.872
33.757762393486	13.3419594945584	24.4030003376774	33.907	14.076	24.403
33.7399323453968	11.6154193011198	26.2428822745552	34.087	11.615	26.904
30.5940001308145	10.0496945291265	26.2523671831788	30.594	9.52	26.782
28.3883423561903	10.2180020369487	26.0538786892999	28.372	10.218	25.305
28.3882779245512	10.4090044887891	28.968822325094	27.927	10.409	29.559
28.3882824520998	12.4409997476555	28.9688063215832	28.181	12.441	28.249
29.0070014160351	14.1775024745341	29.5806122436812	29.007	14.409	30.293
30.1472904584082	14.1775053984212	29.0798255178081	30.202	13.491	28.883
30.7870009858888	14.1775083625448	28.8603842161928	30.787	13.946	28.148
32.5737574913132	14.4010035217993	29.3370681504991	33.322	14.401	29.372
32.5641262870838	15.4729973124805	29.3370991660886	32.022	15.473	29.854
32.686724481946	15.6951118984411	27.8486444633156	32.152	15.246	27.742
32.9853352826104	17.6893368196194	27.239998967297	33.515	18.219	27.24
32.6938443849156	17.5787667626662	23.3148836079016	32.944	17.965	22.768
31.1273892132666	17.3682058567759	23.1558752583795	31.102	17.775	23.735
29.9891838316683	16.3635459865988	22.1474466542429	29.515	16.505	21.691
29.6815569291844	12.8427926183774	21.8426547604607	30.202	12.451	21.726
28.6924319980166	12.3406582566883	21.5781640558864	28.816	12.25	22.231
26.2916152764465	11.9291583654453	20.0220364029116	25.895	12.123	19.556
25.7468958019813	11.3536168912197	19.5915701045903	26.149	11.107	19.141
21.9900119598972	10.9841622162216	19.346183455054	22.022	11.361	19.929
Route: 8 Length: 287.501657496882 Demand Met: 978					
12.0575554793111	19.7068314636442	15.5061842993352	12.37	19.934	15.842
13.6545903797697	21.9574753463158	17.0510045300653	13.513	22.41	17.465
19.3216885813579	22.4902318075852	17.5611736058774	19.482	21.966	17.833
20.9283738725374	24.9776849336326	17.9291305059712	20.942	25.649	17.701
22.2774479275768	25.1300820587422	19.5869860082999	22.974	25.141	19.537
22.449692334756	25.2807345496087	23.6504288325669	21.958	24.76	23.638
25.2463886216266	26.4737177094547	32.4814078628797	25.705	26.22	32.496
26.0860001860524	29.1539520973817	39.6609999478172	26.086	29.903	39.661
32.908744557208	26.2200000087565	42.1829985705547	33.642	26.22	42.336
28.5332553059787	23.6170001514241	42.1830013647911	27.8	23.617	42.03
29.3319097873039	22.7953456448302	43.3445634743821	29.261	23.045	43.901
30.3082389434822	20.7953566598807	43.7480177456293	30.785	20.823	44.268
30.4984903052528	16.9810925140155	43.8893398648338	30.785	16.949	44.302
30.6724676004633	13.8160012481112	44.0178619475237	31.015	13.816	44.684
30.6724929201741	11.5139533522648	44.0178747181294	30.658	10.98	44.543
31.8854177529954	11.5139719202258	43.74197380001	32.607	11.313	43.742
31.8854225698007	13.535502492531	41.9659367311829	32.372	14.092	41.845
30.8403624701454	13.4343991845502	41.9659340770262	30.787	13.686	41.698
29.8659629725865	13.3299982848704	41.9659314269572	29.134	13.33	42.125
29.975001306271	12.5500477522801	40.7940005936252	29.975	11.801	40.794
30.154206829792	12.6828955593868	40.3615281828561	29.975	12.321	39.763
30.4898446690221	13.1249539817911	40.2688284336458	30.202	13.751	40.213
31.3825566390512	13.2849061359899	40.1790682853777	31.015	13.296	40.037
32.9378070878005	13.444507621772	40.0906777788175	33.095	13.231	40.765
33.2555255441205	13.7848042646717	38.9328384457646	33.095	13.491	38.538
33.6053438228177	14.1963425170849	38.3010000042346	34.135	14.726	38.301
33.3820554955693	13.8525532808316	37.7148289848573	33.322	13.361	37.986
33.165337561704	13.6022402416779	36.8117836291914	33.095	14.271	36.737
32.9660476933191	11.5410027608984	36.1449994624818	32.217	11.541	36.145
33.1123447210546	10.6846581427321	35.2199999624779	33.642	10.155	35.22
32.3639623830452	13.1099007694949	34.8520240430888	32.436	13.231	35.38
31.5291276592129	14.6368201375899	34.2545667284237	31.567	14.661	34.796
30.6456486538083	16.0599999694777	32.6206088196705	30.15	16.06	32.059
30.6456476077712	17.203000293291	32.6206080638894	30.023	17.203	33.037
30.8609534908539	17.7756222752415	32.1876053398113	31.61	17.775	32.188
30.8609549618509	23.0681098873136	29.1799999773947	31.293	23.68	29.18
28.626000030592	22.865321419048	23.9683512611362	28.626	22.791	23.223
26.3603444682436	22.8653148705488	24.0066550750786	25.832	22.918	24.535
26.5958316652433	21.8716526165734	23.0854163572094	26.022	21.902	22.93
26.9750010591081	20.8100474292477	22.416999743353	26.975	20.061	22.417
27.8221480717739	21.6943744548774	19.4360443484491	28.245	21.331	19.247
28.2579525093364	26.1569998793667	18.1949998404109	29.007	26.157	18.195
26.6515034822904	27.4584988173759	8.29600009363912	25.959	27.744	8.296
30.7274957291322	27.4584994551468	7.30500100337592	31.42	27.173	7.305
29.0699998612973	28.9639525575719	2.28400018072506	29.07	29.713	2.284
20.0777573765412	27.2663581618484	1.45498643013239	20.117	27.617	1.782
Route: 9 Length: 296.209106520043 Demand Met: 987					
29.146631092135	10.0538260701217	5.31515941493639	29.451	10.155	5.592
31.3226239789609	14.2360376290225	7.03979242211557	31.177	14.433	6.693
35.3575647928949	16.1778370076571	18.064581262461	35.992	16.314	18.057
35.6869287056706	17.0760008965147	35.4129995529332	36.436	17.076	35.413
33.9600002478525	18.9309284115934	39.4099983923362	33.96	19.68	39.41
32.6803806766034	18.3041865167	40.3502213760309	32.372	18.537	39.944
32.0126798202433	17.3516684241745	46.9549992602389	31.483	16.822	46.955
32.8842915960766	17.503966123461	48.4894025014532	33.388	17.584	48.735
33.3560673359844	17.6536472644284	49.307001970474	33.642	18.346	49.307

Solution x	Solution y	Solution z	Original x	Original y	Original z
33.3560696428188	14.6610208560281	52.9629931468068	32.607	14.661	52.963
33.3885926685068	14.269135843082	54.0879952979596	34.135	14.206	54.088
33.0824463046658	14.2691043142807	54.2764806255049	33.322	14.141	54.817
32.6899276921087	14.269072828335	54.4232546591187	32.69	13.52	54.423
30.724073039405	14.4009796820709	55.7170002254164	29.975	14.401	55.717
31.2653440479987	14.4573539210294	57.0859784735568	31.275	14.173	56.999
31.8102574008946	14.5147380149579	58.6696090154081	31.827	14.661	58.532
32.3459262577303	14.5716203806709	60.7239931787779	32.672	15.246	60.724
32.3459266863158	14.0109962416539	61.0110085137955	33.095	14.011	61.011
30.8913801419724	12.9912373493887	61.6104554092196	30.202	12.971	61.507
30.8913801419724	12.9912373493887	61.6104554092196	31.015	12.516	61.408
30.7316700027941	12.5256812694519	64.1419992106958	30.202	11.996	64.142
30.9406179129575	16.4802357379873	65.1619405835023	30.594	17.076	65.103
31.4631068106493	16.6750611427647	67.1269830760295	31.991	17.203	67.188
31.4369379576968	15.1771210535979	67.1270054841356	31.762	15.473	67.554
31.4369379576968	15.1771210535979	67.1270054841356	31.437	14.433	67.041
31.2463612447244	15.3348927960511	68.7431485288132	31.307	14.661	68.868
31.0335315232431	16.0166007440923	69.4198898925928	31.356	16.251	69.04
30.782018623451	16.5219974918825	71.0060441456553	30.785	16.251	71.611
30.5309943145774	18.6639961067231	71.2549241753737	30.531	18.664	72.004
29.7109901907586	19.092528648851	70.0610314063833	29.705	19.426	70.279
28.8981244115086	19.4533361977982	68.2374225493692	29.261	19.172	68.315
27.3559997403942	19.8829253149812	65.9160001631966	27.356	20.632	65.916
25.4009426377057	18.786186623841	63.9310586847861	24.943	18.346	64.008
24.959333352272	18.3556228192331	59.3803228482598	25.197	18.918	59.354
24.308000185631	17.1900728097923	56.0350000446055	24.308	16.441	56.035
23.7204299040364	20.8460713172116	52.7618860055405	24.244	21.077	52.586
20.2288006560069	21.9577785694633	51.4865355345557	20.117	21.775	51.546
17.7477378051766	23.3742904321638	50.1019952349983	17.323	23.934	50.146
17.5060454492435	23.5538079446033	47.1369086141068	17.64	22.918	47.209
17.2260821349604	23.8992712916757	22.5066840947851	17.64	23.426	22.454
16.7605946072228	24.6940521055834	17.8320347627645	16.497	24.315	17.876
16.3699950609271	26.232930946861	10.9679998945175	16.37	26.982	10.968
Route: 10 Length: 333.696877100757 Demand Met: 999					
19.5841421927135	18.1911858074912	2.36426534299447	20.117	18.283	2.485
20.4127047570064	22.2278970941073	3.81728283034076	20.117	22.728	3.645
23.3549998111293	22.8039467056229	9.24699983040606	23.355	23.553	9.247
24.8580803380426	20.0135361818247	11.5395706480538	24.625	19.68	11.726
28.1179955324423	18.8410533553453	12.9310002850235	28.118	18.092	12.931
28.2742405531967	18.8512307921018	15.970722489541	27.864	18.854	16.375
28.4592997892768	18.8614140024625	16.7310525057024	28.689	18.156	16.722
28.485697297826	20.845313625229	28.8685167189929	28.689	21.013	29.015
28.5119463600215	22.2830014744272	32.9080021452212	29.261	22.283	32.908
28.5119470593094	24.1194058252111	50.9516755596282	28.753	24.379	51.035
28.5119477577668	25.262372500817	57.2719355887846	28.499	25.141	57.61
28.511948455456	26.6476026922406	58.9910079924448	28.88	27.3	58.991
27.2027036891537	26.1466020687591	59.240740859889	27.102	25.966	59.543
26.0859998423479	25.6990554700008	59.469001789502	26.086	24.95	59.469
24.9173699079745	27.4793944112843	60.053585898944	25.07	27.744	59.542
22.70271379858	28.2729968534301	62.8706870640574	22.022	28.443	62.892
22.5452853077904	28.6378474954517	64.6927586468747	22.466	28.887	64.369
22.3904673002987	28.9625320984671	74.0285309258101	21.958	29.395	74.461
24.5619991249056	27.7310558292051	72.2589998586921	24.562	26.982	72.259
25.8319997571309	27.7310535927162	70.2218749066833	25.832	27.998	69.522
26.8079404432919	26.9819990823168	70.2218804608974	27.546	26.982	70.094
25.0841451853068	23.7794619367787	70.5658668627315	24.943	23.68	69.938
24.2310564651459	22.4100014773911	74.7249985871503	23.482	22.41	74.725
26.489424184393	22.0973396123045	75.4142108937279	26.911	22.601	75.564
26.8480009276165	19.7430067080946	75.8449433444187	26.848	19.743	76.594
27.4830002693106	19.6160037775717	75.3360562289383	27.483	19.616	74.587
29.0690996438707	13.5200033179469	75.3360560515321	29.197	13.52	74.598
29.0691118497399	11.5908308549505	75.5667598309516	28.626	11.234	75.345
29.0691240482172	10.97988463927	75.842078620801	29.007	10.282	76.107
29.9749997826072	12.3064311724194	75.8420799160253	29.975	12.581	76.539
30.775233779191	12.3064346691275	75.815432505541	30.787	12.906	76.252
31.2129056894973	12.3064381488158	75.5773769789773	30.787	12.646	75.914
32.9102203872992	12.3064416258634	75.2263716049746	32.835	12.613	75.794
36.8543513483023	12.306445099771	72.0099999262812	37.452	12.758	72.01
35.5709996046242	12.1067953646711	66.5167454442108	35.484	11.425	66.484
34.8661025011742	12.0043657775856	64.0168180281803	34.849	11.996	64.173
34.1806336306931	11.9020403547811	59.8642632014249	33.96	11.234	59.829
33.9166643921122	11.8426598924655	58.1280019219831	33.387	11.313	58.128
36.1949445482213	13.0119942720263	57.9359962645029	36.944	13.012	57.936
35.6187829858457	13.1282108509473	51.6207066828241	36.119	13.139	51.404
34.1305975960187	13.2441093884286	49.9782081315551	33.907	13.036	49.61
33.182049043039	13.3650253891989	49.1573289242975	33.095	12.971	48.557
32.7952158576599	14.0325809052423	49.0684902214877	33.322	13.881	49.4
31.0392774818996	15.1259036461439	48.9690264119604	30.982	15.473	49.591
30.2870454159039	15.3112113754092	48.533045620214	30.657	15.246	48.98
27.7370005150684	15.5019454456052	47.6659992279149	27.737	16.251	47.666

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.9831841642277	15.3891198460291	36.0074341100495	27.419	15.044	35.984
24.2281246860765	15.2851217599177	28.6890067345128	24.244	15.997	28.696
18.3820873169784	13.7439949390544	8.71734993807447	18.466	14.155	8.671
Route: 11 Length: 144.673078588696 Demand Met: 565					
24.9429998485024	18.3589553215999	0.303000452972221	24.943	19.108	0.303
26.1669462977831	18.3257919921063	2.63329581924783	26.149	19.045	2.783
32.2243892513773	18.0596368040008	2.80138185712238	32.69	18.346	2.359
32.4023432642691	15.2459999843568	3.84634745597826	32.932	15.246	4.376
31.8971912996867	14.8268482536317	3.67719827170781	31.892	15.246	4.139
31.3990060550379	13.7540000995468	3.45304471472467	31.399	13.754	2.704
31.3620888191745	13.1758741154993	3.48298816486862	30.787	13.166	3.014
31.3472924782326	12.7478628444688	5.86195729209218	31.015	13.036	5.79
31.3325925750063	12.2197794970207	9.06736936261593	32.022	12.126	9.107
31.316646388208	11.8426628635863	10.7109999413641	30.787	11.313	10.711
32.0443665198395	12.3813719483486	11.8800794575069	31.762	12.126	11.712
33.0949998705721	13.2213455808015	13.5193450860086	33.095	13.751	14.049
33.8363425448722	13.0505929807391	10.4417862482949	34.135	13.686	10.417
34.0870001709642	9.50704474427028	8.63900019022186	34.087	8.758	8.639
34.4169552336307	10.7259999699457	7.80300049589614	35.166	10.726	7.803
33.8673998798035	11.8186041762793	7.45420634502896	34.135	12.386	7.828
33.8673998798035	11.8186041762793	7.45420634502896	33.647	11.313	7.765
33.8673998798035	11.8186041762793	7.45420634502896	33.452	11.541	6.941
33.4922747876249	11.9518787902846	6.24859243202547	32.997	11.541	6.26
33.2910447385791	12.1259477675949	4.96899622143279	32.542	12.126	4.969
33.4416612430519	12.2552677666286	4.14040966525082	33.322	12.841	4.069
33.6053709693965	12.3763198320321	3.42599931029867	34.135	12.906	3.426
32.9229350579297	11.4279228072998	0.715843021227847	33.127	11.313	0.11
31.3392423035623	10.7707561005289	0.363708765305497	31.567	11.313	0.396

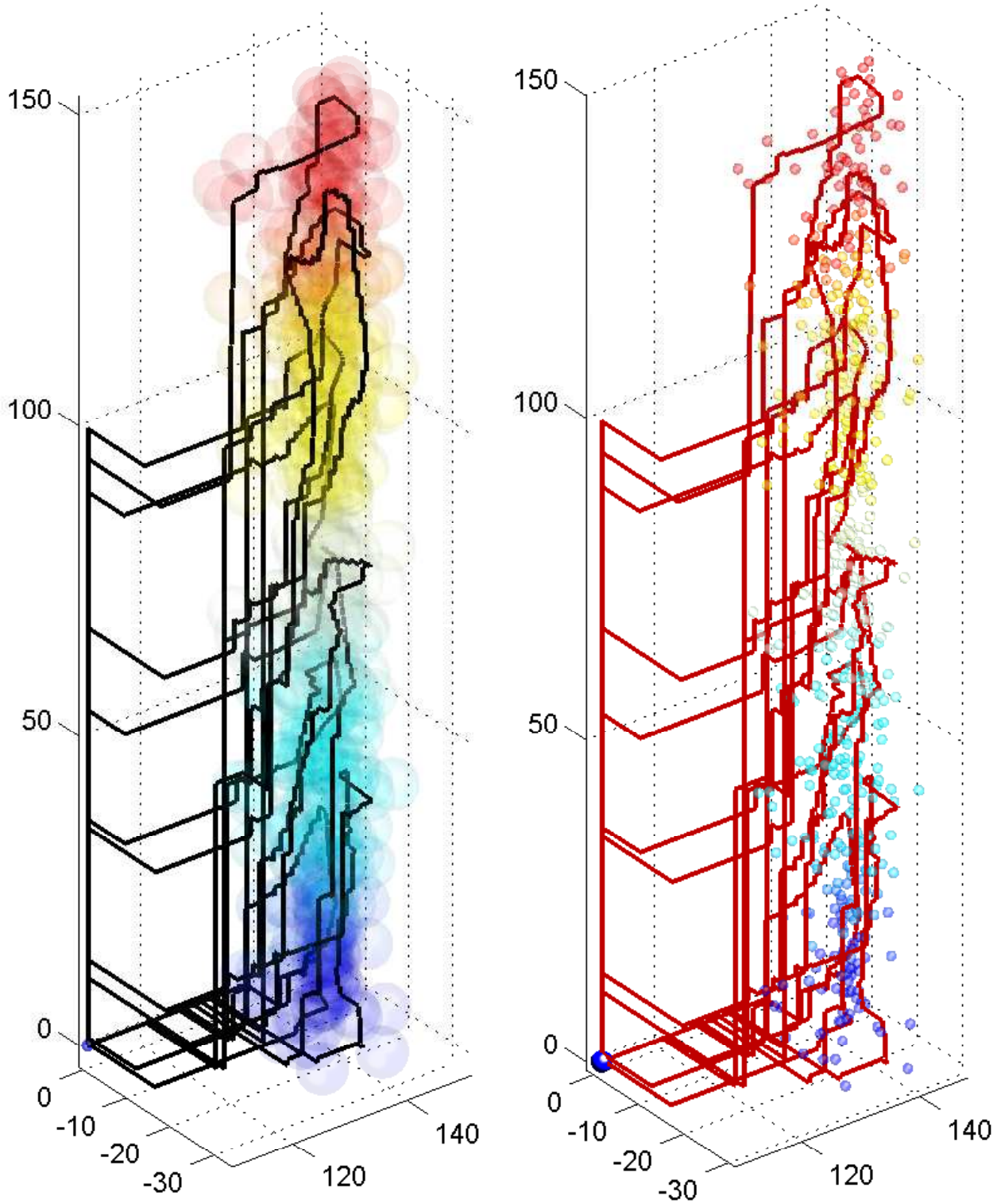


Figure O.190: $d493$, $r = 3.7452$, Equal Radius, 3D, Manhattan, Length = 3054.1521718

Table O-193: Solution for $d493$, $r = 3.7452$, Equal Radius, 3D, Manhattan

Total distance: 3054.15217180303 Total demand met: 10514 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 275.921841169718 Demand Met: 961					
16.1392714778753	10.9562894554127	41.4169737296015	18.021	13.52	41.784
18.8527668113416	12.9187771717764	53.7745337400115	22.276	13.393	54.239
19.5201375577558	14.4004807126258	57.5399037858525	18.466	17.838	58.207
22.7368724616373	14.6314955504839	58.5550102518018	24.308	16.441	56.035
23.9775787655027	14.8363330792924	63.704776916126	24.943	18.346	64.008
24.5315860575583	14.956971584895	65.6808962639151	21.831	13.203	64.85
25.3662797345818	15.0829356937399	68.8725410431593	25.07	11.615	69.179
26.3059457989306	15.2331320436189	71.2166117544082	28.816	12.568	71.763
26.451520752591	17.2694035713575	71.8132277846001	22.974	17.711	70.862
26.8758187931831	18.144206545205	74.4718770722075	27.483	19.616	74.587
27.2950304938704	18.9625839134453	77.1438992593601	27.737	18.664	80.683
27.2950304938704	18.9625839134453	77.1438992593601	26.848	19.743	76.594
27.6821941260874	19.8565537913299	77.6480251354377	26.721	18.283	80.536
28.1128022395755	21.3210247739104	78.00774785119	27.102	21.648	79.965
28.5559468917604	22.7439224594138	78.3523169679022	26.911	22.601	75.564
29.0695180992642	24.2292282512582	78.7742588888072	28.816	21.902	78.963
29.5877155888167	26.1946244546873	79.1947157500035	32.118	27.3	81.725
28.2444853482595	26.1946244842525	76.9280080506635	31.356	26.03	76.034
23.488179012295	26.1946245138602	75.2782440744924	21.958	29.395	74.461
22.5962960494473	26.1946245433202	74.3060141170745	19.164	24.696	74.306
23.0330218803805	26.4044157528658	72.6315555289614	24.562	26.982	72.259
23.4605785969705	26.6120020762881	71.0246164920338	24.943	23.68	69.938
23.8007988022304	26.9818614826882	70.0939807260715	27.546	26.982	70.094
22.8773410432186	27.5046959717461	68.6628313676509	25.832	27.998	69.522
21.3247932720574	27.9739808914801	66.9860005553508	18.72	30.665	66.986
21.3247951361424	27.8970590847951	64.5129018182184	22.466	28.887	64.369
21.3247970036081	27.8203368343733	62.1244215352226	22.022	28.443	62.892
21.3247988738333	27.7439684271908	59.5419949110823	25.07	27.744	59.542
20.3613741740891	26.3901120676685	58.7952543851036	18.974	24.125	61.119
19.7881562905124	25.8427868219993	53.785080165479	17.069	27.046	52.438
19.3395625921273	25.2289844295137	51.5442090892178	20.117	21.775	51.546
18.7605948055244	24.9750471183803	49.3185605424546	17.323	23.934	50.146
18.2082767394045	24.7253479741932	46.8541725590028	17.64	22.918	47.209
17.6661754957736	24.4822878010844	44.2869557982419	17.069	27.744	45.218
17.1674240008335	24.1697259146417	36.0408333552093	20.561	24.696	36.269
16.2174699973996	23.8418914446494	19.1796805531593	16.497	24.315	17.876
15.2570234073445	23.5113051565754	10.9331722070397	16.37	26.982	10.968
Route: 2 Length: 109.531910168186 Demand Met: 611					
27.8579846706496	7.70703559975459	4.60843849932532	29.451	10.155	5.592
31.0000854469886	9.42006895323766	7.08542559097848	34.087	8.758	8.639
31.0000854469886	9.42006895323766	7.08542559097848	33.647	11.313	7.765
31.4207933622328	10.726110956696	7.80414943581518	35.166	10.726	7.803
31.4207921025322	11.2017262374608	7.8655536337874	30.787	11.313	10.711
31.4207908148777	11.6746560521659	7.92412251442628	34.135	12.386	7.828
31.420789633278	12.1259643742973	7.9823685631592	31.762	12.126	11.712
31.3693669017518	12.246851848881	7.19241901526229	32.022	12.126	9.107
31.3176975702171	12.3680243677532	6.29742153201783	31.177	14.433	6.693
31.26591511487	12.4874585085103	5.38329203870145	32.997	11.541	6.26
31.26591511487	12.4874585085103	5.38329203870145	33.452	11.541	6.941
31.2129032745983	12.6097473129272	4.15569927185034	32.542	12.126	4.969
31.1595908990944	12.7326202045521	2.85652630332861	33.127	11.313	0.11
31.1595908990944	12.7326202045521	2.85652630332861	31.567	11.313	0.396
31.0638352411278	13.2097436065482	2.77718669901262	34.135	12.906	3.426
31.0638352411278	13.2097436065482	2.77718669901262	33.322	12.841	4.069
30.9612527714629	13.7144409575	2.6953307567996	32.932	15.246	4.376
30.8557429857267	14.1649569993179	2.61161947032622	31.892	15.246	4.139
30.8557429857267	14.1649569993179	2.61161947032622	31.015	13.036	5.79
30.7485322163239	14.6887783806939	2.5205822298682	31.399	13.754	2.704
30.7485322163239	14.6887783806939	2.5205822298682	30.787	13.166	3.014
30.6401021210504	15.2744651718163	2.42894170736406	32.69	18.346	2.359
26.2231773496024	15.335906206886	2.33884135620359	26.149	19.045	2.783
25.6827349438747	15.3493393081118	1.52259795950301	28.308	15.933	3.524
24.9430201932322	15.362793158701	0.302829408179425	24.943	19.108	0.303
Route: 3 Length: 216.923459910387 Demand Met: 1000					
18.6446833846908	21.5304381966018	1.00464162347312	20.117	22.728	3.645
21.4266567600982	24.7332471377916	1.64886002786365	20.117	27.617	1.782
28.3615214301074	26.0354198941703	2.28399967273814	29.07	29.713	2.284
28.3615217596536	25.6390835803759	6.34909462866758	31.42	27.173	7.305
28.3615220878004	25.1165630174486	7.91838276071552	25.959	27.744	8.296
28.3615224177418	20.7811987192301	9.07178310839768	29.959	17.584	8.664
28.361522746603	20.3272141365774	10.6694849679063	28.118	18.092	12.931
28.3615230756082	19.9348171562637	11.7259964081359	24.625	19.68	11.726
28.9024224043144	19.9348113375993	19.4330741158797	27.864	18.854	16.375
28.9024224043144	19.9348113375993	19.4330741158797	28.689	18.156	16.722

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.9024224043144	19.9348113375993	19.4330741158797	26.975	20.061	22.417
30.2902325435408	19.9348055183816	23.2731159505539	32.944	17.965	22.768
30.2902325435408	19.9348055183816	23.2731159505539	28.626	22.791	23.223
30.2902325435408	19.9348055183816	23.2731159505539	31.102	17.775	23.735
31.2930039971025	19.9347996949641	29.1800418508064	31.293	23.68	29.18
31.2930039971025	19.9347996949641	29.1800418508064	33.515	18.219	27.24
31.2930039971025	19.9347996949641	29.1800418508064	28.689	21.013	29.015
31.2930039971025	19.9347996949641	29.1800418508064	31.61	17.775	32.188
31.9494834238123	18.0344477144437	31.4843176163279	32.022	15.473	29.854
31.9494834238123	18.0344477144437	31.4843176163279	30.15	16.06	32.059
32.6907979936331	17.0759935069906	35.4130013555149	36.436	17.076	35.413
32.6907979936331	17.0759935069906	35.4130013555149	30.023	17.203	33.037
32.6907973629995	17.0156484104728	37.8130505022679	33.095	14.271	36.737
32.6907973629995	17.0156484104728	37.8130505022679	33.322	13.361	37.986
32.6907967331963	16.980066083589	38.9300609380842	34.135	14.726	38.301
32.6907967331963	16.980066083589	38.9300609380842	33.095	13.491	38.538
32.6907961033849	16.9464397813103	40.5227923701856	33.095	13.231	40.765
32.031859705633	16.9667991455975	40.5227934876269	32.372	14.092	41.845
31.3245338861315	16.9874761394549	40.5227946048521	31.015	13.296	40.037
31.1327747076588	17.2542449912393	40.5227957198251	30.202	13.751	40.213
30.9682486731757	19.1418393047466	40.5227968336227	33.96	19.68	39.41
30.9682486731757	19.1418393047466	40.5227968336227	32.372	18.537	39.944
30.784995934542	20.8230004599522	40.5227979466929	30.785	20.823	44.268
30.6602673845381	23.0664417786815	40.4686860191469	29.261	23.045	43.901
30.5741408331944	25.5029772624739	40.3694901547498	33.642	26.22	42.336
28.2321049844626	25.8169327640146	40.0261952057772	27.8	23.617	42.03
26.1867703411212	26.1591539020075	39.6609961142781	26.086	29.903	39.661
26.1867681383269	24.4159073136224	32.9063986884677	25.705	26.22	32.496
26.1867681383269	24.4159073136224	32.9063986884677	29.261	22.283	32.908
26.1867659754519	24.4022948517459	24.1815074381659	26.022	21.902	22.93
26.1867638125312	24.3886039816269	19.9112681018782	29.007	26.157	18.195
26.1867638125312	24.3886039816269	19.9112681018782	28.245	21.331	19.247
21.9580010469614	24.3885607631455	19.9112638606589	21.958	24.76	23.638
20.8758336216127	23.8546306595678	19.5801054576724	22.974	25.141	19.537
19.5806484183851	23.2932551912072	19.2490953868335	20.942	25.649	17.701
17.8450382374758	22.5967557053047	18.9406784426508	17.64	23.426	22.454
16.5161222567409	21.3802707399983	17.4923080854592	19.482	21.966	17.833
13.656978296419	20.035101462059	15.9454211638508	13.513	22.41	17.465
10.9626136286939	17.9063146578381	13.8334070209918	12.37	19.934	15.842
Route: 4 Length: 263.710421321171 Demand Met: 996					
22.2174934710387	20.3499651014233	9.35241984819941	23.355	23.553	9.247
24.3739115482252	21.2712244871609	24.8772233064645	25.832	22.918	24.535
26.1557061277056	22.1080754810035	50.5945191413705	28.753	24.379	51.035
26.8953713511211	22.6430248016767	55.9985300201672	28.499	25.141	57.61
27.4599975943397	23.0408060085913	57.6463046678264	27.102	25.966	59.543
28.0919075936561	23.3036676878565	58.3454768205964	26.086	24.95	59.469
28.8799927881567	23.5547943883258	58.9910005207507	28.88	27.3	58.991
29.2097432683424	22.3679798757728	60.9117157993011	31.356	22.347	59.353
29.5211465586118	21.1859097522285	63.6265690366928	27.356	20.632	65.916
29.877008799609	20.13994013949	64.8943656757521	29.261	19.172	68.315
30.2983356129854	19.5224395007556	65.2084132941385	30.594	17.076	65.103
30.7163433523253	18.9774923637458	65.5240219939116	34.087	18.918	64.082
30.8466633073581	18.464522062024	66.7829013169546	31.991	17.203	67.188
30.9760375656477	17.9705169328589	68.0219033583886	31.307	14.661	68.868
31.1039198124384	17.6404296662047	68.9854873379123	31.356	16.251	69.04
31.2316779109629	17.3176048328386	69.9550316690347	29.705	19.426	70.279
31.3616328700259	16.9747093756387	70.908660293503	30.531	18.664	72.004
31.4925669663974	16.6181168912512	71.8082195203593	33.261	18.537	71.995
31.6210782778305	16.2385377669163	72.7032760256696	30.785	16.251	71.611
31.7502953922148	15.8589271428877	73.6514009610438	32.182	16.632	75.383
31.8791776439541	15.4730007260797	74.5354806595557	33.062	15.473	78.089
31.8791779674467	14.8676059784061	74.5354798887683	32.835	14.173	77.958
31.8791782912351	14.4632828267511	74.5354791247461	32.087	14.661	75.705
31.8791786149781	14.0576535662018	74.5354783604983	32.477	14.433	75.823
31.8791789386146	13.6491073553263	74.5354775958441	29.975	12.581	76.539
31.8791792621485	13.2646350275096	74.5354768304147	29.197	13.52	74.598
31.8791795856366	12.8767625751669	74.5354760645832	30.787	12.906	76.252
31.8791799090793	12.4891407639685	74.5354752978123	30.787	12.646	75.914
31.8791802324768	12.100641014307	74.5354745299781	29.007	10.282	76.107
32.0161922899906	12.1006403665417	74.2896715909606	28.626	11.234	75.345
32.5846435285122	12.1006397188348	73.6948907012517	32.282	12.126	74.654
33.1565424234405	12.100639071256	73.0849676437649	31.502	12.126	74.715
33.7649356127038	12.1006384237732	72.009999935733	37.452	12.758	72.01
33.2844210585315	12.0658474819201	70.7959167307638	31.015	12.776	72.117
32.8469762360361	12.0309820101029	69.406648632108	31.307	11.313	71.461
32.433616996604	11.9961719312384	67.6006865035471	31.437	14.433	67.041
32.433616996604	11.9961719312384	67.6006865035471	31.762	15.473	67.554
32.0797538354953	11.9591407534785	66.1256790764519	30.202	12.711	66.602
32.0797538354953	11.9591407534785	66.1256790764519	28.753	13.457	65.491
32.0139172949936	11.9126502558212	65.7820694647438	32.055	9.837	66.681

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.9481011083973	11.8664148431878	65.4328258943615	35.484	11.425	66.484
31.8059629581997	11.822149129157	63.8901886184679	34.849	11.996	64.173
31.8059629581997	11.822149129157	63.8901886184679	30.202	11.996	64.142
31.6565504928242	11.7777817652264	62.2579165259047	33.095	14.011	61.011
31.6565504928242	11.7777817652264	62.2579165259047	31.015	12.516	61.408
31.504461743518	11.7328248887348	61.0570781384691	32.672	15.246	60.724
29.6802775836734	11.5156364162283	60.6682576324276	30.202	12.971	61.507
27.7531929406651	11.2945742788605	60.2730375797975	28.372	13.52	60.757
25.6272553306886	11.0650768359732	59.8732224813645	25.832	14.219	61.701
20.8658408540052	8.51484924994827	54.1153339942603	22.085	10.853	55.182
Route: 5 Length: 159.267546445036 Demand Met: 995					
21.5486550529888	8.264990729861	18.4213650215426	22.022	11.361	19.929
24.089148687199	8.83282472739585	19.519757776996	26.149	11.107	19.141
25.6584933031583	9.32264842622726	20.6891327166783	25.895	12.123	19.556
27.1922473620674	9.73840458158786	22.1293302927715	28.816	12.25	22.231
28.343140583505	10.1040985906502	23.5572745179826	29.705	13.393	23.437
28.9720528953776	10.3292753951717	25.1574925013235	28.372	10.218	25.305
29.6145424265939	10.5548303790594	26.7607189860819	30.594	9.52	26.782
30.2391827190874	10.7831245736983	28.3934163963548	28.181	12.441	28.249
30.9449205660579	11.0047018364255	30.1117092547058	27.927	10.409	29.559
31.9268088154421	11.2300660468548	32.2011690678098	33.642	10.155	35.22
32.216976018948	11.5409984171571	32.3997961636975	32.217	11.541	36.145
32.233088934621	12.0038510943192	32.2108715560868	32.436	13.231	35.38
32.2492614978702	12.4079786647151	31.9876411986576	31.567	14.661	34.796
32.2656342555291	12.602376374909	30.8383262010674	33.322	14.401	29.372
32.2820097207847	12.7913102072498	29.8628317693592	29.007	14.409	30.293
32.2995857115612	12.9255110610371	27.696585381417	30.202	13.491	28.883
32.3172145147141	13.059096397948	25.0152005238291	33.96	10.536	22.989
32.3172145147141	13.059096397948	25.0152005238291	33.833	10.282	23.21
32.3172145147141	13.059096397948	25.0152005238291	33.062	12.126	22.872
32.3172145147141	13.059096397948	25.0152005238291	34.087	11.615	26.904
32.3172145147141	13.059096397948	25.0152005238291	33.907	14.076	24.403
32.3172145147141	13.059096397948	25.0152005238291	32.152	15.246	27.742
32.3172145147141	13.059096397948	25.0152005238291	30.787	13.946	28.148
32.3343819500114	13.2883517832238	23.3409013107019	32.867	11.313	21.273
32.3515359766911	13.5303029904264	22.1512737784752	35.293	11.552	21.184
32.3677815285984	14.0977675509001	21.6638902840522	29.515	16.505	21.691
32.3986162991657	14.1342582190898	20.9809590619388	30.202	12.451	21.726
32.4296555146575	14.170977199449	20.2605240347139	31.61	13.901	20.326
32.4607300000542	14.207720677543	19.5395347270266	30.787	13.426	19.207
32.4918884279323	14.244526917478	18.8295525331416	30.657	11.541	18.351
32.4918884279323	14.244526917478	18.8295525331416	29.975	14.141	17.903
32.5235781167628	14.2820750317998	18.2023853351197	31.242	12.126	17.355
32.5235781167628	14.2820750317998	18.2023853351197	29.975	12.061	16.621
32.6067899598917	14.384766335496	18.1327847768442	32.182	10.98	18.901
32.6067899598917	14.384766335496	18.1327847768442	31.827	11.313	19.849
32.6961804870758	14.5352012415972	18.0569976239961	35.992	16.314	18.057
32.3436619944352	14.5352012044559	17.1410685326895	31.242	15.473	19.727
32.0088040465283	14.5352011670983	15.8250739272216	31.372	12.353	15.396
31.6801998539427	14.5352011297174	14.5762615590638	31.112	15.246	13.662
31.6801998539427	14.5352011297174	14.5762615590638	31.632	15.246	15.179
31.3566830113403	14.5352010920339	13.3649378729735	33.095	13.751	14.049
31.0205008558102	14.535201054244	12.0622278860828	34.135	13.686	10.417
28.7530028991036	14.5352010163157	11.5769632400356	28.753	10.79	11.577
27.2049641564761	14.536066843007	9.42750339072007	29.134	16.187	10.819
24.1432544973197	14.5369318061162	4.96671566897117	25.07	16.314	3.298
20.1170004228545	14.537796346463	2.48500034789091	20.117	18.283	2.485
18.9284566893687	11.0345144372605	1.25854268049869	22.149	11.742	1.36
Route: 6 Length: 401.065428622731 Demand Met: 996					
19.9899996284029	14.2837904530232	118.965999826917	19.99	18.029	118.966
23.9796174515758	14.2646704284736	126.208419353925	26.594	11.933	126.917
24.7138655205139	14.2459027311643	128.492787304278	24.371	15.235	126.557
25.4590630385087	14.2271172849007	131.581703374462	25.451	17.965	131.595
26.2835219687994	14.0834302541725	133.698606695768	26.149	15.679	137.044
27.3543666715201	13.8040634163796	133.836161461233	28.372	14.663	135.085
28.370393415123	13.5207832495097	133.972597339601	29.324	15.489	136.921
28.8881946959656	12.8532871685587	134.07079096936	29.007	12.949	137.787
29.322462111895	12.0497143496082	134.116939626659	30.912	9.901	131.507
29.3880202554625	11.9980334422238	136.738320693086	29.388	8.313	137.407
30.659702795318	11.9987811083437	136.738322784845	34.135	11.866	136.659
31.2364491680278	11.9995287789644	136.738324893254	34.595	11.996	135.081
31.2364497869268	12.0096920112025	137.693401102204	31.697	11.541	138.673
31.2364503842058	12.0198571428991	138.616068570273	33.907	12.776	139.011
31.2364509810643	12.0300157495431	139.514671641437	34.404	14.028	139.514
31.2364515697854	12.0309864404803	140.78675876234	33.907	14.336	141.111
31.2364521581315	12.0319564740023	141.901273006393	34.785	12.504	141.232
31.2364527457519	12.0329262319582	144.333969607536	31.991	14.092	145.487
31.2364533333044	12.0338958738231	146.387077376462	29.975	13.881	149.391
32.1329872657374	12.0338957064201	146.387074150132	30.787	14.206	147.62
33.1390864643762	12.0338955389567	146.387070923708	31.892	12.353	146.679

Solution x	Solution y	Solution z	Original x	Original y	Original z
34.2031078704487	12.0338953715005	146.38706769724	37.452	10.218	146.804
34.2030954773118	13.1227913094922	146.240466527531	33.907	13.556	148.567
34.2030830841809	14.1805168324621	146.090724707588	33.769	15.679	145.826
34.2030706911586	15.1670934040333	145.941268842366	33.582	15.473	147.748
34.2030582983019	16.1381455033727	145.789809333941	32.944	15.933	144.54
34.2030459058293	17.1186147912373	145.639715233545	34.468	20.442	147.277
34.2030334688117	17.1961672997708	143.986218398546	33.515	20.315	142.968
34.2030210315682	17.2703312691627	142.761023176013	34.341	21.013	142.761
32.7680597744122	17.2703205840574	142.688110918454	31.356	19.68	141.631
31.5859389550737	17.2703098989797	142.615798556498	33.322	15.473	140.664
29.9649737486077	17.2702992140905	142.544810975752	29.975	14.661	145.197
28.2865198985967	17.270288545064	142.384818535244	28.245	14.854	144.187
26.6269005847693	17.2702778762859	142.219853405143	27.356	18.473	143.695
24.8787999208062	17.2702672074494	142.052700732603	24.879	19.934	139.42
20.5080487274862	16.8407086633346	142.052689545932	18.466	18.664	140.644
18.3390008775013	16.3733515069144	142.052678362627	18.339	12.631	142.199
17.2078080523031	16.4305502752435	139.53926557473	17.577	13.647	137.156
14.9986831393457	16.5000969860572	139.225282138891	13.576	14.79	138.325
13.1585051884772	16.5701361885933	138.916895937458	11.163	15.552	141.832
12.7917482446161	16.6456046935822	125.232426479382	11.481	17.711	124.498
12.4333467022835	16.7208053812449	116.201757843353	11.735	20.378	116.222
12.242993661127	16.7597917890845	94.6479999897838	12.243	20.505	94.648
Route: 7 Length: 220.732538149831 Demand Met: 971					
17.1012102588297	11.1863319980868	7.5942694240488	18.466	14.155	8.671
18.9372320754222	12.1460347793792	9.87614628025582	20.434	13.012	7.24
20.271942009224	13.0071692421401	28.3851924366764	19.482	13.076	31.528
21.9611739724532	13.8589513460532	29.9710663584583	24.244	15.997	28.696
22.8438581932303	14.4559200491638	33.0659146800442	24.308	15.044	33.546
23.6737958080178	15.0440350071234	35.9839873415941	27.419	15.044	35.984
23.6737984325203	16.6416460961473	37.6707747990015	26.34	17.203	39.025
23.6738010684941	18.0753149620251	38.9789995999281	26.149	20.886	38.979
23.6737970083722	18.0257370574643	43.3419980724656	24.371	14.346	43.342
23.515629393552	18.0257364801909	45.8392513544268	25.895	18.918	46.48
23.3519389691594	18.0257359026396	48.0509992658071	19.609	18.156	48.051
23.8161622327278	18.0257351841334	49.945711297511	25.07	17.076	49.249
24.2674893630021	18.0257344654924	52.0389630836959	24.244	21.077	52.586
24.7449633759706	18.0257337366107	53.7485216109014	26.594	18.854	52.883
25.1969952181462	18.0257330071308	55.7166352880417	25.197	18.918	59.354
27.2933557073397	15.057814963679	55.7166328592666	29.975	14.401	55.717
28.6260000842907	12.5271115037267	55.7166304302195	28.626	10.091	52.872
30.9916406234442	12.5271122702993	56.0273350032822	30.658	9.71	56.048
30.9916406234442	12.5271122702993	56.0273350032822	31.275	14.173	56.999
33.5571635005073	12.5271130394226	56.3372749511055	33.96	11.234	59.829
33.5571665643529	13.012010088514	56.3372748004675	36.944	13.012	57.936
33.5571665643529	13.012010088514	56.3372748004675	33.387	11.313	58.128
33.5571583464053	13.2169985586708	55.8385702557801	31.827	14.661	58.532
33.5571501267081	13.400700628468	54.8916490878132	32.944	10.536	54.126
33.5571419064121	13.5986611449817	54.0360179364641	32.69	13.52	54.423
33.5571336856299	13.7967655652016	53.1741772766071	32.607	14.661	52.963
33.5571254643204	13.9931698651775	52.3257927855928	34.135	14.206	54.088
33.5571254643204	13.9931698651775	52.3257927855928	33.322	14.141	54.817
33.5571172410961	14.188719822557	51.205371983003	36.119	13.139	51.404
33.5571172410961	14.188719822557	51.205371983003	33.907	13.036	49.61
33.5571090162019	14.3924688133525	50.1887918076724	33.095	12.971	48.557
33.5571090162019	14.3924688133525	50.1887918076724	33.322	13.881	49.4
33.5571007898573	14.6017571440018	49.3070020245658	33.642	18.346	49.307
32.9036882857118	14.4926742296176	48.8482995359229	30.982	15.473	49.591
32.3006950386943	14.3828880809012	48.3801606700831	33.388	17.584	48.735
31.5096706276777	14.2610228562789	47.8880897703436	28.499	12.949	46.85
31.0336056525329	14.1443541010402	47.4591253183231	30.657	15.246	48.98
30.5648056144404	14.026922156562	47.0147689661307	27.737	16.251	47.666
30.386008797319	13.8566678633486	46.3309212454452	31.483	16.822	46.955
30.2012936852421	13.6704002553389	45.5894561271714	30.785	16.949	44.302
30.0065712291375	13.3999526260849	45.0957597030013	31.015	13.816	44.684
29.8103233500794	13.1284406663498	44.6076255312991	29.642	15.108	43.621
29.6146673471728	12.8476316429229	44.1352365304344	27.991	13.647	44.302
29.4223587566452	12.563748332082	43.6619347612967	30.658	10.98	44.543
29.2273932973989	12.2881341126109	43.1771155531758	32.607	11.313	43.742
28.9460562110019	12.0443585671652	42.6213837374695	29.134	13.33	42.125
28.6643767627691	11.7970886223637	42.0748596296658	29.975	12.321	39.763
28.3736695866803	11.5471901403808	41.5853208962066	29.975	11.801	40.794
28.0755708834859	11.2965217078535	41.1074904820832	30.787	13.686	41.698
25.2139578449655	10.5514266632623	40.4059487904976	25.578	12.568	43.273
19.5905454384251	8.55459353114977	36.3884362518312	20.244	11.234	37.646
Route: 8 Length: 381.597090137421 Demand Met: 993					
11.1246427511367	16.9520782317117	100.316010211768	11.608	20.251	101.424
15.1070678598978	17.8118534272757	102.968088483229	16.688	18.092	103.09
18.1888124239155	18.6638082956725	105.585628709879	17.323	21.331	107.01
22.9855879965926	19.3191314122821	107.351231334942	24.879	20.632	106.077
25.8319990053529	19.9347979847337	109.484000128684	25.832	23.68	109.484

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.1450659212201	19.6403483889495	115.620279286284	26.276	20.188	119.025
26.4548717367027	19.3329201048438	116.572801440236	27.927	21.458	117.97
26.7513867428172	19.0036509085107	117.413506608328	25.133	19.235	120.496
27.1020004524107	18.6639991980712	117.877797851158	27.102	18.664	121.623
27.7718538324259	17.9166899592063	117.717992724257	28.054	17.013	121.063
28.4078292999151	17.2970102026927	117.522198219028	27.229	15.362	116.263
29.0817977727961	16.7276033842419	117.330091030618	29.578	18.791	116.421
29.7430163811062	16.1167353808775	117.140058084682	31.502	15.473	118.128
30.3645483900989	15.5202211252327	116.948110997474	29.975	13.101	114.777
31.0149986260094	15.0582032860298	116.774113345052	31.015	14.076	113.16
31.2437528395371	15.0582030531477	117.153235797639	31.991	16.632	118.575
31.4703492616018	15.0582028202604	117.521298753574	32.217	14.433	117.304
31.6955002448148	15.0582025873715	117.890801553861	33.907	14.791	115.865
31.9095043625186	15.0582023544805	118.292146008658	33.907	12.516	116.73
32.0869974835825	15.0582021217071	118.86599923169	32.087	11.313	118.866
32.1601013304377	15.0582050261688	119.888599916973	33.322	13.101	119.477
32.2328501647309	15.0582079307792	120.939329833394	30.594	16.251	121.669
32.3060745082884	15.0582108353183	121.947716445793	34.135	13.946	120.705
32.3786796285719	15.0582137399516	123.047083594685	33.907	13.816	122.673
32.450883942111	15.0582166446716	124.170707025385	33.322	13.621	122.895
32.5228511144333	15.0582195494985	125.388032607865	35.992	13.647	125.389
32.5228522842359	15.3174022112837	125.403107061278	33.907	11.996	124.886
32.5228534534578	17.8816521379968	125.418273453585	33.515	18.029	124.645
32.5228546226682	20.4204223270355	125.433447831554	34.341	22.029	122.727
32.5228557916269	21.1521190178299	125.449022263424	32.245	24.887	125.449
33.6684243909655	18.9180000627315	129.116695481484	36.436	18.918	131.64
33.6684223415983	17.0734216586487	129.11669483646	31.356	16.06	129.885
33.6684202923296	15.4730018462776	129.116694191436	30.462	15.473	131.052
33.6684200335415	14.855984102555	129.088881775426	33.127	14.661	132.624
33.6684197747636	14.2731531118353	129.059821339886	32.282	15.473	127.6
33.66841951599	13.6644665215089	129.030833017939	32.347	14.661	129.857
33.6684192572206	13.0371924412331	129.001811920276	34.976	10.282	131.121
33.6684189980529	12.9303965488183	128.966815804307	35.547	11.234	131.369
33.6684187381031	12.8307721329096	128.930977430587	34.595	9.202	128.931
32.4429400465671	12.9769365553922	128.554045878103	32.867	14.661	131.697
30.7554431098581	13.1064572805006	127.626709215683	30.787	12.386	130.829
29.0506645534447	13.2380652792919	125.778925371461	28.943	16.886	125.854
27.575514999211	13.3321696393589	123.735976736392	27.673	12.695	125.598
26.0904416049968	13.4265785208589	121.190627567866	27.927	12.568	120.417
24.332595937432	13.5214334853822	118.91841526072	22.149	14.282	119.226
22.920031880965	13.6159123080584	116.556373799213	25.197	12.441	114.729
20.4979998862754	13.7117979422078	115.047999645873	20.498	17.457	115.048
17.4579435388912	13.0256259806705	99.4468091459919	18.148	16.505	99.59
Route: 9 Length: 411.435249286862 Demand Met: 998					
10.2892381872693	16.0131866290083	46.0006219175096	12.052	18.854	46.124
15.0190980252307	21.9221969833095	62.8812350397164	17.45	24.188	63.322
16.8207355970749	23.9589412748079	72.7771998056665	17.64	27.49	72.733
17.5884218114922	24.232931394077	89.7757996455735	20.561	25.776	90.646
18.0392892799971	24.4762881364398	92.7987744199878	19.545	25.839	93.739
18.4703740616773	24.7146162681879	95.3497225410267	17.577	25.204	95.05
18.9098260138811	24.9517893796832	98.0280076442671	18.91	28.697	98.028
20.4334915371984	24.9517904975534	102.380659206245	22.276	28.125	102.29
20.6862745928973	24.9517915244908	113.457965068722	24.308	23.998	113.458
20.2051863504791	24.9656399085925	115.966360679007	18.72	28.189	115.769
19.8570898000659	24.9795351909991	119.961000191047	17.64	27.998	119.961
19.8570908861736	24.0686771524284	121.189076781076	20.561	23.553	119.319
19.8570919721011	23.1762533982921	122.642571056585	20.371	23.045	124.747
19.8570930578279	22.2835418069066	123.861345227512	18.91	22.474	122.979
19.8570941435725	21.3805876671582	125.160813613755	18.593	21.648	126.239
19.8570952293833	20.466735589198	126.379569111268	21.577	21.394	126.294
19.8570963149756	19.506513736486	127.617998907119	20.434	15.806	127.618
19.8570966146261	20.5689362692913	129.760341537242	20.434	18.537	132.408
19.8570969141676	23.4942534919697	130.608730672298	18.974	24.569	127.812
19.8570972137532	25.4995140475744	131.918995940126	19.037	26.982	129.54
19.857097513421	26.9824391728112	134.004948128126	18.974	29.967	133.455
19.8570978132135	27.8244545881298	136.698148635188	18.72	29.967	135.012
19.8570981131678	28.5052097937013	143.818571771831	18.529	30.03	146.971
20.5301102069002	28.505209854858	143.402364581309	19.037	28.189	146.557
21.943816549403	28.5052099146638	142.198354624906	22.149	29.713	141.818
23.3355402382076	28.5052099742881	141.023024901967	25.07	30.03	143.44
24.1908376029619	28.505210032158	135.975658211946	26.149	27.49	136.669
24.9442377414634	28.5052100899941	129.083841782283	25.895	29.903	127.854
25.6602436570932	28.5052101475884	124.839211667489	27.229	26.22	125.044
26.3011503629512	28.5052102052124	120.28926822914	27.927	28.125	119.109
26.9003664191019	28.5052102627227	116.986105266808	28.88	25.331	116.966
26.9119151567785	28.5052103246526	115.285986262115	26.911	24.76	115.286
27.0916358392219	28.5052107850334	112.299000006665	30.277	30.475	112.299
26.9543194717135	28.0634269600992	108.701701168462	28.943	30.475	107.548
26.8067390737308	27.4489869065031	106.988464856451	28.943	30.03	106.391
26.6433722260081	26.1760828297543	105.675709962222	28.753	23.998	106.929

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.4677290433438	25.3833591436071	103.687189729401	27.165	25.458	104.784
26.2911051863048	24.589694363737	101.472147512919	29.07	22.347	101.831
26.0318658109477	24.2207158045026	96.7572476217656	27.229	27.554	96.447
25.7264665025039	23.3191697319195	94.0606928415239	25.006	24.188	94.535
25.4243631305523	22.3845040287669	91.222324957632	27.546	22.537	91.326
25.4243631305523	22.3845040287669	91.222324957632	28.245	22.855	90.204
25.0651720178645	21.3833003919951	89.189842750781	28.054	22.918	87.821
25.0651720178645	21.3833003919951	89.189842750781	24.943	18.791	91.664
22.4735886519283	20.6373832760601	77.1844821358253	23.482	22.41	74.725
17.9763942746701	19.697515396073	75.0922154832486	17.45	21.902	76.475
14.2552419836609	18.561784308025	72.358323482851	11.862	17.965	73.909
12.4059863102324	17.5102387910346	67.2893868588194	13.005	20.061	68.646
Route: 10 Length: 321.964068483413 Demand Met: 999					
21.590701849423	8.43015195876558	97.4758906322423	22.212	10.091	100.44
25.3227642087596	9.9871671811123	98.5036484699292	27.419	11.298	96.166
26.3924602611834	10.9303585571797	102.669028153821	28.753	13.838	102.669
26.3924607869501	10.9303589816109	104.115026339238	26.086	14.663	104.115
26.7970275862526	10.930359007242	106.008440483245	26.022	12.631	109.182
27.8998109558809	10.9303590331012	106.147829987736	29.197	12.441	103.553
28.74277023964	10.9303590589811	106.300095990207	29.578	13.203	105.988
29.5381585494686	10.9303590848812	106.453143060071	29.975	13.361	103.951
30.2203627514918	10.9303591108051	106.645041166136	31.177	11.541	103.36
30.763276405882	10.9303591367408	106.907008126717	29.388	11.804	105.494
31.3396238653109	10.9303591626829	107.176944956628	34.135	12.126	105.614
31.7042982311577	10.9303591886545	107.497586524569	33.095	12.711	107.498
31.7042982311577	10.9303591886545	107.497586524569	31.275	12.613	107.178
32.0601243228074	10.9303592146427	107.823098246782	35.674	11.044	107.474
32.0601243228074	10.9303592146427	107.823098246782	32.477	11.541	107.287
32.2075933104778	10.9303592406547	108.201424790516	30.34	9.647	108.046
32.2075933104778	10.9303592406547	108.201424790516	30.721	9.329	106.333
32.3620100476402	10.9303592666736	108.61944814058	34.722	11.742	108.413
32.5121128694969	10.930359292702	109.043121900602	35.103	10.155	111.634
32.4179666743523	11.5913791015745	108.944026086464	30.982	12.126	111.418
32.3252890651633	12.2295056736997	108.842192226042	31.632	12.353	111.341
32.23317234843	12.8670406784174	108.738150069322	32.347	11.313	110.138
32.1410554797603	13.5581325583012	108.633221550269	32.932	12.353	108.278
32.048657958892	14.2885149099415	108.528613230503	34.135	13.426	109.486
31.9548444587444	15.0737822302102	108.423241742788	33.452	15.246	111.765
31.8389466945715	15.7296356243234	108.215065930311	31.047	14.661	110.232
31.724019186988	16.4337726064451	108.000116213299	32.309	19.553	108.506
31.6075780294937	16.9058573433878	107.780688346737	30.975	17.076	111.068
31.4935024460596	17.3653463630094	107.507756349668	34.722	18.219	109.051
31.2462953246503	17.6365784251011	106.688058509147	34.595	18.791	106.414
30.6918660915796	17.8593568926931	105.978431461705	31.293	15.806	105.367
30.1250709637462	18.0902254822255	105.300297737954	31.372	15.246	104.804
29.4859504674316	18.3502280794657	104.667465637487	29.642	17.076	106.306
28.8454377002468	18.6166906359131	103.98713583531	27.292	16.632	106.393
28.3948154444735	18.9572816938693	101.932726634706	27.991	22.601	101.939
28.0521603235981	19.0691379675725	99.8569251026547	27.229	19.616	102.004
27.7182101699847	19.1804418269165	96.608434625667	29.134	22.537	96.334
27.1395940843643	19.261850631404	95.0065291837068	24.752	19.362	96.308
26.6309590536216	19.3432718232439	93.0204907852846	25.832	16.949	91.413
26.1489938771124	19.4267994716077	91.6569992117904	26.149	23.172	91.657
24.318703682342	18.8834776917927	88.8327445661161	25.895	20.759	90.426
20.9314659436879	18.247821455814	75.2737270715088	19.863	21.331	75.529
19.1828109944564	17.0451456328801	38.179905444792	20.561	18.219	35.874
16.7356559398309	15.5946807730233	35.0345941228472	18.212	18.283	36.255
Route: 11 Length: 292.002618108276 Demand Met: 994					
16.5749665584789	9.83445049600432	63.8379262832852	17.323	12.504	65.716
19.8978627323956	10.7944071018643	65.479734739256	19.418	13.901	64.222
29.6582179667086	11.2449489264857	75.121277907587	32.835	12.613	75.794
30.0158265512799	11.5347618620689	76.2896950554798	32.802	12.126	77.71
30.3045803155558	11.8129030604622	77.1398114702574	30.202	14.271	77.775
30.593307529066	12.0739781013353	77.953540417225	30.787	14.466	78.121
30.8800873776514	12.3213889885992	78.7665567106166	31.047	11.313	78.28
31.1660976773073	12.572151514717	79.6070713682865	31.437	11.541	78.241
31.4508423969181	12.8270465125688	80.5292523352522	33.071	16.187	80.531
31.4959923457533	12.8515300071386	81.3128371078877	32.672	12.353	81.337
31.5410198806219	12.8760352407064	82.0999752243474	32.152	12.353	82.503
31.5859913737154	12.9005606389253	82.8746952068697	34.135	13.166	82.509
31.6305277889781	12.925084153361	83.6452530075748	33.907	13.296	83.348
31.6747973315185	12.9496075013636	84.3673714375864	35.42	12.949	84.367
31.6747973022679	13.0389701007727	84.6805139233675	29.975	13.621	83.535
31.6747972730059	13.128163717458	85.0038447329834	31.015	13.556	83.741
31.6747972437159	13.2172661955415	85.3371246982621	34.135	12.646	86.486
31.6747972143557	13.3066477528758	85.6819358791062	34.135	14.466	84.176
31.6747971849479	13.3954844548146	86.0560428184101	34.135	14.986	84.727
31.6747971555531	13.4830186293152	86.4729015402778	32.737	14.433	86.615
31.6747971261128	13.5702583621169	86.894423366537	32.412	15.246	88.024
31.6747970966315	13.6567661542473	87.3094195596939	29.388	13.838	84.576

Solution x	Solution y	Solution z	Original x	Original y	Original z
31.6747970671125	13.7430072452844	88.0229211300858	30.34	10.917	88.584
31.6747970375902	13.8326660430202	88.7043659917461	32.542	15.473	89.387
31.6747970080252	13.9216031183427	89.3734610601151	30.722	15.473	90.573
31.67479697844	14.0097995896145	90.0125373935101	29.975	12.841	90.667
31.6747969488437	14.0986028252183	90.6396140172337	29.975	14.921	90.476
31.6747969192356	14.1870848918902	91.2765082448745	31.957	11.541	90.999
31.6747968895972	14.2774863416102	91.9320913263038	32.737	11.541	92.508
31.6747968599194	14.3707995068482	92.5654090234376	31.547	13.203	92.722
31.674796830214	14.4646212389486	93.2011224351635	31.697	14.433	93.007
31.6747968004782	14.558495949942	93.8466913685844	34.849	13.393	93.121
31.6747967707025	14.6563381610441	94.6586809511487	32.412	12.353	94.929
31.6747967408919	14.755970761821	95.4671992537282	33.322	12.321	95.076
31.6747967110458	14.8589104477004	96.327009891969	30.202	14.791	95.605
31.6747966811854	14.9619418836204	97.2342269457677	33.071	18.346	97.156
31.6747966510978	15.0280341402538	98.2213561475581	32.802	15.473	97.861
31.6747966209793	15.0940655796183	99.232446143001	32.817	17.775	101.585
31.6747950847822	14.8657884327444	99.232445773924	31.737	12.885	98.954
31.6747935470889	14.6444358270387	99.2324454048651	33.322	12.581	100.045
31.6747920089898	14.4340149977352	99.2324450358929	31.957	14.433	102.967
30.8841368717261	14.0300149427446	98.8107473199606	30.202	14.011	102.151
30.2153953207359	13.6244205699287	97.8945762955919	29.515	14.028	97.711
29.5631715527324	13.2149432393543	96.9891114680561	28.753	12.949	99.196
28.9393314942627	12.8084086317038	95.850077094139	30.202	13.231	95.497
28.2822228546978	12.3971249556317	94.7456386788939	30.527	11.313	94.769
27.5068625276356	12.003166067724	93.6431740352645	29.261	11.425	96.137
26.4427517403873	11.6238148699646	91.2523847476146	26.911	14.409	89.199
24.8846236692676	10.5640178440068	90.6506172047608	25.705	12.123	93.472
22.198546970468	8.26435513719996	89.3286862395818	23.482	9.52	92.151

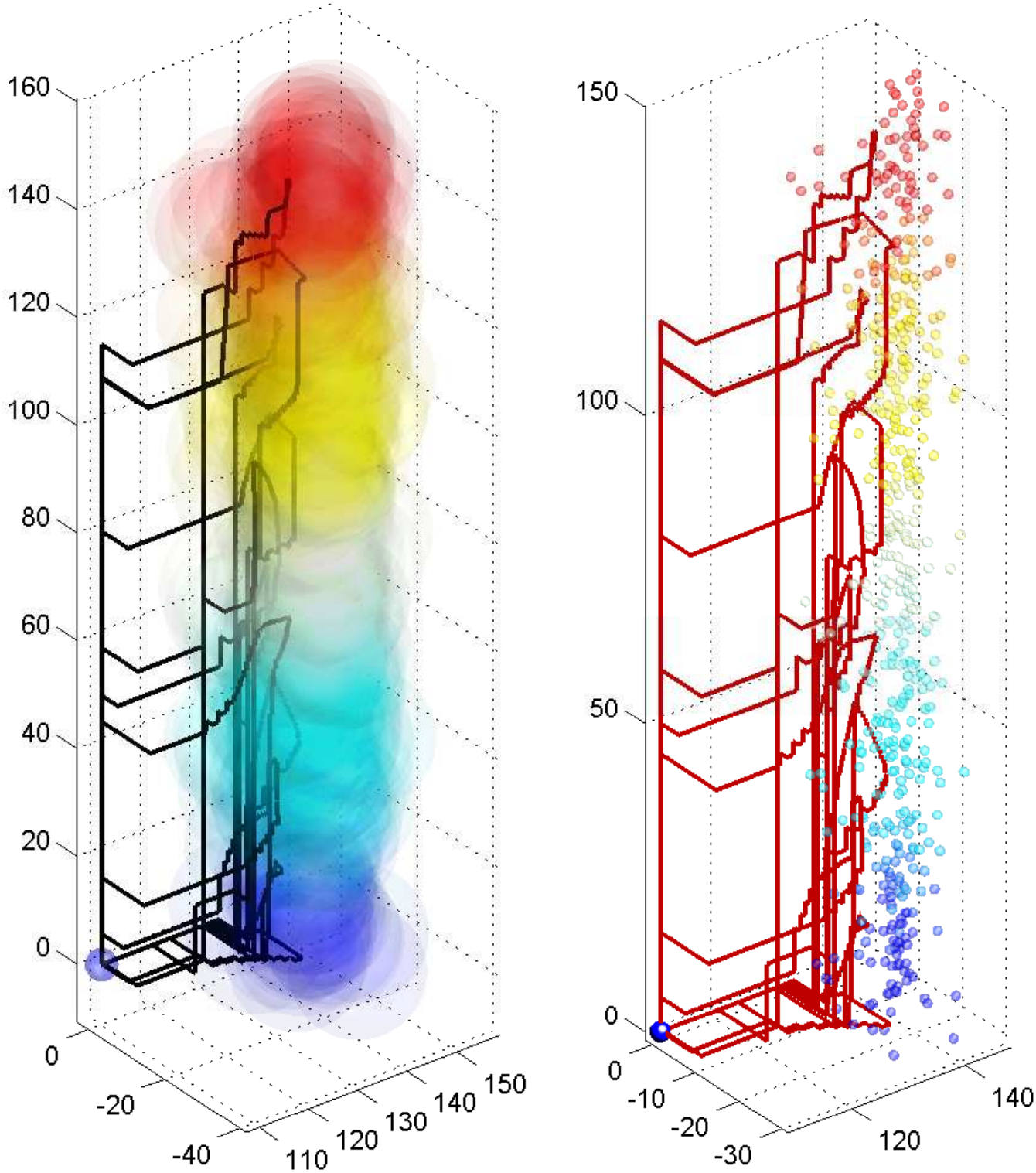


Figure O.191: $d493$, $r = 11.2356$, Equal Radius, 3D, Manhattan, Length = 2596.3213282

Table O-194: Solution for $d493$, $r = 11.2356$, Equal Radius, 3D, Manhattan

Total distance: 2596.32132815398 Total demand met: 10514 Depot: x 0 y 0 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 116.018533317749 Demand Met: 998					
22.1435698200822	6.4989750595418	1.01568801026599	31.567	11.313	0.396
23.0064490068674	7.76430199236389	2.09714346936266	31.399	13.754	2.704
23.7512371474054	8.81151005390134	3.16215066009391	34.135	12.906	3.426
23.9025100291682	9.13599674683588	4.09165430782304	33.322	12.841	4.069
24.0482745673762	9.45165116305732	5.02509523573059	32.542	12.126	4.969
24.1917953670869	9.76483608851253	5.96202018071815	32.997	11.541	6.26
24.3331292400168	10.0766283762078	6.89833071424527	33.452	11.541	6.941
24.4720787401183	10.3872378367519	7.83735185020669	33.647	11.313	7.765
24.6087550828906	10.6974266450845	8.78092980327531	35.166	10.726	7.803
24.7374455563478	11.0088427185739	9.77569734976224	34.135	12.386	7.828
24.8635688632684	11.318704273364	10.8169370239108	34.135	13.686	10.417
24.9873979450831	11.6254939837268	11.8743664291072	31.762	12.126	11.712
25.1106393279521	11.9326339464773	12.9394753749346	33.095	13.751	14.049
25.2328156024533	12.2388008113888	13.9990705935354	31.112	15.246	13.662
25.3545310977679	12.543651615495	15.0705108313745	31.632	15.246	15.179
25.4757079753585	12.8473305977013	16.1521307223606	35.992	16.314	18.057
25.4757079787024	12.8473307513562	16.1521310151176	31.242	15.473	19.727
25.4757079820339	12.8473309050028	16.1521313212605	31.61	13.901	20.326
25.4757079853551	12.8473310586458	16.1521316435677	30.787	13.426	19.207
25.4757079886721	12.8473312122844	16.1521319689367	29.975	14.141	17.903
25.4757079919924	12.8473313659173	16.1521322950192	29.975	12.061	16.621
25.4757079953176	12.8473315195533	16.1521326228166	31.372	12.353	15.396
25.47570799864	12.84733167319	16.1521329115597	31.242	12.126	17.355
25.4757080019589	12.8473318268287	16.1521332127362	30.657	11.541	18.351
25.475708005276	12.8473319804719	16.1521335198811	32.182	10.98	18.901
25.4757080085807	12.8473321341195	16.1521338228621	31.827	11.313	19.849
25.475708011874	12.8473322877713	16.1521341226998	32.867	11.313	21.273
25.4757080151458	12.8473324414188	16.1521344368171	35.293	11.552	21.184
25.4757080187425	12.8473325948805	16.1521347349119	33.96	10.536	22.989
25.4757080226943	12.8473327478759	16.1521350507349	33.833	10.282	23.21
25.3422989362385	13.254780219388	16.1521350486507	33.062	12.126	22.872
25.2051534776844	13.6686290504007	16.1521350520171	30.202	12.451	21.726
25.0674280903064	14.0850837026299	16.1521350423352	28.816	12.25	22.231
24.9293430008606	14.5050293317857	16.1521350282853	29.705	13.393	23.437
24.7904274110828	14.9281364559321	16.1521350376635	29.515	16.505	21.691
24.6509276005958	15.3499297219771	16.1521350857963	27.864	18.854	16.375
24.511259593907	15.7693112145339	16.1521350503947	28.245	21.331	19.247
24.3711639481232	16.1815920792235	16.1521350577855	29.007	26.157	18.195
23.5255768891156	16.2489870079716	16.1521350553211	20.942	25.649	17.701
22.7380150736765	16.3155242160022	16.1521350318415	22.974	25.141	19.537
21.9579974264807	16.381423517177	16.1521349915396	21.958	24.76	23.638
21.5292550872782	16.3814235073166	15.4525615708858	17.64	23.426	22.454
21.1480136350073	16.3814234973164	14.4772684139154	19.482	21.966	17.833
20.7704624663859	16.381423487285	13.4838149373147	13.513	22.41	17.465
20.4227725873712	16.3814234771958	12.3821709701901	16.497	24.315	17.876
20.0937519607395	16.3814234668712	10.9748851213268	16.37	26.982	10.968
20.0937140620688	16.3814234571862	1.78199261986422	20.117	27.617	1.782
18.4751855949808	14.847637017317	1.45535286003969	20.117	22.728	3.645
16.8404356348394	13.1157134273762	1.12610649207646	20.117	18.283	2.485
15.1747710260466	11.2973118265985	0.795615834583556	20.434	13.012	7.24
13.3830372603472	9.46117868234994	0.456454167887703	18.466	14.155	8.671
Route: 2 Length: 93.1291394041536 Demand Met: 519					
23.7260509220626	5.94204558318778	0.226650826974755	33.127	11.313	0.11
24.1457328546786	6.63958214350717	0.454457797718904	30.787	13.166	3.014
24.5742824120741	7.28864970673438	0.680166419077349	31.015	13.036	5.79
24.9816095081032	7.88418852800691	0.900163462752936	31.177	14.433	6.693
25.3432326016656	8.37760071918476	1.10688352830645	32.022	12.126	9.107
25.6048577388912	8.75793727660382	1.27069139573518	34.087	8.758	8.639
25.6048577627309	10.4888797094561	1.27069141746785	30.787	11.313	10.711
25.6048577866237	12.0431693854784	1.27069144521053	28.753	10.79	11.577
25.6048578105437	13.8978054835345	1.2706914801287	29.134	16.187	10.819
25.6048578344536	15.5017481326278	1.27069152179206	29.959	17.584	8.664
25.6048578583333	17.059909506765	1.270691540325	24.625	19.68	11.726
25.6048578822146	18.2505397638342	1.27069158315954	23.355	23.553	9.247
25.6048579060993	19.2985978066684	1.27069161918321	25.959	27.744	8.296
25.6048579298917	19.6890201141628	1.27069165802232	31.42	27.173	7.305
25.2057043505378	19.4141055030233	1.13740976214211	29.07	29.713	2.284
24.260703687804	18.062548054794	0.997040695671437	32.69	18.346	2.359
23.2247248563418	16.7258396798002	0.856464453919994	31.892	15.246	4.139
22.0108476689325	15.4569511680985	0.714870586958897	28.308	15.933	3.524
20.7311505843086	14.1971350913918	0.57288624461801	25.07	16.314	3.298
19.4182474485832	12.9268761527013	0.430592512298944	26.149	19.045	2.783
17.8621243518687	11.4475457925296	0.287460723446818	24.943	19.108	0.303
13.791700766826	7.1442102690994	0.144188992172904	22.149	11.742	1.36

Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 3 Length: 379.360507089115 Demand Met: 1000					
13.8586509418092	9.01822616084035	124.094566934751	20.434	15.806	127.618
17.6430315802917	12.3006759273287	133.54330420696	28.372	14.663	135.085
18.037522218565	13.5113843372233	135.692936157042	29.007	12.949	137.787
18.1616661446066	15.2350675575533	136.353032676212	29.324	15.489	136.921
18.2364852754705	16.6566726344182	136.91403217642	26.149	15.679	137.044
18.3109959852858	18.102870409494	137.477315177854	24.879	19.934	139.42
18.3853080642533	19.5224703389649	138.038297388724	26.149	27.49	136.669
18.4335649219264	19.6448360389591	139.801434549312	22.149	29.713	141.818
18.4810969222023	19.7552453462835	141.107294515002	19.037	28.189	146.557
18.5286404413928	19.8637012537673	142.187163179049	18.529	30.03	146.971
21.679997492534	19.5591539178857	142.187163189484	25.07	30.03	143.44
22.6111733347288	18.602894604536	142.187163198717	27.356	18.473	143.695
23.5209178815672	17.6509696064677	142.187163208238	28.245	14.854	144.187
24.408336936597	16.7182628794051	142.187163217832	29.975	14.661	145.197
25.2672291673962	15.801088688172	142.187163227185	30.787	14.206	147.62
26.091647886688	14.8987724788869	142.18716323657	29.975	13.881	149.391
26.892158509989	14.0071068712272	142.187163246532	33.907	13.556	148.567
27.6293890342292	13.1231432766432	142.187163256561	37.452	10.218	146.804
27.6293889449304	13.1231431941734	142.187163117808	31.892	12.353	146.679
27.6293888556295	13.1231431117078	142.187162979474	31.991	14.092	145.487
27.629388766326	13.1231430292431	142.187162841135	32.944	15.933	144.54
27.6293886770183	13.1231429467762	142.18716270238	33.769	15.679	145.826
27.6293885877043	13.1231428643065	142.187162563449	33.582	15.473	147.748
27.6293884983823	13.1231427818333	142.187162424954	34.468	20.442	147.277
27.6035195043982	13.0865057124202	141.54716887948	34.341	21.013	142.761
27.577516586199	13.0495416501876	140.891773728153	33.515	20.315	142.968
27.5514648061697	13.0124477735598	140.223678871352	31.356	19.68	141.631
27.5254026726273	12.9752957248699	139.553415995953	33.322	15.473	140.664
27.4993281847775	12.9381292660953	138.883172003413	33.907	14.336	141.111
27.4732374090054	12.9009544126208	138.208801773927	34.785	12.504	141.232
27.4471223742875	12.8637825741306	137.524656081795	34.404	14.028	139.514
27.4209879505046	12.8266026757781	136.836337514028	33.907	12.776	139.011
27.394838435579	12.7894238205451	136.143765959665	31.697	11.541	138.673
27.3686847515497	12.7522535359037	135.447485498852	34.135	11.866	136.659
27.3425161852035	12.7150903462767	134.750166845804	34.595	11.996	135.081
27.3163307211747	12.6779337186199	134.054949155475	30.787	12.386	130.829
27.2901470071438	12.6407821870667	133.37152537908	32.347	14.661	129.857
27.2639589876776	12.6036214992405	132.702468676057	32.867	14.661	131.697
27.2377667459024	12.5664534471916	132.039042426582	33.127	14.661	132.624
27.2115704382636	12.5292800490384	131.375739181222	36.436	18.918	131.64
26.3057232094253	11.1981261325368	125.908997148312	35.992	13.647	125.389
25.1214486361295	9.72373020122754	121.022442045901	33.322	13.621	122.895
23.6983921572389	8.09365224784463	115.164104061744	32.217	14.433	117.304
Route: 4 Length: 188.617656266748 Demand Met: 1000					
23.5169082208543	8.20172033598227	27.6439448228541	32.152	15.246	27.742
23.7551051293841	8.48874561105337	31.0831135474668	31.567	14.661	34.796
23.9773730479154	8.75498238418831	33.3232802097352	32.436	13.231	35.38
24.1918303549823	9.01532145308545	35.4104785968167	33.095	14.271	36.737
24.3931090077562	9.26383977713357	37.333700974699	34.135	14.726	38.301
24.4479671396573	9.34898473376008	37.8413968903709	33.322	13.361	37.986
24.5023569180182	9.43358898205699	38.3514381155836	33.095	13.491	38.538
24.5563696300373	9.51772535281087	38.8635540143179	33.095	13.231	40.765
24.6100164579955	9.60142398571038	39.3699726253635	32.372	14.092	41.845
24.6633682764862	9.68465231187733	39.8691679076305	30.787	13.686	41.698
24.7165984602656	9.76764220882291	40.3664701337521	30.202	13.751	40.213
24.769742119597	9.85043120593829	40.8659009374499	29.975	12.321	39.763
24.8228197091211	9.93310322570818	41.3688414733738	29.975	11.801	40.794
24.875835091848	10.015682475558	41.8743631616308	32.607	11.313	43.742
24.9286748753302	10.0981269779212	42.377236365801	30.658	10.98	44.543
24.9814321807988	10.1804914180914	42.8781034477768	31.015	13.816	44.684
25.0340788339209	10.2626367296514	43.3770383317443	29.642	15.108	43.621
25.0866543221621	10.3445360061303	43.8771463901331	29.134	13.33	42.125
25.1391834823159	10.426298119996	44.3813851259853	25.578	12.568	43.273
25.1917293809189	10.507971917499	44.8885230688333	24.371	14.346	43.342
25.2443084867638	10.5894938873239	45.3993938014449	27.991	13.647	44.302
25.2968620207302	10.6708868185381	45.9133812598687	28.499	12.949	46.85
25.3493801904874	10.752171383675	46.4276737415857	27.737	16.251	47.666
25.4018653311074	10.8331997053798	46.9416264686945	25.895	18.918	46.48
25.4543464828534	10.9137134460292	47.4587509355444	25.07	17.076	49.249
25.506845361215	10.993929809778	47.9746348168324	22.276	13.393	54.239
25.5594059660888	11.0739542260235	48.4793724933013	22.085	10.853	55.182
25.6120279577211	11.1538670596305	48.9719405078959	29.975	14.401	55.717
25.6645268831705	11.2334702619254	49.4504499252891	30.658	9.71	56.048
25.7169075014206	11.3129806847627	49.9177384094608	33.387	11.313	58.128
25.7169073020818	11.7939524358143	49.4585359083685	32.944	10.536	54.126
25.7169071026872	12.2808398615439	48.9908533283599	32.607	14.661	52.963
25.7169069032735	12.7657938745771	48.5165709464862	36.119	13.139	51.404
25.7169067037681	13.2475196342704	48.0078492358725	33.907	13.036	49.61
25.7169065042326	13.7316306272191	47.4972165340218	33.322	13.881	49.4

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.7169063047311	14.2173517746577	46.9844188527447	33.388	17.584	48.735
25.7169061051029	14.697047693003	46.4689317767726	33.642	18.346	49.307
25.7169059055183	15.1680745085984	45.9455901209927	30.982	15.473	49.591
25.7169057059063	15.6404276355143	45.4177159073725	30.657	15.246	48.98
25.7169055062858	16.1151746843679	44.885677654898	31.483	16.822	46.955
25.7169053066493	16.5908119664295	44.3520738111565	30.785	16.949	44.302
25.7169051070007	17.0679068449106	43.8205710082548	30.785	20.823	44.268
25.7169049073716	17.5414666289392	43.2904683891384	29.261	23.045	43.901
25.7169047077029	18.0087601468864	42.7613548046587	28.753	24.379	51.035
25.7169045077912	18.3428062114699	41.2929902280785	27.8	23.617	42.03
25.7169043078822	18.6741822224927	39.7880229865167	26.086	29.903	39.661
25.7169039211898	18.6741818144279	39.7880217543517	33.642	26.22	42.336
25.5832421210697	17.8527685400598	38.1746866412213	33.96	19.68	39.41
25.4479015186658	17.0224279213619	36.5486634383493	32.372	18.537	39.944
25.3113915074175	16.1878259920403	34.8442368332089	36.436	17.076	35.413
24.0961992247725	14.6987784746687	31.2058486943336	31.61	17.775	32.188
22.750205527498	13.1432742531431	27.5250017429089	30.023	17.203	33.037
20.7851251755144	11.1668618565292	16.1934846958936	28.689	18.156	16.722
Route: 5 Length: 312.914469176915 Demand Met: 1000					
22.7148735749995	5.70681220826233	100.147758823611	31.177	11.541	103.36
23.6286261725204	6.81650857109243	102.518293840487	31.275	12.613	107.178
24.2261576000348	7.561260827075	103.752018590392	33.095	12.711	107.498
24.5771358805325	8.04878503546174	104.501061990063	32.932	12.353	108.278
24.8980658716846	8.50346041793379	105.18429340524	34.722	11.742	108.413
25.1438557202878	8.89803610395075	105.743554988484	35.674	11.044	107.474
25.33545314904	9.25682195076119	106.248872337016	35.103	10.155	111.634
25.4100000254855	9.53622217515845	106.399678462495	32.347	11.313	110.138
25.4842893956526	9.81440990389314	106.549832775823	31.632	12.353	111.341
25.5583338336477	10.0907658076295	106.699075188511	30.982	12.126	111.418
25.6322053710719	10.3659957028222	106.847591340031	29.975	13.101	114.777
25.7057619032557	10.6380496284743	106.993426014933	31.015	14.076	113.16
25.7790350225025	10.9071634081405	107.137755123187	31.047	14.661	110.232
25.8521465854918	11.1743732254971	107.281616049475	30.975	17.076	111.068
25.9250049999849	11.436942992182	107.424567850591	32.309	19.553	108.506
25.9969112179145	11.6822392026504	107.566227645356	34.595	18.791	106.414
26.0193672745651	11.7138719648343	108.598005285953	34.722	18.219	109.051
26.0416273804879	11.7452572822411	109.605602315779	34.135	13.426	109.486
26.0638625400242	11.7766279940888	110.62342425482	33.452	15.246	111.765
26.0860739582299	11.80797100042	111.637879224312	33.907	14.791	115.865
26.1082434584339	11.8392743390172	112.59594520985	33.907	12.516	116.73
26.1303820855041	11.8705652700094	113.515264673901	32.087	11.313	118.866
26.1525042758981	11.9018533974776	114.398356348721	33.322	13.101	119.477
26.1745995511072	11.9331227753955	115.23946995084	34.135	13.946	120.705
26.1966403693752	11.9643508198271	116.012695385038	33.907	13.816	122.673
26.218584248853	11.9955152659687	116.692894482705	33.907	11.996	124.886
26.2185840383293	12.0953288652864	116.614177937203	27.673	12.695	125.598
26.218583827782	12.1950796378775	116.534857517916	26.594	11.933	126.917
26.2185836172384	12.2948689506432	116.453423725089	24.371	15.235	126.557
26.2185834067603	12.3940921380134	116.367203247365	28.943	16.886	125.854
26.2185831968499	12.4910291863349	116.274236533099	30.594	16.251	121.669
26.2185829869723	12.5877415236394	116.181439536212	31.991	16.632	118.575
26.2185827771483	12.6842279028925	116.088818037527	31.502	15.473	118.128
26.2185825673608	12.7805967505191	115.996385616378	29.578	18.791	116.421
26.2185823575987	12.8766634753683	115.904150164575	27.229	15.362	116.263
26.2185821478388	12.9726800753453	115.812069693623	27.927	12.568	120.417
26.218581938075	13.0687581796573	115.720420739322	28.054	17.013	121.063
26.2185817282923	13.1647022297823	115.629658953263	27.102	18.664	121.623
26.218581518472	13.2604215507938	115.541438259804	25.133	19.235	120.496
26.2185813085692	13.3558942441339	115.454837023665	26.276	20.188	119.025
26.2185810985404	13.4510770342154	115.369625905163	27.927	21.458	117.97
26.2185808882143	13.5457558568991	115.286016448155	26.911	24.76	115.286
25.4154111297398	13.3820146989624	113.428550686102	24.308	23.998	113.458
24.6420697691475	13.2036414563987	111.630070452359	25.832	23.68	109.484
23.8106907432907	13.0023572915043	110.149840763583	27.229	19.616	102.004
20.8091015014955	12.7149414174967	109.74507596075	24.879	20.632	106.077
16.240650378185	12.4114852536086	109.341495251345	17.323	21.331	107.01
11.428492249667	12.0910750023545	108.914463995384	11.735	20.378	116.222
Route: 6 Length: 355.737565958844 Demand Met: 1000					
21.2430951706378	10.8329989754344	74.5159330011555	32.282	12.126	74.654
21.6812840896165	13.5852063138777	98.969204341083	31.957	14.433	102.967
21.9550013822866	15.6675463209817	100.701522463052	32.817	17.775	101.585
22.1352578588018	16.837038531123	102.067493291042	29.07	22.347	101.831
22.3131992965703	17.9310240390705	103.446043940528	27.991	22.601	101.939
22.4899196667332	18.9876488646189	104.854360673925	27.165	25.458	104.784
22.6655375201086	19.9896059316321	106.272552548523	28.753	23.998	106.929
22.8399386616098	20.966094630168	107.690086749549	28.943	30.03	106.391
22.9962798881087	21.4558690315776	109.486258110823	28.943	30.475	107.548
23.1398639405611	21.7974401832822	112.298999947387	30.277	30.475	112.299
23.1398641012433	21.7974402762047	113.720274803126	28.88	25.331	116.966
23.1398642618505	21.7974403690907	115.102830191719	27.927	28.125	119.109

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.1398644223744	21.7974404618612	116.409823432585	18.72	28.189	115.769
23.1398645829517	21.7974405545529	117.734255399473	17.64	27.998	119.961
23.1398647436204	21.7974406471458	119.028704769596	20.561	23.553	119.319
23.1398649043142	21.7974407397256	120.328938625092	18.91	22.474	122.979
23.1398650650453	21.7974408322987	121.614629329414	20.371	23.045	124.747
23.13986522581	21.7974409248614	122.883700510534	21.577	21.394	126.294
23.1398653865919	21.7974410174266	124.135698009652	18.593	21.648	126.239
23.1398655474101	21.7974411099923	125.378811386423	18.974	24.569	127.812
23.1398657082734	21.7974412025337	126.609473514915	19.037	26.982	129.54
23.1398658691955	21.7974412950105	127.816819396988	18.974	29.967	133.455
23.139866030461	21.7974413866108	128.69046101351	18.72	29.967	135.012
23.5683141805041	21.7974368894693	128.690461058303	25.895	29.903	127.854
23.9931264475745	21.7974323895781	128.690461099232	27.229	26.22	125.044
24.4148796938978	21.7974278886639	128.690461138927	32.245	24.887	125.449
24.8214273294005	21.7974233867419	128.690461180481	34.341	22.029	122.727
24.8214271127056	20.1980927593558	129.058591591653	33.515	18.029	124.645
24.8214268958575	18.7074167002414	129.43942562433	32.282	15.473	127.6
24.8214266789264	17.2854256002747	129.823287916833	31.356	16.06	129.885
24.8214264619373	15.8832221063514	130.20775493578	30.462	15.473	131.052
24.8214262449038	14.489371545907	130.592223429741	35.547	11.234	131.369
24.8214251877	14.4893701115498	130.592229282981	34.976	10.282	131.121
24.8214241168377	14.4893686821438	130.592235134517	34.595	9.202	128.931
24.0806800092815	14.4893678815519	130.686311307272	30.912	9.901	131.507
23.3062314948233	14.4893670811827	130.780366523854	29.388	8.313	137.407
22.0624290821822	14.4893662830204	130.870252361149	25.451	17.965	131.595
20.7956048771476	14.4893654847657	130.960143979648	20.434	18.537	132.408
19.5355026920898	14.4893646864061	131.050015558065	18.466	18.664	140.644
18.3440696938854	14.4893638870084	131.137432136953	18.339	12.631	142.199
17.1494470008591	14.4893630915949	131.174974064204	17.577	13.647	137.156
15.9540045239538	14.4893622961834	131.212475981542	13.576	14.79	138.325
14.7863988098628	14.4893615007248	131.249914263411	11.163	15.552	141.832
14.7863986634787	14.1857706734807	126.888981592478	11.481	17.711	124.498
14.7863985171098	13.8803449684569	122.847598888618	19.99	18.029	118.966
14.7863983706728	13.5715285669452	119.315180942506	20.498	17.457	115.048
14.7863982240879	13.2588649755004	116.243093855547	22.149	14.282	119.226
14.7863980772742	12.9448967321743	112.966469437622	25.197	12.441	114.729
14.7863979294999	12.6309701880164	109.182934525259	26.022	12.631	109.182
Route: 7 Length: 163.051103994508 Demand Met: 997					
10.2960443523269	11.176673026969	12.5427279996291	12.37	19.934	15.842
18.0145458866112	15.1190937576583	20.039371862061	26.975	20.061	22.417
18.7092352523376	16.0286037660293	21.8239102416215	26.022	21.902	22.93
19.3650438880413	16.8795477602103	23.5709777614321	25.832	22.918	24.535
19.9877390807302	17.6799563773693	25.2934817326917	28.626	22.791	23.223
20.5249726768762	18.3962207168339	27.2701961654067	28.689	21.013	29.015
21.0336223841978	19.0991801582493	29.1799960079314	31.293	23.68	29.18
21.0072100804288	19.0991801995433	30.5780837028688	29.261	22.283	32.908
20.9807734195856	19.0991802404297	31.9031345238914	25.705	26.22	32.496
20.9543196585009	19.0991802808687	33.2256255667265	26.149	20.886	38.979
20.9278536041214	19.0991803213188	34.4294445521906	26.34	17.203	39.025
20.9013730413351	19.0991803620436	35.5772058713523	20.561	18.219	35.874
20.8748961557868	19.0991804029938	36.7329214728992	18.212	18.283	36.255
20.8484303019837	19.0991804441822	37.9028509985307	20.561	24.696	36.269
20.8219674649768	19.0991804856078	39.1007238860499	17.069	27.744	45.218
20.8219672851867	18.8540532217572	39.1007239360681	12.052	18.854	46.124
21.1072982421709	18.2025527385733	38.5837095946487	18.021	13.52	41.784
21.3947721533403	17.5703027387597	38.0595206113705	20.244	11.234	37.646
21.6833017170988	16.959904327779	37.5364081306513	19.482	13.076	31.528
21.9738474924584	16.3647876753984	37.0273980500059	24.244	15.997	28.696
22.2627658220319	15.7737808476411	36.5426897453636	24.308	15.044	33.546
22.5513514571878	15.1861306770533	36.0619784244844	27.419	15.044	35.984
22.8381642022093	14.6006385896761	35.5810499065238	32.217	11.541	36.145
23.1091718576287	14.0404903176426	35.0980240336757	33.642	10.155	35.22
23.1139924765669	14.0299202337949	26.9039358913464	34.087	11.615	26.904
23.1139924101681	14.0299198646195	26.7834129303174	33.907	14.076	24.403
23.113992339051	14.0299194954823	26.6542310479633	31.102	17.775	23.735
23.1139922676559	14.0299191259966	26.5263004785884	32.944	17.965	22.768
23.1139921561742	14.029918684594	26.5262973817124	33.515	18.219	27.24
22.9577433156171	13.5799387944028	26.1522343043871	33.322	14.401	29.372
22.7739231961927	13.1119724605599	25.7290780245714	32.022	15.473	29.854
22.5790589763611	12.6254290895904	25.2783575105036	30.15	16.06	32.059
22.3649906348365	12.0786833980591	24.7171868541993	29.007	14.409	30.293
22.1473791412107	11.5243459954232	24.1321018319901	30.202	13.491	28.883
21.9234222942401	10.9609754381799	23.5169300418229	30.787	13.946	28.148
21.6819470775755	10.3594563934116	22.8251242110504	28.181	12.441	28.249
21.4362568562609	9.750657848857	22.0998184025806	27.927	10.409	29.559
21.1814500325489	9.13881449054164	21.2625258868738	30.594	9.52	26.782
20.8425071452345	8.5142536209508	19.5821549080717	28.372	10.218	25.305
20.4852456976989	7.8779191777002	17.4567112366374	22.022	11.361	19.929
20.1268452662863	7.23529923701556	15.2805910912783	25.895	12.123	19.556
19.757270999977	6.5654759501994	12.7801443115944	26.149	11.107	19.141

Solution x	Solution y	Solution z	Original x	Original y	Original z
19.3496220293608	5.80854355479277	5.71224356596377	29.451	10.155	5.592
Route: 8 Length: 209.659149856611 Demand Met: 1000					
23.046574844354	5.81929111806679	39.106042493028	31.015	13.296	40.037
24.2368880218529	6.91682656230536	46.8610089558175	33.095	12.971	48.557
24.8796965606905	7.62746607268374	50.6573827314566	32.69	13.52	54.423
25.412182406315	8.23103629581814	53.0683552876916	33.322	14.141	54.817
25.8947710399752	8.78451197667068	55.3034687071549	34.135	14.206	54.088
26.3383981390168	9.30255972692625	57.9359966297613	36.944	13.012	57.936
26.3383982825433	9.30256027201394	59.1849833827568	33.96	11.234	59.829
26.3383984260498	9.30256081691127	60.4404705535407	34.849	11.996	64.173
26.3383985695297	9.30256136179895	61.6088653166491	35.484	11.425	66.484
26.338398713035	9.3025619067568	62.5421093078458	32.055	9.837	66.681
26.3383988565562	9.30256245174117	63.4556865005464	31.307	11.313	71.461
26.338399000064	9.30256299689327	64.2675962824367	31.015	12.776	72.117
26.3383991435653	9.30256354224599	64.991972123606	28.816	12.568	71.763
26.3383992870817	9.30256408782814	65.6890744722138	29.197	13.52	74.598
26.3383994306062	9.30256463354811	66.2764652310594	29.007	10.282	76.107
26.3383995741339	9.30256517942416	66.7817638473292	28.626	11.234	75.345
26.3383997176611	9.3025657254822	67.2613650320565	31.502	12.126	74.715
26.3383998611656	9.30256627177084	67.7161070654928	30.787	12.646	75.914
26.3384000046577	9.30256681825847	68.1381660523488	30.787	12.906	76.252
26.3384001481399	9.30256736492918	68.5316161474261	29.975	12.581	76.539
26.3384002916087	9.30256791179737	68.9077548797807	30.202	14.271	77.775
26.3384004351185	9.3025684585654	69.1886053824905	30.787	14.466	78.121
26.3384004394395	9.3025685318564	69.1886053955718	31.047	11.313	78.28
26.3384004438969	9.30256860509492	69.1886054098715	31.437	11.541	78.241
26.3384004484946	9.30256867826132	69.1886054261218	32.802	12.126	77.71
26.3384004539274	9.30256875119794	69.1886054450644	32.835	12.613	75.794
26.3384004593693	9.30256881952677	69.1886054603012	32.477	14.433	75.823
26.3384004647681	9.30256889236632	69.1886054759854	32.087	14.661	75.705
26.3384004700792	9.30256896514197	69.1886054930842	32.182	16.632	75.383
26.2131196021604	9.17674810001836	68.4647768251566	31.356	16.251	69.04
26.0870027614493	9.04965958663522	67.7429881241963	31.307	14.661	68.868
25.9602704595032	8.92183186052046	67.0209148006173	31.762	15.473	67.554
25.8325441227208	8.79279370132952	66.300995497245	31.991	17.203	67.188
25.7013511067311	8.65879515313865	65.5717564744256	31.437	14.433	67.041
25.5692617804346	8.52380699864976	64.8395982076786	30.202	12.711	66.602
25.4367136196807	8.38834737609083	64.1052068918546	28.753	13.457	65.491
25.3038857029585	8.25231800732601	63.3702707231785	25.832	14.219	61.701
25.1711331581169	8.11559413904992	62.6460282048454	28.372	13.52	60.757
25.0381084442531	7.97819911583527	61.9333862853143	30.202	12.971	61.507
24.9044564282406	7.84010057277276	61.2269765498803	31.015	12.516	61.408
24.7699045894678	7.70125411965601	60.5240826587496	33.095	14.011	61.011
24.630082540469	7.55823429282888	59.8180219794254	32.672	15.246	60.724
24.1522527210567	7.08878234084331	57.715253247331	31.827	14.661	58.532
23.545688915017	6.50174500544577	55.4794812753905	31.275	14.173	56.999
20.8208257645448	4.27010430433993	50.0350686998343	28.626	10.091	52.872
Route: 9 Length: 285.880840211781 Demand Met: 1000					
20.3621732981256	13.5761974409387	74.3510135000093	27.737	18.664	80.683
21.6719837596045	15.3610402938738	75.9120883997409	27.102	21.648	79.965
22.869327240203	16.9127584394749	77.3608033831369	28.816	21.902	78.963
24.0051117230465	18.3806879311677	78.7912386457302	31.356	26.03	76.034
24.5607306354701	18.9857699568528	81.7250001995491	32.118	27.3	81.725
24.5607307186613	18.9857700193808	84.3964054234779	28.054	22.918	87.821
24.5607308020855	18.9857700812707	86.9632883617847	28.245	22.855	90.204
24.5607308856767	18.9857701427292	89.4414118657478	27.546	22.537	91.326
24.5607309693752	18.9857702039446	91.897951976666	26.149	23.172	91.657
24.5607310531424	18.9857702650466	94.4082258630876	25.006	24.188	94.535
24.5607311369585	18.9857703261794	96.9716175507242	22.276	28.125	102.29
24.5607312214502	18.9857703869851	98.027991798098	18.91	28.697	98.028
24.6782348148514	18.1676018544841	98.1071536982151	27.229	27.554	96.447
24.7951224072786	17.2003308140603	98.1865856573933	29.134	22.537	96.334
24.9116520200311	16.1967152944071	98.2661580698773	33.071	18.346	97.156
25.0271604711452	15.1715315405658	98.3458510787362	32.802	15.473	97.861
25.1418993564722	14.1466511409351	98.4256166869296	31.737	12.885	98.954
25.2561368111766	13.1336000485384	98.5054074552096	33.322	12.581	100.045
25.3694955661178	12.1259961643201	98.5851541124769	34.135	12.126	105.614
25.3694955431008	11.5400776667458	98.5851541527876	32.477	11.541	107.287
25.3303436633735	11.4766027628732	98.5115322938816	30.34	9.647	108.046
25.2901726545472	11.4112589847218	98.4287532324407	30.721	9.329	106.333
25.2498531083637	11.3460940488401	98.3449956683918	29.388	11.804	105.494
25.2094804223565	11.2809209444062	98.2608054577498	29.578	13.203	105.988
25.1690308190105	11.2156613256092	98.1759789641451	31.372	15.246	104.804
25.1284003633047	11.1500916692041	98.090276035419	31.293	15.806	105.367
25.087393155001	11.083769860011	98.0025282231454	29.642	17.076	106.306
25.037322436283	10.9751951492459	97.6738676930695	27.292	16.632	106.393
24.987041100113	10.8639213740156	97.3016980696833	26.086	14.663	104.115
24.9367470352058	10.7522965245202	96.9224053476483	28.753	13.838	102.669
24.8863914366469	10.6404117837514	96.5375482700519	30.202	14.011	102.151
24.8359201399173	10.528157421069	96.1454084483736	29.975	13.361	103.951

Solution x	Solution y	Solution z	Original x	Original y	Original z
24.7852373914249	10.4153249011776	95.7320838637725	29.197	12.441	103.553
24.7344215374741	10.3021958690931	95.3017403395233	28.753	12.949	99.196
24.6835551374282	10.1888963140898	94.8681309288185	29.515	14.028	97.711
24.632618550644	10.0753079978653	94.4321125482691	30.202	13.231	95.497
24.5816038496188	9.96149870178636	93.9959687859939	30.202	14.791	95.605
24.5304895364388	9.84724781096854	93.5586433931934	31.697	14.433	93.007
24.4792054161635	9.73244686147255	93.1235981333655	31.547	13.203	92.722
24.4277813538049	9.61730591456326	92.6903760753046	32.737	11.541	92.508
24.376152500349	9.50194685433113	92.2587137085518	34.849	13.393	93.121
24.2396862144439	9.26407129333314	91.4750859118327	33.322	12.321	95.076
24.0988553284654	9.02182203578081	90.6341363506701	32.412	12.353	94.929
23.9547628275193	8.77574763075155	89.7316970804603	30.527	11.313	94.769
23.809312606092	8.52818718576665	88.7882519383421	29.261	11.425	96.137
23.6620632182735	8.27787554564471	87.7275160763618	27.419	11.298	96.166
23.513451978209	8.02438000518302	86.4697473553653	25.705	12.123	93.472
23.3644226519903	7.76844666028035	85.0998112609889	26.911	14.409	89.199
23.214622642494	7.50809830388154	83.6545892482749	30.34	10.917	88.584
23.0625265982245	7.24458385847663	82.0515121475691	32.152	12.353	82.503
22.9028818264006	6.96845100757265	80.4305065833197	32.672	12.353	81.337
Route: 10 Length: 272.618025790511 Demand Met: 1000					
22.0576207880884	7.5944029366373	58.9779541128818	30.202	11.996	64.142
24.0086943594449	10.1445681472963	61.8104632585664	30.594	17.076	65.103
25.4755550086782	11.856181267117	64.0950378503671	34.087	18.918	64.082
25.6813181840455	12.1065170692116	67.7166683339979	33.261	18.537	71.995
25.8604414854294	12.3252520116349	69.180165589926	30.531	18.664	72.004
26.0386822016387	12.5419015936571	70.5950245210043	30.785	16.251	71.611
26.2163998515365	12.7580051502294	72.0099915418049	37.452	12.758	72.01
26.0688404988716	12.8757970968	73.4400559160832	32.835	14.173	77.958
25.919757065845	12.993464037967	74.8025415822507	33.062	15.473	78.089
25.7690131112828	13.1108173344495	76.1217894757984	33.071	16.187	80.531
25.6159444918132	13.2276073791426	77.3578324598297	34.135	13.166	82.509
25.4584791349173	13.3443567040897	78.4463543560156	33.907	13.296	83.348
25.2971274785406	13.4610652147408	79.4383492352355	31.015	13.556	83.741
25.1347237141916	13.5777606771362	80.4051488141759	29.975	13.621	83.535
24.9716240733097	13.6944643065688	81.3601873905688	29.388	13.838	84.576
24.8079069513988	13.8111694402395	82.3039393091173	34.135	14.986	84.727
24.6396809766218	13.9276004119898	83.2118553606096	34.135	14.466	84.176
24.4671136172383	14.0439190040237	84.1132814489368	35.42	12.949	84.367
24.1753723019739	14.1630945173989	84.9743961765172	34.135	12.646	86.486
23.8568078675676	14.2828101514638	85.8082375701401	32.737	14.433	86.615
23.5273379750976	14.4025050248334	86.6407569444914	32.412	15.246	88.024
23.1854517530967	14.522067543522	87.4660786677277	32.542	15.473	89.387
22.8235735183599	14.6414301968538	88.2729304425958	30.722	15.473	90.573
22.4517250373987	14.760699630105	89.0695550013283	29.975	14.921	90.476
22.0714842877925	14.8799736404266	89.8633730575315	29.975	12.841	90.667
21.6806329958665	14.9995214958634	90.6574255517517	31.957	11.541	90.999
21.11506192326	15.1225277594793	91.4419757556892	23.482	9.52	92.151
20.5457475720411	15.2461065298741	92.228664733641	22.212	10.091	100.44
19.9683339537823	15.3709399235293	92.9240916371929	18.148	16.505	99.59
19.3957394678417	15.4957243343994	93.5990887055133	16.688	18.092	103.09
18.8464967270849	15.6194286660835	94.1858080297825	11.608	20.251	101.424
18.8689768001717	15.6194286567274	93.2945777522945	12.243	20.505	94.648
18.8914969496636	15.6194286473679	92.3989516521353	17.577	25.204	95.05
18.914016322068	15.6194286380072	91.4519933645367	19.545	25.839	93.739
18.9364988506303	15.6194286286935	90.3917333792216	20.561	25.776	90.646
18.958943981232	15.6194286194061	89.3429639388137	25.895	20.759	90.426
18.9813110881249	15.6194286101089	88.2908779057534	24.752	19.362	96.308
19.0033481891197	15.6194286007339	86.434557311854	24.943	18.791	91.664
19.0253302590245	15.6194285913468	84.3701457260478	25.832	16.949	91.413
19.0471991319531	15.6194285819449	81.1548529764322	26.721	18.283	80.536
19.0690219901431	15.6194285725334	78.2076546649859	26.848	19.743	76.594
19.0907876348662	15.6194285631046	75.5571665348194	26.911	22.601	75.564
19.1123647917507	15.6194285536641	72.9955318429376	27.483	19.616	74.587
19.133873074938	15.6194285441849	70.2790002488112	29.705	19.426	70.279
18.9026613161619	15.0945290099556	67.6665421101646	29.261	19.172	68.315
13.3486332786769	9.59661820247288	58.8234630184195	19.418	13.901	64.222
Route: 11 Length: 219.334337087049 Demand Met: 1000					
21.6963995176204	15.2460085869447	4.37600227870553	32.932	15.246	4.376
21.696399219682	15.6669186905115	16.7157722234058	28.118	18.092	12.931
21.696398922	16.1552317248042	46.2809467220904	26.594	18.854	52.883
21.6963986245337	16.6864230769387	52.0545913664166	25.197	18.918	59.354
21.6963983271218	17.2361871940829	55.388402897432	24.943	18.346	64.008
21.6963980297803	17.8017491158974	57.3200032884566	27.356	20.632	65.916
21.6963977330471	18.3118453658407	58.0470305298392	31.356	22.347	59.353
21.6963974369834	18.7569707891638	58.7394426802061	28.499	25.141	57.61
21.696397141052	19.1821331990037	59.4534343425972	28.88	27.3	58.991
21.6963968461636	19.4642074063695	60.2439002171203	27.102	25.966	59.543
21.6963965513355	19.7411822025012	61.0534312391835	26.086	24.95	59.469
21.6963962565368	20.0158982757663	61.8848402632451	25.07	27.744	59.542
21.696395961774	20.284270684598	62.7612948488563	22.022	28.443	62.892

Solution x	Solution y	Solution z	Original x	Original y	Original z
21.6963956670029	20.5474872284423	63.6525945667558	22.466	28.887	64.369
21.6963953722292	20.8051005437541	64.5533206414087	18.72	30.665	66.986
21.6963950772302	21.0322841932951	65.3645978414931	17.64	27.49	72.733
21.6963947819268	21.2432720423413	65.9670185643128	19.164	24.696	74.306
21.6963944865574	21.4523642956238	66.5184047302803	21.958	29.395	74.461
21.3498746117472	21.217193979321	66.4096313553179	24.562	26.982	72.259
20.9988739106023	20.9781190454792	66.3001488471201	27.546	26.982	70.094
20.6268162989482	20.7309242290519	66.1899028346021	25.832	27.998	69.522
20.2386669159825	20.4740462191156	66.0791843157932	24.943	23.68	69.938
19.845705158984	20.2161804169831	65.968456103552	23.482	22.41	74.725
19.4383314576827	19.9554023693454	65.8554375104729	19.863	21.331	75.529
19.0307364777526	19.6931596676721	65.7399802892838	17.45	21.902	76.475
18.7177777827503	19.3267831750698	65.4528830149054	11.862	17.965	73.909
18.486020493469	18.9921707747739	64.9847227659187	13.005	20.061	68.646
18.2571138082103	18.6575964992973	64.5135148122813	22.974	17.711	70.862
18.0258414074257	18.3253161870529	64.0282446668732	25.07	11.615	69.179
17.6352827922774	18.1129967200321	62.6758535541381	21.831	13.203	64.85
17.2404427661864	17.9029254182472	61.3171016352172	17.323	12.504	65.716
16.8469583803127	17.6952492349173	59.9059457016663	17.45	24.188	63.322
16.4540618621659	17.4853242769816	58.4481595278786	18.974	24.125	61.119
16.0585408348314	17.2729058684931	56.9552412585356	18.466	17.838	58.207
15.6621763268678	17.0607891985106	55.4732308653707	24.308	16.441	56.035
15.2465831180571	16.8496256404084	54.0096656137658	24.244	21.077	52.586
14.7732475639378	16.6330969660642	52.693491358952	20.117	21.775	51.546
14.2889227800484	16.4147114264563	51.4242285949666	17.069	27.046	52.438
13.4086198052157	15.5166161284901	49.2769583870153	17.323	23.934	50.146
12.4596738356716	14.4411185514533	47.1379460168582	17.64	22.918	47.209
11.3298420254268	12.9043187611527	45.1026466272541	19.609	18.156	48.051

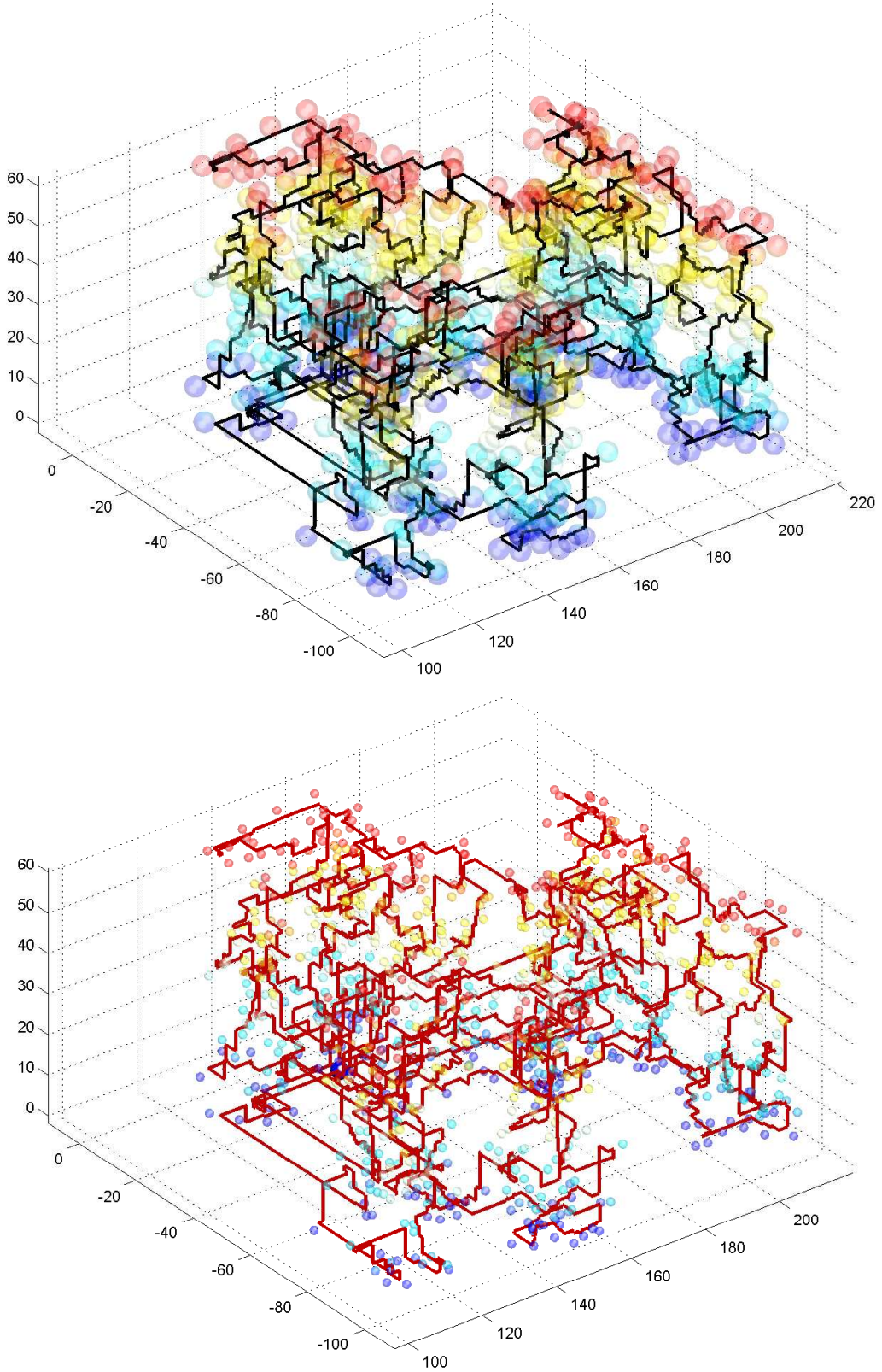


Figure O.192: $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Manhattan, Length = 4976.3723430

Table O-195: Solution for $dsj1000$, $r = 2.429218$, Equal Radius, 3D, Manhattan

Total distance: 4976.37234302661 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 844.94500530303 Demand Met: 9999					
23.5471453222742	16.5955027566441	4.54029784958069	23.3217	16.9506	6.2856
19.7707179623933	21.2637529021403	6.23009486790719	19.6457	23.2311	5.559
16.4906918452519	22.4049965757004	8.98594547566858	15.0509	21.8739	10.7741
16.107549175977	63.7538455799074	9.29846454466448	15.1112	64.361	7.2726
15.8516619847418	64.966678569509	11.0593323125957	14.2239	63.9607	10.3191
15.6254091309882	66.9893583052768	14.1092081391677	16.7224	69.1113	14.1768
14.5218038201438	67.1250893727201	15.9372461123862	14.5018	68.1646	16.8217
13.4194185553502	67.2582567015173	17.4372849064986	13.2613	67.7948	17.1077
12.3338056571315	67.3904751861682	19.0152854071317	12.0587	67.8257	18.5408
11.2773596087036	67.5219288416595	20.7221786054848	12.5389	66.9051	22.2814
9.17069997868532	67.6572761416151	21.5854995673912	9.1707	70.0865	21.5855
8.6931350676237	67.2011870662125	23.3026771445703	10.5042	66.7806	23.1982
8.09878229516022	66.7631988203535	25.0925673453956	6.9842	66.7632	27.251
8.09877639820837	63.5361107441675	25.0925700809774	7.6803	61.1857	24.6436
8.09877484643778	63.5361528842561	32.9432063806342	6.67010000000001	63.5082	34.9077
9.8330641862274	64.2325457025687	32.4726442379025	10.4334	62.822	33.9682
11.0040043857331	65.5113855816187	31.7784723803265	10.7344	66.9849	31.9545
12.2302701549223	66.5097460740221	31.0725686684659	12.0444	66.3239	28.7604
13.9302041601975	67.8121464317285	30.8412121126607	14.7433	68.1941	29.0053
15.08560000209	68.9208796408498	30.6385213542329	15.0856	70.6386	28.9208
19.2460625610279	68.6113254763013	32.8113177583773	18.9682	67.082	33.9115
24.9704596092977	68.3311782172056	34.192245035387	26.4747	67.9787	32.7219
26.220587482575	68.0606768709453	42.6799997144796	26.4833	65.6457	42.68
26.2205926803472	70.4557729901674	45.6233753629599	26.4587	69.6793	44.9112
26.2205978771258	73.5263773138932	49.5074899728313	24.7401	75.4523	49.5075
26.220603401184	73.5264600844138	52.3461965693494	27.6433	72.5657	51.9251
26.2206089230206	73.5265428992838	56.1349441806487	24.1578	73.3792	57.4094
26.7536885918183	76.3472354453436	56.1349534710166	25.3366	76.538	54.326
29.2062047494973	78.1677182735919	56.134962763997	29.376	80.5861	55.9809
29.2062131765901	71.9823167986751	56.51740921668	26.9783	71.0141	56.5271
33.7365740845818	71.9822968149134	56.520020810528	35.1535	70.6086	57.9365
32.8995817238873	72.4853120004011	51.3109271349816	32.697	74.6737	51.2201
32.1350822291761	72.7994667542508	47.2081742494769	32.2488	71.8762	47.8257
31.3631415599959	73.1249145309112	41.4232305772398	31.7515	71.3679	39.9054
29.8555979388162	77.1239085468998	41.0364019643573	31.105	77.2121	42.4385
27.1736002511574	80.8360749363361	40.5955994833791	27.1736	83.2653	40.5956
26.1284943086785	78.4898328235241	38.5744690857869	24.3218	77.9732	38.2426
25.413655327722	76.6662483027986	36.8400739959236	24.4797	75.354	37.647
24.7850122010409	75.4491309683972	34.415416551398	22.8762	75.7017	33.805
24.3229048582692	74.125590698971	32.7492993137354	26.2205	72.9044	33.175
22.0856998988338	73.6052076613378	28.0359755872883	22.0857	71.4539	26.9077
18.7355991658625	77.2890994154703	28.0359756863274	18.7356	77.2891	30.4652
17.9605991717773	79.2295755087489	21.6946003771198	17.9606	81.6588	21.6946
13.5607484190832	77.4641554350912	18.4079876353868	13.7649	76.0563	18.1156
8.54528191178953	76.1544565584192	15.4973040861077	8.0472	76.1743	13.1381
8.35550685553886	74.3815981351905	15.4545315631255	7.5677	74.3816	13.1566
8.35550590018789	74.2160686751076	20.5009052497284	6.65640000000001	74.2265	20.3804
8.35550494607287	74.0505383506341	26.1144342585323	9.9143	75.8382	26.191
8.35550399316392	73.4132998847632	29.0012176454747	8.3117	72.2049	29.6247
8.35550304041749	72.8348982157241	31.3366009729375	7.0214	70.8048	31.3366
10.7875892450024	72.9223539389974	31.6328183984098	11.6475	70.8021	30.9107
11.0122777499746	73.4823801138777	37.6747993700915	12.73	75.2001	37.6748
9.46220211557153	73.2115634706686	38.6082963985647	9.45780000000001	72.6847	40.961
8.03038544455501	73.0793300057895	38.6634137973714	8.8648	72.0358	37.3381
6.06504448695576	72.9508499940209	38.719421497842	6.09139999999999	73.9114	36.5077
2.73882401165392	68.195399775005	39.7657000426911	0.309600000000003	68.1954	39.7657
5.28120061384783	67.9784240989093	44.5708783503135	5.2812	65.5492	44.5709
10.975946632708	68.068081602527	44.6391405256599	12.0097	66.7734	42.888
11.1062773411954	68.7172415781808	45.0759423736244	11.4886	67.7219	43.0579
11.2315981374048	70.0070644061366	46.498187845058	9.3844	71.5303	46.4336
12.6183246624661	70.1508323580056	48.7740035504578	14.0233	68.3418	48.6515
13.1228930756039	70.3380057125277	51.7967203547295	10.9416	69.7746	52.0032
15.4331992955791	70.5396755446427	53.8868002675914	15.4332	72.9689	53.8868
16.696173582889	70.5396763302191	58.3803736061383	18.2654	71.5277	59.9496
15.3123991913764	65.4190258362783	55.148377715727	15.3124	65.205	52.7286
14.2075999660418	65.4190179712506	55.148381913315	14.2076	63.0144	54.8035
11.4441998072653	65.4342205283478	55.6690606895664	11.4442	66.9869	57.5373
8.27503412795321	65.4342194279538	55.6690580111657	8.4928	63.9998	55.0759
4.73420480342112	65.4342183285038	55.6690553327913	4.7342	63.0935	56.3188
4.37957510445091	65.6651834781808	52.3095252077623	4.4426	63.6871	51.0243
4.00889921963483	72.1859998885339	51.990624465691	4.0089	72.186	49.5614
-2.58287698036341	74.5527582755343	55.5804709649072	-4.2807	74.2616	57.1387
-3.06415387060051	85.6295826539547	56.0720375482544	-1.23350000000001	86.0108	56.7294
-3.70472325215761	90.7561233507002	56.5227834318704	-2.30370000000001	90.7079	58.2529

Solution x	Solution y	Solution z	Original x	Original y	Original z
-5.11967425559401	96.920699682659	56.8304980338468	-7.5489	96.9207	56.8305
3.55538666951037	98.03798658042	58.1251837433927	4.95789999999999	99.4405	59.5277
1.27487101091843	95.0589860609718	58.0306833849365	1.1743	92.9818	59.2535
0.542996381805182	95.0014928805304	55.8682038257335	-0.0468000000000046	93.7668	57.0052
-0.12152011952773	94.9449025594	51.399976092277	0.580200000000005	93.7511	50.7296
-0.834674564483237	94.8888926965452	48.3647003480892	-3.26390000000001	94.8889	48.3647
1.81646973026008	94.7799632449655	45.9787598139662	2.1469	96.6722	44.5395
2.41648119626377	93.5150999921776	45.8322122316635	3.4538	93.5151	43.6356
2.41648135249763	90.3652998497393	45.8640074791105	3.55029999999999	90.3653	48.0124
0.484006354093339	89.215790787	44.601353751238	1.20229999999999	90.7259	43.7677
-2.40777881579082	87.3137216290532	43.5866999673453	-4.1255	85.596	43.5867
1.17068526870776	89.8158995507458	36.500640195139	3.5998	89.8159	36.4775
0.865899121230683	92.458345541588	36.5005774232717	0.619299999999996	91.0377	37.0534
0.567211878234488	98.5580990161605	36.5005145794937	-1.86190000000001	98.5581	36.524
1.58427375573351	98.8583088178897	31.1490996103592	3.1448	100.72	31.1491
1.58427059439094	98.8582240134469	30.9043532539707	3.11839999999999	98.924	29.022
0.869923245889112	97.6866108265228	30.9043508230603	1.64530000000001	95.7178	31.8751
-2.73260093865819	97.4015846107436	30.9043483753299	-3.1358	95.2162	31.8855
-2.73260783216458	97.4015843587031	28.6474000111502	-0.311599999999999	97.6012	28.6474
-3.33176617944999	97.4015840658577	26.4861984453888	-5.5457	98.4014	26.4862
-2.62815751923517	96.8936963921894	26.3207390593954	-0.338999999999999	97.1979	25.6607
-2.56116235733954	92.1356581550273	26.2192247879011	-2.5612	92.1356	23.79
-0.735107176564043	92.0900024057198	26.2351416466649	-0.735100000000003	89.6931	26.6301
3.59239997698788	92.4228535401979	26.2351448054269	3.5924	94.7451	26.9481
6.90293108183485	91.6171250007409	26.2351449516845	7.8142	89.6258	27.2865
6.9029313321585	101.957635339222	26.1409938276651	8.0611	104.093	26.141
6.82907835478871	97.7094402440851	20.4791750841846	9.17	97.1621	20.3835
5.24755435000361	97.4097256645923	19.0928189819744	6.3198	96.0864	20.0555
2.33152161059951	97.1415213380861	16.9249000186207	0.613799999999998	95.4238	16.9249
2.44141447395701	98.1095472212985	14.4673238739669	1.4019	97.5847	15.4849
2.55329789265639	99.1767018199507	10.4149248327532	2.55330000000001	99.1767	7.9857
3.01620059460538	104.921763364053	10.414924190795	3.0162	107.1796	11.3112
4.26515364127948	102.242164129999	8.94862444598427	3.81100000000001	100.5395	9.9764
5.77900982070153	101.163399648561	6.1034267919873	8.1477	101.1634	5.5645
4.61826276178168	95.0629538767145	6.10342472033089	4.77370000000001	93.7785	6.1602
3.43039312858062	92.0783805007678	6.10342264899477	2.57040000000001	90.3092	4.6781
3.43039290984467	92.0783952039268	13.1881986393387	5.8502	91.8647	13.1882
-11.0871786164159	93.8535008854061	13.7830787259393	-12.8049	93.8535	15.5008
-6.99229920498571	94.074560773404	9.09633135027534	-6.68600000000001	94.6391	7.4364
-3.71669320602533	94.2904081419425	7.25574598170091	-2.1508	94.1499	7.6254
-1.94470769276356	94.5074107427587	5.17987533276725	-1.9602	93.9224	5.6614
-0.17100137595915	94.7273751232247	2.86719975279337	-0.171000000000006	97.1566	2.8672
-0.100899921874202	90.0486998826025	2.57992455752903	-0.100899999999996	90.0487	0.1507
0.648945371719691	83.8927416746353	2.7338449827852	2.7376	84.0979	3.4333
1.04800787931977	64.7681041366109	2.87911761277681	0.483800000000002	63.8626	0.7436
2.39998884847168	64.4237602591871	11.9941328793654	1.76609999999999	66.5446	12.6159
9.0919653201197	63.3597064591233	13.4311931432642	9.15690000000001	61.6426	15.1483
9.09198127123261	66.4062031982817	9.59404697949602	9.6606	65.5604	9.552
9.0919972213912	70.6084112227775	5.83720182212087	9.00020000000001	73.0359	5.8372
9.43913416678308	68.9424562205248	5.458643063909	10.0835	69.723	3.7551
9.76626389160272	66.3069744689855	5.13777218424796	12.0877	66.3858	4.5331
9.83058855602934	18.6465456963312	4.98216688218569	7.8039	17.6061	5.7787
16.9396996096205	18.5218310301234	0.89790391932423	16.9397	16.157	0.3423
21.5600954774101	19.1151368000759	0.897901909607122	21.2889	20.2133	0.1771
27.0312006648126	19.672267799449	0.897899902067805	27.0312	22.0371	1.4535
28.0443006365258	9.68492250551752	0.549502245868519	28.0443	7.2557	0.5495
Route: 2 Length: 761.314384622697 Demand Met: 9866					
43.7430886637918	16.1572793023257	3.02801262960997	44.2621	15.3855	4.7212
37.9450847995866	34.0145564654791	4.39053065770436	37.4272	33.8061	3.3013
33.6518572022334	65.5429477900646	6.04190688337381	33.839	67.1668	7.1332
28.2410000396357	67.7714887269462	7.1681232719919	28.241	67.9653	9.5896
23.0317113806329	67.7714922781798	5.62230563761807	22.8228	67.5784	3.2098
23.0317081312469	70.159520378105	5.78240156880133	22.9431	70.0987	4.2047
23.0317048819841	72.6126997552746	5.94868084763429	21.3934	72.6127	7.7423
23.6620177157392	73.3272689170716	4.33622476492761	24.5076	73.115	4.3052
24.2597272665825	74.0536228715977	2.73235453252956	23.527	73.6169	0.5641
25.4767000042217	75.1754890880755	2.41093271346382	25.4767	75.481	0.001
26.6151003705222	75.1754924639222	2.41093318933553	26.6151	77.1467	3.8306
31.0448989556377	73.7171977067862	1.72063905449318	31.0449	71.9995	0.0029
31.4826699601887	73.7270248159701	1.79092466177303	31.4906	71.3219	1.4719
31.8631880389228	76.5074240535288	3.98836673439953	31.4187	76.5703	2.7936
32.2516726141979	79.234981006986	7.23604027009823	33.517	80.8699	6.7304
32.5761508243359	80.2335004242066	16.3270812638086	34.9317	80.2335	16.9208
32.1400511514119	89.3501033037181	16.327082128398	32.6009	89.9531	17.4409
31.6915994399591	94.7339369217821	16.3270829928851	31.6916	96.8159	17.5787
30.5920436187508	93.7460998652877	16.3270812123498	29.3468	93.7461	14.2413
30.5920436433676	92.9443274220024	22.4162102282862	29.5221	90.7635	22.4343
31.5871624194645	93.2553024085339	22.4162451353726	34.0163	93.2553	22.3961
30.8579855980925	96.2715058309677	23.1885740635404	31.7064	96.988	25.1942
29.3350338207299	97.3495556364818	23.5281304793729	29.1897	96.4145	23.036

Solution x	Solution y	Solution z	Original x	Original y	Original z
27.8367650294967	98.5624945968894	23.8739656808453	28.2891	98.27	21.6276
23.2572189093492	100.434300128716	25.3971813141457	21.5395	100.4343	27.1149
28.17169999447	107.252271771376	21.6658808257829	28.1717	107.4546	19.2451
32.8369951331638	107.252275145582	21.7377496539461	33.1686	108.6172	19.7963
33.1637866652114	107.252278494756	28.6323998275924	33.1638	109.6815	28.6324
33.2008484985606	106.859105073444	31.8573051628062	31.3011	106.2109	32.3658
33.2387719224471	106.496047753062	33.9426009841366	34.3074	104.3145	33.9426
33.23877298096	106.496047604341	41.3949996293837	35.3466	107.7036	41.395
32.1041630334161	105.477443801869	42.4743900563313	32.8361	107.2479	41.504
30.3495352708053	101.385241765904	44.3863550299679	29.8552	101.3038	43.5974
28.7426375906501	97.471083416377	46.6576002444411	26.6904	96.1713	46.6576
28.7426378457094	97.4710830512931	54.8586313269722	26.9511	99.1097	54.9389
28.8768007644521	96.8775312634851	54.8586470516784	26.55	96.735	54.3574
29.8103469420732	96.3966804674631	54.8586627944344	29.7849	97.5299	53.9895
30.7482022476534	95.87609627264	54.8586785391059	30.7482	95.8761	57.2879
32.1124383148461	95.1116632357142	54.8518760816431	31.4281	94.9219	54.3744
33.6270093553586	94.3581739069286	54.8450759078648	33.6244	92.4492	56.3457
36.1692647708456	94.3525580112326	54.4710213039706	36.1694	94.3523	52.0418
36.742701415793	94.0140193745472	54.8762236958336	37.1788	95.0118	52.8478
37.2014870984791	93.5020098510794	57.1496596518144	35.4152	92.5489	58.019
37.9888396057021	93.0917614229105	58.271923937931	39.6285	91.4521	58.9959
37.4978576855085	101.389250951959	58.2719241006991	35.2228	101.4244	59.0123
37.401627721443	105.680771681035	58.2719242630916	35.7224	107.36	58.7833
41.6499701040356	104.463421028549	58.271923412085	42.4716	105.6496	56.7244
43.4581764769681	101.668906572367	58.2719225613245	44.7902	101.1589	57.6534
44.7715022154377	99.3914001553938	58.271921710599	47.126	99.3914	58.8698
43.8624294603426	98.3270106852223	57.1276586283089	43.0828	99.6317	56.4863
43.0514042937859	96.9436216059356	56.1095387178662	42.0978	97.503	57.9578
42.4399016255681	94.8983719718839	51.1688155885613	44.0393	95.7757	50.8289
41.6640633890266	91.5861355089871	47.5576064034012	41.599	92.4813	48.0171
40.8939001152247	86.7847211832712	43.1765001288253	40.8939	84.3555	43.1765
40.4410738327245	88.0131939700607	40.6544012522628	42.6808	88.2098	40.1619
36.0349787639152	89.0240064130139	39.4608535143003	35.4073	87.2216	40.4202
33.9211105023594	92.5654862876546	37.2873270633855	32.2034	92.5655	35.5696
33.9499784689935	92.6007109894411	39.4513243376905	32.8593	93.0881	38.0081
33.9790536190575	92.6357884843769	47.1538409093186	32.1756	91.0244	47.2823
34.3667084370583	95.6036819168362	47.5775768599957	35.9551	95.9225	47.402
34.7192656039121	98.1816074375063	48.0073145742853	32.4952	97.9758	48.1403
35.4006005242254	102.018977981256	48.4210027435993	35.4006	103.6799	50.1937
39.1959766135569	102.018977419827	48.4210019788015	39.196	99.7694	49.3378
39.2342656492709	102.018993743284	44.9986223943101	39.3246	101.8921	42.5744
39.234288195785	103.029829763827	44.9986219312284	39.1965	105.4524	44.823
41.8482703543146	103.029828321809	44.9986216613731	42.0156	103.5929	44.0945
44.3311720302034	103.029826879736	44.9986213915647	46.5537	103.4177	45.8992
44.1131712826463	101.885725296951	43.4006570319084	42.8352	101.6931	44.9574
43.9113725134838	100.81001272524	37.5071561265247	46.0729	100.678	36.5278
36.1162254372235	99.9901055291633	37.077955149353	33.8351	99.3235	37.4512
36.0281611648737	99.7733995383061	34.5789854910725	36.8108	99.4487	34.5912
35.93949259121	99.5581672809532	32.0728960042763	38.189	100.3805	31.8594
33.3856547195546	97.6479347688042	31.4021442303277	34.0464	97.1856	33.2284
28.596621164403	96.1159000056673	30.3905013495006	26.1674	96.1159	30.3905
30.6128654880051	94.4033990681949	30.1944623043872	29.7064	94.0211	29.3487
33.245757334808	92.8321361499858	30.0022996594632	33.1881	90.5996	30.8927
42.972099247985	92.7469212153941	28.7364999387244	42.9721	90.3177	28.7365
43.3526809912214	99.5570810648665	27.0089999687292	45.0704	101.2748	27.009
42.5779878195748	99.2044454517202	25.1464945456406	42.9226	100.4615	26.2167
41.7641721418655	98.8232172618812	22.3035773704423	42.2565	98.7398	22.9258
40.9177351822466	98.4434865577342	18.8565704693661	40.9431	96.0349	18.7884
39.9363201845777	98.3924174674427	17.5328011284626	38.2186	96.6747	17.5328
42.5793002127507	100.427099388894	17.2680213530457	42.5793	100.4271	14.8388
52.4980881484865	101.135588401873	19.6258882235917	53.9006	102.5381	21.0284
50.9440300111774	98.1235473141451	7.88059444845223	51.1106	98.2963	5.5983
48.9532999546589	92.9051212041486	7.37279987029442	48.9533	90.4759	7.3728
46.7869839487463	93.0077403769098	6.28763401712417	47.7789	92.5461	5.4276
43.7579674089357	93.1110088968523	5.32282624884014	43.1057	91.7939	5.1823
41.4077751398003	93.2163011167311	4.37571243336755	41.6896	94.8028	3.024
38.3235419258925	93.3157122768883	3.72629006349232	37.3296	94.7968	3.7833
36.3901964000169	93.4124192438766	3.0717783673041	37.0706	93.0168	1.0492
31.576230394978	93.5109024227697	2.66392063262238	30.8807	93.5109	0.3364
31.576229757403	100.188199341006	4.04119903239607	30.1816	102.1772	4.0412
32.4690425004061	99.1074554094198	4.40107656104645	33.0573	97.9271	5.3628
33.2898140957557	98.2320923568381	4.74171869514077	33.9629	96.8355	4.449
34.045800231013	97.5134340662474	5.08733808613367	34.0458	95.0903	5.2592
35.4268078646164	97.8723601036236	5.08734208256697	35.7481	97.1257	4.802
36.7472361644145	98.2415411677518	5.08734607906477	35.7859	98.3251	5.4495
38.2853316843762	98.6098003765792	5.08735007544392	40.065	98.6098	6.7408
38.2233820880818	99.9517255340449	4.62390329390137	39.7333	98.7582	4.2197
38.159821295082	102.276698676053	4.18460410285747	35.7306	102.2767	4.1846
40.5225997984446	102.800200045215	3.78412135115364	40.5226	102.8002	1.3549
41.6514825381564	103.726542320808	4.45051905257777	40.9527	105.6227	4.1926

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.1453167773815	104.323824775309	5.15743086821091	42.9285	106.2179	5.6354
44.7830916484387	104.781040041519	5.805750857672	45.465	105.2608	3.7217
45.7299562136207	105.179656198432	10.3388990321886	48.0764	105.8084	10.3389
38.6109485430501	105.179656973889	10.9215680212138	37.1983	106.347	12.5162
38.6109509115589	101.304299408897	10.461504108519	40.2693	101.3043	8.6864
35.8362787832676	101.224823083557	10.4615095975285	35.5571	102.295	9.2843
33.3968404981013	101.144293794542	10.4615150871797	31.6341	101.1443	12.133
34.1534042277138	98.0954938147648	10.3034019980365	35.0473	98.5367	9.9491
34.8660242830248	94.5416960100037	10.1463466891551	35.2297	94.8683	9.4168
35.5624789500276	90.5379011477063	9.99119679972896	37.9917	90.5379	9.9912
34.2684311983537	89.9389003639294	9.16206519559572	34.7819	91.1147	8.0437
32.8028830027586	89.2581650813871	8.45395643511891	33.2241	90.2072	6.3544
23.5476306593545	84.0628000154612	8.22125613843435	23.4089	84.0628	5.796
23.5476256426399	78.9218759793364	9.43045746419366	23.796	77.2181	9.3562
23.5476206257994	76.9047998927657	10.6601000390945	21.1184	76.9048	10.6601
23.9161472936217	72.6698030730862	11.882408696837	22.1344	71.2137	11.8857
24.8304263116493	72.0217154770133	13.1031983213887	24.5354	72.6275	12.2334
25.773700391066	71.3451205490822	14.486500212449	25.7737	68.9159	14.4865
27.270900631935	71.4963793618256	16.4296010964951	27.2709	73.9256	16.4296
29.0445031257748	71.4963765497685	19.4044653679742	31.4455	71.7336	19.6874
24.4451526514422	64.7806188682363	19.4044676732018	22.6268	64.3936	19.9605
22.9335247723746	60.6905190987843	19.4044699782213	23.9369	61.5866	18.0383
20.5747948083004	32.536000070694	19.4044722836376	18.7531	32.536	21.0115
21.1097877537872	27.2931452898595	13.6123283756823	19.8821	27.2321	11.7559
21.9490241882646	22.808442372841	12.7782091013061	20.5046	21.2685	13.3595
23.9083367686405	21.7481506285983	11.7028355042605	24.0847	21.2619	9.4135
25.2223993818767	21.1267993318185	11.4589199475021	25.2224	21.1268	9.0297
25.7564513369032	19.5596522351455	14.0302621764348	24.5729	19.8583	16.0395
31.9656000461407	14.6164003838755	14.3326800079906	31.9656	14.6164	16.7619
41.3103253814178	13.3134004120385	7.28294989774007	41.9974	13.5778	7.3366
Route: 3 Length: 693.231331715016 Demand Met: 9903					
46.4292431509382	17.2691115182951	0.606746507190254	46.503	16.5426	2.0548
45.7244493438798	30.6333819112099	1.14005023109547	44.1303	30.8739	2.5661
45.2504209957553	36.4304985749724	1.54460092875375	42.8212	36.4305	1.5446
45.2504215081835	36.826886452562	2.89666575539406	45.6407	35.658	2.8521
45.2504220205115	37.2460516825866	4.2576065179867	44.3651	39.5082	4.2576
45.2504226975591	37.2460562553909	8.75132520377113	45.4526	36.121	9.3446
45.2504233746171	37.2460608318473	12.139765084612	45.4903	38.3462	11.2293
45.2504240516803	37.2460654048382	17.9560964196059	43.7884	36.8808	19.8614
50.3351994841344	38.9772182365	17.9560966617335	50.3352	41.2014	16.9793
51.1955275729352	34.42148722675	19.374666114758	50.3723	32.2399	19.4829
58.6227998242184	34.0995213916839	20.5870001000739	58.6228	31.6703	20.587
61.4192635462866	35.0851816819433	22.5390826529885	61.1622	34.1592	24.5106
65.7353280843322	36.8839942744104	23.2160303025253	64.9829	35.6055	23.509
73.8756080808029	39.5802111850082	23.8744605843669	74.5598	39.2546	26.0148
75.4962294160949	47.0423151694833	24.2004118098284	75.5201	48.6107	22.753
77.093950139889	48.3643103348909	24.6003322804745	75.5587	49.1352	25.3998
80.7697997955549	49.4336033514701	24.972589450322	80.7698	50.729	27.0276
81.9756485008768	49.4336028245807	23.9501995876031	80.3964	49.7264	23.6683
83.7220544653421	49.4336022973828	22.9716772888162	83.5076	51.7826	22.7284
91.2527995137081	49.4336017562491	22.3271698914479	93.0102	50.1223	20.798
91.2527927199388	47.8830302052815	22.3271717783432	91.9756	47.4725	20.0446
90.5343942632112	47.8830179890274	23.2719093991594	89.3464	46.1786	22.3858
90.072670681897	47.8830058390143	25.5576023577973	87.8413	47.1867	25.6907
89.8829999255005	47.8829937251373	27.1564283621491	87.5129	47.9594	27.6836
93.9128998800439	46.0067738963553	27.15642981704	93.9129	43.6355	26.629
95.303370744418	48.3953604715909	27.3153261079976	95.0864	47.4256	26.3676
96.7561690150563	51.8671942448622	27.4773780166142	96.0562	52.3857	26.7058
98.4139796055517	54.7363640016768	27.6417926056995	98.7715	55.3698	27.9452
99.9753997552567	57.1606413997025	27.8052984439213	99.9754	58.6633	29.714
100.589699218285	57.1606398976683	20.2320365125312	102.8738	56.4102	20.1678
100.658649665239	57.1606384161382	18.1647462729693	102.1595	55.9791	16.6639
94.6877025413163	57.1734275072234	18.7011772405027	94.6877	57.1733	21.1304
94.0293591028459	60.895670760383	17.8003448048062	94.5987	62.0376	18.5629
93.336565197537	63.2030365926216	16.7963290141656	93.5538	62.1822	15.7085
92.6304181285335	66.7028306755191	15.929848532389	92.0851	66.8651	17.5763
91.9729398151545	69.8654233177741	14.7452112517503	93.0933	68.7697	14.1811
91.2228336737297	77.4956258887398	13.683989719022	91.1291	78.4897	13.7054
90.4802891915588	81.7175476978887	12.621668071934	88.6759	82.3658	11.13
91.1400012313955	81.7175482922111	12.6216701769918	91.14	83.5499	11.0268
92.6927867568616	81.7175480830475	16.7723579650013	92.288	83.6157	17.9977
96.2980434821665	81.7175478682767	17.5285027084624	98.2007	80.5294	17.4055
96.9541018369071	81.7175476561017	18.3090222622169	96.9541	82.6989	20.5312
97.0702687303004	81.4666991639625	17.3848159353795	97.8831	81.9659	16.6355
97.1851949772426	81.2123232844893	16.5302988377828	97.1852	78.7831	16.5303
97.5536042171021	81.2123271864962	13.8169406656099	97.3132	81.5365	12.7479
97.9261866666442	81.212331088497	11.7962524239946	96.8706	83.0827	11.4782
98.3775675067563	81.2123349901671	10.2307238292221	98.9119	80.0767	11.0692
98.8143647515646	81.2123388922351	8.274917224673	98.5933	78.8152	8.2256
101.774940802742	81.2123429128605	7.22359925750404	103.8313	82.5056	7.2236

Solution x	Solution y	Solution z	Original x	Original y	Original z
101.683584585427	81.2123418986266	4.81456734938844	103.6911	80.62	5.0557
101.585516746028	81.2123408869171	1.58122450729924	100.0565	80.1054	0.0522
106.679350549066	83.5809690821083	2.43260080913376	107.2392	85.9448	2.4326
106.679351885138	78.0002120122234	2.7610002220885	108.1531	76.0691	2.761
105.982840713531	80.4617428324055	11.9476901415888	107.981	80.0957	12.6444
104.304809783015	84.4874928874785	14.4481345754745	102.2936	85.0217	15.0829
103.655475203232	86.4898139871955	15.8877240100048	102.0461	86.7072	16.2393
103.104729616243	88.3560068790511	17.2144038093478	102.4507	89.6037	15.6617
102.61643235682	89.3762034224671	22.3440107422598	100.7126	88.5952	23.1233
102.285078765193	91.1158292038581	24.0033461325111	104.3693	90.8389	25.0156
100.287972933432	95.4226997903982	24.5497489225695	101.583	94.8217	23.7006
96.7080277994329	103.193159062458	25.1416956004052	95.6122	103.8055	23.229
95.8895343923579	104.716965172466	37.2177677773316	94.4828	106.1237	38.6118
97.8321489935481	99.4165001382148	37.2177155712571	98.8373	99.4165	35.0062
97.8321491993462	97.5346568019196	41.1437755034827	98.2349	98.4363	43.0129
97.8321494040829	92.2346094673172	42.1773999639583	96.8345	90.0197	42.1774
97.9214289629298	92.6219348606802	44.5611058379061	97.0347	92.0258	44.3343
98.0114989476313	93.0210003528937	47.1161527781188	96.5235	92.1962	47.4754
98.1038215117691	93.4466985324416	49.302119662916	98.9319	91.3958	49.6094
98.1911758220273	94.7646032745069	50.8194999934624	100.6204	94.7646	50.8195
97.8825067536468	94.8846385162896	53.056883403891	98.656	92.6213	53.0887
96.0151191755405	96.5837978146021	54.8635178942715	94.0924	96.5838	56.3482
102.650001429387	96.8183517065903	54.8635165173684	103.8628	98.4843	53.5771
102.650000374935	94.181699872069	55.3148441538611	103.2876	94.1817	57.6589
102.493893871679	88.8049451056769	55.0980546415821	104.5599	87.8351	55.8078
98.3727474889674	88.4743926826615	54.5868239680296	98.3726	88.4744	52.1576
98.3617238720963	86.7595994835633	55.1395002004907	95.9325	86.7596	55.1395
98.3617243607911	84.9430000276799	55.655198769586	96.9343	84.943	57.6208
98.8918181885264	83.0978530940511	55.6551987445021	101.0606	82.9382	56.7378
97.3985471553568	83.0978476092351	53.4521006349461	94.9909	83.4209	53.4521
97.3985473191737	81.678322273831	52.0292992313903	97.4314	81.946	52.8698
97.3985474831109	80.2016999935402	50.430752632649	98.567	80.2017	48.301
97.1876585086657	78.2825213122435	53.3761797103953	99.1261	78.6323	53.6332
96.9497621552794	75.933167579163	55.8743430969666	96.1169	76.0362	57.1147
96.7189720100073	73.5049878755804	57.5692907774295	96.2521	73.5638	59.9232
96.5602278912038	67.6404133427812	57.6677879336751	97.9014	66.9835	57.8832
96.3965171337368	63.8911002501935	57.7659764772649	94.6788	63.8911	59.4837
96.5846061355833	63.0805648099988	57.7162489108413	95.1558	61.2395	57.4763
96.9227090938242	62.8405278165478	57.6672773520594	96.4356	62.0951	55.4366
99.452894970944	62.7160058357802	57.6358440809932	99.4285	63.8276	59.6975
102.203703189626	62.5634930450362	57.6015416493493	102.6402	60.9181	59.3218
102.328363653723	62.5342373898997	52.1606238577067	100.6854	61.817	51.0639
102.462882216075	62.5051952763785	50.4601000546005	103.9916	60.6173	50.4601
102.462880450381	66.1067002759478	43.7540025727661	102.9023	68.4164	43.143
96.3283905352585	64.8999995547026	43.7540014156649	93.9444	64.9	44.2206
96.9418638791476	60.8494256280868	43.75399525809	99.3413	60.508	43.9191
96.923579157708	60.8494228408856	40.0614238588833	99.0429	61.6589	39.3422
96.9032378059929	60.8494200366895	39.6295746803404	95.4724	61.7777	41.2303
96.8835752723957	60.849417216887	35.6770451716289	95.479	61.1306	33.7151
96.8835765638049	58.0455985660832	35.6770907215721	94.4551	58.0456	35.6169
98.0430311674652	56.4279121370665	37.7776453977423	99.7259	57.0659	38.9488
98.6764613757526	53.55599955898	38.8448494794701	97.7455	51.8526	39.6885
99.492551206535	52.5486018124687	39.6417973601165	100.5945	52.9653	41.549
100.009609764541	51.1711909210765	40.0396341375289	98.1036	50.8139	41.2796
105.221927430851	50.2213768490575	40.3127460140835	106.6231	51.946	40.2003
106.226780734133	37.3636000827003	40.5897389817898	107.8221	37.3636	42.4217
106.226777863999	34.8418979891041	30.8419200557444	108.656	34.8419	30.8419
105.614898050627	29.5786001596516	30.3648227548405	105.6149	29.5786	27.9356
104.94227683013	23.9715228102746	30.706719781287	104.9423	23.521	33.0938
100.210695009642	23.9715206058598	26.6570002177917	98.3241	22.4412	26.657
101.074164694442	25.2212735414479	24.0033992631277	100.6297	27.3107	24.1251
102.096765420377	25.8381658377371	20.9455020844425	102.4997	24.4075	19.7902
103.037935700825	26.6071362217632	19.2333923159486	102.9016	24.8202	19.8795
104.009011460437	27.7384597423979	16.9263105285767	105.0575	26.2706	17.0665
104.810669736875	29.4497782645015	14.4546004177168	106.8535	30.7643	14.4546
102.921099349792	29.4497776582602	13.8488998658286	102.9211	31.879	13.8489
99.3047915929904	29.3956195773468	12.79729632298	99.272	31.5703	11.7517
97.4172014982938	28.9936185638469	12.6816245154091	96.0238	29.4057	14.5945
97.2644805848703	27.4663990953106	10.4912231368532	97.9141	29.0493	9.3885
97.1070973762722	21.2844222221001	9.23019961101071	97.1071	18.8552	9.2302
92.9864932763053	26.4648999689912	3.25273829584412	90.6179	26.4649	2.7134
93.5754094071451	30.6748103018941	3.25273691399408	93.4265	31.4744	1.0443
94.2454060304517	31.350917696359	3.2527355556018	96.3928	32.1668	2.4627
87.5726008327359	31.3509182034802	3.25273601877721	87.5726	32.8781	1.3636
86.0983068072346	31.3509173562265	3.46224263112384	85.1876	33.113	2.1197
85.8259357371351	31.3509164911341	6.61147176573725	86.512	33.4131	7.017
85.5249988277894	31.3509156231647	8.51022637723783	85.525	32.0217	10.845
79.7168972090413	31.3508464246287	7.15469434756645	79.7169	32.9378	5.3155
73.7988999054349	31.0527410948339	7.15463425316505	73.7989	28.6287	7.3132
68.3701006706798	31.0527373872481	7.08587280681317	68.3701	31.308	4.6701

Solution x	Solution y	Solution z	Original x	Original y	Original z
66.6010216895184	30.5910190587207	7.4192823136768	67.6588	29.7348	5.9837
63.0191961656213	30.1757778079852	7.80589170995866	63.2951	31.2899	8.2512
58.9701466689721	29.7365468799159	8.18482341793424	57.9508	29.6187	7.6435
56.2154039178546	29.3001640333139	8.57295274264888	54.8257	29.6059	7.5612
54.5895000375452	28.8531790212232	8.99103782635083	54.5895	27.7676	11.1642
52.9682459273896	28.853178995857	7.17197249733739	53.915	28.4629	8.3577
50.8591999670113	28.8531789706563	4.46539998674588	50.8592	31.2824	4.4654
48.6070154993833	26.4002906409828	1.90866999750526	47.5893	27.8934	1.3329
Route: 4 Length: 504.703334841343 Demand Met: 8380					
47.1286982490479	8.70716692298167	4.13674595739345	46.5714	10.174	4.4604
47.1286965927404	-4.26358484987149	7.56388564935462	46.0937	-5.8176	9.1179
52.4153192730198	1.33071298287995	6.65743883111612	54.5841	1.3	6.274
52.4153192730198	1.33071298287995	6.65743883111612	51.545	-0.7619	6.4521
52.4153192730198	1.33071298287995	6.65743883111612	52.3291	3.6705	6.1162
57.6380593192497	1.43435516091272	6.42312250999399	58.2741	0.1622	8.0145
57.6380593192497	1.43435516091272	6.42312250999399	58.2864	0.0731	4.559
57.9566740987102	1.70412403821098	6.3352225392576	58.6741	1.1796	4.0744
57.9566740987102	1.70412403821098	6.3352225392576	58.5415	3.6684	5.0311
57.9566778622645	3.92839920327641	6.33522407328884	56.6752	3.9284	4.2715
58.4196124783898	5.93620649561561	8.88927079689076	58.0725	5.2013	11.1785
58.4196124783898	5.93620649561561	8.88927079689076	58.8992	5.3006	6.9433
58.4196124783898	5.93620649561561	8.88927079689076	59.4358	8.0877	8.3998
63.2463755338166	6.33377609519163	4.9430764716999	64.6914	7.7788	3.6297
62.7533201124805	0.556576515631987	4.94308667849359	62.4332	-0.684	2.8792
62.7532525771195	0.5565589320355	11.330795003936	61.9524	-0.333	11.9086
62.7531851010976	0.556541364441344	15.6613911848322	63.0749	1.8033	17.7213
58.3954996093895	0.0245144805104136	15.6614020997577	58.3955	-2.2935	14.9348
54.0487368033904	0.024512048486006	19.5924001465134	56.047	-0.6998	19.4659
54.0487368033904	0.024512048486006	19.5924001465134	51.7765	0.7553	20.0441
54.0487457585229	-2.67592409650742	19.5924050574166	53.8048	-5.0553	19.1679
56.8184260228061	-2.3223854819139	24.1646507741828	57.7878	-4.3732	24.6962
57.4628278344079	1.47174531812067	25.3018769127176	57.7618	2.6586	23.6599
58.0726012475486	3.05029913132977	28.1251723715765	58.0726	3.0503	30.5544
60.2773079602575	4.40232100672186	27.9802421095686	60.5785	6.8128	27.9807
60.2774187721849	4.40233461424708	27.7158243350343	60.2628	6.0605	25.9406
60.3528722947214	-0.083798645146171	27.7653278002901	62.7821	-0.0838	27.7653
59.2141804999348	-1.34025705972	30.853265659282	59.6709	-1.5476	33.1451
53.9680231727563	-2.24948209244273	31.1301820482317	53.5826	-3.7128	29.3577
52.4483271794959	-2.60330475496899	31.7826024936422	50.0191	-2.6033	31.7826
53.2889990862849	-7.23527264075035	34.2743001608556	53.289	-9.6645	34.2743
53.8483324107235	-3.69923129408357	37.4904820520721	53.412	-4.2453	38.3008
54.4236409357092	0.811938720048561	39.9846844716156	55.5686	2.3786	41.1094
54.4236409357092	0.811938720048561	39.9846844716156	52.8937	1.339	38.4463
55.0468484744557	1.45499502868145	44.7704096137588	54.6465	1.327	47.163
55.0468484744557	1.45499502868145	44.7704096137588	55.7669	1.6852	42.4618
58.3534250437271	1.88249904609948	44.2057987674969	60.4167	1.4088	44.4464
58.3534250437271	1.88249904609948	44.2057987674969	57.3839	0.9502	46.0215
60.6124650367761	2.56919863806069	40.4132876381636	62.5325	1.766	39.3982
60.9950717365291	4.34289934474313	39.6924992422768	63.4243	4.3429	39.6925
59.8078699595171	5.29910279098284	37.7765199319505	61.565	4.5717	36.954
54.310806677393	6.58029757677194	36.601727585479	54.3108	6.5803	34.1725
54.0413379817865	7.10446517919949	38.9417972597397	55.5508	6.709	40.6861
54.0413379817865	7.10446517919949	38.9417972597397	53.4617	5.8056	38.0578
54.0413379817865	7.10446517919949	38.9417972597397	55.3647	9.0137	38.8085
50.9598337550767	7.40364898542332	39.3491900431051	50.2911	5.2466	39.9878
50.1782762037161	10.5909193807335	39.6477234263828	48.2378	10.888	40.0435
49.630050685737	13.1085105389217	39.9368438359842	51.9742	12.9315	39.5168
49.630050685737	13.1085105389217	39.9368438359842	51.32	11.9016	40.4537
49.630050685737	13.1085105389217	39.9368438359842	48.9393	11.7496	40.9103
49.630050685737	13.1085105389217	39.9368438359842	47.5448	13.9665	39.1563
46.0713021495613	13.7574396400679	42.2985481204059	46.213	15.3079	43.6977
41.7176341025017	14.2343380382907	43.3733036872842	40.2323	12.6508	42.5989
41.1291172951454	15.9951828264476	49.1426888654989	39.7266	17.3977	50.5452
46.0637597540966	14.8323913950241	49.0869180570407	47.2642	16.1804	48.1934
47.844946938849	12.5580918578502	49.0319393020856	47.6091	10.2274	48.878
52.9361219800568	12.2987928972912	48.9776806381313	53.965	12.2967	46.7771
52.9361224759277	12.2979236819673	52.6772334360766	50.5069	12.3029	52.6774
52.9372608424132	9.43235899686236	52.7011809362929	51.2901	7.6487	52.6277
56.2033436461095	9.43128535036995	53.4089572334506	58.6318	9.4344	53.4701
56.2033427043744	2.66520348044568	53.4090173438163	56.514	2.6652	55.8183
56.2033400823489	1.19018354914475	52.9181279767374	56.6229	3.2945	52.4352
56.2033400823489	1.19018354914475	52.9181279767374	54.7597	1.1902	50.9644
57.1994619175197	1.12865129080827	53.9320112612066	58.2987	1.8222	52.9601
58.0426713579048	1.06668323536619	55.1538986397311	60.4719	1.0667	55.1539
54.4330997143281	-4.53737663302606	55.6586755452718	54.4331	-6.2551	57.3764
43.0368275305622	-4.45543027965711	55.5335639419384	43.0131	-4.6452	57.9101
36.4278998597599	-4.36987711436103	54.861226998947	36.4279	-4.3699	52.432
25.8989032685126	-1.25050612875569	54.861229417756	25.8989	0.7413	53.4706
24.6737860148924	-1.25050518944594	56.3910995419254	22.4229	-2.1641	56.3911
29.5711655309323	-1.08206081849632	57.2252933335217	27.3755	-1.0984	56.1861

Solution x	Solution y	Solution z	Original x	Original y	Original z
29.5711655309323	-1.08206081849632	57.2252933335217	31.0065	-1.0714	59.1851
29.5711655309323	-1.08206081849632	57.2252933335217	31.1391	0.2266	57.7289
29.8576441001288	5.22450144648782	57.225299517965	27.6562	5.4902	56.4427
29.8576441001288	5.22450144648782	57.225299517965	30.7839	5.7178	56.2846
33.5769973055302	6.81337072905392	57.2253057286175	33.7832	8.5886	57.2507
36.7927995386893	7.81373656517338	57.2253119372143	36.7928	9.6586	58.8057
38.068601526153	7.34429711666542	54.2090273812032	38.0686	7.3443	51.7798
44.5542824226225	5.6104993579347	54.2090345803268	44.2937	4.7268	51.9613
44.5542824226225	5.6104993579347	54.2090345803268	46.8369	6.4403	54.1626
45.0298419279611	5.61047665087279	57.171386490979	44.3097	5.4051	59.4302
45.0298419279611	5.61047665087279	57.171386490979	45.5397	7.2979	57.1732
47.7277991307345	5.61045391132096	57.3321701341946	47.7278	5.7114	59.7593
49.310303310719	3.72420155041743	57.3065213541148	49.309	3.6922	59.7251
51.0876746479484	2.8117375901924	51.7873119329918	51.8363	2.0767	53.9783
51.0876746479484	2.8117375901924	51.7873119329918	52.2056	3.4977	49.7426
50.9981838101453	2.74700770593392	46.58499974019	52.0607	4.6851	47.5572
50.9981838101453	2.74700770593392	46.58499974019	50.9668	1.717	44.4164
49.0737982946634	1.58694291494471	43.6930045266024	49.2438	-0.5725	42.7886
49.0737982946634	1.58694291494471	43.6930045266024	49.5265	1.5006	43.2383
44.0450651909499	1.34183270195855	43.1145549830203	43.4311	0.4843	45.1031
42.4154990023245	1.12649279155116	40.7534083164485	42.4155	0.0668	38.5675
33.4349004650635	1.12649268371133	43.1033369970398	33.4349	0.0139	45.2628
28.2165509573024	4.87241334453083	42.8611214140241	27.9452	7.0873	43.7392
27.4302654759351	4.98314817127928	41.0445886177113	29.2732	5.6917	40.0529
23.9417086808408	5.08949862137853	40.1202990255502	22.0744	6.6433	40.1203
28.3301927527547	5.08949344230529	36.5969603088427	29.6205	6.6839	35.8272
29.4040025022146	5.08948823526825	35.1341263266389	31.7997	5.4917	35.1341
28.5571456129112	1.73676246464635	35.0517138537854	28.6989	1.5656	37.4478
26.2246136624285	0.892006837483549	30.9364195207564	24.5208	1.7631	30.0851
25.2479289129284	-0.246272028607562	29.1116968207025	24.8641	0.1355	28.7608
24.3066295414382	-1.43354888250412	27.3956284256491	22.6294	-1.9579	25.7184
31.1127996842286	-1.43355086678983	28.564793701761	31.1128	-2.8096	30.5667
33.6270710306105	-0.856833470702412	21.5566633962918	32.3564	-1.4633	20.5286
39.7894880261634	-0.240505528989065	18.5614176279929	39.9467	-2.3317	18.5214
44.3761003878856	0.905915643628287	15.6960403644701	44.8479	-0.9391	15.0769
47.2065704782568	3.81533244186602	13.7997814421193	48.7027	4.8736	15.3944
47.2065704782568	3.81533244186602	13.7997814421193	48.302	2.6164	11.9932
47.1686335440759	4.30722366738183	10.8498037724391	48.4975	2.4432	11.2037
47.1686335440759	4.30722366738183	10.8498037724391	47.0712	4.3382	9.7807
Route: 5 Length: 549.15645417353 Demand Met: 9129					
43.5463690519089	9.17868777642813	1.06768656923885	42.7704	10.2739	1.2183
40.9482090684576	4.43767645439348	2.11274873667744	42.4139	3.5597	1.814
31.2892982076443	1.79594171682168	3.22487712981662	31.0707	1.7474	5.3999
26.7943001395357	-0.704462456163865	3.70019895912454	26.7943	-2.6353	5.1743
21.392748244519	-0.70446015931438	3.70019858637928	19.4163	-0.8394	2.2943
21.5743213393589	5.00256271271276	8.37537860189954	23.9142	5.5856	8.3806
21.618316325381	5.22190329452577	12.2187281651346	22.4003	2.9895	12.1851
21.6596077666119	8.78378045950165	17.5629999785389	21.6596	11.213	17.563
24.982522864353	8.08458897648323	18.2435589631918	26.246	7.8923	16.6585
26.3450335155348	7.41383016999115	19.317405872649	26.4488	5.1021	19.0029
27.4193933047624	7.22741552857481	22.0265174934051	28.1449	5.3771	22.529
28.2554182720363	7.06257597689636	23.8429504656232	29.2451	9.0499	23.6495
28.8108241484343	6.85708494974117	26.1973459647147	29.9497	8.0977	27.1858
29.2869820378392	6.63660115075872	27.6461579457317	27.2842	5.8331	28.3822
34.3758868803553	6.44863224657985	28.3686539185775	36.2059	6.8965	29.7476
34.7057830305095	6.2336184770639	28.6581967722494	36.4235	4.5159	28.6582
33.1310105920943	6.83914939679198	30.2616507007304	33.6792	4.7017	30.2163
29.3931907381167	10.6834495513877	31.9808897445297	29.4417	11.4808	30.7206
25.6118966823721	13.3017352477496	34.5799621310661	25.9081	14.4892	36.1934
19.6467953902407	14.5774996695967	35.6407803529988	19.6468	14.5775	38.07
19.5872221496389	16.4406724608696	34.84719133081	18.1963	16.0602	36.4885
19.5302864443688	19.8350404160505	28.1174018997519	18.4916	22.031	28.1174
19.53028640574	19.1411696707905	26.9679084462515	19.0397	19.3917	26.8913
19.5302863671781	18.4397060550897	25.8260374816532	17.2669	18.1061	25.0094
22.1958901872872	18.4397040653047	25.8260367652665	23.1228	16.7524	24.3445
22.1958901801255	20.533701282415	26.4429406036234	23.1615	20.5337	28.672
22.1958875569295	21.5890994726127	22.4295993350696	20.5322	21.5891	20.6595
22.7348479709457	25.5239364329789	23.0539101827714	20.8129	26.0745	22.3222
23.7562244254863	27.481671588872	23.852744276783	22.8581	29.0039	22.5241
26.3812826549331	28.1170818383252	27.063300930479	28.099	29.8348	27.0633
20.0697542910632	26.8217888473062	35.4744361047417	17.7323	26.9057	35.8248
19.9092186846351	24.7654000627716	36.4744576123235	19.5225	24.6717	34.6116
19.7507196961895	22.8150018020689	38.4524009814308	17.3215	22.815	38.4524
19.8582907115448	22.0501383677628	38.8569946740591	21.1889	21.267	39.0474
19.9634444602297	21.3559371459812	39.2564996662603	20.7311	19.0512	39.2565
19.9634447364631	21.6814932585969	44.6682864068212	19.4151	20.4264	46.5071
19.9634450131969	22.3093699339397	45.1395691794439	19.3676	20.9011	45.1036
19.9634452900482	23.1471623363948	45.6129081942272	21.7951	21.835	45.5134
19.9634455664966	29.7588107873359	46.1077995704465	21.3113	31.7798	46.1078
19.3518016286613	26.2993994182084	49.9109903508066	16.9754	26.2994	50.4148

Solution x	Solution y	Solution z	Original x	Original y	Original z
20.9727059677662	25.5900030257356	49.9109909834116	23.1689	25.59	48.8728
20.9727060591144	24.0061151795105	50.2191530886313	21.4132	25.3225	51.4824
20.9727061503849	20.9052780380029	50.5022545299455	22.5923	19.795	49.1879
20.9727062396786	20.6020026953941	58.3573566432948	22.0389	18.6688	59.3708
20.943954176343	22.0911851543614	58.3573566043771	19.4476	21.0876	59.2618
20.9154083809025	26.0511000430534	58.357356564797	18.7218	26.0511	59.401
35.4443494999817	30.3269712337788	57.2520401282472	35.5392	31.6783	58.7469
45.5458601885052	31.7577873805343	54.5513981330768	47.4903	33.2139	54.5514
45.5458605261799	31.7577879335125	50.2183757907439	47.3356	31.1656	48.6863
44.3025661151105	32.1687608603073	50.2183759331312	44.6028	29.9319	49.9927
42.5797068424646	36.3570890614153	50.2183760755722	40.9959	37.9409	51.1587
44.3577546164555	36.0648778192232	46.7596580106506	46.003	37.4534	46.4333
45.0394002563777	35.6884457953361	44.656150298949	44.7872	36.1398	42.3342
46.5826925002642	34.9805675490235	44.520773073737	45.9581	33.5048	45.1742
48.6325903736245	34.4139846257705	44.3830705201583	48.6326	32.1618	43.4727
51.4729821740179	34.4139860161228	44.3830702866336	51.473	33.7115	46.7085
51.5755991239743	34.799108767679	42.8701956683601	51.7623	34.8081	42.2217
51.6776938324907	35.1840329554565	41.5065812906288	50.1654	34.298	41.7388
51.7829820884609	35.6042204016227	40.0405323392675	51.6292	37.4529	39.3047
51.8884599898984	35.9338674595524	38.9611859527351	53.589	37.6567	38.7584
51.8884465421632	33.4794118942912	38.9611846766957	54.3132	33.4794	38.814
49.1785467322279	32.3295546750245	38.9611834112569	47.9812	30.2306	39.2099
49.178546842997	32.3748968933844	36.777334678659	51.0819	30.8837	36.7669
49.1785469523279	32.8173576297709	35.5002330666138	47.9603	31.0225	36.0363
49.1785470618878	34.1140557817026	32.4009254696176	48.325	36.101	31.2943
55.4351341041807	33.3641012527832	32.4009255552618	55.9275	34.3566	30.6301
58.1956482421804	32.247236070148	32.4009256412126	58.4334	33.3219	33.0094
60.7516761329377	30.9061176203159	32.4009257271792	60.463	30.4795	30.5011
64.101558380212	29.7893564736963	32.4009258133623	64.1748	30.2745	31.4674
67.3676083647102	28.6001919978805	32.4009258996257	69.5886	28.6002	31.4169
66.4312526655837	28.4620190206088	32.8794753441008	67.5765	27.7962	32.158
65.2503770348547	28.3263622060394	33.3923999089281	63.132	27.7543	33.1939
64.8810256298459	28.1997973083146	33.9476967408069	63.8119	26.0212	34.0563
64.8810256157945	33.4003034976202	33.9476999919431	62.464	33.4003	33.7046
64.8810369586729	33.7632375107313	34.9550197304672	65.4552	32.6167	36.7679
64.8810369586729	33.7632375107313	34.9550197304672	63.5739	32.9982	33.2424
64.8810482937763	34.6453056958949	37.3004665286335	63.8645	34.3723	36.4179
64.8810596273673	35.5628522760997	40.7354569337531	63.453	34.6286	41.047
64.8810709582546	36.7329106075109	43.4307643069188	65.211	38.9167	43.4098
64.8810822894338	37.1310289487175	46.2434349911319	64.2784	38.8059	47.0778
64.8810936175657	37.4418122627822	47.7083295642715	64.8516	39.5774	48.8657
66.6110808522208	36.6446913258315	47.7083295053135	66.7168	38.698	48.2341
68.1176739713754	27.3310008444683	47.7083294463901	68.3676	27.331	45.292
68.1176768012421	26.8933720600137	52.9514883900936	67.8857	28.9512	53.8343
68.1176796313337	25.0661001473299	53.99589949799	70.5469	25.0661	53.9959
62.9051602450656	20.9745011071438	54.6863466852574	63.3795	20.1125	53.5518
54.186932414689	18.4250509233127	55.4832782418204	53.7123	16.59	54.3027
52.082700069756	17.8702918798294	58.3984406558031	52.0827	15.9727	59.9151
48.3264235424023	18.6439053382751	58.398439972872	45.9074	18.6439	58.1761
48.3264236292141	26.3147352658632	58.3984394703711	47.4152	28.2569	57.2588
50.2463383604221	26.3030028436926	58.398440231859	50.1386	26.6573	56.0437
54.2786028636014	26.2911152321791	58.3984409920803	54.2786	24.4277	59.9569
54.4485797732675	27.617996632545	56.4107977648513	56.8778	27.618	56.4108
54.4485797732675	27.617996632545	56.4107977648513	55.089	27.0379	56.5554
54.3066471579276	28.1028640852497	55.3133075831364	54.7376	29.7596	56.3053
54.1614313981123	28.4779910939919	53.5303259074142	52.7074	28.2489	52.4902
54.0227781878197	28.8611713796915	52.3030066552876	55.1607	27.7715	51.8295
53.879605892693	29.280079833391	51.224896113601	53.8796	31.7093	51.2249
51.2910540183401	25.362496301761	51.1296576547731	50.8742	24.2729	53.2264
50.9222199037589	25.1860210075315	47.2333998702425	48.493	25.186	47.2334
50.9222194395199	22.5643088132924	43.5997315237335	49.1449	22.3659	43.2644
50.9222189759244	20.2169423903935	40.775182337528	52.1655	19.1446	41.5432
50.9222185118624	18.7115999852123	35.3790148812482	51.539	18.7116	33.0294
50.774158155653	17.358141713702	35.4112125872979	52.4859	17.4578	33.7507
46.1054410893996	14.2596902115357	35.4524541382125	44.7075	13.3055	33.9605
45.4119086299032	13.3611867695804	35.4953850918982	43.7175	13.3612	37.2361
45.4119086243959	8.81900078519009	35.4953850242498	46.3909	8.819	37.7186
45.4119082472703	8.42952906351959	34.2520386679991	43.7681	7.8375	35.3656
45.4119078709229	8.07758186229552	31.1209009402852	44.0031	6.0986	31.1209
46.206154311032	8.34553200096802	29.1625032794171	46.0043	6.8606	27.4465
47.1620635428745	8.75752990134638	28.6802938412907	49.0558	10.279	28.6803
44.6611382420232	8.75752921318482	24.7623755864225	43.7231	10.6871	23.6231
44.6611366245559	6.22004272729034	24.7623742743435	45.0418	3.8658	25.2247
43.4153139647746	6.22004286736328	18.6446999773388	41.1669	5.3004	18.6447
44.1796103401902	8.08147365981331	15.9595342539538	43.984	9.2005	15.6271
44.9594288706012	9.56772552816645	13.5508560059847	44.5689	9.75	12.1988
45.7759362648839	10.9965575828652	11.9137459484377	44.5228	11.8645	13.3212
Route: 6 Length: 570.176949211251 Demand Met: 9840					
53.4662462763941	23.738025868261	1.4238452421052	54.0368	23.8586	2.2143
58.1005228765412	34.1214418368323	2.69841870611623	58.126	35.24	1.1949

Solution x	Solution y	Solution z	Original x	Original y	Original z
62.6507915178821	37.0757271518936	4.89839897754406	62.6603	37.129	7.3175
65.7316698420282	38.0874704966172	4.93341645673224	66.9624	36.7077	4.2616
67.2925362206583	39.6628804657086	4.96863787975722	68.0366	38.8903	2.9918
68.1922271971945	46.6279136932554	5.00546954273525	68.7356	47.889	4.3235
69.0315903804416	49.6764150008681	5.04243927765273	70.6462	49.6735	6.8503
69.0597163357519	53.6123149388788	5.05770306402761	67.8488	53.6384	2.957
69.8511687763935	54.5668758644735	5.25641710136495	70.916	53.3608	4.8842
70.5434647760723	55.7494494147866	5.4576036306139	72.7757	56.7077	5.4576
70.1788722260567	55.7494496490727	8.73290285783494	70.5527	57.3223	8.5137
69.8049934229236	55.7494498826272	12.4415976715986	69.9782	57.1009	12.9468
69.4270551332467	55.7494501156566	15.393500863124	68.022	53.7678	15.3935
69.4270543946211	56.243142021809	20.706999549613	70.1344	58.5671	20.707
66.2309630474602	55.8793072956014	21.8063388471529	66.0257	55.1875	22.0287
63.2370822703666	55.5238287575358	22.8813280068891	61.2083	54.3519	23.523
69.4840685220316	55.523829023542	22.8813286793385	70.694	53.8562	23.1583
71.261900025215	55.523829291574	22.8813293518349	71.2619	53.5794	21.4252
73.3314238770096	56.1581418340077	27.1555033333658	73.8072	55.2741	29.1095
74.7266743394421	57.037285017402	27.984545734309	73.2116	57.797	29.252
81.1685999484734	57.7423008589402	28.5808778693274	81.1686	57.7423	31.0101
86.2725981825781	58.9131277371937	26.8831832334933	87.1149	58.1702	24.9275
87.572598969987	61.800919473307	26.3311197791659	88.0225	60.7529	26.1198
88.7937004690089	66.2348002282446	25.7908587987499	88.7937	67.447	23.6857
93.0234312545546	66.2348000057752	27.9086720438955	92.749	64.7326	27.0986
98.4227993372295	66.2347997839156	30.989340853267	98.4228	65.0226	33.0945
100.060279247337	67.16860031005	29.4525191961292	101.778	67.1686	27.7348
99.5562114625583	77.8715404270983	29.5293487843565	101.2985	78.2917	28.1682
98.1247484004572	80.3739938154794	29.6125573374291	98.2345	80.86	27.262
91.8221308100466	80.724086475585	31.2189525326817	89.95	80.2132	31.6802
90.3913004673309	81.0915170285113	32.5568002839927	89.5631	83.3752	32.5568
90.3912998549573	81.0915143151708	35.5579751718788	88.0687	81.4777	36.1559
91.9099645996399	78.3452954987655	35.5579768856882	93.1133	78.1389	33.5399
92.2535415853626	76.9857004297697	35.5579786688667	94.4072	76.9857	34.4342
92.2535422391453	75.8870013149797	38.2247493051922	91.0116	75.887	40.3125
94.5489998441362	75.2687043505736	38.2247491793314	94.549	73.3405	36.7472
95.1349455849369	75.268705187336	40.057358551275	95.9481	74.251	38.8025
95.6673925903389	75.2687060251592	43.5603042070038	97.5653	74.5618	43.9951
96.0591284349492	75.2687068644007	45.8369133043032	97.816	74.8015	47.4482
94.4930319525022	78.7107744314251	45.8369095952142	94.6945	78.572	44.5388
92.8824798783898	82.406321797382	45.8369058886137	91.1677	84.1211	45.979
93.3703427158436	82.3083245841023	44.2285373554138	92.1151	81.2598	42.8198
94.0582151334395	82.2144715030486	43.4486009368163	92.6699	80.64	42.9825
95.3048939904147	82.1259445566015	42.780264330681	94.0795	80.8773	41.7611
97.7623998352975	82.0399699302571	42.228851495972	97.7624	79.6432	41.8331
98.8850145395303	83.4871204179049	42.2288497156944	97.0865	83.6094	41.2641
101.964929862929	84.8663992615083	42.2288479382459	104.3617	84.8664	42.6246
101.821784158678	85.1374163748559	36.2051449174179	103.1106	83.2736	35.5168
101.601997051582	89.888276591754	35.5213996115905	101.602	92.3175	35.5214
100.485874098614	89.8882766596562	34.2162153372229	100.5649	91.4192	35.2273
99.3433999429188	89.888276726378	32.3902864633676	99.3434	90.9979	30.2293
98.6833209756819	89.7070751576881	32.6421655387157	98.853	91.6792	31.3431
97.7942995647095	88.2481257966793	33.8399630261887	97.7943	87.7833	36.2243
95.8211751412051	88.2481244279653	31.6465123854821	96.2545	87.1498	32.8659
93.494100607979	88.2481230604139	27.3685003203273	93.4941	85.8189	27.3685
92.1121524619193	89.7876626101668	25.1361246713905	92.5654	91.5305	24.0262
90.3239202823179	90.5503800732261	23.9863001062398	88.6062	92.2681	23.9863
92.4528522106185	90.3881843754705	21.2564596143855	93.1284	88.6615	20.1351
93.7446693641182	90.2440323364319	20.1102719362493	92.7178	89.1801	18.823
95.7390045906426	90.105343567357	19.2780986555146	98.1138	89.594	19.2781
94.8386587413432	90.1053423838844	14.1962695714062	93.9684	87.8762	13.7783
94.838658058558	91.4573753218464	14.196267510504	95.2026	90.5293	12.2607
94.8386573751216	94.7339975588835	14.1962654607037	92.4623	94.734	14.7003
95.0373021098476	96.0954766585276	13.5607992649339	95.0373	98.5247	13.5608
96.0006395102241	95.7627085231319	12.4891571197101	95.7576	96.9635	11.4638
97.0062895734455	95.4070126727781	11.5778288406919	95.504	96.351	10.2996
100.795213353465	94.9840022916287	10.9934758470184	101.8123	94.891	12.8509
102.324434523622	94.5671457986056	9.99286887699223	102.0076	93.075	9.5996
103.979988324783	94.1900271551907	9.05411998669891	105.6506	92.4297	8.9472
103.979982228458	95.9100763385678	9.05411467880377	104.1034	98.3317	9.2012
103.538608186826	95.6645977909942	4.64773971396057	104.1728	96.9352	2.733
101.148971444032	93.1371690928949	4.47272460963046	99.3782	93.0601	2.9898
100.691451534429	91.0290898533134	4.33309634141623	100.8882	91.1406	6.6906
100.133904700332	86.96652098466	3.90345226520325	101.1477	85.2681	2.6541
98.2125447223075	86.5471590134587	3.64697218228407	99.0152	86.155	1.7016
93.0942401035045	86.1542790582514	3.43374881300802	93.0994	86.3608	2.8092
88.055121375463	85.7585999495114	3.22321839302401	86.3374	85.7586	1.5055
88.9157404650122	85.3726549129434	3.29177237912324	88.3633	87.3681	2.2205
90.9170222625911	81.9350815700319	3.36665539598362	93.2494	81.8793	2.8544
91.0513870172438	79.789218262548	3.45118330259419	91.86	79.7087	2.2114
91.1837687531801	77.7014947290777	3.53698974913182	89.835	77.746	1.5427
93.6515533358664	73.509366212961	4.48748315215002	93.9524	73.145	3.1932

Solution x	Solution y	Solution z	Original x	Original y	Original z
95.9242066243185	70.0304853035605	5.62696872889994	94.6798	69.1984	4.5089
101.811379885617	67.9060000135119	7.21578023106524	103.5291	67.906	8.9335
99.8692070116463	64.9489033084501	7.03690972594681	98.4258	65.8894	6.8362
98.594180269769	58.9345213959311	6.85915713866925	98.8606	57.9963	4.7298
96.3133273727181	58.2090477191501	6.73886465528735	95.9041	59.3009	4.8034
94.950909166495	56.6315015061736	6.63490676337582	93.2379	56.4517	4.9219
96.5231487411778	56.6314985645901	10.5959986109555	98.9521	56.5952	10.596
95.6526198890272	56.6314960336554	11.5417385695374	97.3108	57.82	10.7791
92.8209001124046	56.6314934950156	12.9907545850834	92.8209	56.9207	15.4027
91.4833225711443	52.7529891082406	12.3677808088878	92.412	50.9961	13.3675
87.0732923934926	51.95100946557	11.3964963374663	84.6532	51.7406	11.3965
87.241015100336	51.9510053446231	6.66729732404894	89.6611	52.1615	6.6683
82.4317970901989	51.0539022747559	5.57979420887285	82.0477	53.0979	5.7932
79.503703931993	48.6007616696538	4.40000837321138	77.6289	48.4559	5.3003
78.468880171215	46.4111651554698	2.57169332414058	79.9479	46.2913	1.0177
75.7300012092959	44.4406195368682	1.72431863711456	75.73	42.7229	0.0066
75.5051363203341	46.639316615191	2.11764503236076	73.6395	46.5004	2.2066
75.2987725382945	48.9971584499499	2.50782931061536	75.2757	50.6388	0.889
75.0934403102402	49.5164030771492	3.42419623260431	73.5268	49.2611	4.4383
74.9020027710106	50.0530114221361	4.17917498671067	73.911	51.0144	2.5794
74.723097339475	50.5018339379107	5.55029815235219	73.6611	50.4924	3.9757
74.551621689434	50.9510073896419	8.26890108263273	72.1444	51.2772	8.2689
74.9289539717858	50.9510095944394	8.44599561084905	76.2244	51.9684	6.7104
75.0842181682559	50.9510117757487	11.5222184235657	76.5498	52.218	12.9878
72.3561649226783	50.7679997218666	10.9057011373791	71.0505	50.768	8.8572
72.3561653616147	49.8744505328122	12.167826813703	70.7664	48.6137	12.8047
72.3561658022781	49.2573158021449	13.1332404745486	72.0723	49.2863	13.9841
72.3561662431517	48.6395302942785	14.0219012493872	71.8965	50.0142	14.8598
72.3561666844742	47.9131997751797	14.8041228413377	73.2561	47.9132	17.0605
72.3561656191814	46.8635462325074	13.9980384439838	71.8327	48.0379	13.6369
72.3561645543616	45.6176749666005	13.2203128941047	73.2283	44.0709	14.6285
72.3561634865543	45.0926602385141	9.51274715643904	73.6428	45.1426	7.6389
72.3561624134699	44.5580982794983	8.92942829428418	72.9198	44.5581	6.5665
71.650038635025	35.436018150458	9.18309282716354	72.2401	34.2889	7.5435
70.8256044350603	33.462280665881	9.48177164884931	71.5231	31.8286	8.0149
69.1101207057468	32.9542886347939	9.98198572582139	67.4673	33.2544	9.192
68.0393469993966	32.4299291519855	10.5296318361154	66.5887	34.1226	10.8677
67.5090356845512	31.1816930571403	11.0182917656517	69.1853	30.9522	12.1629
66.7818009396863	30.0368998787999	11.4325787314368	66.7818	30.0369	13.8618
66.4043574340456	28.7734774064292	10.8805793317381	66.7482	27.6121	12.1372
66.0179572649994	27.7790166618228	10.2474941094579	68.2062	28.5319	10.0866
63.116645698778	23.4217960962398	9.67333254679241	63.3607	23.5913	11.9128
57.6614722949105	14.8514223628565	5.60073162942786	57.2331	12.7874	5.1838
54.8670791083401	13.7954955545936	3.1941251397621	55.8132	15.4408	3.6174
Route: 7 Length: 531.535973645146 Demand Met: 9631					
50.3467974319579	11.4434498473388	8.05890588201807	52.0306	12.0787	8.641
51.7925965145129	10.8797474414832	11.9927969017252	52.3173	10.0275	11.1526
53.1154005915528	10.3476227833121	18.7099990814916	53.1154	7.9184	18.71
60.5987684423386	12.8070899778897	19.7463921943268	61.7542	11.527	18.9198
63.0493441254164	22.8371095047973	21.0588395310356	62.5649	23.4331	22.9907
67.1633223469415	26.1747427787837	21.7653108364632	67.242	26.9141	23.9429
70.3404967173246	27.2056188817215	22.061728112688	70.1037	27.3839	19.7642
90.643477639213	28.0535840597928	23.4339754368964	90.6435	28.0536	25.8632
90.7200049402264	28.2688835255927	20.8450722954322	90.72	30.049	19.1921
92.5592011120556	27.8561509698999	20.8450781961496	92.5592	25.4331	20.672
96.3226150210603	27.9671927874337	21.0591753996345	97.0499	25.7334	20.6225
96.6268651308779	29.8309430517179	21.3957260408879	96.156	30.1327	19.1399
96.9834785019395	30.9585048407103	24.4820998250707	99.0228	31.9463	24.4512
97.2123791679411	31.5476777174793	27.808299661595	98.9301	33.2654	27.8083
96.7455145121521	30.3314803465108	28.8362696830834	97.4429	30.1528	28.42
96.262639157706	29.1398377923729	29.9129301953335	97.5011	28.0267	29.587
95.7234266330551	28.1915563503018	31.0645214695057	93.9312	28.9768	31.8553
95.3335016972988	26.8773218304223	31.9089005994984	93.6487	25.1273	31.9089
95.3335108440339	26.8773738640089	33.9051076285882	97.3283	27.0933	33.194
95.3335199879069	26.8774258922379	38.6788883761666	92.942	26.4511	38.6789
99.687728077979	27.2933053829796	40.4485358187729	101.5683	27.6266	39.8262
100.95229452332	27.6954184688018	43.1312090123195	100.384	25.6874	43.9589
103.851251634094	28.8707525087639	44.1311053005452	106.1692	29.0085	43.7624
104.084925220587	29.7982563657389	46.8277461337509	105.5782	30.6326	47.1426
104.303023655083	30.5695723071999	49.1369999619196	106.6895	31.0233	49.137
104.08439785373	30.5695742170509	51.1922997587796	104.0844	32.9988	51.1923
102.644343034194	28.9189158502477	53.3231523694172	102.211	28.3893	55.4005
101.561353254666	27.7580072720834	53.9680920235349	101.7295	28.4449	56.1482
100.257308762312	23.39289773645	54.2519867530104	98.3827	22.3334	54.4737
99.6597570031019	22.0454744821989	54.5280014068333	99.0428	19.6959	54.528
99.6597557866603	32.6553814960025	54.9875979499781	101.1976	33.4905	53.5496
99.6597545639127	33.9140991548149	56.0882333076619	100.5275	34.9543	58.1047
96.5468776664592	33.9141000376621	56.0882328647953	96.2582	32.5713	56.693
93.8296230697392	33.914100921361	56.0882324219012	92.4351	33.0022	54.3205
93.8296229752365	36.3195059482177	57.4086036790975	95.1298	37.6897	58.9361

Solution x	Solution y	Solution z	Original x	Original y	Original z
87.0850894184526	36.3195059279172	57.4086034152758	85.065	35.2948	58.2863
90.8756014290919	36.3372859490249	54.5226958524976	91.0332	34.8187	52.6374
91.0286154199147	40.8552679717269	54.5089515382685	90.1236	40.724	54.2833
91.1842082098776	45.6914745032816	54.495209325183	91.1842	48.1207	54.4953
96.2484938256226	45.6914738351407	54.4082814246186	96.2485	47.1277	52.4491
96.4659224365147	44.9657793739913	54.40828132623	98.0763	43.3554	53.563
95.1584416589342	45.5654717693349	57.2611572191401	94.5355	44.3621	59.1041
94.385352696822	47.6076922291589	57.7185204135665	94.5838	45.9916	57.9488
93.6007137633532	52.5780853912219	58.1673855236078	92.1982	53.9806	59.5699
98.1370946346731	51.5735481821705	57.4009009210187	99.0651	51.1078	59.3413
99.5046747995312	50.7717278697746	53.165472637633	99.5817	52.1789	51.8005
100.838856636971	49.5957098972296	51.5495435732145	100.8862	48.4618	50.2894
102.164448847944	48.6671373155484	50.3843127961415	102.9297	48.0592	51.9744
103.220873855177	47.8555002284717	48.28010094145	105.6501	47.8555	48.2801
101.118132723687	47.106602010699	48.0586415926962	101.161	45.7653	49.9947
98.5473508602483	46.8555700888544	46.6974570925828	98.9198	48.0008	44.9228
94.2455470327927	46.5696953108201	46.0356467429677	91.9732	45.8332	46.1527
94.1171416074928	46.4017196096772	45.1284256842412	93.3823	48.5086	44.2946
94.0145771808067	42.713930369882	44.8296536221881	96.2085	41.8253	45.162
92.4223693684049	42.4704628844551	44.3023854464608	90.0385	42.8005	44.3862
92.359800816233	41.9650303512971	43.5343074720188	90.4784	41.2284	44.1276
92.2998811376442	41.5222886823322	42.6025298876241	93.2846	41.9379	42.3812
92.2395795905044	41.0702980409881	41.6950251578497	92.2396	41.0703	39.2658
91.2405080566209	39.6934771186568	42.0553905463156	90.014	39.915	40.6629
90.4694720242645	38.2035916215671	42.4656188907946	91.8795	37.1845	41.8015
89.4328316963154	37.1031964465373	42.9038022823832	88.2545	36.066	42.1212
88.605283781913	36.2039001456351	43.3742693716197	86.5983	36.2039	44.7429
96.4502087222498	35.1501183424028	43.3742685288615	98.5859	34.5756	44.3792
96.4502079330969	35.1501162901094	41.1201011988576	96.5473	37.5774	41.1201
96.450207102948	33.9308594796516	40.1232258722526	95.0864	33.2234	41.4865
96.4502062731894	32.9702656226504	38.3327160041754	98.5493	33.1624	37.7737
96.4502054430117	31.9000095124407	37.1941999256908	97.1838	29.5842	37.1942
95.7972886666478	32.6721615952862	35.4778006804031	95.8908	32.6754	36.0409
95.1416249444632	33.4453074753095	33.5856021160071	92.7124	33.4453	33.5856
95.570992882988	35.9717360487067	32.6859790907532	96.6051	36.0943	31.9245
95.978148904612	38.3973821941933	31.8583111728217	97.0063	39.6578	31.3742
96.3573675481435	39.950481594317	31.0865660843662	96.8865	41.9997	31.9305
96.6849823343748	40.3795132320038	29.415860061044	98.4033	39.6451	29.8224
96.9724132783098	40.8447913442362	27.4088592960785	98.7317	39.6579	27.3708
97.2104293628863	41.4474368857782	25.4746635561603	96.2133	40.5576	25.5914
97.4563319189874	42.0968994307102	23.4853218292165	99.6903	41.4772	23.4888
97.6058983040666	43.3495129174092	21.4915572298878	95.46	44.379	21.4845
98.5804098423557	43.6331923193849	19.5896175607254	98.3613	42.0392	20.5386
99.6141306893925	43.9487667395217	16.3503646327417	98.0879	44.5657	15.6818
101.156312753347	44.2528172212087	14.095309794118	102.543	45.6081	13.7083
102.111290892753	44.5256568497988	12.2899976929395	102.0152	42.2262	11.91
103.186056539268	46.0309419124661	11.3458857592984	104.1102	44.8822	12.643
104.014974320746	49.0894992339349	9.906100419716	106.4442	49.0895	9.9061
102.673410038475	49.97222313407	9.41233204002332	103.8062	50.1176	9.3383
100.996956314019	50.8404570163984	8.9204103249869	99.5987	51.3246	10.6347
100.435248373919	51.4781998837655	7.24103771690999	100.6388	53.8259	6.8403
99.4872760779421	51.5775237967858	6.75736604851023	100.3439	52.2486	6.1962
98.4314024476111	51.676029871745	6.28944694688791	98.2152	53.7701	7.2972
97.65272462106	51.7522838971102	4.77060178511753	98.2004	50.3921	3.9008
96.8097046181257	51.8299578867565	3.56022548206006	96.8097	54.0588	2.5941
96.7179154504676	47.0462643145527	3.56022520814141	95.7654	46.8722	1.8076
96.6283812918541	43.2460006631479	3.56022493471833	96.6284	43.246	1.131
95.0760115787198	41.0220394739426	3.86022228866318	95.8598	39.2349	3.852
92.794829822605	39.9372963451275	4.16069844414914	92.634	40.1716	1.8791
91.1655973795775	38.4940245698738	5.09620151327223	91.1655	36.0648	5.0962
91.1535802655412	38.946751451485	12.8823053255287	89.1249	38.0318	13.3915
91.1418207682216	39.8613921329899	14.4649812695033	89.3668	41.343	14.5671
91.1303560203307	40.1743177679073	15.8042975641627	89.0134	41.3658	15.8043
92.7216392593035	40.1743175167433	15.92011139279	92.8093	39.7693	16.6418
94.3086978475162	40.1743172656112	16.0348500519522	94.3087	39.6383	18.4042
94.538951202029	40.1743180028841	14.5785181307344	94.1971	38.0204	14.8005
94.7782892074947	40.1743187413766	12.7920996812749	97.0806	39.3994	12.7921
94.5725961320401	45.6433856284138	10.6667285459203	94.5726	47.3613	8.9492
89.6388606783382	44.8473470352291	10.6686038808727	89.5287	45.4109	8.5583
85.8648270411673	43.7746628406369	10.6704838428436	85.9182	41.843	9.5066
81.4373837732534	43.3505371974347	10.6723664917006	80.8076	41.6004	10.0065
78.9660525098502	42.9993686570823	10.6742501940379	77.8794	45.0468	10.8339
78.9660525098502	42.9993686570823	10.6742501940379	80.8872	43.1227	9.5119
75.9255100966176	40.5632007817827	10.6761389279644	75.9022	40.5634	8.2476
75.7231784594978	38.1697021915173	10.6954214827728	75.4748	37.8532	8.3059
75.6263875813939	38.03458091969	14.0970663368833	77.5882	39.4219	14.211
72.400289517312	34.1520809310212	15.1974246439189	72.6191	32.6684	16.6889
68.0085374636598	32.9597667942704	15.8609900311338	67.7055	32.9993	17.0949
64.2717000702128	31.7627055634526	16.4611765241412	64.2717	31.7627	18.8904
61.4510737664048	31.6675945066096	15.1794756311246	61.5106	34.0654	15.2705

Solution x	Solution y	Solution z	Original x	Original y	Original z
51.166815953064	29.165002215851	12.6063019398368	49.5432	29.0024	13.3417
48.7529931333107	26.8541899055389	8.54526018703103	46.7677	27.4481	8.8301
47.8462972147659	22.4784542610376	1.84242800014042	46.7163	23.0055	0.3229
Route: 8 Length: 521.3089095146 Demand Met: 9674					
48.4466356174058	15.8445350976485	4.6043127278284	49.3862	17.5735	5.4967
49.2985070826159	16.8190757195847	6.2413838083377	49.1677	19.2175	6.1526
51.6499620382857	16.8942766980839	13.9609014114508	53.9046	16.3668	14.1276
51.9729954763032	16.9729823353132	17.0760007333628	53.4554	15.0784	17.1477
52.0518598531383	18.8532964537443	18.3107081434311	49.9971	19.9155	18.5508
52.1485880926013	19.3980919896924	19.2231392108302	53.2794	21.4994	19.0176
52.2165326660306	19.4962253410561	23.8071342367725	51.6732	17.1776	23.9169
52.2921307471657	19.7623247188513	25.655055112119	49.9475	19.2284	25.6639
54.4698798529527	21.101812698759	27.3293353572354	55.9782	19.9329	26.5423
55.5012668675968	23.994593327843	30.3639194980997	54.6523	25.2022	31.3259
56.7464628735643	25.7139597204776	32.3046783034385	55.4854	26.8201	32.387
58.4855248500433	26.9979195220661	34.1957649430722	58.5931	27.1316	32.5338
60.1801894769975	28.2417742235214	38.4137955068173	60.1802	30.671	38.4138
60.9189817790674	27.4079190023934	38.8896463894636	62.9268	27.0211	37.7555
61.1623161877418	26.7529385060203	40.7250296523268	59.5552	26.5288	41.5263
61.4273174376998	26.1151320112578	42.1255035355778	61.643	23.6955	42.1255
61.4273240522936	26.6128034571888	49.6222977087085	58.9981	26.6128	49.6223
61.5615332219762	32.9493992009818	49.992468285371	60.8351	33.4935	47.8851
61.7089129491634	34.4359729881073	51.296626624938	61.1452	36.2851	50.8184
61.8598117334837	35.2619253115599	52.89576505763	60.137	35.2014	51.7925
62.0242940677634	36.1019992404661	56.8047733469844	62.0243	36.102	59.234
65.1063608101019	46.8702044381617	56.353636259947	65.7303	47.3671	58.4265
66.2862994441115	48.8412727903726	54.2568977538117	66.2863	51.2705	54.2569
68.3024614706536	46.79555150749	51.7974307317912	67.4955	46.0347	52.8305
71.0164686823326	45.1385668000386	47.8150615076931	72.7013	43.6681	47.6828
71.6517977722571	44.5602049692291	44.929824685897	70.5497	45.0925	44.08
72.3615653856436	43.9569913832155	42.8294156777653	72.9378	43.4347	40.5471
72.4925901086112	43.8307271010787	42.788327712513	72.4926	42.7909	40.5929
75.985270419474	43.8307269360809	43.6031210478336	75.9853	41.4015	43.6031
76.4125024660853	46.9809954894206	43.9923726286278	76.4125	46.981	46.4216
76.8183439087057	47.4465986452809	43.6380271690309	74.8417	48.5823	43.578
78.2967005115658	47.7515725246932	43.2865016386163	78.2967	50.1808	43.2865
79.0083683315558	47.1731906216414	42.4941894208269	77.9078	47.2474	41.2613
79.8357288467905	46.5896843026308	41.8199035030117	80.0004	48.0282	43.1849
80.6319790971394	45.784954486996	40.8860751759934	79.533	47.2684	42.1428
82.4717827352282	42.2582516791441	36.9548225178722	81.9079	40.1742	36.8216
86.2521409981753	41.4883579986406	33.8490796716163	87.2346	40.5435	32.6709
88.3547140403623	40.831316033835	32.1068059742855	88.4465	41.4478	32.5802
90.4258911928529	40.1481377309787	30.1983895949201	92.1801	41.0349	29.4683
91.2787824048569	39.2675707523937	28.9622689234677	93.6941	39.0671	28.969
91.2874445287697	39.1948795103895	26.0941004370998	93.6083	38.4774	26.0941
89.9872557557837	39.1948782164639	23.6790024406632	87.5583	39.2312	23.679
92.0487337154292	39.1948768040578	23.0308606173844	91.9372	36.8319	23.3371
101.937330691601	39.1948754084298	20.8907982045495	103.4615	37.3033	20.8908
101.937330280504	46.6582054123135	20.4048322347693	101.377	48.1816	18.5975
101.937331984344	46.6582019803412	23.1432876224844	100.6036	46.802	22.0951
101.937333688671	46.6581985481356	29.2584965207164	101.7941	49.0832	29.2585
101.937335500272	46.1706743624114	33.9195730390162	99.7789	45.6905	34.3678
101.937337314469	45.7446046727325	35.7135775934194	103.0838	43.6629	35.7673
101.937339120525	45.654971458352	37.1499037417395	103.8959	45.4099	37.4639
101.937340924649	45.5659414753695	38.3960819862777	103.3956	43.6231	38.3961
99.7428137686167	45.7803076298788	38.4245216053971	100.0845	45.3198	38.3951
97.3600191157512	45.9969220936363	38.4529486841778	97.5519	44.8528	38.2336
94.8595054772051	46.2205013597401	38.4813856314509	94.4684	44.7163	40.2539
93.9945794570726	46.8501640907756	38.5075042195131	95.1396	47.3596	38.3213
93.0053014076226	47.4557094861669	38.5336345610983	94.3452	48.7818	37.6589
90.9751454621876	47.9180857360322	38.5599662412663	90.4865	46.0315	39.3528
89.5333089886689	48.6307062559115	38.5860947280882	89.352	47.1855	40.3099
88.3446278769623	51.5362987961563	38.6114455691355	85.9154	51.5363	38.6114
90.1060934160528	52.3966896884163	39.2373611785577	90.3356	51.1932	37.7625
91.7462038923882	53.5879939228707	40.0610007725332	93.3932	53.1876	39.0419
92.6728387818692	55.0009105722429	41.1777585232867	92.9131	56.6287	40.2251
93.5388844272998	55.8654958134923	42.7453006363212	95.4289	57.3916	42.7453
91.6542115665538	55.865493148603	44.4916992289674	89.2688	56.3248	44.4917
94.1140680367358	54.9328939982585	45.8512628204987	95.0304	53.2116	46.2852
95.6767825572717	54.2790792995094	46.9943086943268	97.9579	54.2407	46.7851
95.9955682159773	53.6518168384317	48.5236001395456	97.7133	51.9341	48.5236
94.5911163856735	57.5346068187812	49.2813962675469	94.8477	58.3247	47.7413
93.0701728685707	59.9043195612424	50.2912802324631	94.6583	60.3511	50.0221
90.2671991363881	61.8498709379521	51.3538990556778	90.2672	64.2791	51.3539
86.92167767788	61.1701455290867	52.0933594411266	86.2321	62.729	51.1705
84.921123486841	60.1761034522828	53.0178953403996	85.8477	60.7859	54.7762
78.0126167952573	58.8490977492992	53.5786368970579	77.9705	58.8491	56.0075
78.0125830941616	56.358552729528	53.1517769395867	77.8264	55.5164	53.7679
78.0125493942939	54.3894831360116	52.7074780889105	78.0993	54.3894	50.2798
77.4078990923006	51.3085277316088	52.7074780242271	77.4079	49.147	51.5989

Solution x	Solution y	Solution z	Original x	Original y	Original z
75.1332637067235	51.3583106763087	53.4435751558591	74.4488	50.3129	52.3971
73.3683886343283	51.4085156581857	54.3212041303076	73.2401	49.0047	54.3428
72.7094500542007	51.9695449251009	55.0228387584192	73.3859	52.8201	55.9097
72.0059372564839	52.4962919344455	55.6678826207983	72.0304	52.5053	58.0692
71.2135832565674	53.1008470238375	55.7176804782596	69.4154	51.8752	55.6067
70.7764120492278	54.1509553264519	55.767657572827	69.2681	55.3133	57.276
71.5146187335531	54.1509532801075	51.437713875427	72.0955	52.6394	50.8408
72.2084953018128	54.1509512345237	48.611202475333	74.3979	53.0985	48.6112
71.6766834658484	54.1509527325453	46.5219015457441	70.1179	52.2878	46.5219
71.6766815110483	56.6405552574262	45.2128483638366	73.7963	57.8273	45.2128
70.2302749934157	56.6405593498767	42.0030107916642	68.5789	56.8701	42.2821
70.2302749934157	56.6405593498767	42.0030107916642	69.8977	54.8286	42.1718
69.3061509460289	56.6405634440601	37.5546040979819	67.4683	58.2291	37.5546
69.3238913306741	54.0811970588068	37.3541591132407	69.1565	53.343	39.551
69.3416964768572	53.3504007705727	36.9013421677814	69.1689	51.2673	37.9561
69.3595888897822	53.1412147906905	34.6288518695956	68.2826	55.0673	33.7791
69.378230584402	51.5507011934883	34.2121338723074	70.8564	51.5507	32.2844
69.378228629661	51.1468542369915	34.4822555406721	70.2011	52.705	34.7749
69.3782266746341	50.6854993310076	34.7495159886461	66.949	50.6855	34.7495
70.2072136723869	49.6476223442121	34.8888496859214	70.0624	50.1219	34.6274
71.0545555378723	48.5593321158792	35.0286042893542	70.6191	48.182	36.9413
72.0385050419521	47.6030045389956	35.159773078718	72.0385	47.603	37.589
73.0367658222933	46.6491359983882	34.6156365476925	72.4429	44.8985	35.9587
76.2045715307309	46.3228173133281	30.7677992037092	77.9223	44.6051	30.7678
76.0043039598017	48.1516729533246	30.4596040520449	76.0043	50.5809	30.4596
74.9716873023428	48.1404733766658	29.3077481056059	76.379	48.6237	27.9163
70.4096004194461	48.1289951672142	28.7108499302718	70.4096	46.4113	26.9931
68.707549633649	48.2791131080835	29.0996207112946	67.5609	49.631	28.0783
67.7990988102306	48.4164771066572	29.7942776923014	67.7991	50.1342	31.512
66.493469898197	46.8905203207241	29.7692030094646	67.6648	48.1141	30.5928
64.4232004418079	44.0580999425114	29.7440261842333	64.4232	44.0581	27.3148
64.0134910342942	43.0757150040466	31.9518610393323	65.3289	43.5846	33.8262
60.9492997886888	37.7343019343497	32.2167740822383	60.9493	37.7343	34.646
58.6124545012476	36.5834975219507	28.6589259457484	58.8785	37.4935	28.0133
56.1055586313074	35.2769692516226	25.8441385140951	56.2795	36.0371	23.7369
52.5352146668001	31.226890906332	25.2981352748783	52.5136	31.162	22.8965
50.2469688202502	29.8289984362102	25.2460060314622	50.5738	30.8854	25.5173
47.7427991142847	28.1483023706471	25.1938085377474	47.7428	26.438	23.4687
47.1894887451142	28.1483811539462	28.2249512371367	45.985	27.4123	27.7797
46.6837857160928	28.1484599249608	31.9981998832388	46.684	28.1154	34.4272
46.6547295810702	28.4678437481636	31.9981991391254	46.4115	30.3033	33.5708
46.6547191414559	28.4678440728725	31.5684963750857	46.9054	30.8841	31.5685
44.9920099125114	20.7882272772031	30.7215286845568	45.9242	19.9	29.6168
42.651923102993	17.3645256247329	30.002398478801	40.2335	17.1357	30.0024
42.6519282233189	17.364518637026	25.5524167920258	44.3034	16.6265	25.3299
42.6519333413519	17.3645116517395	21.9165949218655	40.715	18.8306	21.9165
45.2705430005945	16.9223268506604	21.7046031698781	47.2412	18.0641	21.8927
45.7287019186633	16.106034646478	21.4856082076823	46.6598	16.011	21.0885
46.1654297780981	15.2969925992278	21.2684974083893	45.8725	14.3747	21.2711
46.6078042066975	14.5482625363715	21.051147332623	48.0446	14.6778	22.9405
46.7828898649848	13.5638758633054	11.144758069609	47.1015	12.1757	10.5923
46.9565342647469	12.7461572642459	5.6837715976725	47.4524	12.1509	5.76

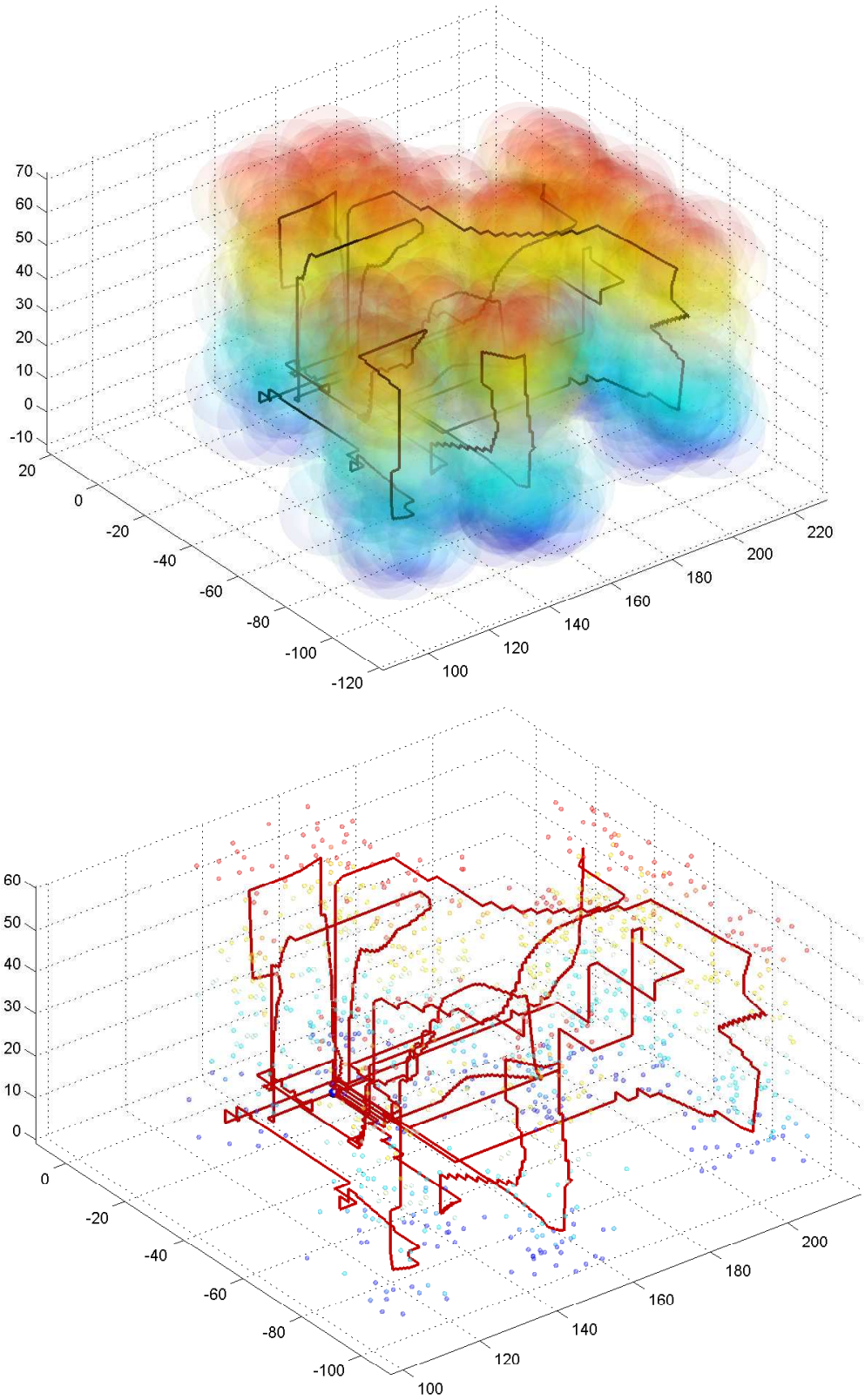


Figure O.193: $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Manhattan, Length = 2252.5017487

Table O-196: Solution for $dsj1000$, $r = 12.14609$, Equal Radius, 3D, Manhattan

Total distance: 2252.50174869065 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 199.86378840302 Demand Met: 9044					
47.2934993960486	13.5251934993956	2.20362848724345	47.1015	12.1757	10.5923
47.2934993960486	13.5251934993956	2.20362848724345	52.0306	12.0787	8.641
47.2934993960486	13.5251934993956	2.20362848724345	42.4139	3.5597	1.814
47.2934993960486	13.5251934993956	2.20362848724345	55.8132	15.4408	3.6174
47.4534537730514	16.2542799728369	3.94012509502022	47.4524	12.1509	5.76
47.4534537730514	16.2542799728369	3.94012509502022	46.5714	10.174	4.4604
47.4534537730514	16.2542799728369	3.94012509502022	46.503	16.5426	2.0548
47.4534537730514	16.2542799728369	3.94012509502022	42.7704	10.2739	1.2183
47.4534537730514	16.2542799728369	3.94012509502022	44.2621	15.3855	4.7212
47.4534537730514	16.2542799728369	3.94012509502022	46.7163	23.0055	0.3229
47.4534537730514	16.2542799728369	3.94012509502022	49.3862	17.5735	5.4967
47.4534537730514	16.2542799728369	3.94012509502022	41.9974	13.5778	7.3366
47.4534537730514	16.2542799728369	3.94012509502022	49.1677	19.2175	6.1526
47.4534537730514	16.2542799728369	3.94012509502022	47.5893	27.8934	1.3329
47.6193609551707	16.6559610661634	19.9133215436672	40.715	18.8306	21.9165
47.6193609551707	16.6559610661634	19.9133215436672	45.9242	19.9	29.6168
47.7880141751283	17.0487687207299	24.1458820829924	51.6732	17.1776	23.9169
47.7880141751283	17.0487687207299	24.1458820829924	49.9475	19.2284	25.6639
47.9562769741624	17.4413393649734	28.496587647533	51.539	18.7116	33.0294
47.9562769741624	17.4413393649734	28.496587647533	52.4859	17.4578	33.7507
48.1234271316541	17.8341344386504	32.0941263753172	51.9742	12.9315	39.5168
48.1234271316541	17.8341344386504	32.0941263753172	52.1655	19.1446	41.5432
48.2875860598907	18.2345844701337	33.9752952071593	48.9393	11.7496	40.9103
48.2875860598907	18.2345844701337	33.9752952071593	51.32	11.9016	40.4537
48.4509716248646	18.6629770737191	35.4524693757246	47.5448	13.9665	39.1563
48.6147670598513	19.0976089892798	36.8977678378276	46.213	15.3079	43.6977
48.6147670598513	19.0976089892798	36.8977678378276	40.2323	12.6508	42.5989
48.8590974863711	20.5996503988052	37.366407835529	49.1449	22.3659	43.2644
49.1035960155258	22.088297618051	37.8286171075955	54.6523	25.2022	31.3259
49.1035960155258	22.088297618051	37.8286171075955	46.4115	30.3033	33.5708
49.3473826312626	23.3396893562542	38.3211118229469	45.985	27.4123	27.7797
49.6078772641088	24.241498045535	39.1550564093882	47.9812	30.2306	39.2099
49.8694437946801	25.119029337593	39.9936930194147	46.9054	30.8841	31.5685
49.8694437946801	25.119029337593	39.9936930194147	47.9603	31.0225	36.0363
50.1367975885283	25.9010141827465	41.0176447443103	45.9581	33.5048	45.1742
50.1367975885283	25.9010141827465	41.0176447443103	44.7872	36.1398	42.3342
50.4376548051031	26.3851901929901	41.9171286268999	48.6326	32.1618	43.4727
50.4376548051031	26.3851901929901	41.9171286268999	50.1654	34.298	41.7388
50.7410906913607	26.8517314008732	42.8234216111388	51.7623	34.8081	42.2217
51.0444883403316	27.3068386325307	43.7417021182013	51.473	33.7115	46.7085
51.0444883403316	27.3068386325307	43.7417021182013	55.1607	27.7715	51.8295
51.3450550088921	27.755683710829	44.5858309414241	47.4903	33.2139	54.5514
51.8082974021528	28.0179803387307	44.829517280492	46.003	37.4534	46.4333
52.3039607067169	28.2610481574617	45.0704820970681	46.684	28.1154	34.4272
54.4284882935019	28.5085630976976	45.8236993797518	61.643	23.6955	42.1255
54.4284882935019	28.5085630976976	45.8236993797518	59.5552	26.5288	41.5263
56.0363435498607	28.7612978932581	46.6331216324232	60.8351	33.4935	47.8851
57.5830977101243	29.012677073191	47.4427183492444	61.1452	36.2851	50.8184
59.0709706100797	29.2603721847933	48.2341002108975	64.8516	39.5774	48.8657
59.0709706100797	29.2603721847933	48.2341002108975	66.7168	38.698	48.2341
59.0709704589287	29.1739227809727	48.7829085285441	60.137	35.2014	51.7925
59.0709703065012	29.0873175893509	49.328334124425	64.2784	38.8059	47.0778
59.070970152087	28.9985783752588	49.9096985104382	62.0243	36.102	59.234
59.0709699991502	27.9839102041772	49.9757489740133	67.8857	28.9512	53.8343
59.0709698433059	26.944673288788	50.0416496382467	68.3676	27.331	45.292
59.0709696846488	25.9118311775318	50.1080615151776	70.5469	25.0661	53.9959
57.4832746916687	25.9118290686103	50.1080619441594	58.9981	26.6128	49.6223
55.9088385031224	25.9118269597079	50.1080623732107	54.2786	24.4277	59.9569
54.4510018625353	25.9118248508446	50.1080628022295	56.8778	27.618	56.4108
52.9799274877359	25.9118227419898	50.1080632312603	54.7376	29.7596	56.3053
51.5035985267376	25.9118206331314	50.1080636602927	50.8742	24.2729	53.2264
51.5035985267376	25.9118206331314	50.1080636602927	52.7074	28.2489	52.4902
50.0635626340663	25.9118185242995	50.108064089392	55.089	27.0379	56.5554
48.5419928090563	25.9118164154664	50.1080645184692	47.2642	16.1804	48.1934
48.5419928090563	25.9118164154664	50.1080645184692	48.493	25.186	47.2334
47.1121774922518	25.9118143066907	50.1080649477097	47.3356	31.1656	48.6863
45.6989741292427	25.9118121979089	50.1080653770162	44.6028	29.9319	49.9927
45.6989741292427	25.9118121979089	50.1080653770162	53.8796	31.7093	51.2249
44.021743587876	25.911810089123	50.1080658063925	50.1386	26.6573	56.0437
42.2002782307802	25.9118079803449	50.1080662357516	47.4152	28.2569	57.2588
40.2381141135905	25.9118058715654	50.1080666650954	40.9959	37.9409	51.1587
34.120811191297	25.9118037617393	50.1080670944032	35.5392	31.6783	58.7469
26.5416161171165	25.9118016517692	50.1080675237537	18.7218	26.0511	59.401
26.5416162280505	24.1461601853175	49.981477544689	19.4476	21.0876	59.2618

Solution x	Solution y	Solution z	Original x	Original y	Original z
26.5416163409917	23.7299094806571	49.6052583935002	22.0389	18.6688	59.3708
26.5416164538476	23.4083609689673	48.8408522230643	22.5923	19.795	49.1879
26.5416164538476	23.4083609689673	48.8408522230643	23.1689	25.59	48.8728
26.5416165668645	23.0886281102256	48.0832197500638	21.4132	25.3225	51.4824
26.5416166799089	22.7679049008315	47.3176942028347	21.7951	21.835	45.5134
26.5416166799089	22.7679049008315	47.3176942028347	19.3676	20.9011	45.1036
26.5416167932046	22.4500532895554	46.5751502531238	19.4151	20.4264	46.5071
26.5416169065858	22.1340399605163	45.8370083362859	21.3113	31.7798	46.1078
26.5416170196939	21.7907810654643	45.1009891341251	16.9754	26.2994	50.4148
26.5416171321976	21.3674724060256	43.5817794466053	20.7311	19.0512	39.2565
26.5416171321976	21.3674724060256	43.5817794466053	21.1889	21.267	39.0474
26.5416172447848	20.948913245284	42.2328362518081	17.3215	22.815	38.4524
26.5416173573729	20.5266841972866	40.9942978507717	19.5225	24.6717	34.6116
26.5416173573729	20.5266841972866	40.9942978507717	17.7323	26.9057	35.8248
26.5416174704544	19.1588912917411	40.5481637894158	19.6468	14.5775	38.07
26.5416174704544	19.1588912917411	40.5481637894158	18.1963	16.0602	36.4885
26.5416175837166	17.9380547083794	40.1203132828436	22.0744	6.6433	40.1203
26.5416177196917	17.9380542183717	33.7829402176658	29.4417	11.4808	30.7206
26.5416177196917	17.9380542183717	33.7829402176658	25.9081	14.4892	36.1934
26.541617855335	17.9380537284485	28.263752176734	28.099	29.8348	27.0633
26.5416179905511	17.93805323706	26.3668150503133	23.1615	20.5337	28.672
26.5416181258414	17.9380527456653	24.4456011174656	19.0397	19.3917	26.8913
26.5416181258414	17.9380527456653	24.4456011174656	18.4916	22.031	28.1174
26.5416182616562	17.9380522542459	22.2890875596971	23.1228	16.7524	24.3445
26.5416182616562	17.9380522542459	22.2890875596971	17.2669	18.1061	25.0094
26.5416183979317	17.9380517628537	19.9421243557136	20.8129	26.0745	22.3222
26.5416183979317	17.9380517628537	19.9421243557136	22.8581	29.0039	22.5241
26.5416185340978	17.9380512705247	10.7740476486925	24.5729	19.8583	16.0395
26.5416185340978	17.9380512705247	10.7740476486925	15.0509	21.8739	10.7741
26.7633233722625	17.3961859046427	10.4173219261716	31.9656	14.6164	16.7619
26.9830216710652	16.8620125029343	10.0547078772239	26.246	7.8923	16.6585
27.2036085977663	16.3802225338922	9.66953642176905	25.2224	21.1268	9.0297
27.2036085977663	16.3802225338922	9.66953642176905	24.0847	21.2619	9.4135
27.4259266377893	15.8888929688705	9.28486008700019	27.0312	22.0371	1.4535
27.4259266377893	15.8888929688705	9.28486008700019	21.2889	20.2133	0.1771
27.676080499113	15.2523529919152	8.97623572666079	19.6457	23.2311	5.559
27.676080499113	15.2523529919152	8.97623572666079	20.5046	21.2685	13.3595
27.9905543842496	13.9969866354708	8.68767427633442	23.3217	16.9506	6.2856
28.3085416696453	12.7228127460564	8.40034561341602	23.9142	5.5856	8.3806
28.3085416696453	12.7228127460564	8.40034561341602	22.4003	2.9895	12.1851
28.7933693433804	12.3247797467194	8.04618811059656	21.6596	11.213	17.563
Route: 2 Length: 172.474055168073 Demand Met: 9528					
39.6481478485739	8.54156060591452	1.61804738590968	28.0443	7.2557	0.5495
38.4842622852477	5.78691166852782	3.42229150222208	31.0707	1.7474	5.3999
37.4146227766359	3.25844738959636	5.17429673143119	26.7943	-2.6353	5.1743
38.0219667329872	3.25844740592012	9.11789852139554	46.0937	-5.8176	9.1179
38.0219667580431	3.67519119997344	14.2895943699669	39.9467	-2.3317	18.5214
38.0219667580431	3.67519119997344	14.2895943699669	32.3564	-1.4633	20.5286
38.0219667832669	4.11724208218907	17.7295556784398	41.1669	5.3004	18.6447
38.0219668086683	4.55953323166524	21.2035587211569	45.0418	3.8658	25.2247
38.0219668086683	4.55953323166524	21.2035587211569	44.0031	6.0986	31.1209
38.0219668341055	4.98224094539913	22.2250263635073	28.1449	5.3771	22.529
38.0219668600381	5.40543489472352	23.2512789545212	29.2451	9.0499	23.6495
38.0219668863267	5.82158436571529	24.2828656254509	43.7231	10.6871	23.6231
38.0219669126126	6.23077424309698	25.3298890509448	44.3034	16.6265	25.3299
37.8453888489244	6.1640397922784	26.9023720297194	40.2335	17.1357	30.0024
37.6648062263873	6.09420949220223	28.0568329566799	44.7075	13.3055	33.9605
37.4700867769949	6.02114992561071	28.69473651896	36.4235	4.5159	28.6582
37.2755294577732	5.94819176378809	29.3338294915258	42.4155	0.0668	38.5675
36.1037308535814	5.8928139917406	29.4520807395195	36.2059	6.8965	29.7476
34.953631902137	5.83743984941821	29.5702755001976	27.2842	5.8331	28.3822
33.9099423724938	5.78207673737751	29.6885147199737	33.6792	4.7017	30.2163
32.8777145070647	5.72673790771313	29.806690840684	24.5208	1.7631	30.0851
31.9517740574875	5.67152788777393	29.9247048062246	29.9497	8.0977	27.1858
31.0388209070495	5.61626229514309	30.0427129500416	22.6294	-1.9579	25.7184
30.976400525209	5.58356619755359	31.7912492731583	24.8641	0.1355	28.7608
30.9142690006246	5.55092887759314	33.6567544745454	31.1128	-2.8096	30.5667
30.8521610051039	5.51838639624464	35.6650063747523	29.6205	6.6839	35.8272
30.7901117519241	5.48582838602359	37.7000451264727	31.7997	5.4917	35.1341
30.7280757861589	5.45325847467871	39.8275131828345	29.2732	5.6917	40.0529
30.6661258154167	5.42067473296381	41.9903270168379	27.9452	7.0873	43.7392
30.6043082396253	5.38806732609597	44.1535438980426	28.6989	1.5656	37.4478
30.5426195100559	5.35549229972901	46.708378259803	33.4349	0.0139	45.2628
30.4809106166256	5.3229580227646	49.4501874460296	31.0065	-1.0714	59.1851
30.4191262760911	5.29087957641003	50.2157650373928	27.6562	5.4902	56.4427
30.3575481706069	5.25877692026824	50.9624931466413	22.4229	-2.1641	56.3911
31.4697265351456	5.25877733264963	50.9624930945196	25.8989	0.7413	53.4706
32.6481962788329	5.25877774506872	50.9624930423797	27.3755	-1.0984	56.1861
33.9533613214879	5.25877815757389	50.9624929901361	31.1391	0.2266	57.7289
35.3277517214783	5.25877857013754	50.9624929378397	36.4279	-4.3699	52.432

Solution x	Solution y	Solution z	Original x	Original y	Original z
36.6947315716489	5.25877898283183	50.9624928855281	33.7832	8.5886	57.2507
36.6947315716489	5.25877898283183	50.9624928855281	30.7839	5.7178	56.2846
38.2984535395418	5.25877939544516	50.962492833225	45.5397	7.2979	57.1732
38.2984535395418	5.25877939544516	50.962492833225	36.7928	9.6586	58.8057
39.7266023110937	5.25877980789471	50.9624927812818	39.7266	17.3977	50.5452
41.7974183420928	5.06550838092928	50.962492741068	38.0686	7.3443	51.7798
44.0665562834373	4.87195490686967	50.9624927007771	54.6465	1.327	47.163
44.7813047323249	4.69004778125551	50.9624926604446	43.0131	-4.6452	57.9101
45.6126623959327	4.53211280179973	50.9624926201766	56.6229	3.2945	52.4352
46.2211360009893	4.37549543802306	50.9624925798211	46.8369	6.4403	54.1626
46.833158916114	4.21869630307763	50.9624925394952	47.6091	10.2274	48.878
47.4489128178609	4.06103888810221	50.9624924990582	51.2901	7.6487	52.6277
48.0607305052002	3.90291985831369	50.9624924585578	52.0607	4.6851	47.5572
48.6687331587092	3.74478542887062	50.9624924178668	52.2056	3.4977	49.7426
49.274692440837	3.58679170500325	50.9624923770276	51.8363	2.0767	53.9783
49.8803441634868	3.42910635436584	50.962492336115	54.7597	1.1902	50.9644
50.4801192023896	3.27187475767217	50.9624922951025	54.4331	-6.2551	57.3764
50.4801192997413	3.27187476371504	49.8515748545699	50.5069	12.3029	52.6774
50.4801193972223	3.27187476956752	48.7166182038109	53.965	12.2967	46.7771
50.4801194946251	3.27187477523165	47.6478645430695	58.2987	1.8222	52.9601
50.480119591845	3.27187478094265	46.515965811051	57.3839	0.9502	46.0215
50.480119591845	3.27187478094265	46.515965811051	60.4167	1.4088	44.4464
50.4801196882919	3.27187478677846	45.476830073934	43.4311	0.4843	45.1031
50.4801196882919	3.27187478677846	45.476830073934	44.2937	4.7268	51.9613
50.4801197857089	3.27187479267539	44.3846419443688	49.5265	1.5006	43.2383
50.4801197857089	3.27187479267539	44.3846419443688	49.2438	-0.5725	42.7886
50.4801198835568	3.27187479826048	43.3373532286504	50.9668	1.717	44.4164
50.4801198835568	3.27187479826048	43.3373532286504	55.7669	1.6852	42.4618
50.4801199813392	3.2718748043302	42.3141171747798	48.2378	10.888	40.0435
50.4801200792954	3.27187481033345	41.3249198565585	55.5508	6.709	40.6861
50.4801201771465	3.27187481629572	40.3506768452366	55.3647	9.0137	38.8085
50.4801202747948	3.27187482219994	39.3982931500416	62.5325	1.766	39.3982
50.4801203140516	3.27187483253929	38.3163856748329	50.2911	5.2466	39.9878
50.4801203534049	3.27187484288411	37.2362576000561	43.7175	13.3612	37.2361
50.9232841743732	3.18508684088441	37.004740334142	43.7681	7.8375	35.3656
51.3809778288227	3.09799658373294	36.7748054297466	46.3909	8.819	37.7186
51.8511865249827	3.01058786985249	36.5449628311158	63.4243	4.3429	39.6925
51.9682920573878	2.91874891372453	36.1693996586904	61.565	4.5717	36.954
52.0836747463986	2.82674876368403	35.7939208779493	52.8937	1.339	38.4463
52.1991563582224	2.73488022730562	35.4176321401955	55.5686	2.3786	41.1094
52.3144714325113	2.6430446535938	35.0368874401725	53.4617	5.8056	38.0578
52.4298670450669	2.55103348094201	34.6548139558356	54.3108	6.5803	34.1725
52.5452972832569	2.45880077687839	34.27430622711	53.289	-9.6645	34.2743
52.5452976295558	2.63244146425195	32.9637728741081	53.412	-4.2453	38.3008
52.5452979758577	2.80819048173973	31.5599062447343	50.0191	-2.6033	31.7826
52.5452983221524	2.98506577554638	30.176396700085	62.7821	-0.0838	27.7653
52.5452986684818	3.16472751819106	28.9972180995373	58.0726	3.0503	30.5544
52.5452986684818	3.16472751819106	28.9972180995373	59.6709	-1.5476	33.1451
52.5452990148331	3.34627448066629	27.7412432665466	53.5826	-3.7128	29.3577
52.5452993611728	3.52963855446464	26.4801897178205	57.7878	-4.3732	24.6962
52.545299707526	3.71641020403715	25.2739761579222	49.0558	10.279	28.6803
52.5453000538752	3.90142745577754	24.035449717236	46.0043	6.8606	27.4465
52.5453004002176	4.08573421774007	22.7649954285544	48.0446	14.6778	22.9405
52.5453007465282	4.25487588128011	21.4991792938049	45.8725	14.3747	21.2711
52.5453010910123	4.287741255096	20.7439008019933	60.2628	6.0605	25.9406
52.5453014354936	4.32058563855702	19.9516257661148	53.8048	-5.0553	19.1679
52.5453017799775	4.35354894986957	19.1700272947444	51.7765	0.7553	20.0441
52.5453017799775	4.35354894986957	19.1700272947444	56.047	-0.6998	19.4659
52.5453021244699	4.38660479899029	18.3920480233665	57.7618	2.6586	23.6599
52.5453021244699	4.38660479899029	18.3920480233665	63.0749	1.8033	17.7213
52.5453024689894	4.41971587453906	17.6094199020984	61.7542	11.527	18.9198
52.5453028136677	4.45243438913166	16.6709248802529	48.7027	4.8736	15.3944
52.5453031583604	4.48516443349919	15.7442691876828	44.8479	-0.9391	15.0769
52.5453035030355	4.51798693765108	14.8302927522663	53.4554	15.0784	17.1477
52.5453038477239	4.55057757989062	13.8694770425748	53.9046	16.3668	14.1276
52.5453041924488	4.58103053181482	12.8825134631008	52.3173	10.0275	11.1526
52.5453041924488	4.58103053181482	12.8825134631008	53.1154	7.9184	18.71
52.5453045371932	4.61143112109917	11.8723689792812	44.5228	11.8645	13.3212
52.5453045371932	4.61143112109917	11.8723689792812	44.5689	9.75	12.1988
52.5453048819072	4.64164536965186	10.8296532093155	43.984	9.2005	15.6271
52.5453052266142	4.67178421092771	9.65626861600482	47.0712	4.3382	9.7807
52.5453055713164	4.7019389264717	8.48666592858019	51.545	-0.7619	6.4521
52.5453059160166	4.73214985148337	7.33997389830409	62.4332	-0.684	2.8792
52.5453062646508	4.79505340205749	7.27704366805296	52.3291	3.6705	6.1162
52.5453062646508	4.79505340205749	7.27704366805296	54.5841	1.3	6.274
52.545306613285	4.85808452549289	7.21426727621806	48.4975	2.4432	11.2037
52.545306613285	4.85808452549289	7.21426727621806	48.302	2.6164	11.9932
52.5453069619136	4.92127147202763	7.15126257309938	58.3955	-2.2935	14.9348
52.5453073129462	5.16242582505253	6.86055504077504	61.9524	-0.333	11.9086
52.5453076645331	5.58382191234628	6.31349066061028	58.2864	0.0731	4.559

Solution x	Solution y	Solution z	Original x	Original y	Original z
52.5453080161192	6.01403606521179	5.77149773978344	58.6741	1.1796	4.0744
52.5453083677338	6.45214827749605	5.23446046316273	58.5415	3.6684	5.0311
52.5453087193391	6.89433117640348	4.69880411073244	56.6752	3.9284	4.2715
52.5453090709491	7.34031002022402	4.16482091058898	57.2331	12.7874	5.1838
52.5453094225648	7.77876851994181	3.62968650715964	64.6914	7.7788	3.6297
52.0223684970738	8.33766415832572	3.15107228106753	58.2741	0.1622	8.0145
51.4353590826774	9.0193061301599	2.6266794187877	58.0725	5.2013	11.1785
50.7467343895756	9.7912381742513	1.97816857508706	59.4358	8.0877	8.3998
49.9459430619691	10.5907952513271	1.2577883423619	58.8992	5.3006	6.9433
Route: 3 Length: 283.874438598757 Demand Met: 9807					
47.4095275206805	23.8979185350968	11.9183564034165	54.0368	23.8586	2.2143
47.4095275206805	23.8979185350968	11.9183564034165	44.1303	30.8739	2.5661
47.4095275206805	23.8979185350968	11.9183564034165	46.7677	27.4481	8.8301
47.4095275206805	23.8979185350968	11.9183564034165	46.6598	16.011	21.0885
47.4095275206805	23.8979185350968	11.9183564034165	50.8592	31.2824	4.4654
47.4095275206805	23.8979185350968	11.9183564034165	47.2412	18.0641	21.8927
47.4095275206805	23.8979185350968	11.9183564034165	49.9971	19.9155	18.5508
47.4095275206805	23.8979185350968	11.9183564034165	53.915	28.4629	8.3577
47.4095275206805	23.8979185350968	11.9183564034165	49.5432	29.0024	13.3417
47.4095275206805	23.8979185350968	11.9183564034165	54.8257	29.6059	7.5612
47.4095275206805	23.8979185350968	11.9183564034165	54.5895	27.7676	11.1642
47.4095275206805	23.8979185350968	11.9183564034165	53.2794	21.4994	19.0176
47.4095275206805	23.8979185350968	11.9183564034165	47.7428	26.438	23.4687
47.4095275206805	23.8979185350968	11.9183564034165	50.3723	32.2399	19.4829
79.8854908922507	33.7749601068238	16.9275336626713	70.1037	27.3839	19.7642
79.8854908922507	33.7749601068238	16.9275336626713	79.7169	32.9378	5.3155
79.8854908922507	33.7749601068238	16.9275336626713	86.512	33.4131	7.017
79.8854908922507	33.7749601068238	16.9275336626713	85.525	32.0217	10.845
79.8854908922507	33.7749601068238	16.9275336626713	80.8076	41.6004	10.0065
79.8854908922507	33.7749601068238	16.9275336626713	74.5598	39.2546	26.0148
79.8854908922507	33.7749601068238	16.9275336626713	90.72	30.049	19.1921
79.8854908922507	33.7749601068238	16.9275336626713	89.1249	38.0318	13.3915
79.8854908922507	33.7749601068238	16.9275336626713	89.0134	41.3658	15.8043
79.8854908922507	33.7749601068238	16.9275336626713	87.5583	39.2312	23.679
88.7261979503602	44.3647686285872	30.4697688635321	80.3964	49.7264	23.6683
88.7261979503602	44.3647686285872	30.4697688635321	83.5076	51.7826	22.7284
88.7261979503602	44.3647686285872	30.4697688635321	80.7698	50.729	27.0276
88.7261979503602	44.3647686285872	30.4697688635321	92.7124	33.4453	33.5856
88.7261979503602	44.3647686285872	30.4697688635321	87.2346	40.5435	32.6709
88.7261979503602	44.3647686285872	30.4697688635321	87.8413	47.1867	25.6907
88.7261979503602	44.3647686285872	30.4697688635321	88.4465	41.4478	32.5802
88.7261979503602	44.3647686285872	30.4697688635321	92.1801	41.0349	29.4683
88.7261979503602	44.3647686285872	30.4697688635321	87.5129	47.9594	27.6836
88.7261979503602	44.3647686285872	30.4697688635321	93.9129	43.6355	26.629
88.7261979503602	44.3647686285872	30.4697688635321	95.0864	47.4256	26.3676
88.7261979503602	44.3647686285872	30.4697688635321	90.014	39.915	40.6629
88.7261979503602	44.3647686285872	30.4697688635321	96.8865	41.9997	31.9305
88.7261979503602	44.3647686285872	30.4697688635321	92.2396	41.0703	39.2658
88.7261979503602	44.3647686285872	30.4697688635321	96.0562	52.3857	26.7058
88.7261979503602	44.3647686285872	30.4697688635321	90.4865	46.0315	39.3528
88.7261979503602	44.3647686285872	30.4697688635321	85.9154	51.5363	38.6114
88.7261979503602	44.3647686285872	30.4697688635321	89.352	47.1855	40.3099
88.7261979503602	44.3647686285872	30.4697688635321	90.3356	51.1932	37.7625
88.7261979503602	44.3647686285872	30.4697688635321	94.4684	44.7163	40.2539
88.7261979503602	44.3647686285872	30.4697688635321	99.7789	45.6905	34.3678
88.7261979503602	44.3647686285872	30.4697688635321	97.5519	44.8528	38.2336
88.7261979503602	44.3647686285872	30.4697688635321	94.3452	48.7818	37.6589
88.7261979503602	44.3647686285872	30.4697688635321	95.1396	47.3596	38.3213
90.8562767481334	63.917731268684	34.9522460446194	81.1686	57.7423	31.0101
90.8562767481334	63.917731268684	34.9522460446194	87.1149	58.1702	24.9275
90.8562767481334	63.917731268684	34.9522460446194	88.0225	60.7529	26.1198
90.8562767481334	63.917731268684	34.9522460446194	88.7937	67.447	23.6857
90.8562767481334	63.917731268684	34.9522460446194	92.749	64.7326	27.0986
90.8562767481334	63.917731268684	34.9522460446194	93.3932	53.1876	39.0419
90.8562767481334	63.917731268684	34.9522460446194	94.4551	58.0456	35.6169
90.8562767481334	63.917731268684	34.9522460446194	99.9754	58.6633	29.714
90.8562767481334	63.917731268684	34.9522460446194	92.9131	56.6287	40.2251
90.8562767481334	63.917731268684	34.9522460446194	95.479	61.1306	33.7151
90.8562767481334	63.917731268684	34.9522460446194	95.4289	57.3916	42.7453
90.8562767481334	63.917731268684	34.9522460446194	99.7259	57.0659	38.9488
90.8562767481334	63.917731268684	34.9522460446194	98.4228	65.0226	33.0945
90.8562767481334	63.917731268684	34.9522460446194	95.4724	61.7777	41.2303
90.8562767481334	63.917731268684	34.9522460446194	99.0429	61.6589	39.3422
90.8562767481334	63.917731268684	34.9522460446194	93.9444	64.9	44.2206
90.8562767481334	63.917731268684	34.9522460446194	94.549	73.3405	36.7472
90.8562767481334	63.917731268684	34.9522460446194	95.9481	74.251	38.8025
98.4811837152763	49.6064465246068	38.6329043154183	101.7941	49.0832	29.2585
98.4811837152763	49.6064465246068	38.6329043154183	98.7715	55.3698	27.9452
98.4811837152763	49.6064465246068	38.6329043154183	103.0838	43.6629	35.7673
98.4811837152763	49.6064465246068	38.6329043154183	100.0845	45.3198	38.3951

Solution x	Solution y	Solution z	Original x	Original y	Original z
98.4811837152763	49.6064465246068	38.6329043154183	103.3956	43.6231	38.3961
98.4811837152763	49.6064465246068	38.6329043154183	103.8959	45.4099	37.4639
98.4811837152763	49.6064465246068	38.6329043154183	97.7455	51.8526	39.6885
98.4811837152763	49.6064465246068	38.6329043154183	98.1036	50.8139	41.2796
98.4811837152763	49.6064465246068	38.6329043154183	100.5945	52.9653	41.549
98.4811837152763	49.6064465246068	38.6329043154183	106.6231	51.946	40.2003
98.4811837152763	49.6064465246068	38.6329043154183	97.9579	54.2407	46.7851
98.4811837152763	49.6064465246068	38.6329043154183	105.6501	47.8555	48.2801
98.4811837152763	49.6064465246068	38.6329043154183	99.3413	60.508	43.9191
96.5000085776143	48.9716604850882	13.336915375993	95.7654	46.8722	1.8076
96.5000085776143	48.9716604850882	13.336915375993	94.1971	38.0204	14.8005
96.5000085776143	48.9716604850882	13.336915375993	89.6611	52.1615	6.6683
96.5000085776143	48.9716604850882	13.336915375993	92.8093	39.7693	16.6418
96.5000085776143	48.9716604850882	13.336915375993	97.0806	39.3994	12.7921
96.5000085776143	48.9716604850882	13.336915375993	94.5726	47.3613	8.9492
96.5000085776143	48.9716604850882	13.336915375993	94.3087	39.6383	18.4042
96.5000085776143	48.9716604850882	13.336915375993	98.2004	50.3921	3.9008
96.5000085776143	48.9716604850882	13.336915375993	96.8097	54.0588	2.5941
96.5000085776143	48.9716604850882	13.336915375993	93.2379	56.4517	4.9219
96.5000085776143	48.9716604850882	13.336915375993	102.0152	42.2262	11.91
96.5000085776143	48.9716604850882	13.336915375993	92.412	50.9961	13.3675
96.5000085776143	48.9716604850882	13.336915375993	89.3464	46.1786	22.3858
96.5000085776143	48.9716604850882	13.336915375993	98.0879	44.5657	15.6818
96.5000085776143	48.9716604850882	13.336915375993	100.3439	52.2486	6.1962
96.5000085776143	48.9716604850882	13.336915375993	98.2152	53.7701	7.2972
96.5000085776143	48.9716604850882	13.336915375993	91.9756	47.4725	20.0446
96.5000085776143	48.9716604850882	13.336915375993	98.3613	42.0392	20.5386
96.5000085776143	48.9716604850882	13.336915375993	100.6388	53.8259	6.8403
96.5000085776143	48.9716604850882	13.336915375993	95.46	44.379	21.4845
96.5000085776143	48.9716604850882	13.336915375993	99.5987	51.3246	10.6347
96.5000085776143	48.9716604850882	13.336915375993	104.1102	44.8822	12.643
96.5000085776143	48.9716604850882	13.336915375993	102.543	45.6081	13.7083
96.5000085776143	48.9716604850882	13.336915375993	103.8062	50.1176	9.3383
96.5000085776143	48.9716604850882	13.336915375993	93.0102	50.1223	20.798
96.5000085776143	48.9716604850882	13.336915375993	92.8209	56.9207	15.4027
96.5000085776143	48.9716604850882	13.336915375993	106.4442	49.0895	9.9061
96.5000085776143	48.9716604850882	13.336915375993	97.3108	57.82	10.7791
96.5000085776143	48.9716604850882	13.336915375993	98.9521	56.5952	10.596
96.5000085776143	48.9716604850882	13.336915375993	101.377	48.1816	18.5975
96.5000085776143	48.9716604850882	13.336915375993	100.6036	46.802	22.0951
96.5000085776143	48.9716604850882	13.336915375993	94.6877	57.1733	21.1304
96.5000085776143	48.9716604850882	13.336915375993	102.1595	55.9791	16.6639
96.5000085776143	48.9716604850882	13.336915375993	102.8738	56.4102	20.1678
86.1718447427174	37.6913325472627	3.50786977418176	75.73	42.7229	0.0066
86.1718447427174	37.6913325472627	3.50786977418176	90.6179	26.4649	2.7134
86.1718447427174	37.6913325472627	3.50786977418176	85.1876	33.113	2.1197
86.1718447427174	37.6913325472627	3.50786977418176	87.5726	32.8781	1.3636
86.1718447427174	37.6913325472627	3.50786977418176	93.4265	31.4744	1.0443
86.1718447427174	37.6913325472627	3.50786977418176	79.9479	46.2913	1.0177
86.1718447427174	37.6913325472627	3.50786977418176	96.3928	32.1668	2.4627
86.1718447427174	37.6913325472627	3.50786977418176	91.1655	36.0648	5.0962
86.1718447427174	37.6913325472627	3.50786977418176	80.8872	43.1227	9.5119
86.1718447427174	37.6913325472627	3.50786977418176	92.634	40.1716	1.8791
86.1718447427174	37.6913325472627	3.50786977418176	85.9182	41.843	9.5066
86.1718447427174	37.6913325472627	3.50786977418176	95.8598	39.2349	3.852
86.1718447427174	37.6913325472627	3.50786977418176	96.6284	43.246	1.131
86.1718447427174	37.6913325472627	3.50786977418176	89.5287	45.4109	8.5583
86.1718447427174	37.6913325472627	3.50786977418176	89.3668	41.343	14.5671
Route: 4 Length: 328.664963192961 Demand Met: 9942					
46.7602358504824	29.6835735900571	3.55049047620282	44.3651	39.5082	4.2576
46.3962414489044	35.6118988983978	7.01356253177125	50.3352	41.2014	16.9793
45.5245063679602	36.0345046052018	7.24798166715521	45.4526	36.121	9.3446
44.6563411714045	36.4578349663031	7.48203003947446	45.4903	38.3462	11.2293
43.7883998248079	36.8808025819212	7.71530865415014	43.7884	36.8808	19.8614
42.6752538573462	79.231821134506	7.71530858180289	34.9317	80.2335	16.9208
42.3940866966105	81.9547870241056	7.7153085090307	33.517	80.8699	6.7304
42.1187256852516	84.8038356746687	7.7153084363414	37.9917	90.5379	9.9912
41.8453320279132	87.4354320977205	7.71530836368721	34.7819	91.1147	8.0437
41.5754532523359	89.9467859131665	7.71530829106197	33.0573	97.9271	5.3628
41.3607422855708	90.7167863506755	7.71530821876561	35.0473	98.5367	9.9491
41.1498098104394	91.4310478191702	7.71530814642038	35.2297	94.8683	9.4168
40.9403788825238	92.1385889637941	7.7153080740527	33.9629	96.8355	4.449
40.7334429286216	92.8299809869763	7.71530800176104	37.3296	94.7968	3.7833
40.7334429286216	92.8299809869763	7.71530800176104	35.7481	97.1257	4.802
40.5284594246378	93.5108990318568	7.71530792937931	30.8807	93.5109	0.3364
40.5284597134628	93.9501863137776	7.83635374771941	37.0706	93.0168	1.0492
40.5284600023233	94.3916686118271	7.95801756824977	33.2241	90.2072	6.3544
40.5284600023233	94.3916686118271	7.95801756824977	34.0458	95.0903	5.2592
40.5284602913567	94.8408897060828	8.08009138317188	47.7789	92.5461	5.4276
40.5284602913567	94.8408897060828	8.08009138317188	48.9533	90.4759	7.3728

Solution x	Solution y	Solution z	Original x	Original y	Original z
40.5284605801066	95.3039733958104	8.20254775690317	43.1057	91.7939	5.1823
40.5284605801066	95.3039733958104	8.20254775690317	41.6896	94.8028	3.024
40.5284608688227	95.773718360846	8.32561936796747	40.2693	101.3043	8.6864
40.5284608688227	95.773718360846	8.32561936796747	35.5571	102.295	9.2843
40.5284611576391	96.2310635666909	8.4485910293511	40.5226	102.8002	1.3549
40.5284614464319	96.676327009631	8.57262949020842	45.465	105.2608	3.7217
40.5284614464319	96.676327009631	8.57262949020842	40.9527	105.6227	4.1926
40.5284617350243	97.0735938700669	8.6988301676927	42.9285	106.2179	5.6354
40.5284617350243	97.0735938700669	8.6988301676927	48.0764	105.8084	10.3389
40.5284620232248	97.4051496614715	8.82436384324402	51.1106	98.2963	5.5983
40.5284620232248	97.4051496614715	8.82436384324402	39.7333	98.7582	4.2197
40.5284623111358	97.7355035926724	8.95142393777369	42.5793	100.4271	14.8388
40.5284625990223	98.0650464593736	9.07804657195532	37.1983	106.347	12.5162
40.5284628869296	98.3867123513146	9.20424844367933	40.065	98.6098	6.7408
40.5284628869296	98.3867123513146	9.20424844367933	35.7859	98.3251	5.4495
40.5284631748972	98.7097160295511	9.33118524999903	35.7306	102.2767	4.1846
40.5284631748972	98.7097160295511	9.33118524999903	30.1816	102.1772	4.0412
40.5284634672857	98.8322267259799	14.6256542452468	31.6341	101.1443	12.133
40.5284634672857	98.8322267259799	14.6256542452468	31.6916	96.8159	17.5787
40.5284637598867	98.9549045681514	19.7962957922615	33.1686	108.6172	19.7963
41.1003817622028	98.95490475658	20.2068238973957	34.0163	93.2553	22.3961
41.6936028841389	98.9549049446689	20.6149875270308	40.9431	96.0349	18.7884
41.6936028841389	98.9549049446689	20.6149875270308	38.2186	96.6747	17.5328
42.2950727099143	98.9549051333069	21.0272394049736	53.9006	102.5381	21.0284
41.5269512645918	98.9549050642433	25.8406131837231	42.2565	98.7398	22.9258
41.5269512645918	98.9549050642433	25.8406131837231	45.0704	101.2748	27.009
40.7524907938707	98.9549049953336	30.9253128725265	42.9721	90.3177	28.7365
40.7524907938707	98.9549049953336	30.9253128725265	42.9226	100.4615	26.2167
39.9653175318421	98.954904926079	37.5359437282625	46.0729	100.678	36.5278
39.9653175318421	98.954904926079	37.5359437282625	38.189	100.3805	31.8594
39.1684907459411	98.9549048568459	46.4505971298301	36.8108	99.4487	34.5912
39.1684907459411	98.9549048568459	46.4505971298301	41.599	92.4813	48.0171
39.1684907459411	98.9549048568459	46.4505971298301	44.0393	95.7757	50.8289
39.1684907459411	98.9549048568459	46.4505971298301	46.5537	103.4177	45.8992
39.1684907459411	98.9549048568459	46.4505971298301	42.8352	101.6931	44.9574
39.1684907459411	98.9549048568459	46.4505971298301	39.3246	101.8921	42.5744
39.1684907459411	98.9549048568459	46.4505971298301	42.0156	103.5929	44.0945
39.1684907459411	98.9549048568459	46.4505971298301	39.196	99.7694	49.3378
39.1684907459411	98.9549048568459	46.4505971298301	36.1694	94.3523	52.0418
39.1684907459411	98.9549048568459	46.4505971298301	37.1788	95.0118	52.8478
39.1684907459411	98.9549048568459	46.4505971298301	39.1965	105.4524	44.823
39.1684907459411	98.9549048568459	46.4505971298301	35.3466	107.7036	41.395
39.1684907459411	98.9549048568459	46.4505971298301	32.8361	107.2479	41.504
39.1684907459411	98.9549048568459	46.4505971298301	31.4281	94.9219	54.3744
39.1684907459411	98.9549048568459	46.4505971298301	35.4006	103.6799	50.1937
39.1684907459411	98.9549048568459	46.4505971298301	29.7849	97.5299	53.9895
39.0879729642847	98.9549047879025	48.4221129862277	43.0828	99.6317	56.4863
39.0879729642847	98.9549047879025	48.4221129862277	42.0978	97.503	57.9578
39.0070462491851	98.9549047188876	49.8686917626983	47.126	99.3914	58.8698
39.0070462491851	98.9549047188876	49.8686917626983	44.7902	101.1589	57.6534
37.5051758157825	98.9549046496273	49.942184977114	42.4716	105.6496	56.7244
35.7224016996056	98.9549045805773	50.0150662473028	35.7224	107.36	58.7833
35.1425284058003	98.0018430082403	50.0150663006839	26.9511	99.1097	54.9389
34.5909551390857	97.0454931442844	50.0150663540522	26.55	96.735	54.3574
34.0607998182881	96.0984791212031	50.0150664074109	30.7482	95.8761	57.2879
33.5375755563398	95.1589217462862	50.0150664607195	35.2228	101.4244	59.0123
33.0044522954183	94.0605536367402	50.0150665141128	35.4152	92.5489	58.019
32.4673040430516	92.9849754503746	50.0150665675136	39.6285	91.4521	58.9959
31.8237236645676	91.9967002674107	50.0150666215162	33.6244	92.4492	56.3457
31.1775033893049	91.01159588246	50.0150666756518	29.376	80.5861	55.9809
31.1775029911191	91.0116153557374	40.207450898711	42.6808	88.2098	40.1619
31.1775029911191	91.0116153557374	40.207450898711	40.8939	84.3555	43.1765
31.1775029911191	91.0116153557374	40.207450898711	33.1881	90.5996	30.8927
31.1775029911191	91.0116153557374	40.207450898711	35.4073	87.2216	40.4202
31.1775029911191	91.0116153557374	40.207450898711	29.7064	94.0211	29.3487
31.1775029911191	91.0116153557374	40.207450898711	32.2034	92.5655	35.5696
31.1775029911191	91.0116153557374	40.207450898711	34.0464	97.1856	33.2284
31.1775029911191	91.0116153557374	40.207450898711	32.8593	93.0881	38.0081
31.1775029911191	91.0116153557374	40.207450898711	26.1674	96.1159	30.3905
31.1775029911191	91.0116153557374	40.207450898711	33.8351	99.3235	37.4512
31.1775029911191	91.0116153557374	40.207450898711	32.1756	91.0244	47.2823
31.1775029911191	91.0116153557374	40.207450898711	35.9551	95.9225	47.402
31.1775029911191	91.0116153557374	40.207450898711	32.4952	97.9758	48.1403
31.1775029911191	91.0116153557374	40.207450898711	29.8552	101.3038	43.5974
31.1775029911191	91.0116153557374	40.207450898711	26.6904	96.1713	46.6576
31.1775025713121	95.0969136010569	35.0156494395501	34.3074	104.3145	33.9426
31.1775025713121	95.0969136010569	35.0156494395501	31.3011	106.2109	32.3658
31.1775021508288	96.3932677741093	31.6406280826748	31.7064	96.988	25.1942
31.1775017302579	97.6989223009379	28.6324002006912	33.1638	109.6815	28.6324
30.8874618981036	97.1877133466808	26.5695671975017	21.5395	100.4343	27.1149

Solution x	Solution y	Solution z	Original x	Original y	Original z
30.6059445567941	96.6689072280605	24.4900544969596	28.2891	98.27	21.6276
30.3254045122237	96.1500719174733	22.4709669326604	28.1717	107.4546	19.2451
30.0664894948911	93.2486916968529	21.4234133731033	29.1897	96.4145	23.036
29.80798437159	90.2924401459553	20.3706738134713	29.3468	93.7461	14.2413
29.5498218440773	87.2179511600752	19.3557167503409	32.6009	89.9531	17.4409
29.2909569455074	84.0878653193511	18.3507363970276	29.5221	90.7635	22.4343
29.0321514605258	80.5176231727574	17.321056103372	31.4455	71.7336	19.6874
28.7720736610156	77.8068797205373	16.2702026082899	27.2709	73.9256	16.4296
28.5125799265786	75.2454046413755	15.2204086277084	25.7737	68.9159	14.4865
28.2542306410034	72.9250147204264	14.1767997570009	16.7224	69.1113	14.1768
28.2542312247014	72.9250145339361	12.4727510929772	24.5354	72.6275	12.2334
28.2542318084723	72.9250143475749	10.7758910312386	28.241	67.9653	9.5896
28.2542323922393	72.9250141609604	9.09868325613663	23.796	77.2181	9.3562
28.2542329761083	72.9250139746512	7.42145237517409	26.6151	77.1467	3.8306
28.254233560017	72.9250137885277	5.79600476388231	21.1184	76.9048	10.6601
28.254233560017	72.9250137885277	5.79600476388231	23.4089	84.0628	5.796
28.9762030449629	72.145344421747	5.35965430238621	21.3934	72.6127	7.7423
28.9762030449629	72.145344421747	5.35965430238621	22.1344	71.2137	11.8857
29.764795305126	71.3757854987695	4.90896976172623	24.5076	73.115	4.3052
30.5700512796008	70.6045271713705	4.45904121406552	25.4767	75.481	0.001
30.5700512796008	70.6045271713705	4.45904121406552	23.527	73.6169	0.5641
31.4397262430821	69.8051890258182	4.02114550992883	22.9431	70.0987	4.2047
32.3604709100029	69.0077747278049	3.58319954757867	22.8228	67.5784	3.2098
33.3745462346218	68.2223580972584	3.14619184004251	31.0449	71.9995	0.0029
34.4025760498894	67.4292532775152	2.71207156070966	31.4906	71.3219	1.4719
35.4475709544548	66.628341279026	2.27915374049185	33.839	67.1668	7.1332
36.5038763176136	65.8281818629534	1.84235035575469	31.4187	76.5703	2.7936
39.069536912269	42.8967441707826	1.38534331131397	37.4272	33.8061	3.3013
41.7649997858311	35.1105704007781	0.925001596413948	42.8212	36.4305	1.5446
44.462642963637	27.220068128927	0.464413113246648	45.6407	35.658	2.8521
Route: 5 Length: 398.633559850537 Demand Met: 9689					
29.9862405681171	14.1304339597214	12.7739326192085	26.4488	5.1021	19.0029
25.5192066567754	32.920761814936	15.5684294120524	18.7531	32.536	21.0115
21.9430810996505	54.2626154302847	18.0697060963276	23.9369	61.5866	18.0383
21.9430810996505	54.2626154302847	18.0697060963276	22.6268	64.3936	19.9605
18.2117055237087	58.2908980509914	20.3855013859541	9.15690000000001	61.6426	15.1483
18.2117055237087	58.2908980509914	20.3855013859541	7.6803	61.1857	24.6436
17.325523881711	60.3075583245418	22.0925418692922	14.5018	68.1646	16.8217
17.325523881711	60.3075583245418	22.0925418692922	13.2613	67.7948	17.1077
16.4978731494666	61.8310448107809	24.2218435146835	12.0587	67.8257	18.5408
15.6988860773779	63.2431075715524	26.6334211383354	12.5389	66.9051	22.2814
15.6988860773779	63.2431075715524	26.6334211383354	10.5042	66.7806	23.1982
14.9311514371429	64.5959216655161	29.3527872770298	22.0857	71.4539	26.9077
14.1067921220322	65.8122242198754	32.3374881547665	15.0856	70.6386	28.9208
13.28028468911	66.9993669624477	35.504592770901	14.7433	68.1941	29.0053
13.28028468911	66.9993669624477	35.504592770901	12.0444	66.3239	28.7604
12.4556911358484	68.1953981993921	39.7657157064896	10.4334	62.822	33.9682
12.4556911358484	68.1953981993921	39.7657157064896	10.7344	66.9849	31.9545
12.4556911358484	68.1953981993921	39.7657157064896	6.67010000000001	63.5082	34.9077
12.4556911358484	68.1953981993921	39.7657157064896	8.3117	72.2049	29.6247
12.4556911358484	68.1953981993921	39.7657157064896	7.0214	70.8048	31.3366
12.4556911358484	68.1953981993921	39.7657157064896	6.09139999999999	73.9114	36.5077
12.4556911358484	68.1953981993921	39.7657157064896	5.2812	65.5492	44.5709
12.4556911358484	68.1953981993921	39.7657157064896	0.309600000000003	68.1954	39.7657
15.6835705820171	70.7357460853257	40.5069347087883	11.6475	70.8021	30.9107
20.2645880683025	73.3029729343976	41.3339267622375	26.4747	67.9787	32.7219
20.2645880683025	73.3029729343976	41.3339267622375	31.7515	71.3679	39.9054
20.2645880683025	73.3029729343976	41.3339267622375	26.2205	72.9044	33.175
20.2645880683025	73.3029729343976	41.3339267622375	26.4833	65.6457	42.68
20.2645880683025	73.3029729343976	41.3339267622375	18.9682	67.082	33.9115
20.2645880683025	73.3029729343976	41.3339267622375	22.8762	75.7017	33.805
20.2645880683025	73.3029729343976	41.3339267622375	26.4587	69.6793	44.9112
20.2645880683025	73.3029729343976	41.3339267622375	24.4797	75.354	37.647
20.2645880683025	73.3029729343976	41.3339267622375	31.105	77.2121	42.4385
20.2645880683025	73.3029729343976	41.3339267622375	18.7356	77.2891	30.4652
20.2645880683025	73.3029729343976	41.3339267622375	24.3218	77.9732	38.2426
20.2645880683025	73.3029729343976	41.3339267622375	27.1736	83.2653	40.5956
20.2645880683025	73.3029729343976	41.3339267622375	12.0097	66.7734	42.888
20.2645880683025	73.3029729343976	41.3339267622375	11.4886	67.7219	43.0579
20.2645880683025	73.3029729343976	41.3339267622375	12.73	75.2001	37.6748
20.2645880683025	73.3029729343976	41.3339267622375	24.7401	75.4523	49.5075
20.2645880683025	73.3029729343976	41.3339267622375	8.8648	72.0358	37.3381
20.2645880683025	73.3029729343976	41.3339267622375	14.0233	68.3418	48.6515
20.2645880683025	73.3029729343976	41.3339267622375	9.45780000000001	72.6847	40.961
20.2645880683025	73.3029729343976	41.3339267622375	9.3844	71.5303	46.4336
21.8181801571446	73.302973079468	45.9282239625073	25.3366	76.538	54.326
21.8181801571446	73.302973079468	45.9282239625073	24.1578	73.3792	57.4094
23.0652888014594	73.3029732239591	46.98772627903	27.6433	72.5657	51.9251
24.2778914703008	73.3029733684507	48.0202901405875	32.2488	71.8762	47.8257
24.2778914703008	73.3029733684507	48.0202901405875	32.697	74.6737	51.2201

Solution x	Solution y	Solution z	Original x	Original y	Original z
25.3265834665813	73.302973512829	49.0309918788395	26.9783	71.0141	56.5271
26.3666807222924	73.3029736572638	49.9954867723651	35.1535	70.6086	57.9365
21.0270635717143	73.3277233965926	49.9954861516151	18.2654	71.5277	59.9496
16.6443714505346	73.3524942781886	49.9954855301711	15.3124	65.205	52.7286
16.6443714505346	73.3524942781886	49.9954855301711	14.2076	63.0144	54.8035
13.8425970717857	73.3776802758886	49.9954849080196	15.4332	72.9689	53.8868
11.0023204544405	73.4028700892381	49.9954842857759	10.9416	69.7746	52.0032
8.18326350873929	73.4280838723999	49.9954836635208	8.4928	63.9998	55.0759
8.18326350873929	73.4280838723999	49.9954836635208	11.4442	66.9869	57.5373
4.92861010764793	73.4535848209293	49.9954830402564	4.4426	63.6871	51.0243
4.92861010764793	73.4535848209293	49.9954830402564	4.7342	63.0935	56.3188
4.04035617818525	77.0329686155554	49.9954823896374	4.0089	72.186	49.5614
4.04035617818525	77.0329686155554	49.9954823896374	-4.2807	74.2616	57.1387
3.31927240938404	83.3840023409656	49.9954817372346	-1.23350000000001	86.0108	56.7294
2.61629397316707	89.1789621907577	49.9954810843119	0.580200000000005	93.7511	50.7296
2.61629397316707	89.1789621907577	49.9954810843119	-0.0468000000000046	93.7668	57.0052
1.92938014904011	93.6082621066295	49.9954804307088	-2.30370000000001	90.7079	58.2529
1.92938014904011	93.6082621066295	49.9954804307088	-7.5489	96.9207	56.8305
1.9293796769488	93.6082635240384	49.7166759948821	1.1743	92.9818	59.2535
1.92937920496595	93.6082649413303	49.4298816842564	4.95789999999999	99.4405	59.5277
1.92937872468079	93.6082662970011	45.6873033470609	3.4538	93.5151	43.6356
1.92937872468079	93.6082662970011	45.6873033470609	3.55029999999999	90.3653	48.0124
1.92937824427872	93.6082676531448	42.0136882441793	0.619299999999996	91.0377	37.0534
1.92937824427872	93.6082676531448	42.0136882441793	1.20229999999999	90.7259	43.7677
1.92937824427872	93.6082676531448	42.0136882441793	-4.1255	85.596	43.5867
1.92937824427872	93.6082676531448	42.0136882441793	2.1469	96.6722	44.5395
1.92937824427872	93.6082676531448	42.0136882441793	-3.26390000000001	94.8889	48.3647
1.92937776495481	93.6082690111728	37.5563140641007	-1.86190000000001	98.5581	36.524
1.92937728585918	93.6082703685772	33.2651118273438	7.8142	89.6258	27.2865
1.92937680622393	93.6082717268422	29.8586557814245	-0.735100000000003	89.6931	26.6301
1.92937680622393	93.6082717268422	29.8586557814245	3.5998	89.8159	36.4775
1.92937632659763	93.6082730863998	26.1409993703505	3.5924	94.7451	26.9481
1.92937632659763	93.6082730863998	26.1409993703505	-2.5612	92.1356	23.79
1.92937632659763	93.6082730863998	26.1409993703505	8.0611	104.093	26.141
1.92937632659763	93.6082730863998	26.1409993703505	-0.338999999999999	97.1979	25.6607
1.92937632659763	93.6082730863998	26.1409993703505	3.11839999999999	98.924	29.022
1.92937632659763	93.6082730863998	26.1409993703505	1.64530000000001	95.7178	31.8751
1.92937632659763	93.6082730863998	26.1409993703505	-0.311599999999999	97.6012	28.6474
1.92937632659763	93.6082730863998	26.1409993703505	3.1448	100.72	31.1491
1.92937632659763	93.6082730863998	26.1409993703505	-3.1358	95.2162	31.8855
1.92937632659763	93.6082730863998	26.1409993703505	-5.5457	98.4014	26.4862
-0.661284553312598	93.6082732620325	15.5007921085717	-12.8049	93.8535	15.5008
-0.475995922342491	93.6082734149046	14.105832490294	-6.68600000000001	94.6391	7.4364
-0.288697780230379	93.6082735677052	12.8058007034123	-0.171000000000006	97.1566	2.8672
-0.288697780230379	93.6082735677052	12.8058007034123	-2.1508	94.1499	7.6254
-0.100956447563789	93.6082737201603	11.763493213966	-0.100899999999996	90.0487	0.1507
-0.100956447563789	93.6082737201603	11.763493213966	2.57040000000001	90.3092	4.6781
0.744612978834454	93.9793376074464	11.7634949405908	4.77370000000001	93.7785	6.1602
0.744612978834454	93.9793376074464	11.7634949405908	-1.9602	93.9224	5.6614
1.5868471847419	94.3524441651495	11.7634966691316	8.1477	101.1634	5.5645
2.30295496238693	94.6996134743906	11.7634984012474	2.55330000000001	99.1767	7.9857
2.30295496238693	94.6996134743906	11.7634984012474	3.81100000000001	100.5395	9.9764
3.01619478965242	95.0419330541907	11.7635001343815	3.0162	107.1796	11.3112
5.74831465473082	91.3249555753986	13.0532270639973	9.17	97.1621	20.3835
5.74831465473082	91.3249555753986	13.0532270639973	6.3198	96.0864	20.0555
5.74831465473082	91.3249555753986	13.0532270639973	1.4019	97.5847	15.4849
5.74831465473082	91.3249555753986	13.0532270639973	0.613799999999998	95.4238	16.9249
8.67137430200488	82.694787000337	13.9380192202961	2.7376	84.0979	3.4333
8.67137430200488	82.694787000337	13.9380192202961	17.9606	81.6588	21.6946
8.67137430200488	82.694787000337	13.9380192202961	5.8502	91.8647	13.1882
8.67137539587587	79.8293828317067	14.2820935264563	7.5677	74.3816	13.1566
8.67137648988964	77.2127760034788	14.6270040370286	13.7649	76.0563	18.1156
8.67137648988964	77.2127760034788	14.6270040370286	8.0472	76.1743	13.1381
8.67137758334749	74.7266254672608	14.9707755562652	6.65640000000001	74.2265	20.3804
8.67137867714649	72.2832586382988	15.311556649103	9.1707	70.0865	21.5855
8.67137977099455	69.9356709725012	15.6485700342401	6.9842	66.7632	27.251
8.67137977099455	69.9356709725012	15.6485700342401	9.9143	75.8382	26.191
8.86456710435557	66.8126962472651	12.4004470232418	9.6606	65.5604	9.552
9.05778114223096	63.7780282681368	9.2828935913327	12.0877	66.3858	4.5331
9.05778114223096	63.7780282681368	9.2828935913327	10.0835	69.723	3.7551
9.05778114223096	63.7780282681368	9.2828935913327	0.483800000000002	63.8626	0.7436
9.05778114223096	63.7780282681368	9.2828935913327	9.00020000000001	73.0359	5.8372
9.05778114223096	63.7780282681368	9.2828935913327	1.76609999999999	66.5446	12.6159
13.515809206248	56.1559842492699	9.09252420014644	15.1112	64.361	7.2726
13.515809206248	56.1559842492699	9.09252420014644	14.2239	63.9607	10.3191
17.7255174848397	21.7512674318726	8.90233535697198	7.8039	17.6061	5.7787
17.7255174848397	21.7512674318726	8.90233535697198	19.8821	27.2321	11.7559
17.7255174848397	21.7512674318726	8.90233535697198	20.5322	21.5891	20.6595
18.5648875136683	16.4789225588243	5.46105255670984	16.9397	16.157	0.3423
19.4163225184224	11.3066908613179	2.29437930599896	19.4163	-0.8394	2.2943

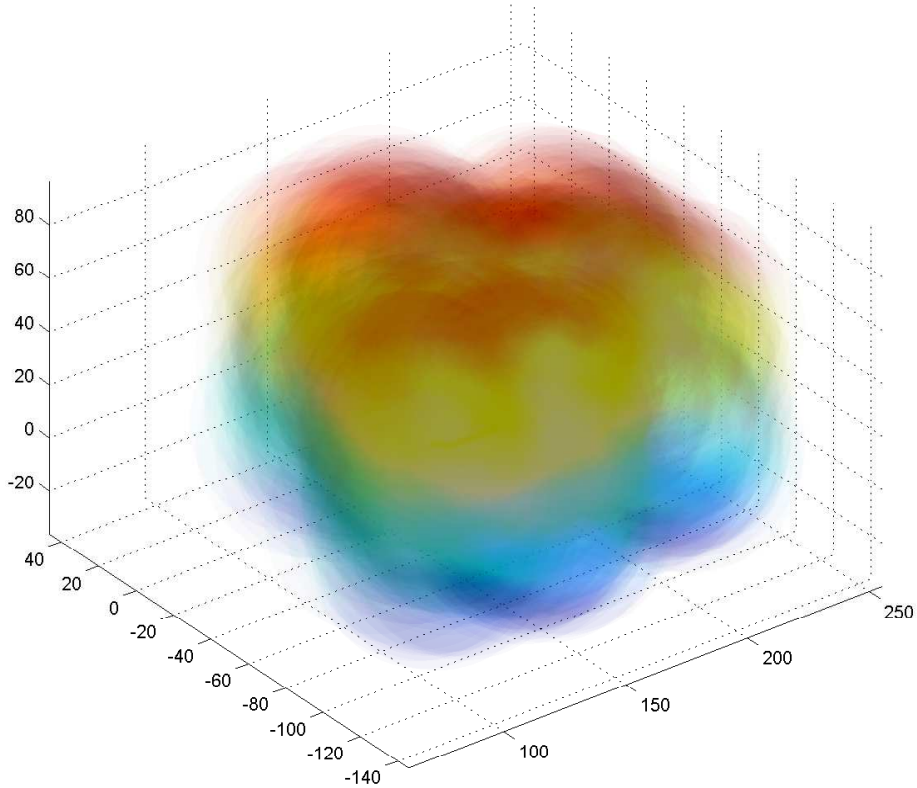
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 6 Length: 191.487703226788 Demand Met: 8724					
51.0299112321748	26.7928982310382	2.94103301981623	58.126	35.24	1.1949
52.0162631721086	28.019238175741	8.37566951252571	57.9508	29.6187	7.6435
52.9683482942351	29.2752604553968	14.323703155592	52.5136	31.162	22.8965
53.9676627159345	30.5437380379523	17.6464461746915	58.6228	31.6703	20.587
54.954490135122	31.8376073763562	20.7917620044811	50.5738	30.8854	25.5173
56.026461206397	33.1955986256436	23.6162652098863	61.1622	34.1592	24.5106
57.0708098781531	34.5775224455433	26.490271375919	64.9829	35.6055	23.509
57.0708098781531	34.5775224455433	26.490271375919	64.4232	44.0581	27.3148
57.2756398750967	34.7593034927694	27.4106192983481	56.2795	36.0371	23.7369
57.2756398750967	34.7593034927694	27.4106192983481	58.8785	37.4935	28.0133
57.4822408990524	34.9411757672088	28.378289606454	48.325	36.101	31.2943
57.4822408990524	34.9411757672088	28.378289606454	55.9275	34.3566	30.6301
57.7032754787726	35.1242259180011	29.3077834184552	51.6292	37.4529	39.3047
57.7032754787726	35.1242259180011	29.3077834184552	53.589	37.6567	38.7584
58.1039004277307	35.2843291900128	29.5212683844744	51.0819	30.8837	36.7669
58.1039004277307	35.2843291900128	29.5212683844744	54.3132	33.4794	38.814
58.6005629606557	35.4522938810859	29.7134833826274	55.4854	26.8201	32.387
59.1200195019804	35.626495313091	29.9053664329296	58.5931	27.1316	32.5338
59.6487728028455	35.8060833412831	30.0971981047362	58.4334	33.3219	33.0094
60.1868304217019	35.9866315518842	30.2893020299306	62.464	33.4003	33.7046
60.1868304217019	35.9866315518842	30.2893020299306	63.5739	32.9982	33.2424
60.7221530753915	36.1693703475864	30.4814319252283	60.9493	37.7343	34.646
60.7221530753915	36.1693703475864	30.4814319252283	63.8645	34.3723	36.4179
61.2610733095955	36.35223198972	30.6718063381088	63.453	34.6286	41.047
61.2610733095955	36.35223198972	30.6718063381088	65.3289	43.5846	33.8262
61.7772622940742	36.5314525067882	30.8488417110198	65.4552	32.6167	36.7679
62.2867320766022	36.7121597753243	31.0240995380519	60.1802	30.671	38.4138
62.815676219493	36.897314635361	31.1953926319595	60.463	30.4795	30.5011
62.815676219493	36.897314635361	31.1953926319595	64.1748	30.2745	31.4674
63.363054399152	37.0867247036997	31.3689351844633	63.132	27.7543	33.1939
63.363054399152	37.0867247036997	31.3689351844633	62.9268	27.0211	37.7555
63.9523283245122	37.4234488554179	31.5095062508962	63.8119	26.0212	34.0563
64.5619029916898	38.0632326498092	31.6452278352668	67.5765	27.7962	32.158
65.1443572132431	38.9284192374657	31.7814461641511	69.5886	28.6002	31.4169
65.6567714771601	40.9571003024947	31.9188797743172	72.4926	42.7909	40.5929
66.1023585518078	42.752485473856	32.0472610463555	72.4429	44.8985	35.9587
66.5368376803557	44.5256789849446	32.1754096559557	72.9378	43.4347	40.5471
66.9417188646357	46.4124794010328	32.2995831399065	72.0385	47.603	37.589
67.3410939700485	48.2794808724449	32.4233438950634	69.8977	54.8286	42.1718
67.5869513193579	48.4847189397651	32.4936570918983	70.6191	48.182	36.9413
67.8332886652362	48.6911672241007	32.5643324054751	69.1689	51.2673	37.9561
68.0809000363781	48.8976284418619	32.635147947872	69.1565	53.343	39.551
68.3292516662258	49.1026596088554	32.7055572378341	70.0624	50.1219	34.6274
68.5789113089314	49.3089334360089	32.7765076949873	68.5789	56.8701	42.2821
68.7523913616645	49.3089333219911	31.8333474852394	68.2826	55.0673	33.7791
68.9275777571098	49.308933207946	30.8877651967997	73.2116	57.797	29.252
68.9275777571098	49.308933207946	30.8877651967997	67.4683	58.2291	37.5546
69.1049153492599	49.3089330951339	29.5350719706383	76.0043	50.5809	30.4596
69.1049153492599	49.3089330951339	29.5350719706383	73.8072	55.2741	29.1095
69.2793949229647	49.3089329820578	28.2286860525377	70.8564	51.5507	32.2844
69.2793949229647	49.3089329820578	28.2286860525377	70.2011	52.705	34.7749
69.4548983242085	49.3089328688378	26.7076984202745	67.7991	50.1342	31.512
69.4548983242085	49.3089328688378	26.7076984202745	66.949	50.6855	34.7495
69.6349582024657	49.3089327555628	24.6992975378699	71.2619	53.5794	21.4252
69.6349582024657	49.3089327555628	24.6992975378699	70.694	53.8562	23.1583
69.8152492969357	49.308932642001	22.9794759200308	70.1344	58.5671	20.707
69.9955136502259	49.3089325281834	21.4275293215169	61.2083	54.3519	23.523
69.9955136502259	49.3089325281834	21.4275293215169	66.0257	55.1875	22.0287
70.1860010665512	49.3089324140389	19.8012711458825	68.022	53.7678	15.3935
70.3782395809487	49.308932299705	18.3246993799214	72.0723	49.2863	13.9841
70.3782395809487	49.308932299705	18.3246993799214	71.8965	50.0142	14.8598
70.570254012526	49.3089321850833	17.0225723672636	70.7664	48.6137	12.8047
70.7631643551928	49.308932070379	15.7943577279747	70.6462	49.6735	6.8503
70.7631643551928	49.308932070379	15.7943577279747	71.0505	50.768	8.8572
70.9584233931142	49.3089319552616	14.8628882275709	72.1444	51.2772	8.2689
70.9584233931142	49.3089319552616	14.8628882275709	76.2244	51.9684	6.7104
71.1493852298983	49.3089318396848	14.1498962915118	70.5527	57.3223	8.5137
71.1493852298983	49.3089318396848	14.1498962915118	69.9782	57.1009	12.9468
71.3422931954022	49.3089317231868	13.5069766346675	72.7757	56.7077	5.4576
71.5335478175458	49.3089316059735	12.9956549015659	67.8488	53.6384	2.957
71.5335478175458	49.3089316059735	12.9956549015659	70.916	53.3608	4.8842
71.7390774937335	49.3089314885633	12.6625573804162	68.7356	47.889	4.3235
71.7390774937335	49.3089314885633	12.6625573804162	72.9198	44.5581	6.5665
71.9492792914724	49.3089313704363	12.3509483711438	73.6395	46.5004	2.2066
71.9492792914724	49.3089313704363	12.3509483711438	73.5268	49.2611	4.4383
72.1591183046582	49.308931251189	12.0721821184923	73.911	51.0144	2.5794
72.1591183046582	49.308931251189	12.0721821184923	73.6611	50.4924	3.9757
72.3694326456934	49.3089311309214	11.8187951174259	75.2757	50.6388	0.889
72.575422467662	49.3089310102079	11.5992596686553	82.0477	53.0979	5.7932

Solution x	Solution y	Solution z	Original x	Original y	Original z
72.7530104823976	49.3089308905772	11.3965171396052	84.6532	51.7406	11.3965
72.323208439412	48.1792365576542	11.1397585689618	76.5498	52.218	12.9878
71.8907724103701	46.9900999037316	10.8810331879092	77.8794	45.0468	10.8339
71.4535020748409	45.8283795354316	10.6224280257303	77.5882	39.4219	14.211
71.0004013262413	44.8120805793694	10.3592129207861	71.8327	48.0379	13.6369
70.5544587049415	43.7865762699992	10.0939416748366	77.6289	48.4559	5.3003
70.0789363013204	42.655350159912	9.83628371273839	73.2283	44.0709	14.6285
69.6044318956537	41.5309907816953	9.57533947908661	73.6428	45.1426	7.6389
69.1283872610134	40.3834773602948	9.31670990416015	75.9022	40.5634	8.2476
68.6408362000319	39.2569865139117	9.05989176492479	75.4748	37.8532	8.3059
68.1403977872397	38.1719019446598	8.80459482788709	72.6191	32.6684	16.6889
67.6096399741268	37.2944414922915	8.5320633709589	67.7055	32.9993	17.0949
67.0884745050991	36.4941445078708	8.24700942552099	67.4673	33.2544	9.192
66.5740110626904	35.7192978678613	7.96272208069957	66.9624	36.7077	4.2616
66.0646496558048	34.9451069187498	7.68317721131026	62.6603	37.129	7.3175
65.5698658500074	34.1651982008849	7.40568305763646	61.5106	34.0654	15.2705
65.5698658500074	34.1651982008849	7.40568305763646	64.2717	31.7627	18.8904
65.1518727514685	33.5854323049764	6.79748308368308	66.5887	34.1226	10.8677
65.1518727514685	33.5854323049764	6.79748308368308	69.1853	30.9522	12.1629
64.729764156626	33.0179615786913	6.16279880644174	66.7482	27.6121	12.1372
64.729764156626	33.0179615786913	6.16279880644174	66.7818	30.0369	13.8618
64.3090260666393	32.4929437892054	5.45446163256871	68.2062	28.5319	10.0866
63.8860001119899	31.9829011368604	4.7260924341817	73.7989	28.6287	7.3132
63.8860001119899	31.9829011368604	4.7260924341817	72.2401	34.2889	7.5435
63.3650413219904	31.4954683518549	3.93418592573917	63.2951	31.2899	8.2512
62.8588624781203	31.0104201106617	3.12695697226399	67.6588	29.7348	5.9837
62.3554877969221	30.5310409566036	2.31006518212402	68.3701	31.308	4.6701
62.3554877969221	30.5310409566036	2.31006518212402	71.5231	31.8286	8.0149
61.8009574511183	30.0760226328275	1.38481975100553	68.0366	38.8903	2.9918
Route: 7 Length: 280.151695977558 Demand Met: 9963					
56.6313405673532	13.2275203749396	19.0745135162573	60.5785	6.8128	27.9807
58.6218323881898	18.9991413784611	20.1968129596815	55.9782	19.9329	26.5423
60.770577428845	24.6965562445256	21.263808603216	62.5649	23.4331	22.9907
62.9540725504789	30.8989995508507	22.3242952552859	67.242	26.9141	23.9429
65.0767005864097	39.2233074119996	23.3775253393521	67.5609	49.631	28.0783
66.4654598686943	40.1168772271157	24.103419672557	70.4096	46.4113	26.9931
67.8071962712277	40.9690245285606	24.8167951499376	73.2561	47.9132	17.0605
68.6049657361716	41.5148488705709	26.3901217379387	75.5201	48.6107	22.753
69.3194216689274	42.0176206191885	28.2525176076607	76.379	48.6237	27.9163
69.989036978794	42.4982608528216	30.161217980357	67.6648	48.1141	30.5928
70.6752926027869	42.9727615439177	32.0863416590823	75.5587	49.1352	25.3998
70.6752926027869	42.9727615439177	32.0863416590823	77.9223	44.6051	30.7678
71.3069602754	43.4234134038242	35.0545719303655	81.9079	40.1742	36.8216
71.3069602754	43.4234134038242	35.0545719303655	75.9853	41.4015	43.6031
71.7935331425095	43.9171796148444	36.8674795689417	65.211	38.9167	43.4098
71.7935331425095	43.9171796148444	36.8674795689417	70.5497	45.0925	44.08
72.3297313725243	44.4433479707127	38.2212055178122	72.7013	43.6681	47.6828
72.8694469099045	44.9759932112445	39.3742436804432	77.9078	47.2474	41.2613
73.402772713033	45.506756727958	40.5226502847256	79.533	47.2684	42.1428
73.9265862266064	46.036623336358	41.6687127038232	78.2967	50.1808	43.2865
73.9265862266064	46.036623336358	41.6687127038232	77.4079	49.147	51.5989
74.4210374500842	46.5369158433527	42.5079790275463	74.8417	48.5823	43.578
74.9190906842824	47.0374857709877	43.3511415435335	74.3979	53.0985	48.6112
74.9190906842824	47.0374857709877	43.3511415435335	74.4488	50.3129	52.3971
75.4275512915379	47.5163423219008	44.0885863203781	72.0955	52.6394	50.8408
75.9510726886186	47.9826708775306	44.7870042047914	70.1179	52.2878	46.5219
76.4934882873201	48.4432276955647	45.4836073052176	67.4955	46.0347	52.8305
77.7028312191173	48.974414078173	45.931116722402	73.2401	49.0047	54.3428
79.0368235451071	49.5086148062643	46.3564891340239	80.0004	48.0282	43.1849
80.3833024684842	50.0488414802878	46.7874512337582	76.4125	46.981	46.4216
81.8062884753787	50.5998058968829	47.2212127252886	73.7963	57.8273	45.2128
83.9826919198343	51.1004017541555	47.6681106889009	89.2688	56.3248	44.4917
85.9398096648374	51.589916385239	48.1237354163969	85.8477	60.7859	54.7762
87.8658080812145	52.006953776304	48.5323230247486	86.2321	62.729	51.1705
90.2672735586978	52.3773695291053	48.9297807332709	90.2672	64.2791	51.3539
90.6537588098151	52.2439681502548	48.9297809308048	94.8477	58.3247	47.7413
90.6537588098151	52.2439681502548	48.9297809308048	94.6583	60.3511	50.0221
91.0471164129406	52.1103356584162	48.9297811257706	91.1842	48.1207	54.4953
91.4454563479338	51.9764251378531	48.9297813206298	96.2485	47.1277	52.4491
91.8439947733481	51.8423284846263	48.929781515466	101.161	45.7653	49.9947
91.8439947733481	51.8423284846263	48.929781515466	102.9297	48.0592	51.9744
91.9841226300863	51.7379166615552	48.929781710041	98.9198	48.0008	44.9228
91.9841226300863	51.7379166615552	48.929781710041	100.8862	48.4618	50.2894
92.1214056946692	51.6334211386036	48.9297819052227	95.0304	53.2116	46.2852
92.2589334435832	51.5289334203481	48.9297821010368	93.3823	48.5086	44.2946
92.3971807772607	51.4244819741406	48.9297822979171	92.1982	53.9806	59.5699
92.5355275533931	51.3194995804618	48.9297824917898	99.5817	52.1789	51.8005
92.6728299928961	51.2141777960957	48.9297826880644	97.7133	51.9341	48.5236
92.8098747848815	51.1085294701307	48.9297828845437	99.0651	51.1078	59.3413
92.8098750390603	49.302976614486	48.9297829073685	94.5838	45.9916	57.9488

Solution x	Solution y	Solution z	Original x	Original y	Original z
92.809875292999	47.6826770123451	48.9297829298539	91.9732	45.8332	46.1527
92.809875547749	46.1225650217565	48.9297829525222	90.0385	42.8005	44.3862
92.8098758035785	44.652229180109	48.9297829754131	90.4784	41.2284	44.1276
92.8098760602788	43.2626355377586	48.9297829985115	93.2846	41.9379	42.3812
92.809876317187	41.9140275711853	48.929783021846	96.2085	41.8253	45.162
92.8098765734636	40.5824139886927	48.9297830453118	94.5355	44.3621	59.1041
92.8098768278707	38.8315841686143	48.9297830676284	90.1236	40.724	54.2833
92.8098770825206	37.0378086478607	48.9297830897608	86.5983	36.2039	44.7429
92.8098773389025	35.2972144544664	48.9297831121649	85.065	35.2948	58.2863
93.381127404409	34.8446542511211	48.9297830396454	91.8795	37.1845	41.8015
93.965731588983	34.3860371169644	48.9297829667739	88.2545	36.066	42.1212
94.5981205197441	33.9213232932793	48.9297828931363	92.4351	33.0022	54.3205
94.5981205197441	33.9213232932793	48.9297828931363	96.2582	32.5713	56.693
95.2507858091163	33.4517482548498	48.9297828196495	104.0844	32.9988	51.1923
95.2507858091163	33.4517482548498	48.9297828196495	98.0763	43.3554	53.563
95.7810965441135	32.8411461252684	48.9297827460605	95.1298	37.6897	58.9361
96.3261451915195	32.1930368482658	48.9297826731039	100.5275	34.9543	58.1047
96.8452955155918	31.5611528622932	48.9297826005764	98.3827	22.3334	54.4737
97.3558052928921	30.985220961379	48.929782527387	101.1976	33.4905	53.5496
97.8632910551955	30.4102016271108	48.9297824540608	99.0428	19.6959	54.528
97.8632916833839	30.4102017152217	48.134246640291	101.7295	28.4449	56.1482
97.8632923113187	30.4102018030101	47.2617788957592	102.211	28.3893	55.4005
97.8632929388991	30.4102018905499	46.2738937838953	100.384	25.6874	43.9589
97.8632935665629	30.4102019784658	45.3137918255914	98.5859	34.5756	44.3792
97.8632941943783	30.4102020663011	44.3696352442374	91.0332	34.8187	52.6374
97.8632948206302	30.4102021539897	42.4216973230173	106.6895	31.0233	49.137
97.8632948206302	30.4102021539897	42.4216973230173	107.8221	37.3636	42.4217
97.8443748453954	30.3784089830326	41.6583403193477	95.0864	33.2234	41.4865
97.8255229921037	30.3466069785472	40.9003603183458	96.5473	37.5774	41.1201
97.806708618574	30.3147205696749	40.1452891124756	105.5782	30.6326	47.1426
97.787833737259	30.2827748937709	39.2778722242487	101.5683	27.6266	39.8262
97.787833737259	30.2827748937709	39.2778722242487	106.1692	29.0085	43.7624
97.7689078561498	30.2508339457766	38.3550606346993	92.942	26.4511	38.6789
97.7500376364316	30.2189545535693	37.4371667545978	97.1838	29.5842	37.1942
97.7311794993143	30.1870798468054	36.5254499423026	98.5493	33.1624	37.7737
97.7123040620187	30.1551472041227	35.6110169230443	93.6487	25.1273	31.9089
97.7123040620187	30.1551472041227	35.6110169230443	97.4429	30.1528	28.42
97.6934562172331	30.1232875361828	34.779942972725	95.8908	32.6754	36.0409
97.6746030792666	30.091382752804	33.9463687839224	90.6435	28.0536	25.8632
97.6746030792666	30.091382752804	33.9463687839224	97.5011	28.0267	29.587
97.6558237857219	30.059573564765	33.2673091795943	93.9312	28.9768	31.8553
97.6370725031562	30.0277943085431	32.5946169914696	97.3283	27.0933	33.194
97.6370725031562	30.0277943085431	32.5946169914696	96.6051	36.0943	31.9245
97.6183332909419	29.9959929632157	31.9263182453378	104.9423	23.521	33.0938
97.5995337403637	29.9643536294618	31.2504121533745	93.6941	39.0671	28.969
97.5995337403637	29.9643536294618	31.2504121533745	98.4033	39.6451	29.8224
97.5807908494674	29.932359856805	30.6064519650361	97.0063	39.6578	31.3742
97.5807908494674	29.932359856805	30.6064519650361	108.656	34.8419	30.8419
97.4435858052502	29.822007451563	25.595025188707	103.4615	37.3033	20.8908
97.4435858052502	29.822007451563	25.595025188707	99.6903	41.4772	23.4888
97.2862967748376	29.5985721810037	24.7554762792626	98.9301	33.2654	27.8083
97.1293949685362	29.3748147272175	23.9055281152929	98.7317	39.6579	27.3708
96.9717497924407	29.1349835341886	22.9741273357871	96.2133	40.5576	25.5914
96.8161766348892	28.8250626076376	21.7935596977349	91.9372	36.8319	23.3371
96.8161766348892	28.8250626076376	21.7935596977349	93.6083	38.4774	26.0941
96.6659605245072	28.4735633869129	20.3263340486241	106.8535	30.7643	14.4546
96.6659605245072	28.4735633869129	20.3263340486241	105.6149	29.5786	27.9356
96.3015006275737	27.9833860727063	19.5693405354264	92.5592	25.4331	20.672
96.3015006275737	27.9833860727063	19.5693405354264	97.0499	25.7334	20.6225
95.9477875234796	27.5059703929027	18.8125389293479	105.0575	26.2706	17.0665
95.5782889846526	27.0349166721047	18.074685557679	102.4997	24.4075	19.7902
95.5782889846526	27.0349166721047	18.074685557679	102.9016	24.8202	19.8795
95.1951004091192	26.5781966804596	17.3251423967158	98.3241	22.4412	26.657
95.1951004091192	26.5781966804596	17.3251423967158	100.6297	27.3107	24.1251
94.7984761262533	26.144707942732	16.3554946256385	99.0228	31.9463	24.4512
94.3857716368548	25.6788088287341	15.0987441629792	96.156	30.1327	19.1399
93.9756075556007	25.2074481884534	13.7997236293382	96.0238	29.4057	14.5945
93.5679232447524	24.7321910481683	12.5020966560162	102.9211	31.879	13.8489
92.2240802877071	23.4956074378831	10.6245910841337	99.272	31.5703	11.7517
90.4093016538403	21.7298143655695	8.64117866914523	97.9141	29.0493	9.3885
87.8828039843471	19.1850651439427	6.60828337810592	97.1071	18.8552	9.2302
63.5825115470831	16.4369574148961	4.10689708063186	63.3607	23.5913	11.9128
Route: 8 Length: 397.351544272956 Demand Met: 9725					
47.7197850565722	11.9658999394737	49.5054653096272	53.7123	16.59	54.3027
47.7197850565722	11.9658999394737	49.5054653096272	52.0827	15.9727	59.9151
48.148241517939	11.9658998888443	50.1740973881397	45.9074	18.6439	58.1761
48.148241517939	11.9658998888443	50.1740973881397	44.3097	5.4051	59.4302
48.7234814418553	11.9658998386103	50.515459488185	47.7278	5.7114	59.7593
49.3089997743118	11.9658997886218	50.8327770244975	49.309	3.6922	59.7251
55.1357296456493	12.1554523136215	50.8327769529958	58.6318	9.4344	53.4701

Solution x	Solution y	Solution z	Original x	Original y	Original z
55.1357296456493	12.1554523136215	50.8327769529958	56.514	2.6652	55.8183
60.0258120103532	12.3519834862628	50.8327768814326	60.4719	1.0667	55.1539
62.4596816824927	24.0177321630292	50.8327768093627	63.3795	20.1125	53.5518
64.8950121343458	39.2811637219981	50.8327767372991	65.7303	47.3671	58.4265
67.2425536748804	43.24050941086	50.8327766650605	66.2863	51.2705	54.2569
69.6564154325666	46.4621696726976	50.8327765928327	69.2681	55.3133	57.276
72.1422927328161	48.5285932369251	50.8327765205076	69.4154	51.8752	55.6067
74.7476453904237	50.5392464759563	50.8327764482005	72.0304	52.5053	58.0692
77.5138744083533	52.5142426145667	50.8327763758729	73.3859	52.8201	55.9097
80.4968678762089	54.4973843056043	50.8327763035393	77.8264	55.5164	53.7679
83.6305375281852	56.4784682506308	50.8327762312102	78.0993	54.3894	50.2798
87.1159491606529	58.5151476206749	50.8327761589039	77.9705	58.8491	56.0075
94.0205152582299	60.5496061634815	50.8327760865946	102.6402	60.9181	59.3218
94.182616556822	61.8578541181078	50.832776013567	103.9916	60.6173	50.4601
94.3420135565601	63.1973027428145	50.8327759405106	100.6854	61.817	51.0639
94.5006938438216	64.5568063904954	50.8327758675066	95.1558	61.2395	57.4763
94.5006938438216	64.5568063904954	50.8327758675066	96.4356	62.0951	55.4366
94.6592808155723	65.992975305	50.8327757944506	94.6788	63.8911	59.4837
94.8179686782473	67.4745353236641	50.8327757213929	97.9014	66.9835	57.8832
94.9763017178779	68.9720666691151	50.8327756483122	99.4285	63.8276	59.6975
95.1321385664256	70.8509977898759	50.8327755752257	102.9023	68.4164	43.143
95.283754662411	72.9845432979247	50.8327755022359	97.816	74.8015	47.4482
95.4352448581189	75.1018294383473	50.8327754292688	96.2521	73.5638	59.9232
95.5866769891865	77.3112199260169	50.8327753562458	96.1169	76.0362	57.1147
95.7381601889057	79.5820898047315	50.8327752832155	99.1261	78.6323	53.6332
95.88944257685	81.9053932115674	50.8327752102335	104.5599	87.8351	55.8078
96.0324069059886	83.3008385128928	50.8327751371833	101.0606	82.9382	56.7378
96.1748551945199	84.7095857359191	50.8327750641744	96.9343	84.943	57.6208
96.3173162688783	86.1250289432583	50.8327749911463	94.9909	83.4209	53.4521
96.3173162688783	86.1250289432583	50.8327749911463	97.4314	81.946	52.8698
96.4599911689857	87.6221429340638	50.8327749181244	95.9325	86.7596	55.1395
96.4599911689857	87.6221429340638	50.8327749181244	98.3726	88.4744	52.1576
96.6027624458994	89.1414920708405	50.8327748450569	103.8628	98.4843	53.5771
96.6027623311839	88.7765153951905	50.0313004663403	94.0924	96.5838	56.3482
96.6027623311839	88.7765153951905	50.0313004663403	103.2876	94.1817	57.6589
96.6027622162794	88.3638496212936	48.8667733384798	98.9319	91.3958	49.6094
96.6027622162794	88.3638496212936	48.8667733384798	98.656	92.6213	53.0887
96.6027621013628	87.9469500997643	47.6745261477049	100.6204	94.7646	50.8195
96.6027619864035	87.5219804210072	46.450583593171	96.5235	92.1962	47.4754
96.6027618714424	87.0940821410477	45.2237392484532	91.1677	84.1211	45.979
96.6027617565306	86.6696917622322	43.9951011418301	97.5653	74.5618	43.9951
96.6027616213332	86.6696916960285	42.3039848770386	88.0687	81.4777	36.1559
96.6027616213332	86.6696916960285	42.3039848770386	92.1151	81.2598	42.8198
96.6027614863047	86.6696916297254	41.3119171543883	92.6699	80.64	42.9825
96.6027613513105	86.6696915634056	40.3124974840762	91.0116	75.887	40.3125
96.6027613697092	87.488755344887	40.0477466994994	94.6945	78.572	44.5388
96.6027613697092	87.488755344887	40.0477466994994	98.567	80.2017	48.301
96.6027613881095	88.5656007626874	39.7651973214356	94.0795	80.8773	41.7611
96.6027613881095	88.5656007626874	39.7651973214356	97.7624	79.6432	41.8331
96.602761406499	89.8347140548903	39.4806025530383	97.0865	83.6094	41.2641
96.602761406499	89.8347140548903	39.4806025530383	104.3617	84.8664	42.6246
96.6027614248732	91.2781539993457	39.1931476096802	96.8345	90.0197	42.1774
96.6027614248732	91.2781539993457	39.1931476096802	97.0347	92.0258	44.3343
96.6027614432368	92.7497663991997	38.9033200580642	98.2349	98.4363	43.0129
96.6027614616067	94.1640474715405	38.611797848832	94.4828	106.1237	38.6118
96.6027615523338	92.3366197899418	37.3586527321059	101.602	92.3175	35.5214
96.6027615523338	92.3366197899418	37.3586527321059	98.8373	99.4165	35.0062
96.6027616430786	90.3709573351728	36.1502411611689	100.5649	91.4192	35.2273
96.6027617338214	88.4096985340047	34.9509365344441	97.7943	87.7833	36.2243
96.6027617338214	88.4096985340047	34.9509365344441	103.1106	83.2736	35.5168
96.6027618245635	86.625509337805	33.7454509069771	96.2545	87.1498	32.8659
96.6027619152871	84.8523980415258	32.5479302403286	89.5631	83.3752	32.5568
96.6027619152871	84.8523980415258	32.5479302403286	98.853	91.6792	31.3431
96.6027620059756	83.0109848901937	31.3665442459587	89.95	80.2132	31.6802
96.6027620059756	83.0109848901937	31.3665442459587	93.1133	78.1389	33.5399
96.6027620965836	81.3328321463577	30.1729284963762	94.4072	76.9857	34.4342
96.6027621871748	79.7302842594845	28.9498161104147	101.2985	78.2917	28.1682
96.6027622778067	78.1569773542479	27.7348000687765	101.778	67.1686	27.7348
96.6027621893786	82.1197885101636	26.5920933277864	98.2345	80.86	27.262
96.6027621893786	82.1197885101636	26.5920933277864	93.4941	85.8189	27.3685
96.6027621009986	86.2247074523909	25.4464813892655	88.6062	92.2681	23.9863
96.6027621009986	86.2247074523909	25.4464813892655	92.5654	91.5305	24.0262
96.602762012713	88.9871099401327	24.3394253112309	104.3693	90.8389	25.0156
96.6027619243977	91.6998686021617	23.2290000475158	95.6122	103.8055	23.229
96.6027618741221	91.5385631764398	22.1601054079019	100.7126	88.5952	23.1233
96.6027618741221	91.5385631764398	22.1601054079019	99.3434	90.9979	30.2293
96.6027618238521	91.3779374383481	21.0156116092505	98.1138	89.594	19.2781
96.6027618238521	91.3779374383481	21.0156116092505	102.4507	89.6037	15.6617
96.6027617735803	91.2180180165698	19.9294293582726	93.1284	88.6615	20.1351
96.6027617735803	91.2180180165698	19.9294293582726	101.583	94.8217	23.7006

Solution x	Solution y	Solution z	Original x	Original y	Original z
96.6027617233156	91.0581027854499	18.8191258252112	102.0461	86.7072	16.2393
96.6027616730379	90.898917830168	17.7293767822162	98.2007	80.5294	17.4055
96.6027616730379	90.898917830168	17.7293767822162	102.2936	85.0217	15.0829
96.6027616227502	90.7445512201798	16.6715221156719	96.9541	82.6989	20.5312
96.6027615724696	90.5917351269676	15.5791937570259	92.288	83.6157	17.9977
96.6027615724696	90.5917351269676	15.5791937570259	92.7178	89.1801	18.823
96.602761522236	90.4403867396993	14.4497562679425	93.9684	87.8762	13.7783
96.6027614720176	90.289372410635	13.3255233781771	92.4623	94.734	14.7003
96.6027614218251	90.1379908955213	12.1939421955438	95.504	96.351	10.2996
96.6027614218251	90.1379908955213	12.1939421955438	101.8123	94.891	12.8509
96.602761371617	89.9855448683109	11.074049866069	95.2026	90.5293	12.2607
96.602761371617	89.9855448683109	11.074049866069	95.7576	96.9635	11.4638
96.6027613214428	89.8324495507799	9.94872620480096	95.0373	98.5247	13.5608
96.6027612712872	89.6775871346068	8.77560081658107	104.1728	96.9352	2.733
96.6027612712872	89.6775871346068	8.77560081658107	104.1034	98.3317	9.2012
96.602761220248	88.7539642108877	8.57986262089613	102.0076	93.075	9.5996
96.602761220248	88.7539642108877	8.57986262089613	105.6506	92.4297	8.9472
96.6027611691587	87.7829861684184	8.38384501874156	99.3782	93.0601	2.9898
96.6027611691587	87.7829861684184	8.38384501874156	100.8882	91.1406	6.6906
96.6027611180526	86.7715125631691	8.18945972456552	88.3633	87.3681	2.2205
96.602761067024	85.7586000240986	7.99779420225632	86.3374	85.7586	1.5055
96.6205124846023	85.1583975326168	7.99779416961922	101.1477	85.2681	2.6541
96.6205124846023	85.1583975326168	7.99779416961922	107.2392	85.9448	2.4326
96.6377933351996	84.5116146497211	7.99779413717309	103.8313	82.5056	7.2236
96.655062318107	83.8720440048316	7.99779410471282	91.14	83.5499	11.0268
96.6723425128565	83.235367376807	7.99779407224193	88.6759	82.3658	11.13
96.6896431724375	82.6036066827294	7.99779403976074	96.8706	83.0827	11.4782
96.7069452347111	81.9731867525498	7.99779400727635	97.8831	81.9659	16.6355
96.7242461081923	81.3451135595774	7.99779397476529	97.3132	81.5365	12.7479
96.7415492605115	80.7188605952275	7.99779394225088	98.9119	80.0767	11.0692
96.7588533683418	80.0957118572485	7.99779390974084	107.981	80.0957	12.6444
96.7486074111389	76.6162006833098	6.89327051199292	108.1531	76.0691	2.761
96.5592255577911	76.4296639367545	6.86515010950934	98.5933	78.8152	8.2256
96.3697701229793	76.242959202355	6.8370263549819	93.0994	86.3608	2.8092
96.1838360631455	76.0458010489464	6.8089924330485	89.835	77.746	1.5427
96.1838360631455	76.0458010489464	6.8089924330485	91.86	79.7087	2.2114
96.0005457425144	75.8477491804856	6.78101025268941	93.2494	81.8793	2.8544
95.8179779435762	75.6484631128887	6.75304799282601	100.0565	80.1054	0.0522
95.8179779435762	75.6484631128887	6.75304799282601	99.0152	86.155	1.7016
95.5800254508483	74.5472345799695	6.72655322631179	103.6911	80.62	5.0557
95.3363376702523	73.3413138050217	6.70007487489678	97.1852	78.7831	16.5303
95.0896239759112	71.8292312894249	6.6733921416654	91.1291	78.4897	13.7054
94.8465170460956	70.0710728901298	6.64664058094194	92.0851	66.8651	17.5763
94.6123268021311	68.753851361116	6.61949160879082	93.0933	68.7697	14.1811
94.3789227327453	67.4443132195165	6.59230811503624	94.6798	69.1984	4.5089
94.3789227327453	67.4443132195165	6.59230811503624	93.9524	73.145	3.1932
94.1461533062472	66.0851470479441	6.56514558821611	98.4258	65.8894	6.8362
93.912750860357	64.7354527195073	6.53798234328535	103.5291	67.906	8.9335
93.6717718323389	63.294068735358	6.51078129147786	93.5538	62.1822	15.7085
93.4312034187792	61.8840677791075	6.48351750897919	94.5987	62.0376	18.5629
91.1507076952836	57.5782863076687	4.46584770918697	95.9041	59.3009	4.8034
88.7962715435277	53.2439856971078	2.441417663689	98.8606	57.9963	4.7298



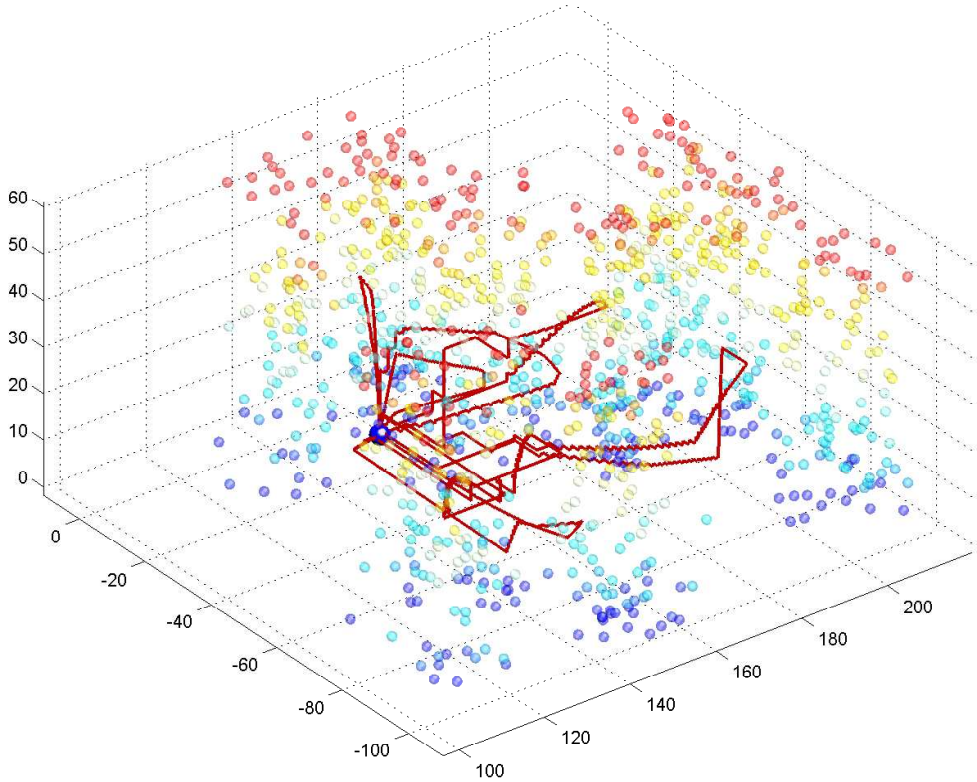


Figure O.194: $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Manhattan, Length = 1190.1531804

Table O-197: Solution for $dsj1000$, $r = 36.43827$, Equal Radius, 3D, Manhattan

Total distance: 1190.15318043963 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0					
Solution x	Solution y	Solution z	Original x	Original y	Original z
Route: 1 Length: 267.43469396914 Demand Met: 10000					
53.4102458901691	21.3590154220723	0.502924838991298	72.6191	32.6684	16.6889
59.239079736499	30.3280794864008	1.00206722826119	76.5498	52.218	12.9878
64.6354726511608	37.8148732994064	1.49759963537108	87.5129	47.9594	27.6836
65.5987536065896	39.7613464877494	1.83271603099045	87.8413	47.1867	25.6907
66.5190877782612	41.6651339640053	2.1613520700553	89.3464	46.1786	22.3858
67.4204026015705	43.5745460546294	2.48713221855895	93.0102	50.1223	20.798
68.2925470276306	45.4696033356185	2.80963768126092	92.412	50.9961	13.3675
69.1560163028375	47.3765101739925	3.13139310827201	92.8209	56.9207	15.4027
70.0090515541596	49.2780900737768	3.45207393999076	93.5538	62.1822	15.7085
70.8493968120623	51.1552702633406	3.77150193888777	93.0933	68.7697	14.1811
71.6766378088918	52.9827134893636	4.08979572506946	91.1291	78.4897	13.7054
72.4770104101298	54.6339413591	4.4058521034362	88.6759	82.3658	11.13
73.2620278374318	56.1567863460062	4.72075955268966	91.14	83.5499	11.0268
74.0267742185471	57.5542161208931	5.03442720170382	92.288	83.6157	17.9977
74.7600685340541	58.8008519042242	5.3438098307312	96.9541	82.6989	20.5312
75.3461204152446	59.6523324081391	5.63211873906013	97.8831	81.9659	16.6355
75.9156118149359	60.46878704325	5.9182348882558	98.2007	80.5294	17.4055
76.475532441648	61.267530799826	6.20284495255671	97.1852	78.7831	16.5303
77.031493680406	62.0597799834344	6.48668734724717	97.3132	81.5365	12.7479
77.5838597173205	62.8446220702453	6.77015913925789	96.8706	83.0827	11.4782
78.1333340885155	63.622349274751	7.05341977065891	98.9119	80.0767	11.0692
78.6803559632837	64.39685263582	7.33656869081375	98.5933	78.8152	8.2256
79.2260499033804	65.1704829718946	7.61984645476045	100.0565	80.1054	0.0522
79.76939540287	65.9418350718999	7.90389305982778	103.6911	80.62	5.0557
80.3086565790468	66.7099605472122	8.18837725453962	103.8313	82.5056	7.2236
80.8439238777523	67.4741381092818	8.47312852460666	100.8882	91.1406	6.6906
81.3738491419098	68.223781616513	8.75828113100324	99.3782	93.0601	2.9898
81.899288523456	68.958232229131	9.04436268246544	104.1728	96.9352	2.733
82.1695819609978	69.2380334581256	9.37947039053213	104.1034	98.3317	9.2012
82.181534637832	69.247202295264	9.9225115805977	105.6506	92.4297	8.9472
82.1934789012436	69.2563646657816	10.466687147581	102.0076	93.075	9.5996
82.2054196594981	69.2655230922708	11.0117991586866	101.8123	94.891	12.8509
82.2173555603848	69.2746761118602	11.5564450346985	92.4623	94.734	14.7003
82.2292920163036	69.283827043547	12.1007571519136	95.0373	98.5247	13.5608
82.2412266018618	69.2929724915705	12.6449078932522	95.7576	96.9635	11.4638
82.2531598433443	69.3021141457718	13.1902095269465	95.504	96.351	10.2996
82.2650920174022	69.3112526629986	13.7373636728243	95.2026	90.5293	12.2607
82.2770244644543	69.3203906031201	14.2856015612565	93.9684	87.8762	13.7783
82.2889576521492	69.3295285638406	14.8346983003973	92.7178	89.1801	18.823
82.3008917028164	69.3386663458101	15.3837063078995	93.1284	88.6615	20.1351
82.3128264845533	69.3478039997691	15.9325129900564	88.6062	92.2681	23.9863
82.3247626910158	69.3569407781481	16.4801787279118	92.5654	91.5305	24.0262
82.3366994059759	69.3660766631768	17.0268423220717	93.4941	85.8189	27.3685
82.3486371051845	69.3752126897568	17.5722715124472	98.2345	80.86	27.262
82.3605750269068	69.3843493928779	18.1167247505742	101.2985	78.2917	28.1682
82.3725124284939	69.3934870179328	18.6600514298654	103.1106	83.2736	35.5168
82.3844466393449	69.4026238581776	19.1979418003679	104.3617	84.8664	42.6246
82.3963535814046	69.4117495140548	19.6812062799895	97.0865	83.6094	41.2641
82.4082594100742	69.4208744715181	20.1590921178246	97.7624	79.6432	41.8331
82.4201642738249	69.4299995489373	20.6325170213624	94.0795	80.8773	41.7611
82.4320693171656	69.4391247720082	21.1024404442226	92.6699	80.64	42.9825
82.4439748284513	69.4482501281969	21.5687847654737	92.1151	81.2598	42.8198
82.4558809108928	69.4573754404553	22.0318693860731	91.1677	84.1211	45.979
82.4677870031696	69.46649946816	22.4896074374368	88.0687	81.4777	36.1559
82.4796947963516	69.4756236942429	22.9463677699142	89.5631	83.3752	32.5568
82.4916039524909	69.4847476465034	23.4026841672195	89.95	80.2132	31.6802
82.503514627406	69.4938718021678	23.8587915418297	93.1133	78.1389	33.5399
82.5154262590548	69.5029962956522	24.3144779120002	94.4072	76.9857	34.4342
82.5273386541594	69.5121212039638	24.7696550066991	94.549	73.3405	36.7472
82.539252062924	69.5212471516837	25.2241027747145	95.9481	74.251	38.8025
82.5511660735684	69.5303739584848	25.6774938180857	91.0116	75.887	40.3125
82.5630821322229	69.5395015510547	26.129808020457	94.6945	78.572	44.5388
82.5749989191094	69.5486290710751	26.5799477453613	98.567	80.2017	48.301
82.5869141224193	69.5577553777332	27.0257459507795	97.816	74.8015	47.4482
82.5988291979806	69.5668822754553	27.4686869621391	97.5653	74.5618	43.9951
82.6107447398584	69.5760099903	27.9099689351266	102.9023	68.4164	43.143
82.6226591141685	69.5851393159447	28.349440337929	99.3413	60.508	43.9191
82.6345735674663	69.5942714410409	28.787260692348	93.9444	64.9	44.2206
82.6464896907304	69.6034057104815	29.2240010311746	90.2672	64.2791	51.3539
82.6584081850301	69.612542215154	29.6582740200715	94.6583	60.3511	50.0221
82.6703278593349	69.6216815710287	30.0901091623062	103.9916	60.6173	50.4601
82.6822427630051	69.6308238587091	30.5171068940812	100.6854	61.817	51.0639
82.6941558382505	69.6399685332804	30.940819602099	96.4356	62.0951	55.4366
82.7060683124706	69.649115854451	31.3601445520018	95.1558	61.2395	57.4763

Solution x	Solution y	Solution z	Original x	Original y	Original z
82.7179802155925	69.6582664625609	31.7740535433544	94.6788	63.8911	59.4837
82.7298912932281	69.6674197218974	32.1817143299767	92.1982	53.9806	59.5699
82.7418013191422	69.6765847771539	32.5794153738277	99.0651	51.1078	59.3413
82.7475462011251	70.2371220299154	32.5859235859451	102.6402	60.9181	59.3218
82.7532856522594	70.8131352820637	32.5924187937354	99.4285	63.8276	59.6975
82.759023710417	71.3971064556727	32.5989086142265	97.9014	66.9835	57.8832
82.7647615677785	71.9860576862479	32.6053959488871	96.2521	73.5638	59.9232
82.770499256804	72.5772114493604	32.6118803307028	96.1169	76.0362	57.1147
82.7762371656129	73.1702326571708	32.6183629947645	99.1261	78.6323	53.6332
82.7819749766226	73.7646453378253	32.6248445285714	97.4314	81.946	52.8698
82.7877130183604	74.359947356281	32.6313251295279	94.9909	83.4209	53.4521
82.7934517481256	74.9562143214257	32.6378048082461	95.9325	86.7596	55.1395
82.7991908624738	75.5517107434313	32.6442830021845	96.9343	84.943	57.6208
82.8049302452799	76.1467631788169	32.6507589943961	101.0606	82.9382	56.7378
82.8106692598766	76.7423553819754	32.6572327210197	104.5599	87.8351	55.8078
82.8164059654035	77.3318382563385	32.663702466693	103.2876	94.1817	57.6589
82.8164060142905	77.3318383253652	32.6637024956344	94.0924	96.5838	56.3482
82.8164060631765	77.3318383946521	32.6637025267416	103.8628	98.4843	53.5771
82.6546454420261	77.176517112595	32.3109883836836	100.6204	94.7646	50.8195
82.4924577567058	77.0208093170478	31.9551652561336	98.656	92.6213	53.0887
82.3299572365756	76.8648449044202	31.5958396102221	98.3726	88.4744	52.1576
82.1673086789374	76.7089231216297	31.2340166143125	98.9319	91.3958	49.6094
82.0044446660737	76.5528654770618	30.8698769387857	96.5235	92.1962	47.4754
81.8415144892762	76.3966975810738	30.5040587657973	97.0347	92.0258	44.3343
81.6785243130213	76.2404345325331	30.1370571805882	96.8345	90.0197	42.1774
81.5155292547825	76.0841941312454	29.7692367710278	97.7943	87.7833	36.2243
81.3525534073501	75.9280837989576	29.401281107943	96.2545	87.1498	32.8659
81.189658676336	75.7721428266471	29.0334800387514	98.853	91.6792	31.3431
81.0267062862921	75.6161633673561	28.6658723936109	99.3434	90.9979	30.2293
80.8636871969537	75.4601696199012	28.2985105175224	100.5649	91.4192	35.2273
80.7004969617865	75.3040862334075	27.930648007615	101.602	92.3175	35.5214
80.5370216011878	75.1478132548953	27.5620249209628	98.8373	99.4165	35.0062
80.3730713889592	74.9907279836247	27.1921180983155	98.2349	98.4363	43.0129
80.2081376307277	74.8322719614142	26.8168188013583	94.4828	106.1237	38.6118
79.9607371092776	74.2966001990811	25.5918441369919	95.6122	103.8055	23.229
79.7115765432108	73.741866520979	24.3808519175765	101.583	94.8217	23.7006
79.4612771990969	73.1815523211431	23.1754142265089	104.3693	90.8389	25.0156
79.2094855719644	72.6167025760751	21.9698826276596	100.7126	88.5952	23.1233
78.9571655363842	72.0504716670075	20.7661676085055	98.1138	89.594	19.2781
78.7045342936012	71.4826877716728	19.5676011432567	102.4507	89.6037	15.6617
78.4506492766752	70.9104882957931	18.3796533582393	102.0461	86.7072	16.2393
78.1958737325231	70.3360261574229	17.1977953770659	102.2936	85.0217	15.0829
77.940199686958	69.7597323882708	16.021670183284	107.981	80.0957	12.6444
77.6817724289787	69.1805697481773	14.8562549891152	108.1531	76.0691	2.761
77.4187655789153	68.5986809870732	13.7348677217348	107.2392	85.9448	2.4326
76.9608962131579	67.3250887381341	13.0732527136922	101.1477	85.2681	2.6541
76.4964890175196	66.0154272744717	12.4200449272005	99.0152	86.155	1.7016
76.0256122577358	64.6578683202485	11.7755268973913	86.3374	85.7586	1.5055
75.5552967353997	63.2854026670001	11.1350485412904	88.3633	87.3681	2.2205
75.0842921715677	61.8803482579181	10.4990451598738	93.0994	86.3608	2.8092
74.6093071946263	60.4147069261913	9.86841350699249	93.2494	81.8793	2.8544
74.1318136473313	58.9142110648991	9.2415412820021	91.86	79.7087	2.2114
73.6525724314244	57.3851698340938	8.61804943469916	89.835	77.746	1.5427
73.1723939006621	55.833131835515	7.99761876607046	93.9524	73.145	3.1932
72.6900552318969	54.2621799181583	7.37950429000249	94.6798	69.1984	4.5089
72.2056527233778	52.6798391146268	6.76292541391229	103.5291	67.906	8.9335
71.685763704327	50.9154592143845	6.14283438424508	98.4258	65.8894	6.8362
71.1586020501149	49.1111333349908	5.52293623776445	95.9041	59.3009	4.8034
70.6282369025232	47.3044420044483	4.90387589606392	93.2379	56.4517	4.9219
70.09602820751	45.5022627467874	4.28538995073237	96.8097	54.0588	2.5941
69.5589863511239	43.6981124929619	3.6681622707843	98.8606	57.9963	4.7298
69.0070568612748	41.8203240793143	3.05067437345696	97.3108	57.82	10.7791
68.4354479965241	39.8151273998604	2.42587907688709	98.9521	56.5952	10.596
67.7268083436845	36.5943626881418	1.76232951142692	102.0152	42.2262	11.91
64.936964807125	29.6284575280773	0.925629260107712	97.0806	39.3994	12.7921
Route: 2 Length: 167.889614397131 Demand Met: 9998					
47.1114656454353	35.9912639179153	0.170736330677627	33.839	67.1668	7.1332
47.094221304491	42.0240613868437	0.340404151837319	22.8228	67.5784	3.2098
47.0770576153348	44.9401488771921	0.509492034196057	22.9431	70.0987	4.2047
47.059959034434	47.0344269138792	0.678022906766778	24.5076	73.115	4.3052
47.0429085424175	48.7419483359078	0.84613994943863	23.527	73.6169	0.5641
47.025898147261	50.2434650133905	1.01433649064622	25.4767	75.481	0.001
47.0089145085449	51.6329719751722	1.18266004620928	31.0449	71.9995	0.0029
46.9919399226192	53.0072872793065	1.35107354967207	31.4906	71.3219	1.4719
46.9749733425928	54.3739331787885	1.51954384893028	31.4187	76.5703	2.7936
46.9580170738231	55.7188839434292	1.68803477538196	26.6151	77.1467	3.8306
46.9410742964659	57.0336040656968	1.85650782170648	23.4089	84.0628	5.796
46.9243491125549	57.8006252610455	2.02280672190393	23.796	77.2181	9.3562
46.9076397228058	58.5559731704526	2.18884399786194	21.1184	76.9048	10.6601
46.8909528727423	59.2944125547162	2.35443044957476	21.3934	72.6127	7.7423

Solution x	Solution y	Solution z	Original x	Original y	Original z
46.874278406034	60.0298762541741	2.51990532894756	22.1344	71.2137	11.8857
46.8576153125589	60.7642295019694	2.68515212919426	24.5354	72.6275	12.2334
46.8409618287681	61.4980775551518	2.85020758176637	25.7737	68.9159	14.4865
46.824316284265	62.2343829872757	3.01505457253995	27.2709	73.9256	16.4296
46.8076793375836	62.9706091014237	3.17961734007719	31.4455	71.7336	19.6874
46.7910493396395	63.708983076306	3.34387416865414	34.9317	80.2335	16.9208
46.7744266480258	64.4458346309787	3.50788670286528	33.517	80.8699	6.7304
46.7578098367309	65.1827490374442	3.67190429432906	33.2241	90.2072	6.3544
46.7412017591808	65.9104315400043	3.83590743673169	34.7819	91.1147	8.0437
46.7246014807857	66.6297701964312	3.99984934717924	37.9917	90.5379	9.9912
46.7080075705209	67.3440184959452	4.16369952265698	35.2297	94.8683	9.4168
46.6914224041657	68.0450978313335	4.32740824326822	35.0473	98.5367	9.9491
46.6748508466424	68.7165593845965	4.4908057355453	35.5571	102.295	9.2843
46.6583408376504	69.2517071498915	4.6528364772129	35.7306	102.2767	4.1846
46.6418558615167	69.7468177397624	4.81497005362831	30.1816	102.1772	4.0412
46.6260107614292	69.8992897226694	4.98013980063175	33.0573	97.9271	5.3628
46.6101731701842	70.0510595157054	5.14534034649834	35.7859	98.3251	5.4495
46.5943422368528	70.2022255961606	5.31057308638034	35.7481	97.1257	4.802
46.5785171079475	70.3529630736557	5.47586544249012	33.9629	96.8355	4.449
46.5626979412472	70.5032649219764	5.64123434668719	34.0458	95.0903	5.2592
46.546883782901	70.6532994702675	5.80665670198048	30.8807	93.5109	0.3364
46.5310748454627	70.8030945425717	5.97229004889331	37.0706	93.0168	1.0492
46.5152698303359	70.9527810129713	6.13808651329822	37.3296	94.7968	3.7833
46.4994686685893	71.1022907690886	6.30398705773459	41.6896	94.8028	3.024
46.4836708900285	71.2516447035624	6.47001104644914	43.1057	91.7939	5.1823
46.4678757503161	71.400994012303	6.63610915169874	47.7789	92.5461	5.4276
46.4520832382876	71.5503050022794	6.8022816153773	48.9533	90.4759	7.3728
46.4362927127629	71.6996785044305	6.96849584824034	51.1106	98.2963	5.5983
46.420503777765	71.8487416627558	7.13480181269176	53.9006	102.5381	21.0284
46.4046638931943	71.995026807121	7.29944956516628	42.5793	100.4271	14.8388
46.3888263751973	72.1408514479262	7.46387463605687	40.2693	101.3043	8.6864
46.3729919227346	72.286175368006	7.62830469406954	40.065	98.6098	6.7408
46.3571601203427	72.4312790702723	7.7928134497373	39.7333	98.7582	4.2197
46.3413312011102	72.576161058341	7.95748086073333	40.5226	102.8002	1.3549
46.3255063341334	72.7203022993154	8.12251090129161	40.9527	105.6227	4.1926
46.3096865101515	72.8629042583008	8.28788911825914	42.9285	106.2179	5.6354
46.2938701626362	73.0039355999386	8.4535249015746	45.465	105.2608	3.7217
46.2780559610357	73.1439234665608	8.61950027379219	48.0764	105.8084	10.3389
46.262242972159	73.2827987322507	8.78541846941044	37.1983	106.347	12.5162
46.246440529151	73.4195518873671	8.95099865153522	31.6341	101.1443	12.133
46.2306444241235	73.5557299079305	9.11650990887793	29.3468	93.7461	14.2413
46.2148519518795	73.6918204019076	9.28196500720259	29.5221	90.7635	22.4343
46.1990635242267	73.8278750388442	9.44712186100973	34.0163	93.2553	22.3961
46.1832792070311	73.9638560690232	9.6120119608994	32.6009	89.9531	17.4409
46.1674979166299	74.0999190683863	9.77683643454078	31.6916	96.8159	17.5787
46.1517211786239	74.2357818459492	9.94153402581582	38.2186	96.6747	17.5328
46.1359479450667	74.3715289004733	10.1061646873379	40.9431	96.0349	18.7884
46.1201778733201	74.5072134809999	10.2707211772675	42.2565	98.7398	22.9258
46.1044111563238	74.6426830529681	10.4350280430218	42.9226	100.4615	26.2167
46.088647756813	74.7777375678327	10.598834178835	45.0704	101.2748	27.009
46.072887333497	74.9122530581807	10.7620511829647	46.0729	100.678	36.5278
44.4569208633434	73.9985771201757	10.7073014732378	42.9721	90.3177	28.7365
42.8711606290458	73.0836451393918	10.6525177119624	42.6808	88.2098	40.1619
41.3063685100676	72.1447477468002	10.5975191013177	40.8939	84.3555	43.1765
39.769134894487	71.1584766703589	10.5420575882585	31.7515	71.3679	39.9054
38.3005059605279	70.1830342112503	10.4864741071512	26.4587	69.6793	44.9112
38.0933943013706	69.3460347749272	10.3529413258101	26.4833	65.6457	42.68
37.8880266283471	68.5273584864681	10.2174010281557	26.4747	67.9787	32.7219
37.6832156366425	67.7155080333791	10.081600456019	18.9682	67.082	33.9115
37.4794652647819	66.9108102794038	9.94530217346856	10.4334	62.822	33.9682
37.394533008211	66.4850925752083	8.90839152682103	7.6803	61.1857	24.6436
37.3102965536953	66.064409311154	7.79859159775103	9.15690000000001	61.6426	15.1483
37.2263357883665	65.6464515023337	6.68000771053889	9.6606	65.5604	9.552
37.1426026404479	65.2301934478307	5.5617616104665	14.2239	63.9607	10.3191
37.0590202941642	64.8157523191163	4.44266928413079	15.1112	64.361	7.2726
36.9755741846618	64.402977556994	3.32508949793816	12.0877	66.3858	4.5331
36.89229704258	63.991514512409	2.21065668883107	0.483800000000002	63.8626	0.7436
36.8922973994285	63.9915107893164	2.21065635077954	10.0835	69.723	3.7551
36.8922977563147	63.9915070662797	2.21065601421575	9.00020000000001	73.0359	5.8372
36.8922981132595	63.991503343213	2.21065566469604	7.5677	74.3816	13.1566
36.8922984702922	63.9914996198593	2.2106553344092	8.0472	76.1743	13.1381
36.8922988274264	63.9914958960653	2.21065499432495	13.7649	76.0563	18.1156
36.8922991845905	63.9914921721014	2.21065466937986	16.7224	69.1113	14.1768
36.892299541774	63.9914884481832	2.21065433167156	13.2613	67.7948	17.1077
36.8922998989922	63.9914847243116	2.21065399790164	12.0587	67.8257	18.5408
36.892300256256	63.9914810004317	2.2106536620425	9.1707	70.0865	21.5855
36.8923006136665	63.9914772758848	2.21065332789549	10.5042	66.7806	23.1982
36.8923009711779	63.9914735511265	2.21065299841371	12.5389	66.9051	22.2814
36.8923013287501	63.9914698262564	2.21065265885785	12.0444	66.3239	28.7604
36.9530481731212	62.3293142394387	2.1894446142788	14.7433	68.1941	29.0053

Solution x	Solution y	Solution z	Original x	Original y	Original z
37.0143254637578	60.5509819855962	2.1681607859866	15.0856	70.6386	28.9208
37.0771557319354	57.1265715488643	2.14657924230791	22.0857	71.4539	26.9077
37.1401202987582	53.3109118884901	2.12497567000673	22.6268	64.3936	19.9605
37.2031519913766	49.4606719417958	2.1033667565482	23.9369	61.5866	18.0383
37.2662359141401	45.5717866137768	2.08175400258371	18.7531	32.536	21.0115
37.32943274176	42.0513435557464	2.060132706579	19.8821	27.2321	11.7559
37.392708758669	38.780005692622	2.03851016221785	20.5322	21.5891	20.6595
37.4561007950689	35.8327495534302	2.0168775648529	20.8129	26.0745	22.3222
37.5195851764902	33.0389031048693	1.99523702242798	22.8581	29.0039	22.5241
37.5831416707809	30.3306296005093	1.97359014441667	28.099	29.8348	27.0633
37.6467509588236	27.6814454021197	1.95193373826711	23.1615	20.5337	28.672
37.7104741286606	25.1622708583677	1.93025916524148	18.4916	22.031	28.1174
37.7743784546106	22.733566168306	1.90856054620033	19.0397	19.3917	26.8913
37.8384282559016	20.3801884474475	1.88684465462544	17.2669	18.1061	25.0094
37.9026290458563	18.0861744920991	1.86511419627273	23.1228	16.7524	24.3445
37.9669130889305	15.8340902094263	1.84337543233091	25.9081	14.4892	36.1934
39.010923225887	15.3369981678174	1.61963037661616	29.4417	11.4808	30.7206
40.0792412486033	14.8430346152385	1.39391196094445	29.9497	8.0977	27.1858
41.1698725882096	14.3525409495743	1.16695073714914	27.2842	5.8331	28.3822
42.3014309175549	13.8672152931916	0.937791504043098	33.6792	4.7017	30.2163
43.4654025757497	13.3871000046479	0.706125152355902	36.2059	6.8965	29.7476
44.6569351851799	12.9104467084841	0.472442695246443	36.4235	4.5159	28.6582
45.8796092659495	12.4379772025137	0.236806259380586	45.0418	3.8658	25.2247
Route: 3 Length: 269.347395578208 Demand Met: 10000					
45.7399693986223	41.6050562132672	4.97399164733019	28.241	67.9653	9.5896
44.4720037052131	52.1153562432407	9.65303991358022	14.5018	68.1646	16.8217
43.4543896709656	57.6121229617317	13.5270714064318	17.9606	81.6588	21.6946
42.8528653321832	58.8121569877662	15.6116439274849	18.7356	77.2891	30.4652
42.2894286038692	59.9269570518826	17.4539268691263	22.8762	75.7017	33.805
41.7392603920202	61.0265813763927	19.2103215279533	26.2205	72.9044	33.175
41.1956325358477	62.1296917817589	20.9328244441261	24.4797	75.354	37.647
40.6595596708654	63.2287090904986	22.6020752132675	24.3218	77.9732	38.2426
40.1300577703116	64.3186755394933	24.2249494257964	12.73	75.2001	37.6748
39.6209455777677	65.3897313004317	25.7628873721795	6.09139999999999	73.9114	36.5077
39.3577811843172	66.1128144091256	26.5680664739229	8.8648	72.0358	37.3381
39.1005077525925	66.8342951217028	27.3558578319826	9.45780000000001	72.6847	40.961
38.8491390773304	67.5532591125972	28.1200664348235	9.3844	71.5303	46.4336
38.6100096653512	68.2650574457093	28.8152323115296	10.9416	69.7746	52.0032
38.4210954194413	68.9538312697675	29.2315797033956	15.4332	72.9689	53.8868
38.2355460377428	69.6401415495128	29.6313072776719	18.2654	71.5277	59.9496
38.1248744293295	70.1711664762504	29.7513731174127	24.1578	73.3792	57.4094
38.0144902976213	70.7035812963931	29.8709467474055	26.9783	71.0141	56.5271
37.9043004795512	71.2397492738534	29.9901433687517	35.1535	70.6086	57.9365
37.7939719717877	71.7796276416288	30.1089051838492	29.376	80.5861	55.9809
37.6836383700928	72.3181120838185	30.2272531456518	25.3366	76.538	54.326
37.5735749751361	72.8586052663017	30.3453012395594	24.7401	75.4523	49.5075
37.4638132161241	73.4020131983996	30.4632324520874	27.6433	72.5657	51.9251
37.3542892063533	73.9495201940665	30.5809876824582	32.697	74.6737	51.2201
37.244791185499	74.5001215934254	30.698573857592	32.2488	71.8762	47.8257
37.1354242024443	75.0554450244329	30.816106277142	31.105	77.2121	42.4385
37.0262181206733	75.6143423744802	30.9337090361529	27.1736	83.2653	40.5956
36.9172784345221	76.1757455005952	31.0514177116882	35.4073	87.2216	40.4202
36.8082942392857	76.7387672965352	31.1691884546108	32.1756	91.0244	47.2823
36.6994104156864	77.3023350885017	31.2868385411085	32.4952	97.9758	48.1403
36.5905554735208	77.8620200206229	31.4042695821912	35.9551	95.9225	47.402
36.4817157379273	78.4206973738459	31.5215579368766	36.1694	94.3523	52.0418
36.3729669556694	78.9787511688297	31.6386100024607	37.1788	95.0118	52.8478
36.2643206758747	79.5359013391783	31.7554181325706	44.0393	95.7757	50.8289
36.1556154744834	80.0916138836313	31.8720254515441	41.599	92.4813	48.0171
36.047011298842	80.6498065013195	31.988579543187	39.196	99.7694	49.3378
35.9385251071644	81.2062307734239	32.1050159050525	35.4006	103.6799	50.1937
35.830223094835	81.7572258708789	32.2212852083744	35.2228	101.4244	59.0123
35.7221554112377	82.2934605991549	32.3368232522057	35.7224	107.36	58.7833
35.3451299917273	82.293460611843	32.3368232562402	42.4716	105.6496	56.7244
34.9632819109789	82.2934606246229	32.3368232572275	44.7902	101.1589	57.6534
34.5790907993282	82.2934606373889	32.3368232586064	47.126	99.3914	58.8698
34.1882739639035	82.293460650138	32.3368232618598	43.0828	99.6317	56.4863
33.7966507892752	82.2934606628683	32.3368232625099	42.0978	97.503	57.9578
33.404166168746	82.2934606755821	32.3368232625416	39.6285	91.4521	58.9959
33.0118477537709	82.2934606883072	32.3368232649673	35.4152	92.5489	58.019
32.6204278650847	82.2934607010406	32.336823267905	33.6244	92.4492	56.3457
32.2300742850319	82.2934607137846	32.3368232697354	30.7482	95.8761	57.2879
31.8410584329998	82.2934607265206	32.3368232736124	31.4281	94.9219	54.3744
31.4531172497447	82.2934607392575	32.3368232762814	29.7849	97.5299	53.9895
31.0664388126214	82.2934607519832	32.3368232776974	26.9511	99.1097	54.9389
30.6817682910629	82.2934607646934	32.3368232795971	26.55	96.735	54.3574
30.2993054041551	82.2934607774102	32.336823287231	26.6904	96.1713	46.6576
29.9190018163353	82.2934607901505	32.3368232934518	29.8552	101.3038	43.5974
29.5402313407122	82.293460802891	32.3368232978822	39.3246	101.8921	42.5744
29.1610479579397	82.293460815619	32.3368232981935	42.8352	101.6931	44.9574

Solution x	Solution y	Solution z	Original x	Original y	Original z
28.7804178685627	82.2934608283354	32.3368233003453	46.5537	103.4177	45.8992
28.3956555043	82.2934608410148	32.3368233033359	42.0156	103.5929	44.0945
28.0093840043994	82.2934608536844	32.3368233046963	39.1965	105.4524	44.823
27.6220031776793	82.293460866338	32.3368233099132	35.3466	107.7036	41.395
27.2344280779863	82.293460878972	32.3368233112939	32.8361	107.2479	41.504
26.8472301725314	82.2934608915921	32.3368233209096	34.3074	104.3145	33.9426
26.4603100778328	82.2934609042165	32.3368233248734	31.3011	106.2109	32.3658
26.0740558741732	82.2934609168374	32.3368233332057	33.1638	109.6815	28.6324
25.6871209756557	82.2934609294181	32.3368233496317	33.1686	108.6172	19.7963
25.2991010554922	82.2934609419567	32.33682335138	28.1717	107.4546	19.2451
24.9116611412236	82.2934609544662	32.3368233459762	28.2891	98.27	21.6276
24.5254287285572	82.293460966992	32.3368233452607	29.1897	96.4145	23.036
24.1401344080857	82.2934609795384	32.3368233445438	31.7064	96.988	25.1942
23.7551436441106	82.2934609920987	32.3368233361589	34.0464	97.1856	33.2284
23.3698547745458	82.2934610046677	32.3368233415365	38.189	100.3805	31.8594
22.9823843100171	82.293461017212	32.3368233398493	36.8108	99.4487	34.5912
22.5930872816959	82.2934610297395	32.3368233382731	33.8351	99.3235	37.4512
22.2025305760942	82.2934610422512	32.3368233380979	32.8593	93.0881	38.0081
21.8114402298999	82.2934610547774	32.3368233425505	32.2034	92.5655	35.5696
21.4198208581943	82.2934610673192	32.3368233497957	33.1881	90.5996	30.8927
21.027346247982	82.2934610798835	32.3368233542295	29.7064	94.0211	29.3487
20.634449933998	82.2934610924603	32.3368233549624	26.1674	96.1159	30.3905
20.2415743521078	82.2934611050424	32.3368233620641	21.5395	100.4343	27.1149
19.8490611235284	82.2934611176123	32.3368233648787	8.0611	104.093	26.141
19.4592757163287	82.2934611301592	32.3368233742465	9.17	97.1621	20.3835
19.0716095906321	82.2934611427169	32.3368233762301	6.3198	96.0864	20.0555
18.6862761793747	82.2934611552872	32.3368233906956	5.8502	91.8647	13.1882
18.3033986579755	82.2934611678843	32.3368233854744	0.613799999999998	95.4238	16.9249
17.924036198635	82.2934611804984	32.336823391455	1.4019	97.5847	15.4849
17.5481167484928	82.293461193122	32.3368234072919	3.0162	107.1796	11.3112
17.1905821361075	82.2934612058044	32.3368234103087	3.81100000000001	100.5395	9.9764
16.8366267679472	82.2934612184765	32.3368234172273	2.55330000000001	99.1767	7.9857
16.4875481696402	82.2934612311423	32.3368234286581	8.1477	101.1634	5.5645
16.1413568615926	82.2934612437673	32.3368234251162	4.77370000000001	93.7785	6.1602
15.7974916575154	82.2934612563951	32.3368234302182	2.57040000000001	90.3092	4.6781
15.4568847986625	82.2934612690315	32.3368234340426	2.7376	84.0979	3.4333
15.1193914269418	82.2934612817007	32.3368234508547	-0.100899999999996	90.0487	0.1507
15.1193913649202	82.2934612842415	32.3368235311914	-0.171000000000006	97.1566	2.8672
15.1193913034357	82.2934612865282	32.336823607687	-1.9602	93.9224	5.6614
15.119391241947	82.2934612888095	32.336823689579	-2.1508	94.1499	7.6254
15.1193911804595	82.2934612910804	32.3368237775003	-6.68600000000001	94.6391	7.4364
15.1193911189874	82.2934612933084	32.3368238447149	-12.8049	93.8535	15.5008
15.1193910574782	82.2934612955242	32.336823918486	-2.5612	92.1356	23.79
15.1193909959857	82.2934612977446	32.3368240018105	-0.735100000000003	89.6931	26.6301
15.1193909345104	82.2934612999857	32.3368240897804	7.8142	89.6258	27.2865
15.1193908730333	82.2934613022439	32.3368241791415	3.5924	94.7451	26.9481
15.1193908115655	82.2934613045026	32.336824269222	-0.338999999999999	97.1979	25.6607
15.1193907501169	82.293461306756	32.3368243558565	-5.5457	98.4014	26.4862
15.1193906886986	82.2934613090027	32.3368244411671	-0.311599999999999	97.6012	28.6474
15.1193906273007	82.2934613112506	32.3368245294013	3.11839999999999	98.924	29.022
15.1193905659144	82.2934613134903	32.3368246152032	3.1448	100.72	31.1491
15.1193905045379	82.2934613157051	32.3368247008199	1.64530000000001	95.7178	31.8751
15.1193904431779	82.293461317928	32.3368247882395	-3.1358	95.2162	31.8855
15.1193903818453	82.2934613201604	32.3368248720998	-1.86190000000001	98.5581	36.524
15.1193903205325	82.2934613223682	32.3368249579313	0.619299999999996	91.0377	37.0534
15.1193902592388	82.2934613245976	32.3368250465086	3.5998	89.8159	36.4775
15.119390197958	82.2934613268505	32.3368251245597	3.55029999999999	90.3653	48.0124
15.1193901366859	82.2934613291139	32.3368252166962	3.4538	93.5151	43.6356
15.1193900754241	82.2934613313764	32.3368253045086	2.1469	96.6722	44.5395
15.1193900141728	82.2934613336163	32.336825391699	1.20229999999999	90.7259	43.7677
15.1193899529369	82.2934613358744	32.3368254782639	-4.1255	85.596	43.5867
15.1193898917291	82.2934613381816	32.3368255645198	-3.26390000000001	94.8889	48.3647
15.119389830542	82.2934613404829	32.3368256507866	0.580200000000005	93.7511	50.7296
15.1193897693695	82.2934613427893	32.3368257345766	-0.0468000000000046	93.7668	57.0052
15.1193897082141	82.2934613451091	32.336825821099	1.1743	92.9818	59.2535
15.1193896470831	82.2934613474668	32.3368259103495	4.95789999999999	99.4405	59.5277
15.1193895858014	82.2934613491422	32.3368259983406	-7.5489	96.9207	56.8305
15.6465393327676	80.7292125669945	31.7095801562595	-2.30370000000001	90.7079	58.2529
16.1948868856458	79.0833193559445	31.0414451660601	-1.23350000000001	86.0108	56.7294
16.7570722106918	77.4238818575275	30.3472030126003	-4.2807	74.2616	57.1387
17.3581832618852	75.867112052276	29.579612789509	4.0089	72.186	49.5614
17.9659350504917	74.3515955881929	28.8034428508711	4.4426	63.6871	51.0243
18.582667192684	72.9040414386093	28.012102942909	4.7342	63.0935	56.3188
19.2184425847986	71.5523440635805	27.1641105778459	8.4928	63.9998	55.0759
19.8647878533594	70.2514061916533	26.2786830364991	11.4442	66.9869	57.5373
20.52246215902	68.9859416101246	25.3246069439706	14.2076	63.0144	54.8035
21.187441557813	67.7585867052121	24.3207277112475	15.3124	65.205	52.7286
21.8584881508862	66.5546834432717	23.2754425347804	14.0233	68.3418	48.6515
22.5360362602544	65.3632976348471	22.200478253648	11.4886	67.7219	43.0579
23.2212328287245	64.184794676903	21.1065462694901	12.0097	66.7734	42.888

Solution x	Solution y	Solution z	Original x	Original y	Original z
23.9144679476648	63.0184886008693	19.9899268285491	5.2812	65.5492	44.5709
24.6283752081823	61.8632631321463	18.8138791814166	0.309600000000003	68.1954	39.7657
25.3821243426298	60.7013427313011	17.5517809016618	6.67010000000001	63.5082	34.9077
26.1510485545664	59.5530414508586	16.2641987684927	6.9842	66.7632	27.251
26.9341511422984	58.4124247354662	14.964958136511	10.7344	66.9849	31.9545
27.7311635150584	57.2768232058163	13.6402781131194	11.6475	70.8021	30.9107
28.5448172521982	56.1354721387038	12.2808780775157	7.0214	70.8048	31.3366
29.401745687217	54.9643185088022	10.828575077401	8.3117	72.2049	29.6247
30.3168241345166	53.740298723588	9.24173191526327	9.9143	75.8382	26.191
31.3443021749315	52.3337792988916	7.370541154294	6.65640000000001	74.2265	20.3804
32.7616609075453	50.2599197087301	4.78178340732491	1.76609999999999	66.5446	12.6159
Route: 4 Length: 7.58505862874064 Demand Met: 6433					
47.0742179085038	11.9658999961145	1.12851090250388E-7	46.5714	10.174	4.4604
47.0204045791386	11.9658999912667	1.11781979228454E-7	47.4524	12.1509	5.76
46.9670375273212	11.96589999401	1.03592761035998E-7	47.1015	12.1757	10.5923
46.9140960610905	11.9658999968212	1.11570841454522E-7	52.0306	12.0787	8.641
46.8614932285879	11.965899999578	1.08786288421925E-7	52.3173	10.0275	11.1526
46.8091672624113	11.965900002217	9.85534640562946E-8	53.1154	7.9184	18.71
46.757018732996	11.9659000047617	1.03222710379214E-7	61.7542	11.527	18.9198
46.7046472830904	11.9659000072882	1.07149332961853E-7	53.4554	15.0784	17.1477
46.652344764339	11.9659000098239	1.15097165576117E-7	53.9046	16.3668	14.1276
46.6000583144893	11.9659000123886	1.10215673032599E-7	49.9971	19.9155	18.5508
46.547813464401	11.9659000149866	1.07447711172881E-7	47.2412	18.0641	21.8927
46.4956439807208	11.9659000176036	1.10803952679817E-7	46.6598	16.011	21.0885
46.4435545602446	11.965900020228	1.1288816637034E-7	45.8725	14.3747	21.2711
46.3915478584262	11.9659000228514	1.13876531315782E-7	48.0446	14.6778	22.9405
46.3395296680718	11.9659000254724	1.14514605797922E-7	43.7231	10.6871	23.6231
46.2876053436672	11.9659000280814	1.28234852070364E-7	43.984	9.2005	15.6271
46.2357976361163	11.9659000306802	1.37082864171134E-7	44.5689	9.75	12.1988
46.1840891721367	11.9659000332768	1.38052762110874E-7	44.5228	11.8645	13.3212
46.1324666896495	11.9659000358785	1.52526340002623E-7	41.9974	13.5778	7.3366
46.0809770171143	11.965900038492	1.62507795664624E-7	44.2621	15.3855	4.7212
46.0295758278003	11.9659000411184	1.7351197101334E-7	46.503	16.5426	2.0548
45.978217905901	11.9659000437545	1.67598358302712E-7	49.3862	17.5735	5.4967
45.9268389952402	11.965900046396	1.68827405389038E-7	49.1677	19.2175	6.1526
45.8754350684352	11.9659000490404	1.88327888395179E-7	46.7163	23.0055	0.3229
45.8240411492503	11.9659000516834	1.88974603076986E-7	47.5893	27.8934	1.3329
45.7726019847186	11.9659000543162	1.87475478696797E-7	44.1303	30.8739	2.5661
45.7211885164346	11.9659000569399	1.8687141078999E-7	37.4272	33.8061	3.3013
45.6699147452175	11.9659000595524	1.96851608791349E-7	42.8212	36.4305	1.5446
45.6186585656845	11.9659000621588	1.96070921276714E-7	45.6407	35.658	2.8521
45.567388843722	11.9659000647665	1.95227251253982E-7	44.3651	39.5082	4.2576
45.5160891325529	11.9659000673875	1.81290964462733E-7	45.4903	38.3462	11.2293
45.4647501397457	11.965900070033	1.87476445034918E-7	45.4526	36.121	9.3446
45.4134314103246	11.9659000726975	1.89916740112039E-7	46.7677	27.4481	8.8301
45.3621961040661	11.9659000753492	1.84376872880421E-7	49.5432	29.0024	13.3417
45.3109649158793	11.9659000779938	1.92251697228585E-7	54.5895	27.7676	11.1642
45.2596389386713	11.9659000806276	2.00960492691138E-7	53.915	28.4629	8.3577
45.2082542580613	11.9659000832515	2.05962450650077E-7	54.8257	29.6059	7.5612
45.1567755132438	11.9659000858765	2.09292593922328E-7	57.9508	29.6187	7.6435
45.1050825619193	11.9659000885192	2.31595670641127E-7	58.126	35.24	1.1949
45.0534290324761	11.9659000912264	2.21197247185501E-7	50.8592	31.2824	4.4654
45.0018151501776	11.9659000939879	2.29819733021941E-7	54.0368	23.8586	2.2143
44.9502316796108	11.9659000967673	2.27279421949333E-7	55.8132	15.4408	3.6174
44.8986858298234	11.9659000995232	2.25628198791128E-7	57.2331	12.7874	5.1838
44.8471431373445	11.965900102246	2.29244243143967E-7	56.6752	3.9284	4.2715
44.7956431911672	11.9659001049074	2.30384330279776E-7	58.5415	3.6684	5.0311
44.7441349954923	11.965900107521	2.28546149116937E-7	58.8992	5.3006	6.9433
44.6926023754378	11.9659001101172	2.21691614399333E-7	58.0725	5.2013	11.1785
44.6410625175707	11.9659001127196	2.30975821580159E-7	59.4358	8.0877	8.3998
44.589477108566	11.9659001153522	2.47349497328742E-7	64.6914	7.7788	3.6297
44.5377738541106	11.965900118039	2.50266460000148E-7	62.4332	-0.684	2.8792
44.4859472707181	11.9659001207301	2.48576405681433E-7	58.6741	1.1796	4.0744
44.4340204598763	11.9659001234222	2.49649744432645E-7	58.2864	0.0731	4.559
44.3819110233874	11.9659001261093	2.43773577324191E-7	58.2741	0.1622	8.0145
44.3294390499389	11.9659001287868	2.49642042149389E-7	54.5841	1.3	6.274
44.2766937939846	11.9659001314529	2.50784452759945E-7	51.545	-0.7619	6.4521
44.2237795034774	11.965900134106	2.45546004862263E-7	46.0937	-5.8176	9.1179
44.1709516197914	11.9659001367478	2.48199405916694E-7	47.0712	4.3382	9.7807
44.1180540444532	11.9659001393767	2.48144921499716E-7	48.4975	2.4432	11.2037
44.0649693964337	11.9659001419934	2.49291318255018E-7	48.302	2.6164	11.9932
44.0117100758443	11.9659001445994	2.46366006706467E-7	48.7027	4.8736	15.3944
43.9583433911387	11.9659001471988	2.48124216284396E-7	44.8479	-0.9391	15.0769
43.9050118346598	11.9659001497974	2.40540224183405E-7	32.3564	-1.4633	20.5286
43.8519818415564	11.9659001523997	2.39924638378852E-7	29.2451	9.0499	23.6495
43.7992671685404	11.9659001550042	2.43375147590541E-7	28.1449	5.3771	22.529
43.7468496038973	11.965900157619	2.50244951871537E-7	26.4488	5.1021	19.0029
43.6947337961933	11.9659001602472	2.56527528108563E-7	26.246	7.8923	16.6585
43.6429029412308	11.9659001628879	2.57583998575228E-7	21.6596	11.213	17.563
43.5913966818374	11.965900165534	2.63589335247616E-7	31.9656	14.6164	16.7619

Solution x	Solution y	Solution z	Original x	Original y	Original z
43.5401283625661	11.9659001682004	2.6688389453966E-7	24.5729	19.8583	16.0395
43.4890089869241	11.9659001708863	2.73531554739748E-7	20.5046	21.2685	13.3595
43.4379905105715	11.9659001735953	2.8015677600024E-7	15.0509	21.8739	10.7741
43.387108783762	11.9659001763271	2.95091119539848E-7	19.6457	23.2311	5.559
43.3361712841165	11.9659001790978	2.94278585499796E-7	7.8039	17.6061	5.7787
43.5950100550066	11.9659001659157	2.96328188653661E-7	16.9397	16.157	0.3423
43.8565635590961	11.9659001527419	2.84700007568972E-7	21.2889	20.2133	0.1771
44.1200239734904	11.9659001395311	2.68535707448336E-7	27.0312	22.0371	1.4535
44.3846635433679	11.9659001261913	2.35255633640463E-7	25.2224	21.1268	9.0297
44.6505589194077	11.9659001127106	2.20405460993334E-7	24.0847	21.2619	9.4135
44.9175995428527	11.9659000990866	2.12544094324585E-7	23.3217	16.9506	6.2856
45.1856843922501	11.965900085455	1.92487057404378E-7	23.9142	5.5856	8.3806
45.4551880268399	11.9659000719909	1.70793100551236E-7	22.4003	2.9895	12.1851
45.7271102642569	11.9659000587725	1.77626880315529E-7	19.4163	-0.8394	2.2943
46.0025996236139	11.9659000457883	1.57666136146872E-7	26.7943	-2.6353	5.1743
46.280379954155	11.9659000329234	1.58038105269043E-7	28.0443	7.2557	0.5495
46.5601401373403	11.965900020071	1.43455508805346E-7	42.4139	3.5597	1.814
46.8413642120828	11.9659000074305	1.32460826307579E-7	42.7704	10.2739	1.2183
Route: 5 Length: 138.637386139595 Demand Met: 9998					
50.9362042031116	13.5993951285264	0.527520103871645	66.5887	34.1226	10.8677
54.2542447366191	15.1281224502317	1.04657905008721	72.9198	44.5581	6.5665
56.6079893358013	16.2780869005041	1.55388459154179	73.6395	46.5004	2.2066
58.6311662846788	17.2606511964783	2.06076002446224	75.73	42.7229	0.0066
60.5933187658221	18.2054201132472	2.56958525854574	75.9022	40.5634	8.2476
62.543443503908	19.1312852757032	3.07648448233224	85.525	32.0217	10.845
64.4482126275894	20.0529024027123	3.58050110079828	86.512	33.4131	7.017
66.3259787002572	20.9725572544728	4.08392146939759	91.1655	36.0648	5.0962
68.1344774386547	21.8836826238557	4.58791936200014	92.634	40.1716	1.8791
69.8543241236347	22.7762347207112	5.09493103013456	95.8598	39.2349	3.852
71.4802390085717	23.6531571499297	5.60413111540412	96.6284	43.246	1.131
72.9956623314346	24.5021620710718	6.11825949576206	95.7654	46.8722	1.8076
74.4262792674052	25.3193630328269	6.63726559219211	98.2004	50.3921	3.9008
75.6598641881631	26.0600356602793	7.16215194727306	98.2152	53.7701	7.2972
76.5637379267916	26.6397688720477	7.68827186549805	100.6388	53.8259	6.8403
76.7499224645972	26.793934617795	8.23835532542324	100.3439	52.2486	6.1962
76.931328699192	26.9448899222011	8.79385842446043	99.5987	51.3246	10.6347
77.1105463042486	27.0942206786407	9.34934131873767	103.8062	50.1176	9.3383
77.2833665742009	27.2401673878116	9.90646215560458	106.4442	49.0895	9.9061
77.1581072299722	27.2401673366904	10.0952241430744	104.1102	44.8822	12.643
77.0319021687733	27.2401672853805	10.2839429334505	102.543	45.6081	13.7083
76.9049073446627	27.2401672338899	10.4725596172905	98.0879	44.5657	15.6818
76.7774692993002	27.2401671823402	10.6610296420824	101.377	48.1816	18.5975
76.6489070069351	27.2401671305044	10.8487962032173	100.6036	46.802	22.0951
76.5194493607849	27.2401670784301	11.0355762312593	95.0864	47.4256	26.3676
76.3892910402083	27.2401670261419	11.2212941495063	93.9129	43.6355	26.629
76.2586489723578	27.2401669737715	11.4062467357354	92.1801	41.0349	29.4683
76.1275628619154	27.2401669213814	11.5903524224121	93.6941	39.0671	28.969
75.996101601552	27.2401668690023	11.7736725577145	93.6083	38.4774	26.0941
75.8643510003545	27.2401668166577	11.9564391963439	91.9372	36.8319	23.3371
75.7323967273927	27.2401667644059	12.1388514399567	87.5583	39.2312	23.679
75.6003791351314	27.2401667122029	12.320948008849	87.2346	40.5435	32.6709
75.4682967234334	27.2401666599529	12.5022245935829	88.4465	41.4478	32.5802
75.3361361224546	27.2401666076341	12.6826704235195	92.7124	33.4453	33.5856
75.2038129606889	27.2401665553972	12.8622896454484	93.9312	28.9768	31.8553
75.0714211901989	27.2401665033178	13.0412813470352	93.6487	25.1273	31.9089
74.9391191700951	27.2401664514631	13.2196801130136	92.942	26.4511	38.6789
74.8067412248695	27.2401663997798	13.3966094077361	97.3283	27.0933	33.194
74.6740686832218	27.2401663482758	13.5727005815838	97.5011	28.0267	29.587
74.5412755790234	27.2401662969808	13.7483969045011	97.4429	30.1528	28.42
74.408407685812	27.2401662459065	13.9238370684519	98.9301	33.2654	27.8083
74.2752370590107	27.2401661950919	14.0990291014965	99.0228	31.9463	24.4512
74.141930601717	27.2401661445829	14.2742314038365	100.6297	27.3107	24.1251
74.0084602044645	27.2401660943779	14.449390816716	105.6149	29.5786	27.9356
73.8728332193358	27.2401660444372	14.6230910756035	104.9423	23.521	33.0938
73.6953911420962	27.2401659947342	14.7710758509833	98.3241	22.4412	26.657
73.5178413569835	27.2401659452787	14.9188554556807	90.6435	28.0536	25.8632
73.340992619588	27.2401658960027	15.0665243973481	96.156	30.1327	19.1399
73.1643211883454	27.2401658468618	15.2143039202752	97.0499	25.7334	20.6225
72.9877981242996	27.2401657978911	15.3620765596844	102.4997	24.4075	19.7902
72.8103919126952	27.2401657490692	15.5097616456434	102.9016	24.8202	19.8795
72.6319092380992	27.2401657003974	15.6572919342855	105.0575	26.2706	17.0665
72.4513725869209	27.2401656518491	15.8047390526105	106.8535	30.7643	14.4546
72.2664380749763	27.2401656032905	15.9522443830082	102.9211	31.879	13.8489
72.080032188097	27.2401655548208	16.0998055295557	103.4615	37.3033	20.8908
71.8910767950473	27.2401655063365	16.2470200318352	98.3613	42.0392	20.5386
71.7010465369297	27.2401654578403	16.3940280221728	94.3087	39.6383	18.4042
71.5108096329635	27.2401654094236	16.5410002813116	94.1971	38.0204	14.8005
71.3203102383808	27.240165361111	16.6881007070593	92.8093	39.7693	16.6418
71.1296016288136	27.2401653128844	16.8353158856281	89.0134	41.3658	15.8043
70.9390288407645	27.240165264747	16.9826953896003	89.3668	41.343	14.5671

Solution x	Solution y	Solution z	Original x	Original y	Original z
70.7485153734051	27.2401652167003	17.1302949086908	89.5287	45.4109	8.5583
70.557764599852	27.2401651685914	17.2783256796563	94.5726	47.3613	8.9492
70.3656066179835	27.2401651202062	17.4269171263062	89.6611	52.1615	6.6683
70.1728749767305	27.2401650713703	17.5761431286541	84.6532	51.7406	11.3965
69.9801273429759	27.2401650224012	17.7257119318273	83.5076	51.7826	22.7284
69.7875000756659	27.2401649733875	17.8754284059388	80.7698	50.729	27.0276
69.5952475031866	27.2401649243549	18.0252317095288	80.3964	49.7264	23.6683
69.4033986282246	27.2401648753048	18.1751146710662	75.5201	48.6107	22.753
69.2123857893294	27.2401648262512	18.3250435086933	75.5587	49.1352	25.3998
69.0221298096765	27.240164777152	18.474952899414	76.379	48.6237	27.9163
68.8325450683233	27.2401647279728	18.6247880154456	76.0043	50.5809	30.4596
68.6435359427202	27.2401646786215	18.7744656759193	77.9223	44.6051	30.7678
68.4550321141082	27.2401646291413	18.9240343949805	81.9079	40.1742	36.8216
68.2663705006004	27.2401645794851	19.0732878529933	75.9853	41.4015	43.6031
68.0778989301418	27.2401645296373	19.2216517355302	72.4926	42.7909	40.5929
67.8900726232797	27.2401644796419	19.3693626543759	72.9378	43.4347	40.5471
67.7027815110024	27.2401644294933	19.5163726679544	72.4429	44.8985	35.9587
67.5161147132494	27.2401643792118	19.6629648964541	72.0385	47.603	37.589
67.3299876736838	27.2401643287459	19.8089833795137	70.6191	48.182	36.9413
67.1445614972349	27.2401642781464	19.9544667571131	69.1689	51.2673	37.9561
66.9598985352531	27.2401642273566	20.0991972352243	69.1565	53.343	39.551
66.7758798389489	27.2401641762441	20.2426859846561	67.4683	58.2291	37.5546
66.5943757280843	27.2401641207318	20.3778549046626	68.2826	55.0673	33.7791
66.4136488970472	27.2401640650451	20.5126735502515	73.8072	55.2741	29.1095
66.2328423163769	27.2401640091521	20.6475657632316	73.2116	57.797	29.252
66.0522391706622	27.2401639526961	20.7824765461939	70.1344	58.5671	20.707
65.8720696898633	27.2401638957183	20.9180190025314	71.2619	53.5794	21.4252
65.6921770126531	27.2401638386016	21.0540936517215	70.694	53.8562	23.1583
65.5125666571765	27.2401637813223	21.1905447960223	70.4096	46.4113	26.9931
65.3334342076617	27.2401637240892	21.3271580666931	67.5609	49.631	28.0783
65.1548853913066	27.2401636668453	21.4638595740995	67.6648	48.1141	30.5928
64.9768808266226	27.24016360962	21.6005657681608	67.7991	50.1342	31.512
64.7993475303509	27.2401635523499	21.7372504522398	70.8564	51.5507	32.2844
64.6220257705434	27.2401634949439	21.8739169444675	70.2011	52.705	34.7749
64.4450544821459	27.2401634373611	22.0104824834343	70.0624	50.1219	34.6274
64.2685701922821	27.2401633796798	22.1469890250938	66.949	50.6855	34.7495
64.092644341361	27.2401633218702	22.2833849140201	65.3289	43.5846	33.8262
63.9172494843445	27.240163264041	22.4196503236102	60.9493	37.7343	34.646
63.7424900065197	27.2401632062884	22.5557205530445	62.464	33.4003	33.7046
63.5682984970617	27.2401631486664	22.6915108107293	63.5739	32.9982	33.2424
63.3946401008501	27.240163091166	22.8268771894338	65.4552	32.6167	36.7679
63.2214765386216	27.2401630337512	22.9616790623648	63.8645	34.3723	36.4179
63.0488596650855	27.2401629763805	23.0957976305317	63.453	34.6286	41.047
62.8768049097118	27.2401629190419	23.2292573380659	65.211	38.9167	43.4098
62.7052650533346	27.2401628616335	23.3620515285396	64.2784	38.8059	47.0778
62.5342994411747	27.2401628042061	23.4943209256265	66.7168	38.698	48.2341
62.3639362411101	27.2401627467834	23.6262133547913	64.8516	39.5774	48.8657
62.1941956162646	27.2401626893739	23.7579515361315	61.1452	36.2851	50.8184
62.0249852513509	27.2401626320116	23.8897591077849	62.0243	36.102	59.234
61.1789467007467	26.3053941508484	23.8568913899709	60.137	35.2014	51.7925
60.3327570695248	25.36805913251	23.823972666441	60.8351	33.4935	47.8851
59.4882314397139	24.4318274779245	23.7910228127422	60.1802	30.671	38.4138
58.6467435125074	23.5002479102947	23.7580579418452	62.9268	27.0211	37.7555
57.8077938203944	22.5746595131678	23.7250596100462	59.5552	26.5288	41.5263
56.9721600413601	21.6547885583586	23.6920082280467	61.643	23.6955	42.1255
56.1391560533904	20.7420582189709	23.6588839079507	68.3676	27.331	45.292
55.3032316935725	19.8308767249302	23.6256538165168	67.8857	28.9512	53.8343
54.4427398362668	18.8992116038839	23.5920925172638	70.5469	25.0661	53.9959
53.5103741312748	17.9348430853236	23.5584842739782	50.8742	24.2729	53.2264
52.5887436862171	16.972881196114	23.5248043913093	53.7123	16.59	54.3027
51.6762116287898	16.0253315042581	23.4909912535276	52.0827	15.9727	59.9151
50.4078691894007	15.0768860986697	22.5941895003823	45.9074	18.6439	58.1761
49.2950988456345	14.053871440015	19.0286487588244	39.7266	17.3977	50.5452
48.2404037380211	13.0319621890876	13.957795756593	47.2642	16.1804	48.1934
Route: 6 Length: 173.000888866462 Demand Met: 10000					
53.499480858174	23.1878296274402	21.3146582221459	50.1386	26.6573	56.0437
60.8740330893858	33.1292403502648	25.3440567866255	65.7303	47.3671	58.4265
62.5699931040161	33.8295192341019	25.6448821056475	67.4955	46.0347	52.8305
64.2780169525215	34.5279621715039	25.9423556892741	66.2863	51.2705	54.2569
66.0064812012482	35.2111439455451	26.2340563239904	69.4154	51.8752	55.6067
67.7397731713524	35.8715178205306	26.5173480342625	69.2681	55.3133	57.276
68.2932098227338	35.9334139312558	26.5554584079645	72.0304	52.5053	58.0692
68.8415951774384	35.9947500725333	26.5930551278315	73.3859	52.8201	55.9097
69.3890892149161	36.0558324284352	26.6304667620017	73.2401	49.0047	54.3428
69.9384249175117	36.1168806102416	26.6678132033352	74.4488	50.3129	52.3971
70.489325809578	36.1778863764944	26.7051067782124	77.4079	49.147	51.5989
71.0406333113115	36.238855831275	26.7423523405237	76.4125	46.981	46.4216
71.5941335109756	36.2998445423339	26.7795869413061	77.9078	47.2474	41.2613
72.149622745272	36.3608485167611	26.8168294138539	79.533	47.2684	42.1428
72.7065504983113	36.4218587007454	26.8540760258981	80.0004	48.0282	43.1849

Solution x	Solution y	Solution z	Original x	Original y	Original z
73.2646002503725	36.4828620732987	26.8913204520187	78.2967	50.1808	43.2865
73.8241894937202	36.543838881852	26.9285601286452	74.8417	48.5823	43.578
74.3868534852083	36.6048156066727	26.9657963856863	70.5497	45.0925	44.08
74.9543805354463	36.6658331327909	27.0030301309072	72.7013	43.6681	47.6828
75.5261546286021	36.7268952730084	27.040246729012	70.1179	52.2878	46.5219
76.1033896335706	36.7879289203795	27.0774440473129	69.8977	54.8286	42.1718
76.6862845086778	36.8489259899545	27.1146387993069	68.5789	56.8701	42.2821
77.2761740240933	36.9098719977246	27.1518297297505	73.7963	57.8273	45.2128
77.8709549020596	36.970735686288	27.1890019264536	74.3979	53.0985	48.6112
78.4711027035535	37.0315799417111	27.226150409507	72.0955	52.6394	50.8408
79.0790733754645	37.0924091699991	27.2632650894096	78.0993	54.3894	50.2798
79.6915841008936	37.1531984799934	27.3003481618131	77.8264	55.5164	53.7679
80.3102258664013	37.2138915664386	27.3373579951995	77.9705	58.8491	56.0075
80.9480750030377	37.2732540968867	27.3737058691838	85.8477	60.7859	54.7762
80.9480751895474	37.2732541246009	27.3737058917448	86.2321	62.729	51.1705
80.9480753759602	37.2732541524336	27.3737059160705	89.2688	56.3248	44.4917
80.9480755624106	37.2732541802236	27.3737059402706	92.9131	56.6287	40.2251
80.9480757488327	37.2732542080084	27.3737059611197	93.3932	53.1876	39.0419
80.9480759353279	37.2732542357499	27.3737059813522	97.7455	51.8526	39.6885
80.9480761218082	37.2732542634611	27.3737060001026	98.1036	50.8139	41.2796
80.9480763083189	37.2732542911396	27.3737060208181	100.5945	52.9653	41.549
80.9480764948605	37.2732543188472	27.3737060430375	106.6231	51.946	40.2003
80.9480766808913	37.2732543466644	27.373706064204	103.8959	45.4099	37.4639
80.9480768669785	37.2732543744641	27.3737060830804	103.3956	43.6231	38.3961
80.9480770530607	37.2732544022377	27.3737061055296	103.0838	43.6629	35.7673
80.9480772391521	37.2732544300067	27.3737061265256	99.7789	45.6905	34.3678
80.9480774253055	37.2732544577779	27.3737061429873	100.0845	45.3198	38.3951
80.9480776114436	37.2732544855685	27.3737061626573	97.5519	44.8528	38.2336
80.9480777976039	37.273254513356	27.3737061825232	95.1396	47.3596	38.3213
80.9480779837836	37.2732545411612	27.3737062032721	94.3452	48.7818	37.6589
80.9480781699582	37.2732545690063	27.373706220777	94.4684	44.7163	40.2539
80.9480783561097	37.2732545968425	27.3737062410028	90.4865	46.0315	39.3528
80.9480785422901	37.2732546246557	27.3737062603579	89.352	47.1855	40.3099
80.9480787284956	37.2732546524524	27.3737062833894	90.3356	51.1932	37.7625
80.9480789146613	37.2732546802695	27.3737063021378	85.9154	51.5363	38.6114
80.9480791008879	37.2732547080764	27.3737063294008	81.1686	57.7423	31.0101
80.9480792872371	37.2732547358953	27.3737063579903	87.1149	58.1702	24.9275
80.9480794735863	37.273254763722	27.373706377571	88.0225	60.7529	26.1198
80.9480796599798	37.2732547915748	27.3737063984022	92.749	64.7326	27.0986
80.9480798462594	37.273254819531	27.3737064227775	88.7937	67.447	23.6857
80.948080032547	37.2732548476177	27.3737064531778	92.0851	66.8651	17.5763
80.9480802187292	37.2732548759137	27.3737064715664	94.5987	62.0376	18.5629
80.9480804048716	37.2732549043073	27.3737064869652	94.6877	57.1733	21.1304
80.948080591071	37.2732549326659	27.3737065107914	102.8738	56.4102	20.1678
80.9480807771019	37.2732549611152	27.3737065366253	102.1595	55.9791	16.6639
80.9480809629659	37.2732549896825	27.373706537582	101.7941	49.0832	29.2585
80.9480811487892	37.2732550181759	27.373706559944	96.0562	52.3857	26.7058
80.9480813347218	37.2732550466068	27.3737065797653	98.7715	55.3698	27.9452
80.9480815206853	37.2732550750166	27.3737065986594	99.9754	58.6633	29.714
80.9480817066351	37.2732551034318	27.373706623006	101.778	67.1686	27.7348
80.9480816998023	37.2296900158357	27.373706634984	98.4228	65.0226	33.0945
80.9480816930155	37.1859695566509	27.3737066523108	95.479	61.1306	33.7151
80.9480816862538	37.1422133970929	27.3737066688753	94.4551	58.0456	35.6169
80.9480816794629	37.0984498222904	27.3737066860336	99.7259	57.0659	38.9488
80.9480816727051	37.054656023723	27.3737067053726	99.0429	61.6589	39.3422
80.9480816659757	37.0107471218623	27.373706722323	95.4724	61.7777	41.2303
80.9480816592603	36.9667516236341	27.373706739714	95.4289	57.3916	42.7453
80.9480816525446	36.9227257270126	27.3737067553723	94.8477	58.3247	47.7413
80.9480816458299	36.8786109432622	27.3737067750276	95.0304	53.2116	46.2852
80.9480816391021	36.8344846766635	27.3737067946206	97.9579	54.2407	46.7851
80.9480816323888	36.7903127469658	27.3737068123908	97.7133	51.9341	48.5236
80.9480816256571	36.7461093845347	27.3737068300069	99.5817	52.1789	51.8005
80.9480816189473	36.7017697281065	27.3737068500771	100.8862	48.4618	50.2894
80.9480816122352	36.6573879622778	27.3737068693857	101.161	45.7653	49.9947
80.9480816055237	36.6129906840199	27.3737068881662	102.9297	48.0592	51.9744
80.9480815988507	36.5684340402182	27.3737069104047	105.6501	47.8555	48.2801
80.9480815922026	36.5237535027733	27.3737069309546	98.9198	48.0008	44.9228
80.9480815855651	36.4790532516252	27.3737069499151	93.3823	48.5086	44.2946
80.9480815789294	36.4343378383226	27.3737069675495	91.9732	45.8332	46.1527
80.9480815723036	36.3896146350645	27.3737069875612	90.0385	42.8005	44.3862
80.9480815656639	36.3448981915548	27.3737070072159	90.4784	41.2284	44.1276
80.9480815590147	36.3001897408662	27.373707029074	90.014	39.915	40.6629
80.9480815523346	36.2554942981317	27.3737070503594	92.2396	41.0703	39.2658
80.948081545664	36.2108002421244	27.3737070677736	93.2846	41.9379	42.3812
80.9480815389889	36.1660980291458	27.3737070859595	96.2085	41.8253	45.162
80.948081532372	36.1213758695531	27.3737071058595	98.5859	34.5756	44.3792
80.948081525777	36.0766646844026	27.3737071254588	100.384	25.6874	43.9589
80.9480815192078	36.0320058240742	27.3737071488927	101.5683	27.6266	39.8262
80.9480815126754	35.9873821938373	27.3737071702755	97.1838	29.5842	37.1942
80.9480815061405	35.9427901052102	27.3737071904139	98.5493	33.1624	37.7737

Solution x	Solution y	Solution z	Original x	Original y	Original z
80.9480814996134	35.8982090799794	27.3737072113299	95.8908	32.6754	36.0409
80.9480814931134	35.853648500377	27.3737072266989	95.0864	33.2234	41.4865
80.9480814865932	35.8091103057906	27.3737072477862	96.5473	37.5774	41.1201
80.9480814801133	35.7645658990033	27.3737072662866	91.8795	37.1845	41.8015
80.9480814736388	35.7200324972309	27.3737072852585	88.2545	36.066	42.1212
80.9480814671624	35.675526155392	27.3737073031095	86.5983	36.2039	44.7429
80.9480814606625	35.6310501593373	27.3737073150044	85.065	35.2948	58.2863
80.9480814541203	35.5866072980582	27.3737073364891	95.1298	37.6897	58.9361
80.9480814476179	35.5421419302107	27.3737073571235	94.5355	44.3621	59.1041
80.9480814411308	35.4972268768685	27.3737073781777	94.5838	45.9916	57.9488
80.9480814346495	35.4519942541924	27.3737074011887	98.0763	43.3554	53.563
80.9480814281644	35.406707975354	27.3737074222966	96.2485	47.1277	52.4491
80.9480814216775	35.3613298166661	27.3737074407368	91.1842	48.1207	54.4953
80.9480814151699	35.3158496703394	27.3737074603236	90.1236	40.724	54.2833
80.9480814086639	35.27036386889	27.3737074811825	91.0332	34.8187	52.6374
80.9480814021394	35.2249060539247	27.3737075006664	92.4351	33.0022	54.3205
80.9480813955987	35.1794733492997	27.373707520344	96.2582	32.5713	56.693
80.9480813890513	35.1340495313288	27.3737075414563	98.3827	22.3334	54.4737
80.948081382491	35.0887838878849	27.3737075617805	99.0428	19.6959	54.528
80.9480813758823	35.0440868087015	27.3737075830707	102.211	28.3893	55.4005
80.9480813692552	34.9995399597051	27.3737076031491	101.7295	28.4449	56.1482
80.9480813625686	34.9552698136249	27.373707623164	100.5275	34.9543	58.1047
80.5501695147235	34.2120099285058	26.8251661133935	101.1976	33.4905	53.5496
80.1437371991875	33.4747023846383	26.250364780168	104.0844	32.9988	51.1923
79.7209933921006	32.7433218561581	25.6371421104485	106.6895	31.0233	49.137
79.229903705738	32.0287796883417	24.887610882609	105.5782	30.6326	47.1426
78.7126033133899	31.3224025888383	24.0804963659341	106.1692	29.0085	43.7624
78.1723766276508	30.625254291334	23.2281087512197	107.8221	37.3636	42.4217
77.3708062404517	29.8470407456159	21.9456685340667	108.656	34.8419	30.8419
76.5218105625055	29.0651291659923	20.6302462929111	96.6051	36.0943	31.9245
75.6721678580171	28.2854897535483	19.3037201469107	96.8865	41.9997	31.9305
74.8146293408996	27.50006415988	17.9555964877635	97.0063	39.6578	31.3742
73.9473515102802	26.710402007654	16.5818748154724	98.4033	39.6451	29.8224
73.0603130741468	25.9125060369439	15.1719572848508	98.7317	39.6579	27.3708
72.1454472762704	25.1027733641446	13.7205037385126	96.2133	40.5576	25.5914
71.2083829105295	24.2808115462843	12.231537572739	99.6903	41.4772	23.4888
70.0986796632588	23.3801344291317	10.5657538413106	95.46	44.379	21.4845
68.898078100768	22.4066307467074	8.7578249639073	91.9756	47.4725	20.0446
55.7029378928289	16.9059280008109	4.3807995330065	31.0707	1.7474	5.3999
Route: 7 Length: 85.6941030789629 Demand Met: 9993					
47.3035246270304	11.9830526922591	0.900048419123529	41.1669	5.3004	18.6447
47.470684362742	11.9999268405548	1.78316538593461	39.9467	-2.3317	18.5214
47.6384796136914	12.0167292632726	2.65432424416593	51.7765	0.7553	20.0441
47.8052759622884	12.0334212631066	3.51504081251824	53.8048	-5.0553	19.1679
47.9716188377571	12.0500427908485	4.36601049231997	56.047	-0.6998	19.4659
48.1387759939066	12.0667177814661	5.20975163357035	58.3955	-2.2935	14.9348
48.307120493759	12.0834980950141	6.05103338621785	61.9524	-0.333	11.9086
48.4761667887664	12.1003769954816	6.89292044492681	63.0749	1.8033	17.7213
48.6452379734863	12.1172986630794	7.73163223500751	57.7618	2.6586	23.6599
48.8144955933676	12.1342348546701	8.56373096682391	60.2628	6.0605	25.9406
48.9834554642803	12.1511366566475	9.38769827804853	60.5785	6.8128	27.9807
49.1520388571569	12.1679988926564	10.2024754401387	58.0726	3.0503	30.5544
49.3206035631407	12.1848597210098	11.0064440604279	50.0191	-2.6033	31.7826
49.4895743091813	12.2017537308665	11.798739000992	54.3108	6.5803	34.1725
49.6587155110005	12.2186467152549	12.5801020094561	53.4617	5.8056	38.0578
49.8280733270119	12.2355489718131	13.3458533554896	50.2911	5.2466	39.9878
49.9978269577331	12.2524729375859	14.0944856213103	55.5508	6.709	40.6861
50.167581222578	12.2694167067392	14.8264514235321	55.3647	9.0137	38.8085
50.3373700419633	12.2863802580992	15.5472903588134	53.965	12.2967	46.7771
50.5071742050658	12.3033548275498	16.2391298654228	50.5069	12.3029	52.6774
50.8848202490846	12.5687384708491	16.1127854313414	47.6091	10.2274	48.878
51.2651074561176	12.8351428505112	15.9858369743474	40.2323	12.6508	42.5989
51.6494642743096	13.1024061761694	15.858532909148	46.213	15.3079	43.6977
52.0368552847569	13.3702232228008	15.7307704473394	49.1449	22.3659	43.2644
52.4264108953546	13.6377408446112	15.6023889413144	52.1655	19.1446	41.5432
52.8175700304266	13.9056803896127	15.473467929749	52.4859	17.4578	33.7507
53.2106138094286	14.1745320307904	15.3443122447202	51.539	18.7116	33.0294
53.6058767551058	14.4442444331914	15.2149169493372	45.9242	19.9	29.6168
54.0043006499019	14.7147974439538	15.0854080838136	45.985	27.4123	27.7797
54.4060878646026	14.9853930844568	14.9557391822704	46.684	28.1154	34.4272
54.811430655558	15.2556448804887	14.8255602640294	46.4115	30.3033	33.5708
55.2205478273748	15.5252389324085	14.6948012319561	46.9054	30.8841	31.5685
55.6333727887255	15.7942673376007	14.5635299210967	50.5738	30.8854	25.5173
56.0489583419416	16.0630324865066	14.4320287347517	47.7428	26.438	23.4687
56.4682409812307	16.3322976541451	14.3004505398995	43.7884	36.8808	19.8614
56.892867461869	16.6003978069225	14.1688965455818	50.3352	41.2014	16.9793
57.3207305635789	16.8663525732519	14.0374326230151	50.3723	32.2399	19.4829
57.7526913325492	17.1322297816841	13.9059125570511	58.6228	31.6703	20.587
58.1862967493784	17.3979777264385	13.7741693512591	61.5106	34.0654	15.2705
58.6207585338373	17.6632911215331	13.6424364185922	63.2951	31.2899	8.2512

Solution x	Solution y	Solution z	Original x	Original y	Original z
59.056320203897	17.9285437808727	13.5110753687958	62.6603	37.129	7.3175
59.4931851606453	18.1930033060456	13.3801192526733	66.9624	36.7077	4.2616
59.9299227181891	18.4566395924428	13.249691941492	68.0366	38.8903	2.9918
60.3662464131621	18.7191956218873	13.1198052793189	68.3701	31.308	4.6701
60.8045135906569	18.9819295583999	12.9902518439061	67.6588	29.7348	5.9837
61.2461762390911	19.2450875117308	12.8609380517477	73.7989	28.6287	7.3132
61.6897904541248	19.5087926893028	12.7318206984134	79.7169	32.9378	5.3155
62.1327614480607	19.7724331690651	12.6029849911222	85.1876	33.113	2.1197
62.5721173494385	20.0355311926304	12.4745839275265	87.5726	32.8781	1.3636
63.006897449327	20.2979807440885	12.3466586865431	93.4265	31.4744	1.0443
63.4215897431965	20.558140991655	12.2195862323788	96.3928	32.1668	2.4627
63.6388699913074	20.7751275280506	12.1023389027708	90.6179	26.4649	2.7134
63.855450173188	20.9925870821398	11.9853501809714	97.1071	18.8552	9.2302
64.0679863234412	21.2113662420561	11.8684616092717	97.9141	29.0493	9.3885
64.2733597949069	21.4291596709125	11.7517101692649	99.272	31.5703	11.7517
64.2733596330632	21.429159744122	11.6039182803615	96.0238	29.4057	14.5945
64.2733594712495	21.4291598173591	11.4558022595199	92.5592	25.4331	20.672
64.2733593093054	21.4291598906642	11.3070673450733	90.72	30.049	19.1921
64.2733591474171	21.4291599640066	11.1577917451243	89.1249	38.0318	13.3915
64.2733589854258	21.4291600373524	11.0083382822423	85.9182	41.843	9.5066
64.273358823626	21.4291601106816	10.8590245964337	80.8076	41.6004	10.0065
64.2733586616377	21.4291601840132	10.7098411676842	80.8872	43.1227	9.5119
64.2733584997613	21.4291602573369	10.5608337927718	77.8794	45.0468	10.8339
64.2733583378383	21.429160330649	10.4119296245836	73.6428	45.1426	7.6389
64.2733581760534	21.4291604039686	10.263224820632	73.2283	44.0709	14.6285
64.2733580141371	21.4291604773015	10.1144072554629	73.2561	47.9132	17.0605
64.2733578523698	21.4291605506147	9.96525407200559	71.8965	50.0142	14.8598
64.2733576906345	21.4291606239178	9.81582965854331	72.0723	49.2863	13.9841
64.2733575288815	21.4291606972097	9.66618226015088	71.8327	48.0379	13.6369
64.2733573670527	21.4291607705059	9.51633793460358	70.7664	48.6137	12.8047
64.2733572054243	21.4291608438109	9.36634548802828	70.6462	49.6735	6.8503
64.2733570436396	21.4291609171235	9.21656008613512	71.0505	50.768	8.8572
64.2733568819775	21.4291609904481	9.06684426481014	72.1444	51.2772	8.2689
64.2733567202932	21.4291610637658	8.91720353060813	76.2244	51.9684	6.7104
64.2733565586122	21.4291611370774	8.76773751897688	82.0477	53.0979	5.7932
64.2733563866868	21.429161204822	8.74446817160543	77.6289	48.4559	5.3003
64.2733562147407	21.4291612726106	8.72121087356354	79.9479	46.2913	1.0177
64.2733560428207	21.4291613404149	8.69798908608762	75.2757	50.6388	0.889
64.2733558708933	21.4291614081848	8.67480601749388	73.911	51.0144	2.5794
64.2733556989651	21.4291614760799	8.65165506004389	73.6611	50.4924	3.9757
64.2733555270301	21.4291615438803	8.62853326304423	73.5268	49.2611	4.4383
64.2733553551139	21.4291616117638	8.60544244815799	68.7356	47.889	4.3235
64.2733551831803	21.4291616796361	8.58237909323174	67.8488	53.6384	2.957
64.2733550112836	21.4291617477046	8.55934658204058	70.916	53.3608	4.8842
64.2733548393696	21.4291618156102	8.53633581290669	72.7757	56.7077	5.4576
64.2733546567581	21.4291618791518	8.51377289411931	70.5527	57.3223	8.5137
64.2150914057771	21.425132698102	8.50403539406994	69.9782	57.1009	12.9468
64.1511834119195	21.4209263117932	8.49419230017845	68.022	53.7678	15.3935
64.0873136951454	21.4167205898012	8.48433922222093	66.0257	55.1875	22.0287
63.3139638108925	21.3209002474974	8.38546186920603	61.2083	54.3519	23.523
62.7613222321465	21.0189174868248	8.23850004294022	64.4232	44.0581	27.3148
62.2128435199463	20.7152040882837	8.09057125335773	74.5598	39.2546	26.0148
61.663042213699	20.4105654699683	7.94172247864066	77.5882	39.4219	14.211
61.111197580573	20.1050359703813	7.79274663364606	75.4748	37.8532	8.3059
60.5587045655647	19.7990642847259	7.64405990927458	72.2401	34.2889	7.5435
60.007477746835	19.4934884316486	7.4957286964588	71.5231	31.8286	8.0149
59.4577924142936	19.1884988611631	7.34774712434437	67.4673	33.2544	9.192
58.9109525451153	18.8838072422683	7.20007378283005	68.2062	28.5319	10.0866
58.3669160126493	18.5799558496381	7.05267150162569	69.1853	30.9522	12.1629
57.8254419479998	18.2764157895056	6.90550086511566	66.7818	30.0369	13.8618
57.2874710227352	17.9733120310218	6.75853231649288	66.7482	27.6121	12.1372
56.7534273819367	17.6708946586737	6.61181238703943	63.3607	23.5913	11.9128
56.2233849345853	17.3694326941397	6.46527749960904	62.5649	23.4331	22.9907
55.6963093848405	17.0685495776531	6.31868579107535	53.2794	21.4994	19.0176
55.1733679102039	16.7684539347634	6.1720347801138	55.9782	19.9329	26.5423
54.652319325236	16.4688533856636	6.02517019243714	49.9475	19.2284	25.6639
54.1344458429794	16.1698114651132	5.87805606603414	51.6732	17.1776	23.9169
53.6179109047736	15.8712806920088	5.73068192851618	44.3034	16.6265	25.3299
53.1060942702814	15.5734708141936	5.58291085507837	40.715	18.8306	21.9165
52.5996576716971	15.2760135603613	5.43467245681229	40.2335	17.1357	30.0024
52.100048168289	14.9790851244705	5.28569356907432	44.7075	13.3055	33.9605
51.6061167925124	14.6832702831594	5.13569277821826	47.5448	13.9665	39.1563
51.1200135479425	14.3885424218924	4.98227444179831	51.9742	12.9315	39.5168
50.6362799660587	14.0954126177723	4.82458682305629	51.32	11.9016	40.4537
50.1557128506676	13.8064390779767	4.65342825532778	48.9393	11.7496	40.9103
49.7087392925755	13.5352443394399	4.23424083696609	48.2378	10.888	40.0435
49.274583071584	13.2703629571941	3.63466960171429	46.3909	8.819	37.7186
48.8465793980085	13.0087563465707	2.96852261763512	43.7681	7.8375	35.3656
48.4205491353063	12.7486000952704	2.25752661069478	44.0031	6.0986	31.1209
47.9945216810993	12.4887895974169	1.52312485049296	46.0043	6.8606	27.4465

Solution x	Solution y	Solution z	Original x	Original y	Original z
47.5721272699279	12.2299300049751	0.772825970799502	49.0558	10.279	28.6803
Route: 8 Length: 80.5640397813875 Demand Met: 10000					
46.9524475065358	11.9659000347384	5.46212571288538	43.7175	13.3612	37.2361
46.7813863730852	11.9659000755922	9.40311494461746	42.4155	0.0668	38.5675
46.6121884406624	11.965900116537	12.5033887218616	43.4311	0.4843	45.1031
46.4443737396631	11.9659001576228	14.3637222339754	33.4349	0.0139	45.2628
46.2824129767024	11.9659001988427	15.4218152464797	28.6989	1.5656	37.4478
46.1225825472299	11.9659002401292	16.4308211372469	24.5208	1.7631	30.0851
45.9648890506631	11.9659002814536	17.4233020813133	24.8641	0.1355	28.7608
45.8089283095054	11.9659003228063	18.4061853213731	22.6294	-1.9579	25.7184
45.6547839327375	11.9659003641866	19.3847098448841	31.1128	-2.8096	30.5667
45.5009603374624	11.9659004055878	20.355791020208	31.7997	5.4917	35.1341
45.3471074034256	11.965900447002	21.3159773539031	29.6205	6.6839	35.8272
45.1935751918854	11.9659004884407	22.2652751225028	29.2732	5.6917	40.0529
45.040462619997	11.9659005299099	23.1973707961748	27.9452	7.0873	43.7392
44.8879183299455	11.9659005714072	24.1051228181914	22.0744	6.6433	40.1203
44.7365702470223	11.9659006129267	24.9943992478837	19.6468	14.5775	38.07
44.58653978669	11.9659006544605	25.8703183333062	18.1963	16.0602	36.4885
44.4379270011454	11.9659006960033	26.7362901793713	20.7311	19.0512	39.2565
44.2904616916928	11.965900737549	27.5912321331421	21.1889	21.267	39.0474
44.1440632547666	11.9659007790912	28.4370341628305	17.3215	22.815	38.4524
43.9991587394249	11.9659008206253	29.2715426785031	19.5225	24.6717	34.6116
43.8552673226949	11.9659008621496	30.1041829899307	17.7323	26.9057	35.8248
43.7125917567817	11.9659009036602	30.9322630787774	16.9754	26.2994	50.4148
43.5868551727463	11.9659009451958	31.4397441977679	21.4132	25.3225	51.4824
43.4620333941368	11.9659009867183	31.9308845486499	23.1689	25.59	48.8728
43.3375480262775	11.9659010282296	32.4150678136553	21.3113	31.7798	46.1078
43.2136354181109	11.9659010697121	32.8905501387101	21.7951	21.835	45.5134
43.0901644693159	11.9659011112029	33.3637893000595	19.3676	20.9011	45.1036
42.9673987783041	11.9659011527107	33.8349613633993	19.4151	20.4264	46.5071
42.8454003450837	11.9659011942396	34.3036022699928	22.5923	19.795	49.1879
42.7240875683096	11.9659012357902	34.7691847291123	22.0389	18.6688	59.3708
42.6039588123498	11.9659012773538	35.2173546534191	19.4476	21.0876	59.2618
42.485265383957	11.9659013189299	35.6385839557208	18.7218	26.0511	59.401
42.5373455531866	11.9659013047758	35.562244241857	35.5392	31.6783	58.7469
42.588959046601	11.9659012905383	35.485068177463	40.9959	37.9409	51.1587
42.6398959288384	11.9659012761912	35.4073398873064	46.003	37.4534	46.4333
42.6901461436755	11.9659012617557	35.3293187132061	44.7872	36.1398	42.3342
42.7401671128797	11.9659012472818	35.2512920610895	45.9581	33.5048	45.1742
42.7900651056866	11.9659012327905	35.173117821274	48.6326	32.1618	43.4727
42.8398576350643	11.9659012182907	35.0948138412671	47.9812	30.2306	39.2099
42.8896697948817	11.9659012038061	35.0165731099018	51.0819	30.8837	36.7669
42.9394782690405	11.9659011893302	34.9384429364276	47.9603	31.0225	36.0363
42.9894198538105	11.9659011748726	34.8604308593673	48.325	36.101	31.2943
43.0395255012833	11.9659011604057	34.7826699750639	55.9275	34.3566	30.6301
43.0897918140045	11.9659011459253	34.7050986207531	58.8785	37.4935	28.0133
43.1403281488391	11.9659011313914	34.6277156935572	56.2795	36.0371	23.7369
43.1910392629575	11.9659011168308	34.550701378334	52.5136	31.162	22.8965
43.2420569972323	11.9659011022933	34.4740383620323	61.1622	34.1592	24.5106
43.2931247411771	11.965901087728	34.3975975860723	64.9829	35.6055	23.509
43.3437694536318	11.9659010730742	34.3214563027981	64.2717	31.7627	18.8904
43.3942072020146	11.9659010583939	34.2457659563312	67.7055	32.9993	17.0949
43.4279693203799	11.9659010439732	34.1953752101533	70.1037	27.3839	19.7642
43.4614714646222	11.9659010295232	34.1451808815553	67.242	26.9141	23.9429
43.4949306862653	11.9659010150829	34.0950532692384	69.5886	28.6002	31.4169
43.5282694924891	11.9659010006126	34.0448752526069	67.5765	27.7962	32.158
43.5615437965079	11.9659009861335	33.9946502706643	63.8119	26.0212	34.0563
43.5948037231651	11.9659009716767	33.9443811080446	63.132	27.7543	33.1939
43.6280466002383	11.9659009572301	33.8940814752724	64.1748	30.2745	31.4674
43.6612456099317	11.9659009427582	33.8437741562561	60.463	30.4795	30.5011
43.6944336039727	11.9659009282768	33.7935056124251	54.6523	25.2022	31.3259
43.7276584948891	11.965900913839	33.7432899921288	55.4854	26.8201	32.387
43.7609197161896	11.9659008994327	33.6931292206297	58.5931	27.1316	32.5338
43.794187953634	11.9659008850457	33.6430268057459	58.4334	33.3219	33.0094
43.8274172101656	11.9659008706244	33.5929769410925	54.3132	33.4794	38.814
43.8606555750898	11.9659008561852	33.5429447381926	53.589	37.6567	38.7584
43.8938721473995	11.9659008416821	33.4929281149943	51.6292	37.4529	39.3047
43.9270869761586	11.9659008271257	33.4429349976335	51.7623	34.8081	42.2217
43.9603068519548	11.9659008125379	33.3929550816594	50.1654	34.298	41.7388
43.9935473943117	11.965900797927	33.3429946131011	51.473	33.7115	46.7085
44.0267767713692	11.9659007832805	33.2930193378713	48.493	25.186	47.2334
44.0600595905078	11.965900768674	33.2430385763105	47.3356	31.1656	48.6863
44.0933844120391	11.9659007540632	33.1930410696515	44.6028	29.9319	49.9927
44.1268003873223	11.9659007394618	33.143021597323	47.4903	33.2139	54.5514
44.160234564909	11.9659007248219	33.0929327913233	47.4152	28.2569	57.2588
44.1937263091053	11.9659007101853	33.0427626950928	54.2786	24.4277	59.9569
44.2271879429557	11.965900695563	32.9925227227964	55.089	27.0379	56.5554
44.2606089793383	11.9659006809297	32.9422165368226	56.8778	27.618	56.4108
44.2939689360788	11.9659006662729	32.8918709879016	54.7376	29.7596	56.3053
44.3273028299735	11.9659006515805	32.8415106934848	53.8796	31.7093	51.2249

Solution x	Solution y	Solution z	Original x	Original y	Original z
44.3606209840798	11.9659006368382	32.7911474820238	52.7074	28.2489	52.4902
44.393966757212	11.9659006220722	32.7407839612711	55.1607	27.7715	51.8295
44.4273007096277	11.9659006072741	32.6904119972101	58.9981	26.6128	49.6223
44.460565049018	11.9659005924422	32.640018156486	63.3795	20.1125	53.5518
44.4937075786848	11.9659005775902	32.5895328898638	58.6318	9.4344	53.4701
44.5268466420252	11.9659005627779	32.5390294531013	51.2901	7.6487	52.6277
44.5600221940494	11.9659005480189	32.4885463041025	52.0607	4.6851	47.5572
44.5932241360833	11.9659005333204	32.4381200019502	52.2056	3.4977	49.7426
44.6264465848505	11.9659005186852	32.3877259944001	51.8363	2.0767	53.9783
44.6596779925084	11.9659005041084	32.3373251684933	49.309	3.6922	59.7251
44.6929094506514	11.9659004895658	32.2869262467116	47.7278	5.7114	59.7593
44.7261291698013	11.9659004750382	32.2365205342017	44.3097	5.4051	59.4302
44.7593491002003	11.9659004605284	32.1861254202311	45.5397	7.2979	57.1732
44.7925493087153	11.965900446023	32.1357150692045	46.8369	6.4403	54.1626
44.8257211639599	11.9659004315267	32.0852966708231	44.2937	4.7268	51.9613
44.8589047034909	11.9659004170495	32.0349005960919	38.0686	7.3443	51.7798
44.8921423338317	11.9659004025792	31.9845352409675	36.7928	9.6586	58.8057
44.9254296466545	11.9659003880859	31.9342184051371	33.7832	8.5886	57.2507
44.9587828727812	11.9659003735775	31.8839707401926	30.7839	5.7178	56.2846
44.9921954500032	11.9659003590673	31.8338599931478	27.6562	5.4902	56.4427
45.0256339997776	11.9659003445529	31.7840428393087	25.8989	0.7413	53.4706
45.0591056014151	11.965900330057	31.7345289968094	22.4229	-2.1641	56.3911
45.1260557150763	11.9659003187026	31.313915983611	27.3755	-1.0984	56.1861
45.1935041098818	11.9659003073717	30.8813637393625	31.0065	-1.0714	59.1851
45.261461790473	11.9659002960666	30.4126949448318	31.1391	0.2266	57.7289
45.329817014743	11.9659002847758	29.9290491569358	36.4279	-4.3699	52.432
45.3984655498662	11.9659002735303	29.4395763255869	43.0131	-4.6452	57.9101
45.4672122140509	11.965900262324	28.929737359062	54.4331	-6.2551	57.3764
45.5347971355223	11.9659002512672	28.2451956015872	56.514	2.6652	55.8183
45.6021449978961	11.9659002402144	27.5330113006739	60.4719	1.0667	55.1539
45.668875451595	11.9659002291577	26.7635517268299	58.2987	1.8222	52.9601
45.7353559526647	11.9659002181101	25.962097818505	56.6229	3.2945	52.4352
45.8016965068314	11.9659002070661	25.1309141958226	54.7597	1.1902	50.9644
45.8680135350663	11.965900196044	24.2719198527087	54.6465	1.327	47.163
45.934352901357	11.9659001850478	23.3950004921297	57.3839	0.9502	46.0215
46.0006288405531	11.9659001740772	22.4974030422649	60.4167	1.4088	44.4464
46.0667447821243	11.9659001631282	21.5768725845896	62.5325	1.766	39.3982
46.1326908219582	11.9659001521986	20.6422522994693	63.4243	4.3429	39.6925
46.1984556336811	11.9659001412697	19.6902220174744	61.565	4.5717	36.954
46.2641835211836	11.9659001303424	18.7262558529295	55.5686	2.3786	41.1094
46.3299718678366	11.9659001194395	17.741020719322	55.7669	1.6852	42.4618
46.3957880111885	11.9659001085652	16.7218849895043	50.9668	1.717	44.4164
46.4616655028344	11.9659000977301	15.6509640254873	49.5265	1.5006	43.2383
46.527637924439	11.9659000869434	14.5237143342077	49.2438	-0.5725	42.7886
46.5937434219127	11.9659000762304	13.315104604771	52.8937	1.339	38.4463
46.6599364195137	11.9659000655824	12.0518207706092	53.412	-4.2453	38.3008
46.7262267523543	11.9659000550437	10.6819565165038	53.289	-9.6645	34.2743
46.792700459934	11.9659000446466	9.16956955564717	53.5826	-3.7128	29.3577
46.8595037989373	11.9659000343361	7.59921526776868	59.6709	-1.5476	33.1451
46.9263837082647	11.9659000241195	5.85966599726923	62.7821	-0.0838	27.7653
46.9933194371557	11.9659000140071	3.99310747584597	57.7878	-4.3732	24.6962
47.0603869552946	11.9659000040113	2.01247435789652	52.3291	3.6705	6.1162

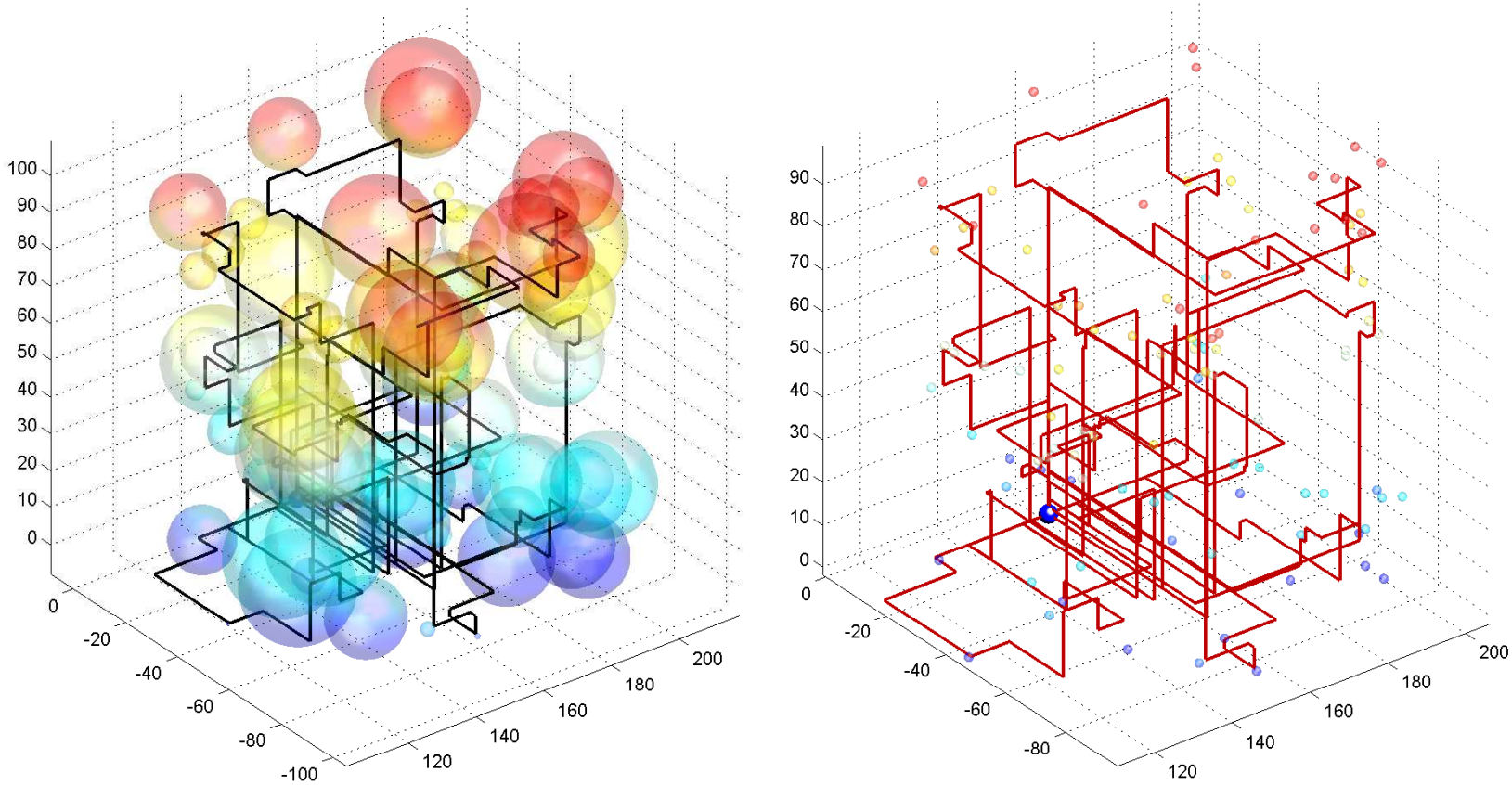


Figure O.195: *team*1_100, arbitrary radius, 3D, Manhattan, Length = 3441.4157329

Table O-198: Solution for *team*1_100, arbitrary radius, 3D, Manhattan

Total distance: 3441.41573285092 Total demand met: 543 Depot: x 50 y 10 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 416.870948380774 Demand Met: 46						
50	63.144	83.9655871852887	52.975	65.56	80.551	9.534
67.6429998897357	87.3565482802964	92.7155509376942	67.643	91.829	97.188	6.325
74.4430792061959	76.8085670336839	90.7630949676295	74.447	77.382	91.404	0.86
74.4430792061959	68.6289825142243	90.7630949676295	76.154	71.763	97.979	8.051
74.4430792061959	67.6791819613775	90.7630949676295	73.523	67.727	97.567	6.866
85.8351872933164	65.1634535285151	90.7630949676295	87.633	63.432	97.407	11.884
85.8361872933164	65.1634535285151	90.7630949676295	93.946	64.003	91.762	8.979
85.8361872933166	63.14081232092	77.0140000561727	89.091	59.886	77.014	4.603
85.8301457064015	65.668	76.9260008474029	93.456	57.69	77.108	14.427
77.9190018350711	65.668	76.9260008474029	77.919	74.057	76.926	8.389
Route: 2 Length: 392.369539824352 Demand Met: 46						
43.4509377074788	48.0772072341297	67.647366953759	43.243	58.404	75.054	12.71
30.2178024892083	68.9769999999983	75.0172414108255	26.213	68.977	77.227	4.574
30.2178024892083	84.0092751436282	75.0172414108255	33.626	83.869	72.958	3.982
30.2178024892083	86.1119419726432	89.7929052110484	30.503	90.056	84.685	13.109
30.2168024892083	86.1119419726432	89.7929052110484	33.443	88.578	84.328	7.057
26.9500772715171	86.1119419726432	89.7929052110484	19.881	93.181	96.862	12.244
57.230000000001	74.1890795002611	84.3289988731525	63.631	81.224	94.784	14.134
57.2300000000016	63.143997217851	84.3289971381811	62.352	63.144	84.329	5.122
50	45.1558340753696	76.5773793468451	47.232	45.27	89.834	13.543
Route: 3 Length: 322.641407439492 Demand Met: 46						
29.402947691224	17.6934306563832	16.1549715332345	33.5	17.352	15.52	4.16
28.0739432096744	50.1092089932111	65.1843768738462	20.103	52.347	63.856	8.385
28.0739432096744	50.9438647777944	69.455219699515	26.732	55.612	72.392	5.676
25.4609254096577	50.9438647777944	80.4269637951859	19.619	52.734	79.19	6.234
21.2989993215119	53.133874580088	80.426963795186	21.299	57.593	80.779	4.473
15.9602140211181	23.8229808440133	80.426963795186	12.414	20.962	80.147	4.565
19.5690001622834	23.8229808440133	84.1470431607763	19.569	24.449	84.923	0.997
20.2219889241638	12.5455478522472	83.2209625478314	15.772	12.549	91.264	9.192
30.5631158823284	12.5455478522472	76.118	26.839	11.732	76.118	5.19
30.5631158823283	12.5455478522472	42.407747420395	33.341	22.178	45.103	10.381
Route: 4 Length: 360.137597461663 Demand Met: 46						
45.7287996616147	50.8282755162141	25.9533320518434	42.804	54.74	25.734	7.11
45.7287996616147	50.8282755162141	25.9533320518434	40.978	46.49	25.743	6.437
26.196382684978	54.5629160179072	47.44322604468	25.923	53.185	46.671	1.603
18.1314265985087	66.9547562772244	58.0991157701339	17.374	67.529	56.063	2.247
18.1314265985087	68.5349949156227	59.8319999999469	5.739	68.535	65.134	13.479
20.3929999706746	83.7930026045939	59.8319999999469	20.393	83.793	60.447	0.615
25.9113927406695	94.0099317967125	39.6271011386737	27.59	93.644	36.826	3.286
25.9113927406695	94.0099317967125	12.551	24.053	94.189	12.551	1.867
36.8055396145777	96.121638193729	7.74036180782158	36.924	96.636	7.226	0.737
36.8055396145777	86.0920000419287	9.98694894348619	36.762	86.092	10.176	0.194
Route: 5 Length: 280.131117693937 Demand Met: 46						
85.5539989843516	10.0609996583787	62.8969999993394	85.554	10.061	65.642	2.745
90.0190843916466	14.4657988270787	62.8969999993394	95.317	17.864	59.209	7.295
90.0190843916466	14.4657988270787	66.4919985025801	91.857	16.502	66.492	2.743
90.0190843916466	14.4657988270787	68.8632626656258	91.007	13.249	70.645	2.373
81.4444259884327	8.69331488244927	85.8791848663039	85.841	12.653	93.498	10.749
81.4444259884327	8.69331488245109	85.8801848663039	88.457	8.185	95.157	13.747
53.7540004238272	4.75617422732369	85.8801848663041	53.754	0.148	93.309	8.742
45.5433350107389	4.75617422732369	76.025	40.868	2.981	76.025	5.001
Route: 6 Length: 230.324029008993 Demand Met: 45						
57.141000056272	56.1719999999861	51.8826632008425	53.958	52.681	59.332	10.486
57.141000056272	56.1719999999861	51.8826632008425	55.281	51.871	55.993	9.377
57.1420000580996	56.1719999999861	51.8826632008425	57.142	56.857	57.493	5.652
57.2430000071105	56.1719999999861	50.9630041108767	57.243	55.792	50.963	0.38
59.5901773766566	63.6891739269975	50.9630041108767	59.534	67.732	45.235	9.572
59.5901773766565	63.6891739269975	32.325000535423	61.493	65.592	32.325	2.691
59.5901773766566	63.0043478135975	30.8249164175888	59.007	60.213	31.626	2.987
Route: 7 Length: 278.008615612356 Demand Met: 46						
29.3015881299081	43.0274246415728	48.2813035085623	18.45	52.954	46.14	14.862
11.2615640673956	59.8222948705213	48.2813035085623	11.844	68.394	54.009	13.519
11.2615640673956	59.8222948705213	48.2813035085623	13.454	69.007	48.213	9.443
11.2615640673956	59.8222948705213	49.9624359396059	7.235	62.367	51.584	12.76
11.2615640673956	60.3034359339679	49.962435939606	11.123	60.442	50.101	0.24
25.1953593999751	54.4766492450385	48.5520333476306	25.201	54.507	48.664	0.116
Route: 8 Length: 307.628927951683 Demand Met: 46						
50	48.0772072341297	56.9625737771098	49.571	48.14	55.073	8.233
86.7849998922106	61.7814198256744	58.1640056132318	86.785	67.217	67.68	10.959
93.8690385369354	61.7814198256745	50.6240000676297	94.619	62.103	50.624	0.816
92.0739934503578	59.1598414771805	50.2625942369705	91.043	63.691	55.511	7.01
92.0739934503578	59.1598414771805	47.4408700713066	87.173	60.998	48.592	11.762
92.0739934503578	59.1598414771805	47.4398700713066	87.18	60.86	47.333	5.182
92.0739934503578	59.1598414771805	11.4358837256958	94.894	61.262	13.169	7.46

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
92.0739934503578	59.1598414771805	1.57166206537595	93.694	56.925	1.612	3.099
76.1755817417022	59.1598414771805	1.57166206537596	68.193	67.124	4.172	11.572
Route: 9 Length: 231.341968524486 Demand Met: 45						
74.7056668712857	41.8939945160197	4.02411723760617	74.679	41.865	10.639	6.615
76.29881584452	72.951999184033	4.02411723760617	85.968	75.194	1.985	10.133
76.482	72.951999184033	4.02411723760617	84.146	71.427	3.869	10.315
76.482	72.951999184033	19.4790000418643	87.252	72.952	19.479	10.77
76.482	77.214856240662	19.4790000418643	78.214	79.218	18.292	2.902
76.482	79.0714921262513	20.1174921359917	81.476	87.316	28.362	12.684
70.1502361831806	79.0240559526822	20.1174921359917	67.179	79.746	30.609	10.928
67.0050326237809	73.7754597501389	16.6721220362369	66.957	73.797	28.023	11.351
67.0050326237809	72.1877657056529	10.4000920236678	66.971	72.201	17.644	7.244
Route: 10 Length: 171.27251597002 Demand Met: 44						
45.2929999999798	10	50.1407934947734	45.293	9.057	63.281	13.174
25.5420000000013	10	48.4185876581995	22.494	14.202	49.345	13.068
25.5420000000013	18.4829999998908	48.0879997963288	25.542	20.506	48.088	2.023
22.9875355096549	9.99999999999999	47.6999149348633	21.459	12.53	50.646	6.577
22.9875355096544	10	39.729	20.541	9.26	39.729	2.556
30.0273039763177	10	26.7536795899366	29.447	11.243	26.345	5.69
Route: 11 Length: 214.110668858486 Demand Met: 41						
50.1641655715671	10	7.4681570921174	54.032	12.197	7.44	11.442
50.1641655715726	40.4483887609779	17.4628658353831	49.02	51.541	23.534	12.697
50.1641655715726	40.4483887609779	17.4628658353831	51.29	49.58	11.489	10.97
87.155999999993	4.00699988061189	28.6444785416629	89.359	10.839	25.32	9.385
87.155999999993	4.00599988061188	28.6444785416629	94.926	4.006	36.794	11.26
87.155999999993	3.85499977988648	22.2019998599513	92.889	3.855	22.202	5.733
87.155999999993	3.16700759201033	14.0201557498495	93.574	3.255	13.429	10.497
53.4050000265252	3.16700759201033	6.22204417722382	53.405	3.041	5.972	0.28
48.3392405543947	3.16700759201033	8.53475945023794	46.154	2.083	10.72	3.275
Route: 12 Length: 236.578396124673 Demand Met: 46						
20.7432305185489	17.4724747187678	0.050000004564686	16.123	17.568	4.443	8.298
2.04800000004678	46.5989999944527	0.050000004564686	1.527	46.599	0.05	0.521
11.8780328710556	64.6890000000248	15.6481980623583	11.878	70.444	28.798	14.354
11.8780328710556	64.6890000000248	15.6481980623583	5.777	62.003	23.29	14.244
11.8780328710556	64.6890000000248	15.6481980623583	8.64100000000001	64.188	15.551	14.025
20.7350157768585	64.6890000000248	7.97798421344134	20.735	74.659	7.978	9.97
27.5019712628705	44.5515020584691	3.56843630558338	27.219	44.51	3.327	4.337

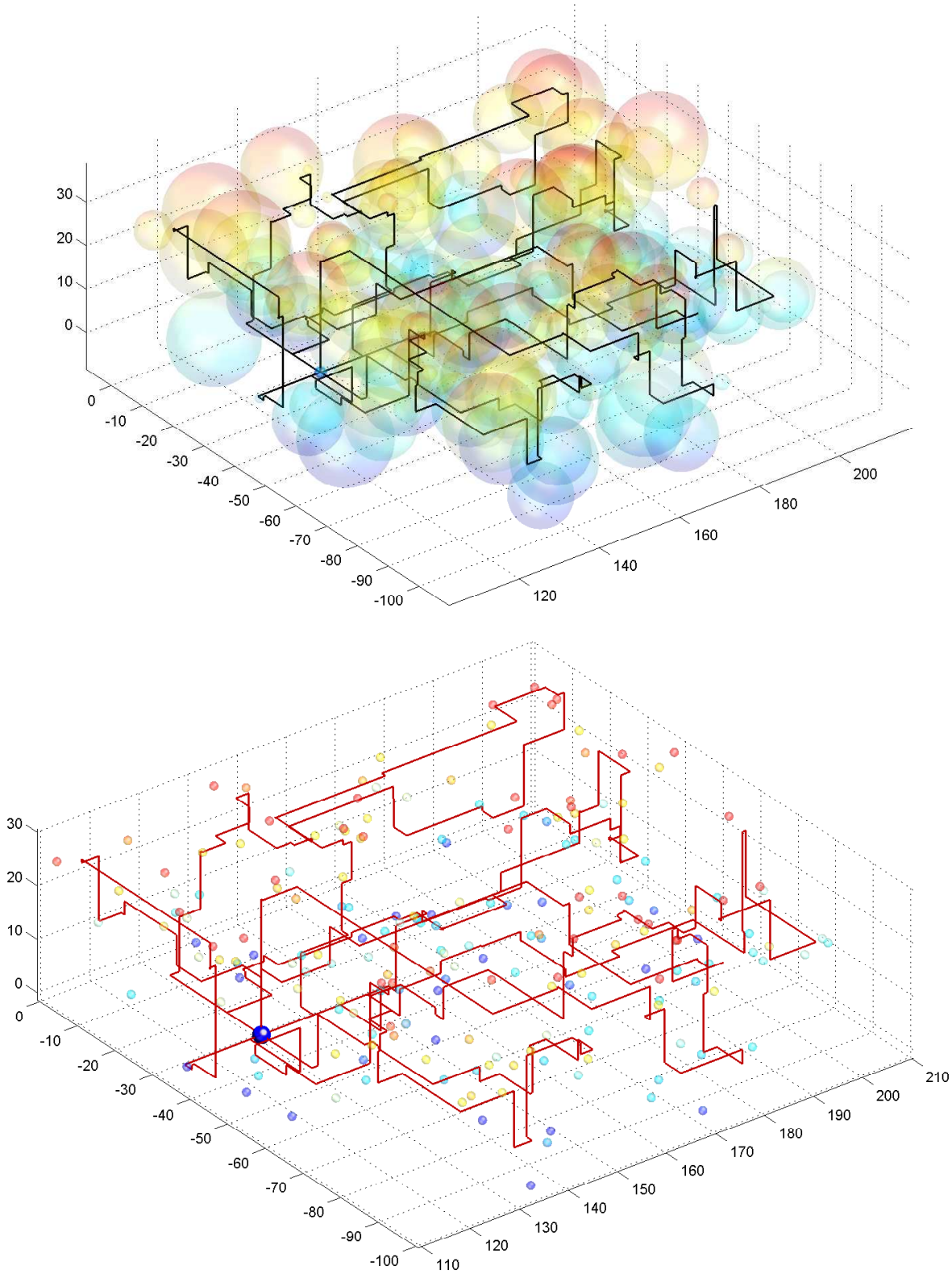


Figure O.196: *team*2_200, arbitrary radius, 3D, Manhattan, Length = 1797.4084715

Table O-199: Solution for *team*2_200, arbitrary radius, 3D, Manhattan

Total distance: 1797.40847154213 Total demand met: 617 Depot: x 19.5535 y 32.6157 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 334.567892429925 Demand Met: 111						
30.1997306608172	29.1104769069823	9.99252111891324	30.249755	29.28668	9.627144	0.408718
39.9343790892256	27.4223482927117	18.9394459350003	39.58443	28.150345	20.548662	1.800561
41.8880447982756	27.4223482927115	26.0507878804242	44.38625	27.294685	26.050788	2.501465
40.1982600113809	27.4223482927118	27.007141608721	40.19826	27.52955	29.10549	2.101085
35.8583185471724	14.9619558285571	26.8174116247293	34.77264	14.924575	26.641448	1.100481
48.7296116643851	14.9619558285571	26.8174116247293	47.997827	21.94091	22.00424	8.509285
48.7296116643851	14.9619558285571	26.8174116247293	49.796921	18.777515	27.389734	4.003148
58.4102889518186	13.9599042943727	26.8174116247293	54.207021	15.63022	20.585643	7.700153
60.8213413895267	13.9599042943727	26.8174116247293	57.51838	10.00522	23.910843	10.000856
68.9921875213938	13.9599042943727	26.8174116247293	69.52818	17.90893	23.466902	5.206535
86.015244999217	7.9908093499913	26.8174116247293	87.144585	5.62369	21.911356	7.10022
86.0162449992169	7.9908093499913	26.8174116247293	86.016245	7.495035	26.90563	0.503562
95.9761725322805	7.9908093499913	26.8174116247293	92.761655	9.792985	28.945088	7.707934
95.9761725322804	7.99080934999131	26.816411624729	94.4971	12.154995	26.111766	9.50306
96.3633638351262	11.2734742196963	26.816411624729	96.04228	11.46233	26.220597	0.702338
97.6045589135506	11.2734742196962	19.983145988553	99.37313	13.042045	19.983146	2.501137
89.5446250116307	11.1432455728579	8.45466699945228	89.544625	11.14329	6.653118	1.801549
87.6307290532019	11.1432455728578	8.45466699945228	93.997115	11.43328	4.127594	7.703152
83.2543189665664	8.35528523870946	9.32127670208449	78.44886	5.02628	2.732259	8.808511
83.2543189665664	8.35528523870946	9.32127670208449	82.741185	8.18936	9.780027	0.708018
71.8469306250499	8.35528523871022	9.32127670208377	74.60069	8.85595	6.459838	4.00271
67.7957750360879	4.8514563000798	14.617194600781	69.299455	6.449115	15.081267	5.10428
67.7947750360879	4.8514563000798	14.617194600781	67.794775	0.2453923	14.617193	4.606064
67.7910840058628	4.8514563000798	16.9206148636824	67.61759	1.570395	20.822479	5.100981
48.6390204706201	4.8514563000798	16.9206148636824	54.294115	8.069135	15.776464	6.606257
46.3594010037234	11.0328794080167	17.5704713942378	49.707097	15.54357	19.872896	9.000518
46.3584010037235	11.0328794080164	17.5704713942378	46.358401	11.954405	18.491997	1.303234
42.8456351934701	9.79738014958197	17.362627	42.845635	9.79738	11.955362	5.407265
40.160460030211	2.34294590631789	24.2047711489372	40.16046	1.62977	24.917947	1.008583
37.5363868044768	6.01322242305935	21.2658980076854	34.695715	0.250565	26.535311	8.309293
30.560740977606	8.82077374235357	21.2658980076853	32.973595	9.54291	20.606347	2.603527
25.7827766159415	8.82077374235357	21.2658980076854	21.673354	6.8005655	13.961641	8.80316
25.7827766159415	8.82077374235357	21.2658980076854	25.662895	8.989655	21.265898	0.207105
25.7827766159415	8.31954491581486	10.3743029864143	28.448025	4.56492	10.374303	4.604428
21.3766971331216	8.31954491581486	10.3742938189522	20.9699	7.87089	11.180156	1.008062
21.3766971331216	8.31954491581486	0	26.97316	5.55935	2.320922	8.204253
Route: 2 Length: 382.930328120736 Demand Met: 118						
41.1149020998332	41.2762399040121	4.938398	41.00732	41.27668	4.938398	0.107583
49.5211300385068	41.2967798335626	7.31796499999994	50.608737	39.047145	0.30438	7.509385
49.5211300385068	41.2967798335626	7.31796499999994	49.52113	41.29678	9.327678	2.009713
57.6194164656593	41.5946347953148	7.31796499999992	50.972003	40.60627	2.976184	8.001002
57.6194164656593	41.5946347953148	7.31796499999992	61.04328	37.44322	1.978623	7.908259
65.4916945037325	41.5946347953161	5.55356448718226	65.72564	44.111465	7.622314	4.10252
65.4926945037326	41.5946347953146	5.55356448718314	69.610075	41.75992	4.719164	4.204327
65.7054949983612	53.2527179548975	4.05278148044434	65.705495	54.4013975	3.082521	1.503619
76.786092185755	51.0395422667873	4.05278148041341	81.466395	54.091358	0.343064	6.706774
91.6154000091354	51.0395422667827	4.05278148041276	92.878595	53.021252	1.55944	10.006179
91.6164000091354	51.0395422667828	4.05278148041263	91.6164	43.026115	2.808093	8.109517
93.4504671525623	51.0395422667827	4.05278148041341	95.92709	54.202926	8.883113	6.608684
93.4504671525623	64.6441765871858	7.93849600091096	93.854515	65.44994	7.938496	0.901393
93.4504671525623	64.2264804350456	26.6204955637866	92.344515	62.02096	28.826016	3.309346
94.0868222888734	64.2264804350457	14.2022007661593	98.425325	63.29758	13.439936	4.501834
94.1760802805591	80.2587399914846	14.2022007661593	98.53739	80.25874	11.354076	5.208919
94.1760802805591	82.8309843101079	14.2022007661593	97.272905	80.426715	12.650593	7.307128
91.0359152441096	82.8309843101079	14.2022007661593	86.26193	79.048	11.651774	6.603528
91.0359152441096	82.8309843101079	14.2022007661593	91.37176	83.481715	13.123111	1.3041
84.724535192498	82.8309843101079	16.6219867365068	84.72455	82.62255	16.621981	0.208434
84.7245351924982	82.8309843101079	25.5289528237333	82.980165	82.460215	28.432538	3.407507
74.2342049869792	83.5206995673707	29.0623415480233	74.234205	84.088705	29.630347	0.803281
74.2342049869793	76.7688251153229	21.0688347053707	74.635475	75.231085	23.616275	3.002518
71.7180209541949	74.8425970320378	21.0688347053707	67.24276	72.18951	20.816233	5.208708
71.0398372176884	74.8425970320376	11.1878604141609	68.40623	74.741575	8.582781	3.705743
81.3584389274719	74.8425970320378	11.187860414161	87.254685	75.06877	11.123991	5.900928
78.4199770382128	71.8523429189906	11.5530125455676	79.72973	69.6285	5.76607	6.503827
78.4199770382128	71.8523429189906	11.5530125455676	81.449	70.90379	9.10693	4.00725
76.0792354553485	71.8523429191431	11.5530125455671	75.60926	70.05143	9.458663	2.801868
64.7226419290988	57.4211199838673	11.5530125455676	62.26967	64.78212	6.975531	9.008592
64.7226419290988	55.6374258714845	19.4301512111666	63.17424	62.764205	21.920947	7.706659
64.7216419291089	55.6374258714845	19.4301512111666	70.55475	53.342402	18.770686	6.30295
63.4371950002381	45.8850970302509	19.4301512111665	63.437195	41.00367	26.99622	9.004095
45.9133078953355	45.8850970302504	19.4301512111665	53.824634	40.64213	16.603226	9.902994
42.7533350852258	45.8850970302504	19.3863552832491	42.753335	50.906813	15.568394	6.308285
40.1842051946448	45.8850970302504	19.3863552832491	40.184205	46.1874365	21.269314	1.907077
29.3340872031353	38.0292249181295	12.3082772699467	35.347265	40.483415	12.676508	6.900943

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
29.3330872031353	38.0292249181295	12.3082772699467	29.577285	38.20107	12.365171	0.303974
24.0147129678025	38.0292249181295	12.3082772699467	24.567885	37.86062	12.401465	3.403033
24.0137129678025	38.0292249181293	12.3082772699467	21.779985	37.899125	15.006029	3.504901
Route: 3 Length: 161.216920485798 Demand Met: 60						
3.89234200000004	34.539165	0.815621000019116	2.888575	34.539165	0.815621	1.003767
4.35570562624889	40.215473842463	15.4969259959817	4.535275	41.40327	15.496926	1.201293
4.35570562624889	40.215473842463	21.7459859759663	6.09162499999999	39.029145	21.745986	2.102568
2.99797122001341	40.215473842463	21.7461597491256	7.79806000000001	41.063165	21.758433	5.901659
2.99797122001341	40.6791445695173	26.716630961889	1.56824	43.114435	27.74491	3.00535
2.99797122001341	40.215473842463	26.716630961889	7.76846999999999	43.27595	27.165517	8.308131
2.99797122001341	32.271765	26.716630961889	3.09506	32.271765	28.722779	2.008496
2.99797122001341	6.36170808554401	26.062187000015	0.024124999999998	3.6794065	26.062187	4.00481
6.58510000000008	6.36170808554401	13.8939109067893	6.5851	6.152225	13.546134	0.405995
11.1215705939747	7.17737670647185	13.8990656188803	7.39533	10.545265	21.25087	8.903739
11.1215705939753	7.17737670647185	16.4494112975906	15.031135	2.9821155	24.523433	9.903269
11.1215705939753	11.269683206966	16.4494112975906	16.776285	16.423415	15.502152	7.709348
11.1215705939753	17.37734	16.4494112975906	11.54701	17.37734	26.244082	9.803906
11.1215705939753	20.5293639949769	16.4494112975906	10.44323	18.54025	17.132759	2.209906
11.1215705939753	21.036865164547	10.6629122665642	1.87583499999999	21.036865	8.472142	9.501742
11.1215705939753	27.6123299995961	10.6629122665642	10.613375	27.61233	15.443404	4.807428
Route: 4 Length: 285.23553588681 Demand Met: 107						
45.4207839912593	34.7055538965111	12.4308228963991	46.870011	29.816545	8.525673	7.806658
45.4207839912593	34.7055538965111	12.4308228963991	45.420784	35.70231	13.427579	1.409626
51.7192430203793	33.4285536704719	10.2246216963608	51.719243	33.03008	9.909651	0.507925
64.5951359640181	34.2264687040182	10.2246216963609	64.595135	34.78327	9.989898	0.604254
71.2730367551134	34.2264687040182	23.1181699641518	71.273045	32.62062	26.349189	3.608079
76.452514699827	34.2264687040182	23.1181699641518	80.066985	32.520545	19.480329	5.404485
76.4535146998269	34.2264687040182	23.1181699641518	78.52122	37.890255	25.630233	6.801958
76.4535146998269	40.521025	21.3128168929116	74.17807	43.76639	28.605582	8.300269
84.6187404266726	40.521025	19.1703051240548	79.319755	37.96047	22.926601	9.501655
84.6187404266726	40.521025	19.1703051240548	83.48933	38.25693	16.203282	8.302552
84.6187404266726	40.521025	19.1703051240548	84.61874	44.121625	19.170305	3.6006
84.6187404266726	40.521025	19.1703051240548	89.661665	37.28143	20.914346	7.609892
86.714418598723	40.521025	12.3034547042173	87.57797	41.66484	5.551613	6.902275
90.4462087662476	32.6806471308192	11.6249426514354	86.845365	25.906095	9.026374	8.100197
90.4462087662476	32.6806471308192	11.6249426514354	88.660005	37.051535	6.873362	7.30023
90.4462087662476	32.6806471308192	11.6249426514354	94.955665	36.40187	7.771411	7.002314
92.7883050967707	32.6806471308192	22.9351631263476	90.572985	26.136825	24.857885	8.602133
92.7883050967707	32.6806471308192	22.9351631263476	92.788305	33.10169	27.022649	4.109114
94.7228880000001	32.6806471308192	22.9351631263476	97.982935	40.137435	28.75306	10.003975
94.722888	32.6806471308192	22.9341631263394	99.67714	33.98061	22.565216	5.405501
94.722888	24.3147849965506	12.8049880384952	95.62369	24.314785	12.804988	0.900802
91.0964299845108	23.8919589999678	6.91312599442826	91.09643	22.6866	6.913126	1.205359
75.008629742178	23.8919589999678	3.35061545641248	79.01289	29.7258	2.755744	7.100822
73.4488200114538	27.6854897473223	3.35061545641248	73.44882	27.71684	3.250298	0.105102
59.8002610991084	27.6854897473223	3.47229788675206	57.95186	28.956245	5.320699	2.906543
60.4349589996902	27.6854897473223	3.12447456287328	57.48649	24.517395	4.703245	9.301244
60.4349589996902	20.7561149855553	3.12447456287328	63.31789	20.756115	1.726904	3.203825
56.742657775646	19.3770690761428	3.12447456287328	50.337118	13.87323	4.749218	8.600173
56.742657775646	19.3770690761428	3.12447456287328	58.979255	16.987345	1.276103	4.304944
48.0626709637593	19.3770690761428	3.12447456286933	47.801417	19.06334	7.814097	4.70736
48.0626709637593	19.377069076127	2.27718805370632	49.216563	20.76273	2.277188	1.803198
33.1694450096947	15.5341480000159	1.12918500698776	33.169445	12.82499	1.129185	2.709158
28.7787551682379	16.3240114364889	0	27.827995	16.04415	0.143676	1.001454
28.7787551682409	23.4204320542161	0	25.954135	17.869355	4.361083	7.603419
Route: 5 Length: 303.045009386723 Demand Met: 119						
17.2347351763942	45.9519768549297	8.24463783208573	23.528225	48.047471	10.497692	7.005381
15.5662999130936	45.9519768549297	8.24463783208578	15.566305	47.445917	16.822861	8.70734
8.0714657073059	45.9519768549298	6.52084856249684	8.071465	45.7971455	5.631658	0.90257
7.9726079999993	45.9519768549296	6.52084856249684	4.493385	48.2428075	1.749018	7.3014
7.9726079999993	54.336059	8.41222882897312	2.26291999999999	54.336059	8.412226	5.709688
7.9726079999993	62.4024243778074	8.60285260166585	5.35044999999999	59.245825	2.02242	9.802178
15.823908283433	62.4024243778074	8.60285260166044	18.601355	58.3359	16.263038	9.106551
15.823908283433	62.4024243778074	8.60285260166044	16.28216	64.658715	7.376906	2.608407
18.7966786999456	62.4024243778074	23.7115732852952	15.17562	59.299125	20.231796	5.903506
18.7966786999456	67.3646658574017	24.7923030001463	22.77816	61.91876	23.535116	9.100277
18.7966786999456	67.3646658574017	24.7923030001463	27.294235	67.36467	25.05905	8.501742
18.7966786999456	67.3646658574017	24.7923030001463	19.19225	67.891335	25.986874	4.001137
14.9981433499709	70.4395750015913	24.7923030001463	14.99811	70.439575	28.594361	3.802058
14.9981433499709	73.1593160353137	24.7923030001463	10.737535	78.399525	25.651463	6.808137
10.3022639025039	78.0801599999876	24.7249811980948	10.302265	79.88844	24.724981	1.80828
8.96414149840007	77.9771420000679	21.6042047211111	8.96414	75.77293	21.604208	2.204212
8.45447452560047	77.9771420000679	21.6042047211111	4.81189000000001	71.48163	19.467897	9.90886
8.45447452560047	77.9771420000679	15.7023934968908	1.401765	76.07236	14.516115	7.401092
13.4950755543562	80.7779799976089	15.7023934968908	16.17437	80.77798	18.674423	4.001447
13.495075554356	93.4443618011635	15.7023934968908	10.636965	99.941455	22.606097	9.901623
13.496075554356	93.4443618011635	15.7023934968909	12.30828	95.415795	18.734286	4.20063
20.8926548702663	93.4443618011635	15.7023934968908	20.26183	95.676245	17.846167	5.307169
24.3845088246967	93.4443618011635	5.1180776784845	30.09705	94.85711	4.685105	8.906507
24.3845088246967	93.4443618011635	5.1180776784845	24.384515	97.907795	0.111537	6.707286

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
28.0658730113796	92.0508672266239	20.4362696064578	20.60172	86.45345	23.44328	9.802386
28.0658730113796	92.0508672266239	20.4362696064578	28.966505	91.93771	20.861988	1.002586
28.0658730113796	92.0508672266239	20.4362696064578	23.159665	94.99055	21.634541	6.103619
37.3536158278896	94.285523999992	18.4151889788326	37.353615	96.195315	18.415189	1.909791
39.8630690847953	90.3099064548283	14.5838037676359	39.89323	90.309885	11.775799	2.808165
39.8630690847953	81.7827069636287	14.5838037676359	40.48646	81.157135	14.786912	0.906206
36.3458719014976	82.7183667426229	14.5838037676359	31.22881	79.877355	13.445056	7.509507
36.3458719014976	82.7183667426228	6.22330311693933	36.34587	87.597465	1.344209	6.900084
35.9018858587284	74.6126277712478	6.22330311693934	30.1948	77.47401	0.923346	8.506801
35.9018858587284	74.6126277712478	6.22330311693934	43.88264	75.9979	6.534575	8.106066
31.8102825552338	74.6126277712478	9.04784558783688	27.85894	70.297015	5.978866	7.608202
31.8102825552338	74.6126277712478	9.04784558783688	33.93752	71.055425	5.905417	5.201316
22.3261790917925	60.078093172831	9.57686199999978	25.726765	62.875185	13.655865	6.002164
22.3261790917925	58.4529298607388	9.57686199999978	22.32618	58.45293	10.978007	1.401145
20.795519367926	46.0197220884974	0	24.393135	53.387308	3.209069	8.804674
Route: 6 Length: 330.412785232142 Demand Met: 102						
35.6586300061411	43.3457150059215	7.20797599999973	35.65863	43.345715	7.513468	0.305492
39.7243548553724	52.6573180627863	5.92612400000002	36.49954	48.989475	3.669737	8.009904
39.7243548553724	52.6573180627863	5.92612400000002	39.724355	52.657318	1.123019	4.803105
39.7243548553724	54.7179669410304	11.9536276992272	42.291825	54.317701	14.78098	4.104253
48.8130297448324	54.7179669410304	11.9536276992272	51.37375	46.298003	11.79476	8.802177
48.8130297448324	56.1071610056983	11.9536276992272	53.302235	56.10093	10.554691	4.70213
48.9105445476303	74.6773743278381	14.0718454551764	52.486843	76.711165	9.36826	6.306844
48.9105445475742	74.6773743278141	24.4318457618919	48.983044	68.08194	24.712405	6.601797
48.9105445475742	74.6773743278141	24.4318457618919	45.96408	75.36881	19.356846	5.908922
48.9105445475742	74.6773743278141	24.4318457618919	51.801592	75.702955	19.859805	5.507245
49.2006239988586	76.643573	27.9054949990426	49.200624	76.95068	27.905495	0.307107
59.2147674353003	75.6507103519414	28.4106920502708	56.10401	69.44853	29.951816	7.107666
60.4151946244268	75.6507103519415	28.4106920502708	63.457115	71.302795	28.410692	5.306378
60.4151946244241	75.6507103519415	28.7691252488348	58.86286	75.490835	22.793064	6.800719
60.4151946244242	83.27301995929	28.7691252488348	59.609455	83.27302	29.920795	1.405546
63.7212318228069	85.6605582340975	28.7691252488348	61.393495	78.21387	27.829379	9.209541
63.7212318228069	85.6605582340975	28.7691252488348	59.88564	90.256965	29.954013	6.102678
63.7212318228068	85.6605582340975	26.747765756215	64.30468	84.91	26.009678	1.203546
66.3365967904086	90.14561002515	17.817861	67.48261	90.51293	17.817861	1.203441
65.5878043946139	90.1456100251498	6.9589613944376	65.23767	90.033385	6.608827	0.507723
68.3050229046179	96.917766791697	9.61434503840009	69.51155	98.000325	10.150379	1.707329
58.9163010378677	96.917766791697	9.61434503840009	58.9163	98.60932	2.300231	7.507171
57.955144935746	96.917766791697	9.6143450384001	54.766852	92.295455	6.553331	9.502154
57.955144935746	96.917766791697	9.6143450384001	49.437672	97.29667	7.39626	8.8097
55.7501794761064	92.5273269982442	9.61434503840009	58.59379	93.155945	12.405414	9.907152
55.7501794761063	92.5273269982442	19.6172786680918	55.7501	90.920415	19.617278	1.606912
51.7255850680529	93.9880470142043	25.8584120054609	51.725585	96.536445	28.40681	3.603979
39.7978611948947	84.9923812321128	25.5023330593997	38.950185	86.058925	28.399966	3.201927
26.5472162645711	84.9923812321128	25.5023330593997	23.602775	87.83846	18.275699	8.306271
26.5472162645711	83.8078753830743	25.5023330593997	32.35548	77.08328	26.131092	8.907943
26.5472162645711	57.7561747970302	25.5023330593997	27.03592	58.11764	25.51317	0.607949
26.5472162645711	38.2918632012843	25.5023330593997	21.800035	44.699325	19.798588	9.804285
26.5472162645729	32.9580677959108	25.5023330593997	25.46019	34.06066	24.177315	5.200669
26.5472162645711	32.9570677959108	25.5023330593997	26.379295	27.934205	23.031473	5.600223
26.5472162645711	32.9570677959108	25.5023330593997	22.373755	32.6144	28.047693	4.900414

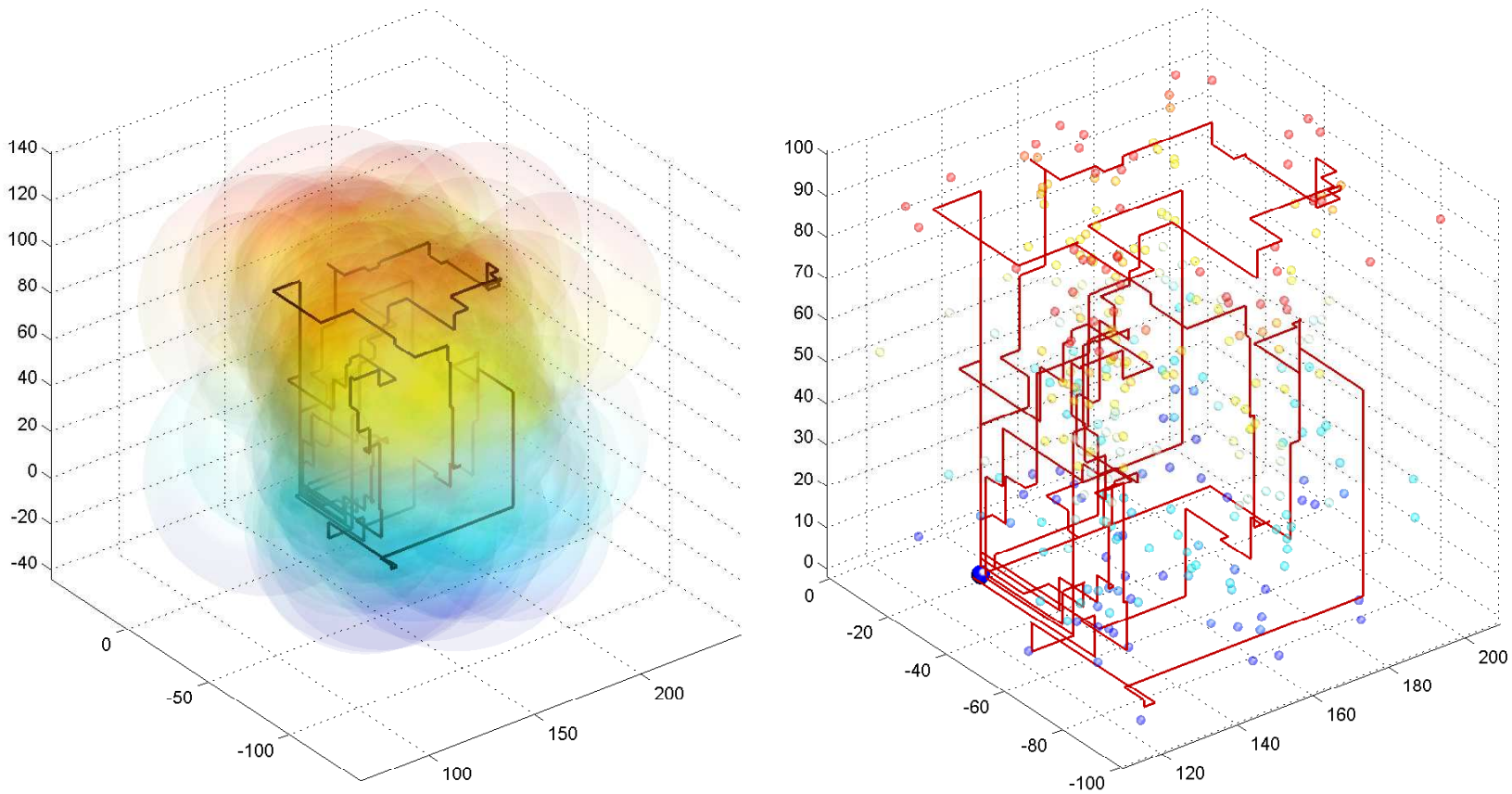


Figure O.197: *team*3_300, arbitrary radius, 3D, Manhattan, Length = 2459.0915094

Table O-200: Solution for *team*3_300, arbitrary radius, 3D, Manhattan

Total distance: 2459.09150938096 Total demand met: 9490 Depot: x 23.55 y 20.83 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 301.501550331734 Demand Met: 1293						
49.3568115355237	20.6447318394559	0	47.45	7.49	9.86	16.55
49.3568115355237	17.4190161130287	4.80170836792363	48.26	14.58	6.53	3.5
49.3568115355237	9.64942148587664	4.80170836792363	54.22	8.18	8.6	10.41
85.201428402879	9.64942148587664	4.80170836792363	90.79	7.27	2.84	30.18
85.201428402879	9.64942148587664	13.178988182882	89.81	1.33	12.56	26.05
85.201428402879	9.64942148587664	13.179988182882	91.86	5.09	13.18	8.07
85.201428402879	9.64942148587664	23.9629763795313	84.85	7.49	23.97	13.74
85.201428402879	9.64942148587664	29.8743662416407	78.01	26.19	31.01	23.38
85.201428402879	9.64942148587664	36.0560231426185	86.46	7.15	36.07	18.46
85.2014284028749	9.64942148587664	36.0570231426185	90.71	5.35	36.18	17.99
85.2014284028749	9.64942148587664	46.8451537758972	86.71	7.9	46.76	17.03
85.2014284028749	9.64942148587664	46.8461537758972	87.56	46.99	46.13	41.58
85.2014284028749	9.64942148587664	51.1704445455831	83.08	5.9	51.4	14.32
85.2014284028749	9.64942148587664	60.1535640092453	83.63	6.61	58.86	7.21
85.2014284028748	9.64942148587664	60.1545640092453	83.98	4.24	58.09	15.73
85.2014284028748	9.64942148587664	66.0616919683882	87.06	2.89	85.23	20.41
85.2004284028748	9.64942148587664	66.0616919683914	90.14	0.74	66.47	21.22
84.2100267880004	9.64942148587664	66.0616919683914	84.21	1.15	74	11.63
74.500446122473	9.64942148587664	66.0616919683914	77.94	16.73	64.38	14.1
60.4188424790307	12.6034272765091	66.0616919683914	56.85	15.49	62.45	20.36
60.4188424790307	12.6044272765091	66.0616919683914	46.38	12.31	81.64	40.75
60.4188424790307	12.6054272765091	66.0616919683914	55.38	10.13	64.28	5.89
60.4188424790307	12.6064272765091	66.0616919683881	52.67	4.65	71.84	26.24
60.4178424790306	12.6064272765091	66.0616919683881	60.89	11.99	66.92	21.62
60.4178424790306	16.88	66.0616919683881	62.16	16.88	79.65	21
60.4178424790306	32.4553543518803	66.0616919683881	58.02	32.46	71.61	35.22
45.6537219278635	32.6870762804582	66.0616919683881	41.47	31.69	75.83	27.11
45.4219999992856	32.687076280465	66.0616919683881	34.24	70.46	67.21	46.56
45.4209999992856	32.687076280465	66.0616919683914	44.15	32.64	73.77	10.23
45.4199999992856	32.687076280465	66.0616919683914	45.42	39.91	67.31	7.33
43.0121730966875	32.687076280465	66.0616919683914	60.94	57.56	60.13	37.6
43.0111730966876	32.687076280465	66.0616919683881	57.66	15.51	81.33	35.11
43.0101730966875	32.687076280465	66.0616919683881	42.69	39.78	60.49	10.22
43.0101730966875	32.687076280465	51.834655384295	41.07	43.98	42.76	16.59
29.5723114157841	32.687076280465	51.8346553842949	19.65	58.2	51.17	41.68
29.5723114157842	32.687076280465	51.833655384295	26.15	61.96	69.66	39.04
29.5723114157842	32.203039177504	51.8336553842949	27.62	60.61	68.71	40.48
29.5723114157806	32.2030391775055	51.8326553842949	25.86	63.85	60.16	38.15
29.5723114157842	32.2030391775055	24.969964074062	31.99	67.74	24.97	46.93
26.6435597145066	25.3583150696965	13.3337453433302	27.74	25.63	13.28	7.06
26.6435597145066	20.83	13.3337453433302	23.55	20.83	14.19	11.78
Route: 2 Length: 83.750549623912 Demand Met: 750						
23.55	20.83	0.001	19.48	4.75	3.34	45.94
24.4919809917602	47.8459264052112	8.15854423408803	20.56	61.44	16.14	30.47
24.4929809917601	47.8459264052112	8.15854423408803	15.54	52.83	23.01	26.09
24.4939809917601	47.8459264052112	8.15854423408803	24.49	66.27	29.11	27.9
24.4949809917601	47.8459264052112	8.15854423408803	8.59999999999999	80.56	11.38	41.43
26.262770232753	47.8459264052112	8.15854423408803	36.6	82.94	12.12	44.77
27.455295476652	47.8459264052112	8.15854423408803	27.36	59.94	13.4	22.06
27.9056538395735	47.886196046258	8.15854423408803	27.64	62.78	13.86	15.95
28.8199961251438	47.9367305778682	8.15854423408803	28.82	81.78	35.71	43.64
30.159999999999	47.9367305778682	8.15854423408803	35.37	65.99	46.58	42.77
30.159999999999	47.9357305778705	8.15854423408802	40.4	40.19	35.32	32.32
30.159999999999	47.9347305778682	8.15854423408802	45.6	43.93	17.79	19.94
30.159999999999	47.9337305778682	8.15854423408802	43.21	42.35	12.25	16.43
30.159999999999	47.9327305778682	8.15854423408802	45.6	41.81	1.51	23.25
30.159999999999	47.9317305778682	8.15854423408802	42.56	42.28	42.23	38.94
30.159999999999	47.9307305778682	8.15854423408802	40.11	39.6	39.05	36.03
30.1599999999998	47.541000142632	2.21999992933998	37.85	53.76	4.29	19.4
30.1599999999998	47.540000142632	2.21999992933998	51.12	47.54	2.22	20.96
30.1599999999998	46.6680087649718	2.20918485904598	25.24	60.77	36.77	37.65
30.1599999999991	35.6354359761602	2.20918485904598	45.71	40.8	10.89	34.61
30.159999999999	35.63443597616	2.20918485904597	42.59	39.16	5.9	36.88
Route: 3 Length: 198.702823112311 Demand Met: 1176						
23.55	22.6398336233719	24.6317747466839	25.65	24.53	24.47	2.83
23.55	28.37	38.7717572327027	53.73	28.37	56.21	48.55
23.55	36.5257204332855	38.7717572327027	3.20999999999999	36.35	38.54	37.4
23.55	55.8599164161039	42.8899117079449	23.5	55.84	45.92	18.38
23.55	61.5091363746512	42.889911707945	22.51	60.15	43.07	23.44
23.55	61.5101363746512	42.889911707945	21.39	62.71	50.33	35.55
23.55	61.511136374651	42.8899117079449	28.77	62.05	46.68	31.17
27.8700000040924	67.83998246261	42.8899117079449	28.86	67.84	42.89	0.99
27.8700000040924	67.84098246261	42.8899117079449	38.08	89.48	68.3	35.64
27.8700000040924	67.84098246261	42.8909117079449	48.89	93.1	33.02	36.74

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
27.8700000040924	69.2340581257241	42.8909117079449	39.7	88.73	54.48	41.5
27.8700000040924	69.2340581257241	45.0986188167131	48.42	91.53	51.1	30.91
27.8700000040924	68.7521754584201	45.0986188167131	47.67	92.59	55.65	35.3
23.7298403233029	68.75217545842	45.0986188167131	23.47	70.49	67.86	29.96
23.7298403233029	68.75117545842	45.0986188167131	23.78	67.37	54.34	23.49
23.7298403233029	68.75017545842	45.0986188167131	37.88	93.16	68.12	38.09
23.7288403233037	68.75017545842	45.0986188167131	46.8	93.43	44.07	39.27
22.0230904603133	68.7501754584198	45.0986188167131	37.93	93.92	46.64	38.41
22.0220904603133	68.7501754584199	45.0986188167131	8.95	75.43	49.37	30.95
22.0212653903911	68.7500005283421	45.0986188167131	20.35	68.75	46.32	2.07
22.0222653903911	68.750000528342	45.0986188167131	24.2	92.42	34.13	40.35
22.0222653903911	68.750000528342	43.6569372349114	11.74	69.17	44.25	18.09
22.0222653903911	67.8604760489921	43.6569372349211	8.67	72.77	42.39	28.82
22.0222653903911	67.8604760489918	34.2955187511247	4.15000000000001	75.92	20.91	36
22.0222653903911	67.8604760489916	34.2945187511247	30.85	54.39	47.15	33.55
22.0222653903912	67.8604760489915	34.2935187511129	38.36	90.43	43.39	47.27
22.0222653903892	67.8604760489945	34.2925187511387	22.17	64.94	33.7	3.52
22.0222653903892	66.7769336475394	34.0472490997672	11.18	57.92	34.05	14
22.0222653903911	66.7769336475395	34.0120688778505	25.01	63.12	37.19	28.84
22.0222653903911	66.7769336475395	34.0110688778505	2.01000000000001	79.01	40.57	42.13
22.0222653903911	66.7769336475395	34.0100688778505	23.19	66.22	32.78	5.11
22.0222653903911	66.7769336475395	32.5592246335185	4.20999999999999	66.53	21.42	21.01
22.0222653903895	66.703399286357	32.5592246335185	0.620000000000005	84.95	30.66	36.73
22.0222653903893	66.703399286357	18.1910001246429	21.1	78.12	20.54	28.48
22.0222653903891	66.703399286357	18.1900001246429	19.86	66.11	18.19	2.9
23.5489988894737	60.8398003772451	11.7526975852875	22.65	62.2	11.71	11.7
23.548998889474	47.9347304515968	3.91028899161654	24.47	65.24	5.9	32.36
23.549998889474	47.9347304515968	3.91028899161654	25.62	68.98	3.75	43.08
Route: 4 Length: 419.933885655031 Demand Met: 1287						
84.0825359304372	48.4604592776267	7.47694263716432	87.92	47.46	7.48	19.28
84.0825359304371	48.4604592776267	14.7502169547568	90.65	58.26	13.09	31.68
84.0825359304371	48.4604592776267	14.7512169547568	89.33	46.23	11.31	10.42
84.0825359304371	48.4688053318992	22.9883802890455	85.21	44.35	20.93	35.25
84.0825359304371	48.4688053318992	22.9893802890455	89.11	45.94	22.79	8.83
86.4510615241995	48.4688053318992	26.4089980474494	91.08	56.32	19.58	17.84
86.4510615241995	48.4688053318992	26.4099980474494	90.93	51.78	26.41	5.57
86.4510615241995	48.4688053318992	26.4117273391984	86.88	55.34	28.08	10.88
86.4510615241995	48.4688053318992	32.6970414144902	85.02	48.75	32.58	30.39
86.4510615241995	48.4688053318992	39.3052656226659	92.82	43.5	36.14	36.84
86.4510615241995	48.4688053318992	39.3062656226659	84.47	44.91	39.53	21.75
86.4510615241995	48.4688053318992	42.9658652769201	98.41	37.64	42.84	22.32
86.4510615241995	48.4688053318992	48.0974339669356	92	48.8	50.4	13.39
86.4510615241995	48.4688053318992	52.3176175777476	85.85	46.49	60.83	8.76
86.4510615241995	49.1100000932291	52.3176175777476	93.86	49.11	54.34	7.68
83.9470047988866	50.7700000002108	52.3176175777476	85.43	53	49.96	9.41
72.5765625797166	50.7700000002108	52.3176175777476	63.26	50.77	40.6	14.97
72.5765625797166	66.60888021412	58.3589137607558	73.63	17.07	53.58	49.78
72.5765625797166	79.0399816626825	58.3589137607558	32.42	78.27	77.18	49.72
72.5765625797166	79.0399816626825	58.3599137607558	68.17	79.21	59.57	25.07
72.5765625797166	88.4600000518312	58.3599137607558	92.92	88.46	92.3	39.57
72.5765625797166	88.4610000518312	58.3599137607558	54.83	99.88	42.57	28.66
72.5765625797166	88.4625013133776	56.7970843887454	78.98	97.83	29.61	29.46
72.5765625797166	88.4625013133776	29.6338490968425	85.6	88.65	32.39	40.1
72.5765625797166	88.4625013133776	8.61257670054618	74.49	84.46	5.13	5.64
64.4624297135678	88.4625013133776	8.61257670054618	70.23	90.73	4.71	37.84
52.2986450816628	88.4625013133776	8.61257670054618	44.33	87.3	2.27	27.93
52.2976450816627	88.4625013133776	8.61257670054618	49.91	91.9	29.51	43.61
52.2966450816627	88.4625013133776	8.61257670054618	48.25	85.26	10.69	49.96
40.966230692234	88.4625013133776	8.61257670054618	41.11	86.33	11.14	3.31
40.966230692234	88.4625013133775	8.61157670054618	47.56	92.03	4.61	9.48
40.965230692234	88.4625013133775	8.61157670054618	39.42	71.54	17.38	47.2
40.964230692234	88.4625013133776	8.61157670054618	42.78	91.87	12.41	35.26
9.42201622760436	95.4079837701643	6.96000003622899	5.54000000000001	99.29	6.96	5.49
12.3680253067409	52.9857976095774	0	11.46	53.07	0.5	1.04
Route: 5 Length: 347.022668236551 Demand Met: 1293						
21.5494949345124	62.6669381416959	4.84774227580983	20.64	65	8.49	4.42
21.5494949345125	62.6669381416959	10.1607281198922	16.79	62.67	10.23	4.76
17.7728938778565	78.5352731034142	22.0669752173369	12.07	80.14	22.08	6.18
16.9880491010273	78.5352731034142	32.2435330307603	46.89	94.85	27.74	49.64
16.9880491010273	78.5352731034142	51.0714043162199	16.99	78.36	62.01	10.94
9.41000040079966	82.0600000000001	51.5399995991633	9.41	84.38	51.54	2.32
9.41000040079966	82.06	61.8399999811901	4.8	88.51	50.28	18.34
4.62899569495315	82.06	61.83999998119	2.19	82.13	61.84	2.44
4.62899569495315	82.06	61.8409999811901	1.01000000000001	87.83	68.27	21.8
4.62899569495407	81.2095251202981	64.9729184537893	0.909999999999997	72.43	63.78	18.26
4.62899569495407	81.2095251202981	64.9739184537893	3.44	75.58	64.88	32.57
4.62899569495407	81.2095251202982	69.6182893597513	1.23999999999999	99.01	69.5	41.19
4.62899569495436	81.2095251202981	70.4884983853856	1.36	82.41	81.26	36.76
4.84521480122267	81.2095251202981	70.4884983853857	6.36	80.44	74.53	34.29
4.84521480122267	76.3313851008452	70.4884983853856	2.98999999999999	72.09	73.38	6.04

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
4.84521480122267	76.3313851008452	75.511553230525	5.06999999999999	73.15	76.92	4.26
4.84521480122277	76.3313851008452	75.8700000736851	6.62000000000001	72.96	75.87	3.81
4.84521480122267	76.3313851008452	83.1086261565738	8.06	78.36	80.59	4.56
4.84521480122267	79.5095877554162	83.5997175694574	1.20999999999999	81.97	77.86	14.68
4.84521480122267	79.5105877554162	83.5997175694574	4.75	76.37	88.59	18.12
4.84521480121154	79.5115877554162	83.5997175694574	0.969999999999999	75.78	96.61	17.69
4.84521480122267	79.512587755416	83.5997175694574	8.28999999999999	81.45	86.91	44.4
4.84521480122267	79.5135877554161	83.5997175694633	0.760000000000005	80.97	91.36	8.89
8.91060312950466	79.5135877554161	83.5997175694633	11.23	82.6	85.27	5.9
8.91160312950467	79.5135877554161	83.5997175694633	10.66	76.44	91.14	43.81
15.9747092354467	79.5135877554161	76.7767547893095	51.75	85.81	80.64	36.53
15.9747092354467	79.5135877554161	76.7757547893095	16.07	82.14	77.28	24.27
24.0564095871376	79.5135877554161	76.7757547893095	35.46	90.5	93.34	36.39
24.0574095871376	79.5135877554161	76.7757547893095	48.98	92.03	89.79	41.59
24.0584095871376	79.5135877554161	76.7757547893095	27.35	82.24	75.13	4.58
24.0584095871376	72.4579023086124	76.7757547893095	34.79	81.57	97.09	35.28
24.0584095871376	72.4569023086124	76.7757547893095	23.52	71.05	74.38	2.83
24.0584095871376	68.6540285835681	76.7757547893095	28.95	69.72	73.23	21.24
24.0584095871376	68.6530285835681	76.7757547893095	21.49	69.2	86.43	28.99
24.0584095871375	68.6520285835681	76.7757547893095	13.36	65	72.75	29.08
24.0584095871375	66.0500211903033	76.7757547893095	24.86	66.05	97.16	20.4
24.0584095871375	56.7599975056343	76.7757547893095	24.03	65.56	79.56	12.46
20.0449172969007	56.7599975056343	74.369852220467	21.99	57.15	79.17	10.23
17.4799999979546	56.7599975056343	74.369852220467	12.14	56.76	74.37	5.34
17.8475500515586	56.7599975056343	64.9479526709165	25.84	61.09	65.42	17.04
17.8475500515586	48.8000773792927	51.6597359703329	2.56999999999999	49.67	48.06	15.72
17.8475500515586	20.83	51.659735970333	3.36	12.54	56.95	17.51
Route: 6 Length: 208.772044068554 Demand Met: 1204						
27.3300817212751	20.8299999999999	3.49991090147289	27.4	59.84	3.43	47.68
54.5335728751328	20.8299999999999	11.6099999205965	63.88	23.81	11.61	9.81
54.5335728751327	20.8299999999999	13.2042559175446	75.98	28.26	8.37	25
54.5335728751327	20.829	13.2042559175447	76.81	16.4	5.21	34.4
54.5335728751328	20.829	13.2052559175446	78.41	15.88	16.4	33.29
54.5335728751327	20.829	22.511778755841	42.95	44.74	22.67	47.83
54.5335728751327	15.7397182159014	22.511778755841	55.5	8.86	22.02	30.33
54.5335728751328	15.7397182159014	32.9000000084804	53.85	15.08	32.9	0.95
54.5335728751328	15.7397182159014	38.1569950083205	55.4	11.17	38.22	24.33
54.5335728751328	15.7397182159014	38.1579950083205	51.98	10.99	46.43	14.06
54.5335728751328	15.7397182159014	38.1589950083205	44.72	11.87	38.22	20.59
54.5335728751327	15.7397182159014	38.1599950083205	56.38	14.32	39.64	21.79
54.5335728751327	15.7397182159014	38.1609950083205	56.31	21.31	38.26	24.49
54.5335728751327	15.7397182159014	42.2600858468819	43.23	11.54	68.02	40.96
54.5335728751327	15.7397182159014	42.2610858468819	50.52	8.68	79.3	38.38
54.5335728751328	15.7397182159014	42.2620858468819	52.96	3.75	74.52	34.45
57.6275491205649	15.7397182159014	42.2620858468819	84.57	2.19	72.59	42.77
57.6275491205649	15.7397182159014	42.2610858468819	52.12	16.84	52.03	26.81
57.6275491205648	16.2868272016354	42.2610858468819	52.03	16.04	55.64	40.73
66.0528272016353	16.2868272016354	42.2610858468819	65.16	40.78	60.78	37.77
66.0538272016354	16.2868272016354	42.2610858468819	83.5	4.83	59.12	37.8
66.0548272016354	16.2868272016354	42.2610858468819	64.87	11.36	51.75	35.55
66.0558272016354	16.2868272016354	42.2610858468818	67	3.94	64.95	32.81
66.0568272016354	16.2868272016354	42.2610858468818	61.27	24.41	67.08	39.95
66.0568272016354	16.2868272016354	42.2600858468818	49.85	30.56	58.41	44.85
66.0568272016354	16.2868272016354	42.2590858468818	71.33	32.23	64.13	42.89
66.0568272016354	16.2868272016354	42.2580858468818	79.79	30.32	50.96	35.55
66.0568272016354	16.2868272016354	39.83	66.87	17.1	39.83	1.15
66.0568272016354	6.21664175772822	39.83	83.08	6.85	43.86	42.38
66.0568272016354	6.21564175772822	39.83	85.18	6.81	41.52	43.66
66.0568272016354	6.21564175772822	20.6	51.86	7.7	30.42	17.94
64.3000000000001	1.76	20.6	64.3	1.03	20.6	0.73
63.3850697723061	1.76	20.6	84.22	4.25	20.41	43.87
63.385069772306	1.76	8.70001619970124	85.34	3.13	7.91	40.46
63.3850697723061	20.8299999999999	8.70001619972675	74.93	38.63	8.7	25.85
56.0658257995109	20.83	0.001999999999996	92.92	45.3	3.79	44.4
56.0658257995109	20.83	0.001	56.26	10.34	5.55	24.93
56.0648257995108	20.83	0.001	50.21	0.82	0.76	29.59
56.0648257995108	20.83	0	54.15	15.54	5.27	39.45
Route: 7 Length: 497.33599554765 Demand Met: 1191						
23.55	52.7399999999952	48.9340724878869	30.36	58.14	54.2	13.13
27.2799999999864	52.7399999999978	69.9399999998383	27.28	65.47	69.94	12.73
34.4000700270865	52.7399999999952	75.6999999999221	26.5	63.44	75.23	28.82
34.4000700270865	47.87	75.699999999922	30.83	54.42	86.59	13.2
41.7330986064527	47.8700000000355	75.6999999999213	58.75	56.63	68.13	26.43
41.734098606442	47.87	75.6999999999619	27.18	54.04	89.82	49.76
41.9700000004271	47.87	75.6999999999598	41.97	43.22	75.7	4.65
41.9700000004271	47.87	79.1670196000566	42.62	44.81	79.79	3.21
41.9710000004222	47.87	79.167019600385	43.21	42.61	80.16	13.5
41.9710000004223	47.87	79.16801960035	43.96	42.1	91.03	13.34
44.5325506845498	47.87	86.8341541984807	47.34	38.25	97.3	14.49
53.3500000000146	77.0516676679906	93.586330201029	53.35	83.14	97.2	7.08

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
60.0575929122417	74.3799624775748	93.586330201029	57.57	78.44	87.74	7.54
60.0575929122417	65.6262754407608	93.586330201029	70.7	73.7	97.99	18.06
60.0585929122417	65.6262754407608	93.5863302010291	66.26	99.07	96.4	34.13
82.4079875077894	61.0207941015833	93.5863302010291	87.26	54.53	99.96	10.31
82.4079875077894	61.0207941015831	93.5853302010372	72.93	73.7	97.12	16.22
86.6084310149467	54.0241908717747	88.9367490538447	82.42	49.99	99.02	11.64
86.6094310149466	54.0241908717748	88.9367490538447	92.09	44.08	96.66	37.36
86.6094310150214	54.0241908717748	81.6400000000022	89.36	56.03	81.08	3.45
92.8941640395121	49.7300000000002	81.6400000000022	89.59	51.88	82.73	4.09
96.35	49.73	81.6400000000022	96.43	49.73	81.64	0.08
96.35	49.7299999999997	80.5203455202862	92.59	46.16	69.75	30.13
88.92	43.6199999998876	80.5200000000082	88.92	43.62	77.06	3.46
88.92	26.8171827660399	81.1903131403557	84.47	48.16	64.66	27.36
88.9189999999999	26.8171827660399	81.1903131403557	85.78	45.37	88.36	33.83
88.9189999999999	26.8171827660399	81.1913131403556	90.45	0.18	67.28	30.09
88.918	26.8171827660398	81.1913131403556	88.21	3.61	89.96	26.68
88.9169999999999	26.8171827660399	81.1913131403556	86.49	3.97	82.84	35.89
85.7600000031878	19.2699998525783	86.6699999720214	85.76	19.27	96.66	9.99
62.2131479428303	19.2699998525783	84.7000000841398	63.35	21.49	87.32	4.65
57.2650403115436	19.2699998525783	84.7000000841398	50.3	13.28	95.6	17.44
57.2650403115435	16.3811469199468	84.7000000841398	55.24	13.37	88.36	7.67
57.1014219714193	16.3811469199468	84.7000000841398	54.5	15.91	93.18	18.5
47.9999999999072	5.79000006724478	84.7000000841398	48	4	84.7	1.79
47.9999999999071	10.9993923284629	73.2157582167114	51.38	10.51	60.31	13.35
47.9999999999072	10.9993923284629	63.5893505893055	56.94	12.18	54.17	13.04
47.9999999999071	10.9993923284629	61.5448451347847	52.67	8.88	54.93	8.37
41.4288682783923	10.9993923284629	48.6446280374916	31.22	0.18	51	17.31
41.4288682783924	10.9993923284629	43.4072462597524	41.49	2.29	43.49	8.71
36.1520566983123	20.83	36.1270305522002	45.63	23.76	45.59	13.71
Route: 8 Length: 402.071992805212 Demand Met: 1296						
23.55	20.83	53.9133107244338	42.72	42.84	54.45	48.6
23.55	20.83	53.9133107244338	45.57	28.26	77.82	48.56
23.55	20.83	53.9143107244339	44.53	2.72	56.05	49.48
23.55	20.83	53.9143107244339	53.87	15.51	67.82	48.76
23.55	20.83	83.5299073066568	45.57	12.76	80.46	29.32
23.55	20.83	83.5299073066568	45.09	11.7	92.12	48.9
23.55	20.83	83.5309073066568	50.97	4.59	83.57	36.43
23.55	20.83	92.665618415751	24.66	9.13	90.15	37.86
16.8103139974771	20.83	92.665618415751	4.01000000000001	20.5	95.59	30.01
16.8093139974769	20.83	92.6656184157509	5.58	22.9	91.06	47.89
10.8463802686784	50.3688530599049	92.6656184157509	9.06999999999999	51.92	93.4	2.47
26.7171416953739	50.368853059905	92.6656184157509	40	38.77	99.41	18.88
25.700383466812	55.5367107798272	92.6656184157509	33.01	55.55	89.21	36.48
25.700383466812	55.5377107798272	92.6656184157509	21.75	55.19	94.83	18.06
25.700383466812	59.3720025453136	92.6656184157509	20.88	59.51	94.7	36.31
25.700383466812	66.6719481405619	92.6656184157509	12.82	66.49	92.89	17.6
25.7003834668118	70.1000000007575	92.6656184157509	22.6	70.1	92.91	3.11
25.700383466812	76.5983472533264	89.9213711046307	24.25	76.66	84.45	7.23
25.700383466812	88.9453473346942	89.9213711046303	30.69	95.98	98.88	13.17
41.11	88.9453473346941	89.9213711046303	42.37	92.45	91.48	18.71
41.11	88.9453473346941	89.9203711046303	47.48	94.9	89.56	26.29
41.11	88.9453473346941	83.035545006933	44.75	90.08	82.93	11.27
41.11	88.9453473346941	83.035545006933	46.92	92.94	79.18	12.72
41.11	90.4	75.4981481295403	48.68	92.55	68.87	20.63
41.11	90.4	75.4981481295403	40.14	88.25	82.87	7.74
41.11	90.4	72.9299994624405	41.11	92.55	72.93	2.15
41.11	90.4000000000001	63.6995207045981	39.18	94.86	64.79	14.97
42.3284135650458	90.4	63.5232793992349	39.28	92.99	62.54	15.28
42.3284135650458	90.3004855122448	59.5072975848547	39.31	87.14	57.08	5.32
42.3284135650458	90.3004855122449	59.5062975848547	42.93	88.78	59.49	12.51
42.3284135650458	90.3004855122448	36.6517626171028	40.14	85.47	20.22	26.51
42.3284135650458	90.3004855122448	36.6517626171028	24.67	93.34	35.07	18.16
42.3284135650458	90.3004855122448	36.6517626171028	45.57	93.71	36.64	20.17
42.3284135650458	90.3004855122448	36.6517626171028	47.08	88.26	42.71	25.21
42.3284135650458	90.3004855122448	36.6517626171028	49.11	94.31	36.24	17.31
46.5300000269096	90.3004855122449	36.6500025547443	50.91	90.3	36.65	4.38
44.36	86.5196584575564	36.6500025547444	40.13	86.48	38.33	6.39
44.36	86.5196584575564	26.5300000136306	38.99	86.42	22.62	12.82
44.36	76.0599999776984	26.5300000136307	35.58	76.06	26.53	8.78
46.460000000061	67.9384947850353	26.5300000136306	47.3	55.25	23.22	13.14
46.4600000000611	61.4799798589359	16.5899999979763	49.78	61.48	16.59	3.32
46.4600000000611	61.4799798589359	12.211815749164	54.05	68.39	12.29	14.97
46.460000000061	61.4799798589359	5.46128256707087	60.12	71.05	6.63	24.74

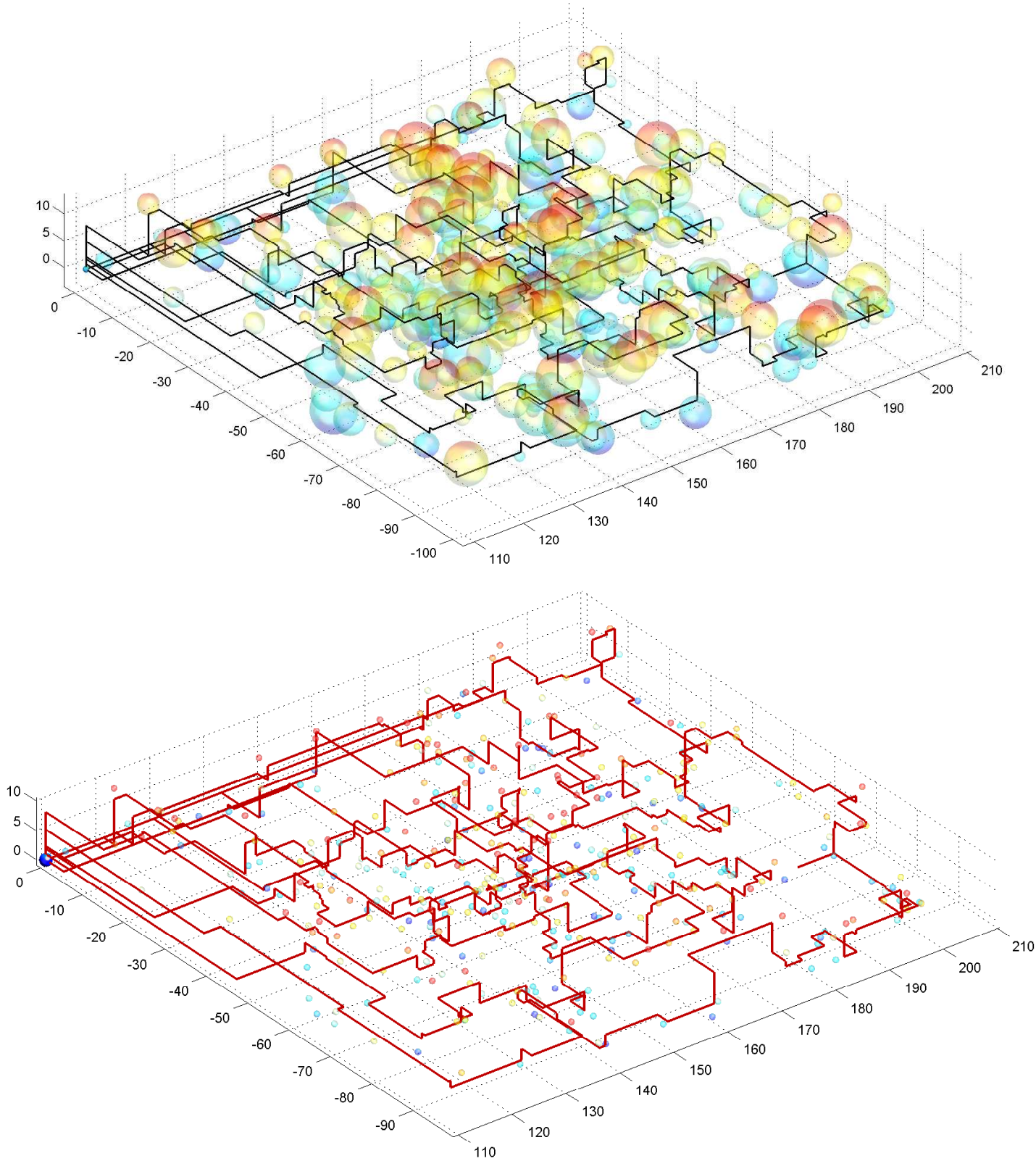


Figure O.198: *team*4_400, arbitrary radius, 3D, Manhattan, Length = 2459.2418944

Table O-201: Solution for *team*4_400, arbitrary radius, 3D, Manhattan

Total distance: 2459.24189438406 Total demand met: 2245 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 407.975615854919 Demand Met: 373						
2.39617289339155	1.18095110523935	0	2.34935	1.70725	1.418964	1.5141472
14.9096321489903	9.36003119042686	0.262371379595257	17.13825	10.254625	1.09375	2.541304
20.4649791444712	21.48695963905	0.262371379595386	20.686175	21.9667	1.804567	1.6301674
20.4649791443273	21.4869596390765	5.42874329999836	20.995625	24.282225	3.380339	3.5058599
22.7931787659942	31.8095036702318	5.42874329999836	22.793175	31.8095	6.267813	0.8390697
25.4985500151265	33.4547499832364	5.01765670001221	25.49855	33.45475	4.180424	0.8372327
26.5141500000744	33.5758250017435	9.43921729988319	26.51415	33.575825	9.461971	0.0227537
30.9650737305659	36.0460999172698	5.68247801380348	30.2641	36.115	4.866777	1.0777196
31.8023293363533	36.0460999172698	5.68247801380348	32.29465	34.1886	4.533526	3.1017705
31.8023293363533	36.0460999172698	5.68247801380348	31.8731	36.0461	3.846108	1.8377332
31.8023293363533	39.5926999184193	7.43401819731841	31.7652	39.5927	8.134315	0.7012804
37.1914528718609	44.2529499600527	7.43401819731837	38.0514	44.25295	8.429467	1.3154571
37.1914528718608	45.3055130132271	7.43401819731837	35.77655	45.5234	7.314779	1.4365385
37.1914528718608	45.5585750001782	6.55351184335828	36.34605	45.558575	2.970524	3.6813731
40.7628	47.4839516466942	6.55351184335828	40.7628	47.39015	6.093812	2.9963842
43.4796493863282	52.4779000109652	6.55351184336327	42.80595	50.969325	5.199786	2.8313705
43.4796493863284	52.4779000109652	9.21309879999616	43.47965	52.4779	9.729662	0.5165632
44.7642780999993	55.2890134514858	8.12048815634281	45.616825	55.349625	8.112205	0.8547389
44.7642780999993	59.21932504383	7.83516399995065	45.110025	59.219325	7.835164	0.3457469
42.1237192041648	60.8719500313502	6.96665089480107	42.114525	60.87195	6.966651	0.0091942
43.6959792181046	61.2396543774449	4.17270838564771	44.541975	62.0002	4.336081	1.1492733
43.6959792181046	64.7039249962473	2.50807445616087	44.4217	64.703925	2.042243	0.8623628
42.6789883617914	64.7039249962454	2.50807445616087	44.898775	67.784675	2.145396	3.8144474
42.3891000138397	68.3790314897003	2.50807445616087	42.3891	68.379025	5.906332	3.3982575
39.5838042908794	70.4283243471552	1.58909028146873	40.205375	70.4585	3.559151	2.1049867
39.5828042908794	70.4283243471554	1.58909028146873	39.430175	70.428325	1.436461	0.2158504
49.8005843641031	71.056250842455	1.58909028146873	49.5023	72.1454	0.362105	1.6675468
53.5970965030704	73.5108911809111	1.58909028146873	50.03295	71.692275	1.548117	4.0015227
53.5980965030704	73.5108911809112	1.58909028146873	53.249925	71.4317	1.507319	2.1097265
53.5980965030705	75.4790860751524	6.59381966141498	52.726325	74.9715	6.042198	1.1497459
54.3333150707324	75.4790860751524	7.84419336361023	55.289875	75.9977	8.05121	1.1076205
59.3111996390902	76.6389893128283	7.84419336361023	60.77085	76.3761	8.633151	1.6799218
59.3111996390902	77.2490207472395	7.84419336361023	59.360575	77.3659	4.085186	3.7611478
59.3111996390902	81.9563753356604	7.8566720559703	60.2356	81.956375	8.121308	0.9615343
55.5261459672364	85.0099885184622	7.8566720559703	56.13655	83.451075	6.561985	2.1163693
55.5261459672364	85.5346650025833	7.85667205597031	54.01775	81.8894	8.14471	3.9555254
47.4999658072678	85.5346650025833	7.8566720559703	49.4347	86.0537	7.963635	2.0059997
43.9034002662793	85.5346650025833	7.85667205597031	43.9034	88.387225	9.898098	3.5077797
41.4292934553837	85.5346650025833	7.85667205597031	42.31835	87.347525	7.738111	3.5183382
41.4282934553838	85.5346650025833	7.85667205597031	40.913925	82.729825	6.876661	3.0771461
41.4282934553838	77.6159487271975	7.85667205597031	40.4153	76.30845	7.455735	1.7018987
36.1103250080989	77.6159487271976	1.97750878479908	36.110325	75.95995	0.32151	2.3419359
36.110325008099	83.2442820800477	1.97750878479908	35.60905	81.995775	1.580638	1.4026949
36.110325008099	83.2442820800477	2.51236807633014	36.3513	83.686975	3.385766	3.004223
33.3240249973473	86.8146542999829	2.51236807633014	33.324025	88.862275	2.512368	2.0476207
33.2524229096373	86.814654299983	2.51236807633014	32.733925	86.47665	2.244896	0.6742613
33.2524229096373	86.814654299983	5.71167055991366	30.896	84.86835	8.084952	3.8695341
25.464446569348	83.925904521964	5.71167055991367	27.4824	83.15295	4.645899	2.409453
25.463446569348	83.925904521964	5.71167055991367	22.609375	83.218325	5.878629	2.9452111
24.1930917616095	82.5303417688836	6.88172723476466	24.1584	82.49565	6.916419	0.0600879
24.969075303729	90.9404870424756	6.8817272347644	23.831575	88.204275	5.345531	3.750467
24.969075303729	90.9404870424763	5.90924837292324	27.27955	90.9405	3.131217	3.6132742
24.969075303729	97.2517677789213	5.90924837292324	26.6212	98.85125	4.844028	2.5342758
22.2763499916952	97.2517677789213	5.90924837292324	22.27635	97.920025	9.573749	3.7249339
15.4510499979419	94.8346334579977	4.01257284013184	15.45105	94.471525	3.135131	0.9496062
2.30792499034057	94.8346334579978	5.15222109502485	2.307925	97.449675	7.701639	3.6521191
1.91663335555211	79.2563748641222	5.15222109502417	0.00154999999999461	79.256375	5.511897	1.9485664
1.91663335555211	68.0048607897173	5.15222109502394	0.331024999999997	69.303175	3.842333	2.7183647
2.1347967399247	68.0048607897408	5.15222109502396	1.692025	67.9044	4.763979	0.5973869
3.0358481737733	63.9543127762612	5.15222109502422	2.404275	62.37445	1.602613	3.9363141
3.03584817378236	62.5985558519982	5.15222109502503	2.20627500000001	60.72485	3.544594	2.6045019
3.03584817378236	38.2205499446976	5.15222109502498	4.729125	38.22055	5.844342	1.829267
0	20.9503996120334	5.15222109502502	0.610974999999996	22.331075	4.829551	1.7663891
Route: 2 Length: 412.350349442404 Demand Met: 375						
13.0127748246464	4.00441217010464	4.62662193323614	12.34295	3.720825	3.558355	1.2923936
16.4871979789544	6.26755195219138	5.49728582339361	16.533825	6.314025	5.413684	0.10641
34.4135379715486	8.79310003895002	7.97134309999955	33.240325	8.160175	9.454403	1.9941137
43.2503000029644	8.79310003895002	7.97134309999955	43.2503	8.7931	9.432262	1.4609189
44.3334162691814	8.79310003895002	7.97134309999955	44.6523	7.1683	9.495828	2.2507146
54.9888307343357	9.53708707907862	7.97134309999955	54.0981	10.209075	9.589747	1.9657569
55.4866385105493	13.4074142367445	5.92591116202002	53.686425	15.19815	7.953267	3.2492576
56.7858149418625	13.4074142367445	5.92591116202002	56.7601	13.3255	9.545614	3.6207209
58.6432504098696	13.4074142367445	5.92591116202002	56.680125	15.845675	6.62366	3.207153
58.6442504098696	13.4074142367445	5.92591116202002	58.66755	14.455925	4.659081	1.8727735

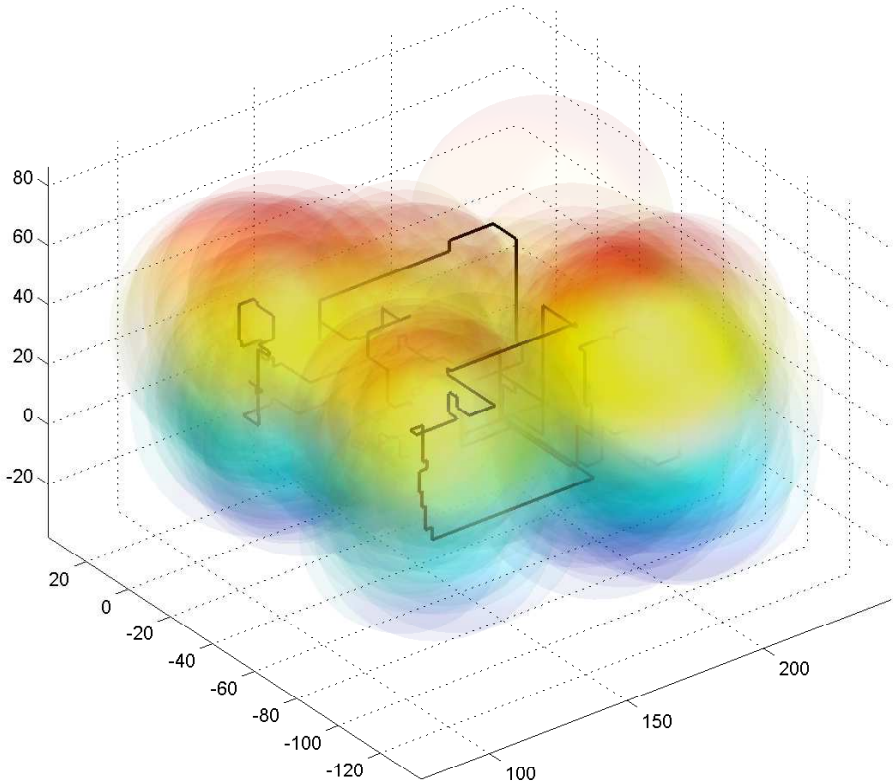
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
58.6442504098696	13.4074142367445	5.92491116202002	58.962525	15.549225	6.884037	2.3682429
58.6442504098696	14.710053807366	2.80085966031062	59.666825	17.15215	3.601254	2.7658857
65.936558339297	16.5813999988139	2.80085966031062	66.273425	16.5814	2.463993	0.4764014
65.936558339297	20.9714988484862	2.80085966031062	65.789175	19.559925	1.053267	2.251298
65.9355583392971	20.9714988484862	2.80085966031062	62.8697	20.929125	3.670375	3.2881032
65.9355583392971	20.9714988484862	6.63629846903456	64.881075	21.1972	7.607995	1.4515751
65.8646913070679	28.4959500023827	9.36561469049284	65.757275	28.49595	9.473031	0.1519096
65.8646913070679	28.4959500023826	3.63921641504196	68.792375	27.90175	4.368368	3.9463741
68.2729403758444	28.4959500023826	3.63921641504174	67.6691	30.587025	1.957775	2.7503569
72.8555109464175	34.9039975366357	1.66845500000181	74.4851	34.7013	1.961771	1.668137
72.8565109464175	34.9039975366357	1.66845500000181	74.186175	37.664625	1.593253	3.0650817
77.2672750884389	35.3235999689822	1.66845500000181	77.267275	35.3236	0.141297	1.527158
79.8493379869585	37.974874996624	1.66845500000181	82.455325	37.974875	2.274181	2.6754574
79.8493379869585	39.4857489134357	1.66845500000181	80.128375	42.2928	0.877447	2.9296913
76.7618427518453	39.3793927495575	4.88448162800397	77.736325	41.257125	4.306668	2.4159837
76.7618427518453	39.3793927495579	8.10279725220038	76.5757	39.19325	8.28894	0.3224087
76.7618427518452	41.9435773200269	8.10279725220038	76.046775	40.829925	8.304908	1.3388025
79.5563249996437	47.9513551622992	8.10279725220038	80.003925	44.278875	7.256115	3.7953033
79.5563249996436	48.3289470338808	6.44834333496831	79.556325	49.1563	6.397826	0.8288938
82.1659999981466	46.0371393496056	6.44834333496838	82.166	45.384	5.835084	0.895923
83.2473249997442	46.1224747883645	8.46383379241525	83.247325	46.458225	8.799584	0.4748225
84.6122924551146	44.1973647732553	8.46383379241525	84.710775	44.260425	5.70064	3.5456061
84.6122924551143	44.1973647732551	5.69964699942394	85.82305	42.253575	5.699647	2.2900333
84.6122924551143	44.1973647732551	5.69864699942394	86.306375	44.08645	5.63357	1.9276333
84.6122924551143	44.1973647732551	1.11251397798962	83.98185	43.958725	1.112514	0.6740969
84.8648940734844	46.8847999531719	0.983018897241693	85.726975	46.8848	0.120938	1.2191665
84.8648940734844	51.7630494018307	1.14552480956126	83.835575	49.221375	2.182226	3.0061312
84.8648940734844	54.5167639098431	4.47478074625809	85.3769	55.416	3.88436	1.1913741
78.8974750301454	60.1681699832746	5.37009591643517	78.897475	61.3791	6.581026	1.7125137
76.7766469674261	57.8315760527758	5.37009591643517	74.7548	56.66355	6.610021	2.6437784
76.4804377671577	57.6243206367568	5.37009591643517	75.12385	56.355025	6.655597	2.2591934
75.8652359545036	51.2199884210697	4.64988529843982	74.97575	51.8098	4.043794	1.2273588
74.0477376742502	50.0812021266842	4.222255247531	75.70595	48.354275	5.510084	2.7185379
73.8836931637729	46.3533363032662	4.13606610687308	74.018375	45.692475	4.261669	0.6860415
64.0450501252343	44.9106752316953	3.89266950000031	64.04505	44.910675	0.523975	3.3686945
63.629988463684	44.7632136893969	4.17330169245209	60.81405	45.86495	6.053591	3.5607331
59.4986196107736	39.4640375160394	4.4453105966634	58.980725	40.369175	5.096252	1.2293142
54.2718662000007	38.6935000000229	6.380105999946	54.125425	38.6935	6.380106	0.1464412
55.8945249965919	37.2992500028268	8.18347359999994	55.894525	37.29925	9.136585	0.9531114
59.3978845999973	36.9077749752435	7.1579369693055	60.313175	36.907775	7.157937	0.9152904
59.3978845999973	36.5383460648666	4.72077098539732	59.92645	35.207	4.720771	1.4324328
59.3978845999973	36.5383460648668	1.88982112184916	59.82755	37.21565	1.143092	1.095882
59.3978845999973	32.9967051091752	1.88982112184916	59.25755	30.092125	1.789844	2.9531507
53.0850500703628	32.9967051091752	1.88982112184916	53.08505	32.116125	1.177184	1.1328164
50.8224147187266	32.9967051091752	1.88982112184916	49.821325	32.088775	0.505787	2.6868713
50.8224147187266	32.9967051091752	4.42140111494854	48.825175	33.4678	4.421401	2.052047
50.8224147187266	26.9492750986574	4.89077459165581	49.48335	26.949275	8.082485	3.4612295
54.9667128948851	26.9492750986574	4.89077459165581	53.429725	29.230175	5.838259	2.9604889
54.9667128948851	26.9492750986574	4.88977459165581	52.727475	27.05645	3.021539	2.9182147
56.1847499730438	26.4957817987682	2.11630364871329	54.7913	22.79115	2.590985	3.9863921
56.1847499730438	26.4957817987682	1.96725889585902	56.18475	25.5187	0.990177	1.3818024
56.3234022355074	28.9043700788081	7.87729727383077	53.51985	31.610925	8.734185	3.9899375
56.3234022355074	28.9043700788081	7.87729727383077	57.8987	27.066925	9.346556	3.9092312
56.3234022355074	28.9043700788081	7.87729727383077	59.6161	30.5374	8.744708	3.7763801
56.3724787657285	27.2382148581375	7.87729727383077	58.5251	25.335175	8.213376	2.8927993
56.3724787657285	20.9858000008552	7.87729727383077	56.46315	20.9863	9.377425	3.1469731
56.3724787657285	20.9848000008552	7.87729727383033	56.707375	20.9848	8.081779	0.3923879
56.3724787657285	20.9848000008552	7.358246394295	56.145325	18.970525	8.712859	3.3151033
46.7938460779987	20.9848000008552	7.358246394295	47.99765	20.639375	7.512605	1.2618593
46.7938460779986	4.32341833475615	0	46.59205	4.24755	0.914106	2.7958463
22.5527777563517	4.32341833475628	0	25.090375	4.2535	0.574579	2.6027734
Route: 3 Length: 283.121138224319 Demand Met: 373						
10.7325999800067	2.49094977605764	7.68044429999565	10.7326	2.49095	9.542224	1.8617797
12.9606820903105	10.0835943740816	7.68044429999946	13.011825	10.0758	8.49229	0.8489863
12.9606820903105	14.0496323458373	7.68044429999946	12.54795	14.295525	6.980367	1.0755618
12.9606820903105	14.0496323458373	7.50705425996404	12.5519	14.734025	9.438961	2.0899186
14.6484302962582	15.9309493264376	7.50705425996314	14.259	13.428825	7.786985	2.5476741
21.0548474553768	21.1529510015548	7.50705425996403	20.9892	20.7572	9.683969	2.581261
21.0548474553769	23.3725701200345	4.06881852964531	21.1268	22.989225	6.335554	2.3000479
28.0261232598759	25.8943799183322	3.4810949051195	28.216025	27.287675	5.4487	2.41843
28.026123259876	28.011765967409	3.4810949051194	27.65685	28.081275	4.203862	0.8146082
28.026123259876	31.2299249154472	2.67203487680675	29.46595	31.229925	1.232208	2.0362226
28.0261232598761	40.8803331626151	2.67203487680675	27.2689	42.18555	1.296271	2.7742388
28.0261232598761	40.9950914870129	2.67203487680675	28.231575	43.86655	5.176578	3.8908642
27.9113648391491	40.9950914870129	2.67203487680784	27.251975	44.47235	3.840979	3.7272714
27.911364839149	47.3643666171616	4.46566427373316	26.549225	47.5983	5.827804	1.9405088
31.2444484357102	47.3643666171616	3.07841577616698	30.804475	50.3614	3.667235	3.2757758
31.2454484357102	47.3643666171616	3.07841577616698	31.916925	49.63125	4.365548	3.3038515
31.2464484357404	47.3643666171616	3.07841577616698	31.24645	46.9846	0.258005	2.8458636
34.2417741556517	47.3643666171616	3.07841577616698	34.241775	45.041325	3.482667	2.3579528

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
34.8219999701105	49.5540225000004	1.965488	34.822	51.041775	1.965488	1.4877525
36.479433083449	48.7247008877403	1.965488	33.276075	49.648225	0.482877	3.6486347
39.3899416534874	48.7247008877402	1.965488	37.32375	47.164775	1.301487	3.8061293
42.5902248513388	48.7247008877403	1.5683118977008	43.5222	45.0811	1.214529	3.7775081
42.5902248513388	48.7247008877403	1.56731189770093	43.10885	48.272275	1.575949	0.6882847
42.1290639889148	51.8118250607178	1.37585983063753	41.3638	51.811825	0.610596	1.0822466
42.531344933205	52.0353949566956	1.37585983063753	38.966475	52.166125	2.317575	3.6894736
42.531344933205	52.0353949566956	3.39465131940267	44.413025	51.821425	3.225875	1.9013123
42.5313449332065	54.6706050999986	3.39465131940266	43.054225	52.07985	5.94327	3.6716308
44.3691799302548	54.6706050999987	3.39465131940267	44.549375	51.8385	4.639375	3.4753711
46.1191250696617	54.6706050999916	3.94563179067713	46.119125	55.3112	3.945632	0.6405949
47.4739515999936	54.5327000022367	5.17848566932889	47.802925	54.5327	5.178486	0.3289734
47.4739515999937	53.920839157614	5.3200820069004	47.81055	52.508825	5.320082	1.4515793
40.3095448586711	53.9208391576141	5.48876015722369	39.658325	53.39295	5.48876	0.8383044
40.310544858671	53.9208391576141	5.48876015722363	41.89655	53.797625	8.251962	3.5360134
40.6402331574107	53.9208391576139	6.05299904467308	40.529725	53.231175	6.058478	3.1574837
40.6402331574107	55.53782476597	6.05299904467308	40.703325	55.537825	6.299364	0.2543153
40.6402331574107	55.7769097470036	4.45407568094666	40.468775	56.35765	3.688499	2.0428185
40.6402331574108	56.1020084131281	4.45407568094666	41.765825	57.606275	4.678763	1.8921573
40.6402331574107	57.0651503986675	3.82244855169321	41.323875	57.06515	2.903463	1.1453823
38.1239750290604	57.5654092999998	4.09656516582672	39.243575	59.34405	2.988695	2.5403868
38.1229750291087	57.5654092999998	4.09656516582672	38.122975	58.912025	4.096565	1.3466157
36.8500084210177	55.6905250067821	7.25441874374029	36.8297	55.690525	7.310631	0.0597683
36.8500084210176	53.9757751465868	7.25441874374029	37.074525	51.14655	9.462196	3.5957201
29.8313874615332	53.9757751465868	5.39633966684585	29.2116	52.625	7.111098	2.2691686
29.8313874615331	54.7668289697205	3.91546810120265	28.87265	55.2137	3.915468	1.0577671
29.9497034292106	54.7668289697204	2.29055371591847	30.1798	54.1346	0.93414	1.5141057
29.9497034292105	58.2664441755807	2.29055371591847	30.688625	60.637275	0.70091	3.9031621
29.9497034292105	58.2664441755807	6.71385952410933	32.800625	59.186225	6.71386	2.9956219
27.3100382240349	58.2664441755805	8.90068371270332	30.732825	57.781	6.904491	3.9919808
26.5977999999357	58.2664441755807	8.9006837127033	26.5978	58.30075	8.947543	0.0580748
23.622099314572	57.0475780558276	8.90068371270334	22.891175	56.122525	6.014662	3.1174634
20.8082333167577	50.690283388195	6.79357964779402	21.4066	50.274675	5.660638	1.3469706
20.8072333167297	50.690283388195	6.79357964779402	19.028925	48.6519	8.742576	3.3340627
15.2325250618164	50.690283388195	6.79357964779402	17.219275	51.795125	6.528901	2.288647
14.9125496382465	46.0322747454517	6.79357964779402	13.3837	46.032275	5.26473	2.1621199
17.1964391999996	44.4723671122879	7.51724353140204	17.095675	43.177	5.934841	3.0748926
17.1964391999996	43.8704248001901	8.14294430724669	19.292975	43.870425	8.142944	2.0965358
17.1964391999996	42.182436375447	8.83645260938978	19.322625	41.061025	7.646061	2.6823985
16.3319694441857	40.87694979854	8.83645260938977	15.806625	40.87695	9.361797	0.7429492
17.4384219	37.4078226150832	3.88183226989859	18.77905	36.01655	4.45503	2.0153111
17.4384219	32.5001500110167	2.4294201150985	18.476575	32.50015	2.42942	1.0381531
14.432157408728	26.2209938858043	2.32678315725232	15.2685	27.387025	1.441223	1.686213
14.4321574087288	26.2199938858022	2.32678315725232	14.358825	25.883825	4.414924	2.1162985
Route: 4 Length: 376.932452502322 Demand Met: 375						
32.5306999672962	9.24608463823084	0	32.636425	9.71905	0.854223	1.0447423
32.5306999672828	9.24608463823084	4.98048375499135	32.5307	9.603625	5.102178	0.3776832
62.7727468295743	9.24608463823084	4.98048375499136	64.181275	8.885925	4.857898	1.4590044
62.0439047146447	10.2837999999999	7.5100362853588	61.5062	10.2838	8.047741	0.7604293
62.0439047146447	10.775003120641	7.51003628535881	62.944875	12.9098	8.420704	2.4896628
68.2970208767117	11.8320750000134	7.5100362853588	68.784175	11.8632	9.776368	2.318307
76.069624	11.8320750000049	5.79362300000464	76.1173	11.832075	5.793623	0.047676
76.069624	13.2462793340208	5.79362300000465	77.464	15.628175	3.533669	3.5672263
76.0696239999983	15.484393593773	1.23969228832559	77.750225	18.79385	0.265085	3.8375488
75.8820452759019	17.780525031263	1.23969228832559	75.3053	17.780525	0.662947	0.815641
76.5701072816745	17.7805250312647	1.23969228832559	77.472675	18.057475	0.141489	1.59513
76.5701072816745	22.84910816099	1.23969228832559	76.538875	22.08605	1.37194	0.7706109
80.6833347472798	23.6720792000028	4.77397800000023	83.1155	24.690275	4.773978	2.6366931
75.4199500000004	23.6720792000028	8.70117899999905	75.41995	23.365625	8.701179	0.3064542
75.4199500000006	26.617318356979	8.70117899999902	76.27055	23.463675	8.429053	3.2776576
75.4199500000006	35.2043319737772	8.70117899999902	75.0516	36.4713	6.125794	3.1806421
73.6642799928168	35.2043319737773	9.00366117859839	72.419975	34.998125	8.679512	1.302263
69.4258	42.3644951805622	9.0036611785984	69.4258	42.661825	9.2188	0.367001
64.6280250002587	40.1687491557109	9.00366117859841	64.48255	39.62755	9.929967	1.7702677
64.6270249999987	40.1687491557106	9.00366117859841	64.627025	39.598675	9.161247	0.591454
63.9796104079737	48.047766899967	9.00366117859839	65.024675	48.473875	9.912197	1.4488497
63.9786104079738	48.0477668999671	9.00366117860264	63.06625	46.073225	9.963062	3.8790845
60.7388755868247	48.0477668999671	9.00366117860268	61.33205	47.81805	9.220678	0.6721027
60.7388755868247	48.047766899967	6.77975708409993	58.59885	48.807625	9.719414	3.714657
56.4549000000011	48.0477668999959	6.77975708409993	56.7604	48.090675	9.498427	3.4617573
56.4549000000014	48.0477668999964	6.74004300000049	56.4549	49.1402	6.740043	1.0924331
55.8910031751807	48.0477668999993	4.80909456858484	54.870925	48.098925	4.394617	1.102256
55.8910031751807	44.4455268374985	4.80909456887088	57.24125	42.40615	5.476964	2.5354041
55.8910031751807	44.4455268374985	3.65989183261699	55.460475	43.213925	0.442759	3.4716194
55.8910031751807	44.4455268374985	1.85816920204472	56.281125	43.406775	0.357518	1.8663211
53.2226103317213	47.1116749999984	1.85816920204472	51.332325	47.3944	1.206534	2.0193416
51.5984953266037	47.1116749999983	1.85816920204472	48.801425	47.111675	0.180447	3.261649
51.8265365449044	50.0234433292755	2.17966919999999	52.703075	49.56845	2.111726	0.9899267
57.231948497965	50.0234433292756	2.17966919999999	55.262125	52.9866	2.328913	3.5612885
57.231948497965	50.0234433292756	2.17966919999999	59.0369	52.162425	0.980631	3.0447964

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
58.1717985912816	51.7088000000006	2.1796692	61.491825	51.7088	3.765748	3.6794322
57.7679749974497	53.1620226869152	2.1796692	55.9361	51.897075	1.720125	2.2731123
57.7679749974497	55.4124999975714	2.1796692	57.767975	55.4125	2.368927	0.1892578
57.7669749974497	55.4124999975714	2.1796692	59.205025	55.76	1.820366	2.6513752
54.5694090496988	62.5864499999945	2.01623581828619	53.6353	62.58645	0.328338	1.9291342
54.5694090496988	65.938900000007	2.01623581828618	55.5813	65.9389	1.049446	1.399502
54.1798503349199	66.2119539268085	2.01623581828618	52.902425	64.80215	1.303032	2.0317535
46.0252695285346	66.2119539268084	6.86276569410302	46.228875	65.56925	6.129679	2.8726006
46.0242695285335	66.2119539268084	6.86276569410302	45.884675	65.715725	8.319043	2.1094453
42.8041902434246	66.2119539268179	6.86276569410278	43.7645	63.186425	9.005722	3.8299193
42.8031902434246	66.2119539268179	6.86276569410054	42.88515	65.09985	8.113938	2.6385081
41.6831749999541	66.211953926818	6.86276569410055	41.683175	67.299925	9.367966	2.7312469
39.7753000000146	66.2119539268179	6.36764868186684	39.7753	66.19835	5.821872	0.5459462
39.5930786184915	66.2119539268174	6.36764868186761	37.615325	65.262725	9.608735	3.9137176
34.2795924321215	66.211953926818	7.14321743626862	34.7277	67.482525	7.589491	2.9420086
31.5835249998775	66.2119539268179	7.14321743626862	31.583525	68.6781	7.867205	2.5702207
28.2020499998854	66.211953926818	7.14321743626861	28.20205	68.6988	5.301267	3.0947027
24.4446499998894	63.570242768698	7.83301323129901	24.44465	63.1281	8.275156	0.6252843
21.5561559363941	63.5702427686976	6.2059665811534	21.668825	63.73225	4.392072	1.824597
21.0090999998815	66.3750414035867	5.4038019	21.0091	68.35155	4.610936	2.1296062
18.3821999892786	65.7727250165185	5.4038019	18.3822	65.772725	3.391578	2.0122239
18.3614430665082	65.7727250165184	7.42354628384904	17.272875	64.973225	8.378801	1.6542893
12.3976170327518	65.7727250165183	7.42354628384904	12.50315	65.202575	6.796126	2.0894727
10.1121900999928	54.8181544480593	7.42354628384904	10.71515	57.182775	5.281599	3.2469865
10.1121900999928	54.8181544480593	8.40806300000398	11.458875	55.406825	8.437123	3.5619902
10.1121900999928	52.2460999836868	8.408063000004	9.352575	52.2461	8.408063	0.7596151
10.4397140739101	51.5806749836732	8.64730707804948	11.134375	51.580675	9.341968	0.9823989
8.70030325192943	46.589728833921	8.6473070780495	8.7059	46.626875	9.397095	1.0497725
7.27039181925315	13.9773293675382	8.14202539976131	5.29819999999999	16.16745	9.485319	3.2389206
2.22232539431778	13.9773293675382	8.14202539976133	2.12502499999999	13.8908	8.215003	0.1492663
Route: 5 Length: 410.636293231221 Demand Met: 374						
19.9845000033775	26.714522999999	0.660018999936973	19.9845	27.40155	0.660019	0.687027
34.0987254241799	26.6026953958003	3.0108978346542	34.098725	26.483975	3.010898	0.1187202
36.7552008136449	26.6026953958003	5.68686473650714	33.989075	25.3104	7.891632	3.7659631
37.3880276526066	26.7037302796201	5.68686473650714	39.217825	28.48755	6.718496	2.7558001
37.3880276526066	37.9478499999944	5.68686473650714	37.4986	37.94785	9.024015	3.3389816
37.3880276526066	38.4515360002424	3.77404699595185	35.05695	38.887125	3.774047	2.3714259
37.3880276526066	38.4515360002424	3.77304699595187	36.0198	39.389875	2.90819	1.9831699
37.4905999999146	38.4515360002424	3.38347663109562	37.4906	38.735475	3.373994	0.2840973
39.4736499999937	38.025015157809	3.38347663109562	39.47365	37.672175	3.042346	0.4907813
44.9410494708416	40.1955397293329	3.38347663109562	45.015525	41.584025	2.803346	2.3336041
44.9410494708416	40.1955397293329	7.65594939997495	43.242475	40.8624	6.853519	1.9934273
44.9410494708416	40.1965397293328	7.65594939997495	44.89855	41.381	7.163397	2.1076985
44.9410494708416	48.071	7.65594939997495	46.718325	46.79505	7.837302	2.1962207
47.3591499999195	48.0710000000001	7.65594939997496	47.35915	48.071	7.780887	0.1249376
48.8724824603364	49.7108828463307	7.10392800000465	50.075475	49.526025	6.785114	1.2581756
50.3420000004646	58.1771868555023	7.10392800000465	50.342	58.1772	6.133715	0.970213
50.7200002283469	59.7833032345155	7.10392800000465	51.0767	59.931625	7.815468	0.8096439
53.3194000000002	59.7833032345155	7.10392800000464	53.1029	58.71345	6.825055	3.7092457
53.3194000000002	59.7833032345155	7.10392800000464	53.3194	62.871025	8.033264	3.2245451
55.8084817529877	59.4421437002892	7.10392800000464	56.708375	61.084725	7.280884	3.5527238
63.23065	59.4421437002892	7.10392800000464	62.1796	60.091575	6.795975	3.7726122
63.23165	59.4421437002892	7.10392800000464	63.23165	61.378	8.16167	3.0992482
67.662423756828	59.4421437002892	7.10392800000464	68.048425	58.486425	8.31929	1.6060654
67.662423756828	59.4421437002892	5.2471299965815	67.662425	58.9604	5.24713	0.4817437
67.662423756828	63.8848926550484	5.2471299965815	67.8084	64.88	6.618444	1.7006027
67.6624237568281	63.8848926550484	4.24652950685608	68.033375	62.578975	2.177441	2.4747025
72.0066083351898	66.3381250022461	4.24652950685609	73.97555	66.71955	2.504	2.6718873
75.2724051265901	66.3381250022461	2.18508363926337	75.320425	66.338125	2.101527	0.0963723
75.2724051265898	66.3391250022461	2.18508363926337	74.919425	66.332825	2.561604	3.2122786
75.2724051265906	68.8420882916881	5.4531224129811	74.758025	68.76505	2.771423	2.7316723
75.2724051265906	68.8430882916881	5.4531224129811	76.3481	68.05155	4.299693	1.7646676
75.2724051265905	70.2725224817525	5.4531224129811	72.106325	71.513625	4.730422	3.4765924
75.2724051265907	77.0935	7.09153361639069	75.94035	77.0935	8.244154	1.3321727
71.96685	78.4112295721425	7.09153361639069	71.96685	79.285825	7.324255	0.9050284
69.4663703308398	78.4112295721425	5.3384947434481	67.096325	78.407125	5.545343	2.3790582
69.4663703308412	75.3840286290154	1.46733376877659	69.349625	77.516575	1.446757	2.180516
67.9701499999545	75.3840286290155	1.46733376877659	67.97015	74.943825	1.28227	0.4775226
65.6637840515031	80.5526036004838	1.46733376877659	64.2971	80.8087	0.617407	1.6296583
65.6637840515031	80.5526036004838	7.79100446063151	66.686275	83.4025	9.789982	3.6281274
65.6637840515031	76.7065499999993	7.79100446063153	65.721375	76.70655	7.829144	0.0690749
63.147376433338	73.8012226826531	6.93479629137517	63.106325	74.44845	6.994666	0.6512855
62.1142611000307	70.4930503909209	4.62259395888196	63.9561	69.944325	5.325084	2.046353
62.1142611000307	66.4790750000328	4.62259395888195	61.692525	66.479075	4.622593	0.4217361
62.1142611000307	66.2294461152864	2.04141857172149	62.481725	64.778425	2.883198	1.7172899
62.1142611000307	61.2181749999545	2.04141857172149	62.138225	61.218175	0.933898	1.1077798
62.1142611000307	60.2897500509367	2.98703804879441	61.732525	60.28975	3.358698	0.5327791
62.9810825088837	58.6140999915022	2.98703804879441	63.564825	58.6141	2.885043	0.5925861
61.237073855454	55.8537025140713	5.3323930764668	61.751375	53.5726	3.689653	2.857714
61.237073855454	55.7677749999365	5.33239307646674	60.964225	55.767775	5.605242	0.3858666

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
65.2024135969741	55.7675773229546	5.3323930764668	66.095725	55.876775	6.205798	1.2540995
68.5012786929696	50.4960286490409	4.820236	70.38585	48.289775	4.820236	2.9015796
68.5012786929696	51.264575	1.68843142606497	70.163125	48.595475	2.681471	3.4643229
68.5012786929696	51.264575	1.0930917527007	70.20275	51.264575	0.287703	1.88246
52.0777248247591	51.264575	1.0930917527007	54.099275	51.121125	0.198175	2.2154275
50.7032182200365	51.7745999999965	1.0930917527007	50.5204	51.7746	0.922891	0.2497815
51.8115005536114	53.8400005536068	4.56358997975668	51.731775	54.063975	3.386729	1.2006342
51.8115005536116	53.8400005536068	9.61580755361519	51.8225	53.851	9.626807	0.0190516
51.5298163592964	51.5173275785458	9.0602996936293	50.9611	51.5263	9.096967	0.5699678
51.5298163592956	45.4215306119918	7.99296572468682	51.464375	46.273425	9.764247	1.9665818
50.2635936474699	45.4215306119974	7.99296572468921	52.0729	45.66175	8.843258	2.0135272
48.3296930772967	42.0308615257908	7.99296572468847	49.0937	40.0849	6.606023	2.5088011
48.3296930772967	32.6096749206829	7.99296572467764	49.014675	34.9475	8.94848	2.6167984
41.8995444567876	32.6096749206834	7.99296572467764	43.312375	33.022625	9.818329	3.1742295
41.8995444567897	27.2377910436978	3.23866778500213	42.344525	27.231625	2.735005	0.6721026
38.6688209767543	11.3107866155709	3.23866778500213	40.4237	12.94705	3.760655	3.5125829
38.6688209767543	8.42390678742555	2.57899380004609	40.718225	8.45085	2.325605	2.0651849
28.4664592585136	6.86366570765796	1.87889220368876	28.471925	7.124375	1.494169	0.46477
Route: 6 Length: 568.22604512888 Demand Met: 375						
69.8175747929379	1.30682500300069	3.32186350000001	69.817575	1.306825	4.894499	1.5726355
71.8295249305654	4.94358568861986	2.42703073334206	71.829525	5.85575	2.05089	0.986674
77.3352247839092	2.31270922243824	2.42703073334206	77.335225	0.00945	1.073545	2.6715027
79.6523000821913	2.31270922243824	2.42703073334206	77.882675	4.11235	4.515775	3.3455297
79.6523000821913	4.1446249955749	7.44013709992514	79.6523	4.144625	8.31435	0.8742129
82.7598150761552	4.1446249955749	7.01786221979588	82.33615	2.420325	8.700274	2.4460605
82.7598150761551	10.8706817538287	5.80242715283561	81.52085	13.687775	5.204149	3.1351213
87.3022999960001	11.9183658496362	5.80242715283562	87.3023	11.937375	5.783418	0.026883
94.0900496177894	9.3588753298443	8.63398929999961	94.09005	9.358875	9.999877	1.3658877
96.9554451483793	8.69667132176074	8.63398929999961	98.6909	7.723575	8.237085	2.0288551
98.8291343275236	8.69667132176074	3.82854699530113	99.82775	8.49955	3.828547	1.0178851
96.3462836991542	8.69667132176073	1.14841730155573	94.81355	7.137025	0.426722	2.3027404
96.3462836991542	16.7463501770624	1.14841730155573	96.9141	16.74635	0.695888	0.7260841
95.0659027517475	29.5811440820505	1.14841730155573	95.640625	28.68455	2.397586	2.2964659
95.0659027517475	35.7438525467295	2.95124643573544	94.997925	34.851	5.629957	2.8244109
92.0948035567903	35.7438525467261	2.95124643573581	90.921925	35.308625	2.502062	1.329223
89.9625777296732	37.1432000349701	7.07980528376093	87.349525	37.1432	9.692858	3.6954146
92.0255744762238	40.9274977733532	7.07980528376092	92.049975	40.056175	5.962344	1.6551621
95.0444728036412	40.9274977733534	7.07980528376092	95.9689	41.808	7.756384	1.4448559
95.0444728036412	44.425783698324	6.46115197797209	94.807975	43.25145	7.382414	1.5111964
95.0444728036411	52.7465250158615	6.4611519779721	95.486225	52.746525	3.57388	2.9208705
95.0444728036412	57.5521000121287	6.4611519779721	94.377175	57.5521	6.223661	0.7082996
95.0706893316706	61.7875720231614	6.69699461600368	92.124775	61.791725	6.696503	2.9459173
97.7924321526563	68.3222749925864	7.8036881690108	98.93765	68.322275	8.948906	1.6195826
94.4039999999244	75.0858824	7.13167300237022	94.404	75.185075	7.131673	0.0991926
93.7657130832214	75.0858824	7.13167300237022	91.825175	77.123475	9.251483	3.5229343
91.4177575784863	71.460799970418	6.05541513757765	90.725625	70.444425	7.760216	2.1020018
91.4177575785001	71.4597999704179	6.05541513757764	90.314475	71.662575	4.957094	1.5699234
91.2900613275443	71.4597999704179	1.75066737183115	91.08095	71.69145	1.548548	3.6485541
84.5466336955822	71.4597999704178	1.75066737183116	82.150425	71.4598	0.532397	2.6881218
91.2900613275443	71.2964737714217	1.75066737183115	91.5733	68.725	1.37953	2.6135119
91.2900613275444	81.5455004245927	1.75066737183114	91.03755	80.9252	1.385966	0.7625888
91.2900613275443	84.1265999118254	1.75066737183114	92.480625	84.1266	1.286063	1.2780059
91.0597715448615	90.3153152823165	1.88939595680864	92.685275	90.310575	1.584168	1.653919
89.0595	90.3153152823165	1.96409400081815	89.0595	90.291	3.16566	1.201812
89.0574105725708	90.4736831114782	4.96827248320645	90.195175	89.03695	6.180904	3.7016857
89.0574105725709	90.4736831114782	4.96927248320643	87.858275	88.334025	4.100051	3.4946441
84.9489807903444	92.6644749834673	4.96927248320643	84.25115	92.664475	5.874601	1.1430606
84.9489807903444	95.2830750006099	4.42308315264815	84.77555	95.283075	3.666391	0.7763126
84.9489807903444	96.170767302142	7.30359024874582	84.9479	97.513325	6.355392	1.6436369
84.9489807903444	96.1717673021675	7.30359024874582	84.730325	97.611875	9.216212	2.4041303
85.8268348876071	98.8370848502141	7.3840988857586	86.192975	99.203225	7.750239	0.6341733
74.3345433209123	98.8370848502141	6.59482571131542	74.44305	98.0205	8.628544	3.9109049
74.3335433209122	98.837084850214	6.59482571131541	72.222075	99.2555	9.348041	3.494791
74.3335433209122	97.9771000813382	6.59482571131542	72.374675	95.981125	5.386278	3.0465832
72.8222921000001	97.9771000813383	2.88266592147735	71.306475	97.9771	2.882666	1.5158171
75.2342084802168	90.0013414211675	2.61473487320779	75.8385	89.39705	2.129044	0.982971
72.9327346226771	90.0013414211677	2.61473487320779	75.589675	88.707575	0.958209	3.3878078
72.8222921000119	93.2860738789951	2.61473487320778	72.88955	91.55335	2.086078	1.8128248
67.6794750264231	94.6089094307895	2.6147348732078	67.679475	96.828325	2.179153	2.2617553
64.6041472213897	94.6089094307895	3.47508250072443	64.46975	94.91155	5.12346	1.6813097
64.6041472213897	91.2626406691305	8.50519230583733	66.508125	91.303225	8.984758	3.030605
56.4280773716944	91.2626406691306	8.50519230583726	56.428075	90.20545	9.562383	1.4950934
48.9904518378912	97.7314510999977	3.92732100084216	48.99045	98.5583	3.927321	0.8268489
48.9904518378912	97.7314510999977	3.19845152321832	49.100125	97.070175	0.603113	2.680503
40.3321516808506	95.256561293441	3.19831594300304	40.290225	96.689525	2.280132	1.7024114
30.6639980686224	95.256561293441	1.29465419865792	32.22375	93.28635	0.1273	2.7707895
29.5793422678909	80.022376525604	1.29465419865579	29.23795	80.022375	0.178216	1.1674686
29.579342267891	80.0213765256073	1.29465419865792	30.46345	78.65395	2.876347	2.8521408
29.5793422678909	77.5234620910129	2.47868131031277	31.60195	76.5275	2.478681	2.2545249
29.579342267891	77.5234620910129	3.85544775624418	29.5312	77.759375	2.944562	0.9421706

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
22.8933712684593	77.5234620910129	3.85544775624418	22.467675	76.02705	4.2329	1.6009174
20.9401	77.5234620910128	7.41246629969715	20.9401	75.2051	6.209147	3.2102784
19.41455	77.5234620910129	7.41246629969714	19.41455	76.0326	9.16761	2.3028676
13.1458311900552	78.588864824753	7.41246629969715	13.11545	76.27845	9.886291	3.3850773
13.1458311900701	82.5412502999996	6.55535602294459	12.1212	83.525275	6.555356	1.4206244
13.9285500793231	82.5412502999996	6.06707189045768	13.92855	83.165725	6.067072	0.6244747
15.7552395	79.8607249977598	3.65875999583957	16.4015	79.860725	3.65876	0.6462605
9.03076689294207	79.0333997042063	2.66211159669553	8.347775	79.0334	0.64524	2.1293776
9.03076689294207	66.0937500023825	2.66211159669553	8.8531	66.09375	2.882202	0.2828521
12.3384387343443	51.5103800575333	2.66211159669553	8.9679	51.422725	2.23495	3.3986294
12.6406166	46.1101249831407	0.966330982940731	14.24105	46.110125	0.966331	1.6004334



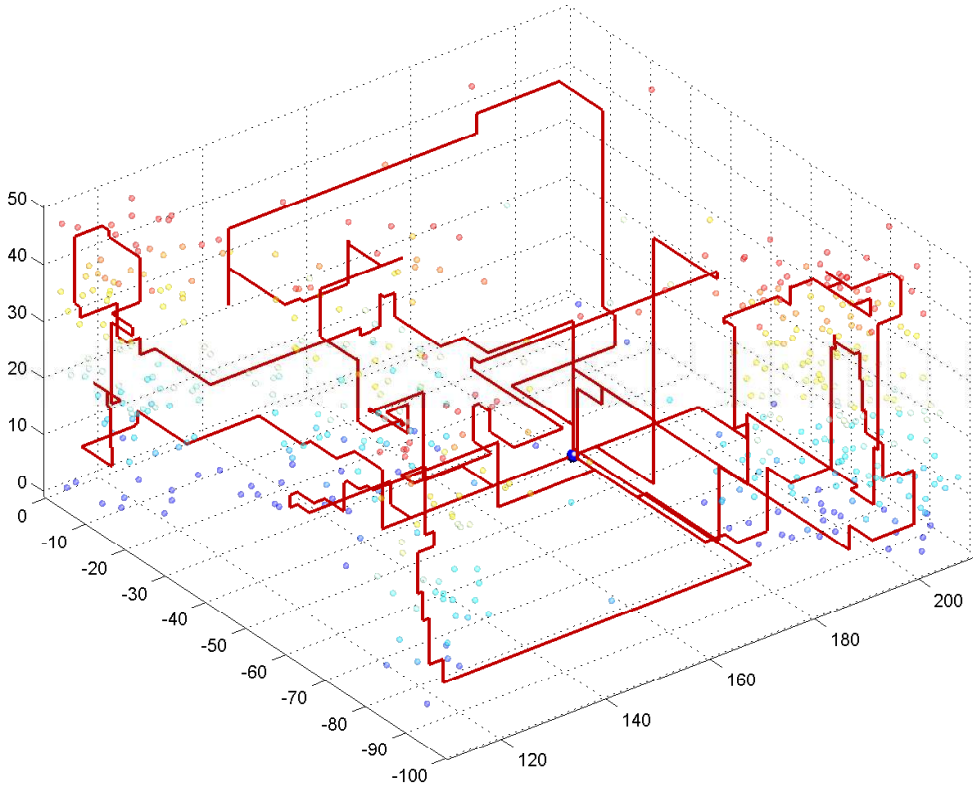


Figure O.199: *team*5_499, arbitrary radius, 3D, Manhattan, Length = 1822.3350498

Table O-202: Solution for *team*5_499, arbitrary radius, 3D, Manhattan

Total distance: 1822.3350498011 Total demand met: 9744 Depot: x 70 y 40 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 72.1211210553594 Demand Met: 858						
70.0000000000001	41.0674	12.3472	42.0622	41.0674	12.3472	34.7982
70	47.2687943476116	15.3717966666093	35.3466	47.2689	27.5268	39.4146
70	57.6997967915097	15.3717966666093	84.4928	76.9707	34.1362	35.8799
70	59.3958093504678	15.3717966666093	84.6626	79.7388	29.6454	28.8542
70	59.3968093504679	15.3717966666093	70.0314	77.1275	8.8524	35.8588
70	59.3968093504678	15.3727966666093	71.4242	75.4202	7.9198	25.4968
70	59.3968093504678	15.373796645065	85.6153	86.7737	15.008	37.7006
70	59.3978093504678	15.373796645065	77.1151	89.3423	7.0894	37.2077
70	59.3988093504678	15.373796645065	79.3483	75.3688	19.5443	27.2443
70	59.3998093504679	15.373796645065	75.2812	79.5319	0.6498	38.4796
70	59.4008093504679	15.373796645065	86.8895	84.3247	23.0154	31.0852
70	59.4018093504679	15.373796645065	90.1019	83.486	18.038	37.2389
70	59.4018093504679	15.373796645065	94.7529	81.9671	23.1963	38.2984
70	59.4028093504679	15.373796645065	76.1847	74.2911	12.7823	17.8739
70.0000000000001	59.403809350468	15.373796645065	84.7658	77.8153	16.2748	28.1634
70	59.404809350468	15.373796645065	88.7272	81.0174	24.4065	30.12
70	60.4653176981177	15.373796645065	88.1669	82.2879	22.5207	36.2685
70	60.4663176981177	15.373796645065	75.6074	70.2776	13.8577	26.094
70	60.4673176981177	15.373796645065	73.1545	60.0435	17.8914	34.4744
70	60.4683176981177	15.373796645065	72.5026	72.4828	42.5897	37.2859
70.0000000000001	60.4693176981177	15.373796645065	79.7775	80.296	30.6811	29.6152
70.0000000000001	60.4703176981177	15.373796645065	76.3867	80.9989	23.608	33.1367
70	60.4713176981177	15.373796645065	97.0848	81.6578	13.6354	37.2835
70.0000000000001	60.4723176981177	15.373796645065	70.8021	79.2974	26.7913	26.617
70.0000000000001	60.4723176981177	15.373796645065	75.4182	80.175	27.0139	23.5169
70	60.4733176981177	15.373796645065	76.9521	88.589	30.1519	36.7425
70.0000000000001	60.4743176981177	15.373796645065	78.9268	79.6337	5.1041	28.7763
70.0000000000001	60.4743176981177	15.373796645065	77.4302	82.5606	3.0237	33.5083
70	60.4753176981177	15.373796645065	83.5177	79.6473	12.5117	24.9276
70	60.6491784054059	15.373796645065	87.5661	81.6563	15.3738	27.3837
70	60.6491784054059	15.4063821222322	85.22	71.0885	8.0711	39.2361
70	60.6491784054059	15.4063821222322	89.379	76.0987	3.6739	38.3025
70	60.6491784054059	15.4073821222322	70.8501	86.3243	19.985	34.4665
70	60.6491784054059	15.4083821222322	81.0134	86.425	30.4534	31.9429
70	60.6491784054059	15.4093821222322	80.2014	81.5949	36.2605	32.3848
70	60.6491784054059	15.4103821222322	73.6161	81.1388	33.9424	38.2238
70	60.6491784054059	15.4113821222734	77.364	70.7565	29.611	18.9213
70	57.3135342165276	15.4113821222734	44.1821	62.8241	31.2839	34.6478
70	57.3125342165276	15.4113821222734	73.5352	77.8165	42.524	36.1475
70	57.3125342165276	15.4103821222734	70.5598	83.7819	30.4468	31.7327
70	57.3125342165276	15.4093821222734	83.3441	85.5151	19.0157	31.408
70	57.3125342165276	15.4083821222734	72.3356	86.155	20.9164	38.7669
70	57.3125342165276	15.4073821222734	75.9291	73.9471	7.416	36.4707
70	57.3125342165276	15.4063821222734	73.6863	74.2382	1.6716	25.5224
70	40.001	15.4063821222734	91.1956	46.5873	37.0515	33.1213
70	40	15.4063821222734	84.8772	45.0654	27.1944	32.4975
Route: 2 Length: 366.404008161606 Demand Met: 1510						
70	40	23.8374267139728	78.1743	38.6355	23.4376	9.4129
53.7335923073911	40	23.8374267139726	43.1416	9.2079	26.5197	35.1675
53.7325923073911	40	23.8374267139719	30.7692	16.7931	38.6765	37.8932
53.7325923073911	39.999	23.8374267139715	38.1953	36.049	49.7462	32.0805
53.7325923073911	39.9979999999446	23.8374267139716	43.5486	39.6053	49.4906	27.6035
53.7325923073911	33.9937888409874	23.8374267139718	49.7446	26.3767	39.5089	17.8751
49.2795996068393	22.4101999978043	27.895	49.2796	22.4102	31.3443	3.4493
47.3120000287628	21.2889	27.895	52.9148	12.3625	13.3985	18.1234
47.3120000287627	21.2889	22.1432999983429	47.312	20.115	22.1433	1.1739
45.8433999924864	21.2889	21.9435848660345	45.8434	28.1097	8.3609	15.1991
43.6519330056066	21.2889	23.3237871338157	44.6412	21.1681	25.9788	2.8359
21.8455078819995	21.2889	23.3237871338157	24.5672	24.4137	22.4773	9.9276
21.8445078819859	21.2889	23.3237871338157	23.4789	26.9268	25.8998	12.6384
14.8794092367571	21.2889	23.3237871338157	19.7672	14.9362	24.0245	14.1421
14.8794092367571	21.2879	23.3237871338157	16.5052	19.9903	24.3242	2.3082
14.8794092367571	18.727406767826	23.3237871338157	19.0819	14.2893	25.2658	6.4132
14.8794092367571	18.2709505584	23.3237871338156	12.8565	9.4609	19.9198	9.659
14.8784092367571	18.2709505584	23.3237871338157	15.42	17.0914	20.8872	16.8786
14.8774092367571	18.2709505584	23.3237871338157	13.9396	19.5452	20.1112	16.1224
14.8774092367571	7.53521885052231	23.3237871338157	18.8587	8.5087	18.9878	16.8623
14.8764092367571	7.53521885052231	23.3237871338157	15.4595	7.4752	20.3496	3.0314
11.9070833963081	7.53521885052231	26.3962539825763	16.6256	12.3206	29.6782	7.479
11.9070833963081	7.53521885052231	26.3962539825763	10.2894	7.4847	25.4008	1.9001
9.4263001392642	5.0869467524827	26.3962539825763	15.5961	8.5134	30.9972	9.1422
9.4263001392642	5.0869467524827	32.1939091414788	9.9632	1.8111	30.9688	39.4027
9.42530013926419	5.0869467524827	32.1939091414788	9.42529999999999	3.1222	32.8197	2.062
9.42430013926419	5.0869467524827	32.1939091414788	5.6246	7.277	28.7239	11.7089

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.34060232116587	5.0869467524827	32.1939091414788	1.4037	6.1535	31.8542	1.4597
2.34060232116587	5.0869467524827	34.0300678122047	4.1027	5.9391	36.7092	6.8207
2.34060232116587	3.67984192275054	34.0300678122047	3.8933	3.6617	34.8265	1.7453
2.34060232116587	3.67884192275054	34.0300678122047	3.6086	13.0876	23.3357	29.6311
2.34060232116587	3.67884192275054	34.0300678122047	3.76260000000001	17.1174	49.9096	21.877
2.34060232116587	3.67884192275054	34.0300678122047	12.1595	5.1953	46.5778	17.8764
2.34060232116587	3.67884192275054	34.0300678122047	2.4532	11.1564	41.7483	29.4831
2.34060232116587	3.67884192275054	45.7312566105213	1.2646	1.8964	47.5137	2.7408
7.62180000021577	5.41210000813194	44.573676820955	8.8668	5.4121	44.5737	1.245
7.62180000021577	7.15126224832925	44.5736768209552	17.8934	15.1905	44.1135	13.0517
7.62180000021577	7.15126224832925	44.5736768209552	9.9074	11.0867	39.8487	12.9373
7.62180000021577	13.2021893520274	41.3625291461367	19.0824	1.094	9.1576	39.3681
7.62180000021577	13.2021893520274	41.3625291461367	2.3396	12.8751	20.4499	24.3453
7.62180000021577	13.2021893520274	41.3625291461367	2.4914	14.471	42.2927	5.3662
7.62180000021577	13.2021893520274	41.3625291461367	3.9756	4.3104	38.409	39.2995
7.62180000021577	13.2021893520274	41.3625291461367	2.4773	0.052	34.3258	34.0937
7.62180000021577	13.2021893520274	36.7339807229782	8.098	10.1576	40.7441	7.8091
7.62180000021577	13.2021893520274	36.7329807229782	5.6082	3.0104	39.1925	11.8319
5.0673476583615	13.2021893520274	36.7329807229782	5.0355	11.9367	30.2057	6.6489
2.08903837779964	18.4334616640278	35.1787000052225	0.782799999999995	19.7397	35.1787	1.8473
2.08903837779964	13.2780196265	23.2775673722441	1.5116	19.0597	21.7588	16.8413
2.08903837774258	13.2780196265	20.7291000000008	2.785	16.9995	21.2146	3.817
3.82868578606067	6.60051476136448	20.7291000000001	3.9473	4.1638	20.7291	2.4396
3.82868578606966	9.85644345659556	18.1895627554576	15.3264	12.7877	8.2093	21.1927
3.82868578606966	9.85644345659556	18.1895627554576	4.8686	17.5054	20.7421	8.1304
3.82868578606966	9.85644345659556	18.1895627554576	9.7281	5.4172	24.1163	13.7083
3.82868578606966	9.85644345659556	18.1895627554576	10.526	3.779	24.6321	20.82
3.82868578606966	9.85644345659556	18.1895627554576	2.2625	16.1551	5.423	18.392
3.82868578606966	9.85644345659556	18.1895627554576	2.7247	6.6491	25.454	8.9474
3.82868578606966	9.85644345659556	18.1895627554576	0.421099999999996	5.2548	22.7354	12.1971
3.82868578606067	10.6914285758557	11.1607999999824	3.5607	15.7968	11.1608	5.1124
4.13723069881469	10.6914285758557	7.80746659168182	8.40090000000001	11.7989	4.4087	5.5639
4.13723069881469	10.5675522938221	7.80746659168182	4.24299999999999	12.8676	1.4876	6.736
4.13723069881468	6.40137571846516	7.80746659168182	2.5621	10.2967	1.629	12.6169
4.13723069881469	3.10468880087752	7.80746659168182	1.2522	5.4022	3.551	7.2247
4.13723069881469	3.10468880087752	7.80746659168182	1.729	2.5191	1.116	7.1357
4.13823069881468	3.10468880087752	7.80746659168182	10.31	1.5005	9.6337	14.7461
8.88596745233167	3.10468880087752	7.80746659168182	8.95990000000001	2.5066	9.8186	22.9145
8.8869674523159	3.10468880087751	7.80746659168182	11.169	1.5527	6.9406	37.2188
8.88696745230583	3.10468880087735	7.80846659169763	13.2084	1.5682	5.3875	22.8241
14.6184022289132	3.10468880087734	8.269499936456	14.8098	1.8409	8.2695	1.2782
14.6184022289127	3.36698172933568	10.3927948717788	14.7151	17.4542	12.2868	14.2143
14.6184022289128	3.36698172933568	10.3937948717779	11.3126	12.1774	8.305	11.447
14.6184022289127	15.7557999998558	10.393794871778	13.7484	0.7577	11.0651	20.4003
14.6184022289127	15.7568000005449	10.393794871778	14.5843	15.7568	10.6354	0.244
28.4224436533093	16.1482680324091	10.3937948717779	20.9805	20.9752	1.6334	15.7265
28.4224436533093	16.1492680324091	10.3937948717779	19.5822	17.4941	4.8723	10.5093
28.4224436533093	16.1502680324091	10.3937948717779	23.4201	21.9457	1.1934	16.8924
28.4224436533093	26.6153952877915	10.3937948717779	26.5855	26.5008	8.649	2.5361
28.4224436533093	26.6163952877915	10.3937948717779	27.7157	24.2487	8.5851	7.9151
29.9963879158162	26.6163952877915	10.3937948717779	33.6715	23.2449	9.8871	5.013
29.9963879158162	33.0794951747172	10.3937948717781	26.8183	32.6012	18.9499	9.1398
33.4511497235659	33.0794951747172	10.3937948717781	28.4031	32.2444	2.4033	13.356
33.4511497235657	34.0226368753832	10.3937948717781	33.7228	34.609	11.6821	1.4413
33.4511497235659	39.999	0	32.6566	40.0511	6.9534	38.6421
33.4511497235662	40	0	45.5527	26.8832	17.5652	29.6166
49.3039075651447	40	0	49.2766	27.3707	5.7576	19.0778
53.4860723946985	40	0	43.0635	31.4686	2.6925	35.4855
Route: 3 Length: 227.876505206172 Demand Met: 1606						
85.8413961257251	75.1410077906503	0	84.2824	83.9445	3.7257	9.6857
85.8415145365784	75.1418893797969	0	86.8222	80.0693	3.9589	26.0963
85.8415145365785	88.3952003502001	0	86.0867	81.533	3.6186	7.8826
85.8425145365749	88.3952003502001	0	85.8335	84.6274	4.9143	15.0275
85.8425145365779	88.3952003502001	4.37092404217654	87.7484	83.7546	3.1863	5.1562
85.8425145365779	92.033443020763	4.37092404217546	96.809	92.5136	0.2967	11.7087
85.842514536571	92.0344430207621	4.37092404217655	86.7862	83.711	0.7854	21.1375
85.842514536571	92.0344430207621	4.37092404217655	89.3359	93.6392	1.2449	11.0562
85.8483661982399	94.3078548952894	4.37092404217654	83.6163	95.496	9.4544	6.5288
85.8483661982399	94.3078548952895	4.4906004483819	92.1839	88.8237	5.0595	30.3052
90.2506594101407	94.3078548952894	4.4906004483819	89.931	94.5372	6.4495	17.4038
93.65843807445	94.3078548952893	4.4906004483819	95.4796	96.129	4.4906	2.5755
93.65843807445	94.3078548952894	13.9338203218397	92.8113	98.2407	8.6156	11.443
93.65843807445	94.3078548952894	13.9348203218397	99.7949	88.8243	9.6989	10.9809
91.4897345687839	94.3078548952894	13.9348203218397	94.4375	89.8165	9.7901	6.7853
91.4897345687838	94.3078548952894	13.9358203218397	98.1513	96.345	10.1326	8.7509
91.4897345687838	93.308058219523	13.9358203218397	94.8083	91.5304	12.0006	29.5468
91.4897345687838	93.308058219523	13.9358203218397	96.0605	94.495	5.5816	12.9494
91.4897345687838	93.3080582195229	13.9368203218397	99.292	98.0492	12.4987	20.4892
88.4883655752979	93.3080582195229	13.9368203218397	84.0572	98.2927	13.228	11.5023
88.4883655752979	93.308058219523	13.9378203218397	88.3602	93.5594	13.9637	0.2833

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
88.4883655752979	93.308058219523	19.9256240310282	84.3608	92.148	16.0712	27.0972
88.4883655752979	88.9936912073316	19.9256240310282	85.8291	89.3215	18.2752	27.9965
88.4873655752979	88.9936912073316	19.9256240310282	90.6972	96.9626	11.6096	12.1171
88.4873655752978	88.9936912073316	19.9266240310279	93.4254	97.8126	20.9017	10.7468
88.4873655752979	88.9936912073316	19.9276240310281	88.176	88.8141	22.7557	24.7619
88.4873655752979	88.9936912073316	19.9276240310281	89.0976	96.4455	27.3307	23.7594
88.4873655752979	88.9936912073316	19.9286240310282	94.509	92.4532	22.8398	10.0411
88.4873655752979	88.9936912073316	23.847121589696	85.8774	87.324	15.9329	11.0712
88.4873655752979	88.9936912073316	23.847121589696	88.3919	89.421	29.806	7.2563
87.845458608326	88.9936912073316	24.2657272052534	93.3103	99.0843	27.6346	24.3725
87.8454586083259	88.9936912073316	25.5475831356328	89.0638	74.5581	37.2181	18.603
87.8454586083259	88.9936912073316	25.5475831356328	92.5909	80.0433	37.2966	19.5797
87.845458608326	88.9936912073316	25.5485831356329	89.9071	81.4441	38.6007	15.7904
87.845458608326	88.9936912073316	25.5495831356329	91.4519	94.5103	31.5983	21.3367
87.845458608326	88.9936912073316	26.6014171606568	84.8025	72.2361	43.599	24.0623
87.845458608326	88.9936912073316	26.6014171606568	84.7887	79.7551	43.3502	24.4915
87.845458608326	88.9936912073316	29.4234183872819	82.1226	91.9552	25.5944	29.2899
87.845458608326	88.9936912073316	29.4244183872819	88.0059	90.774	26.7084	31.4291
87.8454586083259	88.9936912073316	29.4254183872819	88.2817	96.351	29.2562	29.8948
87.8454586083259	88.9936912073316	29.4264183872819	82.7904	89.3622	35.5781	32.2308
87.8454586083259	88.9936912073316	29.4264183872819	85.1326	93.3031	36.2953	30.9423
87.8454586083259	88.9936912073316	29.4274183872818	80.026	88.4312	32.9439	31.2606
87.8454586083259	88.3579344216863	34.1197533817023	94.6937	81.204	45.1011	23.1601
87.8454586083259	88.3579344216863	34.1207533817023	99.1691	80.9928	48.8748	24.2662
87.845458608326	88.3579344216863	34.1217533817023	87.6085	88.0524	34.9791	0.9405
87.845458608326	88.3579344216862	34.1227533817023	85.5459	86.1581	36.8243	23.0206
86.8575608158729	83.4368991483771	35.4306391128443	85.9222	83.4369	36.366	1.3228
86.8575608158729	83.4368991483771	33.3562141489831	78.4301	80.0876	35.2889	24.8331
86.8575608158729	83.4368991483771	33.3562141489831	79.415	85.235	33.6242	23.8334
87.0280436533878	83.436899148377	33.3562141489831	86.675	81.8002	49.155	31.4898
87.0280436533878	83.436899148377	33.3562141489831	85.7193	87.9646	47.7548	30.5682
87.0290436533878	83.436899148377	33.3562141489831	82.5335	87.3296	48.5022	23.2737
87.0290436533878	83.4358991483771	33.3562141489831	89.5983	91.5249	48.4013	17.2739
87.0290436533878	83.4348991483771	33.3562141489831	95.9324	92.1458	48.2362	31.1565
87.0290436533879	83.4348991483771	32.5507184256017	99.0472	85.7396	32.4859	19.7408
87.0290436533879	82.263697959373	32.5507184256017	99.7041	87.1751	32.3993	20.8453
87.0290436533879	82.2636979593729	32.5497184256017	88.5666	89.9178	38.0498	22.668
87.0290436533879	82.263697959373	32.5487184256017	87.2864	89.2526	43.6381	24.3141
87.0290436533879	82.263697959373	32.5477184256017	79.7296	78.3022	25.4406	15.676
87.0290436533879	82.263697959373	32.5467184256017	82.4808	71.6064	25.4475	18.1512
87.0290436533878	82.2636979593729	29.3201117878991	96.671	90.7145	10.1968	32.754
87.0290436533878	82.2636979593729	29.3201117878991	92.093	98.3621	2.0725	32.0505
87.0292488904575	82.2629031964428	29.3201117878991	84.1657	89.6201	18.7606	13.6552
87.0292488904575	82.2629031964427	29.3191117878991	80.4141	88.4668	31.9981	26.3631
87.0292488904575	82.2629031964428	29.3181117878991	84.0326	80.947	31.8699	25.7062
87.0292488904575	82.2629031964428	29.3171117878991	81.0772	83.8409	29.4446	24.7807
87.0292488904575	82.2629031964428	29.3161117878991	85.5265	86.4226	22.7788	27.3567
87.0292488904575	82.2629031964428	10.8440480760628	90.3741	83.7882	8.516	6.0655
87.0292488904575	82.2629031964428	10.8430480760628	89.4354	80.1567	8.4369	4.0019
87.0282488904575	82.2629031964428	10.8430480760628	87.1273	84.0324	13.0404	22.6844
87.0272488904575	82.2629031964428	10.8430480760628	96.6476	96.9796	12.6166	23.7398
87.0272488904575	82.2629031964428	11.2126805219715	83.3685	88.3604	12.0152	8.2767
79.7671649604815	82.2629031964427	11.2126805219715	74.9451	88.4605	13.7746	8.2599
79.3746792054912	82.2629031964428	11.2126805219715	79.3747	83.7664	12.9303	2.2827
79.3736792054912	82.2629031964428	11.2126805219715	71.008	83.9726	12.5028	10.613
79.3736792054912	77.8670560778757	11.2126805219715	77.1908	76.3248	19.088	8.3165
79.3736792054912	76.2665731700272	6.19017695587026	79.9937	73.4457	8.9779	4.0141
79.3736792054912	76.2665731700272	0	93.093	71.3467	11.2543	21.4346
79.3726792054912	76.2665731700272	0	76.4126	75.548	2.1999	18.6216
73.7373692527213	73.1274879689155	0	73.6361	68.0431	3.2936	6.0588
Route: 4 Length: 362.262281757569 Demand Met: 1575						
74.4492423514855	54.4112284673804	43.4061817007586	97.6128	23.6668	47.1593	38.6763
74.4492423514854	61.984417035342	43.4061817007585	89.697	88.1654	44.368	35.3374
74.4492423514855	61.985417035342	43.4061817007585	77.6803	63.0066	43.1391	3.3991
74.45024235145	61.985417035342	43.4061817007585	76.8895	78.6378	42.7161	24.9962
74.45024235145	61.985417035342	43.4061817007585	81.6179	74.1421	49.6219	15.9576
74.45024235145	61.985417035342	43.4061817007585	79.6279	80.9538	46.8845	23.4026
74.450242351467	70.2392451604454	44.7498726314085	78.8402	71.1237	45.9036	4.6244
64.8746649133378	70.2392451604454	44.7498726314085	94.4683	90.0421	37.16	36.408
64.8736649133797	70.2392451604454	44.7498726314085	83.1514	91.319	24.221	39.4372
64.8736649133797	70.2392451604454	44.7498726314085	80.5965	92.0964	38.2365	36.4049
63.7544000001094	70.2392451604454	44.7498726314085	63.7544	71.2264	45.6612	1.3435
31.8342819473255	70.2392451604454	44.7498726314085	44.9743	74.4953	49.2176	27.6089
28.7719041020122	70.2392451604454	44.7498726314085	25.0595	61.5431	43.0509	18.8768
28.7719041020122	68.4857702431623	42.7401922642755	28.8128	30.4765	38.3516	39.1387
28.7709041020122	68.4857702431623	42.7401922642756	22.2385	33.2025	32.4261	37.3358
28.7709041020122	85.3690118031905	42.7401922642756	17.0519	88.8308	49.5668	13.9972
28.7709041020122	91.328893328624	42.7401922642756	26.3736	85.6358	40.2837	33.6814
28.7709041020122	91.3298933286241	42.7401922642756	29.7505	96.621	38.9958	6.5556
19.2978772979849	85.3690118031846	46.7307848598647	19.3715	86.9483	48.882	2.6697

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
18.7875999998665	83.3981626531536	47.0379607041547	18.7876	82.3448	48.1119	1.5043
17.6076865934774	83.3981626531537	40.7679074451825	16.072	81.5553	45.6344	6.7432
17.6076865934774	83.3981626531538	40.7669074451829	15.9151	82.9337	42.2853	11.014
17.6076865934774	83.3981626531538	40.7659074451826	14.2245	83.0966	40.7659	3.3966
17.6076865934774	87.6990652556408	40.506137713372	19.7188	83.0222	34.7895	29.297
17.60768659346	87.7000652556397	40.506137713372	19.5543	89.8549	35.5989	33.619
17.6076865935211	87.7010652556445	40.506137713372	17.7167	97.5636	38.0165	31.3797
17.6076865935211	87.7020652556444	40.5061377133721	1.0919	90.7016	20.5918	28.434
17.6076865935211	87.7030652556451	40.5061377133721	19.4915	88.9148	34.46	6.4477
17.6066865935211	87.7030652556451	40.5061377133721	11.8372	87.4011	35.0448	35.7247
17.6056865935211	87.703065255645	40.5061377133721	6.7503	86.812	36.4409	32.5272
17.6046865935211	87.7030652556451	40.5061377133721	13.8296	81.5783	47.5142	24.0124
17.6046865935211	87.7030652556451	40.5061377133721	0.775099999999995	88.6342	47.6629	34.6112
16.7266733607605	87.7030652556451	40.5061377133721	1.19329999999999	81.8445	35.7922	20.336
16.7266733607605	87.7030652556451	40.5061377133721	0.0289999999999964	82.9455	44.9095	21.0457
16.7256733607606	87.7030652556452	40.5061377133721	5.09099999999999	83.7862	45.0917	25.4049
16.7256733607606	87.7030652556452	40.5061377133721	1.983	86.3665	46.2259	17.6822
16.7246733607606	87.7030652556453	40.5061377133721	7.6764	88.6806	43.7076	9.6476
6.87415378179824	87.7030652556452	40.5061377133721	9.52200000000001	88.7288	32.8263	27.8783
6.87415378179824	87.7030652556452	40.5061377133721	7.47969999999999	86.7529	34.8532	25.8983
6.8731537818195	87.7030652556452	40.5061377133721	1.82250000000001	87.776	42.1327	36.7171
2.85179576432394	87.7030652556452	40.5061377133721	1.5647	88.8122	41.3941	1.9171
2.85179576432395	84.5533324584527	40.5061377133721	2.0599	86.005	27.783	20.2991
7.46245223991477	84.5533324584527	28.4706536435627	17.8311	84.5721	16.3475	18.6031
7.46245223991477	84.5533324584527	28.4706536435627	13.6279	83.3943	14.3913	17.0874
7.46245223991477	84.5533324584527	28.4706536435627	8.87560000000001	85.3213	18.2881	16.0341
7.46245223991477	84.5533324584527	28.4706536435627	2.696	85.7661	44.4643	16.7328
7.46245223991477	84.5533324584527	28.4696536435627	5.1015	81.8103	26.7596	31.1473
7.46245223991477	84.5533324584527	28.4696536435627	6.0677	84.3942	30.725	37.1993
7.46245223991477	84.5533324584527	28.4686536432048	16.4864	81.6235	25.3496	21.8233
7.46245223991477	84.5533324584527	28.4686536432048	16.887	83.4344	26.4901	34.5743
9.1636770152963	84.5533324584527	25.7993991323217	16.2773	81.3093	25.7994	7.8184
6.0668946434034	84.5533324584527	22.6092857009966	0.247299999999996	82.0871	22.6092	6.3206
6.0668946434034	84.5533324584527	18.6619257355366	2.5389	82.9669	19.2333	4.4555
7.0436107051414	84.5533324584527	18.6619257355366	9.2565	85.6186	20.1316	2.8621
7.04461070514141	84.5533324584527	18.6619257355366	17.8246	84.0918	18.5648	15.5287
7.04461070514141	84.5533324584527	18.6619257355366	14.2132	82.4414	28.7174	14.4019
7.04461070514141	84.5533324584527	18.6609257355366	13.2856	89.4879	17.2258	21.8166
7.04561070514141	84.5533324584527	18.6609257355366	7.74030000000001	89.8119	11.7653	8.6997
7.04561070514141	84.5533324584527	18.6599257355366	3.3964	83.4982	10.9781	22.6969
7.04561070514141	84.5533324584527	13.4680724136471	15.4215	81.5375	18.2132	38.9838
7.04561070514141	84.5533324584527	13.4670724136471	13.617	84.1913	11.8486	7.3733
7.04561070514141	84.5533324584527	13.4670724136471	9.9966	85.8576	17.8499	5.4423
8.32087547731324	84.5533324584527	13.4670724136471	17.1642	87.7833	12.5892	37.7116
8.32087547731324	84.5533324584527	13.4670724136471	5.1953	87.1361	22.5444	37.283
8.32087547731324	84.5533324584527	13.4660724136471	2.625	81.2761	5.8521	30.3022
8.32087547731324	84.5533324584527	13.4650724136471	12.6448	83.0865	6.5696	35.3802
8.32087547731324	84.5533324584527	13.4640724136471	17.0206	82.7787	9.6966	29.1615
8.32087547731324	84.5533324584527	13.4640724136471	10.6041	85.0219	16.3433	25.6845
8.32087547731324	84.5533324584527	5.43342629459731	4.4842	86.5445	8.1765	5.1195
10.9053803864613	84.5533324584527	5.43342629459731	10.8331	85.8288	6.1261	11.4013
10.9063803864619	84.5533324584527	5.43342629459731	11.6247	87.7046	5.4339	3.2321
10.9063803864619	84.5533324584527	1.28313458540159	5.387	87.7604	0.9494	6.3922
39.3353999999684	84.5533324584526	1.28313458540158	39.3354	89.658	8.0536	8.4792
Route: 5 Length: 282.727457022708 Demand Met: 1610						
94.1159	52.0430999574029	4.3408	99.2739	52.0431	4.3408	5.158
94.1158999999986	79.847450080356	4.340799999998	94.7976	88.4491	0.0367	36.0251
94.1158999999922	79.8484500803436	4.34080000002414	90.7381	99.8897	10.9244	39.8736
94.1148999999914	79.8484500803432	4.34080000002954	94.2258	98.7848	13.3192	33.585
94.1138999999914	79.8484500803432	4.34080000002906	93.255	98.1789	24.6576	39.9406
92.5679458673962	85.7216179237412	11.7562	92.0809	99.3222	11.7562	13.6093
92.5679458673962	85.7216179237412	14.5054205254918	97.9735	93.9042	14.8216	16.4454
92.5679458673963	85.7216179237412	14.5064205254918	85.3838	89.3565	26.2565	14.2439
92.5679458673962	85.7226179236851	14.5064205254918	89.4099	75.3847	11.7139	13.3372
92.5679458673962	85.7236179236556	14.5064205254918	93.0738	84.8753	19.4127	27.0049
92.5679458673962	85.7246179236812	14.5064205254918	87.314	87.2617	7.5328	16.5203
92.5679458673962	85.7256179236811	14.5064205254918	81.7913	86.2239	2.8298	19.3521
92.5679458673962	85.7266179236811	14.5064205254918	82.7718	81.5009	6.6283	13.2622
92.5679458673962	86.4842257935604	14.5064205254918	80.3025	81.1115	9.6723	15.7523
92.5679458673962	86.4842257935604	14.5074205254918	83.3686	96.8014	16.23	13.9298
92.5679458673962	86.8466676977724	15.2241623658666	84.3334	97.0716	17.1577	13.2701
92.5679458673962	86.8466676977724	15.2251623658799	83.9295	97.9734	19.8967	22.5699
92.5679458673962	86.8466676977724	15.2261623658799	81.2522	99.2612	19.5952	19.7395
92.5679458673962	86.8466676977724	15.2271623658799	80.252	96.9762	30.8948	27.7656
92.5679458673962	86.8466676977745	15.2281623658799	84.785	93.3953	20.8615	25.851
92.5679458673962	86.8466676977745	15.2291623658799	96.5452	93.172	22.7505	16.1374
92.5679458673962	86.8466676977744	15.3451682623131	95.3031	91.4204	17.8619	25.4609
92.5679458673962	86.8466676977744	22.6377000165344	97.4362	85.8361	18.6294	6.7092
92.5679458673962	86.8466676977744	22.6387000165344	86.994	98.105	22.6387	12.5626
92.5679458673962	86.8466676977744	23.7533174576948	87.8356	87.4643	21.4217	27.6715

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
92.5679458673962	86.8466676977744	23.7543174576948	96.6676	92.6743	28.4611	10.3882
92.5679458673962	86.8466676977744	33.9641503718419	96.1791	97.5552	24.4974	14.7422
92.5679458673961	86.8466676977744	36.6992765209735	84.7929	84.8117	21.5385	17.1593
92.5679458673962	86.7239000000008	36.6992765209735	97.0965	81.0307	25.4066	20.0164
92.5689458673961	86.7239000000007	36.6992765209735	88.2673	94.5543	28.7709	14.161
92.5699458673954	86.7239000000008	36.6992765209735	88.9513	72.6403	24.2874	19.8606
92.5699458673955	86.7229000000007	36.6992765209735	96.8293	85.3988	23.0282	25.2212
92.5699458673954	86.7219	36.6992765209735	90.256	83.0105	30.9795	8.936
96.9656625564862	86.7219	36.6992765209759	98.6006	82.3388	36.0882	4.9458
96.9656625564861	86.7219	43.0362899654373	97.0785	86.7219	43.0832	0.1222
96.9656625564862	84.5409783997616	43.0362899654372	92.7639	86.5161	40.1878	5.447
89.3024000000001	84.5409783997616	43.0362899654372	89	83.7031	44.7227	2.6411
89.3023999999999	80.8534714289163	43.0362899654372	89.7033	80.1502	39.6028	26.8819
89.3014000000032	80.8534714289159	43.0362899654373	80.2922	75.8098	32.7263	14.5911
89.3014000000016	79.3293221410805	43.0362899654373	87.485	79.3312	28.225	14.9303
89.3014000000017	77.9630393605857	43.0362899654372	87.3294	86.7915	39.9582	10.1629
89.3003999999999	77.9630393605787	43.0362899654381	88.3323	91.5035	43.0727	13.825
89.2994	77.9630393605781	43.0362899654394	89.2994	73.1482	41.8171	4.9668
89.2984	77.9630393605787	43.0362899654389	82.7574	74.2926	38.276	14.8137
89.2973999999999	77.9630393605856	43.0362899654372	87.0156	79.966	38.2934	12.6359
89.2974	82.0711000120984	43.0362899654371	89.6546	85.279	42.7332	10.469
86.4684290822481	82.0711000120984	43.036289965437	87.8518	83.2273	45.632	10.2812
86.4684290822464	82.0721000121115	43.0362899654371	78.0272	82.0721	40.7931	8.7342
86.4684290822481	82.0731000121126	43.0362899654371	87.8874	83.7559	45.2883	28.0801
86.4684290822481	84.5502700397518	43.0362899654371	79.4655	74.4467	41.2824	12.4177
86.4684290822482	92.8754619392504	46.1206	89.983	98.6224	48.7896	7.2459
83.1802999999999	92.8754619392504	46.1206	84.4799	87.8799	46.3607	17.7516
83.1803	86.2205	46.1206	83.1803	86.2205	46.5816	0.461
83.1802999999999	82.8835262690236	46.1206	83.0689	84.7397	49.7222	17.7189
82.7144651636369	82.8835262690236	46.1206	76.1087	74.9228	48.9063	26.6713
82.7144651636369	82.8825262690236	46.1206	74.3211	82.1244	47.3456	8.5161
79.1157237133328	82.8825262690236	46.1206	82.0258	98.9707	44.6731	16.4132
79.1157237133328	82.6219251152435	46.1206	81.9035	87.9149	41.5399	16.8426
79.1147237133328	82.6219251152435	46.1206000000002	81.9044	86.793	39.6738	18.7468
79.1137237133328	82.6219251152435	46.1206000000002	80.1131	82.5047	41.0389	19.9521
79.1137237133328	82.4781848720288	46.1206000000002	82.0065	75.6791	41.5159	28.4662
79.1137237133328	82.4781848720288	46.1196000000002	78.4966	80.8407	46.208	27.0644
79.1137237133328	82.4781848720288	42.8623989395374	84.5701	92.5098	41.6265	11.4862
79.1137237133328	82.4781848720288	42.8613989395372	85.4655	89.4614	40.2893	13.9477
79.1137237133328	82.4771848720288	42.8613989395372	76.7822	82.9894	44.8431	3.1025
79.1137237133328	79.3464862838831	42.8613989395373	73.8575	87.669	40.179	25.5244
79.1127237133328	79.3464862838831	42.8613989395372	80.5183	71.0301	37.6084	20.9716
79.1127237133328	79.3454862838831	42.8613989395372	77.9819	77.7483	36.1545	19.944
79.1117237133328	79.3454862838831	42.8613989395372	91.162	99.965	45.0985	25.8943
68.6970921699695	79.3454862838831	42.8613989395372	71.0504	85.2637	43.1302	27.4246
68.6960921699695	79.3454862838831	42.8613989395372	59.4827	70.1321	42.8614	13.0297
68.6960921699694	79.3454862838831	41.9252496737573	75.5773	80.7384	32.0605	16.9072
69.3464111030523	81.1737999998301	41.9252496737573	80.7173	88.9602	30.7691	17.7309
69.3464111030523	81.17379999983	23.7512008314984	73.1002	79.4037	30.5501	12.7865
70.0776998104742	81.1737999998301	23.7512008314984	72.5273	88.3137	27.5858	14.2003
70.0786998104742	81.17379999983	23.7512008314984	70.0787	86.0551	23.7512	4.8813
71.8381999998313	81.17379999983	13.1092959277427	72.6803	81.9225	14.2859	4.2531
71.8381999998313	74.0914932570742	13.1092959277427	77.4087	74.0915	13.1093	5.5705
71.8381999998313	74.0914932570742	0	80.7551	80.6861	0.4798	19.901
71.8381999998313	56.0319532797378	0	73.5126	71.3248	10.3828	18.5601
Route: 6 Length: 145.858273873624 Demand Met: 1071						
70.0000000000001	45.4772801075428	0	84.5964	57.5663	6.5683	31.6899
62.0249230659408	45.5235984745402	0	44.7377	48.2657	7.7582	29.7234
51.4444666529252	45.5235984745402	11.3720723768221	25.8602	58.6207	10.547	28.7536
47.0350989447721	45.5235984745402	11.3720723768221	47.0351	69.5204	13.3405	24.0774
47.0350989447721	45.5225984745402	11.3720723768221	49.5234	55.0957	34.2852	33.4236
34.2852768927221	45.5225984745402	11.3720723768221	42.5333	36.3249	41.241	34.2929
34.2842768927219	45.5225984745402	11.3720723768221	23.9463	67.9458	29.6197	30.7026
27.4651807074148	44.0238177975601	11.3720723768221	41.7938	26.8087	24.3703	25.8964
25.9664000292263	41.04014892752	11.3720723768221	22.0871	33.226	43.1435	33.6947
25.9654000292263	41.04014892752	11.3720723768221	12.6858	19.6571	22.2672	29.725
25.9644000292263	41.04014892752	11.3720723768221	25.9644	23.203	35.3119	29.8543
25.2676836603415	41.04014892752	11.3720723768221	27.0169	46.6583	34.9486	30.8141
25.2666836603415	41.04014892752	11.3720723768221	29.0396	36.1372	21.3542	26.8002
25.2656836603448	41.0401489275545	11.3720723768221	23.8226	36.8408	17.9115	22.7865
25.2656836603448	41.0401489275545	10.7682967866017	22.5313	48.1754	17.677	10.3014
25.2656836603448	41.0401489275545	10.7672967866017	20.8616	31.8567	15.5881	16.439
25.2656836603448	41.0401489275545	6.40297618795177	20.1897	48.2132	1.8547	9.8947
25.2656836603448	41.0391489275545	6.40297618795177	25.2216	48.8368	12.0716	29.4028
25.2656836603448	41.0381489275545	6.40297618795177	37.4163	24.6203	17.7469	31.2894
25.2656836603448	41.0371489275545	6.40297618795176	35.1494	28.8106	26.783	32.8637
25.2656836603448	36.3136001435111	6.40297618795177	37.7223	44.0563	30.8827	29.1657
25.2656836603795	36.3126001435111	6.40297618795177	36.302	43.7274	11.7602	22.8064
25.2656836603711	36.3116001435111	6.40297618795177	44.3864	36.3116	23.5359	25.6737
25.2656836603733	36.3106001454061	6.40297618795178	13.8628	4.3052	10.5937	36.3913

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
23.16008851362	34.696066093615	6.40297618795177	49.5874	32.9921	18.1971	32.9977
23.1600885136417	34.6950660936149	6.40297618795178	9.20950000000001	19.5087	23.9042	29.1422
23.1600885136417	34.694066093615	6.40297618795177	24.4655	29.9184	30.3851	29.8304
23.1600885136417	34.6930660936149	6.40297618795177	27.0476	34.4285	7.3345	22.5144
23.1580885136418	32.2061667817614	6.40297618795177	5.3173	19.9696	21.9865	36.3373
23.1580885136419	32.2051667817606	6.40297618795177	9.00749999999999	17.4052	0.9316	24.0927
23.1570885136417	32.2051667817606	6.40297618795177	21.333	28.4534	22.585	38.4741
21.7653671328837	32.2051667817607	6.40297618795177	20.4824	37.2243	17.8497	26.8839
21.7643671328837	32.2051667817606	6.40297618795177	25.1657	24.0751	15.8892	31.1219
21.7633671328837	32.2051667817606	6.40297618795177	11.8636	12.6991	19.7066	36.7112
21.7623671328837	32.2051667817606	6.40297618795177	6.693	16.2603	19.0942	35.4947
21.7623671328837	32.2051667817606	6.40197618795177	15.9493	16.7531	4.9236	36.5644
21.7613671328837	32.2051667817606	4.24670045131958	20.5677	31.0115	4.2467	1.6881
21.7623671328837	32.2051667817606	4.24670045131958	14.7479	11.7757	0.3405	30.4615
23.3714128378682	32.2051667817606	4.03294638096594	8.65000000000001	19.7295	4.359	27.9816
23.3724128378682	32.2051667817607	4.03294638096594	16.2452	9.322	13.5564	31.0488
23.3724128378682	32.2061667817606	4.03294638096594	30.1704	30.5441	13.3093	13.1238
23.3724128378682	34.9435103958538	4.03294638096594	30.555	31.3009	2.2328	18.8032
23.65246824121	34.9435103958538	4.03294638096594	29.5705	36.67	2.9094	21.5656
38.9072362312868	34.9435103958537	4.03294638096595	48.2875	25.5427	23.29	34.7388
38.9082362312868	34.9435103958536	4.03294638096595	41.9344	32.8635	38.9519	35.1115
38.9082362312868	34.9445103958536	4.03294638096595	37.9243	23.9119	1.2026	11.4323
38.9082362312868	34.9445103958536	4.03194638096595	21.8127	22.4456	3.4445	26.3083
38.9082362312868	34.9445103958536	3.34544755270758	22.5985	27.2784	2.308	18.0514
38.9082362312868	34.9445103958536	3.34444755269381	29.0027	23.8765	31.3376	31.6897
38.9082362312868	34.9445103958536	3.34344755269383	28.392	21.3903	1.2616	19.1959
38.9092362312873	34.9445103958536	3.34344755269383	41.315	20.08	19.8292	34.9881
38.9092362312873	34.9445103958536	3.34244755269383	47.7847	28.4345	6.8217	34.5556
38.9092362312873	34.9445103958536	0	30.4469	21.4825	3.8833	31.6307
38.9092362312873	39.999	0	47.2998	37.9687	10.4015	27.2808
38.9102362312872	39.999	0	38.8284	23.4703	6.171	29.4494
70	39.999	0	64.954	37.309	2.2557	38.0588
Route: 7 Length: 365.085402724064 Demand Met: 1514						
54.66860009083	32.2923000000251	0	40.4113	32.0356	8.7762	16.7439
47.2259000070211	32.2923000000205	15.6818720938057	48.0614	30.3792	22.0976	10.3406
47.2249000070211	32.2923000000205	15.6818720938057	47.2249	31.4694	15.6819	0.8229
36.8411385236861	32.2923000000205	15.6818720938057	35.5448	24.2684	24.4525	19.4434
36.8411385236861	32.2923000000205	16.3809181903912	36.1356	35.5262	17.2008	3.41
36.8411385236861	32.2933000000205	16.3809181903912	47.3754	37.9401	16.076	18.8601
36.8411385236861	42.0195670661828	21.6026285523374	41.4412	38.9568	21.684	5.527
36.8401385236861	42.0195670661828	21.6026285523374	45.8348	38.3992	25.1619	22.4696
36.8391385236861	42.0195670661828	21.6026285523374	36.9556	37.1182	29.5204	17.3813
36.8381385236861	42.0195670661828	21.6026285523374	32.6554	40.5505	15.9859	13.7264
36.8371385236861	42.0195670661828	21.6026285523375	30.9136	43.9894	21.9238	22.4068
32.6654750465791	46.6578999999343	21.6026285523375	54.1532	48.4548	25.954	21.9974
32.031898907048	46.6578999999343	21.6233954501332	32.0319	48.7602	21.6234	2.1023
32.031898907048	46.6578999999343	22.6003080105509	31.0932	49.2942	23.7876	14.8063
26.4261780546472	43.1111078481237	22.6003080104756	27.2789	43.4795	19.1307	3.5918
26.4261780546472	43.1111078481237	23.9157116169194	23.1185	40.5549	22.8959	4.3029
26.4261780546472	43.1111078481237	23.9167116169194	32.7117	42.3778	27.3609	10.9453
26.4261780546472	43.1111078481237	23.9177116169194	32.0569	46.2162	23.8838	8.3019
26.4261780546472	43.1111078481237	23.9187116169194	22.4944	48.7727	6.2361	18.9786
26.4261780546472	43.1111078481237	33.778762071437	28.4876	46.0461	28.1502	21.3519
26.4261780546472	43.1111078481236	33.779762071431	24.5323	49.8988	32.6923	23.3971
26.0690112827808	43.1111078481237	33.779762071431	23.5397	47.0618	33.8948	4.6924
26.0690112827808	34.0905283343628	38.0602827883911	23.8984	35.8981	31.4349	7.2024
26.0690112827808	34.0905283343793	42.0980768265376	24.2607	34.0424	42.9391	1.9949
26.5234133270331	34.0905283343793	42.0980768265376	22.8416	32.9746	42.6888	3.8923
26.5244133270331	34.0905283343794	42.0980768265376	37.6461	42.0792	39.3984	22.0605
26.5254133270331	34.0905283343794	42.0980768265376	33.3877	38.8388	47.9844	13.1359
33.5696630911788	34.0905283343793	42.0980768265376	44.7486	39.7162	41.5468	12.5268
34.2502882166904	34.0905283343794	42.0980768265377	45.8095	43.1051	48.3862	19.6777
34.251288216691	34.0905283343794	42.0980768265375	47.084	47.7144	42.2332	24.8395
41.8592804599964	34.0905283343793	42.0980768265376	44.5785	34.1629	40.8334	2.9998
37.8149019784427	25.8689998855739	42.7422995969724	37.8149	25.869	45.9364	3.1941
37.8149019784427	25.8121042738174	42.7422995969724	33.916	28.6484	33.3227	11.305
37.8149019784427	25.8121042738174	35.0518000000407	32.1965	21.571	25.1134	23.9954
35.7720124011589	25.8121042738174	35.0518000000407	27.0718	22.4926	21.0532	16.8129
30.3240958489404	25.8121042737615	35.0518000000407	30.3241	25.8121	22.3846	12.6672
29.2459478335169	24.8615731087863	35.0518000000407	20.1974	25.6106	23.6453	21.4356
29.2459478335169	24.8605731087863	35.0518000000407	31.0534	27.3935	41.3669	17.9341
29.2459478335169	24.8595731087863	35.0518000000407	4.753	19.8404	42.7266	29.0972
29.2459478335169	24.8585731087863	35.0518000000407	20.821	23.0825	24.0822	38.9893
26.4089330944086	10.7750971848084	35.0518000000407	12.3192	17.7013	37.8038	29.1964
26.4089330944086	10.7740971848026	35.0518000000407	13.2666	12.9678	48.999	29.5528
26.4089330944086	10.7730971848026	35.0518000000407	12.5256	4.7007	49.4275	23.5883
26.4089330944086	10.7720971848026	35.0518000000407	16.1355	6.6685	45.2938	36.4875
26.4089330944086	10.7710971848026	35.0518000000407	18.0288	10.2093	41.4498	31.7011
26.4089330944086	10.7700971848026	35.0518000000407	15.3812	8.8682	40.3179	15.4856
26.4089330944086	10.7690971848026	35.0518000000407	12.9432	8.6486	42.1679	15.3773

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
26.4089330944086	10.7690971848026	35.0508000000407	5.49809999999999	6.1028	41.7036	36.5373
26.4089330944085	10.7690971848026	35.0498000000407	4.1301	7.1548	40.2018	37.1524
26.4089330944086	10.7690971848026	30.9329294399404	2.67230000000001	10.4123	33.2768	24.6134
26.4089330944086	10.7690971848018	30.9319294399404	28.6149	8.2266	35.9223	6.0195
26.4089330944086	10.7690971848015	30.9309294399403	4.0211	5.0495	22.5141	26.717
26.4089330944086	10.7690971848015	30.9299294399404	11.5168	3.287	14.9558	27.8697
26.4089330944085	10.7690971848007	28.4098528927957	5.20059999999999	6.8919	22.4547	22.5304
26.4089330944085	10.7690971847984	28.4088528927925	8.02670000000001	2.1019	15.008	25.3395
26.4089330944085	10.7690971847965	28.4078528927925	5.4781	9.3534	39.1694	25.1036
26.4089330944086	10.7690971847965	28.4068528927925	2.87569999999999	1.3778	31.3806	25.9254
26.4089330944086	10.7690971847965	28.4058528927925	18.2952	1.0836	13.7585	19.3439
26.4089330944086	10.7690971847965	28.4068528927926	8.6382	10.3371	11.0732	27.1817
26.4089330944085	10.7690971847965	41.8938842313293	18.6523	3.9117	30.6336	19.4015
26.4089330944085	10.7690971847965	41.8948842313293	18.047	6.7045	32.7171	18.9999
26.4089330944086	10.7690971847965	41.8958842313293	15.7685	10.3669	47.703	18.5804
26.4089330944085	10.7690971847965	41.8968842313292	22.1476	14.8515	41.0167	12.414
26.4089330944085	10.7690971847965	41.8978842313293	4.024	17.3232	48.8138	37.3677
26.4089330944085	10.7690971847965	41.8988842313293	12.295	19.9912	41.8654	28.6871
26.4089330944085	10.7690971847965	41.8998842312993	1.2192	5.9144	48.7598	28.8322
26.4089330944086	10.7690971847965	41.9008842312994	11.5459	0.8736	43.2005	30.4629
26.4089330944086	10.7690971847965	41.9018842312994	19.3111	17.5672	45.5963	32.0992
26.4089330944086	10.7690971847965	41.9028842312994	29.6006	20.2054	49.7928	12.7079
26.4099330944085	10.7690971847965	41.9028842312994	10.6256	1.7583	32.3574	24.4015
31.4057503363267	10.7690971847965	41.9028842312994	17.3372	11.1211	33.7282	21.5037
56.7367114969132	10.7690971847965	41.9028842312994	57.0413	9.9678	41.9779	25.5663
73.9225000518438	10.7690971847965	45.4407157598407	73.9225	9.6395	49.6476	4.3559
89.787699999966	21.6944365769786	10.8944728187157	84.9979	3.9891	22.3271	21.6131
89.7876999999937	24.6879858808976	10.8944728187157	92.9329	22.8145	25.5988	15.1532
89.7876999999945	24.6879858808977	5.30089995577517	94.4757	9.4701	4.1216	35.9228
89.7876999999946	24.6879858808977	5.29989995577528	92.0943	24.688	5.2999	2.3066
70.001	24.6879858808977	5.29571279984782	48.8851	33.6728	5.7706	37.4425

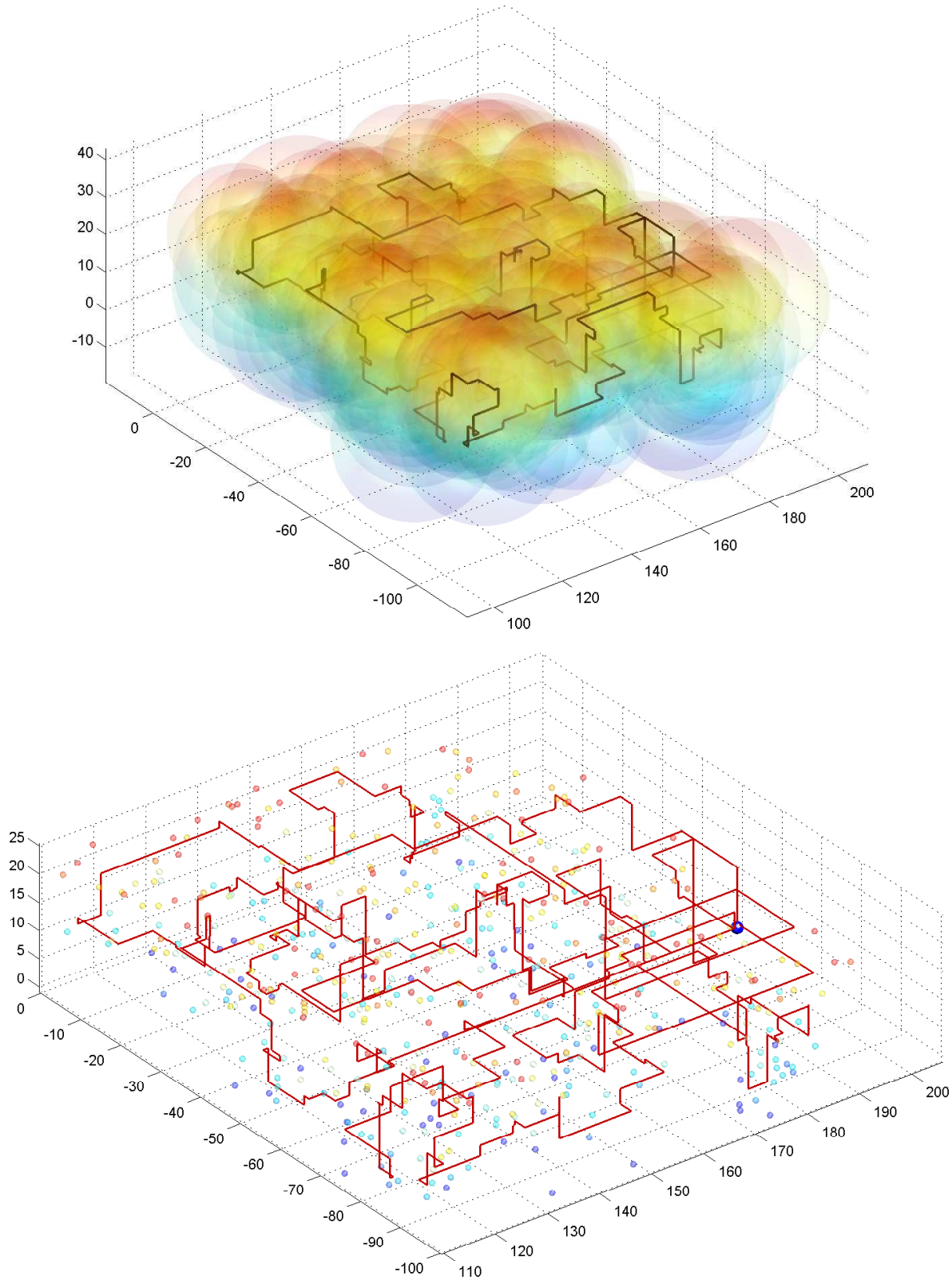


Figure O.200: *team*6_500, arbitrary radius, 3D, Manhattan, Length = 2004.4224885

Table O-203: Solution for *team*6_500, arbitrary radius, 3D, Manhattan

Total distance: 2004.42248850435 Total demand met: 25539 Depot: x 95 y 50 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 402.08750390295 Demand Met: 4979						
27.885575911661	51.7122764092639	0	13.919931	46.2670929	1.9535236	15.1163989
27.8845759116613	51.7122764092655	0	22.4746551	48.1041051	9.2672876	15.816336
24.4137605475102	51.7122764092673	4.20431680989204	18.6253841	45.1799856	19.5247549	17.6321283
24.4137605475102	51.7122764092673	4.20431680989204	25.3533813	42.3962835	8.9845466	16.55549
24.4137605475158	51.7132764092633	4.20431680989205	18.3784185	57.1026507	1.60641	10.6506348
24.4137605475103	53.0342284094334	4.20431680989204	24.284459	53.5118781	4.6981631	0.6991082
24.4127605475102	53.0342284094699	4.20431680989204	18.1200543	57.6122523	16.2352309	15.16683
19.6609496740318	53.0342284094698	7.40914872387882	20.3277951	46.570702	14.9318681	10.9961913
19.6609496740318	61.7658977297981	7.40914872387882	23.9069485	59.9121563	8.8002389	8.0586758
17.9198502575298	61.7658977297981	7.4091487238788	17.9198509	62.5969087	8.2401641	1.1752301
11.4590264707523	61.7658977297981	5.11615120858972	15.5276897	59.9411898	0.034091	6.7609848
8.6991492000121	58.9049738818988	5.1240813	8.7488745	58.9072962	5.1240813	0.0497795
5.87406724344275	57.6934421414037	3.52561164556441	2.2999767	55.3764405	4.437231	4.3558776
5.87406724344275	49.6056785502305	3.52561164556441	5.3360715	49.6056788	2.051856	1.5688834
5.87406724344277	48.6153662941067	3.52561164556441	2.4253981	44.8523436	2.2881323	11.7215543
5.87406724344284	48.614366294073	9.36103169294482	6.5220454	46.8393292	9.3610404	1.8896117
5.87406724344275	48.615366294073	9.36103169294482	2.27936	46.9159446	7.984275	4.2205505
4.9451088681175	52.8424744999991	9.36103169294481	9.4077401	50.7341371	22.0830838	15.2153276
4.9451088681175	52.8424744999845	10.2966515480686	4.9451086	53.7479899	10.2966488	0.9055154
4.9451088681175	50.7657480019298	11.5783934479943	1.389212	56.8496436	7.9005554	9.3148689
4.9451088681175	50.7657480019298	11.5783934479943	3.9504558	53.4738105	7.1081084	13.2039761
4.9441088681175	50.7657480019298	11.5783934479943	4.8021518	64.3437535	14.9149548	13.9826688
4.9441088681175	50.7657480019298	11.5783934479943	6.14577610000001	57.4553139	19.7085867	10.5969023
4.9441088681175	50.7657480019298	15.5394854710718	9.41537220000001	53.1681384	17.4096726	17.5248196
4.9441088681175	50.7647480019305	15.5394854710718	3.2029124	51.042154	21.6188315	12.1504864
4.94410886811745	47.973850943716	15.5394854710718	6.1363219	48.8674613	19.7646406	18.2256529
4.94310886811746	47.973850943716	15.5394854710719	4.944301	50.787374	18.9241415	6.1768296
4.93213508901228	47.973850943716	18.0164153275553	7.20936620000001	55.909681	20.1638147	8.5307974
4.93213508901195	46.6238901081131	18.0164153275553	3.9184302	46.6238898	20.1933306	2.4013658
4.93213508901228	46.6223886019698	18.0164153275554	2.1729785	46.8604253	18.9044886	11.1913394
4.93213508901228	46.6223886019698	18.0164153275554	2.57466789999999	43.4683609	15.573931	9.7340669
4.93213508901226	46.6213886019697	18.0164153275553	11.8541821	36.7134083	15.5034658	16.0938551
4.93213508901228	27.9866031762116	17.8361649290044	3.1062568	26.7803784	17.2167375	2.2743131
6.89250097926689	27.9866031762116	17.8361649290044	1.0903939	26.3844516	18.4073439	6.0462866
9.79710566689393	27.9866031762115	17.8361649290044	10.2638739	16.7343669	2.745395	18.8298176
9.79710566689391	27.9866031762116	17.8361649290044	10.881307	21.222109	11.4410052	15.2562401
9.79710566689387	27.9866031762116	17.971771770421	4.5207011	34.7763494	11.5308277	18.0479256
9.79710566689388	27.9866031762116	17.972771770421	6.7702019	28.6398243	6.655852	18.6590849
9.79710566689388	27.9866031762116	17.972771770421	14.6392528	26.7492086	4.8139494	14.0759419
9.79710566689208	27.9866031762117	19.421615864941	1.44105020000001	27.5670412	20.5926225	9.0702473
9.79710566689029	27.9866031762116	21.8401640351625	9.78612250000001	28.4044715	22.2738758	0.6023624
10.521895769534	27.9866031762116	18.0114171433987	17.2034005	24.1027648	4.0750954	19.2446407
10.521895769564	27.9239909246511	18.0114171433987	7.3492035	35.5012058	13.5793477	9.3339917
10.521895769564	27.9239909246306	15.8199717852923	4.4919615	30.1971308	23.0431363	9.6799472
10.521895769564	26.7283647596118	12.1948946716091	11.5512784	26.7283657	10.5788887	1.9160125
10.521895769564	23.6863746491215	12.1948946716091	9.1420339	20.9818632	21.7425538	15.7590069
10.521895769564	19.4929267662116	12.6271148449521	16.5956207	19.4929376	15.3111277	6.6403358
10.521895769564	17.6577552617331	12.6271148449521	13.6477983	21.6503409	20.9429038	10.1300266
10.521895769564	17.6567552617331	12.6271148449521	4.41833269999999	14.4467589	21.446539	11.646626
10.3812565501159	17.6567552617331	12.6271148449521	10.0346396	20.0550826	11.5771729	2.640927
10.3812565501166	13.8762398919191	12.6271148449521	15.820225	13.1438067	8.0447276	7.149623
3.59169894152851	13.8762398919191	12.6271148449521	2.4227502	13.8762399	13.6085461	1.5263186
3.59169894152851	13.8752398919191	12.6271148449521	8.8711802	13.2955279	17.3948906	15.7653907
3.59169894152851	13.8742398919191	12.6271148449521	12.2844966	12.8434228	15.9512599	16.9324181
3.59169894152851	13.8742398919191	12.6271148449521	16.5565287	18.5575743	19.3585299	18.4350632
3.59169894152851	13.8732398919191	12.6271148449521	15.3634563	8.946465	9.6121679	13.8278483
3.59169894152851	13.8722398919191	12.6271148449521	10.2956976	4.6843351	8.4372721	13.6376992
3.59169894153814	13.8712398919191	12.6271148449521	11.2137447	2.0282324	10.133715	19.8233424
3.59169894153814	13.8712398919191	12.6271148449521	7.7653349	6.167634	7.7136991	19.726704
3.79685344640016	3.63286596099072	11.4957302577054	3.796854	1.0310825	8.8837938	3.6866637
8.27032350871772	3.63286596099073	18.8145138939742	1.16963010000001	7.0254341	24.7260216	16.3262783
8.27132350872515	3.63286596099073	18.8145138939742	6.43216459999999	5.6038094	17.9548593	10.5758755
8.27132350871686	3.63286596099073	18.8155138939744	1.18933079999999	3.3623299	20.9336159	7.3969025
15.3944602203869	3.63286596099072	18.8155138939744	9.4518233	0.0818322	21.8708164	12.2091392
15.3954602203869	3.63286596099071	18.8155138939744	15.0419936	3.4632806	14.5409941	4.5348945
15.3964602203869	3.63286596099074	18.8155138939744	9.8269964	6.8843491	16.4620329	6.8651251
15.3974602203869	3.6328659609994	18.8155138939744	14.9649191	8.2569823	17.1672819	11.1052011
15.3984602203068	3.6328659609994	18.8155138939744	15.2275578	8.2482088	20.735321	10.0059049
15.3994602203069	3.6328659609994	18.8155138939744	14.7546051	14.610274	24.9337615	12.5838102
30.996510852953	3.63286596099073	18.8155138939744	19.95828	6.5164086	22.2907726	19.0088103
30.996510852953	3.63286596099072	19.9974709119285	34.237799	1.769458	21.0926833	3.8958604
30.996510852953	5.67951366520365	19.9974709119285	33.5301093	3.5426558	21.7233363	3.7368294
30.9965108529531	10.5412732434265	19.9974709119285	43.6411268	3.9331303	13.8180098	18.3321607
30.996510852953	10.5422732434265	19.9974709119285	41.2499501	12.693222	14.1376671	15.4469364

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
30.9965108529531	10.5432732434127	19.9974709119285	33.6893922	8.5224136	7.0176775	19.9918892
30.9965108529531	13.462696092907	19.9974709119286	30.8819888	13.4626957	23.5805357	3.5848945
31.5756601361837	22.9256298525897	19.9974709119285	28.9097869	26.1468646	19.859402	4.1835746
37.9821895086174	22.9256298525889	19.9974709119285	40.565033	30.2350611	14.624538	16.7047972
37.983189508624	22.9256298525878	19.9974709119286	35.0133629	33.6653342	20.0549291	15.142596
37.9841895086238	22.9256298525889	19.9974709119285	36.9545772	32.1019086	19.1323386	17.1509479
37.9851895086238	22.92562985259	19.9974709119285	39.7157151	22.5518047	13.0027284	19.2813071
37.9851895086238	22.92662985259	19.9974709119285	39.21475	31.0795566	21.1487172	8.3251067
37.9861895086238	22.92662985259	19.9974709119285	38.9701661	21.3778805	18.3750053	5.0370217
37.9871895086238	22.92662985259	19.9974709119285	36.6688954	15.3802855	11.2906359	16.9765386
46.3294228307398	22.92662985259	19.9974709119285	44.272376	24.1529526	16.7575015	13.4087757
46.3304228307398	22.92662985259	19.9974709119285	45.092729	13.545129	18.3076608	9.6124868
49.4662606536177	22.92662985259	19.9974709119285	52.4413086	6.2567644	20.6204114	17.7872557
49.4662606536178	24.3780353588492	19.9974709119285	52.3761166	17.3066951	24.8659343	10.3802999
49.4672606536145	24.3780353588492	19.9974709119285	49.4509792	19.23293	17.9552005	5.5356339
49.46726065361	28.3318416353902	19.9974709119285	44.7688336	34.8472485	18.3927145	19.5683767
49.4672606536059	28.3328416353977	19.9974709119285	57.0336699	24.3925592	19.6603049	10.3178167
56.6017823101957	28.3328416353977	19.9974709119285	55.5353048	38.1752447	17.6684542	10.1702798
56.6017823101957	28.3338416353977	19.9974709119285	51.358437	31.183912	20.2786449	5.9744983
65.5227065430578	28.3338416353977	19.9974709119285	62.1748486	23.5386262	9.8971034	19.2663276
65.5237065430579	28.3338416353977	19.9974709119285	70.2766166	21.7580017	19.3250026	9.1846004
65.5237065430577	31.5765570694377	19.9974709119285	62.1996928	26.9322785	20.2466983	11.912547
65.5247065430564	31.5765570694377	19.9974709119285	65.5247054	34.4819771	22.2818751	3.6959394
65.5247065430565	31.5765570694377	16.7109647000024	68.3855742	35.3493495	17.8360025	5.6398572
70.5957341083206	31.5765570694377	16.7109647000024	73.9542296	35.1681427	22.8323041	17.0431609
70.5957341083206	27.6007014080358	16.7109647000024	70.5957341	27.6007009	14.8208364	1.8901283
71.1038146806241	27.1904951764756	16.7109647000024	71.3343578	25.5495623	21.1336705	6.1682291
77.5184600475926	27.1904951764756	19.1636106137157	77.5184606	26.3492827	20.0048231	1.1896541
77.5184600475926	33.2098272798072	18.8263675112023	75.8801773	29.7113355	20.1473913	15.8480612
77.5194600476071	33.2098272798217	18.8263675112023	78.2442809	33.2914556	24.7068001	5.9254971
85.4210807226725	36.1756855476851	18.8263675112023	76.8303918	30.6898889	19.4810071	15.6982902
85.4210807226778	36.1756855476897	10.6888804708629	78.8734057	30.5074156	10.2492504	17.7741551
Route: 2 Length: 342.13418807617 Demand Met: 4938						
87.6955832154387	54.6404134261843	0	78.4065879	56.8222853	10.2773712	18.7893207
83.0551694154067	54.6404134261844	0	75.4422908	46.5496079	10.6773392	15.4085245
83.0551694154268	54.6404134261843	21.9666837	79.80288	56.0883078	18.4129389	5.2865846
79.1559290000446	54.6404134261843	21.9666837	79.155929	54.6404138	23.5670664	1.6003827
75.0747659852799	60.5657780000222	20.3285049651928	70.748982	60.565778	20.2126548	4.327335
75.0747659852799	61.1797744681051	20.3285049651928	74.3685871	61.179785	20.6768635	0.787426
75.0747659852799	61.1797744681051	17.4864515839884	69.1126526	61.5737532	13.3447692	13.1055803
75.0747659852799	61.4970611606949	17.4864515839884	73.7932186	65.1929118	21.2635249	5.5307734
75.9167051583366	71.0148630999203	17.4864515839884	77.5651358	71.0148631	15.8380209	2.331233
75.9167051583366	74.1746930000343	20.5616571	78.4106856	73.5257917	13.7197973	15.5467792
75.9157051583366	74.1746930000342	20.5616570999999	73.2290706	73.9762718	17.115174	18.8679238
67.3900644209083	74.1746930000342	20.5616570999999	67.3900644	74.174693	20.6721334	0.1104763
54.1515159336759	74.1746930000343	20.5616570999999	63.6802314	81.8267454	23.9676687	19.0132656
54.1515159336759	76.0182958896516	20.3313291144614	55.0653569	81.234009	22.9552522	5.9096312
54.1505159336759	76.0182958896516	20.3313291144614	51.7496653	79.9144917	22.4057667	15.0357032
51.183235551588	76.0182958896516	20.3313291144615	50.7478618	74.0551131	24.8207298	4.9191824
49.7783582999766	76.840760599999	19.1457188000011	49.7783583	78.4397036	19.1457188	1.598943
43.2274254727624	76.840760599999	12.4480854259992	46.8228713	71.844353	9.3127449	6.908088
43.2274254727625	76.8407605999868	12.4470854259992	43.6827488	74.1878852	3.8851851	13.0248043
43.2274254727625	72.4084399000244	12.4470854259992	50.8238583	67.1806384	20.6239323	19.5280512
43.2274254727625	72.4084399000244	12.4470854259992	47.2434466	72.8348775	10.3871125	7.3999265
35.1926471000041	72.4084399	12.4470854259992	35.4564008	78.9241199	21.2236154	15.1810796
35.1926471000041	72.4084399	12.3857241999967	35.1926471	70.9963316	12.3857242	1.4121083
34.7213983234703	72.4084399	12.2432714322166	30.51178	74.0433946	6.2558417	12.6878142
34.7203983232779	72.4084399000014	12.2432714322166	32.5068688	76.0167984	20.6942387	18.6744309
34.720398323278	80.7593229265829	12.2432714322166	38.0621359	81.3957333	12.1235509	6.4246672
34.720398323278	80.7593229265828	12.2422714322166	32.0336769	81.0046037	12.2328895	2.6979108
35.2498043852712	80.7593229265828	12.2422714322166	28.3264783	80.6515072	10.7169993	7.0901709
36.9941580369886	80.7593229265828	12.2422714322166	40.9923031	81.1407106	10.4646561	14.9699296
36.9941580369886	80.7593229265828	12.2422714322166	43.3709663	79.9295648	12.3122786	6.4309473
36.9941580369886	80.7593229265894	11.3270746087821	37.6570142	81.9317057	5.2409906	6.23332
36.9941580369887	80.7593229265895	10.6046125256456	34.482979	80.365325	2.7097027	8.2940253
36.9941580369887	80.7593229265895	10.6046125256456	39.6568849	80.0063838	5.1586736	8.4281529
40.9379614999737	80.7593229265895	10.6046125256456	42.9598051	72.0704928	1.9046969	12.5037762
40.9379614999737	87.2916931953796	10.6046125256456	45.3765455	76.9954785	11.855076	19.7202249
40.9379614999736	87.2916931953795	10.6056125256456	45.3945603	79.9114427	16.0984045	10.2225307
40.9379614999737	87.2916931953796	10.6066125256456	50.0446513	86.3510967	14.724494	11.408718
40.9379614999737	87.2916931953796	20.7399312256747	41.3355343	82.7796974	17.0555529	5.9611972
40.9379614999736	90.577008222692	20.7399312256747	40.8799687	90.9919823	19.2349904	1.5621823
40.9379614999737	90.5780082227151	23.1742709846518	40.9379615	91.8870672	23.915222	1.5042087
40.9379614999737	90.5770082226918	23.1742709846517	40.3910959	90.932739	23.935083	16.8734606
40.9379614999737	83.9038922072533	23.1742709846518	44.680977	94.9895485	20.4805113	12.4233676
58.8555417610785	83.9038922072535	23.1742709846518	45.8972803	89.1189208	23.3584238	14.0274616
58.8565417610904	83.9038922072526	23.1742709846518	56.1389342	85.561632	20.0765614	4.4417673
59.139708399947	83.9038922072527	23.1742709846518	59.1397084	81.6064397	24.1713239	2.5044765
59.1886992782735	83.9038922072526	23.1742709846518	60.774398	89.648206	21.5223541	12.5083419
61.4440580400688	86.5238554873241	19.5454053996214	61.4066356	99.633296	10.2157007	16.0904388

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
64.9057859475558	86.8023516736192	19.5454053996214	77.3466754	92.4222135	24.9773835	14.6923437
64.9057859475591	86.8023516736191	19.5444053996966	69.765468	86.0199863	16.8900143	10.8561261
64.9057859475594	86.802351673619	19.4705099002286	75.0360354	91.1497098	19.4705099	11.023678
64.9057859475591	86.802351673619	17.4286444879425	75.6464183	86.4517504	17.8073467	11.7494177
62.6655582418461	86.8023516736192	17.4140052999973	62.4719528	86.6470186	17.4140053	0.2482165
62.665558241847	86.8023516736192	17.3254943614973	64.3381393	93.722702	21.2607142	16.872102
62.6655582418469	94.4429157863871	17.3254943614973	64.9776601	99.8572829	20.7305349	14.8646935
62.6655582418469	94.4429157863871	17.3254943614973	62.6982725	97.3778678	18.7400798	9.4559017
62.665558241847	94.4429157863871	17.3244943614882	61.0630253	98.699805	24.8594975	11.0127062
62.665558241847	94.4429157863871	16.2537806551435	70.4834315	96.1070737	18.6164445	17.0458905
62.665558241847	94.4429157863871	16.2537806551435	64.4754864	95.6952093	9.6236824	6.985863
62.6655582418469	94.4429157863871	10.946958001072	56.5514993	98.5201232	15.0548231	8.4190197
62.6655582418469	94.4429157863872	10.9459580010656	64.0121883	92.7907393	13.624016	9.0477095
62.6655582418469	94.4439157863872	10.9459580010656	63.2522018	99.6147456	0.7669575	18.4401179
62.6655582418469	94.4439157863872	10.9459580010656	61.0866811	94.7582572	1.1597592	17.8354325
62.6655582418469	94.4449157863872	10.9459580010656	68.523768	98.3881808	6.8534875	8.1618794
62.6655582418469	94.8851497942151	4.65183938357745	63.7965883	99.8649883	6.5257645	5.4396338
62.6655582418469	94.8851497942151	4.65183938357745	62.3573907	96.159986	6.7572642	5.0891887
62.6655582418469	94.8851497942151	3.38625340824582	61.0701287	98.8683739	3.7920781	7.9054547
62.6655582418468	94.8861497941904	3.38625340824582	61.1689993	94.8861498	0.1686343	3.5486281
66.3719211997271	94.8861497941904	3.38625340824582	65.7364961	88.9695394	1.2659879	13.1578882
66.3719211997686	94.8861497941904	11.621384461644	71.5874534	94.5399994	3.1033191	16.9233519
66.3719211997686	94.8861497941904	11.621384461644	72.4289329	91.88372	3.0217722	10.9387068
66.371921199727	97.6337966000356	11.9390608455316	67.0620012	97.8077872	5.6584534	8.2792999
66.371921199727	97.6337966000356	11.9390608455316	67.3268965	96.007007	6.0328841	10.9024154
66.372921199727	97.6337966000356	11.9390608455316	66.3729212	97.9005203	11.9390694	0.2667237
66.372921199727	96.6200788222609	12.1517075765681	79.9522127	98.0359405	21.2412381	18.7966063
66.372921199727	96.6200788222609	12.1517075765681	66.5761879	96.7049476	8.0800553	4.0776062
68.0400205999681	95.2927242999921	14.2384430699347	62.5782193	94.8345715	12.3846974	11.8936571
68.0400205999681	95.2927242999921	14.2384430699347	63.9530194	87.4245185	17.4311618	11.3124411
68.0410205999679	95.2927242999921	14.2384430699348	68.0410206	93.0677269	14.2384361	2.2249974
71.9211222161862	95.2927242999921	14.2384430699347	76.9820609	94.8106777	15.132467	5.1618551
73.9689748658377	95.2927242999957	14.4220879661284	75.4923392	99.8090463	23.5616918	10.3077719
73.9689748658378	95.2927242999957	9.01562516560817	74.8496365	95.8479299	7.1137605	2.1681576
73.9689748658377	89.085682649548	9.01562516560818	77.1265753	88.6843079	7.3792466	19.9105474
73.9689748658378	82.8664549474188	9.01562516560818	67.7945884	81.6777909	13.5506647	7.7525837
73.9689748658378	80.7924281702086	9.33333509956296	72.4566884	79.8068651	12.2176684	3.4026054
73.9689748658377	80.7924281702086	9.33233509945894	78.2121151	82.5216358	9.4131561	10.3605913
73.9689748658376	80.7924281702088	7.97961100501251	71.4909917	88.8238404	7.979611	8.4049975
73.9689748658377	77.5923566334929	0.001000000000001	77.2293497	82.6694496	0.4080071	19.9727905
73.9689748658376	77.5923566334929	-1.54993E-10	75.0689318	72.4744486	0.4051745	14.9698309
73.9689748658376	77.5913566334154	0	75.4040099	79.0607348	6.3376777	12.6702712
75.7905847107258	77.59135663342	0	74.4567732	73.8913977	2.9219836	9.1604579
75.7905847107355	50.0009999999862	0	67.1669184	49.4371849	3.0262948	15.5982026
75.7905847107355	49.9999999999862	0	73.3690079	50.7128517	12.3210863	17.0196572
Route: 3 Length: 387.63613207485 Demand Met: 4819						
51.5711599207466	50	0	58.9987357	45.7674431	3.4982849	9.2369593
47.9335840709842	50	0.233867919583355	32.3710377	53.6854	0.0060466	15.9945905
42.6375045336641	50	1.97060146933521	43.0965371	49.287121	4.5164689	2.8888775
42.6375045336637	60.1558514014357	1.97060146933521	43.0002757	59.9692573	5.0791111	5.8261393
36.3824585972606	60.1558514014357	1.97060146933521	33.1471098	60.1558513	4.4414558	4.0709462
36.3824585972619	67.1119328715311	1.97060146933521	37.415218	67.1119326	2.4786359	1.1509522
36.3814585972614	67.1119328715311	1.97060146933521	29.1113171	69.2428114	2.3178943	9.8595935
25.3977479874777	67.1119328715311	1.97060146933521	21.4467307	69.0185063	0.8942161	4.517097
25.3977479874777	67.111932871531	1.95768480000378	25.1363027	82.596723	1.6788626	16.9876139
25.3977479874777	70.9164804678398	1.95768480000209	18.5593029	70.8497614	1.5511613	16.4543343
21.6218152640161	70.9164804678399	1.95768480000209	21.6218153	70.9164832	0.5487705	1.4089143
21.6217839494323	70.9164804678399	5.11745252483241	23.3330747	67.4297538	2.1722534	6.4618896
21.6217839494323	70.9164804678398	5.1184525248323	32.7632095	61.4478694	17.2734289	19.7763438
21.6217839494323	70.9174804678401	5.1184525248323	29.6716712	65.8677857	16.615982	16.7115843
21.6217839494323	71.9710282356734	5.1184525248323	20.3908302	60.0437447	17.3381089	17.1200275
21.6217839494323	71.9710282356731	11.4268956999925	23.2409835	69.6045703	6.9223743	11.4000663
21.6217839494323	71.9720282356733	11.4268956999925	21.5799527	71.4486566	7.5717836	10.0338577
21.6217839494323	71.9730282356734	11.4268956999925	25.8819635	79.9487476	10.2285525	9.3875474
21.6217839494323	71.9730282356733	11.4278956999925	23.1076735	77.6165558	13.9842376	6.3711973
20.1950128	71.9730282356733	11.4278956999925	20.1950128	67.681815	12.2807597	11.7719782
19.221999249681	71.9730282356733	11.4278956999924	26.1534967	60.2417469	15.9637624	15.8350837
15.7178354639523	72.1075890549866	11.4278956999992	17.0586402	58.0717087	14.4615884	18.9407433
15.7168354639518	72.1075890549866	11.4278956999992	15.7168362	72.1075902	13.3837018	1.9558061
13.1085796346911	72.1075890549864	11.4278956999992	14.8230271	72.6203252	11.2037362	2.4779351
13.1075796346904	72.1075890549867	11.4278956999992	12.9149435	73.6813943	7.0579	16.8344008
13.1065796346904	72.1075890549869	11.4278956999924	6.65024940000001	63.3598676	12.1766222	19.9843888
13.1055796346904	72.1075890549869	11.4278956999924	6.6484375	67.6725429	4.7357573	18.7895827
13.1055796346904	72.1075890549869	11.4268956999924	9.6122245	63.4753738	1.8891309	15.5818673
11.3944320214382	72.1075890549869	7.03346294214651	6.2196931	67.2192158	1.3051514	9.1371587
11.3944320214382	72.1075890549864	7.0324629421497	13.6466825	56.641223	0.3772494	16.9874359
11.3934320214382	72.1075890549863	7.0324629421497	9.81425009999999	65.891213	10.4751695	15.3270767
11.3924320214382	72.107589054986	7.0324629421497	0.795030699999998	63.4582891	12.408302	17.1080484
11.3914320214381	72.1075890549863	7.0324629421497	1.295681	73.7881021	0.4861457	19.2219951
2.56534644155634	72.1075890549866	7.0324629421497	2.4095765	76.567725	8.2487866	13.9285738

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.56434644155694	72.1075890549865	7.03246294214971	6.0949397	74.0865476	5.2825592	7.6811646
2.56434644155695	78.4457318431263	7.0324629421497	6.9413921	77.9428724	3.7844258	8.4884288
2.56334644155694	78.4457318431263	7.0324629421497	5.6520223	82.6769432	10.5413091	11.1746738
2.56234644155694	78.4457318431264	7.03246294214971	0.933565799999997	72.1659561	13.9038289	13.4077909
2.56234644155694	78.4467318431264	7.03246294214971	4.0094679	79.3774545	3.2513282	4.1542009
2.56234644155694	82.572246137258	7.03246294214971	2.2068367	85.97283	4.4333903	4.2948267
2.56234644155694	83.4893080175231	3.67311528866626	1.90777989999999	84.1438746	3.0185488	1.1337425
3.22018943098674	79.9331156549624	14.9212902606768	11.0262565	80.6460603	18.6716382	8.6895387
3.22018943098674	79.4984949178823	14.9212902606768	4.2645198	75.4568775	14.9212902	4.1743619
3.22018943098674	80.735697248388	16.6900594280989	2.2118306	78.338365	17.5236695	2.7310978
3.22018943098674	85.657235707659	22.3179216892789	3.24432779999999	74.1558976	22.7592184	17.4562068
3.22018943098674	85.657235707659	22.9228625596506	2.73342340000001	77.6753662	22.8134911	7.9974461
3.22018943098674	91.7761923210758	22.9228625596506	2.92961390000001	91.7761922	24.0474062	1.1614786
6.29027758034221	91.7761923210761	22.9228625596506	17.6447354	95.7025091	24.4008135	18.1912178
6.29127758034221	91.776192321076	22.9228625596506	13.4475731	91.4293541	19.9118277	11.6363893
6.29227758034212	91.7761923210762	22.9228625596506	5.3401207	99.7769332	23.3119522	19.3172668
6.29227758034212	91.7761923210761	22.3766773394721	4.0389978	87.3302987	23.4710958	15.0585227
6.29327758034216	91.7761923210758	22.3766773394721	3.4980922	86.0326352	18.0570339	13.3409157
6.29427758034173	91.7761923210762	22.3766773394721	6.5131248	96.1438685	22.6159881	18.9754882
6.29527758034173	91.7761923210764	22.3766773394721	7.5281123	85.6801168	11.1420674	14.3445898
6.29627758034172	91.7761923210763	22.3766773394721	5.5712407	90.2337915	20.7281907	18.9787731
6.2972775803413	91.7761923210762	22.376677339468	13.1891897	88.2938542	23.4034575	7.7896989
6.8239905168881	91.7761923210763	22.376677339472	8.45094570000001	92.4898096	19.3229772	15.3075709
6.8239905168881	97.2216290342602	22.376677339468	16.4819632	98.2716229	22.9610856	9.7324435
7.95553543435871	97.2216290342602	17.7695631899304	14.3875276	98.8261078	17.7695633	6.6290931
7.95453543435872	97.2216290342603	17.7695631899304	5.93926279999999	95.2323551	18.983803	4.2724995
7.95453543435872	97.2216290342602	17.7685631899304	1.8947773	99.155621	15.7943163	13.566985
0.54474854798822	97.2216290342602	16.390282553886	0.604558600000004	98.8714353	15.0611354	2.1193873
0.54474854798822	97.2216290342601	12.5524594930106	0.0137857999999937	97.6201473	12.5524591	0.6638812
2.28855087359004	97.2216290342601	12.5524594930271	2.7731053	90.8551563	10.3958831	11.768651
2.28855087359003	93.0945681893847	6.9611550004321	2.2885744	93.0945686	4.7870646	2.1740904
2.28855087359003	93.0935681893847	6.9611550004321	2.8109458	93.7321232	7.4419786	1.5519124
2.28855087359045	91.0647652783432	6.96115500043209	9.22639889999999	90.0124515	4.4717238	19.4614621
10.2494167727048	91.0647652783432	6.96115500043209	9.5621792	88.5032381	1.7950294	5.8071138
14.0477925257525	91.0647652783431	8.80779968542326	13.5790401	86.3111074	8.8070912	4.776713
14.0477925257525	91.0477424999999	8.80779968542327	19.6070156	87.5155962	19.7643343	13.0351264
20.4274747866758	91.0477424999999	10.0950291143939	20.4274735	84.2677658	10.0950289	6.7799767
20.7465399067416	91.0477424999999	10.8096373081682	20.5127244	86.7993916	9.2772764	6.7971193
20.7475399067417	91.0477424999999	10.8096373081682	11.9839899	90.8471274	5.5312557	12.6071325
20.7475399067417	91.0487424999999	10.8096373081685	19.6994488	87.7215703	8.9292535	12.92719
20.7475399067417	91.0497424999999	10.8096373081685	21.4283979	90.119601	10.9146393	12.23519
20.7475399067417	91.0497424999999	10.8106373081685	31.00496	87.5127119	14.2496673	15.7467648
20.7475399067417	91.0507424999999	10.8106373081685	23.9936704	92.6751712	13.4234383	7.0508341
20.7475399067417	93.5973867999975	10.8106373081685	20.7475398	95.759314	10.8106372	2.1619272
27.3801628471576	93.5973867999975	11.7462116878515	26.8042407	95.3391438	15.0909578	3.8148041
27.3811628471468	93.5973867999974	11.7462116878515	27.0999394	87.1794445	14.318048	15.3093219
27.3811628471468	93.5973867999975	13.8536315397849	28.8394854	85.6978668	0.4508897	18.7042447
27.3821628471468	93.5973867999975	13.8536315397849	30.1525293	91.7059859	19.8161573	6.8413479
27.3821628471468	93.5973867999974	6.49652492100384	22.9057445	97.6296948	0.3244356	8.6251096
38.2308231018865	93.5973867999974	6.49652492100384	38.2308224	97.9753907	0.1604725	7.7014595
41.1867389063549	90.8227543998754	9.12002789999979	37.489488	92.2138591	10.0537289	7.9102312
41.1867389063549	90.8227543998713	9.12102789999477	34.617789	91.6565199	3.2534463	17.1587159
41.1877389063556	90.8227543998751	9.12102789999999	33.8269693	93.4852631	8.3635932	7.8640695
49.7030600720837	90.8227543998752	9.12102789999999	49.7030604	90.8227548	10.5216088	1.4005809
49.7030600720686	85.8803445932107	9.12102789999999	49.4827685	84.8462228	4.1362821	10.3517087
49.7030600720686	85.8803445932106	8.32778501575253	48.3895216	84.8378656	6.8593636	2.445755
49.7030600720686	77.7959760484238	8.32778501575289	47.9098314	77.7959758	13.7573709	9.5350991
53.7028271060105	69.1704846762947	8.32778501575289	54.3749565	73.471727	7.5546522	4.4215583
53.7028271060086	69.1704846762941	3.9786469187212	50.0180258	68.4527432	3.6702061	3.7667027
53.7028271060087	69.1704846762941	0.758412875259226	53.0250996	68.7918887	2.0307378	1.5438111
70.946406868439	69.1704846762947	0.758412875259227	64.4543682	70.2655389	2.1929672	6.7382235
70.9464068684385	69.1694846762992	0.758412875259227	68.5426632	70.6500378	2.313903	3.2232857
Route: 4 Length: 102.933050255109 Demand Met: 959						
77.5020158783421	49.4369194615702	6.41854792526819	77.6409989	49.4044045	6.2831565	0.1967239
77.2112352519808	45.5951376869862	6.41854792526819	67.7343836	45.7338412	11.9249335	10.9613064
77.2112352519808	45.5951376869862	6.41854792526819	73.6483802	37.1698351	8.0638871	9.29445
76.1612584202811	40.3477079867753	14.3848395527423	76.1612584	37.0439506	15.0269683	3.365582
70.4409594869813	40.3477079867753	14.3848395527423	74.2228108	38.6099587	15.750928	8.4402478
70.4399594869813	40.3477079867753	14.3848395527423	73.6393721	37.6930766	12.5724621	4.535198
68.6068206214166	40.3477079867753	14.3848395527423	72.24704	39.7077335	13.756154	3.7506664
67.5706064384125	48.2600973976123	14.3848395527423	63.3830619	45.6708392	19.4411223	11.4259131
67.5706064384124	48.2610973976123	14.3848395527423	62.9728444	48.2610974	18.088966	5.9042331
67.5706064384124	48.2610973976123	14.2153372188101	65.8501112	46.5185477	18.4012114	5.7590293
67.5706064384124	48.8124690783596	14.2153372188101	67.7686962	50.942416	23.8888342	9.9071922
69.7889859273865	48.8124690783596	14.2153372188101	69.6306367	57.4599551	14.1507992	8.6491765
69.7899859273867	48.8124690783596	14.2153372188101	63.3053921	48.8331121	7.8682203	9.0739339
69.7899859273867	50	6.82066832351623	64.136723	44.5156078	8.6797357	8.3082067
69.7899859273867	50	6.81966832351623	69.2934493	49.5142976	7.1641629	0.775327
70.984528429244	50	6.81966832351623	77.1618533	52.0527053	6.1051205	6.548551
Route: 5 Length: 366.145620583963 Demand Met: 4906						

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
82.3775027692024	34.6437568455146	4.72586967938915	75.1791401	28.4357222	11.5456464	18.0653964
75.0478130000044	34.643756845486	4.72586967938915	69.6772126	28.9703915	6.8785128	10.4491408
75.047813000002	34.6427568454855	4.7258696793845	78.3681704	28.4149174	19.0447715	15.9637623
75.0468130000022	34.6427568454855	4.72586967938451	67.6344777	29.9025036	14.033884	17.8609779
73.5481111168547	34.6427568454856	7.32968977690569	67.7860652	18.0440513	10.7235759	17.8951575
73.5481111168544	17.8373060974746	7.32968977690569	71.2868972	13.7571779	21.261272	15.5198317
73.5481111168519	17.8363060974693	7.32968977690569	79.9570853	14.106802	16.0131314	15.0949781
73.5481111168519	17.8353060974765	7.32968977690568	72.0757838	18.033427	9.5185824	4.1897587
73.5481111168503	17.8343060974765	7.32968977690569	71.8742878	17.8343061	13.6189325	6.5081686
73.5481111168517	10.3273652512209	7.32968977690569	70.9135058	14.8761766	3.8438809	6.3074316
73.5481111168544	7.45161020565284	7.32968977690568	72.8917692	2.6849909	9.1068195	5.1292918
73.5481111168546	4.87060293589274	6.74430459996286	73.9903157	3.2090585	6.7443046	1.7193821
73.5481111168547	8.40525255203651	6.74430459996281	75.2339764	1.1053279	6.9329867	16.7841753
73.5481111168546	8.40525255203651	4.58348135212165	72.9487249	9.0752285	0.6396625	6.7256814
70.7312312237275	8.40525255203653	4.58348135212165	72.320279	3.8462993	6.5608426	12.1872623
70.7302312237274	8.40525255203651	4.58348135212166	68.4102584	6.9403941	4.658299	16.8109375
62.7166475461385	8.4052525520365	4.58348135212165	70.8086056	11.5809577	17.5154997	15.5821047
62.7156475461606	8.4052525520365	4.58348135212166	54.6678163	5.1970784	7.0182008	9.6677205
62.7156475461604	10.1841347001322	4.58348135212165	61.3811866	10.1841347	3.2294003	1.9011369
62.7156475461604	10.1841347001322	5.61027234770471	68.9038468	16.8104734	21.7337542	18.4978064
62.7156475461604	10.6539562260941	6.58645114995434	64.1033853	11.196525	7.8712992	1.9674937
62.7156475461385	10.6549562260941	6.58645114995433	58.3586123	20.3359236	6.4801103	10.6167883
63.1761512003621	10.6549562260941	14.6666304988234	70.2907843	10.4186099	14.6666305	7.1185577
63.1761512003497	13.1357099999999	14.6666304988234	67.4654721	12.1137109	23.8276929	14.0781794
60.5482991999975	13.13571	16.8556106000069	60.5482992	13.7850738	16.8556106	0.6493638
60.3505914128874	13.1357099999999	17.7408301764957	57.1362338	5.5136309	23.5708492	10.1201436
60.3505914128949	13.1357099999998	17.7418301764236	73.292725	7.8305571	19.3842603	14.0833606
60.350591412895	11.0252037466715	19.3226858774455	64.943613	1.686391	19.5930668	14.0946653
55.253710399265	1.68654127568526	19.3226858774455	55.2537104	1.3428502	19.4907476	0.3825811
45.9609802650006	5.950871899887	19.3226858774945	41.5241877	2.2495139	17.9679654	5.9346817
45.9609802650006	6.64819491033378	19.3226858774884	39.0651937	2.4238303	22.4127866	9.0370307
45.9609802650006	8.92391460054336	19.3226858774884	38.5584867	8.9239146	23.1054293	8.3130054
47.1413401075866	11.444191205251	19.3226858774884	46.2315326	17.3070005	18.3576471	18.9782971
47.1413401076257	11.444191205251	19.3216858774455	45.3795945	10.2393952	3.6711995	17.2768189
47.1413401076257	11.444191205251	11.5222249999899	47.2237184	11.5265695	11.522225	0.1165005
47.1413401076257	11.444191205251	11.5212249999908	42.0438698	1.2746098	8.4709115	18.5219549
39.133597909672	9.10003683241149	5.46951086641241	37.7928549	6.0601138	4.720283	3.405887
39.133597909672	14.8347249349667	5.4695108664124	41.0252369	15.6288565	6.5265879	2.3078897
37.3849664032802	14.8347249349667	5.26128779762053	37.3849664	18.6565566	4.7787046	3.8521791
23.0422862851545	14.8347249349667	5.26128779762053	20.1050057	16.8211128	11.4177964	7.104643
23.0412862851546	14.8347249349667	5.26128779762053	23.260163	19.1726271	1.8635456	5.5937891
21.6168977240069	9.83032979954811	5.26128779762053	17.3929381	9.8303298	1.4719335	5.6745961
21.6168977240069	9.8293297995481	5.26128779762052	18.0605132	3.6100683	1.3230623	8.5868999
21.6168977240069	9.82832979954809	5.26128779762053	26.3324067	9.9110212	1.9657306	19.0585155
22.7885076381427	8.88140084415368	5.26128779762053	30.2787157	8.2280249	1.312123	8.4927039
22.7885076381427	8.88140084415366	11.563658531612	21.5004558	1.4444458	11.8706015	10.4654737
22.7885076381427	8.88140084415366	11.5646585316119	21.5694811	0.9567502	13.1824134	13.3401903
22.7885076381427	8.88140084415367	11.5656585316119	25.7941467	5.022901	22.6635913	13.154074
25.3620641971283	8.88140084415367	11.5656585316119	25.3620642	2.9418291	18.8013171	9.3612642
28.9980611001155	8.88140084415367	10.7477571539965	28.9980611	9.3107142	10.3932004	0.5567948
29.8399515450686	8.67146032495617	10.7477571539968	29.8399494	3.731908	9.1569031	5.1894117
30.5972086309195	8.67146032495617	12.5575682322498	31.6461166	7.3585956	24.5416178	12.8469017
30.5972086309195	15.2531662059163	12.5575682322498	33.7088519	9.9711832	22.3346661	13.226048
30.5982086309195	15.2531662059163	12.5575682322498	31.9710737	13.1659452	6.9350237	6.1525799
33.451690688771	15.2531662059163	13.6973158887384	33.7699504	15.2531662	14.0155756	0.4500872
32.9281438272729	22.7083050039362	10.6038325278132	30.6527015	22.708305	8.3283902	3.2179614
32.9281438272223	22.7083050039364	10.7041074166496	31.6418617	23.7354033	9.0609597	2.3258089
32.9281438272729	22.7083050039365	10.7051074166496	34.0986738	23.3047286	4.238405	16.797077
33.0131411145312	22.7083050039365	10.7051074166496	34.7673517	23.4200763	4.8203284	8.3957645
33.0131411145313	29.9271434000104	10.7051074166496	33.8398153	32.0377234	11.3609992	2.359689
34.4052219816246	29.9271434	16.1089553049827	31.5115819	30.4349931	13.1711147	4.1547529
37.1301720058677	29.9271434	16.1089553049827	37.130172	34.1670861	22.6509329	7.7958056
38.9767874014275	29.9271434	7.54261000177883	38.9767874	28.6595996	7.54261	1.2675438
38.9767874014272	29.9271434	5.71962779999432	39.7052051	20.7340789	2.9027737	9.9402181
42.1790577702925	29.9271434000001	5.71962779999646	54.100404	16.0525172	0.8678853	18.9251989
45.1695924645674	29.9271434000099	5.71962780000097	56.0727891	23.8686819	7.47443	15.5553362
45.1695924645683	33.2150554052949	5.71962780000071	38.4714341	30.1541626	2.0837059	8.9883187
45.1705924662687	33.215055405294	5.71962780000011	45.1705924	33.2150554	0.7183829	5.0012449
49.3371030701898	35.2495274641918	5.71962780000071	39.4220046	48.156385	14.5273965	18.6805968
49.3381030701897	35.2495274641918	5.71962780000074	53.5581269	47.7413894	5.6200486	13.1857928
49.3381030701897	35.0689933726063	6.91124483550635	48.3601763	34.0464698	9.5017871	2.951746
51.6262519928509	35.0689933726063	6.91124483550635	51.6262531	32.9510025	3.9807244	3.6157759
54.2924335310529	35.0689933726063	10.412750104716	51.2078647	35.5791539	12.2358489	4.4951633
54.2924335310529	35.1534656778311	10.412750104716	55.1300701	40.0588307	9.3430467	5.0900091
56.9471598000946	35.1534656778311	10.412750104716	58.429274	38.9397266	17.4146787	18.6397178
56.9481598000946	35.1534656778311	10.412750104716	51.5218465	39.5765057	8.1668107	17.6859637
56.9481598000946	35.1534656778311	10.413750104716	48.2549784	40.2375649	15.7273532	18.4484604
56.9481598000946	35.1534656778311	11.1206095686905	56.9481598	35.7189477	11.6860928	0.7997132
56.9481598000946	35.1236152000447	11.1206095686905	56.98499	36.3050676	16.2652139	14.2729457
62.0390375131175	35.123615200012	11.1206095686905	61.8021468	40.7857588	11.6604123	13.1222565

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
62.0390375131203	35.123615200012	11.1196095686905	54.9748886	31.6899499	9.1125802	11.8489378
62.0390375131185	35.123615200012	8.70118483256619	62.0390375	27.7696953	8.7011853	7.3539199
63.4166168368513	35.3279271139288	5.65383767249351	57.9600279	34.4089577	5.7051211	11.7355261
63.4166168368512	35.3279271139289	4.01880815979997	66.7264937	28.6241638	4.754423	9.8453178
63.4166168368505	35.3279271139286	4.0178081600784	57.8811625	36.8910334	2.4827855	11.1609103
63.5059072678816	35.3279271139277	4.0178081600784	65.5339196	33.299582	2.2513726	4.4914809
63.5059072678816	35.3279271139278	0.334062418401234	65.884583	36.2103636	0.6036001	2.551361
63.5059072678831	35.3279271139282	0.333062418417667	59.7400431	37.5401839	2.8523374	7.0381524
63.5059072678798	35.3279271139289	0.332062418433966	57.9145816	37.4787407	0.4915272	9.8427718
63.5059072678831	50	0	53.1446811	48.4277704	1.8438372	14.7395753
Route: 6 Length: 403.485993611307 Demand Met: 4938						
90.8899427893191	50	0	77.8566059	47.3210428	1.4302369	13.3824609
61.0801247915138	50.8585456535597	3.28067627734333	61.0935569	52.6920317	4.4207174	2.1590612
54.7283186361211	50.8585456535684	3.28067627734419	54.2235528	56.265496	3.5115961	13.6774223
54.7283186361469	50.8585456535683	7.53432299232188	48.6878693	60.2173135	5.6974781	11.2892676
54.7273186361554	50.8585456535643	7.53432299232465	51.8847181	57.7017397	23.1071854	17.2459771
54.7263186361555	50.8585456535667	7.53432299232468	58.3317264	48.8464518	15.1551224	16.6689028
53.0769579752682	50.8585456535667	7.53432299232468	53.3341085	54.2742297	9.8426206	4.845343
53.0769579752682	50.8585456535667	20.301401884395	55.3536754	50.0230289	15.6187386	10.7398558
53.0769579752682	52.4842858451981	20.301401884395	46.3458684	54.8708712	24.5219613	8.2955698
53.0779579752682	52.4842858451982	20.301401884395	45.6990417	60.3070344	11.94067	16.3509992
56.9137494734958	52.4842858451983	20.301401884395	57.7424662	53.0431767	19.7584506	1.1375089
56.9137494734959	52.4842858451982	22.3974353818148	56.2067364	40.2417677	14.7422616	19.6165059
56.913749473496	48.1460277634193	22.3974353818148	57.0032853	47.929495	24.4820709	2.0977627
56.9127494734959	48.1460277634193	22.3974353818148	47.6524078	52.2249928	24.4877735	17.0127082
50.2398544302297	48.1460277634192	21.2937400762	38.9617732	51.3997809	16.210445	12.7914782
50.2398544302297	48.1460277634192	18.88684680369	49.7681271	46.8278362	16.9025729	2.4284766
50.2398544302297	48.1460277634192	22.5503486486056	54.8328865	43.6672378	22.5503676	6.4152555
50.2398544302297	50.7502125982003	23.2339660014049	39.5709227	52.0192185	20.9490324	18.7792196
45.9517601155668	50.7502125982002	23.2339660014048	44.8729194	51.9811136	24.4648411	2.0479424
45.9517601155668	48.5457428899853	11.3681505299145	44.2906965	51.8898251	11.3116798	3.7343282
45.9517601155668	48.3119543058895	11.3681505299145	49.3212736	48.3119567	9.5488066	3.8293124
45.9517601155668	43.2505009331942	11.3681505299145	42.5831476	37.1399223	7.4293369	8.4151487
44.6441662000081	43.2505009331942	11.3681505299145	44.6441662	33.1239716	16.5654644	11.3823841
36.5349468797147	43.2505009331942	11.3681505299145	41.3950957	34.602479	9.5059407	10.330203
36.5339468797147	43.2505009331942	11.3681505299144	40.4352515	45.1450838	11.9573703	4.3768484
32.4189095034647	43.2505009331942	9.82855035018649	37.4597811	44.2188485	16.422469	8.3563058
32.4189095034647	43.2505009331942	9.82755035020683	30.0937988	44.3308943	14.5383671	9.1718387
32.4179095034643	43.2505009331942	9.82755035020683	34.4981613	43.6098189	6.3838863	7.4849006
32.4169095034643	43.2505009331942	9.82755035020684	38.128444	50.990683	1.5244057	14.1351688
32.4169095034643	43.2505009331942	7.72833824386077	37.6481264	47.8813096	6.5793036	7.0802754
32.4159095034643	43.2505009331942	7.72833824386078	34.2887402	41.9043439	6.835982	4.1016802
28.2512057326255	43.2505009331942	7.72833824386072	28.2512087	43.1796715	6.8189779	0.9121146
28.0194949244877	43.2505009331942	7.72833824386078	32.3078962	45.114069	10.6720814	14.2581658
28.019494924488	43.5631931000076	18.7011823521133	31.5095969	51.0684653	11.523883	15.7915136
28.0184949244883	43.5631931000077	18.7011823521134	28.018456	49.9258106	18.7011667	6.3626175
26.2185766857527	40.5220972002537	18.7011823521134	32.8302989	42.2309887	13.616708	9.1323516
26.2185766857527	40.5220972002537	21.6298833000001	36.1244237	41.0242921	19.6707957	15.4858909
26.2175766857523	40.5220972002521	21.6298833000001	26.2175773	40.5220972	21.9150058	0.2851225
26.2175766857527	40.5210972002521	21.6298833000001	23.0786229	38.1227731	23.1605385	15.8911359
24.6147487822514	40.5210972003046	21.6298833000001	21.8832831	32.2702186	24.0783885	16.0376904
24.6147487822514	31.7730644111595	21.6298832999927	25.6408756	32.9849766	23.8146293	2.7008855
24.6147487822514	31.7730644111595	15.0568713669196	25.434095	30.36432	15.4263508	1.6710488
24.6147487822514	31.7730644111594	15.0558713669196	27.922577	21.764341	5.4511195	14.2606988
24.6137487822514	31.7730644111595	15.0558713669196	18.0420031	31.0087706	14.9562459	9.8590332
24.6137487822514	31.7730644111595	15.0548713669196	33.6742877	16.0147514	17.7329183	19.9827348
24.6137487822514	31.7730644111595	14.7309748894033	35.4889656	25.3753347	12.2670294	17.6050983
24.6137487822514	28.9597159185389	14.7309748894032	24.3319298	37.4283803	9.9719727	13.053577
24.4057909190876	28.9597159185389	14.7309748894032	24.4057133	14.819481	14.2616378	14.1480218
21.2013766103404	28.9597159185389	14.7309748894032	19.7989907	26.8559855	1.6393695	13.3335104
21.2013766103404	30.6755788601758	15.6775838691257	21.2205961	30.6755865	15.8621351	0.1855493
21.2013766103404	34.1031680499843	15.6775838691257	25.8175111	47.2716024	20.9185995	14.9058581
21.2003766103404	34.1031680499843	15.6775838691257	24.4888337	25.329984	1.2423959	19.8782132
21.1993766103404	34.1031680499843	15.6775838691257	13.0553452	35.1491327	19.4677587	12.3752896
13.6464992025526	34.1031680499843	13.5453198012022	11.1949114	32.5347928	13.765914	2.918689
12.7684867818823	37.3702865785013	12.1623516530491	12.1928408	37.3702852	11.5867049	0.8140869
12.7684867818823	39.233190556552	12.1623516530491	14.7299938	38.6202015	11.4606651	5.5606508
15.1805142801087	39.2331905565541	12.1623516530491	13.5198617	39.2703319	6.7423337	5.6665967
15.1805142801087	39.2331905565541	12.937088211303	6.820668	39.0713932	12.1631417	16.2462105
15.1815142801087	39.2331905565541	12.937088211303	15.6671545	41.9038059	9.4975475	18.2677056
15.8019386859177	47.9427469139221	12.937088211303	12.7057803	46.3942459	23.5548248	11.1678278
15.8019386859177	47.9437469139221	12.937088211303	16.0956015	47.1989931	18.8482809	14.2319044
15.8019386859177	47.9447469139239	12.937088211303	20.6501388	50.1791373	13.3126618	16.3804834
15.8019386859177	47.9457469139221	12.937088211303	21.0216738	51.8703093	12.3795264	6.5542883
15.8019386859177	47.9467469139221	12.937088211303	23.2467308	53.1536864	15.3512789	11.4161743
15.8019386859177	53.8307657400415	12.937088211303	16.954408	52.9270638	19.3144339	16.3581023
15.8019386859177	53.8307657400415	12.938088211303	16.1987878	59.3187745	15.8426137	8.6880066
15.8019386859177	53.8307657400416	23.0890305508687	18.474215	58.4012448	21.6380189	5.4896057
15.8019386859177	53.8307657400416	23.0900305508687	22.9209187	53.7233909	24.603033	7.2787759
20.3222801703199	53.8307657400416	23.0900305508687	19.3270801	51.9549025	21.8491926	14.5767542

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
20.3222801703199	56.615555926239	23.090030550873	20.4303529	56.6155569	23.1754411	0.1377486
6.14270656516108	64.7359497313609	23.090030550873	0.2763329	64.7359652	24.1588067	5.9629374
12.6805169890743	64.8717077835575	23.090030550873	15.1928212	63.8863652	20.6093336	3.6655736
22.1331057069826	64.8717077835575	23.0900305508687	19.7736057	66.4248411	22.4431961	8.3807699
22.1331057069826	69.1282031388449	23.0900305508687	25.824676	62.4300357	22.6279041	7.6620297
22.1331057069519	69.1292031388367	23.0900305508687	22.4809106	75.2843669	23.7038192	6.1954617
23.5091146816062	69.1292031388367	23.0900305508687	16.6661596	74.8364156	22.1285239	8.962299
26.7897321273619	72.5332840425611	23.0900305508687	26.7897314	74.395765	23.1412606	1.8631854
37.6916055876787	72.5332840425611	22.9067880527076	37.7594155	72.4638416	24.7804303	1.8761545
37.6916055876788	72.5332840425611	18.5797691521455	52.878421	80.2956919	22.1921533	17.8391178
45.2110691640897	72.533284042561	18.5797691521455	46.3729602	74.0499355	16.6434815	10.9997053
45.2120691641173	72.5332840425611	18.5797691521455	46.0567355	72.019762	4.0391076	17.1499692
45.2120691641229	67.7779088274952	18.5797691521455	44.3710695	67.9205927	10.1383529	17.6190773
45.2130691641297	67.7779088274952	18.5797691521455	43.8195847	68.1613988	20.4285954	3.0343172
52.298986802025	67.7779088274952	17.7262784613672	45.5118999	65.9532613	1.4856264	17.6961201
52.298986802025	67.7769088274952	17.7262784613672	63.772212	68.1836695	14.3458559	14.1434905
52.298986802025	67.7759088274952	17.7262784613672	61.6781701	59.473286	10.2741841	14.5751959
53.1168502700619	67.7759088274952	17.7262784613672	65.5436157	56.992435	13.1266946	17.084027
53.1168502700619	67.7759088274952	17.7252784613671	64.4880133	60.4854675	12.6069191	17.3914578
53.1168502700619	67.7759088274951	17.7242784613668	66.0988248	58.3515559	13.6719306	17.5072809
53.1168502700619	67.7759088274952	17.7232784613668	45.412979	71.2677197	7.8505587	19.9703759
53.1178502700618	67.7759088274958	17.7232784613668	56.7397866	71.0931061	18.3430984	12.7871715
56.2527702721632	67.7759088274959	17.7232784613668	56.0822206	62.8731122	23.9833277	7.9532835
56.2537702721631	67.7759088274959	17.7232784613668	57.43771	71.1535593	20.5447257	13.3451357
56.2547702721631	67.7759088274959	17.7232784613668	56.5346421	68.6367247	22.9662555	7.6638079
58.6094117225194	67.7759088274959	17.7232784613668	58.1838222	68.9986011	16.3418061	5.0984315
58.6094117225194	66.402598516432	17.7232784613668	57.8283627	65.6998258	15.4827548	5.6799674
58.6094117225194	66.402598516432	17.7222784613669	66.8428254	74.9418962	18.8280244	11.9134957
58.6094117225194	64.3841723165501	6.67112891890868	61.6425082	72.8564323	6.6704147	8.9988257
66.594749193074	64.38417231655	6.67112891890868	64.6626599	65.39963	6.8345581	5.0684212
66.5947491930739	64.3841723165536	6.67012891890868	57.0800315	64.0172849	6.0370203	9.5428133

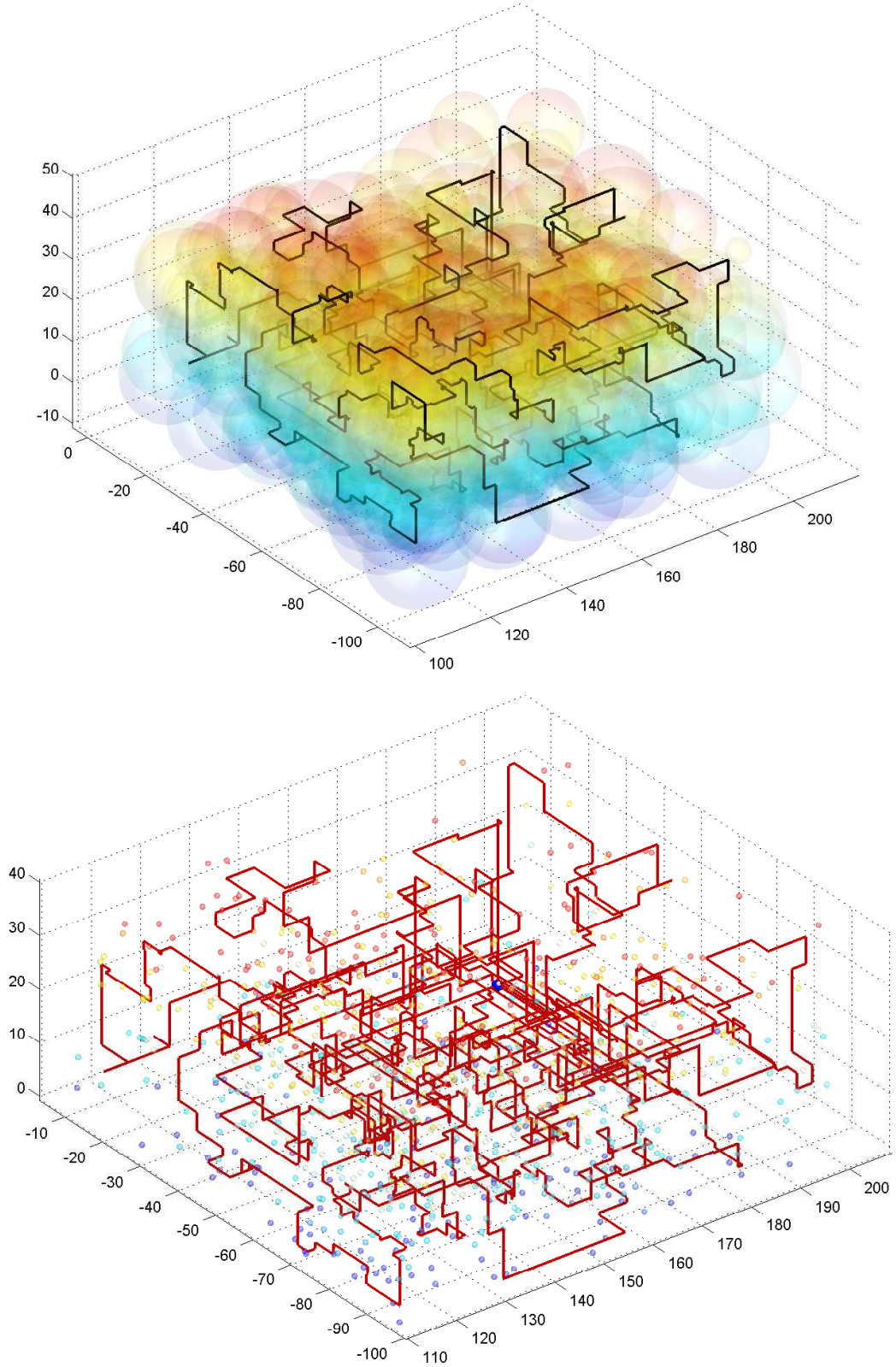


Figure O.201: *bonus*1000, arbitrary radius, 3D, Manhattan, Length = 4098.6913147

Table O-204: Solution for *bonus*1000, arbitrary radius, 3D, Manhattan

Total distance: 4098.6913147132 Total demand met: 25289 Depot: x 80 y 20 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 457.737796469772 Demand Met: 2529						
85.2382473489291	11.6819181336593	13.8384068978809	85.22979418	8.715884504	12.16207554	3.406980154
89.640644285558	10.3477431007508	23.2985922689419	93.53556787	11.2495411	17.39352488	9.93311926
89.6416442855581	10.3477431007508	23.2985922689422	94.43184685	8.796264511	23.29859307	5.035188817
89.6416442855581	10.3477431007508	33.099502597	83.75499038	5.857780347	33.63275215	7.422722871
90.8181982100833	13.0911923351443	33.099502597	94.15587216	20.2227246	36.0994515	8.426061551
90.8181982100834	18.2159484000104	33.099502597	90.81819821	18.2159484	35.33294835	2.233445753
90.8181982100834	18.2363308164082	27.4240225008734	95.99475962	18.1472698	27.39786086	6.014618976
91.2249876	30.5898166421202	23.8173625659403	94.17807015	30.5898166	23.81736257	2.95308255
87.567482825873	30.5898166421203	23.2890710988392	88.13068149	33.9074779	16.96093724	7.167241247
87.5674828258729	36.2740664291461	23.2890710988394	82.01891737	31.58538586	22.96295297	7.858683337
87.567482825873	36.2740664291461	21.2079113470018	87.56748283	36.27406643	21.13489416	0.073017187
87.567482825873	43.3606217372295	21.2079113470018	84.85983095	39.85329756	21.28837281	7.318048431
78.3982244508024	43.3606217372295	21.2079113470018	76.57028534	49.55513485	21.13053287	6.459051132
78.3982244508022	43.3606217372295	29.5611140006972	79.30599483	40.28434635	35.54252376	6.78710395
77.5375737688097	53.8703292719998	29.5611140006972	72.13050555	55.03070373	28.54528132	5.622701454
82.6461390001602	53.8703292719998	31.7272110277292	83.19197135	53.48639501	32.18766969	0.813698186
86.5184823096994	53.8703292719998	31.7272110277292	88.60564442	53.67349247	30.97358927	11.4446079
89.410277839201	53.8703292719998	31.7272110277292	91.19333201	55.09349477	31.72721103	2.162271031
86.5184823096994	53.8703292719998	36.9010209177176	86.51848331	50.71555717	36.90102142	3.154772102
86.5184823096993	53.8703292719998	39.5033964639983	83.91646182	55.69492785	39.74024442	10.80258547
78.360017140324	53.8703292719998	39.5033964639983	77.87000631	52.21112855	39.93820594	1.783848909
72.7342607295396	54.9502142790788	39.5033964639983	72.73426073	54.95021428	39.57914747	0.075751006
67.2780966483391	54.9502142790788	37.6471088978277	65.98277732	56.02257659	36.50214422	2.034393571
67.2780966483391	56.7921752615806	34.2162369565607	66.67873973	56.13517049	35.54640769	1.600074425
67.2780966483391	56.7921752615808	33.174553521	67.27809665	56.79217526	31.19414535	1.980408171
67.2780966483391	61.5103191910524	33.174553521	67.87575086	63.89107621	33.2359079	2.566981804
65.3473523014904	62.7186141803504	33.174553521	62.01287875	62.70691628	29.4740589	7.75530817
65.3473523014904	65.1273991092574	33.174553521	65.34735437	72.80394877	34.67473005	7.821760947
65.3473523014904	64.5363001333821	33.174553521	63.48323083	69.36201841	31.45080353	5.452872617
57.094883480889	62.7186141803504	33.174553521	57.09480153	60.45993374	34.61199265	2.677287543
57.094883480889	62.7186141803504	25.8861153947844	61.59665848	60.86573745	25.73038778	4.870665397
56.9649970744505	63.6410563070167	25.8861153947844	54.03625818	65.02303827	30.15017844	5.354401863
56.9649970744505	64.427470511401	25.0898459518066	60.59756518	67.42291916	21.31629348	6.033901052
56.9649970744505	71.6710932466323	25.0898459518066	67.45457311	72.85375456	29.93900874	11.61655168
56.9649970744505	71.6710932466323	25.0898459518066	60.79681015	75.33369853	28.93747546	8.472276725
56.9649970744505	71.6710932466323	21.6393097717675	67.69295238	75.24403656	20.54681948	11.35995088
56.9649970744505	71.6710932466323	21.6393097717675	57.06276587	74.98770524	20.67544591	9.477514768
56.9649970744505	71.6710932466323	21.6383097717675	58.81674593	76.2826012	22.48412381	7.335997979
56.9649970744505	71.6710932466323	21.6373097717676	59.10597324	64.72617137	21.25191915	7.277653794
56.9649970744505	71.8079198858511	21.6373097717676	57.97334153	65.39941546	18.27090119	9.414607276
55.8328833916673	71.8079198858511	21.6373097717676	55.72002047	71.91921816	21.5952445	0.163996439
55.8318833916673	71.8079198858511	21.6373097717676	58.20433528	69.50520456	29.55764241	8.582697416
55.8318833916673	71.8079198858511	18.7006326458574	56.76810138	74.93595817	28.17323894	10.01955077
55.8318833916673	75.7898049608999	18.7006326458574	50.78444002	76.12504454	23.00978791	8.918500215
51.1170006671614	75.7898049608999	13.8718901635849	52.24575767	74.98560476	14.55357765	1.544515511
51.1160006671614	75.7898049608999	13.8718901635848	55.99099974	83.60147673	17.9737132	11.10984141
51.1160006671614	75.7898049608999	13.8718901635848	51.49657531	83.11057243	16.78262105	7.887384084
48.1420203098029	77.7033920601794	13.8718901635849	46.11608956	79.13405595	12.05021293	3.077288175
48.1410203098032	77.7033920601794	13.8718901635849	47.14165764	77.84331314	10.33249494	3.855818645
48.1410203098032	77.7033920601794	13.8718901635849	51.91696279	73.69595809	14.416915	5.533020939
44.4708676644067	80.173052491538	8.44396042399999	44.47086767	80.17305261	3.885836986	4.558123438
44.4666079478015	80.173052491538	8.44396042399999	45.32225765	79.26748614	7.718311017	4.954739166
44.4656079478015	80.1730524915381	8.44396042399999	51.18829335	82.80979047	5.597845952	7.761910446
42.0820961806418	80.1730524915379	8.44396042399999	48.20934555	82.30314786	4.491594241	7.596162818
42.0820961806417	80.174052491538	8.4439604240002	40.58416037	81.54961967	6.0287924	7.064640642
38.4466324780541	80.1740524915379	8.4439604240002	38.00030199	82.20200968	0.019607641	9.151482372
38.4466324780548	84.7019166247478	9.77216113519525	38.25086273	84.70191635	10.62939488	0.879303979
38.4466324780541	86.8894024093471	6.68497530666474	38.21932161	86.88940242	6.390388464	0.372090901
38.4466324780541	92.8167552641384	6.68497530666524	35.55901251	90.85604615	4.893665446	4.28990011
42.692913486	92.8167552641384	6.68497530666524	42.23200248	88.95299773	4.136491045	4.651433464
42.692913486	93.3979288322368	6.68497530666524	44.01236363	95.54242778	0.007676566	10.44212715
42.692913486	93.3979288322368	6.97366615372638	43.91518159	93.39792889	6.973666169	1.222268104
42.692913486	93.3979288322366	6.97466615372663	48.86252985	99.44183304	4.964951227	10.4064769
42.692913486	93.3979288322366	6.97466615372663	47.96746082	95.14523251	6.669541987	8.805162658
42.692913486	93.3979288322365	12.4914695277078	45.33430047	93.58613905	11.44191552	5.098588574
39.9794613786908	96.9478549471317	12.4914695277078	37.35140359	99.57591236	15.11952707	4.551929256
42.692913486	96.9478549471317	12.4914695277078	41.23951851	98.4925435	12.0504117	2.263631388
46.2073210550581	95.0576187388454	12.4914695277078	46.02083433	88.3362158	14.03418258	9.025977842
46.2073210550582	95.0576187388454	11.6240071703721	46.20732106	94.82215894	11.38854737	0.332990442
46.2073210550582	97.1820410690191	11.6240071703717	49.03663551	90.65504513	13.8830876	8.507710049
46.2083210550582	97.1820410690191	11.6240071703717	50.67630959	98.08417141	16.59101162	8.634086059
52.2623598771831	97.1820410690191	11.7395017119088	52.2623599	99.83573023	14.38314162	3.745784047
52.2623598771832	91.7351533479415	11.7395017119088	54.90972966	93.30800556	12.19693664	7.380299806
52.2623598771831	91.7341533479415	11.7395017119088	54.10050901	92.28618361	12.05829408	9.480891031

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
52.2623598771831	91.7331533479416	11.7395017119088	54.09260921	96.04789718	12.52208915	7.918650854
56.304448210534	91.7331533479417	11.7395017119088	57.43254842	97.94119843	9.821238574	10.09429194
56.304448210534	91.7321533479414	11.7395017119088	57.53422575	91.73216299	13.63995038	2.263638208
56.304448210534	89.9138339585422	11.7395017119088	53.26472651	92.17526811	13.38443287	6.470026475
56.304448210534	89.9138339585422	6.34329514483087	54.43632749	91.92787857	15.4166252	10.0796961
56.304448210534	89.9128339585422	6.34329514483078	56.30399813	89.72916428	6.343295144	0.18367023
60.1367840454368	89.9128339585422	6.34329514483077	62.35255518	88.46202983	5.064300638	4.962229956
60.1367840454367	92.716830482125	6.3432951448308	53.87450626	88.16447802	6.291517338	7.742268204
68.1595236971794	92.716830482125	6.3432951448307	61.09603132	95.38804721	2.385400865	8.526033691
68.1605236971797	92.716830482125	6.34329514483048	70.07355989	96.61021246	6.954740599	7.658895206
68.1605236971797	92.716830482125	6.34329514483048	64.64609008	95.09261932	13.24961232	9.659748021
68.1605236971797	92.716830482125	6.16067169781383	69.38304877	98.18671586	10.95698255	10.74668541
71.1161307443054	92.716830482125	6.16067169781406	79.19703593	96.06011661	13.22486099	11.2419465
71.1161307443054	92.716830482125	6.16067169781406	69.92952441	96.42807986	14.30332435	9.02685985
73.0487227683371	92.716830482125	4.19655013133307	78.18108034	99.79242924	3.657350909	11.42083614
73.0487227683371	92.716830482125	4.19655013133307	79.39161289	97.26593015	10.2457076	9.87516425
73.0487227683371	92.716830482125	1.70696216057025	71.17046416	92.96230041	3.31475723	4.264714687
73.0497227683371	92.716830482125	1.70696216057025	73.04972269	93.68364053	0.740152131	1.367275869
74.0501783432072	92.716830482125	1.70696216057025	67.89989075	88.12316705	3.528198384	7.944934507
74.0501783432072	85.3155833551805	2.68389409714274	77.11333094	85.3156461	2.683835286	3.063152598
74.0501783432072	82.9228885019827	7.41081273933364	75.38279951	84.8495864	16.86303573	9.738201242
74.0501783432072	82.9228885019827	7.41081273933364	74.46580568	79.0435318	1.384862598	7.178734541
74.0501783432072	73.1167064231936	10.6288562789914	73.75840634	73.11670598	12.48249331	1.876459737
74.0501783432072	69.6913329621102	10.6288562789914	72.70378804	66.70645397	9.083647724	3.620764964
79.2741633141722	50.5169176804966	7.48253881686529	78.92131522	50.41345477	7.556720976	0.375112442
79.2741633141722	50.5169176804966	0	75.19376171	39.75388964	3.378695446	11.99616742
Route: 2 Length: 385.277550935671 Demand Met: 2288						
78.5743037636562	46.8105121900379	10.5180066601179	77.77449926	46.72256252	10.92269156	0.900649502
65.341504028467	46.810512190038	10.5180066601179	66.65703205	47.7722791	14.44067044	4.863538053
65.3415040284671	46.8105121900384	17.3362699529899	63.21772914	46.4808445	18.00555738	2.251010045
65.3415040284671	46.8105121900385	18.7134856693667	64.66140077	51.58253517	18.71344865	4.820243123
65.3415040284671	46.8105121900384	18.7144856693667	74.55729645	43.48740037	20.58508364	11.94062462
65.3415040284671	46.810512190038	24.1398910278496	71.99750065	50.82091856	33.04720741	11.82057255
57.2485771075126	46.810512190038	24.1398910278496	55.80484172	50.30189669	30.08035465	7.040116877
57.2485771075126	43.4628807879779	24.0712231499776	63.12520069	41.24941139	24.07122315	6.279661735
57.2485771075125	43.4628807879778	24.0347340700126	58.48548965	38.49282405	23.12403661	11.79894595
51.2154049416665	43.4628807879779	24.0347340700126	49.90577559	41.072269	23.3893886	2.801182703
51.2154049416664	43.8564857988517	24.0347340700126	51.65508094	43.85648581	22.32830057	1.762166358
51.2154049416666	48.9503027348086	24.0567107212507	50.26037041	48.95030273	24.30726963	0.987355419
51.2154049416666	48.9513027348087	24.0567107212507	49.48945411	49.44119699	20.62289914	4.953096168
52.4087991172106	54.4387132678684	24.0567107212507	56.36080227	54.43871329	23.33898219	4.01664825
51.5183075690757	56.0081264851884	24.0567107212507	52.64945222	62.68533593	20.742851	7.539647236
51.5183075690757	56.0091264851473	24.0567107212507	48.01348394	55.67625048	22.64155069	3.794373864
49.2268958244985	56.0091264851473	24.0567107212507	56.12304172	60.76926662	25.75259057	8.549372537
48.0973768582025	56.0091264851474	24.0567107212507	46.15723029	56.4070148	19.959172	5.286178878
48.0973768582025	56.0091264851473	24.1036266130067	53.50308144	57.04941766	21.52167719	6.080321585
47.2097127687106	60.3614170299632	24.1036266129988	52.59359138	61.87082203	17.23711721	8.855134315
41.7217047437518	60.3614170299633	24.103626613	41.72170476	60.36141703	24.46424235	0.360615737
41.7217047437518	60.7386402192347	24.1036266129988	41.10546356	60.73573959	25.88754111	2.160394708
38.8304559436802	60.7386402192347	24.1036266129965	38.05290287	66.43336709	23.58284008	5.771110944
38.8304559436802	61.1349451227305	17.9243242020962	38.18944723	65.54612606	17.9243242	4.457511574
38.8304559436802	60.6389407692373	16.5792955115949	42.10911161	58.06602885	13.19335194	5.369736734
36.6563983423952	60.6389407692373	16.5792955115949	36.65639834	59.2724504	14.55953297	2.438593171
35.7584652062793	60.6389407692372	16.5792955115949	34.17044541	50.63731129	14.2756352	11.2605766
35.7574652062793	60.6389407692373	16.5792955115949	26.97467166	54.66512134	21.38913798	11.66012717
35.7574652062793	60.6399407692373	16.5792955115949	26.36749261	61.24478927	19.91950535	10.05967123
35.7574652062793	60.6399407692373	14.4887078935519	28.66025221	61.13181458	11.59083816	8.682831908
35.7574652062793	60.6409407692373	14.4887078935519	33.50828257	58.48410354	3.557102036	11.3670918
35.7574652062793	64.6641224103113	10.2895595386689	34.32584869	66.311045	4.144300462	8.8122254
35.7574652062793	64.6651224103113	10.2895595386689	36.44207057	76.13900165	9.824805701	11.50367704
35.7574652062793	64.9653017176997	10.2895595386689	36.88863481	65.11756178	9.028914476	1.700574542
35.7574652062794	64.9653017176997	15.6480155495033	36.99117209	62.09652931	16.1628835	3.164960791
29.478633763214	64.9653017176997	15.6480155495033	28.38294287	59.7022254	11.36065683	6.876187581
29.478633763214	64.9653017176997	15.6490155495034	21.56136042	60.00845368	9.387366518	11.66584778
29.478633763214	64.9722170346816	16.7136018633627	29.47881008	65.01108227	16.71360152	0.038865631
29.478633763214	64.9663017176997	16.7136018633627	27.36103425	64.84526011	12.45761345	5.82414556
29.478633763214	64.9653017176997	16.7136018633627	28.86030824	61.83789689	13.23528428	5.323228343
29.4039914880546	64.7436206672573	16.7136018633627	26.6523776	66.91672378	14.68008016	7.970867369
29.4039914880545	64.7436206672573	21.0433242158397	24.58618772	59.92581691	21.04332426	6.813403422
31.6133502335148	70.2611189350679	21.8177246468676	31.96159565	70.60936436	21.8177247	0.492493397
28.885534211	67.0518807523447	24.4256071653224	26.03259253	67.05188068	24.42560707	2.852941681
28.8855342110002	67.0518807523448	24.4323495260866	28.77703399	67.75671878	24.26797752	2.359780417
31.7371838953861	66.5741861000022	26.7072749039321	32.14669335	66.5741861	28.83764483	2.169371802
31.7371838953863	62.7454817355936	26.0360683856018	31.78300706	62.74548174	25.97934086	0.072923073
31.4694214699029	62.7454817355935	26.0360683856009	25.66105506	62.27941228	31.77717439	9.39136023
31.4694214699029	58.9850055011042	26.0360683856009	24.68488711	59.85199485	22.75052505	7.587909595
31.4694214699029	58.9840055011043	26.0360683856009	32.83493269	54.50530143	23.93617923	5.131563652
31.4694214699029	58.9830055011043	26.0360683856009	29.89833465	58.88393924	31.18403904	9.428399067
31.4694214699029	58.9820055011043	26.0360683856009	33.45872958	53.85918585	23.94292918	6.545746658
27.8996304308145	48.8161356623239	26.0360683856009	28.72359173	49.06807614	23.44175989	3.019170961

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
27.8996304308145	47.032507996742	26.2350209490641	26.12441872	44.96485891	27.03242338	2.839436564
27.8996304308144	47.0325079967421	26.236020949064	27.37711129	46.43616017	27.11673494	2.003178979
27.8996304308144	47.0325079967421	26.237020949064	29.65914735	42.12761495	24.52937867	5.483604448
27.8996304308144	47.2514084887347	26.237020949064	34.06373355	42.77086753	33.9464291	11.54083384
27.8996304308144	47.2514084887348	30.1247819832671	28.94274384	52.01860718	30.54475385	4.898024634
25.7434186910093	44.0237358602562	30.1247819832671	25.71821347	44.02373583	30.1225615	0.02530284
25.7434186910094	44.022735860256	30.1247819832672	30.55507662	47.73107042	32.65818922	10.01719534
25.7434186910093	44.0227358602561	30.3558557361985	30.18073163	48.32029982	32.22769732	9.58620967
27.65521077	44.022735860256	30.3558557361661	31.52001616	50.89228775	38.01036066	10.98721573
27.6552107699999	42.6651354464699	30.3558557361985	30.28185343	43.77834378	32.70178342	7.043480934
27.6552107699837	42.6651354464699	35.9678882546701	30.83636789	38.35208021	33.99399048	5.711258926
27.65521077	39.5531739126011	35.9678882546701	30.41452332	39.55317391	35.96788826	2.75931255
27.65521077	38.9139998006782	37.6692646659715	30.62796082	46.77730777	34.94066727	8.83821808
27.65521076992	35.8263649414244	37.669264666	31.80593192	45.60640645	39.41102857	10.76621751
27.4285342819703	33.2762277425474	37.669264666	27.42853428	33.27622768	38.61257115	0.943306484
27.4272525080758	33.2762277425473	37.669264666	26.37919279	28.3108891	38.48025156	11.05276225
27.2661940836537	26.9941991482511	35.3927779039443	27.26619514	25.90196542	35.39277783	1.092233728
24.8795906852191	26.9941991482511	32.7714140383398	24.87958822	27.09583401	32.67332021	0.141251684
21.0485560619617	25.4481196660487	32.7714140383398	22.07359754	33.01769228	30.23180819	8.049766298
21.0485560619617	22.1770542156733	32.7714140383398	14.86812736	22.17705421	27.08627601	8.397529002
21.0485560619617	22.0380313413381	32.7714140383398	21.70527032	21.60018691	37.91508039	8.932392927
21.0485560619617	22.0380313413381	35.165701662	20.73212412	24.23741148	36.78766314	6.929326091
25.8381828882569	22.0380313413381	35.165701662	25.83818458	22.03803134	36.60516078	1.439459118
29.1581155231139	19.9469446592225	35.165701662	27.39065822	19.10906735	34.23380192	2.166651987
29.1581155231139	14.3302230956489	35.165701662	29.15811552	9.518746656	35.77137383	4.849447835
33.2921008868321	14.3302230956483	35.165701662	32.11403346	10.63014558	35.85165647	3.943215754
34.8283457577718	22.5948558652922	35.165701662	34.82834577	24.45085722	36.05632865	2.058629996
43.9391557443804	22.5948558652922	35.165701662	39.25918273	24.78783876	35.71196052	9.890531084
43.9391557443804	18.4245283193755	31.3757749592857	44.45005227	17.91363181	31.37577496	0.722516784
37.4643577394887	18.6888760226561	25.2868873228596	35.94447387	20.12395641	25.28688733	2.090335546
37.4643577394893	18.6888760226561	25.2858873228616	38.46066343	17.33665094	24.22591115	2.23318621
42.6858294499313	18.6888760226561	25.2858873228616	38.38951699	19.65672727	24.71703453	4.440566438
42.6858294499313	18.6888760226561	18.4897886209648	39.07927218	20.57348801	18.57850652	5.646872091
64.1566735275033	18.6888760226561	18.4897886209648	62.61153544	17.95816147	22.4620849	4.324411312
73.3870533580202	18.6888760226561	15.0316445100062	77.03036191	15.51069798	15.03164451	4.834719524
73.3870533580202	18.6888760226561	1.51512158813583	72.1570689	9.179080442	1.515121588	9.589007965
80.0000000000001	18.6888760226561	0	87.03899122	21.09553754	1.216015821	10.64878101
Route: 3 Length: 391.238828953464 Demand Met: 2807						
48.2064271359152	39.2457115927605	0.045015683133374	48.20619517	39.24794213	0.08063613	0.03569097
48.2054271359158	39.2457115927605	0.045015683133374	43.74535734	43.87626012	1.779657186	7.961235625
43.7532416888552	39.2457115927605	4.47146497041774	41.57443341	43.13832473	6.475589725	5.186489261
43.7532416888551	39.2457115927604	4.47246497041773	40.81010844	38.77304558	7.861958026	5.734432078
43.7532416888551	54.8312226130271	4.47246497041773	45.78512338	48.76667443	13.05604142	10.70444172
43.7532416888551	58.8248359017449	4.47246497041773	40.92420024	52.54921675	3.399585878	7.535927257
43.7532416888551	58.8258359017449	4.47246497041773	45.47068469	56.96814934	6.687113785	4.238980951
43.7522416888551	58.8258359017449	4.47246497041773	44.98764045	56.96391467	9.231659535	10.72794423
43.7522416888551	58.8268359017448	4.47246497041773	53.04622082	62.56220406	2.597564218	11.46013038
43.7522416888551	58.8278359017447	4.47246497041773	53.70737401	57.8077763	9.994366281	11.42963583
43.7522416888551	58.8288359017447	4.47246497041773	44.96838238	64.05706864	11.93558957	9.942108139
39.3247290340368	58.8288359017446	4.47246497041773	37.58124673	53.7047325	1.291628295	6.278048118
38.873339904226	60.6942762530017	4.47246497041773	38.87334077	61.97418169	4.472466865	1.279905437
38.8723399040824	60.6942762530017	4.47246497041774	36.53251416	65.89826385	3.47943245	7.253690252
35.2419032052337	60.6942762530017	4.47246497041773	33.85806756	68.2147305	3.068667124	8.272925857
35.2409032052337	60.6942762530003	4.47246497041773	38.55825219	62.0328479	1.356643655	8.230604564
35.2409032052337	60.6942762530003	4.47346497041774	32.28903103	63.37386507	1.032108002	5.529867185
35.2409032052337	60.6942762530003	4.47446497041773	34.15128455	57.37934974	2.952751483	3.806785854
35.2409032052337	60.6942762530003	4.47446497041773	37.36735143	64.72519961	6.841621681	8.210035462
32.479330607244	60.1672324879196	10.0803840076079	32.47933058	60.09950546	10.14811096	0.095780428
26.5598857109595	60.6696925421981	9.11379434020218	28.17203359	56.51587977	9.985576368	4.557563307
25.8458900632089	60.6696925421981	9.11379434020218	25.84588775	61.17671521	8.212138725	1.034434548
25.080119446892	60.6696925421981	9.11379434020218	25.08011935	60.4806985	0.592321921	8.52356797
24.6574865768185	60.6696925421981	9.46510279712457	24.61643689	54.01115924	6.209992422	7.411713322
22.7575530840815	60.6696925421981	9.46510279712457	22.84438078	60.01413405	11.39370551	9.832099483
22.7575530840815	60.6696925421981	11.9213096972233	27.13020332	56.00735022	18.32075531	9.113612959
22.7575530840815	64.0643793855842	11.9213096972233	22.58317288	64.23875961	11.9213097	0.246610864
23.6536074077538	62.612278086407	19.6356371222174	26.36495426	64.10386589	19.00754119	5.012038977
23.6536074077537	62.611278086407	19.6356371222175	26.46280572	62.61127777	22.19141047	3.79783788
20.5309420995542	61.5072041029137	19.6356371222174	20.53092136	55.63617906	20.16527215	5.894866268
18.1171686181815	64.7785492468897	19.3374256769543	21.61039636	65.83676525	18.75923326	4.44331993
16.6338319854111	64.7785492468897	19.3374256769542	16.63383213	64.77854357	18.98571058	0.351715097
16.3300264171544	64.7785492468897	19.3374256769543	16.07158763	60.00636388	16.82852088	7.250262131
16.3290264171544	64.7785492468907	19.3374256769543	12.00297966	63.9466553	16.56981835	5.950994709
14.5110896657212	66.5848894921811	22.8082370483046	14.11476256	66.58488992	23.55512122	0.845524181
14.5110896657212	66.5848894921812	21.7519213513494	10.36857839	64.9958121	20.62230905	11.82219863
14.5110896657212	66.5848894921812	21.7519213513494	13.50520564	67.72241024	17.09707449	9.360297306
14.5110896657212	66.5858894921812	21.7519213513494	11.73654707	68.82383733	18.16264782	7.948897757
14.5110896657212	66.5868894921811	21.7519213513494	11.54525803	68.93314303	25.95468917	9.632544021
14.5110896657212	66.587889492181	21.7519213513494	14.01917911	69.22007201	23.43359605	9.959122763
14.5110896657212	70.4574150684695	21.7519213513494	18.15807888	79.40011164	23.44302335	9.804701845
14.5110896657212	70.4574150684695	21.7509213513494	18.49430275	75.1491321	23.37172362	9.770365975

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
14.5110896657212	72.684061771179	21.7509213513494	14.67447984	73.22055772	21.75092301	0.560824618
14.5110896657212	72.684061771179	18.9810997991304	20.16006997	73.55306832	21.43875646	7.784192094
14.5110896657212	72.684061771179	15.6918047851442	18.79013692	77.54174683	13.67079469	11.83768723
14.5110896657212	72.6627140648624	15.6918047851442	19.17901123	72.48982593	17.20855307	10.20159412
14.5110896657209	72.6617140648587	15.6918047851442	13.34199807	71.15108407	14.18117491	2.435319437
14.5120896657212	72.6617140648585	15.6918047851442	16.80968797	72.84815948	15.34934359	5.35823493
14.5120896657212	73.5991827544666	15.6918047851441	14.09860615	77.68853822	13.45994873	11.70742841
15.5068662569656	75.7160075400003	16.3994046458164	15.50686687	76.44859369	16.39940441	0.73258615
15.5068662569656	75.7160075400003	16.4004046458165	18.15532249	77.80652015	16.99185344	5.054973135
15.9638299988822	75.7160075400003	20.7798113705446	19.47269695	75.25893863	20.7798111	3.538510883
13.3908641013767	77.9345918466908	20.7798113705447	21.51917751	80.74471553	21.88319617	9.9567065
13.3908641013767	77.9345918466885	21.8110221687909	20.11668251	80.56671914	21.763779	7.222669816
11.3857575001436	77.9345918466884	21.8110221687909	10.77763243	89.00986935	18.62168793	11.5413795
9.46861262090145	77.9345918466885	21.8110221687909	10.28504553	75.43578797	21.16629174	2.70670664
9.46861262090145	77.9345918466908	22.7623890610381	9.01858207399999	78.03824041	22.65782791	0.473501375
7.93737362770601	77.9345918466908	22.7623890610381	3.05949055799999	82.05603574	19.35294441	7.23908529
7.93737362770601	77.9345918466908	22.7623890610381	6.979895184	73.91637244	25.14533012	7.031194882
7.93737362770601	77.9355918466909	22.7623890610381	3.380314451	80.99890539	17.02151813	11.39696855
7.93737362770601	77.9365918466908	22.7623890610381	3.795442881	81.20966501	27.41200193	11.97973034
7.93737362770601	78.6498753745055	26.9711297071938	5.779054124	82.01317499	31.17715184	10.01915756
7.93637362770602	78.6498753745055	26.9711297071938	7.936374341	83.63932008	31.96057141	7.056138248
7.93637362770602	74.8555014879654	26.9711297071939	4.203561784	71.28689241	26.51244139	5.184520227
3.64491789652848	69.7405042323505	26.020342014936	3.702577787	67.55965669	35.63856131	9.862533299
1.52082344952343	69.7405042323502	24.9036395624218	3.972668798	68.43095677	28.84137669	4.819982765
1.52082344952208	69.7405042323503	21.5213630097704	0.155166121999997	73.1143838	18.2350269	9.943054863
1.52082344952211	69.7405042323503	21.5203630097385	0.299902086000003	68.51958527	21.52036301	1.726641853
1.52082344952208	69.7405042323503	20.884186727992	2.76637406099999	66.09545945	29.36453565	9.314186257
3.27187416578812	70.7788227907778	20.3972525402171	5.863440787	76.06172049	20.11271942	5.891195528
3.27187416578812	70.7788227907778	20.3962525402178	2.544714587	74.45838234	20.47608884	3.751572119
3.27187416578812	69.7397604024191	16.9112157749637	1.009741561	74.32200243	17.21598932	6.745106086
3.27187416578812	69.7397604024194	16.9102157749637	3.705228073	66.5975084	22.49684982	9.299418871
3.27187416578812	69.7387604024192	16.9102157749637	2.885089549	70.78781924	5.964704064	11.83875801
3.27187416578812	69.7387604024192	16.9102157749637	6.04179221699999	70.01715429	8.958731963	11.62482668
3.27287416578812	69.7387604024192	16.9102157749637	3.336609071	66.34370608	12.08281041	10.13002568
3.27287416578812	63.5555038223408	16.9102157749637	0.793870075000001	65.00803843	8.045595465	9.318627115
3.89551178088873	63.5555038223408	16.9102157749637	9.088863996	70.57778186	13.84286783	9.588159879
3.89551178088873	63.5555038223408	16.9102157749637	8.93361225699999	64.19415642	15.31500377	8.119454693
3.89551178088873	63.0860442915047	16.9102157749637	11.71156616	63.23151575	10.39694521	10.95254356
3.89551178088873	63.0850442915047	16.9102157749637	8.01127751600001	61.69215045	17.84993877	10.57580758
3.89551178088873	63.0850442915047	16.9102157749637	10.63863267	61.64507704	12.52958841	8.169031835
6.09682062318422	63.0850442915047	16.9102157749637	3.16457285600001	61.67055704	18.73530868	3.732266773
6.28196545972507	63.0850442915047	16.9102157749637	4.692804385	58.08052349	25.21182896	11.75765381
6.28196545972506	54.9875698678704	16.9102157749637	6.962926975	47.87740863	12.6680673	8.307462013
6.28196545972506	54.9865698679681	16.9102157749637	0.0735544159999932	50.20291794	9.32702938	11.48330524
6.28196545972506	54.9865698679681	16.9102157749637	6.810990128	49.52757429	10.46442277	9.894324521
6.28196545972506	54.9855698679681	16.9102157749637	0.715064701000003	54.34039001	17.34040242	5.620649576
7.97362590941312	48.584866729482	16.9102157749637	3.857750749	53.93522034	16.19502855	9.829595519
7.97362590930513	48.583866729374	16.9102157749637	7.342191074	50.36568708	15.52547031	3.656790591
7.97462590930419	48.583866729374	16.9102157749637	7.974625907	40.8370263	13.38849506	8.509762243
10.3028824246163	48.583866729374	16.9102157749637	8.736047039	47.86465463	22.63362148	7.075947311
10.3038824246165	48.583866729374	16.9102157749637	10.30388261	47.84277995	17.55376223	0.981509885
10.3038824246165	48.583866729374	16.9102157749637	11.99216143	50.52822644	12.13005328	8.464820885
10.3038824246544	48.583866729374	15.3139881070377	10.84189087	50.74783931	12.90312929	3.28397178
10.3038824246544	48.583866729374	14.3819453142304	9.954481978	42.50823893	15.05115407	10.6166074
10.3038824246544	48.583866729374	14.3819453142304	16.47526591	49.4455512	6.794569926	9.818184126
10.3038824246544	48.583866729374	12.3002032869497	13.89109091	56.92730438	11.2581209	9.141496171
17.6587190715132	48.583866729374	12.3002032869371	9.89102482200001	52.16610985	9.967821485	9.993987041
17.6587190715132	48.583866729374	10.8467550801095	20.72246404	50.29048837	10.84675569	3.507005939
17.6587190715132	48.583866729374	6.96163427080568	18.13426387	49.15791018	7.430088572	1.2520007
17.6587190715132	48.583866729374	1.65036852397719	10.20301226	47.6234059	3.00365475	9.015245558
17.0373672629089	48.583866729374	1.65036852397719	17.80089583	46.64512233	2.63462135	2.679415185
17.0373672629089	28.3124681193954	1.65036852397719	16.76117492	28.31246812	1.562447455	0.289848796
24.2349393780954	17.9885673622118	1.65036852397719	24.23492671	17.98856994	0.400117348	1.250251176
33.7865978216049	17.3913277068392	1.65036852397719	34.15723352	12.84614068	2.236297964	4.597761329
33.7865978216049	14.6760958523119	3.90469785405914	35.62470684	10.73896033	9.362523366	6.976212454
42.3424660579965	6.23136163940663	3.90469785405914	38.07401644	11.09458783	4.920078282	6.973490769
42.3434660574037	6.23136163940662	3.90469785405916	42.34346606	5.769949569	4.366098536	0.652527155
63.2238111346519	6.82613956859968	1.63207965695862	63.24920239	4.015695007	1.646238652	2.810594924
77.5572881343873	15.6109378208535	1.63207965695877	76.68650337	13.86956158	1.8774276	1.962359022
Route: 4 Length: 433.7495009689 Demand Met: 3000						
70.718224165511	19.549302262955	3.29842092985168	70.71952594	19.54937922	9.466423791	6.168002999
65.5150150199252	18.9935174179883	3.29842092985168	65.51501196	11.68636529	3.24100338	7.30737771
65.5150150199252	18.9935174179883	10.1246707261386	64.88897514	21.58345165	8.959362969	5.371825022
65.5150150199252	27.6442329907629	10.1246707261386	62.17589976	23.53474989	9.188656209	5.377142852
53.6915060727074	27.6442329907628	10.1246707261386	55.07321291	28.85442279	12.55016086	3.578504928
53.6915060727074	27.6442329907629	10.1256707261386	50.20668952	26.40233109	10.32749181	3.704996422
53.6915060727074	29.4013889184102	17.198306988212	54.00076983	32.50218762	13.15428984	8.205190824
53.6915060727074	29.4013889184102	17.198306988212	58.14893689	37.55022655	17.10511358	9.288752836
53.6915060727074	29.4013889184102	19.8474603914474	55.9549233	32.80200534	27.96563646	9.08801586
53.6915060727074	29.4013889184102	21.0454008317362	49.49892788	30.73465222	20.32700892	9.148611436

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
53.6905060727074	29.4013889184102	21.0454008317363	46.26887105	26.53209753	18.29584073	8.81744986
51.8163606416151	29.4013889184102	21.0454008317363	51.99282443	27.99909333	30.19770488	9.260790549
51.6867259263463	30.4302163679695	21.0454008317363	48.88810081	29.6929228	28.59078684	11.17097838
51.6867259263463	30.4302163679695	21.0454008317363	47.52772375	30.54529654	17.6892221	5.345510096
38.9785254136108	34.3767785721318	21.0454008317362	42.45831495	25.01806118	18.69304905	11.16727795
38.9785254136107	34.3767785721318	24.754356148604	36.2315122	27.60710766	22.87055815	7.544747892
38.9785254136108	35.1804226681148	24.754356148604	40.05041388	28.81118981	27.86495236	7.168813073
38.9785254136108	35.1804226681148	24.755356148604	41.09480481	34.92509896	27.7383049	6.686212606
38.9785254136108	35.1814226681148	24.755356148604	39.35568633	35.06788426	34.69629234	9.948736286
38.9785254136108	35.7931093883856	24.755356148604	39.91233765	41.2977364	28.26450372	9.100834641
31.8192170638944	35.7931093883856	24.755356148604	31.80606468	35.45021175	24.23960074	0.619311075
22.9772208328476	35.7931093883856	25.5900841814322	19.64225061	34.99214308	28.17560222	6.554722745
22.9772208328476	41.6592076751699	25.5900841814323	28.08331623	42.02257662	27.79667825	9.317039589
22.9772208328476	41.6592076751699	25.5900841814323	32.06711817	41.12824267	27.14001544	9.236365321
19.8060895633691	41.6592076751699	25.5900841814323	24.77779172	44.04083387	26.11612996	11.013687
19.8060895633691	41.6602076751753	25.5900841814323	19.40209516	41.66020767	37.5577128	11.97444555
19.8060895633691	41.6612076751754	25.5900841814323	19.77510428	38.58926296	16.64922472	11.91376449
19.8060895633691	43.155952092876	23.0801577389997	27.06311365	42.64274924	23.39166283	7.281813729
19.8060895633691	43.155952092876	22.2951983233827	17.93093151	43.30092715	17.11460176	5.511425972
19.8060895633691	43.155952092876	22.5150086806943	18.21138052	45.58660191	25.83715904	4.414503197
19.8060895633691	43.155952092876	22.6854901226897	9.19676513100001	46.15569372	17.99642834	11.9809647
19.8060895633691	50.6544964543713	23.0801577389997	22.68802089	46.28526246	22.76975049	10.38254064
13.2177106429838	55.1607484318389	23.0801577389997	13.21771043	55.16074821	22.9111302	0.169027539
11.9607726251544	59.9789908210832	27.9703283268364	11.86612062	56.83051802	27.8782456	3.1512409
11.5270093033616	59.9789908210984	30.1231410448501	3.684518627	54.75346427	34.67646632	10.66155854
11.5270093033597	60.2540076452958	31.1790811415573	3.390983182	60.32064994	30.61068338	8.156128877
11.5040623839132	60.3931834972311	31.1790811415573	14.52745655	66.82146945	34.730647	9.209129847
11.5040623839132	60.3935005686383	31.6172207371304	14.35540419	64.70998039	34.26175056	9.721773775
11.5030623838995	60.3935005686256	31.6172207371304	8.88093920200001	67.16779099	33.76570468	7.575125342
11.5030623838995	60.3935005686256	31.6172207371304	9.964092428	69.02740379	34.44916177	10.49120227
11.503062383898	60.3935005686698	31.6182207371304	8.689838933	62.80875147	27.12937634	6.672826006
11.503062383898	60.5265150192911	31.6192207371304	8.07711459799999	60.52651503	33.72017469	4.01884632
11.503062383898	60.7135633576922	31.6192207371304	14.06057656	63.93249207	34.35643485	5.381459732
11.5030623838964	60.7145633577095	31.619220737133	18.97844246	66.0992932	30.20753751	9.320379407
11.5030623838964	61.6944313637168	31.6192207371329	17.25601024	61.69443137	35.1920429	6.772109512
11.5030623838964	64.6818096508051	31.6192207371329	19.29354577	63.34226321	29.80733532	9.732805781
11.5030623838964	64.6828096508051	31.619220737133	9.89788954300001	67.94003152	30.38024953	3.836811672
11.5020623839164	64.6828096508091	31.6192207371329	11.17807544	66.07771318	32.92555185	3.944211846
11.5020623839412	71.1568963570714	31.619220737133	11.56644578	72.10851879	29.32762892	2.482161061
8.67523481471713	72.4837297229993	31.619220737133	8.675234817	76.17385221	29.29611493	4.360484441
5.38504596278955	71.6214517044442	31.619220737133	2.559418382	66.60707534	29.94444397	5.994415632
5.38504596276586	71.6214517044442	31.620220737133	5.020361565	69.58798476	32.44258164	2.661868193
5.38504596276586	71.6214517044442	38.6518439098781	1.09685186199999	69.20060768	38.65184391	4.924336954
5.38504596276586	77.2304964112328	38.6518439098781	1.83782096500001	81.06813079	39.8464095	5.360711684
5.38504596276586	77.2304964112328	38.7874340728102	1.696022601	79.3379408	35.04130759	6.739019376
9.50899563458795	85.5193160662804	38.7874340728067	7.992357197	82.08091397	36.27596397	4.51998708
9.5089956345879	86.4845923413178	38.7874340728067	10.08146406	81.46406963	37.62633094	5.184740001
9.5089956345879	86.4855923413178	38.7874340728067	9.940095688	86.998178	38.16021851	0.917600499
9.5089956345879	91.4538905618171	38.7874340728067	5.231683223	94.88567828	37.04813984	5.753061171
14.1136195669164	91.4538905618169	39.3223559819927	14.30638295	91.72702037	37.41288443	2.704929464
14.1146195669163	91.453890561817	39.3223559819927	12.48771043	90.90107319	36.2773466	3.496358466
16.8508056780822	91.4538905618173	39.3223559819927	16.85080568	91.45389056	39.93862668	0.616270698
18.3782254845389	91.4538905618171	39.3223559819927	18.21730526	92.48725442	38.15120003	1.5701409
18.3782254845389	94.8212674565105	35.6225425755717	18.65944439	93.90622028	36.26618878	1.153549238
25.3443633908153	94.8212674565105	35.6225425755716	22.00240146	99.12603644	39.9893956	7.885601786
25.3443633908153	97.9440901631524	35.6225425755716	25.64004891	98.33585155	37.39052093	1.834844509
25.3443633908153	97.9440901631539	32.8105034827661	25.35918107	97.93925835	33.70510702	0.894739291
25.3443633907675	99.141954546002	32.5246283163928	27.50072899	99.76767751	31.96071673	2.315046026
25.3455320346943	99.141954546002	30.3567167961588	25.34553204	99.20543489	30.35671629	0.063480344
26.1398589685838	99.141954546002	25.4685952469947	23.65267964	99.40598609	29.7230242	5.864138835
26.1408589685837	99.1419545459916	25.4685952469948	28.69202489	99.34571575	27.8214658	3.476487599
26.1408589685837	96.4313633000026	25.4685952469948	31.65500689	99.46882276	25.89517482	7.475813284
30.0874508730072	96.431363299997	25.4685952469953	27.03699297	98.99807723	18.13725322	9.045435578
30.0884508730082	96.431363299997	25.4685952469956	30.08845088	94.04600611	25.46859145	2.38535719
36.0045114898165	96.7369198005668	25.4685952469954	35.84999591	97.26233792	26.33021041	1.02094072
37.1138163356892	97.1566040273368	23.4394010105512	31.89808649	95.62749105	29.09944527	8.151929048
37.1138163356892	97.1566040273368	23.4394010105512	37.35558564	97.30806318	23.47070651	0.287005759
37.1138163356892	97.1566040273368	23.4394010105512	39.84944538	96.227912	20.60442108	4.047622309
37.1138163356892	97.1566040273368	23.4394010105512	36.43143728	90.48214242	22.55722277	6.954373264
37.1138163356892	97.1566040274354	19.8824390519126	37.87107476	99.67477247	15.46291348	5.142647072
37.1138163356892	94.3443176810983	19.8824390519126	44.53236455	98.59505273	17.96036731	8.99567986
37.1138163356892	94.3443176810984	21.5440645692187	36.26720319	91.81523904	18.88940672	3.763004237
36.3598029682824	87.6279904833637	21.5440645692201	33.91919319	90.52236574	22.93790886	7.193036058
36.3598029682824	87.6269904833636	21.5440645692191	41.14116704	94.61634345	23.98672915	11.9580341
36.3598029682824	87.6269904833636	21.5440645692191	40.55838899	87.88304878	23.6255072	7.94496914
36.3598029682824	87.6259904833636	21.5440645692192	32.87814817	90.10176773	12.94837243	9.598818493
36.3598029682789	87.6249904833861	21.5440645692252	33.71990859	84.56649705	17.88810749	11.87467854
36.3598029682788	87.6249904833691	21.5450645692551	26.49994117	86.49656314	20.04082186	11.41565502
36.3598029682853	87.6239904833952	21.5450645692268	30.46512782	92.10545477	16.97866967	8.699579279
36.3598029682804	85.4683168848644	21.5450645692267	32.77989789	83.25231939	22.10896744	4.247864371

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
32.9323621090065	85.4683168848682	21.5450645692267	31.67974116	78.20082263	20.94127433	10.5302733
32.9323621090108	80.9888463335294	22.4278796009713	32.56942546	80.98884638	22.4278796	0.362936649
38.3658090655243	80.9888463335298	23.1545165199555	38.78697828	81.20736169	22.75217398	1.751750667
42.6325572012789	80.2538909894465	23.1545165199554	43.12816365	79.63219046	23.15451647	0.795070626
42.6325572012789	80.2538909894466	24.6478046467312	46.93472918	83.75304242	25.57195373	7.122281837
42.6325572012789	80.2538909894466	24.6478046467312	40.76978451	74.94346594	30.5932008	8.186468819
42.6335572012789	80.2538909894465	24.6478046467312	40.77647626	81.23711291	32.65865455	8.680043042
44.5775934297858	80.2538909894465	24.6478046467312	49.21219028	82.18677234	33.0110742	11.80432558
44.5785934297856	80.2538909894465	24.6478046467312	44.66930475	80.79724102	25.59577081	1.096402137
44.5785934297962	80.0443705439051	20.5194867523556	44.56064253	79.77318093	20.51948675	0.271783078
44.7551865629626	81.4688875395568	20.5194867523556	45.13867401	81.86371268	20.6390675	0.563248674
46.9607837755022	81.4688875395567	20.5194867523556	49.62844822	78.65994225	20.1083463	3.895592856
46.9607837755022	81.4688875395568	19.9590155386402	49.77274656	84.13753559	18.23448828	4.242971999
56.0958795443782	82.847972315002	19.9590155386401	58.40265516	82.89286098	16.95320583	3.789211097
59.0160247972767	82.847972315002	19.9590155386402	59.01602486	86.99268685	19.95901958	4.144714535
60.9313594016563	82.847972315002	19.9590155386402	61.30013954	82.69641043	22.92622968	3.087682485
60.9313594016563	82.847972315002	19.9590155386402	60.70093329	80.64454551	19.95511414	3.209176581
61.6783446682209	82.847972315002	13.4703304232305	61.67834468	82.51967341	13.24261796	0.399541158
68.1155712445364	83.7252771565102	13.4703304232305	68.11557125	90.29313921	19.6765572	9.036263761
68.2417249764457	83.7252771565103	13.1463892247064	69.09548968	84.07624055	12.89569188	0.956524245
67.7244043263758	76.447949796244	13.1463892247064	62.03157877	81.16617953	8.458189727	8.754951123
67.7244043263757	73.0846847444326	13.1463892247064	68.36889636	72.61479797	11.90493723	6.100291297
67.7244043263758	73.0836847444326	13.1463892247064	70.36283848	70.39401036	9.239076068	6.760808749
67.7244043263758	70.7171374549547	13.1463892247064	76.04244622	64.45001766	13.22117777	10.41499903
67.7234043263759	70.7171374549547	13.1463892247064	65.09617026	64.32634731	13.59892336	6.924546531
62.9628526775255	64.7246209402754	13.1463892247064	61.64088805	64.72462094	13.53456764	1.377778269
62.9628526775255	60.4291021605887	7.50062438157044	59.0134746	66.34233581	2.610073656	8.63026105
64.2376045710714	60.4291021605887	5.16748088235866	59.77266019	58.01872841	1.019723189	6.553588622
64.4255657153239	60.4291021605887	5.16748088235866	65.55566867	66.58332744	7.127202217	6.556838353
64.4255657153239	60.4281021605887	5.16748088235866	61.56325619	58.635877	0.997422198	7.786489382
64.425565715324	57.098899429817	5.16748088236119	62.81703196	55.94894639	0.04067048	5.494902887
64.4255657153239	47.9988928590197	5.16748088236247	63.59211348	50.34808715	9.20862338	9.725987624
64.425565715324	47.9978928590195	5.16748088236248	63.41360315	44.69674786	5.219771375	7.070238855
64.425565715324	47.9968928590195	5.16748088236107	63.76560063	37.45231942	9.842542758	11.55334525
67.0245406374268	47.9968928590195	5.16748088236247	67.10787364	49.80646667	13.82525922	8.845260172
67.0245406374263	47.9958928590197	5.16748088236248	64.75792457	49.92103542	3.951957012	4.153788299
67.0245406374243	44.0927053484042	1.14700034456869	57.35658457	43.71456461	3.914439364	10.0633535
77.2861451735774	44.0927053484007	1.14700034456966	77.14427045	45.25079579	0.327384457	1.425858377
Route: 5 Length: 524.174436914782 Demand Met: 2903						
75.756341393163	60.0220000796852	4.77900132999998	75.75634139	60.02200009	5.726434896	0.947433566
66.163855421093	63.8943312347568	4.77900132999999	65.33791464	63.72798066	4.706052333	0.84567857
54.1510215912201	63.8943312347569	2.37048807000006	54.15102156	63.89433124	1.875052021	0.495436049
53.5600529565612	66.179443828149	2.37048807000013	52.45383187	66.17944394	1.57361944	1.363350544
53.5600529565641	69.2709572745309	5.57898095878413	56.84900895	69.27095699	14.65228976	9.651018813
53.5600529565641	70.8029022610707	5.51445616579483	53.60239056	70.80290226	5.406808424	0.11567415
53.5600529565641	73.3950851829741	5.51445616579483	53.90080059	74.55382457	8.588853077	11.74270355
51.1775436714556	73.395085182974	6.39113702199361	51.17754367	73.39508539	6.606709632	0.21557261
51.1765436713932	73.3950851829742	6.39113702199361	41.95376322	74.60739468	6.926728294	10.5272795
48.0254378653863	73.3950851829742	6.39113702199361	39.75179858	71.51477588	1.359571846	9.864345808
36.9374327018777	73.3950851829744	6.03428020000283	36.17809574	80.13104248	5.688631409	8.234427368
36.9364327018777	73.3950851829742	6.03428020000283	38.24583972	80.95791524	3.839199962	10.77332683
36.9364327018777	73.3960851829741	6.03428020000283	38.19879917	73.45302115	2.159211899	11.60064907
36.9354327018779	73.3960851829742	6.03428020000283	34.30971303	75.90183293	2.096267325	10.30780315
35.0366229678696	76.319026535225	6.03428020000283	35.03662295	76.31902131	1.401481412	4.632798788
31.3418362517045	76.7010114909973	6.46215484127212	31.34183617	77.86791685	6.462154326	1.166905359
28.7421207019985	75.5720125807947	8.90163359846654	28.44331265	74.98671685	9.740464776	1.065596119
28.7421207019985	74.7605624830972	10.2977777054872	24.66562586	67.58605744	10.297776	8.251747258
28.7421207019985	74.7605624830972	16.2149349787051	28.17365085	71.94302821	19.49378883	4.360337135
28.7421207019985	80.6990976862247	16.2149349787051	29.05539546	78.84402949	14.28609887	4.430792212
28.7421207019985	80.6990976862247	16.2139349787051	24.57644237	79.57543571	13.43961074	7.621327433
28.7421207019985	80.6990976862204	14.7860886393017	28.34961296	82.66841267	14.80317352	2.008122438
28.7421207019768	86.7982956044759	12.402025522018	28.95022635	86.79829568	12.40202554	0.208105648
28.7421207019985	90.5330096134226	12.4020255220181	33.84742868	94.52834747	10.85109907	8.71001742
28.7421207019985	90.5330096134226	12.4020255220181	31.03913924	88.81924735	11.29281098	5.700862296
28.7421207019985	90.5330096134225	10.3234523470814	36.90788531	88.78292268	9.064555312	8.871911482
28.7421207019985	90.5330096134226	10.3224523470814	29.03165996	90.53300961	6.710005169	3.624031953
28.7421207019985	90.5330096134227	11.9456238668455	30.51609732	92.20951413	14.80192542	7.873323153
25.4178630640164	93.1808159757403	14.2887501853799	24.92385591	92.07997464	15.00916266	3.317074037
25.4178630640164	93.1818159757465	14.2887501853799	25.24294214	93.18181598	14.28875041	0.174920924
25.4178630640164	93.1828159757464	14.2887501853798	23.10855555	93.46528062	15.33870171	6.046811031
25.4178630640164	95.4891153560951	18.9687539029068	22.19955839	99.83998701	15.37683497	6.495340695
25.8941779213509	96.6499465479529	18.9687539029068	27.32463884	98.08040747	18.9687539	2.022977234
21.650126711552	93.3833159265644	18.9687539029068	21.53298817	97.76613815	23.69582939	6.447332374
21.65012671154	91.0392239607773	18.9687539029068	17.22630202	94.08640458	22.99978352	10.84424377
21.65012671154	91.0392239607773	19.789697108775	22.62104276	94.03699994	18.3046068	3.483508579
21.65012671154	91.0382239607766	19.789697108775	20.03955091	90.83830295	21.35984013	2.258156755
21.6501267115421	90.4920961071469	25.9956807543944	21.63379999	90.72848541	25.0330528	0.991362215
20.7512981452232	88.7330340896166	31.5470299339722	20.75129811	88.7330358	32.51930493	0.972274996
20.7512981452232	86.6147175415939	30.7009669030001	20.16675465	86.45561332	33.59426088	5.662375247
18.8550020186741	86.6147175415939	30.7009669030001	18.85500198	86.61471751	28.9549492	1.746017703

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
18.3152372727102	83.3734600658664	30.7009669030001	18.31523717	76.27495825	29.81755027	7.153261702
16.8626487656543	86.7692855093998	30.7009669029996	17.38954679	82.23173111	30.2609052	4.9464631
16.2645725112904	86.7692855093997	30.7009669029996	14.92906226	79.42060964	37.22040132	9.914113666
15.613601238693	86.7692855093996	30.7009669029996	9.701793671	81.23141394	32.23008983	8.243525166
15.613601238693	86.7692855093995	31.5596328294299	10.82142722	82.89323555	36.78865334	9.472743412
15.6136012387047	91.7888539479998	31.5596328294299	16.23739593	85.87006787	34.99641701	9.998633909
11.1311468495223	91.7888539479998	31.5596328294299	16.10416337	94.62212285	35.78598723	7.114799892
10.3543998304423	91.7888539479998	31.5596328294299	10.35439985	93.61856888	31.55963283	1.829714932
9.50566361657034	91.2674587967322	31.5596328294299	9.577914639	89.11916471	27.81169318	4.320583214
6.74777764538656	91.267458796732	31.5596328294299	3.115821998	88.00026043	26.66042774	11.67905671
6.74777764538649	91.267458796732	31.5606328294225	6.256438132	90.66257931	27.09179537	10.99795307
6.74777764538649	91.2674587967321	31.5616328294225	5.209294544	90.50333801	29.97691556	7.245222646
6.74677764538548	91.2674587967321	31.5616328294225	5.333729823	86.89695613	31.50319232	7.779774892
6.74677764538548	91.2674587967321	31.5616328294225	12.03430063	87.78817585	32.36153594	9.339380238
5.84026823044326	89.4611065417515	32.7992585639564	5.838459994	89.46110654	32.98505569	0.185805925
5.84026823044326	87.4475939044125	30.972965458392	5.912402555	83.10767778	28.97692543	4.777473299
1.94234627881778	87.4475939044125	30.9729654583919	0.539457489	84.81338557	26.32883597	5.520424731
1.94234627881778	87.482304855139	37.8434180832808	2.643010323	87.48230483	39.26134045	1.581592217
1.88481624806374	98.214833071927	37.843418083281	1.662890125	98.21483308	37.96621421	0.253633777
1.88481624806374	98.8972610394502	28.7773125494481	3.212591442	94.51392157	23.83849287	10.08518593
6.70734384971644	98.8972610394502	28.7773125494481	5.819691822	97.53170939	24.16806715	10.47278678
6.70734384971642	98.8972610394502	26.2160494437446	7.810086676	100	26.21604958	1.559511127
6.70734384971642	98.8972610394502	26.2150494437446	11.04946885	95.30278919	26.87229799	11.15137795
6.70734384971644	90.2358255406791	26.2003037238635	8.980893435	92.30918249	24.9496481	10.59560796
6.70734384971564	90.2358255406791	25.3383708503231	7.17818211399999	91.76838261	25.47562666	1.609117439
6.57919437428873	90.2285732750444	23.9511045155599	6.57919393199999	89.24907689	23.95110219	0.979496385
4.14577298174147	90.7953888612451	22.9696071355982	3.553988961	91.38716753	22.96960314	0.836905203
4.936558280833	90.7953888612451	20.203877947167	6.625140742	98.72893978	20.20468371	8.11126017
4.936558280833	90.7953888612451	20.203877947167	1.72500424899999	93.73701725	20.97210735	6.881927737
4.93655828083301	90.2588668987192	19.1372830781757	2.88784862599999	89.80188387	16.96831616	3.077223153
5.79312025077076	90.2588668987192	19.1372830781757	5.793118726	87.72031575	18.95737877	2.544917974
7.87382388990579	90.2588668987192	19.1372830781757	9.921883095	86.8721598	22.00737941	5.099750684
7.8748238899058	90.2588668987192	19.1372830781757	9.98481624199999	87.60870523	18.9809529	5.654212003
9.04510310206881	90.2588668987192	19.1372830781757	13.01348985	89.5505908	15.47048063	6.625491116
9.04510310206881	93.0561935788969	19.1372830781757	8.327911253	95.97957355	16.39239366	8.978439052
15.4871091080758	93.0561935788969	19.1372830781757	14.02380259	94.55773265	18.6627295	2.149671288
15.4881091080759	93.0561935788969	19.1372830781739	11.28159713	86.83718755	19.13922705	7.508047868
15.4891091080759	93.0561935788969	19.1372830781742	11.51332542	99.95442641	21.54207323	9.875636287
18.1027054905189	97.8322616693517	19.1372830781823	18.10270516	98.29192556	19.61359774	0.6619415
18.330932923136	97.8322616693518	17.8698680719087	18.56973911	98.93410982	17.86986814	1.127429706
18.3309329231358	97.8322616693518	13.9964983030206	17.81960057	98.01765152	13.9964983	0.543902723
18.3309329231356	97.832261669351	10.709692274013	22.06521104	97.80973943	1.986453498	10.44097889
18.3309329231356	97.832261669351	10.709692274013	17.25875189	95.69940805	8.290437664	3.398739413
18.3309329231356	97.832261669351	10.709692274013	23.23282295	99.37897746	14.24859303	9.140009252
18.3309329231356	97.832261669351	10.709692274013	21.95406549	97.08230078	10.07565883	5.310921574
18.3309329231356	97.832261669351	10.709692274013	19.55892343	94.48515334	9.227774263	8.137719702
18.3309329231356	97.832261669351	10.709692274013	21.61123904	90.19731465	15.12916055	9.443600344
21.4730416459877	97.8322616693542	1.37353356202124	20.42707279	96.69258649	1.544902576	2.602601065
39.4705372140128	97.8322616693543	1.37353356202124	39.47053756	98.01039691	0.046804559	1.338634383
46.2582597458295	90.884267334463	1.82866793726308	46.25821854	91.17761288	0.218810451	1.63636571
51.8480394382479	90.8842673344623	2.77774896973039	49.59427698	92.51123595	3.551090207	5.147122326
51.8480394382479	85.5820931799803	2.77774896973039	52.05342714	85.82620662	0.803032132	2.610320997
51.848039438248	85.5820931799803	4.52904147129175	58.00620671	94.64720593	1.304858734	11.42342539
51.8480394382481	82.1026041030559	4.52904147129176	51.98537923	93.03310405	5.658677856	10.9895755
52.3945254287308	82.1026041030563	4.52904147129176	47.92908542	80.11129273	4.265931676	4.896396861
52.3955254287285	82.1026041030608	4.52904147129176	49.55654528	80.81624315	0.169379697	5.359214828
55.7308290395735	82.1026041030608	6.16641190915306	55.75342338	84.56592915	0.703415223	5.992730061
55.7308290395735	81.0587046132851	7.50492408899283	55.73082902	81.05870461	7.770192012	0.265267923
55.7308290395735	79.8065811461949	7.50492408899283	53.08761619	83.0335557	12.88369987	11.99564131
55.7308290395733	77.787285588051	7.50492408899283	57.82109764	79.24611201	0.587934441	11.76834886
58.2152383783812	77.787285588051	2.69509978314053	58.21523833	76.77458472	1.682398914	1.432175303
63.6803789051152	77.9611642199999	5.70566465935573	63.68037897	79.29990004	5.705664659	1.33873582
63.7139812977908	76.979206823014	5.70566465935573	61.63608438	74.03409399	0.746346368	7.121975094
63.7139812977908	74.4165442799803	6.2032832139996	61.14896118	72.70410502	7.635652533	3.400508534
66.8108788702607	72.193378245109	6.2032832139998	66.81087893	72.19337817	6.977880898	0.774597684
69.1263439939705	69.4594230180838	4.57259653997482	69.12634406	69.4594231	3.844630021	0.727966519
70.9436594962374	58.1456075431283	4.99459283799991	70.94365949	58.14560753	5.076539278	0.08194644
94.864881436	57.6821517338988	3.06936073863625	95.77662579	57.68215173	3.069360741	0.911744354
81.6433831388404	33.4594214187609	0.561118472868745	86.50661976	33.33916758	0.489048022	4.865256989
Route: 6 Length: 492.09154137121 Demand Met: 2926						
80	46.0041789151662	0	84.14082278	54.46253046	0.380513445	9.425227564
80	54.2018319997017	8.29183736874198	79.86750899	54.35421653	8.27403967	0.202710806
80	54.2018319997017	8.29283736874353	87.34079917	59.37931572	10.08579475	11.8500657
80	54.2018319997017	8.29283736874353	85.71414415	51.67250379	7.296357424	10.80797757
80	56.897892250981	17.605070155239	78.85550393	52.04144231	24.20403351	8.272925398
80.001	56.897892250981	17.605070155239	83.55927983	59.64747077	24.27812457	10.99948591
87.0839659811934	56.897892250981	17.6050701552389	85.16088414	60.47696067	19.97453885	4.793291165
87.0849659811934	56.897892250981	17.6050701552389	90.50689197	55.43830225	17.11301088	10.39640446
87.0849659811934	66.1715882087348	17.6050701552389	93.29522257	74.82458329	19.9847248	10.91349472
87.0849659811934	72.6787630037258	17.6050701552389	91.59995025	72.67875795	22.12004218	6.385143329

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
84.2786088660022	81.3656084177831	17.6050701552389	83.77232341	73.14211564	19.82850896	8.533805631
84.2786088660021	81.3656084177844	15.0472038090383	91.90328388	76.16243153	11.12653143	10.02897755
84.2786088659999	87.5818934627937	14.0731422942112	82.09017124	81.333147	13.10533341	9.364452955
84.2786088659997	88.8790790862204	14.0731422942112	82.53992082	88.87907996	14.07314191	1.738688046
86.1092169123632	91.3279567650804	11.1218413525672	86.10921689	91.46882481	10.98097302	0.199217703
89.3159618245879	91.3279567650796	14.3611522458683	86.37403118	99.02923308	15.37465632	11.96387757
89.3159618245877	85.8363768596609	14.3611522458693	91.04765146	90.60180149	20.03455373	7.6089096
89.3159618245876	85.8353768596562	14.3611522458689	97.99058573	82.84537681	12.83735391	9.301137649
89.3159618245877	85.8353768596563	14.3621522458694	93.12739448	86.70709298	18.39915073	11.17874385
89.3159618245878	85.8353768596576	29.9459196568516	87.63411723	89.72076827	28.65831969	4.425243646
92.1674322371744	85.8353768596576	34.9098148781008	94.75890926	85.83537613	36.18471901	2.888102094
84.5434790095031	81.4007680406057	34.9098148781008	86.75397464	75.23932777	39.5614605	8.469131771
78.5840908603419	81.4007680406057	34.9098148781008	81.4352048	82.89764497	33.18556014	3.652744946
75.2099824915925	81.4007680406057	34.9098148781008	75.20998283	80.5662569	34.55930276	0.905134017
75.2099824915925	90.835513801095	34.9098148781008	76.48394754	93.81500316	33.05082675	3.73579719
74.5796992655537	94.866919597438	34.9098148781008	74.57969734	99.83821951	39.01985633	6.450291742
66.4394493011245	93.3146489884039	34.9098148781008	63.88368354	92.98872817	38.82161587	4.684052733
66.4394493011245	93.3146489884039	34.4051727521282	64.96530116	93.98228963	34.40488013	1.618288248
66.4394493011245	89.5802294210238	34.3919360887497	66.59307852	88.41880362	32.58136924	2.156539854
66.4394493011245	89.5802294210237	34.615371180289	64.88497046	82.96772641	30.52764719	9.339812785
62.2017430200823	89.5802294210237	34.615371180289	63.32241418	89.29380754	27.27800065	7.42798409
62.2017430200824	89.5802294210236	36.0223414385621	62.20174968	80.96664236	37.77358899	8.789809443
62.0367556081108	90.5906610759987	36.0223414385621	68.01446808	90.26524455	37.65674979	9.658401998
62.0367556081108	90.5906610759987	36.0223414385621	61.4906739	91.40517217	33.71736683	5.140621126
62.0367556081136	90.5916610759815	36.0223414385621	62.03675317	91.42777069	38.34727303	2.470705606
56.1567193520759	90.5916610759812	36.0223414385621	57.84005051	97.24933499	35.2604133	10.98084378
56.1557193520759	90.5916610759814	36.0223414385621	56.15571936	89.41500769	36.83882342	1.432185748
51.1232768504881	90.5916610759813	36.0223414385621	53.27314218	89.6748569	31.66096453	11.35118685
51.1232768504881	90.5916610759813	36.0223414385621	51.44475874	86.59474587	38.70943792	4.908082369
51.1232768504598	91.1574759380015	36.022341438577	43.63164404	99.67485887	36.08960829	11.34349589
48.82360524	91.1574759380015	35.9745547715321	48.82360524	98.37839062	35.9745595	7.220914682
48.2473315791183	91.1574759380015	35.9745547715321	43.04035221	95.37042711	39.63020675	9.4350131
48.2473315791183	85.841147514113	35.9745547715321	49.19512952	89.44346883	37.79505672	4.342724929
48.2473315791183	82.3616614785898	35.9745547715321	45.3176187	83.7901857	37.67961833	4.538711056
48.2473315791183	82.3616614785898	35.9745547715321	47.34853229	74.63427391	38.87043339	8.300992216
47.9935534799657	74.7477703760047	30.2774750824859	49.38151416	71.84627519	34.52041136	5.560857427
47.9925534799537	74.7477703759996	30.2774750824958	41.14789047	74.75727523	32.931636	7.341258219
42.587736762902	74.7477703759996	30.2774750824958	42.58773685	73.94634336	30.2774743	0.801427016
41.1483311060213	80.5904310670001	30.0144650372591	41.14833132	82.10595877	30.01446557	1.515527703
36.3917484478384	80.5904310669994	30.0144650372592	35.96077646	77.38727187	28.20511129	5.108866084
31.9980217488186	77.9204763819903	29.5483712161132	32.43971284	75.52883521	28.48064207	2.656140818
31.9970217488185	77.9204763819904	29.5483712161132	33.57300136	70.51852673	38.6296637	11.82127081
31.9960217488185	77.9204763819904	29.5483712161132	38.57181853	69.29967661	29.47346952	10.842735
29.9782760478525	77.9204763819904	28.1031304637783	30.01509861	69.93828769	21.72402497	10.72586107
29.9782760478525	76.6433278514352	28.1031304637783	29.09610379	74.18683092	25.64666307	3.584248474
29.9782760478525	77.7527504971552	30.1473004578575	29.7776223	79.3796747	28.90759999	3.220365403
29.9782760478525	77.7527504971552	30.1473004578575	31.54519137	79.16359507	27.34637643	3.505835342
29.9782760478533	77.7527504971552	33.982292250821	29.81370195	76.77877617	33.99746475	0.987897175
29.9782760478529	82.2530142290281	34.6201775665009	19.16596982	83.58117432	33.35557023	11.91490763
29.9782760478529	82.2530142290281	34.6201775665009	24.67927032	81.21698222	36.79859251	7.738446369
29.9782760478532	82.9943287651502	34.8611632531784	27.46499326	78.56518576	33.59652638	6.680683032
29.9782760478973	82.9943287651502	34.8621632531343	28.94608169	87.05476962	32.15968695	8.550013673
29.9782760478973	82.9953287651502	34.8621632531615	31.92346769	85.96439053	34.03343791	5.672562244
29.9782760478973	82.9953287651502	34.8621632531615	30.96168192	84.99460949	29.50639116	5.800733164
29.9782760478973	82.9953287651502	34.8631632531343	30.78074407	88.67743671	34.14412331	9.308222123
29.9782760478973	82.9953287651502	36.7099321024923	32.33676606	89.56266763	36.70990188	6.977995049
29.9782760478519	82.9953287651502	37.633042863	38.20769452	77.89743741	37.44950686	10.9290231
29.4961378473588	81.7773715735107	37.633042863	29.49613778	81.77737157	38.35679407	0.723751207
23.9911476225105	81.7452201593305	37.633042863	25.47356848	81.94258519	37.44485814	6.220239291
23.9911476224988	80.7377860234311	37.6330428629982	22.46431132	85.87828698	39.40664672	5.64815455
23.9911476224964	80.7377860234311	33.9566993610303	24.84752889	78.21896812	35.91459865	11.0945574
23.9911476224963	76.1845276471503	33.9566993610303	25.63863856	75.55318582	34.2564448	1.789599458
21.4410398403159	76.1845276471504	33.9566993610302	25.39416892	74.01493111	32.17996221	4.846769394
21.3878989362912	76.1845276471503	33.9566993610301	22.14002238	72.37729838	30.29531679	10.56803504
21.3878989362912	76.1845276471503	33.9566993610301	24.37529212	73.10827156	29.72637521	9.946110191
21.3878989362912	76.1845276471503	33.9556993610302	22.96398221	79.24584246	32.40861489	5.253467184
21.3878989362913	76.1845276471504	33.9546993610781	21.16552744	75.92926841	33.87335876	0.348170438
21.3878989362913	76.1845276471504	33.9536993610106	18.46683587	77.29301103	30.42019724	4.716670657
23.3679478070068	73.8368892128018	36.6929805252423	22.95220857	73.2582761	29.61659281	8.329429805
23.3679478070068	73.8368892128017	36.6939805255127	23.86908483	73.83689183	36.6939804	0.501137023
22.6819169237656	72.9080835500696	38.327945542	22.68191696	72.90808337	38.77088424	0.442938698
22.6819169237649	70.4910746131891	38.3279455419991	21.2618816	68.31108552	38.60957073	3.123606085
21.4900902644072	70.491074613189	32.8959313376339	19.92687299	66.4828608	36.85195291	7.674542398
21.4900902644072	70.491074613189	32.8959313376339	21.52581462	69.05739134	31.57893426	1.947101759
19.8848179700111	70.491074613189	29.3052957279758	14.51945543	70.49107423	24.26034768	7.364687094
19.8848179700111	70.491074613189	29.3052957279758	17.24413003	73.14298035	27.78293034	6.329084859
22.1065668204654	69.2669048261361	29.3052957279758	24.00842436	69.26671548	26.32388978	3.536360214
22.1065668204654	61.8914535658966	29.3052957279758	21.30645349	61.8915326	27.89064267	1.625246019
22.1065668204654	59.169672659307	33.6876421202924	20.97945435	58.66863495	34.56781671	2.745603401
24.0546008619834	59.169672659307	33.6876421202923	24.05460087	58.82740751	33.73414623	0.345409995

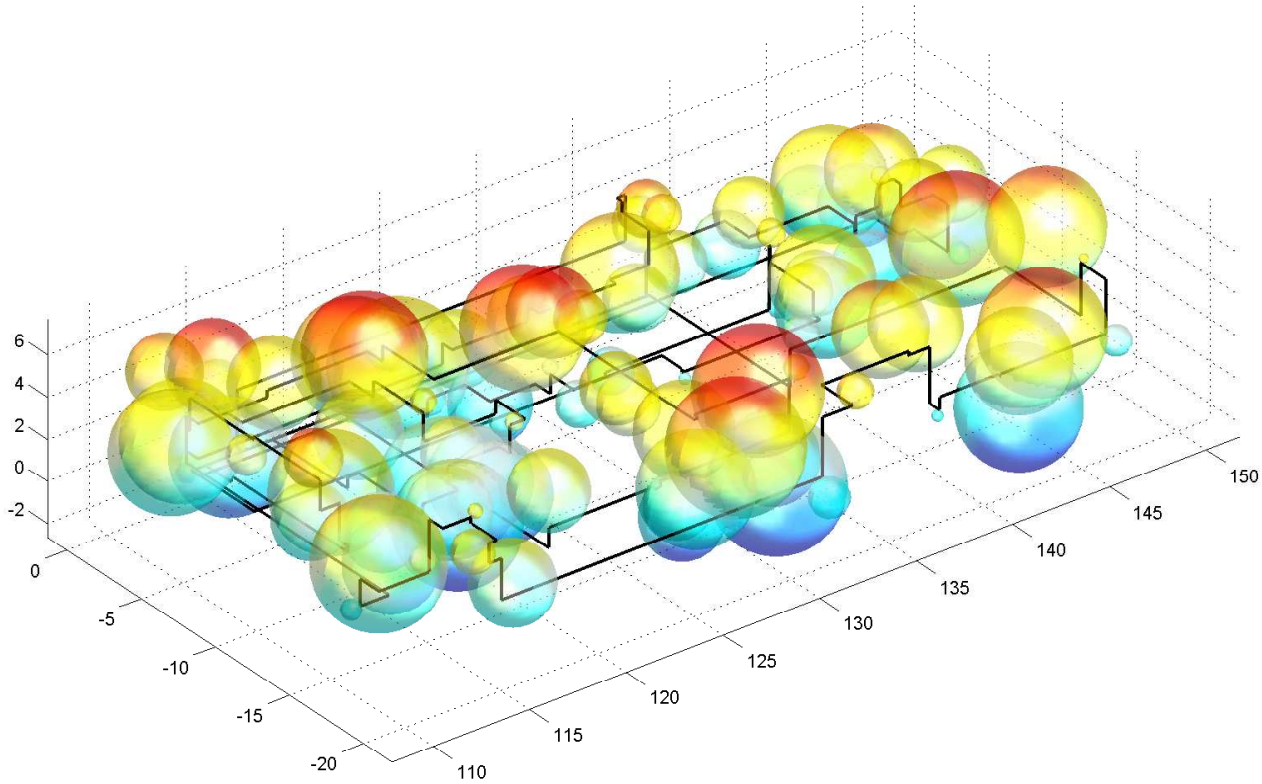
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
25.2040380420058	59.9494670606991	33.6876421202922	22.06521443	57.50548607	32.39286042	6.030659205
25.2040380420058	59.9494670606991	33.6876421202922	25.20403775	63.98638021	32.83153178	4.126692706
25.2040380420058	59.9494670606991	33.6876421202922	23.29263587	57.34435722	30.94445508	5.760491154
40.734430502789	59.9494670606991	33.6876421202922	35.39691212	60.01558524	36.77171252	7.016255469
40.735430502806	59.9494670606991	33.6876421202922	37.67648628	59.01822185	34.10509713	8.663388767
40.735430502803	59.949467060699	33.7469289357755	39.00311055	58.98114927	34.60197054	3.475306118
40.7364305028036	59.949467060699	33.7469289357755	42.95157888	64.84132436	26.30910849	9.17378456
40.7364305028036	59.949467060699	33.7469289357755	36.93641703	55.80482127	27.58013236	9.247821291
40.7364305028037	59.9494670606991	37.4871568528609	49.39322363	67.57061768	37.48715692	11.53351655
40.7364305028037	59.9494670606991	37.4871568528609	41.72708173	62.5487287	34.68501321	8.265204335
40.7364305028037	55.5818551343945	37.7161567898933	39.86159624	55.58185516	39.85963663	2.315133001
40.7364305028044	55.103823994376	37.7161567898932	41.84687745	52.15158968	38.57062516	3.267858024
40.7364305028052	55.103823994376	33.2557151471506	40.32660467	53.626561	31.93108458	11.22803277
48.13072745972	52.9676250011588	33.2557151471505	48.91348948	54.77748717	32.9330217	1.998111236
48.1307274597171	52.359332228809	33.2557151471507	48.65047008	56.26343732	32.64491993	11.1175127
48.1317274597086	52.359332228809	33.2557151471509	47.38308024	49.71863955	31.58389373	4.361961303
48.3582676058062	52.359332228809	33.255715147151	48.35826716	45.69665672	26.59304148	9.422444764
52.9991421479497	52.359332228809	33.2557151471509	56.73611746	58.87824868	26.03485933	10.42122905
54.3238708800884	53.7189302836451	33.255715147151	55.16481024	55.42346911	31.47512835	2.604442543
54.3248708800884	53.7189302836241	33.2557151471511	52.57887869	54.16196226	35.47497689	4.016092555
58.5050389775109	53.7189302836241	36.1885880070452	58.50503897	53.8647284	36.33438611	0.206189664
58.5050389775109	42.7370514961352	36.1885880070452	57.48443808	43.25173204	37.88033317	5.068521277
61.8685967410326	42.7370514961329	36.1885880070452	71.61626861	44.97765672	39.11549021	11.56039904
61.8685967410326	37.8222031934928	31.8282414761195	63.54041364	40.47906672	32.95919177	10.09103037
61.8685967410336	37.8212031934921	31.8282414761231	61.01859213	37.82208646	31.82775528	0.850005209
61.8685967410336	21.153491784531	31.8282414761267	62.83458953	32.37480154	31.54745986	11.26631142
71.1177410866792	21.1534917845307	30.8296070804147	71.29498477	19.86081824	30.17263192	1.460834206
Route: 7 Length: 501.194590351457 Demand Met: 2909						
62.0324235277133	21.628580388469	13.1954780856496	66.17419814	21.15751135	18.97034229	7.122166774
62.0324235277133	21.6285803884691	27.2644050543256	63.04507341	24.29862677	23.57575014	4.664845393
62.0314235277126	21.6285803884691	27.2644050543256	66.92261807	21.4897109	27.4812889	4.897969721
62.0314235277126	25.6681040170492	27.2644050543256	67.26622281	20.02005982	35.0966755	10.98398776
62.0304235277126	25.6681040170492	27.2644050543256	60.71671796	14.8721563	28.06290831	10.90485749
56.3791800481594	25.6681040170492	27.2644050543256	59.97712424	27.07719444	29.13491814	8.051501149
56.3791800481594	28.7591944691367	30.949105854663	50.59311922	22.75724468	32.75181399	8.529458236
56.3791800481594	28.7591944691367	30.949105854663	59.48412304	31.97998889	33.72997467	5.267581898
52.8552860524002	28.7591944691367	30.949105854663	51.08696185	26.42044109	32.70824117	3.4213392
52.8552860524002	36.7161122110465	30.949105854663	53.48089128	34.57431179	29.79987824	2.509863553
51.1226102599743	40.8803192769459	30.949105854663	51.12261026	42.05252276	30.83772297	1.177483398
44.9441076402416	39.3800822815597	31.186882037512	44.94410764	36.28576006	32.88778098	3.530989553
44.3753902443509	45.2016115849442	31.186882037512	45.94832838	45.50704308	38.19660802	7.19052718
44.3753902443509	45.2016115849442	31.186882037512	38.72818734	43.64397508	34.64285831	6.801536894
44.3753902443509	45.2016115849442	31.186882037512	42.25980634	46.86827481	24.73500352	6.991437475
44.3753902443509	49.23744946228	30.9495166745157	43.66555329	47.77139353	28.778171	2.714393217
39.8753657637893	49.2374494622799	30.5744418800029	39.67150404	49.44131071	30.57444188	0.288303678
39.8753657637893	49.2374494622798	26.4879389172364	39.96945525	49.46230999	23.88525166	2.614076519
43.0445054547778	45.00092033	20.2824634352223	43.11381093	45.00092033	20.21315796	0.098012743
42.2510866035944	43.1864934372891	21.5522132422092	40.57741767	42.47262	24.8981708	3.80870253
38.9024180400338	40.0540171277368	21.5522132422102	38.90241804	39.45548462	22.15074575	0.84645279
38.9024180400339	40.0540171277367	13.3461011935132	39.58652985	43.55288071	14.45846769	5.227108341
36.682694913483	40.0540171277368	13.3461011935122	38.78467609	39.06908374	12.83761672	2.608214338
36.681694913483	40.0540171277374	13.3461011935132	35.17250587	39.36136713	13.28284014	1.66175135
28.8538050491013	40.4764884925871	13.3461011935132	28.54401437	40.13690379	8.087159098	5.278992328
28.8538050491013	40.4764884925871	13.3461011935132	29.90863496	38.4851443	12.83287597	2.311172422
25.7317461200313	40.476488492587	13.3461011935122	23.91492832	35.50451908	14.65205958	5.452232026
25.7317461200012	44.0260618100011	9.17098607897717	25.73174612	44.02606181	8.459085063	0.711901016
25.7317461200012	44.0260618100013	15.5117503223836	30.33187934	43.75504148	14.96541955	8.637269115
25.7317461200012	47.8878386779999	15.5117503223836	18.80954314	50.67936902	11.76647286	11.57690137
25.7317461200012	47.8878386779999	15.5117503223836	23.73647568	45.21539639	11.53681715	5.188751838
25.7317461200012	47.887838678	22.6828927460168	26.567735	46.7768569	17.70634543	5.167125033
22.8158557500001	47.887838678	26.591446068315	22.81585575	48.67591425	26.59144604	0.788075572
22.81485575	47.8878386779999	26.5914460683149	19.18169919	47.05766373	27.00382561	3.954790614
18.1083469116028	47.8878386779999	26.591446068315	14.81228179	50.29125842	28.12065032	4.356482226
14.5291550487275	47.887838678	26.5914460683137	10.71615729	46.62293177	28.86994808	5.678630364
14.5291550487275	47.887838678	32.78844324235	12.77181014	48.33401693	34.40572033	2.429592834
17.6410723576713	42.3162692175082	32.78844324235	18.69463352	36.26547074	33.27071747	6.160741982
17.641072357672	43.6041514999911	32.4929412713484	17.47416259	43.6041515	31.53434731	0.973016574
17.6410723576721	44.7733333737754	35.4780339580083	23.40792676	43.64379836	35.72280889	8.702120093
17.6410723576713	44.7733333737754	35.4790339580083	12.31993183	42.07287161	37.42873621	11.95610617
17.6410723576713	44.7733333737754	35.4790339580083	17.44262234	43.68368222	35.8944745	10.91295355
18.8434751792357	44.7733333737754	35.4790339580082	18.10483235	51.48322234	38.87016683	8.264928029
18.8434751792357	44.7733333737754	35.4790339580082	22.79879511	41.59634367	39.45795983	7.012240784
18.8434751792357	44.7733333737754	35.4790339580082	22.00300591	49.77440842	32.73357505	6.521574248
18.8434751792357	44.7743333737749	35.4790339580083	18.21468575	45.65080463	39.25800482	4.897381571
18.8434751792385	51.4501986505064	35.4790339580083	20.37447933	52.92580791	35.47903396	2.126357542
18.8434751791605	51.4501986505064	36.9753254200012	23.68432498	51.4412716	36.97532542	4.840858032
15.3644888600001	54.607885834649	39.2084567633186	15.36448886	54.97389236	39.50883453	0.473484508
10.168029985437	51.8108322847781	39.2084567633191	10.16802995	51.02082052	39.350114	0.802611588
10.167029985437	51.8108322847782	39.2084567633186	9.26512226200001	48.10149258	36.29819804	9.899762573
9.83903771194333	52.4859083195054	38.1929039495151	7.88086425500001	53.63419396	36.66849242	2.73437995

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
2.67286719519991	52.4859083195054	38.1929039495151	3.166581108	54.38581172	37.35766501	2.806090341
2.67286719519991	52.4859083195052	30.68854948	1.250751092	48.74029716	30.02493246	5.852672895
2.6728671951996	52.4859083195055	30.68754948	0.102323447000003	55.05645207	30.68754948	3.635297833
7.66762696960775	52.4859083195052	30.68754948	5.351054934	54.87903352	31.2051026	3.370669882
8.07851066572043	52.1246572699883	29.0523807799855	8.078510661	52.12465727	17.30721805	11.74516273
9.20360908418887	50.9273524799997	29.0523807799914	12.24975114	50.92735248	27.57127396	3.387131358
9.20360908419185	50.1638197620655	29.0523807799975	14.44281578	41.35822358	23.25943932	11.77700274
9.14411058183694	50.1638197620655	29.0523807799975	8.013859219	41.41457221	25.49555223	9.523443187
9.14411058183694	50.1638197620655	29.0523807799975	13.48749824	42.29987548	28.42807605	9.005353542
9.1441105818358	44.3648824944646	31.0310059582952	9.755265232	43.18329059	30.87649008	1.339232837
9.1441105818347	40.1160924471261	31.0310059583167	2.885836634	40.60849192	26.29324057	7.864786769
9.1441105818347	40.1160924471261	31.0310059583167	6.302525489	40.0085763	32.06550398	3.025946417
9.14411058184143	38.582945625293	35.177572012986	9.832177112	38.08691559	39.13126485	4.043657799
9.14411058183327	38.582945625293	35.1765720129687	12.97854061	40.66549102	35.96453487	4.434042673
9.14411058183327	38.5152283590863	34.6114626242585	14.50630809	38.16565664	31.09752118	6.420525444
9.14411058183327	25.7033547211594	34.6114626242585	17.16840861	23.65521269	38.43535721	10.62185038
9.14411058183327	25.7023547211256	34.6114626242585	10.62327399	24.29073933	35.14972626	10.64782213
6.77290589200324	25.7023547211257	34.6114626242585	6.772905892	23.04434695	34.36872103	2.6690689
6.54729506536469	26.4252443026289	34.6114626242585	2.51827574799999	30.45426362	34.97941135	5.70976178
6.88659594010302	21.4437785763862	34.611462624259	5.677247541	18.04924585	36.67897415	6.000363709
6.88659594010302	21.4437785763862	34.611462624259	10.79914705	20.42039499	35.93251466	9.255684285
6.88659594010302	21.4437785763862	33.0572574800047	2.197761157	16.16441336	29.99258788	10.88783855
6.88659594010302	21.4437785763862	33.0572574800047	7.31997787899999	15.37807435	33.05725748	6.081166637
6.88659594010303	21.7789026890044	26.6497551351494	3.815111582	26.65111472	27.4138472	5.810017463
6.88659594010379	21.7789026890044	26.6487551351245	5.584406208	23.81184943	17.55438576	9.409363681
6.88659594010379	21.7789026890044	26.6487551351245	9.44237495500001	27.32019574	23.59921997	10.87002293
6.88659594010322	23.3986662991613	26.6487551353148	4.281409798	24.72152663	26.34546352	3.095213609
6.88659594010284	23.3986662991613	24.1215635599962	6.71940622700001	25.73868862	24.12156356	2.345987396
6.88659594010323	23.3986662991613	24.1205635601018	5.72255099500001	17.38650207	24.6119319	10.68361364
6.88659594010323	23.3986662991613	24.1205635601018	4.953508892	23.81507206	25.41914679	11.32693583
6.88659594010375	11.2254038175894	24.1205635601018	8.465864182	8.874062551	25.43796737	11.71772619
6.88659594010375	11.2254038175894	24.1205635601018	3.177857831	14.97802426	24.78576733	5.317837399
8.05853134180322	8.85543048919862	19.2705173587759	8.67995437099999	15.22687294	13.91463376	10.6053774
8.05853134180035	8.85543048919966	19.2695173587759	8.98802709899999	7.925934732	19.26951737	1.314505506
8.05853134180033	8.85543048919965	8.89626454580198	5.801300438	5.23076571	0.128009607	10.356567
8.0585313417987	15.8683778523462	8.89626454579755	3.082410661	9.043855976	8.462200359	9.949435792
3.04713510265242	15.8683778523474	8.89626454579768	0.867278095000003	18.04823486	8.201101929	3.160190534
7.74053964011216	15.8683778523474	8.89626454579754	10.89890727	16.02503912	12.34011368	4.675459945
16.4786701279044	11.6858161050272	8.89626454579752	18.20950886	6.619599382	5.445678785	6.369371766
16.4786701279044	11.6858161050272	8.89626454579752	14.9958336	14.5728326	1.422152891	8.817791313
16.4786701279044	15.7828502045114	17.0789860519997	12.63680518	12.91935497	10.56277797	10.77386908
16.4786701279044	15.7828502045114	17.0789860519997	12.36712067	15.90584574	24.47249551	8.460729812
20.0778732824175	15.7828502045218	17.0789860519998	20.19850768	8.627828216	19.22611956	7.471216408
20.0778732824175	15.7828502045218	17.0789860519998	18.39694528	22.72524013	21.81072027	8.568057279
28.8226301658152	15.7828502045399	17.0789860519997	35.53984032	15.99196501	21.54085765	8.611862088
28.8226301658152	20.3670625401529	17.0789860519998	28.82263126	20.36706254	14.69297653	2.386009522
30.0465717420919	28.3419731962291	17.0789860519997	30.34406593	27.74432368	15.48974465	1.723178802
37.07046765	30.0447921104554	17.717118877	37.07046765	30.04479215	18.0646406	0.347521723
40.8411649383274	30.8402330050001	16.631598280594	40.57036155	31.31828969	15.51939441	1.240512039
44.2168769797586	30.840233005	11.892728290001	44.21687698	34.39769027	11.89272829	3.557457265
54.7544332016478	30.8402330049997	10.1710938785512	56.1557774	36.1071959	13.13084437	6.201998603
54.7544332016769	30.8402330049958	4.09028995549732	58.09138733	33.97784367	3.040604697	4.941158085
54.7544332016769	30.8402330049997	0	59.11600598	27.89604561	4.171146498	6.714910247
Route: 8 Length: 473.015221852154 Demand Met: 2943						
51.1985870354255	31.098129207339	5.241722061	51.19858704	31.0981292	6.058142298	0.816420237
50.3298268237991	34.505006321	5.0640798551182	50.32982697	35.43640834	3.785700884	1.581696088
37.5175245934776	34.505006321	6.81702630047259	37.51752459	33.09106605	16.01141602	9.30247437
36.7712121174152	34.505006321	6.3994281675793	36.77121212	29.70512597	6.399428168	4.799880351
33.135557899571	34.505006321	6.3994281675793	25.40396983	32.32053998	7.877867709	11.43146897
33.134557899571	34.505006321	6.3994281675793	25.99458773	34.37910238	4.84512326	11.0175516
33.134557899571	34.506006321	6.3994281675793	31.17947294	31.40633137	5.155453447	3.870118229
33.134557899571	47.5845957278262	6.3994281675793	34.31056081	43.95356429	5.695822859	3.881034988
33.134557899571	52.5541180590625	3.772635554	34.68773061	48.27076221	5.003934468	4.719701242
33.134557899571	52.5541180590625	3.771635554	35.40868681	49.33377596	1.880059691	6.467074744
33.134557899571	52.5551180590625	3.771635554	33.45977848	51.47641849	1.316430254	7.198818879
31.1212177114567	52.616783340641	3.771635554	31.12121771	52.61678334	1.82071962	1.950915934
25.6524776355549	56.5792118590272	4.88505654900001	25.6524776	56.5792119	5.011755882	0.126699333
16.3746769832035	56.5792118590271	4.88505654900001	20.16713628	56.2637712	6.937664837	7.589009856
16.3746769832035	56.5792118590272	2.52767724102894	17.45311026	57.02027397	2.53786626	4.698442012
16.3746769832035	59.1984086785125	1.40455037725819	16.54761864	53.09785344	0.161381972	6.228334506
16.3746769832035	61.2420599238308	1.40455037725819	10.83705181	59.65376627	0.709551762	8.510330825
16.3746769832035	66.1930933592323	1.40455037725819	13.17908278	60.05355856	0.206865651	7.781969298
16.3746769832035	66.1940933592322	1.40455037725819	15.77830732	66.19409337	0.808180704	0.843394073
16.3746769832035	66.4652401970045	5.04755325111633	15.83973733	72.60736968	8.73861151	9.12349234
16.3746769832035	66.4662401970045	5.0475532511162	13.78543979	72.75062985	12.01531817	9.733830208
16.3756769832035	66.4662401970045	5.0475532511162	16.73656026	65.26611785	12.28815231	7.348251841
17.2709607124557	67.3597613633027	5.04755325111633	16.29427026	68.63097998	5.127480774	1.605088602
24.2279999021808	68.898941938027	6.49730803897682	24.34494447	68.89894191	6.614252607	0.165384594
22.5796639758305	72.9290746605538	3.68662124669986	20.75020952	68.82081849	3.659175109	6.986664743
22.5796639758305	72.9290746605538	3.68562124669986	23.39691794	71.43920824	1.906907845	2.45996491

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
22.5796639758305	76.8459778799999	3.68562124669986	21.60880813	73.64895737	1.318444959	8.789616797
21.0474950601599	76.8459778799999	0.85357598	21.04749508	76.84597788	0.391094884	0.462481096
19.889655773	77.922488502054	0.924123085952491	16.93400358	77.9224885	0.924123088	2.955652193
23.2529540389999	80.471437783626	3.12332845502775	22.95922483	75.83051285	0.740171728	9.548150341
23.2539540389999	80.471437783626	3.12332845502775	17.20155001	81.69531761	4.530646889	7.066943728
23.2539540389999	80.4714377836263	3.12432845502775	23.53960858	80.471438	3.12432842	0.285654541
23.2539540389999	85.3486514224034	3.281967721892	26.20322759	94.45704722	0.043122659	10.10698797
22.4010439182599	85.6910780179818	3.281967721892	23.92476676	88.85275247	0.073261016	4.755388035
22.4010439182599	85.6910780179818	3.28296772189199	15.25088212	86.85170355	0.622562014	8.312417494
21.4042787995258	85.6910780179818	8.36659681405455	24.68088332	89.71453351	6.983081462	5.772547732
21.4032787995259	85.6910780179818	8.36659681405455	21.4032788	88.65695382	8.541884	2.971051139
20.4748161099964	85.6817678097332	8.36659681405455	20.47481611	85.68176763	4.096992025	4.269604774
19.2915350580049	85.6694919783972	8.36659681405455	19.29153506	80.52426775	7.949521468	5.162100755
18.5085871575147	85.6694919783972	8.36659681405455	18.16441332	83.32201509	7.61422766	4.389263708
18.3585485716351	85.6694919783972	11.0694865087886	12.63857375	82.42671014	11.06948651	6.575237335
18.3585485716351	86.0793480224102	15.0569424112888	24.79158589	85.73273425	15.36547182	9.89839469
18.3585485716351	86.0803480224102	15.0569424112888	24.93956922	85.18138774	19.5490822	10.96633056
18.3585485716351	86.0803480224102	15.4677982790986	25.58817455	94.62259734	16.80660453	11.27075496
17.5933682703294	86.0803480224102	15.4677982790986	15.06397637	86.4956065	14.41870487	2.769631739
5.07636469918225	86.0803480224102	15.4677982790986	6.663988874	86.9326968	14.76370285	2.017737523
5.07536469918225	86.0803480224102	15.4677982790986	4.961462551	81.51420623	19.50536364	9.226598726
5.06665772135086	77.227344922777	15.4677982790986	3.765987951	77.28123402	18.22137656	9.204063574
5.06565772135086	77.227344922777	15.4677982790986	5.065657714	76.41830653	16.15003851	1.058298093
5.06565772135086	77.227344922777	15.4667982790986	5.04273939700001	78.40053531	10.86923314	10.26257011
5.06565772135086	78.6370305490949	14.3459464922082	9.360499311	76.63383999	11.96842635	9.675555003
5.06465772135083	78.6370305490949	14.3459464922082	3.10003410199999	78.61964126	7.805263196	6.829391359
1.52394986200001	80.8724426734653	12.3799135551559	1.45195925500001	80.87244268	12.37991353	0.071990607
3.96710454106298	80.8724426734653	10.9693232754834	5.724809855	81.80721271	6.405774196	6.479054365
3.96810454106297	80.8724426734654	10.9693232754834	0.773453591000006	79.81662315	5.077053724	6.785233233
3.96810454106297	83.8209109310326	10.9693232754834	3.437419026	82.39656928	11.4164042	1.58437925
3.96810454106297	87.9679092172523	10.2415957481709	3.319354366	86.8534104	10.89284525	1.444683466
6.00894397499999	87.9679092172523	10.2415957481709	5.902742913	84.57417463	9.395938461	10.96205759
6.00894397499999	87.9679092172523	10.2405957481709	12.45480817	85.29988604	5.441763796	8.467366828
6.00894397499999	89.1202321174465	10.2405957481709	7.009024866	89.80852716	6.686928303	9.591229282
6.00894397499999	89.1202321174465	10.2395957481709	7.085383584	88.77850283	10.21283209	1.129697938
6.00894397499999	91.9690015864095	9.71811289364867	6.29169329299999	89.27097954	11.1353809	4.843225065
6.00894397499999	91.9690015864095	9.71711289364867	10.40564453	91.96900158	9.717112894	4.396700555
3.28260479629341	94.0522603919365	9.36087897184654	4.44010970700001	94.87692744	8.233710837	8.411496493
3.28260479629341	94.0522603919365	6.5645208690299	2.510162792	94.82470236	6.564520873	1.092397933
3.2826047962934	94.0522603919365	3.54133711348109	8.37640356200001	96.83801393	4.582503625	9.194583524
3.2826047962934	94.0522603919365	1.082232864	0.846436707999999	97.15575264	0.271481864	11.19775474
3.29857692929689	92.2686951099416	1.082232864	3.298576907	92.26869515	0.703140302	0.379092562
3.29857692929689	85.2028625616296	1.082232864	4.297539438	80.73294711	0.059971047	11.22405457
3.29857692929689	85.2028625616297	2.84461714168656	3.10551266100001	84.71082736	3.992777578	5.063715926
3.68803001099999	85.2028625616298	2.84461714168657	0.848777487999996	80.80421078	5.669295757	10.36784038
3.68803001099999	85.2018625616298	2.84461714168657	4.724328509	85.88211036	2.778795893	10.66842937
3.68803001099999	85.2018625616298	2.84461714168657	6.810206318	85.20186256	2.844617135	3.122176307
3.68803001099999	84.9845914235082	4.14279885121926	4.377655918	84.98459142	5.210127271	1.270737521
3.68803001099999	84.9835914235082	4.14279885121926	6.35930977699999	87.06467249	1.39262333	5.433004527
3.68803001099999	82.3264412830425	4.14279885121926	8.842438164	89.89183088	2.824200169	9.248878075
3.68803001099999	80.5662999742428	4.14279885121926	12.87616068	80.54131267	1.790579055	11.25097601
3.68803001099999	80.565299974243	4.14279885121926	8.595205897	76.73972439	1.498449057	10.65699304
3.68803001099999	75.8609137850172	2.20089533113834	3.252339284	73.9521337	6.052632886	4.320781181
3.68803001099999	71.1520257389553	1.06265336751797	2.881941531	70.78732912	3.789169139	7.680996283
2.11639788709047	71.1520257389553	1.06265336751797	1.834626902	71.15202574	0.775939504	0.401994686
2.11639788709047	71.1510257389553	1.06265336751797	1.825477279	70.78130479	1.056192161	2.330446868
2.11639788709047	69.7475486950358	1.06265336751797	2.82031094	66.9400554	1.18723785	6.180554629
2.11639788709047	68.5455731886323	2.60421743540357	1.28261934699999	62.39268391	2.604217434	6.209124989
2.11639788709047	68.5455731886323	7.21989409096492	2.781332517	68.35625636	3.710000307	5.523577876
5.33135390910299	68.5455731886323	7.21989409096492	6.334374787	68.85467086	8.438723386	1.608457989
5.33135390910299	54.9040126309321	7.21989409096492	3.200690229	54.90401263	9.791910202	3.339909369
5.33135390910299	52.3627971080707	7.21989409096492	5.28300793299999	51.8957834	3.767703534	3.483971696
5.33135390910299	49.557756969949	4.75437194685937	8.91589750200001	48.83105962	4.105846181	5.482065711
7.69873691341886	48.505044400205	3.96684152282875	8.81169210500001	48.50504439	3.044600386	1.445405816
3.69717997686497	46.3839736213475	3.96684152282875	1.77561061599999	46.38397362	3.634697851	1.950063647
3.69717997686497	42.8293313710581	4.36112636468241	0.0942256310000005	39.91558536	7.02793547	5.346313369
3.69817997686474	42.8293313710581	4.36112636468241	5.668356774	43.14782971	2.118277692	8.305775856
6.60137412191415	42.8293313710581	4.36112636468241	7.871697725	40.35198819	7.19843067	6.3641027
6.60237412191415	42.8293313710581	4.36112636468241	9.020444459	42.86210706	4.331128313	2.418478506
6.60237412191415	42.8293313710581	5.87141003558056	6.668915236	38.80565327	2.074648475	8.512380576
6.60237412191415	35.8743109442551	5.87141003558056	9.320660383	27.08555662	0.10230943	10.8588123
6.60237412191415	35.8743109442551	5.87241003558027	0.438114408000004	29.42535326	2.454773911	10.7393682
6.60237412191415	35.8743109442551	9.25030761727195	0.224660494000005	41.43611847	14.21171956	9.809410917
6.60237412191415	31.206222371056	9.25030761727195	8.02660248300001	29.17059173	11.48261049	9.758103666
6.60237412191415	31.206222371056	12.8447466517638	2.694391803	27.62826968	12.84474665	5.298497076
6.60237412191415	31.206222371056	17.3112852774729	3.43019284899999	27.39779729	20.1502757	6.526989384
7.86706596388255	31.206222371056	17.3112852774729	1.354188569	31.31594018	20.59719751	7.295671947
10.7809135486405	31.206222371056	20.6098277837253	10.78091353	34.08373955	26.71276523	6.747292093
17.3587375416939	31.206222371056	17.3090065584472	12.65054039	38.20990532	17.83269917	8.455350331
17.3587375416939	31.206222371056	17.3080065584472	11.00474377	35.14184161	13.52979102	10.56540176

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
17.3597375416939	31.206222371056	17.3080065584472	23.06731773	35.0375678	21.55663613	8.814338039
17.3597375416939	28.5880892538747	17.3080065584472	14.14878683	27.98719075	26.90047422	10.13344558
17.3597375416939	28.5880892538747	12.8609900049396	18.71921477	25.10440199	21.46380598	9.380442313
22.9850980852775	28.5880892538747	11.6651820939998	18.74305811	29.30240259	6.154559295	6.990859055
23.3197569315894	27.3418277789156	11.6651820939998	23.31975826	27.34182644	2.882941415	8.782240679
23.3197569315894	27.3408277789162	11.6651820939998	24.70443529	26.12365999	11.74081492	8.158816457
23.3197569315894	27.3398277789162	11.6651820939998	22.33900559	31.60235215	9.968662506	6.287046338
23.6494117298897	19.9429130992563	13.5197945922967	23.64941173	19.80991504	13.65279264	0.188087651
27.4812766813742	20	12.0114991702631	21.65865806	17.99154884	8.745957007	8.718780186
27.4822766813742	20	12.0114991702631	24.09498187	20.3828805	2.129534364	10.45340098
27.4832766813554	19.9999999999999	12.0114991702443	28.59013959	24.83311171	20.75915805	10.05513054
27.4832766813554	20	11.8636495677596	29.56587444	24.57869021	18.08116751	7.997446269
31.4876337110356	20	6.23290962175519	30.90434674	20.96780911	4.645040707	1.948898626
36.5808140033463	20	6.23290962175519	36.57027062	15.62107689	13.23399254	9.745800746
36.5818140033463	20	6.23290962175519	35.85991513	20.90404301	13.98769394	8.748151694
Route: 9 Length: 440.211846895787 Demand Met: 2984						
79.9900917293052	29.6488608232318	12.5891209596901	75.00767938	29.50135545	13.77877729	5.124594895
70.6994931990244	40.7467591800449	12.5891209596901	69.67922342	40.74675918	12.58912096	1.020269779
70.699493199	40.7477591800449	12.5891209596901	73.13866372	41.71405139	17.04301109	6.333819835
70.699493199	40.7477591800449	12.5901209596901	64.47235297	44.07915445	14.05919317	7.777532307
70.699493199	58.8129261996067	15.7654781593133	68.52022941	55.69012612	11.12241046	6.004927032
70.6994931990115	58.8139261996205	15.7654781593133	71.85259834	57.85616299	9.805797889	6.145303146
70.6994931990115	58.8139261996205	21.1720721538838	69.70404765	60.5822767	24.01827102	3.495543351
70.6994931990114	63.4738211163248	21.1720721538838	65.84999623	61.37790202	25.6974767	9.405960407
70.7004931990243	63.4738211163255	21.1720721538838	74.07680751	69.16329968	17.32839223	10.96743145
72.0862909975575	68.6712955399551	21.1720721538838	73.05372772	69.26625594	20.0928079	1.566755571
75.2169592063576	69.5913649081157	23.66130135842	78.29263567	66.45988674	19.86750284	6.639910385
75.2169592063576	69.5913649081158	23.6623013581047	81.47694776	70.94126153	23.66230135	6.403879885
75.2169592063576	69.5913649081158	26.2628956250797	78.83068399	69.67274441	24.24069079	11.30182844
75.2159592063576	69.5913649081156	26.2628956250923	72.84290598	65.67053988	28.7186167	5.910036243
70.2283575417379	69.5913649081157	29.264318856099	63.47892732	68.70647259	29.32775126	6.807486056
70.2283575417379	69.591364908117	29.2653188560989	63.53725064	67.03413314	29.14142524	7.164195385
70.2283575417379	70.2335333279925	29.265318856099	70.77169737	73.88064127	33.24954023	8.726232409
70.5558189823306	70.2335333279921	29.7743826368544	74.85083054	64.74645556	30.78568814	10.29426937
70.5558189823306	81.4174980000857	29.7743826368544	72.09010058	81.417498	36.30236671	6.705862814
70.5558189823307	81.4174980000855	28.7518139018097	68.96890483	80.55619731	30.92710539	4.842060922
70.5558189823306	81.4184980000856	28.7518139018097	68.84275879	76.03221479	29.69910657	10.79538264
70.5558189823306	81.4194980000857	28.7518139018097	69.80433177	81.60817435	25.92271927	4.561618689
70.5558189823306	81.4204980000859	28.7518139018097	70.61748839	78.65460339	33.23222305	7.660924967
70.5558189823305	81.4214980000858	28.7518139018097	70.83372488	78.21085961	24.5182183	5.320597925
70.5558189823306	90.0432043465866	27.7380576160172	71.22771139	93.77569631	25.9346523	4.877275027
70.5558189823306	90.0432043465864	27.7370576160174	69.82339194	93.15949799	27.73705762	3.201208435
73.0485238699076	90.0432043465863	25.5551218104692	72.91384846	91.54886288	27.04740893	4.973733961
73.0485238699076	90.0432043465864	25.5541218104692	72.48804708	89.57044348	25.63543235	0.737731979
76.6853325603981	86.7407794977908	21.7171473754688	76.68533256	86.49303137	21.67959601	0.250577812
76.8761125366436	97.9765417277969	21.7171473754688	80.84419352	99.98848979	20.3915349	4.64228932
67.6117448285711	97.976541727792	21.7171473754689	66.92699784	97.50570073	24.16462464	6.78636185
67.6107448285724	97.9765417277937	21.7171473754688	68.09186985	95.85522589	22.47153407	2.454162297
62.613097809609	97.9765417277973	21.7171473754688	62.61309781	94.29391595	17.98130243	5.245785935
61.1191398387309	97.9765417277921	31.0838961856201	65.26732099	95.86741863	25.98441419	6.903660169
61.1191398387309	98.2582671971826	31.0838961856201	66.67195124	95.92017704	38.76714707	9.763847817
53.9688228645684	98.2582671971826	32.6990872266526	54.48965648	89.30641789	34.42411824	9.13140765
53.9678228645684	98.2582671971826	32.6990872266526	52.71570498	99.46690315	35.19170787	5.481309266
53.9678228645683	99.4443084035284	32.6990872266526	53.69991452	99.81161169	33.42740223	0.858562362
53.9678228645683	99.4443084035285	29.6861185920001	54.29998953	99.89190946	28.80232628	1.044878103
52.6048781490219	98.5105344260355	29.6861185920001	57.58318464	98.55697919	27.3972425	7.09566511
52.603878149022	98.5105344260353	29.686118592	52.60387814	98.51053443	27.61605738	2.070061212
52.6038781490215	98.5095344260354	29.6861185920001	47.31578899	98.13704672	24.13193979	11.87713881
47.6392132391939	98.5095344260356	29.6861185920001	48.39934621	99.02729511	30.05026749	0.989182834
44.5730183224539	97.2244727022118	30.4079355958319	45.34071838	99.2752365	24.31073394	6.545950484
44.5730183224539	97.2234727022118	30.4079355958319	44.56970667	97.22856143	30.36827838	0.038895351
42.5321527442402	93.95406033	30.407935595832	45.01212749	95.47966426	34.75016178	8.619068903
42.5321527442402	93.95406033	36.1765382306286	42.53215273	92.92397176	36.17653823	1.03008857
39.4428818771348	96.3802785442217	36.949100334	39.44288188	96.38027853	38.94704805	1.997947716
37.7464195113223	96.3802785442219	36.9491003339999	37.83606476	96.13365876	36.97541326	0.51935799
36.5990532056662	96.3802785442218	36.9491003339999	35.92075185	99.04269187	36.73360907	5.09129157
36.5990532056662	96.9407909955795	36.9491003339999	37.64776281	91.60925844	32.09349115	7.287109974
36.5990532056662	98.3556302051644	35.6071420790669	36.49499514	99.8776323	35.60714208	1.525555131
36.5990532056662	92.5997558714899	32.3663417091366	35.60188133	93.1465045	36.33325574	7.692381008
36.5990532056662	92.5997558714899	30.3136410189961	34.28587406	93.01320732	33.5082721	5.515074689
36.5990532056662	92.5997558714899	30.3126410189961	34.03327785	85.06694553	30.01520061	9.82794583
36.5990532056662	92.5997558714899	30.310373958592	32.21271953	85.45061531	28.67707968	9.951664756
36.5990532056662	92.5997558714899	29.4554032793423	30.18341718	92.15484297	29.45540328	6.43104448
36.8667696908201	92.5997558714899	29.3979352644148	36.86677729	93.06343809	25.83290646	3.595056547
36.8677696908201	92.5997558714899	29.3979352644148	39.57638463	86.69599702	34.69521123	10.21132869
36.8687696908201	92.5997558714899	29.3979352644148	36.79414467	92.2553405	34.07762876	5.623371076
36.8697696908201	92.5997558714899	29.3979352644148	39.86881125	93.47781189	29.627917	5.895861926
36.8707696908201	92.5997558714899	29.3979352644148	36.31961338	94.1541845	22.11569666	11.14531248
36.8717696908201	92.5997558714899	29.3979352644148	40.16683897	89.097423	24.82067356	10.1742901
48.6888738711361	92.5997558714899	29.3979352644148	45.13861135	90.47060332	31.83589749	6.162353189

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
48.6898738711362	92.59975587149	29.3979352644148	53.29556121	92.47449182	25.90682802	6.766260463
48.6908738711362	92.5997558714902	29.3979352644148	48.69087386	94.64188777	30.6210566	2.380405111
50.6417270811572	92.59975587149	29.3979352644149	51.95218378	92.57992082	30.72068519	2.064617824
50.6417270811567	91.9495592680182	29.3979352644148	48.45592928	88.4082341	31.5542414	6.862006444
53.9241510303622	85.6860773703825	28.4361632177385	55.11001594	85.68607737	27.25029831	1.677066237
53.9241510303622	85.6860773703825	29.2695858751018	51.91564321	83.24154723	26.19545671	4.641150631
52.7488959144434	83.7998666616882	29.2695858751018	46.03038143	83.79986665	30.96050312	6.928032766
52.7488959144434	82.2099047615975	29.2695858751018	50.20394782	81.95454381	24.2461412	5.63710621
53.4624207995112	82.2099047615976	29.2695858751018	52.83415121	85.50123146	31.48102764	6.270496768
53.4624207995112	82.2099047615976	30.1677763589286	56.64479831	82.24679775	31.938846	3.64219376
53.4624207995112	77.998107109522	30.1677763589287	53.61605765	80.93460352	33.38542247	4.795394132
53.4624207995112	77.9971071095229	30.1677763589287	55.58088554	76.52999392	28.31600672	3.50422197
53.4624207995112	76.4501246809073	30.1677763589286	55.90538334	73.56581582	30.52666899	5.910476566
53.4624207995112	76.4491246809073	30.1677763589286	59.09181099	73.44789922	33.41304482	8.247004523
53.4624207995112	76.4481246809072	30.1677763589286	53.92763119	74.12654413	38.27376011	8.444710151
52.4098637197811	76.4481246809073	30.1677763589286	52.40986372	76.90026657	30.53428803	0.582033584
49.1471765012289	75.7960237541343	27.7223344068644	49.13669956	77.10708156	27.62901252	1.314416719
47.9512384488942	72.3376246062416	27.7223344068644	52.68458788	66.68600654	36.07142386	11.1378938
47.9512384488942	72.3376246062416	24.0487158599641	51.90516717	74.10528304	22.83711571	4.497348507
45.6011956826173	70.2145241197815	24.0487158599641	45.59084573	70.21452412	23.93560611	0.113582292
45.6011956826173	66.6332444128149	24.048715859964	45.68320409	63.6499192	24.04332627	2.984457028
42.8374484398422	66.6332444128149	24.048715859964	41.95981534	64.94436816	23.77879253	2.929752986
42.2968080951582	66.633244412815	24.048715859964	42.13585343	68.94604524	25.50967647	4.750703238
40.7333467308075	66.9251895399155	24.0487158599641	39.73860453	66.92518954	24.34934694	1.039178085
42.2968069797552	69.4622581022504	19.1706755183518	43.59103477	70.75648589	19.17067552	1.830314492
42.2968069797548	69.4622581022493	19.1696755183518	44.42598809	67.45202223	18.20113405	3.872665591
40.9132759829275	68.3766853250001	16.0167482284789	40.91327599	65.05437313	16.01674823	3.322312195
40.0480390526133	68.3766853250001	13.871153153986	37.43465738	70.14594443	13.87115315	3.15595335
41.6516268374766	68.3766853250001	13.3297737080474	39.12047899	68.75765335	13.33882614	3.957947734
41.6516268374766	68.3766853250001	10.511257361059	39.83687168	68.05987049	1.771904532	8.931405029
41.6516268374767	68.2394868374666	8.19294386399999	41.30767537	70.05965636	6.684179381	2.389077221
41.6526268374766	68.2394868374666	8.19294386399999	44.13660931	71.38940487	9.812814914	5.060740493
44.2639302138479	68.2394868374666	8.19294386399999	47.89205446	67.3947139	7.919602812	3.735189713
46.8635174158951	68.2394868374666	8.19294386399999	50.86986196	67.11854893	6.466301231	4.50428609
46.8635174158951	64.0758257879899	8.19294386399999	43.40294282	59.60424206	0.51389979	9.536160415
49.8727493174081	64.0758257879899	6.3488724286412	50.29671492	64.07582579	3.765527546	2.617903286
49.8727493174081	64.0758257879899	12.9345259268634	56.20333441	63.09635143	9.893720293	7.090992634
49.8727493174081	63.5418380784211	13.2628392391016	50.37372436	63.54183807	17.2232387	3.991959404
49.8727493174081	60.8867453599656	13.2628392391015	49.52719402	60.88674536	13.02441036	0.419829482
53.540118898	57.6116880416361	14.0959644601522	55.40337389	57.61168804	14.09596446	1.863254992
53.540118898	51.6495337935663	14.0959644601522	53.22205568	50.84724902	15.61737169	8.874987766
53.5401188979981	51.6495337935663	14.128668261408	54.43373891	52.12894009	7.9067999	7.548403707
53.5401188979982	51.6485337935663	14.128668261408	47.22851165	47.89903616	20.36250944	11.51868038
53.5401188979982	45.5186764610225	14.128668261408	59.28037529	42.02965748	18.78086606	8.171091803
53.5401188979982	45.5186764610902	16.0072967799337	47.65008175	45.51867646	25.16647853	10.88958897
53.5401188979982	43.1946727992838	16.0072967799337	52.03099226	42.50134863	22.51431543	7.192186477
53.5401188979982	43.1936727992707	16.0072967799325	49.81718199	39.89953162	25.94554765	11.40867509
53.5401188980001	43.1936727992705	4.45935451920808	53.79810347	45.16180718	4.496135918	1.985311525
53.5401188979982	43.1926727992708	4.45935451920808	51.33580352	40.30660727	1.042528676	4.986289138
56.4178856434193	43.1926727992708	4.45935451920808	57.56166222	41.97700689	5.193477838	1.823459763
57.6213267961082	36.7526990800548	4.45935451920808	55.55130491	39.21526309	7.425393497	11.86807905
57.6213267961074	36.7516990800692	4.45935451920808	54.69460289	37.32086801	4.721267047	6.733868048
62.2639093260677	36.7516990800683	1.86910892292326	70.24663893	43.40548551	1.656037041	10.39433718
80	36.7516990800687	1.86910892292446	74.78372311	42.05088328	3.322634156	8.48875153



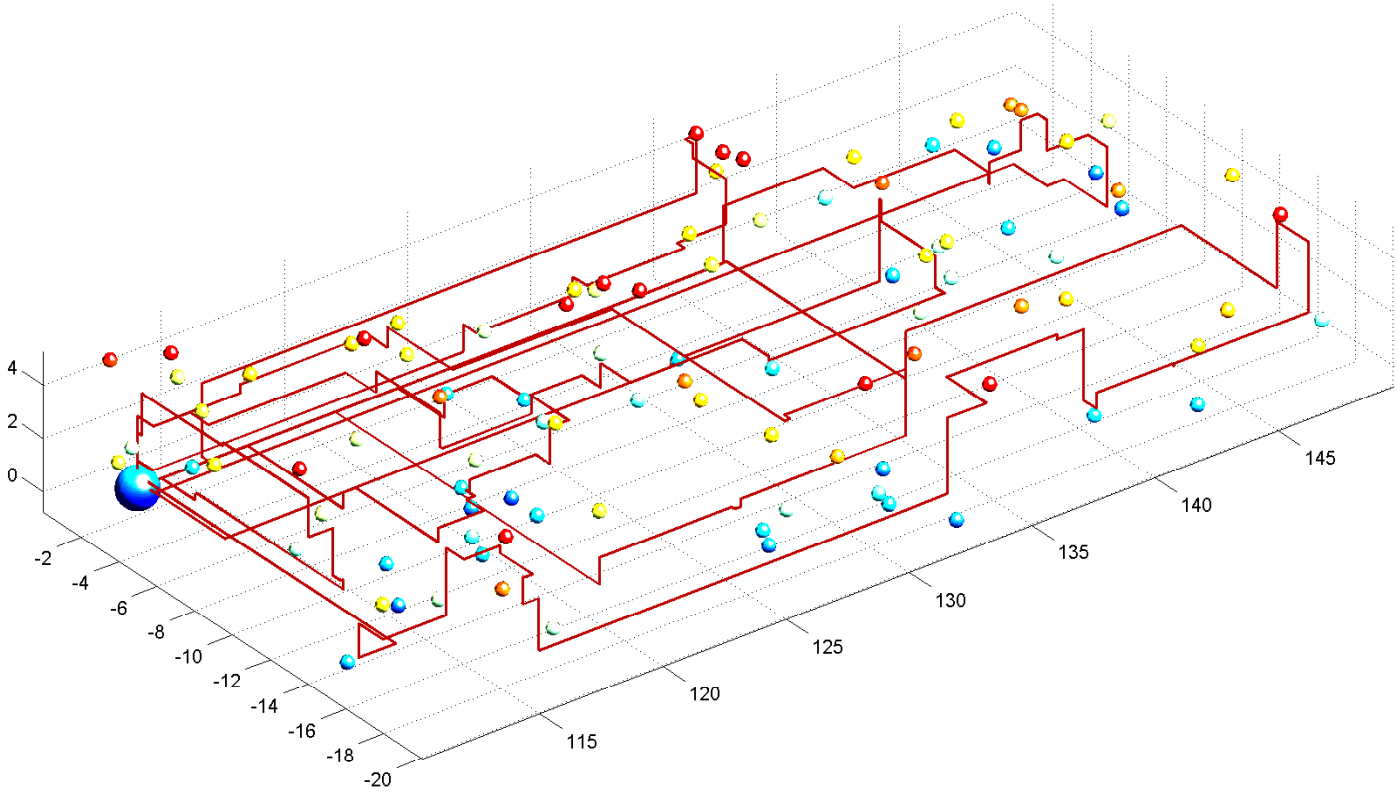


Figure O.202: $kroD100$, arbitrary radius, 3D, Manhattan, Length = 515.1331662

Table O-205: Solution for $kroD100$, arbitrary radius, 3D, Manhattan

Total distance: 515.133166233284 Total demand met: 2719 Depot: x 2.78 y 1.65 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 28.6751709012396 Demand Met: 335						
3.77307899220135	3.38785741593131	0.189999993916584	3.66	3.39	1.25	2.53
3.87246043346227	11.1191099416855	0.189999993916583	4.64	13.02	0.19	2.05
3.87246043346227	11.1191099416855	0.580000010127748	5.55	11.21	0.58	1.68
3.76870674094172	10.689999903938	2.34618435228896	4.01000000000001	9.8	2.35	2.63
2.78	10.689999903938	2.34618435228899	2.34999999999999	10.59	1.97	1.67
2.78	10.689999903938	3.77601507547206	2.41	10.69	4.97	1.25
2.78	6.17390670857143	3.65014494615805	2.40000000000001	6.19	3.07	0.88
2.78	3.61340737879722	3.65014494615805	0.469999999999999	3.63	2.67	2.62
2.78	2.05297380475042	3.65014494615805	3.87	1.99	4.81	2
2.78	1.8730667584271	3.65014494615805	2.64	0.36	4.24	1.63
2.78	1.8730667584271	2.08	2.02	2.33	2.08	2.61
Route: 2 Length: 50.6307092960881 Demand Met: 398						
7.24029252238897	6.72015232915215	0.558021289364428	7.81	6.7	2.36	1.89
7.78000643720949	11.0376959327781	1.05412480206891	7.78	12.82	1.55	1.85
9.63987417124648	10.6879537818048	1.05412480206891	8.11	12.95	0.83	2.74
9.63987417124648	10.1355556669804	1.05412480206891	10.09	10.01	2.31	1.34
9.97000011344735	9.50670636612193	1.05412480206891	9.97	9.42	1.03	0.09
9.97000011344735	9.87317165381262	1.54682513280322	10.21	9.62	0.29	2.98
11.061374433829	9.87317165381263	1.54682513280322	11.79	9.69	0.13	2.24
11.062374433829	9.87317165381263	1.54682513280322	11.09	11.96	0.79	2.22
12.6399999926275	10.6100861891246	2.8900862503022	12.64	10.9	3.18	0.41
13.4420967866156	8.59000000022231	2.20790414465258	13.93	8.59	1.72	0.69
9.81000000949651	8.47999997281902	3.47999999999805	9.81	8.48	4.05	0.57
9.81000000949651	5.11867328546873	2.69363944524553	9.31	5.12	4.87	2.65
9.81000000949651	3.48435565350791	2.69363944524554	10.17	3.33	3.55	2.62
4.25743570061356	2.45998523960774	2.68952383754644	4.59999999999999	2.67	2.69	0.47
Route: 3 Length: 60.9414359353833 Demand Met: 399						
5.66732030979391	1.28327829807666	2.73159702564852	5.47	0.25	2.56	1.09
25.7869059893586	1.23309401209	4.89690599042432	25.81	1.21	4.92	0.04
25.3363877733302	1.64369270653782	4.39233689444868	25.92	2.48	4.76	1.24
25.3363877733302	3.38976324565609	4.39233689444868	25.97	3.49	4.95	0.85
25.3363877733302	3.38976324565609	2.70999999999998	26.58	3.6	2.5	1.33
23.3658389954013	3.38976324565609	2.70999999999998	23.47	3.88	3.22	2.49
23.34	3.79999999999871	2.70999999999998	23.34	5.23	2.71	1.43
19.3780681583545	3.30371726127629	2.70999999999998	18.28	4.56	3.27	1.76
19.3304456224695	3.12263641909183	2.05158079746808	19.62	3.89	2.49	0.93
15.4020786476913	2.43406145947993	1.0287057912825	15.41	3.54	2.28	1.67
Route: 4 Length: 77.1312290597063 Demand Met: 390						
10.8200003078071	15.6099993815627	0.970000000000137	10.82	15.61	2.72	1.75
16.197377259678	15.7062428224641	0.970000000000137	16.32	17.42	0.34	1.83
16.2299995663962	15.7749398637858	0.970000000000137	16.23	17.23	0.85	1.46
16.4366782520365	15.7749398637858	1.25365996901655	16.46	18.17	1.97	2.5
19.1117612843601	15.7749398637858	1.25365996901655	20.5	18.33	0.82	2.94
21.0129431344911	15.7749398637858	1.25365996901655	22.21	15.78	0.34	2.02
23.131957934896	15.7749398637858	3.78162317416959	23.56	15.68	4.13	0.56
18.1988326494259	16.0810334207876	3.78162317416959	20.28	17.36	4.94	2.77
17.9680411255665	16.0810334207876	3.78162317416959	17.68	15.78	3.21	2.13
17.9680411255665	16.0820334207876	3.78162317416959	17.87	19.02	3.83	2.94
17.9680411255665	12.9399999548362	3.78162317416959	16.99	12.94	3.45	1.36
17.9680411255665	12.3799999548361	3.78162317416959	16.77	12.38	3.99	1.54
17.9680411255665	8.13999271400484	3.78162317416959	18.19	8.14	4.91	1.15
17.9680411255665	6.93461762903543	3.78162317416959	17.66	6.92	4.8	1.93
16.04	6.93461762903543	3.78162317416959	16.04	7.06	4.67	2.63
11.52	3.48435565350791	3.030000000083	12.03	3.85	2.73	2.95
11.52	2.45999999999917	3.030000000083	12.72	2.46	3.03	1.2
6.34001107508352	2.45999999999917	2.69000188696985	6.34	2.94	3.58	1.98
Route: 5 Length: 76.7589080128609 Demand Met: 398						
13.3815534628402	4.08162930028348	0.87	13.46	4.08	0.87	0.73
15.3163456501763	5.78619562371892	0.87	15.29	5.81	0.79	1.78
17.6600000271793	6.78000000000001	1.78	17.66	6.78	2.14	0.36
17.6600000271793	8.35353942926443	1.78	17.25	9.27	1.67	1.01
22.2300000230659	9.70908115783088	1.60091881967162	22.23	9.9	1.41	0.27
29.4	9.20099999999999	2.73149839629184	29.82	9.49	1.92	2.12
29.4	9.2	2.73149839629184	29.01	9.2	2.88	1.16
29.4	8.71000033375105	2.73149839629184	30.23	8.71	2.76	2.25
29.4	7.81	2.73149839629184	30.6	7.81	2.03	1.39
29.4	6.31999993193474	3.52129166806968	29.44	6.32	4.14	0.62
29.4	6.24000004687969	0.470000067411432	29.93	6.24	0.47	0.53
20.9170973476132	6.24000004708121	0.265132883593969	20.67	6.94	0.95	1.01
Route: 6 Length: 131.776321259716 Demand Met: 400						
26.7170913020364	11.1330482944542	1.77215454115473	27.4	11.01	2.19	0.81
33.5821652366321	11.1330482944542	1.77215454115473	33.32	10.49	1.92	0.71
33.5831652366321	11.1330482944542	1.77215454115473	35.35	11.12	3.97	2.82
37.90122837632	11.1330482944542	1.77215454115474	39.18	12.17	3.68	2.52

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
37.9015075950624	16.1899999810318	4.29150755683934	38.05	16.19	4.44	0.21
37.8599999613753	17.93	1.71999985703189	37.86	18.62	1.72	0.69
32.3983543997648	17.93	1.6265053151789	33.73	19.02	3.72	2.71
32.3983543997648	17.7700002820829	1.6265053151789	32.2	19.45	3.11	2.25
32.3973543997648	17.7700002820829	1.6265053151789	32.48	19.06	0.64	2.69
29.3624714648747	17.7700002820829	1.01300005799157	29.27	17.77	0.77	0.26
29.3624714648747	17.0999740245454	3.68000000023352	30.07	15.24	3.68	1.99
28.2498353524451	17.1395330327361	3.88791655560199	28.34	15.12	3.98	2.04
23.740000047629	19.285798612728	3.89519555230795	23.74	19.44	4.67	0.79
22.1399998561634	19.285798612728	1.07864946883513	22.14	19.77	0.32	0.9
20.5976041589484	19.285798612728	1.07864946883513	19.94	18.52	1.49	1.09
5.53815184361758	19.285798612728	3.03984637506651	5.70999999999999	19.82	2.08	1.86
4.88753466013829	19.285798612728	3.98999999643383	3.94	19.44	3.99	0.96
5.31665478156312	17.529999995438	4.26665474285377	5.55	17.53	4.5	0.33
3.85296063305105	16.6039311121089	1.75680351687789	3.86	16.16	2.13	0.58
1.27	15.3300000263748	0.471000032813408	1.48999999999999	16.29	2.83	2.86
1.27	15.3300000263888	0.470000032813408	0.799999999999997	15.33	0.47	0.47
Route: 7 Length: 89.2193917682896 Demand Met: 399						
26.560000086281	1.65	2.12846594444143	26.56	1.28	3.27	1.2
30.6293144061748	3.29	2.12846594444143	30.62	3.29	3.3	1.51
34.7123839993321	5.10252895046946	1.69668045347281	35.03	3.01	2.97	2.47
34.7123839993321	5.10252895046946	1.69668045347281	34.52	6.37	0.69	1.63
34.7123839993321	5.13926075308804	2.5315891137557	36	4.59	3.96	2
35.9900000033194	5.140000000514	3.62000000000197	35.99	5.14	4.02	0.4
36.6590058742348	5.63382716073906	2.4828269378311	36.42	6.99	3.53	1.73
37.7375485864355	5.63382716073906	2.48282693782913	39.35	5.4	2.53	1.63
38.3489551966909	6.63895519648262	0.261456920606569	38.68	6.97	0.22	0.47
38.348955196691	4.34999117908896	0.261456920606569	39.46	4.59	0.2	2.26
37.6402307932587	2.57524037730933	0.261456920607187	37.66	1.54	0.37	1.75
35.3800000968769	2.57524037730933	0.261456920607188	35.38	1.25	1.14	1.59
29.9499999162666	2.57524037730933	0.261456920607187	29.95	2.64	1.7	1.44

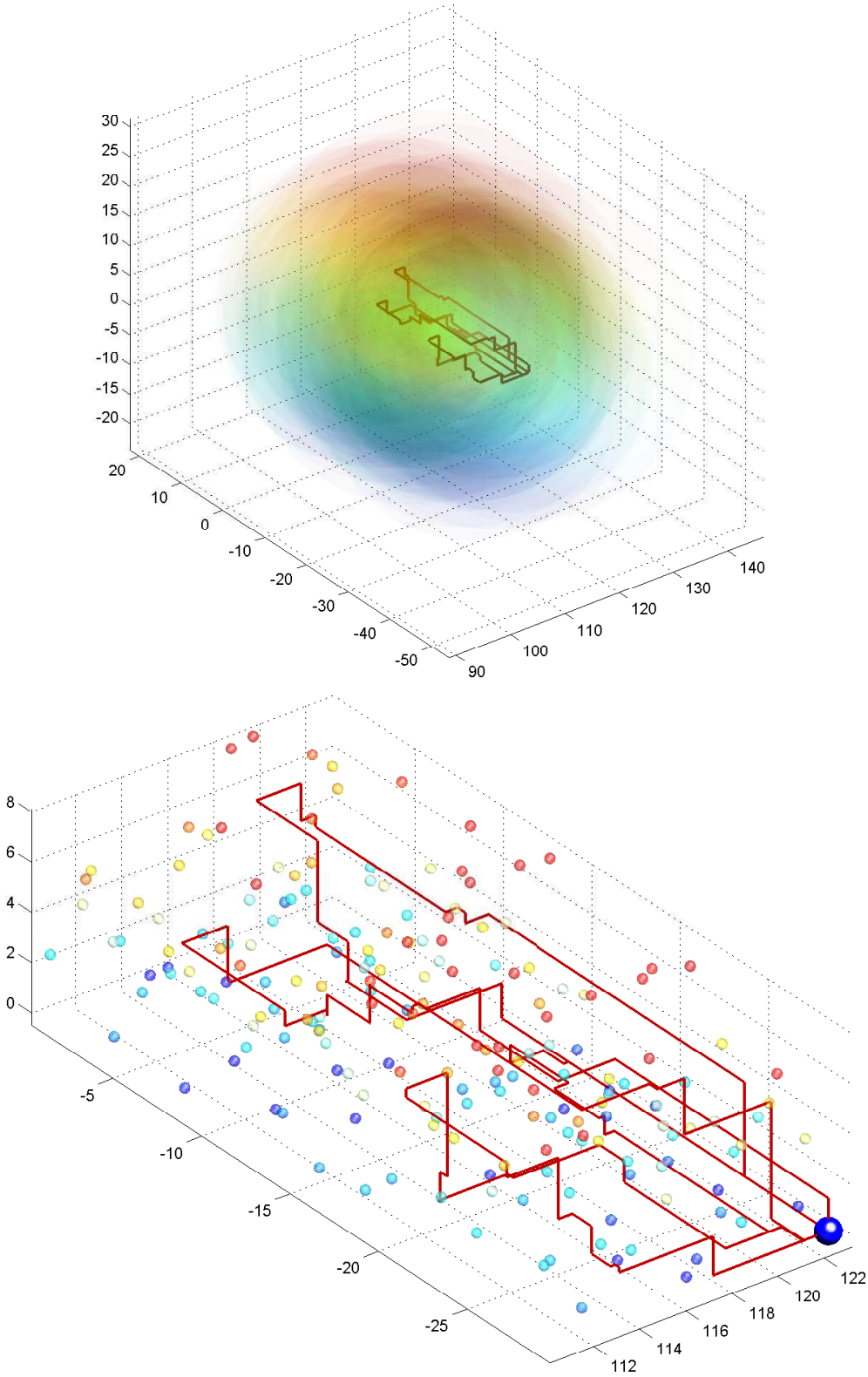


Figure O.203: *rat*195, arbitrary radius, 3D, Manhattan, Length = 265.0912359

Table O-206: Solution for *rat*195, arbitrary radius, 3D, Manhattan

Total distance: 265.091235868124 Total demand met: 11712 Depot: x 12.7 y 29 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 0.00600000000037682 Demand Met: 1934						
12.7	29	0	7.7	12.7	4.4	23
12.7	29	0	3.59999999999999	10.8	4.8	22
12.699	29	0	4.3	20.6	6.3	21.1
12.699	29	0	0.5	20.7	6.8	19
12.699	29	0	12.7	27.3	0.2	3.1
12.701	29	0	4.5	26.7	5.4	21.1
12.701	29	0	6.7	22.9	2.9	22
12.701	29	0	5.8	25.2	5.8	22.1
12.702	29	0	11.3	24.6	0.1	14.1
12.702	29	0	5.59999999999999	10.5	0.4	25
12.702	29	0	9.5	17.4	3.2	17
12.702	29	0	10.4	15.1	4.9	18
12.702	29	0	11.7	15.3	3.7	18
12.702	29	0	4.40000000000001	18.9	6.5	24
12.702	29	0	5.3	21.1	5.7	15.1
12.702	29	0	4.7	24.8	2.4	24
12.702	29	0	10.4	11.3	7	24
12.702	29	0	6.40000000000001	21.3	7.2	20
12.702	29	0	7.5	23.4	5.3	15.1
12.702	29	0	8.40000000000001	21.2	7.3	24
12.702	29	0	9.40000000000001	24.5	2.9	16.1
12.702	29	0	7.40000000000001	26.5	3.3	18
12.702	29	0	12.7	20.9	2.2	21
12.702	29	0	5.3	29.5	4.1	24
12.702	29	0	11.5	20.6	7	14
12.702	29	0	10.4	21.5	7.4	16
12.702	29	0	10.6	26.4	2.7	17
12.702	29	0	11.7	22.5	7.9	14.1
12.702	29	0	8.7	29.3	1.9	21
12.702	29	0	10.4	29.1	7.1	17.1
12.7	29	0	0.700000000000003	28.7	7.3	22.1
Route: 2 Length: 82.0887106036841 Demand Met: 1982						
11.6487782276626	27.1413500689478	4.67688209607826	11.6	27.1	4.6	0.1
7.89366241668013	27.1413500689478	6.89999999999999	4.3	22.7	1.3	8
6.6999999999973	26.7000000000023	6.9	6.7	26.7	7.9	1
3.77550020015977	17.5	6.89999999999999	4.40000000000001	16.9	6.4	1
3.5	17.5	6.6	3.5	17.5	6.6	0
3.5	15.1000000001876	6.69999999999991	3.5	15.1	6.8	0.1
3.5	15.1000000001876	5.13049042611307	2.7	13.4	6.1	5.1
3.5	15.0990000001876	5.13049042611307	2.40000000000001	15.3	3.6	3.1
3.5	13.0699033785649	5.13049042611307	5.40000000000001	13.2	5.7	3.1
3.5	12.6503042461048	4.29884916291673	3.5	12.6	3.2	1.1
3.5	12.6503042461048	4.5311340905258	0.700000000000003	11.4	6.7	12.1
1.68555625065341	12.6503042461048	4.5311340905258	1.5	11.1	3.9	2
1.68555625065341	12.6503042461048	5.12941876207729	0.599999999999994	12.7	5.3	1.1
1.70241530982817	8.40000000165214	5.12941876207729	3.7	8.4	7.5	3.1
1.70241530982817	6.80365804666506	5.12941876207729	1.3	9.5	6.3	7
1.70241530982817	6.80265804666506	5.12941876207729	1.5	7.5	4.4	4
1.70241530982817	6.80165804666506	5.12941876207729	2.3	0.9	5.1	8
1.70241530982817	6.80065804666506	5.12941876207729	0.299999999999997	3.2	6.5	4.1
3.67988829562606	6.80065804666506	2.98489013503292	10.7	6.5	4.1	12
3.67988829562606	6.81257942561349	2.98489013503292	4.7	6.8	4	3
3.67988829562606	6.8135794256135	2.98489013503292	2.59999999999999	3.4	1.3	4.1
3.67988829562606	6.9784055809674	2.98489013503292	2.7	7.3	2.8	3
3.67988829562606	6.9784055809674	2.98389013503292	8.8	4.9	6.7	12
3.68088829562605	6.9784055809674	2.98389013503292	4.7	8.7	1.2	4.1
3.68188829562605	6.9784055809674	2.98389013503292	9.8	5	1.1	13
7.8642039848785	12.5401257318567	2.98389013503292	12.3	9.3	7.2	13.1
7.8642039848785	12.5411257318567	2.98389013503292	6.3	12.4	6.5	4
10.2219657035796	12.5411257318567	2.98389013503292	8.2	13.4	6.9	18
10.2219657035796	12.5411257318567	1.31007596511692	7.5	15.1	1.1	23.1
10.2219657035796	12.5411257318567	1.30907596511692	2.40000000000001	11.2	0.3	8
10.2219657035796	16.9544347409002	1.30907596511692	5.3	17.4	7.6	8
Route: 3 Length: 16.6655647759116 Demand Met: 1859						
12.7	28.999	0	7.40000000000001	21.2	2.2	20.1
12.7	28.998	0	6.5	24.8	0.7	19.1
12.7	28.997	0	6.7	28.8	0.2	14.1
12.7	21.2488308786384	0	0.299999999999997	16.4	1.1	19
12.7	21.2478308786384	0	12.5	25.3	2.9	5
12.7	21.2468308786384	0	7.3	11.2	0.4	18.1
12.7	21.2408308786384	0	8.5	18.8	1.3	23
12.7	21.2388308786384	0	1.7	12.5	1	18.1
12.7	21.2378308786384	0	10.4	25.6	3.6	8.1
12.7	21.2368308786384	0	10.5	22.8	0.7	15.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
12.7	21.2358308786384	0	0.299999999999997	19	1.4	19.1
12.7	21.2308308786384	0	7.7	19.2	6.3	23
12.7	21.2298308786384	0	10.6	16.8	0	19.1
12.7	20.6672176120443	0	10.3	12.6	5.4	10
12.7	21.1236343340809	0	6.3	8.6	0.9	20
12.7	21.1246343340809	0	5.3	9.5	2	19.1
12.7	21.1256343340809	0	11.7	6.5	2.6	20.1
12.7	21.1266343340809	0	1.3	22.7	4.8	22.1
12.7	21.1276343340809	0	12.7	14.8	0.7	9
12.7	21.1286343340809	0	12.5	19.5	0.7	5.1
12.7	21.1296343340809	0	8.7	15.4	1.1	17
12.7	21.1306343340809	0	9.40000000000001	7.4	2	19
12.7	21.2338308786384	0	4.5	15.4	4.9	20.1
12.7	21.2348308786384	0	5.40000000000001	4.6	2.8	24
12.7	21.2358308786384	0	4.40000000000001	13.1	0.1	16
12.7	21.2418308786384	0	7.59999999999999	17.1	1.9	19.1
12.7	21.2428308786384	0	11.4	29.4	4.3	25.1
12.7	21.2438308786384	0	9.3	18.5	2.6	9.1
12.7	21.2448308786384	0	11.3	19.3	1.9	6.1
12.7	21.2458308786384	0	11.4	16.9	4.3	15
Route: 4 Length: 53.8217331769351 Demand Met: 1963						
11.5999989137621	27.7939016293978	0	9.5	27.1	1	21
9.17049353384827	22.0557940302659	0.864884033894599	6.40000000000001	16.8	1.7	6
9.17049353384827	22.0557940302659	0.865884033894599	1.59999999999999	18.8	1.3	10
9.13865949791182	22.0557940302659	0.881264058932273	6.40000000000001	11.2	5.2	12
9.13765949791181	22.0557940302659	0.881264058932273	9.40000000000001	20.9	2.9	9.1
9.13665949791182	22.0557940302659	0.881264058932273	8.59999999999999	10.7	4.5	14
9.13565949791183	22.0557940302659	0.881264058932273	9.5	23.5	3.6	3.1
9.13565949791182	20.9104156932987	0.881264058932273	10.6	19.2	0.8	11
9.13565949791183	20.7144116420554	0.881264058932273	8.7	26.4	4.3	9.1
9.13465949791183	20.7144116420554	0.881264058932273	8.7	24.9	3.7	12.1
9.13365949791182	20.7144116420554	0.881264058932273	8.5	6.5	2.8	24.1
6.20412382814465	20.7144116420554	0.881264058932273	4.3	11.2	3.3	10
5.39999939769848	20.3891334115135	0.881264058932273	5.40000000000001	19.4	0.4	1.1
2.40400000000001	20.4982975687575	0.881264058932273	8.7	23	0.9	11
2.40400000000001	20.4982975687575	2.06904163780378	2.5	9.4	1.9	11.1
2.40300000000001	20.4982975687575	2.06904163780378	1.5	21.3	4.6	6
2.40300000000001	20.9	2.06904163780378	3.7	18.6	2.9	17
2.402	20.9	2.06904163780378	3.3	21.4	7.2	7
2.402	20.9	6.2	0.700000000000003	15.2	6.3	7.1
2.40100000000001	20.9	6.2	3.40000000000001	22.5	7.6	5
2.40000000000001	20.9	6.2	2.40000000000001	20.9	6.2	0
2.399	20.9	6.2	2.5	19.5	4.2	6
0.600000000018994	20.9	6.2	1.59999999999999	17.2	3.9	21.1
0.600000000018994	20.9	5.86174792810136	3.3	24.6	6.9	9.1
0.600000000018994	26.6000000094715	5.79999952356658	0.5	26.6	5.8	0.1
0.600000000018994	26.6000000094715	5.79899952356658	0.599999999999994	22.9	2.8	14
0.600000000018994	26.6000000094715	5.2860803026859	1.7	29.4	1	22
2.83681121246612	26.6000000094715	5.2860803026859	0.599999999999994	24.9	2.3	4.1
2.83681121246612	26.6000000094715	2.8443209199413	1.59999999999999	27.4	1.8	19.1
3.44453156417161	27.7027048893887	1.74357625722909	3.3	28.4	2.5	7.1
3.44453156417161	27.7027048893887	1.74257625722909	2.59999999999999	23.5	7.4	8
3.44453156417161	27.7027048893887	1.74157625722908	2.59999999999999	25.5	6.5	11
3.44453156417161	28.7618642276653	1.74157625722908	2.40000000000001	26.7	1.4	11
3.64168907438489	28.7618642276653	1.74157625722908	1.5	24.6	3.5	5
3.64168907438489	29	1.54441874701582	2.3	28.7	7.3	13
7.69658929027011	29	1.54441874701582	7.3	24.7	2.7	8
7.69758779495245	29	1.54441725169817	7.3	28.6	0.6	1.1
7.69758779495245	29	0	4.3	28.8	2.1	4
Route: 5 Length: 37.7660815610388 Demand Met: 1981						
12.0760416663423	29	0	3.7	26.6	6.4	21.1
12.0760416663423	28.999	0	9.40000000000001	28.4	4.3	5.1
11.5999997502855	27.7939016293978	0	3.59999999999999	7.3	0	22
11.0504870468434	19.0615663021857	0	11.7	11.5	2.9	9.1
11.0504870468434	19.0615663021857	0.001000000000001	8.7	17.3	3.1	13.1
10.6148485964255	19.0615663021857	0.74925893576984	1.59999999999999	14.7	5.3	11
10.4023333323757	19.0615663021857	0.74925893576984	6.59999999999999	19.2	7.9	8.1
10.3846930473142	16.499999993446	0.74925893576984	2.5	16.5	6.9	10
11.0418409896331	14.4297959370446	0.74925893576984	5.5	14.6	7.4	9.1
11.0418409896331	14.4287959370446	0.74925893576984	12.6	10.9	4	9
11.0418409896331	13.3222902517582	0.74925893576984	6.3	15.5	7.6	11
11.0418409896331	13.3212902517582	0.74925893576984	11.6	13	7.6	12
11.0418409896331	13.3202902517581	0.74925893576984	4.8	5	7.8	21.1
11.0418409896331	13.3192902517581	0.74925893576984	9.40000000000001	9.5	1	13
11.0418409896331	13.3182902517581	0.74925893576984	1.5	4.6	5.8	22
11.0418409896331	13.3172902517581	0.74925893576984	0.599999999999994	7.5	5.5	17.1
11.0418409896331	13.3162902517581	0.74925893576984	5.40000000000001	1.2	0.3	23
11.0418409896331	13.3152902517581	0.74925893576984	6.59999999999999	1.6	1.4	18
11.0418409896331	13.3142902517581	0.74925893576984	12.7	4.9	6.8	23
11.0418409896331	13.1815251079363	0.74925893576984	12.5	3.4	2.8	10.1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
11.0418409896331	13.1815251079363	0.74825893576984	1.5	3.2	3.6	14.1
11.0418409896331	13.1815251079363	0.001	9.8	10.8	3.4	8.1
12.4886754921525	13.1815251079363	0.001	0.299999999999997	4.8	1	20
12.4886754921525	13.1815251079363	0	3.59999999999999	5.4	1.9	18.1
12.4896754921525	13.1815251079363	0	11.5	9.5	4.3	21
12.4906754921525	13.1815251079363	0	12.5	6.8	4.3	14.1
12.4906754921525	14.3219259006244	0	3.3	3.4	4	20.1
12.4906754921525	14.3229259006244	0	3.40000000000001	1.1	2	18.1
12.4906754921525	14.3239259006244	0	0.299999999999997	1.2	2.6	18.1
12.6989999999998	14.8489096228896	0	4.7	1.1	0.2	20.1
12.6989999999998	14.9124389317558	0	12.5	16.9	0.1	2
12.6999999999998	14.9124389317558	0	9.3	15.6	1.2	5.1
12.7	19.3999244781912	0	5.5	22.5	1.9	14.1
Route: 6 Length: 74.7431457505543 Demand Met: 1993						
12.7	10.5569693093884	0	10.7	0.9	0.9	23.1
12.7	10.5559693093885	0	8.3	8.9	1.9	9
12.7	10.5559693093885	1.39800018926797	10.3	9.2	3.3	4
8.56012532636132	7.19999981304349	1.39800018926797	0.599999999999994	8.4	0.5	8.1
8.49999999999999	7.1999998130434	1.39800018926797	6.40000000000001	5.4	1.3	8
8.49999999999999	7.1999998130434	1.39900018926797	6.40000000000001	3.2	0.3	5.1
8.49999999999999	7.1999998130434	1.40000018926797	5.40000000000001	7.2	1.4	3.1
8.49999999999999	7.1989998130434	1.40000018926797	4.2	3.4	5.8	10.1
8.49999999999999	7.19890785883369	1.40090823505826	2.59999999999999	5	2.8	9.1
8.49999999999999	7.19790785883369	1.40090823505826	6.59999999999999	6.8	6.1	7.1
8.59899193611619	7.19790785883369	1.40090823505826	1.7	1.2	4.1	10
8.59899193611618	7.19690785883369	1.40090823505826	7.40000000000001	3.2	3.2	9
8.59899193611619	7.19690785883369	2.94961241970294	7.5	4.4	2.9	14.1
8.59999193611618	7.19690785883369	2.94961241970294	5.3	2.5	6.5	9.1
8.59999193611618	7.19590785883141	2.94961241970294	7.40000000000001	6.7	6.3	8
8.59999193611618	5.49102940789542	2.94961241970294	10.3	5.4	1.9	2
8.59999193611618	5.49102940789542	6.18578579106935	8.5	3.4	4.2	3.1
8.59999193611618	2.01421291579225	6.18578579106935	8.59999999999999	0.6	7.6	2
10.5401561926363	2.01421291579225	6.18578579106935	9.40000000000001	0.8	7.9	3
10.5401561926363	2.01421291579225	4.68640613787175	11.5	1.4	6.7	3.1
11.1736284866236	2.01421291579225	4.21957244921921	12.3	1.5	6	5
11.1736284866236	6.38936486764984	4.21957244921921	11.5	4.7	3.2	2
11.1736284866236	9.37169579986729	4.21957244921921	10.4	2.5	2.2	19
11.6838967528238	9.37169579986729	4.2195724492192	9.5	2.8	2.3	19
11.6848967528238	9.37169579986744	4.21957244921921	7.5	0.7	4.6	14.1
11.6848967528238	9.80296659739358	4.21957244921921	11.3	3.1	6.2	7
11.6848967528238	9.80296659739358	3.79419004783822	7.7	9.3	3.2	10.1
12.7	12.5428835448997	3.79419004783822	12.6	13.4	7.7	4
12.7	12.5428835448997	3.74451011815426	9.59999999999999	12.8	7.5	5
12.7	24.2638456745052	3.74451011815426	12.7	23	4.7	4.1
12.7	24.2638456745052	0	5.40000000000001	26.6	0.3	19.1

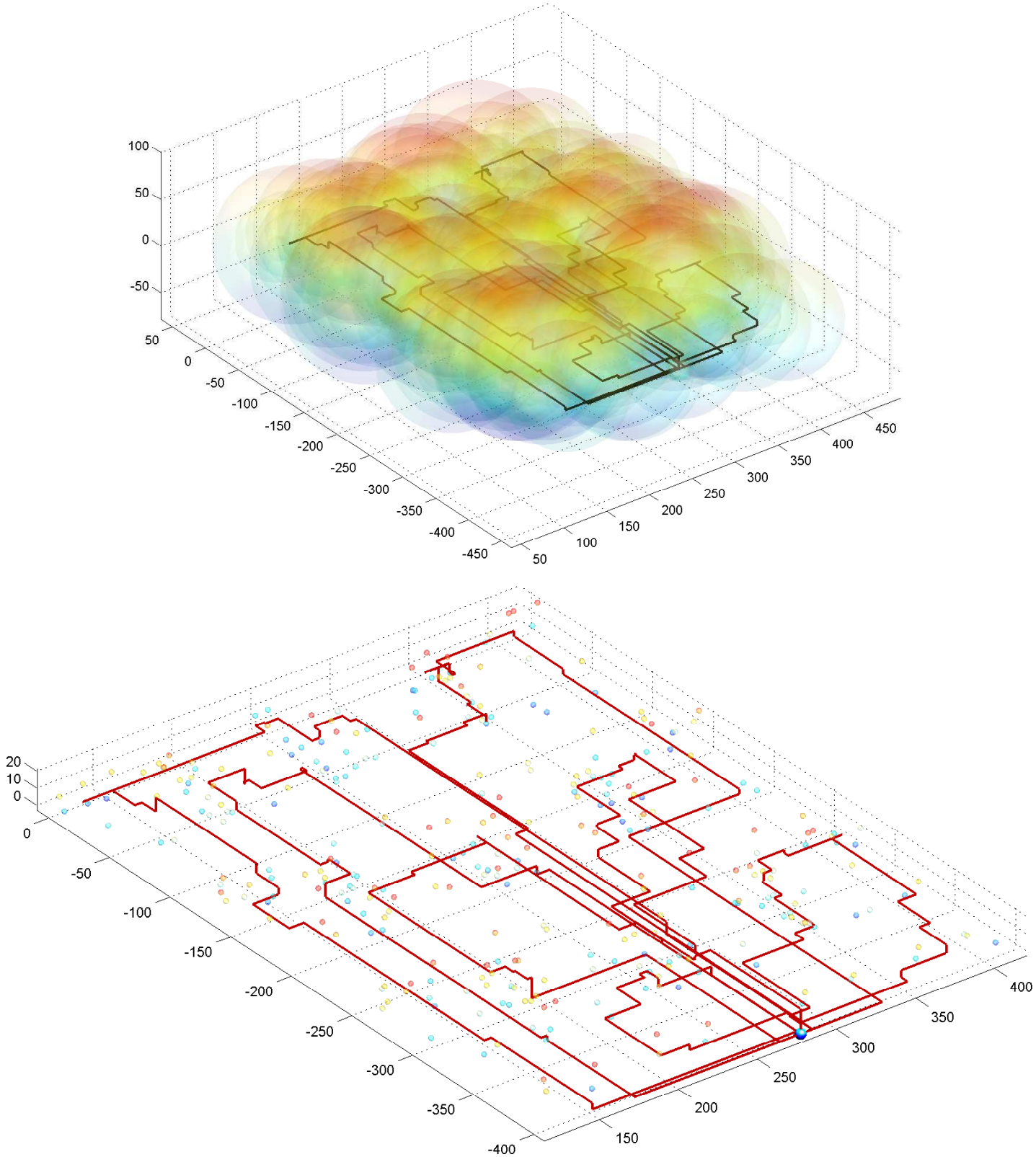


Figure O.204: *lin*318, arbitrary radius, 3D, Manhattan, Length = 5617.0622443

Table O-207: Solution for *lin*318, arbitrary radius, 3D, Manhattan

Total distance: 5617.06224432374 Total demand met: 6261 Depot: x 169.3 y 405.5 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 995.229494692213 Demand Met: 929						
64.4051493068814	333.099905558353	2.69900003378683	59.1	339.4	4.8	8.5
64.4051493068814	333.098905558343	2.69900003378683	63.8	331.6	18.4	16.8
64.4051493068814	333.098905558343	2.70000003378684	63.8	297.6	5.2	81.2
64.4051493068814	333.098905558343	2.70000003378684	28.3	339.4	12.9	44.9
60.7	254.399999944336	2.70000003378683	51.2	254.4	2.7	9.5
60.7	197.347877533117	2.70000003378683	67.7	198.5	11.8	13.7
60.7	197.346877533116	2.70000003378683	58.3	196.1	1.6	20.4
60.7	155.099999904648	10.4014709064067	63.8	164.5	8.3	10.7
60.7	155.099999904648	10.4014709064067	60.6	155.1	13.8	3.4
76.8864106915033	136.870161079691	9.07858940043822	76.4	155.1	3.4	19.1
76.8864106915033	136.870161079691	9.07858940043822	89	127.6	0.1	17.7
71.7485281340729	67.8969512195122	14.0514718592252	59.1	73.2	9.3	29.3
71.7485281340729	67.8969512195122	14.0514718592252	67.7	65.4	8.4	19.9
71.7485281340729	49.6009998937915	14.0514718592252	63.8	31.4	12.4	27.9
71.7485281340729	49.5999998937916	14.0514718592252	70.9	49.6	14.9	1.2
71.7495281340729	49.5999998937916	14.0514718592252	142.5	29.1	2.7	81.1
71.7495281340729	49.5999998937916	14.0514718592252	63.8	49.6	2.8	33.5
71.7495281340729	49.5999998937916	14.0514718592252	24.4	6.9	1.6	74.1
71.7495281340729	44.0405949408434	14.0514718592252	60.6	22	16.9	36.4
82.882894035264	44.0405949408434	14.0514718592252	85.8	37	14	59.3
82.882894035264	44.0405949408434	14.0514718592252	81.1	18.9	10.9	25.4
82.8838940352667	44.0405949408434	14.0514718592252	67.7	31.5	4.3	48.5
82.883894035264	44.0405949408434	14.0504718592269	76.4	22	1.9	28.1
95.3348787462961	44.0405949408434	5.08317778816842	100	73.2	14.4	54.1
95.3348787462961	44.0405949408434	5.08317778816842	63.8	65.4	13.7	57.7
95.3358787462962	44.0405949408434	5.08317778816842	116.5	37	12.1	49.6
95.3358787462962	42.373936170821	5.08317778816842	141.7	17.3	2	52.8
95.3358787462962	42.373936170821	5.08317778816842	84.3	17.3	5.6	27.4
99.2000002061703	52.4763241936429	5.08317778816842	99.2	63	0.7	11.4
101.526879203406	52.4763241936429	5.08317778816842	66.9	14.2	11.4	52
101.527879203406	52.4763241936429	5.08317778816842	161.4	49.6	13.6	79.4
101.527879203406	52.4763241936429	5.08317778816842	70.9	65.4	6.9	71.5
101.527879203406	52.4763241936429	5.08317778816842	148.8	29.1	19.2	68.3
101.527879203406	52.4763241936429	5.08317778816842	67.7	49.6	9.5	74
101.527879203406	52.4763241936429	5.08317778816842	70.9	31.5	11.6	68.2
104.819313618419	52.4763241936429	5.08317778816842	52.8	15.7	13.8	64.3
114.586836469784	52.4763241936429	5.08317778816842	142.5	49.6	0.1	28.5
128.001437114563	48.8402622740548	5.08317778816842	130.7	73.2	7.2	24.6
128.001437114563	48.8402622740548	5.08317778816842	129.9	63	9.4	16
128.001437114563	48.8402622740548	5.08317778816842	136.2	49.6	6.3	8.7
128.001437114563	48.8402622740548	5.08317778816842	136.2	29.1	0.8	21.8
126.261051439851	48.8402622740548	5.08317778816842	142.5	65.4	2.7	66.7
126.261051439851	48.8402622740548	5.08317778816842	148.8	49.6	18.9	66.7
126.261051439851	121.299997875461	5.08317778816842	122.8	121.3	7.8	4.4
126.261051439851	198.503026753058	5.08317778816842	129.9	196.1	10	31.1
132.45851884224	198.503026753058	5.08317778816842	136.2	198.5	8.4	5
161.351851316068	198.503026753058	0.099903861316583	161.4	198.5	1.4	1.3
Route: 2 Length: 1200.20587227603 Demand Met: 945						
176.641480705981	285.233923897752	7.34473587233496	173.2	285.1	12.1	7.8
176.641480705981	148.153354903516	7.34473587233495	227.6	198.5	10.4	71.7
176.641480705981	148.153354903516	7.34473587233495	119.7	127.6	15.5	64
176.641480705981	148.153354903516	7.34473587233495	211.8	127.6	10.4	53.8
176.641480705982	62.999999997156	7.34473587233496	191.3	63	18.3	18.3
176.641480705981	29.5005468172242	7.34473587233495	155.1	49.6	5.1	57
176.641480705981	29.4995468172243	7.34473587233496	136.2	65.4	3.7	54.2
176.641480705981	29.4995468172243	7.34473587233496	178	37	4.3	22.7
173.200000017624	22.6811996041463	7.34473587233495	173.2	18.9	8.3	3.9
155.100000014311	27.4736564733893	3.02634766684501	155.1	29.1	1.4	2.3
150.494419284249	-0.648080708758364	3.02634766684501	149.6	-7.9	5.2	8.2
141.700000001833	-0.648080708758364	3.76353924579857	141.7	-7.9	4.6	7.3
136.224533739663	7.10000055104906	3.76353924579856	127.6	20.5	16.5	20.4
75.4478367423314	7.10000055105037	3.76353924579857	58.3	63	8.5	68.9
75.4478367423314	7.10000055105037	3.76353924579857	70.1	14.2	16.8	18.4
75.4478367423314	7.10000055105037	3.76353924579857	63.8	14.2	14.4	23.68
75.4478367423314	7.10000055105037	3.76353924579857	39.4	6.9	14.8	37.7
21.2216225927633	7.10000055105036	3.76353924579855	9.40000000000001	7.1	2.4	11.9
39.8435077472372	25.6373623327498	3.76353924579852	14.2	37	6.3	44.6
39.8435077472372	25.6373623327498	3.76353924579852	36.2	6.9	0.3	19.4
39.8435077472372	25.6373623327498	3.76353924579852	21.3	6.9	14.1	41
39.8435077472372	25.6373623327498	3.76353924579852	6.3	7.1	12	39.2
44.1928932502026	36.9999994423485	11.7928931873747	44.9	37	12.5	1
44.1928932502026	85.7443783303122	11.7928931873747	28.3	73.2	9.3	20.4
44.1928932502026	121.268530855351	11.7928931873747	63.8	182.7	4.6	81.7
44.1928932502026	121.268530855351	11.7928931873747	70.1	147.3	17.8	74.2

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
44.1928932502026	121.268530855351	11.7928931873747	21.3	140	9.6	51.1
44.1928932502026	121.268530855351	11.7928931873747	20.5	121.3	8.4	76.9
44.1928932502026	121.268530855351	11.7928931873747	9.40000000000001	140.2	11.5	80.8
44.1928932502026	121.268530855351	11.7928931873747	6.3	140.2	17.5	53.1
44.1928932502026	121.268530855351	11.7928931873747	27.6	63	3.4	76.3
43.0538386432774	121.268530855351	7.13758457950235	51.2	121.3	6.2	8.2
43.0538386432774	140.000001842265	3.50000000012172	48	127.6	5.5	40.8
36.2000000518395	140.000001842266	3.50000000012172	39.4	140	3.5	4.5
36.2000000518395	140.000001842266	3.50000000012172	36.2	140	1.4	2.1
26.5616341962717	170.099999999645	3.50000000012172	14.2	170.1	13.5	15.9
35.7675335390506	185.005964618087	3.50000000012172	28.3	206.3	15.8	25.7
35.7675335390506	185.005964618087	3.49900000012172	27.6	196.1	18.7	35.6
35.7675335390506	264.826082346042	3.49900000012172	70.9	198.5	18.8	76.6
35.7675335390506	264.826082346042	3.49900000012172	92.1	254.4	16.6	70.4
35.7675335390506	264.826082346042	3.49900000012172	60.6	288.2	12.5	62.7
35.7675335390506	264.826082346042	3.49900000012172	52.8	281.9	9	48.7
35.7675335390506	264.826082346042	3.49900000012172	36.2	273.1	6.7	28.7
35.7675335390506	264.826082346042	3.49900000012172	24.4	273.1	19.3	45.5
35.7675335390506	264.826082346042	3.49900000012172	17.3	260.7	14.5	36.9
35.7675335390506	264.826082346042	3.49900000012172	44.9	303.2	8.5	67.2
35.7675335390506	264.826082346042	3.49900000012172	21.3	273.1	15.8	71.9
35.7675335390506	264.826082346042	3.49900000012172	9.40000000000001	273.3	14	39.2
35.7675335390506	264.826082346042	3.49900000012172	6.3	273.3	11.2	71.7
35.7675335390506	290.291169842187	3.49900000012172	70.9	331.6	19.3	81.8
35.7675335390506	290.291169842187	3.49900000012172	14.2	303.2	5.3	25.2
35.7675335390506	318.853851205015	3.49900000012172	27.6	329.2	2.8	13.2
40.1061968903994	402.363631203896	0.002	17.3	393.8	14.6	28.4
40.1061968903994	402.363631203896	0.001	20.5	387.5	17.4	30.2
40.1061968903994	402.363631203896	0	51.2	387.5	1.4	18.6
Route: 3 Length: 704.078888493932 Demand Met: 944						
156.074813419703	295.295520800042	0	155.1	295.3	0.7	1.2
83.7961819126251	295.295520800042	12.100000000109	67.7	315.8	13.4	26.1
81.0998534507034	285.099977160555	12.1000000001092	81.1	285.1	18.2	6.1
81.0988534507034	285.099977160556	12.100000000109	66.9	280.4	18.4	41.3
81.0988534507034	285.099977160556	12.100000000109	70.9	297.7	11.7	30.8
81.0978534507034	285.099977160556	12.100000000109	76.4	288.2	6.4	37.9
81.0978534507034	285.099977160556	12.100000000109	63.8	280.4	12.2	22
79.9167224636601	278.53959707749	12.100000000109	70.1	280.4	12.5	10
70.6405617008963	229.429536001148	12.100000000109	119.7	260.7	11.7	67.1
70.6405617008963	229.429536001148	12.100000000109	89	260.7	3.7	48.3
70.6405617008963	229.429536001148	12.100000000109	59.1	206.3	14.9	26
70.6405617008963	229.429536001148	12.100000000109	48	260.7	17.4	54.8
70.6405617008963	229.429536001148	12.100000000109	39.4	273.1	0.8	61.9
70.6405617008963	229.429536001148	12.100000000109	20.5	254.4	9	56.1
70.6405617008963	189.420843063775	12.100000000109	24.4	140	15.5	73
70.6405617008963	182.896270565159	12.100000000109	67.7	182.7	12.4	29.6
70.6405617008963	182.896270565159	12.100000000109	70.9	164.6	8.4	21.9
70.6405617008963	182.89527056517	12.100000000109	63.8	198.5	2.5	60.1
70.6415617008963	182.895270565194	12.100000000109	52.8	148.8	15.5	54.4
70.6415617008963	177.837916658076	12.100000000109	44.9	170.1	19.9	42
70.6415617008963	177.836916658076	12.100000000109	17.3	127.6	16.4	73.4
83.6052834191849	177.836916658076	12.100000000109	92.1	121.3	6.9	64.6
83.6052834191849	177.836916658076	12.100000000109	63.8	147.3	12.9	52
83.6062834191849	177.836916658076	12.100000000109	84.3	150.4	4.3	61.5
83.6062834191849	177.836916658076	12.100000000109	81.1	152	7.1	42.7
83.6072834191849	177.836916658076	12.100000000109	67.7	164.6	2.1	53.4
83.6072834191849	177.836916658076	12.100000000109	66.9	147.3	5	43.6
85.7816801624185	177.836916658076	12.100000000109	85.8	170.1	5	56
89.4994499433583	177.836916658076	12.100000000109	100	206.3	18	53.6
89.4994499433583	177.836916658076	12.100000000109	70.9	182.7	16.9	40.4
100.104569456662	174.439669874287	12.100000000109	136.2	182.7	6.2	73.4
100.104569456662	174.439669874287	12.100000000109	99.2	196.1	13.9	46.1
140.795536709029	174.439669874287	12.100000000109	130.7	206.3	18.1	42
140.795536709029	174.439669874287	12.100000000109	116.5	170.1	13.6	39
140.795536709028	174.438669874287	12.100000000109	161.4	182.7	0.7	56.9
140.795536709028	174.438669874287	12.100000000109	142.5	162.2	2.7	56.6
148.094528911595	174.438669874287	12.100000000109	136.2	162.2	1.7	53.2
148.094528911595	166.420994052163	12.100000000109	127.6	153.6	18.6	25.7
148.094528911595	166.419994052162	12.100000000109	184.3	121.3	14.5	57.9
148.094528911595	166.420994052162	12.100000000109	173.2	152	19.2	43.5
148.094528911595	166.421994052162	12.100000000109	155.1	162.2	15.7	51.3
148.094528911595	166.421994052162	12.100000000109	141.7	150.4	15.8	56
148.094528911594	166.422994052162	12.100000000109	155.1	182.7	16.5	57.9
148.094528911595	166.423994052162	12.100000000109	148.8	182.7	9.2	49.8
148.094528911595	166.423994052162	12.100000000109	142.5	182.7	2.1	52.7
148.094528911595	166.424994052162	12.100000000109	148.8	198.5	8.3	59.7
148.094528911595	166.425994052162	12.1000000001099	155.1	198.5	17.6	57.2
148.094528911595	258.981136009771	12.1000000001099	122.8	254.4	9.9	25.8
148.094528911595	283.500006981135	12.1000000001099	141.7	283.5	17.7	8.5
158.714076400943	283.500006981135	12.1000000001099	142.5	295.3	13.4	23

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
159.271684151228	331.113120813349	14.3	155.1	331.6	14.3	4.2
Route: 4 Length: 725.641373070006 Demand Met: 948						
169.3	291.510445716714	2.2825272246843	178	303.2	1.5	29.3
169.3	249.544128331298	2.2825272246843	184.3	254.4	16.9	21.5
169.3	249.544128331298	2.2825272246843	181.1	260.7	13.4	21.4
193.869971119229	235.377005874775	2.2825272246843	224.4	280.4	17.9	71.8
193.869971119229	206.573684962729	6.75537707974214	192.1	206.3	17	10.4
207.165259765011	188.247014322936	8.2999999888169	142.5	198.5	1.1	69.8
207.165259765011	188.247014322936	8.2999999888169	148.8	162.2	5.3	66
207.165259765011	188.247014322936	8.2999999888169	161.4	162.2	17.4	60.1
207.165259765011	188.247014322936	8.2999999888169	191.3	196.1	16.7	65.9
207.165259765011	188.247014322936	8.2999999888169	208.7	170.1	15.4	55.8
207.165259765011	188.247014322936	8.2999999888169	222.8	206.3	17	36.2
207.165259765011	188.247014322936	8.2999999888169	227.6	182.7	0.3	69
207.165259765011	188.247014322936	8.2999999888169	218.9	153.6	11.5	44.9
207.165259765011	188.247014322936	8.2999999888169	231.5	198.5	1.6	54.9
207.165259765011	188.247014322936	8.2999999888169	231.5	182.7	19.2	62.1
207.165259765011	188.247014322936	8.2999999888169	227.6	164.6	1.4	68.2
207.165259765011	188.247014322936	8.2999999888169	234.6	198.5	10.6	64.9
207.165259765011	188.247014322936	8.2999999888169	233.1	147.3	11.4	53.4
207.165259765011	188.247014322936	8.2999999888169	240.2	155.1	5.1	52.7
207.165259765011	188.247014322936	8.2999999888169	215	121.3	10.5	69.7
221.999999672625	152.000023968655	8.2999999888169	222	152	14.6	6.3
240.576358098678	152.000023968655	8.2999999888169	236.2	147.3	7.3	14.3
251.428814585274	148.156260619828	8.2999999888169	224.4	147.3	2.3	27.7
251.428814585274	148.156260619828	8.2999999888169	234.6	164.6	0.1	25.4
251.428814585274	148.156260619828	8.2999999888169	240.2	148.8	5.8	12
251.428814585274	148.156260619828	8.2999999888169	252.8	127.6	3.3	21.2
261.440753748106	148.156260619828	11.1998172363846	249.6	170.1	0.7	30.4
261.440753748106	148.156260619828	11.1998172363846	280.3	170.1	14.3	29.1
263.076947154861	148.156260619828	11.2000018997802	305.5	140	11.2	43.2
263.076947154861	148.156260619828	11.2010018997802	248	147.3	4.5	33
263.076947154861	148.156260619828	11.2010018997802	278.7	140	19.3	31.7
262.089730400142	148.156260619828	11.6999999999159	275.6	140	4.2	63.7
262.089730400142	148.156260619828	11.6999999999159	290.6	140	0.4	58.6
261.440723995855	148.156260619828	11.6999999999446	308.7	140	16.6	57.3
261.440723995855	182.699988758686	11.6999999999693	293.7	140	9.3	60.8
234.60000243411	182.699997567885	11.6999999999693	234.6	182.7	13.3	1.6
231.48167885361	245.032081064315	11.6999999999693	231.5	164.6	6.5	80.6
231.48167885361	245.032081064315	11.6999999999693	263.8	206.3	6.2	78
215.547405057008	267.852085737931	11.6999999999159	211.8	260.7	3.2	12.9
215.037273297389	267.852085737932	11.6999999999159	215	254.4	19.4	15.5
169.3	318.604519279464	11.6999999999157	148.8	295.3	14.4	39.6
169.3	318.604519279464	7.11965029798387	161.4	315.8	7.1	25.4
Route: 5 Length: 1097.80385447047 Demand Met: 942						
220.897375185933	295.10716910539	0	218.9	286.7	3.7	9.4
220.897375185933	196.10003021109	0	222	196.1	3.2	5.1
291.191427488562	196.100000052254	2.88024560762259	293.7	196.1	5.6	3.7
291.191427488561	127.600999951351	2.88024560762115	283.5	127.6	15	48.7
291.191427488561	127.599999951351	2.88024560762115	301.6	127.6	0.4	10.7
291.19142748856	127.598999951351	2.88024560761692	286.6	121.3	15.1	53.2
291.191427488552	50.8561141710579	6.20762849467437	293.7	63	15.4	37
291.191427488561	14.0966132719845	6.20762849467437	290.6	6.9	18.4	35.4
291.191427488561	14.0956132719845	6.20762849467437	294.5	73.2	1.3	59.4
291.191427488561	10.4076204928127	9.35642588422927	293.7	6.9	18.6	10.2
291.190427488561	10.4076204928127	9.35642588422927	308.7	6.9	18.2	32.2
291.189427488659	10.4076204928127	9.35642588422927	278.7	6.9	10.2	32.7
291.189427488659	10.4076204928127	9.35642588422927	305.5	6.9	5.7	29.6
275.59999999567	10.4076204928127	9.35642588422927	275.6	6.9	6.7	4.4
241.930457393049	26.5289064429911	9.35642588422927	161.4	29.1	11.5	80.6
241.930457393049	26.5289064429911	9.35642588422927	263	63	0.7	43
241.930457393049	26.5289064429911	9.35642588422927	249.6	37	15.8	20.7
241.930457393049	26.5289064429911	9.35642588422927	233.1	14.2	19.1	77.3
241.930457393049	26.5289064429911	9.35642588422927	240.2	15.7	7.9	16
241.930457393049	26.5289064429911	9.35642588422927	280.3	37	9.6	73
241.930457393049	26.5289064429911	9.35642588422927	248	14.2	2	37.6
240.200000002575	23.5500508855172	15.0004746380311	240.2	22	17.8	3.2
224.662856222108	23.5500508855172	15.0004746380311	218.9	20.5	18.5	7.4
233.463030503309	23.5500508855173	5.96374668698449	222	18.9	3.1	14.4
233.463030503309	23.5500508855173	5.96374668698449	224.4	14.2	0.3	14.2
233.463030503309	23.5500508855173	5.96374668698449	236.2	14.2	3.3	10.1
234.201646266121	49.600000000356	5.96374668698449	234.6	49.6	6	0.4
231.499999999055	65.3999999989953	3.20000000006555	231.5	65.4	1.8	1.4
231.499999999055	65.3999999989952	7.59999999987873	227.6	65.4	13.5	8.3
216.89470345092	68.9201366351687	7.59999999996876	255.9	121.3	14.5	72.9
216.89470345092	68.9201366351687	7.59999999996876	155.1	65.4	8.7	62
216.89470345092	68.9201366351687	7.59999999996876	161.4	65.4	7.2	60
216.89470345092	68.9201366351687	7.59999999996876	148.8	65.4	6.2	68.2
216.89470345092	68.9201366351687	7.59999999996876	222.8	73.2	10.5	62.4
216.89470345092	68.9201366351687	7.59999999996876	222	63	7.9	20.4

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
216.89470345092	68.9201366351687	7.59999999996876	234.6	65.4	4.6	24.2
216.89470345092	68.9201366351687	7.59999999996876	227.6	49.6	17.6	30.7
216.89470345092	68.9201366351687	7.59999999996876	263.8	73.2	0.8	55.8
216.89470345092	68.9201366351687	7.59999999996876	231.5	49.6	10.4	41.1
216.89470345092	68.9201366351687	7.59999999996876	208.7	37	3.4	62.2
216.89470345092	68.9201366351687	7.59999999996876	227.6	31.5	14.9	39.6
216.89470345092	68.9201366351687	7.59999999996876	231.5	31.5	11.2	56.7
216.89470345092	68.9201366351687	7.59999999996876	234.6	31.5	11.8	69.7
190.766311221982	70.9771022863596	7.60000000001982	192.1	73.2	7.8	2.6
178.013565003375	139.3665020074	7.60000000000002	181.1	127.6	7.7	13.2
177.999999994743	170.099998316914	7.60000000000035	178	170.1	11.6	4
169.459963294191	333.901981413126	7.59999999999982	227.6	331.6	9.8	65.9
Route: 6 Length: 548.807046238651 Demand Met: 869						
176.792149248502	396.637320172428	0	215	387.5	7.3	42
176.792149248502	396.637320172428	0	211.8	393.8	13.7	37.7
243.678817401552	391.573221506964	4.22061612427263	255.9	387.5	4.9	12.9
272.01737458409	391.573221506964	9.20893379815481	283.5	393.8	11.4	11.9
272.01737458409	369.438480906053	9.20893379815481	252.8	393.8	15.4	64.1
272.01737458409	369.438480906053	9.20893379815481	286.6	387.5	8.3	29.3
278.878184534594	342.631252496334	9.20893379815481	231.5	315.8	7.2	80.7
278.878184534594	342.631252496334	9.20893379815481	293.7	273.1	6.2	71.8
278.878184534594	342.631252496334	9.20893379815481	305.5	273.1	0.7	77.3
278.878184534594	342.631252496334	9.20893379815481	263	329.2	0.8	67.9
278.878184534594	342.631252496334	9.20893379815481	263.8	339.4	8.3	73.1
278.878184534594	342.631252496334	9.20893379815481	293.7	329.2	1.4	38.2
278.878184534594	342.631252496334	9.20893379815481	294.5	339.4	13.8	16.6
278.878184534594	342.631252496334	9.20893379815481	301.6	393.8	0.9	56.6
290.775777741474	273.099999730213	9.20893379815481	294.5	206.3	5.6	67.1
290.775777741474	273.099999730213	9.20893379815481	301.6	260.7	2.7	17.7
290.775777741474	273.099999730213	9.39999992088657	280.3	303.2	11.5	54.2
296.9	273.099999730213	9.39999992088657	308.7	273.1	9.4	11.8
284.318567062109	273.099999730213	9.39999992088656	286.6	254.4	15.7	68.8
284.317567062108	273.099999730213	9.39999992088643	283.5	260.7	2.6	62.8
284.316567062109	273.099999730213	9.39999992088644	275.6	273.1	17.9	24
284.316567062109	273.098999730213	9.39999992088644	255.9	254.4	18.1	74.1
263.000000001864	269.896476880675	11.1999999999996	263	196.1	17.9	74.1
246.028100926603	281.890597532041	11.1999999999996	252.8	260.7	8.8	64.9
246.027100926603	281.890597532041	11.1999999999996	248	280.4	9.5	61.5
240.200000000659	281.890597532041	11.1999999999996	290.6	273.1	10.7	54.5
240.200000000659	281.899999999987	11.1999999999995	240.2	281.9	12.5	1.3
240.200000000659	282.482404969994	11.1999999999996	236.2	280.4	11.1	68.9
240.200000000657	282.482404969995	6.89877276374814	234.6	297.7	7.7	68.2
240.200000000657	282.482404969995	6.89877276374814	278.7	273.1	18.4	72.9
240.199000000656	282.482404969995	6.89877276374814	233.1	280.4	17.3	78.4
240.199000000656	282.482404969995	6.89877276374814	240.2	288.2	11.3	74.7
239.342261818913	282.482404969995	6.89877276374814	222	285.1	1.9	76.7
239.342261818913	298.97769919201	6.89877276374814	208.7	303.2	16.2	47.1
239.342261818913	298.97769919201	6.89877276374814	227.6	297.7	4.1	31.3
239.342261818913	298.97769919201	6.89877276374814	227.6	315.8	6.5	32.6
239.342261818913	298.97769919201	6.89877276374814	249.6	303.2	7.3	11.1
239.342261818913	298.97769919201	6.89877276374814	234.6	315.8	11.2	30.3
239.342261818913	298.97769919201	6.89877276374814	231.5	331.6	8.7	33.6
234.137896753756	314.8947313911	6.89877276374814	231.5	297.7	7.4	23.7
234.137896753757	331.524390319301	5.72090560261859	234.6	331.6	5.2	0.7
222.201855447558	339.172975914109	5.72090560261859	222.8	339.4	15.5	9.8
183.071393160912	395.674248443194	5.72090560261859	181.1	393.8	14.3	9
169.469177884773	405.5	0	184.3	387.5	3.8	61.5
169.469177884773	405.5	0	119.7	393.8	17.8	72
Route: 7 Length: 345.295715082435 Demand Met: 684						
169.3	377.114851186237	0	192.1	339.4	1.6	44.1
169.46917788478	331.527239625982	4.89104282841679	222	329.2	14.2	53.4
161.400000000106	331.527239625982	4.89104282841679	161.4	331.6	4.6	0.3
136.200999999998	331.527239625982	4.89104282841679	142.5	331.6	14.7	70.4
136.199999999998	331.527239625982	4.89104282841679	142.5	315.8	4.2	63.6
136.199999999998	331.527239625982	9.70000000000105	136.2	331.6	10.8	42.4
136.199999999998	322.200000000004	9.70000000000105	116.5	303.2	9.1	28.2
136.199999999998	322.200000000004	9.70000000000105	136.2	315.8	9.7	6.4
131.106977148509	322.200000000005	9.70000000000105	191.3	329.2	9.3	60.6
131.106977148509	326.679634198489	9.93933919681761	148.8	331.6	0.2	79
131.106977148509	326.679634198489	9.93933919681761	67.7	331.6	4.4	72.5
131.105977148509	326.67963419849	9.93933919681761	127.6	286.7	5.8	75.6
131.105977148509	326.67963419849	9.93933919681761	129.9	329.2	5.1	48.2
119.922763619589	326.67963419849	9.93933919681762	161.4	295.3	10.8	52.8
119.922763619589	326.67963419849	9.93933919681762	155.1	315.8	5.4	37.1
117.699092813324	326.679634198489	9.93933919681762	148.8	315.8	8.4	45
113.193404967	326.679634198489	9.93933919681761	130.7	339.4	10.6	25.3
113.192404967	326.679634198489	9.93933919681761	136.2	295.3	3.1	62.2
113.192404967	326.679634198489	9.93933919681761	84.3	283.5	16.3	54.6
113.192404967	326.679634198489	9.93933919681761	85.8	303.2	13.4	50.8
113.192404967	326.679634198489	9.93933919681761	99.2	329.2	7.7	46.6

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
113.192404967	326.679634198489	9.93933919681761	63.8	315.8	14.7	50.8
113.192404967	326.679634198489	9.93933919681761	100	339.4	3.8	61.5
113.192404967	326.679634198489	9.93933919681761	58.3	329.2	7.6	56.8
113.192404967	326.679634198489	9.93933919681761	122.8	387.5	3.6	61.9
113.192404967	347.108859386113	9.93933919681762	67.7	297.7	2.9	81
113.192404967	347.109859386113	9.93933919681762	70.9	315.8	15.2	68
113.191404967	347.109859386112	9.93933919681762	92.1	387.5	18.7	46.4
90.0606595403763	393.799998541399	9.93933919681761	89	393.8	11	1.5
108.067763416808	393.799998541399	6.67900168609228	48	393.8	19.4	61.4

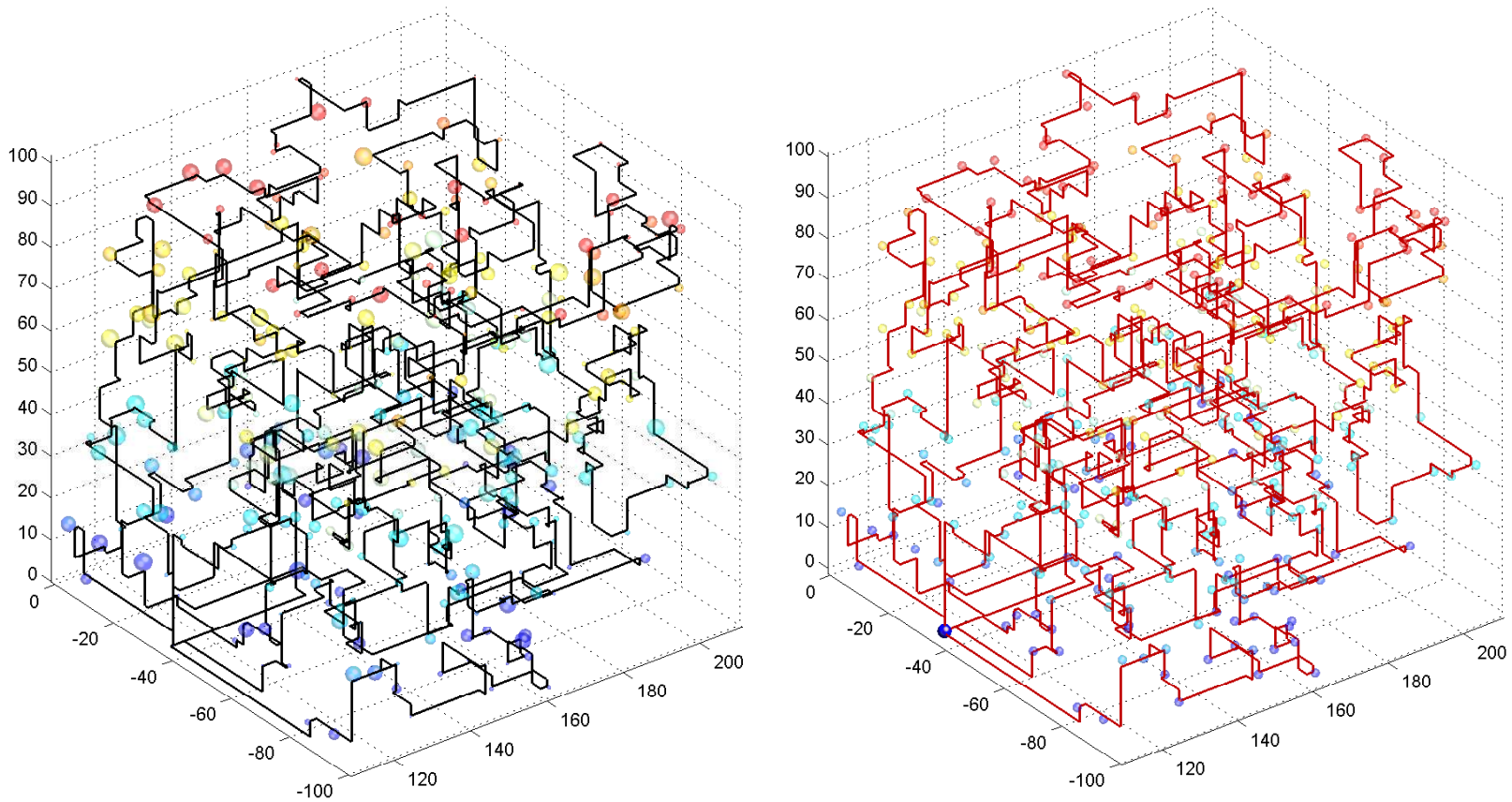


Figure O.205: $rd400$, arbitrary radius, 3D, Manhattan, Length = 5448.0089976

Table O-208: Solution for $rd400$, arbitrary radius, 3D, Manhattan

Total distance: 5448.00899755598 Total demand met: 3297 Depot: x 2.28315 y 35.5085 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 1342.55756505701 Demand Met: 796						
36.9641423503104	32.2455134112527	21.1360410532882	36.8488	32.2474	21.2512	0.163
37.0271999968709	27.4580999999141	23.0384	37.0272	27.4581	25.0096	1.9712
47.7513962482348	25.3162093512304	18.2981705410675	47.6331	25.3181	18.59	0.3149
54.7553464483576	20.4425405911453	11.8371429669326	54.7387	20.4852	11.8363	0.0458
61.6824035570961	19.7057999949961	3.18259583745336	62.8285	19.7058	3.0557	1.1531
59.2820245678392	7.56070999739233	3.18259583745336	58.2097	7.56071	2.229	1.435
72.8884000000039	5.70821000466731	6.03059636725936	74.5771	5.70821	6.0306	1.6887
70.1017965172828	5.65362999999538	9.03819999953689	70.1018	4.34543	9.0382	1.3082
67.267000001142	13.1968085931244	17.3061360513537	67.267	14.1516	17.4107	0.9605
60.334395143505	13.1968085931244	17.3061360513537	58.7637	13.9566	16.9818	1.7747
56.1254000028894	2.07558836178222	17.3061360513536	56.1254	1.40532	17.903	0.8975
49.0258722816137	2.0776785868923	13.9190720226807	48.5894	0.54797	14.4264	1.6697
47.925070642273	2.23053000071062	7.57437064782502	47.3917	2.23053	7.041	0.7543
47.925070642273	7.38685938924768	22.1183921212666	48.6979	8.85907	21.303	1.8519
49.4044960792579	18.5833000000056	26.5254999999685	49.4045	19.961	26.5255	1.3777
49.4416498301128	16.3797501618658	40.7381999994321	49.4944	16.327	40.7382	0.0746
49.1294999999999	32.8613999979267	42.5439000459492	49.1148	32.8614	42.5439	0.0147
55.549200003481	34.9627000000001	44.2535004263916	55.5492	35.9315	44.2535	0.9688
56.0388999999934	33.8756	51.1097999987822	56.0389	33.1015	51.1098	0.7741
56.9788000002862	35.9945999953668	54.3598	56.9788	35.9946	54.4126	0.0528
61.2952584369564	35.9945999953668	53.6949823976141	60.6972	35.5066	52.4287	1.483
61.2952584369563	41.5858219119856	50.1349999995377	61.5258	41.6034	50.3406	0.3112
76.8063728877028	41.5858219119856	50.1349999995377	76.05	41.1841	50.3284	0.878
81.199699991588	44.822	50.1349999995377	81.1997	46.621	50.135	1.799
81.2998336101339	44.6151897085558	50.1349999995377	81.4209	43.6493	50.298	0.987
87.199581038562	43.176	48.3956556006071	88.1955	43.6361	47.6404	1.3319
91.3248999994728	43.176	41.659699999957	91.3249	42.8902	41.6597	0.2858
92.0633999943286	44.164243797356	40.702444973669	92.0634	46.0336	40.4672	1.8841
95.5557707607201	42.3195158111223	40.7024449736691	96.1419	41.3034	39.8142	1.4714
95.5557707607201	42.4486530997258	53.7601659848693	94.61	43.2995	53.8065	1.6034
95.55577076072	42.4486530997258	60.2643999708141	96.3235	44.2629	60.2644	1.97
92.8756	41.0169999992114	61.4441999910592	92.3029	41.017	61.4442	0.5727
95.7469	38.233200067562	74.74440000074	95.9404	38.2332	74.7444	0.1935
89.0360000024081	31.6390698287739	77.0254301702566	89.036	30.7257	77.9388	1.2917
86.8558999996288	48.252	70.9689000012331	86.8559	48.4797	70.9689	0.2277
78.6057999989224	43.258199982499	67.2437	78.6058	43.2582	65.7281	1.5156
72.564999998344	41.2822	84.1996000002857	72.565	40.2263	84.1996	1.0559
70.0979000006495	43.9307999991014	97.1777	70.0979	43.9308	97.3335	0.1558
64.1256	52.6724000086412	96.4245999771399	62.6521	52.6724	96.4246	1.4735
64.8783000000091	59.6742	95.6550999999666	64.8783	60.379	95.6551	0.7048
75.2120283252357	58.4698720329693	94.9267999976149	75.5117	58.1702	94.9268	0.4238
69.9395000002073	63.4645	90.6048000082058	69.9395	64.1832	90.6048	0.7187
60.9916064754846	59.8265190593176	88.5607986032848	59.9164	58.75	88.5608	1.5215
60.9916064754848	62.1421022828891	76.222748594582	59.9164	61.9972	76.3491	1.3282
60.9916064754848	70.7510482062659	67.7000517931217	60.9907	71.4945	66.9566	1.0514
65.9760718122413	69.5769999942463	71.4148969193621	65.9297	69.3415	71.7927	0.4476
78.218593375422	69.5769999942463	71.4148969193621	78.2186	68.7569	71.4148	0.8201
80.6262943003796	74.8815000000482	80.6009622335819	80.9911	75.8316	78.9882	1.9298
80.8888915803042	74.8815000000482	85.0128915817125	80.8889	76.3527	85.0129	1.4712
85.9475605867218	74.8815000000482	92.3152903607597	86.1254	75.412	92.2501	0.5633
85.9475605867218	74.7332703166909	94.0460734166698	87.0562	74.7862	94.9506	1.4318
93.4247986998734	68.5015013032364	97.6997000000037	93.4248	68.5015	98.1606	0.4609
95.9828793474646	58.8621206524288	97.3506989663609	96.3481	58.4969	97.3507	0.5165
88.7881	66.6382000221341	86.5413999742156	88.5712	66.6382	86.5414	0.2169
96.8505759684263	73.5090009303808	85.4089229126395	98.0725	73.509	85.0617	1.2703
95.4453532674087	79.2325007002554	85.4089229126395	95.1537	79.2325	85.4918	0.3032
97.9682000000012	82.1976996087184	81.4504003916506	98.0879	82.1977	81.4504	0.1197
92.7384971359248	89.9534028740679	79.6058999999913	92.7385	89.9534	78.6648	0.9411
75.5455043235016	91.2028920873713	80.4939989312926	75.4786	92.9344	80.494	1.7328
75.5455043235016	90.536171976506	80.4939989312926	75.6586	91.7899	79.8395	1.4188
75.5455043235016	82.5752856841407	90.6153788860139	74.5996	81.8744	91.5993	1.5343
84.9030120813013	82.5752856841407	90.1716291144871	85.2864	82.465	90.0038	0.4328
83.951480823815	88.2707985995676	90.1716291144871	83.5669	88.2708	89.9554	0.4412
86.1563010669428	95.4019010804384	98.1971000000006	86.1563	95.4019	99.9835	1.7864
86.8965000000324	96.733105796066	97.5761941955886	87.9339	96.7331	97.5762	1.0374
75.6359000000996	99.6312	96.3468999992953	75.6359	99.7073	96.3469	0.0761
65.933199230222	99.1551568278203	87.0417377514899	65.9332	98.9174	85.8003	1.264
54.3707014792709	99.1551568278203	89.1041	54.3707	99.6057	90.3024	1.2802
51.2472000050025	90.6525999989096	89.1041	51.2472	90.6526	88.5593	0.5448
37.7452999998689	86.6271	90.2585000005385	37.7453	86.3505	90.2585	0.2766
32.5895999985205	90.1902033093462	98.9290033010809	32.5896	90.759	99.4978	0.8044
28.6316085277763	90.1902033093462	94.8236643807912	28.4623	90.5817	94.8789	0.4301
27.1360999924811	74.931443108037	93.918243115284	27.1361	73.6904	92.6772	1.7551
16.835400466695	76.9324014328522	96.4024014329272	16.8354	77.4785	96.9485	0.7723

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
5.76827999997047	74.2732952323629	96.2117952407333	4.99968	74.2733	96.2118	0.7686
13.8308003877618	55.9988090220307	91.0814087921459	13.8308	54.4775	90.8096	1.5454
17.601101036197	61.0877143890809	91.0814087921459	17.6011	61.1721	91.0121	0.1092
23.2084713467036	58.8069286484626	91.859800000536	23.2085	58.8069	93.3912	1.5314
31.1068	43.8079000014169	91.7683000004699	31.4339	43.8079	91.7683	0.3271
27.4222000002738	25.958129116462	88.3647291155611	27.4222	25.8428	88.2494	0.1631
20.3288000020299	28.0220000004248	93.786	20.3288	28.022	94.6827	0.8967
19.2470000010337	29.1747	80.8169999996317	19.247	29.2712	80.817	0.0965
4.05597602229109	27.930199999853	74.3874978865294	4.056	25.9589	74.3875	1.9713
3.44571075165251	28.1433000000091	68.8960007499036	3.44571000000001	28.2052	68.896	0.0619
2.40317993999761	24.029500030868	62.0949199661684	2.38826	24.0295	62.08	0.0211
15.3758999986649	23.4313916618381	64.7125083437976	15.3759	23.0999	65.044	0.4688
15.3896999995698	24.7701	58.7078000042283	15.3897	25.3897	58.7078	0.6196
15.3896999995698	20.0780330368505	58.6850678076573	15.6993	18.7479	59.9926	1.8907
17.0643551189714	17.3231991683745	33.3520448802856	17.2907	17.3232	33.1257	0.3201
16.5826623097586	17.3231991683745	35.078421637359	15.6444	17.8995	34.8069	1.1341
16.110995448929	9.51072025343487	36.5082045574886	14.8737	9.51072	37.7455	1.7498
17.6410149536441	2.34763310158364	36.1157047538998	19.0116	0.977048	36.1157	1.9383
10.9680991326472	3.35999826852978	32.3555	12.6307	2.70835	31.4638	1.996
8.57051999987041	3.36732000064527	32.3555	8.57052	3.36732	32.2638	0.0917
4.96046963442465	4.06059035582952	33.6530000000001	4.96047	4.06059	34.5353	0.8823
3.46855133158391	9.96618001895988	33.6530000000001	2.19732	10.251	34.6682	1.6516
3.46855133158391	27.2938704891183	27.3545743909672	5.25835000000001	27.1001	26.8402	1.8723
2.22049044087194	27.2938704891183	27.3545743909672	2.1823	25.6845	27.6693	1.6403
1.105806	35.3950000134948	17.4188999875028	0.642905999999996	35.395	17.4189	0.4629
Route: 2 Length: 1063.74087926963 Demand Met: 632						
1.68508000000753	82.9527002640869	3.70720032736662	1.02508	82.9527	3.7072	0.66
3.34344465575872	88.1986596684965	3.70726428779558	3.35356	88.986	2.7967	1.2038
3.34344465575872	94.9245330968694	18.175133098079	4.45068999999999	94.0863	19.178	1.713
15.0425330972663	94.9245330968694	18.175133098079	15.2733	95.1553	18.4059	0.3997
14.0121999999975	91.1149000000064	15.3598000001558	12.3803	91.1149	15.3598	1.6319
17.8877197121352	91.0712802874563	8.92680000576915	18.6101	90.3489	8.9268	1.0216
17.027594713936	97.4805999999689	6.26429471562695	16.854	97.4806	6.0907	0.2455
34.6978555718009	99.691755572732	13.3847555714799	34.7579	99.7518	13.4448	0.104
33.3188000000001	86.8799999986666	6.02959999672081	32.7208	86.88	6.0296	0.598
40.7052999978239	86.1058	6.02650000184708	40.7053	85.7824	6.0265	0.3234
40.7363969692038	94.034939701871	3.41316891239235	40.4171	94.2218	3.0792	0.4984
51.5711807599254	98.697780756174	1.86141924693493	51.8363	98.9629	1.5963	0.4592
49.8327952457483	95.7616612892694	8.80385648808372	48.9418	95.7946	8.5835	0.9184
49.8327952457483	92.657099995494	8.83239999050159	49.8328	92.6571	10.5815	1.7491
49.178729656957	88.5470999985606	3.75672965698042	48.934	88.5471	3.512	0.3461
53.4464144907848	87.0164999997823	7.07602313954484	54.7886	87.0165	7.4948	1.406
50.5771999982041	80.4225825472227	7.07602313954477	50.5772	79.5094	6.7911	0.9566
45.6946000119632	80.926200001098	7.07602313954483	45.1636	79.7971	7.5816	1.3964
45.6946000119632	80.9262000010978	21.6183	45.6946	80.9262	23.2292	1.6109
43.7605688437236	81.9597241630448	16.2890999998404	43.9629	81.9344	16.1851	0.2289
43.6547672484893	85.0626327544246	16.2890999998404	43.3068	85.4106	16.2891	0.4921
51.058154461646	83.3917657214804	15.5968325920737	50.9984	83.4341	15.7476	0.351
54.1690000001652	83.3917657214804	13.7970165058716	54.169	81.8375	12.9059	1.7916
63.458594508103	85.0160945080527	13.7970165058717	63.6977	85.2552	13.695	0.3532
61.0006021530502	78.1642021535814	16.4053000019783	60.7208	77.8844	16.4053	0.3957
66.3965956115117	80.7086622031601	23.2022000000965	66.7645	81.0279	23.2022	0.4871
61.845300000111	80.70866220316	28.4820046556562	61.8453	80.8454	29.5157	1.0427
60.3485000000059	80.1704008591977	27.9583000006283	60.2539	80.1704	27.9583	0.0946
60.3560000329599	72.3736000214805	26.7879000000243	60.356	72.3736	25.6911	1.0968
64.2708454445138	68.2171546048913	28.6409000044888	65.3011	67.1869	28.6409	1.457
61.6788999991031	74.850700001194	40.9954000000188	61.6789	74.8507	42.3385	1.3431
59.2712000002582	75.467197013261	40.007702984817	59.2712	76.4167	39.0582	1.3428
58.3448000001357	61.8963999999427	41.5011105828663	58.3448	60.9201	41.5011	0.9763
56.2717801512364	62.0658198490779	45.2502198484108	56.0439	62.2937	45.4781	0.3947
57.5459281733802	54.8997999999981	45.2502198484108	57.8122	54.5104	45.2899	0.4734
67.6643545010853	54.899799999998	43.2255457464367	67.8108	54.6502	44.2592	1.0734
70.5895929822588	54.899799999998	39.1491918031991	70.983	56.1077	39.9244	1.4882
80.6138999999995	54.899799999998	37.9974999999091	80.6139	53.7748	37.9975	1.125
81.8773999996796	59.7407677260492	26.4264322762475	81.8774	60.6902	25.477	1.3427
82.3441	58.0478999993542	28.49589999913	82.7455	58.0479	28.4959	0.4014
76.1299783939986	55.1293517032046	29.3965912393095	76.3859	55.8636	29.5918	0.8017
74.3936943029163	53.1065415940531	29.3965912393095	74.8357	53.7031	27.6754	1.8745
74.393694302916	48.218771193652	30.179244581757	74.6616	49.1772	30.6996	1.123
74.393694302916	44.6995000014337	30.1792445817575	73.064	44.6995	31.3834	1.7939
80.474773818285	38.8538999998414	30.1792445817574	81.8496	38.8539	28.9342	1.8548
80.474773818285	37.8776551561536	30.1792445817569	80.5435	37.2793	30.7227	1.6755
80.2491813022961	32.7664000006948	32.8186186979876	80.1207	32.7664	32.9471	0.1817
80.3909266141357	28.1119999977048	20.5563733855939	81.7106	28.112	19.2367	1.8663
76.4190000015943	23.4947999999932	27.7958000014053	76.419	22.7841	27.7958	0.7107
62.9777016179495	27.2195983809155	31.040100000065	62.0154	28.1819	31.0401	1.3609
68.2389000005067	8.57209555845303	37.4330544403899	68.2389	8.47105	37.5341	0.1429
78.0566446436827	10.729957081589	32.5132094957273	77.911	9.90186	32.1435	0.9185
79.2918999908569	12.0645000000001	22.4659992528043	79.2919	13.6517	22.466	1.5872
88.9050258127344	10.7700999996036	17.684183337106	88.9914	10.7701	17.3091	0.3849

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
88.9050258127343	1.6700796518039	24.5962623449458	88.6343	0.494442	25.7719	1.6845
95.7658999993482	2.55348976421348	7.66480000000305	95.7659	2.55349	7.5519	0.1129
98.1426765943034	4.73210999942546	12.0098765896366	98.9579	4.73211	12.8251	1.1529
97.5637000000022	17.1802000008727	10.0021000228063	97.4766	17.1802	10.0021	0.0871
98.2075999999168	23.4577026555546	6.84350049679215	99.5853	23.4577	6.8435	1.3777
98.2075999999168	24.4492053391333	5.73531240241473	98.8743	25.646	5.6301	1.374
90.1100000009945	21.3737603450912	5.73531240241469	90.11	20.7153	5.7932	0.661
80.0506000155931	36.8528996647896	1.99980000000082	80.0506	36.8529	1.8328	0.167
79.5061000013517	47.8608533256063	11.4687132382244	79.5061	49.6701	11.7965	1.8387
72.4781999999498	47.2040638819585	11.4687132382244	72.4782	47.1166	11.4083	0.1063
70.427824902593	47.2040638819582	16.1011000033256	69.2786	47.5055	16.1011	1.1881
85.2354000010402	42.9565544963832	16.8060732085081	85.2354	42.0312	17.7315	1.3087
89.8766924333983	48.3318000022846	13.9354075678814	90.8764	48.3318	12.9357	1.4138
88.4474000000348	55.9131000000094	14.5585999999116	88.4474	55.9131	14.5629	0.0043
85.7560294812349	62.1637999998516	2.06872948608166	85.3959	62.1638	1.7086	0.5093
97.1353612207815	70.917061219921	3.84760000096643	97.9153	71.697	3.8476	1.103
66.9764000000127	66.2721999999989	9.0944000000199	66.9764	66.2314	9.0944	0.0408
52.5117999956869	67.3057803965466	10.1738803992377	52.5118	68.1256	10.9937	1.1594
51.7929999861962	64.9464000001081	0.956000000000008	51.793	64.9464	0.9013	0.0547
31.7368000000255	61.756360866917	0.956000000000008	31.2678	61.1344	2.0752	1.3636
31.7368000000255	55.2626004973155	12.017400524413	30.6696	55.2626	12.0174	1.0672
37.309949415796	49.4356000016591	12.2765494156346	37.4105	49.4356	12.3771	0.1422
30.3745793951134	42.9357456710152	12.2765494156346	28.6889	43.6077	12.417	1.8201
Route: 3 Length: 944.751016960976 Demand Met: 610						
5.22149264217015	62.0405719118745	6.11493096348157	5.52590000000001	61.9092	6.1438	0.3328
8.82942036949775	65.792370367327	6.73260065730176	9.17265	66.1356	6.7326	0.4854
8.59077999999121	64.3565022968836	18.8287991992719	8.25408	64.3565	18.8288	0.3367
19.6655985772377	61.3862027103122	19.5228999999901	19.6656	61.3862	20.5906	1.0677
24.3622548210749	60.3267087930084	13.4915003195659	24.5176	59.5849	13.4915	0.7579
24.3622548210751	69.8637003400124	9.67100478826809	24.7619	69.8637	9.1655	0.6444
21.0102046130208	75.2844595183766	17.4681834414597	20.7262	75.308	17.3361	0.3141
17.8883262370366	77.2717552878414	24.7940325122785	17.2306	77.2747	24.7644	0.6584
9.80243999999999	80.3325457893508	24.7940325122785	10.1219	82.045	24.5182	1.7637
9.80243999999999	83.8954000084488	29.0611001747616	8.89064000000001	83.8954	29.0611	0.9118
23.3568999843315	84.1982000000001	30.5317997250395	23.3569	85.0798	30.5318	0.8816
25.9392103407402	79.6888903745931	37.5420998750819	26.7929	78.8352	37.5421	1.2073
25.7615000146814	81.4539000168529	43.0907	25.7615	81.4539	44.2448	1.1541
16.9762999999997	81.4553935561643	36.5974328945762	16.5471	81.1813	37.3426	0.9026
16.9762999999997	94.3592996450677	34.7835000842783	16.7243	94.3593	34.7835	0.252
23.1083028079985	95.2263587174715	22.7964412766367	23.1083	96.0553	21.9675	1.1723
29.5532974487948	93.1832781869028	26.3951	29.5533	92.3189	26.5937	0.8869
32.8291724371274	93.2543000833866	26.3951	33.1283	92.3481	27.8161	1.7117
34.7487000235407	93.2543000833867	26.3951	34.7487	93.2543	26.9859	0.5908
48.6626043182799	97.8711813208368	26.3042187498863	48.6626	98.7924	25.383	1.3028
57.6013808041564	93.7822192012905	37.2537996692881	58.0371	93.3465	37.2538	0.6162
54.8664999688944	95.0433	41.9419000459426	54.8665	95.2849	41.9419	0.2416
49.0740936943127	87.5020113483304	41.9818351402432	50.0418	88.5256	42.3177	1.6597
49.0740936943126	84.7535712261417	41.9818351402432	47.7087	83.4773	42.5429	1.9514
48.3205999527858	81.9315000000464	48.7053000443271	48.3206	81.4332	48.7053	0.4983
46.5605652261756	88.3515989251113	55.9487000000026	44.9959	88.3516	56.7624	1.7636
53.714399932697	89.3849000119742	55.9487	53.7144	89.3849	55.8234	0.1253
59.3326005624981	95.2820000000002	60.2925004124743	59.3326	96.8644	60.2925	1.5824
68.1812153320168	94.5656205956097	63.4727999029032	68.3546	93.0491	63.4728	1.5264
68.181215332017	96.8285569946787	68.8343570942716	68.0526	97.9535	69.9593	1.5961
74.703193452032	96.8285569946787	62.0832559541516	74.1314	97.2935	62.187	0.8261
77.3697440505385	90.2453000451104	62.0832559541464	77.8131	90.2453	61.6399	0.627
74.2726749201933	82.4562749200886	63.5442000403801	73.8931	82.0767	63.5442	0.5368
83.897753732766	85.0621535166637	68.8388537249674	84.4594	85.6238	69.4005	0.9728
83.1753502141584	80.2718985790895	62.2851999999995	82.6909	80.2719	62.172	0.4975
89.1083999944467	77.1611000034785	62.2851999999999	89.1084	77.1611	62.2997	0.0145
94.2046000063366	74.3489	49.4797000066181	94.2046	73.3577	49.4797	0.9912
95.4347631419011	77.8602411100904	37.2508953019685	95.4573	78.5053	38.9919	1.8568
95.6134011536033	95.8731012219795	35.4747998856536	96.3227	96.5824	35.4748	1.0031
90.9633579876488	95.2682782905233	33.7740191477678	91.0373	94.8618	33.7328	0.4152
90.9633579876488	87.935400036566	31.6404737246663	91.8947	87.6684	31.3605	1.0085
80.7777000151816	87.9354000365659	24.1554000001147	80.7777	87.9354	23.575	0.5804
76.5666180129927	81.401998990256	36.9708819827335	75.9957	81.402	37.5418	0.8074
77.5351943354327	78.0346940331683	34.7099999999776	77.5352	78.0347	33.1993	1.5107
82.0447696000814	71.4326303635797	35.9746997387036	82.5413	70.9361	35.9747	0.7022
80.2661999999999	73.816799990512	40.4273002746534	78.9206	73.8168	40.4273	1.3456
83.8416999999996	75.7356999998392	43.6346000019813	84.0931	75.7357	43.6346	0.2514
79.6042000327664	79.2262386805601	47.7480575118796	79.6042	79.6519	48.0916	0.547
77.2633747900802	75.1456051362413	47.748057511894	76.2214	75.1456	46.9071	1.339
78.5989001777739	74.3855405095286	50.255292590877	78.3667	74.2083	50.3369	0.3033
81.7729000000024	62.9891004026786	53.3906997394769	81.8209	62.9891	53.3907	0.048
81.4228857065403	58.4381994979044	60.6443930022994	82.834	58.4111	60.6469	1.5249
69.3671998850217	55.8483945731409	60.9966054899337	69.3672	55.5594	61.2856	0.4087
69.3671998850216	58.3239270694832	59.7468332454211	69.1414	57.6653	59.1832	0.8958
64.2573000203787	58.9530005147963	50.6242999999999	64.2573	58.953	49.3124	1.3119
60.7710111977422	66.3546819694404	51.7927822034103	60.771	67.3196	52.7577	1.3646

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
41.2396172491385	61.0801979301043	50.1595999934961	40.6271	60.1839	50.1596	1.0856
41.2396172491385	66.9855997015692	48.5915500895254	42.1545	66.9856	47.2528	1.6215
23.5861285023411	67.966216293301	50.4016289918244	23.6206	68.344	50.228	0.4172
23.5861285023414	68.8687130070867	59.4769586987919	23.7167	70.7298	59.5174	1.8661
16.5249628086187	69.6355133978432	59.476958698792	16.576	71.2313	59.4946	1.5967
14.0140996104778	70.1708000000019	60.1608008740956	14.0141	70.4084	60.1608	0.2376
2.67325887530288	61.4642022506606	60.9323450109179	1.5771	61.4642	62.0285	1.5502
9.18954670045011	61.4642022506606	53.7839295868334	8.30742000000001	60.1487	54.798	1.8807
9.18954670045011	58.8780000590292	48.3175136456099	10.4725	58.878	47.8708	1.3585
9.18954670045009	54.2933199165423	48.3175136456099	9.35554999999999	53.1101	48.6717	1.2462
2.65755159554735	54.2933199165423	45.8235467522355	3.30116	54.5758	46.8676	1.2586
2.65755159554735	66.958421258163	45.561168577364	2.55217	66.9796	45.1209	0.4532
0.844272147616977	70.584093411934	31.0365993557329	0.194864999999993	71.2335	31.0366	0.9184
2.2998503572428	50.9807977990297	25.3767776525256	2.40393	50.9808	25.185	0.2182
2.29985035724282	38.4710995102206	26.7603823957111	2.57158	38.4711	27.3546	0.6534
Route: 4 Length: 1007.90231936821 Demand Met: 624						
12.2426583899905	44.3175471380415	1.68613356246482	12.2621	43.6923	1.4336	0.6746
12.2426583899905	46.4953505862444	6.72290000051718	11.7937	48.0467	6.2423	1.685
13.3717817345752	57.7661817362597	6.72290000051718	13.5318	57.9262	6.7229	0.2263
12.3795000000017	55.5177994982888	10.172900010392	10.9638	55.5178	10.1729	1.4157
12.5871999999629	53.7048518288818	19.2836481708804	12.5872	53.6987	19.2898	0.0087
22.4698	53.7551996638483	18.8728821212369	22.8193	53.7552	17.9075	1.0267
22.4698	54.8411072763939	28.403400028977	22.5447	55.6169	28.4034	0.7794
22.4698	49.421399999994	29.6987000000001	23.6126	49.4214	29.6987	1.1428
16.8477694119997	45.7996642067857	30.2350000321775	15.6372	44.5891	30.235	1.712
20.0031999999999	47.721899874399	38.8825999625526	20.5641	47.7219	38.8826	0.5609
18.8040080014007	55.1629000068121	42.9867920090751	17.5187	55.1629	44.2721	1.8177
18.9041999967786	61.3621783120946	35.9772499994746	18.9042	62.1271	34.907	1.3155
25.6512993227992	61.3621783120946	36.4952544554293	25.6513	60.6643	37.4717	1.2002
32.6410000257787	61.4989999999987	34.0062000005604	32.641	61.5676	34.0062	0.0686
33.4191999994217	61.1764000000071	33.0003995590245	33.4192	59.483	33.0004	1.6934
35.9094000000013	66.9975	29.2316999997104	35.9094	68.8825	29.2317	1.885
45.2183999973107	66.7199000000002	18.543099978142	45.2184	66.3382	18.5431	0.3817
46.8116435623856	71.1772865039988	18.1560559903705	47.6475	71.1843	17.3202	1.1821
46.339899419839	71.1772865039987	30.3479305735489	46.3399	71.17	31.2162	0.8683
41.4130999982541	74.8199000018267	29.0163000000001	41.4131	74.8199	27.7293	1.287
39.1682530918375	82.0382707839494	33.0946838966684	38.4806	81.2568	32.7466	1.0976
36.723	84.3383	38.0239	36.723	86.3354	38.0239	1.9971
34.9223994381991	84.3383	46.6240314986423	34.4937	83.7515	46.1073	0.8917
34.922399438199	80.2209803334649	53.8823781368321	34.9224	79.9328	54.0968	0.3592
23.3293002643783	80.2209803334649	53.8823781368321	23.3293	78.9181	52.7226	1.7443
20.7615632129304	82.1482999990646	61.427936787584	19.5225	82.1483	62.667	1.7523
26.9040574899018	94.5622983180111	60.7185253473204	27.8353	94.5623	59.9313	1.2194
18.0639999466999	95.6625794740876	60.7185253473204	18.064	96.3276	61.2807	0.8708
4.28893991965006	92.6489003173052	50.5405000000007	4.28894	92.6489	49.3954	1.1451
3.06059014641977	89.1425000000003	51.3597999890074	3.06059000000001	88.1315	51.3598	1.011
3.06059014641977	93.7932198106124	51.9762570819946	3.24988	93.8751	52.5027	0.5654
1.010318	97.3272000054533	63.0477000000575	0.299018000000004	97.3272	63.0477	0.7113
3.57800999799451	98.7133814905083	79.5168814901309	3.57801000000001	99.0366	79.8401	0.4571
13.9768824951361	98.5971871298084	79.5168814901309	12.7313	98.6134	79.0339	1.4759
28.2516961389045	88.9763716682431	79.5168814901309	27.9893	89.6021	79.9213	0.7899
29.8826999994099	79.7819000000008	74.8633999990209	29.8827	79.684	74.8634	0.0979
41.5460000026649	81.415714770653	72.0075812544659	41.546	82.3742	71.0491	1.3555
43.0766494096283	81.415714770653	80.9625221019623	43.0779	81.6476	81.3569	0.4575
43.0766494096282	69.3338513388276	86.8454997831849	43.1006	68.5786	87.3861	0.9291
47.8959999999998	62.5481000332546	86.8454997831849	48.6743	62.5481	86.8455	0.7783
43.5840999999932	58.7521999999011	99.4065000000004	43.5841	58.7522	99.5019	0.0954
42.3921	58.1198999952869	97.2119000057484	41.7302	58.1199	97.2119	0.6619
53.7709305196794	53.3434058837808	93.0748729564439	54.0007	52.8659	92.5002	0.7817
53.7709305196794	44.612700007462	87.2316499557424	53.4254	44.9898	88.3964	1.2721
54.4192999999999	37.8510998245787	81.0116998901368	55.717	37.8511	81.0117	1.2977
54.4192999999999	31.7709999994902	71.5562235342303	55.099	31.771	70.6981	1.0947
38.4042751835936	31.440800195035	76.205899998788	37.7688	31.4408	76.6336	0.766
46.0828985329471	25.5503005829598	76.205899998788	46.0829	25.5503	78.1024	1.8965
48.1385378320818	21.1558838707364	74.1672839554549	47.6864	20.3976	74.364	0.9045
49.9869418804534	17.339459417707	69.6797999956371	50.9211	16.4053	69.6798	1.3211
36.0033000023406	17.4645694050594	68.554114790121	36.0033	17.5038	68.4307	0.1295
27.3595000026441	17.4645694050594	76.6802926807493	27.3595	17.3028	77.1892	0.534
27.2622	21.338299979945	63.9830000161337	26.0672	21.3383	63.983	1.195
33.1554547421458	23.0392999942744	62.861288329193	34.4638	23.0393	61.4662	1.9126
33.1554547421458	31.1822000000319	62.8808948692316	31.6686	31.1822	62.9487	1.4884
34.372200392897	38.725100396225	62.8808948692316	34.4656	38.8185	62.9703	0.1595
23.2873999760916	33.2844000000009	59.4617000232869	23.2874	32.7742	59.4617	0.5102
17.5683814874199	36.1271649630883	57.0245688603697	17.6023	36.5196	56.7286	0.4927
10.4476512456387	36.5141583485564	54.1714002172912	9.16001	37.8018	54.1714	1.821
21.6313	34.3604000924328	52.0640999913838	22.7183	34.3604	52.0641	1.087
20.3183717550044	31.2404716989223	48.5254999909972	19.5262	30.4483	48.5255	1.1203
25.7378897839375	32.8004873097552	46.8035127009551	25.7714	33.2927	46.3113	0.6969
25.7378897839375	24.1355437878885	50.0936796743327	25.8125	25.1372	50.1121	1.0046
25.7378897839374	18.1900874752235	52.4421125171283	25.7178	17.895	52.7372	0.4178

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
31.067430475794	22.1985244287568	49.3279206825297	31.0765	22.0815	48.5077	0.8334
38.2173000185308	22.4852999999992	49.0769999516113	38.2173	22.874	49.077	0.3887
41.1891594021886	22.4852999999995	37.9859953774063	42.987	22.9253	37.986	1.8509
41.1891594021886	4.74661913219725	36.9379988888187	42.0178	3.44287	36.938	1.5448
37.4981696303267	7.68620773739839	32.651293433818	37.2177	7.79249	31.0238	1.6549
37.4981696303268	8.98744885344666	19.4719487394142	38.2491	9.61738	19.3363	0.9895
25.6231000006291	11.6094433370331	18.5444580890027	25.6231	12.6549	17.499	1.4785
23.1983999347853	2.12728802202036	18.8544117117887	23.1984	1.0131	19.9686	1.5757
21.4743999821812	6.44005999999997	12.0685000204874	21.4744	8.21886	12.0685	1.7788
12.7115999963861	4.29146999421573	5.62930000000058	12.7116	4.29147	5.5693	0.06
9.04959800546301	3.46355000055705	6.77420185519187	9.0496	1.67955	6.7742	1.784
1.17937664718326	3.46355000055705	13.8235782004709	0.219756000000004	2.58493	14.7832	1.6167
2.09528516368974	5.40610272908861	3.43290467960166	2.00806	6.28968	2.6575	1.1788
Route: 5 Length: 1089.05721690014 Demand Met: 635						
13.0913	22.887399987677	2.33310001077716	13.4	22.8874	2.3331	0.3087
5.42772415110144	21.7758871281233	10.4351391674227	5.81823	20.7452	12.0688	1.9707
1.10505000000128	19.6999001584046	21.2279999190199	0.659450000000007	19.6999	21.228	0.4456
2.1356299999985	16.3883001440836	43.9304996011822	2.68873000000001	16.3883	43.9305	0.5531
0.965562000000546	12.2623998147524	51.4967000156474	0.613562000000002	12.2624	51.4967	0.352
6.43446957741141	10.6262300000001	59.8478000003902	6.43447000000001	8.70233	59.8478	1.9239
11.0325342279305	10.6262300000001	65.3085875000284	10.9524	12.0779	65.6188	1.7347
15.9009742765344	10.6262300000001	73.5431999999034	17.1854	11.1942	73.5432	1.4044
12.467	2.73525000039026	75.6448000002886	10.9477	2.73525	75.6448	1.5193
19.7287000009638	0.298559479113464	79.4664565241064	19.7287	0.198716	79.5663	0.1412
22.3291060119158	2.71779414079426	73.0480000002074	23.5387	4.13129	73.048	1.8604
22.3291060119158	2.71779414079426	56.6173107674934	21.7245	2.01127	55.495	1.4575
26.7979	5.07356	59.4639999999867	26.7979	6.90196	59.464	1.8284
32.0714492678184	2.07366000007362	62.2722128859694	33.1085	0.882753	62.284	1.5792
56.3237000003489	2.07366000007362	65.1621	56.3237	2.07366	66.7228	1.5607
60.7013003613021	1.84050768508934	46.8969476888432	60.7013	1.36116	46.4176	0.6779
74.6319996623682	4.79893999999659	48.5008988449359	74.632	5.60444	48.5009	0.8055
93.9356698611458	4.50980020363128	48.7197697175923	95.0473	3.39817	49.8314	1.9254
91.8815117484346	10.4307882493942	38.6827999986374	91.7898	10.5225	38.6828	0.1297
98.591080087439	8.70009995516089	36.5945003023866	99.5164	7.77478	36.5945	1.3086
97.2905000005294	22.0418999414971	34.3515000000001	97.2905	22.0419	32.8941	1.4574
87.5588999882611	24.107477446205	44.9682775636518	87.5589	25.1226	45.9834	1.4356
87.1993632335785	18.0064999117451	43.7665632302129	86.8707	18.0065	43.4379	0.4648
87.6324845715129	15.63671525528	45.4756999990163	88.2698	14.9994	45.4757	0.9013
80.0349999999928	15.8589000000136	56.1907	80.035	15.8589	58.0701	1.8794
77.9596347698623	17.6508229380115	53.4372382980593	78.906	18.0381	53.555	1.0293
74.5652429623263	32.0501000002644	53.0122429143746	73.2088	32.0501	51.6558	1.9183
83.8298	32.1300999999772	62.1612000000062	85.0689	32.1301	62.1612	1.2391
75.3418719974117	34.7023287972882	63.466600158188	74.0572	35.987	63.4666	1.8168
75.3418719974117	34.7023287972882	65.0217453769358	74.7866	36.0265	64.8468	1.4465
77.6386864202999	28.9096421749593	65.9173714412939	77.6794	29.1288	65.8649	0.229
81.6579999999999	23.4882999561179	70.1915999417634	82.6839	23.4883	70.1916	1.0259
77.5458203321585	19.0806405403595	71.3738667559192	77.5205	18.1054	72.6356	1.5949
76.9072007813372	18.2917010042369	79.6242000000007	76.9072	18.2917	80.6948	1.0706
74.8038856762349	8.94958575647002	79.6242000000007	73.4709	7.6166	79.1313	1.9485
90.4882999997697	12.6215999998729	82.1624	90.4883	12.6216	83.5226	1.3602
96.4015559726773	16.65230000013	74.7229669963463	96.7716	16.6523	73.2113	1.5563
96.4015559726773	23.1039869840527	82.3479999827798	96.7473	23.5618	82.348	0.5737
93.1463999848427	19.8145999636036	96.5689999999989	93.1464	19.8146	96.7782	0.2092
75.2455000019745	17.3083999957776	92.0401	75.2455	17.3084	91.8789	0.1612
67.6002839546527	16.3822868609144	98.3436049737235	68.0574	15.6194	97.6814	1.1416
61.723695032469	0.698901019496897	98.3436049737235	61.5069	0.482106	98.5604	0.3755
62.8049	3.66175999990784	91.1440999999753	64.5769	3.66176	91.1441	1.772
52.1402871978577	5.63507559211789	87.7869082367072	52.4925	5.37248	88.2454	0.635
51.7699000000005	6.04103001083864	87.327000102383	51.1528	6.04103	87.327	0.6171
55.3251791188024	16.4754790142468	85.8883997471367	55.9929	17.1432	85.8884	0.9443
43.8962004758088	14.0516000000051	83.4665004350348	43.8962	13.6901	83.4665	0.3615
40.6403235375363	19.2268002140477	80.504622910879	39.9475	19.2268	79.8118	0.9798
42.6942812788975	19.3947831861864	85.9823590837924	41.7205	19.4188	86.0496	0.9813
42.6942812788975	23.9677514920916	88.7392008618648	42.4972	23.9973	88.7768	0.2028
44.1205907173493	30.2661906906698	94.9689999817386	44.5404	30.686	94.969	0.5937
30.7066914229318	29.7184773267586	96.9071	29.1053	29.2049	97.3043	1.728
27.2481999999956	20.2425000000006	96.9071	27.2482	20.2425	98.6789	1.7718
22.6997004311417	16.7324999999999	96.5597001275362	22.6997	14.9199	96.5597	1.8126
9.27452999565529	18.2743942574566	95.8715334149176	9.96077	19.2347	95.1963	1.6989
9.27452999565529	38.979316164942	95.8715334149176	8.75416	38.928	96.5496	1.075
9.27452999565529	43.1110999999982	88.7547000615001	9.27453	43.3967	88.7547	0.2856
7.53949866101811	42.7001486613827	79.4030003409261	7.21925	42.3799	79.403	0.4529
11.9279204197912	50.6388000000001	76.5678270056469	13.2524	50.7626	76.4367	1.3367
17.8084999999619	50.6387999999999	71.4677000000134	17.8085	51.9553	71.4677	1.3165
24.4594000004456	48.9996	68.2546000012733	24.4594	47.3987	68.2546	1.6009
30.4468000076809	53.5688000175878	58.9855000000001	30.4468	53.5688	58.3124	0.6731
44.1021584464384	55.0105584447242	59.2126002624121	44.4217	55.3301	59.2126	0.4519
41.6782999332344	52.1534999924666	70.2889999999997	41.6783	52.1535	70.8377	0.5487
38.4337896642506	48.5345729116954	64.4662388054038	38.5534	48.7846	64.7262	0.38
38.4337896642506	45.754899996564	62.6722896640442	38.1612	45.7549	62.3997	0.3855

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
46.3137412848517	42.8154	64.4019410346832	47.522	42.292	65.6102	1.7871
46.203699999911	42.8154	48.7253999997951	46.2037	41.7062	48.7254	1.1092
33.2770999999776	45.1110865655406	45.4780328092398	33.2771	46.652	45.1216	1.5816
32.7353003826418	39.0128989745561	45.4780328092398	32.7353	38.4372	45.6112	0.5909
24.9834	40.0123999999419	41.5073999995891	23.6339	40.0124	41.5074	1.3495
25.2672018800925	41.6273019029996	24.4871002292706	26.2003	42.5604	24.4871	1.3196
17.4732353697704	40.9576194986055	24.0835165674878	17.5856	40.8861	25.0628	0.9883
13.4561458924656	40.9576194986055	22.5589275732555	13.4598	41.6191	22.5554	0.6615
11.3656088019193	37.7192242689794	14.288841115556	11.4258	37.7412	14.2255	0.0901

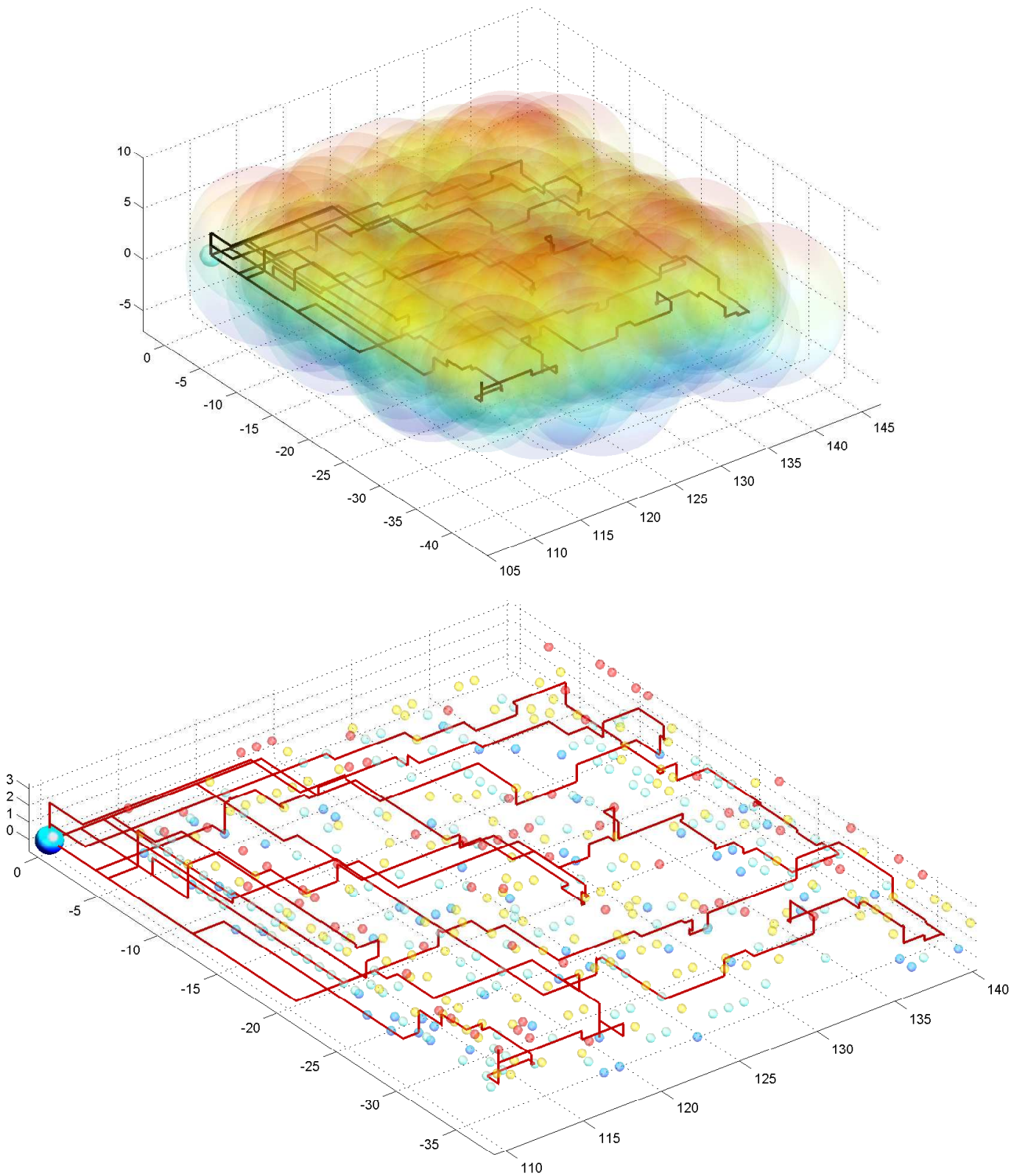


Figure O.206: *pcb*442, arbitrary radius, 3D, Manhattan, Length = 627.6374638

Table O-209: Solution for *pcb*442, arbitrary radius, 3D, Manhattan

Total distance: 627.637463771702 Total demand met: 1066 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 110.581291627107 Demand Met: 179						
2	6	1	2	6	1	0
2	22	1	2	22	1	0
4.00864466796558	23.0022843685806	1.00002810839451	4	23	2	1
4.69110579335978	25.4999912370806	1.00002810839451	4.7	25.5	2	1
4.69110579335978	26.0603796603766	1.00002810839451	4	26	0	3
5.23446506179749	26.0603796603766	1.00002810839451	7	27	1	2
6.26901817428626	26.0603796603766	1.00002810839451	8	26	0	2
10.9989999998921	26.0603796603766	1.00002810839451	13	27	2	7
10.9989999998921	28.1979118340482	1.00002810839451	8	30	0	5
10.9999999998921	28.1979118340482	1.00002810839451	9	27	3	6
10.9999999998921	28.200000000004	1.00002810839451	14	28.2	1	3
10.9999999998921	28.2013509140908	1.00570167462662	10	27	1	5
10.9999999998921	28.2013509140908	1.00670167462662	11	27	2	5
10.9999999998921	28.2013509140908	1.00770167462662	15	28.6	2	6
10.9999999998921	28.2023509140908	1.00770167462662	7	30	2	5
10.9999999998921	30.0000000466688	1.99980077905877	12	30	2	1
10.9991992208333	30.0000000466688	1.99999999999998	15	27	3	6
10.003	30.0000000466688	1.99999999999998	11	30	2	7
10.002	30.0000000466688	1.99999999999998	9	30	2	2
10.001	30.0000000466688	1.99999999999998	13	30	2	5
10	30.0000000466688	1.99999999999998	10	30	3	1
10	32.9999978029362	1.99999999999998	9	33	2	1
10	32.9999978029362	0.004997802936193	11	36	1	6
10	32.9999978029362	0.003997802936197	8	33	2	4
10	32.9999978029362	0.002997802936197	11	33	1	4
10	33	0.002	14	36	0	7
10	33	0.002	15	30	2	7
10	33	0.001	12	33	1	4
10	33	0	10	33	0	0
9.99999998761812	33	0.000999987618121	9	36	0	5
9.99999998761812	33	0.999727435662752	7	33	1	3
10.0000000330685	33.0003639064445	1.00036348376783	14	33	1	4
10.0000000330685	35.031352725988	1.00036348376783	13	33	2	6
10.0000000330685	35.031352725988	1.00036348376783	15	33	2	6
10.0000000330685	35.031352725988	1.74840143746031	12	36	1	4
10.0000000330685	35.031352725988	1.74940143746031	13	36	2	6
10.0000000330685	35.0317541634481	1.75000000000005	10	36	2	1
7.99999999998144	35.0317541634481	1.74999999999996	8	36	0	2
7.3165291564097	35.0317541634481	1.75000000000005	6.2	37.1	3	3
7.3155291564097	35.0317541634481	1.75000000000025	6.2	36.5	2	3
7.3155291564097	35.0317541634481	2.25000000000013	7	36	1	6
4.39541131703047	35.0317541634481	2.25000000000013	4.7	33.5	3	6
3.99999999009243	35.0317541634481	2.25000000000013	4	36	2	1
2.59701801910819	35.0317541634481	2.25000000000013	4	34	3	5
2.59601801910819	35.0317541634481	2.25000000000013	4	35	3	5
2.468047051049	35.0317541634481	2.25000000000013	3	35	2	3
2	35.0317541634481	2.25000000000013	2	36	2	1
2	35.0317541634481	2.25000000000013	1.5	35.5	2	1
2	35	3	2	35	3	0
2	35	2.999	2	33	3	4
2	35	1.86602540378444	1.5	35	1	1
2	34.9992009566328	1	2	32	1	3
2	34	1	2	34	1	0
3.00000034805726	34	1	3	33	1	1
4.7	34.5	1	4.7	34.5	1	0
4.7	34.499	1	3	34	1	5
4.49362230620552	34.499	1.61779534467446	4	33	1	4
4.49362230620552	34.499	1.61879534467446	4	32	1	4
4.49362230620552	31.6005613645887	1.61879534467446	5	31	1	1
4.49362230620552	31	1.61879534467446	5.2	32	2	3
4.49262230620552	31	1.61879534467446	4	30	0	5
4	31	2	4	31	2	0
3.0000006766509	31.0000000000002	2	3	32	2	1
3	31.0000000000002	1.9990006766509	3	31	2	3
3	30	1.9990006766509	3	30	2	2
2.94110839523761	30	1.9990006766509	2	30	3	3
2.94110839523761	29.0000000147628	1.9990006766509	4	29	2	3
2.94110839523761	29.0000000147628	1.33810499613777	2	29	1	1
2.94110839523761	28.9990000147628	1.33810499613777	2	31	3	3
2.99999999999989	27.1127016653793	1.33810499613777	3	29	2	2
2.99999999999989	27.1127016653793	1.33810499613777	3	26	3	2
2.99999999999989	27.1127016653793	1.33710499613778	2	28	2	4
2.99999999999989	27.1127016653793	1.28540706625754	4	28	2	6
2.99999999999989	27.0000005000001	0.001	3	28	0	1

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
3.00000000000013	27.0000004999999	0	4	27	0	1
2.0029944880209	26.2980739295766	0	3	27	0	6
2.0019944880209	26.2980739295766	0	2	25	2	3
2.00099448802091	26.2980739295766	0	2	27	1	6
1.9999944880209	26.2980739295766	0	3	24	1	3
1.9999944880209	26.0000000000252	0	2	26	0	2
1.9999944880209	25.8284271247408	0	2	23	1	3
1.9999944880209	14.9999996409257	0	2	15	1	1
1.9999944880209	12.0000059447016	0	2	12	1	1
Route: 2 Length: 90.4681758328597 Demand Met: 181						
2	9	2	2	9	2	0
4	12	2	4	12	2	0
5	15	2	5	15	2	0
7	15	3	7	15	3	0
7	17	3	7	18	0	7
7.00100000000001	17	3	9	15	1	5
7.00100000000001	17	3	12	18	0	6
9.55428635861799	17	3	10	16.3	0	5
11.1726108034447	17	3	12	15	3	6
11.1736108034447	17	3	12	17	1	6
11.1736108034447	17	3	15	18	3	7
13.5	17	3	13.5	17	3	0
13.5	17	2.7531450727679	20	16	3	7
14.6325670217166	19.7143694598602	2.75314507276791	16	18	3	4
14.6325670217166	19.7143694598602	2.75314507276791	14	18	3	2
16	19.7143694598602	2.7531450727679	17	18	3	2
16	24	2	16	24	2	0
16.2297468414132	23.3784810484794	1.18275327649825	20	29	1	7
16.2297468414132	23.3784810484794	1.18275327649825	16	30	2	7
16.2297468414132	23.3784810484794	1.18275327649825	18.3	28	0	7
16.2297468414132	23.3784810484794	1.18275327649825	16	27	0	7
16.2297468414132	23.3784810484794	1.18275327649825	20	24	0	4
16.2297468414132	23.3784810484794	1.18275327649825	9.5	22.2	2	7
16.2297468414132	23.3784810484794	1.18275327649825	20	23	2	7
16.2297468414132	23.3784810484794	1.18275327649825	14	25	0	3
16.2297468414132	23.3784810484794	1.18275327649825	12	24	2	5
16.2297468414132	23.3784810484794	1.18275327649825	17	24	2	2
16.2297468414132	23.3784810484794	1.18275327649825	13	24	1	5
16.2297468414132	23.3784810484794	1.18275327649825	14	24	1	5
16.2297468414132	23.3784810484794	1.18275327649825	12.2	22.1	3	5
16.2297468414132	23.3784810484794	1.18275327649825	15	24	1	4
16.2297468414132	23.3784810484794	1.18275327649825	15.5	18.5	2	5
16.2297468414132	23.3784810484794	1.18275327649825	14	21	2	7
16.2297468414132	23.3784810484794	1.18275327649825	15	21	2	6
16.2297468414132	23.3784810484794	1.18275327649825	14	20	2	5
16.4932938163299	21.3175781033319	1.18275327649825	16	21	3	3
16.4932938163299	21.3175781033319	1.18275327649825	13.5	21.4	1	3
16.4932938163299	21.3175781033319	1.18275327649825	15	19	0	3
17.016841192925	20.9999999999069	1.18275327649825	18	21	1	1
17.016841192925	20.0169854456053	1.18275327649825	17	21	1	1
17.016841192925	15.0390267072553	1.18275327649825	16	15	1	5
17.016841192925	15.0390267072553	1.18275327649825	15	15	0	7
17.016841192925	15.0380267072553	1.18275327649825	18	15	3	6
16.5478826225292	14.9999984917322	1.18275327649825	17	15	2	6
14.8330871010531	14.9999984917322	2	13	18	1	5
13.9999999999989	14.9999984917323	2	13	15	2	1
14.0000000000048	14.9196799224835	2	14	15	2	1
14.0000000000048	12.0017494434376	2	16.5	10.5	0	6
14.0000000000048	12.0007494434376	2	14	9.3	1	7
14.0000000000048	12.0007494434376	2	13	11.3	2	4
14.0000000000048	11.9997494434376	2	17	12	2	3
14.0000000000048	11.9997494434376	2	16	13	1	6
13.9979998393834	7.39664994005655	2	10	6	2	7
13.9979998393834	7.39664994005655	2	14.5	7.7	3	4
11.0009999989794	7.00000000000283	2	11	7	1	2
10.9999999989794	7.00000000000283	2	11	6	2	1
9.40000000000001	7.4	2	9.40000000000001	7.4	2	0
9.3413979694908	5.06008115965922	2	9	6	2	1
7.81192560433938	4.9	1.81192560433937	2	4	3	6
7.81192560433938	4.9	1.81192560433937	4	4	1	4
7.81192560433938	4.9	1.81192560433937	4	5	1	4
7.81192560433938	4.9	1.81192560433937	8	3	2	2
7.81192560433938	4.9	1.81192560433937	6	4	1	3
7.81192560433938	4.9	1.81192560433937	9	3	1	6
7.81192560433938	4.9	1.81192560433937	10	3	3	4
7.81192560433938	4.9	1.81192560433937	13	3	2	6
7.81192560433938	4.9	1.81192560433937	8.5	5.2	1	4
7.81192560433938	4.9	1.81192560433937	7	6	2	5
7.81192560433938	4.9	1.81192560433937	8	6	2	4
7.5	4.9	0	7.5	4.9	0	0

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
7.5	3.86602540379546	0	7	3	0	1
Route: 3 Length: 56.3790532401516 Demand Met: 172						
4	3.99516712560003	-2.7976E-9	3	4	0	7
4	7.99516713544496	-5.723376E-9	3	8	0	5
4	9.998	0	2	8	1	4
4	9.998	0	2	10	1	3
4	9.999	0	2	11	1	7
4	9.999	0	3	11	1	2
4	10	0	4	10	0	0
4.22701494019806	10	0	8	10.3	1	5
4.22701494019806	10	0.026382546873269	2	16	1	7
4.22701494019806	12.9772266164461	0.026382546873269	3	13	1	6
4.22701494019806	12.9782266164461	0.026382546873269	3	14	0	6
4.22701494019806	12.9782266164461	0.026382546873269	4	14	1	4
4.22701494019806	12.9792266164461	0.026382546875436	2	13	0	4
4.22701494019806	15.0424684153213	0.026382546875436	4	15	1	6
4.22701494019806	19.0230926806177	0.026382546875436	4	18	1	3
4.22701494019806	19.0230926806177	0.026382546875436	4	19	1	1
4.22701494019806	19.0240926806177	0.026382546875436	9	18	1	6
4.22701494019806	20.9969999929832	0.026382546873269	2	24	0	5
4.22701494019806	20.9969999929832	0.026382546873269	3	23	1	5
4.22701494019806	20.9969999929832	0.995010946313258	4	24	1	4
4.22701494019806	20.9969999929832	0.99601094631326	7	24	2	6
4.22701494019806	20.9969999929832	1.00001094631338	8	24	1	6
4.22701494019806	20.9969999929832	1.00001094631338	8	21	2	6
4.22701494019806	20.9979999929832	1.00001094631338	3	25	0	6
4.22701494019806	20.9979999929832	1.00001094631338	2	21	1	3
4.22701494019806	20.9989999929832	1.00001094631338	7	21	1	3
4.22701494019806	20.9999999929832	1.00001094631338	3	22	0	5
4.22701494019806	20.9999999929832	1.00001094631338	3	21	2	3
4.99999206677022	20.9999999999523	1.00001094631338	5.40000000000001	24.3	3	5
4.99999206677022	20.9999999999523	1.00001094631338	9	24	1	5
4.99999206677022	20.9999999999523	1.9999994427085	4	21	3	2
4.99999206677022	20.9999999999523	1.9999994427085	5.3	21	2	5
3.99999994141902	20.9999999999523	1.9999994427085	4	25	2	4
3.99999994141902	20.9999999999523	1.9999994427085	4	22	1	2
3.63414940762013	20.9101775526819	1.99999944270849	2	19	1	5
3.63414940762013	20.9101775526819	2.18953454762418	2	20	1	4
3.63414940762013	20.9101775526819	2.18953454762418	3	20	3	4
3.63414940762013	20.9091775526819	2.18953454762418	4	20	2	1
3.63414940762013	20.9091775526819	2.18953454762418	5.40000000000001	23.3	2	6
3.63414940762013	18	2.18953454762418	2	18	1	5
3.58778643762398	17.0971256203436	2.18953454762418	2	17	2	5
3.58678643762397	17.0971256203436	2.18953454762418	5	18.3	1	4
3.58578643762397	17.0971256203436	2.18953454762418	3	19	2	2
3.58578643762397	17.0961256203436	2.18953454762418	7	16	2	5
3.58578643762397	17.0961256203436	2.18953454762418	8	18	1	5
3.58578643762397	16.9999989593717	2.18953454762418	3	17	3	1
3.58578643762397	16.9999989593717	2.18953454762418	4	17	3	1
3.58578643762397	16.9989989593717	2.18953454762418	4	16	3	5
3.58578643762397	16.9979989593717	2.18953454762418	3	16	2	4
3.58578643762397	16.9959989593717	2.18953454762418	3	15	1	4
3.58578643762397	16.9959989593717	2.18953454762418	3	18	2	2
3.58578643762397	11.2231089659249	2.18953454762418	10.5	10.5	2	7
3.58578643762397	11.2221089659249	2.18953454762418	3	12	2	4
3.58578643762397	11.2221089659249	2.18953454762418	2	14	3	7
3.58578643762397	11.2211089659249	2.18953454762418	3	10	2	6
3.58578643762397	11.2201089659249	2.18953454762521	4	11	3	5
3.58578643762397	11.2191089659249	2.18953454762521	4	13	3	2
3.58578643762397	8	2.18953454762521	4	8	3	7
3.58578643762397	6.41421356237216	2.18953454762521	4	6	3	1
2.00199999665102	6.41421356237461	2.18953454762521	4	7	2	7
2.00099999665103	6.41421356237461	2.18953454762418	3	6	1	3
2.00099999665103	6.41421356237461	2.18953454762418	3	7	1	3
1.99999999665103	6.41421356237461	2.18953454762418	2	7	3	1
1.88255174952225	4.92805475714002	0	2	5	2	3
1.88255174952225	4.89697029459503	0	3	5	1	3
Route: 4 Length: 128.825091287208 Demand Met: 178						
3.48696156981563	9.85836563838143	0	4	9	0	1
3.48696156981563	10.7985034681291	0.273189361215505	3	9	1	2
10.128589765219	11.6746932396537	0.273189361218167	10	11	1	1
10.9106264307236	14.31900171772	0.273189361218167	11.5	13.5	2	2
10.9106264307236	14.31900171772	0.273189361218167	11	15	1	1
10.9106264307214	14.9987240448926	0.273189361218167	10	15	2	2
10.9106264307214	14.9997240448931	0.273189361218665	8	15	1	3
18.6011547019991	18.4056070860816	0.27318936124958	20	17	0	3
18.6011547019991	18.4056070860816	0.27318936124958	18	18	2	3
19.6075626722746	18.4937640203824	0.273189361249579	20	19	2	2
19.6085626722746	18.4937640203822	0.273189361249579	20	18	0	1
20.4509219674922	18.4937640203822	1.0517761649744	20.6	16.5	1	2

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
21.7	19	3	21.7	19	3	0
21	20.0000001587504	3	20	20	3	1
21	20.2679491924311	1.99999998872688	20	22	2	2
21	20.2679491924311	1.99999998872688	20	21	1	2
25.0910153132099	20.2679491924311	1.99999998870433	21.1	20	2	4
25.1305492855545	20.2501253126553	1.66489856640457	27	19	3	5
25.1305492855545	20.2501253126553	1.66489856640457	27	18	1	3
25.1305492855545	20.2511253126554	1.6648985664016	27	20	1	2
25.1305492855545	20.2511253126554	1.6648985664016	26	20	1	2
24.9421820573553	20.9999997847232	1.66489856640457	27	21	1	4
24.9421820573553	20.9999997847232	1.66489856640457	24	21	2	1
24.9421820573553	23.2243349205791	1.32699523826485	27	23	2	3
24.9431820573553	23.2243349205791	1.32699523826485	26	21	2	4
24.9431820573553	23.2243349205791	1.32699523826485	26	19	0	5
25.3960170388287	23.2243349205791	1.32699523826485	26	24	0	3
25.3960170388287	23.2243349205791	1.32699523826485	26	22	0	3
26.139716535161	23.2243349205791	1.32699523826485	27	25	1	2
26.139716535161	23.2243349205791	1.32699523826485	27	22	0	2
26.1397165351611	24.0098084580231	0.999999999999582	26	25	1	1
26.9332469176509	24.0098084580231	1	27.6	23.6	1	7
26.9332469176509	24.0098084580231	1	26	26	1	7
26.9995951512754	24.0098084580231	0.999999999999999	27	27	1	7
26.9995951512754	24.0098084580231	0.999999999999999	26	27	2	6
26.9995951513413	27	1	27	30	3	6
27.0005951517442	27	1	26	30	2	7
27.0015951517442	27	1	30	30	0	7
27.0015951517442	27	1	29	30	0	7
30	27	1	30	27	1	0
30	26.9389962622848	1.02921035467804	30	26	1	1
30	25.5833333333333	1.02921035467804	30	28	3	6
30	25.5833333333333	1.02921035467804	30	25	1	4
29.624999999883	24.0000000530274	1.21937525010652	29	24	2	1
29.624999999883	23.38	1.21937525025639	30	23	1	5
29.624999999883	23.38	1.21937525025639	28.5	22	1	6
29.624999999883	22.05	1.21937525025639	30	22	3	4
29.624999999883	22.05	1.21937525025639	26	23	3	6
29.624999999883	20.5	1.21937525025639	30	20	2	1
29.5	20.5	1	29.5	20.5	1	0
30	19.125	1	30	21	0	6
30	19.125	1	30	19	0	5
30	17	1	30	17	1	2
30	16	1	30	16	1	0
28.0011233454013	16	2	26	16	1	3
27	16	2	27	16	2	0
26.9990004994997	16.0000004995007	2	27	17	2	1
26.7071067996817	16.2928932373086	2	26	17	2	1
27	16.2928932373086	2	26	18	2	5
27	14.0000152590279	2	27	14	1	2
27	14.0000152590279	2	26	14	2	1
27	13	2	27	13	2	0
23.9009999639632	13	0.999999999999999	23.2	15	1	6
23.8999999639632	13	0.999999999999999	23.9	13	0	1
22.8998469915621	13	0.999999999999999	22.9	14	1	1
20.60327271209	13	1.00081125192343	20	14	2	6
20.0000320133488	13	1.00081125192343	18	12.3	2	3
20.0000320133488	13	1.00081125192343	20	15	1	2
20.0000320133488	13	1.98399428077981	20	13	2	1
20.0000320133488	10.8217999592801	1.98399428070623	20	11	1	1
20.0000320133487	9.82179995928009	1.98399428070623	20	10	1	1
13.6902385808454	6.92928429517087	2.2011928476664	14	6	2	1
13.6902385808454	6.92928429517087	2.2011928476664	13.5	7.5	3	1
10.7958057083868	4.38268696434741	2.20119284765001	12	3	3	2
10.7958057083868	2.78943828166224	2.20119284765001	11	3	3	1
Route: 5 Length: 92.910666723654 Demand Met: 172						
13.6092660633668	4.76107782322283	0.527486095494906	17.1	3.1	2	6
13.6092660633668	4.76107782322283	0.527486095494906	14	3	1	3
13.6092660633668	4.76107782322283	0.527486095494906	12	6	2	3
13.6092660633668	4.76107782322283	0.527486095494906	13	6	0	5
13.6092660633668	4.76107782322283	0.527486095494906	13	7	0	3
13.6092660633668	4.76107782322283	0.527486095494906	11	9	1	5
18.5499771299554	5.80215654330982	1.12917430958789	17.1	5.1	1	2
18.5499771299554	5.80215654330982	1.12917430958789	19	6	2	1
18.5499771299554	6.7881976241017	1.12917430958789	19	3	1	5
18.5499771299554	6.7881976241017	1.12917430958789	18	3	1	5
18.5499771299554	6.7881976241017	1.12917430958789	15.5	5	3	4
18.5499771299554	6.7881976241017	1.12917430958789	16	11	2	5
22.0882506152549	7.45879714550977	1.12917430958789	23	3	0	6
22.0882506152549	7.45879714550977	1.12917430958789	26	5	1	6
22.0882506152549	7.45879714550977	1.12917430958789	20	3	2	5
22.0882506152549	7.45879714550977	1.12917430958789	22	6	1	3

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
22.0882506152549	7.45879714550977	1.12917430958789	20	6	1	5
22.0882506152549	7.45879714550977	1.12917430958789	18	6	1	5
22.0882506152549	7.45879714550977	1.12917430958789	20	8	1	6
22.0882506152549	7.45879714550977	1.12917430958789	17.5	7.5	1	6
22.0882506152549	7.45879714550977	1.12917430958789	20	9	1	6
22.0882506152549	7.45879714550977	1.12917430958789	20	12	1	5
26.3658605161443	9.07833841326162	1.12917430958789	26	8	2	2
26.3658605161443	9.07833841326162	1.12917430958789	26	10	1	1
27.5758741638654	10.394463153446	2.01096789205479	28	11.3	2	1
29.8522993246807	10.9999999999953	2.01096789207315	30	11	3	1
29.8522993246808	12.5143479727015	1.13841621481649	25.5	7.1	2	7
29.8522993246808	12.5143479727015	1.13841621481649	30	13	2	1
29.8522993246808	12.5143479727015	1.13841621481649	30	15	1	4
29.8522993246808	12.5143479727015	1.13841621481649	25	8	2	7
29.8522993246808	12.5143479727015	1.13841621481649	30	18	1	6
29.8522993246808	12.5143479727015	1.13841621481649	29.5	17.5	1	5
29.8522993246808	12.5143479727015	1.13841621481649	27	15	1	7
29.8522993246808	12.5143479727015	1.13841621481649	26	15	1	5
30	12	0	30	12	0	0
29.9494216183435	10.1013629567475	0	27.5	5.2	2	6
29.9494216183435	10.1013629567475	0	30	8	3	4
29.9494216183435	10.1013629567475	0	30	9	1	2
29.9494216183435	10.1013629567475	0	30	10	3	6
29.9494216183435	10.1013629567475	0	27	7	2	6
29.9494216183435	10.1013629567475	0	28	9	1	4
29.9494216183435	10.1013629567475	0	27	9	2	6
29.9494216183435	10.1013629567475	0	27	10	1	6
29.9494216183435	10.1013629567475	0	29	14	2	5
29.9494216183435	10.1013629567475	0	27	11	1	6
29.9494216183435	10.1013629567475	0	27	12	1	4
29.9494216183435	10.1013629567475	0	26	11	3	6
29.9494216183435	10.1013629567475	0	26	12	1	5
29.9494216183435	10.1013629567475	0	26	13	1	5
29.0000009949086	10.1013629567475	0.259474241373045	29.3	9.5	1	1
29.0000009949086	5.41421302069421	1.58578589590455	29	4	3	2
29.0000009949086	5.41421302069421	1.58578589590455	29	5	2	1
25.5823950420176	5.75844462184198	1.01422391036254	30	7	3	5
25.5823950420176	5.75844462184198	1.01422391036254	25	3	2	3
25.5823950420176	5.75844462184198	1.01422391036254	26	4	1	2
25.5823950420176	5.75844462184198	1.01422391036254	24	3	2	5
25.5823950420176	5.75844462184198	1.01422391036254	27	8	3	4
25.5823950420176	5.75844462184198	1.01422391036254	24	6	2	5
25.5823950420176	5.75844462184198	1.01422391036254	24.5	7.1	0	2
25.5823950420176	5.75844462184198	1.01422391036254	26	9	0	5
25.5823950420176	5.75844462184198	1.01422391036254	21	6	3	5
23.0000000000354	5.75844462184198	1	23	6	0	2
23.0000000000354	4.7	1	22	4.7	1	1
23.0000000000354	4.699	1	22	3	1	4
23.0000000000354	4.699	1	21	3	2	4
20	3.7	1	20	3.7	2	1
15.5	3	1	15.5	3	1	1
Route: 6 Length: 148.473185060722 Demand Met: 184						
9.45580058555375	7.29401571500794	0	8.5	7	0	1
10.3382741552083	18.7486960803503	0.038662143194688	13	21	2	4
10.3382741552083	18.7486960803503	0.039662143194688	11	18	0	1
10.3382741552083	18.7486960803503	0.040662143194686	10	18	0	3
10.3382741552083	25.3881357977007	0.040662143194686	8.5	22.8	2	7
10.3392741552083	25.3881357977007	0.040662143194686	10	26	2	4
10.3402741552083	25.3881357977007	0.040662143194686	7.5	25.5	1	3
10.3412741552083	25.3881357977007	0.040662143194686	8	27	1	3
10.3412741552083	27.8790417401623	0.040662143194686	11	24	1	5
13.7334870388	27.8790417401623	0.040662143194686	12	27	0	3
13.7334870388	27.8790417401623	0.041662143194687	14	27	0	1
13.7334870388	27.8790417401623	0.999999999999997	9.09999999999999	26	1	5
13.7334870388	28.036168665423	1	14	29	1	1
14	30	1	14	30	1	0
14	33.2999999999958	1	15	36	1	3
14	33.2999999999958	1.001	17	36	1	5
17.7999999999944	33.2999999999958	2	17.2	34.1	2	1
17.9	33.3	2	17.9	33.3	2	0
17.9	33.3	2.001	23	35	1	6
17.9	33.3	2.002	16	36	1	4
17.901	33.3	2.002	20.5	31.5	3	4
17.901	33.3	2.002	19	30	3	4
17.9773709818848	33.3	2.002	16	33	2	2
19.1660230943795	34	2.002000000361	18.3	34.5	2	1
19.1660230943795	34	2.00300000036097	19	35.2	1	6
21.7320482094901	34	2.00300000036097	20	35	2	2
23	34	3	23	34	3	0
23	31.9968404839052	3	22.8	32.5	1	7

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
23.0626185844718	31.9968404839053	3	21.5	32.5	2	7
23.0626185844718	31.9968404839052	1.70810678181648	22	32	2	7
23.0626185844718	31.9968404839052	1.70710678181648	23.2	31.5	2	2
23.0626185844716	31.7071067805676	1.70710678181648	21	32	1	6
26.0000006500469	31.7071067805675	1.70710678181658	26	31	1	1
26.6905197216711	33	2	27	31	3	3
26.999	33	2	27	34	2	2
27	33	2	27	33	2	0
27.0048460004654	36.1343505794287	2	27	32	2	7
27.1314563208078	36.1343505794287	1.40324336048662	26	34	2	7
27.1314563208078	36.1343505794287	1.40224336048669	26.2	36.5	2	3
27.1314563208078	36.1343505794287	1.40224336048669	27	35	2	3
27.1314563208077	36.1343505794288	0.982175726398899	27	36	0	1
28.4628462424139	36.1343505794288	0.65328180383644	30	38	2	7
29.6173178494251	36.1343505794288	0.65328180383688	27	38	1	4
29.6173178494251	36.3467180880751	0.653281803836881	30	37	0	1
29.6173178494251	34.7615015824453	0.65328180383688	27	37	0	6
29.6173178494251	34.7615015824453	0.654281803835668	28.5	33.5	2	5
29.6173178494251	34.7615015824492	0.655281803863063	30	33	2	5
29.6173178494251	34.7615015824453	0.65628180383465	30	35	2	2
29.6173178494251	34.7615015824453	0.796920879716345	30	36	2	3
29.6173178494251	32.0000008096391	0.796920879716345	30	34	3	3
29.6173178494251	32.0000008096391	2.07611993655039	30	32	3	1
29.6173178494251	28.0791789713439	2.07611993654931	27	29	1	3
29.6173178494251	28.079178971365	2.07511993653119	30	29	2	1
29.6173178494252	27.5	2.07511993653119	30	31	1	4
26.8903736863934	27.5	2.07511993653119	27	26	3	3
26.8893736863934	27.5	2.07511993653119	28.5	27	1	2
26.8893736863934	27.5	0.858801237827229	26	28	1	3
26.8883736863932	27.5	0.858801237837363	27	28	0	1
21.3082561414826	27.5	0.858801237838693	26	29	0	5
21.2	27.5	0.480131584642913	22.2	28.2	1	3
21.2	27.5	0.480131584642913	20	28	2	2
21.2	27.5	0	21.2	27.5	0	0
20	27.5	0.35119919280148	20	31	0	6
20	27.7639320225679	0.999999999924264	20	30	3	3
19.5169323420712	27.4985069764394	0.999999999924264	20	26	1	4
19.5169323420711	27.4975069764653	0.999999999924264	20	27	2	3
19.5169323420724	27.496506976467	0.999999999924264	20	25	3	5
19.5159323420725	27.496506976467	0.999999999924264	18	24	2	6
18.3	27.496506976467	0.999999999924263	18.3	27	1	5
17.9	27.496506976467	0.999999999924264	17.9	25.8	2	5
17.7842525532237	27.496506976467	0.999999999924263	17.2	26.1	2	6
17.7832525532237	27.496506976467	0.999999999924263	15	28	2	3
16.9316060096756	26.8838872031174	0.999999999924264	16.9	26.8	2	1
12.0662990615321	22.3695982696687	0.999999999924264	13	22	1	1
12.0652990615321	22.3695982696687	0.999999999924263	11.7	22.8	2	3
12.0642990615319	22.3695982696687	0.999999999924264	12	21	2	4
10.999998740526	21.0000109964645	0.999999999924263	11	21	3	2
9.12145760601301	20.880407077194	0.999999999924263	9	21	1	1
9.12145760601301	20.6491548436301	0	10	24	2	4
9.12145760601301	20.6491548436301	0	10	21	2	4

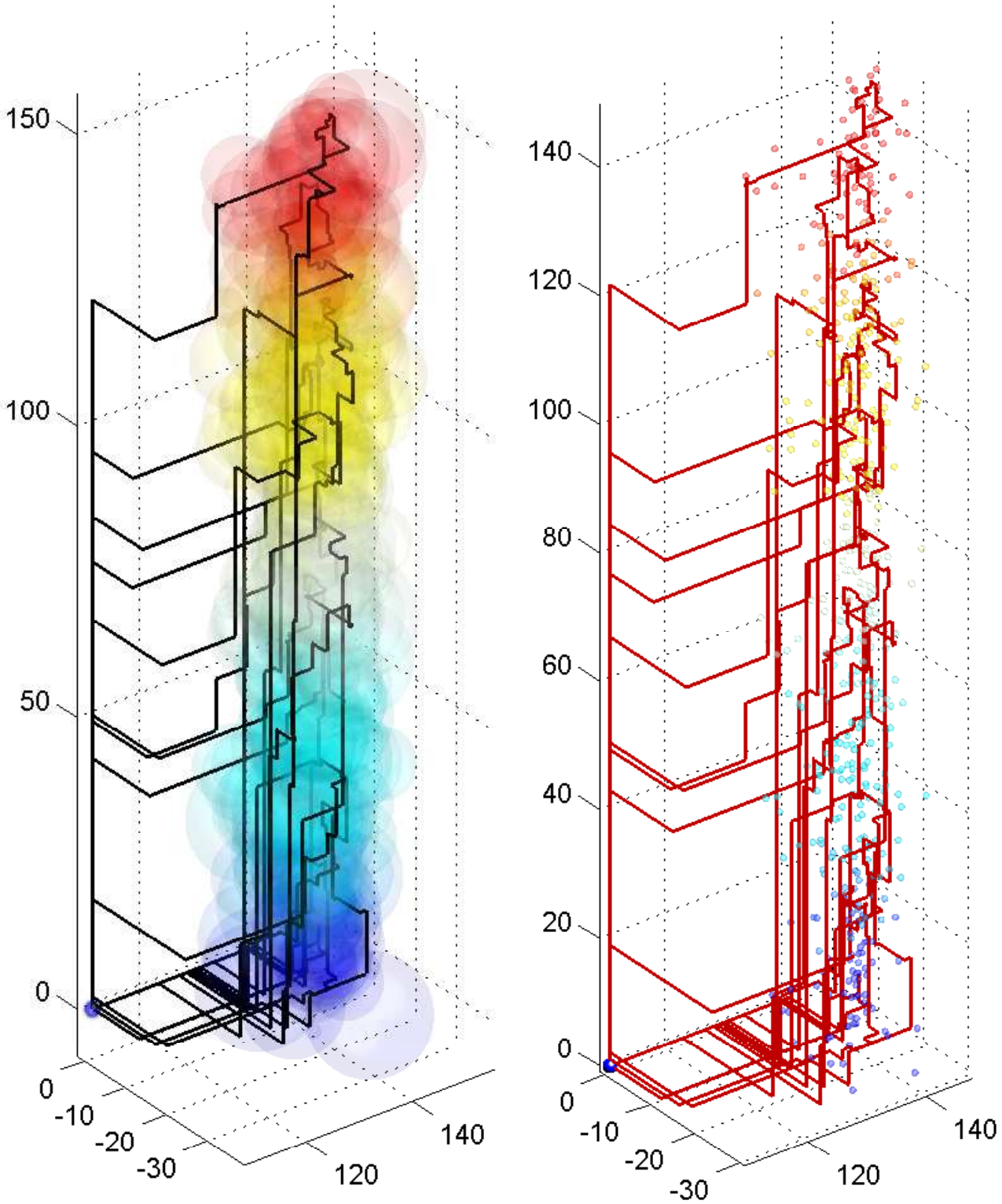


Figure O.207: $d493$, arbitrary radius, 3D, Manhattan, Length = 3296.7635101

Table O-210: Solution for $d493$, arbitrary radius, 3D, Manhattan

Total distance: 3296.76351006562 Total demand met: 11160 Depot: x 0 y 0 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 108.624356799564 Demand Met: 391						
29.5845459532929	10.0660064163223	4.66580042244562	29.451	10.155	5.592	0.94
31.3915296498433	11.3130000056829	4.66580042244562	32.542	12.126	4.969	1.441
33.6470000003976	11.3130000056829	5.73679736040942	32.997	11.541	6.26	0.865
33.6470000003976	11.3130000056829	6.50431153458752	31.015	13.036	5.79	5.03
33.6470000003976	11.3130000056829	6.50431153458752	33.452	11.541	6.941	4.46
33.6470000003976	11.3130000056829	6.50431153458752	35.166	10.726	7.803	5.004
33.6470000003976	11.3130000056829	6.50431153458752	34.135	13.686	10.417	4.602
33.6470000003976	11.3130000056829	7.73799999999821	33.647	11.313	7.765	0.027
33.6470000003976	11.3130000056829	3.43422008178763	33.322	12.841	4.069	4.98
33.7588652933499	12.8153131064341	3.43422008178763	34.135	12.906	3.426	0.387
30.224999999993	12.8153131064341	3.43422008178763	28.308	15.933	3.524	3.661
30.224999999993	12.7622741503929	1.27997276884616	30.787	13.166	3.014	1.867
30.224999999993	11.3129993926827	0.110000005576375	33.127	11.313	0.11	2.902
Route: 2 Length: 190.328179815232 Demand Met: 987						
18.3257945900247	13.9487680204735	10.8527944022378	18.466	14.155	8.671	2.196
24.7136139324475	17.7380832346519	11.5493707769674	20.434	13.012	7.24	7.723
24.7136139324475	17.7380832346519	11.5493707769674	23.355	23.553	9.247	6.4
24.7136139324475	17.7380832346519	11.5493707769674	27.864	18.854	16.375	5.87
24.7136139324474	17.7380832346519	20.7468776540388	22.022	11.361	19.929	6.97
24.7136139324474	17.7380832346519	20.7468776540388	25.832	22.918	24.535	6.514
26.9750000604962	19.789	22.4169999378901	26.975	20.061	22.417	0.272
31.1420293000078	18.2189997470976	23.9444376721144	33.515	18.219	27.24	4.061
31.1420293000078	18.2179997470976	23.9444376721143	31.102	17.775	23.735	2.111
31.1420293000078	17.9649999961694	23.9444376721142	33.833	10.282	23.21	9.452
31.1420293000078	17.9649999961694	23.9444376721142	32.944	17.965	22.768	2.152
31.1420293000065	17.105	26.7820001724681	28.181	12.441	28.249	9.321
30.5940000438761	17.105	26.7820001724681	28.816	12.25	22.231	9.823
30.5940000438761	17.105	26.7820001724681	30.594	9.52	26.782	7.585
30.5930000438761	17.105	26.7820001724681	27.927	10.409	29.559	7.95
30.5930000438761	17.105	26.7820001724681	24.244	15.997	28.696	8.356
30.5930000438761	17.105	28.6824668811602	30.202	13.491	28.883	9.735
30.5930000438761	17.105	28.6824668811602	29.007	14.409	30.293	6.619
30.0270020993102	17.1050000000014	28.6824668811602	32.152	15.246	27.742	4.552
30.0270020993102	17.1050000000014	28.6824668811602	32.022	15.473	29.854	6.4
30.0270020993102	17.1050000000014	28.6834668811602	33.322	14.401	29.372	5.546
30.0270020993102	17.1050000000009	28.6844668811602	33.095	14.271	36.737	9.731
30.0270020993102	17.1050000000009	32.8620000000001	30.202	13.751	40.213	8.941
30.0260020993102	17.105000000001	32.8620000000002	24.308	15.044	33.546	9.423
30.0260020993102	17.105000000001	32.8620000000002	32.436	13.231	35.38	5.906
30.0250020993102	17.1050000000014	32.8620000000002	30.15	16.06	32.059	8.901
30.0250020993102	17.1050000000014	32.8620000000002	27.419	15.044	35.984	7.778
30.0240020993101	17.1050000000013	32.8620000000002	31.61	17.775	32.188	4.415
30.0230000175981	17.2030000143039	32.8620000000001	30.023	17.203	33.037	0.175
29.8741109165936	21.0129999984434	32.8620000000002	29.261	22.283	32.908	1.411
28.9289999999998	21.0129999984434	29.0149996850152	28.689	21.013	29.015	0.24
28.929	21.0129999984434	18.2627352438631	28.245	21.331	19.247	3.596
29.635412574587	26.5790302984877	18.2627352438631	29.007	26.157	18.195	0.76
30.826030309119	26.5790302984877	7.30500029016533	31.42	27.173	7.305	0.84
26.1795028249841	26.5790302984876	7.30500029016533	25.959	27.744	8.296	5.865
20.2075760453768	26.5790302984877	2.07273928777389	20.117	27.617	1.782	1.231
20.2075760453768	18.2428367616801	2.07273928777389	20.117	18.283	2.485	0.424
Route: 3 Length: 155.750265373351 Demand Met: 902						
28.9126483240973	10.5877095272297	11.13921583258	28.753	10.79	11.577	0.508
30.0908896190763	12.6652134520473	11.6683472597021	34.135	12.386	7.828	5.584
30.0908896190763	12.6652134520473	11.6683472597021	29.134	16.187	10.819	3.747
30.0908896190763	12.6652134520473	11.6683472597021	31.372	12.353	15.396	3.954
30.0908896190763	12.6652134520473	11.6683472597021	31.632	15.246	15.179	4.737
31.7038574005793	11.9649920704436	11.8677152570213	31.177	14.433	6.693	9.897
31.7038574005793	11.9649920704436	11.8677152570213	34.087	8.758	8.639	5.137
31.7038574005793	11.9649920704436	11.8677152570213	32.022	12.126	9.107	7.596
31.7038574005793	11.9649920704436	11.8677152570213	30.787	11.313	10.711	9.249
31.7038574005793	11.9649920704436	11.8677152570213	31.762	12.126	11.712	6.006
31.7038574005793	11.9649920704436	11.8677152570213	33.095	13.751	14.049	7.425
31.7038574005793	11.9649920704436	11.8677152570213	31.112	15.246	13.662	8.972
31.7038574005793	11.9649920704436	11.8677152570213	29.975	12.061	16.621	7.414
31.7038574005793	11.9649920704436	11.8677152570213	30.657	11.541	18.351	6.88
31.7038574005793	11.9649920704436	11.8677152570213	32.182	10.98	18.901	7.118
31.7038574005793	11.9649920704436	11.8677152570213	30.787	13.426	19.207	9.125
31.7038574005793	11.9649920704436	21.078333735597	30.787	13.946	28.148	7.399
31.7038574005793	11.9649920704436	22.6817425586006	26.149	11.107	19.141	6.643
31.7038574005793	11.9649920704436	22.6817425586006	31.827	11.313	19.849	3.091
31.7038574005793	11.9649920704436	22.6817425586006	35.293	11.552	21.184	5.688
31.7038574005793	11.9649920704436	22.6817425586006	33.062	12.126	22.872	4.87
31.7038574005793	11.9649920704436	22.6817425586006	28.372	10.218	25.305	4.687

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
31.7038574005793	11.9649920704436	22.6817425586006	34.087	11.615	26.904	4.861
31.7038574005793	12.4397415530005	21.7305029177574	32.867	11.313	21.273	1.814
30.2166277517749	12.4397415530005	21.7305029177574	30.202	12.451	21.726	0.019
29.6005599628644	16.4194401218021	21.6909999999383	33.96	10.536	22.989	7.536
29.6005599628644	16.4194401218021	21.6909999999383	29.515	16.505	21.691	0.121
31.2420008777668	15.8990000000015	19.7270000195876	31.242	15.473	19.727	0.426
31.2420008777668	15.9770449671262	16.5687571892923	24.625	19.68	11.726	9.202
31.2420008777668	15.9770449671262	16.5687571892923	31.242	12.126	17.355	5.83
31.2420008777668	15.9770449671262	16.5687571892923	28.689	18.156	16.722	4.491
31.2420008777668	15.9770449671262	16.5687571892923	35.992	16.314	18.057	6.3
31.2420008777668	15.9770449671262	16.5687571892923	31.61	13.901	20.326	7.404
31.2420008777668	15.9770449671262	16.5687571892923	29.705	13.393	23.437	8.359
31.6661129563731	15.9770449671262	14.1913390412133	29.959	17.584	8.664	6.004
31.6661129563731	15.9770449671262	6.35520694133943	31.892	15.246	4.139	6.832
31.6661129563731	15.9770449671262	2.4969099051604	31.567	11.313	0.396	7.667
31.6661129563731	15.9770449671262	2.4969099051604	31.399	13.754	2.704	6.233
31.6661129563731	15.9770449671262	2.4959099051669	32.932	15.246	4.376	6.384
31.6661129563731	18.3459989094192	2.4959099051669	32.69	18.346	2.359	1.033
29.0699907060349	20.105336694486	2.4959099051669	29.07	29.713	2.284	9.61
26.1490001231891	19.0925423753454	2.4959099051669	26.149	19.045	2.783	0.291
24.9692677001999	19.0925423753454	0.902225391458013	24.943	19.108	0.303	0.6
24.9692677001998	16.3140000131497	1.00020692755444	25.07	16.314	3.298	2.3
20.0701233457028	15.3657855788331	1.00020692755426	22.149	11.742	1.36	9.67
20.0701233457028	15.3657855788331	1.00020692755426	20.117	22.728	3.645	7.823
Route: 4 Length: 432.586783397703 Demand Met: 999						
16.2301671058457	25.455818613205	9.23827801762454	16.37	26.982	10.968	2.311
17.318378107249	25.4558186132051	44.1228116596905	17.069	27.744	45.218	2.549
17.3183781072491	26.5538794484339	72.7146241724279	17.64	27.49	72.733	0.99
17.318378107249	26.981291678771	121.118730343216	17.64	27.998	119.961	1.574
17.318378107248	26.9812916787692	135.464769977648	19.037	26.982	129.54	6.169
17.318378107248	26.9812916787486	135.465769977648	18.72	29.967	135.012	7.58
17.8972719458115	27.4780570929984	135.465769977648	26.149	27.49	136.669	8.339
17.8972719458115	27.4780570929984	135.465769977648	18.974	29.967	133.455	3.376
18.5289992800371	28.5599249676719	145.500925035654	18.529	30.03	146.971	2.079
21.3091509623958	26.8751312834171	144.077000000066	19.037	28.189	146.557	3.611
24.8789937655436	26.8751312834171	144.077000000065	22.149	29.713	141.818	6.925
24.8789937655436	26.8751312834171	144.076000000065	25.07	30.03	143.44	3.224
24.8789937655437	19.9339992531648	144.076000000065	24.879	19.934	139.42	4.656
28.3949683462515	19.3357379657962	144.549794134707	31.356	19.68	141.631	4.172
28.3949683462515	18.8743574006306	144.549794134707	27.356	18.473	143.695	1.404
28.3949683462515	18.8743574006306	144.550794134707	28.245	14.854	144.187	5.84
28.3949683462515	18.8743574006306	144.550794134707	29.324	15.489	136.921	9.524
33.6234467961071	18.8743574006306	144.550794134707	33.515	20.315	142.968	2.143
33.6234467961071	15.1600450933958	144.550794134707	34.468	20.442	147.277	9.777
33.6234467961071	15.1600450933958	144.550794134707	34.341	21.013	142.761	9.585
33.6234467961071	15.1600450933958	147.76205243413	33.582	15.473	147.748	0.316
33.906992243299	13.5651878351835	147.76205243413	33.907	13.556	148.567	0.805
34.0662276219165	13.5651878351835	146.803999996853	37.452	10.218	146.804	4.761
34.0662276219165	13.5651878351835	146.803999996853	30.787	14.206	147.62	3.808
34.0662276219165	13.5651878351835	146.803999996853	31.892	12.353	146.679	3.015
34.0662276219165	13.5651878351835	146.803999996853	33.769	15.679	145.826	3.318
34.0662276219165	13.5651878351835	146.803999996853	31.991	14.092	145.487	3.28
32.9440005376313	14.6743678835575	146.597568758382	32.944	15.933	144.54	2.412
30.6168608102165	14.6743678835575	146.597568758382	29.975	13.881	149.391	2.974
30.6168608102163	14.6743678835574	145.197000004211	29.975	14.661	145.197	0.642
31.988612350065	14.6743678835574	141.111000055866	33.907	14.336	141.111	1.948
31.988612350065	14.6743678835574	141.111000055866	33.322	15.473	140.664	2.231
31.988612350065	14.6743678835574	140.119292217053	34.785	12.504	141.232	9.071
31.988612350065	14.6743678835574	140.118292217053	33.907	12.776	139.011	9.552
31.988612350065	14.6743678835574	140.118292217053	31.697	11.541	138.673	4.577
31.988612350065	14.6743678835574	140.117292217053	29.007	12.949	137.787	8.697
31.988612350065	14.6743678835574	140.116292217053	28.372	14.663	135.085	8.657
31.988612350065	14.6743678835574	140.116292217053	32.867	14.661	131.697	8.465
13.5760001148772	14.7900006564171	139.962000000005	18.339	12.631	142.199	6.166
13.5760001148772	14.7900006564171	139.962000000005	13.576	14.79	138.325	1.637
13.5760001148772	14.7900006564171	139.962000000005	17.577	13.647	137.156	6.049
11.4839654922051	15.3206848215815	141.315013113273	11.163	15.552	141.832	0.651
11.4839654922015	15.3206848215815	137.663989471549	18.466	18.664	140.644	8.295
11.4839654922072	15.3206848215815	126.239012698347	18.593	21.648	126.239	9.517
11.4839654922072	15.3206848215815	126.239012698347	11.481	17.711	124.498	3.058
11.4839654922021	15.3206848215815	121.734328896395	11.735	20.378	116.222	7.485
Route: 5 Length: 279.195317044827 Demand Met: 957						
12.4173717613688	19.8955693322356	15.842	12.37	19.934	15.842	0.061
17.8959999999907	19.7778392215825	46.497493650279	17.323	23.934	50.146	5.56
17.8969999999907	19.7778392215825	46.497493650279	17.64	22.918	47.209	3.23
17.8969999999907	21.7750000064534	51.5460000001582	20.117	21.775	51.546	2.22
17.7156434728043	26.2805875496765	52.4380000019924	17.069	27.046	52.438	1.002
17.7156434728043	25.7415786354299	62.6796364200141	17.45	24.188	63.322	1.702
21.3868795458813	25.7415786354298	62.6796364200141	26.086	24.95	59.469	5.746
21.3868795458813	25.7415786354298	62.6806364200141	25.07	27.744	59.542	6.389

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
21.3868795458813	25.7415786354299	66.9860000006845	22.022	28.443	62.892	5.071
21.3868795458828	28.7247532404838	66.9860000006844	18.974	24.125	61.119	8.219
21.3868795458828	28.7247532404838	66.9860000006844	18.72	30.665	66.986	3.298
21.3868795458828	28.7247532404838	66.9860000006844	22.466	28.887	64.369	7.763
21.3868795458828	28.7247532404838	66.9860000006844	27.546	26.982	70.094	8.192
21.3868795458828	28.7247532404838	66.9860000006844	24.562	26.982	72.259	7.031
21.9580000013799	28.7247532404839	73.3447682671783	21.958	29.395	74.461	1.302
25.9240510704371	28.7302367106554	69.522	25.832	27.998	69.522	0.738
26.7189917745384	17.3342212604475	69.3577820502649	25.07	11.615	69.179	8.154
26.7189917745384	17.3342212604475	69.3577820502649	30.531	18.664	72.004	6.676
26.7189917745384	17.3342212604475	69.006163863456	29.261	19.172	68.315	3.212
29.2639854035369	17.3342212604475	69.006163863456	30.785	16.251	71.611	3.205
29.2639854035369	17.3342212604475	69.006163863456	29.705	19.426	70.279	2.488
30.5390040693758	16.3922694756682	69.0061638634533	31.991	17.203	67.188	2.464
30.5390040693758	16.3922694756682	69.0061638634533	31.307	14.661	68.868	1.899
30.5390040693758	15.1823374704638	69.6956343895084	31.015	12.776	72.117	4.762
30.5390040693758	15.1823374704638	69.6956343895084	28.816	12.568	71.763	3.752
30.5390040693758	15.1813374704638	69.6956343895084	30.787	14.466	78.121	9.289
30.5390040693758	15.1813374704638	69.6956343895084	29.197	13.52	74.598	8.532
30.5390040693758	13.2289999999999	69.6956343895085	30.787	12.906	76.252	6.569
30.2068798018819	12.5410987939073	66.9201723091525	32.182	16.632	75.383	9.605
30.5390040693758	13.2289999999999	68.3432302326285	32.477	14.433	75.823	7.82
30.5390040693758	13.2289999999999	67.6375321378186	31.502	12.126	74.715	9.301
30.5380040693662	13.2289999999999	67.6375321378187	32.055	9.837	66.681	5.02
30.5380040693662	13.2289999999999	67.6375321378187	31.307	11.313	71.461	7.443
30.5370040693758	13.229	67.6375321378187	34.087	18.918	64.082	9.955
30.5370040693758	13.229	67.6375321378187	33.261	18.537	71.995	7.388
30.2020000000009	13.229	64.141999996528	30.202	11.996	64.142	1.233
30.1261568353141	14.1496241321324	61.6065664491582	32.672	15.246	60.724	2.909
30.1251568353141	14.1496241321324	61.6065664491582	27.356	20.632	65.916	8.262
25.6279606773958	14.1496241321324	61.6065664491582	21.831	13.203	64.85	7.88
25.6279606773958	14.1506241321326	61.6065664491582	25.832	14.219	61.701	0.235
25.6279606773958	15.6334523467203	61.6065664491582	25.197	18.918	59.354	4.006
25.6279606773958	15.6334523467203	61.6065664491582	24.943	18.346	64.008	3.687
24.2439999869032	16.242	52.5860000447094	24.244	21.077	52.586	4.835
24.2439999869032	16.242	52.5860000447094	24.308	16.441	56.035	3.717
19.838496427103	16.242	50.3758476516351	19.609	18.156	48.051	3.821
Route: 6 Length: 192.281015067047 Demand Met: 990						
18.9516762969702	15.4347501035836	31.528	19.482	13.076	31.528	9.717
18.9516762969702	15.4347501035836	38.5025912918926	20.244	11.234	37.646	6.925
18.9526762969702	15.4347501035836	38.5025912918926	20.561	18.219	35.874	9.121
18.9526762969702	15.4347501035836	38.5025912918926	18.212	18.283	36.255	7.954
18.9536762969702	15.4347501035835	38.5025912918926	18.021	13.52	41.784	4.982
26.0186650887285	15.4347501035836	39.2261914844855	31.015	13.296	40.037	5.495
26.0186650887285	15.4347501035836	39.2261914844855	26.34	17.203	39.025	3.101
29.4895075316211	17.4964575158319	40.491062618337	29.975	12.321	39.763	7.85
29.4895075316211	17.4964575158319	40.491062618337	32.372	18.537	39.944	3.113
29.4895075316211	17.4964575158319	40.491062618337	33.095	13.231	40.765	6.668
29.4895075316211	17.4964575158319	40.491062618337	32.372	14.092	41.845	6.932
29.4895075316211	17.4964575158319	40.491062618337	30.787	13.686	41.698	6.343
29.4895075316211	17.4964575158319	40.491062618337	32.607	11.313	43.742	7.65
29.4895075316211	17.4974575158319	40.4910626183371	33.322	13.361	37.986	9.946
29.4895075316211	17.4974575158319	40.4910626183371	33.96	19.68	39.41	7.146
29.4895075316211	17.4974575158319	40.4910626183371	26.149	20.886	38.979	5.887
29.4895075316211	17.4974575158319	40.4910626183371	27.8	23.617	42.03	6.658
29.4895075316211	17.4974575158319	40.4910626183371	30.658	10.98	44.543	9.268
29.4895075316211	17.4974575158319	40.4910626183371	29.642	15.108	43.621	5.237
29.4895075316211	17.4974575158319	40.4910626183371	24.371	14.346	43.342	7.57
29.4895075316211	17.4974575158319	40.4910626183371	30.785	20.823	44.268	6.267
29.4895075316211	17.4974575158319	40.4910626183371	30.785	16.949	44.302	7.677
29.4895075316211	17.4974575158319	40.4910626183371	31.483	16.822	46.955	9.589
29.4895075316211	17.4974575158319	40.4910626183371	25.895	18.918	46.48	7.438
29.4895075316211	17.4974575158319	40.4910626183371	27.737	16.251	47.666	9.503
29.4895075316211	17.4974575158319	40.4910626183371	30.982	15.473	49.591	9.722
29.2609999999916	23.0450000232573	40.642	29.261	23.045	43.901	3.259
28.5440070033764	24.5862752966369	40.6419999999997	26.086	29.903	39.661	5.939
28.5440070033764	24.5862752966369	40.6419999999997	33.642	26.22	42.336	5.615
25.705032501322	26.0090000019024	32.4959999998959	25.705	26.22	32.496	0.211
25.2638179577874	24.3619425059289	28.7204966586118	17.64	23.426	22.454	9.913
25.2638179577874	24.3619425059289	28.7204966586118	31.293	23.68	29.18	6.085
22.2587284680284	22.7223380993449	18.8096168507105	28.118	18.092	12.931	9.723
22.2587284680284	22.7223380993449	18.8096168507105	13.513	22.41	17.465	8.854
22.2587284680284	22.7223380993449	18.8096168507105	20.942	25.649	17.701	8.469
22.2587284680284	22.7223380993449	18.8096168507105	22.974	25.141	19.537	2.625
22.2587284680284	22.7223380993449	18.8096168507105	26.022	21.902	22.93	6.288
22.2587284680284	22.7223380993449	18.8096168507105	28.626	22.791	23.223	9.57
22.2587284680284	22.7223380993449	18.8096168507105	21.958	24.76	23.638	6.761
15.0780243187049	22.7223380993449	18.8096168507105	16.497	24.315	17.876	2.342
Route: 7 Length: 235.980136472144 Demand Met: 992						
29.0507926492354	13.8091379772127	17.8973104811987	29.975	14.141	17.903	0.982

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
34.1408064818281	13.8091379772127	24.2914994559835	33.907	14.076	24.403	0.382
34.429	17.0760001489728	35.4130001491009	36.436	17.076	35.413	2.007
33.6658929631567	17.3061070331441	48.735000002876	33.388	17.584	48.735	0.393
34.1034055235086	13.3457512511253	53.7303400066403	36.119	13.139	51.404	3.085
34.1034055235086	13.3457512511253	53.7303400066403	34.135	14.206	54.088	1.632
34.1034055235086	13.3457512511252	56.4611586110708	32.944	10.536	54.126	3.833
34.1034055235086	13.3457512511252	56.4611586110708	33.322	14.141	54.817	3.297
34.1034055235086	13.3457512511252	56.4611586110708	36.944	13.012	57.936	3.218
32.514421383837	14.1351234467067	56.4611586110708	32.607	14.661	52.963	4.485
32.514421383837	14.1351234467067	56.4611586110708	29.975	14.401	55.717	4.095
32.514421383837	14.1351234467142	56.9989882884439	31.275	14.173	56.999	1.24
32.514421383837	14.1351234467067	58.2741877137787	30.658	9.71	56.048	8.685
32.514421383837	14.1351234467067	58.2741877137787	31.827	14.661	58.532	8.515
32.5144213838361	14.1351234466812	58.2751877137788	28.372	13.52	60.757	4.868
32.5144213838412	14.1351234466812	58.2761877137788	31.015	12.516	61.408	8.72
32.5144213838412	14.1351234466812	58.2761877137788	30.202	12.971	61.507	8.778
32.5144213838412	14.1351234466812	63.6753890813429	31.356	22.347	59.353	9.352
32.5144213838412	14.1351234466812	63.6753890813429	33.095	14.011	61.011	2.901
32.5144213838412	14.1351234466812	63.6753890813429	34.849	11.996	64.173	7.912
32.5144213838412	14.1351234466812	63.6753890813429	31.356	16.251	69.04	5.882
32.5144213838412	14.1351234466812	61.2888878088571	30.594	17.076	65.103	5.185
32.5144213838412	14.1351234466812	61.2878878088571	30.202	12.711	66.602	9.036
32.5144213838412	14.1351234466812	61.2878878088571	28.753	13.457	65.491	9.22
32.5526810300742	14.135123446681	60.9951286945239	31.437	14.433	67.041	8.72
32.5526810300742	14.135123446681	60.9951286945239	31.762	15.473	67.554	7.919
32.5526810300742	13.8470901954611	60.9951286945239	33.96	11.234	59.829	9.284
32.5526810300742	13.8470901954611	60.9941286945238	33.387	11.313	58.128	9.319
32.5526810300742	13.7720168703554	54.4229971519431	32.69	13.52	54.423	0.287
32.5526810300742	13.7720168703554	49.3999999403944	33.322	13.881	49.4	0.777
31.3531191505118	13.3195239188386	47.7898439031957	29.134	13.33	42.125	6.084
31.3531191505118	13.3195239188386	47.7898439031957	33.095	12.971	48.557	2.042
31.3531191505118	13.3195239188386	47.7898439031957	33.907	13.036	49.61	3.305
31.3531191505118	13.3195239188386	47.7898439031957	33.642	18.346	49.307	5.973
28.4990002295586	13.3195239188386	47.2205239878921	28.499	12.949	46.85	0.524
26.5940000019265	13.9127378502635	47.9417377758734	29.975	11.801	40.794	8.467
26.5940000019265	13.9127378502635	47.9417377758734	25.578	12.568	43.273	5.855
26.5940000019265	13.9127378502635	47.9417377758734	30.657	15.246	48.98	4.816
26.5940000019265	13.9127378502635	47.9417377758734	25.07	17.076	49.249	5.925
26.5940000019265	13.9127378502635	47.9417377758734	28.626	10.091	52.872	7.98
26.5940000019265	13.9127378502635	47.9417377758734	26.594	18.854	52.883	6.988
25.7733696481994	13.9127378502635	42.9361951026155	27.991	13.647	44.302	2.618
Route: 8 Length: 277.074100887118 Demand Met: 991						
19.4816560705908	22.0394499700203	17.8240005670128	19.482	21.966	17.833	0.074
20.5610000072922	24.3349999999999	36.2690000084927	20.561	24.696	36.269	0.361
28.1590910700793	24.335	51.4742450147248	28.753	24.379	51.035	0.74
28.1590910700793	24.335	58.1556985608926	28.499	25.141	57.61	1.031
28.1590910700793	24.335	59.2775085878227	28.88	27.3	58.991	4.959
28.1600910700793	24.335	59.2775085878228	27.102	25.966	59.543	2.428
28.1600910700793	24.335	75.6129238647785	31.356	26.03	76.034	3.642
28.780660582964	24.335	78.5588241338331	32.118	27.3	81.725	5.473
27.7602395527603	21.6632616540849	78.5588241338331	24.943	23.68	69.938	9.291
27.7602395527603	21.6632616540849	78.5588241338331	26.911	22.601	75.564	7.439
27.7602395527603	21.6632616540849	78.5588241338331	27.483	19.616	74.587	4.477
27.7602395527603	21.6632616540849	78.5588241338331	19.863	21.331	75.529	9.178
27.7602395527603	21.6632616540849	78.5588241338331	23.482	22.41	74.725	8.804
27.7602395527603	21.6632616540849	78.559824133833	28.816	21.902	78.963	4.368
27.7602395527603	21.6479999999998	79.9333504935078	27.102	21.648	79.965	0.659
30.7679420438748	15.2459999999766	79.9333504935079	32.412	15.246	88.024	8.256
30.7679420438748	15.2459999999766	79.9333504935079	34.135	14.986	84.727	7.609
30.7679420438748	15.2459999999766	79.9333504935079	34.135	14.466	84.176	7.813
30.7679420438748	15.2459999999766	79.9333504935079	32.152	12.353	82.503	7.264
30.7679420438748	15.2459999999766	79.9333504935079	29.388	13.838	84.576	7.053
30.7679420438748	15.2459999999766	79.9333504935079	33.071	16.187	80.531	6.12
30.7679420438748	15.2459999999766	79.9333504935079	33.062	15.473	78.089	7.07
30.7679420438748	15.2459999999766	79.9333504935079	27.737	18.664	80.683	7.927
30.7679420438748	15.2459999999766	79.9333504935079	26.721	18.283	80.536	8.04
30.7679420438748	14.2709999999762	77.9487055064664	30.202	14.271	77.775	0.592
32.680278920667	14.1729999999939	77.9487055064665	32.835	14.173	77.958	0.155
32.680278920667	14.1729999999939	77.9421194073971	33.907	13.296	83.348	9.748
32.680278920667	14.1729999999939	77.9421194073971	29.975	13.621	83.535	8.631
32.680278920667	14.171999999994	77.9421194073971	32.672	12.353	81.337	8.34
32.680278920667	14.171999999994	77.9421194073971	32.802	12.126	77.71	6.243
32.607847934784	14.171999999994	76.9333474381564	32.282	12.126	74.654	3.133
32.607847934784	14.171999999994	76.9333474381564	32.087	14.661	75.705	1.421
32.607847934784	13.208802593624	76.5049474022039	31.437	11.541	78.241	2.677
32.607847934784	13.208802593624	76.5049474022039	32.835	12.613	75.794	0.955
32.384862996302	13.208802593624	75.9139988499894	28.626	11.234	75.345	4.284
30.7870006651439	12.8300000007933	75.9139988499894	30.787	12.646	75.914	0.184
30.7870006651439	12.8300000007933	75.9129988499894	29.975	12.581	76.539	3.034
23.9317939534282	12.8300000007933	70.192051678787	26.848	19.743	76.594	9.863

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
23.9317939534282	12.8300000007933	70.192051678787	22.974	17.711	70.862	5.019
18.466000000439	12.8300000007933	69.043065373342	17.323	12.504	65.716	3.533
18.466000000439	13.3979999999736	58.2069999990034	18.466	17.838	58.207	4.44
12.8439925434309	13.3979999999736	49.2687131524008	12.052	18.854	46.124	6.347
Route: 9 Length: 331.694408696585 Demand Met: 992						
30.5440536947378	11.5505617681402	19.4248122941903	25.895	12.123	19.556	4.686
32.0619961887147	11.5505617681498	36.271025358883	32.217	11.541	36.145	0.2
32.0619961887147	12.7813736217826	36.579543509833	33.642	10.155	35.22	3.353
32.0619961887147	12.7813736217826	36.579543509833	31.567	14.661	34.796	2.638
32.0619961887147	12.7813736217826	36.579543509833	34.135	14.726	38.301	3.323
32.3299384174531	13.1346058713849	38.5380000000001	33.095	13.491	38.538	0.844
32.3299384173752	13.1346058713852	44.684	31.015	13.816	44.684	1.481
33.1023669422457	13.1346058713849	66.4428206029881	35.484	11.425	66.484	2.932
35.5020348675838	13.1346058713849	72.0099999999992	37.452	12.758	72.01	1.986
32.5341467754505	13.1346058713849	82.761832676168	34.135	12.646	86.486	4.083
32.5341467754505	13.1346058713849	82.761832676168	34.135	13.166	82.509	1.621
32.5341467754505	13.1346058713849	82.761832676168	31.015	13.556	83.741	2.877
31.2763436180406	14.0126067585488	88.8223402687681	34.849	13.393	93.121	6.061
31.2763436180406	14.0126067585488	88.8223402687681	32.737	11.541	92.508	5.142
31.2763436180406	14.0126067585488	88.8223402687681	31.547	13.203	92.722	3.992
31.2763436180406	14.0126067585488	88.8223402687681	32.542	15.473	89.387	5.858
31.2763436180406	14.0126067585488	88.8223402687681	29.975	14.921	90.476	2.292
31.2763436180406	14.0126067585488	88.8223402687681	30.34	10.917	88.584	4.723
31.2763436180406	14.0126067585488	88.8223402687681	32.737	14.433	86.615	4.264
31.2763436180406	14.0126067585488	88.8223402687681	26.911	14.409	89.199	5.204
31.2763436180402	15.6816379768575	90.0778663334504	30.722	15.473	90.573	0.772
29.1339999999997	22.5130000000314	96.3339999725431	29.134	22.537	96.334	0.024
29.1339999999997	22.4163755735428	96.5820222362299	28.753	12.949	99.196	9.829
29.1339999999997	22.4163755735428	96.5820222362299	27.229	27.554	96.447	5.774
29.1339999999997	22.4163755735428	96.5820222362299	27.546	22.537	91.326	5.492
29.1339999999997	22.4163755735428	96.5820222362299	28.245	22.855	90.204	6.887
29.1339999999997	22.4163755735429	100.822817961221	25.832	23.68	109.484	9.355
29.1339999999997	22.4163755735429	100.822817961221	29.07	22.347	101.831	8.48
27.474871813482	22.416375573544	101.883084740561	27.991	22.601	101.939	0.551
27.2289999925322	19.7369152599626	101.883084740561	27.229	19.616	102.004	0.171
22.2825603602079	19.7369152599626	101.883084740561	17.323	21.331	107.01	8.168
22.2825603602079	19.7369152599626	101.883084740561	16.688	18.092	103.09	8.156
22.2825603602079	20.3436551030804	101.883084740561	18.148	16.505	99.59	6.09
22.2825603602079	25.620002373463	101.883084740561	22.276	28.125	102.29	2.538
18.9099989474391	25.6859999999995	98.0280015588417	18.91	28.697	98.028	3.011
18.9099989474391	25.6859999999995	95.8602584371247	24.752	19.362	96.308	9.904
18.9099989474391	25.6859999999995	95.8602584371247	19.545	25.839	93.739	4.367
18.9099989474391	25.6859999999995	95.8602584371247	20.561	25.776	90.646	5.596
18.9099989474391	22.3752760842382	95.8602584371247	17.577	25.204	95.05	4.26
13.7968937709614	22.3752760842382	95.8602584371247	11.608	20.251	101.424	6.345
13.7968937709614	22.3752760842382	95.8602584371247	12.243	20.505	94.648	2.717
13.7968937709614	16.9562857917656	72.794916574217	11.862	17.965	73.909	2.45
13.7968937709614	16.9562857917656	70.9405881884431	13.005	20.061	68.646	3.941
13.7968937709614	16.9562857917656	66.7578070719874	19.418	13.901	64.222	6.882
Route: 10 Length: 312.621118341862 Demand Met: 974						
22.7988679453089	12.0640425124996	55.2771293308068	22.085	10.853	55.182	1.409
24.8197891989986	12.0640425124997	55.2771293308068	22.276	13.393	54.239	3.052
24.8197891989986	13.6864460718488	91.3979281638168	25.832	16.949	91.413	3.416
24.8197891989986	13.9248259508617	91.3979281638169	24.943	18.791	91.664	4.875
27.7959830848365	13.9248259508613	103.479326402352	26.086	14.663	104.115	1.968
27.7959830848365	13.9248259508613	103.479326402352	28.753	13.838	102.669	1.257
28.8744016554409	13.9248259508581	106.414000594332	31.293	15.806	105.367	3.238
31.4566021169198	15.1723595470844	106.414000594332	34.595	18.791	106.414	4.79
31.4566021169198	15.1723595470844	106.415000594332	33.095	12.711	107.498	5.532
31.4566021169198	15.1723595470844	107.286997800901	35.674	11.044	107.474	6.002
31.4566021169198	15.1723595470844	107.286997800901	32.477	11.541	107.287	3.772
31.4566021169198	15.1723595470844	107.287997800901	31.275	12.613	107.178	5.931
31.4566021169198	15.1723595470844	107.287997800901	29.388	11.804	105.494	6.15
31.2934318304355	15.1723595470843	108.031355630631	31.015	14.076	113.16	6.371
31.2934318304355	15.1723595470843	108.031355630631	30.982	12.126	111.418	5.546
30.9749999822668	15.1723595470843	108.031355630631	30.975	17.076	111.068	3.584
30.9749999822668	15.1723595470843	108.031355630631	31.047	14.661	110.232	2.465
30.9749999822668	14.3803436704148	105.987999999931	29.642	17.076	106.306	3.024
30.9749999822668	13.2029999998613	105.987999999931	31.957	14.433	102.967	4.494
29.94	13.2029999998613	105.987999999931	29.578	13.203	105.988	0.362
30.4917157074645	12.4350463687763	104.731779007067	31.632	12.353	111.341	8.922
30.4917157074645	12.4350463687763	104.731779007067	34.135	13.426	109.486	8.117
30.4917157074645	12.4350463687763	104.731779007067	30.721	9.329	106.333	3.502
30.4917157074645	12.4350463687763	104.731779007067	34.135	12.126	105.614	8.535
30.4917157074645	12.4350463687763	104.731779007067	31.372	15.246	104.804	6.866
30.4917157074645	12.4350463687763	104.731779007067	29.975	13.361	103.951	8.8
30.4917157074645	12.4350463687763	104.731779007067	29.197	12.441	103.553	7.211
30.4917157074645	12.4350463687763	104.731779007067	30.202	14.011	102.151	8.617
30.4917157074645	12.4350463687763	104.731779007067	33.322	12.581	100.045	6.265
30.4917157074645	12.4350463687763	104.731779007067	31.737	12.885	98.954	5.959

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
30.4917157074645	12.4350463687763	104.731779007067	29.261	11.425	96.137	8.741
30.6771441221767	12.994761326321	103.558045720729	31.177	11.541	103.36	1.55
30.6771441221767	13.3481441228922	98.9608965191467	27.292	16.632	106.393	9.708
30.6771441221767	13.3481441228922	98.9608965191467	32.817	17.775	101.585	7.615
30.6771441221767	13.3481441228922	98.9608965191467	33.071	18.346	97.156	7.578
30.6771441221767	13.3481441228922	98.9608965191467	29.515	14.028	97.711	5.055
30.6771441221767	13.3481441228922	98.9608965191467	32.412	12.353	94.929	7.931
30.6771441221767	13.3481441228922	98.9608965191467	30.202	14.791	95.605	5.659
30.6771441221767	13.3481441228922	98.9608965191467	31.697	14.433	93.007	8.117
30.6771441221767	13.3481441228922	98.9608965191467	25.705	12.123	93.472	8.029
30.6771441221767	13.3481441228922	98.9608965191467	31.957	11.541	90.999	8.595
30.6771441221767	13.3481441228922	98.9608965191467	29.975	12.841	90.667	8.339
30.6771441221767	13.3481441228922	97.8609999996498	32.802	15.473	97.861	3.005
29.9309319642171	12.7767583087931	95.5536622091546	30.202	13.231	95.497	0.532
27.1307898057429	9.91801945164808	95.5536622091546	27.419	11.298	96.166	1.537
22.9712659110308	9.91801945164808	95.5536622091546	22.212	10.091	100.44	4.948
22.9712659110308	9.91801945164808	95.5536622091546	23.482	9.52	92.151	3.464
Route: 11 Length: 378.01140526009 Demand Met: 999						
17.6250767929615	20.6107169389655	81.6423851230741	19.164	24.696	74.306	8.537
17.6250767929615	20.6107169389655	81.6423851230741	17.45	21.902	76.475	6.347
25.8795952667787	20.6107169389655	90.3963549666112	25.895	20.759	90.426	0.152
26.6214614268954	22.3070000000005	91.4749425606552	28.054	22.918	87.821	3.972
26.6214614268954	22.5419678579586	91.656999999927	26.149	23.172	91.657	0.891
26.6214614268954	23.9979923164194	94.571200254091	25.006	24.188	94.535	1.627
27.5140000000236	23.9979923164194	106.894610471846	32.309	19.553	108.506	9.666
27.5140000000236	23.9979923164194	106.894610471846	24.879	20.632	106.077	4.555
27.5140000000236	23.9979923164194	106.894610471846	27.165	25.458	104.784	2.59
27.5140000000238	23.9979923164194	106.929000000004	28.753	23.998	106.929	1.239
27.5140000000235	27.6073223681753	107.548000000002	28.943	30.475	107.548	3.204
27.5140000000237	27.6073223681753	112.327358571725	28.943	30.03	106.391	6.569
26.2790606596459	27.6073223681753	114.334110082122	18.72	28.189	115.769	7.716
26.2790606596459	27.6073223681753	114.334110082122	30.277	30.475	112.299	7.266
26.2790606596459	23.9990000000003	114.334110082122	28.88	25.331	116.966	8.431
26.2790606596459	23.9990000000003	114.334110082122	26.911	24.76	115.286	7.931
26.2790606596459	23.9980000000003	114.334110082122	24.308	23.998	113.458	2.157
28.6508283429123	22.2496188613478	117.244293956811	27.927	28.125	119.109	6.761
28.6508283429123	22.2496188613478	117.244293956811	26.276	20.188	119.025	3.614
28.6508283429124	21.5224381016226	117.244293956811	34.341	22.029	122.727	7.918
28.6508283429124	21.5224381016226	117.244293956811	27.927	21.458	117.97	1.027
28.9287357696697	18.6042701954916	117.244293956831	29.578	18.791	116.421	1.065
28.9297357696697	18.6042701954916	117.244293956811	27.102	18.664	121.623	5.391
28.9297357696697	18.6042701954916	117.244293956811	25.133	19.235	120.496	5.738
31.2839856070226	14.5783043338604	117.244293956831	31.502	15.473	118.128	5.299
31.2839856070226	14.5783043338604	117.244293956831	27.229	15.362	116.263	4.245
32.7949046467394	14.5783043338603	117.105036489491	32.087	11.313	118.866	9.723
32.7949046467394	14.5783043338603	117.105036489491	25.197	12.441	114.729	9.295
32.7949046467394	14.5773043338604	117.105036489511	31.991	16.632	118.575	2.73
32.7949046467394	14.5773043338604	117.105036489511	33.907	12.516	116.73	2.372
32.7949046467394	14.5773043338604	117.105036489511	32.217	14.433	117.304	0.628
33.079141300011	14.5773043338604	115.868022437029	33.907	14.791	115.865	0.855
33.079141300011	13.0259365032878	115.744827968033	33.322	13.621	122.895	7.179
33.079141300011	13.0259365032878	115.744827968033	34.135	13.946	120.705	7.157
33.2496273386108	13.0259365032878	112.660797489119	33.322	13.101	119.477	6.817
33.2496273386468	13.0259365032995	111.707874029056	29.975	13.101	114.777	5.333
33.2496273386468	13.0259365032995	111.707874029056	35.103	10.155	111.634	3.418
33.2496273386468	13.0259365032995	111.707874029056	33.452	15.246	111.765	2.23
33.2496273386468	13.0259365032995	111.707874029056	32.932	12.353	108.278	3.826
32.6567127701622	11.622712770161	110.138000000001	32.347	11.313	110.138	0.438
34.663058533707	18.1591509937236	109.05100003826	34.722	18.219	109.051	0.084
34.663058533707	12.2576427632206	108.413002158144	34.722	11.742	108.413	0.519
32.9643440570016	12.2576427632206	94.7689984183408	30.527	11.313	94.769	2.614
32.9643440570016	12.2576427632206	94.7679984183384	33.322	12.321	95.076	0.752
34.091079695876	12.2576427632206	84.3669876057457	35.42	12.949	84.367	1.498
Route: 12 Length: 402.616422910103 Demand Met: 986						
20.1957646044169	10.7177858006694	118.003481473671	20.498	17.457	115.048	7.365
20.1957646044169	14.282000000002	118.969540470292	22.149	14.282	119.226	1.97
20.0014665386532	18.0289986631588	118.969540470292	19.99	18.029	118.966	0.012
20.0014665386532	23.4994726859331	126.093476261279	25.895	29.903	127.854	9.341
20.0014665386532	23.4994726859331	126.093476261279	18.974	24.569	127.812	2.27
20.0014665386532	23.4994726859331	126.093476261279	20.434	15.806	127.618	8.615
20.0014665386532	23.4994726859331	126.093476261279	20.371	23.045	124.747	6.483
20.0014665386532	23.4994726859331	126.093476261279	18.91	22.474	122.979	4.101
20.0014665386532	23.4994726859331	126.093476261279	20.561	23.553	119.319	7.372
21.5769999006135	23.4994726859331	126.093476261279	21.577	21.394	126.294	2.115
26.6024124703272	23.4994726859331	126.093476261279	27.229	26.22	125.044	2.987
30.5532222507822	23.4994726859331	125.448999882492	32.245	24.887	125.449	2.188
30.5532222507822	16.8761015089428	124.286072081295	33.515	18.029	124.645	3.593
30.5532222507822	16.8761015089428	124.286072081295	30.594	16.251	121.669	2.691
29.441466598747	16.8761015089428	125.472139986633	28.943	16.886	125.854	0.628
27.3875763605791	16.8761015089429	127.909	20.434	18.537	132.408	8.447

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
27.3875763605791	16.8761015089429	127.909	25.451	17.965	131.595	5.492
32.2819999999992	15.4730000000013	127.90900000011	32.282	15.473	127.6	0.309
33.0445346747701	14.2793300976875	131.361228615192	26.149	15.679	137.044	9.977
33.0445346747701	14.2793300976875	131.361228615192	34.595	11.996	135.081	4.778
33.0445346747701	14.2793300976875	131.361228615192	33.127	14.661	132.624	2.812
33.0445346747701	14.2793300976875	131.361228615192	35.547	11.234	131.369	6.26
33.0445346747701	14.2793300976875	131.361228615192	36.436	18.918	131.64	5.753
33.0445346747701	14.2793300976875	131.361228615192	34.976	10.282	131.121	4.446
33.0445346747701	14.2793300976875	131.361228615192	30.462	15.473	131.052	6.788
33.0445346747701	14.2793300976875	131.361228615192	32.347	14.661	129.857	7.755
33.0445346747701	14.2793300976875	131.361228615192	31.356	16.06	129.885	3.559
33.0445346747701	14.2793300976875	131.361228615192	35.992	13.647	125.389	9.144
33.0445346747701	14.2793300976875	131.361228615192	33.907	11.996	124.886	7.29
33.0445346747701	14.2793300976875	131.361228615192	33.907	13.816	122.673	8.76
33.0445346747563	11.8658539757141	135.27240177501	34.135	11.866	136.659	1.771
31.3419996261338	9.94601449427662	135.327073769918	34.404	14.028	139.514	9.888
31.3419996261338	9.94601449427662	135.327073769918	29.388	8.313	137.407	3.288
31.3419996261338	9.94601449427662	135.327073769918	30.787	12.386	130.829	7.465
31.3419996261337	9.94601449427662	131.615149827081	30.912	9.901	131.507	0.974
31.3419996261337	9.94601449427661	128.930999999997	34.595	9.202	128.931	3.337
27.1990000001543	11.9329999999946	126.917000000015	26.594	11.933	126.917	0.605
27.6458787871437	11.9329999999946	124.553940044686	24.371	15.235	126.557	7.737
27.6458787871437	11.9329999999946	124.553940044686	27.673	12.695	125.598	3.999
27.6458787871436	11.9329999999946	124.552940044634	28.054	17.013	121.063	8.339
27.6458787871437	12.3383483862777	120.416999999989	27.927	12.568	120.417	0.363
27.6204304905119	12.3383483862777	109.182000000002	26.022	12.631	109.182	1.625
29.051	9.64699999999761	108.045999999999	30.34	9.647	108.046	1.289
29.051	9.64699999999763	82.5648370398978	31.047	11.313	78.28	6.138
25.0206674180849	9.64699999999762	76.6795875883729	29.007	10.282	76.107	4.077

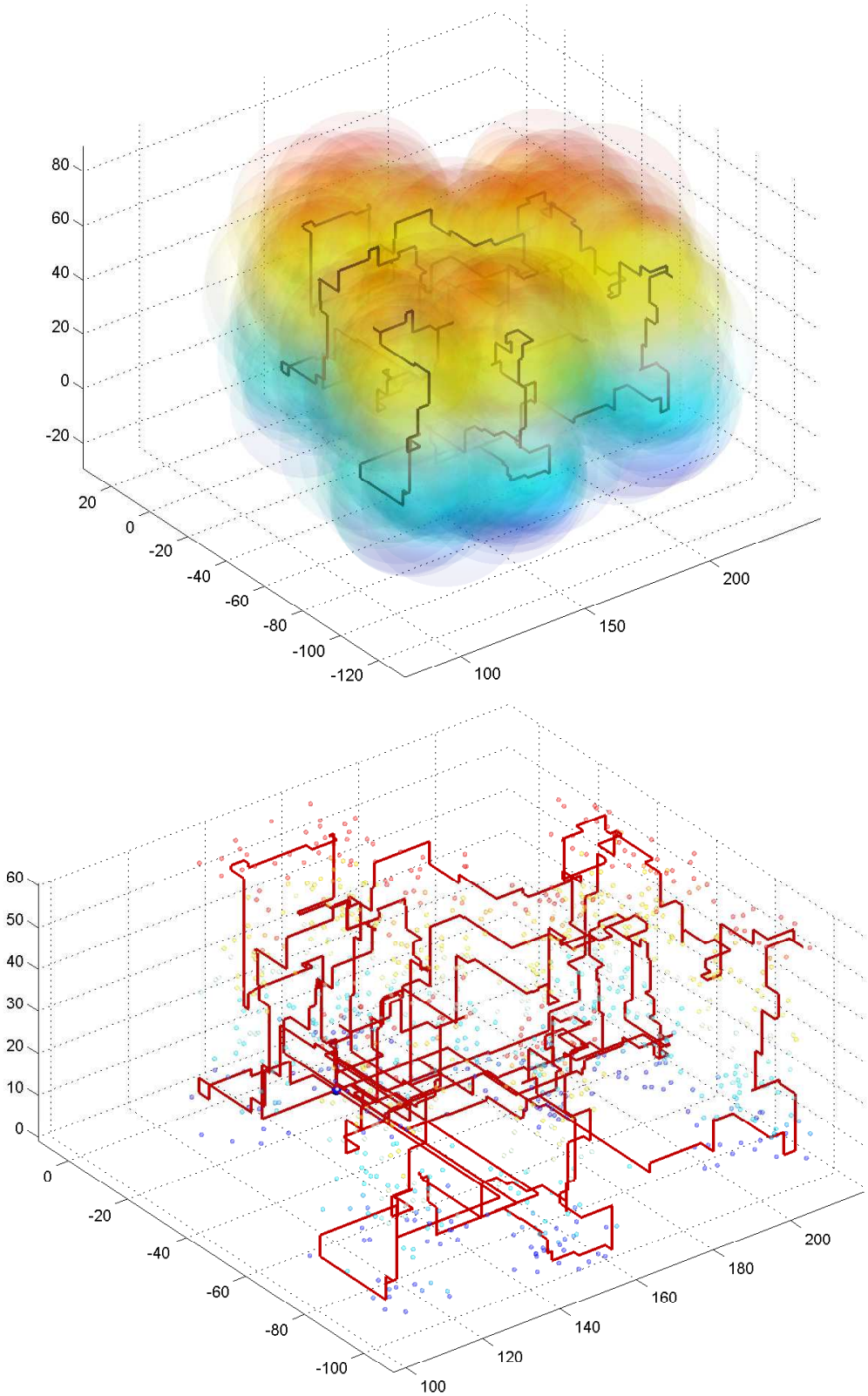


Figure O.208: $dsj1000$, arbitrary radius, 3D, Manhattan, Length = 3102.3662511

Table O-211: Solution for $dsj1000$, arbitrary radius, 3D, Manhattan

Total distance: 3102.36625110613 Total demand met: 76422 Depot: x 47.1287 y 11.9659 z 0						
Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
Route: 1 Length: 294.808789143946 Demand Met: 9064						
47.9079654934998	11.9659	0	49.3862	17.5735	5.4967	29.4535
47.9079654934998	11.9659	0	46.7163	23.0055	0.3229	28.4765
47.9079654934998	11.9659	0.001	42.7704	10.2739	1.2183	5.5443
51.4316819562374	31.2898997308172	0.001	37.4272	33.8061	3.3013	15.7441
51.4316819562374	31.2898997308172	0.001	44.3651	39.5082	4.2576	12.4052
51.4316819562374	31.2898997308172	5.40559912288991	45.4526	36.121	9.3446	8.6374
51.4316819562374	31.2898997308172	5.40559912288991	62.6603	37.129	7.3175	12.7997
59.2747000000001	31.2898997308172	8.25119898074901	42.8212	36.4305	1.5446	19.4237
59.2747000000001	31.2898997308172	8.25119898074901	63.2951	31.2899	8.2512	4.0204
59.2306517395033	31.3049508503974	8.46543744433503	75.9022	40.5634	8.2476	19.0711
59.2306517395033	31.3049508503974	8.46643744433504	67.4673	33.2544	9.192	16.5328
59.2306517395033	31.3049508503974	8.46643744433504	67.7055	32.9993	17.0949	14.8259
59.2306517395033	31.3059508503974	8.46643744433503	66.7818	30.0369	13.8618	10.9633
59.2306517395033	31.3059508503974	8.46643744433503	69.1853	30.9522	12.1629	13.139
59.2306517395033	31.3069508503974	8.46643744433504	61.5106	34.0654	15.2705	10.912
51.629180952995	31.3069508503974	19.4887103124217	46.5714	10.174	4.4604	27.098
51.629180952995	31.3069508503974	19.4887103124217	41.9974	13.5778	7.3366	24.1613
51.629180952995	31.3069508503974	19.4887103124217	52.0306	12.0787	8.641	25.2448
51.629180952995	31.3069508503974	19.4887103124217	52.3173	10.0275	11.1526	24.0147
51.629180952995	31.3069508503974	19.4887103124217	44.5228	11.8645	13.3212	25.0082
51.629180952995	31.3069508503974	19.4887103124217	47.5893	27.8934	1.3329	19.7112
51.629180952995	31.3069508503974	19.4887103124217	53.915	28.4629	8.3577	20.5718
51.629180952995	31.3069508503974	19.4887103124217	50.8592	31.2824	4.4654	23.4486
51.629180952995	31.3069508503974	19.4887103124217	54.8257	29.6059	7.5612	17.9639
51.629180952995	31.3069508503974	19.4887103124217	45.8725	14.3747	21.2711	19.0119
51.629180952995	31.3069508503974	19.4887103124217	49.5432	29.0024	13.3417	8.1871
51.629180952995	31.3069508503974	19.4887103124217	57.9508	29.6187	7.6435	14.7612
51.629180952995	31.3069508503974	19.4887103124217	47.2412	18.0641	21.8927	26.9311
51.629180952995	31.3069508503974	19.4887103124217	63.3607	23.5913	11.9128	24.1094
51.629180952995	31.3069508503974	19.4887103124217	40.715	18.8306	21.9165	23.0792
51.629180952995	31.3069508503974	19.4887103124217	43.7231	10.6871	23.6231	24.1762
51.629180952995	31.3069508503974	19.4887103124217	45.6407	35.658	2.8521	25.0567
51.629180952995	31.3069508503974	19.4887103124217	49.9475	19.2284	25.6639	17.8419
51.629180952995	31.3069508503974	19.4887103124217	66.7482	27.6121	12.1372	22.4893
51.629180952995	31.3069508503974	19.4887103124217	50.3723	32.2399	19.4829	6.6627
51.629180952995	31.3069508503974	19.4887103124217	49.0558	10.279	28.6803	25.3924
51.629180952995	31.3069508503974	19.4887103124217	62.5649	23.4331	22.9907	17.3284
51.629180952995	31.3069508503974	19.4887103124217	45.9242	19.9	29.6168	25.1738
51.629180952995	31.3069508503974	19.4887103124217	58.6228	31.6703	20.587	25.6598
51.629180952995	31.3069508503974	19.4887103124217	66.5887	34.1226	10.8677	18.4197
51.629180952995	31.3069508503974	19.4887103124217	45.985	27.4123	27.7797	25.7471
51.629180952995	31.3069508503974	19.4887103124217	50.5738	30.8854	25.5173	21.7078
51.629180952995	31.3069508503974	19.4887103124217	66.9624	36.7077	4.2616	25.6742
51.629180952995	31.3069508503974	19.4887103124217	43.7884	36.8808	19.8614	16.446
51.629180952995	31.3069508503974	19.4887103124217	64.2717	31.7627	18.8904	14.3523
51.629180952995	31.3069508503974	19.4887103124217	50.3352	41.2014	16.9793	12.9522
51.629180952995	31.3069508503974	19.4887103124217	56.2795	36.0371	23.7369	11.477
51.629180952995	31.3069508503974	19.4887103124217	46.9054	30.8841	31.5685	23.9447
51.629180952995	31.3069508503974	19.4887103124217	55.9275	34.3566	30.6301	23.3784
51.629180952995	31.3069508503974	19.4887103124217	48.325	36.101	31.2943	13.1633
51.629180952995	31.3069508503974	19.4887103124217	58.8785	37.4935	28.0133	17.2077
51.629180952995	31.3069508503974	19.4887103124217	63.8119	26.0212	34.0563	22.8759
51.629180952995	31.3069508503974	19.4887103124217	58.4334	33.3219	33.0094	26.7455
51.629180952995	31.3069508503974	19.4887103124217	54.3132	33.4794	38.814	25.0485
51.629180952995	31.3069508503974	37.4449746816416	47.9603	31.0225	36.0363	3.9403
51.629180952995	31.3069508503974	38.3340802342112	51.0819	30.8837	36.7669	1.7131
51.629180952995	37.1917999999163	39.3047000821725	51.6292	37.4529	39.3047	0.2611
49.7526029072783	37.1917999999163	41.5843656025646	53.589	37.6567	38.7584	4.7875
49.7526029072783	37.1917999999163	41.5843656025646	50.1654	34.298	41.7388	3.7703
49.7526029072783	34.7529097119776	44.8325203372229	44.7872	36.1398	42.3342	5.7289
49.7526029072783	34.7529097119776	44.8325203372229	51.473	33.7115	46.7085	2.7502
51.92006769307	29.4200755596932	50.2741000000002	53.8796	31.7093	51.2249	3.1598
51.92006769307	29.0362323401433	51.7018669607919	64.2784	38.8059	47.0778	29.0239
51.92006769307	29.0362323401433	51.7018669607919	66.7168	38.698	48.2341	29.069
51.92006769307	29.0362323401433	51.7028669607919	52.7074	28.2489	52.4902	1.3637
49.7526029072783	29.0362323401433	51.7028669607919	45.9581	33.5048	45.1742	9.009
44.602800169456	29.9318997218412	50.2741000000002	44.6028	29.9319	49.9927	0.2814
40.9959	31.0363176528011	51.1576647264954	40.9959	37.9409	51.1587	12.8365
35.5392000000065	31.036317652801	58.1049178539205	35.5392	31.6783	58.7469	0.9079
33.1431459509349	31.0363176528011	58.1049178539205	22.0389	18.6688	59.3708	16.6692
31.7582945397759	31.036317652801	54.9029262235396	18.7218	26.0511	59.401	18.3773
30.2486051536022	31.0363176528011	54.9029262235396	21.4132	25.3225	51.4824	11.064
27.1628812991763	31.036317652801	54.9029262235396	19.4476	21.0876	59.2618	13.323
19.6068673033017	31.0363176528011	47.2985346083845	21.3113	31.7798	46.1078	2.2081

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
19.6068673033017	20.6181674148138	46.5070999541255	19.4151	20.4264	46.5071	0.2712
19.6068673033017	20.6181674148138	46.5060999541256	19.3676	20.9011	45.1036	22.1053
19.6068673033017	21.2092894263302	39.047468910494	22.0744	6.6433	40.1203	29.8611
19.6068673033017	21.2092894263302	39.0464689105384	21.1889	21.267	39.0474	20.9082
19.943697595166	21.2092894263302	35.399880356089	27.2842	5.8331	28.3822	18.4271
19.943697595166	21.2092894263302	35.399880356089	20.8129	26.0745	22.3222	16.1762
19.943697595166	21.2092894263302	35.399880356089	25.9081	14.4892	36.1934	15.0463
19.943697595166	21.2092894263302	35.399880356089	18.1963	16.0602	36.4885	17.912
19.943697595166	21.2092894263302	35.399880356089	19.6468	14.5775	38.07	7.1553
19.943697595166	24.7459958602533	35.399880356089	17.7323	26.9057	35.8248	28.6742
19.943697595166	24.7459958602533	35.399880356089	16.9754	26.2994	50.4148	25.4942
19.9436975951648	24.7459958602532	34.6115687490065	19.5225	24.6717	34.6116	0.4277
19.943697595166	24.7459958602533	29.0763354850465	18.4916	22.031	28.1174	8.3539
19.943697595166	24.7459958602532	26.9404741004293	19.0397	19.3917	26.8913	27.4702
19.943697595166	24.7459958602532	19.3714435314199	18.7531	32.536	21.0115	27.0946
20.1299001964943	24.7459958602532	19.3714435314199	19.8821	27.2321	11.7559	8.0149
20.1299001964943	24.7459958602532	19.3714435314199	22.8581	29.0039	22.5241	5.9592
20.1299001964943	22.8954612482455	11.4361459684128	20.5046	21.2685	13.3595	15.1676
20.1299001964943	22.8954612482455	11.4361459684128	15.0509	21.8739	10.7741	20.7664
20.1299001964943	22.8954612482617	10.742009274213	25.2224	21.1268	9.0297	20.0558
20.1299001964943	22.8944612482617	10.742009274213	27.0312	22.0371	1.4535	12.0381
20.1299001964943	22.8944612482617	10.742009274213	21.2889	20.2133	0.1771	12.2867
20.1299001964943	18.4557129792662	10.742009274213	7.8039	17.6061	5.7787	13.3149
20.1299001964943	18.4557129792661	7.25411094973813	19.6457	23.2311	5.559	5.0904
20.1299001964943	18.4557129792196	7.25311094973875	23.3217	16.9506	6.2856	12.0877
20.1299001964943	18.4557129792196	7.25311094973875	24.0847	21.2619	9.4135	18.4856
20.1299001964943	18.4547129792196	7.25311094973885	20.5322	21.5891	20.6595	28.8292
20.1299001964943	11.1032093599021	7.25311094973939	21.6596	11.213	17.563	23.4533
20.1299001964943	11.1022093599021	7.25311094973922	16.9397	16.157	0.3423	23.6795
20.1299001964943	0.597546271983885	7.25311094973908	26.7943	-2.6353	5.1743	24.1177
20.1299001964943	0.597546271983885	7.25311094973908	32.3564	-1.4633	20.5286	25.6089
20.1299001964943	0.597546271983397	7.04449106847881	28.0443	7.2557	0.5495	23.7219
20.1299001964943	0.597546271983884	3.73124627978764	19.4163	-0.8394	2.2943	2.1538
20.1299001964943	4.14690000003113	7.0444910684788	23.9142	5.5856	8.3806	20.6816
20.1299001964943	4.14690000003113	7.0444910684788	22.4003	2.9895	12.1851	21.9707
28.144899975211	4.1469000000014	7.04449106847882	28.1449	5.3771	22.529	15.5333
31.0707001379835	4.14690000000001	5.3999000148018	46.7677	27.4481	8.8301	29.3514
31.0707001379835	4.14690000000001	5.3999000148018	31.0707	1.7474	5.3999	2.3995
41.1107452517214	4.14690000000138	2.50864471932935	41.1669	5.3004	18.6447	27.2131
41.1107452517213	4.14690000000138	0	47.0712	4.3382	9.7807	28.9099
Route: 2 Length: 472.486229403418 Demand Met: 9117						
47.1015000001027	12.1757000000563	9.74799999998175	47.1015	12.1757	10.5923	0.8443
43.9444239840024	37.4124016849933	9.74799999998176	45.4903	38.3462	11.2293	2.3358
43.9444239840024	84.8568769158411	9.74799999999975	43.1057	91.7939	5.1823	21.808
43.9434239841001	84.8568769158411	9.74799999999975	41.6896	94.8028	3.024	26.2925
37.8026998144663	84.8568769158412	9.74799999998175	30.8807	93.5109	0.3364	15.6566
37.8016998144662	84.8568769158412	9.74799999998175	33.517	80.8699	6.7304	7.8126
35.2297000069464	84.8568769158412	9.74799999998175	35.2297	94.8683	9.4168	10.0169
32.3397456930659	84.8568769158418	9.74799999998175	34.7819	91.1147	8.0437	26.8877
32.3387456930659	84.8568769158412	9.74799999998175	23.4089	84.0628	5.796	9.7975
34.6195999999993	90.5379000241346	9.74799999998175	34.9317	80.2335	16.9208	24.9565
34.6195999999993	90.5379000241345	9.99120010272926	37.9917	90.5379	9.9912	3.3721
34.6195999999443	98.1580994250725	10.1641961095063	34.0458	95.0903	5.2592	23.4922
33.6028909314072	98.1580994250689	10.1641961095063	37.3296	94.7968	3.7833	26.3816
33.6028909314071	98.1590994250675	10.1641961095063	33.2241	90.2072	6.3544	24.6184
33.6028909314072	98.160099425066	10.1641961095063	37.0706	93.0168	1.0492	27.7874
33.6028909314072	101.144300000288	10.1641961095063	31.6341	101.1443	12.133	2.7843
33.6028909314071	101.144300000288	6.79431737547746	35.0473	98.5367	9.9491	21.3919
33.6028909314071	101.145300000288	6.79431737547747	35.7481	97.1257	4.802	23.4808
34.8471852844206	101.145300000288	6.7943173754743	8.1477	101.1634	5.5645	26.7278
34.8471852844908	101.145300000288	6.79431737547747	35.7306	102.2767	4.1846	20.2694
34.8471852844908	101.145300000288	6.79331737547747	33.0573	97.9271	5.3628	8.5196
34.8471852844908	101.145300000288	6.79331737547747	30.1816	102.1772	4.0412	8.5674
34.8481852844908	101.145300000288	6.79331737547747	33.9629	96.8355	4.449	13.8521
34.8491852844908	101.145300000288	6.79331737547746	35.5571	102.295	9.2843	22.4132
34.8491852844908	101.145300000288	6.79231737547744	35.7859	98.3251	5.4495	3.261
34.8491852844908	101.145300000288	4.57520000003522	40.065	98.6098	6.7408	21.6771
40.5225999986195	101.145300000288	4.57520000003522	40.2693	101.3043	8.6864	10.0221
40.5225999986195	102.800199993394	4.57520000003522	40.5226	102.8002	1.3549	3.2203
47.3938298247667	102.800199993394	4.57520000003522	40.9527	105.6227	4.1926	16.0561
47.3938298247667	105.125829823445	4.57520000003522	45.465	105.2608	3.7217	13.9094
47.3938298247667	105.125829823445	10.3379000000057	42.9285	106.2179	5.6354	10.4101
47.3938298247667	105.125829823445	10.3389000000057	48.0764	105.8084	10.3389	0.9653
47.3938298247667	105.125829823445	10.3399000000057	51.1106	98.2963	5.5983	24.3822
47.3938298247667	105.125829823445	15.1208475101108	48.9533	90.4759	7.3728	19.0092
40.7228599815258	105.125829823445	15.1208475101108	39.7333	98.7582	4.2197	18.7088
40.7228599815258	105.125829823445	15.1218475100685	47.7789	92.5461	5.4276	17.3786
40.7218599815258	105.125829823445	15.1218475100685	37.1983	106.347	12.5162	4.5493
39.4091556655296	98.855111116804	15.1218475100685	42.5793	100.4271	14.8388	3.5498
39.4091556655295	98.855111116804	15.1228475101108	29.3468	93.7461	14.2413	24.255

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
39.4091556655296	97.8662557100972	15.1228475101108	31.7064	96.988	25.1942	27.9597
39.4091556655295	97.8652557100971	15.1228475101107	31.6916	96.8159	17.5787	27.5118
39.4091556655295	97.8652557100971	17.5328000041481	38.2186	96.6747	17.5328	1.6837
41.4769969054209	97.8652557100972	28.9136422033796	40.9431	96.0349	18.7884	13.182
41.477996905421	97.8652557100972	28.9136422033796	26.1674	96.1159	30.3905	22.0166
41.4779969054209	97.8652557100972	28.9146422033796	53.9006	102.5381	21.0284	26.8445
41.4789969054209	97.8652557100972	28.9146422033796	42.9226	100.4615	26.2167	4.0129
41.4799969054209	97.8652557100971	28.9146422033796	42.2565	98.7398	22.9258	24.1013
41.4809969054209	97.8652557100972	28.9146422033796	42.9721	90.3177	28.7365	7.6955
45.5012040541273	100.106304280663	36.5277999999388	46.0729	100.678	36.5278	0.8085
40.4961512938596	100.106304280663	36.5277999999388	45.0704	101.2748	27.009	15.9718
40.4951512938596	100.106304280663	36.5277999999388	38.189	100.3805	31.8594	26.8425
40.4941512938595	100.106304280663	36.5277999999386	42.0156	103.5929	44.0945	23.2765
40.4931512938595	100.106304280663	36.5277999999388	46.5537	103.4177	45.8992	24.5733
40.4931512938859	97.7738681372903	36.5277999999388	33.8351	99.3235	37.4512	26.1581
40.4931512938859	97.7728681372903	36.5277999999387	32.2034	92.5655	35.5696	28.0393
40.493151293886	97.7718681372902	36.5277999999388	36.8108	99.4487	34.5912	12.3219
40.493151293886	97.7718681372902	36.5287999999388	32.8593	93.0881	38.0081	18.3654
40.493151293886	88.5204944966455	36.5287999999388	27.1736	83.2653	40.5956	16.1862
40.493151293886	88.5194944966009	36.5287999999387	42.6808	88.2098	40.1619	26.1251
40.493151293886	88.5194944966009	40.4202000001397	22.8762	75.7017	33.805	22.7687
40.4921512938596	88.5194944966009	40.4202000001397	34.3074	104.3145	33.9426	24.0514
36.705194497199	88.5194944966008	40.4202000001398	35.4073	87.2216	40.4202	1.8355
38.4107914510788	88.5194944966008	40.4202000001397	34.0464	97.1856	33.2284	23.2445
38.4107914511076	88.5194944965886	48.0171000002275	29.376	80.5861	55.9809	14.4218
38.6522999999999	92.4813000000419	48.0171000002275	41.599	92.4813	48.0171	2.9467
38.6522999999935	96.6248773951398	48.0171000002275	32.1756	91.0244	47.2823	9.1133
38.6522999999935	96.6248773951399	48.0181000002275	40.8939	84.3555	43.1765	20.2802
38.6522999999935	96.6248773951399	48.0191000002525	26.6904	96.1713	46.6576	25.5008
38.6522999999935	96.6248773951399	48.0191000002525	29.8552	101.3038	43.5974	17.7782
38.6522999999935	96.6248773951399	52.2417581838796	33.6244	92.4492	56.3457	13.8672
38.6522999999999	96.6248773951399	52.2427581838796	35.9551	95.9225	47.402	5.5858
38.651299999978	96.6248773951398	52.2427581838796	32.4952	97.9758	48.1403	7.8091
38.651299999978	96.6248773951398	52.2427581838796	39.196	99.7694	49.3378	4.3434
36.5011983171306	96.6248773951399	52.2427581838796	36.1694	94.3523	52.0418	28.0801
36.5011983171306	96.6248773951399	52.2437581838796	31.4281	94.9219	54.3744	25.0918
36.5011983171307	96.6248773951398	53.988500001055	44.0393	95.7757	50.8289	16.7138
36.5011983171306	96.6248773951398	53.9895000010549	29.7849	97.5299	53.9895	6.777
36.5011983171306	96.6248773951399	54.7987950375799	37.1788	95.0118	52.8478	2.6206
36.5011983171306	96.6248773951399	55.5036667478248	35.4152	92.5489	58.019	4.9112
41.1443209032253	96.6248773951398	55.5036667478248	39.6285	91.4521	58.9959	19.1143
41.1443209032253	104.801900002183	55.5036667478248	42.4716	105.6496	56.7244	1.9926
36.8215613490863	104.801900002183	55.5036667478248	44.7902	101.1589	57.6534	13.5802
36.8205613490863	104.801900002183	55.5036667478248	42.0978	97.503	57.9578	9.3352
36.8205613490863	104.801900002183	50.2400298930603	47.126	99.3914	58.8698	14.4896
36.8195613490863	104.801900002183	50.2400298930604	35.2228	101.4244	59.0123	27.011
36.8185613490863	104.801900002183	50.2400298930603	35.7224	107.36	58.7833	11.5177
36.8175613490863	104.801900002183	50.2400298930603	43.0828	99.6317	56.4863	26.6664
36.8165613490863	104.801900002183	50.2400298930603	30.7482	95.8761	57.2879	28.9897
36.8165613490863	104.801900002183	50.2400298930603	32.8361	107.2479	41.504	24.978
35.4006012649169	104.801900002183	50.1937000052466	35.4006	103.6799	50.1937	1.122
35.4006012649169	104.801900002183	46.1027355046355	39.1965	105.4524	44.823	4.0584
35.3529886370137	104.801900002183	41.7795187988506	39.3246	101.8921	42.5744	13.7336
35.3529886370137	108.123417991914	41.7795187988506	42.8352	101.6931	44.9574	21.2677
35.3529886370137	108.123417991914	41.7795187988506	33.1638	109.6815	28.6324	13.4189
35.3528689398382	108.115552303542	41.395	35.3466	107.7036	41.395	0.412
35.3529886370137	108.123417991914	26.9041804033352	31.3011	106.2109	32.3658	16.9428
33.1686000010726	108.220016635499	26.9041804033352	28.1717	107.4546	19.2451	16.9459
33.1686000010726	108.220016635499	20.193480402239	33.1686	108.6172	19.7963	0.5617
33.1686000010726	108.220016635499	22.5130999999972	8.0611	104.093	26.141	29.9646
33.1686000010726	99.9071851693572	22.5130999999972	32.6009	89.9531	17.4409	11.1863
32.2279562103734	99.9071851693572	22.5130999999985	34.0163	93.2553	22.3961	18.0121
29.1896999999696	96.4144999914171	22.5130999999986	29.1897	96.4145	23.036	0.5229
29.1896999999694	95.0323602450624	22.5130999999986	33.1881	90.5996	30.8927	12.9818
27.8075602483918	91.5737764961145	22.5130999999972	29.5221	90.7635	22.4343	1.898
23.8212925835247	91.5737764961146	22.5130999999972	29.7064	94.0211	29.3487	26.0785
23.8212925834984	91.5727764961146	22.5130999999972	9.9143	75.8382	26.191	21.3192
23.8212925835135	91.5727764961146	22.5120999999972	28.2891	98.27	21.6276	21.2566
23.8212925835134	91.5727764961146	14.3426359110267	5.8502	91.8647	13.1882	18.0105
23.8212925835134	71.1915844897919	14.3426359110267	24.5354	72.6275	12.2334	5.9717
24.3434353573845	70.0867165983351	15.0540254524357	21.1184	76.9048	10.6601	8.7289
23.8212925835134	71.1905844897919	14.3426359110267	22.1344	71.2137	11.8857	6.3651
23.8212925835134	71.1895844897919	14.3426359110267	17.9606	81.6588	21.6946	21.1617
23.8212925835134	71.1885844897921	14.3426359110267	7.5677	74.3816	13.1566	29.6105
23.8212925835192	71.1875844897919	14.3426359110261	6.67010000000001	63.5082	34.9077	29.6501
23.8222925835193	71.1875844897919	14.3426359110267	22.6268	64.3936	19.9605	24.3192
23.8232925835239	71.187584489792	14.3426359110267	14.5018	68.1646	16.8217	28.3495
25.5892050332881	71.1875844897919	14.3426359110267	25.7737	68.9159	14.4865	2.2837
25.5892050332881	71.1875844897919	8.16346952512474	28.241	67.9653	9.5896	4.4101
25.5892050332881	74.0957267544452	7.09946515752177	22.9431	70.0987	4.2047	5.5998

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
25.5892050332881	74.0957267544452	7.09846515752179	24.5076	73.115	4.3052	8.9241
25.5892050332888	74.0957267544452	1.38627323756196	25.4767	75.481	0.001	1.9623
25.5892050332888	74.0957267544453	1.80060000000058	31.0449	71.9995	0.0029	23.5272
46.5030000012674	27.4524996998421	1.80059999999334	44.1303	30.8739	2.5661	4.2334
46.5030000012673	16.5426000041326	1.8005999999996	46.503	16.5426	2.0548	0.2542
Route: 3 Length: 262.843751370248 Demand Met: 8576						
47.1287	11.9659	0.001000000000002	42.4139	3.5597	1.814	13.287
46.7426219437968	11.9659	1.23205104362224	62.4332	-0.684	2.8792	29.6949
46.7426219437968	11.9659	1.23205104362224	61.9524	-0.333	11.9086	23.4378
46.7426219437968	4.8933527773453	1.23205104361314	49.1677	19.2175	6.1526	29.9217
46.7416219437968	4.8933527773453	1.23205104361314	48.4975	2.4432	11.2037	10.4173
46.7416219437968	4.8933527773453	1.23305104361314	44.8479	-0.9391	15.0769	19.1888
46.7416219437968	-5.16967805659435	1.23305104359493	48.7027	4.8736	15.3944	25.6148
46.7416219437968	-5.16967805659435	9.11789999983723	46.0937	-5.8176	9.1179	0.9163
48.301961033418	1.27380000056119	11.9931999927513	48.302	2.6164	11.9932	1.3426
48.3019610334179	1.27380000056119	14.3193328615412	39.9467	-2.3317	18.5214	24.6235
50.0562870902316	1.27380000056119	18.6123540843309	53.8048	-5.0553	19.1679	14.1877
50.8453247264852	1.27380000056119	18.6123540843309	53.1154	7.9184	18.71	19.9574
50.8453247264852	1.27380000056088	20.0441016941652	51.7765	0.7553	20.0441	1.0658
50.8453247264852	2.62670200976744	26.3824323028247	52.5136	31.162	22.8965	28.7958
45.2117258587203	4.2539689973325	27.5465636622725	46.0043	6.8606	27.4465	2.7263
45.2117258587203	6.49319999999608	27.5465636622725	44.0031	6.0986	31.1209	17.8329
45.2117258587203	6.49419999999608	27.5465636622725	36.4235	4.5159	28.6582	16.6099
36.2058999997867	6.49419999999609	27.5465636622725	36.2059	6.8965	29.7476	2.2375
29.9497000020095	6.49419999999608	27.1857998978058	29.9497	8.0977	27.1858	1.6035
28.4989366486852	6.49419999999608	27.1857998978058	29.2451	9.0499	23.6495	5.6713
28.4989366486852	6.49419999999608	23.3368982433665	26.246	7.8923	16.6585	7.1855
28.4989366486852	4.90202546268287	23.3368982433665	23.1228	16.7524	24.3445	13.0518
28.4989366486852	4.90202546268287	30.5327068083194	29.4417	11.4808	30.7206	11.6626
28.4989366486852	4.90202546268287	30.5337068083193	24.8641	0.1355	28.7608	6.251
28.4989366486852	4.90202546268287	30.5347068083193	31.1128	-2.8096	30.5667	18.9309
28.4989366486852	4.90202546268287	30.5347068083193	22.6294	-1.9579	25.7184	16.8768
28.4989366486852	4.90202546268287	38.5210374632872	31.7997	5.4917	35.1341	9.7028
28.4989366486852	4.90202546268287	38.5210374632872	29.6205	6.6839	35.8272	7.8815
28.4989366486852	4.90202546268287	43.7392	27.9452	7.0873	43.7392	24.5101
28.4989366486852	4.90202546268288	53.883574256453	33.4349	0.0139	45.2628	13.2105
28.4989366486852	4.90202546268288	53.883574256453	36.4279	-4.3699	52.432	20.2708
28.4989366486852	0.549454580495639	53.883574256453	29.2732	5.6917	40.0529	15.7976
28.4989366486852	0.548454580495635	53.883574256453	25.8989	0.7413	53.4706	22.2466
28.4989366486852	0.548454580495635	53.883574256453	31.0065	-1.0714	59.1851	23.9753
28.4989366486852	0.547454580495451	53.883574256453	27.6562	5.4902	56.4427	8.29
28.4989366486852	0.547454580495451	54.9235890906393	27.3755	-1.0984	56.1861	2.359
28.8044127342897	0.547454580495451	54.9235890906393	22.4229	-2.1641	56.3911	7.0873
31.1391001522124	0.547454580495451	54.9235890906393	31.1391	0.2266	57.7289	2.8236
31.1401001521687	0.54745458049545	54.9235890906393	33.7832	8.5886	57.2507	17.2676
31.9315032111844	0.547454580495451	54.9235890906393	36.7928	9.6586	58.8057	12.2244
31.9325032111844	0.547454580495451	54.9235890906393	30.7839	5.7178	56.2846	20.1469
31.9325032111844	2.07369025831112	53.8835750510439	38.0686	7.3443	51.7798	25.6467
43.6175709705705	2.07369025831113	53.8835750510438	44.2937	4.7268	51.9613	3.889
46.9005061469548	4.13520109863972	53.8835750510438	48.6326	32.1618	43.4727	29.9479
46.9015061469552	4.13520109863972	53.8835750510439	43.0131	-4.6452	57.9101	20.9992
46.9025061469552	4.13520109863972	53.8835750510439	44.3097	5.4051	59.4302	11.9467
46.9035061469552	4.13520109863972	53.8835750510439	45.5397	7.2979	57.1732	4.7628
49.1747810839932	4.15757748979619	53.8835750510439	51.2901	7.6487	52.6277	4.2708
53.354977226845	4.15757748979619	53.8835750510438	58.6318	9.4344	53.4701	7.474
53.354977226845	2.07970000226429	53.8835750510438	54.7597	1.1902	50.9644	4.007
53.0451945137378	2.07970000226429	53.8835750510438	54.4331	-6.2551	57.3764	16.56
53.0451945137378	2.07870000226429	53.8835750510439	43.4311	0.4843	45.1031	25.8563
53.0451945137378	2.07870000226429	53.8835750510439	54.6465	1.327	47.163	23.7327
53.0451945137378	2.07770000226429	53.8835750510438	58.2987	1.8222	52.9601	22.9315
53.0451945137378	2.07670000226429	53.8835750510439	51.8363	2.0767	53.9783	1.2126
53.0451945137377	1.7930695644182	53.8835750510439	52.2056	3.4977	49.7426	20.8953
53.0461945137377	1.7930695644182	53.8835750510438	56.514	2.6652	55.8183	22.7885
53.0461945137377	1.7930695644182	53.8835750510438	47.7278	5.7114	59.7593	28.1097
53.0461945137377	1.7930695644182	53.882575051044	60.4719	1.0667	55.1539	17.5347
54.3326771062442	1.7930695644182	53.8825750510439	56.6229	3.2945	52.4352	3.6572
54.3326771062442	1.7930695644182	46.0215000559186	57.3839	0.9502	46.0215	3.1655
54.3326771062442	1.7930695644182	46.0205000559186	50.5069	12.3029	52.6774	19.1593
54.3326771062442	1.7930695644182	46.0195000559185	52.0607	4.6851	47.5572	25.9984
54.3326771062442	1.7930695644182	38.5684997921115	55.7669	1.6852	42.4618	24.4965
52.1387692737167	1.7930695644182	38.5684997921114	52.8937	1.339	38.4463	0.8894
46.299228153329	1.7930695644182	38.5684997921114	49.5265	1.5006	43.2383	5.684
44.8006406417594	1.7930695644182	38.5684997921115	40.2323	12.6508	42.5989	15.4062
44.8006406417578	1.7930695644182	38.5674997921114	42.4155	0.0668	38.5675	2.9443
44.8006406417594	2.5925079754174	38.4033353085413	46.4115	30.3033	33.5708	28.1751
44.8016406417594	2.5925079754174	38.4033353085413	46.684	28.1154	34.4272	27.5206
51.5516574055026	4.54412810456049	38.4033353085413	51.32	11.9016	40.4537	29.8963
56.3427730031717	4.54412810456049	38.4033353085413	46.3909	8.819	37.7186	24.8054
56.3437730031717	4.54412810456049	38.4033353085413	54.3108	6.5803	34.1725	23.4136
56.3447730031717	4.54412810456049	38.4033353085413	55.5508	6.709	40.6861	3.2447

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
56.3457730031717	4.54412810456049	38.4033353085413	53.4617	5.8056	38.0578	21.7012
56.3457730031717	4.54412810456049	38.4023353085557	60.1802	30.671	38.4138	27.7411
56.3457730031717	4.5441281045605	38.4013353085413	52.1655	19.1446	41.5432	15.5087
56.3457730031717	4.5441281045605	38.400335308544	49.1449	22.3659	43.2644	23.3416
56.3457730031717	4.54412810456049	37.1119103499022	58.0726	3.0503	30.5544	10.1594
56.3467730031726	4.54412810456049	37.1119103499022	51.9742	12.9315	39.5168	19.8738
56.3477730031736	4.54412810456049	37.1119103499022	48.9393	11.7496	40.9103	17.8826
56.3487730031736	4.54412810456049	37.1119103499022	49.2438	-0.5725	42.7886	17.8927
56.3497730031736	4.54412810456049	37.1119103499022	50.9668	1.717	44.4164	23.9816
56.3507730031736	4.54412810456049	37.1119103499022	53.412	-4.2453	38.3008	16.6165
56.3517730031737	4.54412810456049	37.1119103499021	55.3647	9.0137	38.8085	9.4748
56.604350806072	4.54412810456049	37.1119103499021	60.4167	1.4088	44.4464	18.4179
56.604350806072	4.54512810456049	37.1119103499021	43.7681	7.8375	35.3656	19.4193
56.604350806072	4.54512810456049	37.1119103499021	50.2911	5.2466	39.9878	6.9728
56.605350806072	4.54512810456049	37.1119103499021	54.6523	25.2022	31.3259	28.2307
56.606350806072	4.54512810456049	37.1119103499021	53.289	-9.6645	34.2743	25.3042
57.1688362534748	4.54512810456049	37.1119103499021	55.5686	2.3786	41.1094	17.8085
58.1915019230254	4.54512810456049	37.1119103499021	62.5325	1.766	39.3982	5.6387
58.1915019230254	4.54512810456049	37.1109103499021	62.9268	27.0211	37.7555	28.5574
58.1925019230254	4.54512810456049	37.1109103499021	63.4243	4.3429	39.6925	22.7299
59.2212763579152	4.54512810456049	37.1109103499021	59.6709	-1.5476	33.1451	26.9171
59.2212763579152	4.54512810456049	37.1109103499021	61.565	4.5717	36.954	20.8967
59.2212763579152	4.54512810456049	27.9807000038705	60.5785	6.8128	27.9807	2.6428
59.2212763579152	2.37119999999711	27.7652997826223	62.7821	-0.0838	27.7653	4.3251
59.2212763579152	2.37119999999711	14.334509728462	53.5826	-3.7128	29.3577	20.6553
59.2212763579152	2.37119999999711	14.334509728462	50.0191	-2.6033	31.7826	29.6269
59.2202763579152	2.37119999999711	14.334509728462	57.7878	-4.3732	24.6962	27.1183
59.2192763579152	2.37119999999711	14.334509728462	56.047	-0.6998	19.4659	25.6513
59.2192763579152	2.37119999999711	14.332509728462	63.0749	1.8033	17.7213	22.3131
59.2192763579152	2.37119999999711	14.332509728462	57.7618	2.6586	23.6599	24.3155
58.288400052285	2.37119999999711	14.332509728462	58.3955	-2.2935	14.9348	20.2689
58.287400052285	2.37119999999711	14.332509728462	64.6914	7.7788	3.6297	22.2178
58.2874000522849	2.37119999999711	4.56000367122807	58.8992	5.3006	6.9433	25.2792
58.2874000522849	2.37119999999711	4.56000367122807	58.6741	1.1796	4.0744	18.8015
58.2864000522865	2.37119999999711	4.56000367122807	58.2741	0.1622	8.0145	6.0785
58.2864000522863	2.37119999999711	4.55900367122601	58.2864	0.0731	4.559	2.2981
58.2854000522865	2.37119999999711	4.55900367122806	58.5415	3.6684	5.0311	22.039
52.6264764037737	4.26018107052424	4.55900367122806	52.3291	3.6705	6.1162	19.2214
52.6264764037737	4.26018107052425	0	54.5841	1.3	6.274	17.8466
52.6264764037737	4.26018107052425	0	51.545	-0.7619	6.4521	25.0267
52.6264764037738	11.5783214768122	0	56.6752	3.9284	4.2715	9.6519
52.6264764037737	11.9659	0	47.4524	12.1509	5.76	13.8821
Route: 4 Length: 342.017477522258 Demand Met: 9857						
47.1287	11.9659	4.07869092733279	44.2621	15.3855	4.7212	17.5289
56.7196870857583	11.9659	4.07869092733279	55.8132	15.4408	3.6174	11.5975
59.4008999990247	11.9659	4.07869092733279	54.0368	23.8586	2.2143	14.1498
59.4008999990247	11.9659	4.07869092733279	53.9046	16.3668	14.1276	12.2702
59.4008999990247	8.08770118608817	4.07869092733279	57.2331	12.7874	5.1838	7.0243
59.4008999990247	8.08770118608817	8.39980046927043	59.4358	8.0877	8.3998	0.0349
59.4008999990247	7.88045016418834	11.1784797059127	58.0725	5.2013	11.1785	2.9904
59.4008999990247	11.8222495509851	17.7556267434184	61.7542	11.527	18.9198	4.9252
59.4008999990247	11.8232495509851	17.7556267434184	53.4554	15.0784	17.1477	7.1719
59.4018999990247	11.8232495509851	17.7556267434184	60.2628	6.0605	25.9406	10.0471
64.9475126064403	29.5149721908625	17.7556267434184	70.1037	27.3839	19.7642	17.3373
64.9475126064403	29.5149721908625	17.7556267434184	67.242	26.9141	23.9429	16.4624
64.9485126064403	29.5149721908625	17.7556267434184	61.1622	34.1592	24.5106	28.1161
64.9485126064403	29.5149721908625	33.9052000000001	55.4854	26.8201	32.387	10.8698
64.9485126064403	29.5149721908625	33.9052000000001	60.463	30.4795	30.5011	7.3122
64.9485126064403	29.5159721908625	33.9052000000001	62.464	33.4003	33.7046	5.2338
64.9485126064403	29.5159721908625	33.9052000000001	60.9493	37.7343	34.646	9.1697
64.9485126064403	33.2397652029374	33.9052	63.453	34.6286	41.047	7.4277
66.9489997823634	50.6854998005332	33.9052000000001	66.949	50.6855	34.7495	0.8443
68.2826009346394	50.9545326980477	33.9052000000001	68.2826	55.0673	33.7791	4.1147
70.0624002273896	50.315236706803	33.9208752885647	70.0624	50.1219	34.6274	0.7325
72.7757001837888	50.3152367068211	28.8180560215626	72.7757	56.7077	5.4576	24.2193
72.7757001837888	50.3152367068211	28.8180560215626	67.7991	50.1342	31.512	7.0884
72.7757001837888	50.3152367068211	28.8180560215626	70.6191	48.182	36.9413	10.2546
72.7757001837888	50.3152367068211	28.8180560215626	70.2011	52.705	34.7749	12.1835
72.7757001837888	50.3152367068211	28.8180560215626	68.5789	56.8701	42.2821	16.6688
75.7779985314508	46.7494011593472	30.7677999965238	77.9223	44.6051	30.7678	3.0325
75.7779985314507	46.7494011593473	44.6749829345084	92.1801	41.0349	29.4683	29.4376
75.7779985314507	46.7494011593473	44.6759829345084	90.4784	41.2284	44.1276	19.2596
75.7779985314506	52.4054592717942	44.6759829345084	77.9078	47.2474	41.2613	6.5423
75.7779985314506	52.4054592717942	44.6759829345084	74.3979	53.0985	48.6112	4.2274
74.1804205307093	52.4054592717943	44.6759829345084	70.1179	52.2878	46.5219	5.6226
74.1804205307093	57.4431794072988	45.2039864790935	73.7963	57.8273	45.2128	0.5433
79.5589087472639	56.3217329467324	45.2039864792051	78.0993	54.3894	50.2798	5.6239
79.5589087472639	48.4078006598501	45.2039864792051	91.9732	45.8332	46.1527	12.7139
80.5743051300482	48.4078006598501	45.2039864792051	88.2545	36.066	42.1212	15.726
80.5743051300482	48.4078006598501	45.2039864792051	86.5983	36.2039	44.7429	13.6175

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
80.5743051300482	48.4078006598501	50.9483365425662	79.533	47.2684	42.1428	8.9398
80.5743051300482	48.4078006598501	50.9483365425662	80.0004	48.0282	43.1849	9.8035
80.5743051300482	48.4078006598501	50.9493365425661	90.0385	42.8005	44.3862	21.625
80.5743051300482	48.4078006598501	52.6569663030676	90.1236	40.724	54.2833	15.0486
80.5743051300483	48.4078006598501	52.6579663030676	92.4351	33.0022	54.3205	23.0347
80.5743051300482	48.4078006598501	52.6589663030676	91.1842	48.1207	54.4953	17.5671
80.5743051300482	48.4078006598501	52.6589663030676	96.2485	47.1277	52.4491	17.9146
80.5743051300482	48.4078006598501	52.659966303062	99.0651	51.1078	59.3413	22.694
80.5743051300482	48.4078006598501	52.659966303062	95.1558	61.2395	57.4763	27.409
80.5743051300482	48.40780065985	52.6609663030676	98.0763	43.3554	53.563	27.4576
80.5743051300482	48.40780065985	52.6609663030676	101.161	45.7653	49.9947	23.4902
80.5743051300482	48.4078006598501	52.6619663030676	99.5817	52.1789	51.8005	22.5087
80.5743051300483	48.4078006598501	52.6629663030539	95.0304	53.2116	46.2852	22.3786
80.5743051300483	48.40780065985	52.6639663030664	97.9579	54.2407	46.7851	26.2321
80.5743051300482	48.40780065985	54.9827817745552	93.9444	64.9	44.2206	23.8239
80.5743051300482	48.40780065985	54.9827817745552	96.4356	62.0951	55.4366	20.9554
79.8478168650192	48.40780065985	54.9827817745552	103.9916	60.6173	50.4601	27.4308
79.8468168649881	48.40780065985	54.9827817745552	86.2321	62.729	51.1705	16.3953
79.8468168649881	48.40780065985	54.9827817745552	85.8477	60.7859	54.7762	18.5843
79.8458168650237	48.4078006598501	54.9827817745552	77.9705	58.8491	56.0075	15.3336
79.8448168650237	48.40780065985	54.9827817745552	77.8264	55.5164	53.7679	14.0686
79.8438168650237	48.40780065985	54.9827817745552	76.4125	46.981	46.4216	12.1404
78.2967059327962	48.40780065985	54.9827817745552	74.8417	48.5823	43.578	11.9548
78.2967059327962	48.40780065985	54.9827817745552	78.2967	50.1808	43.2865	11.8299
77.8317036871174	48.40780065985	54.9827817745552	72.0304	52.5053	58.0692	20.8079
69.9381686482551	48.40780065985	54.9827817745552	69.2681	55.3133	57.276	27.1365
69.9381686482551	48.40780065985	54.9837817745552	74.4488	50.3129	52.3971	5.5377
69.9381686482551	48.40780065985	54.9837817745552	73.2401	49.0047	54.3428	19.489
69.9381686482551	48.3754628464919	54.9837817745552	66.2863	51.2705	54.2569	7.8797
69.9381686482551	48.3754628464919	54.9837817745552	72.0955	52.6394	50.8408	7.0709
69.9381686482551	48.3754628464919	54.9847817745552	69.4154	51.8752	55.6067	4.1739
69.1680959393281	46.5703519562409	54.9847817745552	67.4955	46.0347	52.8305	3.4091
69.1680959393282	46.5703519562409	56.1356942185873	65.7303	47.3671	58.4265	12.9967
69.1680959393282	46.5703519562409	56.1356942185873	73.3859	52.8201	55.9097	15.2561
62.2592321707865	36.1020000017539	56.1356942185882	62.0243	36.102	59.234	3.1072
62.2592321707866	33.8584587921258	54.0663746525451	58.9981	26.6128	49.6223	10.0374
62.2592321707866	33.8584587921258	54.0663746525451	60.8351	33.4935	47.8851	6.3537
62.2592321707866	33.8584587921258	54.0663746525451	60.137	35.2014	51.7925	3.3879
62.2592321707866	33.8584587921258	54.0663746525451	67.8857	28.9512	53.8343	7.9175
62.2592321707865	23.5485388775152	54.0663746525455	63.3795	20.1125	53.5518	3.6505
62.2592321707865	23.837336622327	59.3665364744479	54.7376	29.7596	56.3053	17.0277
62.2592321707865	23.837336622327	59.3665364744479	70.5469	25.0661	53.9959	16.1699
54.2785994605809	23.837336622327	59.366536474448	54.2786	24.4277	59.9569	0.8349
49.2760429426914	23.837336622327	59.3665364744479	50.1386	26.6573	56.0437	9.4164
49.2760429426914	23.837336622327	59.3665364744479	56.8778	27.618	56.4108	8.9898
47.8654165457917	23.837336622327	59.366536474448	52.0827	15.9727	59.9151	11.4211
47.8644165457918	23.837336622327	59.3665364744479	47.4152	28.2569	57.2588	4.917
47.8644165457918	23.837336622327	56.4657904563423	47.4903	33.2139	54.5514	11.8665
47.8644165457918	23.837336622327	53.5000621001633	47.3356	31.1656	48.6863	22.3253
47.8644165457918	23.837336622327	53.4990621001633	50.8742	24.2729	53.2264	23.767
47.2385086392794	23.837336622327	48.1082118693135	48.493	25.186	47.2334	2.0582
47.2385086392794	17.4299088155632	48.1082118693135	39.7266	17.3977	50.5452	17.8866
47.2385086392794	16.4655575127935	48.1082118693135	23.1689	25.59	48.8728	25.7524
47.2385086392794	16.1736120023896	45.031311652551	47.2642	16.1804	48.1934	3.1622
47.2385086392794	15.3990550548289	43.57142516342	24.5208	1.7631	30.0851	29.7307
47.2385086392794	15.3990550548289	43.57142516342	48.2378	10.888	40.0435	5.8133
47.2385086392794	15.3990550548289	43.57142516342	46.213	15.3079	43.6977	3.873
47.2385086392794	15.3990550548289	43.57142516342	59.5552	26.5288	41.5263	17.0515
47.2385086392794	15.3990550548289	43.57142516342	65.4552	32.6167	36.7679	29.012
47.2385086392794	15.3990550548289	43.57142516342	51.7623	34.8081	42.2217	20.8873
47.2385086392794	15.3990550548289	43.57142516342	47.6091	10.2274	48.878	11.8474
47.2385086392794	15.3990550548289	43.57142516342	46.003	37.4534	46.4333	29.0578
47.2385086392794	15.3990550548289	43.57142516342	46.8369	6.4403	54.1626	14.1993
47.2385086392794	15.3990550548289	43.57142516342	55.1607	27.7715	51.8295	18.2237
47.2385086392794	15.3990550548289	43.57142516342	53.7123	16.59	54.3027	19.1512
47.2385086392794	15.3990550548289	43.57142516342	61.1452	36.2851	50.8184	29.605
47.2385086392794	15.3990550548289	43.57142516342	45.9074	18.6439	58.1761	15.0199
47.2385086392794	15.3990550548289	43.57142516342	55.089	27.0379	56.5554	20.8338
47.2385086392794	15.3990550548289	43.57142516342	49.309	3.6922	59.7251	20.878
47.2385086392794	15.3990550548289	39.8787508353152	22.5923	19.795	49.1879	27.7634
51.8016672894451	18.9972344731251	39.8787508353152	58.5931	27.1316	32.5338	12.8934
51.8016672894451	18.9972344731251	39.8787508353152	47.5448	13.9665	39.1563	6.8471
51.8016672894451	18.9972344731251	39.8787508353152	47.9812	30.2306	39.2099	11.8841
51.8016672894451	18.9972344731251	39.8787508353152	53.965	12.2967	46.7771	9.8572
52.1363210930735	17.5142038812567	36.0718384523955	51.539	18.7116	33.0294	3.3237
52.1363210930735	17.5142038812567	33.7507035122437	52.4859	17.4578	33.7507	0.3541
41.8756700758781	17.5142038812567	32.9211627814594	17.3215	22.815	38.4524	26.1071
41.8756700758781	17.5142038812567	32.9211627814594	21.7951	21.835	45.5134	24.0928
41.8756700758781	17.5142038812568	28.6720011062327	23.1615	20.5337	28.672	18.9562
41.8756700758781	17.5142038812568	28.6720011062327	20.7311	19.0512	39.2565	27.1888

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
41.8756700758781	12.3265797658805	27.1651552621668	28.6989	1.5656	37.4478	19.8786
41.8756700758781	12.0411870090445	26.1884989031782	31.9656	14.6164	16.7619	14.4873
41.8756700758781	12.0411870090445	26.1884989031782	48.0446	14.6778	22.9405	8.8581
41.8756700758781	12.0411870090445	26.1884989031782	44.3034	16.6265	25.3299	9.4533
41.8756700758781	12.0411870090445	26.1884989031782	45.0418	3.8658	25.2247	10.1722
41.8756700758781	12.0411870090445	26.1884989031782	40.2335	17.1357	30.0024	11.2782
41.8756700758781	12.0411870090445	26.1884989031782	33.6792	4.7017	30.2163	13.2435
41.8756700758781	12.0411870090445	26.1884989031782	44.7075	13.3055	33.9605	12.6011
41.8756700758781	12.0411870090445	26.1884989031782	43.7175	13.3612	37.2361	11.2776
44.5688999894424	12.0411870090445	26.1884989031782	46.6598	16.011	21.0885	13.039
44.5688999894424	10.3447000000077	12.1988000052422	44.5689	9.75	12.1988	0.5947
44.5688999894424	11.9659	12.1988000052422	43.984	9.2005	15.6271	7.1984
Route: 5 Length: 336.862337485537 Demand Met: 9880						
50.7283853898558	21.0963999870124	17.5324207992336	49.9971	19.9155	18.5508	3.9588
50.7283853898558	21.0973999870124	17.5324207992337	53.2794	21.4994	19.0176	2.9791
51.6735189554604	21.0973999870124	23.91690922931	51.6732	17.1776	23.9169	3.9198
56.2159441728563	22.5959013103719	26.5485200667647	55.9782	19.9329	26.5423	2.6736
60.5813824252597	22.5959013103725	26.5485200668097	67.5765	27.7962	32.158	15.1317
60.5813824252597	26.1709032375672	26.5485200668093	63.132	27.7543	33.1939	11.7407
60.5813824252597	26.1719032375672	26.5485200668088	69.5886	28.6002	31.4169	10.8714
60.5813824252597	26.171903237561	40.7298	61.643	23.6955	42.1255	3.0344
68.367600020356	27.3310000021013	40.7298	68.3676	27.331	45.292	4.5622
68.6641480978296	27.3310000021013	40.7298	65.211	38.9167	43.4098	22.6036
68.6651480978296	27.3310000021013	40.7297999999986	64.8516	39.5774	48.8657	16.3435
68.6651480978296	43.4091674997686	40.7297999999986	72.7013	43.6681	47.6828	23.6645
68.6651480978296	43.4101674997686	40.7297999999986	70.5497	45.0925	44.08	13.3393
68.6651480978296	43.415167499768	40.7297999999986	64.4232	44.0581	27.3148	28.7966
68.6651480978296	43.415167499768	40.7297999999986	65.3289	43.5846	33.8262	21.6754
68.6651480978296	43.4161674997681	40.7297999999986	67.6648	48.1141	30.5928	12.6345
68.6651480978296	43.4161674997681	40.7297999999986	70.8564	51.5507	32.2844	19.1375
68.6661480978296	43.4161674997681	40.7297999999986	63.5739	32.9982	33.2424	17.0906
68.6661480978296	43.4161674997681	40.7297999999986	63.8645	34.3723	36.4179	14.5693
68.6671480978301	43.4161674997681	40.7297999999987	70.4096	46.4113	26.9931	21.9243
68.6681480978295	43.4161674997681	40.7297999999987	73.8072	55.2741	29.1095	22.0263
68.6681480978295	43.4161674997681	40.7297999999987	81.1686	57.7423	31.0101	24.938
68.6691480978295	43.4161674997681	40.7297999999987	67.4683	58.2291	37.5546	22.4924
68.6691480978295	43.4161674997681	40.7297999999987	69.8977	54.8286	42.1718	26.5823
68.6691480978296	43.418167499768	40.7297999999986	72.0385	47.603	37.589	19.8624
68.6691480978296	43.418167499768	40.7297999999986	69.1689	51.2673	37.9561	13.4858
68.6701480978296	43.4181674997681	40.7297999999987	69.1565	53.343	39.551	16.8114
72.9762672437124	43.4181674997681	40.7297999999986	72.4926	42.7909	40.5929	23.9047
72.9772672437124	43.4181674997681	40.7297999999986	72.9378	43.4347	40.5471	22.409
78.4623572024088	43.5732887602367	40.7297999999986	81.9079	40.1742	36.8216	6.2209
78.4623572024088	47.1754966807855	40.7297999999987	72.4429	44.8985	35.9587	21.9495
78.4623572024088	47.1764966807855	40.7297999999987	75.9853	41.4015	43.6031	28.8962
78.4633572024089	47.1764966807853	40.7297999999987	77.4079	49.147	51.5989	24.2468
78.4643572024071	47.176496680787	39.6637072167301	90.014	39.915	40.6629	25.9424
78.4643572024071	47.176496680787	39.6637072167301	93.2846	41.9379	42.3812	28.0563
78.4653572024072	47.176496680787	39.6637072167301	87.2346	40.5435	32.6709	24.2659
85.9154002812464	50.4839745932791	39.6637072167301	85.9154	51.5363	38.6114	1.4882
89.3520000815966	47.8671999999822	40.3098949510076	89.352	47.1855	40.3099	0.6817
90.1582361181912	47.8671999999821	40.3098949510076	90.4865	46.0315	39.3528	3.9724
90.1592361181912	47.8671999999821	40.3098949510076	94.4684	44.7163	40.2539	7.0613
96.442386892211	47.8671999999821	40.3098949510076	97.5519	44.8528	38.2336	3.8542
96.4423868922111	47.86719999999	40.4985693218646	98.9198	48.0008	44.9228	5.0724
97.3226317997175	50.8138998098187	40.4985693218646	98.1036	50.8139	41.2796	1.1045
97.3226317997175	51.8299593499747	40.4985693218646	97.7455	51.8526	39.6885	5.024
97.3226317997175	51.8299593499747	38.9089211258985	94.3452	48.7818	37.6589	4.4406
92.1064303747867	53.7326706004734	32.5963765629427	97.3108	57.82	10.7791	22.7988
92.1064303747867	53.7326706004734	32.5963765629427	90.3356	51.1932	37.7625	6.8103
92.1064303747867	53.7326706004734	32.5963765629427	94.5987	62.0376	18.5629	22.0196
92.1064303747867	53.7326706004734	32.5963765629427	94.4551	58.0456	35.6169	10.0481
92.1064303747867	53.7326706004734	32.5963765629427	92.9131	56.6287	40.2251	15.0729
92.1064303747867	53.7326706004734	32.5963765629427	89.2688	56.3248	44.4917	12.5008
92.1064303747867	53.7326706004734	32.5963765629427	95.479	61.1306	33.7151	12.7416
92.1064303747867	53.7326706004734	32.5963765629427	95.4289	57.3916	42.7453	14.9929
92.1064303747867	53.7326706004734	32.5963765629427	100.5945	52.9653	41.549	16.0066
92.1064303747867	53.7326706004734	32.5963765629427	98.4228	65.0226	33.0945	19.713
92.1064303747867	53.7326706004734	32.5963765629427	99.3413	60.508	43.9191	18.4113
92.1064303747867	53.7326706004734	32.5953765629429	88.4465	41.4478	32.5802	21.203
92.1064303747867	53.7326706004734	32.5943765629428	89.3464	46.1786	22.3858	28.4968
92.1054303747867	53.7326706004734	32.5943765629429	94.6877	57.1733	21.1304	13.9646
92.1054303747867	53.7326706004734	24.9531213294979	95.46	44.379	21.4845	10.525
92.1054303747867	53.7326706004734	24.9531213294979	96.0562	52.3857	26.7058	12.0834
92.1044303747867	53.7326706004734	24.9531213294979	92.8209	56.9207	15.4027	12.3836
90.0805166675507	53.7326706004734	21.008489085719	89.6611	52.1615	6.6683	14.4321
90.0805166675506	53.7336706004734	21.0084890857189	92.412	50.9961	13.3675	8.4715
90.0805166675506	68.1149901211986	21.5894518053437	92.288	83.6157	17.9977	16.0638
90.0805166675506	68.9189446742736	22.1303958408602	93.4941	85.8189	27.3685	18.0194
90.0795166675505	68.9189446742736	22.1303958408602	97.1852	78.7831	16.5303	16.1734

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
90.0785166675506	68.9189446742736	22.1303958408602	93.9524	73.145	3.1932	21.3513
88.0686711820119	68.9189446742736	22.1303958408602	88.0687	81.4777	36.1559	18.8265
88.0686711820119	68.9179446742736	22.1303958408602	94.4072	76.9857	34.4342	17.5737
88.0686711820119	62.5510147669277	22.1303958408602	88.7937	67.447	23.6857	7.6628
88.0686711820118	62.5500147669271	22.1303958408602	87.1149	58.1702	24.9275	8.6573
70.6394190469807	58.5671059927746	21.2120122793586	70.1344	58.5671	20.707	0.7142
74.2015859994998	58.5671059927746	21.6839016877255	66.0257	55.1875	22.0287	16.5761
74.2015859994998	58.1738225035169	21.6839016877255	70.694	53.8562	23.1583	5.7549
74.2015859994998	55.9078734698971	21.6839016877255	67.8488	53.6384	2.957	21.5605
74.2015859994998	55.9078734698971	21.6839016877255	73.911	51.0144	2.5794	19.7234
74.2015859994998	55.9078734698971	21.6839016877255	71.8965	50.0142	14.8598	19.3441
74.2015859994998	55.9078734698971	21.6839016877255	61.2083	54.3519	23.523	20.9342
74.2015859994998	55.9078734698971	21.6839016877255	67.5609	49.631	28.0783	13.5732
74.2015859994998	55.9078734698971	21.6839016877255	70.5527	57.3223	8.5137	18.2025
74.2015859994998	55.9078734698971	21.6839016877255	69.9782	57.1009	12.9468	18.2604
74.2015859994998	55.9078734698971	21.6839016877255	82.0477	53.0979	5.7932	18.2605
74.2015859994998	55.9078734698971	21.6839016877255	87.8413	47.1867	25.6907	18.3729
74.2015859994998	55.9078734698971	21.6839016877255	73.2116	57.797	29.252	20.4365
74.2015859994998	55.9078734698971	21.6839016877255	91.9756	47.4725	20.0446	19.7423
74.2015859994998	55.9078734698971	21.6839016877255	92.749	64.7326	27.0986	21.2415
74.2015859994997	51.7825928462067	21.6839016877255	80.7698	50.729	27.0276	24.0359
82.5954168403086	51.7825928462067	22.1405386867872	83.5076	51.7826	22.7284	1.0852
81.1621478136962	49.6067700403597	22.1405386867872	80.3964	49.7264	23.6683	1.7131
81.1621478136962	48.1652899761283	22.1405386867872	75.5201	48.6107	22.753	10.8007
81.1621478136962	48.1652899761283	22.1405386867872	71.2619	53.5794	21.4252	11.3066
81.1611478136962	48.1652899761283	22.1405386867872	76.379	48.6237	27.9163	7.5959
81.1601478136963	48.1652899761282	22.1405386867872	75.5587	49.1352	25.3998	7.8556
77.6585348277603	45.3862753855837	22.1405386867872	74.5598	39.2546	26.0148	7.8873
77.6585348277602	45.3862753855837	22.1395386867872	87.5583	39.2312	23.679	14.1099
77.6585348277602	45.3862753855837	22.1395386867872	87.5129	47.9594	27.6836	13.3149
77.6585348277603	45.3862753855837	10.8367043581263	89.1249	38.0318	13.3915	15.9201
77.6585348277603	45.3862753855837	10.8367043581263	89.3668	41.343	14.5671	15.2017
77.6585348277603	45.3862753855837	10.8357043581263	84.6532	51.7406	11.3965	13.6619
77.6585348277603	45.3862753855837	10.8347043581263	80.8872	43.1227	9.5119	14.1296
77.6585348277603	45.3862753855816	10.8337043581263	77.8794	45.0468	10.8339	0.405
77.6585348277603	45.3872753855837	10.8337043581263	73.2283	44.0709	14.6285	10.2788
77.6585348277603	48.4826000000217	10.8337043581263	75.4748	37.8532	8.3059	28.9661
76.2243939607382	48.4826000000217	6.71042557976039	76.2244	51.9684	6.7104	3.4858
68.9678405788398	47.8740051877353	3.96677844052579	75.2757	50.6388	0.889	7.5436
68.9678405788399	47.8730051877353	3.96677844052579	73.5268	49.2611	4.4383	16.8647
68.9678405788399	47.8730051877353	3.96677844052579	77.6289	48.4559	5.3003	16.6228
68.9678405788399	47.1072999206631	3.96677844052579	71.0505	50.768	8.8572	14.6692
68.9678405788399	47.1072999206631	3.96677844052579	72.0723	49.2863	13.9841	10.8405
68.9678405788398	47.1062999206631	3.96677844052579	71.8327	48.0379	13.6369	28.84
68.9678405788399	47.1062999206631	2.1681466786395	68.7356	47.889	4.3235	2.3048
67.9997275448179	35.8270633227444	1.32237361105178	68.0366	38.8903	2.9918	3.4888
58.1390300480276	35.5161711647113	1.32237361105178	58.126	35.24	1.1949	0.3044
Route: 6 Length: 570.155640101603 Demand Met: 9946						
76.1376450792536	42.8894355498396	0	75.73	42.7229	0.0066	0.4404
77.9144967027002	78.1386861884729	2.21139628080279	86.3374	85.7586	1.5055	11.3801
90.7505123600734	78.1386861884729	2.21139628080278	89.835	77.746	1.5427	1.1998
91.1791000000065	78.1386861884729	2.21139628080279	93.2494	81.8793	2.8544	4.3234
91.1791000000064	79.7086993427916	2.21139628080279	91.86	79.7087	2.2114	0.6809
91.1790999999881	82.365840896958	2.21139628080279	91.1291	78.4897	13.7054	23.993
91.1440150228015	82.365840896958	6.610353868532	94.6798	69.1984	4.5089	14.7127
91.1440150228015	82.365840896958	6.610353868532	98.5933	78.8152	8.2256	8.4088
91.1440150228015	82.3658408969582	6.61135386853304	100.0565	80.1054	0.0522	29.4827
91.1440150228015	82.365840896958	9.98175310882563	101.1477	85.2681	2.6541	21.9848
91.1440150228015	82.365840896958	9.98275310882564	88.3633	87.3681	2.2205	27.6489
91.1440150228015	82.365840896958	9.98375310882564	88.6759	82.3658	11.13	2.7213
91.1440150228015	83.0816784363656	9.98375310882564	91.14	83.5499	11.0268	11.1932
91.1450150228015	83.0816784363656	9.98375310882563	103.8313	82.5056	7.2236	18.7916
91.1460150228015	83.0816784363656	9.98375310882564	108.1531	76.0691	2.761	21.0274
91.1460150228015	83.0826784363657	9.98375310882564	98.2007	80.5294	17.4055	24.0186
91.1470150228015	83.0826784363657	9.98375310882564	97.8831	81.9659	16.6355	26.0286
91.1480150228015	83.0826784363656	9.98375310882564	93.0994	86.3608	2.8092	27.9466
95.7143446647676	83.0826784363657	9.98375310882564	102.0461	86.7072	16.2393	14.3206
95.7153446647677	83.0826784363656	9.98375310882564	96.9541	82.6989	20.5312	14.592
95.7163446647676	83.0826784363656	9.98375310882564	96.8706	83.0827	11.4782	1.8883
95.7163446647676	87.1457833272796	9.98375310882564	98.9119	80.0767	11.0692	14.6996
95.7163446647676	87.1467833272796	9.98375310882564	97.3132	81.5365	12.7479	6.4549
95.7163446647676	87.1477833272189	9.98375310882563	102.2936	85.0217	15.0829	21.6835
95.7163446647676	87.148783327219	9.98375310882562	103.6911	80.62	5.0557	12.7759
95.7163446647676	87.1497833272189	9.98375310882563	93.9684	87.8762	13.7783	12.1102
95.7163446647676	87.1507833272189	9.98375310882563	99.0152	86.155	1.7016	11.2918
95.7163446647676	87.1507833272189	9.98375310882563	100.8882	91.1406	6.6906	9.708
95.7163446647676	87.1517833272189	9.98375310882564	95.504	96.351	10.2996	27.717
95.7163446647676	87.1527833272189	9.98375310882564	95.7576	96.9635	11.4638	15.3189
95.7163446647676	87.1537833272189	9.98375310882564	95.2026	90.5293	12.2607	13.6073
95.7163446647676	95.6841413773632	9.98375310882565	92.4623	94.734	14.7003	13.3072

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
95.7163446647676	95.6851413773633	9.98375310882564	95.0373	98.5247	13.5608	4.6173
95.7163446647676	95.6851413773633	9.98275310882564	104.1034	98.3317	9.2012	13.8815
95.7173446647676	95.6851413773632	9.98275310882564	99.3782	93.0601	2.9898	23.8531
99.2811703881487	95.6851413773632	9.98275310882564	102.0076	93.075	9.5996	14.2567
99.2811703881486	95.6851413773633	4.63069655502605	105.6506	92.4297	8.9472	20.7058
102.275103083992	95.6851413773632	4.63069655502604	104.1728	96.9352	2.733	2.9606
102.275103083992	95.6851413773632	11.9270462584902	107.2392	85.9448	2.4326	25.7344
102.275103083992	95.6851413773632	11.9280462584902	101.8123	94.891	12.8509	1.3025
102.275103083992	95.6851413773632	11.9290462584902	102.4507	89.6037	15.6617	13.3753
102.275103083992	95.6851413773633	18.1389185277702	101.583	94.8217	23.7006	5.6707
102.275103083992	90.271356604068	18.9648082469641	104.3693	90.8389	25.0156	29.9766
98.1137996489088	90.271356604068	18.9648082469642	98.1138	89.594	19.2781	0.7463
95.0201320101955	90.271356604068	18.9648082469642	92.7178	89.1801	18.823	2.5518
96.0826040589165	90.271356604068	18.9648082469642	88.6062	92.2681	23.9863	22.8388
96.0826040589165	90.271356604068	18.9648082469642	100.7126	88.5952	23.1233	21.6123
96.0826040589165	90.271356604068	18.9658082469642	93.1284	88.6615	20.1351	29.2956
96.0826040589165	90.271356604068	18.9668082469861	92.5654	91.5305	24.0262	28.4592
96.0826040589165	90.271356604068	28.1681945029883	101.2985	78.2917	28.1682	13.0659
96.0826040589165	92.3578273777495	32.370212801088	96.2545	87.1498	32.8659	21.7369
96.0826040589165	92.3578273777495	32.370212801088	99.3434	90.9979	30.2293	16.5588
96.0826040589165	92.3588273777494	32.3702128010879	103.1106	83.2736	35.5168	15.1682
96.0826040589165	92.3588273777496	32.3712128010879	95.6122	103.8055	23.229	14.657
96.0826040589165	92.3598273777494	32.3712128010879	98.853	91.6792	31.3431	14.5242
96.0826040589165	92.3608273777495	32.3712128010879	100.5649	91.4192	35.2273	20.5542
96.0826040589164	92.3608273777494	32.372212801088	101.602	92.3175	35.5214	24.3611
96.0826040589164	92.3608273777495	32.3732128010057	89.95	80.2132	31.6802	25.9539
96.0826040589164	92.3608273777495	32.3732128010057	89.5631	83.3752	32.5568	25.9016
96.0826040589165	92.3608273777495	32.3742128010057	97.7943	87.7833	36.2243	29.1465
96.0826040589164	92.3608273777495	38.6118103554377	98.8373	99.4165	35.0062	17.0801
96.0826040589165	96.770633648099	38.6118103554377	94.4828	106.1237	38.6118	9.4889
97.0346935698525	96.770633648099	44.3342859157796	96.8345	90.0197	42.1774	11.1201
97.0346935698526	92.4559000000598	44.3342859157796	97.0347	92.0258	44.3343	0.4301
97.0346935698525	92.774965882825	45.7820586721248	96.5235	92.1962	47.4754	1.8611
97.0346935698525	92.774965882825	47.3875453781765	98.9319	91.3958	49.6094	11.9055
97.0346935698525	92.7749658828251	47.3885453781765	100.6204	94.7646	50.8195	15.4911
97.0346935698525	92.774965882825	53.5770979017459	92.1151	81.2598	42.8198	24.5532
102.976537726928	92.774965882825	53.5770979017563	98.2349	98.4363	43.0129	21.6189
102.976537726927	97.3352872090956	53.5770979017563	103.8628	98.4843	53.5771	1.4511
102.976537726927	94.1816992250163	56.2993308210134	103.2876	94.1817	57.6589	1.3947
102.976537726927	94.0194598959163	56.2993308210134	104.5599	87.8351	55.8078	14.6615
102.975537726927	94.0194598959163	56.2993308210134	101.0606	82.9382	56.7378	16.7992
96.3973025444161	94.0194598959162	56.2993308210135	99.1261	78.6323	53.6332	23.8719
96.396302544416	94.0194598959162	56.2993308210134	98.567	80.2017	48.301	23.8946
96.3953025444186	94.0194598959163	56.2993308210134	98.656	92.6213	53.0887	22.9191
96.3943025444187	94.0194598959162	56.2993308210133	94.0924	96.5838	56.3482	3.4463
96.3943025444187	88.9861450271613	52.7258288849545	94.9909	83.4209	53.4521	6.6825
96.3943025444187	88.9861450271612	52.7248288849544	97.4314	81.946	52.8698	7.1176
96.3943025444187	88.9861450271612	52.7238288849544	96.1169	76.0362	57.1147	25.7488
96.3943025444187	88.9861450271612	52.7228288849544	98.3726	88.4744	52.1576	13.4661
96.3943025444187	78.1419821533686	52.7228288849544	96.9343	84.943	57.6208	15.8069
96.3943025444187	78.1409821533687	52.7228288849544	96.2521	73.5638	59.9232	18.6663
96.3943025444187	78.1399821533686	52.7228288849544	97.5653	74.5618	43.9951	26.0912
96.3943025444187	78.1399821533686	44.7104430256056	94.6945	78.572	44.5388	1.7622
96.3943025444187	78.1399821533686	44.7094430256057	95.9325	86.7596	55.1395	20.5114
96.3943025444186	78.1399821533687	44.7084430256065	91.1677	84.1211	45.979	16.3324
96.3943025444186	78.1399821533686	44.7074430256057	92.6699	80.64	42.9825	12.8577
96.3943025444186	78.1399821533687	44.7064430256057	97.7624	79.6432	41.8331	23.8114
96.3943025444186	78.1389821533687	44.7064430256057	97.816	74.8015	47.4482	15.0437
96.3943025444186	78.1389821533687	40.5520999995321	94.0795	80.8773	41.7611	27.9293
93.1133061049751	78.1389821533687	40.5520999995321	93.1133	78.1389	33.5399	7.0122
92.8475313958381	75.8870000336762	40.5520999995321	91.0116	75.887	40.3125	1.8515
95.4924091957843	73.9369473195841	40.8821077491857	94.549	73.3405	36.7472	4.2829
95.4924091957842	73.9369473195841	42.3902067503495	97.0865	83.6094	41.2641	9.8674
102.149521491017	68.4174004633216	42.3902067503495	104.3617	84.8664	42.6246	23.8168
102.149521491016	68.4164004633216	42.3902067503496	102.9023	68.4164	43.143	1.0646
102.149521491016	68.4154004633217	42.3902067503495	95.9481	74.251	38.8025	27.2231
99.7408139823487	61.6588999749703	42.3902067503495	95.4724	61.7777	41.2303	4.4248
99.0428998061945	61.6588999749703	39.609100000066	99.0429	61.6589	39.3422	0.2669
99.0418998061945	61.6588999749703	39.609100000066	99.7259	57.0659	38.9488	5.4613
99.0418998061945	61.6588999749706	48.5286989142651	99.4285	63.8276	59.6975	13.2796
99.0418998061945	61.6578999749704	48.528698914265	100.6854	61.817	51.0639	3.0255
99.0418998061946	59.2954553006092	48.5286989142651	94.6788	63.8911	59.4837	17.5158
99.0418998061945	59.2944553006093	48.528698914265	97.9014	66.9835	57.8832	12.1626
95.0571033872836	59.2944553006092	48.5286989142649	90.2672	64.2791	51.3539	29.5547
95.0571033872835	59.2944553006093	56.7109965332491	102.6402	60.9181	59.3218	29.8857
95.0571033872836	59.2934553006093	56.7109965332491	94.6583	60.3511	50.0221	8.4724
95.0571033872836	53.9805998285537	56.7109965332491	92.1982	53.9806	59.5699	4.0431
97.381459943904	53.9805998285539	56.710996533249	94.8477	58.3247	47.7413	10.8435
97.381459943904	40.7741483819991	51.4149775784228	97.7133	51.9341	48.5236	11.5332
97.3814599439041	40.7731483819971	51.4149775784228	105.6501	47.8555	48.2801	11.3295

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
97.3814599439041	38.1740237889402	51.4149775784228	101.7295	28.4449	56.1482	24.6989
97.3814599438388	38.1740237889401	51.4139775784228	100.8862	48.4618	50.2894	10.9264
97.3814599438388	34.9480305697545	51.4139775784227	102.9297	48.0592	51.9744	14.2478
103.862721626612	32.9987999525477	51.4139775784228	104.0844	32.9988	51.1923	0.3135
102.211999786942	31.4267289636154	55.1617207483962	101.1976	33.4905	53.5496	15.926
102.210999786942	31.4267289636154	55.1617207483965	102.211	28.3893	55.4005	3.0468
94.5848070838857	31.4267289636154	55.1617207483964	98.3827	22.3334	54.4737	15.4136
94.5848070838857	33.9572189743944	55.1617207483963	100.5275	34.9543	58.1047	18.18
94.5838070838857	33.9572189743945	55.1617207483963	94.5355	44.3621	59.1041	13.4241
94.5828070838857	33.9572189743968	55.1617207483964	94.5838	45.9916	57.9488	12.3529
89.1387546710123	34.3750802487218	55.1617207483964	99.0428	19.6959	54.528	17.7192
88.4561537977003	34.3750802487218	55.1617207483963	85.065	35.2948	58.2863	4.702
89.1387546710123	34.3750802487218	55.1607207483965	95.1298	37.6897	58.9361	8.2516
89.1387546710123	34.3750802487219	45.1629720334288	96.2582	32.5713	56.693	16.7348
93.6281920685985	34.3750802487218	45.1629720334288	91.0332	34.8187	52.6374	16.4532
93.6281920685985	34.3750802487218	45.1619720334287	96.2085	41.8253	45.162	7.8844
93.6281920685984	34.3750802487219	43.39482876405	91.8795	37.1845	41.8015	3.6728
93.6281920685985	28.1146494911025	42.3016526663947	101.5683	27.6266	39.8262	8.8382
93.6281920685984	28.1146494911025	42.300652666396	98.5859	34.5756	44.3792	9.3554
93.6281920685984	28.1146494911025	41.3974745484894	92.942	26.4511	38.6789	3.2602
104.810742306404	28.1146494911026	42.3016526663948	106.1692	29.0085	43.7624	2.1859
104.810742306404	25.4000001418988	33.0937999573174	104.9423	23.521	33.0938	1.8836
101.489479716645	25.4000001418988	18.9847796745448	102.9016	24.8202	19.8795	1.7694
96.7952466563928	29.37924879069	14.5945001755182	96.0238	29.4057	14.5945	0.7719
97.0031585749658	29.37924879069	11.7516991232977	99.272	31.5703	11.7517	3.1541
89.0396215499129	29.37924879069	7.48687171903735	85.525	32.0217	10.845	5.5598
73.781718374052	28.7020308648278	7.48687171903735	73.7989	28.6287	7.3132	0.1893
69.5175379594887	28.7020308648278	7.48687171903735	68.2062	28.5319	10.0866	2.9167
54.1646987724953	28.7020308648278	7.48687171903735	54.5895	27.7676	11.1642	3.8179
Route: 7 Length: 314.89570956458 Demand Met: 9994						
68.3657736814497	30.6166612944098	0	64.9829	35.6055	23.509	27.8112
68.3657736814492	30.6166612944084	3.35488066022786	67.6588	29.7348	5.9837	2.8615
68.3657736814492	30.6166612944084	4.19499156718992	68.3701	31.308	4.6701	5.8267
72.267514090826	34.3177880698032	4.57056673686669	72.2401	34.2889	7.5435	2.9732
74.4063069398348	34.3177880698033	4.57056673686442	79.7169	32.9378	5.3155	5.5373
77.2083055743262	34.3177880698034	4.57056673686395	73.6428	45.1426	7.6389	25.8084
77.2093055743295	34.3177880698034	4.57056673686725	79.9479	46.2913	1.0177	20.0233
77.2103055743295	34.3177880698034	4.57056673686395	85.1876	33.113	2.1197	12.2337
78.7234589636188	34.3177880698034	4.57056673686395	86.512	33.4131	7.017	8.2137
78.7234589636188	34.3187880698039	4.57056673686725	87.5726	32.8781	1.3636	19.8465
78.7234589636188	35.8394450687993	4.57056673686724	90.6179	26.4649	2.7134	21.9514
91.1654999981745	35.8394450687993	4.87084506885924	91.1655	36.0648	5.0962	0.3187
94.3376285018413	33.680078977007	3.97597946782802	105.0575	26.2706	17.0665	21.5332
96.3917999965273	33.6800789770069	3.9759794678277	95.8598	39.2349	3.852	9.5298
96.3927999965273	33.6800789770069	3.97597946782769	96.3928	32.1668	2.4627	2.1401
96.4576877611708	33.6800789770069	3.97597946782802	93.4265	31.4744	1.0443	21.1215
96.4576877611708	33.6800789770069	3.9769794678282	92.634	40.1716	1.8791	17.8594
96.4576877611708	37.9390754018722	3.9769794678282	96.6284	43.246	1.131	6.0243
96.4576877611709	37.9390754018722	12.7897967099034	97.9141	29.0493	9.3885	23.1555
96.4576877611709	38.776250054841	12.7897967099034	102.9211	31.879	13.8489	24.191
96.4576877611709	38.7762500548409	12.7907967099034	97.0806	39.3994	12.7921	0.8811
96.4576877611709	36.7909632149691	12.7907967099082	97.1071	18.8552	9.2302	18.2973
96.4377027721458	36.7909632149701	16.6429331691362	106.8535	30.7643	14.4546	22.1596
96.4377027721457	36.7909632149691	16.6439331691362	94.1971	38.0204	14.8005	3.1512
96.4377027721458	36.7909632149691	16.6449331691362	92.8093	39.7693	16.6418	4.7222
96.4377027721457	36.7909632149691	20.420445156209	94.3087	39.6383	18.4042	5.7437
96.4377027721459	36.7909632149691	20.421445156209	96.156	30.1327	19.1399	15.6026
96.4377027721459	36.7909632149691	20.422445156209	103.4615	37.3033	20.8908	18.992
96.4377027721459	36.7909632149691	20.422445156209	101.377	48.1816	18.5975	20.458
95.8228843656724	36.7909632149692	20.422445156209	98.3613	42.0392	20.5386	22.2209
95.8228843656724	36.7909632149691	20.423445156209	99.6903	41.4772	23.4888	20.1453
95.8228843656724	36.7909632149691	20.424445156209	93.6083	38.4774	26.0941	16.8124
95.8228843656724	36.7909632149691	23.3371000133264	91.9372	36.8319	23.3371	3.8859
95.8228843656724	36.7909632149691	23.3381000133248	90.72	30.049	19.1921	25.9851
95.8238843656724	36.7909632149691	23.3381000133249	96.2133	40.5576	25.5914	17.1844
95.8248843656725	36.7909632149691	23.3381000133249	93.9129	43.6355	26.629	15.3805
95.8248843656725	36.7909632149691	23.3391000133249	93.6941	39.0671	28.969	9.1173
97.4538322264501	36.7909632149691	23.6777890634009	98.7317	39.6579	27.3708	13.6077
97.4538322264502	32.1529999999827	23.6777890634009	102.4997	24.4075	19.7902	22.2451
97.4538322264502	32.1519999999827	23.6777890634009	97.0499	25.7334	20.6225	22.9168
97.4548322264503	32.1519999999827	23.6777890634009	92.5592	25.4331	20.672	8.84
97.4558322264505	32.1519999999827	23.677789063401	90.6435	28.0536	25.8632	9.6928
97.4558322264504	32.1509999999827	23.677789063401	98.9301	33.2654	27.8083	6.2044
97.4558322264504	32.1499999999827	23.677789063401	99.0228	31.9463	24.4512	24.3368
97.4558322264506	32.1499999999827	23.6787890634009	97.4429	30.1528	28.42	27.9419
97.4568322264507	32.1499999999827	23.6787890634009	93.6487	25.1273	31.9089	25.1293
97.4568322264508	32.1499999999827	29.5869856700137	93.9312	28.9768	31.8553	14.5805
97.5011014262468	32.1499999999827	29.5869856700137	97.5011	28.0267	29.587	4.1233
97.5021014262468	32.1499999999827	29.5869856700137	97.3283	27.0933	33.194	16.7318
97.5031014262468	32.1499999999827	29.5869856700137	98.5493	33.1624	37.7737	15.8362

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
97.5031014262468	32.1509999999827	29.5869856700137	97.1838	29.5842	37.1942	15.6415
99.9975920379559	32.1509999999827	29.5869856700137	100.384	25.6874	43.9589	21.4485
99.9975920379565	32.1519999999827	29.5869856700137	95.0864	33.2234	41.4865	27.2565
99.9975920379595	32.1519999999827	30.841899999968	96.5473	37.5774	41.1201	13.5522
99.9985920379597	32.1519999999827	30.8418999999681	98.3241	22.4412	26.657	19.863
99.9995920379597	32.1519999999827	30.8418999999681	100.6297	27.3107	24.1251	20.9684
100.00059203796	32.1519999999827	30.8418999999681	105.6149	29.5786	27.9356	12.2754
100.001592037959	32.1519999999827	30.841899999968	105.5782	30.6326	47.1426	17.6401
104.864499999998	34.8419000075212	30.841899999968	108.656	34.8419	30.8419	3.7915
100.376576049559	40.8370444773109	30.841899999968	103.3956	43.6231	38.3961	9.5596
100.375576049559	40.8370444773109	30.8418999999681	106.6895	31.0233	49.137	23.9388
100.375576049559	40.8380444773109	30.841899999968	95.8908	32.6754	36.0409	17.855
100.375576049559	40.8380444773109	30.8448348348579	92.7124	33.4453	33.5856	14.4155
100.375576049559	40.8390444773108	30.8448348348578	96.6051	36.0943	31.9245	18.2734
100.375576049559	40.8400444773109	30.8448348348578	107.8221	37.3636	42.4217	23.6325
100.375576049559	40.8410444773109	30.8448348348578	98.4033	39.6451	29.8224	2.523
100.375576049559	44.8572002215452	30.8448348348579	97.0063	39.6578	31.3742	6.2182
100.375576049559	45.6885004922967	30.8448348348578	96.8865	41.9997	31.9305	5.9999
100.375576049559	45.6885004922967	30.8458348348579	92.2396	41.0703	39.2658	23.428
100.375576049559	45.6895004922967	30.8458348348579	103.8959	45.4099	37.4639	16.5891
100.375576049559	45.6895004922967	32.7875985881907	95.1396	47.3596	38.3213	26.132
100.375576049559	45.6905004922967	32.7875985881907	99.7789	45.6905	34.3678	1.6891
100.375576049559	47.9492470985969	29.2585001507073	103.0838	43.6629	35.7673	28.7382
100.375576049559	47.9502470985969	29.2585001507074	100.0845	45.3198	38.3951	20.4175
100.375576049559	47.9512470985969	29.2585001507074	93.3932	53.1876	39.0419	28.8804
100.375576049559	47.9522470985969	29.2585001507073	99.9754	58.6633	29.714	10.7282
100.375576049559	49.0464467201042	29.2585001507074	101.7941	49.0832	29.2585	1.419
100.375576049559	49.0464467201042	22.0951140328913	100.6036	46.802	22.0951	2.256
98.9802143466185	49.0464467201042	22.0951140328913	101.778	67.1686	27.7348	23.9527
98.9802143466185	52.0100767473128	22.0951140328913	106.6231	51.946	40.2003	20.5204
98.9802143466185	52.0100767473129	17.9462356459137	93.3823	48.5086	44.2946	29.5211
98.9792143466184	52.0100767473128	17.9462356459137	95.0864	47.4256	26.3676	15.4813
98.9782143466207	52.0100767473129	17.9462356459135	102.1595	55.9791	16.6639	15.0641
98.9772143466207	52.0100767473129	17.9462356459134	93.0102	50.1223	20.798	27.268
97.7180759283784	55.3685427112263	17.9462356459135	98.7715	55.3698	27.9452	10.7015
97.7180759283785	55.3695427112263	17.9462356459135	92.0851	66.8651	17.5763	14.1856
97.7180759283786	55.3705427112265	17.9462356459135	102.8738	56.4102	20.1678	11.5644
97.7180759283785	55.9299828968692	15.7084999986388	107.981	80.0957	12.6444	26.4329
97.7180759283785	58.017889416923	15.7084999986388	93.5538	62.1822	15.7085	5.8892
97.7180759283788	55.9824923490806	15.7084999986387	103.5291	67.906	8.9335	21.3267
97.7180759283787	55.9814923490818	15.7084999986388	98.2345	80.86	27.262	27.4352
98.0271630913394	55.2425426372091	9.69914384007549	93.0933	68.7697	14.1811	21.8016
98.0271630913397	55.2425426372105	9.69814384007168	98.4258	65.8894	6.8362	20.8311
98.0271630913424	55.2415426372091	9.69814384007168	98.9521	56.5952	10.596	9.6017
98.0281630913389	55.2415426372091	9.69814384007169	98.2152	53.7701	7.2972	29.4627
98.028163091338	55.2405426372091	9.69814384007169	95.9041	59.3009	4.8034	16.7412
98.0281630913386	55.2395426372111	9.69814384007169	98.8606	57.9963	4.7298	15.8873
98.0281630913388	55.2385426372111	9.69814384007169	93.2379	56.4517	4.9219	7.5848
100.343899995767	52.248599999781	7.2828000000009	100.3439	52.2486	6.1962	1.0866
100.343899995767	50.4031066353816	7.2828000000009	98.2004	50.3921	3.9008	18.7026
100.343899995767	50.4031066353813	9.50797878479941	100.6388	53.8259	6.8403	11.1764
100.343899995767	50.4031066353813	9.50897878479941	103.8062	50.1176	9.3383	16.2282
100.343899995767	50.4031066353812	9.50997878480669	96.8097	54.0588	2.5941	13.9289
100.343899995767	49.1482839580636	9.50997878480669	99.5987	51.3246	10.6347	2.5606
106.048078777552	49.0894999993927	9.5099787847994	106.4442	49.0895	9.9061	0.5602
97.4256533343331	43.6094462044404	7.61590537226863	102.543	45.6081	13.7083	21.8293
97.425653334333	43.6084462044404	7.61590537226863	102.0152	42.2262	11.91	18.485
97.4246533343398	43.6084462044404	7.61590537226846	98.0879	44.5657	15.6818	26.354
97.4246533343415	43.6074462044407	7.61590537226871	104.1102	44.8822	12.643	24.3902
97.4246533343406	43.6074462044407	7.61490537226871	94.5726	47.3613	8.9492	6.423
92.5981158065748	43.6074462044407	7.61490537226871	89.5287	45.4109	8.5583	3.6829
87.4813349346326	43.6074462044407	7.61490537226871	95.7654	46.8722	1.8076	22.8599
87.4813349346326	43.6074462044427	6.7955631901897	80.8076	41.6004	10.0065	22.8911
87.4813349346326	43.6074462044407	6.7945631901897	85.9182	41.843	9.5066	3.5933
87.4803349346326	43.6074462044374	6.7945631901897	89.0134	41.3658	15.8043	27.9234
87.4793349346327	43.6074462044374	6.7945631901897	77.5882	39.4219	14.211	18.0454
87.4793349346327	43.6074462044373	5.21911859124759	76.5498	52.218	12.9878	29.3359
87.4793349346327	42.7799914420785	5.21911859124759	76.0043	50.5809	30.4596	29.1787
87.4783349346326	42.7799914420772	5.21911859124735	88.0225	60.7529	26.1198	27.571
87.4783349346302	42.7799914420772	3.55628934346854	72.1444	51.2772	8.2689	22.7706
87.4783349346302	40.8527527605065	3.55628934346854	70.6462	49.6735	6.8503	27.2687
87.4783349346318	40.8527527605065	3.55528934346854	73.6611	50.4924	3.9757	19.7557
81.6956349346212	40.8527527605065	3.55528934346854	73.6395	46.5004	2.2066	26.6417
71.6455525321618	40.8527527605065	3.55528934346854	70.916	53.3608	4.8842	25.4746
71.6455525321618	40.8527527605065	3.55428934346854	68.022	53.7678	15.3935	25.621
71.6445525321618	40.8527527605065	3.55428934346854	73.2561	47.9132	17.0605	27.6156
71.6435525321618	40.8527527605065	3.55428934346854	70.7664	48.6137	12.8047	19.7705
71.6425525321619	40.8527527605065	3.55428934346854	72.9198	44.5581	6.5665	29.4271
71.6425525321621	29.7405426793866	3.55428934346857	72.6191	32.6684	16.6889	20.9501
71.6415525321614	29.7405426793866	3.55428934346857	71.5231	31.8286	8.0149	7.639

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
66.5134746366228	29.7405426793867	3.55428934346836	64.1748	30.2745	31.4674	28.016
47.1287	29.7405426793866	0	47.7428	26.438	23.4687	28.0445
Route: 8 Length: 508.296316514537 Demand Met: 9988						
27.9144000000063	11.9659	12.8257520909742	26.4488	5.1021	19.0029	9.3497
27.9144000000063	18.1061009010235	25.0093992302469	24.5729	19.8583	16.0395	11.2071
27.9144000000063	18.1061009010235	25.0093992302469	17.2669	18.1061	25.0094	10.6475
27.9144000000063	29.8347999999041	26.1704843807357	28.099	29.8348	27.0633	0.9117
27.9144000000063	61.6405999989214	26.1704843807357	23.9369	61.5866	18.0383	22.0202
21.5665161670767	61.6405999989226	26.1704843807357	22.0857	71.4539	26.9077	17.4147
21.5655161670762	61.6405999989211	26.1704843807357	31.4455	71.7336	19.6874	27.0146
21.5655161670762	61.6405999989214	24.3784652903152	10.5042	66.7806	23.1982	12.8873
21.5655161670762	61.6415999989214	24.3784652903152	12.5389	66.9051	22.2814	25.9958
21.5655161670762	61.6425999989215	24.378465290315	16.7224	69.1113	14.1768	26.0784
10.8590428710491	61.642599999051	24.378465290315	9.15690000000001	61.6426	15.1483	9.3858
10.8590428710494	61.6435999990512	24.3784652903151	9.1707	70.0865	21.5855	9.3679
10.8590428710494	61.6445999990511	24.3784652903152	21.3934	72.6127	7.7423	27.5896
10.8590428710494	61.6445999990511	24.3784652903152	14.7433	68.1941	29.0053	9.3958
10.8590428710494	67.3429524738464	24.3784652903152	13.7649	76.0563	18.1156	11.1171
7.26528639076105	67.3429524738464	24.3784652903152	12.0587	67.8257	18.5408	15.0634
7.26528639076105	67.3429524738464	27.2489999970341	6.65640000000001	74.2265	20.3804	11.3789
7.26528639075659	67.3429524738474	27.2499999970341	7.6803	61.1857	24.6436	15.0459
7.26528639075659	67.3429524738468	27.2509999970341	6.9842	66.7632	27.251	0.6443
7.26528639075561	67.3429524738468	27.2519999970342	8.3117	72.2049	29.6247	15.4861
7.26528639075561	67.3429524738468	27.2519999970342	9.45780000000001	72.6847	40.961	17.4171
7.26528639075659	67.3429524738464	32.3678916802143	7.0214	70.8048	31.3366	24.0693
7.26528639075561	72.4588434601025	32.3678916802143	0.309600000000003	68.1954	39.7657	12.3905
7.26528639075562	72.4588434601026	36.5076999999783	6.09139999999999	73.9114	36.5077	1.8676
7.26528639075561	72.4588434601025	37.9056319809786	9.3844	71.5303	46.4336	26.9324
9.22978667729991	72.4588434601025	37.9056319809786	14.0233	68.3418	48.6515	20.9704
9.22978667729991	72.4588434601025	37.9056319809786	10.9416	69.7746	52.0032	20.3266
9.2307866772999	67.2704255378098	37.9056319809786	11.4886	67.7219	43.0579	21.8599
11.7126691130574	67.2704255378098	37.9056319809786	12.0097	66.7734	42.888	5.0159
11.7126691130574	67.2704255378099	37.3381000040176	8.8648	72.0358	37.3381	5.5515
11.7126691130574	67.2704255378099	37.3371000040176	12.0444	66.3239	28.7604	13.9456
11.7126691130574	67.2704255378099	37.3361000040176	11.6475	70.8021	30.9107	20.1612
11.7136691130574	67.2704255378098	37.3361000040176	5.2812	65.5492	44.5709	11.3895
11.7136691130574	67.1345380338509	33.9640380338338	10.7344	66.9849	31.9545	3.0771
17.5120906695113	67.134538033851	33.9640380338338	10.4334	62.822	33.9682	8.2889
18.9653979978905	67.1345380338509	33.9640380338338	15.0856	70.6386	28.9208	28.271
18.9682000000039	67.134538033851	33.9640380338333	18.9682	67.082	33.9115	0.0743
20.3687322283438	74.1253052742702	33.9640380338338	18.7356	77.2891	30.4652	27.8207
20.3687322283438	74.1253052742702	33.9650380338338	24.4797	75.354	37.647	15.2855
20.3687322283438	74.1253052742702	33.9650380338338	12.73	75.2001	37.6748	18.6111
20.3687322283438	74.1253052742702	34.890636636314	26.2205	72.9044	33.175	6.2191
25.1593518484848	74.1253052742703	38.4528237874284	24.3218	77.9732	38.2426	3.9436
26.438474248042	74.1253052742703	42.68	26.4747	67.9787	32.7219	12.3016
26.439474248042	74.1253052742697	42.68	26.4833	65.6457	42.68	15.8608
26.4394742480419	74.1253052742705	44.9329412423337	26.4587	69.6793	44.9112	4.4461
26.4394742480423	74.1253052742704	51.2201003778816	31.105	77.2121	42.4385	19.85
26.4394742480422	74.4747201517969	51.2201003778816	31.7515	71.3679	39.9054	28.4179
32.4980201517517	74.4747201517969	51.220100377899	32.697	74.6737	51.2201	0.2814
32.4980201517516	74.4747201517968	51.2211003778948	32.2488	71.8762	47.8257	10.0488
25.1216906176639	71.5740778113715	51.2211003778948	24.7401	75.4523	49.5075	27.8452
25.1206906176639	71.5740778113715	51.2211003778948	25.3366	76.538	54.326	21.2393
25.1206906176639	71.5740778113715	51.2221003778948	35.1535	70.6086	57.9365	16.7445
25.1206906176639	71.5740778113715	51.2231003778948	26.9783	71.0141	56.5271	24.9531
25.1206906176638	71.5730778113715	51.2231003778948	27.6433	72.5657	51.9251	2.8004
25.1206906176638	71.5720778113715	51.2231003778948	24.1578	73.3792	57.4094	11.3579
18.2653999999839	71.5720778113715	59.2509079220014	18.2654	71.5277	59.9496	0.7001
15.4331999999885	71.5720778113715	55.8875438075264	15.4332	72.9689	53.8868	2.4401
15.4321999999888	71.5720778113715	55.8875438075265	14.2076	63.0144	54.8035	24.0324
15.431199999989	71.5720778113715	55.8875438075264	4.4426	63.6871	51.0243	23.1902
5.05403038247228	67.8337901791875	55.8875438075264	4.7342	63.0935	56.3188	4.7706
5.05403038247228	71.9611680113828	51.592452055439	11.4442	66.9869	57.5373	21.9247
5.05403038247228	71.9611680113872	51.5914520554391	8.4928	63.9998	55.0759	9.7983
5.05403038247228	71.9611680113829	51.5904520554272	15.3124	65.205	52.7286	17.4654
5.05403038247228	72.1860000000359	51.5904520554272	4.0089	72.186	49.5614	2.2824
5.05403038247228	89.4756078327901	51.5904520554272	-1.23350000000001	86.0108	56.7294	9.9154
5.05403038247229	89.4766078327879	51.5904520554272	0.580200000000005	93.7511	50.7296	6.2472
5.05403038247231	89.476607832788	52.6950783256628	-7.5489	96.9207	56.8305	21.6
5.05403038247231	92.2433035278306	52.6950783256728	-0.0468000000000046	93.7668	57.0052	20.328
5.05403038247198	97.2709447093078	52.6950783256728	26.9511	99.1097	54.9389	22.0884
4.95998234164385	97.2709447093074	52.6950783256731	4.95789999999999	99.4405	59.5277	7.1688
4.9589823416505	97.2709447093072	52.6950783256728	1.1743	92.9818	59.2535	22.3694
4.9589823416558	97.2709447093072	52.6940783256728	-4.2807	74.2616	57.1387	26.6495
4.9589823416558	97.2709447093072	52.6940783256728	-2.30370000000001	90.7079	58.2529	19.8948
4.95898234165571	97.2709447093073	52.6930783256738	26.55	96.735	54.3574	21.6617
4.95898234165571	97.2709447093099	41.3991561111225	-0.735100000000003	89.6931	26.6301	28.3044
4.95798234165572	97.2709447093103	41.3991561111224	3.55029999999999	90.3653	48.0124	9.6646
4.95698234165573	97.2709447093101	41.3991561111224	1.20229999999999	90.7259	43.7677	19.1166

Solution x	Solution y	Solution z	Original x	Original y	Original z	Radius
4.95698234165573	97.2709447093099	41.3981561111224	0.619299999999996	91.0377	37.0534	11.2677
4.95598234165573	97.27094470931	41.3981561111224	3.4538	93.5151	43.6356	19.9908
4.95498234165561	97.2709447093101	41.3981561111224	2.1469	96.6722	44.5395	20.9499
4.95498234165561	97.27094470931	41.3971561111224	-3.26390000000001	94.8889	48.3647	23.5193
4.95498234165561	97.2709447093099	41.3961561111224	-4.1255	85.596	43.5867	25.3799
0.674509497877153	97.2709447093102	41.3961561111224	3.5998	89.8159	36.4775	20.0402
0.673509497877163	97.2709447093099	41.3961561111224	-1.86190000000001	98.5581	36.524	15.9681
0.673509497877163	97.2709447093104	31.7309680002394	-3.1358	95.2162	31.8855	4.3309
0.673509497877163	97.2709447093104	31.7299680002395	1.64530000000001	95.7178	31.8751	2.5699
0.673509497877163	97.2709447093103	31.7289680002413	-0.311599999999999	97.6012	28.6474	20.2615
-3.81325850517621	97.2709447093102	26.9294613932709	-5.5457	98.4014	26.4862	2.1156
1.63683087264967	97.2709447093106	26.9294613932709	6.3198	96.0864	20.0555	13.0595
1.63683087264883	95.5849465973371	26.9294613932708	3.5924	94.7451	26.9481	6.9732
1.63683087264945	95.5839465973309	26.9294613932708	3.11839999999999	98.924	29.022	10.2515
1.63683087264947	95.5829465973325	26.9294613932708	3.1448	100.72	31.1491	20.6463
1.63683087264944	95.581946597331	26.9294613932708	21.5395	100.4343	27.1149	29.9057
1.6368308726488	91.0212486166503	26.9294613932709	9.17	97.1621	20.3835	26.9226
6.41875138339195	91.0212486166506	26.9294613932709	7.8142	89.6258	27.2865	2.0055
1.37676110988787	92.4226256832361	22.7649451407885	1.4019	97.5847	15.4849	8.9245
1.07046767145468	92.4226256832361	8.05229431788385	-0.171000000000006	97.1566	2.8672	11.053
-1.67963373144988	92.4226256832361	8.05229431788386	4.77370000000001	93.7785	6.1602	12.9549
-1.68063373145137	92.4226256832361	8.05229431788386	-6.68600000000001	94.6391	7.4364	5.5087
0.148030538573025	92.4226256832361	8.05229431788385	3.0162	107.1796	11.3112	15.3823
0.148030538573025	90.9720866809065	8.05229431788385	-2.5612	92.1356	23.79	25.3912
0.148030538573025	90.9710866809064	8.05229431788385	0.613799999999998	95.4238	16.9249	17.1272
0.148030538573025	90.9710866809065	8.05129431788385	3.81100000000001	100.5395	9.9764	22.995
0.148030538573025	90.9710866809063	8.05029431788384	-0.338999999999999	97.1979	25.6607	24.9263
0.148030538567454	90.9700866809065	8.05029431788385	-12.8049	93.8535	15.5008	19.948
0.148030538573025	90.9690866808944	8.05029431788385	-2.1508	94.1499	7.6254	24.1365
0.148030538573025	90.049699999978	8.05029431788384	-1.9602	93.9224	5.6614	23.076
0.148030538573025	90.0496999999779	2.44936047883733	2.55330000000001	99.1767	7.9857	13.4676
0.148030538567326	90.0486999999741	2.44936047883732	-0.100899999999996	90.0487	0.1507	2.3121
0.149030538572902	90.0486999999737	2.44936047883731	2.57040000000001	90.3092	4.6781	25.529
0.15003053857302	90.0486999999735	2.44936047883731	2.7376	84.0979	3.4333	22.8219
0.15003053857302	67.6235021928068	4.63667709063911	0.483800000000002	63.8626	0.7436	5.7993
0.15003053857302	67.6235021928068	4.63767709063666	10.0835	69.723	3.7551	14.2892
0.15003053857302	67.6235021928068	7.56263695037844	8.0472	76.1743	13.1381	21.0495
3.65764747459782	67.6235021928068	7.56263695037844	1.76609999999999	66.5446	12.6159	26.4568
3.65864747459783	67.6235021928068	7.56263695037844	9.00020000000001	73.0359	5.8372	24.3533
9.66059759557643	67.6235021928068	7.56263695037844	9.6606	65.5604	9.552	2.866
13.2602999991979	67.6235021928069	7.56263695037844	12.0877	66.3858	4.5331	4.791
13.2612999991962	67.6235021928068	7.56263695037844	13.2613	67.7948	17.1077	9.5466
18.3171182116816	67.6235021928068	7.56263695037844	15.1112	64.361	7.2726	9.0815
20.1608422801826	67.6235021928068	7.56263695037844	14.2239	63.9607	10.3191	12.6801
20.1608422801656	67.6235021928068	0.001	23.527	73.6169	0.5641	21.6834
20.1608422801656	67.6235021928067	0	26.6151	77.1467	3.8306	15.3985
26.4185656277353	67.6235021928067	0	31.4187	76.5703	2.7936	26.413
26.4195656277186	67.6235021928068	0	27.2709	73.9256	16.4296	19.9916
26.4205656277184	67.6235021928067	0	23.796	77.2181	9.3562	18.2059
31.4890187703689	67.6235021928068	0	22.8228	67.5784	3.2098	16.2582
31.4900187703689	67.6235021928068	0	31.4906	71.3219	1.4719	26.6563
47.1287000000945	67.6235021928068	0	33.839	67.1668	7.1332	20.2124

Appendix P

SDTOP Best Known Solutions

In this appendix, we present the best known solution for each SDTOP problem presented in this dissertation. Each solution is presented in a table along with the total profit obtained, the total distance of the routes, and the total distance when service time is included. The Meta-route sequence is given, after which each individual route is listed. All capacity and maximum route length restrictions are not violated in any solution. Solution figures are not shown since the routes are so convoluted as to give little or no value to the reader (see Figure 5.2). In 12 of the 140 problems (p13_2Q1SetII, p13_3Q1SetII, p13_4Q1SetII, p14_2Q1SetII, p14_2Q2SetII p14_2Q3SetII p14_3Q1SetII p14_3Q2SetII p14_3Q3SetII p14_4Q1SetII p14_4Q2SetII p14_4Q3SetII), none of the nodes can be visited without violating maximum route length constraints. These problems are not included below.

Table P-1: p03_SetI

Total profit: 50152 Total distance: 1890.88 Total distance and service time: 2880.88 Meta-route order: 40 94 26 88 70 37 98 62 30 91 51 21 16 1 96 61 20 47 86 23 60 56 31 71 17 59 69 54 44 67 46 36 75 18 95 33 97 9 52 27 87 85 80 39 8 28 72 5 19 50 35 15 55 22 64 76 25 41 48 81 92 42 45 6 82 100 74 38 49 29 89 66 10 73 43 99 24 13 14 63 93 4 11 58 65 90 84 68 2 78 34 79 83 77 7 53 57 3 12
Individual routes: 1: 20 33 35 66 34 3 2: 88 36 64 49 11 7 3: 30 80 81 65 4: 62 69 27 28 6 89 77 5: 47 46 19 48 82 57 6: 67 39 55 25 78 12 7: 23 75 29 24 68 79 8: 94 54 72 22 41 74 73 58 9: 70 1 31 52 92 100 99 84 10: 91 61 17 8 10 63 90 11: 37 98 96 60 18 43 53 12: 16 59 95 97 87 38 14 13: 40 26 21 56 15 42 13 2 14: 86 44 85 5 45 93 83 15: 51 71 9 50 76 4

Table P-2: p06_SetI

Total profit: 8764 Total distance: 1152.51 Total distance and service time: 1652.51 Meta-route order: 18 48 2 49 9 12 41 20 3 33 43 5 39 34 42 22 15 17 19 11 29 45 40 4 21 31 7 37 50 38 23 8 1 25 30 35 44 36 10 14 28 27 16 6 46 26 24 13 32 47
Individual routes: 1: 33 15 4 25 46 32 2: 3 22 7 23 14 13 3: 9 17 1 24 47 4: 48 43 31 8 28 26 5: 18 12 5 45 37 10 6: 2 34 29 38 27 6 7: 41 42 19 40 44 8: 49 39 21 50 30 16 9: 20 11 35 36

Table P-3: p07_SetI

Total profit: 25834 Total distance: 1936.68 Total distance and service time: 2686.68 Meta-route order: 51 12 45 2 74 27 48 30 32 53 9 28 15 57 34 11 62 22 36 61 21 7 42 59 18 71 41 5 54 64 60 19 29 24 13 58 66 8 39 49 72 3 1 47 17 73 63 31 14 56 37 4 44 75 6 23 55 20 70 69 16 10 43 52 68 67 25 33 40 35 46 65 50 38 26
Individual routes: 1: 42 41 75 40 2: 53 54 13 70 3: 11 39 55 25 4: 15 17 52 5: 45 27 34 58 72 44 6: 74 62 3 43 7: 51 7 19 8 14 8: 22 65 38 9: 60 47 37 20 10: 59 66 67 46 26 11: 12 18 31 10 12: 48 36 71 4 35 13: 64 50 14: 9 24 49 63 68 15: 32 69 16: 57 5 29 16 17: 2 30 21 1 73 6 18: 28 61 56 23 33

Table P-4: p08_SetI

Total profit: 51909 Total distance: 1890.07 Total distance and service time: 3348.07 Meta-route order: 28 26 94 69 88 98 54 33 30 91 42 96 51 16 45 25 32 9 46 8 23 15 1 86 11 80 56 71 97 36 75 52 20 47 60 27 39 87 17 64 72 21 29 44 81 67 6 48 40 82 58 62 22 5 19 74 50 77 18 89 3 61 43 70 55 59 41 35 10 49 92 66 31 13 95 37 90 34 100 85 63 53 57 99 65 76 73 84 2 14 7 68 83 24 93 4 12 38 78 79
Individual routes: 1: 32 20 77 3 73 4 2: 16 97 87 5 61 57 2 3: 28 51 9 71 81 50 31 4: 45 8 60 82 49 7 5: 69 11 64 66 65 78 6: 88 36 48 19 10 90 63 7: 25 29 35 34 68 12 8: 94 42 15 44 43 100 83 9: 23 75 72 21 22 74 10: 26 54 56 39 67 55 76 11: 98 96 52 6 18 95 84 93 0 12: 30 1 27 58 59 13 53 13: 33 80 40 41 14 38 14: 91 86 17 89 92 37 85 99 15: 46 47 62 70 24 79

Table P-5: p09_SetI

Total profit: 84228 Total distance: 971.57 Total distance and service time: 1971.57 Meta-route order: 12 139 11 38 76 32 17 126 1 149 142 109 55 108 104 81 14 130 50 120 134 137 34 111 131 132 67 112 66 145 20 71 30 41 59 95 94 25 124 113 19 69 135 54 96 125 49 121 33 141 72 82 97 9 3 110 148 140 122 98 4 101 73 44 8 133 47 127 10 107 57 22 106 146 15 63 29 31 52 144 48 53 143 5 100 103 150 27 2 105 87 51 46 75 56 147 138 37 102 62
Individual routes: 1: 126 131 20 59 121 3 101 22 100 51 2: 38 108 71 124 125 33 72 122 10 5 103 3: 14 132 96 133 143 150 87 147 37 4: 139 55 134 67 95 25 110 47 146 144 46 5: 104 34 54 73 106 105 75 62 6: 12 149 109 111 66 41 94 19 141 148 4 63 7: 32 1 81 112 69 97 98 57 48 27 8: 76 130 50 30 49 9 127 29 53 2 9: 11 120 113 82 140 8 31 138 102 10: 17 142 137 145 135 44 107 15 52 56

Table P-6: p10_SetI

Total profit: 260699 Total distance: 2089.83 Total distance and service time: 3929.83 Meta-route order: 152 95 126 127 188 4 33 139 16 195 12 158 1 28 67 187 176 101 59 106 194 8 102 65 192 104 157 159 183 79 112 191 180 9 74 147 144 161 174 69 35 66 184 13 110 58 178 146 63 160 100 18 19 43 142 155 23 27 36 75 141 149 78 181 76 138 143 118 22 83 40 51 133 114 189 37 190 44 62 172 150 25 14 113 107 56 3 82 46 185 197 179 99 116 50 24 175 20 68 167 39 109 48 140 84 42 72 94 151 90 168 124 171 111 115 134 186 26 47 154 49 45 81 34 85 182 80 97 10 86 131 53 198 108 125 120 105 17 38 129 130 156 98 164 122 92 123 193 71 57 137 93 89 173 170 30 21 128 169 136 117 70 54 121 64 199 6 73 87 32 5 103 31 41 2 96 119 132 29 77 7 60 55 61
Individual routes: 1: 8 102 58 83 179 99 167 45 125 98 54 2: 16 67 104 63 44 3 151 105 117 96 3: 126 12 9 161 76 40 50 168 26 81 17 4: 187 110 75 189 39 109 10 129 71 169 5: 139 100 149 51 175 111 34 128 70 6: 28 101 155 36 82 140 136 199 61 7: 33 195 159 160 23 62 116 49 182 2 8: 158 194 112 141 22 42 53 198 193 6 9: 79 13 27 46 108 170 132 7 10: 95 106 147 146 18 118 25 56 72 97 130 11: 188 192 191 184 143 113 68 156 93 64 12: 127 4 157 66 190 197 186 86 30 87 13: 69 78 134 85 164 119 77 14: 1 142 114 94 122 5 103 29 15: 176 172 48 171 47 120 173 21 121 16: 59 174 138 37 20 124 154 123 60 17: 183 43 185 90 115 137 89 41 18: 180 19 133 14 84 38 31 19: 152 65 35 178 150 80 131 57 32 20: 74 144 181 107 24 92 73 55

Table P-7: p13_SetI

Total profit: 93994 Total distance: 3836.10 Total distance and service time: 9836.10 Meta-route order: 18 115 97 95 91 2 13 110 74 77 78 80 76 1 39 117 45 27 34 56 33 51 30 99 36 54 26 53 66 119 93 96 17 22 37 65 101 105 61 20 82 104 23 89 103 31 48 118 44 75 29 86 108 73 69 43 107 83 7 24 42 102 70 3 41 4 111 63 15 72 58 8 113 120 55 12 62 14 59 88 52 21 10 64 71 28 85 60 35 112 98 11 68 116 5 94 9 16 6 25 87 19 81 49 84 32 50 92 47 90 46 40 109 106 38 57 79 100 67 114
Individual routes: 1: 56 75 69 85 112 94 81 90 106 2: 34 26 17 31 3: 18 97 1 82 108 71 68 4: 78 76 118 107 111 11 5 9 6 5: 80 65 61 43 42 41 6: 77 105 104 103 86 83 120 98 116 87 7: 45 15 47 46 57 79 67 8: 39 102 113 88 38 100 114 9: 13 119 7 3 4 8 12 14 10 10: 51 37 48 44 55 59 64 60 11: 27 33 30 36 22 20 23 29 24 12: 66 21 28 35 16 25 19 32 13: 115 95 91 110 117 99 93 96 101 89 14: 74 54 53 73 70 72 84 92 109 15: 2 63 58 62 52 49 50 40

Table P-8: p14_SetI

Total profit: 52518 Total distance: 2416.54 Total distance and service time: 10246.54 Meta-route order: 69 8 9 46 40 91 1 88 51 90 98 97 16 23 96 56 60 62 94 64 36 61 85 26 86 87 44 75 17 58 54 47 15 72 35 81 82 39 67 19 70 50 48 20 22 43 21 29 33 3 27 5 92 59 55 13 18 31 68 41 100 74 49 14 10 99 28 25 6 2 57 30 89 66 95 65 63 76 73 93 83 79 77 12 7 11 24
Individual routes: 1: 88 90 61 58 50 59 68 74 57 2: 46 60 44 39 29 13 66 65 63 3: 69 23 54 33 76 73 7 11 4: 16 26 47 67 3 5 100 6 2 5: 40 51 36 17 15 20 18 14 30 6: 8 1 98 94 75 19 31 28 25 7: 91 62 64 35 22 21 27 41 49 8: 9 96 85 86 87 81 70 99 89 9: 97 72 48 43 55 93 12 24 10: 56 82 92 10 95 83 79 77

Table P-9: p15_SetI

Total profit: 117169 Total distance: 1568.98 Total distance and service time: 2938.98 Meta-route order: 146 28 89 13 40 52 132 69 137 26 95 12 18 97 118 21 60 2 50 109 112 102 98 91 82 81 58 59 57 76 45 134 114 1 124 144 133 53 131 14 39 6 47 74 101 34 125 17 115 75 90 142 33 92 143 25 126 67 63 145 84 135 79 88 129 55 35 49 41 110 116 3 141 77 7 4 22 61 71 93 54 23 107 38 36 140 68 16 20 139 72 19 136 128 5 62 150 120 104 99 29 56 9 119 121 10 96 48 44 149 147 70 106 87 80 123 31 37 73 94 30 100 111 130 127 117 85 42 148 122 108 24 105 27 8 51 138
Individual routes: 1: 69 131 90 126 63 107 19 106 148 2: 137 2 58 53 116 77 68 29 121 80 3: 95 97 57 144 115 145 41 22 72 149 4: 146 18 82 114 125 84 93 5 96 37 5: 132 50 102 76 33 79 129 3 120 9 6: 81 34 135 35 71 136 122 51 7: 13 133 74 75 110 4 139 56 73 8: 12 1 101 88 7 62 10 31 127 27 9: 28 26 109 134 25 55 54 150 111 105 10: 89 98 59 6 92 61 16 87 42 11: 124 47 143 49 36 48 123 8 12: 91 14 142 38 140 119 44 100 85 13: 118 60 45 17 141 104 99 147 94 117 14: 1 -40 21 39 67 23 130 24 138 15: 52 112 20 128 70 30 108

Table P-10: p16_SetI

Total profit: 256933 Total distance: 2102.48 Total distance and service time: 3942.48 Meta-route order: 28 105 89 52 180 69 176 95 76 162 50 101 118 106 178 104 6 157 1 158 148 102 144 4 91 159 87 138 193 93 13 155 150 152 191 160 78 172 19 187 177 11 40 16 126 39 147 154 55 79 192 129 188 58 135 195 112 35 74 17 194 185 12 43 149 56 100 143 24 197 139 14 175 146 161 113 49 71 134 27 103 181 120 44 9 25 86 163 167 18 179 174 168 133 32 145 47 107 51 75 170 141 140 116 59 29 83 38 110 128 30 31 184 121 22 46 42 96 115 48 60 186 63 171 88 183 68 66 165 73 80 123 130 190 131 84 189 54 127 45 108 119 41 196 125 97 10 81 62 77 198 94 3 61 20 109 2 33 151 82 85 114 182 72 98 122 70 99 199 37 57 7 21 92 173 153 166 117 137 132 26 111 53 156
Individual routes: 1: 52 152 40 58 133 186 198 72 26 2: 106 17 113 86 141 94 99 92 117 3: 158 78 79 129 185 120 9 51 196 77 4: 69 138 112 18 83 60 84 61 166 5: 101 160 188 161 103 30 131 122 132 6: 28 155 55 139 25 170 165 21 53 7: 95 6 13 147 146 27 167 31 88 190 127 8: 19 143 49 107 189 108 10 70 111 9: 178 87 172 43 140 38 85 98 37 10: 91 193 191 16 14 59 96 183 97 151 11: 76 102 24 134 116 184 68 80 3 12: 162 1 154 12 163 29 121 81 33 13: 118 93 192 100 44 42 119 173 14: 105 144 74 197 145 115 41 57 137 15: 180 4 187 39 56 179 110 130 54 109 16: 176 150 177 195 149 75 22 171 73 2 17: 50 157 135 35 71 128 66 20 18: 159 11 181 32 63 62 182 153 156 19: 148 126 175 168 47 48 123 82 7 20: 89 104 194 174 46 45 125 114 199

Table P-11: p03_2Q1SetII

Total profit: 338 Total distance: 58.47 Total distance and service time: 98.47 Meta-route order: 40 94 26 89
Individual routes: 1: 40 26 2: 94 89

Table P-12: p03_2Q2SetII

Total profit: 1087 Total distance: 75.00 Total distance and service time: 145.00 Meta-route order: 53 40 96 58 93 27 6
Individual routes: 1: 53 40 58 27 2: 96 93 6

Table P-13: p03_2Q3SetII

Total profit: 1852 Total distance: 103.13 Total distance and service time: 193.13 Meta-route order: 27 6 94 18 87 82 92 95 89
Individual routes: 1: 6 94 87 92 95 2: 27 18 82 89

Table P-14: p03_3Q1SetII

Total profit: 670 Total distance: 87.90 Total distance and service time: 137.90 Meta-route order: 94 69 97 27 89
Individual routes: 1: 94 89 2: 97 3: 69 27

Table P-15: p03_3Q2SetII

Total profit: 1845 Total distance: 112.31 Total distance and service time: 212.31 Meta-route order: 53 40 26 96 99 93 28 13 27 6
Individual routes: 1: 96 99 93 2: 40 13 6 3: 53 26 28 27

Table P-16: p03_3Q3SetII

Total profit: 3326 Total distance: 134.58 Total distance and service time: 284.58 Meta-route order: 53 40 94 96 97 26 92 99 93 28 59 27 6 13 89
Individual routes: 1: 97 99 59 6 89 2: 94 96 92 93 13 3: 53 40 26 28 27

Table P-17: p03_4Q1SetII

Total profit: 1041 Total distance: 117.33 Total distance and service time: 187.33 Meta-route order: 40 94 69 97 26 27 89
Individual routes: 1: 97 2: 94 89 3: 69 27 4: 40 26

Table P-18: p03_4Q2SetII

Total profit: 2739 Total distance: 158.08 Total distance and service time: 278.08 Meta-route order: 53 40 26 96 93 98 60 94 27 59 6 89
Individual routes: 1: 96 60 89 2: 53 26 27 3: 40 94 6 4: 93 98 59

Table P-19: p03_4Q3SetII

Total profit: 5001 Total distance: 223.27 Total distance and service time: 393.27 Meta-route order: 53 40 26 96 60 94 83 54 97 27 92 5 59 69 77 18 89
Individual routes: 1: 40 27 69 89 2: 60 83 5 18 3: 53 26 54 77 4: 96 94 97 92 59

Table P-20: p06_2Q1SetII

Total profit: 243 Total distance: 56.88 Total distance and service time: 96.88 Meta-route order: 27 5 6 46
Individual routes: 1: 27 6 2: 5 46

Table P-21: p06_2Q2SetII

Total profit: 446 Total distance: 74.45 Total distance and service time: 134.45 Meta-route order: 27 11 48 5 6 46
Individual routes: 1: 11 5 46 2: 27 48 6

Table P-22: p06_2Q3SetII

Total profit: 753 Total distance: 117.58 Total distance and service time: 197.58 Meta-route order: 27 5 46 9 49 14 6 12
Individual routes: 1: 5 9 49 12 2: 27 46 14 6

Table P-23: p06_3Q1SetII

Total profit: 342 Total distance: 85.32 Total distance and service time: 145.32 Meta-route order: 27 11 5 6 32 46
Individual routes: 1: 11 32 2: 5 46 3: 27 6

Table P-24: p06_3Q2SetII

Total profit: 770 Total distance: 142.14 Total distance and service time: 222.14 Meta-route order: 27 11 5 32 37 50 6 46
Individual routes: 1: 11 50 2: 5 37 46 3: 27 32 6

Table P-25: p06_3Q3SetII

Total profit: 1382 Total distance: 164.20 Total distance and service time: 284.20 Meta-route order: 27 12 32 11 48 5 37 50 14 47 6 46
Individual routes: 1: 12 5 37 47 2: 32 11 50 46 3: 27 48 14 6

Table P-26: p06_4Q1SetII

Total profit: 458 Total distance: 119.73 Total distance and service time: 189.73 Meta-route order: 27 11 5 6 4 32 46
Individual routes: 1: 11 32 2: 4 3: 27 6 4: 5 46

Table P-27: p06_4Q2SetII

Total profit: 1105 Total distance: 181.14 Total distance and service time: 291.14 Meta-route order: 11 48 37 38 16 27 5 50 47 6 46
Individual routes: 1: 11 38 5 2: 48 27 6 3: 16 50 4: 37 47 46

Table P-28: p06_4Q3SetII

Total profit: 1938 Total distance: 242.27 Total distance and service time: 392.27 Meta-route order: 11 48 17 38 37 8 16 10 44 27 9 5 49 6 46
Individual routes: 1: 48 8 27 6 2: 17 37 44 46 3: 10 9 49 4: 11 38 16 5

Table P-29: p07_2Q1SetII

Total profit: 343 Total distance: 53.16 Total distance and service time: 93.16 Meta-route order: 75 6 34 26
Individual routes: 1: 75 34 2: 6 26

Table P-30: p07_2Q2SetII

Total profit: 795 Total distance: 74.42 Total distance and service time: 144.42 Meta-route order: 75 51 30 17 6 26 68
Individual routes: 1: 30 6 68 2: 75 51 17 26

Table P-31: p07_2Q3SetII

Total profit: 1335 Total distance: 95.49 Total distance and service time: 195.49 Meta-route order: 75 51 30 6 68 29 45 4 34 26
Individual routes: 1: 51 6 68 4 26 2: 75 30 29 45 34

Table P-32: p07_3Q1SetII

Total profit: 668 Total distance: 65.95 Total distance and service time: 125.95 Meta-route order: 75 4 6 34 67 26
Individual routes: 1: 6 26 2: 75 4 3: 34 67

Table P-33: p07_3Q2SetII

Total profit: 1424 Total distance: 130.19 Total distance and service time: 220.19 Meta-route order: 51 12 45 72 75 4 6 34 26
Individual routes: 1: 45 75 6 2: 51 4 34 3: 12 72 26

Table P-34: p07_3Q3SetII

Total profit: 2465 Total distance: 162.20 Total distance and service time: 292.20 Meta-route order: 75 51 30 6 63 68 28 33 4 62 34 17 26
Individual routes: 1: 75 30 28 62 2: 63 33 17 26 3: 51 6 68 4 34

Table P-35: p07_4Q1SetII

Total profit: 992 Total distance: 97.62 Total distance and service time: 177.62 Meta-route order: 75 4 17 6 46 34 67 26
Individual routes: 1: 75 6 2: 46 26 3: 17 67 4: 4 34

Table P-36: p07_4Q2SetII

Total profit: 2133 Total distance: 170.62 Total distance and service time: 290.62 Meta-route order: 75 51 52 30 6 68 3 4 33 34 17 26
Individual routes: 1: 52 4 34 2: 75 3 17 3: 51 6 33 4: 30 68 26

Table P-37: p07_4Q3SetII

Total profit: 3687 Total distance: 204.71 Total distance and service time: 374.71 Meta-route order: 68 51 45 3 4 39 62 44 72 46 74 34 40 2 17 67 26
Individual routes: 1: 45 4 46 34 2: 68 62 74 2 3: 39 72 67 26 4: 51 3 44 40 17

Table P-38: p08_2Q1SetII

Total profit: 384 Total distance: 59.93 Total distance and service time: 96.93 Meta-route order: 52 99 27 6
Individual routes: 1: 52 27 2: 99 6

Table P-39: p08_2Q2SetII

Total profit: 975 Total distance: 82.11 Total distance and service time: 147.11 Meta-route order: 53 97 52 99 27 92 6
Individual routes: 1: 97 99 92 6 2: 53 52 27

Table P-40: p08_2Q3SetII

Total profit: 1914 Total distance: 92.08 Total distance and service time: 191.08 Meta-route order: 53 40 26 37 98 99 96 27 92 6
Individual routes: 1: 37 98 99 96 92 6 2: 53 40 26 27

Table P-41: p08_3Q1SetII

Total profit: 645 Total distance: 82.29 Total distance and service time: 142.29 Meta-route order: 53 40 52 99 27 6
Individual routes: 1: 52 27 2: 99 6 3: 53 40

Table P-42: p08_3Q2SetII

Total profit: 1738 Total distance: 108.13 Total distance and service time: 214.13 Meta-route order: 53 52 26 99 40 96 27 92 28 6
Individual routes: 1: 52 27 28 2: 99 96 92 6 3: 53 26 40

Table P-43: p08_3Q3SetII

Total profit: 3119 Total distance: 154.78 Total distance and service time: 287.78 Meta-route order: 53 40 52 26 37 98 60 96 27 99 6 92 89 2
Individual routes: 1: 37 98 96 6 89 2: 52 60 99 92 2 3: 53 40 26 27

Table P-44: p08_4Q1SetII

Total profit: 947 Total distance: 104.66 Total distance and service time: 181.66 Meta-route order: 53 40 26 52 99 27 6
Individual routes: 1: 52 27 2: 53 40 3: 26 4: 99 6

Table P-45: p08_4Q2SetII

Total profit: 2496 Total distance: 146.74 Total distance and service time: 282.74 Meta-route order: 53 52 26 99 2 40 96 27 92 28 13 6
Individual routes: 1: 99 96 92 6 2: 53 26 40 3: 52 27 28 4: 2 13

Table P-46: p08_4Q3SetII

Total profit: 4469 Total distance: 229.84 Total distance and service time: 386.84 Meta-route order: 28 52 40 7 98 26 91 55 37 53 92 25 83 99 96 6 89 24 80
Individual routes: 1: 28 40 26 53 2: 98 91 37 92 99 96 6 3: 55 25 24 80 4: 52 7 83 89

Table P-47: p09_2Q1SetII

Total profit: 768 Total distance: 49.38 Total distance and service time: 89.38 Meta-route order: 77 5 12 108
Individual routes: 1: 5 12 2: 77 108

Table P-48: p09_2Q2SetII

Total profit: 2147 Total distance: 67.41 Total distance and service time: 147.41 Meta-route order: 77 5 78 12 103 139 108 46
Individual routes: 1: 77 78 103 108 2: 5 12 139 46

Table P-49: p09_2Q3SetII

Total profit: 3598 Total distance: 97.54 Total distance and service time: 197.54 Meta-route order: 5 103 102 56 123 144 12 90 108 139
Individual routes: 1: 5 103 123 90 108 2: 102 56 144 12 139

Table P-50: p09_3Q1SetII

Total profit: 1399 Total distance: 74.80 Total distance and service time: 134.80 Meta-route order: 5 56 144 90 12 139
Individual routes: 1: 56 12 2: 144 139 3: 5 90

Table P-51: p09_3Q2SetII

Total profit: 3494 Total distance: 109.66 Total distance and service time: 219.66 Meta-route order: 46 5 11 27 49 76 119 32 38 47 56
Individual routes: 1: 11 47 56 2: 46 27 119 32 3: 5 49 76 38

Table P-52: p09_3Q3SetII

Total profit: 6353 Total distance: 146.61 Total distance and service time: 296.61 Meta-route order: 103 5 47 56 149 123 148 144 135 15 12 4 139 108 46
Individual routes: 1: 149 144 12 139 46 2: 47 56 148 135 4 3: 103 5 123 15 108

Table P-53: p09_4Q1SetII

Total profit: 2197 Total distance: 102.26 Total distance and service time: 182.26 Meta-route order: 78 5 56 144 90 12 108 139
Individual routes: 1: 56 12 2: 78 108 3: 5 90 4: 144 139

Table P-54: p09_4Q2SetII

Total profit: 5408 Total distance: 140.65 Total distance and service time: 290.65 Meta-route order: 78 11 76 63 17 5 142 51 103 109 56 32 47 108 144
Individual routes: 1: 142 109 144 2: 76 5 103 108 3: 63 17 56 47 4: 78 11 51 32

Table P-55: p09_4Q3SetII

Total profit: 9682 Total distance: 192.50 Total distance and service time: 392.50 Meta-route order: 103 46 5 27 17 12 149 81 142 47 143 148 120 135 87 147 4 51 102 146
Individual routes: 1: 46 27 81 120 51 2: 103 5 12 47 102 3: 17 143 135 4 146 4: 149 142 148 87 147

Table P-56: p10_2Q1SetII

Total profit: 1222 Total distance: 42.82 Total distance and service time: 92.82 Meta-route order: 152 54 6 139 95
Individual routes: 1: 152 6 95 2: 54 139

Table P-57: p10_2Q2SetII

Total profit: 2897 Total distance: 62.72 Total distance and service time: 142.72 Meta-route order: 61 126 152 26 54 81 139 127
Individual routes: 1: 126 26 81 127 2: 61 152 54 139

Table P-58: p10_2Q3SetII

Total profit: 4999 Total distance: 98.89 Total distance and service time: 198.89 Meta-route order: 152 112 191 157 195 66 120 86 30 61
Individual routes: 1: 191 195 66 86 61 2: 152 112 157 120 30

Table P-59: p10_3Q1SetII

Total profit: 2133 Total distance: 72.03 Total distance and service time: 142.03 Meta-route order: 152 54 6 139 66 95 112
Individual routes: 1: 66 112 2: 54 139 3: 152 6 95

Table P-60: p10_3Q2SetII

Total profit: 5171 Total distance: 111.61 Total distance and service time: 221.61 Meta-route order: 95 188 151 76 105 96 17 130 193 100 61
Individual routes: 1: 76 130 100 2: 188 105 96 193 3: 95 151 17 61

Table P-61: p10_3Q3SetII

Total profit: 9341 Total distance: 136.65 Total distance and service time: 296.65 Meta-route order: 95 125 76 40 58 197 12 158 168 167 53 81 179 105 193 127
Individual routes: 1: 95 76 40 12 168 81 2: 197 158 53 105 193 3: 125 58 167 179 127

Table P-62: p10_4Q1SetII

Total profit: 3286 Total distance: 98.77 Total distance and service time: 188.77 Meta-route order: 152 126 54 6 139 26 95 157 127
Individual routes: 1: 152 6 95 2: 126 157 3: 26 127 4: 54 139

Table P-63: p10_4Q2SetII

Total profit: 7903 Total distance: 130.55 Total distance and service time: 290.55 Meta-route order: 126 95 188 157 81 151 112 100 195 86 17 105 60 127 61 6
Individual routes: 1: 81 100 60 127 2: 157 112 86 6 3: 188 195 105 61 4: 126 95 151 17

Table P-64: p10_4Q3SetII

Total profit: 13878 Total distance: 183.17 Total distance and service time: 383.17 Meta-route order: 95 125 81 188 96 100 105 158 33 58 197 27 12 194 43 179 167 199 60 127
Individual routes: 1: 95 188 96 105 33 194 2: 81 100 12 60 127 3: 158 197 43 199 4: 125 58 27 179 167

Table P-65: p13_2Q2SetII

Total profit: 120 Total distance: 32.03 Total distance and service time: 132.03 Meta-route order: 119 92
Individual routes: 1: 119 2: 92

Table P-66: p13_2Q3SetII

Total profit: 120 Total distance: 50.14 Total distance and service time: 150.14 Meta-route order: 101 113
Individual routes: 1: 101 2: 113

Table P-67: p13_3Q2SetII

Total profit: 319 Total distance: 40.47 Total distance and service time: 190.47 Meta-route order: 88 119 81
Individual routes: 1: 81 2: 88 3: 119

Table P-68: p13_3Q3SetII

Total profit: 350 Total distance: 82.57 Total distance and service time: 232.57 Meta-route order: 85 94 115
Individual routes: 1: 85 2: 94 3: 115

Table P-69: p13_4Q2SetII

Total profit: 554 Total distance: 79.19 Total distance and service time: 279.19 Meta-route order: 105 101 94 84
Individual routes: 1: 94 2: 105 3: 101 4: 84

Table P-70: p13_4Q3SetII

Total profit: 585 Total distance: 95.99 Total distance and service time: 295.99 Meta-route order: 102 85 94 115
Individual routes: 1: 94 2: 85 3: 115 4: 102

Table P-71: p15_2Q1SetII

Total profit: 725 Total distance: 55.56 Total distance and service time: 95.56 Meta-route order: 105 58 111 27
Individual routes: 1: 105 111 2: 58 27

Table P-72: p15_2Q2SetII

Total profit: 2136 Total distance: 63.85 Total distance and service time: 143.85 Meta-route order: 112 89 26 105 52 58 53 27
Individual routes: 1: 26 105 58 53 2: 112 89 52 27

Table P-73: p15_2Q3SetII

Total profit: 3500 Total distance: 94.13 Total distance and service time: 194.13 Meta-route order: 40 26 105 109 53 58 150 12 117 138
Individual routes: 1: 40 105 53 58 117 2: 26 109 150 12 138

Table P-74: p15_3Q1SetII

Total profit: 1391 Total distance: 75.86 Total distance and service time: 135.86 Meta-route order: 105 26 28 117 138 13
Individual routes: 1: 117 13 2: 26 138 3: 105 28

Table P-75: p15_3Q2SetII

Total profit: 3800 Total distance: 108.27 Total distance and service time: 218.27 Meta-route order: 26 69 132 105 53 111 37 28 95 27 117
Individual routes: 1: 37 95 117 2: 69 132 111 28 3: 26 105 53 27

Table P-76: p15_3Q3SetII

Total profit: 6385 Total distance: 131.71 Total distance and service time: 281.71 Meta-route order: 89 137 1 132 144 53 105 87 111 26 28 95 138 94 27
Individual routes: 1: 89 53 105 26 138 2: 137 144 87 95 94 3: 1 132 111 28 27

Table P-77: p15_4Q1SetII

Total profit: 2123 Total distance: 97.01 Total distance and service time: 177.01 Meta-route order: 112 89 40 26 105 58 138 53
Individual routes: 1: 40 58 2: 112 105 3: 26 138 4: 89 53

Table P-78: p15_4Q2SetII

Total profit: 5442 Total distance: 152.58 Total distance and service time: 292.58 Meta-route order: 26 52 132 69 1 105 101 106 58 53 28 27 138 147
Individual routes: 1: 26 105 58 53 2: 1 28 138 3: 52 106 147 4: 132 69 101 27

Table P-79: p15_4Q3SetII

Total profit: 9355 Total distance: 189.65 Total distance and service time: 389.65 Meta-route order: 112 89 40 69 132 105 58 1 137 59 138 93 111 149 92 94 95 6 26 53
Individual routes: 1: 40 58 137 92 95 2: 69 132 1 111 26 3: 89 59 93 94 6 4: 112 105 138 149 53

Table P-80: p16_2Q1SetII

Total profit: 1163 Total distance: 38.52 Total distance and service time: 88.52 Meta-route order: 112 146 156 27 53
Individual routes: 1: 112 27 2: 146 156 53

Table P-81: p16_2Q2SetII

Total profit: 3108 Total distance: 65.67 Total distance and service time: 145.67 Meta-route order: 28 6 176 96 112 146 156 27
Individual routes: 2: 6 96 112 156 1: 28 176 146 27

Table P-82: p16_2Q3SetII

Total profit: 5143 Total distance: 98.10 Total distance and service time: 198.10 Meta-route order: 112 58 146 40 149 111 12 167 53 156
Individual routes: 1: 58 40 149 12 156 2: 112 146 111 167 53

Table P-83: p16_3Q1SetII

Total profit: 2184 Total distance: 76.21 Total distance and service time: 146.21 Meta-route order: 112 146 156 147 137 53 27
Individual routes: 1: 112 137 2: 147 27 3: 146 156 53

Table P-84: p16_3Q2SetII

Total profit: 5359 Total distance: 96.36 Total distance and service time: 216.36 Meta-route order: 112 28 111 89 13 138 58 146 40 167 53 156
Individual routes: 1: 13 58 40 53 2: 112 89 146 167 3: 28 111 138 156

Table P-85: p16_3Q3SetII

Total profit: 9116 Total distance: 130.16 Total distance and service time: 280.16 Meta-route order: 111 52 28 195 149 194 106 153 146 12 109 53 167 26 156
Individual routes: 1: 111 28 146 53 156 2: 52 194 106 153 167 3: 195 149 12 109 26

Table P-86: p16_4Q1SetII

Total profit: 3212 Total distance: 88.64 Total distance and service time: 178.64 Meta-route order: 112 27 111 167 89 52 146 53 156
Individual routes: 1: 27 167 146 2: 112 89 3: 52 156 4: 111 53

Table P-87: p16_4Q2SetII

Total profit: 8249 Total distance: 134.45 Total distance and service time: 294.45 Meta-route order: 27 28 183 180 69 94 76 162 58 152 89 40 154 138 167 146
Individual routes: 1: 180 58 152 40 2: 27 69 162 167 3: 28 76 154 138 4: 183 94 89 146

Table P-88: p16_4Q3SetII

Total profit: 14110 Total distance: 187.41 Total distance and service time: 387.41 Meta-route order: 89 58 152 154 138 6 40 96 146 195 149 12 5 60 116 198 31 190 167 156
Individual routes: 1: 89 146 31 190 167 2: 58 152 40 149 198 3: 154 138 195 12 116 4: 6 96 5 60 156

Table P-89: p03_2SetIII

Total profit: 6124 Total distance: 186.26 Total distance and service time: 396.26 Meta-route order: 53 27 6 94 18 87 8 92 82 91 83 16 5 86 96 59 95 100 97 13 89
Individual routes: 1: 27 18 8 82 83 5 96 59 95 97 13 2: 53 6 94 87 92 91 16 86 100 89

Table P-90: p03_3SetIII

Total profit: 11060 Total distance: 271.48 Total distance and service time: 591.48 Meta-route order: 53 27 40 6 94 18 92 83 4 91 16 5 56 100 59 37 98 97 25 87 95 55 96 57 99 54 89 73 68 72 76 28
Individual routes: 1: 53 40 4 56 25 55 54 68 76 28 2: 6 94 92 91 16 100 37 98 95 96 99 89 3: 27 18 83 5 59 97 87 57 73 72

Table P-91: p03_4SetIII

Total profit: 15805 Total distance: 398.60 Total distance and service time: 778.60 Meta-route order: 53 27 40 94 37 61 91 4 51 16 33 56 92 98 17 50 96 25 95 55 83 80 87 60 5 57 54 39 99 59 68 97 72 6 73 79 89 76
Individual routes: 1: 94 37 91 16 17 83 60 5 99 59 6 2: 27 51 33 50 80 54 68 79 76 3: 61 92 98 96 95 87 57 97 89 4: 53 40 4 56 25 55 39 72 73

Table P-92: p06_2SetIII

Total profit: 2242 Total distance: 227.07 Total distance and service time: 397.07 Meta-route order: 12 5 38 15 45 21 37 50 16 11 13 1 25 8 27 6 46
Individual routes: 1: 5 38 21 50 16 11 1 8 27 2: 12 15 45 37 13 25 6 46

Table P-93: p06_3SetIII

Total profit: 3724 Total distance: 346.76 Total distance and service time: 586.76 Meta-route order: 12 5 18 14 15 45 34 21 37 1 17 50 4 48 38 23 16 13 11 8 25 27 6 46
Individual routes: 1: 18 14 1 48 23 8 27 46 2: 12 34 21 50 38 16 11 6 3: 5 15 45 37 17 4 13 25

Table P-94: p06_4SetIII

Total profit: 5154 Total distance: 474.25 Total distance and service time: 794.25 11 48 5 14 2 18 37 20 44 15 13 29 9 42 34 40 22 21 1 17 19 50 47 31 4 38 8 16 6 25 46
Individual routes: 1: 14 18 13 40 19 4 25 2: 48 9 34 21 50 38 16 46 3: 11 2 20 29 22 1 31 8 4: 12 5 37 44 15 42 17 47 6

Table P-95: p07_2SetIII

Total profit: 2893 Total distance: 172.02 Total distance and service time: 312.02 Meta-route order: 39 1 72 73 68 65 6 38 67 35 46 34 7 26
Individual routes: 1: 1 73 68 6 67 46 34 2: 39 72 65 38 35 7 26

Table P-96: p07_3SetIII

Total profit: 5225 Total distance: 259.88 Total distance and service time: 469.88 Meta-route order: 4 2 74 32 15 28 57 39 1 27 10 73 52 38 34 65 16 7 26 17 8
Individual routes: 1: 2 74 28 1 73 16 17 2: 4 15 57 27 52 34 7 26 3: 32 39 10 38 65 8

Table P-97: p07_4SetIII

Total profit: 7562 Total distance: 342.56 Total distance and service time: 622.56 Meta-route order: 51 12 27 39 58 45 63 9 30 32 11 3 68 28 65 4 62 49 10 67 33 16 72 73 35 7 6 26
Individual routes: 1: 27 45 30 28 62 33 73 2: 12 58 11 65 10 72 26 3: 51 63 68 4 67 35 7 4: 39 9 32 3 49 16 6

Table P-98: p08_2SetIII

Total profit: 7088 Total distance: 274.20 Total distance and service time: 451.20 Meta-route order: 52 50 7 33 78 46 3 8 80 60 84 40 17 61 91 56 98 92 95 55 99 96 25 6 24
Individual routes: 1: 50 33 78 3 80 40 56 55 25 24 2: 52 7 46 8 60 84 17 61 91 98 92 95 99 96 6

Table P-99: p08_3SetIII

Total profit: 11178 Total distance: 365.23 Total distance and service time: 682.23 Meta-route order: 28 52 50 69 18 33 83 88 78 7 82 3 37 92 8 98 80 91 46 100 97 21 17 58 74 84 53 56 60 40 99 96 55 25 6 89 24
Individual routes: 1: 50 33 78 3 80 21 74 56 55 25 24 2: 52 18 83 37 92 98 91 100 97 58 53 40 3: 28 69 88 7 82 8 46 17 84 60 99 96 6 89

Table P-100: p08_4SetIII

Total profit: 16095 Total distance: 491.29 Total distance and service time: 915.29 Meta-route order: 28 40 52 69 88 37 1 74 91 16 56 70 51 61 33 41 90 50 95 63 92 97 15 62 57 78 7 73 43 21 80 8 26 100 84 98 55 53 93 25 83 99 60 6 96 24
Individual routes: 1: 28 69 1 51 33 50 78 80 55 25 24 2: 40 74 56 41 15 57 43 100 98 93 99 6 3: 37 91 16 61 95 92 97 73 21 26 53 4: 52 88 70 90 63 62 7 8 84 83 60 96

Table P-101: p09_2SetIII

Total profit: 11627 Total distance: 187.62 Total distance and service time: 397.62 Meta-route order: 12 49 146 76 103 66 141 150 52 71 56 47 123 15 55 37 149 4 144 147 139
Individual routes: 1: 12 146 66 141 150 56 47 55 149 4 144 2: 49 76 103 52 71 123 15 37 147 139

Table P-102: p09_3SetIII

Total profit: 20296 Total distance: 253.42 Total distance and service time: 593.42 Meta-route order: 12 46 5 76 32 145 119 142 103 81 150 108 141 1 120 137 55 52 15 143 138 135 107 27 148 87 4 147 68 56 37 102 144 139
Individual routes: 1: 46 32 119 81 1 120 138 27 68 102 139 2: 5 76 103 108 137 52 15 107 147 37 144 3: 12 145 142 150 141 55 143 135 148 87 4 56

Table P-103: p09_4SetIII

Total profit: 27092 Total distance: 333.80 Total distance and service time: 793.80 Meta-route order: 103 46 12 5 90 145 81 137 142 76 27 49 107 141 135 9 32 119 143 62 92 1 130 55 51 87 110 53 133 147 129 29 83 68 146 131 47 16 102 56 149 4 139 144 38 78
Individual routes: 1: 137 107 92 87 147 146 47 56 149 4 144 2: 46 81 27 32 119 1 51 83 131 38 78 3: 103 5 90 76 49 9 62 130 53 129 29 16 4: 12 145 142 141 135 143 55 110 133 68 102 139

Table P-104: p10_2SetIII

Total profit: 16899 Total distance: 153.85 Total distance and service time: 393.85 Meta-route order: 95 112 188 2 105 96 33 98 197 58 43 111 199 34 191 1 195 53 35 7 149 61 26 60
Individual routes: 1: 95 188 105 96 33 197 43 199 191 1 195 53 61 2: 112 2 98 58 111 34 35 7 149 26 60

Table P-105: p10_3SetIII

Total profit: 30661 Total distance: 251.73 Total distance and service time: 591.73 Meta-route order: 126 95 157 33 112 195 188 67 151 159 101 76 40 184 173 12 160 172 100 41 7 45 197 149 27 26 194 66 179 167 86 17 65 127
Individual routes: 1: 157 112 101 173 172 45 27 179 167 65 127 2: 126 95 188 151 76 40 12 100 7 149 26 17 3: 33 195 67 159 184 160 41 197 194 66 86

Table P-106: p10_4SetIII

Total profit: 45018 Total distance: 346.10 Total distance and service time: 796.10 Meta-route order: 95 188 157 4 105 33 16 101 159 112 99 104 58 196 111 173 160 172 141 22 41 28 43 100 199 94 197 149 195 140 158 175 194 21 65 186 167 93 48 2 34 86 30 60 54
Individual routes: 1: 95 16 159 104 160 41 43 195 186 93 86 2: 188 105 33 112 196 141 22 199 197 158 194 2 3: 157 101 173 172 28 94 140 21 48 30 54 4: 4 99 58 111 100 149 175 65 167 34 60

Table P-107: p13_2SetIII

Total profit: 11904 Total distance: 282.23 Total distance and service time: 1432.23 Meta-route order: 85 18 115 108 97 96 119 1 95 111 10 7 92 82 8 91 14 94 9 100 87 98 104
Individual routes: 1: 85 18 108 1 10 7 8 14 9 98 104 2: 115 97 96 119 95 111 92 82 91 94 100 87

Table P-108: p13_3SetIII

Total profit: 20202 Total distance: 448.13 Total distance and service time: 2148.13 Meta-route order: 96 107 108 119 95 69 117 1 111 75 72 85 10 7 82 70 92 8 118 14 9 87 6 88 81 91 113 98 109 100 104 90 105 102
Individual routes: 1: 96 119 95 117 111 85 82 92 118 87 88 81 2: 108 1 10 7 8 14 9 6 113 109 90 3: 107 69 75 72 70 91 98 100 104 105 102

Table P-109: p13_4SetIII

Total profit: 27411 Total distance: 667.93 Total distance and service time: 2867.93 Meta-route order: 107 18 115 110 99 96 108 69 119 70 1 111 4 75 72 85 10 112 7 92 14 82 9 88 6 87 113 12 91 32 94 30 28 100 25 98 16 104 81 120 90 105 114 109
Individual routes: 1: 107 69 70 75 72 94 100 98 104 120 105 2: 18 1 4 10 7 14 9 6 12 81 90 3: 115 99 119 111 85 112 92 82 88 87 113 91 4: 110 96 108 32 30 28 25 16 114 109

Table P-110: p14_2SetIII

Total profit: 8472 Total distance: 353.55 Total distance and service time: 2063.55 Meta-route order: 23 1 36 22 33 27 25 47 45 87 41 66 65 63 67 68 57 82 83
Individual routes: 1: 1 22 27 87 67 68 57 82 83 2: 23 36 33 25 47 45 41 66 65 63

Table P-111: p14_3SetIII

Total profit: 14696 Total distance: 500.96 Total distance and service time: 3110.96 Meta-route order: 22 9 51 1 8 98 33 23 96 36 27 25 87 47 41 44 45 65 21 68 72 29 66 82 67 83 5 10 99
Individual routes: 1: 9 1 98 96 87 65 68 72 66 67 2: 51 33 36 47 82 83 5 10 99 3: 22 8 23 27 25 41 44 45 21 29

Table P-112: p14_4SetIII

Total profit: 19978 Total distance: 749.08 Total distance and service time: 4079.08 Meta-route order: 22 1 61 51 8 98 23 36 33 26 27 25 39 47 67 41 44 45 48 49 6 75 18 29 66 87 5 63 68 99 73 65 79 83 82 10 11
Individual routes: 1: 22 8 23 47 41 44 45 48 49 66 2: 1 98 67 29 63 68 65 10 11 3: 61 26 27 25 6 75 87 73 79 4: 51 36 33 39 18 5 99 83 82

Table P-113: p15_2SetIII

Total profit: 11710 Total distance: 164.88 Total distance and service time: 394.88 Meta-route order: 53 28 27 116 77 68 150 94 134 98 80 109 61 12 138 104 59 111 37 96 146 117 13
Individual routes: 1: 28 116 77 68 150 134 80 109 12 138 111 146 2: 53 27 94 98 61 104 59 37 96 117 13

Table P-114: p15_3SetIII

Total profit: 19886 Total distance: 245.00 Total distance and service time: 595.00 Meta-route order: 105 89 40 69 132 58 1 137 82 87 33 144 57 102 125 45 115 3 79 84 129 73 116 110 93 77 99 76 149 92 111 94 6 53 147
Individual routes: 1: 89 82 125 45 84 93 99 92 94 6 147 2: 69 132 1 33 102 3 79 129 116 77 76 111 3: 105 40 58 137 87 144 57 115 73 110 149 53

Table P-115: p15_4SetIII

Total profit: 28530 Total distance: 326.21 Total distance and service time: 796.21 Meta-route order: 27 112 89 40 69 132 105 58 1 60 118 137 138 102 149 114 33 57 8 144 129 82 79 130 2 3 106 116 87 7 110 77 76 72 59 31 92 75 111 95 88 74 94 148 73 6 53
Individual routes: 1: 89 60 118 114 8 82 106 7 31 88 148 2: 27 69 132 1 102 33 129 79 3 116 77 76 111 3: 112 105 138 149 130 110 72 75 74 73 53 4: 40 58 137 57 144 2 87 59 92 95 94 6

Table P-116: p16_2SetIII

Total profit: 17188 Total distance: 158.71 Total distance and service time: 398.71 Meta-route order: 146 105 52 149 194 106 109 153 12 177 166 150 80 163 104 134 92 24 85 193 54 26 112 156
Individual routes: 1: 105 149 109 12 177 150 80 163 134 24 54 26 2: 146 52 194 106 153 166 104 92 85 193 112 156

Table P-117: p16_3SetIII

Total profit: 29683 Total distance: 238.20 Total distance and service time: 588.20 Meta-route order: 111 149 50 69 157 167 110 102 52 76 56 184 194 106 68 153 150 80 171 74 18 72 163 109 180 94 12 26 89 28 112 53 154 138 156
Individual routes: 1: 50 157 102 76 184 68 150 80 163 109 12 53 2: 149 110 56 171 74 72 180 26 28 154 138 3: 111 69 167 52 194 106 153 18 94 89 112 156

Table P-118: p16_4SetIII

Total profit: 41953 Total distance: 329.25 Total distance and service time: 789.25 Meta-route order: 146 105 147 52 6 149 195 95 106 153 151 177 110 150 80 99 4 116 76 56 184 16 197 176 72 91 50 74 171 173 12 115 70 109 101 104 137 96 130 132 54 53 27 112 156 26
Individual routes: 1: 105 149 110 4 56 197 72 74 171 115 137 53 2: 147 6 95 151 99 16 91 173 104 96 112 156 3: 146 52 106 153 176 12 109 130 54 26 4: 195 177 150 80 116 76 184 50 70 101 132 27

Table P-119: p03_SetIV

Total profit: 271668 Total distance: 3531.76 Total distance and service time: 4531.76 Meta-route order: 50 17 25 29 22 69 57 27 30 23 97 72 8 20 36 86 60 5 4 91 45 78 90 70 24 19 56 84 89 10 28 55 76 48 46 54 59 34 87 58 14 42 99 2 80 15 51 13 74 43 40 18 41 96 53 1 31 63 94 77 98 44 93 7 75 35 79 61 73 83 67 81 3 21 92 38 11 16 71 100 26 32 62 52 66 49 95 33 64 12 37 39 6 9 88 47 85 65 68 82
Individual routes: 1: 50 17 25 29 22 69 57 27 30 23 97 72 8 20 36 86 60 5 4 91 45 78 90 70 24 19 56 84 89 10 28 55 76 48 46 54 59 34 87 58 14 42 99 2 80 15 51 13 74 43 40 18 41 96 53 1 31 63 94 77 98 44 93 7 75 35 79 61 73 83 67 81 3 21 92 38 11 16 71 100 26 32 62 52 66 49 95 33 64 12 37 39 6 9 88 47 85 65 68 82

Table P-120: p06_SetIV

Total profit: 34693 Total distance: 1919.77 Total distance and service time: 2419.77 Meta-route order: 47 38 19 16 22 44 12 29 15 21 28 45 20 37 41 42 35 6 26 9 3 48 34 31 5 46 36 2 18 39 11 13 33 50 24 14 25 17 32 10 30 49 43 23 4 8 40 1 7 27
Individual routes: 1: 47 38 19 16 22 44 12 29 15 21 28 45 20 37 41 42 35 6 26 9 3 48 34 31 5 46 36 2 18 39 11 13 33 50 24 14 25 17 32 10 30 49 43 23 4 8 40 1 7 27

Table P-121: p07_SetIV

Total profit: 116126 Total distance: 2599.14 Total distance and service time: 3349.14 Meta-route order: 24 34 48 39 12 19 40 60 21 2 46 1 36 3 70 37 73 43 30 69 11 16 38 41 47 56 13 61 62 18 58 5 33 72 50 27 22 14 74 32 23 49 45 63 31 6 75 29 68 64 52 53 7 10 8 17 42 66 59 35 51 28 65 57 15 9 67 26 25 20 55 4 71 54 44
Individual routes: 1: 24 34 48 39 12 19 40 60 21 2 46 1 36 3 70 37 73 43 30 69 11 16 38 41 47 56 13 61 62 18 58 5 33 72 50 27 22 14 74 32 23 49 45 63 31 6 75 29 68 64 52 53 7 10 8 17 42 66 59 35 51 28 65 57 15 9 67 26 25 20 55 4 71 54 44

Table P-122: p08_SetIV

Total profit: 271848 Total distance: 3563.51 Total distance and service time: 5021.51 Meta-route order: 50 10 17 24 22 1 38 35 25 29 69 57 19 55 48 34 30 75 23 97 72 84 8 26 20 36 86 60 5 4 54 59 91 87 90 58 83 14 80 56 76 89 46 74 99 79 18 51 44 13 45 41 53 61 92 28 62 11 78 43 71 70 64 98 9 32 63 40 93 52 42 7 67 100 94 66 73 49 95 2 33 15 82 96 81 16 77 12 27 3 21 31 39 65 88 6 37 47 85 68
Individual routes: 1: 50 10 17 24 22 1 38 35 25 29 69 57 19 55 48 34 30 75 23 97 72 84 8 26 20 36 86 60 5 4 54 59 91 87 90 58 83 14 80 56 76 89 46 74 99 79 18 51 44 13 45 41 53 61 92 28 62 11 78 43 71 70 64 98 9 32 63 40 93 52 42 7 67 100 94 66 73 49 95 2 33 15 82 96 81 16 77 12 27 3 21 31 39 65 88 6 37 47 85 68

Table P-123: p09_SetIV

Total profit: 905836 Total distance: 4531.89 Total distance and service time: 6031.89 Meta-route order: 60 24 112 68 99 55 91 10 122 59 102 129 135 134 146 100 50 92 6 148 74 27 26 144 84 20 67 18 81 5 79 137 139 16 58 11 119 118 110 52 138 93 57 14 120 8 87 17 104 12 53 15 109 124 141 54 63 72 131 37 46 73 108 71 123 88 76 25 95 82 35 64 13 65 133 136 19 127 29 130 143 40 107 105 49 75 80 51 56 44 116 101 21 85 39 89 30 113 69 98 48 96 142 34 90 23 2 1 7 31 149 47 38 106 78 126 140 70 9 22 111 33 4 150 121 28 97 3 36 128 83 125 147 41 145 66 43 94 132 62 77 86 115 117 61 32 45 114 103 42
Individual routes: 1: 60 24 112 68 99 55 91 10 122 59 102 129 135 134 146 100 50 92 6 148 74 27 26 144 84 20 67 18 81 5 79 137 139 16 58 11 119 118 110 52 138 93 57 14 120 8 87 17 104 12 53 15 109 124 141 54 63 72 131 37 46 73 108 71 123 88 76 25 95 82 35 64 13 65 133 136 19 127 29 130 143 40 107 105 49 75 80 51 56 44 116 101 21 85 39 89 30 113 69 98 48 96 142 34 90 23 2 1 7 31 149 47 38 106 78 126 140 70 9 22 111 33 4 150 121 28 97 3 36 128 83 125 147 41 145 66 43 94 132 62 77 86 115 117 61 32 45 114 103 42

Table P-124: p10_SetIV

Total profit: 2102454 Total distance: 5589.01 Total distance and service time: 7579.01 Meta-route order: 18 63 9 102 54 30 108 83 45 122 21 166 14 8 186 59 184 96 40 57 141 12 109 174 196 51 180 176 26 90 140 92 194 151 154 15 150 70 13 175 42 182 137 24 146 89 107 104 192 25 160 158 5 1 112 103 80 159 144 101 190 36 91 29 10 98 149 75 118 74 116 132 4 164 31 100 163 114 87 64 19 23 189 73 145 173 139 55 2 61 34 60 22 56 33 105 37 120 50 95 129 133 157 65 81 41 153 155 161 16 165 110 124 181 187 72 167 123 7 77 52 11 148 119 185 62 48 66 17 99 46 78 126 38 82 20 39 156 131 193 3 97 93 152 125 199 143 136 171 121 130 67 115 88 197 172 6 117 162 86 127 198 47 142 113 169 49 147 28 195 79 191 53 178 177 69 35 134 170 76 135 85 71 44 106 168 94 68 183 138 179 84 32 43 188 27 111 58 128
Individual routes: 1: 18 63 9 102 54 30 108 83 45 122 21 166 14 8 186 59 184 96 40 57 141 12 109 174 196 51 180 176 26 90 140 92 194 151 154 15 150 70 13 175 42 182 137 24 146 89 107 104 192 25 160 158 5 1 112 103 80 159 144 101 190 36 91 29 10 98 149 75 118 74 116 132 4 164 31 100 163 114 87 64 19 23 189 73 145 173 139 55 2 61 34 60 22 56 33 105 37 120 50 95 129 133 157 65 81 41 153 155 161 16 165 110 124 181 187 72 167 123 7 77 52 11 148 119 185 62 48 66 17 99 46 78 126 38 82 20 39 156 131 193 3 97 93 152 125 199 143 136 171 121 130 67 115 88 197 172 6 117 162 86 127 198 47 142 113 169 49 147 28 195 79 191 53 178 177 69 35 134 170 76 135 85 71 44 106 168 94 68 183 138 179 84 32 43 188 27 111 58 128

Table P-125: p13_SetIV

Total profit: 467330 Total distance: 6021.72 Total distance and service time: 12021.72 Meta-route order: 95 4 65 24 38 105 41 14 72 46 73 80 102 22 20 2 25 30 84 19 13 89 108 77 1 111 17 7 87 11 39 29 93 33 120 104 67 112 75 74 62 64 18 115 63 98 21 15 107 43 60 42 66 56 79 100 57 61 36 109 83 8 70 68 5 92 58 50 6 28 26 85 9 106 116 52 118 59 10 23 96 88 71 117 31 34 81 54 32 99 76 3 16 86 110 101 45 69 37 40 12 51 27 35 53 90 114 113 55 48 97 47 49 44 94 103 78 119 91 82
Individual routes: 1: 95 4 65 24 38 105 41 14 72 46 73 80 102 22 20 2 25 30 84 19 13 89 108 77 1 111 17 7 87 11 39 29 93 33 120 104 67 112 75 74 62 64 18 115 63 98 21 15 107 43 60 42 66 56 79 100 57 61 36 109 83 8 70 68 5 92 58 50 6 28 26 85 9 106 116 52 118 59 10 23 96 88 71 117 31 34 81 54 32 99 76 3 16 86 110 101 45 69 37 40 12 51 27 35 53 90 114 113 55 48 97 47 49 44 94 103 78 119 91 82

Table P-126: p14_SetIV

Total profit: 271812 Total distance: 3830.70 Total distance and service time: 12830.70 Meta-route order: 50 24 22 10 1 38 17 35 25 29 69 57 19 55 48 34 30 75 23 97 72 84 8 26 20 36 86 60 5 4 54 59 91 87 90 11 58 83 14 80 56 46 74 99 79 51 13 53 61 64 45 78 76 70 89 43 40 18 41 98 44 92 9 28 71 32 63 93 42 7 67 94 66 73 95 100 2 33 49 82 96 81 31 15 16 77 3 62 52 27 21 39 12 65 88 6 37 47 85 68
Individual routes: 1: 50 24 22 10 1 38 17 35 25 29 69 57 19 55 48 34 30 75 23 97 72 84 8 26 20 36 86 60 5 4 54 59 91 87 90 11 58 83 14 80 56 46 74 99 79 51 13 53 61 64 45 78 76 70 89 43 40 18 41 98 44 92 9 28 71 32 63 93 42 7 67 94 66 73 95 100 2 33 49 82 96 81 31 15 16 77 3 62 52 27 21 39 12 65 88 6 37 47 85 68

Table P-127: p15_SetIV

Total profit: 906003 Total distance: 4740.95 Total distance and service time: 6240.95 Meta-route order: 143 60 24 122 59 74 135 57 112 46 134 76 14 146 68 92 55 6 107 100 10 20 71 11 119 1 106 50 105 27 31 53 18 144 120 79 126 130 87 17 129 123 148 21 91 81 26 131 104 4 23 149 84 99 137 45 16 118 47 67 139 110 58 52 93 12 109 127 138 63 102 72 96 37 140 8 73 15 88 108 25 95 40 13 38 116 133 111 66 80 82 78 101 70 65 29 121 36 141 97 86 56 75 5 44 9 35 136 49 30 83 43 19 124 145 85 115 113 42 64 54 69 39 98 22 51 33 117 89 48 150 28 7 34 3 128 132 142 125 147 2 94 90 62 61 41 32 77 103 114
Individual routes: 1: 143 60 24 122 59 74 135 57 112 46 134 76 14 146 68 92 55 6 107 100 10 20 71 11 119 1 106 50 105 27 31 53 18 144 120 79 126 130 87 17 129 123 148 21 91 81 26 131 104 4 23 149 84 99 137 45 16 118 47 67 139 110 58 52 93 12 109 127 138 63 102 72 96 37 140 8 73 15 88 108 25 95 40 13 38 116 133 111 66 80 82 78 101 70 65 29 121 36 141 97 86 56 75 5 44 9 35 136 49 30 83 43 19 124 145 85 115 113 42 64 54 69 39 98 22 51 33 117 89 48 150 28 7 34 3 128 132 142 125 147 2 94 90 62 61 41 32 77 103 114

Table P-128: p16_SetIV

Total profit: 2103188 Total distance: 5315.95 Total distance and service time: 7305.95 Meta-route order: 102 30 63 9 104 57 140 108 142 166 8 96 141 83 40 103 109 92 62 174 12 150 51 194 176 116 90 97 154 13 78 160 149 190 106 4 42 182 14 127 89 1 173 39 125 112 21 68 137 145 24 117 45 107 144 25 80 29 70 126 10 164 151 75 15 186 36 175 118 132 31 114 95 87 16 56 153 123 93 64 159 146 19 189 167 139 55 22 115 122 158 50 77 169 101 184 162 133 100 73 53 76 129 99 44 94 59 91 192 74 72 163 136 157 65 23 187 43 41 18 98 156 2 143 61 54 34 60 52 33 105 110 177 17 148 48 161 131 113 37 155 130 3 69 120 35 81 49 7 196 121 165 79 11 66 71 185 86 5 119 38 46 47 88 193 172 180 147 195 152 134 67 178 183 197 171 170 191 85 28 138 179 84 27 58 199 6 168 124 188 82 181 135 26 111 32 20 198 128
Individual routes: 1: 102 30 63 9 104 57 140 108 142 166 8 96 141 83 40 103 109 92 62 174 12 150 51 194 176 116 90 97 154 13 78 160 149 190 106 4 42 182 14 127 89 1 173 39 125 112 21 68 137 145 24 117 45 107 144 25 80 29 70 126 10 164 151 75 15 186 36 175 118 132 31 114 95 87 16 56 153 123 93 64 159 146 19 189 167 139 55 22 115 122 158 50 77 169 101 184 162 133 100 73 53 76 129 99 44 94 59 91 192 74 72 163 136 157 65 23 187 43 41 18 98 156 2 143 61 54 34 60 52 33 105 110 177 17 148 48 161 131 113 37 155 130 3 69 120 35 81 49 7 196 121 165 79 11 66 71 185 86 5 119 38 46 47 88 193 172 180 147 195 152 134 67 178 183 197 171 170 191 85 28 138 179 84 27 58 199 6 168 124 188 82 181 135 26 111 32 20 198 128

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